

Jointherm®

1 What is Jointherm®?

Jointherm is a kind of film thermistor for 2nd battery package. Its high strength chip is placed and soldered automatically with impact strength & water resistance coating material and then lead wire is protected again with PI film from external load, shocking, moisture, friction. Reel packing can be to the benefit of customer's automatic manufacture process.

2 Application of Jointherm®

- Temperature Sensing and Protection in 2nd cell for Notebook, Mobile phone. PDA. Computer CPU.
- Temperature Sensing and Protection in Electronic Device.

3 Feature of Jointherm®

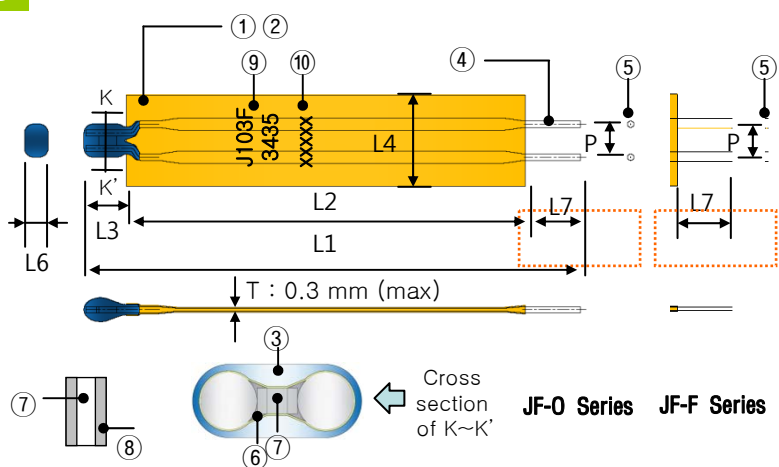
- Because of using 100% autosorted chip, Jointherm has good reliability.
- Lead wire will not cut easily by repetition bending on pcb hole soldered and drop test.
- Used thermistor chip with tin electrode supply good solderability.
- The diameter of lead wire is bigger than chip's thickness, so the chip is protected from external impact, load and bending.

4 Jointherm (JF Series) Comparison table

EU-RoHS Halogen Free

Division		JF-O Series	JF-F Series
Lead	Form	Round wire (0.35Φ mm)	Round wire (0.35Φ mm)
	Mat'l	Fe-Ni-Cu-Sn Plating	Fe-Ni-Cu-Sn Plating
Thermistor chip		Thermistor chip resistance sorted 100%	
Protective coating		Impact strength and epoxy with water resistance	
Heat_resistance film		Heat_resistance adhesive + Polyimide film	
Lead terminal		Round 0.35Φ (mm)	Rectangle 0.65×0.15 (mm)
Manufacture method		Automation System	
Resistance inspection		100% Auto resistance sorting	
Supply method		Reel taping or bulk	
Strong point		Cost / Automation / Good solderbility / watertight / Mechanical strength / Various length	

5 Jointherm (JF Series) Material & Size, Structure



Division	Material	Remark
1	Film	Poly imide Yellow
2	Adhesive	Silicon Heat resistant
3	Coating	Epoxy Impact_strength Watertight
4	Lead	Fe-Cu-Sn Φ0.35mm
5	Terminal	JF-O Series Φ0.35mm
		JF-F Series 0.65×0.15
6	Solder	Sn Pb Free
7	Thermistor	NTC t=0.30mm
8	Electrode	Ni/Sn Plating
9	Part No.	Marking ink Black
10	Lot No.	Marking ink Black

Type	L1	L2	L3	L4	L5	L6	L7	P	Remark
JF - O	36(max)	22(max)	2±0.5	5±0.5	2.0(max)	1.5(max)	26(max)	1.8±0.5	
JF - F	27(max)	22(max)	2±0.5	5±0.5	2.0(max)	1.5(max)	17(max)	1.8±0.5	

6 Characteristics

Part No.	Operating Temp. range	R@25°C	B (25/85)	δ(mW/°C)	T(sec)	Mechanical Strength in chip
JF-O Series JF-F Series	-40 ~120°C	10kΩ	3435K	0.7	5	Min. 5kg

