RELIABILITY REPORT

FOR

MAX6895AALT+

PLASTIC ENCAPSULATED DEVICES

October 26, 2009

MAXIM INTEGRATED PRODUCTS

120 SAN GABRIEL DR.

SUNNYVALE, CA 94086

Approved by
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Quality Assurance
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Conclusion

The MAX6895AALT+ 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 MAX6895-MAX6899 is a family of small, low-power, voltage-monitoring circuits with sequencing capability. These miniature devices offer tremendous flexibility with an adjustable threshold capable of monitoring down to 0.5V and an external capacitor-adjustable time delay. These devices are ideal for use in power-supply sequencing, reset sequencing, and power-switching applications. Multiple devices can be cascaded for complex sequencing applications. A high-impedance input with a 0.5V threshold allows an external resistive divider to set the monitored threshold. The output asserts (OUT = high or active-low OUT = low) when the input voltage rises above the 0.5V threshold and the enable input is asserted (ENABLE = high or active-low ENABLE = low). When the voltage at the input falls below 0.5V or when the enable input is deasserted (ENABLE = low or active-low ENABLE = high), the output deasserts (OUT = low or active-low OUT = high). All devices provide a capacitor-programmable delay time from when the input rises above 0.5V to when the output is asserted. The MAX689_A versions provide the same capacitor-adjustable delay from when enable is asserted to when the output asserts. The MAX689_P devices have a 1µs propagation delay from when enable is asserted to when the output asserts. The MAX6895A/P offers an active-high enable input and an active-high push-pull output. The MAX6896A/P offers an active-low enable input and an active-low push-pull output. The MAX6897A/P offers an active-high enable input and an active-high open-drain output. Finally, the MAX6898A/P offers an active-low enable input and an active-low open-drain output. The MAX6899A/P offers an active-low enable with an active-high push-pull output. All devices operate from a 1.5V to 5.5V supply voltage and are fully specified over the -40°C to +125°C operating temperature range. These devices are available in ultra-small 6-pin µDFN (1.0mm x 1.5mm) and thin SOT23 (1.60mm x 2.90mm) packages.

II. Manufacturing Information

A. Description/Function:	Ultra-Small, Adjustable Sequencing/Supervisory Circuits
B. Process:	B8
C. Number of Device Transistors:	
D. Fabrication Location:	California or Texas
E. Assembly Location:	Thailand
F. Date of Initial Production:	April 23, 2005

III. Packaging Information

A. Package Type:	6-pin uDFN
B. Lead Frame:	Substrate
C. Lead Finish:	Gold
D. Die Attach:	Non-conductive Epoxy
E. Bondwire:	Gold (1 mil dia.)
F. Mold Material:	Epoxy with silica filler
G. Assembly Diagram:	#05-9000-1758
H. Flammability Rating:	Class UL94-V0
I. Classification of Moisture Sensitivity per JEDEC standard J-STD-020-C	Level 1
J. Multi Layer Theta Ja:	477°C/W

IV. Die Information

A. Dimensions:	31 X 30 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:	0.8 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

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:

$$\lambda = \frac{1}{MTTF} = \frac{1.83}{192 \times 4340 \times 46 \times 2}$$ (Chi square value for MTTF upper limit)

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

$\lambda = 23.4 \times 10^{-9}$

λ = 23.4 F.I.T. (60% confidence level @ 25°C)

The following failure rate represents data collected from Maxim"s reliability monitor program. Maxim performs quarterly 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 B8 Process results in a FIT Rate of 0.06 @ 25C and 0.99 @ 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 MS95 die type has been found to have all pins able to withstand a HBM transient pulse of +/-2000 V per JEDEC JESD22-A114. Latch-Up testing has shown that this device withstands a current of +/-250 mA.

Table 1

Reliability Evaluation Test Results

MAX6895AALT+

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	46	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	-55ºC/125ºC 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