

DESIGN OBJECTIVES

GB DC/AC CHARGING INLET

108-101624(Restricted for JLR)

The product described in this document has not been fully tested to ensure conformance to the requirements outlined herein. TE Connectivity makes no representation or warranty, express or implied that the product will comply with these requirements. Further, TE Connectivity reserves the right these requirements based on the results of additional testing and evaluation. Contact TE Connectivity Engineering for further information. If necessary, This document will become the Product Specification at successful completion of testing.

1. Scope:

1.1 Content

This specification covers the requirements for product performance, test methods and quality assurance provisions of GB DC/AC CHARGING INLET.

GB TWIN CHARGING INLET: Consists of inlet Assy, Flap Assy, sealing, cover.....,the detail see the drawing 2327420/2337337

2. Applicable Documents:

The following documents form a part of this Specification to the extent specified herein. In the event of conflict between the requirements of this Specification and 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:

- A. 109 SERIES: General Requirement for Test Specification
- B. 108-94519: Product Specification, TE actuator for charging inlets
- C. 114-101059: Application specification, 12mm Circle Terminal for charging inlet
- D. 114-101060: Application specification, 6mm PE terminal for charging inlet
- E. 114-101097: Application specification, Close crimp terminal for charging inlet
- F. 114-13000: Application specification, Micro Mate-N-Lock connectors

2.2 OTHER DOCUMENTS:

- A. GB GB20234.1.
- B. LV214
- C. USCAR-2 REVISION 6
- D. SAE J1772
- E. CETP00 00E412
- F. TPJLR.18.125

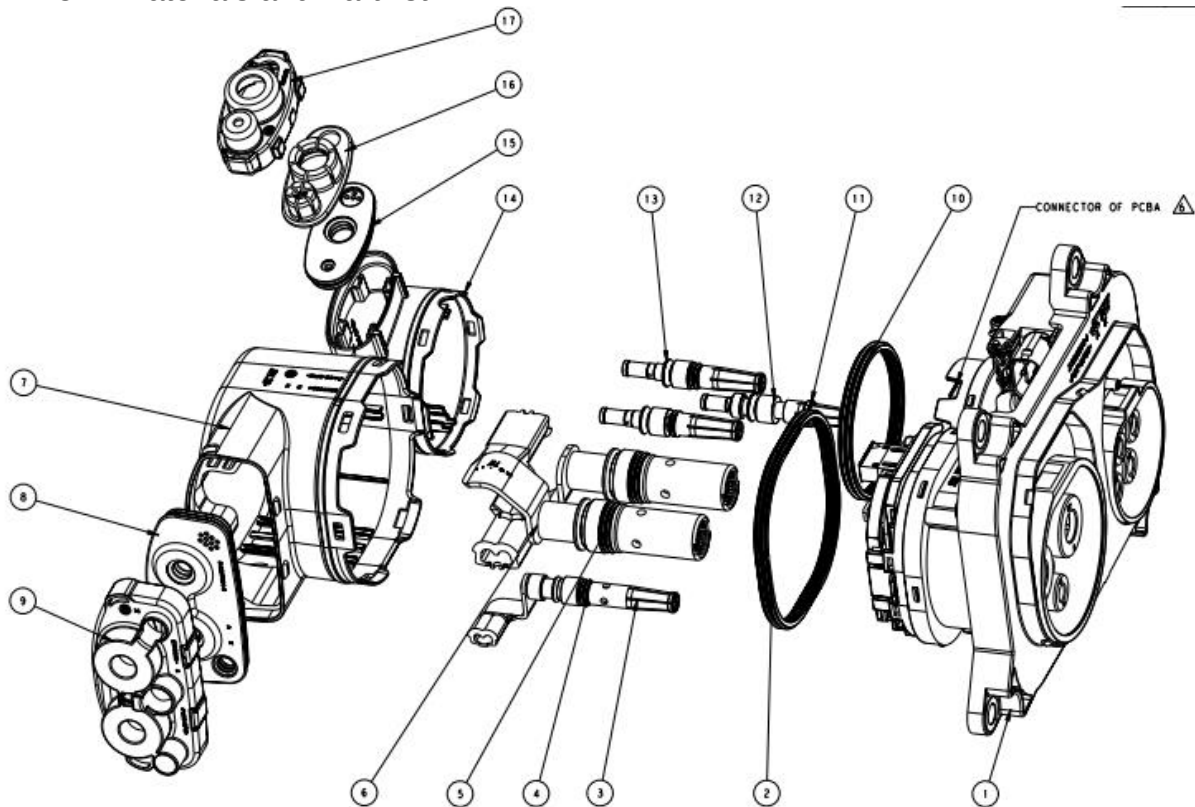
				DR P.YANG 31MAY19				TE Connectivity Shanghai, China	
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				APP I.YIN 31MAY19		NO. 108-101624		REV 1	
				PAGE	TITLE				
1	PRELIMINARY	PL.Y	31MAY19	1 of 14	GB DC/AC CHARGING INLET				
LTR	REVISION RECORD	DR	DATE						

