

DD MMM YY Rev.A

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-E SEALED ASSEMLBY SERIES

1. SCOPE

1.1. Content

This specification covers the requirements for product performance, test methods and quality assurance provisions of MCP-E SEALED ASSEMLBY SERIES 6.3 2P Plug/CAP Assembly

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

- 114-61242: MCP-E SEALED 6P PLUG ASSEMBLY(INTERFACE DRAWING)
- 936245: Customer Drawing (MCP-E SEALED 4P PLUG ASSEMBLY)
- 936257: Customer Drawing (MCP-E SEALED 6P PLUG ASSEMBLY)
- 936293: Customer Drawing (MCP-E SEALED 4P CAP ASSEMBLY)
- 936294: Customer Drawing (MCP-E SEALED 6P CAP ASS'Y)
- 936303: Customer Drawing (COVER HSG FOR MCP-E SEALED 6P PLUG CONN'R)

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 engage and disengage force	Max 10 kgf and less	Measure force by inserting and disengaging the connector with terminal assembled at constant 50 mm/min speed. However, remove lock part when measuring disengage force.	
Reverse insertion between housings	It shall not be incorrectly inserted by applying force of 20kgf.	1) Insert terminal to housing 2) Fix housing of female connector to moving part of measuring instrument in reverse insertion direction. (Reverse insertion: 180 degree rotation on the locking part) 3) Set a measuring instrument to stop at force of 20kgf and insert that. At this moment, monitor resistance of one terminal matched to identify current carrying between terminals. 4) Check the insertion by housing modification of male connector after connector insertion.	
Reverse insertion between terminal and housing	5kgf or more	Crimp cable of maximum size on terminal and then insert it into housing by end of insulation barrel in the reserve direction.	
Engage force between terminal and housing	Max 1.5kgf or less	As shown in the following figure 4-1, measure the weight while inserting terminal into fixed housing at 50mm/min speed. Terminal Housing <figure 4-1=""></figure>	
CONN Clip panel engage and retention force	Engage: Max 12kgf or less Retention: Min 15kgf or more	Insert clip into the fixed plate that can be furnished with clip at 50mm/min and measure the force at that time. Pull clip at 50mm.min and measure the force when destroyed or disengaged	
Strength of HSG lock	Min 10kgf or less	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 50mm/min. Then measure weight when lock structure is disengaged or destroyed.	
HSG lock releasing 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	

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			test at the section in order to secure visibility.		
			A Lock releasing <pre> </pre> <pre> <pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre>		
Terminal retention force	Min	6kgf	Fix the housing after inserting crimped terminals. Extend one line of cable in axial direction at a speed of 50mm/min at a position 50~100mm away from crimped part, and measure weight when terminal is disengaged from the housing.		
Terminal engage and	Engage	0.3~1.5kgf	As shown in figure 4-3, engage and disengage male terminal or steel gauge into or from female terminal at 50 mm/min speed.		
disengage force (kgf)	Disengage	0.15~1.5kgf	Steel Female		
Crimp strength (kgf)	1.25SQ: Min 17kgf or more		Fix the crimped terminal, and draw the cable at a position 50~100 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		
Voltage	Max 3mV/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).		
Drop			1)HARNESS versus UNIT:VD =V(L3+L4) Application Open voltage Short-circuit current Division		
			Signal circuit 20 ± 5 mW 10 mA ECU, Sensor		
			Power circuit 13 V 1 A Other than the above		
			<table5-1></table5-1>		
Insulation resistance	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. Comparison of the content of the		
Leakage current	1 μ A or less		Measure it by applying DC 14V between neighboring terminals (figure 5-6).		

