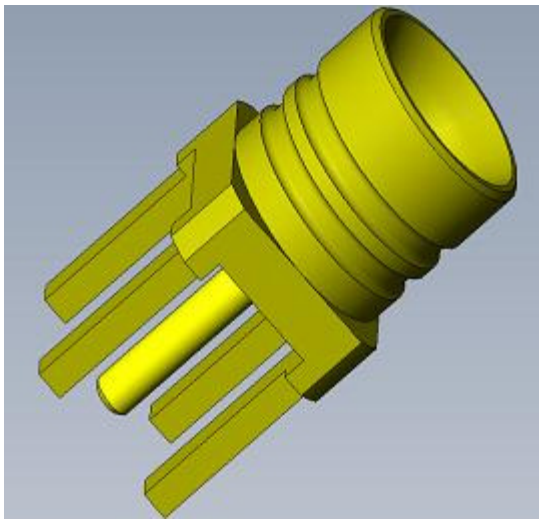
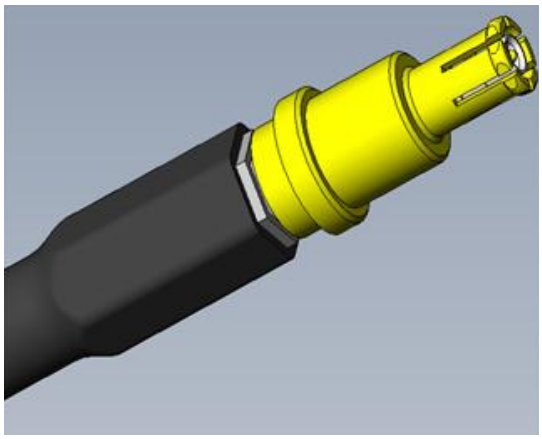
Project Number: Design Qualification Test Report	Tracking Code: 215434_Report_Rev_3		
Requested by: John Liao	Date: 10/8/2013	Product Rev: 1	
Part #: MMCXV-J-P-GF-ST-TH1/RF316-V3SP4-V3SP4-0305	Lot #: N/A	Tech: Kason He	Eng: Vico Zhao
Part description: MMCXV/RF316		Qty to test: 40	
Test Start: 09/27/2012	Test Completed: 11/17/2012		





DESIGN QUALIFICATION TEST REPORT

MMCXV/RF316
MMCXV-J-P-GF-ST-TH1/RF316-V3SP4-V3SP4-0305

REVISION HISTORY

DATA	REV.NUM.	DESCRIPTION	ENG
1/31/2013	**1**	**Initial Issue**	**KH**
2/21/2013	**2**	**Grammatical changes**	**CE**
10/08/2013	**3**	**Update the S&V data**	**KH**

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.

SCOPE

To perform the following tests: Design Qualification test. Please see test plan.

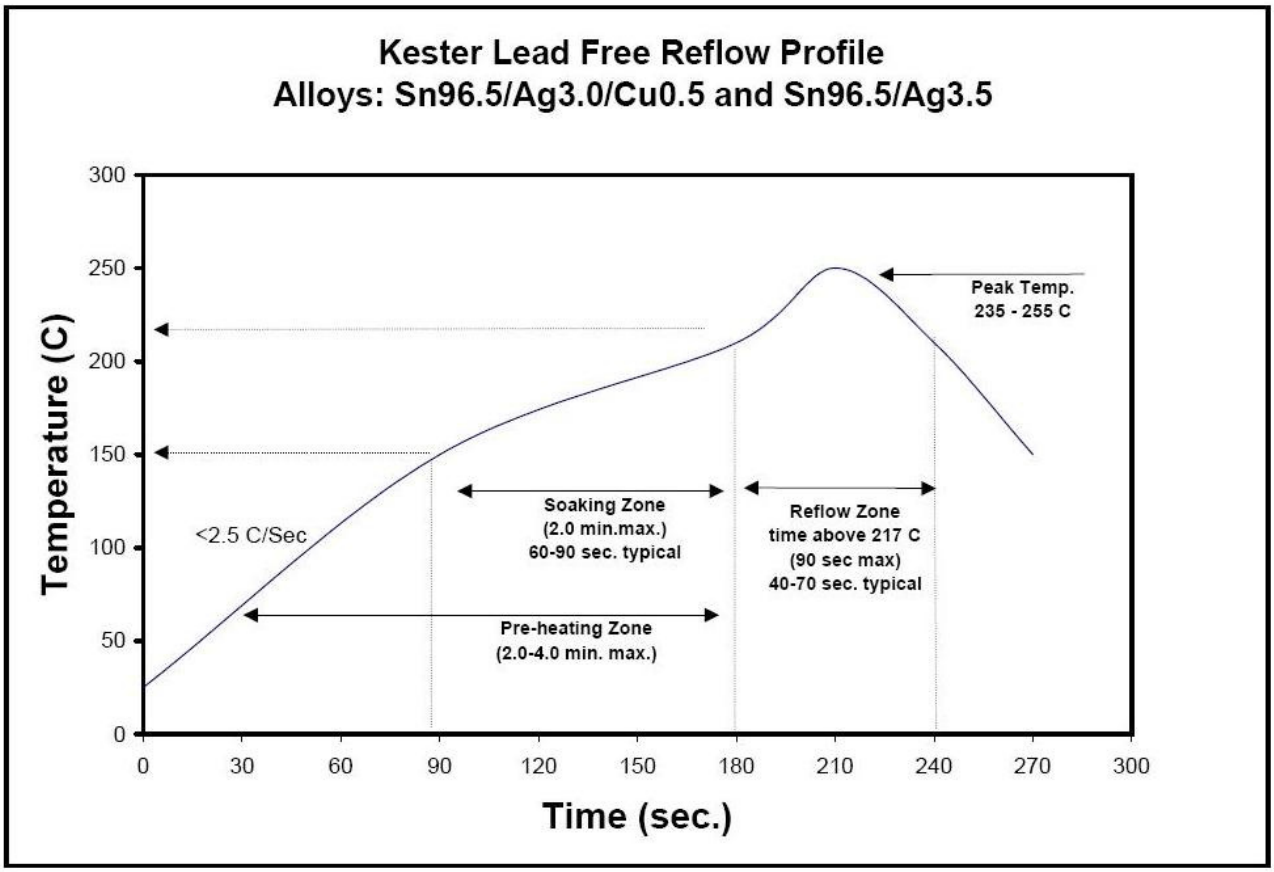
APPLICABLE DOCUMENTS

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 to be used for LLCR testing were cleaned according to TLWI-0001.
4) Either an automated cleaning procedure or an ultrasonic cleaning procedure may be used.
5) The automated procedure is used with aqueous compatible soldering materials.
6) Parts not intended for testing LLCR are visually inspected and cleaned if necessary.
7) Any additional preparation will be noted in the individual test sequences.
8) Solder Information: Lead Free
9) Re-Flow Time/Temp: See accompanying profile.
10) Samtec Test PCBs used: PCB-103846-TST-01/PCB-103847-TST-02/PCB-103918-TST-01
PCB-103919-TST-01

TYPICAL OVEN PROFILE (Soldering Parts to Test Boards)



FLOWCHARTS

Gas Tight

TEST STEP	GROUP A1 8 Points Min.(MMCXV-J-P-GF-ST-TH1 and RF316-V3SP4-V3SP4-0305)
1	LLCR-1 (both center and outer)
2	Gas Tight
3	LLCR-2 (both center and outer)

Gas Tight = EIA-364-36A

LLCR = EIA-364-23, LLCR

20 mV Max, 100 mA Max

Use Keithley 580 or 3706 in 4 wire dry circuit mode

Normal Force

TEST STEP	GROUP B1 Individual Contacts (8min) MMCX-SKT-001-G	GROUP B2 Individual Contacts (8min) MMCX-SKT-001-G + MMCXV-P-C-G-ST-CA1-PIN	GROUP B3 Individual Contacts (8min)MMCXV-P-C-F-ST-SHL	GROUP B4 Individual Contacts (8min) MMCXV-P-C-F-ST-SHL+ MMCXV-J-P-F-ST-TH1-SHL
1	Contact Gaps	Contact Gaps	Contact Gaps	Contact Gaps
2	Setup Approved	Thermal Aging (Mated and Undisturbed)	Setup Approved	Thermal Aging (Mated and Undisturbed)
3	Normal Force	Contact Gaps	Normal Force	Contact Gaps
4		Setup Approved		Setup Approved
5		Normal Force		Normal Force

Thermal Aging = EIA-364-17, Test Condition 4 (105°C)

Time Condition 'B' (250 Hours)

Normal Force = EIA-364-04

(Perpendicular) Displacement Force = 12.7 mm/min ± 6 mm/min

Spec is 50 N @ 1 mm displacement

Contact Gaps / Height - No standard method. Usually measured optically

Gaps to be taken on a minimum of 20% of each part tested

FLOWCHARTS Continued

Thermal Aging

TEST STEP	GROUP C1 8 points (MMCXV-J-P-GF-ST-TH1 and RF316-V3SP4-V3SP4-0305) Thermal Aging (Mated)
1	Contact Gaps
2	Forces - Mating / Unmating
3	LLCR-1
4	Thermal Aging (Mated and Undisturbed)
5	LLCR-2
6	Forces - Mating / Unmating
7	Contact Gaps

Thermal Aging = EIA-364-17, Test Condition 4 (105°C)

Time Condition 'B' (250 Hours)

Mating / Unmating Forces = EIA-364-13

Contact Gaps / Height - No standard method. Usually measured optically.

