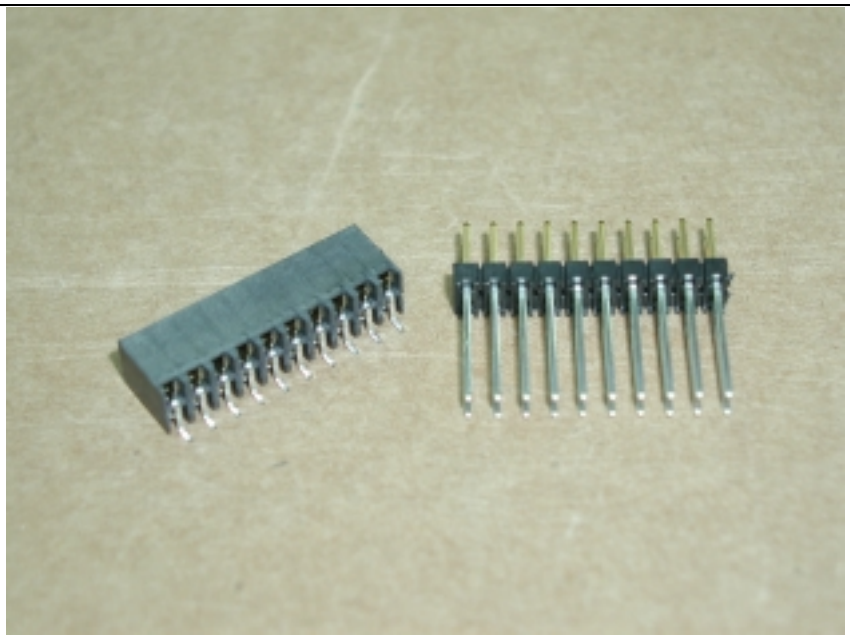
Project Number: 027C	Tracking Code: 0121-027C-0435		
Requested by: WILL OUYANG	Date: 5/21/01	Product Rev: AP/ BR RESPECTIVELY	
Part #: SSM-110-S-DH, TSW-110-10-S-D	Lot #: 05/17/01	Tech: T. Cook; J. Wantland	Eng: J. Tozier
Part description: 0.100 C.L. CONNECTOR ASSEMBLY		Qty to test: 2	
Test Start: 5/30/01	Test Completed: 8/6/01		



SUMMARY REPORT

PART DESCRIPTION

SSM-110-S-DH, TSW-110-10-S-D

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CERTIFICATION

All instruments and measuring equipment were calibrated to National Institute for Standards and Technology (NIST) traceable standards according to IS0 10012-l and ANSI/NCSL 2540-1, as applicable.

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SCOPE

To perform the following tests: CCC/IR/DWV

APPLICABLE DOCUMENTS

Standards: EIA Publication 364

TEST SAMPLES AND PREPARATION

1) All materials were manufactured in accordance with the applicable product specification.
2) All test samples were identified and encoded to maintain traceability throughout the test sequences.
3) After soldering, the parts were cleaned according to TLP-0001:
   a) Sample test boards are to be ultrasonically cleaned after test lead attachment, preparation and/or soldering using the following process.
   b) Immerse the sample test boards into the Branson 3510 cleaner which contains Kyzen Ionox HC1 (or equivalent) cleaning solution with the following conditions:
      i) Temperature: 60 Degrees C+/- 5 Degrees C
      ii) Frequency: 40 KHz
      iii) Immersion Time: 8 to 12 Minutes
   c) Sample test boards are then slowly removed and placed into the Branson 3510 cleaner which contains DI water with the following conditions:
      i) Temperature: 60 Degrees C +/- 5 Degrees C
      ii) Frequency: 40 KHz
      iii) Immersion Time: 8 to 12 Minutes
   d) Sample test boards are then removed and placed in a a beaker, on a hot plate with a magnetic stirrer containing DI water warmed to 55 +/- 5 Degrees C for 1 to 2 minutes (Use 55 C as target)
   e) Upon removal, the sample test boards are then rinsed for 1 to 2 minutes in room temperature free flowing DI water.
   f) After the final rinse, the sample test boards are to be dried in an air-circulating oven for 10 to 15 minutes at 50 +/- 2 Degrees C (Use 52 C as target)
   g) Sample test boards are then allowed to set and recover to room ambient condition prior to testing.
4) Any further preparation will be noted in the individual test procedures.

