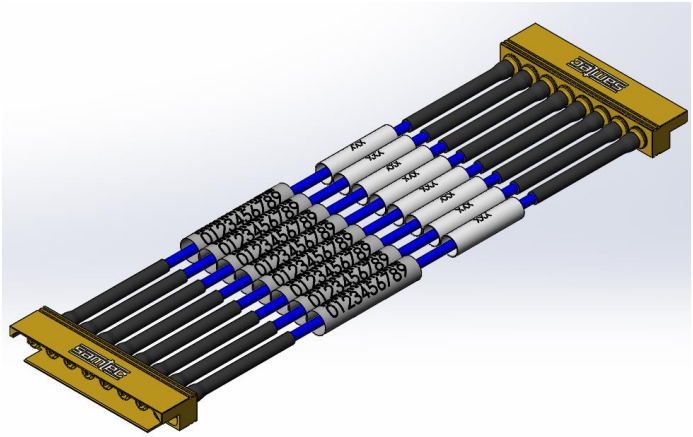
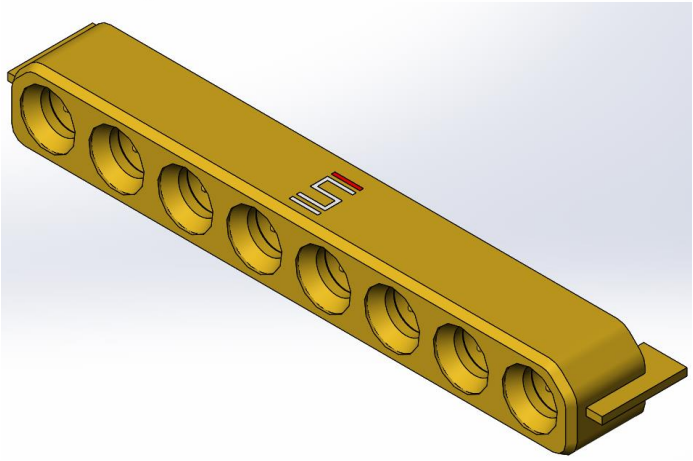
Project Number: Design Qualification Test Report	Tracking Code: CR-633304_Report_Rev_1
Requested by: Brian Luallen	Date: 10/26/2021
Part #: GC47-1-08-0152/ GPPC-PX-1-08-EG-ST-EM	
Part description: GC47/GPPC	Tech: Tony Wagoner
Test Start: 8/18/2021	Test Completed: 10/15/2021





DESIGN QUALIFICATION TEST REPORT

GC47/GPPC
GC47-1-08-0152/ GPPC-PX-1-08-EG-ST-EM

REVISION HISTORY

DATA	REV.NUM.	DESCRIPTION	ENG
10/26/2021	**1**	**Initial Issue**	**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, 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 and DWV/IR testing were cleaned according to CO-SC-WI-3029.
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 and DWV/IR 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-110972-TST

FLOWCHARTS

Mating/Unmating/Durability

Group 1
RF047-A-GC47-505050-0152
GPPC-PF-1-08-EG-ST-EM
5 Assemblies
1 POS. FD. WITH CABLES
Note: USE 1 MATING PART. USE 1 PORT PER MUD ASSEMBLY. (HAS 8 PORTS AVAILABLE.)

Step	Description
1.	Interface Gaging
2.	LLCR (1) - Non Standard *Note: Signal and ground.*
3.	Mating/Unmating Force (2) - Non Standard
4.	Cycles Quantity = 50 Cycles
5.	Mating/Unmating Force (2) - Non Standard
6.	Cycles Quantity = 50 Cycles
7.	Mating/Unmating Force (2) - Non Standard
8.	LLCR (1) - Non Standard Max Delta = 15 mOhm *Note: Signal and ground.*
9.	Interface Gaging

Group 2
SK-14925
GPPC-PF-1-08-EG-ST-EM
1 Assemblies
8 POS. FD. NO CABLES

Step	Description
1.	Mating/Unmating Force (2) - Non Standard
2.	Cycles Quantity = 50 Cycles
3.	Mating/Unmating Force (2) - Non Standard
4.	Cycles Quantity = 50 Cycles
5.	Mating/Unmating Force (2) - Non Standard

Group 3
PRFM0-J-C-EE-047A-SD-1
GPPC-PS-1-08-EG-ST-EM
5 Assemblies
1 POS. SB. NO CABLES
Note: USE 1 MATING PART. USE 1 PORT PER MUD ASSEMBLY. (HAS 8 PORTS AVAILABLE.)

