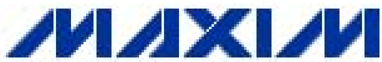

RELIABILITY REPORT

FOR

MAX15103EWL+T

WAFER LEVEL PRODUCTS

November 15, 2011

MAXIM INTEGRATED PRODUCTS

120 SAN GABRIEL DR.

SUNNYVALE, CA 94086

Approved by
Richard Aburano
Quality Assurance
Manager, Reliability Engineering

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Conclusion

The MAX15103EWL+T successfully meets the quality and reliability standards required of all Maxim products. In addition, Maxim's continuous reliability monitoring program ensures that all outgoing product will continue to meet Maxim's quality and reliability standards.

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I. Device Description

A. General

The MAX15103 is a small, low-dropout linear regulator optimized for networking, datacom, and server applications. The regulator delivers up to 3A from a 1.7V to 5.5V input supply with output accuracy of ±1.6%. The output is adjustable down to 0.6V with a guaranteed dropout voltage of less than 200mV at full load. The internal p-channel switch is protected with a foldback current limit and thermal shutdown. The MAX15103 features an external bypass input to reduce noise. This bypass input also serves as a soft-start control. An enable input and power-good output are included for power sequence control. The MAX15103 is available in a 1.6mm x 2.7mm WLP package and is fully specified from the -40°C to +85°C operating temperature range.

II. Manufacturing Information

A. Description/Function:	Small 3A, Low-Dropout Linear Regulator in a 2.7mm x 1.6mm Package
B. Process:	S18
C. Number of Device Transistors:	6860
D. Fabrication Location:	USA
E. Assembly Location:	Japan and USA
F. Date of Initial Production:	September 2, 2011

III. Packaging Information

A. Package Type:	15-bump WLP 3x5 array
B. Lead Frame:	N/A
C. Lead Finish:	N/A
D. Die Attach:	N/A
E. Bondwire:	N/A (N/A mil dia.)
F. Mold Material:	N/A
G. Assembly Diagram:	#05-9000-4586
H. Flammability Rating:	Class UL94-V0
I. Classification of Moisture Sensitivity per JEDEC standard J-STD-020-C	Level 1
J. Single Layer Theta Ja:	°C/W
K. Single Layer Theta Jc:	°C/W
L. Multi Layer Theta Ja:	52°C/W
M. Multi Layer Theta Jc:	°C/W

IV. Die Information

A. Dimensions:	105.9 X 63.4 mils
B. Passivation:	Si_3N_4/SiO_2 (Silicon nitride/ Silicon dioxide)
C. Interconnect:	Al/0.5%Cu with Ti/TiN Barrier
D. Backside Metallization:	None
E. Minimum Metal Width:	Metal1 = 0.23 / Metal2-3 = 0.28 / Metal 4 = 2.6 microns (as drawn)
F. Minimum Metal Spacing:	Metal1 = 0.23 / Metal2-3 = 0.28 / Metal 4 = 3.0 microns (as drawn)
G. Bondpad Dimensions:	
H. Isolation Dielectric:	SiO_2
I. Die Separation Method:	Wafer Saw

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V. Quality Assurance Information

A. Quality Assurance Contacts: Richard Aburano (Manager, Reliability Engineering)
Don Lipps (Manager, Reliability Engineering)
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 (λ) is calculated as follows:

$$\lambda = \frac{1}{MTTF} = \frac{1.83}{192 \times 4340 \times 48 \times 2}$$ (Chi square value for MTTF upper limit)

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

$\lambda = 22.9 \times 10^{-9}$

λ = 22.9 F.I.T. (60% confidence level @ 25°C)

The following failure rate represents data collected from Maxim's reliability monitor program. Maxim performs quarterly life test monitors on its processes. This data is published in the Reliability Report found at http://www.maxim-ic.com/qa/reliability/monitor. Cumulative monitor data for the S18 Process results in a FIT Rate of 0.06 @ 25C and 1.00 @ 55C (0.8 eV, 60% UCL)

B. E.S.D. and Latch-Up Testing (lot S2OZBQ001D, D/C 1135)

The NQ78 die type has been found to have all pins able to withstand a HBM transient pulse of +/- 2500V per JEDEC JESD22-A114. Latch-Up testing has shown that this device withstands a current of +/- 250mA and overvoltage per JEDEC JESD78.

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Table 1

Reliability Evaluation Test Results

MAX15103EWL+T

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES	COMMENTS
Static Life Test (Note 1)					
	Ta = 135C Biased Time = 192 hrs.	DC Parameters & functionality	48	0	S2OZBQ001D, D/C 1135

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

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