Gaps to be taken on a minimum of 20% of each part tested

LLCR = EIA-364-23, LLCR

20 mV Max, 100 mA Max

Use Keithley 580 or 3706 in 4 wire dry circuit mode

FLOWCHARTS Continued

Durability/Mating/Unmating/Gaps

TEST STEP	GROUP D1 8 Points (MMCXV-J-P-GF-ST-TH1 and RF316-V3SP4-V3SP4-0305)	GROUP D2 8 Points (MMCXV-J-P-HF-ST-TH1 and RF316-V3SP1-V3SP1-0305)
1	Contact Gaps	Contact Gaps
2	LLCR-1	LLCR-1
3	Forces - Mating / Unmating	Forces - Mating / Unmating
4	25 Cycles	125 Cycles
5	Forces - Mating / Unmating	Forces - Mating / Unmating
6	25 Cycles (50 Total)	125 Cycles (250 Total)
7	Forces - Mating / Unmating	Forces - Mating / Unmating
8	25 Cycles (75 Total)	125 Cycles (375 Total)
9	Forces - Mating / Unmating	Forces - Mating / Unmating
10	25 Cycles (100 Total)	125 Cycles (500 Total)
11	Forces - Mating / Unmating	Forces - Mating / Unmating
12	Clean w/Compressed Air	Clean w/Compressed Air
13	Contact Gaps	Contact Gaps
14	LLCR-2	LLCR-2
15	Thermal Shock (Mated and Undisturbed)	Thermal Shock (Mated and Undisturbed)
16	LLCR-3	LLCR-3
17	Cyclic Humidity (Mated and Undisturbed)	Cyclic Humidity (Mated and Undisturbed)
18	LLCR-4	LLCR-4
19	Forces - Mating / Unmating	Forces - Mating / Unmating

Thermal Shock = EIA-364-32, Table II, Test Condition I:

-55°C to +85°C 1/2 hour dwell, 100 cycles

Humidity = EIA-364-31, Test Condition B (240 Hours)

and Method III (+25°C to +65°C @ 90% RH to 98% RH)

ambient pre-condition and delete steps 7a and 7b

Mating / Unmating Forces = EIA-364-13

Contact Gaps / Height - No standard method. Usually measured optically.

Gaps to be taken on a minimum of 20% of each part tested

LLCR = EIA-364-23, LLCR

20 mV Max, 100 mA Max

Use Keithley 580 or 3706 in 4 wire dry circuit mode

FLOWCHARTS Continued

IR & DWV

TEST STEP	GROUP E11 2 Mated Sets (MMCXV-J-P-GF-ST-TH1 and RF316-V3SP4-V3SP4-0305) Break Down Pin-to-Ground	GROUP E12 2 Unmated of Part # Being Tested(MMCXV-J-P-GF-ST-TH1) Break Down Pin-to-Ground	GROUP E13 2 Unmated of Mating Part #(RF316-V3SP4-V3SP4-0305) Break Down Pin-to-Ground	GROUP E14 2 Mated Sets (MMCXV-J-P-GF-ST-TH1 and RF316-V3SP4-V3SP4-0305 Break Down Pin-to-Ground
1	DWV/Break Down Voltage	DWV/Break Down Voltage	DWV/Break Down Voltage	IR & DWV at test voltage (on both mated sets and on each connector unmated)
2				Thermal Shock (Mated and Undisturbed)
3				IR & DWV at test voltage (on both mated sets and on each connector unmated)
4				Cyclic Humidity (Mated and Undisturbed)
5				IR & DWV at test voltage (on both mated sets and on each connector unmated)

DWV on Group B1 to be performed at Test Voltage

DWV test voltage is equal to 75% of the lowest break down voltage from Groups A1, A2 or A3

Thermal Shock = EIA-364-32, Table II, Test Condition I:

-55°C to +85°C 1/2 hour dwell, 100 cycles

Humidity = EIA-364-31, Test Condition B (240 Hours)

and Method III (+25°C to +65°C @ 90% RH to 98% RH)

ambient pre-condition and delete steps 7a and 7b

IR = EIA-364-21

DWV = EIA-364-20, Test Condition 1

FLOWCHARTS Continued

TEST STEP	GROUP E21 2 Mated Sets (MMCXV-J-P-GF-ST-EM1 and RF316-V3RP4-V3RP4-0305) Break Down Pin-to-Ground	GROUP E22 2 Unmated of Part # Being Tested(MMCXV-J-P-GF-ST-EM1) Break Down Pin-to-Ground	GROUP E23 2 Unmated of Mating Part #(RF316-V3RP4-V3RP4-0305) Break Down Pin-to-Ground	GROUP E24 2 Mated Sets (MMCXV-J-P-GF-ST-EM1 and RF316-V3RP4-V3RP4-0305) Break Down Pin-to-Ground
1	DWV/Break Down Voltage	DWV/Break Down Voltage	DWV/Break Down Voltage	IR & DWV at test voltage (on both mated sets and on each connector unmated)
2				Thermal Shock (Mated and Undisturbed)
3				IR & DWV at test voltage (on both mated sets and on each connector unmated)
4				Cyclic Humidity (Mated and Undisturbed)
5				IR & DWV at test voltage (on both mated sets and on each connector unmated)

TEST STEP	GROUP E31 2 Mated Sets (MMCXV-P-P-GF-ST-EM1and RF316-V3SJ4-V3SJ4-0305) Break Down Pin-to-Ground	GROUP E32 2 Unmated of Part # Being Tested(MMCXV-P-P-GF-ST-EM1) Break Down Pin-to-Ground	GROUP E33 2 Unmated of Mating Part #(RF316-V3SJ4-V3SJ4-0305) Break Down Pin-to-Ground	GROUP E34 2 Mated Sets (MMCXV-P-P-GF-ST-EM1and RF316-V3SJ4-V3SJ4-0305) Break Down Pin-to-Ground
1	DWV/Break Down Voltage	DWV/Break Down Voltage	DWV/Break Down Voltage	IR & DWV at test voltage (on both mated sets and on each connector unmated)
2				Thermal Shock (Mated and Undisturbed)
3				IR & DWV at test voltage (on both mated sets and on each connector unmated)
4				Cyclic Humidity (Mated and Undisturbed)
5				IR & DWV at test voltage (on both mated sets and on each connector unmated)

FLOWCHARTS Continued

Mechanical Shock / Vibration / LLCR

TEST STEP	GROUP 1 8 Assemblies MMCXV-J-P-GF-ST-TH1 MMCXV-P-C-GF-ST-CA1
01	LLCR-1
02	Mechanical Shock
03	Random Vibration
04	LLCR-2

(1) LLCR = EIA-364-23

Open Circuit Voltage = 20 mV Max

Test Current = 100 mA Max

(2) Mechanical Shock = EIA-364-27

Test Condition = C (100 G Peak, 6 milliseconds, Half Sine)

Number of Shocks = 3 Per Direction, Per Axis, 18 Total

(3) Random Vibration = EIA-364-28

Condition = VB (7.56 gRMS Average, 2 Hours/Axis)

(4) LLCR Max Delta = 15 mOhm

Shock / Vibration / nanoSecond Event Detection

TEST STEP	GROUP 1 12 Points MMCXV-J-P-GF-ST-TH1/MMCXV-P-C-GF-ST-CA1
01	Nanosecond Event Detection (Mechanical Shock) (1) - Non Standard
02	Nanosecond Event Detection (Random Vibration) (1) - Non Standard

(1) Nanosecond Event Detection (Mechanical Shock) = Other

Use EIA-364-87 for Nanosecond Event Detection:

Test Condition = D (10 nanoseconds at 10 ohms)

Use EIA-364-27 for Mechanical Shock:

Test Condition = C (100 G Peak, 6 milliseconds, Half Sine)

Number of Shocks = 3 Per Direction, Per Axis, 18 Total

(2) Nanosecond Event Detection (Random Vibration) = Other

Use EIA-364-87 for Nanosecond Event Detection:

Test Condition = D(10 nanoseconds at 10 ohms)

Use EIA-364-28 for Random Vibration:

Condition = VB (7.56 gRMS Average, 2 Hours/Axis)

FLOWCHARTS Continued

Connector Pull

TEST STEP	GROUP 3A1 5 Pieces MMCXV-P-C-G-ST-CA1-PIN (Terminated with cable) & SUB-MMCXV-P-C-FF-ST-CA1	GROUP 3A2 5 Pieces MMCXV-J-P-GF-ST-TH1 + RF316-V3SP4-V3SP4-0305	GROUP 3A3 5 Pieces MMCXV-J-P-GF-ST-EM1 and RF316-V3RP4-V3RP4-0305
	Center contact only to cable 0°	SIG & GND 90° Connector to Cable	SIG & GND 90° and 0° Connector to Cable
1	Pull test, Removal	Pull test, Continuity	Pull test, Continuity

TEST STEP	GROUP 3B1 5 Pieces MMCXV-J-C-G-ST-CA1-PIN (Terminated with cable) & SUB-MMCXV-J-C-FF-ST-CA1	GROUP 3B2 5 Pieces MMCXV-P-P-GF-ST-EM1and RF316-V3SJ4-V3SJ4-0305
	Center contact only to cable 0°	SIG & GND 90° Connector to Cable
1	Pull test, Removal	Pull test, Continuity

ATTRIBUTE DEFINITIONS

The following is a brief, simplified description of attributes.

