



# PRODUCT SPECIFICATION

## TITLE

### 1.0 SCOPE

This Product Specification covers the 1.0mm (0.04inch) or 0.5mm(0.02inch) centerline (pitch) FFC/FPC connector series.

### 2.0 PRODUCT DESCRIPTION

#### 2.1 PRODUCT NAME AND SERIES NUMBER(S)

PRODUCT NAME	PART NUMBER
EMBOSSSED TAPE PACKAGE WITH CONNECTOR	47331-**9*

#### 2.2 DIMENSIONS, MATERIALS, PLATINGS AND MARKINGS

Please see the appropriate Sales Drawings for information on dimensions, materials, platings and markings.

### 3.0 RATINGS

#### 3.1 VOLTAGE

50 Volts Max. AC (RMS)

#### 3.2 CURRENT

1 Amps Max.

#### 3.3 TEMPERATURE AND ENVIRONMENT

Operating Temperature Range:	-40°C to +85°C (Without loss function)
Operating Humidity Range:	Relative humidity 90% MAX.
Storage Temperature Range:	-40°C to +100°C (Without loss function)
Storage Humidity Range:	Relative humidity 90% MAX.

Note: Including terminal temperature rise.

### 4.0 PERFORMANCE

Method of measuring resistance should be used connector and FFC/FPC cable.

FPC/FFC thickness=0.3+/-0.05mm.

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DOCUMENT NUMBER: <b>PS-47331-001</b>	CREATED / REVISED BY: <b>HHE</b>	CHECKED BY: <b>HWWANG</b>	APPROVED BY: <b>JNCHEN</b>



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## 4.1 ELECTRICAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
4.1.1	<b>Contact Resistance</b>	Mate applicable FPC, measure by dry circuit, 20mV, 10mA. (JIS C5402 5.4)	Initially: 40 milliohms MAX. After test: 50 milliohms MAX.
4.1.2	<b>Insulation Resistance</b>	Mate applicable FPC, apply 500V DC between adjacent terminal or ground. (JIS C5402 5.2/MIL-STD-202 Method 302)	500 Megohms MIN.
4.1.3	<b>Dielectric Strength</b>	Mate applicable FPC, apply 500V AC for 1minute between adjacent terminal or ground. (JIS C5402 5.2/MIL-STD-202 Method 301)	No breakdown

## 4.2 MECHANICAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
4.2.1	<b>Terminal/Housing Retention Force</b>	Apply axial pull out force at the speed rate of 25±3 mm/minute on the terminal assembled in the housing	5.0 N {0.5kgf} MIN.
4.2.2	<b>Fitting nail/Housing Retention force</b>	Apply axial pull out force at the speed rate of 25±3 mm/minute on the fitting nail assembled in the housing	5.0 N (0.5 Kgf) MIN
4.2.3	<b>FFC/FPC Retention force</b>	Close the Actuator, pull the FFC/FPC at the speed rate of 25±3mm/minute.	Refer to the paragraph 5
4.2.4	<b>Actuator open force</b>	Actuator open force at the speed rate of 25±3mm/minute from closed position, after reflow	The initial force is 2.5N~6N.

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## 4.3 ENVIRONMENTAL REQUIREMENTS AND OTHERS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT	
4.3.1	Durability	Close and open Actuator up to 100 cycles at the rate of 10 cycle/minute.	Contact resistance	50 milliohms MAX.
			FFC/FPC Retention force	Refer to the paragraph 5
4.3.2	Temperature Rise	Connector shall be mated with applicable FPC and measure the temperature rise of contact, when the maximum AC rated current is flowed.(UL498)	Temperature Rise	30°C MAX.
4.3.3	Vibration	Amplitude: 1.5mm P-P Sweep time: 10~55~10 Hz in 1 minute Duration: 2 hours in each X.Y.Z. axes (MIL-STD-202 Method 201)	Appearance	No Damage
			Contact Resistance	50 milliohms MAX.
			Discontinuity	1 microsecond MAX.
4.3.4	Mechanical Shock	490m/s <sup>2</sup> {50G}, 3 strokes in each X.Y.Z. axes. (JIS C0041/MIL-STD-202 Method 213)	Appearance	No Damage
			Contact Resistance	50 milliohms MAX.
			Discontinuity	1 microsecond MAX.
4.3.5	Heat Resistance	Connector shall be mated with applicable FPC, and exposed to the conditions of 85± 2°C for 96 hours. Upon completion of the exposure period, the test specimens shall be conditioned at room ambient conditions for 1~2 hours, after which the specified measurement shall be performed. (JIS C0021/MIL-STD-202 Method 108)	Appearance	No Damage
			Contact Resistance	50 milliohms MAX.
4.3.6	Cold Resistance	Connector shall be mated with applicable FPC, and exposed to the conditions of -40±3°C for 96 hours. Upon completion of the exposure period, the test specimens shall be conditioned at room ambient conditions for 1~2 hours, after which the specified measurement shall be performed. (JIS C0020)	Appearance	No Damage
			Contact Resistance	50 milliohms MAX.

