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Title	GET 16P PLUG COVER HSG
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2 MATERIAL**[1] SCOPE****[2] LABORATORY CONDITION****[3] SPECIMEN****[4] HEAT AND HUMIDITY CYCLE RESISTANCE TEST – TYPE C**

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Part number	Description
2219458-2	GET 16P PLUG COVER HSG

[2] SCOPE

This SPEC defines the test method for Wire Cover.

* **Related specification: ES91500-00**

[3] Quality

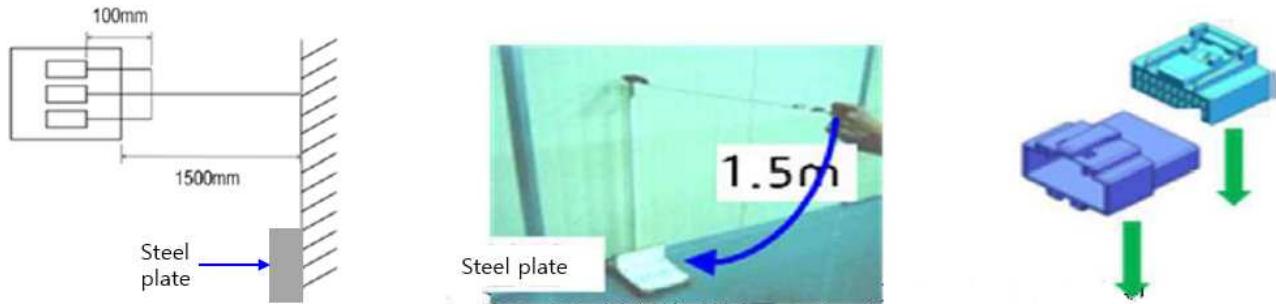
The quality of Cover have to meet each characteristics at column 3 with items of test in table 1.

[4] Test Method**4.1) Appearance**

- A) By sense of sight and touch

4.2) Cold temperature test

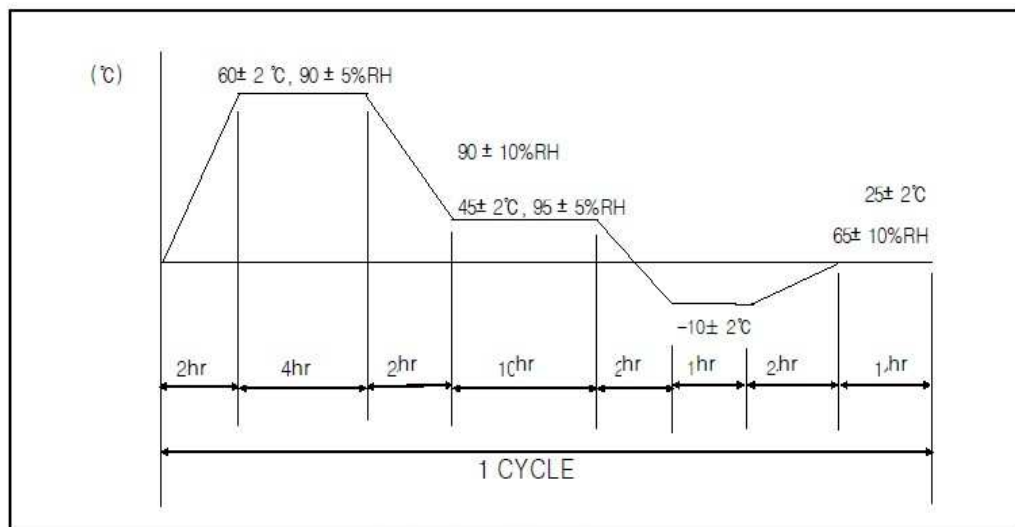
- A) Leave connector with terminal assembled in temperature chamber of -40°C for 120 hours and estimate below items for each sample dividing two groups.
- a) Estimate voltage drop and leakage current assembled connector.
 - b) Leave connector for 2 hours and separate connector with male and female, and then drop it onto the concrete surface more than 10T from 1.5m height 3 items. The method of connector drop follows figure 5-1.



