

PRODUCT SPECIFICATION

Customer: GENERAL		No. T-1-1183 (PMC-0097)	Date Issued: April 20, 1989
Title Subject: FF CONNECTOR		Revised: D	Date Revised: April 24, 2001
			Issued by: Osaka Engineering Center

This product specification contains the results of general performance tests for the FF Connector.

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Prepared by: <u>T.Sawano</u>	Checked by: <u>M.Asami</u>	Reviewed by: <u>K.Wanaka</u>	Approved by: <u>K.Shimizu</u>
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1. PART NAME & PART NUMBER

Part Name		Part Number
FF Connector	Side entry type	*FF-SF

Note: * represents one or two-digit figure indicating number of circuits.

2. CONSTRUCTION, DIMENSIONS, MATERIAL & SURFACE FINISH

Construction and dimensions shall be in accordance with the referenced drawing. Material and surface finish shall be as specified below.

Part Name	Material	Surface Finish, etc.
Contact	Phosphor bronze	Copper-underplated Tin/lead-alloy plated
Housing	66 Nylon (Glass-filled)	Flammability: UL94V-0

3. CHARACTERISTICS

Current rating: 1.0 A AC, DC

Voltage rating: 50 V AC, DC

Temperature range: -25 °C to + 85 °C (Including temperature rise in applying an electrical current.)

Applicable lead (FPC, FFC) *1:

Conductor pitch: 1.25 mm

Conductor width: 0.8 mm

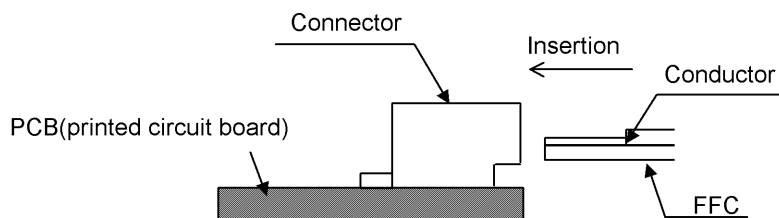
Thickness of mating section: 0.32 + 0.03/-0.02 mm

Note1: In the case of applying FFC/FPC, its applicability with the connector shall be confirmed before use. (See the attached drawing: KRD-10238-1)

4. CAUTION FOR HANDLING USE

[The insertion direction of FFC]

Make the conductor part of FFC upward and insert FF connector as shown in the figure below.



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5. SPECIMEN

Part Name		Part Number
FF Connector	Side entry type	*FF-SF

Note: * represents one or two-digit figure indicating number of circuits.

6. TEST CONDITIONS

6.1 When tested in accordance with the test conditions and method specified in each item, each requirement shall be met. Unless otherwise specified, tests shall be conducted under the following ambient conditions specified in JIS C 0010 (IEC 68-1) [Basic Environmental Testing Procedures General and Guidance].

Temperature: 15 to 35 °C

Relative humidity: 25 to 75 %

6.2 For environmental tests, as a rule, specimens assembled for actual use and testing lead (FFC) specified in attached drawing (KRD-10238-1) shall be used.

7. REQUIREMENTS, TEST METHODS & TEST RESULTS

7.1 Appearance

Requirement: There shall be no crack, deformation nor discoloration which may affect the performance specified in this specification.

Test method: Visual inspection.

Test result: Good.

7.2 Mechanical Test

7.2.1 Lead Insertion Force

Requirement:

Initial Insertion Force;

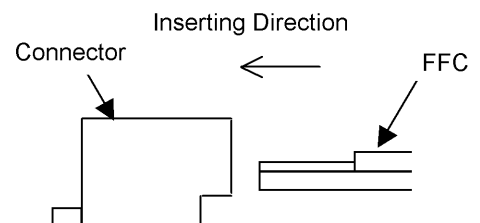
F_1 [N] max.

$F_1 = P \times 2.5$ (P: No. of circuits)

EX. 21-circuit: 52.5 N max.

Test method: A lead shall be inserted into the connector on the same axis as shown in the figure on the right side. The lead insertion force shall be measured.

(Testing speed: 1 to 5 mm/sec.)