3. Requirements:

3.1 Design and Construction

Product shall be of the design, construction and physical dimensions specified in the Applicable product drawing.

3.2 Materials and Part list



1	1	1	2322311-1	ORANGE	PA66-GF15	SEALING COVER,GB AC	17
1	1	1	2322310-1	NATURAL	PA66-GF15	STRAIN RELIEF, GB AC	16
1	1	1	2322309-1	NATURAL	ELASTOMER	FAMILY SEALING,GB AC	15
1	1	1	2322308-1	ORANGE	PA66-GF15	COVER,GB AC	14
2	2	2	2327099-1	-	COPPY-ALLOY	L1&N TERMINAL(6MM),GB AC (CRIMP 4MM2 WIRE)	13
1	1	1	2327544-1	-	COPPY-ALLOY	PE TERMIANL(6MM),GB AC (CRIMP 4MM2 WIRE)	12
3	3	3	2309448-2	WHITE	ELASTOMER	SWS FOR 6MM TERMIANL	11
1	1	1	2322307-1	YELLOW	ELASTOMER	RADIAL SEAL, GB AC	10
1	1	1	2307665-2	ORANGE	PA66-GF15	SEALING COVER,GB DC	9
1	1	1	2307664-2	NATURAL	ELASTOMER	FAMILY SEALING,GB DC	8
1	1	1	2307662-2	ORANGE	PA66-GF15	COVER,GB DC	7
2	2	2	2325606-1	-	COPPY-ALLOY	TERMINAL ASSY DIA 12mm,GB DC (CRIMP 16MM2 WIRE)	6
2	2	2	2309448-3	WHITE	ELASTOMER	SWS FOR 12MM TERMIANL	5
1	1	1	2309448-2	WHITE	ELASTOMER	SWS FOR 6MM TERMIANL	4
1	1	1	2307087-1	-	COPPY-ALLOY	PE TERMINAL ASSY(6MM), GB DC (CRIMP 25MM2 WIRE)	3
1	1	1	2309463-1	YELLOW	ELASTOMER	RADIAL SEAL, GB DC	2
1	1	1	2324934-1	-	SEE THE 2324934 DRAWING	GB TW IN SUB-ASSY.	1
2327420-3	2327420-2	2327420-1	P/N	COLOUR	MATERIAL	DESCRIPTION	ITEM



