

RELIABILITY REPORT
FOR
MAX4619CSE+
PLASTIC ENCAPSULATED DEVICES

April 1, 2011

MAXIM INTEGRATED PRODUCTS

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Approved by
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Conclusion

The MAX4619CSE+ 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 MAX4617/MAX4618/MAX4619 are high-speed, low-voltage, CMOS analog ICs configured as an 8-channel multiplexer (MAX4617), two 4-channel multiplexers (MAX4618), and three single-pole/double-throw (SPDT) switches (MAX4619). These CMOS devices can operate continuously with a +2V to +5.5V single supply. Each switch can handle rail-to-rail analog signals. The off-leakage current is only 1nA at TA = +25°C and 10nA at TA = +85°C. All digital inputs have 0.8V to 2.4V logic thresholds, ensuring TTL/CMOS-logic compatibility when using a single +5V supply.

II. Manufacturing Information

A. Description/Function:	High-Speed, Low-Voltage, CMOS Analog Multiplexers/Switches
B. Process:	TS60
C. Number of Device Transistors:	
D. Fabrication Location:	Taiwan
E. Assembly Location:	Malaysia, Philippines, Thailand
F. Date of Initial Production:	July 24, 1999

III. Packaging Information

A. Package Type:	16-pin SOIC (N)
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:	#05-1201-0115
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:	115°C/W
K. Single Layer Theta Jc:	32°C/W
L. Multi Layer Theta Ja:	75°C/W
M. Multi Layer Theta Jc:	24°C/W

IV. Die Information

A. Dimensions:	72 X 63 mils
B. Passivation:	Si ₃ N ₄ /SiO ₂ (Silicon nitride/ Silicon dioxide)
C. Interconnect:	Aluminum/Si (Si = 1%)
D. Backside Metallization:	None
E. Minimum Metal Width:	Metal 1 - 0.9 microns / Metal 2 - 0.9 microns (as drawn)
F. Minimum Metal Spacing:	Metal 1 - 0.9 microns / Metal 2 - 0.9 microns (as drawn)
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: Richard Aburano (Manager, Reliability Engineering)
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. Sampling Plan: Mil-Std-105D

VI. Reliability Evaluation

A. Accelerated Life Test

The results of the 192 biased (static) life test are shown in Table 1. Using these results, the Failure Rate (λ) is calculated as follows:

$$\lambda = \frac{1}{\text{MTTF}} = \frac{1.83}{192 \times 4340 \times 80 \times 2} \quad (\text{Chi square value for MTTF upper limit})$$

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

$$\lambda = 13.7 \times 10^{-9}$$

$$\lambda = 13.7 \text{ F.I.T. (60\% confidence level @ 25}^\circ\text{C)}$$

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 TS60 Process results in a FIT Rate of 0.5 @ 25C and 8.57 @ 55C (0.8 eV, 60% UCL)

B. E.S.D. and Latch-Up Testing (lot K6UCAQ001G D/C 9923)

The AH24-2 die type has been found to have all pins able to withstand a HBM transient pulse of +/-600V 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

MAX4619CSE+

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES	COMMENTS
Static Life Test (Note 1)	Ta = 135°C Biased Time = 192 hrs.	DC Parameters & functionality	80	0	K6UAAQ001G, D/C 9923

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