

CABLINE®-CA IIP PLUS

Part No. Plug:82065-*00B-0# Receptacle:20790-0**E-0##

Product Specification

Qualification Test Report No. TR-24055

0	S24433	November 13, 2024	S.Shigekoshi	M.Muro	T.Masunaga
Rev.	ECN	Date	Prepared by	Checked by	Approved by

1. Scope

This product specification defines the test conditions and the performances of the CABLINE-CA IIP PLUS Connector , a wire-to-board connector of 0.4mm contact pitch.

2. Product Name and Parts No.

2.1 Product Name

CABLINE-CA IIP PLUS

2.2 Parts No.

Plug: 82065-*00B-0#

Receptacle: 20790-0**E-0##

3. Rating

3.1 Applicable Cable

Micro-Coaxial Cable AWG#【38】,Characteristic Impedance 42.5 Ω (Diff 85ohm)

Micro-Coaxial Cable AWG#【36】,Characteristic Impedance 42.5 Ω (Diff 85ohm)

Twinax Cable AWG#【34】,Characteristic Impedance 85 Ω

3.2 Operating Conditions

0.4 A AC/DC (Micro-Coaxial Cable AWG#【38】,Characteristic Impedance 42.5 Ω (Diff 85ohm))

0.4 A AC/DC (Micro-Coaxial Cable AWG#【36】,Characteristic Impedance 42.5 Ω (Diff 85ohm))

0.6 A AC/DC (Twinax Cable AWG#【34】,Characteristic Impedance 85 Ω)

Voltage: 100V AC (per contact)

Operating temperature: 233 to 358K(-40°C to 85°C) (Containing temperature rise by current)

Operating humidity: 85% max

3.3 Storage Conditions

Storage temperature: 248 to 333K(-25°C to 60°C)

Storage humidity: 85% max. (Non-condensing)

4. Test and Performance

Test Condition

Unless otherwise specified, all tests and measurements shall be performed.
under the following conditions in accordance with MIL-STD-202.

Temperature: 288K to 308K(15°C to 35°C)

Pressure: 866hPa to 1066hPa (650mmHg to 800mmHg)

Relative humidity: 45 to 75% R.H.

4.1. Electrical Performance

1. Contact resistance

Reference standard: MIL-STD-202-307

Test conditions: Solder the receptacle connector to the test board and mate the plug connector together, then apply 20mV MAX. DC open circuit voltage and 10mA MAX. DC closed circuit current. Measure the contact resistance of signal and GROUND at the section shown in Fig.1 by the four terminal methods.

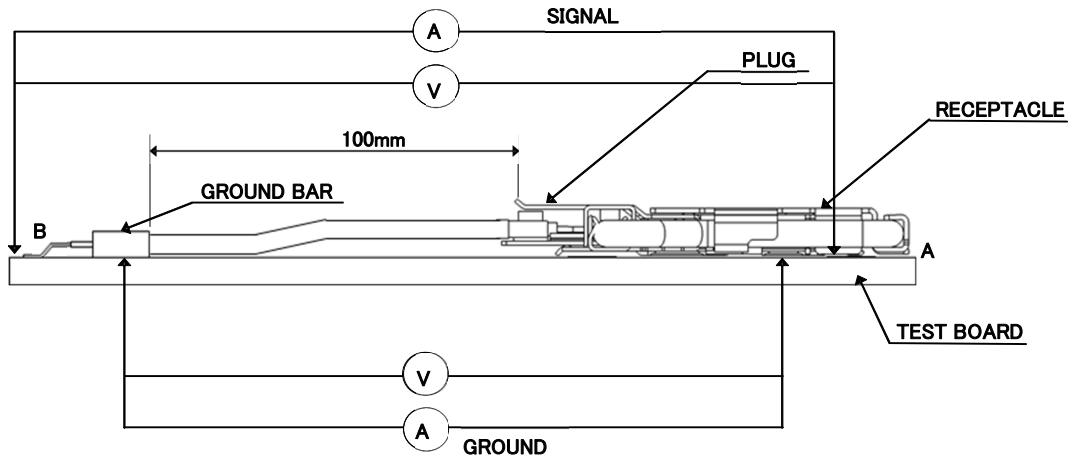


Fig.1

Pass criteria:

Signal Contact
 Initial: 380 mΩMAX.(Micro-Coaxial Cable AWG#38)
 : 275 mΩMAX.(Micro-Coaxial Cable AWG#36)
 : 180 mΩMAX.(Twinax Cable AWG#34)
 After testing: Δ R40 mΩ MAX.
 Initial value contains the following conductor resistance of a cable 100 mm.
 300 mΩ(Micro-Coaxial Cable AWG#38)
 195 mΩ(Micro-Coaxial Cable AWG#36)
 100 mΩ(Twinax Cable AWG#34)
 GROUND
 Initial: 50 mΩ MAX. After testing: Δ R 40 mΩ MAX.

