RELIABILITY REPORT

FOR

MAX5068BAUE+

PLASTIC ENCAPSULATED DEVICES

September 12, 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 MAX5068BAUE+ 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 MAX5068 is a high-frequency, current-mode, pulse-width modulation (PWM) controller that integrates all the building blocks necessary for implementing AC-DC or DC-DC fixed-frequency power supplies. Isolated or nonisolated power supplies are easily constructed using either primary- or secondary-side regulation. Current-mode control with leading-edge blanking simplifies control-loop design, and a programmable internal slope-compensation circuit stabilizes the current loop when operating at duty cycles above 50%. The MAX5068A/B limit the maximum duty cycle to 50% for use in single-ended forward converters. The MAX5068C/D/E/F allow duty cycles up to 75%. The MAX5068 features an accurate externally programmable oscillator that simplifies system design. An input undervoltage lockout (UVLO) programs the input-supply startup voltage and ensures proper operation during brownout conditions. A single external resistor programs the output switching frequency from 12.5kHz to 1.25MHz. The MAX5068A/B/C/E provide a SYNC input for synchronization to an external clock. The maximum FET-driver duty cycle is 50% for the MAX5068A/B and 75% for the MAX5068C/D/E/F. Programmable hiccup current limit provides additional protection under severe faults. The MAX5068 is specified over the -40°C to +125°C automotive temperature range and is available in a 16-pin thermally enhanced TSSOP-EP package. Refer to the MAX5069 data sheet for dual FET-driver applications. **Warning:** The MAX5068 is designed to work with high voltages. Exercise caution.

II. Manufacturing Information

A. Description/Function:	High-Frequency, Current-Mode PWM Controller with Accurate Programmable Oscillator
B. Process:	B8
C. Number of Device Transistors:	
D. Fabrication Location:	Oregon
E. Assembly Location:	Thaland
F. Date of Initial Production:	January 24, 2004

III. Packaging Information

A. Package Type:	TSSOP-EP 16L
B. Lead Frame:	Copper
C. Lead Finish:	100% matte Tin
D. Die Attach:	Conductive
E. Bondwire:	Au (1 mil dia.)
F. Mold Material:	Epoxy with silica filler
G. Assembly Diagram:	#05-9000-0897 / A
H. Flammability Rating:	Class UL94-V0
I. Classification of Moisture Sensitivity per JEDEC standard J-STD-020-C	1
J. Single Layer Theta Ja:	47°C/W
K. Single Layer Theta Jc:	3°C/W
L. Multi Layer Theta Ja:	38.3°C/W
M. Multi Layer Theta Jc:	3°C/W

IV. Die Information

A. Dimensions:	108 X 82 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:	0.8 microns (as drawn)
F. Minimum Metal Spacing:	0.8 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 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)

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

$\lambda = 22.9$ 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 B8 Process results in a FIT Rate of 0.06 @ 25C and 0.99 @ 55C (0.8 eV, 60% UCL)

B. E.S.D. and Latch-Up Testing (lot SPA1BQ001A D/C 0422)

The NP66-1 die type has been found to have all pins able to withstand a HBM transient pulse of +/-2000V per Mil-Std 883 Method 3015.7. Latch-Up testing has shown that this device withstands a current of +/-250mA.

Table 1
Reliability Evaluation Test Results

MAX5068BAUE+

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	48	0	SPA7AQ001D, D/C 0351

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