



The product described in this document has not been fully tested to ensure conformance to the requirements outlined below. Therefore, TE Connectivity (TE) makes no representation or warranty, express or implied, that the product will comply with these requirements. Further, TE may change these requirements based on the results of additional testing and evaluation. Contact TE Engineering for further details.

MCP 2.8 / 6.3 / 9.5 HYBRID SERIES

1. SCOPE

1.1. Content

This specification covers the requirements for product performance, test methods and quality assurance provisions of MCP 2.8/6.2/9.5 HYBRID SERIES

1.2. Qualification

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

1.3. Qualification Test Results

Successful qualification testing on the subject product line has not been completed. The Qualification Test Report number will be issued upon successful qualification testing.

2. APPLICABLE DOCUMENTS AND FORMS

The following documents and forms constitute a part of this specification to the extent specified herein. Unless otherwise indicated, the latest edition of the document applies.

2.1. TE Documents

- 1743134: Customer Drawing (HYBRID 60P PLUG ASSEMBLY BOLT TYPE)

3. REQUIREMENTS

3.1. Design and Construction

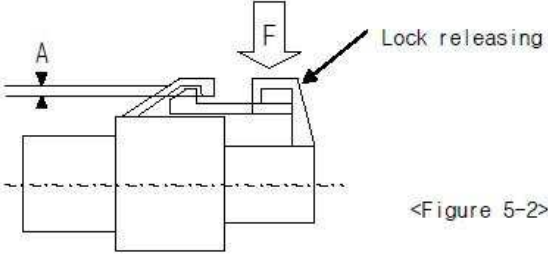
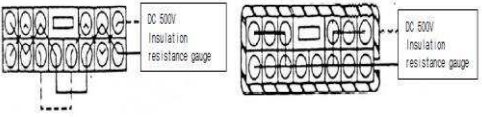
Product shall be of the design, construction, materials and physical dimensions specified on the applicable product drawing.

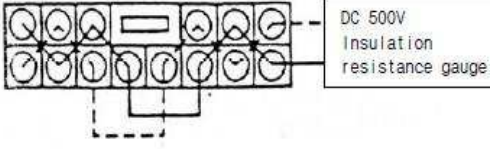
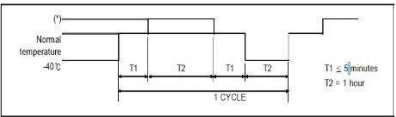
3.2. Ratings

Voltage	Temperature	Humidity
12V DC	25±5°C	65±20%

3.3. Test Requirements and Procedures Summary

Unless otherwise specified, all tests shall be performed at ambient environmental conditions.

