Summary of Noise Rejection Testing of the UT63M1X5C Transceiver

Table 1: Cross Reference of Affected Product Revisions

<table>
<thead>
<tr>
<th>Product Name:</th>
<th>Product Revision</th>
<th>Internal PIC* Number:</th>
</tr>
</thead>
<tbody>
<tr>
<td>UT63M1X5C Transceiver</td>
<td>Rev C</td>
<td>BA02</td>
</tr>
</tbody>
</table>

* PIC = Aeroflex Internal Product Identification Code

1 Overview

Aeroflex MIL-STD-1553 transceivers and protocol devices are subjected to full RT validation testing per MIL-STD-1553B as part of the internal qualification process. The objective of RT validation testing is to demonstrate device compatibility with the MIL-STD-1553 specification. This product advisory provides clarification on the RT validation test results obtained during the Noise Rejection portion of the test.

2 Noise Rejection Test Results

2.1 Test Configuration

Noise Rejection testing of the UT63M1X5C transceiver was performed at Test Systems, Inc. using a SumMIT-E as the protocol handler. The device under test (DUT) was placed into a modified TSI 1553 Interface Card PN 5024-64, which is installed into a PC. Separate buses are used for testing of channels A and B in a transformer-coupled configuration in accordance with Section 4.5.2.1.2.4 of MIL-STD-1553B. Messages having an amplitude of 2.1V peak-to-peak, line-to-line are sent to the terminal in the presence of 140mV RMS gaussian noise in the range of 1kHz to 4MHz coupled into the system. Testing proceeds until a word error rate of 100E-9 is statistically demonstrated resulting in a “PASS” outcome.

2.2 Test Results

The pass criteria for Noise Rejection testing is that a device must exhibit no more than one error in 10^7 words, or an error rate of 100E-9. The device is also allowed to have up to 24 errors provided the average error rate is no greater than 100E-9 errors per message. Three devices (six die total) were subjected to 140mV RMS noise per MIL-STD-1553 Noise Rejection testing with the following results:

- Device #1 Bus A passed with one error out of 52,100,004 words processed
- Device #1 Bus B passed with one error out of 52,100,004 words processed
- Device #2 Bus A failed with 24 errors out of 176,734,668 words processed *
- Device #2 Bus B failed with 24 errors out of 218,322,951 words processed *
- Device #3 Bus A passed with three errors out of 68,300,001 words processed
- Device #3 Bus B passed with three errors out of 68,300,001 words processed

* These devices passed when retested at 135mV RMS noise

The six die tested exhibited a mean error rate of 62E-9 with a standard deviation of 49E-9. The error rate was calculated by dividing the number of errors by the number of received messages. Based upon this data, 78% of die should have an error rate less than the specification limit of 100E-9.
2.3 Conclusion
Testing and analysis of data taken from the three UT63M1X5C devices tested indicates that 78% of
devices will meet the requirements of Section 4.5.2.1.2.4 Noise Rejection per MIL-STD-1553B. Given
the error rate at 140mV RMS noise, the system should expect one retry for every 1.6E7 messages.
Assuming bus traffic with all transmit or receive commands having the same number of data words, this
equates to a system overhead of approximately 6.2E-6% of a fully utilized MIL-STD-1553 bus.