7 R / T Table

Temp(°C)	Resistance(kohm)
	JF-□ 103F345F_
-40	190.746
-30	113.286
-20	68.872
-10	42.936
0	27.459
10	18.008
25	10.000
40	5.832
50	4.171
60	3.035
70	2.243
80	1.680
90	1.274
100	0.975
110	0.753
120	0.586

8 Order method (Standard product)

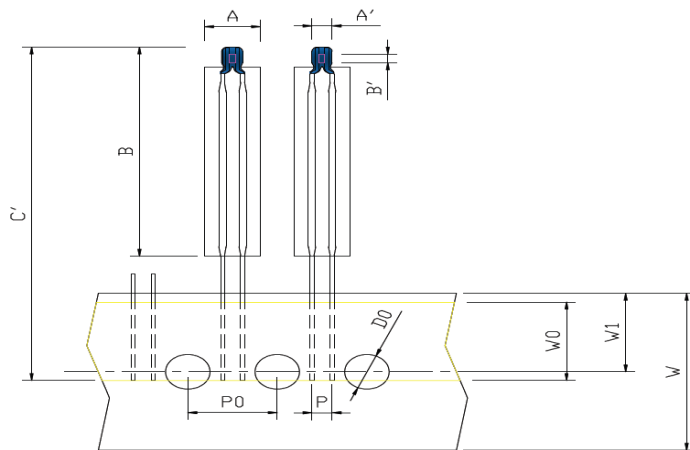
Part No. : J O 103 F 3435 F B ** - 5 - 22 - 26 - 1.8
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫

①	J	Jointherm Series.	⑥	F	Tolerance : F (1%)	
②	FO	Terminal shape ; O : Φ0.35 (mm)	⑦	B	B : Bulk, T : Taping	
	FF	Terminal shape ; F : 0.65×0.15 (mm)		⑧	**	** : Customer code
	L	Lead type				
	TH	SMD Type			⑨	5
③	103	103=10×10 ³ (Ω)@25°C	⑩	22	Film length (mm)	
④	F	Tolerance : F (1%)	⑪	26	Total length (mm)	
⑤	3435	B(25/85) Value	⑫	1.8	Lead space (mm)	

* Another specifications are available on request

9 Packing Method : Reel Taping or Bulk

A : 1) Reel Taping specification



Code	Dimension
Po	8±1
W	18 +1.0/-0.5
Wo	8(Min)
W ₁	8(Min)
Do	Φ4±0.2
P	1.8
A	5.0
A'	Max 2.0
B	Max 25
B'	1.0
C'	Max 36

2). Packing method and quantity

Division	Inner box	Outer box
Unit (EA)	2,000	10,000

B : Bulk packing and quantity

Division	Pcs / bag	Inner box	Outer box
Unit(EA)	1,000	10,000	100,000

Why Jointherm (JF Series) have environment reliability ?

1. Jointherm have good reliability from strong impact and water resistance

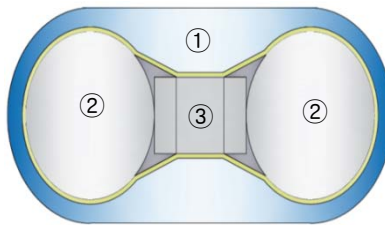
Component construction

Div	Name	Strong point
①	Thermistor	1. Use 100% autosorted chip with tin plating electrode and high mechanical strength. 2. Good solderability and quality using the 100% autosorted chip.
②	Lead wire	1. Lead terminal shapes are round or frame type Available. 2. The thickness of lead wire is thick than chip's, So from the outside Impact, thermistor chip is protected with reliability.
③	Coating mat'l	1. Protective coating layer with good insulation and water resistance protect thermistor from the environment circumstance. 2. Small coating size is suitable to all applications.

Manufacture process

Process	Strong point
Auto insert chip and soldering	1. Lead wire and chip assembly process supply reliability electrical contact. 2. Thermistor chip with tin electrode not silver supply good solderability.

