RELIABILITY REPORT

FOR

MXL1016MJ8

PLASTIC ENCAPSULATED DEVICES

January 30, 2015

MAXIM INTEGRATED

160 RIO ROBLES

SAN JOSE, CA 95134

Approved by
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Quality Assurance
Reliability Engineer

Conclusion

The MXL1016MJ8 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 Maxim MXL1016 (10ns, typ) high-speed, complementary-output comparator is designed specifically to interface directly to TTL logic while operating from either a dual ±5V supply or a single +5V supply. The MXL1016 remains stable with the outputs in the active region, which greatly reduces output instability common with slow-moving input signals. In addition, an output latch (LE) is provided. For lower-power, higher-performance comparators, see the MAX912/MAX913 dual/single comparators data sheet. The MAX913 is an improved plug-in replacement for the MXL1016 and the MAX912 is the dual equivalent to the MAX913.

II. Manufacturing Information

A. Description/Function:	Ultra-Fast Precision TTL Comparator
B. Process:	CB2
C. Number of Device Transistors:	
D. Fabrication Location:	Oregon
E. Assembly Location:	Malaysia, Philippines, Thailand
F. Date of Initial Production:	Pre 1997

III. Packaging Information

A. Package Type:	8-pin CDIP
B. Lead Frame:	Alloy42
C. Lead Finish:	63Sn/37Pb
D. Die Attach:	Conductive
E. Bondwire:	Au (1 mil dia.)
F. Mold Material:	Epoxy with silica filler
G. Assembly Diagram:	#05-1501-0268
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:	125°C/W
K. Single Layer Theta Jc:	16°C/W
L. Multi Layer Theta Ja:	N/A
M. Multi Layer Theta Jc:	N/A

IV. Die Information

A. Dimensions:	60X61 mils
B. Passivation:	Si_3N_4 (Silicon nitride)
C. Interconnect:	Au
D. Backside Metallization:	None
E. Minimum Metal Width:	2 microns (as drawn)
F. Minimum Metal Spacing:	2 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 150C biased (static) life test are shown in Table 1. Using these results, the Failure Rate (λ) is calculated as follows:

$$\lambda = \frac{1}{MTTF} = \frac{1.83}{1000 \times 9706 \times 474 \times 2}$$ (Chi square value for MTTF upper limit)

(where 9706 = Temperature Acceleration factor assuming an activation energy of 0.8eV)

$\lambda = 0.20 \times 10^{-9}$

$\lambda = 0.20$ 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 CB2 Process results in a FIT Rate of 0.06 @ 25C and 0.95 @ 55C (0.8 eV, 60% UCL).

B. E.S.D. and Latch-Up Testing (lot NKE0CQ002G, D/C 0405)

The CM86 die type has been found to have all pins able to withstand a HBM transient pulse of +/-2000V 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

MXL1016MJ8

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES	COMMENTS
Static Life Test (Note 1)					
	Ta = 150°C Biased Time = 1000 hrs.	DC Parameters & functionality	80	0	NKE0C2057D, D/C 1107
			80	0	NKE0C2052B, D/C 1023
			78	0	NKE0C2062D, D/C 1144
			80	0	NKE0C2060D, D/C 1144
			80	0	NKE0C0261E, D/C 1211
			76	0	NKE0CA008B, D/C 0428

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