TEST DESCRIPTION	REQUIREMENT	PROCEDURE																		
Appearance	No crack, damage, distortion are permitted	Using sense of sight and touch.																		
Reverse insertion between housings	It shall not be incorrectly inserted by applying force of 30kgf.	Insert the housing with terminal by pushing it in reverse direction with applying 30kgf.																		
Strength of HSG lock	Min 10kgf	Combine housing only, fix the one side of housing in completely locked condition, and extend the other side in axial direction and 30 angle direction at a constant speed of 20~200mm/min. Then measure weight when lock structure is disengaged or destroyed.																		
HSG lock releasing force	Max 5kgf	Apply force (F) to lock releasing part, and measure weight on the point of A=0. However, cut connector and then perform test at the section in order to secure visibility.  <Figure 5-2>																		
Terminal retention force	Min 10kgf	Fix the housing after inserting crimped terminals. Extend one line of cable in axial direction at a speed of 50mm/min at a position 20~200mm away from crimped part, and measure weight when terminal is disengaged from the housing.																		
Crimp strength (kgf)	<table border="1" data-bbox="357 1228 755 1302"> <thead> <tr> <th>SO</th> <th>0.3</th> <th>0.5</th> <th>0.9</th> <th>1.3</th> <th>2.0</th> <th>3.0</th> <th>5.0</th> <th>6.0</th> </tr> </thead> <tbody> <tr> <td>Kgf (MIN.)</td> <td>6</td> <td>9</td> <td>13</td> <td>17</td> <td>20</td> <td>35</td> <td>40</td> <td>4.5</td> </tr> </tbody> </table>	SO	0.3	0.5	0.9	1.3	2.0	3.0	5.0	6.0	Kgf (MIN.)	6	9	13	17	20	35	40	4.5	Fix the crimped terminal and draw the cable at a position 50±5 mm away from crimped part in axial direction at 100 mm/min speed. Then measure the weight when cable is cut or disengaged from the crimped part
SO	0.3	0.5	0.9	1.3	2.0	3.0	5.0	6.0												
Kgf (MIN.)	6	9	13	17	20	35	40	4.5												
Voltage Drop	Max 3 mV/A	Measure the circuit voltage drop (V) by sending voltage and current described in the table 5-1 with terminal combined on the connector. Then calculate a voltage drop (VD) in terminal by subtracting cable resistance (L) from the circuit voltage drop (V). 1) HARNESS versus UNIT: $VD = V(L3+L4)$ <table border="1" data-bbox="836 1501 1404 1627"> <thead> <tr> <th>Application</th> <th>Open voltage</th> <th>Short circuit current</th> <th>Division</th> </tr> </thead> <tbody> <tr> <td>Signal circuit</td> <td>20 ± 5 mV</td> <td>10 mA</td> <td>ECU, Sensor</td> </tr> <tr> <td>Power circuit</td> <td>13 V</td> <td>1 A</td> <td>Other than the above</td> </tr> </tbody> </table> <Table5-1>	Application	Open voltage	Short circuit current	Division	Signal circuit	20 ± 5 mV	10 mA	ECU, Sensor	Power circuit	13 V	1 A	Other than the above						
Application	Open voltage	Short circuit current	Division																	
Signal circuit	20 ± 5 mV	10 mA	ECU, Sensor																	
Power circuit	13 V	1 A	Other than the above																	
Insulation resistance	Min 100 MΩ	Measure resistance between neighbor terminals (figure 5-6), and between terminal and housing surface (figure 5-7) with DC 500V insulation resistance gauge with connector combined.  <Figure 5-6: Between neighboring terminals> <Figure 5-7: Between neighboring terminal and housing surface>																		

Leakage current	Max 1 mA		Measure it by applying DC 13V between neighboring terminals (figure 5-6).  <Figure 5-6: Between neighboring terminals>										
High voltage test	No allowed Insulation breakdown		Measured by applying test potential of 1000 V AC between the adjacent contact between the contact and housing.										
Temperature Rise	Max 30°C		After the electrode reaches saturation temperature by supplying current to the connected connector, measure the temperature of the terminal compression.										
Connector Engage and Disengage Endurance Test	Appearance	No crack, damage, distortion are permitted	Make combine connectors engage and disengage at 20~200mm/min. Perform it 30 times. (Do not use locking device)										
	Voltage Drop	Max 6 mV/A											
Twisting Test	Appearance	No crack, damage, distortion are permitted	Apply 8kgf force on the end part of combined connector 10 times each in the (front, rear, left, right) directions perpendicular to axial direction.										
	Voltage Drop	Max 6 mV/A											
Mechanical Shock	Appearance	No crack, damage, distortion are permitted	Engage connector with terminal and then perform the following test. <table border="1" data-bbox="824 1075 1414 1262"> <thead> <tr> <th>Division</th> <th>Condition</th> </tr> </thead> <tbody> <tr> <td>Frequency</td> <td>20Hz ~ 200Hz</td> </tr> <tr> <td>Vibration direction</td> <td>Up / Down</td> </tr> <tr> <td>Vibration acceleration</td> <td>44 m/s²</td> </tr> <tr> <td>Vibration time</td> <td>8 hours</td> </tr> </tbody> </table>	Division	Condition	Frequency	20Hz ~ 200Hz	Vibration direction	Up / Down	Vibration acceleration	44 m/s ²	Vibration time	8 hours
	Division	Condition											
Frequency	20Hz ~ 200Hz												
Vibration direction	Up / Down												
Vibration acceleration	44 m/s ²												
Vibration time	8 hours												
Over Current Cycle Test	Instant short circuit	Max 10 μ S											
	Appearance	No crack, damage, distortion are permitted	Engage connector with terminal assembled and apply the following current 1000 cycles for the connector with electrodes in series at 60°C of ambient temperature.										
	Voltage Drop	Max 6 mV/A											
Temperature Rise	Max 50°C												
Cold temperature test	Appearance	No crack, damage, distortion are permitted	Engage connector with terminal assembled, and leave it in temperature chamber of -40°C for 24ours. Make connector engaged and disengaged 5 times immediately (Voltage drop & Temperature rise test perform at normal temperature)										
	Voltage Drop	Max 6 mV/A											
Cold and hot temperature shock test	Appearance	No crack, damage, distortion are permitted	Engage Connector with terminal assembled, and this repeats 100 CYCLE by below test condition. (ENG ROOM : 120°C, ENG ROOM except : 80°C) 										
	Voltage Drop	Max 6 mV/A											

