RELIABILITY REPORT
FOR
MAX9643UATA+
PLASTIC ENCAPSULATED DEVICES

May 9, 2012

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

Approved by
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Quality Assurance
Reliability Engineer
Conclusion

The MAX9643UATA+ 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 MAX9643 is a high-speed 60V precision unidirectional current-sense amplifier ideal for a wide variety of power-supply control applications. Its high signal bandwidth allows its use within DC-DC switching converter power-supply control loops with minimal phase delay. The IC also features 50µV (max) precision input offset voltage, allowing small sense resistors to be used in applications where efficiency is important and when wide dynamic-range current measurement is needed. High DC CMRR and AC CMRR make it easy to use in a wide variety of aggressive environments. The device is available in fixed gains of 2.5V/V and 10V/V. It is also available in a small, 8-pin TDFN (2mm x 3mm) package and is rated over the -40°C to +125°C temperature range.
II. Manufacturing Information

A. Description/Function: 60V High-Speed Precision Current-Sense Amplifier
B. Process: CB5HV
C. Number of Device Transistors: 5653
D. Fabrication Location: Oregon
E. Assembly Location: Taiwan, Thailand
F. Date of Initial Production: August 25, 2011

III. Packaging Information

A. Package Type: 8L TDFN
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: #05-9000-4349 / A
H. Flammability Rating: Class UL94-V0
I. Classification of Moisture Sensitivity per JEDEC standard J-STD-020-C
J. Single Layer Theta Ja: 60°C/W
K. Single Layer Theta Jc: 11°C/W
L. Multi Layer Theta Ja: 60°C/W
M. Multi Layer Theta Jc: 11°C/W

IV. Die Information

A. Dimensions: 124 X 131 mils
B. Passivation: Si₃N₄/SiO₂ (Silicon nitride/ Silicon dioxide)
C. Interconnect: Al/0.5%Cu with Ti/TiN Barrier
D. Backside Metallization: None
E. Minimum Metal Width: 5.0 microns (as drawn)
F. Minimum Metal Spacing: 5.0 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:
   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 biased (static) life test are shown in Table 1. Using these results, the Failure Rate (λ) is calculated as follows:

\[
\lambda = \frac{1}{\text{MTTF}} = \frac{1.83}{500 \times 4340 \times 80 \times 2}
\]

(Chi square value for MTTF upper limit)

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

\[
\chi = 5.3 \times 10^{-9}
\]

\[
\chi = 5.3 \text{ F.I.T. (60% confidence level @ 25°C)}
\]

B. E.S.D. and Latch-Up Testing (ESD lot JX1ZBQ001E D/C 1104, Latch-Up lot JX1ZBQ001DL D/C 1102)

The OY51-1 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 +/-100mA and overvoltage per JEDEC JESD78.
### 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>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Static Life Test</td>
<td>(Note 1)</td>
<td>Ta = 135°C, Biased</td>
<td>80</td>
<td>0</td>
<td>JX1ZBQ001DL, D/C 1102</td>
</tr>
<tr>
<td></td>
<td>Time = 500 hrs.</td>
<td>DC Parameters &amp; functionality</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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