



Project Number: Design Qualification Test Report	Tracking Code: 3541345_Report_Rev_1
Requested by: Joe Huang	Date: 3/28/2023
Part #: RF280-04SP-505050-0152/RF280-04RP-505050-0152/RF280-04BJ-505050-0152	
Part description: RF280-04SP/RF280-04RP/ RF280-04BJ	Tech: Peter Chen
Test Start: 11/5/2022	Test Completed: 11/20/2022



DESIGN QUALIFICATION TEST REPORT

RF280-04SP/RF280-04RP/ RF280-04BJ
RF280-04SP-505050-0152/RF280-04BJ-505050-0152/RF28004RP-505050-0152

Tracking Code: 3541345_Report_Rev_1

Part #: RF280-04SP-505050-0152/RF280-04RP-505050-0152/RF280-04BJ-505050-0152

Part description: RF280-04SP/ RF280-04RP/ RF280-04BJ

REVISION HISTORY

DATA	REV.NUM.	DESCRIPTION	ENG
1/16/2023	1	Initial Issue	PC

CERTIFICATION

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

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SCOPE

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

APPLICABLE DOCUMENTS

Standards: MIL-PRF-39012

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

FLOWCHARTS**Mating/Unmating/Durability**Group 1

RF280-04SP-505050-0152

RF280-04BJ-505050-0152

4 Assemblies

Step	Description
1.	Length & Mass
2.	Interface Gaging <i>Note: Pin to Body 5.28[.208] MIN</i>
3.	DWV at Test Voltage ⁽¹⁾ - Non Standard DWV = 500 VAC
4.	LLCR ⁽²⁾ - Non Standard <i>Note: Signal and ground.</i>
5.	Cycles Quantity = 500 Cycles <i>Note: By hand. Torque each time to 6 in-lbs. Rotate plug coupling nut only. Do not rotate entire assembly. MIL-PRF-39012, Paragraph. 4.6.12</i>
6.	LLCR ⁽²⁾ - Non Standard Max Delta = 15 mOhm <i>Note: Signal and ground.</i>
7.	Interface Gaging <i>Note: Pin to Body 5.28[.208] MIN</i>

Group 2

RF280-04RP-505050-0152

RF280-04BJ-505050-0152

4 Assemblies

Step	Description
1.	Length & Mass
2.	Interface Gaging <i>Note: Pin to Body 5.28[.208] MIN</i>
3.	DWV at Test Voltage ⁽¹⁾ - Non Standard DWV = 500 VAC
4.	LLCR ⁽²⁾ - Non Standard <i>Note: Signal and ground.</i>
5.	Cycles Quantity = 500 Cycles <i>Note: By hand. Torque each time to 6 in-lbs. Rotate plug coupling nut only. Do not rotate entire assembly. MIL-PRF-39012, Paragraph. 4.6.12</i>
6.	LLCR ⁽²⁾ - Non Standard Max Delta = 15 mOhm <i>Note: Signal and ground.</i>
7.	Interface Gaging <i>Note: Pin to Body 5.28[.208] MIN</i>

(1) DWV at Test Voltage = Other

Test Condition = 1 (Sea Level) Test voltage applied for 60 seconds
MIL-PRF-39012, Paragraph. 4.6.14 per MIL-STD-202-301

(2) LLCR = Other

Open Circuit Voltage = 20 mV Max

Test Current = 100 mA Max

MIL-PRF-39012, Paragraph 4.6.13 except current to be 100mA nominal and voltage to be 20 mV maximum.

FLOWCHARTS Continued**IR/DWV****Pin-to-Ground**Group 1

RF280-04SP-505050-0152

RF280-04BJ-505050-0152

4 Assemblies

Note: For STEP 6, please put the following additional cable assemblies in the thermal shock chamber (ride along parts).

Plug & jack versions are mated with dust caps on open ends.