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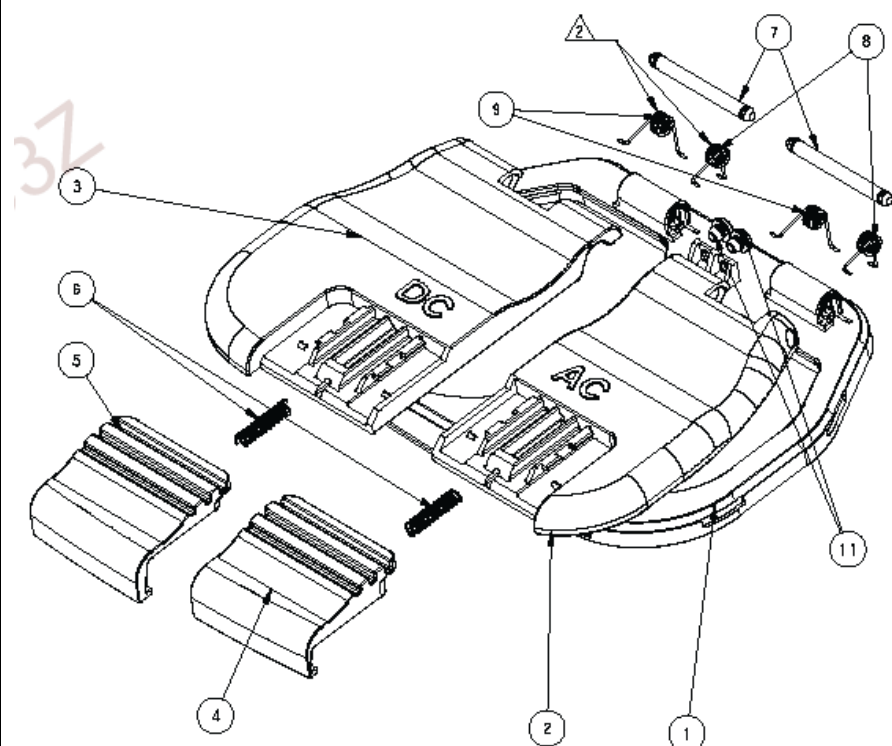
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2	2	2	-	EPDM	EROMMET, FLAP DAMPENER	10
2	2	2	-	SUS	SPRING, TORSION	9
2	2	2	-	SUS	SPRING, TORSION	8
2	2	2	-	SUS	BOLT, FLAP AXIS	7
2	2	2	-	SUS	SPRING	6
1	1	1	BLACK	PBT	LEVER, DC	5
1	1	1	BLACK	PBT	LEVER, AC	4
1	1	1	BLACK	PBT+TPV	FLAP DC	3
1	1	1	BLACK	PBT+TPV	FLAP AC	2
1	1	1	BLACK	PBT	CARRIER	1
2337337-3	2337337-2	2337337-1	COLOUR	MATERIAL	DESCRIPTION	ITEM

3.3 Ratings:

A. Operating temperature Range : -40°C to + 85°C

B. Current : DC 200A; AC 32A

C. Voltage: DC 500V; AC 265V

For application at higher voltage please contact TE Connectivity.

3.4 Quality Assurance Provision

A. Sample Preparation:

The test samples to be used for the test shall be prepared by random selection from the current production. No sample shall be reused, unless otherwise specified.

B. Test Condition:

All the test shall be performed under any combination of the following test condition, unless otherwise specified:

Room temperature: 23 ± 5 °C

Relative humidity: 45~75%

Atmospheric pressure: 860~1060 mbar

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3.5 Requirements and Procedures Summary

