

MIL-DTL-38999 Connector Performance Specifications



All performance requirements are per the current revision of MIL-DTL-38999

Test	Performance Specifications																																																							
Dielectric Withstanding Voltage	<p>Test voltage at sea level — 1300 Volts AC (rms). Wired, assembled, unmated connectors withstand the following:</p> <table border="1"> <tr> <td>550 VAC (rms) @ 50,000 ft.</td> </tr> <tr> <td>350 VAC (rms) @ 70,000 ft.</td> </tr> <tr> <td>200 VAC (rms) @ 100,000 ft.</td> </tr> </table>	550 VAC (rms) @ 50,000 ft.	350 VAC (rms) @ 70,000 ft.	200 VAC (rms) @ 100,000 ft.																																																				
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Insulation Resistance	Unmated connectors shall be tested as specified in test method EIA-364-21 5000 megohms min. at 25° C																																																							
Supported Wire Size	<table border="1"> <thead> <tr> <th>Contact Size</th> <th>Wire Gauge</th> </tr> </thead> <tbody> <tr> <td>22D</td> <td>#22 - #28</td> </tr> <tr> <td>20</td> <td>#20 - #24</td> </tr> <tr> <td>16</td> <td>#16 - #20</td> </tr> <tr> <td>12</td> <td>#12 - #14</td> </tr> <tr> <td>10</td> <td>#10 - #12</td> </tr> </tbody> </table>	Contact Size	Wire Gauge	22D	#22 - #28	20	#20 - #24	16	#16 - #20	12	#12 - #14	10	#10 - #12																																											
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EMI Shielding	<p>Effective over a range of 100 MHz to 10 GHz with a minimum 50dB effectiveness at 10GHz, in accordance with test method EIA-364-10</p> <table border="1"> <thead> <tr> <th rowspan="2">Frequency MHz</th> <th colspan="3">Attenuation Minimum dB</th> </tr> <tr> <th>Series I</th> <th>Series II</th> <th>Series III and IV</th> </tr> </thead> <tbody> <tr> <td>100</td> <td>90</td> <td>65</td> <td>90</td> </tr> <tr> <td>200</td> <td>88</td> <td>60</td> <td>88</td> </tr> <tr> <td>300</td> <td>88</td> <td>55</td> <td>88</td> </tr> <tr> <td>400</td> <td>87</td> <td>55</td> <td>87</td> </tr> <tr> <td>800</td> <td>85</td> <td>45</td> <td>85</td> </tr> <tr> <td>1,000</td> <td>85</td> <td>45</td> <td>85</td> </tr> <tr> <td>1,500</td> <td>69</td> <td>—</td> <td>76</td> </tr> <tr> <td>2,000</td> <td>65</td> <td>—</td> <td>70</td> </tr> <tr> <td>3,000</td> <td>61</td> <td>—</td> <td>69</td> </tr> <tr> <td>4,000</td> <td>58</td> <td>—</td> <td>68</td> </tr> <tr> <td>6,000</td> <td>55</td> <td>—</td> <td>66</td> </tr> <tr> <td>10,000</td> <td>50</td> <td>—</td> <td>65</td> </tr> </tbody> </table>	Frequency MHz	Attenuation Minimum dB			Series I	Series II	Series III and IV	100	90	65	90	200	88	60	88	300	88	55	88	400	87	55	87	800	85	45	85	1,000	85	45	85	1,500	69	—	76	2,000	65	—	70	3,000	61	—	69	4,000	58	—	68	6,000	55	—	66	10,000	50	—	65
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Thermal Shock	After cycling the connector between -65° C and +175° C, it will meet all applicable electrical and mechanical requirements.																																																							

