

RELIABILITY REPORT FOR MAX44280AXT+

PLASTIC ENCAPSULATED DEVICES

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MAXIM INTEGRATED

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Conclusion

The MAX44280AXT+ 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.

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- I. Device Description
 - A. General

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The MAX44280 offers a unique combination of high speed, precision, low noise, and low-voltage operation making it ideally suited for a large number of signal processing functions such as filtering and amplification of signals in portable and industrial equipment. The amplifier features an input offset of less than 50µV and a high-gain bandwidth product of 50MHz while maintaining a low 1.8V supply rail. The device is internally compensated for gains of 5V/V or greater. The device's rail-to-rail input/outputs and low noise guarantee maximum dynamic range in demanding applications such as 12- to 16-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 MAX44280 includes a fast-power-on shutdown mode for further power savings. The MAX44280 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 MAX44280 is available in a small, 6-pin SC70 package and is also available in a 1mm x 1.5mm thin µDFN (ultra-thin LGA) package.



II. Manufacturing Information

- A. Description/Function:1.8V, 50MHz, Low-Offset, Low-Power, Rail-to-Rail I/O Op AmpB. Process:S18C. Number of Device Transistors:1805D. Fabrication Location:CaliforniaE. Assembly Location:Texas, Malaysia, Thailand
- F. Date of Initial Production: December 21, 2011

III. Packaging Information

A. Package Type:	6-pin SC70
B. Lead Frame:	Copper
C. Lead Finish:	100% matte Tin
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

Α.	Dimensions:	29.92X30.315 mils
В.	Passivation:	$Si_3N_4/SiO_2\;$ (Silicon nitride/ Silicon dioxide)
C.	Interconnect:	Al with Ti/TiN Barrier
D.	Backside Metallization:	None
E.	Minimum Metal Width:	0.18um
F.	Minimum Metal Spacing:	0.18um
G.	Bondpad Dimensions:	
Н.	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)
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

Accelerated Life Test

The results of the 135C biased (static) life test are shown in Table 1. Using these results, the Failure Rate (λ) is calculated as follows:

$$\lambda = \underbrace{1}_{\text{MTTF}} = \underbrace{1.83}_{1000 \text{ x } 4340 \text{ x } 229 \text{ x } 2} \text{ (Chi square value for MTTF upper limit)}$$

$$\lambda = 0.92 \text{ x } 10^{-9}$$

$$\lambda = 0.92 \text{ F.I.T. (60\% confidence level @ 25°C)}$$

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 S18 Process results in a FIT Rate of 0.05 @ 25C and 0.93 @ 55C (0.8 eV, 60% UCL)

B. E.S.D. and Latch-Up Testing (lot SABE7Q003A, D/C 1143)

The OY68-3 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 +/-100mA and overvoltage per JEDEC JESD78.



Table 1 Reliability Evaluation Test Results

MAX44280AXT+

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES	COMMENTS
Static Life Test (Note	e 1) Ta = 135°C Biased Time = 1000 hrs.	DC Parameters & functionality	229	0	EADW5A007Q, D/C 1219

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