RELIABILITY REPORT

FOR

MAXM17537ALY#, MAXM17537ALY#T

May 8, 2020

MAXIM INTEGRATED

160 RIO ROBLES

SAN JOSE, CA 95134

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Conclusion

The MAXM17537 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 Himalaya series of voltage regulator ICs and power modules enable cooler, smaller, and simpler power supply solutions. The MAXM17537 is an easy-to-use, step-down power module that combines a switching power supply controller, dual n-channel MOSFET power switches, fully shielded inductor, and the compensation components in a low-profile, thermally-efficient system-in-package (SiP). The device operates over a wide input-voltage range of 4.5V to 60V and delivers up to 3A continuous output current with excellent line and load regulation over an outputvoltage range of 8V to 24V. The high level of integration significantly reduces design complexity and manufacturing risks, and offers a true plug-and-play power supply solution, reducing time to market.

II. Manufacturing Information

A. Description/Function:	4.5V to 60V, 3A High-Efficiency, DC-DC Step-Down SiP Power Module with Integrated Inductor
B. Process:	S18
C. Device Count:	N/A
D. Fabrication Location:	USA
E. Assembly Location:	Korea
F. Date of Initial Production:	July 11, 2019

III. Packaging Information

A. Package Type:	Power LGA
B. Lead Frame:	N/A
C. Lead Finish:	N/A
D. Die Attach:	95SN5SB
E. Bondwire:	1.30 Mil Au; 2.00Mil Au
F. Mold Material:	GE100LFCWA
G. Assembly Diagram:	05-101320
H. Flammability Rating:	UL-94 (V-0 Rating)
I. Classification of Moisture Sensitivity per JEDEC standard J-STD-020-C	Level 3

A. Single Layer Theta Ja:	N/A
B. Single Layer Theta Jc:	N/A
C. Multi Layer Theta Ja:	N/A
D. Multi Layer Theta Jc:	N/A

IV. Die Information

A. Dimensions:	119.29X107.09 mils
B. Passivation:	SiN/SiO2

V. Quality Assurance Information

A. Quality Assurance Contacts:	Veronica Mercado (Engineer, Reliability) Ryan Wall (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:

$$\lambda = \frac{1}{MTTF} = \frac{1.83}{192\ x\ 2454\ x\ 77\ x\ 2}$$ (Chi square value for MTTF upper limit)

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

$\lambda = 25.2\ x\ 10^{-9}$
$\lambda = 25.2\ FITs\ (60\%\ confidence\ level\ @25°C)$

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.

S18 cumulative process FIT
$\lambda = 0.02\ FITs\ (60\%\ confidence\ level\ @25°C)$
$\lambda = 0.24\ FITs\ (60\%\ confidence\ level\ @55°C)$

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

The MAXM17537 has been found to have all pins able to withstand an HBM transient pulse of +/- 2500 V per JEDEC / ESDA JS-001. Latch-Up testing has shown that this device withstands +/- 100 mA current injection and supply overvoltage per JEDEC JESD78.

Table 1
Reliability Evaluation Test Results
MAX17506ATP+ (Note 1)

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES	COMMENTS
Static Life Test (Note 2)					
	Ta = 125C Biased Time = 192 hrs.	DC Parameters & functionality	77	0	

Note 1: MAXM17537 and MAX17506 have the same silicon.

Note 2: Life Test Data may represent plastic DIP qualification lots.