

## 1.0 SCOPE

### 1.1. Content

This specification covers performance, tests and quality requirements for 3.0mm pitch WtW Connector. Applicable product descriptions and part numbers are as shown on product drawing.

### 1.2. Qualification:

When tests are performed on the subject product line, procedures specified shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

## 2.0 APPLICABLE DOCUMENTS:

The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the latest edition of the document applies. In the event of conflict between the requirements of this specification and the product drawing, the product drawing shall take precedence. In the event of conflict between the requirements of this specification and the referenced documents, this specification shall take precedence.

### 2.1 TE Connectivity Documents:

- 114-137279: Application Specification
- 501-137279: Qualification Test Report

## 3.0 REQUIREMENTS:

### 3.1 Material:

- A. Housing: Thermoplastic, UL94V-0, color: natural.
- B. Contact: Copper Alloy, Tin plated over nickel under plated all over.

### 3.2 Ratings:

#### A. Current Rating and applicable wires:

AWG	Recommend Amps	Max. Outside Insulation Diameter
20	5	1.85 mm
22	5	1.85 mm
24	4	1.85 mm
26	3	1.27 mm
28	2	1.27 mm
30	1	1.27 mm

- B. Voltage Rating: 250 Vrms maximum,
- C. Operating temperature: -40°C to +105°C

### 3.3 Performance Requirements and Test Descriptions

The product is designed to meet the electrical, mechanical and environmental performance requirements as specified. Unless otherwise specified, all tests are performed at ambient environmental conditions.

### 3.4 TEST REQUIREMENTS AND PROCEDURES SUMMARY

TEST ITEM		REQUIREMENT	PROCEDURE
1	Examination of Product	Meets requirements of product drawing. No physical damage.	Visual inspection
<b>ELECTRICAL REQUIREMENT</b>			
2	Low Level Contact Resistance	Initial-10milliohms maximum per mated pair Final- $\Delta R=20$ milliohms maximum per mated pair	The object of this test procedure is to detail a standard method to measure the electrical resistance across a pair of mated contacts such that the insulating films, if present, will not be broken or asperity melting will not occur. Subject mated contacts assembled in housing to closed circuit current of 100mA maximum at open circuit at 20 mV maximum.
3	Insulation Resistance	1,000Megohms minimum	The object of this test procedure is to detail a standard method to assess the insulation resistance of connectors. This test procedure is used to determine the resistance offered by the insulation materials and the various seals of a connector to a DC potential tending to produce a leakage of current through or on the surface of these members. Measure by applying test potential between the adjacent contacts, and between the contacts and ground in the mated connector assemblies.
4	Dielectric withstanding Voltage	No flashover, no sparkover, no excess leakage, no breakdown Current leakage < 5 mA	The object of this test procedure is to detail a test method to prove that a connector can operate safely at its rated voltage and withstand momentary over potentials due to switching, surges and/ or other similar phenomena. Measure by applying test potential between the adjacent contacts, and between the contacts and ground in the mated connector assemblies. Test Potential: 1000 VAC at sea level, 60 Hz Test Duration: 60 seconds
5	Temperature Rise (Via Current Cycling)	Temperature rise: +30°C MAXIMUM	Mate connector: measure the temperature rise at the rate current after: 1) 96 hours (steady state) 2) 240 hours (45 minutes ON and 15 minutes OFF per hour) 3) 96 hours (steady state)
<b>MECHANICAL REQUIREMENT</b>			
TEST ITEM		REQUIREMENT	PROCEDURE
6	Insertion Force	Insertion Force : 8.0 N maximum	Subject connector to mate and unmate to measure the mechanical forces required to engage and disengage at a rate of 25+/-6 mm per minute Record by using autograph.

