



Power Distribution Tap Connector

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for TE Connectivity (TE) Power Distribution Tap Connectors. These Power Tap Connector series includes:

1. Power Tap STD 6P Connector (Centerline: .125x .250) P/N: 5055323-9, 3-5055323-5
2. Power Tap STD 10P Connector (Centerline: .125x.250, .100x.300) P/N: 1-5055323-0, 5055558-4
3. Power Tap HC 4P Connector (Centerline: .200 x .400) P/N: 5213815-*
4. Power Tap HC 6P Connector (Centerline: .200 x .400) P/N: 5213816-*
5. Power Tap 16mm stacked height 6P connector P/N: 5055324-1

1.2. Definition

For the purpose of this specification, the following definitions shall apply.

- Power Distribution Tap: A printed circuit board mounted device intended as an interface between printed circuit board and power leads.
- ACTION PIN* Contacts: Action Pins used on power distribution tap for distributing current to printed circuit board.

1.3. Qualification

When tests are performed on the subject product line, procedures specified in item 3.4 shall be used. All inspections shall be performed using applicable inspection plan and product drawing.

2. APPLICABLE DOCUMENTS AND FORMS

The following documents constitute 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.

2.1. TE Documents

- 109 Series Test Specifications as indicated in Figure 1
- 114-11000 Application Specification (Power Distribution Tap Connector)
- 501-215 Qualification Test Report (Power Distribution Tap Connector)
- [109-197](#) Test Specification (TE Test Specification vs EIA and IEC Test Methods)
- EIA-364 Electrical Connector/Socket Test Procedures Including Environmental Classifications

3. REQUIREMENTS

3.1. Design and Construction

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

3.2. Materials

- Contact: Copper alloy
- Housing: Thermoplastic, UL94 V-0

3.3. Ratings

- Current: See Figure 2 for applicable current carrying capability
- Voltage: 48V ac/dc (general application), 600V ac/dc max voltage
- Operating Temperature: -55°C to 105°C
- Storage Temperature: -25°C to 55°C

3.4. Performance and Test Description

Product is designed to meet the electrical, mechanical and environmental performance requirements specified in item 3.5. Unless otherwise specified, all tests shall be performed at ambient environmental conditions per Test Specification 109-1.

3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure																		
Examination of product	Meets requirements of product drawing and Application Specification 114-11000.	Visual, dimensional and functional per applicable quality inspection plan.																		
ELECTRICAL																				
Termination resistance, specified current CR	<table border="1"> <thead> <tr> <th>Position</th> <th>Test Current (amperes)</th> <th>Resistance (milliohms) maximum</th> </tr> </thead> <tbody> <tr> <td>1. STD 6P</td> <td>50</td> <td>0.5</td> </tr> <tr> <td>2. STD 10P</td> <td>60</td> <td>0.4</td> </tr> <tr> <td>3. HC 4P</td> <td>50</td> <td>0.5</td> </tr> <tr> <td>4. HC 6P</td> <td>65</td> <td>0.4</td> </tr> <tr> <td>5. 16mm SH 6P</td> <td>50</td> <td>0.5</td> </tr> </tbody> </table>	Position	Test Current (amperes)	Resistance (milliohms) maximum	1. STD 6P	50	0.5	2. STD 10P	60	0.4	3. HC 4P	50	0.5	4. HC 6P	65	0.4	5. 16mm SH 6P	50	0.5	TE Spec 109-25. Measure potential drop of mated contacts assembled in housing. Calculate resistance. See Figure. Termination Resistance Probe Locations.
Position	Test Current (amperes)	Resistance (milliohms) maximum																		
1. STD 6P	50	0.5																		
2. STD 10P	60	0.4																		
3. HC 4P	50	0.5																		
4. HC 6P	65	0.4																		
5. 16mm SH 6P	50	0.5																		
Termination resistance, dry circuit. LLCR	<table border="1"> <thead> <tr> <th>Position</th> <th>Resistance (milliohms maximum)</th> </tr> </thead> <tbody> <tr> <td>1. STD 6P</td> <td>0.5</td> </tr> <tr> <td>2. STD 10P</td> <td>0.4</td> </tr> <tr> <td>3. HC 4P</td> <td>0.5</td> </tr> <tr> <td>4. HC 6P</td> <td>0.4</td> </tr> <tr> <td>5. 16mm SH 6P</td> <td>0.5</td> </tr> </tbody> </table>	Position	Resistance (milliohms maximum)	1. STD 6P	0.5	2. STD 10P	0.4	3. HC 4P	0.5	4. HC 6P	0.4	5. 16mm SH 6P	0.5	TE Spec 109-3. Subject connectors to 1 ampere test current and millivolt test method.						
Position	Resistance (milliohms maximum)																			
1. STD 6P	0.5																			
2. STD 10P	0.4																			
3. HC 4P	0.5																			
4. HC 6P	0.4																			
5. 16mm SH 6P	0.5																			
Current cycling	See Note.	TE Spec 109-51. Subject mated contacts to 250 cycles at 31.25 amperes for 15 minutes ON and 15 minutes OFF.																		
Temperature rise vs current	30°C max temperature rise at specified current: 1. Power Tap STD 6P Connector: 50A 2. Power Tap STD 10P Connector: 60A 3. Power Tap HC 4P Connector: 50A 4. Power Tap HC 6P Connector: 65A 5. Power Tap 16mm SH 6P conn: 50A	EIA-364-70, Method II. Stabilize at a single current level until 3 readings at 5 minutes interval are within 1°C.																		

