



RELIABILITY REPORT
FOR
MAX3362AKA#G
PLASTIC ENCAPSULATED DEVICES

November 20, 2008

MAXIM INTEGRATED PRODUCTS

120 SAN GABRIEL DR.
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Approved by
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Conclusion

The MAX3362AKA#G 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 MAX3362 low-power, high-speed transceiver for RS-485/RS-422 communication operates from a single +3.3V power supply. The device contains one differential transceiver consisting of a line driver and receiver. The transceiver operates at data rates up to 20Mbps, with an output skew of less than 6ns. Driver and receiver propagation delays are guaranteed below 50ns. This fast switching and low skew make the MAX3362 ideal for multidrop clock/data distribution applications. The output level is guaranteed at +1.5V with a standard 54 Ω load, compliant with RS-485 specifications. The transceiver draws 1.7mA supply current when unloaded or fully loaded with the drivers disabled. Additionally, the MAX3362 has a low-power shutdown mode, reducing the supply current to 1 μ A. The MAX3362 has a 1/8-unit-load receiver input impedance, allowing up to 256 transceivers on the bus. The MAX3362 is designed for half-duplex communication. The device has a hot-swap feature that eliminates false transitions on the data cable during circuit initialization. The drivers are short-circuit current limited, and a thermal shutdown circuit protects against excessive power dissipation. The MAX3362 is available in an 8-pin SOT package and specified over industrial and automotive temperature ranges.

II. Manufacturing Information

A. Description/Function:	3.3V, High-Speed, RS-485/RS-422 Transceiver in SOT Package
B. Process:	B8
C. Number of Device Transistors:	0
D. Fabrication Location:	California or Texas
E. Assembly Location:	Carsem Malaysia, UTL Thailand
F. Date of Initial Production:	Pre 1997

III. Packaging Information

A. Package Type:	8-Pin SOT23
B. Lead Frame:	Copper Alloy
C. Lead Finish:	85Sn/15Pb plate
D. Die Attach:	Ag Filled Epoxy
E. Bondwire:	Au (1.0 mil dia.)
F. Mold Material:	Epoxy with silica filler
G. Assembly Diagram:	#
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:	103°C/W
K. Single Layer Theta Jc:	75°C/W

IV. Die Information

A. Dimensions:	90 X 45 mils
B. Passivation:	Si ₃ N ₄ /SiO ₂ (Silicon nitride/ Silicon dioxide)
C. Interconnect:	Aluminum/Si (Si = 1%)
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:	5 mil. Sq.
H. Isolation Dielectric:	SiO ₂
I. Die Separation Method:	Wafer Saw

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 135°C biased (static) life test are pending. Using these results, the Failure Rate (λ) is calculated as follows:

$$\lambda = \frac{1}{\text{MTTF}} = \frac{1.83}{192 \times 4340 \times 125 \times 2} \quad (\text{Chi square value for MTTF upper limit})$$

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

$$\lambda = 8.6 \times 10^{-9}$$
$$\lambda = 8.6 \text{ F.I.T. (60\% confidence level @ 25°C)}$$

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 B8 Process results in a FIT Rate of 2.71 @ 25C and 17.30 @ 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 RT32 die type has been found to have all pins able to withstand a HBM transient pulse of +/-2500 V per Mil-Std 883 Method 3015.7. Latch-Up testing has shown that this device withstands a current of +/-250 mA.

Table 1
Reliability Evaluation Test Results

MAX3362AKA#G

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES
Static Life Test (Note 1)	Ta = 135°C Biased Time = 192 hrs.	DC Parameters & functionality	125	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