
About us:

EXSENSE Electronic Technology Co., Ltd. is a private high-tech company, involved in the Production Selling, R & D of NTC thermistor, temperature sensor and electronic materials in question. Depending on the strong cooperation in circle, we provide complementary service for various electronic components.

Adopting advanced semi-conductor processing system, combining with NTC Thermistor and temperature sensor and electronic materials with our own intellectual property rights, and using high precision material processing, cutting, sealing, packing and testing equipment from Japan, Taiwan and Germany, we are able to manufacture in batches. Meanwhile, through creative management and intensive quality control, we assure the high stability and reliability during continuous production. At present we mainly manufacture items as follows: AT series – non-insulated lead type NTC thermistor, LT series – non-insulated lead (small type) NTC thermistor, BT series – insulated lead type NTC thermistor, IT series -- high precision NTC for electronic thermometer, CT series -- chip NTC thermistor, FT series -- film type NTC thermistor, GT series -- glass sealed NTC thermistor, PT series -- power type NTC thermistor, TS series -- NTC temperature sensor, OT series -- OA (office automation) NTC thermistor & temperature sensor, VT series -- NTC thermistor for vehicle temperature sensor & thermo switch making, VTS series -- vehicle temperature sensor & thermo switch, MT series -- NTC thermistor for medical temperature sensor making, DT series -- die (bare chip) NTC thermistor, DTV series -- die (bare chip) NTC thermistor for vehicle temperature sensor & thermo switch making, and DTM series -- die (bare chip) NTC thermistor for Medical temperature sensor making.

We keep bringing forth new ideas and possess various intellectual property rights in the field of temperature sensor and electronic materials.

We keep improving our R & D and cooperating with people in this occupation. We work hard to supply our customers with both high-tech products and quality service.

We pursue our management philosophy as following:



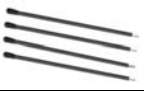













Striving for perfection-----quality cast brand;

Sharing development-----repay staffs and society;

True Practice-----enterprise serve our country.

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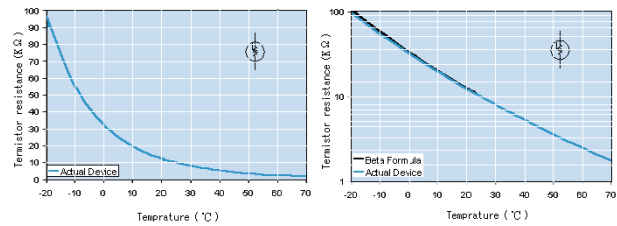
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Basic Characteristics of NTC Thermistor

What is NTC Thermistor?

NTC: Negative Temperature Coefficient

Thermistor: Thermally Sensitive Resistor



[A] Nonlinear temperature [B] Close to real temp. while Y axis as log coordinates

NTC Feature: Exhibit a decrease in resistance when temperature rises.

Thermistor is a semiconducting ceramic resistor produced by sintering the materials at high temperature and made mainly from metal oxide. NTC thermistors are resistors with large negative temperature coefficient. Change in resistance of the NTC thermistors can be brought about either externally by a change in ambient temperature or internally by self-heating resulting from a current flowing through the device. At certain measure power, its resistance reduces rapidly while the temperature getting increases. Taking advantage of this characteristic, it can achieve the detecting and controlling temperature purpose.

1. Zero-power resistance (R_T)

The zero-power resistance is the value of a resistance when measured at a specified temperature, under conditions such that the change in resistance due to the internal generation of heat is negligible with respect to the total error of measurement.

2. Rated zero-power resistance R_{25}

The rated zero-power resistance is the nominal value at the standard temperature of 25°C unless otherwise specified.