Step	Description
1.	Mating/Unmating Force (3) - Non Standard
2.	Cycles Quantity = 250 Cycles
3.	Mating/Unmating Force (3) - Non Standard
4.	Cycles Quantity = 250 Cycles
5.	Mating/Unmating Force (3) - Non Standard

Group 4
SK-14925
GPPC-PS-1-08-EG-ST-EM
1 Assemblies
8 POS. SB. NO CABLES

Step	Description
1.	Mating/Unmating Force (3) - Non Standard
2.	Cycles Quantity = 250 Cycles
3.	Mating/Unmating Force (3) - Non Standard
4.	Cycles Quantity = 250 Cycles
5.	Mating/Unmating Force (3) - Non Standard

(1) LLCR = EIA-364-23
Open Circuit Voltage = 20 mV Max
Test Current = 100 mA Max

(2) Mating/Unmating Force = Other
DSCC 10019, PER MIL-STD-348A, FULL DETENT

(3) Mating/Unmating Force = Other
DSCC 10019, PER MIL-STD-348A, SMOOTH BORE

FLOWCHARTS Continued

IR/DWV

Pin-to-Ground

Group 1

RF047-A-GC47-505050-0152

5 Assemblies

1 POS.

Note: USE 1 MATING PART. USE 1 PORT PER MUD ASSEMBLY. (HAS 8 PORTS AVAILABLE.)

Step	Description
1.	IR (2) - Non Standard
2.	DWV at Test Voltage(1) - Non Standard Test Voltage = 325 VAC
3.	LLCR (3) - Non Standard *Note: Signal and ground.*
4.	Thermal Shock (4) - Non Standard
5.	IR (2) - Non Standard
6.	DWV at Test Voltage(1) - Non Standard Test Voltage = 325 VAC
7.	LLCR (3) - Non Standard Max Delta = 15 mOhm *Note: Signal and ground.*

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(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 = 325V DC, 2 Minutes Max
DSCC-10019 / MIL-PRF-39012, Paragraph 4.6.8 per MIL-STD-202-302

(3) LLCR = EIA-364-23
Open Circuit Voltage = 20 mV Max
Test Current = 100 mA Max

(4) Thermal Shock = Other
DSCC-10019 / MIL-STD-202-107
TEST COND. B PER DSCC-10019. EXCEPTION: HIGH TEMP. TO BE +165C°.

FLOWCHARTS Continued

Mechanical Shock/Random Vibration/LLCR

Group 1
GC47-1-08-0152
GPPC-PF-1-08-EG-ST-EM
2 Assemblies
8 POS.

Step	Description
1.	LLCR (1)
2.	Mechanical Shock (2) - Non Standard
3.	Random Vibration (3) - Non Standard
4.	LLCR (1) Max Delta = 15 mOhm

(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)

Mechanical Shock/Random Vibration/Event Detection

Group 1
GC47-1-08-0152
GPPC-PF-1-08-EG-ST-EM
2 Assemblies
8 POS

Step	Description
1.	Nanosecond Event Detection (Mechanical Shock) (1) - Non Standard
2.	Nanosecond Event Detection (Random Vibration) (2)

(1) Nanosecond Event Detection (Mechanical Shock) = Other
Use EIA-364-87 for Nanosecond Event Detection:
Test Condition = F (50 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)
Use EIA-364-87 for Nanosecond Event Detection:
Test Condition = F (50 nanoseconds at 10 ohms)
Use EIA-364-28 for Random Vibration:
Condition = VB (7.56 gRMS Average, 2 Hours/Axis)

