RELIABILITY REPORT

FOR

MAX5064BATC+T

PLASTIC ENCAPSULATED DEVICES

February 15, 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 MAX5064BATC+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 MAX5062/MAX5063/MAX5064 high-frequency, 125V half-bridge, n-channel MOSFET drivers drive high-and low-side MOSFETs in high-voltage applications. These drivers are independently controlled and their 35ns typical propagation delay, from input to output, are matched to within 3ns (typ). The high-voltage operation with very low and matched propagation delay between drivers, and high source/sink current capabilities in a thermally enhanced package make these devices suitable for the high-power, high-frequency telecom power converters. The 125V maximum input voltage range provides plenty of margin over the 100V input transient requirement of telecom standards. A reliable on-chip bootstrap diode connected between VDD and BST eliminates the need for an external discrete diode. The MAX5062A/C and the MAX5063A/C offer both noninverting drivers (see the *Selector Guide* of the full data sheet). The MAX5062B/D and the MAX5063B/D offer a noninverting high-side driver and an inverting low-side driver. The MAX5064A/B offer two inputs per driver that can be either inverting or noninverting. The MAX5062A/B/C/D and the MAX5064A feature CMOS (VDD / 2) logic inputs. The MAX5063A/B/C/D and the MAX5064B feature TTL logic inputs. The MAX5064A/B include a break-before-make adjustment input that sets the dead time between drivers from 16ns to 95ns. The drivers are available in the industry-standard 8-pin SO footprint and pin configuration, and a thermally enhanced 8-pin SO and 12-pin (4mm x 4mm) thin QFN packages. All devices operate over the -40°C to +125°C automotive temperature range.

II. Manufacturing Information

A. Description/Function:	125V/2A, High-Speed, Half-Bridge MOSFET Drivers
B. Process:	BCD250
C. Number of Device Transistors:	
D. Fabrication Location:	Oregon
E. Assembly Location:	China, Thailand
F. Date of Initial Production:	October 23, 2004

III. Packaging Information

A. Package Type:	12-pin TQFN 4x4
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:	#05-9000-1071
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:	59.3°C/W
K. Single Layer Theta Jc:	6°C/W
L. Multi Layer Theta Ja:	41°C/W
M. Multi Layer Theta Jc:	6°C/W

IV. Die Information

A. Dimensions:	85 X 88 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 = 1.5µm / Metal2 = 3.0µm
F. Minimum Metal Spacing:	Metal1 = 1.5µm / Metal2 = 3.0µm
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 Operations) 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:

$$\lambda = \frac{1}{MTTF} = \frac{1.83}{192 \times 4340 \times 207 \times 2}$$ (Chi square value for MTTF upper limit)

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

$\lambda = 5.31 \times 10^{-9}$

$\lambda = 5.31$ 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 BCD250 Process results in a FIT Rate of 0.43 @ 25C and 7.42 @ 55C (0.8 eV, 60% UCL)

B. E.S.D. and Latch-Up Testing (lot NOP5B1004B, D/C 0516)

The NP63-5 die type has been found to have all pins able to withstand a HBM transient pulse of +/- 1000V 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

MAX5064BATC+T

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES	COMMENTS
Static Life Test (Note 1)					
	Ta = 135°C	DC Parameters	50	0	NOP5B1002A, D/C 0439
	Biased	& functionality	80	0	NOP5B1003B, D/C 0504
	Time = 192 hrs.		77	0	NOP5B1004B, D/C 0516

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