

# Unisys

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SUBJECT: Radiation Report on: AD667  
Project: SMEX/LITE  
Job #: C78111  
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PPM-97-050

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A radiation evaluation was performed on AD667 (12 bit ADC) to determine the total dose tolerance of these parts. A brief summary of the test results is provided below. For detailed information, refer to Tables I through IV and Figure 1.

The total dose testing was performed using a Co<sup>60</sup> gamma ray source. During the radiation testing, five parts were irradiated under bias (see Figure 1 for bias configuration) and one part was used as a control sample. The total dose radiation levels were 2.5, 5.0, 7.5, 10.0, 15.0, 20.0, 30.0, and 50.0 kRads.\* The dose rate was between 0.062 and 0.625 kRads/hour (0.017 to 0.174 Rads/s). After the 50.0 kRad exposure, the parts were annealed for 168 hours at 25°C. See Table II for the radiation schedule and effective dose rate calculation. The Effective dose rate overall testing was 0.032 Rads/sec. After each radiation exposure and annealing treatment, parts were electrically tested according to the test conditions and the specification limits\*\* listed in Table III.

Initial electrical measurements were made on 6 samples. Five samples (SN's 741, 742, 743, 744, and 745) were used as radiation samples while SN 740 was used as a control sample. All parts passed all tests during initial electrical measurements.

All parts passed all tests up to 50.0 kRads with no significant degradation in any parameter.

After the 100.0 kRad irradiation, all parts showed degradation in DNL with three parts marginally exceeding the specification limit of 0.75lsb for DNL with readings of 0.78, 0.77, and 0.78lsb. The other two parts had readings of 0.74lsb. **All parts passed all other tests.**

After annealing the parts for 168 hours at 25°C, parts showed no significant recovery in any parameter. The three parts that exceeded the specification limit for DNL had readings of 0.76, 0.79 and 0.84lsb.

Table IV provides a summary of the test results with the mean and standard deviation values for each parameter after each irradiation exposure and annealing step.

Any further details about this evaluation can be obtained upon request. If you have any questions, please call me at (301) 731-8954.

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\* The term Rads, as used in this document, means Rads (silicon). All radiation levels cited are cumulative.

\*\* These are manufacturer's pre-irradiation data specification limits. The manufacturer provided no post-irradiation limits at the time these tests were performed.

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