

SALT ver 4.5 measurement loogbook

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Created: June 2018

Last change: July 6, 2018

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Documentation Conventions

To aid the readers understanding, a consistent formatting style has been used throughout this manual.

- Internal signals are written using *italic* font.
- External connections names (pads) like supplies use CAPITAL LETTERS only.
- External signals names, however, are in capital letters but using *ITALIC* font also.
- Configuration elements like register names are written in sans serif font.
- Signals controlled by configuration bits use *slanted sans serif* font.

For numbers the Verilog prefix style is used:

- **'b** for binary numbers e.g 'b1010,
- **'h** for hexadecimal numbers e.g 'hA7,
- **'d** for decimal numbers e.g 'd72,
- no prefix means that the number is in decimal notation.

Some C style prefixes **0x** for hexadecimal numbers may also appear in this document.

1 Measurements setup

1.1 SALT registers configuration

Table 1: Base configuration (from JC); DLL VCDL setting is different in each chip

Addr	Value	Comment
'h004	'h8C	PLL on
'h006	'h12	PLL VCO='h12
'h004	'hCC	PLL connected
'h000	'h22	pattern register to output
'h001	'hF0	pattern value='hF0
'h008	'h00	ser_byte_start=0
'h300	'h0C	DLL not connected and started, HLP inactive; test and monitors off
'h301	??	DLL VCDL=?? (see table 4)
'h300	'h4C	DLL not connected, started, HLP inactive; test and monitors off
'h300	'h6C	DLL connected, started, HLP inactive; test and monitors off
'h002	'h1F	deser_cfg: deser_byte_start=7; data_clk_sel[1:0]=2'b11
'h003	'h3B	pll_clk_cfg: sel[1]=3; sel[0]='hB
'h507	'h01	idle group size=1

Table 2: Test pulse configuration (from JC)

Addr	Value	Comment
'h300	'hE4	DLL active, test channels on
'h305	'h9F	Calib inverted, pulse_len 'h1F='d31 (max)
'h306	'h3F	Calib volt='h3F
'h007	'h07	tfc_fifo_len='h07
'h303	'h63	adc_clk_sel='h23
'h104	'h80	adc_sync_sel=1 (DSP input synchronization)
'h203	'h0C	shaper_dac='h0C
'h201	'h0F	preamp_dac='h0F
'h31B	'h15	vcm_cur='h15

Table 3: Calibration and ADC delay optimizations

Addr	Value	Comment
'h305	'hE4	Calib not inverted, pulse_len 'h1F='d31 (max)
'h306	'h9F	Calib volt='h00
'h200	'h07	ADC delay='d7

1.2 DLL `dll_vcdl_cfg` register optimal value for different ASICs

Optimum value of `dll_vcdl_cfg` was obtained from DLL configuration procedure described in the SALT documentation. The procedure have to be repeated for each particular ASIC.

Table 4: Optimal `dll_vcdl_cfg` register value

ASIC version	<code>dll_vcdl_cfg</code>
ASIC 0	–
ASIC 1	'h31
ASIC 2	'h2F
ASIC 3	–
ASIC 4	'h28
ASIC 5	'h2B

For ASIC 0 a suboptimal value 'h23 was used, which caused some DLL instabilities.

1.3 Input capacitance assembly

Input capacitance assembly is shown on Figure 1 – small PCB (hereinafter referred as cap-PCB) glued in front of SALT ASIC. The cap-PCB contains two signal bondpads (top right and bottom right), the center bondpad, common for both capacitors, bonded directly to the ASIC ground pad on main PCB, and two capacitors soldered (on the left). The signal bondpads of cap-PCB are boned to the inputs 0 and 127 on SALT ASIC (connected to the test channels 0 and 1, referred hereinafter as channels -1 and 128).

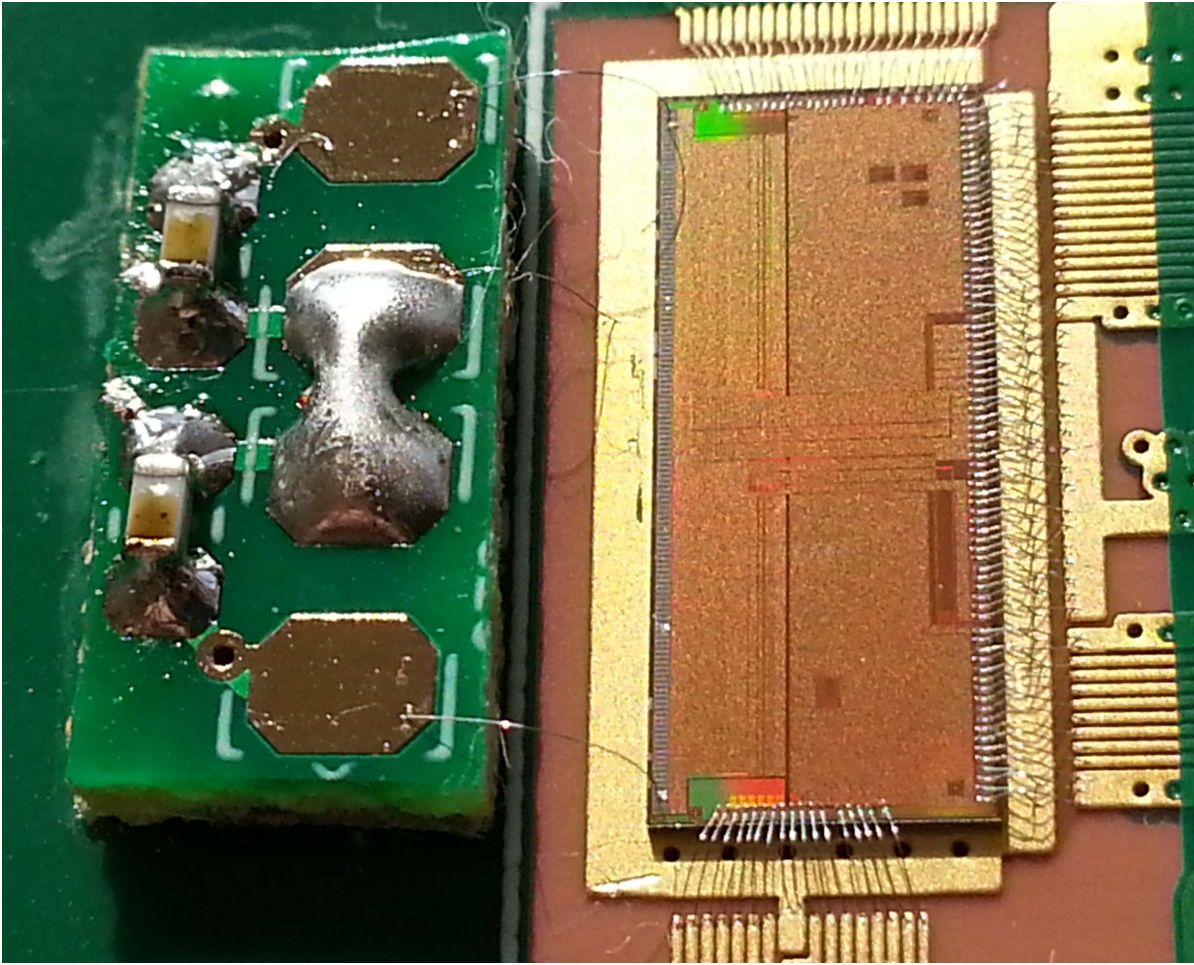


Figure 1: Input capacitance assembly

2 Board 0 with ASIC 0

No quantitative measurements done, only some result which may be partial or incomplete.

2.1 Before input pads bonded

ASIC configuration: default values after reset.

No results for channel 128 before bonding.

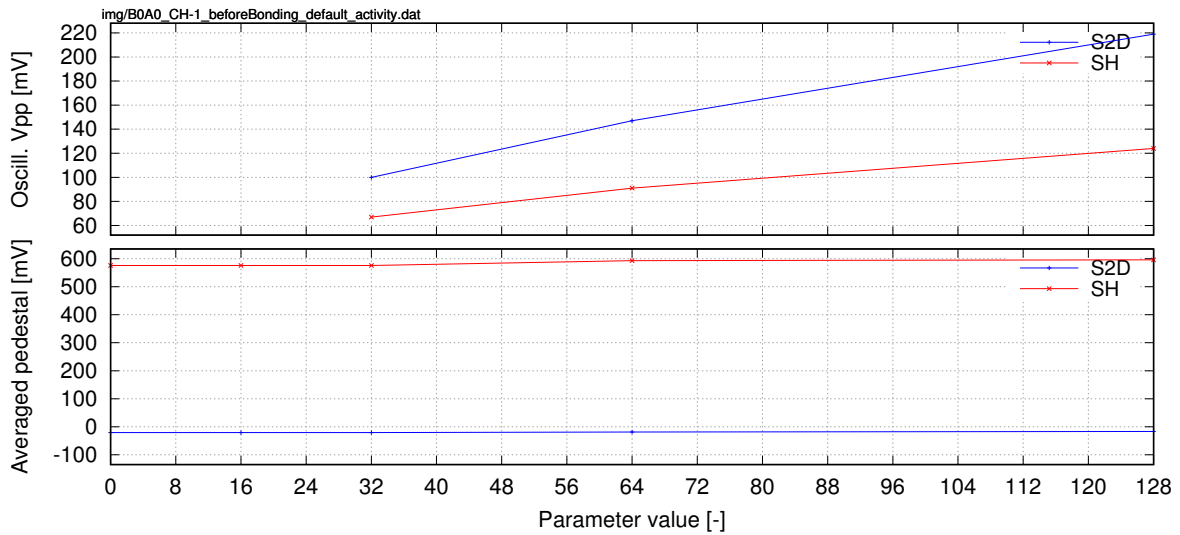


Figure 2: B0A0, channel -1, before bonding. Parameter=no. of active ADCs

2.2 Cap-PCB bonded, 12 pF capacitors assembled

ASIC configuration: default values after reset.

Cap-PCB assembled, bonded to SALT input pads 0 and 127, two 12 pF capacitors soldered to the cap-PCB.

Short on cap-PCB found, this result is irrelevant.

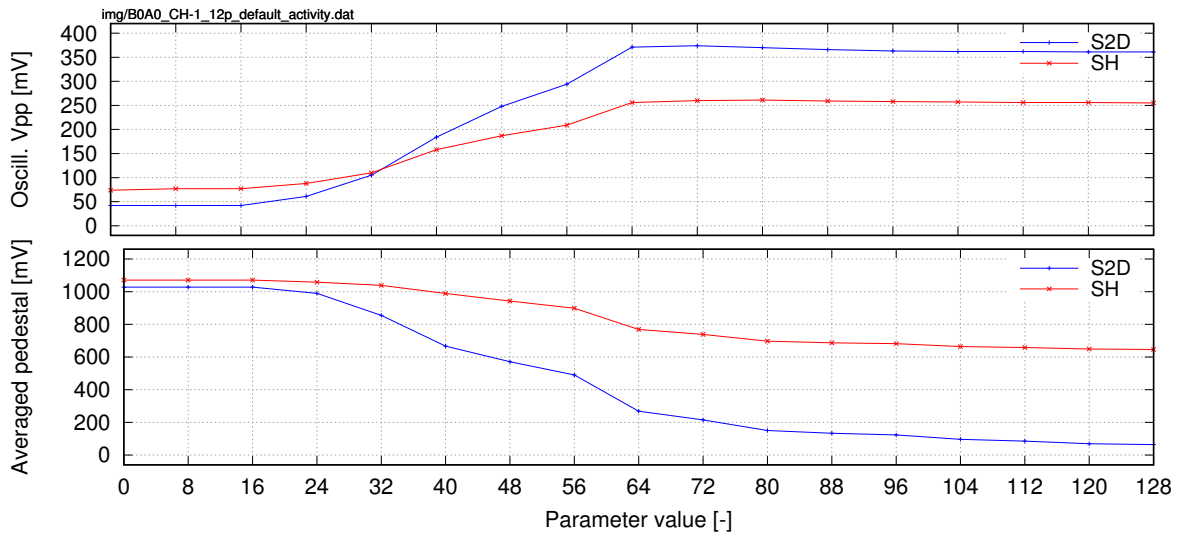


Figure 3: B0A0, channel -1, cap-PCB bonded, 12 pF capacitors assembled. Parameter=no. of active ADCs

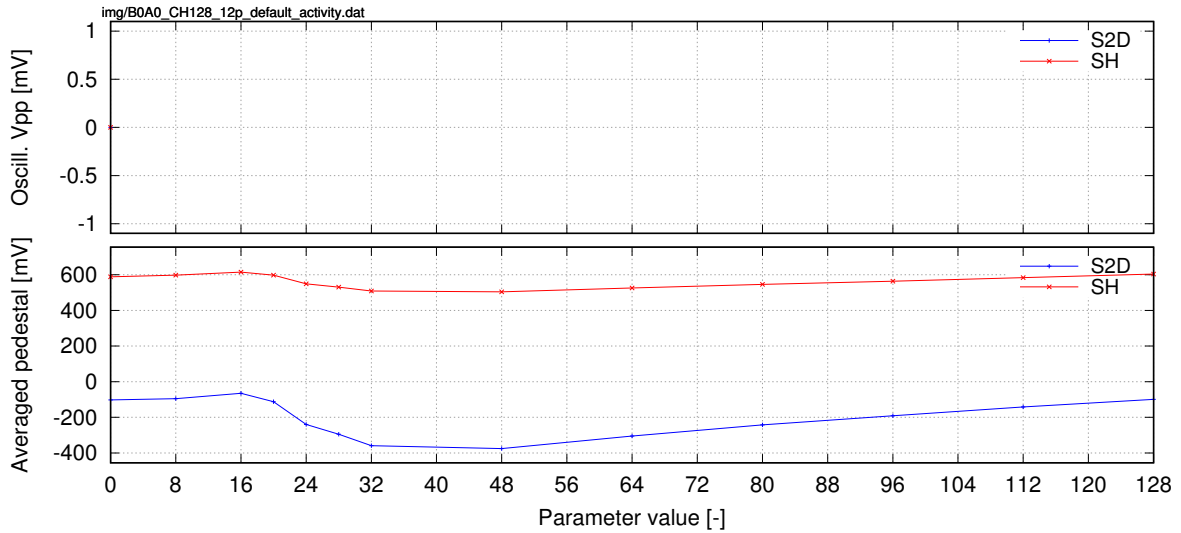


Figure 4: B0A0, channel 128, cap-PCB bonded, 12 pF capacitors assembled, **no data for oscillations**. Parameter=no. of active ADCs

2.3 Cap-PCB bonded, capacitors removed

ASIC configuration: default values after reset.

Cap-PCB assembled, bonded to SALT input pads 0 and 127. Capacitors removed from cap-PCB.

Short on cap-PCB found, this result is irrelevant.

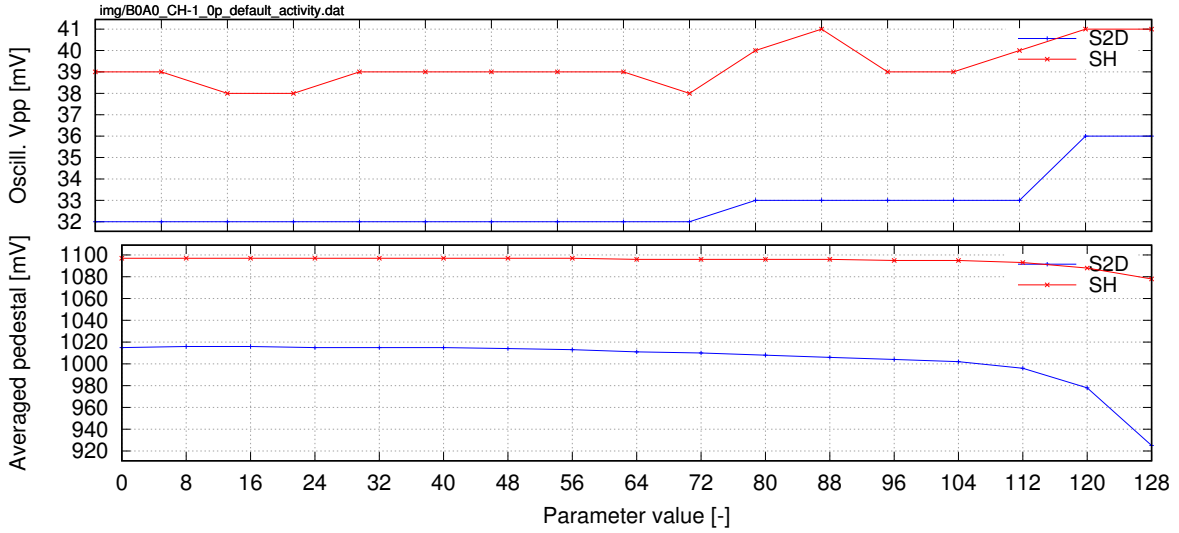


Figure 5: B0A0, channel -1, cap-PCB bonded, capacitors removed. Parameter=no. of active ADCs

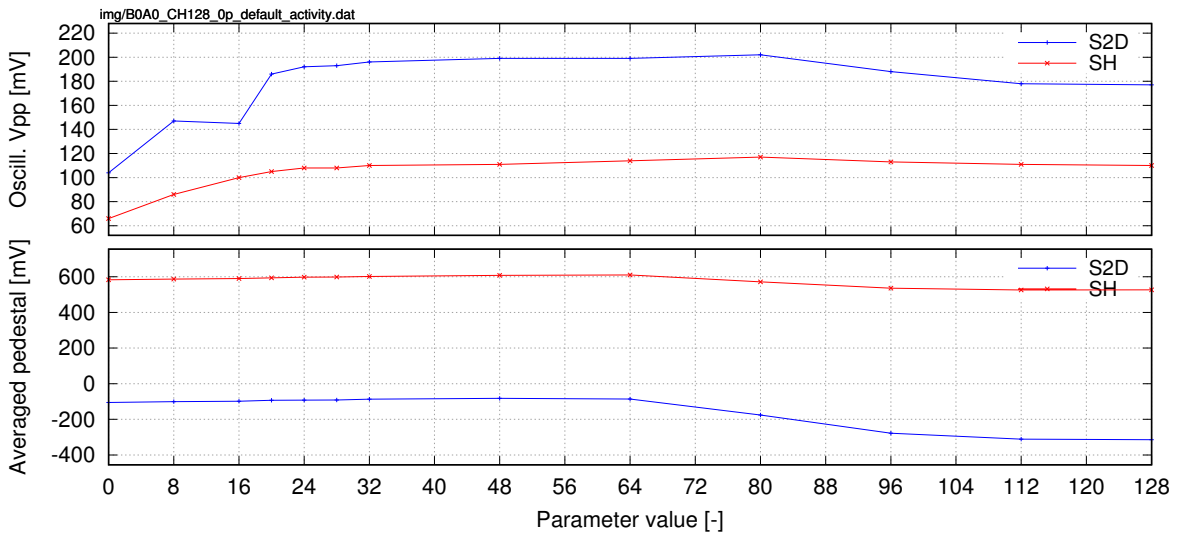


Figure 6: B0A0, channel 128, cap-PCB bonded, capacitors removed. Parameter=no. of active ADCs

2.4 Cap-PCB bonded, 12 pF capacitors re-assembled

ASIC configuration: default values after reset.

Cap-PCB assembled, bonded to SALT input pads 0 and 127, two 12 pF capacitors re-assembled to the cap-PCB.

Short on cap-PCB found, this result is irrelevant.

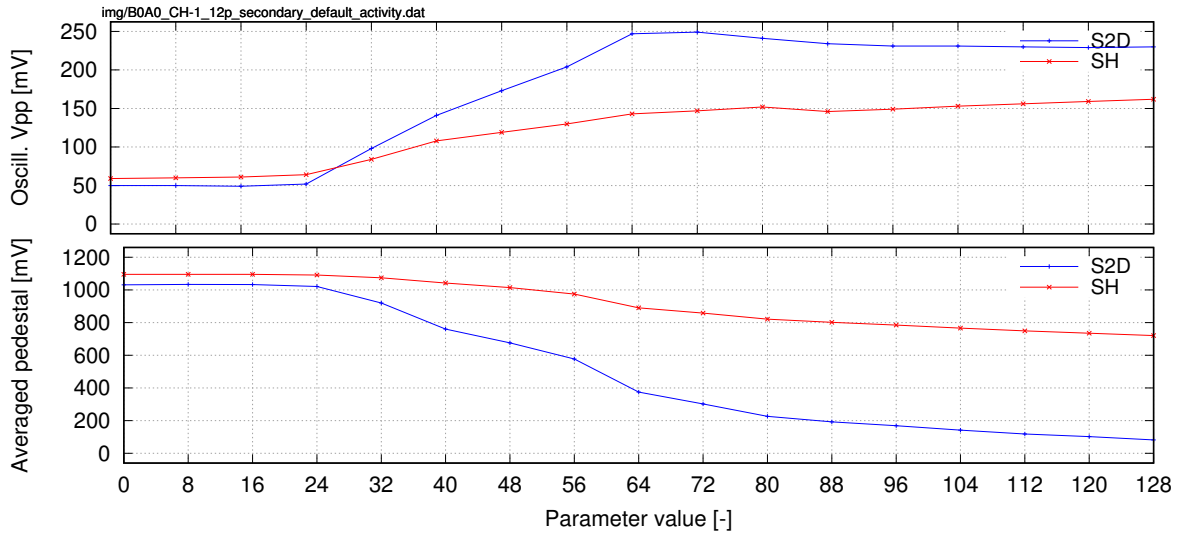


Figure 7: B0A0, channel -1, cap-PCB bonded, 12 pF capacitors re-assembled. Parameter=no. of active ADCs

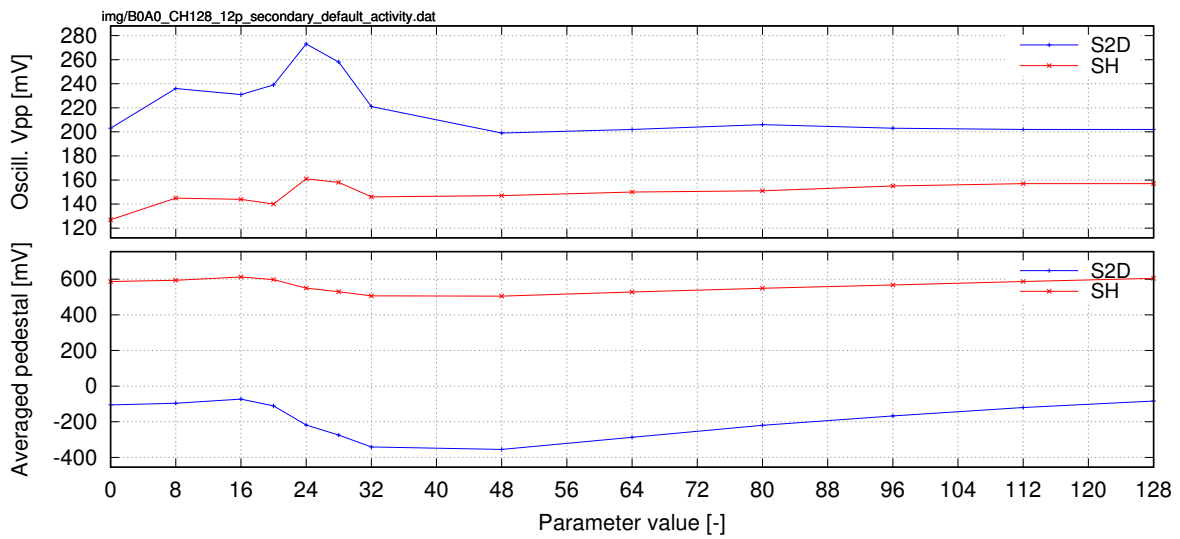


Figure 8: B0A0, channel 128, cap-PCB bonded, 12 pF capacitors re-assembled. Parameter=no. of active ADCs

2.4.1 Channel -1, krum_cfg='h00

ASIC configuration: default values after reset + Krummenacher DAC set to zero (see table 5). Only channel -1 measured.

Table 5: Krummenacher current set to zero

Addr	Value	Comment
'h202	'h80	Low gain=1, krum_cfg=0

Short on cap-PCB found, this result is irrelevant.

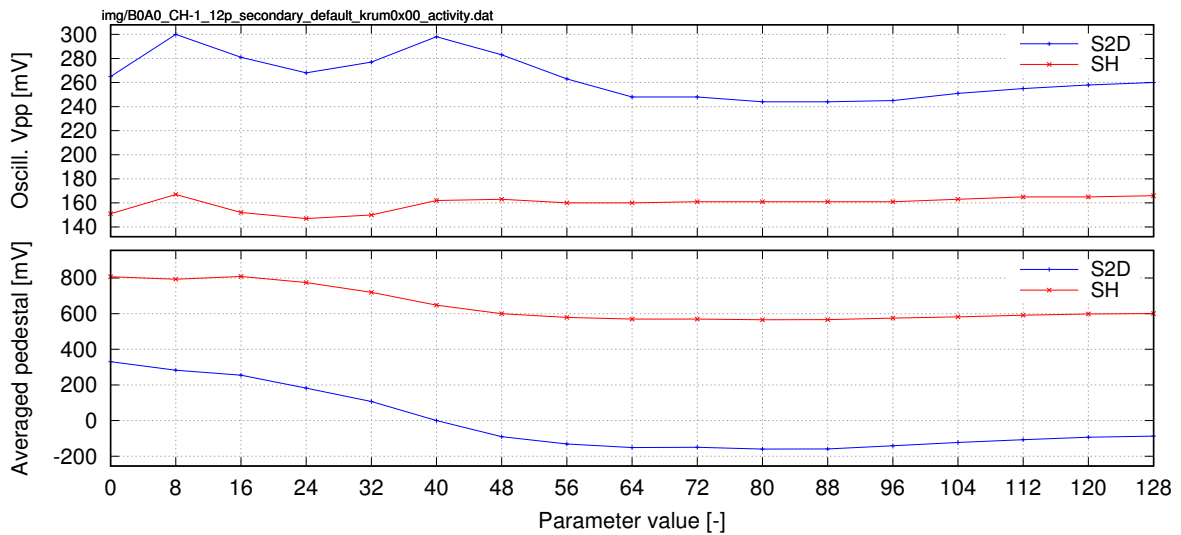


Figure 9: B0A0, channel -1, cap-PCB bonded, 12 pF capacitors re-assembled, krum_cfg='h00. Parameter=no. of active ADCs

2.5 Input bonds completely removed

ASIC configuration: default values after reset.

Cap-PCB assembled, bonds between cap-PCB and SALT inputs removed.

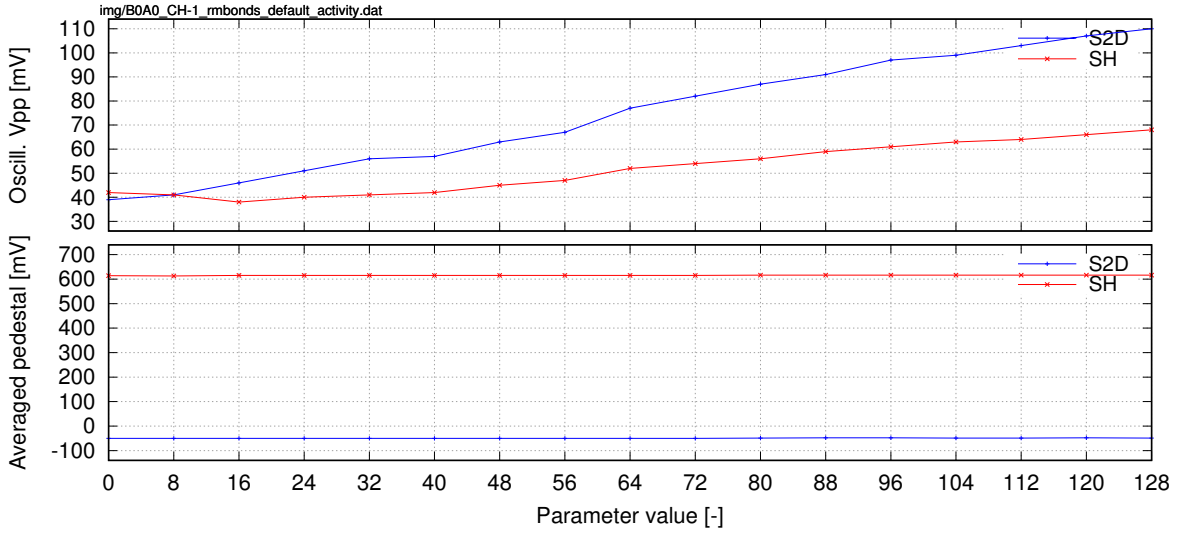


Figure 10: B0A0, channel -1, input bonds completely removed. Parameter=no. of active ADCs

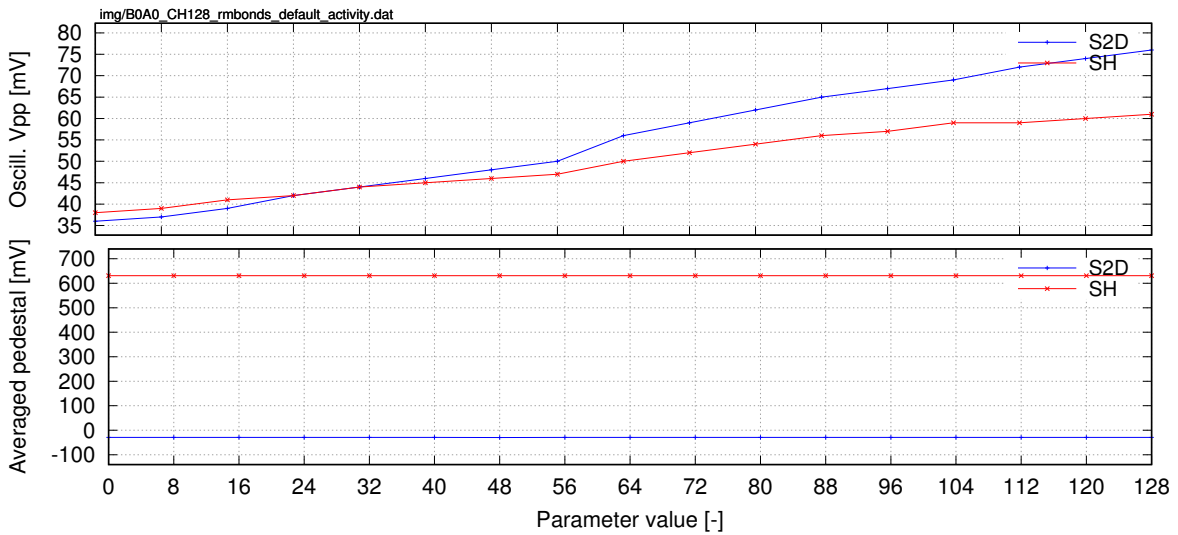


Figure 11: B0A0, channel 128, input bonds completely removed. Parameter=no. of active ADCs

3 Board 1 with ASIC 1

3.1 Before input pads bonded

ASIC configuration: JC configuration (tables 1 & 2).

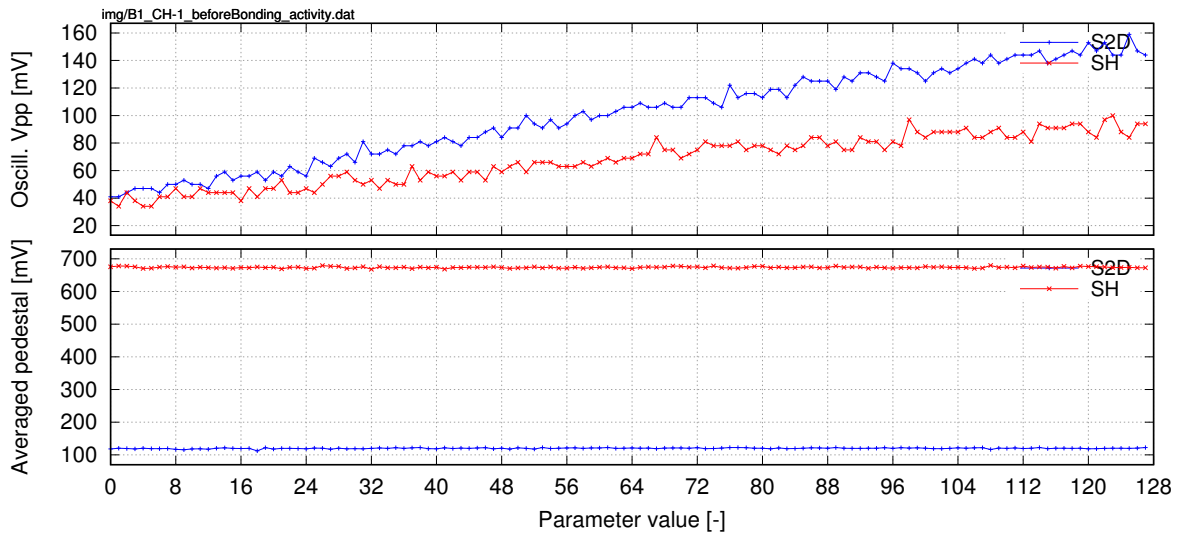


Figure 12: B1A1, channel -1, before bonding. Parameter=no. of active ADCs

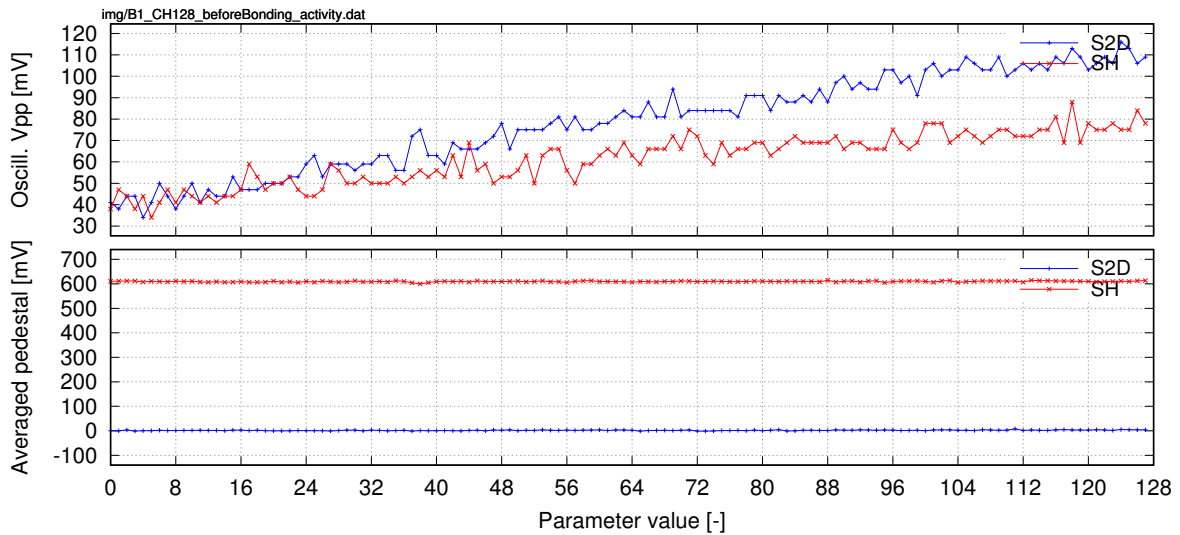


Figure 13: B1A1, channel 128, before bonding. Parameter=no. of active ADCs

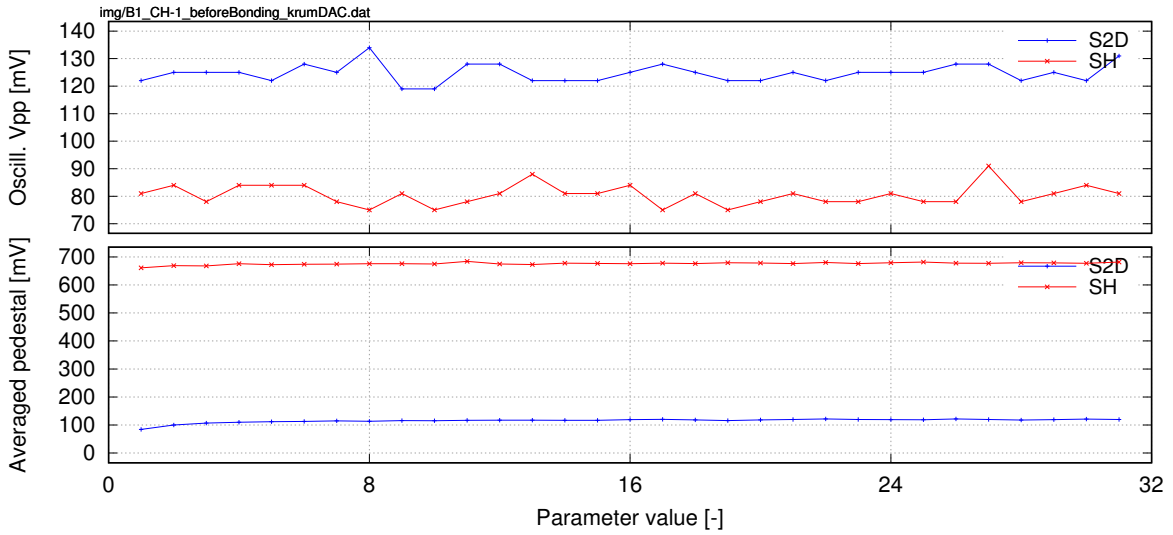


Figure 14: B1A1, channel -1, before bonding. Parameter=Krummenacher DAC

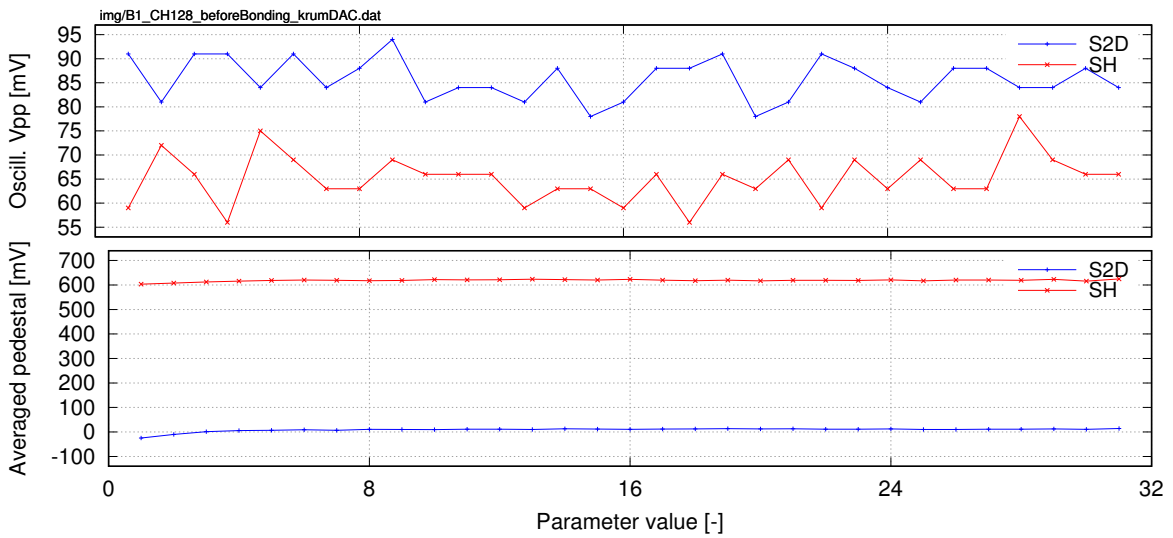


Figure 15: B1A1, channel 128, before bonding. Parameter=Krummenacher DAC

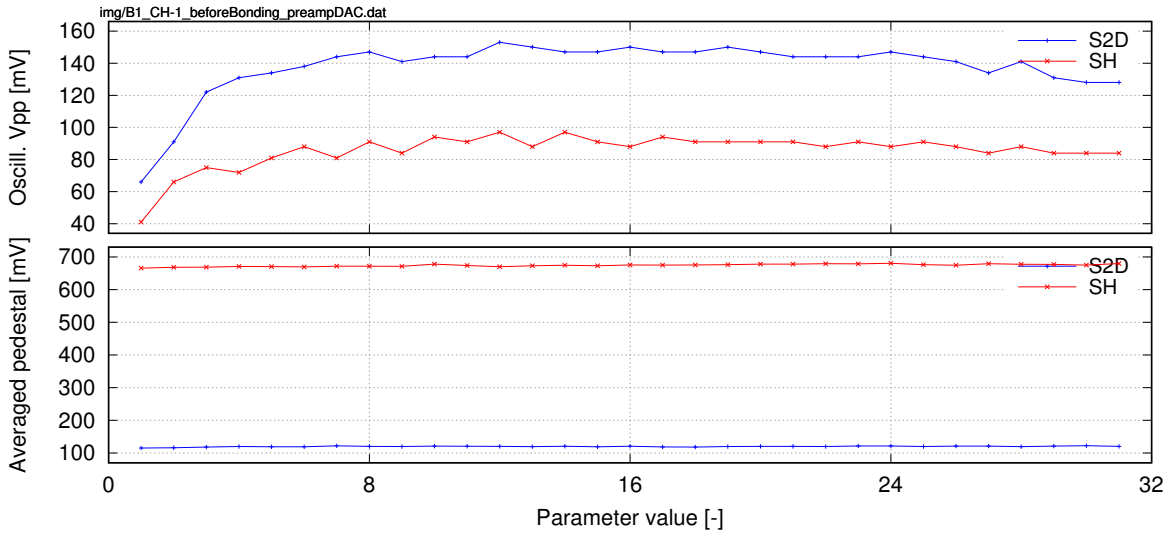


Figure 16: B1A1, channel -1, before bonding. Parameter=preamp DAC

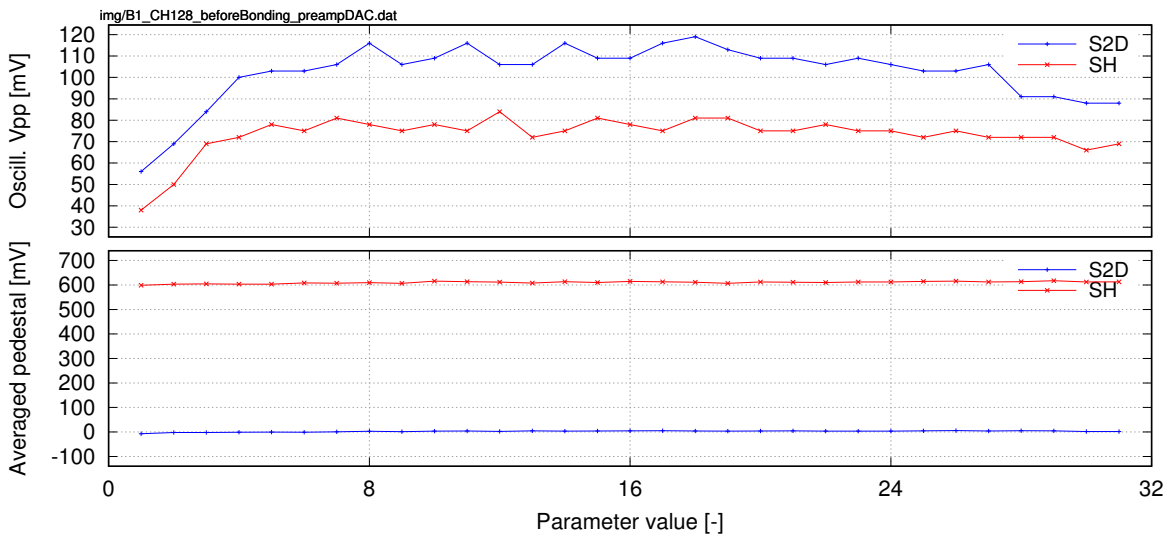


Figure 17: B1A1, channel 128, before bonding. Parameter=preamp DAC

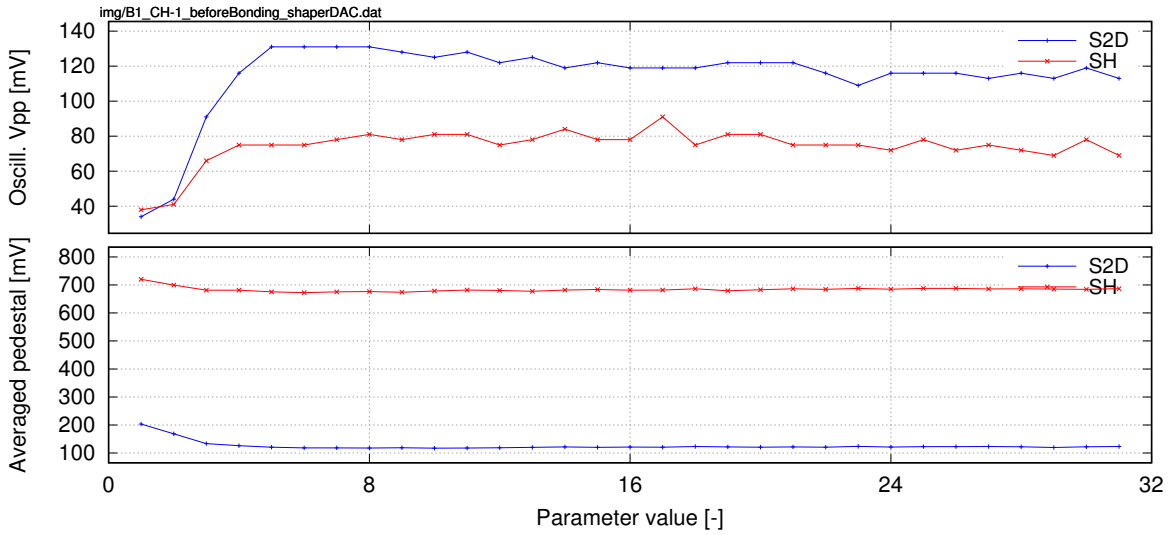


Figure 18: B1A1, channel -1, before bonding. Parameter=shaper DAC

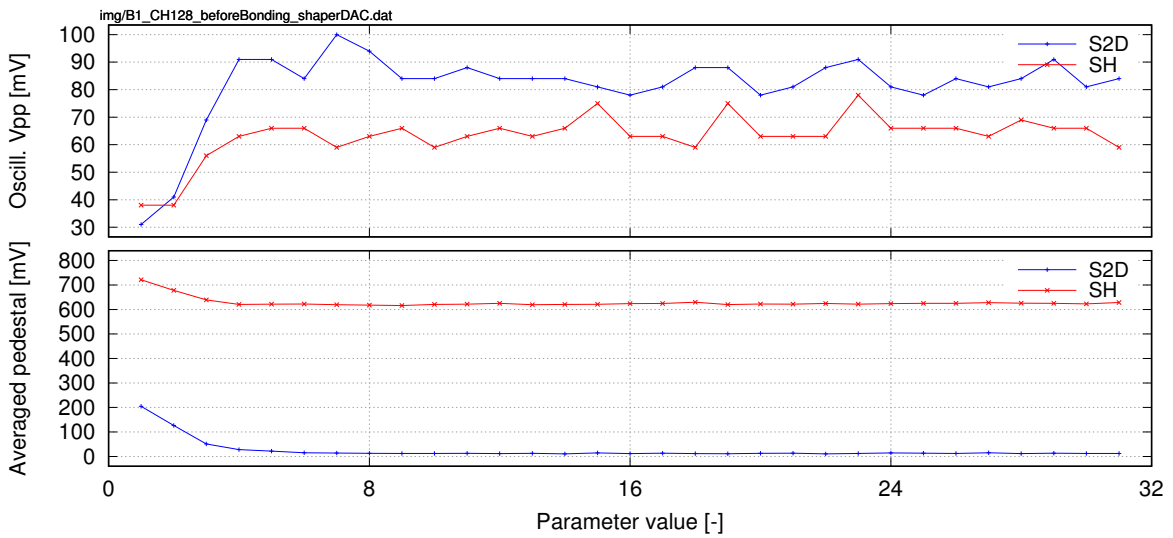


Figure 19: B1A1, channel 128, before bonding. Parameter=shaper DAC

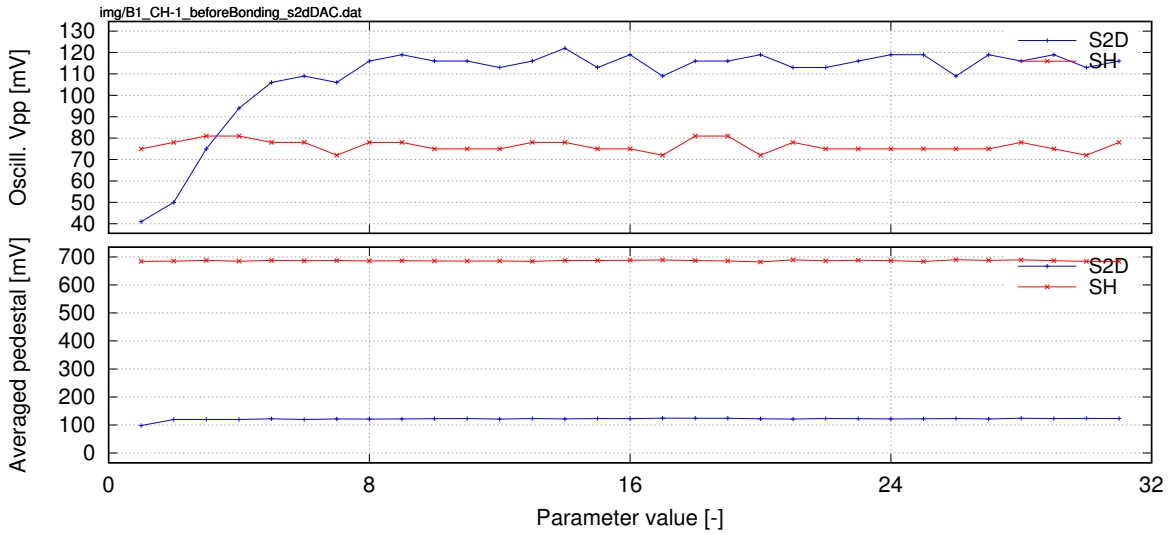


Figure 20: B1A1, channel -1, before bonding. Parameter=S2D DAC

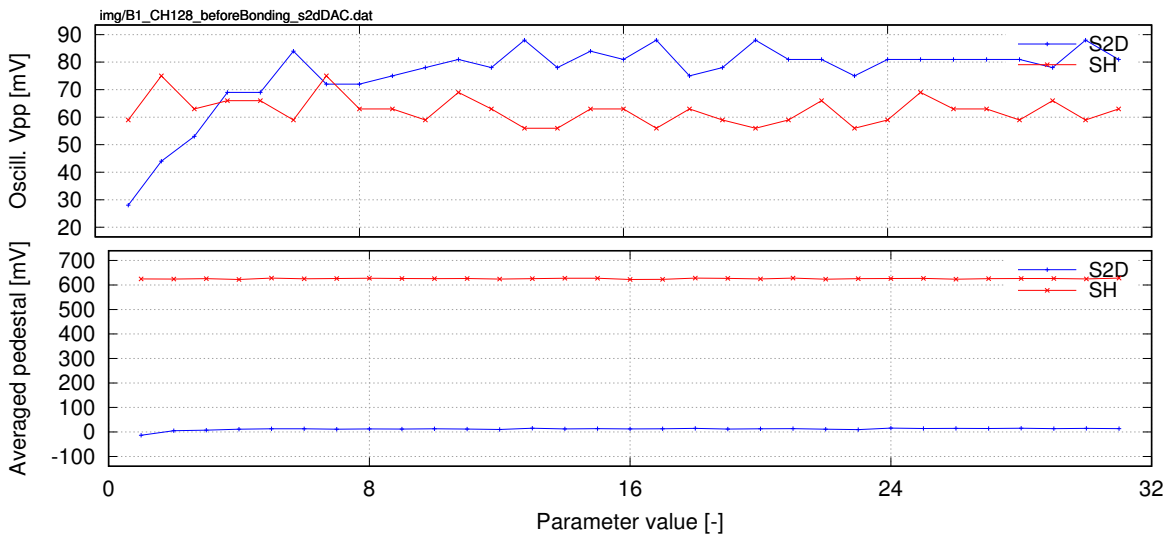


Figure 21: B1A1, channel 128, before bonding. Parameter=S2D DAC

3.2 Dummy bond on input pads

ASIC configuration: JC configuration (tables 1 & 2).

Wirebonds bonded to the SALT input pads 0 and 128 and cut off (second side not bonded anywhere). As a result each pad has dangling wirebond connected to it.

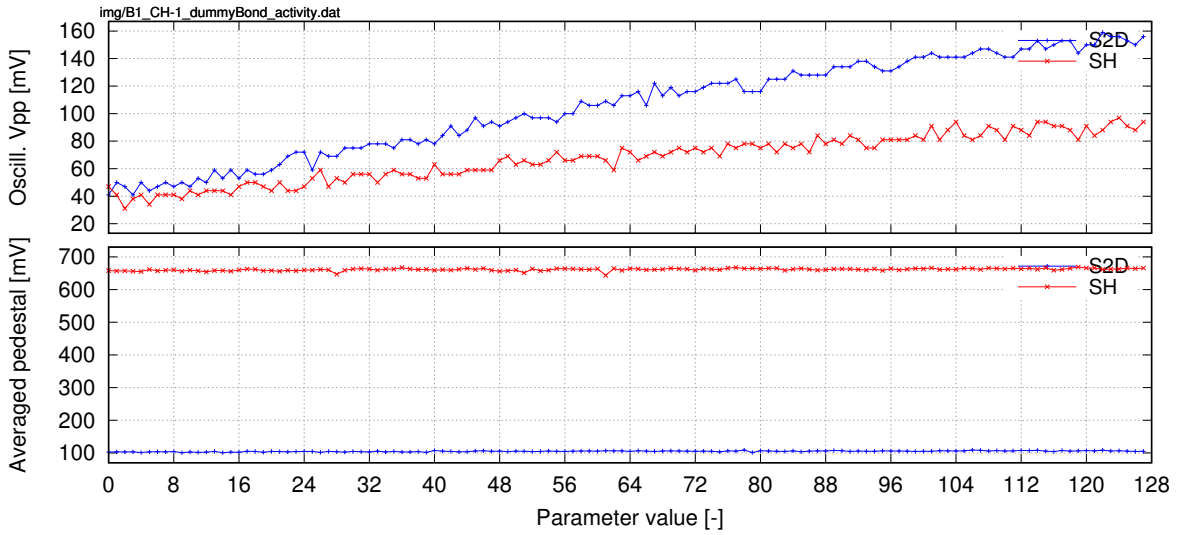


Figure 22: B1A1, channel -1, dummy bond. Parameter=no. of active ADCs

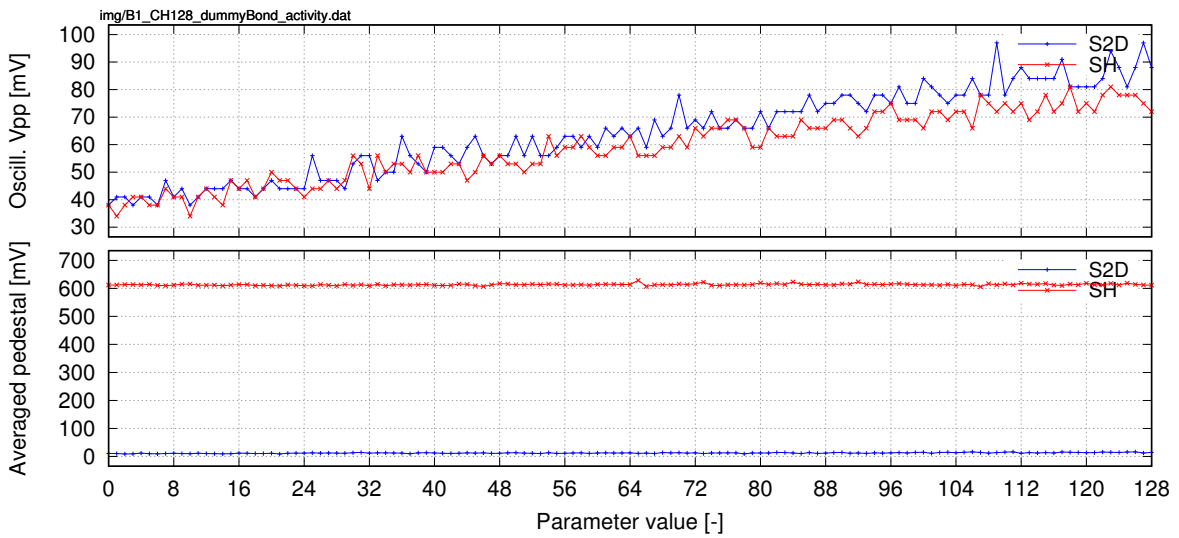


Figure 23: B1A1, channel 128, dummy bond. Parameter=no. of active ADCs

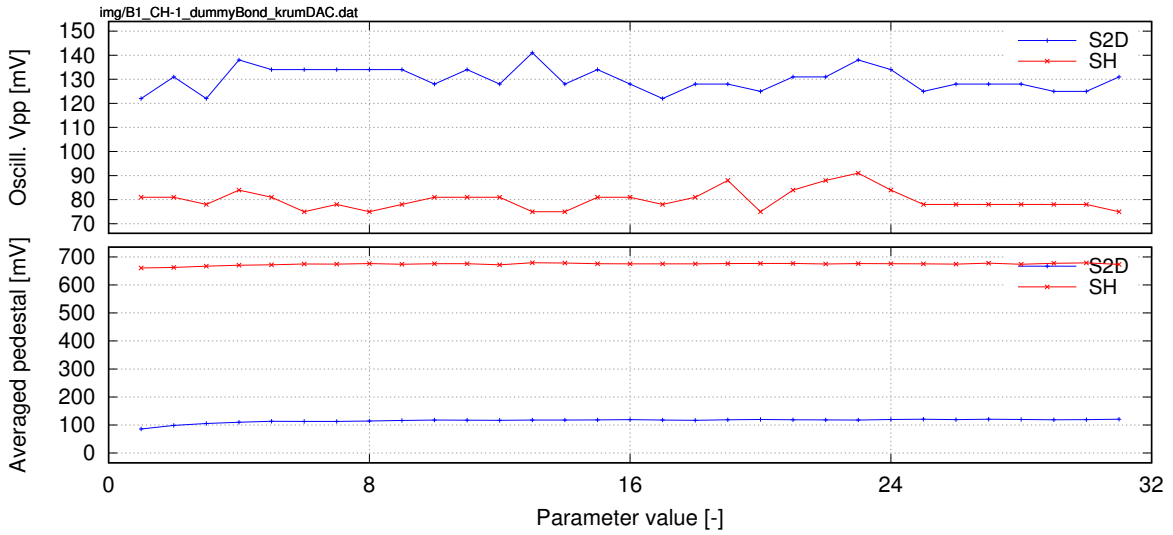


Figure 24: B1A1, channel -1, dummy bond. Parameter=Krummenacher DAC

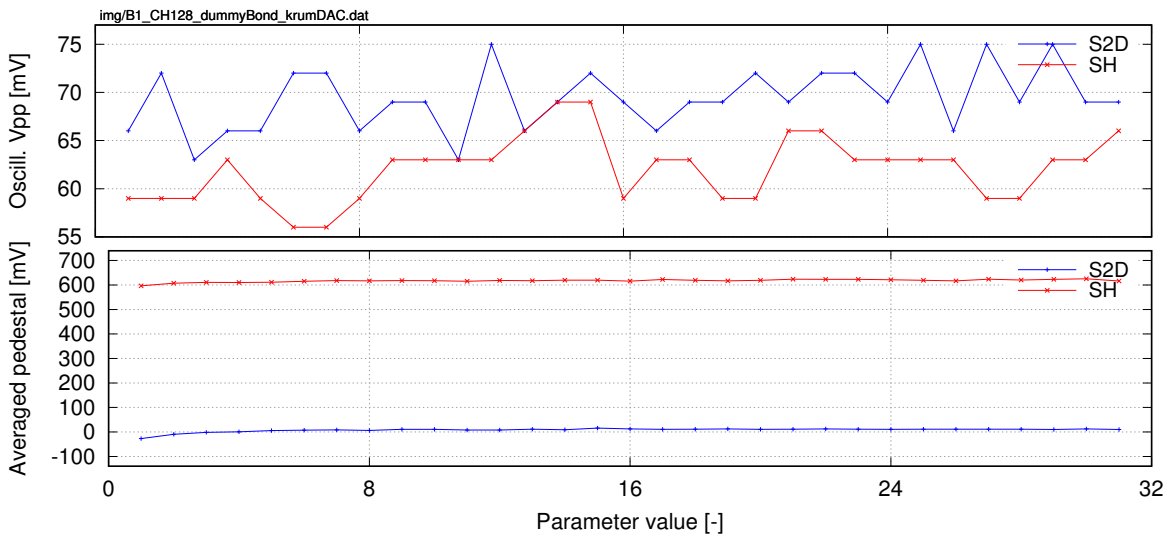


Figure 25: B1A1, channel 128, dummy bond. Parameter=Krummenacher DAC

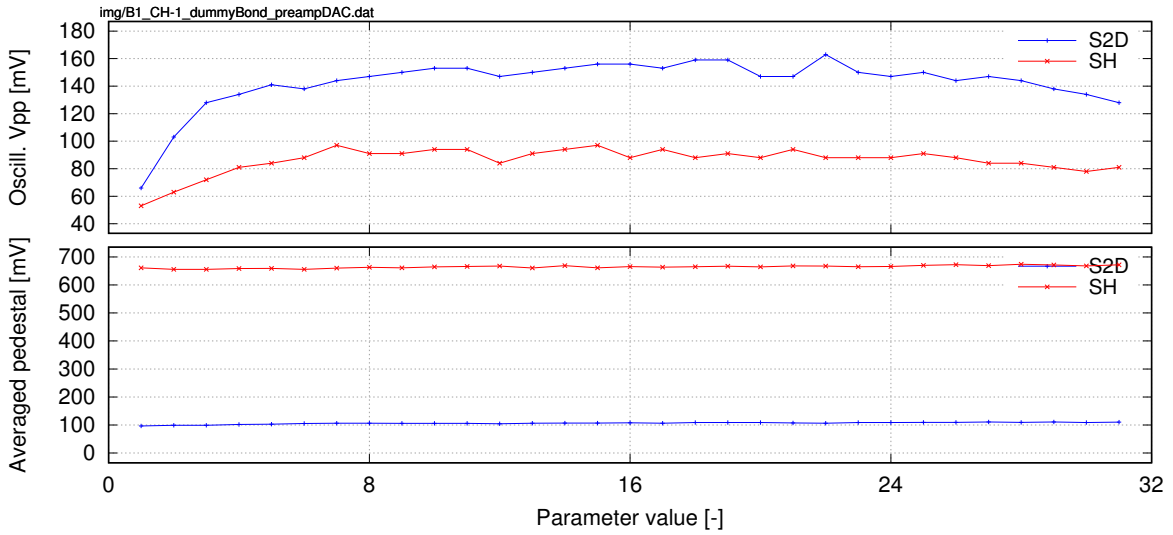


Figure 26: B1A1, channel -1, dummy bond. Parameter=preamp DAC

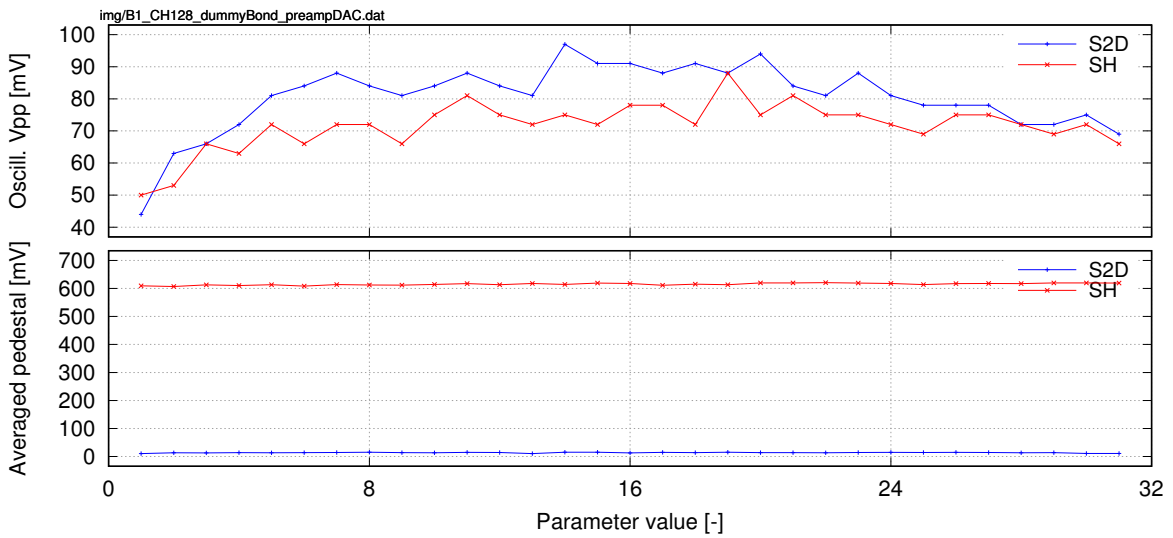


Figure 27: B1A1, channel 128, dummy bond. Parameter=preamp DAC

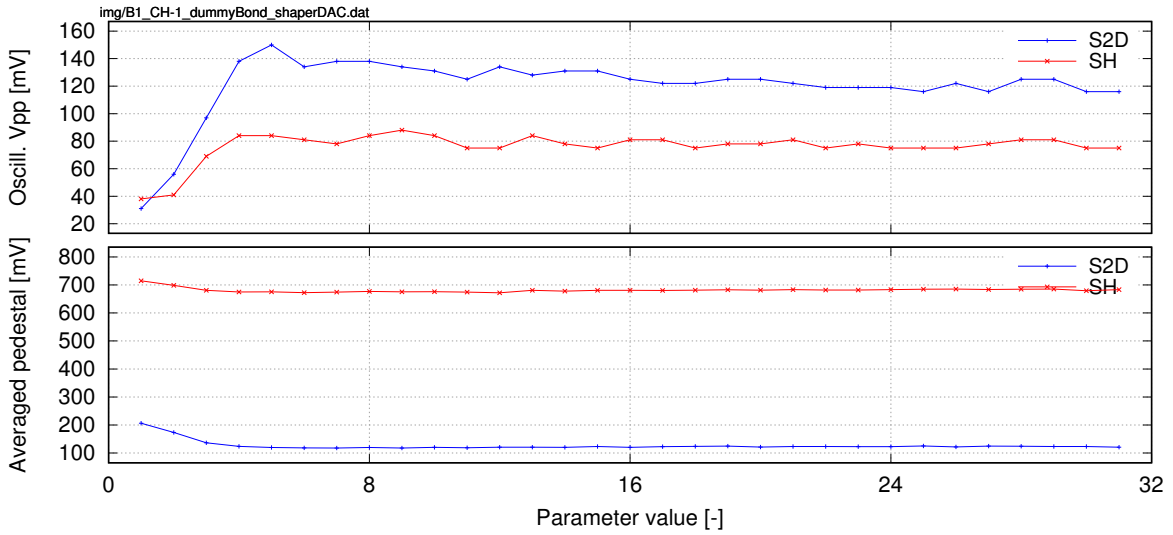


Figure 28: B1A1, channel -1, dummy bond. Parameter=shaper DAC

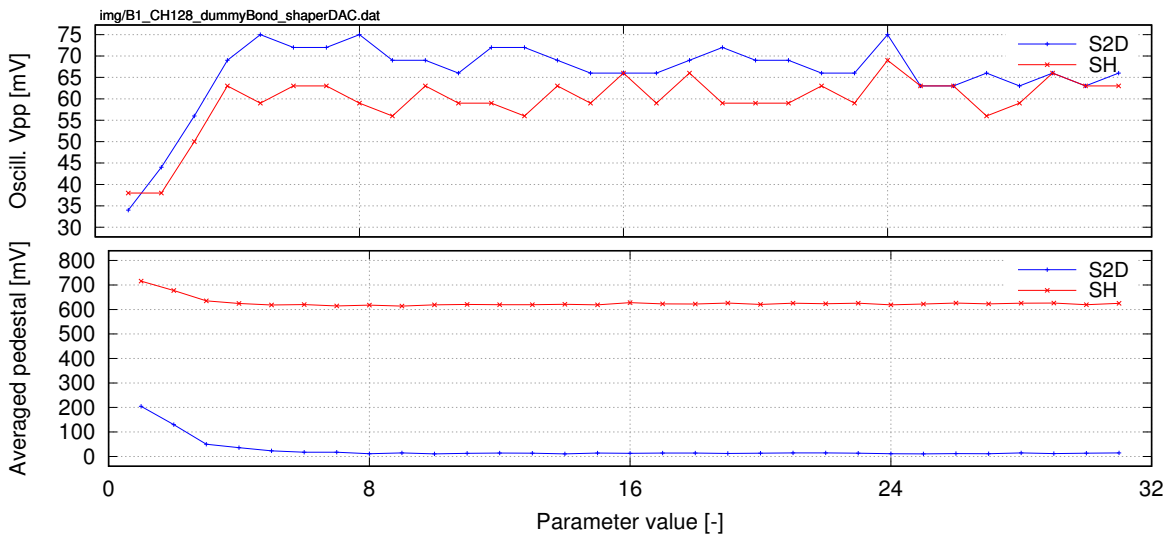


Figure 29: B1A1, channel 128, dummy bond. Parameter=shaper DAC

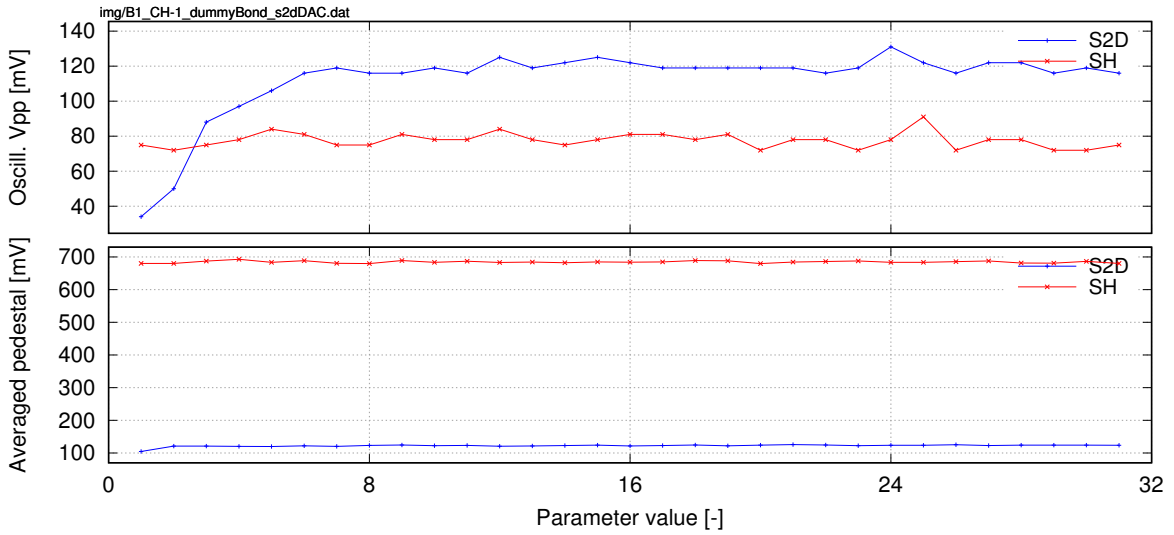


Figure 30: B1A1, channel -1, dummy bond. Parameter=S2D DAC

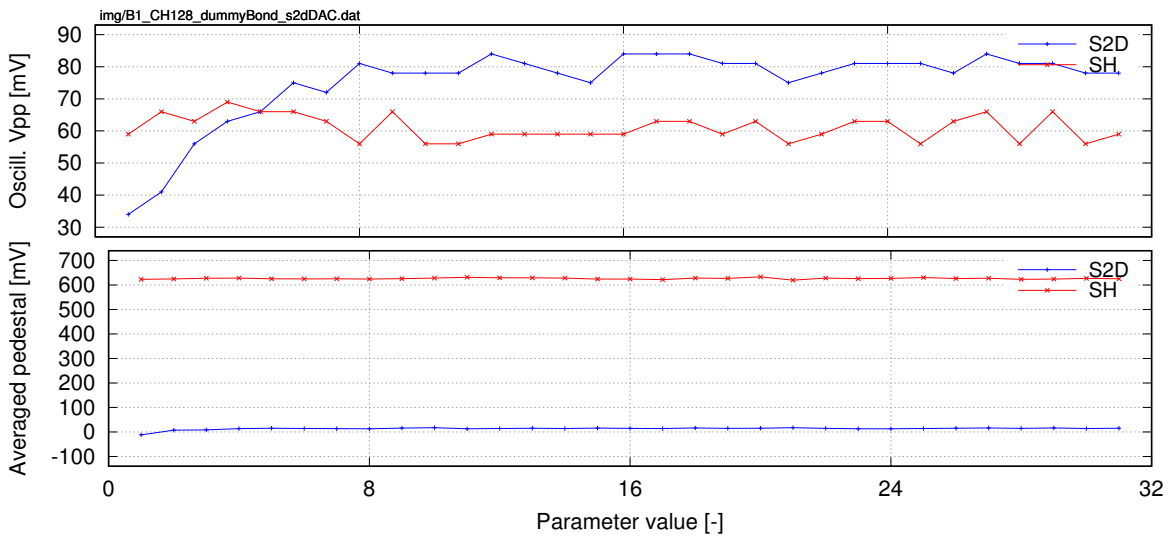


Figure 31: B1A1, channel 128, dummy bond. Parameter=S2D DAC

3.3 Cap-PCB bonded, no capacitors assembled

Empty Cap-PCB assembled, bonded to SALT input pads 0 and 127 (no capacitors assembled to the cap-PCB).

3.3.1 Default ASIC configuration

ASIC configuration: JC configuration (tables 1 & 2).

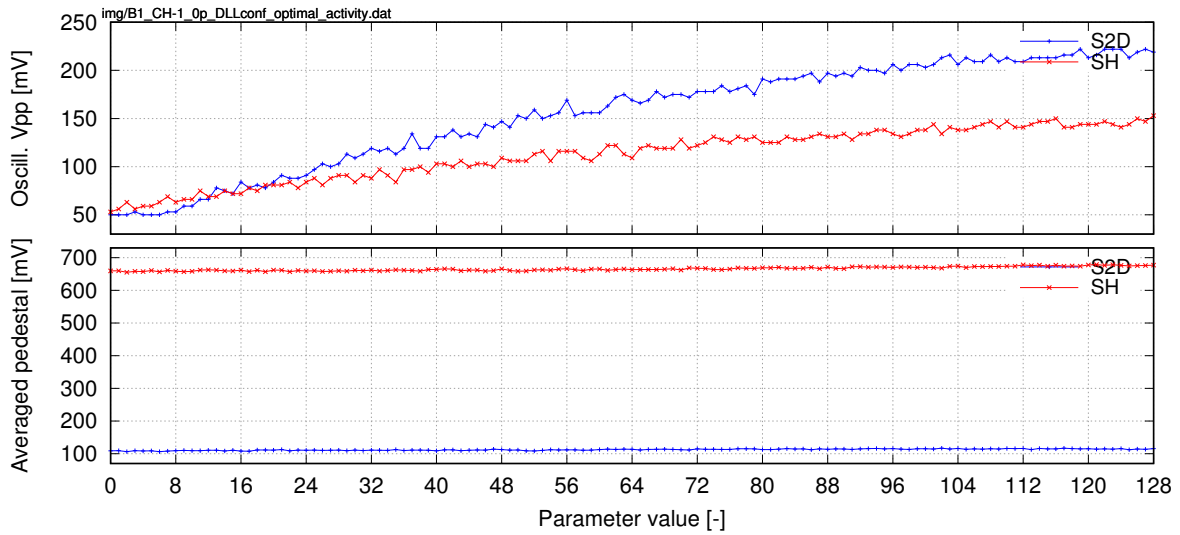


Figure 32: B1A1, channel -1, Empty cap-PCB bonded. Parameter=no. of active ADCs

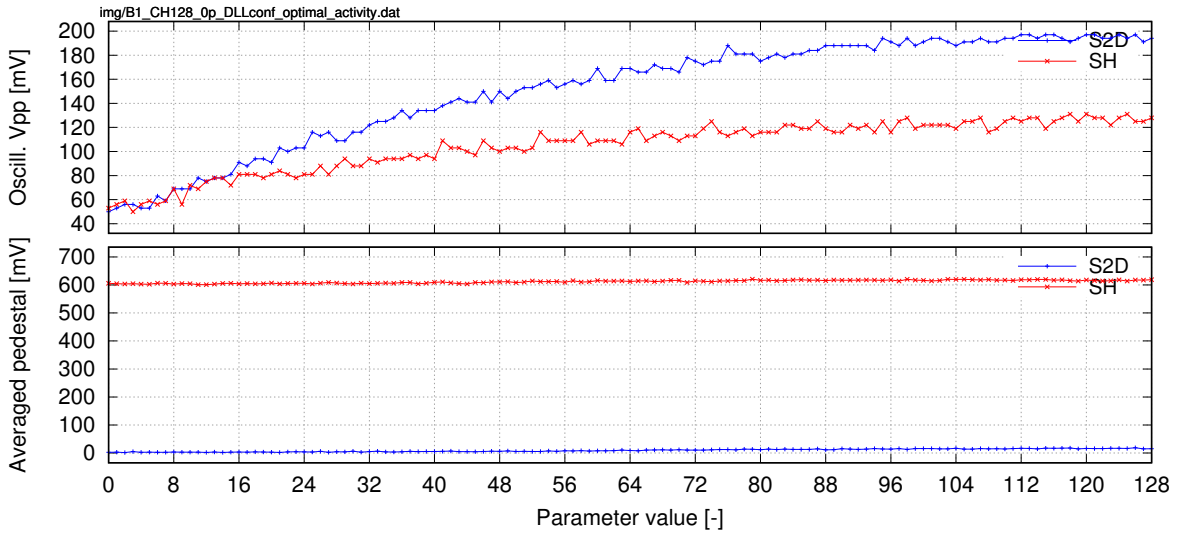


Figure 33: B1A1, channel 128, Empty cap-PCB bonded. Parameter=no. of active ADCs

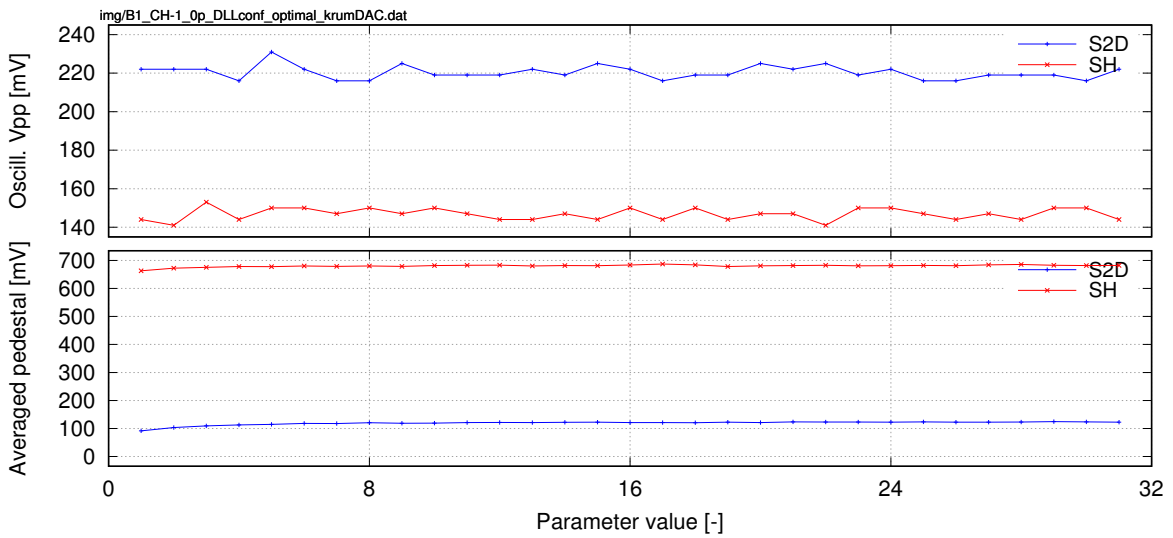


Figure 34: B1A1, channel -1, Empty cap-PCB bonded. Parameter=Krummenacher DAC

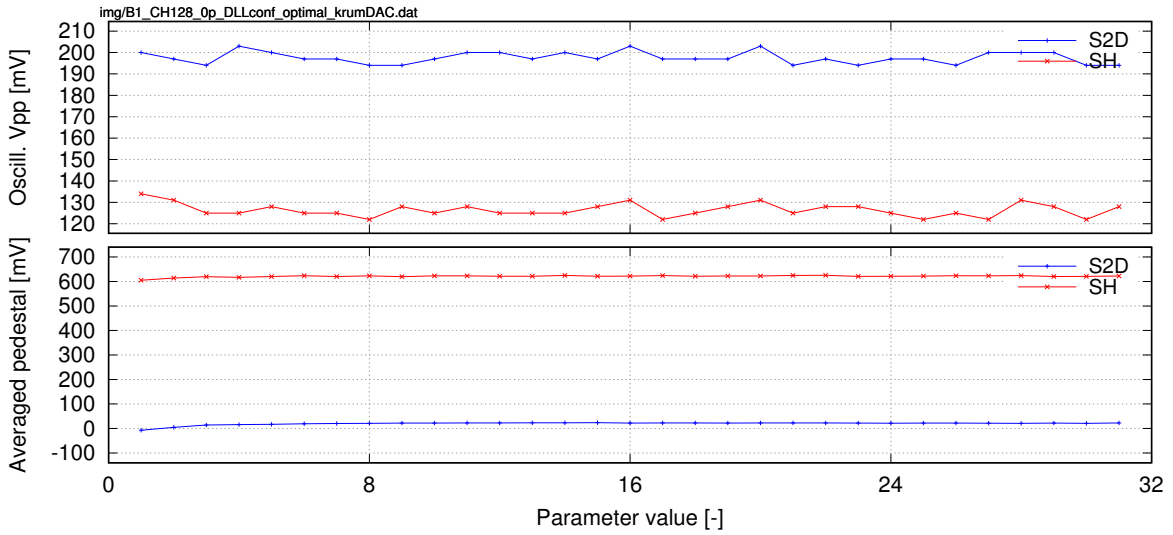


Figure 35: B1A1, channel 128, Empty cap-PCB bonded. Parameter=Krummenacher DAC

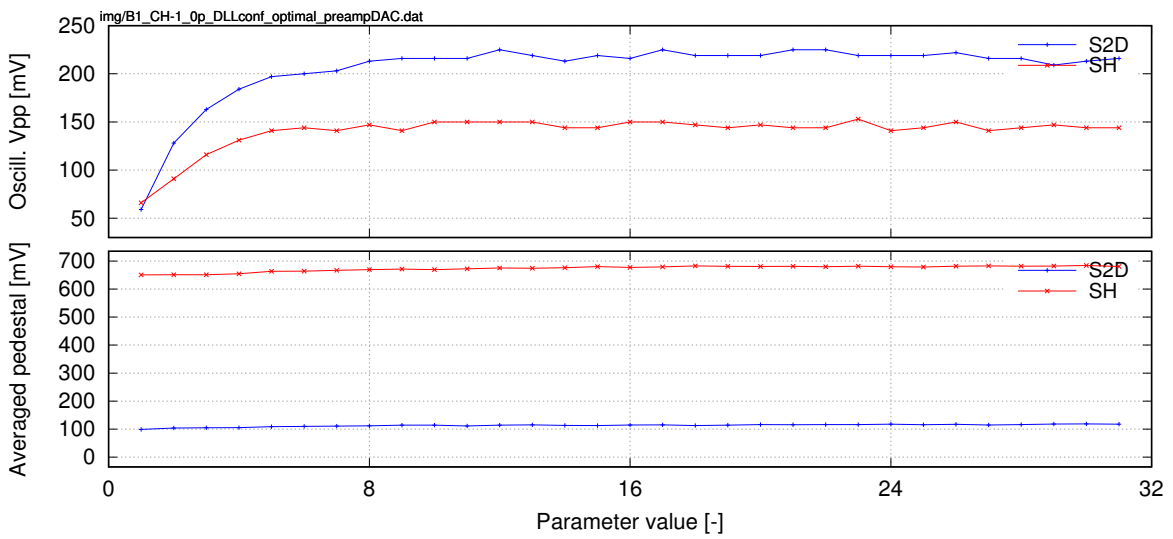


Figure 36: B1A1, channel -1, Empty cap-PCB bonded. Parameter=preamp DAC

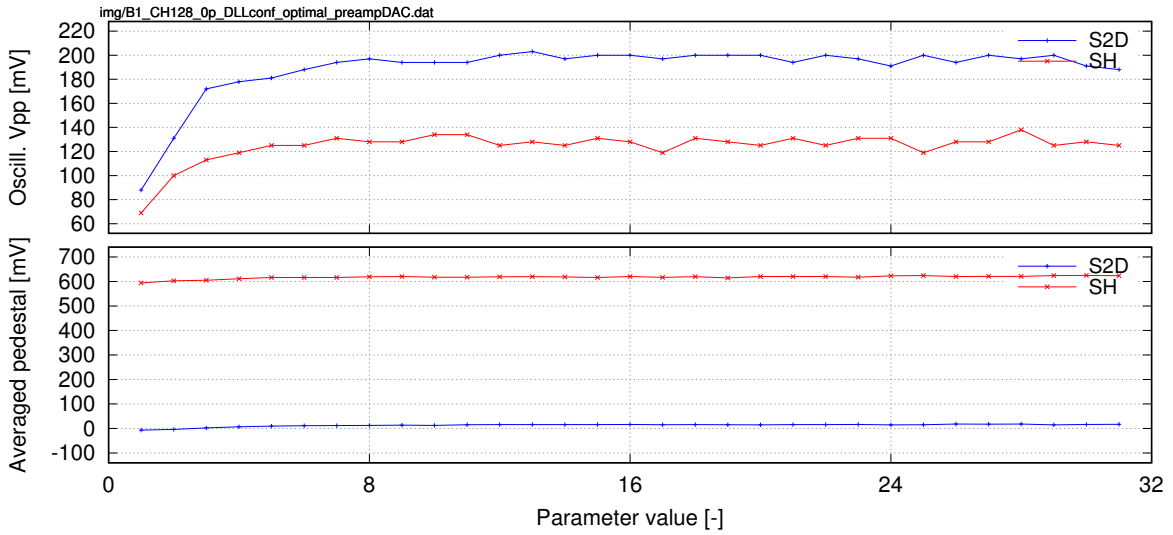


Figure 37: B1A1, channel 128, Empty cap-PCB bonded. Parameter=preamp DAC

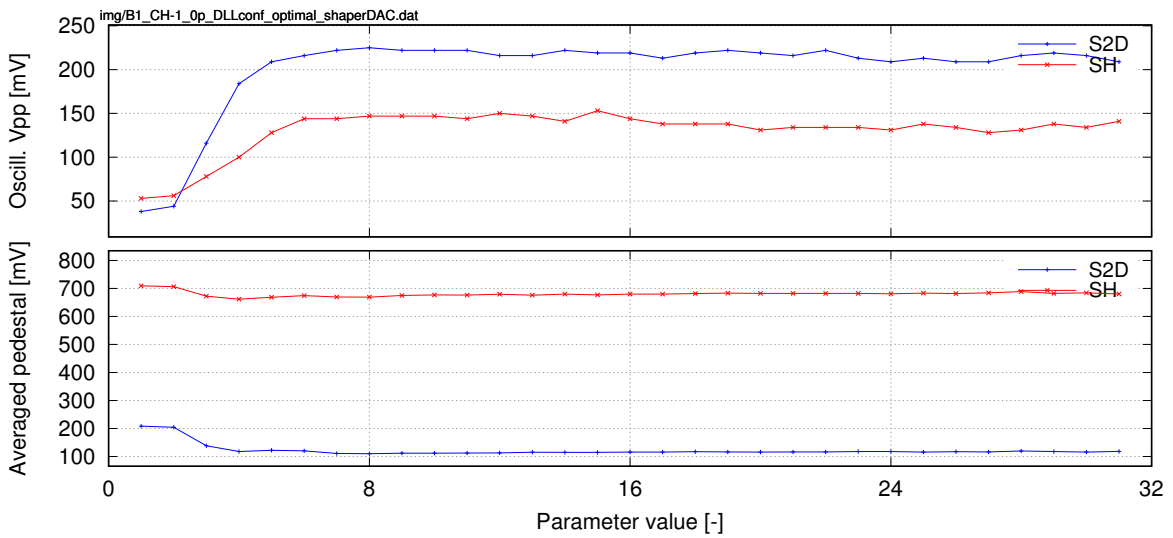


Figure 38: B1A1, channel -1, Empty cap-PCB bonded. Parameter=shaper DAC

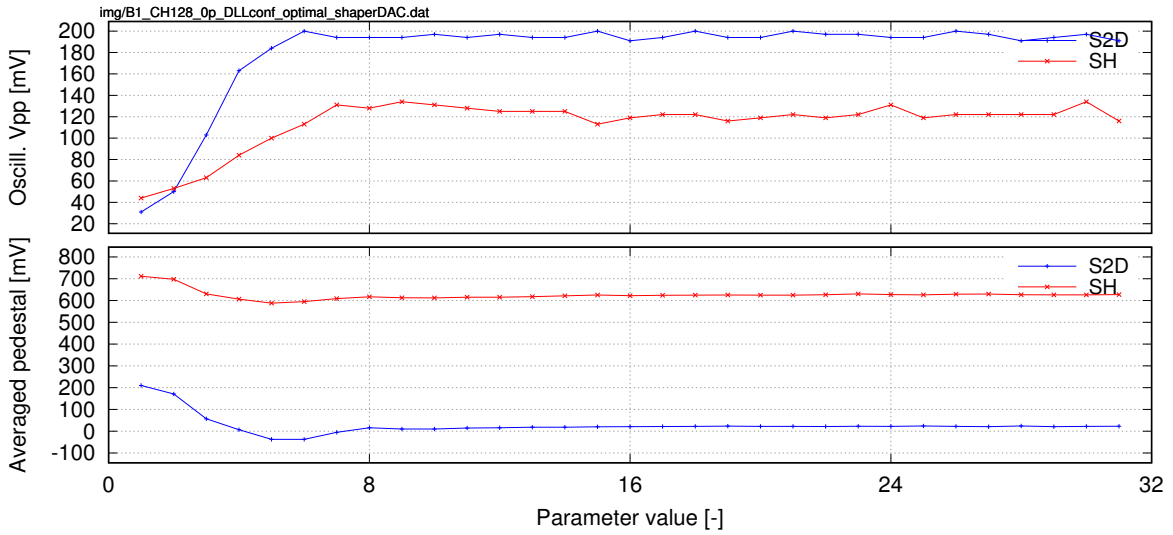


Figure 39: B1A1, channel 128, Empty cap-PCB bonded. Parameter=shaper DAC

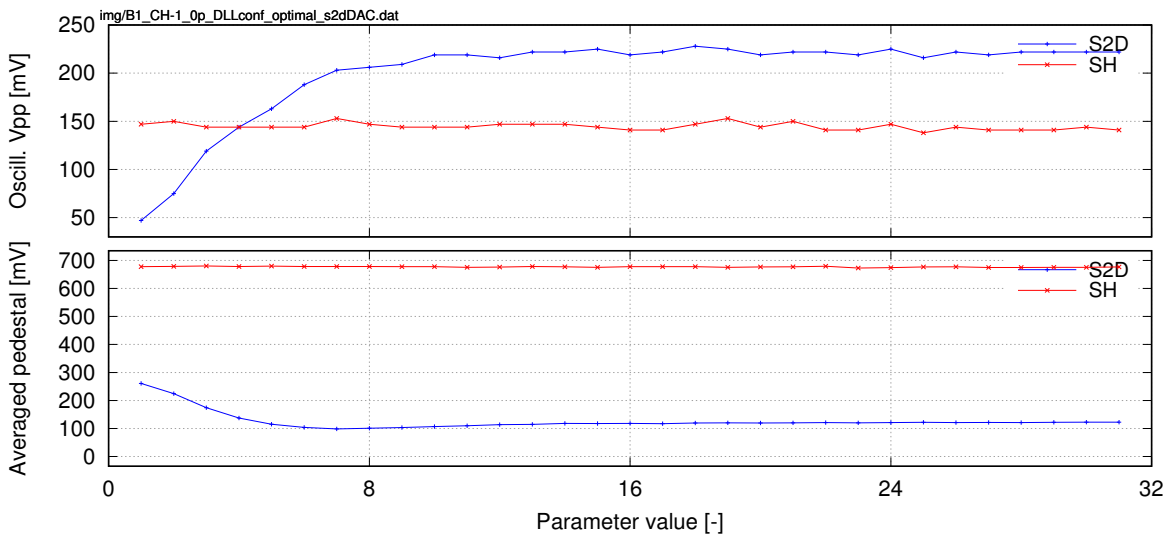


Figure 40: B1A1, channel -1, Empty cap-PCB bonded. Parameter=S2D DAC

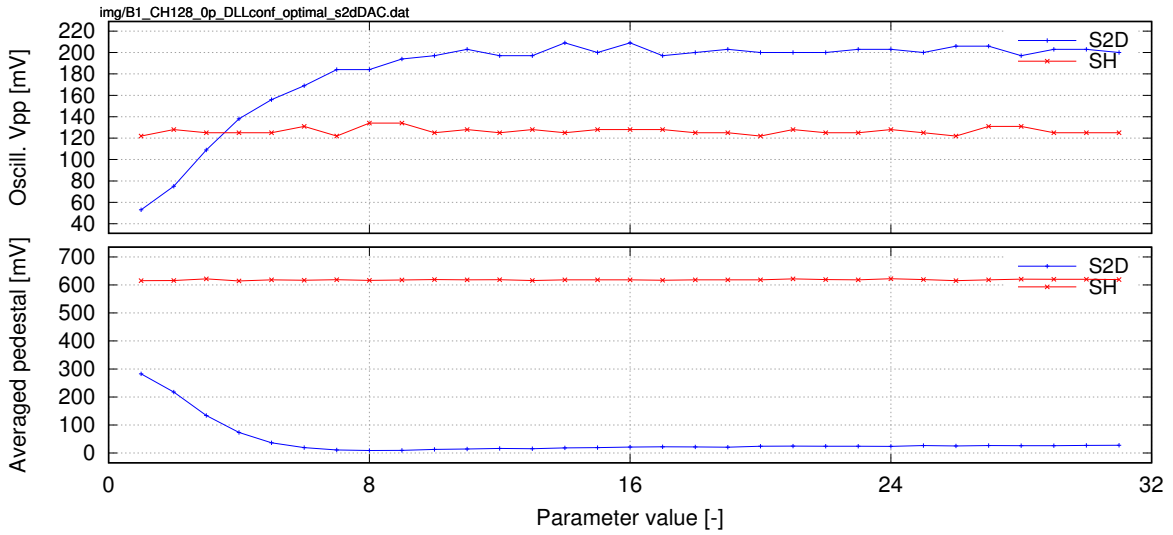


Figure 41: B1A1, channel 128, Empty cap-PCB bonded. Parameter=S2D DAC

3.3.2 Optimized test pulse and ADC delay

ASIC configuration: JC configuration (tables 1 & 2) + test pulse and ADC delay optimizations (table 3).

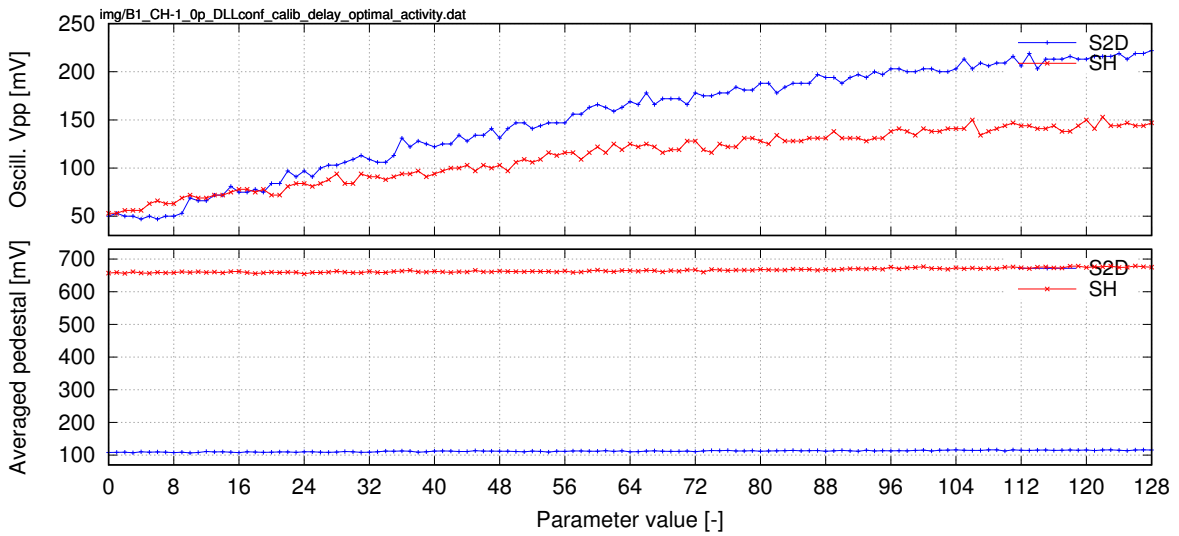


Figure 42: B1A1, channel -1, Empty cap-PCB bonded. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

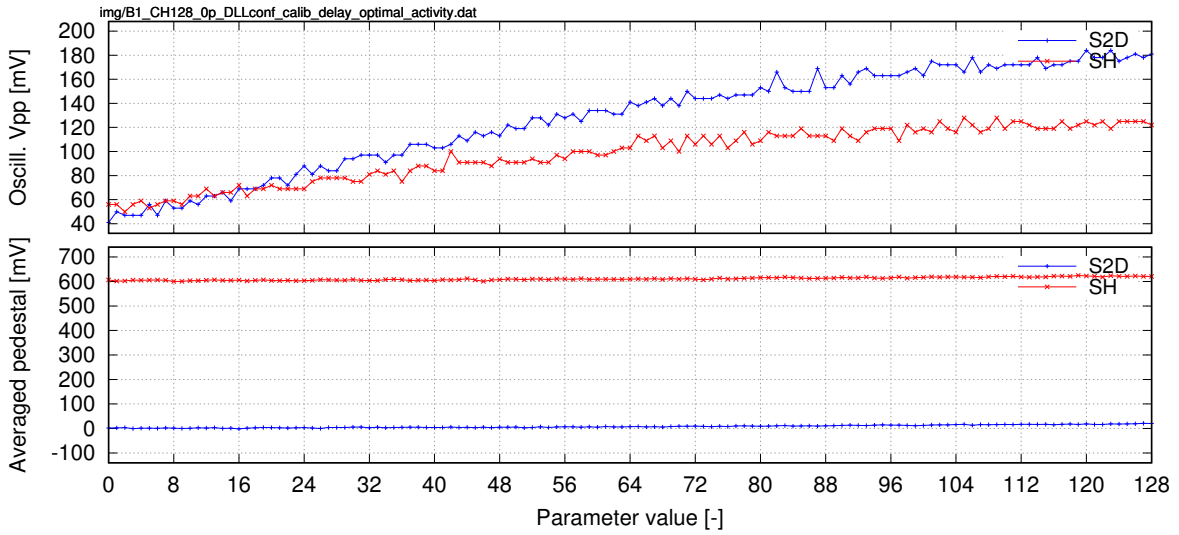


Figure 43: B1A1, channel 128, Empty cap-PCB bonded. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

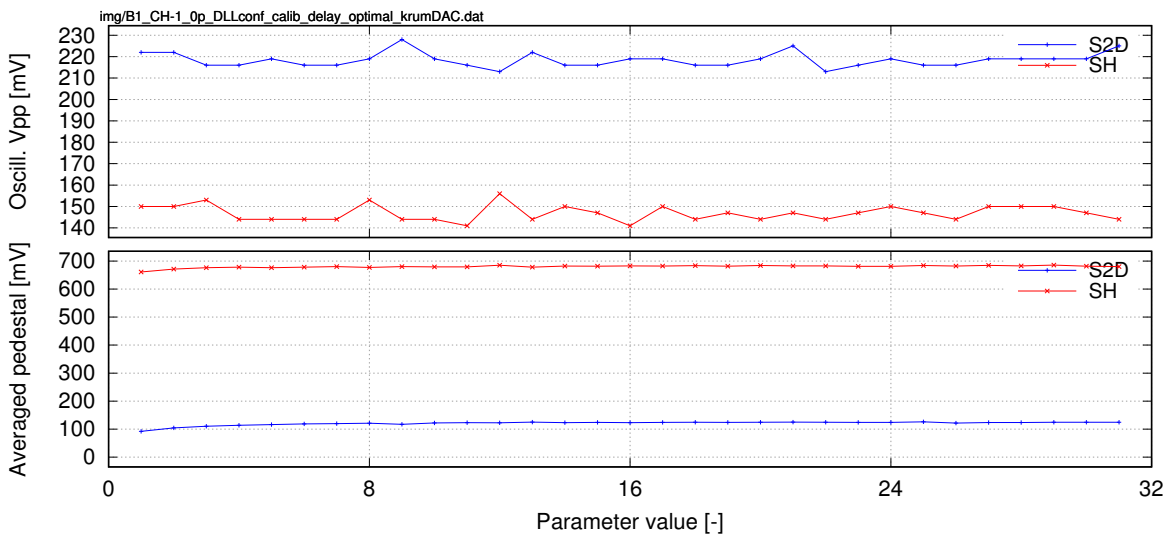


Figure 44: B1A1, channel -1, Empty cap-PCB bonded. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

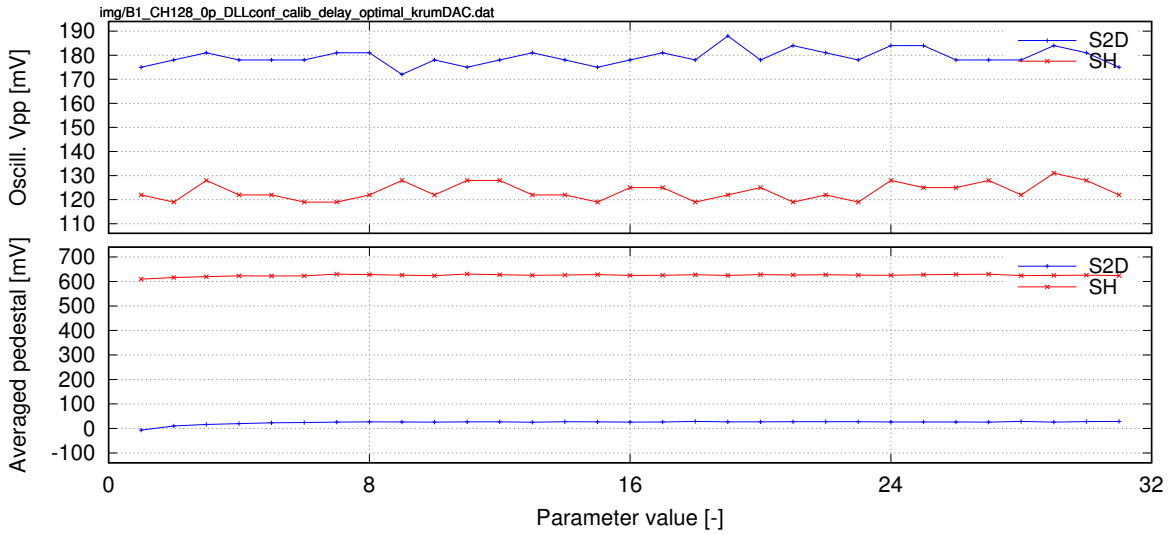


Figure 45: B1A1, channel 128, Empty cap-PCB bonded. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

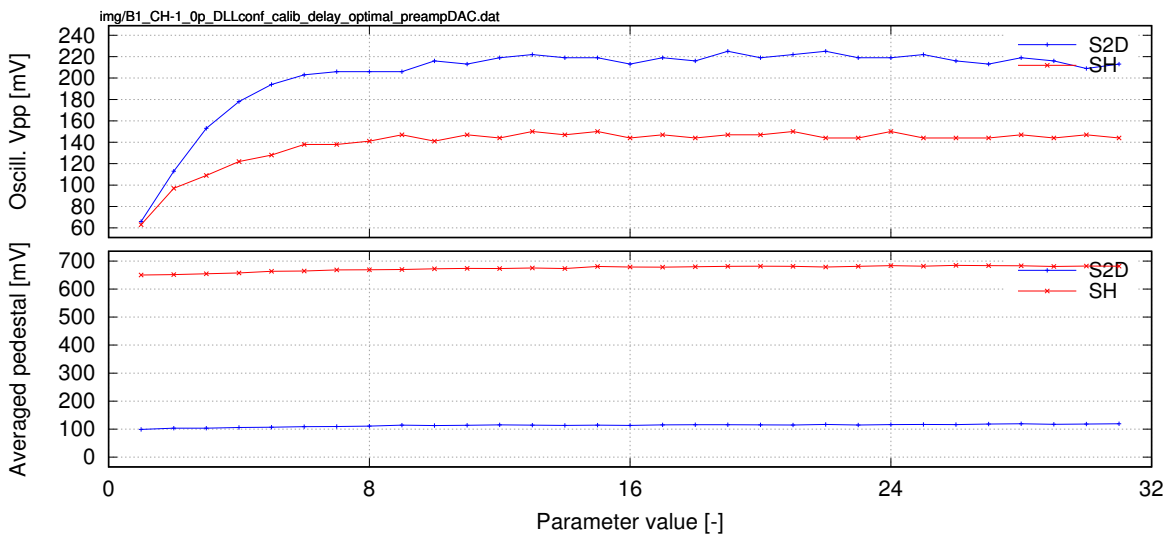


Figure 46: B1A1, channel -1, Empty cap-PCB bonded. Optimized test pulse and ADC delay. Parameter=preamp DAC

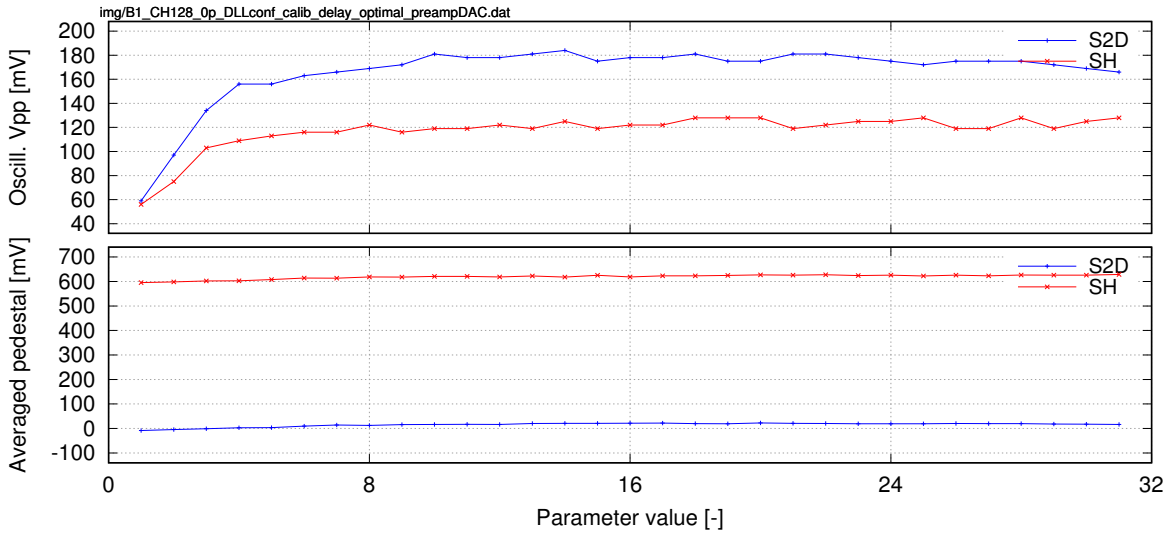


Figure 47: B1A1, channel 128, Empty cap-PCB bonded. Optimized test pulse and ADC delay. Parameter=preamp DAC

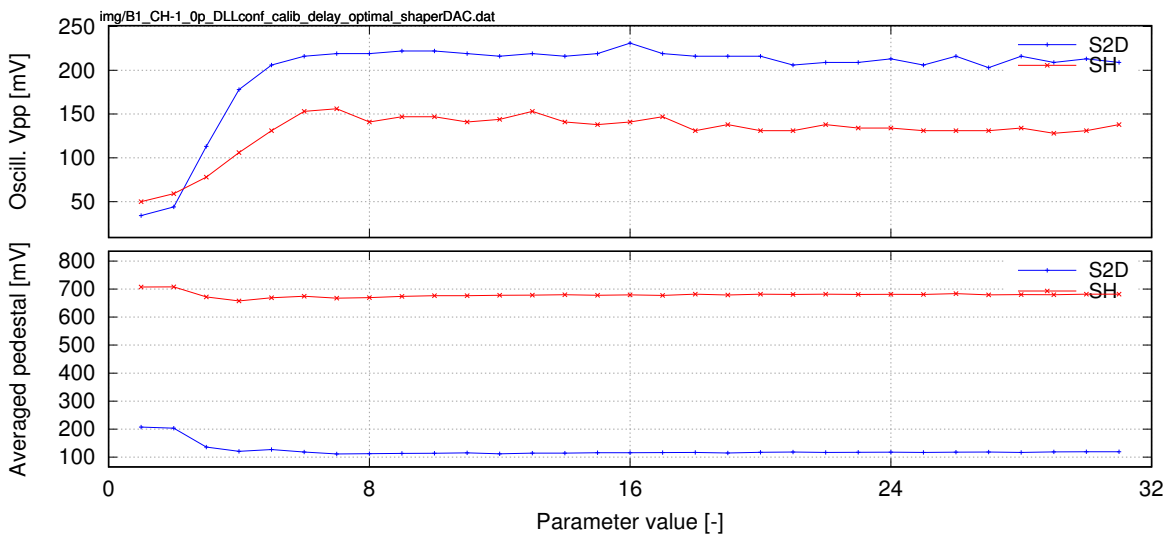


Figure 48: B1A1, channel -1, Empty cap-PCB bonded. Optimized test pulse and ADC delay. Parameter=shaper DAC

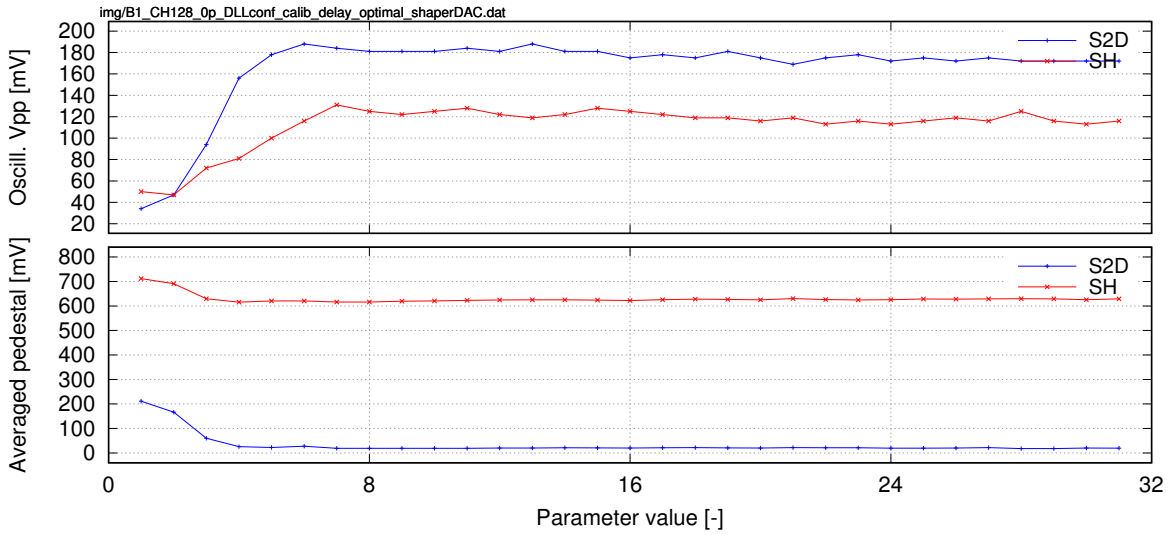


Figure 49: B1A1, channel 128, Empty cap-PCB bonded. Optimized test pulse and ADC delay. Parameter=shaper DAC

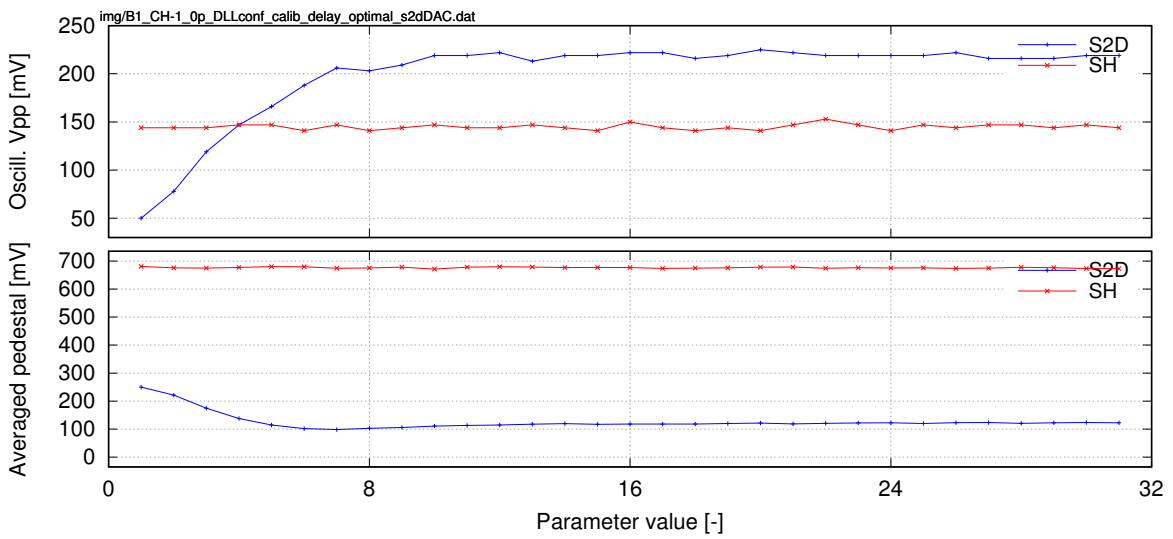


Figure 50: B1A1, channel -1, Empty cap-PCB bonded. Optimized test pulse and ADC delay. Parameter=S2D DAC

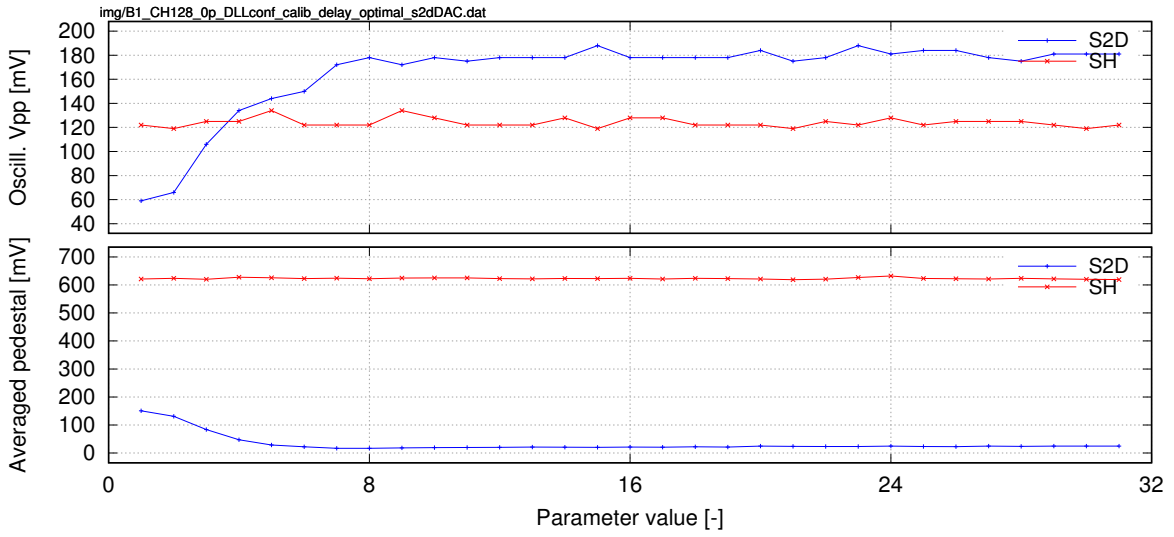


Figure 51: B1A1, channel 128, Empty cap-PCB bonded. Optimized test pulse and ADC delay. Parameter=S2D DAC

3.4 Cap-PCB bonded, 2.2 pF capacitors assembled

Cap-PCB assembled, bonded to SALT input pads 0 and 127, two 2.2 pF capacitors assembled to the cap-PCB.

3.4.1 Default ASIC configuration

ASIC configuration: JC configuration (tables 1 & 2).

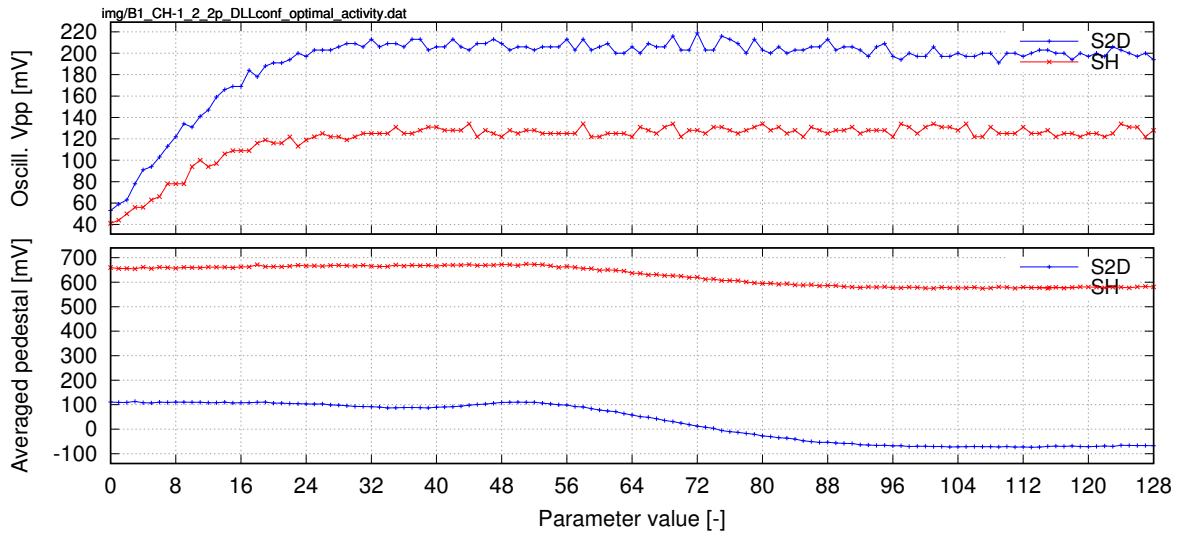


Figure 52: B1A1, channel -1, cap-PCB bonded, 2.2 pF capacitors assembled. Parameter=no. of active ADCs

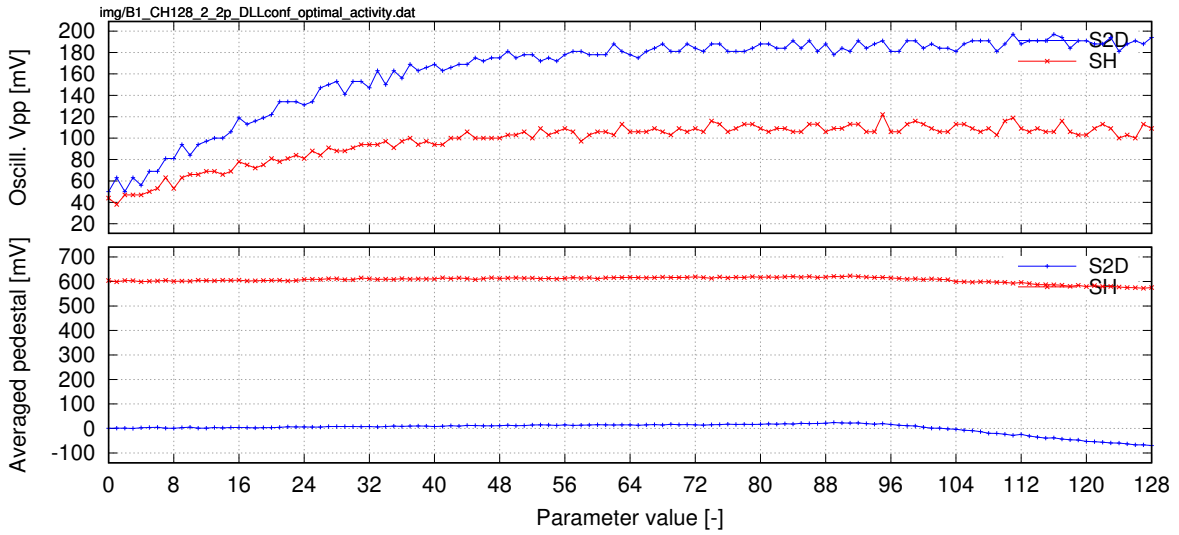


Figure 53: B1A1, channel 128, cap-PCB bonded, 2.2 pF capacitors assembled. Parameter=no. of active ADCs

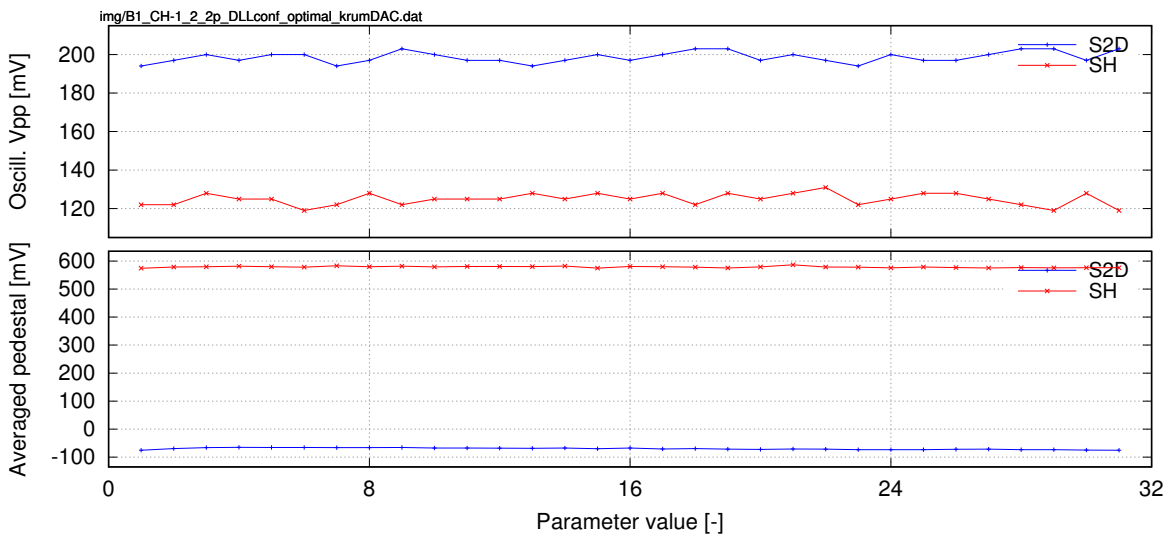


Figure 54: B1A1, channel -1, cap-PCB bonded, 2.2 pF capacitors assembled. Parameter=Krummenacher DAC

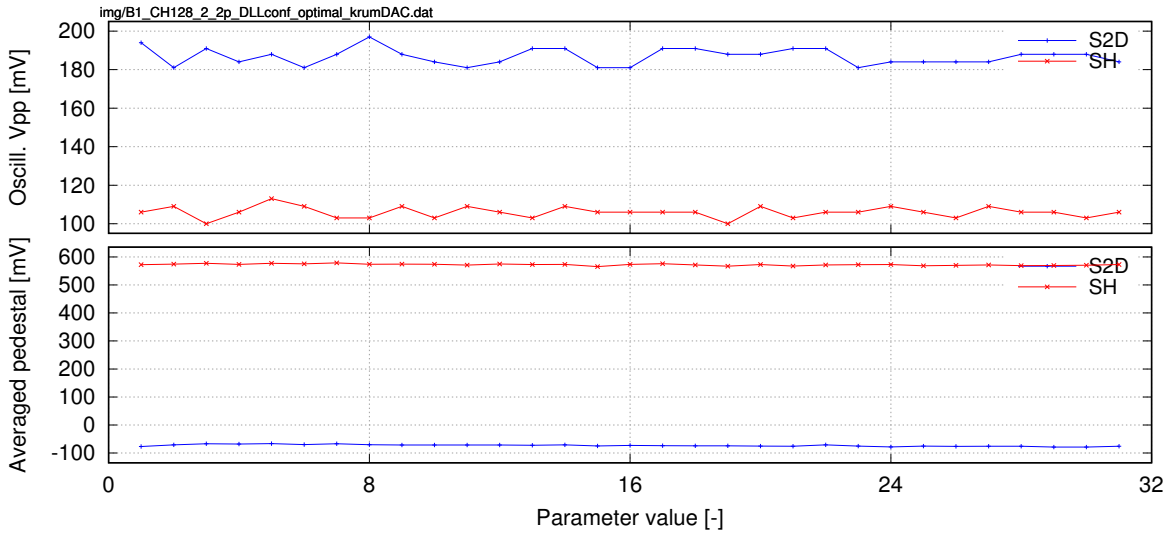


Figure 55: B1A1, channel 128, cap-PCB bonded, 2.2 pF capacitors assembled. Parameter=Krummenacher DAC

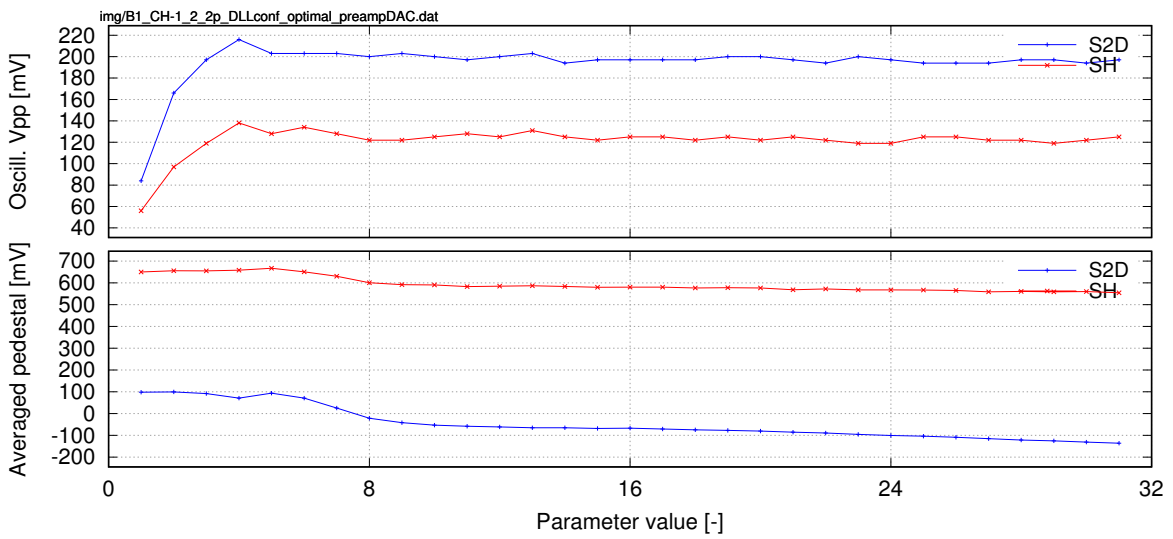


Figure 56: B1A1, channel -1, cap-PCB bonded, 2.2 pF capacitors assembled. Parameter=preamp DAC

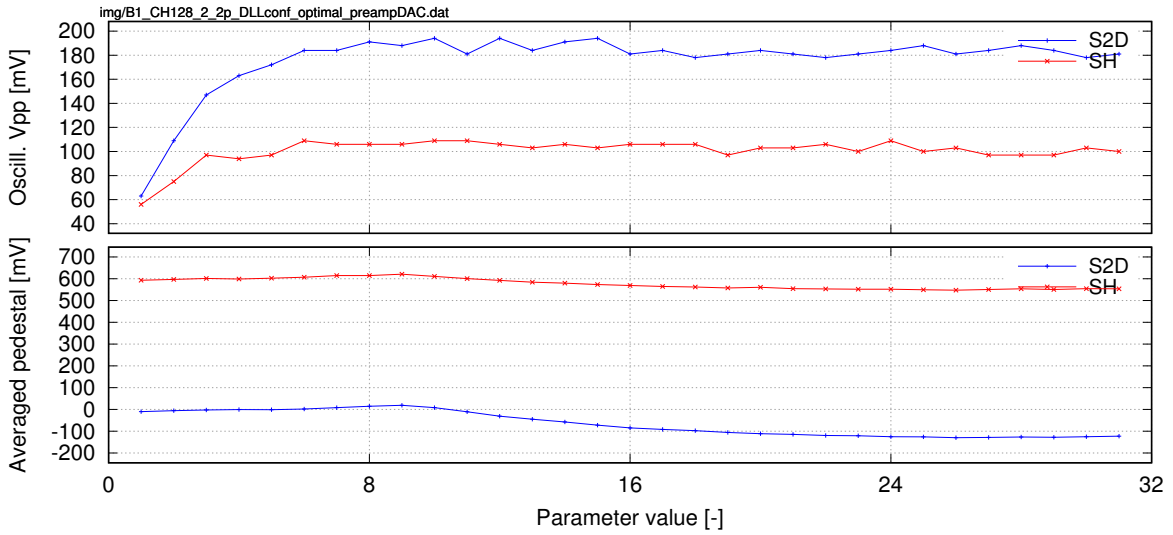


Figure 57: B1A1, channel 128, cap-PCB bonded, 2.2 pF capacitors assembled. Parameter=preamp DAC

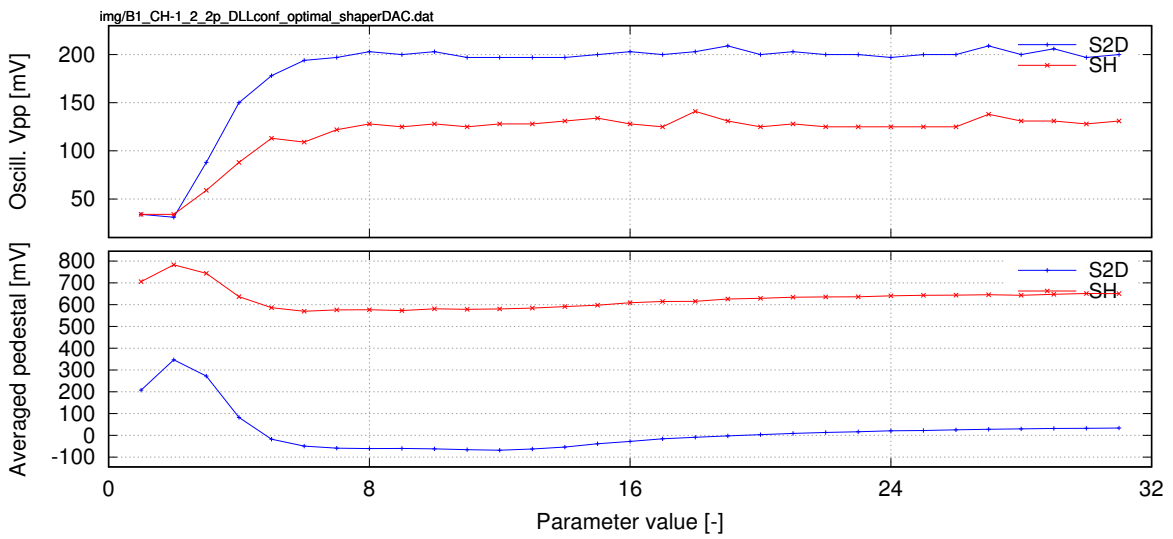


Figure 58: B1A1, channel -1, cap-PCB bonded, 2.2 pF capacitors assembled. Parameter=shaper DAC

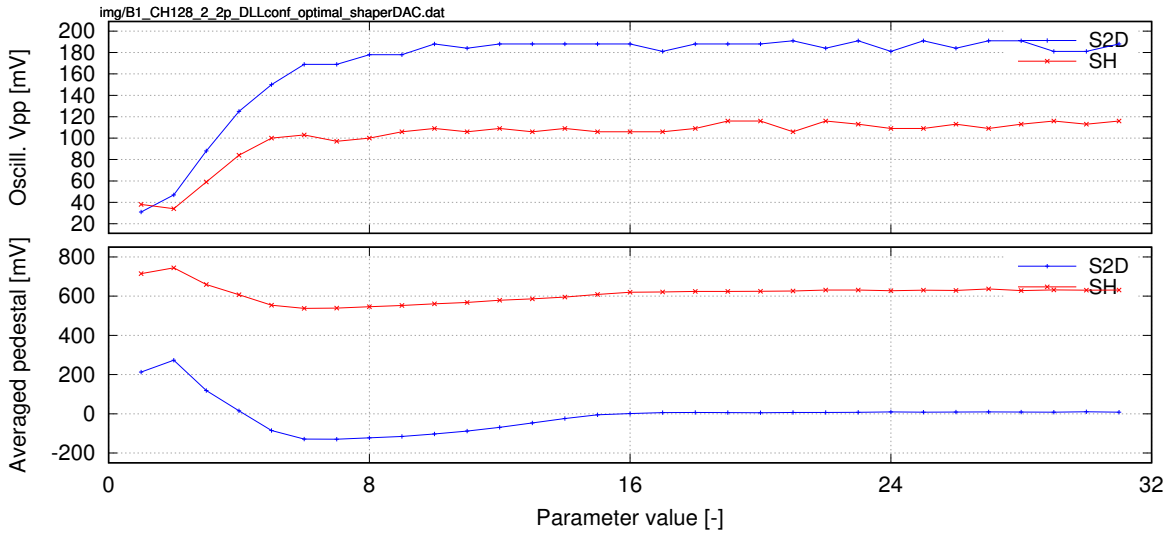


Figure 59: B1A1, channel 128, cap-PCB bonded, 2.2 pF capacitors assembled. Parameter=shaper DAC

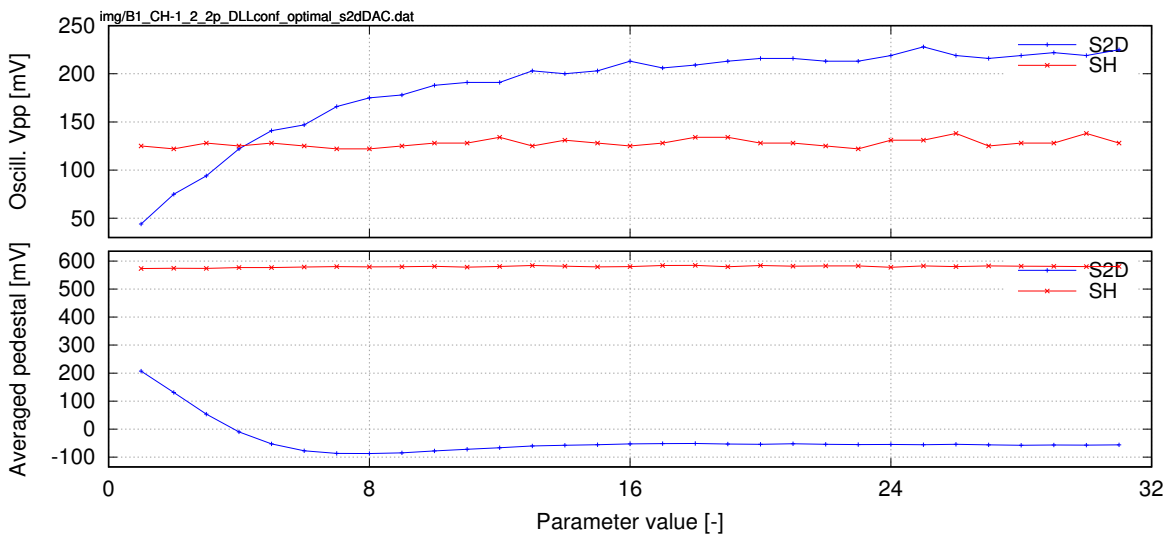


Figure 60: B1A1, channel -1, cap-PCB bonded, 2.2 pF capacitors assembled. Parameter=S2D DAC

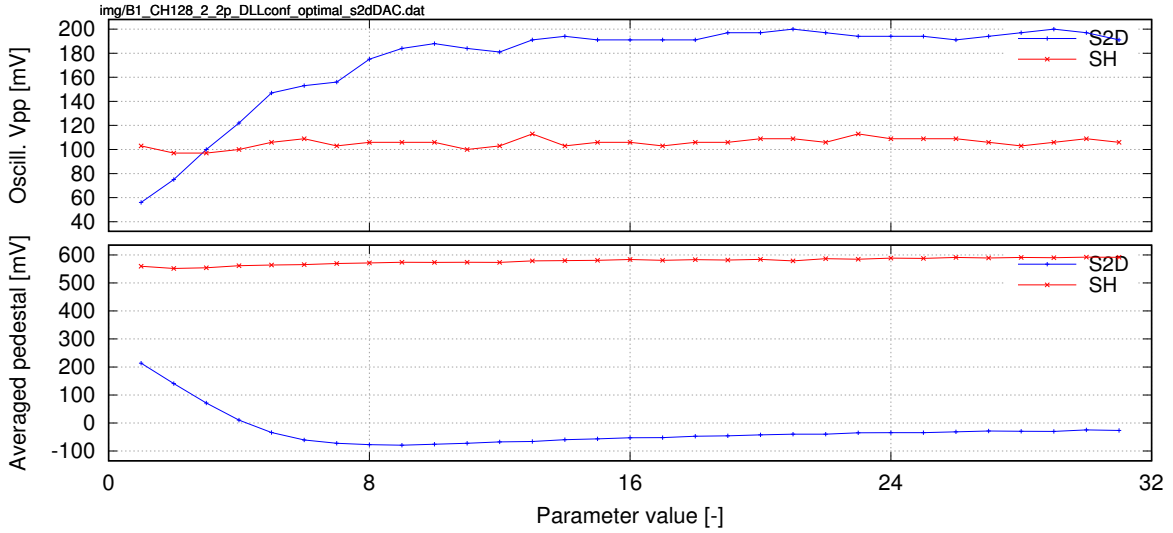


Figure 61: B1A1, channel 128, cap-PCB bonded, 2.2 pF capacitors assembled. Parameter=S2D DAC

3.4.2 Optimized test pulse and ADC delay

ASIC configuration: JC configuration (tables 1 & 2) + test pulse and ADC delay optimizations (table 3).

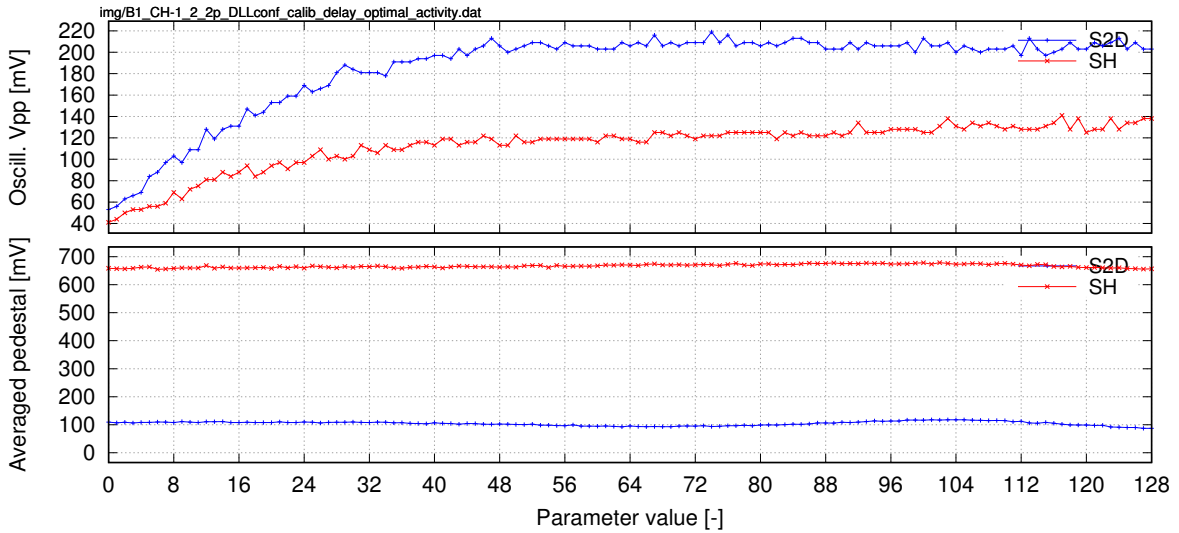


Figure 62: B1A1, channel -1, cap-PCB bonded, 2.2 pF capacitors assembled. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

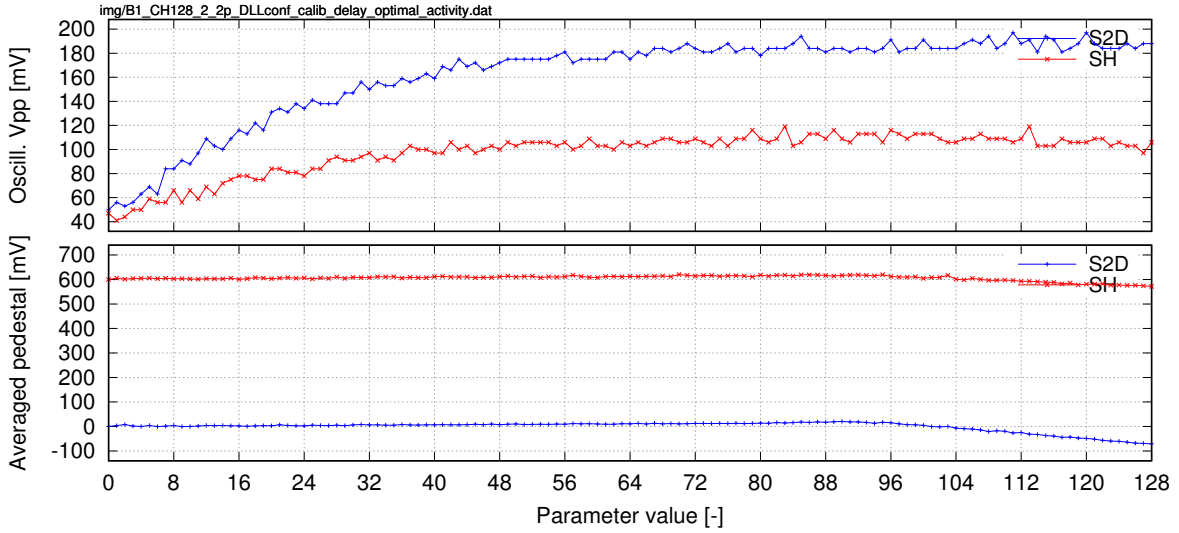


Figure 63: B1A1, channel 128, cap-PCB bonded, 2.2 pF capacitors assembled. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

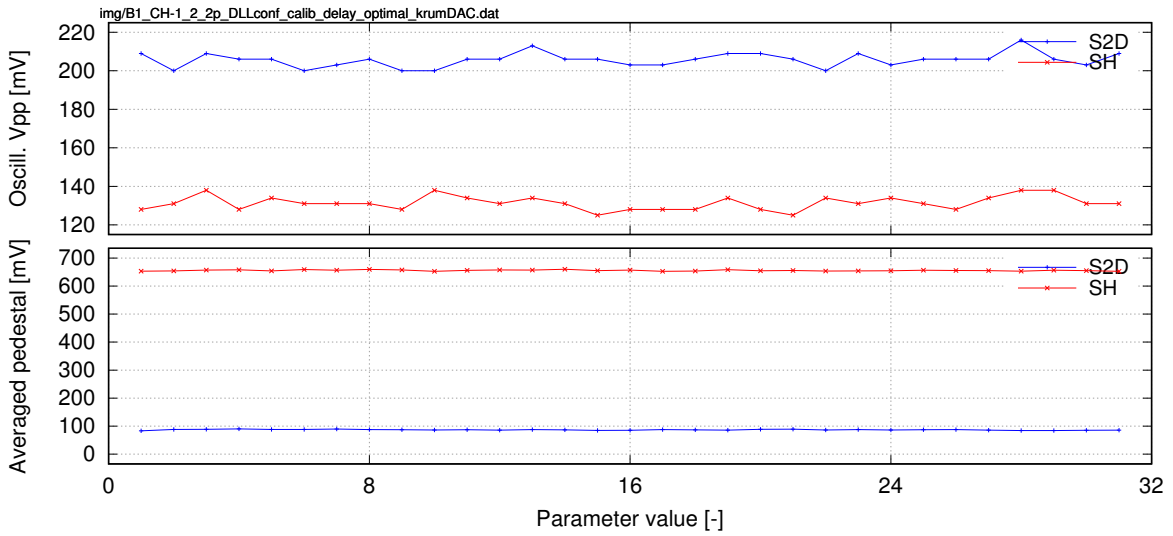


Figure 64: B1A1, channel -1, cap-PCB bonded, 2.2 pF capacitors assembled. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

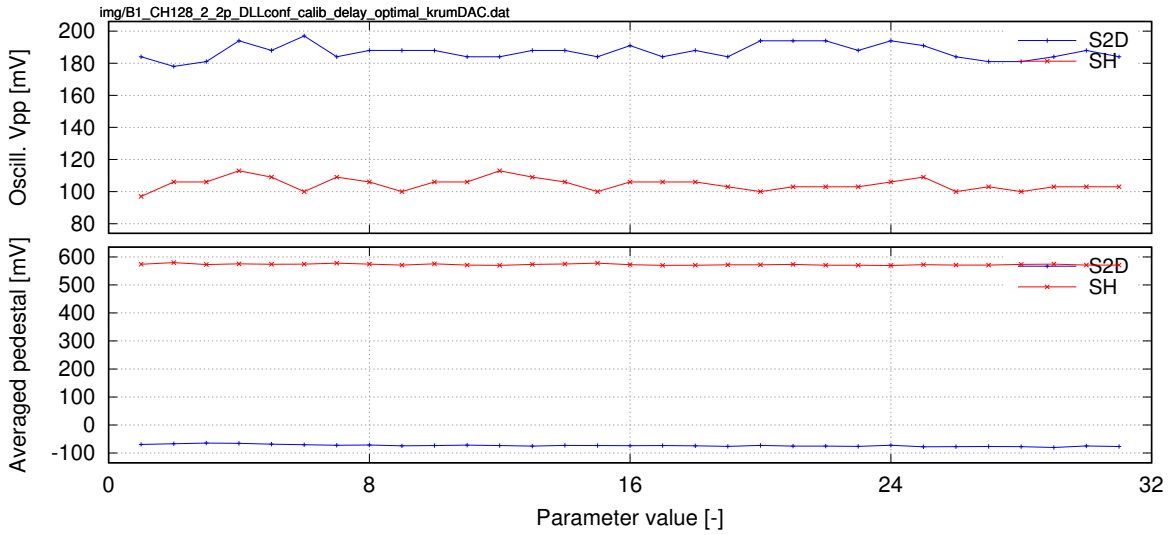


Figure 65: B1A1, channel 128, cap-PCB bonded, 2.2 pF capacitors assembled. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

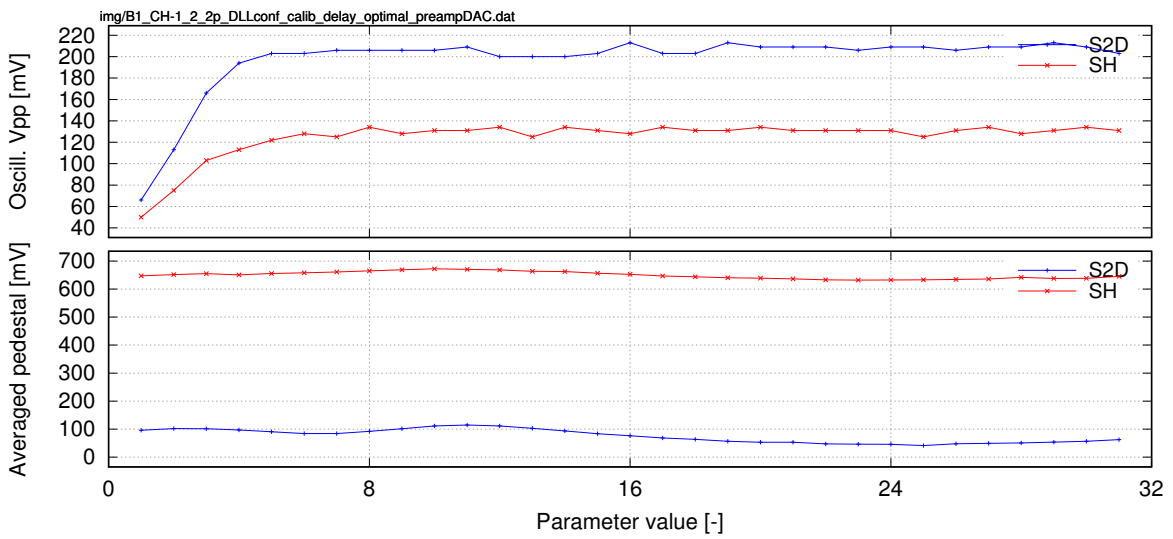


Figure 66: B1A1, channel -1, cap-PCB bonded, 2.2 pF capacitors assembled. Optimized test pulse and ADC delay. Parameter=preamp DAC

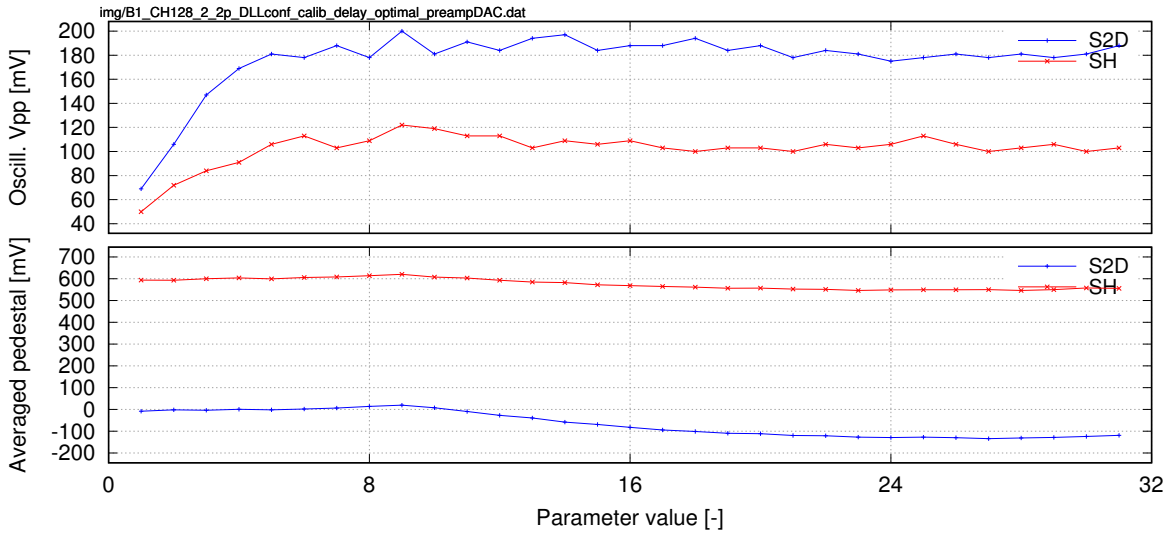


Figure 67: B1A1, channel 128, cap-PCB bonded, 2.2 pF capacitors assembled. Optimized test pulse and ADC delay. Parameter=preamp DAC

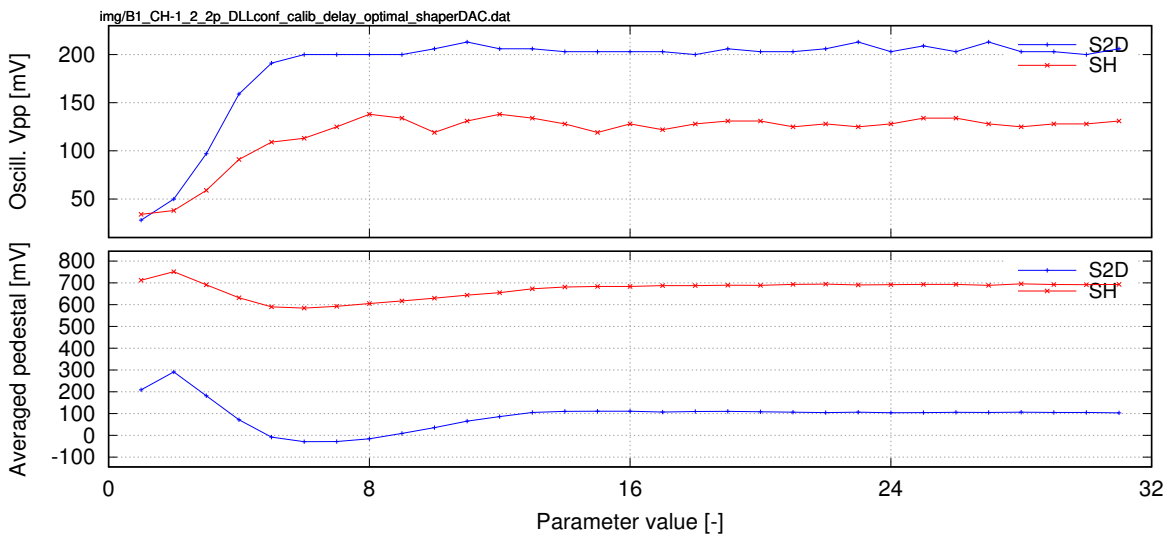


Figure 68: B1A1, channel -1, cap-PCB bonded, 2.2 pF capacitors assembled. Optimized test pulse and ADC delay. Parameter=shaper DAC

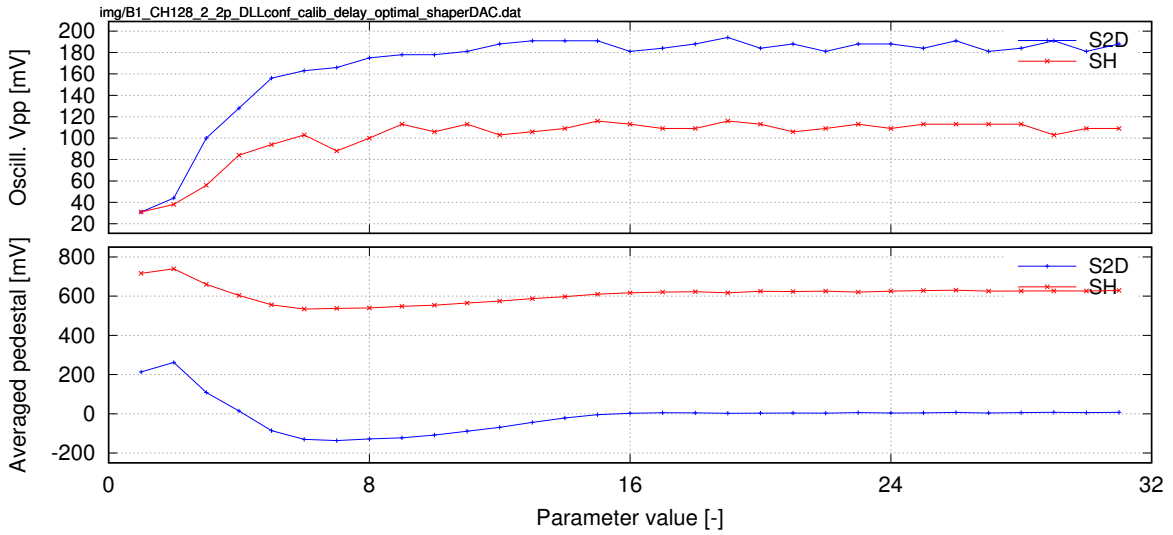


Figure 69: B1A1, channel 128, cap-PCB bonded, 2.2 pF capacitors assembled. Optimized test pulse and ADC delay. Parameter=shaper DAC

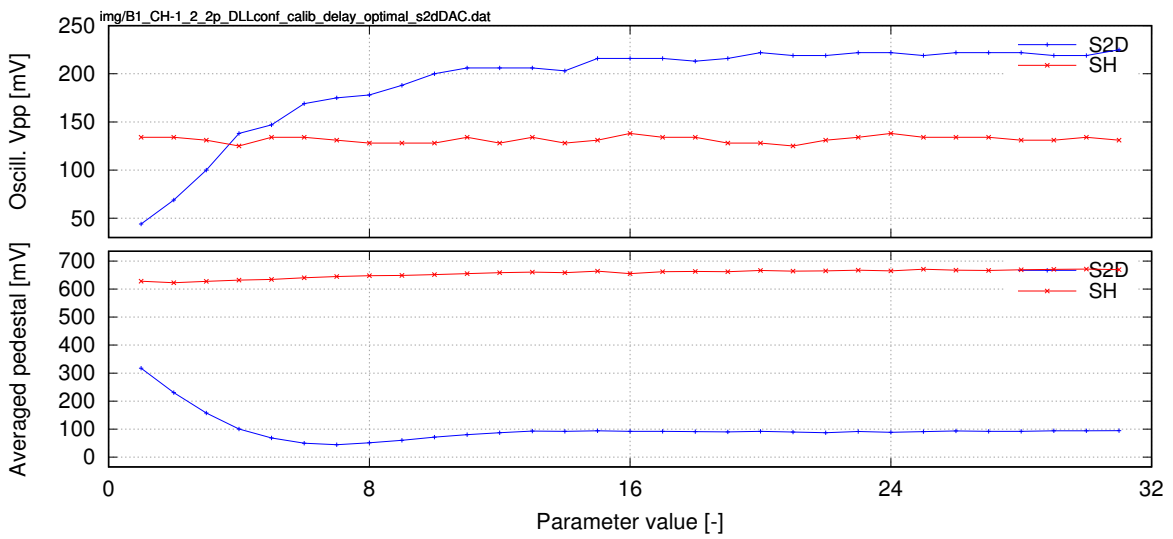


Figure 70: B1A1, channel -1, cap-PCB bonded, 2.2 pF capacitors assembled. Optimized test pulse and ADC delay. Parameter=S2D DAC

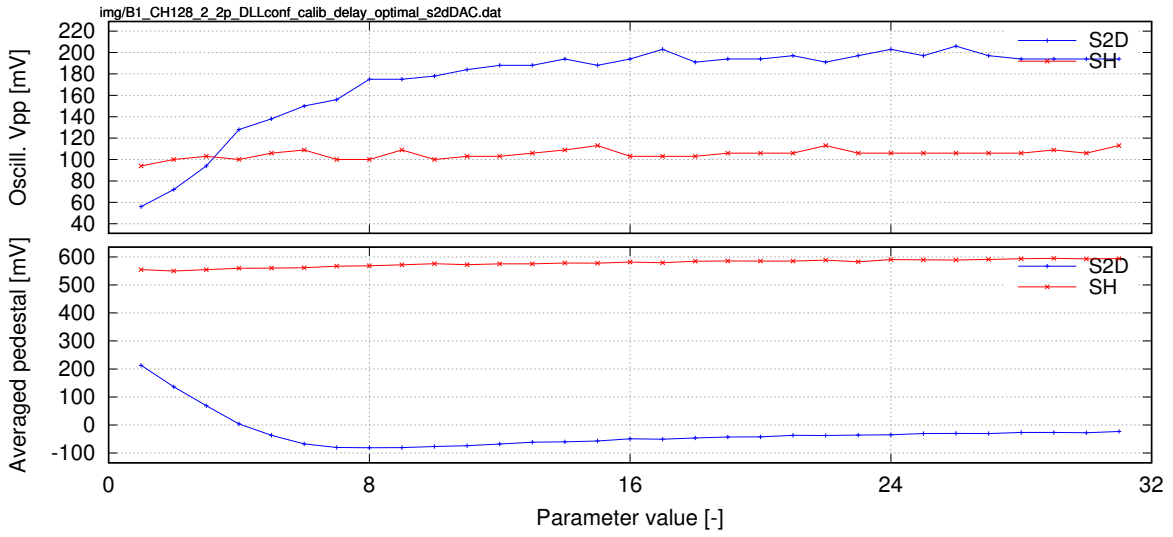


Figure 71: B1A1, channel 128, cap-PCB bonded, 2.2 pF capacitors assembled. Optimized test pulse and ADC delay. Parameter=S2D DAC

3.5 Cap-PCB bonded, 12 pF capacitors assembled

Cap-PCB assembled, bonded to SALT input pads 0 and 127, two 12 pF capacitors assembled to the cap-PCB.

