

RELIABILITY REPORT
FOR
MAX8868EUK50+T
PLASTIC ENCAPSULATED DEVICES

January 30, 2015

MAXIM INTEGRATED

160 RIO ROBLES
SAN JOSE, CA 95134

Approved by
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Conclusion

The MAX8868EUK50+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.

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I. Device Description

A. General

The MAX8867/MAX8868 low-noise, low-dropout linear regulators operate from a 2.5V to 6.5V input and deliver up to 150mA. Typical output noise for these devices is just 30 μ VRMS, and typical dropout is only 165mV at 150mA. The output voltage is preset to voltages in the range of 2.5V to 5.0V, in 100mV increments. The MAX8867 and MAX8868 are pin-compatible with the MAX8863 and MAX8864, except for the BP pin. Designed with an internal P-channel MOSFET pass transistor, the MAX8867/MAX8868 maintain a low 100 μ A supply current, independent of the load current and dropout voltage. Other features include a 10nA logic-controlled shutdown mode, short-circuit and thermal-shutdown protection, and reverse battery protection. The MAX8868 also includes an auto-discharge function, which actively discharges the output voltage to ground when the device is placed in shutdown. Both devices come in regular and thin 5-pin SOT23 packages.

II. Manufacturing Information

A. Description/Function:	Low-Noise, Low-Dropout, 150mA Linear Regulators in SOT23
B. Process:	B12
C. Number of Device Transistors:	
D. Fabrication Location:	Oregon, California or Texas
E. Assembly Location:	Malaysia, Thailand
F. Date of Initial Production:	October 25, 1997

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:	#05-1101-0050
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:	38X57 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:	1.2 microns (as drawn)
F. Minimum Metal Spacing:	1.2 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:

$$\lambda = \frac{1}{\text{MTTF}} = \frac{1.83}{192 \times 4340 \times 160 \times 2} \quad (\text{Chi square value for MTTF upper limit})$$

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

$$\lambda = 6.87 \times 10^{-9}$$

$$\lambda = 6.87 \text{ F.I.T. (60\% confidence level @ 25°C)}$$

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 B12 Process results in a FIT Rate of 0.05 @ 25C and 0.92 @ 55C (0.8 eV, 60% UCL).

B. E.S.D. and Latch-Up Testing (lot NL9BBX001B, D/C 9736)

The PX36-1 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.

Table 1
Reliability Evaluation Test Results

MAX8868EUK50+T

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES	COMMENTS
Static Life Test (Note 1)	Ta = 135°C	DC Parameters	80	0	NL9BBX001A, D/C 9736
	Biased	& functionality	80	0	NL9BBX001B, D/C 9736
	Time = 192 hrs.				

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