

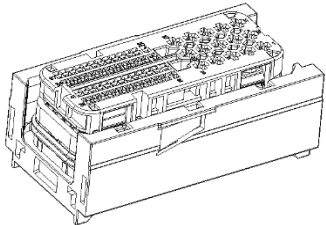
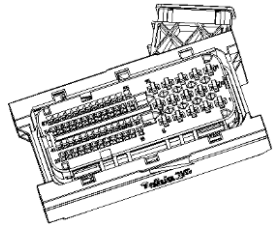
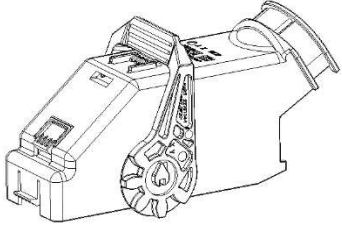
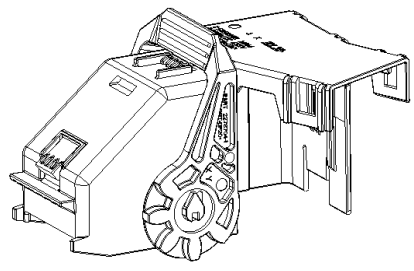
**Product Specification**


67WAY HEADER (Restricted)  
67WAY, MCON1.2&MCP2.8 HYBIRD, SEALED, PLUG (General Sale)

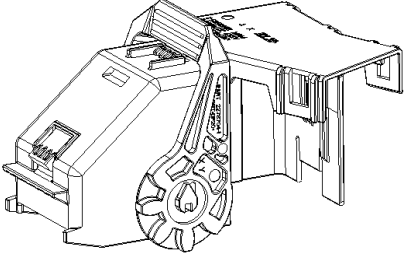
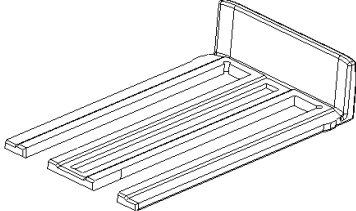
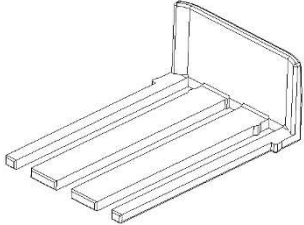
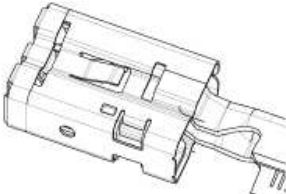

**108-101374****1. Scope:**

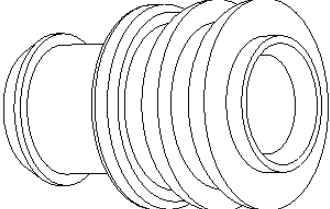

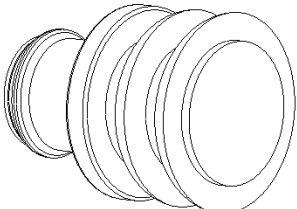
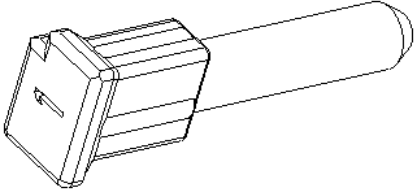
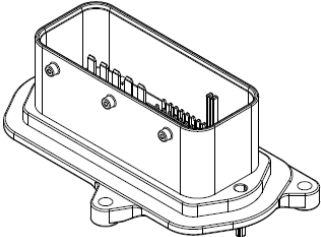
## 1.1 Content

This specification covers the requirements for product performance, test methods and Quality assurance provisions of MCON1.2&MCP2.8 67WAY SEAL connector.