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Appearance Disengage Endurance Test Appearance Max 10mV/A Appearance Max 10mV/A Cold Insulation Resistance Leakage Temperature test Cold and hot temperature shock test Appearance Disengage Max 10mV/A Cold and hot temperature shock test Appearance Appearance Disengage Max 10mV/A Cold and hot temperature shock test Appearance Appearance Disengage Max 10mV/A Cold and hot temperature shock test Appearance Appearance Disengage Max 10mV/A Cold and hot temperature shock test Appearance Appearance Disengage Max 10mV/A Cold and hot temperature shock test Appearance Appearance Appearance Disengage Max 10mV/A Sealing Min 0.5kgf/cm² Appearance Appearance Appearance Disengage Max 10mV/A Appearance Disengage Adad disengage Connector with terminal assemble times with hands, this repeats 200 CYCLE by below test condition. (Sealed : 120°C, Non-Sealed : 80°C) Appearance Disengage Disengage Connector with terminal assemble times with hands, and leave it in combined state at the temperature chamber of the table 6-1 for 300 hours. Then it out and leave it until it returns to normal temperature. High Temperature Connector Using Part Disengage Disengage Connector with temperature. High Temperature Connector Using Part Disengage Disengage Connector With Leminal assemble times with hands, and leave it in combined state at the temperature chamber of the table 6-1 for	High voltage test	No allowed insulation breakdown			Figure 5–6: Between neighboring terminals> Measured by applying test potential of 1000 V AC between the adjacent contact between the contact and housing.
Disergage Endurance Test Appearance No crack, damage, distortion are permitted	Test - Connector	Appearance	distorti	on are	perpendicular to axial direction.
Appearance Appea	Disengage Endurance	M			100mm/min. Perform it 50 times.
Cold temperature test Cold temperature test Sealed temperature test Sealing test Sealing temperature test Sealing test Seali		Appearance	distorti	on are	
Cold temperature test Sealed CONN'R : High temperature shock test			Max 10mV/A		connector engaged and disengaged 5 times immediately, and
Temperature Rise Max 40°C Sealing Min 0.5kgf/cm² Cold and hot temperature shock test High temperature test Woltage Drop Appearance No crack, damage, distortion are permitted High Temperature Connector Using Part 120°C Waterproof Connector		Insulation			direction of figure 6-1. (Voltage drop & Temperature rise test
Cold and hot temperature shock test Cold and hot temperature shock test		Resistance		_	
Temperature Rise Max 40°C Sealing Min 0.5kgf/cm² No crack, damage, distortion are permitted Cold and hot temperature shock test Voltage Drop Appearance Max 10mV/A Woltage Drop Appearance No crack, damage, distortion. (Sealed : 120°C, Non-Sealed : 80°C) Sealing Min 0.5kgf/cm² No crack, damage, distortion are permitted Appearance No crack, damage, distortion are permitted Voltage Drop Max 10mV/A High temperature test Voltage Drop Max 10mV/A Sealing Min 0.5kgf/cm² Fingage and disengage connector with terminal assemble times with hands, and leave it in combined state at the temperature chamber of the table 6-1 for 300 hours. Then it out and leave it until it returns to normal temperature. High Temperature Connector Using Part 120°C Waterproof Connector				00 <i>μ</i> Α	
Cold and hot temperature shock test No crack, damage, distortion are permitted Voltage Drop Max 10mV/A Sealing No crack, damage, distortion are permitted No crack, damage, distortion. (Sealed : 120°C, Non-Sealed : 80°C) Woltage Drop Min 0.5kgf/cm² No crack, damage, distortion are permitted No crack, damage, distortion are permitted Voltage Drop Max 10mV/A Sealing Min 0.5kgf/cm² Fingage and disengage Connector with terminal assemble times with hands, and leave it in combined state at the temperature chamber of the table 6-1 for 300 hours. Then it out and leave it until it returns to normal temperature. High Temperature Connector Using Part 120°C Waterproof Connector			Max	40°C	← Serigure 6-1>
Appearance distortion are permitted Cold and hot temperature shock test Voltage Drop Max 10mV/A Sealing Min 0.5kgf/cm² No crack, damage, distortion are permitted Appearance Appearance Appearance Appearance No crack, damage, distortion are permitted Voltage Drop Max 10mV/A Sealing No crack, damage, distortion are permitted Voltage Drop Max 10mV/A Appearance		Sealing	Min 0.5	kgf/cm ²	
temperature shock test Sealing		Appearance	distorti	on are	· · · · · · · · · · · · · · · · · · ·
Sealing Min 0.5kgf/cm² No crack, damage, distortion are permitted High temperature test Voltage Drop Sealing Min 0.5kgf/cm² No crack, damage, distortion are permitted Max 10mV/A Max 10mV/A Sealing Min 0.5kgf/cm² Figure and disengage connector with terminal assemble times with hands, and leave it in combined state at the temperature chamber of the table 6-1 for 300 hours. Then it out and leave it until it returns to normal temperature. High Temperature Connector Using Part 120°C Waterproof Connector	temperature	temperature Voltage		0mV/A	Normal temperature
Appearance distortion are permitted times with hands, and leave it in combined state at the temperature chamber of the table 6-1 for 300 hours. Then it out and leave it until it returns to normal temperature. Voltage Drop	Sealing	Sealing	Min 0.5kgf/cm ²		T2 = 1 hour
temperature test Voltage Drop Max 10mV/A High Temperature Connector Using Part 120°C Waterproof Connector Figure 2 and diseases and diseases connector with terminal assembles		Appearance	distortion are		temperature chamber of the table 6-1 for 300 hours. Then pick
Sealing Min 0.5kgf/cm ² Uaterproof Connector Engage and disengage connector with terminal assemble	temperature	_	Max 10mV/A		
Appearance No crack, damage, Engage and disengage connector with terminal assemble	1001	Sealing	Min 0.5kgf/cm ²		120°C Waterproof Connector
		Appearance	No crack,	damage,	Engage and disengage connector with terminal assembled 10

