

NUMBER SC-HLW05	TYPE GENERAL PRODUCT SPECIFICATION	Amphenol FCI	
TITLE CONNECTOR USED FOR FPC/FFC WITH 1mm CONTACT SPACING HLW__R/S-2__LF		PAGE 1 of 10	REVISION C
		AUTHORIZED BY S.Watanabe	DATE 02/02/'24
		CLASSIFICATION UNRESTRICTED	

Table of Contents:

1	SCOPE	3
2	APPLICABLE STANDARDS	3
3	CATALOG NO. STRUCTURE	3
4	CONNECTOR SHAPE, DIMENSIONS AND MATERIALS	3
5	ACCOMMODATED CONDUCTORS (FPC/FFC)	3
6	PACKAGING CONDITION	3
7	RECOMMENDED MOUNTING PATTERN DIMENSIONS	3
8	RATING	4
8-1	Voltage	4
8-2	Current	4
8-3	Operating Temperature	4
9	PERFORMANCE CHARACTERISTICS	4
9-1	Electrical Performance	4
9-1-1	Contact resistance	4
9-1-2	Insulation resistance	5
9-1-3	Dielectric withstanding voltage	5
9-2	Mechanical Performance	5
9-2-1	Vibration (Sinusoidal)	5
9-2-2	Durability (Insertion and Extraction)	5

NUMBER SC-HLW05	TYPE GENERAL PRODUCT SPECIFICATION	Amphenol FCI	
TITLE CONNECTOR USED FOR FPC/FFC WITH 1mm CONTACT SPACING HLW__R/S-2__LF		PAGE 2 of 10	REVISION C
		AUTHORIZED BY S.Watanabe	DATE 02/02/'24
		CLASSIFICATION UNRESTRICTED	

9-3	Environmental Performance	6
9-3-1	Damp heat (Steady state)	6
9-3-2	Salt spray	6
9-3-3	Change of temperature	7
9-4	Other performance	8
9-4-1	Soldering (Solderability)	8
9-4-2	Soldering (Resistance to soldering)	8
9-4-3	Conductor retention force (Reference)	8
9-4-4	Conductor Insertion force (Reference)	8
10	INDICATION AND PACKAGING	9
10-1	Indication	9
10-2	Packaging	9
11	REMARKS	9
12	REVISION RECORD	10

NUMBER SC-HLW05	TYPE GENERAL PRODUCT SPECIFICATION	Amphenol FCI	
TITLE CONNECTOR USED FOR FPC/FFC WITH 1mm CONTACT SPACING HLW__R/S-2__LF		PAGE 3 of 10	REVISION C
		AUTHORIZED BY S.Watanabe	DATE 02/02/'24
		CLASSIFICATION UNRESTRICTED	

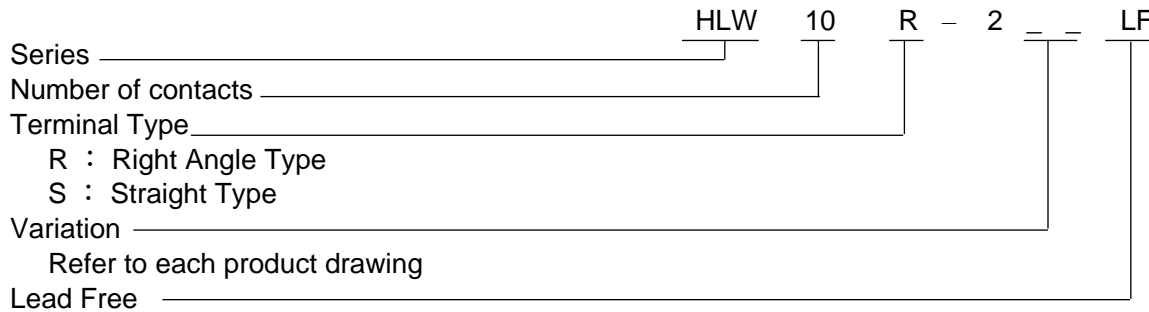
1. SCOPE

This specification covers the requirements for the connector (HLW__R/S-2__LF) which the edges of 1mm spacing FPC (Flexible Printed circuit) or FFC (Flexible Flat Cable) are inserted into directly and connected to.