3. B constance in Kelvin's (K)

B constance is an index of the thermal sensitivity expressed by the formula:

$$B = \frac{\ln(R_1) - \ln(R_2)}{[1/T_1 - 1/T_2]}$$

Resistance in ohms () at temperature T1
Resistance in ohms () at temperature T2
 $T_1 = 2731.5k + (T_1 \text{ } ^\circ\text{C}), T_2 = 2731.5k + (T_2 \text{ } ^\circ\text{C})$

The B constance, unless otherwise specified, is calculated using the zero-power resistance when 25°C and 50°C in environment temperature.

4. Dissipation factor(δ)

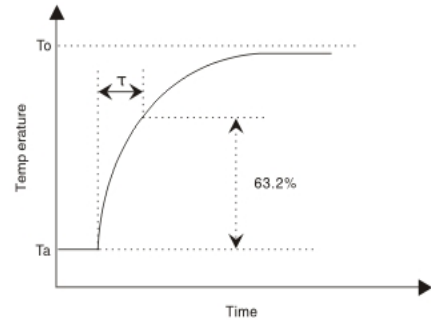
$$\delta = \Delta P / \Delta T \text{ (mW/}^\circ\text{C)}$$

Dissipation factor (δ) is power in milliwatts required to raise thermistor temperature 1°C , measured with thermistor suspended by its leads in a specified environment.

5. Thermal time constant (τ)

$$\tau = C / \delta$$

Thermal time constant (τ) is the time required by a thermistor to change 63.2% of the difference between its initial and final temperature, measured with thermistor suspended by its leads in specified environment.



6. Power rating

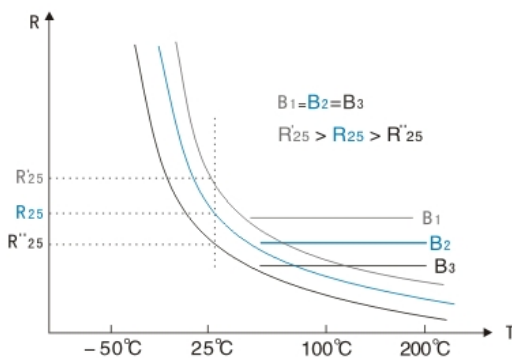
Rated power = heat dissipation factor δ \times (maximum operating temperature $- 25^\circ\text{C}$)

7. Resistance/temperature characteristic

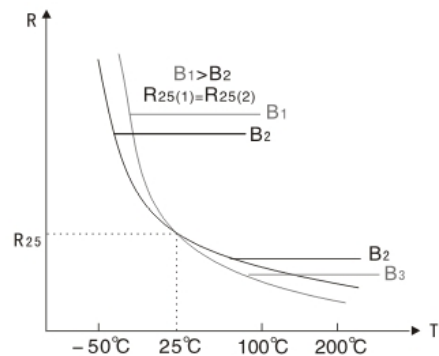
The resistance law of the relationship between the zero-power resistance of a thermistor and its body temperature follows approximately the formula:

$$R = R_1 e^{B \left(\frac{1}{T} - \frac{1}{T_1} \right)}$$

R1: Resistance value at absolute temperature T1 (K)
B: B constance



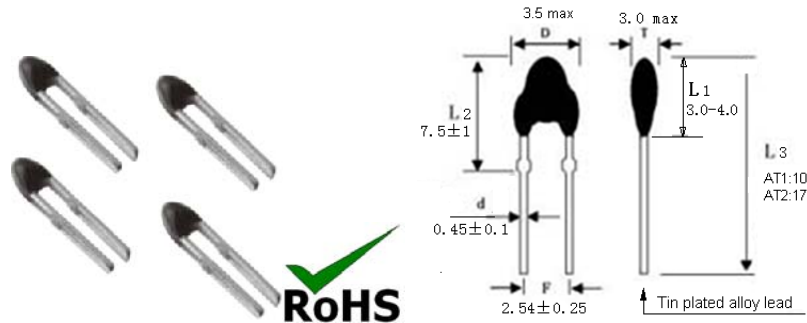
A



B

A. The same B constance while the different resistances B. The same resistance while the different B constances

AT Series—Non-insulated Lead Type NTC Thermistor



unit : mm

FEATURES

- Small size, Fast response, High sensitivity
- High accuracy tolerances to $\pm 0.1^{\circ}\text{C}$
- Excellent thermal cycle endurance
- High stability
- Operating ranges from $-50^{\circ}\text{C} \sim +125^{\circ}\text{C}$

