RELIABILITY REPORT

FOR

MAX11506CEE+
(MAX11506/MAX11507)

PLASTIC ENCAPSULATED DEVICES

January 21, 2009

MAXIM INTEGRATED PRODUCTS

120 SAN GABRIEL DR.

SUNNYVALE, CA 94086

Approved by
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Quality Assurance
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Conclusion

The MAX11506CEE+ 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 MAX11506/MAX11507 integrated filters offer six channels, three for standard-definition (SD) video and three for either SD or high-definition (HD) video, and include +6dB output buffers on each channel. These video filters are ideal for anti-aliasing and DAC smoothing in applications such as set-top boxes, digital video recorders, DVD players, and personal video recorders. The MAX11506/MAX11507 video inputs feature a transparent clamp compatible with AC- and DC-coupled input signals and allow DAC outputs to be directly coupled. The filters provide -3dB bandwidth of 9.0MHz for the SD filters and 33MHz for the HD filters. Each channel includes an output buffer with a gain of +6dB capable of driving a full 2VP-P video signal into a 150 video load. The buffers drive either AC- or DC-coupled loads and assure a blanking level of below 1V after the backmatch resistor. DC-coupling eliminates bulky coupling capacitors. The MAX11506 offers a flat passband while the MAX11507 features 0.8dB peaking on the three SD-only channels to compensate for system roll-off. The MAX11506/MAX11507 operate from a single +5V supply and are available in the 0°C to +70°C commercial temperature grade. The MAX11506/MAX11507 are offered in the 16-pin QSOP package.

II. Manufacturing Information

A. Description/Function:	Low-Cost, 6-Channel SD Plus HD/SD Selectable Video Filters and Buffers
B. Process:	C6
C. Number of Device Transistors:	
D. Fabrication Location:	California
E. Assembly Location:	Carsem Malaysia, ATP Philippines
F. Date of Initial Production:	4/26/2008

III. Packaging Information

A. Package Type:	16-pin QSOP
B. Lead Frame:	Copper
C. Lead Finish:	100% matte Tin
D. Die Attach:	Conductive Epoxy
E. Bondwire:	Au (1.0 mil dia.)
F. Mold Material:	Epoxy with silica filler
G. Assembly Diagram:	#
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:	120°C/W
K. Single Layer Theta Jc:	37°C/W
L. Multi Layer Theta Ja:	103.7°C/W
M. Multi Layer Theta Jc:	37°C/W

IV. Die Information

A. Dimensions:	61 X 110 mils
B. Passivation:	SiO2/SiN3
C. Interconnect:	Al/Cu
D. Backside Metallization:	None
E. Minimum Metal Width:	0.6um
F. Minimum Metal Spacing:	0.6um
G. Bondpad Dimensions:	5 mil. Sq.
H. Isolation Dielectric:	SiO2
I. Die Separation Method:	Saw

V. Quality Assurance Information

A. Quality Assurance Contacts:	Ken Wendel (Director, Reliability Engineering) Bryan Preeshl (Managing Director 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)

$\lambda = 22.4 \times 10^{-9}$

$\lambda = 22.4$ F.I.T. (60% confidence level @ 25°C)

The following failure rate represents data collected from Maxim's reliability monitor program. Maxim performs quarterly 1000 hour life test monitors on its processes. This data is published in the Product Reliability Report found at http://www.maxim-ic.com/. Current monitor data for the CB3 Process results in a FIT Rate of 0.14 @ 25C and 2.42 @ 55C (0.8 eV, 60% UCL)

B. Moisture Resistance Tests

The industry standard 85°C/85%RH or HAST testing is monitored per device process once a quarter.

C. E.S.D. and Latch-Up Testing

The VP34 die type has been found to have all pins able to withstand a HBM transient pulse of +/-2500 V per JEDEC JESD22-A114-D. Latch-Up testing has shown that this device withstands a current of +/-250 mA, 1.5x VCCmax Overvoltage per JESD78.

Table 1
Reliability Evaluation Test Results

MAX11506CEE+

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES
Static Life Test (Note 1)				
	Ta = 135°C Biased Time = 192 hrs.	DC Parameters & functionality	48	0
Moisture Testing (Note 2)				
85/85	Ta = 85°C RH = 85% Biased Time = 1000hrs.	DC Parameters & functionality	77	0
Mechanical Stress (Note 2)				
Temperature Cycle	-65°C/150°C 1000 Cycles Method 1010	DC Parameters & functionality	77	0

Note 1: Life Test Data may represent plastic DIP qualification lots.
Note 2: Generic Package/Process data