maxim integrated

RELIABILITY REPORT

FOR

MAX4304EUK+T

PLASTIC ENCAPSULATED DEVICES

September 16, 2013

MAXIM INTEGRATED

160 RIO ROBLES

SAN JOSE, CA 95134

Approved by
Sokhom Chum
Quality Assurance
Reliability Engineer

Maxim Integrated. All rights reserved.

maxim integrated™

Conclusion

The MAX4304EUK+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.

Table of Contents

I. ....Device Description **IV. ....Die Information**

II. ....Manufacturing Information **V. ....Quality Assurance Information**

III. ....Packaging Information **VI. ....Reliability Evaluation**

.....Attachments

I. Device Description

A. General

The MAX4104/MAX4105/MAX4304/MAX4305 op amps feature ultra-high speed, low noise, and low distortion in a SOT23 package. The unity-gain-stable MAX4104 requires only 20mA of supply current while delivering 625MHz bandwidth and 400V/µs slew rate. The MAX4304, compensated for gains of +2V/V or greater, delivers a 730MHz bandwidth and a 1000V/µs slew rate. The MAX4105 is compensated for a minimum gain of +5V/V and delivers a 410MHz bandwidth and a 1400V/µs slew rate. The MAX4305 has +10V/V minimum gain compensation and delivers a 340MHz bandwidth and a 1400V/µs slew rate. Low voltage noise density of 2.1nV/ Hz and -88dBc spurious-free dynamic range make these devices ideal for low-noise/low-distortion video and telecommunications applications. These op amps also feature a wide output voltage swing of ±3.7V and ±70mA output current- drive capability. For space-critical applications, they are available in a miniature 5-pin SOT23 package.

Maxim Integrated. All rights reserved.

II. Manufacturing Information

A. Description/Function:	740MHz, Low-Noise, Low-Distortion Op Amps in SOT23-5
B. Process:	CB2
C. Number of Device Transistors:	
D. Fabrication Location:	Oregon
E. Assembly Location:	Philippines or Malaysia
F. Date of Initial Production:	January 20, 1998

III. Packaging Information

A. Package Type:	5-pin SOT23
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:	#05-0601-0518
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:	324.3°C/W
K. Single Layer Theta Jc:	82°C/W
L. Multi Layer Theta Ja:	255.9°C/W
M. Multi Layer Theta Jc:	81°C/W

IV. Die Information

A. Dimensions:	37 X 36 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

Maxim Integrated. All rights reserved.

V. Quality Assurance Information

A. Quality Assurance Contacts: Richard Aburano (Manager, Reliability Engineering)
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:

$$\lambda = \frac{1}{MTTF} = \frac{1.83}{192 \times 9706 \times 319 \times 2}$$ (Chi square value for MTTF upper limit)

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

$\lambda = 1.5 \times 10^{-9}$

λ = 1.5 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 (ESD lot BIDCBX001A D/C 9741, Latch-up lot NIDCCQ001A D/C 0017)

The OA80-2 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.

Maxim Integrated. All rights reserved.

maxim integrated™

Table 1
Reliability Evaluation Test Results

MAX4304EUK+T

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES	COMMENTS
Static Life Test (Note 1)					
	Ta = 150°C	DC Parameters	79	0	NIDADQ001A, D/C 0018
	Biased	& functionality	80	0	BIDACX001A, D/C 9743
	Time = 192 hrs.		80	0	BIDDBX001A, D/C 9741
			80	0	NIDCCQ001A, D/C 0017

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

Maxim Integrated. All rights reserved.