



SPECIFICATION

宏致電子股份有限公司

桃園縣中壢市東園路13號

No.13, Dongyuan Rd., Jhongli City,

Taoyuan County 320, Taiwan (R.O.C.)

TEL: +886-3-463-2808

FAX: +886-3-463-1800

SPEC. NO.: PS-31938-XXXXX-XXX REVISION: B

PRODUCT NAME: CIRCULAR PUSH PULL CONN.

PRODUCT NO: 31938 / 31939 / 31946 / 31947

PREPARED: PENG, WU CHUAN DATE: 23/01/10	CHECKED: CHANG, CHUN TE DATE: 23/01/10	APPROVED: KUO, RONG HSUN DATE: 23/01/10
--	---	--



TITLE: CIRCULAR PUSH PULL CONN.

RELEASE DATE: 2023-01-10

REVISION: B

ECN No: 011462

PAGE: **2** OF **12**

1. REVISION HISTORY	3
2. SCOPE	4
3. APPLICABLE DOCUMENTS.....	4
4. REQUIREMENTS	4
5. PERFORMANCE	6
6. SOLDERING CONDITION.....	11
7. PRODUCT QUALIFICATION AND TEST SEQUENCE.....	12



Aces P/N: **31938 series**

TITLE: **CIRCULAR PUSH PULL CONN.**

RELEASE DATE: 2023-01-10

REVISION: B

ECN No: 011462

PAGE: **3** OF **12**

1 Revision History

Rev.	ECN #	Revision Description	Prepared	Date
A	ECN-007734	Release	Eric	22/11/05
B	ECN-011462	Add 31946 & 31947 Series	Eric	23/01/10

TITLE: **CIRCULAR PUSH PULL CONN.**

RELEASE DATE: 2023-01-10

REVISION: B

ECN No: 011462

PAGE: **4** OF **12**

2 SCOPE

This specification covers the requirements for product performance, test methods and quality assurance provisions of **CIRCULAR PUSH PULL Connector**.

3 APPLICABLE DOCUMENTS

The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the latest edition of the document applies. In the event of conflict between the requirements of this specification and the product drawing, 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.

EIAJ RC 5320A

EIA-364 : The Test Sequence and Test Procedures for Electrical Connectors and Sockets.

