Evaluation of .100 Inch Centerline Type II Crimp-Snap Terminal

1. PURPOSE

The purpose of this test is to evaluate test group 2 of Design Objectives 108-1948, Rev. O1 by doing an abbreviated test on a single connector. Testing was performed at the Product Reliability Center, Winston-Salem, NC under test number 20010022ACL.

2. RESULTS

The CST-100 Type II, 0.100-inch centerline crimp-snap terminal had a maximum ΔR of 1.5 milliohms after vibration testing. All testing was performed in March 2001. See Figure 1 for test results.

Test Environment	Requirement	Results
Test Group 2 - CST-100, Type II 28 position, 22 AWG		
Examination of product (initial).	No damage to form, fit or function	Passed. No visual signs of damage to form, fit or function.
Termination resistance (initial).	6 milliohms maximum initial. 10 milliohms maximum final.	22 AWG, circuits 1-14: 2.74 milliohms minimum. 3.46 milliohms maximum. 22 AWG, circuits 15-28: 2.78 milliohms minimum. 3.48 milliohms maximum.
Temperature rise vs current (initial).	30°C temperature rise vs current.	29.50°C maximum at 4.0 amperes.
Termination resistance (after initial temperature rise vs current).	6 milliohms maximum initial. 10 milliohms maximum final.	22 AWG, circuits 1-14: 2.79 milliohms minimum. 3.49 milliohms maximum. 22 AWG, circuits 15-28: 2.87 milliohms minimum. 3.56 milliohms maximum.
Durability.	No damage to form, fit or function after 15 cycles.	Passed. No visual signs of damage to form, fit or function.
Termination resistance (after durability).	6 milliohms maximum initial. 10 milliohms maximum final.	22 AWG, circuits 1-14: 3.04 milliohms minimum. 3.78 milliohms maximum. 22 AWG, circuits 15-28: 3.04 milliohms minimum. 3.85 milliohms maximum.
Humidity-temperature cycling.	No visual damage.	Passed. No visual signs of damage to form, fit or function.

Figure 1 (cont)

* Trademark
I Indicates change

LOC B

Test Environment	Requirement	Results
Termination resistance (after humidity-temperature cycling).	6 milliohms maximum initial. 10 milliohms maximum final.	22 AWG, circuits 1-14: 2.97 milliohms minimum. 3.90 milliohms maximum. 22 AWG, circuits 15-28: 3.01 milliohms minimum. 5.01 milliohms maximum.
Temperature rise vs current (final).	30°C temperature rise vs current.	31.98°C maximum at 4.0 amperes.
Termination resistance (after final temperature rise vs current).	6 milliohms maximum initial. 10 milliohms maximum final.	22 AWG, circuits 1-14: 2.99 milliohms minimum. 3.96 milliohms maximum. 22 AWG, circuits 15-28: 3.08 milliohms minimum. 5.01 milliohms maximum.
Vibration (X axis).	No damage to form, fit or function.	Passed. No visual signs of damage to form, fit or function.
Termination resistance (after X axis vibration).	6 milliohms maximum initial. 10 milliohms maximum final.	22 AWG, circuits 1-14: 3.19 milliohms minimum. 3.95 milliohms maximum. 22 AWG. Circuits 15-28: 3.16 milliohms minimum. 4.27 milliohms maximum.
Vibration (Y and Z axis).	No damage to form, fit or function.	Passed. No visual signs of damage to form, fit or function.
Termination resistance (final).	6 milliohms maximum initial. 10 milliohms maximum final.	22 AWG, circuits 1-14: 3.27 milliohms minimum. 4.18 milliohms maximum. 22 AWG, circuits 15-28: 3.30 milliohms minimum. 4.56 milliohms maximum.
Examination of product (final).	No damage to form, fit or function.	Passed. No visual signs of damage to form, fit or function.

