RELIABILITY REPORT

FOR

MAX9124ESE+

PLASTIC ENCAPSULATED DEVICES

November 9, 2010

MAXIM INTEGRATED PRODUCTS

120 SAN GABRIEL DR.

SUNNYVALE, CA 94086

Approved by
Don Lipps
Quality Assurance
Manager, Reliability Engineering

Conclusion

The MAX9124ESE+ 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

A. General

The MAX9124 quad low-voltage differential signaling (LVDS) line driver is ideal for applications requiring high data rates, low power, and low noise. The MAX9124 is guaranteed to transmit data at speeds up to 800Mbps (400MHz) over controlled impedance media of approximately 100 . The transmission media may be printed circuit (PC) board traces, backplanes, or cables. The MAX9124 accepts four LVTTL/LVCMOS input levels and translates them to LVDS output signals. Moreover, the MAX9124 is capable of setting all four outputs to a high-impedance state through two enable inputs, EN and EN-bar, thus dropping the device to an ultra-low-power state of 16mW (typ) during high impedance. The enables are common to all four transmitters. Outputs conform to the ANSI TIA/EIA-644 LVDS standard. The MAX9124 operates from a single +3.3V supply and is specified for operation from -40°C to +85°C. It is available in 16-pin TSSOP and SO packages. Refer to the MAX9125/MAX9126 data sheet for quad LVDS line receivers.

II. Manufacturing Information

A. Description/Function:	Quad LVDS Line Driver
B. Process:	TS35
C. Number of Device Transistors:	
D. Fabrication Location:	Taiwan
E. Assembly Location:	Malaysia, Philippines, Thailand
F. Date of Initial Production:	April 28, 2001

III. Packaging Information

A. Package Type:	16-pin SOIC (N)
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:	#05-2801-0021
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:	N/A
K. Single Layer Theta Jc:	N/A
L. Multi Layer Theta Ja:	82.2°C/W
M. Multi Layer Theta Jc:	32°C/W

IV. Die Information

A. Dimensions:	57 X 61 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:	0.35µm F.
Minimum Metal Spacing:	0.35µm
G. Bondpad Dimensions:	5 mil. Sq.
H. Isolation Dielectric:	SiO_2
I. Die Separation Method:	Wafer Saw

V. Quality Assurance Information

A. Quality Assurance Contacts:	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 135°C biased (static) life test are shown in Table 1. Using these results, the Failure Rate (λ) is calculated as follows:

$$\lambda = \frac{1}{MTTF} = \frac{1.83}{192 \times 4340 \times 79 \times 2}$$ (Chi square value for MTTF upper limit)

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

$\lambda = 13.9 \times 10^{-9}$

λ = 13.9 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 TS35 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 (lot Q3T0AQ001C, D/C 0103)

The HS11 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

MAX9124ESE+

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	79	0	Q3T0AQ001B, DC 0201

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