

CABLIN[®]-VSF

Part No. Plug: 3049-0**# (SHELL Only) , 20645-0**T-01 (SHELL ASS'Y)

Receptacle: 20455-0**E-~~2~~, 20455-0**E-~~9~~

Product Specification

Qualification Test Report No. TR-14095 (20455-0**E-~~2~~)

Qualification Test Report No. TR-17048 (20455-0**E-~~9~~)

11	S23163	May 31, 2023	T.Onishi	M.Muro	H.Ikari
10	S22099	March 8, 2022	E.Tanaka	T.Onishi	H.Ikari
9	S21657	December 2, 2021	M.Muro	-	H.Ikari
8	S18665	November 1, 2018	Y.Sasa	T.Masunaga	H.Ikari
Rev.	ECN	Date	Prepared by	Checked by	Approved by

1. Scope
This Product Specification defines the test conditions and the performances of the CABLINE-VSF Connector , a shield FPC-to-board connector of 0.5mm contact pitch.

2. Product Name and Parts No.

2.1 Product Name

CABLINE-VSF

2.2 Parts No

PLUG SHELL Only : 3049-0**#
PLUG SHELL ASS'Y (with LOCK BAR): 20645-0**T-01

2.3 Applicable RECE Connector

CABLINE-VS RECE. : 20455-0**E-※2※
CABLINE-VS RECE. (TYPE-U) : 20455-0**E-※9※

2.4 Applicable FPC

Shielded FPC Conductor pitch / size of thickness . . . 0.5mm / 0.28^{+0.02}/_{-0.03}mm
Thermosetting adhesive. Refer to the product drawing (DWG No. 3049 or 20645) for a detail dimension and structure.

3. Rating

3.1 Operating Conditions

Amperage: 0.5A AC/DC (per contact pin) *Available up to 20 Pin
Amperage: 0.3A AC/DC (per contact pin) *Available for all Pin
Voltage: 100V AC (per contact)
Operating temperature: 233~358K(-40°C~+85°C)
(Containing temperature rise by current)
Operating humidity: 85% max

3.2 Storage Conditions

Storage temperature: 248~333K(-25°C~+60°C)
Storage humidity: 85% max. (Non-condensing)

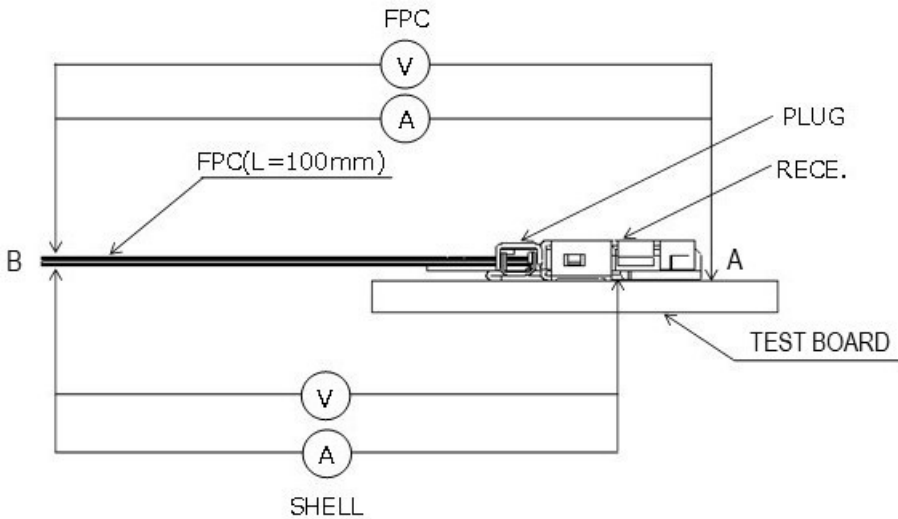
4. Test and Performance

Test Condition

This initial test is equal to it's at shipping condition and unless otherwise specified, all tests and measurements shall be performed under the following conditions in accordance with MIL-STD-202 G.

Temperature . . . 288K~308K (15°C~35°C)
Pressure . . . 866hPa~1066hPa (650mmHg~800mmHg)
Relative humidity . . . 45~75%R.H.

4.1 Electrical Performance

1. Contact resistance	
Reference standard:	MIL-STD-202G, Method 307
Test conditions:	Solder the receptacle connector to the test board and mate the plug connector together, and then apply 20mV MAX. DC open circuit voltage and 1mA 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.
	
