

AP-TSS10/AP-LT10

AP-TSS10: 3782-000* AP-LT10: 3571-0081-0*T

Product Specification

Qualification Test Report No. TR-23036

2	S23433	December 5, 2023	S.Kamada	-	Y.Hashimoto
1	S23350	October 11, 2023	S.Kamada	-	Y.Hashimoto
0	S23267	September 1, 2023	S.Kamada	-	Y.Hashimoto
Rev.	ECN	Date	Prepared by	Checked by	Approved by

1. Scope

This Product Specification defines the test conditions and the performances of the AP-TSS10 and AP-LT10.

2. Product Name and Parts No.

AP-TSS10: 3782-000*

AP-LT10: 3571-0081-0*T

3. Rating

3.1 Operating Conditions

Amperage: 32A DC

Operating temperature: 233~398K(-40°C~125°C)

(Containing temperature rise by current)

Operating humidity: 85% max

screw tightening torque : 0.75~0.93Nm (Recommended value)

3.2 Storage Conditions

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

Storage humidity: 85% max. (結露無きこと / Non-condensing)

Keeping the production in the above conditions, we asked to use them within 1 year after delivery.

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 G.

Temperature... 288K~308K (15°C~35°C)

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

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

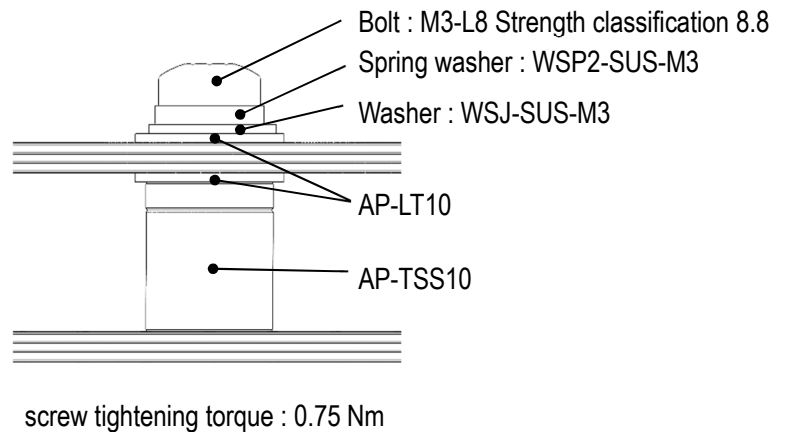
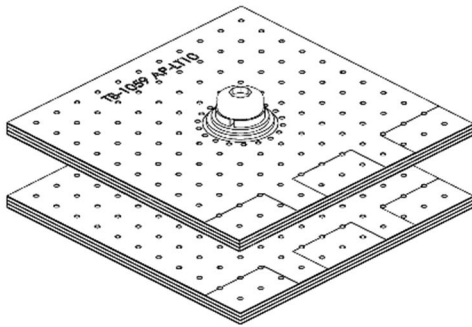
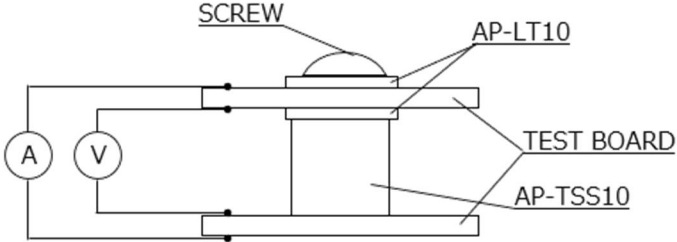


Fig.1
Mating test sample

4.1. Electrical Performance

1. Contact resistance	
Reference standard:	MIL-STD-202-307
Test conditions:	Solder the AP-LT10 and AP-TSS10 to the test board, mate them with screw, then apply 20mV MAX. DC open circuit voltage and 10mA MAX. DC closed circuit current. Measure the contact resistance as shown in Fig.2 by the four terminal methods.
 <p>Fig.2</p>	
Pass criteria:	Initial: 1.0 mΩ MAX After testing: 1.0mΩ MAX

2. Temperature rising	
Reference standard:	-
Test conditions:	Fixed terminal together and then apply rating current per contact. Measure delta T over ambient.
Pass criteria:	Over ambient $\Delta T \leq 25.0$ °C MAX.

4.2. Mechanical Performance

1. Vibration	
Reference standard:	IEC 60068-2-6
Test conditions:	Solder the terminal to the test board, then mate and place them on the vibrator. Frequency : 10-500Hz Acceleration : 98m/s ² (10G) Directions , Duration :3 mutually perpendicular Direction 24 hours about each direction.
Pass criteria:	[Contact Resistance] Shall meet 4.1.1. [Appearance] No abnormality adversely affecting the performance shall occur.

