

RELIABILITY REPORT  
FOR  
MAXM15066AMB+  
MAXM15066AMB+T

September 7, 2020

**MAXIM INTEGRATED**

160 RIO ROBLES  
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## Conclusion

The MAXM15066 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 MAXM15065/MAXM15066/MAXM15067 are a family of high-efficiency, synchronous step-down DC-DC modules with integrated controller, MOSFETs, compensation components, and inductor that operate over a wide input-voltage range. The modules operate from 4.5V to 60V input and deliver up to 300mA output current. The MAXM15065 and MAXM15066 are fixed 3.3V and 5V output modules respectively. The MAXM15067 is an adjustable output (0.9V to 6.3V) module. The modules significantly reduce design complexity, manufacturing risks, and offer a true plug and play power/supply solution, reducing time-to-market.

The MAXM15065/MAXM15066/MAXM15067 modules employ peak-current-mode control architecture. To reduce input inrush current, the modules offer a fixed 3.75ms soft-start time.

The MAXM15065/MAXM15066/MAXM15067 modules are available in a low profile, compact 10-pin, 2.6mm x 3mm x 1.5mm, uSLIC™ package.

**II. Manufacturing Information**

A. Description/Function:	4.5V to 60V, 300mA Himalaya uSLIC Step-Down Power Module
B. Process:	S18
C. Device Count:	17522
D. Fabrication Location:	Japan
E. Assembly Location:	China
F. Date of Initial Production:	April 3, 2019

**III. Packaging Information**

A. Package Type:	eMGA
B. Lead Frame:	ENIG
C. Lead Finish:	N/A
D. Die Attach:	N/A
E. Bondwire:	N/A
F. Mold Material:	N/A
G. Assembly Diagram:	05-100674
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:	N/A
K. Single Layer Theta Jc:	N/A
L. Multi Layer Theta Ja:	42.8 °C/W
M. Multi Layer Theta Jc:	21.8 °C/W

**IV. Die Information**

A. Dimensions:	55.12X65.35 mils
B. Passivation:	SiN/SiO2

## V. Quality Assurance Information

<b>A. Quality Assurance Contacts:</b>	Ryan Wall (Manager, Reliability) Michael Cairnes (Executive Director, Reliability) Bryan Preeshl (SVP of QA)
<b>B. Outgoing Inspection Level:</b>	0.1% for all electrical parameters guaranteed by the Datasheet. 0.1% for all Visual Defects.
<b>C. Observed Outgoing Defect Rate:</b>	< 50 ppm
<b>D. Sampling Plan:</b>	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  $\lambda$  is calculated as follows:

$$\lambda = \frac{1}{MTTF} = \frac{1.83}{192 \times 2454 \times 80 \times 2} \text{ (Chi square value for MTTF upper limit)}$$

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

$$\lambda = 24.30 \times 10^{-9}$$

$$\lambda = 24.30 \text{ FITs (60\% confidence level @25°C)}$$

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

$$\lambda = 0.02 \text{ FITs (60\% confidence level @25°C)}$$

$$\lambda = 0.24 \text{ FITs (60\% confidence level @55°C)}$$

### B. ESD and Latch-Up Testing

The MAXM15066 has been found to have all pins able to withstand an HBM transient pulse of  $\pm 2500$  V per JEDEC / ESDA JS-001. Latch-Up testing has shown that this device withstands  $\pm 250$  mA current injection and supply overvoltage per JEDEC JESD78.

**Table 1**  
Reliability Evaluation Test Results  
**MAXM15067AMB+T (Note 1)**

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES	COMMENTS
Static Life Test (Note 2)	Ta = 125°C Biased Time = 192 hrs.	DC parameters & functionality	80	0	

Note 1: MAXM15066 and MAXM15067 are the same silicon.

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