Figure 1 (end)

3. TEST PREPARATION

3.1. Sample Description

Test Group	Part Number	Description	Quantity Tested	Number of Data Points
2	2-1375820-8	CST-100 Type II receptacle housing	1	28
2	1375819-1	Tin plated CST-100 Type II contact	28	NA
2	2-640456-8	MTA 100 C/L friction lock header, tin plated	1	28

Figure 2

3.2. Sample Preparation

The CST-100 Type II Connector was mounted to PC board PN 93-660017 Rev. O by placing the MTA 100 C/L friction lock header (PN 2-640456-8) onto the PC board and then soldering the pins. Twenty-eight tin-plated CST-100 Type II contacts were stripped 6 inches from the crimp and then tinned. These wires were then inserted and soldered to the PC board. The thermocouples were inserted into the female terminals and taped in place just behind the wire crimp then inserted into the CST-100 Type II receptacle housing (PN 2-1375820-8). Two 22 AWG wires were soldered to the top and bottom edges of the PC board for the purpose of temperature rise testing and energizing the sample during vibration.

4. TEST PROCEDURE

NOTE *Unless otherwise stated the following environmental conditions prevailed during testing:*
Temperature: 15 to 35°C
Relative Humidity: 20 to 80%

4.1. Examination of Product

It was performed by visually examining the product under 10X magnification for any indications of damage to form, fit or function at Initial and Final.

4.2. Termination Resistance

Reference Product Specification 108-1328 Rev. O, EIA Method 346-23A and IEC Method 512-2 Test 2A (Amendment 1, 1994). Each mated sample was subjected to 6 milliohms maximum for initial and 10 milliohms maximum requirements for final readings. The sample was scanned using the 4-wire probe method. Resistance was measured at 100 milliamperes, 20 millivolts open circuit voltage. Measurements were taken on the B1 BUTTONS Data Acquisition System using the PC board scan method.

4.3. Temperature Rise vs Current

Reference EIA 364-70A. All positions were loaded during testing. Measurements were made by energizing 100% of the circuits. Test samples were arranged in a draft free enclosure in a horizontal attitude a minimum of 2 inches above the bottom of the enclosure, a minimum of 6 inches below the top, and at least 8 inches from the sides. The ambient probe was place 6 inches from the test samples and on the same horizontal attitude as the test samples. Temperature rise measurements were made with the Automated T-Rise System (T3). Samples were energized at a current level and allowed to maintain thermal stability. Thermal stabilization is achieved when temperature rise of 3 consecutive readings taken at 5 minute intervals differ at most by 1°C [1.8° F]. Once the test sample is considered stable at that current level, the current is increased to the next level. This was repeated until a 30°C temperature rise was reached.

4.4. Durability

Reference Product Specification 108-1328 Rev. O and EIA Standard 364-9C. The test sample was manually mated and unmated for 15 cycles at a maximum cycle rate of 10 cycles per minute. See Figure 3. These photos are of the last cycle of durability to show that the pins were straight and undamaged prior to testing.