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ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT	
4.3.7	Humidity	Connector shall be mated with applicable FPC, and exposed to the conditions of 60± 2°C, relative humidity 90~95% for 96 hours. Upon completion of the exposure period, the test specimens shall be conditioned at room ambient conditions for 1~2 hours, after which the specified measurement shall be performed. (JIS C0022/MIL-STD-202 Method 103)	Appearance	No Damage
			Contact Resistance	50 milliohms MAX.
			Dielectric Strength	Must meet 4.1.3
			Insulation Resistance	20 Megohms MIN.
4.3.8	Temperature Cycling	Connector shall be mated with applicable FPC, and subjected to the following conditions for 5 cycles Upon completion of the exposure period, the test specimens shall be conditioned at room ambient conditions for 1~2 hours, after which the specified measurement shall be performed. (Transfer time shall be within 5 minutes) 1 cycles: a) -55°C 30 minutes b) +85°C 30 minutes (JIS C0025)	Appearance	No Damage
			Contact Resistance	50 milliohms MAX.
4.3.9	Salt Spray	Connector shall be mated with applicable FPC, and exposed to the following salt mist conditions. At the completion of the exposure period, Salt deposits shall be removed by a gentle wash or dip in running water, after which the specified measurement shall be performed. NaCl solution Concentration : 5±1% Spray time: 48 hours Ambient temperature: 35±2°C (JIS C0023/MIL-STD-202 Method 101)	Appearance	No Damage
			Contact Resistance	50 milliohms MAX.
4.3.10	Solderability	Solder time : 3±0.5 sec. Solder temperature : 245±5°C. 0.3mm from terminal tip 0.3mm from fitting nail tip.	Solder wetting	90% of immersed area must show no voids, pin holes.

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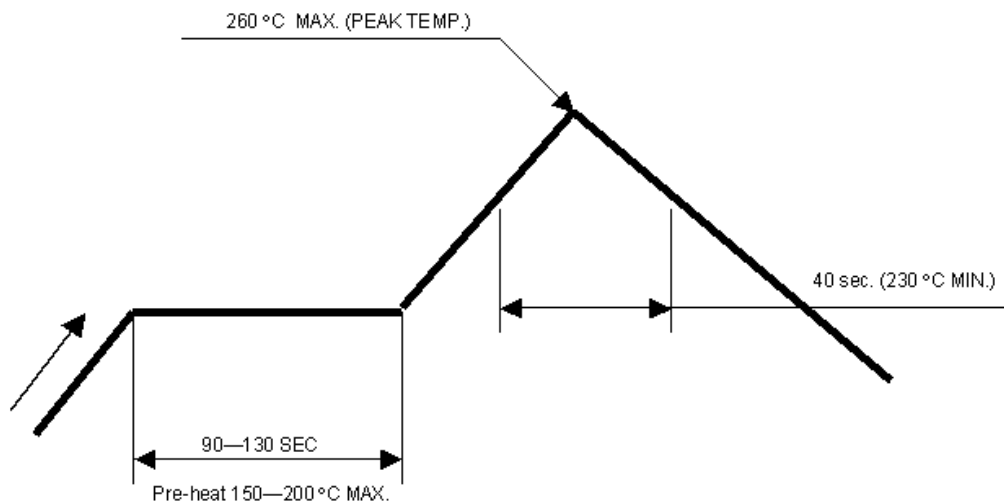
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ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT	
4.3.11	Resistance to Soldering Heat	(When reflow) see paragraph 6.	Appearance	No Damage
		Solder By Iron: Solder time: 2~5 sec. Solder temperature: 370~400°C 0.2mm from terminal tip. 0.2mm from fitting nail tip.		