67 POS, MIXED, REC HSG, ASSY, SEALED, TYPE180°	PN 2278584-1	
67 POS, MIXED, REC HSG, ASSY, SEALED, TYPE45°	PN 2278584-2	
67 POS, COVER ASSY, TYPE180°	PN 2278586-1	
67 POS, COVER ASSY, TYPE45°	PN 2278586-2	

		DR Danny Ding, Gary Zhu		 TE Connectivity Shanghai, China				
		CHK SY. Wang						
		APP I. Yin		NO. 108-101374	REV A1	LOC ES		
		PAGE		TITLE MCON1.2&MCP2.8 67WAY SEAL PLUG				
A1	Add LV214(PG23)	GZ	21JUN2017				1 of 14	
A	<b>Initial</b>	DD, GZ	13MAY2015					
LTR	REVISION RECORD	DR	DATE					

<p>67 POS, COVER ASSY,TYPE45°</p>	<p>PN 2278586-2</p>			
<p>2<sup>ND</sup>-LOCK FOR MCON1.2</p>	<p>PN 1452409-2</p>			
<p>2<sup>ND</sup>-LOCK FOR MCP2.8</p>	<p>PN 2278827-1</p>			
<p>AMP MCP 2.8 TERMINAL</p>	<p>PN 1-968882-X 1-968855-X 1-968857-X</p>			
 <p>TE Connectivity Shanghai, China</p>	<p>PAGE 2 of 14</p>	<p>NO. 108-101374</p>	<p>REV A1</p>	<p>LOC ES</p>

SWS FOR AMP MCP 2.8 TERMINAL	PN 828904-1 828905-1	
AMP MCON1.2 TERMINAL	PN 1534594-X 1670144-X	
BLINDPLUG FOR MCP 2.8	PN 0-828922-1	
BLINDPLUG FOR MCON1.2	PN 1-1452424-1	
67WAY HEADER	PN 2278594-1	



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## 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 Documents

C2278584 67POS, MIXED, REC HSG, ASSY, SEALED;  
C2278586 67POS, COVER ASSEMBLY;  
C2278827 2ND-LOCK FOR MCP2.8  
C1452409 2ND-LOCK FOR MCON1.2;  
C1355036 AMP MCP2.8 CONTACT SYSTEM  
C1534326 MCON1.2CB CONTACT SYSTEM  
C828905 SINGLE WIRE SEAL(SWS)  
C2278594 67POS HEADER  
114-94272 INTERFACE DRAWING 67POS

### 2.2 Product Specifications:

108-18513 AMP MCP2.8 CONTACT SYSTEM  
108-18782 MCON1.2CB CONTACT SYSTEM  
109 SERIES Test Specification, Requirements for Test Methods.  
USCAR-2 Rev. 6 Test Specification  
ISO 16750-3 Test Specification

### 2.3 Application Specifications

114-18148 AMP MCP2.8 CONTACT SYSTEM  
114-18464 MCON1.2CB CONTACT SYSTEM  
114-101036 67POS, MIXED, REC HSG, ASSY, SEALED

## 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

Plug:

A. Housing

-Material: PA66-GF35

B. O-ring/Family Sealing

-SILICONE RUBBER

C. Cover

-PBT/ASA-GF20

D. Lever

-PBT-GF20



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E. 2ND-Lock  
- PA66-GF25

Header:

A. Pin

-Material: 1.2 X 0.6 Pin CuZn30  
2.8 X 0.8 Pin CuFe2P

-Finish: Mating side Plating Ag over Ni  
PCB side Plating Sn over Ni

B. Housing

-Material: PA66 GF 30%

### 3.3 Ratings:

A. Voltage  $\leq$  16 V

B. Current contact carrying capacities see product specifications contact systems;

C. Temperature range contacts

-40°C to +140°C (AMP MCP 2.8 ) for silver-plated

-40°C to +150°C (MCON1.2CB) for silver-plated

In housings values are similar. Special Applications have to be tested separately.