Plug version: RF280-04SP-04SP-1000 (4 PCS)

Jack version: RF280-04BJ-04BJ-1000 (4 PCS)

Step	Description
1.	Length & Mass
2.	Interface Gaging <i>Note: Pin to Body 5.28[.208] MIN</i>
3.	IR (2) - Non Standard
4.	DWV at Test Voltage ⁽¹⁾ - Non Standard Test Voltage = 500 VAC
5.	LLCR (3) - Non Standard <i>Note: Signal and ground.</i>
6.	Thermal Shock (4) - Non Standard
7.	IR (2) - Non Standard
8.	DWV at Test Voltage ⁽¹⁾ - Non Standard Test Voltage = 500 VAC
9.	LLCR (3) - Non Standard Max Delta = 15 mOhm <i>Note: Signal and ground.</i>
10.	Interface Gaging <i>Note: Pin to Body 5.28[.208] MIN</i>

(1) DWV at Test Voltage = Other

Test Condition = 1 (Sea Level) Test voltage applied for 60 seconds
MIL-PRF-39012, Paragraph. 4.6.8 per MIL-STD-202-302

(2) IR = Other

Test Condition = 500V DC, 2 Minutes Max
MIL-PRF-39012, Paragraph 4.6.8 per MIL-STD-202-302

(3) LLCR = Other

Open Circuit Voltage = 20 mV Max
Test Current = 100 mA Max
MIL-PRF-39012, Paragraph 4.6.13 except current to be 100mA nominal and voltage to be 20 mV maximum.

(4) Thermal Shock = Other

Exposure Time at Temperature Extremes = 1/2 Hour
Test Condition = I (-55°C to +125°C)
Test Duration = test condition B except 10 cycles instead of 5.
MIL-PRF-39012, Paragraph. 4.6.17 per MIL-STD-202-107

Part description: RF280-04SP/ RF280-04RP/ RF280-04BJ

FLOWCHARTS Continued**Cable Pull**Group 1

RF280-04RP-505050-0152
 RF280-04BJ-505050-0152
 4 Assemblies
 0 Degrees

Step	Description
1.	Length & Mass
2.	Interface Gaging <i>Note: Pin to Body 5.28[.208] MIN</i>
3.	LLCR (3) - Non Standard <i>Note: Signal and ground.</i>
4.	Cable Retention (1) - Non Standard <i>Note: Apply 40 pounds(18.15 kg) for 30 seconds min. for Cable Retention test.</i>
5.	LLCR (3) - Non Standard Max Delta = 15 mOhm <i>Note: Signal and ground.</i>
6.	Interface Gaging <i>Note: Pin to Body 5.28[.208] MIN</i>

Group 2

RF280-04SP-505050-0152
 RF280-04BJ-505050-0152
 4 Assemblies
 0 Degrees

Step	Description
1.	Length & Mass
2.	Interface Gaging <i>Note: Pin to Body 5.28[.208] MIN</i>
3.	LLCR (3) - Non Standard <i>Note: Signal and ground.</i>
4.	Cable Retention (1) - Non Standard <i>Note: Apply 40 pounds(18.15 kg) for 30 seconds min. for Cable Retention test.</i>
5.	LLCR (3) - Non Standard Max Delta = 15 mOhm <i>Note: Signal and ground.</i>
6.	Interface Gaging <i>Note: Pin to Body 5.28[.208] MIN</i>

Group 3

RF280-04SP-505050-0152
 2 Assemblies
 0 Degrees

Step	Description
1.	Cable Retention (2) - Non Standard <i>Note: Pull-to-destruct.</i>

Group 4

RF280-04BJ-505050-0152
 2 Assemblies
 0 Degrees

Step	Description
1.	Cable Retention (2) - Non Standard <i>Note: Pull-to-destruct.</i>

Group 5

RF280-04RP-505050-0152
 2 Assemblies
 0 Degrees

Step	Description
1.	Cable Retention (2) - Non Standard <i>Note: Pull-to-destruct.</i>

(1) Cable Retention = Other

MIL-PRF-39012, Paragraph 4.6.21

(2) Cable Retention = Other

Pull-to-destruct.

MIL-PRF-30192, Paragraph 4.6.21

(3) LLCR = Other

Open Circuit Voltage = 20 mV Max

Test Current = 100 mA Max

MIL-PRF-39012, Paragraph 4.6.13 except current to be 100mA nominal and voltage to be 20 mV maximum.

ATTRIBUTE DEFINITIONS

The following is a brief, simplified description of attributes.

