RELIABILITY REPORT

FOR MAX4773EUT+T

PLASTIC ENCAPSULATED DEVICES

January 26, 2010

MAXIM INTEGRATED PRODUCTS

120 SAN GABRIEL DR.

SUNNYVALE, CA 94086

Approved by
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Quality Assurance
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Conclusion

The MAX4773EUT+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.

Table of Contents

I. Device Description

A. General

The MAX4772/MAX4773 switches feature selectable internal current limiting to prevent damage to host devices due to faulty load conditions. The MAX4772/MAX4773 include a logic input to select a guaranteed 200mA or 500mA current limit, making them ideal for SDIO and other load-switching applications. These analog switches have a low 0.2 on-resistance and operate from a 2.0V to 4.5V input voltage range. When the switch is on and a load is connected to the port, a guaranteed blanking time of 14ms ensures that the transient voltage settles down. If, after this blanking time, the load current is greater than the current limit, the MAX4772 switch is turned off and issues an active-low FLAG to the microprocessor. The switch can be turned on again by cycling the power or the ON input. The MAX4773 has an autoretry feature where the switch turns off and issues an active-low FLAG to the microprocessor after the blanking time and then continuously checks to see if the overload condition is present. The switch remains on after the overload condition disappears and active-low FLAG deasserts. The MAX4772/MAX4773 are available in tiny space-saving 6-pin SOT23 and 6-pin TDFN (3mm x 3mm) packages.

II. Manufacturing Information

A. Description/Function:	200mA/500mA Selectable Current-Limit Switches
B. Process:	C6
C. Number of Device Transistors:	1701
D. Fabrication Location:	California
E. Assembly Location:	Malaysia, Philippines, Thailand
F. Date of Initial Production:	July 24, 2003

III. Packaging Information

A. Package Type:	6-pin 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:	#05-9000-0273
H. Flammability Rating:	Class UL94-V0
I. Classification of Moisture Sensitivity per JEDEC standard J-STD-020-C	Level 1
J. Single Layer Theta Jb:	115°C/W
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:	55 X 31 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:	0.6 microns (as drawn)
F. Minimum Metal Spacing:	0.6 microns (as drawn)
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:	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 135°C biased (static) life test are shown in Table 1. Using these results, the Failure Rate (λ) is calculated as follows:

$$\lambda = \frac{1}{MTTF} = \frac{1.83}{192 \times 4340 \times 96 \times 2}$$ (Chi square value for MTTF upper limit)

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

$\lambda = 11.45 \times 10^{-9}$

λ = 11.45 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 C6 Process results in a FIT Rate of 0.43 @ 25C and 7.50 @ 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 AS09-2 die type has been found to have all pins able to withstand a HBM transient pulse of +/- 2500V per JEDEC JESD22-A114. Latch-Up testing has shown that this device withstands a current of +/- 250mA.

Table 1
Reliability Evaluation Test Results

MAX4773EUT+T

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES
Static Life Test (Note 1)				
	Ta = 135°C Biased Time = 192 hrs.	DC Parameters & functionality	96	0
Moisture Testing (Note 2)				
HAST	Ta = 130°C RH = 85% Biased Time = 96hrs.	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