

RELIABILITY REPORT FOR MAX4716EXK+T PLASTIC ENCAPSULATED DEVICES

August 4, 2011

MAXIM INTEGRATED PRODUCTS

120 SAN GABRIEL DR. SUNNYVALE, CA 94086

Approved by	
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Quality Assurance	
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Conclusion

The MAX4716EXK+T 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 V.Quality Assurance Information
- II.Manufacturing Information

- VI.Reliability Evaluation
- III.Packaging Information
-Attachments

IV.Die Information

I. Device Description

A. General

The MAX4715/MAX4716 are low on-resistance, low-voltage, single-pole/single-throw (SPST) analog switches that operate from a +1.6V to +3.6V single supply. The MAX4715 is normally open (NO), and the MAX4716 is normally closed (NC). These devices also have fast switching speeds (tON = 18ns max, tOFF = 12ns max). When powered from a +3V supply, the MAX4715/MAX4716 offer 0.4 max on-resistance (RON) with 0.1 max RON flatness. Their digital logic inputs are +1.8V CMOS compatible when using a single +3V supply. The MAX4715 is pin compatible with the MAX4594, and the MAX4716 is pin compatible with the MAX4595. The MAX4715/MAX4716 are available in SC70-5 packages.



II. Manufacturing Information

A. Description/Function:

- B. Process:
- C. Number of Device Transistors:
- D. Fabrication Location:
- E. Assembly Location:
- F. Date of Initial Production:

III. Packaging Information

A. Package Type:	5-pin SC70
B. Lead Frame:	Alloy42
C. Lead Finish:	100% matte Tin
D. Die Attach:	Non-conductive
E. Bondwire:	Au (1 mil dia.)
F. Mold Material:	Epoxy with silica filler
G. Assembly Diagram:	#05-1201-0223
H. Flammability Rating:	Class UL94-V0
 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
L. Multi Layer Theta Ja:	324°C/W
M. Multi Layer Theta Jc:	115°C/W

0.4, Low-Voltage, Single-Supply SPST Analog Switches

CMOS

Taiwan

Malaysia, Thailand April 20, 2001

IV. Die Information

Α.	Dimensions:	30 X 30 mils
В.	Passivation:	Si_3N_4/SiO_2 (Silicon nitride/ Silicon dioxide)
C.	Interconnect:	Al/0.5%Cu with Ti/TiN Barrier
D.	Backside Metallization:	None
Ε.	Minimum Metal Width:	0.35µm
F.	Minimum Metal Spacing:	0.35µm
G.	Bondpad Dimensions:	
Н.	Isolation Dielectric:	SiO ₂
I.	Die Separation Method:	Wafer Saw



V. Quality Assurance Information

Α.	Quality Assurance Contacts:	Richard Aburano (Manager, Reliability Engineering)			
		Don Lipps (Manager, Reliability Engineering)			
		Bryan Preeshl (Vice President of QA)			
В.	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:

 $\lambda = \frac{1}{\text{MTFF}} = \frac{1.83}{192 \times 4340 \times 78 \times 2}$ (Chi square value for MTTF upper limit) (where 4340 = Temperature Acceleration factor assuming an activation energy of 0.8eV) $\lambda = 14.1 \times 10^{-9}$ $\lambda = 14.1 \text{ F.I.T.}$ (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 VS35 Process results in a FIT Rate of 0.11 @ 25C and 1.93 @ 55C (0.8 eV, 60% UCL)

B. E.S.D. and Latch-Up Testing

The AH80-2 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

MAX4716EXK+T

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES	COMMENTS
Static Life Test (Note	e 1) Ta = 135°C Biased Time = 192 hrs.	DC Parameters & functionality	78	0	

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