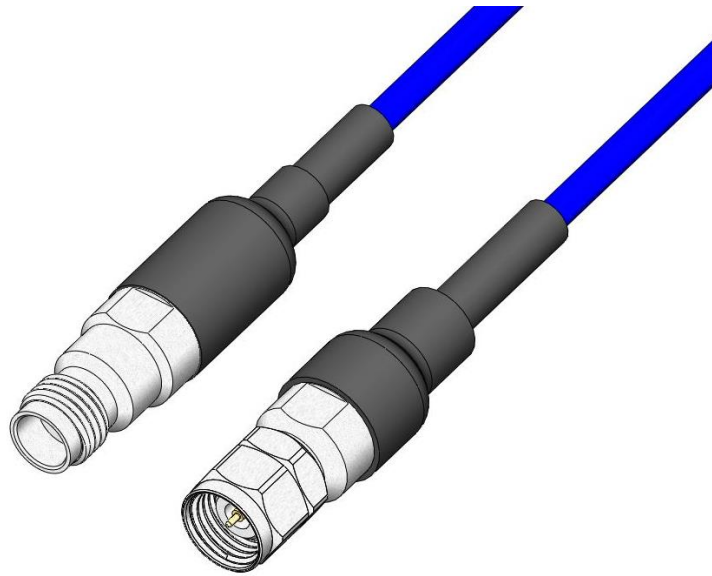




Project Number: Design Qualification Test Report	Tracking Code: 2377163_Report_Rev_1
Requested by: Alvin Wang	Date: 6/16/2020
Part #: RF085-24SJ-24SJ-0152/RF085-24SP-24SP-0152	Tech: Tony Wagoner
Part description: RF085/ RF085	Qty to test: 20
Test Start: 05/10/2020	Test Completed: 05/30/2020



DESIGN QUALIFICATION TEST REPORT

RF085 / RF085

RF085-24SJ-24SJ-0152/RF085-24SP-24SP-0152

Tracking Code: 2377163_Report_Rev_1	Part #: RF085-24SJ-24SJ-0152/RF085-24SP-24SP-0152
Part description: RF085-24SJ / RF085-24SP	

REVISION HISTORY

DATA	REV.NUM.	DESCRIPTION	ENG
6/11/2020	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.

All contents contained herein are the property of Samtec. No portion of this report, in part or in full shall be reproduced without prior written approval of Samtec.

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) Samtec Test PCBs used: PCB-103219-TST

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

RF085-24SJ-505050-0152

RF085-24SP-505050-0152

4 Assemblies

Step	Description
1.	Length & Mass
2.	Interface Gaging
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 8 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

(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

RF085-24SJ-505050-1000

RF085-24SP-505050-1000

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 (Green) on open ends.
 Plug version: RF085-24SJ-24SJ-1000 (4 PCS)
 Jack version: RF085-24SP-24SP-1000 (4 PCS)*

Step	Description
1.	Length & Mass
2.	Interface Gaging
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

(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) 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 (-65°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

FLOWCHARTS Continued**Cable Pull**Group 1

RF085-24SJ-505050-0152

2 Assemblies

0 Degrees

Step Description

1. Cable Retention (2) • Non Standard
Note: Pull-to-destruct.

Group 2

RF085-24SP-505050-0152

2 Assemblies

0 Degrees

Step Description

1. Cable Retention (2) • Non Standard
Note: Pull-to-destruct.

Group 3

RF085-24SJ-505050-0152

RF085-24SP-505050-0152

4 Assemblies

0 Degrees

Step Description

1. Length & Mass
2. Interface Gaging
3. LLCR (3) • Non Standard
Note: Signal and ground.
4. Cable Retention (1) • Non Standard
Note: Apply 10 pounds (4.6 kg) for Cable Retention test.
5. LLCR (3) • Non Standard
Note: Signal and ground.
6. Interface Gaging

(1) Cable Retention = Other

Apply 15 pounds (6.8kg) for Cable Retention test.
MIL-PRF-30192, 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 (-65°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.

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.

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. $\leq +5.0$ 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

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

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**
 - SJ**
 - **Min**-----46.57 lbs
 - **Max** -----47.12 lbs
 - SP**
 - **Min**-----36.85 lbs
 - **Max** -----48.37 lbs

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

DWV Mating/Unmating Durability Group

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

Pin to Ground

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

RESULTS Continued**Length & Mass****Mating/Unmating Durability Group****Length****SJ**

- Min----- 155.57 mm
- Max----- 155.57 mm

SP

- Min----- 155.57 mm
- Max----- 155.57 mm

Mass**SJ**

- Min----- 9.22 g
- Max----- 9.25 g

SP

- Min----- 9.36 g
- Max----- 9.40 g

IR/DWV Group**Length****SJ**

- Min-----1003.00 mm
- Max-----1006.47 mm

SP

- Min-----1003.30 mm
- Max-----1004.88 mm

Mass**SJ**

- Min-----25.83 g
- Max-----25.88 g

SP

- Min-----25.99 g
- Max-----26.04 g

Cable Pull Group**Length****SJ**

- Min----- 155.60 mm
- Max----- 155.60 mm

SP

- Min----- 155.60 mm
- Max----- 155.60 mm

Mass**SJ**

- Min----- 9.22 g
- Max----- 9.30 g

SP

- Min----- 9.37 g
- Max----- 9.44 g

RESULTS Continued**Interface Gaging****Mating/Unmating Durability Group****SJ****Initial**

