



RELIABILITY REPORT  
FOR  
MAX15070AAUT+  
PLASTIC ENCAPSULATED DEVICES

March 30, 2012

**MAXIM INTEGRATED PRODUCTS**

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<b>Approved by</b>
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Quality Assurance
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## Conclusion

The MAX15070AAUT+ 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 MAX15070A/MAX15070B are high-speed MOSFET drivers capable of sinking 7A and sourcing 3A peak currents. The ICs, which are an enhancement over MAX5048 devices, have inverting and noninverting inputs that provide greater flexibility in controlling the MOSFET. They also feature two separate outputs working in complementary mode, offering flexibility in controlling both turn-on and turn-off switching speeds. The ICs have internal logic circuitry that prevents shoot-through during output-state changes. The logic inputs are protected against voltage spikes up to +16V, regardless of V+ voltage. Propagation delay time is minimized and matched between the inverting and noninverting inputs. The ICs have a very fast switching time, combined with short propagation delays (12ns typ), making them ideal for high-frequency circuits. The ICs operate from a +4V to +14V single power supply and typically consume 0.5mA of supply current. The MAX15070A has standard TTL input logic levels, while the MAX15070B has CMOS-like high-noise-margin (HNM) input logic levels. Both ICs are available in a 6-pin SOT23 package and operate over the -40°C to +125°C temperature range.

## II. Manufacturing Information

A. Description/Function:	7A Sink, 3A Source, 12ns, SOT23 MOSFET Drivers
B. Process:	S18
C. Number of Device Transistors:	
D. Fabrication Location:	California
E. Assembly Location:	Thailand
F. Date of Initial Production:	September 24, 2010

## III. Packaging Information

A. Package Type:	6L SOT23
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:	#05-9000-4102 / 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:	N/A
K. Single Layer Theta Jc:	80°C/W
L. Multi Layer Theta Ja:	230°C/W
M. Multi Layer Theta Jc:	76°C/W

## IV. Die Information

A. Dimensions:	56.70 X 34.64 mils
B. Passivation:	Si <sub>3</sub> N <sub>4</sub> /SiO <sub>2</sub> (Silicon nitride/ Silicon dioxide)
C. Interconnect:	Al with Ti/TiN Barrier
D. Backside Metallization:	None
E. Minimum Metal Width:	0.18μm
F. Minimum Metal Spacing:	0.18μm
G. Bondpad Dimensions:	
H. Isolation Dielectric:	SiO <sub>2</sub>
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 ( $\lambda$ ) is calculated as follows:

$$\lambda = \frac{1}{\text{MTTF}} = \frac{1.83}{1000 \times 4340 \times 78 \times 2} \quad (\text{Chi square value for MTTF upper limit})$$

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

$$\lambda = 2.7 \times 10^{-9}$$

$$\lambda = 2.7 \text{ F.I.T. (60\% confidence level @ 25°C)}$$

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 S18 Process results in a FIT Rate of 0.40 @ 25C and 6.96 @ 55C (0.8 eV, 60% UCL)

### B. E.S.D. and Latch-Up Testing (SJ0ZDQ002A D/C 1110)

The NQ55 die type has been found to have all pins able to withstand a HBM transient pulse of:

ESD-HBM:	+/- 2500V per JEDEC JESD22-A114
ESD-CDM:	+/- 750V per JEDEC JESD22-C101

Latch-Up testing has shown that this device withstands a current of +/- 250mA and overvoltage per JEDEC JESD78.

**Table 1**  
Reliability Evaluation Test Results

**MAX15070AAUT+**

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES	COMMENTS
<b>Static Life Test</b> (Note 1)	Ta = 135°C Biased Time = 1000 hrs.	DC Parameters & functionality	78	0	SJ0ZDQ002A, D/C 1110

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