1. Scope

This specification covers the requirements for BTFW series which are the floating connector with 1.0mm contact spacing for P.C. Board used for electronic equipment.

2. Applicable standards

JIS C 5402 Method for Test of connectors for electronic equipment.
JIS C 0806 Packaging of electronic components on continuous tapes.
UL-94 TESTS FOR FLAMMABILITY OF PLASTIC MATERIALS FOR PARTS IN DEVICES AND APPLIANCES.

3. Part numbers structure

BTFW	20	R	-	3	R	ST	G	E4	LF
1	2	3		4	5	6	7	8	9

1	Series name
2	Number of contact
3	Connector Type P : Plug R : Receptacle
4	Number of contact rows Two rows (Staggered)
5	Terminal type S : Straight R : Right angle
6	Terminal variation ST : SMT without boss SB : SMT with boss D : Dipping type
7	Plating Option G : Contact area Gold plating Terminal area: Tin plating A : Contact area Gold plating Terminal area : Tin plating Blank : Tin plating
8	Packaging E4 : Plastic reel (SMT Type) 7 : Tray (Only for Dipping Type Rece)
9	Lead free

4. Connector shape, Dimension and material

See attached drawings.

5. Packaging condition

See attached drawings.

6. Recommended P.C. board layout

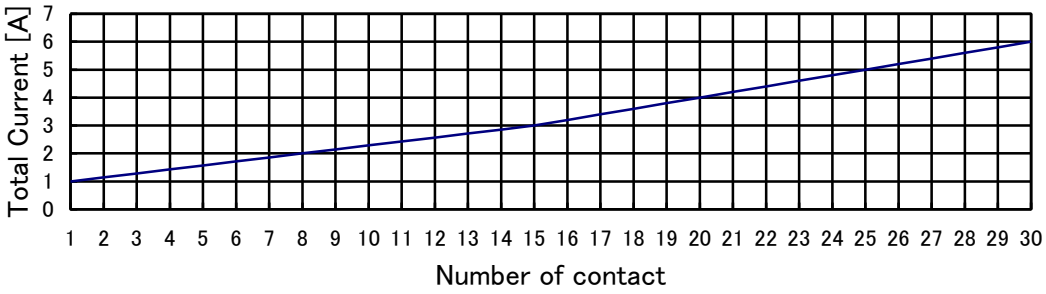
See attached drawings.

7. Rating

7.1 Rating voltage : AC/DC 100V

7.2 Rating current : AC/DC 1A

7.3 Operating temperature range : -55˚C ~ 105˚C
(Including temperature rise caused by application of current.)
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.



8. Performance characteristics

Table 1. Performance of various

Item		Requirements	Condition
Electrical Requirements	Contact resistance	(1) Initial : 70mΩ Max. (2) Contact resistance after the test is in accordance with the value specified in each test item.	9.1
	Insulation resistance	(1) More than 100MΩ	9.2
	Dielectric Withstanding Voltage	(1) No evidence of arc-over or insulation breakdown.	9.3
Mechanical Performance	Mating / Unmating force	(1) Initial Mating Force : Less than 2.5N/pin (2) Initial Unmating Force : More than 0.2N/pin (3) After Mating Force : Less than 2.5N/pin (4) After Unmating Force : More than 0.15N/pin	9.4
	Durability	(1) Initial contact resistance : Less than 70mΩ (2) Contact resistance after the test : Less than 100mΩ (3) Free from any defect such as break etc. on the connector.	9.5
	Vibration (Sinusoidal)	(1) During the test, no circuit opening for more than 1μsec. (2) Free from any defect such as break, deformation, loosing and falling off etc. on each portion of the connector.	9.6
Environmental Performance	Humidity (Steady state)	(1) Initial contact resistance : Less than 70mΩ (2) Contact resistance after the test : Less than 100mΩ (3) Insulation resistance after the test : More than 100MΩ	9.7
	Salt mist	(1) Initial contact resistance : Less than 70mΩ (2) Contact resistance after the test : Less than 100mΩ	9.8
	Change of temperature	(1) Initial contact resistance : Less than 70mΩ (2) Contact resistance after the test : Less than 100mΩ (3) Free from any defect such as crack, warping and deformation eta. on each portion of the connector.	9.9
Other Performance	Solder heat resistance	(1) Free from any damage on performance and contact performance after soldering.	9.10
	Solderability	(1) Soldered area 95% MIN.	9.11

