RELIABILITY REPORT

FOR

MAX6749KA+

PLASTIC ENCAPSULATED DEVICES

November 27, 2013

MAXIM INTEGRATED

160 RIO ROBLES

SAN JOSE, CA 95134

Approved by
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Quality Assurance
Reliability Engineer

Conclusion

The MAX6749KA+ 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 MAX6746-MAX6753 low-power microprocessor (µP) supervisory circuits monitor single/dual system supply voltages from 1.575V to 5V and provide maximum adjustability for reset and watchdog functions. These devices assert a reset signal whenever the VCC supply voltage or RESET IN falls below its reset threshold or when manual reset is pulled low. The reset output remains asserted for the reset timeout period after VCC and RESET IN rise above the reset threshold. The reset function features immunity to power-supply transients. The MAX6746-MAX6753 have ±2% factory-trimmed reset threshold voltages in approximately 100mV increments from 1.575V to 5.0V and/or adjustable reset threshold voltages using external resistors. The reset and watchdog delays are adjustable with external capacitors. The MAX6746-MAX6751 contain a watchdog select input that extends the watchdog timeout period by 128x. The MAX6752/MAX6753 contain a window watchdog timer that looks for activity outside an expected window of operation. The MAX6746-MAX6753 are available with a push-pull or open-drain active-low RESET output. The MAX6746-MAX6753 are available in an 8-pin SOT23 package and are fully specified over the automotive temperature range (-40℃ to +125℃).

II. Manufacturing Information

A. Description/Function:	µP Reset Circuits with Capacitor-Adjustable Reset/Watchdog Timeout Delay
B. Process:	B8
C. Number of Device Transistors:	
D. Fabrication Location:	California or Texas
E. Assembly Location:	Malaysia or Thailand
F. Date of Initial Production:	January 25, 2003

III. Packaging Information

A. Package Type:	8-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:	#05-9000-0417
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:	110*°C/W
K. Single Layer Theta Jc:	80°C/W
L. Multi Layer Theta Ja:	196°C/W
M. Multi Layer Theta Jc:	70°C/W

IV. Die Information

A. Dimensions:	24X80 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:	
H. Isolation Dielectric:	SiO_2
I. Die Separation Method:	Wafer Saw

V. Quality Assurance Information

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

$$\lambda = \frac{1}{\text{MTTF}} = \frac{1.83}{1000 \times 4340 \times 48 \times 2}$$ (Chi square value for MTTF upper limit)

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

$\lambda = 4.4 \times 10^{-9}$

λ = 4.4 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 0.01 @ 25C and 0.26 @ 55C (0.8 eV, 60% UCL).

B. E.S.D. and Latch-Up Testing (lot DLZ3CA004D D/C 0713)

The MS62-3 die type has been found to have all pins able to withstand a HBM transient pulse of +/-2000V per JEDEC JESD22-A114. Latch-Up testing has shown that this device withstands a current of +/-250mA.

Table 1

Reliability Evaluation Test Results

MAX6749KA+

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES	COMMENTS
Static Life Test (Note 1)	Ta = 135°C Biased Time = 1000 hrs.	DC Parameters & functionality	48	0	DLZ3CA004D, D/C 0713

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