RELIABILITY REPORT

FOR

MAX9258GCM+

PLASTIC ENCAPSULATED DEVICES

October 29, 2008

MAXIM INTEGRATED PRODUCTS

120 SAN GABRIEL DR.

SUNNYVALE, CA 94086

Approved by
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Quality Assurance
Director, Reliability Engineering

Conclusion

The MAX9258GCM+ 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.

Table of Contents

I. Device Description

A. General

The MAX9257 serializer pairs with the MAX9258 deserializer to form a complete digital video serial link. The MAX9257/MAX9258 feature programmable parallel data width, parallel clock frequency range, spread spectrum, and preemphasis. An integrated control channel transfers data bidirectionally at power-up during video blanking over the same differential pair used for video data. This feature eliminates the need for external CAN or LIN interface for diagnostics or programming. The clock is recovered from input serial data at MAX9258, hence eliminating the need for an external reference clock.

The MAX9257 serializes 10, 12, 14, 16, and 18 bits with the addition of two encoding bits for AC-coupling. The MAX9258 deserializer links with the MAX9257 to deserialize a maximum of 20 (data + encoding) bits per pixel/parallel clock period for a maximum serial-data rate of 840Mbps. The word length can be adjusted to accommodate a higher pixel/parallel clock frequency. The pixel clock can vary from 5MHz to 70MHz, depending on the serial-word length. Enabling parity adds two parity bits to the serial word. The encoding bits reduce ISI and allow AC-coupling.

The MAX9258 receives programming instructions from the electronic control unit (ECU) during the control channel and transmits to the MAX9257 over the serial video link. The instructions can program or update the MAX9257, MAX9258, or an external peripheral device, such as a camera. The MAX9257 communicates with the peripheral device with I²C or UART.

The MAX9257/MAX9258 operate from a +3.3V core supply and feature separate supplies for interfacing to +1.8V to +3.3V logic levels. These devices are available in 40-lead TQFN or 48-pin LQFP packages. These devices are specified over the -40°C to +105°C temperature range.

II. Manufacturing Information

A. Description/Function:	Programmable Serializer/Deserializer with UART/I²C Control Channel
B. Process:	0.35UM 2 Poly 4 Metal CMOS
C. Number of Device Transistors:	
D. Fabrication Location:	TSMC
E. Assembly Location:	Carsem Malaysia, NSEB/UTL Thailand, Unisem Malaysia
F. Date of Initial Production:	October 26, 2007

III. Packaging Information

A. Package Type:	48-pin LQFP 7x7
B. Lead Frame:	Copper
C. Lead Finish:	100% matte Tin
D. Die Attach:	Ag Filled Epoxy
E. Bondwire:	1.0 (mil dia.)
F. Mold Material:	Epoxy with silica filler
G. Assembly Diagram:	#
H. Flammability Rating:	Class UL94-V2 or less
I. Classification of Moisture Sensitivity per JEDEC standard J-STD-020-C	Level 1
J. Multi Layer Theta Ja:	46.0°C/W
K. Multi Layer Theta Jc:	10.0°C/W

IV. Die Information

A. Dimensions:	120 x 119 mils
B. Passivation:	Silicon Dioxide/Silicon Nitride
C. Interconnect:	Al/Cu
D. Backside Metallization:	None
E. Minimum Metal Width:	0.35 um
F. Minimum Metal Spacing:	0.35 um
G. Bondpad Dimensions:	5 mil. Sq.
H. Isolation Dielectric:	Silicon Dioxide
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 biased (static) life test are pending. 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)

$\lambda = 22.37 \times 10^{-9}$

$\lambda = 22.37$ 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 TS352P4M Process results in a FIT Rate of 0.43 @ 25C and 7.50 @ 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 HS43Z die type has shown the following ESD performance per pin:

HBM	3KV
MM	200
IEC Contact	8KV
IEC Air	20KV
ISO Contact	10KV
ISO Air	30KV

Latch-Up testing has shown that this device withstands a current of 250 mA.

Table 1
Reliability Evaluation Test Results

MAX9258GCM+

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES
Static Life Test (Note 1)				
	Ta = 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