

MINIDOCK™

Part No. Plug: 30*** Receptacle: 30***

Product Specification

Qualification Test Report No. TR-9020

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16	S21581	November 5, 2021	Y.Kuribayashi	S.Suzuki	Y.Hashimoto
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Rev.	ECN	Date	Prepared by	Checked by	Approved by

1. Scope

MINIDOCK Connector is designed for horizontal board to board connection and features small size with 0.635 mm pitch for applications in high density packaging. It also employs metallic die-cast housings to minimize EMI noise.

2. Product Name and Parts No.

2.1 Product Name

MINIDOCK

2.2 Parts No.

Plug: 30***_**0T-F, **F

Receptacle: 30***_**0T-F, **F

3. Rating

3.1 Operating Conditions

Amperage: 0.5A AC/DC (per contact pin)

Voltage: 250V AC (per contact pin)

Operating temperature: 208 to 358K(-65°C to +85°C)

(Containing temperature rise by current)

Operating humidity: 85% max

3.2 Storage Conditions

Storage temperature: 248 to 333K(-25°C to 60°C)

Storage humidity: 85% max. (Non-condensing)

4. Test and Performance

Test Condition

This initial test is equal to it's at shipping condition and unless otherwise specified, all tests and measurements shall be performed under the following conditions in accordance with MIL-STD-202.

The condition of this product is a thing that does the screw stop to the substrate and uses it.

The examination is a thing done with the screw stopped to the test board.

Temperature... 288K to 308K (15°C to 35°C)

Pressure... 866hPa to 1066hPa (650mmHg to 800mmHg)

Relative humidity... 45 to 75%R.H.

4.1. Electrical Performance

1. Contact resistance

Reference standard: MIL-STD-202, Method 307

Test conditions: Solder the receptacle connector to the test board and mate the plug connector together, then measure the contact resistance as shown in Fig.1 by the four terminal methods. Apply the low level condition of 20mV MAX. DC for the open circuit voltage and 10mA MAX. DC for the closed circuit current.

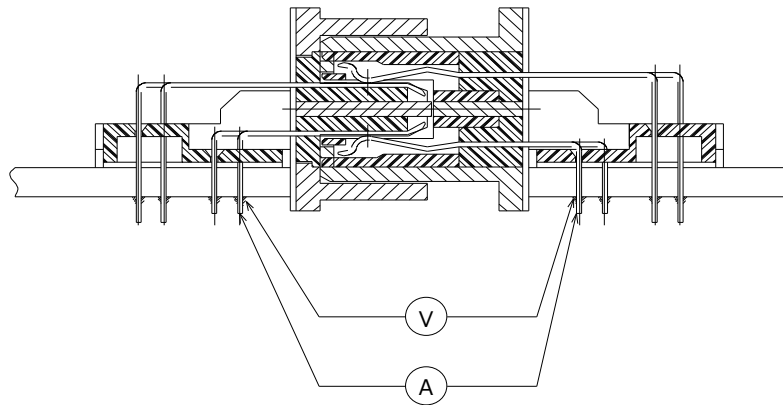


Fig.1

Pass criteria: Contact
Initial: 70 mΩ MAX. After testing: Δ R25 mΩ MAX.

2. Insulation resistance

Reference standard: MIL-STD-202, Method 302 B

Test conditions: Mate the plug and receptacle connector together, and then apply DC 500 V between the inner contact and the ground contact. Test board is not used.

Pass criteria: Initial: 10,000 MΩ MIN. After testing: 1,000 MΩ MIN.

3. Dielectric withstanding voltage

Reference standard: MIL-STD-202, Method 301

Test conditions: Mate the receptacle and plug connector together, then apply AC 500V(rms) between the neighboring contacts for a minute. Test board is not used.

Pass criteria: No abnormalities such as creeping discharge, flashover, insulator breakdown occur.

4. Temperature rising

Reference standard: -

Test conditions: Mate the plug and receptacle connector together and then apply rating current per contact pin.

Pass criteria: Over ambient Δ T30°C MAX.

