RELIABILITY REPORT

FOR

MAX3462ESA

PLASTIC ENCAPSULATED DEVICES

June 11, 2014

MAXIM INTEGRATED
160 RIO ROBLES
SAN JOSE, CA 95134

Approved by
Sokhom Chum
Quality Assurance
Reliability Engineer

Conclusion

The MAX3462ESA successfully meets the quality and reliability standards required of all Maxim Integrated products. In addition, Maxim Integrated's continuous reliability monitoring program ensures that all outgoing product will continue to meet Maxim Integrated's quality and reliability standards.

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I. Device Description

A. General

The MAX3460-MAX3464 are high-speed differential bus transceivers for RS-485 and RS-422 communications. They are designed to meet TIA/EIA-422-B, TIA/EIA-485-A, V.11, and X.27 standards. The transceiver complies with the PROFIBUS specification providing +2.1V output level with a 54 load, 20Mbps data rate, and output skew less than 2ns. Each part contains one three-state differential line driver and one differential input line receiver. The devices operate from a +5V supply and feature true fail-safe circuitry, which guarantees a logic-high receiver output when the receiver inputs are open or shorted. This enables all receiver outputs on a terminated bus to output logic highs when all transmitters are disabled. All devices feature a 1/4 standard unit load receiver input impedance that allows 128 transceivers on the bus. Driver and receiver propagation delays are guaranteed under 20ns for multidrop, clock distribution applications. Drivers are short-circuit current limited and are protected against excessive power dissipation by thermal shutdown circuitry. The driver and receiver feature active-high and active-low enables, respectively, that can be connected together externally to serve as a direction control.

II. Manufacturing Information

A. Description/Function:	+5V, Fail-Safe, 20Mbps, PROFIBUS RS-485/RS-422 Transceivers
B. Process:	B8
C. Number of Device Transistors:	
D. Fabrication Location:	California or Texas
E. Assembly Location:	Malaysia, Philippines, Thailand
F. Date of Initial Production:	October 27, 2001

III. Packaging Information

A. Package Type:	8-pin SOIC (N)
B. Lead Frame:	Copper
C. Lead Finish:	85Sn/15Pb
D. Die Attach:	Conductive
E. Bondwire:	Au (1 mil dia.)
F. Mold Material:	Epoxy with silica filler
G. Assembly Diagram:	#05-2601-0053
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:	170°C/W
K. Single Layer Theta Jc:	40°C/W
L. Multi Layer Theta Ja:	136°C/W
M. Multi Layer Theta Jc:	38°C/W

IV. Die Information

A. Dimensions:	70X70 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:	0.8 microns (as drawn)
F. Minimum Metal Spacing:	0.8 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:	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 135C biased (static) life test are shown in Table 1. Using these results, the Failure Rate (λ) is calculated as follows:

$$\lambda = \frac{1}{\text{MTTF}} = \frac{1.83}{192 \times 4340 \times 317 \times 2} \quad \text{(Chi square value for MTTF upper limit)}$$

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

$\lambda = 3.47 \times 10^{-9}$

λ = 3.47 F.I.T. (60% confidence level @ 25°C)

The following failure rate represents data collected from Maxim Integrated's reliability monitor program. Maxim Integrated performs quarterly life test monitors on its processes. This data is published in the Reliability Report found at http://www.maximintegrated.com/qa/reliability/monitor. Cumulative monitor data for the B8 Process results in a FIT Rate of 0.01 @ 25C and 0.26 @ 55C (0.8 eV, 60% UCL).

B. E.S.D. and Latch-Up Testing (ESD lot I2Y2BQ001B D/C 0133, Latch-Up lot S2Y2DQ002B D/C 0577)

The RT28-2 die type has been found to have all pins able to withstand a HBM transient pulse of +/-1000V 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

MAX3462ESA

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	77	0	I2Y0CQ002A, D/C 0244
			80	0	I2Y0BQ001B, D/C 0132
			80	0	I2Y1BQ001A, D/C 0144
			80	0	I2Y2BQ001B, D/C 0133

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