3.5.1 Default ASIC configuration

ASIC configuration: JC configuration (tables 1 & 2).

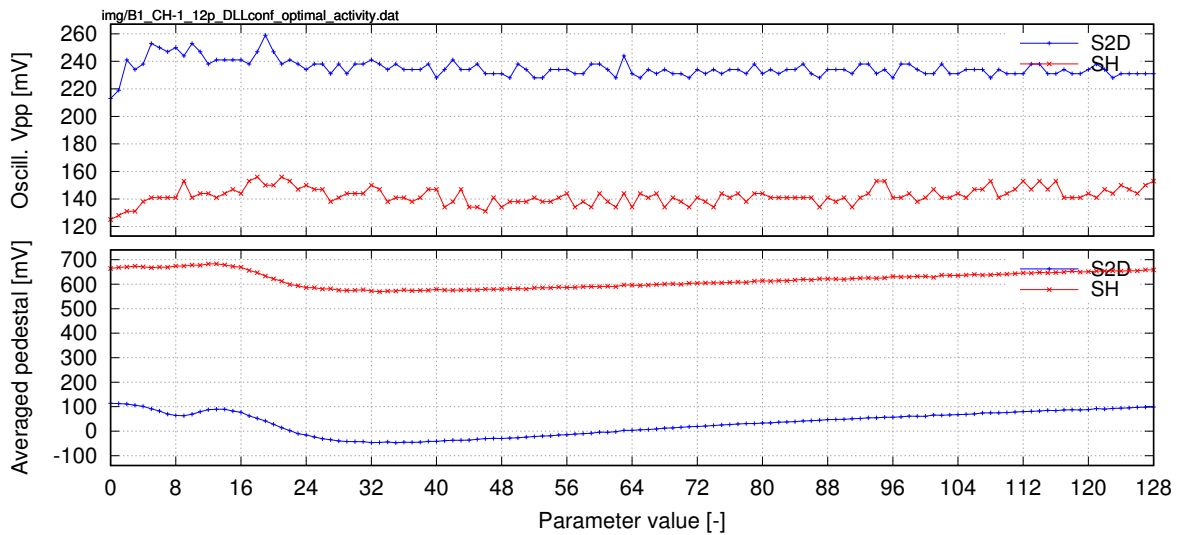


Figure 72: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors assembled. Parameter=no. of active ADCs

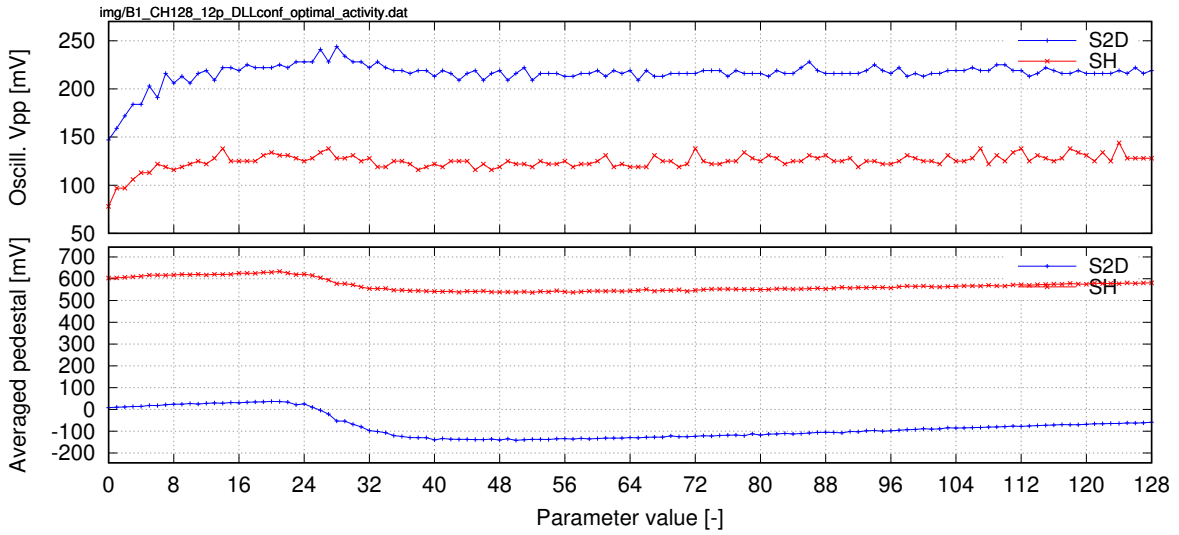


Figure 73: B1A1, channel 128, cap-PCB bonded, 12 pF capacitors assembled. Parameter=no. of active ADCs

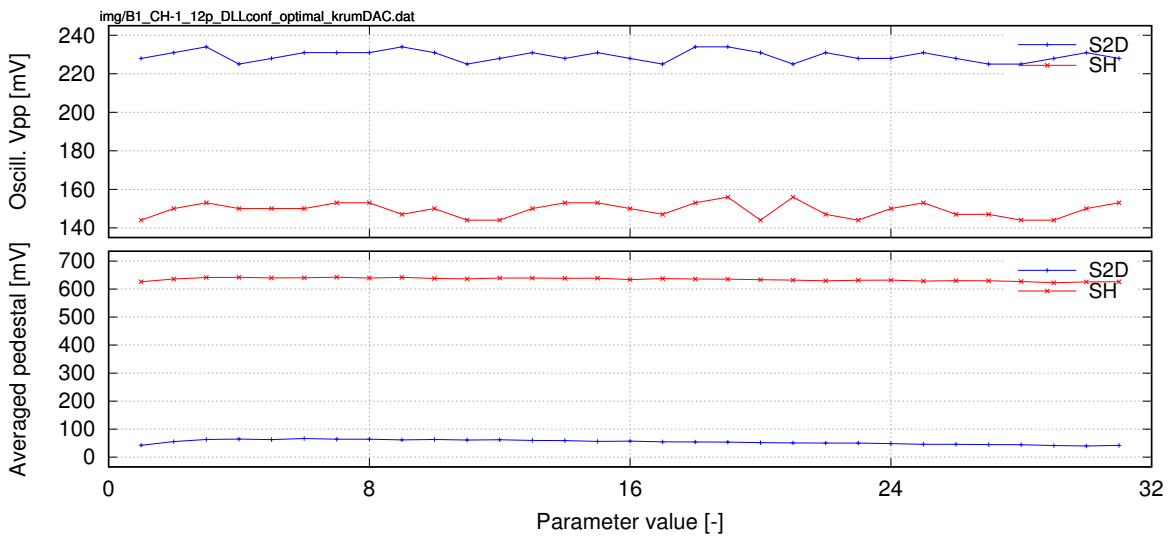


Figure 74: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors assembled. Parameter=Krummenacher DAC

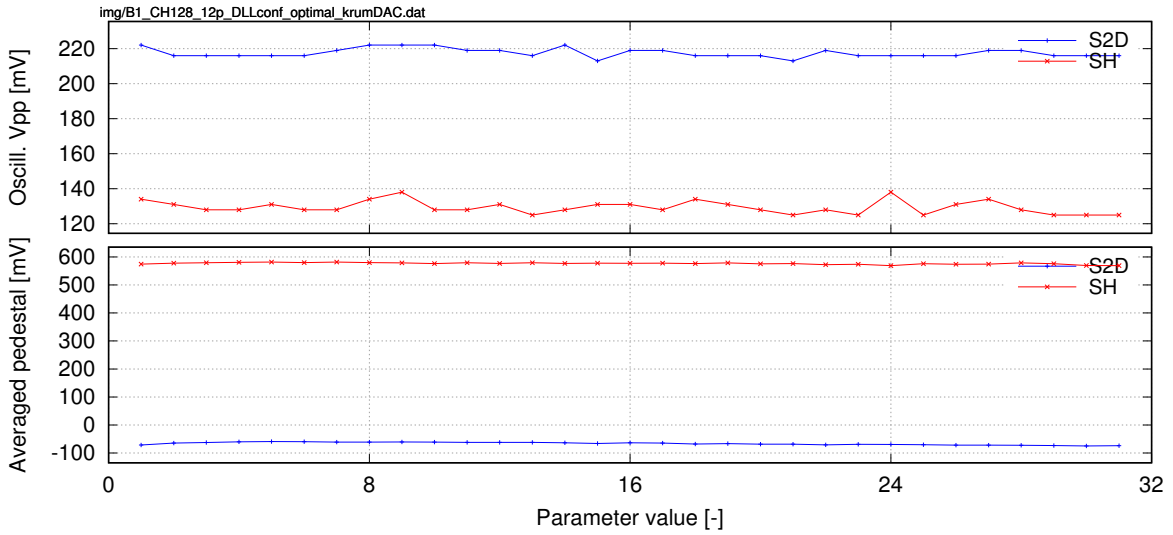


Figure 75: B1A1, channel 128, cap-PCB bonded, 12 pF capacitors assembled. Parameter=Krummenacher DAC

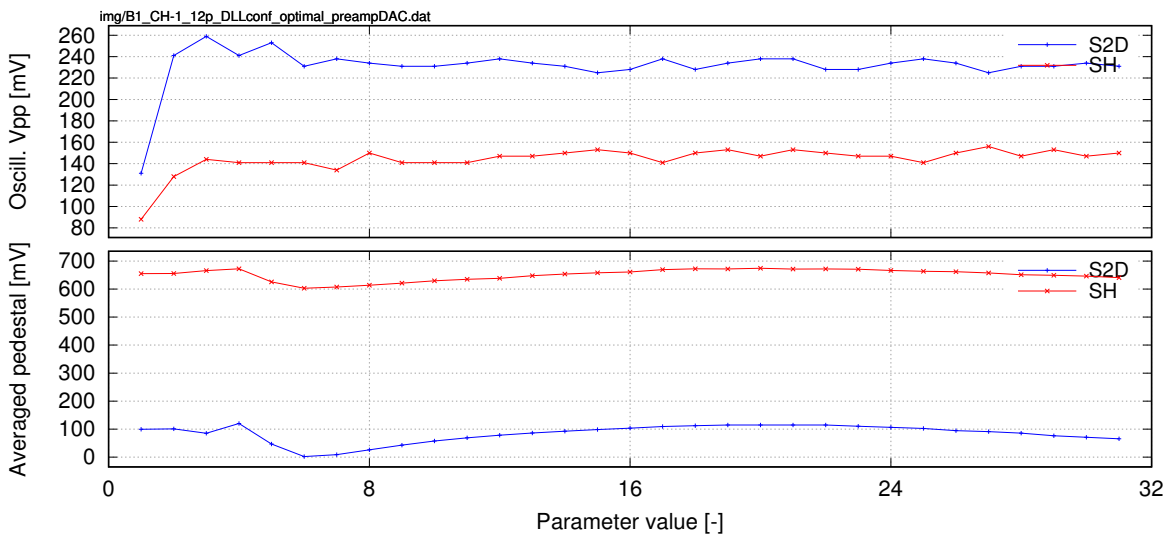


Figure 76: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors assembled. Parameter=preamp DAC

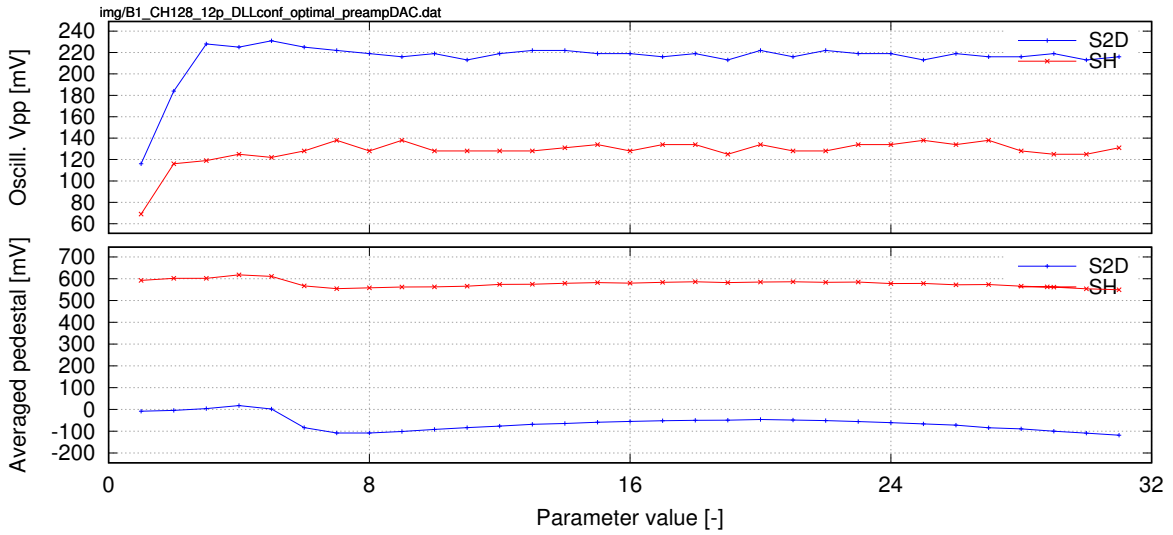


Figure 77: B1A1, channel 128, cap-PCB bonded, 12 pF capacitors assembled. Parameter=preamp DAC

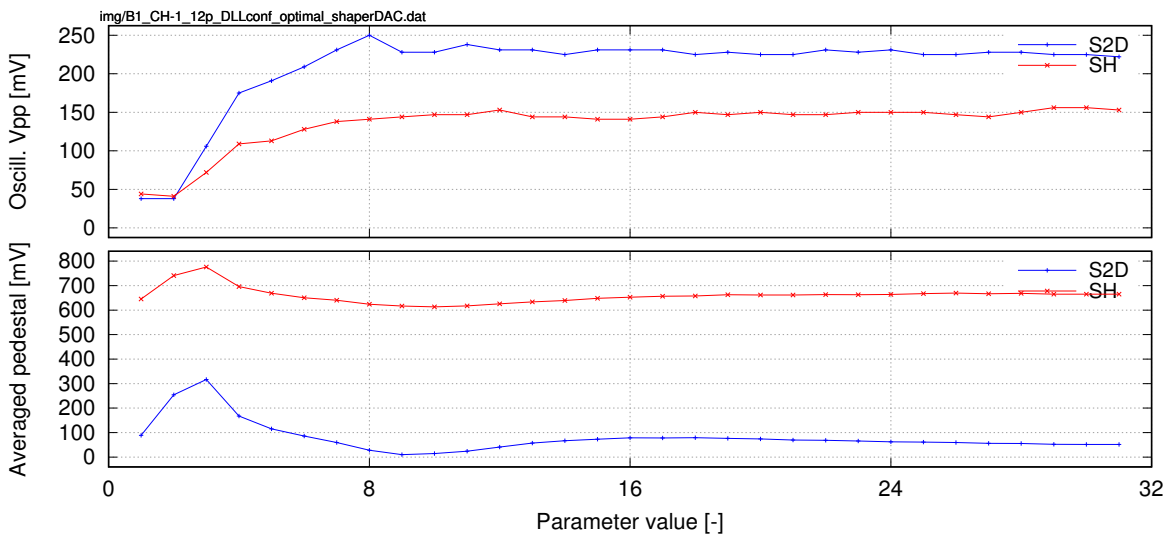


Figure 78: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors assembled. Parameter=shaper DAC

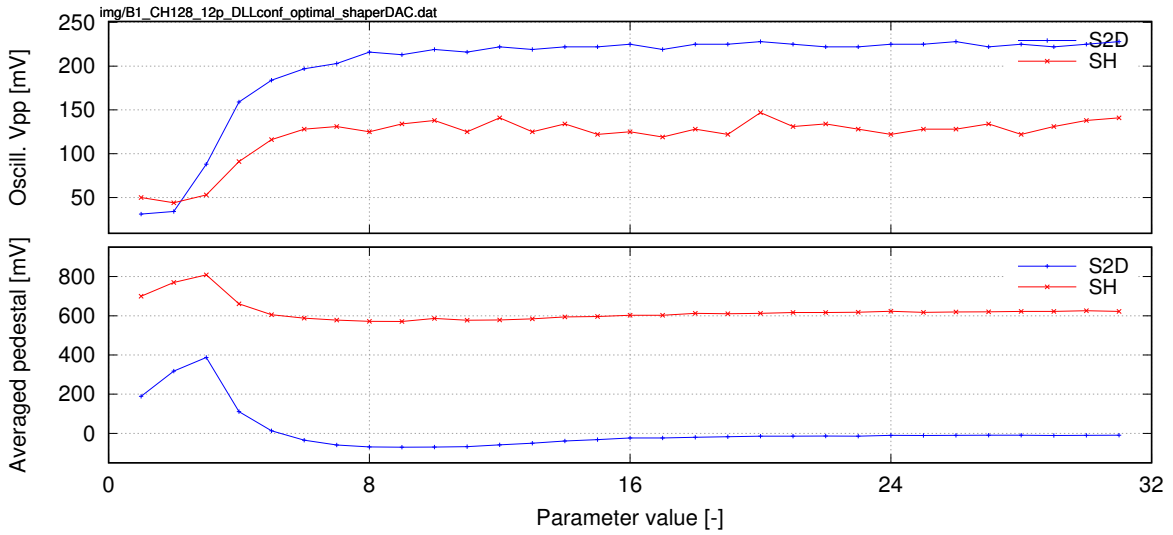


Figure 79: B1A1, channel 128, cap-PCB bonded, 12 pF capacitors assembled. Parameter=shaper DAC

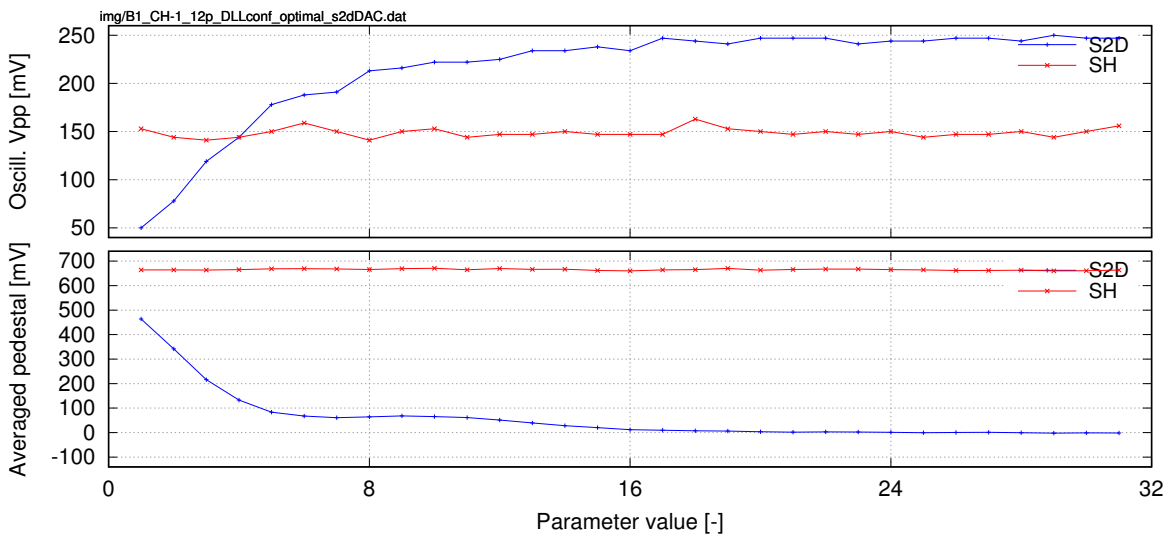


Figure 80: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors assembled. Parameter=S2D DAC

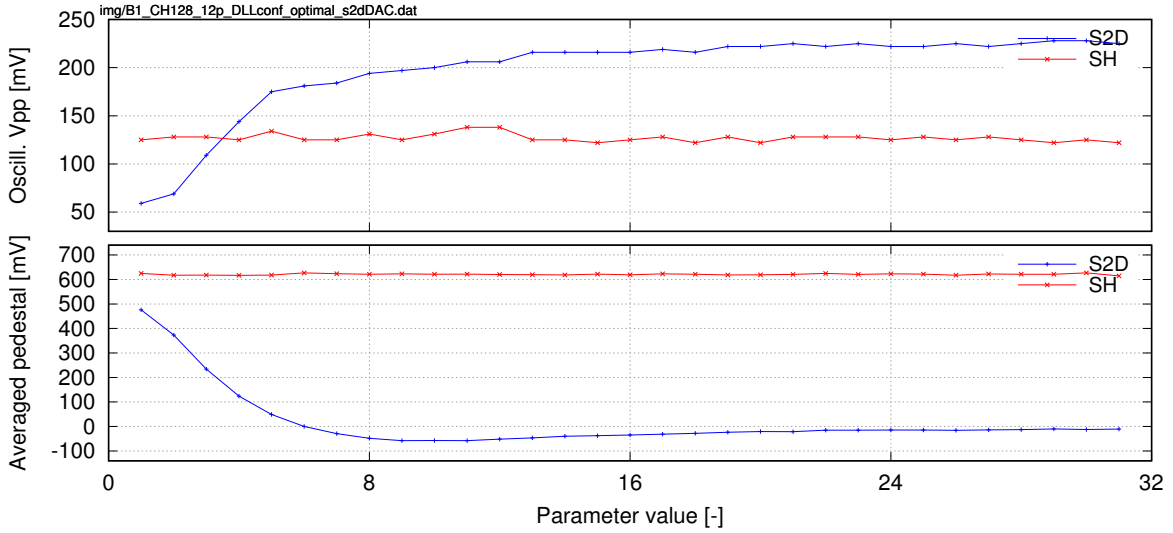


Figure 81: B1A1, channel 128, cap-PCB bonded, 12 pF capacitors assembled. Parameter=S2D DAC

3.5.2 Optimized test pulse and ADC delay

ASIC configuration: JC configuration (tables 1 & 2) + test pulse and ADC delay optimizations (table 3).

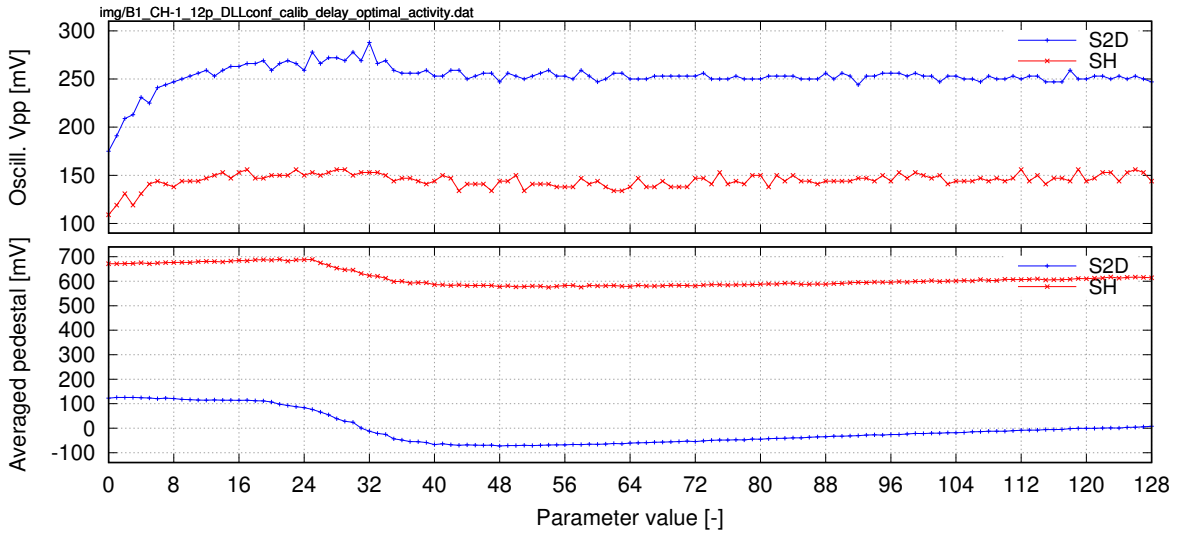


Figure 82: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors assembled. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

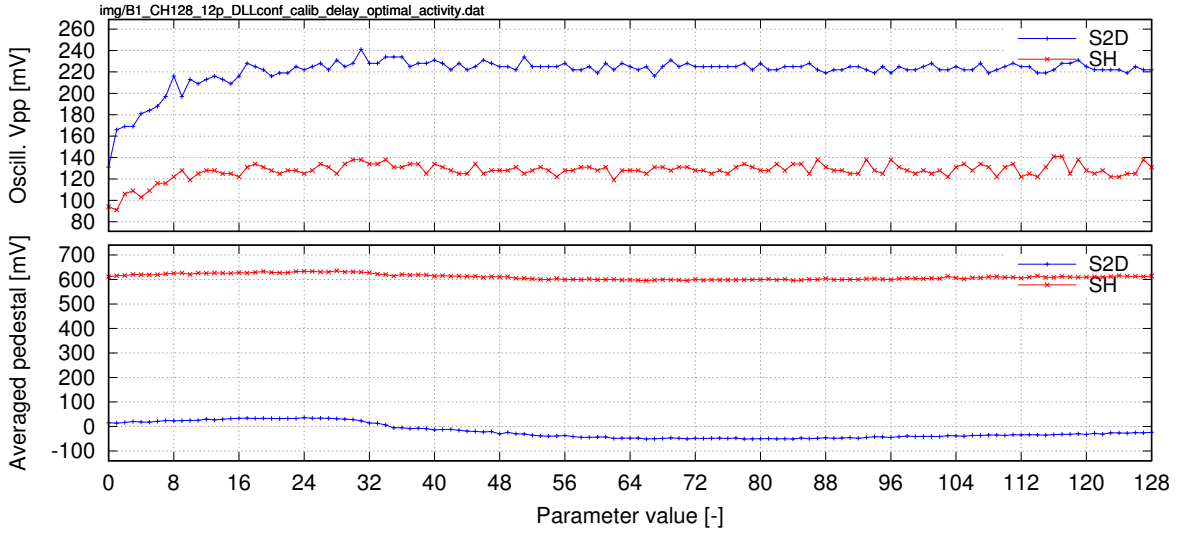


Figure 83: B1A1, channel 128, cap-PCB bonded, 12 pF capacitors assembled. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

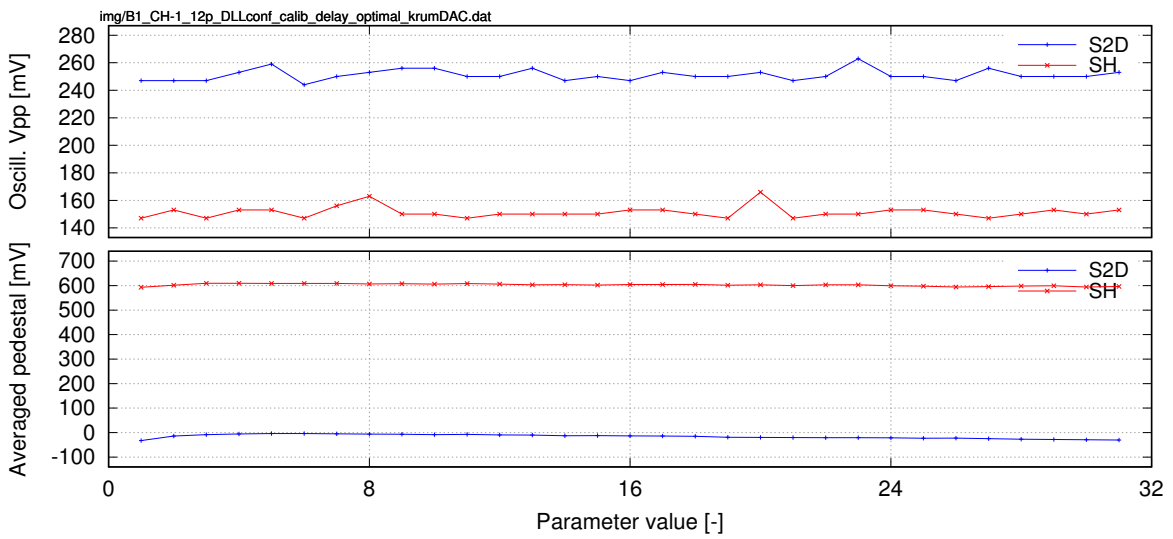


Figure 84: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors assembled. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

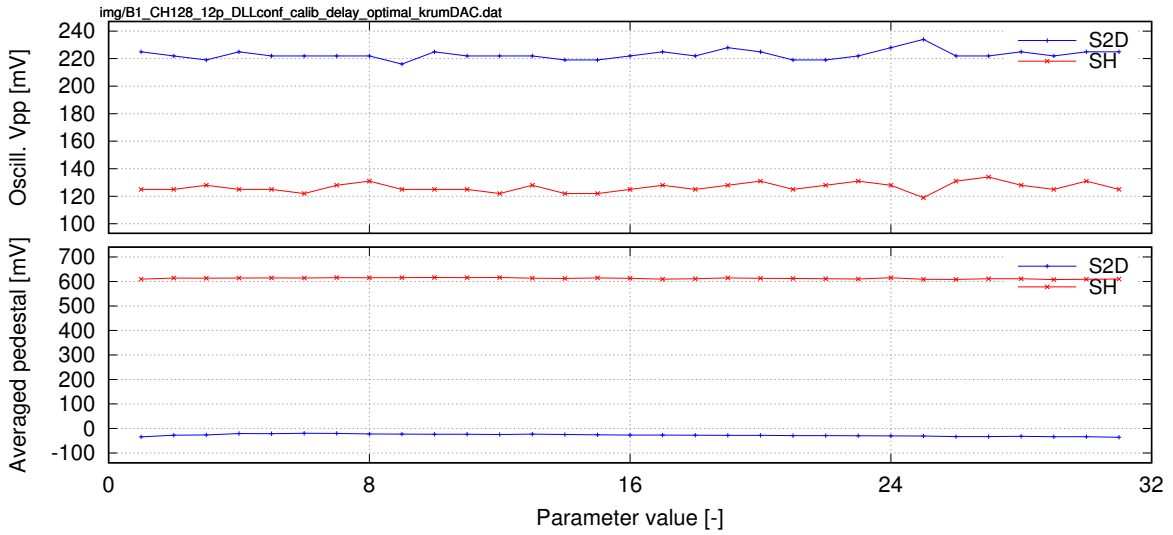


Figure 85: B1A1, channel 128, cap-PCB bonded, 12 pF capacitors assembled. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

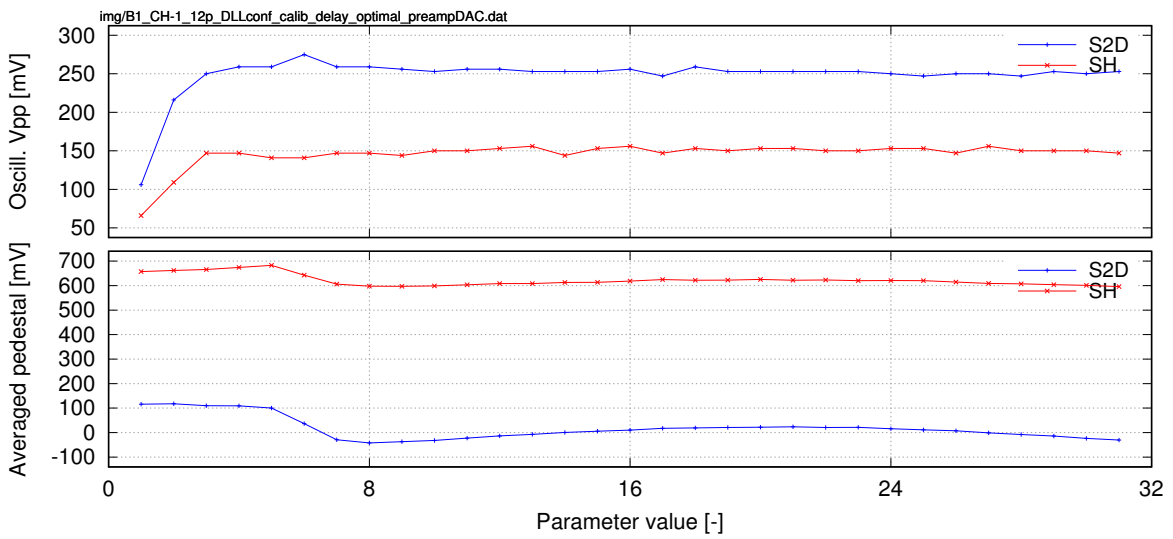


Figure 86: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors assembled. Optimized test pulse and ADC delay. Parameter=preamp DAC

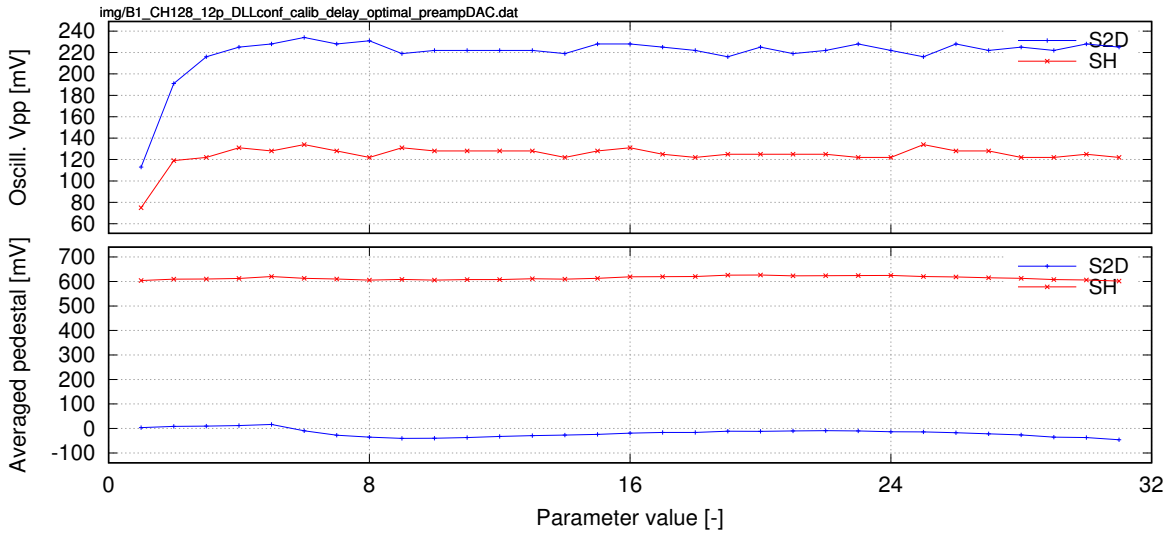


Figure 87: B1A1, channel 128, cap-PCB bonded, 12 pF capacitors assembled. Optimized test pulse and ADC delay. Parameter=preamp DAC

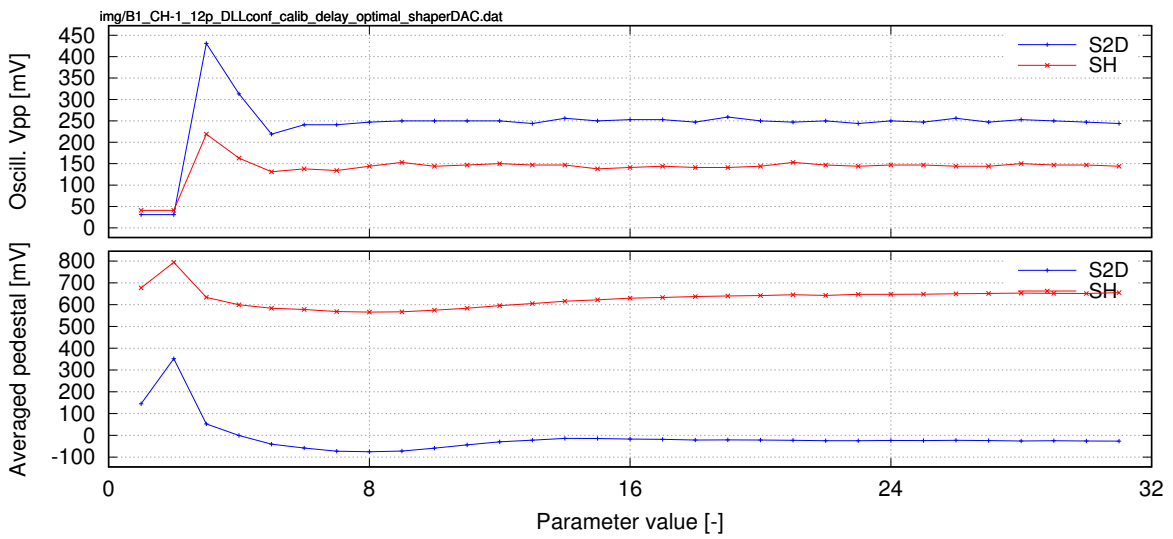


Figure 88: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors assembled. Optimized test pulse and ADC delay. Parameter=shaper DAC

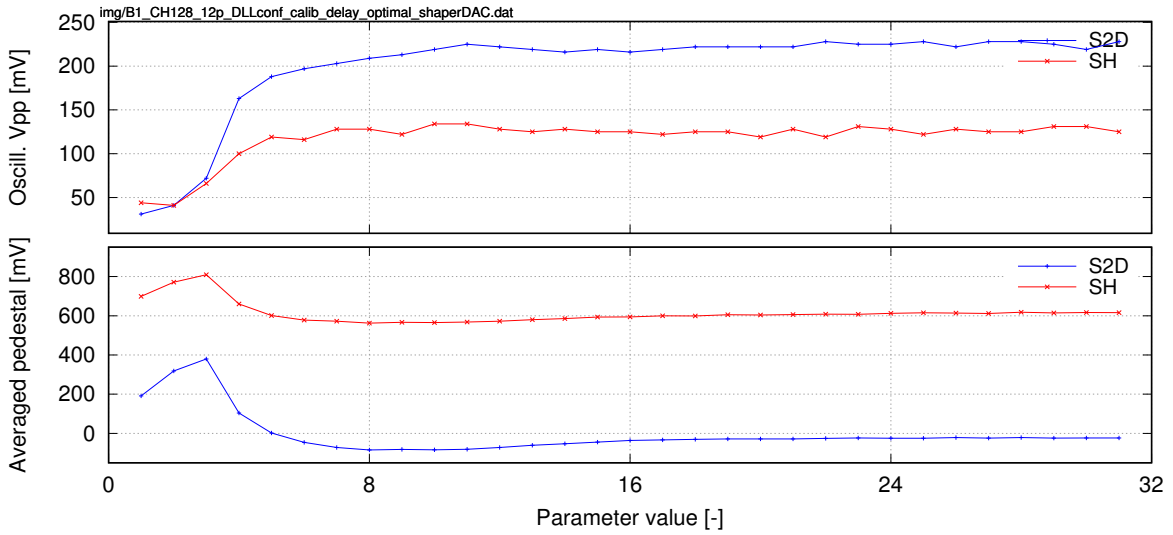


Figure 89: B1A1, channel 128, cap-PCB bonded, 12 pF capacitors assembled. Optimized test pulse and ADC delay. Parameter=shaper DAC

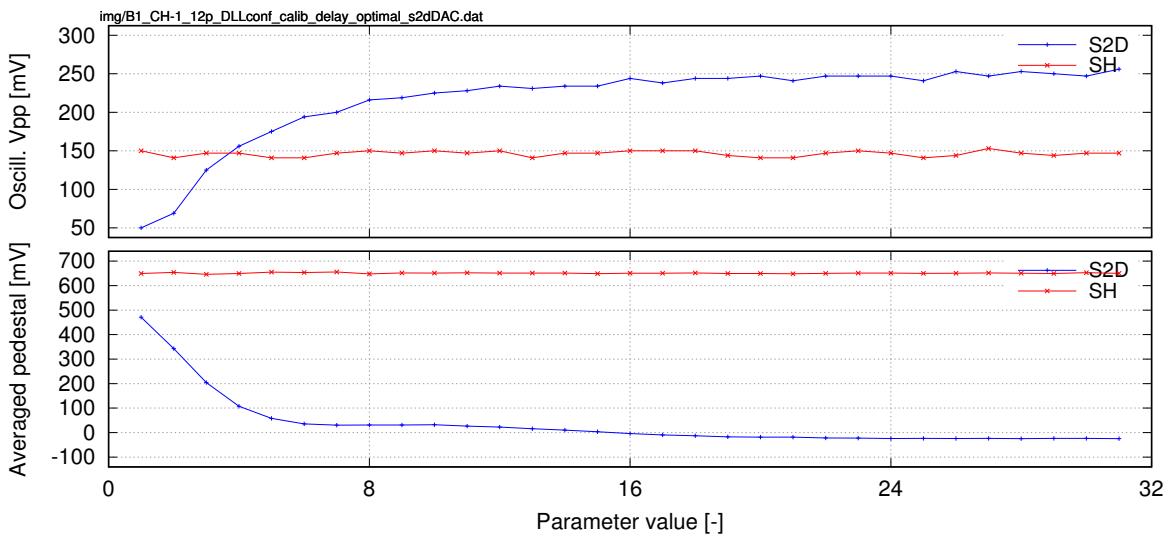


Figure 90: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors assembled. Optimized test pulse and ADC delay. Parameter=S2D DAC

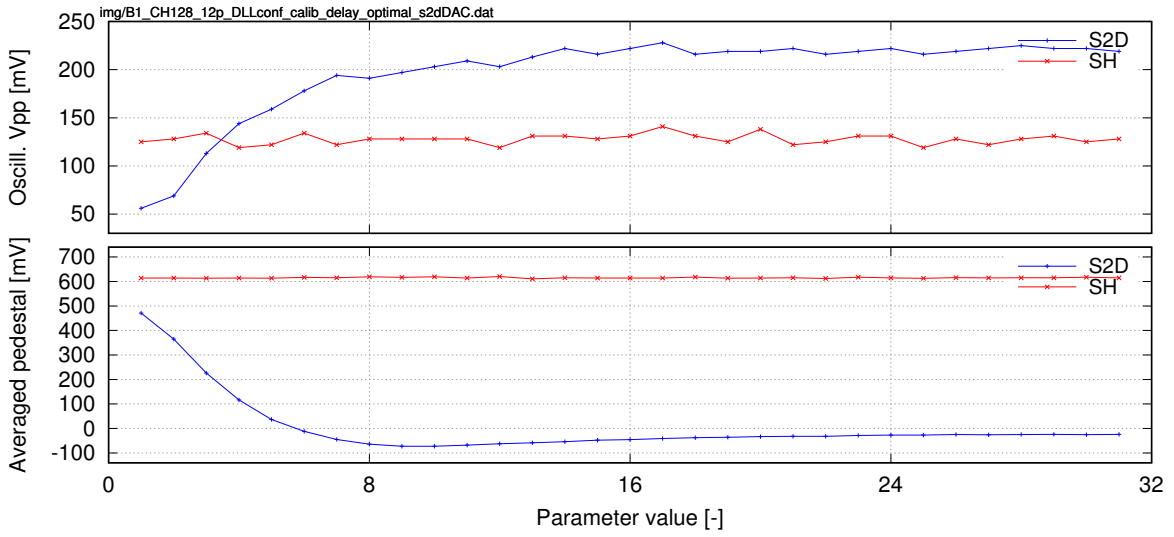


Figure 91: B1A1, channel 128, cap-PCB bonded, 12 pF capacitors assembled. Optimized test pulse and ADC delay. Parameter=S2D DAC

3.6 Cap-PCB bonded, 12 pF capacitors + 620 kΩ resistors assembled

Cap-PCB assembled, bonded to SALT input pads 0 and 127, two 12 pF capacitors assembled to the cap-PCB, 620 kΩ resistors soldered in parallel to the capacitors. Only channel -1 measured.

3.6.1 Default ASIC configuration

ASIC configuration: JC configuration (tables 1 & 2).

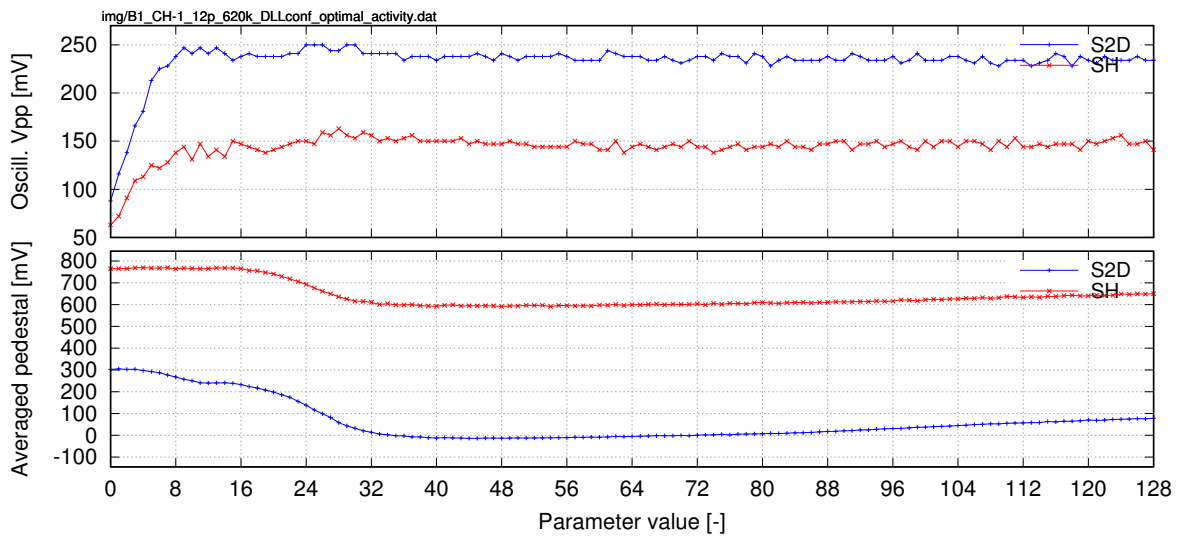


Figure 92: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 620 kΩ resistors assembled. Parameter=no. of active ADCs

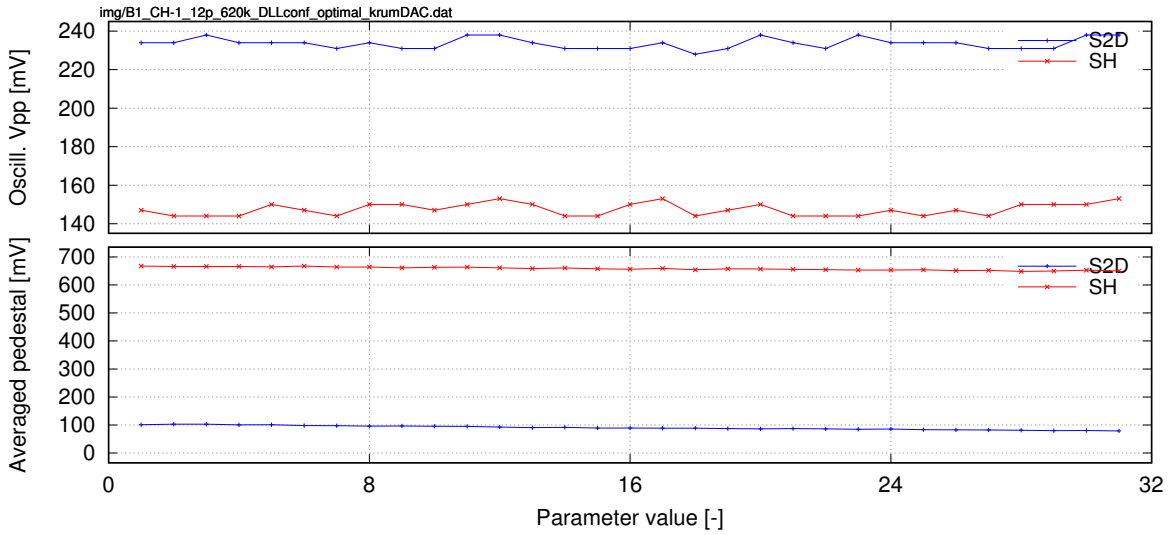


Figure 93: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 620 kΩ resistors assembled. Parameter=Krummenacher DAC

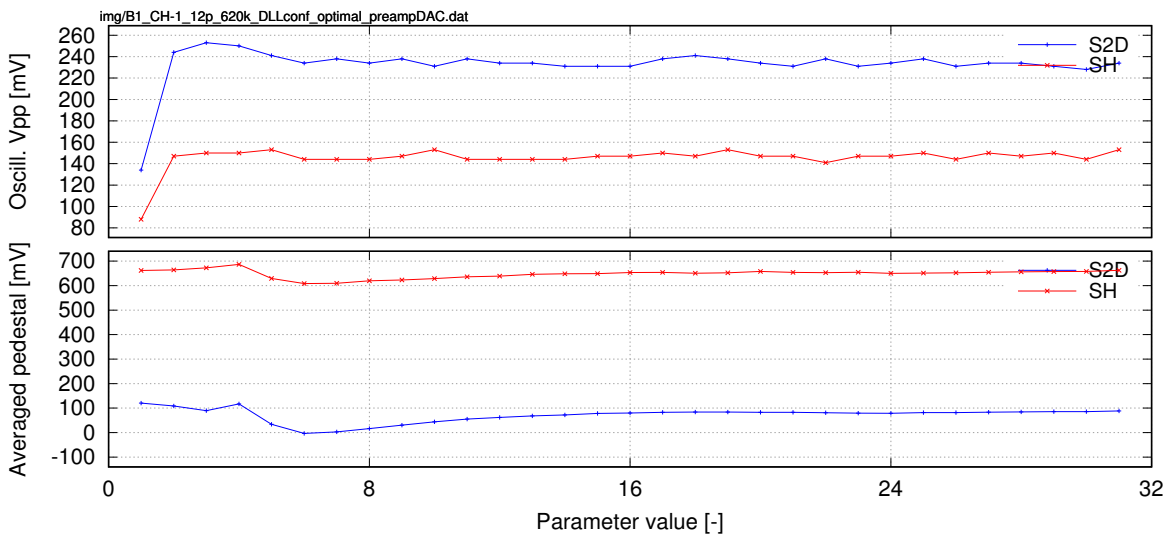


Figure 94: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 620 kΩ resistors assembled. Parameter=preamp DAC

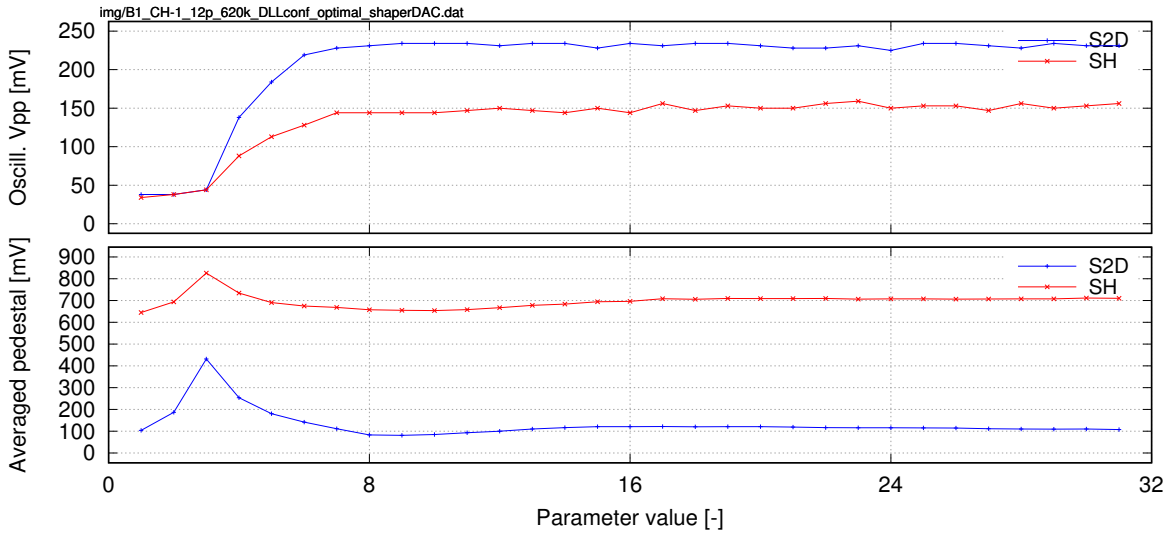


Figure 95: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 620 k Ω resistors assembled. Parameter=shaper DAC

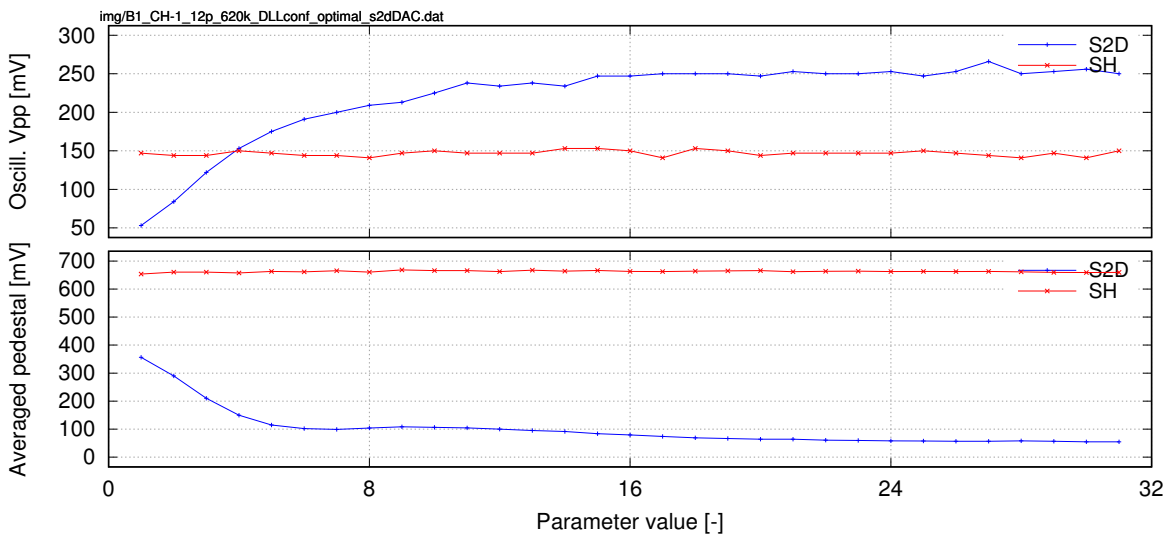


Figure 96: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 620 k Ω resistors assembled. Parameter=S2D DAC

3.6.2 Optimized test pulse and ADC delay

ASIC configuration: JC configuration (tables 1 & 2) + test pulse and ADC delay optimizations (table 3).

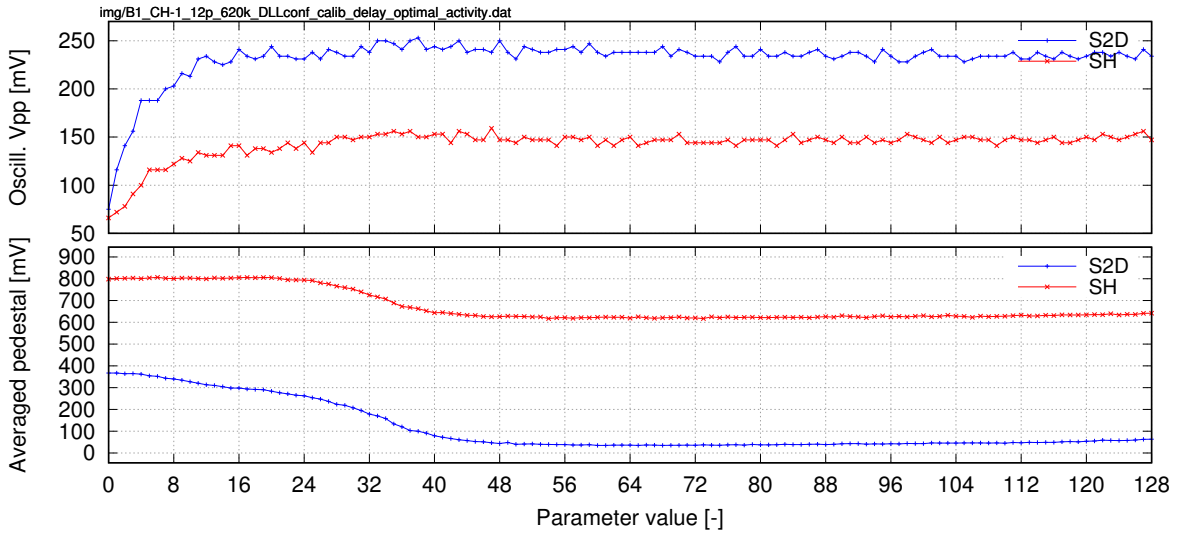


Figure 97: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 620 kΩ resistors assembled. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

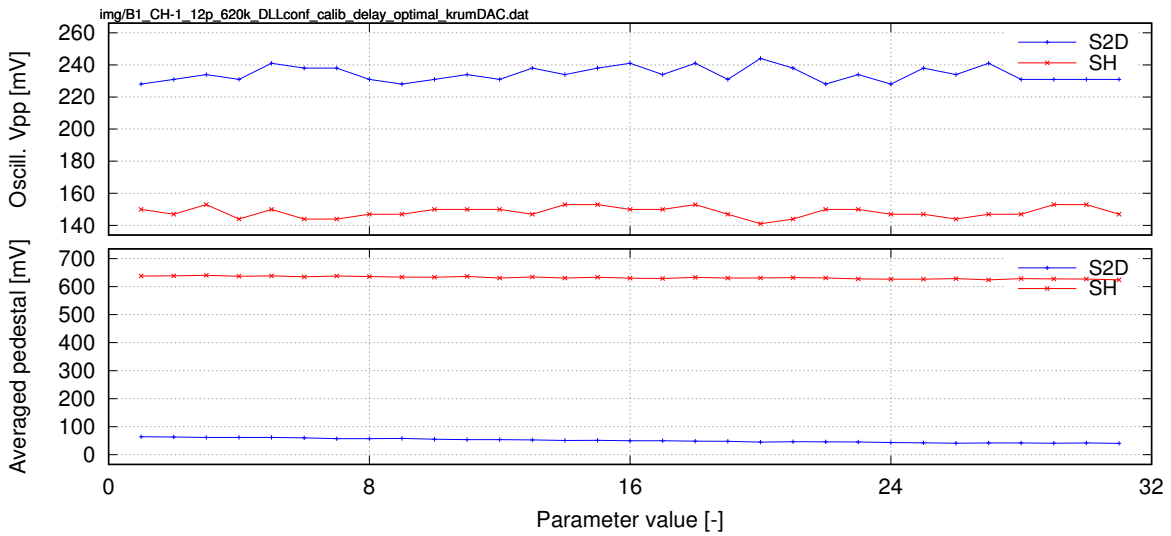


Figure 98: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 620 kΩ resistors assembled. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

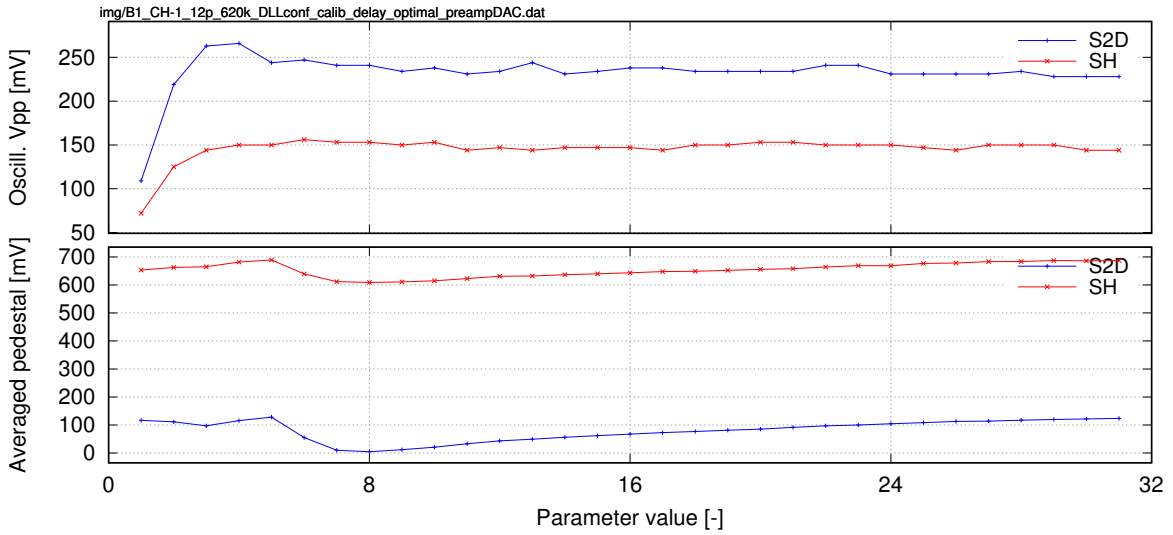


Figure 99: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 620 k Ω resistors assembled. Optimized test pulse and ADC delay. Parameter=preamp DAC

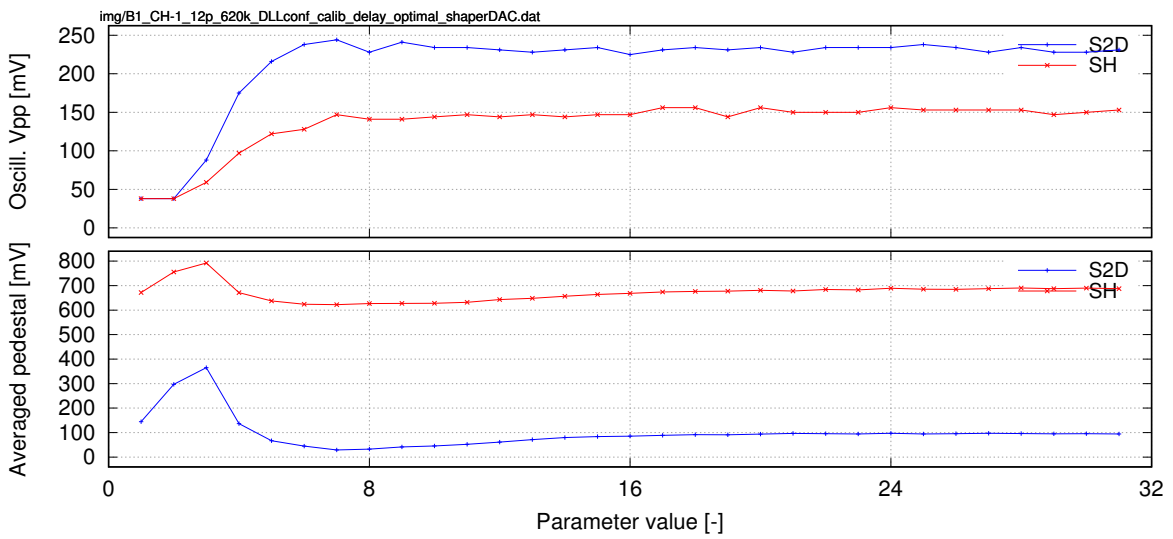


Figure 100: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 620 k Ω resistors assembled. Optimized test pulse and ADC delay. Parameter=shaper DAC

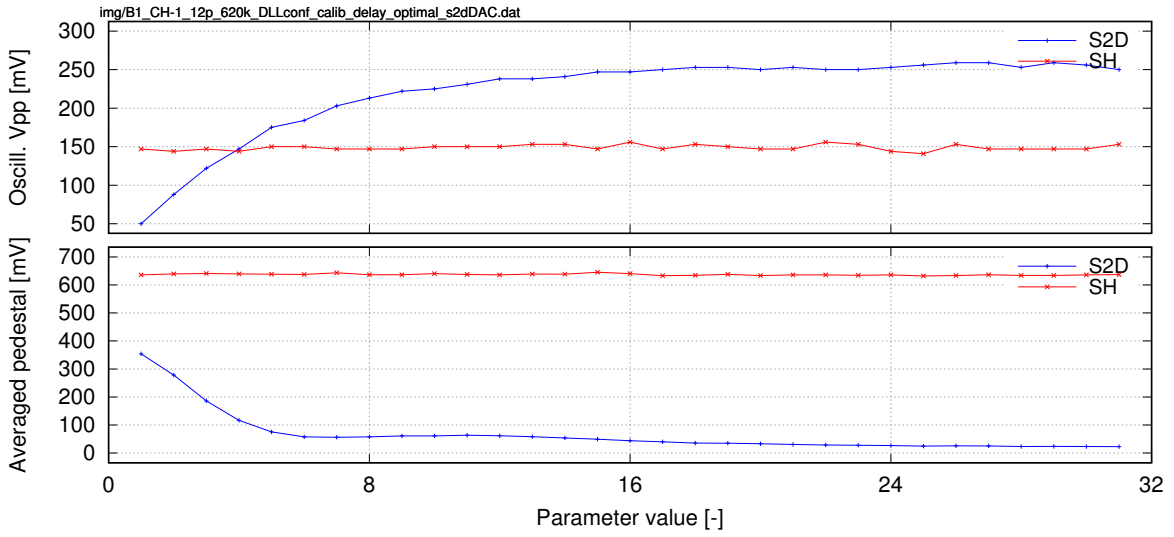


Figure 101: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 620 kΩ resistors assembled. Optimized test pulse and ADC delay. Parameter=S2D DAC

3.7 Cap-PCB bonded, 12 pF capacitors + 620 kΩ resistors assembled; Ibuf current maximized

Cap-PCB assembled, bonded to SALT input pads 0 and 127, two 12 pF capacitors assembled to the cap-PCB, 620 kΩ resistors soldered in parallel to the capacitors. Ibuf current maximized – 1 kΩ resistor between VDDA and Ibuf pad. Only channel -1 measured.

3.7.1 Default ASIC configuration

ASIC configuration: JC configuration (tables 1 & 2).

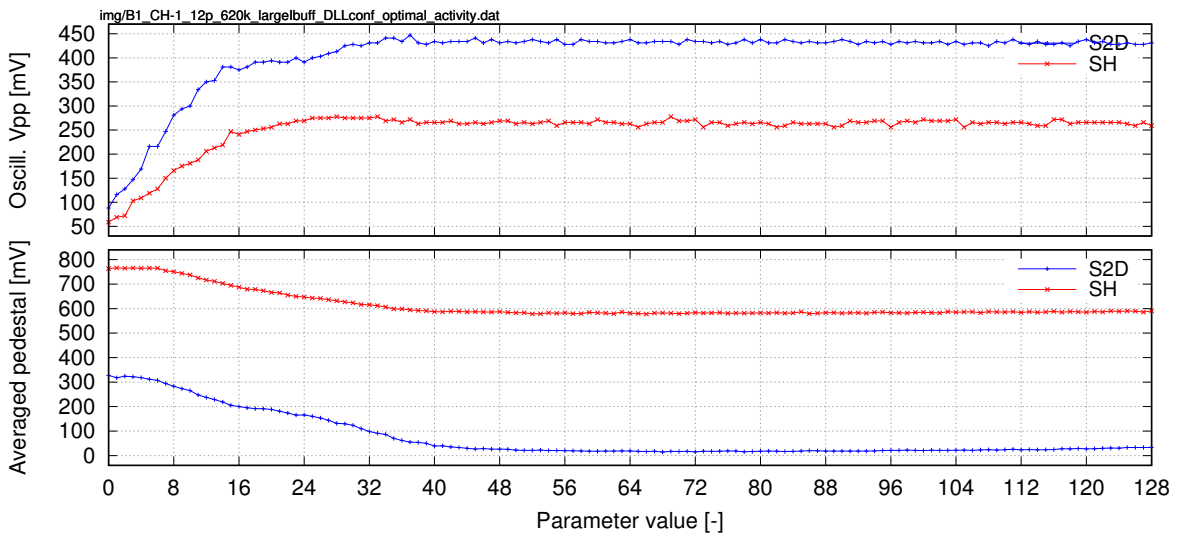


Figure 102: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 620 kΩ resistors assembled; Ibuf current maximized. Parameter=no. of active ADCs

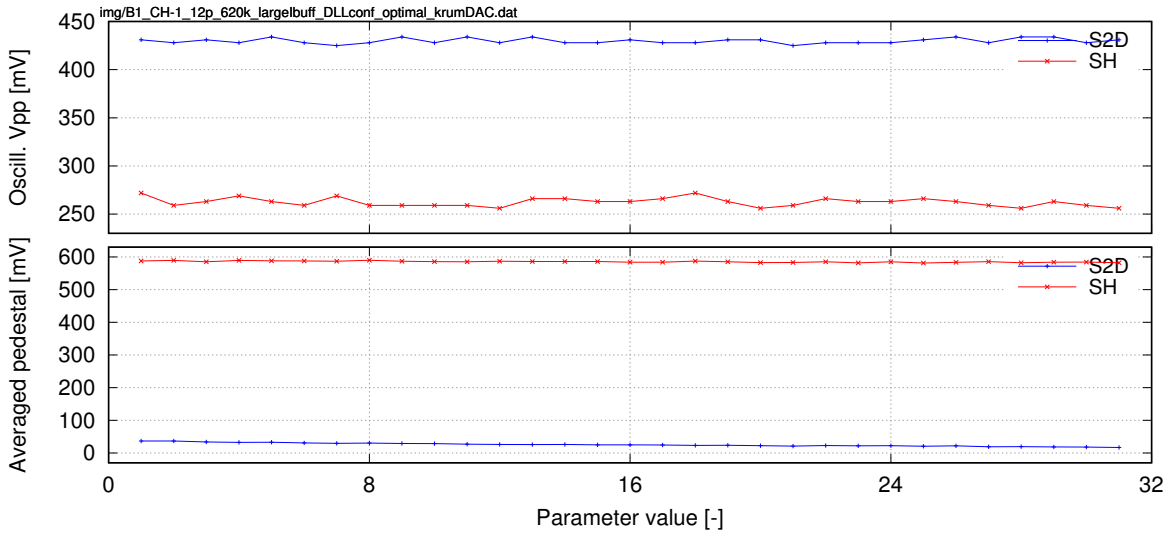


Figure 103: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 620 kΩ resistors assembled; Ibuf current maximized. Parameter=Krummenacher DAC

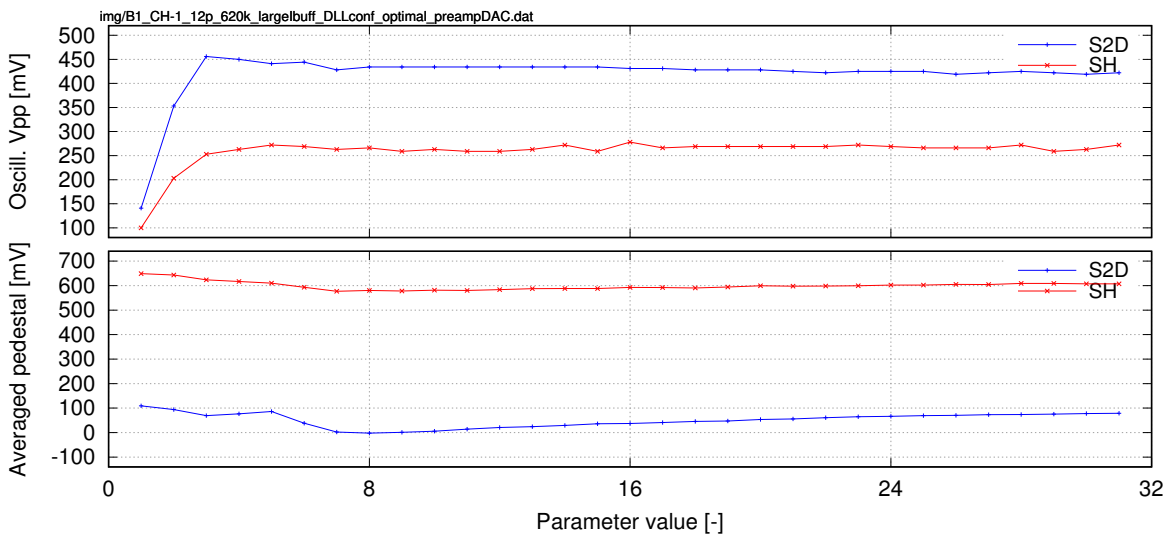


Figure 104: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 620 kΩ resistors assembled; Ibuf current maximized. Parameter=preamp DAC

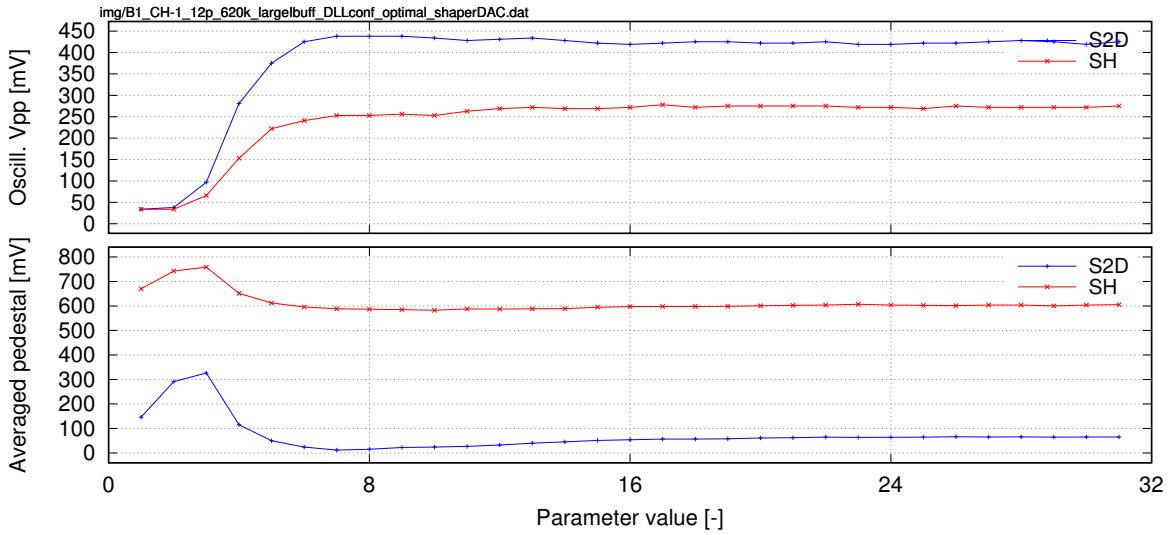


Figure 105: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 620 kΩ resistors assembled; Ibuf current maximized. Parameter=shaper DAC

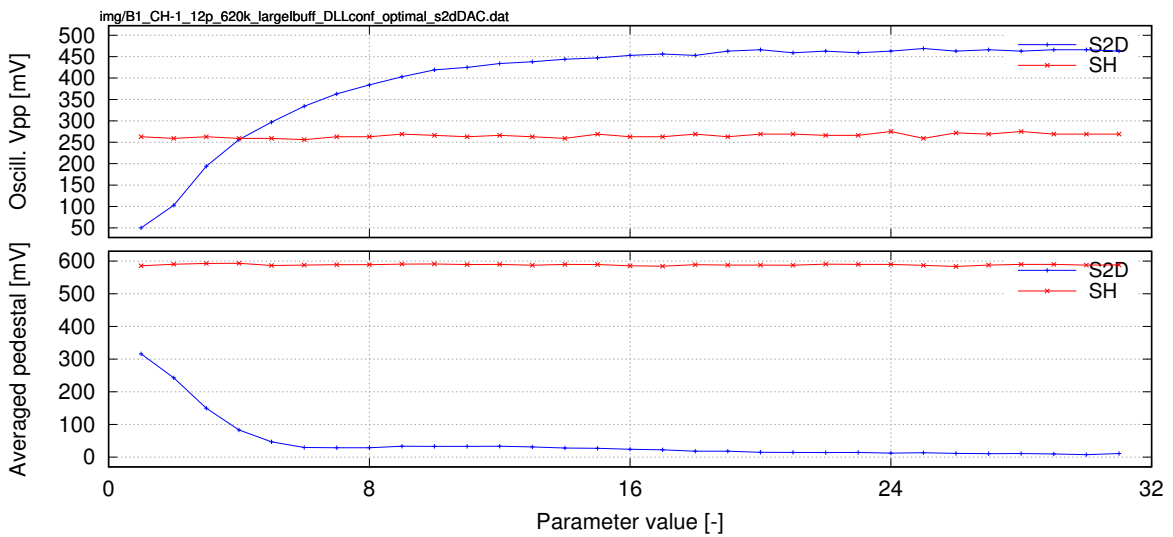


Figure 106: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 620 kΩ resistors assembled; Ibuf current maximized. Parameter=S2D DAC

3.7.2 Optimized test pulse and ADC delay

ASIC configuration: JC configuration (tables 1 & 2) + test pulse and ADC delay optimizations (table 3).

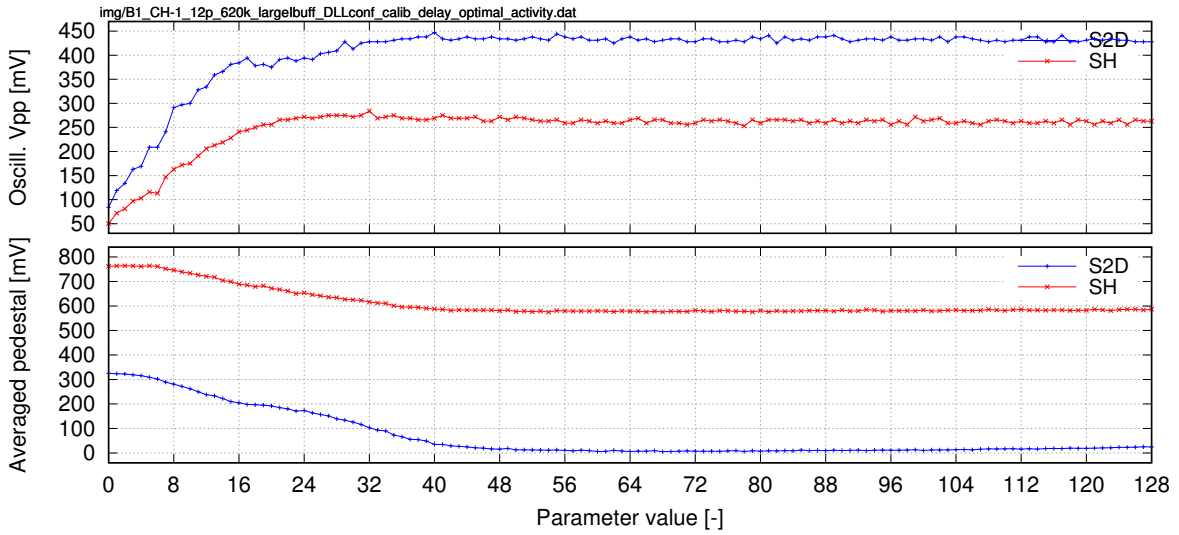


Figure 107: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 620 kΩ resistors assembled; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

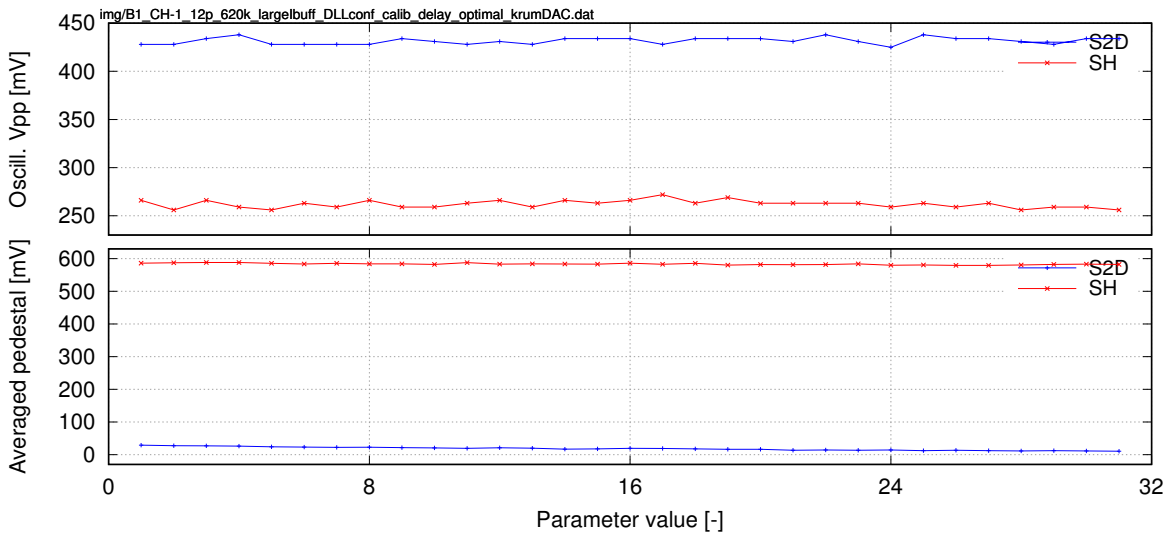


Figure 108: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 620 kΩ resistors assembled; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

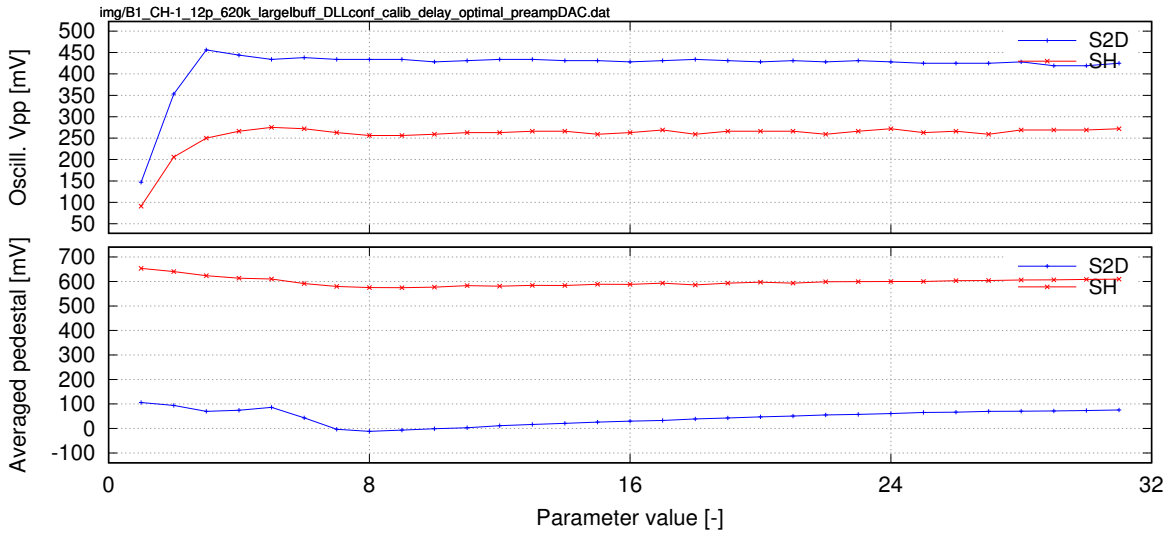


Figure 109: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 620 k Ω resistors assembled; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=preamp DAC

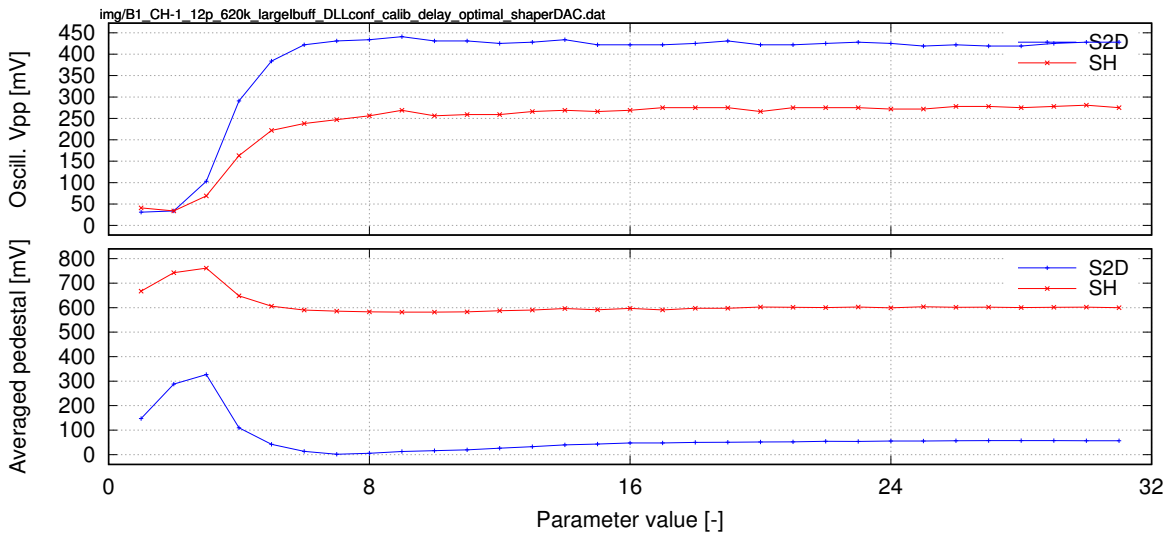


Figure 110: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 620 k Ω resistors assembled; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=shaper DAC

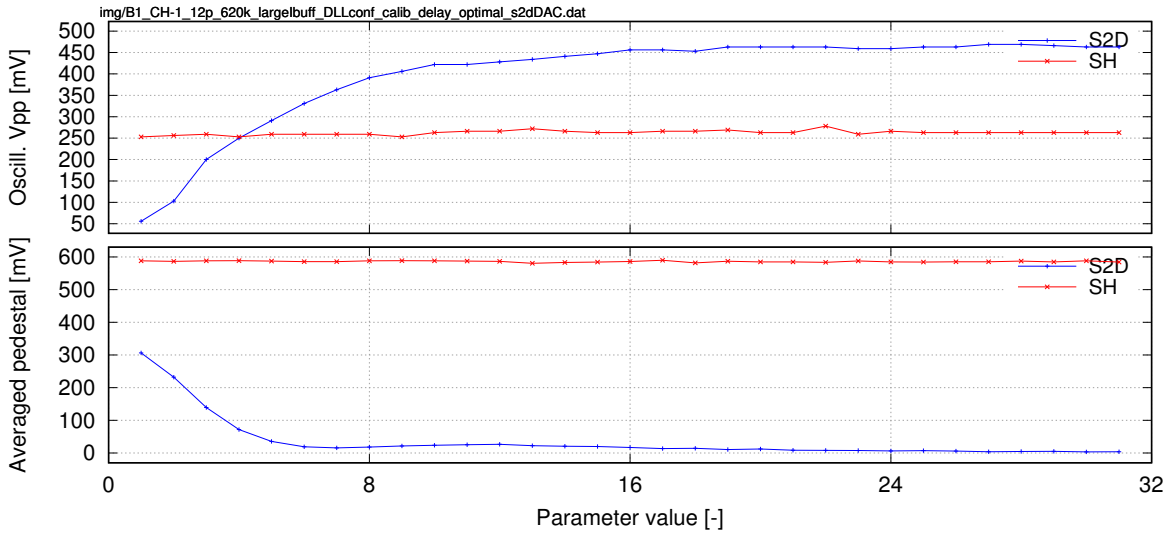


Figure 111: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 620 k Ω resistors assembled; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=S2D DAC

3.8 Cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized

Cap-PCB assembled, bonded to SALT input pads 0 and 127, two 12 pF capacitors assembled to the cap-PCB, 820 k Ω resistors soldered in parallel to the capacitors. Ibuf current maximized – 1 k Ω resistor between VDDA and Ibuf pad. Only channel -1 measured.

3.8.1 Default ASIC configuration

ASIC configuration: JC configuration (tables 1 & 2).

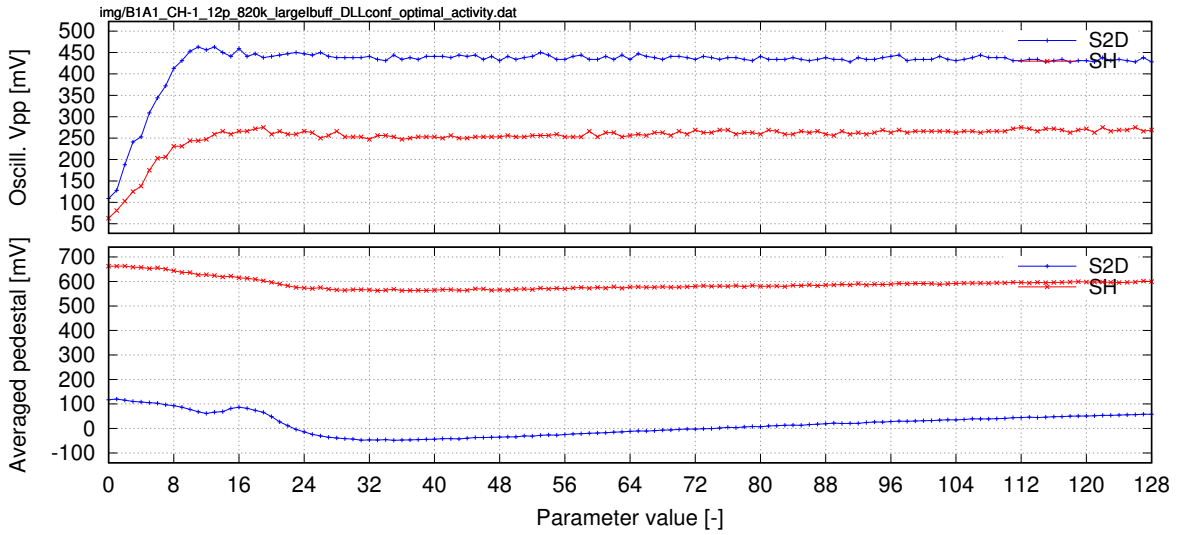


Figure 112: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized. Parameter=no. of active ADCs

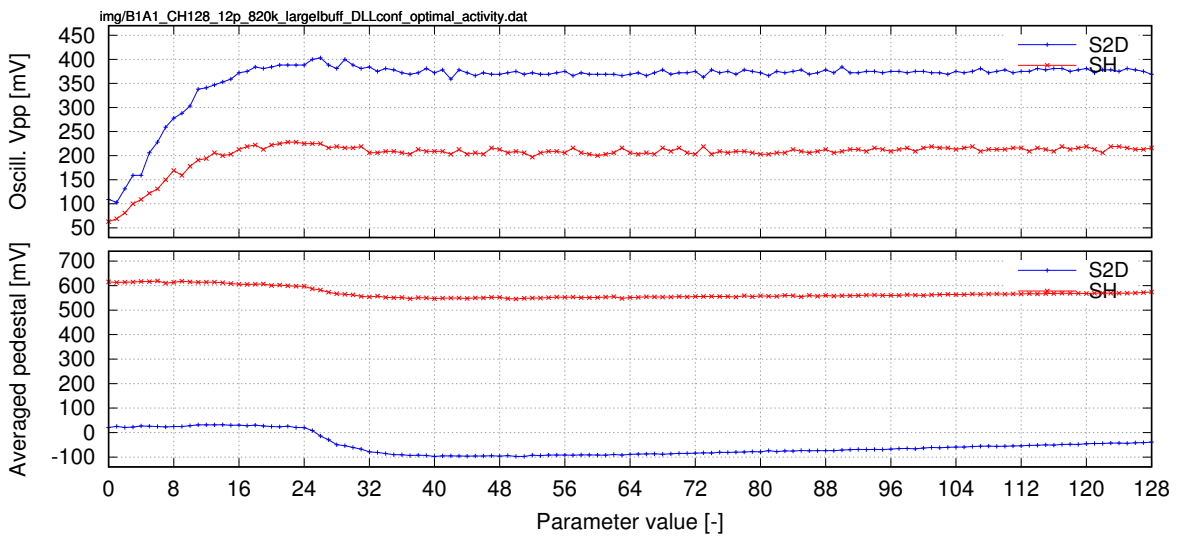


Figure 113: B1A1, channel 128, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized. Parameter=no. of active ADCs

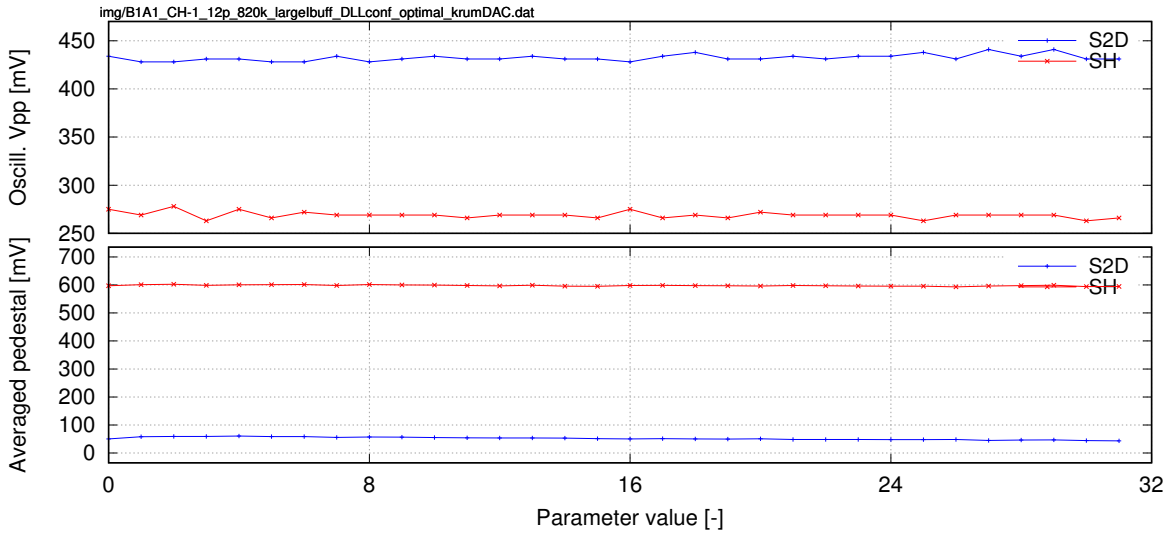


Figure 114: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 820 kΩ resistors assembled; Ibuf current maximized. Parameter=Krummenacher DAC

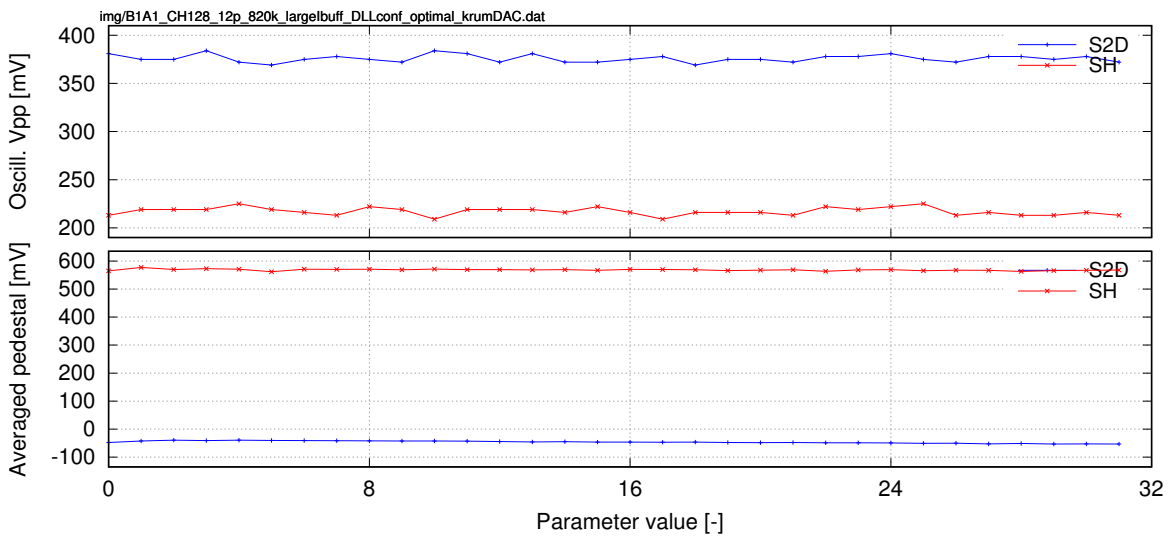


Figure 115: B1A1, channel 128, cap-PCB bonded, 12 pF capacitors + 820 kΩ resistors assembled; Ibuf current maximized. Parameter=Krummenacher DAC

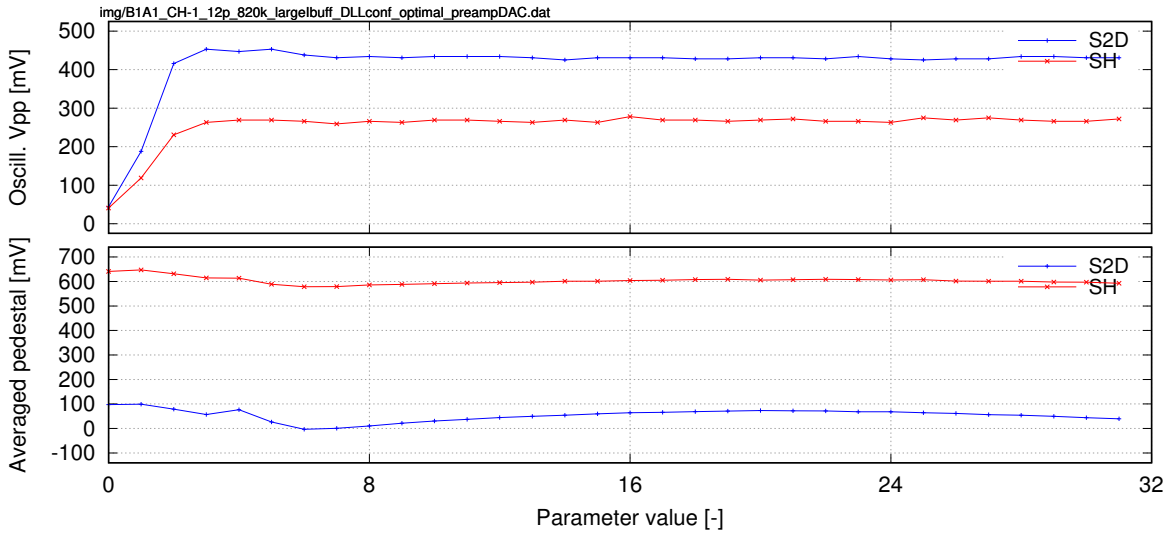


Figure 116: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 820 kΩ resistors assembled; Ibuf current maximized. Parameter=preamp DAC

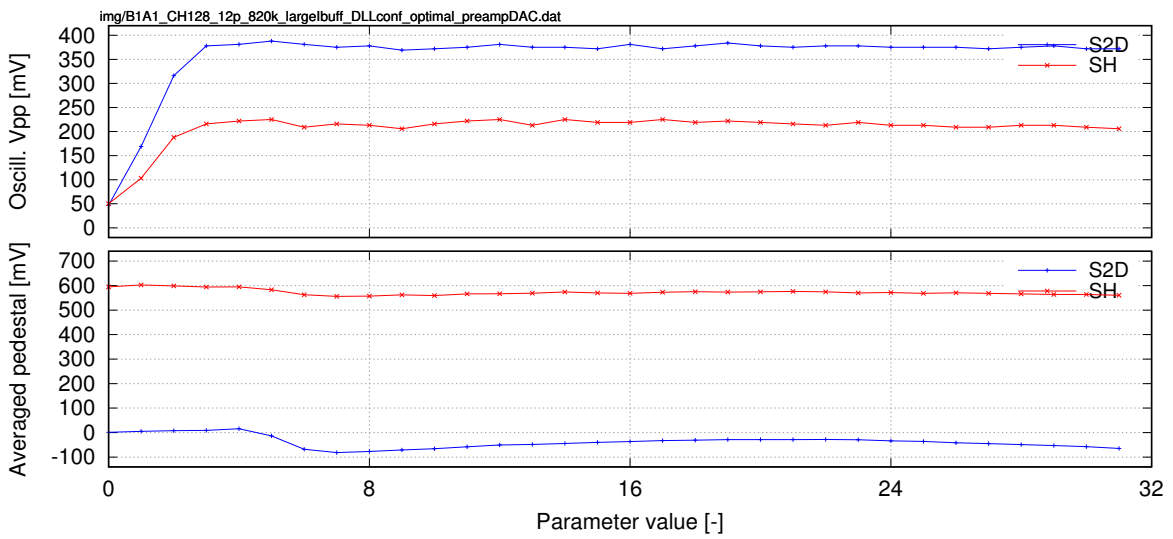


Figure 117: B1A1, channel 128, cap-PCB bonded, 12 pF capacitors + 820 kΩ resistors assembled; Ibuf current maximized. Parameter=preamp DAC

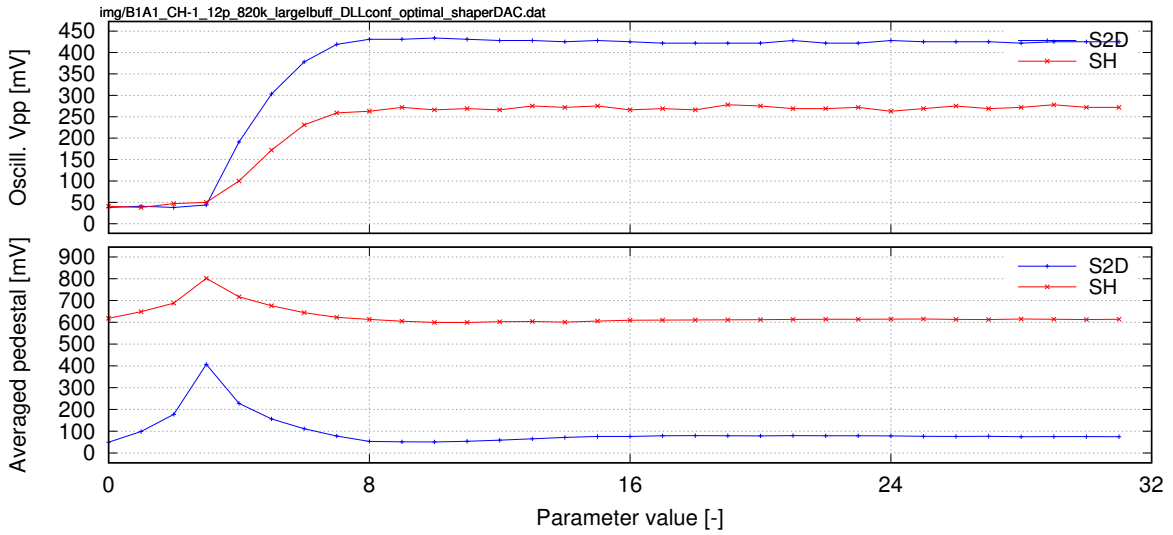


Figure 118: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 820 kΩ resistors assembled; Ibuf current maximized. Parameter=shaper DAC

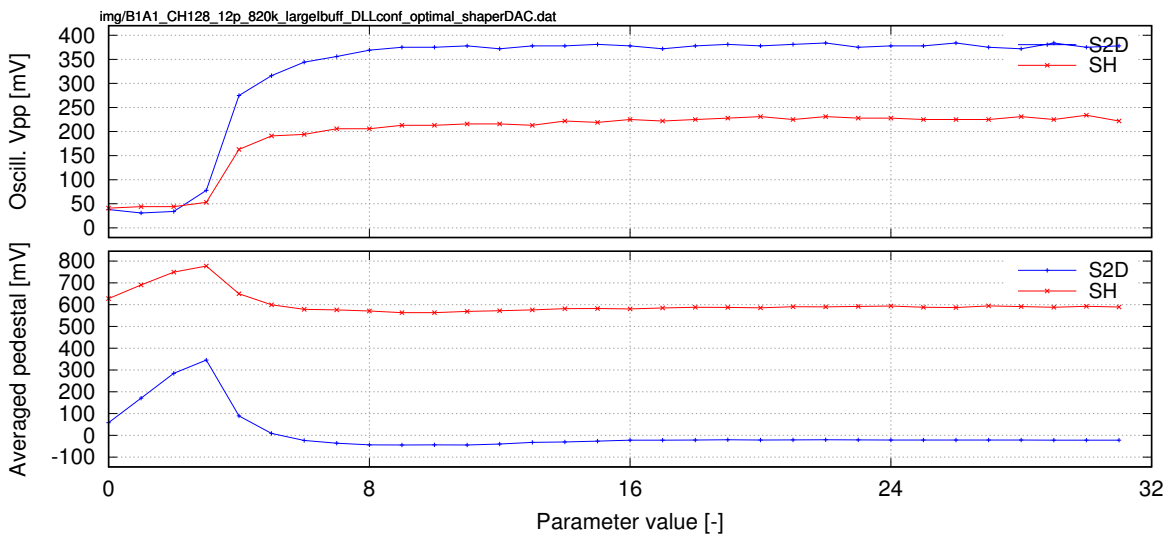


Figure 119: B1A1, channel 128, cap-PCB bonded, 12 pF capacitors + 820 kΩ resistors assembled; Ibuf current maximized. Parameter=shaper DAC

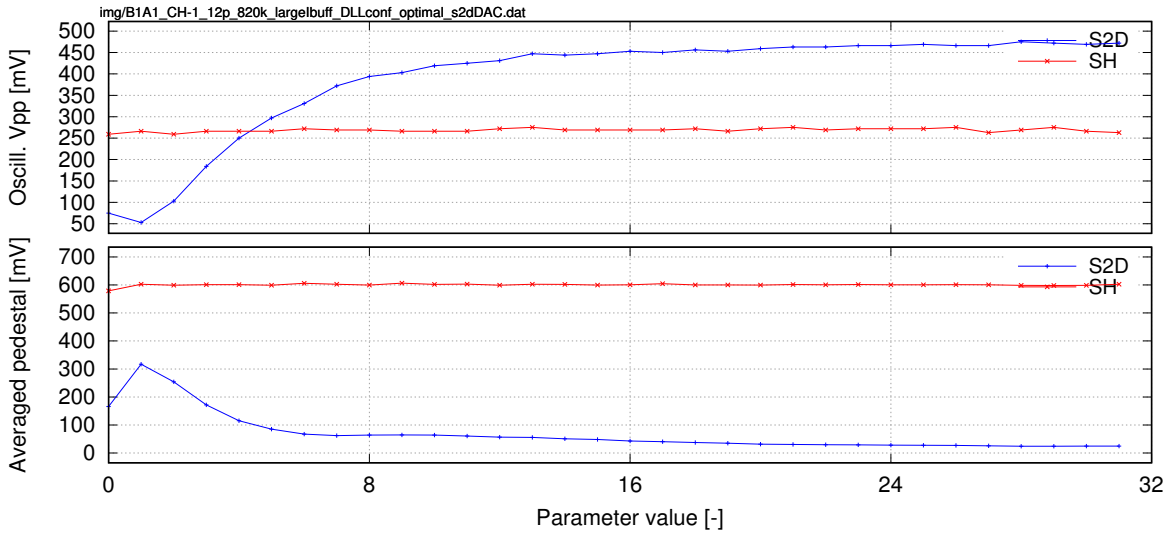


Figure 120: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized. Parameter=S2D DAC

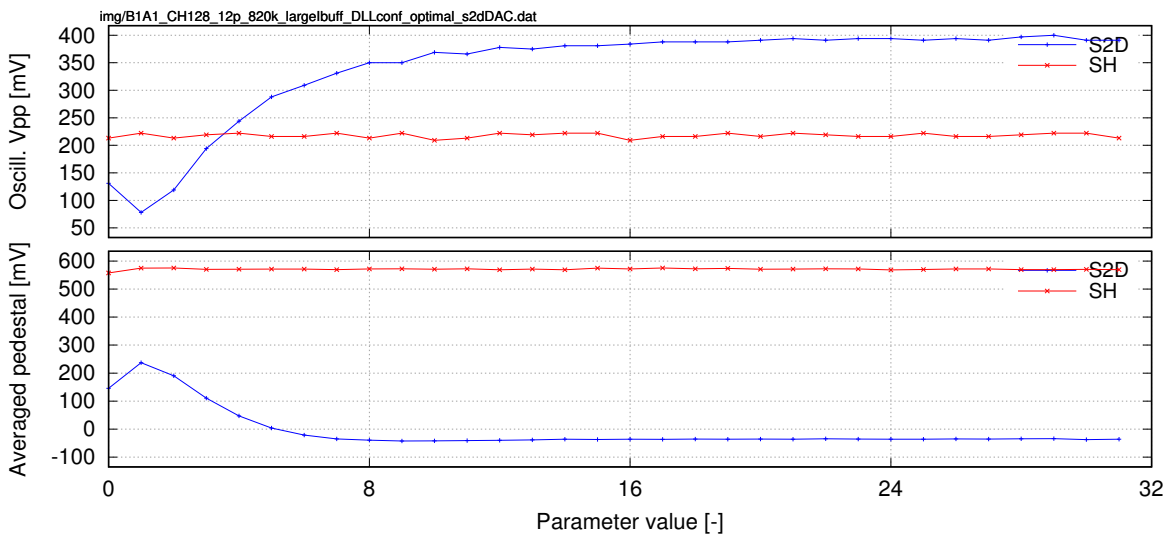


Figure 121: B1A1, channel 128, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized. Parameter=S2D DAC

3.8.2 Optimized test pulse and ADC delay

ASIC configuration: JC configuration (tables 1 & 2) + test pulse and ADC delay optimizations (table 3).

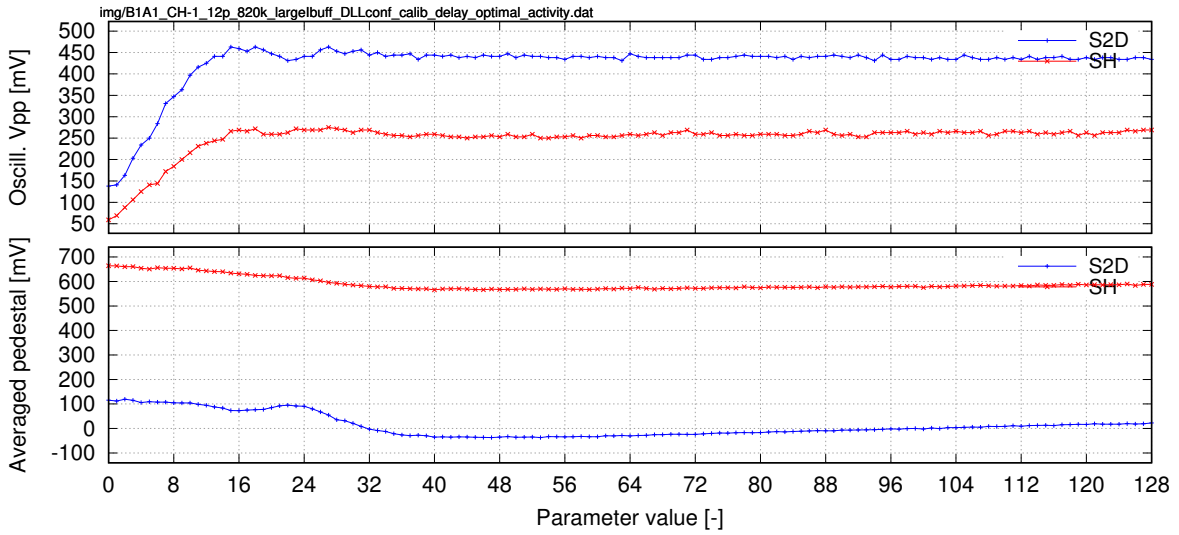


Figure 122: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

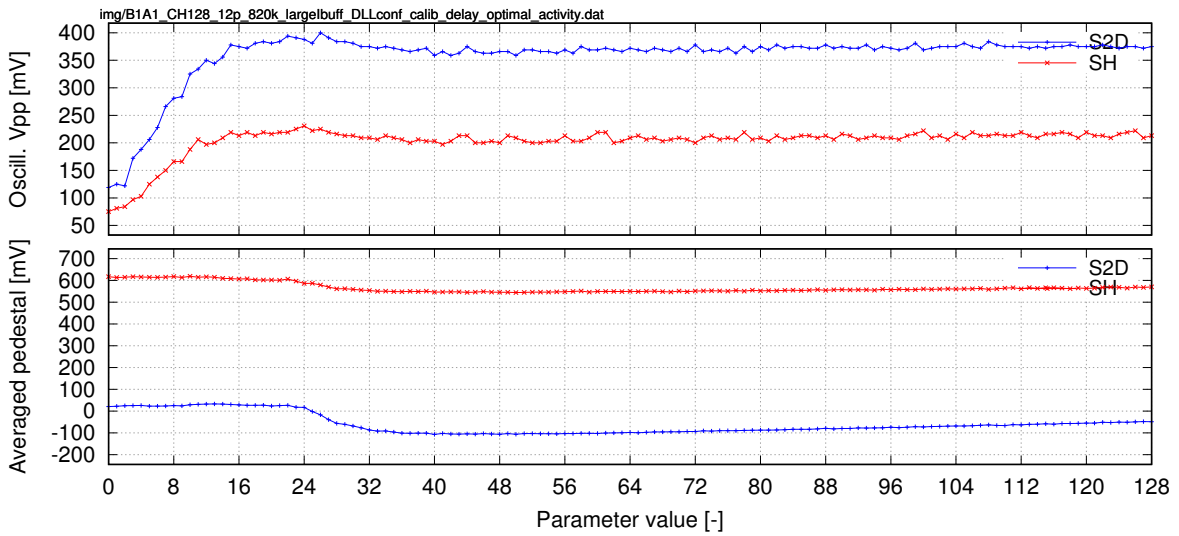


Figure 123: B1A1, channel 128, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

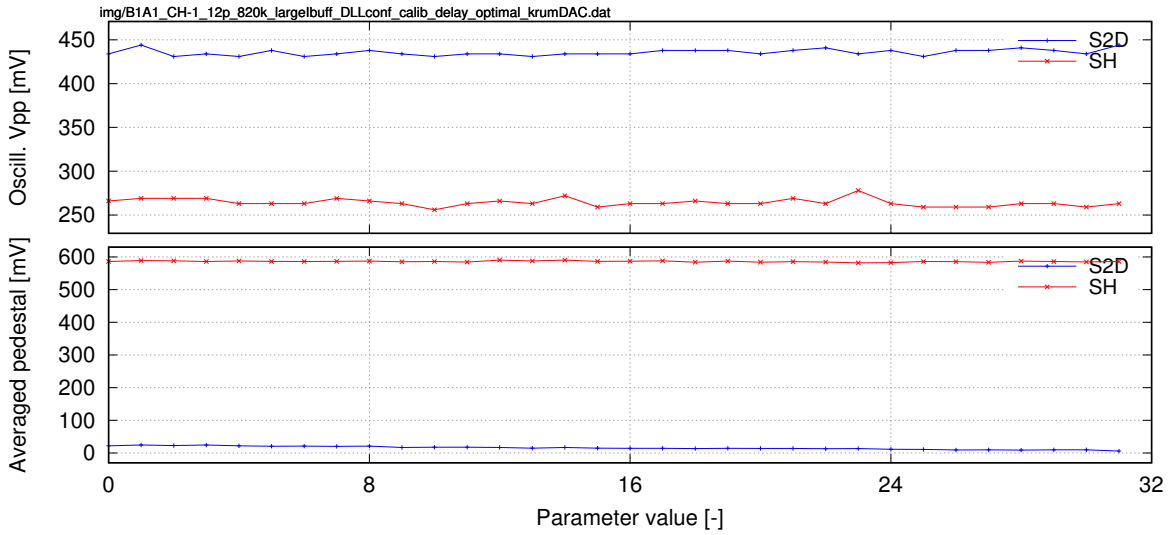


Figure 124: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

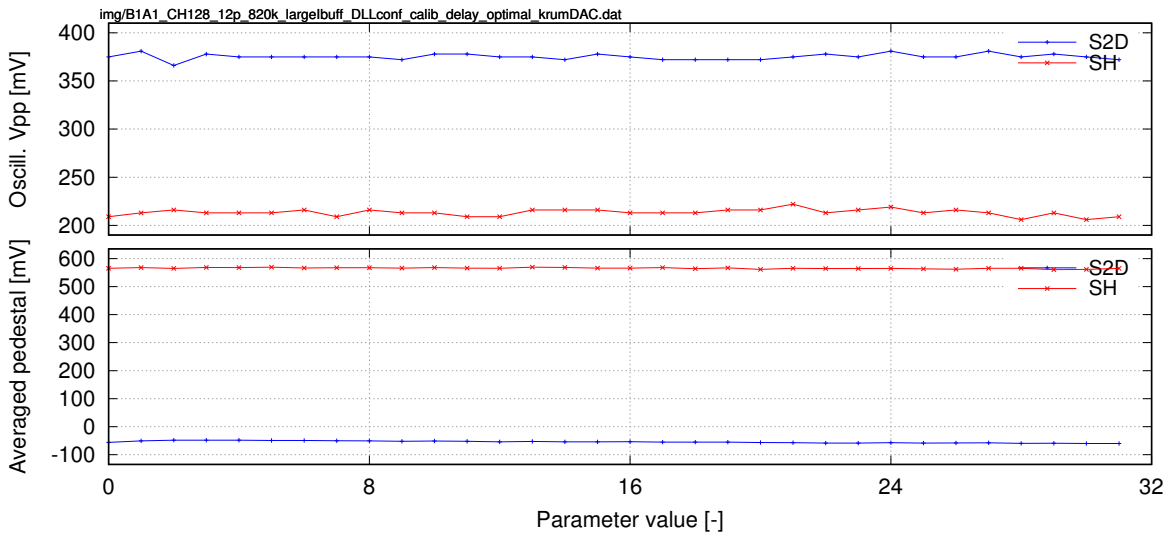


Figure 125: B1A1, channel 128, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

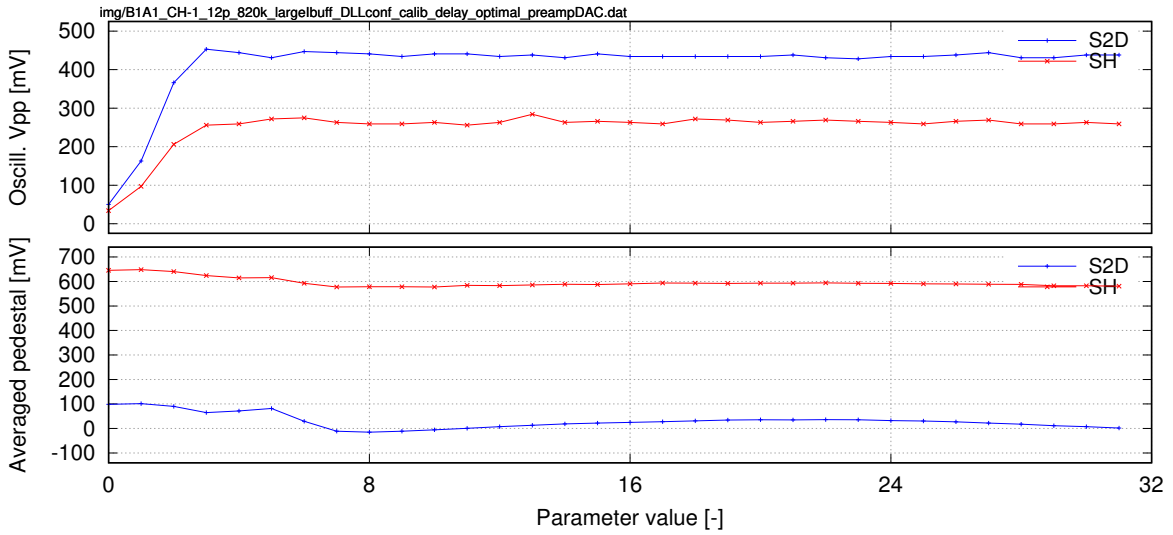


Figure 126: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=preamp DAC

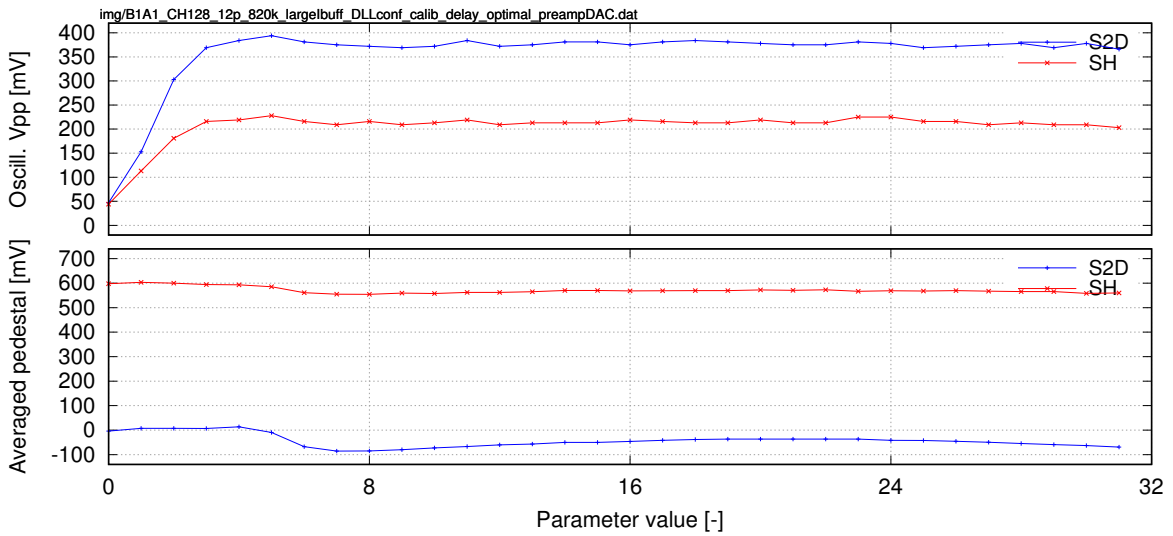


Figure 127: B1A1, channel 128, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=preamp DAC

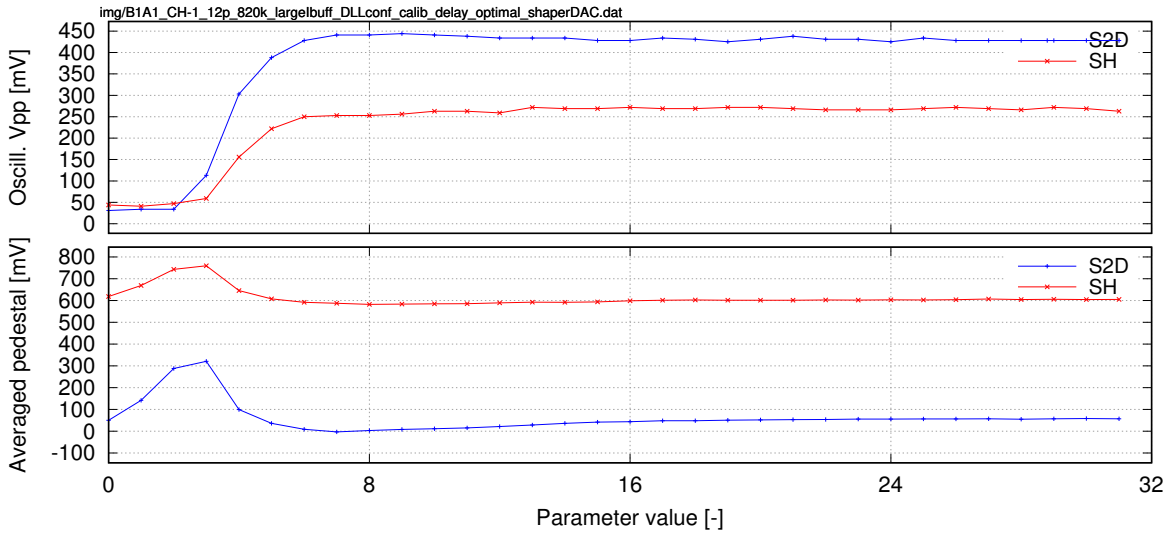


Figure 128: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 820 kΩ resistors assembled; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=shaper DAC

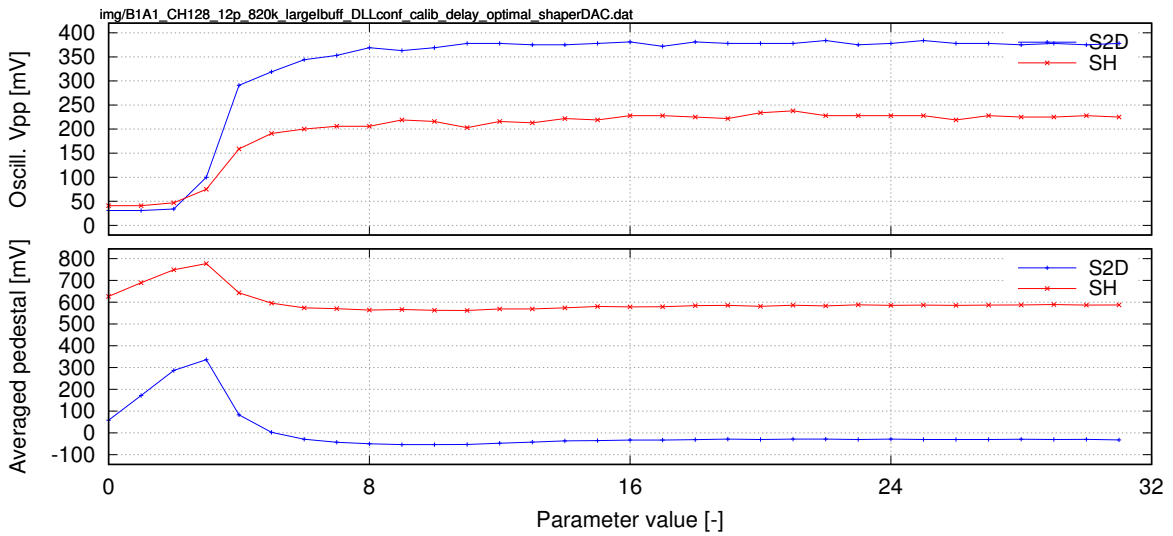


Figure 129: B1A1, channel 128, cap-PCB bonded, 12 pF capacitors + 820 kΩ resistors assembled; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=shaper DAC

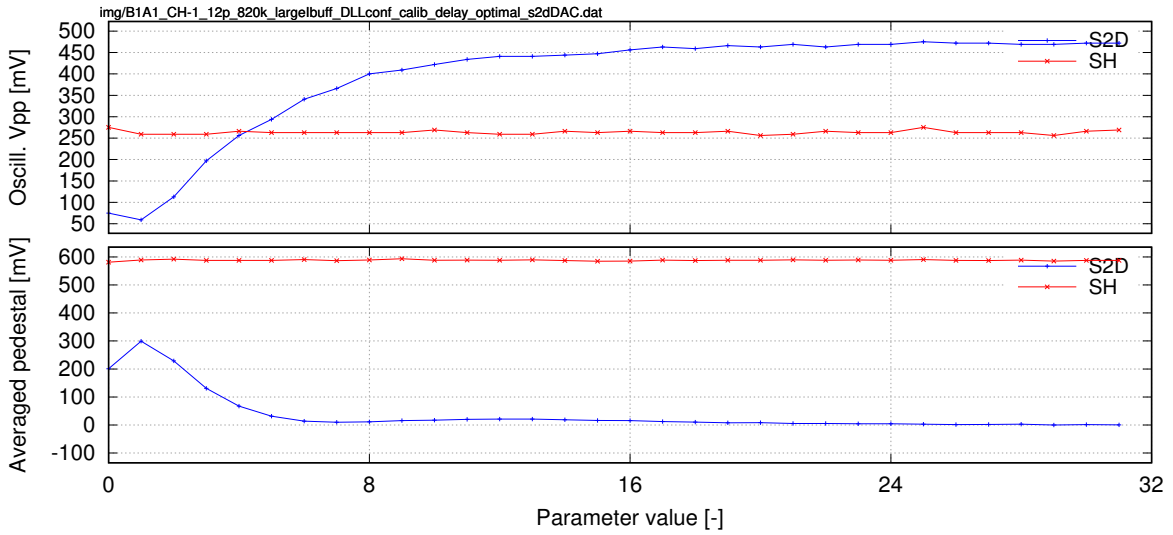


Figure 130: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=S2D DAC

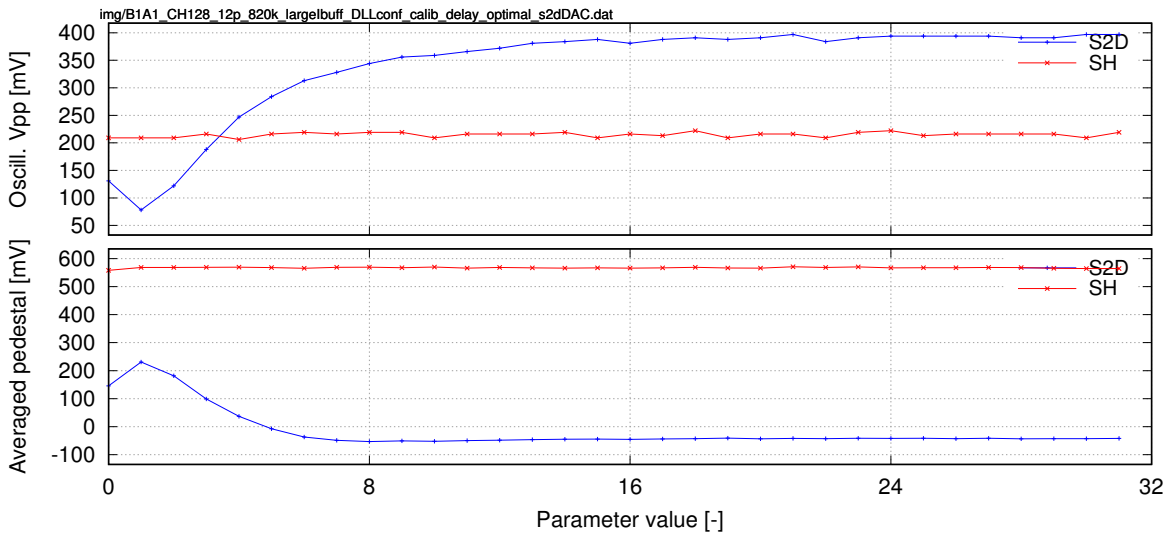


Figure 131: B1A1, channel 128, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=S2D DAC

3.9 Cap-PCB bonded, 12 pF capacitors + 820 kΩ resistors assembled; Ibuf current maximized; Preamp GND configuration – input + backside

Cap-PCB assembled, bonded to SALT input pads 0 and 127, two 12 pF capacitors assembled to the cap-PCB, 820 kΩ resistors soldered in parallel to the capacitors. Ibuf current maximized – 1 kΩ resistor between VDDA and Ibuf pad. Preamp GND bonded from both sides - input pads + backside (default) pads. Only channel -1 measured.

3.9.1 Default ASIC configuration

ASIC configuration: JC configuration (tables 1 & 2).

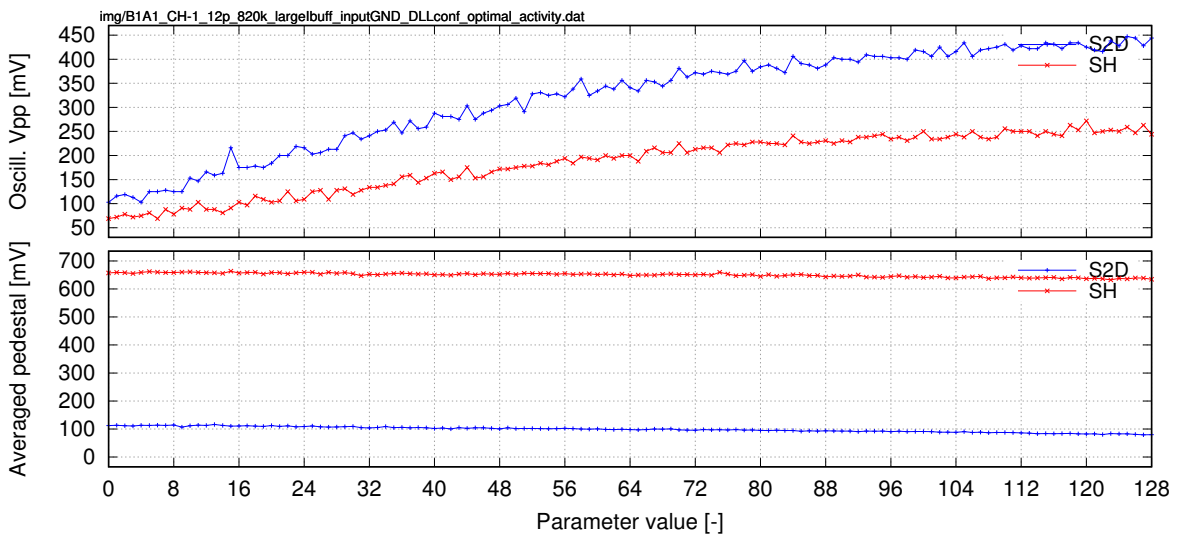


Figure 132: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 820 kΩ resistors assembled; Ibuf current maximized; Preamp GND configuration – input + backside. Parameter=no. of active ADCs

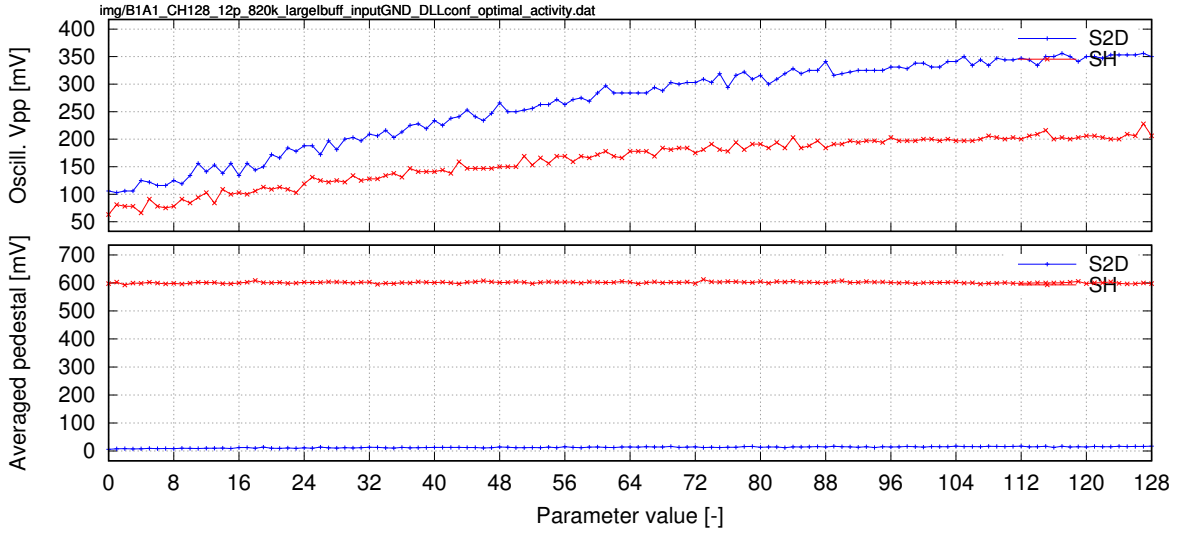


Figure 133: B1A1, channel 128, cap-PCB bonded, 12 pF capacitors + 820 kΩ resistors assembled; Ibuf current maximized; Preamp GND configuration – input + backside. Parameter=no. of active ADCs

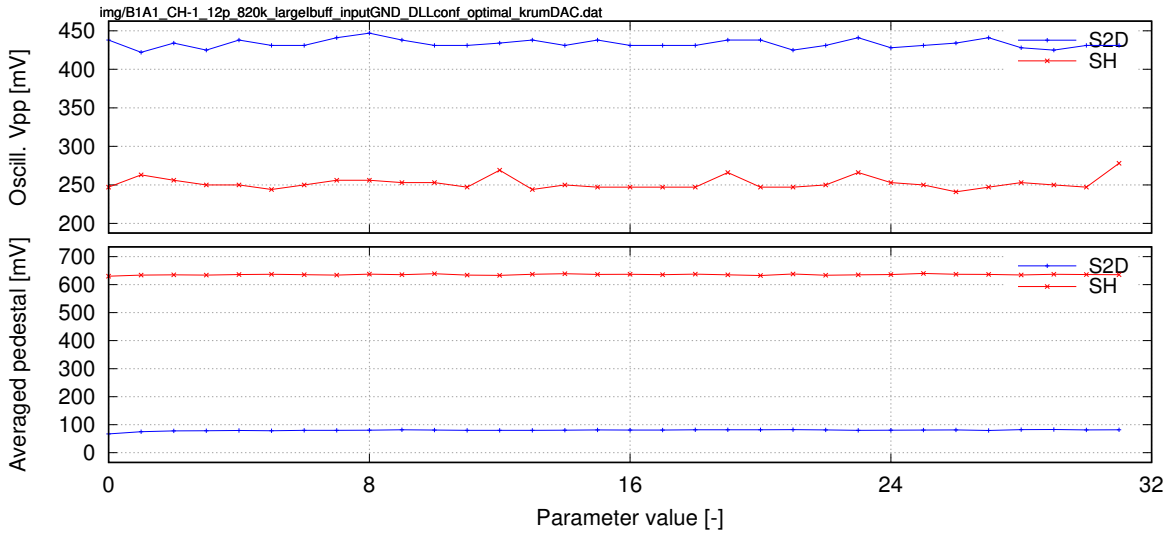


Figure 134: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 820 kΩ resistors assembled; Ibuf current maximized; Preamp GND configuration – input + backside. Parameter=Krummenacher DAC

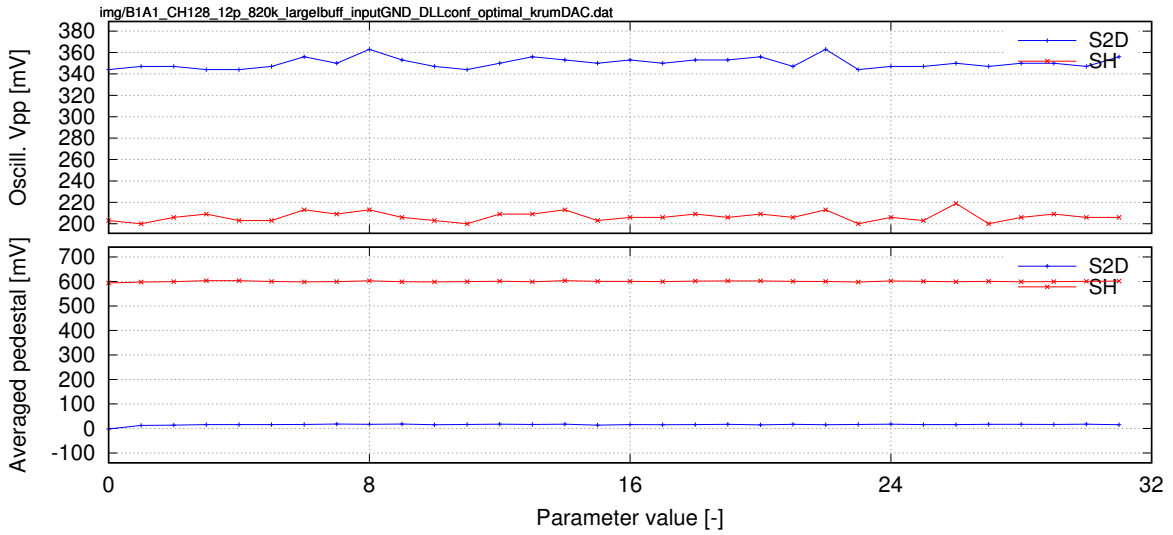


Figure 135: B1A1, channel 128, cap-PCB bonded, 12 pF capacitors + 820 kΩ resistors assembled; Ibuf current maximized; Preamp GND configuration – input + backside. Parameter=Krummenacher DAC

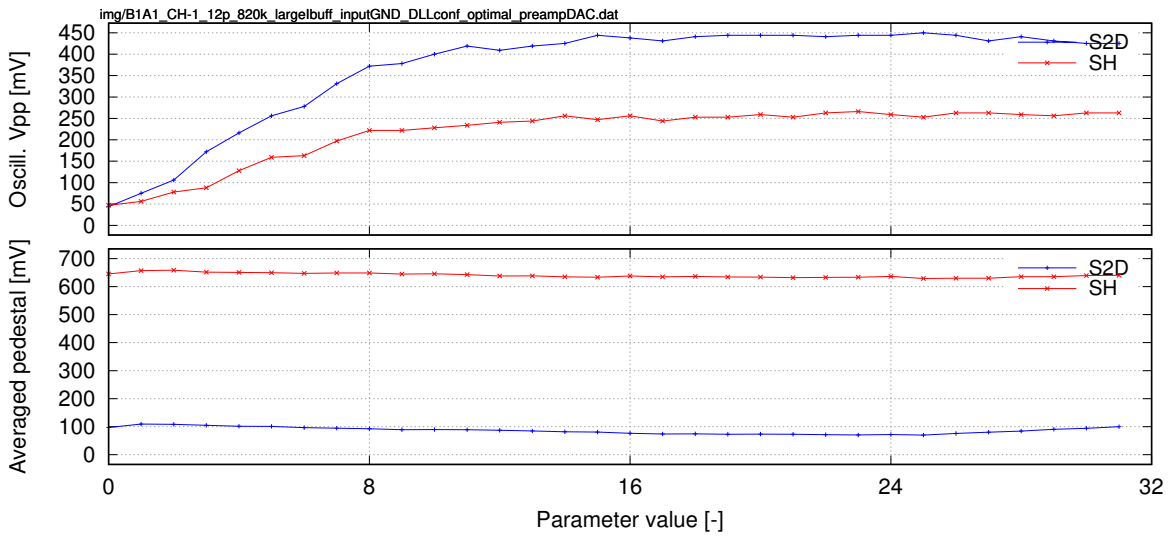


Figure 136: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 820 kΩ resistors assembled; Ibuf current maximized; Preamp GND configuration – input + backside. Parameter=preamp DAC

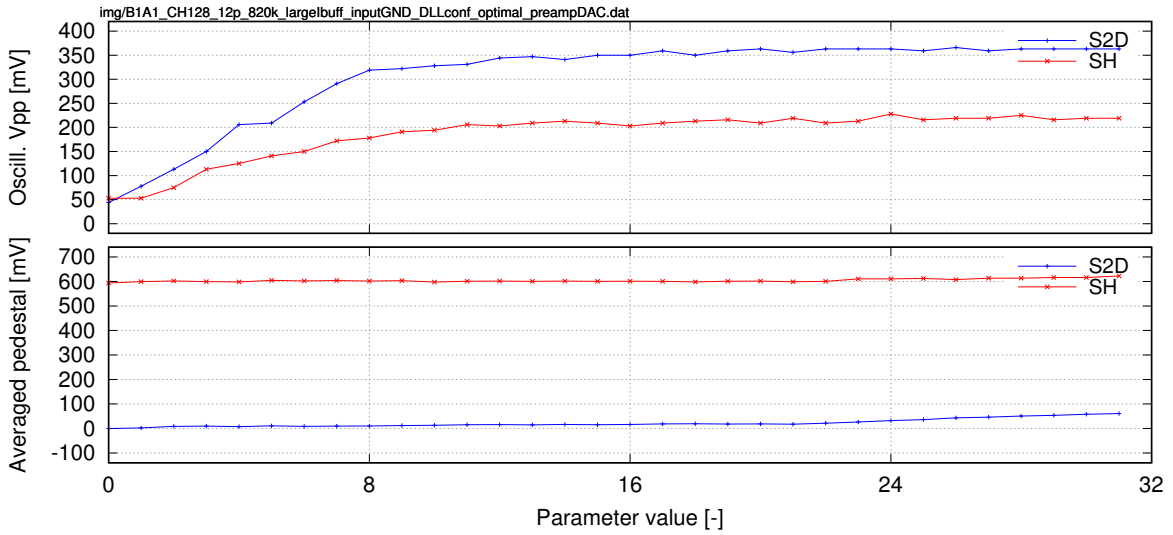


Figure 137: B1A1, channel 128, cap-PCB bonded, 12 pF capacitors + 820 kΩ resistors assembled; Ibuf current maximized; Preamp GND configuration – input + backside. Parameter=preamp DAC

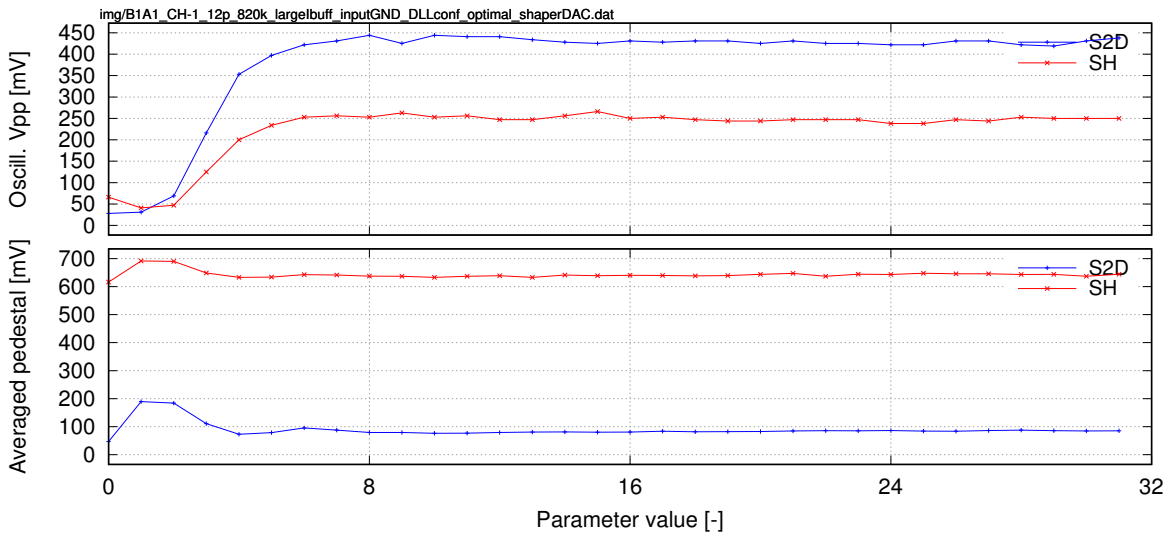


Figure 138: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 820 kΩ resistors assembled; Ibuf current maximized; Preamp GND configuration – input + backside. Parameter=shaper DAC

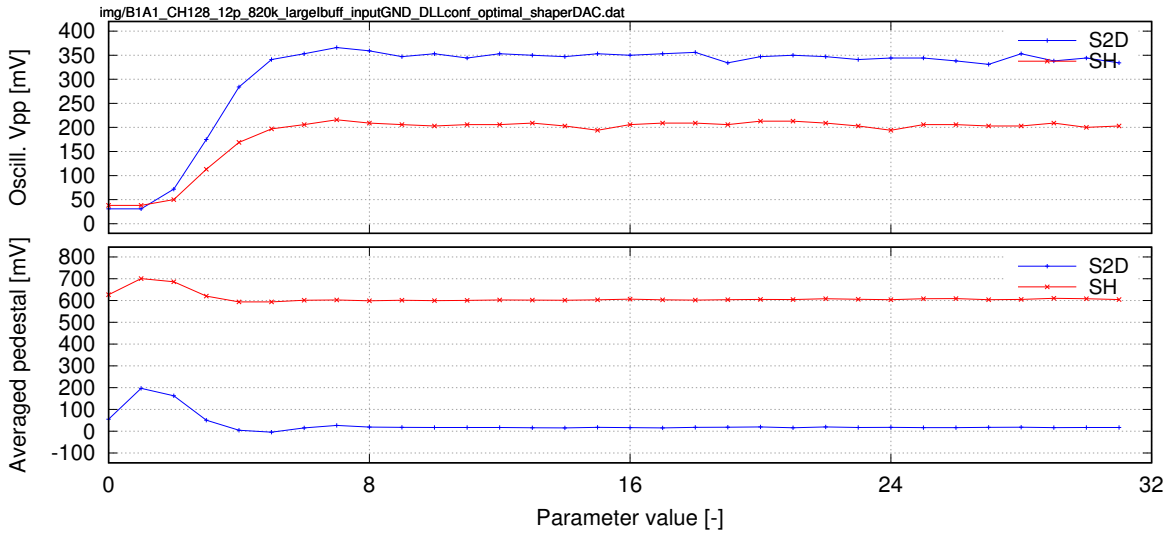


Figure 139: B1A1, channel 128, cap-PCB bonded, 12 pF capacitors + 820 kΩ resistors assembled; Ibuf current maximized; Preamp GND configuration – input + backside. Parameter=shaper DAC

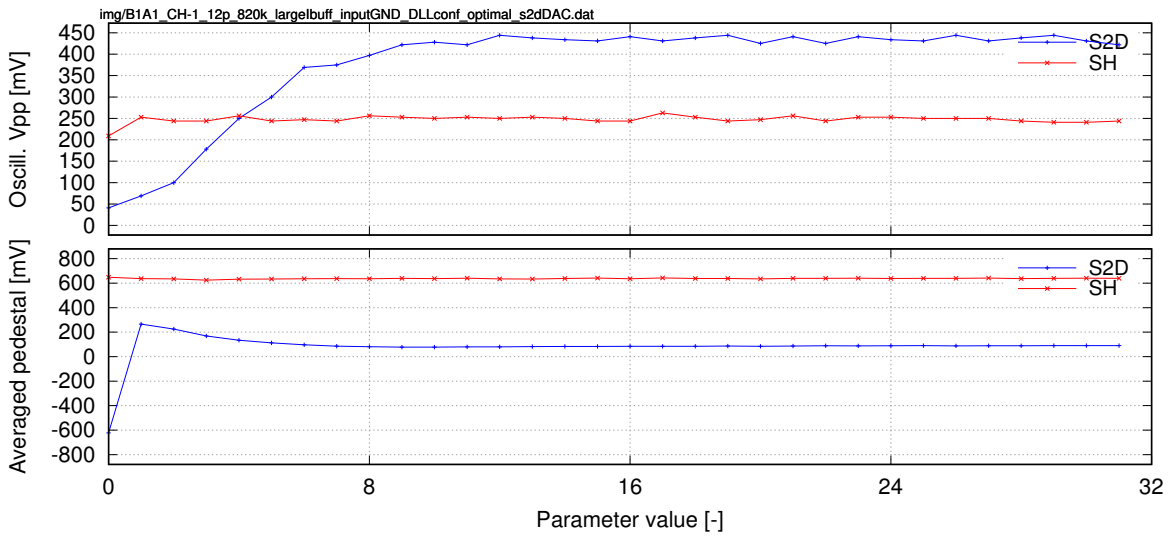


Figure 140: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 820 kΩ resistors assembled; Ibuf current maximized; Preamp GND configuration – input + backside. Parameter=S2D DAC

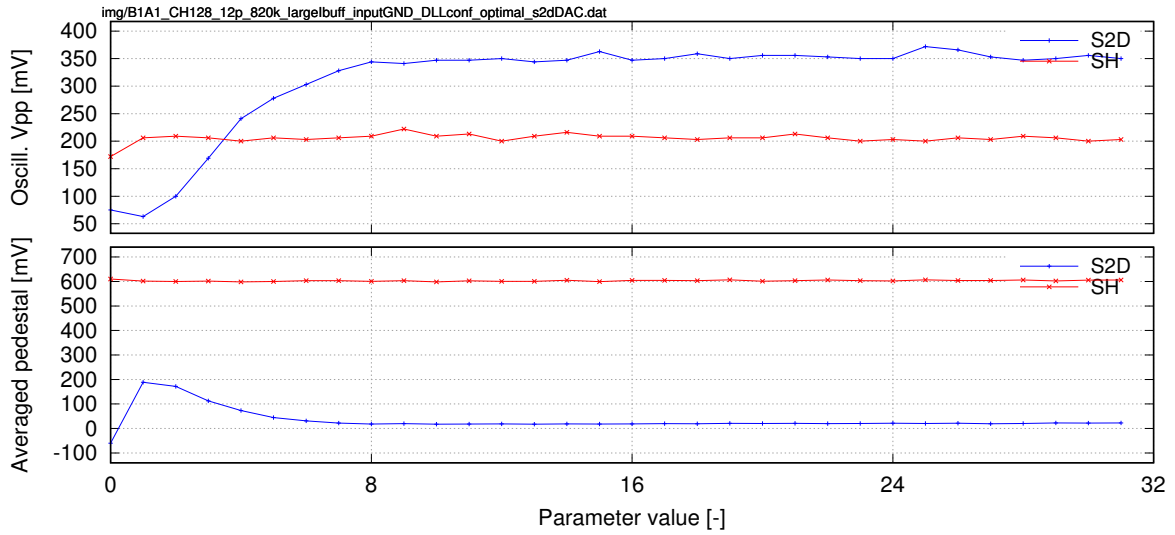


Figure 141: B1A1, channel 128, cap-PCB bonded, 12 pF capacitors + 820 kΩ resistors assembled; Ibuf current maximized; Preamp GND configuration – input + backside. Parameter=S2D DAC

3.9.2 Optimized test pulse and ADC delay

ASIC configuration: JC configuration (tables 1 & 2) + test pulse and ADC delay optimizations (table 3).