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FLOWCHART

TEST STEP	GROUP 5 2 Boards
01	IR
02	DWV
03	Thermal Aging
04	IR
05	DWV
06	Cyclic Humidity
07	IR
08	DWV
09	Working Voltage

GROUP 7 2 Boards 5 Contacts in series
Std Temp Rise Test

Temperature derated 20% and based on 125 deg C

Tabulate at 60 and 80 degrees also

Thermal Aging = EIA-364-17, 125 deg C, Condition 'B' except for 300 hours,

Cyclic Humidity =10 days with 1 cycles/day, +25 @ 92%RH to +65 @ 92%RH

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ATTRIBUTE DEFINITION

Following is a brief, simplified description of each attribute measured.

THERMAL AGING

1) EIA-364-17, *Temperature Life with or without Electrical Load Test Procedure for Electrical Connectors*, 125 degrees C, Condition B but for 300 hours.
2) Connectors are mated.

CYCLIC HUMIDITY

1) Reference document: EIA-364-31, *Humidity Test Procedure for Electrical Connectors*, Method III, Test Condition B excluding Steps 7a , 7b [10 days, +25 deg C to + 65 deg C, 90% to 95% RH].

TEMPERATURE RISE:

1) When current passes through a contact, the temperature of the contact increases as a result of I^2R (resistive) heating.
2) The number of contacts being investigated plays a significant part in power dissipation and therefore temperature rise.
3) The size of the temperature probe can affect the measured temperature.
4) Copper traces on PC boards will contribute to temperature rise:
   a) Self heating (resistive)
   b) Reduction in heat sink capacity affecting the heated contacts
5) EIA-364-70, *Temperature Rise versus Current Test Procedure for Electrical Connectors and Sockets*.
6) A de-rating curve, usually 20%, is calculated.
7) Calculated de-rated currents at three temperature points are reported:
   a) Ambient
   b) 60º C
   c) 80º C
8) Typically, neighboring contacts (in close proximity to maximize heat build up) are energized.
9) The thermocouple (or temperature measuring probe) will be positioned at a location to sense the MAXIMUM temperature in the vicinity of the heat generation area.
10) A computer program, *TR803.tst*, ensures accurate stability for data acquisition.

DIELECTRIC WITHSTANDING VOLTAGE (DWV)

To determine if the sockets can operate at its rated voltage and withstand momentary over potentials due to switching, surges, and other similar phenomenon.

1) PROCEDURE:
   a) Reference document: EIA-364-20, *Withstanding Voltage Test Procedure for Electrical Connectors*.

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b) Test Conditions:
   i) Between Adjacent Contacts
   ii) Mated or Unmated
   iii) Mounted or Unmounted
   iv) Rate of Application 500 V/Sec
   v) Test Voltage (VAC) until breakdown occurs

2) MEASUREMENTS/CALCULATIONS
   a) The breakdown voltage shall be measured and recorded.
   b) The dielectric withstanding voltage shall be recorded as 75% of the minimum breakdown voltage
   c) The working voltage shall be recorded as one-third (1/3) of the dielectric withstanding voltage (one-fourth of the breakdown voltage).

INSULATION RESISTANCE (IR)

To determine the resistance of insulation materials to leakage of current through or on the surface of these materials when a DC potential is applied.

