

RELIABILITY REPORT
FOR
MAX4760EWX+
PLASTIC ENCAPSULATED DEVICES

January 14, 2010

MAXIM INTEGRATED PRODUCTS

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Conclusion

The MAX4760EWX+ 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 MAX4760/MAX4760A/MAX4761/MAX4761A (DPDT) analog switches operate from a single +1.8V to +5.5V supply. These switches feature a low 54pF (typ) capacitance for high-speed data switching applications.

The MAX4760/MAX4760A are quad double-pole/double-throw (DPDT) switches, and the MAX4761/MAX4761A are octal single-pole/double-throw (SPDT) switches. They have eight 2.0 Ω (typ) on-resistance, low-capacitance switches to route audio and data signals. The MAX4760/MAX4760A have four logic inputs to control the switches in pairs. The MAX4761/MAX4761A have one logic control input and an enable input (active-low EN) to disable the switches.

The MAX4760/MAX4760A/MAX4761/MAX4761A are available in a small 36-pin (6mm x 6mm) TQFN and 36-bump (3mm x 3mm) chip-scale package (UCSP™).

II. Manufacturing Information

A. Description/Function:	High-Bandwidth, Quad DPDT Switches
B. Process:	E35
C. Number of Device Transistors:	
D. Fabrication Location:	Texas
E. Assembly Location:	Japan, Texas
F. Date of Initial Production:	10/23/2004

III. Packaging Information

A. Package Type:	36-pin WLP
B. Lead Frame:	NA
C. Lead Finish:	SAC (SnAgCu) Balls
D. Die Attach:	Na
E. Bondwire:	NA (NA mil dia.)
F. Mold Material:	Epoxy with silica filler
G. Assembly Diagram:	#05-9000-4014
H. Flammability Rating:	Class UL94-V0
I. Classification of Moisture Sensitivity per J-STD-020-C	Level 1

IV. Die Information

A. Dimensions:	122 X 122 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:	0.35µm
F. Minimum Metal Spacing:	0.35µm
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: 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 125°C biased (static) life test are shown in Table 1. Using these results, the Failure Rate (λ) is calculated as follows:

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

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

$$\lambda = 22.4 \times 10^{-9}$$
$$\lambda = 22.4 \text{ F.I.T. (60\% confidence level @ 25°C)}$$

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 E35 Process results in a FIT Rate of 0.68 @ 25C and 11.68 @ 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 AS27-2 die type has been found to have all pins able to withstand a HBM transient pulse of +/-2000 V per Mil-Std 883 Method 3015.7. Latch-Up testing has shown that this device withstands a current of +/-250 mA.

Table 1
Reliability Evaluation Test Results

MAX4760EWX+

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES
Static Life Test (Note 1)				
	Ta = 125°C Biased Time = 192 hrs.	DC Parameters & functionality	48	0
Moisture Testing (Note 2)				
HAST	Ta = 130°C RH = 85% Biased Time = 96hrs.	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