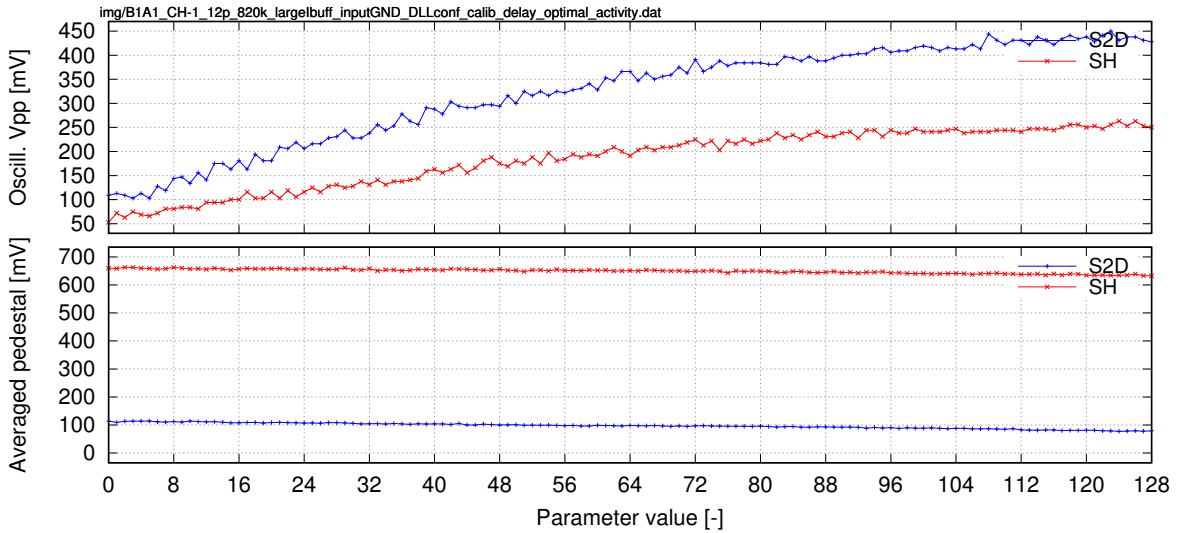


Figure 142: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

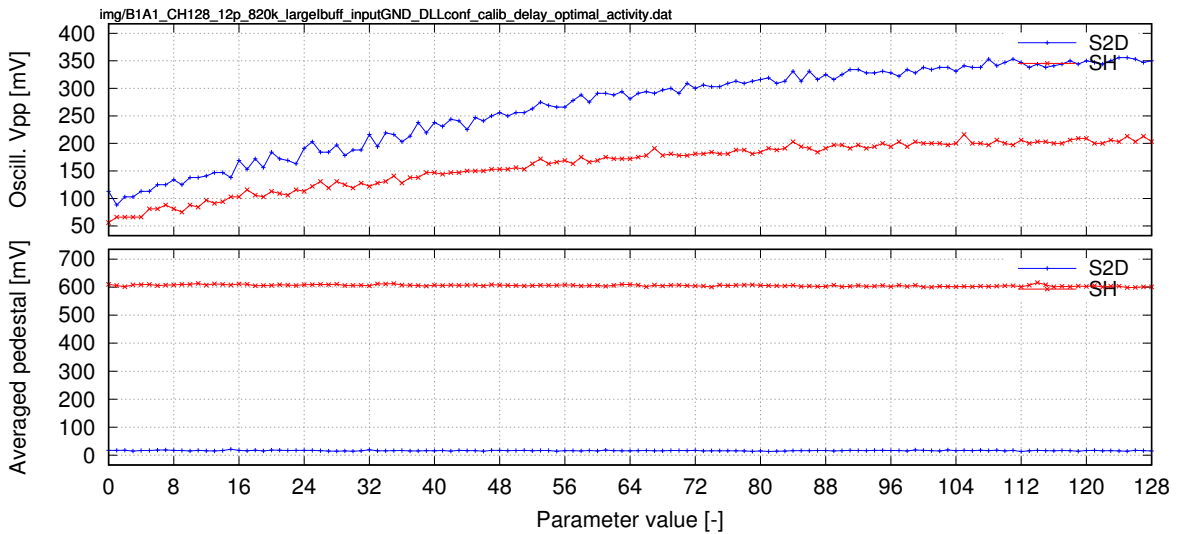


Figure 143: B1A1, channel 128, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

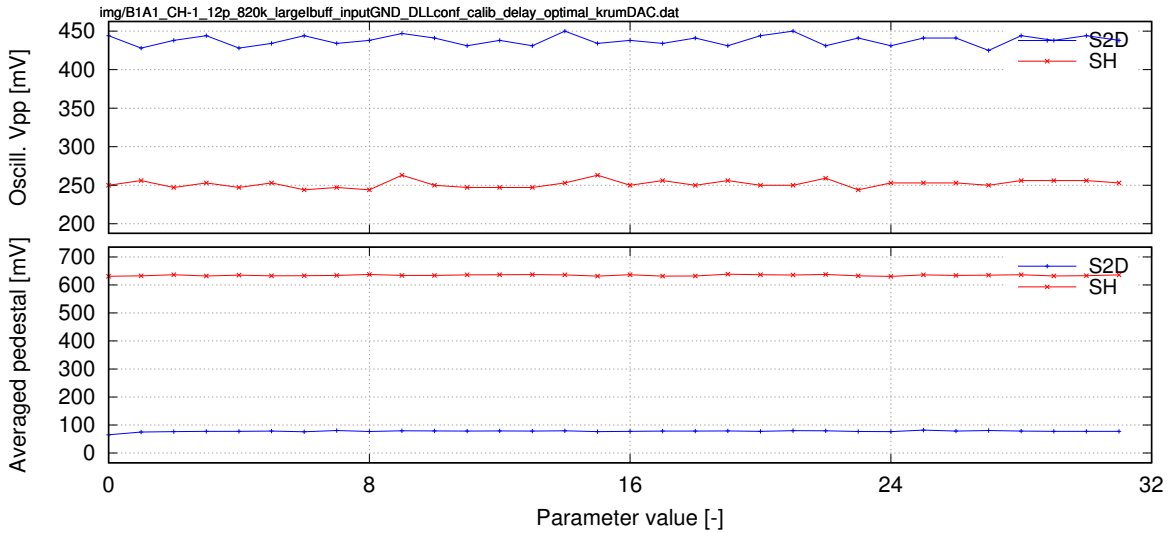


Figure 144: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

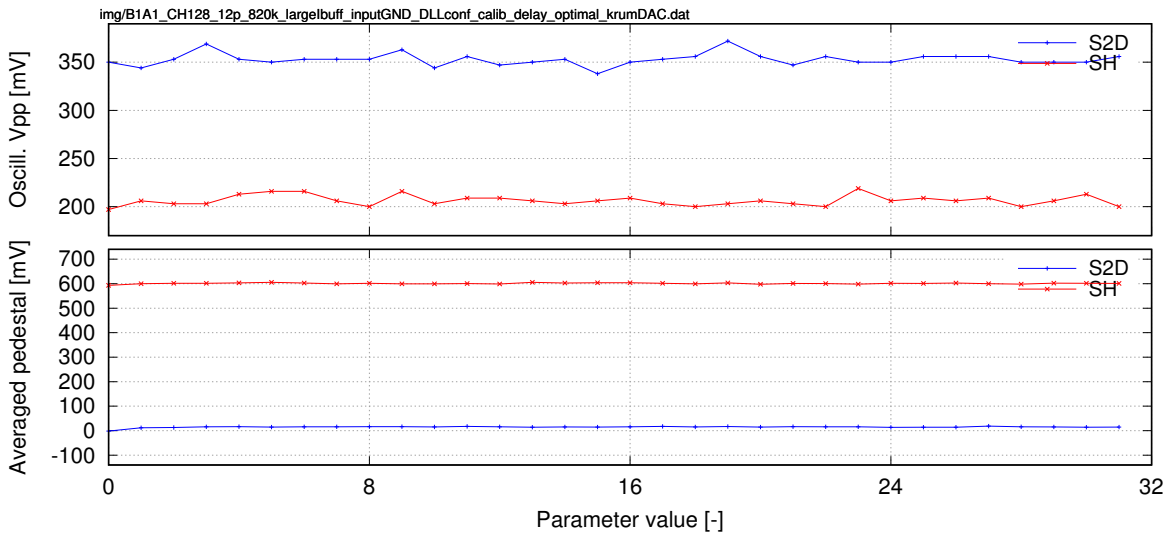


Figure 145: B1A1, channel 128, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

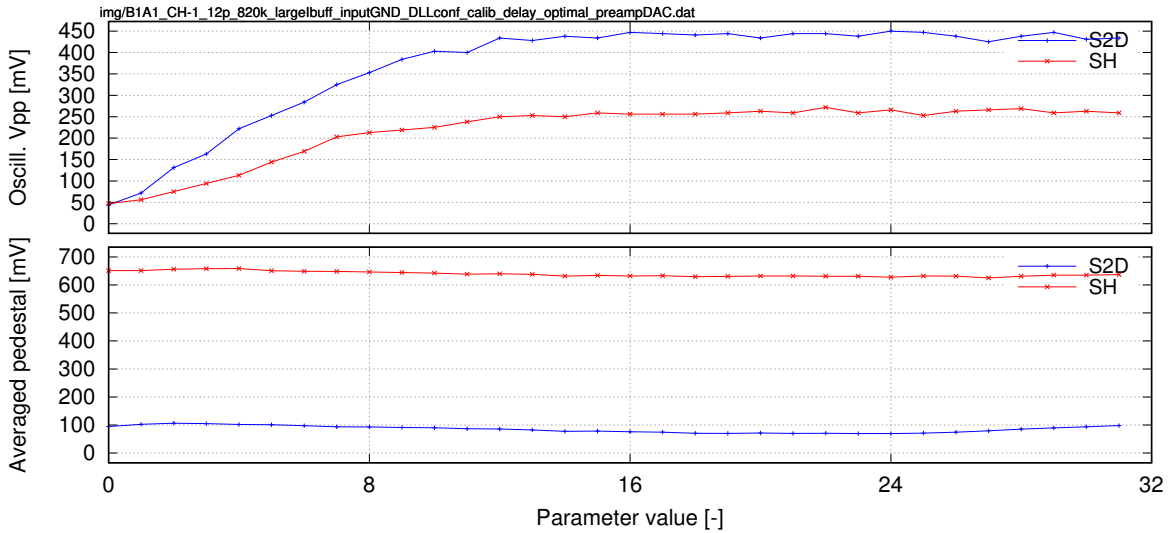


Figure 146: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 820 kΩ resistors assembled; Ibuf current maximized; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=preamp DAC

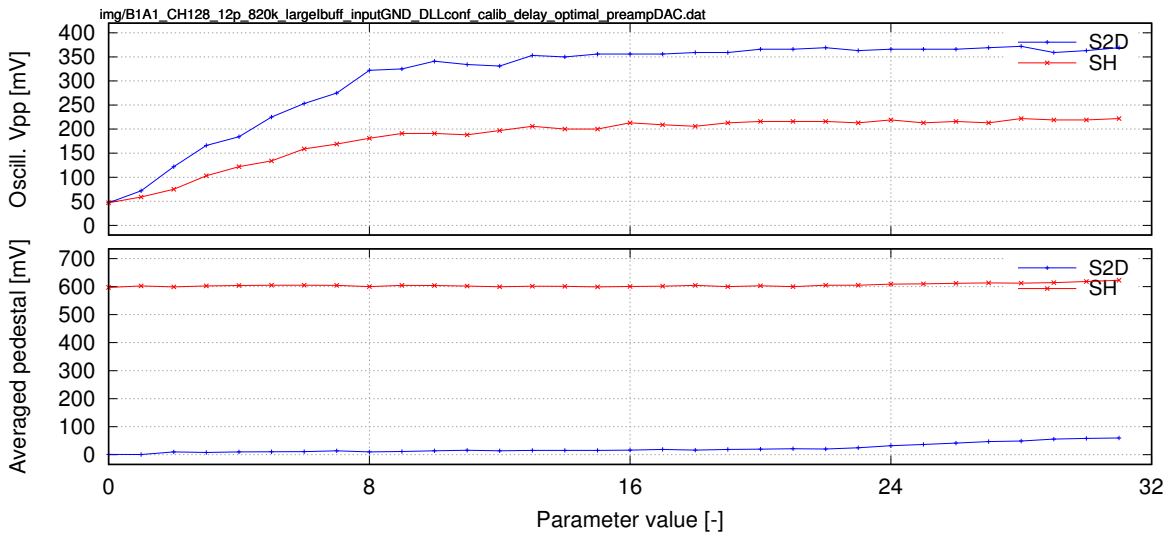


Figure 147: B1A1, channel 128, cap-PCB bonded, 12 pF capacitors + 820 kΩ resistors assembled; Ibuf current maximized; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=preamp DAC

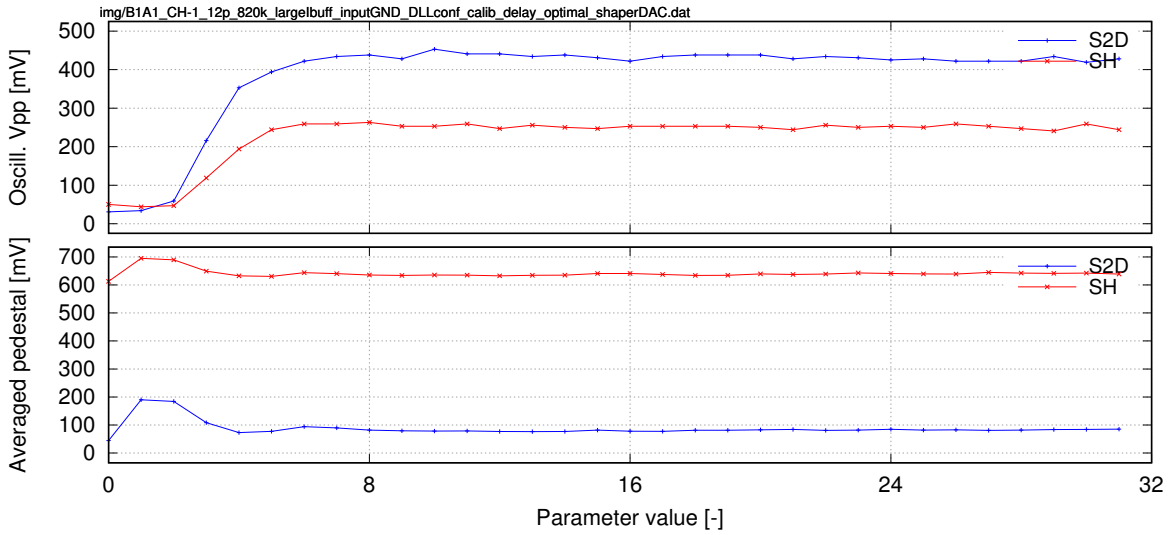


Figure 148: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=shaper DAC

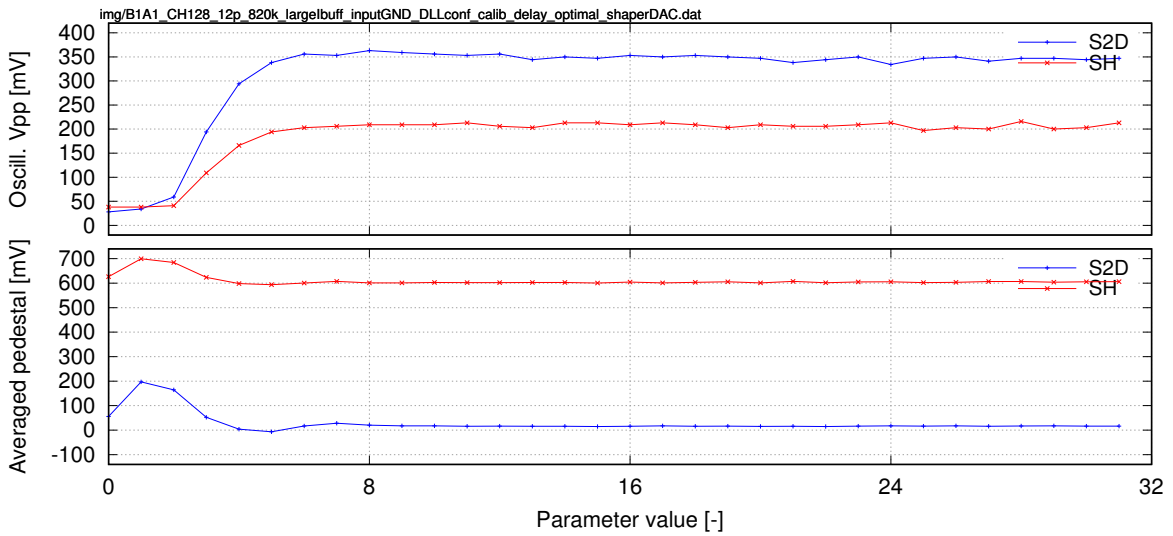


Figure 149: B1A1, channel 128, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=shaper DAC

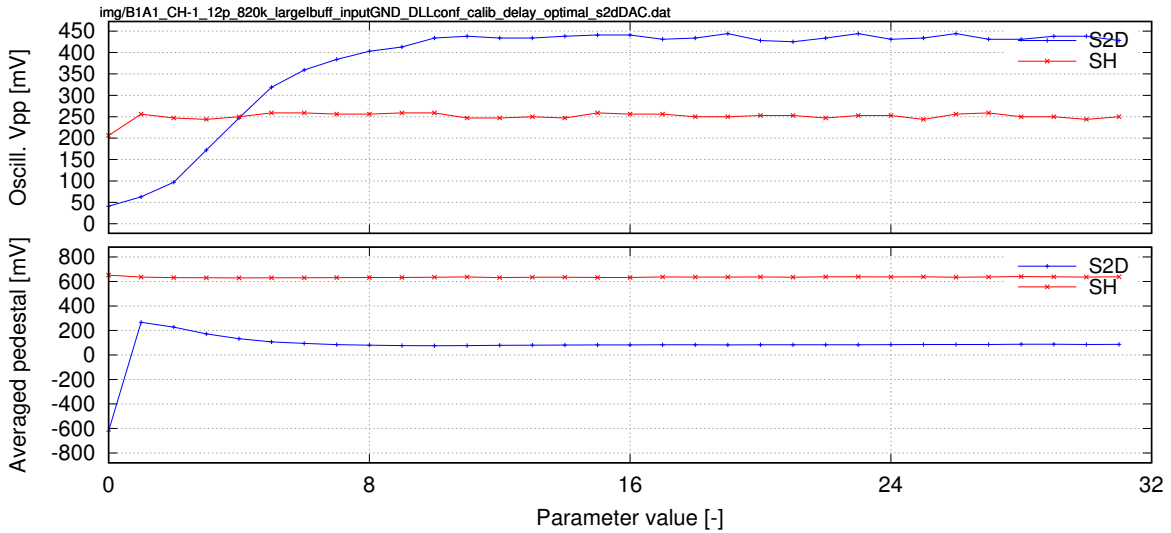


Figure 150: B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=S2D DAC

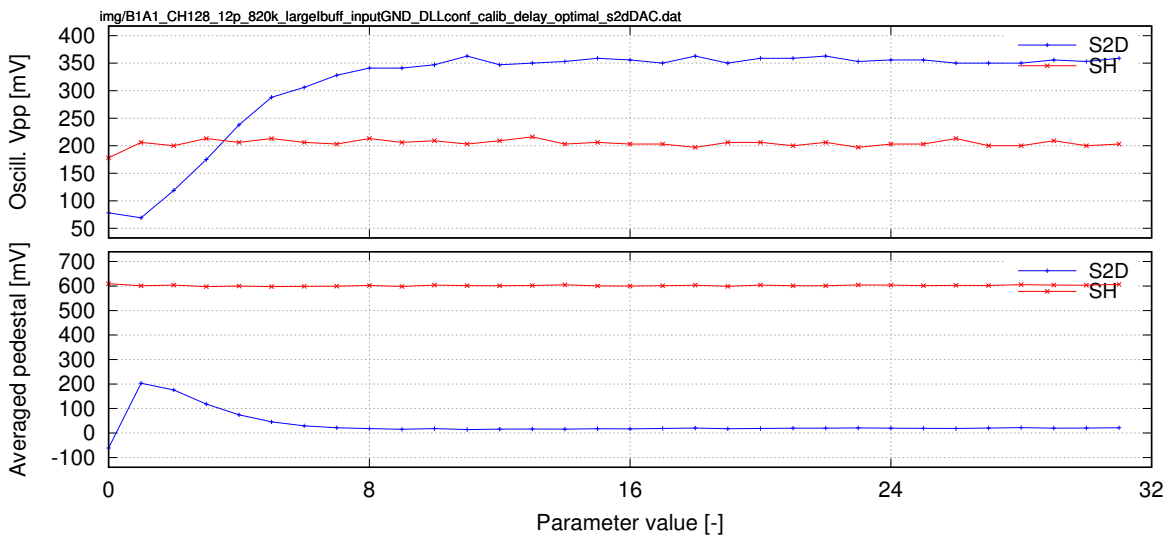


Figure 151: B1A1, channel 128, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=S2D DAC

3.10 DLL and PLL stability monitoring

ASIC configuration: JC configuration (tables 1 & 2).

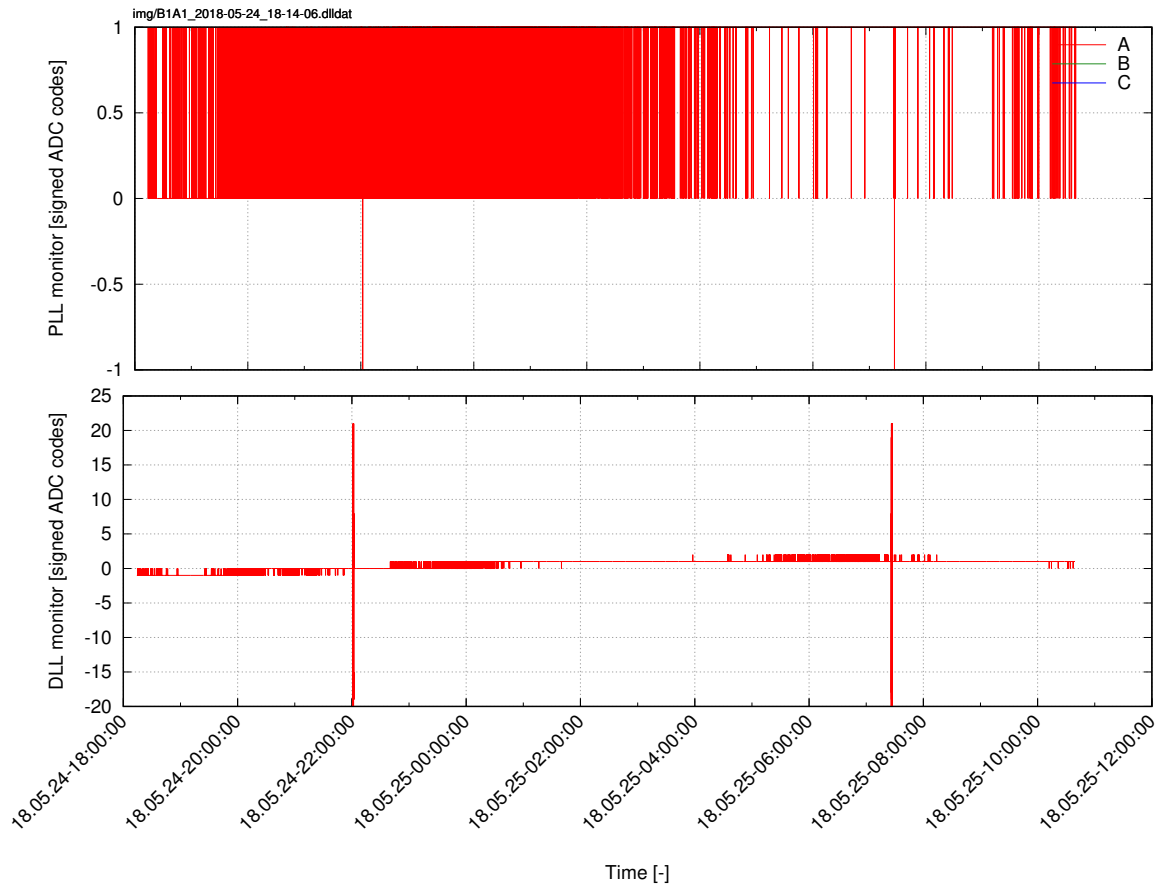


Figure 152: B1A1, DLL & PLL stability monitoring (one night); HLP active; only one PLL monitor red

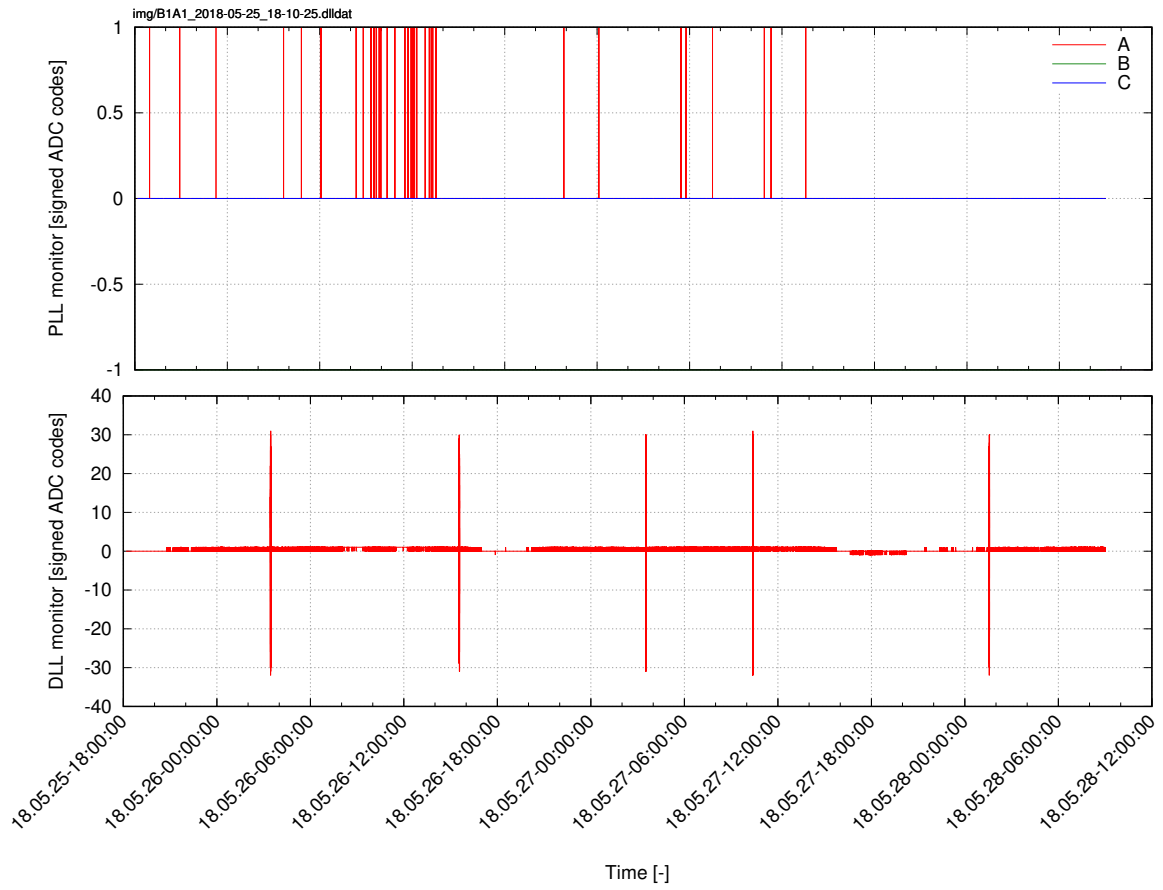


Figure 153: B1A1, DLL & PLL stability monitoring (a weekend); HLP active

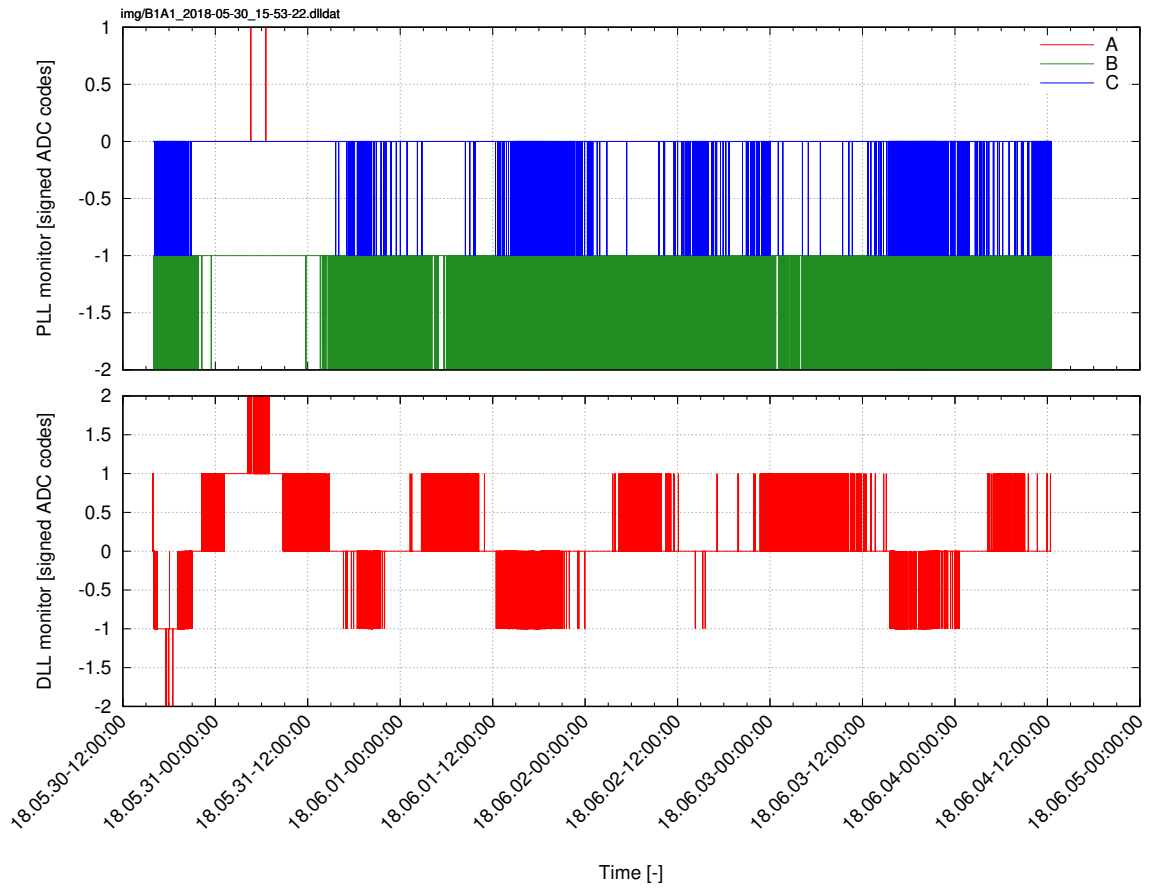


Figure 154: B1A1, DLL & PLL stability monitoring (four days); HLP inactive

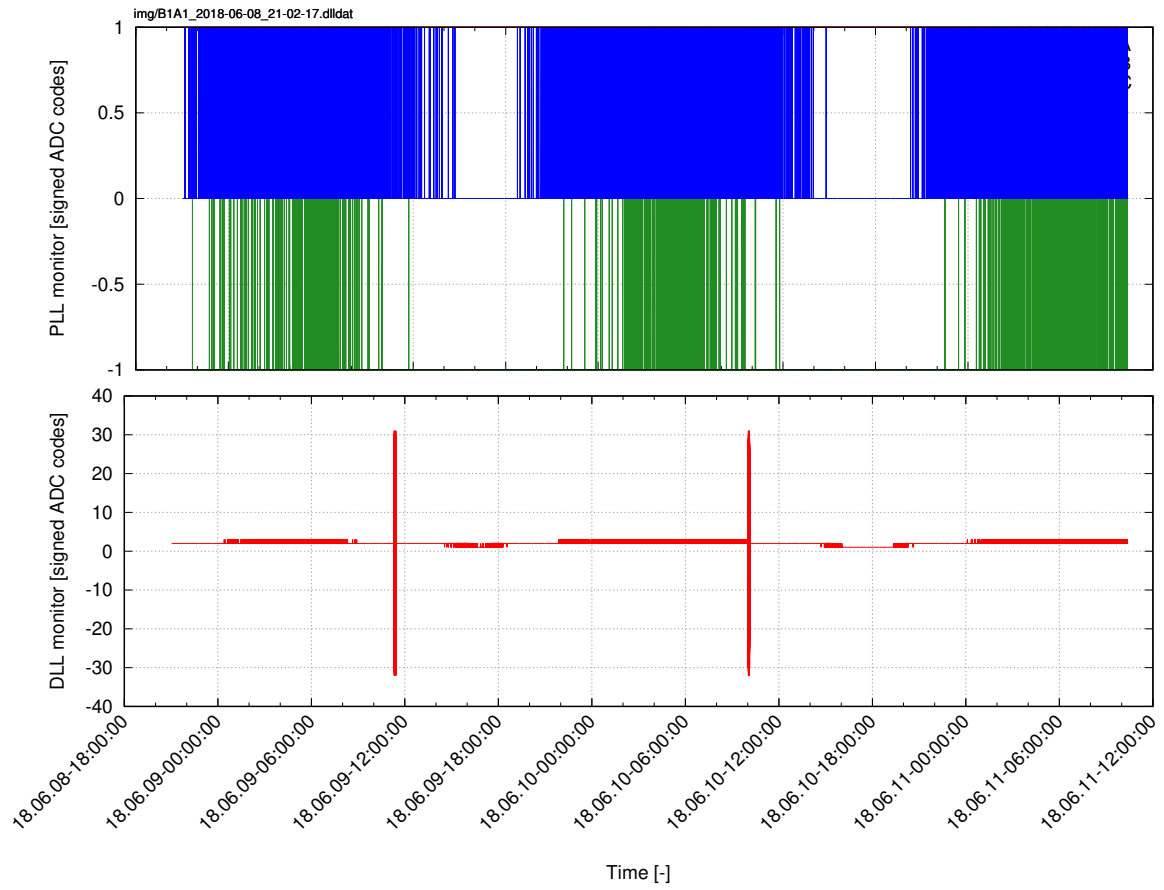


Figure 155: B1A1, DLL & PLL stability monitoring (two days); HLP active, DLL CP current lowered to 'h4

4 Board 0 with ASIC 2

Cap-PCB initially bonded with 12 pF, however a short was found on cap-PCB by removing bond from channel -1. Therefore the first results are done for channel -1 with bond removed.

4.1 Input bonds completely removed from channel -1

Cap-PCB assembled, bond to SALT input pad 0 removed, two 12 pF capacitors assembled to the cap-PCB.

4.1.1 Default ASIC configuration

ASIC configuration: JC configuration (tables 1 & 2).

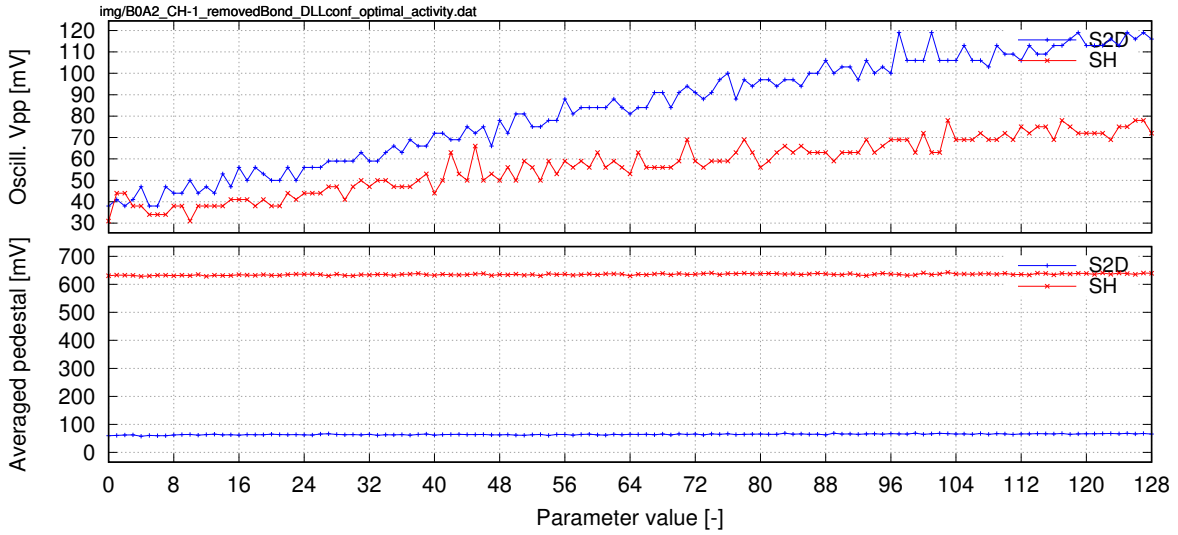


Figure 156: B0A2, channel -1, input bond removed from channel -1. Parameter=no. of active ADCs

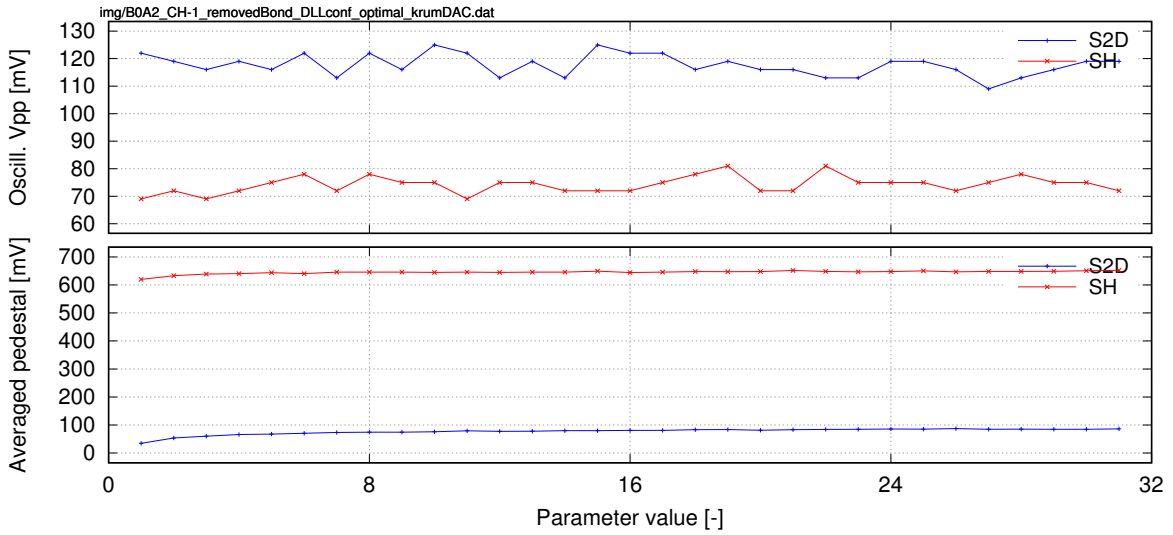


Figure 157: B0A2, channel -1, input bond removed from channel -1. Parameter=Krummenacher DAC

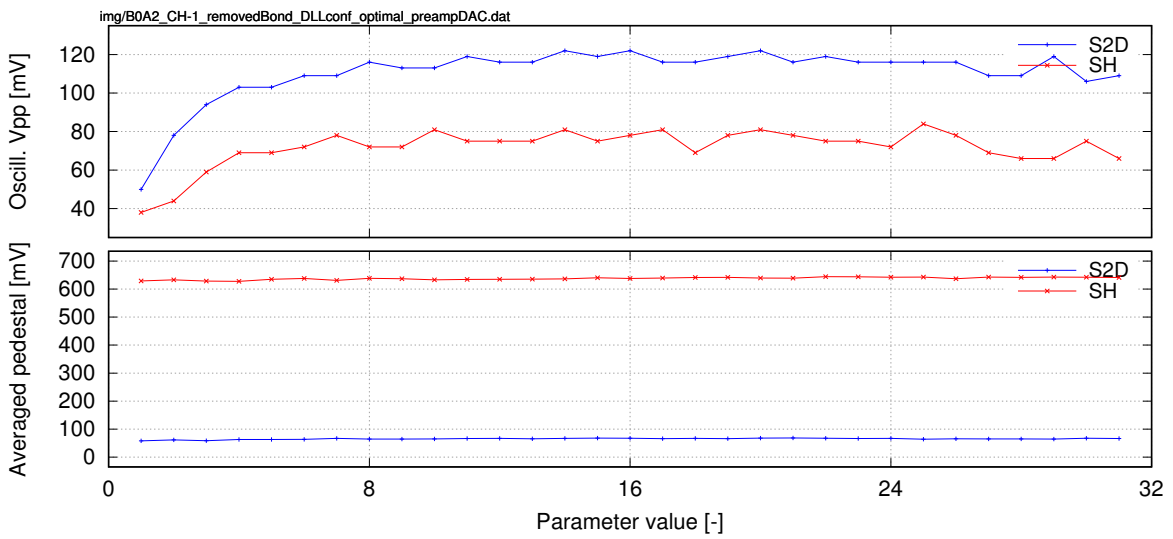


Figure 158: B0A2, channel -1, input bond removed from channel -1. Parameter=preamp DAC

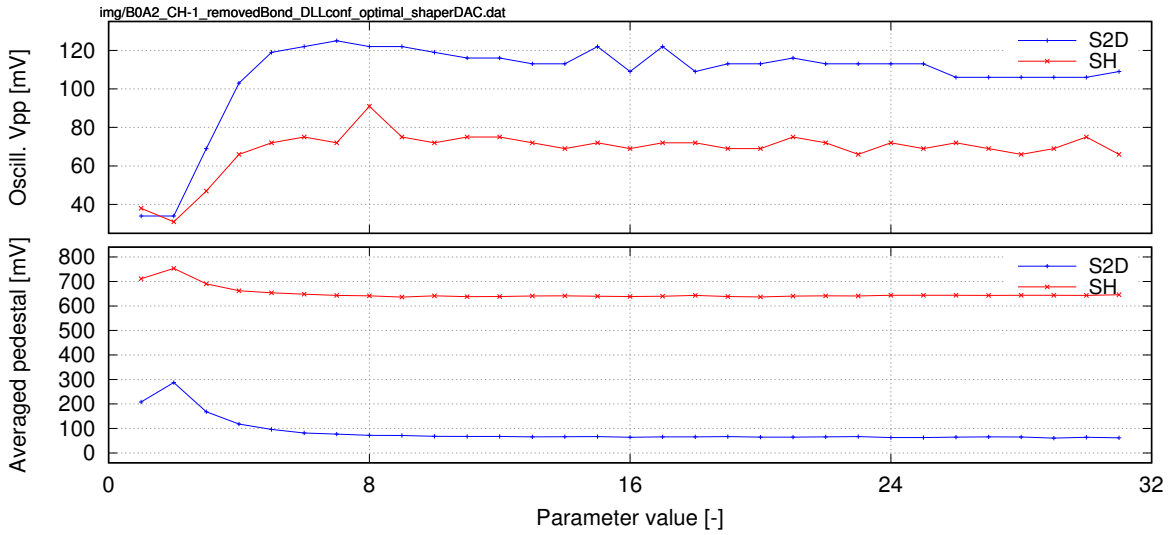


Figure 159: B0A2, channel -1, input bond removed from channel -1. Parameter=shaper DAC

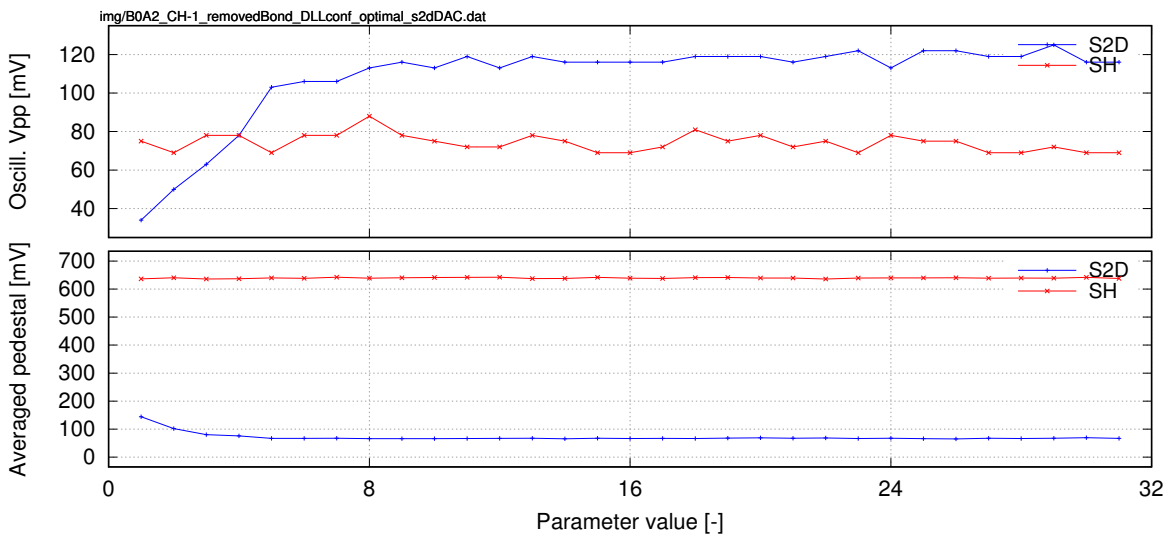


Figure 160: B0A2, channel -1, input bond removed from channel -1. Parameter=S2D DAC

4.1.2 Optimized test pulse and ADC delay

ASIC configuration: JC configuration (tables 1 & 2) + test pulse and ADC delay optimizations (table 3).

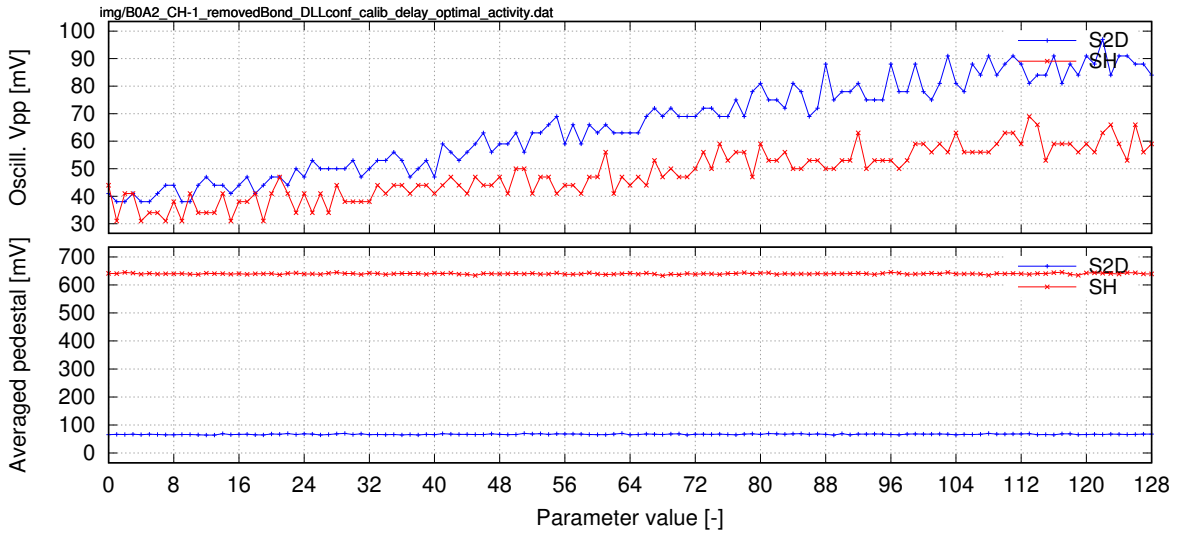


Figure 161: B0A2, channel -1, input bond removed from channel -1. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

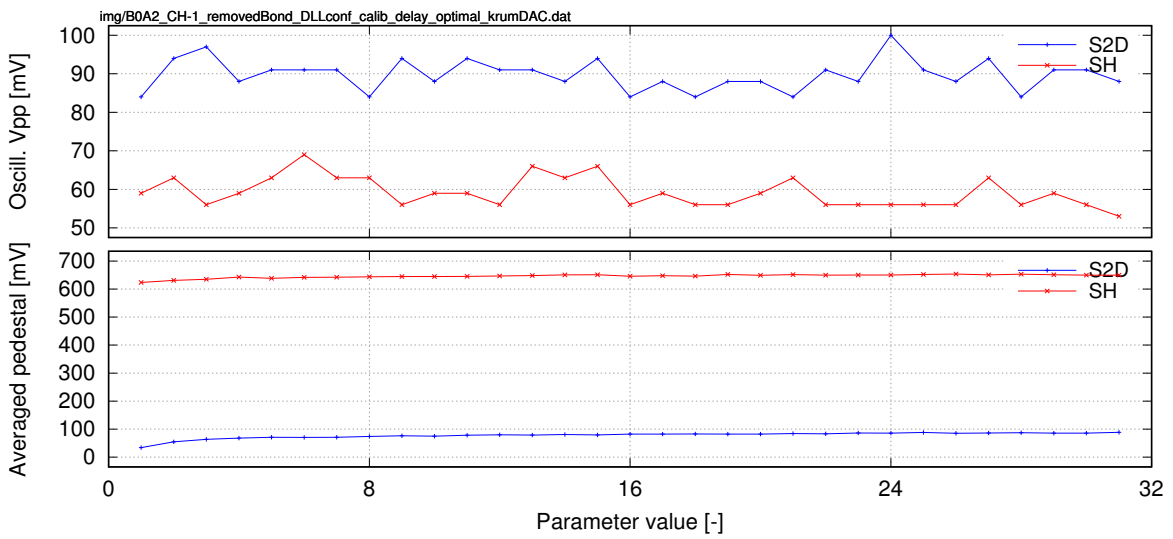


Figure 162: B0A2, channel -1, input bond removed from channel -1. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

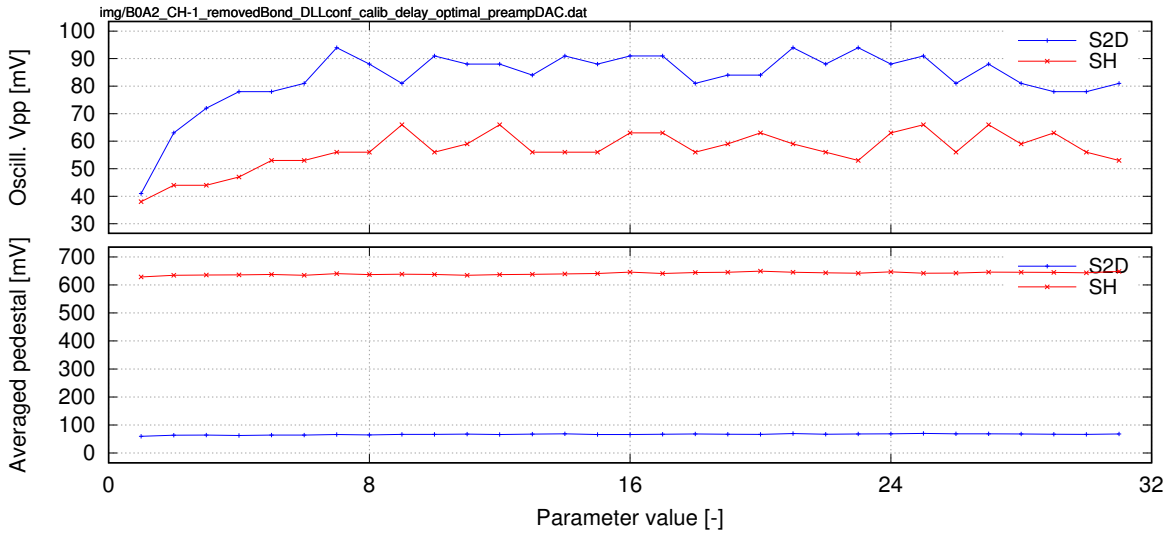


Figure 163: B0A2, channel -1, input bond removed from channel -1. Optimized test pulse and ADC delay. Parameter=preamp DAC

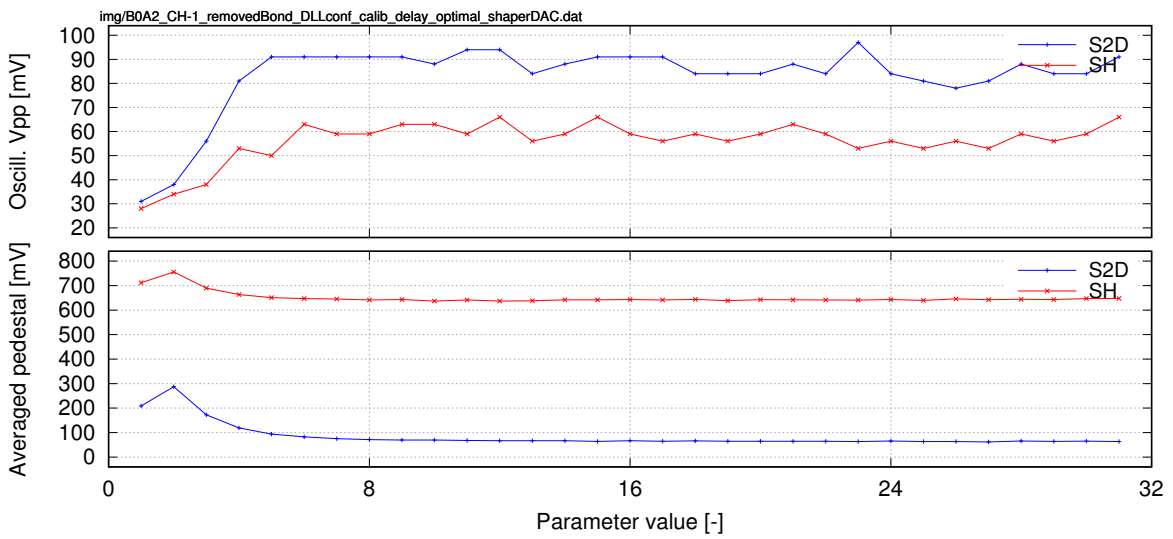


Figure 164: B0A2, channel -1, input bond removed from channel -1. Optimized test pulse and ADC delay. Parameter=shaper DAC

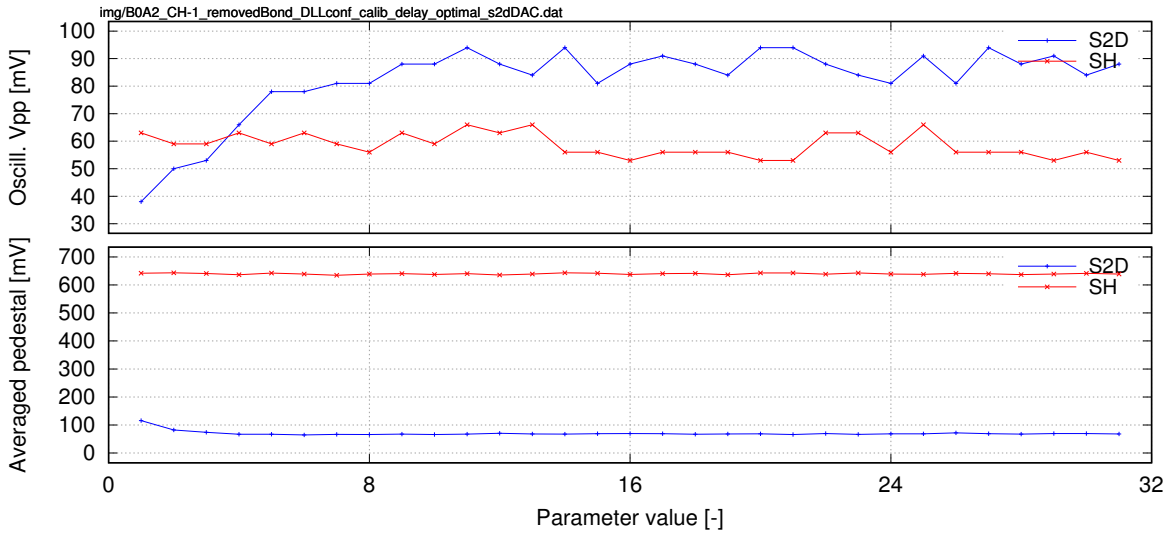


Figure 165: B0A2, channel -1, input bond removed from channel -1. Optimized test pulse and ADC delay. Parameter=S2D DAC

4.2 Cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized

Cap-PCB assembled, bonded to SALT input pads 0 and 127, two 12 pF capacitors assembled to the cap-PCB.

Ibuf current maximized – 1 k Ω resistor between VDDA and Ibuf pad.

Channel 128 have damaged input.

4.2.1 Default ASIC configuration

ASIC configuration: JC configuration (tables 1 & 2).

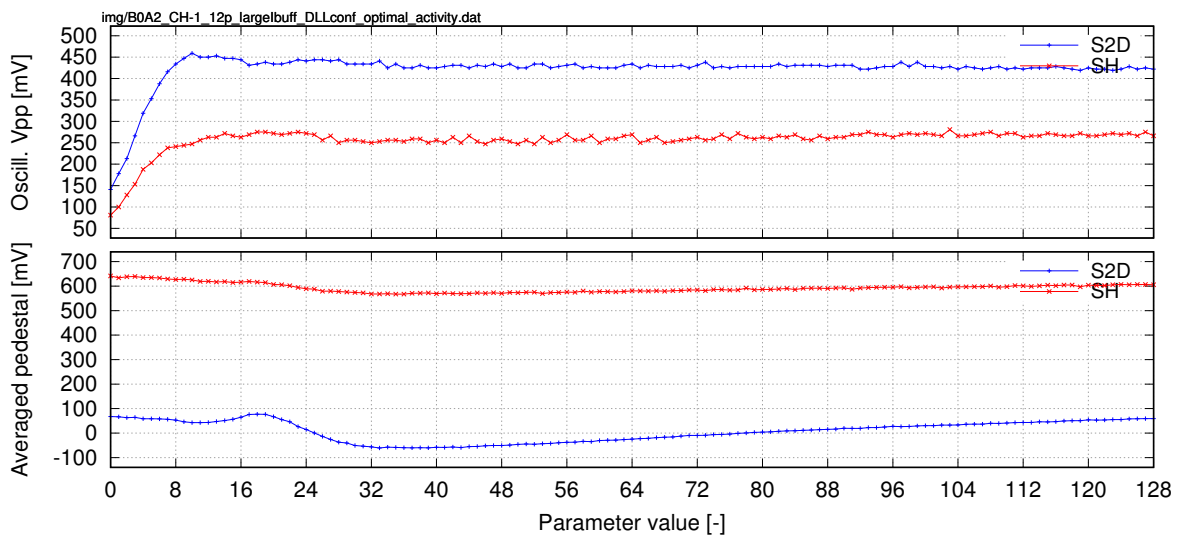


Figure 166: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Parameter=no. of active ADCs

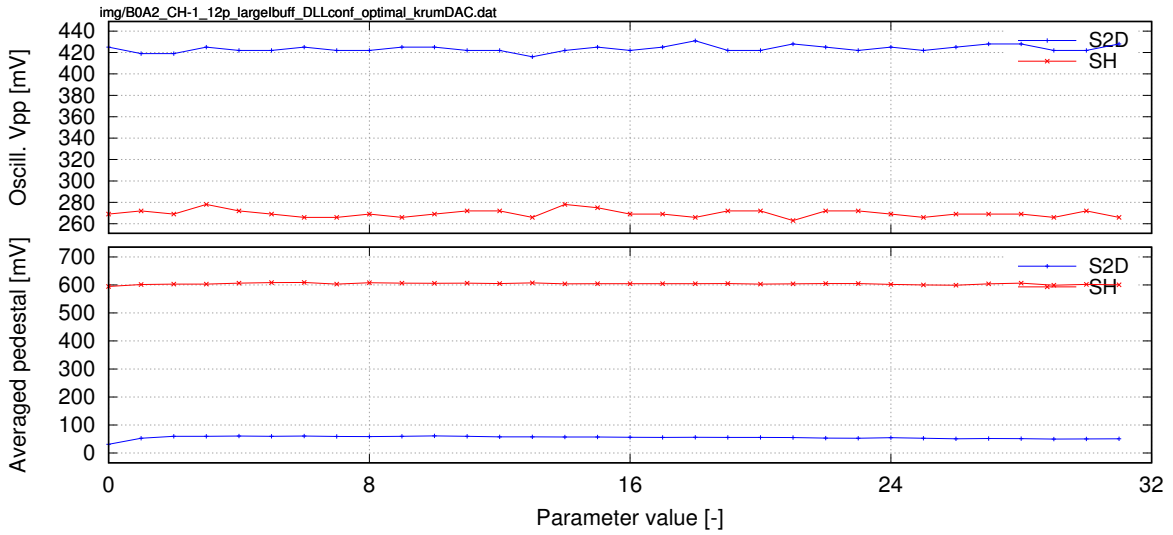


Figure 167: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Parameter=Krummenacher DAC

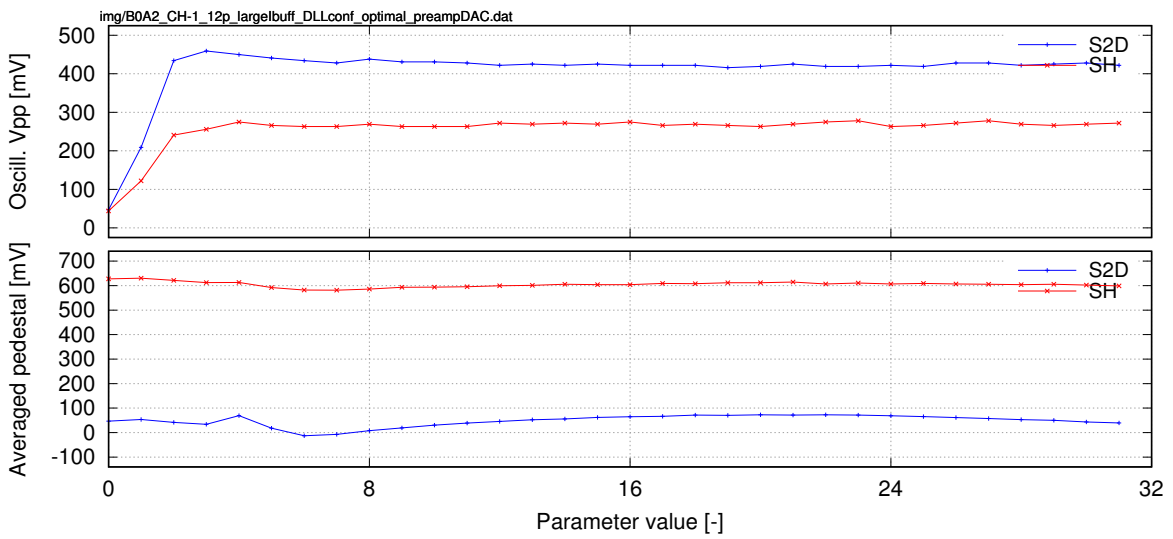


Figure 168: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Parameter=preamp DAC

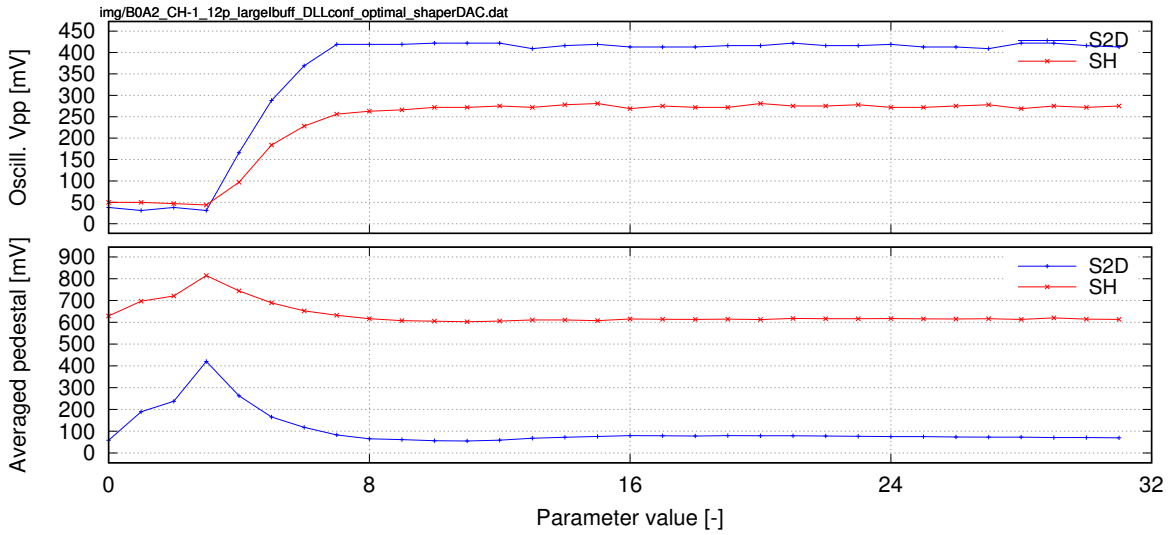


Figure 169: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Parameter=shaper DAC

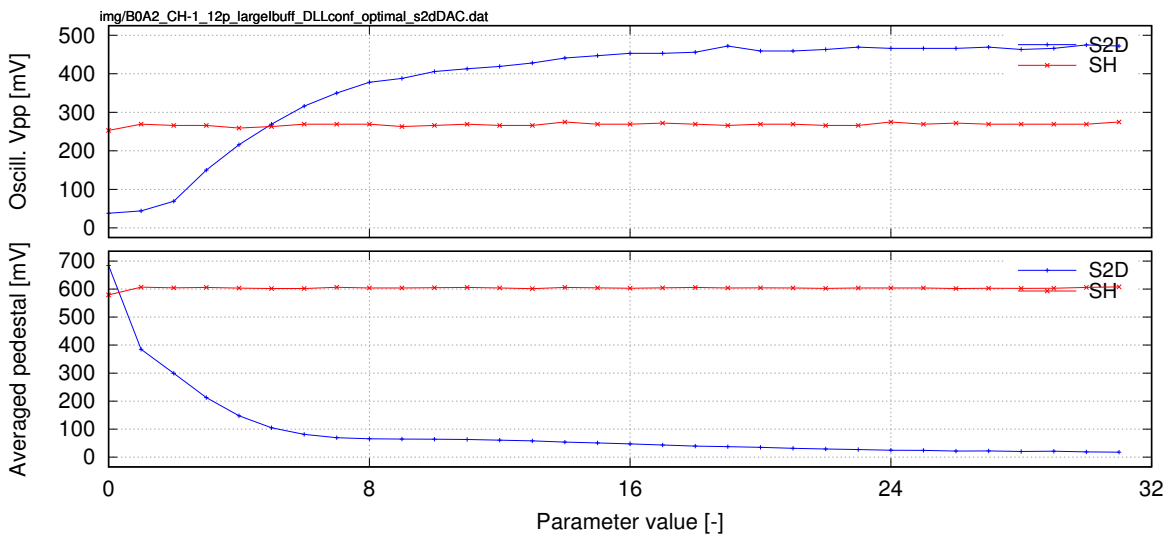


Figure 170: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Parameter=S2D DAC

4.2.2 Optimized test pulse and ADC delay

ASIC configuration: JC configuration (tables 1 & 2) + test pulse and ADC delay optimizations (table 3).

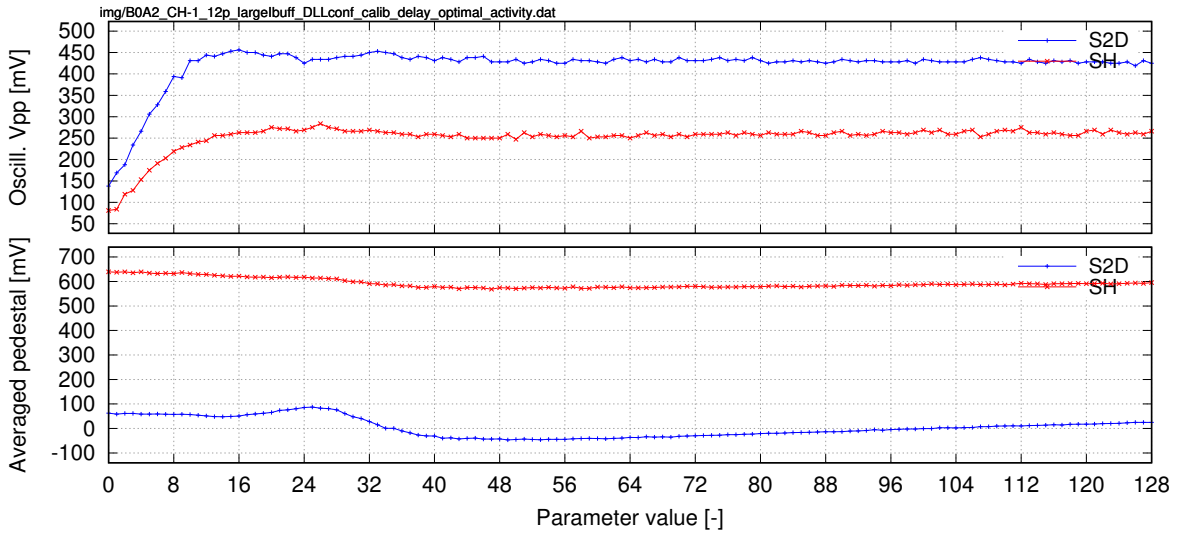


Figure 171: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

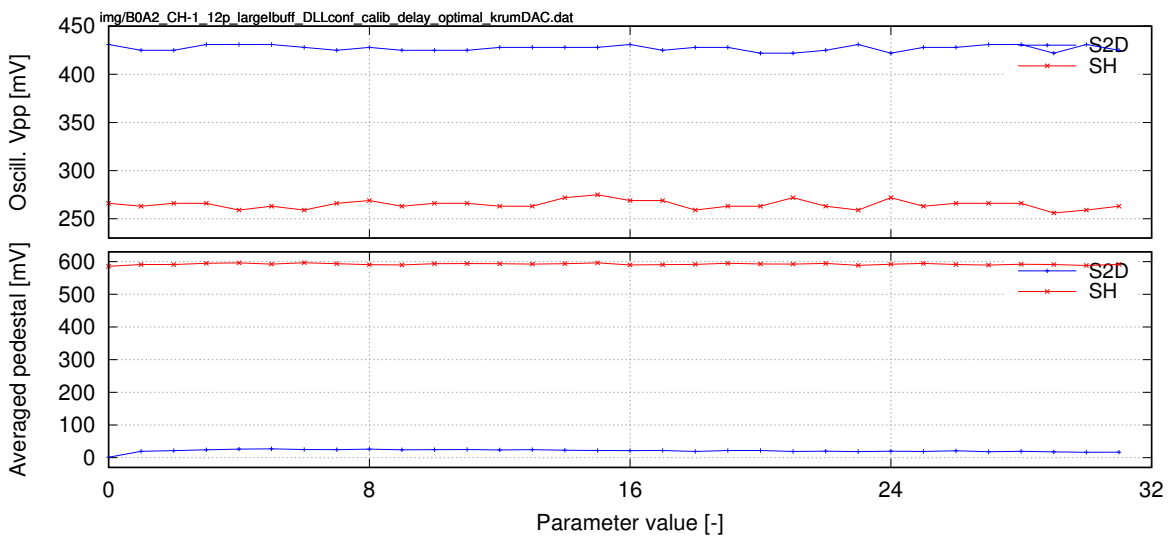


Figure 172: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

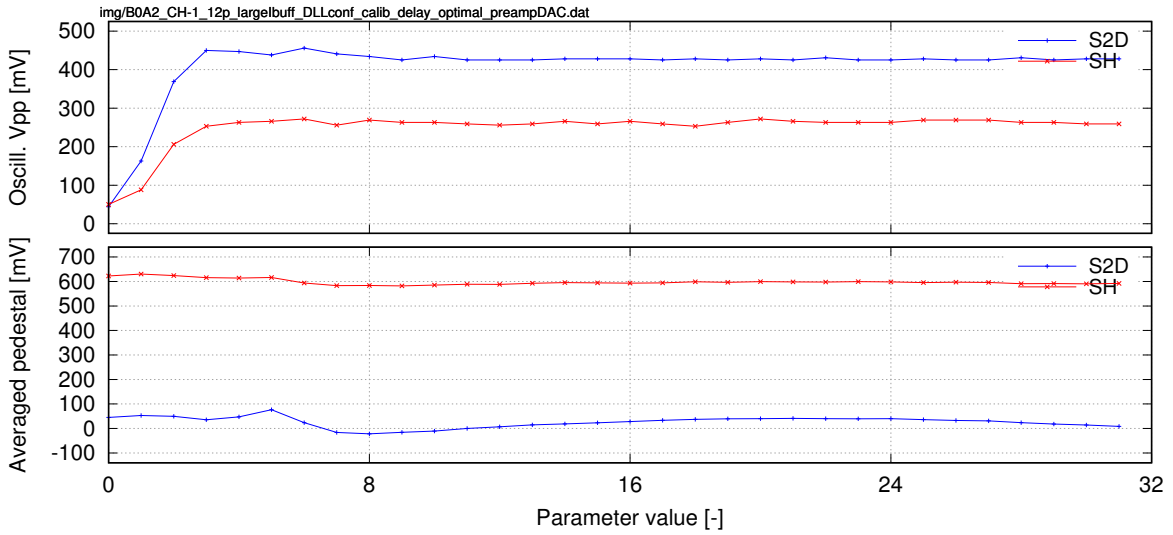


Figure 173: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=preamp DAC

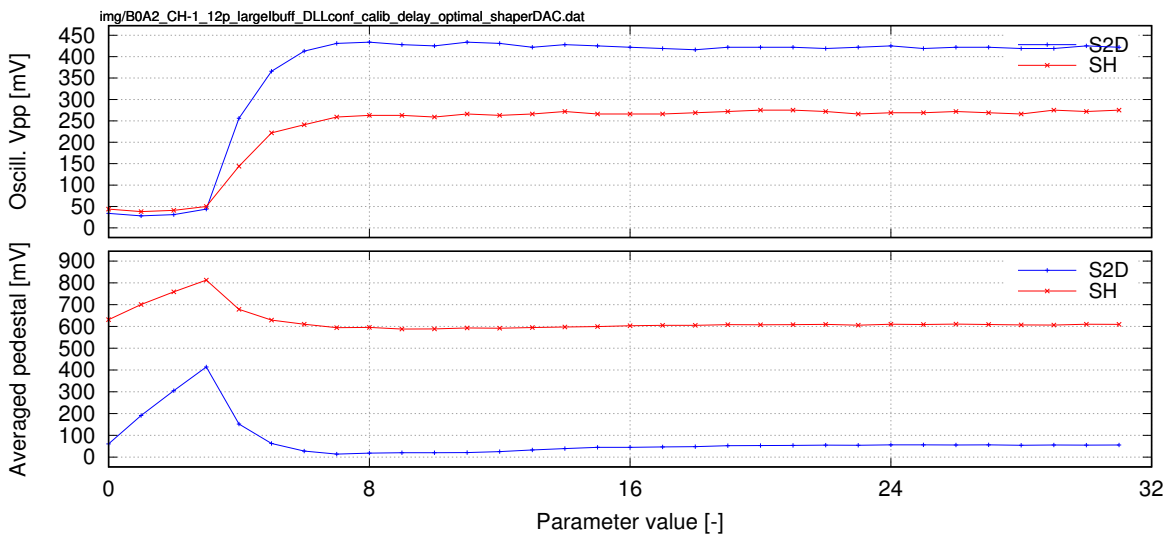


Figure 174: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=shaper DAC

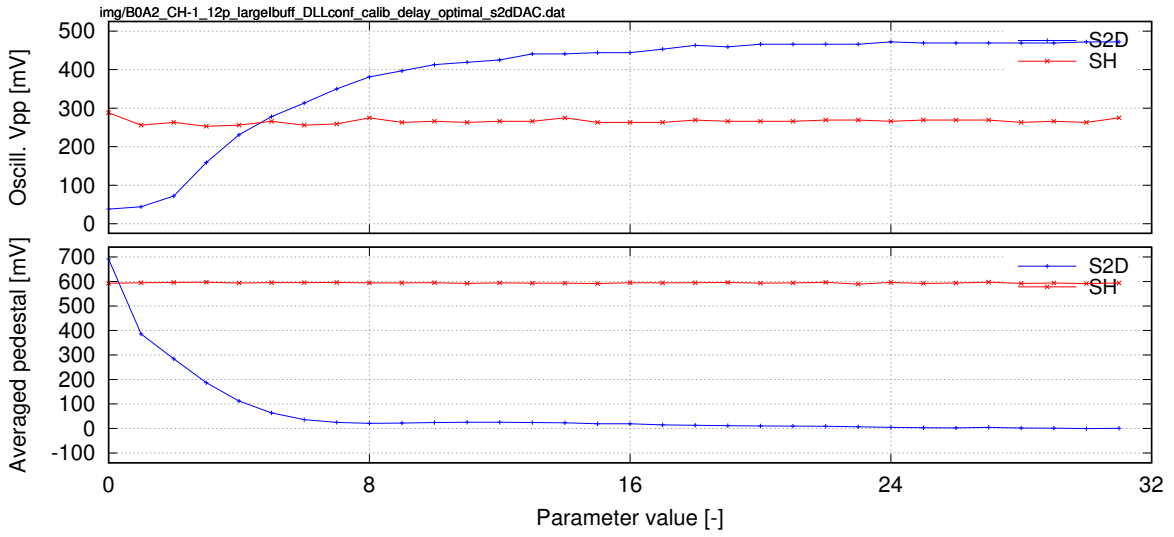


Figure 175: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=S2D DAC

4.3 Cap-PCB bonded, 12 pF capacitors + 820 kΩ resistors assembled; Ibuf current maximized

Cap-PCB assembled, bonded to SALT input pads 0 and 127, two 12 pF capacitors assembled to the cap-PCB, 820 kΩ resistors soldered in parallel to the capacitors. Ibuf current maximized – 1 kΩ resistor between VDDA and Ibuf pad.

Channel 128 have damaged input.

4.3.1 Default ASIC configuration

ASIC configuration: JC configuration (tables 1 & 2).

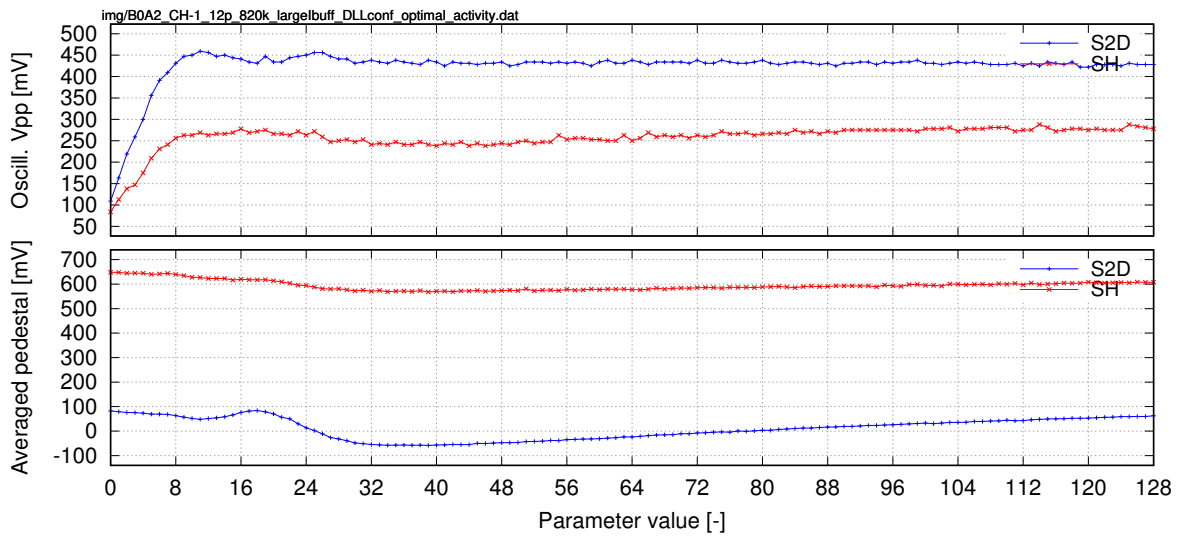


Figure 176: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 kΩ resistor assembled; Ibuf current maximized. Parameter=no. of active ADCs

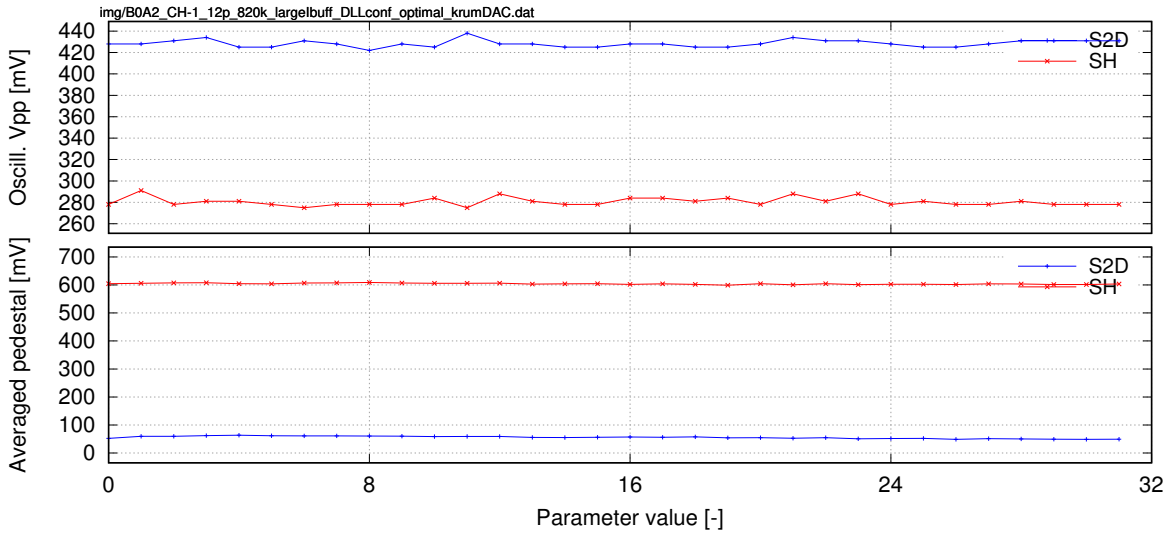


Figure 177: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 kΩ resistor assembled; Ibuf current maximized. Parameter=Krummenacher DAC

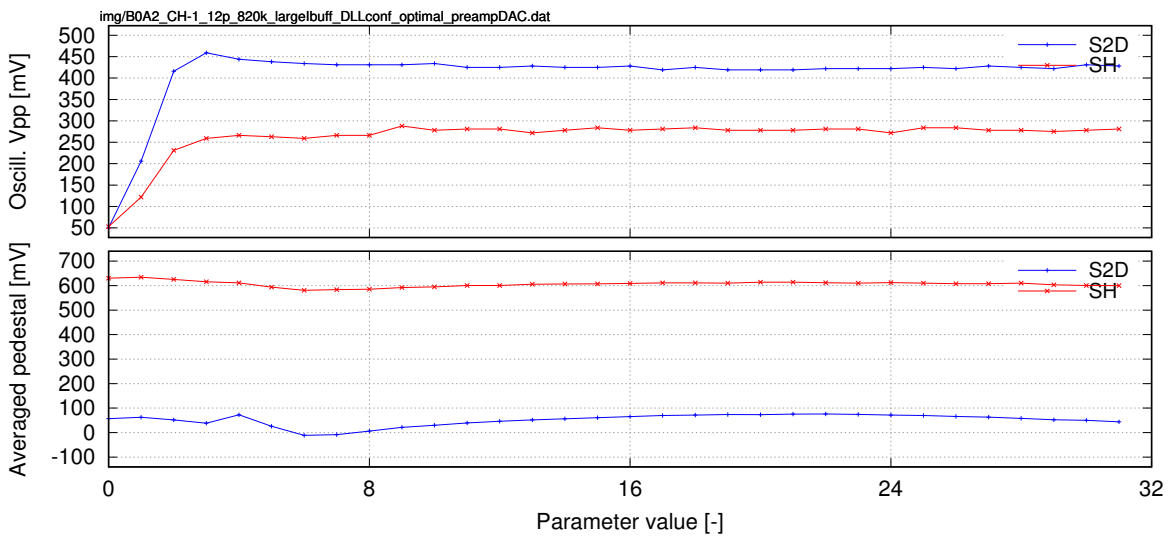


Figure 178: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 kΩ resistor assembled; Ibuf current maximized. Parameter=preamp DAC

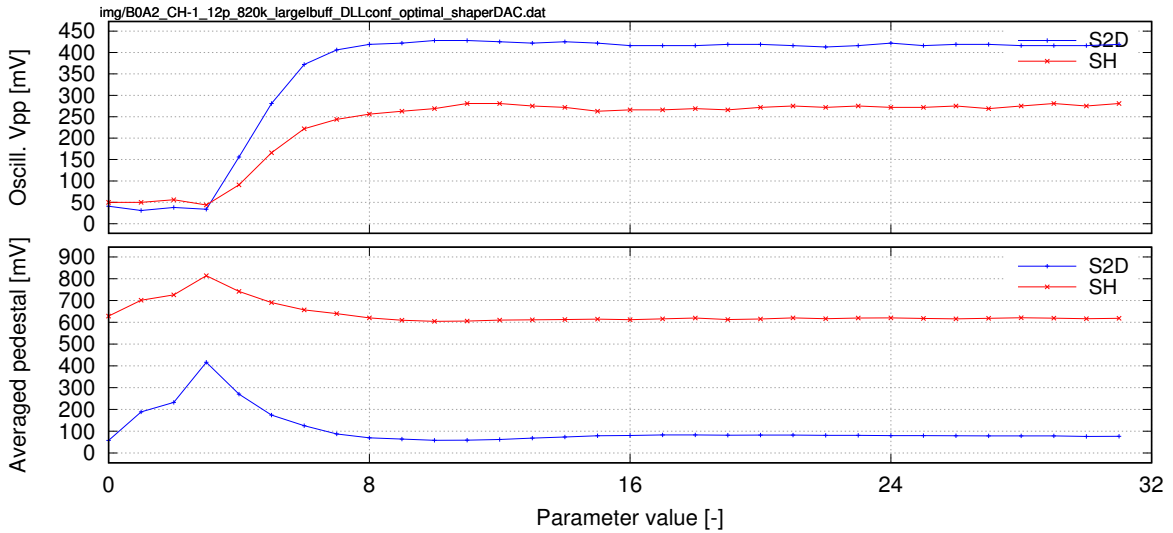


Figure 179: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized. Parameter=shaper DAC

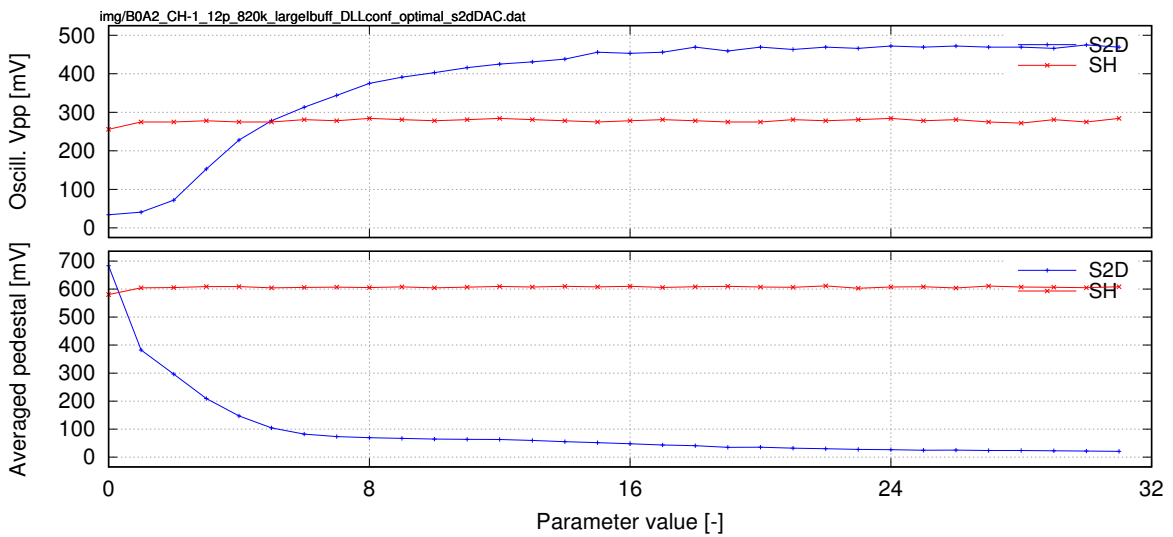


Figure 180: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized. Parameter=S2D DAC

4.3.2 Optimized test pulse and ADC delay

ASIC configuration: JC configuration (tables 1 & 2) + test pulse and ADC delay optimizations (table 3).

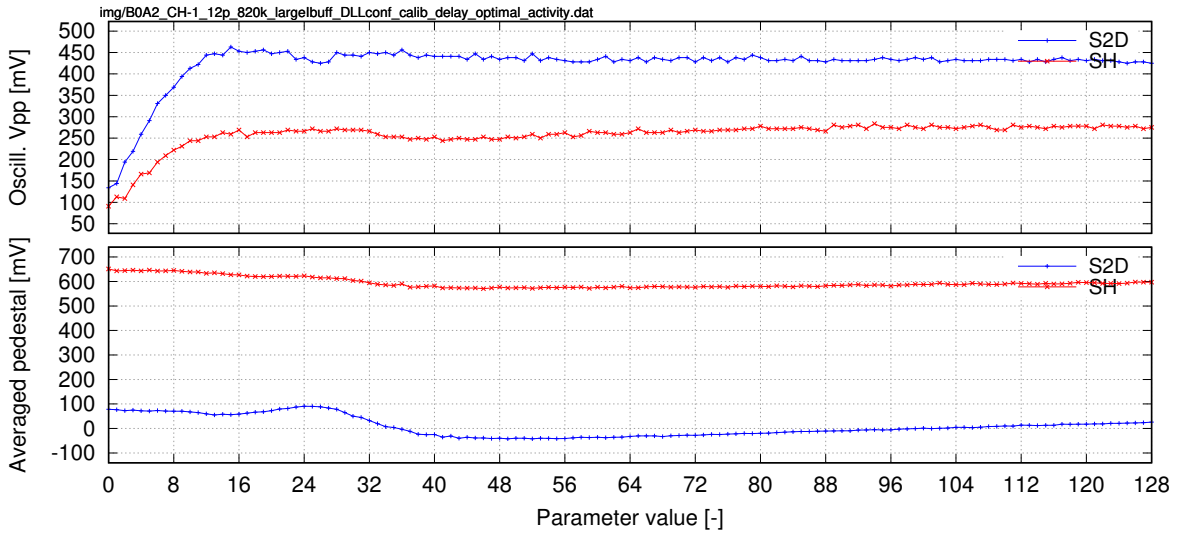


Figure 181: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 kΩ resistor assembled; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

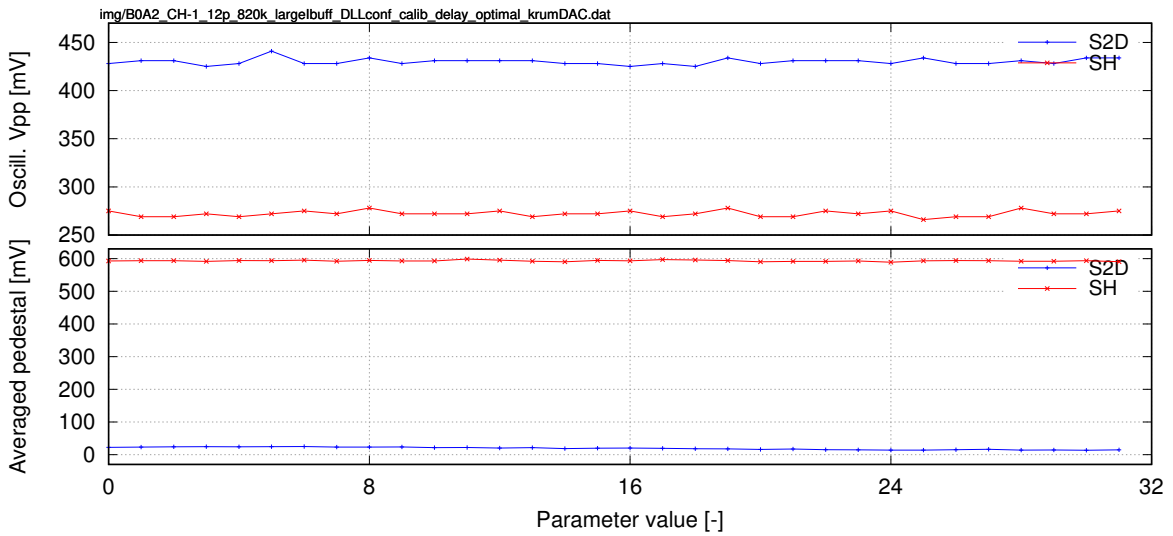


Figure 182: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 kΩ resistor assembled; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

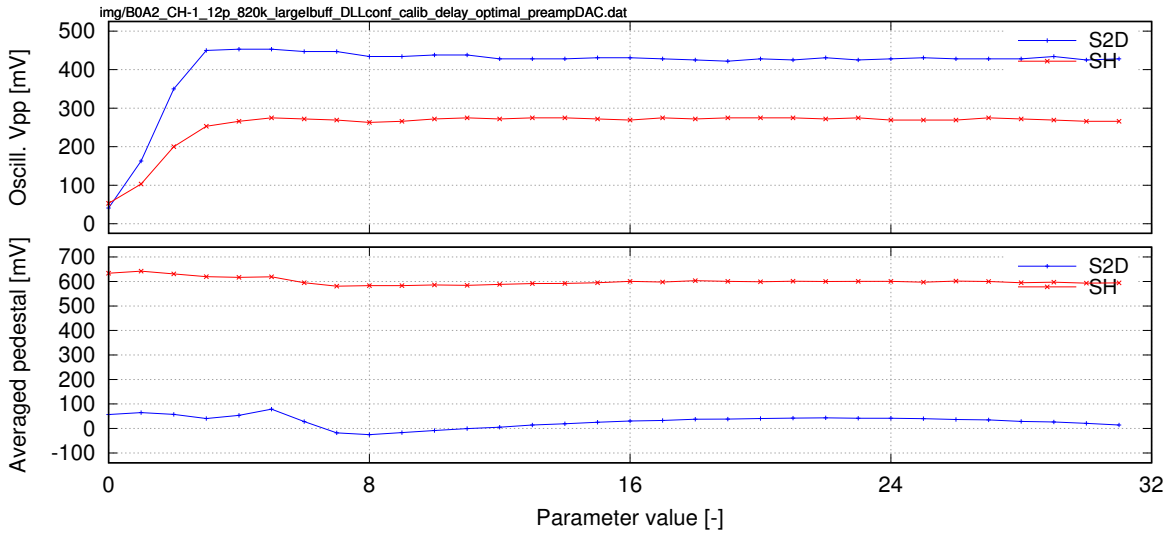


Figure 183: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=preamp DAC

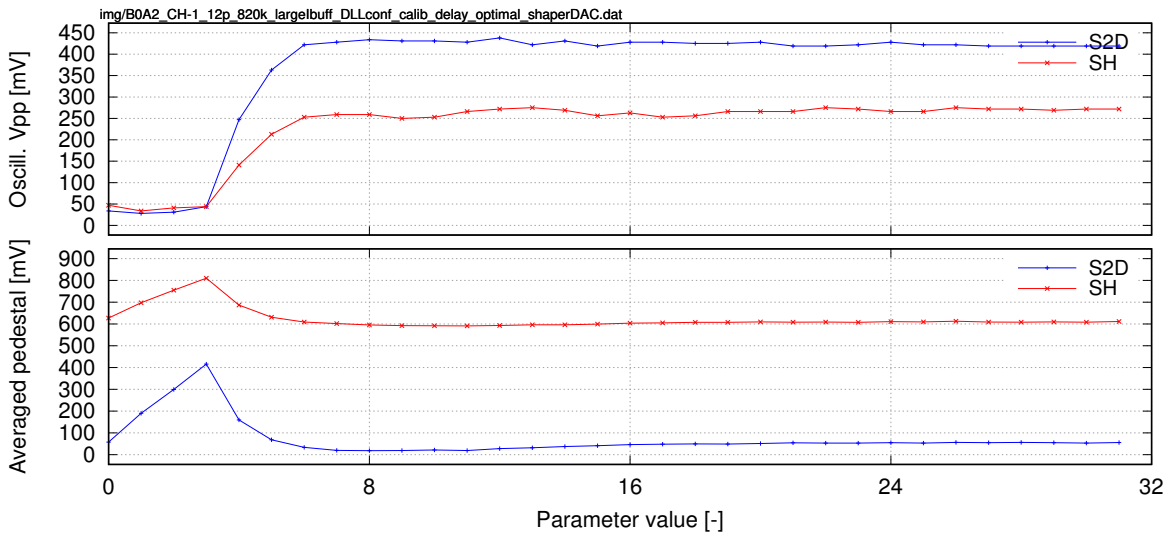


Figure 184: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=shaper DAC

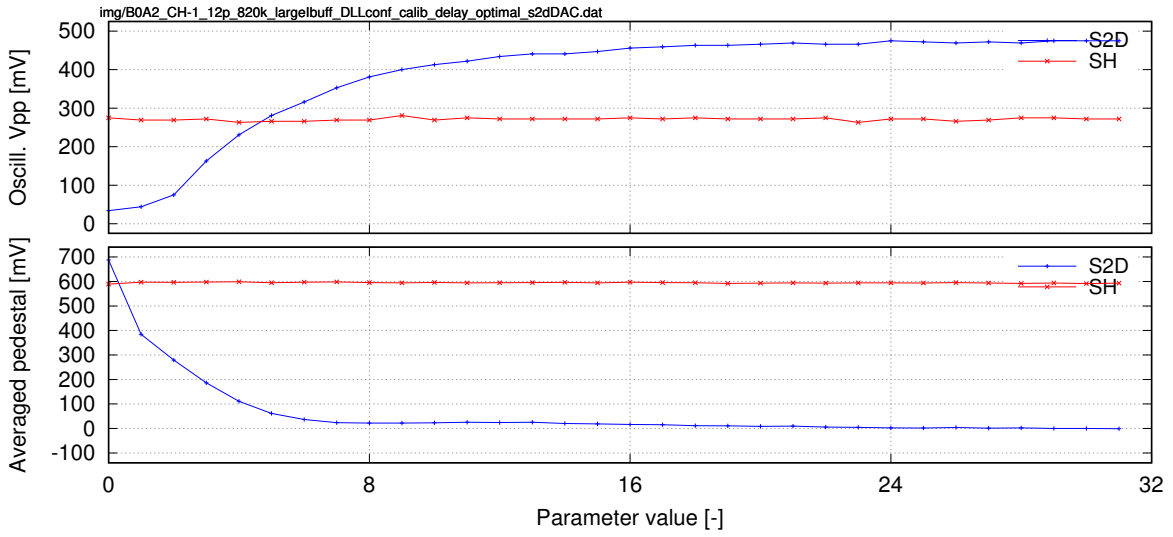


Figure 185: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 kΩ resistor assembled; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=S2D DAC

4.4 Cap-PCB bonded, 12 pF capacitors + 820 kΩ resistors assembled; Ibuf current maximized; ADC power supply with 2.2 Ω series resistor

Cap-PCB assembled, bonded to SALT input pads 0 and 127, two 12 pF capacitors assembled to the cap-PCB, 820 kΩ resistors soldered in parallel to the capacitors.

Ibuf current maximized – 1 kΩ resistor between VDDA and Ibuf pad.

2.2 Ω resistor assembled in series between onboard decoupling power supply capacitors and VDDADC + VREFD bonds.

Channel 128 have damaged input.

4.4.1 Default ASIC configuration

ASIC configuration: JC configuration (tables 1 & 2).

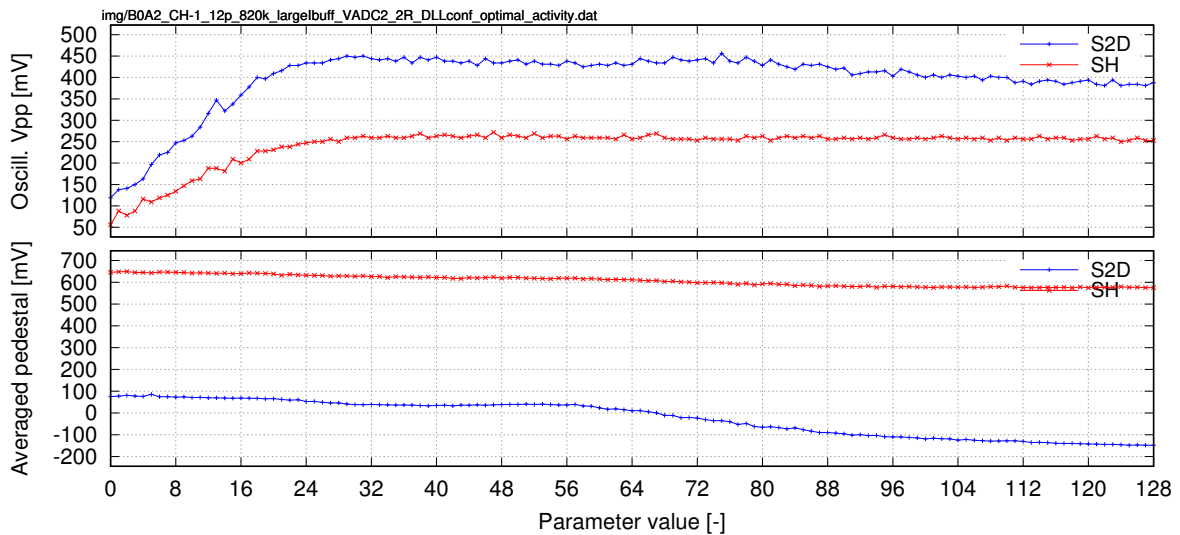


Figure 186: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 kΩ resistor assembled; Ibuf current maximized; ADC power supply with 2.2 Ω series resistor. Parameter=no. of active ADCs

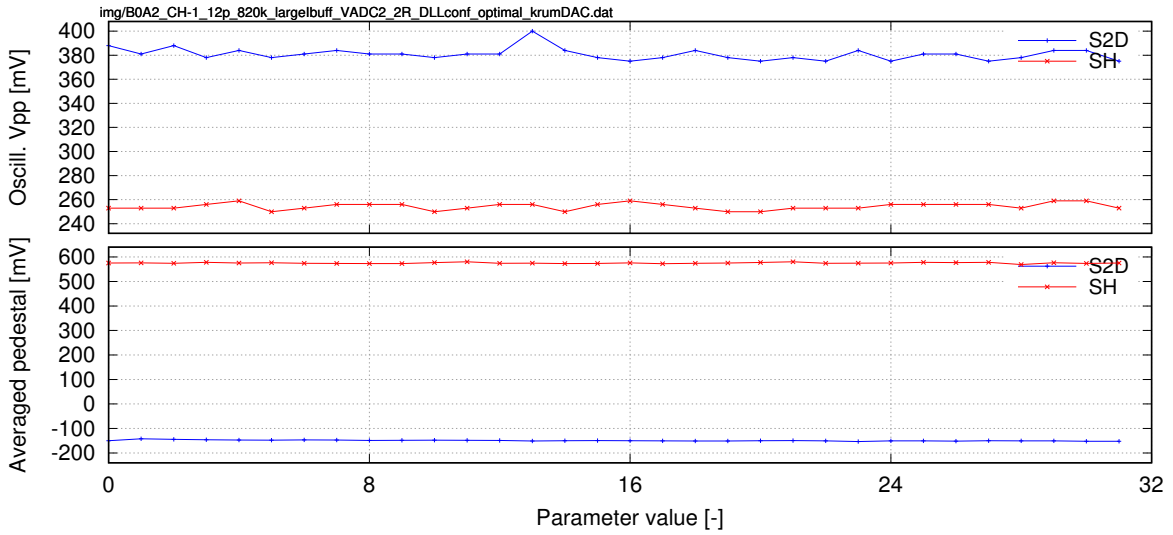


Figure 187: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized; ADC power supply with 2.2 Ω series resistor. Parameter=Krummenacher DAC

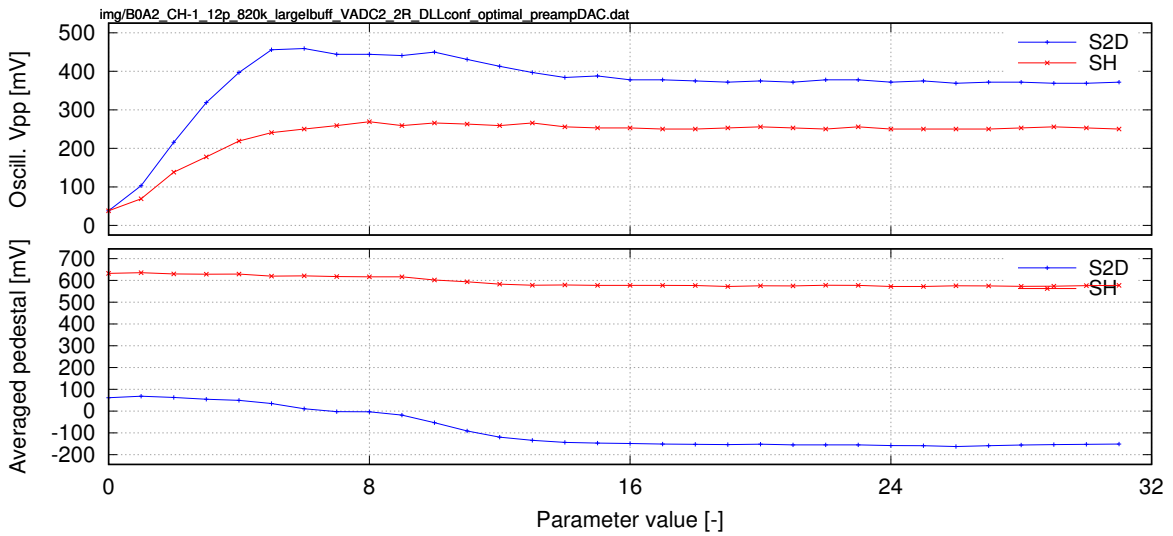


Figure 188: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized; ADC power supply with 2.2 Ω series resistor. Parameter=preamp DAC

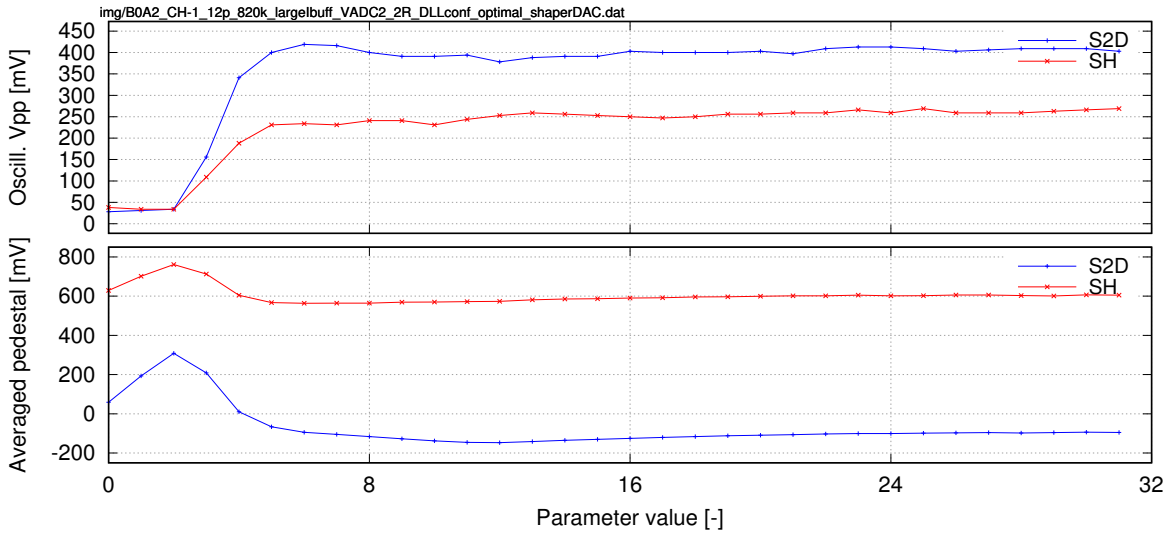


Figure 189: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized; ADC power supply with 2.2 Ω series resistor. Parameter=shaper DAC

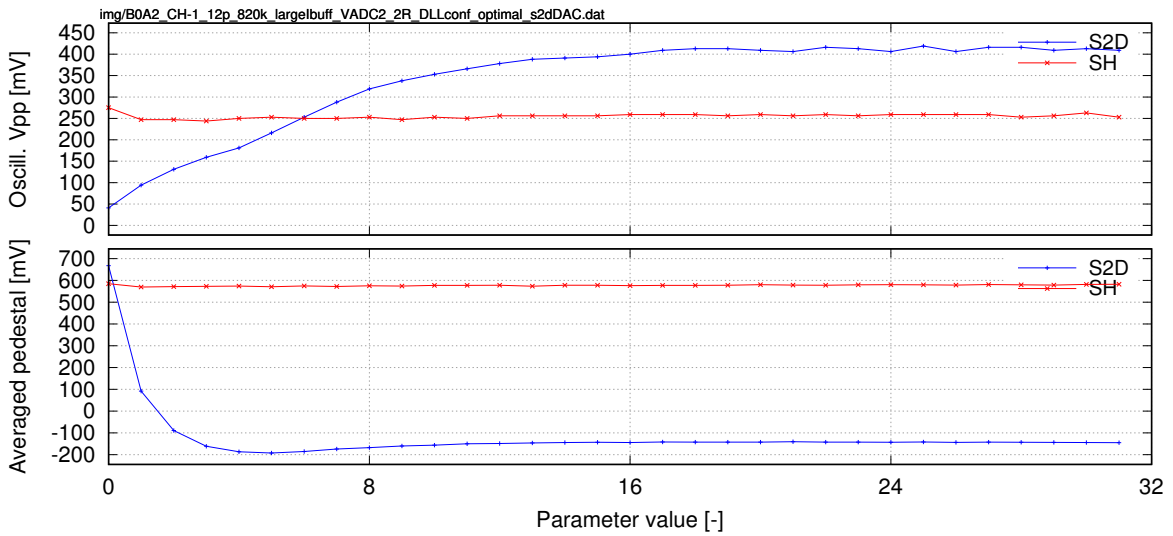


Figure 190: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized; ADC power supply with 2.2 Ω series resistor. Parameter=S2D DAC

4.4.2 Optimized test pulse and ADC delay

ASIC configuration: JC configuration (tables 1 & 2) + test pulse and ADC delay optimizations (table 3).

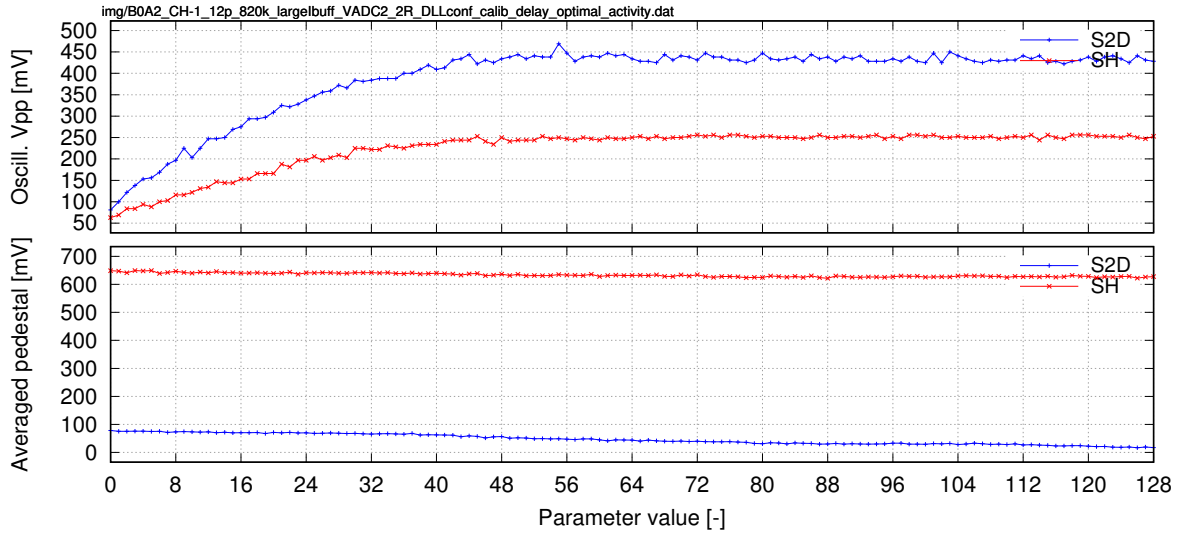


Figure 191: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized; ADC power supply with 2.2 Ω series resistor. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

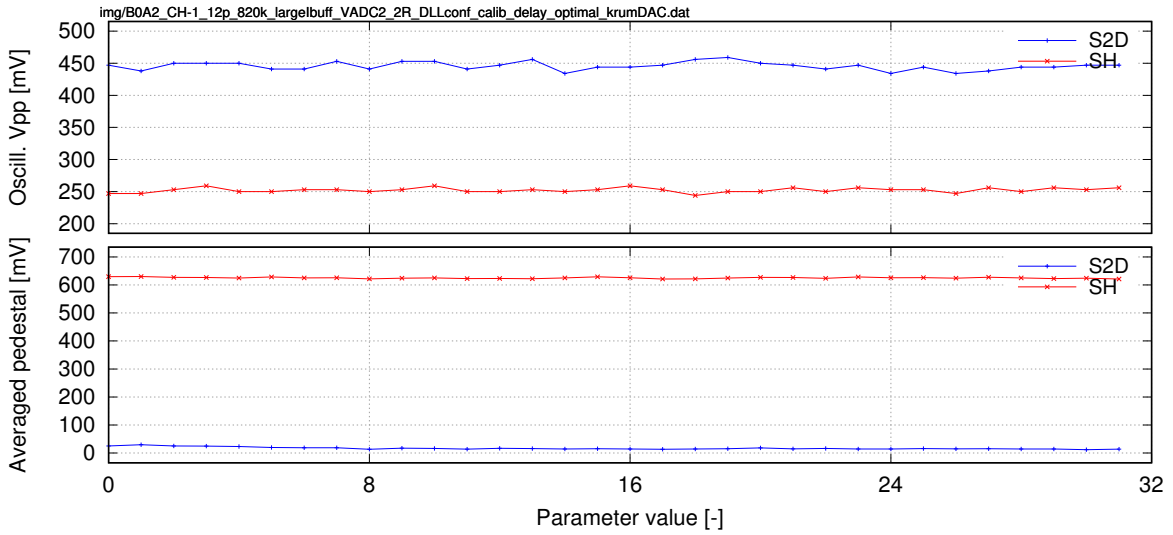


Figure 192: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized; ADC power supply with 2.2 Ω series resistor. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

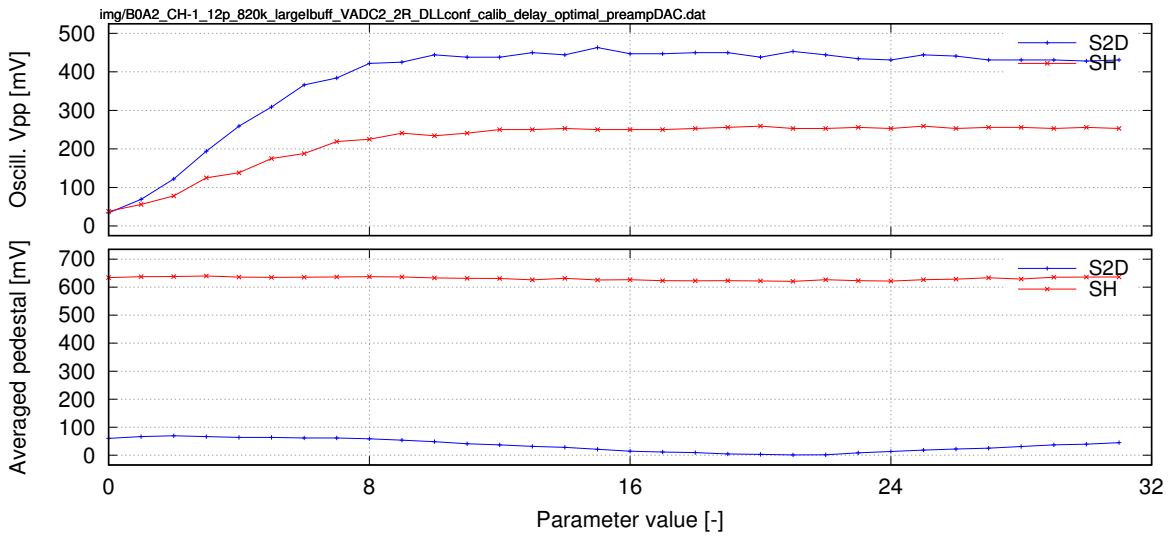


Figure 193: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized; ADC power supply with 2.2 Ω series resistor. Optimized test pulse and ADC delay. Parameter=preamp DAC

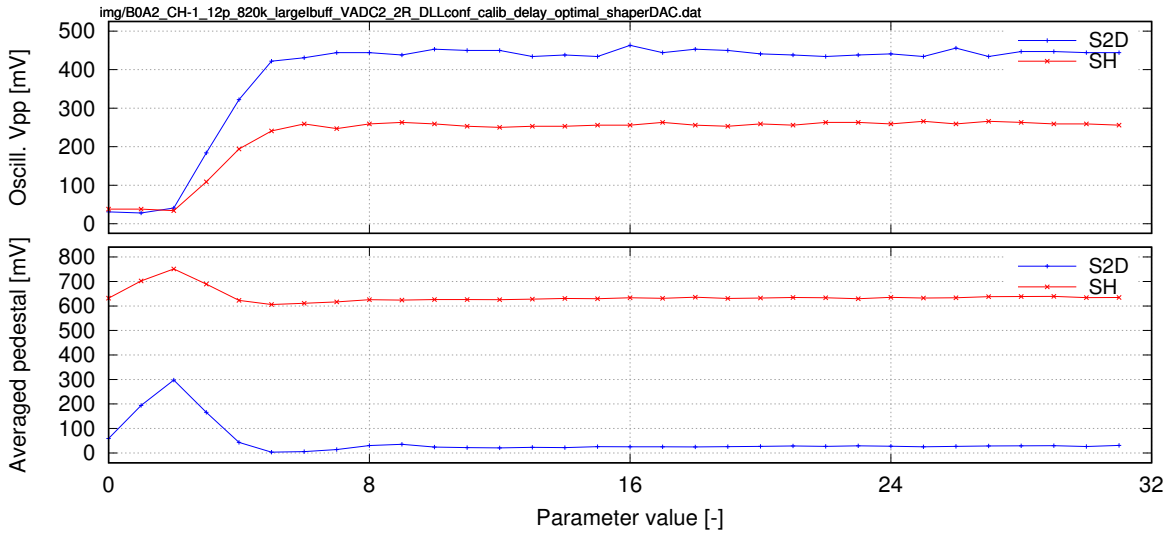


Figure 194: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized; ADC power supply with 2.2 Ω series resistor. Optimized test pulse and ADC delay. Parameter=shaper DAC

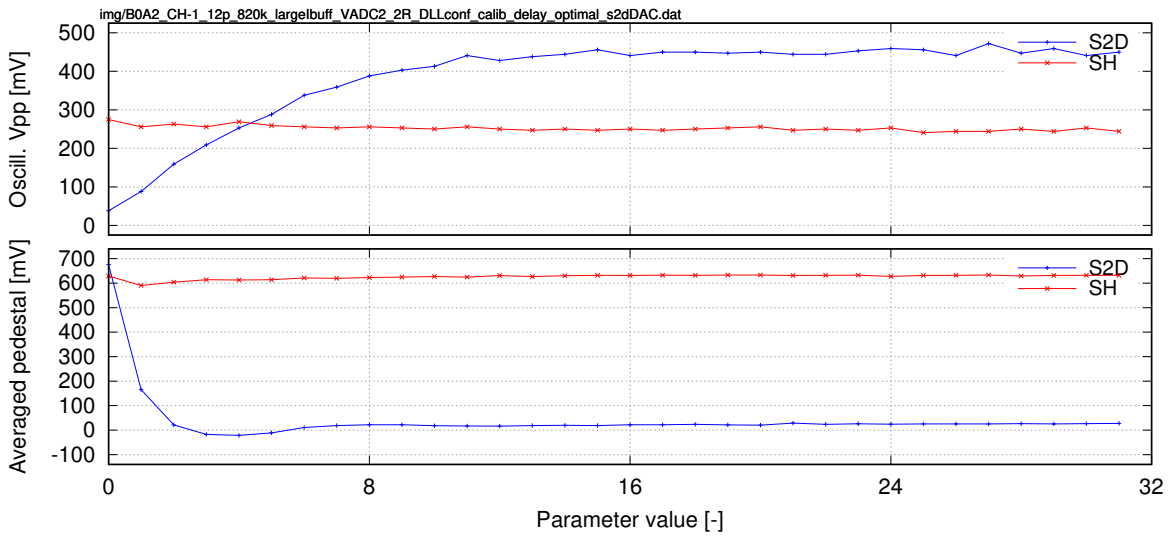


Figure 195: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized; ADC power supply with 2.2 Ω series resistor. Optimized test pulse and ADC delay. Parameter=S2D DAC

4.5 Cap-PCB bonded, 12 pF capacitors + 820 kΩ resistors assembled; Ibuf current maximized; ADC power supply with 1 μH series inductor

Cap-PCB assembled, bonded to SALT input pads 0 and 127, two 12 pF capacitors assembled to the cap-PCB, 820 kΩ resistors soldered in parallel to the capacitors.

Ibuf current maximized – 1 kΩ resistor between VDDA and Ibuf pad.

1 μH inductor assembled in series between onboard decoupling power supply capacitors and VDDADC + VREFD bonds.

Channel 128 have damaged input.

4.5.1 Default ASIC configuration

ASIC configuration: JC configuration (tables 1 & 2).

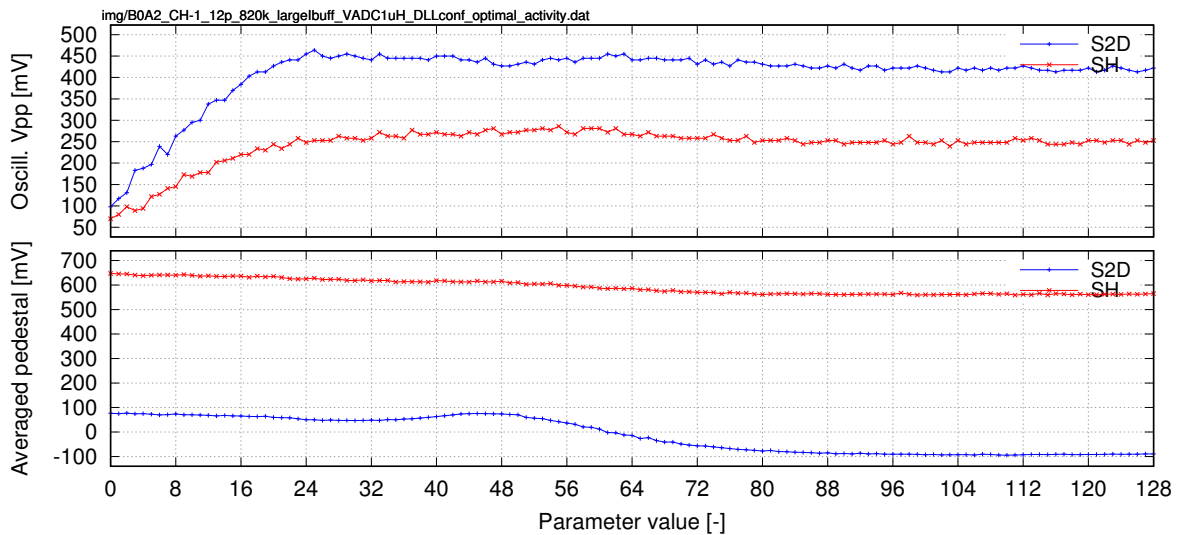


Figure 196: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 kΩ resistor assembled; Ibuf current maximized; ADC power supply with 1 μH series inductor. Parameter=no. of active ADCs

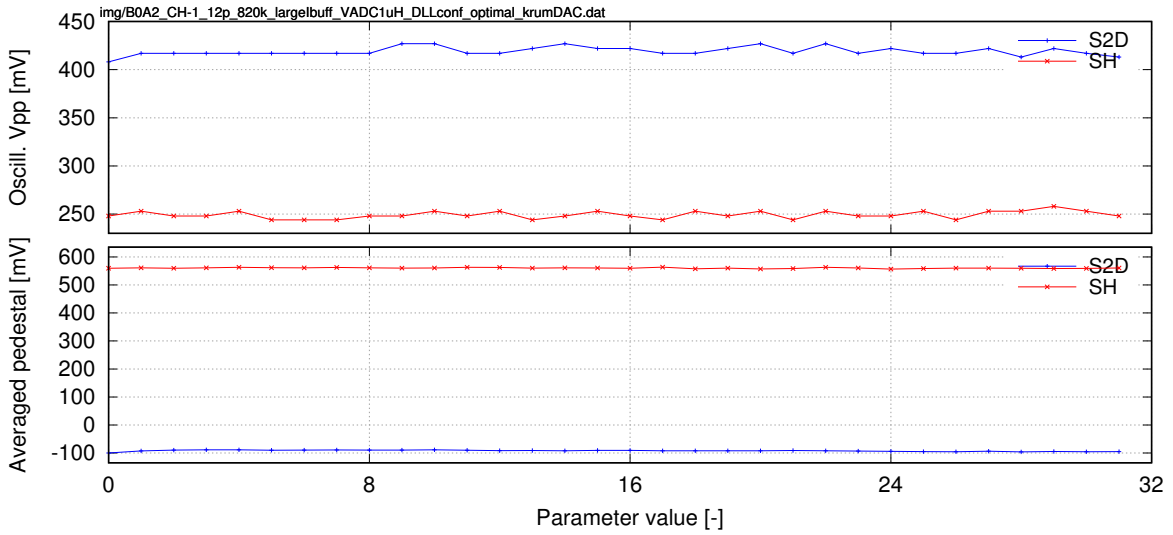


Figure 197: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor. Parameter=Krummenacher DAC

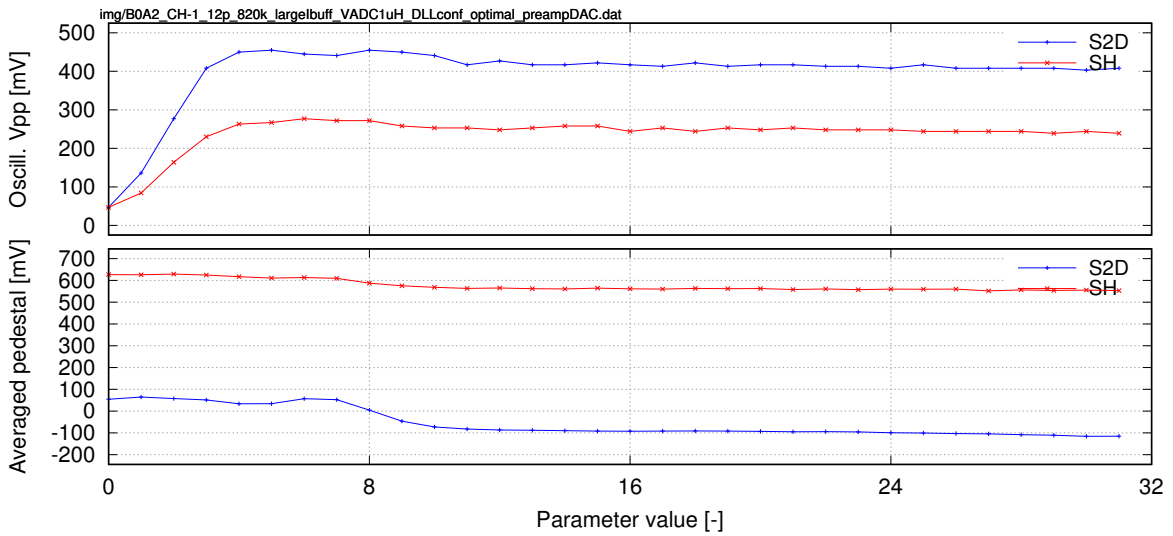


Figure 198: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor. Parameter=preamp DAC

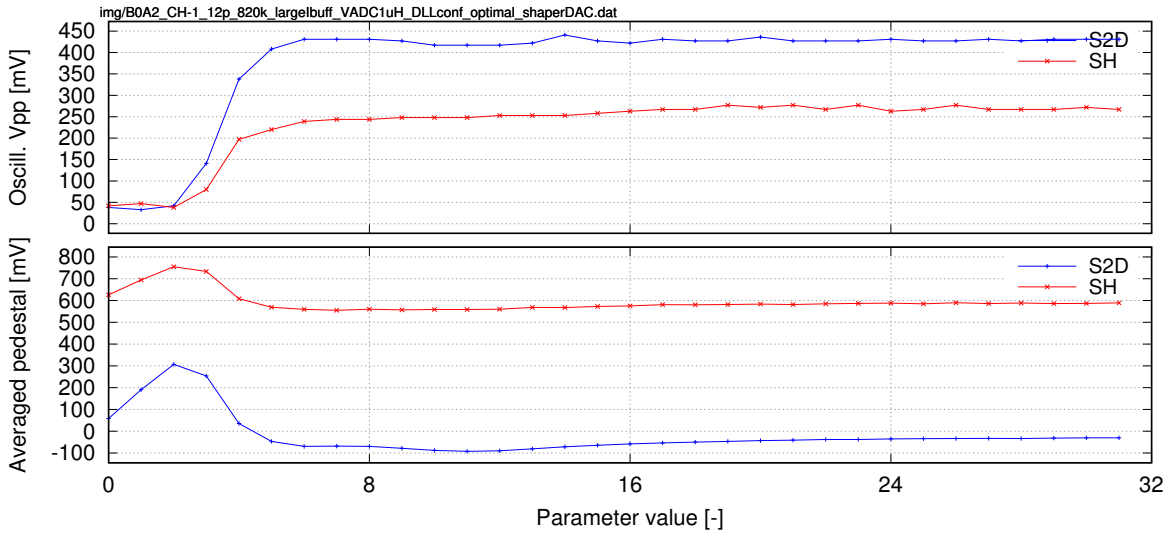


Figure 199: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 kΩ resistor assembled; Ibuf current maximized; ADC power supply with 1 μH series inductor. Parameter=shaper DAC

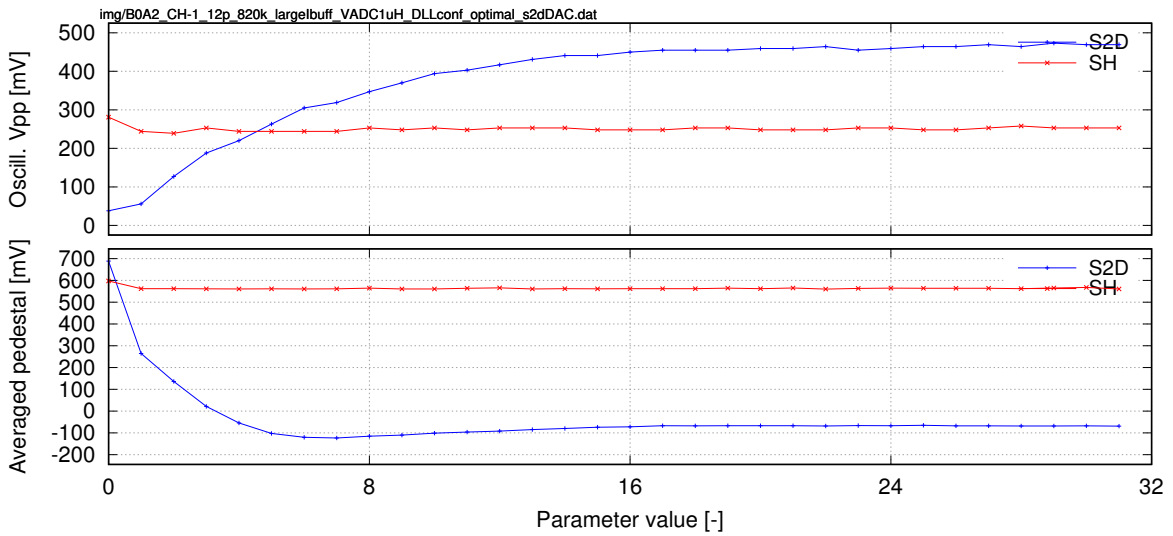


Figure 200: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 kΩ resistor assembled; Ibuf current maximized; ADC power supply with 1 μH series inductor. Parameter=S2D DAC

4.5.2 Optimized test pulse and ADC delay

ASIC configuration: JC configuration (tables 1 & 2) + test pulse and ADC delay optimizations (table 3).

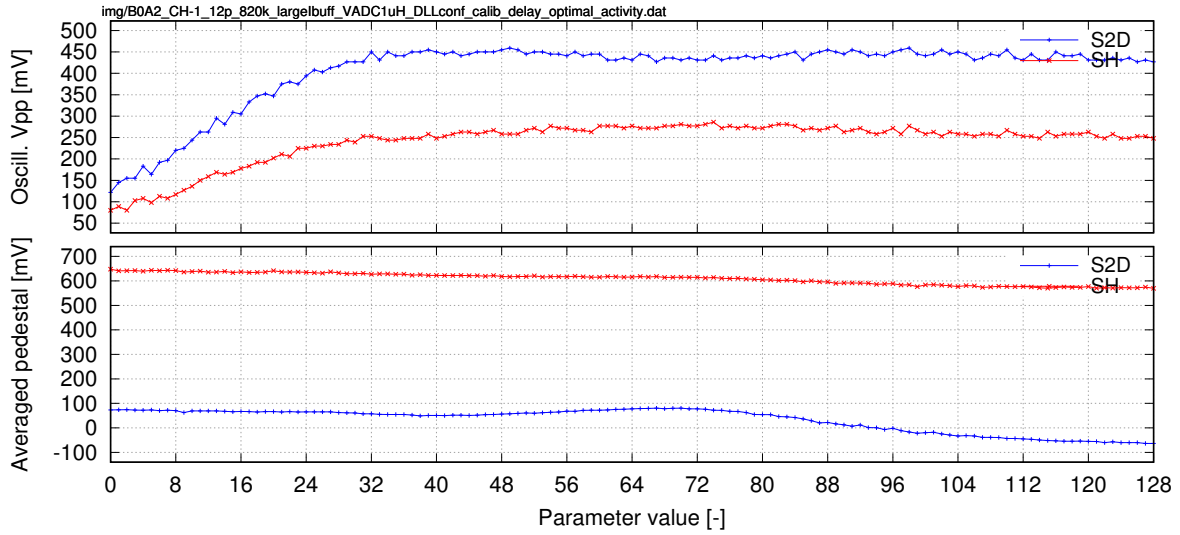


Figure 201: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

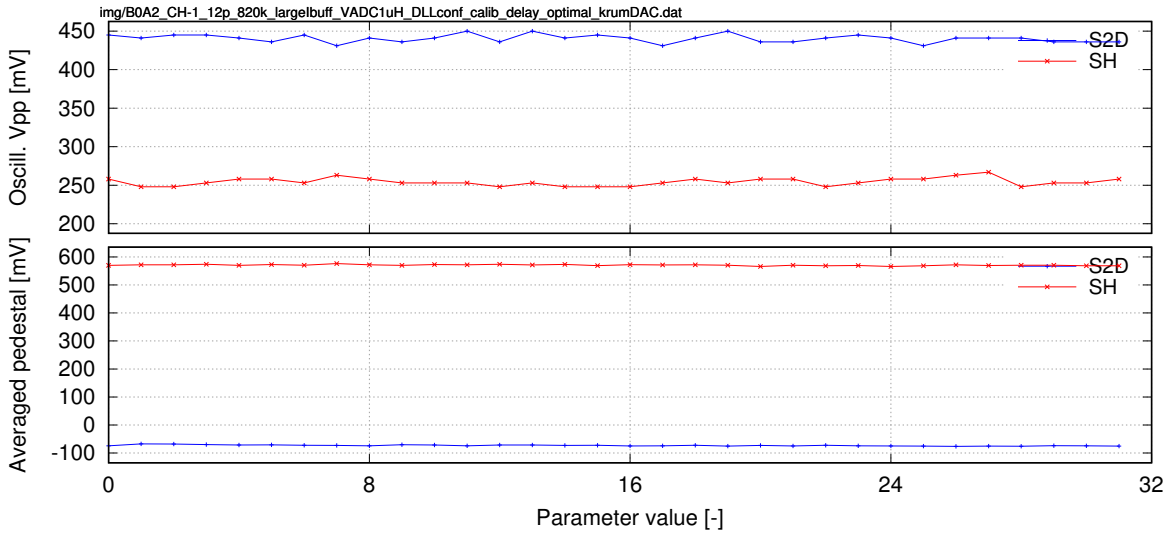


Figure 202: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

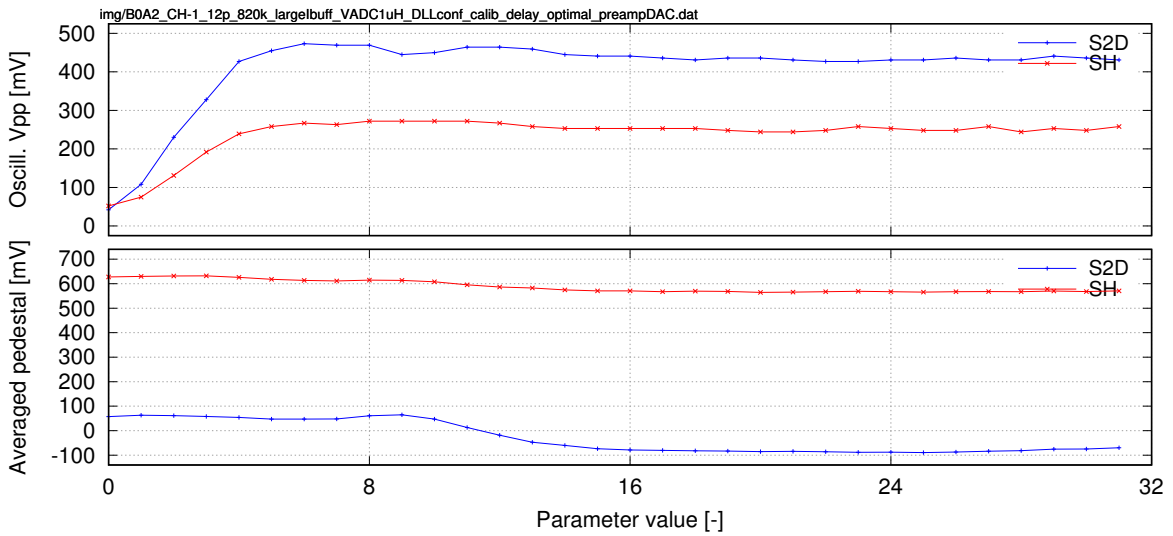


Figure 203: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor. Optimized test pulse and ADC delay. Parameter=preamp DAC

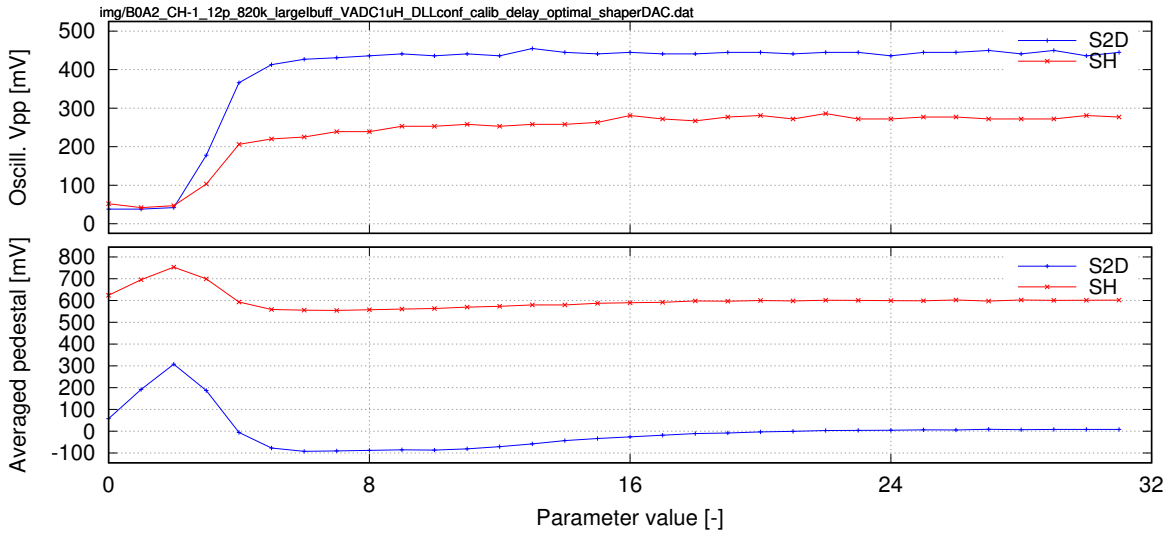


Figure 204: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor. Optimized test pulse and ADC delay. Parameter=shaper DAC

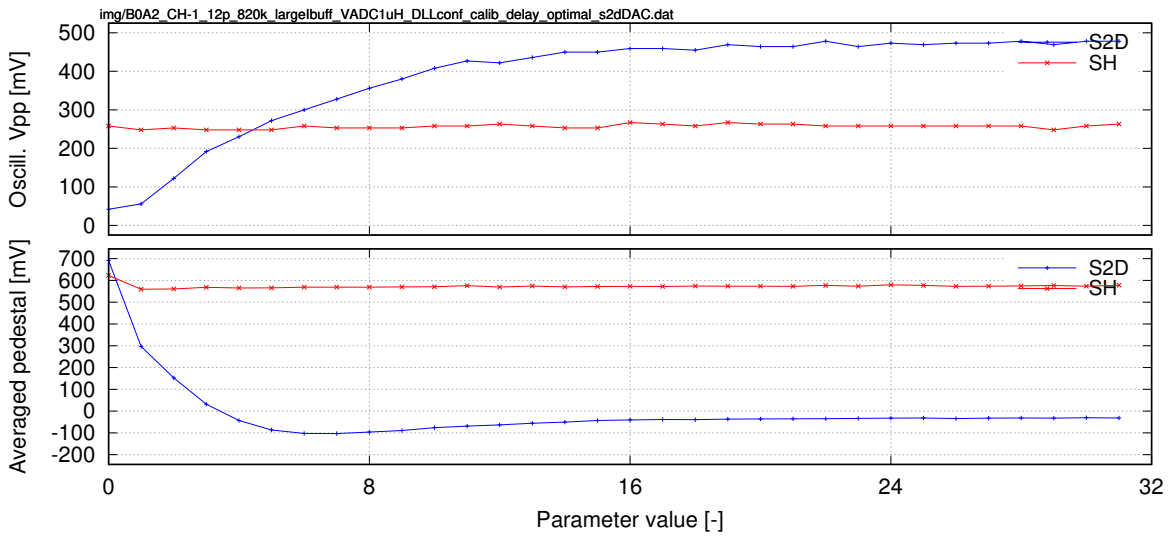


Figure 205: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor. Optimized test pulse and ADC delay. Parameter=S2D DAC

4.6 Cap-PCB bonded, no capacitors assembled; Ibuf current maximized; ADC power supply with 1 μH series inductor

Cap-PCB assembled, bonded to SALT input pads 0 and 127, no capacitors assembled to the cap-PCB.

Ibuf current maximized – 1 k Ω resistor between VDDA and Ibuf pad.

1 μH inductor assembled in series between onboard decoupling power supply capacitors and VDDADC + VREFD bonds.

Channel 128 have damaged input.

4.6.1 Default ASIC configuration

ASIC configuration: JC configuration (tables 1 & 2).

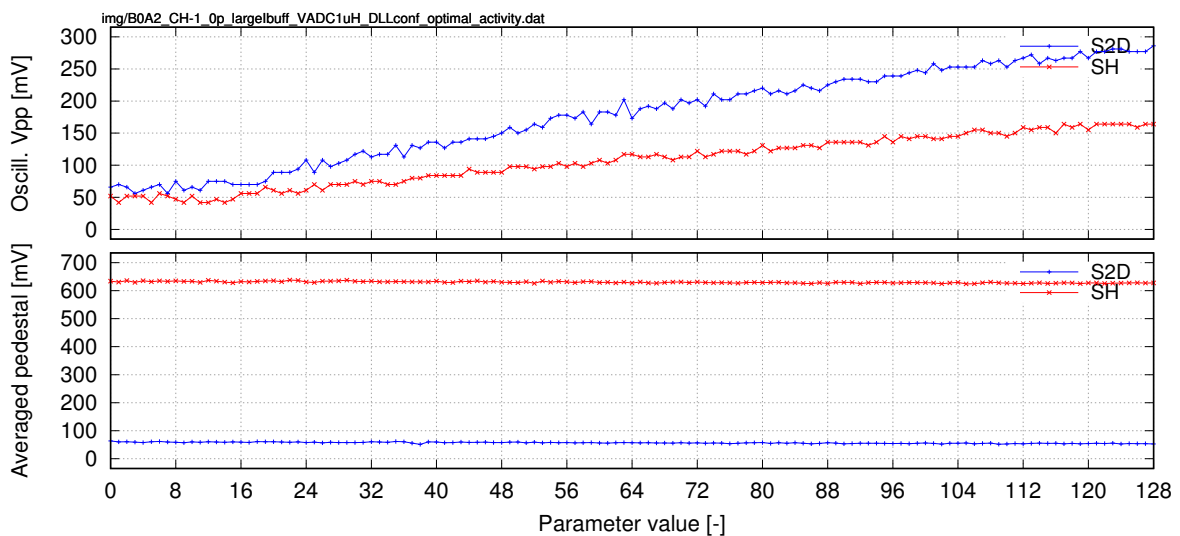


Figure 206: B0A2, channel -1, cap-PCB bonded, no capacitors assembled; Ibuf current maximized; ADC power supply with 1 μH series inductor. Parameter=no. of active ADCs

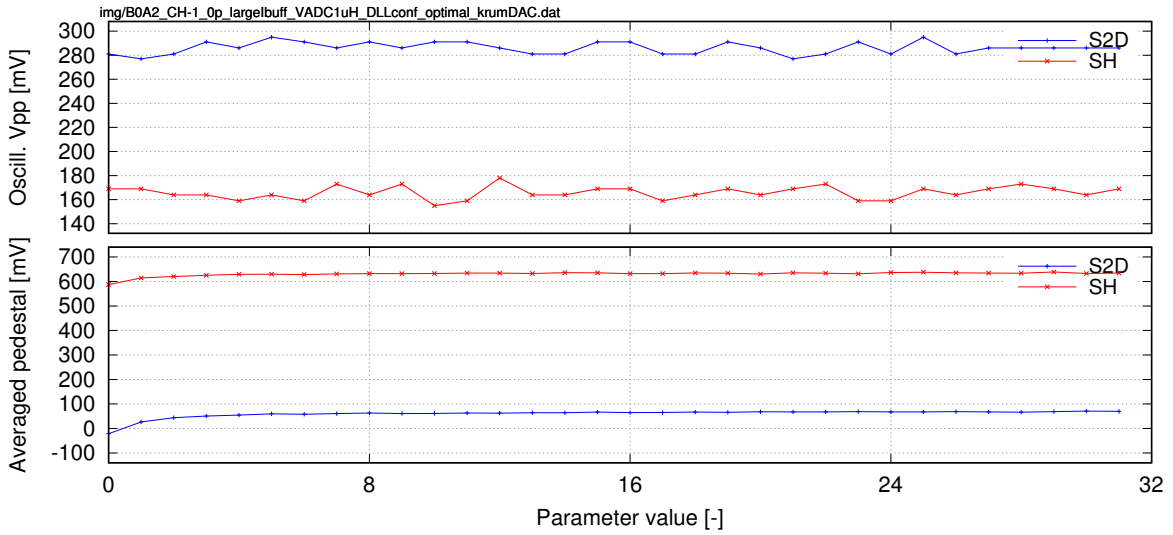


Figure 207: B0A2, channel -1, cap-PCB bonded, no capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor. Parameter=Krummenacher DAC

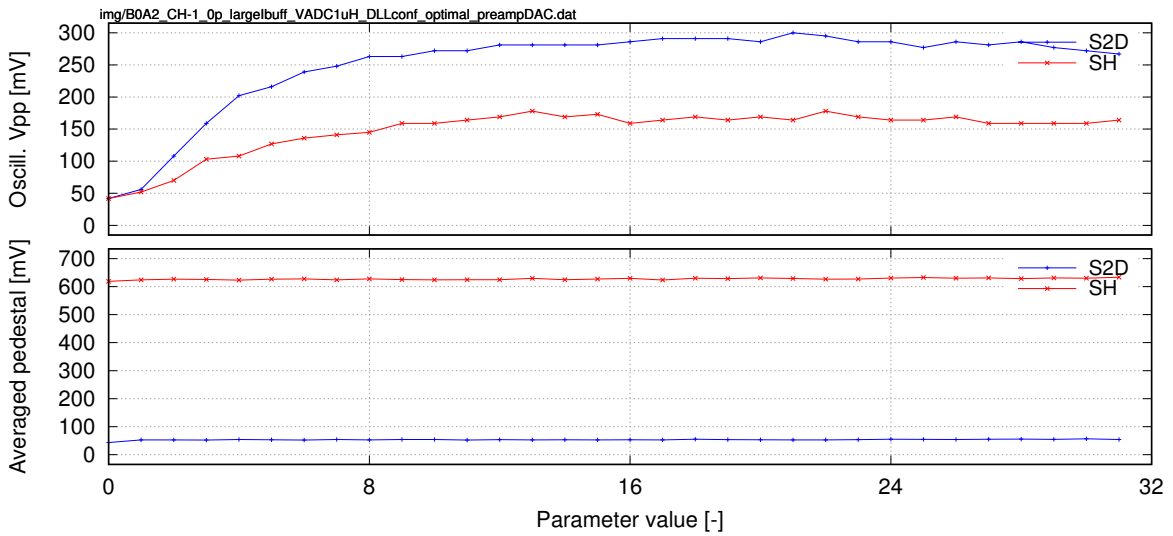


Figure 208: B0A2, channel -1, cap-PCB bonded, no capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor. Parameter=preamp DAC

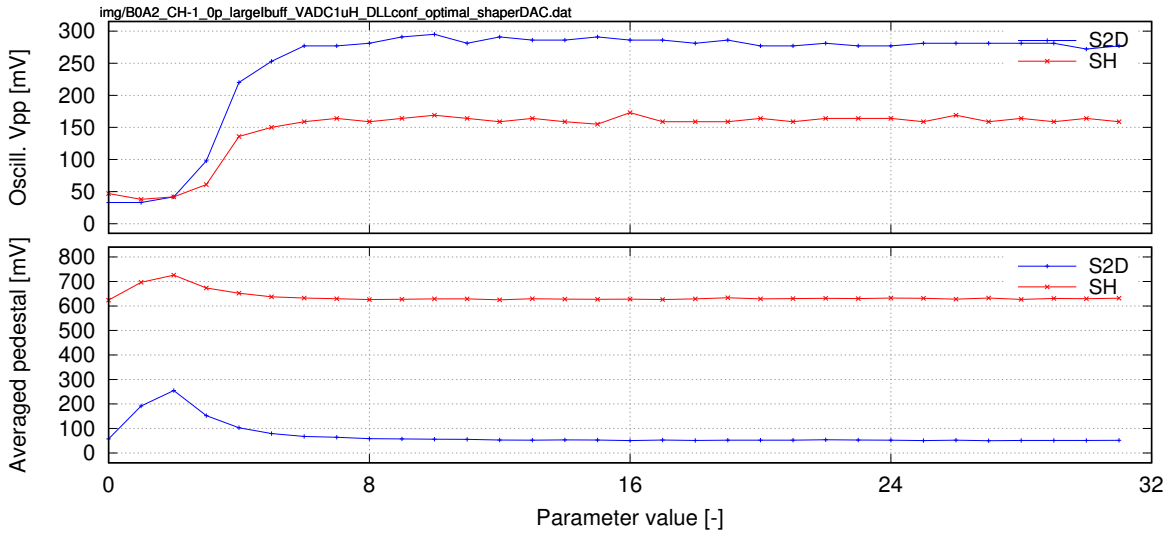


Figure 209: B0A2, channel -1, cap-PCB bonded, no capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor. Parameter=shaper DAC

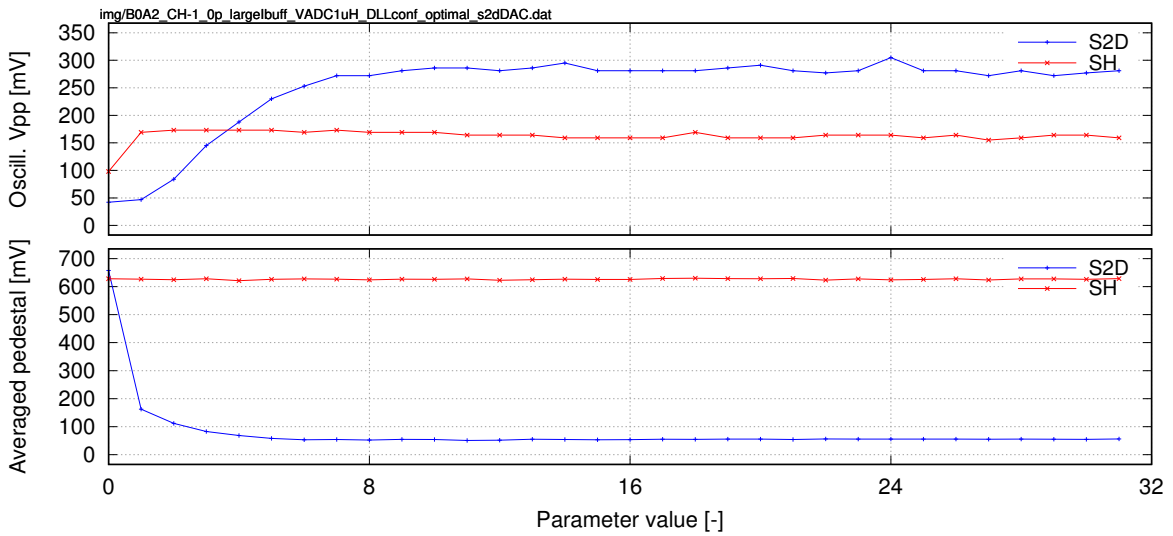


Figure 210: B0A2, channel -1, cap-PCB bonded, no capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor. Parameter=S2D DAC

4.6.2 Optimized test pulse and ADC delay

ASIC configuration: JC configuration (tables 1 & 2) + test pulse and ADC delay optimizations (table 3).

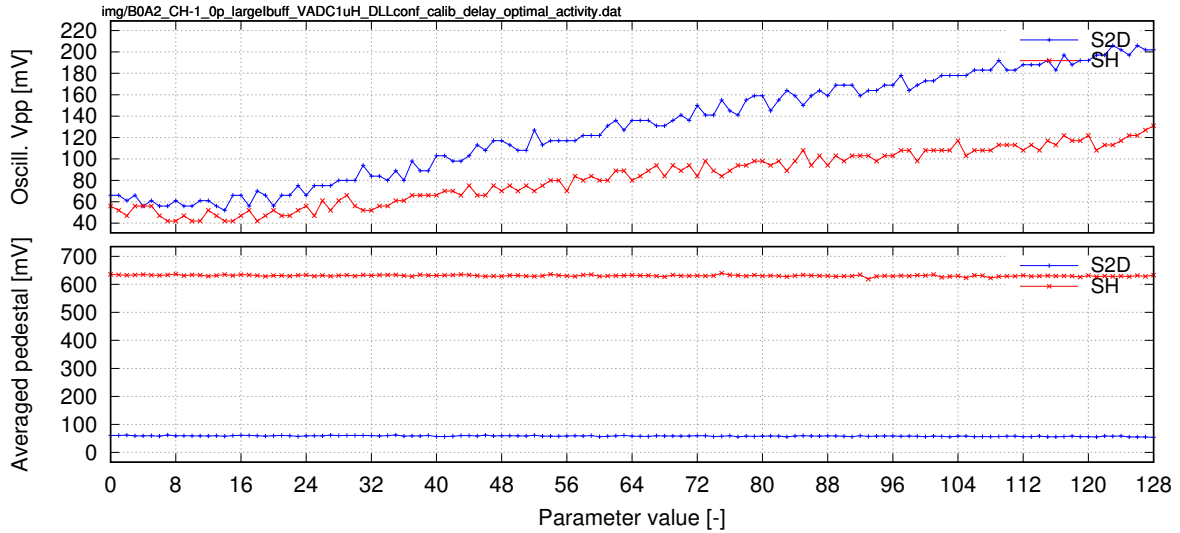


Figure 211: B0A2, channel -1, cap-PCB bonded, no capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

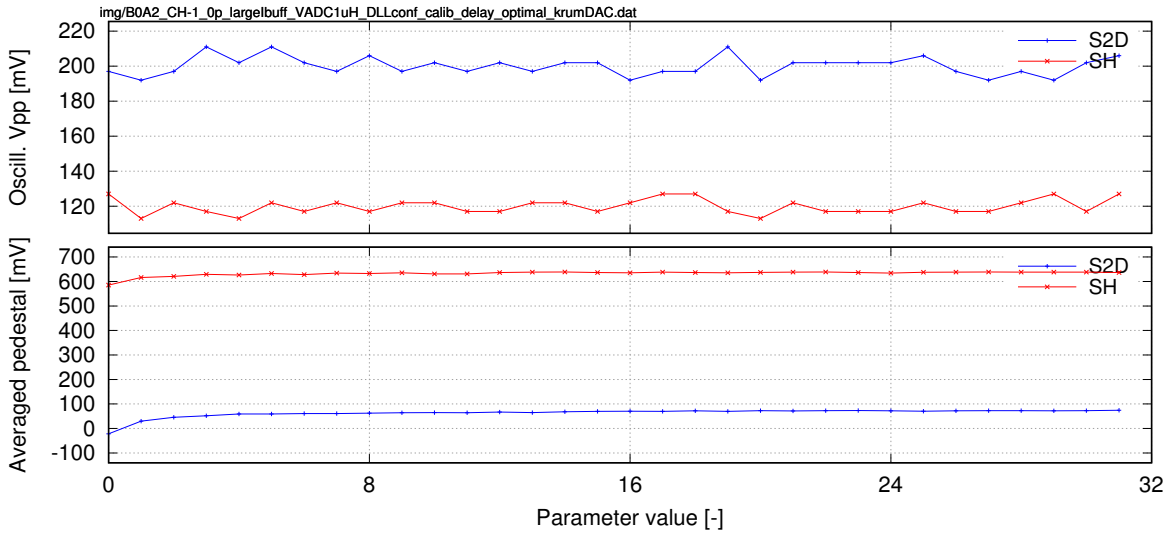


Figure 212: B0A2, channel -1, cap-PCB bonded, no capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

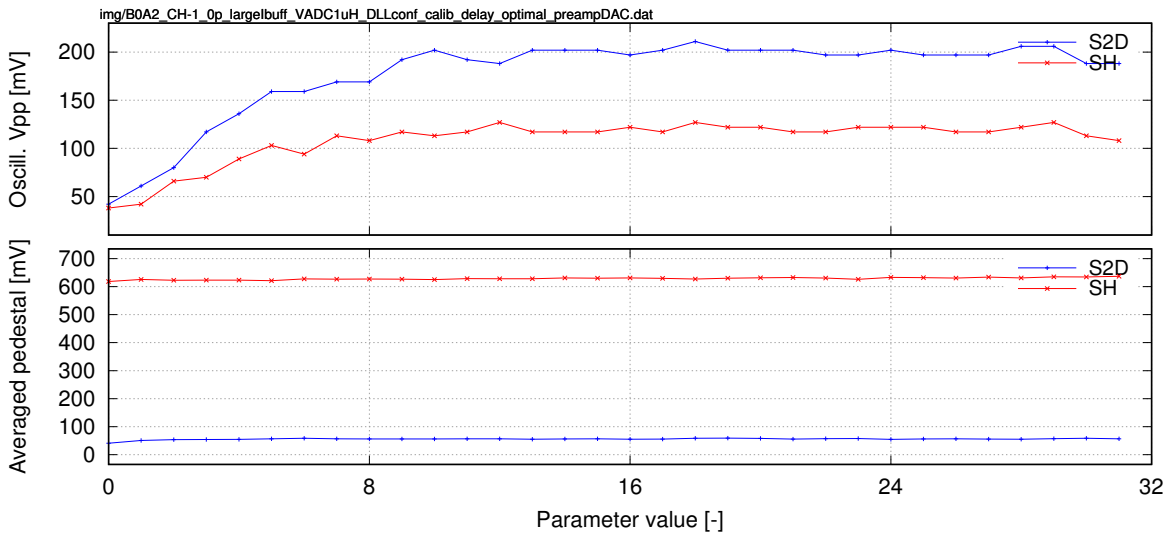


Figure 213: B0A2, channel -1, cap-PCB bonded, no capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor. Optimized test pulse and ADC delay. Parameter=preamp DAC

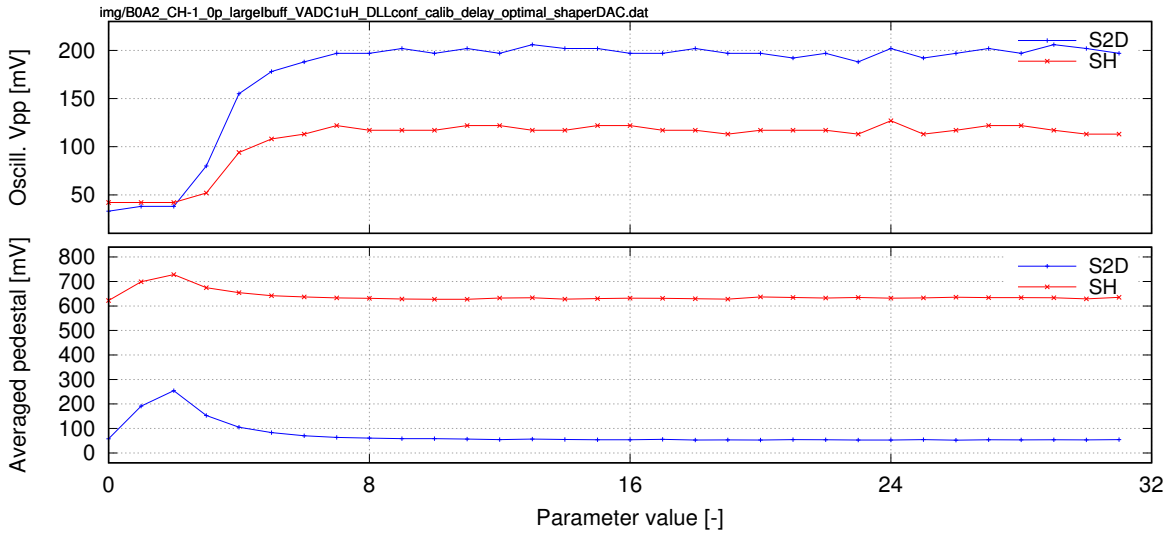


Figure 214: B0A2, channel -1, cap-PCB bonded, no capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor. Optimized test pulse and ADC delay. Parameter=shaper DAC

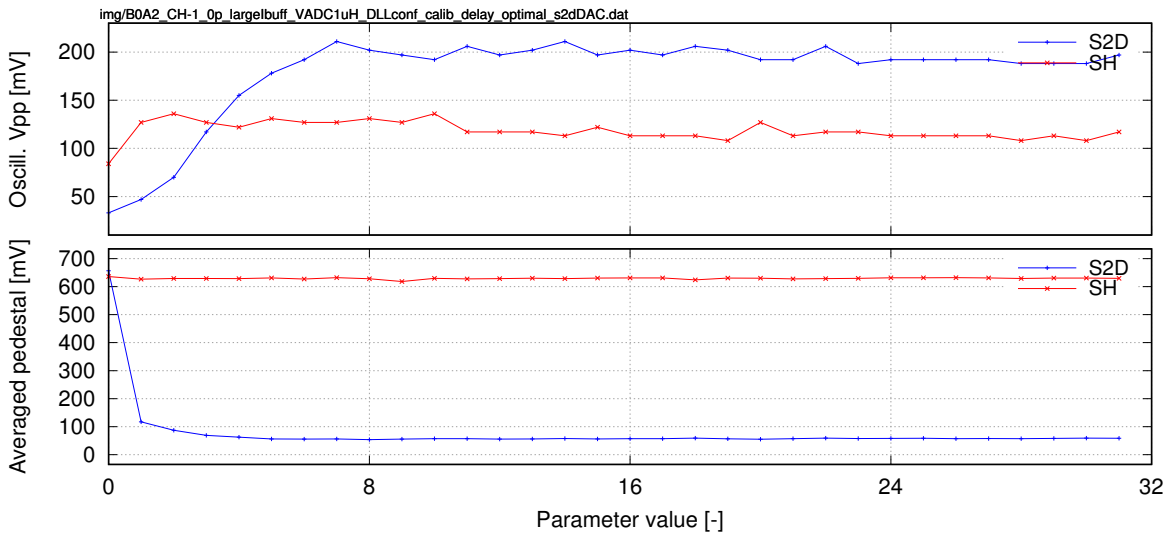


Figure 215: B0A2, channel -1, cap-PCB bonded, no capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor. Optimized test pulse and ADC delay. Parameter=S2D DAC

4.7 Cap-PCB bonded, no capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC

Cap-PCB assembled, bonded to SALT input pads 0 and 127, no capacitors assembled to the cap-PCB.

