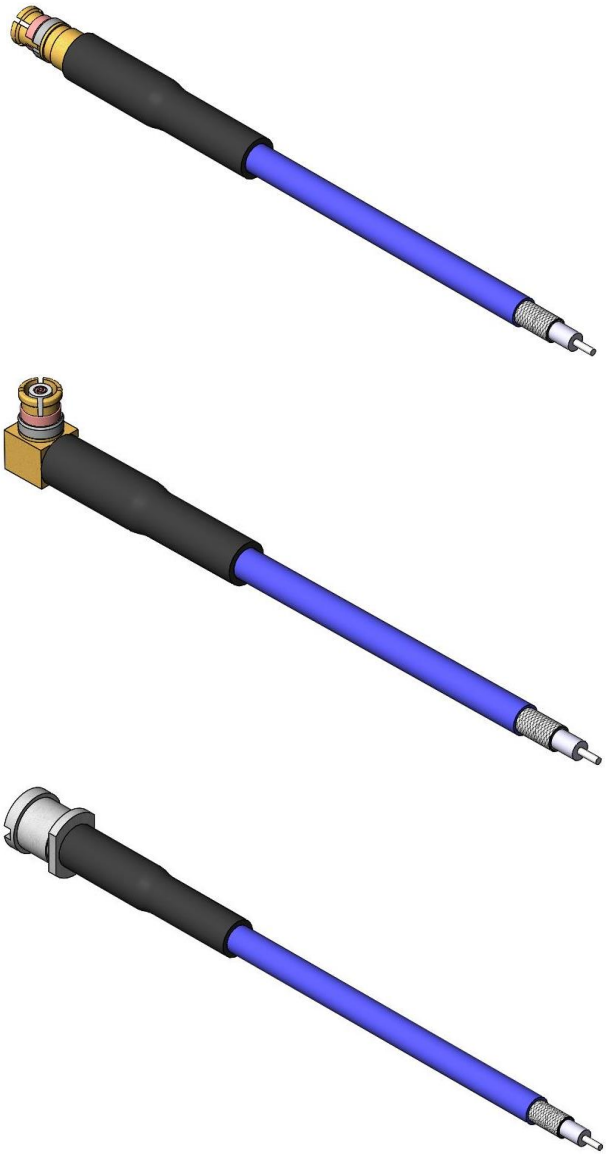
Project Number: Design Qualification Test Report	Tracking Code: CR-948918_Report_Rev_1
Requested by: Jenny Chou	Date: 8/23/2023
Part #: RF086-00SJ-505050-0152/RF086-00MJ-505050-0152/RF086-00BF-505050-0152	
Part description: RF086 SMP CABLE ASSEMBLY	Tech: Kason He
Test Start: 7/19/2023	Test Completed: 7/21/2023



DESIGN QUALIFICATION TEST REPORT

RF086 SMP CABLE ASSEMBLY
RF086-00SJ-505050-0152/RF086-00MJ-505050-0152/RF086-00BF-505050-0152

REVISION HISTORY

DATA	REV.NUM.	DESCRIPTION	ENG
8/23/2023	**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: 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 are visually inspected and cleaned if necessary.
4) Any additional preparation will be noted in the individual test sequences.

FLOWCHARTS

Cable Pull

Group 1
RF086-00SJ-505050-0152
2 Assemblies
0 Degrees

Step	Description
1.	Cable Retention (2) - Non Standard *Note: Pull-to-destruct.*

Group 2
RF086-00MJ-505050-0152
2 Assemblies
0 Degrees

Step	Description
1.	Cable Retention (2) - Non Standard *Note: Pull-to-destruct.*

Group 3
RF086-00SJ-505050-0152
RF086-00BF-505050-0152
4 Assemblies
0 Degrees

Step	Description
1.	Interface Gaging *Note: Contact depth of 00SJ is .000 -.006; Contact location of 00BF is .045-.055 above reference plane*
2.	LLCR (3) - Non Standard *Note: Signal and ground.*
3.	Cable Retention (1) - Non Standard APPLIED FORCE = 15 lbs
4.	LLCR (3) - Non Standard *Note: Signal and ground.*
5.	Interface Gaging *Note: Contact depth of 00SJ is .000 -.006; Contact location of 00BF is .045-.055 above reference plane*

Group 4
RF086-00MJ-505050-0152
RF086-00BF-505050-0152
4 Assemblies
0 Degrees

Step	Description
1.	Interface Gaging *Note: Contact depth of 00MJ is .000-.006; Contact location of 00BF is .045-.055 above reference plane*
2.	LLCR (3) - Non Standard *Note: Signal and ground.*
3.	Cable Retention (1) - Non Standard APPLIED FORCE = 15 lbs
4.	LLCR (3) - Non Standard *Note: Signal and ground.*
5.	Interface Gaging *Note: Contact depth of 00MJ is .000-.006; Contact location of 00BF is .045-.055 above reference plane*

(1) Cable Retention = Other
Apply 15 pounds (6.8kg) 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 = 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.

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

CABLE RETENTION:

1) Apply 15 pounds (6.8 kg) for cable retention test.
2) Pull to destruct.
3) MIL-PRF-30192, paragraph. 4.6.21.