2. Insulation resistance

Reference standard: MIL-STD-202-302

Test conditions: Mate the plug and receptacle connector together, and then apply DC 250 V between the neighboring contacts and between contacts and Shell..

Pass criteria: Initial: 1000 MΩ MIN. After testing: 500 MΩ MIN.

3. Dielectric withstanding voltage

Reference standard: MIL-STD-202-301

Test conditions: Mate the receptacle and plug connector together, then apply AC 250V(rms) between the neighboring contacts and between contacts and Shell. for a minute.

Pass criteria: No abnormalities such as creeping discharge, flashover, insulator breakdown occur.

4. Temperature rising	
Reference standard:	-
Test conditions:	Mate the plug and receptacle connector together, and apply rating current per contact. Measure delta T over ambient.
Pass criteria:	Over ambient ΔT 30 °C MAX.

4.2. Mechanical Performance

1. Mating force and Un-mating force	
Reference standard:	-
Test conditions:	Solder the receptacle connector to the test board, then place the board and plug on push-on/pull-off machine. Repeat mating/unmating 30 cycles at a speed 25±3mm/min. along the mating axis. Measure the mating and unmating force at the initial and after 30cycles.
Pass criteria:	Mating force 60 P Initial / 30cycles: 40 N MAX. Unmating force 60 P Initial / 30cycles: 2.0 N MIN.

2. Durability	
Reference standard:	-
Test conditions:	Solder the receptacle connector to the test board, then place the board and plug on the push-on/pull-off machine, and repeat mating and unmating 30cycles at a speed 25±3mm/min. along the mating axis.
Pass criteria:	Contact resistance: Shall meet 4.1.1

3. Cable retention force	
Reference standard:	-
Test conditions:	Place the plug connector on the push-on/pull-off machine, then apply force on the cable along the direction at a speed 25±3mm/min. Measure the force when the cable dislodges the plug connector.
Pass criteria:	60P: 29.40 N MIN.

4. Connector Lock	
Reference standard:	-
Test conditions:	Mate, and place them on the push-on/pull-off machine, then apply 10N (1.02gf) force on the cable along the mating axis.
Pass criteria:	The lock does not damage and cancel.

5. Vibration	
Reference standard:	MIL-STD-202-201
Test conditions:	Solder the receptacle connector to the test board, then mate plug connector, and place them on the vibrator. Then apply the following vibration. During the testing, run 100mA DC to check electrical discontinuity. Frequency: 10Hz→55Hz→10Hz/approx. 1min. Directions: 3 mutually perpendicular directions. Total Amplitude: 1.52mm Sweep duration: 2 hours for each direction, a total of 6 hours.
Pass criteria:	Contact resistance: Shall meet 4.1.1. Electrical discontinuity: No electrical discontinuity greater than 1μs shall occur. Appearance: No abnormality adversely affecting the performance shall occur.

6. Shock	
Reference standard:	MIL-STD-202-213, Test condition A.
Test conditions:	Solder the receptacle connector to the test board, then mate plug connector, and place them on the shock machine. Then apply the following shock. MAX.G: 50G Duration: 11msec Wave Form: Half Sinusoidal Directions: 6 mutually perpendicular direction Cycle: 3 cycles each direction
Pass criteria:	Contact resistance: Shall meet 4.1.1. Electrical discontinuity: No electrical discontinuity greater than 1μs shall occur. Appearance: No abnormality adversely affecting the performance shall occur.

4.3. Environmental Performance

1. Thermal shock	
Reference standard:	MIL-STD-202-107, Test condition A.
Test conditions:	Solder the receptacle connector to the test board, then mate plug connector, and expose them to the following environment. Temperature: 218K(-55°C),30min.→358K(85°C),30min. Transition time: 5min. MAX. Cycle: 5 cycles
Pass criteria:	Contact resistance: Shall meet 4.1.1. Insulation resistance: Shall meet 4.1.2. Dielectric withstanding voltage: Shall meet 4.1.3. Appearance: No abnormality adversely affecting the performance shall occur.