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	Voltage	distortion are permitted Max 10mV/A		times with hands, and leave it at 25°C ambient temperature and 65% relative humidity for 25 hours. And perform 5 cycles of the method specified in figure 6-3. Then pick	
Риор	Drop		Datasas	connector out of chamber and dry	
			Between	it for 2 hours or more.	
Temperature	Insulation	Min 100	terminals	(°C) 60±2°C,90±5%RH	
Humidity	Resistance	MΩ	housing	90 ± 10%RH	
Test			surface	45± 2°C, 95± 5%,RH 25± 2°C 65± 10%,RH	
	Current Leakage	Max 100 <i>⊯</i> A		2hr 4hr 2hr 1thr 2hr 1thr 2hr 1.hr	
	Sealing	Min 0.5kgf/cm ²		1 CYCLE < Figure 6-3: Test pattern >	
	Appearance	No crack, damage, distortion are permitted		Engage and disengage 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 150mm distance from wall in the closed	
Dust Test	Voltage Drop	Max 10mV/A		container of 900~1200mm length, width and height, with connector combined. After 1 hour, measure it.	
	Sealing	Min 0.5kgf/cm ²			
		No crack, damage,		Make combined connectors engaged and disengaged 10 times k	
	Appearance	distortion are permitted		hands, and leave it in combined state at 120 °C ambient temperator 40 minutes and then spray water of normal temperature for 2	
			Between	minutes according to S2 of JIS D0203. Repeat 48 cycles of this. * JIS D0203 S2 condition: attach specimen at 400mm distance f	
Waterproof	Insulation Min Resistance 100 №	terminals	the waterproof pipe with water spray hole or water discharge hole		
Test		100 MΩ	housing	and rotate waterproof pipe 23 times per minute around the axis.	
			surface		
	Current Leakage	Max 100 μA			
	Sealing	Min 0.5	kgf/cm ²		
	Appearance	No crack, damage, distortion are permitted		Engage and disengage connector with terminal assembled 10 times with hands, and perform test each sample with connector combined.	
	Voltage	May 1	0mV/A	A. Immerge connector in combined state for 2 hours in mixed	
	Drop	IVIAX I	UIIIV/A	oil of 50± 2°C ENG oil (SAE10W) or equivalent oil and	
Oil and liquid test	Sealing	Min 0.5kgf/cm ²		B. Immerge connector in combined state for 1 hour in car gasoline (JIS K2202) at normal temperature, and then pick it out. C. Immerge connector in combined state for 1 hour in brake liquid (pure product) at normal temperature, and then pick it out. D. Immerge connector in combined state for 1 hour in 100% washer liquid (pure product) at normal temperature, and then pick it out. E. Immerge connector in combined state for 1 hour in 50% LLC (Long life coolant) at normal temperature, and then pick it out.	
Ozone Test	Appearance	No crack, damage, distortion are permitted		Engage and disengage Connector with terminal assembled 10 times with hands, and samples keep at 40℃ and 50±5pphm	