2. APPLICABLE STANDARDS

- JIS C 5402 (IEC 60512) Method for Test of Connectors for Electronic Equipment
- JIS C 0806 Packaging of Electronic Components on Continuous Tapes (Surface Mount Components)
- JIS C 60068 (IEC 60068) Method for Environmental testing
- UL - 94 TESTS FOR FLAMMABILITY OF PLASTIC MATERIALS FOR PARTS IN DEVICES AND APPLIANCES

3. CATALOG No. STRUCTURE



4. CONNECTOR SHAPE, DIMENSIONS AND MATERIALS

Refer to product drawings.

5. ACCOMMODATED CONDUCTORS (FPC/FFC)

Refer to product drawings.

6. PACKAGING CONDITION

Refer to product drawings.

7. RECOMMENDED MOUNTING PATTERN DIMENSIONS

Refer to product drawings.

NUMBER SC-HLW05	TYPE GENERAL PRODUCT SPECIFICATION	Amphenol FCI	
TITLE CONNECTOR USED FOR FPC/FFC WITH 1mm CONTACT SPACING HLW__R/S-2__LF		PAGE 4 of 10	REVISION C
		AUTHORIZED BY S.Watanabe	DATE 02/02/'24
CLASSIFICATION UNRESTRICTED			

8. RATING

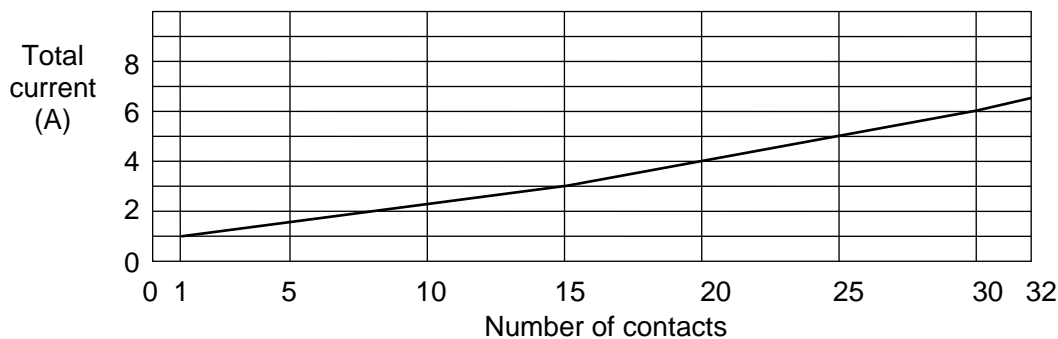
8-1. Voltage : A.C. 100V D.C. 100V

8-2. Current : A.C. 1A D.C. 1A (Refer to the following note.)

8-3. Operating Temperature : -55°C ~ +85°C (Including terminal temperature rises)

NOTE

Allowable maximum current for one contact is 1A. Total allowable current for a whole connector is the value which is shown in the following figure.



9. PERFORMANCE CHARACTERISTICS

9-1. Electrical Performance

No.	Test Item	Test Method	Requirements
9-1-1	Contact resistance	<p>JIS C 5402-2-1 (IEC60512-2-1)</p> <p>1) Measure contact resistance between V₁-V₂ by voltage drop method by the following circuit by mating accommodated conductor specified in clause 5 after reflow soldering the connector on the P.C.B.</p> <p>2) Open circuit voltage : Less than A.C.20mV</p> <p>3) Test current : Less than A.C.20mA</p>	<p>1) Initial value : Less than 30mΩ</p> <p>2) Contact resistance after the test is in accordance with the value specified in each test item.</p>

NUMBER SC-HLW05	TYPE GENERAL PRODUCT SPECIFICATION	Amphenol FCI	
TITLE CONNECTOR USED FOR FPC/FFC WITH 1mm CONTACT SPACING HLW__R/S-2__LF		PAGE 5 of 10	REVISION C
		AUTHORIZED BY S.Watanabe	DATE 02/02/'24
CLASSIFICATION UNRESTRICTED			

9-1-2	Insulation resistance	JIS C 5402-3-1 (IEC60512-3-1) 1) Measure insulation resistance between adjacent contacts in a connector individual. 2) Test voltage : D.C.500V 3) Read value one minute after applying test voltage.	1) More than 500MΩ
9-1-3	Dielectric withstanding voltage	JIS C 5402-4-1 (IEC60512-4-1) 1)For one minute, apply A.C.500V between adjacent contacts in a connector individual. 2) Set current : A.C.1mA	1) Free from any short circuit and insulation breakdown.