RESULTS

Cable Pull force

- **0° Pull**

Group 1 RF086-00SJ-505050-0152

- **Min----------35.04 lbs**
- **Max ----------36.00 lbs**

Group 2 RF086-00MJ-505050-0152

- **Min----------38.10 lbs**
- **Max ----------38.34 lbs**

Interface Gaging

Group 3 RF086-00SJ-505050-0152/RF086-00BF-505050-0152

00SJ

Initial

- **Min---------- 0.00079 in**
- **Max ---------- 0.00118 in**

After Retention (15 lbs)

- **Min---------- 0.00100 in**
- **Max ---------- 0.00250 in**

00BF

Initial

- **Min---------- 0.04850 in**
- **Max ---------- 0.05050 in**

After Retention (15 lbs)

- **Min---------- 0.04850 in**
- **Max ---------- 0.04950 in**

Group 4 RF086-00MJ-505050-0152/RF086-00BF-505050-0152

00MJ

Initial

- **Min---------- 0.00039 in**
- **Max ---------- 0.00157 in**

After Retention (15 lbs)

- **Min---------- 0.00050 in**
- **Max ---------- 0.00100 in**

00BF

Initial

- **Min---------- 0.04800 in**
- **Max ---------- 0.04950 in**

After Retention (15 lbs)

- **Min---------- 0.04650 in**
- **Max ---------- 0.04800 in**

RESULTS Continued

LLCR Cable Pull (4 ground and 4 signal LLCR test points)

Group 3 RF086-00SJ-505050-0152/RF086-00BF-505050-0152

Ground pin

- **Initial ---------- 8.22 mOhms Max**
- **After Retention (15 lbs)**
  - **<= +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**

Signal pin

- **Initial ---------- 22.52 mOhms Max**
- **After Retention (15 lbs)**
  - **<= +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**

Group 4 RF086-00MJ-505050-0152/RF086-00BF-505050-0152

Ground pin

- **Initial ---------- 7.96 mOhms Max**
- **After Retention (15 lbs)**
  - **<= +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**

Signal pin

- **Initial ---------- 22.29 mOhms Max**
- **After Retention (15 lbs)**
  - **<= +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

Group 1 RF086-00SJ-505050-0152

	Force (lbs)
Minimum	**35.04**
Maximum	36.00
Average	35.52

Group 2 RF086-00MJ-505050-0152

	Force (lbs)
Minimum	**38.10**
Maximum	38.34
Average	38.22

DATA SUMMARIES Continued

Interface Gaging

Group 3 RF086-00SJ-505050-0152/RF086-00BF-505050-0152

Gaging (0.000 /0.006)(in)			
00SJ	Initial	Retention	Delta
1	0.00079	0.00150	0.00071
2	0.00118	0.00250	0.00132
3	0.00079	0.00100	0.00021
4	0.00118	0.00200	0.00082

Gaging (0.045 /0.055)(in)			
00BF	Initial	Retention	Delta
1	0.04850	0.04850	0.00000
2	0.04900	0.04900	0.00000
3	0.05050	0.04850	0.00200
4	0.04950	0.04950	0.00000

Group 4 RF086-00MJ-505050-0152/RF086-00BF-505050-0152

Gaging (0.000 /0.006)(in)			
00MJ	Initial	Retention	Delta
1	0.00157	0.00050	0.00107
2	0.00079	0.00100	0.00021
3	0.00039	0.00050	0.00011
4	0.00118	0.00050	0.00068

Gaging (0.045 /0.055)(in)			
00BF	Initial	Retention	Delta
5	0.04900	0.04800	0.00100
6	0.04850	0.04750	0.00100
7	0.04800	0.04650	0.00150
8	0.04950	0.04800	0.00150

DATA SUMMARIES Continued

LLCR Cable Pull:

1) A total of 4 signal and 4 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. <= +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 3 RF086-00SJ-505050-0152/RF086-00BF-505050-0152

LLCR Measurement Summaries by Pin Type				
Date	7/20/2023	7/21/2023		
Room Temp (Deg C)	22	22		
Rel Humidity (%)	50	50		
Technician	Kason He	Kason He		
mOhm values	Actual **Initial**	**Delta 15 lbf Retention**		
Pin Type: Signal 1				
Average	22.1	0.2225		
St. Dev.	0.4138	0.1742		
Min	21.72	0.03		
Max	22.52	0.37		
Summary Count	4	4		
Total Count	4	4		
Pin Type: GND 1				
Average	7.8575	0.205		
St. Dev.	0.2711	0.0772		
Min	7.64	0.1		
Max	8.22	0.28		
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 15 lbf Retention	**8**	**0**	**0**	**0**	**0**	**0**

DATA SUMMARIES Continued

Group 4 RF086-00MJ-505050-0152/RF086-00BF-505050-0152

LLCR Measurement Summaries by Pin Type				
Date	7/20/2023	7/21/2023		
Room Temp (Deg C)	22	22		
Rel Humidity (%)	50	50		
Technician	Kason He	Kason He		
mOhm values	Actual **Initial**	**Delta 15 lbf Retention**		
Pin Type: Signal 1				
Average	22.1825	0.9975		
St. Dev.	0.1193	1.3744		
Min	22.02	0.08		
Max	22.29	3.03		
Summary Count	4	4		
Total Count	4	4		
Pin Type: GND 1				
Average	7.8975	0.1025		
St. Dev.	0.0585	0.0826		
Min	7.83	0		
Max	7.96	0.2		
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 15 lbf Retention	**8**	**0**	**0**	**0**	**0**	**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: 3/4/2023, Next Cal: 3/3/2024

Equipment #: HZ-MO-05
Description: Micro-ohmmeter
Manufacturer: Keithley
Model: 3706
Serial #: 1285188
Accuracy: Last Cal: 12/17/2022, Next Cal: 12/16/2023