1.7. Tests Performed

Test	Quantity	Part Number
Contact current rating	5	440062-2
TMDS (see Note) signals, time domain impedance	5	440062-2
TMDS signals, time domain far-end crosstalk (FEXT)	5	440062-2
TMDS signals, rise time degradation	5	440062-2
Analog RGB coaxial signals, time domain impedance	5	440062-2
Analog RGB coaxial signals, time domain far-end crosstalk (FEXT)	5	440062-2
Analog RGB coaxial signals, rise time degradation	5	440062-2
Board insertion force	10	440062-1
	10	440062-2
Thread torque	30	440058-1
Resistance to soldering heat	5	440062-1
Solderability	5	440062-2

NOTE *TMDS = Transition Minimized Differential Signaling.*

Figure 2

2. SUMMARY OF TESTING

2.1. Contact Current Rating

All specimens had a temperature rise of less than 30°C above ambient when tested using a current of 1.5 amperes.

2.2. TMDS Signals, Time Domain Impedance

All specimens had an impedance between 85 and 115 ohms.

2.3. TMDS Signals, Time Domain Far-end Crosstalk (FEXT)

All specimens had a crosstalk of less than 5%.

2.4. TMDS Signals, Rise Time Degradation

All specimens had a rise time degradation of less than 160 picoseconds.

2.5. Analog Red, Green, Blue (RGB) Coaxial Signals, Time Domain Impedance

All specimens had an impedance between 67.5 and 82.5 ohms.

2.6. Analog RGB Coaxial Signals, Time Domain Far-end Crosstalk (FEXT)

All specimens had a crosstalk of less than 3%.

3.5. Analog RGB Coaxial Signal, Time Domain Impedance

A TDR was used to measure the impedance of the specimen. An airline was connected to the test board and the test board was connected to a DVI cable assembly. The other end of the cable assembly was open. The differential impedance measurement was performed and the maximum impedance of each coaxial line within the DVI cable assembly was recorded.

3.6. Analog RGB Coaxial Signals, Time Domain Far-end Crosstalk (FEXT)

A TDR was used to measure FEXT. An airline was connected to the first test board, a DVI cable assembly, and the second test board. The whole test system was configured to measure FEXT (the far end of the aggressive coaxial liner and the near end of the victim coaxial line were terminated.) The coupling voltage of the victim coaxial liner was measured. The percentage FEXT was calculated from the coupling voltage and the launching voltage.

3.7. Analog RGB Coaxial Signals, Rise Time Degradation

A TDR was used to measure rise time degradation. The system rise time was measured with 2 test boards connected together via a short pin and a ground pin. The pins were then removed and a DVI cable assembly was inserted between the test boards. The rise time degradation was calculated from the rise time of the coaxial line and the system rise time.

3.8. Board Insertion Force

A PC board was placed on a flat surface, with an extra board underneath, to prevent stubbing of the solder tails upon insertion of the test specimen. Each specimen was laid on the board with a flat bar on top, to push the specimen onto the PC board. A rod was mounted to the load cell of the tensile machine and was used to push against the bar on the specimen. The specimens were then inserted at a rate of .1 inch per minute until fully inserted on the board. The force was measured and recorded.

3.9. Thread Torque

Test plugs were inserted into the test specimen. The jack screws on the plug were tightened into the test specimen until the threads were stripped, the screws broke, or the jackposts turned freely. A torque wrench was used to tighten the jack screws. The maximum torque was measured and recorded.

3.10. Resistance to Soldering Heat

The specimens were mounted to printed circuit boards with plated through terminal holes. The specimens were immersed in flux, type "RMA" (mildly activated rosin), for 5 to 10 seconds. The flux was maintained at room temperature. The specimens were then removed from the flux, and the excess was allowed to drain off for 5 to 20 seconds The specimens were attached to a dipping machine where the dross and any oxidized flux were skimmed away. The specimens were immersed at a rate of approximately 1 inch per minute into a soldering bath filled with melted 60% tin and 40% lead, controlled at 260 ± 5°C, until the printed circuit board rested on the molten solder. The specimens were held in the solder bath 10 seconds. The specimens were removed from the solder at a rate of approximately 1-inch per minute and then subjected to a 5 minute cleaning in isopropyl alcohol.

Right Angle DVI Receptacle Connector

1. INTRODUCTION

1.1. Purpose

Testing was performed on the Tyco Electronics Right Angle Digital Visual Interface (DVI) Receptacle Connector to determine its conformance to the requirements of Product Specification 108-1941 Revision A.

