RELIABILITY REPORT

FOR

MAX4684EXX+

PLASTIC ENCAPSULATED DEVICES

December 14, 2009

MAXIM INTEGRATED PRODUCTS

120 SAN GABRIEL DR.

SUNNYVALE, CA 94086

Approved by
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Quality Assurance
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Conclusion

The MAX4684EXX+ 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 MAX4684/MAX4685 low on-resistance (RON), low-voltage, dual single-pole/double-throw (SPDT) analog switches operate from a single +1.8V to +5.5V supply. The MAX4684 features a 0.5 (max) RON for its NC switch and a 0.8 (max) RON for its NO switch at a +2.7V supply. The MAX4685 features a 0.8 max on-resistance for both NO and NC switches at a +2.7V supply. Both parts feature break-before-make switching action (2ns) with t ON = 50ns and tOFF = 40ns at +3V. The digital logic inputs are 1.8V logic-compatible with a +2.7V to +3.3V supply. The MAX4684/MAX4685 are packaged in the chipscale package (UCSP(tm)), significantly reducing the required PC board area. The chip occupies only a 2.0mm x 1.50mm area. The 4 x 3 array of solder bumps are spaced with a 0.5mm bump pitch.

II. Manufacturing Information

A. Description/Function:	0.5 /0.8 Low-Voltage, Dual SPDT Analog Switches in UCSP
B. Process:	VS50
C. Number of Device Transistors:	
D. Fabrication Location:	Taiwan
E. Assembly Location:	Philippines, Malaysia, Thailand
F. Date of Initial Production:	January 27, 2001

III. Packaging Information

A. Package Type:	10-pin uMAX	12-pin CSP
B. Lead Frame:	Copper	NA
C. Lead Finish:	100% matte Tin	SnCuAg (SAC)
D. Die Attach:	Conductive Epoxy	NA
E. Bondwire:	Gold (1.3 mil dia.)	NA
F. Mold Material:	Epoxy with silica filler	NA
G. Assembly Diagram:	#05-1201-0200	#05-1201-0202
H. Flammability Rating:	Class UL94-V0	Class UL94-V0
I. Classification of Moisture Sensitivity per JEDEC standard J-STD-020-C	Level 1	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:	82 X 60 mils
B. Passivation:	SiO_2 (Oxide)/Si_3N_4 (Nitride)
C. Interconnect:	Al/Cu (0.5%)
D. Backside Metallization:	None
E. Minimum Metal Width:	0.5um
F. Minimum Metal Spacing:	0.5um
G. Bondpad Dimensions:	5 mil. Sq.
H. Isolation Dielectric:	Silicon dioxide
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:

$$\lambda = \frac{1}{MTTF} = \frac{1.83}{192 \times 4340 \times 130 \times 2}$$ (Chi square value for MTTF upper limit)

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

$\lambda = 8.3 \times 10^{-9}$

$\lambda = 8.3$ F.I.T. (60% confidence level @ 25°C)

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 AH71 die type has been found to have all pins able to withstand a HBM transient pulse of +/-200 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

MAX4684EXX+

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	130	0
Moisture Testing (Note 2)				
85/85	Ta = 85°C RH = 85% Biased Time = 1000hrs.	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