RELIABILITY REPORT

FOR

MAX9933EUA+

PLASTIC ENCAPSULATED DEVICES

October 26, 2007

MAXIM INTEGRATED PRODUCTS

120 SAN GABRIEL DR.

SUNNYVALE, CA 94086

Approved by
Ken Wendel
Quality Assurance
Director, Reliability Engineering

Conclusion

The MAX9933EUA+ 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 MAX9930-MAX9933 low-cost, low-power logarithmic amplifiers are designed to control RF power amplifiers (PA) and transimpedance amplifiers (TIA), and to detect RF power levels. These devices are designed to operate in the 2MHz to 1.6GHz frequency range. A typical dynamic range of 45dB makes this family of logarithmic amplifiers useful in a variety of wireless and GPON fiber video applications such as transmitter power measurement, and RSSI for terminal devices. Logarithmic amplifiers provide much wider measurement range and superior accuracy to controllers based on diode detectors. Excellent temperature stability is achieved over the full operating range of -40°C to +85°C. The choice of three different input voltage ranges eliminates the need for external attenuators, thus simplifying PA control-loop design. The logarithmic amplifier is a voltage-measuring device with a typical signal range of -58dBV to -13dBV for the MAX9930/MAX9933, -48dBV to -3dBV for the MAX9931, and -43dBV to +2dBV for the MAX9932. The MAX9930-MAX9933 require an external coupling capacitor in series with the RF input port. These devices feature a power-on delay when coming out of shutdown, holding OUT low for approximately 2.5µs to ensure glitch-free controller output. The MAX9930-MAX9933 family is available in an 8-pin Î¼MAX® package. These devices consume 7mA with a 5V supply, and when powered down, the typical shutdown current is 13µA.

II. Manufacturing Information

A. Description/Function:	2MHz to 1.6GHz 45dB RF-Detecting Controllers and RF Detector
B. Process:	CB3
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 uMAX
B. Lead Frame:	Copper
C. Lead Finish:	100% matte Tin
D. Die Attach:	Conductive Epoxy
E. Bondwire:	Gold (1 mil dia.)
F. Mold Material:	Epoxy with silica filler
G. Assembly Diagram:	#05-9000-2800
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:	221°C/W
K. Single Layer Theta Jc:	41.9°C/W
L. Multi Layer Theta Ja:	206.3°C/W
M. Multi Layer Theta Jc:	41.9°C/W

IV. Die Information

A. Dimensions:	51 X 54 mils
B. Passivation:	Si_3N_4 (Silicon nitride)
C. Interconnect:	Gold
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:	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 150°C biased (static) life test are pending. Using these results, the Failure Rate (λ) is calculated as follows:

$$\lambda = \frac{1}{MTTF} = \frac{1.83}{192 \times 4340 \times 45 \times 2}$$ (Chi square value for MTTF upper limit)

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

$\lambda = 23.86 \times 10^{-9}$

λ = 23.86 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 CB3 Process results in a FIT Rate of 0.14 @ 25C and 2.42 @ 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 OY27-3 die type has been found to have all pins able to withstand a HBM transient pulse of +/-2500V per JEDEC JESD22-A114-D. Latch-Up testing has shown that this device withstands a current of 250mA.

Table 1
Reliability Evaluation Test Results

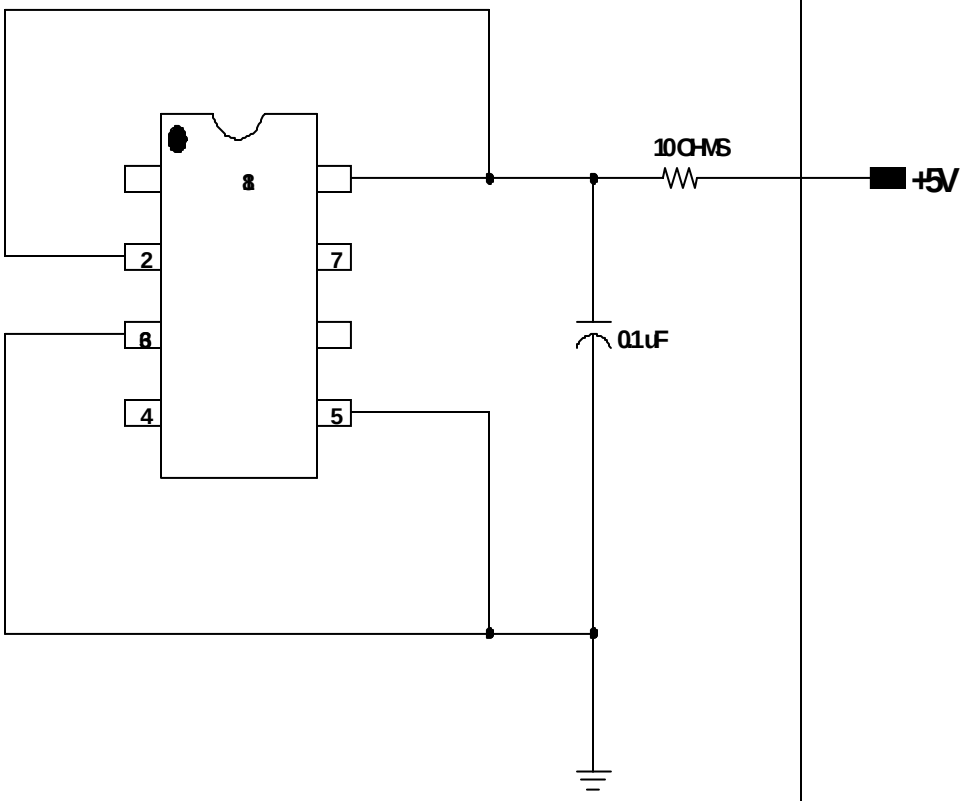
MAX9933EUA+

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES
Static Life Test (Note 1)				
	Ta = 150°C Biased Time = 192 hrs.	DC Parameters & functionality	45	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

ONCE PER SOCKET

ONCE PER BOARD



DEVICES: MAX4000/4001/4002/4003/9930/9931/9932/9933
PACKAGE: 8-uMAX
MAX EXPECTED CURRENT = 8mA

DRAWN BY: TEK TAN
NOTES: