

RELIABILITY REPORT  
FOR  
MAX7474EAE+  
PLASTIC ENCAPSULATED DEVICES

November 29, 2010

**MAXIM INTEGRATED PRODUCTS**

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<b>Approved by</b>
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## Conclusion

The MAX7474EAE+ 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.

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### I. Device Description

#### A. General

The MAX7474 adaptive equalizer recovers losses incurred in the transmission of a composite video (CVBS) signal over unshielded twisted-pair (UTP) cable. The device fully recovers losses for cable lengths of up to 300m and greatly improves signal quality for cable lengths of up to 600m. The device automatically adapts to all cable lengths for CVBS signals with color burst and allows fixed-equalization settings for video signals without burst. The MAX7474 is optimized to provide compensation for losses that occur when transmitting composite video signals over UTP cables such as Category 5e. The device compensates for low frequency and chroma band losses. The MAX7474 is compatible with NTSC and PAL standards. The MAX7474 accepts differential input and provides a single-ended output. The output is capable of driving two AC- or DC-coupled standard 150 video loads. The output back-porch DC level is adjustable with an externally applied DC voltage at the BPLVL input. The device also features loss-of-sync (LOS) and loss-of-burst (LOB) logic outputs. The MAX7474 is available in a 16-pin SSOP package and is fully specified over the extended (-40°C to +85°C) temperature range.

MAX74742008 Product of the Year Award Winner from the EN-Genius Network  
Best Advance in Video Security

**II. Manufacturing Information**

A. Description/Function:	Adaptive Equalizer for Video Over Twisted Pair
B. Process:	B6
C. Number of Device Transistors:	
D. Fabrication Location:	California
E. Assembly Location:	Philippines
F. Date of Initial Production:	January 24, 2008

**III. Packaging Information**

A. Package Type:	16-pin SSOP
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:	#05-9000-2187
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:	140°C/W
K. Single Layer Theta Jc:	34°C/W
L. Multi Layer Theta Ja:	N/A
M. Multi Layer Theta Jc:	N/A

**IV. Die Information**

A. Dimensions:	123 X 136 mils
B. Passivation:	Si <sub>3</sub> N <sub>4</sub> /SiO <sub>2</sub> (Silicon nitride/ Silicon dioxide)
C. Interconnect:	Al with Ti/TiN Barrier
D. Backside Metallization:	None
E. Minimum Metal Width:	0.6 microns (as drawn)
F. Minimum Metal Spacing:	0.6 microns (as drawn)
G. Bondpad Dimensions:	5 mil. Sq.
H. Isolation Dielectric:	SiO <sub>2</sub>
I. Die Separation Method:	Wafer Saw

## 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 135°C biased (static) life test are shown in Table 1. Using these results, the Failure Rate ( $\lambda$ ) is calculated as follows:

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

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

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

$\lambda = 22.9$  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 B6 Process results in a FIT Rate of 0.06 @ 25C and 1.04 @ 55C (0.8 eV, 60% UCL)

### B. E.S.D. and Latch-Up Testing (lot SR00CA007A, DC 0742)

The VP18 die type has been found to have all pins able to withstand a HBM transient pulse of +/-1500V per JEDEC JESD22-A114. Latch-Up testing has shown that this device withstands a current of +/-250mA.

**Table 1**  
Reliability Evaluation Test Results

**MAX7474EAE+**

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES	COMMENTS
<b>Static Life Test</b> (Note 1)	Ta = 135°C Biased Time = 192 hrs.	DC Parameters & functionality	48	0	SR00CA007A, DC 0742

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