RELIABILITY REPORT

FOR

MAX9547ESA+

PLASTIC ENCAPSULATED DEVICES

January 15, 2013

MAXIM INTEGRATED

160 RIO ROBLES

SAN JOSE, CA 95134

Approved by
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Quality Assurance
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Conclusion

The MAX9547ESA+ 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.

Table of Contents

I. Device Description

A. General

The MAX9546/MAX9547 differential interface chipset converts single-ended voltages to differential voltages for transport and then converts back to single-ended voltages. These devices eliminate costly, bulky, single-ended coaxial cables with inexpensive, readily available, differential shielded (ScTP) or unshielded (UTP) twisted pairs. The fault detection of the MAX9546 and loss-of-signal detection of the MAX9547 allow proactive and speedy diagnosis, such as identifying failures in the manufacturing stage and troubleshooting equipment at repair facilities. The MAX9546/MAX9547 are low-cost, convenient solutions for transporting CVBS/FBAS analog video signals (PAL or NTSC) through hostile environments. The MAX9546 driver converts the single-ended input into a differential output with a 6dB fixed gain to drive a back-terminated, DC-coupled differential video output to unity gain. This DC connection allows the detection of a short-circuit condition at the differential outputs. The active-low FAULT output indicates a short-circuit condition including a short to a high battery condition (VBAT = +16V) or ground. The MAX9547 receiver converts the differential signal from the MAX9546 into a single-ended signal. Like the MAX9546 output, the MAX9547 input survives a short to a high battery condition or ground. The MAX9547 receiver loss-of-signal output (active-low LOS) operates by detecting the H-Sync and thus can support both monochrome and color video signals. The MAX9547 gain is set with an external impedance between ZT+ and ZT-. The MAX9546/MAX9547 operate from a 7.5V to 10V single supply. Both devices include ±15kV ESD Human Body Model (HBM) protection. The MAX9546/MAX9547 are offered in a thermally enhanced 8-pin SO package and specified over the -40°C to +85°C extended temperature range.

II. Manufacturing Information

A. Description/Function:	Differential Video Interface Chipset
B. Process:	BCD8
C. Number of Device Transistors:	
D. Fabrication Location:	Oregon
E. Assembly Location:	Philippines, Thailand
F. Date of Initial Production:	October 22, 2005

III. Packaging Information

A. Package Type:	8-pin SOIC (N)
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:	#05-9000-1992
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:	52°C/W
K. Single Layer Theta Jc:	6°C/W
L. Multi Layer Theta Ja:	41°C/W
M. Multi Layer Theta Jc:	7°C/W

IV. Die Information

A. Dimensions:	85 X 112 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:	3.0 microns (as drawn)
F. Minimum Metal Spacing:	3.0 microns (as drawn)
G. Bondpad Dimensions:	
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:

$$\lambda = \frac{1}{MTTF} = \frac{1.83}{192 \times 4340 \times 48 \times 2}$$ (Chi square value for MTTF upper limit)

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

$\lambda = 22.9 \times 10^{-9}$

λ = 22.9 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 BCD8 Process results in a FIT Rate of 0.06 @ 25C and 1.08 @ 55C (0.8 eV, 60% UCL)

B. E.S.D. and Latch-Up Testing (NZS0BQ001D D/C 0532)

The VA47 die type has been found to have all pins able to withstand a HBM transient pulse of +/-2000V per JEDEC JESD22-A114. Latch-Up testing has shown that this device withstands a current of +/-250mA.

Table 1
Reliability Evaluation Test Results

MAX9547ESA+

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	48	0	NZS0BQ001D, D/C 0532

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