< Fig. 5-1 >

4.3) Temperature and humidity cycle test

- A) Engage and disengage connector with terminal assembled 10 times with hands, and leave it at 25°C ambient temperature and 65% relative humidity for 25 hours. And perform 5 cycles of the method specified in figure 5-2. Then pick connector out of chamber and dry it for 2 hours or more.



< Fig. 5-2 >

[5] Test conditions

5.1) Specimen

Unless there is specific mention, initial sample should use for the test specimen, and test specimen shall be 5EA or more for each cavity. However, if performance is expected to be clearly satisfactory ever by applying load to the same specimen in turn, it is possible to apply multiple test items to the same specimen. In such case, performance shall be satisfied with each item.

5.2) Laboratory condition

Perform each test at designated temperature and humidity. And control humidity at designated absorption ratio for the connector which uses absorbent resin housing.

Temperature: $25 \pm 5^\circ\text{C}$

Humidity: $60 \pm 20\%$

Standard absorption ratio (reference value)

6 NYLON: 2 ~ 4%

66 NYLON: 1.5 ~ 3%

5.3) Basic current

Basic current value "I" shall be based on the following. ($I = I_0 * K$)

Cable size (SQ)	I_0		Remarks
	General	L TYPE -375	
0.22	4 A		
0.3	6 A		4A for signal
0.5	8 A		5A for signal
0.85	10 A		
1.25	14 A		
2	18 A		
3	22 A	34 A	
5	25 A	46 A	
8		60 A	

< Table 2 >

Number of simultaneous electrode within the same connector	K
	Reduction factor
1	1
2 ~ 3	0.75
4 ~ 5	0.6
6 ~ 8	0.55
9 ~ 10	0.5
11 ~ 25	0.4
26 or more	0.3
-	-

< Table 3 >

5.4) Evaluation

Evaluation shall be represented by evaluation applicable connector. And Annual evaluation of connectors shall be represented by evaluation of connectors of the maximum number of poles in the same series.

5.5) Cable size

The size of connector lead wire used in each test shall be follow Table 5.

Test Item		MIN WIRE	MAX WIRE	Test Item		MIN WIRE	MAX WIRE
Cold temperature Test	Appearance	-	O	Temperature and humidity cycle test	Voltage Drop	-	O
	Voltage Drop	-	O		Insulation resistance	O	O
	resistance		O		Leakage current	-	O
	Leakage current	-	O		Sealing	O	O
	Temperature rise	-	O				
	Sealing	O	O				
Complex environment Endurance test	Crimp strength	O	O				
	Voltage Drop	-	O				
	Temperature rise	-	O				
	Instant short circuit	-	O				
	Sealing	O	O				

< Table 5 >

2 MATERIAL

[1] SCOPE

This test specification covers a general efficiency for the plastic product applying engine room.

[2] LABORATORY CONDITION

Perform each test at designated temperature and humidity.

Temperature: 23 ± 2 °C

Humidity: $50 \pm 5\%$

[3] SPECIMEN

Specimen shall be selected from finished products or equivalents made under the same conditions with the finished products. The test products shall keep in standard laboratory condition for 24 hours and then assembled in regular using condition.

Note (4) fixed on the B.I.W or test jig as assembled in the real vehicle.

[4] HEAT AND HUMIDITY CYCLE RESISTANCE TEST - TYPE C

Repeat 3 times with designated condition Figure 1.

Apply the heat and humidity cycle resistance test - TYPE C for the plastic product which is to install

around the engine room and to be affected by high temperature such as radiant heat or convection in engine room.