Para.	Test items	Requirements	Procedures		
GB SPEC					
3.5.1	Visual Inspection	The connector assembly must not show, with the aid of 10X magnification, any evidences of deterioration, cracks, deformities, etc...Connector locking mechanisms must function without breakage.	Visually, Dimensionally and Functionally inspected per applicable inspection plan. GB20234.1 7.2		
3.5.2	Retention Force, locked	200N min.	GB20234.1 7.3		
3.5.3	Mating Force/Un-mating force	DC: 140N max. AC: 100N max	GB20234.1 7.4		
3.5.4	Ageing resistance of rubber and thermoplastic materials	natural ventilate 168h/80°C	GB20234.1 7.8		
3.5.5	Dust/water protect when Connector Mated	IP55	GB20234.1 7.9		
3.5.6	Insulation resistance	500V d.c >100MΩ.	GB20234.1 7.10		
3.5.7	Dielectric intensity	DC: no breakdown 50/60Hz 2500V 1Min. AC: no breakdown 50/60Hz 2000V 1Min	GB20234.1 7.10		
3.5.8	Breaking capacity	DC:100A 1.1*rated voltage AC: 40A 1.1*rated voltage	GB20234.1 7.11		
3.5.9	Mechanical strength	1.Impact energy of pendulum impact test energy /J DC:4 AC:1	GB20234.1 7.15		
3.5.10	Screws, current-carrying parts and connection	2.5 Screws: 0.4N.m 10cycles 3.5 Screws: 0.8N.m 10cycles	GB20234.1 7.16		
3.5.11	Creepage distance, electrical clearance and sealant penetration distance	DC: Current Voltage 500V AC: Current Voltage 265V	GB20234.1 7.17		
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Para.	Test items	Requirements	Procedures
3.5.12	Resistance to heat, combustion and tracking	1.The test is made in a heating cabinet at a temperature of: (125 ± 5) °C for parts supporting live parts of rewirable accessories; (80 ± 3) °C for other parts 2.resistant to abnormal heat and to fire (650 ± 10) °C for parts of insulating material not necessary to retain current-carrying parts and parts of the earthing circuits in position, even though they are in contact with them (850 ± 15) °C for parts of insulating material necessary to retain current-carrying parts and parts of the earthing circuits in position 3.tracking PTI test; solution a; applied voltage 175V	GB20234.1 7.18
3.5.13	Resistance to corrosion and rusting	1.immersed for 10 min in a 10 % solution of ammonium chloride in water at a temperature of (20 ± 5) ° C 2.placed for 10 min in a box containing air saturated with moisture at a temperature of (20 ± 5) ° C	GB20234.1 7.19
3.5.14	Conditional short-circuit current withstanding test	withstand of 10 kA or of a higher value specified	GB20234.1 7.20
SPECIFIC-----MECHINCAL &ENVIRONMENTAL TEST			
3.5.15	Determination of Contact Insertion Forces	Only refer	LV214 PG8 E8.1
3.5.16	Contact Removal Forces from Housing (Primary Lock Only)	3mm and 6mm terminal >80N 12mm terminal >150N	LV214 PG8 E8.2.1
3.5.17	Contact Removal Forces from Housing (Secondary Lock)	3mm and 6mm terminal >120N 12mm terminal >200N	LV214 PG8 E8.2.2
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Para.	Test items	Requirements	Procedures
3.5.18	Mechanical Stability Of The Inlet/Carrier	Charging Socket Stability downwards 1000-1500N Charging Socket Stability upwards 800-1500N Charging Socket Stability left 500-1000N Charging Socket Stability right 500-1000N Charging Socket Stability Plugging 800-1500N	100mm from Interface
3.5.19	Mechanical Stability Of The front flap	Overopening/Left/Right	Data record
3.5.20	Drop Test	Drop Test – left or right side Drop Test – top side Drop Test – interface-front	USCAR5.4.8
3.5.21	Parameter test	Inspect PCBA and Actuator LV signals	See appendix 5.1
3.5.22	Aging In Dry Heat	120H 85 °C	LV214 PG23 B19.3
3.5.23	Temperature Shock	Temperature Shock -40°C/85°C 144cycles 15Min respectively	LV214 PG23 B19.1
3.5.24	Immersion With Pressure Difference	IPX7	ISO 20653
3.5.25	Thermal Shock	Air temperature 85°C 30min each Water temperature 0°C 15min each in 5%NaCl	LV214 PG23 B23.3
3.5.26	Pressure Washer Test (IPX9K)	Test duration per side: 15 s Distance, nozzle-DUT: (100 – 150) mm Pressure: 80 bar Temperature: 80 °C The test is performed 3 times.	LV214 PG23 B23.4
3.5.27	Flap waterproof	IPX5(Flap closed)	ISO20653
3.5.28	Dynamic Load	Body sealed Tmax=85°C	LV214 PG17 B17.1& B17.2& B17.3

