RELIABILITY REPORT

FOR

MAX6358LRUT+

PLASTIC ENCAPSULATED DEVICES

October 4, 2010

MAXIM INTEGRATED PRODUCTS

120 SAN GABRIEL DR.

SUNNYVALE, CA 94086

Approved by
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Quality Assurance
Manager, Reliability Engineering

Conclusion

The MAX6358LRUT+ 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 MAX6351-MAX6360 microprocessor (µP) supervisors with multiple reset voltages significantly improve system reliability and accuracy compared to separate ICs or discrete components. If any input supply voltage drops below its associated preset threshold, all reset outputs are asserted. In addition, the outputs are valid as long as either input supply voltage remains greater than +1.0V. All devices in this series have an active-low debounced manual reset input. In addition, the MAX6358/MAX6359/MAX6360 offer a watchdog-timer input with a 46.4s startup timeout period and a 2.9s timeout period. The MAX6355/MAX6356/MAX6357 offer an additional voltage monitor input to monitor a third voltage. The MAX6351 features two active-low, push-pull reset outputs, one is referenced to VCC1 and the other is referenced to VCC2. The MAX6353/MAX6356/MAX6359 offer an active-low, push-pull reset output referenced to VCC1. The MAX6354/MAX6357/MAX6360 offer an active-low, push-pull reset output referenced to V CC2. All these devices are offered with a wide variety of voltage threshold levels, as shown in the *Voltage Threshold Levels* table. They are available in 5- and 6-pin SOT23 packages and operate over the extended (-40°C to +85°C) temperature range.

II. Manufacturing Information

A. Description/Function:	Dual/Triple-Voltage µP Supervisory Circuits
B. Process:	B12
C. Number of Device Transistors:	
D. Fabrication Location:	Oregon, California or Texas
E. Assembly Location:	Malaysia, Philippines, Thailand
F. Date of Initial Production:	October 22, 1999

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:	#05-1601-0070
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:	N/A
M. Multi Layer Theta Jc:	N/A

IV. Die Information

A. Dimensions:	35 X 55 mils
B. Passivation:	Si_3N_4/SiO_2 (Silicon nitride/ Silicon dioxide)
C. Interconnect:	Al/0.5%Cu with Ti/TiN Barrier
D. Backside Metallization:	None
E. Minimum Metal Width:	1.2 microns (as drawn)
F. Minimum Metal Spacing:	1.2 microns (as drawn)
G. Bondpad Dimensions:	5 mil. Sq.
H. Isolation Dielectric:	SiO_2
I. Die Separation Method:	Wafer Saw

V. Quality Assurance Information

A. Quality Assurance Contacts:	Don Lipps (Manager, 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 135°C biased (static) life test are shown in Table 1. Using these results, the Failure Rate (λ) is calculated as follows:

$$\lambda = \frac{1}{\text{MTTF}} = \frac{1.83}{192 \times 4340 \times 70 \times 2}$$ (Chi square value for MTTF upper limit)

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

$\lambda = 15.7 \times 10^{-9}$

λ = 15.7 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 B12 Process results in a FIT Rate of 0.06 @ 25C and 1.06 @ 55C (0.8 eV, 60% UCL)

B. E.S.D. and Latch-Up Testing (lot I6EHBQ002H, D/C 9935)

The MS19-7 die type has been found to have all pins able to withstand a HBM transient pulse of +/1000V per Mil-Std 883 Method 3015.7. Latch-Up testing has shown that this device withstands a current of +/100mA.

Table 1

Reliability Evaluation Test Results

MAX6358LRUT+

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES	COMMENTS
Static Life Test (Note 1)					
	Ta = 135°C Biased Time = 192 hrs.	DC Parameters & functionality	70	0	I6EABQ002F, DC 9936

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