FLOWCHARTS Continued

Cable Pull

Group 1 RF047-A-GC47-GC47-0152 5 Assemblies 1 POS. NO HOUSING.		Group 2 RF047-A-GC47-505050-0152 5 Assemblies 1 POS. NO HOUSING.	
Step	**Description**	**Step**	**Description**
1.	Cable Retention (2) - Non Standard *Note: Pull-to-destruct. Record data.*	1.	Interface Gaging
		2.	LLCR (3) - Non Standard *Note: Signal and ground.*
		3.	Cable Retention (1) - Non Standard
		4.	LLCR (3) - Non Standard MAX DELTA = 15 mOhm *Note: Signal and ground.*
		5.	Interface Gaging

(1) Cable Retention = Other
Apply 5 pounds (2.3 kg) for Cable Retention test.
MIL-PRF-39012, Paragraph 4.6.21

(2) Cable Retention = Other
Pull-to-destruct.
MIL-PRF-39012, Paragraph 4.6.21

(3) LLCR = EIA-364-23
Open Circuit Voltage = 20 mV Max
Test Current = 100 mA Max

Pull/Shear

Group 1 SK-14884 5 Points 1 PORT. IN HOUSING. *Note: PULL TO DESTRUCT, RECORD FORCE. TESTING RETAINING RING STRENGTH. (PULL ON SINGLE CABLE. SOLDER JOINT MAY FAIL FIRST)*		Group 2 GC47-1-08-0152 2 Assemblies 8 PORT. IN HOUSING. *Note: PULL TO DESTRUCT, RECORD FORCE. TESTING RETAINING RING STRENGTH. (PULL ON ALL CABLES TOGETHER. SOLDER JOINT MAY FAIL FIRST)*	
Step	**Description**	**Step**	**Description**
1.	Connector Pull *Note: PULL TO DESTRUCT. RECORD FORCE. TESTING RETAINING RING STRENGTH (SOLDER JOINT MAY FAIL FIRST.)*	1.	Connector Pull *Note: PULL TO DESTRUCT. RECORD FORCE. TESTING RETAINING RING STRENGTH (SOLDER JOINT MAY FAIL FIRST.)*

ATTRIBUTE DEFINITIONS

The following is a brief, simplified description of attributes.

THERMAL SHOCK:

1) MIL-STD-202-107, *Thermal Shock (Temperature Cycling) Test Procedure for Electrical Connectors.*
2) Test Condition B per DSCC 10019. Exception – high temperature to be +165° C. Visual inspection for damage.
3) All test samples are pre-conditioned at ambient.
4) 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 50 nanosecond events

MATING/UNMATING:

1) Reference document: DSCC 10019, PER MIL-STD-348A.
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.

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 +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.
5000 megohms min per DSCC 10019 and MIL-STD-202-302. MIL-PRF-39012, Para 4.6.8.

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) Breakdown:
    Record breakdown voltage. (Data only). MIL-PRF-39012, para 4.6.14
2) Test Voltage
    a. 325 Vrms min. at sea level per DSCC 10019.
    b. DWV test voltage is equal to 75% of the lowest breakdown voltage.
    c. Test voltage applied for 60 seconds. Per DSCC-10019 and MIL-PRF-39012, PARA 4.6.14.

CABLE Pull:

1) Apply 5 pounds (2.3 kg) for cable retention test.
2) Pull to destruct.
3) MIL-PRF-39012, paragraph. 4.6.21.

PULL/SHEAR:

Pull to destruct, record force testing retaining ring strength.

