



## RAST 2.5 Standard Timer Product Specification

### 1. SCOPE

#### 1.1. Content

This specification covers performance, tests and quality requirements for the TE Connectivity (TE) RAST 2.5 Standard Timer Connector System. The RAST 2.5 Standard Timer is a part of wire-to-board connection consisting of crimp-snap contacts seated in a housing that mates to PCB with frame or RAST 2.5 tab header, the whole wire-to-board connector has the interface which meet the RAST 2.5 Standard. The RAST 2.5 Standard Timer is available in 3, 4, 5, 7 and 9 positions with 2.5mm centerlines. It is designed to be terminated with 24 AWG to 20 AWG wire.

#### 1.2. Qualification

When tests are performed on the subject product line, procedures specified in Table 1 shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

#### 1.3. Revision Summary

Revisions to this specification include:

- Rev 1 – preliminary version first release
- Rev A – Active version first release

### 2. APPLICABLE DOCUMENTS AND FORMS

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 Specifications

- [114-160192](#) Application Specification (RAST2.5 Standard timer)
- [501-160437](#) Qualification Test Report (RAST2.5 Standard timer)

#### 2.2. Commercial Standards and Specifications

- IEC 61984 International Standard – Safety Requirements and Tests
- IEC 60335 International Standard – Safety of Household and Similar Appliance
- IEC 60512 International Standard – Connectors for Electronic Equipment – Tests and Measurements
- IEC 60695 International Standard – Fire Hazard Testing
- UL 1977 Safety Standards – Component Connectors for Use in Data, Signal, Control, and Power Applications
- EIA-364 Electrical Connector/Socket Test Procedures Including Environmental Classifications

#### 2.3. Reference Documents

- [102-950](#) Qualification of Separable Interface Connectors
- [109-1](#) General Requirements for Testing
- [109-197](#) Test Specifications vs EIA and IEC Test Methods

### 3. REQUIREMENTS

#### 3.1. Design and Construction

Product shall be of the design, construction, materials and physical dimensions specified on the applicable product drawing.

#### 3.2. Ratings

- A. Voltage Rating: 50 VAC
- B. Current Rating: See Figure 6 (to be determined) for applicable current carrying capability. Maximum rated current that can be carried by this product is limited by maximum operating temperature of the connector (105°C) and temperature rise of the connector (30°C). Put 2A for fully loaded and 3A for selectively loaded
- C. as the max current. Variables to be considered for each application are: wire size, connector size, contact material, ambient temperature, and printed circuit board design.
- D. Temperature Rating: -40°C to +105°C (The upper limit of the temperature includes the temperature rising by energized current.)

#### 3.3. Performance Requirements and Test Description

The product should meet the electrical, mechanical and environmental performance requirements specified in Figure 2. All tests shall be performed at ambient environmental conditions otherwise specified.

#### 3.4. Test Requirements and Procedure Summary

Test Description	Requirement	Procedure
Initial Examination of Product	Meets requirements of product drawing and Application Specification 114-160192.	IEC 60512-1-1 Visual and dimensional inspection per product drawing.
Final Examination of Product	Meets visual requirements.	IEC 60512-1-1 Visual examination.
<b>Electrical</b>		
Low Level Contact Resistance (LLCR)	10 milliohms maximum initial. 20 milliohms maximum final.	IEC60512-2-1 Subject specimens to 100 milliamperes maximum and 20 millivolts maximum open circuit voltage. See Figure 3.
Insulation Resistance	1000 megohm minimum initial. 500 megohm minimum final.	IEC 60512-3-1 500 volts DC for one-minute hold. Test between adjacent contacts.
Withstanding Voltage	One minute hold with no breakdown or flashover. 3.0 milliamperes maximum leakage current.	IEC 60512-4-1. 1250V min initial, 1000V min after testing at sea level. Test between adjacent contacts.
Temperature Rise vs. Current	30°C maximum temperature rise.	IEC 60512-5-1/2. Stabilize at a single current level until 3 readings at 5 minutes intervals are within 1°C.
<b>Mechanical</b>		
Sinusoidal Vibration	No discontinuities of 1 microsecond or longer duration. See Note.	IEC 60512-6-4 Subject mated specimens to 10 to 55 to 10Hz traversed in 1 minute with 1.5 mm maximum

