To be more Smart Mobile Phone
for better life style,
display temperatures on it.

Ambient air temperature

Body & anywhere temperature

25℃ ±0.18℃

- High accuracy (±0.18℃)
- Fast response time
- Contact & Non-contact measuring

Creative & Innovative Temperature Sensing Technology

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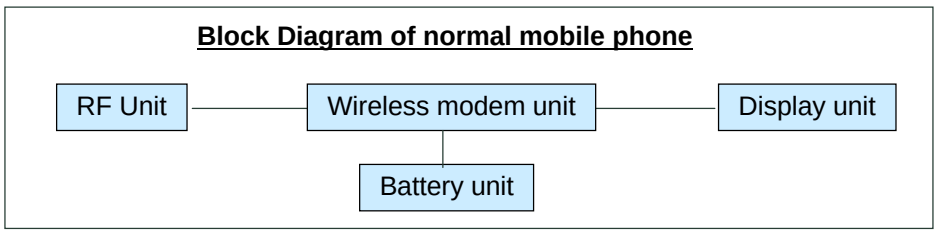
TÜV
ISO9001

The structure of ordinary mobile phones could be briefly classified with a RF unit, a wireless modem unit, a display unit, and a battery unit. Here, the wireless modem unit indicates the concept including peripheral circuits which are necessary for communication. It can be composed of a large number of chip devices or an integrated chip.



Mobil phones will need an additional functional circuit by which temperature can be converted to electric resistance or other properties to measure the temperature of a specific region such as an ambient air temperature, phone temperature, and body heat,

For realizing this concept, Joinset Co. Ltd. developed a technology based on using functionality of standard components in mobile phones which is a temperature sensor named Jointherm™

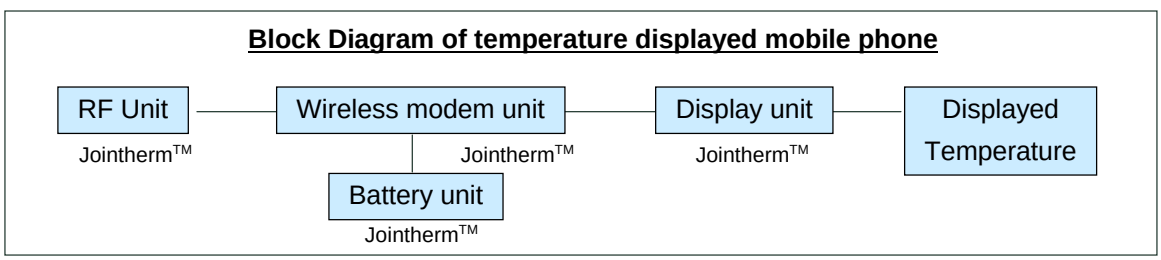
By using Jointherm™, Joinset Co. Ltd. has developed the **World's First** temperature measurement system in mobile phones that can measure an ambient air temperature, phone temperature, body heat, etc. Thus, Joinset Co. Ltd. has opened the new way to make mobile phones more sensitive and more useful life style products. [Patent pending]

In a wireless modem unit, Jointherm™ can be used as a high sensitive sensor to display the temperature of a specific region where we would like to know, some logical circuit design needs. That is, Jointherm™ will generate the voltage signal which is compatible to temperature, this analog signal will be converted to digital form by an A/D converter in a wireless modem unit. LCD will display the temperature, fahrenheit or centigrade. In this circuit, the signal will be changed with the R/T table of Jointherm™, which is already input as software data.

Because the display unit has an exclusive CPU in which a command signal can be converted to the display form on the LCD, S/W designers could easily control this mechanism.

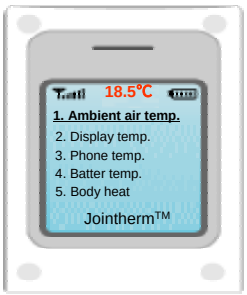
Jointherm™ has been manufactured by combination technology such as a precise raw mat'l tech., design capability due to know-how, and process technology controlled with a high quality management system.

Also, Jointherm™ is ± 0.18℃ sensibility, more accuracy than a general use thermometer, ± 0.20℃.



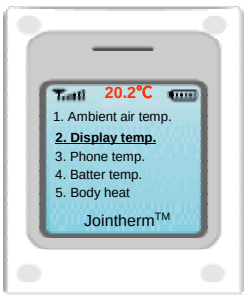
1. Ambient air temperature measurement method
; temperature always displays on LCD [Standard]

a. Jointherm™ (Thermistor unit ; temperature sensor) can be located at a proper place such as beneath speaker of the phone, where it is not affected by the heat of a call and is well ventilated.
b. Product : Jointherm-103 or Jointherm-104



2. LCD temperature measurement method
; Using menu selection button [Option]

a. Locate the Jointherm™ in the display unit.
b. Product :
* Wire type : Jointherm-103 or Jointherm-104
* SMD type : Joinset SMD Thermistor (ECTH series)



3. Phone body temperature measurement method
; Using menu selection button [Option]

a. Locate the Jointherm™ in wireless modem unit of the phone.
b. Product :
* Wire type : Jointherm-103 or Jointherm-104
* SMD type : Joinset SMD Thermistor (ECTH series)

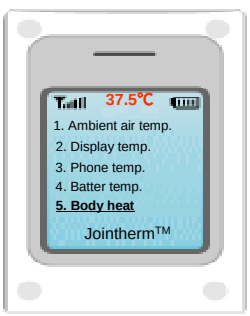
4. Battery temperature measurement method
; Using menu selection button [Option]

a. Locate the Jointherm™ in the battery unit.
b. Product :
* Wire type : Jointherm-103 or Jointherm-104
* SMD type : Joinset SMD Thermistor (ECTH series)

(Ref.) In case the battery has a 4 pin-electrode, those pins are used for Vcc, ground, capacity of battery, and temperature sensing for each other batteries. A temperature sensor for the 4th pin is located in the internal space of the battery or battery charger.

