

DESIGN OBJECTIVES

GET 0.64 3WAY SEAL PLUG

108-101315

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 GET 0.64 3WAY SEAL connector .

GET 0.64 3WAY SEAL PLUG : 2278398-1
consists of 2278394-1, 2278395-1,2278396-1,2278397-1, 1326025-2

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: Test Specification, Requirements for Test Methods.
- B. GMW 3191

3. Requirements:

3.1 Design and Construction

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

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				CHK A.D 21JULY14			
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LTR	REVISION RECORD	DR	DATE				

3.2 Materials

- A. Housing
-Material: PA66-GF35
- B. TPA
- PBT-GF30
- C. Back Cover
-PBT-GF30
- D. O-ring/Family Sealing
-SILICONE RUBBER

3.3 Ratings:

- A. Operating temperature Range : -40°C to + 85°C
- B. Nominal operating voltage: 12V DC; 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		
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. GMW3191 3.4 Visual Examination.		
Mechanical Test					
3.5.2	Mating force	$F \leq 75N$ Refer to USCAR25	GMW3191 4.2.8 Connector-to-Connector Engagement Force.		
3.5.3	Un-mating force (press-latch)	$F < 100N$ disconnect the connector pairs with the locks properly disengaged $F < 70N$ disengage the primary lock	GMW3191 4.2.19 Unlocked Connector Disengagement Force		
3.5.4	Connector extraction force	$F > 80N$	GMW3191 4.2.18 Locked Connector Disengagement Force Terminal Size:0.64mm		
3.5.5	Contact Insertion force	TPA in Open Position: $F \leq 15N$ TPA in Fully Seated Position: $F > 30N$	GMW 3191 4.2.4 Terminal-to-Connector Engagement Force		
3.5.6	Contact retention force without second lock (no TPA)	Primary Lock Only $F \geq 30N$	GMW 3191 4.2.5 Terminal-from-Connector Extraction Force Terminal Size: 0.64mm		
3.5.7	Contact retention force with second lock (with TPA)	1.with all TPAs fully seated , $F \geq 60N$ 2.Post-Moisture Conditioning per Section 4.2.5.4, Item 8, $F \geq 60N$ 3.Post Thermal Aging Section 4.4.1 and Post Humid Heat Cyclic(HHC) $F \geq 50N$	GMW 3191 4.2.5 Terminal-from-Connector Extraction Force Terminal Size: 0.64mm		
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Para.	Test items	Requirements	Procedures																	
3.5.8	TPA from pre-lock to end-lock	1.Pre-lock to Lock Position without Terminals $15N \leq F$ 2. Pre-lock to Lock Position with Properly Seated Terminals $F \leq 60N$ 3. Pre-lock to Lock Position with One Incorrectly Seated Terminal $60 N$ or $2 \times$ the measured value of item 2,	USCAR-2, SECTION 5.4.5.2																	
3.5.9	TPA from end lock location to pre-lock location (with Contacts)	TPA Locked to Pre-locked Position $25N \leq F \leq 45N$	USCAR-2, SECTION 5.4.1 GMW 4.2.9 Terminal Position Assurance (TPA)																	
3.5.10	TPA from pre-lock fall away	TPA Removal from Connector $F \geq 20N$	GMW 4.2.9 Terminal Position Assurance (TPA)																	
3.5.11	Connector Lock Mechanical Overstress	150N, There are no damage	GMW 4.2.14 Connector Lock Mechanical Overstress																	
3.5.12	Connector Seal Retention - Mated Connector	Seal shall remain on the connector and in its intended position	4.2.16 Connector Seal Retention - Mated Connector																	
3.5.13	Mechanical Shock	There shall be no loss of electrical continuity	<p>4.2.21 Mechanical Shock</p> <table border="1"> <thead> <tr> <th rowspan="2"></th> <th colspan="2">Test Number</th> </tr> <tr> <th>1</th> <th>2</th> </tr> </thead> <tbody> <tr> <td>Acceleration (in Gravity (G))</td> <td>25</td> <td>100</td> </tr> <tr> <td>Nominal Shock Duration (in millisecond (ms))</td> <td>15</td> <td>11</td> </tr> <tr> <td>Nominal Shock Shape</td> <td>half sine</td> <td>half sine</td> </tr> <tr> <td>Number of shocks per axis, (positive and negative)</td> <td>$132 \times 6 = 792$</td> <td>$3 \times 6 = 18$</td> </tr> </tbody> </table>		Test Number		1	2	Acceleration (in Gravity (G))	25	100	Nominal Shock Duration (in millisecond (ms))	15	11	Nominal Shock Shape	half sine	half sine	Number of shocks per axis, (positive and negative)	$132 \times 6 = 792$	$3 \times 6 = 18$
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ELECTRICAL Test						
Para.	Test items	Requirements	Procedures			
3.5.14	Isolation Resistance	All measured isolation resistance shall be greater than 100 MΩ at 500VDC	GMW 4.3.5 Isolation Resistance			
3.5.15	Dry Circuit Resistance – Contact Resistance	Initial ≤15mΩ After ≤15mΩ	GMW 4.3.2 Dry Circuit Resistance			
3.5.16	Dielectric Rigidity	No discharge, cracking, shorting, incipient arcing or arcing must occur during the test	GMW 4.3.6 Dielectric Strength Using the high potential (hi-pot) tester, apply an alternating current (AC) voltage of 1000 VRMS at 50 Hz or 60 Hz, or a DC voltage of 1600 V across each adjacent cavity for at least 60 seconds			
ENVIRONMENTAL Test						
3.5.17	Thermal Aging	No defect, crack, could not affect their fit and function	GMW 4.4.1 Thermal Aging. General Application 85°C 1008Hours			
3.5.18	Thermal Shock	No defect, crack, could not affect their fit and function	GMW 4.4.2 Thermal Shock. Class 1(-40°C to + 85°C) 100Cycle			
3.5.19	Temperature humidity Cycling	No defect, crack, could not affect their fit and function	GMW 4.4.3 Humid Heat Cyclic (HHC) 10 days			
3.5.20	Humid Heat Constant (HHCO).	No defect, crack, could not affect their fit and function	GMW 4.4.4 Humid Heat Constant (HHCO) Temperature (+85 ± 3) °C Duration 10 days Relative Humidity (90 ± 5)%			
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Para.	Test items	Requirements	Procedures
3.5.21	Vibration with Thermal Cycling	no loss of electrical continuity	GMW 4.4.8 Vibration with Thermal Cycling Mounting Location: Body
3.5.22	Waterproof	The leakage current shall be less than 5 μ A No evidence of water or florescent dye shall be present in the interior of either mated connector	GMW 4.4.9 Water Submersion (+23 \pm 5) $^{\circ}$ C de-ionized water to a depth of 100 mm for at least 1 hour
3.5.23	Pressure /Vacuum Leak	No evidence of water or florescent dye shall be present in the interior of either mated connector	GMW 4.4.10 Pressure/Vacuum Leak depth of 300 mm to 400 mm below the surface air pressure: 48 kPa 15 seconds 48 kPa (7 psig) of vacuum 15 seconds