THERMAL SHOCK:

- 1) MIL-PRF-39012, *Paragraph. 4.6.17 per MIL-STD-202-107*
- 2) Test Condition: I (-55°C to +125°C)
- 3) Test Time: ½ hour dwell at each temperature extreme
- 4) Test Duration: Test condition B except 10 cycles instead of 5.
- 5) All test samples are pre-conditioned at ambient.
- 6) All test samples are exposed to environmental stressing in the mated condition.

LLCR:

- 1) MIL-PRF-39012, *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 +1000 mOhms: -----Unstable
 - f. >+1000 mOhms:-----Open Failure

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: MIL-PRF-39012, *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: MIL-PRF-39012, *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

ATTRIBUTE DEFINITIONS

The following is a brief, simplified description of attributes

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).

CABLE PULL:

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

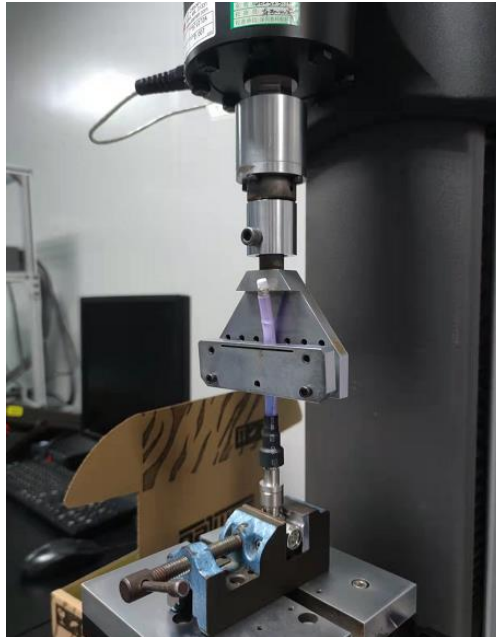


Fig. 1

0° Connector pull, notice the electrical continuity hook-up wires.

RESULTS**Cable Pull force**

- **0° Pull**
 - SP**
 - **Min**----- **185.50 lbs**
 - **Max**----- **215.10 lbs**
 - RP**
 - **Min**----- **179.50 lbs**
 - **Max**----- **180.50 lbs**
 - BJ**
 - **Min**----- **171.30 lbs**
 - **Max**----- **183.00 lbs**

IR_DWV**Group 1(04SP/04BJ)****Insulation Resistance minimums, IR****Pin to Ground**

- **Initial**
 - **Mated**----- **45000 Meg Ω** ----- **Passed**
- **Thermal Shock**
 - **Mated**----- **45000 Meg Ω** ----- **Passed**

Dielectric Withstanding Voltage minimums, DWV

- **Minimums**
 - **Test Voltage**----- **500 VAC**

Pin to Ground

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

Group 2(04RP/04BJ)**Pin to Ground**

- **Initial**
 - **Mated**----- **45000 Meg Ω** ----- **Passed**
- **Thermal Shock**
 - **Mated**----- **45000 Meg Ω** ----- **Passed**

Dielectric Withstanding Voltage minimums, DWV

- **Minimums**
 - **Test Voltage**----- **500 VAC**

Pin to Ground

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

DWV Mating/Unmating Durability Group**Group 1(04SP/04BJ)**

- **Minimums**
 - **Test Voltage**----- **500 VAC**

Pin to Ground

- **Initial DWV**----- **Passed**

Group 2(04SP/04BJ)

- **Minimums**
 - **Test Voltage**----- **500 VAC**

Pin to Ground

- **Initial DWV**----- **Passed**

Part description: RF280-04SP/ RF280-04RP/ RF280-04BJ

RESULTS Continued**Length & Mass****Mating/Unmating Durability Group****Group 1****Length****SP**