APPLICATION

- Home electronics
- CPU fan
- Battery and charger
- Automobile electrics
- Electric table-board
- Heating apparatus
- Electronic clock
- Computer main board
- Air-conditioner
- Liquid level sensor
- Battery of mobile telephone

Part Number Identification

AT	103	F	3435	A				
①	②	③	④	⑤				
①	②	③	④	⑤				
Product Series Code	Resistance @25°C		R Tolerance	B Constance	Test Temp. of B			
AT	A Type NTC Thermistor	202	$20 \times 10^2 \Omega$	B	$\pm 0.05^{\circ}\text{C}$	3435: B=3435	A	25°C/50°C
		103	$10 \times 10^3 \Omega$	C	$\pm 0.1^{\circ}\text{C}$			
		473	$47 \times 10^3 \Omega$	D	$\pm 0.2^{\circ}\text{C}$	4100: B=4100	B	25°C/85°C
				F	$\pm 1\%$			
		G	$\pm 2\%$					
		H	$\pm 3\%$					
		J	$\pm 5\%$					

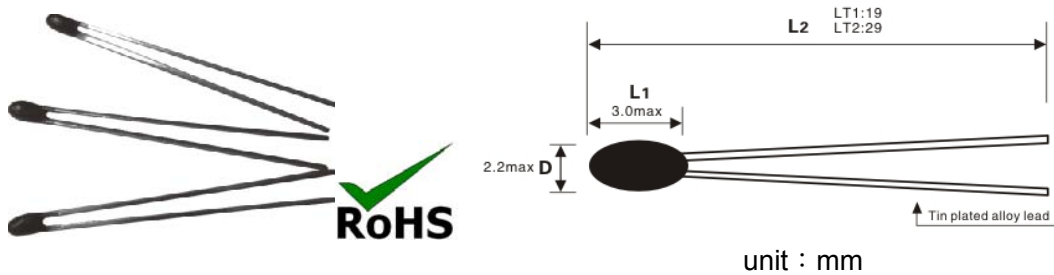
Electronic Parameter Specification

Part No.	R _{25°C} (KΩ)	B(K)	Rated Power @25°C (mW)	Dissipation Factor(δ) (mW/°C)	Thermal Time Constant (S)
AT102□3150A	1.0	3150	15	2.5	≤15
AT202□3150A	2.0	3150			
AT502□3274A	5.0	3274			
AT502□3435B	5.0	3435			
AT502□3470A	5.0	3470			
AT502□3950A	5.0	3950			
AT103□3274A	10.0	3274			
AT103□3435B	10.0	3435			
AT103□3470A	10.0	3470			
AT103□3950A	10.0	3950			
AT103□4100A	10.0	4100			
AT153□3950A	15.0	3950			
AT153□4100A	15.0	4100			
AT203□3950A	20.0	3950			
AT203□4100A	20.0	4100			
AT223□4200A	22.0	4200			
AT333□3950A	33.0	3950			
AT403□3928A	40.27	3928			
AT473□3950A	47.0	3950			
AT473□4100A	47.0	4100			
AT503□3950A	50.0	3950			
AT503□4100A	50.0	4100			
AT104□3950A	100	3950			
AT104□4100A	100	4100			
AT104□4400A	100	4400			

◆ The B-tolerance is ±1% when R-tolerance within ±3%, others are ±2%.

◆ Special part number could be custom designed.