9-2. Mechanical Performance

No.	Test Item	Test Method	Requirements
9-2-1	Vibration (Sinusoidal)	JIS C 60068-2-6 (IEC60068-2-6) 1) Frequency range : 10 ~ 500Hz 2) Amplitude : 0.75mm or Acceleration : 100m/s ² 3) Sweep rate : 1 octave/minute 4) Kind of test : Sweep endurance test 5) Test time : 10 cycles	1) During the test, no circuit opening for more than 1μs. 2) Free from any defect such as break, deformation, loosening and falling off etc. on each portion of the connector.
9-2-2	Durability (Insertion and extraction)	1) Measure contact resistance before and after the test by the method in clause 9-1-1 by mating the accommodated conductor specified in clause 5. 2) Number of slider open and close : 30 times 3) Speed of insertion and extraction : Less than 10 times per minute	1) Initial contact resistance : Less than 30mΩ 2) Contact resistance after the test : Less than 50mΩ 3) Free from any defect such as break etc. on the connector and conductor.

NUMBER SC-HLW05	TYPE GENERAL PRODUCT SPECIFICATION	Amphenol FCI	
TITLE CONNECTOR USED FOR FPC/FFC WITH 1mm CONTACT SPACING HLW__R/S-2__LF		PAGE 6 of 10	REVISION C
		AUTHORIZED BY S.Watanabe	DATE 02/02/24
CLASSIFICATION UNRESTRICTED			

9-3. Environmental Performance

No.	Test Item	Test Method	Requirements
9-3-1	Damp heat (Steady state)	<p>JIS C 60068-2-78 (IEC60068-2-78)</p> <p>1) Measure contact resistance before and after the test by the method in clause 9-1-1 by using the accommodated conductor specified in clause 5.</p> <p>2) Measure insulation resistance after the test by the method in clause 9-1-2.</p> <p>3) Bath temperature : 40°C</p> <p>4) Bath humidity : 90 ~ 95%RH</p> <p>5) Period of exposure : 48 hours</p> <p>6) Expose conductor and connector after mating them (Without insertion and extraction) and dry them naturally after post treatment.</p>	<p>1) Initial contact resistance : Less than 30mΩ</p> <p>2) Contact resistance after the test : Less than 50mΩ</p> <p>3) Insulation resistance after the test : More than 100MΩ</p>
9-3-2	Salt spray	<p>JIS C 60068-2-11 (IEC60068-2-11)</p> <p>1) Measure contact resistance before and after the test by the method in clause 9-1-1 by using the accommodated conductor specified in clause 5.</p> <p>2) Salt solution concentration : 5%</p> <p>3) Period of exposure : 48 hours</p> <p>4) Expose conductor and connector in mated condition and leave them under normal temperature after posttreatment. (24 hours)</p>	<p>1) Initial contact resistance : Less than 30mΩ</p> <p>2) Contact resistance after the test : Less than 50mΩ</p>

NUMBER SC-HLW05	TYPE GENERAL PRODUCT SPECIFICATION	Amphenol FCI	
TITLE CONNECTOR USED FOR FPC/FFC WITH 1mm CONTACT SPACING HLW__R/S-2__LF		PAGE 7 of 10	REVISION C
		AUTHORIZED BY S.Watanabe	DATE 02/02/'24
CLASSIFICATION UNRESTRICTED			

9-3-3	Change of temperature	<p>JIS C 0025 (IEC60068-2-14)</p> <p>1) Measure contact resistance before and after the test by the method in clause 9-1-1 by using the accommodated conductor specified in clause 5.</p> <p>2) One cycle of temperature is as follow and test 5 cycles.</p> <table border="1"> <thead> <tr> <th>Step</th> <th>Temp.(°C)</th> <th>Time(min.)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-55±3</td> <td>30</td> </tr> <tr> <td>2</td> <td>25±2</td> <td>2 ~ 3</td> </tr> <tr> <td>3</td> <td>85±2</td> <td>30</td> </tr> <tr> <td>4</td> <td>25±2</td> <td>2 ~ 3</td> </tr> </tbody> </table> <p>3) Expose conductor and connector in mated condition and leave them under normal temperature.</p>	Step	Temp.(°C)	Time(min.)	1	-55±3	30	2	25±2	2 ~ 3	3	85±2	30	4	25±2	2 ~ 3	<p>1) Initial contact resistance : Less than 30mΩ</p> <p>2) Contact resistance after the test : Less than 50mΩ</p> <p>3) Free from any defect such as crack, warping and deformation etc. on each portion the connector.</p>
Step	Temp.(°C)	Time(min.)																
1	-55±3	30																
2	25±2	2 ~ 3																
3	85±2	30																
4	25±2	2 ~ 3																