RESULTS

Mating/Unmating Forces

Mating/Unmating Durability Group

Group1 RF047-A-GC47-505050-0152/GPPC-PF-1-08-EG-ST-EM (1 POS. FD. WITH CABLES)

- **Initial**
  - **Mating**
    - **Min ---------- 0.89 Lbs**
    - **Max---------- 1.07 Lbs**
  - **Unmating**
    - **Min ---------- 0.94 Lbs**
    - **Max---------- 1.05 Lbs**
- **After 50 Cycles**
  - **Mating**
    - **Min ---------- 1.08 Lbs**
    - **Max---------- 1.50 Lbs**
  - **Unmating**
    - **Min ---------- 1.05 Lbs**
    - **Max---------- 1.36 Lbs**
- **After 100 Cycles**
  - **Mating**
    - **Min ---------- 1.23 Lbs**
    - **Max---------- 1.46 Lbs**
  - **Unmating**
    - **Min ---------- 1.16 Lbs**
    - **Max---------- 1.28 Lbs**

Group2 SK-14925/GPPC-PF-1-08-EG-ST-EM (8 POS. FD. NO CABLES)

- **Initial**
  - **Mating ---------- 7.51 Lbs**
  - **Unmating---------- 7.57 Lbs**
- **After 50 Cycles**
  - **Mating ----------16.03 Lbs**
  - **Unmating----------13.55 Lbs**
- **After 100 Cycles**
  - **Mating ----------15.52 Lbs**
  - **Unmating----------12.65 Lbs**

RESULTS Continued

Group3 PRFM0-J-C-EE-047A-SD-1/GPPC-PS-1-08-EG-ST-EM (1 POS. SB. NO CABLES)

- **Initial**
  - **Mating**
    - **Min ---------- 0.45 Lbs**
    - **Max---------- 0.98 Lbs**
  - **Unmating**
    - **Min ---------- 0.35 Lbs**
    - **Max---------- 0.63 Lbs**
- **After 250 Cycles**
  - **Mating**
    - **Min ---------- 0.62 Lbs**
    - **Max---------- 1.01 Lbs**
  - **Unmating**
    - **Min ---------- 0.55 Lbs**
    - **Max---------- 0.95 Lbs**
- **After 500 Cycles**
  - **Mating**
    - **Min ---------- 0.69 Lbs**
    - **Max---------- 1.00 Lbs**
  - **Unmating**
    - **Min ---------- 0.58 Lbs**
    - **Max---------- 0.88 Lbs**

Group4 SK-14925/GPPC-PS-1-08-EG-ST-EM (8 POS. SB. NO CABLES)

- **Initial**
  - **Mating ---------- 4.66 Lbs**
  - **Unmating---------- 4.19 Lbs**
- **After 250 Cycles**
  - **Mating ----------10.13 Lbs**
  - **Unmating---------- 6.92 Lbs**
- **After 500 Cycles**
  - **Mating ----------10.68 Lbs**
  - **Unmating---------- 6.88 Lbs**

Cable Pull force

Group1 Pull to destruct

- **Min----------14.29 lbs**
- **Max ----------15.53 lbs**

Pull/Shear:

Group1 SK-14884 (1 PORT. IN HOUSING)

- **Min----------13.86 lbs**
- **Max ----------15.99 lbs**

Group2 GC47-1-08-0152 (8 PORT. IN HOUSING)

- **Min---------- 100.70 lbs**
- **Max ---------- 104.10 lbs**

RESULTS Continued

Insulation Resistance minimums, IR

Pin to Ground

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

Dielectric Withstanding Voltage minimums, DWV

- **Minimums**
  - **Test Voltage ---------- 325 VAC**

Pin to Ground

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

Interface Gaging

Mating/Unmating Durability Group

Group 1 RF047-A-GC47-505050-0152/GPPC-PF-1-08-EG-ST-EM (1 POS. FD. WITH CABLES)

RF047-A

Initial

- **Min ---------- 0.04020 mm**
- **Max ---------- 0.05310 mm**

After 100 Cycles

- **Min ---------- 0.03740 mm**
- **Max ---------- 0.05340 mm**

GPPC

Initial

- **Min ---------- 0.00086 mm**
- **Max ---------- 0.00233 mm**

After 100 Cycles

- **Min ---------- 0.00080 mm**
- **Max ---------- 0.00212 mm**

Cable Pull Group

Group 2 RF047-A-GC47-505050-0152

Initial

- **Min ---------- 0.03160 mm**
- **Max ---------- 0.04820 mm**

After 5 lb Retention

- **Min ---------- 0.03130 mm**
- **Max ---------- 0.04740 mm**

RESULTS Continued

LLCR IR&DWV (5 signal and 5 ground LLCR test points)

