RELIABILITY REPORT

FOR

MAX1107EUB+

PLASTIC ENCAPSULATED DEVICES

February 15, 2011

MAXIM INTEGRATED PRODUCTS

120 SAN GABRIEL DR.

SUNNYVALE, CA 94086

Approved by
Sokhom Chum
Quality Assurance
Reliability Engineer

Conclusion

The MAX1107EUB+ 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.

Table of Contents

I. Device Description

A. General

The MAX1106/MAX1107 low-power, 8-bit, single-channel, analog-to-digital converters (ADCs) feature an internal track/hold (T/H), voltage reference, clock, and serial interface. The MAX1106 is specified from +2.7V to +3.6V and consumes only 96µA. The MAX1107 is specified from +4.5V to +5.5V and consumes only 107µA. The analog inputs are pin-configurable, allowing unipolar and single-ended or differential operation. The full-scale analog input range is determined by the internal reference of +2.048V (MAX1106) or +4.096V (MAX1107), or by an externally applied reference ranging from 1V to VDD. The MAX1106/MAX1107 also feature a pin-selectable power-down mode that reduces power consumption to 0.5µA when the device is not in use. The 3-wire serial interface directly connects to SPI(tm), QSPI(tm), and MICROWIRE(tm) devices without external logic. Conversions up to 25ksps are performed using the internal clock. The MAX1106/MAX1107 are available in a 10-pin µMAX® package with a footprint that is just 20% of an 8-pin plastic DIP.

II. Manufacturing Information

A. Description/Function:	Single-Supply, Low-Power, Serial 8-Bit ADCs
B. Process:	B12
C. Number of Device Transistors:	
D. Fa brication Location:	California
E. Assembly Location:	Malaysia, Philippines, Thailand
F. Date of Initial Production:	January 22, 1999

III. Packaging Information

A. Package Type:	10-pin uMAX
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:	#05-0101-0470
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:	180°C/W K.
Single Layer Theta Jc:	41.9°C/W
L. Multi Layer Theta Ja:	113.1°C/W
M. Multi Layer Theta Jc:	41.9°C/W

IV. Die Information

A. Dimensions:	61 X 87 mils
B. Passivation:	Si_3N_4/SiO_2 (Silicon nitride/ Silicon dioxide)
C. Interconnect:	Al/0.5%Cu with Ti/TiN Barrier
D. B ackside 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. Is olation 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. S ampling 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:

$$\lambda = \frac{1}{MTTF} = \frac{1.83}{192 \times 4340 \times 160 \times 2}$$ (Chi square value for MTTF upper limit)

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

$\lambda = 6.9 \times 10^{-9}$

λ = 6.9 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 B12 Process results in a FIT Rate of 0.06 @ 25C and 1.06 @ 55C (0.8 eV, 60% UCL)

B. E.S.D. and Latch-Up Testing (lot IT7BCQ001B D/C 9751)

The AD98-1 die type has been found to have all pins able to withstand a HBM transient pulse of +/-1500V 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

MAX1107EUB+

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES	COMMENTS
Static Life Test (Note 1)					
	Ta = 135°C	DC Parameters	80	0	NT7DEA001D, D/C 0452
	Biased	& functionality	80	0	IT7DCB002G, D/C 9947
	Time = 192 hrs.				

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