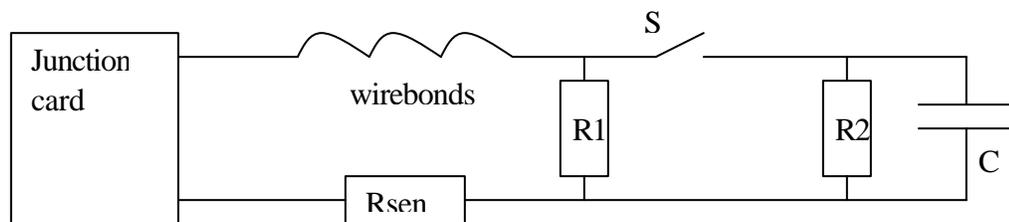


Test of Wirebond Resistance to Current Transients

M. Garcia-Sciveres, Aug. 8, 2002

The purpose of this test was to see if a current transient that does not trip the SVX-II power supplies is capable of breaking a wirebond.

The DVDD3 output of the FCC CAEN power was used to supply the current for this test. Power was supplied through cables and a junction card matching the installed system. A diagram of the test circuit is shown below.



The current was measured by the voltage drop across a 1.3Ω resistor, R_{sen} . A 12Ω load resistor, R_1 , provided a DC current draw of 425mA . Closing the momentary switch S added a current pulse on top of the DC baseline. The pulse size was determined by the value of the capacitor C , which was varied between $100 \mu\text{F}$ and $540 \mu\text{F}$. The resistor R_2 (100Ω) allowed C to discharge after the switch was reopened.

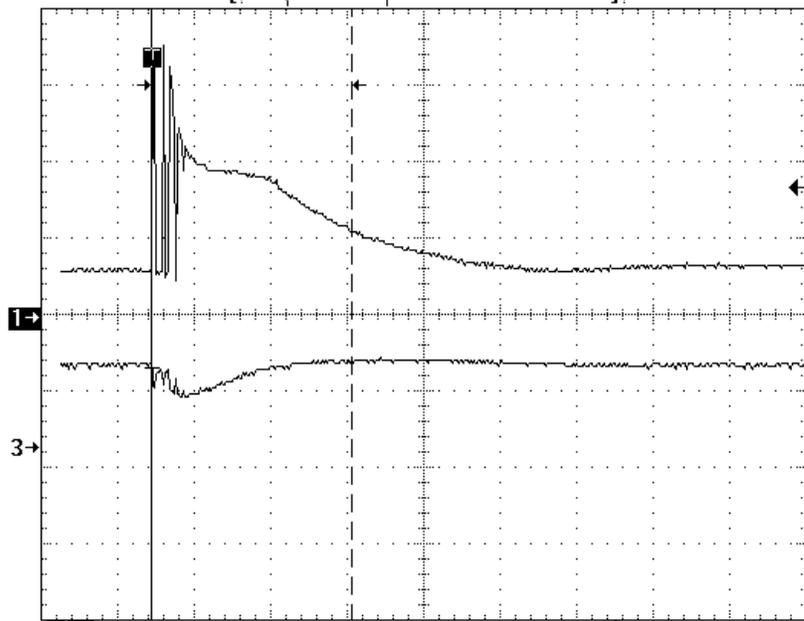
All current passed through 9 wirebonds in series, each bond 5mm long. Bonds were 1 mil aluminum wire on gold plated copper. No wirebonds broke after approximately 600 test pulses with the largest value of C . In this case the trip limit of the power supply was set to 650mA , or 225mA above the baseline DC current. None of the 600 pulses produces an over current trip with this setting (a few times an under voltage trip occurred). On the other hand, a few pulses were tried with a trip limit of 600mA , and in that case the supply tripped (ovc) every time. Between the first 100 and last 500 pulses the wirebonds were aged by heating at 120°C for 12 hours.

The following figure shows a typical pulse (top trace) measured as a voltage drop across R_{sen} as well as the voltage seen by the wirebonds (bottom trace).

Tek Run: 50.0kS/s

Sample

Trig2



Δ : 2.62ms
@: -20 μ s

Ch1 1.00 V
Ch3 5.00 V

M1.00ms

Ch1 1.70 V

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