

RELIABILITY REPORT FOR MAX4383EUD+T PLASTIC ENCAPSULATED DEVICES

February 20, 2017

MAXIM INTEGRATED

160 RIO ROBLES SAN JOSE, CA 95134

Eric Wright **Reliability Engineer**

Brian Standley Manager, Reliability



Conclusion

The MAX4383EUD+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
- III.Packaging Information
- V.Quality Assurance Information
- VI.Reliability Evaluation

.....Attachments

I. Device Description

A. General

The MAX4380-MAX4384 family of op amps are unity-gain-stable devices that combine high-speed performance, rail-to-rail outputs, and high-impedance disable mode. These devices operate from a +4.5V to +11V single supply or from ±2.25V to ±5.5V dual supplies. The common-mode input voltage range extends beyond the negative power-supply rail (ground in single-supply applications). The MAX4380-MAX4384 require only 5.5mA of quiescent supply current per op amp while achieving a 210MHz -3dB bandwidth, 55MHz 0.1dB gain flatness and a 485V/µs slew rate. These devices are an excellent solution in low-power/low-voltage systems that require wide bandwidth, such as video, communications, and instrumentation. The MAX4380 single with disable is available in an ultra-small 6-pin SC70 package.

II. Manufacturing Information

integrated_™

Ultra-Small, Low-Cost, 210MHz, Single-Supply Op Amps with Rail-to-Rail

Outputs and Disable

Philippines, Thailand, Malaysia

CB2

USA

April 28, 2001

- A. Description/Function:
- B. Process:
- C. Fabrication Location:
- D. Assembly Location:
- E. Date of Initial Production:

III. Packaging Information

A. Package Type:	14-pin TSSOP
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:	#05-2501-0117
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:	110°C/W
K. Single Layer Theta Jc:	30°C/W
L. Multi Layer Theta Ja:	100.4°C/W
M. Multi Layer Theta Jc:	30°C/W
formation	

IV. Die Information

Α.	Dimensions:	60X69 mils
В.	Passivation:	Si ₃ N 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.	Isolation Dielectric:	SiO ₂
Н.	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)
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 (x) is calculated as follows:

λ=___

<u>1</u> = <u>1.83</u> (Chi square value for MTTF upper limit) MTTF 192 x 4340 x 80 x 2 (where 4340 = Temperature Acceleration factor assuming an activation energy of 0.8eV)

а = 13.7 x 10⁻⁹

λ = 13.7 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 0.14 @ 25C and 2.48 @ 55C (0.8 eV, 60% UCL)

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

The OX74 die type has been found to have all pins able to withstand an 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 JEDEC JESD78.



Table 1 Reliability Evaluation Test Results

MAX4383EUD+T

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES	COMMENTS		
Static Life Test (Note 1)							
	Ta = 150C	DC Parameters	80	0			
	Biased	& functionality					
	Time = 192 hrs.						

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