Test Description	Requirement		Procedure
			total excursion. Two hours in each of 3 mutually perpendicular planes.
Mechanical Shock	No discontinuities of 1 microsecond or longer duration. See Note.		IEC 60512-6-3 Subject mated specimens to 30 G's half-sine shock pulses of 11 milliseconds duration. Three shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks.
Durability	See Note.		IEC 60512-9-1 Mate and unmate specimens for 30 cycles at a maximum rate of 500 cycles per hour.
Contact Engaging and Separating Forces (with Terminal of Tab Header)	Engaging: 9.8N (maximum) Separating: 0.2N (maximum)		IEC 60512-13-2 Operating Speed: 25.4 mm/min Number of Cycles: 1
Connector Mating and Unmating Force	Mating: 9.8 N maximum per contact Unmating: 0.55 N minimum per contact.		IEC 60512-13-2 Measure force necessary to mate specimens with companion headers with a distance of 4.60 mm from point of initial contact at a maximum rate of 12.7 mm per minute. Testing cycles: 25, record each test value The latch on the housing need to be removed
Contact Insertion Force	13.3 N (maximum) per Contact		IEC 60512-13-2
Contact Retention Force	30 N (minimum)		IEC 60512-15-1 Testing in axial direction Operation Speed: 25.4 mm/min
Crimp Tensile Strength	<b>Wire Size (AWG)</b>	<b>Crimp Tensile (minimum) (N)</b>	EIA-364-8 Operation Speed: 25.4 mm/min Apply an axial pull force to the crimped wire, remove the insulation crimp.
	24	30	
	22	49	
	20	75	
<b>Environmental</b>			
Thermal Shock	See Note.		IEC 60512-11-4 Subject mated specimens to 10 cycles between -40 and 105°C with 30 minutes dwells at temperature extremes and 2-5 minutes transition between temperatures.
Humidity/temperature Cycling	See Note.		IEC 60512-11-12 Subject specimens to 10 cycles (10 days) between 25 and 65°C at 80 to 90% RH.
Temperature Life	See Note.		IEC 60512-11-9 Subject mated specimens to 105°C for 96 hours.

Test Description	Requirement	Procedure
Salt Spray	See Note.	EIA-364-26. Subject mated specimens to 5% salt concentration for 48 hours.
Hydrogen Sulfide	See Note.	Subject mated specimens to $3 \pm 1$ ppm H <sub>2</sub> S gas concentration maintained at $40 \pm 2^\circ\text{C}$ for 96 hours.
Ammonia	See Note.	Subject mated specimens in atmosphere that rated 25 mL/L of 3% NH <sub>3</sub> for 7 hours.
Resistance to Cold	See Note.	IEC 60512-11-10 Mated connectors, $-30 \pm 2^\circ\text{C}$ , 96 hours
Glow Wire Test 750°C	Test at 750°C	IEC 60695-2-11 and IEC 60335-1 Perform visual check and take picture after the test.

**Figure 1 (end)**



**NOTE**

*Shall meet visual requirements, show no physical damage, and meet requirements of additional tests as specified in the Product Qualification and Requalification Test Sequence shown in Figure 2.*

3.5. Product Qualification and Requalification Test Sequence

TEST OR EXAMINATION	TEST GROUP (a)										
	1	2	3	4	5	6	7	8	9	10	11
	TEST SEQUENCE (b)										
Initial examination of product	1	1	1	1	1	1	1	1	1	1	1
LLCR	2,6		2,7				2,7	2,6	2,6	2,6	
Withstanding Voltage			4,9				4,9	4,8	4,8	4,8	
Insulation Resistance			3,8				3,8	3,7	3,7	3,7	
Temperature Rise vs. Current				2							
Sinusoidal Vibration	3										
Mechanical Shock	4										
Durability	5										
Contact Engaging/Separating force		2									
Connector Mating/Unmating Force		3									
Crimp Tensile Strength					2						
Contact Insertion Force						2					
Contact Retention Force						3					
Thermal Shock			5								
Humidity/Temperature Cycling			6								
Temperature Life							5				
Salt Spray								5			
Hydrogen Sulfide									5		
Ammonia										5	
Resistance to Cold							6				
Glow Wire Test											2
Final Examination of Product	7	4	10	3	3	4	10	9	9	9	3