Para.	Test items	Requirements	Procedures
3.5.29	DUT's Inserted & Disconnected Twice	DC: 12mm Terminal AC: 6mm power Terminal	LV214 PG15 B15.1
3.5.30	Contact Opening Dimension	DC: 12mm Terminal AC: 6mm power Terminal	LV214 PG15 E5.1
3.5.31	Contact Resistance	Signal-contacts,PE,10pos Micro-MNL,MQS Actuator	LV214 PG15 E0.2 E14.0
3.5.32	Derating	DC:250A 750V AC:32A 265V	LV214 PG15 E12.2
3.5.33	Temperature & Current Endurance Cycling	Cycles:60	LV214 PG15 B15.2
3.5.34	Humid Heat Cycling	Number of cycles: 21 (1 day = 1 cycle) relative humidity 95%, Tu = 25 °C, To = 55 °C	LV214 PG15 E15.3
3.5.35	Temperature Rise & Voltage Drop	Temp Rise ≤50°C Delta ≤10°C	SAE J1772 App H
3.5.36	Temperature & Humidity exposure	85°C/85%/240h	USCAR-2 5.6.3
3.5.37	Salt & Sand Exposure	Plug dipped for 5sec. into 25mm high 5%NaCl+5%Sand acc. ISO12103-A4 Coarse Grade Test Dust; dried	SAE J1772 App H
3.5.38	2500 Mating & Un-mating Cycles	(NO CURRENT/VOLTAGE)	SAE J1772 App H
3.5.39	Dust protect without flap	IP6X	ISO20653
3.5.40	Low temperature exposure	24h @ T5 (-40 °C)	CETP00 00E412 6.4.5.1
3.5.41	Low temperature operation	24hours T1 (-40°C)	CETP00 00E412 6.4.5.2
3.5.42	High Temperature Exposure	1000h @ T6 (85°C)	CETP00 00E412 6.4.8.1
3.5.43	High Temperature operation	24h T2 (75°C)	CETP00 00E412 6.4.5.4
3.5.44	Thermal shock resistance	interval see Tab "Thermal shock 6.4.5.6" T5 (-40°C); T6 (85°C) 6 Cycles	CETP00 00E412 6.4.5.6
3.5.45	Audible Noise	Condition see 6.4.6.c	CETP00 00E412 6.4.6.2
3.5.46	Salt mist atmosphere	temperature: 35 ± 5 °C hours: 24h	CETP00 00E412 6.4.7.1

Para.	Test items	Requirements	Procedures
3.5.47	Chemical resistance	Dry heat 96h/+85 °C Kerosene/fuel/leather wax/car wax and silicone protectants/window glass cleaner/car wash soap/window washer fluid/damper oil/CaCl ₂	CETP00 00E412 6.4.7.2
3.5.48	Derating with housing	Current load: DC: 60A,80A and 100A AC: 19.2A, 25.6A and 32A Duration: each 20 minute	LV 214 PG13 EN 60512-5-1/2
3.5.49	Temperature rise LV 214 PG13	Current load: DC: 60A,80A and 100A AC: 19.2A, 25.6A and 32A Duration: each 20 minute	LV 214 PG13 EN 60512-5-1/2
3.5.50	Outside view crimp	CH min, CH max,	TE 109-18079
3.5.51	Cross section crimp	CH min, CH max	TE 109-18079
3.5.52	Wire pull out force	CH min. & CH max	EN 60512-16-4
3.5.53	Crimp resistance	Test current I = 1 A	EN 60512-2-2
3.5.54	Thermal Shock	T=- 40 °C / 100 °C each 15 min 500 cycles	EN 60068-2-14 Na
3.5.55	Humid Heat, cyclic	25 °C / 55 °C rel. humidity 95 %, 10 cycles 1 cycle = 24 h	EN 60068-2-30 Db
3.5.56	Flap durability	Cycles: 10000 Before and after Opening angle; 112+2/-10° C Opening and closure fore: Waterproof : IPX5	
3.5.57	Opening and closure force	Opening force: 5N-10N Closure force: 20N max.	
3.5.58	UV solar radiation resistance	500KJ/m ² ISO 105-AO2 Grey scale 4 Minimum No detrimental effect such as cracking,crazing,chalking,etc Any off-tone fade will also be cause for rejection	STJLR-51-5262 SAE j2527
3.5.59	Mar resistance	No marring at loads below 50g	TPJLR.52.002
3.5.60	High Temperature Operation	24h T2 (75°C)	TPJLR.18.125 K4

