1. **Scope**

This specification covers the FWF20009/FWF20010 series connectors.

2. **Applicable documents**

The following documents form a part of this specification to the extent specified herewith. In the event of conflict between the requirements of the specification and the product drawing, the product drawing shall take precedence.
In the event of conflict between the requirements of the specification and the referenced documents, this specification shall take precedence.

3. **Ordering information**

Refer to the drawing.

4. **Connector dimensions**

Refer to the drawing.

5. **Material**

Housing: PA66 (UL 94V-0/UL 94V-2)
Color :Transparent
Contacts terminal: Copper alloy
Plating:Tin plated

6. **Accommodated P.C.B layout**

Refer to the drawing.

7. **Rating**

Operating voltage(Max.)	125V AC/DC
Current rating(Max.)	2.0A DC
Temperature range-operating	-25°C -- +85°C(Including terminal temperature rese)

8. **Performance**

Test item	Requirement	Test Condition
Electrical Performance		
Contact Resistance	20 mΩ (Max.)	Mate connectors, measure by dry circuit, 20mV MAX., 10mA. Mated Length : 50mm (AWG. #22) (Based upon JIS C5402 5.4)
Insulation Resistance	1000 MΩ (Min.)	Mate connectors, apply 500V DC between adjacent terminals or ground. (Based upon JIS C5402 5.2/MIL-STD-202 method 302 Cond.B)
Dielectric strength	No breakdown and flashover	Mate connectors, apply 1000V AC for 1 minute between adjacent terminal or ground. (Based upon JIS C5402 5.1/MIL-STD-202 Method 301)

Test item	Requirement	Test Condition
Contact resistance on crimped portion	20 mΩ (Max.)	Crimp the maximum applicable wire on to the terminal, measure by dry circuit, 20mV MAX., 10mA. Wire Length : 50mm (AWG.#22)

Mechanical Performance

Insertion and Withdrawal Force	Refer to paragraph 9						Insertion and withdrawal connectors at the speed rate of 25±3mm/minute
Crimping pull out Force	Wire size		#22	#24	#26	#28	#30	Fix the crimped terminal,apply axial pull out force on the wire at the speed rate of 25±3mm/minute (Based upon JIS C5402 6.8)
	1	width	1.35±0.10					
		height	0.90~1.00	0.90~1.00	0.80~0.90	0.70~0.80	0.60~0.70	
	2	width	1.55±0.10					
		height	1.80	1.60	1.50	1.40	1.30	
	Crimp strength		4.0kg min.	3.0kg min.	1.8kg min.	1.1kg min.	0.6kg min.	
	1. Conductor (mm) 2: Insulation (mm)							
Terminal Insertion Force	1.2kgf (Max.)							Insert the crimped terminal into the housing at the speed rate of 25±3mm/min.
Terminal/Housing Retention Force	1.3kgf (Min.)							Apply axial pull out force at the speed rate of 25± 3mm/minute on the terminal assembled In the housing.
Pin retention force	1.0kgf (Min.)							Apply axial push force at the speed rate of 25± 3mm/minute on the contact pin assembled in the base wafer.

Environmental Performance and others

Repeated Insertion/ withdrawal	Contact Resistance	40 mΩ Max.	Mate connector up to 30 cycles repeatedly at a rate of 10 cycles/minute. After which test the contact resistance
Temperature Rise	30 ℃ Max.		Apply rated current load on mated connector in series-connection. Measure change of temperature on contact using thermocouples for 4 hours. (Based upon UL 1977)
Heat resistance	Appearance	No Damage	Mated connector shall be placed in an oven for 96±4 hours at +85±2°C. (Based upon JIS C5402 7.8)
	Contact Resistance	40 mΩ Max.	

Test item	Requirement		Test Condition
Cold resistance	Appearance	No Damage	Mated connector shall be placed in a temperature chamber for 96±4 hours at -25±3°C (Based upon JIS C5402 7.9)
	Contact Resistance	40 mΩ Max.	
Vibration	Appearance	No Damage	Amplitude: 1.52mm P.P Sweep time: 10-55-10Hz/minute Duration: 2 hours in each X、Y、Z axlals. (Based upon MIL-STD-202 method 201)
	Contact Resistance	40 mΩ Max.	
	Discontinuity	1μ sec Max.	
Shock	Appearance	No Damage	50G, 3 strokes in each X、Y、Z. axlals. (Based upon JIS C0041)
	Contact Resistance	40 mΩ Max.	
	Discontinuity	1μ sec Max.	
Humidity	Appearance	No Damage	Mated connector shall be placed in a humidity chamber on the following conditions. Temperature: 40±2°C Relative humidity: 90~95% Duration : 240 Hours (Based upon MIL-STD-202 Method 103 cond.A)
	Contact Resistance	40 mΩ Max.	
	Withstand voltage	1000 V AC/min	
	Insulation Resistance	100 MΩ Min.	
Temperature Cycling	Appearance	No Damage	Mated connector shall be set to temperature cycling for 5 cycles of which 1 cycle consists of: 1>.+25°C ~ 3 minutes 2>.-25°C ~ 30 minutes 3>.+25°C ~ 3 minutes 4>.+85°C ~ 30 minutes (Based upon JIS C5402 7.2)
	Contact Resistance	40mΩ Max.	
	Dielectric Strength	1000V,AC/min	
	Insulation Resistance	100MΩ Min.	
Salt Spray	Appearance	No Damage	Mated connector shall be placed in a salt spray chamber on the following conditions. Salt Solution Density : 5±1% Temperature : 35±2°C Duration : First punch,second plate:24 Hours First plate,second punch:8 Hours Remarks : We make sure the important area (Based upon JIS C5402 7.1/MIL-STD-202 Method 101 Condition B)
	Contact Resistance	40 mΩ Max.	
Solderability	95% of immersed area must show no voids nor pin holes.		Immerse fluxed soldered section of contact pin into a solder bath for 3±0.5sec Temperature: 230±5°C

Test item	Requirement		Test Condition
Resistance to soldering heat	Appearance	No Damage	Mated connector shall be dipped on solder bath for 5 ±1sec Temperature: 260±5°C

9. **Insertion force and withdrawal force**

(Unit:kgf)

Circuits	Insertion (Max.)	Withdrawal (Min.)		
	Initial	Initial	10th	30th
2	1.2	0.40	0.30	0.30
3	1.8	0.60	0.45	0.45
4	2.4	0.80	0.60	0.60
5	3.0	1.00	0.75	0.75
6	3.6	1.20	0.90	0.90
7	4.2	1.50	1.05	1.05
8	4.8	1.70	1.20	1.20
9	5.4	1.90	1.35	1.35
10	6.0	2.10	1.50	1.50
11	6.6	2.30	1.65	1.65
12	7.2	2.50	1.80	1.80
13	7.8	2.80	1.95	1.95
14	8.4	3.00	2.10	2.10
15	9.0	3.20	2.25	2.25
16	9.6	3.40	2.40	2.40