- **Min** ----- 154.00 mm
- **Max** ----- 155.00 mm

BJ

- **Min** ----- 155.00 mm
- **Max** ----- 155.00 mm

Mass**SP**

- **Min** -----50.45 g
- **Max** -----50.56 g

BJ

- **Min** -----44.91 g
- **Max** -----45.12 g

Group 2**Length****RP**

- **Min** ----- 155.00 mm
- **Max** ----- 156.00 mm

BJ

- **Min** ----- 155.00 mm
- **Max** ----- 155.00 mm

Mass**RP**

- **Min** -----64.67 g
- **Max** -----64.99 g

BJ

- **Min** -----44.87 g
- **Max** -----45.02 g

IR/DWV Group**Group 1****Length****Length****SP**

- **Min** ----- 154.00 mm
- **Max** ----- 155.00 mm

BJ

- **Min** ----- 155.00 mm
- **Max** ----- 155.00 mm

Mass**SP**

- **Min** -----50.45 g
- **Max** -----50.56 g

BJ

- **Min** -----44.91 g
- **Max** -----45.12 g

Part description: RF280-04SP/ RF280-04RP/ RF280-04BJ

RESULTS Continued**Group 2****Length****Length****SP**

- **Min** ----- 155.00 mm
- **Max** ----- 155.00 mm

BJ

- **Min** ----- 154.00 mm
- **Max** ----- 155.00 mm

Mass**RP**

- **Min** ----- 64.81 g
- **Max** ----- 65.09 g

BJ

- **Min** ----- 44.88 g
- **Max** ----- 45.12 g

Cable Pull Group**Group 1****Length****SP**

- **Min** ----- 154.00 mm
- **Max** ----- 155.00 mm

BJ

- **Min** ----- 154.00 mm
- **Max** ----- 155.00 mm

Mass**SP**

- **Min** ----- 50.39 g
- **Max** ----- 50.62 g

BJ

- **Min** ----- 45.01 g
- **Max** ----- 45.12 g

Group 2**Length****SP**

- **Min** ----- 154.00 mm
- **Max** ----- 155.00 mm

BJ

- **Min** ----- 154.00 mm
- **Max** ----- 155.00 mm

Mass**RP**

- **Min** ----- 64.58 g
- **Max** ----- 64.85 g

BJ

- **Min** ----- 44.85 g
- **Max** ----- 45.06 g

RESULTS Continued**Interface Gaging****Mating/Unmating Durability Group****Group 1****SP****Initial**

- **Min** ----- 5.33 mm
- **Max** ----- 5.36 mm

After 500 cycles

- **Min** ----- 5.33 mm
- **Max** ----- 5.36 mm

BJ**Initial**

- **Min** ----- 5.25 mm
- **Max** ----- 5.26 mm

After 500 cycles

- **Min** ----- 5.25 mm
- **Max** ----- 5.27 mm

Group 2**RP****Initial**

- **Min** ----- 5.35 mm
- **Max** ----- 5.36 mm

After 500 cycles

- **Min** ----- 5.33 mm
- **Max** ----- 5.37 mm

BJ**Initial**

- **Min** ----- 5.24 mm
- **Max** ----- 5.27 mm

After 500 cycles

- **Min** ----- 5.26 mm
- **Max** ----- 5.27 mm

IR/DWV Group**SP****Initial**

- **Min** ----- 5.35 mm
- **Max** ----- 5.36 mm

After 500 cycles

- **Min** ----- 5.33 mm
- **Max** ----- 5.36 mm

BJ**Initial**

- **Min** ----- 5.23 mm
- **Max** ----- 5.25 mm

After 500 cycles

- **Min** ----- 5.21 mm
- **Max** ----- 5.22 mm

Part description: RF280-04SP/ RF280-04RP/ RF280-04BJ

RESULTS Continued**Cable Pull Group****Group 1****SP****Initial**

- **Min** ----- 5.35 mm
- **Max** ----- 5.38 mm

After 500 cycles

- **Min** ----- 5.36 mm
- **Max** ----- 5.38 mm

BJ**Initial**

- **Min** ----- 5.24 mm
- **Max** ----- 5.26 mm

After 500 cycles

- **Min** ----- 5.26 mm
- **Max** ----- 5.29 mm

Group 2**RP****Initial**

- **Min** ----- 5.33 mm
- **Max** ----- 5.36 mm

After 500 cycles

- **Min** ----- 5.32 mm
- **Max** ----- 5.34 mm

BJ**Initial**

- **Min** ----- 5.20 mm
- **Max** ----- 5.26 mm

After 500 cycles

- **Min** ----- 5.27 mm
- **Max** ----- 5.32 mm

RESULTS Continued**LLCR IR/DWV (4 signal and 4 ground LLCR test points)****Signal Pin**