THERMAL SHOCK:

1) EIA-364-32, *Thermal Shock (Temperature Cycling) Test Procedure for Electrical Connectors.*
2) Test Condition 1: -55°C to +85°C
3) Test Time: ½ hour dwell at each temperature extreme
4) Number of Cycles: 100
5) All test samples are pre-conditioned at ambient.
6) All test samples are exposed to environmental stressing in the mated condition.

THERMAL:

1) EIA-364-17, *Temperature Life with or without Electrical Load Test Procedure for Electrical Connectors.*
2) Test Condition 4 at 105° C.
3) Test Time Condition B for 250 hours.
4) All test samples are pre-conditioned at ambient.
5) All test samples are exposed to environmental stressing in the mated condition.

HUMIDITY:

1) Reference document: EIA-364-31, *Humidity Test Procedure for Electrical Connectors.*
2) Test Condition B, 240 Hours.
3) Method III, +25° C to + 65° C, 90% to 98% Relative Humidity excluding sub-cycles 7a and 7b.
4) All samples are pre-conditioned at ambient.
5) All test samples are exposed to environmental stressing in the mated condition.

MECHANICAL SHOCK (Specified Pulse):

1) Reference document: EIA-364-27, *Mechanical Shock Test Procedure for Electrical Connectors*
2) Test Condition C
3) Peak Value: 100 G
4) Duration: 6 Milliseconds
5) Wave Form: Half Sine
6) Velocity: 12.3 ft/s
7) Number of Shocks: 3 Shocks / Direction, 3 Axis (18 Total)

VIBRATION:

1) Reference document: EIA-364-28, *Vibration Test Procedure for Electrical Connectors*
2) Test Condition V, Letter B
3) Power Spectral Density: 0.04 G^2 / Hz
4) G 'RMS': 7.56
5) Frequency: 50 to 2000 Hz
6) Duration: 2.0 Hours per axis (3 axis total)

NANOSECOND-EVENT DETECTION:

1) Reference document: EIA-364-87, *Nanosecond-Event Detection for Electrical Connectors*
2) Prior to test, the samples were characterized to assure the low nanosecond event being monitored will trigger the detector.
3) After characterization it was determined the test samples could be monitored for 10 nanosecond events

ATTRIBUTE DEFINITIONS Continued

The following is a brief, simplified description of attributes

MATING/UNMATING:

1) Reference document: EIA-364-13, *Mating and Unmating Forces Test Procedure for Electrical Connectors*.
2) The full insertion position was to within 0.003" to 0.004" of the plug bottoming out in the receptacle to prevent damage to the system under test.
3) One of the mating parts is secured to a floating X-Y table to prevent damage during cycling.

NORMAL FORCE (FOR CONTACTS TESTED OUTSIDE THE HOUSING):

1) Reference document: EIA-364-04, *Normal Force Test Procedure for Electrical Connectors*.
2) The contacts shall be tested in the loose state, *not* inserted in connector housing.
3) The contacts shall be prepared to allow access to the spring member at the same attitude and deflection level as would occur in actual use.
4) In the event that portions of the contact prevent insertion of the test probe and/or deflection of the spring member under evaluation, said material shall be removed leaving the appropriate contact surfaces exposed.
5) In the case of multi-tine contacts, each tine shall be tested independently on separate samples as required.
6) The connector housing shall be simulated, if required, in order to provide an accurate representation of the actual contact system performance.
7) A holding fixture shall be fashioned to allow the contact to be properly deflected.
8) Said holding fixture shall be mounted on a floating, adjustable, X-Y table on the base of the Dillon TC^2, computer controlled test stand with a deflection measurement system accuracy of 5 µm (0.0002").
9) The probe shall be attached to a Dillon P/N 49761-0105, 5 N (1.1 Lb) load cell providing an accuracy of ± 0.2%.
10) The nominal deflection rate shall be 5 mm (0.2")/minute.
11) Unless otherwise noted a minimum of five contacts shall be tested.
12) The force/deflection characteristic to load and unload each contact shall be repeated five times.
13) The system shall utilize the TC^2 software in order to acquire and record the test data.
14) The permanent set of each contact shall be measured within the TC^2 software.
15) The acquired data shall be graphed with the deflection data on the X-axis and the force data on the Y-axis and a print out will be stored with the Tracking Code paperwork.

ATTRIBUTE DEFINITIONS Continued

The following is a brief, simplified description of attributes

LLCR:

1) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets*.
2) A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
3) The following guidelines are used to categorize the changes in LLCR as a result from stressing
    a. <= +5.0 mOhms: ---------- Stable
    b. +5.1 to +10.0 mOhms: ---------- Minor
    c. +10.1 to +15.0 mOhms: ---------- Acceptable
    d. +15.1 to +50.0 mOhms: ---------- Marginal
    e. +50.1 to +2000 mOhms: ---------- Unstable
    f. >+2000 mOhms: ---------- Open Failure

GAS TIGHT:

To provide method for evaluating the ability of the contacting surfaces in preventing penetration of harsh vapors which might lead to oxide formation that may degrade the electrical performance of the contact system.

1) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets*.
2) A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
3) The following guidelines are used to categorize the changes in LLCR as a result from stressing
    a. <= +5.0 mOhms: ---------- Stable
    b. +5.1 to +10.0 mOhms: ---------- Minor
    c. +10.1 to +15.0 mOhms: ---------- Acceptable
    d. +15.1 to +50.0 mOhms: ---------- Marginal
    e. +50.1 to +2000 mOhms:---------- Unstable
    f. >+2000 mOhms: ---------- Open Failure
4) Procedure:
    a. Reference document: EIA-364-36, *Test Procedure for Determination of Gas-Tight Characteristics for Electrical Connectors, Sockets and/or Contact Systems*.
    b. Test Conditions:
        i. Class II--- Mated pairs of contacts assembled to their plastic housings.
        ii. Reagent grade Nitric Acid shall be used of sufficient volume to saturate the test chamber
        iii. The ratio of the volume of the test chamber to the surface area of the acid shall be 10:1.
        iv. The chamber shall be saturated with the vapor for at least 15 minutes before samples are added.
        v. Exposure time, 55 to 65 minutes.
        vi. The samples shall be no closer to the chamber walls than 1 inches and no closer to the surface of the acid than 3 inches.
        vii. The samples shall be dried after exposure for a minimum of 1 hour.
        viii. Drying temperature 50^{o} C
        ix. The final LLCR shall be conducted within 1 hour after drying.

ATTRIBUTE DEFINITIONS Continued

The following is a brief, simplified description of attributes

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 or Signal-to-Ground
        ii. Electrification Time 2.0 minutes
        iii. Test Voltage (500 VDC) corresponds to calibration settings for measuring resistances.
2) MEASUREMENTS:
3) When the specified test voltage is applied (VDC), the insulation resistance shall not be less than 5000 megohms.

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. Separate samples are used to evaluate the effect of environmental stresses so not to influence the readings from arcing that occurs during the measurement process.

1) PROCEDURE:
    a. Reference document: EIA-364-20, *Withstanding Voltage Test Procedure for Electrical Connectors*.
    b. Test Conditions:
        i. Between Adjacent Contacts or Signal-to-Ground
        ii. Barometric Test Condition 1
        iii. Rate of Application 500 V/Sec
        iv. 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).

