RELIABILITY REPORT

FOR

MAX6736XKVRD3+

PLASTIC ENCAPSULATED DEVICES

June 15, 2010

MAXIM INTEGRATED PRODUCTS

120 SAN GABRIEL DR.

SUNNYVALE, CA 94086

Approved by
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Quality Assurance
Manager, Reliability Engineering

Conclusion

The MAX6736XKVRD3+ 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 MAX6736–MAX6745 are low-power dual-/triplevoltage microprocessor (ìP) supervisors. These devices assert a 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 reduce size and power compared to separate ICs or discrete components. The low supply current of 6ìA makes these devices ideal for portable equipment. The MAX6736/MAX6737 are dual fixed-voltage ìP supervisors with a manual reset input. The MAX6738/ MAX6739 have one fixed and one adjustable reset threshold and a manual reset input. The MAX6740/ MAX6743 are triple-voltage ìP supervisors with two fixed and one user-adjustable reset threshold inputs. The MAX6741/MAX6744 are dual-voltage ìP supervisors with a power-OK (POK) output ideal for powersupply sequencing. The MAX6742/MAX6745 monitor the primary VCC supply and have an independent power-fail comparator. The MAX6736–MAX6745 monitor I/O supply voltages (VCC1) from 1.8V to 5.0V and core supply voltages (VCC2) from 0.9V to 3.3V with factory-trimmed reset threshold voltage options (Table 1). An external adjustable RSTIN input option allows monitoring voltages down to 0.5V. A variety of push-pull or open-drain reset outputs along with manual reset input and power-fail input/output features are available (see the Selector Guide). The MAX6736–MAX6745 are offered in a space-saving 5-pin SC70 package and operate over the -40°C to +85°C temperature range.

II. Manufacturing Information

A. Description/Function:	Low-Power Dual-/Triple-Voltage SC70 ìP Supervisory Circuits
B. Process:	B6
C. Number of Device Transistors:	
D. Fabrication Location:	California
E. Assembly Location:	Thailand
F. Date of Initial Production:	July 27, 2002

III. Packaging Information

A. Package Type:	5-pin SC70
B. Lead Frame:	Alloy42
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:	#
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:	324°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

A. Dimensions:	31 X 30 mils
B. Passivation:	Si_3N_4/SiO_2 (Silicon nitride/ Silicon dioxide)
C. Interconnect:	Al with Ti/TiN Barrier
D. Backside Metallization:	None
E. Minimum Metal Width:	0.6 microns (as drawn)
F. Minimum Metal Spacing:	0.6 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:

$$\lambda = \frac{1}{MTTF} = \frac{1.83}{192 \times 4340 \times 128 \times 2}$$ (Chi square value for MTTF upper limit)

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

$\lambda = 8.6 \times 10^{-9}$

$\lambda = 8.6$ 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 B6 Process results in a FIT Rate of 0.06 @ 25C and 1.04 @ 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 MS77 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

MAX6736XKVRD3+

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	128	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