

RELIABILITY REPORT  
FOR  
MAX6721AUTTGD3+T  
PLASTIC ENCAPSULATED DEVICES

June 28, 2016

**MAXIM INTEGRATED**

160 RIO ROBLES  
SAN JOSE, CA 95134

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## Conclusion

The MAX6721AUTTGD3+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 MAX6715A-MAX6729A/MAX6797A are ultra-low-voltage microprocessor ( $\mu\text{P}$ ) supervisory circuits designed to monitor two or three system power-supply voltages. These devices assert a system reset if any monitored supply falls below its factory-trimmed or adjustable threshold and maintain reset for a minimum timeout period after all supplies rise above their thresholds. The integrated dual/triple supervisory circuits significantly improve system reliability and reduce size compared to separate ICs or discrete components. These devices monitor primary supply voltages (VCC1) from 1.8V to 5.0V and secondary supply voltages (VCC2) from 0.9V to 3.3V with factory-trimmed reset threshold voltage options (see the *Reset Voltage Threshold Suffix Guide* in the full data sheet). An externally adjustable RSTIN input option allows customers to monitor a third supply voltage down to 0.62V. These devices are guaranteed to be in the correct reset output logic state when either VCC1 or VCC2 remains greater than 0.8V. A variety of push-pull or open-drain reset outputs along with watchdog input, manual-reset input, and power-fail input/output features are available (see the *Selector Guide* in the full data sheet). Select reset timeout periods from 1.1ms to 1120ms (min) (see the *Reset Timeout Period Suffix Guide* in the full data sheet). The MAX6715A-MAX6729A/MAX6797A are available in small 5-, 6-, and 8-pin SOT23 packages and operate over the  $-40^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$  temperature range.

## II. Manufacturing Information

A. Description/Function:	Dual/Triple, Ultra-Low-Voltage, SOT23 $\mu$ P Supervisory Circuits
B. Process:	B8
C. Fabrication Location:	USA
D. Assembly Location:	Malaysia, Thailand
E. Date of Initial Production:	April 22, 2006

## III. Packaging Information

A. Package Type:	6-pin SOT23
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:	#05-9000-2050
H. Flammability Rating:	Class UL94-V0
I. Classification of Moisture Sensitivity per JEDEC standard J-STD-020-C	Level 1
J. Single Layer Theta Jb:	115°C/W
K. Single Layer Theta Jc:	80°C/W
L. Multi Layer Theta Ja:	115°C/W
M. Multi Layer Theta Jc:	80°C/W

## IV. Die Information

A. Dimensions:	32X57 mils
B. Passivation:	$\text{Si}_3\text{N}_4/\text{SiO}_2$ (Silicon nitride/ Silicon dioxide)
C. Interconnect:	Al/0.5%Cu with Ti/TiN Barrier
D. Backside Metallization:	None
E. Minimum Metal Width:	0.8 microns (as drawn)
F. Minimum Metal Spacing:	0.8 microns (as drawn)
G. Bondpad Dimensions:	
H. Isolation Dielectric:	$\text{SiO}_2$
I. Die Separation Method:	Wafer Saw

## V. Quality Assurance Information

- A. Quality Assurance Contacts: Eric Wright (Reliability Engineering)  
Bryan Preeshl (Vice President of QA)
- B. Outgoing Inspection Level: 0.1% for all electrical parameters guaranteed by the Datasheet.  
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 135C biased (static) life test are shown in Table 1. Using these results, the Failure Rate ( $\lambda$ ) is calculated as follows:

$$\lambda = \frac{1}{\text{MTTF}} = \frac{1.83}{192 \times 4340 \times 89 \times 2} \quad (\text{Chi square value for MTTF upper limit})$$

(where 4340 = Temperature Acceleration factor assuming an activation energy of 0.8eV)

$$\lambda = 12.4 \times 10^{-9}$$

$$\lambda = 12.4 \text{ F.I.T. (60\% confidence level @ 25°C)}$$

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 B8 Process results in a FIT Rate of 0.06 @ 25C and 0.99 @ 55C (0.8 eV, 60% UCL)

### B. E.S.D. and Latch-Up Testing

The MS68-4 die type has been found to have all pins able to withstand an 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

**MAX6721AUTTGD3+T**

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES	COMMENTS
<b>Static Life Test</b> (Note 1)	Ta = 135C Biased Time = 192 hrs.	DC Parameters & functionality	89	0	

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