RELIABILITY REPORT

FOR

MAX4507CAP+, MAX4507CPN+,
MAX4507CWN+, MAX4507EAP+,
MAX4507EWN+

PLASTIC ENCAPSULATED DEVICES

April 20, 2018

MAXIM INTEGRATED

160 RIO ROBLES

SAN JOSE, CA 95134

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Conclusion

The MAX4507 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 MAX4507 multiple, two-terminal signal-line protectors are pin-compatible with the industry-standard MAX366/MAX367. These new circuit protectors feature fault-protected inputs and Rail-to-Rail® signal handling capability. The input pins are protected from overvoltage faults up to ±36V with power on or ±40V with power off. During a fault condition, the input terminal becomes an open circuit and only nanoamperes of leakage current flow from the source; but the switch output (OUT_) furnishes typically 19mA from the appropriate polarity supply to the load. This ensures unambiguous rail-to-rail outputs when a fault begins and ends.

II. Manufacturing Information

A. Description/Function:	Fault-Protected, High-Voltage Signal-Line Protectors
B. Process:	S5
C. Device Count:	N/A
D. Fabrication Location:	USA
E. Assembly Location:	Thailand, Malaysia, Philippines
F. Date of Initial Production:	January 23, 1999

III. Packaging Information

A. Package Type:	SSOP, PDIP, SOIC (W)
B. Lead Frame:	Cu194
C. Lead Finish:	Matte Tin
D. Die Attach:	Ablebond 8390A
E. Bondwire:	1 mil Au
F. Mold Material:	G605L, G600, CEL8240HF10-LXC
G. Assembly Diagram:	05-0301-0853, 05-0301-0854, 05-0301-0855
H. Flammability Rating:	UL-94 (V-0 Rating)
I. Classification of Moisture Sensitivity per JEDEC standard J-STD-020-C	Level 1
J. Single Layer Theta Ja:	125 °C/W (SSOP)
K. Single Layer Theta Jc:	33 °C/W (SSOP)
L. Multi Layer Theta Ja:	83 °C/W (SSOP)
M. Multi Layer Theta Jc:	33 °C/W (SSOP)

IV. Die Information

A. Dimensions:	113X174 mils
B. Passivation:	N/A

V. Quality Assurance Information

A. Quality Assurance Contacts:	Brian Standley (Manager, Reliability) Bryan Preeshl (SVP 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 125C biased (static) life test are shown in Table 1. Using these results, the Failure Rate λ is calculated as follows:

$$\lambda = \frac{1}{MTTF} = \frac{1.83}{1000 \times 2454 \times 77 \times 2}$$ (Chi square value for MTTF upper limit)

(where 2454 = Temperature Acceleration factor assuming an activation energy of 0.8eV)

$\lambda = 4.85 \times 10^{-9}$

$\lambda = 4.85$ FITs (60% confidence level @ 25°C)

Maxim Integrated performs quarterly life test monitors on its processes. This data is published in the Reliability Report found at https://www.maximintegrated.com/en/support/qa-reliability/reliability/reliability-monitor-program.html.

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

The MAX4507x has been found to have all pins able to withstand an HBM transient pulse of +/- 700 V per JEDEC / ESDA JS-001. Latch-Up testing has shown that this device withstands +/- 250 mA current injection and supply overvoltage per JEDEC JESD78.

Table 1

Reliability Evaluation Test Results

MAX4507EPN

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES	COMMENTS
Static Life Test (Note 1)					
	Ta = 125C Biased Time = 1000 hrs.	DC Parameters & functionality	77	0	

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