

RELIABILITY REPORT  
FOR  
MAX32000CCB+  
MAX32000CCB+T

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**MAXIM INTEGRATED**

160 RIO ROBLES  
SAN JOSE, CA 95134



Sheena Karlyn Basinang  
Engineer, Reliability



Ryan Wall  
Manager, Reliability

## Conclusion

The MAX32000 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 MAX32000 is a fully integrated, quad-channel, high-performance pin-electronics driver with built-in level setting DACs, ideal for memory and SOC ATE systems. Each MAX32000 channel includes a four-level pin driver, programmable cable-droop compensation, five 14-bit DACs, and a comparator that is useful for AC calibration.

The driver features a wide -2V to +6V operating range and a data rate of 1200Mbps at +2V operation, and in high-voltage mode (VHH mode) offers an output voltage range of 0 to 13V. The device includes high impedance, active termination (3rd-level drive), and is highly linear even at low voltage swings. The calibration comparators and multiplexer provide a timing calibration path for each channel. A serial interface configures the device, easing PCB signal routing.

The MAX32000 is available in a 64-pin TQFP-EPR package with top side exposed pad.

## II. Manufacturing Information

A. Description/Function:	High-Speed Quad Driver with Integrated DACs, Cable-Droop Compensation, Slew Rate Control, and VHH Fourth Level Drive
B. Process:	CB40
C. Device Count:	53031
D. Fabrication Location:	USA
E. Assembly Location:	Philippines
F. Date of Initial Production:	June 1, 2020

## III. Packaging Information

A. Package Type:	TQFP
B. Lead Frame:	CU194
C. Lead Finish:	Matte Tin
D. Die Attach:	AB3230
E. Bondwire:	1.2 mil Au
F. Mold Material:	G700Y
G. Assembly Diagram:	05-9000-3682
H. Flammability Rating:	UL-94 (V-0 Rating)
I. Classification of Moisture Sensitivity per JEDEC standard J-STD-020-C	Level 3
J. Single Layer Theta Ja:	N/A
K. Single Layer Theta Jc:	N/A
L. Multi Layer Theta Ja:	40 °C/W
M. Multi Layer Theta Jc:	1 °C/W

## IV. Die Information

A. Dimensions:	222.0472X225.9842 mils
B. Passivation:	SiN

## V. Quality Assurance Information

<b>A. Quality Assurance Contacts:</b>	Ryan Wall (Manager, Reliability) Michael Cairnes (Executive Director, Reliability) Bryan Preeshl (SVP of QA)
<b>B. Outgoing Inspection Level:</b>	0.1% for all electrical parameters guaranteed by the Datasheet. 0.1% for all Visual Defects.
<b>C. Observed Outgoing Defect Rate:</b>	< 50 ppm
<b>D. Sampling Plan:</b>	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  $\lambda$  is calculated as follows:

$$\lambda = \frac{1}{MTTF} = \frac{1.83}{240 \times 2454 \times 48 \times 2} \text{ (Chi square value for MTTF upper limit)}$$

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

$$\lambda = 32.4 \times 10^{-9}$$

$$\lambda = 32.4 \text{ FITs (60\% confidence level @25°C)}$$

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>.

CB40 cumulative process Fit

$$\lambda = 0.29 \text{ FITs (60\% confidence level @25°C)}$$

$$\lambda = 3.47 \text{ FITs (60\% confidence level @55°C)}$$

### B. ESD and Latch-Up Testing

The MAX32000 has been found to have all pins able to withstand an HBM transient pulse of  $\pm 2500$  V per JEDEC / ESDA JS-001. Latch-Up testing has shown that this device withstands  $\pm 250$  mA current injection and supply overvoltage per JEDEC JESD78.

**Table 1**  
Reliability Evaluation Test Results  
**MAX19001BECB+ (Note 1)**

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES	COMMENTS
Static Life Test (Note 2)	Ta = 125°C Biased Time = 240 hrs.	DC parameters & functionality	48	0	

Note 1: MAX32000 and MAX19001B are same silicon.

Note 2: Life Test Data may represent plastic DIP qualification lots.