

RELIABILITY REPORT  
FOR  
MAX5075AAUA+T  
PLASTIC ENCAPSULATED DEVICES

October 21, 2013

**MAXIM INTEGRATED**

160 RIO ROBLES  
SAN JOSE, CA 95134

<b>Approved by</b>
Sokhom Chum
Quality Assurance
Reliability Engineer

## Conclusion

The MAX5075AAUA+T successfully meets the quality and reliability standards required of all Maxim Integrated products. In addition, Maxim Integrated's continuous reliability monitoring program ensures that all outgoing product will continue to meet Maxim Integrated's quality and reliability standards.

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## I. Device Description

### A. General

The MAX5075 is a +4.5V to +15V push-pull, current-fed topology driver subsystem with an integrated oscillator for use in telecom module power supplies. The device drives two MOSFETs connected to a center-tapped transformer primary providing secondary-side, isolated, negative or positive voltages. This device features a programmable, accurate, integrated oscillator with a synchronizing clock output that synchronizes an external PWM regulator. A single external resistor programs the internal oscillator frequency from 50kHz to 1.5MHz. The MAX5075 incorporates a dual MOSFET driver with  $\pm 3A$  peak drive currents and 50% duty cycle. The MOSFET driver generates complementary signals to drive external ground-referenced n-channel MOSFETs. The MAX5075 is available with a clock output frequency to MOSFET driver frequency ratio of 1x, 2x, and 4x. The MAX5075 is available in a thermally enhanced 8-pin  $\mu\text{MAX}^\circ$  package and is specified over the  $-40^\circ\text{C}$  to  $+125^\circ\text{C}$  operating temperature range.

**II. Manufacturing Information**

A. Description/Function:	Push-Pull FET Driver with Integrated Oscillator and Clock Output
B. Process:	E35
C. Number of Device Transistors:	
D. Fabrication Location:	Texas
E. Assembly Location:	Philippines, Thailand, or Malaysia
F. Date of Initial Production:	April 21, 2005

**III. Packaging Information**

A. Package Type:	8-pin uMAX
B. Lead Frame:	Copper
C. Lead Finish:	100% matte Tin
D. Die Attach:	Conductive
E. Bondwire:	Au (1 mil dia.)
F. Mold Material:	Epoxy with silica filler
G. Assembly Diagram:	#05-9000-1278
H. Flammability Rating:	Class UL94-V0
I. Classification of Moisture Sensitivity per JEDEC standard J-STD-020-C	Level 1
J. Single Layer Theta Ja:	97°C/W
K. Single Layer Theta Jc:	4.8°C/W
L. Multi Layer Theta Ja:	77.6°C/W
M. Multi Layer Theta Jc:	4.8°C/W

**IV. Die Information**

A. Dimensions:	61 X 65 mils
B. Passivation:	Si <sub>3</sub> N <sub>4</sub> /SiO <sub>2</sub> (Silicon nitride/ Silicon dioxide)
C. Interconnect:	Al/0.5%Cu with Ti/TiN Barrier
D. Backside Metallization:	None
E. Minimum Metal Width:	0.35um
F. Minimum Metal Spacing:	0.35um
G. Bondpad Dimensions:	
H. Isolation Dielectric:	SiO <sub>2</sub>
I. Die Separation Method:	Wafer Saw

## V. Quality Assurance Information

- |                                   |  |
|-----------------------------------|--|
| A. Quality Assurance Contacts:    | Richard Aburano (Manager, Reliability Engineering)<br>Don Lipps (Manager, Reliability Engineering)<br>Bryan Preeshl (Vice President of QA) |
| B. Outgoing Inspection Level:     | 0.1% for all electrical parameters guaranteed by the Datasheet.<br>0.1% For all Visual Defects.  |
| C. Observed Outgoing Defect Rate: | < 50 ppm   |
| D. Sampling Plan:                 | Mil-Std-105D   |

## VI. Reliability Evaluation

### A. Accelerated Life Test

The results of the 125C biased (static) life test are shown in Table 1. Using these results, the Failure Rate ( $\lambda$ ) is calculated as follows:

$$\lambda = \frac{1}{\text{MTTF}} = \frac{1.83}{192 \times 4340 \times 48 \times 2} \quad (\text{Chi square value for MTTF upper limit})$$

(where 2454 = Temperature Acceleration factor assuming an activation energy of 0.8eV)

$$\lambda = 40.5 \times 10^{-9}$$

$$\lambda = 40.5 \text{ F.I.T. (60\% confidence level @ 25°C)}$$

The following failure rate represents data collected from Maxim Integrated's reliability monitor program. Maxim Integrated performs quarterly life test monitors on its processes. This data is published in the Reliability Report found at <http://www.maximintegrated.com/qa/reliability/monitor>. Cumulative monitor data for the E35 Process results in a FIT Rate of 0.4 @ 25C and 6.84 @ 55C (0.8 eV, 60% UCL).

### B. E.S.D. and Latch-Up Testing (lot DTX1EQ001A, D/C 0830)

The NP70-1 die type has been found to have all pins able to withstand a HBM transient pulse of +/-2500V per JEDEC JESD22-A114. Latch-Up testing has shown that this device withstands a current of +/-250mA and overvoltage per JEDEC JESD78.

**Table 1**  
Reliability Evaluation Test Results

**MAX5075AAUA+T**

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES	COMMENTS
<b>Static Life Test</b> (Note 1)	Ta = 125°C Biased Time = 192 hrs.	DC Parameters & functionality	48	0	CTX0BA007C, D/C 0502

Note 1: Life Test Data may represent plastic DIP qualification lots.