MECHANICAL

Random vibration	No discontinuities greater than 10 microseconds. See Note.	EIA-364-28 (TE Spec 109-21-5.) Subject mated connectors to 16.91 G's rms for 20 minutes in each of 3 mutually perpendicular planes. See Figure 6.
Vibration	No discontinuities greater than 1 microsecond or longer duration. See Note.	EIA-364-28, Test Condition V, letter C. Subject mated connectors to 9.26G's RMS acceleration frequency range 50 to 2000 to 50 Hz, duration 120 minutes in each of three mutually perpendicular planes.
Mechanical shock	No discontinuities greater than 1 microsecond or longer duration. See Note.	EIA-364-27, Method A. Peak acceleration 490 m/s ² (50G's) with normal duration 11ms, velocity change 3.44m/s:11.3ft/s, three shocks in each direction applied 3 mutually perpendicular planes, 18 total shocks.
Board press force	178 N max every Action Pin. 1780N max ref. for 10 action pins. 1068N max ref. for 6 action pins. 712N max ref. for 4 action pins.	EIA-364-13 Measure force necessary to mount tap onto test board using proper mounting fixture per applicable Instruction Sheet.
Board extraction force	10 N min every Action Pin. 100N min ref. for 10 action pins. 60N min ref. for 6 action pins. 40N min ref. for 4 action pins.	EIA-364-13 Measure force necessary to remove tap from test board.
Torque Force Test	See Note. Power Tap 6/10P STD: 1.02N.m (9 ibf.inch) max Power Tap 4/6P HC: 1.02N.m (9 ibf.inch) max Power Tap 16mm SH: 1.20N.m max	Apply the rated torque to tap screw terminal, hold 15 seconds and release.

ENVIRONMENTAL

Thermal shock	See Note.	EIA-364-32, Method A, Condition II. Subject mated specimens to 25 cycles between -65°C and 105°C.
Humidity-temperature cycling	See Note.	TE Spec 109-23-4, Condition B Subject connectors in place to 10 humidity-temperature cycles between 25 and 65°C at 95% RH.

Humidity-temperature cycling	See Note.	EIA-364-31, Method III, Condition B. Subject mated specimens to 10 cycles (10 days) between 25°C and 65°C and 80~98% RH .
Salt Spray Test	See Note.	EIA-364-26, Condition B. Subject specimens tested for 48 hours, with 5% solution salt spray 35 ± 2°C.
Mixed Flowing Gas	See Note. Special Test Item for customer Only for Power Tap 16mm SH connector 5055324-1	EIA-364-65, Class IIA. Subject specimens screw-mounted for 336 hours(14 days)
Temperature life	See Note.	Test I: TE Spec 109-43. Subject taps with wire in place to 85°C for 168 hours. Test II: EIA-364-17, Method A, Condition 4. Subject mated specimens to 105°C for 504 hours.