Signal pin

- **Initial ---------- 45.58 mOhms Max**
- **Thermal Shock**
  - **<= +5.0 mOhms----------5 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 ---------- 15.24 mOhms Max**
- **Thermal Shock**
  - **<= +5.0 mOhms----------5 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 (5 signal and 5 ground LLCR test points)

Signal pin

- **Initial ---------- 46.43 mOhms Max**
- **5 lb Retention**
  - **<= +5.0 mOhms----------5 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 ---------- 16.57 mOhms Max**
- **5 lb Retention**
  - **<= +5.0 mOhms----------5 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 Mating-Unmating Durability (5 signal and 1 ground LLCR test points)

Signal pin

- **Initial ---------- 47.44 mOhms Max**
- **Durability 100 cycles**
  - **<= +5.0 mOhms----------5 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 ----------2.11 mOhms Max**
- **Durability 100 cycles**
  - **<= +5.0 mOhms----------1 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 Shock & Vibration (16 signal and 2 ground LLCR test points)

Signal pin

- **Initial ---------- 89.35 mOhms Max**
- **Shock &Vibration**
  - **<= +5.0 mOhms---------- 16 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 ----------2.24 mOhms Max**
- **Shock &Vibration**
  - **<= +5.0 mOhms----------2 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**

Mechanical Shock & Random Vibration:

- **Shock**
  - **No Damage---------- ---------- Pass**
  - **50 Nanoseconds ---------- ---------- Pass**
- **Vibration**
  - **No Damage---------- ---------- Pass**
  - **50 Nanoseconds ---------- ---------- Pass**

DATA SUMMARIES

MATING/UNMATING:

Mating/Unmating Durability Group

Group1 RF047-A-GC47-505050-0152/GPPC-PF-1-08-EG-ST-EM (1 POS. FD. WITH CABLES)

	Initial				50 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	3.96	0.89	4.18	0.94	4.80	1.08	4.67	1.05
Maximum	4.76	1.07	4.67	1.05	6.67	1.50	6.05	1.36
Average	4.31	**0.97**	4.44	**1.00**	5.74	**1.29**	5.17	**1.16**
St Dev	0.33	0.07	0.19	0.04	0.66	0.15	0.54	0.12
Count	5	5	5	5	5	5	5	5

	100 Cycles			
	Mating		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	5.47	1.23	5.16	1.16
Maximum	6.49	1.46	5.69	1.28
Average	6.13	**1.38**	5.38	**1.21**
St Dev	0.39	0.09	0.22	0.05
Count	5	5	5	5

Group2 SK-14925/GPPC-PF-1-08-EG-ST-EM (8 POS. FD. NO CABLES)

Initial		**50 Cycles**		**100 Cycles**	
Mating	Unmating	Mating	Unmating	Mating	Unmating
7.51	7.57	16.03	13.55	15.52	12.65

Group3 PRFM0-J-C-EE-047A-SD-1/GPPC-PS-1-08-EG-ST-EM (1 POS. SB. NO CABLES)

	Initial				250 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	2.00	0.45	1.56	0.35	2.76	0.62	2.45	0.55
Maximum	4.36	0.98	2.80	0.63	4.49	1.01	4.23	0.95
Average	3.06	**0.69**	2.04	**0.46**	3.68	**0.83**	3.34	**0.75**
St Dev	0.85	0.19	0.65	0.15	0.65	0.15	0.68	0.15
Count	5	5	5	5	5	5	5	5

	500 Cycles			
	Mating		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	3.07	0.69	2.58	0.58
Maximum	4.45	1.00	3.91	0.88
Average	4.04	**0.91**	3.35	**0.75**
St Dev	0.59	0.13	0.58	0.13
Count	5	5	5	5

DATA SUMMARIES Continued

Group4 SK-14925/GPPC-PS-1-08-EG-ST-EM (8 POS. SB. NO CABLES)