Ibuf current maximized – 1 k Ω resistor between VDDA and Ibuf pad.

1 μ H inductor assembled in series between onboard decoupling power supply capacitors and VDDADC + VREFD bonds.

Floating copper foil glued directly on passivation on top of the ASIC (see figure 549).

Channel 128 have damaged input.

4.7.1 Default ASIC configuration

ASIC configuration: JC configuration (tables 1 & 2).

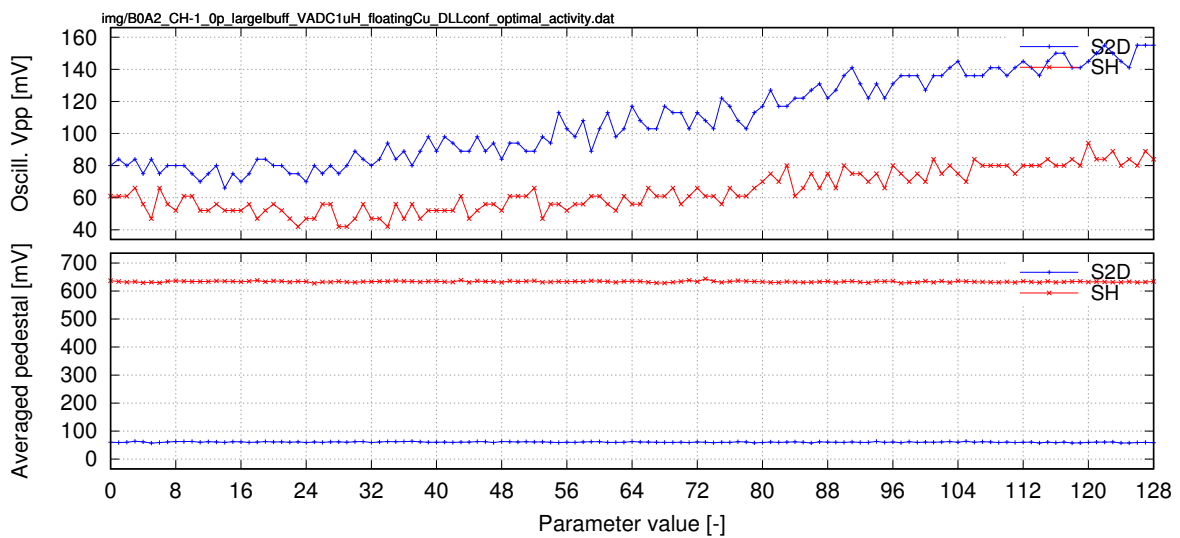


Figure 216: B0A2, channel -1, cap-PCB bonded, no capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC. Parameter=no. of active ADCs

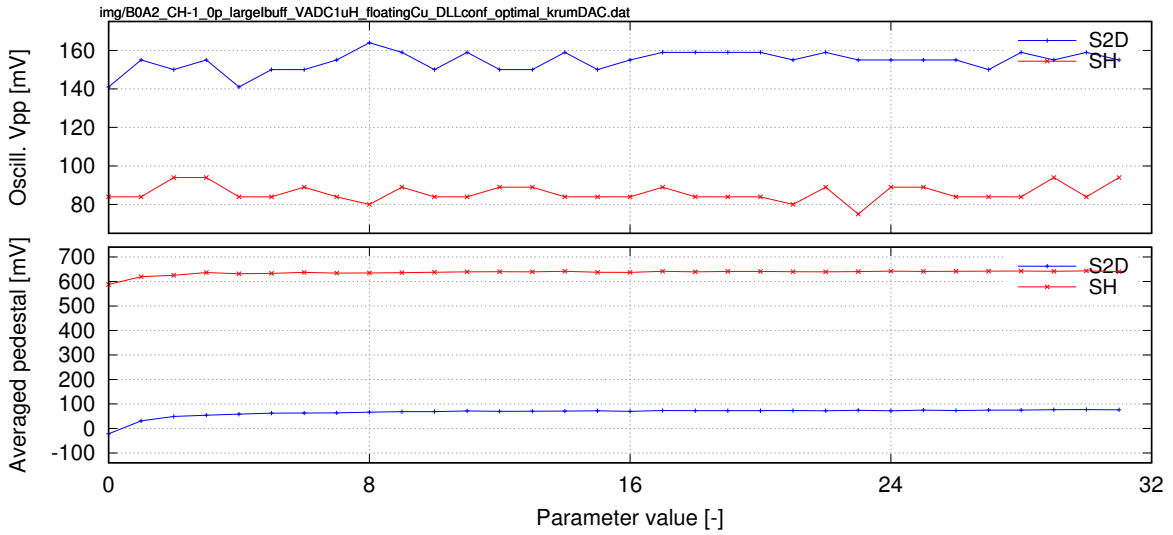


Figure 217: B0A2, channel -1, cap-PCB bonded, no capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC. Parameter=Krummenacher DAC

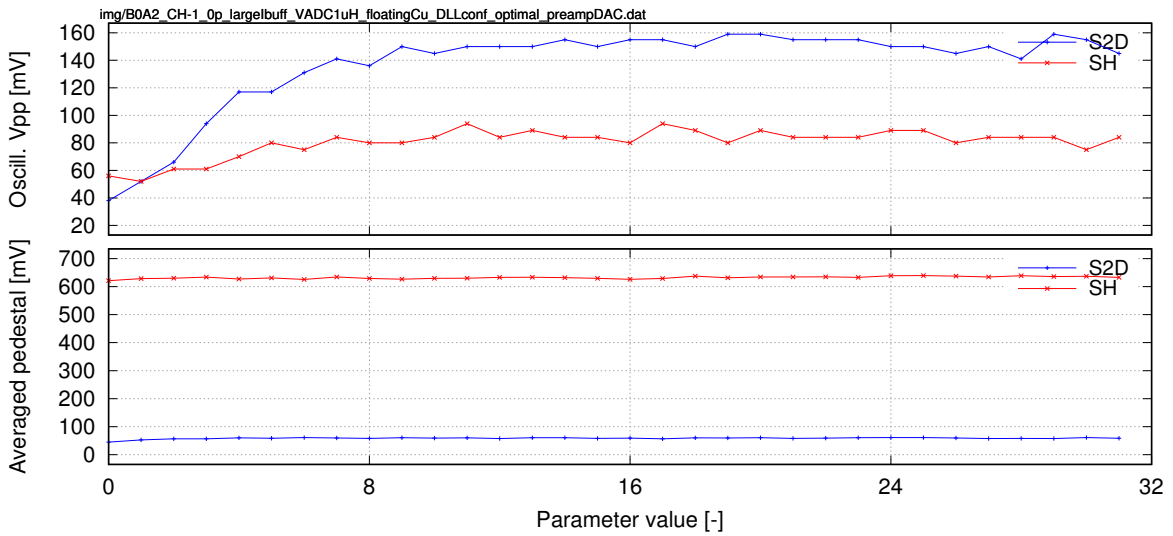


Figure 218: B0A2, channel -1, cap-PCB bonded, no capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC. Parameter=preamp DAC

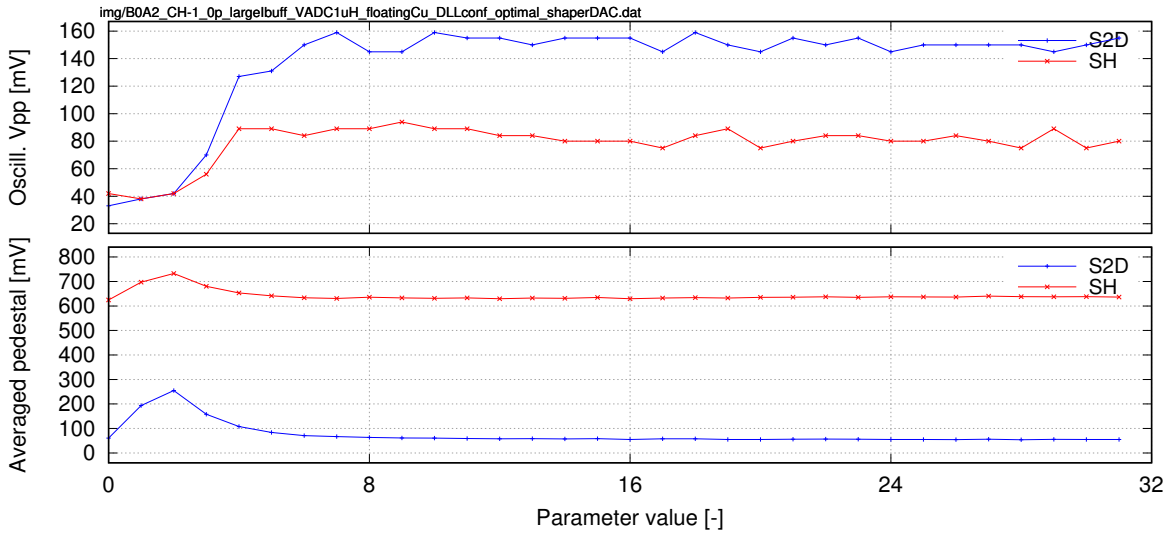


Figure 219: B0A2, channel -1, cap-PCB bonded, no capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC. Parameter=shaper DAC

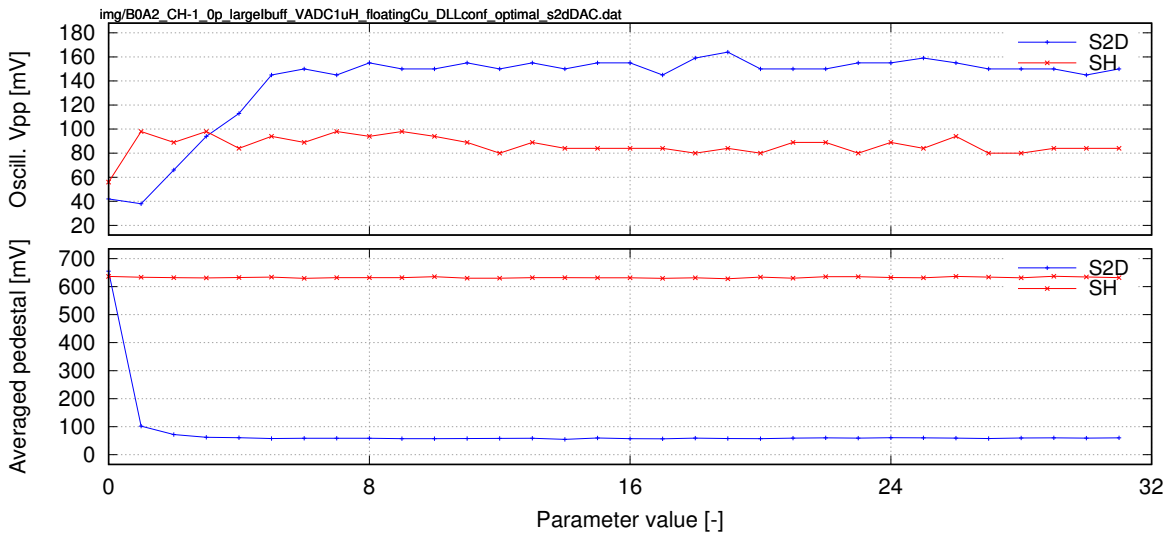


Figure 220: B0A2, channel -1, cap-PCB bonded, no capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC. Parameter=S2D DAC

4.7.2 Optimized test pulse and ADC delay

ASIC configuration: JC configuration (tables 1 & 2) + test pulse and ADC delay optimizations (table 3).

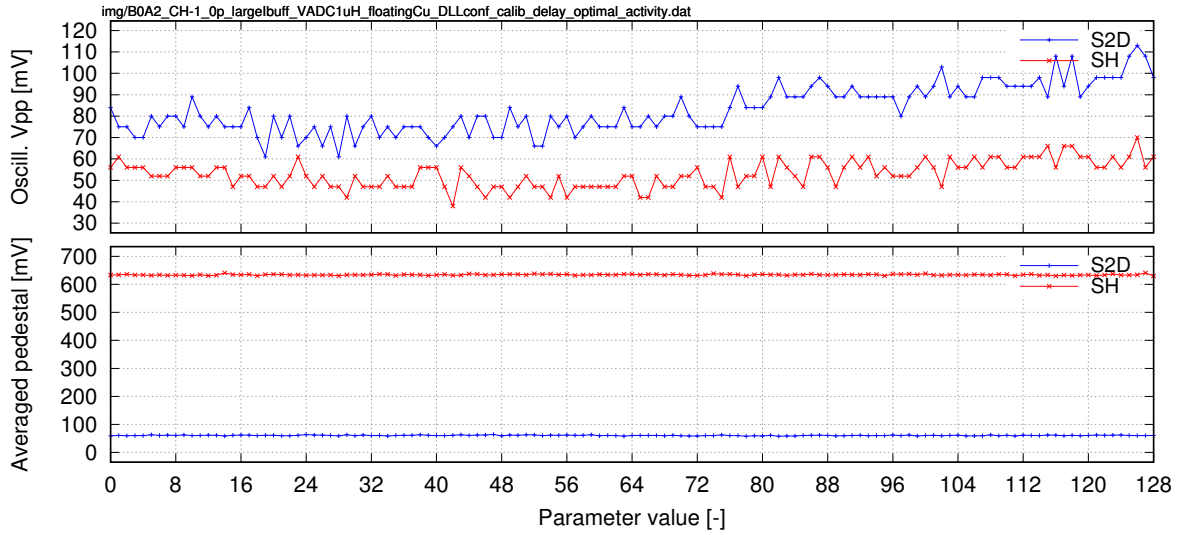


Figure 221: B0A2, channel -1, cap-PCB bonded, no capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

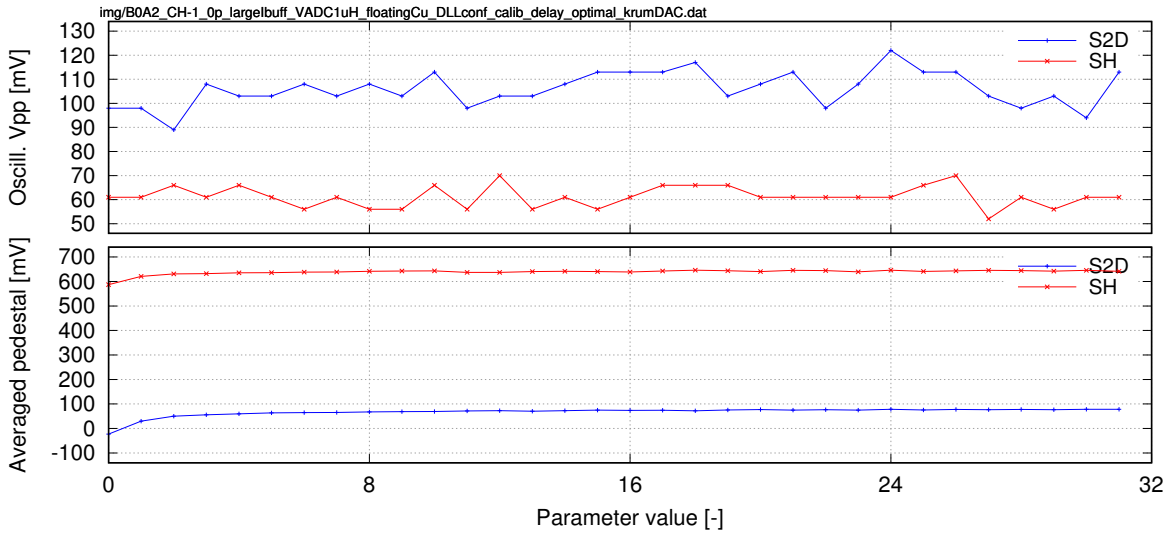


Figure 222: B0A2, channel -1, cap-PCB bonded, no capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

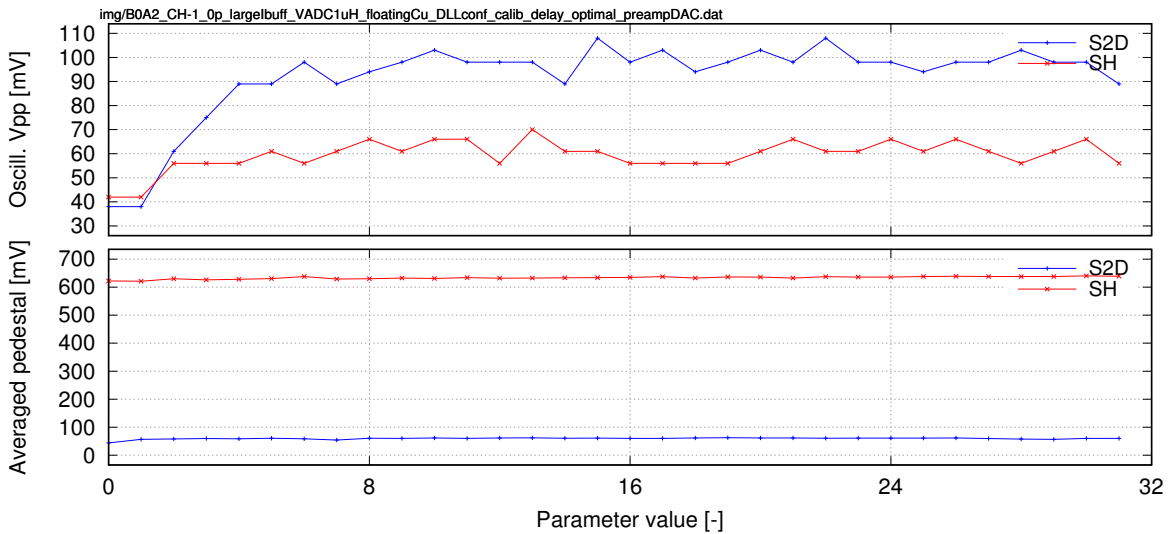


Figure 223: B0A2, channel -1, cap-PCB bonded, no capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC. Optimized test pulse and ADC delay. Parameter=preamp DAC

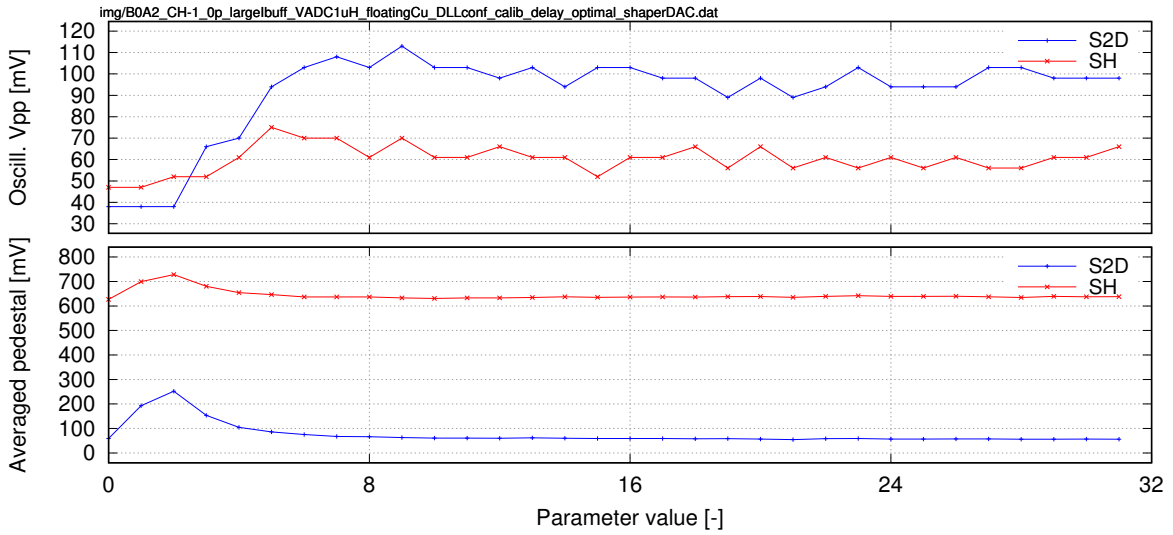


Figure 224: B0A2, channel -1, cap-PCB bonded, no capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC. Optimized test pulse and ADC delay. Parameter=shaper DAC

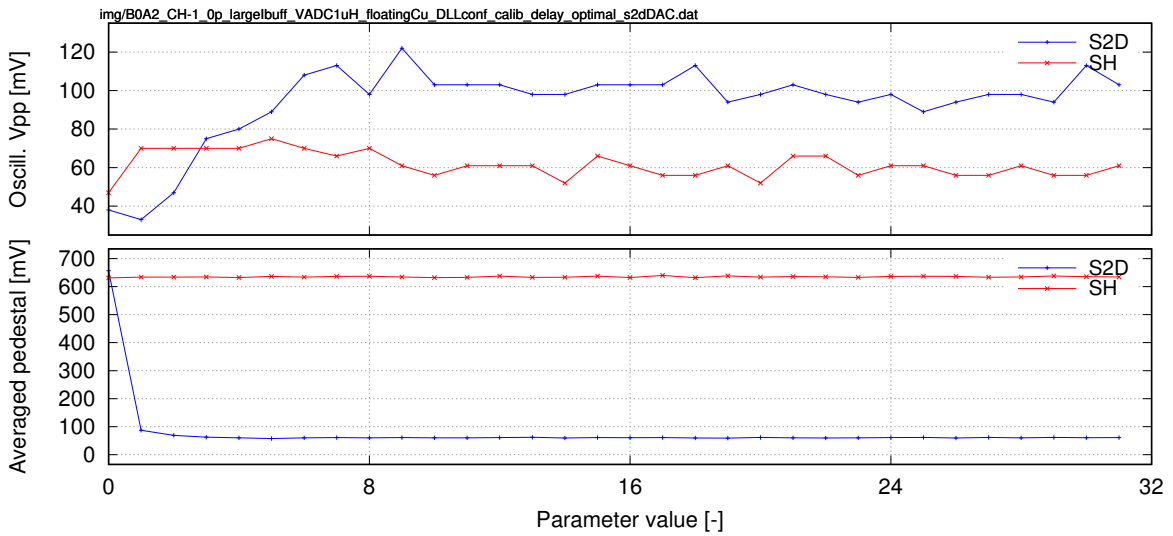


Figure 225: B0A2, channel -1, cap-PCB bonded, no capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC. Optimized test pulse and ADC delay. Parameter=S2D DAC

4.8 Cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC

Cap-PCB assembled, bonded to SALT input pads 0 and 127, no capacitors assembled to the cap-PCB.

Ibuf current maximized – 1 k Ω resistor between VDDA and Ibuf pad.

1 μ H inductor assembled in series between onboard decoupling power supply capacitors and VDDADC + VREFD bonds.

Floating copper foil glued directly on passivation on top of the ASIC (see figure 549).

Channel 128 have damaged input.

4.8.1 Default ASIC configuration

ASIC configuration: JC configuration (tables 1 & 2).

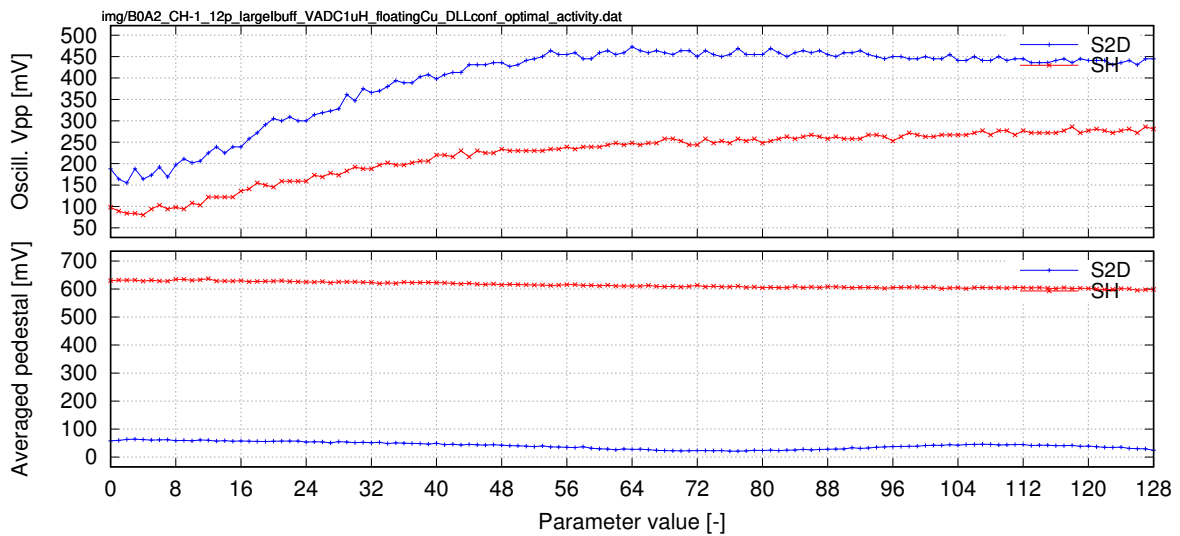


Figure 226: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC. Parameter=no. of active ADCs

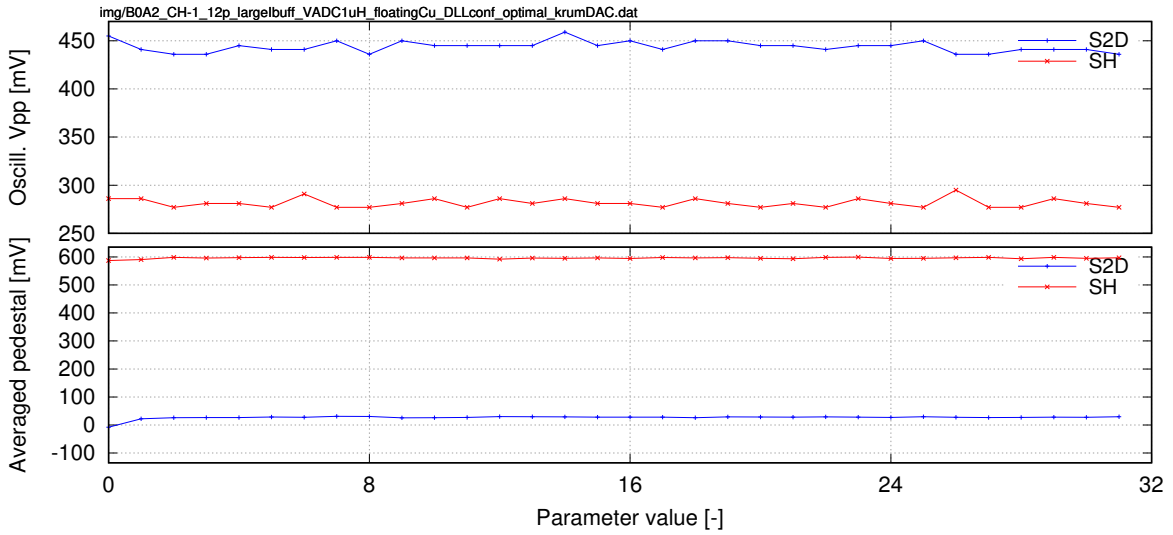


Figure 227: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC. Parameter=Krummenacher DAC

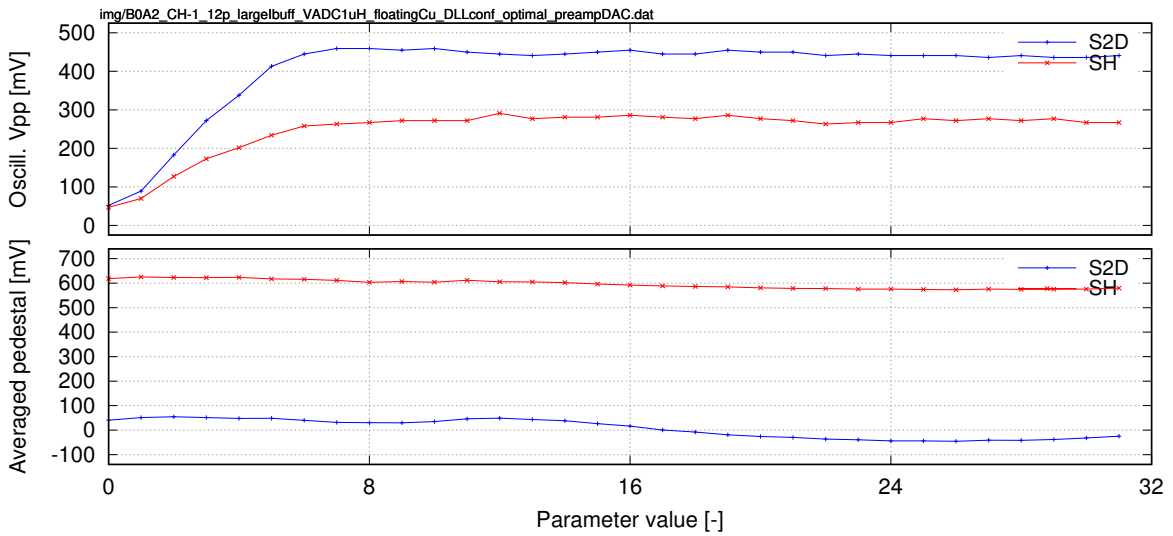


Figure 228: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC. Parameter=preamp DAC

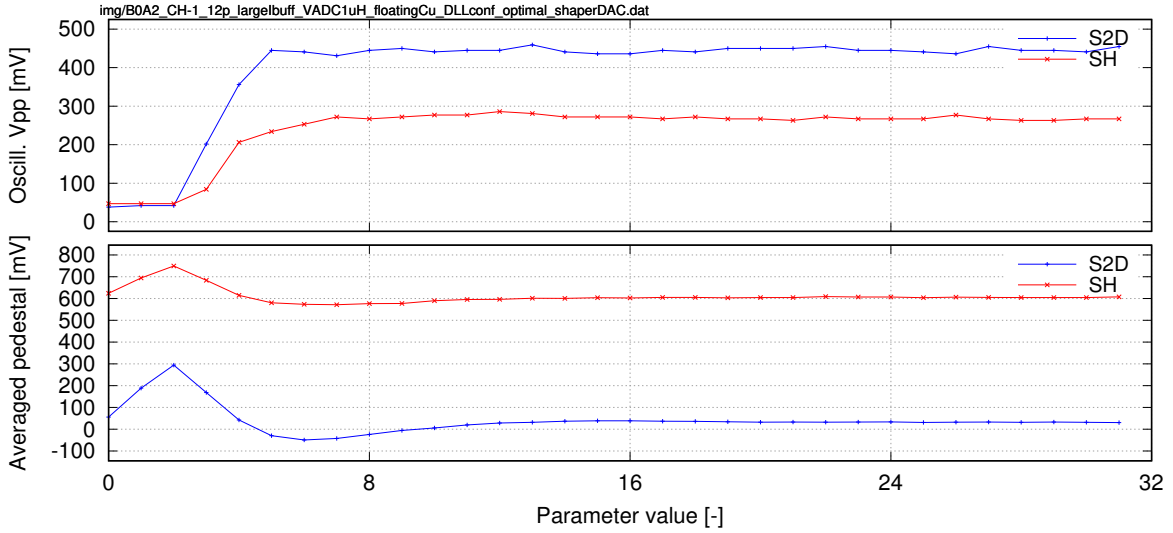


Figure 229: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC. Parameter=shaper DAC

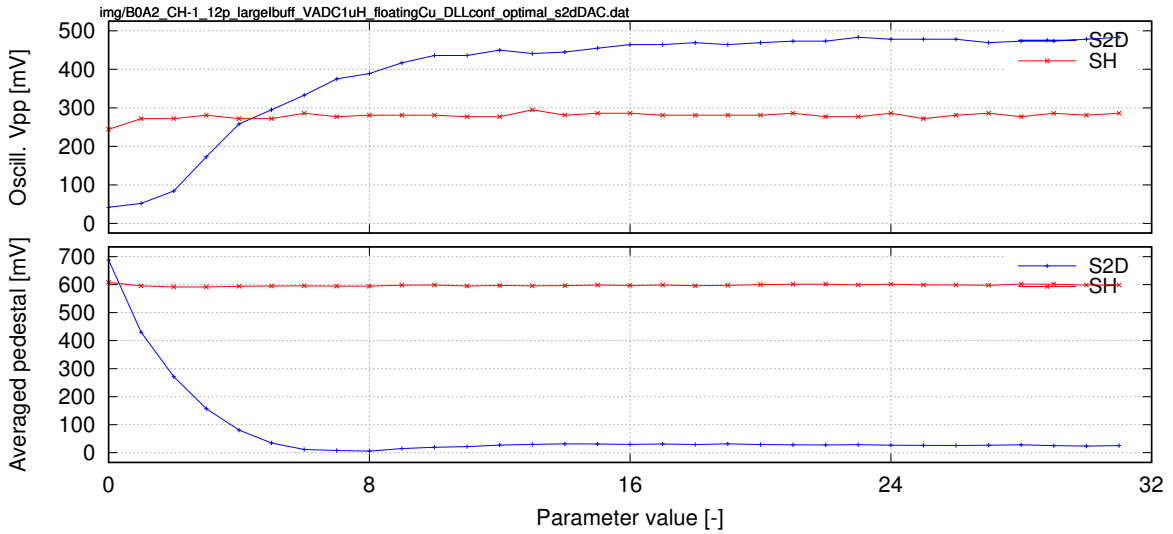


Figure 230: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC. Parameter=S2D DAC

4.8.2 Optimized test pulse and ADC delay

ASIC configuration: JC configuration (tables 1 & 2) + test pulse and ADC delay optimizations (table 3).

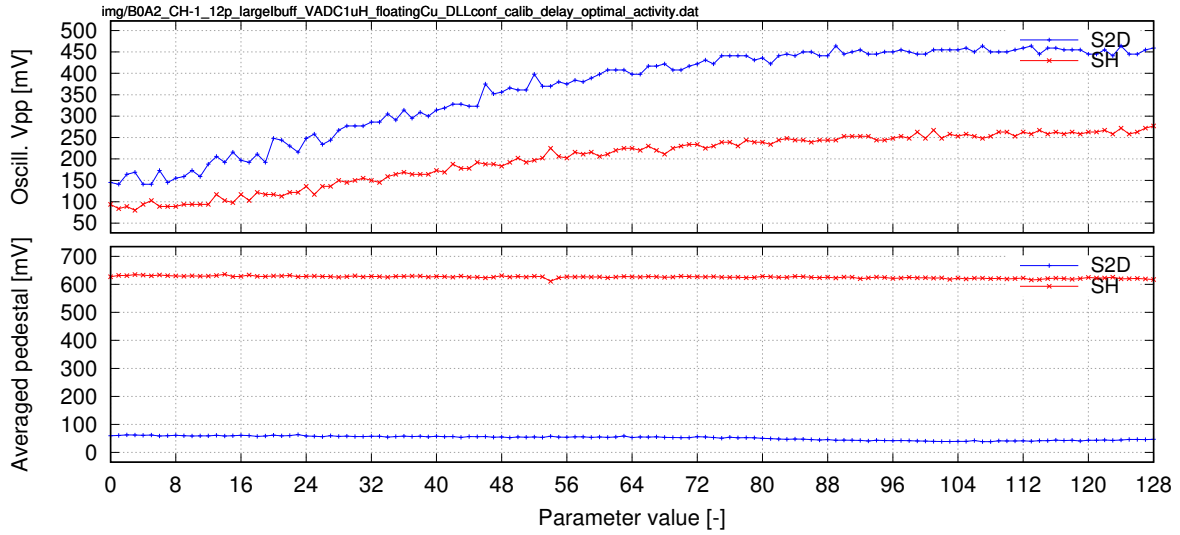


Figure 231: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

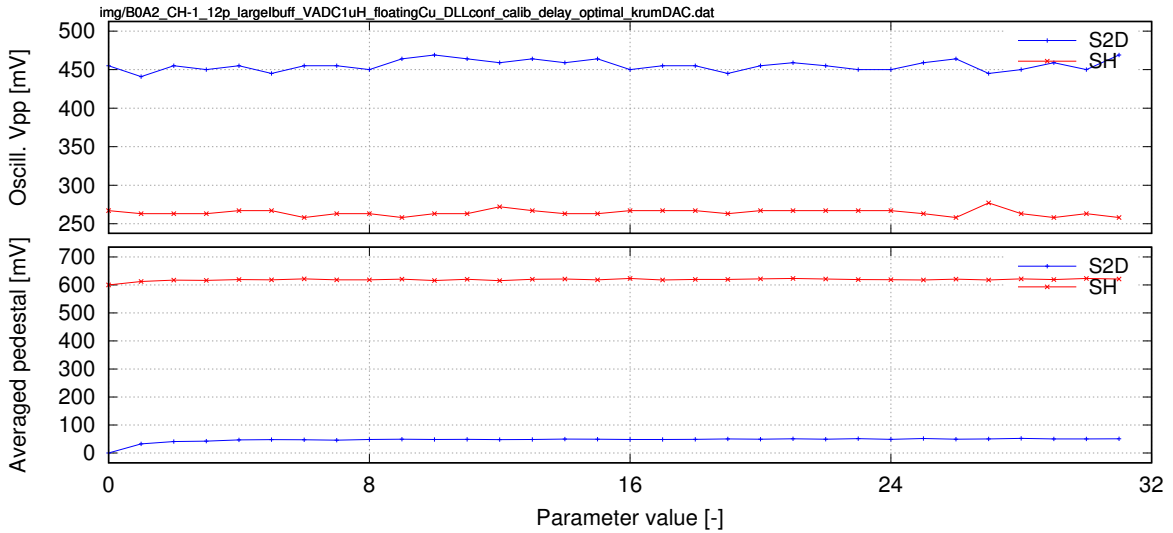


Figure 232: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

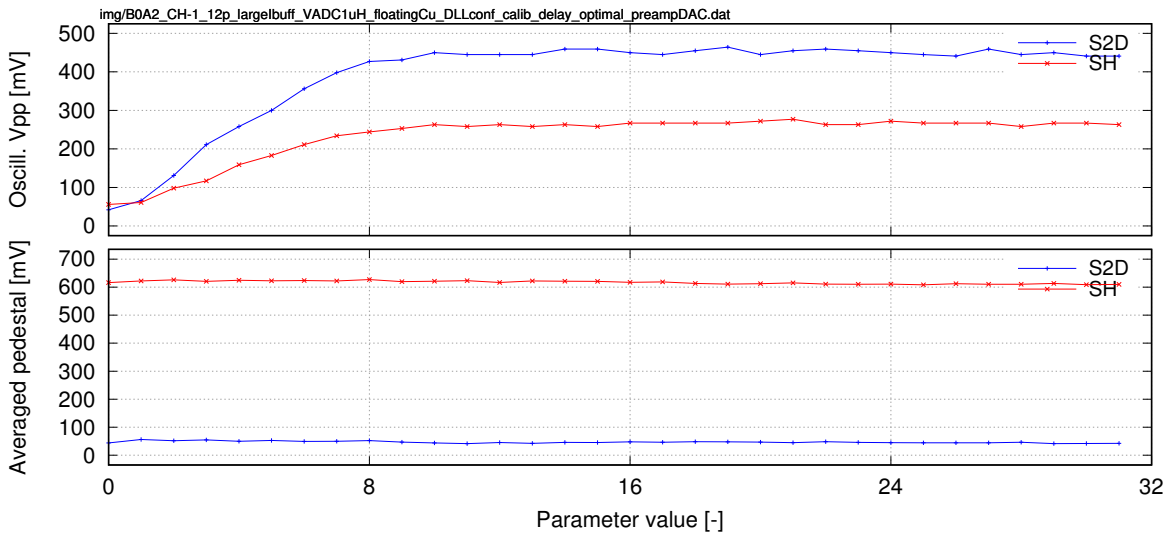


Figure 233: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC. Optimized test pulse and ADC delay. Parameter=preamp DAC

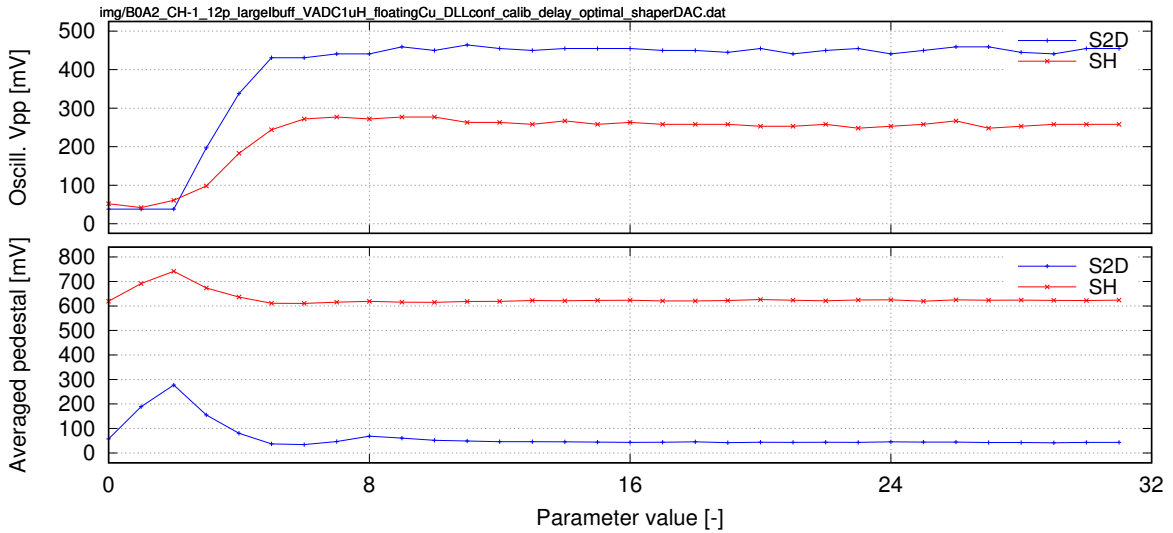


Figure 234: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC. Optimized test pulse and ADC delay. Parameter=shaper DAC

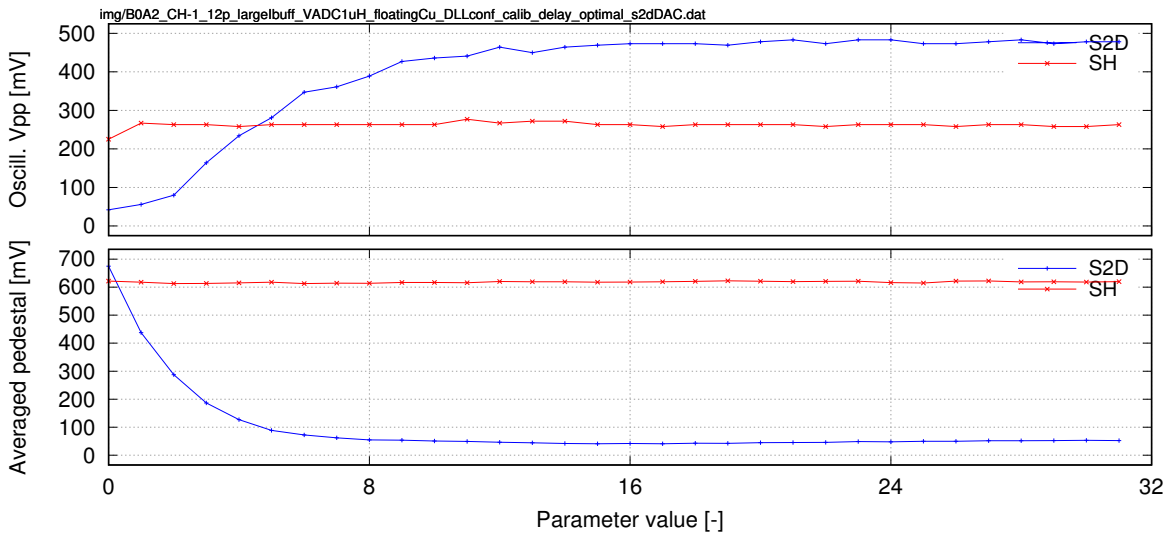


Figure 235: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC. Optimized test pulse and ADC delay. Parameter=S2D DAC

4.9 Cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC; Preamp GND configuration – input + backside

Cap-PCB assembled, bonded to SALT input pads 0 and 127, 12 pF capacitors assembled to the cap-PCB.

Ibuf current maximized – 1 k Ω resistor between VDDA and Ibuf pad.

1 μ H inductor assembled in series between onboard decoupling power supply capacitors and VDDADC + VREFD bonds.

Floating copper foil glued directly on passivation on top of the ASIC (see figure 549).

Preamp GND bonded from both sides - input pads + backside (default) pads.

Channel 128 have damaged input.

4.9.1 Default ASIC configuration

ASIC configuration: JC configuration (tables 1 & 2).

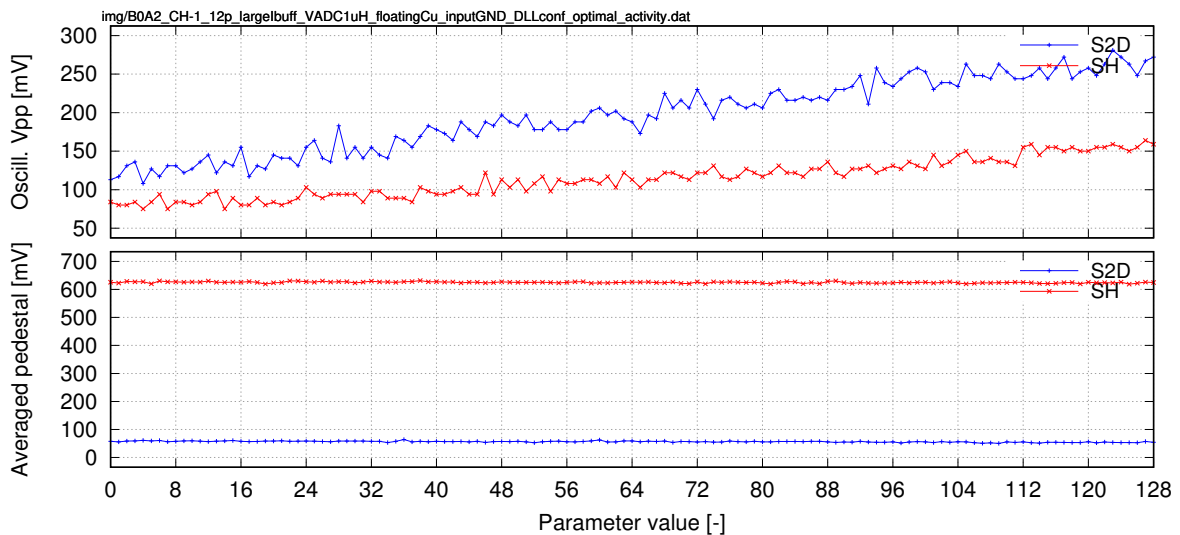


Figure 236: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC; Preamp GND configuration – input + backside. Parameter=no. of active ADCs

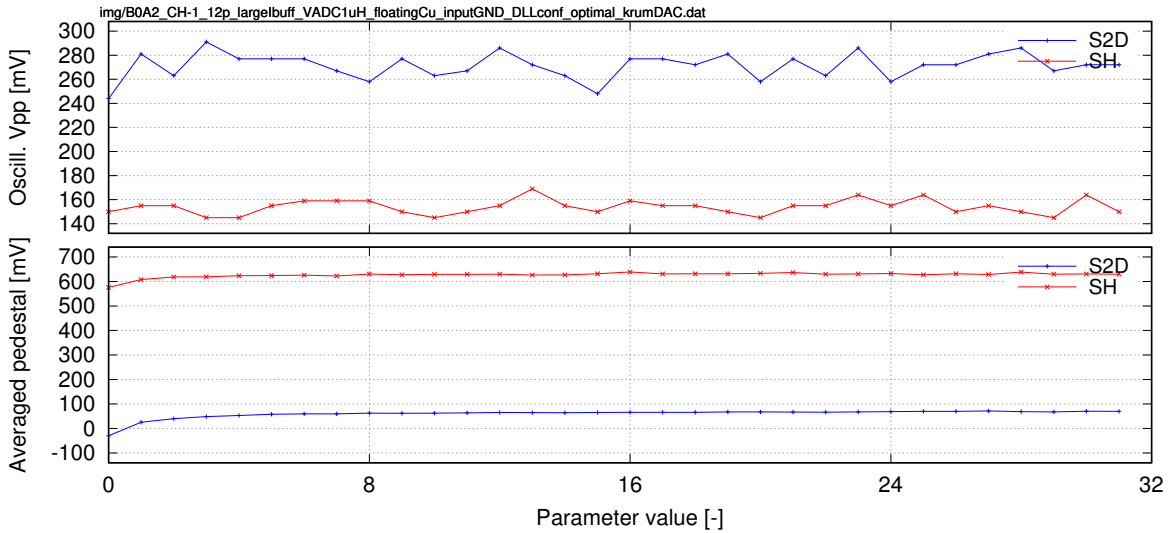


Figure 237: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC; Preamp GND configuration – input + backside. Parameter=Krummenacher DAC

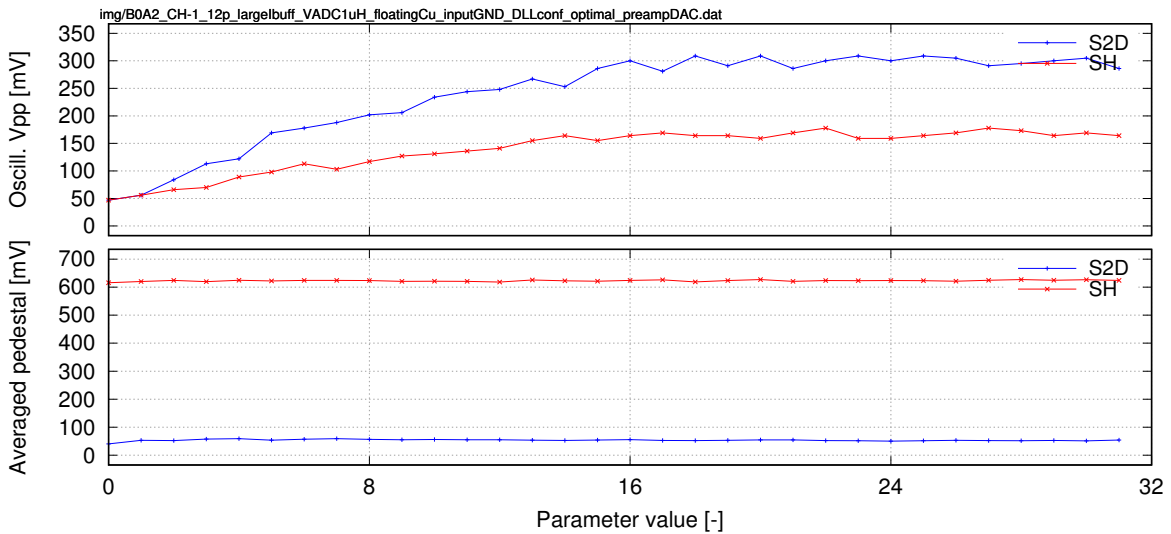


Figure 238: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC; Preamp GND configuration – input + backside. Parameter=preamp DAC

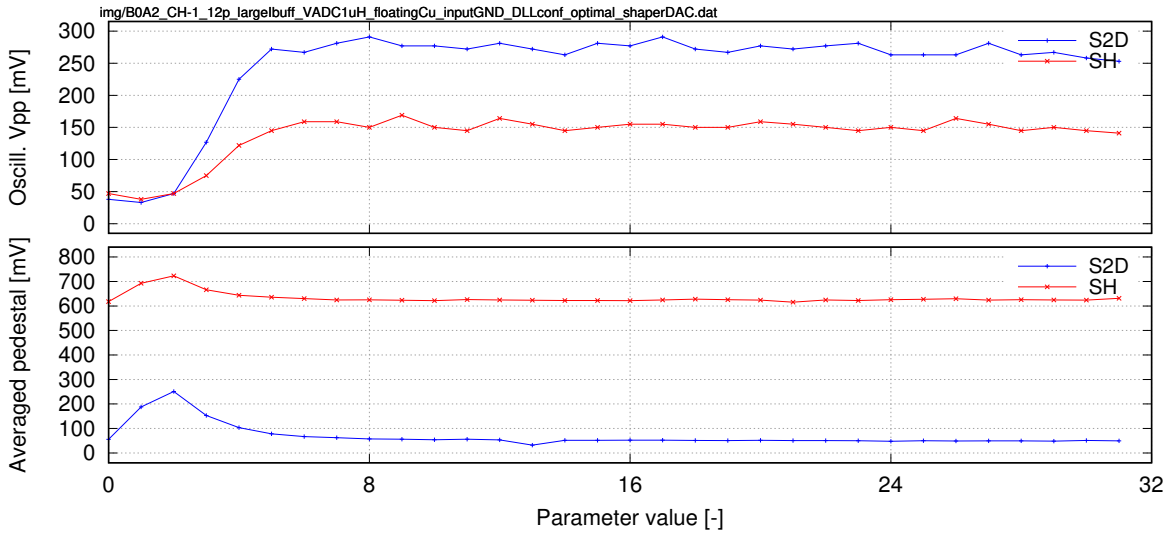


Figure 239: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC; Preamp GND configuration - input + backside. Parameter=shaper DAC

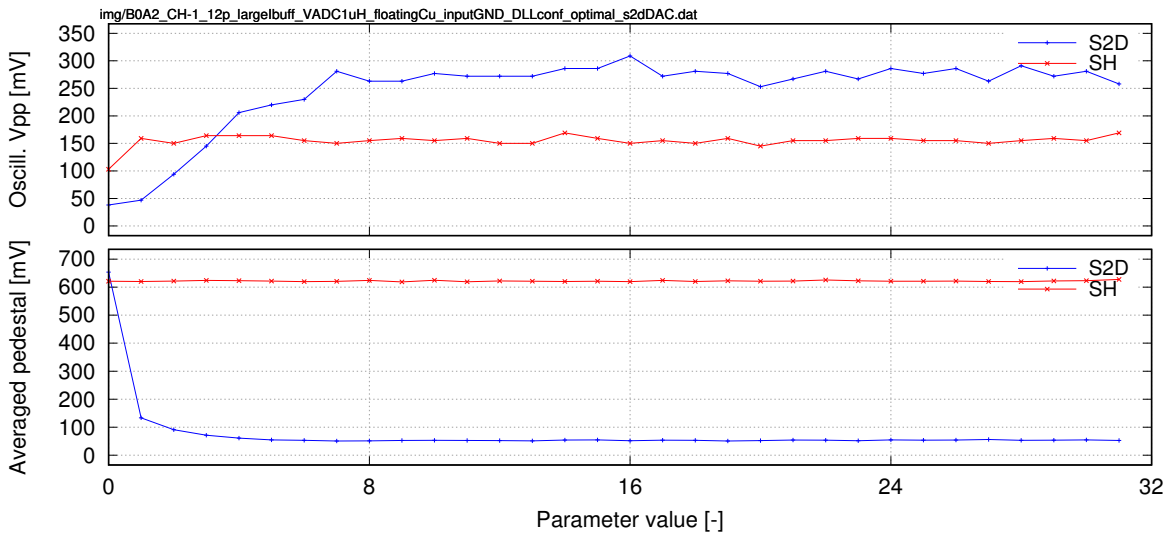


Figure 240: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC; Preamp GND configuration - input + backside. Parameter=S2D DAC

4.9.2 Optimized test pulse and ADC delay

ASIC configuration: JC configuration (tables 1 & 2) + test pulse and ADC delay optimizations (table 3).

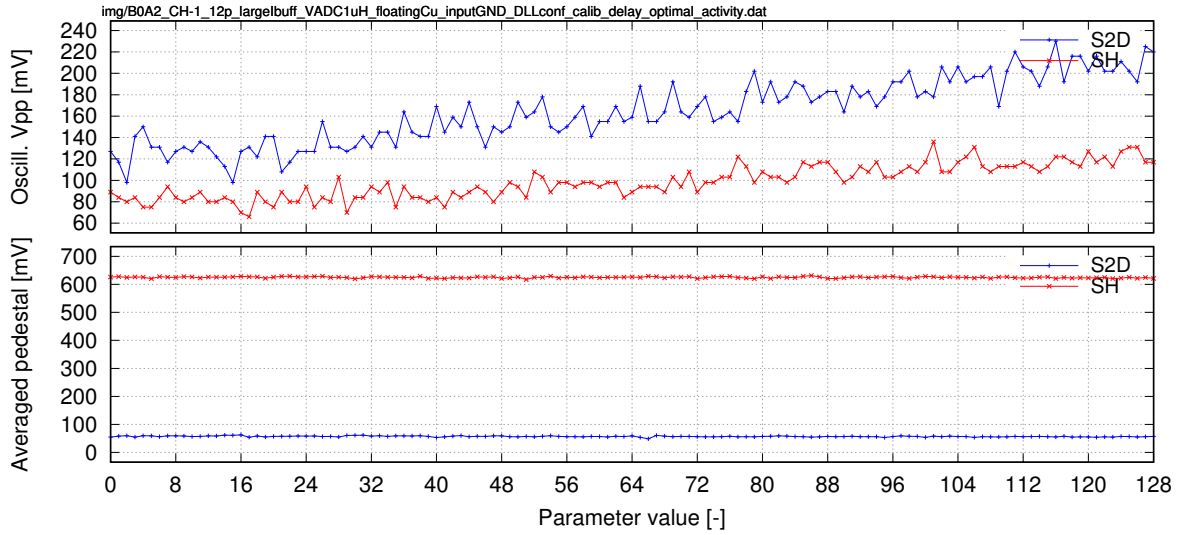


Figure 241: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

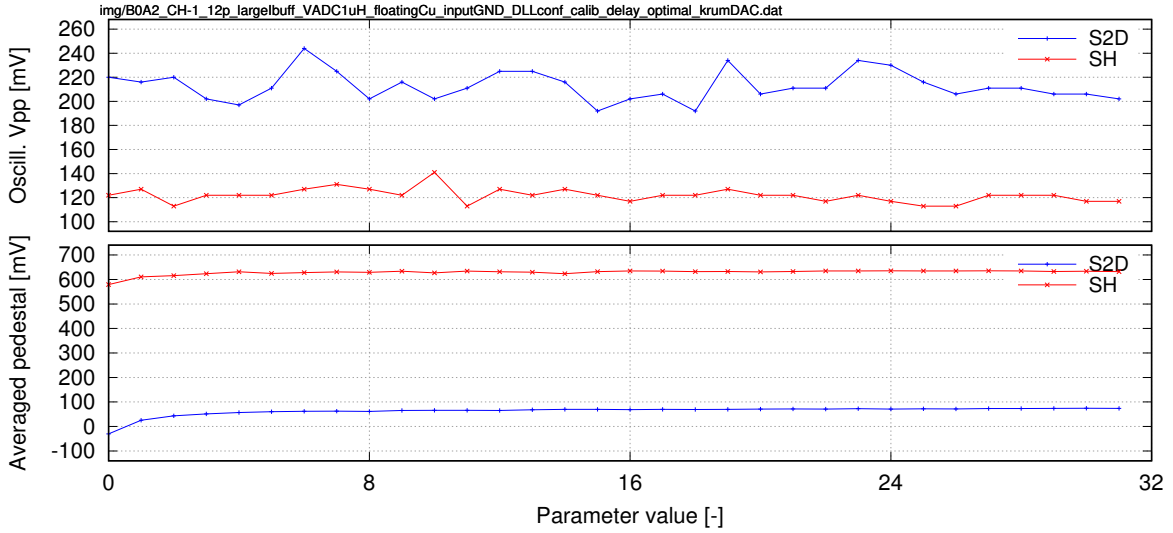


Figure 242: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

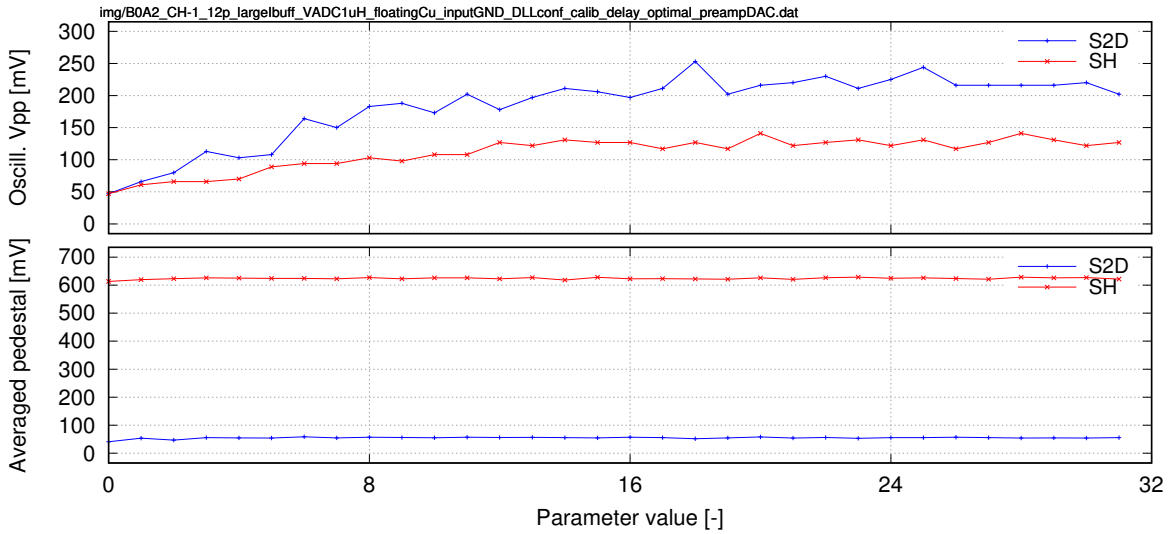


Figure 243: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=preamp DAC

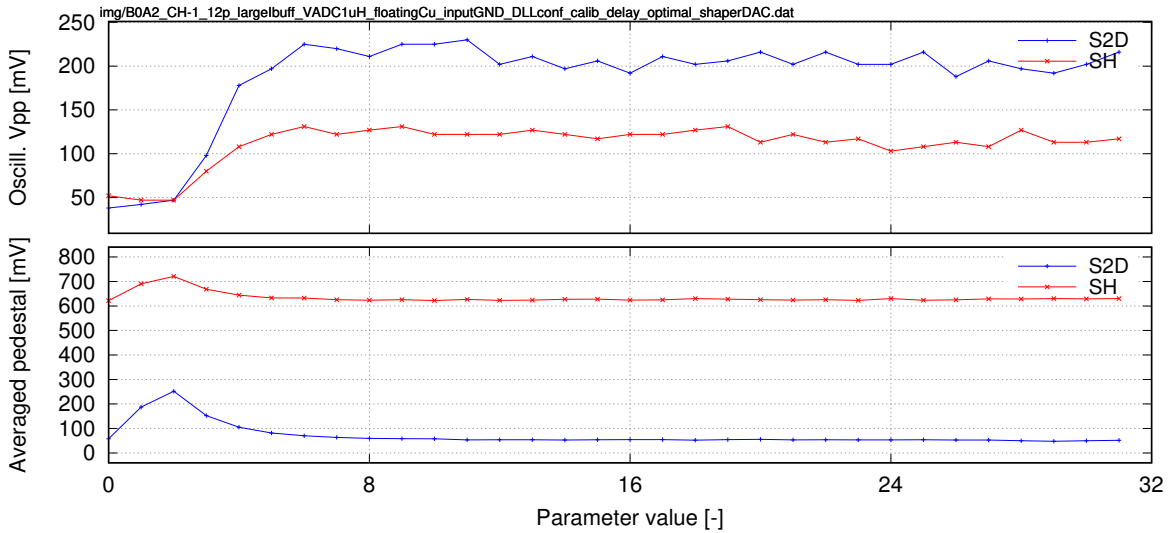


Figure 244: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=shaper DAC

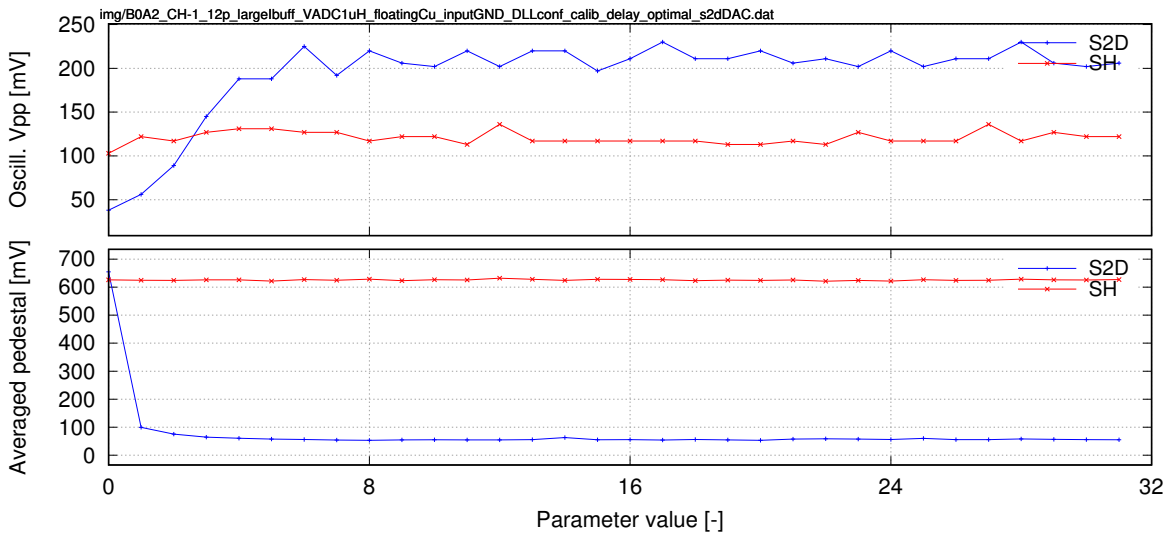


Figure 245: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=S2D DAC

4.10 Cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; grounded copper foil on ASIC; Preamp GND configuration – input + backside

Cap-PCB assembled, bonded to SALT input pads 0 and 127, no capacitors assembled to the cap-PCB.

Ibuf current maximized – 1 k Ω resistor between VDDA and Ibuf pad.

1 μ H inductor assembled in series between onboard decoupling power supply capacitors and VDDADC + VREFD bonds.

Grounded copper foil glued directly on passivation on top of the ASIC.

Preamp GND bonded from both sides - input pads + backside (default) pads.

Channel 128 have damaged input.

4.10.1 Default ASIC configuration

ASIC configuration: JC configuration (tables 1 & 2).

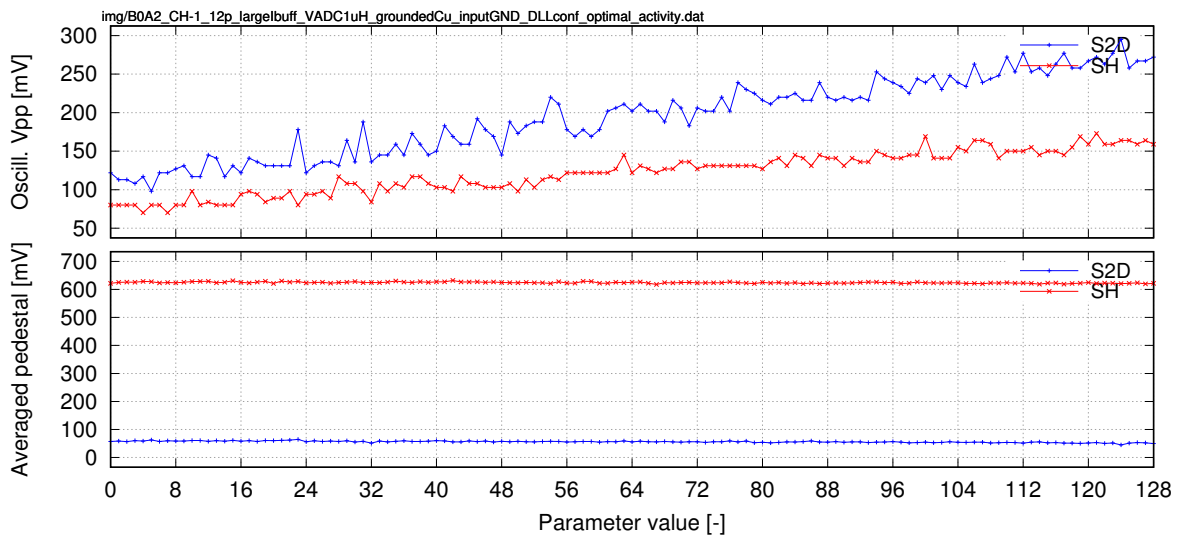


Figure 246: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; grounded copper foil on ASIC; Preamp GND configuration – input + backside. Parameter=no. of active ADCs

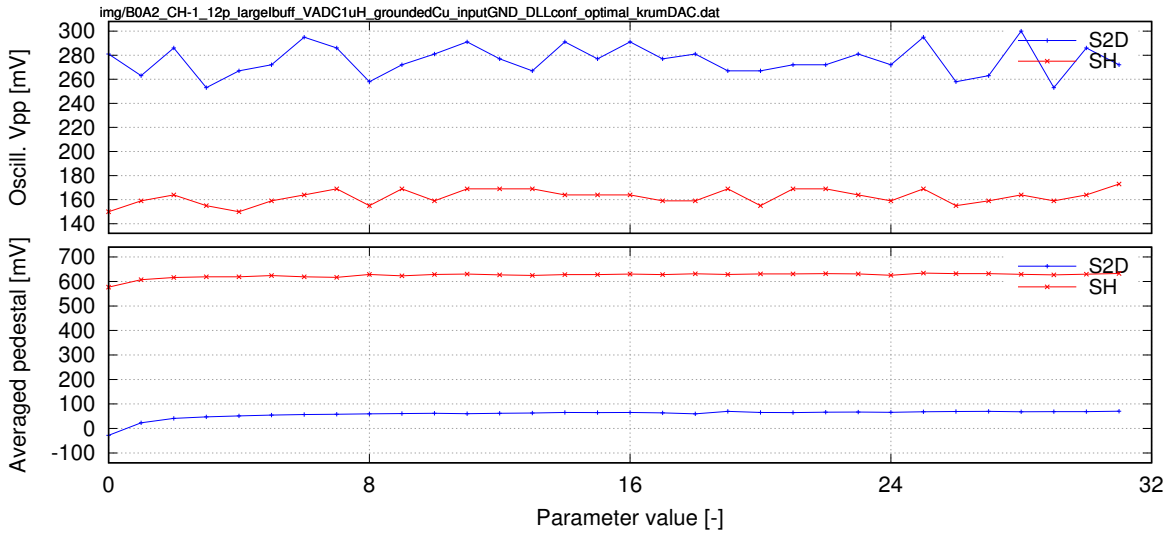


Figure 247: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; grounded copper foil on ASIC; Preamp GND configuration – input + backside. Parameter=Krummenacher DAC

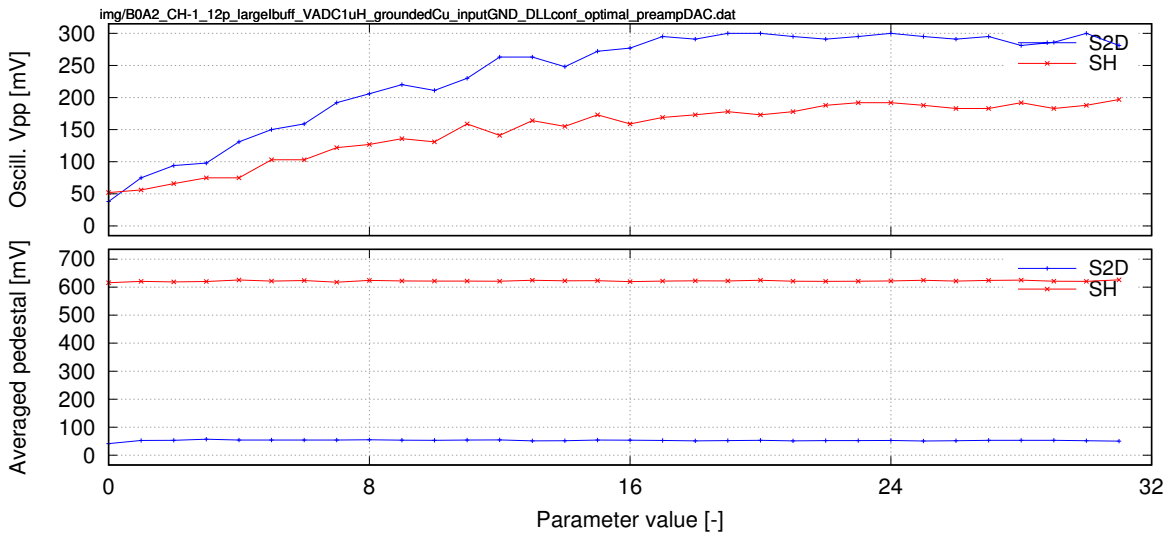


Figure 248: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; grounded copper foil on ASIC; Preamp GND configuration – input + backside. Parameter=preamp DAC

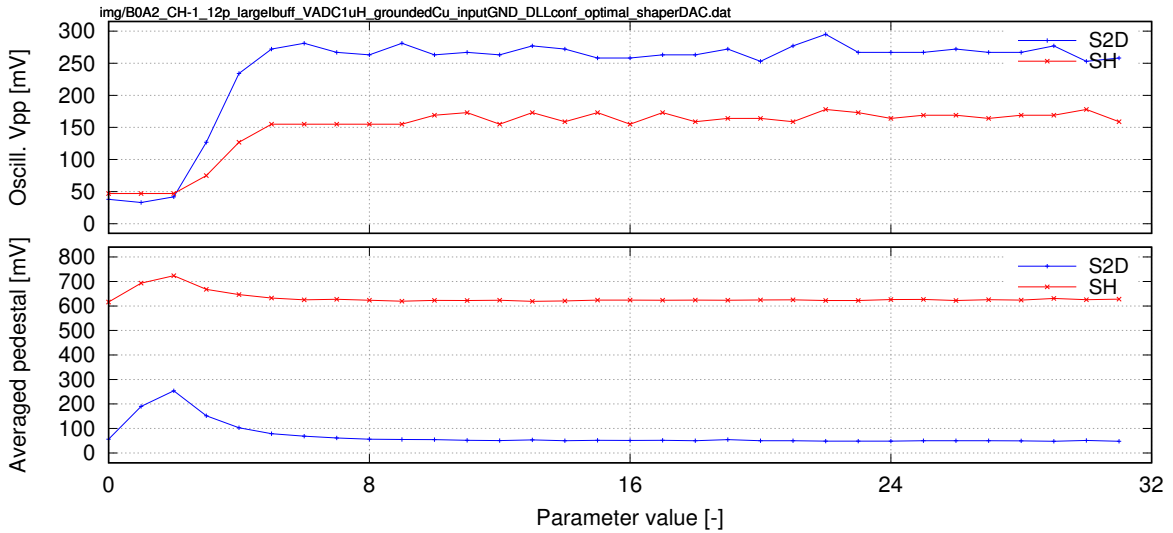


Figure 249: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; grounded copper foil on ASIC; Preamp GND configuration – input + backside. Parameter=shaper DAC

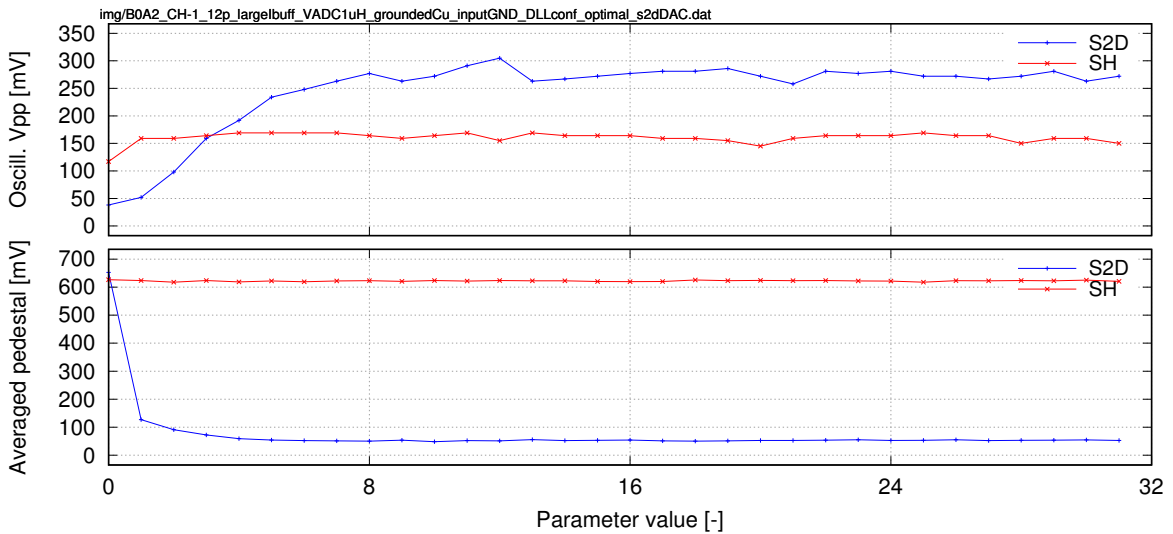


Figure 250: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; grounded copper foil on ASIC; Preamp GND configuration – input + backside. Parameter=S2D DAC

4.10.2 Optimized test pulse and ADC delay

ASIC configuration: JC configuration (tables 1 & 2) + test pulse and ADC delay optimizations (table 3).

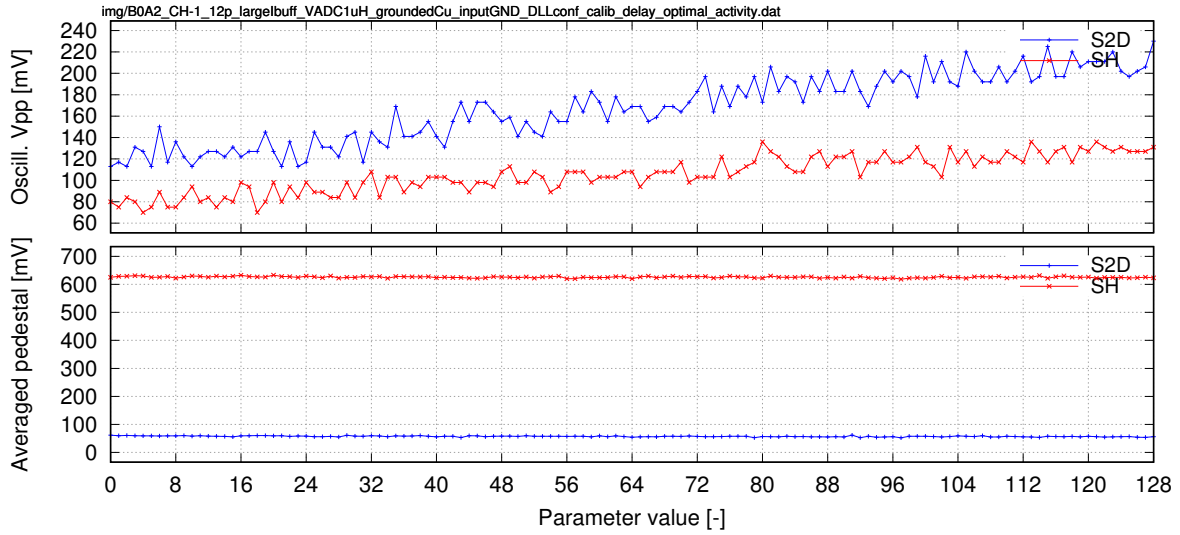


Figure 251: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; grounded copper foil on ASIC; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

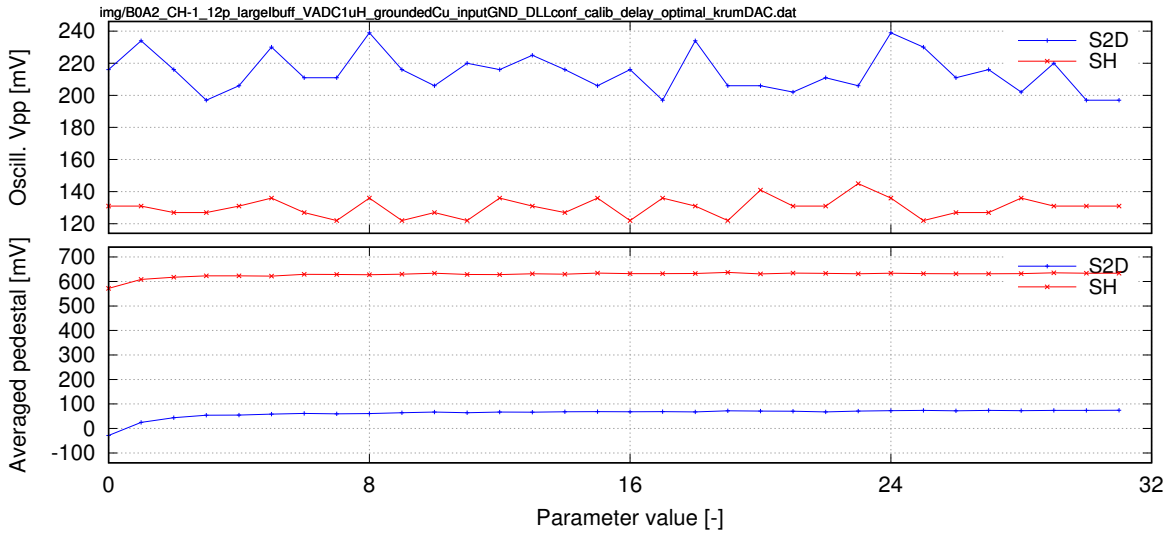


Figure 252: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; grounded copper foil on ASIC; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

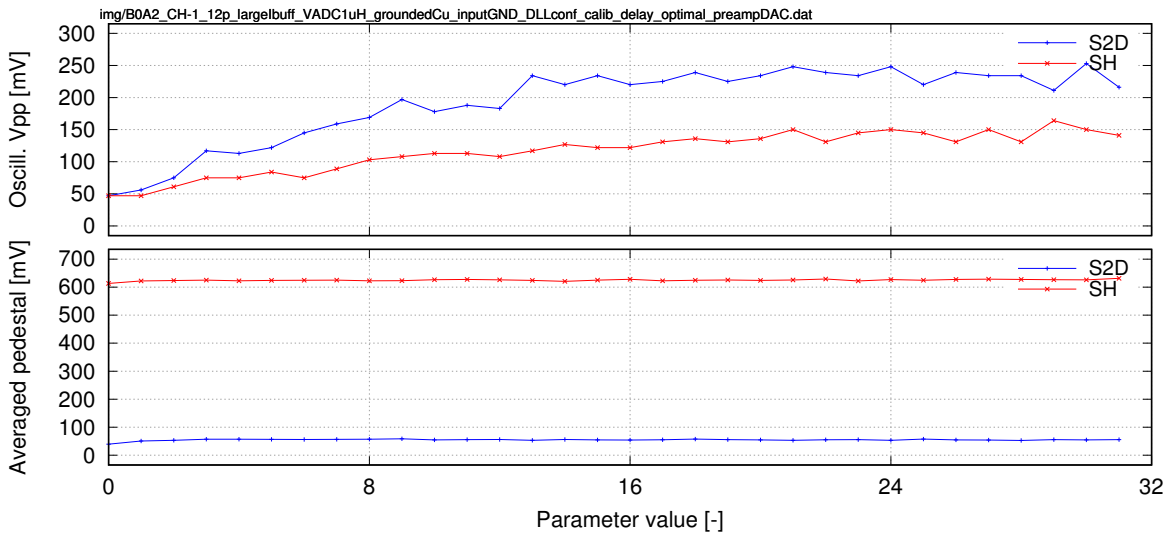


Figure 253: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; grounded copper foil on ASIC; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=preamp DAC

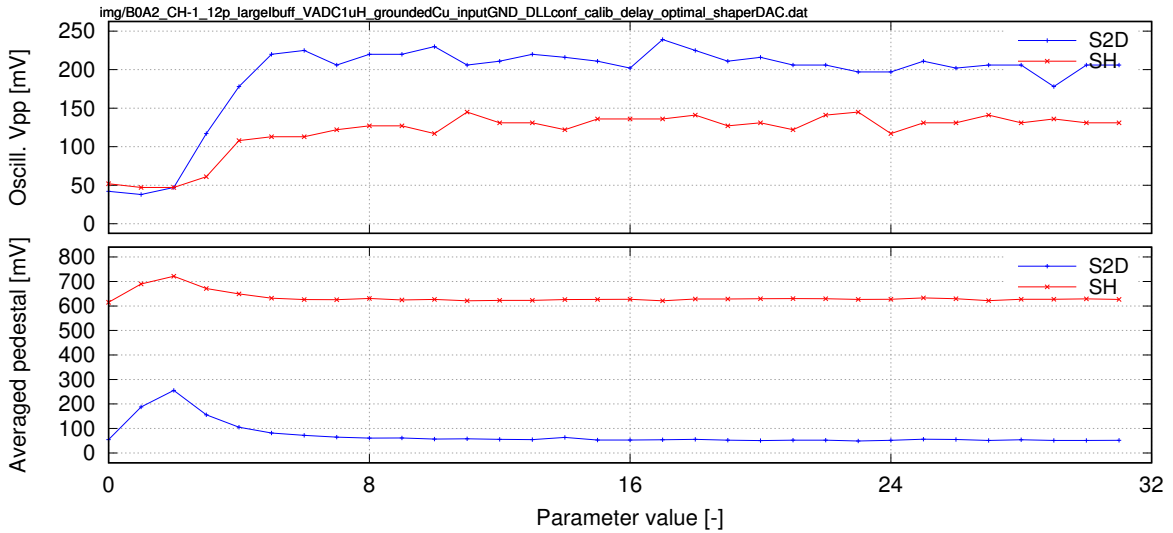


Figure 254: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; grounded copper foil on ASIC; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=shaper DAC

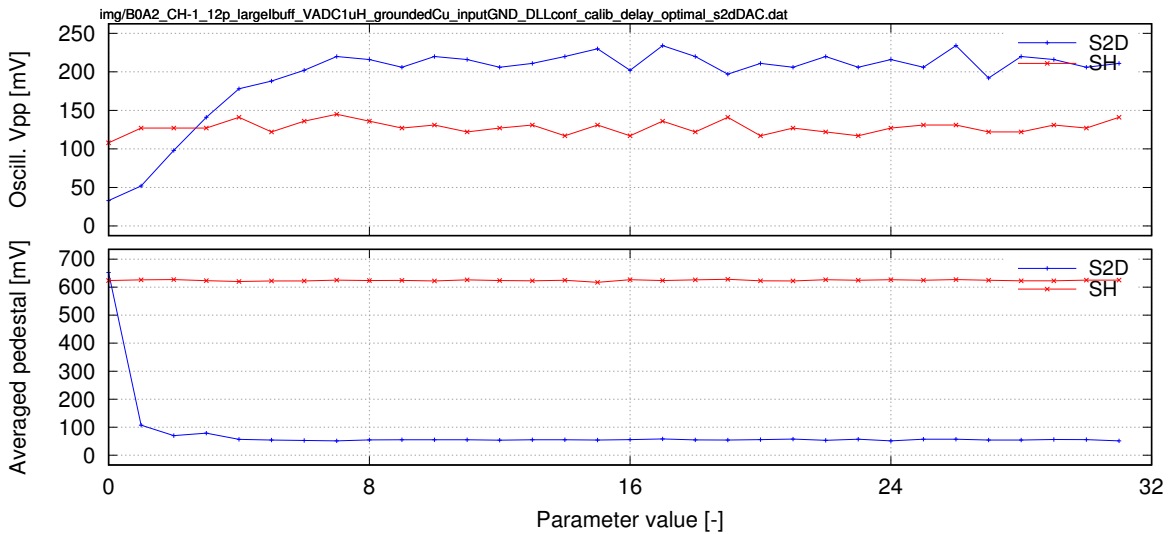


Figure 255: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; grounded copper foil on ASIC; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=S2D DAC

4.11 Cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ALL power supply with 1 μ H series inductor; grounded copper foil on ASIC; Preamp GND configuration – input + backside

Cap-PCB assembled, bonded to SALT input pads 0 and 127, no capacitors assembled to the cap-PCB.

Ibuf current maximized – 1 k Ω resistor between VDDA and Ibuf pad.

1 μ H inductor assembled in series between onboard decoupling power supply capacitors and all VDD bonds.

Grounded copper foil glued directly on passivation on top of the ASIC.

Preamp GND bonded from both sides - input pads + backside (default) pads.

Channel 128 have damaged input.

4.11.1 Default ASIC configuration

ASIC configuration: JC configuration (tables 1 & 2).

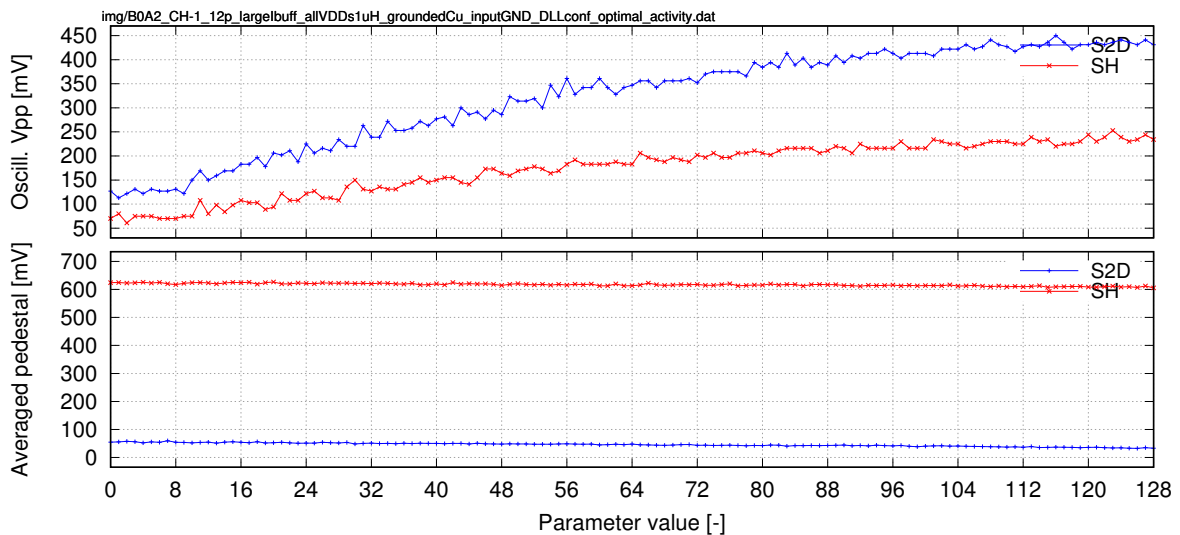


Figure 256: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ALL power supply with 1 μ H series inductor; grounded copper foil on ASIC; Preamp GND configuration – input + backside. Parameter=no. of active ADCs

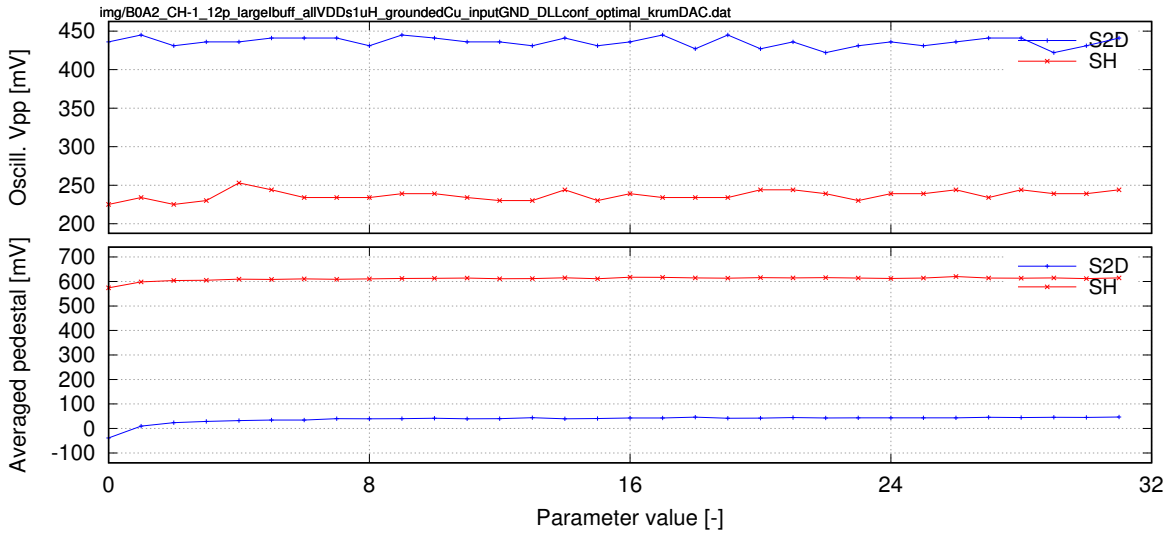


Figure 257: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ALL power supply with 1 μ H series inductor; grounded copper foil on ASIC; Preamp GND configuration – input + backside. Parameter=Krummenacher DAC

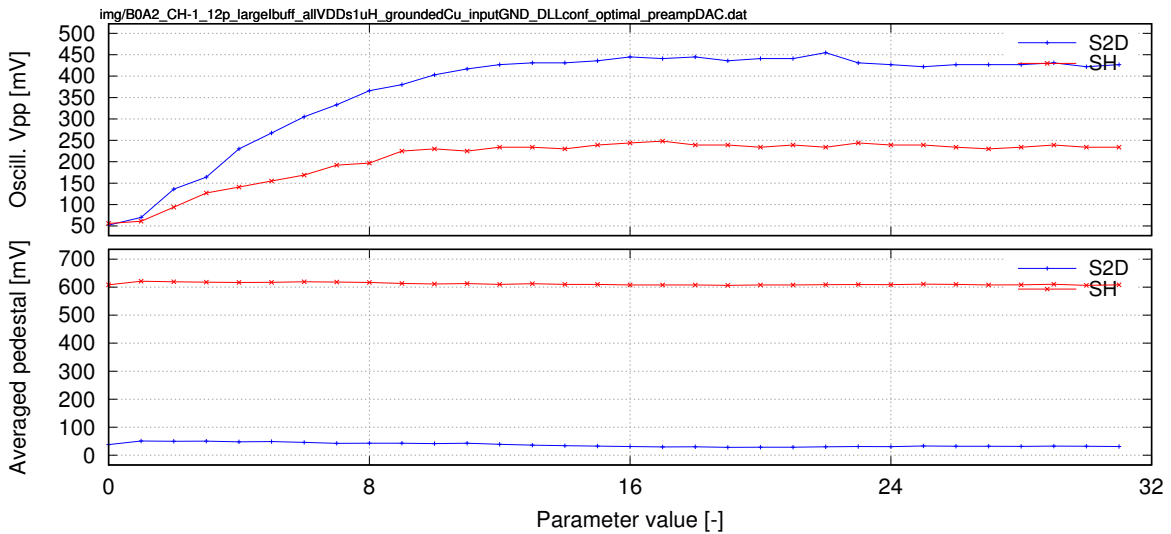


Figure 258: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ALL power supply with 1 μ H series inductor; grounded copper foil on ASIC; Preamp GND configuration – input + backside. Parameter=preamp DAC

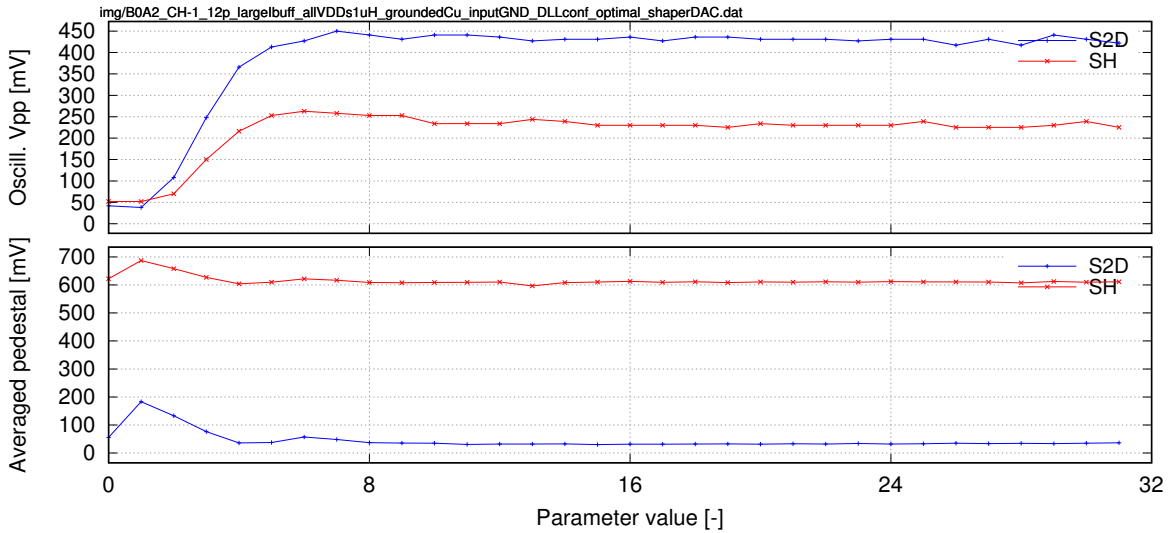


Figure 259: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ALL power supply with 1 μ H series inductor; grounded copper foil on ASIC; Preamp GND configuration – input + backside. Parameter=shaper DAC

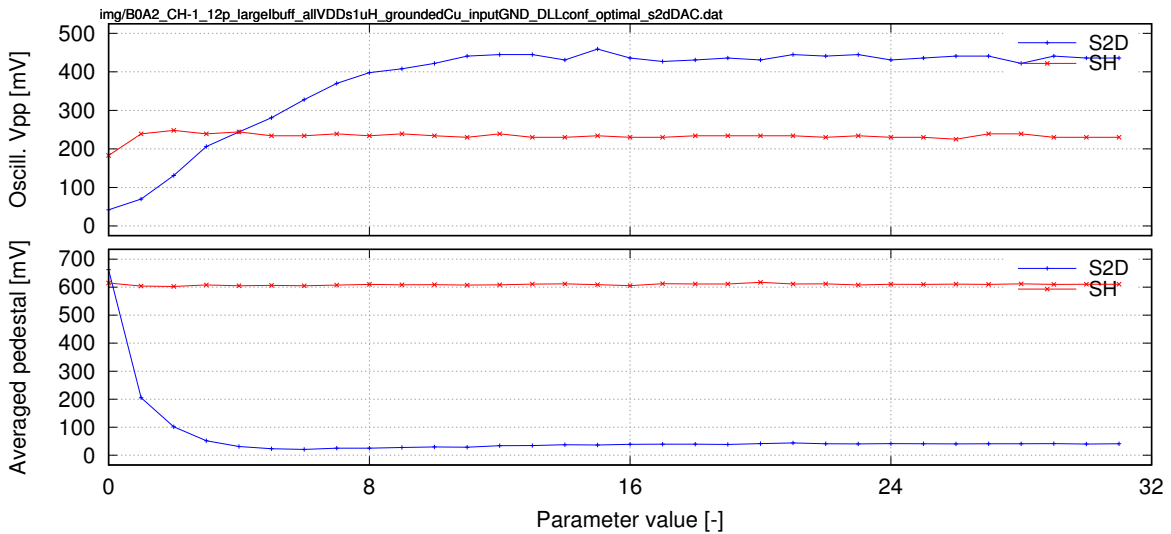


Figure 260: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ALL power supply with 1 μ H series inductor; grounded copper foil on ASIC; Preamp GND configuration – input + backside. Parameter=S2D DAC

4.11.2 Optimized test pulse and ADC delay

ASIC configuration: JC configuration (tables 1 & 2) + test pulse and ADC delay optimizations (table 3).

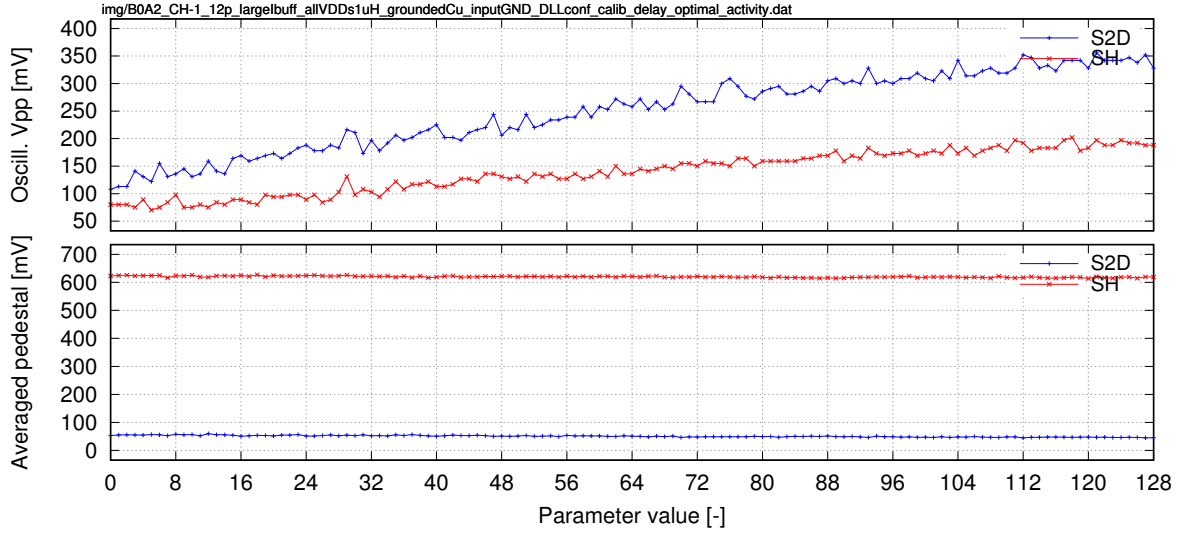


Figure 261: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ALL power supply with 1 μ H series inductor; grounded copper foil on ASIC; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

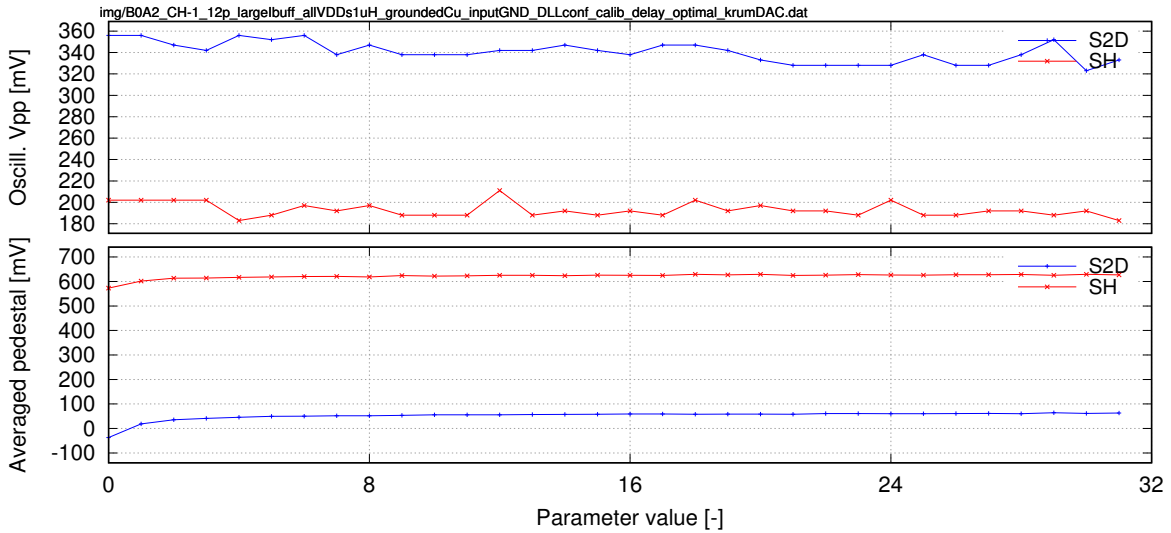


Figure 262: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ALL power supply with 1 μ H series inductor; grounded copper foil on ASIC; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

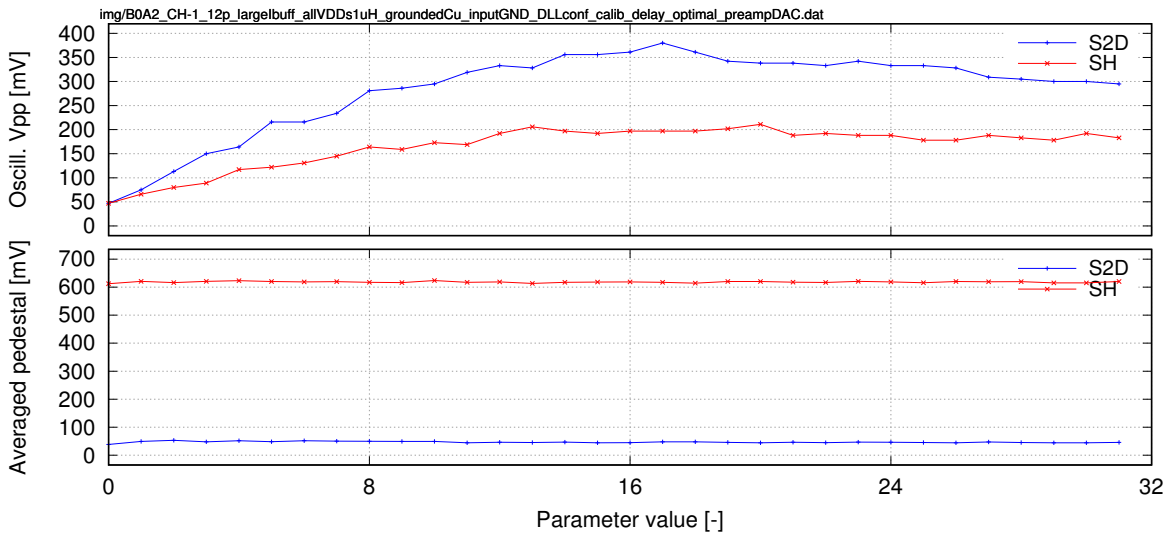


Figure 263: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ALL power supply with 1 μ H series inductor; grounded copper foil on ASIC; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=preamp DAC

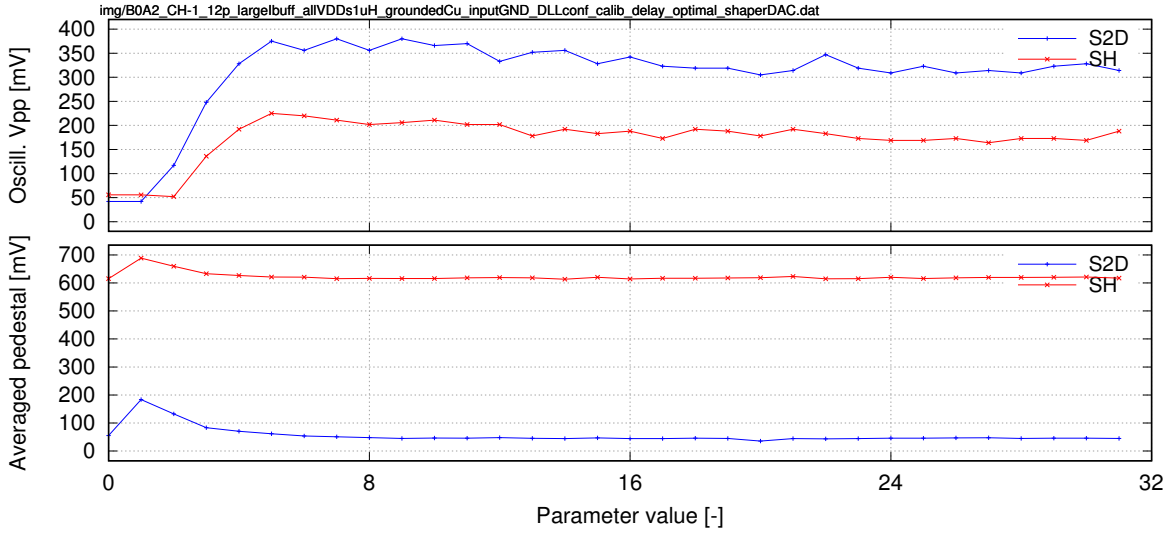


Figure 264: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ALL power supply with 1 μ H series inductor; grounded copper foil on ASIC; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=shaper DAC

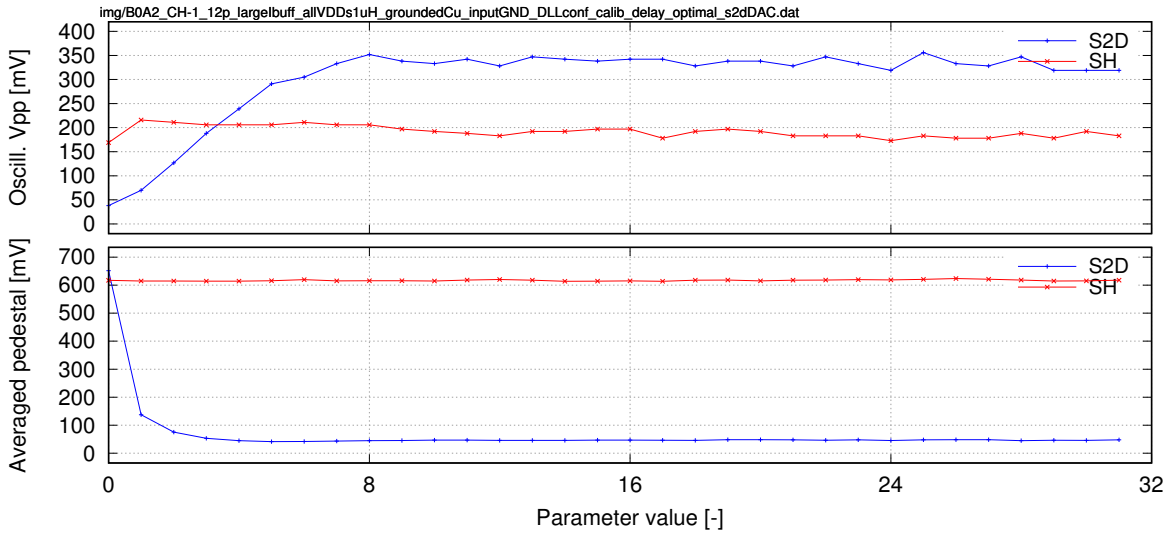


Figure 265: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ALL power supply with 1 μ H series inductor; grounded copper foil on ASIC; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=S2D DAC

4.11.3 ASIC response for EMI source

ASIC configuration: default (chip after reset), EMI source 552 1cm over the ASIC.

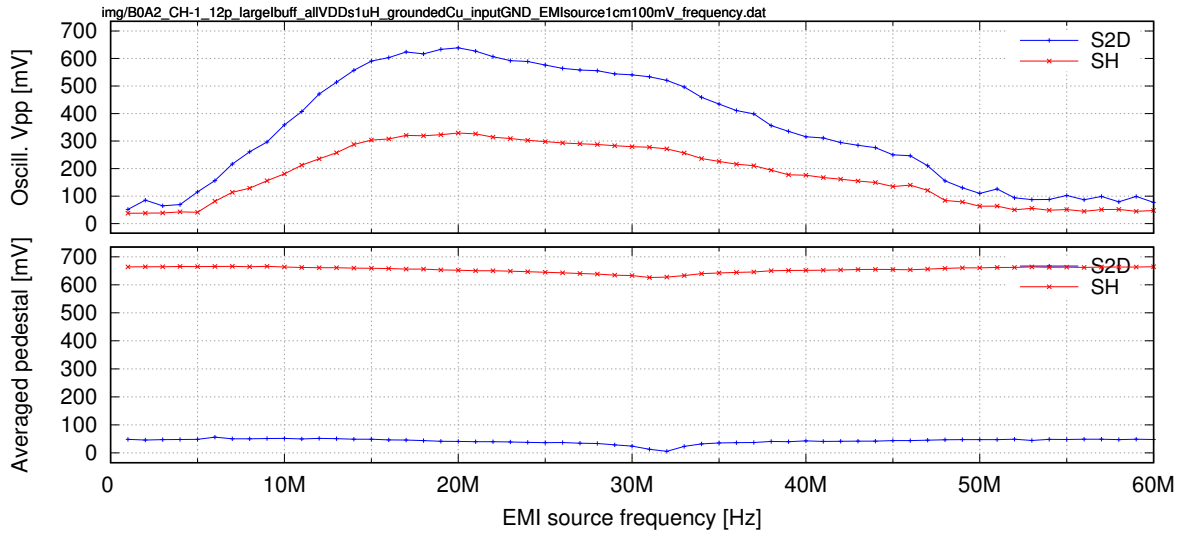


Figure 266: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ALL power supply with 1 μ H series inductor; grounded copper foil on ASIC; Preamp GND configuration – input + backside. EMI source amplitude 100mV. Parameter=frequency of EMI source

4.12 Cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ALL power supply with 1 μ H series inductor; grounded copper foil on ASIC; Preamp GND configuration – only backside

Cap-PCB assembled, bonded to SALT input pads 0 and 127, no capacitors assembled to the cap-PCB.

Ibuf current maximized – 1 k Ω resistor between VDDA and Ibuf pad.

1 μ H inductor assembled in series between onboard decoupling power supply capacitors and all VDD bonds.

Grounded copper foil glued directly on passivation on top of the ASIC.

Preamp GND bonded only from backside (default) pads.

Channel 128 have damaged input.

4.12.1 ASIC response for EMI source

ASIC configuration: default (chip after reset), EMI source 552 1cm over the ASIC.

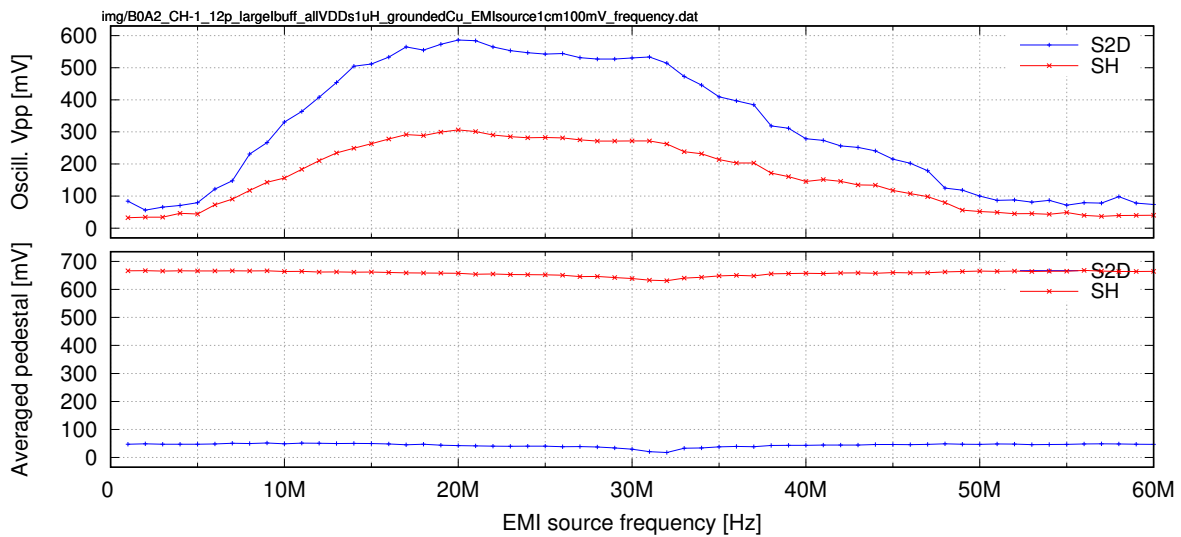


Figure 267: B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ALL power supply with 1 μ H series inductor; grounded copper foil on ASIC; Preamp GND configuration – only backside. EMI source amplitude 100mV. Parameter=frequency of EMI source

4.13 S2D response for different sampling frequencies

1 μH inductor assembled in series between onboard decoupling power supply capacitors and VDDADC + VREFD bonds.

Channel 128 S2D output shown (yellow trace) with sampling clock (purple trace). Scope triggered on sampling clock; averaging active.

ASIC configuration - default after reset.

4.13.1 Response at 1 MHz at full activity with 12 pF + 820 k Ω at input

Cap-PCB assembled, bonded to SALT input pads 0 and 127, two 12 pF capacitors assembled to the cap-PCB, 820 k Ω resistors soldered in parallel to the capacitors.

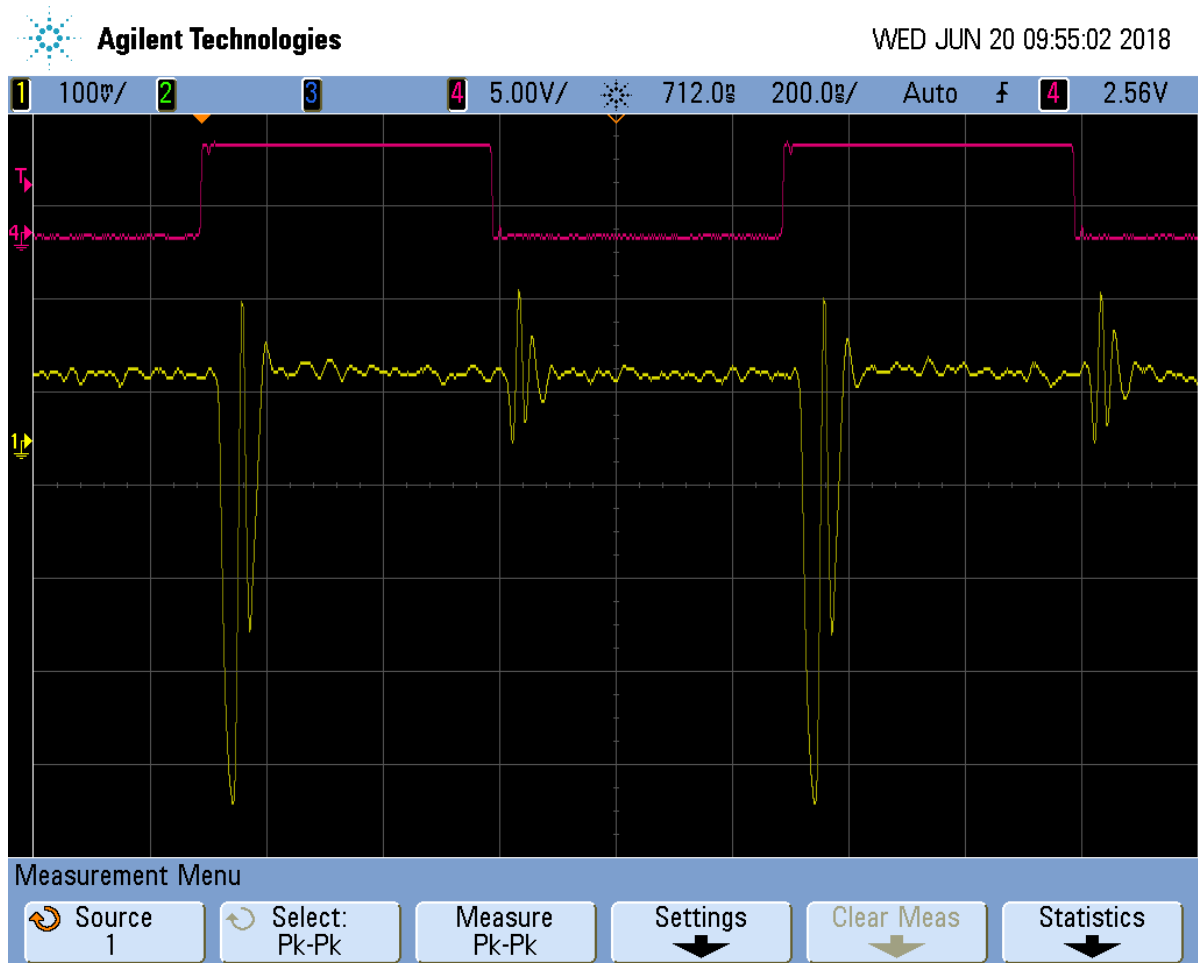


Figure 268: B0A2, S2D response at 1 MHz of main clock. Rising edge corresponds to the ADC conversion. 12 pF + 820 k Ω at input.

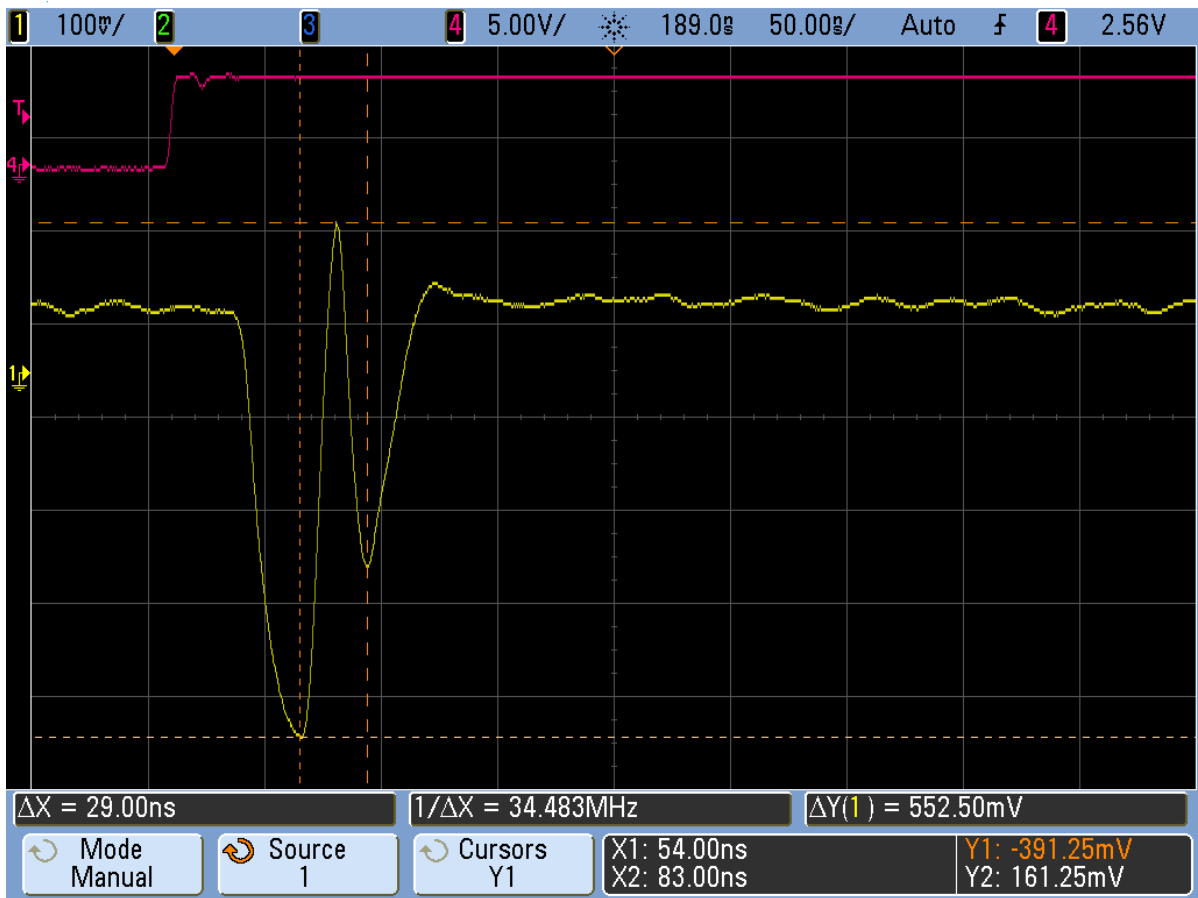


Figure 269: B0A2, Amplitude of S2D response at 1 MHz. 12 pF + 820 kΩ at input.

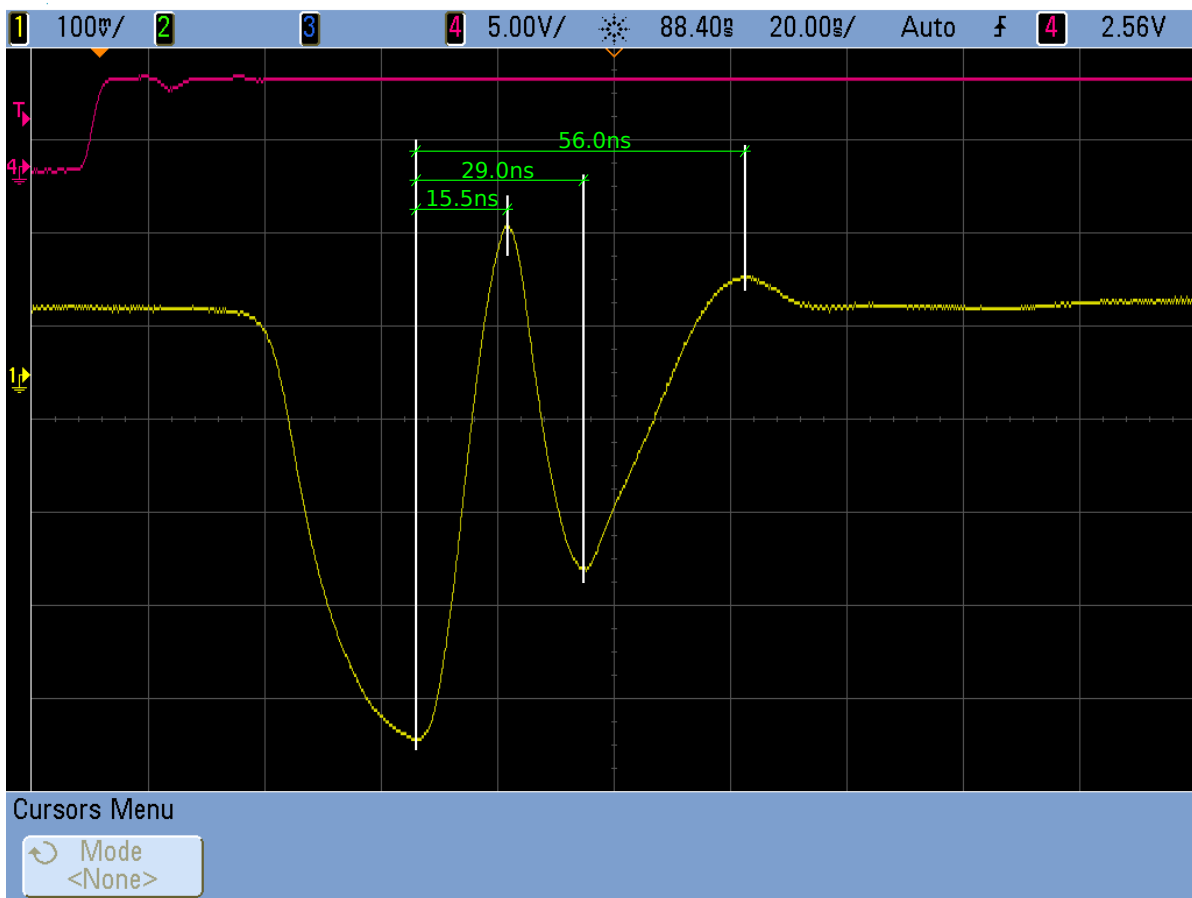


Figure 270: B0A2, Time structure of S2D response at 1 MHz. 12 pF + 820 kΩ at input.

4.13.2 Response at 1 MHz at full activity with 0 pF; floating copper foil on ASIC

Cap-PCB assembled, bonded to SALT input pads 0 and 127, no capacitors assembled to the cap-PCB.

Floating copper foil glued directly on passivation on top of the ASIC (see figure 549).

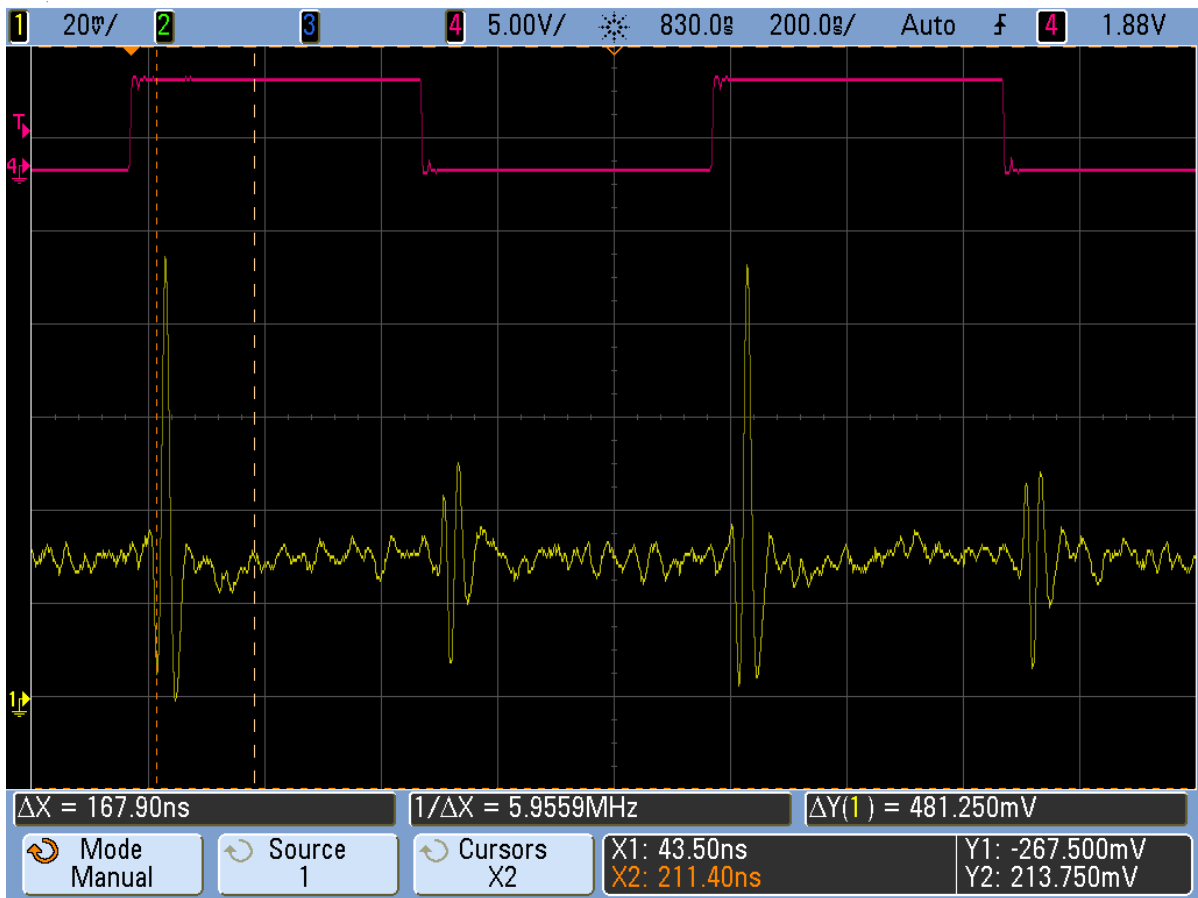


Figure 271: B0A2, S2D response at 1 MHz of main clock. Rising edge corresponds to the ADC conversion. 0 pF; floating plane on passivation.

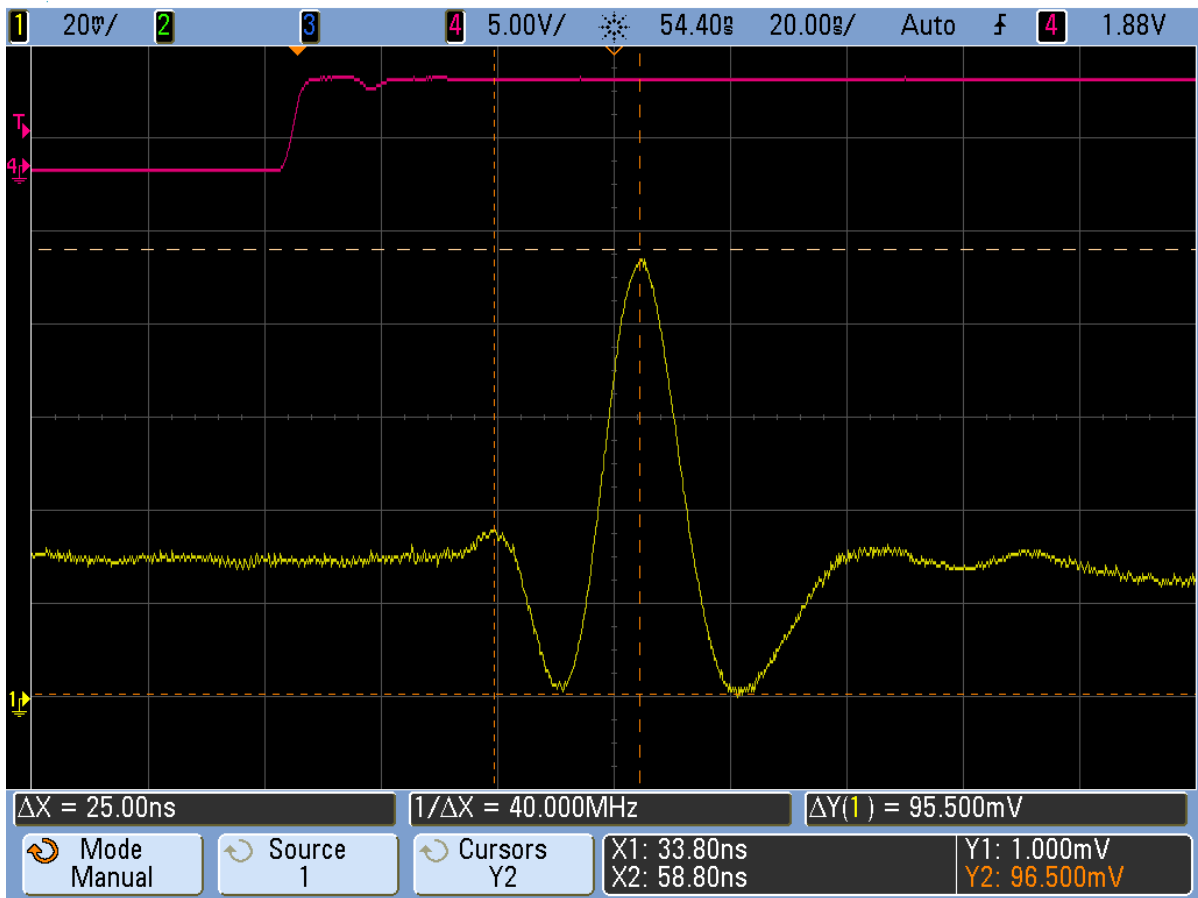


Figure 272: B0A2, Amplitude of S2D response at 1 MHz. 0 pF; floating plane on passivation.

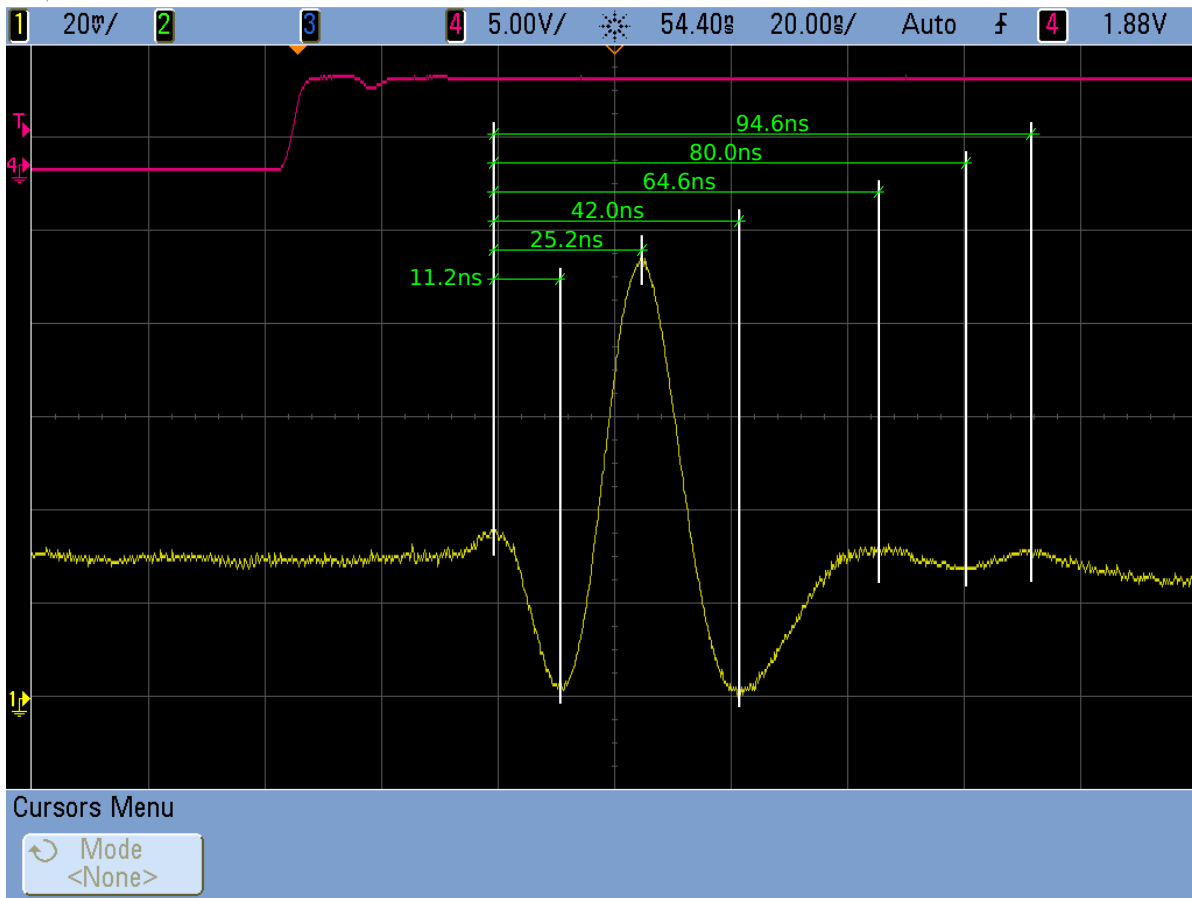


Figure 273: B0A2, Time structure of S2D response at 1 MHz. 0 pF; floating plane on passivation.

4.13.3 Response at 1 MHz at full activity with 12 pF; grounded copper foil on ASIC; Preamp GND configuration – input + backside.

Cap-PCB assembled, bonded to SALT input pads 0 and 127, two 12 pF capacitors assembled to the cap-PCB.

Grounded copper foil glued directly on passivation on top of the ASIC (see figure 549). Preamp GND bonded from both sides - input pads + backside (default) pads.

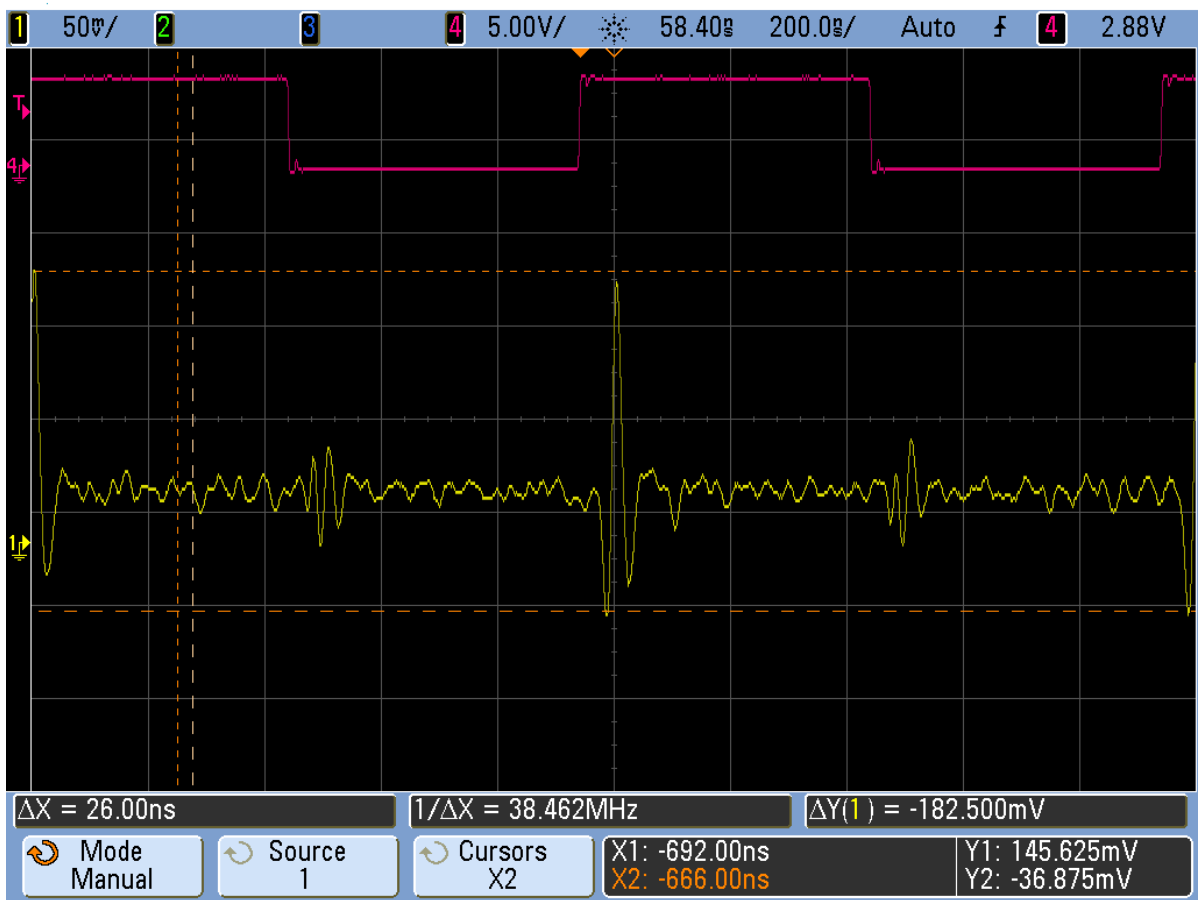


Figure 274: B0A2, S2D response at 1 MHz of main clock. Rising edge corresponds to the ADC conversion. 12 pF; grounded plane on passivation; Preamp GND configuration – input + backside.

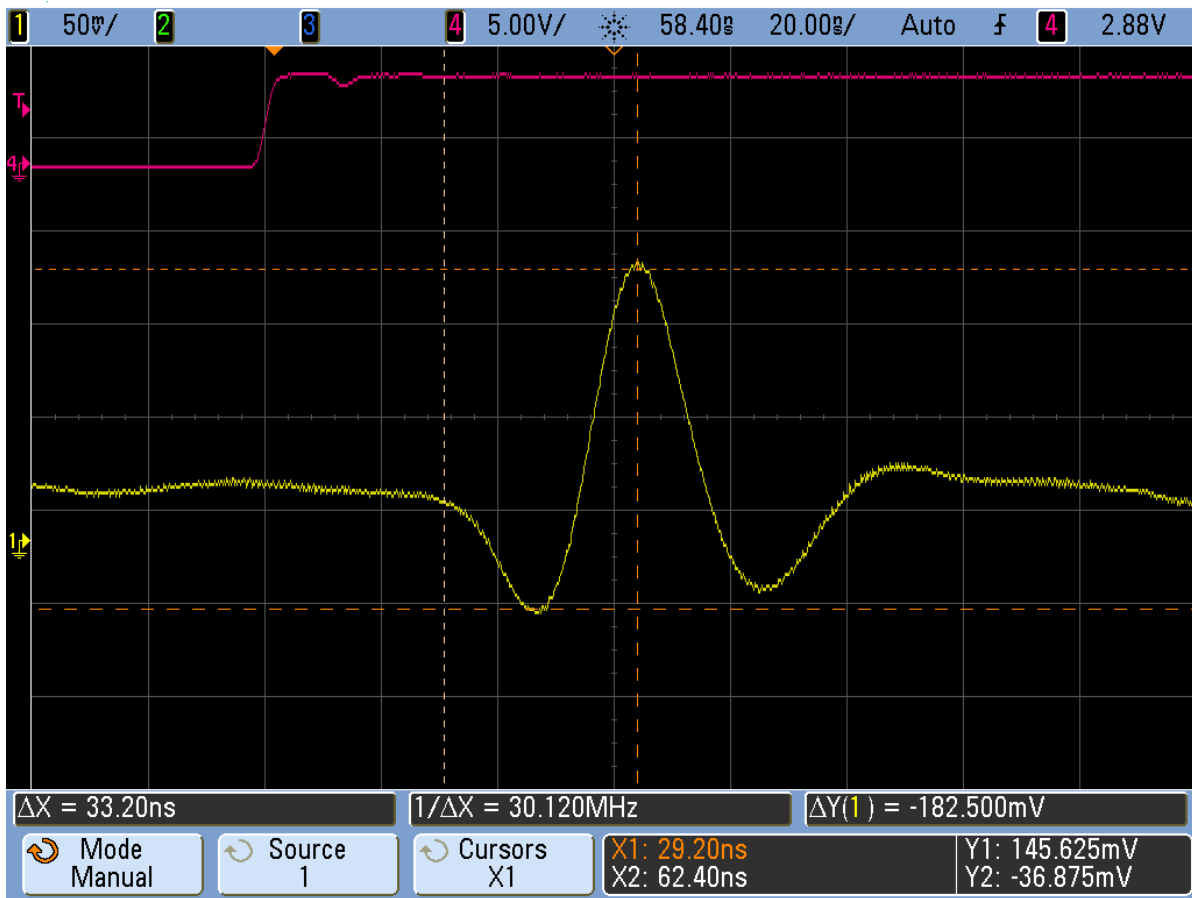


Figure 275: B0A2, Amplitude of S2D response at 1 MHz. 12 pF; grounded plane on passivation; Preamp GND configuration – input + backside.

5 Board 1 with ASIC 4

5.1 S2D response for different sampling frequencies

Channel 128 S2D output shown (yellow trace) with sampling clock (purple trace). Scope triggered on sampling clock; averaging active.

ASIC configuration - default after reset.

5.1.1 Response at 1 MHz at full activity without input pads bonded

Input pads not bonded.



Figure 276: B1A4, S2D response at 1 MHz of main clock. Rising edge corresponds to the ADC conversion. Input pads not bonded.

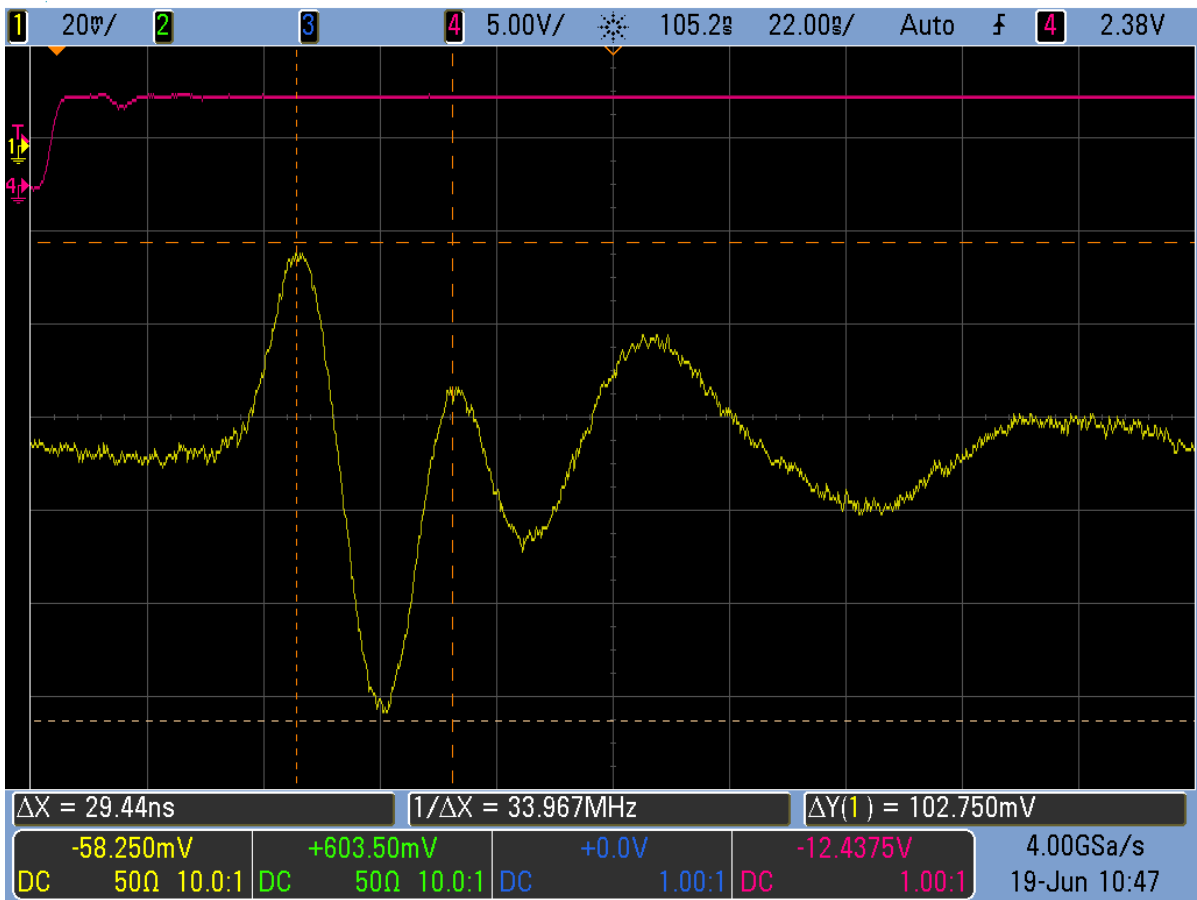


Figure 277: B1A4, Amplitude of S2D response at 1 MHz. Input pads not bonded.

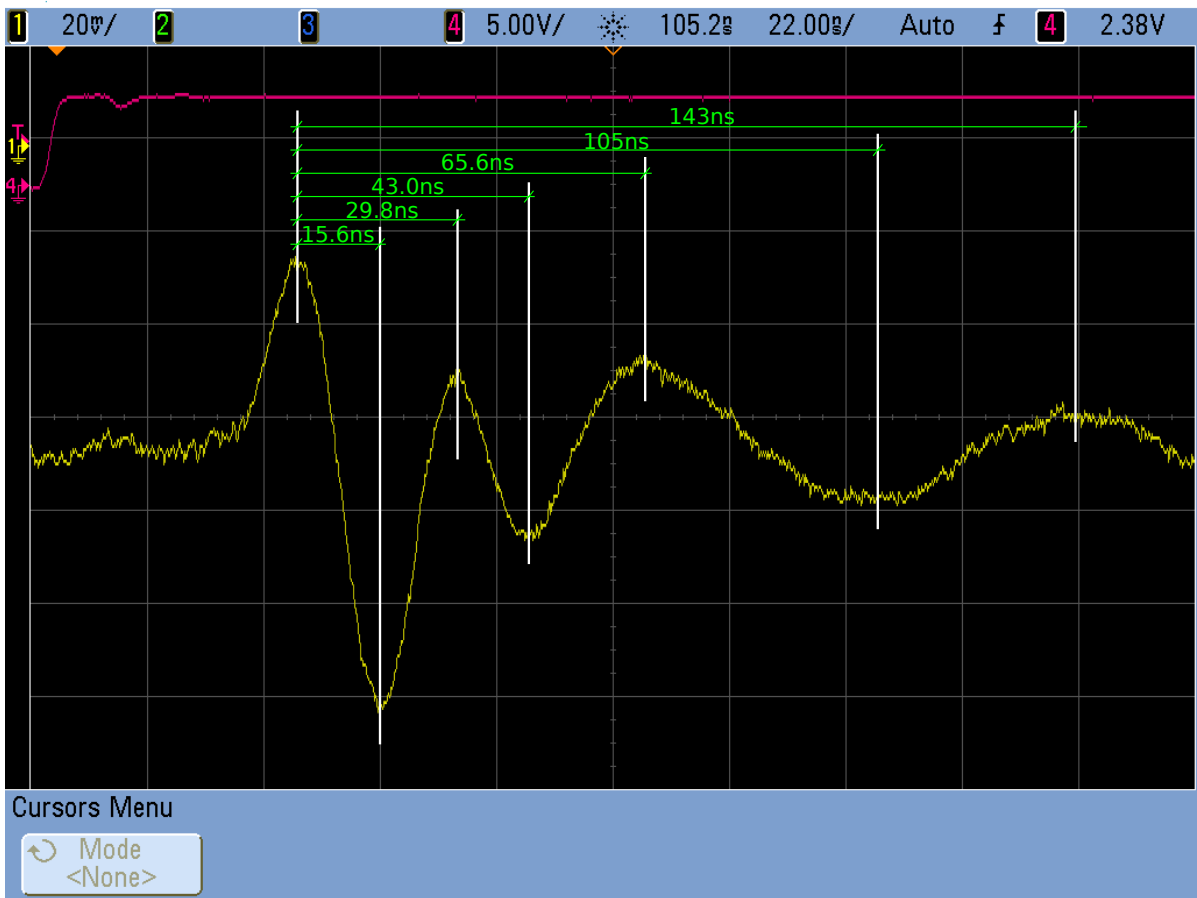


Figure 278: B1A4, Time structure of S2D response at 1 MHz. Input pads not bonded.

5.1.2 Response at 1 MHz at full activity with 12 pF at input

Cap-PCB assembled, bonded to SALT input pads 0 and 127, two 12 pF capacitors assembled to the cap-PCB.

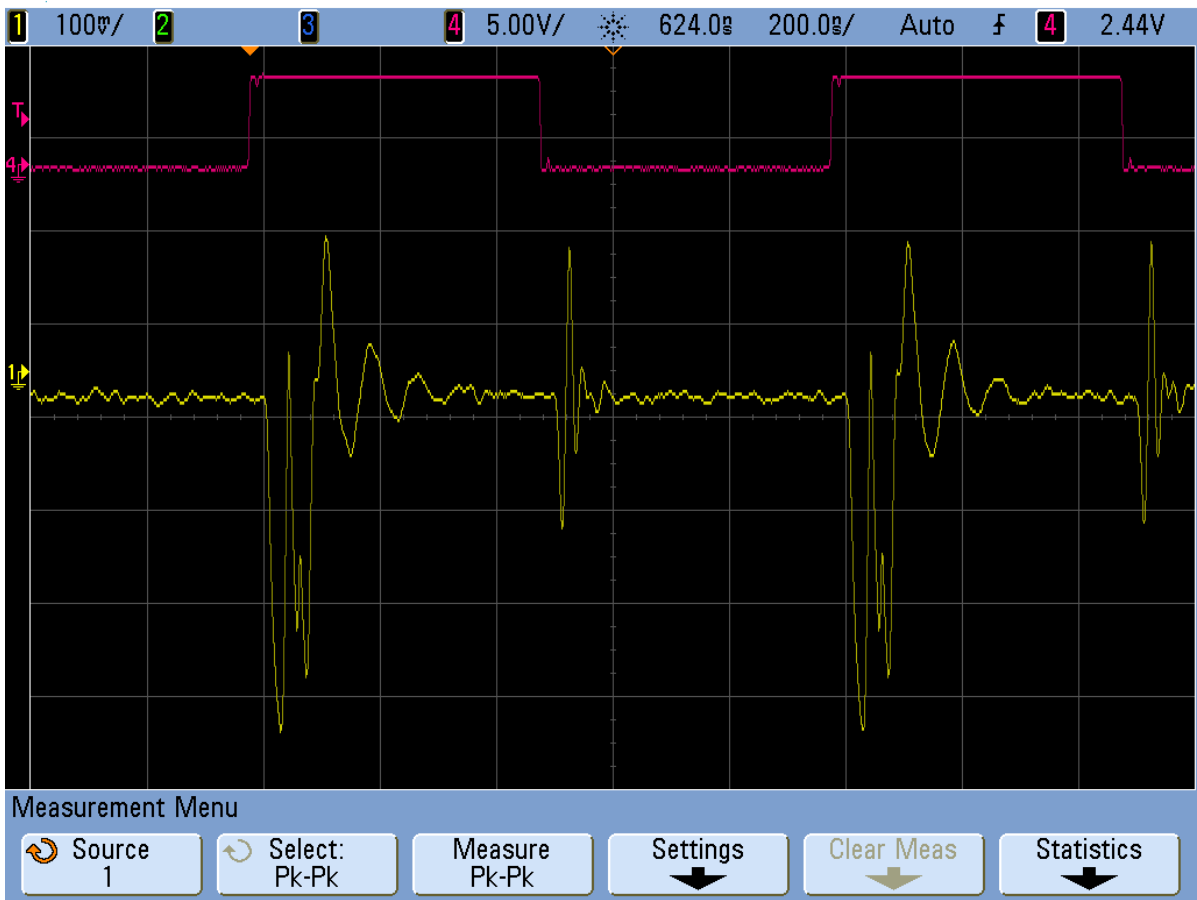


Figure 279: B1A4, S2D response at 1 MHz of main clock. Rising edge corresponds to the ADC conversion. 12 pF at inputs.

