

CABLINE®-VSF

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

Receptacle: 20455-0**E-X2X, 20455-0**E-X9X

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
Confident	tial C		I-PEX Inc.		QKE-DFFDE06-08 REV.9

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/-0.03mm
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 \cdots 288K \sim 308K (15 $^{\circ}$ C \sim 35 $^{\circ}$ C)

Pressure · · · 866hPa ~ 1066hPa (650mmHg ~ 800mmHg)

Relative humidity \cdots 45 \sim 75%R.H.

4.1 Electrical Performance

4.1 Electrical Perio	omance
1. Contact resistar	nce
Reference standar	rd: 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.
	FPC V A PLUG RECE. B TEST BOARD SHELL
Con	ntact Resistance=R _{AB} -(FPC 100mm Conductor Resistance)-(Test Board Conductor Resistance)
	Fig.1
Pass criteria:	Contact · · · Initial: 60 mΩMAX. After testing: ⊿R40 mΩ MAX. Ground contact · · · Initial: 60 mΩ MAX. After testing: ⊿R 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	ng 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 ∠T 30 ℃ 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, measure of initial and mating/unmating 30 cycles at a speed 25±3mm/min. along the mating axis.	
Pass criteria:	Mating force 30 P : 24.0 N MAX. 40 P : 32.0 N MAX.	
	Unmating force 30 P : 1.10 N MIN. 40 P : 1.40 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 meet4.1.1

3. Vibration	
Reference standard:	MIL-STD-202G, Method 201
Test conditions:	Solder the receptacle connector to the test board and mate the plug connector together, 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 direction. 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.

4. Shock		
Reference standard:	MIL-STD-202G, Method 213, Condition A.	
Test conditions:	Solder the receptacle connector to the test board and mate the plug connector together, and p them on the shock machine. Then apply the following shock. MAX.G: 50G Directions: 6 mutually perpendicular direction Cycle: 3 cycles about each direction Wave Form: Half Sinusoidal	lace
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-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℃) Duration: 250 hours
Pass criteria:	Contact resistance: Shall meet 4.1.1.

3. Humidity (Steady sta	ate)
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℃) 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: $298[263]\sim338K$ ($25[-10]\sim65^{\circ}C$) Humidity: $90\sim98\%RH$ Duration: 10 cycles (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.

4.3 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±2K (35±2°C) Salt water density: 5±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±2K (40±2°C) Relative humidity: 80±5%RH Gas: H2S 3±1ppm 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									
rest item	А	В	С	D	Е	F	G	Н	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.	

XNumbers indicate sequence in which tests are performed.

5. Precautions for Handling Cable ConnectorsRefer to instruction manual: HIM-13010 for the handling of CABLINE-VSF.