Initial		250 Cycles		500 Cycles	
Mating	Unmating	Mating	Unmating	Mating	Unmating
4.66	4.19	10.13	6.92	10.68	6.88

INSULATION RESISTANCE (IR)& DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Initial

	Pin to Ground	
	RF047-A	
	IR	DWV
Minimum	45000	325
Maximum	45000	325
Average	45000	325

After Thermal

	Pin to Ground	
	RF047-A	
	IR	DWV
Minimum	45000	325
Maximum	45000	325
Average	45000	325

Cable Pull Force:

Group1 Pull to destruct

	Force (lbs)
Minimum	**14.29**
Maximum	15.53
Average	14.93

Pull/Shear:

Group1 SK-14884 (1 PORT. IN HOUSING)

	Force (lbs)
Minimum	**13.86**
Maximum	15.99
Average	15.52

Group2 GC47-1-08-0152 (8 PORT. IN HOUSING)

	Force (lbs)
Minimum	**100.70**
Maximum	104.10
Average	102.40

DATA SUMMARIES Continued

INTERFACE GAGING

Mating/Unmating Durability Group

Interface Gaging - RF047-A (0.05/0.00)			
Sample 1	Initial	100 Cycles	Delta
1	0.04090	0.04350	0.00260
2	0.04020	0.05190	0.01170
3	0.05310	0.05340	0.00030
4	0.04710	0.05130	0.00420
5	0.04180	0.03740	-0.00440

Interface Gaging - GPPC (.002+/-.002)			
Sample 2	Initial	100 Cycles	Delta
1	0.00155	0.00147	-0.00008
2	0.00197	0.00212	0.00015
3	0.00086	0.00080	-0.00006
4	0.00207	0.00194	-0.00013
5	0.00233	0.00206	-0.00027

Cable Pull Group

Interface Gaging - RF047-A (0.05/0.00)			
Sample 1	Initial	5 lb Retention	Delta
1	0.0393	0.03920	0.00010
2	0.0417	0.04130	0.00040
3	0.0465	0.04360	0.00290
4	0.0316	0.03130	0.00030
5	0.0482	0.04740	0.00080

DATA SUMMARIES Continued

LLCR Mating-Unmating Durability:

1) A total of 5 signal and 1 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. <= +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	2021/8/24	2021/8/25	2021/8/24	2021/8/25
Room Temp (Deg C)	22	23	22	23
Rel Humidity (%)	48	52	48	52
Technician	Tony Wagoner	Tony Wagoner	Tony Wagoner	Tony Wagoner
mOhm values	Actual **Initial**	**Delta 100 Cycles**	Actual **Initial**	**Delta 100 Cycles**
	Pin Type: Signal 1		**Pin Type: Ground 1**	
Average	46.98	0.34	2.11	0.06
St. Dev.	0.36	0.18	0	0
Min	46.47	0.14	2.11	0.06
Max	47.44	0.59	2.11	0.06
Summary Count	5	5	1	1
Total Count	5	5	1	1

LLCR Delta Count by Category						
	Stable	**Minor**	**Acceptable**	**Marginal**	**Unstable**	**Open**
mOhms	**<=5**	**>5 & <=10**	**>10 & <=15**	**>15 & <=50**	**>50 & <=1000**	**>1000**
100 Cycles	**6**	**0**	**0**	**0**	**0**	**0**

DATA SUMMARIES Continued

LLCR IR/DWV:

1) A total of 5 signal and 5 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. <= +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	2021/8/18	2021/8/19
Room Temp (Deg C)	22	22
Rel Humidity (%)	52	50
Technician	Tony Wagoner	Tony Wagoner
mOhm values	Actual **Initial**	**Delta** **Ther Shock**
	Pin Type: Signal 1	
Average	44.68	0.55
St. Dev.	0.76	0.45
Min	43.77	0.12
Max	45.58	1.24
Summary Count	5	5
Total Count	5	5
	Pin Type: GND 1	
Average	14.94	0.44
St. Dev.	0.20	0.26
Min	14.74	0.24
Max	15.24	0.73
Summary Count	5	5
Total Count	5	5

