RELIABILITY REPORT

FOR

MAX4892ETX+

PLASTIC ENCAPSULATED DEVICES

December 16, 2011

MAXIM INTEGRATED PRODUCTS

120 SAN GABRIEL DR.

SUNNYVALE, CA 94086

Approved by
Sokhom Chum
Quality Assurance
Reliability Engineer

Maxim Integrated Products. All rights reserved.

Conclusion

The MAX4892ETX+ 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

II. ....Manufacturing Information

III. ....Packaging Information

.....Attachments

IV. ....Die Information

V. ....Quality Assurance Information

VI. ....Reliability Evaluation

I. Device Description

A. General

The MAX4890/MAX4891/MAX4892 high-speed analog switches meet the needs of 10/100/1000 Base-T applications. These devices switch the signals from two interface transformers and connect the signals to a single 10/100/1000 Base-T Ethernet PHY, simplifying docking station design and reducing manufacturing costs. The MAX4890/MAX4891/MAX4892 can also route signals from a common interface transformer to two different boards in board-redundancy applications. The MAX4890/MAX4891/MAX4892 switches provide an extremely low capacitance and on-resistance to meet Ethernet insertion and return-loss specifications. The MAX4891/MAX4892 feature one and three built-in LED switches, respectively. The MAX4890/MAX4891/MAX4892 are available in space-saving 32- and 36-lead TQFN packages, significantly reducing the required PC board area. These devices operate over the -40°C to +85°C temperature range.

Maxim Integrated Products. All rights reserved.

II. Manufacturing Information

A. Description/Function:	10/100/1000 Base-T Ethernet LAN Switch
B. Process:	S4
C. Number of Device Transistors:	
D. Fabrication Location:	Texas
E. Assembly Location:	China
F. Date of Initial Production:	July 21, 2006

III. Packaging Information

A. Package Type:	36L TQFN 6x6
B. Lead Frame:	Copper
C. Lead Finish:	100% matte Tin
D. Die Attach:	Conductive
E. Bondwire:	Au (1 mil dia.)
F. Mold Material:	Epoxy with silica filler
G. Assembly Diagram:	#05-9000-1245 / 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:	38°C/W
K. Single Layer Theta Jc:	1°C/W
L. Multi Layer Theta Ja:	28°C/W
M. Multi Layer Theta Jc:	1°C/W

IV. Die Information

A. Dimensions:	61 X 100 mils
B. Passivation:	Si_3N_4/SiO_2 (Silicon nitride/ Silicon dioxide)
C. Interconnect:	Al with Ti/TiN Barrier
D. Backside Metallization:	None
E. Minimum Metal Width:	Metal1 = 0.5 / Metal2 = 0.6 / Metal3 = 0.6 microns (as drawn)
F. Minimum Metal Spacing:	Metal1 = 0.45 / Metal2 = 0.5 / Metal3 = 0.6 microns (as drawn)
G. Bondpad Dimensions:	
H. Isolation Dielectric:	SiO_2
I. Die Separation Method:	Wafer Saw

Maxim Integrated Products. All rights reserved.

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:

$$\lambda = \frac{1}{MTTF} = \frac{1.83}{192 \times 4340 \times 48 \times 2}$$ (Chi square value for MTTF upper limit)

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

$\lambda = 22.9 \times 10^{-9}$

λ = 22.9 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 S4 Process results in a FIT Rate of 0.05 @ 25C and 0.83 @ 55C (0.8 eV, 60% UCL)

B. E.S.D. and Latch-Up Testing (lot STJ1CZ001D D/C 0443)

The AS45-1 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.

Maxim Integrated Products. All rights reserved.

Table 1
Reliability Evaluation Test Results

MAX4892ETX+

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	48	0	SX00AQ001D, D/C 0624

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

Maxim Integrated Products. All rights reserved.