RELIABILITY REPORT

FOR

MAX1127EGK+D

PLASTIC ENCAPSULATED DEVICES

May 21, 2010

MAXIM INTEGRATED PRODUCTS

120 SAN GABRIEL DR.

SUNNYVALE, CA 94086

Approved by
Don Lipps
Quality Assurance
Manager, Reliability Engineering

Conclusion

The MAX1127EGK+D 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 MAX1127 quad, 12-bit analog-to-digital converter (ADC) features fully differential inputs, a pipelined architecture, and digital error correction. This ADC is optimized for low-power, high-dynamic performance for medical imaging, communications, and instrumentation applications. The MAX1127 operates from a 1.7V to 1.9V single supply and consumes only 563mW while delivering a 69.6dB signal-to-noise ratio (SNR) at a 19.3MHz input frequency. In addition to low operating power, the MAX1127 features a 675µA power-down mode for idle periods. An internal 1.24V precision bandgap reference sets the ADC's full-scale range. A flexible reference structure allows the use of an external reference for applications requiring increased accuracy or a different input voltage range. A single-ended clock controls the conversion process. An internal duty-cycle equalizer allows for wide variations in input-clock duty cycle. An on-chip phaselocked loop (PLL) generates the high-speed serial low-voltage differential signaling (LVDS) clock. The MAX1127 provides serial LVDS outputs for data, clock, and frame alignment signals. The output data is presented in two's complement or binary format. Refer to the MAX1126 data sheet for a pin-compatible 40Msps version of the MAX1127. The MAX1127 is available in a small, 10mm x 10mm x 0.9mm, 68-pin QFN package with exposed paddle and is specified for the extended industrial (-40°C to +85°C) temperature range.

II. Manufacturing Information

A. Description/Function:	Quad, 12-Bit, 65Msps, 1.8V ADC with Serial LVDS Outputs
B. Process:	TS18
C. Number of Device Transistors:	
D. Fabrication Location:	Taiwan
E. Assembly Location:	Korea
F. Date of Initial Production:	January 22, 2004

III. Packaging Information

A. Package Type:	68-pin QFN 10x10
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:	#05-9000-0828
H. Flammability Rating:	Class UL94-V0
I. Classification of Moisture Sensitivity per JEDEC standard J-STD-020-C	Level 3
J. Single Layer Theta Ja:	35°C/W
K. Single Layer Theta Jc:	0.8°C/W
L. Multi Layer Theta Ja:	24°C/W
M. Multi Layer Theta Jc:	0.8°C/W

IV. Die Information

A. Dimensions:	188 X 174 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:	0.18µm
F. Minimum Metal Spacing:	0.18µm
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:

$$\lambda = \frac{1}{MTTF} = \frac{1.83}{192 \times 4340 \times 96 \times 2}$$ (Chi square value for MTTF upper limit)

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

$\lambda = 11.5 \times 10^{-9}$

λ = 11.5 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 TS18 Process results in a FIT Rate of 0.24 @ 25C and 4.14 @ 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 CA09-1 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

MAX1127EGK+D

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	96	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