7	Withdrawal Force	Withdrawal Force: 3.7 N minimum	Subject connector to mate and unmate to measure the mechanical forces required to engage and disengage at a rate of 25+/-6 mm per minute Record by using autograph.
8	Terminal Retention Force in Housing for Cable assembly	24.5 N minimum.	Apply an axial pull out force on the terminal in the housing at a rate of 25+/-6 mm per minute.
9	Terminal Insertion Force in Housing for Cable assembly	14.7 N maximum.	Apply an axial insertion force on the terminal at a rate of 25+/-6mm per minute.
10	Wire Pullout Force (Axial) (Wire from Terminal)	MINIMUM pullout force 20 awg: 57.8 N 22 awg: 35.6 N 24 awg: 22.2 N 26 awg: 13.3 N 28 awg: 8.9 N 30 awg: 6.6 N	Apply an axial pullout force on the wire at a rate of 25+/-6mm per minute.
11	Thumb Latch to Ramp Yield Strength	68.4 N minimum Yield Strength.	Full mate and then unmated the connector at a rate of 25+/-6mm per minute.
12	Durability	100 mating/ unmating cycles at a maximum rate of 200 cycles per hour. No evidence of damage The contact resistance: 20 milliohms maximum (Final)	The object of this test procedure is to detail a uniform test method for determining the effects caused by subjecting a connector to the conditioning action of insertion and extraction, simulating the expected life of the connectors. Durability cycling with a gauge is intended only to produce mechanical stress. Durability performed with mating components is intended to produce both mechanical and wear stress.

**ENVIRONMENTAL REQUIREMENTS**

TEST ITEM		REQUIREMENT	PROCEDURE
13	Salt Spray	No evidence of damage. Contact resistance: 20 milliohms maximum (Final)	The object of this test procedure is to detail a standard test method to assess the effects of a controlled salt laden atmosphere on connector components, finishes and mechanisms. Subject mated and unmated connectors should be tested according to the condition listed below: Temperature: 35± 1.1°C Humidity: 95~98% (R.H.) PH value: 6.5~7.2 Duration: 48 hours
14	Thermal Aging	No evidence of damage. Contact resistance: 20 milliohms maximum (Final)	Mate connectors: expose to: 240 hours at 105 ± 2°C

15	Humidity (Steady State)	<ol style="list-style-type: none"> <li>1) 20 milliohms maximum (Final)</li> <li>2) Dielectric Withstanding Voltage: No Breakdown at 500 VAC</li> <li>3) Insulation Resistance: 1000 Megohms Minimum.</li> </ol>	Mate connectors: expose to a temperature of $40 \pm 2^{\circ}\text{C}$ with a relative humidity of 90-95% for 96 hours. Note: Remove surface moisture and air dry for 1 hour prior to measurements.
16	Cold Resistance	20 milliohms maximum (Final)	Mate connectors: Duration: 96 hours, Temperature: $-40 \pm 3^{\circ}\text{C}$

### 3.5 PRODUCT QUALIFICATION AND REQUALIFICATION TEST SEQUENCE

Test or Examination	Test Group									
	A	B	C	D	E	F	G	H	I	J
	Test Sequence (a)									
Examination of Product	1,9	1,11	1,5	1,2	1,2	1,2	1	1	1	1,5
Low Level Contact Resistance	2,8	2,6,10	2,4							2,4
Insulation Resistance		3,8								
Dielectric Withstanding Voltage		4,9								
Temperature Rise (Via Current Cycling)			3	3						
Insertion Force	3,6									
Withdrawal Force	4,7									
Terminal Retention Force in Housing for Cable assembly							3			
Terminal Insertion Force in Housing for Cable assembly							2			
Wire Pullout Force (Axial) (Wire from Terminal)								2		
Thumb Latch to Ramp Yield Strength									2	
Durability	5									
Salt Spray					2					
Thermal Aging		5								
Humidity (Steady State)		7								
Cold Resistance										3
Sample Size per Test Group	5	5	5	5	5	5	5	5	5	5

#### **4.0 Quality Assurance Provisions**

##### **4.1 Qualification Testing**

###### **A. Specimen Selection**

Specimens shall be prepared in accordance with applicable Instruction Sheets and shall be selected at random from current production.

###### **B. Test Sequence**

Qualification inspection shall be verified by testing specimens as specified.

##### **4.2 Requalification Testing**

If changes significantly affecting form, fit or function are made to the product or manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of the original testing sequence as determined by development/product, quality and reliability engineering.

##### **4.3 Acceptance**

Acceptance is based on verification that the product meets the requirements. Failures attributed to equipment, test setup or operator deficiencies shall not disqualify the product. If product failure occurs, corrective action shall be taken and specimens resubmitted for qualification. Testing to confirm corrective action is required before resubmitted.

##### **4.4 Quality Conformance Inspection**

The applicable quality inspection plan shall specify the sampling acceptable quality level to be used.

Dimensional and functional requirements shall be in accordance with the applicable product drawing and this specification.

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