RELIABILITY REPORT

FOR

MAX811REUS+

PLASTIC ENCAPSULATED DEVICES

October 30, 2008

MAXIM INTEGRATED PRODUCTS

120 SAN GABRIEL DR.

SUNNYVALE, CA 94086

Approved by
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Conclusion

The MAX811REUS+ 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 MAX811/MAX812 are low-power microprocessor (µP) supervisory circuits used to monitor power supplies in µP and digital systems. They provide excellent circuit reliability and low cost by eliminating external components and adjustments when used with 5V- powered or 3V-powered circuits. The MAX811/MAX812 also provide a debounced manual reset input. These devices perform a single function: They assert a reset signal whenever the V CC supply voltage falls below a preset threshold, keeping it asserted for at least 140ms after VCC has risen above the reset threshold. The only difference between the two devices is that the MAX811 has an active-low RESET output (which is guaranteed to be in the correct state for VCC down to 1V), while the MAX812 has an active-high RESET output. The reset comparator is designed to ignore fast transients on VCC. Reset thresholds are available for operation with a variety of supply voltages. Low supply current makes the MAX811/MAX812 ideal for use in portable equipment. The devices come in a 4-pin SOT143 package.

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II. Manufacturing Information

A. Description/Function:	4-Pin µP Voltage Monitors with Manual Reset Input
B. Process:	B12
C. Number of Device Transistors:	
D. Fabrication Location:	Oregon, California or Texas
E. Assembly Location:	Carsem Malaysia, UTL Thailand, Unisem Malaysia
F. Date of Initial Production:	Pre 1997

III. Packaging Information

A. Package Type:	4-pin SOT
B. Lead Frame:	Alloy42
C. Lead Finish:	100% matte Tin
D. Die Attach:	Conductive Epoxy
E. Bondwire:	Gold (1 mil dia.)
F. Mold Material:	Epoxy with silica filler
G. Assembly Diagram:	#05-1601-0059
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:	250*°C/W
K. Single Layer Theta Jc:	130°C/W

IV. Die Information

A. Dimensions:	37 X 31 mils
B. Passivation:	Si_3N_4/SiO_2 (Silicon nitride/ Silicon dioxide
C. Interconnect:	Aluminum/Si (Si = 1%)
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

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V. Quality Assurance Information

A. Quality Assurance Contacts:	Ken Wendel (Director, 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 pending. Using these results, the Failure Rate (λ) is calculated as follows:

$$\lambda = \frac{1}{\text{MTTF}} = \frac{1.83}{192 \times 4340 \times 80 \times 2}$$ (Chi square value for MTTF upper limit)

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

$\lambda = 13.4 \times 10^{-9}$

λ = 13.4 F.I.T. (60% confidence level @ 25°C)

The following failure rate represents data collected from Maxim's reliability monitor program. Maxim performs quarterly 1000 hour life test monitors on its processes. This data is published in the Product Reliability Report found at http://www.maxim-ic.com/. Current monitor data for the B12 Process results in a FIT Rate of 3.13 @ 25C and 54.16 @ 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 MS28-4 die type has been found to have all pins able to withstand a HBM transient pulse of per JEDEC JESD22-A114-D. Latch-Up testing has shown that this device withstands a current of 250 mA.

The MS28-3 die types have shown the following +/- ESD performance per pin:

HBM	2.5KV
CDM	750V
MM	250V

Latch-Up testing has shown that this device withstands a current of 250 mA.

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Table 1
Reliability Evaluation Test Results

MAX811REUS+

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	80	0
Moisture Testing (Note 2)				
85/85	Ta = 85°C RH = 85% Biased Time = 1000hrs.	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

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