

RELIABILITY REPORT FOR MAX6467XS16D3+

PLASTIC ENCAPSULATED DEVICES

September 10, 2010

## MAXIM INTEGRATED PRODUCTS

120 SAN GABRIEL DR.

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Approved by		
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#### Conclusion

The MAX6467XS16D3+ successfully meets the quality and reliability standards required of all Maxim products. In addition, Maxim's continuous reliability monitoring program ensures that all outgoing product will continue to meet Maxim's quality and reliability standards.

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- I. Device Description
  - A. General

The MAX6467/MAX6468 microprocessor (µP) supervisory circuits monitor single power-supply voltages from +1.8V to +5.0V and assert a reset if the supply voltage drops below its preset threshold. An edge-triggered, one-shot manual reset function ensures that the µP enters the reset mode for a fixed timeout period only, even in the event of a continuously asserted manual reset. The MAX6467/MAX6468 significantly improve system reliability compared to traditional manual reset supervisory circuits. A variety of factory-trimmed threshold options accommodate different supply voltages and tolerances, eliminating external components. The factory-set thresholds range from +1.575V to +4.625V to monitor +5.0V, +3.3V, +3.0V, +2.5V, and +1.8V supplies with various tolerances. Reset timeout periods of 150ms (min) and 1200ms (min) are available to accommodate different µP platforms. A single, active-low RESET output asserts when VCC drops below its threshold or if the edge-triggered active-low MR asserts low. Active-low RESET remains low for the reset timeout period after VCC rises above its threshold and for a fixed, one-shot timeout period after a manual reset input falling edge. Active-low RESET remains valid as long as VCC remains above +1V. Open-drain (MAX6467) and push-pull (MAX6468) output options provide additional flexibility in the system design. The MAX6467/MAX6468 are offered in the space-saving 4-pin SOT143 package and the ultra-small 4-pin SC70 package and are specified over the automotive (-40°C to +125°C) temperature range.



## II. Manufacturing Information

A. Description/Function:	Microprocessor Supervisory Reset Circuits with Edge-Triggered, One-Shot Manual Reset
B. Process:	B8
C. Number of Device Transistors:	
D. Fabrication Location:	California or Texas
E. Assembly Location:	Malaysia

July 26, 2002

- E. Assembly Location:
- F. Date of Initial Production:

## III. Packaging Information

A. Package Type:	4-pin SC70
B. Lead Frame:	Alloy42
C. Lead Finish:	100% matte Tin
D. Die Attach:	Non-conductive
E. Bondwire:	Au (1 mil dia.)
F. Mold Material:	Epoxy with silica filler
G. Assembly Diagram:	#05-1601-0187
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:	327°C/W
K. Single Layer Theta Jc:	115°C/W
L. Multi Layer Theta Ja:	N/A
M. Multi Layer Theta Jc:	N/A

## IV. Die Information

31 X 30 mils
$Si_3N_4/SiO_2$ (Silicon nitride/ Silicon dioxide)
Al/0.5%Cu with Ti/TiN Barrier
None
0.8 microns (as drawn)
0.8 microns (as drawn)
5 mil. Sq.
SiO <sub>2</sub>
Wafer Saw



V. Quality Ass	Irance Information
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A. Quality Assurance Contacts:	Don Lipps (Manager, Reliability Engineering) Bryan Preeshl (Managing Director 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. S ampling Plan:	Mil-Std-105D		

#### VI. Reliability Evaluation

A. Accelerated Life Test

The results of the 135°C biased (static) life test are shown in Table 1. Using these results, the Failure Rate (  $\lambda$ ) is calculated as follows:

 $\lambda = \underbrace{1}_{\text{MTTF}} = \underbrace{1.83}_{192 \text{ x} 4340 \text{ x} 79 \text{ x} 2}$  (Chi square value for MTTF upper limit) (where 4340 = Temperature Acceleration factor assuming an activation energy of 0.8eV)  $\lambda = 13.9 \text{ x} 10^{-9}$ 

x = 13.9 F.I.T. (60% confidence level @ 25°C)

The following failure rate represents data collected from Maxim''s reliability monitor program. Maxim performs quarterly life test monitors on its processes. This data is published in the Reliability Report found at http://www.maxim-ic.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 (lot IH90AQ001B, D/C 0215)

The MS75 die type has been found to have all pins able to withstand a HBM transient pulse of +/-2000V per Mil-Std 883 Method 3015.7. Latch-Up testing has shown that this device withstands a current of +/-250mA.



# Table 1 Reliability Evaluation Test Results

## MAX6467XS16D3+

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES	COMMENTS
Static Life Test (Note	e 1) Ta = 135°C Biased Time = 192 hrs.	DC Parameters & functionality	79 0		IH92AQ001BQ, D/C 0215

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