RELIABILITY REPORT

FOR

MAX3600ACTL+

PLASTIC ENCAPSULATED DEVICES

July 11, 2013

MAXIM INTEGRATED

160 RIO ROBLES

SAN JOSE, CA 95134

Approved by
Sokhom Chum
Quality Assurance
Reliability Engineer

Conclusion

The MAX3600ACTL+ 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 MAX3600 laser driver for projectors supports video imaging with red, blue, and green lasers. Each output includes a 10-bit video digital-to-analog converter (DAC) with programmable gain and offset. For operation with synthetic green lasers, the driver includes a periodic off function and a fourth output with a random-noise generator. The MAX3600B/R/G are monochrome drivers for blue, red, and green lasers. The MAX3600A guarantees higher full-scale output currents than the MAX3600, and is recommended for new designs.

II. Manufacturing Information

A. Description/Function:	Laser Driver for Projectors
B. Process:	CB50
C. Number of Device Transistors:	43466
D. Fabrication Location:	Oregon
E. Assembly Location:	China or Thailand
F. Date of Initial Production:	July 20, 2009

III. Packaging Information

A. Package Type:	40-pin TQFN 5x5
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:	#05-9000-3329
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:	45°C/W
K. Single Layer Theta Jc:	1.7°C/W
L. Multi Layer Theta Ja:	28°C/W
M. Multi Layer Theta Jc:	1.7°C/W

IV. Die Information

A. Dimensions:	124.8 X 139.8 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:	5.0 microns (as drawn)
F. Minimum Metal Spacing:	5.0 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:

$$\lambda = \frac{1}{MTTF} = \frac{1.83}{1000 \times 4340 \times 66 \times 2}$$ (Chi square value for MTTF upper limit)

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

$\lambda = 3.2 \times 10^{-9}$

$\lambda = 3.2$ F.I.T. (60% confidence level @ 25°C)

B. E.S.D. and Latch-Up Testing (lot JQCZGU008B, D/C 1013)

The HT75 die type has been found to have all pins able to withstand a HBM transient pulse of +/-1000V per JEDEC JESD22-A114. Latch-Up testing has shown that this device withstands a current of +/-200mA.

Table 1
Reliability Evaluation Test Results

MAX3600ACTL+

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES	COMMENTS
Static Life Test (Note 1)					
	Ta = 135°C	DC Parameters	23	0	JQCZFA023A, D/C 0916
	Biased	& functionality	43	0	JQCFA024D, D/C 0949
	Time = 1000 hrs.				

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