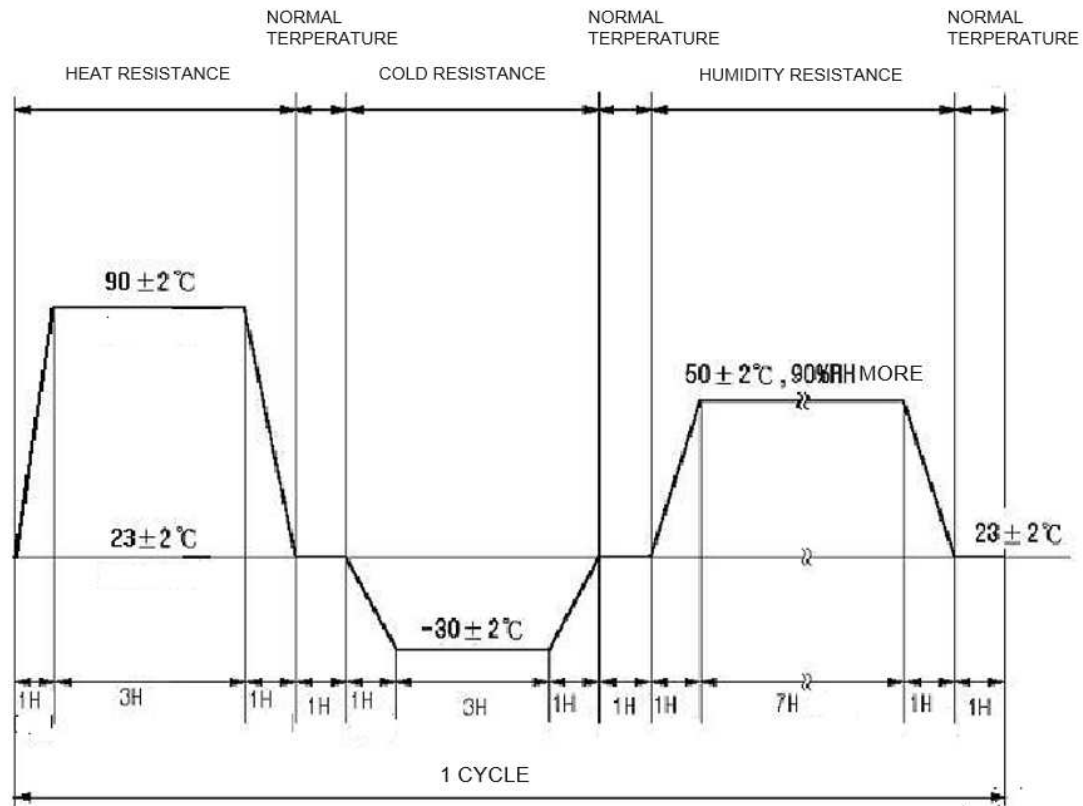


FIGURE 1

[5] WEATHERABILITY TEST

Apply weather-o-meter (Xenon arc described in ISO 105, JIS L 0843, ASTM D 6695, SAE J 1960, SAE J 2527) with the test condition in Table 1 for 500 hours.

RADIANT EXPOSURE	BLACK PNL TEMPERATURE	CYCLE	SPECTRAL IRRADIANCE
660KJ/ m ² [340nm]	70 ± 2 °C (LIGHT) 38 ± 2 °C (DARK)	40 min (50 ± 5 %RH) 20 min (water spray on the surface) 60 min (50 ± 5 %RH) 60 min (95 ± 5 %RH, water spray on front/back surface)	0.55 ± 0.02 W/(m ² • nm) [340 nm]

TABLE 1

[6] VIBRATION RESISTANCE TEST

Apply 33 Hz (1980 cycle/MIN) of vibration frequency and 32 m/s² (3.3G) of vibration speed with the direction of upward-downward for 4 hours, leftward-rightward for 2 hours and forward-backward for 2 hours.

[7] WATER RESISTANCE TEST

Dip the sample into $40 \pm 2^\circ\text{C}$ water bath for 240 hours, then clean the surface. Use an air blower to drain and dry it and leave the specimen under the test condition as specified 4-1 for an hours.

[8] CHEMICAL RESISTANCE

*. CHEMICAL TYPE : Gasoline, Paint-protect was, Was remover, Brake fluid, Anti-freezer, Engine oil, Wind shield washer, Gloss was, Solvent including Benzene or Toluene, Thinner, Nonflammable washer.

8.1) WIPPING Test

Wet the surface using 250 X 250 mm horizontally and vertically folded medicine gauze with 5 ml of chemicals fully as mentioned chemical type and then leave it for 30 minutes under the test condition as specified 4-1.