LT Series—Non-insulated Lead (Small Type) NTC Thermistor



FEATURES

- Small size, Fast response, High sensitivity
- High accuracy tolerances to +/-0.1°C
- Excellent thermal cycle endurance
- High stability
- Operating ranges -50°C ~ +125°C

APPLICATION

- For high accuracy temperature sensor production

Part Number Identification

LT	103	F	3435	B		
①	②	③	④	⑤		
①	②	③	④	⑤		
Product Series Code	Resistance @25°C		R Tolerance	B Constance	Test Temp. of B	
LT	L Type NTC Thermistor	202	20×10 ² Ω	B ±0.05°C	3435: B=3435	A 25°C/50°C
		103	10×10 ³ Ω	C ±0.1°C		
		473	47×10 ³ Ω	D ±0.2°C	4100: B=4100	B 25°C/85°C
				F ±1%		
				G ±2%		
			H ±3%			
			J ±5%			

Electronic Parameter Specification

Part No.	R _{25°C} (KΩ)	B(K)	Rated Power @25°C (mW)	Dissipation Factor(δ) (mW/°C)	Thermal Time Constant (S)
LT502□3274A	5.0	3274	10-15	2	≤10
LT502□3435B	5.0	3435			
LT502□3470A	5.0	3470			
LT502□3950A	5.0	3950			
LT103□3274A	10.0	3274			
LT103□3435B	10.0	3435			
LT103□3470A	10.0	3470			
LT103□3950A	10.0	3950			
LT103□4100A	10.0	4100			
LT153□3950A	15.0	3950			
LT153□4100A	15.0	4100			
LT203□3950A	20.0	3950			
LT203□4100A	20.0	4100			
LT403□3928A	40.27	3928			
LT473□3950A	47.0	3950			
LT473□4100A	47.0	4100			
LT503□3950A	50.0	3950			
LT503□4100A	50.0	4100			
LT104□3950A	100	3950			
LT104□4100A	100	4100			
LT104□4400A	100	4400			

◆The B-tolerance is ±1% when R--tolerance within ±3%, others are ±2%.

◆Special part number could be custom designed.

BT Series—Insulated Lead Type NTC Thermistor



FEATURES

- Small size, Fast response, High sensitivity
- High operating ranges from -30 °C ~ +125 °C
- High accuracy tolerances to +/-0.10 °C
- Excellent thermal cycle endurance
- High stability
- Pb free, RoHS compliance

APPLICATION

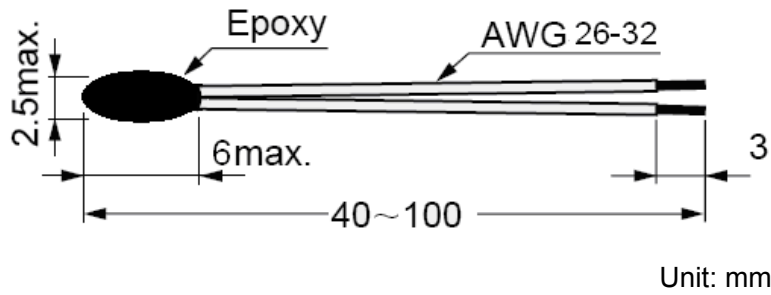
- Battery pack for computer & home appliance etc.

Part Number Identification

BT	103	F	3435	A	-	32	L100
①	②	③	④	⑤		⑥	Length(mm)

①		②		③		④		⑤		⑥	
Product Code	Series	Resistance @25°C		Tolerance		B Constance		Test Temp. of B		AWG No.	
BT	Battery series NTC Thermistor	202	20×10 ² Ω	F	±1%	3435: B=3435	A	25°C/50°C		28	AWG 28
		103	10×10 ³ Ω	G	±2%	4100: B=4100	B	25°C/85°C		30	AWG 30
		473	47×10 ³ Ω	J	±5%					32	AWG 32

