RELIABILITY REPORT

FOR

MAX6034AEXR25+

PLASTIC ENCAPSULATED DEVICES

January 29, 2010

MAXIM INTEGRATED PRODUCTS

120 SAN GABRIEL DR.

SUNNYVALE, CA 94086

Approved by
Ken Wendel
Quality Assurance
Director, Reliability Engineering

Conclusion

The MAX6034AEXR25+ 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 MAX6034 precision, low-dropout, micropower voltage references are available in a miniature 3-pin SC70 surface-mount package. They feature a proprietary, temperature-coefficient, curvature-correction circuit and laser-trimmed, thin-film resistors that result in a low temperature coefficient of 30ppm/°C (max) and initial accuracy of ±0.20% (max). These devices are available over the extended temperature range of -40°C to +85°C. The MAX6034 series-mode voltage references typically draw only 90µA of supply current and can source 1mA and sink 200µA of load current. Unlike conventional shunt-mode (two terminal) references that waste supply current and require an external resistor, devices in the MAX6034 family offer supply current that is virtually independent of supply voltage (16µA/V, max variation) and do not require an external resistor. These internally compensated devices do not require an external compensation capacitor, but are stable with up to 1µF of load capacitance. Eliminating the external compensation capacitor saves valuable board space in space-critical applications. The low dropout voltage and supply-independent, ultra-low supply current make the MAX6034 ideal for battery-powered applications.

II. Manufacturing Information

A. Description/Function:	Precision, Micropower, Low-Dropout, SC70 Series Voltage Reference
B. Process:	B8
C. Number of Device Transistors:	
D. Fabrication Location:	California or Texas
E. Assembly Location:	Malaysia
F. Date of Initial Production:	April 27, 2002

III. Packaging Information

A. Package Type:	3-pin SC70
B. Lead Frame:	Alloy42
C. Lead Finish:	100% matte Tin
D. Die Attach:	84-1lmisr4
E. Bondwire:	Au (1 mil dia.)
F. Mold Material:	Epoxy with silica filler
G. Assembly Diagram:	#05-0901-0175
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:	340°C/W
K. Single Layer Theta Jc:	115°C/W

IV. Die Information

A. Dimensions:	31 X 30 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:	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 shown in Table 1. Using these results, the Failure Rate (λ) is calculated as follows:

$$\lambda = \frac{1}{MTTF} = \frac{1.83}{192 \times 4340 \times 93 \times 2}$$ (Chi square value for MTTF upper limit)

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

$\lambda = 11.6 \times 10^{-9}$

λ = 11.6 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 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 RF34-1 die type has been found to have all pins able to withstand a transient pulse of:

HBM: +/-2500 V per JESD22-A114

CDM: +/-250 V per JESD22-C101

MM: +/-250 V per JESD22-A115

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

Table 1

Reliability Evaluation Test Results

MAX6034AEXR25+

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	93	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