

RELIABILITY REPORT FOR MAX4455ECQ+ PLASTIC ENCAPSULATED DEVICES

December 1, 2011

MAXIM INTEGRATED PRODUCTS

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Conclusion

The MAX4455ECQ+D 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.

IV.Die Information

Table of Contents

- I.Device Description
- II.Manufacturing Information
- III.Packaging Information
-Attachments

V.Quality Assurance Information VI.Reliability Evaluation

I. Device Description

A. General

The MAX4455 is an eight-channel arbitrary graphics on-screen display (OSD) video generator that inserts arbitrary gray-scale bit-mapped graphics into eight asynchronous composite video sources. Ideal for security camera surveillance systems, the MAX4455 supports the insertion of graphics and text on up to eight video output channels in 15 levels of brightness. It easily displays information such as company logo, camera location, time, and date with arbitrary fonts and sizes. Arbitrary graphics capability enables the display of unique languages and fonts, allowing manufacturers to tailor their system for any geographic market. The MAX4455 is designed to work with Maxim's video crosspoint switches, such as the MAX4356 and MAX4358, which include circuitry that simplifies the insertion of the OSD information. The MAX4455 can also be used with discrete fast mux switches. The MAX4455 operates from a 3V to 3.6V digital supply, and a 2.7V to 5.5V analog supply. Independent interface supplies enable the MAX4455 to communicate with microprocessors and OSD crosspoint switch logic with logic levels ranging from 2.7V to 5.5V. The MAX4455 uses an external 16Mb SDRAM for graphical image storage for all eight video channels. The MAX4455 manages all memory interface functions, allowing a simple host µP interface. The MAX4455's multiple-channel memory sharing and multiple-location write function allow fast memory updates of shared graphics information necessary for rapidly changing OSD information, such as a time stamp. The MAX4455 EVSYS is available to evaluate the MAX4455 along with the MAX4458 (32 x 16 video crosspoint switch with OSD).



II. Manufacturing Information

Α.	Description/Function:	Arbitrary Graphics On-Screen Display Video Generator
В.	Process:	TS50
C.	Number of Device Transistors:	

D. Fabrication Location:	Oregon
E. Assembly Location:	Korea
F. Date of Initial Production:	April 27, 2002

III. Packaging Information

A. Package Type:	100L TQFP-EP
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:	#05-3701-0001 / B
H. Flammability Rating:	Class UL94-V0
 Classification of Moisture Sensitivity per JEDEC standard J-STD-020-C 	3
J. Single Layer Theta Ja:	N/A
K. Single Layer Theta Jc:	N/A
L. Multi Layer Theta Ja:	27°C/W
M. Multi Layer Theta Jc:	2°C/W

IV. Die Information

171 X 163 mils
Si_3N_4/SiO_2 (Silicon nitride/ Silicon dioxide)
Al/0.5%Cu with Ti/TiN Barrier
None
0.50µm
0.50µm
5 mil. Sq.
SiO ₂
Wafer Saw



V. Quality Assurance Infor	rmation
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Α.	Quality Assurance Contacts:	Richard Aburano (Manager, Reliability Engineering)		
		Bryan Preeshl (Vice President of QA)		
В.	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:

 $\lambda = \underbrace{1}_{\text{MTTF}} = \underbrace{1.83}_{192 \text{ x } 4340 \text{ x } 45 \text{ x } 2} \text{ (Chi square value for MTTF upper limit)}$ $\lambda = 24.4 \text{ x } 10^{-9}$ $\lambda = 24.4 \text{ F.I.T. (60\% confidence level @ 25°C)}$

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 TS50 Process results in a FIT Rate of 0.25 @ 25C and 6.11 @ 55C (0.8 eV, 60% UCL)

B. E.S.D. and Latch-Up Testing (lot K2K0DQ001G D/C 0227)

The VP01 die type has been found to have all pins able to withstand a HBM transient pulse of +/-500V per Mil-Std 883 Method 3015.7. Latch-Up testing has shown that this device withstands a current of +/-250mA.



Table 1 Reliability Evaluation Test Results

MAX4455ECQ+D

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES	COMMENTS
Static Life Test (Note	e 1) Ta = 135°C Biased Time = 192 hrs.	DC Parameters & functionality	45	0	K2K0DQ001G, D/C 0212

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