Dimension



Electronic Parameter Specification

Part No.	$R_{25^{\circ}\text{C}}$ (K Ω)	B (K)	Rated Power @25 $^{\circ}\text{C}$ (mW)	Dissipation Factor(δ) (mW/ $^{\circ}\text{C}$)	Thermal Time Constant (S)
BT502□3274A	5.0	3274	10-20	2-4	≤ 15
BT502□3435B	5.0	3435			
BT502□3470A	5.0	3470			
BT103□3274A	10.0	3274			
BT103□3435B	10.0	3435			
BT103□3470A	10.0	3470			
BT103□3950A	10.0	3950			
BT103□4100A	10.0	4100			
BT503□3950A	50.0	3950			
BT503□4100A	50.0	4100			
BT104□3950A	100	3950			
BT104□4100A	100	4100			
BT104□4400A	100	4400			

◆The B-tolerance is $\pm 1\%$ when R-tolerance within $\pm 3\%$, others are $\pm 2\%$.

◆Special parameter could be custom designed.

IT Series--Electronic Thermometer Series High Precision

NTC Thermistor



FEATURES

- High accuracy tolerances to +/-0.1°C, Good coherence
- Small size, Fast response, High sensitivity
- High stability and High reliability
- Operating temperature range : -50°C ~ +110°C

APPLICATION

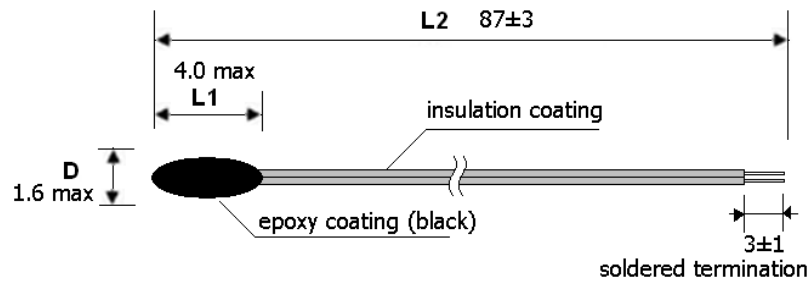
- Electronics thermometer
- Medical instrument

Part Number Identification

IT	103	F	3435	A	-	L87
①	②	③	④	⑤		Length(mm)

①		②		③		④		⑤	
Product Series Code		Resistance @25°C		Tolerance		B Constance		Test Temp. of B	
IT	Electronic Thermometer Series NTC Thermistor	202	20×10 ² Ω	A	±0.02°C	3435: B=3435	A	25°C/50°C	
				B	±0.05°C		B	25°C/85°C	
				D	±0.2°C		C	0°C/25°C	
		103	10×10 ³ Ω	F	±1%	4100: B=4100	D	0°C/50°C	
				G	±2%		E	0°C/100°C	
				H	±3%		F	25°C/100°C	
		473	47×10 ³ Ω	J	±5%				

Dimension



Unit: mm

Electronic Parameter Specification

Part No.	$R_{25^{\circ}\text{C}}$ ($\text{K}\Omega$)	B(K)	Rated Power @ 25°C (mW)	Dissipation Factor (δ) ($\text{mW}/^{\circ}\text{C}$)	Thermal Time Constant (S)
IT502□3470A	5.0	$3470 \pm 1\%$	3.5	0.7	≤ 3.2
IT502□3950A	5.0	$3950 \pm 1\%$			
IT103□3470A	10.0	$3470 \pm 1\%$			
IT103□3950A	10.0	$3950 \pm 1\%$			
IT203□3950A	20.0	$3950 \pm 1\%$			
IT503□3950A	50.0	$3950 \pm 1\%$			
IT104□3950A	100	$3950 \pm 1\%$			

◆The B-tolerance is $\pm 1\%$ when R-tolerance within $\pm 3\%$, others are $\pm 2\%$.

◆Special part number could be custom designed.

