

RELIABILITY REPORT
FOR
MXB7843EUE+T / MXB7843EEE+T
PLASTIC ENCAPSULATED DEVICES

March 29, 2015

MAXIM INTEGRATED

160 RIO ROBLES
SAN JOSE, CA 95134

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Quality Assurance
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Conclusion

The MXB7843EUE+T / MXB7843EEE+T 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 MXB7843 is an industry-standard 4-wire touch-screen controller. It contains a 12-bit sampling analog-to-digital converter (ADC) with a synchronous serial interface and low on-resistance switches for driving resistive touch screens. The MXB7843 uses an external reference. The MXB7843 can make absolute or ratiometric measurements. The MXB7843 has two auxiliary ADC inputs. All analog inputs are fully ESD protected, eliminating the need for external devices. The MXB7843 is guaranteed to operate with a single 2.375V to 5.25V supply voltage. In shutdown mode, the typical power consumption is reduced to under 0.5 μ W, while the typical power consumption at 125ksps throughput and a 2.7V supply is 650 μ W. Low-power operation makes the MXB7843 ideal for battery-operated systems, such as personal digital assistants with resistive touch screens and other portable equipment. The MXB7843 is available in 16-pin QSOP and TSSOP packages, and is guaranteed over the -40°C to +85°C temperature range.

II. Manufacturing Information

A. Description/Function:	2.375V to 5.25V, 4-Wire Touch-Screen Controller	
B. Process:	C6Y	
C. Number of Device Transistors:	10459	
D. Fabrication Location:	Japan	
E. Assembly Location:	Malaysia, Philippines, Thailand	Philippines, Thailand
F. Date of Initial Production:	April 27, 2002	

III. Packaging Information

A. Package Type:	16-pin TSSOP	16-pin QSSOP
B. Lead Frame:	Copper	Copper
C. Lead Finish:	100% matte Tin	100% matte Tin
D. Die Attach:	Conductive	Conductive
E. Bondwire:	Au (1 mil dia.)	Au (1 mil dia.)
F. Mold Material:	Epoxy with silica filler	Epoxy with silica filler
G. Assembly Diagram:	#05-2101-0046	#05-2101-0047
H. Flammability Rating:	Class UL94-V0	Class UL94-V0
I. Classification of Moisture Sensitivity per JEDEC standard J-STD-020-C	Level 1	Level 1
J. Single Layer Theta Ja:	106°C/W	120°C/W
K. Single Layer Theta Jc:	27°C/W	37°C/W
L. Multi Layer Theta Ja:	90°C/W	105°C/W
M. Multi Layer Theta Jc:	27°C/W	37°C/W

IV. Die Information

A. Dimensions:	86 X 144 mils
B. Passivation:	Si ₃ N ₄ /SiO ₂ (Silicon nitride/ Silicon dioxide)
C. Interconnect:	Al with Ti/TiN Barrier
D. Backside Metallization:	None
E. Minimum Metal Width:	0.6 microns (as drawn)
F. Minimum Metal Spacing:	0.6 microns (as drawn)
G. Bondpad Dimensions:	
H. Isolation 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. Sampling 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:

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

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

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

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

The following failure rate represents data collected from Maxim Integrated's reliability monitor program. Maxim Integrated performs quarterly life test monitors on its processes. This data is published in the Reliability Report found at <http://www.maximintegrated.com/qa/reliability/monitor>. Cumulative monitor data for the C6Y Process results in a FIT Rate of 0.17 @ 25°C and 2.9 @ 55°C (0.8 eV, 60% UCL)

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

The AC29-3 die type has been found to have all pins able to withstand an HBM transient pulse of +/-2000V per JEDEC JESD22-A114. Latch-Up testing has shown that this device withstands a current of +/-250mA and overvoltage per JEDEC JESD78.

Table 1
Reliability Evaluation Test Results
MXB7843EUE+T / MXB7843EEE+T

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	

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