NUMBER SC-HLW05	TYPE GENERAL PRODUCT SPECIFICATION	Amphenol FCI	
TITLE CONNECTOR USED FOR FPC/FFC WITH 1mm CONTACT SPACING HLW__R/S-2__LF		PAGE 8 of 10	REVISION C
		AUTHORIZED BY S.Watanabe	DATE 02/02/'24
CLASSIFICATION UNRESTRICTED			

9-4. Other performance

No.	Test Item	Test Method	Requirements
9-4-1	Soldering (Solderability)	JIS C 60068-2-20 (IEC60068-2-20) Test method : Ta Method 1 1) The connector is soldered by the following condition after mounted on P.C.B. and dipped in inactive rosin family flux. 2) Soldering bath Temp. : 230±5°C 3) Dipping Time : 5±0.5s 4) Solder paste to be used is JIS Z 3282 Sn96.5Ag3.0Cu0.5	1) Actual soldered area must be more than 95% of the dipped area intended to be soldered.
9-4-2	Soldering (Resistance to soldering heat)	JIS C 60068-2-20 (IEC60068-2-20) Test method : Tb 1) The connector is soldered by the following condition after mounted on P.C.B.. 2) Test condition 1 (Solder iron) 2)-1 Solder iron Temp. : 350±10°C 2)-2 Dipping Time : 3.5±0.5s 3) Test condition 2 (Soldering bath) 3)-1 Soldering bath Temp. : 260±5°C 3)-2 Dipping Time : 10±1s	1) Free from any damage concerning feature and contacting performance after test.
9-4-3	Conductor retention force (Reference)	1) Measure total extraction force (initial value) by using accommodated conductor specified in clause 5.	1) More than 0.49N/contact (More than 50gf/contact)
9-4-4	Conductor insertion force (Reference)	1) Measure total insertion force (initial value) by using accommodated conductor specified in clause 5.	1) Less than 1.96N/contact (Less than 200gf/contact)

NUMBER SC-HLW05	TYPE GENERAL PRODUCT SPECIFICATION	Amphenol FCI	
TITLE CONNECTOR USED FOR FPC/FFC WITH 1mm CONTACT SPACING HLW__R/S-2__LF		PAGE 9 of 10	REVISION C
		AUTHORIZED BY S.Watanabe	DATE 02/02/'24
		CLASSIFICATION UNRESTRICTED	

10. INDICATION AND PACKAGING

10-1. Indication

- 1) Catalog number and lot number are not indicated on the connector.
- 2) Catalog number and quantity shall be indicated on the surface of the package box.

10-2. Packaging

- 1) The connector individuals are put into the package box with specified quantity in accordance with the method specified in FCI packaging specification.

11. REMARKS

11-1. Please refer to the "Handling procedures and remarks" before use.

11-2. Conductor retention force specified in clause 9-4-3 and Conductor insertion force specified in clause 9-4-4 differ due to different thickness, structure and surface treatment of conductor. Therefore, the value of retention force and insertion force specified in each clause for performance is reference value.

11-3. Since this connector cannot be used for CIC (Conductor such as silver paste, carbon etc.) as accommodated conductor, please consult us separately.

11-4. HLW__R/S-2__LF series are not suitable for reflow process. Please refer to application spec for the recommended soldering conditions.

NUMBER SC-HLW05	TYPE GENERAL PRODUCT SPECIFICATION	Amphenol FCI	
TITLE CONNECTOR USED FOR FPC/FFC WITH 1mm CONTACT SPACING HLW__R/S-2__LF		PAGE 10 of 10	REVISION C
		AUTHORIZED BY S.Watanabe	DATE 02/02/'24
CLASSIFICATION UNRESTRICTED			

12. REVISION RECORD

REV.	PAGE	DESCRIPTION	ECR #	DATE
A	All	New release	J05-0270	05/13/'05
B	All	Format change Add Table of Contents to page 1 and 2 Match with JIS/IEC number Add reference specification of Conductor insertion force	ELX-J-13767	12/20/'12
C	All 3 4,5 9	Format change Add IEC60512 and JIS 60068 (IEC60068) in item2 Add JIS5402(IEC60512) in 9-1-1, 9-1-2, 9-1-3 Add item 11-4	ELX-J-50619	02/02/'24