CT Series--Chip Type NTC Thermistor



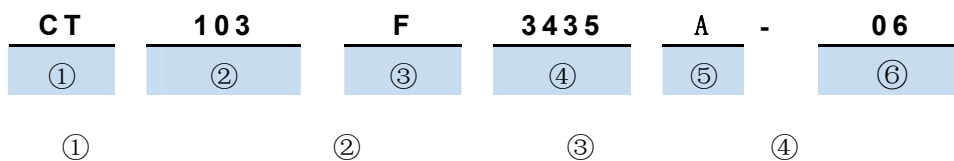
FEATURES

- All sizes are constructed 4-side glass encapsulation, high reliability and stability available.
- Highly reliable multilayer and monolithic structure, Leadless, ideal for high density SMT installation.
- Excellent Temperature Coefficient, Wide ranges of operating temperature (-40°C ~ +125°C)

APPLICATION

- TCXO, Temperature compensating circuit of LCD
- Temperature sensing in rechargeable batteries and chargers \ CPU
- IC and Semiconductor protecting
- Printer temperature compensating circuit. Player Driver
- Telecom exchanger
- DC/AC transformer and HIC over heat protecting.

Part Number Identification

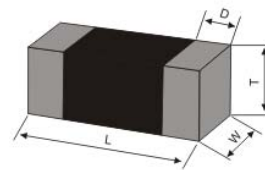
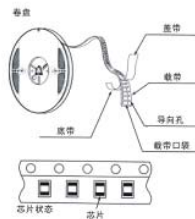
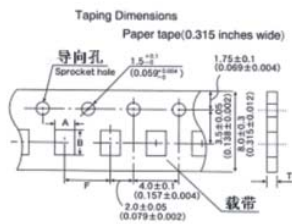


Product Series Code		Resistance @25°C		Tolerance		B Constance	Test Temp. of B		Dimension	
CT	Chip NTC Thermistor	202	20×10 ² Ω	F	±1%	3435: B=3435	A	25°C/50°C	02	0201
				G	±2%				04	0402
		103	10×10 ³ Ω	H	±3%	4100: B=4100	B	25°C/85°C	06	0603
				J	±5%				08	0805
		473	47×10 ³ Ω	K	±10%				12	1206

Electronic Parameter Specification

Part No.	R _{25°C} (KΩ)	B(K)	Rated Power @25°C (mW)	Dissipation Factor(δ) (mW/°C)	Thermal Time Constant (S)
CT101□2700A-□	0.1	2700			
CT221□2900A-□	0.22	2900			
CT331□3000A-□	0.33	3000			
CT471□3100A-□	0.47	3100			
CT681□3150A-□	0.68	3150			
CT102□3200A-□	1.0	3200	0402 : 100 mW	0402 : 1 mW/°C	0402 : 3 S
CT222□3250A-□	2.2	3250			
CT332□3300A-□	3.3	3300			
CT472□3350A-□	4.7	3350	0603 : 200 mW	0603 : 2 mW/°C	0603 : 3 S
CT682□3400A-□	6.8	3400			
CT103□3435A-□	10	3435			
CT103□3950A-□	10	3900			
CT153□3500A-□	15	3500	0805 : 300 mW	0805 : 3 mW/°C	0805 : 5 S
CT223□3600A-□	22	3600			
CT333□3800A-□	33	3800			
CT473□3900A-□	47	3900			
CT683□3950A-□	68	3950	1206 : 350 mW	1206 : 3.5 mW/°C	1206 : 5 S
CT104□4100A-□	100	4100			
CT224□4200A-□	220	4200			
CT334□4300A-□	330	4300			
CT474□4500A-□	470	4500			
CT564□4500A-□	560	4500			

Packaging



单位 Unit: mm (inch)

