



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.

MQS 64P LIF CONNECTOR SERIES

1. SCOPE

1.1. Content

This specification covers the requirements for product performance, test methods and quality assurance provisions of MQS 64P LIF CONNECTOR 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

- 368434: Customer Drawing (64 POSITION FEMALE CONNECTOR ASS'Y)
- 368440: Customer Drawing (MQS RETAINER HSG FOR 64 POS.)
- 368441: Customer Drawing (COVER HSG FOR 64 POS)

3. REQUIREMENTS

3.1. Design and Construction

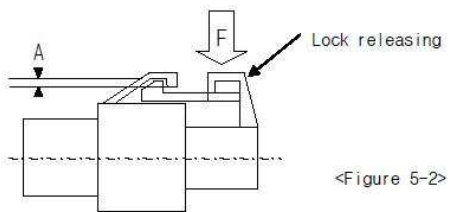
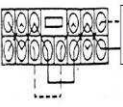
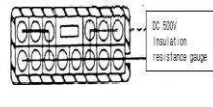
Product shall be of the design, construction, materials and physical dimensions specified on the applicable product drawing.

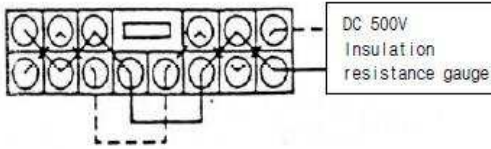
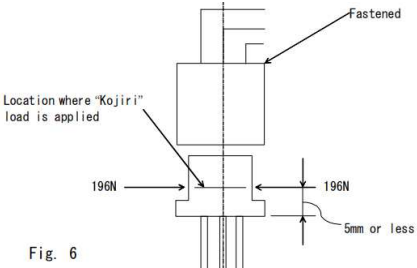
3.2. Ratings

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.																		
CONN insertion and extraction force	Max 18.0 kgf	Measure force by inserting and disengaging the connector with terminal assembled at constant 100 mm/min speed.																		
HSG to HSG Inverse force	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.																		
CONN locking Strength	Min 10kgf	Combine housing only, fix the one side of housing in completely locked condition, and extend the other side in axial direction at a constant speed of 50mm/min. Then measure weight when lock structure is disengaged or destroyed.																		
CONN lock release force	Max 6kgf	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>																		
Contact retention fore	Min 10kgf	Fix the housing after inserting crimped terminals. Extend one line of cable in axial direction at a speed of 50~100mm/min at a position 50~100mm away from crimped part, and measure weight when terminal is disengaged from the housing.																		
Crimp tensile strength	<table border="1" data-bbox="357 1207 755 1281"> <tr> <td>SO</td> <td>0.3</td> <td>0.5</td> <td>0.9</td> <td>1.3</td> <td>2.0</td> <td>3.0</td> <td>5.0</td> <td>6.0</td> </tr> <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> </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	090 ~ 375 : Max 3 mV/A 030 ~ 070 : Max 5 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="795 1480 1372 1606"> <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	Sealed : Min 250 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>																		

