RELIABILITY REPORT

FOR

MAX4561EUT+

PLASTIC ENCAPSULATED DEVICES

September 20, 2012

MAXIM INTEGRATED PRODUCTS

160 Rio Robles

San Jose, CA 95134

Approved by
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Conclusion

The MAX4561EUT+ 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 MAX4561/MAX4568/MAX4569 are low-voltage, ESD-protected analog switches. The normally open (NO) and normally closed (NC) inputs are protected against ±15kV electrostatic discharge (ESD) without latchup or damage, and the COM input is protected against 2.5kV ESD. These switches operate from a single +1.8V to +12V supply. The 70 at 5V (120 at 3V) on-resistance is matched between channels to 2 max, and is flat (4 max) over the specified signal range. The switches can handle rail-to-rail analog signals. Off-leakage current is only 0.5nA at +25°C and 5nA at +85°C. The digital input has +0.8V to +2.4V logic thresholds, ensuring TTL/CMOS-logic compatibility when using a single +5V supply. The MAX4561 is a single-pole/double-throw (SPDT) switch. The MAX4568 NO and MAX4569 NC are single-pole/single-throw (SPST) switches. The MAX4561 is available in a 6-pin SOT23 package, and the MAX4568/MAX4569 are available in 5-pin SOT23 packages.

II. Manufacturing Information

A. Description/Function:	±15kV ESD-Protected, Low-Voltage, SPDT/SPST, CMOS Analog Switches
B. Process:	S3
C. Number of Device Transistors:	
D. Fabrication Location:	Oregon
E. Assembly Location:	Thailand
F. Date of Initial Production:	April 22, 2000

III. Packaging Information

A. Package Type:	6L SOT
B. Lead Frame:	Copper
C. Lead Finish:	NICKEL-PALLADIUM
D. Die Attach:	Non-conductive
E. Bondwire:	Au (1 mil dia.)
F. Mold Material:	Epoxy with silica filler
G. Assembly Diagram:	#05-1201-0167 / B
H. Flammability Rating:	Class UL94-V0
I. Classification of Moisture Sensitivity per JEDEC standard J-STD-020-C	1
J. Single Layer Theta Ja:	115°C/W
K. Single Layer Theta Jc:	80°C/W
L. Multi Layer Theta Ja:	74.6°C/W
M. Multi Layer Theta Jc:	6°C/W

IV. Die Information

A. Dimensions:	61 X 42 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:	3.0 microns (as drawn)
F. Minimum Metal Spacing:	3.0 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 biased (static) life test are shown in Table 1. Using these results, the Failure Rate (λ) is calculated as follows:

$$\lambda = \frac{1}{MTTF} = \frac{4.04}{192 \times 4340 \times 79 \times 2}$$ (Chi square value for MTTF upper limit)

$\lambda = 30.7 \times 10^{-9}$

$\lambda = 30.7$ 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 S 3 Process results in a FIT Rate of 0.51 @ 25C and 8.79 @ 55C (0.8 eV, 60% UCL)

B. E.S.D. and Latch-Up Testing (lot N47ABA004A D/C 0322)

The AH52 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

MAX4561EUT+

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES	COMMENTS
Static Life Test (Note 1)					
	Ta = 135°C Biased Time = 192 hrs.	DC Parameters & functionality	79	1	I47AAQ001G, D/C 0012

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