

RELIABILITY REPORT

FOR

MAX4310ESA+, MAX4310ESA+T,
MAX4310EUA+, MAX4310EUA+T

April 16, 2020

MAXIM INTEGRATED

160 RIO ROBLES

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Conclusion

The MAX4310 successfully meets the quality and reliability standards required of all Maxim Integrated products. In addition, Maxim Integrated's continuous reliability monitoring program ensures that all outgoing product will continue to meet Maxim Integrated's quality and reliability standards.

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I. Device Description

A. General

The MAX4310 single-supply mux-amps combine high-speed operation, low-glitch switching, and excellent video specifications. The MAX4310 integrate 2-/4-/8-channel multiplexers, respectively, with an adjustable gain amplifier optimized for unity-gain stability. It has 40ns channel switching time and low 10mVp-p switching transients, making them ideal for video-switching applications. They operate from a single +4V to +10.5V supply, or from dual supplies of $\pm 2V$ to $\pm 5.25V$, and they feature rail-to-rail outputs and an input common-mode voltage range that extends to the negative supply rail.

II. Manufacturing Information

A. Description/Function:	High-Speed, Low-Power, Single-Supply Multichannel, Video Multiplexer-Amplifiers
B. Process:	CB20
C. Device Count:	N/A
D. Fabrication Location:	USA
E. Assembly Location:	Thailand, Philippines, Malaysia,
F. Date of Initial Production:	July 17, 1998

III. Packaging Information

A. Package Type:	SOIC	uMAX
B. Lead Frame:	Cu194	Cu7025
C. Lead Finish:	Matte Tin	Matte Tin
D. Die Attach:	AB2200D, AB8290, 84-1LMISR4	AB8290, 84-1LMISR4
E. Bondwire:	1.00 mil Au	1.00 mil Au
F. Mold Material:	G600, G600C	G700K, G600
G. Flammability Rating:	UL-94 (V-0 Rating)	UL-94 (V-0 Rating)
H. Classification of Moisture Sensitivity per JEDEC standard J-STD-020-C	Level 1	Level 1
I. Single Layer Theta Ja:	170 °C/W	221 °C/W
J. Single Layer Theta Jc:	40 °C/W	42 °C/W
K. Multi Layer Theta Ja:	136 °C/W	206.3 °C/W
L. Multi Layer Theta Jc:	38 °C/W	42 °C/W

IV. Die Information

A. Dimensions:	58 X 51 mils
B. Passivation:	Nitride

V. Quality Assurance Information

- A. Quality Assurance Contacts: Veronica Mercado (Engineer, Reliability)
Ryan Wall (Manager, Reliability)
Bryan Preeshl (SVP 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 125C biased (static) life test are shown in Table 1. Using these results, the Failure Rate λ is calculated as follows:

$$\lambda = \frac{1}{MTTF} = \frac{1.83}{192 \times 2454 \times 77 \times 2} \text{ (Chi square value for MTTF upper limit)}$$

(where 2454 = Temperature Acceleration factor assuming an activation energy of 0.8eV)

$$\lambda = 25.2 \times 10^{-9}$$

$$\lambda = 25.2 \text{ FITs (60\% confidence level @25°C)}$$

Maxim Integrated performs quarterly life test monitors on its processes. This data is published in the Reliability Report found at <https://www.maximintegrated.com/en/support/qa-reliability/reliability/reliability-monitor-program.html>.

CB20 cumulative process FIT

$$\lambda = 0.21 \text{ FITs (60\% confidence level @25°C)}$$

$$\lambda = 2.47 \text{ FITs (60\% confidence level @55°C)}$$

B. E.S.D. and Latch-Up Testing

The MAX4310 has been found to have all pins able to withstand an HBM transient pulse of +/- 2500 V per JEDEC / ESDA JS-001. Latch-Up testing has shown that this device withstands +/- 250 mA current injection and supply overvoltage per JEDEC JESD78.

Table 1
Reliability Evaluation Test Results

MAX4310ESA+

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES	COMMENTS
Static Life Test (Note 1)	Ta = 125C Biased Time = 192 hrs.	DC Parameters & functionality	77	0	

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