RELIABILITY REPORT

FOR

MAX1792EUAxx+T

PLASTIC ENCAPSULATED DEVICES

May 25, 2013

MAXIM INTEGRATED

160 RIO ROBLES

SAN JOSE, CA 95134

Approved by
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Quality Assurance
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Conclusion

The MAX1792EUAxx+T 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 MAX1792 low-dropout linear regulator operates from a +2.5V to +5.5V supply and delivers a guaranteed 500mA load current with low 130mV dropout. The high-accuracy (±1%) output voltage is preset at an internally trimmed voltage (see Selector Guide) or can be adjusted from 1.25V to 5.0V with an external resistive divider. An internal PMOS pass transistor allows the low 80µA supply current to remain independent of load, making this device ideal for portable battery-operated equipment such as personal digital assistants (PDAs), cellular phones, cordless phones, base stations, and notebook computers. Other features include an active-low open-drain reset output with a 4ms timeout period that indicates when the output is out of regulation, a 0.1µA shutdown mode, short-circuit protection, and thermal shutdown protection. The device is available in a miniature 1.3W, 8-pin power-µMAX® package with a metal pad on the underside of the package.

II. Manufacturing Information

A. Description/Function:	500mA, Low-Dropout Linear Regulator in µMAX
B. Process:	B8
C. Number of Device Transistors:	47901
D. Fabrication Location:	USA
E. Assembly Location:	Philippines, Thailand, Malaysia
F. Date of Initial Production:	April 22, 2000

III. Packaging Information

A. Package Type:	8-pin µMAX
B. Lead Frame:	Copper
C. Lead Finish:	100% matte Tin
D. Die Attach:	Conductive
E. Bondwire:	Au (1.3 mil dia.)
F. Mold Material:	Epoxy with silica filler
G. Assembly Diagram:	#05-2301-0027
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:	97°C/W
K. Single Layer Theta Jc:	5°C/W
L. Multi Layer Theta Ja:	77.6°C/W
M. Multi Layer Theta Jc:	5°C/W

IV. Die Information

A. Dimensions:	60 X 60 mils
B. Passivation:	BCB
C. Interconnect:	Al/0.5%Cu with Ti/TiN Barrier
D. Backside Metallization:	None
E. Minimum Metal Width:	0.8 microns (as drawn)
F. Minimum Metal Spacing:	1.2 microns (as drawn)
G. Bondpad Dimensions:	
H. Isolation Dielectric:	SiO_2
I. Die Separation Method:	Wafer Saw

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 135ºC biased (static) life test are shown in Table 1. Using these results, the Failure Rate (λ) is calculated as follows:

$$\lambda = \frac{1}{MTTF} = \frac{1.83}{192 \times 4340 \times 290 \times 2}$$ (Chi square value for MTTF upper limit)

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

$\lambda = 3.8 \times 10^{-9}$

$\lambda = 3.8$ F.I.T. (60% confidence level @ 25°C)

The following failure rate represents data collected from Maxim Integrated's reliability monitor program. Maxim Integrated performs quarterly life test monitors on its processes. This data is published in the Reliability Report found at http://www.maximintegrated.com/qa/reliability/monitor. Cumulative monitor data for the B8 Process results in a FIT Rate of 0.05 @ 25C and 0.90 @ 55C (0.8 eV, 60% UCL)

B. E.S.D. and Latch-Up Testing (lot JOKAFA020C, D/C 1126)

The PY27 die type has been found to have all pins able to withstand a transient pulse of:

ESD-HBM:	+/- 2500V per JEDEC JESD22-A114
ESD-CDM:	+/- 750V per JEDEC JESD22-C101

Latch-Up testing has shown that this device withstands a current of +/- 250mA and overvoltage per JEDEC JESD78.

Table 1

Reliability Evaluation Test Results

MAX1792EUA33+T

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES	COMMENTS
Static Life Test (Note 1)					
	Ta = 135ºC Biased Time = 192 hrs.	DC Parameters & functionality	80 135 75	0 0 0	JOKAFA020C, D/C 1126 SOKADQ001E, D/C 0325 SOKAD3044B, D/C 0514

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