5. Body heat or contact surface temp. measurement method
; Using menu selection button [Option]

a. Locate the Jointherm™ on the antenna, keyboard, or other places for certain needs of the mobile phone. In this case, external temperature could be transferred faster to Jointherm™ by using mat'l which has good thermal conductivity, such as metal etc.
b. Product :
* Wire type : Jointherm-103 or Jointherm-104



■ Specifications

1. Wire type [Jointherm™; Patent pending]

1) Part No. : Jointherm-103, Jointherm-104

2) Advantage : Temp. accuracy / Quick response time / High reliability / Flexibility / Ultra thin

3) Properties :

① Temp. accuracy : Resistance tolerance ± 0.8% [@ 25℃, ± 0.18℃ temp. tolerance]

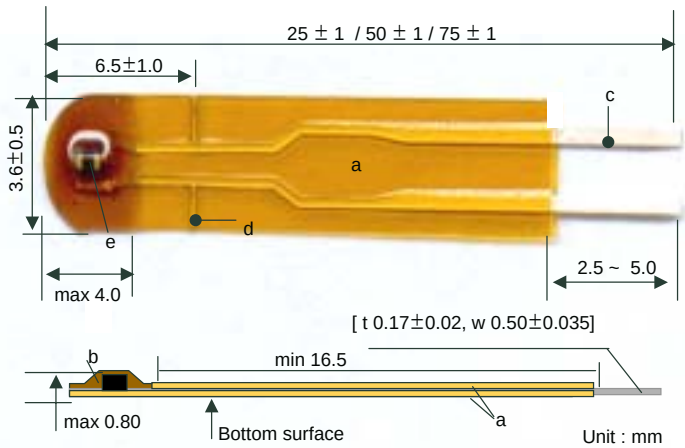
② Response time : Over 30% faster than the existing sensor.

* Realize the optimum product design for a quick response

* Quick response time due to pore free in cover layer

[Thermal conductivity of Air : 0.000057cal/cm sec ℃]

③ Thickness : 0.5mm ④ Rated temperature : -40℃ ~ 150℃



a. Base : Polyimide film [up to 250℃]
b. Cover : Polymer with thermal conductive powder
c. Lead wire : Tin plated flat copper
d. Thermal wire : Tin plated flat copper
e. Thermistor[sensor element] : 3μm parylene coated on body

Temp (℃)	Part No.	
	Jointherm-103	Jointherm-104
-40	188.5	3204
-30	111.4	1710
-20	67.80	948.6
-10	42.45	545.4
0	27.28	324.1
10	17.96	198.4
20	12.09	124.9
25	10.00	100.0
30	8.313	80.56
40	5.827	53.16
50	4.160	35.80
60	3.020	24.55
70	2.228	17.12
80	1.667	12.11
90	1.265	8.683
100	0.972	6.298
110	0.757	4.615

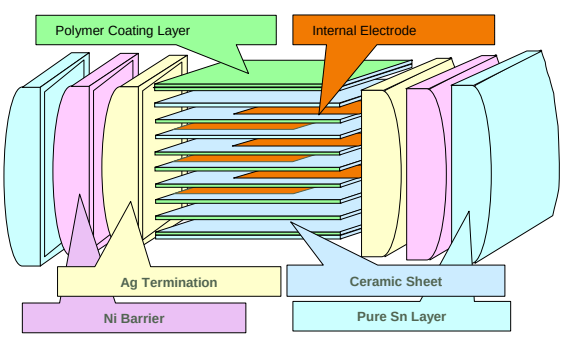
Part No	R25℃	B25℃/85℃	δ [mW/℃]	τ [sec]	max. rated power	Temp. [℃]
Jointherm-103	10kΩ ± 0.8%	3435K ± 0.8%	0.7	5	3.5mW	-40 ~ 150
Jointherm-104	100kΩ ± 0.8%	4050K ± 0.8%	0.7	5	3.5mW	-40 ~ 150

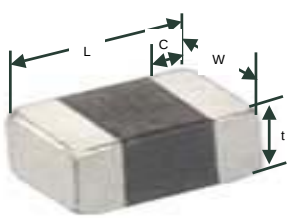
2. SMD type [ECTH 1005 Series ; if applicable, has ±0.23℃ tolerance at 25℃]

1) Part No. : ECTH 100505 103F 3435F T, ECTH 100505 104F 4050 F T

2) Advantages : Temp. accuracy / Quick response time / High reliability / Strong against ESD

3) Structure





Unit : mm

Size	L	W	t	C
1005	1.00 ± 0.05	0.50 ± 0.05	0.50 ± 0.05	0.25 ± 0.10

4) Properties : Please refer to our catalog.