RELIABILITY REPORT

FOR

MAX14934EAWE+

PLASTIC ENCAPSULATED DEVICES

September 17, 2015

MAXIM INTEGRATED

160 RIO ROBLES

SAN JOSE, CA 95134

Approved by
Sokhom Chum
Quality Assurance
Reliability Engineer

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Conclusion

The MAX14934EAWE+ 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 MAX14934-MAX14936 are a family of four-channel, 5kV digital isolators utilizing Maximâ€™s proprietary process technology. For applications requiring 2.75kV of isolation, see the MAX14930-MAX14932. The MAX14934-MAX14936 family transfers digital signals between circuits with different power domains at ambient temperatures up to +125°C. The MAX14934-MAX14936 family offers all three possible unidirectional channel configurations to accommodate any four-channel design, including SPI, RS-232, RS-485, and large digital IO modules. For applications requiring bidirectional channels, such as I²C, refer to the MAX14937. Devices are available with data rates from DC up to 1Mbps, 25Mbps, or 150Mbps. Each device is also available in either a default high or default low configuration. The default is the state an output goes to when its input is unpowered. See the Ordering Information/Selector Guide in the data sheet for the suffixes associated with each option. Independent 1.71V to 5.5V supplies on each side of the isolator also make the devices suitable for use as level translators. The MAX14934-MAX14936 are available in a 16-pin wide body (10.3mm x 7.5mm) SOIC package. All devices are rated for operation at ambient temperatures of -40°C to +125°C.

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II. Manufacturing Information

A. Description/Function:	Four-Channel, 5kV_{RMS} Digital Isolators
B. Process:	Hybrid
C. Number of Device Transistors:	
D. Fabrication Location:	Oregon
E. Assembly Location:	Taiwan
F. Date of Initial Production:	September 26, 2014

III. Packaging Information

A. Package Type:	300 mil 16L SOIC HYBRID
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:	#31-4896
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:	N/A
L. Multi Layer Theta Ja:	N/A
M. Multi Layer Theta Jc:	N/A

IV. Die Information

A. Dimensions:	N/A
B. Passivation:	N/A
C. Interconnect:	N/A
D. Backside Metallization:	N/A
E. Minimum Metal Width:	N/A
F. Minimum Metal Spacing:	N/A
G. Bondpad Dimensions:	
H. Isolation Dielectric:	N/A
I. Die Separation Method:	N/A

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V. Quality Assurance Information

A. Quality Assurance Contacts: 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 (λ) is calculated as follows:

$$\lambda = \frac{1}{MTTF} = \frac{1.83}{1000 \times 4340 \times 717 \times 2}$$ (Chi square value for MTTF upper limit)

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

$\lambda = 0.29 \times 10^{-9}$

λ = 0.29 F.I.T. (60% confidence level @ 25°C)

B. E.S.D. and Latch-Up Testing (lot BAQU7AG, D/C 1430)

The RU66-11 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 and overvoltage per JEDEC JESD78.

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Table 1
Reliability Evaluation Test Results

MAX14934EAWE+

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES	COMMENTS
Static Life Test (Note 1)					
	Ta = 135°C	DC Parameters	239	0	NAWT7AC, N/A
	Biased	& functionality	78	0	BASJ9AAQA, D/C 1420
	Time = 1000 hrs.		80	0	BASJ9AAQB, D/C 1420
			80	0	BASJ9AAQC, D/C 1420
			80	0	BASJ9AAQ2, D/C 1419
			80	0	BASJ5AAQ4, D/C 1420
			80	0	BASJ9ABQ6, D/C 1420

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

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