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

DATA SUMMARIES Continued

LLCR Cable Pull:

1) A total of 5 signal and 5 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. <= +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	2021/8/24	2021/8/25		
Room Temp (Deg C)	22	22		
Rel Humidity (%)	48	51		
Technician	Tony Wagoner	Tony Wagoner		
mOhm values	Actual **Initial**	**Delta** **5lb Retention**		
	Pin Type: Signal 1			
Average	45.03	1		
St. Dev.	1.21	0.8		
Min	43.54	0.24		
Max	46.43	2.29		
Summary Count	5	5		
Total Count	5	5		
	Pin Type: GND 1			
Average	16.02	0.49		
St. Dev.	0.58	0.29		
Min	15.17	0.15		
Max	16.57	0.88		
Summary Count	5	5		
Total Count	5	5		

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

DATA SUMMARIES Continued

LLCR Shock &Vibration:

1). A total of 16 signal and 2 ground points were measured.
2). EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets.*
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

LLCR Measurement Summaries by Pin Type		
Date	2021/10/1	2021/10/15
Room Temp (Deg C)	22	22
Rel Humidity (%)	50	51
Technician	Tony Wagoner	Tony Wagoner
mOhm values	Actual	**Delta**
	Initial	**Shock-Vib**
Pin Type: Signal 1		
Average	88.54	0.35
St. Dev.	0.54	0.29
Min	87.82	0
Max	89.35	1.06
Summary Count	16	16
Total Count	16	16
Pin Type: GND 1		
Average	2.13	0.35
St. Dev.	0.15	0.01
Min	2.03	0.35
Max	2.24	0.36
Summary Count	2	2
Total Count	2	2

LLCR Delta Count by Category						
	Stable	**Minor**	**Acceptable**	**Marginal**	**Unstable**	**Open**
mOhms	**<=5**	**>5 & <=10**	**>10 & <=15**	**>15 & <=50**	**>50 & <=1000**	**>1000**
Shock-Vib	**18**	**0**	**0**	**0**	**0**	**0**

Nanosecond Event Detection:

Shock and Vibration Event Detection Summary	
Contacts tested	60
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 #: 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: 05/29/2021, Next Cal: 05/29/2022

Equipment #: MO-11
Description: Switch/Multimeter
Manufacturer: Keithley
Model: 3706
Serial #: 120169
Accuracy: See Manual
… Last Cal: 09/11/2021, Next Cal: 09/11/2022

Equipment #: THC-05
Description: Temperature/Humidity Chamber (Chamber Room)
Manufacturer: Thermotron
Model: SM-8-3800
Serial #: 05 23 00 02
Accuracy: See Manual
… Last Cal: 11/14/2020, Next Cal: 11/14/2021

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: 06/30/2021, Next Cal: 06/30/2022

Equipment #: HPT-01
Description: Hipot Safety Tester
Manufacturer: Vitrek
Model: V73
Serial #: 019808
Accuracy:
… Last Cal: 05/15/2021, Next Cal: 05/15/2022

Equipment #: PS-02
Description: Power Supply
Manufacturer: Hewlett-Packer
Model: 6033A
Serial #: N/A
Accuracy: See Manual
… Last Cal: NOT CALIBRATED

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: 04/22/2021, Next Cal: 04/22/2022

Equipment #: ACLM-01
Description: Accelerometer
Manufacturer: PCB Piezotronics
Model: 352C03
Serial #: 115819
Accuracy: See Manual
… Last Cal: 07/18/2021, Next Cal: 07/18/2022

Equipment #: ED-03
Description: Event Detector
Manufacturer: Analysis Tech
Model: 32EHD
Serial #: 1100604
Accuracy: See Manual
… Last Cal: 10/31/2020, Next Cal: 10/31/2021

Equipment #: MO-04
Description: Multimeter /Data Acquisition System
Manufacturer: Keithley
Model: 2700
Serial #: 0798688
Accuracy: See Manual
… Last Cal: 09/11/2021, Next Cal: 09/11/2022