Current leakage	Sealed : Max 100 μ A		<p>Measure it by applying DC 13V between neighboring terminals (figure 5-6).</p>  <p><Figure 5-6: Between neighboring terminals></p>										
Dielectric withstand voltage	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.										
Waterproof test	Min 1.0 kg/cm ²		Place the connector in water, and must withstand the air pressure of 10Kpa for 30cm deep water. Increase pressure at a rate of a rate of 10Kpa until air leakage laces place.										
Resistance to Kojiri	Appearance	No crack, damage, distortion are permitted	<p>After the cap housing connector is fastened, the plug housing is mated in the regular manner and then 196N force is applied to and fro twice as shown in Fig.6. This test is repeated with the connector half if pulled from other half with slide distance stepped up by an increment of 1mm each time until the connector is fully unmated. These test procedure is defined as one cycle and is repeated 25 cycles. Test with the force applied towards right and left, is also made in the same manner. (Test with the force applied towards combined direction of to/fro and right/left is also acceptable.)</p>  <p>Fig. 6</p>										
	Voltage Drop	Max 10 mV/A											
Connector Engage and Disengage Endurance Test	Appearance	No crack, damage, distortion are permitted	Measure the required force to mate Connector as speed of 100 min/min. (Repeat 50 cycle)										
	Voltage Drop	Max 10 mV/A											
Impact test	Appearance	No crack, damage, distortion are permitted	<p>Engage connector with terminal assembled and conduct the test in the following conditions.</p> <table border="1" data-bbox="786 1682 1377 1871"> <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>Vertical</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	Vertical	Vibration acceleration	44 m/s ²	Vibration time	8 hours
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Voltage Drop	Max 10 mV/A												
Instant short circuit	Max 10 μ S												