1.2. Scope

This report covers additional testing not performed as part of the qualification testing per Product Specification 108-1941 Revision A. Testing was performed at the Engineering Assurance Product Test Laboratory between 19Nov00 and 22Feb01. The test file number for this testing is CTL 6477-001A. This documentation is on file at and available from the Engineering Assurance Product Test Laboratory.

1.3. Conclusion

The Right Angle DVI receptacle Connectors listed in paragraph 1.5, conformed to the performance requirements of Product Specification 108-1941 Revision A.

1.4. Product Description

The DVI Receptacle Connector is designed to meet the industry's requirements for analog and digital computer monitors. The receptacle connector supports host systems that are enabled to transmit both analog and digital video. This is achieved by utilizing two different sets of contacts in one housing.

1.5. Test Specimens

Test specimens were representative of normal production lots. Specimens identified with the following part numbers were used for test:

Part Number	Description
440062-1	DVI-I receptacle (integrated) with gold flash contacts
440062-2	DVI-I receptacle (integrated) with 10μin gold contacts
440058-1	DVI-D receptacle (digital) with gold flash contacts

Figure 1

1.6. Environmental Conditions

Unless otherwise stated, the following environmental conditions prevailed during testing:

- Temperature: 15 to 35°C
- Relative Humidity: 25 to 75%

* Trademark
I Indicates change

3.11. Solderability

Prior to the application of flux and the immersion into solder, the specimens were suspended in a closed container, 2 inches above boiling deionized water using a stainless steel holder. The specimen surfaces were exposed to this steam environment for 8 hours. Then within 24 hours the specimens were subjected to solderability testing as described. The area of the specimens to be evaluated were immersed in flux type "R", (non-activated water white rosin) for 5 to 10 seconds. The flux was maintained at room temperature. The specimens were then removed from the flux and the excess was allowed to drain off for 5 to 20 seconds. The specimens were attached to a dipping machine where the dross and any oxidized flux were skimmed away. The specimens were immersed at a rate of approximately 1 inch per minute into a soldering bath filled with melted 60% tin and 40% lead, controlled at 245 ± 5°C until the entire surface to be evaluated was coated. The specimens were held in the solder bath for 4 to 5 seconds. The specimens were removed from the solder at a rate of approximately 1-inch per minute and then subjected to a 5 minute cleaning in isopropyl alcohol.

2.7. Analog RGB Coaxial Signals, Rise Time Degradation

All specimens had a rise time degradation of less than 140 picoseconds.

2.8. Board Insertion Force

All specimens had a board insertion force of less than 10 pounds.

2.9. Thread Torque

All specimens had a minimum thread torque of 5.0 inch-pounds.

2.10. Resistance to Soldering Heat

No evidence of physical damage was visible as a result of exposure to soldering heat.

2.11. Solderability

All specimens had a minimum of 95% solder coverage.

3. TEST METHODS

3.1. Contact Current Rating

Temperature rise curves were produced by measuring individual contact temperatures at 5 different current levels. These measurements were plotted to produce a temperature rise vs current curve. Thermocouples were attached to individual contacts to measure their temperatures. The ambient temperature was then subtracted from this measured temperature to find the temperature rise. When the temperature rise of 3 consecutive readings taken at 5 minute intervals did not differ by more than 1°C, the temperature measurement was recorded.

3.2. TMDS Signal, Time Domain Impedance

A Time Domain Reflectometer (TDR) was used to measure the impedance of the specimen. An airline was connected to the test board and the test board was connected to a DVI cable assembly. The other end of the cable assembly was open. The differential impedance measurement was performed and the maximum impedance of each pair within the DVI cable assembly was recorded.

3.3. TMDS Signals, Time Domain Far-end Crosstalk (FEXT)

A TDR was used to measure FEXT. An airline was connected to the first test board, a DVI cable assembly, and the second test board. The whole test system was configured to measure FEXT (the far end of the aggressive pair and the near end of the victim pair were terminated.) The coupling voltage of the victim pair was measured. The percentage FEXT was calculated from the coupling voltage and the launching voltage.

3.4. TMDS Signals, Rise Time Degradation

A TDR was used to measure rise time degradation. The system rise time was measured with 2 test boards connected together via 2 short pins. The pins were then removed and a DVI cable assembly was inserted between the test boards. The rise time degradation was calculated from the rise time of the data pair and the system rise time.