RELIABILITY REPORT
FOR
MAX6043BAUT25-T
PLASTIC ENCAPSULATED DEVICES

May 21, 2009

MAXIM INTEGRATED PRODUCTS
120 SAN GABRIEL DR.
SUNNYVALE, CA 94086

Approved by
Ken Wendel
Quality Assurance
Director, Reliability Engineering
The MAX6043BAUT25-T 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.

Table of Contents

I. Device Description
   A. General

II. Manufacturing Information
III. Packaging Information
IV. Die Information
V. Quality Assurance Information
VI. Reliability Evaluation

I. Device Description

A. General

The MAX6043 precision voltage reference provides accurate preset +2.5V, +3.3V, +4.096V, +5.0V, and +10V reference voltages from up to +40V input voltages. The MAX6043 features a proprietary temperature coefficient curvature-correction circuit and lasertrimmed thin-film resistors that result in a very low temperature coefficient of 15ppm/°C (max) and excellent initial accuracy of 0.05% (max). Low temperature drift and low noise make the MAX6043 ideal for use with high-resolution A/D or D/A converters. The MAX6043 draws 320µA of supply current and sources 10mA or sinks 0.6mA of load current. The MAX6043 uses bandgap technology for low-noise performance and excellent accuracy. The MAX6043 does not require an output bypass capacitor for stability, and is stable with capacitive loads up to 100µF. Eliminating the output bypass capacitor saves valuable board area in space-critical applications. The supply-independent, low supply current makes the MAX6043 ideal for battery-operated, high-performance systems. The MAX6043 is available in a 6-pin SOT23 package and operates over the automotive (-40°C to +125°C) temperature range.
II. Manufacturing Information

A. Description/Function: Precision High-Voltage Reference in SOT23
B. Process: S3
C. Number of Device Transistors: 152
D. Fabrication Location: Oregon
E. Assembly Location: UTL
F. Date of Initial Production: October 24, 2003

III. Packaging Information

A. Package Type: 6-pin SOT23
B. Lead Frame: Copper
C. Lead Finish: 85Sn/15Pb plate
D. Die Attach: None Epoxy
E. Bondwire: 95%Pb/5%Sn (Solder Bump mil dia.)
F. Mold Material: Epoxy with silica filler
G. Assembly Diagram: #05-0901-0181
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: 185.5°C/W
K. Single Layer Theta Jc: 75°C/W
L. Multi Layer Theta Ja: 134.4°C/W
M. Multi Layer Theta Jc: 38.7°C/W

IV. Die Information

A. Dimensions: 90 X 45 mils
B. Passivation: Si₃N₄/SiO₂ (Silicon nitride/ Silicon dioxide
C. Interconnect: Aluminum/0.5% Cu
D. Backside Metallization: None
E. Minimum Metal Width: 3.0 microns (as drawn)
F. Minimum Metal Spacing: 3.0 microns (as drawn)
G. Bondpad Dimensions: 5 mil. Sq.
H. Isolation Dielectric: SiO₂
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 135°C biased (static) life test are shown in Table 1. Using these results, the Failure Rate ($\lambda$) is calculated as follows:

   $\lambda = \frac{1}{MTTF} = \frac{1.83}{192 \times 4340 \times 50 \times 2}$

   (Chi square value for MTTF upper limit)

   $\lambda = 21.99 \times 10^{-9}$

   $\lambda = 21.99$ F.I.T. (60% confidence level @ 25°C)

   The following failure rate represents data collected from Maxim’s reliability monitor program. Maxim performs quarterly 1000 hour life test monitors on its processes. This data is published in the Product Reliability Report found at http://www.maxim-ic.com/. Current monitor data for the S3 Process results in a FIT Rate of 0.12 @ 25°C and 2.1 @ 55°C (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 RF46 die type has been found to have all pins able to withstand a HBM transient pulse of +/-2500V per JEDEC JESD22-A114. Latch-Up testing has shown that this device withstands a current of +/-250mA.
Table 1
Reliability Evaluation Test Results

<table>
<thead>
<tr>
<th>TEST ITEM</th>
<th>TEST CONDITION</th>
<th>FAILURE IDENTIFICATION</th>
<th>SAMPLE SIZE</th>
<th>NUMBER OF FAILURES</th>
</tr>
</thead>
</table>
| **Static Life Test** (Note 1) | Ta = 135°C  
Biased  
Time = 192 hrs. | DC Parameters & functionality | 50          | 0                  |
| **Moisture Testing** (Note 2) | 85/85  
Ta = 85°C  
RH = 85%  
Biased  
Time = 1000hrs. | DC Parameters & functionality | 77          | 0                  |
| **Mechanical Stress** (Note 2) | -65°C/150°C  
Cycle  
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