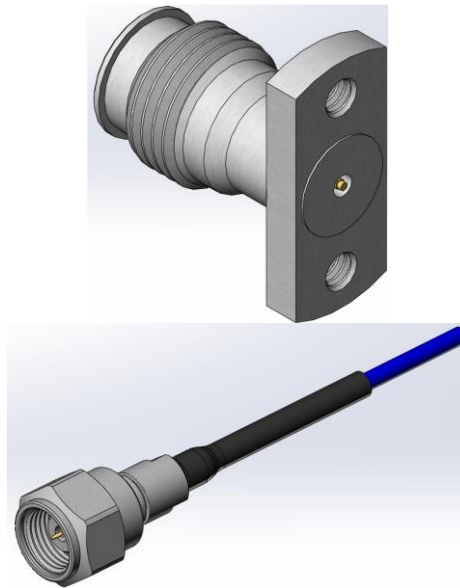




Project Number: Design Qualification Test Report	Tracking Code: 3043354_Report_Rev_1
Requested by: Joe Huang	Date: 11/18/2021
Part #: 135-J-P-VP-ST-CM-X/PRF13-P-C-VP-047A-SS-5050	
Part description: 135-J-P/RF047-A	Tech: Kason He
Test Start: 10/28/2021	Test Completed: 11/12/2021



DESIGN QUALIFICATION TEST REPORT
135-J-P/RF047-A
135-J-P-VP-ST-CM-X//PRF13-P-C-VP-047A-SS-5050

Tracking Code: 3043354_Report_Rev_1	Part #: 135-J-P-VP-ST-CM-X/PRF13-P-C-VP-047A-SS-5050
Part description: 135-J-P/RF047-A	

REVISION HISTORY

DATA	REV.NUM.	DESCRIPTION	ENG
11/18/2021	1	Initial Issue	KH

CERTIFICATION

All instruments and measuring equipment were calibrated to National Institute for Standards and Technology (NIST) traceable standards according to 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) Parts not intended for testing LLCR and DWV/IR are visually inspected and cleaned if necessary.
- 4) Any additional preparation will be noted in the individual test sequences.

FLOWCHARTS

IR/DWV

Pin-to-Ground

Group 1

135-J-P-VP-ST-CM-1

PRF13-P-C-VP-0A7A-SS-5050

8 Assemblies

Note: Package label as suckout pass

Step	Description
1.	Interface Gaging <i>Note: Measure and record pin depth at interface reference plane using a drop gauge BEFORE mating to the mating part</i>
2.	IR (2) - Non Standard
3.	DWV at Test Voltage ⁽¹⁾ - Non Standard Test Voltage = 500 VAC
4.	LLCR (3) - Non Standard <i>Note: Signal and ground.</i>
5.	Interface Gaging <i>Note: Measure and record pin depth at interface reference plane using a drop gauge AFTER LLCR</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: Measure and record pin depth at interface reference plane using a drop gauge AFTER LLCR</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 = 500 Vdc, 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
Method A, 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

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.

LLCR:

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

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: MIL-PRF-39012, paragraph. 4.6.8 per MIL-STD-202-302.
 - 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 1000 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, paragraph. 4.6.14 per MIL-STD-202-301.
 - b. Test Conditions:
 - i. Between Adjacent Contacts or Signal-to-Ground
 - ii. Barometric Test Condition 1(Sea Level) Test voltage applied for 60 seconds.
 - 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).

RESULTS**Interface Gaging****C1 (0.002/0.00)****Initial**

- Min-----0.00000 inch
- Max -----0.00200 inch

After LLCR

- Min-----0.00000 inch
- Max -----0.00200 inch

After Thermal Shock

- Min-----0.00010 inch
- Max -----0.00120 inch

C2 (0.2795/0.2775)**Initial**

- Min-----0.27718 inch
- Max -----0.27918 inch

After Thermal Shock

- Min-----0.27760 inch
- Max -----0.27900 inch

C3 (0.004/0.0005)**Initial**

- Min-----0.00150 inch
- Max -----0.00350 inch

After Thermal Shock

- Min-----0.00010 inch
- Max -----0.00020 inch

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

RESULTS Continued**LLCR IR/DWV (8 ground and 8 signal LLCR test points)****Ground pin**

- **Initial** ----- 17.38 mOhms Max
- **After Thermal Shock**
 - **<= +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

Signal pin

- **Initial** ----- 47.36 mOhms Max
- **After Thermal Shock**
 - **<= +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

DATA SUMMARIES**INSULATION RESISTANCE (IR):**

	Pin to Ground
	Mated
Minimum	135-J/PRF13
Initial	45000
Thermal Shock	45000

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Voltage Rating Summary	
Minimum	135-J/PRF13
Test Voltage	500

Pin to Ground	
Initial Test Voltage	Pass
After Thermal Shock Test Voltage	Pass

INTERFACE GAGING

Interface Gaging (inch)							
135-J	Initial			After LLCR	After Ther Shock		
	C1 (0.002/0.00)	C2 (0.2795/0.2775)	C3 (0.004/0.0005)	C1	C1	C2	C3
1	0.0010	0.27860	0.0020	0.0020	0.0004	0.27856	0.0001
2	0.0000	0.27918	0.0015	0.0005	0.0004	0.27900	0.0001
3	0.0020	0.27842	0.0035	0.0000	0.0012	0.27760	0.0001
4	0.0010	0.27824	0.0030	0.0005	0.0002	0.27818	0.0002
5	0.0005	0.27718	0.0020	0.0010	0.0003	0.27834	0.0001
6	0.0000	0.27844	0.0020	0.0010	0.0001	0.27878	0.0001
7	0.0010	0.27830	0.0020	0.0010	0.0005	0.27828	0.0001
8	0.0010	0.27810	0.0020	0.0015	0.0002	0.27867	0.0002
Min	0.0000	0.27718	0.0015	0.0000	0.0001	0.27760	0.0001
Max	0.0020	0.27918	0.0035	0.0020	0.0012	0.27900	0.0002
Average	0.0008	0.27831	0.0023	0.0009	0.0004	0.27843	0.0001

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

- 1) A total of 8 signal and 8 ground points were measured.
- 2) MIL-PRF-39012, *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	11/2/2021	11/11/2021		
Room Temp (Deg C)	22	22		
Rel Humidity (%)	50	50		
Technician	Kason He	Kason He		
mOhm values	Actual	Delta		
	Initial	Thermal Shock		
Pin Type: Signal 1				
Average	46.82	1.055		
St. Dev.	0.3621	0.7986		
Min	46.27	0.19		
Max	47.36	2.48		
Summary Count	8	8		
Total Count	8	8		
Pin Type: GND 1				
Average	16.8525	1.6225		
St. Dev.	0.3371	0.8203		
Min	16.55	0.17		
Max	17.38	2.75		
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
After Thermal Shock	16	0	0	0	0	0

EQUIPMENT AND CALIBRATION SCHEDULES**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: 04/15/2021, Next Cal: 04/14/2022

Equipment #: DG-HPT-01**Description:** Hipot Safety Tester**Manufacturer:** Vitrek**Model:** V73**Serial #:** 025866**Accuracy:**

... Last Cal: 04/15/2021, Next Cal: 04/14/2022

Equipment #: HZ-MO-05**Description:** Micro-ohmmeter**Manufacturer:** Keithley**Model:** 3706**Serial #:** 1285188**Accuracy:** Last Cal: 12/17/2020, Next Cal: 12/16/2021