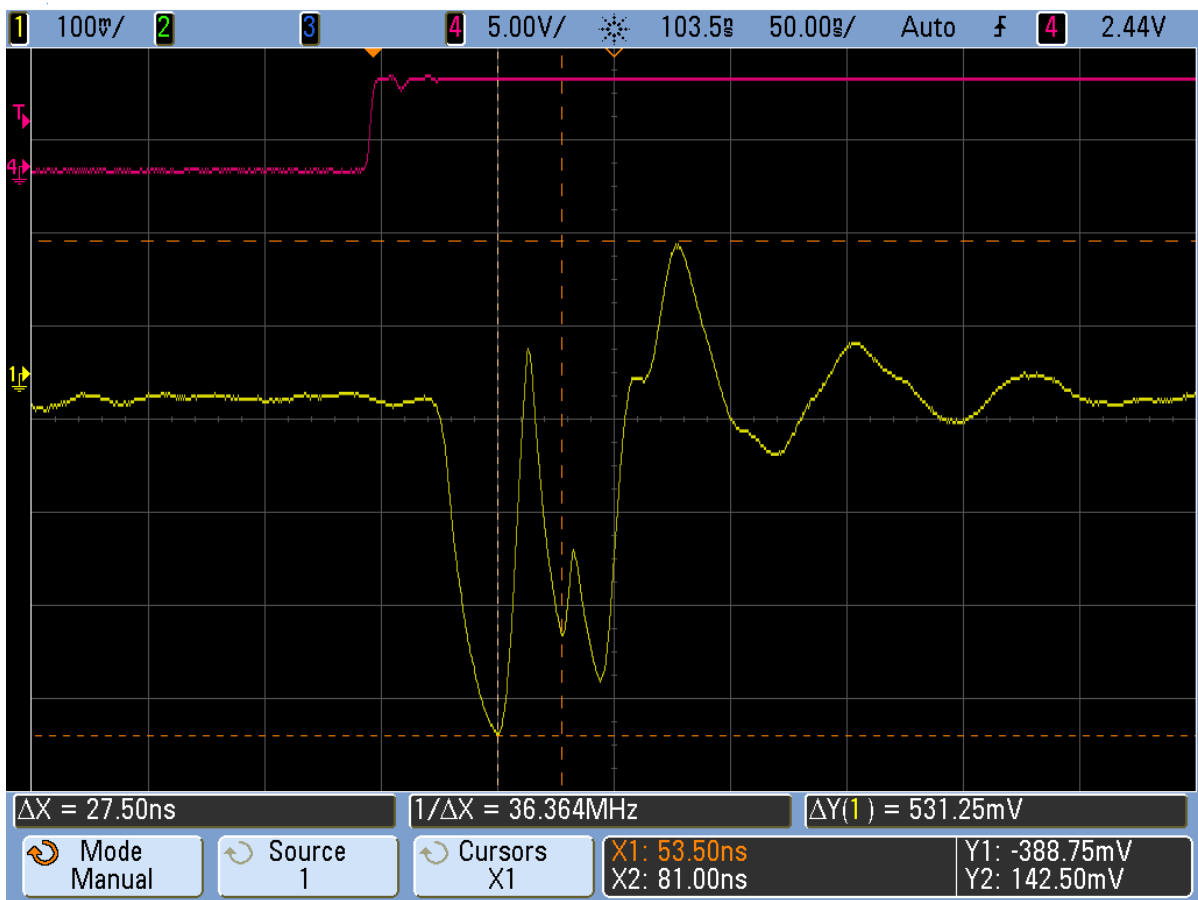


Figure 280: B1A4, Amplitude of S2D response at 1 MHz. 12 pF at inputs.

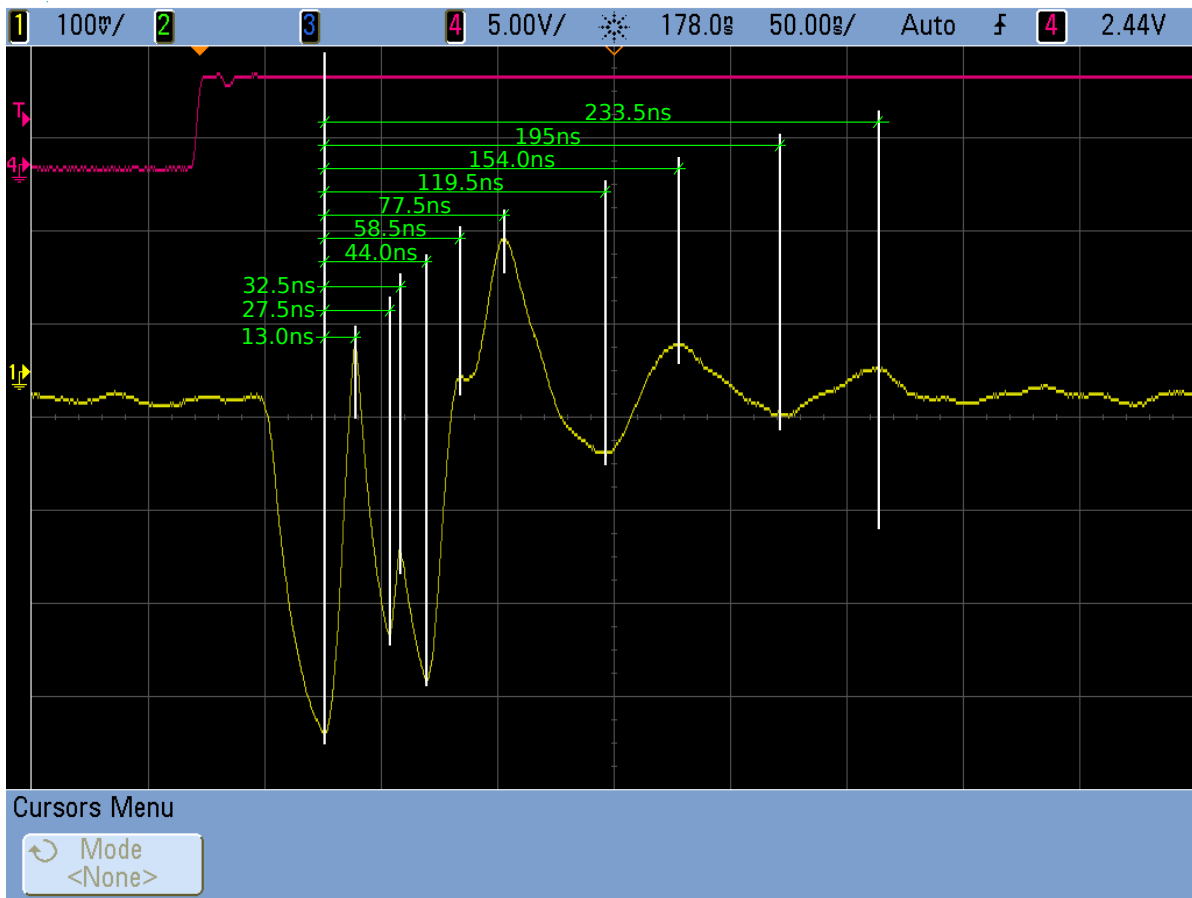


Figure 281: B1A4, Time structure of S2D response at 1 MHz. 12 pF at inputs.

5.1.3 Response at 1 MHz at full activity with 12 pF at input; preamp GND configuration – input + backside

Cap-PCB assembled, bonded to SALT input pads 0 and 127, two 12 pF capacitors assembled to the cap-PCB.

Preamp GND configuration – input + backside

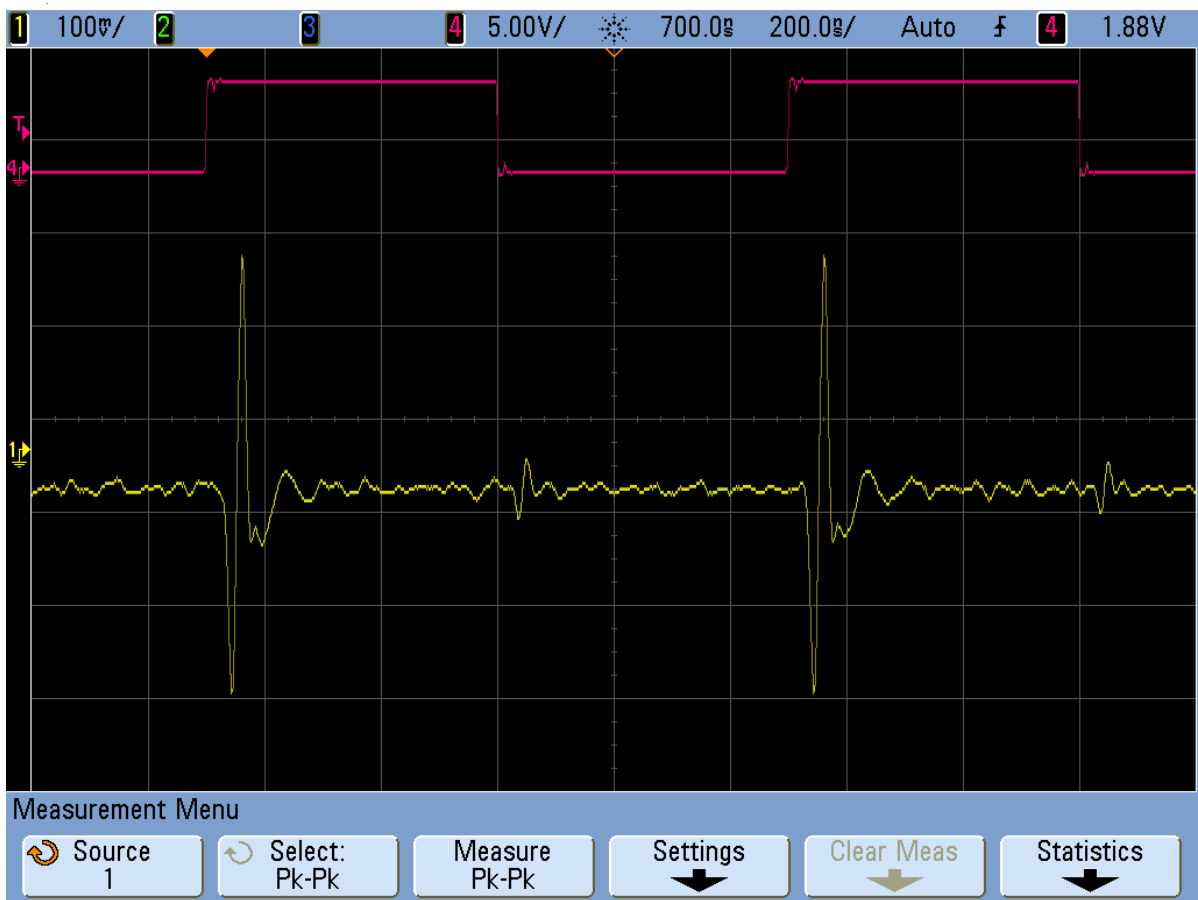


Figure 282: B1A4, S2D response at 1 MHz of main clock. Rising edge corresponds to the ADC conversion. 12 pF at inputs. Preamp GND – input + backside

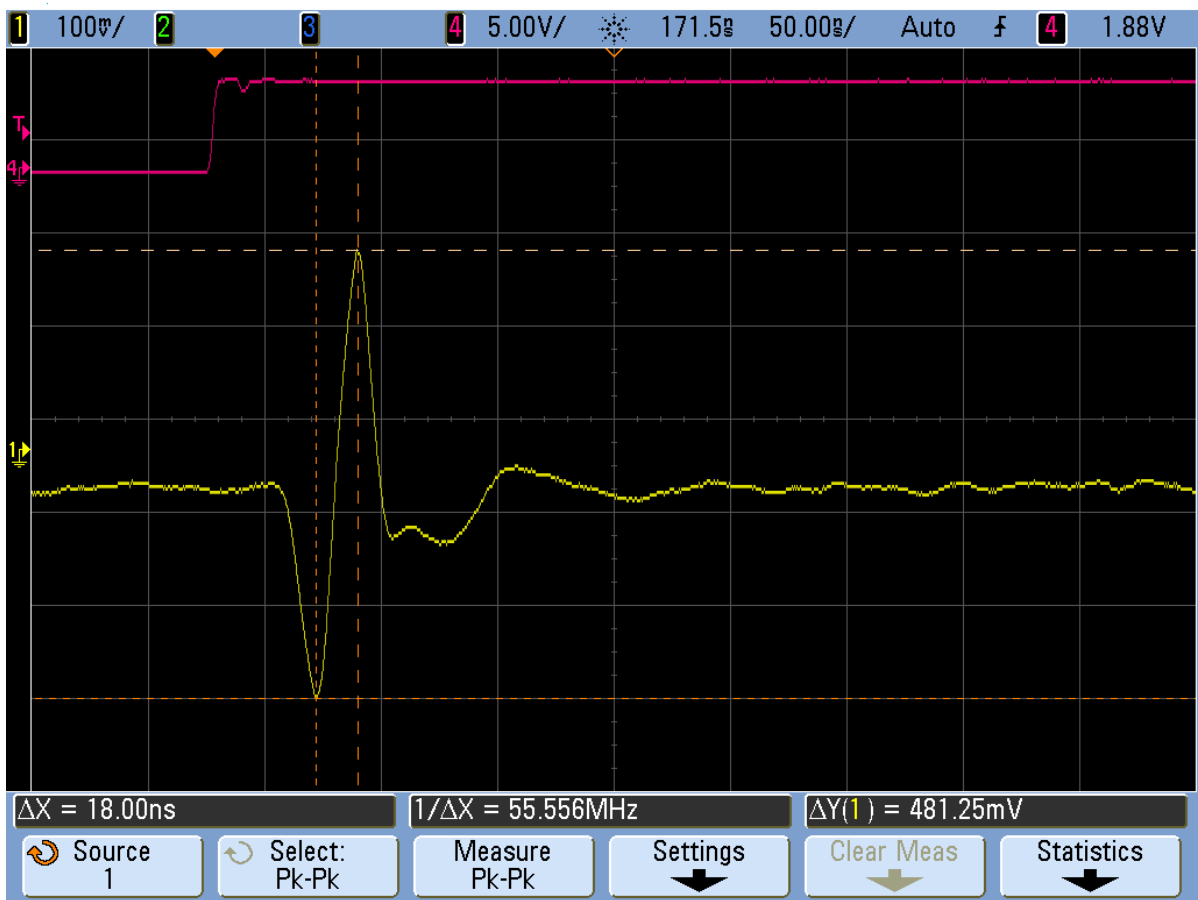


Figure 283: B1A4, Amplitude of S2D response at 1 MHz. 12 pF at inputs. Preamp GND – input + backside



Figure 284: B1A4, Time structure of S2D response at 1 MHz. 12 pF at inputs. Preamp GND – input + backside

5.1.4 Response vs main clock frequency without input pads bonded

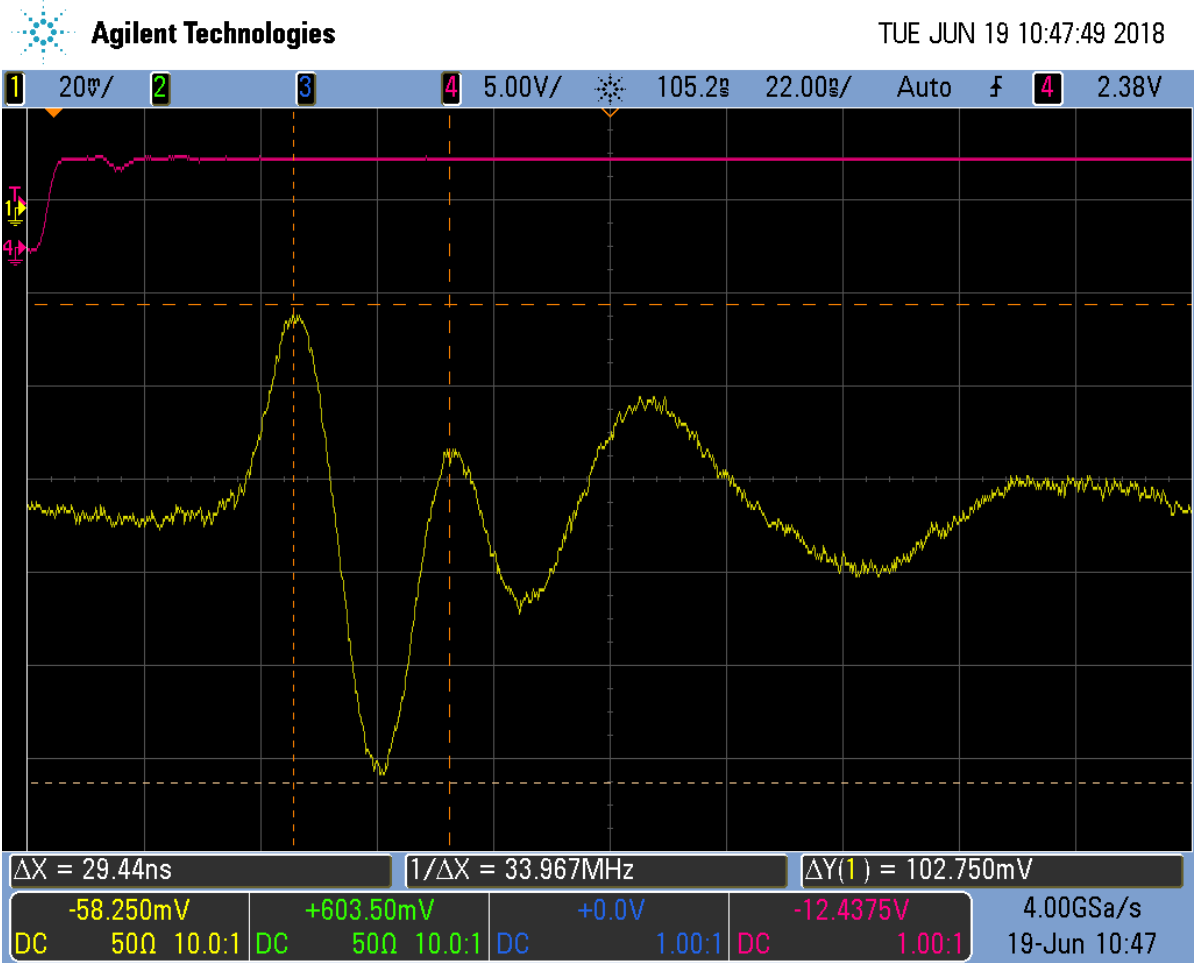


Figure 285: B1A4, S2D response at 1 MHz of main clock. Input pads not bonded.



Figure 286: B1A4, S2D response at 5 MHz of main clock. Input pads not bonded.

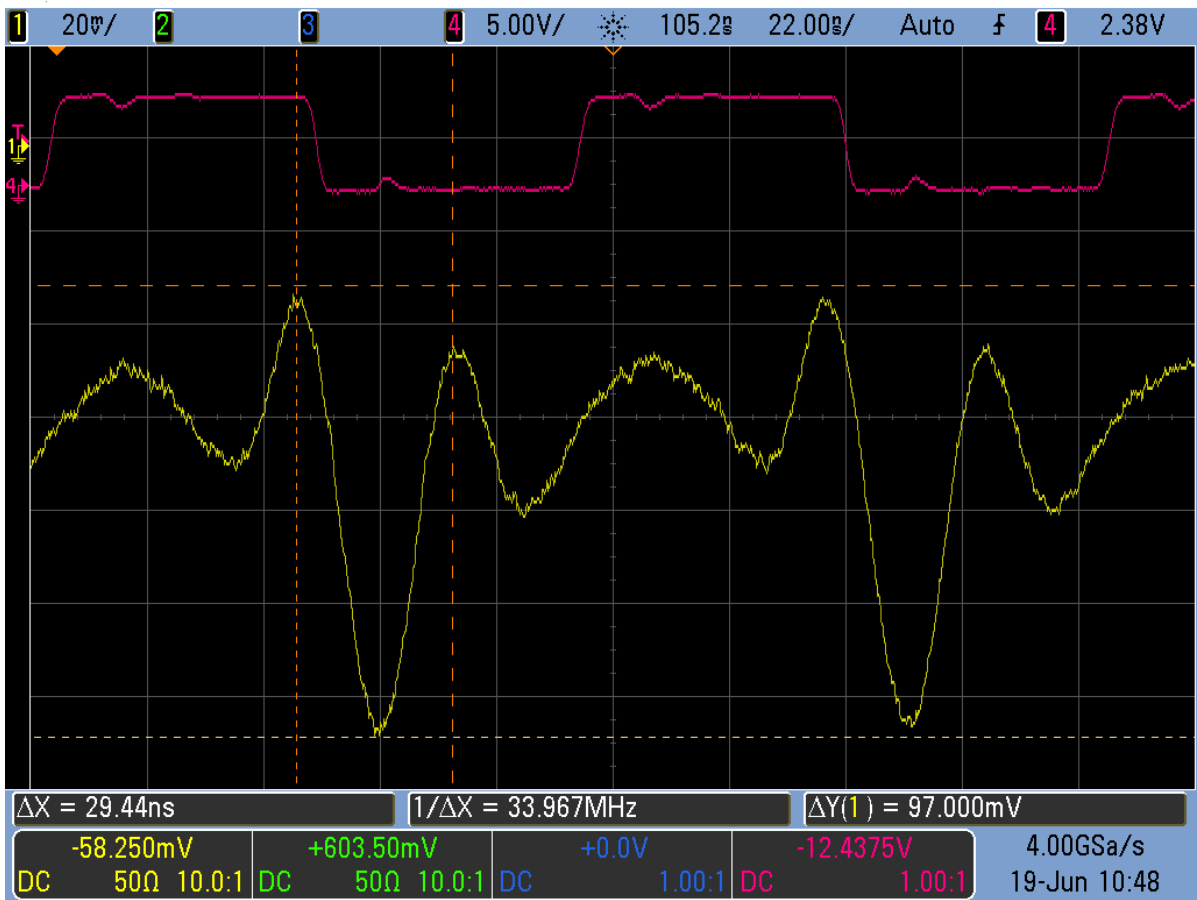


Figure 287: B1A4, S2D response at 10 MHz of main clock. Input pads not bonded.

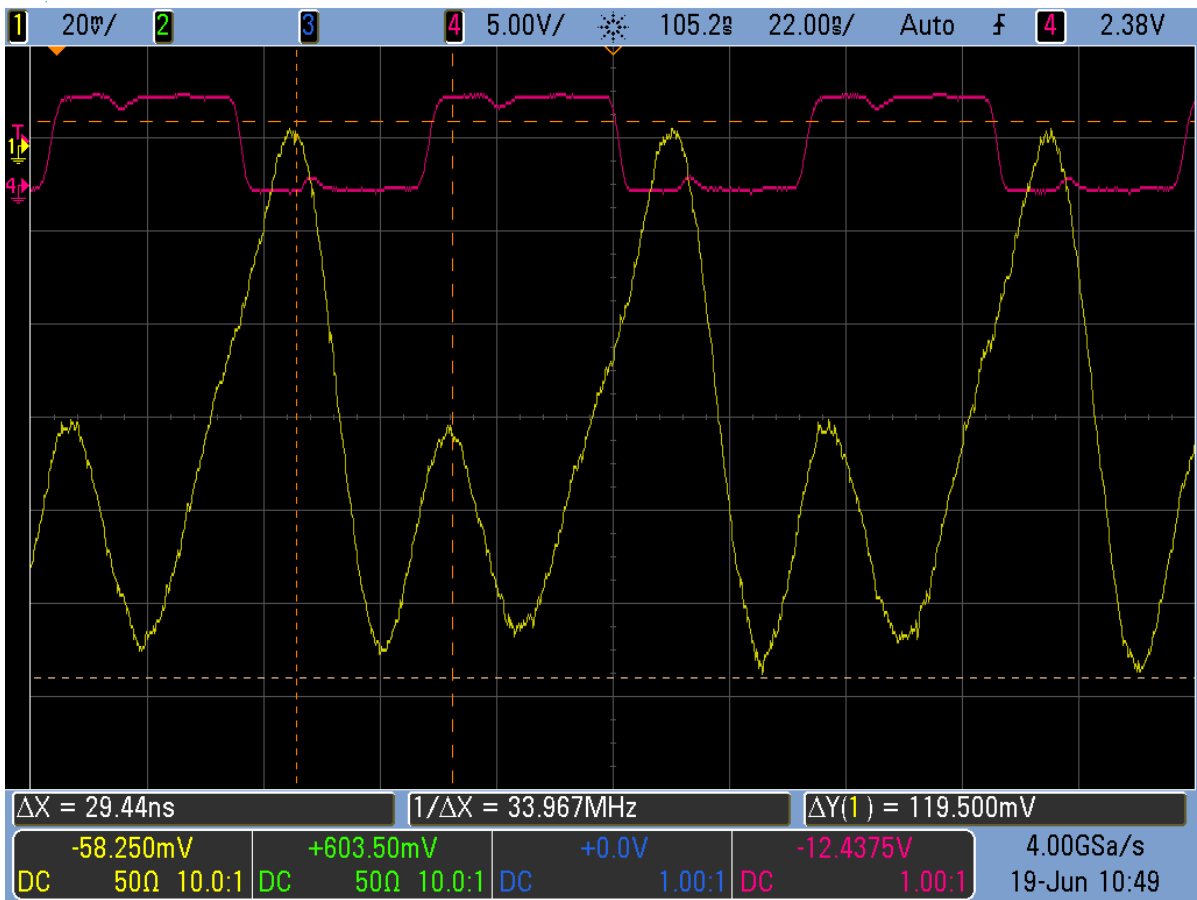


Figure 288: B1A4, S2D response at 14 MHz of main clock. Input pads not bonded.

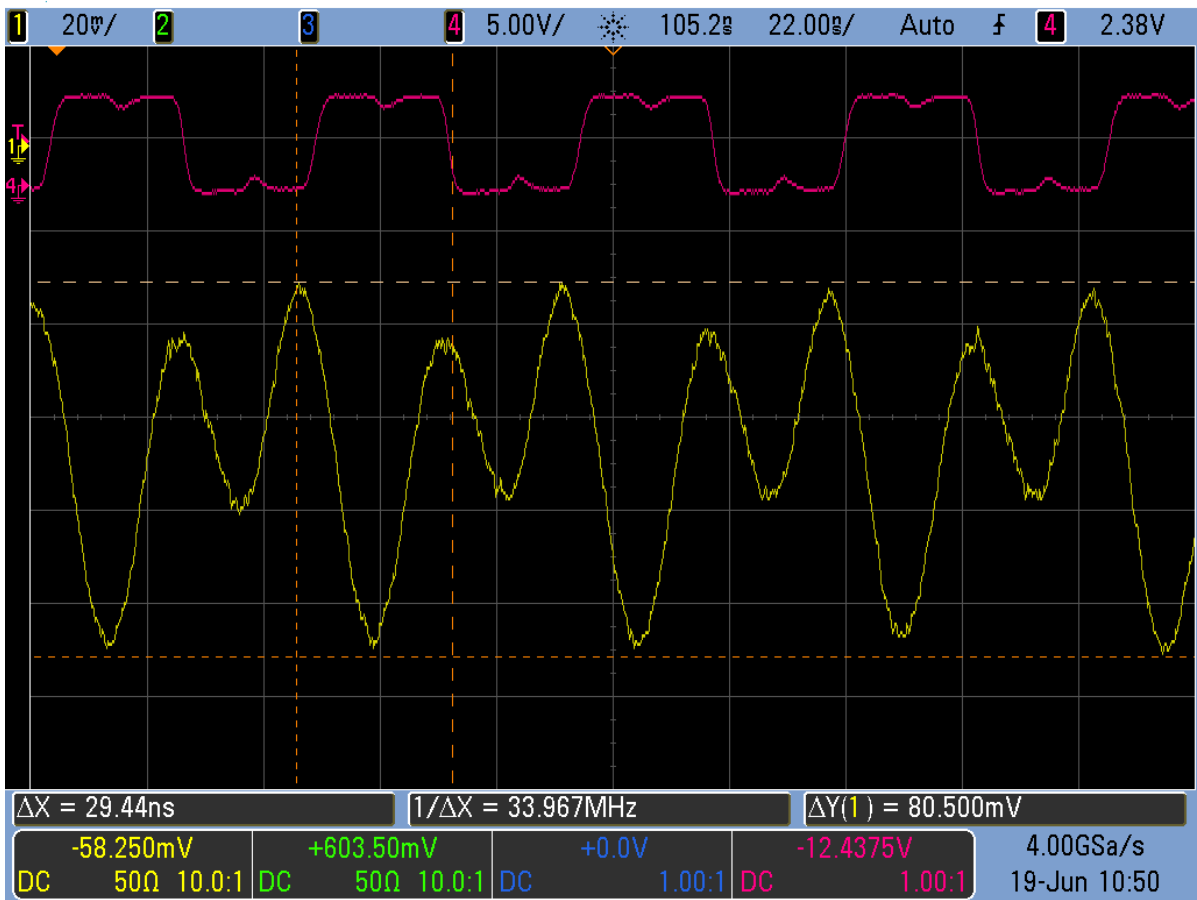


Figure 289: B1A4, S2D response at 20 MHz of main clock. Input pads not bonded.

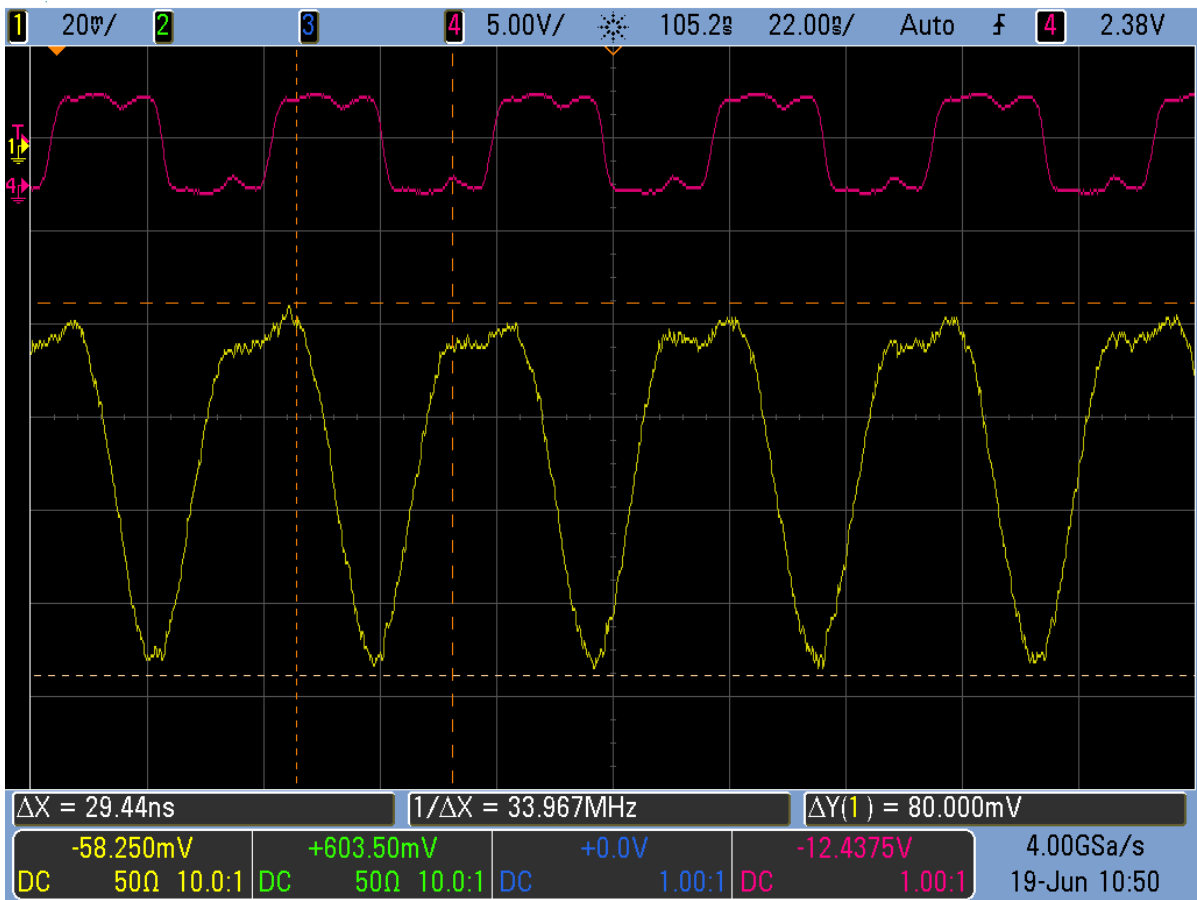


Figure 290: B1A4, S2D response at 24 MHz of main clock. Input pads not bonded.

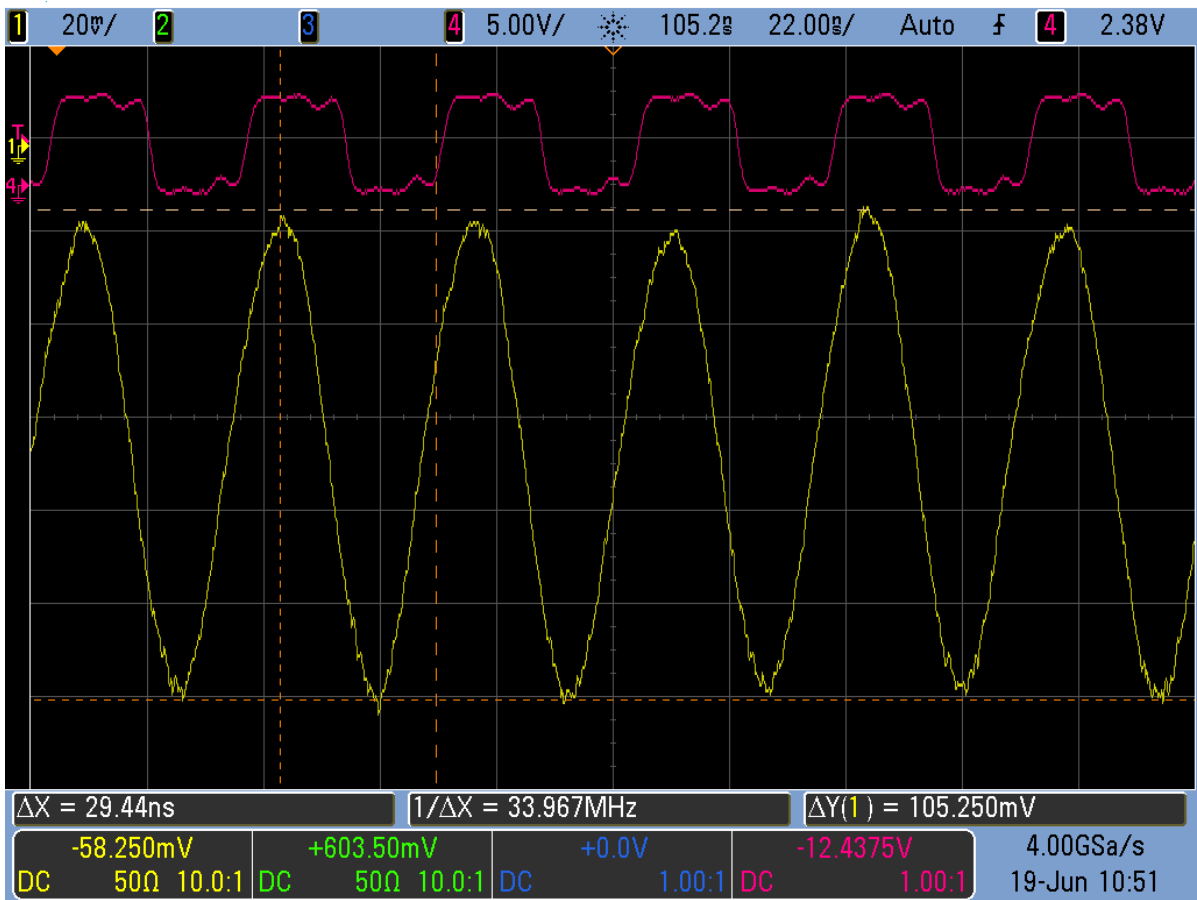


Figure 291: B1A4, S2D response at 27 MHz of main clock. Input pads not bonded.

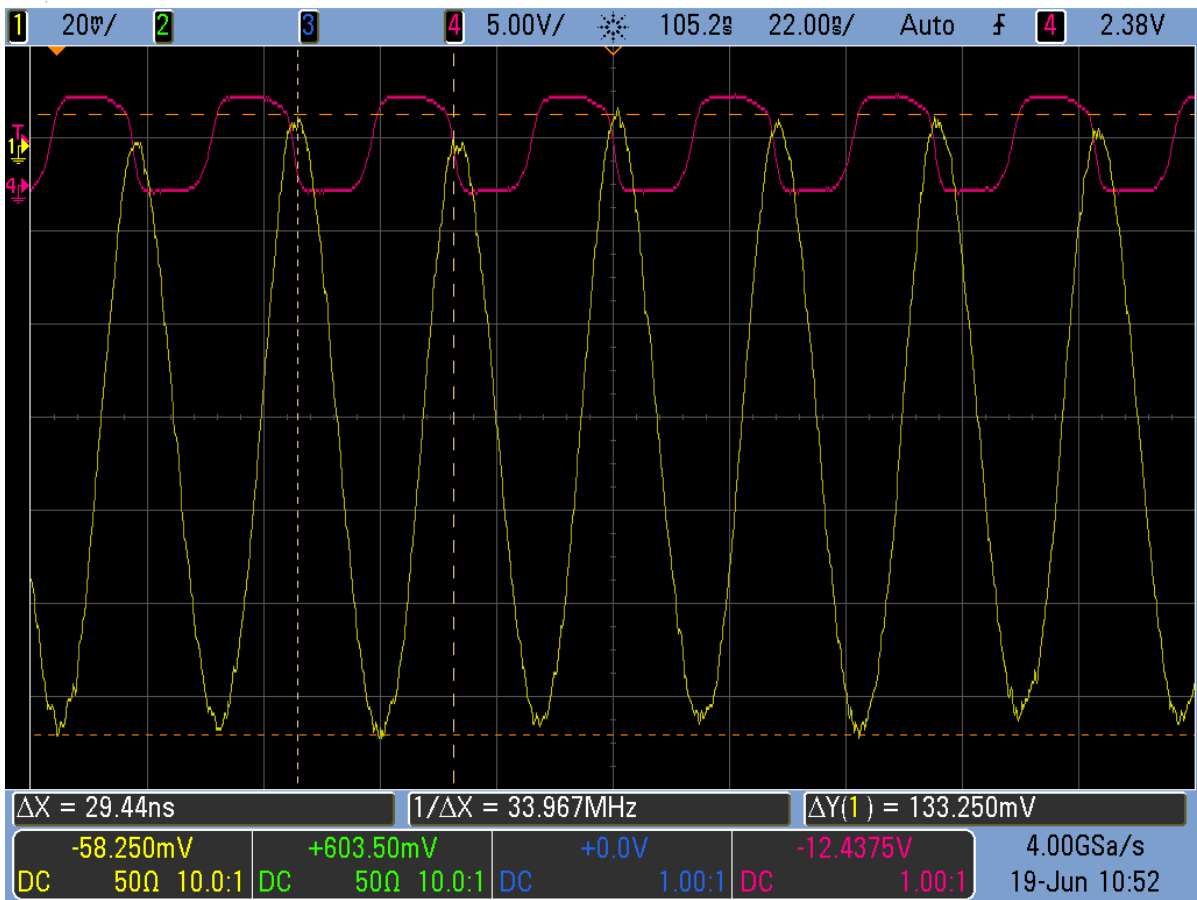


Figure 292: B1A4, S2D response at 33 MHz of main clock. Input pads not bonded.

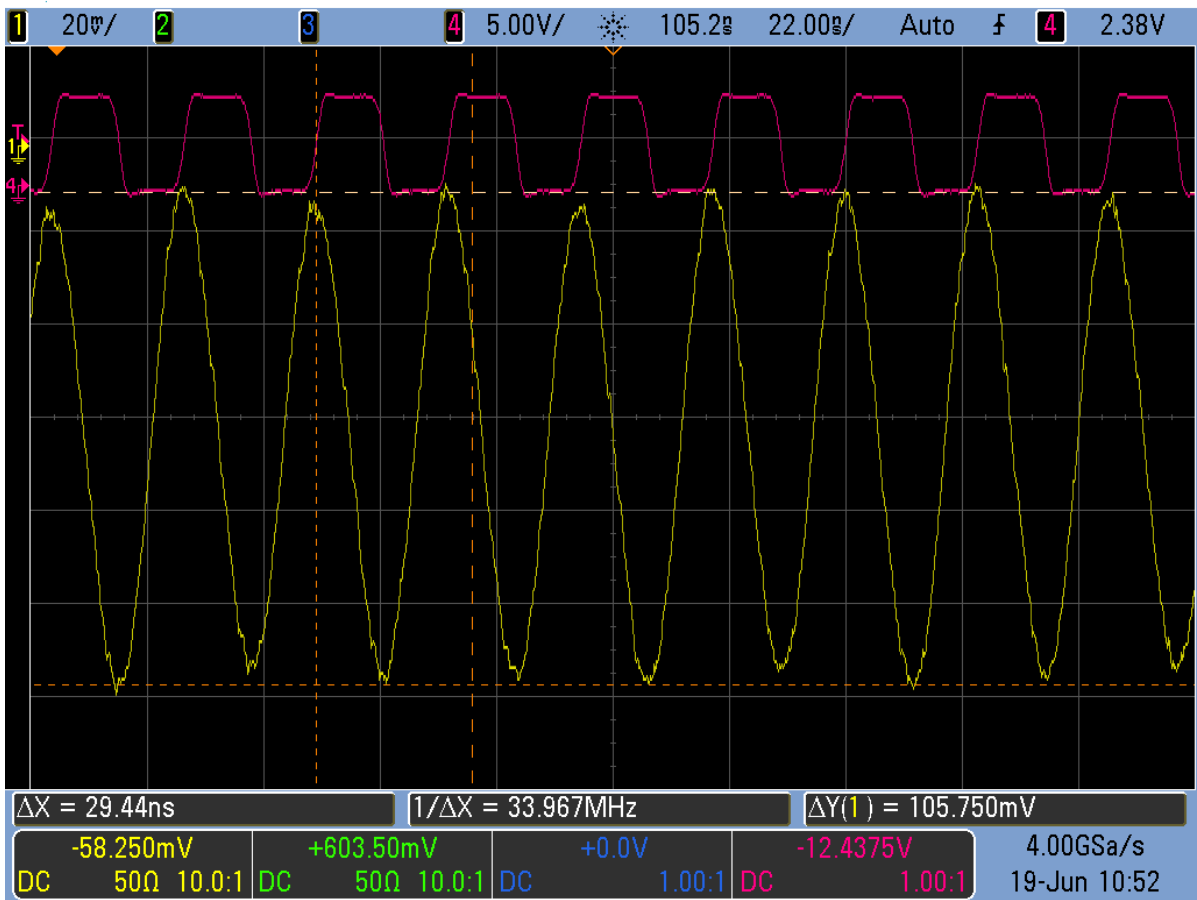


Figure 293: B1A4, S2D response at 40 MHz of main clock. Input pads not bonded.

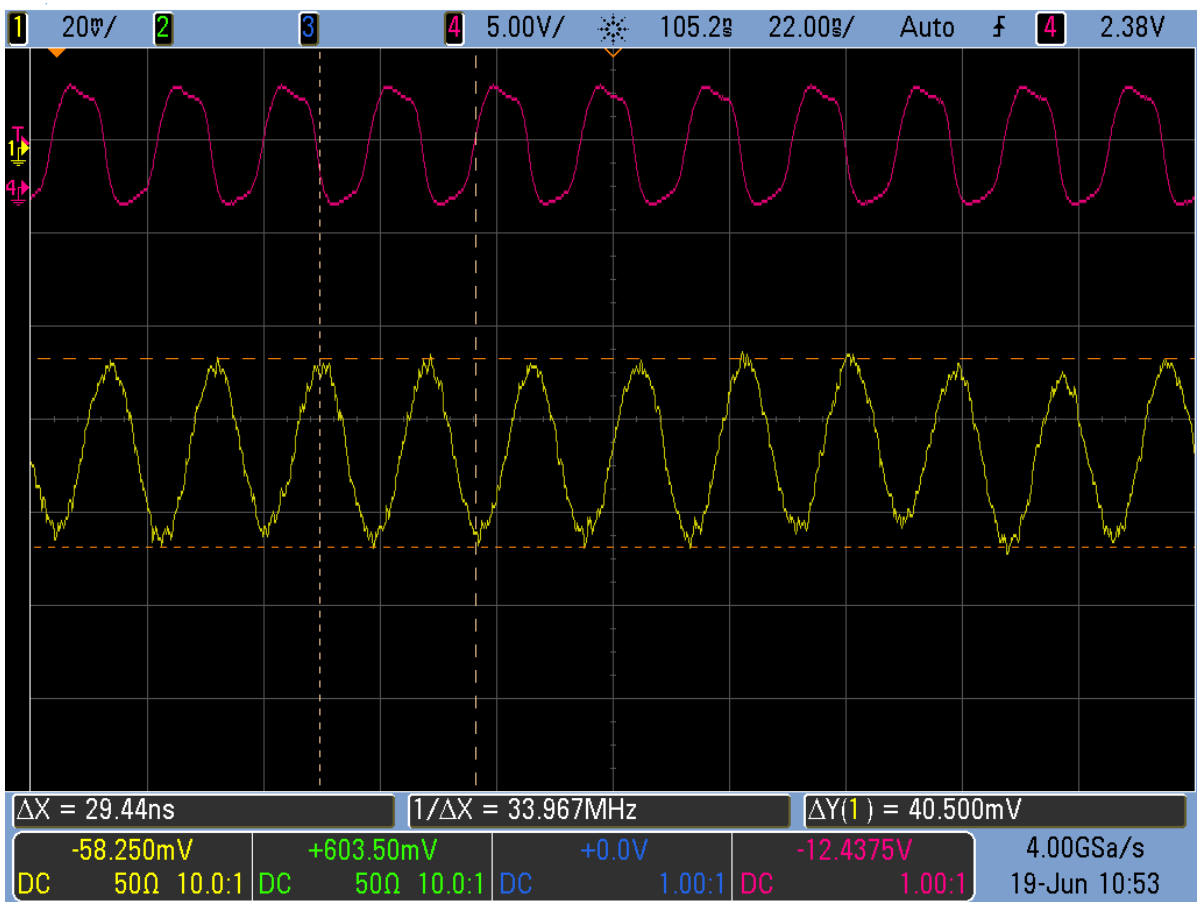


Figure 294: B1A4, S2D response at 50 MHz of main clock. Input pads not bonded.

5.1.5 Response at 1 MHz vs activity without input pads bonded

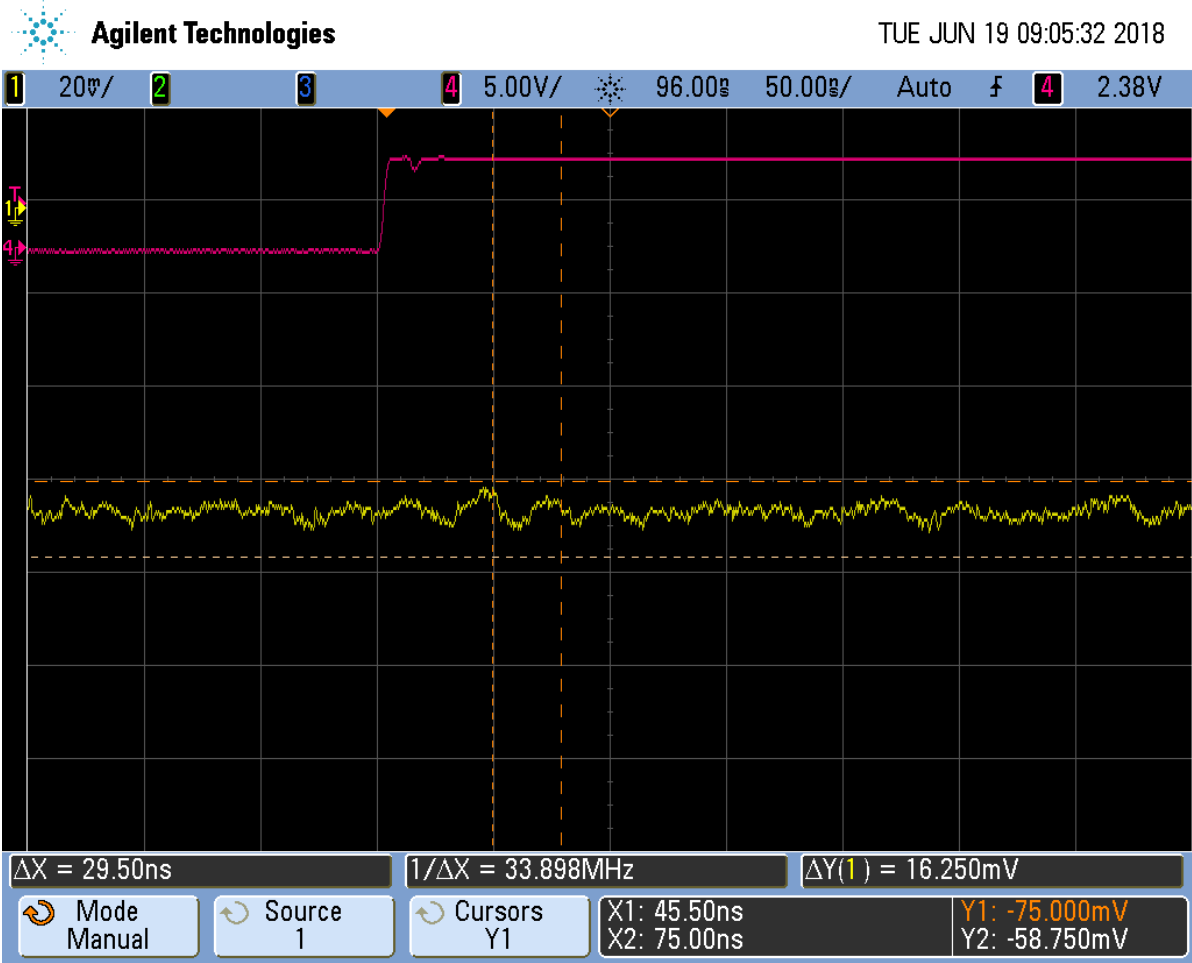


Figure 295: B1A4, S2D response at 1 MHz; 0 ADCs active. Input pads not bonded.

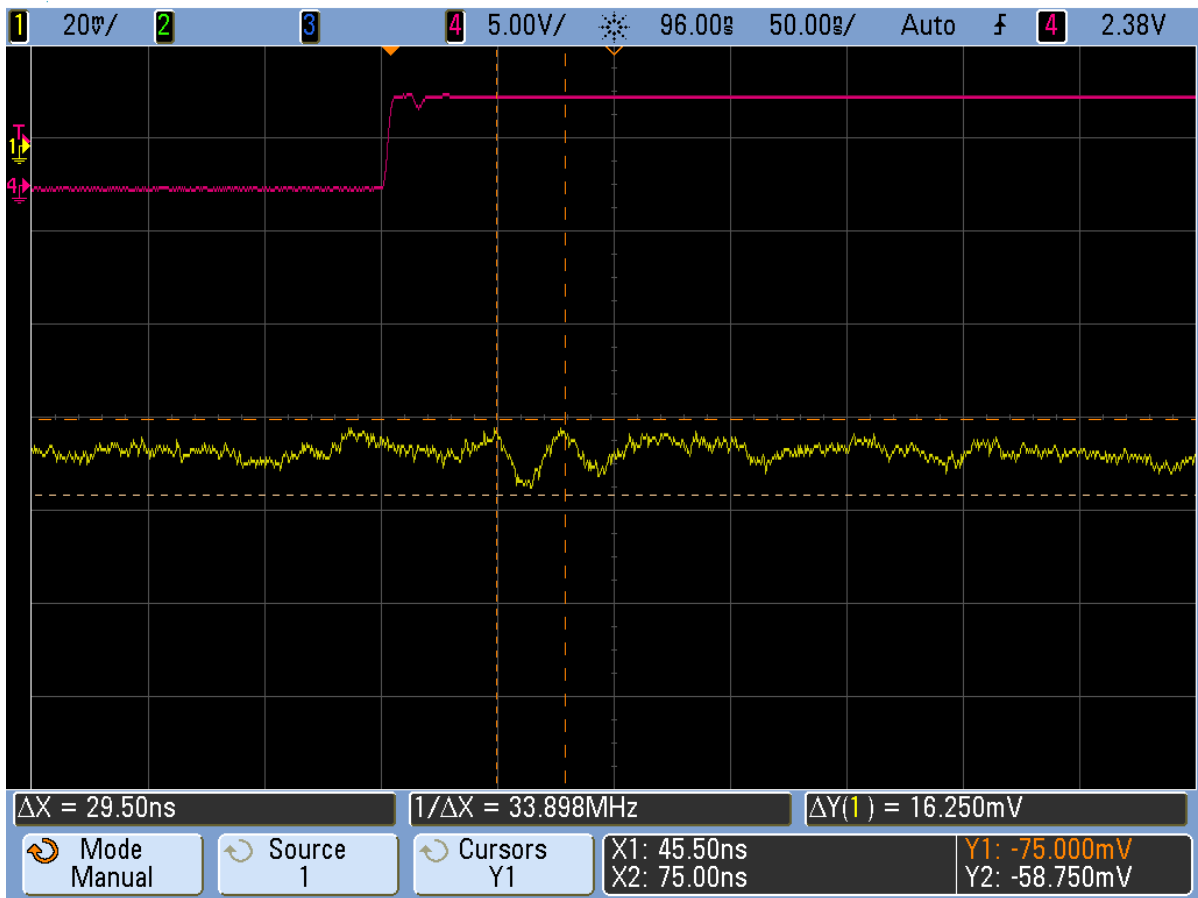


Figure 296: B1A4, S2D response at 1 MHz; 8 ADCs active. Input pads not bonded.

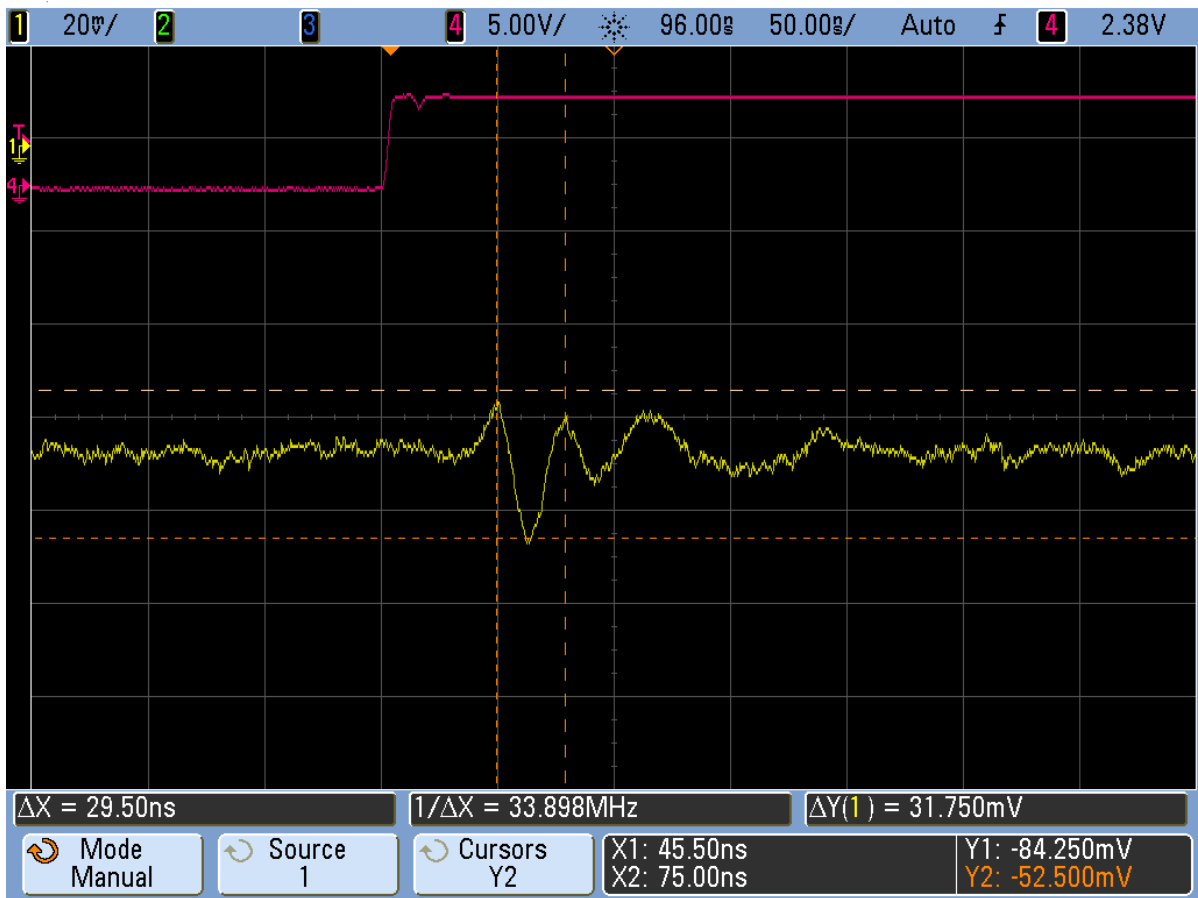


Figure 298: B1A4, S2D response at 1 MHz; 32 ADCs active. Input pads not bonded.

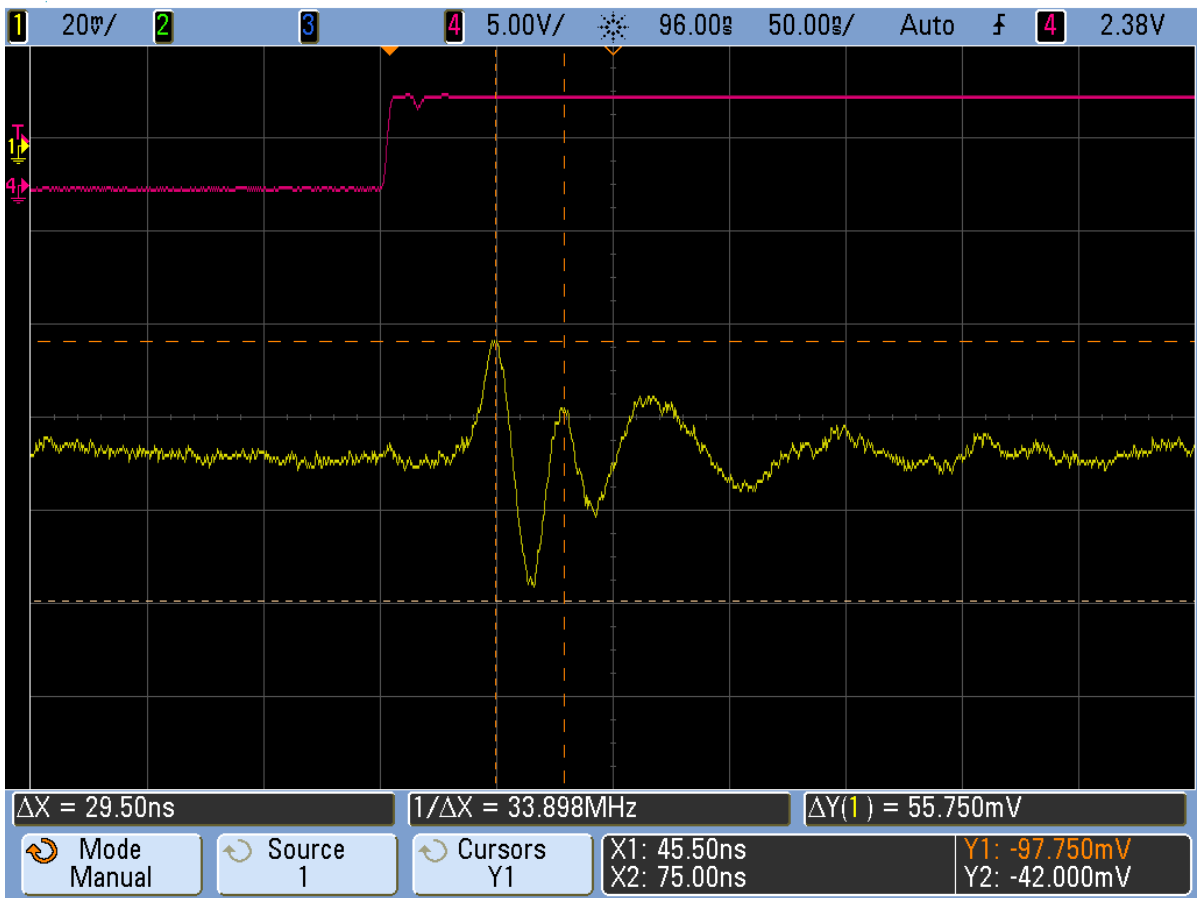


Figure 299: B1A4, S2D response at 1 MHz; 64 ADCs active. Input pads not bonded.

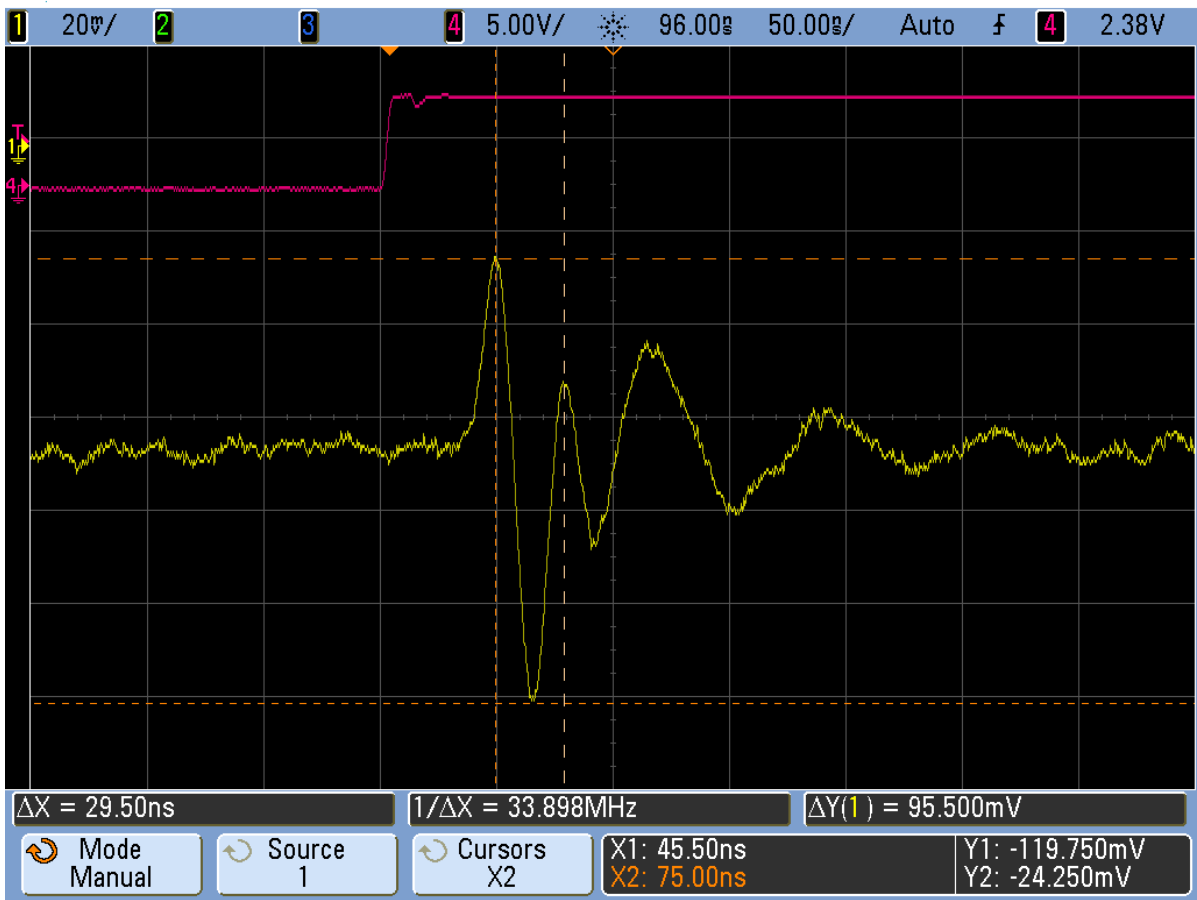


Figure 300: B1A4, S2D response at 1 MHz; 128 ADCs active. Input pads not bonded.

5.2 Before input pads bonded

5.2.1 Default ASIC configuration

ASIC configuration: JC configuration (tables 1 & 2).

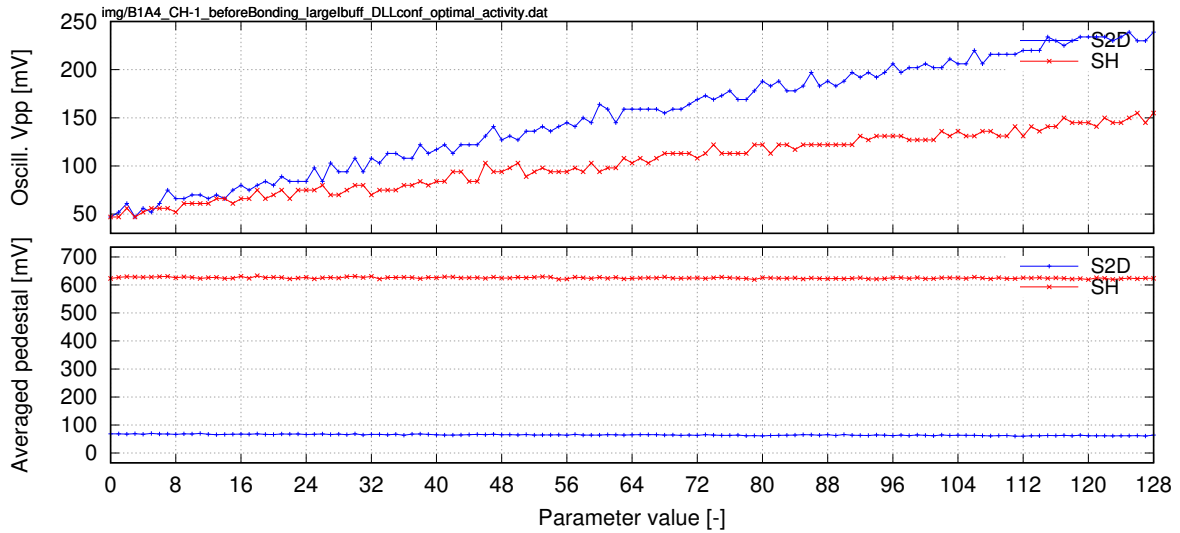


Figure 301: B1A4, channel -1, Before input pads bonded. Parameter=no. of active ADCs

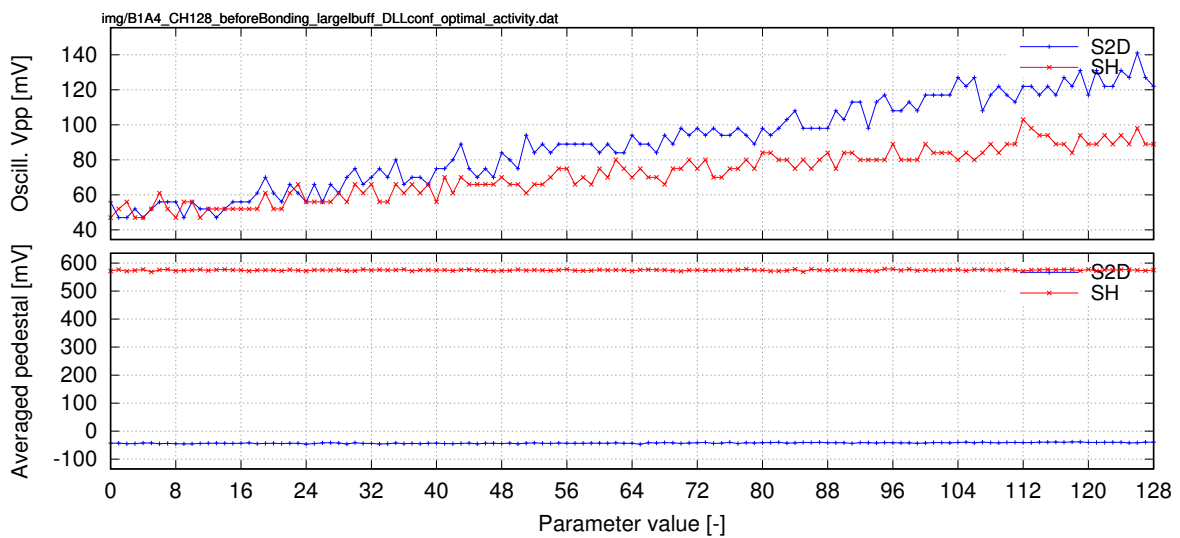


Figure 302: B1A4, channel 128, Before input pads bonded. Parameter=no. of active ADCs

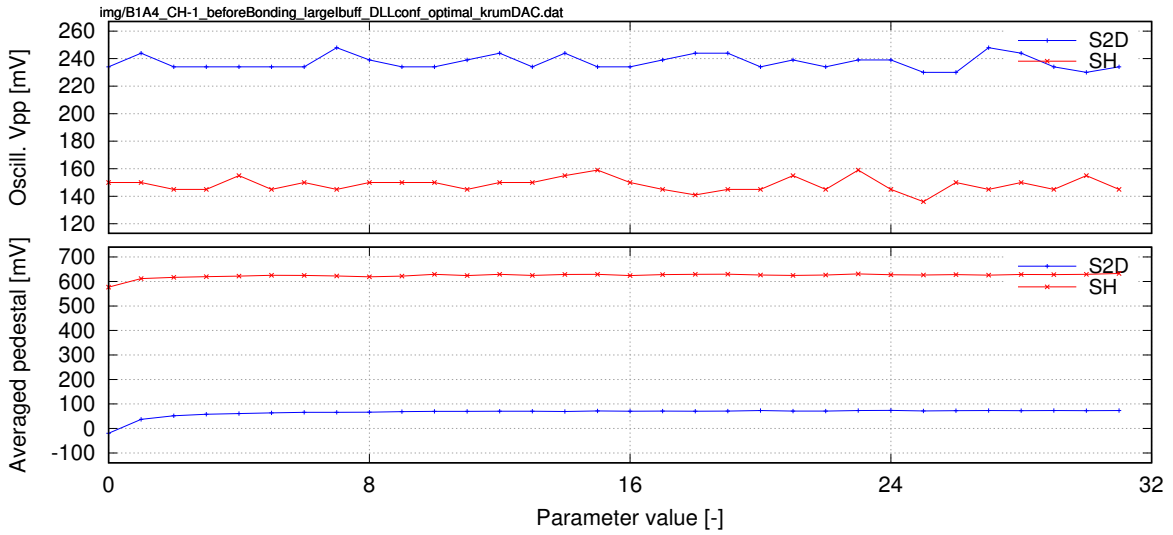


Figure 303: B1A4, channel -1, Before input pads bonded. Parameter=Krummenacher DAC

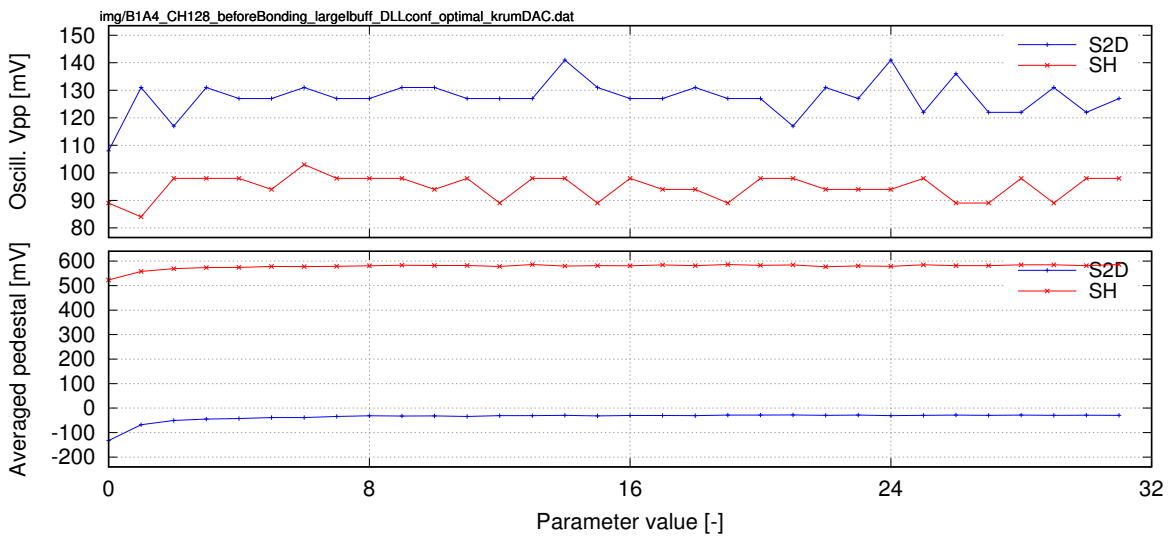


Figure 304: B1A4, channel 128, Before input pads bonded. Parameter=Krummenacher DAC

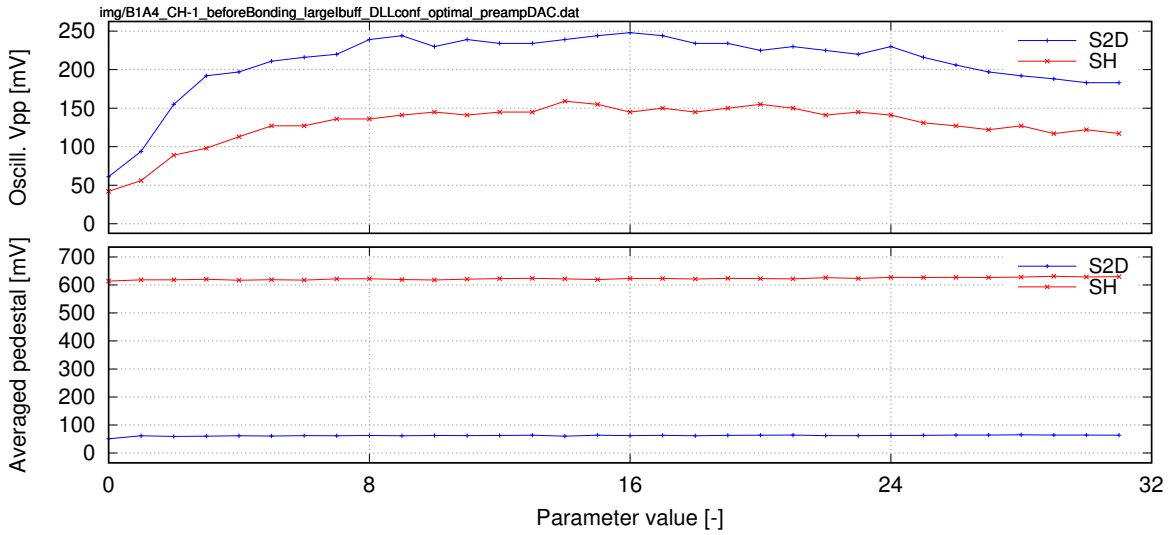


Figure 305: B1A4, channel -1, Before input pads bonded. Parameter=preamp DAC

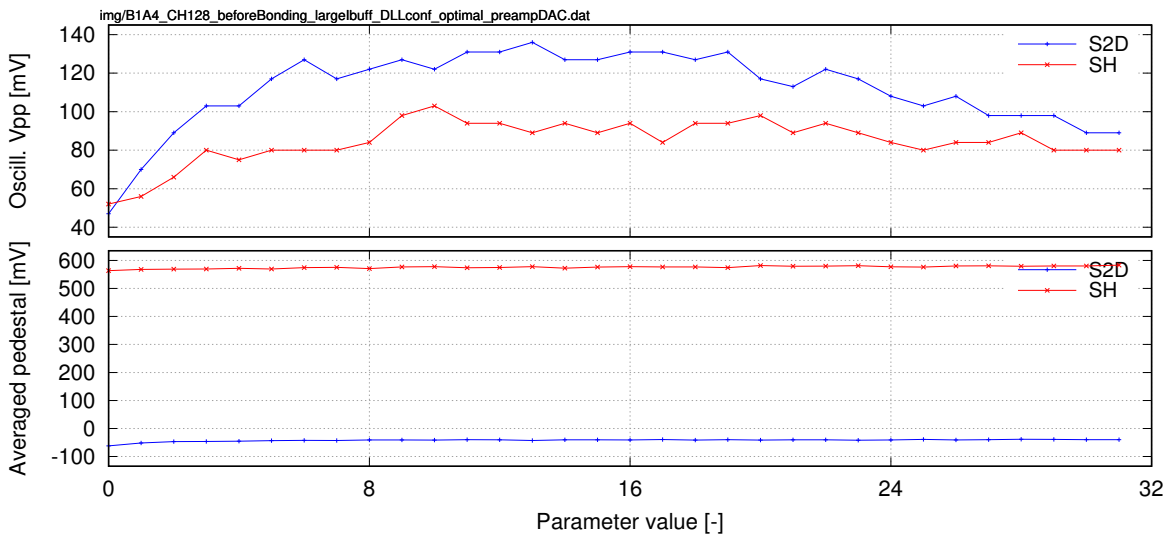


Figure 306: B1A4, channel 128, Before input pads bonded. Parameter=preamp DAC

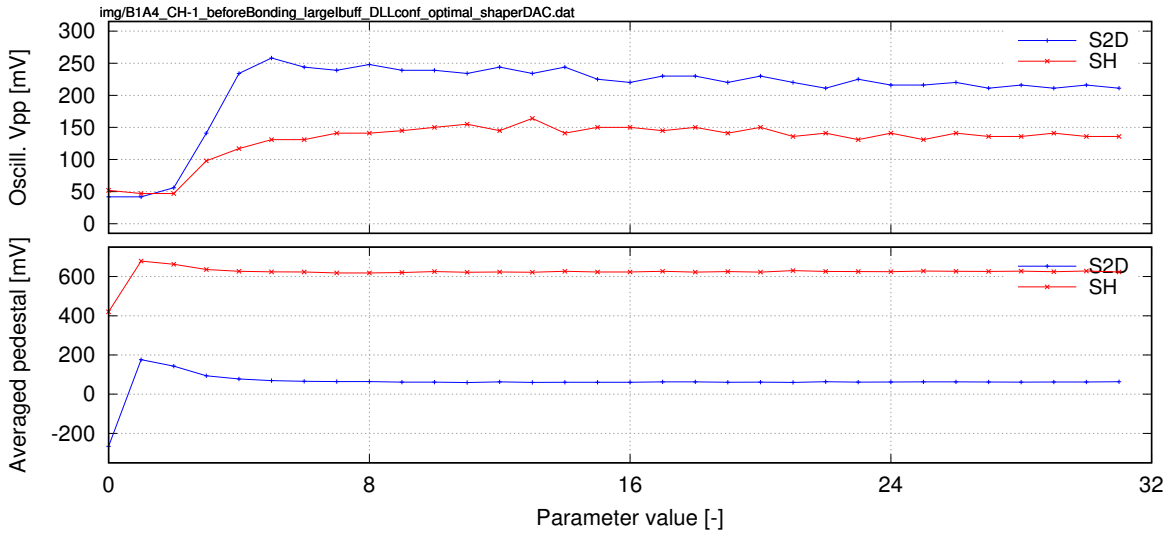


Figure 307: B1A4, channel -1, Before input pads bonded. Parameter=shaper DAC

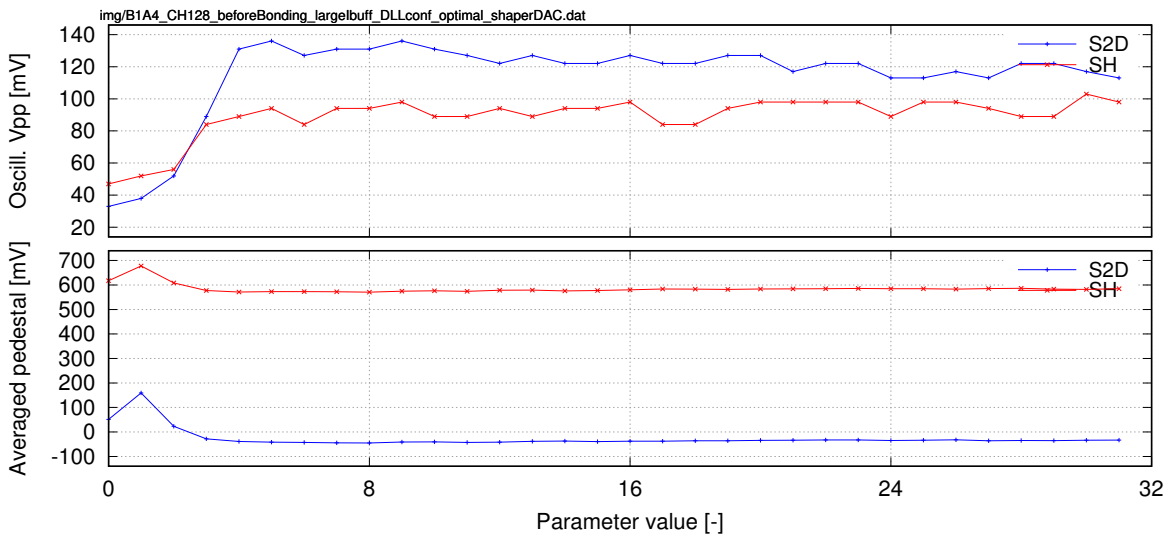


Figure 308: B1A4, channel 128, Before input pads bonded. Parameter=shaper DAC

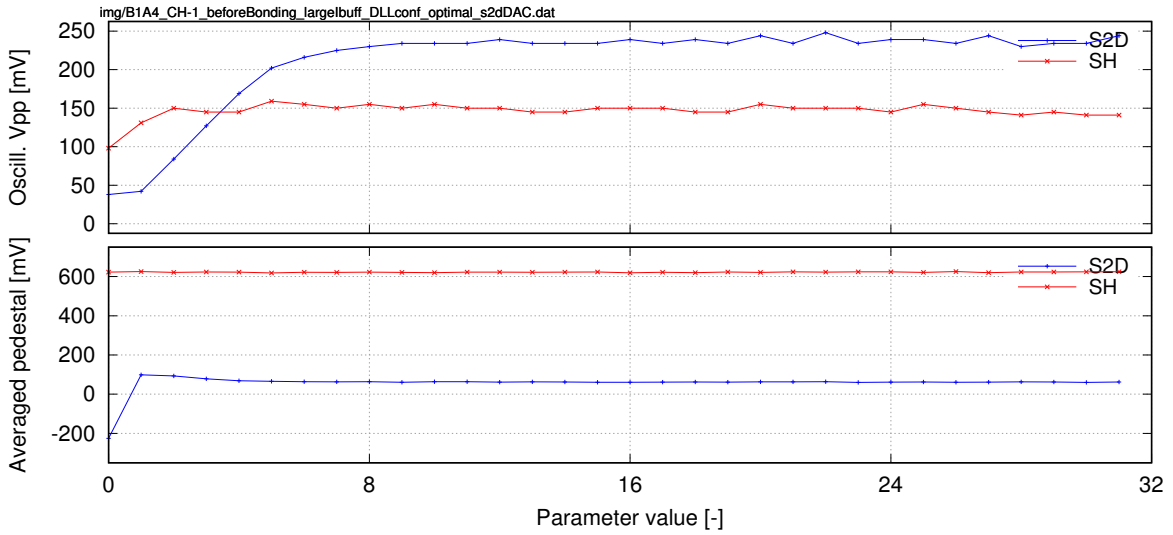


Figure 309: B1A4, channel -1, Before input pads bonded. Parameter=S2D DAC

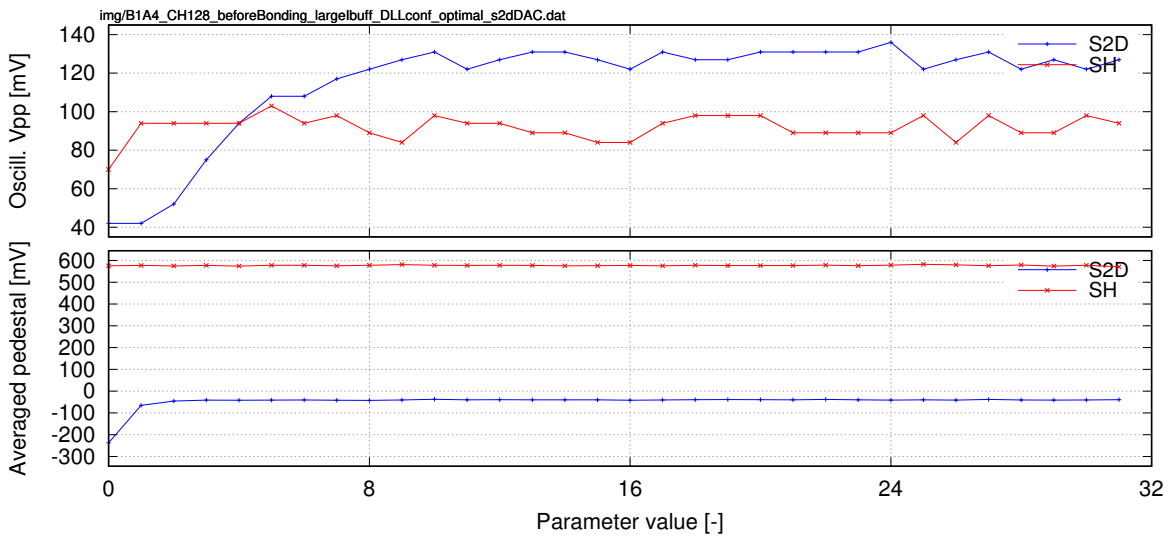


Figure 310: B1A4, channel 128, Before input pads bonded. Parameter=S2D DAC

5.2.2 Optimized test pulse and ADC delay

ASIC configuration: JC configuration (tables 1 & 2) + test pulse and ADC delay optimizations (table 3).

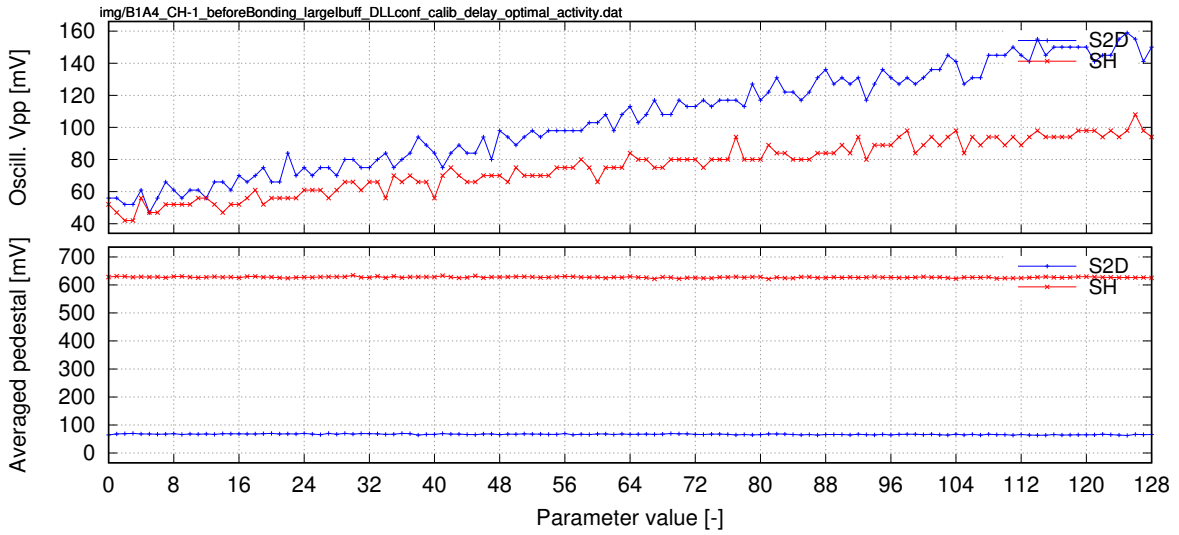


Figure 311: B1A4, channel -1, Before input pads bonded. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

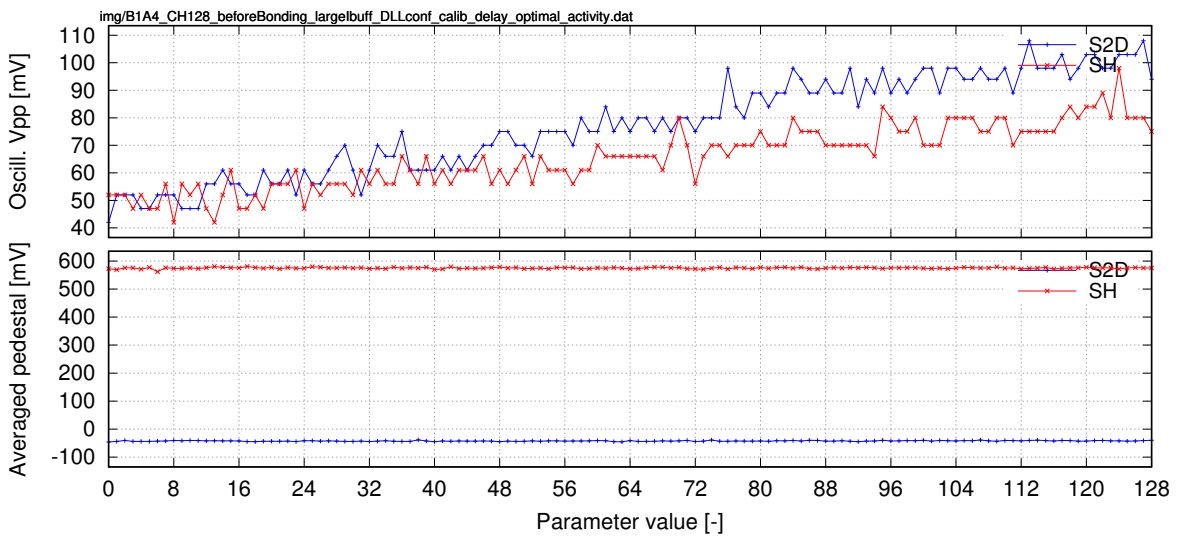


Figure 312: B1A4, channel 128, Before input pads bonded. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

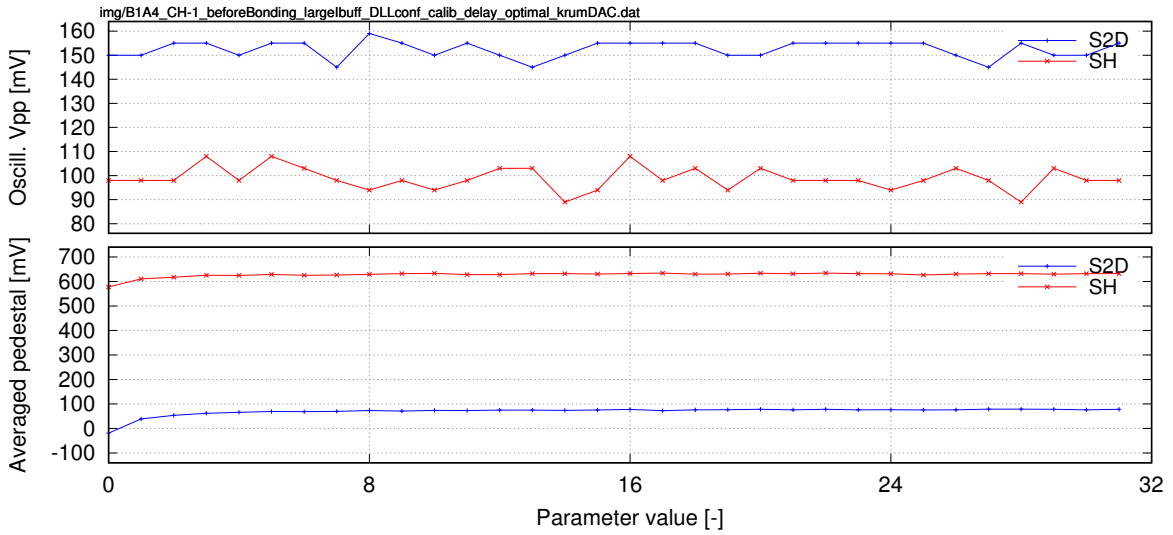


Figure 313: B1A4, channel -1, Before input pads bonded. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

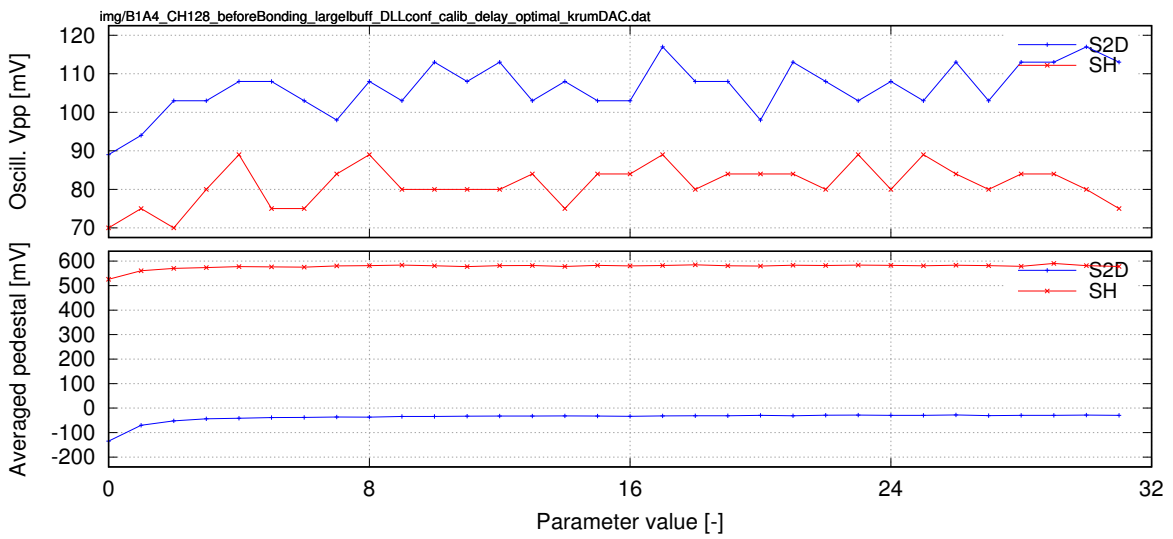


Figure 314: B1A4, channel 128, Before input pads bonded. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

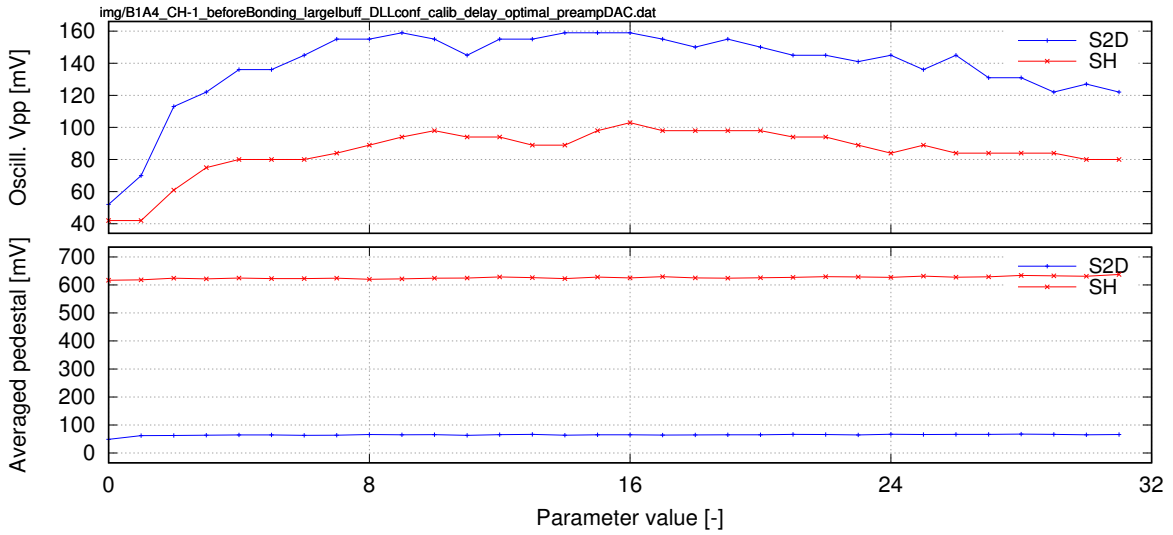


Figure 315: B1A4, channel -1, Before input pads bonded. Optimized test pulse and ADC delay. Parameter=preamp DAC

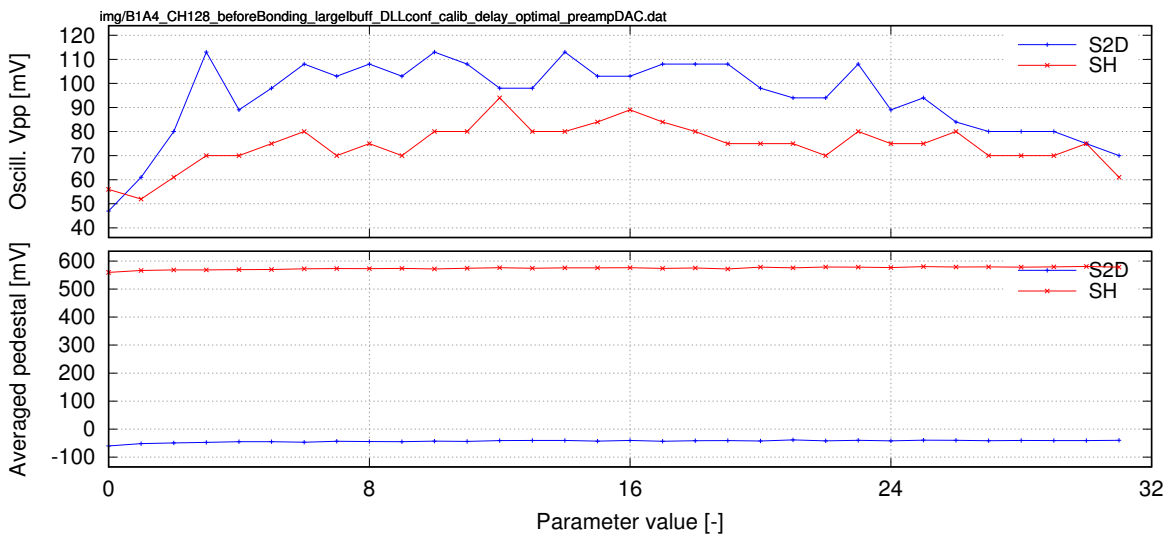


Figure 316: B1A4, channel 128, Before input pads bonded. Optimized test pulse and ADC delay. Parameter=preamp DAC

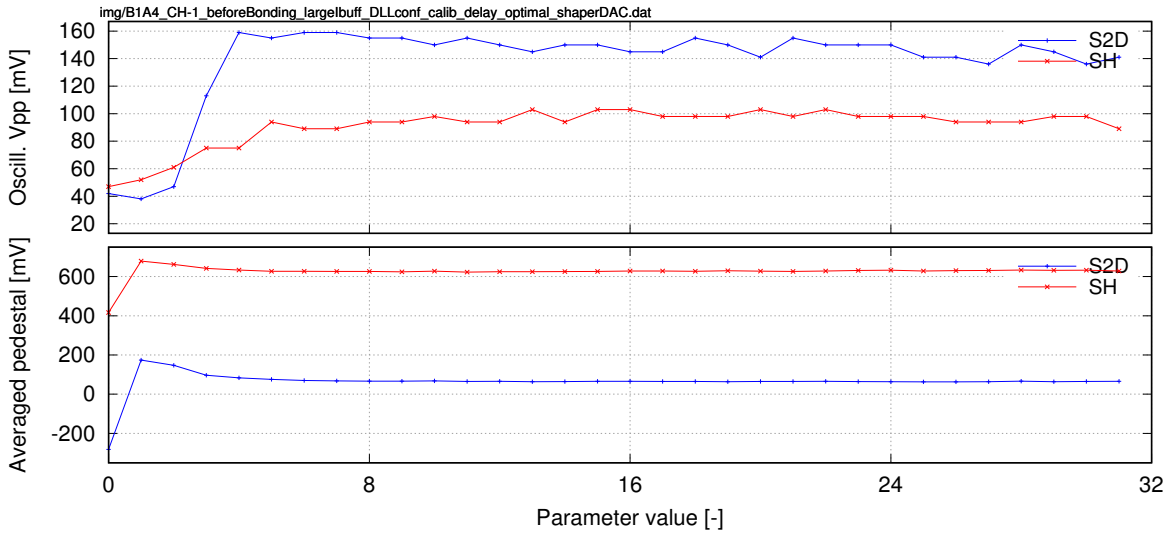


Figure 317: B1A4, channel -1, Before input pads bonded. Optimized test pulse and ADC delay. Parameter=shaper DAC

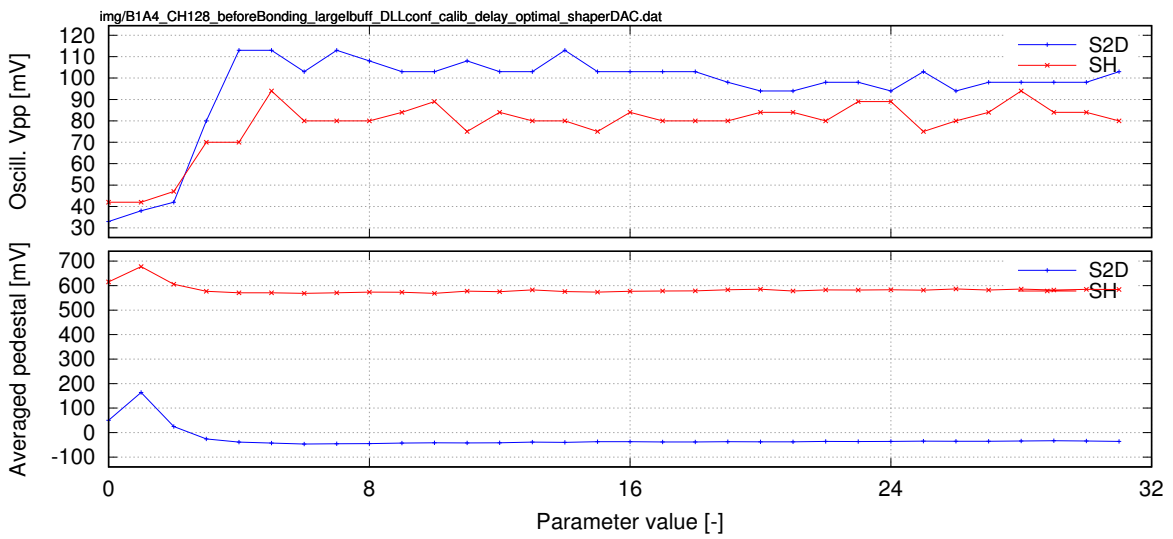


Figure 318: B1A4, channel 128, Before input pads bonded. Optimized test pulse and ADC delay. Parameter=shaper DAC

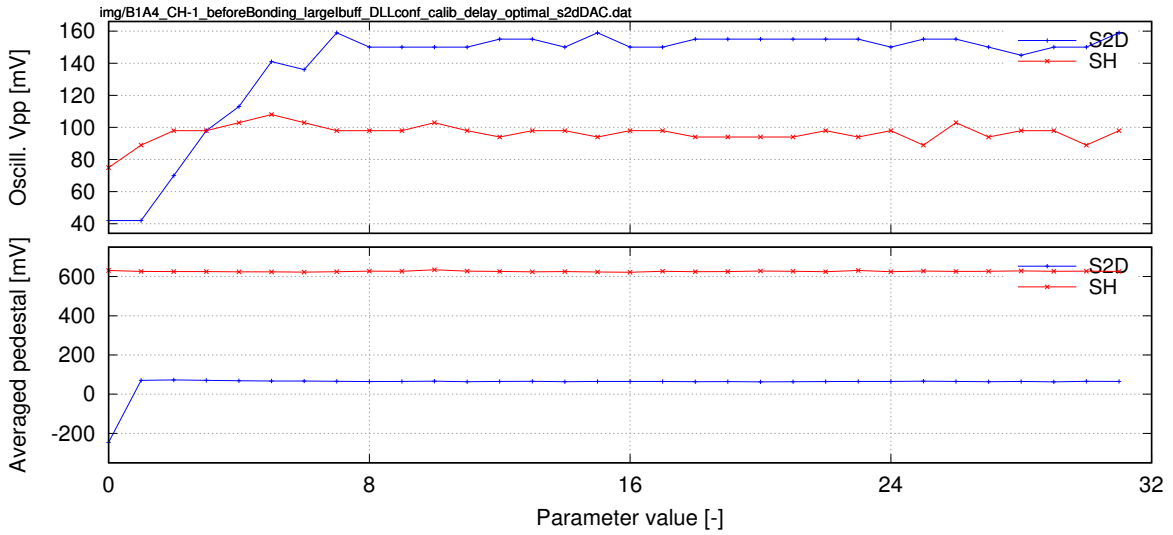


Figure 319: B1A4, channel -1, Before input pads bonded. Optimized test pulse and ADC delay. Parameter=S2D DAC

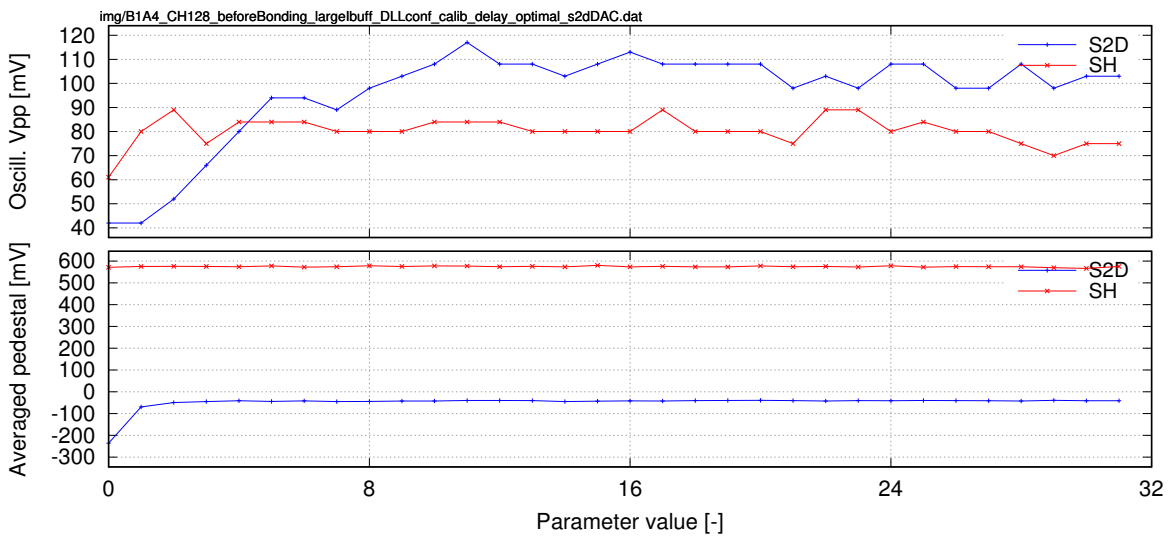


Figure 320: B1A4, channel 128, Before input pads bonded. Optimized test pulse and ADC delay. Parameter=S2D DAC

5.3 Cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized

Cap-PCB assembled, bonded to SALT input pads 0 and 127, two 12 pF capacitors assembled to the cap-PCB.

Ibuf current maximized – 1 kΩ resistor between VDDA and Ibuf pad.

5.3.1 Default ASIC configuration

ASIC configuration: JC configuration (tables 1 & 2).

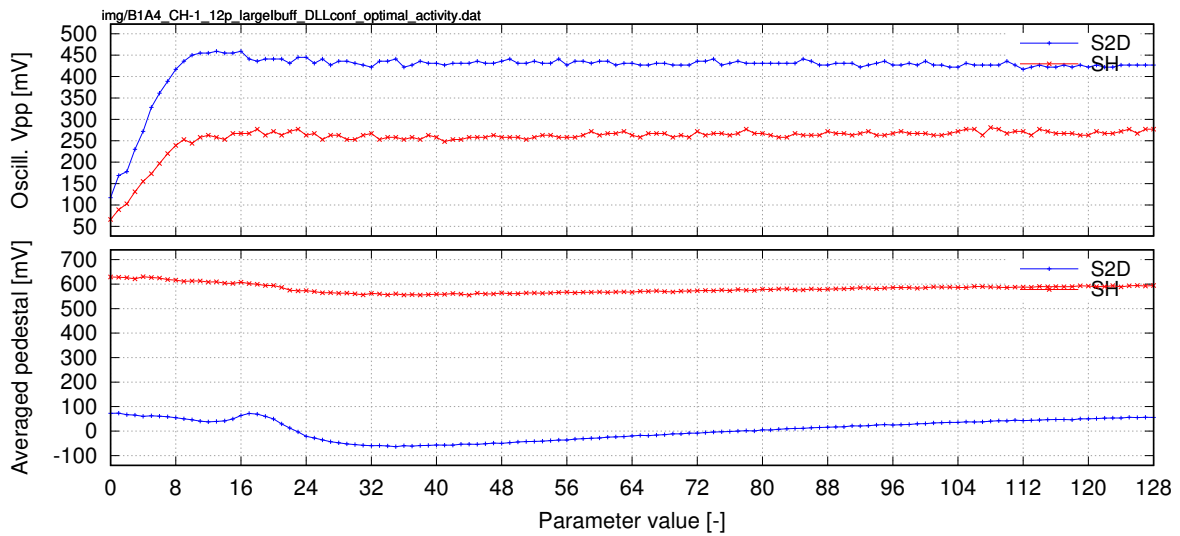


Figure 321: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Parameter=no. of active ADCs

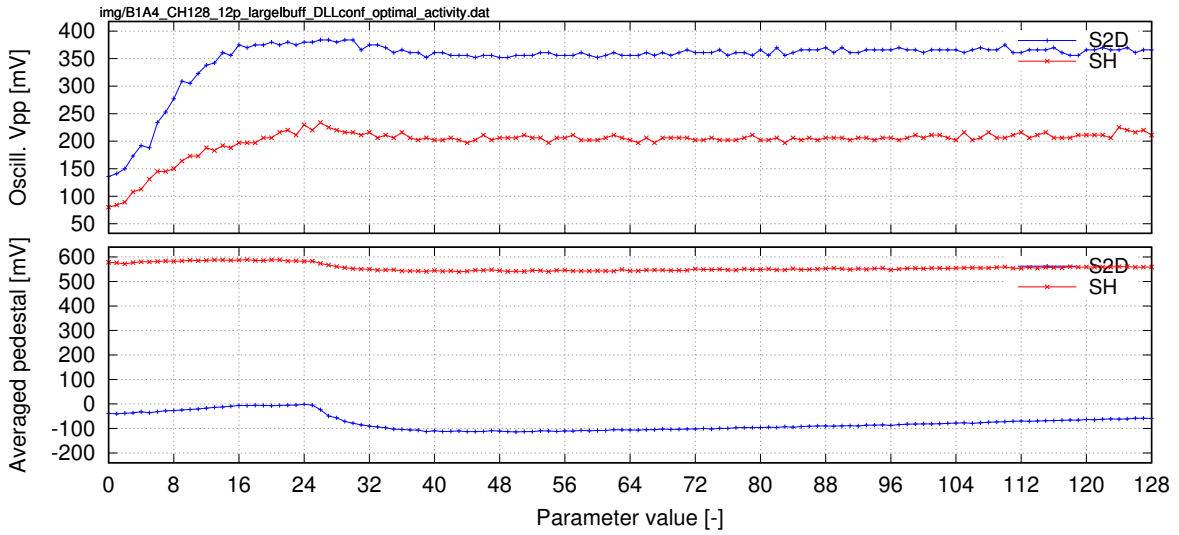


Figure 322: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Parameter=no. of active ADCs

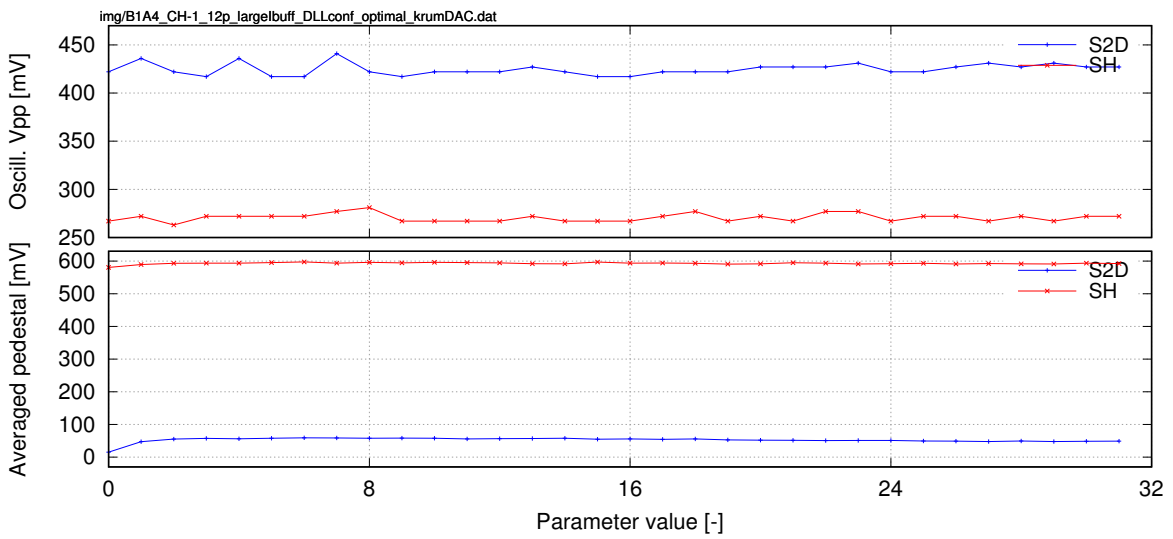


Figure 323: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Parameter=Krummenacher DAC

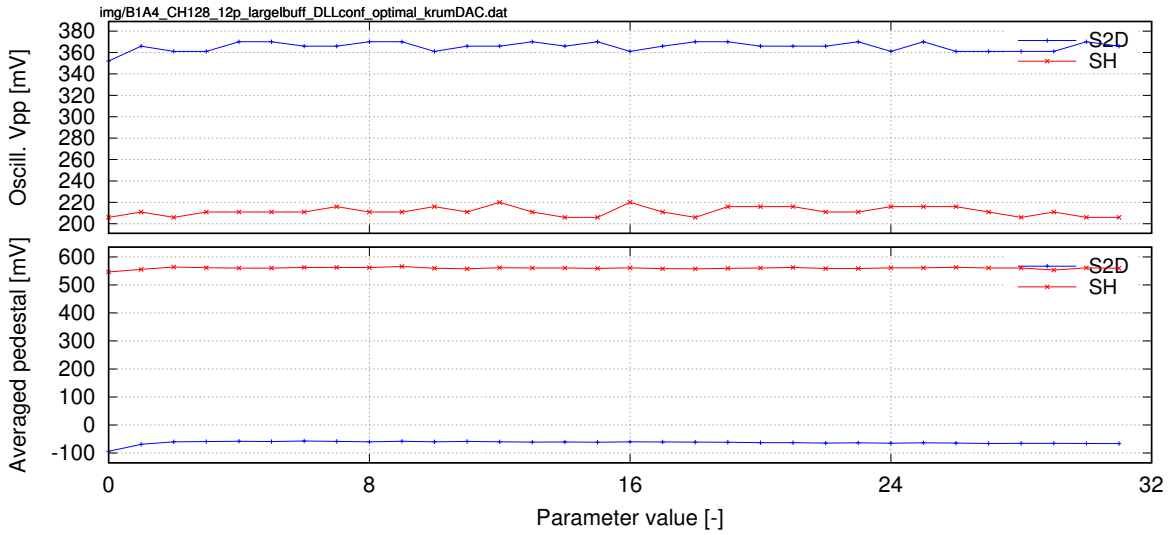


Figure 324: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Parameter=Krummenacher DAC

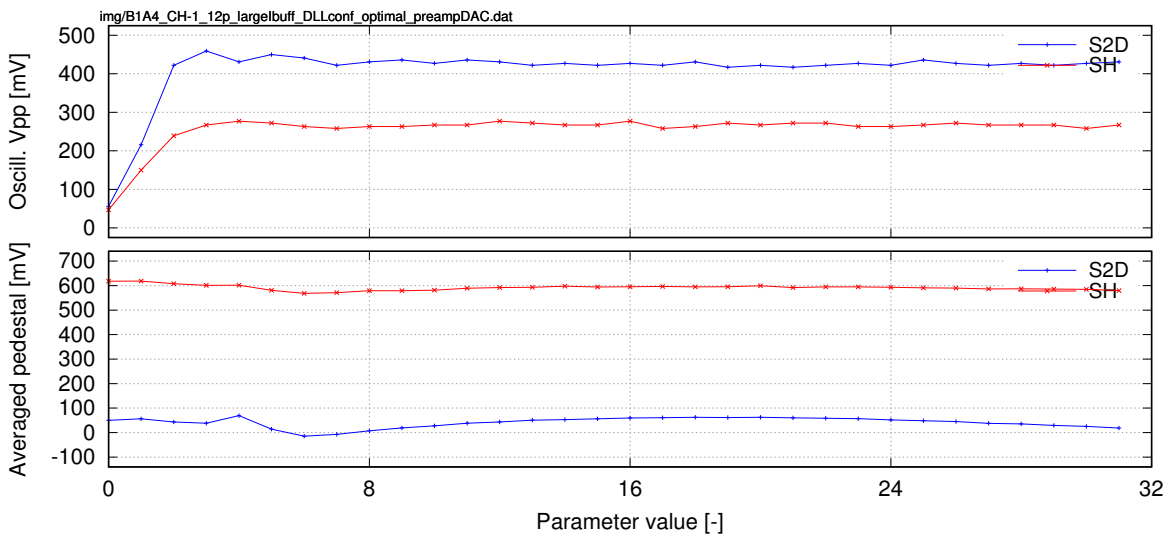


Figure 325: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Parameter=preamp DAC

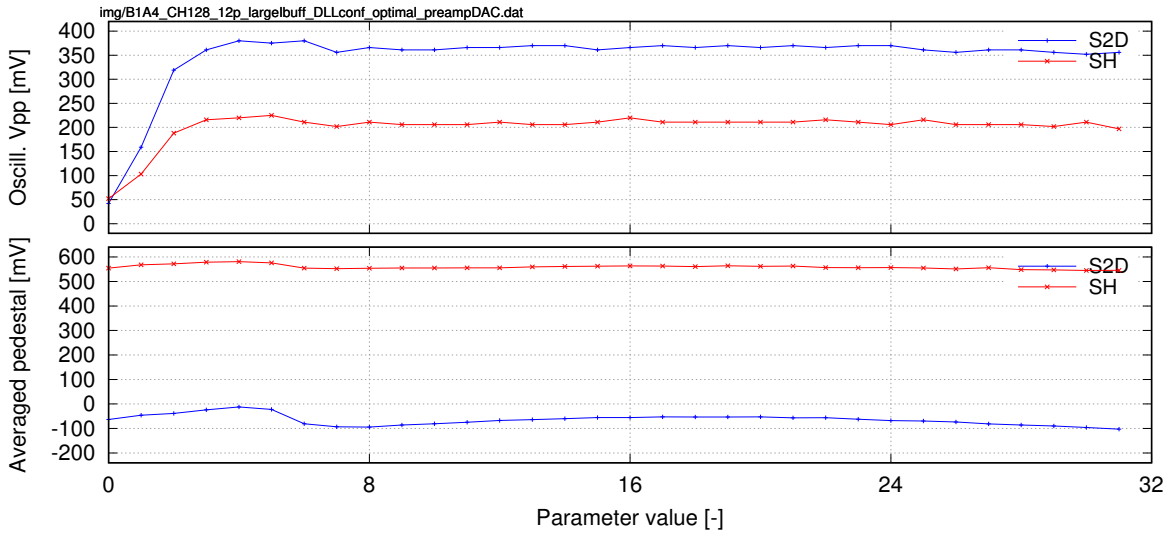


Figure 326: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Parameter=preamp DAC

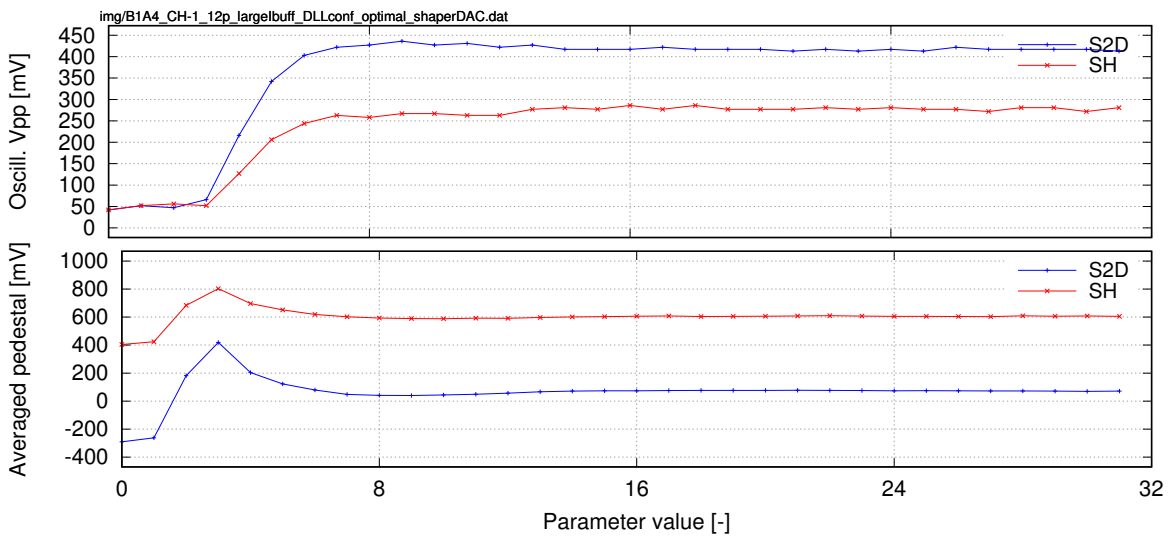


Figure 327: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Parameter=shaper DAC

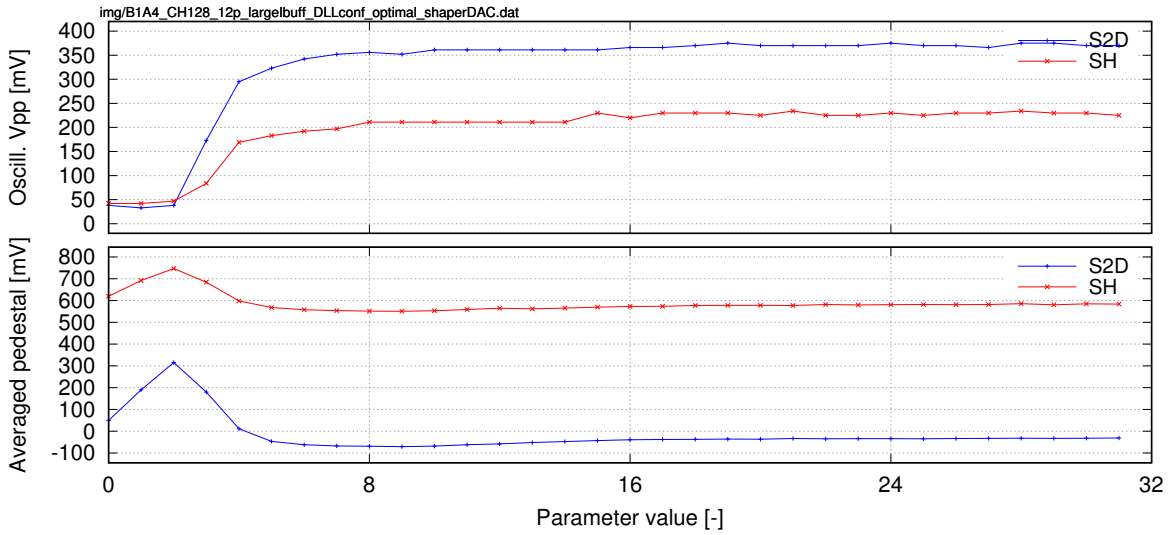


Figure 328: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Parameter=shaper DAC

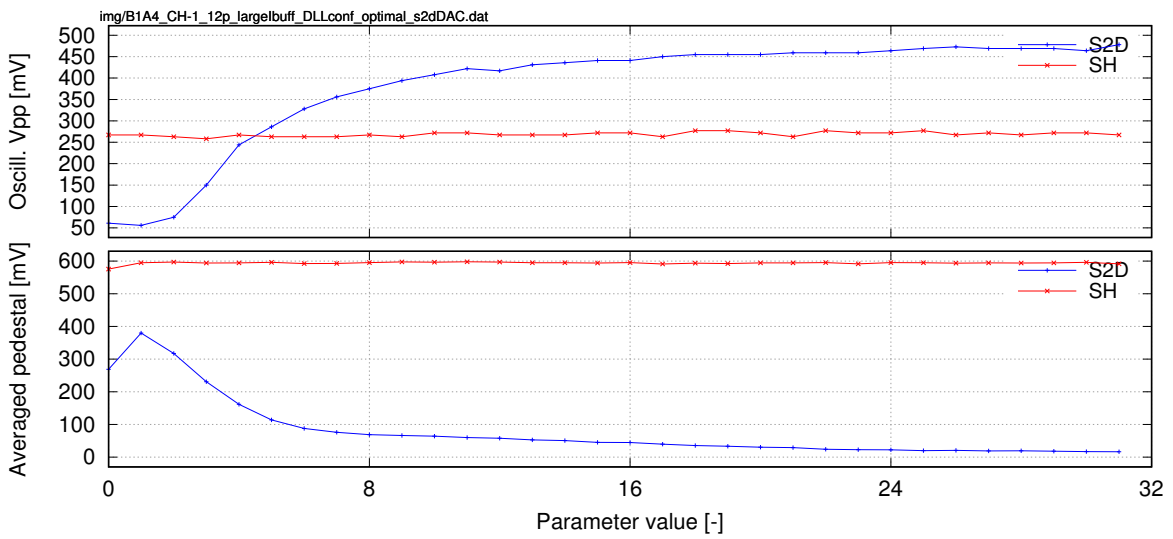


Figure 329: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Parameter=S2D DAC

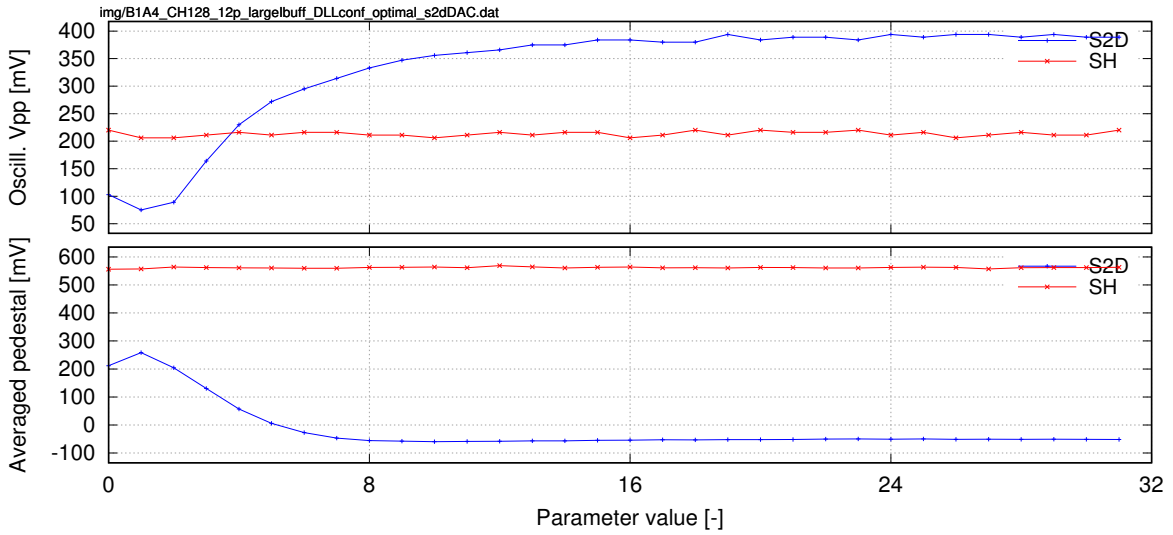


Figure 330: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Parameter=S2D DAC

5.3.2 Optimized test pulse and ADC delay

ASIC configuration: JC configuration (tables 1 & 2) + test pulse and ADC delay optimizations (table 3).

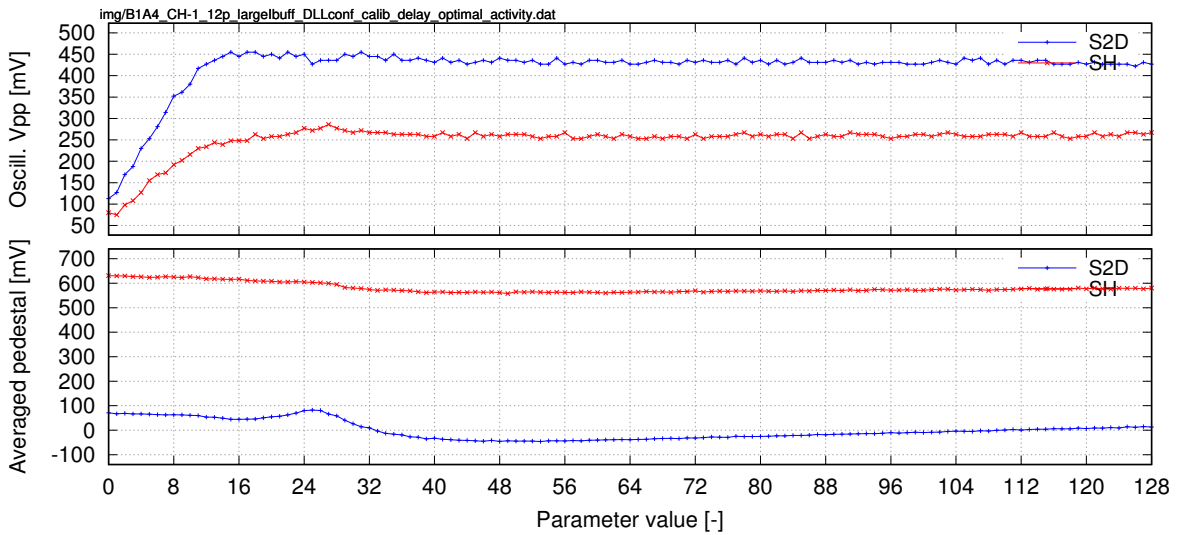


Figure 331: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

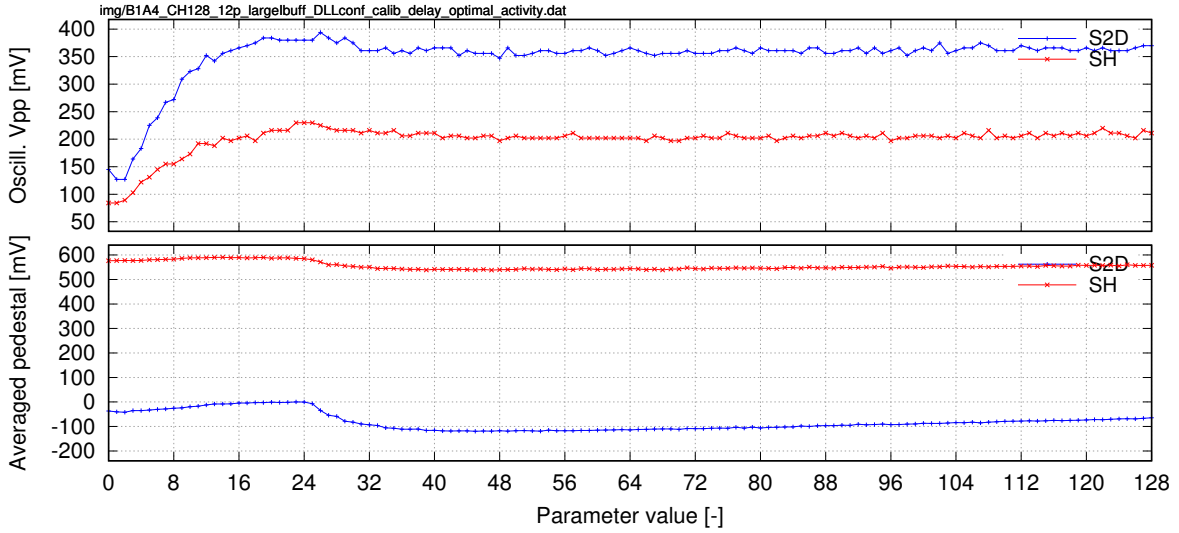


Figure 332: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

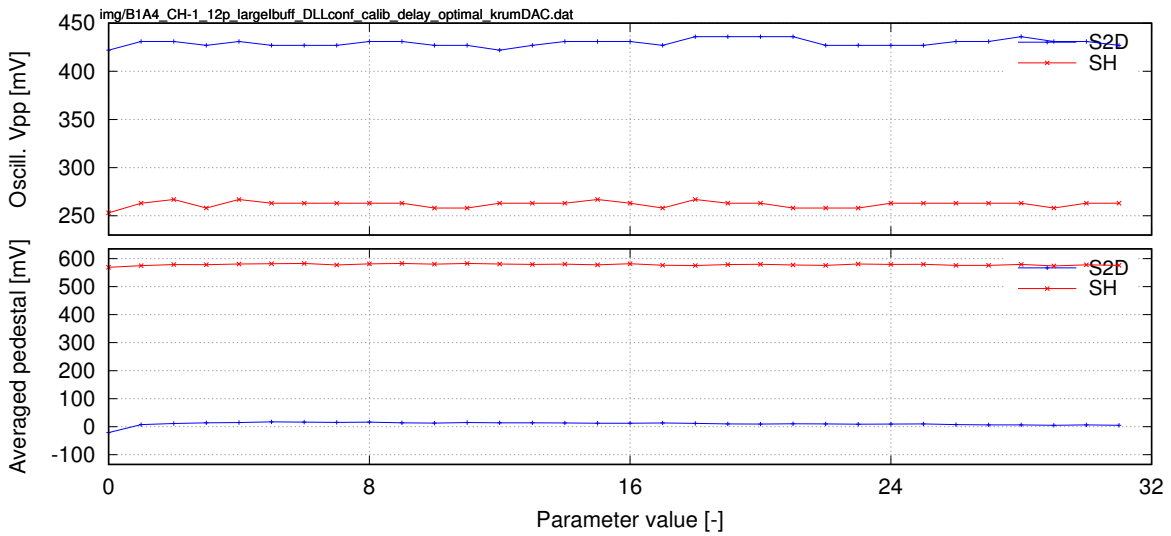


Figure 333: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

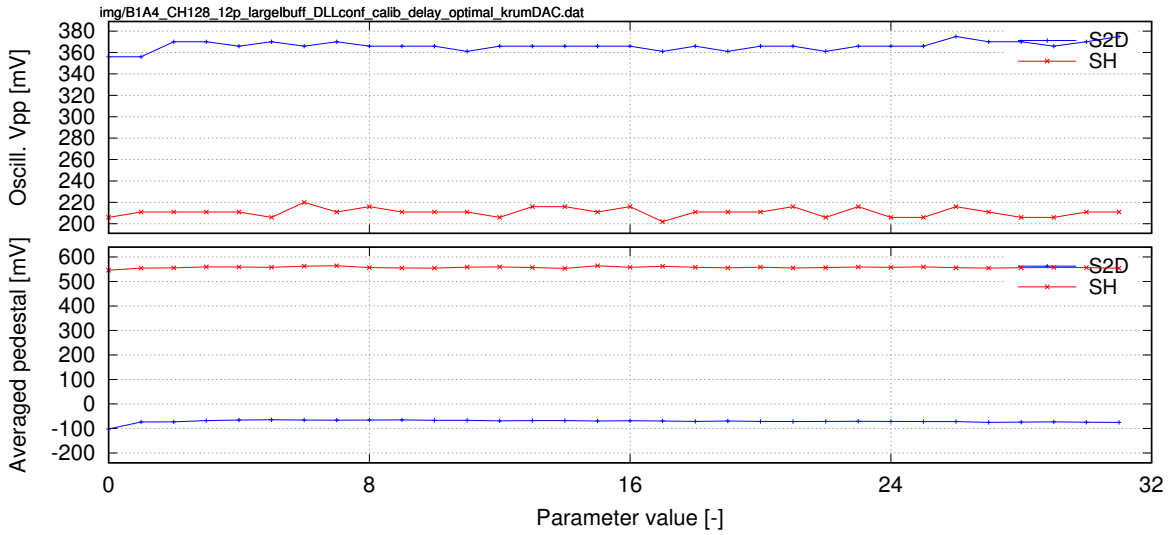


Figure 334: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

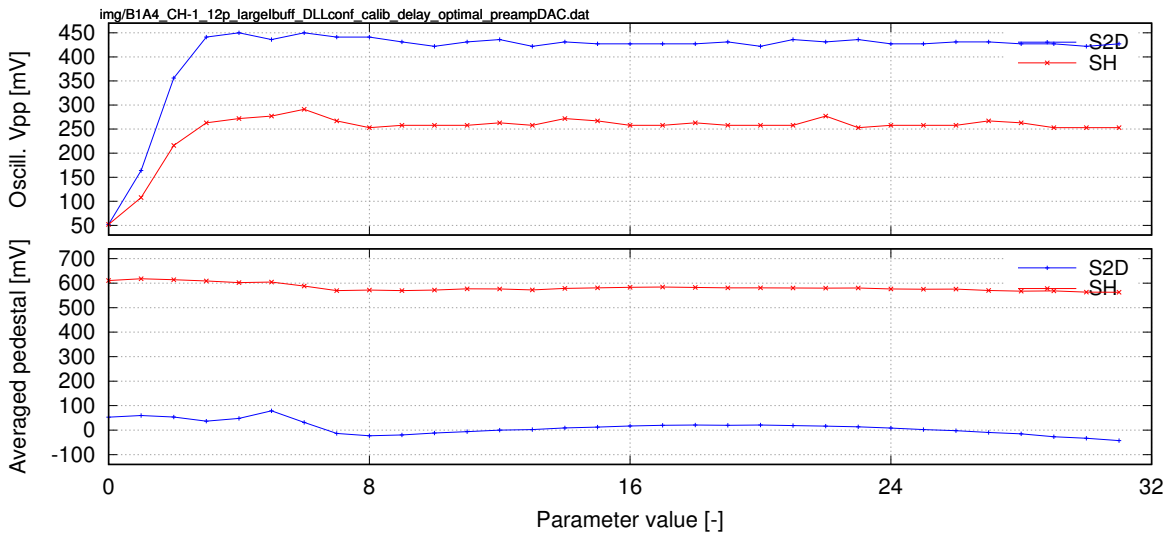


Figure 335: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=preamp DAC

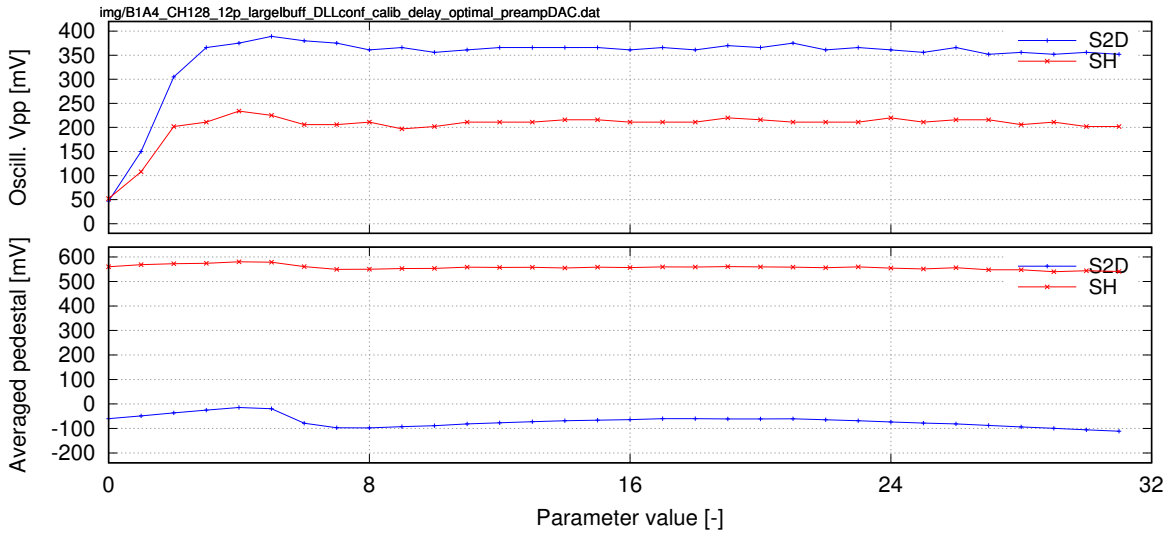


Figure 336: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=preamp DAC

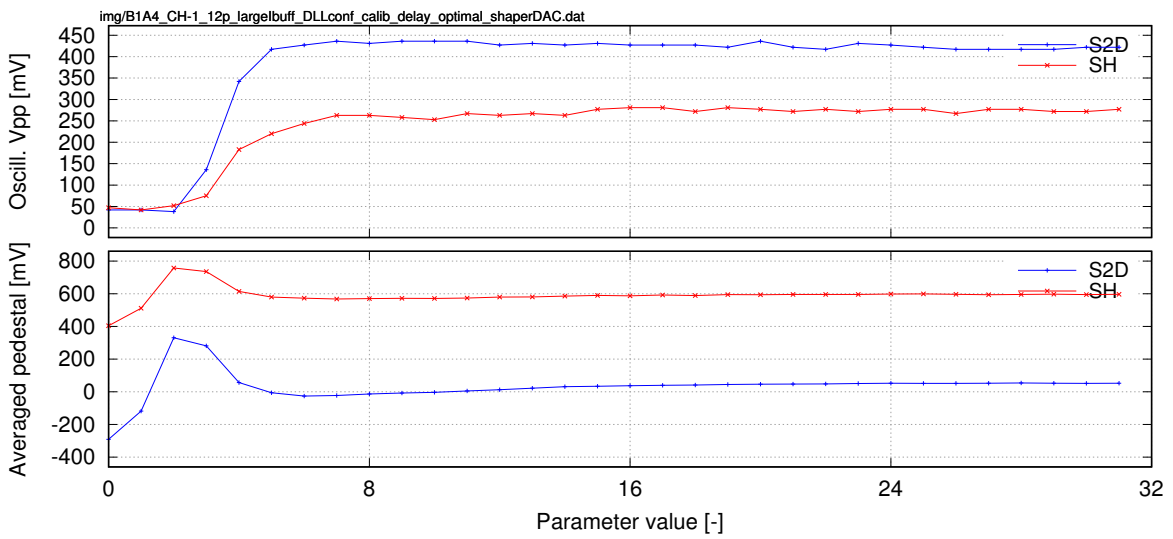


Figure 337: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=shaper DAC

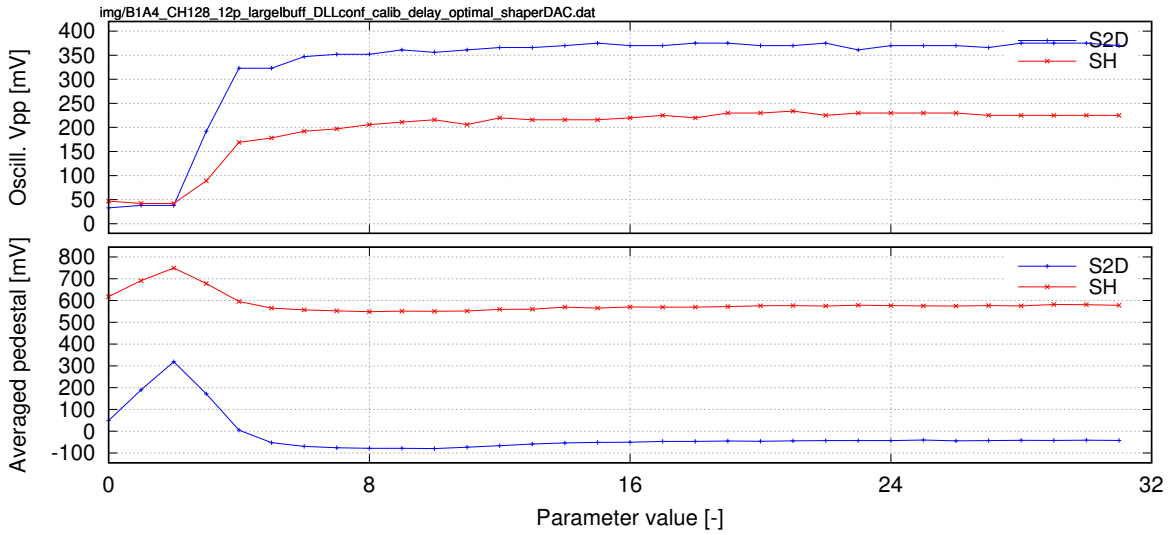


Figure 338: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=shaper DAC

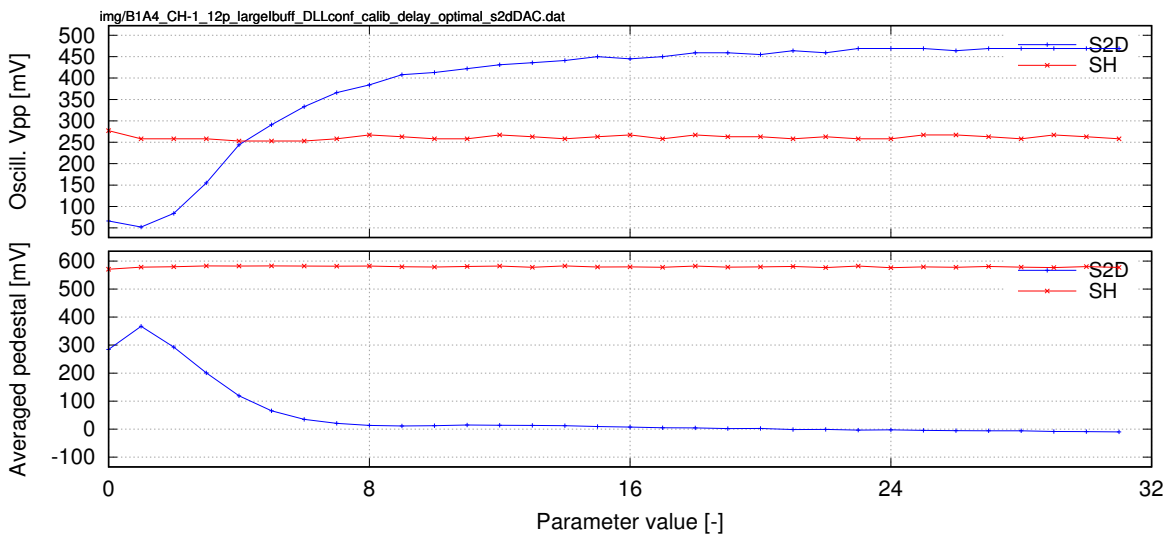


Figure 339: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=S2D DAC

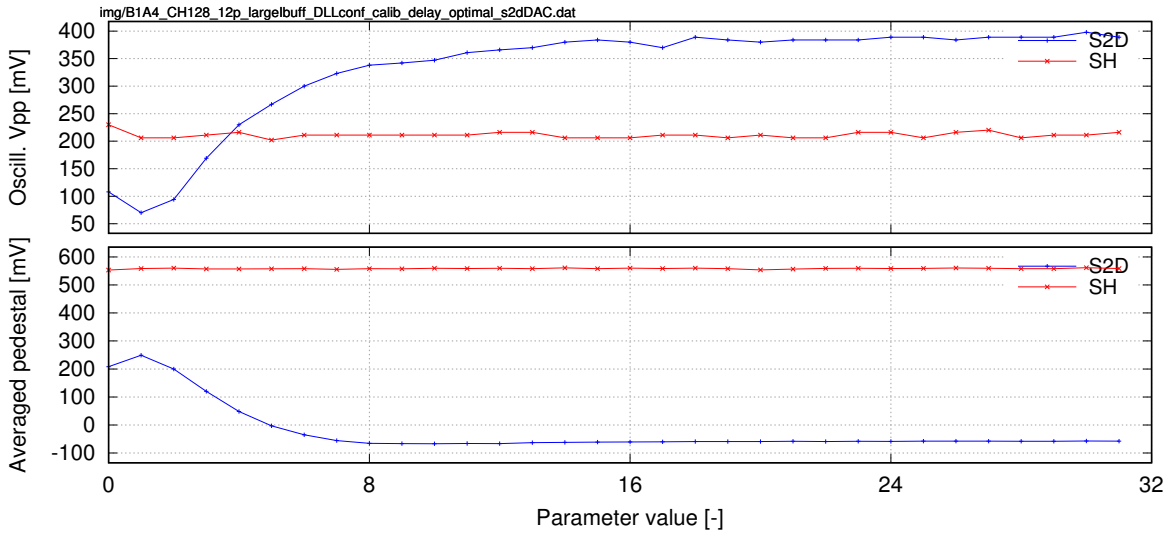


Figure 340: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=S2D DAC

5.4 Cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; F_{smp}=33 MHz

Cap-PCB assembled, bonded to SALT input pads 0 and 127, two 12 pF capacitors assembled to the cap-PCB.

Ibuf current maximized – 1 k Ω resistor between VDDA and Ibuf pad.

Main clock (ADC sampling) frequency = 33 MHz.

Only channel 128 measured.

5.4.1 Default ASIC configuration

ASIC configuration: JC configuration (tables 1 & 2).

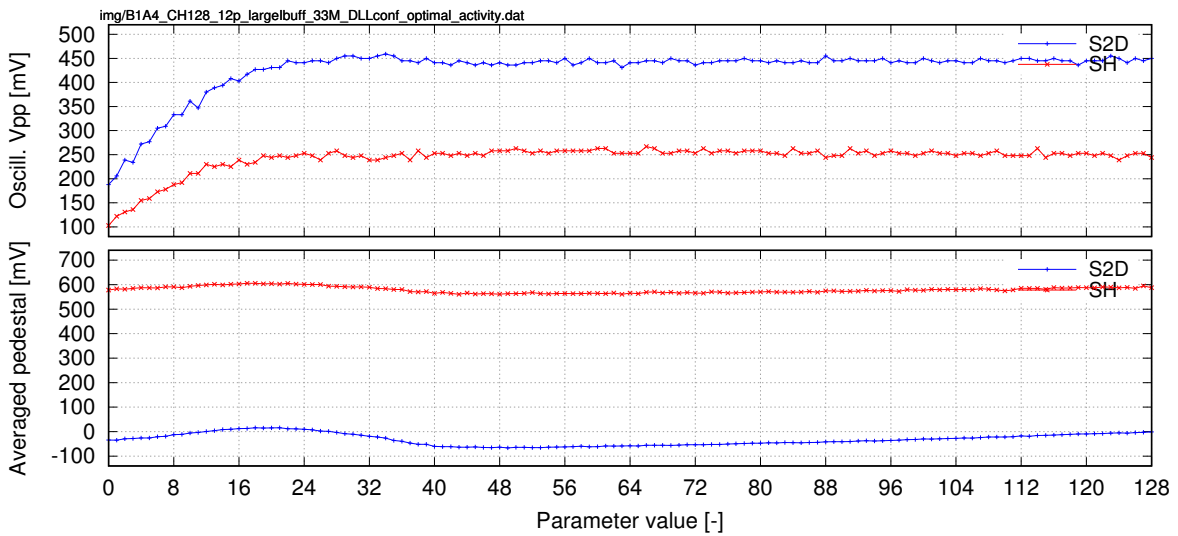


Figure 341: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; F_{smp}=33 MHz. Parameter=no. of active ADCs

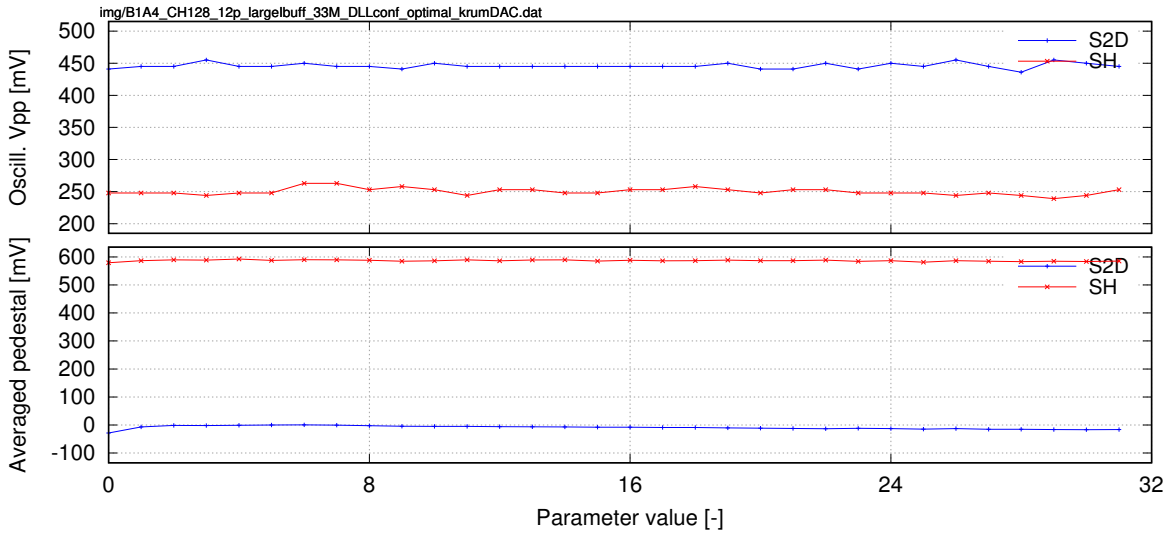


Figure 342: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; F_{smp}=33 MHz. Parameter=Krummenacher DAC

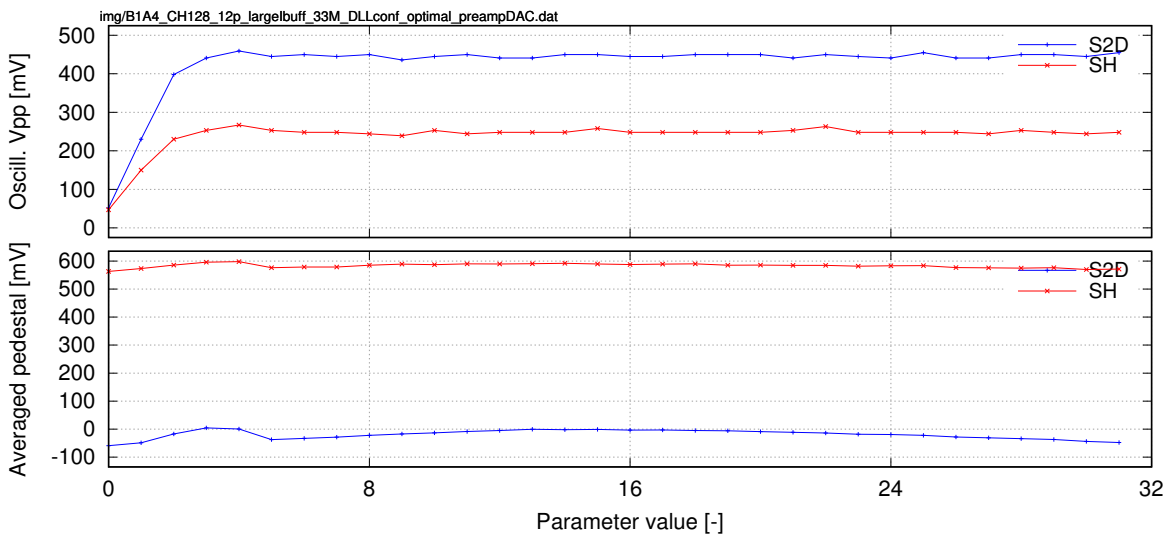


Figure 343: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; F_{smp}=33 MHz. Parameter=preamp DAC

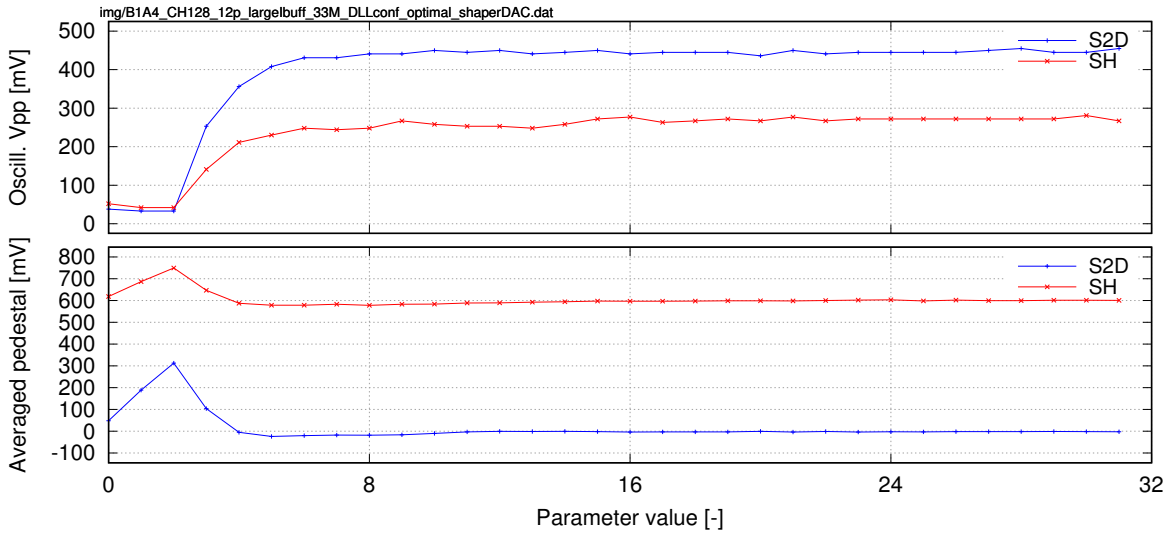


Figure 344: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Fsmp=33 MHz. Parameter=shaper DAC

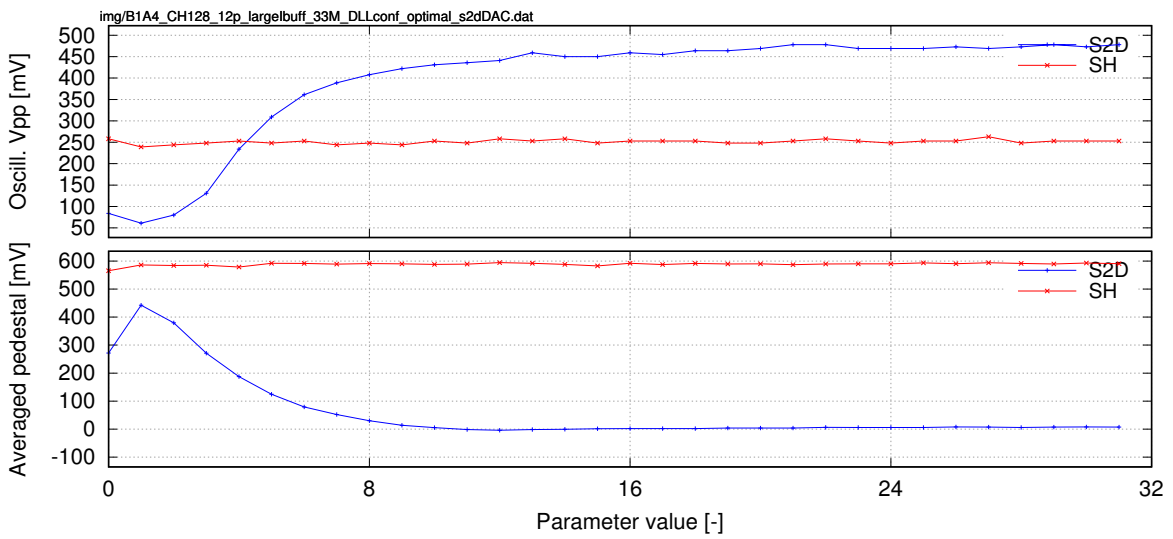


Figure 345: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Fsmp=33 MHz. Parameter=S2D DAC

5.4.2 Optimized test pulse and ADC delay

ASIC configuration: JC configuration (tables 1 & 2) + test pulse and ADC delay optimizations (table 3).

