RELIABILITY REPORT

FOR

MAX4182ESA+

PLASTIC ENCAPSULATED DEVICES

November 6, 2012

MAXIM INTEGRATED

160 RIO ROBLES

SAN JOSE, CA 95134

Approved by
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Quality Assurance
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Conclusion

The MAX4182ESA+ 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 MAX4180 family of current-feedback amplifiers combines high-speed performance, low distortion,and excellent video specifications with ultra-low-power operation in miniature packages. They operate from ±2.25V to ±5.5V dual supplies, or from a single +5V supply. They require only 1mA of supply current per amplifier while delivering up to ±60mA of output current drive. The MAX4180/MAX4182/MAX4183/MAX4186 are compensated for applications with a closed-loop gain of +2 (6dB) or greater, and provide a -3dB bandwidth of 240MHz and a 0.1dB bandwidth of 70MHz. The MAX4181/MAX4184/MAX4185/MAX4187 are compensated for applications with a +1 (0dB) or greater gain, and provide a -3dB bandwidth of 270MHz and a 0.1dB bandwidth of 60MHz. The MAX4180-MAX4187 feature 0.08%/0.03° differential gain and phase errors, a 20ns settling time to 0.1%, and a 450V/µs slew rate, making them ideal for high-performance video applications. The MAX4180/MAX4181/MAX4183/MAX4185 have a low-power shutdown mode that reduces power-supply current to 135µA and places the outputs in a high-impedance state. This feature makes them ideal for multiplexing applications. The single MAX4180/MAX4181 are offered in space-saving 6-pin SOT23 packages.

II. Manufacturing Information

A. Description/Function:	Single/Dual/Quad, 270MHz, 1mA, SOT23, Current-Feedback Amplifiers with Shutdown
B. Process:	CB2
C. Number of Device Transistors:	
D. Fabrication Location:	Oregon
E. Assembly Location:	Malaysia, Thailand, Philippines
F. Date of Initial Production:	July 26, 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:	#05-3001-0008
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:	136°C/W
M. Multi Layer Theta Jc:	38°C/W

IV. Die Information

A. Dimensions:	56 X 49 mils
B. Passivation:	Si_3N_4 (Silicon nitride)
C. Interconnect:	Au
D. Backside Metallization:	None
E. Minimum Metal Width:	2 microns (as drawn)
F. Minimum Metal Spacing:	2 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 150°C biased (static) life test are shown in Table 1. Using these results, the Failure Rate (λ) is calculated as follows:

$$\lambda = \frac{1}{MTTF} = \frac{1.83}{192 \times 4340 \times 230 \times 2}$$ (Chi square value for MTTF upper limit)

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

$\lambda = 4.8 \times 10^{-9}$

$\lambda = 4.8$ 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 CB2 Process results in a FIT Rate of 0.14 @ 25C and 2.48 @ 55C (0.8 eV, 60% UCL)

B. E.S.D. and Latch-Up Testing (lot BA8CBB006A D/C 9811)

The OP13-2 die type has been found to have all pins able to withstand a HBM transient pulse of +/-2500V per Mil-Std 883 Method 3015.7. Latch-Up testing has shown that this device withstands a current of +/-250mA.

Table 1
Reliability Evaluation Test Results

MAX4182ESA+

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES	COMMENTS
Static Life Test (Note 1)					
	Ta = 135°C	DC Parameters	80	0	NA8DDA006B, D/C 0103
	Biased	& functionality	70	0	BD8DCA007B, D/C 9912
	Time = 192 hrs.		80	0	BA8ABQ003A, D/C 9727

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