RELIABILITY REPORT

FOR

MAX4595EXK+

PLASTIC ENCAPSULATED DEVICES

October 29, 2009

MAXIM INTEGRATED PRODUCTS

120 SAN GABRIEL DR.

SUNNYVALE, CA 94086

Approved by
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Quality Assurance
Director, Reliability Engineering

Conclusion

The MAX4595EXK+ 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 MAX4594-MAX4597 single-pole/single-throw (SPST) analog switches operate from a single +2.0V to +5.5V supply. The MAX4594/MAX4596 switches are normally open (NO), and the MAX4595/MAX4597 are normally closed (NC). The MAX4596/MAX4597 pinouts are optimized for the highest SC70 package off-isolation available. These switches have 10 max on-resistance (RON), with 1.5 max RON flatness over the analog signal range when powered from a +5V supply. The MAX4594-MAX4597 offer low 0.5nA leakage currents and fast switching times less than 40ns. They are packaged in an ultra-small 5-pin SC70 and 6-pin µDFN.

II. Manufacturing Information

A. Description/Function:	Low-Voltage, Single-Supply, 10 SPST CMOS Analog Switches
B. Process:	B8
C. Number of Device Transistors:	
D. Fabrication Location:	California or Texas
E. Assembly Location:	Malaysia, Thailand
F. Date of Initial Production:	April 22, 2000

III. Packaging Information

A. Package Type:	5-pin SC70
B. Lead Frame:	Alloy42
C. Lead Finish:	100% matte Tin
D. Die Attach:	Non-conductive Epoxy
E. Bondwire:	Gold (1 mil dia.)
F. Mold Material:	Epoxy with silica filler
G. Assembly Diagram:	#05-1201-0152
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:	324°C/W
K. Single Layer Theta Jc:	115°C/W

IV. Die Information

A. Dimensions:	31 X 30 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

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:

$$\lambda = \frac{1}{MTTF} = \frac{1.83}{192 \times 4340 \times 158 \times 2}$$ (Chi square value for MTTF upper limit)

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

$\lambda = 6.80 \times 10^{-9}$

λ = 6.80 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 AH65-1 die type has been found to have all pins able to withstand a HBM transient pulse of +/-2500 V per Mil-Std 883 Method 3015.7. Latch-Up testing has shown that this device withstands a current of +/-250 mA.

Table 1

Reliability Evaluation Test Results

MAX4595EXK+

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	158	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