



RELIABILITY REPORT
FOR
MAX9063EBS+G45
CHIP SCALE PACKAGE

March 20, 2017

MAXIM INTEGRATED

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SAN JOSE, CA 95134

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Conclusion

The MAX9063EBS+G45 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 MAX9060-MAX9064 are small single comparators, ideal for a wide variety of portable electronics applications such as cell phones, media players, and notebooks that have extremely tight board space and power constraints. These comparators are offered in both, a miniature 4-bump UCSF(tm) package with a 1mm x 1mm footprint (as small as two 0402 resistors), and a 5-pin SOT23 package. The MAX9060-MAX9064 feature an input voltage range of -0.3V to +5.5V independent of supply voltage. These devices maintain high impedance at the inputs even when powered down (V_{CC} or $V_{REF} = 0V$). They also feature internal filtering to provide high RF immunity. The MAX9060 and MAX9061 have open-drain outputs and draw quiescent supply current from a user-supplied reference voltage, V_{REF} , between 0.9V and 5.5V. These devices consume only 100nA (max) supply current and operate over the extended -40°C to +85°C temperature range. The MAX9062, MAX9063 and MAX9064 are single comparators with an internal 0.2V reference. These devices feature either a push-pull or an open-drain output. They consume only 700nA (max) supply current. The MAX9062, MAX9063, and MAX9064 operate down to $V_{CC} = 1V$ over the extended -40°C to +85°C temperature range.

II. Manufacturing Information

A. Description/Function:	Ultra-Small, Low-Power Single Comparators in 4-Bump UCSP and 5-SOT23	
B. Process:	B8	
C. Fabrication Location:	USA	
D. Assembly Location:	USA, Taiwan	Thailand, Malaysia
E. Date of Initial Production:	April 26, 2008	

III. Packaging Information

A. Package Type:	4-bump UCSP	5-pin SOT23
B. Lead Frame:	N/A	Copper
C. Lead Finish:	N/A	100% matte Tin
D. Die Attach:	None	Conductive
E. Bondwire:	N/A	Au (1 mil dia.)
F. Mold Material:	None	Epoxy with silica filler
G. Assembly Diagram:	#05-9000-3029	#05-9000-3169
H. Flammability Rating:	Class UL94-V0	Class UL94-V0
I. Classification of Moisture Sensitivity per JEDEC standard J-STD-020-C	Level 1	Level 1
J. Single Layer Theta Ja:	N/A	324.3°C/W
K. Single Layer Theta Jc:	N/A	82°C/W
L. Multi Layer Theta Ja:	335°C/W	255.9°C/W
M. Multi Layer Theta Jc:	N/A	81°C/W

IV. Die Information

A. Dimensions:	41X41 mils
B. Passivation:	Si ₃ N 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. Isolation Dielectric:	SiO ₂
H. Die Separation Method:	Wafer Saw

V. Quality Assurance Information

- A. Quality Assurance Contacts: Eric Wright (Reliability Engineering)
Brian Standley (Manager, Reliability)
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:

$$\lambda = \frac{1}{\text{MTTF}} = \frac{1.83}{192 \times 4340 \times 557 \times 2} \quad (\text{Chi square value for MTTF upper limit})$$

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

$$\lambda = 1.97 \times 10^{-9}$$

$\lambda = 1.97$ 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 0.06 @ 25C and 0.99 @ 55C (0.8 eV, 60% UCL)

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

The CM92-3 die type has been found to have all pins able to withstand a transient pulse of:

ESD-HBM: +/- 2500V per JEDEC JESD22-A114
ESD-CDM: +/- 750V per JEDEC JESD22-C101

Latch-Up testing has shown that this device withstands a current of +/-250mA and overvoltage per JEDEC JESD78.

Table 1
Reliability Evaluation Test Results

MAX9063EBS+G45

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES	COMMENTS
Static Life Test (Note 1)	Ta = 135C Biased Time = 192 hrs.	DC Parameters & functionality	557	0	

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