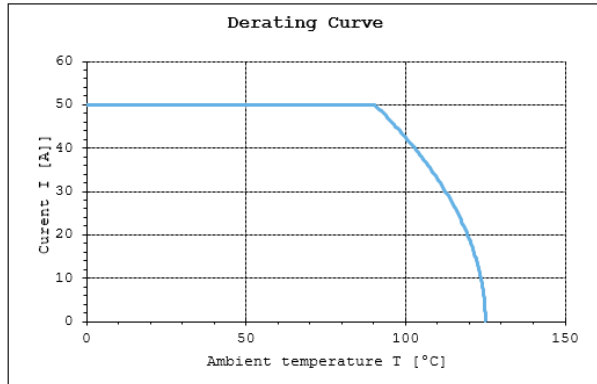
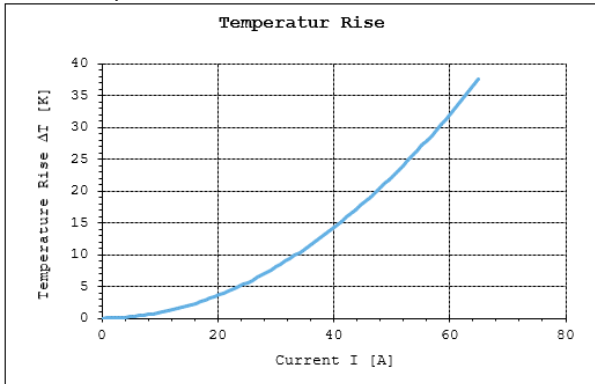
NOTE Shall meet visual requirements, show no physical damage and shall meet requirements of additional tests specified in Test Sequence in item 3.6.

3.6. Product Qualification and Requalification Test Sequence

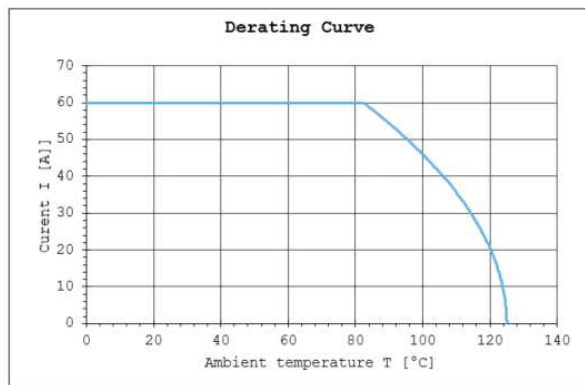
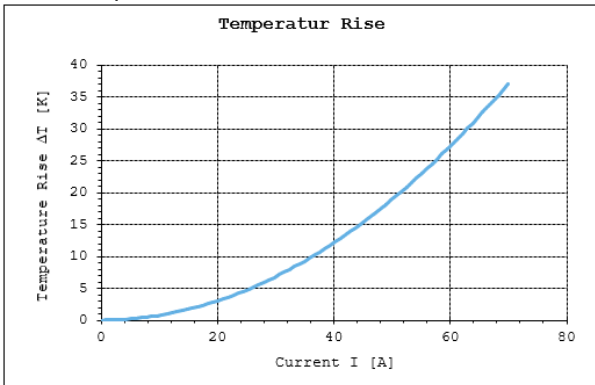
Test or Examination	Test Group								
	1	2	3	4	5	6	7	8	9
	Test sequence								
Examination of product	1	1	1	1	1	1			
Contact resistance, specified current	4,7,9,11	3,5,7,9							
LLCR, dry circuit				3,8	2,4	2,4			
Current cycling		6							
Temperature rise vs current	5	10	2	4,9					
Vibration	8								
Board press force	2								
Board extraction force	12								
Torque	3,10	2,8		2					
Thermal shock		4							
Humidity-temperature cycling	6			5					
Salt Spray Test					3				
Max Flowing Gas						3			
Temperature life				6					