ATTRIBUTE DEFINITIONS Continued

The following is a brief, simplified description of attributes

CONNECTOR PULL:

1) Secure cable near center and pull on connector
    a. At 90°, right angle to cable
    b. At 0°, in-line with cable

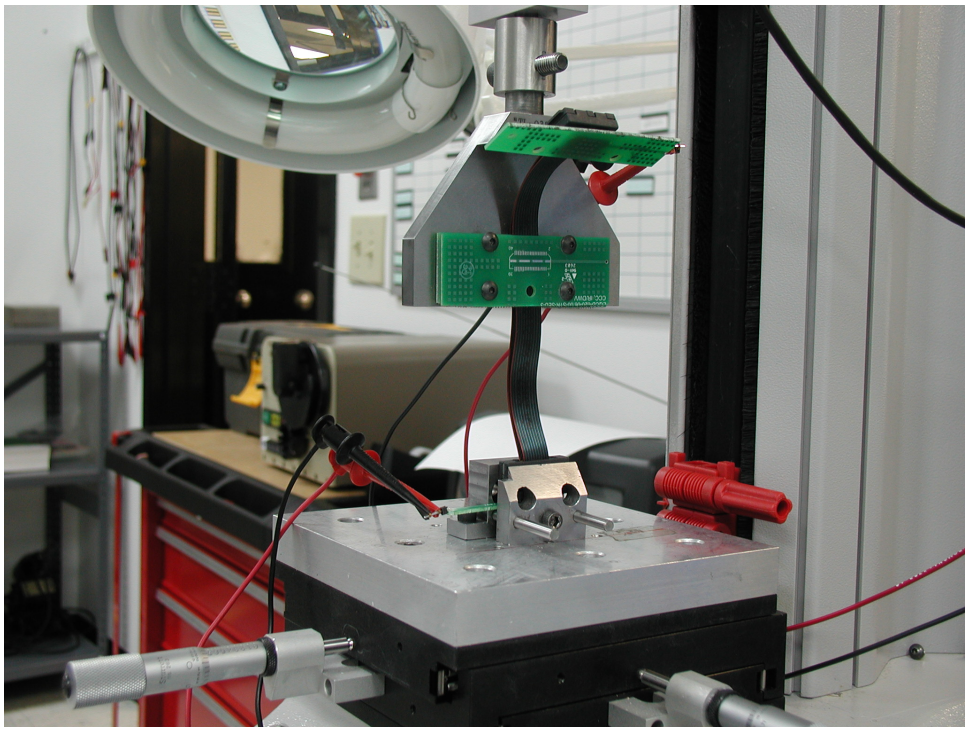


Fig. 1
(Typical set-up, actual part not depicted.)
0° Connector pull, notice the electrical continuity hook-up wires.

RESULTS

Mating/Unmating Forces: Mating/Unmating Durability Group

MMCXV-J-P-GF-ST-TH1/ RF316-V3SP4-V3SP4-0305

- **Initial**
  - **Mating**
    - **Min ---------- 2.11 Lbs**
    - **Max---------- 2.61 Lbs**
  - **Unmating**
    - **Min ---------- 2.98 Lbs**
    - **Max---------- 3.66 Lbs**
- **After 25 Cycles**
  - **Mating**
    - **Min ---------- 1.88 Lbs**
    - **Max---------- 2.85 Lbs**
  - **Unmating**
    - **Min ---------- 2.94 Lbs**
    - **Max---------- 3.60 Lbs**
- **After 50 Cycles**
  - **Mating**
    - **Min ---------- 2.14 Lbs**
    - **Max---------- 2.89 Lbs**
  - **Unmating**
    - **Min ---------- 2.43 Lbs**
    - **Max---------- 3.63 Lbs**
- **After 75 Cycles**
  - **Mating**
    - **Min ---------- 2.16 Lbs**
    - **Max---------- 3.07 Lbs**
  - **Unmating**
    - **Min ---------- 2.89 Lbs**
    - **Max---------- 3.74 Lbs**
- **After 100 Cycles**
  - **Mating**
    - **Min ---------- 2.29 Lbs**
    - **Max---------- 3.39 Lbs**
  - **Unmating**
    - **Min ---------- 3.22 Lbs**
    - **Max---------- 3.69 Lbs**
- **After Humidity**
  - **Mating**
    - **Min ---------- 2.28 Lbs**
    - **Max---------- 2.53 Lbs**
  - **Unmating**
    - **Min ---------- 3.02 Lbs**
    - **Max---------- 3.27 Lbs**

RESULTS Continued

Mating/Unmating Forces: Mating/Unmating Durability Group

MMCXV-J-P-HF-ST-TH1 and RF316-V3SP1-V3SP1-0305

- **Initial**
  - **Mating**
    - **Min ---------- 1.80 Lbs**
    - **Max---------- 2.30 Lbs**
  - **Unmating**
    - **Min ---------- 2.76 Lbs**
    - **Max---------- 3.53 Lbs**
- **After 125 Cycles**
  - **Mating**
    - **Min ---------- 2.21 Lbs**
    - **Max---------- 3.39 Lbs**
  - **Unmating**
    - **Min ---------- 2.67 Lbs**
    - **Max---------- 3.80 Lbs**
- **After 250 Cycles**
  - **Mating**
    - **Min ---------- 2.75 Lbs**
    - **Max---------- 3.86 Lbs**
  - **Unmating**
    - **Min ---------- 2.94 Lbs**
    - **Max---------- 4.16 Lbs**
- **After 375 Cycles**
  - **Mating**
    - **Min ---------- 3.10 Lbs**
    - **Max---------- 4.02 Lbs**
  - **Unmating**
    - **Min ---------- 2.90 Lbs**
    - **Max---------- 3.86 Lbs**
- **After 500 Cycles**
  - **Mating**
    - **Min ---------- 2.98 Lbs**
    - **Max---------- 3.92 Lbs**
  - **Unmating**
    - **Min ---------- 2.51 Lbs**
    - **Max---------- 3.54 Lbs**
- **After Humidity**
  - **Mating**
    - **Min ---------- 2.19 Lbs**
    - **Max---------- 2.84 Lbs**
  - **Unmating**
    - **Min ---------- 2.17 Lbs**
    - **Max---------- 2.63 Lbs**

RESULTS Continued

Mating/Unmating Forces: Thermal Aging Group

MMCXV-J-P-GF-ST-TH1/ RF316-V3SP4-V3SP4-0305

- **Initial**
  - **Mating**
    - **Min ---------- 2.16 Lbs**
    - **Max---------- 2.94 Lbs**
  - **Unmating**
    - **Min ---------- 3.24 Lbs**
    - **Max---------- 3.65 Lbs**
- **After Thermal**
  - **Mating**
    - **Min ---------- 1.76 Lbs**
    - **Max---------- 2.00 Lbs**
  - **Unmating**
    - **Min ---------- 2.94 Lbs**
    - **Max---------- 3.45 Lbs**

Normal Force at 0.0034 inch deflection (center contact)

MMCX-SKT-001-G/ MMCXV-P-C-G-ST-CA1-PIN

- **Initial**
  - **Min ---------- 264.00 gf Set------ 0.0000 in**
  - **Max ---------- 444.80 gf Set------ 0.0005 in**
- **Thermal**
  - **Min ---------- 238.40 gf Set------ 0.0004 in**
  - **Max ---------- 467.90 gf Set------ 0.0011 in**

Normal Force at 0.0071 inch deflection (shell)

MMCXV-P-C-F-ST-SHL/MMCXV-J-P-F-ST-TH1-SHL

- **Initial**
  - **Min ---------- 477.20 gf Set------ 0.0001 in**
  - **Max ---------- 523.10 gf Set------ 0.0011 in**
- **Thermal**
  - **Min ---------- 438.30 gf Set------ 0.0001 in**
  - **Max ---------- 554.20 gf Set------ 0.0010 in**

RESULTS Continued

Connector Pull:

MMCXV-P-C-G-ST-CA1-PIN /SUB-MMCXV-P-C-FF-ST-CA1
Center contact only to cable 0°

- **Min ---------- 1.65 Lbs**
- **Max---------- 1.77 Lbs**

MMCXV-J-P-GF-ST-TH1/RF316-V3SP4-V3SP4-0305
SIG & GND 90° Connector to Cable

- **Min ---------- 1.97 Lbs**
- **Max---------- 2.36 Lbs**

MMCXV-J-P-GF-ST-EM1 and RF316-V3RP4-V3RP4-0305
SIG & GND 90° Connector to Cable

- **Min ---------- 12.83 Lbs**
- **Max---------- 13.54 Lbs**

SIG & GND 0° Connector to Cable

- **Min ---------- 2.51 Lbs**
- **Max---------- 3.03 Lbs**

MMCXV-J-C-G-ST-CA1-PIN/SUB-MMCXV-J-C-FF-ST-CA1
Center contact only to cable 0°

- **Min ---------- 4.19 Lbs**
- **Max---------- 4.47 Lbs**

MMCXV-P-P-GF-ST-EM1/RF316-V3SJ4-V3SJ4-0305
SIG & GND 90° Connector to Cable

- **Min ---------- 1.39 Lbs**
- **Max---------- 1.68 Lbs**

RESULTS Continued

Insulation Resistance minimums, IR

MMCXV-J-P-GF-ST-TH1/RF316-V3SP4-V3SP4-0305

Pin to Ground

- **Initial**
  - **Mated ---------- 10000Meg Ω ---------- Passed**
  - **Unmated ---------- 10000Meg Ω ---------- Passed**
- **Thermal**
  - **Mated ---------- 10000Meg Ω ---------- Passed**
  - **Unmated ---------- 10000Meg Ω ---------- Passed**
- **Humidity**
  - **Mated ---------- 10000Meg Ω ---------- Passed**
  - **Unmated ---------- 10000Meg Ω ---------- Passed**

