RELIABILITY REPORT

FOR

MAX6627MTA+T

PLASTIC ENCAPSULATED DEVICES

June 7, 2011

MAXIM INTEGRATED PRODUCTS

120 SAN GABRIEL DR.

SUNNYVALE, CA 94086

Approved by
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Quality Assurance
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Conclusion

The MAX6627MTA+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 MAX6627/MAX6628 precise digital temperature sensors report the temperature of a remote sensor. The remote sensor is a diode-connected transistor, typically a low-cost, easily mounted 2N3904 NPN type that replaces conventional thermistors or thermocouples. The MAX6627/MAX6628 can also measure the die temperature of other ICs, such as microprocessors (µPs) or microcontrollers (µCs) that contain an on-chip, diode-connected transistor. Remote accuracy is ±1°C when the temperature of the remote diode is between 0°C and +125°C and the temperature of the MAX6627/MAX6628 is +30°C. The temperature is converted to a 12-bit + sign word with 0.0625°C resolution. The architecture of the device is capable of interpreting data as high as +145°C from the remote sensor. The MAX6627/MAX6628 temperature should never exceed +125°C. These sensors are 3-wire serial interface SPI(tm) compatible, allowing the MAX6627/MAX6628 to be readily connected to a variety of µCs. The MAX6627/MAX6628 are read-only devices, simplifying their use in systems where only temperature data is required. Two conversion rates are available, one that continuously converts data every 0.5s (MAX6627), and one that converts data every 8s (MAX6628). The slower version provides minimal power consumption under all operating conditions (30µA, typ). Either device can be read at any time and provide the data from the last conversion. Both devices operate with supply voltages between +3.0V and +5.5V, are specified between -55°C and +125°C, and come in space-saving 8-pin SOT23 and lead-free TDFN packages.

II. Manufacturing Information

A. Description/Function:	Remote ±1°C Accurate Digital Temperature Sensors with SPI-Compatible Serial Interface
B. Process:	B8
C. Number of Device Transistors:	
D. Fabrication Location:	Oregon
E. Assembly Location:	China, Malaysia, Philippines, Thailand
F. Date of Initial Production:	April 28, 2001

III. Packaging Information

A. Package Type:	8-pin TDFN 3x3
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:	#05-9000-2434
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:	54°C/W
K. Single Layer Theta Jc:	8°C/W
L. Multi Layer Theta Ja:	41°C/W
M. Multi Layer Theta Jc:	8°C/W

IV. Die Information

A. Dimensions:	45 X 90 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:	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 135°C biased (static) life test are shown in Table 1. Using these results, the Failure Rate (λ) is calculated as follows:

$$\lambda = \frac{1}{MTTF} = \frac{1.83}{192 \times 4340 \times 80 \times 2}$$ (Chi square value for MTTF upper limit)

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

$\lambda = 13.7 \times 10^{-9}$

λ = 13.7 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. E.S.D. and Latch-Up Testing (lot I81ABQ001B D/C 0115)

The TS05 die type has been found to have all pins able to withstand a HBM transient pulse of +/-1500V per Mil-Std 883 Method 3015.7. Latch-Up testing has shown that this device withstands a current of +/-100mA.

Table 1
Reliability Evaluation Test Results

MAX6627MTA+T

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES	COMMENTS
Static Life Test (Note 1)					
	Ta = 135°C Biased Time = 192 hrs.	DC Parameters & functionality	80	0	I81ABQ001A, D/C 0214

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