1) PROCEDURE:
   a) Reference document: EIA-364-21, *Insulation Resistance Test Procedure for Electrical Connectors*.
   b) Test Conditions:
      i) Between Adjacent Contacts
      ii) Mated or Unmated
      iii) Mounted or Unmounted
      iv) Electrification Time 2.0 minutes
      v) Test Voltage (500 VDC) corresponding to calibration settings for measuring resistances
2) MEASUREMENTS:
   a) When the specified test voltage is applied (VDC), the insulation resistance shall not be less than 5000 megohms.

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TEST PROCEDURES / RESULTS

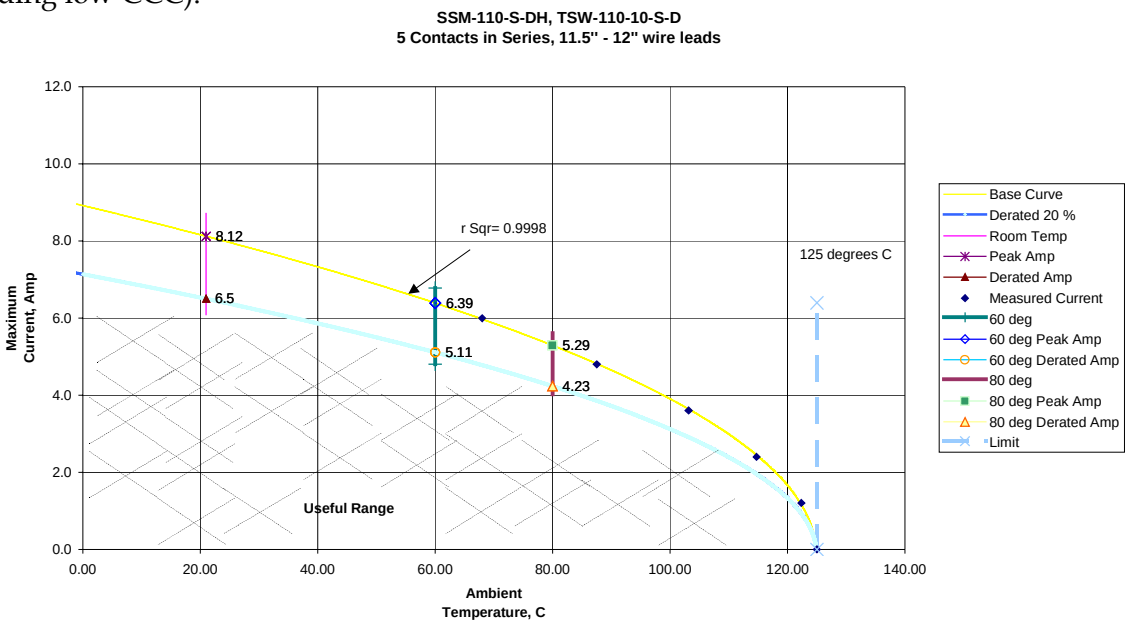
TEMPERATURE RISE:

1) High quality thermocouples whose temperature slopes track one another were used for temperature monitoring.
2) The thermocouples were placed at a location to sense the MAXIMUM temperature generated during testing.
3) Temperature readings recorded are those for which three successive readings, 15 minutes apart, differ less than 1 degree (computer controlled data acquisition).
4) Five (5) contacts were energized.

The thermocouple was sandwiched between the two mating parts to attain a maximum temperature. The third position of five energized contacts was chosen as the location.

Interconnecting that allowed six contacts to be energized were solder balls. There was no convenient area onto which wires / shorting strips could be soldered.

Notice the high CCC compared to the parallel test TC0121-027C-0434. In the parallel test mentioned, the CCC was lower. This is in part due to the small solder tails of socket material needed to connect the connector to a PC board. This small amount of material will self-heat from the current, contributing to the temperature rise (and corresponding lower CCC). Additionally, the lead-in wire (16 AWG) is prevented from heat sinking the socket because of the same fact (causing higher socket temperature and corresponding low CCC).