9. Test method

9.1 Contact resistance

Measure contact resistance between V1-V2 by voltage drop method by the following conditions.

(a) Test current : 20 mA AC Max.
(b) Open circuit voltage : 20 mV AC Max

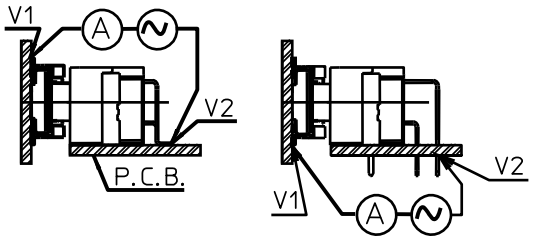


Fig.1 Contact Resistance measuring method

9.2 Insulation resistance

Measure insulation resistance between adjacent contacts in a connector individual.

(a) Test voltage : D.C.500V
(b) Test duration : 1 minute

9.3 Dielectric withstanding voltage

For one minute, apply AC500V between adjacent contacts in a connector individual.

(a) Set current :A.C.1mA

9.4 Mating / Unmating force

Measure the insertion force when Plug and Rece are mating. And measure the extraction force when Plug and Rece are ummating.

(a) Test speed : 25mm/min.

9.5 Durability

Measure contact resistance before and after test by method specified in clause 9.1.

(a) Number of cycle
Gold plating type : 100 times
Tin plating type : 20 times.
(b) Test speed: 10 times/minutes Max.

9.6 Vibration(JIS C 60068-2-6(IEC60068-2-6))

(a) Confirm circuit opening by discontinuity monitor after mating.
(b) Kind of test: Sweep endurance test
(c) Frequency range:10 to 500Hz
(d) Amplitude, acceleration amplitude :0.75mm or 100m/s^2
(e) Sweep rate : 1 octave/minutes
(f) Test time :10 cycles

9.7 Humidity (steady state) (JIS C 60068-2-78(IEC60068-2-78))

Measure contact resistance before and after test by method specified in clause 9.1. after mating.

(a) Measure insulation resistance after the test by the method in clause 9.2.
(b) Test temperature : 40˚C
(c) Test humidity : 90 to 95%RH
(d) Test Duration : 48 hours
(e) Expose connector in mated condition and leave them under room temp. after post treatment. (24 hours)

9.8 Salt mist (JIS C 0023)

Measure contact resistance before and after test by method specified in clause 9.1 after mating.

(a) Salt density : 5%
(b) Test temperature : 35˚C
(c) Test duration : 48 hours
(d) The test samples should be measured after rinsed with running water and dried for 24 hours at room temp.

9.9 Change of temperature(JIS C 0025(IEC60068-2-14))

Measure contact resistance before and after test by method specified in clause 9.1 after mating.

(a) One cycle of temperature is as follow and test 5 cycles.

Step	Temp. [˚C]	Time [min.]
1	-55±3	30
2	(25±2)	Within 2
3	105±2	30
4	(25±2)	Within 2

(b) Leave them room temp.

9.10 Resistance to soldering heat (JIS C 60068-2-58(IEC60068-2-58))

9.10.1 SMT Type

Solder by setting reflow bath to the following condition for SMT.