3.7 Product Current & Temperature Rise Curve and Dating Curve.

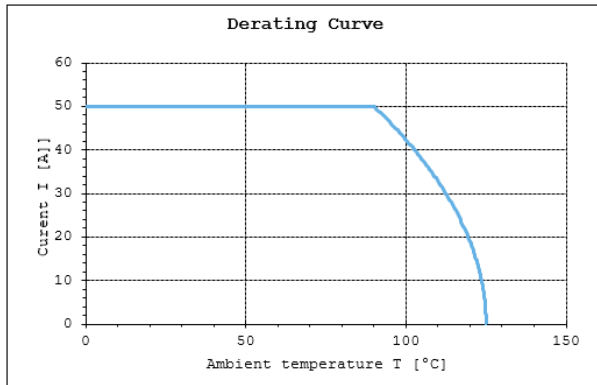
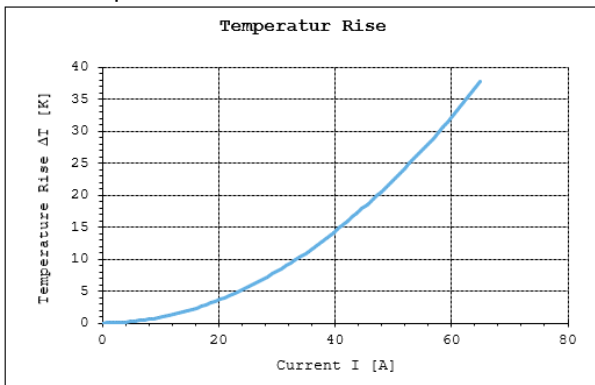
Power Tap STD 6P Connector



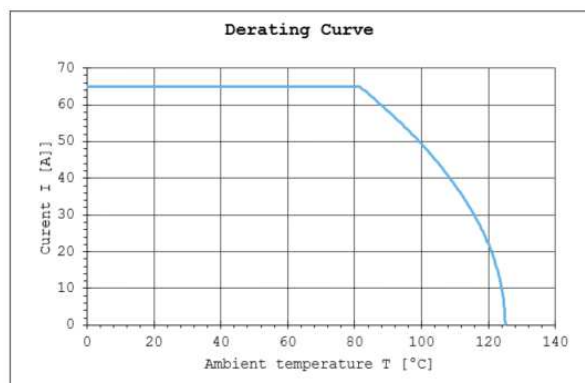
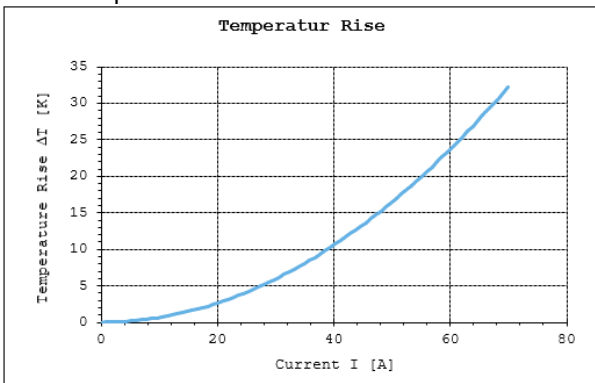
Power Tap STD 10P Connector



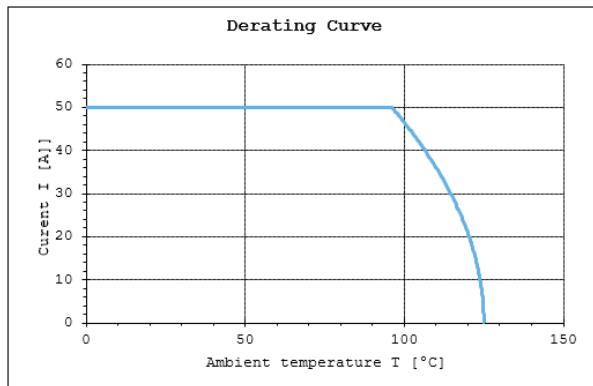
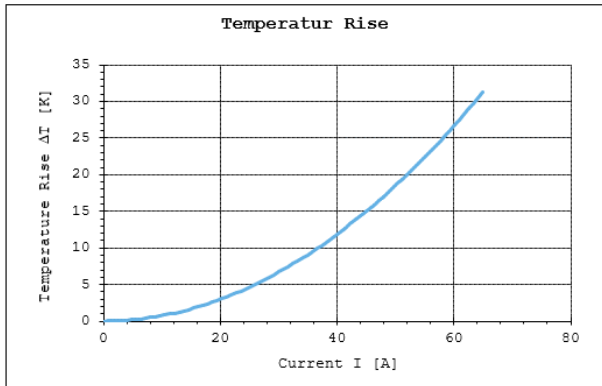
Power Tap HC 4P Connector