4.2. Mechanical Performance

1. Mating force and Un-mating force					
Reference standard:	-				
Test conditions:	Solder the receptacle connector to the test board, then place the board and plug on push-on/pull-off machine, measure mating/un-mating at a speed 25 ± 3 mm/min. along the mating axis.				
Pass criteria:	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">Mating force</td> <td style="width: 50%;">Un-mating force</td> </tr> <tr> <td>0.9 N /pos. MAX.</td> <td>0.059 N /pos. MIN.</td> </tr> </table>	Mating force	Un-mating force	0.9 N /pos. MAX.	0.059 N /pos. MIN.
Mating force	Un-mating force				
0.9 N /pos. MAX.	0.059 N /pos. MIN.				

2. Durability	
Reference standard:	-
Test conditions:	Solder the receptacle connector to the test board, then place the board and plug on the push-on/pull-off machine, and repeat mating and unmating 5,000cycles at a speed 25 ± 3 mm/min. along the mating axis.
Pass criteria:	Contact resistance: Shall meet 4.1.1

3. Vibration	
Reference standard:	MIL-STD-202, Method 201
Test conditions:	<p>Solder the receptacle connector to the test board, then mate plug connector, and place them on the vibrator. Then apply the following vibration. During the testing, run 100mA DC to check electrical discontinuity.</p> <p>Frequency: 10Hz→55Hz→10Hz/approx. 1min.</p> <p>Directions: 3 mutually perpendicular directions</p> <p>Total Amplitude: 1.52mm</p> <p>Sweep duration: 2 hours for each direction, a total of 6 hours.</p>
Pass criteria:	<p>Contact resistance: Shall meet 4.1.1.</p> <p>Electrical discontinuity: No electrical discontinuity greater than 1μs shall occur.</p> <p>Appearance: No abnormality adversely affecting the performance shall occur.</p>

4. Shock							
Reference standard:	MIL-STD-202, Method 213, Condition A.						
Test conditions:	<p>Solder the receptacle connector to the test board, then mate plug connector, and place them on the shock machine. Then apply the following shock.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">MAX.G: 50G</td> <td style="width: 50%;">Directions: 6 mutually perpendicular direction</td> </tr> <tr> <td>Duration: 11msec</td> <td>Cycle: 18 cycles about each direction</td> </tr> <tr> <td>Wave Form: Half Sinusoidal</td> <td></td> </tr> </table>	MAX.G: 50G	Directions: 6 mutually perpendicular direction	Duration: 11msec	Cycle: 18 cycles about each direction	Wave Form: Half Sinusoidal	
MAX.G: 50G	Directions: 6 mutually perpendicular direction						
Duration: 11msec	Cycle: 18 cycles about each direction						
Wave Form: Half Sinusoidal							
Pass criteria:	<p>Contact resistance: Shall meet 4.1.1.</p> <p>Electrical discontinuity: No electrical discontinuity greater than 1μs shall occur.</p> <p>Appearance: No abnormality adversely affecting the performance shall occur.</p>						

4.3. Environmental Performance

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1. Thermal shock	
Reference standard:	MIL-STD-202, Method 107, Condition B.
Test conditions:	Solder the receptacle connector to the test board, then mate plug connector, and expose them to the following environment. Temperature: 208K(-65°C),30min.→398K(125°C),30min. Transition time: 5min. MAX. No. of cycles: 5 cycles
Pass criteria:	Contact resistance: Shall meet 4.1.1. Insulation resistance: Shall meet 4.1.2. Dielectric withstanding voltage: Shall meet 4.1.3. Appearance: No abnormality adversely affecting the performance shall occur.

2. High temperature life	
Reference standard:	MIL-STD-202, Method 108, Condition B.
Test conditions:	Solder the receptacle connector to the test board, then mate plug connector, and expose them to the following environment. Temperature: 358±2K (85±2°C) Duration: 250 hours
Pass criteria:	Contact resistance: Shall meet 4.1.1. Contact retention force: Shall meet 4.2.3. Appearance: No abnormality adversely affecting the performance shall occur.

