

**Series 28 HiPer-D
General information and Reference
Product Specifications**



DESCRIPTION	REQUIREMENT	PROCEDURE
ELECTRICAL		
Contact resistance	SAE AS39029 Table V Max Wire Size Test Current Voltage Drop 20 7.5 55 22 5 73 24 3 45 26 2 52 28 1.5 54	EIA-364-06 IEC 60512-2-1 Test current in amperes. Voltage drop in milli-volts. Silver-coated copper wire, +25°C.
Low Level Contact Resistance	Wire Size Max. Milliohms 20 9 22 15 24 20 26 31 28 50	EIA-364-23 100 milliamperes maximum and 20 milli-volts maximum open circuit voltage
Insulation Resistance	5000 meg-ohms minimum	EIA-364-21 IEC-60512-3-1 500 volts DC ± 50 volts. Test between adjacent contacts and contacts to shell.
Dielectric withstanding voltage	No breakdown or flashover	EIA-364-20 IEC-60512-4-1 Sea level AC RMS 50 or 60 Hz. One minute dwell. 1000 volts
Current carrying capacity	Contact Size Max Current 20 7.5 22 5	EIA-364-70 Method 1 IEC-60512-5 Test 9b
Shell-to-shell resistance (connectors with ground springs)	2.5 milli-volt drop maximum	EIA-364-83 IEC-60512-2-6 Electroless nickel plated connectors.
Shielding Effectiveness	Frequency GHz Min Attenuation (dB) 0.1 100 0.4 90 0.8 85 1.0 80 3.0 55 6.0 40 10.0 30	EIA-364-66 IEC-60512-23-3 Pin Connector with Optional Grounding Spring, Electroless nickel plated shells
MECHANICAL		
Water Immersion	No evidence of water penetration into mated connectors. No evidence of water penetration into an unmated panel mounted PCB receptacle. ≥ 100 MΩ insulation resistance.	MIL-STD-810F Method 512.4 1 meter immersion 1 hour

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Air Pressure	No detectable moisture. $\geq 100 \text{ M}\Omega$ insulation resistance.	IEC-60512-7 Test 14b 0.4 bar overpressure 48 hours immersion at a depth of 150mm in 25° C tap water.
Ingress Protection	IP67 rating	IEC-60529
Vibration, Sine	No discontinuity of greater than 1 microseconds, no cracking, breaking or loosening of parts, plug shall not become disengaged from receptacle. Connectors shall meet electrical requirements after vibration test.	EIA-364-28 Test Condition IV IEC-60512-6-4 100 milliamp test current 254 mm/sec from 10-50 Hz; 1.5 mm double amplitude from 50-140 Hz, and 60 G from 140-2,000 Hz
Vibration, Random	No discontinuity of greater than 1 microseconds, no cracking, breaking or loosening of parts, plug shall not become disengaged from receptacle. Connectors shall meet electrical requirements after vibration test.	EIA-364-28 Test Condition VI Letter J IEC-60512-6-4 100 milliamp test current 50- 2,000 Hz 43.92 g. RMS
Mechanical Shock	No discontinuity of greater than 1 microsecond, no cracking, breaking or loosening of parts, plug shall not become disengaged from receptacle. Connectors shall meet electrical requirements after shock test.	EIA-364-27 Condition D IEC-60512-6-3 3 shocks X 3 axes X 2 directions = 18 shocks 2941 m/s ² (300 g's), 3 ms, half-sine
Thermal Shock	No mechanical damage or loosening of parts. Following thermal shock, connector shall meet contact resistance, DWV, Insulation resistance and shell-to-shell resistance requirements.	EIA-364-32 Test Condition IV IEC-60512-11-4 5 cycles consisting of -65° C 30 minutes, +25° C 5 minutes max., + 200° C 30 minutes, +25° C 5 minutes max.
Humidity, Cyclic (Damp Heat, Cyclic) (Moisture Resistance)	No deterioration which will adversely affect the connector. 100 meg-ohms minimum insulation resistance during the final cycle. Following the recovery period, connectors shall meet contact resistance, shell-to-shell resistance and DWV requirements.	EIA-364-31 Condition B Method III IEC-60512-11-12 80-98% RH 10 cycles (10 days) +25° C to +65° C Step 7b vibration deleted. 24 hour recovery period.
21 Day Humidity (Damp heat, Long Term)	No deterioration which will adversely affect the connector. Following the drying period, connectors shall meet 100 meg-ohms minimum, contact resistance, shell-to-shell resistance, DWV, mating and un-mating requirements.	EIA-364-31 Condition C Method II IEC-60512-11-3 Severity C 90-95% RH 40° C Apply 100 volts DC during test. 4 hours drying time at ambient temperature prior to final measurements.
Mechanical Durability, at Ambient Temperature	No deterioration which will adversely affect the connector after 2000 cycles of mating and un-mating. Connectors shall meet contact resistance, insulation resistance, shell-to-shell resistance, DWV, and mating and un-mating force.	EIA-364-09 IEC-60512-5 Test 9a

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Corrosion (Salt Mist)	No exposure of base metal. Connectors shall meet DWV and contact resistance requirements following the test.	EIA-364-26 IEC 60512-11-6 5% salt solution 35° C Unmated connectors Code M: Electroless nickel 48 hours Code MT: Nickel-PTFE 500 hours Code JF: Cadmium 500 Hours																					
Solderability, PC Tail Contacts	95% solder coverage. Smooth, bright and even finish.	EIA-364-52 Category 3 IEC-60512-12-1 IEC-68-2-20 Test Ta, method 1 8 hours steam aging prior to test 245° C 4-5 sec. dwell 10X magnification																					
Resistance To Soldering Heat	No damage to connector. Connectors shall meet insulation resistance and waterproof sealing requirements.	EIA-364-56 IEC-60512-12-5 Test 12e 260° C, 10 seconds (PC tail)																					
Impact, Cable Connectors	No impairment of function. Connector shall meet contact resistance, insulation resistance and waterproof sealing.	EIA-364-42 IEC-60512-5 test 7b 1 meter, 8 drops																					
Fluid Immersion	No damage from immersion in various fuels and oils. Connector shall meet mating/un-mating force and dielectric withstanding voltage.	EIA-364-10																					
Altitude Immersion	No evidence of moisture on connector interface or contacts. Connector shall meet dielectric withstanding voltage.	EIA-364-03																					
Contact Retention	<table border="1"> <thead> <tr> <th>Contact Size</th> <th>Min. Pounds</th> <th>Min. Newtons</th> </tr> </thead> <tbody> <tr> <td>22</td> <td>9</td> <td>40</td> </tr> <tr> <td>20</td> <td>9</td> <td>40</td> </tr> </tbody> </table>	Contact Size	Min. Pounds	Min. Newtons	22	9	40	20	9	40	EIA-364-29 .012 inch maximum displacement, both axial directions												
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4	2.50	39.0																					
5	3.25	49.0																					
6	4.50	65.0																					
Residual Magnetism	2 μ maximum.	EIA-364-54																					
Insert Retention	No dislocation of inserts from their original positions when subjected to an axial load of 60 pounds per square inch	EIA-364-35 Apply force at a rate of 10 pounds per square inch per second until specified pressure is reached.																					

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