Apply the heat and humidity cycle resistance test - TYPE A as shown Figure 2 to it for 1 cycle and remove the chemical.

8.2) SPOT Test

Use the dropping pipet to drop 0.2 ml to chemical as mentioned chemical type on the surface and leave it for 1 hours under the test condition as specified 4-1.

Apply the heat and humidity cycle resistance test – TYPE A as shown Figure 2 to it for 1 cycle and remove the chemical.

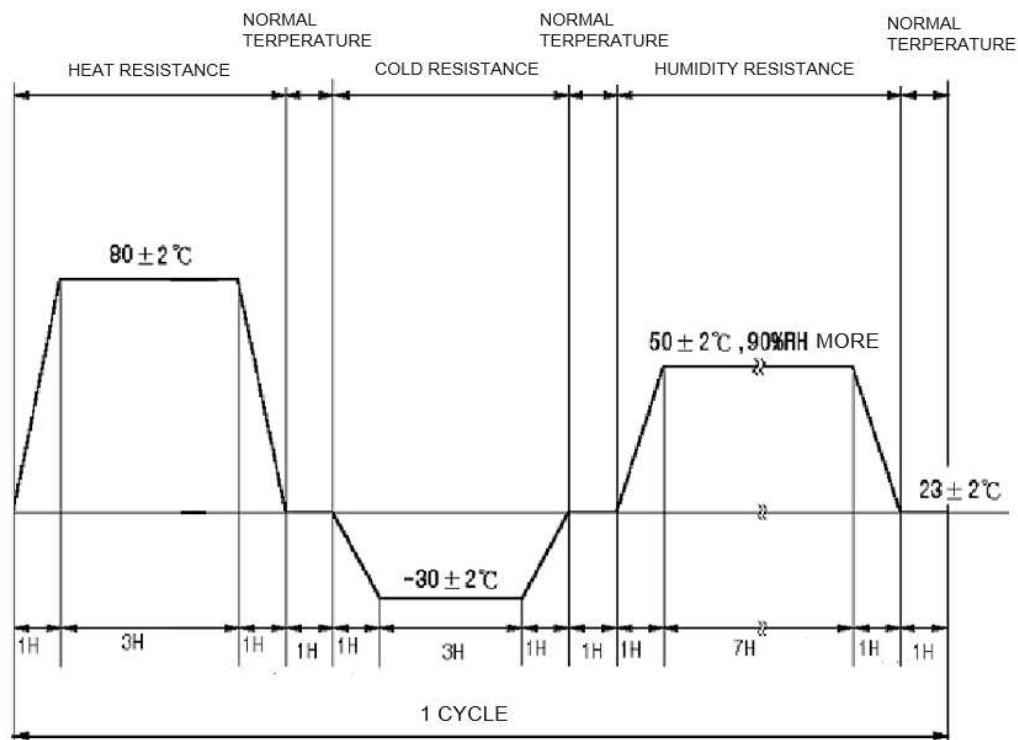


FIGURE 2

[9] IMPACK RESISTANCE

9.1) Normal Temperature

Set the assembled sample with regular using condition to be facing-up and parallel to upward.
Drop the iron ball to keep the specified energy in below Table 2.

9.2) Low Temperature

Drop the iron ball for 3 times after -30℃ for 3 hours.

ASSEMBLE LOCAATION ON VEHICLE	TEST TEMPERATURE	IMPACT ENERGY
FRONT PART (EXCEPT BUMPER)	23 ± 2 °C, -30 ± 2 °C	1.47 J
UPPER SIDE PART	23 ± 2 °C, -30 ± 2 °C	0.98 J
LOWER SIDE PART	23 ± 2 °C, -30 ± 2 °C	1.96 J
REAR PART (EXCEPT BUMPER)	23 ± 2 °C, -30 ± 2 °C	0.98 J

TABLE 2

3 HISTORY AND APPROVAL

Rev	Change	Description	Date
A		Initial Released	12.Jul.'16

Prepared by,	Checked By,	Approved by
JY BAE	KT LIM	HG CHO
Product Engineer	Senior Product Engineer	Product Engineering Manager