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Test result:

UNIT: N			
No. of circuits	Ave.	Max.	Min.
5	8.3	8.9	7.6
6	10.1	10.8	9.0
7	11.8	12.8	10.7
10	16.3	17.2	15.4
19	31.2	32.8	29.3
21	35.7	37.1	34.0
23	38.5	40.2	36.5

n=10

7.2.2 Lead Retention Force

Requirement:

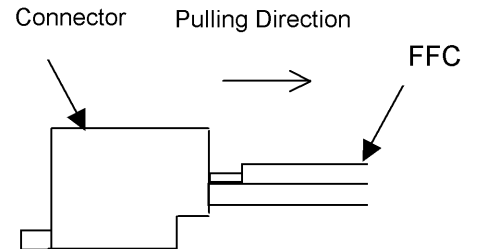
Initial Retention Force:

F_2 [N] min.

$F_2 = P \times 0.7$ (P: Number of circuits)

EX. 21-circuit: 14.7 N min.

Test method: A lead shall be inserted into the connector as shown in the figure on the right side. Then the lead shall be pulled on the same axis. The load required to pull the lead out of the connector shall be measured. (Testing speed: 1 to 5 mm/sec.)



Test result:

UNIT: N			
No. of circuits	Ave.	Max.	Min.
5	7.8	9.1	6.6
6	10.0	10.8	9.2
7	11.6	12.5	10.7
10	15.9	16.8	14.8
19	28.5	30.5	26.4
21	34.2	35.7	32.7
23	36.8	38.5	34.5

n=10

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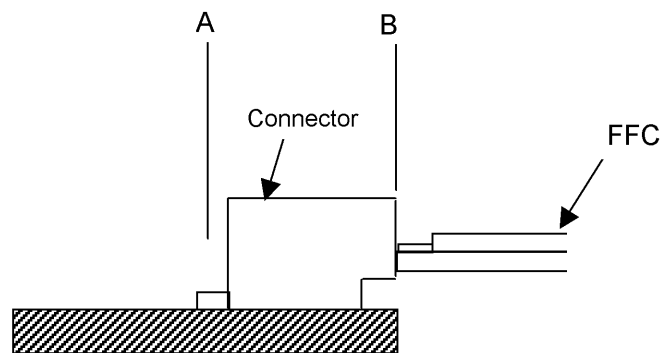
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7.3 Electrical Test

7.3.1 Contact Resistance

Requirement: Initial: 20 mΩ max.
After tests: 30 mΩ max.

Test method: Contact resistance between points A and B shown in the figure below shall be measured under the following conditions.



Test current: 1 mA (DC)
Open voltage: 20 mV max.

Test result: See items 6.4.1 to 6.4.7.

7.3.2 Current Continuity

Requirement: There shall be no current discontinuity longer than 1 microsecond during a vibration test.

Test method: Each circuit of a specimen shall be connected in series and test current of 10 mA DC shall be applied. Current discontinuity longer than 1 microsecond during a vibration test shall be detected by continuity meter.

Test result: See item 6.4.7.

7.3.3 Insulation Resistance

Requirement: Initial: 800 MΩ min.
After tests: 500 MΩ min. (Humidity test)

Test method: 500V DC shall be applied between adjacent contacts of a mated specimen (connector shall not be soldered to PCB.) to measure insulation resistance.

Test result:

	Measured values
Initial	800 MΩ min.
After humidity test	500 MΩ min.

n=10

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7.3.4 Dielectric Withstanding Voltage

Requirement: There shall be no breakdown nor flashover.

Test method: Testing voltage specified below shall be applied between adjacent contacts of a mated specimen (connector shall not be soldered to PCB.) for one minute.

Initial; AC 500V
After tests; AC 250V (Humidity test)

Test result:

	Test results
Initial	Good
After humidity test	Good

n=10

7.4 Environmental Test

7.4.1 Durability

Requirement: Contact resistance shall be 30 milliohms max. after the test.

Test method: A connector and a lead shall be mated and unmated by the normal operating way. After repeated 20 cycles, contact resistance shall be measured.

Test result:

UNIT: mΩ

Test item	Initial			After test		
	Ave.	Max.	Min.	Ave.	Max.	Min.
Contact Resistance	6.16	7.1	6.1	6.85	8.4	6.2

n=21

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7.4.2 Humidity

Requirement: Contact resistance shall be 30 milliohms max. after the test. Insulation resistance shall be 500 megohms min. after the test. There shall be no breakdown nor flashover on the dielectric withstanding voltage test.

Test method: The specimen shall be placed in a humidity chamber of the following conditions. After the test, contact resistance, insulation resistance and dielectric withstanding voltage shall be measured.