Over Current Cycle Test	Appearance	No crack, damage, distortion are permitted		Engage connector with terminal assembled and apply the following current 100 cycles for the connector with electrodes in series at 60 °C of ambient temperature.																								
	Voltage Drop	Condition A	Max 10mV/A																									
		Condition B																										
Temperature Rise	Condition A	Max 40°C																										
	Condition B																											
		<table border="1"> <tr> <td rowspan="2">Applying Condition A</td> <td>Applied Current</td> <td>2 times of basic Current</td> </tr> <tr> <td>Current application time</td> <td>1min-ON, 9min-OFF</td> </tr> <tr> <td rowspan="2">Applying Condition B</td> <td>Applied Current</td> <td>5 times of basic Current</td> </tr> <tr> <td>Current application time</td> <td>10sec-ON, 590sec-OFF</td> </tr> </table>			Applying Condition A	Applied Current	2 times of basic Current	Current application time	1min-ON, 9min-OFF	Applying Condition B	Applied Current	5 times of basic Current	Current application time	10sec-ON, 590sec-OFF														
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Cold Resistance test	Appearance	No crack, damage, distortion are permitted		Engage connector with terminal assembled 10 times with hands and leave it in temperature chamber of -40°C for 120ours. Make connector engaged and disengaged 5 times immediately (Voltage drop & Temperature rise test perform at normal temperature) :																								
	Voltage Drop	Max 10 mV/A																										
Thermal shock test	Appearance	No crack, damage, distortion are permitted		Engage Connector with terminal assembled 10 times with hands and this repeats 200 CYCLE by below test condition. (ENG ROOM : 120°C, ENG ROOM except : 80°C)																								
	Voltage Drop	Max 10 mV/A																										
	Sealing	Min 0.5kgf/cm ²																										
Freezing 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 10 mV/A																										
	Leakage current	Max 100 μA																										
Dust Bombardment Test	Appearance	No crack, damage, distortion are permitted		Engage connector with terminal assembled 10 times with hands and diffuse 1.5kg Portland cement(JIS R5210) with fan (or others) for 10 seconds per 15 minutes while maintaining 150 mm 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 10 mV/A																										
Watertight Sealing Test	Appearance	No crack, damage, distortion are permitted		Engage connector with terminal assembled 10 times with hands and leave it in combined state at 120 °C ambient temperature for 40 minutes and then spray water of normal temperature for 20 minutes according to S2 of JIS D0203. Repeat 48 cycles of this. * JIS D0203 S2 condition: attach specimen at 400mm distance from the waterproof pipe with water spray hole or water discharge hole, and rotate waterproof pipe 23 times per minute around the axis.																								
	Voltage Drop	Max 10 mV/A																										
	Leakage current	Max 100 μA																										
Resistance to Oil	Appearance	No crack, damage, distortion are permitted		Engage and disengage Connector with terminal assembled 10 times with hands, and immerse mated connectors into oils the following in the specified sequence.																								
	Voltage Drop	Max 10 mV/A																										
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Ozon Weather Test	Appearance	No crack, damage, distortion are permitted	Engage and disengage Connector with terminal assembled 10 times with hands and samples keep at 38±2°C and 50±5pphm Ozone for 100hour.																																		
	Voltage Drop	Max 10 mV/A																																			
	Sealing	Min 0.5kgf/cm ²																																			
Salt spray test	Appearance	No crack, damage, distortion are permitted	Engage and disengage Connector with terminal assembled 10 times with hands 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 10 mV/A																																			
SO2 Corrosion test	Appearance	No crack, damage, distortion are permitted	Engage and disengage Connector with terminal assembled 10 times with hands, 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 10 mV/A																																			
Composite Environmental Vibration/ Mechanical test	Appearance	No crack, damage, distortion are permitted	<p>Engage and disengage Connector with terminal assembled 10 times with hands and then perform the following vibration test.</p> <p>1) Sign wave test</p> <table border="1"> <thead> <tr> <th>Division</th> <th>Condition</th> </tr> </thead> <tbody> <tr> <td>Ambient temperature/humidity</td> <td>120°C</td> </tr> <tr> <td>Applied current</td> <td>Basic current</td> </tr> <tr> <td>Vibration acceleration</td> <td>-</td> </tr> <tr> <td>Current application cycle</td> <td>120 Cycle (45 min:on / 15 min:off)</td> </tr> <tr> <td>Frequency</td> <td>20Hz ~ 200Hz (sweep time 3min max)</td> </tr> <tr> <td>Vibration time</td> <td>X,Y,Z axial – each 40 hours</td> </tr> </tbody> </table> <p>2)Random wave test</p> <table border="1"> <thead> <tr> <th>Division</th> <th>Condition</th> </tr> </thead> <tbody> <tr> <td>Ambient temperature/humidity</td> <td>120°C</td> </tr> <tr> <td>Applied current</td> <td>Basic current</td> </tr> <tr> <td>Current application cycle</td> <td>120 Cycle (45 min:on / 15 min:off)</td> </tr> <tr> <td>Vibration time</td> <td>X,Y,Z axial – each 40 hours</td> </tr> </tbody> </table> <p>가속도 G 25 20 15 10 5 0 0.01 0.1 1 10 100 1000 Hz PSD (G/Hz)</p> <table border="1"> <thead> <tr> <th>Breakpoint (Hz)</th> <th>Magnitude</th> </tr> </thead> <tbody> <tr> <td>60.0</td> <td>0.20100</td> </tr> <tr> <td>200.0</td> <td>1.50000</td> </tr> <tr> <td>210.0</td> <td>0.10000</td> </tr> <tr> <td>1000.0</td> <td>0.10000</td> </tr> </tbody> </table> <p>Max 10 μs</p>	Division	Condition	Ambient temperature/humidity	120°C	Applied current	Basic current	Vibration acceleration	-	Current application cycle	120 Cycle (45 min:on / 15 min:off)	Frequency	20Hz ~ 200Hz (sweep time 3min max)	Vibration time	X,Y,Z axial – each 40 hours	Division	Condition	Ambient temperature/humidity	120°C	Applied current	Basic current	Current application cycle	120 Cycle (45 min:on / 15 min:off)	Vibration time	X,Y,Z axial – each 40 hours	Breakpoint (Hz)	Magnitude	60.0	0.20100	200.0	1.50000	210.0	0.10000	1000.0	0.10000
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3.4. Applied Part No List

TE Part no	Description
368434-1	64 POSITION FEMALE CONNECTOR ASSY
368434-2	64 POSITION FEMALE CONNECTOR ASSY
1-368434-1	64 POSITION FEMALE CONNECTOR ASSY
1-368434-2	64 POSITION FEMALE CONNECTOR ASSY
368440-1	MQS RETAINER HSG FOR 64 POS.
368441-1	COVER HSG FOR 64 POS.