Para.	Test items	Requirements	Procedures
3.5.61	WCCA/High Temperature Endurance	T2(75°C) for 1000h	TPJLR.18.125 K18
3.5.62	85/85 Humidity Test	1000h 85°C while 85% Humidity	TPJLR.18.125 K21
3.5.63	Thermal Shock Endurance	T5 (-40°C); T6 (85°C) 1000 Cycles	TPJLR.18.125 K7
3.5.64	Dust protection (Flap)	IP5KX	ISO20653

3.6.1Product Qualification Test and Sequences(DVP)

TEST OR EXAMINATION	TEST GROUP																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
3.5.1 Visual Inspection	1,4,6,8,10	1,4,6	1,3,6	1,5	1,4	1,3	1,3	1,4,7	1,4,6,9,12,15	1,6	1,5	1,12	1,16	1,3	1,10	1,4	1,5	1,7	1,3	1,3	1,3	1,3	1,3
3.5.2 Retention Force, locked	3																						
3.5.3 Mating Force /Un-mating force	2																						
3.5.4 Ageing Resistance Of rubber and thermoplastic materials	5																						
3.5.5 Dust/water protect when Connector Mated	7																						
3.5.6 Insulation resistance	9		5		3				3,5,8,11,14	5													
3.5.7 Dielectric intensity																							
3.5.8 Breaking capacity		2																					
3.5.9 Mechanical strength								6															
3.5.10 Screws, current-carrying parts and connection		3																					
3.5.11 Creepage distance, electrical clearance and sealant penetration distance		5																					
3.5.12 Resistance to heat, combustion and tracking			2																				
3.5.13 Resistance to corrosion and rusting					2																		
3.5.14 Conditional short-circuit current with-standing test			4																				
3.5.15 Determination of Contact Insertion Forces				2																			
3.5.16 Contact Removal Forces from Housing (Primary Lock Only)				3																			
3.5.17 Contact Removal Forces from Housing (Secondary Lock)				4																			
3.5.18 Mechanical Stability Of The Inlet/Carrier						2																	
3.5.19 Mechanical Stability Of Front flap							2																
3.5.20 Drop test								3												2			
3.5.21 parameter test								2,5			2,7												
3.5.22 Aging in dry heat									2	2													
3.5.23 Temperatureshock									4	3													
3.5.24 Immersion With Pressure Difference									7														
3.5.25 Thermal Shock									10														
3.5.26 Pressure Washer Test (IPX9K)									13														
3.5.27 Flap waterproof										4													
3.5.28 Dynamic Load											4												
3.5.29 DUT's Inserted & Disconnected Twice												2											



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TEST OR EXAMINATION	TEST GROUP																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
3.5.30 Contact Opening Dimension												3, 11											
3.5.31 Contact Resistance											3,6	4,9											
3.5.32 Derating												5, 10											
3.5.33 Temperature & Current Endurance Cycling												6,8											
3.5.34 Humid Heat Cycling												7											
3.5.35 Temperature Rise & Voltage Drop													2,4 ,9,, 15										
3.5.36 Temperature & Humidity Cycling													3, 14										
3.5.37 Salt & Sand Exposure													5,7 ,10 ,12										
3.5.38 2500 Mating & Un-mating Cycles													6,8 ,11 ,13										
3.5.39 Dust protect without flap														2									
3.5.40 Low Temperature Exposure															2								
3.5.41 Low Temperature Operation															3								
3.5.42 High Temperature Exposure															4								
3.5.43 High Temperature Operation															5								
3.5.44 Thermal Shock Resistance															6								
3.5.45 Audial noise															7								
3.5.46 Salt Mist Atmosphere															8								
3.5.47 Chemical Resistance															9					2			
3.5.48 Derating with housing																2					2		
3.5.49Temperature rise LV 214 PG13																3					3		
3.5.50outside view crimp																	2						
3.5.51cross section crimp																	3						
3.5.52 Wire pull out force																	4						
3.5.53 Crimp resistance																		2, 4, 6					
3.5.54 Thermal Shock																		3					
3.5.55 Humid Heat, cyclic																		5					
3.5.56 Flap durability																			2				
3.5.57 Opening and closure force																					2		
3.5.58 UV solar radiation resistance																						2	
3.5.59 Mar resistance																							2
Sample Size	3	3	3	3	3	5	3	3	3	2	2	2	1	2	6	1	1 0	1 0	1	6	5	3	3