MMCXV-J-P-GF-ST-EM1/RF316-V3RP4-V3RP4-0305

Pin to Ground

- **Initial**
  - **Mated ---------- 10000Meg Ω ---------- Passed**
  - **Unmated ---------- 10000Meg Ω ---------- Passed**
- **Thermal**
  - **Mated ---------- 10000Meg Ω ---------- Passed**
  - **Unmated ---------- 10000Meg Ω ---------- Passed**
- **Humidity**
  - **Mated ---------- 10000Meg Ω ---------- Passed**
  - **Unmated ---------- 10000Meg Ω ---------- Passed**

MMCXV-P-P-GF-ST-EM1/RF316-V3SJ4-V3SJ4-0305

Pin to Ground

- **Initial**
  - **Mated ---------- 10000Meg Ω ---------- Passed**
  - **Unmated ---------- 10000Meg Ω ---------- Passed**
- **Thermal**
  - **Mated ---------- 10000Meg Ω ---------- Passed**
  - **Unmated ---------- 10000Meg Ω ---------- Passed**
- **Humidity**
  - **Mated ---------- 10000Meg Ω ---------- Passed**
  - **Unmated ---------- 10000Meg Ω ---------- Passed**

RESULTS Continued

Dielectric Withstanding Voltage minimums, DWV

MMCXV-J-P-GF-ST-TH1/RF316-V3SP4-V3SP4-0305

- **Minimums**
  - **Breakdown Voltage ----------750 VAC**
  - **Test Voltage ----------563 VAC**
  - **Working Voltage ----------188 VAC**

Pin to Ground

- **Initial DWV ---------- Passed**
- **Thermal DWV ---------- Passed**
- **Humidity DWV ---------- Passed**

MMCXV-J-P-GF-ST-EM1/RF316-V3RP4-V3RP4-0305

- **Minimums**
  - **Breakdown Voltage ---------- 1000 VAC**
  - **Test Voltage ----------750 VAC**
  - **Working Voltage ----------250 VAC**

Pin to Ground

- **Initial DWV ---------- Passed**
- **Thermal DWV ---------- Passed**
- **Humidity DWV ---------- Passed**

MMCXV-P-P-GF-ST-EM1/RF316-V3SJ4-V3SJ4-0305

- **Minimums**
  - **Breakdown Voltage ---------- 1350 VAC**
  - **Test Voltage ---------- 1013 VAC**
  - **Working Voltage ----------338 VAC**

Pin to Ground

- **Initial DWV ---------- Passed**
- **Thermal DWV ---------- Passed**
- **Humidity DWV ---------- Passed**

RESULTS Continued

LLCR Gas Tight (10 center contact and 10 outer contact LLCR test points)

MMCXV-J-P-GF-ST-TH1/ RF316-V3SP4-V3SP4-0305

Center contact

- **Initial ---------- 11.78 mOhms Max**
- **Gas-Tight**
  - **<= +5.0 mOhms---------- 10 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ----------0 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms----------0 Points ---------- Acceptable**
  - **+15.1 to +50.0 mOhms----------0 Points ---------- Marginal**
  - **+50.1 to +2000 mOhms ----------0 Points ---------- Unstable**
  - **>+2000 mOhms ----------0 Points ---------- Open Failure**

Outer contact

- **Initial ----------1.56 mOhms Max**
- **Gas-Tight**
  - **<= +5.0 mOhms---------- 10 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ----------0 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms----------0 Points ---------- Acceptable**
  - **+15.1 to +50.0 mOhms----------0 Points ---------- Marginal**
  - **+50.1 to +2000 mOhms ----------0 Points ---------- Unstable**
  - **>+2000 mOhms ----------0 Points ---------- Open Failure**

LLCR Thermal Aging (8 outer contact and 8 center contact LLCR test points)

MMCXV-J-P-GF-ST-TH1/RF316-V3SP4-V3SP4-0305

Center contact

- **Initial ---------- 10.78 mOhms Max**
- **Thermal Aging**
  - **<= +5.0 mOhms----------8 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ----------0 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms----------0 Points ---------- Acceptable**
  - **+15.1 to +50.0 mOhms----------0 Points ---------- Marginal**
  - **+50.1 to +2000 mOhms ----------0 Points ---------- Unstable**
  - **>+2000 mOhms ----------0 Points ---------- Open Failure**

Outer contact

- **Initial ----------1.71 mOhms Max**
- **Thermal Aging**
  - **<= +5.0 mOhms----------8 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ----------0 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms----------0 Points ---------- Acceptable**
  - **+15.1 to +50.0 mOhms----------0 Points ---------- Marginal**
  - **+50.1 to +2000 mOhms ----------0 Points ---------- Unstable**
  - **>+2000 mOhms ----------0 Points ---------- Open Failure**

RESULTS Continued

LLCR Durability (8 outer contact and 8 center contact LLCR test points)

MMCXV-J-P-GF-ST-TH1/RF316-V3SP4-V3SP4-0305

Center contact

- **Initial ---------- 10.87 mOhms Max**
- **Durability, 100 Cycles**
  - **<= +5.0 mOhms---------- 8 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ---------- 0 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms---------- 0 Points ---------- Acceptable**
  - **+15.1 to +50.0 mOhms---------- 0 Points ---------- Marginal**
  - **+50.1 to +2000 mOhms ---------- 0 Points ---------- Unstable**
  - **>+2000 mOhms ---------- 0 Points ---------- Open Failure**
- **Thermal**
  - **<= +5.0 mOhms---------- 8 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ---------- 0 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms---------- 0 Points ---------- Acceptable**
  - **+15.1 to +50.0 mOhms---------- 0 Points ---------- Marginal**
  - **+50.1 to +2000 mOhms ---------- 0 Points ---------- Unstable**
  - **>+2000 mOhms ---------- 0 Points ---------- Open Failure**
- **Humidity**
  - **<= +5.0 mOhms---------- 8 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ---------- 0 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms---------- 0 Points ---------- Acceptable**
  - **+15.1 to +50.0 mOhms---------- 0 Points ---------- Marginal**
  - **+50.1 to +2000 mOhms ---------- 0 Points ---------- Unstable**
  - **>+2000 mOhms ---------- 0 Points ---------- Open Failure**

Outer contact

- **Initial ----------1.78 mOhms Max**
- **Durability, 100 Cycles**
  - **<= +5.0 mOhms---------- 8 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ---------- 0 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms---------- 0 Points ---------- Acceptable**
  - **+15.1 to +50.0 mOhms---------- 0 Points ---------- Marginal**
  - **+50.1 to +2000 mOhms ---------- 0 Points ---------- Unstable**
  - **>+2000 mOhms ---------- 0 Points ---------- Open Failure**
- **Thermal**
  - **<= +5.0 mOhms---------- 8 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ---------- 0 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms---------- 0 Points ---------- Acceptable**
  - **+15.1 to +50.0 mOhms---------- 0 Points ---------- Marginal**
  - **+50.1 to +2000 mOhms ---------- 0 Points ---------- Unstable**
  - **>+2000 mOhms ---------- 0 Points ---------- Open Failure**
- **Humidity**
  - **<= +5.0 mOhms---------- 8 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ---------- 0 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms---------- 0 Points ---------- Acceptable**
  - **+15.1 to +50.0 mOhms---------- 0 Points ---------- Marginal**
  - **+50.1 to +2000 mOhms ---------- 0 Points ---------- Unstable**
  - **>+2000 mOhms ---------- 0 Points ---------- Open Failure**

RESULTS Continued

LLCR Durability (8 outer contact and 8 center contact LLCR test points)

MMCXV-J-P-HF-ST-TH1/RF316-V3SP1-V3SP1-0305

Center contact

- **Initial ---------- 11.45 mOhms Max**
- **Durability, 500 Cycles**
  - **<= +5.0 mOhms---------- 8 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ---------- 0 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms---------- 0 Points ---------- Acceptable**
  - **+15.1 to +50.0 mOhms---------- 0 Points ---------- Marginal**
  - **+50.1 to +2000 mOhms ---------- 0 Points ---------- Unstable**
  - **>+2000 mOhms ---------- 0 Points ---------- Open Failure**
- **Thermal**
  - **<= +5.0 mOhms---------- 8 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ---------- 0 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms---------- 0 Points ---------- Acceptable**
  - **+15.1 to +50.0 mOhms---------- 0 Points ---------- Marginal**
  - **+50.1 to +2000 mOhms ---------- 0 Points ---------- Unstable**
  - **>+2000 mOhms ---------- 0 Points ---------- Open Failure**
- **Humidity**
  - **<= +5.0 mOhms---------- 8 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ---------- 0 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms---------- 0 Points ---------- Acceptable**
  - **+15.1 to +50.0 mOhms---------- 0 Points ---------- Marginal**
  - **+50.1 to +2000 mOhms ---------- 0 Points ---------- Unstable**
  - **>+2000 mOhms ---------- 0 Points ---------- Open Failure**