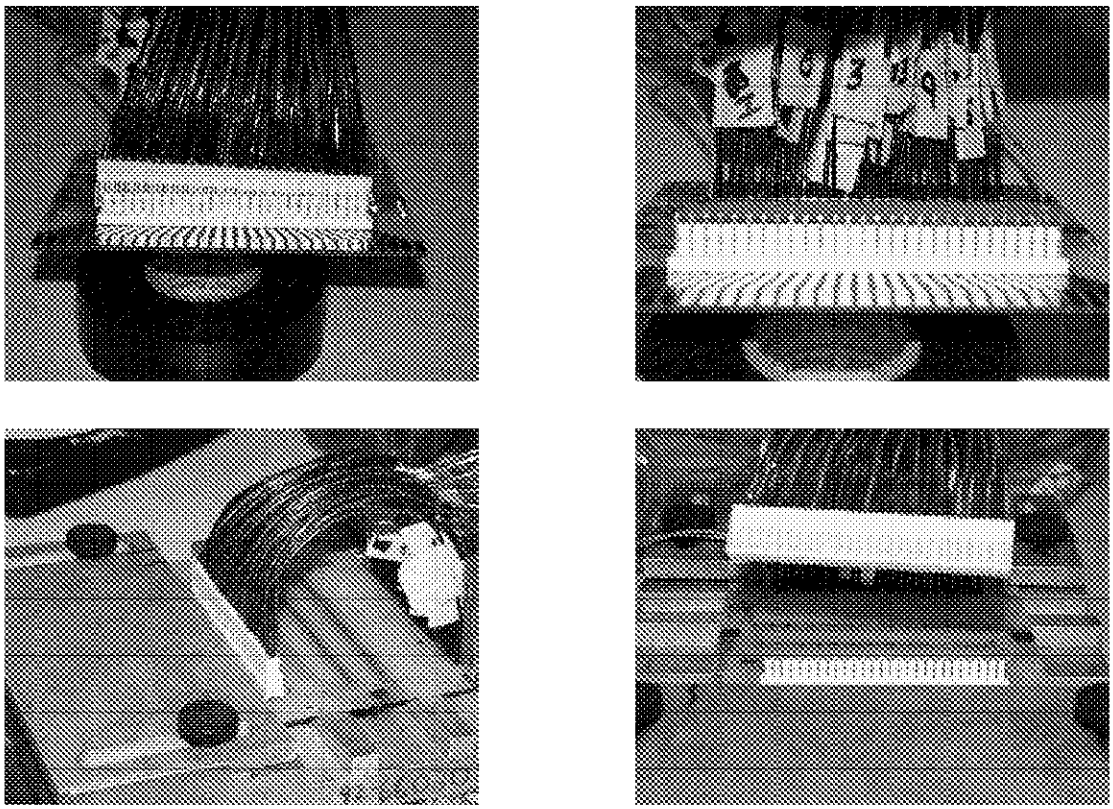

Figure 3

4.5. Humidity-temperature Cycling

Reference EIA 364-31B. Test samples were subjected to 10 days of humidity-temperature cycling variation of 25 to 65°C and a relative humidity of 95%. Upon completion of exposure samples were stabilized at room ambient temperature for a period 24 hours. Measurements were made between 24 and 48 hours after completion of exposure. See Figure 4.

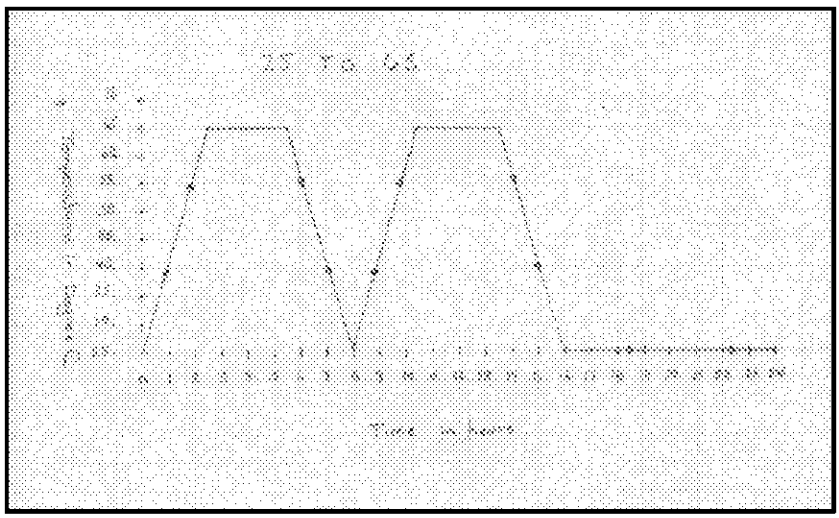

Figure 4

4.6. Low Frequency Sinusoidal Vibration

Reference EIA 364-28D. Fixture PN 92-660-154 was used to secure the sample to the low frequency vibration table. Samples were subjected to 10-55-10 Hz transversed in 1 minute. Each sample was vibrated for 2 hours in each of 3 mutually perpendicular planes. Sample was energized at 3 amperes in order to provide an 18°C temperature rise level for 100 % loadings per Specification 109-151. Due to scheduling backlog the sample was vibrated in the X axis on 20Mar and the Y and Z axis's were vibrated on 21Mar. Dry circuit readings were taken between these readings to insure that there was no changes to the sample due to movement.

4.7. Test Equipment

Instrument Description	Manufacturer	Model Number	Calibration Number	Purpose
" Buttons 1" Data Acquisition System	AMP	BUTTONS 1	E2997-0281	Termination resistance
"T-Rise 3" Data Acquisition System	AMP	T 3	E2997-0321	Temperature rise vs current
Humidity-temperature chamber #15	Blue M	FR-256PB-1	E2997-0097	Humidity-temperature cycling
Low Frequency Vibration	L.A.B Corp.	RVH18-100	E2997-0333	Vibration

Figure 5

4.8. Wire Information

Group Number	Wire Gage	Overall Diameter	Strand Diameter	Number of Strands	Wire Length
2	22	0.0615 inch	0.0098 inch	7	6 inches

Figure 6