Temperature: 40 ± 2 °C
Relative humidity: 90 to 95 %
Period: 240 hours

Test result:

UNIT: mΩ

Test item	Initial			After test		
	Ave.	Max.	Min.	Ave.	Max.	Min.
Contact Resistance	7.09	7.6	6.2	6.97	7.5	6.1

n=21

7.4.3 Heat Aging

Requirement: Contact resistance shall be 30 milliohms max. after the test.

Test method: The specimen shall be placed in a heat oven of the following conditions. After the test, contact resistance shall be measured.

Temperature: 85 ± 2 °C
Period: 250 hours

Test result:

UNIT: mΩ

Test item	Initial			After test		
	Ave.	Max.	Min.	Ave.	Max.	Min.
Contact Resistance	6.58	7.1	6.1	6.77	7.2	6.2

n=21

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7.4.4 Thermal Shock

Requirement: Contact resistance shall be 30 milliohms max. after the test.

Test method: The specimen shall be subjected to a thermal shock test of the following conditions. After the test, contact resistance shall be measured.

1 cycle consists of:

- 55 ± 3 °C for 30 minutes

+ 85 ± 2 °C for 30 minutes

Total cycles: 25 cycles

Test result:

UNIT: mΩ

Test item	Initial			After test		
	Ave.	Max.	Min.	Ave.	Max.	Min.
Contact Resistance	6.87	7.3	6.5	7.00	7.4	6.5

n=21

7.4.5 Hydrogen Sulfide Gas

Requirement: Contact resistance shall be 30 milliohms max. after the test.

Test method: The specimen shall be subjected to hydrogen sulfide gas of the following conditions. After the test, contact resistance shall be measured.

Concentration: 3 ± 1 ppm

Temperature: 40 ± 2 °C

Relative humidity: 80 ± 5 %

Period: 96 hours

Test result:

UNIT: mΩ

Test item	Initial			After test		
	Ave.	Max.	Min.	Ave.	Max.	Min.
Contact Resistance	6.72	7.4	6.1	6.84	7.4	6.1

n=21

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7.4.6 Salt Spray

Requirement: Contact resistance shall be 30 milliohms max. after the test.

Test method: The specimen shall be subjected to a salt spray test of the following conditions. After the test, it shall be washed with running water and dried naturally before the measurement of contact resistance.

Temperature: 35 ± 2 °C
Concentration: 5 % in weight
Period: 48 hours

Test result:

UNIT: mΩ

Test item	Initial			After test		
	Ave.	Max.	Min.	Ave.	Max.	Min.
Contact Resistance	6.79	7.4	6.2	6.95	7.6	6.4

n=21

7.4.7 Vibration

Requirement: Contact resistance shall be 30 milliohms max. after the test. There shall be no current discontinuity longer than 1 microsecond during the test.

Test method: The specimen shall be mounted on a PCB. It shall be subjected to a vibration test of the following conditions. During the test, current continuity shall be checked. After the test, contact resistance shall be measured.

Frequency: 10-55-10 Hz/min.
Amplitude: 1.52 mm
Direction: Each of X,Y,Z-axis directions
*Each axis shall be in right angles to others.
Period: 2 hours for each direction

Test result:

UNIT: mΩ

Test item	Initial			After test		
	Ave.	Max.	Min.	Ave.	Max.	Min.
Contact Resistance	6.76	7.4	6.2	6.85	7.6	6.2

n=21

Current continuity: There was no current discontinuity longer than 1 microsecond during the test. n=21

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7.4.8 Solderability

Requirement: Plating surface of solder-dipping section shall be covered with smooth solder.

Test method: Fluxed soldering section of a specimen shall be dipped in solder of the following conditions. Flux and solder specified in JIS C 0050 (IEC 68-2-20) shall be used.

Solder temperature: 230 ± 5 °C
Immersion period: 3 ± 0.5 seconds

Test result: Good. n=10

7.4.9 Resistance to Soldering Heat

Requirement: There shall be no deformation nor damage which may affect the performance.

Test method:

[By Soldering iron]

The specimen shall be soldered by soldering iron of the following conditions. Flux and solder specified in JIS C 0050 (IEC 68-2-20) shall be used. After the test, the appearance shall be observed. No abnormal load such as lateral load shall be applied to the specimen during the test.