Outer contact

- **Initial ----------1.76 mOhms Max**
- **Durability, 500 Cycles**
  - **<= +5.0 mOhms---------- 8 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ---------- 0 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms---------- 0 Points ---------- Acceptable**
  - **+15.1 to +50.0 mOhms---------- 0 Points ---------- Marginal**
  - **+50.1 to +2000 mOhms ---------- 0 Points ---------- Unstable**
  - **>+2000 mOhms ---------- 0 Points ---------- Open Failure**
- **Thermal**
  - **<= +5.0 mOhms---------- 8 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ---------- 0 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms---------- 0 Points ---------- Acceptable**
  - **+15.1 to +50.0 mOhms---------- 0 Points ---------- Marginal**
  - **+50.1 to +2000 mOhms ---------- 0 Points ---------- Unstable**
  - **>+2000 mOhms ---------- 0 Points ---------- Open Failure**
- **Humidity**
  - **<= +5.0 mOhms---------- 8 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ---------- 0 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms---------- 0 Points ---------- Acceptable**
  - **+15.1 to +50.0 mOhms---------- 0 Points ---------- Marginal**
  - **+50.1 to +2000 mOhms ---------- 0 Points ---------- Unstable**
  - **>+2000 mOhms ---------- 0 Points ---------- Open Failure**

RESULTS Continued

LLCR Shock & Vibration (8 outer contact and 8 center contact LLCR test points)

MMCXV-J-P-GF-ST-TH1/ MMCXV-P-C-GF-ST-CA1

Center contact

- **Initial ---------- 74.62 mOhms Max**
- **Shock &Vibration**
  - **<= +5.0 mOhms---------- 8 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ---------- 0 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms---------- 0 Points ---------- Acceptable**
  - **+15.1 to +50.0 mOhms---------- 0 Points ---------- Marginal**
  - **+50.1 to +2000 mOhms ---------- 0 Points ---------- Unstable**
  - **>+2000 mOhms ---------- 0 Points ---------- Open Failure**

Outer contact

- **Initial ----------9.35 mOhms Max**
- **Shock &Vibration**
  - **<= +5.0 mOhms---------- 8 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ---------- 0 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms---------- 0 Points ---------- Acceptable**
  - **+15.1 to +50.0 mOhms---------- 0 Points ---------- Marginal**
  - **+50.1 to +2000 mOhms ---------- 0 Points ---------- Unstable**
  - **>+2000 mOhms ---------- 0 Points ---------- Open Failure**

Mechanical Shock &Vibration:

- **Shock**
  - **No Damage ---------- ---------- Pass**
  - **10 Nanoseconds ---------- ---------- Pass**
- **Vibration(random vibration)**
  - **No Damage ---------- ---------- Pass**
  - **10 Nanoseconds ---------- ---------- Pass**

DATA SUMMARIES

Mating\Unmating Force: Mating\Unmating Durability Group

MMCXV-J-P-GF-ST-TH1/RF316-V3SP4-V3SP4-0305

	Initial				After 25 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	9.39	2.11	13.26	2.98	8.36	1.88	13.08	2.94
Maximum	11.61	2.61	16.28	3.66	12.68	2.85	16.01	3.60
Average	10.30	**2.32**	14.96	**3.36**	10.57	**2.38**	15.00	**3.37**
St Dev	0.84	0.19	1.01	0.23	1.44	0.32	1.11	0.25
Count	8	8	8	8	8	8	8	8

	After 50 Cycles				After 75 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	9.52	2.14	10.81	2.43	9.61	2.16	12.85	2.89
Maximum	12.85	2.89	16.15	3.63	13.66	3.07	16.64	3.74
Average	10.88	**2.45**	14.23	**3.20**	11.85	**2.66**	14.94	**3.36**
St Dev	1.01	0.23	1.77	0.40	1.17	0.26	1.18	0.27
Count	8	8	8	8	8	8	8	8

	After 100 Cycles				After Humidity			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	10.19	2.29	14.32	3.22	10.14	2.28	13.43	3.02
Maximum	15.08	3.39	16.41	3.69	11.25	2.53	14.54	3.27
Average	12.45	**2.80**	15.27	**3.43**	10.67	**2.40**	13.93	**3.13**
St Dev	1.40	0.31	0.67	0.15	0.41	0.09	0.41	0.09
Count	8	8	8	8	8	8	8	8

DATA SUMMARIES

Mating\Unmating Force: Mating\Unmating Durability Group

MMCXV-J-P-HF-ST-TH1/ RF316-V3SP1-V3SP1-0305

	Initial				After 125 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	8.01	1.80	12.28	2.76	9.83	2.21	11.88	2.67
Maximum	10.23	2.30	15.70	3.53	15.08	3.39	16.90	3.80
Average	9.08	**2.04**	13.79	**3.10**	12.14	**2.73**	15.02	**3.38**
St Dev	0.72	0.16	1.09	0.25	1.55	0.35	1.78	0.40
Count	8	8	8	8	8	8	8	8

	After 250 Cycles				After 375 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	12.23	2.75	13.08	2.94	13.79	3.10	12.90	2.90
Maximum	17.17	3.86	18.50	4.16	17.88	4.02	17.17	3.86
Average	14.75	**3.32**	16.09	**3.62**	15.45	**3.47**	15.00	**3.37**
St Dev	1.54	0.35	1.80	0.40	1.48	0.33	1.66	0.37
Count	8	8	8	8	8	8	8	8

	After 500 Cycles				After Humidity			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	13.26	2.98	11.16	2.51	9.74	2.19	9.65	2.17
Maximum	17.44	3.92	15.75	3.54	12.63	2.84	11.70	2.63
Average	14.92	**3.35**	13.69	**3.08**	11.31	**2.54**	10.76	**2.42**
St Dev	1.57	0.35	1.69	0.38	1.10	0.25	0.82	0.19
Count	8	8	8	8	8	8	8	8

DATA SUMMARIES

Mating\Unmating Force: Thermal Aging Group

MMCXV-J-P-GF-ST-TH1/RF316-V3SP4-V3SP4-0305

	Initial				After Thermals			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	9.61	2.16	14.41	3.24	7.83	1.76	13.08	2.94
Maximum	13.08	2.94	16.24	3.65	8.90	2.00	15.35	3.45
Average	11.15	**2.51**	15.00	**3.37**	8.42	**1.89**	13.99	**3.15**
St Dev	1.14	0.26	0.67	0.15	0.40	0.09	0.79	0.18
Count	8	8	8	8	8	8	8	8

DATA SUMMARIES Continued

NORMAL FORCE (FOR CONTACTS TESTED OUTSIDE THE HOUSING):

1) Calibrated force gauges are used along with computer controlled positioning equipment.
2) Typically, 8-10 readings are taken and the averages reported.

MMCX-SKT-001-G/MMCXV-P-C-G-ST-CA1-PIN

	Deflections in inches Forces in Grams										
Initial	**0.0003**	**0.0007**	**0.0010**	**0.0014**	**0.0017**	**0.0020**	**0.0024**	**0.0027**	**0.0031**	**0.0034**	***SET***
Averages	28.33	54.63	92.17	130.31	156.71	189.67	231.52	264.96	302.58	342.23	0.0002
Min	21.20	41.30	68.40	101.50	120.80	141.80	174.30	198.20	229.00	264.00	0.0000
Max	38.10	71.50	117.00	163.50	200.70	247.90	314.60	349.00	384.60	444.80	0.0005
St. Dev	6.052	11.117	15.046	20.067	26.129	33.547	45.277	50.827	54.425	61.701	0.0002
Count	10	10	10	10	10	10	10	10	10	10	10

After Thermals	Deflections in inches Forces in Grams										
	0.0003	**0.0007**	**0.0010**	**0.0014**	**0.0017**	**0.0020**	**0.0024**	**0.0027**	**0.0031**	**0.0034**	***SET***
Averages	-0.05	4.91	33.52	68.02	98.82	129.98	173.06	212.69	255.34	316.45	0.0007
Min	-0.30	-0.30	-0.10	13.40	51.10	77.30	111.20	155.50	188.70	238.40	0.0004
Max	0.20	16.40	60.60	95.80	133.60	160.80	233.30	305.40	392.80	467.90	0.0011
St. Dev	0.135	6.111	20.662	26.046	25.673	27.767	33.581	41.266	57.346	65.819	0.0002
Count	10	10	10	10	10	10	10	10	10	10	10