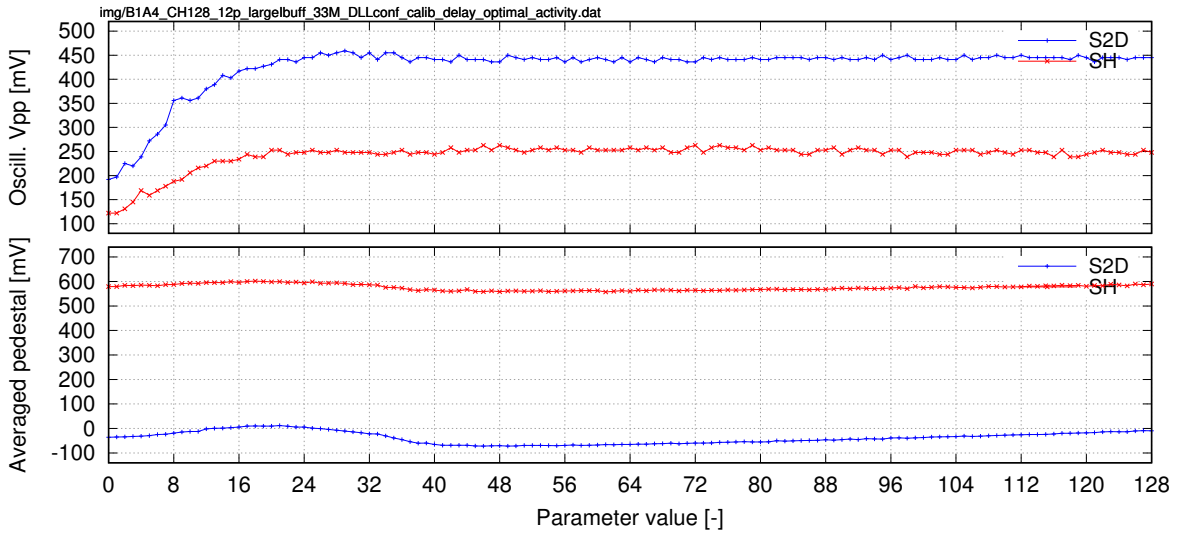


Figure 346: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Fsmp=33 MHz. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

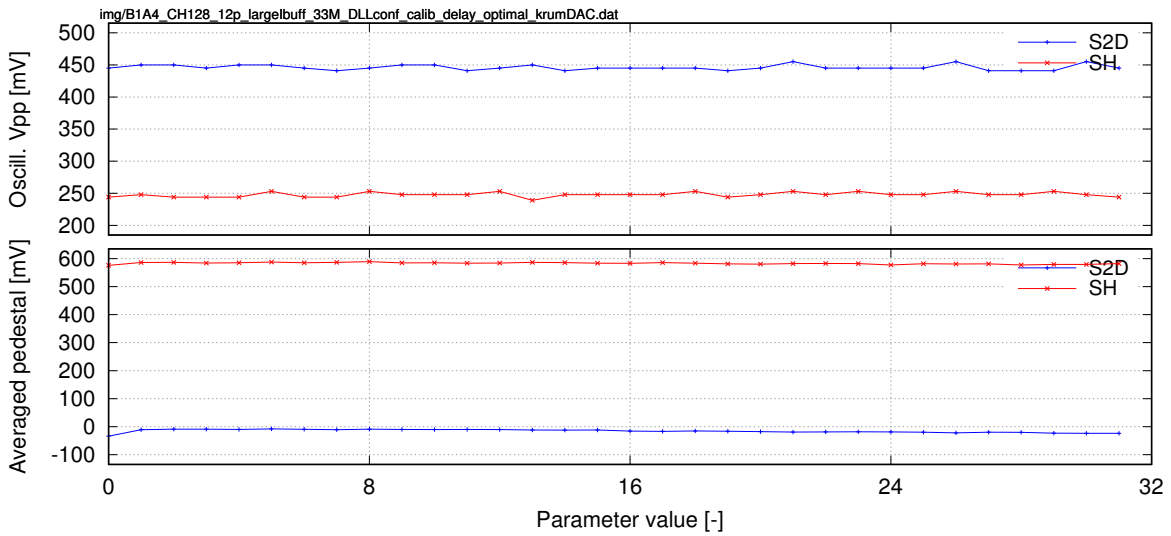


Figure 347: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Fsmp=33 MHz. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

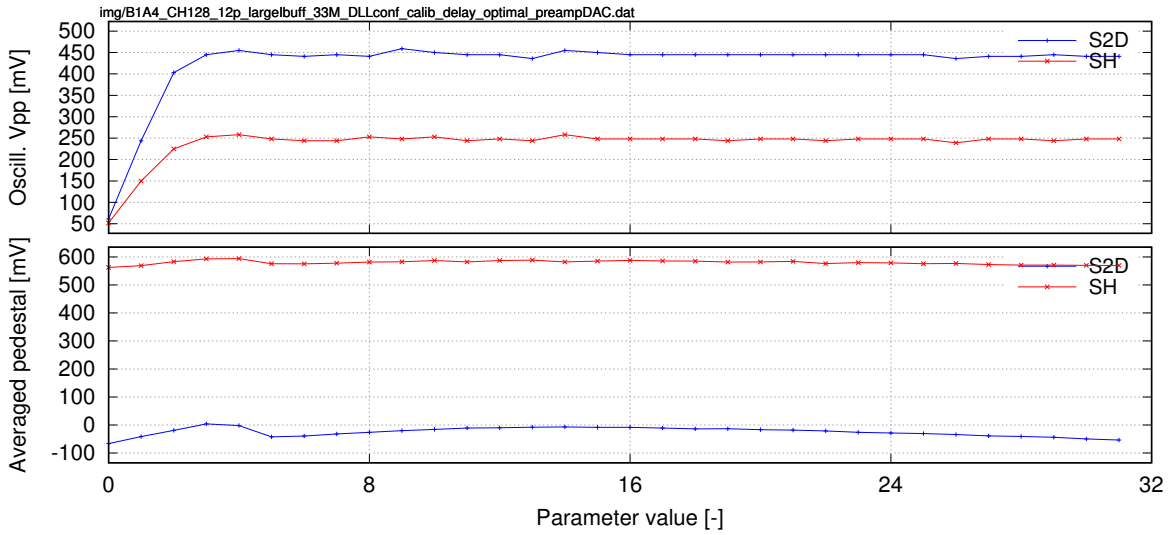


Figure 348: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Fsmp=33 MHz. Optimized test pulse and ADC delay. Parameter=preamp DAC

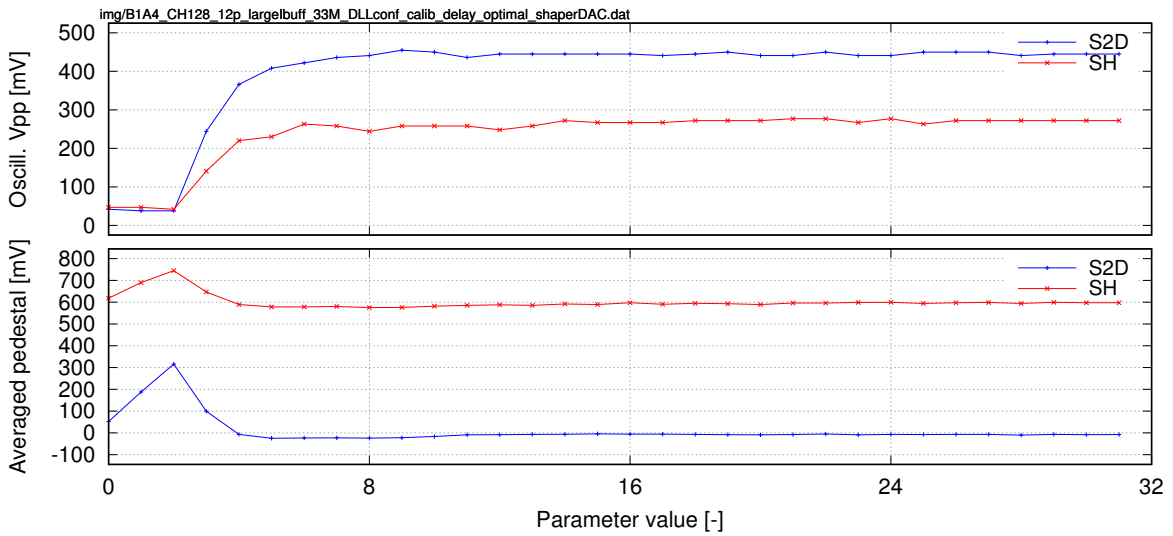


Figure 349: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Fsmp=33 MHz. Optimized test pulse and ADC delay. Parameter=shaper DAC

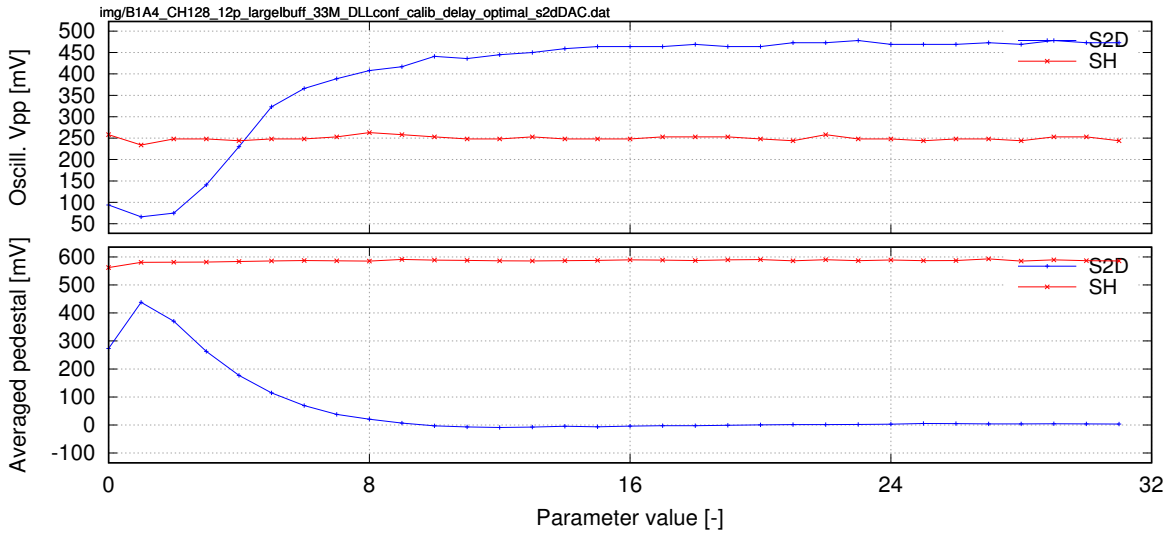


Figure 350: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Fsmp=33 MHz. Optimized test pulse and ADC delay. Parameter=S2D DAC

5.5 Cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; Preamp GND configuration – input + backside

Cap-PCB assembled, bonded to SALT input pads 0 and 127, two 12 pF capacitors assembled to the cap-PCB.

Ibuf current maximized – 1 k Ω resistor between VDDA and Ibuf pad.

Preamp GND bonded from both sides - input pads + backside (default) pads.

5.5.1 Default ASIC configuration

ASIC configuration: JC configuration (tables 1 & 2).

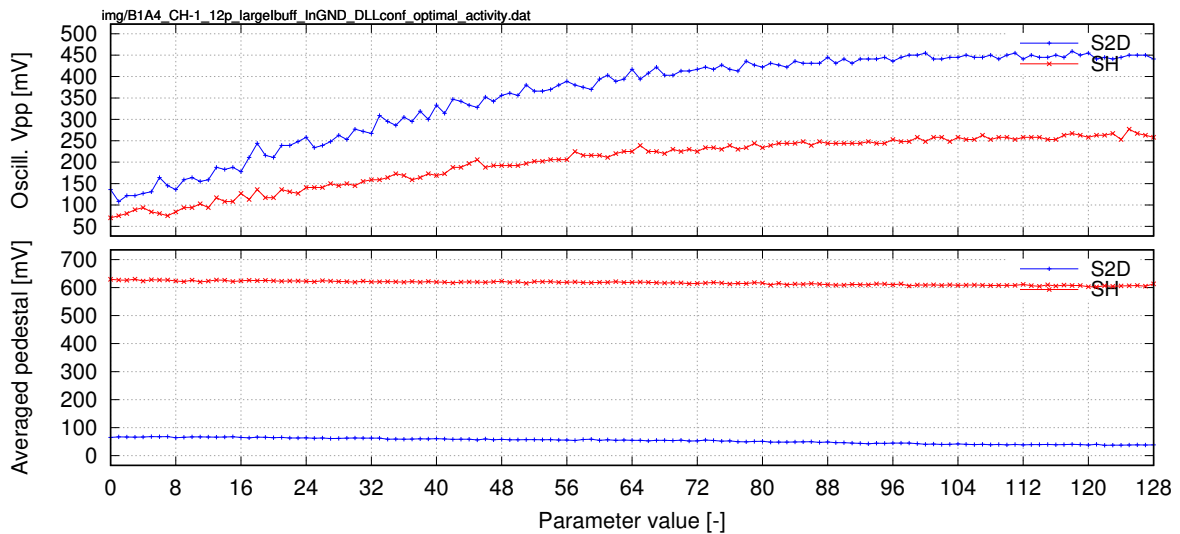


Figure 351: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Preamp GND configuration – input + backside. Parameter=no. of active ADCs

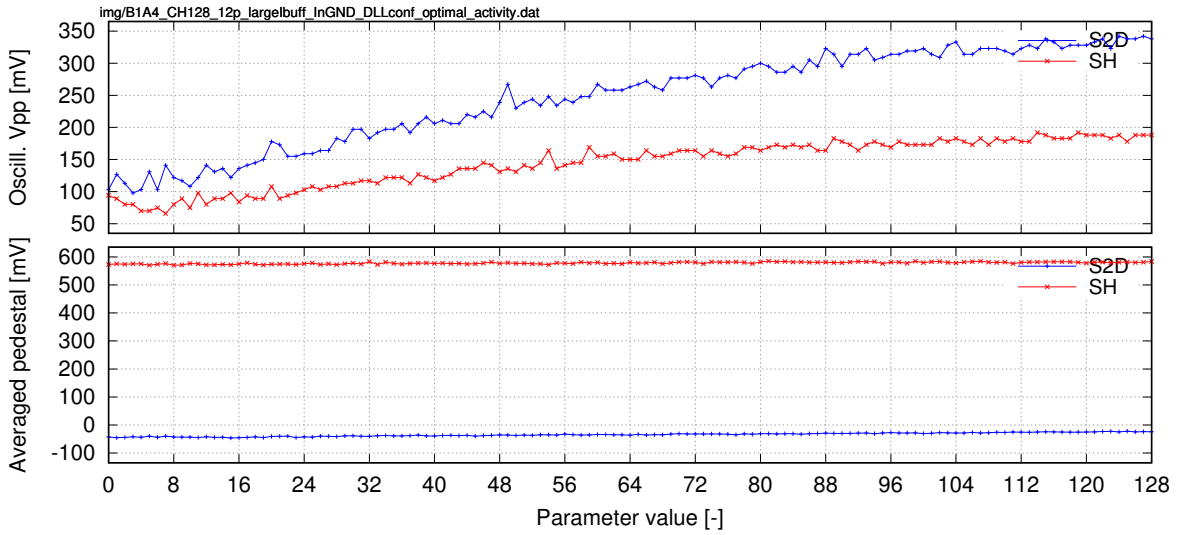


Figure 352: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Preamp GND configuration – input + backside. Parameter=no. of active ADCs

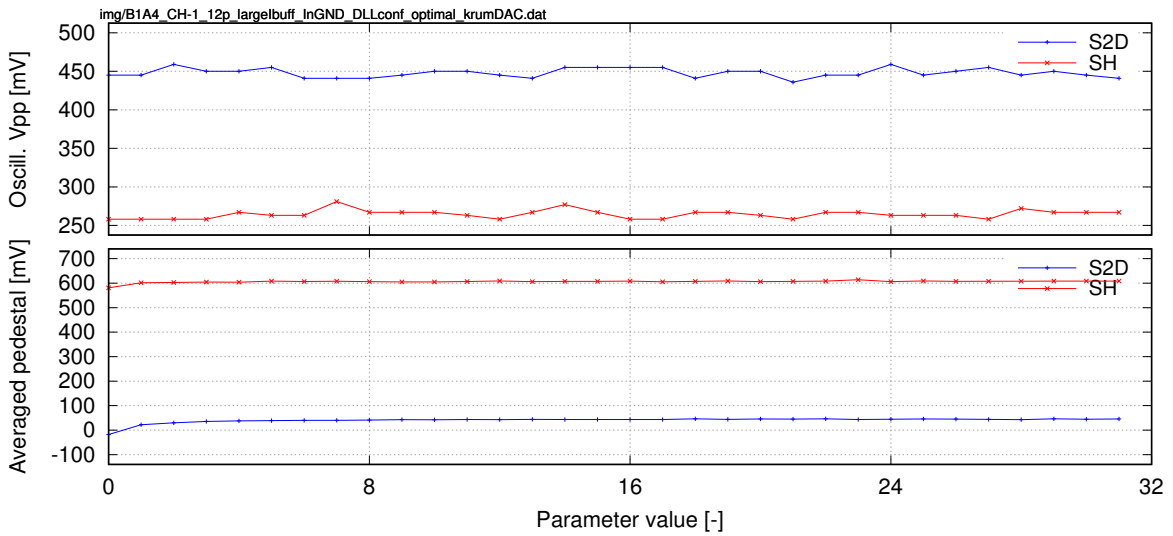


Figure 353: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Preamp GND configuration – input + backside. Parameter=Krummenacher DAC

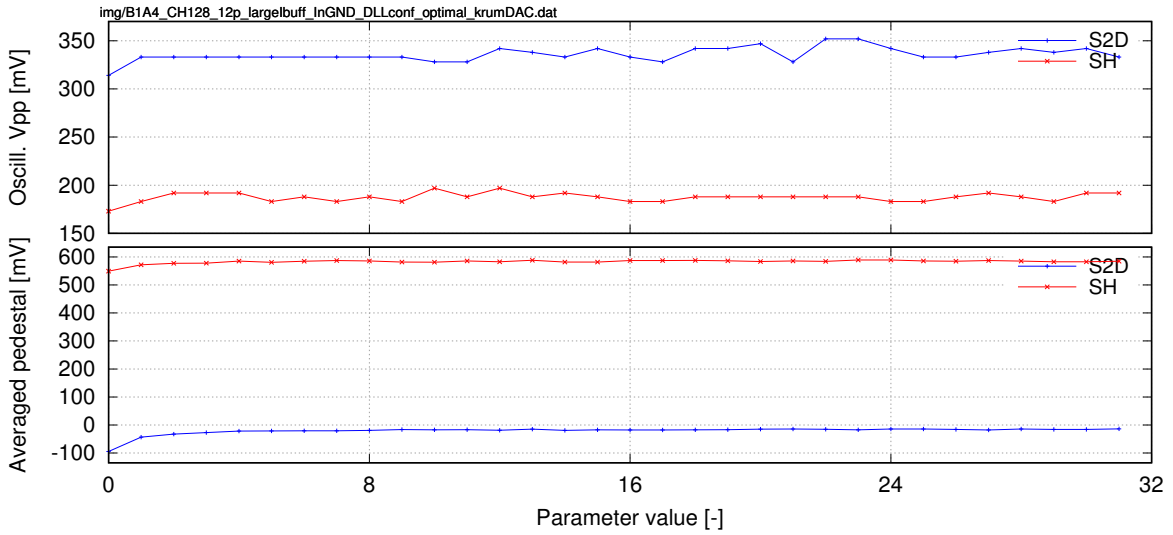


Figure 354: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Preamp GND configuration - input + backside. Parameter=Krummenacher DAC

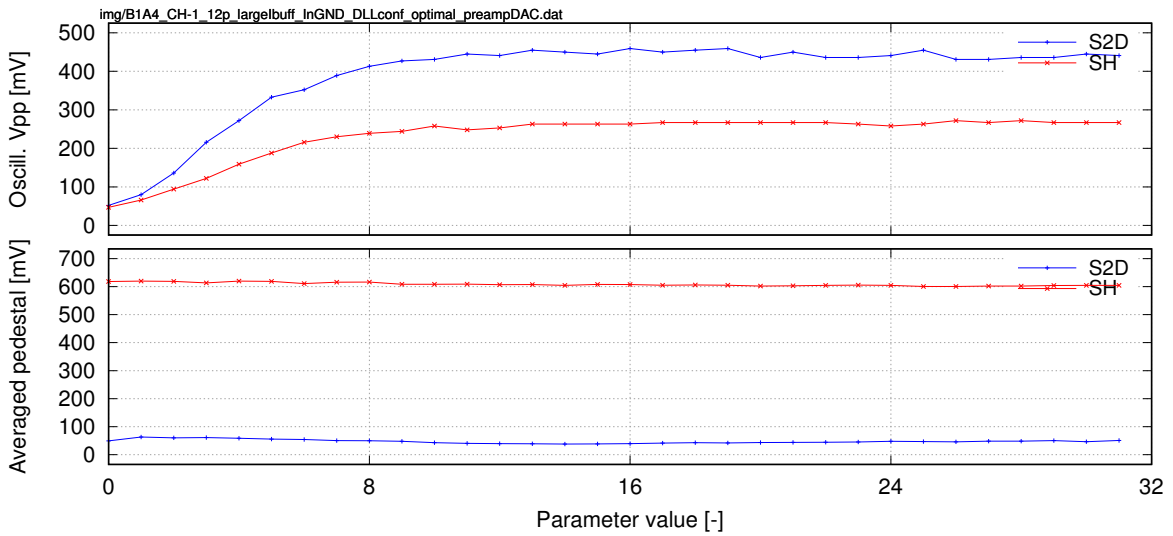


Figure 355: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Preamp GND configuration - input + backside. Parameter=preamp DAC

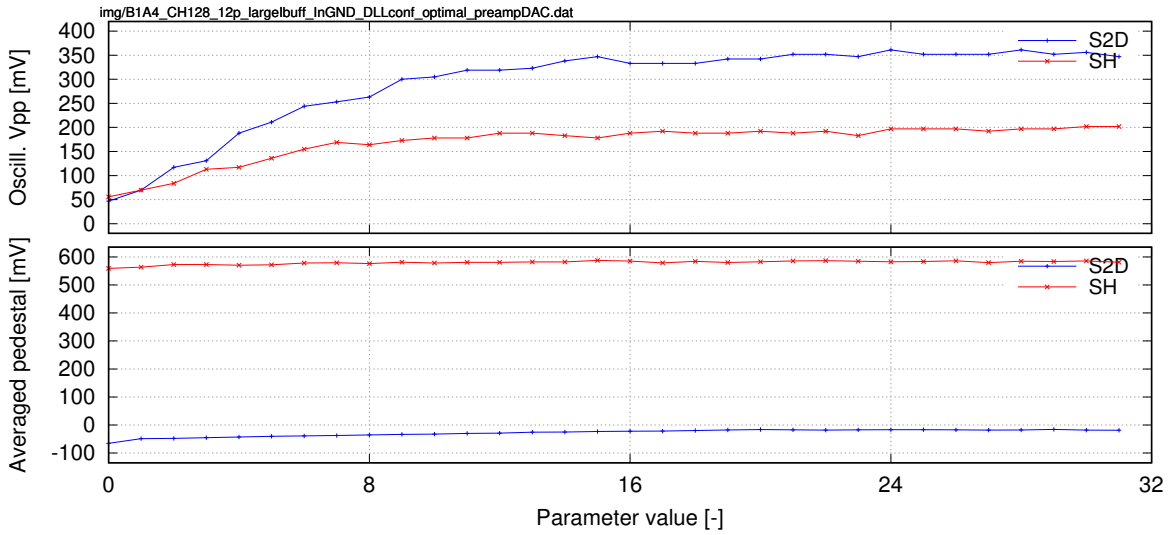


Figure 356: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Preamp GND configuration – input + backside. Parameter=preamp DAC

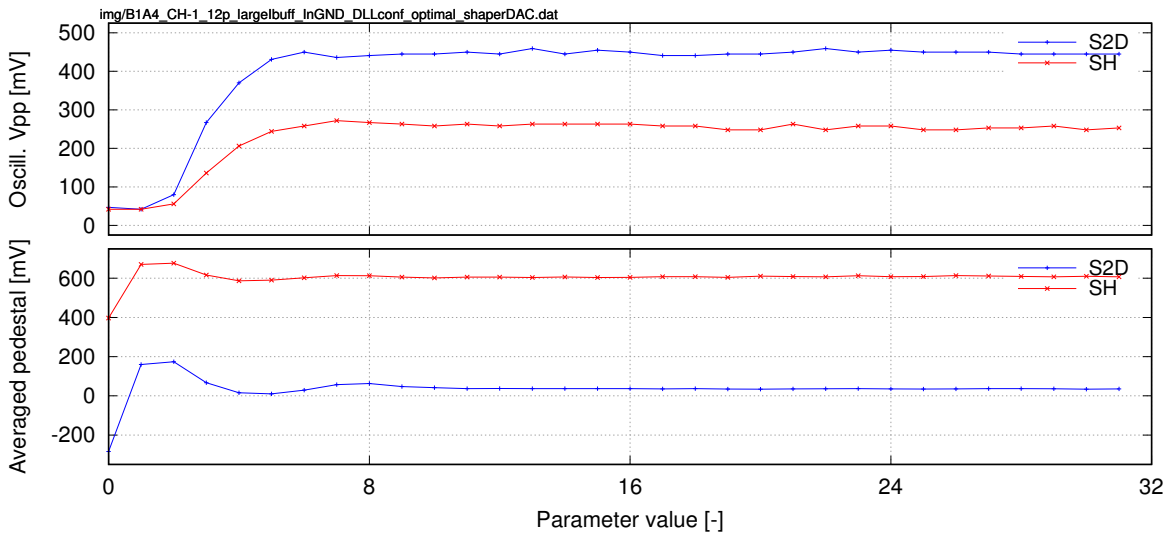


Figure 357: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Preamp GND configuration – input + backside. Parameter=shaper DAC

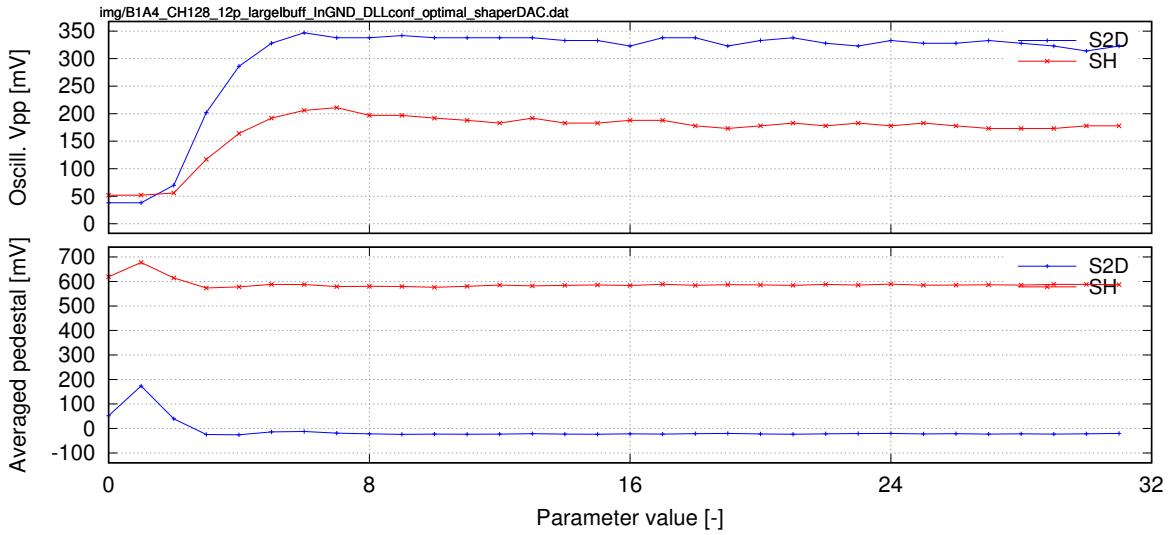


Figure 358: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Preamp GND configuration – input + backside. Parameter=shaper DAC

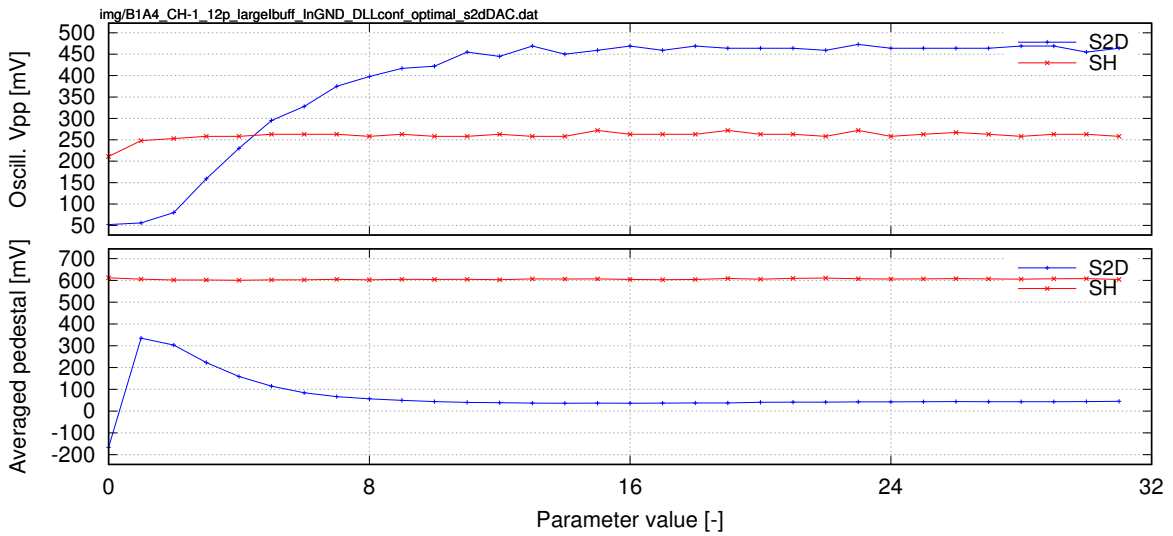


Figure 359: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Preamp GND configuration – input + backside. Parameter=S2D DAC

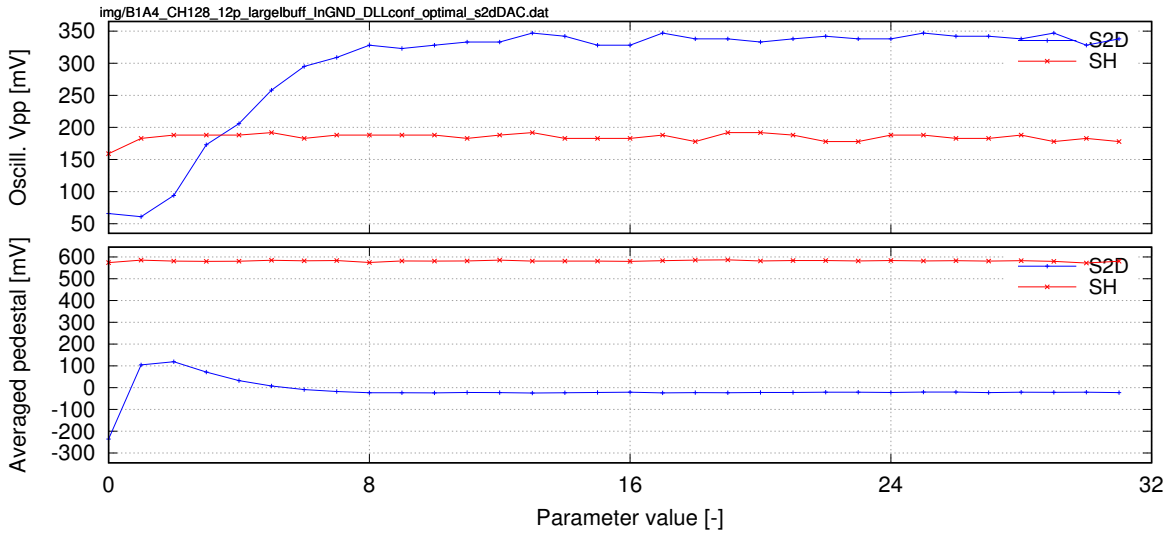


Figure 360: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Preamp GND configuration – input + backside. Parameter=S2D DAC

5.5.2 Optimized test pulse and ADC delay

ASIC configuration: JC configuration (tables 1 & 2) + test pulse and ADC delay optimizations (table 3).

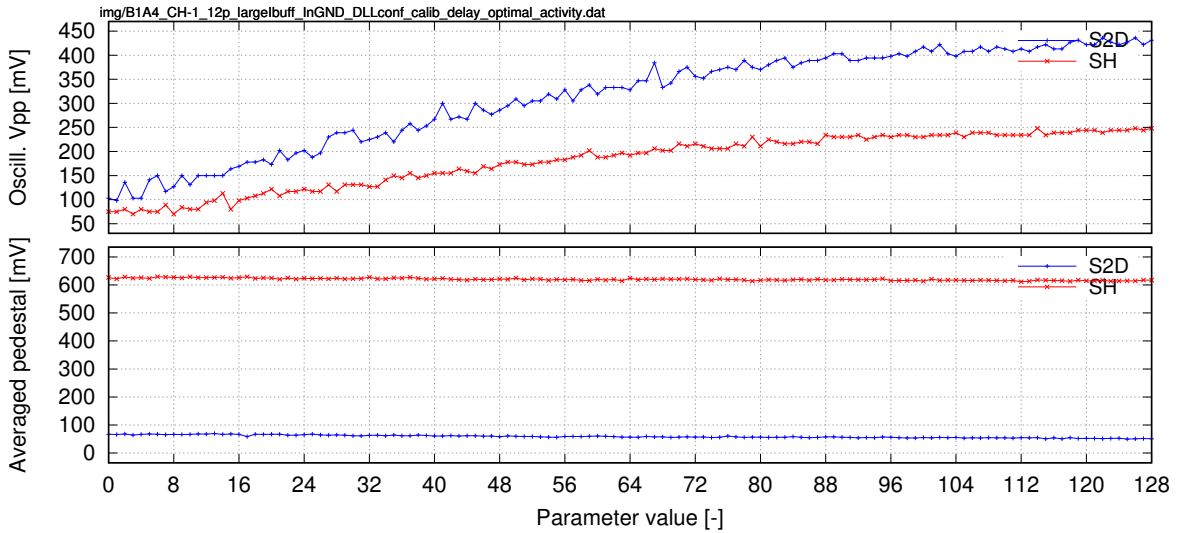


Figure 361: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

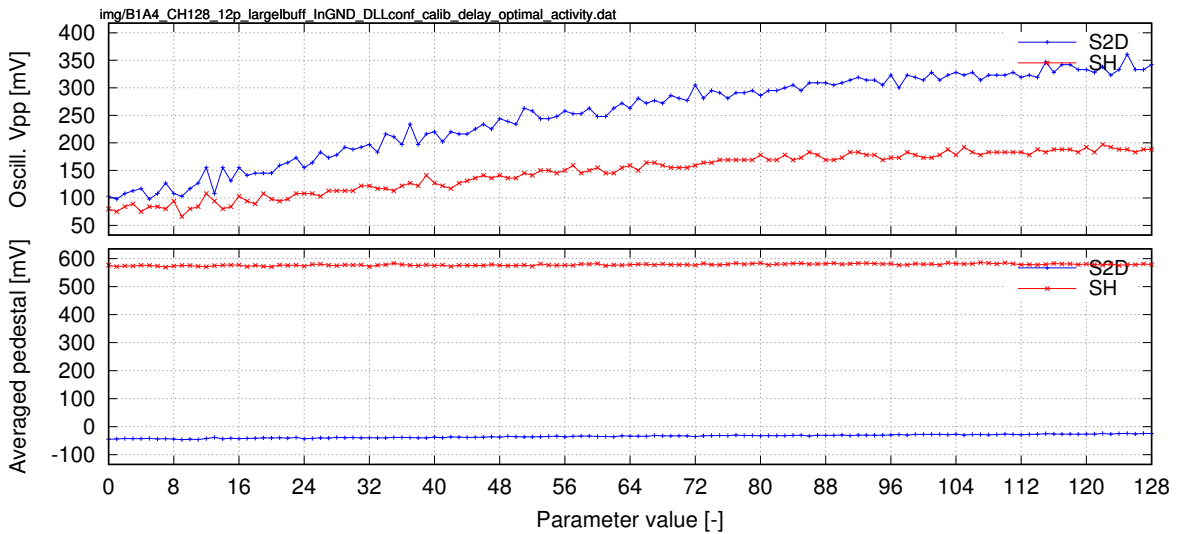


Figure 362: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

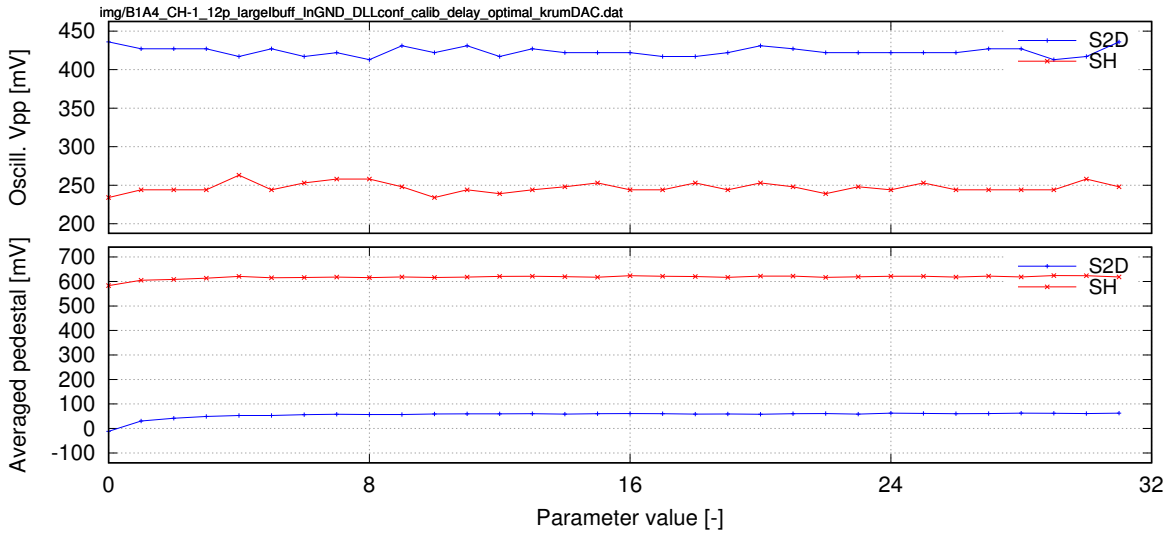


Figure 363: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

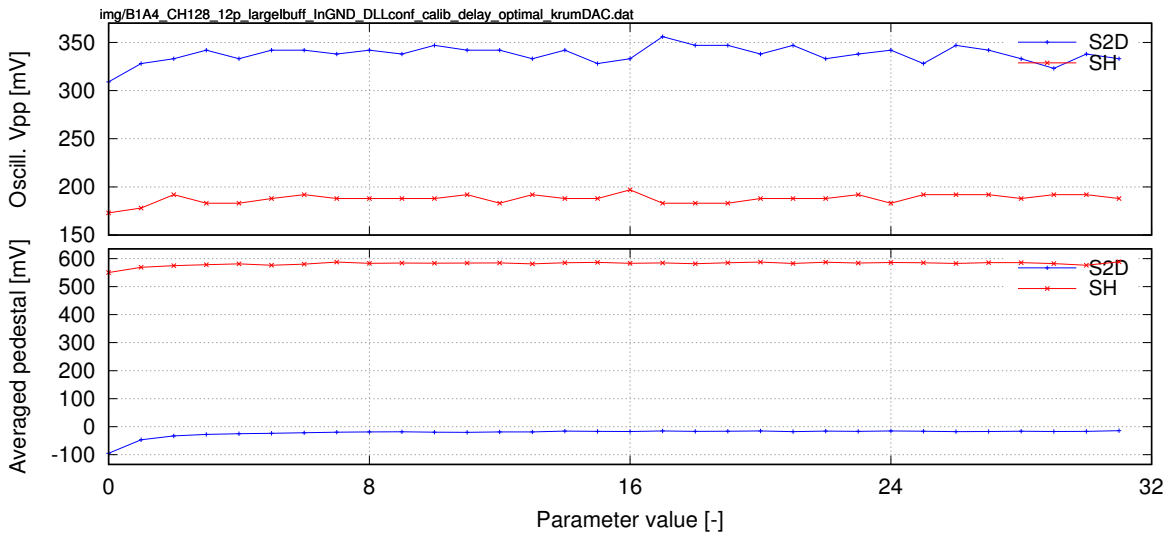


Figure 364: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

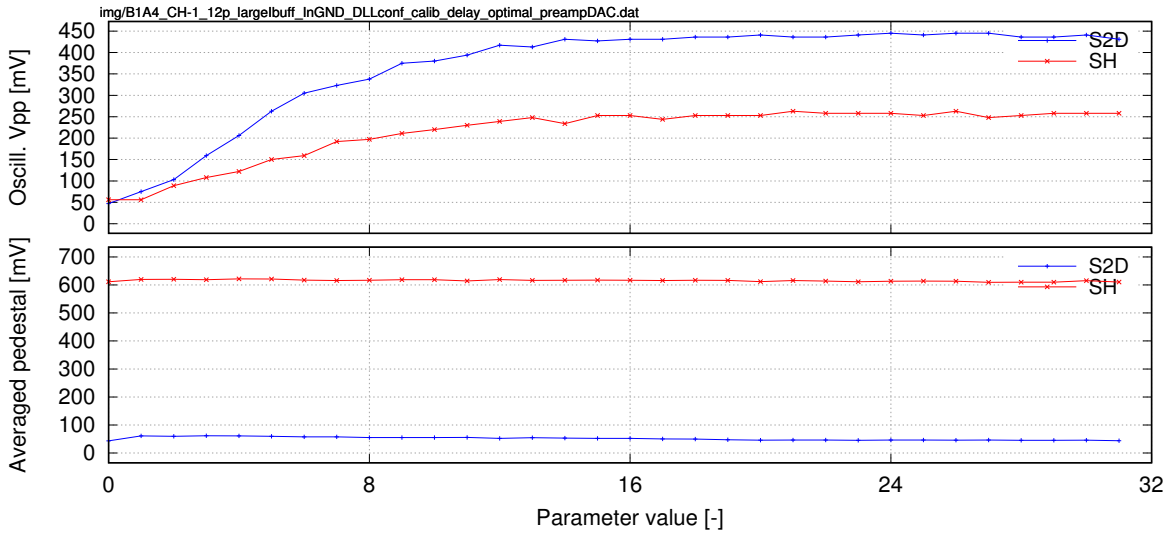


Figure 365: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=preamp DAC

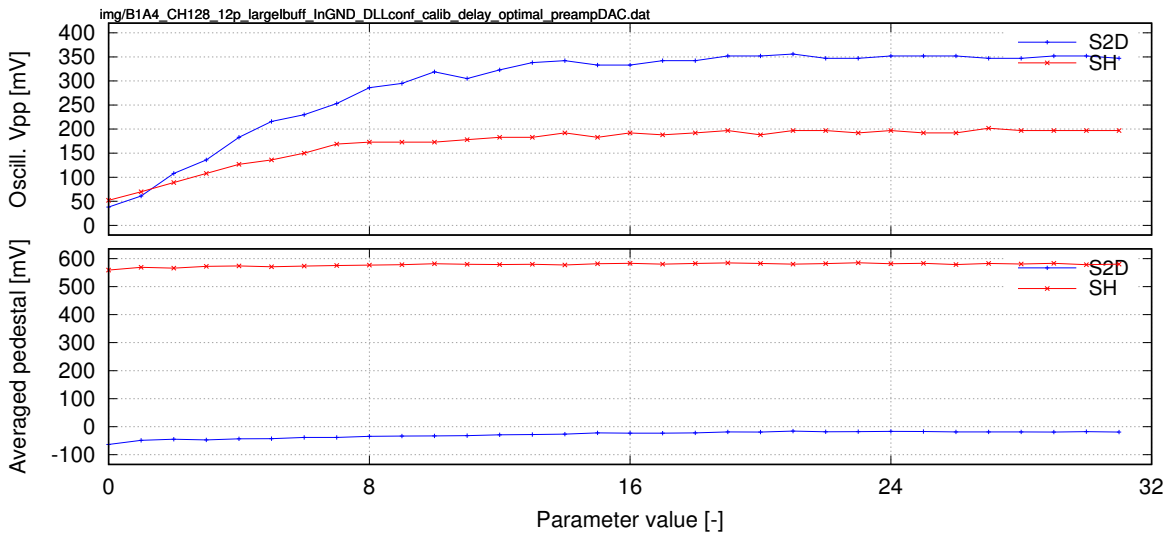


Figure 366: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=preamp DAC

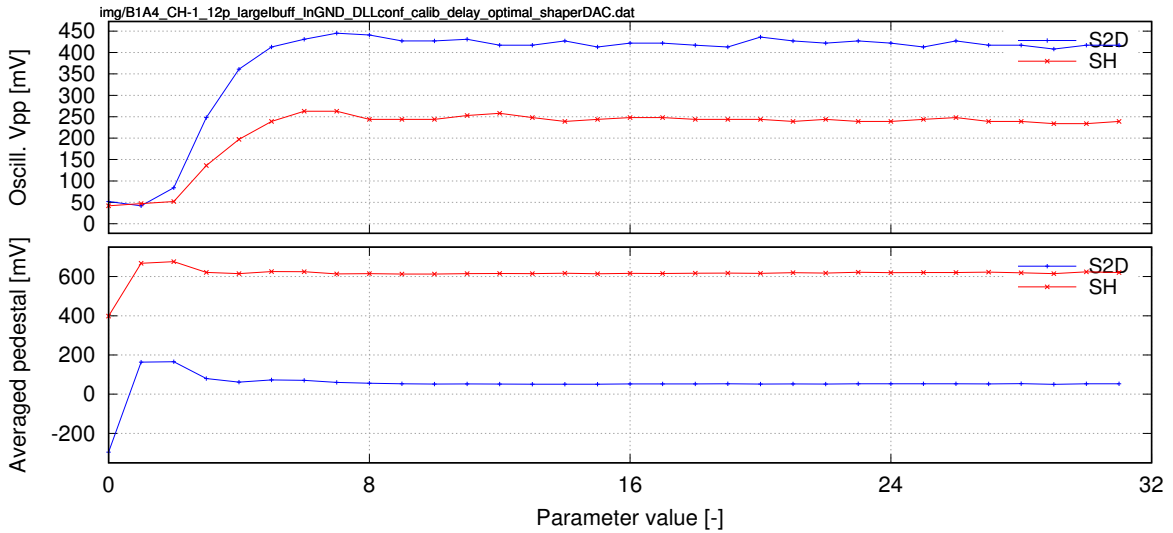


Figure 367: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=shaper DAC

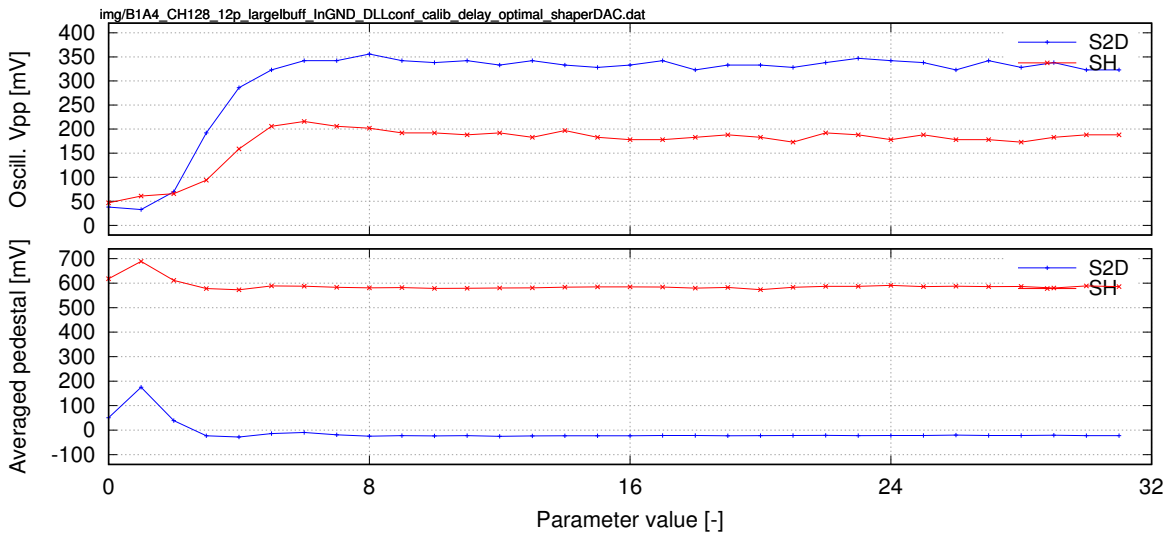


Figure 368: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=shaper DAC

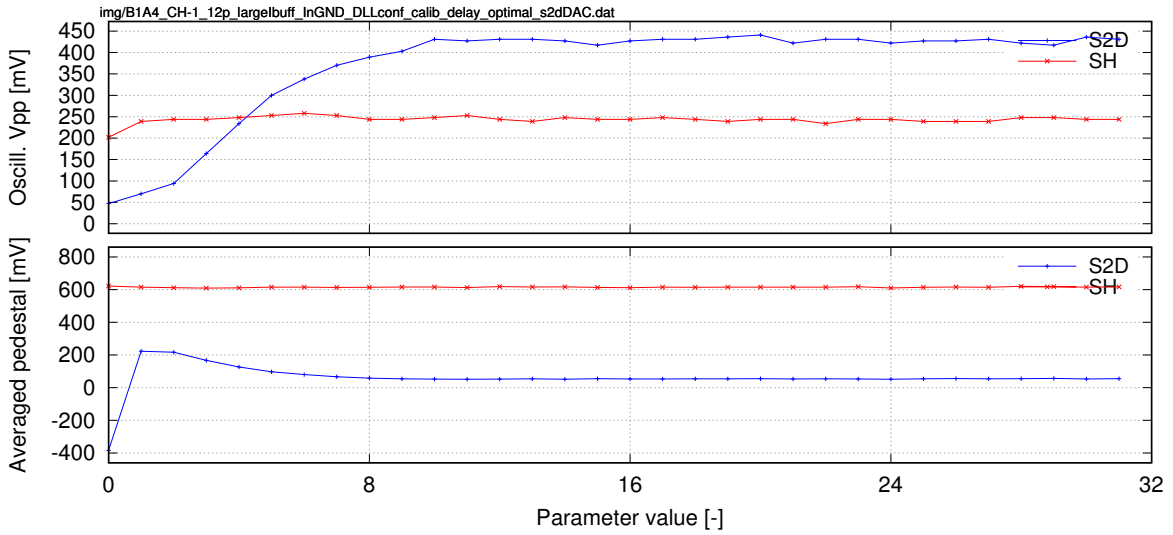


Figure 369: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=S2D DAC

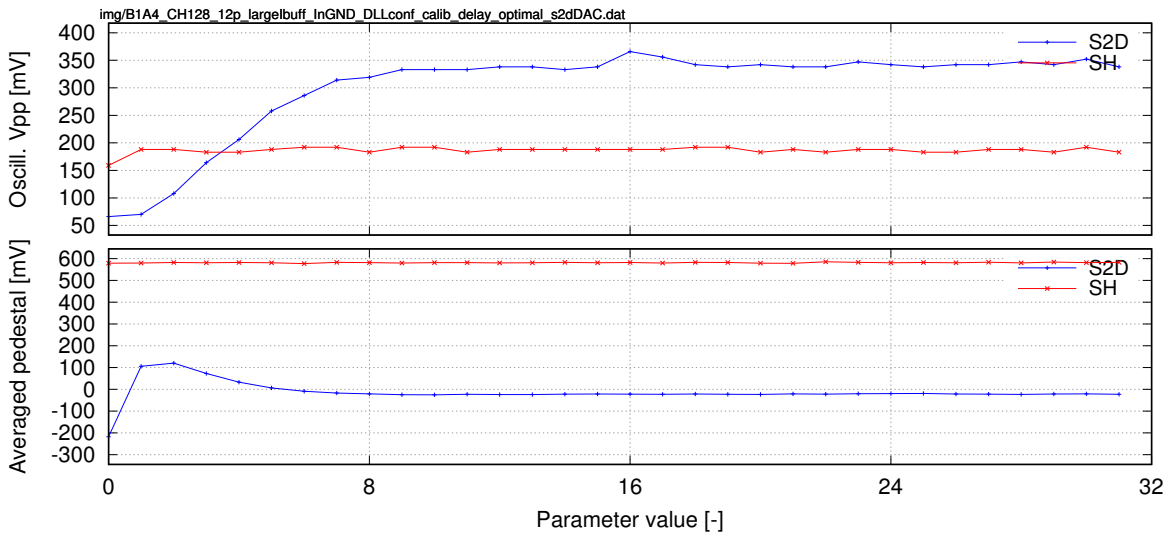


Figure 370: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=S2D DAC

5.6 Cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; Preamp GND configuration – only input

Cap-PCB assembled, bonded to SALT input pads 0 and 127, two 12 pF capacitors assembled to the cap-PCB.

Ibuf current maximized – 1 k Ω resistor between VDDA and Ibuf pad.

Preamp GND bonded only using input pads.

5.6.1 Default ASIC configuration

ASIC configuration: JC configuration (tables 1 & 2).

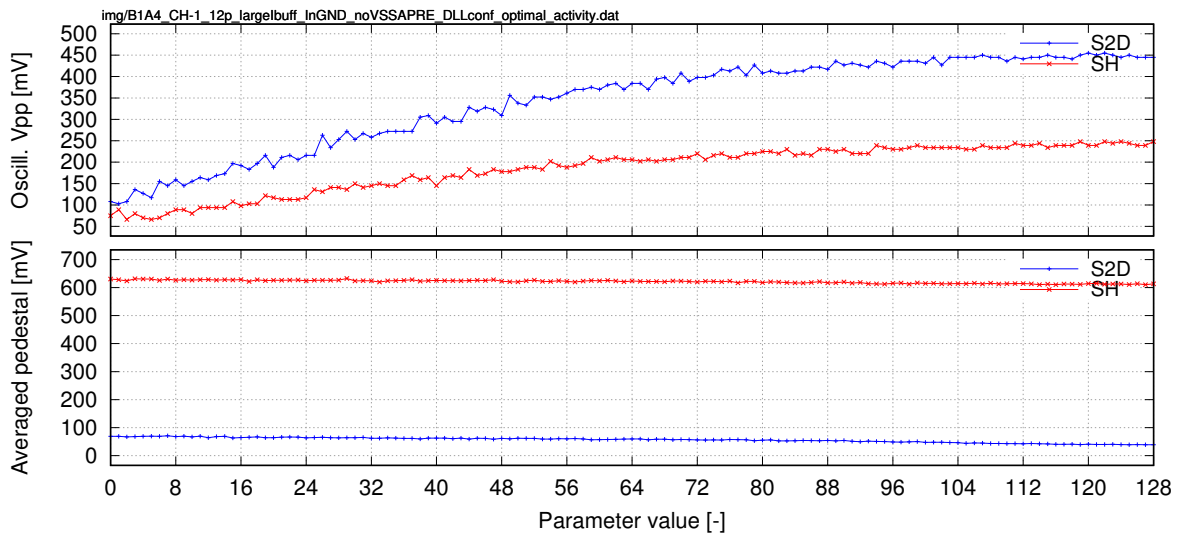


Figure 371: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Preamp GND configuration – only input. Parameter=no. of active ADCs

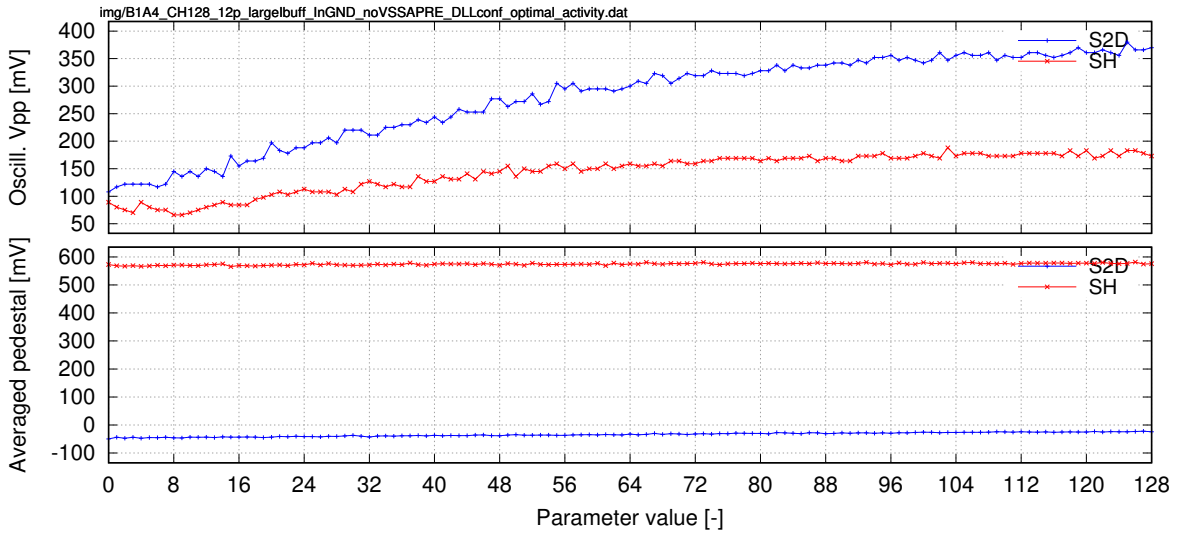


Figure 372: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Preamp GND configuration – only input. Parameter=no. of active ADCs

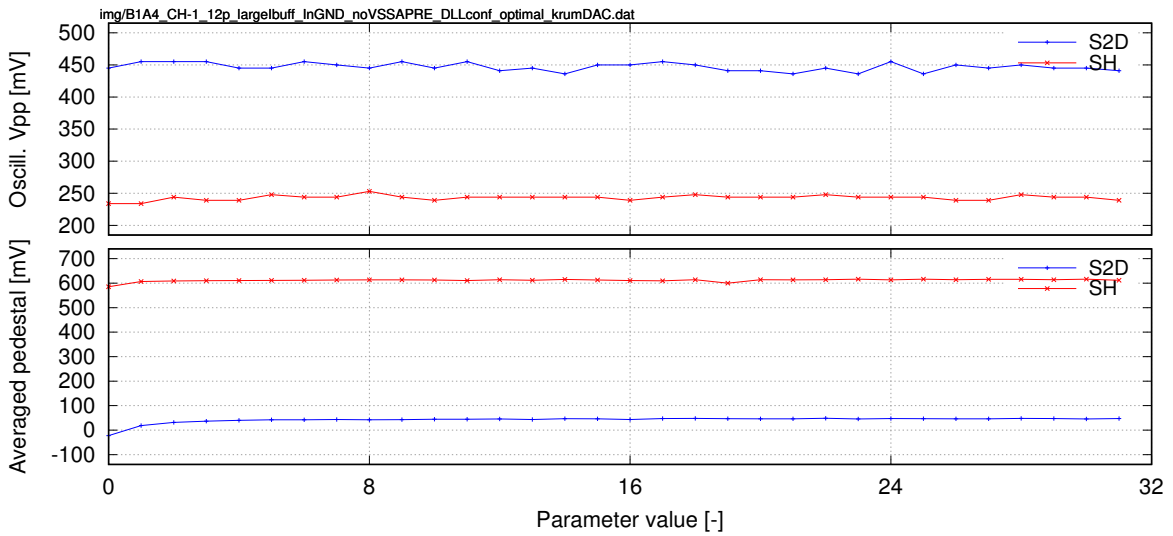


Figure 373: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Preamp GND configuration – only input. Parameter=Krummenacher DAC

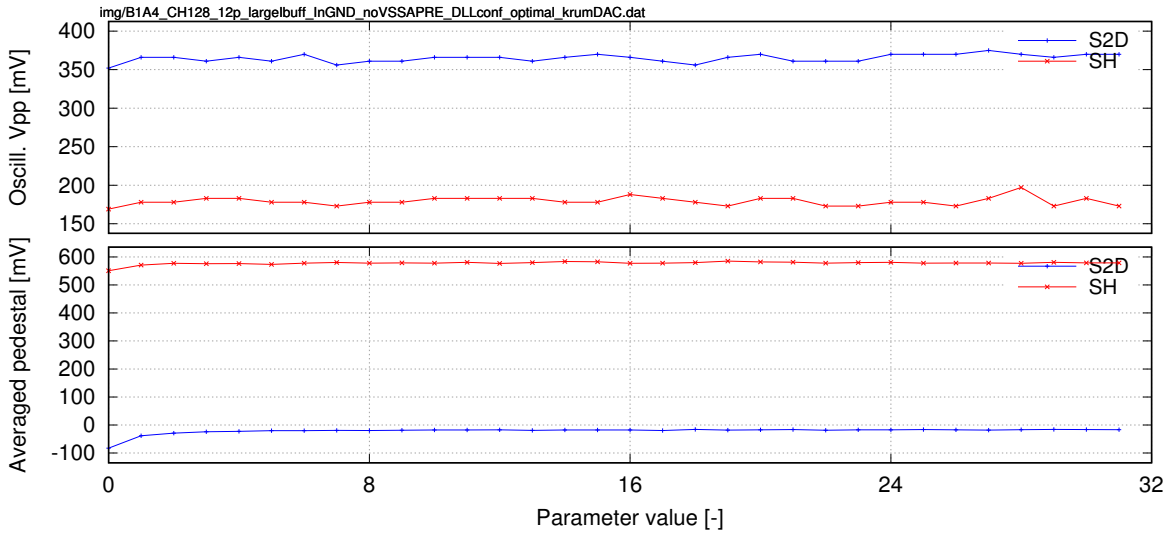


Figure 374: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Preamp GND configuration – only input. Parameter=Krummenacher DAC

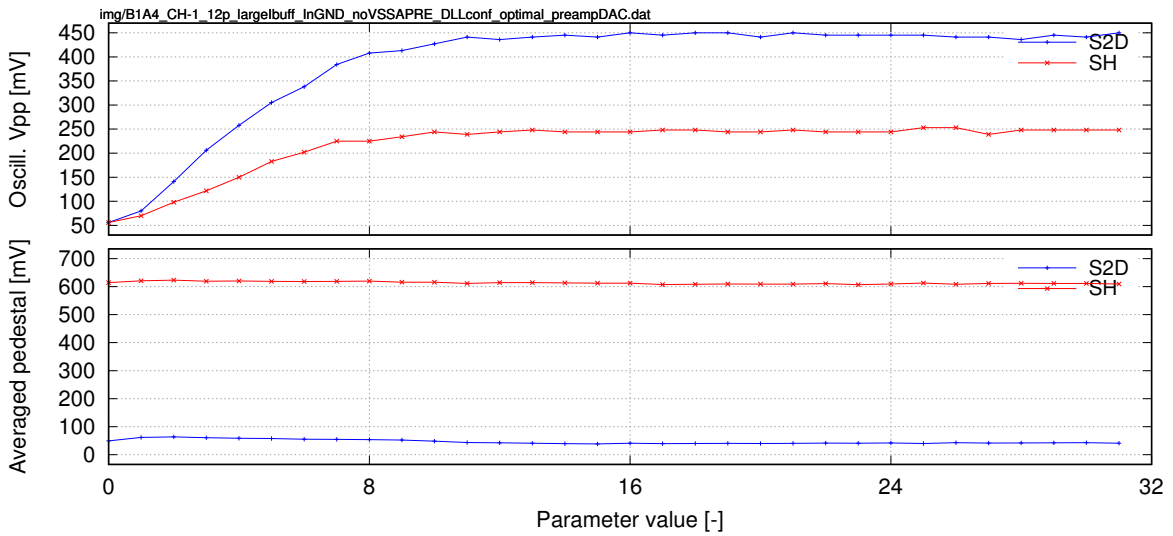


Figure 375: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Preamp GND configuration – only input. Parameter=preamp DAC

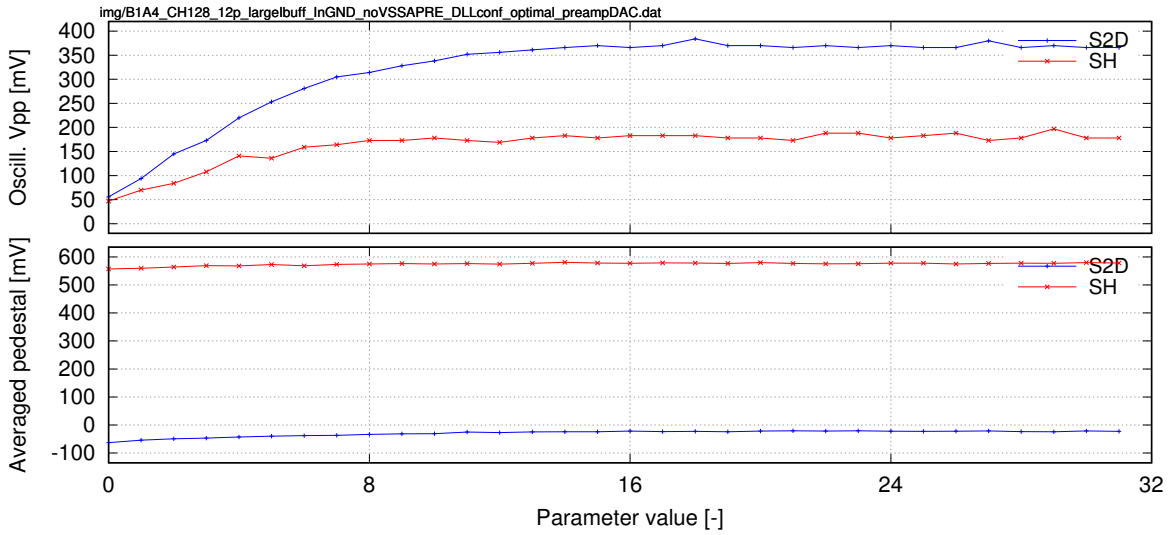


Figure 376: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Preamp GND configuration – only input. Parameter=preamp DAC

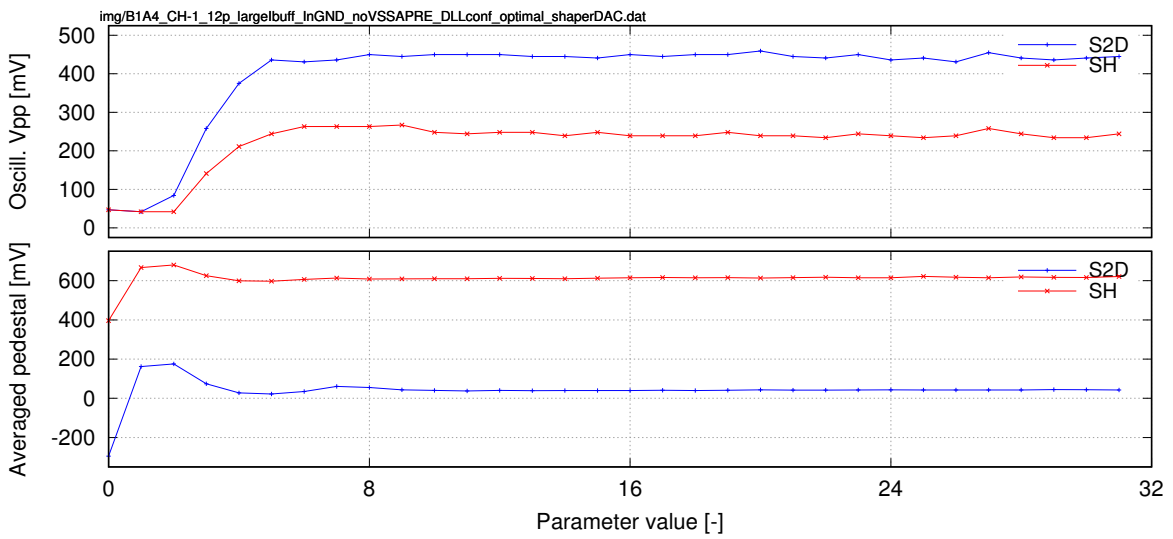


Figure 377: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Preamp GND configuration – only input. Parameter=shaper DAC

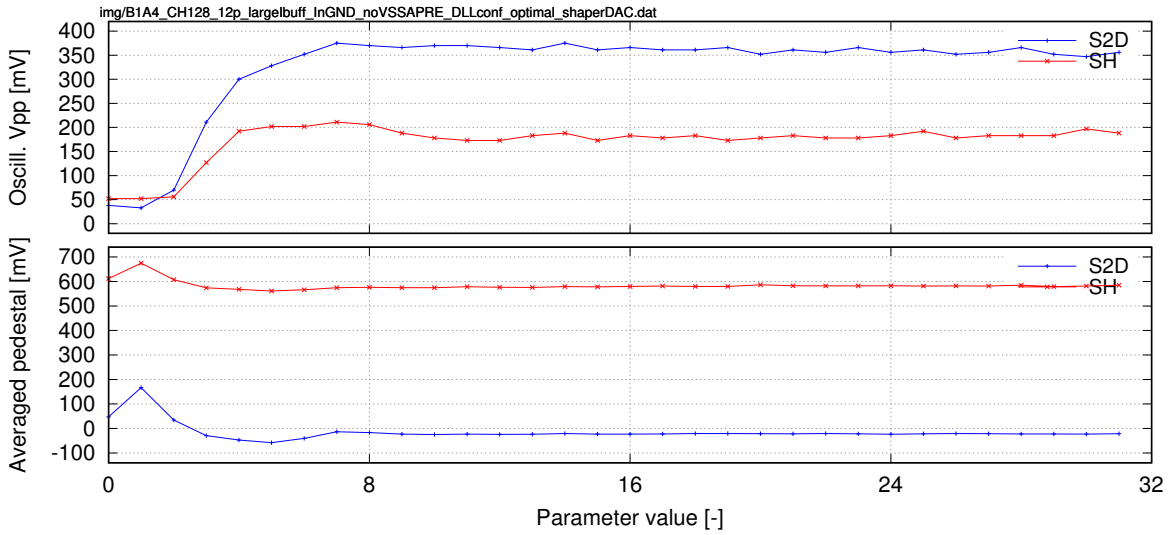


Figure 378: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Preamp GND configuration – only input. Parameter=shaper DAC

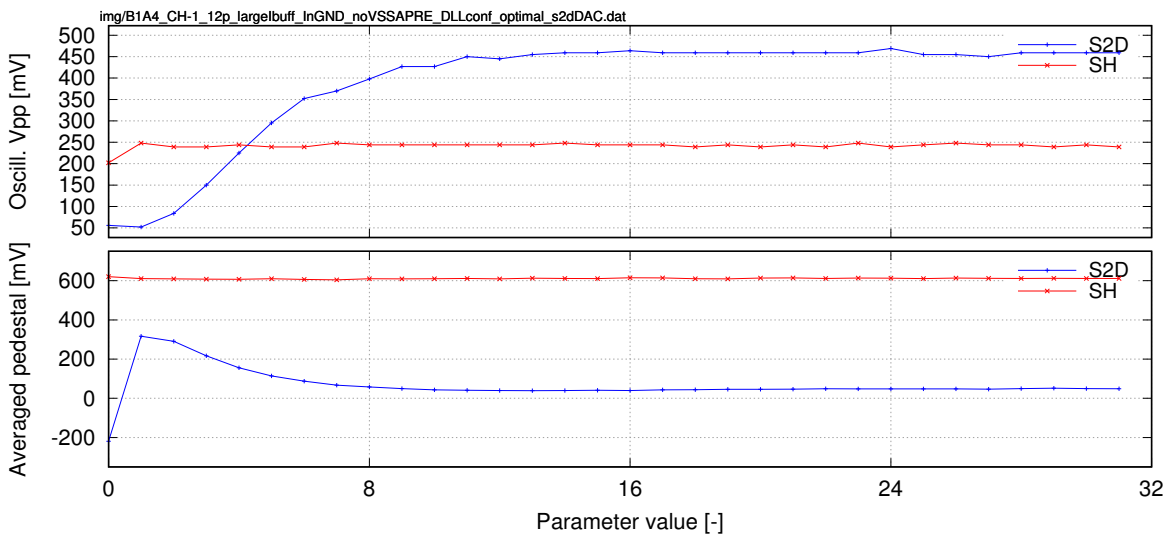


Figure 379: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Preamp GND configuration – only input. Parameter=S2D DAC

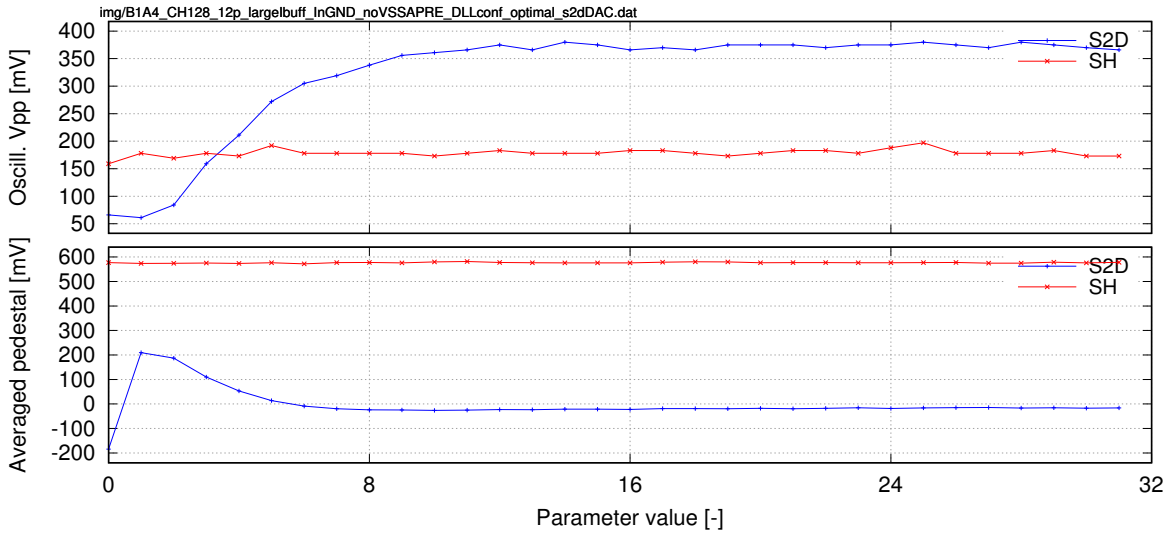


Figure 380: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Preamp GND configuration – only input. Parameter=S2D DAC

5.6.2 Optimized test pulse and ADC delay

ASIC configuration: JC configuration (tables 1 & 2) + test pulse and ADC delay optimizations (table 3).

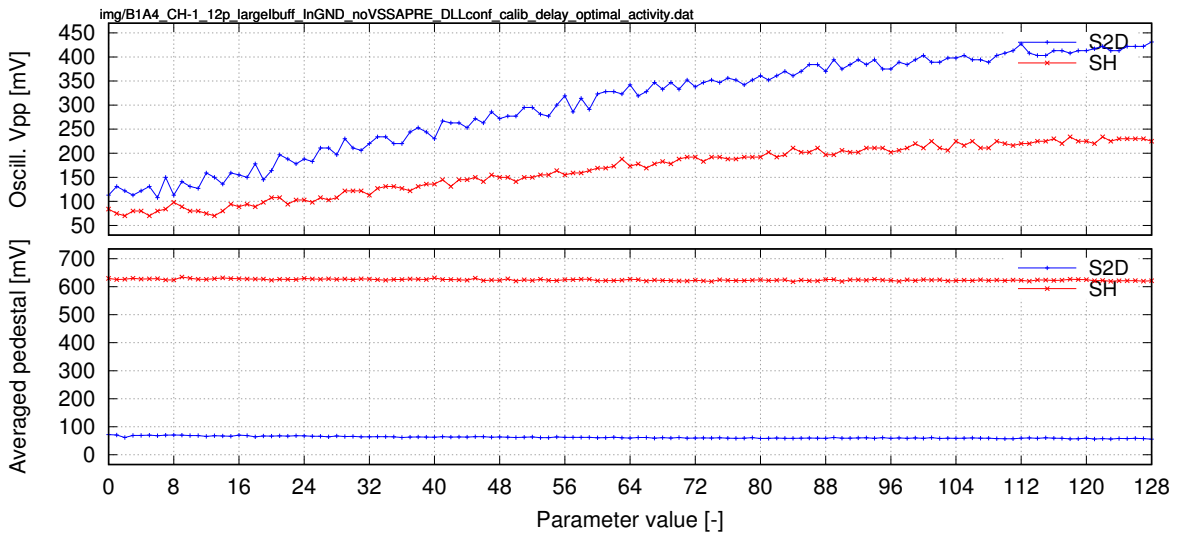


Figure 381: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Preamp GND configuration – only input. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

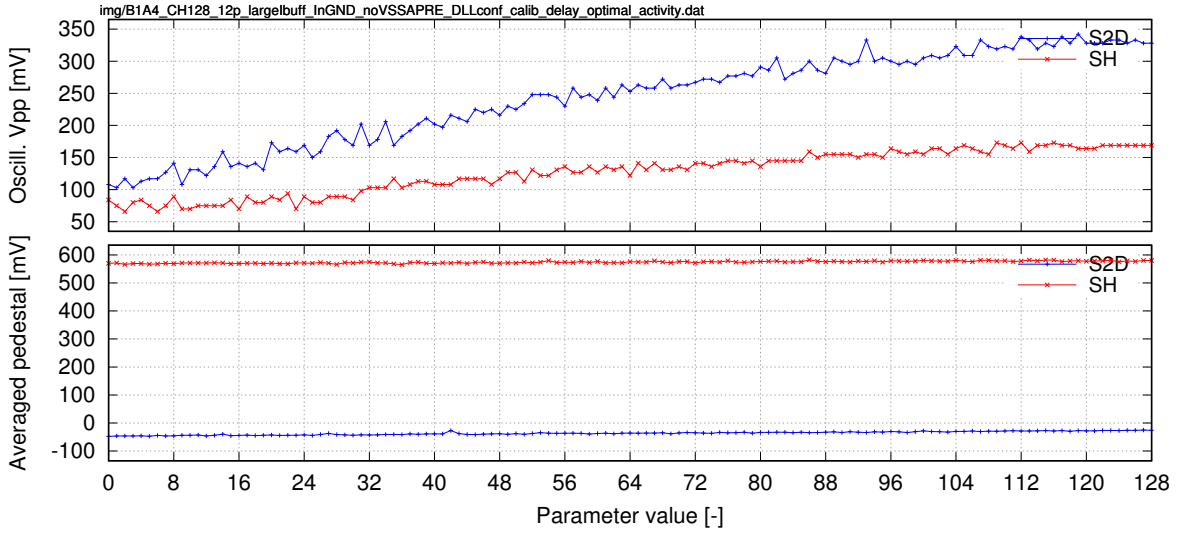


Figure 382: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Preamp GND configuration – only input. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

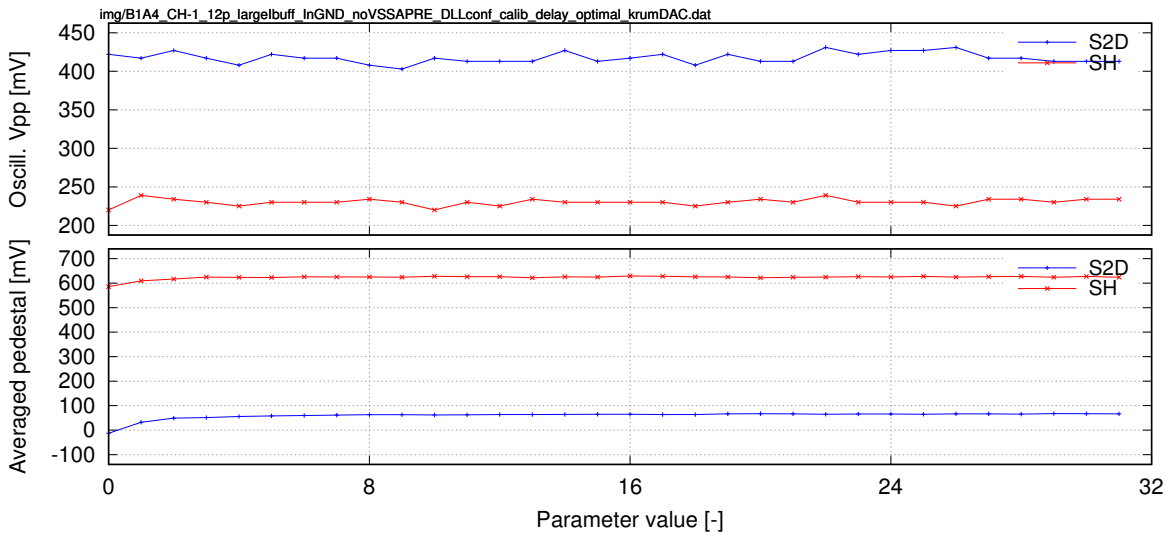


Figure 383: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Preamp GND configuration – only input. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

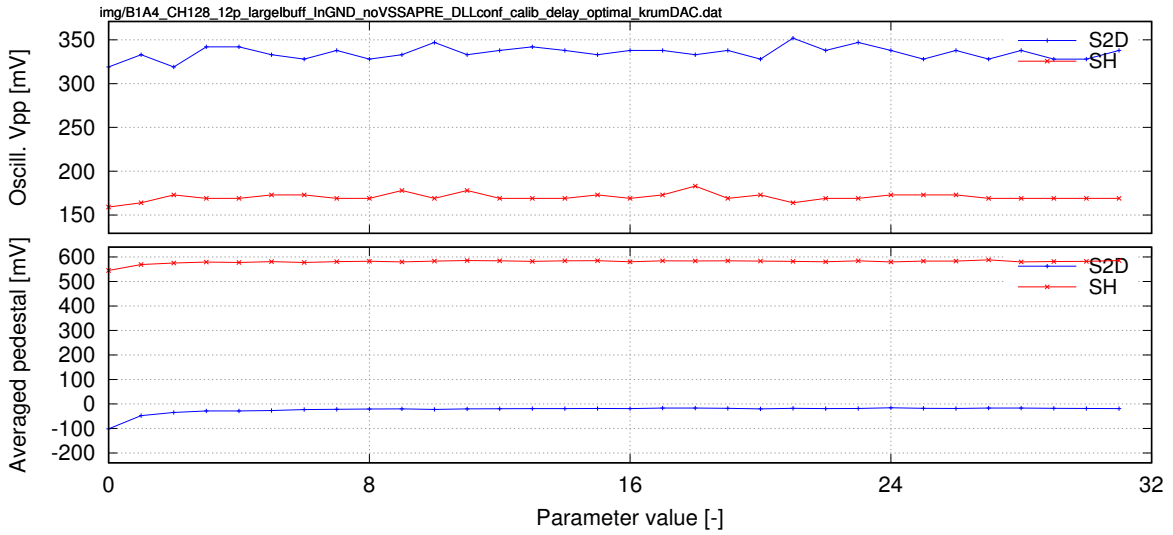


Figure 384: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Preamp GND configuration – only input. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

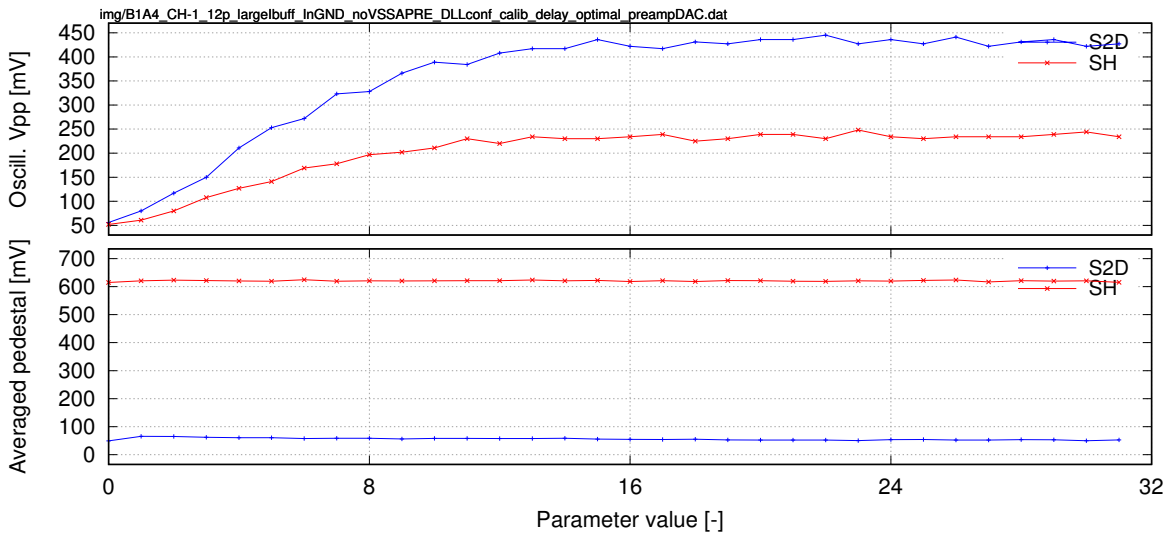


Figure 385: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Preamp GND configuration – only input. Optimized test pulse and ADC delay. Parameter=preamp DAC

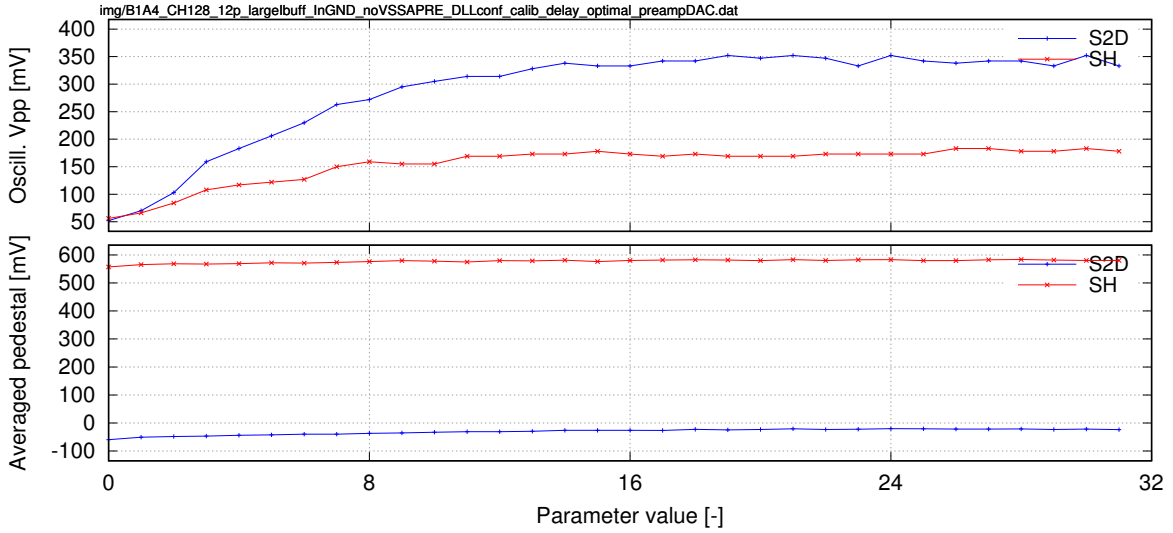


Figure 386: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Preamp GND configuration – only input. Optimized test pulse and ADC delay. Parameter=preamp DAC

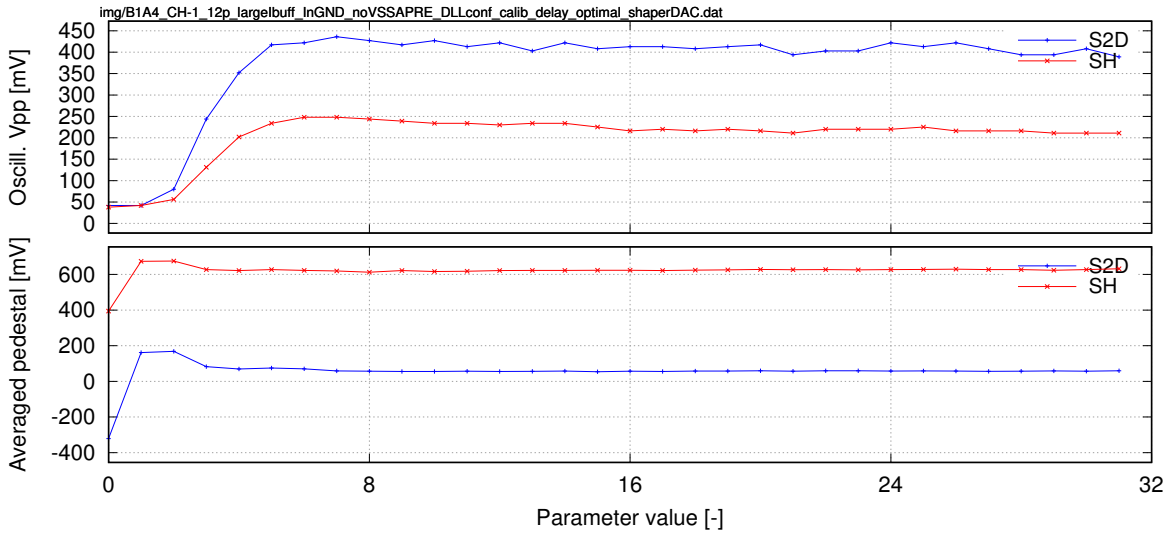


Figure 387: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Preamp GND configuration – only input. Optimized test pulse and ADC delay. Parameter=shaper DAC

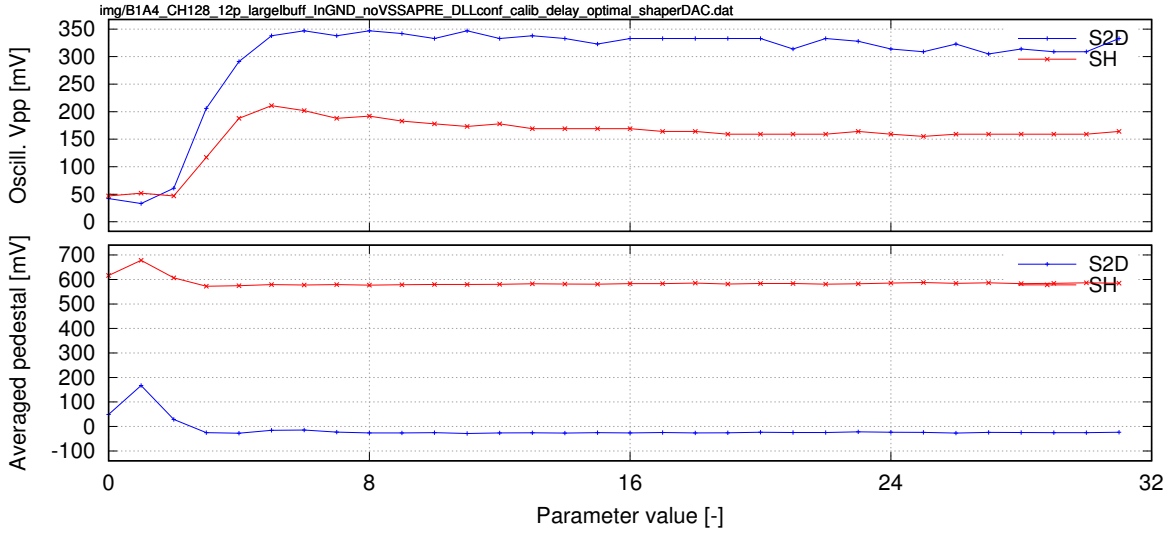


Figure 388: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Preamp GND configuration – only input. Optimized test pulse and ADC delay. Parameter=shaper DAC

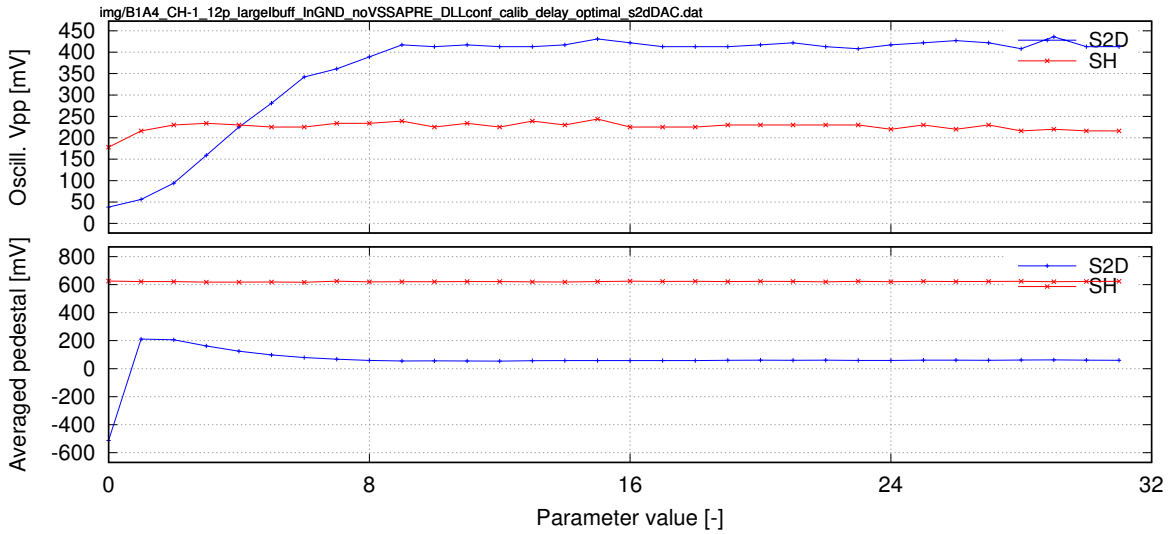


Figure 389: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Preamp GND configuration – only input. Optimized test pulse and ADC delay. Parameter=S2D DAC

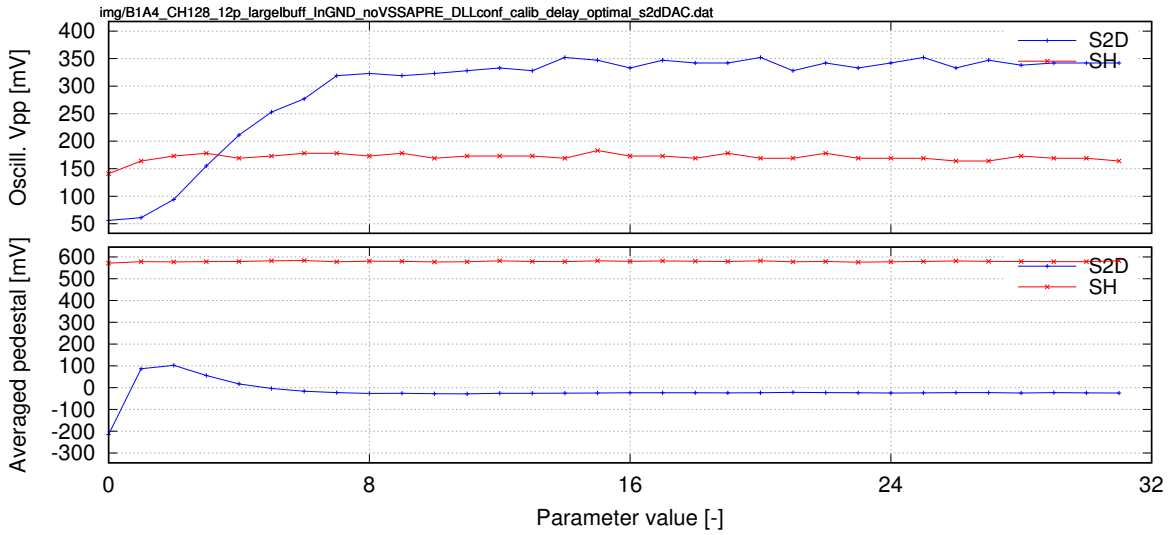


Figure 390: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; Preamp GND configuration – only input. Optimized test pulse and ADC delay. Parameter=S2D DAC

5.7 Cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – only input

Cap-PCB assembled, bonded to SALT input pads 0 and 127, two 12 pF capacitors assembled to the cap-PCB.

Ibuf current maximized – 1 k Ω resistor between VDDA and Ibuf pad.

Floating copper foil glued directly on passivation on top of the ASIC (see figure 549).

Preamp GND bonded only using input pads.

5.7.1 Default ASIC configuration

ASIC configuration: JC configuration (tables 1 & 2).

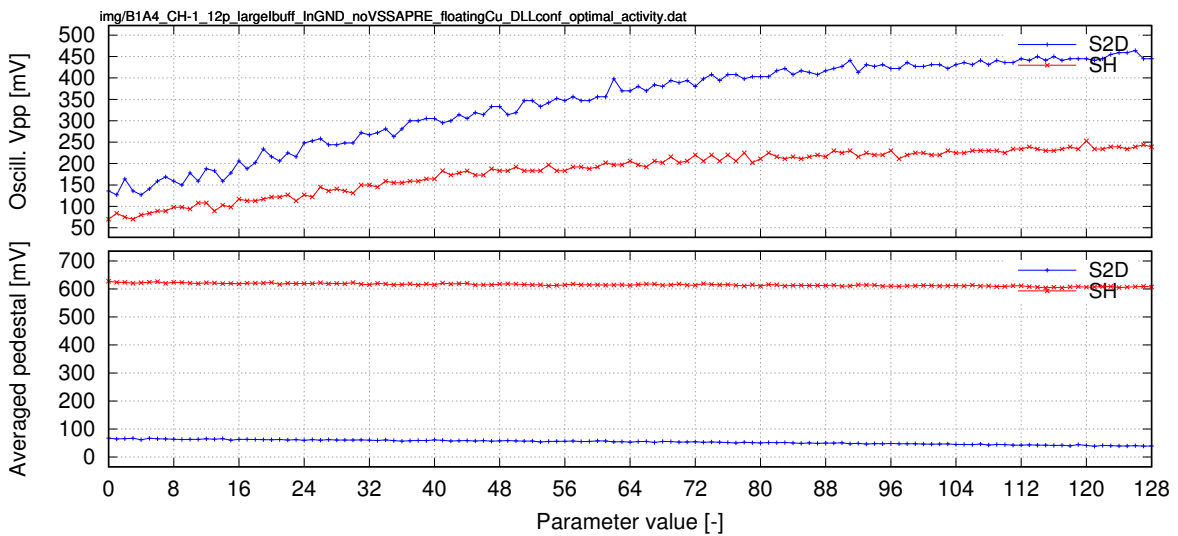


Figure 391: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – only input. Parameter=no. of active ADCs

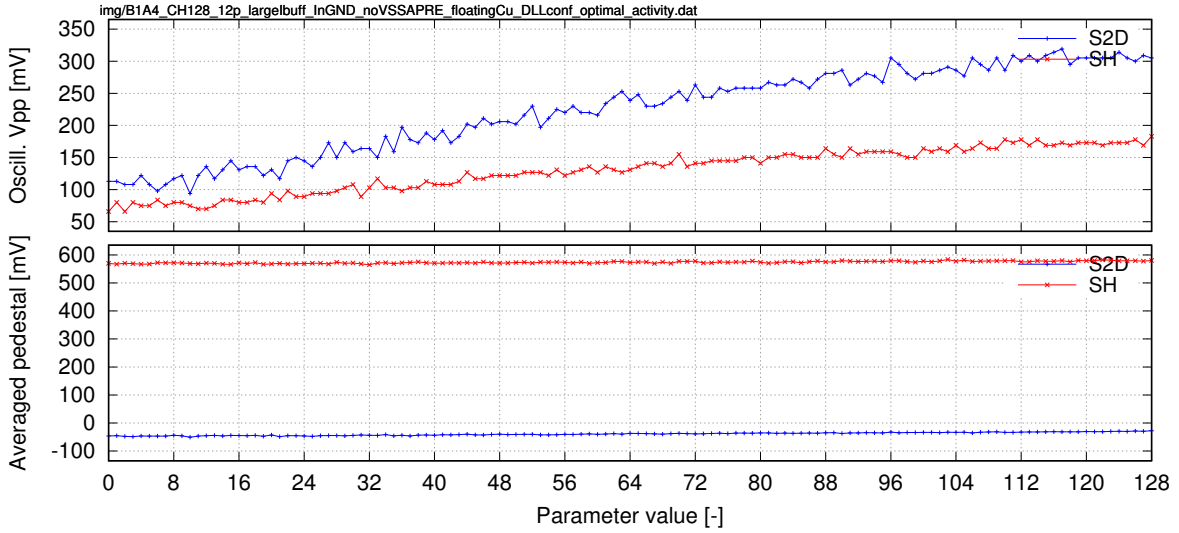


Figure 392: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – only input. Parameter=no. of active ADCs

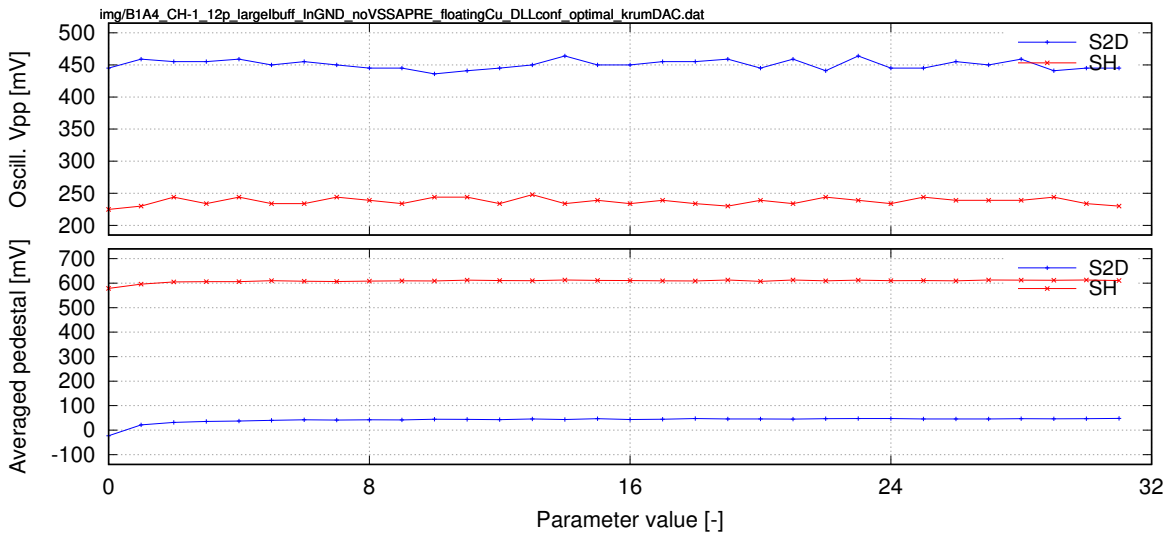


Figure 393: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – only input. Parameter=Krummenacher DAC

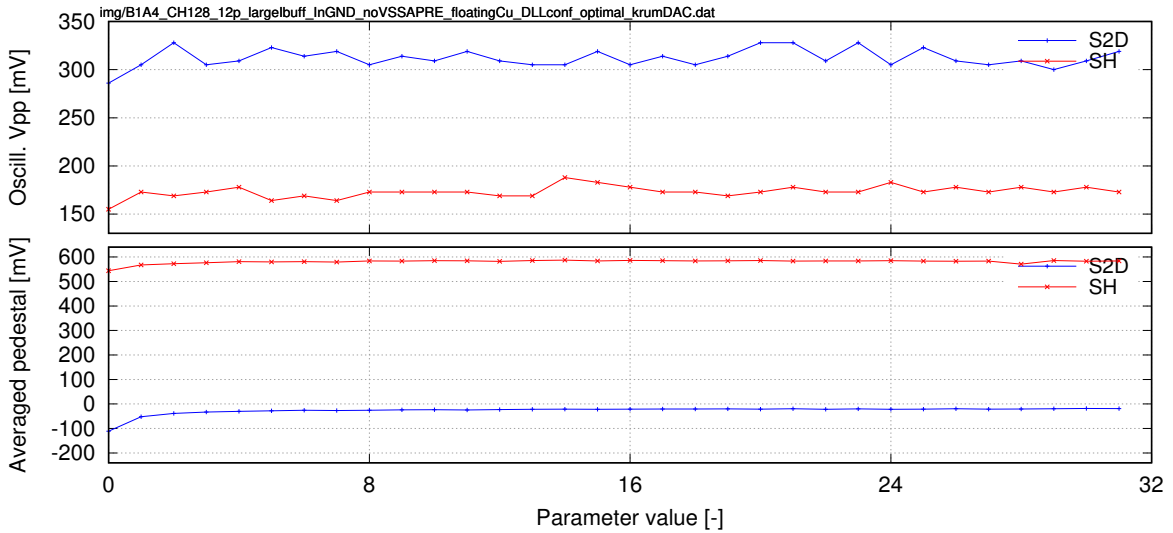


Figure 394: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – only input. Parameter=Krummenacher DAC

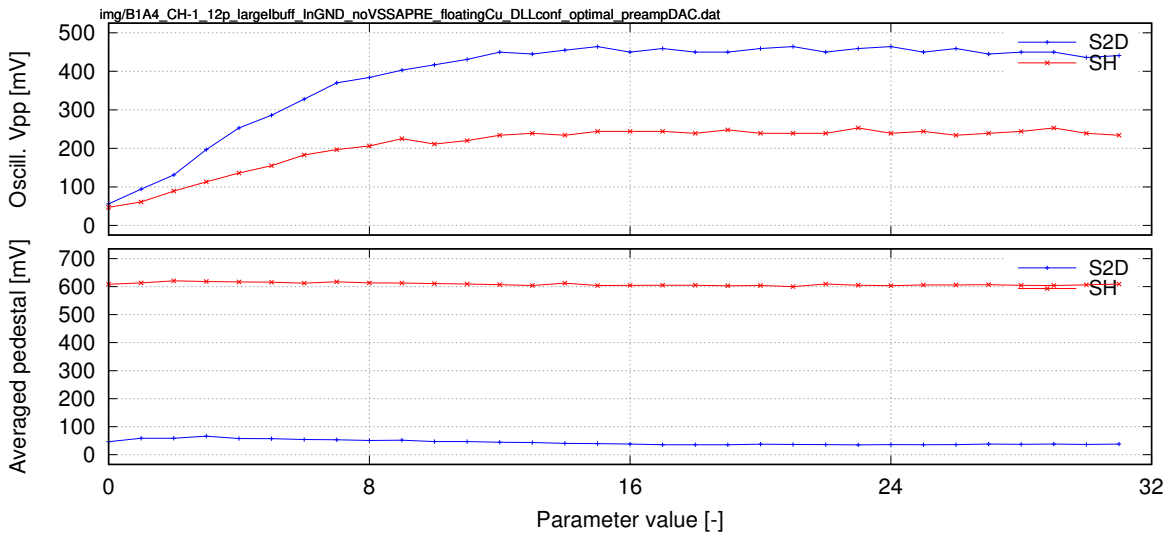


Figure 395: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – only input. Parameter=preamp DAC

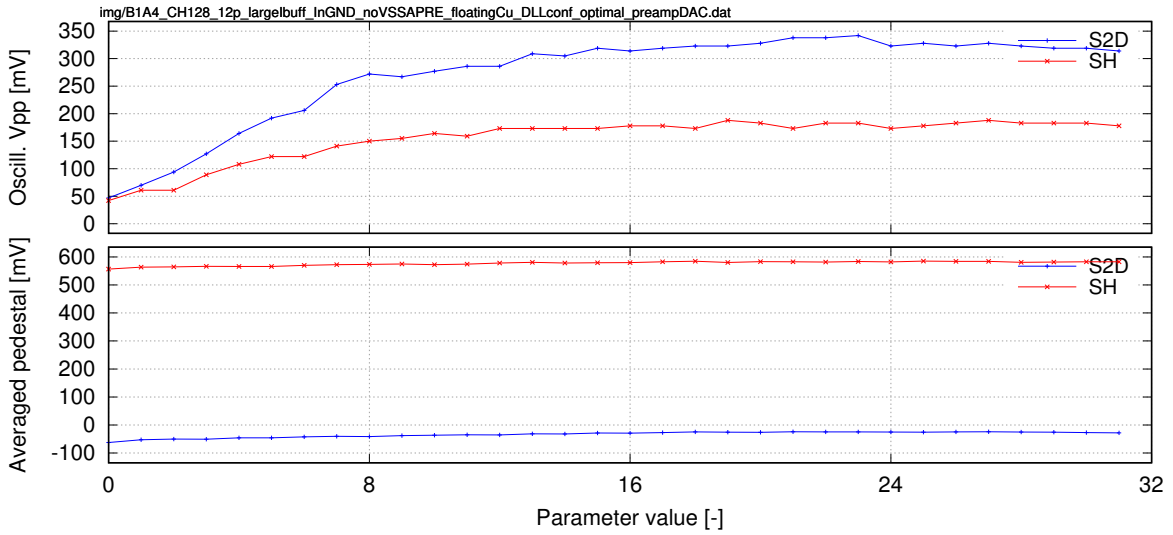


Figure 396: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – only input. Parameter=preamp DAC

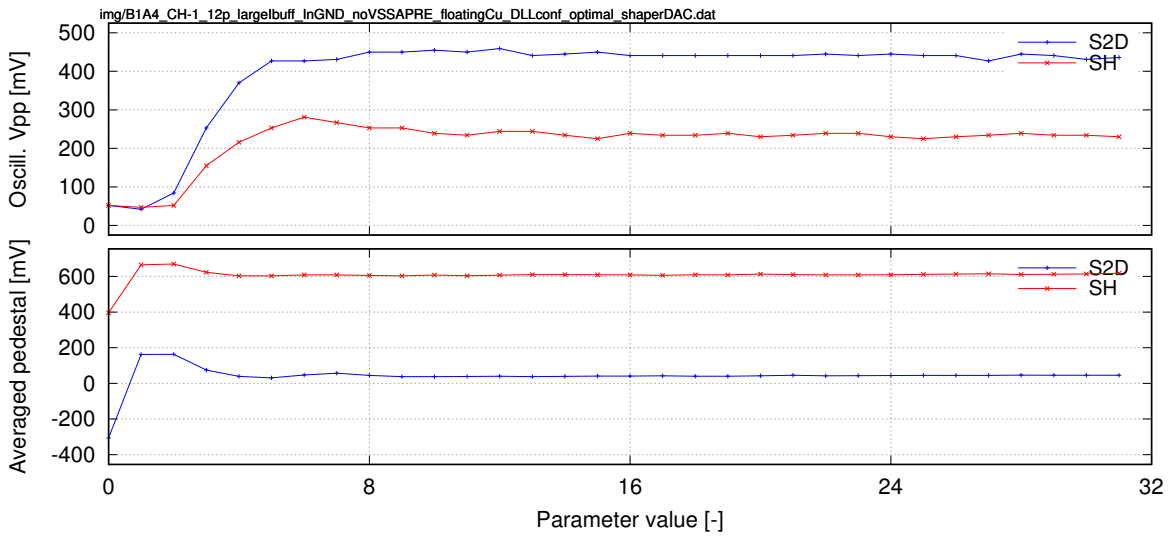


Figure 397: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – only input. Parameter=shaper DAC

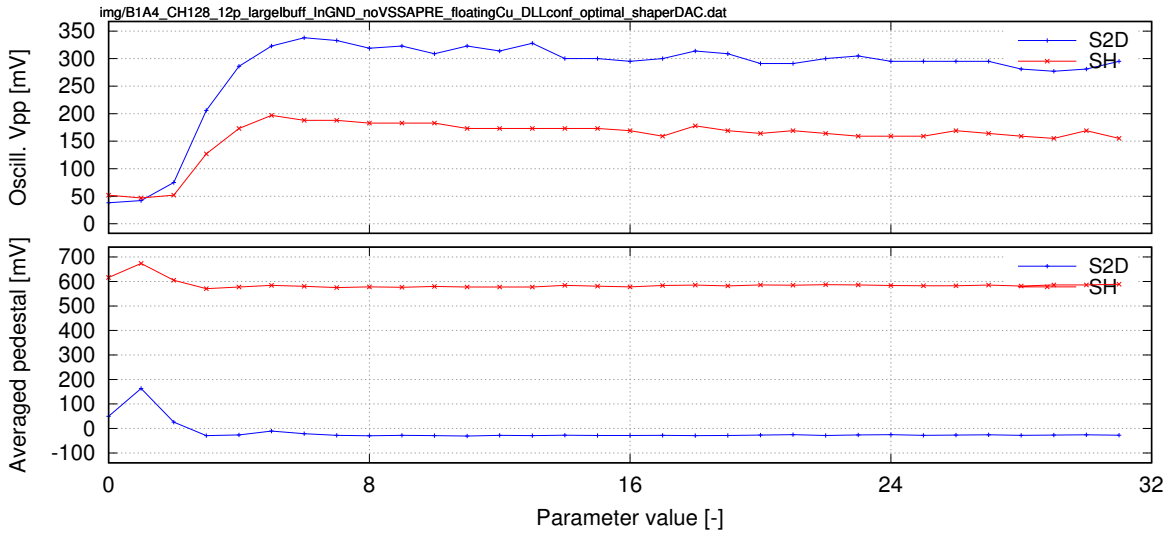


Figure 398: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – only input. Parameter=shaper DAC

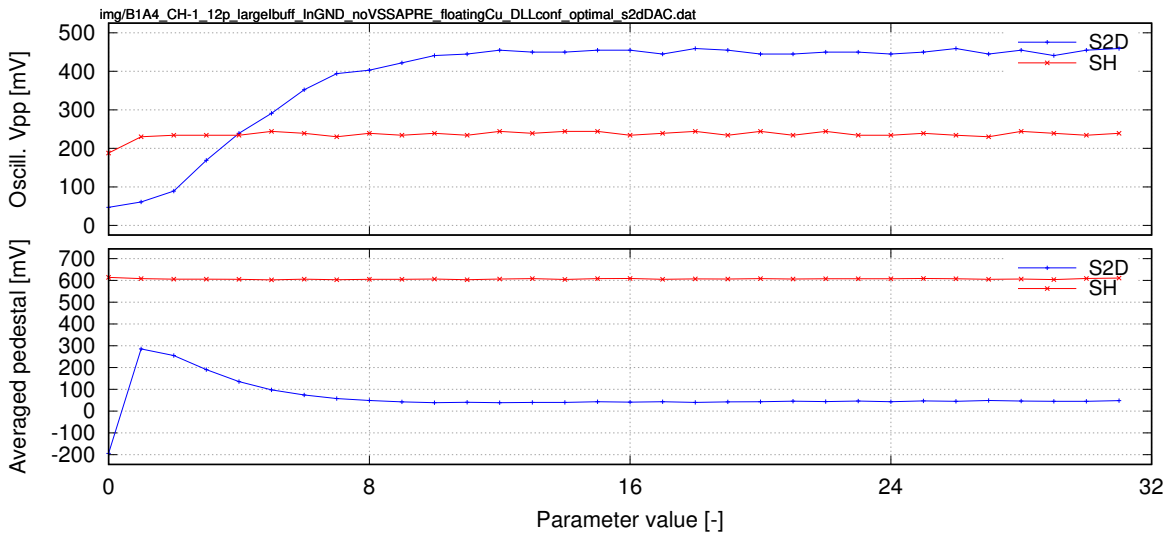


Figure 399: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – only input. Parameter=S2D DAC

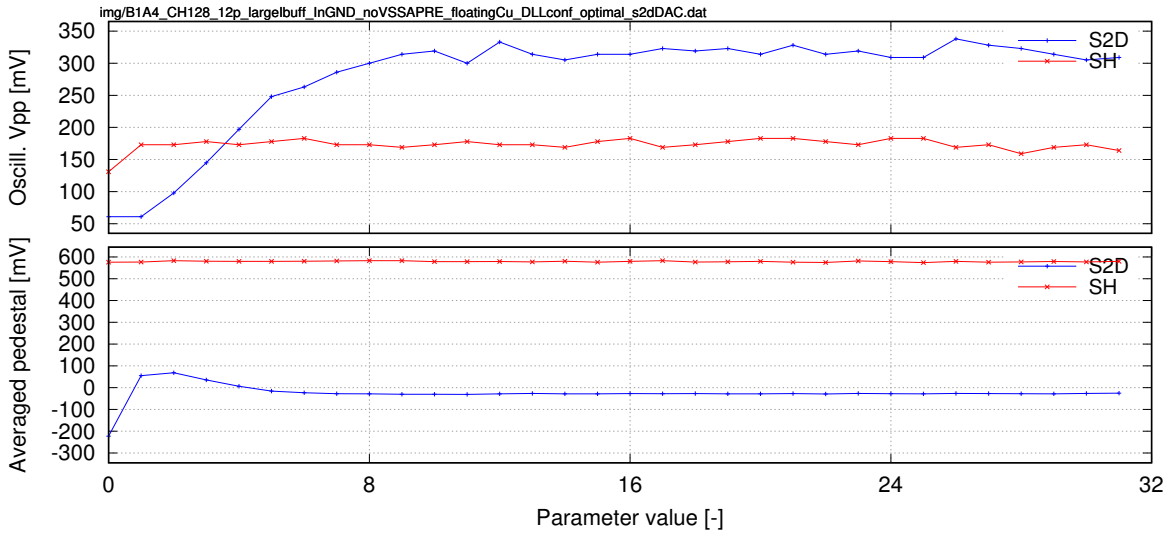


Figure 400: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – only input. Parameter=S2D DAC

5.7.2 Optimized test pulse and ADC delay

ASIC configuration: JC configuration (tables 1 & 2) + test pulse and ADC delay optimizations (table 3).

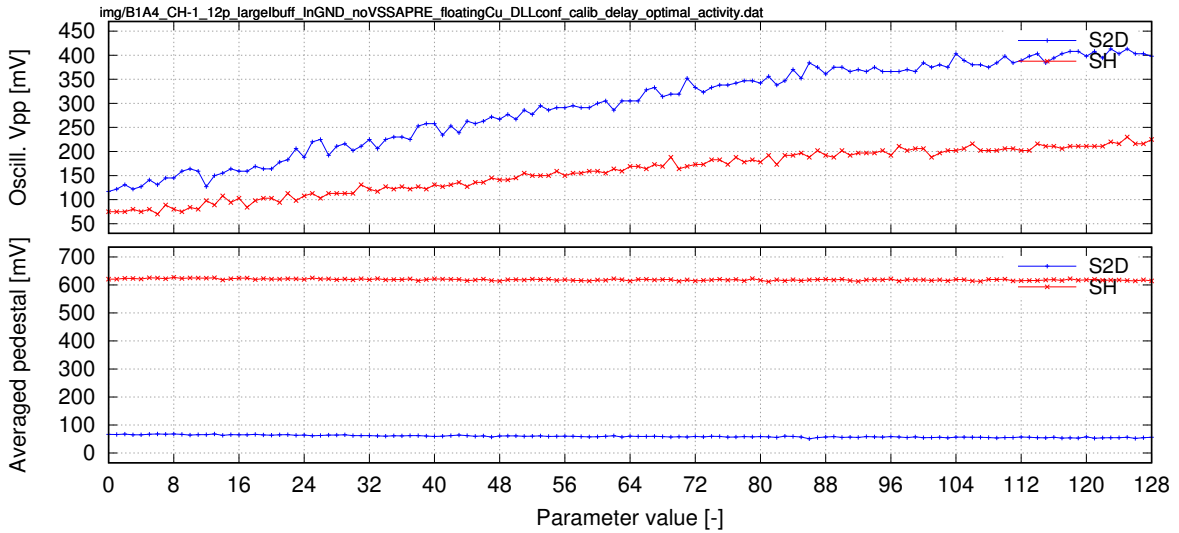


Figure 401: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – only input. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

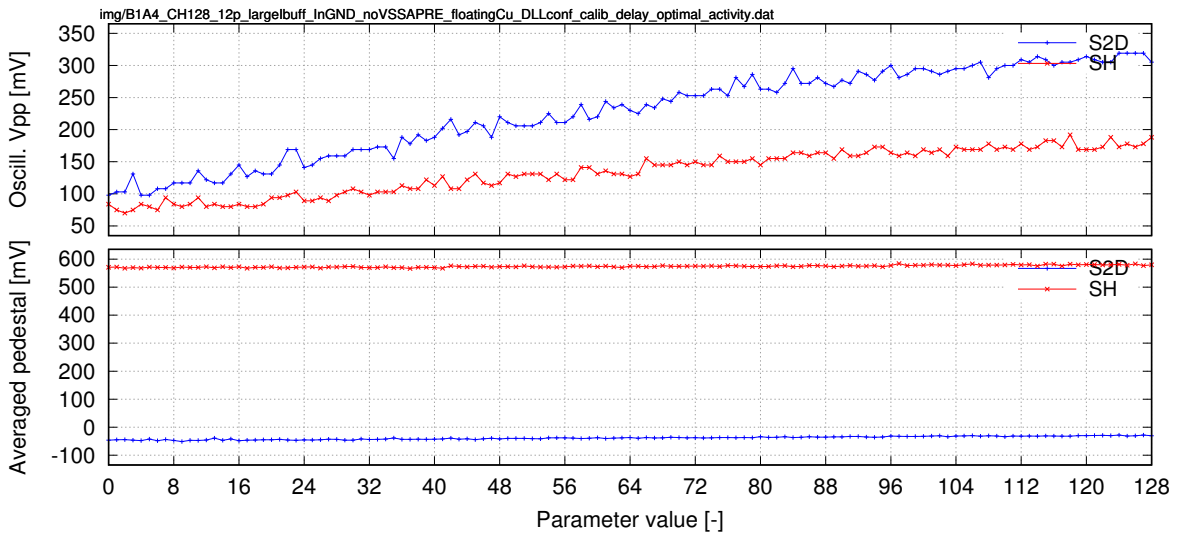


Figure 402: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – only input. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

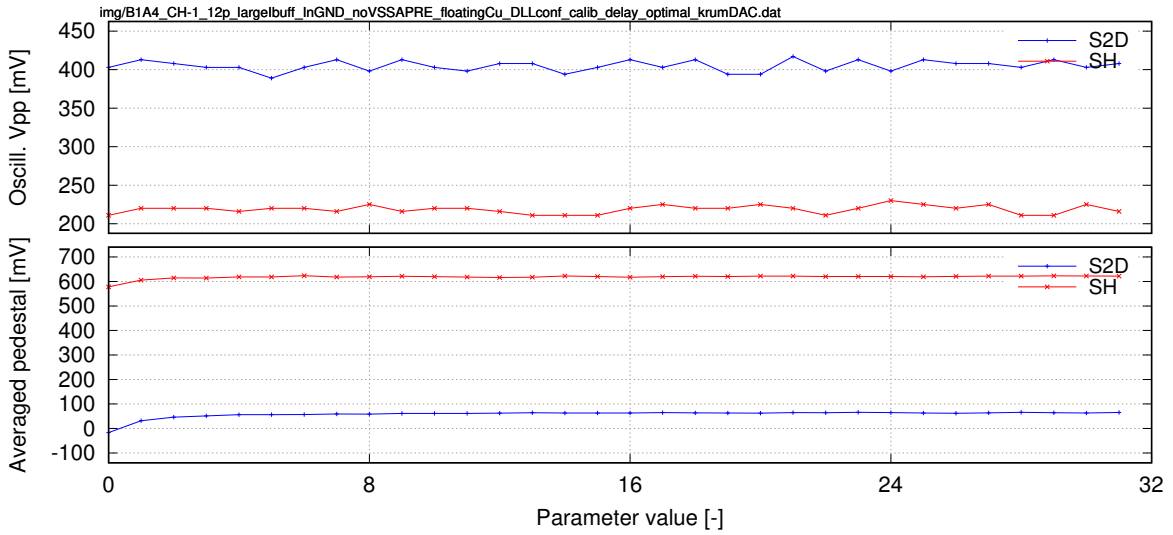


Figure 403: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – only input. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

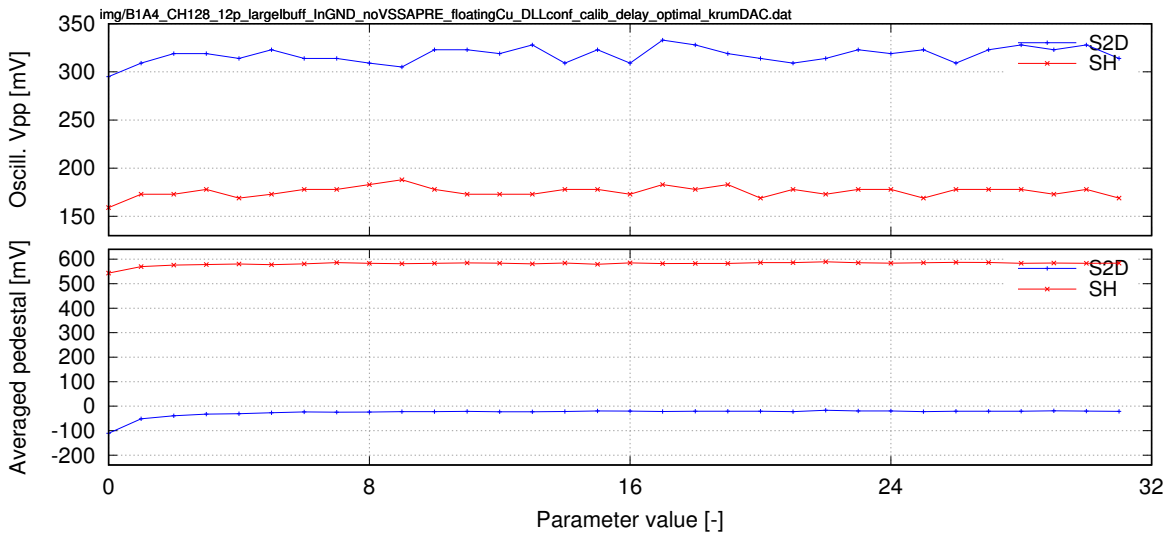


Figure 404: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – only input. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

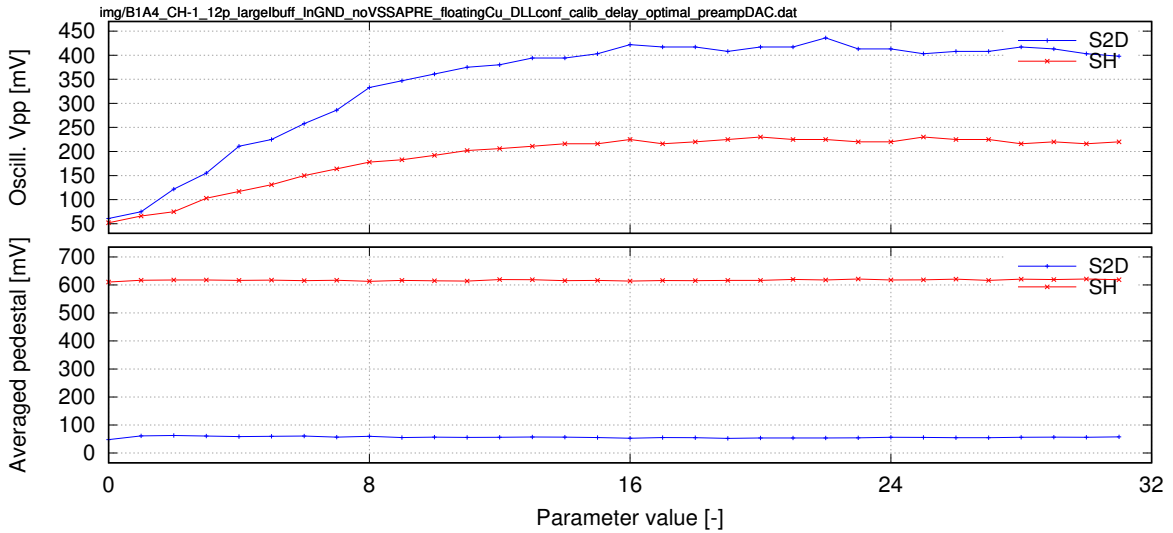


Figure 405: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – only input. Optimized test pulse and ADC delay. Parameter=preamp DAC

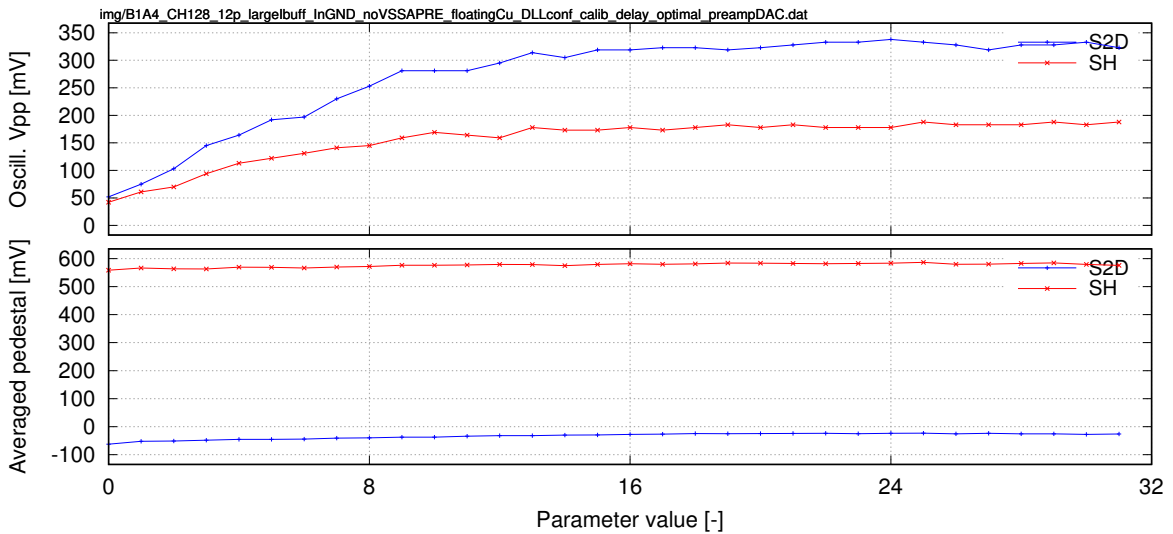


Figure 406: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – only input. Optimized test pulse and ADC delay. Parameter=preamp DAC

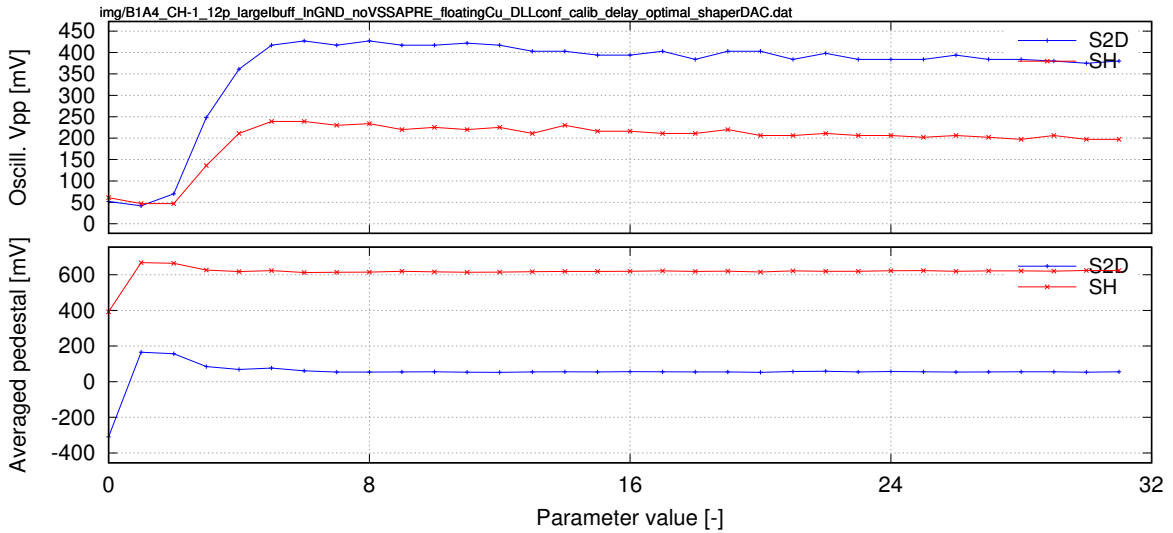


Figure 407: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – only input. Optimized test pulse and ADC delay. Parameter=shaper DAC

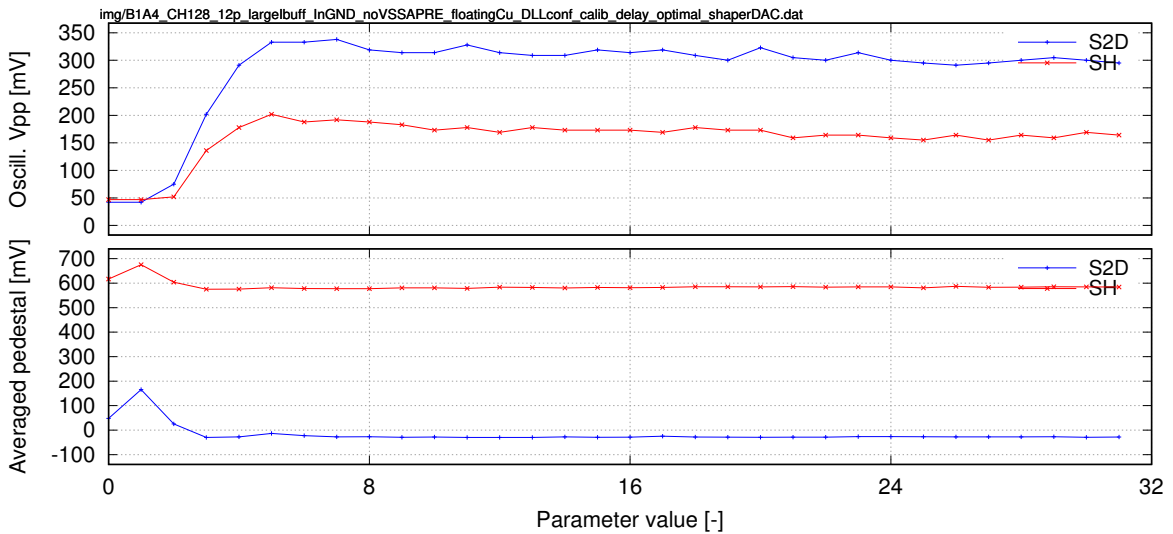


Figure 408: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – only input. Optimized test pulse and ADC delay. Parameter=shaper DAC

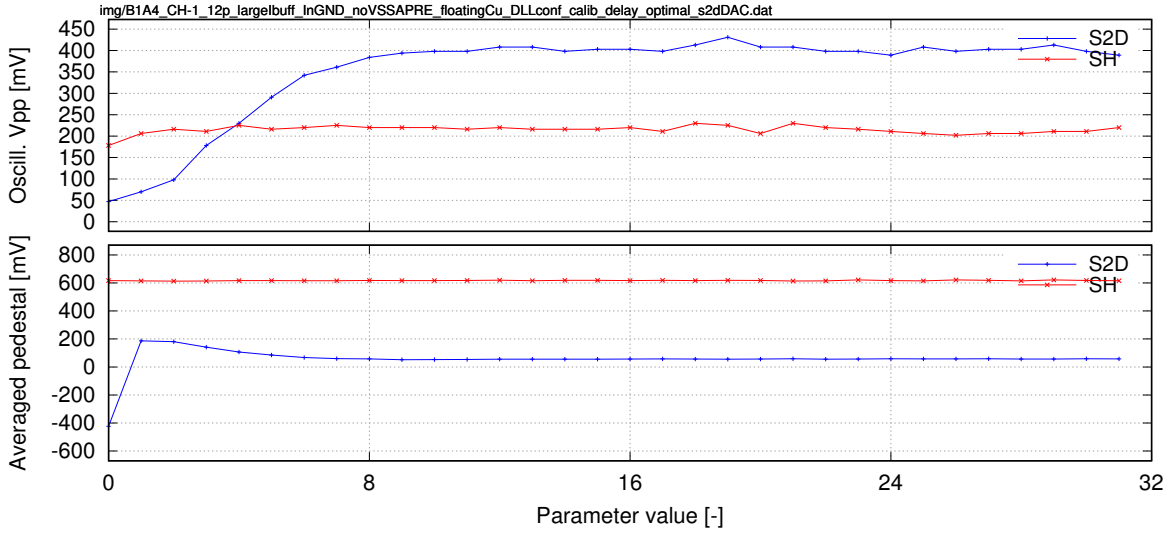


Figure 409: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – only input. Optimized test pulse and ADC delay. Parameter=S2D DAC

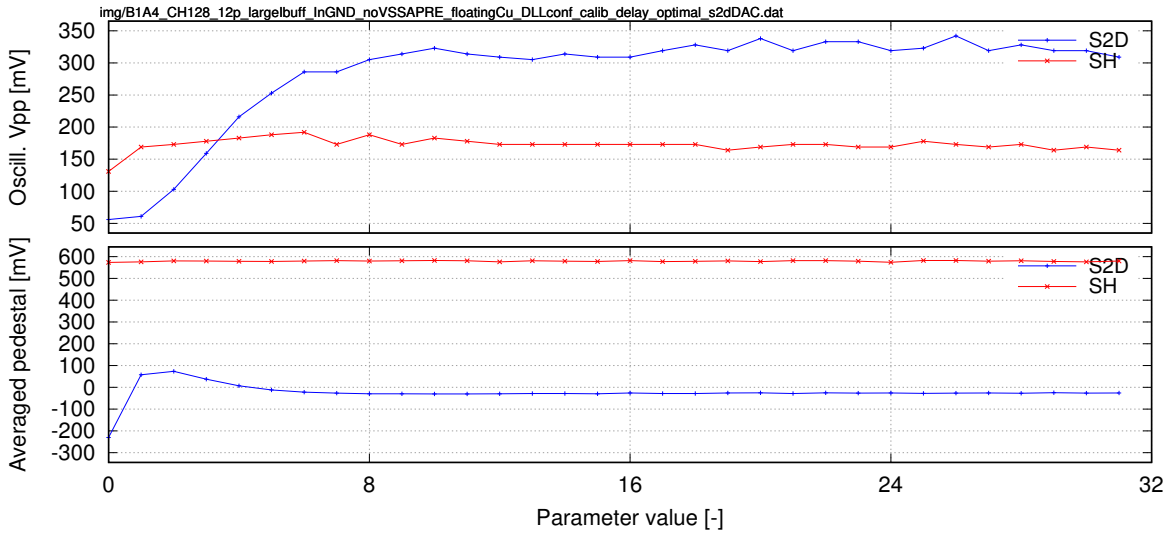


Figure 410: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – only input. Optimized test pulse and ADC delay. Parameter=S2D DAC

5.8 Cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – input + backside

Cap-PCB assembled, bonded to SALT input pads 0 and 127, two 12 pF capacitors assembled to the cap-PCB.

Ibuf current maximized – 1 k Ω resistor between VDDA and Ibuf pad.

Floating copper foil glued directly on passivation on top of the ASIC (see figure 549).

Preamp GND bonded from both sides - input pads + backside (default) pads.

5.8.1 Default ASIC configuration

ASIC configuration: JC configuration (tables 1 & 2).

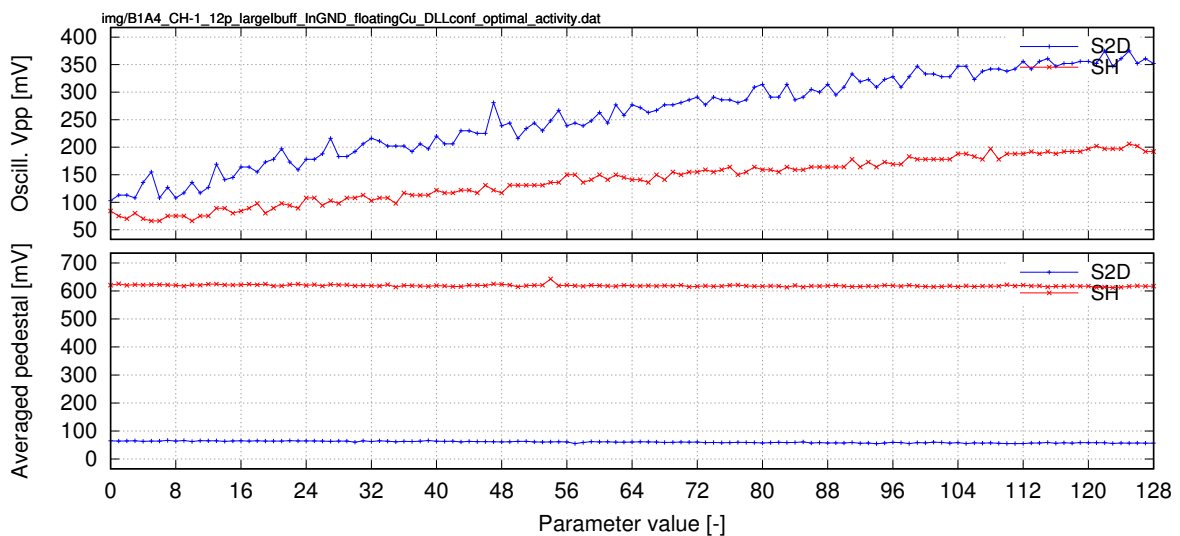


Figure 411: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – input + backside. Parameter=no. of active ADCs

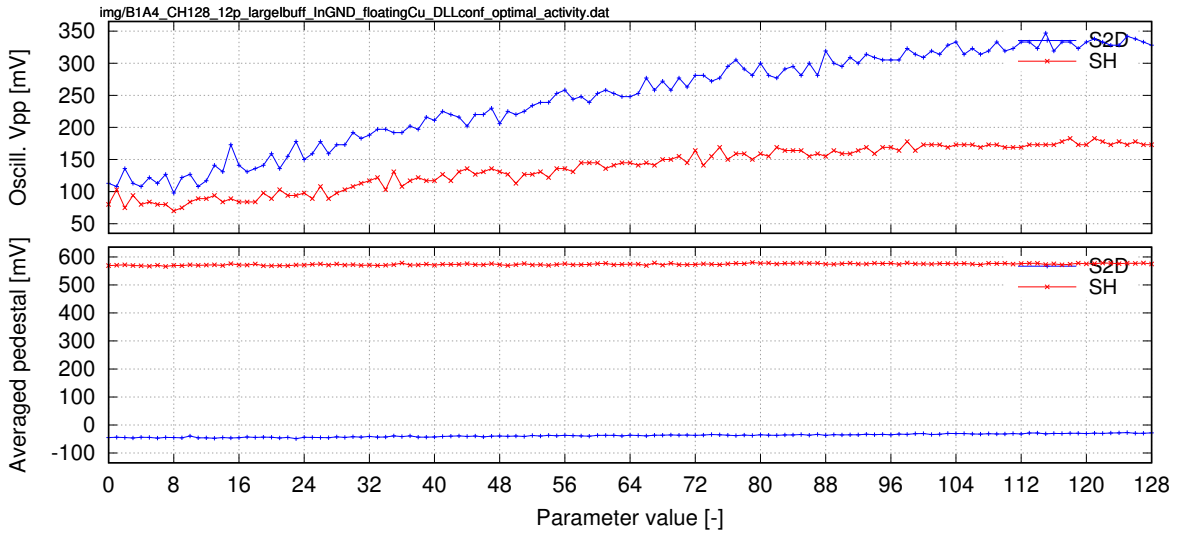


Figure 412: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – input + backside. Parameter=no. of active ADCs

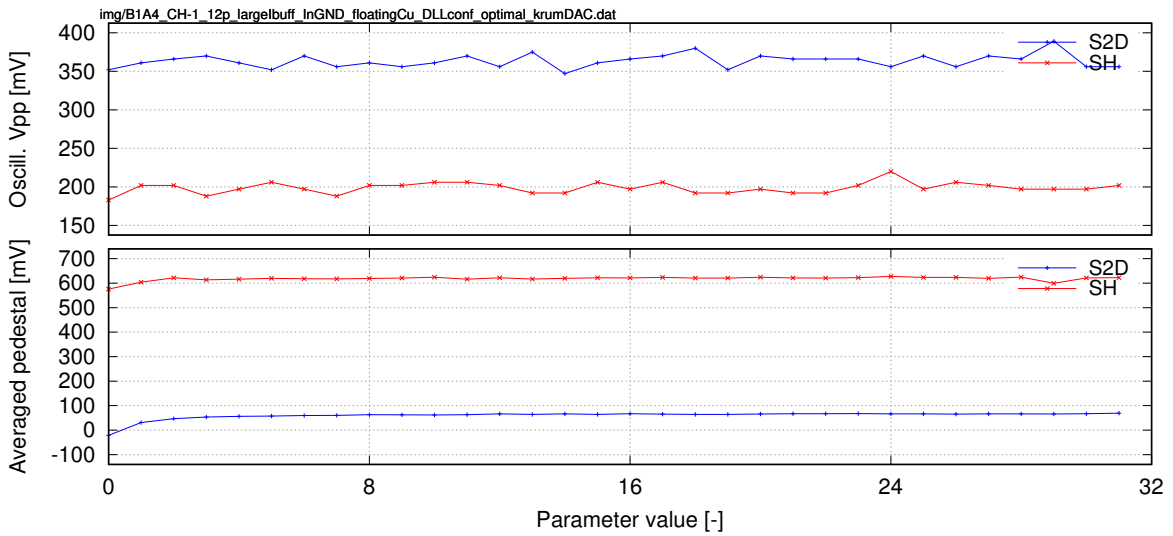


Figure 413: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – input + backside. Parameter=Krummenacher DAC

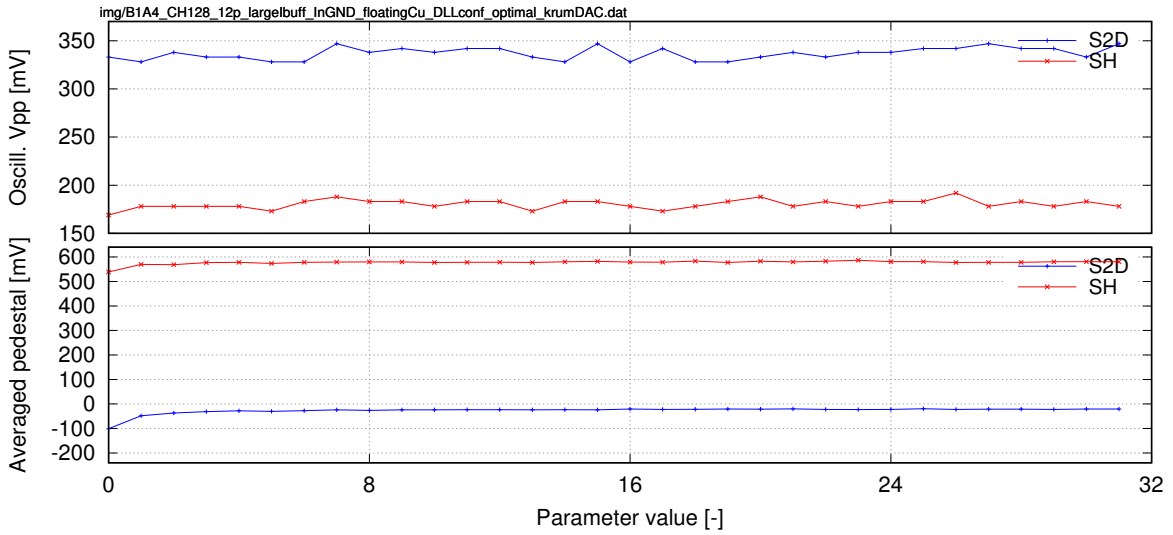


Figure 414: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – input + backside. Parameter=Krummenacher DAC

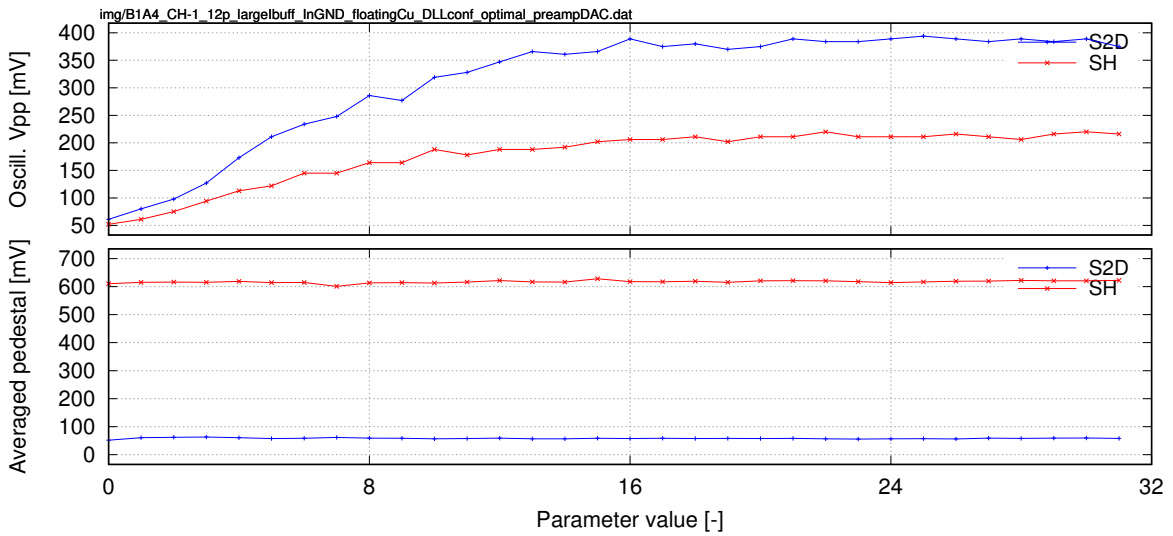


Figure 415: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – input + backside. Parameter=preamp DAC

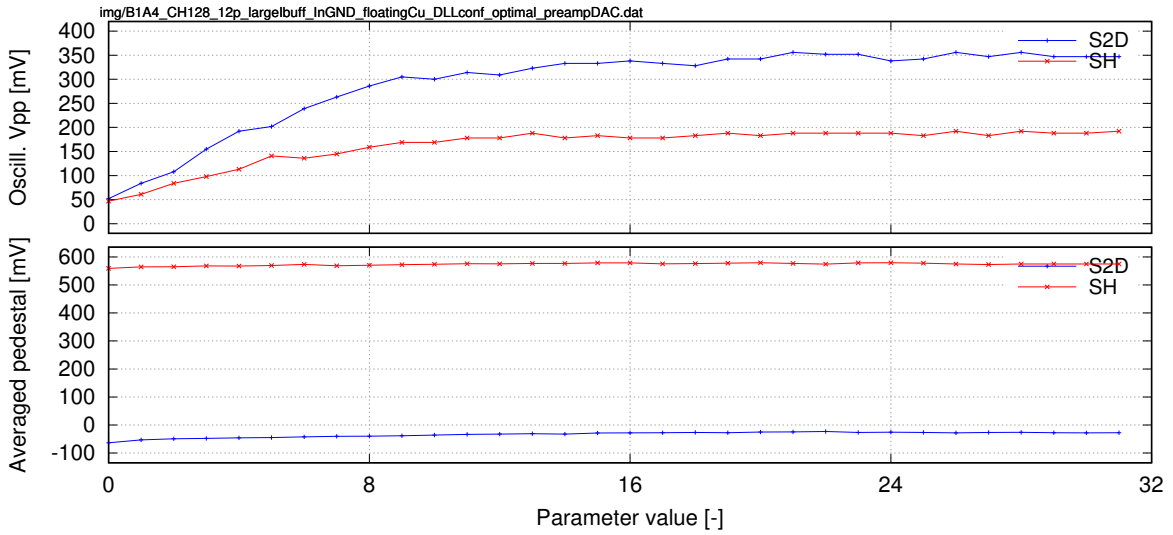


Figure 416: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – input + backside. Parameter=preamp DAC

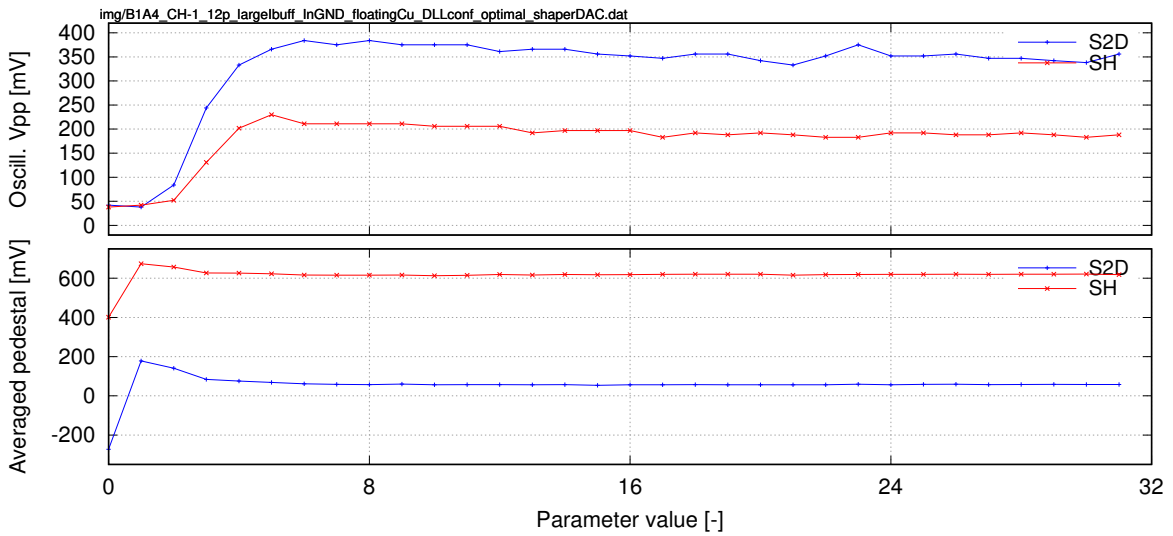


Figure 417: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – input + backside. Parameter=shaper DAC

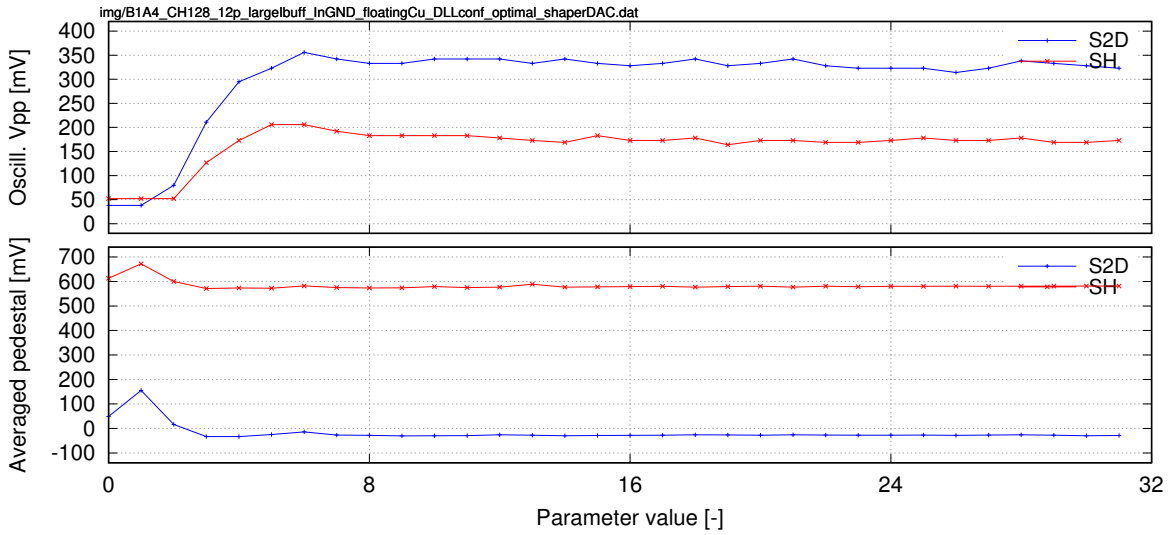


Figure 418: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – input + backside. Parameter=shaper DAC

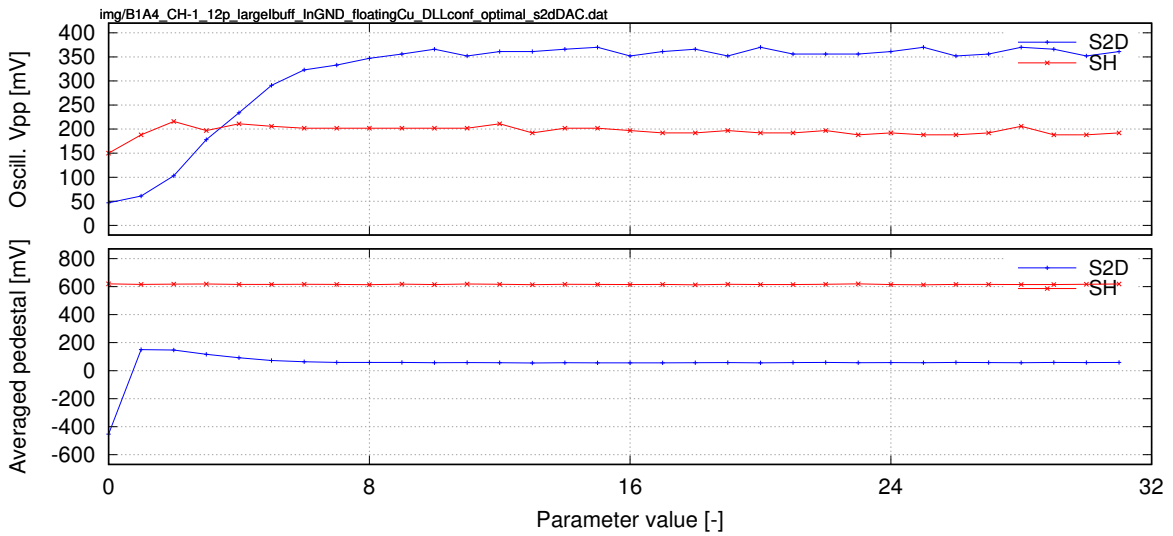


Figure 419: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – input + backside. Parameter=S2D DAC

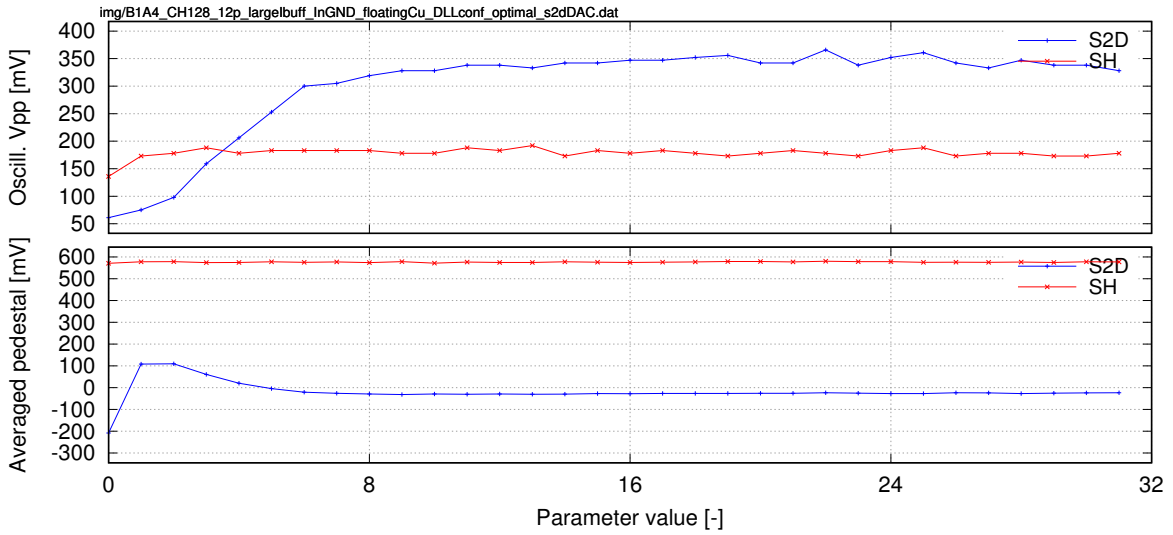


Figure 420: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – input + backside. Parameter=S2D DAC

5.8.2 Optimized test pulse and ADC delay

ASIC configuration: JC configuration (tables 1 & 2) + test pulse and ADC delay optimizations (table 3).

