RELIABILITY REPORT

FOR

MAX9235ETE+

PLASTIC ENCAPSULATED DEVICES

November 11, 2008

MAXIM INTEGRATED PRODUCTS

120 SAN GABRIEL DR.

SUNNYVALE, CA 94086

Approved by
Ken Wendel
Quality Assurance
Director, Reliability Engineering

Maxim Integrated Products. All rights reserved.

Conclusion

The MAX9235ETE+ 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
V. ....Quality Assurance Information
VI. ....Reliability Evaluation
IV. ....Die Information

I. Device Description

A. General

The MAX9235 serializer transforms 10-bit-wide parallel LVCMOS/LVTTL data into a serial high-speed, low-voltage differential signaling (LVDS) data stream. The serializer typically pairs with deserializers like the MAX9206, which receives the serial output and transforms it back to 10-bit-wide parallel data. The MAX9235 transmits serial data at speeds up to 450Mbps over PCB traces or twisted-pair cables. Since the clock is recovered from the serial data stream, clock-to-data and data-to-data skew that would be present with a parallel bus are eliminated. The MAX9235 serializer requires no external components and no control signals and can lock to a 16MHz to 45MHz system clock. The serializer output is held in high impedance until the device is fully locked to the local system clock. The MAX9235 operates from a single +3.3V supply, is specified for operation from -40°C to +105°C, and is available in a 16-pin TQFN (3mm x 3mm) package.

Maxim Integrated Products. All rights reserved.

II. Manufacturing Information

A. Description/Function:	10-Bit LVDS Serializer
B. Process:	0.35UM 2 Poly 3 Metal CMOS
C. Number of Device Transistors:	
D. Fabrication Location:	Taiwan
E. Assembly Location:	UTL Thailand
F. Date of Initial Production:	7/12/2007

III. Packaging Information

A. Package Type:	16-pin TQFN 3x3
B. Lead Frame:	Copper
C. Lead Finish:	100% matte Tin
D. Die Attach:	Conductive Epoxy
E. Bondwire:	Gold (1 mil dia.)
F. Mold Material:	Epoxy with silica filler
G. Assembly Diagram:	#05-9000-2851
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:	°C/W
K. Single Layer Theta Jc:	°C/W
L. Multi Layer Theta Ja:	68°C/W
M. Multi Layer Theta Jc:	10°C/W

IV. Die Information

A. Dimensions:	66 X 69 mils
B. Passivation:	Silicon Dioxide/Silicon Nitride
C. Interconnect:	Al/Cu
D. Backside Metallization:	None
E. Minimum Metal Width:	0.35um
F. Minimum Metal Spacing:	0.35um
G. Bondpad Dimensions:	5 mil. Sq.
H. Isolation Dielectric:	Silicon Dioxide
I. Die Separation Method:	Wafer Saw

Maxim Integrated Products. All rights reserved.

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 biased (static) life test are pending. 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)

$\lambda = 22.4 \times 10^{-9}$

λ = 22.4 F.I.T. (60% confidence level @ 25°C)

The following failure rate represents data collected from Maxim's reliability monitor program. Maxim performs quarterly 1000 hour life test monitors on its processes. This data is published in the Product Reliability Report found at http://www.maxim-ic.com/. Current monitor data for the TS352P3M Process results in a FIT Rate of 0.43 @ 25C and 7.50 @ 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 HS65 die type has been found to have all pins able to withstand a HBM transient pulse of +/-2500V per JEDEC JESD22-A114. Latch-Up testing has shown that this device withstands a current of 250 mA.

Maxim Integrated Products. All rights reserved.

Table 1
Reliability Evaluation Test Results

MAX9235ETE+

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES
Static Life Test (Note 1)				
	Ta = Biased Time = 192 hrs.	DC Parameters & functionality	48	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

Maxim Integrated Products. All rights reserved.