Freeze test.	Appearance	No crack, damage, distortion are permitted.	After immersed in boiling water (100 °C) for 60 minutes with the connector combined, freeze at -30 °C and measure the voltage drop and leakage current.												
	Voltage Drop	Max 6 mV/A													
	Leakage current	Max 1 mA													
Dust Test	Appearance	No crack, damage, distortion are permitted	Engage connector with terminal assembled and diffuse 1.5kg Portland cement(JIS R5210) with fan (or others) for 10 seconds per 15 minutes while maintaining 150mm distance from wall in the closed container of 900~1200mm length, width and height, with connector combined. After 1 hour, measure it.												
	Voltage Drop	Max 6 mV/A													
Oil and liquid test	Appearance	No crack, damage, distortion are permitted	Engage connector with terminal assembled, and perform test each sample with connector combined. A. Immerse connector in combined state for 2 hours in mixed oil of 50± 2°C ENG oil (SAE10W) or equivalent oil and B. Immerse connector in combined state for 1 hour in car gasoline (JIS K2202) at normal temperature, and then pick it out. C. Immerse connector in combined state for 1 hour in brake liquid (pure product) at normal temperature, and then pick it out. D. Immerse connector in combined state for 1 hour in 100% washer liquid (pure product) at normal temperature, and then pick it out. E. Immerse connector in combined state for 1 hour in 50% LLC (Long life coolant) at normal temperature, and then pick it out.												
	Voltage Drop	Max 6 mV/A													
Ozone Test	Appearance	No crack, damage, distortion are permitted	Engage Connector with terminal assembled and samples keep at 38±2°C and 50±5pphm Ozone for 100hour.												
	Voltage Drop	Max 6 mV/A													
Salt Water Test	Appearance	No crack, damage, distortion are permitted	Engage connector with terminal, and put it in 35°C temperature regulation chamber, spray 5% salty water for 24 hours according to JIS Z2371, and, maintain room temperature without spray for 1 hour, Then repeat this four times. Then pick connector out of chamber and dry it at room temperature for 2 hours or more.												
	Voltage Drop	Max 6 mV/A													
Sulfur (SO ₂) gas test	Appearance	No crack, damage, distortion are permitted	Engage connector with terminal assembled, and expose it in combined state to sulfur gas of 40±2°C, density 10ppm, humidity 90~95%, for 24 hours. Then pick connector out of chamber and dry it for 2 hours or more.												
	Voltage Drop	Max 6 mV/A													
Complex environment endurance test	Appearance	No crack, damage, distortion are permitted	Engage connector with terminal and then perform the following vibration test.												
	Voltage Drop	Max 6 mV/A													
	Insulation resistance	Min 100 MΩ													
	Temperature Rise	Max 5°C													
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	Instant short circuit	Max 10 μ s	Vibration time	20 min/cycle(11.7 Hz~200Hz~11.7Hz)
			Connector attaching method	Test mode A, B, C

3.4. Applied Part No List

TE Part no	Description
1743134-2	HYBRID 60P PLUG ASS'Y
1-1743134-3	HYBRID 60P PLUG ASS'Y
2-1743134-3	HYBRID 60P PLUG ASS'Y