

CX3061-A Heavy Ion Test

Brookhaven National Labs

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Summary

A heavy ion test was conducted at Brookhaven National Labs in November, 1998. Two CX3061-A devices were screened for single event latchup (SEL) and single event upset (SEU). The SEL threshold is $< 22 \text{ MeV-cm}^2/\text{mg}$. Destructive latchup was observed.

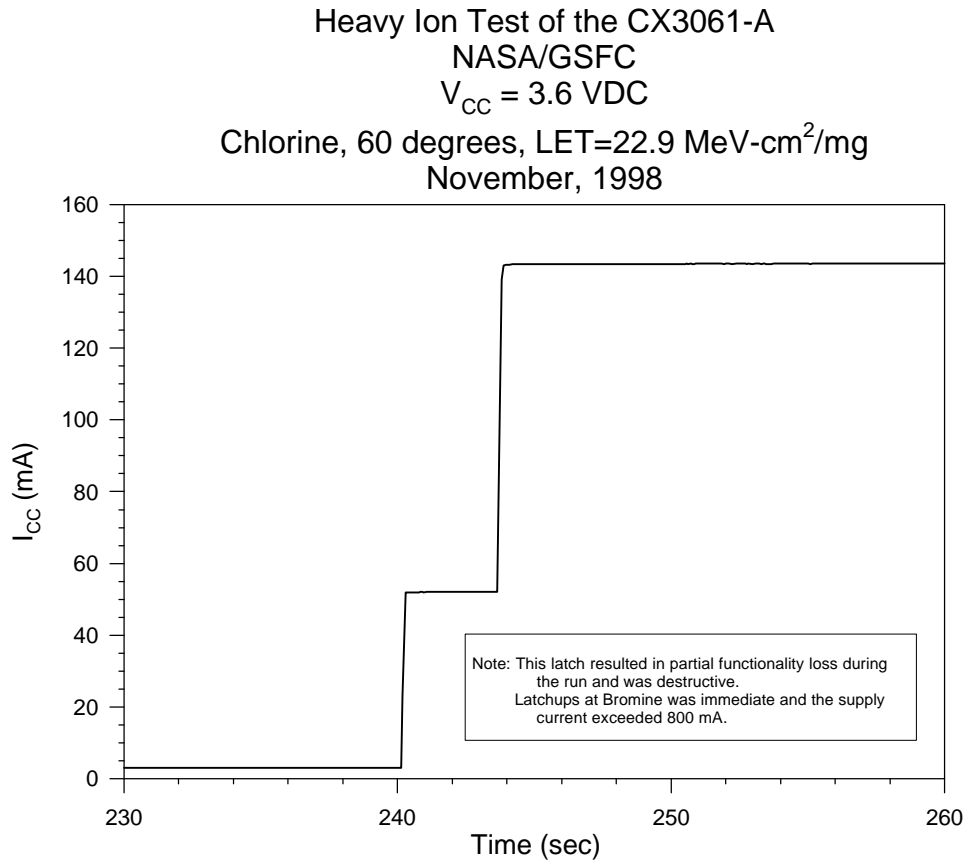
Detailed Test Results

S/N TAM305 and TAM306 were subjected to single event upset (SEU) and single event latchup (SEL) tests. The lot date code for these devices is 9834. All exposures were done at worst-case bias conditions, $V_{CC} = 3.6 \text{ VDC}$. All runs had a fluence per run of 10^7 ions/cm^2 unless the device latched and exceeded 800 mA, the limit set for the power supply.

Latchup

S/N TAM305 and S/N TAM306 were first tested with Bromine, with the beam normal to the device, an LET of $37 \text{ MeV-cm}^2/\text{mg}$. S/N TAM305 immediately latched twice and S/N TAM306 immediately latched once. Each latch had currents in excess of 800 mA, the programmed limit of our power supply, ending the run.

S/N TAM305 was next tested with Chlorine with the beam at an angle of 60°, giving an effective LET of 22.9 MeV-cm²/mg. The device again latched, partially losing functionality, and was damaged. A partial plot of I_{CC} vs. time, with a flux of 4.2 x 10⁴ ions/cm²/sec, is shown below.



Single Event Upset

Data was taken on only one run, Chlorine at 60°, giving an effective LET of 28 MeV-cm²/mg. No clock upsets were detected. The SEU cross-section measured was approximately 10⁻⁷ cm²/flip-flop.