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DIELECTRIC WITHSTANDING VOLTAGE (DWV)

To determine if the sockets can operate at its rated voltage and withstand momentary over potentials due to switching, surges, and other similar phenomenon.

1) PROCEDURE:
   a) Reference document: EIA-364-20, *Withstanding Voltage Test Procedure for Electrical Connectors*.
   b) Test Conditions:
      i) Between Adjacent Contacts
      ii) Mated
      iii) Unmounted
      iv) Rate of Application 500 V/Sec
      v) Test Voltage (VAC) until breakdown occurs
2) MEASUREMENTS/CALCULATIONS
   a) The breakdown voltage shall be measured and recorded.
   b) The dielectric withstanding voltage shall be recorded as 75% of the minimum breakdown voltage.
   c) The working voltage shall be recorded as one-third (1/3) of the dielectric withstanding voltage (one-fourth of the breakdown voltage).

	Breakdown Voltage	DWV	Working Voltage
Initial	1900	1425	475
After Thermal	1800	1350	450
After Humidity	2700	2025	675

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INSULATION RESISTANCE (IR)

To determine the resistance of insulation materials to leakage of current through or on the surface of these materials when a DC potential is applied.

1) PROCEDURE:
   a) Reference document: EIA-364-21, *Insulation Resistance Test Procedure for Electrical Connectors*.
   b) Test Conditions:
      i) Between Adjacent Contacts
      ii) Mated
      iii) Unmounted
      iv) Electrification Time 2.0 minutes
      v) Test Voltage (500 VDC) corresponding to calibration settings for measuring resistances
2) MEASUREMENTS:
   a) When the specified test voltage is applied (VDC), the insulation resistance shall not be less than 5000 megohms
3) RESULTS:

	Insulation Resistance megohms	Actual megohms
Initial	exceeded 5,000	over 100,000
After Thermal	exceeded 5,000	over 100,000
After Humidity	exceeded 5,000	over 50,000

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EQUIPMENT AND CALIBRATION SCHEDULES

Description: Temperature/Humidity Chart Recorder
Manufacturer: Dickson
Model: THDX
Serial #: 00120351
Accuracy: Temp: +/- 1C; Humidity: +/-2% RH (0 - 60%), +/- 3% RH (61 - 95%).
… Last Cal: 6/15/01, Next Cal: 6/15/02

Description: System Power Supply
Manufacturer: Hewlett Packard
Model: HP 6033A
Serial #: (HP) 3329A-07330
Accuracy: See Manual
… Last Cal: 6/14/01, Next Cal: 6/14/02

Description: Multimeter /Data Acquisition System
Manufacturer: Keithley
Model: 2700
Serial #: 0780546
Accuracy: See Manual
… Last Cal: 6/14/01, Next Cal: 6/14/02

Description: Hipot Megommeter
Manufacturer: Hipotronics
Model: H306B-A
Serial #: M9905004
Accuracy: 2 % Full Scale Accuracy
… Last Cal: 6/14/01, Next Cal: 6/14/02

Description: Cascade Tek Forced Air Oven
Manufacturer: Cascade Tek
Model: TFO-5
Serial #: 0500100
Accuracy: Temp. Stability: +/-.1C/C change in ambient
… Last Cal: 6/14/01, Next Cal: 6/14/02

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Description: Temperature/Humidity Chamber
Manufacturer: Thermotron
Model: SE-1000-6-6
Serial #: 0500100
Accuracy: see manual
… Last Cal: 3/27/01, Next Cal: 3/27/02

Description: Temperature/Humidity Chamber
Manufacturer: Thermotron
Model: SM-8-7800
Serial #: 30676
Accuracy: see manual
… Last Cal: 6/14/01, Next Cal: 6/30/02

Description: Digital Thermometer
Manufacturer: Barnant 90
Model: 600-2840
Serial #: 621994
Accuracy: .25% reading +/- 1.0 degree Celsius
… Last Cal: 6/25/01, Next Cal: 6/25/02