

RELIABILITY REPORT  
FOR  
MAX44260AXT+T  
PLASTIC ENCAPSULATED DEVICES

August 4, 2011

**MAXIM INTEGRATED PRODUCTS**

120 SAN GABRIEL DR.  
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## Conclusion

The MAX44260AXT+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 MAX44260/MAX44261 offer a unique combination of high speed, precision, low noise, and low-voltage operation making them ideally suited for a large number of signal processing functions such as filtering and amplification of signals in portable and industrial equipment. The amplifiers feature an input offset of less than 50 $\mu$ V and a high-gain bandwidth product of 15MHz while maintaining a low 1.8V supply rail. The devices' rail-to-rail input/outputs and low noise guarantee maximum dynamic range in demanding applications such as 12- to 14-bit SAR ADC drivers. Unlike traditional rail-to-rail input structures, input crossover distortion is absent due to an optimized input stage with an ultra-quiet charge pump. The MAX44260 includes a fast-power-on shutdown mode for further power savings. The MAX44261 offers a unique on-demand calibration pin where the user can invoke self-trimming of the input offset voltage. The family of parts operates from a supply range of 1.8V to 5.5V over the -40°C to +125°C temperature range and can operate down to 1.7V over the 0°C to +70°C temperature range. The MAX44260/MAX44261 are available in small, 6-pin SC70 packages.

**II. Manufacturing Information**

A. Description/Function:	1.8V, 15MHz Low-Offset, Low-Power, Rail-to-Rail I/O Op Amps
B. Process:	S18
C. Number of Device Transistors:	1805
D. Fabrication Location:	California
E. Assembly Location:	Malaysia and Thailand
F. Date of Initial Production:	June 17, 2011

**III. Packaging Information**

A. Package Type:	6-pin SC70
B. Lead Frame:	Copper or Alloy42
C. Lead Finish:	NiPdAu
D. Die Attach:	Non-conductive
E. Bondwire:	Au (0.8 mil dia.)
F. Mold Material:	Epoxy with silica filler
G. Assembly Diagram:	#05-9000-4381
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:	326°C/W
K. Single Layer Theta Jc:	115°C/W
L. Multi Layer Theta Ja:	326.5°C/W
M. Multi Layer Theta Jc:	115°C/W

**IV. Die Information**

A. Dimensions:	29.92 X 30.31 mils
B. Passivation:	Si <sub>3</sub> N <sub>4</sub> /SiO <sub>2</sub> (Silicon nitride/ Silicon dioxide)
C. Interconnect:	Al with Ti/TiN Barrier
D. Backside Metallization:	None
E. Minimum Metal Width:	0.18µm
F. Minimum Metal Spacing:	0.18µm
G. Bondpad Dimensions:	
H. Isolation Dielectric:	SiO <sub>2</sub>
I. Die Separation Method:	Wafer Saw

## 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 135°C biased (static) life test are shown in Table 1. Using these results, the Failure Rate ( $\lambda$ ) is calculated as follows:

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

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

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

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

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 S18 Process results in a FIT Rate of 0.40 @ 25C and 6.96 @ 55C (0.8 eV, 60% UCL)

### B. E.S.D. and Latch-Up Testing (lot SW2ZDQ001B, D/C 1113)

The OY68 die type has been found to have all pins able to withstand a HBM transient pulse of +/- 2000V per JEDEC JESD22-A114. Latch-Up testing has shown that this device withstands a current of +/- 100mA and overvoltage per JEDEC JESD78.

**Table 1**  
Reliability Evaluation Test Results

**MAX44260AXT+T**

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES	COMMENTS
<b>Static Life Test</b> (Note 1)	Ta = 135°C Biased Time = 192 hrs.	DC Parameters & functionality	48	0	SW2ZDQ001B, D/C 1113

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