RELIABILITY REPORT

FOR

MAX16807AUI+
(MAX16808)

PLASTIC ENCAPSULATED DEVICES

November 13, 2008

MAXIM INTEGRATED PRODUCTS

120 SAN GABRIEL DR.

SUNNYVALE, CA 94086

Approved by
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Quality Assurance
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Conclusion

The MAX16807AUI+ 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 MAX16807/MAX16808 are integrated, high-efficiency white or RGB LED drivers. They are designed for LCD backlighting and other LED lighting applications with multiple strings of LEDs. The MAX16807/MAX16808's current-mode PWM controller regulates the necessary voltage to the LED array. Depending on the input voltage and LED voltage range, it can be used with boost or buck-boost (SEPIC) topologies. The MAX16807/MAX16808 feature an 8V to 26.5V input voltage range. A wide range of adjustable frequency (20kHz to 1MHz) allows design optimization for efficiency and minimum board space. The MAX16807/MAX16808 LED drivers include eight open-drain, constant-current-sinking LED driver outputs rated for 36V continuous operation. The LED current-control circuitry achieves ±3% current matching among strings and enables paralleling of outputs for LED string currents higher than 55mA. The output-enable pin is used for simultaneous PWM dimming of all output channels. Dimming frequency range is 50Hz to 30kHz and dimming ratio is up to 5000:1. The constant-current outputs are single resistor programmable and the LED current can be adjusted up to 55mA per output channel. The MAX16807/MAX16808 operate either in stand-alone mode or with a microcontroller (µC) using an industry-standard, 4-wire serial interface. The MAX16808 includes circuitry that automatically detects open-circuit LEDs. The MAX16807/MAX16808 include overtemperature protection, operate over the full -40°C to +125°C temperature range, and are available in a thermally enhanced, 28-pin TSSOP exposed paddle package.

MAX16807MAX16808EEPW AnalogMixed-Signal IC Market Application
Award Winner 2006

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II. Manufacturing Information

A. Description/Function:	Integrated 8-Channel LED Drivers with Switch-Mode Boost and SEPIC Controller
B. Process:	0.8um CMOS (B8)
C. Number of Device Transistors:	
D. Fabrication Location:	Oregon
E. Assembly Location:	UTL Thailand
F. Date of Initial Production:	October 21, 2006

III. Packaging Information

A. Package Type:	28-pin TSSOP
B. Lead Frame:	Copper Alloy
C. Lead Finish:	100% matte Tin
D. Die Attach:	Conductive Epoxy
E. Bondwire:	Gold (1 mil dia.)
F. Mold Material:	Epoxy with silica filler
G. Assembly Diagram:	#31-4811
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:	78.0 °C/W°C/W
K. Single Layer Theta Jc:	12.5 °C/W°C/W

IV. Die Information

A. Dimensions:	N/A mils
B. Passivation:	Si_3N_4/SiO_2 (Silicon nitride/ Silicon dioxide
C. Interconnect:	Aluminum/Cu (Cu = 0.5%)
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:	5 mil. Sq.
H. Isolation Dielectric:	SiO_2
I. Die Separation Method:	Wafer Saw

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V. Quality Assurance Information

A. Quality Assurance Contacts:	Ken Wendel (Director, Reliability Engineering) Bryan Preeshl (Managing Director 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 pending. 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)

$\lambda = 22.4 \times 10^{-9}$

$\lambda = 22.4$ F.I.T. (60% confidence level @ 25°C)

The following failure rate represents data collected from Maxim's reliability monitor program. Maxim performs quarterly 1000 hour life test monitors on its processes. This data is published in the Product Reliability Report found at http://www.maxim-ic.com/. Current monitor data for the B8 Process results in a FIT Rate of 2.71 @ 25C and 17.30 @ 55C (0.8 eV, 60% UCL)

B. Moisture Resistance Tests

The industry standard 85°C/85%RH or HAST testing is monitored per device process once a quarter.

C. E.S.D. and Latch-Up Testing

The SP10 die type has been found to have all pins able to withstand a HBM transient pulse of +/-2500 V per JEDEC JESD22-A114-D. Latch-Up testing has shown that this device withstands a current of 250 mA.

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Table 1
Reliability Evaluation Test Results

MAX16807AUI+

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES
Static Life Test (Note 1)				
	Ta = Biased Time = 192 hrs.	DC Parameters & functionality	48	0
Moisture Testing (Note 2)				
85/85	Ta = 85°C RH = 85% Biased Time = 1000hrs.	DC Parameters & functionality	77	0
Mechanical Stress (Note 2)				
Temperature Cycle	-65°C/150°C 1000 Cycles Method 1010	DC Parameters & functionality	77	0

Note 1: Life Test Data may represent plastic DIP qualification lots.
Note 2: Generic Package/Process data

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