



RELIABILITY REPORT
FOR
MAX7461EUK+T
PLASTIC ENCAPSULATED DEVICES

December 18, 2010

MAXIM INTEGRATED PRODUCTS

120 SAN GABRIEL DR.
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Conclusion

The MAX7461EUK+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.

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I. Device Description

A. General

The MAX7461 single-channel loss-of-sync alarm (active-low LOS) provides composite video sync detection in NTSC, PAL, and SECAM standard-definition television (SDTV) systems. The MAX7461's advanced detection circuitry delivers robust performance by preventing false loss-of-sync alarms due to noise. The device accepts an AC-coupled composite (CVBS), luma (Y), or any other video signal with sync and outputs a logic-level signal. The open-drain active-low LOS output is low when no sync is detected and high impedance when sync is detected. The device operates from a single +5V supply. The MAX7461 is available in a 5-pin SOT23 package and is specified for operation over the -40°C to +85°C temperature range.

II. Manufacturing Information

A. Description/Function:	Loss-of-Sync Alarm
B. Process:	C6
C. Number of Device Transistors:	1776
D. Fabrication Location:	California
E. Assembly Location:	Malaysia, Philippines, Thailand
F. Date of Initial Production:	April 22, 2006

III. Packaging Information

A. Package Type:	5-pin SOT23
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:	#05-9000-2334
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:	324.3°C/W
K. Single Layer Theta Jc:	82°C/W
L. Multi Layer Theta Ja:	255.9°C/W
M. Multi Layer Theta Jc:	81°C/W

IV. Die Information

A. Dimensions:	51 X 34 mils
B. Passivation:	Si ₃ N 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:	0.6 microns (as drawn)
F. Minimum Metal Spacing:	0.6 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 Operations)
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:

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

(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 C6 Process results in a FIT Rate of 0.43 @ 25C and 7.50 @ 55C (0.8 eV, 60% UCL)

B. E.S.D. and Latch-Up Testing (lot SX20CA007B, D/C 0934)

The VP23 die type has been found to have all pins able to withstand a transient pulse of

ESD-HBM: +/- 1000V per JEDEC JESD22-A114
ESD-MM: +/- 250V per JEDEC JESD22-A115 (lot SX20CA009M, D/C 1026)

Latch-Up testing has shown that this device withstands a current of +/- 250mA and overvoltage per JEDEC JESD78.

Table 1
Reliability Evaluation Test Results

MAX7461EUK+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	48	0	SX20AQ001E, D/C 0613

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