RELIABILITY REPORT

FOR

MAX505BEAG+

PLASTIC ENCAPSULATED DEVICES

December 15, 2010

MAXIM INTEGRATED PRODUCTS

120 SAN GABRIEL DR.

SUNNYVALE, CA 94086

Approved by
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Quality Assurance
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Conclusion

The MAX505BEAG+ 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 MAX505 and MAX506 are CMOS, quad, 8-bit voltage-output digital-to-analog converters (DACs). The parts operate with a single +5V supply or a dual ±5V supplies. Internal, precision output buffers swing rail-to-rail. The reference input range includes both supply rails. Offset, gain, and linearity are factory calibrated to provide 1 LSB total unadjusted error (TUE) over the full operating temperature range. The MAX505 contains double-buffered logic inputs, which allow all analog outputs to be simultaneously updated using the asynchronous load DAC (active-low LDAC) control signal. The MAX505 also has four separate reference inputs, allowing each DACâ€™s full-scale range to be independently set. The MAX506 has separate inputs latches for each of its four DACs. Data is transferred to the input latches from a common 8-bit input port. The DACs are individually selected through address inputs A0 and A1, and updated by bringing active-low WR low. All MAX506 DACs share a common reference input. All logic inputs are TTL and +5V CMOS compatible.

II. Manufacturing Information

A. Description/Function:	Quad, 8-Bit DAC with Rail-to-Rail Outputs
B. Process:	S3
C. Number of Device Transistors:	
D. F abrication Location:	Oregon
E. Assembly Location:	Malaysia
F. Date of Initial Production:	Pre 1997

III. Packaging Information

A. Package Type:	24-pin SSOP
B. Lead Frame:	Copper
C. Lead Finish:	100% matte Tin
D. Die Attach:	Conductive
E. Bondwire:	Au (1.3 mil dia.)
F. Mold Material:	Epoxy with silica filler
G. Assembly Diagram:	#05-0401-0481
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:	125°C/W
K. Single Layer Theta Jc:	26°C/W
L. Multi Layer Theta Ja:	N/A
M. Multi Layer Theta Jc:	N/A

IV. Die Information

A. Dimensions:	118 X 130 mils
B. Passivation:	Si_3N_4/SiO_2 (Silicon nitride/ Silicon dioxide)
C. Interconnect:	Al/0.5%Cu with Ti/TiN Barrier
D. B ackside Metallization:	None
E. Minimum Metal Width:	3.0 microns (as drawn)
F. Minimum Metal Spacing:	3.0 microns (as drawn)
G. Bondpad Dimensions:	5 mil. Sq.
H. Is olation Dielectric:	SiO_2
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. S ampling 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:

$$\lambda = \frac{1}{MTTF} = \frac{1.83}{192 \times 4340 \times 160 \times 2}$$ (Chi square value for MTTF upper limit)

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

$\lambda = 6.9 \times 10^{-9}$

λ = 6.9 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 S3 Process results in a FIT Rate of 0.04 @ 25C and 0.69 @ 55C (0.8 eV, 60% UCL)

B. E.S.D. and Latch-Up Testing (lot NXJAEA150B D/C 0241)

The DA36 die type has been found to have all pins able to withstand a HBM transient pulse of +/-1000V 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

MAX505BEAG+

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES	COMMENTS
Static Life Test (Note 1)					
	Ta = 135°C	DC Parameters	80	0	NXJADQ001B, D/C 9704
	Biased	& functionality	80	0	XXJBVB061B, D/C 0438
	Time = 192 hrs.				

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