- Initial -----2.05 mOhms Max

Ground Pin

- Initial -----5.08 mOhms Max
- Thermal Shock
 - $\leq +5.0$ 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 $+1000$ mOhms -----0 Points ----- Unstable
 - $>+1000$ mOhms -----0 Points ----- Open Failure

LLCR Cable Pull (4 signal and 4 ground LLCR test points)**Group 1****Signal Pin**

- Initial -----2.00 mOhms Max

Ground Pin

- Initial -----4.55 mOhms Max
- 5 Ib Retention
 - $\leq +5.0$ 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 $+1000$ mOhms -----0 Points ----- Unstable
 - $>+1000$ mOhms -----0 Points ----- Open Failure

Group 2**Signal Pin**

- Initial -----4.47 mOhms Max

Ground Pin

- Initial -----6.12 mOhms Max
- 5 Ib Retention
 - $\leq +5.0$ 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 $+1000$ mOhms -----0 Points ----- Unstable
 - $>+1000$ mOhms -----0 Points ----- Open Failure

RESULTS Continued**LLCR Durability (4 signal and 4 ground LLCR test points)****Group 1****Signal Pin**

- **Initial -----2.02 mOhms Max**

Ground Pin

- **Initial -----6.56 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 +1000 mOhms-----0 Points ----- Unstable**
 - **>+1000 mOhms-----0 Points ----- Open Failure**

Group 2**Signal Pin**

- **Initial -----3.01 mOhms Max**

Ground Pin

- **Initial -----5.12 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 +1000 mOhms-----0 Points ----- Unstable**
 - **>+1000 mOhms-----0 Points ----- Open Failure**

Part description: RF280-04SP/ RF280-04RP/ RF280-04BJ

DATA SUMMARIES**Cable Pull Force:
0° Pull**

04SP	Force (lbs)
Minimum	185.50
Maximum	215.10
Average	200.30

04BJ	Force (lbs)
Minimum	179.50
Maximum	180.50
Average	180.00

04RP	Force (lbs)
Minimum	171.30
Maximum	183.00
Average	177.15

Part description: RF280-04SP/ RF280-04RP/ RF280-04BJ

DATA SUMMARIES Continued**IR_DWV****Group 1****INSULATION RESISTANCE (IR):**

	Pin to Ground
	Mated
Minimum	04SP/04BJ
Initial	45000
Thermal Shock	45000

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Pin to Ground (500 VAC)	
Initial Test Voltage	Pass
After Thermal Shock Test Voltage	Pass

DWV Mating/Unmating Durability Group**Group 1**

Pin to Ground (500 VAC)	
Initial Test Voltage	Pass

Group 2

Pin to Ground (500 VAC)	
Initial Test Voltage	Pass

Part description: RF280-04SP/ RF280-04RP/ RF280-04BJ

DATA SUMMARIES Continued**LENGTH & MASS****Mating/Unmating Durability Group****Group 1**

04SP	Length (mm)	Mass (g)
1	154.00	50.48
2	154.00	50.56
3	154.00	50.45
4	155.00	50.55
Min	154.00	50.45
Max	155.00	50.56
Avg	154.50	50.51

04BJ	Length (mm)	Mass (g)
1	155.00	45.12
2	155.00	44.91
3	155.00	44.99
4	155.00	45.04
Min	155.00	44.91
Max	155.00	45.12
Avg	155.00	45.02

Group 2

04RP	Length (mm)	Mass (g)
1	156.00	64.71
2	155.00	64.67
3	155.00	64.99
4	155.00	64.96
Min	155.00	64.67
Max	156.00	64.99
Avg	155.50	64.83

04BJ	Length (mm)	Mass (g)
1	155.00	45.01
2	155.00	45.02
3	155.00	44.93
4	155.00	44.87
Min	155.00	44.87
Max	155.00	45.02
Avg	155.00	44.96

Part description: RF280-04SP/ RF280-04RP/ RF280-04BJ

DATA SUMMARIES Continued**IR/DWV Group**

04SP	Length (mm)	Mass (g)
1	154.00	50.49
2	155.00	50.64
3	155.00	50.45
4	155.00	50.35
Min	154.00	50.35
Max	155.00	50.64
Avg	154.50	50.50

