

RELIABILITY REPORT FOR MAX908ESD+T PLASTIC ENCAPSULATED DEVICES

June 30, 2016

MAXIM INTEGRATED

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Approved by
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Conclusion

The MAX908ESD+T 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 MAX907/MAX908/MAX909 are dual/quad/single, high-speed, ultra-low-power voltage comparators designed for use in systems powered from a single +5V supply; the MAX909 also accepts dual ±5V supplies. Their 40ns propagation delay (with 5mV input overdrive) is achieved with a power consumption of only 3.5mW per comparator. The wide input common-mode range extends from 200mV below ground (below the negative supply rail for the MAX909) to within 1.5V of the positive supply rail. Because they are micropower, high-speed comparators that operate from a single +5V supply and include built-in hysteresis, these devices replace a variety of older comparators in a wide range of applications. MAX907/MAX908/MAX909 outputs are TTL-compatible, requiring no external pullup circuitry. All inputs and outputs can be continuously shorted to either supply rail without damage. These easy-to-use comparators incorporate internal hysteresis to ensure clean output switching even when the devices are driven by a slow-moving input signal. The MAX909 features complementary outputs and an output latch. A separate supply pin for extending the analog input range down to -5V is also provided. The dual MAX907 and single MAX909 are available in 8-pin DIP and SO packages, and the quad MAX908 is available in 14-pin DIP and SO packages. These comparators are ideal for single +5V-supply applications that require the combination of high speed, precision, and ultra-low power dissipation.



II. Manufacturing Information

A. Description/Function:	Dual/Quad/Single, High-Speed, Ultra-Low-Power, Single-Supply TTL Comparators
B. Process:	CB3
C. Fabrication Location:	USA
D. Assembly Location:	Philippines
E. Date of Initial Production:	Pre 1997

III. Packaging Information

	A. Package Type:	14-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:	#05-1501-0243
	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:	120°C/W
	K. Single Layer Theta Jc:	37°C/W
	L. Multi Layer Theta Ja:	84°C/W
	M. Multi Layer Theta Jc:	34°C/W
IV. Die	Information	
	A. Dimensions:	63X51 mils
	B. Passivation:	Si ₃ N ₄ (Silicon nitride)
	C. Interconnect:	Au
	D. Backside Metallization:	None
	E. Minimum Metal Width:	Metal1 = 0.5 / Metal2 = 0.6 / Metal3 = 0.6 microns (as drawn)
	F. Minimum Metal Spacing:	Metal1 = 0.45 / Metal2 = 0.5 / Metal3 = 0.6 microns (as drawn)
	G. Bondpad Dimensions:	

SiO₂

Wafer Saw

H. Isolation Dielectric:I. Die Separation Method:



V. Quality Assurance Information

Α.	Quality Assurance Contacts:	Eric Wright (Reliability Engineering) Bryan Preeshl (Vice President of QA)
В.	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:

λ=	1	=	1.83	(Chi square value for MTTF upper limit)	
	MTTF		192 x 9706 x 48 x 2		
			(where 4340 = Temperature Acceleration factor assuming an activation energy of 0.8eV)		
$\lambda = 10.24 \times 10^{-9}$					

𝒫 = 10.24 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 CB3 Process results in a FIT Rate of 0.25 @ 25C and 4.38 @ 55C (0.8 eV, 60% UCL)

B. E.S.D. and Latch-Up Testing

The CM74 die type has been found to have all pins able to withstand an HBM transient pulse of +/-2000V per JEDEC JESD22-A114. Latch-Up testing has shown that this device withstands a current of +/-250mA and overvoltage per JEDEC JESD78.



Table 1 Reliability Evaluation Test Results

MAX908ESD+T

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES	COMMENTS
Static Life Test (Note 1)					
	Ta = 150C	DC Parameters	48	0	
	Biased	& functionality			
	Time = 192 hrs.				

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