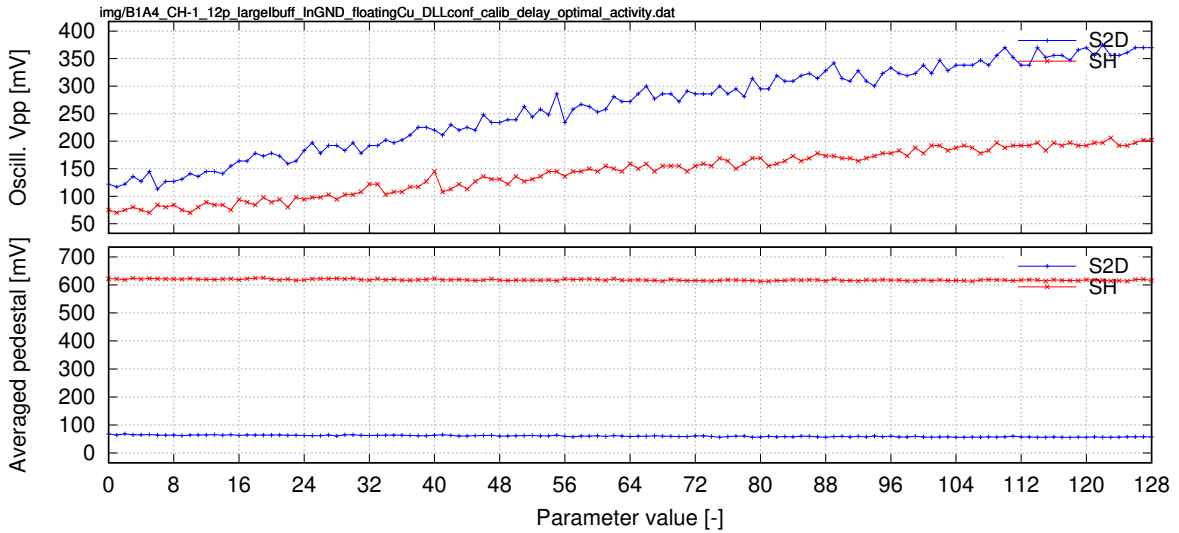


Figure 421: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

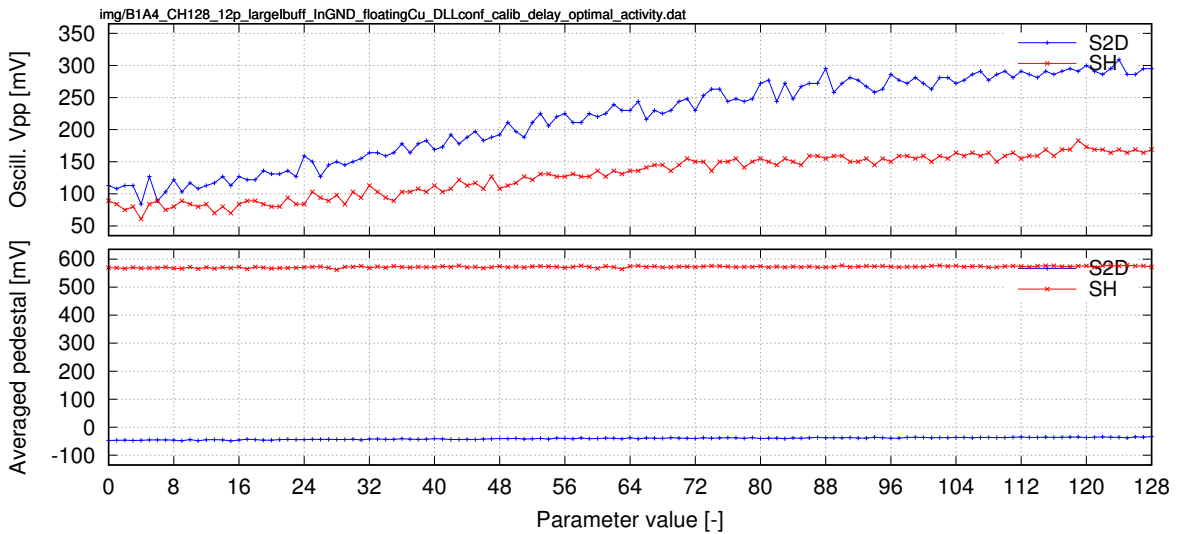


Figure 422: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

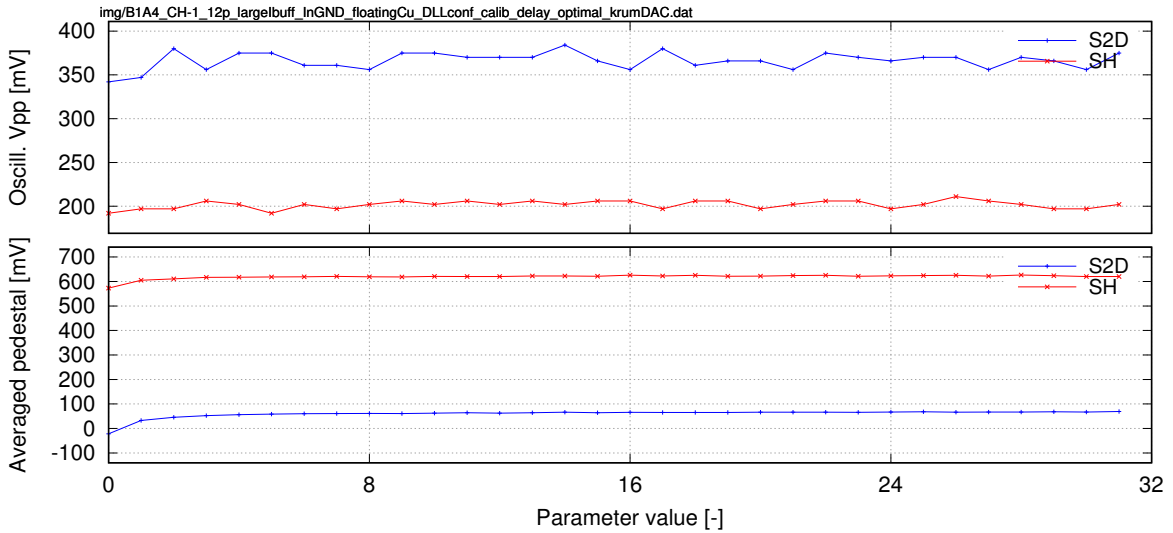


Figure 423: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

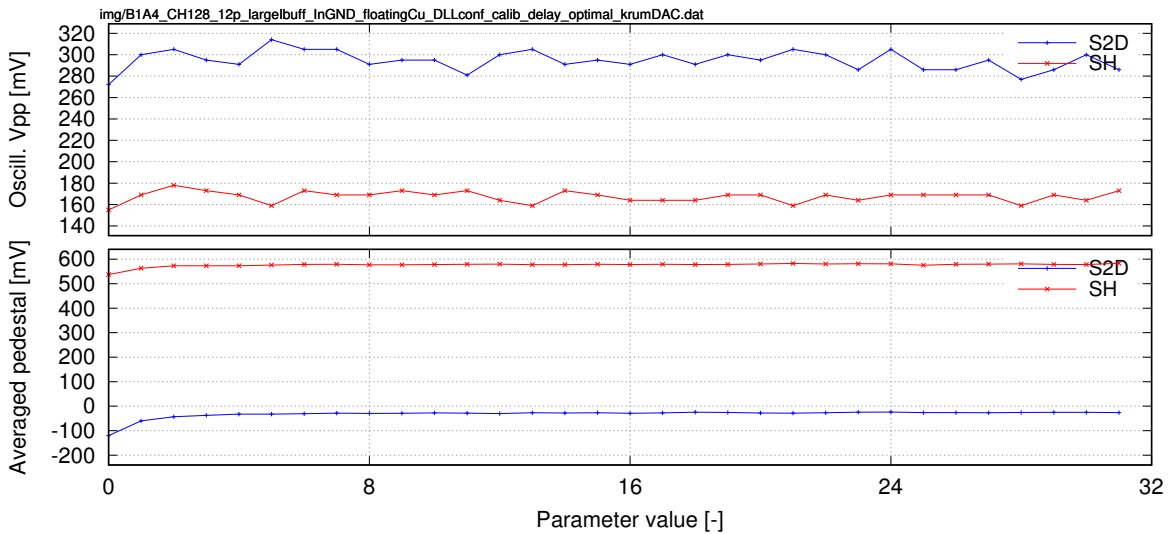


Figure 424: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

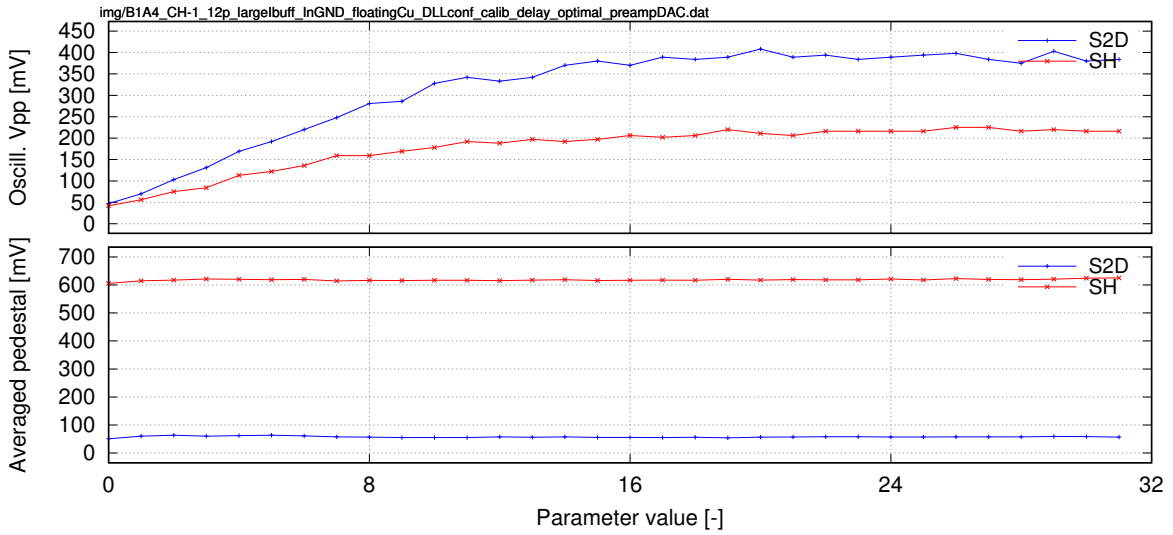


Figure 425: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=preamp DAC

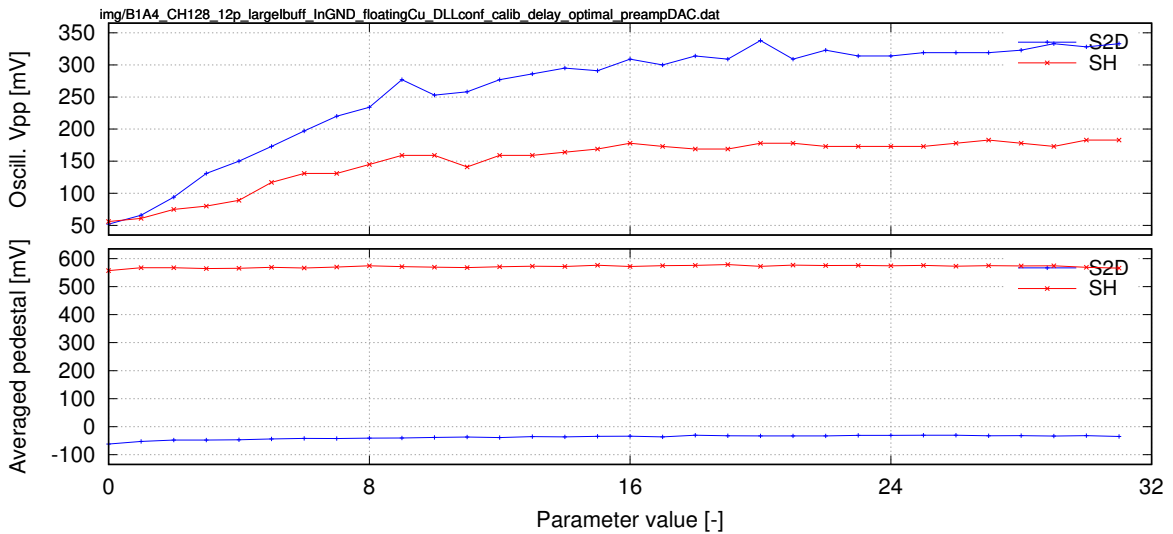


Figure 426: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=preamp DAC

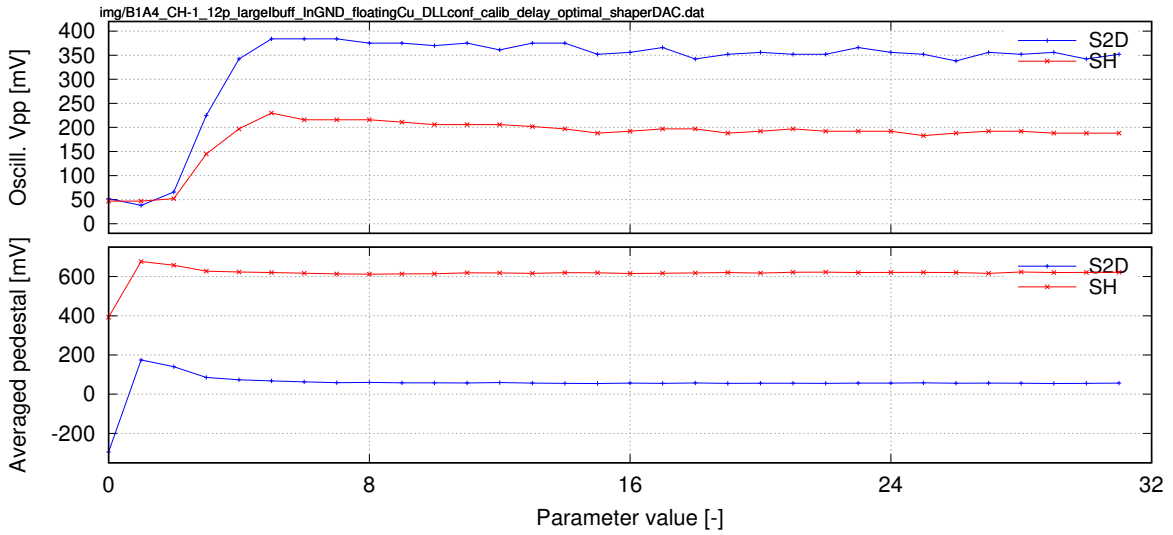


Figure 427: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=shaper DAC

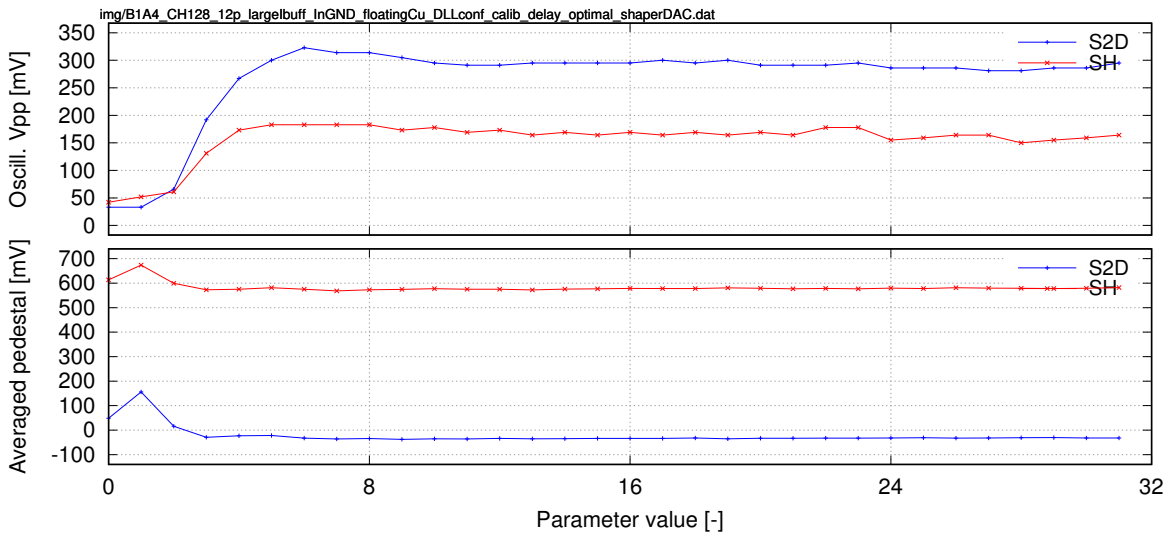


Figure 428: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=shaper DAC

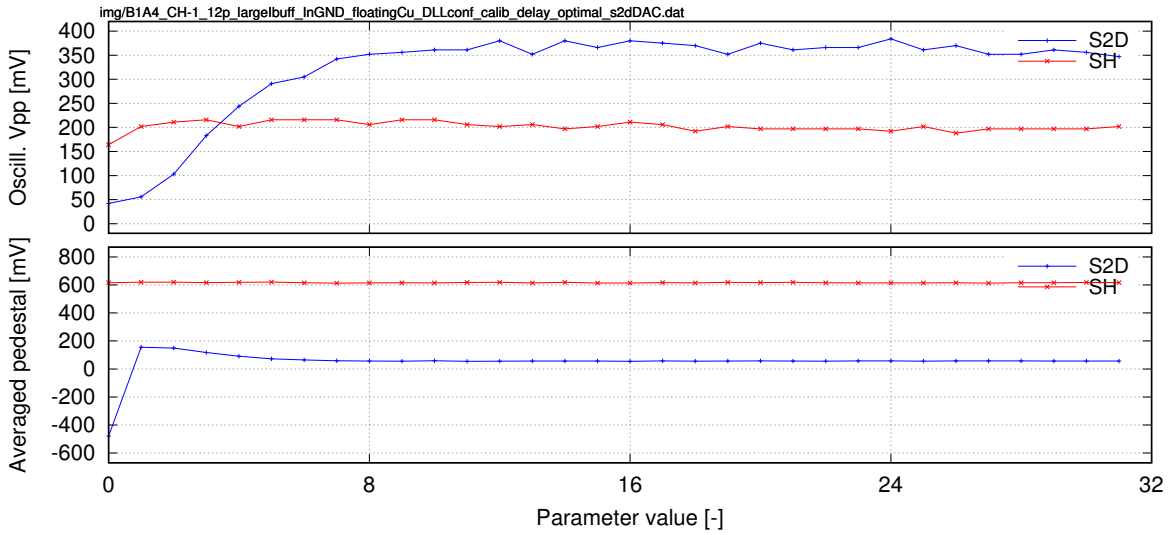


Figure 429: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=S2D DAC

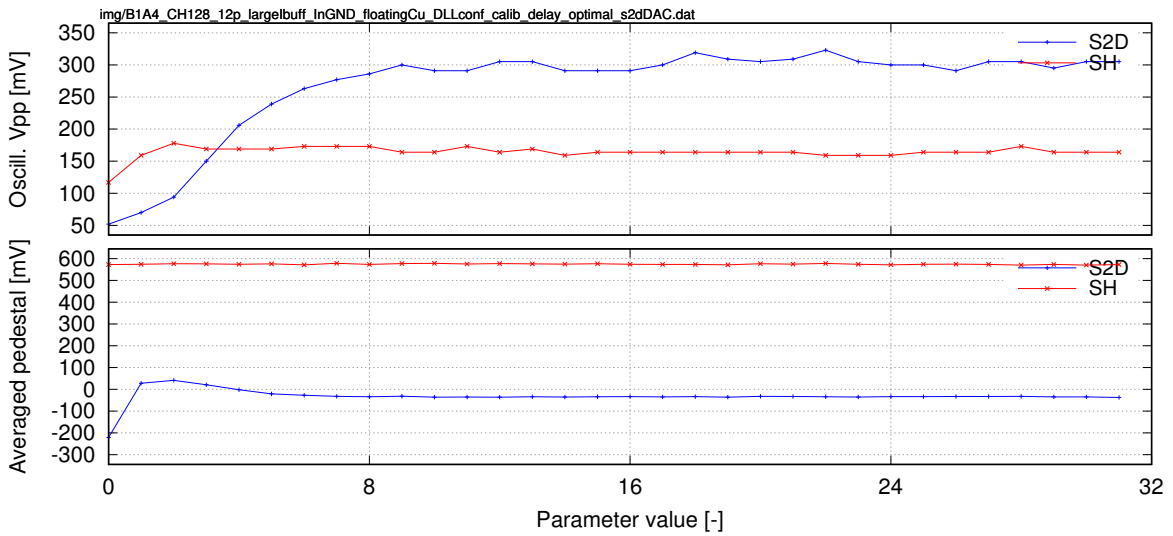


Figure 430: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=S2D DAC

5.9 Cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – only backside

Cap-PCB assembled, bonded to SALT input pads 0 and 127, two 12 pF capacitors assembled to the cap-PCB.

Ibuf current maximized – 1 k Ω resistor between VDDA and Ibuf pad.

Floating copper foil glued directly on passivation on top of the ASIC (see figure 549).

Preamp GND bonded only from backside (default pads).

5.9.1 Default ASIC configuration

ASIC configuration: JC configuration (tables 1 & 2).

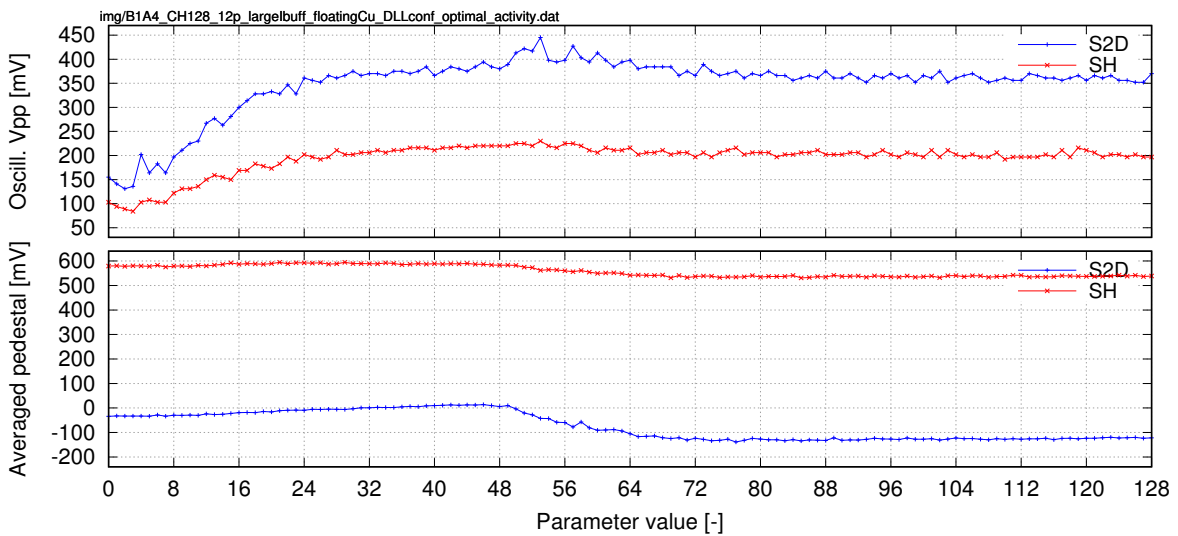


Figure 431: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – only backside. Parameter=no. of active ADCs

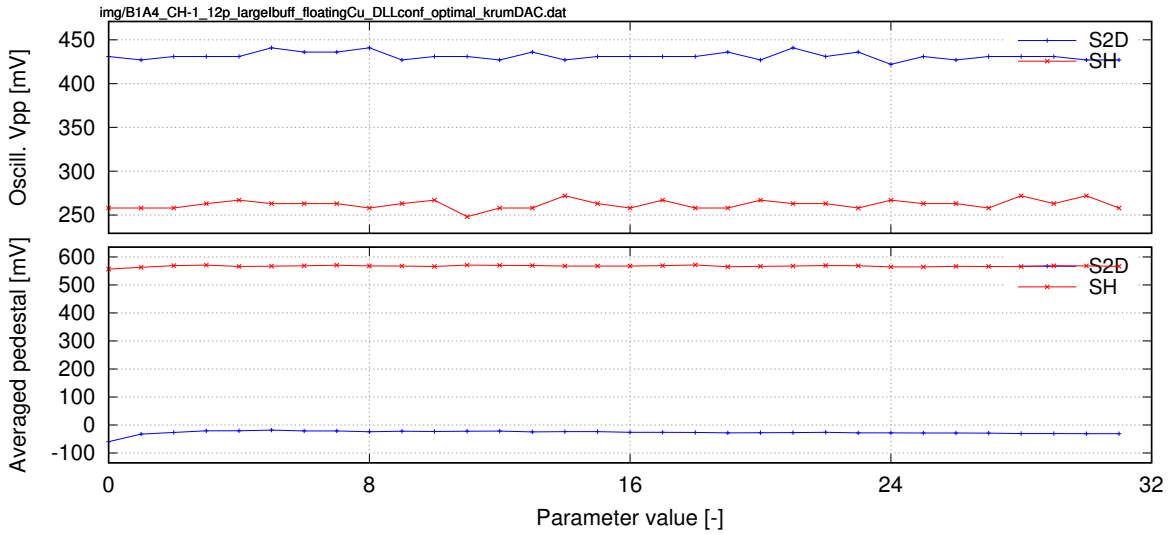


Figure 432: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – only backside. Parameter=Krummenacher DAC

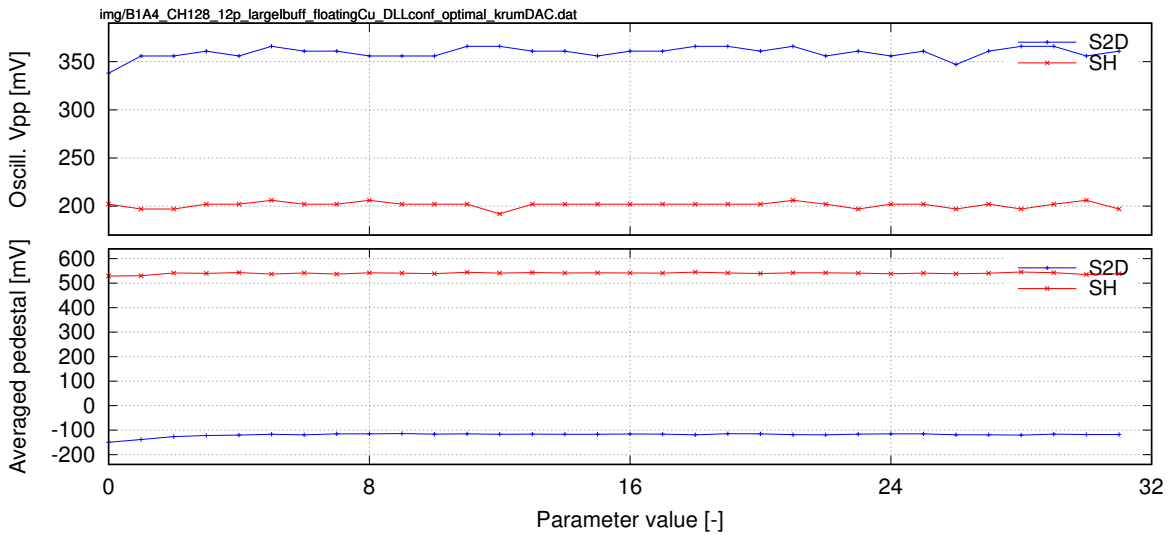


Figure 433: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – only backside. Parameter=Krummenacher DAC

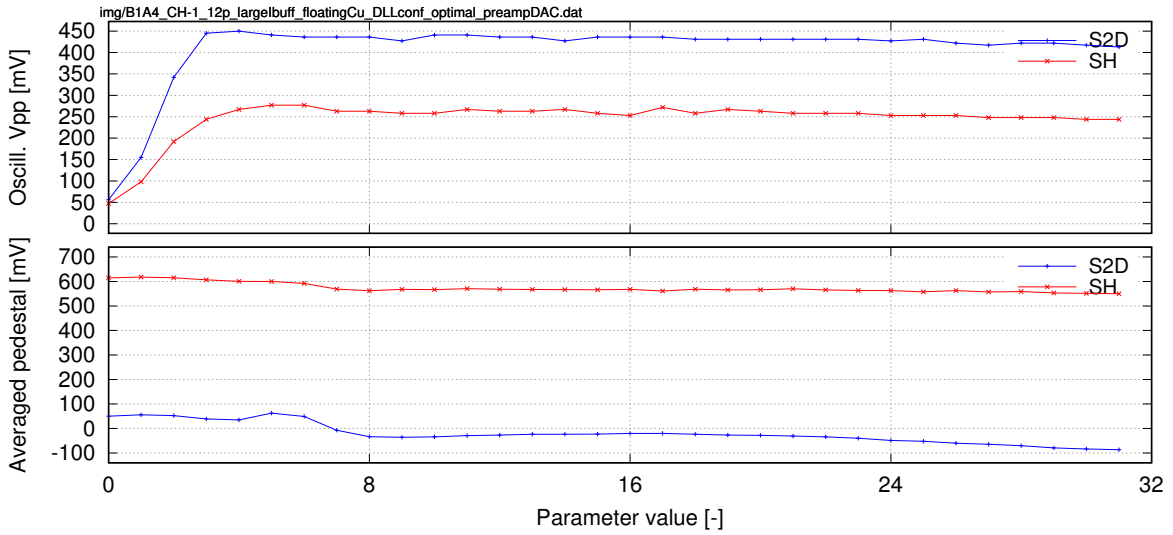


Figure 434: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – only backside. Parameter=preamp DAC

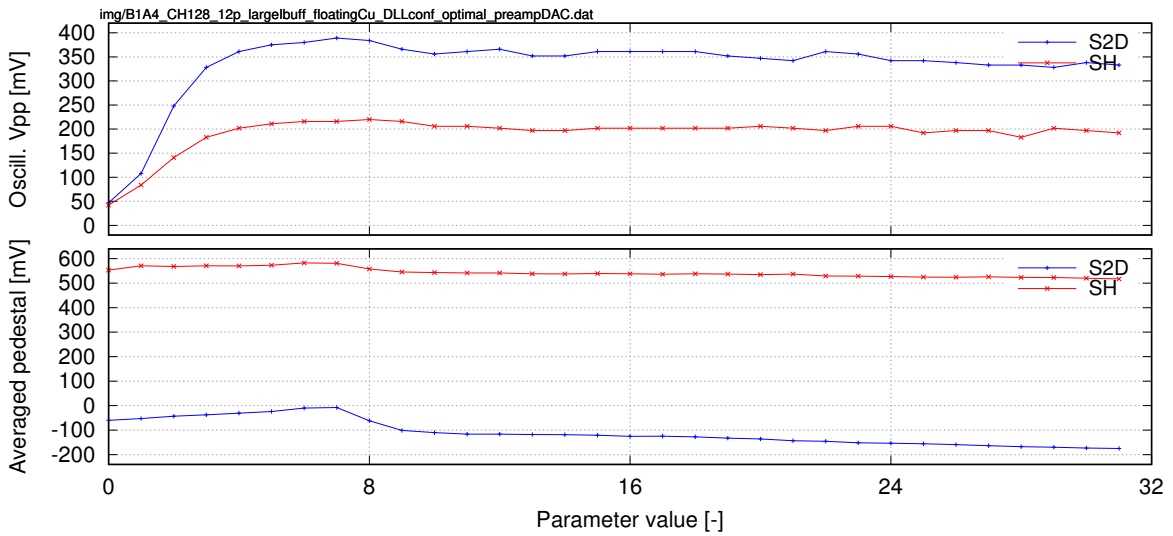


Figure 435: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – only backside. Parameter=preamp DAC

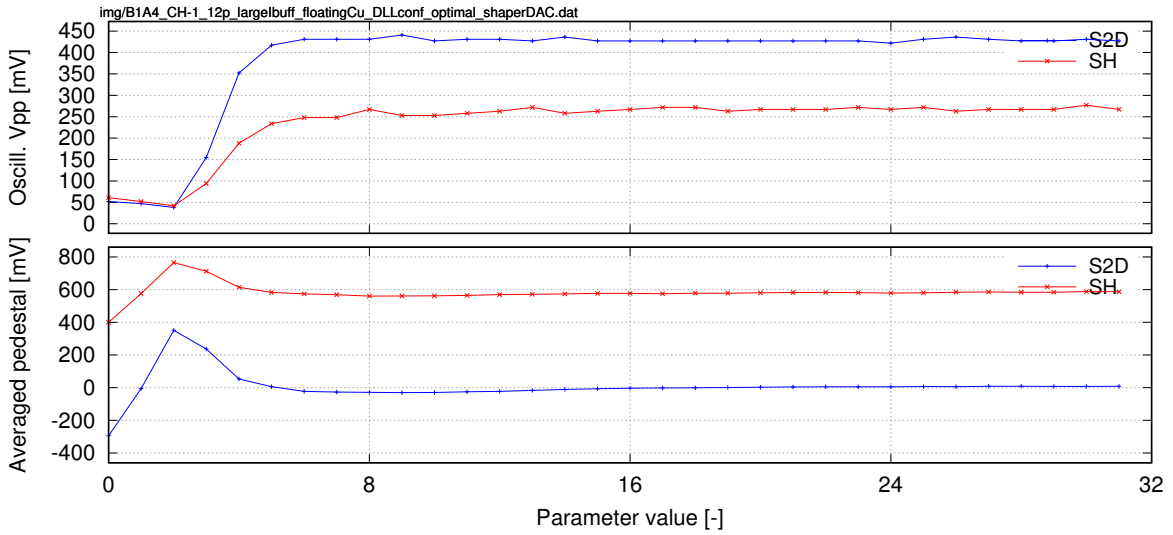


Figure 436: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – only backside. Parameter=shaper DAC

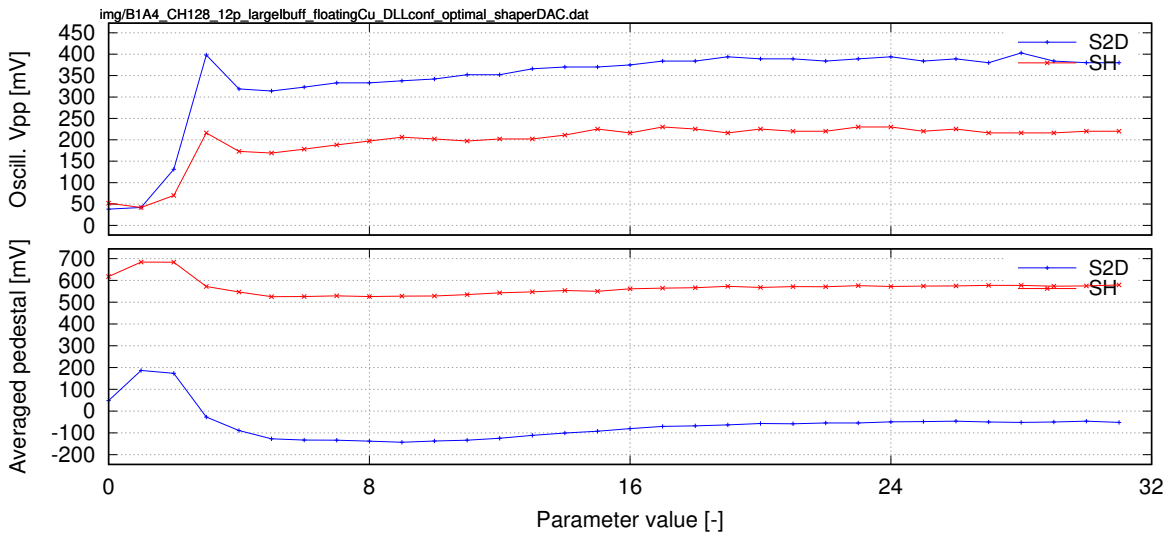


Figure 437: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – only backside. Parameter=shaper DAC

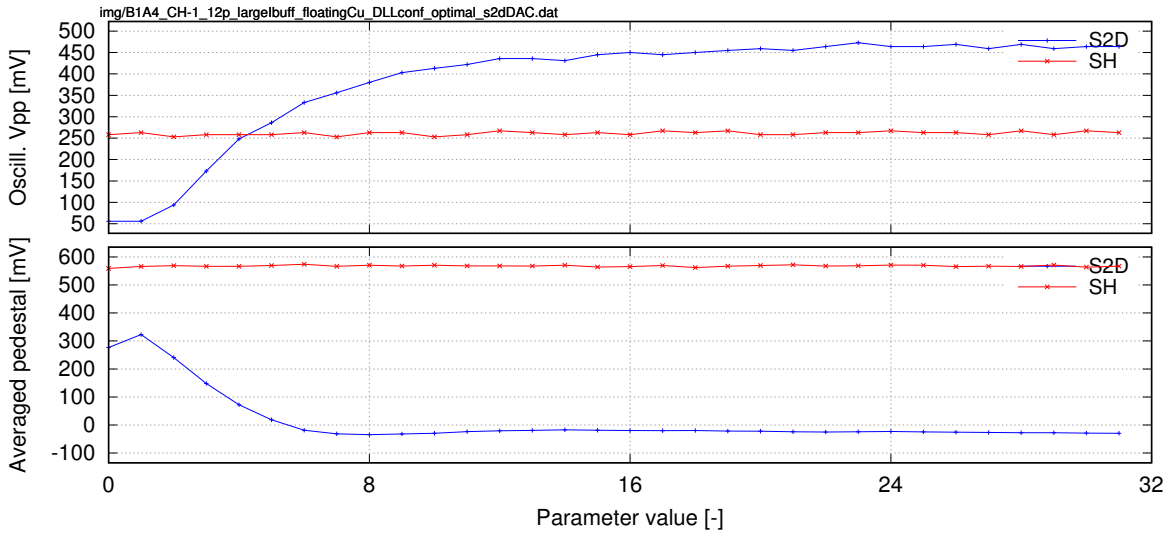


Figure 438: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – only backside. Parameter=S2D DAC

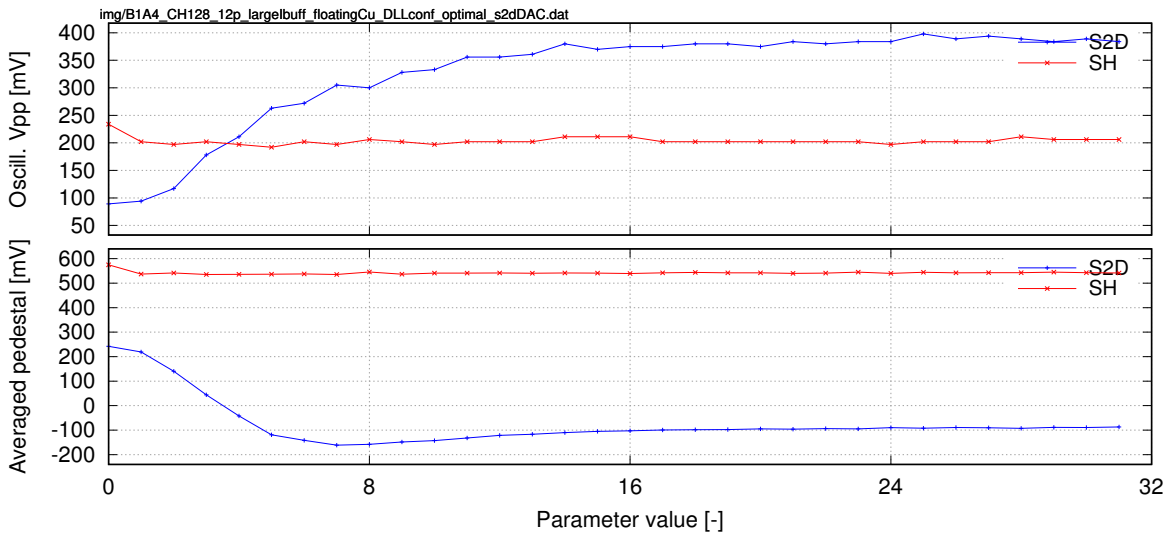


Figure 439: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – only backside. Parameter=S2D DAC

5.9.2 Optimized test pulse and ADC delay

ASIC configuration: JC configuration (tables 1 & 2) + test pulse and ADC delay optimizations (table 3).

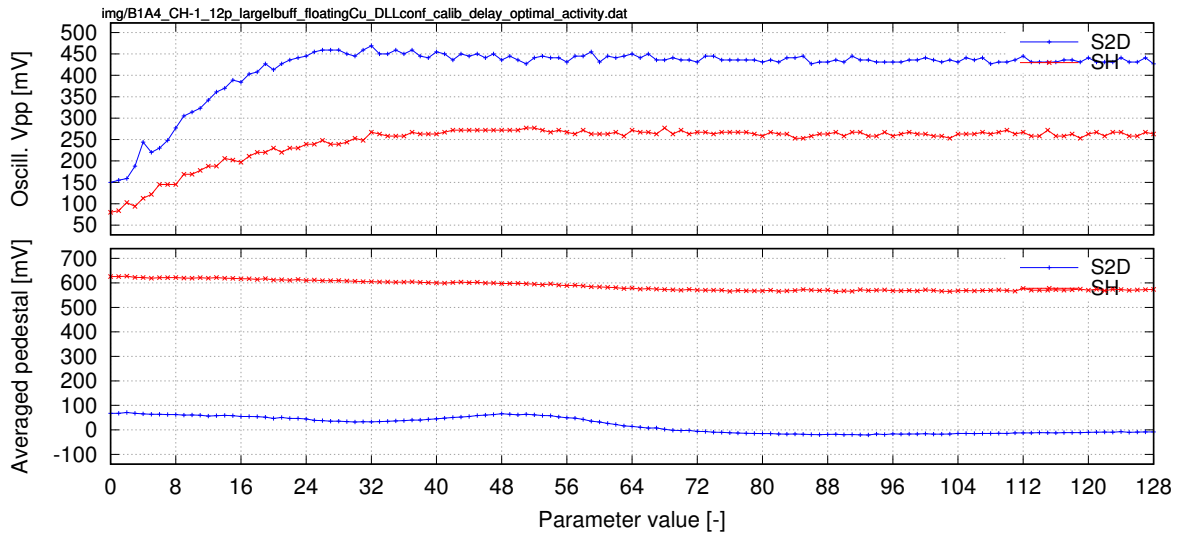


Figure 440: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – only backside. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

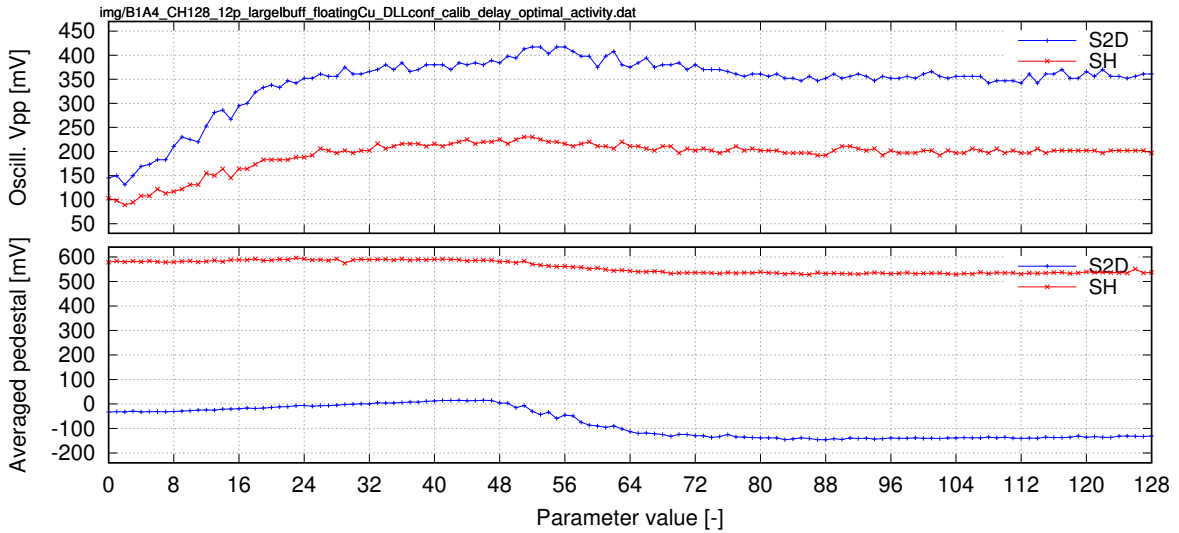


Figure 441: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – only backside. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

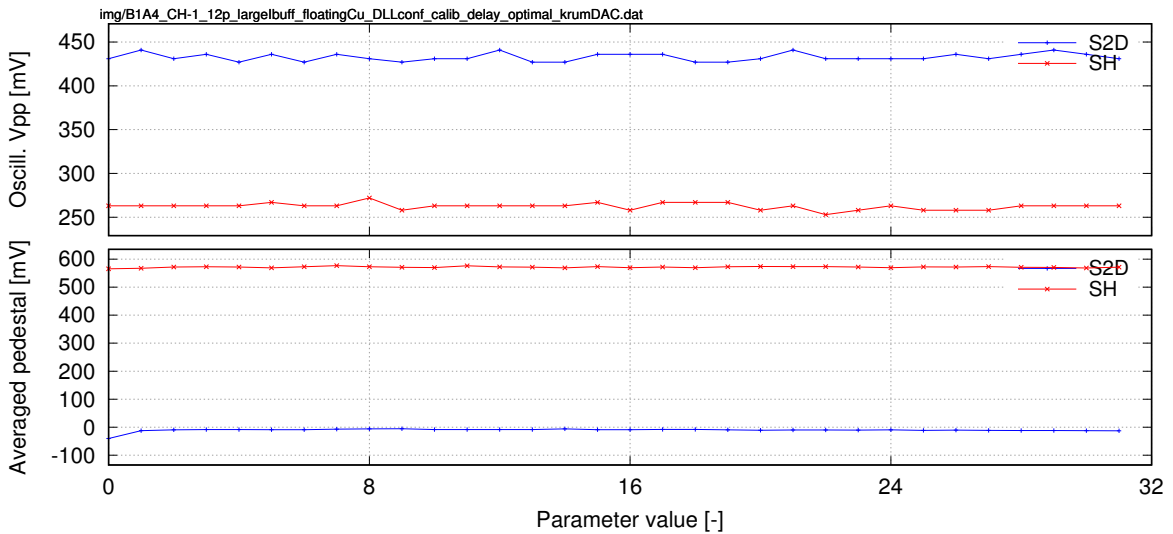


Figure 442: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – only backside. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

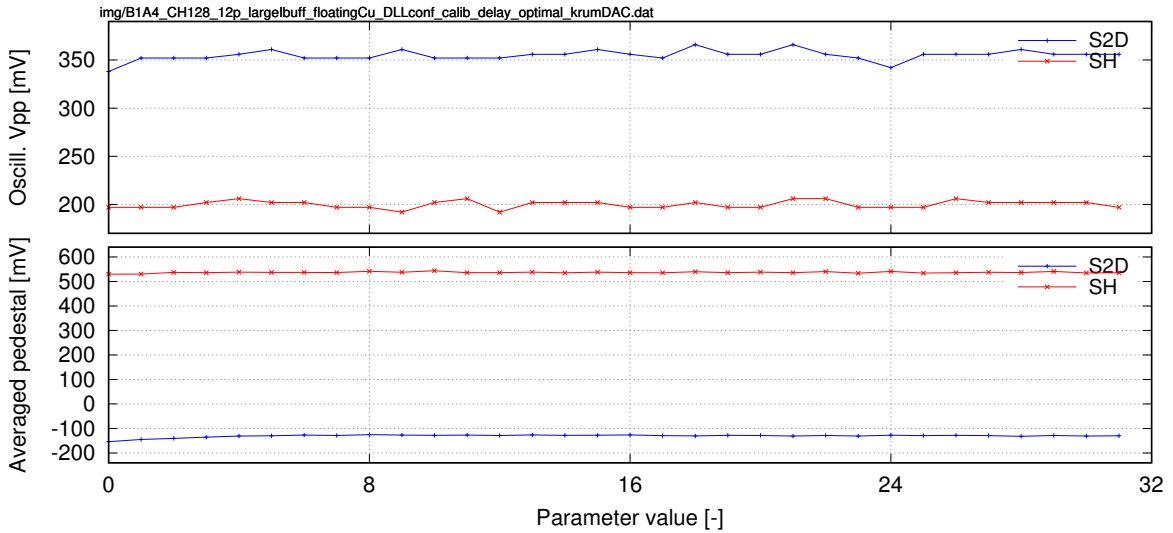


Figure 443: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – only backside. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

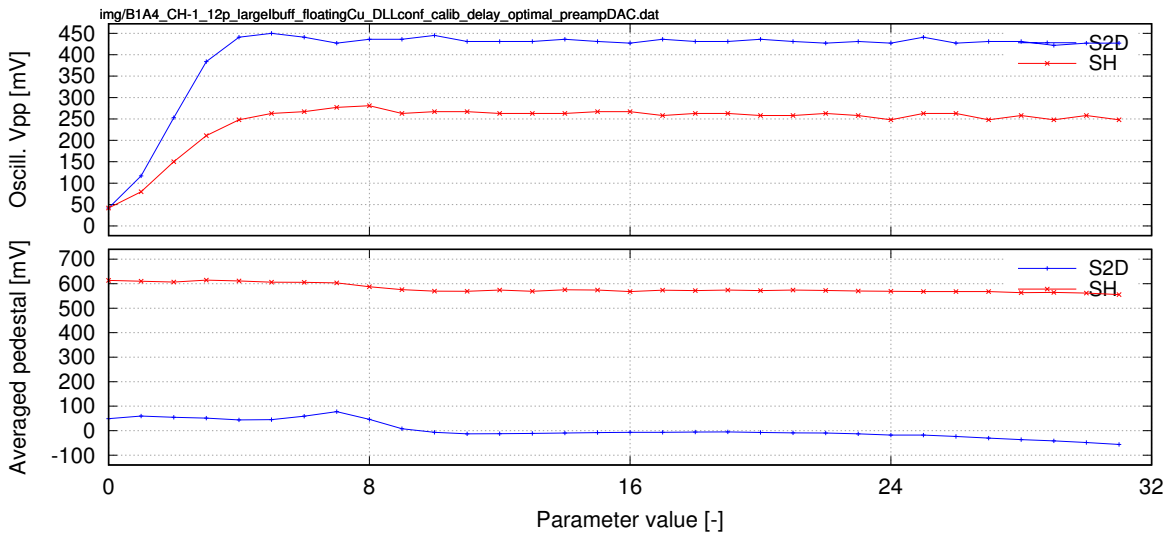


Figure 444: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – only backside. Optimized test pulse and ADC delay. Parameter=preamp DAC

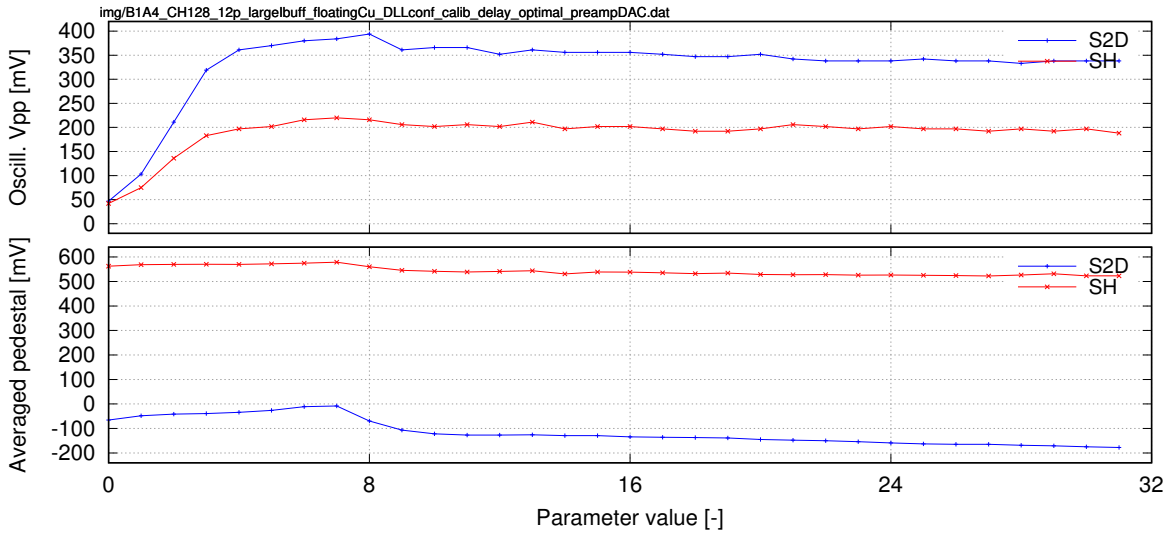


Figure 445: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – only backside. Optimized test pulse and ADC delay. Parameter=preamp DAC

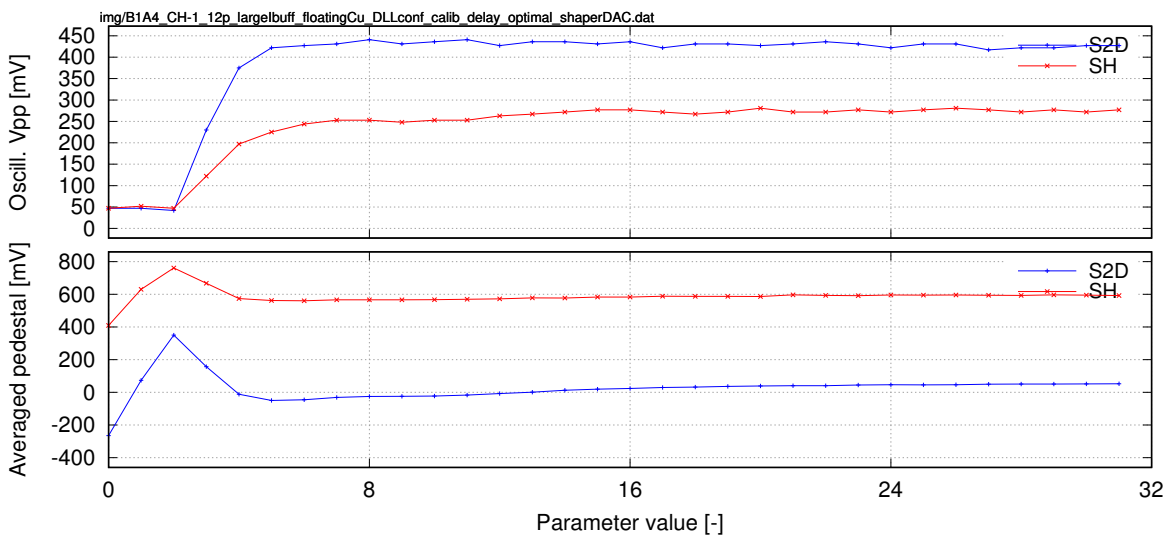


Figure 446: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – only backside. Optimized test pulse and ADC delay. Parameter=shaper DAC

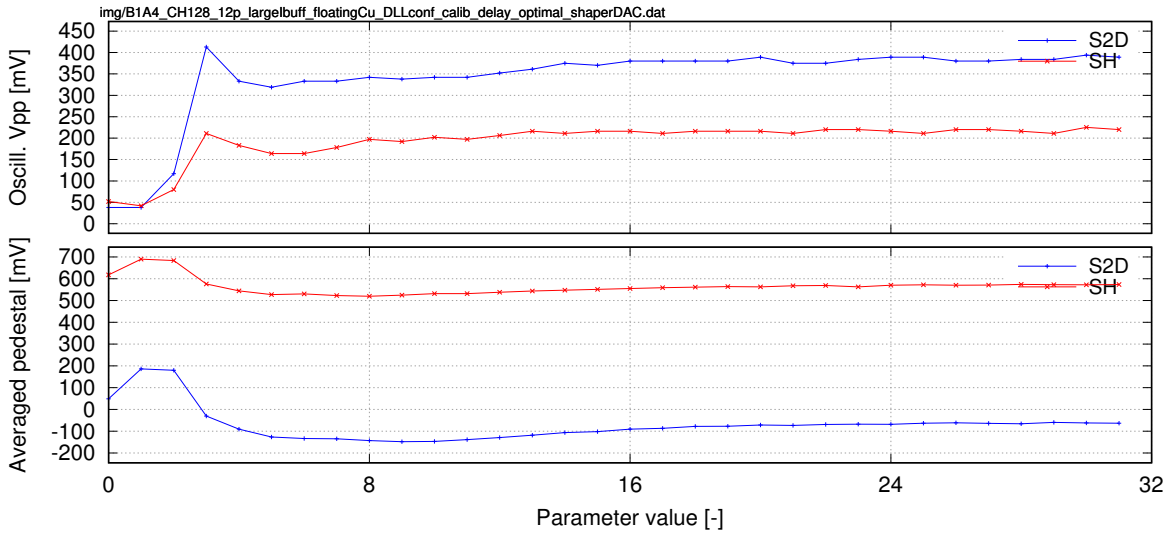


Figure 447: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – only backside. Optimized test pulse and ADC delay. Parameter=shaper DAC

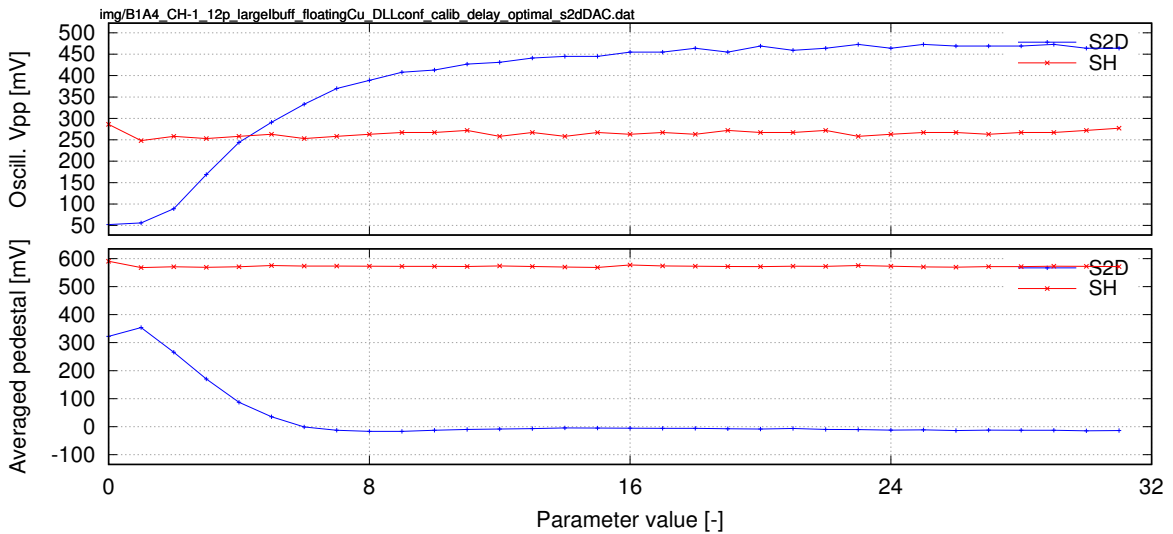


Figure 448: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – only backside. Optimized test pulse and ADC delay. Parameter=S2D DAC

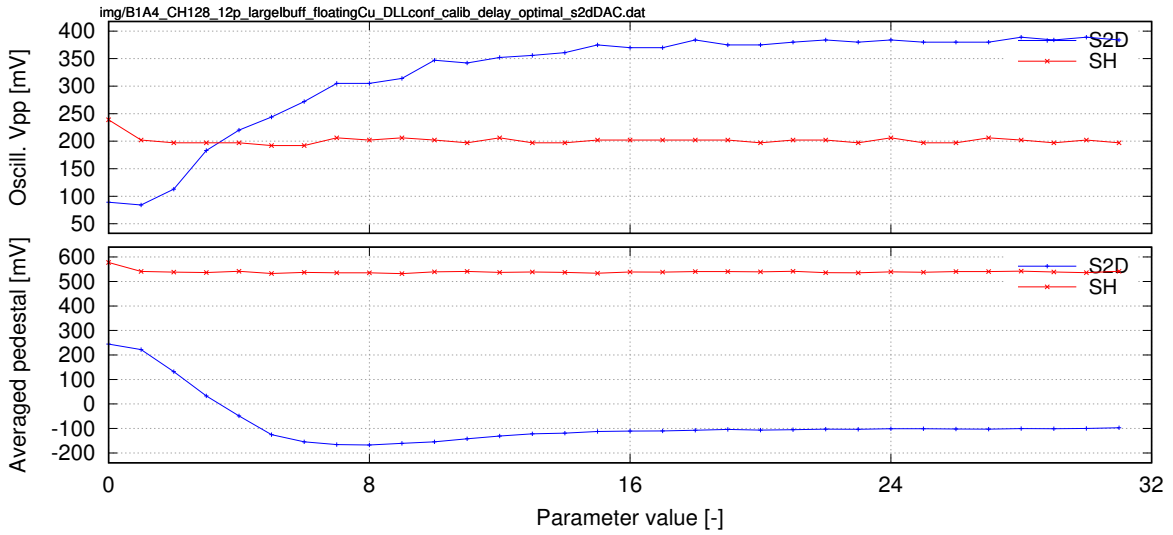


Figure 449: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; Preamp GND configuration – only backside. Optimized test pulse and ADC delay. Parameter=S2D DAC

5.10 Cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; floating copper foil on ASIC; All inputs grounded; Preamp GND configuration – only backside

Cap-PCB assembled, bonded to SALT input pads 0 and 127, two 12 pF capacitors assembled to the cap-PCB.

Ibuf current maximized – 1 k Ω resistor between VDDA and Ibuf pad.

Floating copper foil glued directly on passivation on top of the ASIC (see figure 549).

All inputs was bonded to ground (except test channels -1 and 128) Preamp GND bonded only from backside (default pads).

5.10.1 Default ASIC configuration

ASIC configuration: JC configuration (tables 1 & 2).

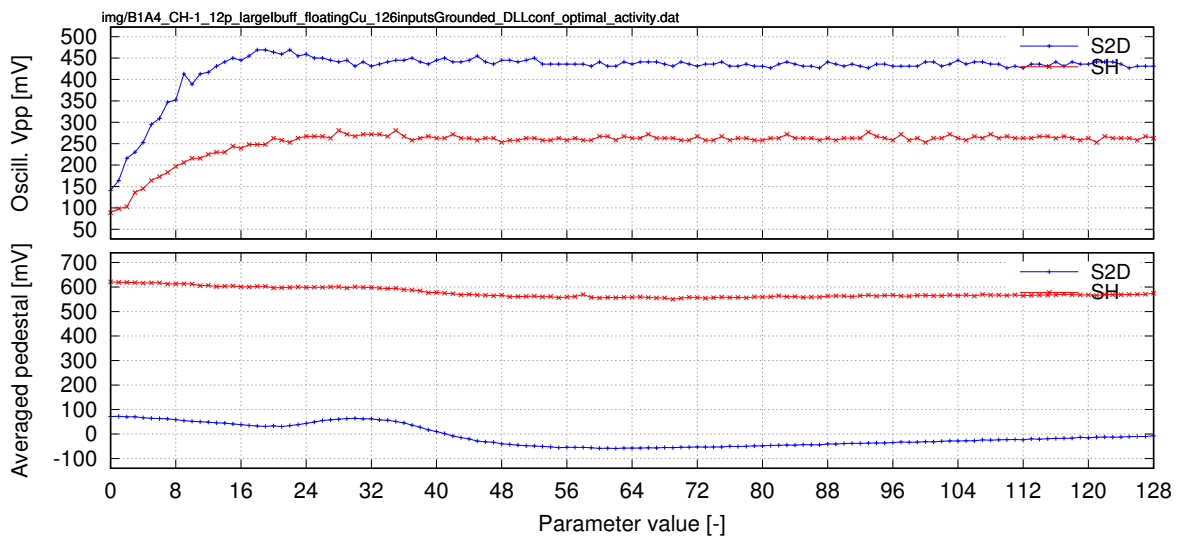


Figure 450: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; All inputs grounded; Preamp GND configuration – only backside. Parameter=no. of active ADCs

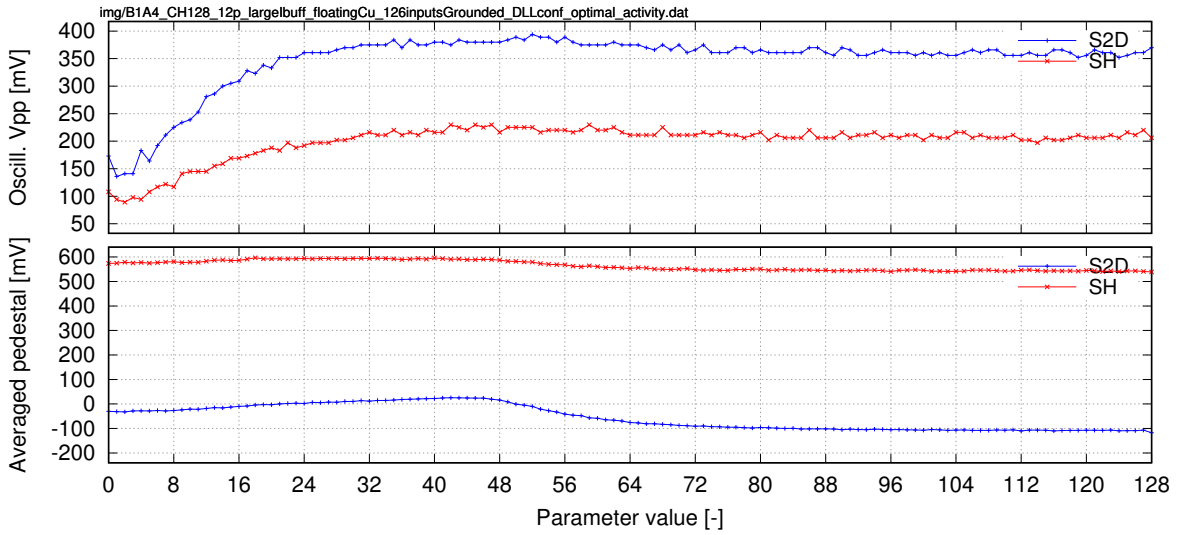


Figure 451: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; All inputs grounded; Preamp GND configuration – only backside. Parameter=no. of active ADCs

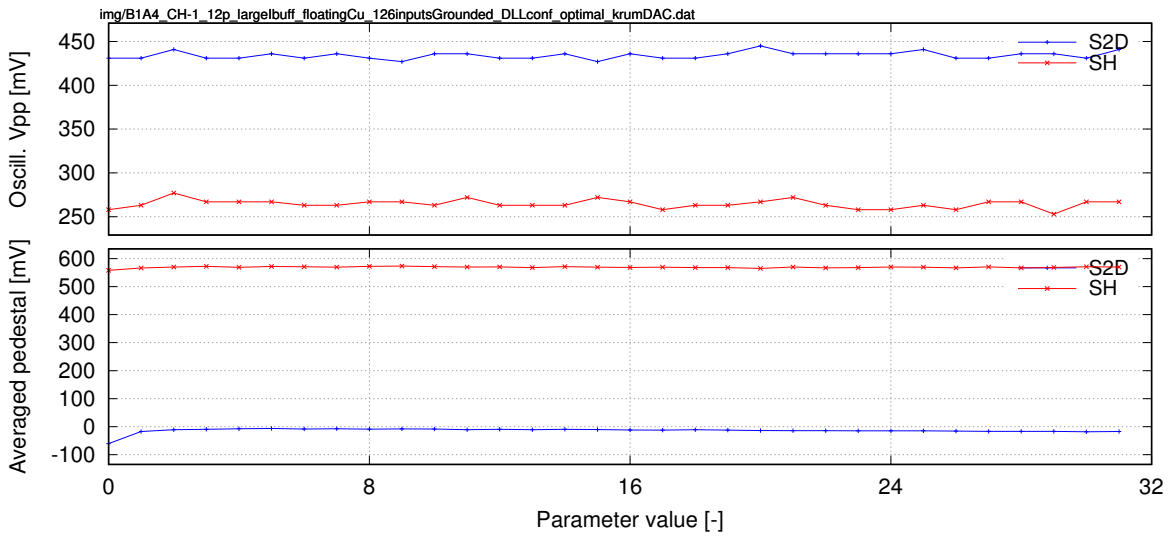


Figure 452: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; All inputs grounded; Preamp GND configuration – only backside. Parameter=Krummenacher DAC

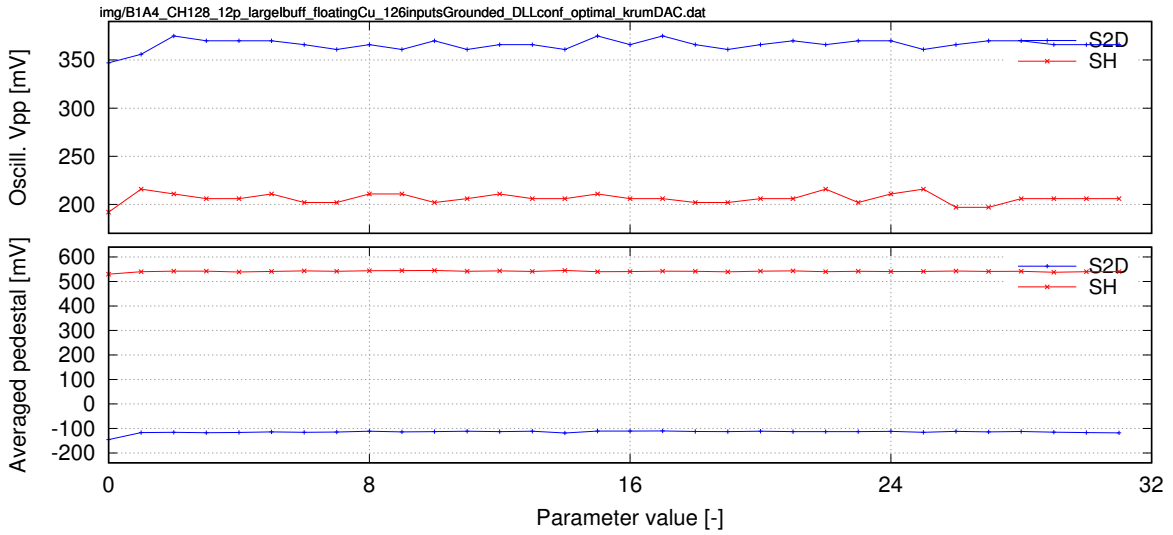


Figure 453: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; All inputs grounded; Preamp GND configuration – only backside. Parameter=Krummenacher DAC

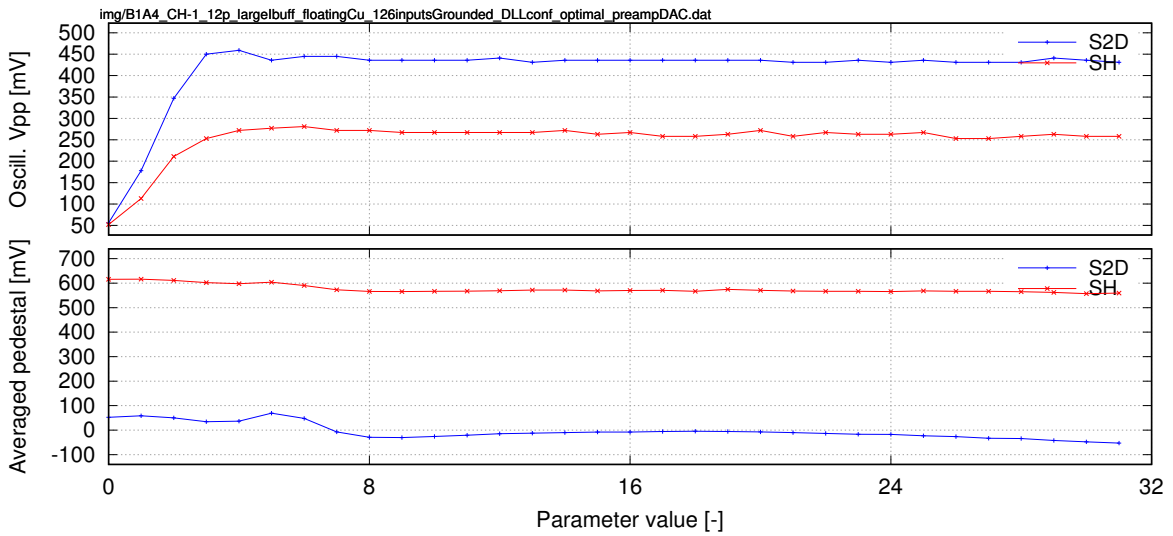


Figure 454: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; All inputs grounded; Preamp GND configuration – only backside. Parameter=preamp DAC

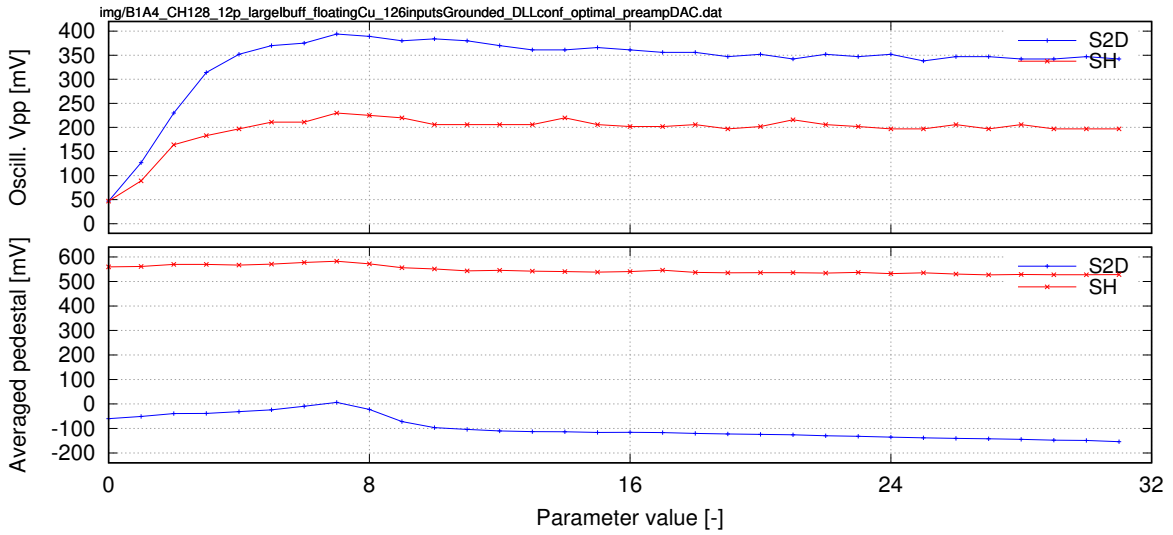


Figure 455: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; All inputs grounded; Preamp GND configuration – only backside. Parameter=preamp DAC

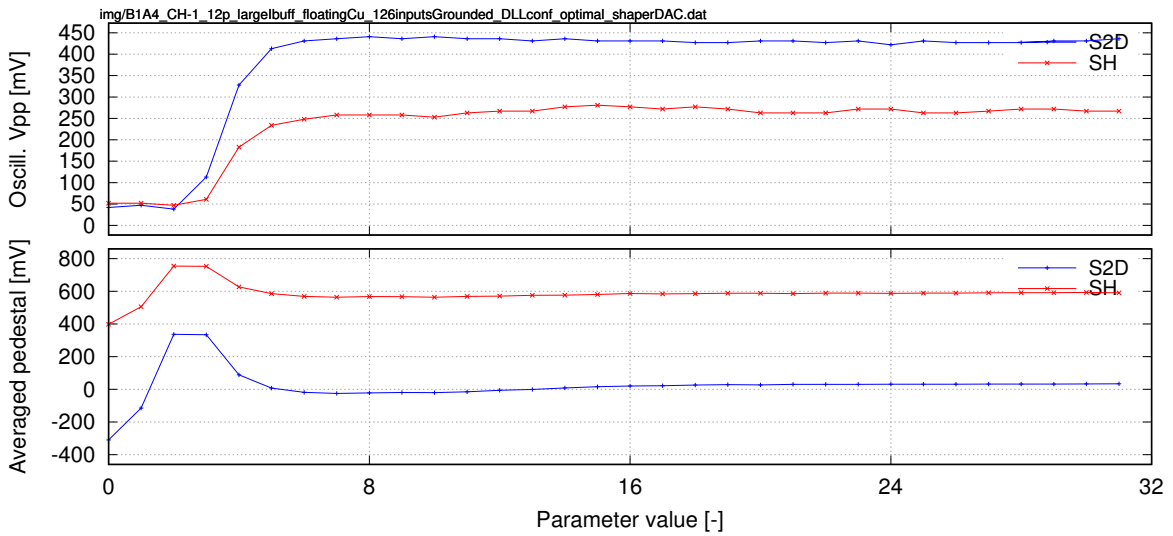


Figure 456: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; All inputs grounded; Preamp GND configuration – only backside. Parameter=shaper DAC

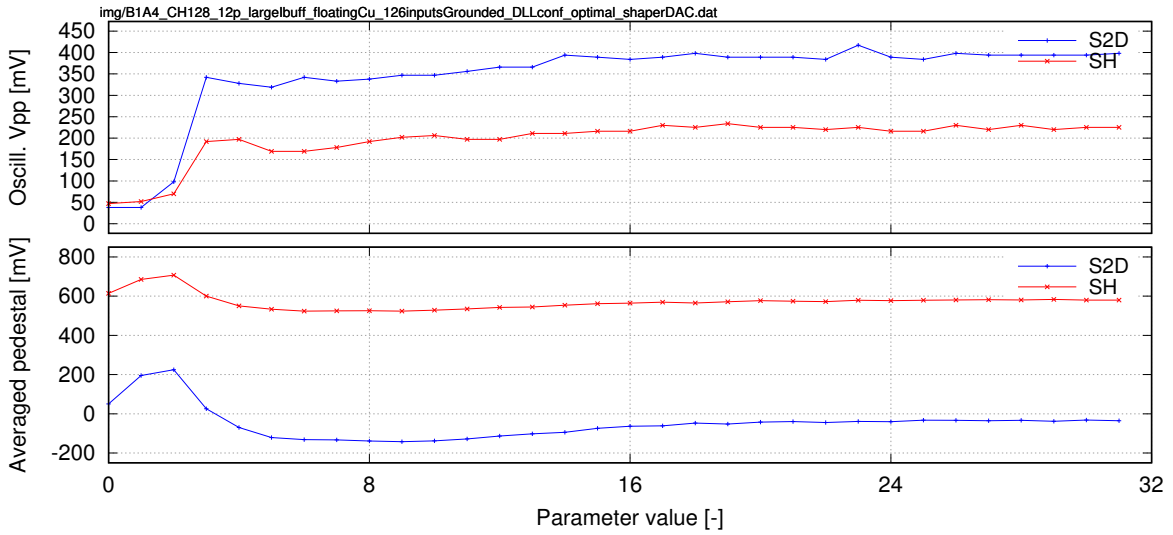


Figure 457: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; All inputs grounded; Preamp GND configuration – only backside. Parameter=shaper DAC

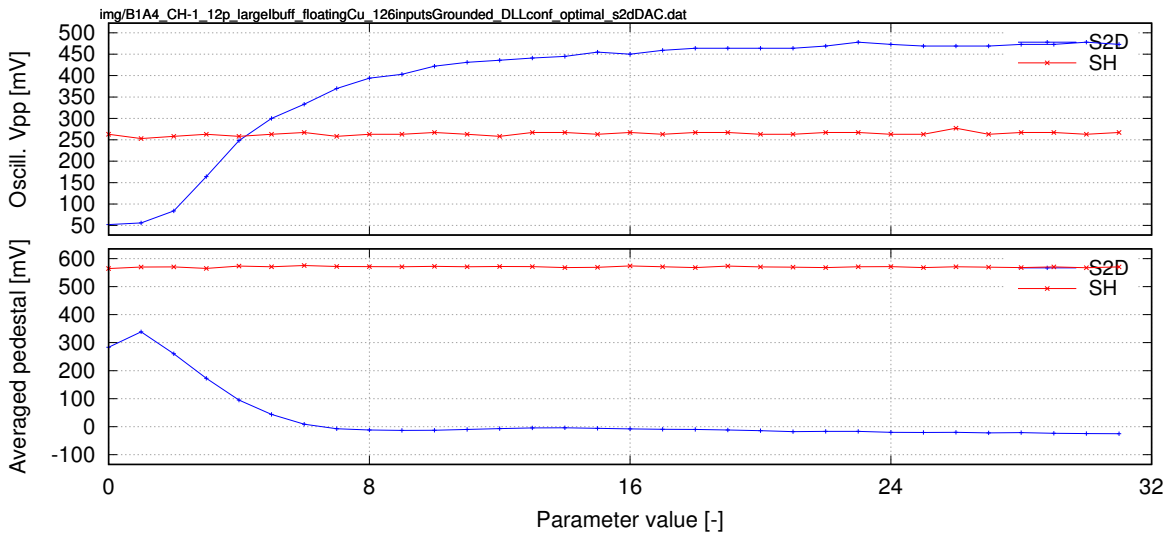


Figure 458: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; All inputs grounded; Preamp GND configuration – only backside. Parameter=S2D DAC

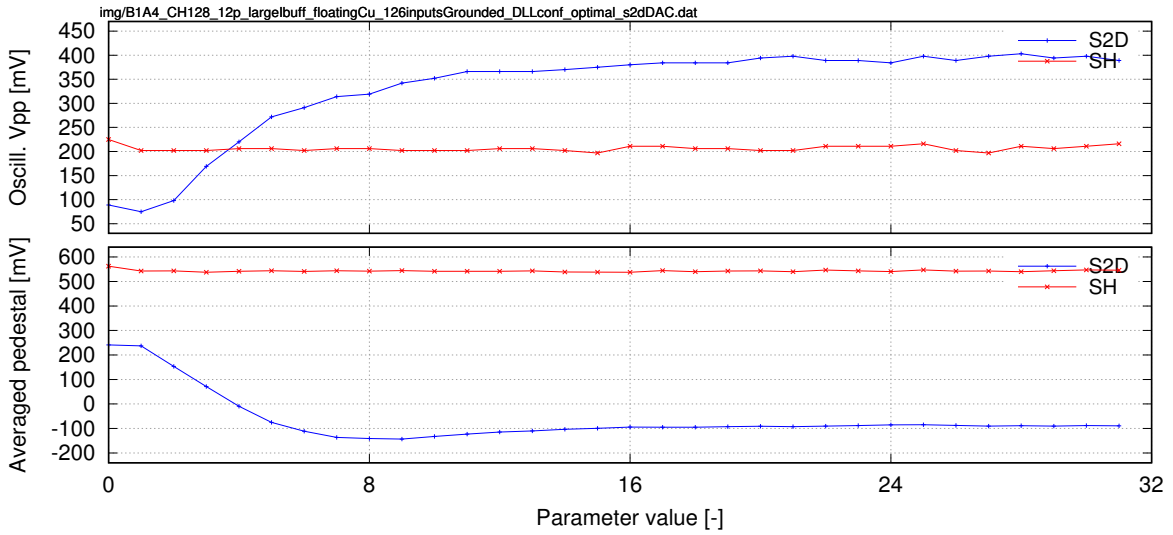


Figure 459: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; All inputs grounded; Preamp GND configuration – only backside. Parameter=S2D DAC

5.10.2 Optimized test pulse and ADC delay

ASIC configuration: JC configuration (tables 1 & 2) + test pulse and ADC delay optimizations (table 3).

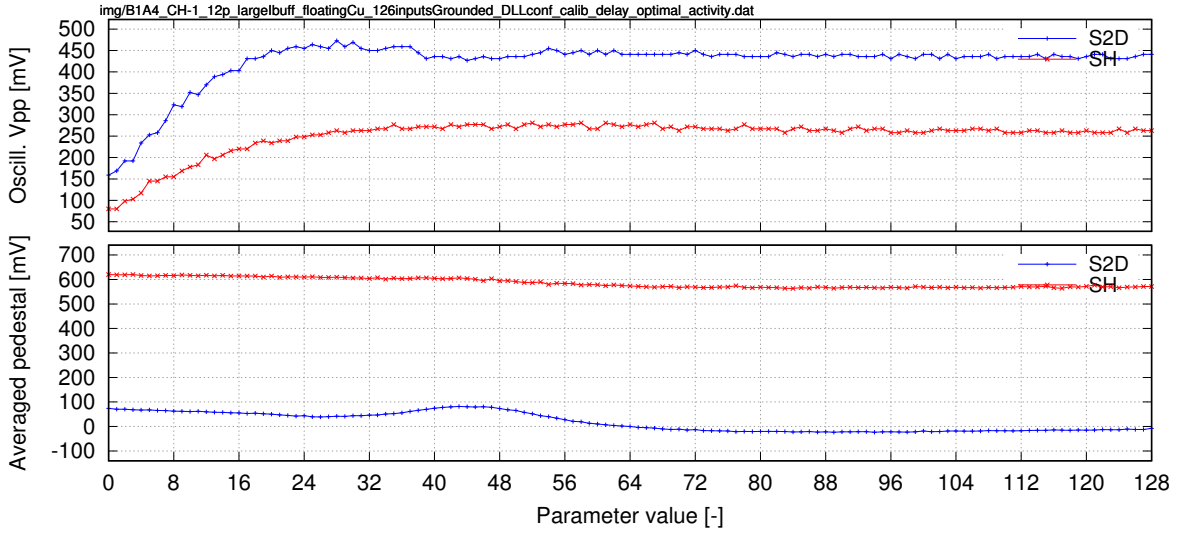


Figure 460: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; All inputs grounded; Preamp GND configuration – only backside. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

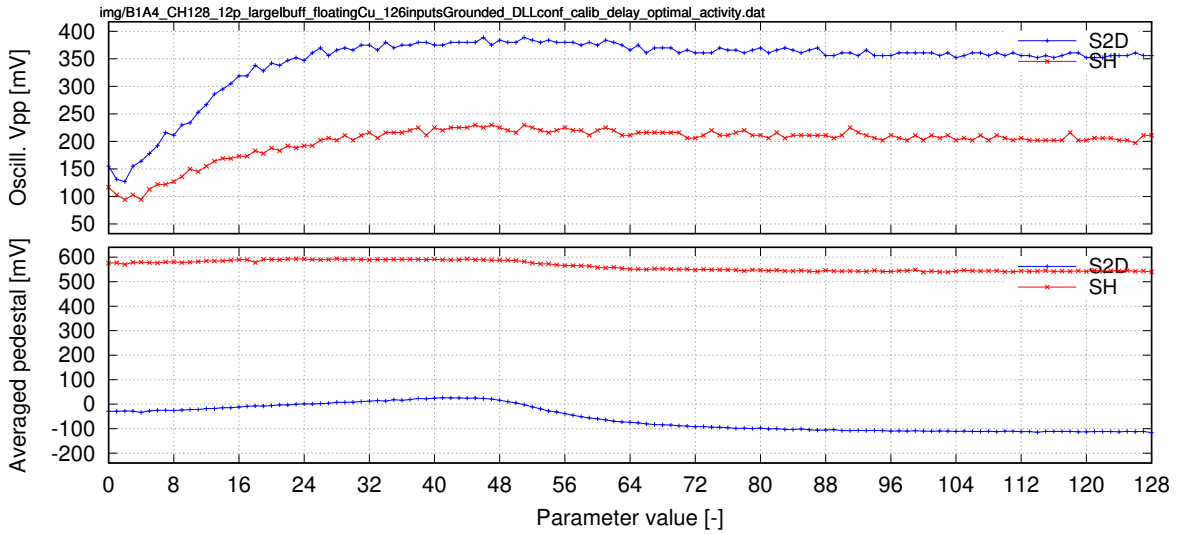


Figure 461: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; All inputs grounded; Preamp GND configuration – only backside. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

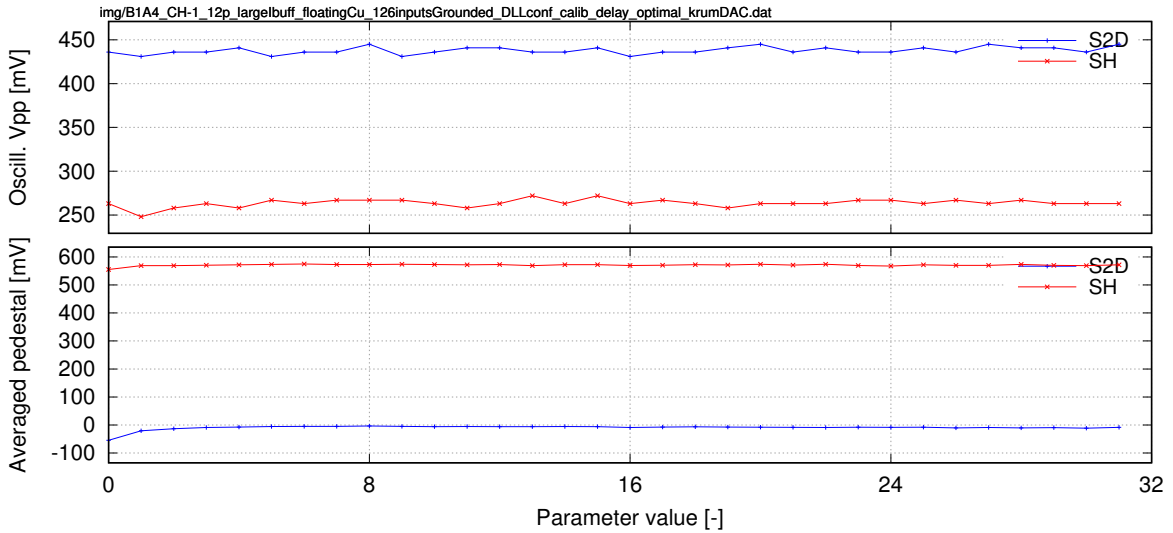


Figure 462: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; All inputs grounded; Preamp GND configuration – only backside. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

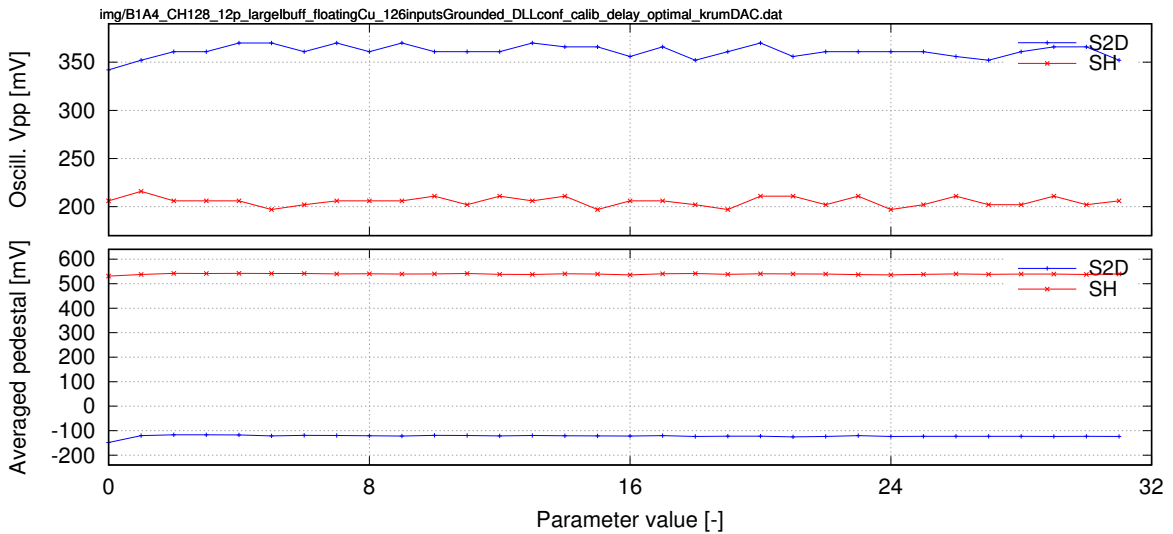


Figure 463: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; All inputs grounded; Preamp GND configuration – only backside. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

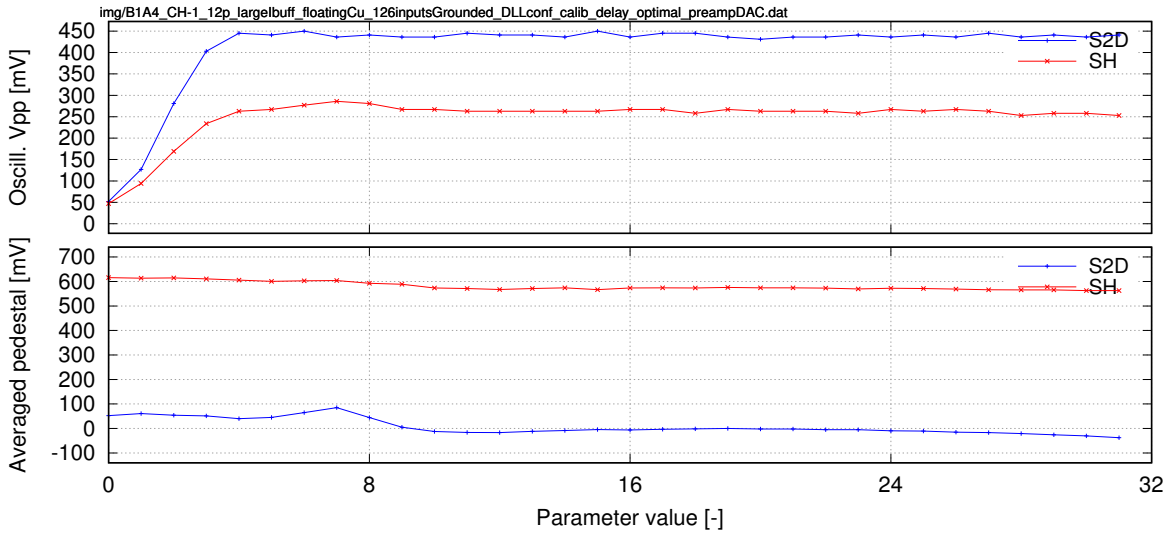


Figure 464: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; All inputs grounded; Preamp GND configuration – only backside. Optimized test pulse and ADC delay. Parameter=preamp DAC

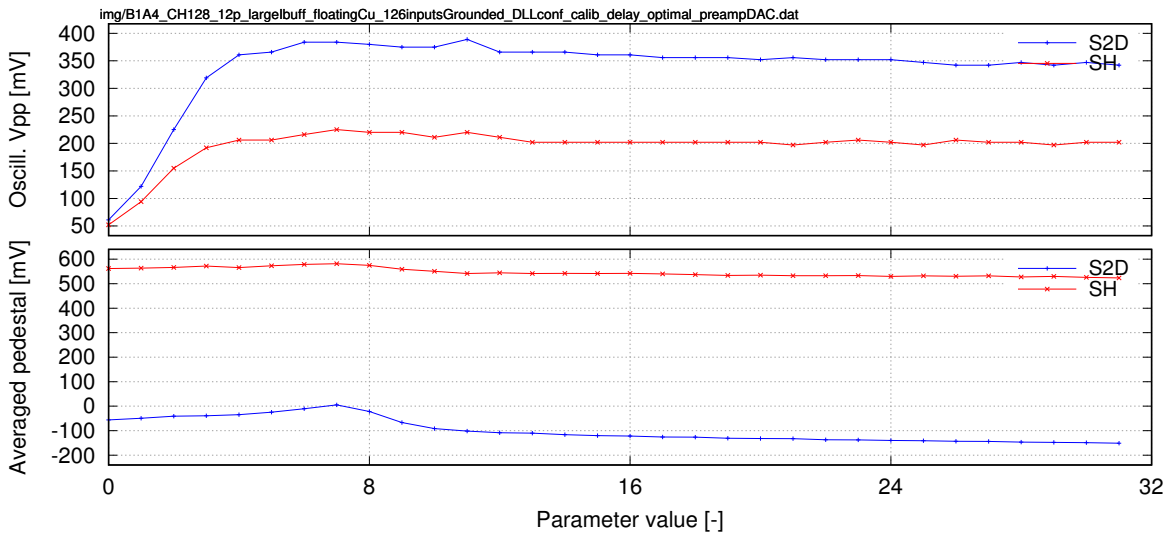


Figure 465: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; All inputs grounded; Preamp GND configuration – only backside. Optimized test pulse and ADC delay. Parameter=preamp DAC

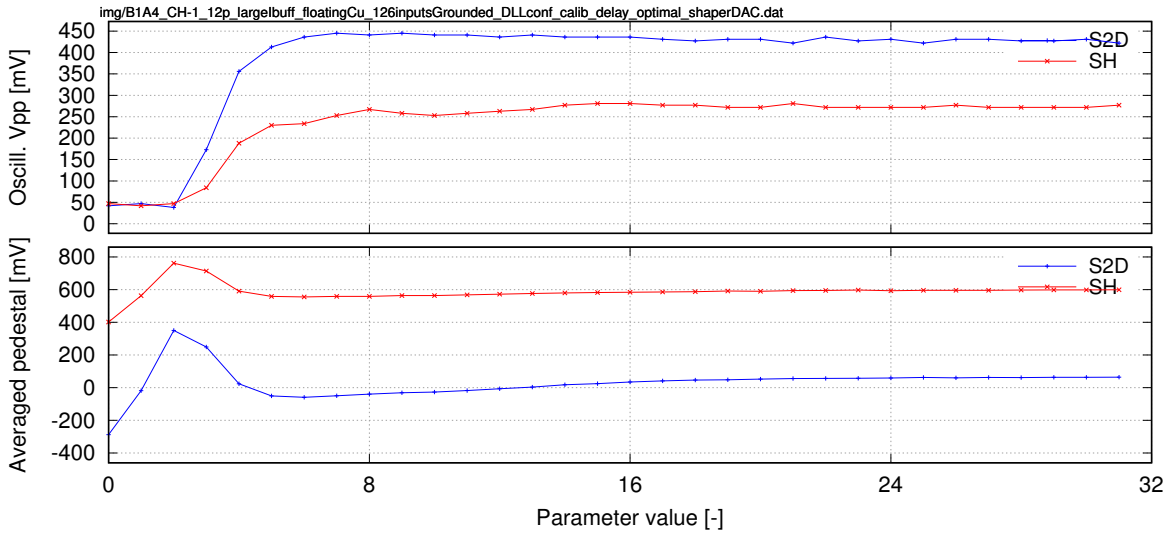


Figure 466: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; All inputs grounded; Preamp GND configuration – only backside. Optimized test pulse and ADC delay. Parameter=shaper DAC

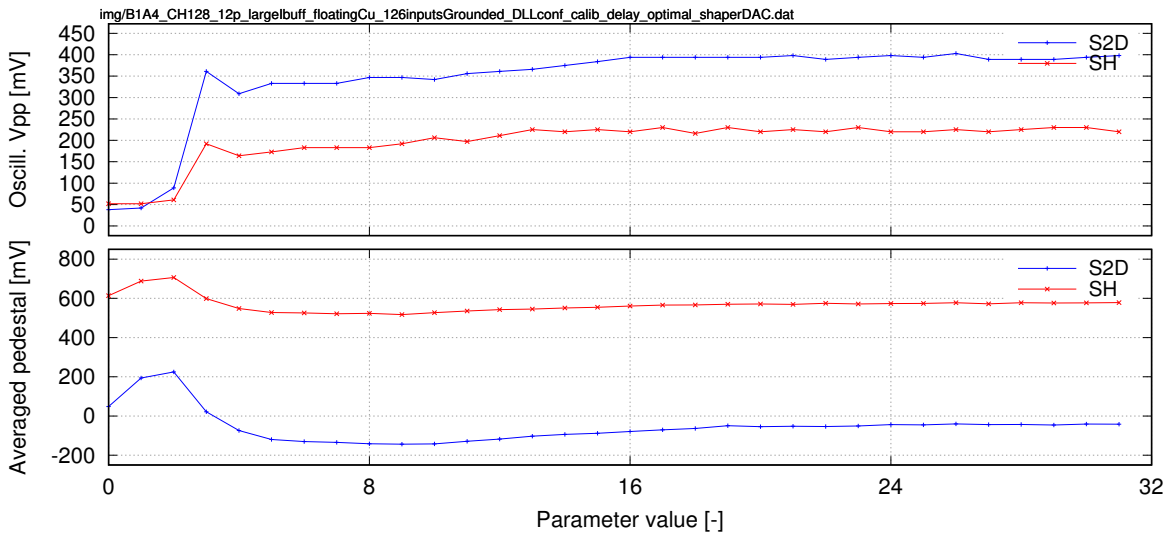


Figure 467: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; All inputs grounded; Preamp GND configuration – only backside. Optimized test pulse and ADC delay. Parameter=shaper DAC

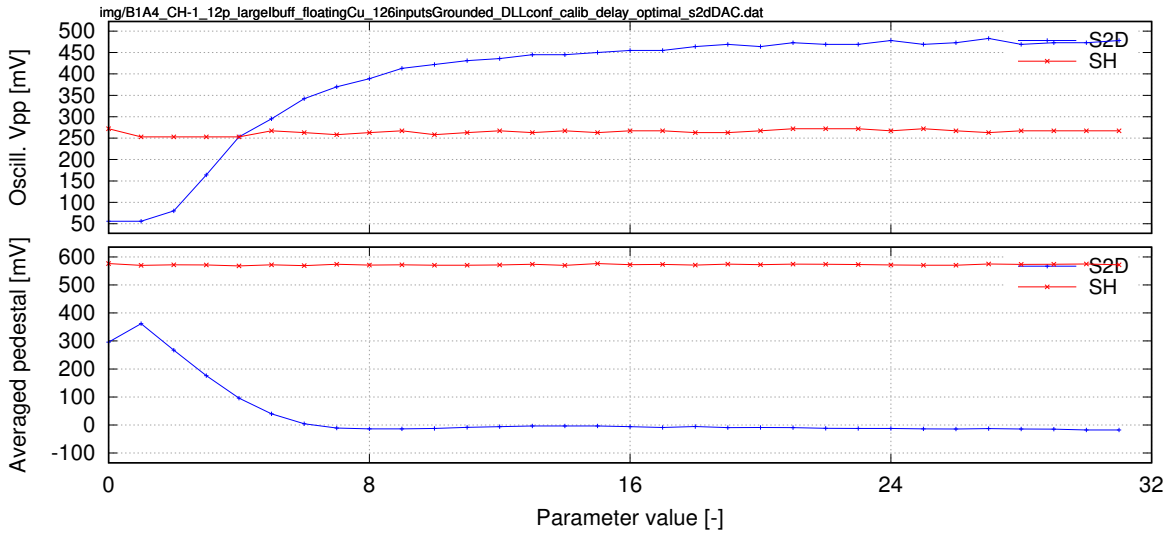


Figure 468: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; All inputs grounded; Preamp GND configuration – only backside. Optimized test pulse and ADC delay. Parameter=S2D DAC

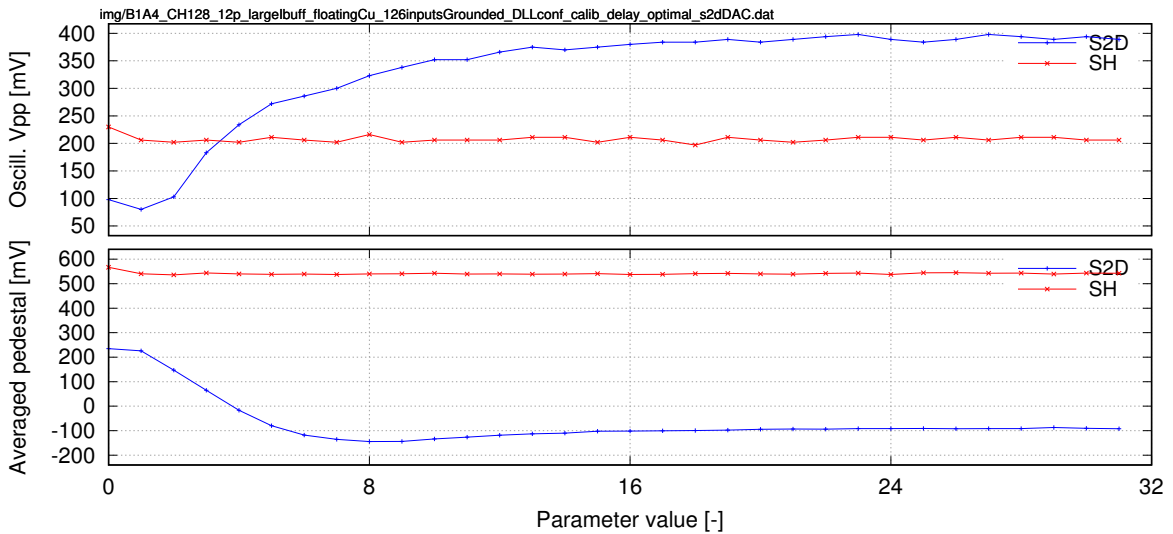


Figure 469: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating copper foil on ASIC; All inputs grounded; Preamp GND configuration – only backside. Optimized test pulse and ADC delay. Parameter=S2D DAC

5.11 Cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; floating small horizontal copper foil on ASIC; All inputs grounded; Preamp GND configuration – only backside

Cap-PCB assembled, bonded to SALT input pads 0 and 127, two 12 pF capacitors assembled to the cap-PCB.

Ibuf current maximized – 1 k Ω resistor between VDDA and Ibuf pad.

Floating small horizontal copper foil glued directly on passivation on top of the ASIC (see figure 551).

All inputs was bonded to ground (except test channels -1 and 128) Preamp GND bonded only from backside (default pads).

5.11.1 Default ASIC configuration

ASIC configuration: JC configuration (tables 1 & 2).

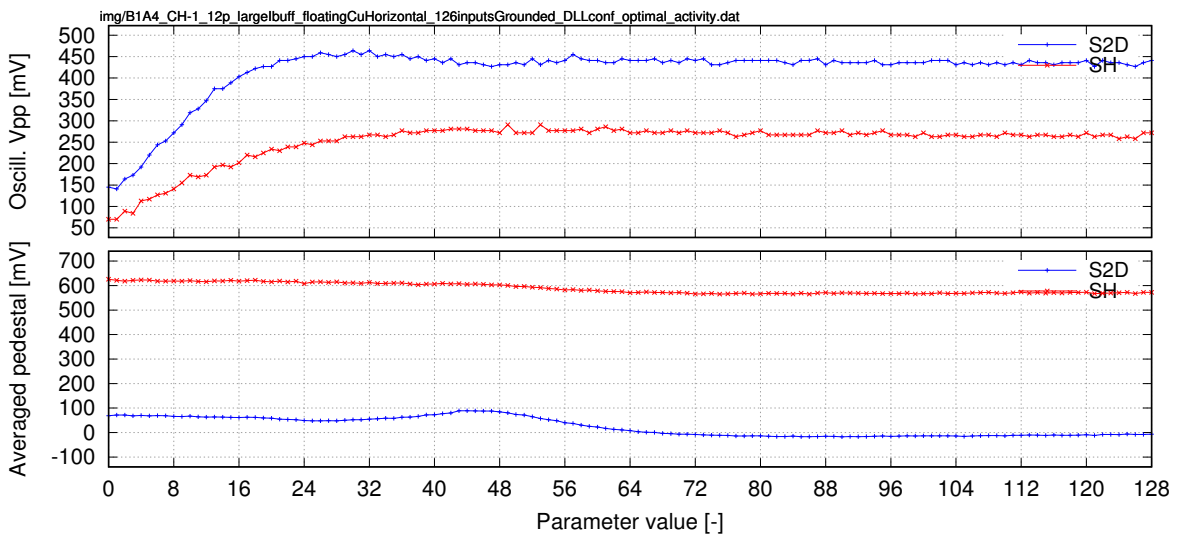


Figure 470: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating small horizontal copper foil on ASIC; All inputs grounded; Preamp GND configuration – only backside. Parameter=no. of active ADCs

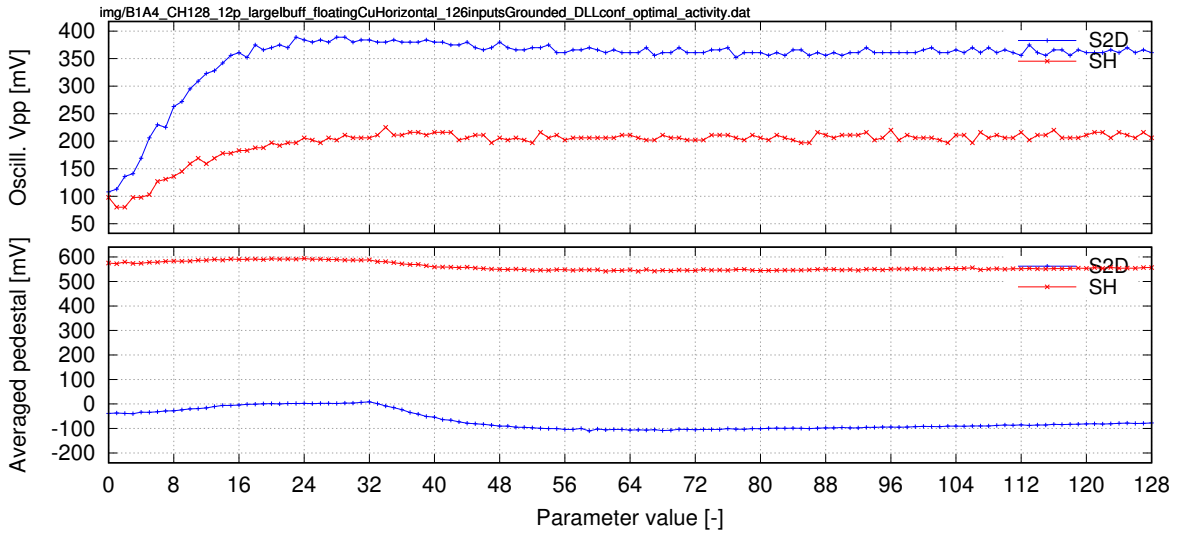


Figure 471: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating small horizontal copper foil on ASIC; All inputs grounded; Preamp GND configuration – only backside. Parameter=no. of active ADCs

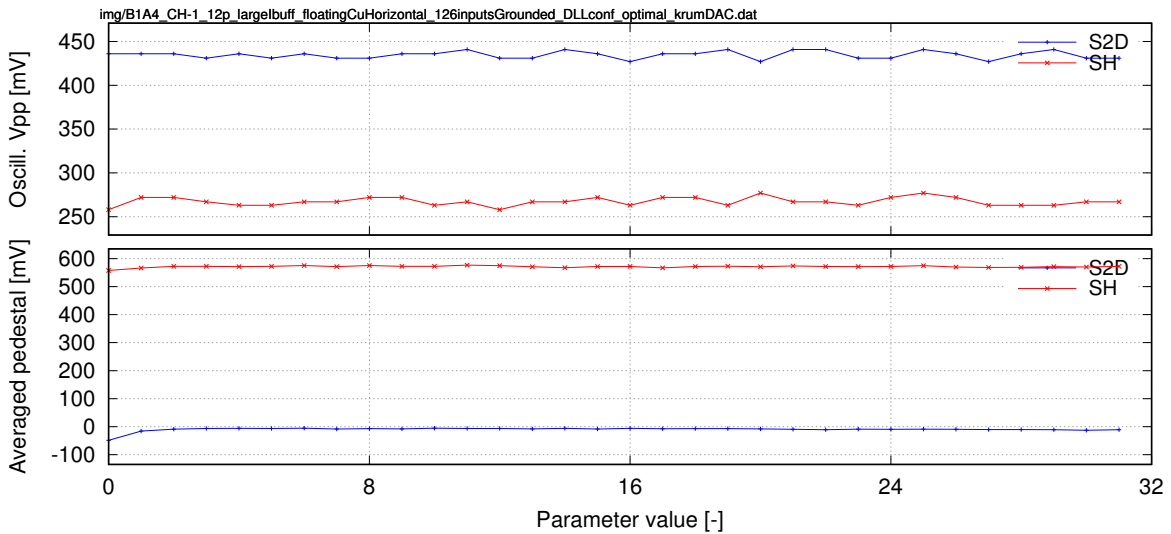


Figure 472: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating small horizontal copper foil on ASIC; All inputs grounded; Preamp GND configuration – only backside. Parameter=Krummenacher DAC

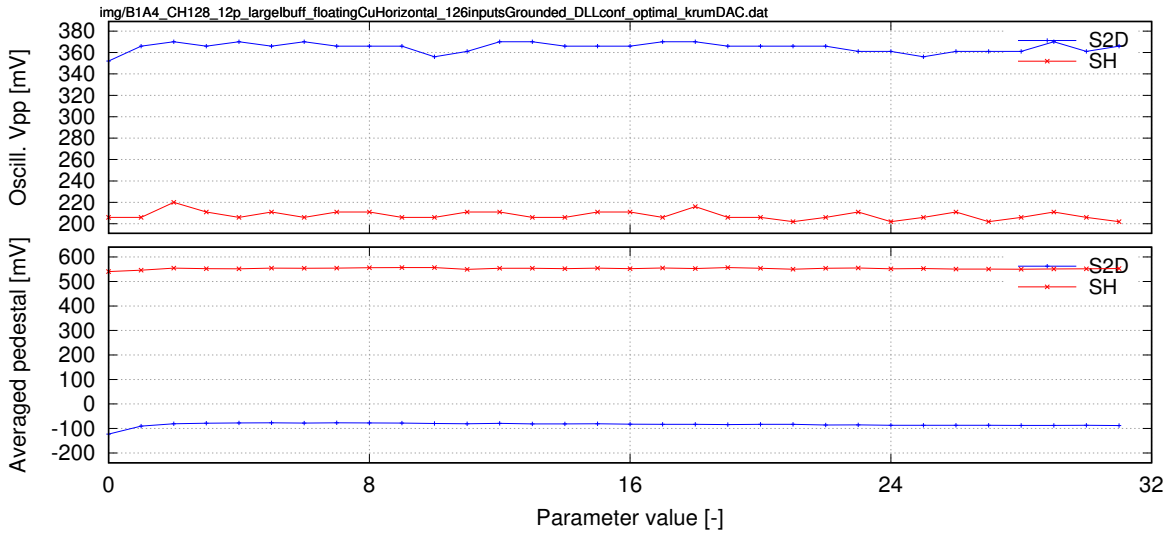


Figure 473: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating small horizontal copper foil on ASIC; All inputs grounded; Preamp GND configuration – only backside. Parameter=Krummenacher DAC

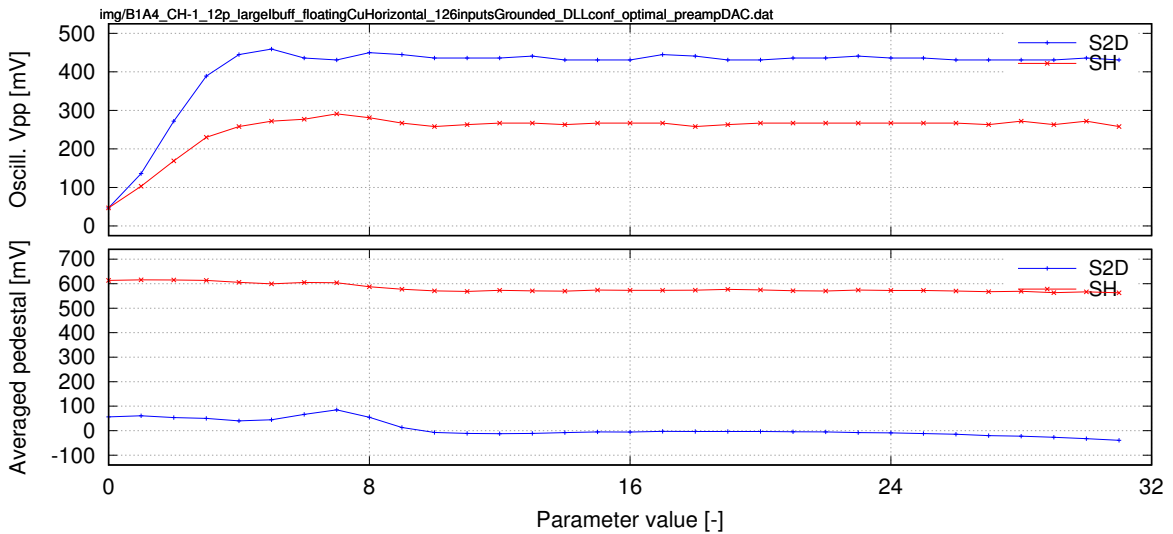


Figure 474: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating small horizontal copper foil on ASIC; All inputs grounded; Preamp GND configuration – only backside. Parameter=preamp DAC

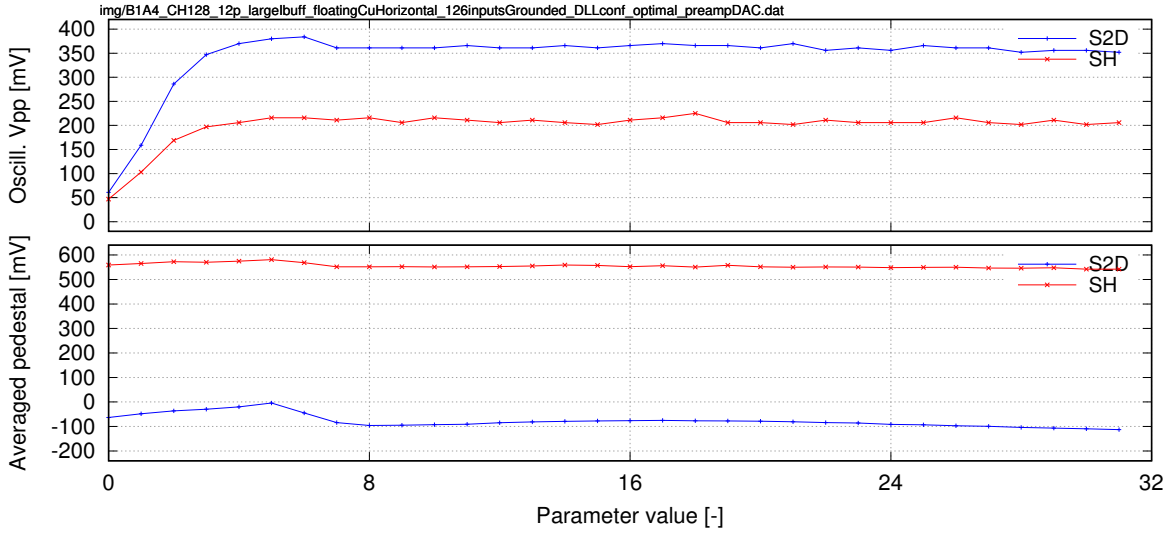


Figure 475: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating small horizontal copper foil on ASIC; All inputs grounded; Preamp GND configuration – only backside. Parameter=preamp DAC

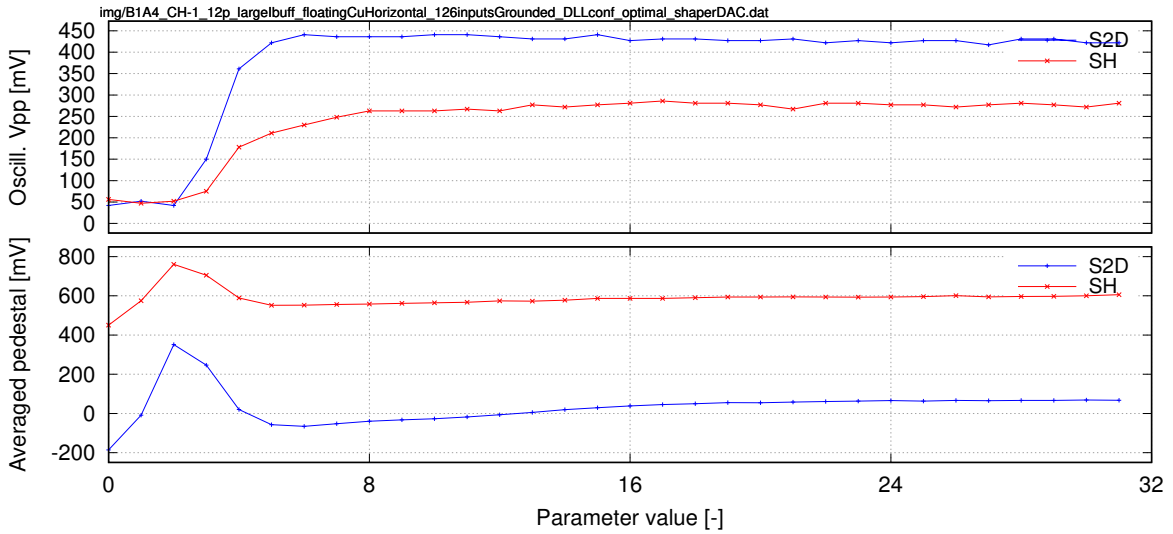


Figure 476: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating small horizontal copper foil on ASIC; All inputs grounded; Preamp GND configuration – only backside. Parameter=shaper DAC

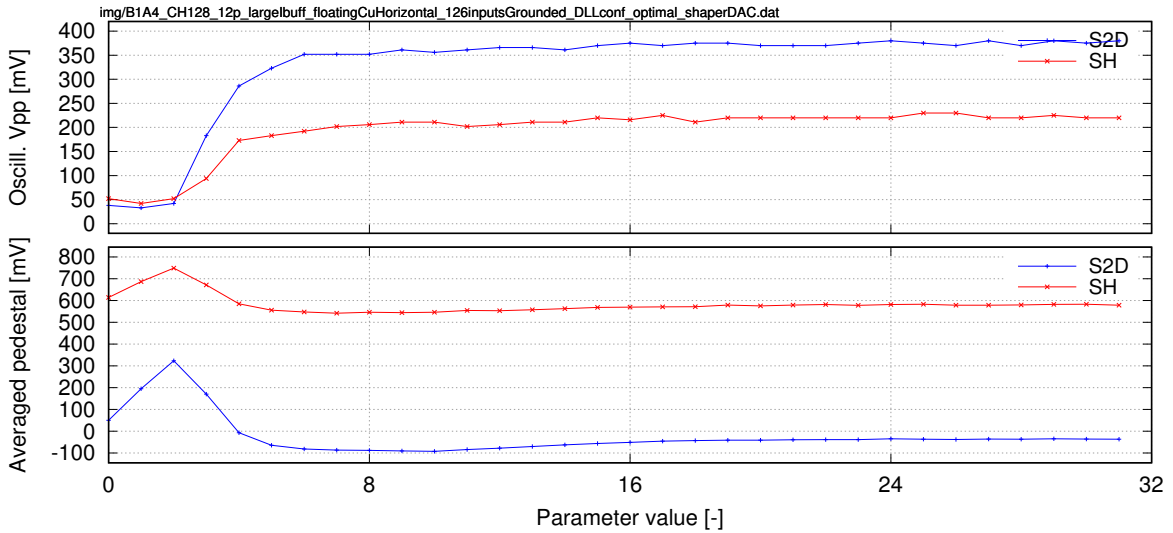


Figure 477: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating small horizontal copper foil on ASIC; All inputs grounded; Preamp GND configuration – only backside. Parameter=shaper DAC

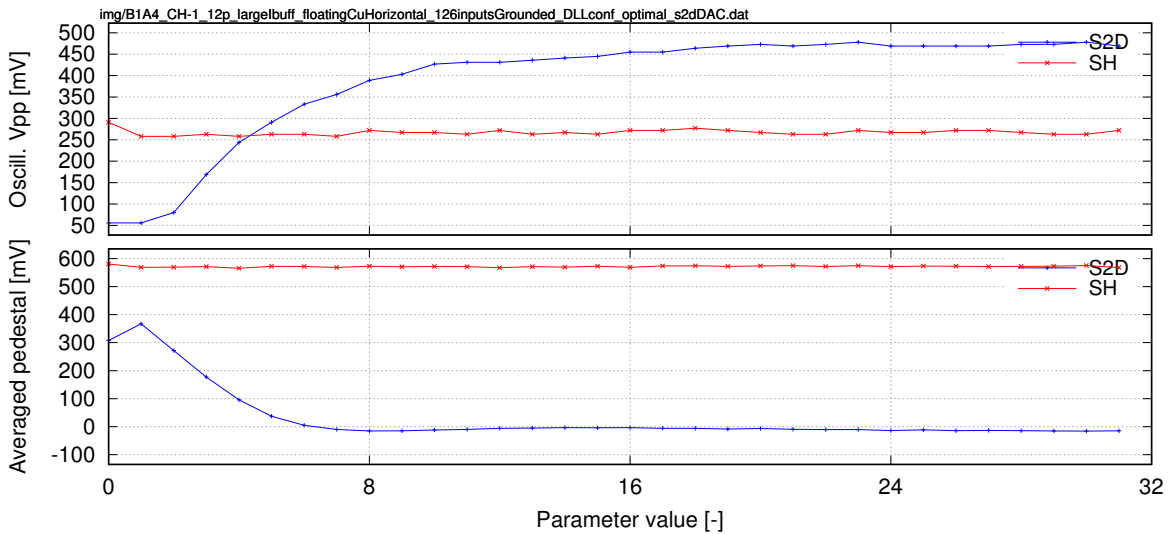


Figure 478: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating small horizontal copper foil on ASIC; All inputs grounded; Preamp GND configuration – only backside. Parameter=S2D DAC

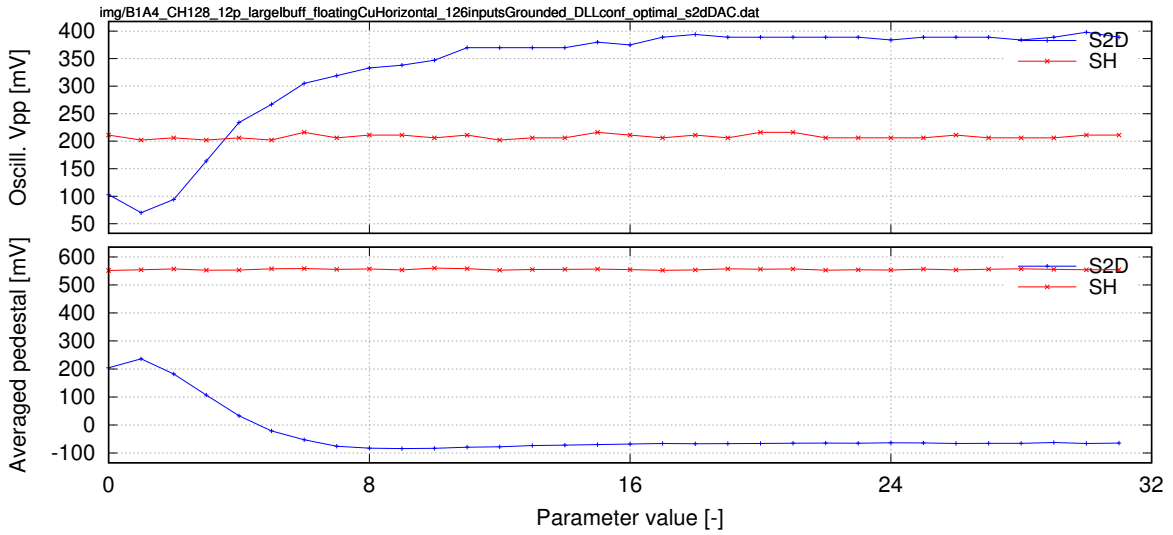


Figure 479: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating small horizontal copper foil on ASIC; All inputs grounded; Preamp GND configuration – only backside. Parameter=S2D DAC

5.11.2 Optimized test pulse and ADC delay

ASIC configuration: JC configuration (tables 1 & 2) + test pulse and ADC delay optimizations (table 3).

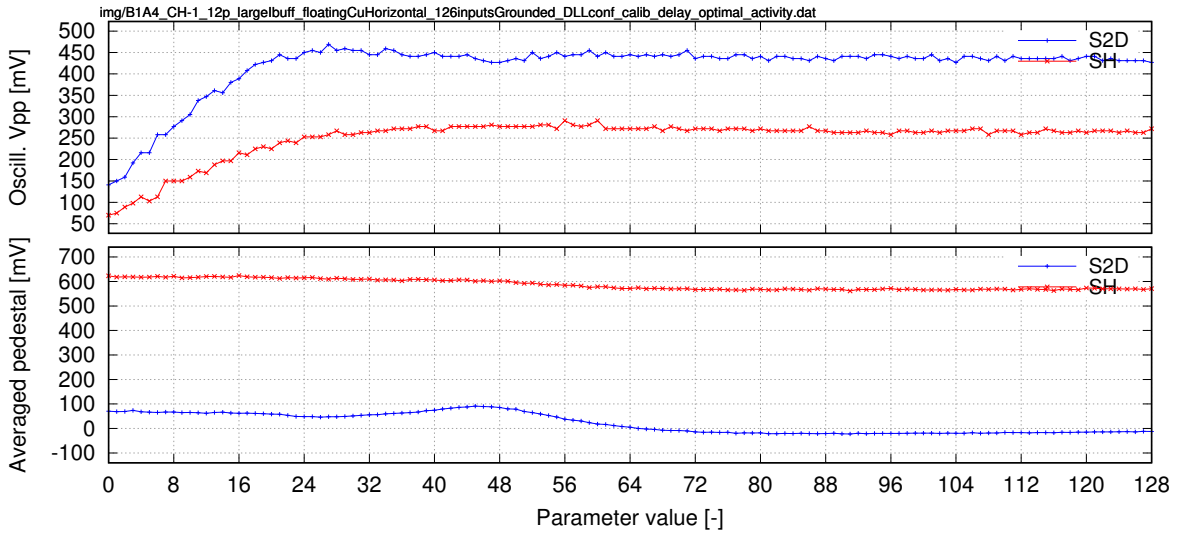


Figure 480: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating small horizontal copper foil on ASIC; All inputs grounded; Preamp GND configuration – only backside. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

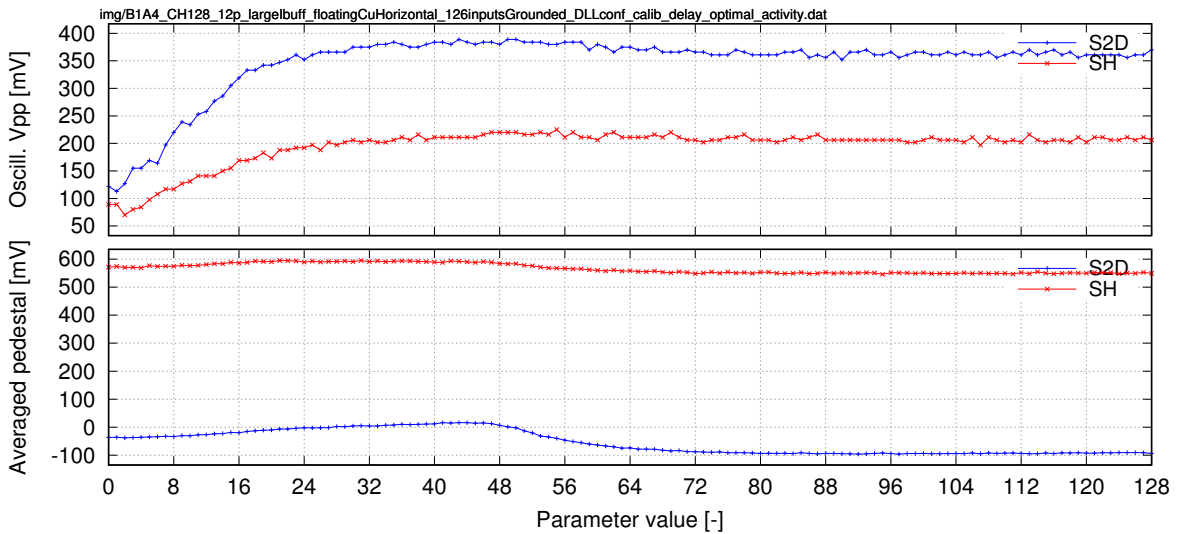


Figure 481: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating small horizontal copper foil on ASIC; All inputs grounded; Preamp GND configuration – only backside. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

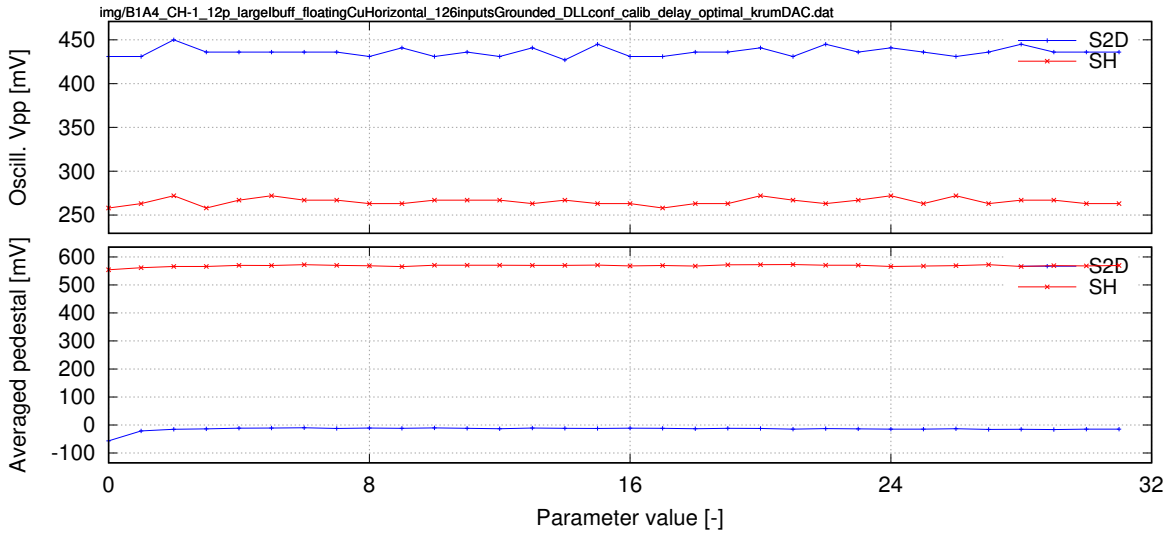


Figure 482: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating small horizontal copper foil on ASIC; All inputs grounded; Preamp GND configuration – only backside. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

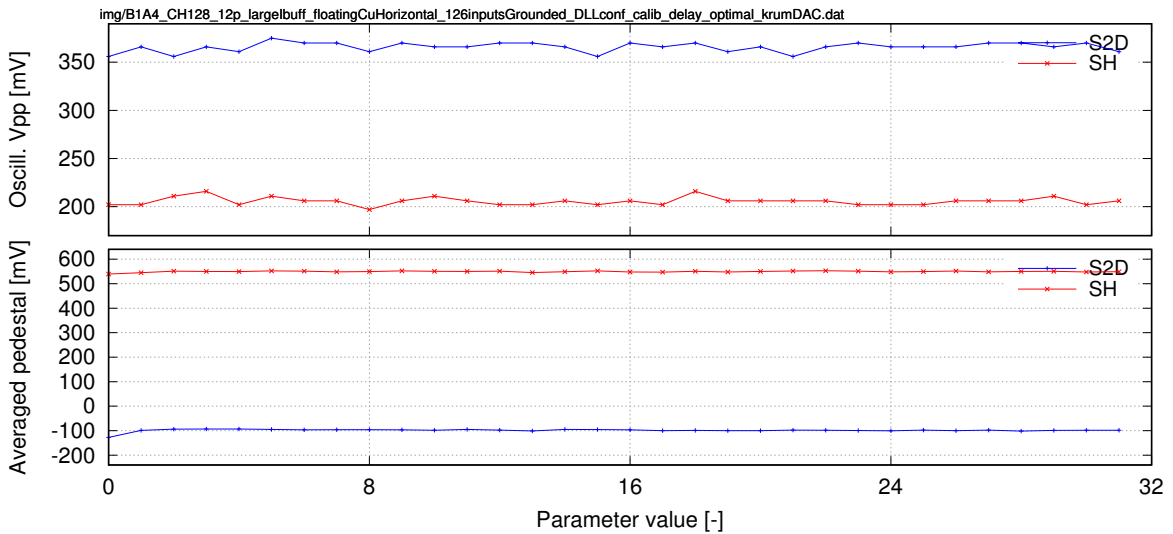


Figure 483: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating small horizontal copper foil on ASIC; All inputs grounded; Preamp GND configuration – only backside. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

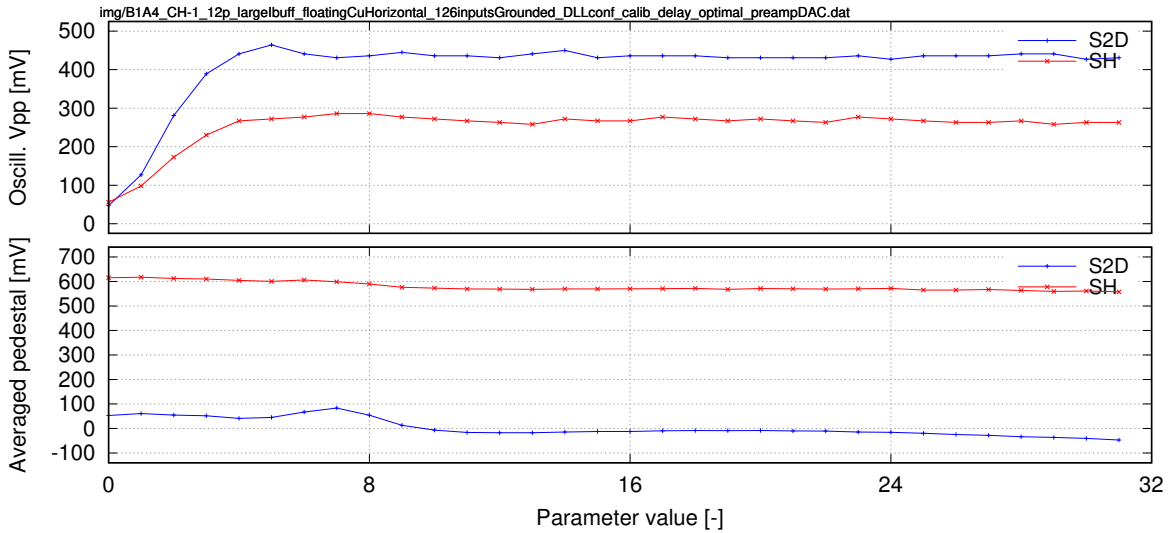


Figure 484: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating small horizontal copper foil on ASIC; All inputs grounded; Preamp GND configuration – only backside. Optimized test pulse and ADC delay. Parameter=preamp DAC

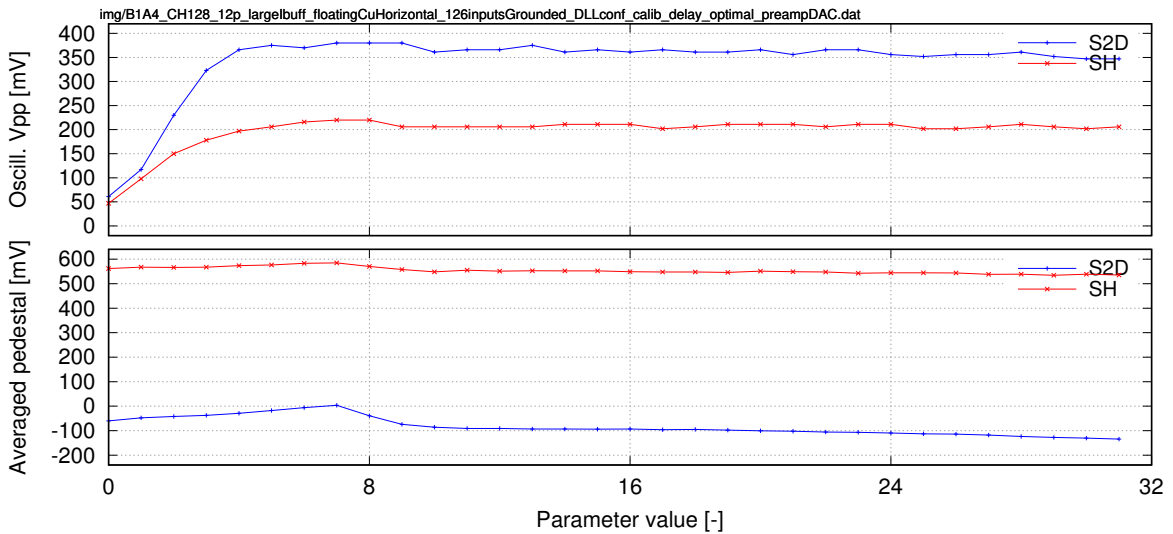


Figure 485: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating small horizontal copper foil on ASIC; All inputs grounded; Preamp GND configuration – only backside. Optimized test pulse and ADC delay. Parameter=preamp DAC

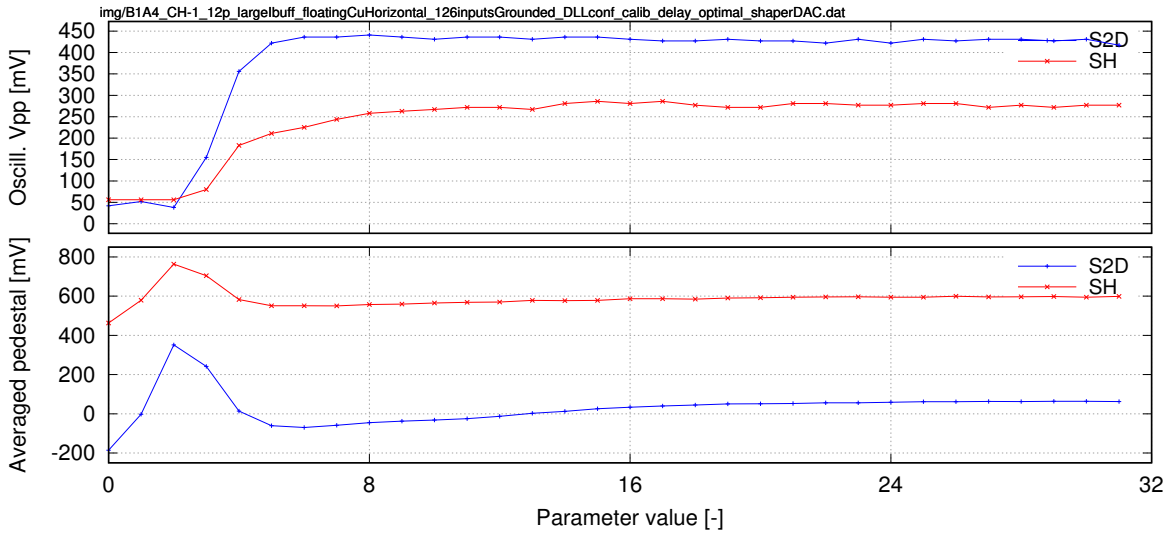


Figure 486: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating small horizontal copper foil on ASIC; All inputs grounded; Preamp GND configuration – only backside. Optimized test pulse and ADC delay. Parameter=shaper DAC

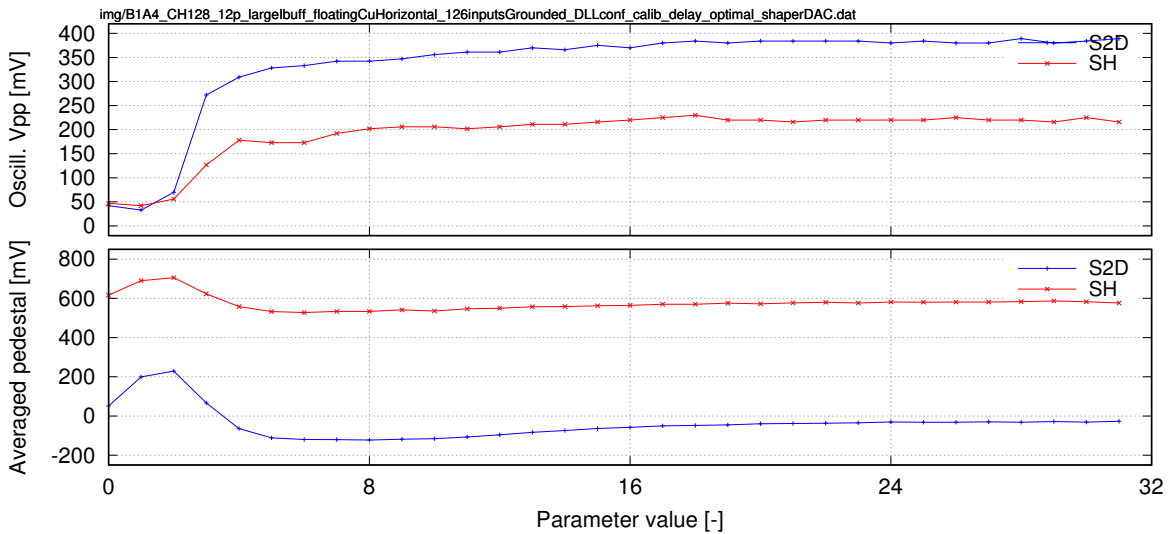


Figure 487: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating small horizontal copper foil on ASIC; All inputs grounded; Preamp GND configuration – only backside. Optimized test pulse and ADC delay. Parameter=shaper DAC

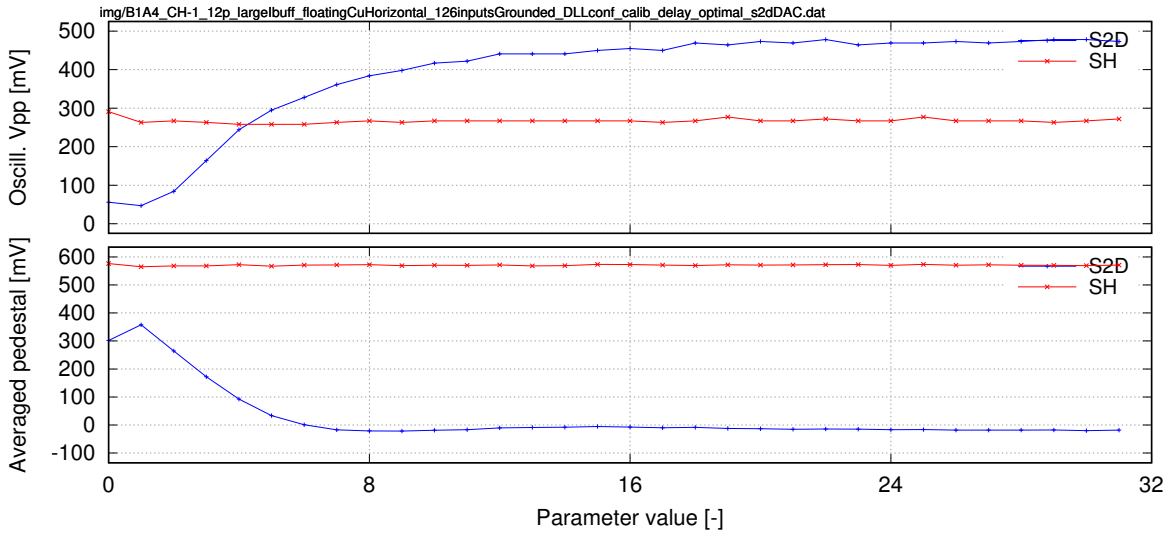


Figure 488: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating small horizontal copper foil on ASIC; All inputs grounded; Preamp GND configuration – only backside. Optimized test pulse and ADC delay. Parameter=S2D DAC

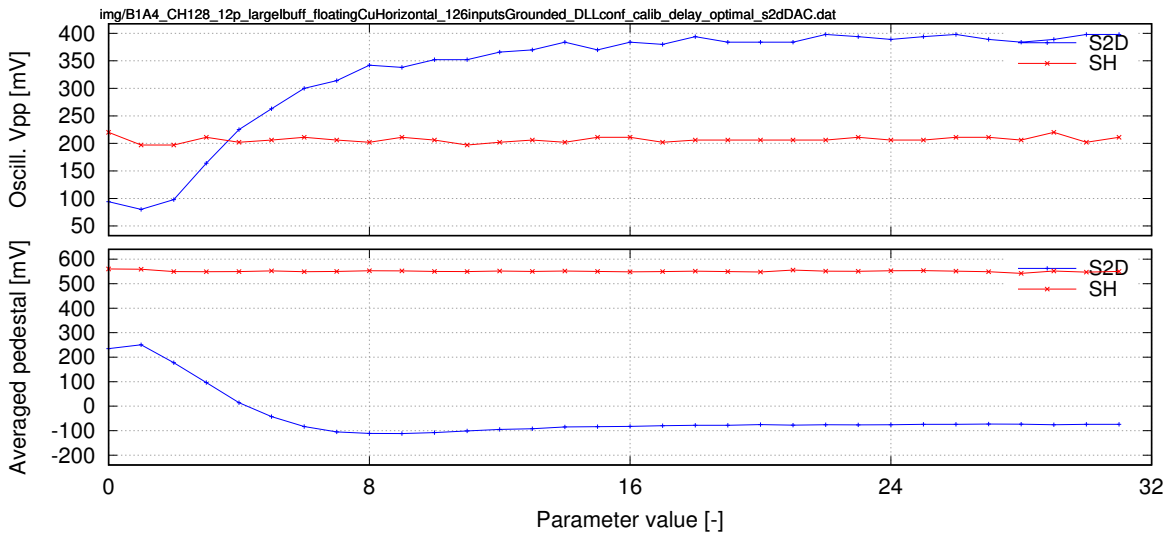


Figure 489: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating small horizontal copper foil on ASIC; All inputs grounded; Preamp GND configuration – only backside. Optimized test pulse and ADC delay. Parameter=S2D DAC

5.12 Cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; floating small horizontal copper foil on ASIC; Preamp GND configuration – only backside

Cap-PCB assembled, bonded to SALT input pads 0 and 127, two 12 pF capacitors assembled to the cap-PCB.

Ibuf current maximized – 1 k Ω resistor between VDDA and Ibuf pad.

Floating small horizontal copper foil glued directly on passivation on top of the ASIC (see figure 551).

Preamp GND bonded only from backside (default pads).

5.12.1 Default ASIC configuration

ASIC configuration: JC configuration (tables 1 & 2).