04BJ	Length (mm)	Mass (g)
1	155.00	45.11
2	155.00	45.05
3	155.00	44.95
4	155.00	45.10
Min	155.00	44.95
Max	155.00	45.11
Avg	155.00	45.00

**Cable Pull Group
Group 1**

04SP	Length (mm)	Mass (g)
1	155.00	50.390
2	154.00	50.550
3	154.00	50.620
4	155.00	50.530
Min	154.00	50.39
Max	155.00	50.62
Avg	154.50	50.52

04BJ	Length (mm)	Mass (g)
1	155.00	45.11
2	154.00	45.01
3	155.00	45.08
4	155.00	45.12
Min	154.00	45.01
Max	155.00	45.12
Avg	154.80	45.08

Part description: RF280-04SP/ RF280-04RP/ RF280-04BJ

DATA SUMMARIES Continued**Group 2**

04RP	Length (mm)	Mass (g)
1	155.00	64.74
2	155.00	64.58
3	154.00	64.76
4	154.00	64.85
Min	154.00	64.58
Max	155.00	64.85
Avg	155.50	64.73

04BP	Length (mm)	Mass (g)
1	155.00	44.85
2	154.00	44.94
3	155.00	44.91
4	155.00	45.06
Min	154.00	44.85
Max	155.00	45.06
Avg	155.50	44.94

Part description: RF280-04SP/ RF280-04RP/ RF280-04BJ

DATA SUMMARIES Continued**INTERFACE GAGING****Mating/Unmating Durability Group****Group 1**

Gaging (5.28 min) (mm)			
04SP	Initial	500 Cycles	Deltas
1	5.33	5.35	0.02
2	5.34	5.33	0.01
3	5.36	5.36	0.00
4	5.36	5.37	0.01
Min	5.33	5.33	0.00
Max	5.36	5.36	0.02
Avg	5.35	5.35	0.01

Gaging (5.28 / 5.03) (mm)			
04BJ	Initial	500 Cycles	Deltas
1	5.26	5.26	0.00
2	5.25	5.25	0.00
3	5.25	5.26	0.01
4	5.25	5.27	0.02
Min	5.25	5.25	0.00
Max	5.26	5.27	0.02
Avg	5.25	5.26	0.01

Group 2

Gaging (5.28 min) (mm)			
04RP	Initial	500 Cycles	Deltas
1	5.36	5.33	0.03
2	5.36	5.36	0.00
3	5.36	5.37	0.01
4	5.35	5.33	0.02
Min	5.35	5.33	0.00
Max	5.36	5.37	0.03
Avg	5.36	5.35	0.01

Gaging (5.28 / 5.03) (mm)			
04BJ	Initial	500 Cycles	Deltas
1	5.27	5.26	0.01
2	5.26	5.27	0.01
3	5.24	5.26	0.02
4	5.24	5.26	0.02
Min	5.24	5.26	0.01
Max	5.27	5.27	0.02
Avg	5.25	5.26	0.02

Part description: RF280-04SP/ RF280-04RP/ RF280-04BJ

DATA SUMMARIES Continued**IR/DWV Group**

Gaging (5.28 min) (mm)			
04SP	Initial	After thermal shock	Deltas
1	5.36	5.36	0.00
2	5.36	5.35	0.01
3	5.36	5.33	0.03
4	5.35	5.35	0.00
Min	5.35	5.33	0.00
Max	5.36	5.36	0.03
Avg	5.36	5.34	0.01

Gaging (5.28 / 5.03) (mm)			
04BJ	Initial	After thermal shock	Deltas
1	5.24	5.21	0.03
2	5.24	5.22	0.02
3	5.23	5.21	0.02
4	5.25	5.22	0.03
Min	5.23	5.21	0.02
Max	5.25	5.22	0.03
Avg	5.24	5.21	0.02

**Cable Pull Group
Group 1**

Gaging (5.28 min) (mm)			
04SP	Initial	After retention	Deltas
1	5.35	5.36	0.01
2	5.36	5.38	0.02
3	5.38	5.36	0.02
4	5.35	5.37	0.02
Min	5.35	5.36	0.01
Max	5.38	5.38	0.02
Avg	5.34	5.34	0.01