MMCXV-P-C-F-ST-SHL/MMCXV-J-P-F-ST-TH1-SHL

	Deflections in inches Forces in Grams										
Initial	**0.0007**	**0.0014**	**0.0021**	**0.0028**	**0.0036**	**0.0043**	**0.0050**	**0.0060**	**0.0064**	**0.0071**	***SET***
Averages	40.64	89.13	140.53	193.08	244.73	298.17	356.63	430.39	449.88	501.57	0.0005
Min	23.50	68.80	120.60	176.50	233.20	280.30	340.30	413.00	431.40	477.20	0.0001
Max	58.60	115.20	160.90	220.30	271.40	318.40	375.80	452.00	468.00	523.10	0.0011
St. Dev	10.865	14.231	12.016	12.891	11.960	11.015	11.515	13.417	12.638	15.484	0.0003
Count	10	10	10	10	10	10	10	10	10	10	10

After Thermals	Deflections in inches Forces in Grams										
	0.0007	**0.0014**	**0.0021**	**0.0028**	**0.0036**	**0.0043**	**0.0050**	**0.0060**	**0.0064**	**0.0071**	***SET***
Averages	22.31	62.92	113.10	165.20	218.55	273.73	333.01	409.07	432.64	488.43	0.0005
Min	8.40	31.40	75.00	118.90	161.10	211.50	266.00	348.30	370.50	438.30	0.0001
Max	36.70	95.70	154.70	213.90	277.20	333.20	396.90	474.70	499.30	554.20	0.0010
St. Dev	9.306	20.595	25.735	30.188	33.919	34.778	36.777	35.478	35.413	32.358	0.0002
Count	10	10	10	10	10	10	10	10	10	10	10

DATA SUMMARIES Continued

Connector Pull:

MMCXV-P-C-G-ST-CA1-PIN /SUB-MMCXV-P-C-FF-ST-CA1

Center contact only to cable 0

	Force (lbs)
Minimum	1.65
Maximum	1.77
Average	1.70

MMCXV-J-P-GF-ST-TH1/RF316-V3SP4-V3SP4-0305

SIG & GND 90° Connector to Cable

	Force (lbs)
Minimum	1.97
Maximum	2.39
Average	2.21

MMCXV-J-P-GF-ST-EM1 and RF316-V3RP4-V3RP4-0305

SIG & GND 90° Connector to Cable

	Force (lbs)
Minimum	12.83
Maximum	13.54
Average	13.16

SIG & GND 0° Connector to Cable

	Force (lbs)
Minimum	2.51
Maximum	3.03
Average	2.77

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MMCXV-J-C-G-ST-CA1-PIN/SUB-MMCXV-J-C-FF-ST-CA1

Center contact only to cable 0°

	Force (lbs)
Minimum	4.19
Maximum	4.47
Average	4.33

MMCXV-P-P-GF-ST-EM1/RF316-V3SJ4-V3SJ4-0305

SIG & GND 90° Connector to Cable

	Force (lbs)
Minimum	1.39
Maximum	1.68
Average	1.55

DATA SUMMARIES Continued

INSULATION RESISTANCE (IR):

MMCXV-J-P-GF-ST-TH1/ RF316-V3SP4-V3SP4-0305

	Pin to Ground		
	Mated	Unmated	Unmated
Minimum	**MMCXV/RF316**	**MMCXV**	**RF316**
Initial	10000	10000	10000
Thermal	10000	10000	10000
Humidity	10000	10000	10000

MMCXV-J-P-GF-ST-EM1/ RF316-V3RP4-V3RP4-0305

	Pin to Ground		
	Mated	Unmated	Unmated
Minimum	**MMCXV/RF316**	**MMCXV**	**RF316**
Initial	10000	10000	10000
Thermal	10000	10000	10000
Humidity	10000	10000	10000

MMCXV-P-P-GF-ST-EM1/RF316-V3SJ4-V3SJ4-0305

	Pin to Ground		
	Mated	Unmated	Unmated
Minimum	**MMCXV/RF316**	**MMCXV**	**RF316**
Initial	10000	10000	10000
Thermal	10000	10000	10000
Humidity	10000	10000	10000

DATA SUMMARIES Continued

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

MMCXV-J-P-GF-ST-TH1/ RF316-V3SP4-V3SP4-0305

Voltage Rating Summary	
Minimum	MMCXV/RF316
Break Down Voltage	750
Test Voltage	563
Working Voltage	188

Pin to Ground	
Initial Test Voltage	Passed
After Thermal Test Voltage	Passed
After Humidity Test Voltage	Passed

MMCXV-J-P-GF-ST-EM1/ RF316-V3RP4-V3RP4-0305

Voltage Rating Summary	
Minimum	MMCXV/RF316
Break Down Voltage	1000
Test Voltage	750
Working Voltage	250

Pin to Ground	
Initial Test Voltage	Passed
After Thermal Test Voltage	Passed
After Humidity Test Voltage	Passed

MMCXV-P-P-GF-ST-EM1/RF316-V3SJ4-V3SJ4-0305

Voltage Rating Summary	
Minimum	MMCXV/RF316
Break Down Voltage	1350
Test Voltage	1013
Working Voltage	338

Pin to Ground	
Initial Test Voltage	Passed
After Thermal Test Voltage	Passed
After Humidity Test Voltage	Passed

DATA SUMMARIES Continued

LLCR Durability:

1) A total of 8 outer contact points and 8 center contact points were measured.
2) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets.*
3) A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
4) The following guidelines are used to categorize the changes in LLCR as a result from stressing.
   a. <= +5.0 mOhms: ---------- Stable
   b. +5.1 to +10.0 mOhms: ---------- Minor
   c. +10.1 to +15.0 mOhms: ---------- Acceptable
   d. +15.1 to +50.0 mOhms: ---------- Marginal
   e. +50.1 to +2000 mOhms ---------- Unstable
   f. >+2000 mOhms: ---------- Open Failure

MMCXV-J-P-GF-ST-TH1/RF316-V3SP4-V3SP4-0305

	LLCR Measurement Summaries by Pin Type			
Date	10/13/2012	10/17/2012	11/6/2012	11/17/2012
Room Temp (Deg C)	21	22	24	22
Rel Humidity (%)	56	57	52	57
Technician	Kason He	Kason He	Kason He	Kason He
mOhm values	**Actual Initial**	**Delta 100 cycles**	**Delta Therm Shck**	**Delta Humidity**
	Pin Type 1: Center contact			
Average	10.57	0.14	1.55	1.84
St. Dev.	0.22	0.25	0.65	0.59
Min	10.26	-0.15	0.64	1.15
Max	10.87	0.52	2.53	2.70
Summary Count	8	8	8	8
Total Count	8	8	8	8
	Pin Type 2: Outer contact			
Average	1.60	0.28	1.62	1.74
St. Dev.	0.11	0.15	0.68	0.74
Min	1.46	0.16	1.38	1.45
Max	1.78	0.44	2.19	2.37
Summary Count	8	8	8	8
Total Count	8	8	8	8

LLCR Delta Count by Category						
	Stable	**Minor**	**Acceptable**	**Marginal**	**Unstable**	**Open**
mOhms	**<=5**	**>5 & <=10**	**>10 & <=15**	**>15 & <=50**	**>50 & <=1000**	**>1000**
100 cycles	**16**	**0**	**0**	**0**	**0**	**0**
Therm Shck	**16**	**0**	**0**	**0**	**0**	**0**
Humidity	**16**	**0**	**0**	**0**	**0**	**0**

DATA SUMMARIES Continued

LLCR Durability:

1) A total of 8 outer contact points and 8 center contact points were measured.
2) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets.*
3) A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
4) The following guidelines are used to categorize the changes in LLCR as a result from stressing.
   a. <= +5.0 mOhms: ---------- Stable
   b. +5.1 to +10.0 mOhms: ---------- Minor
   c. +10.1 to +15.0 mOhms: ---------- Acceptable
   d. +15.1 to +50.0 mOhms: ---------- Marginal
   e. +50.1 to +2000 mOhms ---------- Unstable
   f. >+2000 mOhms: ---------- Open Failure

MMCXV-J-P-HF-ST-TH1/RF316-V3SP1-V3SP1-0305

	LLCR Measurement Summaries by Pin Type			
Date	10/13/2012	10/17/2012	11/6/20123	11/17/2012
Room Temp (Deg C)	21	22	24	22
Rel Humidity (%)	56	57	52	57
Technician	Kason He	Kason He	Kason He	Kason He
mOhm values	**Actual Initial**	**Delta 500 cycles**	**Delta Therm Shck**	**Delta Humidity**
	Pin Type 1: Signal			
Average	10.94	0.94	2.93	3.42
St. Dev.	0.36	0.49	0.74	0.68
Min	10.56	0.35	1.67	2.00
Max	11.45	1.68	4.01	4.27
Summary Count	8	8	8	8
Total Count	8	8	8	8
	Pin Type 2:Groud			
Average	1.62	0.77	2.88	3.10
St. Dev.	0.09	0.28	0.67	0.67
Min	1.48	0.43	1.52	1.86
Max	1.76	1.15	3.63	3.91
Summary Count	8	8	8	8
Total Count	8	8	8	8

