Gain for Bonded and Unbonded Channels with 100 ns, 200 ns, and 400 ns Shaping Times

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The last 22 channels of Chip 6 on DFA `D02B-8` are not bonded to the silicon. This makes it easy to study the gain of bonded vs unbonded channels. The data presented were taken after the commissioning module assembly at UCSB with a clock frequency of 40 MHz and a duty cycle of 50 %. The following chip parameters, from Amedeo Perazzo, were used to convert the gain from threshold counts over cal DAC counts to mV/fC:

- 1 threshold count = 10.5 mV.
- 1 cal DAC count = 8.5 mV.
- Charge injection capacitor = 56 fF.

Table 1 lists the gain values in both threshold counts over cal DAC counts and mV/fC. Figures 1 and 2 show the individual channel gain data and the fits for the average values.

Shaping	Gain (counts/counts)		Gain (mV/fC)	
Time (ns)	Bonded	Unbonded	Bonded	Unbonded
100	-8.65	-9.51	191	210
200	-10.68	-11.55	236	255
400	-9.17	-9.86	202	217

Table 1: Chip 6 gain for bonded and unbonded channels.

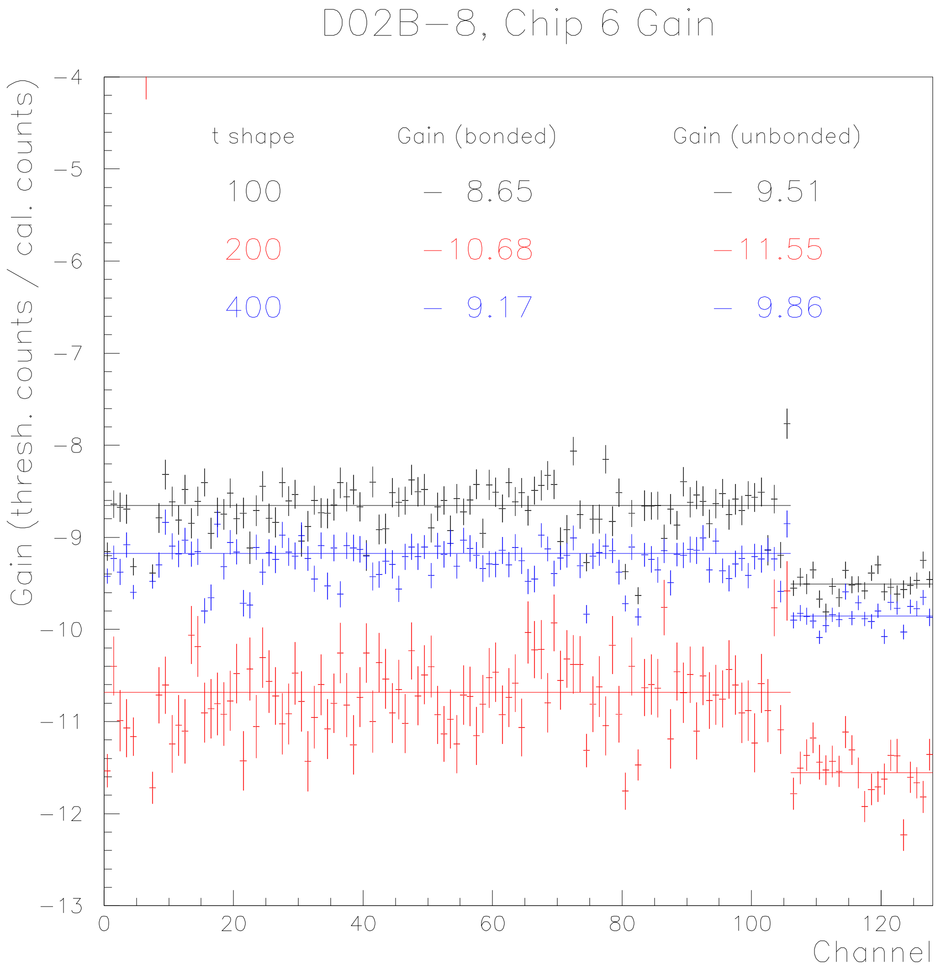

Figure 1: Chip 6 gain in threshold counts over cal DAC counts for 100 ns, 200 ns, and 400 ns shaping times. Channels 106-127 are not bonded to the silicon.

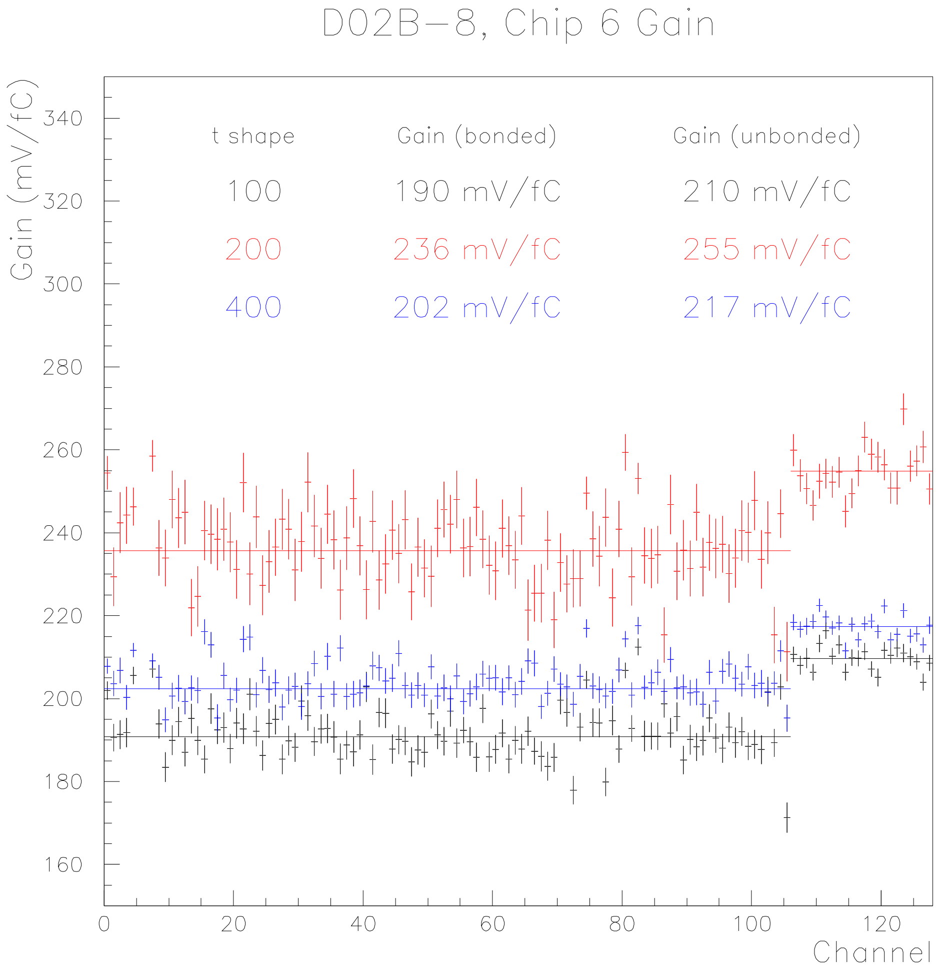

Figure 2: Chip 6 gain in mV/fC for 100 ns, 200 ns, and 400 ns shaping times. Channels 106-127 are not bonded to the silicon.