

RELIABILITY REPORT
FOR
MAX8572EUT+
PLASTIC ENCAPSULATED DEVICES

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MAXIM INTEGRATED

160 RIO ROBLES
SAN JOSE, CA 95134

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Quality Assurance
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Conclusion

The MAX8572EUT+ 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

The MAX8570 family of LCD step-up converters uses an internal n-channel switch and an internal p-channel output isolation switch. These converters operate from a 2.7V to 5.5V supply voltage and deliver up to 28V at the output. A unique control scheme provides the highest efficiency over a wide range of load conditions. The internal MOSFET switch reduces external component count and a high switching frequency (up to 800kHz) allows for tiny surface-mount components. Three current-limit options are available. The MAX8570 and MAX8572 use a 110mA current limit to reduce ripple and component size in low-current applications. For high-power requirements, the MAX8574 and MAX8575 use a 500mA current limit and supply up to 20mA at 20V. The MAX8571 and MAX8573 use a 250mA current limit for a compromise between ripple and power. Built-in safety features protect the internal switch and down-stream components from fault conditions. Additional features include a low quiescent current and a True Shutdown(tm) mode to save power. The MAX8570/MAX8571/MAX8574 allow the user to set the output voltage between 3V and 28V, and the MAX8572/MAX8573/MAX8575 have a preset 15V output. These step-up converters are ideal for small LCD panels with low current requirements, but can also be used in other applications. The MAX8571 evaluation kit is available to help reduce design time.

II. Manufacturing Information

A. Description/Function:	High-Efficiency LCD Boost with True Shutdown
B. Process:	B8
C. Number of Device Transistors:	741
D. Fabrication Location:	California or Texas
E. Assembly Location:	Thailand
F. Date of Initial Production:	July 09, 2004

III. Packaging Information

A. Package Type:	6-pin SOT23
B. Lead Frame:	Copper
C. Lead Finish:	100% matte Tin
D. Die Attach:	Non-conductive
E. Bondwire:	Au (1.3 mil dia.)
F. Mold Material:	Epoxy with silica filler
G. Assembly Diagram:	#05-9000-1157
H. Flammability Rating:	Class UL94-V0
I. Classification of Moisture Sensitivity per JEDEC standard J-STD-020-C	Level 1
J. Single Layer Theta Jb:	115°C/W
K. Single Layer Theta Jc:	80°C/W
L. Multi Layer Theta Ja:	74.6°C/W
M. Multi Layer Theta Jc:	6.1°C/W

IV. Die Information

A. Dimensions:	60X41 mils
B. Passivation:	Si ₃ N ₄ /SiO ₂ (Silicon nitride/ Silicon dioxide)
C. Interconnect:	Al/0.5%Cu with Ti/TiN Barrier
D. Backside Metallization:	None
E. Minimum Metal Width:	0.8 microns (as drawn)
F. Minimum Metal Spacing:	0.8 microns (as drawn)
G. Bondpad Dimensions:	
H. 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)
- 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 135C biased (static) life test are shown in Table 1. Using these results, the Failure Rate (λ) is calculated as follows:

$$\lambda = \frac{1}{\text{MTTF}} = \frac{1.83}{192 \times 4340 \times 144 \times 2} \quad (\text{Chi square value for MTTF upper limit})$$

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

$$\lambda = 7.64 \times 10^{-9}$$

$$\lambda = 7.64 \text{ F.I.T. (60\% confidence level @ 25}^\circ\text{C)}$$

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 B8 Process results in a FIT Rate of 0.01 @ 25C and 0.26 @ 55C (0.8 eV, 60% UCL).

B. E.S.D. and Latch-Up Testing (lot SOB2BQ001A, D/C 0442)

The PN50-2 die type has been found to have all pins able to withstand a HBM transient pulse of +/-1000V per Mil-Std 883 Method 3015.7. Latch-Up testing has shown that this device withstands a current of +/-250mA.

Table 1
Reliability Evaluation Test Results

MAX8572EUT+

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES	COMMENTS
Static Life Test (Note 1)	Ta = 135°C	DC Parameters	48	0	SOB5BQ001A, D/C 0441
	Biased	& functionality	48	0	SOB1BQ001A, D/C 0442
	Time = 192 hrs.		48	0	SOB5AQ001A, D/C 0415

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