RELIABILITY REPORT

FOR

MAX6629MTT+T

PLASTIC ENCAPSULATED DEVICES

March 7, 2013

MAXIM INTEGRATED

160 RIO ROBLES

SAN JOSE, CA 95134

Approved by
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Quality Assurance
Reliability Engineer

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Conclusion

The MAX6629MTT+T 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 MAX6629-MAX6632 are local digital temperature sensors with an SPI™-compatible serial interface. The temperature is converted to a 12-bit + sign word with a resolution of 0.0625°C/LSB. An extended temperature range provides useful readings up to +150°C. These sensors are 3-wire serial interface SPI compatible, allowing the MAX6629-MAX6632 to be readily connected to a variety of microcontrollers (µCs). The MAX6629-MAX6632 are read-only devices, simplifying their use in systems where only temperature data is required. All four digital temperature sensors require very little supply current, making them ideal for portable systems. The MAX6631/MAX6632 perform a temperature-to-digital conversion once every 8s and require minimal average supply current, 32µA (typ). The MAX6629/MAX6630 perform a conversion once every 0.5s and require only 200µA (typ) supply current. Any of these temperature sensors can perform conversions more often-up to approximately four conversions per second by reading the conversion results more often.

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II. Manufacturing Information

A. Description/Function:	12-Bit + Sign Digital Temperature Sensors with Serial Interface
B. Process:	B8
C. Number of Device Transistors:	
D. Fabrication Location:	California or Texas
E. Assembly Location:	Thailand
F. Date of Initial Production:	April 28, 2001

III. Packaging Information

A. Package Type:	6-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:	#05-2901-0027
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:	55°C/W
K. Single Layer Theta Jc:	8.5°C/W
L. Multi Layer Theta Ja:	42°C/W
M. Multi Layer Theta Jc:	8.5°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:	
H. Isolation Dielectric:	SiO_2
I. Die Separation Method:	Wafer Saw

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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:

$$\lambda = \frac{1}{MTTF} = \frac{1.83}{192 \times 4340 \times 130 \times 2}$$ (Chi square value for MTTF upper limit)

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

$\lambda = 8.4 \times 10^{-9}$

λ = 8.4 F.I.T. (60% confidence level @ 25°C)

The following failure rate represents data collected from Maxim Integrated's reliability monitor program. Maxim Integrated performs quarterly life test monitors on its processes. This data is published in the Reliability Report found at http://www.maximintegrated.com/qa/reliability/monitor. Cumulative monitor data for the B8 Process results in a FIT Rate of 0.04 @ 25C and 0.73 @ 55C (0.8 eV, 60% UCL)

B. E.S.D. and Latch-Up Testing (ESD lot I3OABU002C D/C 0107, Latch-Up lot I30ABA03A)

The TS03 die type has been found to have all pins able to withstand a HBM transient pulse of +/-1500V per Mil-Std-883.
Latch-Up testing has shown that this device withstands a current of +/-200mA.

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Table 1
Reliability Evaluation Test Results

MAX6629MTT+T

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES	COMMENTS
Static Life Test (Note 1)					
	Ta = 135°C	DC Parameters	50	0	S30DCQ001A, D/C 0439
	Biased	& functionality	80	0	I30BBU002C, D/C 0114
	Time = 192 hrs.				

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

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