Power Tap HC 6P Connector



Power Tap 16mm Stacked Height 6P Connector P/N: 5055324-1



4. QUALITY ASSURANCE PROVISIONS

4.1. Qualification Testing

A. Sample Selection

Taps shall be prepared in accordance with applicable Instruction Sheets and shall be selected at random from current production. Each test group shall consist of one fully populated bus bar assembly with a minimum of 30 pcs power tap samples measured.

B. Test sequence

Qualification inspection shall be verified by testing samples as specified in item 3.6.

4.2. Requalification Testing

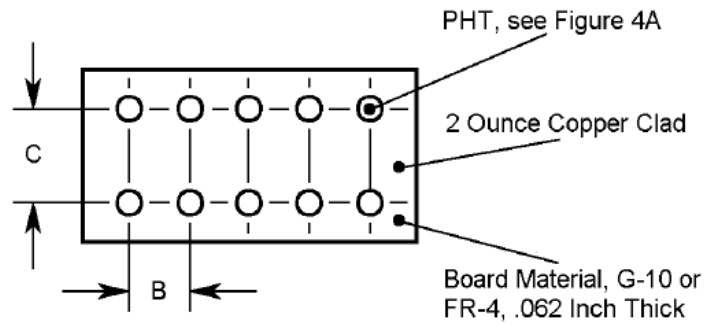
If changes significantly affecting form, fit or function are made to the product or manufacturing process, product assurance shall coordinate requalification testing consisting of all or part of the original testing sequence as determined by development/product, quality and reliability engineering.

4.3. Acceptance

Acceptance is based upon verification that product meets the requirements of item 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 prior to resubmittal.

4.4. Quality Conformance Inspection

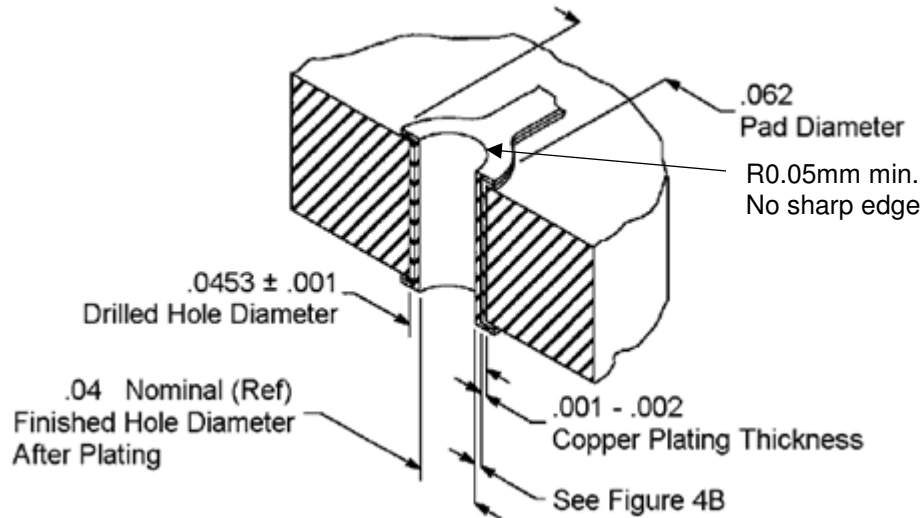
The applicable quality inspection plan will specify acceptable quality sampling level to be used. Dimensional and functional requirements shall be in accordance with the applicable product drawing and this specification.