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3.6.1 Product Qualification Test and Sequences

Test or examination	TEST GROUP						
	1 (28A)	2 (28B)	3 (28C&28P)	4 (28N)	5 (28D)	6 (28J)	7 (28L)
3.5.1 Visual Inspection	1,3	1,4	1,4	1,3	1,5	1,3	1,3
3.5.2 Mating force			2				
3.5.3 un-Mating force			3				
3.5.4 Connector extraction force				2			
3.5.5 Contact insertion force	2						
3.5.6 Contact retention force (NO TPA)		2					
3.5.7 Contact retention force (with TPA)		3					
3.5.8 TPA From pre-lock to end-lock					2		
3.5.9 TPA From end-lock to pre-lock					3		
3.5.10 TPA From pre-lock fall away					4		
3.5.11 Connector Lock Mechanical Overstress						2	
3.5.12 Connector Seal Retention Mated Connector							2
3.5.13 Mechanical Shock							
3.5.14 Isolation Resistance							
3.5.15 Dry Circuit Resistance- Contact Resistance							
3.5.16 Dielectric Rigidity							
3.5.17 Thermal Aging							
3.5.18 Thermal Shock							
3.5.19 Temperature humidity Cycling							
3.5.20 Humid Heat Constant (HHCO)							
3.5.21 Vibration							
3.5.22 Waterproof							
3.5.23 Pressure/Vacuum Leak							
Sample Size	12	60	10	10	10	10	10

Fig. 2

Test or examination	TEST GROUP				
	8 (28S)	9 (29C)	10 (29D)	11 (29E)	12 (29F)
3.5.1 Visual Inspection	1,7	1,8,12	1,8,12	1,,8,12	1,8,12
3.5.2 Mating force					
3.5.3 un-Mating force					
3.5.4 Connector extraction force					
3.5.5 Contact insertion force					
3.5.6 Contact retention force (NO TPA)					
3.5.7 Contact retention force (with TPA)					
3.5.8 TPA From pre-lock to end-lock					
3.5.9 TPA From end-lock to pre-lock					
3.5.10 TPA From pre-lock fall away					
3.5.11 Connector Lock Mechanical Overstress					
3.5.12 Connector Seal Retention - Mated Connector					
3.5.13 Mechanical Shock	3				
3.5.14 Isolation Resistance		2,9	2,9	2,9	2,9
3.5.15 Dry Circuit Resistance- Contact Resistance	2,4,6	3,11	3,11	3,11	3,11
3.5.16 Dielectric Rigidity		10	10	10	10
3.5.17 Thermal Aging		5			
3.5.18 Thermal Shock			5		
3.5.19 Temperature humidity Cycling				5	
3.5.20 Humid Heat Constant (HHCO)					5
3.5.21 Vibration	5				
3.5.22 Waterproof		7	7	7	7
3.5.23 Pressure/Vacuum Leak		4,6	4,6	4,6	4,6
Sample Size	10	10	10	10	13

Fig. 2

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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.

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