Fig. 2

3.6.2 Product Qualification Test and Sequences(PVP)

TEST OR EXAMINATION	TEST GRUOP							
	1	2	3	4	5	6	7	8
3.5.1 Visual Inspection	1,4,7,10	1,5	1,3	1,3	1,3	1,3	1,3	1,3
3.5.5 IPX5(Connector mated)	2							
3.5.6 Insulation resistance	3,6,9							
3.5.21 parameter test		2,7						
3.5.24 Immersion With Pressure Difference	5							
3.5.26 Pressure Washer Test (IPX9K)	8							
3.5.27 Flap waterproof							2	
3.5.28 Dynamic Load		4						
3.5.31 Contact Resistance		3,6						
3.5.60 High Temperature Operation			2					
3.5.61 WCCA/High Temperature Endurance				2				
3.5.62 85/85 Humidity Test					2			
3.5.63 Thermal Shock Endurance						2		
3.5.64 Dust protection (Flap)								2
Samples size	5	5	6	6	6	8	5	5

4. QUALIFICATION TEST

4.1 Sample selection

Samples shall be prepared in accordance with applicable specification.

4.2 Test sequence

Qualification test shall be conducted as sequence specified in Fig. 2 .

4.3 Requalification test

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

5 APPENDIX

5.1 AC PCBA Parameter test

PINNING PCB

PIN NO.	GB AC
1	RESERVED
2	RESERVED
3	TacL GND
4	RESERVED
5	RESERVED
6	CC
7	RESERVED
8	TacL
9	RESERVED
10	CP

AC TESTING PARAMETER

TEST ITEM	RESISTANCE MEASUREMENT		VALUE @Tamb = 25°±5°C
	TEST PINS		
TacL RESISTANCE	3	8	7690.5Ω TO 12411.8 Ω
RPROXI	CC	PE	2700±27Ω
CC	CC	6	0±1Ω
CP	CP	10	0±1Ω

DC PCBA Parameter test

PINNING PCB

PIN NO.	GB DC
1	TDC+
2	TDC GND
3	TDC-
4	RESERVED
5	RESERVED
6	S+
7	RESERVED
8	RESERVED
9	CC2
10	S-

DC TESTING PARAMETER

TEST ITEM	RESISTANCE MEASUREMENT		VALUE •Tamb : 25°±5°C
	TEST PINS		
T DC+	1	2	7690.5Ω TO 12411.8 Ω
T DC-	3	2	7690.5Ω TO 12411.8 Ω
R1	CC1	PE	1000±10 Ω
CC2	CC2	9	0±1Ω
S+	S+	6	0±1Ω
S-	S-	10	0±1Ω

Actuator Parameter test

0-2293469-X (4 WIRE CONFIGURATION):

PIN 2	PIN 3	STATUS/ CURRENT (mA)	FUNCTION
+	-	3.0 ± 1.0	LOCK SIGNAL
		10.0 ± 2.0	DRIVE/ FAULT SIGNAL
		17.0 ± 2.0	UNLOCK SIGNAL

PIN 1	PIN 4	FUNCTION
-	+	UNLOCKING
+	-	LOCKING