- Min----- 0.02794 mm
- Max----- 0.04572 mm

After 500 cycles

- Min----- 0.03556 mm
- Max----- 0.05080 mm

SP**Initial**

- Min----- 0.03556 mm
- Max----- 0.04572 mm

After 500 cycles

- Min----- 0.03810 mm
- Max----- 0.06350 mm

IR/DWV Group**SJ****Initial**

- Min----- 0.03556 mm
- Max----- 0.05340 mm

After 500 cycles

- Min----- 0.04572 mm
- Max----- 0.05842 mm

SP**Initial**

- Min----- 0.03048 mm
- Max----- 0.04064 mm

After 500 cycles

- Min----- 0.03302 mm
- Max----- 0.04572 mm

Cable Pull Group**SJ****Initial**

- Min----- 0.03048 mm
- Max----- 0.04064 mm

After 500 cycles

- Min----- 0.04572 mm
- Max----- 0.05588 mm

SP**Initial**

- Min----- 0.03048 mm
- Max----- 0.03810 mm

After 500 cycles

- Min----- 0.03556 mm
- Max----- 0.04572 mm

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

- **Initial** -----388.8 mOhms Max
- **Thermal Shock**
 - <= +5.0 mOhms-----4 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

Ground Pin

- **Initial** ----- 47.95 mOhms Max
- **Thermal Shock**
 - <= +5.0 mOhms-----0 Points ----- Stable
 - +5.1 to +10.0 mOhms -----4 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)**Signal Pin**

- **Initial** ----- 58.81 mOhms Max
- **5 Ib Retention**
 - <= +5.0 mOhms-----4 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

Ground Pin

- **Initial** -----8.98 mOhms Max
- **5 Ib Retention**
 - <= +5.0 mOhms-----4 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)****Signal Pin**

- **Initial** ----- 57.84 mOhms Max
- **Durability, 500 Cycles**
 - **<= +5.0 mOhms**-----4 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

Ground Pin

- **Initial** ----- 8.47 mOhms Max
- **Durability, 500 Cycles**
 - **<= +5.0 mOhms**-----4 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

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

24SJ	Force (lbs)
Minimum	46.57
Maximum	47.12
Average	46.85

24SP	Force (lbs)
Minimum	36.85
Maximum	48.37
Average	42.61

INSULATION RESISTANCE (IR):

	Pin to Ground
	Mated
Minimum	RF085/RF085
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

Pin to Ground (500 VAC)	
Initial Test Voltage	Pass

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

24SJ	Length (mm)	Mass (g)
1	155.575	9.224
2	155.575	9.226
3	155.575	9.233
4	155.575	9.254
Min	155.575	9.224
Max	155.575	9.254
Avg	155.575	9.234

24SP	Length (mm)	Mass (g)
1	155.575	9.398
2	155.575	9.396
3	155.575	9.398
4	155.575	9.404
Min	155.575	9.396
Max	155.575	9.404
Avg	155.575	9.399

IR/DWV Group

24SJ	Length (mm)	Mass (g)
1	1003.300	25.887
2	1006.475	25.863
3	1006.475	25.832
4	1006.475	25.885
Min	1003.300	25.832
Max	1006.475	25.887
Avg	1005.681	25.866

24SP	Length (mm)	Mass (g)
1	1004.800	26.010
2	1003.300	26.046
3	1003.300	25.990
4	1003.300	26.014
Min	1003.300	25.990
Max	1004.887	26.046
Avg	1003.697	26.015

DATA SUMMARIES Continued**Cable Pull Group**

24SJ	Length (mm)	Mass (g)
13	155.6	9.252
14	155.6	9.291
15	155.6	9.300
16	155.6	9.223
Min	155.6	9.223
Max	155.6	9.300
Avg	155.6	9.267

24SP	Length (mm)	Mass (g)
13	155.6	9.442
14	155.6	9.403
15	155.6	9.373
16	155.6	9.430
Min	155.6	9.373
Max	155.6	9.442
Avg	155.6	9.412

INTERFACE GAGING**Mating/Unmating Durability Group**

Gaging (.08 / .000) (mm)			
24SJ	Initial	500 Cycles	Deltas
1	0.04572	0.03810	0.00762
2	0.02794	0.05080	0.02286
3	0.03810	0.05080	0.01270
4	0.03810	0.03556	0.00254
Min	0.02794	0.03556	0.02286
Max	0.04572	0.05080	0.00762
Avg	0.037465	0.043815	0.00635