Tap Size	"B" Dimension	"C" Dimension
.125 X .250	.125	.250
.100 X .300	.100	.300

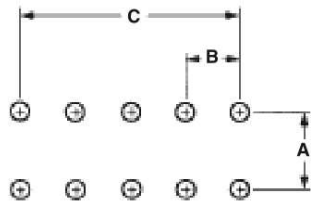
Hole Type	PCB thickness	Drilled Hole Diameter	Plating Thickness		Finished Hole Diameter		Copper Hardness (Knoop)
			Copper	Tin	After Plating	After Reflow	
A	3mm ref. 1.37mm min	.0453 ± .001" 1.15 ± 0.02 mm	.001~.003	.00002 min	.040 ± .003" 1.015 ± 0.05mm	.036 to .043" 1.00 ± 0.09mm	150 max

Figure. The recommended PCB spec of Power Tap STD 6P/10P connector



Surface Finish	
Thickness	Plating
.0002 - .0006	Hot Air Solder Leveling, Tin-Lead
.00002 Minimum	Immersion Tin
.000008 - .00002	Organic Solderability Preservative
.000004 Minimum	Immersion, Silver

Figure. PTH Dimension



Type	A	B	C
4 Position	10.16 .400	5.08 .200	5.08 .200
6 Position	10.16 .400	2.54 .100	5.08 .200
I	—	5.08 .200	5.08 .200
II	—	2.54 .100	5.08 .200
III	10.16 .400	5.08 .200	5.08 .200
IV	7.62 .300	2.54 .100	7.62 .300

PT Type	PCB thickness	Drilled Hole Diameter	Plating Thickness		Finished Hole Diameter		Copper Hardness (Knoop)
			Copper	Tin	After Plating	After Reflow	
PT HC	3~5mm ref. 1.6mm min	.063 ± .001" 1.60± 0.02 mm	.001~.003	.00002 min	.055 ~ .061" 1.39~1.54mm	.054 to .061" 1.36~1.54mm	150 max

Figure. The recommended PCB spec of Power Tap HC connector

The recommended PCB hole spec of special Power Tap HC connector 5167892-*, please refer to the product drawing.

Product Evaluation Test Reference View

Thermocouple Placement
(Thermocouple attached using Loctite
Output conductive adhesive)