LLCR Delta Count by Category						
	Stable	**Minor**	**Acceptable**	**Marginal**	**Unstable**	**Open**
mOhms	**<=5**	**>5 & <=10**	**>10 & <=15**	**>15 & <=50**	**>50 & <=1000**	**>1000**
500 cycles	**16**	**0**	**0**	**0**	**0**	**0**
Therm Shck	**16**	**0**	**0**	**0**	**0**	**0**
Humidity	**16**	**0**	**0**	**0**	**0**	**0**

DATA SUMMARIES Continued

LLCR Thermal Aging:

1) A total of 8 outer contact points and 8 center contact points were measured.
2) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets.*
3) A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
4) The following guidelines are used to categorize the changes in LLCR as a result from stressing.
   a. <= +5.0 mOhms: ---------- Stable
   b. +5.1 to +10.0 mOhms: ---------- Minor
   c. +10.1 to +15.0 mOhms: ---------- Acceptable
   d. +15.1 to +50.0 mOhms: ---------- Marginal
   e. +50.1 to +2000 mOhms: ---------- Unstable
   f. >+2000 mOhms: ---------- Open Failure

MMCXV-J-P-GF-ST-TH1/RF316-V3SP4-V3SP4-0305

	LLCR Measurement Summaries by Pin Type			
Date	10/12/2012	10/27/2012		
Room Temp (Deg C)	22	24		
Rel Humidity (%)	54	52		
Technician	Kason He	Kason He		
mOhm values	**Actual Initial**	**Delta Thermal Age**	**Delta**	**Delta**
	Pin Type 1: Center contact			
Average	10.42	0.52		
St. Dev.	0.26	0.21		
Min	9.93	0.20		
Max	10.78	0.90		
Summary Count	8	8		
Total Count	8	8		
	Pin Type 2: Outer contact			
Average	1.65	0.36		
St. Dev.	0.06	0.07		
Min	1.55	0.25		
Max	1.71	0.44		
Summary Count	8	8		
Total Count	8	8		

LLCR Delta Count by Category						
	Stable	**Minor**	**Acceptable**	**Marginal**	**Unstable**	**Open**
mOhms	**<=5**	**>5 & <=10**	**>10 & <=15**	**>15 & <=50**	**>50 & <=1000**	**>1000**
Thermal Age	**16**	**0**	**0**	**0**	**0**	**0**

DATA SUMMARIES Continued

LLCR Gas Tight:

1) A total of 10 outer contact points and 10 center contact points were measured.
2) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets.*
3) A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
4) The following guidelines are used to categorize the changes in LLCR as a result from stressing.
   a. <= +5.0 mOhms: ---------- Stable
   b. +5.1 to +10.0 mOhms: ---------- Minor
   c. +10.1 to +15.0 mOhms: ---------- Acceptable
   d. +15.1 to +50.0 mOhms: ---------- Marginal
   e. +50.1 to +2000 mOhms: ---------- Unstable
   f. >+2000 mOhms: ---------- Open Failure

MMCXV-J-P-GF-ST-TH1/RF316-V3SP4-V3SP4-0305

	LLCR Measurement Summaries by Pin Type			
Date	9/27/2012	9/28/2012		
Room Temp (Deg C)	22	22		
Rel Humidity (%)	54	58		
Technician	Kason He	Kason He		
mOhm values	**Actual Initial**	**Delta Acid Vapor**	**Delta**	**Delta**
	Pin Type 1: Center contact			
Average	11.03	0.40		
St. Dev.	0.37	0.48		
Min	10.45	0.02		
Max	11.78	1.23		
Summary Count	10	10		
Total Count	10	10		
	Pin Type 2: Outer contact			
Average	1.52	0.09		
St. Dev.	0.03	0.05		
Min	1.45	0.01		
Max	1.56	0.15		
Summary Count	10	10		
Total Count	10	10		

LLCR Delta Count by Category						
	Stable	**Minor**	**Acceptable**	**Marginal**	**Unstable**	**Open**
mOhms	**<=5**	**>5 & <=10**	**>10 & <=15**	**>15 & <=50**	**>50 & <=1000**	**>1000**
Acid Vapor	**20**	**0**	**0**	**0**	**0**	**0**

DATA SUMMARIES Continued

LLCR Shock &Vibration:

1). A total of 8 outer contact points and 8 center contact points were measured.
2). Mil-PRF-28800F, *PERFORMANCE SPECIFICATION*
3). EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets.*
4). A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
5). The following guidelines are used to categorize the changes in LLCR as a result from stressing.
   a. <= +5.0 mOhms:---------- Stable
   b. +5.1 to +10.0 mOhms: ---------- Minor
   c. +10.1 to +15.0 mOhms: ---------- Acceptable
   d. +15.1 to +50.0 mOhms: ---------- Marginal
   e. +50.1 to +2000 mOhms ---------- Unstable
   f. >+2000 mOhms: ---------- Open Failure

MMCXV-J-P-GF-ST-TH1/ MMCXV-P-C-GF-ST-CA1

LLCR Measurement Summaries by Pin Type				
Date	2013-8-14	2013-8-15		
Room Temp (Deg C)	22	22		
Rel Humidity (%)	45	45		
Technician	Craig Ryan	Craig Ryan		
mOhm values	**Actual Initial**	**Delta Shock-Vib**	**Delta**	**Delta**
	Pin Type 1: Center contact			
Average	73.86	0.19		
St. Dev.	0.32	0.14		
Min	73.46	0.03		
Max	74.62	0.49		
Summary Count	8	8		
Total Count	8	8		
	Pin Type 2: Outer contact			
Average	9.29	0.03		
St. Dev.	0.04	0.02		
Min	9.24	0.00		
Max	9.35	0.06		
Summary Count	8	8		
Total Count	8	8		

LLCR Delta Count by Category						
	Stable	**Minor**	**Acceptable**	**Marginal**	**Unstable**	**Open**
mOhms	**<=5**	**>5 & <=10**	**>10 & <=15**	**>15 & <=50**	**>50 & <=1000**	**>1000**
Shock-Vib	**16**	**0**	**0**	**0**	**0**	**0**

DATA SUMMARIES Continued

Nanosecond Event Detection:

Shock and Vibration Event Detection Summary	
Contacts tested	12
Test Condition	C, 100g's, 6ms, Half-Sine
Shock Events	0
Test Condition	V-B, 7.56 rms g
Vibration Events	0
Total Events	0

EQUIPMENT AND CALIBRATION SCHEDULES

Equipment #: HZ-TCT-01
Description: Normal force analyzer
Manufacturer: Mecmesin Multitester
Model: Mecmesin Multitester 2.5-i
Serial #: 08-1049-04
Accuracy: Last Cal: 4/27/2012, Next Cal: 4/26/2013

Equipment #: HZ-OV-01
Description: Oven
Manufacturer: Huida
Model: CS101-1E
Serial #: CS101-1E-B
Accuracy: Last Cal: 12/14/2011, Next Cal: 12/13/2012

Equipment #: HZ-THC-01
Description: Humidity transmitter
Manufacturer: Thermtron
Model: HMM30C
Serial #: D0240037
Accuracy: Last Cal: 3/1/2012, Next Cal: 2/28/2013

Equipment #: HZ-HPM-01
Description: NA9636H
Manufacturer: Ainuo
Model: 6031A
Serial #: 089601091
Accuracy: Last Cal: 3/8/2012, Next Cal: 3/7/2013

Equipment #: MO-04
Description: Multimeter /Data Acquisition System
Manufacturer: Keithley
Model: 2700
Serial #: 0798688
Accuracy: Last Cal: 4/20/2012, Next Cal: 4/20/2013

Equipment #: HZ-MO-05
Description: Micro-ohmmeter
Manufacturer: Keithley
Model: 3706
Serial #: 1285188
Accuracy: Last Cal: 11/16/2011, Next Cal: 11/15/2012

Equipment #: HZ-TSC-01
Description: Vertical Thermal Shock Chamber
Manufacturer: Cincinnatti Sub Zero
Model: VTS-3-6-6-SC/AC
Serial #: 10-VT14994
Accuracy: See Manual
… Last Cal: 06/28/2012, Next Cal: 06/27/2013

EQUIPMENT AND CALIBRATION SCHEDULES

Equipment #: SVC-01
Description: Shock & Vibration Table
Manufacturer: Data Physics
Model: LE-DSA-10-20K
Serial #: 10037
Accuracy: See Manual
… Last Cal: 11/30/2011, Next Cal: 11/30/2012

Equipment #: ACLM-01
Description: Accelerometer
Manufacturer: PCB Piezotronics
Model: 352C03
Serial #: 115819
Accuracy: See Manual
… Last Cal: 07/08/2012, Next Cal: 07/07/2013

Equipment #: ED-03
Description: Event Detector
Manufacturer: Analysis Tech
Model: 32EHD
Serial #: 1100604
Accuracy: See Manual
… Last Cal: 06/03/2012, Next Cal: 06/02/2013