4.3. Environmental Performance

1. High Temperature Life	
Reference standard:	IEC 60068-2-2
Test conditions:	Solder the terminal to the test board, then mate and expose them to the following environment in accordance. Temperature : $398 \pm 2K$ ($125 \pm 2^{\circ}C$) Duration : 1000 hours
Pass criteria:	[Contact Resistance] Shall meet 4.1.1. [Appearance] No abnormality adversely affecting the performance shall occur.

2. High Temperature Life(Energization)	
Reference standard:	IEC 60068-2-2
Test conditions:	Solder the terminal to the test board, then mate and expose them to the following environment in accordance. During the testing, run rated Amperage. Temperature : $398 \pm 2K$ ($125 \pm 2^{\circ}C$) Duration : 1000 hours
Pass criteria:	[Contact Resistance] Shall meet 4.1.1. [Appearance] No abnormality adversely affecting the performance shall occur.

3. High Temperature and humidity	
Reference standard:	IEC 60068-2-66 , 60068-2-67 , 60068-2-78
Test conditions:	Solder the terminal to the test board, then mate and expose them to the following environment in accordance. Temperature : $333 \pm 2K$ ($60 \pm 2^{\circ}C$) Humidity: 90~95%RH Duration : 1000 hours
Pass criteria:	[Contact Resistance] Shall meet 4.1.1. [Appearance] No abnormality adversely affecting the performance shall occur.

4. High Temperature and humidity(Energization)	
Reference standard:	IEC 60068-2-66 , 60068-2-67 , 60068-2-78
Test conditions:	Solder the terminal to the test board, then mate and expose them to the following environment in accordance. During the testing, run rated Amperage. Temperature : $333 \pm 2K$ ($60 \pm 2^{\circ}C$) Humidity: 90~95%RH Duration : 1000 hours
Pass criteria:	[Contact Resistance] Shall meet 4.1.1. [Appearance] No abnormality adversely affecting the performance shall occur.

4.3. Environmental Performance

5. Temperature cycling	
Reference standard:	-
Test conditions:	Solder the terminal to the test board, then mate and expose them to the following environment in accordance. Temperature : 233(-40°C), 30min→398K (125°C), 30min Transition time : 5min. MAX. Duration : 1000cycles
Pass criteria:	[Contact Resistance] Shall meet 4.1.1. [Appearance] No abnormality adversely affecting the performance shall occur.

6. SO ₂ Gas	
Reference standard:	IEC 60068-2-43
Test conditions:	Solder the terminal to the test board, then mate and expose them to the following environment in accordance. Temperature : 313K (40°C) Humidity : 80%RH Gas(SO ₂) : 25ppm Duration : 500 hours
Pass criteria:	[Contact Resistance] Shall meet 4.1.1. [Appearance] No abnormality adversely affecting the performance shall occur.

4.4. Others

1. Soldering Heat Resistance									
Reference standard:	-								
Test conditions:	Reflow temperature profile see Fig.3. The number of times of Reflow is within 2.								
<table border="1" style="float: right; margin-left: 20px;"> <thead> <tr> <th></th> <th>Soldering Heat Resistance</th> </tr> </thead> <tbody> <tr> <td>Pre heat part (150~180°C)</td> <td>110s MIN.</td> </tr> <tr> <td>Reflow part (220°C MIN.)</td> <td>60s MIN.</td> </tr> <tr> <td>Peak temperature</td> <td>260°C MIN.</td> </tr> </tbody> </table>			Soldering Heat Resistance	Pre heat part (150~180°C)	110s MIN.	Reflow part (220°C MIN.)	60s MIN.	Peak temperature	260°C MIN.
	Soldering Heat Resistance								
Pre heat part (150~180°C)	110s MIN.								
Reflow part (220°C MIN.)	60s MIN.								
Peak temperature	260°C MIN.								
Fig.3									
Pass criteria:	No abnormality adversely affecting the performance shall occur.								

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

3. Solder junction life	
Reference standard:	IEC 60068-2-14
Test conditions:	Reflow temperature profile see 3782 and 3571 drawing. The number of times of Reflow is 2. Mate the connector together, and expose them to the following environment in accordance. Temperature : 233(-40°C), 30min → 398K (125°C), 30min Transition time : 5min. MAX. Duration : 3000cycles
Pass criteria:	Electrical continuity is confirmed after the test, and 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
Contact Resistance		1,3	1,3	1,3	1,3	1,3	1,3	1,3			
Temperature rising	1										
Vibration		2									
High Temperature Life			2								
High Temperature Life (Energization)				2							
High Temperature and humidity					2						
High Temperature and humidity (Energization)						2					
Temperature cycling							2				
SO ₂ Gas								2			
Soldering Heat Resistance									1		
Solder ability										1	
Solder junction life											1
Specimen Quantity.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.

※ Numbers indicate sequence in which tests are performed

5. Recommended Metal Mask

Refer to drawing for the recommended metal mask thickness and opening dimension.