(a) Preheating : 150~180˚C, 120±5sec.
(b) Soldering : 220˚C MIN., 60sec. MAX.
(c) Peak temp. : 245˚C 20sec. MAX. (Peak : 260˚C MAX.)
(d) Solder paste : Sn 96.5 / Ag 3.0 / Cu 0.5 (Senju metal industry M705-221etc.)

9.10.2 Dip Type

The connector is soldered by the following condition after mounted P.C.Board for Dipping type.

(a) Soldering bath temp. : 260±5˚C
(b) Dipping time :10±1 sec.
(c) Solder paste : Sn 96.5 / Ag 3.0 / Cu 0.5 (Senju metal industry M705-221etc.)

9.10.3 Hand Soldering

The SMT and Dip type connectors are hand soldered by the following condition after mounted P.C.Board.

(a) Temp. on the edge of iron : 350±10˚C
(b) Solder time : 3±0.5 sec.

9.11 Solderability (JIS C 60068-2-58(IEC60068-2-58))

9.11.1 SMT Type

Solder by setting reflow bath to the following condition for SMT.

(a) Preheating : 150~180°C, 60~120s
(b) Soldering : 225°C min., 20±5s
(c) Peak temp. : 235°C max.
(d) Solder paste : Sn 96.5 / Ag 3.0 / Cu 0.5 (Senju metal industry M705-221etc.)

9.11.2 Dip Type

The connector is soldered by the following condition.

(a) Solder temp.: 245±5°C
(b) Dipping time : 2±0.5 sec.
(c) Solder paste : Sn 96.5 / Ag 3.0 / Cu 0.5 (Senju metal industry M705-221etc.)

9 Test sequence

Table 2. Test sequence

Test item		Test group								Test Method
		1	2	3	4	5	6	7	8	
1	Contact resistance	2 5	1 3	1 3		1 3	1 3			9.1
2	Insulation resistance				1 4					9.2
3	Dielectric with standing voltage				2 5					9.3
4	Mating/Unmating Force	1 4								9.4
5	Durability	3								9.5
6	Vibration		2							9.6
7	Humidity			2	3					9.7
8	Salt mist					2				9.8
9	Change of temperature						2			9.9
10	Resistance to soldering heat							1		9.10
11	Solderability								1	9.11

10 Note

11.1 Parts number and Lot No. indication

Catalog number and lot number are not be indicated on the connector.
Catalog number , quantity and manufacture's name shall be indicated on the surface of the package box.

11.2 Packaging

11.2.1 Automatic mounting & SMT

The connector individuals are packed by tapes with specified quantity in accordance with JIS C 0806 "Packaging of Electronic Components on Continuous Tapes (Surface Mount components)" and put into package box in accordance with FCI packaging specification.

11.2.2 Dipping type

The connector individuals are put into the package box with specified quantity in accordance with the method specified in the separate packaging.

12. Notice

Please be sure to look through application specification of relevance in the case of use of this product.

REVISION RECORD

Rev	Page	Description	EC#	Date
A	All	New Release	J08-0133	3/24/'08
B	ALL	Change JIS No. and add IEC No. Change durability condition. (Separate Gold plating condition and Tin plating condition) Change temperature of solderability to 245°C from 235°C (Lead free condition) Add storage of connector condition	J11-0064	Nov./21/'11
C	ALL	Change the latest form. Fill in UNRESTRICTED on classification. Delete to note of 11-4,11-5,11-6 Add No.15 notice	ECR-ELX-J-011423	Nov./25/'12
D	ALL P4 P5 P6 P3~8 P5	Change Format and Removed Japanese. Add mating / Unmating force spec as Item 9.4. Change test condition of Change of Temperature (Step 2 and 4). Change test condition of Solderability (Add SMT type condition). The numbers after item 9.4 have been shifted. Change condition of Resistance to soldering heat SMT Type item 9.10.1 based on JIS C 60068-2-58	ELX-J-31177	Sep./05/'18
E	P5	Change of temperature：85℃==）105℃	ECR-ELX-N-38570	Oct./ 09/20