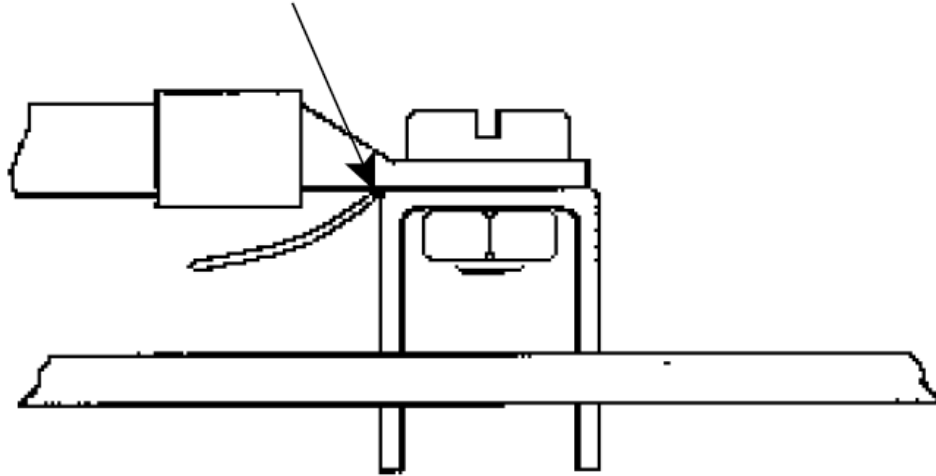


Figure. Thermocouple Mounting

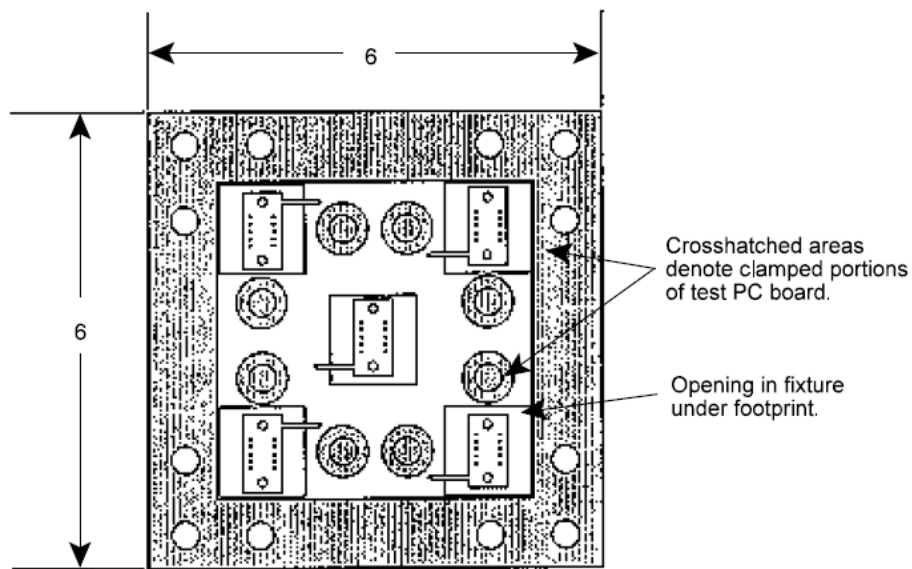


Figure. Vibration Test

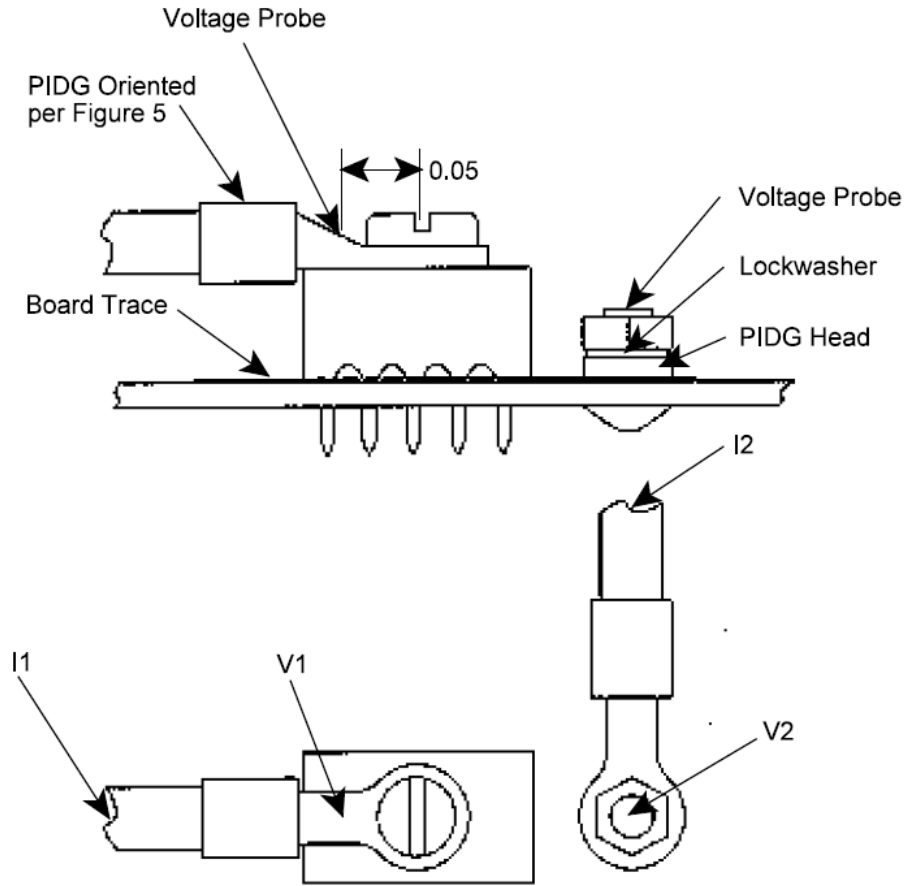


Figure. Termination Resistance Probe Location

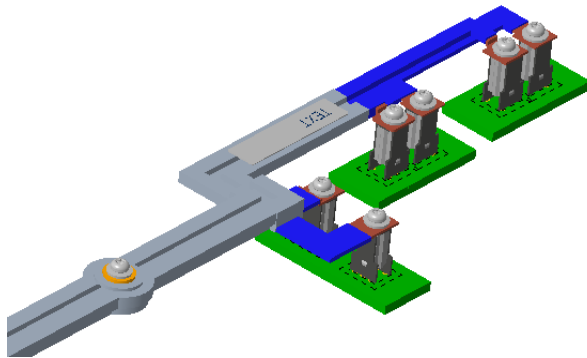


Figure. Reference Product Application View of Power Tap 16mm Stacked Height 6P connector