$\text{Contact Resistance} = R_{AB} - (\text{FPC } 100\text{mm Conductor Resistance}) - (\text{Test Board Conductor Resistance})$	
Fig.1	
Pass criteria:	Contact ... Initial: 60 mΩ MAX. After testing: ΔR 40 mΩ MAX. Ground contact ... Initial: 60 mΩ MAX. After testing: ΔR 40 mΩ MAX.

2. Insulation resistance	
Reference standard:	MIL-STD-202G, Method 302
Test conditions:	Solder the receptacle connector to the test board and mate the plug connector together, and then apply DC 250 V between the neighboring contacts.
Pass criteria:	Initial: 1000 MΩ MIN. After testing: 500 MΩ MIN.

3. Dielectric withstanding voltage	
Reference standard:	MIL-STD-202G, Method 301
Test conditions:	Solder the receptacle connector to the test board and mate the plug connector together, and then apply AC 250V (rms) between the neighboring contacts for a minute.
Pass criteria:	No creeping discharge, flashover, no insulator breakdown shall occur.

4. Temperature rising	
Reference standard:	-
Test conditions:	Solder the receptacle connector to the test board and mate the plug connector together, and then apply rating current to each contact and measure temperature rise around the connector.
Pass criteria:	Over ambient ΔT 30 °C MAX.

4.3 Environmental Performance

1. Thermal shock

Reference standard: MIL-STD-202G, Method 107, Condition A.

Test conditions: Solder the receptacle connector to the test board and mate the plug connector together, and expose them to the following environment.
 Temperature: 218K(-55°C),30min.→358K(85°C),30min.
 Transition time: 5min. MAX.
 No. of cycles: 5 cycles

Pass criteria: Contact resistance: Shall meet 4.1.1.

2. High temperature life

Reference standard: MIL-STD-202G, Method 108, Condition B.

Test conditions: Solder the receptacle connector to the test board and mate the plug connector together, 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.

3. Humidity (Steady state)

Reference standard: MIL-STD-202G, Method 103, Condition A.

Test conditions: Solder the receptacle connector to the test board and mate the plug connector together, and expose them to the following environment.
 Temperature: 313±2K (40±2°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.

4. Humidity (Cycling)

Reference standard: MIL-STD-202G, Method 106.

Test conditions: Solder the receptacle connector to the test board and mate the plug connector together, and expose them to the following environment.
 Temperature: 298[263]~338K (25[-10]~65°C)
 Humidity: 90~98%RH
 Duration: 10cycles (240hours)

Pass criteria: Contact resistance: Shall meet 4.1.1.
 Insulation resistance: Shall meet 4.1.2.
 Dielectric withstanding voltage: Shall meet 4.1.3.

4.3 Environmental Performance

5. Salt water spray

Reference standard: MIL-STD-202 G, Method 101, Condition B.

Test conditions: Solder the receptacle connector to the test board and mate the plug connector together, and expose them to the following environment.
 Temperature: $308 \pm 2\text{K}$ ($35 \pm 2^\circ\text{C}$)
 Salt water 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. H₂S gas

Reference standard: -

Test conditions: Solder the receptacle connector to the test board and mate the plug connector together, and expose them to the following environment.
 Temperature: $313 \pm 2\text{K}$ ($40 \pm 2^\circ\text{C}$)
 Relative humidity: $80 \pm 5\%$ RH
 Gas: H₂S 3 ± 1 ppm
 Duration: 96 hours

Pass criteria: Contact resistance: Shall meet 4.1.1.
 Appearance: No abnormality adversely affecting the performance shall occur.

4.4 Test Sequence and Specimen Quantity

Table 1. Test Sequence and Sample Quantity

Test Item	Group								
	A	B	C	D	E	F	G	H	J
Contact Resistance		2,6	1,3,5	1,3	1,3	1,5	1,5	1,3	1,3
Insulation Resistance						2,6	2,6		
D. W. Voltage						3,7	3,7		
Temperature rising	1								
Mating Force		1,5							
Un-mating Force		3,7							
Durability		4							
Vibration			2						
Shock			4						
Thermal Shock				2					
High Temperature Life					2				
Humidity (Steady State)						4			
Humidity (Cycling)							4		
Salt Water Spray								2	
H2S Gas									2
Specimen Quantity.	5 pcs.	5 pos.	5 pos.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.

※Numbers indicate sequence in which tests are performed.

5. Precautions for Handling Cable Connectors

Refer to instruction manual : HIM-13010 for the handling of CABLINE-VSF.