### 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		
3.5.1	Visual Inspection	Meets requirements of product Drawing. Any evidences of deterioration, cracks, deformities, etc...are not permit. Connector locking mechanisms must function without breakage.	Visually, Dimensionally and Functionally inspected per applicable inspection plan.  USCAR2.6/5.1.8 Visual Inspection		
<b>Mechanical Test</b>					
3.5.2	Terminal Insertion Force	30 N max	ACC to USCAR2.6/5.4.1		
3.5.3	Terminal Push Through Force	50 N min or wire buckles	ACC to USCAR2.6/5.4.1		
3.5.4	Terminal Extraction Force	40 N min. For MCON 1.2mm (Primary lock only) 60N min. For MCP 2.8mm (Primary lock only) 70 N min. For MCON 1.2mm (TPA lock) 100N min. For MCP 2.8mm (TPA lock) 50 N min. For MCON 1.2mm (TPA lock after Temp/Humidity) 70N min. For MCP 2.8mm (TPA lock after Temp/Humidity)	ACC to USCAR2.6/5.4.1 table 5.4.1.4		
3.5.5	TPA Insert force with Terminals	60 N max	ACC to USCAR2.6/ 5.4.5		
3.5.6	TPA Remove force Lock with Terminals	15N min	ACC to USCAR2.6/ 5.4.5 Note: 15N is allowed for TPA is reused per LV214 spec		
3.5.7	Engage/unseat Force to/from pre-lock position	Engage force: 75 N max Unseat force: 15~75N	ACC to USCAR2.6/ 5.4.3 (Terminals loaded)		
3.5.8	Lever Actuation Force	90N max Test with terminal full loaded  75 N max Test with 15/16/17/25/31/32/33/39 /43/44/45/46/51 blank or 15/16/17/31/32/33/43 /44/45/46/51 blank)	ACC to USCAR2.6/ 5.4.3 (Terminals loaded)		
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Para.	Test items	Requirements	Procedures																								
3.5.9	Un-mating Force Connector latch fully engaged	110 N min	ACC to USCAR2.6/ 5.4.3 (without Terminals)																								
3.5.10	Un-mating Force Connector latch completely disengaged	90N max Test with terminal full loaded  75 N max Test with 15/16/17/25/31/32/33/39/ 43/44/45/46/51 blank or 15/16/17/31/32/33/43 /44/45/46/51 blank)	ACC to USCAR2.6/ 5.4.3 (without Terminals)																								
3.5.11	Polarization Feature Effectiveness	No mating <150N or 3 x insertion force	ACC to USCAR2.6/ 5.4.4																								
3.5.12	Connector Drop Test	1.meet the Visual Inspection; 2.components not be displaced from shipping position;	ACC to USCAR2.6/ 5.4.8																								
3.5.13	Connector Seal Retention-Mated connector	Seal shall in its intended position	ACC to USCAR2.6/ 5.4.14																								
3.5.14	Connector Cycling	Mating / Un-mating 10 cycles	ACC to USCAR2.6/ 5.1.7 Connector and/or terminal cycling																								
3.5.15	Vibration	Breakage shall not occur. Functional status can meet the requirement	<p>1. Test according to ISO 16750-3: 2007, 4.1.2.1.2.1 Frequency range: 100Hz~440Hz Sweep rate: 0.5octave/minute</p> <table border="1"> <thead> <tr> <th>Frequency (Hz)</th> <th>Acceleration (m/s<sup>2</sup>)</th> </tr> </thead> <tbody> <tr> <td>100</td> <td>30</td> </tr> <tr> <td>200</td> <td>85</td> </tr> <tr> <td>250</td> <td>85</td> </tr> <tr> <td>275</td> <td>60</td> </tr> <tr> <td>440</td> <td>60</td> </tr> </tbody> </table> <p>2. Test according to ISO 16750-3: 2007, 4.1.2.1.2.2 Frequency range: 10Hz~2000Hz R.m.s acceleration value: 96.6m/s<sup>2</sup></p> <table border="1"> <thead> <tr> <th>Frequency (Hz)</th> <th>PSD [(m/s<sup>2</sup>)<sup>2</sup>/Hz]</th> </tr> </thead> <tbody> <tr> <td>10</td> <td>10</td> </tr> <tr> <td>100</td> <td>10</td> </tr> <tr> <td>300</td> <td>0,51</td> </tr> <tr> <td>500</td> <td>5</td> </tr> <tr> <td>2000</td> <td>5</td> </tr> </tbody> </table> <p>Tmax=130° C</p>	Frequency (Hz)	Acceleration (m/s <sup>2</sup> )	100	30	200	85	250	85	275	60	440	60	Frequency (Hz)	PSD [(m/s <sup>2</sup> ) <sup>2</sup> /Hz]	10	10	100	10	300	0,51	500	5	2000	5
Frequency (Hz)	Acceleration (m/s <sup>2</sup> )																										
100	30																										
200	85																										
250	85																										
275	60																										
440	60																										
Frequency (Hz)	PSD [(m/s <sup>2</sup> ) <sup>2</sup> /Hz]																										
10	10																										
100	10																										
300	0,51																										
500	5																										
2000	5																										