Solder temperature: 350 ± 5 °C
Immersion period: 3 seconds

Test result: There was no deformation nor damage which may affect the performance. n=10

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REV.	DESCRIPTION	DATE	DESIGNED
①	Part No. is added.	Apr.15.1996	M.NAGO
②	Drawing format change.	Oct.30.1998	M.HIRAMOTO

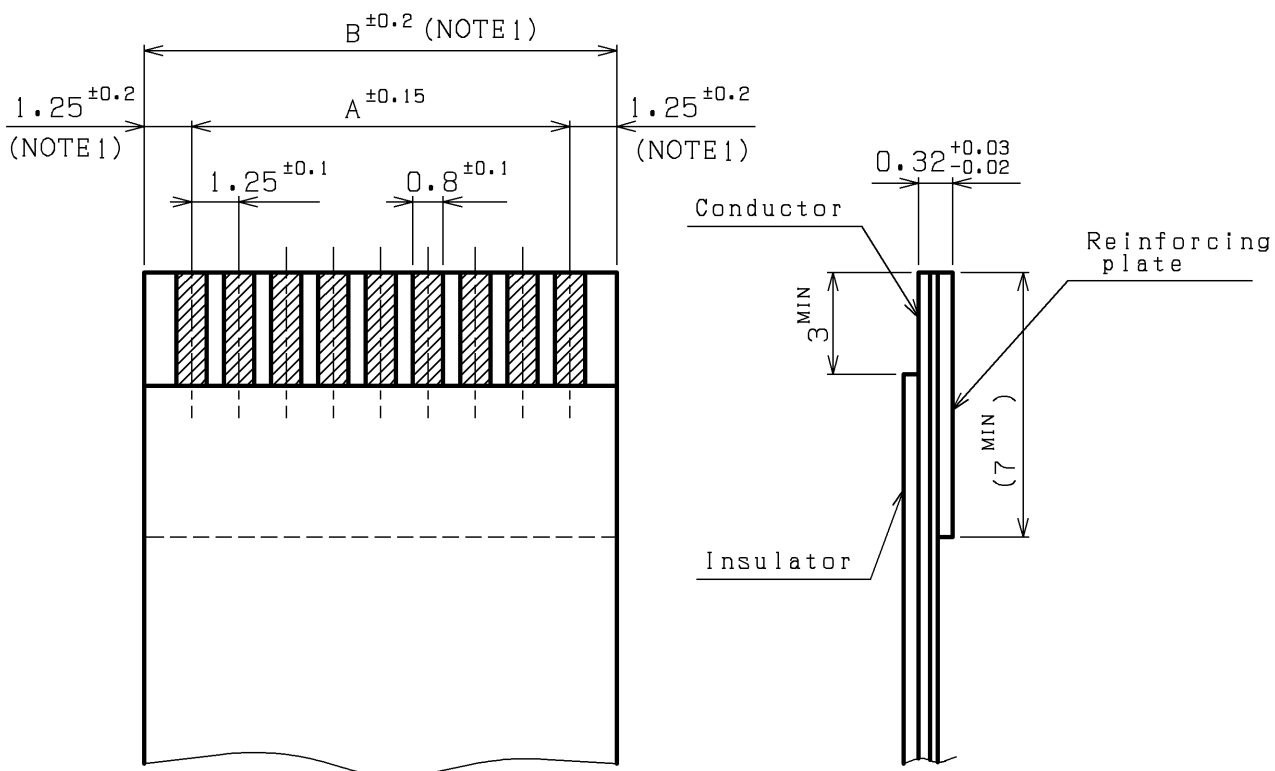
A

B

C

D

E



NOTE

1. Tolerance between the center of conductor and the end of FFC shall be 1.25 ± 0.2 MAX.

Total width shall be within $B \pm 0.2$

2. Conductor thickness: 0.1mm

Plating: Tin-plated $1 \sim 3 \mu\text{m}$.

Cir-cuits	Dimensions	
	A	B
5	5.00	7.50
6	6.25	8.75
7	7.50	10.00
① 8	8.75	11.25
10	11.25	13.75
17	20.00	22.50
19	22.50	25.00
21	25.00	27.50
23	27.50	30.00

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No.	PART NAME	MATERIAL	SURFACE FINISH	REMARKS			
SIZE	UNIT	SCALE	PROJECTION	DATE	CUSTOMER		
A4	METRIC	5:1		OCT.23.1995			
APPROVED	CHECKED	DESIGNED	DRAWN	SERIES NAME	1.25mm PITCH FFC FOR FF CONNECTOR		
T.N	S.S	M.H	M.T	PART No.			
J.S.T.MFG.CO.,LTD					DRAWING No.	KRD-10238-1	R2