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Durability	No electrical or mechanical defects after 500 cycles of engagement and disengagement																																																																																																		
Insert Retention	Unmated connectors shall retain their inserts in their proper location in the shell and there shall be no evidence of cracking, breaking, separation from the shell, or loosening of parts.																																																																																																		
Contact Retention	The axial displacement of the contact shall not exceed .012 inch (0.30 mm). No damage to contacts or inserts shall result.																																																																																																		
Coupling Pin Strength	Applicable to series I and II only Bayonet coupling pins shall withstand a load of 50 +5, -0 pounds without displacement or perceptible loosening of coupling pins.																																																																																																		
Contact Engagement and Disengagement Forces	Applicable to hermetic connectors with sockets only Contact engagement and separating forces shall be within the limits specified in SAE-AS39029 .																																																																																																		
Resistance to Probe Damage	Applicable to hermetic connectors with sockets only Contacts shall withstand the bending moment and depth of test probe insertion without evidence of damage that would interfere with the mechanical or electrical performance.																																																																																																		
EMI Ground Spring Forces	<p>The forces necessary to engage and separate EMI plugs with receptacle shells shall be within the values specified in the table shown below:</p> <table border="1"> <thead> <tr> <th rowspan="2">Shell size</th> <th colspan="4">Axial force for Series I, II, and III</th> <th colspan="4">Axial force for Series IV</th> </tr> <tr> <th>Maximum Pounds</th> <th>Minimum Newtons</th> <th>Maximum Pounds</th> <th>Minimum Newton</th> <th>Pounds</th> <th>Newton</th> <th>Pounds</th> <th>Newton</th> </tr> </thead> <tbody> <tr> <td>8/9</td> <td>25</td> <td>111</td> <td>0.5</td> <td>2</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>10/11</td> <td>25</td> <td>111</td> <td>0.5</td> <td>2</td> <td>5</td> <td>22.3</td> <td>0.3</td> <td>1.3</td> </tr> <tr> <td>12/13</td> <td>30</td> <td>133</td> <td>0.5</td> <td>2</td> <td>5</td> <td>22.3</td> <td>0.3</td> <td>1.3</td> </tr> <tr> <td>14/15</td> <td>30</td> <td>133</td> <td>0.5</td> <td>2</td> <td>6</td> <td>26.7</td> <td>0.4</td> <td>1.8</td> </tr> <tr> <td>16/17</td> <td>35</td> <td>156</td> <td>0.5</td> <td>2</td> <td>7</td> <td>31.1</td> <td>0.4</td> <td>1.8</td> </tr> <tr> <td>18/19</td> <td>35</td> <td>156</td> <td>0.5</td> <td>2</td> <td>8</td> <td>35.6</td> <td>0.5</td> <td>2.2</td> </tr> <tr> <td>20/21</td> <td>35</td> <td>156</td> <td>0.5</td> <td>2</td> <td>9</td> <td>40</td> <td>0.5</td> <td>2.2</td> </tr> <tr> <td>22/23</td> <td>35</td> <td>156</td> <td>0.5</td> <td>2</td> <td>10</td> <td>44.5</td> <td>0.5</td> <td>2.2</td> </tr> <tr> <td>24/25</td> <td>35</td> <td>156</td> <td>0.5</td> <td>2</td> <td>10</td> <td>44.5</td> <td>0.5</td> <td>2.2</td> </tr> </tbody> </table>	Shell size	Axial force for Series I, II, and III				Axial force for Series IV				Maximum Pounds	Minimum Newtons	Maximum Pounds	Minimum Newton	Pounds	Newton	Pounds	Newton	8/9	25	111	0.5	2	-	-	-	-	10/11	25	111	0.5	2	5	22.3	0.3	1.3	12/13	30	133	0.5	2	5	22.3	0.3	1.3	14/15	30	133	0.5	2	6	26.7	0.4	1.8	16/17	35	156	0.5	2	7	31.1	0.4	1.8	18/19	35	156	0.5	2	8	35.6	0.5	2.2	20/21	35	156	0.5	2	9	40	0.5	2.2	22/23	35	156	0.5	2	10	44.5	0.5	2.2	24/25	35	156	0.5	2	10	44.5	0.5	2.2
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