

# **Total Dose Radiation Test Report**

## **MSK5805RH RAD Hard Ultra Low Dropout Adjustable Positive Linear Regulator**

July 9, 2014 (1st Test, IC Wafer Lot: W10809524.1 #8  
Transistor Wafer Lot: CJ302831RC#20)

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## **I. Introduction:**

The total dose radiation test plan for the MSK5805RH series was developed to qualify the device as RAD Hard to 300 Krad(Si). The testing was performed beyond 300 Krad(Si) to show trends in device performance as a function of total dose. The test does not classify maximum radiation tolerance of the device, but simply offers designers insight to the critical parameter-shifts up to the specified total dose level.

MIL-STD-883 Method 1019 and ASTM F1892-06 were used as guidelines in the development and implementation of the total dose test plan for the MSK5805RH.

## **II. Radiation Source:**

This total dose test was performed at the University of Massachusetts, Lowell, using a cobalt 60 radiation source. The dose rate was determined to be 119 rads(Si)/sec. The total dose schedule can be found in Table I.

## **III. Test Setup:**

All test samples were subjected to Group A Electrical Test at 25°C IAW the device data sheet. In addition, all devices received 320 hours of burn-in per MIL-STD-883 Method 1015. For test platform verification, two control devices were tested at 25°C. Ten devices were then tested at 25°C, prior to irradiation, and were found to be within acceptable test limits.

The devices were vertically aligned with the radiation source and enclosed in a lead/aluminum container during irradiation. Five devices were biased during irradiation. The maximum recommended operating voltage of +7.5V was used for the bias condition. Five devices had all leads grounded during irradiation for the unbiased condition.

After each irradiation the device leads were shorted together and transported to the MSK electrical test platform and tested IAW MSK device data sheet. Testing was performed on irradiated devices, as well as two control devices, at each total dose level. Electrical tests were completed within one hour of irradiation. Devices were subjected to subsequent radiation doses within two hours of removal from the radiation field.

## **IV. Data:**

All performance curves are averaged from the test results of the biased and unbiased devices, respectively. If required, full test data can be obtained by contacting M.S. Kennedy Corporation.

## **V. Summary:**

Based on the test data recorded during radiation testing, the MSK5805RH qualified as a 300Krad(Si) radiation hardened device. Feedback Voltage, Shutdown Threshold, and Output Current Limit exhibited the most significant shift due to irradiation, however all parameters remained within specification up to 450 KRAD (Si) TID.

MSK 5805RH Biased/Unbiased Dose Rate  
Schedule

Dosimetry Equipment  
Bruker Biospin # 0371

Irradiation Date  
7/9/14

Exposure Length (min:sec)	Incremental Dose rads(Si)	Cumulative Dose rads(Si)
14:26	103,054	103,054
7:13	51,527	154,581
21:39	154,581	309,162
21:39	154,581	463,743

Biased S/N – 0027, 0028, 0029, 0030, 0031

Unbiased S/N – 0032, 0033, 0034, 0035, 0036

Table 1

**Dose Time, Incremental Dose and Total Cumulative Dose**













