RELIABILITY REPORT

FOR

MAX4360EAX+

PLASTIC ENCAPSULATED DEVICES

November 9, 2011

MAXIM INTEGRATED PRODUCTS

120 SAN GABRIEL DR.

SUNNYVALE, CA 94086

Approved by
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Quality Assurance
Reliability Engineer

Conclusion

The MAX4360EAX+ 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 MAX4359/MAX4360/MAX4456 low-cost video crosspoint switches are designed to reduce component count, board space, design time, and system cost. Each contains a matrix of T-switches that connect any of their four (MAX4359) or eight (MAX4360/MAX4456) video inputs to any of their buffered outputs, in any combination. Each matrix output is buffered by an internal, high-speed (250V/µs), unity-gain amplifier that is capable of driving 400 and 20pF at 2.6VP-P. For applications requiring increased drive capability, buffer the MAX4359/MAX4360/MAX4456 outputs with the MAX4395 quad, operational amplifier. The MAX4456 has a digitally controlled 8x8 switch matrix and is a low-cost pin-for-pin compatible alternative to the popular MAX456. The MAX4359/MAX4360 are similar to the MAX4456, with the 8x8 switch matrix replaced by a 4x4 (MAX4359) or an 8x4 (MAX4360) switch matrix. Three-state output capability and internal, programmable active loads make it feasible to parallel multiple devices to form larger switch arrays. The inputs and outputs are on opposite sides, and a quiet power supply or digital input line separates each channel, which reduces crosstalk to -70dB at 5MHz. For applications demanding better DC specifications, see the MAX456 8x8 video crosspoint switch.

II. Manufacturing Information

A. Description/Function:	Low-Cost 4x4, 8x4, 8x8 Video Crosspoint Switches
B. Process:	SG5
C. Number of Device Transistors:	
D. Fabrication Location:	Oregon
E. Assembly Location:	Malaysia
F. Date of Initial Production:	October 23, 1999

III. Packaging Information

A. Package Type:	36L SSOP
B. Lead Frame:	Copper
C. Lead Finish:	100% matte Tin
D. Die Attach:	Conductive
E. Bondwire:	Au (1.3 mil dia.)
F. Mold Material:	Epoxy with silica filler
G. Assembly Diagram:	#05-2501-0012 / A
H. Flammability Rating:	Class UL94-V0
I. Classification of Moisture Sensitivity per JEDEC standard J-STD-020-C	1
J. Single Layer Theta Ja:	84.7°C/W
K. Single Layer Theta Jc:	19.3°C/W
L. Multi Layer Theta Ja:	57.6°C/W
M. Multi Layer Theta Jc:	19.3°C/W

IV. Die Information

A. Dimensions:	168 X 144 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:	5.0 microns (as drawn)
F. Minimum Metal Spacing:	5.0 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:

$$\lambda = \frac{1}{MTTF} = \frac{1.83}{192 \times 4340 \times 80 \times 2}$$ (Chi square value for MTTF upper limit)

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

$\lambda = 13.7 \times 10^{-9}$

$\lambda = 13.7$ 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 SG5 Process results in a FIT Rate of 0.12 @ 25C and 2.04 @ 55C (0.8 eV, 60% UCL)

B. E.S.D. and Latch-Up Testing (lot N6IAAU002B D/C 9937)

The OX32 die type has been found to have all pins able to withstand a HBM transient pulse of +/-2000V 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

MAX4360EAX+

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	80	0	N6IAAU002B, D/C 9937

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