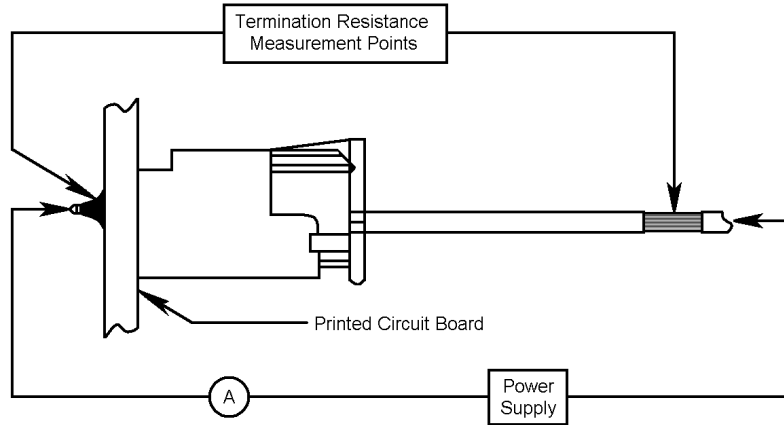
Figure 2



**NOTE**

(a) See paragraph 4.2.

(b) Numbers indicate sequence in which tests are performed.



**Figure 3: LLCR Measurement Points (Subtract Wire Bulk)**

**4. QUALITY ASSURANCE PROVISIONS**

4.1. Test Conditions

Unless otherwise specified, all the tests shall be performed in any combination of the following test conditions shown in Figure 4.

Temperature	15°C – 35°C
Relative Humidity	45% – 75%
Atmospheric Pressure	86.6 – 106.6 kPa

**Figure 4**

4.2. Qualification Testing

A. Specimen Selection

Specimens shall be prepared in accordance with applicable instruction sheets and shall be selected at random from current production. See Figure 5 for minimum number of connectors per test group

WIRE SIZE	TEST GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Awg 24	3		3	3	3	3	3	3	3	3	
Awg 22	3		3	3	3		3				
Any Size		5									5

**Figure 5**

**B. Test Sequence**

Qualification inspection shall be verified by testing specimens as specified in Figure 5 **Error! Reference source not found.**

**4.3. 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.

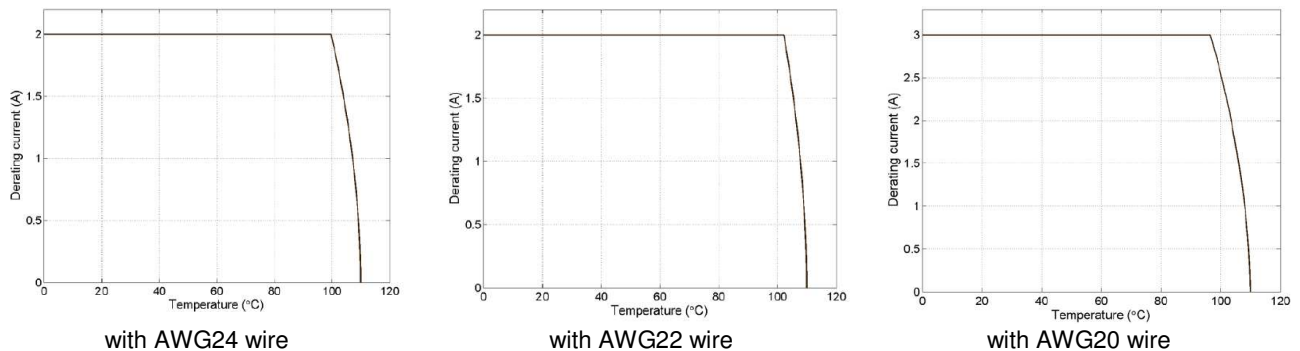
**4.4. Acceptance**

Acceptance is based on verification that the product meets the requirements in Figure 1. 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 resubmittal.

**4.5. 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.

**5. DERATING CURVE**



**Figure 6**