

MIL-DTL-38999 Connector Performance Specifications



Test	Performance Specifications																																																																																							
Dielectric Withstanding Voltage	<p>(meets MIL-C-38999, paragraph 3.14) 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	<p>(meets MIL-C-38999, paragraph 3.13) Unmated connectors shall be tested as specified in test method EIA-364-21 5000 megohms min. at 25° C</p>																																																																																							
Supported Wire Size	<p>(meets MIL-DTL-38999, paragraph 3.4.3.1)</p> <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>(meets MIL-DTL-38999, paragraph 3.31) 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="3">Frequency MHz</th> <th colspan="5">Leakage Attenuation (dB) Minimum</th> </tr> <tr> <th>Series II</th> <th colspan="2">Series III and IV</th> <th>Series I</th> </tr> <tr> <th>Finishes B, F, N, R, T and Z</th> <th>Classes H, K, and Y</th> <th>Classes F, G, L, N, M, R and S</th> <th>Classes J, T, W, X, and Z</th> <th>Finishes B, F, N, R, T and Z</th> </tr> </thead> <tbody> <tr> <td>100</td> <td>65</td> <td>80</td> <td>90</td> <td>90</td> <td>90</td> </tr> <tr> <td>200</td> <td>60</td> <td>75</td> <td>88</td> <td>88</td> <td>88</td> </tr> <tr> <td>300</td> <td>55</td> <td>73</td> <td>88</td> <td>88</td> <td>88</td> </tr> <tr> <td>400</td> <td>55</td> <td>71</td> <td>87</td> <td>87</td> <td>87</td> </tr> <tr> <td>800</td> <td>45</td> <td>66</td> <td>85</td> <td>85</td> <td>85</td> </tr> <tr> <td>1,000</td> <td>45</td> <td>65</td> <td>85</td> <td>85</td> <td>85</td> </tr> <tr> <td>1,500</td> <td>—</td> <td>59</td> <td>76</td> <td>69</td> <td>69</td> </tr> <tr> <td>2,000</td> <td>—</td> <td>55</td> <td>70</td> <td>65</td> <td>65</td> </tr> <tr> <td>3,000</td> <td>—</td> <td>52</td> <td>69</td> <td>61</td> <td>61</td> </tr> <tr> <td>4,000</td> <td>—</td> <td>50</td> <td>68</td> <td>58</td> <td>58</td> </tr> <tr> <td>6,000</td> <td>—</td> <td>48</td> <td>66</td> <td>55</td> <td>55</td> </tr> <tr> <td>10,000</td> <td>—</td> <td>45</td> <td>65</td> <td>50</td> <td>50</td> </tr> </tbody> </table>	Frequency MHz	Leakage Attenuation (dB) Minimum					Series II	Series III and IV		Series I	Finishes B, F, N, R, T and Z	Classes H, K, and Y	Classes F, G, L, N, M, R and S	Classes J, T, W, X, and Z	Finishes B, F, N, R, T and Z	100	65	80	90	90	90	200	60	75	88	88	88	300	55	73	88	88	88	400	55	71	87	87	87	800	45	66	85	85	85	1,000	45	65	85	85	85	1,500	—	59	76	69	69	2,000	—	55	70	65	65	3,000	—	52	69	61	61	4,000	—	50	68	58	58	6,000	—	48	66	55	55	10,000	—	45	65	50	50
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Thermal Shock	<i>(meets MIL-C-38999, paragraph 3.7)</i> After cycling the connector between -65° C and +175° C, it will meet all applicable electrical and mechanical requirements.																										
Physical Shock	<i>(meets MIL-C-38999, paragraph 3.27)</i> No loosening of parts, cracking or other deleterious results hindering further part operation after 300 G's in each of 3 mutually perpendicular planes.																										
Fluid Compatibility	<i>(meets MIL-DTL-38999, paragraph 3.33)</i> Designed to function in all fluids encountered in any modern military or aerospace environment																										
Fluid Immersion	<p><i>(meets MIL-DTL-38999, paragraph 3.31)</i></p> <table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>50Leakage Attenuation Minimum (dB)</th> </tr> </thead> <tbody> <tr><td>100</td><td>90</td></tr> <tr><td>200</td><td>88</td></tr> <tr><td>300</td><td>87</td></tr> <tr><td>400</td><td>85</td></tr> <tr><td>800</td><td>85</td></tr> <tr><td>1,000</td><td>85</td></tr> <tr><td>1,500</td><td>69</td></tr> <tr><td>2,000</td><td>65</td></tr> <tr><td>3,000</td><td>61</td></tr> <tr><td>4,000</td><td>58</td></tr> <tr><td>6,000</td><td>55</td></tr> <tr><td>10,000</td><td>50</td></tr> </tbody> </table>	Frequency (MHz)	50Leakage Attenuation Minimum (dB)	100	90	200	88	300	87	400	85	800	85	1,000	85	1,500	69	2,000	65	3,000	61	4,000	58	6,000	55	10,000	50
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High Impact Shock	<i>(meets MIL-C-38999, paragraph 3.27)</i> Mated connectors, wired with MIL-C-915/60 or /63 cable and equipped with straight environmentally sealed backshells, withstand high impact shock per MIL-S-901.																										
Vibration	<i>(meets MIL-C-38999, paragraph 3.26)</i> There shall be no electrical discontinuity and there shall be no disengagement of the mated connectors, backing off of the coupling mechanism, evidence of cracking, breaking, or loosening of parts.																										
Fungus	<i>(meets MIL-C-38999, paragraph 4.2.2)</i> Materials used in the construction of these connectors shall be fungus inert per certification of method 508.4 of MIL-STD-810																										
Corrosion	<i>(meets MIL-C-38999, paragraph 3.16)</i> When tested in accordance with EIA-364-26, meets appropriate electrical and mechanical requirements and shows no exposure of base metal after 500 hours of salt spray																										

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Mating / Unmating Forces	<i>(meets MIL-C-38999, paragraph 3.10)</i> The coupling torque for mating and unmating of the counterpart connectors and protective covers shall meet the requirements MIL-DTL-38999, paragraph 3.10.																																																																																																		
Durability	<i>(meets MIL-C-38999, paragraph 3.11)</i> No electrical or mechanical defects after 500 cycles of engagement and disengagement																																																																																																		
Insert Retention	<i>(meets MIL-C-38999, paragraph 3.15)</i> 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	<i>(meets MIL-C-38999, paragraph 3.23)</i> 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	<i>(meets MIL-C-38999, paragraph 3.20)</i> 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	<i>(meets MIL-C-38999, paragraph 3.16)</i> 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	<i>(meets MIL-C-38999, paragraph 3.42)</i> 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><i>(meets MIL-C-38999, paragraph 3.30)</i> 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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