3. Humidity(Steady state)	
Reference standard:	MIL-STD-202, Method 103, Condition B.
Test conditions:	Solder the receptacle connector to the test board, then mate plug connector, and expose them to the following environment. Temperature: 313±2K (40±2°C) Humidity: 90 to 95%RH Duration: 96 hours
Pass criteria:	Contact resistance: Shall meet 4.1.1. Insulation resistance: Shall meet 4.1.2. Dielectric withstanding voltage: Shall meet 4.1.3. Appearance: No abnormality adversely affecting the performance shall occur.

4. Humidity(Cycling)	
Reference standard:	MIL-STD-202, Method 106.
Test conditions:	Solder the receptacle connector to the test board, then mate plug connector, and expose them to the following environment. Temperature: 298[263] to 338K (25[-10] to 65°C) Humidity: 90 to 98%RH Duration: 10cycles (240hours)
Pass criteria:	Contact resistance: Shall meet 4.1.1. Insulation resistance: Shall meet 4.1.2. Dielectric withstanding voltage: Shall meet 4.1.3. Appearance: No abnormality adversely affecting the performance shall occur.

4.3. Environmental Performance

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5. Salt water spray

Reference standard:	MIL-STD-202, Method 101 B.
Test conditions:	Solder the receptacle connector to the test board, then mate plug connector, and expose them to the following environment. Temperature: $308\pm 2\text{K}$ ($35\pm 2^\circ\text{C}$) Salt water density: $5\pm 1\%$ [by weight] Duration: 48 hours
Pass criteria:	Contact resistance: Shall meet 4.1.1. Appearance: No abnormality adversely affecting the performance shall occur.

6. SO₂ gas

Reference standard:	-
Test conditions:	Solder the receptacle connector to the test board, then mate plug connector, and expose them to the following environment. Temperature: $298\pm 2\text{K}$ ($25\pm 2^\circ\text{C}$) Relative humidity: 95%RH Gas: SO ₂ 10ppm Duration: 48 hours
Pass criteria:	Contact resistance: Shall meet 4.1.1. Appearance: No abnormality adversely affecting the performance shall occur.

4.4. Others

1. Solder ability

Reference standard:	MIL-STD-202, Method 208
Test conditions:	Dip the solder tine of the contact in the solder bath at $518\pm 5\text{K}$ ($245\pm 5^\circ\text{C}$) for 5 ± 0.5 seconds after immersing the tine in the flux of RMA or R type for 5 to 10 seconds.
Pass criteria:	More than 95% of the dipped surface shall be evenly wet.

2. Soldering heat resistance

Reference standard:	-
Test conditions:	<ol style="list-style-type: none"> 1. Solder bath (2 times) Place the connector on the PCB, then immerse the solder tine in the solder bath at $260\pm 5^\circ\text{C}$ for 10 seconds in accordance with MIL-STD-202, Method 210A. 2. Soldering iron A point of soldering iron ··· $350^\circ\text{C}_{\text{MAX}}\pm 10^\circ\text{C}$ Heating time ········ 3 ± 0.5 sec Heating times ········ 2 times
Pass criteria:	No abnormality adversely affecting the performance shall not occur.

4.5 Test Sequence and Specimen Quantity

Table 1 Test Sequence and Sample Quantity

Test Item	Group												
	A	B	C	D	E	F	G	H	J	K	L	M	
Contact Resistance	2,4				1,5	1,5	1,5	1,3	1,3	1,3			
Insulation Resistance					2,6	2,6	2,6						
D. W. Voltage					3,7	3,7	3,7						
Temperature rising		1											
Mating/Un-mating Force	1												
Durability	3												
Vibration			1										
Shock				1									
Thermal Shock					4								
Humidity(Stead state)						4							
Humidity(Cycles)							4						
Salt Water Spray								2					
SO ₂ gas									2				
High Temperature Life										2			
Solder ability											2		
Soldering Heat Resistance												2	
Sample QTY.	PLUG	3	3	3	3	3	3	3	3	3	3	3	3
	RECE	3	3	3	3	3	3	3	3	3	3	3	3

※Numbers indicate sequence in which tests are performed.