RELIABILITY REPORT

FOR

MAX700ESA+T

PLASTIC ENCAPSULATED DEVICES

February 4, 2014

MAXIM INTEGRATED

160 RIO ROBLES

SAN JOSE, CA 95134

Approved by
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Quality Assurance
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Conclusion

The MAX700ESA+T 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 MAX700/MAX701/MAX702 are supervisory circuits used to monitor the power supplies in microprocessor (µP) and digital systems. The active-low RESET/RESET outputs of the MAX700/MAX701/MAX702 are guaranteed to be in the correct state for VCC voltages down to +1V (Figure 4). They provide excellent circuit reliability and low cost by eliminating external components and adjustments when used with +5V-powered circuits. The MAX702 is the simplest part in the family. When VCC falls to 4.65V, active-low RESET goes low. The MAX702 also provides a debounced manual reset input. The MAX701 performs the same functions but has both active-low RESET and RESET outputs. Their primary function is to provide a system reset. Accordingly, an active reset signal is supplied for low supply voltages and for at least 200ms after the supply voltage reaches its operating value. In addition to the features of the MAX701 and MAX702, the MAX700 provides preset or adjustable voltage detection so thresholds other than 4.65V can be selected, and adjustable hysteresis. All parts are supplied in 8-pin PDIP and Narrow SO packages in commercial and extended temperature ranges.

II. Manufacturing Information

A. Description/Function:	Power-Supply Monitor with Reset
B. Process:	M6
C. Number of Device Transistors:	
D. Fabrication Location:	Oregon
E. Assembly Location:	Malaysia. Philippines, Thailand
F. Date of Initial Production:	Pre 1997

III. Packaging Information

A. Package Type:	8-pin SOIC (N)
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:	#05-0701-0354
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:	170°C/W
K. Single Layer Theta Jc:	40°C/W
L. Multi Layer Theta Ja:	132°C/W
M. Multi Layer Theta Jc:	38°C/W

IV. Die Information

A. Dimensions:	76X120 mils
B. Passivation:	Si_3N_4/SiO_2 (Silicon nitride/ Silicon dioxide)
C. Interconnect:	Al/1.0%Si
D. Backside Metallization:	None
E. Minimum Metal Width:	Metal1 = 0.5 microns (as drawn)
F. Minimum Metal Spacing:	Metal1 = 0.45 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:	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:

$$\lambda = \frac{1}{MTTF} = \frac{1.83}{192 \times 4340 \times 498 \times 2}$$ (Chi square value for MTTF upper limit)

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

$\lambda = 2.2 \times 10^{-9}$

$\lambda = 2.2$ 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 M6 Process results in a FIT Rate of 0.38 @ 25C and 6.48 @ 55C (0.8 eV, 60% UCL).

B. E.S.D. and Latch-Up Testing (lot NPAAHQ002A, D/C 9937)

The PS53 die type has been found to have all pins able to withstand a HBM transient pulse of +/-3000V per Mil-Std 883 Method 3015.7. Latch-Up testing has shown that this device withstands a current of +/-50mA.

Table 1

Reliability Evaluation Test Results

MAX700ESA+T

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES	COMMENTS
Static Life Test (Note 1)					
	Ta = 135°C	DC Parameters	98	0	NPAAHQ001B, D/C 9845
	Biased	& functionality	80	0	NPAAGQ001F, D/C 9650
	Time = 192 hrs.		80	0	NPAAFO002B, D/C N/A
			80	0	XPAACA143A, D/C N/A
			80	0	BPAAEZ007Q, D/C N/A
			80	0	BPAAEZ001A, D/C N/A

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