Gaging (5.28 / 5.03) (mm)			
04BJ	Initial	After retention	Deltas
1	5.24	5.26	0.02
2	5.26	5.29	0.03
3	5.26	5.27	0.01
4	5.25	5.28	0.03
Min	5.24	5.26	0.01
Max	5.26	5.29	0.03
Avg	5.25	5.28	0.02

Part description: RF280-04SP/ RF280-04RP/ RF280-04BJ

DATA SUMMARIES Continued**Group 2**

Gaging (5.28 min) (mm)			
04RP	Initial	After retention	Deltas
1	5.36	5.34	0.02
2	5.33	5.32	0.01
3	5.33	5.34	0.01
4	5.35	5.34	0.01
Min	5.33	5.32	0.01
Max	5.36	5.34	0.02
Avg	5.34	5.34	0.01

Gaging (5.28 / 5.03) (mm)			
04BJ	Initial	After retention	Deltas
1	5.20	5.27	0.07
2	5.23	5.32	0.09
3	5.26	5.31	0.05
4	5.25	5.32	0.07
Min	5.20	5.27	0.05
Max	5.26	5.32	0.09
Avg	5.23	5.31	0.07

Part description: RF280-04SP/ RF280-04RP/ RF280-04BJ

DATA SUMMARIES Continued**LLCR Durability:**

- 1) A total of 4 signal and 4 ground 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. $\leq +5.0$ 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 $+1000$ mOhms: -----Unstable
 - f. $>+1000$ mOhms: -----Open Failure

Group 1

LLCR Measurement Summaries by Pin Type			
Date	11/9/2022	11/14/2022	
Room Temp (Deg C)	22	22	
Rel Humidity (%)	50	50	
Technician	Peter Chen	Peter Chen	
mOhm values	Actual Initial	Delta 500 CYCLES	
Pin Type: Signal 1			
Average	1.97	0.11	
St. Dev.	0.04	0.02	
Min	1.93	0.1	
Max	2.02	0.14	
Summary Count	4	4	
Total Count	4	4	
Pin Type: GND 1			
Average	4.86	1.05	
St. Dev.	1.14	0.91	
Min	4.14	0.17	
Max	6.56	2.32	
Summary Count	4	4	
Total Count	4	4	

LLCR Delta Count by Category						
	Stable	Minor	Acceptable	Marginal	Unstable	Open
mOhms	≤ 5	>5 & ≤ 10	>10 & ≤ 15	>15 & ≤ 50	>50 & ≤ 1000	>1000
After 500 Cycles	8	0	0	0	0	0

Part description: RF280-04SP/ RF280-04RP/ RF280-04BJ

DATA SUMMARIES Continued**Group 2**

LLCR Measurement Summaries by Pin Type			
Date	11/9/2022	11/14/2022	
Room Temp (Deg C)	22	23	
Rel Humidity (%)	50	50	
Technician	Peter Chen	Peter Chen	
mOhm values	Actual Initial	Delta 500 CYCLES	
Pin Type: Signal 1			
Average	2.94	0.06	
St. Dev.	0.05	0.03	
Min	2.91	0.01	
Max	3.01	0.08	
Summary Count	4	4	
Total Count	4	4	
Pin Type: GND 1			
Average	4.81	0.75	
St. Dev.	0.30	0.34	
Min	4.42	0.3	
Max	5.12	1.12	
Summary Count	4	4	
Total Count	4	4	

LLCR Delta Count by Category						
	Stable	Minor	Acceptable	Marginal	Unstable	Open
mOhms	<=5	>5 & <=10	>10 & <=15	>15 & <=50	>50 & <=1000	>1000
After 500 Cycles	8	0	0	0	0	0

DATA SUMMARIES Continued**LLCR IR/DWV:**

- 1) A total of 4 signal and 4 ground 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. $\leq +5.0$ 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 $+1000$ mOhms: -----Unstable
 - f. $>+1000$ mOhms:-----Open Failure