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## ELECTRICAL Test

Para.	Test items	Requirements	Procedures
3.5.16	Isolation Resistance	All measured isolation resistance shall be greater than 100 MΩ at 500VDC	ACC to USCAR2.6/ 5.5.1 Isolation Resistance
3.5.17	Dry Circuit Resistance	For Plug $R_T \leq 10 \text{ m}\Omega$ for MCON 1.2mm $R_T \leq 5 \text{ m}\Omega$ for MCP 2.8mm For header $R_T \uparrow 5 \text{ m}\Omega$ for 1.2mm $R_T \uparrow 5 \text{ m}\Omega$ for 2.8mm	ACC to USCAR2.6/ 5.3.1 Dry Circuit Resistance
3.5.18	Voltage drop	mVD = 50mV max	ACC to USCAR2.6/5.3.2 Voltage drop

## ENVIRONMENTAL Test

3.5.19	Thermal Shock	Per USCAR2.6/ 5.1.9.4	ACC to USCAR2.6/5.6.1 Thermal Shock. (-40°C to + 130°C) 100Cycle
3.5.20	High Temperature Exposure	No defect, crack, could not affect their fit and function	ACC to USCAR2.6/5.6.3(Tmax=125°C)
3.5.21	Pressure/ Vacuum Leak	No bubbles visible exiting any test sample	ACC to USCAR2.6/5.6.6 Pressure/ Vacuum Lea



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Para.	Test items	Requirements	Procedures		
3.5.22	Temperature/Humidity Cycling	NONE	ACC to USCAR2.6/5.6.2 Temperature/Humidity Cycling. (-40°C to + 125°C)		
3.5.23	Submersion	No evidence of water or florescent dye shall be present in the interior of either mated connector	ACC to USCAR2.6/5.6.5 Submersion		
3.5.24	High Pressure Spray	No evidence of water or florescent dye shall be present in the interior of either mated connector	ACC to USCAR2.6/5.6.7 High Pressure Spray		
3.5.25	Header pin retention force	1. 2x 0.6 pin $\geq 30N$ 2.8 x0.8 pin $\geq 60N$	Push out peak value (All the header Pin need to test) ACC to USCAR 5.7.1		
3.5.26	Wetting test	No bad wetting, no bad areas (magnifying glass 10 times )	ACC to Bosch Order spec 4.3.1		
3.5.27	DIS-Wetting test	No bad wetting, no bad areas (magnifying glass 10 times )	ACC to Bosch Order spec 4.3.2		
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Para.	Test items	Requirements	Procedures		
3.5.28	Solder temperature durability	No bad wetting, no bad areas (magnifying glass 10 times)	ACC to Bosch Order spec 4.3.3		
3.5.29	Adhesive ability test	No bad adhesive (test by UAES)	ACC to Bosch spec 1269927799		
3.5.30	IP6KX	No dust enter	ACC to ISO 20653 8.3		
3.5.31	IP6X	No dust enter	ACC to IEC-60529 13.4 and 13.6		
3.5.32	IPX6K	No water enter	ACC to DIN 40 050 Part9 Bosch spec: 1 269 918 532-V1		
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Para.	Test items	Requirements	Procedures
3.5.33	Visual Inspection	No corrosion, discoloration, cracks, etc	ACC to LV214 E0.1
3.5.34	Aging in dry heat	120 h/130 °C	ACC to LV214 B19.3
3.5.35	Temperature shock	144 cycles (-40 °C/130 °C 15 min)	ACC to LV214 B19.1
3.5.36	Immersion with pressure difference	No medium must penetrate into the connector	ACC to LV214 B23.1
3.5.37	Line movement during immersion with pressure difference – vacuum	No defects	ACC to LV214 B23.2
3.5.38	Thermal shock test	No defects	ACC to LV214 B23.3
3.5.39	Degree of protection test/pressure washer test	No defects	ACC to LV214 B23.4
3.5.40	Insulation resistance	R > 100 MΩ @ 500 VDC	ACC to LV214 E0.3


