



RELIABILITY REPORT  
FOR  
MAX34446ETL+T  
PLASTIC ENCAPSULATED DEVICES

October 9, 2017

**MAXIM INTEGRATED**

160 RIO ROBLES  
SAN JOSE, CA 95134

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## Conclusion

The MAX34446ETL+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 MAX34446 data logger for power supplies can monitor voltages for overvoltage and undervoltage, as well as for overcurrent conditions and overtemperature conditions. The device constantly checks for user-programmable thresholds; when these thresholds are exceeded, the device logs the recent real-time operating conditions in nonvolatile flash memory. The device can monitor up to four voltages or currents, and can monitor three temperature sensors. See the *Typical Application Circuit/Block Diagram* for more details.

**II. Manufacturing Information**

A. Description/Function:	PMBus Power-Supply Data Logger
B. Process:	TS18
C. Fabrication Location:	Taiwan
D. Assembly Location:	China, Taiwan, Thailand
E. Date of Initial Production:	June 14, 2011

**III. Packaging Information**

A. Package Type:	40-pin TQFN
B. Lead Frame:	Copper
C. Lead Finish:	100% matte Tin
D. Bondwire:	Au (1 mil dia.)
E. Mold Material:	Epoxy with silica filler
F. Assembly Diagram:	#05-MAXCIM-0695
G. Flammability Rating:	Class UL94-V0
H. Classification of Moisture Sensitivity per JEDEC standard J-STD-020-C	Level 1
I. Single Layer Theta Ja:	39°C/W
J. Single Layer Theta Jc:	1.5°C/W
K. Multi Layer Theta Ja:	28°C/W
L. Multi Layer Theta Jc:	1.5°C/W

**IV. Die Information**

A. Dimensions:	102.36X125.2 mils
B. Passivation:	Si <sub>3</sub> N <sub>4</sub> /SiO <sub>2</sub>
C. Interconnect:	Al/0.5%Cu
D. Minimum Metal Width:	0.23 microns (as drawn)
E. Minimum Metal Spacing:	0.23 microns (as drawn)
F. Isolation Dielectric:	SiO <sub>2</sub>
G. 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)
- 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 ( $\lambda$ ) is calculated as follows:

$$\lambda = \frac{1}{\text{MTTF}} = \frac{1.83}{192 \times 4340 \times 45 \times 2} \quad (\text{Chi square value for MTTF upper limit})$$

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

$$\lambda = 24.4 \times 10^{-9}$$

$$\lambda = 24.4 \text{ F.I.T. (60\% confidence level @ 25°C)}$$

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 TS18 Process results in a FIT Rate of 0.1@ 25C and 1.9@ 55C (0.8 eV, 60% UCL)

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

The MI08 die type has been found to have all pins able to withstand a transient pulse of:

ESD-HBM: +/- 2500V per JEDEC JESD22-A114

ESD-CDM: +/- 750V per JEDEC JESD22-C101

Latch-Up testing has shown that this device withstands a current of +/-250mA and overvoltage per JEDEC JESD78.

**Table 1**  
Reliability Evaluation Test Results

**MAX34446ETL+T**

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES	COMMENTS
<b>Static Life Test</b> (Note 1)	Ta = 135C Biased Time = 192 hrs.	DC Parameters & functionality	45	0	

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