2. High temperature life	
Reference standard:	MIL-STD-202-108, Test condition A.
Test conditions:	Solder the receptacle connector to the test board, then mate plug connector, and expose them to the following environment. Temperature: 358±2K (85±2°C) Duration: 250 hours
Pass criteria:	Contact resistance: Shall meet 4.1.1. Contact retention force: Shall meet 4.2.3. Appearance: No abnormality adversely affecting the performance shall occur.

3. Humidity (Steady state)	
Reference standard:	MIL-STD-202-103, Test condition B.
Test conditions:	Solder the receptacle connector to the test board, then mate plug connector, and expose them to the following environment. Temperature: $313 \pm 2\text{K}$ ($40 \pm 2^\circ\text{C}$) Humidity: 90~95%RH Duration: 240 hours
Pass criteria:	Contact resistance: Shall meet 4.1.1. Insulation resistance: Shall meet 4.1.2. Dielectric withstanding voltage: Shall meet 4.1.3. Appearance: No abnormality adversely affecting the performance shall occur.

4. Humidity (Cycling)	
Reference standard:	MIL-STD-202-106.
Test conditions:	Solder the receptacle connector to the test board, then mate plug connector, and expose them to the following environment. Temperature: $298[263] \sim 338\text{K}$ ($25[-10] \sim 65^\circ\text{C}$) Humidity: 90[80]~100%RH Duration: 10cycles (240hours)
	<p>The graph plots Temperature [deg.] on the y-axis (ranging from -20 to 80) against Time [h] on the x-axis (ranging from 0 to 25). The temperature profile consists of two cycles, A and B. Cycle A (0-14h) ramps up from 25°C to 65°C at 2h, holds at 65°C until 6h, and ramps down to 25°C at 10h. Cycle B (10-24h) ramps down from 25°C to -10°C at 18h, holds at -10°C until 21h, and ramps up to 25°C at 24h. A legend box indicates: A : 90-100% RH, B : 80-100% RH.</p>
Pass criteria:	Contact resistance: Shall meet 4.1.1. Insulation resistance: Shall meet 4.1.2. Dielectric withstanding voltage: Shall meet 4.1.3. Appearance: No abnormality adversely affecting the performance shall occur.

5. Saltwater spray	
Reference standard:	MIL-STD-202-101, Test condition B.
Test conditions:	Solder the receptacle connector to the test board, then mate plug connector, and expose them to the following environment. Temperature: $308 \pm 2\text{K}$ ($35 \pm 2^\circ\text{C}$) Saltwater density: $5 \pm 1\%$ [by weight] Duration: 48 hours
Pass criteria:	Contact resistance: Shall meet 4.1.1. Appearance: No abnormality adversely affecting the performance shall occur.

6. H ₂ S gas	
Reference standard:	-
Test conditions:	<p>Solder the receptacle connector to the test board, then mate plug connector, and expose them to the following environment.</p> <p>Temperature: 313±2K (40±2°C)</p> <p>Relative humidity: 80±5%RH</p> <p>Gas: H₂S 3±1ppm</p> <p>Duration: 96 hours</p>
Pass criteria:	<p>Contact resistance: Shall meet 4.1.1.</p> <p>Appearance: No abnormality adversely affecting the performance shall occur.</p>

4.4 Test Sequence and Specimen Quantity

Details of the Testing Groups A to J are indicated in test report.

Table.1 Test Sequence and Sample Quantity

No.	Test Item	Testing Groups										
		A	B	C	D	E	F	G	H	I	J	
4.1 Electrical Performance	1	Contact resistance	2,6		1,3,5	1,5	1,3	1,5	1,5,7	1,3	1,3	
	2	Insulation resistance				2,6		2,6	2,8			
	3	Dielectric withstanding voltage				3,7		3,7	3,9			
	4	Temperature rising										1
4.2 Mechanical Performance	1	Mating force	1,5									
		Unmating force	3,7									
	2	Durability	4						4			
	3	Cable retention force	8									
	4	Connector Lock		1								
	5	Vibration			2							
	6	Shock			4							
4.3 Environmental Performance	1	Thermal shock				4						
	2	High temperature life					2					
	3	Humidity (Steady State)						4				
	4	Humidity (Cycling)							6			
	5	Saltwater spray								2		
	6	H ₂ S gas									2	
Specimen quantity			5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.

※Numbers indicate test sequences.

5. Recommended Metal Mask

Refer to drawing for the recommended metal mask thickness and opening dimension.

6. Precautions for Handling Cable Connectors

Refer to instruction manual: HIM-24004 for the handling of CABLINE-CA IIP PLUS.