4 REQUIREMENTS

4.1 Design and Construction

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

4.2 Materials and Finish

4.2.1 Jack & Plug Housing : Thermoplastic or Thermoplastic High Temp., UL94V-0

4.2.2 Jack & Plug Terminal : Copper Alloy
Finish: Refer to the drawing.

4.2.3 Jack & Plug Casing : Zinc Alloy
Finish: Refer to the drawing.

4.2.4 Jack & Plug Spring : Stainless Steel
Finish: Refer to the drawing.

4.2.5 Jack Washer : Copper Alloy
Finish: Refer to the drawing.

4.2.6 Jack Nut : Copper Alloy
Finish: Refer to the drawing.

4.2.7 Plug Ring : Stainless Steel
Finish: Refer to the drawing.

TITLE: **CIRCULAR PUSH PULL CONN.**

RELEASE DATE: 2023-01-10

REVISION: B

ECN No: 011462

PAGE: **5** OF **12**

4.2.8 Plug Coupler : Zinc Alloy
Finish: Refer to the drawing.

4.2.9 Plug Groove : Thermoplastic or Thermoplastic High Temp., UL94V-0

4.2.10 Plug Clamp : Copper Alloy
Finish: Refer to the drawing.

4.2.11 Plug Boot : Thermoplastic , UL94V-HB

4.2.12 Plug Screw : Steel
Finish: Refer to the drawing.

4.3 Ratings

4.3.1 Rated Voltage : **AC 100V / DC 140V**

4.3.2 Current : **2A**

4.3.3 Operating Temperature : **-25°C to +85°C**

4.3.4 Storage Temperature : **-10°C to +60°C**

TITLE: **CIRCULAR PUSH PULL CONN.**

RELEASE DATE: 2023-01-10

REVISION: B

ECN No: 011462

PAGE: **6** OF **12**

5 Performance

5.1. Test Requirements and Procedures Summary

Item	Requirement	Standard
Examination of Product	Visual and dimensional inspection per product drawing	Meet requirement of product drawing
ELECTRICAL		
Item	Requirement	Standard
Low Level Contact Resistance	Per Pin Initial: 10mΩ MAX. After test: 15mΩ MAX.	The object of this test procedure is to detail a standard method to measure the electrical resistance across a pair of mated contacts such that the insulating films, if present, will not be broken or asperity melting will not occur. Subject mated contacts assembled in housing to closed circuit current of 1 A maximum at open circuit at 5.5 V maximum. (EIA 364- 23)
Insulation Resistance	(1) Initial: 1000MΩ Min. (2) After test: 500MΩ Min.	The object of this test procedure is to detail a standard method to assess the insulation resistance of connectors. This test procedure is used to determine the resistance offered by the insulation materials and the various seals of a connector to a DC potential tending to produce a leakage of current through or on the surface of these members. Measure by applying test potential between the adjacent contacts. Test Voltage : 500V DC.(EIA 364- 21)
Dielectric Withstanding Voltage	1. No flashover, No sparkover, No excess leakage, No breakdown. 2. Current leakage : < 0.5 mA	The object of this test procedure is to detail a test method to prove that a connector can operate safely at its rated voltage and withstand momentary over potentials due to switching, surges and/or other similar phenomena. Measure by applying test potential between the adjacent contacts. Test Potential : 500 V AC at sea level Test Duration : 60 seconds (EIA-364-20)

TITLE: CIRCULAR PUSH PULL CONN.

RELEASE DATE: 2023-01-10

REVISION: B

ECN No: 011462

PAGE: **7** OF **12**

<p>Temperature Rise vs Current Rating</p>	<p>The Temp rise shall not exceed +30°C at any point in the connector under test.</p>	<p>The object of this procedure is to detail a standard method to assess the current carrying capacity of mated connector contacts. Measure temperature rise vs current at 2A when measured at an ambient temperature of 23±3°C. (EIA 364- 70 Method B)</p>
---	---	--

MECHANICAL

<p>Insertion and Withdrawal force</p>	<p>1. Initial & After Durability : Insertion & Withdrawal force : 0.5kgf ~3.5kgf. 2. Pairwise Comparison : AA : Aces Plug with Aces Jack. AB : Aces Plug with HRS Jack. BA : HRS Plug with Aces Jack.</p>	<p>The object of this test is to detail a standard method for determining the mechanical forces required for inserting connector. Subject connector to mate and unmate to measure the mechanical forces required to engage and disengage at a rate of 25.4mm per (EIA-364-13)</p>
---------------------------------------	--	---

<p>Mechanical Shock</p>	<p>1. No evidence of damage. 2. The electrical performances should meet the spec. specified.</p>	<p>The object of this test procedure is to detail a standard method to assess the ability of a connector to withstand specified severity of mechanical shock. Subject mated connectors should be tested according to the condition listed below : Wave form : Half-sine Peak acceleration : 50 G's Duration : 11 ms Times : 3 shocks in each direction applied along three mutually perpendicular planes, total 18 shocks (EIA-364-27 Condition H).</p>
-------------------------	--	--

<p>Durability</p>	<p>1. 1000 insertion / withdrawal cycles at maximum rate of 500 cycles per hours. 2. No evidence of damage. 3. The electrical performances should meet the spec. specified.</p>	<p>The object of this test procedure is to detail a uniform test method for determining the effects caused by subjecting a connector to the conditioning action of insertion and extraction simulating the expected life of the connectors. Durability cycling with a gauge is intended only to produce mechanical stress. Durability performed with mating components is intended to produce both mechanical and wear stress. (EIA-364-09)</p>
-------------------	---	---

TITLE: **CIRCULAR PUSH PULL CONN.**

RELEASE DATE: 2023-01-10

REVISION: B

ECN No: 011462

PAGE: **8** OF **12**

ENVIRONMENTAL

Item	Requirement	Standard
Humidity (Temperature Cycling)	<ol style="list-style-type: none"> 1. No evidence of damage. 2. Insulation Resistance 	<p>The object of this test procedure is to detail a standard test method for the evaluation of the properties of materials used in connectors as they are influenced by the effects of high humidity and heat.</p> <p>Subject mated and unmated connectors should be tested according to the condition listed below :</p> <p>Temperature : 38~42°C Humidity : 90 ~ 95% (R.H) Duration : 96 hours (EIA 364-31 Method III Test Condition A)</p>
Vibration (Random)	<ol style="list-style-type: none"> 1. No discontinuities of 10μs or longer duration. 2. No evidence of damage. 3. The electrical performances should meet the spec. specified. 	<p>This test procedure is applicable to connectors that may, in service, be subjected to conditions involving vibration. Whether a connector has to function during vibration or merely to survive conditions of vibration should be clearly stated by the detailed product specification. In either case, the relevant specification should always prescribe the acceptable performance tolerances.</p> <p>Subject mated connectors should be tested according to the condition listed below :</p> <p>Test condition : Random Frequency : 10 ~ 55 Hz Amplitude : 0.75 mm Duration : 2 hours / axis Times : Each of three mutually perpendicular planes. (EIA 364-28 Condition V Test letter A)</p>

TITLE: CIRCULAR PUSH PULL CONN.