LLCR Measurement Summaries by Pin Type			
Date	11/5/2022	11/29/2021	
Room Temp (Deg C)	22	22	
Rel Humidity (%)	50	50	
Technician	Peter Chen	Peter Chen	
mOhm values	Actual Initial	Delta Thermal Shock	
Pin Type: Signal 1			
Average	1.9725	0.11	
St. Dev.	0.1103	0.0572	
Min	1.81	0.04	
Max	2.05	0.17	
Summary Count	4	4	
Total Count	4	4	
Pin Type: GND 1			
Average	4.69	0.77	
St. Dev.	0.3371	0.6385	
Min	4.26	0.11	
Max	5.08	1.6	
Summary Count	4	4	
Total Count	4	4	

LLCR Delta Count by Category						
	Stable	Minor	Acceptable	Marginal	Unstable	Open
mOhms	≤ 5	$>5 \ \& \ \leq 10$	$>10 \ \& \ \leq 15$	$>15 \ \& \ \leq 50$	$>50 \ \& \ \leq 1000$	>1000
Thermal Shock	8	0	0	0	0	0

Part description: RF280-04SP/ RF280-04RP/ RF280-04BJ

DATA SUMMARIES Continued**LLCR Cable Pull:**

- 1) A total of 4 signal and 4 ground 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. $\leq +5.0$ 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 $+1000$ mOhms: -----Unstable
 - f. $>+1000$ mOhms: -----Open Failure

Group 1

LLCR Measurement Summaries by Pin Type			
Date	12/1/2022	12/1/2022	
Room Temp (Deg C)	22	22	
Rel Humidity (%)	50	50	
Technician	Peter Chen	Peter Chen	
mOhm values	Actual	Delta	
	Initial	40 lbf Retention	
Pin Type: Signal 1			
Average	1.95	0.14	
St. Dev.	0.06	0.12	
Min	1.86	0.04	
Max	2.00	0.31	
Summary Count	4	4	
Total Count	4	4	
Pin Type: GND 1			
Average	4.18	0.18	
St. Dev.	0.28	0.10	
Min	3.94	0.05	
Max	4.55	0.27	
Summary Count	4	4	
Total Count	4	4	

LLCR Delta Count by Category						
	Stable	Minor	Acceptable	Marginal	Unstable	Open
mOhms	≤ 5	>5 & ≤ 10	>10 & ≤ 15	>15 & ≤ 50	>50 & ≤ 1000	>1000
40 lbf Retention	8	0	0	0	0	0

Part description: RF280-04SP/ RF280-04RP/ RF280-04BJ

DATA SUMMARIES Continued**Group 2**

LLCR Measurement Summaries by Pin Type			
Date	12/1/2022	12/1/2022	
Room Temp (Deg C)	22	22	
Rel Humidity (%)	50	50	
Technician	Keney Chen	Keney Chen	
mOhm values	Actual	Delta	
	Initial	40 lbf Retention	
Pin Type: Signal 1			
Average	4.39	0.08	
St. Dev.	0.06	0.07	
Min	4.34	0.02	
Max	4.47	0.14	
Summary Count	4	4	
Total Count	4	4	
Pin Type: GND 1			
Average	5.67	0.45	
St. Dev.	0.37	0.30	
Min	5.37	0.13	
Max	6.12	0.85	
Summary Count	4	4	
Total Count	4	4	

LLCR Delta Count by Category						
	Stable	Minor	Acceptable	Marginal	Unstable	Open
mOhms	<=5	>5 & <=10	>10 & <=15	>15 & <=50	>50 & <=1000	>1000
40 lbf Retention	8	0	0	0	0	0

EQUIPMENT AND CALIBRATION SCHEDULES**Equipment #:** MO-11**Description:** Switch/Multimeter**Manufacturer:** Keithley**Model:** 3706**Serial #:** 120169**Accuracy:** See Manual

... Last Cal: 09/11/2022, Next Cal: 09/11/2023

Equipment #: TSC-01**Description:** Vertical Thermal Shock Chamber**Manufacturer:** Cincinnati Sub Zero**Model:** VTS-3-6-6-SC/AC**Serial #:** 10-VT14993**Accuracy:** See Manual

... Last Cal: 06/30/2022, Next Cal: 06/30/2023

Equipment #: HPT-01**Description:** Hipot Safety Tester**Manufacturer:** Vitrek**Model:** V73**Serial #:** 019808**Accuracy:**

... Last Cal: 05/15/2022, Next Cal: 05/15/2023