RELIABILITY REPORT
FOR
MAX3120CSA+
PLASTIC ENCAPSULATED DEVICES

October 26, 2009

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

Approved by
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Quality Assurance
Director, Reliability Engineering
Conclusion

The MAX3120CSA+ 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 MAX3120 IrDA 1.2-compatible infrared transceiver is optimized for battery-powered, space-constrained applications. It consumes only 120µA while supporting data rates up to 115kbps over a wide 3V to 5.5V operating range, and features a 10nA shutdown mode to further extend battery life. The MAX3120 reduces the space required for IrDA applications by requiring a minimum of external components: photodiode, infrared LED, and current-setting resistor. Optical components are external to allow maximum flexibility in PC board design. The MAX3120 is available in 8-pin µMAX® and SO packages. The µMAX package consumes half the board space of an 8-pin SO.
II. Manufacturing Information

A. Description/Function: Low-Profile 3V, 120µA IrDA Infrared Transceiver
B. Process: S12
C. Number of Device Transistors: 
D. Fabrication Location: Oregon, California or Texas
E. Assembly Location: Malaysia, Philippines, Thailand
F. Date of Initial Production: Pre 1997

III. Packaging Information

A. Package Type: 8-pin SOIC (N)
B. Lead Frame: Copper
C. Lead Finish: 100% matte Tin
D. Die Attach: Conductive Epoxy
E. Bondwire: Gold (1.3 mil dia.)
F. Mold Material: Epoxy with silica filler
G. Assembly Diagram: #05-1901-0191
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: 170°C/W
K. Single Layer Theta Jc: 40°C/W
L. Multi Layer Theta Ja: 136°C/W
M. Multi Layer Theta Jc: 38°C/W

IV. Die Information

A. Dimensions: 61 X 40 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: 1.2 microns (as drawn)
F. Minimum Metal Spacing: 1.2 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 (λ) is calculated as follows:

\[ \lambda = \frac{1}{\text{MTTF}} = \frac{4.05}{192 \times 4340 \times 239 \times 2} \]

(Chi square value for MTTF upper limit)

\[ \lambda = 9.92 \times 10^{-9} \]

\[ \lambda = 9.92 \text{ F.I.T. (60% confidence level @ 25°C)} \]

The following failure rate represents data collected from Maxim's reliability monitor program. Maxim performs quarterly life test monitors on its processes. This data is published in the Reliability Report found at http://www.maxim-ic.com/qa/reliability/monitor. Cumulative monitor data for the S12 Process results in a FIT Rate of 0.17 @ 25°C and 3.00 @ 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 RS65 die type has been found to have all pins able to withstand a HBM transient pulse of +/-600 V per Mil-Std 883 Method 3015.7. Latch-Up testing has shown that this device withstands a current of +/-250 mA.
Table 1
Reliability Evaluation Test Results

MAX3120CSA+

<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>
<tbody>
<tr>
<td>Static Life Test</td>
<td>Ta = 135°C</td>
<td>DC Parameters &amp; functionality</td>
<td>239</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Biased</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Time = 192 hrs.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Moisture Testing</td>
<td>Ta = 130°C</td>
<td>DC Parameters &amp; functionality</td>
<td>77</td>
<td>0</td>
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<tr>
<td></td>
<td>RH = 85%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biased</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Time = 96hrs.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mechanical Stress</td>
<td>-65°C/150°C</td>
<td>DC Parameters &amp; functionality</td>
<td>77</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>1000 Cycles</td>
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<td></td>
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</tr>
<tr>
<td></td>
<td>Method 1010</td>
<td></td>
<td></td>
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</table>

Note 1: Life Test Data may represent plastic DIP qualification lots.
Note 2: Generic Package/Process data