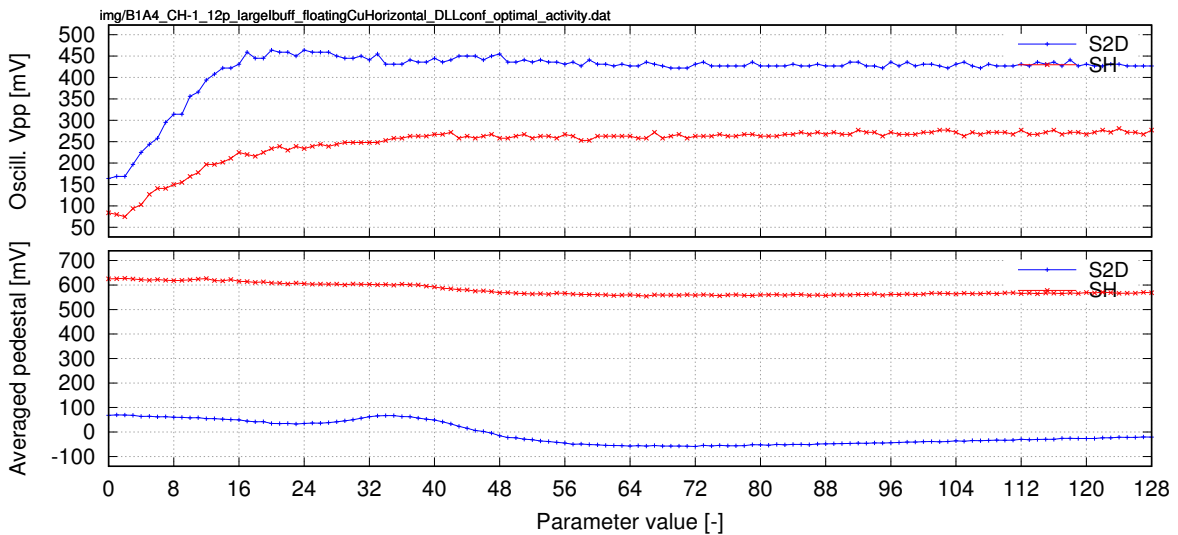


Figure 490: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating small horizontal copper foil on ASIC; Preamp GND configuration – only backside. Parameter=no. of active ADCs

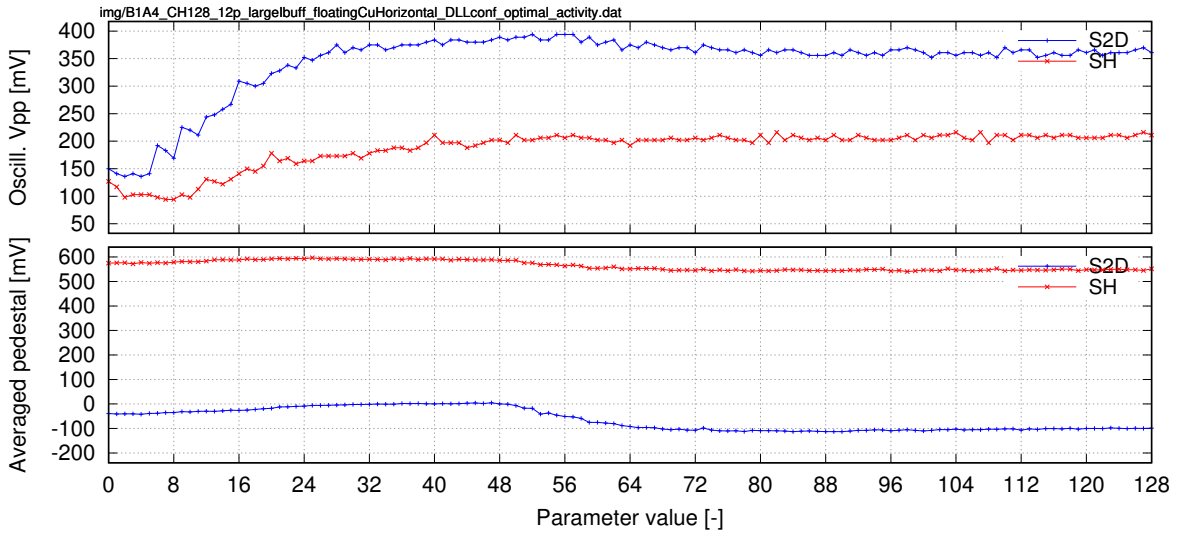


Figure 491: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating small horizontal copper foil on ASIC; Preamp GND configuration – only backside. Parameter=no. of active ADCs

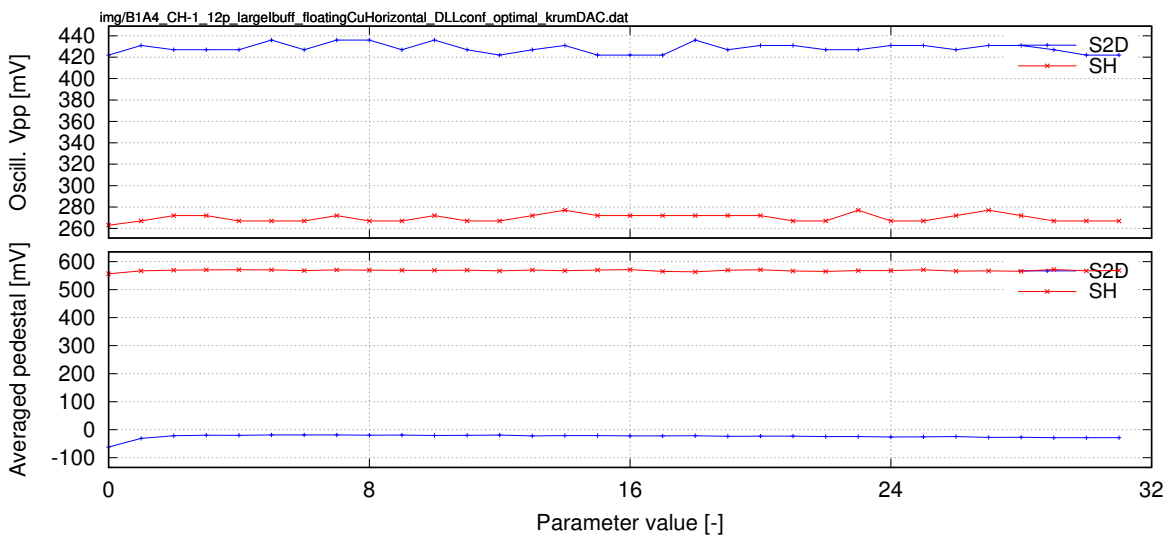


Figure 492: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating small horizontal copper foil on ASIC; Preamp GND configuration – only backside. Parameter=Krummenacher DAC

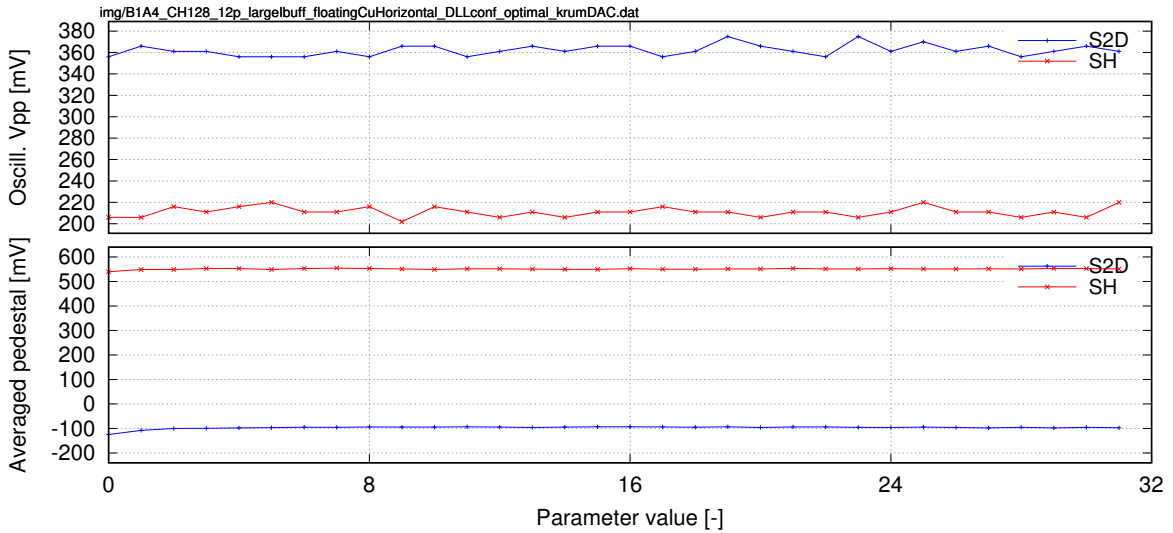


Figure 493: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating small horizontal copper foil on ASIC; Preamp GND configuration – only backside. Parameter=Krummenacher DAC

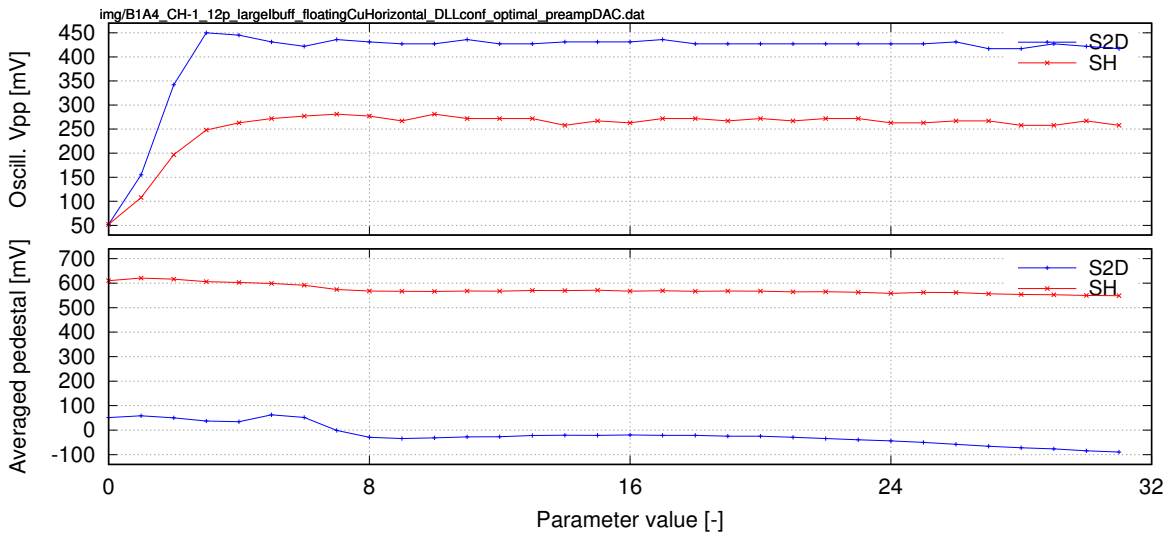


Figure 494: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating small horizontal copper foil on ASIC; Preamp GND configuration – only backside. Parameter=preamp DAC

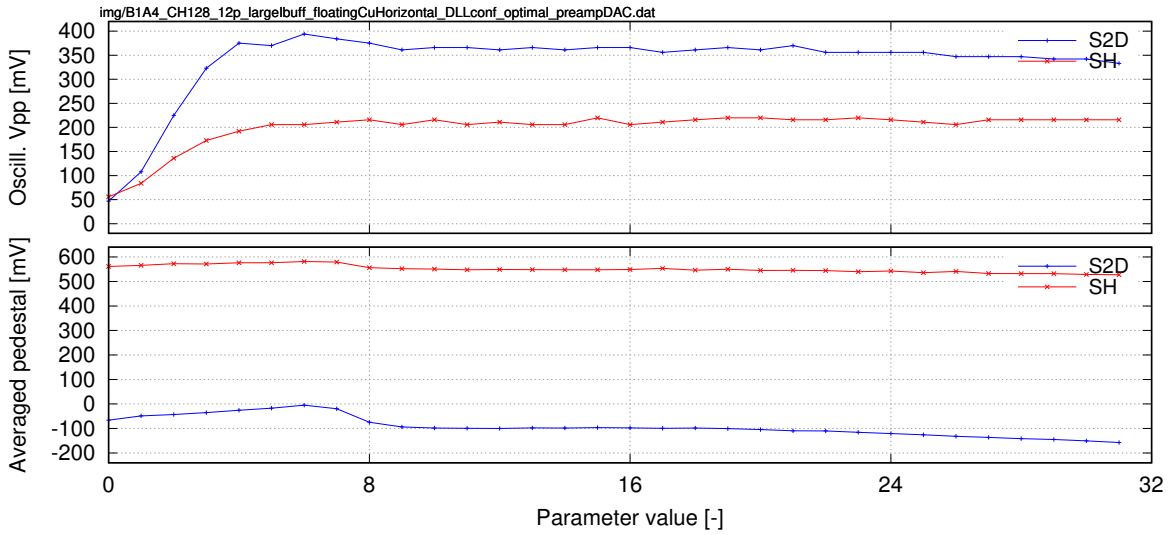


Figure 495: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating small horizontal copper foil on ASIC; Preamp GND configuration – only backside. Parameter=preamp DAC

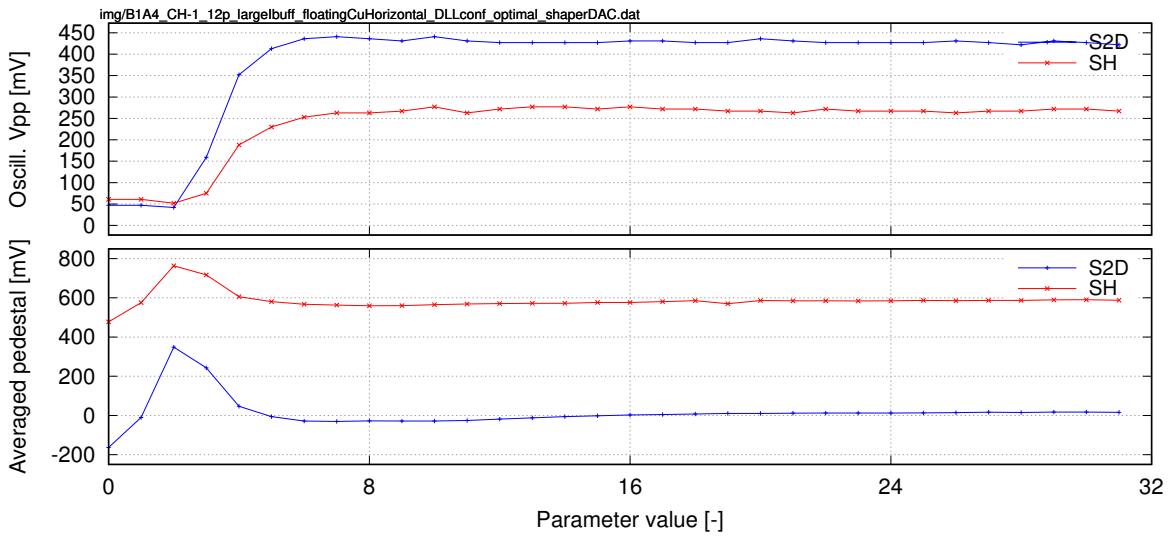


Figure 496: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating small horizontal copper foil on ASIC; Preamp GND configuration – only backside. Parameter=shaper DAC

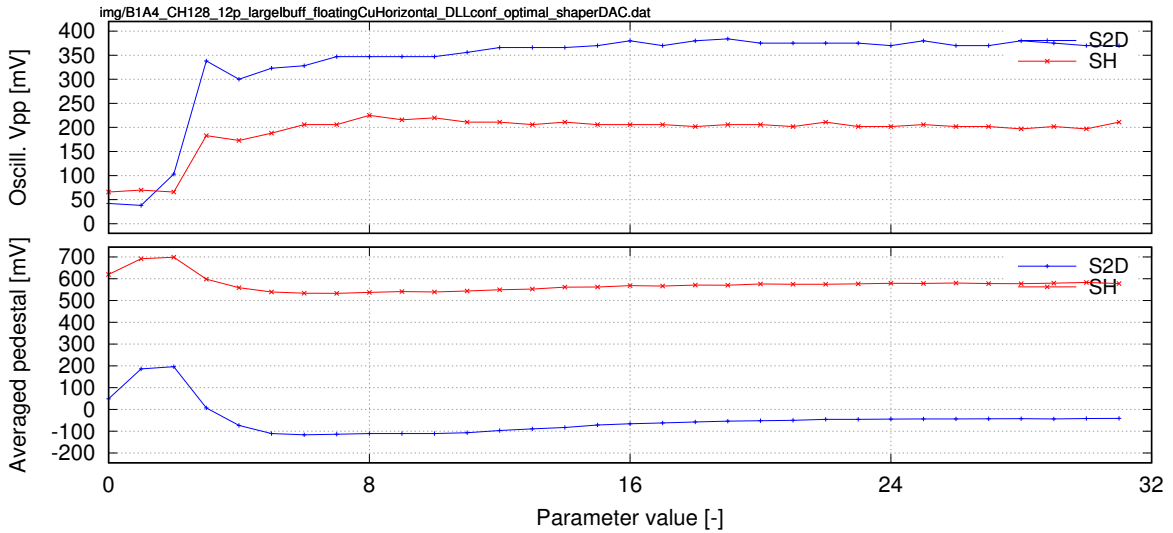


Figure 497: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating small horizontal copper foil on ASIC; Preamp GND configuration – only backside. Parameter=shaper DAC

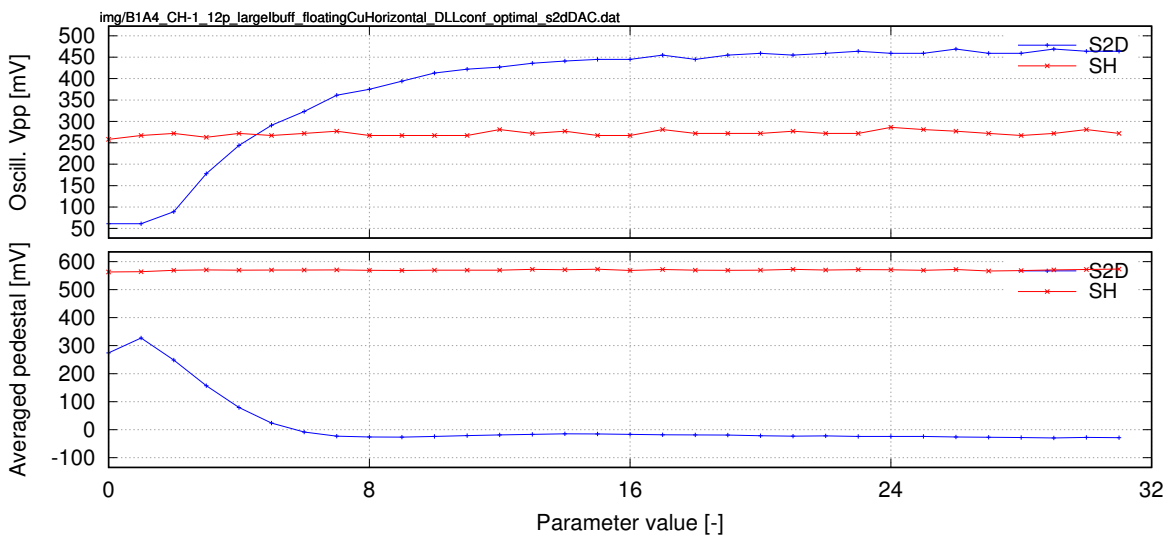


Figure 498: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating small horizontal copper foil on ASIC; Preamp GND configuration – only backside. Parameter=S2D DAC

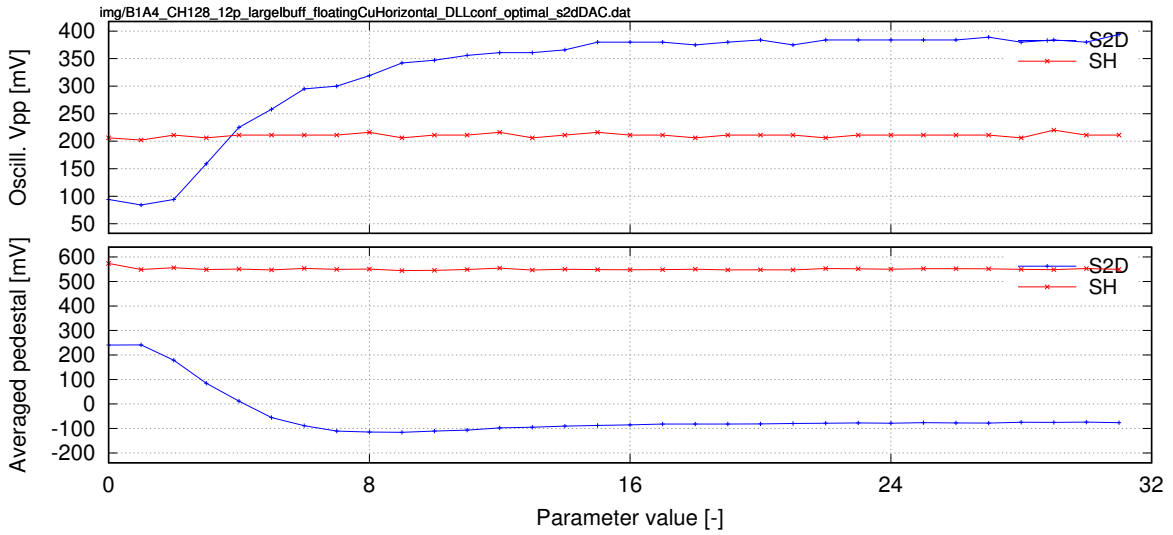


Figure 499: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating small horizontal copper foil on ASIC; Preamp GND configuration – only backside. Parameter=S2D DAC

5.12.2 Optimized test pulse and ADC delay

ASIC configuration: JC configuration (tables 1 & 2) + test pulse and ADC delay optimizations (table 3).

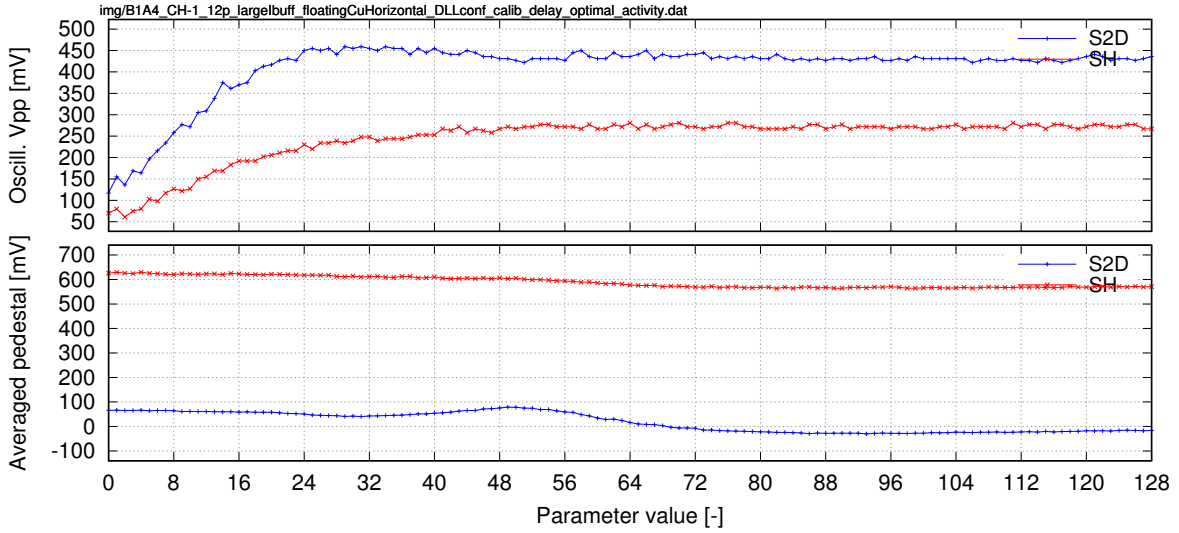


Figure 500: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating small horizontal copper foil on ASIC; Preamp GND configuration – only backside. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

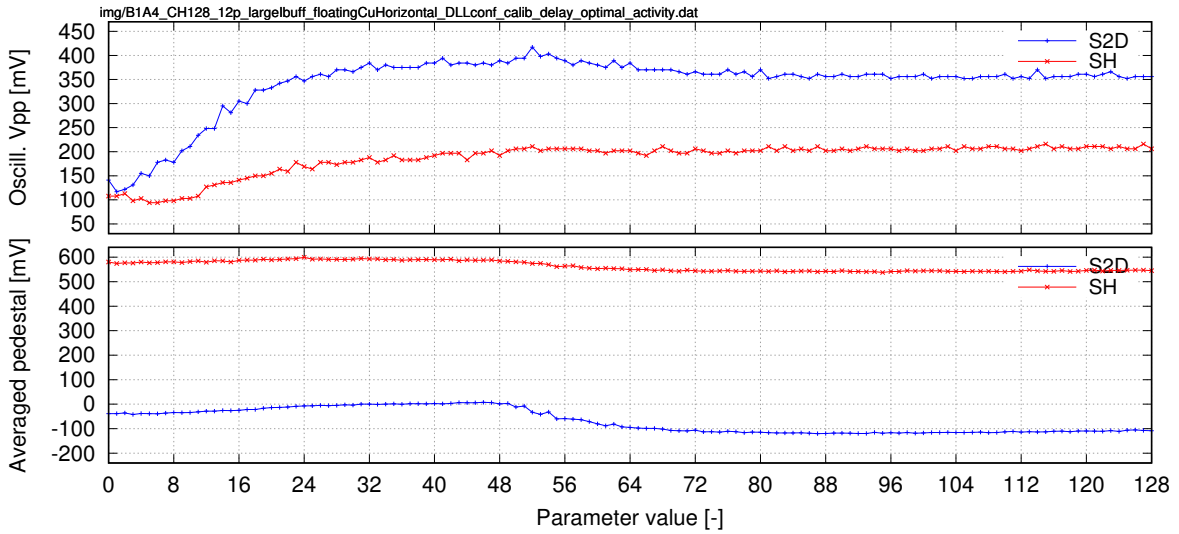


Figure 501: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating small horizontal copper foil on ASIC; Preamp GND configuration – only backside. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

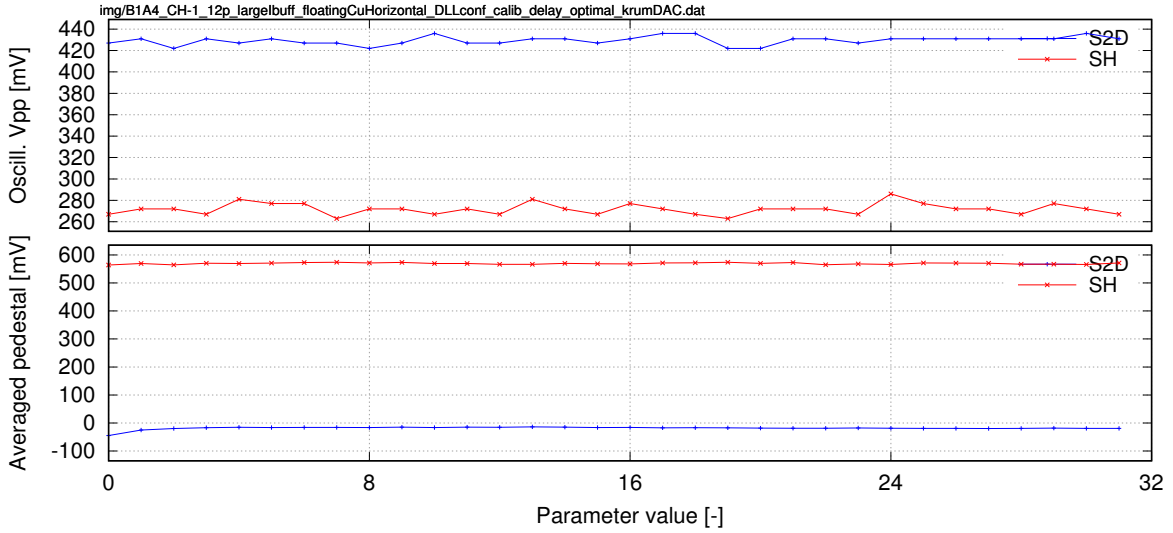


Figure 502: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating small horizontal copper foil on ASIC; Preamp GND configuration – only backside. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

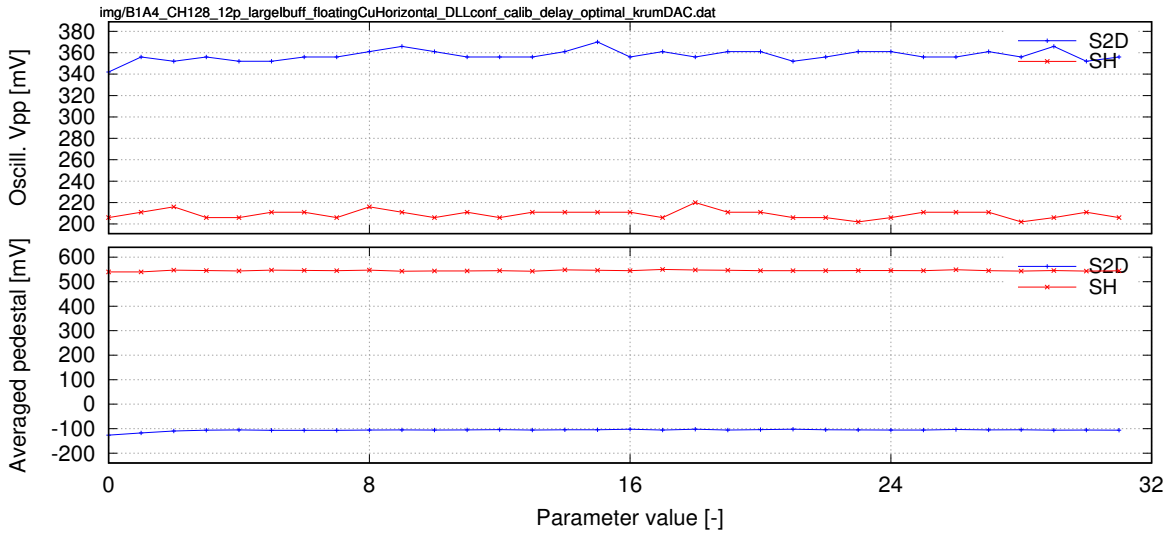


Figure 503: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating small horizontal copper foil on ASIC; Preamp GND configuration – only backside. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

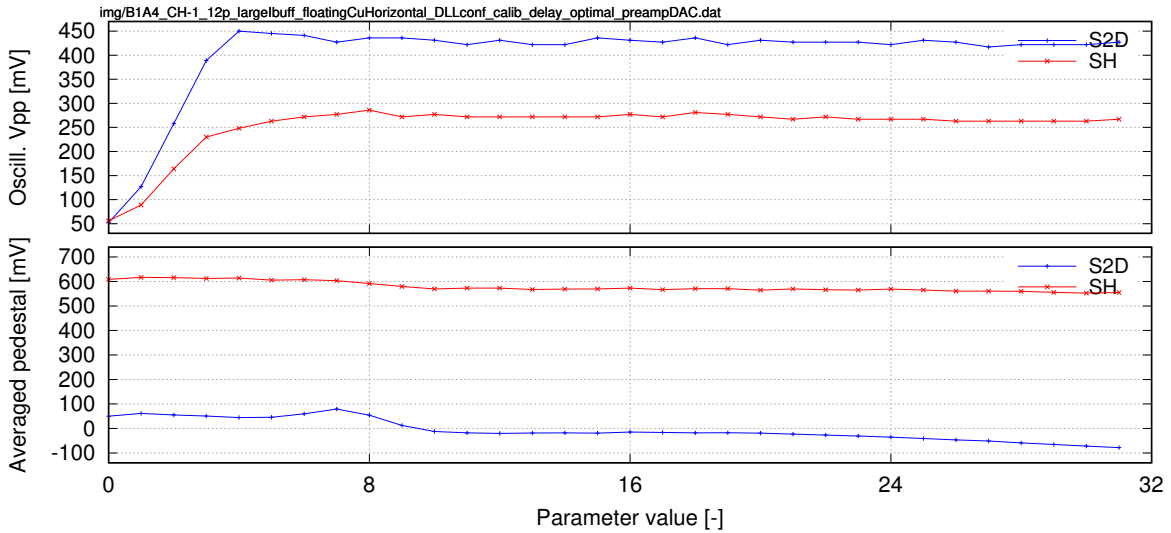


Figure 504: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating small horizontal copper foil on ASIC; Preamp GND configuration – only backside. Optimized test pulse and ADC delay. Parameter=preamp DAC

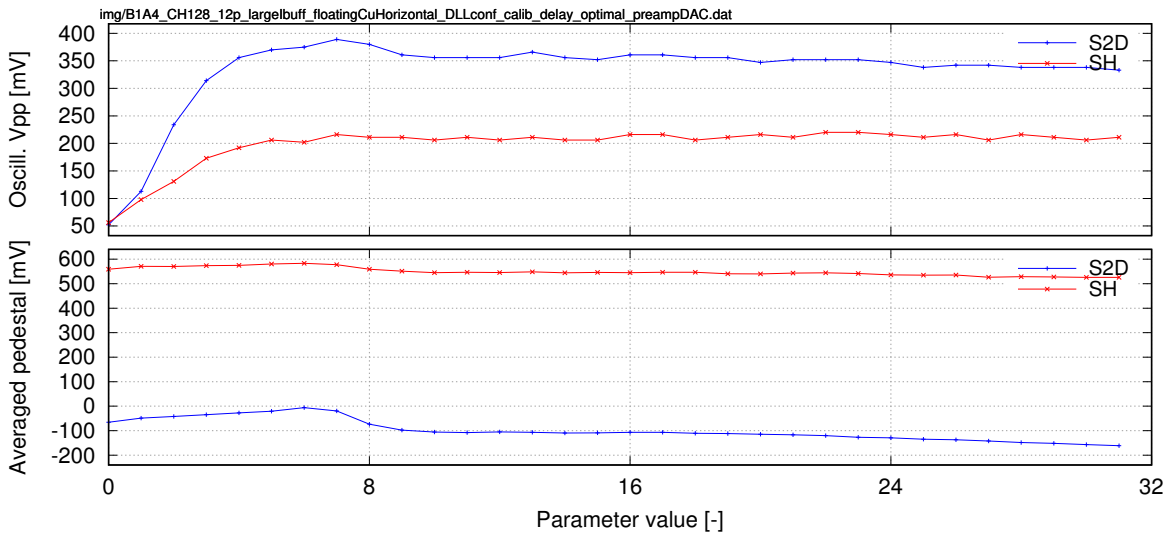


Figure 505: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating small horizontal copper foil on ASIC; Preamp GND configuration – only backside. Optimized test pulse and ADC delay. Parameter=preamp DAC

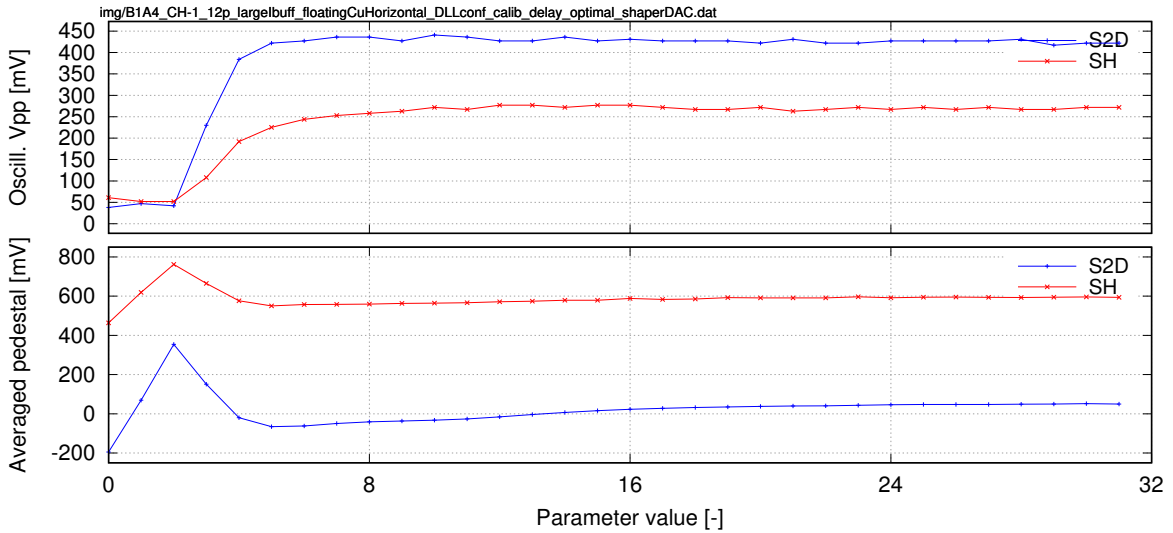


Figure 506: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating small horizontal copper foil on ASIC; Preamp GND configuration – only backside. Optimized test pulse and ADC delay. Parameter=shaper DAC

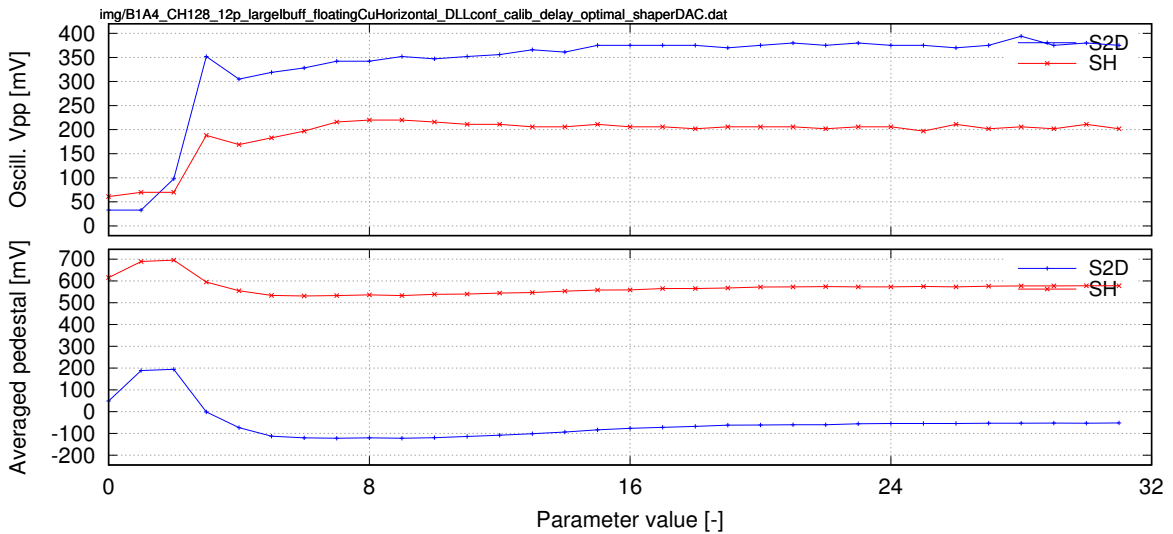


Figure 507: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating small horizontal copper foil on ASIC; Preamp GND configuration – only backside. Optimized test pulse and ADC delay. Parameter=shaper DAC

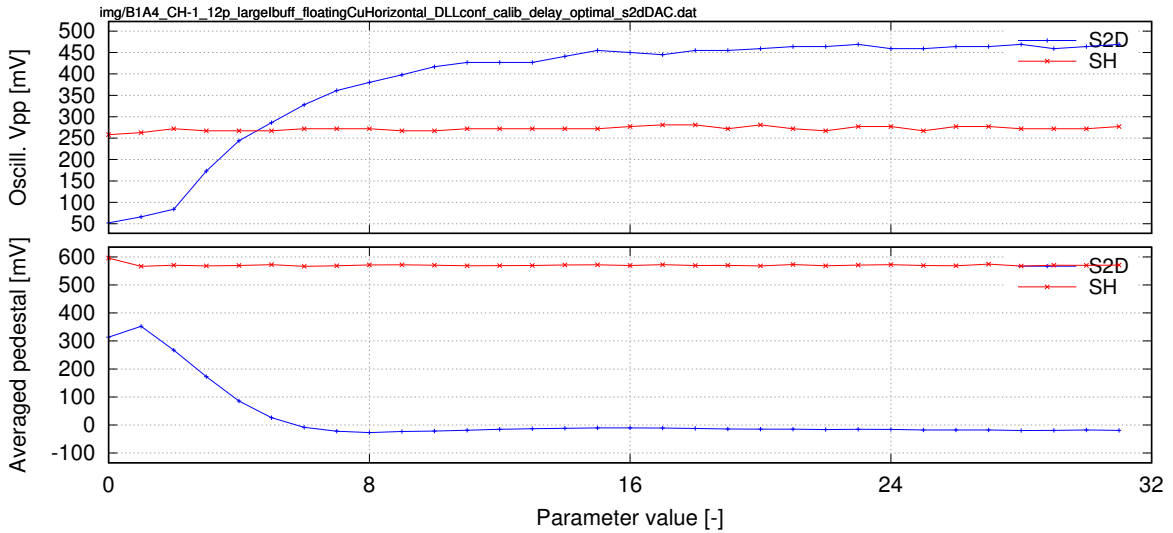


Figure 508: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating small horizontal copper foil on ASIC; Preamp GND configuration – only backside. Optimized test pulse and ADC delay. Parameter=S2D DAC

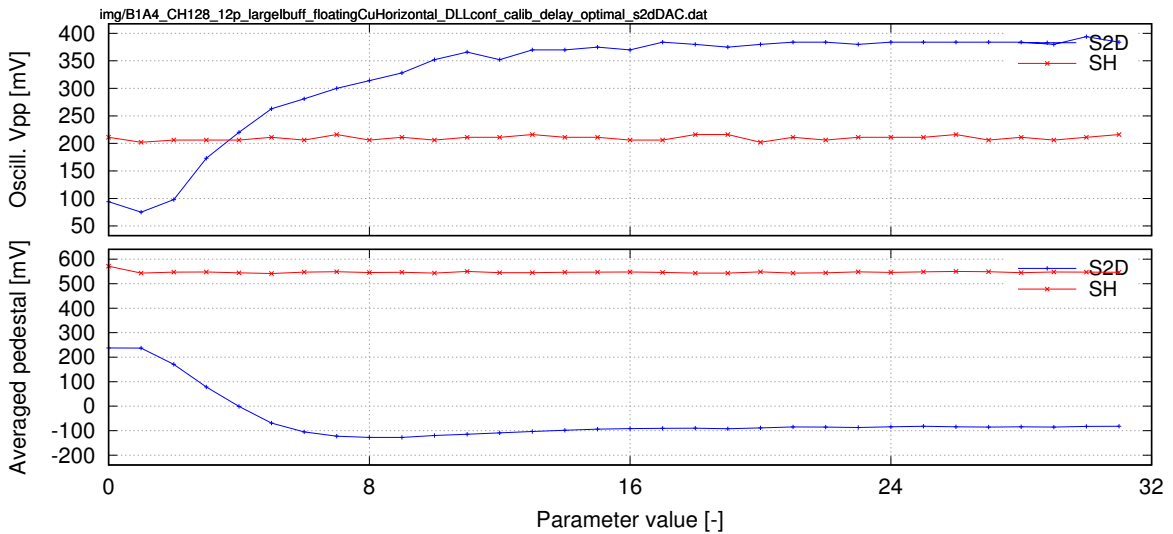


Figure 509: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized; floating small horizontal copper foil on ASIC; Preamp GND configuration – only backside. Optimized test pulse and ADC delay. Parameter=S2D DAC

5.13 Cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; Results comparison

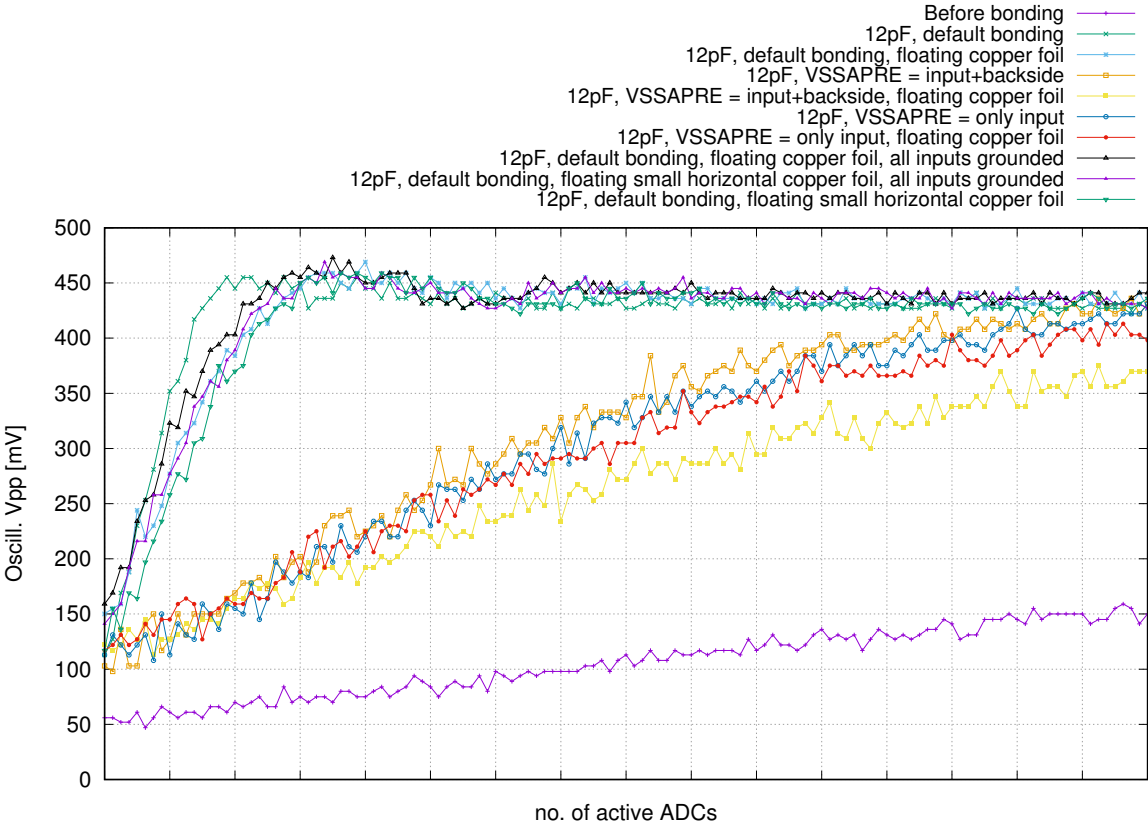


Figure 510: B1A4, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Optimized test pulse and ADC delay.

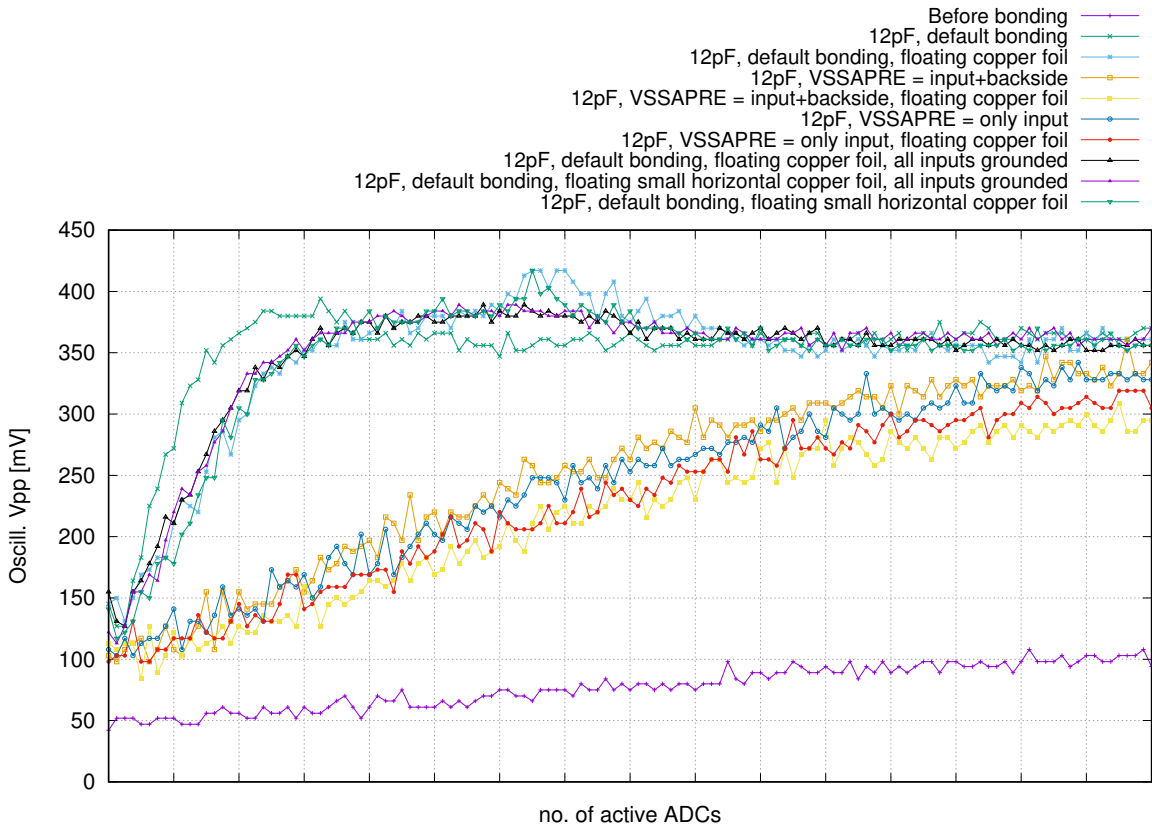


Figure 511: B1A4, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Optimized test pulse and ADC delay.

6 Board 1 with ASIC 5

6.1 Cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized

Cap-PCB assembled, bonded to SALT input pads 0 and 127, two 12 pF capacitors assembled to the cap-PCB.

Ibuf current maximized.

6.1.1 Default ASIC configuration

ASIC configuration: JC configuration (tables 1 & 2).

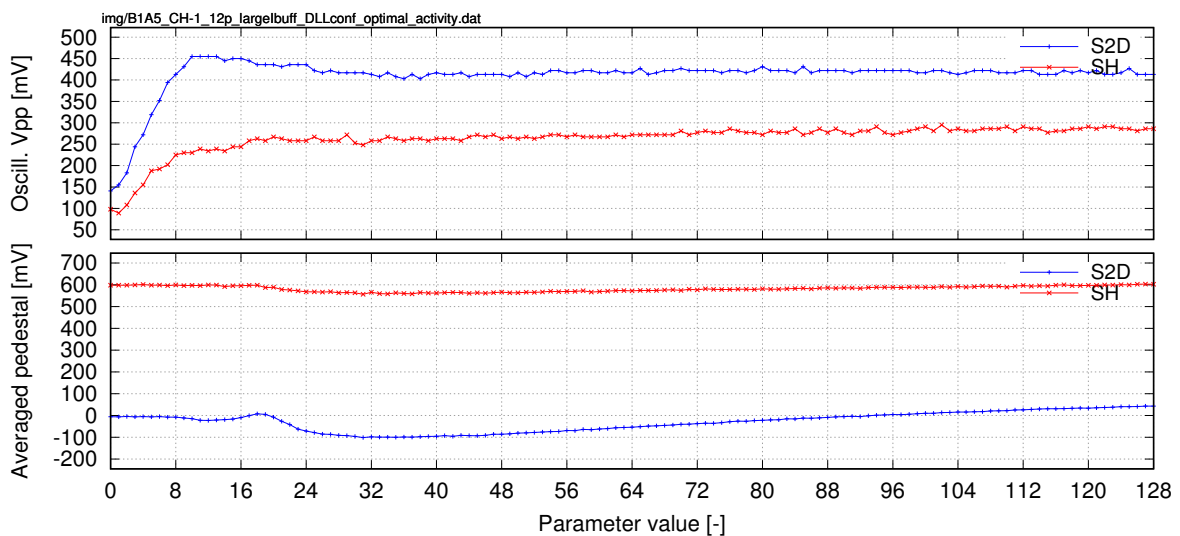


Figure 512: B1A5, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Parameter=no. of active ADCs

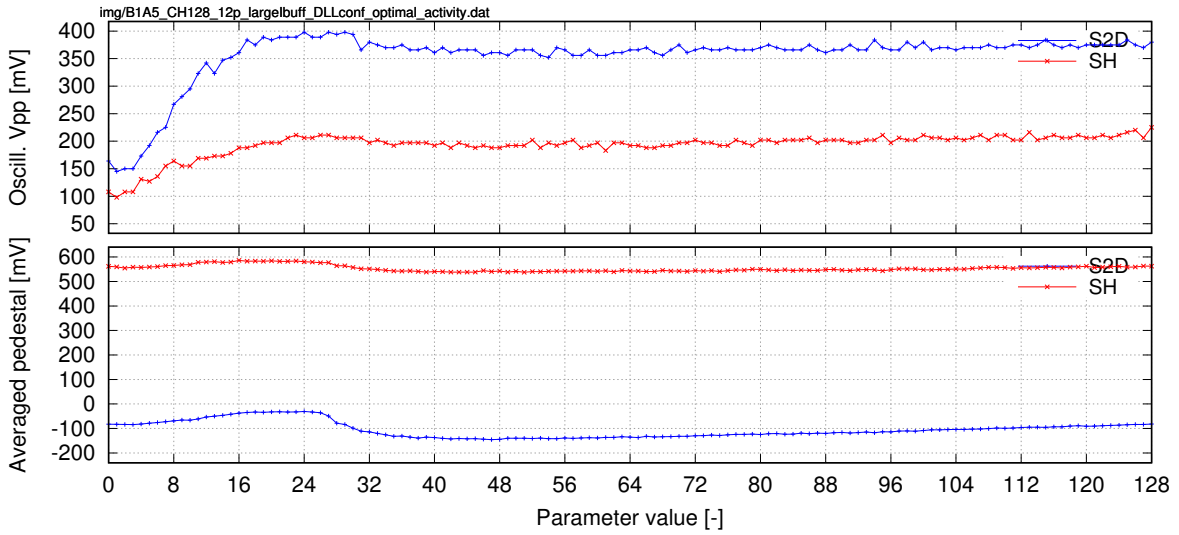


Figure 513: B1A5, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Parameter=no. of active ADCs

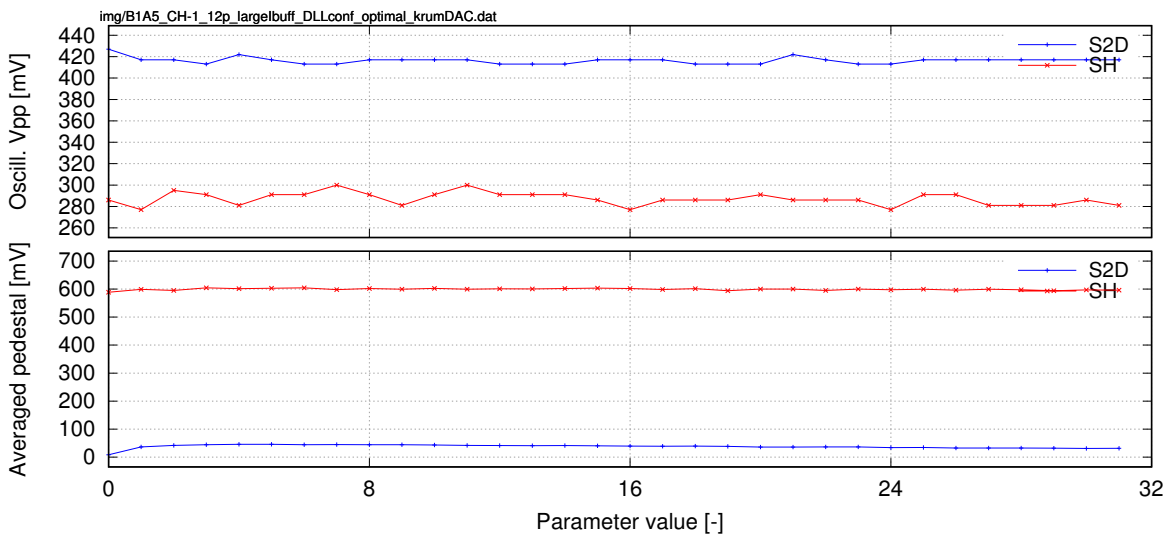


Figure 514: B1A5, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Parameter=Krummenacher DAC

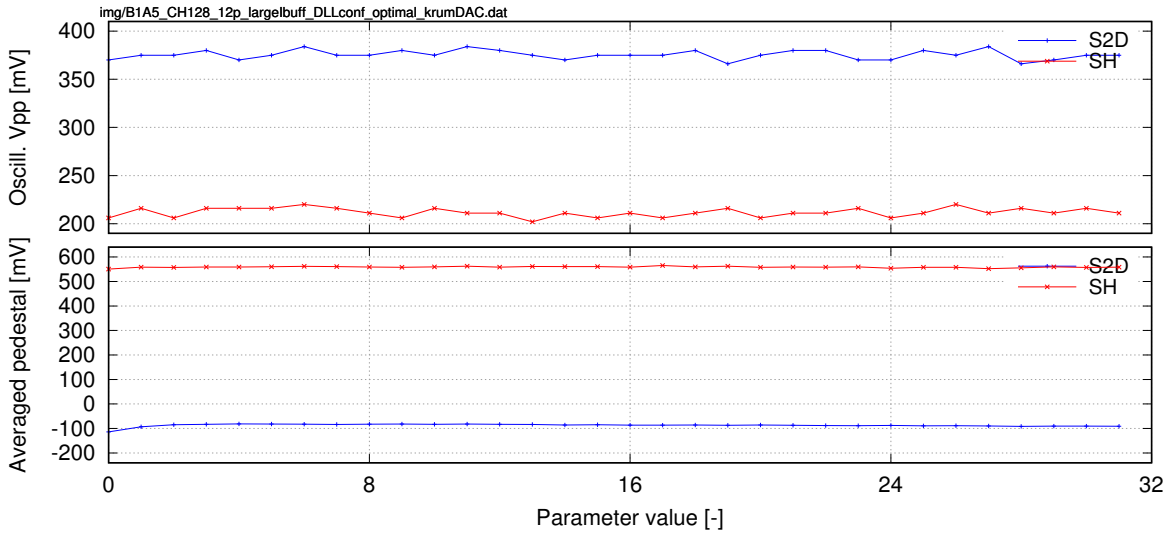


Figure 515: B1A5, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Parameter=Krummenacher DAC

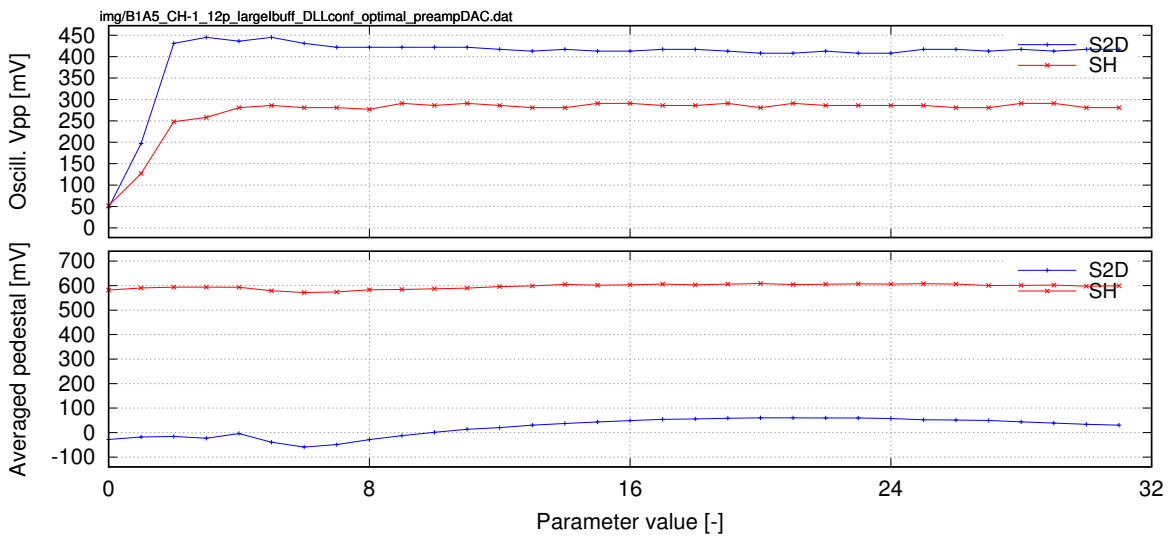


Figure 516: B1A5, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Parameter=preamp DAC

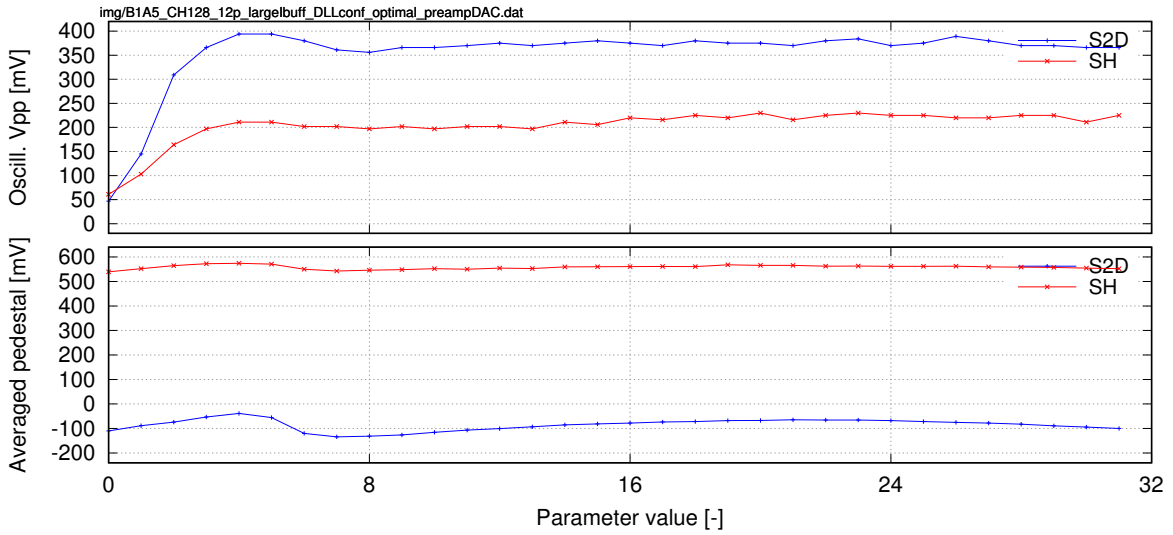


Figure 517: B1A5, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Parameter=preamp DAC

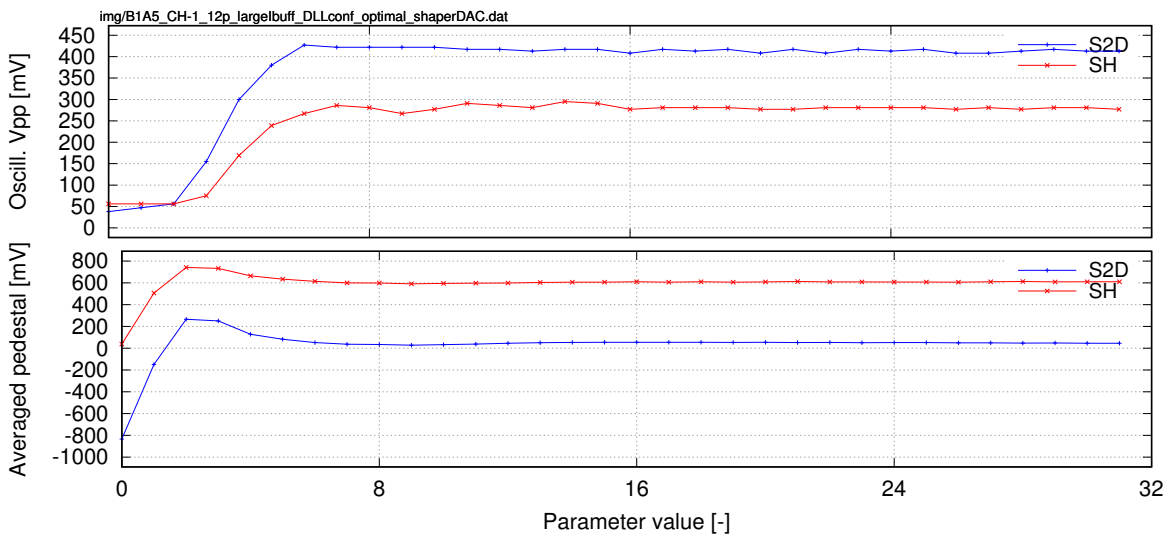


Figure 518: B1A5, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Parameter=shaper DAC

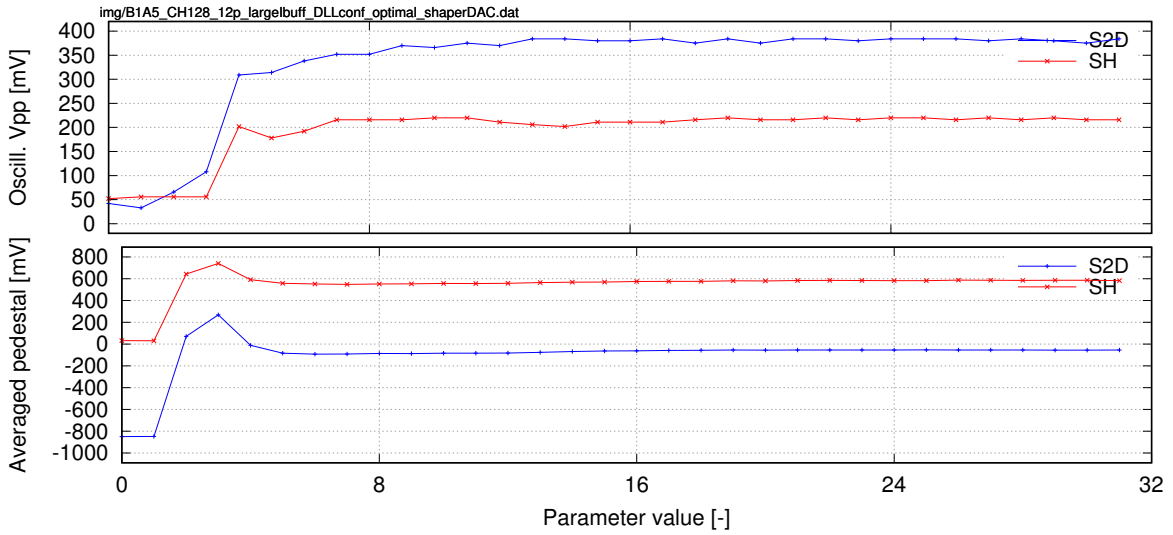


Figure 519: B1A5, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Parameter=shaper DAC

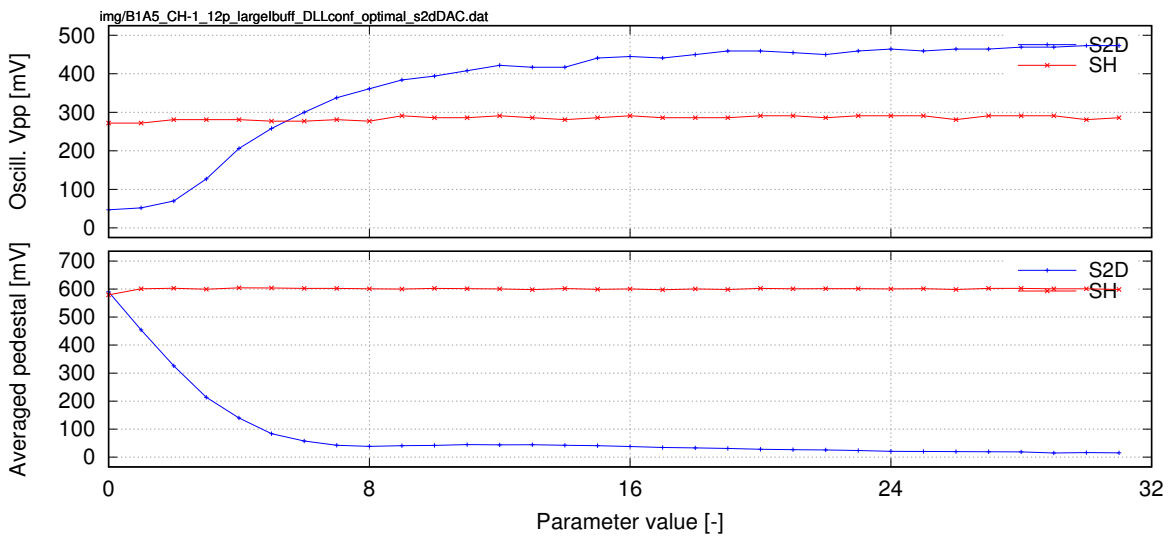


Figure 520: B1A5, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Parameter=S2D DAC

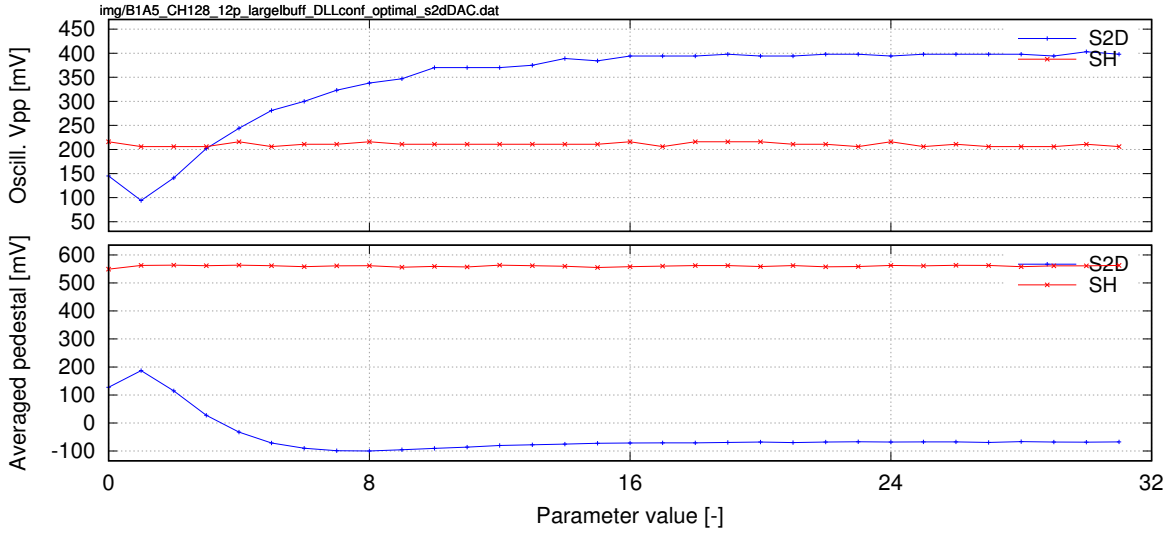


Figure 521: B1A5, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Parameter=S2D DAC

6.1.2 Optimized test pulse and ADC delay

ASIC configuration: JC configuration (tables 1 & 2) + test pulse and ADC delay optimizations (table 3).

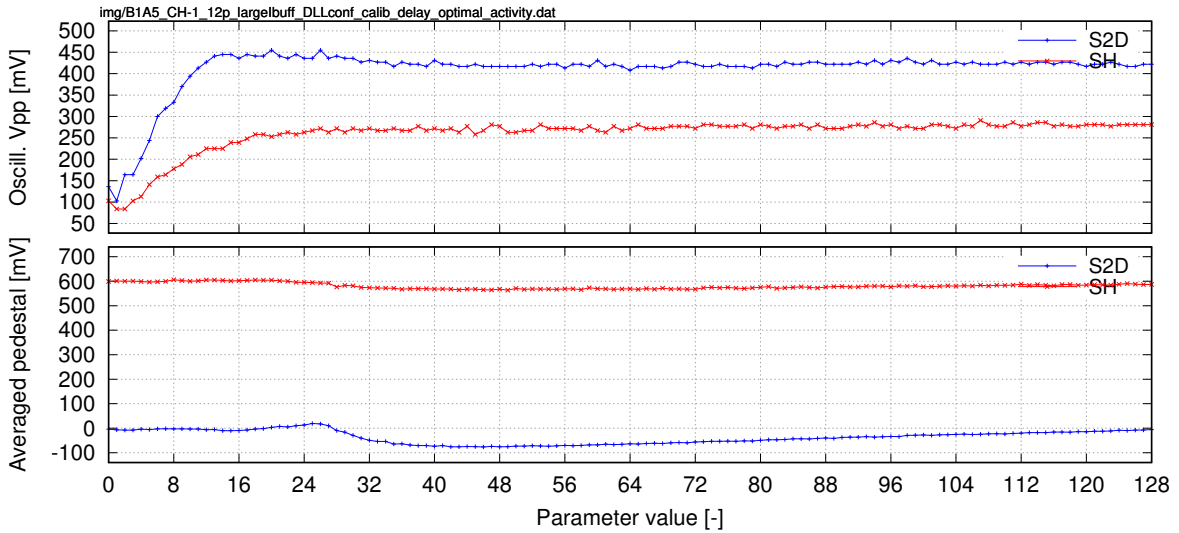


Figure 522: B1A5, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

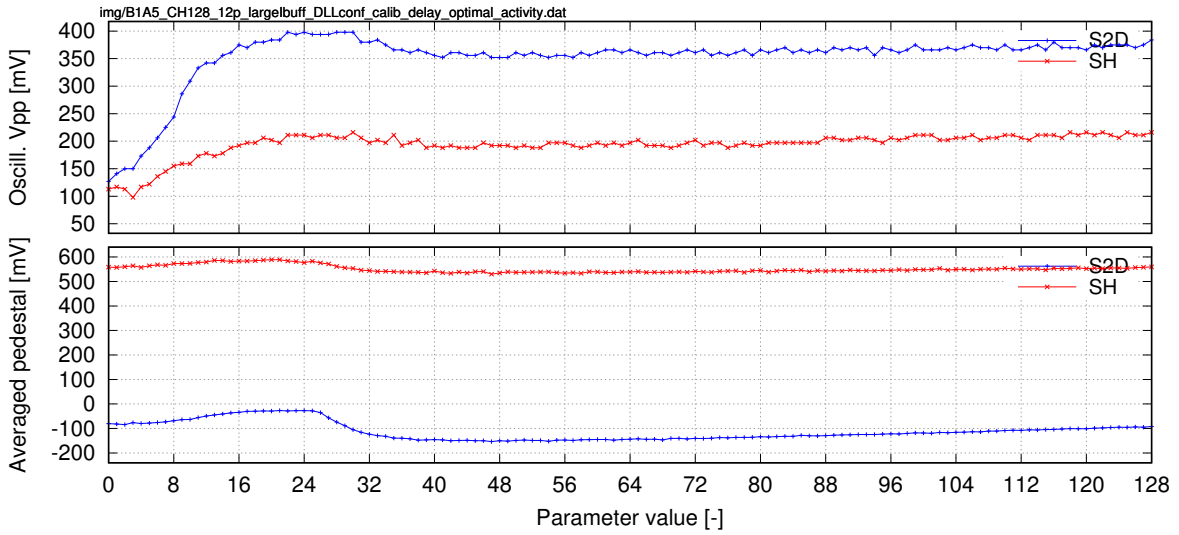


Figure 523: B1A5, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=no. of active ADCs

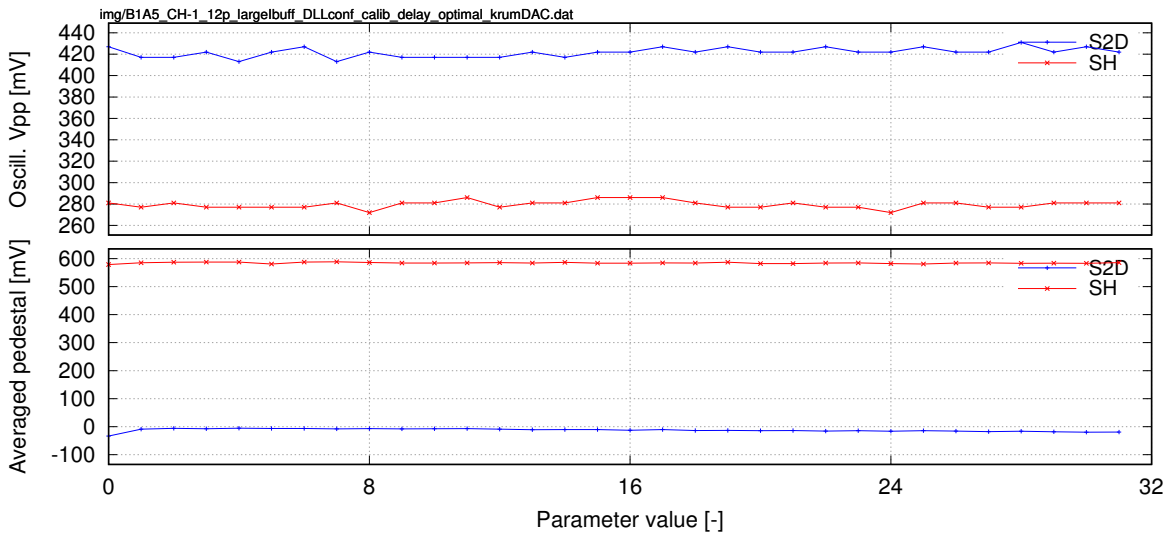


Figure 524: B1A5, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

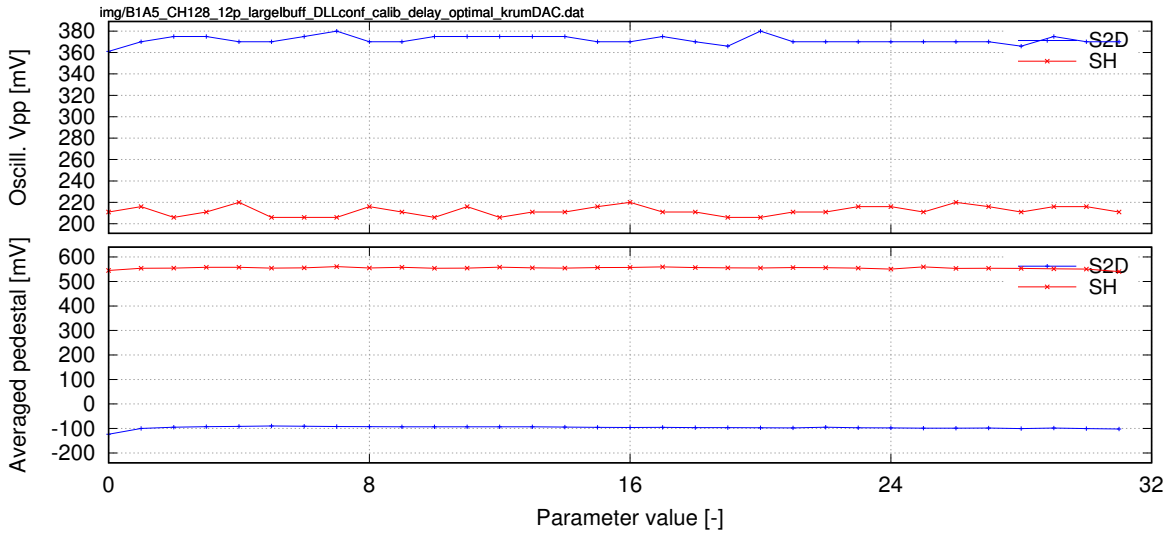


Figure 525: B1A5, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC

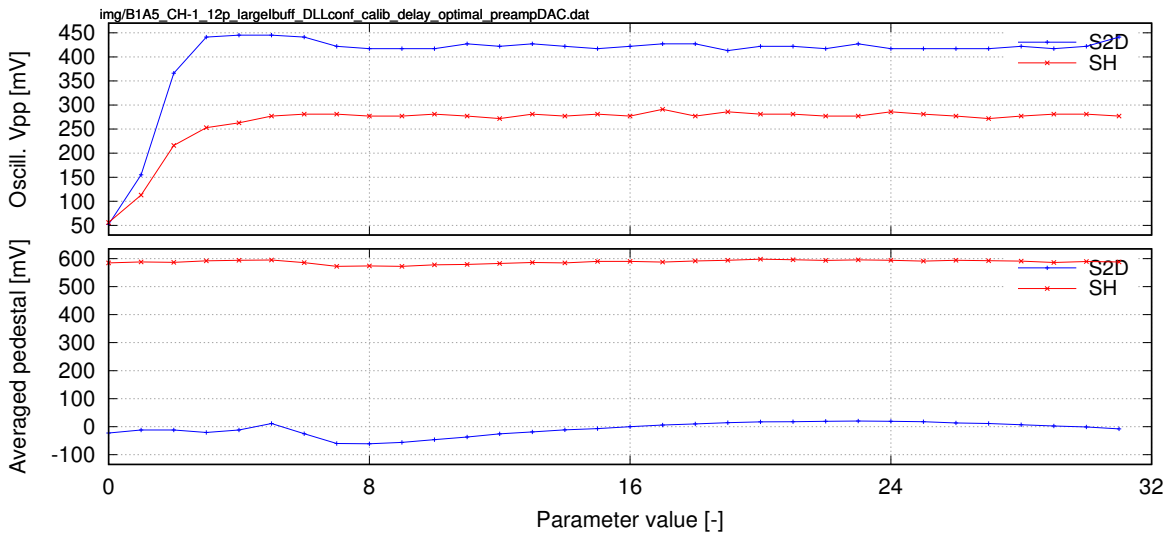


Figure 526: B1A5, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=preamp DAC

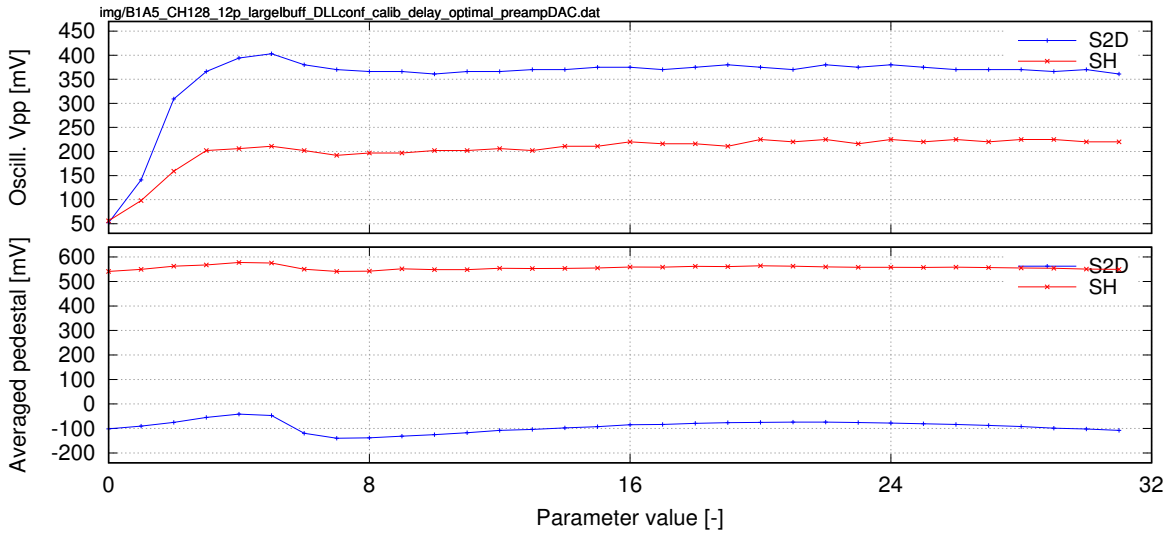


Figure 527: B1A5, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=preamp DAC

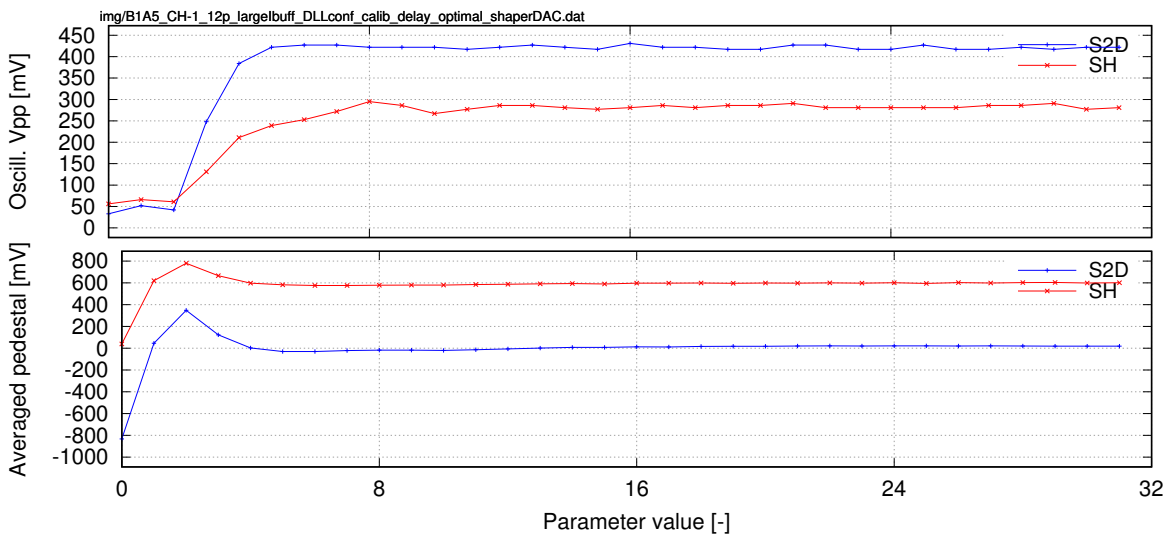


Figure 528: B1A5, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=shaper DAC

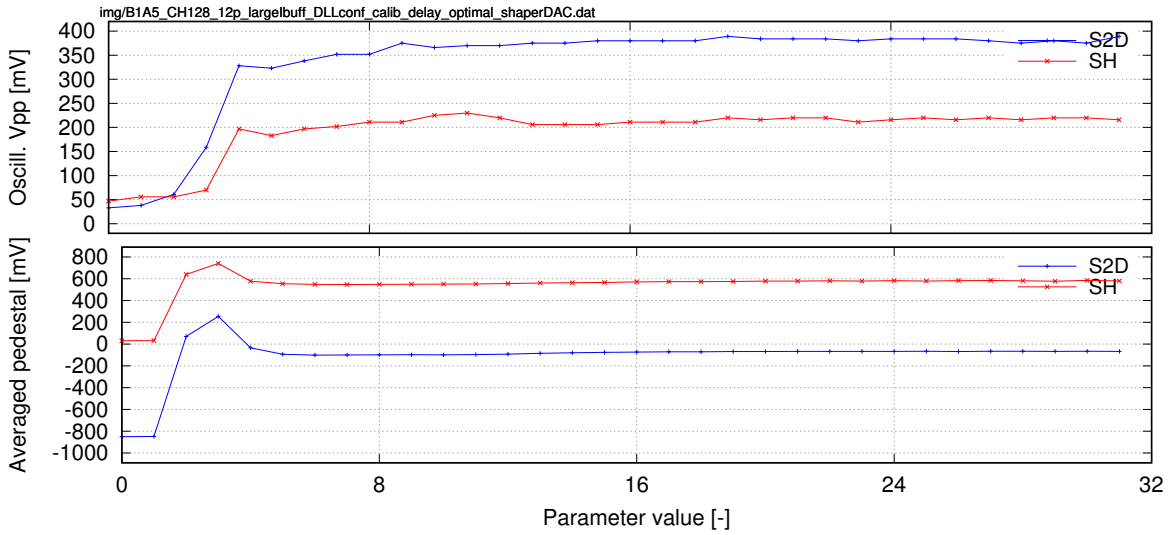


Figure 529: B1A5, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=shaper DAC

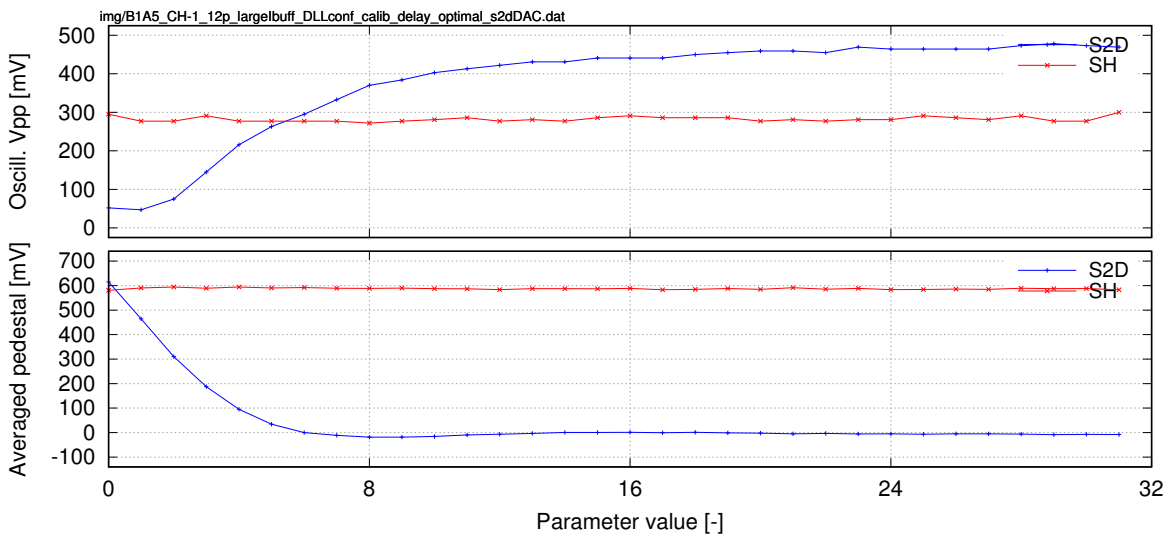


Figure 530: B1A5, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=S2D DAC

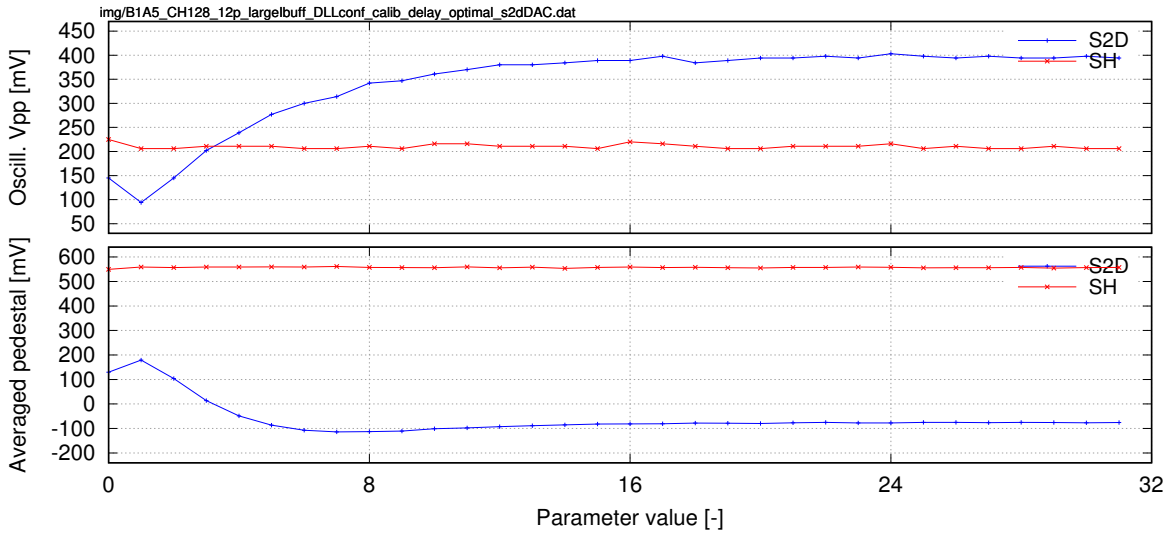


Figure 531: B1A5, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=S2D DAC

6.1.3 ASIC response for EMI source

ASIC configuration: default (chip after reset), EMI source 552 over the ASIC.

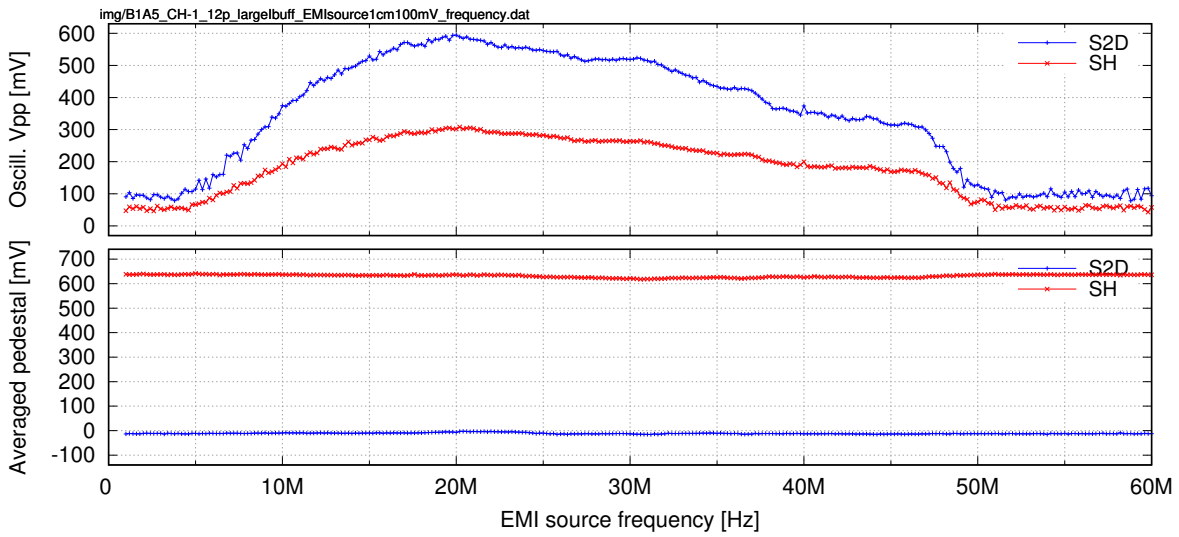


Figure 532: B1A5, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. EMI source 1cm over ASIC, amplitude 100mV. Parameter=frequency of EMI source

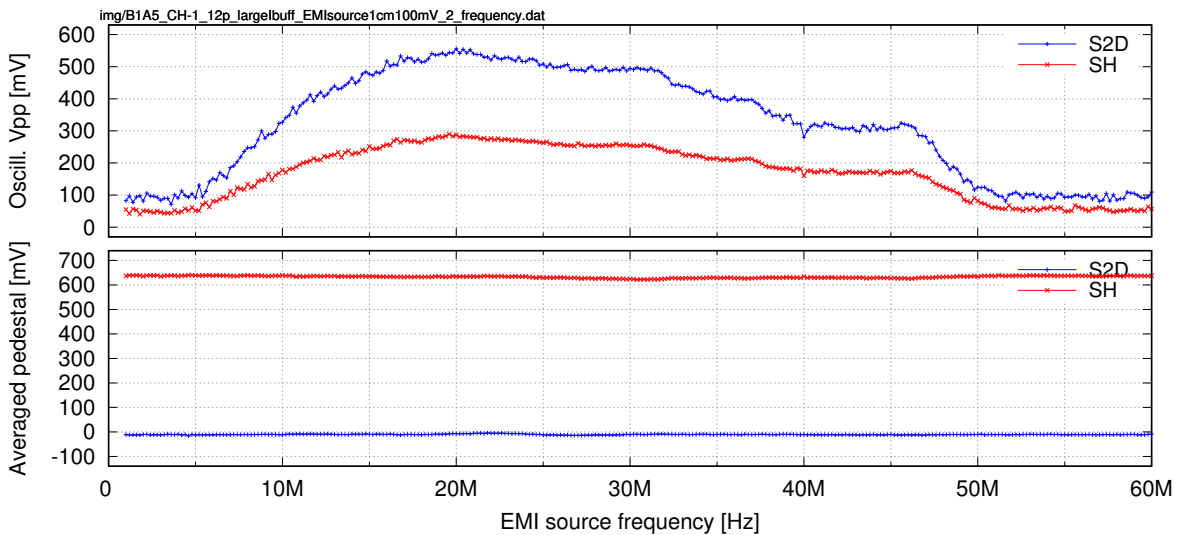


Figure 533: B1A5, channel -1 (second measurement), cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. EMI source 1cm over ASIC, amplitude 100mV. Parameter=frequency of EMI source

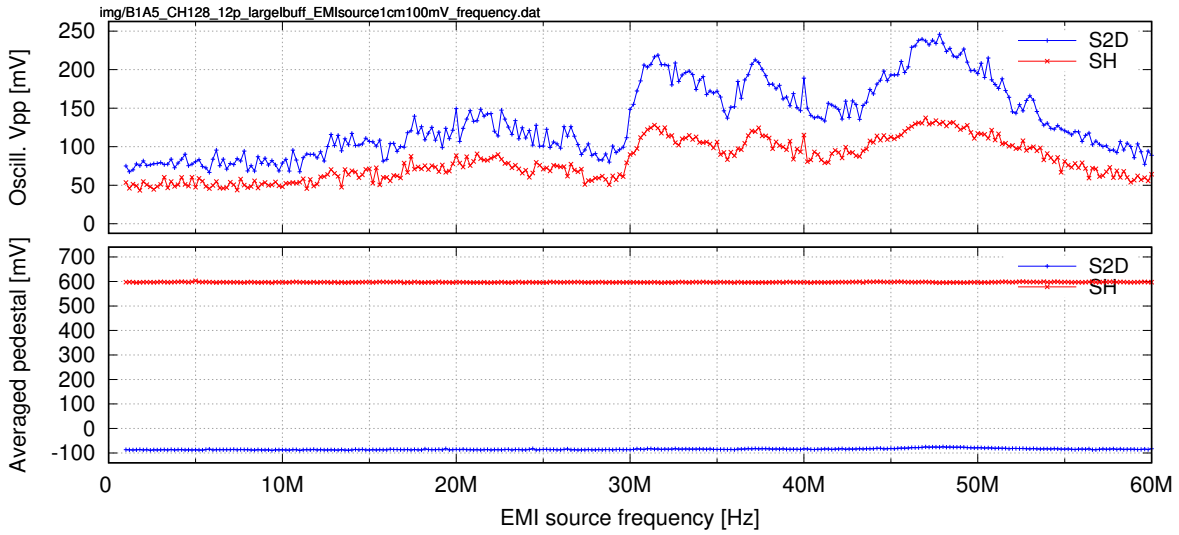


Figure 534: B1A5, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. EMI source 1cm over ASIC, amplitude 100mV. Parameter=frequency of EMI source

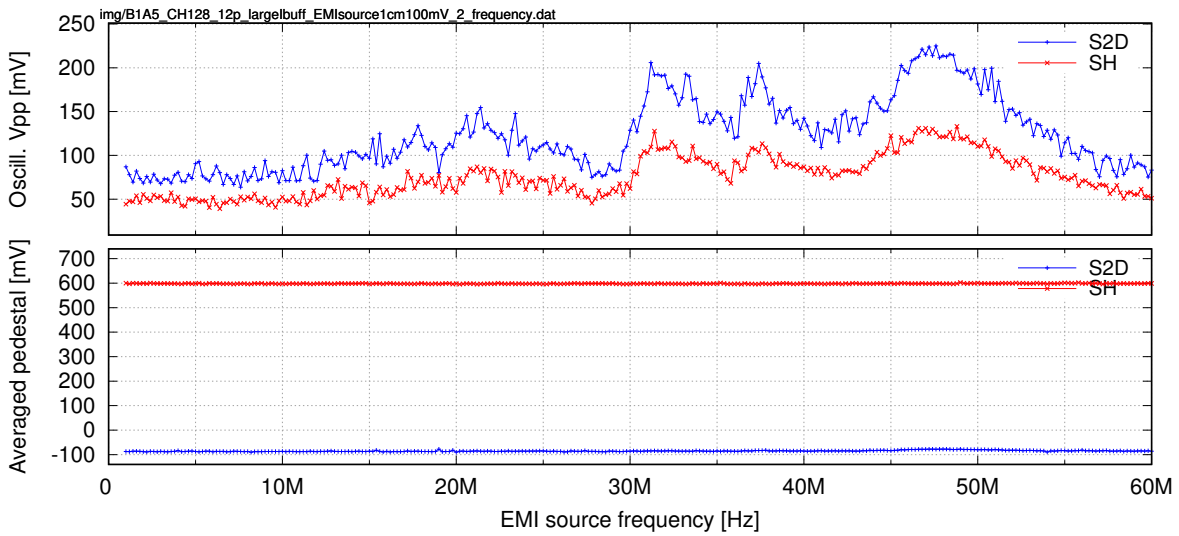


Figure 535: B1A5, channel 128 (second measurement), cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. EMI source 1cm over ASIC, amplitude 100mV. Parameter=frequency of EMI source

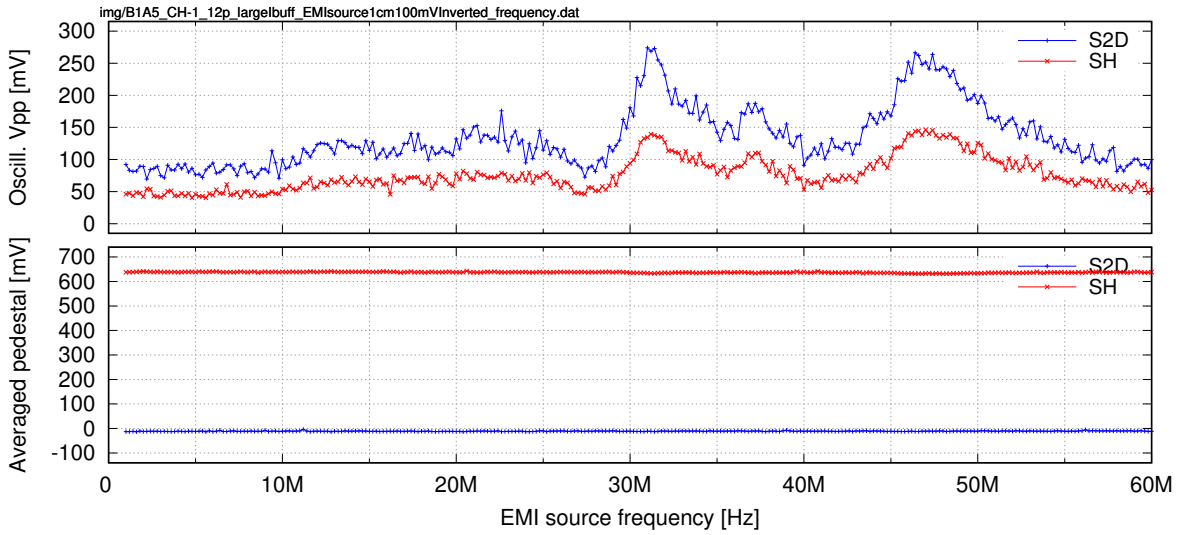


Figure 536: B1A5, channel -1 (inverted polarity of EMI source), cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. EMI source 1cm over ASIC, amplitude 100mV. Parameter=frequency of EMI source

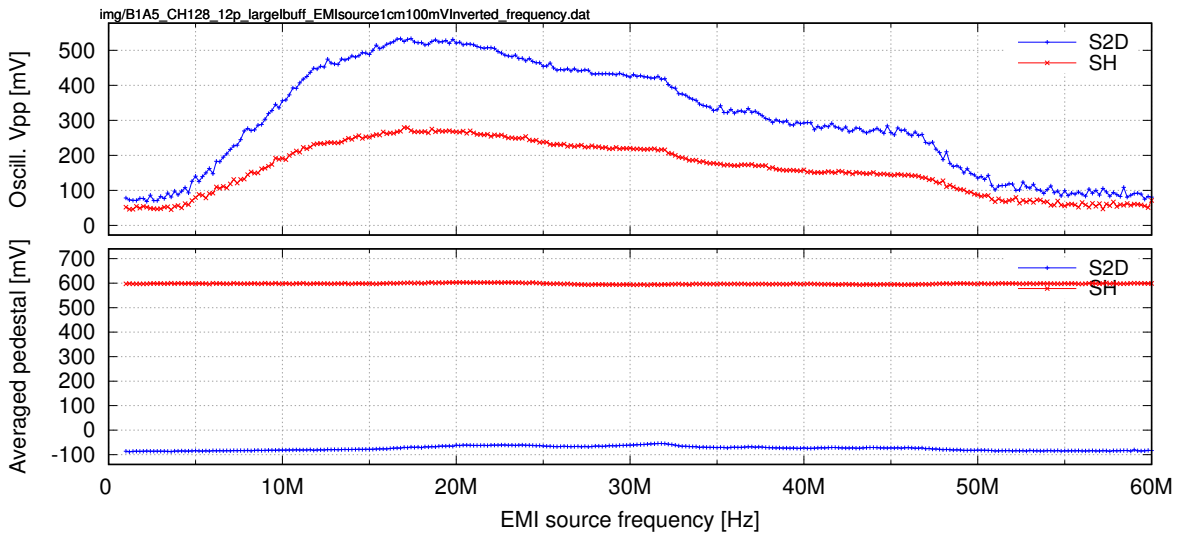


Figure 537: B1A5, channel 128 (inverted polarity of EMI source), cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. EMI source 1cm over ASIC, amplitude 100mV. Parameter=frequency of EMI source

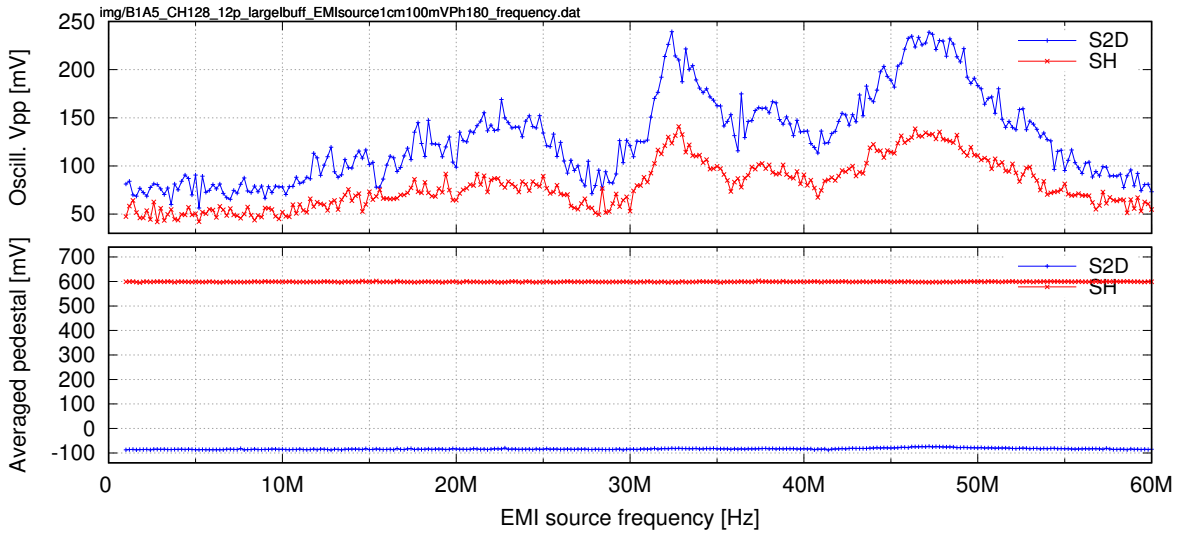


Figure 538: B1A5, channel 128 (inverted phase (180 deg.) of EMI source), cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. EMI source 1cm over ASIC, amplitude 100mV. Parameter=frequency of EMI source

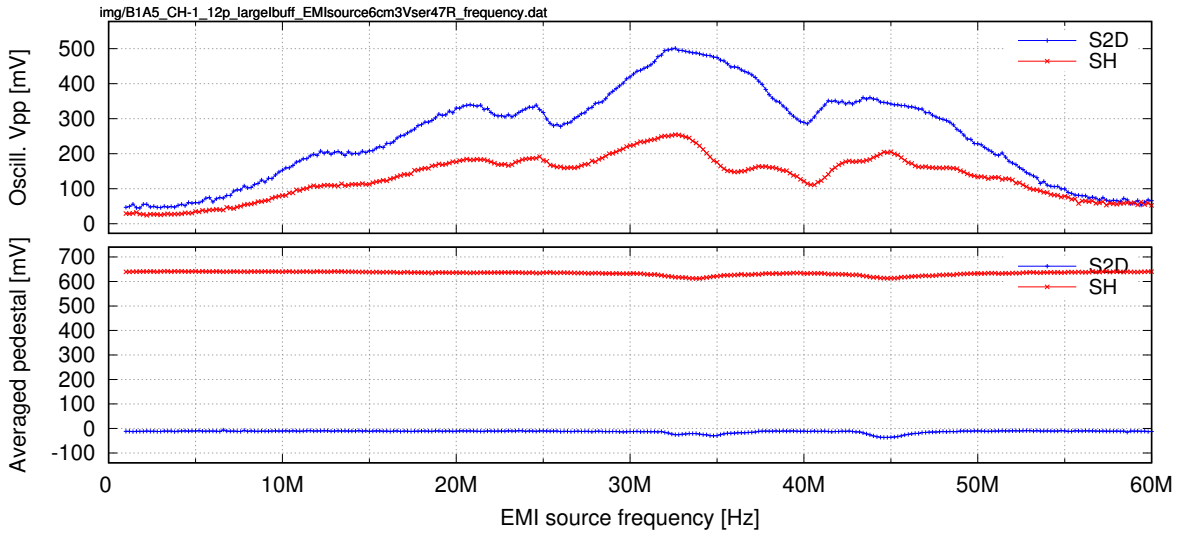


Figure 539: B1A5, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. EMI source (47 Ω serial resistance added) 6cm over ASIC, amplitude 3V. Parameter=frequency of EMI source

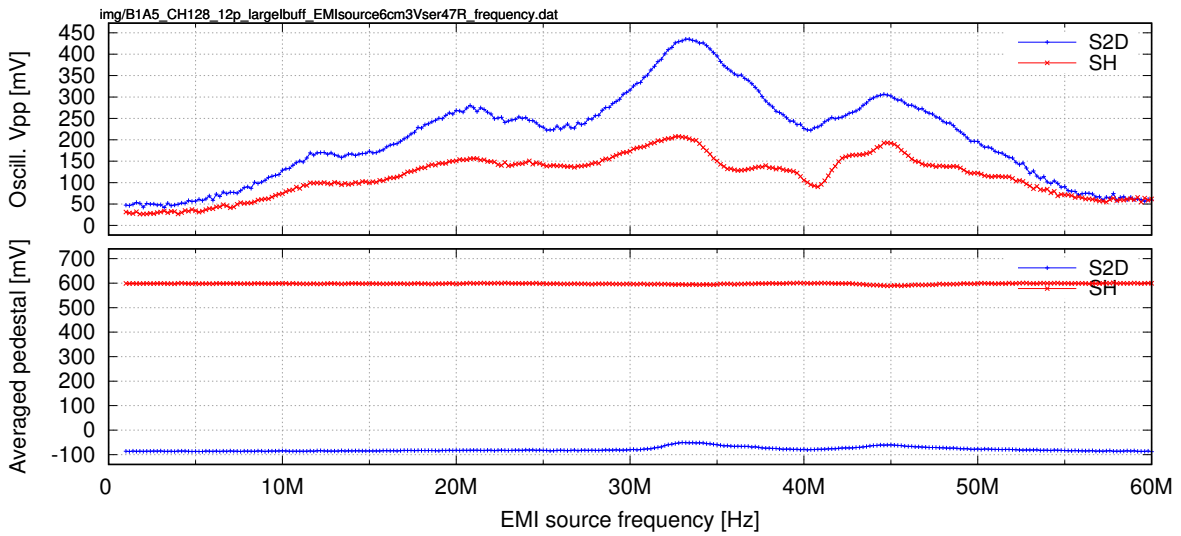


Figure 540: B1A5, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. EMI source (47 Ω serial resistance added) 6cm over ASIC, amplitude 3V. Parameter=frequency of EMI source

6.2 Cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; Preamp GND configuration – input + backside

Cap-PCB assembled, bonded to SALT input pads 0 and 127, two 12 pF capacitors assembled to the cap-PCB.

Ibuf current maximized.

Preamp GND bonded from both sides - input pads + backside (default) pads.

6.2.1 ASIC response for EMI source

ASIC configuration: default (chip after reset), EMI source 552 over the ASIC.

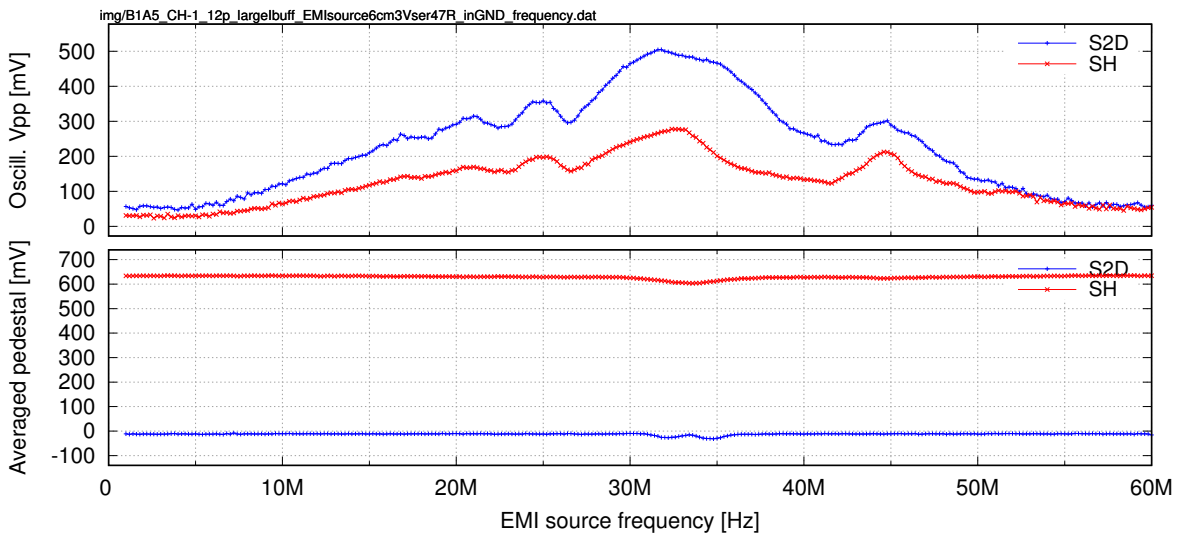


Figure 541: B1A5, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. EMI source (47 Ω serial resistance added) 6cm over ASIC, amplitude 3V. Preamp GND configuration – input + backside. Parameter=frequency of EMI source

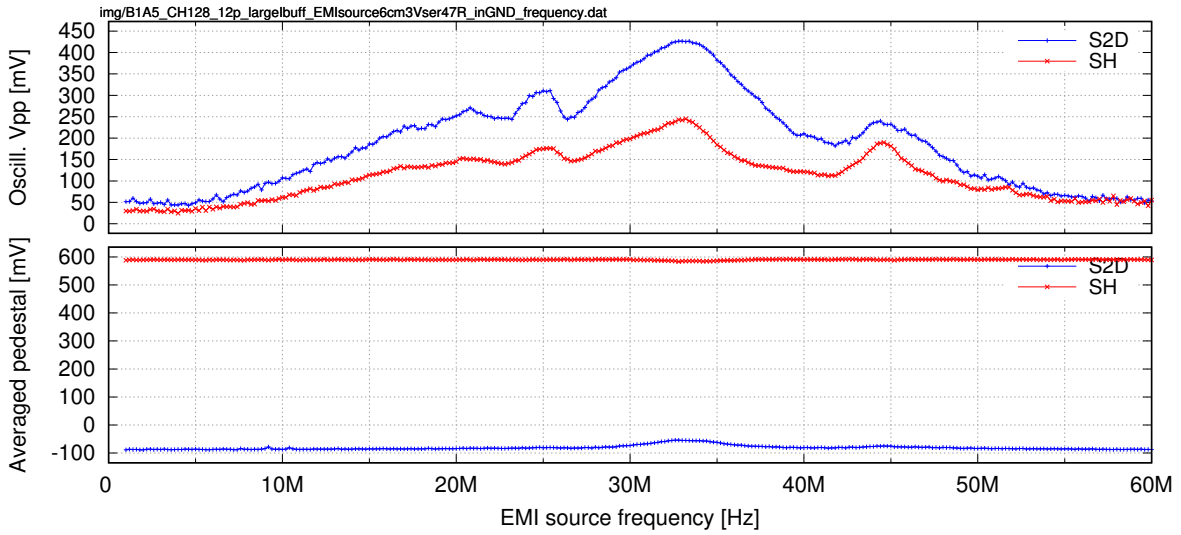


Figure 542: B1A5, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. EMI source (47 Ω serial resistance added) 6cm over ASIC, amplitude 3V. Preamp GND configuration – input + backside. Parameter=frequency of EMI source

6.3 Cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; Preamp GND configuration – only input

Cap-PCB assembled, bonded to SALT input pads 0 and 127, two 12 pF capacitors assembled to the cap-PCB.

Ibuf current maximized.

Preamp GND bonded only using input pads.

6.3.1 ASIC response for EMI source

ASIC configuration: default (chip after reset), EMI source 552 over the ASIC.

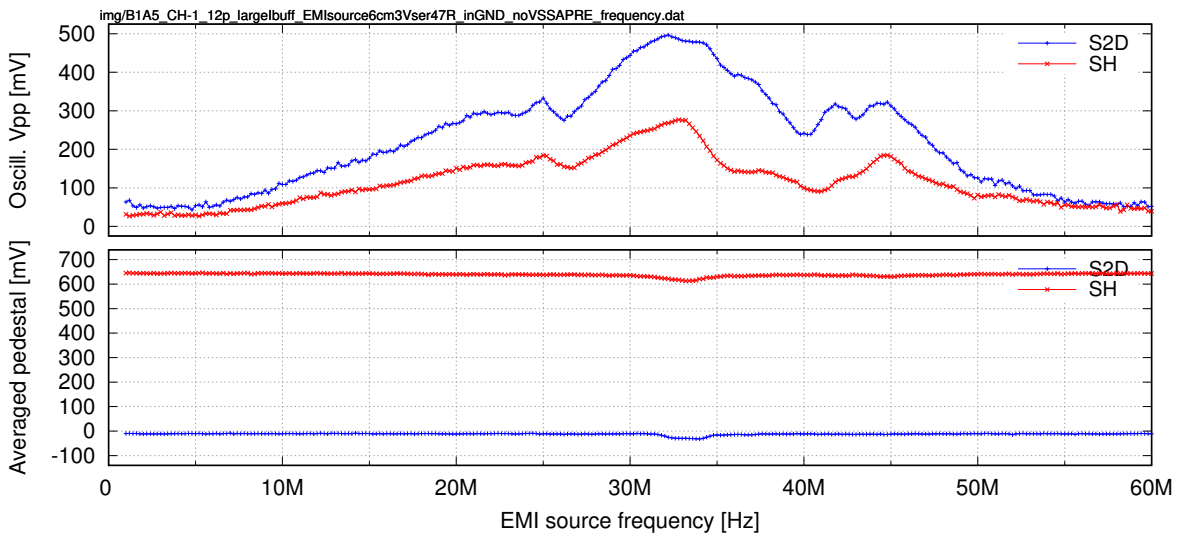


Figure 543: B1A5, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. EMI source (47 Ω serial resistance added) 6cm over ASIC, amplitude 3V. Preamp GND configuration – only input. Parameter=frequency of EMI source

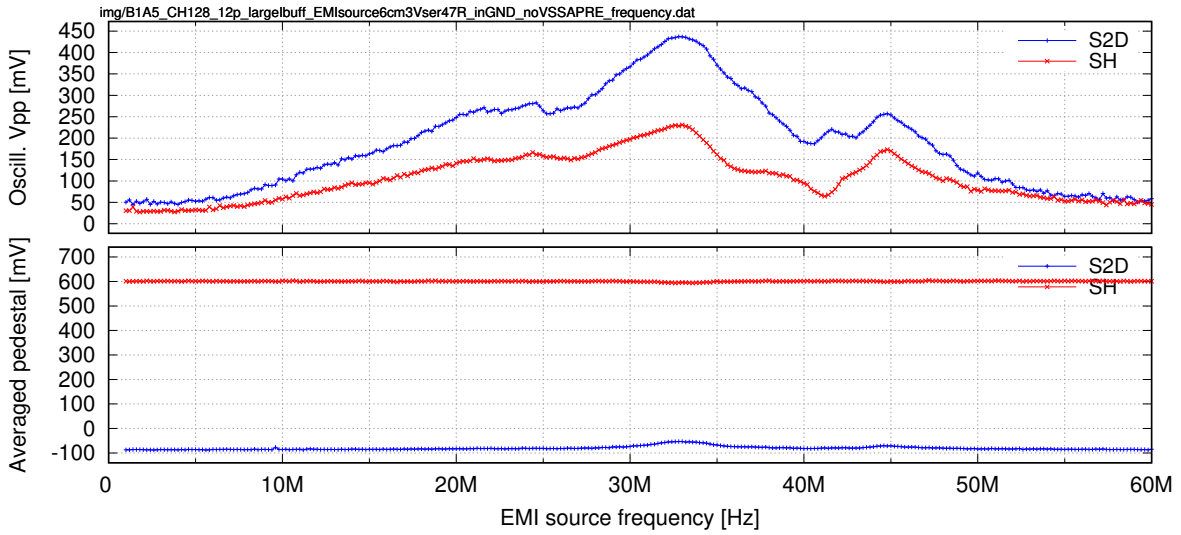


Figure 544: B1A5, channel 128, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. EMI source (47 Ω serial resistance added) 6cm over ASIC, amplitude 3V. Preamp GND configuration – only input. Parameter=frequency of EMI source

7 ASICs history

- B0A0 (Board 0, ASIC 0)
 - ASIC fully functional without cap-PCB;
 - Shortcut between inputs 0 and 128 found with cap-PCB; ESD issue wrongly suspected – short on cap-PCB found later;
 - A real ESD issue on input pads created on probe station – shortcut between middle input pads (around channel 70.) created; probe station was not ESD-safe;
 - ASIC removed.
- B1A1 (Board 1, ASIC 1)
 - ASIC fully functional without and with cap-PCB; full set of measurements done;
 - Input GND bonds added, ASIC still fully functional;
 - ASIC damaged during handling or reconnecting to test setup (boards 0 and 1 exchanging) – no I2C response, the same digital current consumption with or without clock; analogue part still working correctly. No broken bonds found, main CLK SLVS receiver probably damaged on ASIC;
 - ASIC removed.
- B0A2 (Board 0, ASIC 2)
 - Shortcut between inputs 0 and 128 found with cap-PCB; ASIC fully functional after input bonds removing;
 - Short on cap-PCB found and removed;
 - Channel 128 damaged after re-bonding inputs to modified cap-PCB; channel -1 operating correctly;
 - Backside ADC power supply scheme changed – 2.2 Ω resistor added in series;
 - Backside ADC power supply scheme changed – 1 μH inductor added in series;
 - Floating copper foil glued directly on passivation on top of the ASIC (see figure 549);
- B1A3 (Board 1, ASIC 3)
 - ASIC damaged after assembly; 800 mA of analogue current consumption measured (instead of around 200 mA); 0.55 Ω measured between VDDA and GND; bonding issues (see section 8.1) could be a possible reason;
 - Digital part functional – I2C communication working, digital current consumption depends on main CLK as expected;

- Around 150 mV at shaper outputs measured – analogue part not working correctly;
- No damaged, shorted or misplaced bonds found; analogue current consumption dropped to zero after all analogue power supply bonds removed – no short on PCB board, huge current consumption caused only by ASIC
- ASIC removed.
- B1A4 (Board 1, ASIC 4)
 - ASIC fully functional without cap-PCB; ASIC corner damaged (see fig. 545);
 - Cap-PCB assembled and bonded, ASIC fully functional. Some slightly damaged bondpads found – see section 8.1;
 - Analogue current consumption typical, huge current consumption on digital power supply
 - ASIC removed.
- B1A5 (Board 1, ASIC 5)
 - Cap-PCB with 12 pF assembled and bonded, ASIC fully functional.

8 Various issues

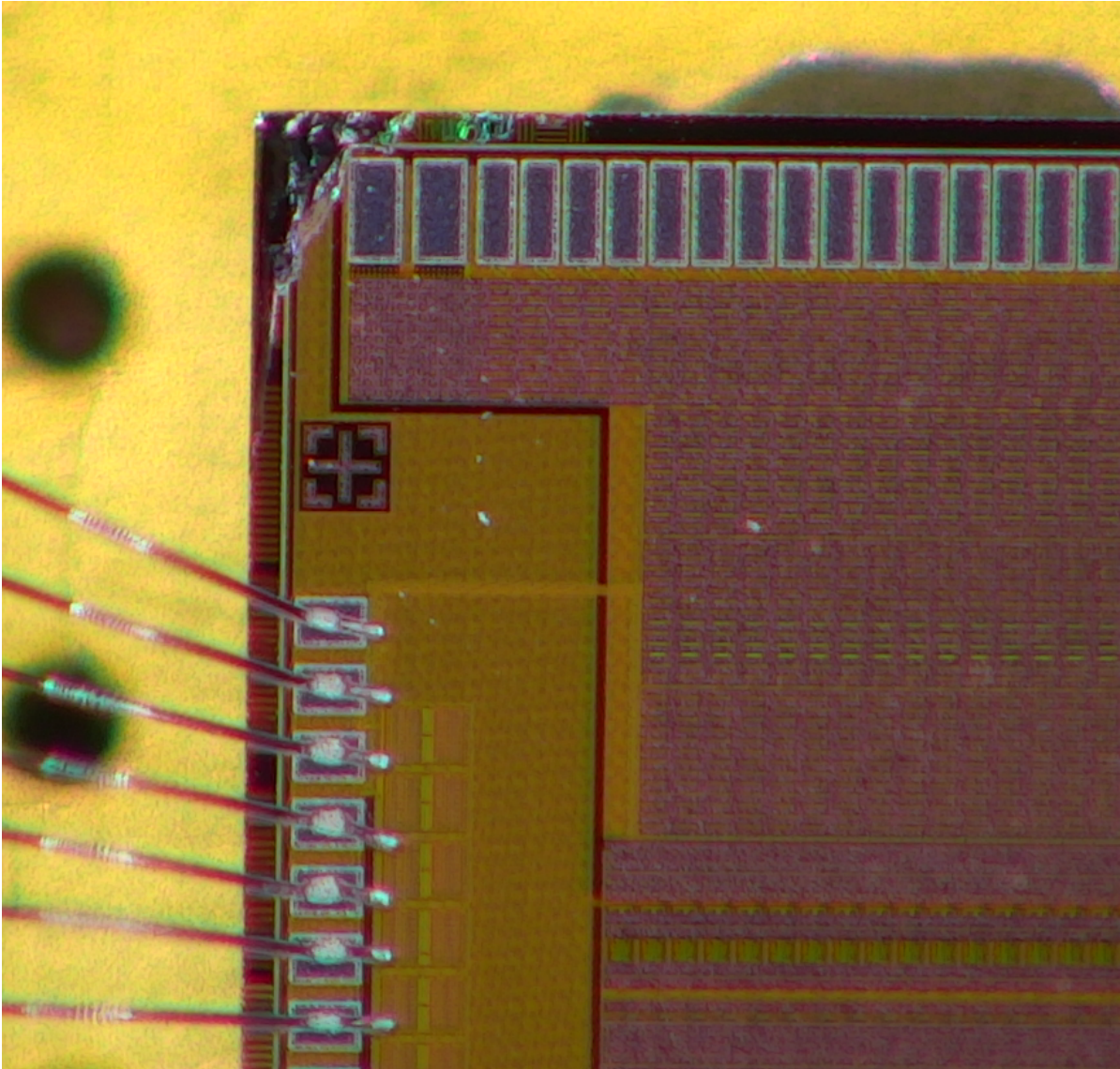


Figure 545: Damaged corner of ASIC 4

8.1 Bonding issue at AGH-UST

Bonding issue found during ASIC 4 assembly – some of the bonds are partially damaged and bondpads are deeply scratched.

Probably too much pressure used during bonding caused the bondpad surface to bend. The edge of the deflection cuts out the tail of the bonding wire, allowing the bonding needle foot to touch and scratch the bondpad surface (usually the foot should be pressed against the wire and should not touch the bondpad directly).

A very deep scratch was found on one pad at ASIC 4 (see figure 548). The scratch reaches beneath the bondpad into the structures (so called padding) located underneath. In this particular case padding seems to be untouched, however damaging it will most probably cause the shortcut between power supply and ground, which may explain the issue with ASIC 3.

For the next bonding, a modified parameters with less pressure and increased bonding time should be used.

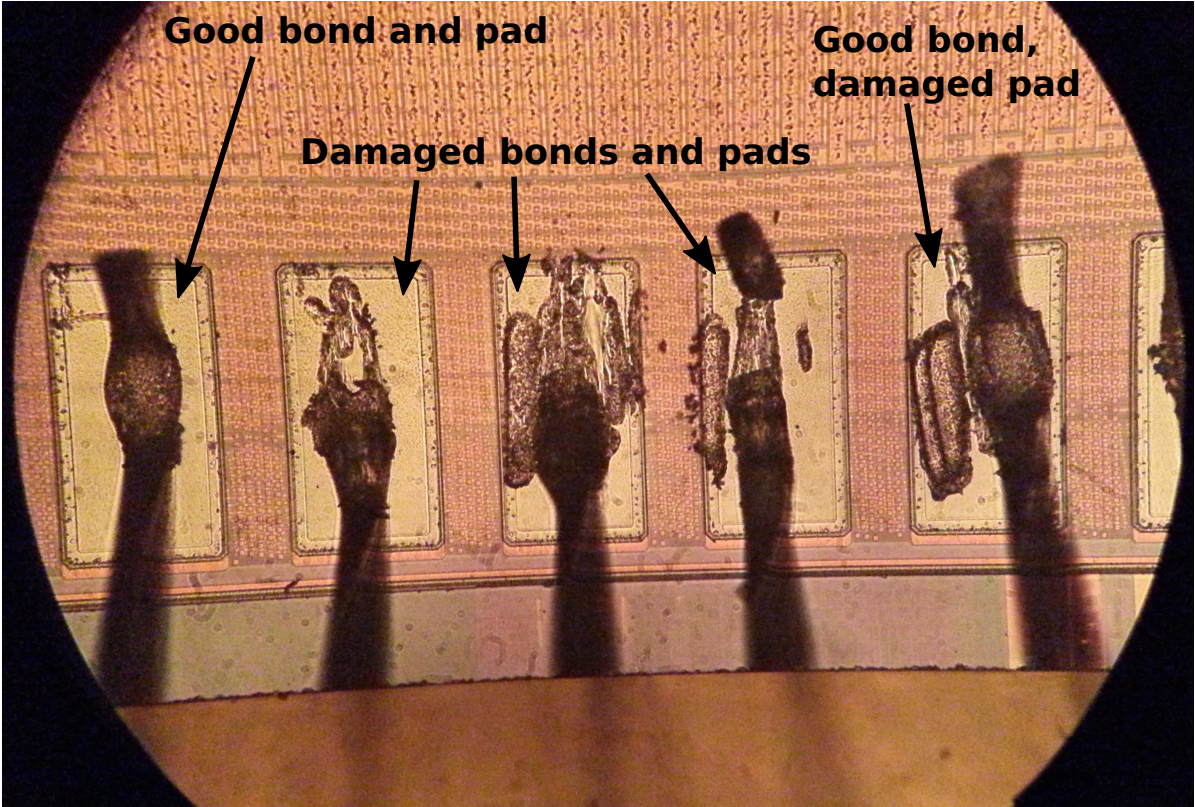


Figure 546: ASIC 4 – Good and damaged bonds and pads

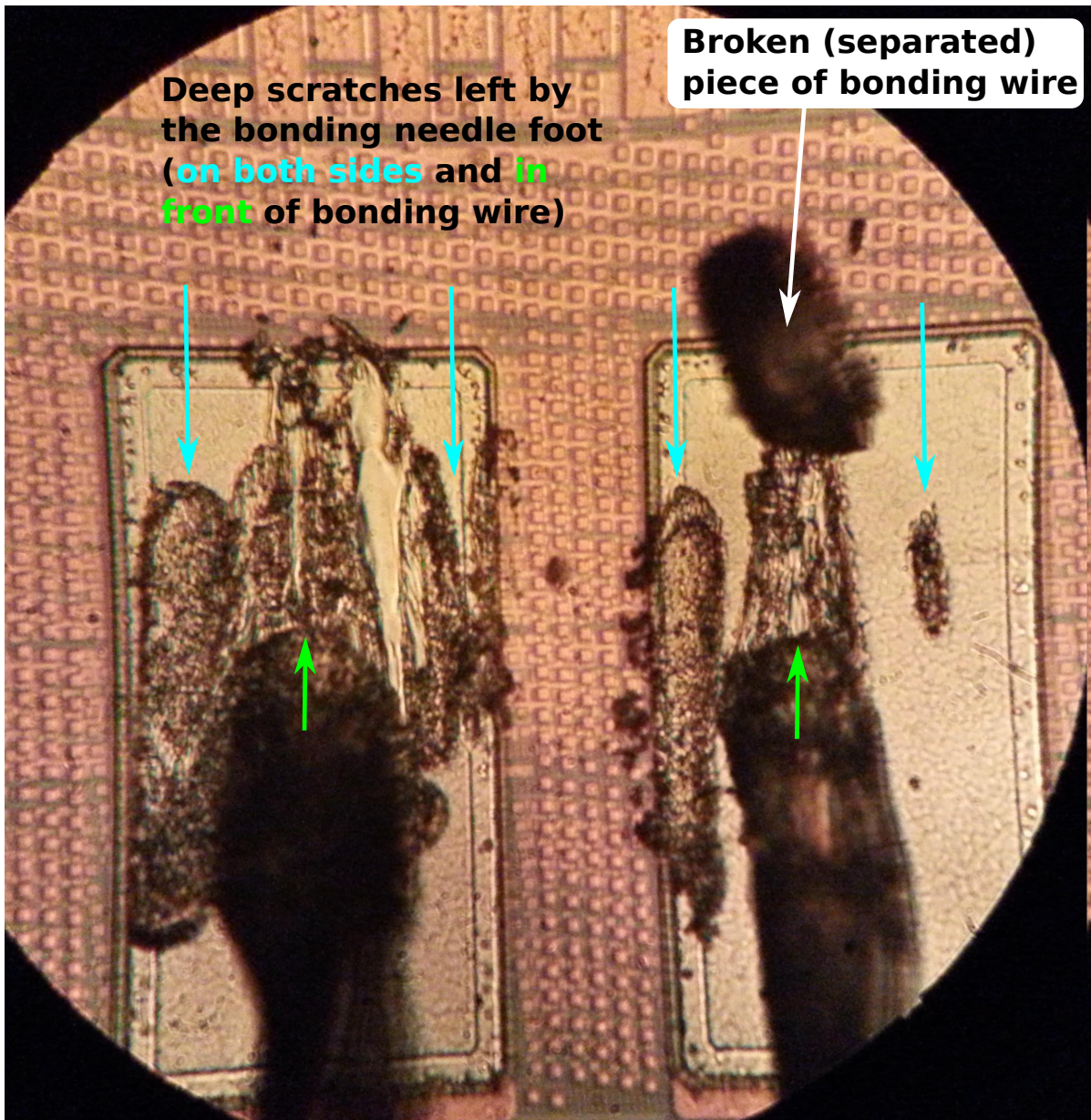


Figure 547: ASIC 4 – Damaged bonds and pads

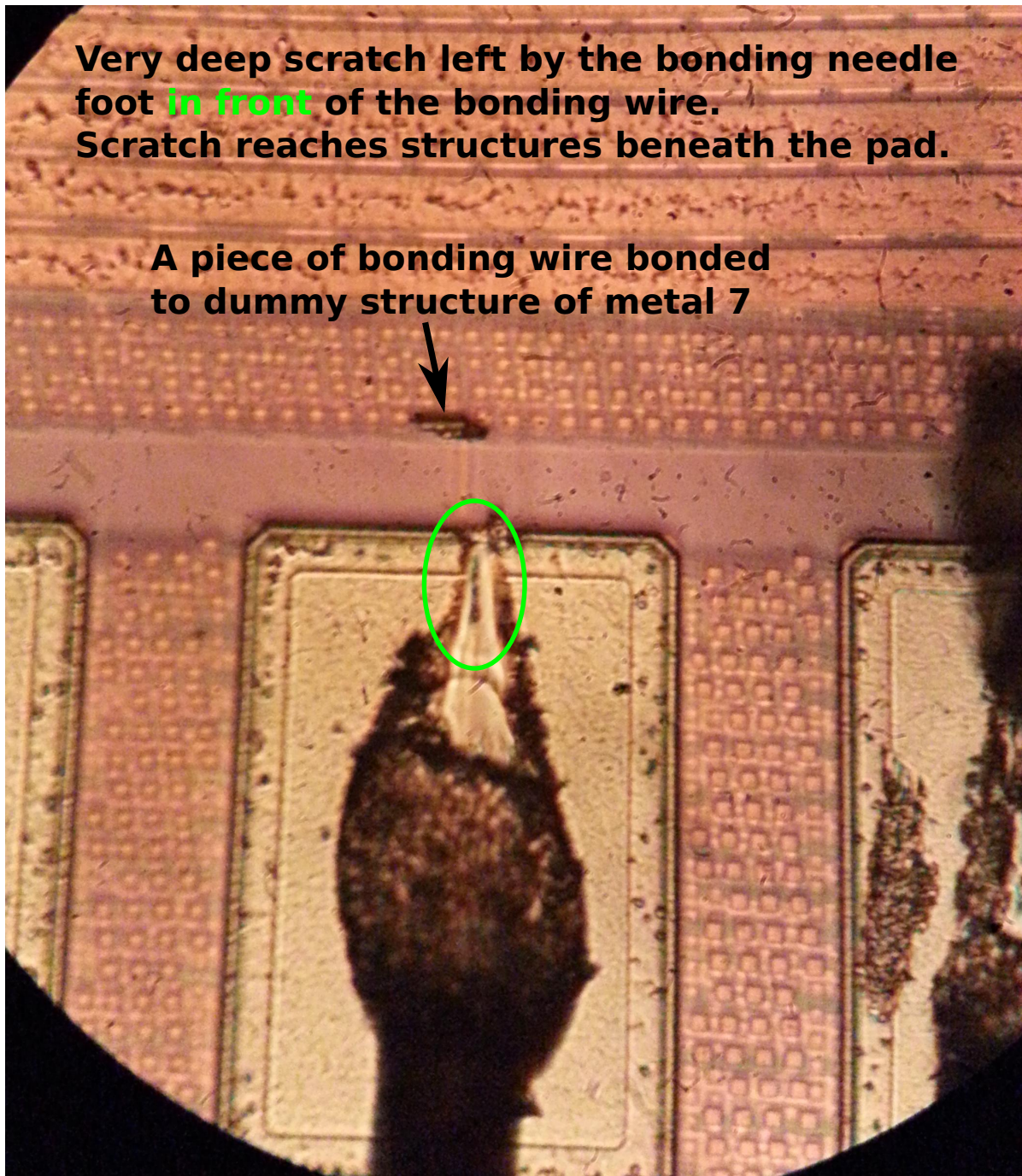


Figure 548: ASIC 4 – Very deep scratch reaching beneath the pad

8.2 Copper foil on ASIC B0A2 and 1 μH inductor assembly

Floating copper foil glued directly on passivation on top of the ASIC.

1 μH inductor assembled in series between onboard decoupling power supply capacitors

and VDDADC + VREFD bonds.

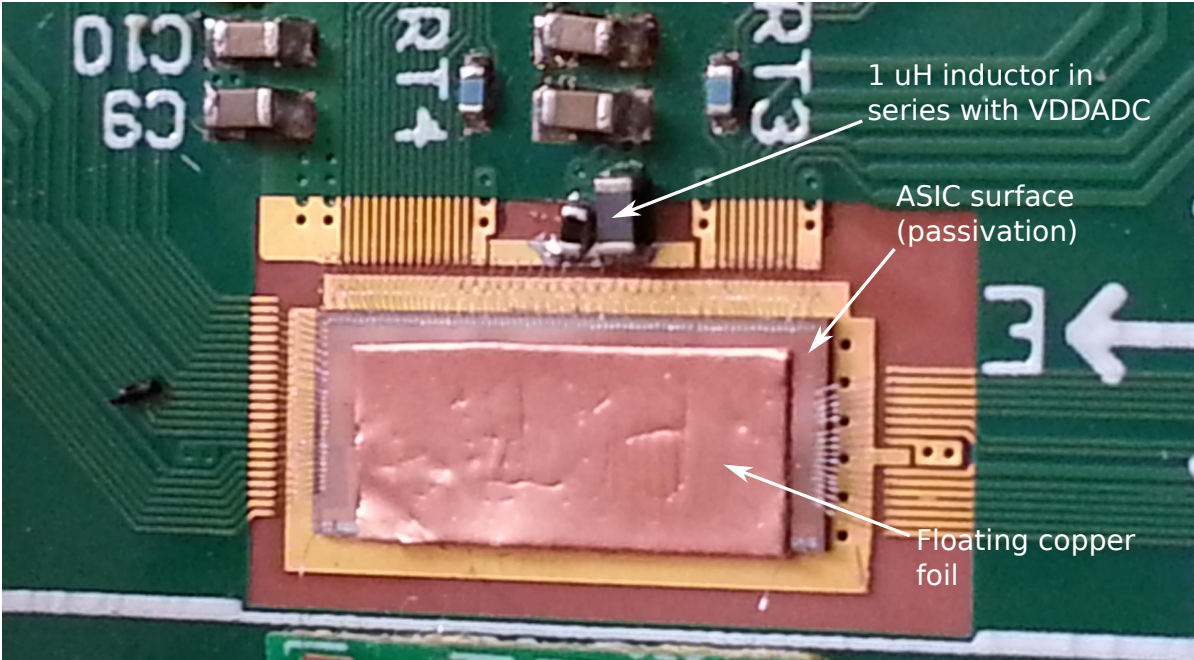


Figure 549: Copper foil on ASIC B0A2 and 1 μ H inductor assembly

8.3 Copper foil on ASIC B1A4

Floating copper foil glued directly on passivation on top of the ASIC.

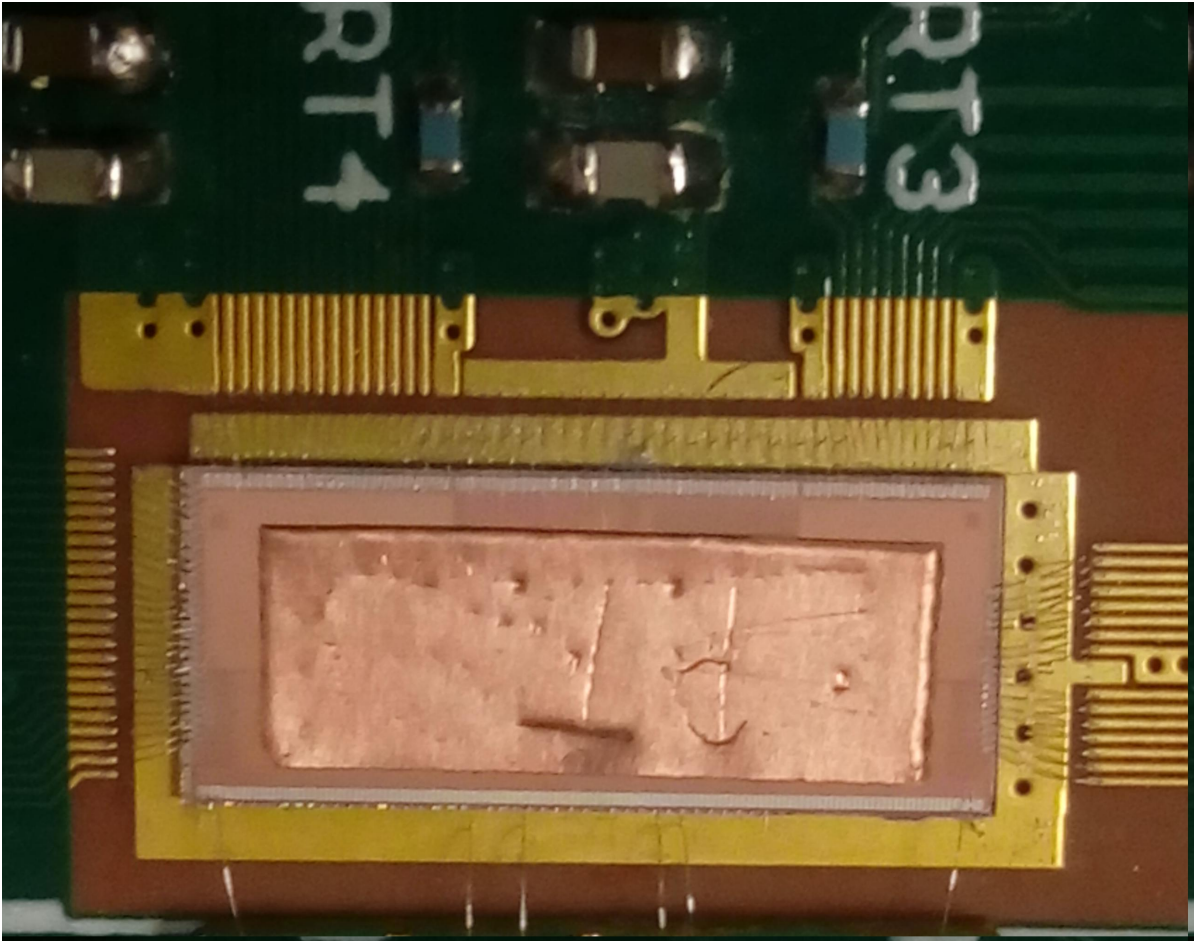


Figure 550: Copper foil on ASIC B1A4

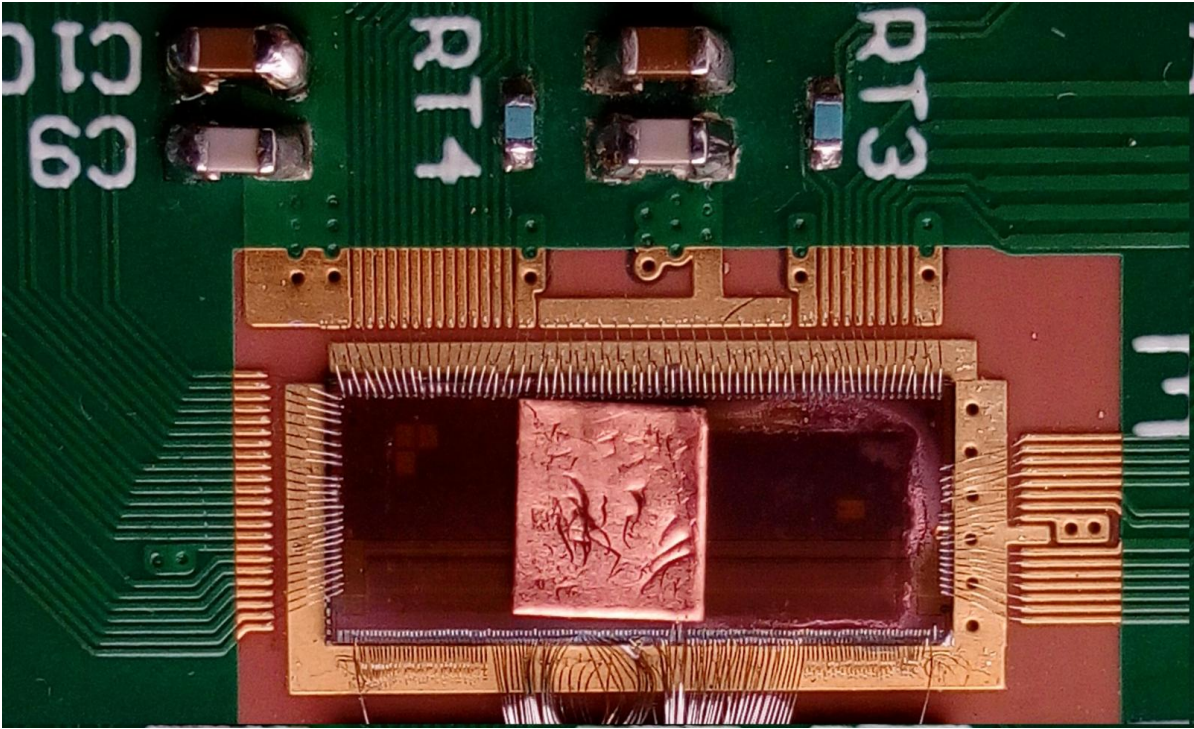


Figure 551: Small horizontal copper foil on ASIC B1A4

8.4 EMI source over ASIC B0A2

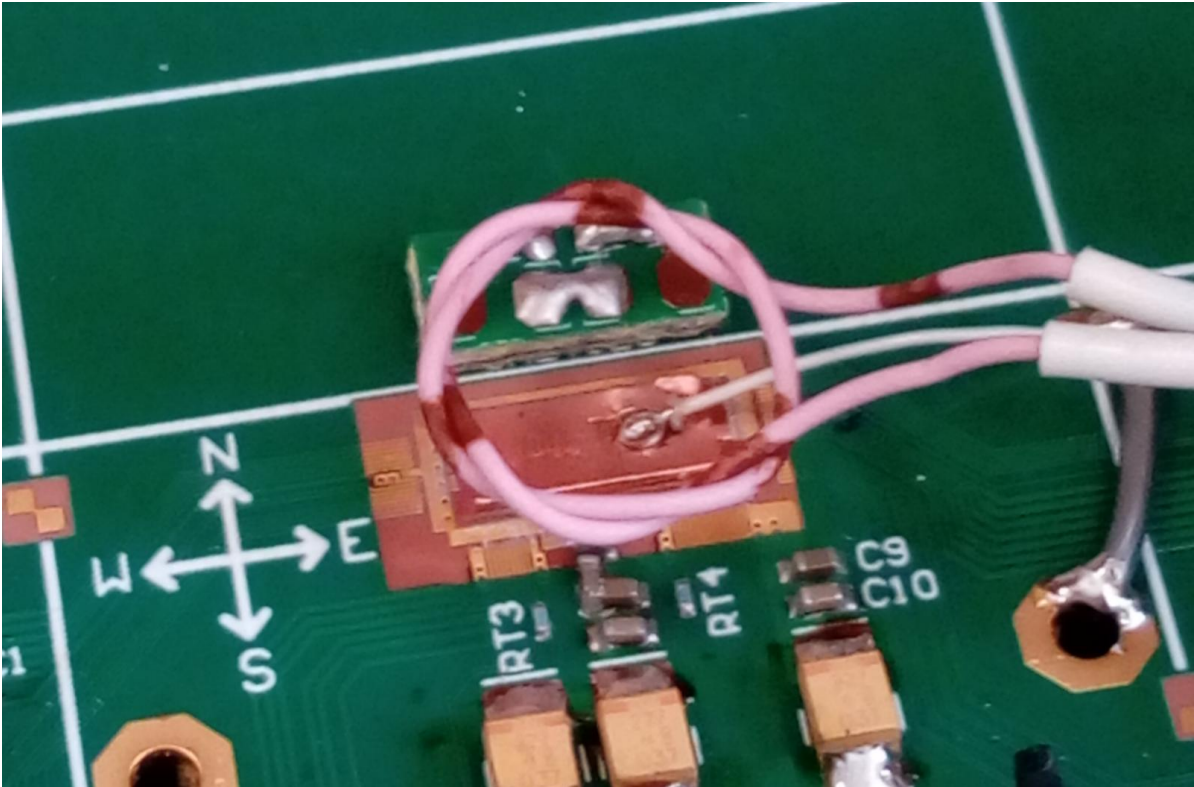


Figure 552: EMI source over ASIC B0A2

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122	B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=no. of active ADCs	77
123	B1A1, channel 128, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=no. of active ADCs	77
124	B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC	78
125	B1A1, channel 128, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC	78
126	B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=preamp DAC	79
127	B1A1, channel 128, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=preamp DAC	79
128	B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=shaper DAC	80
129	B1A1, channel 128, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=shaper DAC	80
130	B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=S2D DAC	81
131	B1A1, channel 128, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=S2D DAC	81
132	B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized; Preamp GND configuration – input + backside. Parameter=no. of active ADCs	82
133	B1A1, channel 128, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized; Preamp GND configuration – input + backside. Parameter=no. of active ADCs	83
134	B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized; Preamp GND configuration – input + backside. Parameter=Krummenacher DAC	83

135	B1A1, channel 128, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized; Preamp GND configuration – input + backside. Parameter=Krummenacher DAC	84
136	B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized; Preamp GND configuration – input + backside. Parameter=preamp DAC	84
137	B1A1, channel 128, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized; Preamp GND configuration – input + backside. Parameter=preamp DAC	85
138	B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized; Preamp GND configuration – input + backside. Parameter=shaper DAC	85
139	B1A1, channel 128, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized; Preamp GND configuration – input + backside. Parameter=shaper DAC	86
140	B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized; Preamp GND configuration – input + backside. Parameter=S2D DAC	86
141	B1A1, channel 128, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized; Preamp GND configuration – input + backside. Parameter=S2D DAC	87
142	B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=no. of active ADCs	88
143	B1A1, channel 128, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=no. of active ADCs	88
144	B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC	89
145	B1A1, channel 128, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC	89
146	B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=preamp DAC	90

147	B1A1, channel 128, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=preamp DAC	90
148	B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=shaper DAC	91
149	B1A1, channel 128, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=shaper DAC	91
150	B1A1, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=S2D DAC	92
151	B1A1, channel 128, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistors assembled; Ibuf current maximized; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=S2D DAC	92
152	B1A1, DLL & PLL stability monitoring (one night); HLP active; only one PLL monitor red	93
153	B1A1, DLL & PLL stability monitoring (a weekend); HLP active	94
154	B1A1, DLL & PLL stability monitoring (four days); HLP inactive	95
155	B1A1, DLL & PLL stability monitoring (two days); HLP active, DLL CP current lowered to 'h4	96
156	B0A2, channel -1, input bond removed from channel -1. Parameter=no. of active ADCs	97
157	B0A2, channel -1, input bond removed from channel -1. Parameter=Krummenacher DAC	98
158	B0A2, channel -1, input bond removed from channel -1. Parameter=preamp DAC	98
159	B0A2, channel -1, input bond removed from channel -1. Parameter=shaper DAC	99
160	B0A2, channel -1, input bond removed from channel -1. Parameter=S2D DAC	99
161	B0A2, channel -1, input bond removed from channel -1. Optimized test pulse and ADC delay. Parameter=no. of active ADCs	100
162	B0A2, channel -1, input bond removed from channel -1. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC	100
163	B0A2, channel -1, input bond removed from channel -1. Optimized test pulse and ADC delay. Parameter=preamp DAC	101
164	B0A2, channel -1, input bond removed from channel -1. Optimized test pulse and ADC delay. Parameter=shaper DAC	101
165	B0A2, channel -1, input bond removed from channel -1. Optimized test pulse and ADC delay. Parameter=S2D DAC	102
166	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Parameter=no. of active ADCs	103

167	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Parameter=Krummenacher DAC	104
168	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Parameter=preamp DAC	104
169	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Parameter=shaper DAC	105
170	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Parameter=S2D DAC	105
171	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=no. of active ADCs	106
172	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC	106
173	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=preamp DAC .	107
174	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=shaper DAC .	107
175	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=S2D DAC . . .	108
176	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized. Parameter=no. of active ADCs . . .	109
177	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized. Parameter=Krummenacher DAC . .	110
178	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized. Parameter=preamp DAC	110
179	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized. Parameter=shaper DAC	111
180	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized. Parameter=S2D DAC	111
181	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=no. of active ADCs	112
182	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC	112
183	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=preamp DAC	113
184	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=shaper DAC	113

185	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized. Optimized test pulse and ADC delay. Parameter=S2D DAC	114
186	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized; ADC power supply with 2.2 Ω series resistor. Parameter=no. of active ADCs	115
187	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized; ADC power supply with 2.2 Ω series resistor. Parameter=Krummenacher DAC	116
188	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized; ADC power supply with 2.2 Ω series resistor. Parameter=preamp DAC	116
189	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized; ADC power supply with 2.2 Ω series resistor. Parameter=shaper DAC	117
190	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized; ADC power supply with 2.2 Ω series resistor. Parameter=S2D DAC	117
191	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized; ADC power supply with 2.2 Ω series resistor. Optimized test pulse and ADC delay. Parameter=no. of active ADCs	118
192	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized; ADC power supply with 2.2 Ω series resistor. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC	119
193	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized; ADC power supply with 2.2 Ω series resistor. Optimized test pulse and ADC delay. Parameter=preamp DAC	119
194	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized; ADC power supply with 2.2 Ω series resistor. Optimized test pulse and ADC delay. Parameter=shaper DAC	120
195	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized; ADC power supply with 2.2 Ω series resistor. Optimized test pulse and ADC delay. Parameter=S2D DAC	120
196	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor. Parameter=no. of active ADCs	121
197	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor. Parameter=Krummenacher DAC	122
198	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor. Parameter=preamp DAC	122

199	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor. Parameter=shaper DAC	123
200	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor. Parameter=S2D DAC	123
201	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor. Optimized test pulse and ADC delay. Parameter=no. of active ADCs	124
202	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC	125
203	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor. Optimized test pulse and ADC delay. Parameter=preamp DAC	125
204	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor. Optimized test pulse and ADC delay. Parameter=shaper DAC	126
205	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors + 820 k Ω resistor assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor. Optimized test pulse and ADC delay. Parameter=S2D DAC	126
206	B0A2, channel -1, cap-PCB bonded, no capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor. Parameter=no. of active ADCs	127
207	B0A2, channel -1, cap-PCB bonded, no capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor. Parameter=Krummenacher DAC	128
208	B0A2, channel -1, cap-PCB bonded, no capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor. Parameter=preamp DAC	128
209	B0A2, channel -1, cap-PCB bonded, no capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor. Parameter=shaper DAC	129
210	B0A2, channel -1, cap-PCB bonded, no capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor. Parameter=S2D DAC	129
211	B0A2, channel -1, cap-PCB bonded, no capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor. Optimized test pulse and ADC delay. Parameter=no. of active ADCs	130
212	B0A2, channel -1, cap-PCB bonded, no capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC	131

213	B0A2, channel -1, cap-PCB bonded, no capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor. Optimized test pulse and ADC delay. Parameter=preamp DAC	131
214	B0A2, channel -1, cap-PCB bonded, no capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor. Optimized test pulse and ADC delay. Parameter=shaper DAC	132
215	B0A2, channel -1, cap-PCB bonded, no capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor. Optimized test pulse and ADC delay. Parameter=S2D DAC	132
216	B0A2, channel -1, cap-PCB bonded, no capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC. Parameter=no. of active ADCs	133
217	B0A2, channel -1, cap-PCB bonded, no capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC. Parameter=Krummenacher DAC	134
218	B0A2, channel -1, cap-PCB bonded, no capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC. Parameter=preamp DAC	134
219	B0A2, channel -1, cap-PCB bonded, no capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC. Parameter=shaper DAC	135
220	B0A2, channel -1, cap-PCB bonded, no capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC. Parameter=S2D DAC	135
221	B0A2, channel -1, cap-PCB bonded, no capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC. Optimized test pulse and ADC delay. Parameter=no. of active ADCs	136
222	B0A2, channel -1, cap-PCB bonded, no capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC	137
223	B0A2, channel -1, cap-PCB bonded, no capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC. Optimized test pulse and ADC delay. Parameter=preamp DAC	137
224	B0A2, channel -1, cap-PCB bonded, no capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC. Optimized test pulse and ADC delay. Parameter=shaper DAC	138
225	B0A2, channel -1, cap-PCB bonded, no capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC. Optimized test pulse and ADC delay. Parameter=S2D DAC	138

226	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC. Parameter=no. of active ADCs	139
227	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC. Parameter=Krummenacher DAC	140
228	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC. Parameter=preamp DAC	140
229	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC. Parameter=shaper DAC	141
230	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC. Parameter=S2D DAC	141
231	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC. Optimized test pulse and ADC delay. Parameter=no. of active ADCs	142
232	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC	143
233	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC. Optimized test pulse and ADC delay. Parameter=preamp DAC	143
234	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC. Optimized test pulse and ADC delay. Parameter=shaper DAC	144
235	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC. Optimized test pulse and ADC delay. Parameter=S2D DAC	144
236	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC; Preamp GND configuration – input + backside. Parameter=no. of active ADCs	145
237	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC; Preamp GND configuration – input + backside. Parameter=Krummenacher DAC	146

238	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC; Preamp GND configuration – input + backside. Parameter=preamp DAC	146
239	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC; Preamp GND configuration – input + backside. Parameter=shaper DAC	147
240	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC; Preamp GND configuration – input + backside. Parameter=S2D DAC	147
241	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=no. of active ADCs . .	148
242	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC .	149
243	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=preamp DAC	149
244	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=shaper DAC	150
245	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; floating copper foil on ASIC; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=S2D DAC	150
246	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; grounded copper foil on ASIC; Preamp GND configuration – input + backside. Parameter=no. of active ADCs	151
247	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; grounded copper foil on ASIC; Preamp GND configuration – input + backside. Parameter=Krummenacher DAC	152
248	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; grounded copper foil on ASIC; Preamp GND configuration – input + backside. Parameter=preamp DAC	152

249	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; grounded copper foil on ASIC; Preamp GND configuration – input + backside. Parameter=shaper DAC	153
250	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; grounded copper foil on ASIC; Preamp GND configuration – input + backside. Parameter=S2D DAC	153
251	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; grounded copper foil on ASIC; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=no. of active ADCs . .	154
252	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; grounded copper foil on ASIC; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=Krummenacher DAC .	155
253	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; grounded copper foil on ASIC; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=preamp DAC	155
254	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; grounded copper foil on ASIC; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=shaper DAC	156
255	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ADC power supply with 1 μ H series inductor; grounded copper foil on ASIC; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=S2D DAC	156
256	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ALL power supply with 1 μ H series inductor; grounded copper foil on ASIC; Preamp GND configuration – input + backside. Parameter=no. of active ADCs	157
257	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ALL power supply with 1 μ H series inductor; grounded copper foil on ASIC; Preamp GND configuration – input + backside. Parameter=Krummenacher DAC	158
258	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ALL power supply with 1 μ H series inductor; grounded copper foil on ASIC; Preamp GND configuration – input + backside. Parameter=preamp DAC	158
259	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ALL power supply with 1 μ H series inductor; grounded copper foil on ASIC; Preamp GND configuration – input + backside. Parameter=shaper DAC	159

260	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ALL power supply with 1 μ H series inductor; grounded copper foil on ASIC; Preamp GND configuration – input + backside. Parameter=S2D DAC	159
261	B0A2, channel -1, cap-PCB bonded, 12 pF capacitors assembled; Ibuf current maximized; ALL power supply with 1 μ H series inductor; grounded copper foil on ASIC; Preamp GND configuration – input + backside. Optimized test pulse and ADC delay. Parameter=no. of active ADCs . . .	160
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