RELEASE DATE: 2023-01-10

REVISION: B

ECN No: 011462

PAGE: **9** OF **12**

<p>Temperature Life</p>	<p>1. No evidence of damage. 2. The electrical performances should meet the spec. specified.</p>	<p>The object of this test is to detail a standard test method to assess the ability of a connector to withstand elevated temperatures with or without electrical loading. Subject mated connectors should be tested according to the condition listed below : Temperature : 85±2°C Duration : 96 hours (EIA 364-17)</p>
<p>Thermal Shock</p>	<p>1. No evidence of damage. 2. The electrical performances should meet the spec. specified.</p>	<p>The object of this test is to determine the resistance of a connector to exposure at extremes of high and low temperatures and to the shock of alternate exposures to these extremes, simulating the worst case conditions for storage, transportation and application. Subject mated and unmated connectors should be tested according to the condition listed below : Temperature : -55 ~ 85°C Cycles : 5 cycles Exposure time at temp. extremes : 30 minutes (EIA-364-32)</p>
<p>Salt Spray</p>	<p>1. No evidence of Physical damage. 2. The electrical performances should meet the spec. specified.</p>	<p>The object of this test procedure is to detail a standard test method to assess the effects of a controlled salt laden atmosphere on connector components, finishes and mechanisms. Subject mated and unmated connectors should be tested according to the condition listed below : Temperature : 35±2°C Humidity : 95 ~ 98% (R.H.) Connectors to 5% salt-solution Duration : 48 hours (EIA 364-26 Test Condition A)</p>

TITLE: CIRCULAR PUSH PULL CONN.

RELEASE DATE: 2023-01-10

REVISION: B

ECN No: 011462

PAGE: **10** OF **12**

Cold test	<p>1. No evidence of damage. 2. The electrical performances should meet the spec specified.</p>	<p>Temperature : -55°C Duration :96hours (EIA-364-59)</p>
Solder ability	<p>Continuous solder coating with a min. 95% coverage</p>	<p>The object of this test procedure is to detail a uniform test method for determining connector solder ability. The surfaces to be tested shall be immersed in flux for a minimum of 2 seconds to 3 seconds. Unless otherwise specified in the referencing document, the temperature of the solder bath shall be maintained as measured below the surface oh the solder at 245°C ± 5°C Examination The test specimens shall be examined at 10X magnification. Referee magnification shall be at 30X magnification and shall only be used when examining specimens rejected. (EIA 364-52 Category 2)</p>
Hand Soldering (Temperature Resistance)	<p>Continuous solder coating with a min. 95% coverage .</p>	<p>T = 350°C ± 10°C, 3 seconds to 4 seconds at least</p>



TITLE: CIRCULAR PUSH PULL CONN.

RELEASE DATE: 2023-01-10

REVISION: B

ECN No: 011462

PAGE: **11** OF **12**

6 SOLDERING CONDITION :

AUTOMATIC OR HAND SOLDERING:

THE TERMINAL OF PLUG TESTED SHALL BE HEATED TO 1.5 MILLIMETERS FROM A TIP OF THE TERMINAL BY A SOLDERING IRON TO HAVE A CAPACITY OF 60 WATTS CONSUMPTION AT A TEMPERATURE CONTROLLED OF $350^{\circ}\text{C} \pm 10^{\circ}\text{C}$ FOR A PERIOD OF 0.5 SECONDS.



Aces P/N: **31938 series**

TITLE: **CIRCULAR PUSH PULL CONN.**

RELEASE DATE: 2023-01-10

REVISION: B

ECN No: 011462

PAGE: **12** OF **12**

7 PRODUCT QUALIFICATION AND TEST SEQUENCE

Test or Examination	Test Group										
	1	2	3	4	5	6	7	8	9		
	Test Sequence										
Appearance	1,3	1,7	1,10	1,10	1,9	1,9	1,9	1,3	1,3		
Low Level Contact Resistance		2,6	2,9	2,7	2,6	2,6	2,6				
Insulation Resistance			3,7	3,8	3,7	3,7	3,7				
Dielectric Withstanding Voltage			4,8	4,9	4,8	4,8	4,8				
Temperature Rise vs Current Rating	2										
Mating and Unmating force		3,5									
Mechanical Shock			6								
Durability		4									
Humidity (Temperature Cycling)				6							
Vibration (Random)			5								
Temperature Life					5						
Thermal Shock				5							
Salt Spray						5					
Cold test							5				
Solder ability								2			
Hand Soldering (Temperature Resistance)									2		
Sample Size	2	3	3	3	3	3	3	2	2		