Gaging (.08 / .000) (mm)			
24SP	Initial	500 Cycles	Deltas
1	0.03810	0.05080	0.01270
2	0.04064	0.06350	0.02286
3	0.04572	0.03810	0.00762
4	0.03556	0.05080	0.01524
Min	0.03556	0.03810	0.02286
Max	0.04572	0.06350	0.00762
Avg	0.040005	0.05080	0.01079

DATA SUMMARIES Continued**IR/DWV Group**

Gaging (.08 / .000) (mm)			
24SJ	Initial	500 Cycles	Deltas
1	0.04572	0.03810	0.00762
2	0.02794	0.05080	0.02286
3	0.03810	0.05080	0.01270
4	0.03810	0.03556	0.00254
Min	0.02794	0.03556	0.02286
Max	0.04572	0.05080	0.00762
Avg	0.037465	0.043815	0.00635

Gaging (.08 / .000) (mm)			
24SP	Initial	500 Cycles	Deltas
1	0.03810	0.05080	0.01270
2	0.04064	0.06350	0.02286
3	0.04572	0.03810	0.00762
4	0.03556	0.05080	0.01524
Min	0.03556	0.0381	0.02286
Max	0.04572	0.0635	0.00762
Avg	0.040005	0.0508	0.01079

Cable Pull Group

Gaging (.08 / .000) (mm)			
24SJ	Initial	500 Cycles	Deltas
1	0.04064	0.055880	0.015240
2	0.03302	0.045720	0.012700
3	0.03048	0.045720	0.015240
4	0.03556	0.048260	0.012700
Min	0.03048	0.04572	0.01270
Max	0.04064	0.05588	0.01524
Avg	0.03493	0.04890	0.01397

Gaging (.08 / .000) (mm)			
24SP	Initial	500 Cycles	Deltas
1	0.03810	0.03810	0.00000
2	0.03810	0.03810	0.00000
3	0.03048	0.04572	0.01524
4	0.03556	0.03556	0.00000
Min	0.03048	0.03556	0.00000
Max	0.03810	0.04572	0.01524
Avg	0.03556	0.03937	0.00381

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

		LLCR Measurement Summaries by Pin Type	
Date		5/21/2020	5/26/2020
Room Temp (Deg C)		23	23
Rel Humidity (%)		45	52
Technician		Tony Wagoner	Tony Wagoner
mOhm values		Actual	Delta
		Initial	after 500 Cycles
		Pin Type: Signal 1	
Average		57.64	0.21
St. Dev.		0.24	0.11
Min		57.3	0.1
Max		57.84	0.36
Summary Count		4	4
Total Count		4	4
		Pin Type: GND 1	
Average		8.05	0.36
St. Dev.		0.28	0.34
Min		7.89	0.03
Max		8.47	0.67
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
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	5/21/2020	5/27/2020	
Room Temp (Deg C)	23	22	
Rel Humidity (%)	41	56	
Technician	Tony Wagoner	Tony Wagoner	
mOhm values	Actual	Delta	
	Initial	Thermal Shock	
Pin Type: Signal 1			
Average	388.6	0.99	
St. Dev.	0.24	0.49	
Min	388.27	0.47	
Max	388.8	1.5	
Summary Count	4	4	
Total Count	4	4	
Pin Type: GND 1			
Average	45.89	7.24	
St. Dev.	1.68	1.27	
Min	44.14	6.35	
Max	47.95	9.09	
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	4	4	0	0	0	0

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

LLCR Measurement Summaries by Pin Type			
Date	5/21/2020	5/21/2020	
Room Temp (Deg C)	23	23	
Rel Humidity (%)	44	41	
Technician	Tony Wagoner	Tony Wagoner	
mOhm values	Actual	Delta	
	Initial	after 10 lb retention	
Pin Type: Signal 1			
Average	58.03	0.28	
St. Dev.	0.61	0.23	
Min	57.44	0	
Max	58.81	0.57	
Summary Count	4	4	
Total Count	4	4	
Pin Type: GND 1			
Average	8.27	0.12	
St. Dev.	0.48	0.1	
Min	7.97	0.03	
Max	8.98	0.26	
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
after 10 lb retention	8	0	0	0	0	0

EQUIPMENT AND CALIBRATION SCHEDULES**Equipment #:** TCT-04**Description:** Dillon Quantrol TC21 25-1000 mm/min series test stand**Manufacturer:** Dillon Quantrol**Model:** TC2 I series test stand**Serial #:** 04-1041-04**Accuracy:** Speed Accuracy: +/- 5% of indicated speed; Speed Accuracy: +/- 5% of indicated speed;
... Last Cal: 05/29/2020, Next Cal: 05/29/2021**Equipment #:** MO-11**Description:** Switch/Multimeter**Manufacturer:** Keithley**Model:** 3706**Serial #:** 120169**Accuracy:** See Manual

... Last Cal: 09/11/2019, Next Cal: 09/11/2020

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: 06/30/2019, Next Cal: 06/30/2020

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

... Last Cal: 05/15/2020, Next Cal: 05/15/2021