### 3.6.1 Product Qualification Test and Sequences

Test or examination	TEST GROUP								
	1	2	3	4	5	6	7	8	9
3.5.1 Visual Inspection	1,5	1,4	1,6	1,3	1,3	1,3	1,7	1,7	1,9, 13
3.5.2 Terminal Insertion Force	2								
3.5.3 Terminal Push Through Force	3								
3.5.4 Terminal Extraction Force	4								14
3.5.5 TPA Insert force with Terminals		2							
3.5.6 TPA Remove force Lock with Terminals		3							
3.5.7 Engage/unseat Force to/from pre-lock position			2						
3.5.8 Lever Actuation Force			3						
3.5.9 Un-mating Force Connector latch fully engaged			4						
3.5.10 Un-mating Force Connector latch disengaged			5						
3.5.11 Polarization Feature Effectiveness				2					
3.5.12 Connector Drop Test					2				
3.5.13 Connector Seal Retention-mated connector						2			
3.5.14 Connector Cycling							2	2	2
3.5.15 Vibration							4		
3.5.16 Isolation Resistance									3,11
3.5.17 Dry Circuit Resistance							3,5	3,5	4,12
3.5.18 Voltage drop							6	6	
3.5.19 Thermal Shock								4	
3.5.20 High Temperature Exposure									
3.5.21 Pressure/ Vacuum Leak									5,7
3.5.22 Temperature/Humidity Cycling									6
3.5.23 Submersion									8
3.5.24 High Pressure Spray									10
3.5.25 Header pin retention force									
3.5.26 Wetting test									
3.5.27 DIS-Wetting test									
3.5.28 Solder temperature durability									
3.5.29 Adhesive ability test									
3.5.30 IP6KX									
3.5.31 IP6X									
3.5.32 IPX6K									
<b>Sample Size</b>	3	10	10	10	3	10	3	10	10

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Test or examination	TEST GROUP								
	10	11	12	13	14	15	16	17	18
3.5.1 Visual Inspection	1,13	1	1	1	1	1	1	1	1
3.5.2 Terminal Insertion Force									
3.5.3 Terminal Push Through Force									
3.5.4 Terminal Extraction Force	14								
3.5.5 TPA Insert force with Terminals									
3.5.6 TPA Remove force Lock with Terminals									
3.5.7 Engage/unseat Force to/from pre-lock position									
3.5.8 Lever Actuation Force									
3.5.9 Un-mating Force Connector latch fully engaged									
3.5.10 Un-mating Force Connector latch disengaged									
3.5.11 Polarization Feature Effectiveness									
3.5.12 Connector Drop Test									
3.5.13 Connector Seal Retention-mated connector									
3.5.14 Connector Cycling	2								
3.5.15 Vibration									
3.5.16 Isolation Resistance	3,12								
3.5.17 Dry Circuit Resistance	4,7								
3.5.18 Voltage drop	8								
3.5.19 Thermal Shock									
3.5.20 High Temperature Exposure	6								
3.5.21 Pressure/ Vacuum Leak	5,9								
3.5.22 Temperature/Humidity Cycling									
3.5.23 Submersion	10								
3.5.24 High Pressure Spray	11								
3.5.25 Header pin retention force		2							
3.5.26 Wetting test			2						
3.5.27 DIS-Wetting test				2					
3.5.28 Solder temperature durability					2				
3.5.29 Adhesive ability test						2			
3.5.30 IP6KX							2		
3.5.31 IP6X								2	
3.5.32 IPX6K									2
<b>Sample Size</b>	10	1 short	10)*	10)*	10)*	1 short	3	3	3

)\* pin of each tab pin

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Test or examination	TEST GROUP							
	19							
3.5.33 Visual Inspection	1,4,7,9,12							
3.5.34 Aging in dry heat	2							
3.5.35 Temperature shock	3							
3.5.36 Immersion with pressure difference	5							
3.5.37 Line movement during immersion with pressure difference – vacuum	6							
3.5.38 Thermal shock test	8							
3.5.39 Degree of protection test/pressure washer test	10							
3.5.40 Insulation resistance	11							
<b>Sample Size</b>	6							

## 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.

### 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.

### 4.4 Acceptance

Acceptance is based on verification that the product meets the requirements of paragraph 3.5. Failures attributed to equipment, test setup, or operator deficiencies shall not disqualify the product. When product failure occurs, corrective action shall be taken and samples resubmitted for qualification. Testing to confirm corrective action is required before resubmittal.

### 4.5 Quality Conformance Inspection

The applicable quality inspection plan will 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.

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