RELIABILITY REPORT

FOR

MAX2664EWS+T

WAFER LEVEL PRODUCTS

February 23, 2011

MAXIM INTEGRATED PRODUCTS

120 SAN GABRIEL DR.

SUNNYVALE, CA 94086

Approved by
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Quality Assurance
Reliability Engineer

Conclusion

The MAX2664EWS+T 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 MAX2664 and MAX2665 are ultra-compact LNAs for VHF/UHF applications. These devices incorporate a broadband LNA with an integrated bypass switch. The MAX2664 covers the UHF frequency range from 470MHz to 860MHz, and the MAX2665 covers the VHF frequency range from 75MHz to 230MHz. Each device has a zero-power bypass mode for improved high-signal-level handling conditions. Additionally, the output port is internally matched to 50 while a single external inductor is used to match the input port to 50 . The MAX2664 and MAX2665 are available in a 4-bump (0.8mm x 0.8mm x 0.64mm), lead-free, wafer-level package (WLP).

II. Manufacturing Information

A. Description/Function:	VHF/UHF Low-Noise Amplifiers
B. Process:	MB3
C. Number of Device Transistors:	844
D. Fabrication Location:	California
E. Assembly Location:	Japan
F. Date of Initial Production:	August 17, 2010

III. Packaging Information

A. Package Type:	4-bump WLP 2x2 array
B. Lead Frame:	N/A
C. Lead Finish:	N/A
D. Die Attach:	None
E. Bondwire:	N/A (N/A mil dia.)
F. Mold Material:	Epoxy with silica filler
G. Assembly Diagram:	#05-9000-4096/A
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:	°C/W
K. Single Layer Theta Jc:	°C/W
L. Multi Layer Theta Ja:	103°C/W
M. Multi Layer Theta Jc:	60°C/W

IV. Die Information

A. Dimensions:	34.25 X 34.25 mils
B. Passivation:	BCB
C. Interconnect:	Al with top layer 100% Cu
D. Backside Metallization:	None
E. Minimum Metal Width:	0.35µm F.
Minimum Metal Spacing:	0.35µm
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:	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 135°C biased (static) life test are shown in Table 1. Using these results, the Failure Rate (λ) is calculated as follows:

$$\lambda = \frac{1}{MTTF} = \frac{1.83}{192 \times 4340 \times 48 \times 2}$$ (Chi square value for MTTF upper limit)

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

$\lambda = 22.9 \times 10^{-9}$

$\lambda = 22.9$ F.I.T. (60% confidence level @ 25°C)

The following failure rate represents data collected from Maxim's reliability monitor program. Maxim performs quarterly life test monitors on its processes. This data is published in the Reliability Report found at http://www.maxim-ic.com/qa/reliability/monitor. Cumulative monitor data for the MB3 Process results in a FIT Rate of 0.08 @ 25C and 1.33 @ 55C (0.8 eV, 60% UCL)

B. E.S.D. and Latch-Up Testing (lot SL2XBQ001A, D/C 1016)

The WG59-1 die type has been found to have all pins able to withstand a HBM transient pulse of +/-2500V per JEDEC JESD22-A114. Latch-Up testing has shown that this device withstands a current of +/-250mA and overvoltage per JDEC JESD78.

Table 1
Reliability Evaluation Test Results

MAX2664EWS+T

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	48	0	SL2XBQ001A, D/C 1016

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