RELIABILITY REPORT

FOR

MAXM15063AMB+, MAXM15063AMB+T

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MAXIM INTEGRATED

160 RIO ROBLES

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Conclusion

The MAXM15063 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 MAXM15062/MAXM15063/MAXM15064 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 MAXM15062 and MAXM15063 are fixed 3.3V and 5V output modules respectively. The MAXM15064 is an adjustable output (0.9V to 5V) module. The modules significantly reduce design complexity, manufacturing risks, and offer a true plug and play power/ supply solution, reducing time-to-market.

The MAXM15062/3/4 modules employ peak-currentmode control architecture. To reduce input inrush current, the modules offer a fixed 4.1ms soft-start time.

The MAXM15062/3/4 modules are available in a low profile, compact 10-pin, 2.6mm × 3mm × 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:	Taiwan
F. Date of Initial Production:	April 19, 2019

III. Packaging Information

A. Package Type:	eMGA
B. Lead Frame:	N/A
C. Lead Finish:	N/A
D. Die Attach:	N/A
E. Bondwire:	N/A
F. Mold Material:	N/A
G. Assembly Diagram:	05-100800
H. Flammability Rating:	N/A
I. Classification of Moisture Sensitivity per JEDEC standard J-STD-020-C	Level 3
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:	55.1181X65.3543 mils
B. Passivation:	Si_3N_4/SiO_2

V. Quality Assurance Information

A. Quality Assurance Contacts:	Ryan Wall (Manager, Reliability) Michael Cairnes (Executive Director, 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:

$$\lambda = \frac{1}{MTTF} = \frac{1.83}{1000\ x\ 2454\ x\ 231\ x\ 2}$$ (Chi square value for MTTF upper limit)

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

$$\lambda = 1.61\ x\ 10^{-9}$$

$$\lambda = 1.61\ FITs\ (60\%\ confidence\ level\ @25°C)$$

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 data:

$$\lambda = 0.02\ FITs\ (60\%\ confidence\ level\ @25°C)$$
$$\lambda = 0.25\ FITs\ (60\%\ confidence\ level\ @55°C)$$

B. ESD and Latch-Up Testing

The MAXM15063 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

MAXM15064AMB+ (Note 1)

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES	COMMENTS
Static Life Test (Note 2)	Ta = 125°C Biased Time = 1000 hrs.	DC parameters & functionality	77	0	R29673AL1
Static Life Test (Note 2)	Ta = 125°C Biased Time = 1000 hrs.	DC parameters & functionality	77	0	R29673BL1
Static Life Test (Note 2)	Ta = 125°C Biased Time = 1000 hrs.	DC parameters & functionality	77	0	R29673CL1

Note 1: MAXM15063 uses the same silicon as MAXM15064.

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