RELIABILITY REPORT

FOR

MAX6700UT+

PLASTIC ENCAPSULATED DEVICES

April 8, 2010

MAXIM INTEGRATED PRODUCTS

120 SAN GABRIEL DR.

SUNNYVALE, CA 94086

Approved by
Don Lipps
Quality Assurance
Manager, Reliability Engineering

Conclusion

The MAX6700UT+ 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 MAX6700/MAX6710 precision triple/quad voltage microprocessor (µP) supervisory circuits monitor up to four system-supply voltages and assert a single reset if any supply voltage drops below its preset threshold. These devices significantly reduce system size and component count while improving reliability compared to separate ICs or discrete components. A variety of factory-trimmed threshold voltages are available to accommodate different supply voltages and tolerances with minimal external component requirements. The MAX6710 includes internally fixed options for monitoring 5.0V, 3.3V, 3.0V, 2.5V, and 1.8V supplies with -5% or -10% tolerances. The MAX6710 is also available with one to three adjustable threshold options to monitor voltages down to 0.62V. The MAX6700 monitors three voltages with adjustable thresholds down to 0.62V. A single active-low output asserts when any monitored input falls below its associated threshold. The open-drain output has a weak internal pullup (10µA) to IN2. For the MAX6710, reset remains low for the reset timeout period (140ms min) after all voltages rise above the selected threshold. The MAX6700 acts as a voltage detector with a propagation delay of 5µs after all monitored voltages exceed their thresholds. The output remains valid as long as either IN2 or IN2 input voltage remains above 1V (MAX6710) or VCC is above 2V (MAX6700/MAX6710Q). The MAX6700/MAX6710 are available in a small 6-pin SOT23 package and operate over the extended (-40°C to +85°C) temperature range.

II. Manufacturing Information

A. Description/Function:	Low-Voltage, High-Accuracy, Triple/Quad Voltage µP Supervisory Circuits in SOT Package
B. Process:	B8
C. Number of Device Transistors:	
D. Fabrication Location:	California or Texas
E. Assembly Location:	Malaysia, Thailand
F. Date of Initial Production:	April 27, 2002

III. Packaging Information

A. Package Type:	6-pin SOT23
B. Lead Frame:	Copper
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:	#05-1601-0154
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:	56 X 34 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:	0.8 microns (as drawn)
F. Minimum Metal Spacing:	0.8 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 (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. 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:

$$\lambda = \frac{1}{MTTF} = \frac{1.83}{192 \times 4340 \times 130 \times 2}$$ (Chi square value for MTTF upper limit)

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

$\lambda = 8.5 \times 10^{-9}$

λ = 8.5 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. Moisture Resistance Tests

The industry standard 85°C/85%RH or HAST testing is monitored per device process once a quarter.

C. E.S.D. and Latch-Up Testing

The MS72-9 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.

Table 1
Reliability Evaluation Test Results

MAX6700UT+

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES
Static Life Test (Note 1)				
	Ta = 135°C Biased Time = 192 hrs.	DC Parameters & functionality	130	0
Moisture Testing (Note 2)				
HAST	Ta = 130°C RH = 85% Biased Time = 96hrs.	DC Parameters & functionality	77	0
Mechanical Stress (Note 2)				
Temperature Cycle	-65°C/150°C 1000 Cycles Method 1010	DC Parameters & functionality	77	0

Note 1: Life Test Data may represent plastic DIP qualification lots.
Note 2: Generic Package/Process data