Section Structure of Thermistor molding part

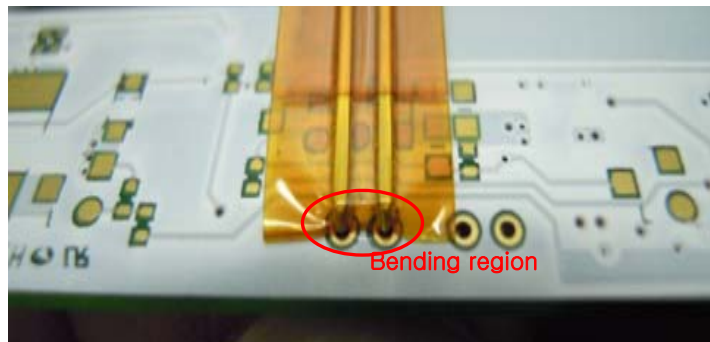


Cross section of K~K' In the first page picture

Resistance sorting method

Process	Strong point
Resistance Inspection method	Because of using the 100% sorted chip Final product has good reliability.

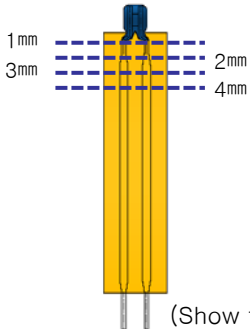
2. Bending strength of lead wire is strong after soldering it on pcb.(JF – O Series)



Reference : Experiment data

Test method	Count	JF□103F3435F01B	remark
As shown in figure, bend the soldered wire to 90° and then count the number until the lead wire broken.	3 time	0	Comparative advantage than others
	4 time	0	
	5 time	0	
	6 time	0	
	7 time	7	
	8 time	17	
	9 time	6	
	Total	30pcs	

3. Bending strength of hermistor coating part is strong, so quality problem can be prevented



Reference : Experiment data

(Show the bending region in the end of coating part)

Test method	Distance	Joinset (JF□103F3435F01B_)	remark
As shown in picture, bending the sample 20pcs five times in each region, and then check electrical resistance change.	1mm	0	Comparative advantage than others
	2mm	0	
	3mm	0	
	4mm	0	
	Total	0/100pcs	
Result		All good	

4. PCT (Pressure Cooker Test : 121 °C × 2atm × 24hr)

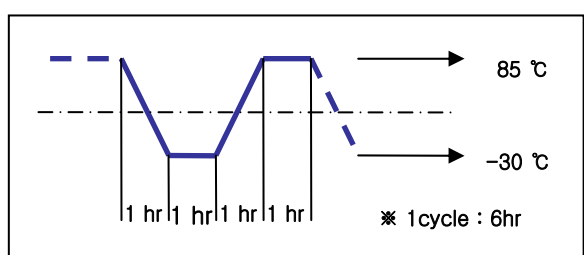
; Protective coating material has good insulation and water resistance, so chip thermistor can be protected in high temperature and high presure circumstance.

5. Accelerated life test (ALT)

Test condition (sample 25EA, 750hr test , 10 years guarantee)

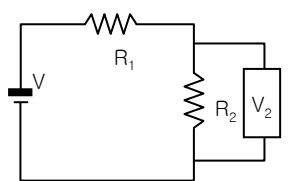
Temperature Cycle Test

Div.	Temperature	Humidity	Voltage
Circumstance	20 °C ~ 45 °C	10 ~ 90%	5 V
Accelerated condition	-30 °C ~ 85 °C	85%	5 V



Using the time of day	Using the time of 1 year	Using the time of 10 years
24 hr / day	24 hr X 365 day = 8,760 hrs	87,600 hrs

Test Circuit



V=DC5V, V₂=Output voltage (DC)
R₁=10kΩ, R₂= Chip resistance

$$\frac{R_2 \times V}{R_1 + R_2} = V_2$$

※ Calculating roots : In case of the thermistor normally DC5V loaded in the above circuit.