RELIABILITY REPORT

FOR

MAX662ACSA+

PLASTIC ENCAPSULATED DEVICES

May 13, 2011

MAXIM INTEGRATED PRODUCTS

120 SAN GABRIEL DR.

SUNNYVALE, CA 94086

Approved by
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Quality Assurance
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Conclusion

The MAX662ACSA+ 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.

Table of Contents

I. .....Device Description
II. .....Manufacturing Information
III. .....Packaging Information
.....Attachments
IV. .....Die Information
V. .....Quality Assurance Information
VI. .....Reliability Evaluation

I. Device Description

A. General

The MAX662A is a regulated +12V, 30mA-output, charge-pump DC-DC converter. It provides the necessary +12V ±5% output to program byte-wide flash memories, and requires no inductors to deliver a guaranteed 30mA output from inputs as low as 4.75V. It fits into less than 0.1in² of board space. The MAX662A is a pin-compatible upgrade to the MAX662, and is recommended for new designs. The MAX662A offers lower quiescent and shut-down currents, and guarantees the output current over all temperature ranges. The MAX662A is the first charge-pump boost converter to provide a regulated +12V output. It requires only a few inexpensive capacitors, and the entire circuit is completely surface-mountable. A logic-controlled shutdown pin that interfaces directly with microprocessors reduces the supply current to only 0.5µA. The MAX662A comes in 8-pin narrow SO and DIP packages. For higher-current flash memory programming solutions, refer to the data sheets for the MAX734 (120mA output current, guaranteed) and MAX732 (200mA output current, guaranteed) PWM, switch-mode DC-DC converters. Or, refer to the MAX761 data sheet for a 150mA, PFM switch-mode DC-DC converter that operates from inputs as low as 2V.

II. Manufacturing Information

A. Description/Function:	12V, 30mA Flash Memory Programming Supply
B. Process:	S3
C. Number of Device Transistors:	
D. Fabrication Location:	Oregon
E. Assembly Location:	Malaysia, Philippines, Thailand
F. Date of Initial Production:	Pre 1997

III. Packaging Information

A. Package Type:	8-pin SOIC (N)
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:	#05-0701-0762
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:	170°C/W
K. Single Layer Theta Jc:	40°C/W
L. Multi Layer Theta Ja:	128.4°C/W
M. Multi Layer Theta Jc:	36°C/W

IV. Die Information

A. Dimensions:	86 X 86 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:	3.0 microns (as drawn)
F. Minimum Metal Spacing:	3.0 microns (as drawn)
G. Bondpad Dimensions:	5 mil. Sq.
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 135°C biased (static) life test are shown in Table 1. Using these results, the Failure Rate (λ) is calculated as follows:

$$\lambda = \frac{1}{MTTF} = \frac{1.83}{192 \times 4340 \times 80 \times 2}$$ (Chi square value for MTTF upper limit)

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

$\lambda = 13.7 \times 10^{-9}$

λ = 13.7 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 S3 Process results in a FIT Rate of 0.04 @ 25C and 0.69 @ 55C (0.8 eV, 60% UCL)

B. E.S.D. and Latch-Up Testing (lot NSTAFO007B D/C 9536)

The PS98 die type has been found to have all pins able to withstand a HBM transient pulse of +/-2500V per Mil-Std 883 Method 3015.7. Latch-Up testing has shown that this device withstands a current of +/-200mA.

Table 1
Reliability Evaluation Test Results

MAX662ACSA+

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES	COMMENTS
Static Life Test (Note 1)					
	Ta = 135°C Biased Time = 192 hrs.	DC Parameters & functionality	80	0	BSTAEB014C, D/C N/A

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