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	Voltage Drop	Max 10mV/A Min 0.5kgf/cm ²		Ozone for 100hour. The dry it for 2hours or more	en pick connector out of chamber and e.
	Sealing				
	Appearance	No crack, damage, arance 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	
	Voltage Drop	Max 10	DmV/A	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.	
Salt Water			Between	Chamber and dry it at ro	of the inperature for 2 hours of more.
Test	Insulation	Min 100	terminals		
	Resistance	МΩ	housing		
			surface		
	Current Leakage	Max 1	00 μΑ		
	Appearance	No crack, distorti	on are		connector with terminal assembled 10 expose it in combined state to sulfur gas
Sulfur (SO2)		perm	itted		m, humidity 90~95%, for 24 hours.
gas test	Voltage Drop	Max 10mV/A		more.	t of chamber and dry it for 2 hours or
	Sealing	Min 0.5kgf/cm ²			
Mechanical shock test	Instant short circuit: Max 10 μs		with hands, and apply 1 direction of figure 20 an samples. Perform test in open voltage and 10mA Shock direction HARNESS 200mm or more		
-				< Fig. 6-4 >	< Fig. 6-5 >
Complex environment	Appearance	No crack, damage, distortion are permitted		times with hands, and le temperature chamber of hours. And then perform the fo	connector with terminal assembled 10 eave it in combined state in the f 120°C or 80°C (follows table 7) for 48 ellowing vibration test. Then measure ording to the method of clause 4.16 for it.
endurance test	Crimp Tensile Strength	1.25SQ	Min	Division	Condition
			17kgf or more	Ambient temperature/humidity	Refer to figure 4-8, 90~95%
	Guengui		111016	Applied current	Basic current (Connector electrodes in series.)
				Current application cycle	120 CYCLE (45 minutes-ON, 15 minutes-OFF)
				Vibration acceleration	Follow figure 6-7

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		Frequency	20Hz ~ 200Hz (sweep time: 3 minutes or less)	
Voltage Drop Max		Vibration time	40 hours for X, Y, Z each	
	Max 10mV/A	Connector attaching method	Test mode A, B, C	
_		Acceleration G		
Temperature Rise	Max 40°C	2) Random Wave Test	Frequency 150 180 200 Hz	
		Division	Condition	
		Ambient temperature/humidity	Refer to figure 4-8, 90~95%	
		Applied current	Basic current (Connector electrodes in series.)	
		Current application cycle	24 CYCLE (45 minutes-ON, 15 minutes-OFF)	
Instant short	Max 10 <i>⊯</i> s	Vibration acceleration	Follow figure 6-8	
on out		Frequency 20Hz ~ 200Hz (sweep time minutes or less)		
		Vibration time	8 hours for X, Y, Z each	
		Connector attaching method	Test mode D, E, F	
Sealing	Min 0.5kgf/cm ²	PSD (G*/Hz) 10 1 0.1 0.01 0 500 Frequency	Breakpoint Magnitude (84)+E) 60.0 0.00100 200.0 1.50000 210.0 0.10000 1000.0 0.10000 1000.0 1000	

3.4. Applied Part No List

TE Part no	Description
936254-2	MCP-E SLD 4P PLUG ASSY BLK
936257-2	MCP-E SLD 6P PLUG ASSY BLK
936293-2	MCP-E SLD 4P CAP ASSY BLK
936294-2	MCP-E SLD 6P CAP ASSY BLK
936294-3	MCP-E SLD 6P CAP ASSY GRY
936303-2	COVER FOR MCP-E SLD 6P PLUG

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