## 5. FPC/FFC RETENTION FORCE

No. of CKT	Conditions	Retention force(N MIN.)
8	1st	2.5
	100th	2.5
20	1st	3.0
	100th	3.0
25	1st	5.0
	100th	5.0
50	1st	15.0
	100th	15.0

## 6. INFRARED REFLOW CONDITION



TEMPERATURE CONDITION GRAPH  
(TEMPERATURE ON BOARD PATTEN SIDE)

NOTES: Please check the reflow soldering condition by your own devices beforehand.  
Because the condition changes by the soldering devices, p.c. boards, and so on.

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## 7. TEST SEQUENCE

Item	Group									
	1	2	3	4	5	6	7	8	9	10
Appearance	1,9	1,9	1,7	1,5	1,7	1,3	1,3	1,5	1,5	1,3
2 Contact Resistance (4.1.1)	2,4,6,8	2,4,6,8	2,4,6					2,4	2,4	
3 Temperature Cycling (4.3.8)	3	5			3					
4 Heat Resistance (4.3.5)	5	7								
5 Humidity (4.3.7)	7				5					
6 Vibration (4.3.3)			3							
7 Mechanical Shock (4.3.4)			5							
8 FFC/FPC Retention Force (4.2.3)				2,4						
9 Actuator open force(4.2.4)										2
10 Solderability (4.3.10)						2				
11 Dielectric Strength (4.1.3)					2					
12 Insulation Resistance (4.1.2)					4,6					
13 Durability (4.3.1)		3		3						
14 Resistance to soldering Heat (4.3.11)							2			
15 Cold Resistance (4.3.6)								3		
16 Salt Spray (4.3.9)									3	
Sample size	2 SET	2 SET	2 SET	2 SET	2 SET	2 SET	2 SET	2 SET	2 SET	2 SET

## 8. OTHER TEST

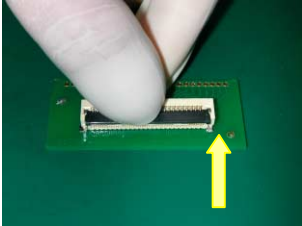
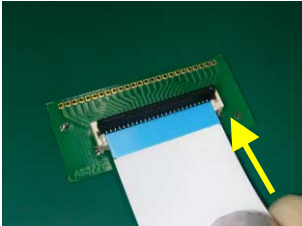
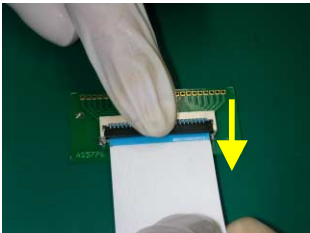
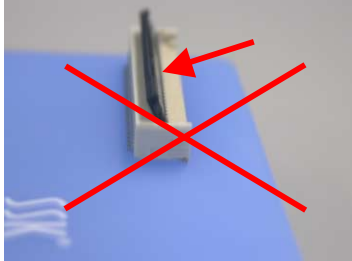
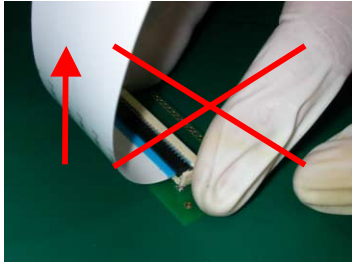
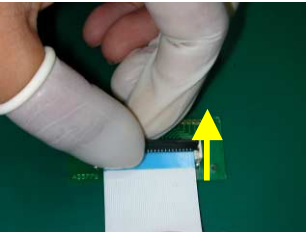
Item	Requirement
1 Terminal/Housing Retention Force (4.2.1)	Meet Specification 4.2.1 (sample size: 5 pcs)
2 Fitting nail/Housing Retention force (4.2.2)	Meet Specification 4.2.2 (sample size: 5 pcs)
3 Temperature Rise (4.3.2)	Meet Specification 4.3.2 (sample size: 2 pcs)

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## 9. Operation and Precautions

Operation	Precautions
<p><b>1. FPC/FFC insertion procedure, Connector installed on the board.</b></p> <p>(1) Lift up the actuator. Use thumb or index finger.</p>  <p>(2) Fully insert the FPC/FFC in the connector parallel to mounting surface, with the exposed conductive traces facing down.</p>  <p>(3) Rotate down the actuator until firmly closed. It is critical that the inserted FPC/FFC is not moved and remains fully inserted.</p> 	<p>(1) Don't apply excessive force or use any type of tool to operate the actuator.</p>  <p>(2) Exercise caution when applying upward force to the connected FPC/FFC. FPC/FFC conductor pad on opposite side.</p> 
<p><b>2. FPC/FFC removal</b></p> <p>Lift up the actuator.</p> 	

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