RELIABILITY REPORT

FOR

MAX9634FERS+

CHIP SCALE PACKAGE

June 28, 2010

MAXIM INTEGRATED PRODUCTS

120 SAN GABRIEL DR.

SUNNYVALE, CA 94086

Approved by
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Conclusion

The MAX9634FERS+ 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 MAX9634 high-side current-sense amplifier offers precision accuracy specifications of VOS less than 250µV (max) and gain error less than 0.5% (max). Quiescent supply current is an ultra-low 1µA. The MAX9634 fits in a tiny, 1mm x 1mm UCSP™ package size or a 5-pin SOT23 package, making the part ideal for applications in notebook computers, cell phones, PDAs, and all battery-operated portable devices where accuracy, low quiescent current, and small size are critical. The MAX9634 features an input common-mode voltage range from 1.6V to 28V. These current-sense amplifiers have a voltage output and are offered in four gain versions: 25V/V (MAX9634T), 50V/V (MAX9634F), 100V/V (MAX9634H), and 200V/V (MAX9634W). The four gain selections offer flexibility in the choice of the external current-sense resistor. The very low 250µV (max) input offset voltage allows small 25mV to 50mV full-scale VSENSE voltage for very low voltage drop at full-current measurement. The MAX9634 is offered in tiny 4-bump UCSP (1mm x 1mm x 0.6mm footprint) and 5-pin SOT23 packages specified for operation over the -40°C to +85°C extended temperature range.

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II. Manufacturing Information

A. Description/Function:	1µA, 4-Bump UCSP/SOT23, Precision Current-Sense Amplifier
B. Process:	B8
C. Number of Device Transistors:	30
D. Fabrication Location:	California or Texas
E. Assembly Location:	
F. Date of Initial Production:	March 01, 2010

III. Packaging Information

A. Package Type:	4-pin UCSP
B. Lead Frame:	N/A
C. Lead Finish:	N/A
D. Die Attach:	N/a
E. Bondwire:	N/A (N/A mil dia.)
F. Mold Material:	N/A
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:	N/A
K. Single Layer Theta Jc:	N/A
L. Multi Layer Theta Ja:	N/A
M. Multi Layer Theta Jc:	N/A

IV. Die Information

A. Dimensions:	41 X 41 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

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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:

$$\lambda = \frac{1}{MTTF} = \frac{1.83}{192 \times 4340 \times 55 \times 2}$$ (Chi square value for MTTF upper limit)

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

$\lambda = 20.0 \times 10^{-9}$

λ = 20.0 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 OY32-1 die type has been found to have all pins able to withstand a HBM transient pulse of 2500 per JEDEC JESD22-A114. Latch-Up testing has shown that this device withstands a current of 250.

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Table 1
Reliability Evaluation Test Results

MAX9634FERS+

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	55	0
Mechanical Stress (Note 2)				
Temperature Cycle	-40°C/125°C 1000 Cycles JESD22-A104 1 cycle/hr	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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