Code	L	W	T	D
0402	1.0±0.15 (0.040±0.006)	0.5±0.1 (0.045±0.004)	0.5±0.15 (0.020±0.006)	0.25±0.10 (0.010±0.004)
0603	1.6±0.2 (0.063±0.008)	0.8±0.2 (0.031±0.008)	0.6±0.2 (0.024±0.008)	0.3±0.2 (0.01±0.008)
0805	2.0±0.2 (0.079±0.008)	1.2±0.2 (0.047±0.008)	0.6±0.2 (0.024±0.008)	0.5±0.3 (0.020±0.012)
1206	3.2±0.2 (0.126±0.008)	1.6±0.2 (0.063±0.008)	0.9±0.2 (0.035±0.008)	0.5±0.3 (0.020±0.012)

FT Series--Film Type NTC Thermistor



FEATURES

- Suitable for narrow space
- Rapid response time
- Elastic and solder easily
- Operating temperature: -50°C ~ +90 °C

APPLICATION

- Narrow temperature detecting space
- Computer
- Printer
- Home appliances

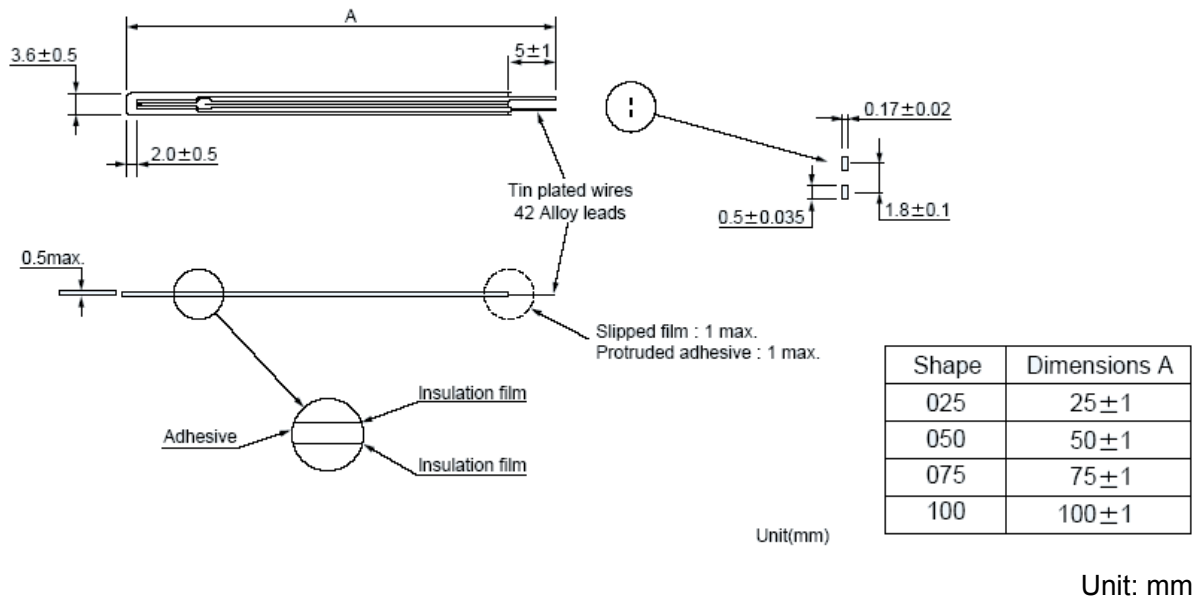
Part Number Identification



①
②
③
④
⑤
⑥

① Product Series Code		② Resistance @25°C		③ Tolerance		④ B Constance		⑤ Test Temp. of B		⑥ Dimension	
FT	Film Type NTC Thermistor	20	$20 \times 10^2 \Omega$	F	$\pm 1^\circ\text{C}$	3435: B=3435	A	25°C/50°C	Shape	A	
				G	$\pm 2^\circ\text{C}$				025	25mm	
		103	$10 \times 10^3 \Omega$	H	$\pm 3^\circ\text{C}$	4100: B=4100	B	25°C/85°C	050	50mm	
		473	$47 \times 10^3 \Omega$	J	$\pm 5\%$				075	75mm	
				K	$\pm 10\%$			100	100mm		

Dimension



Electronic Parameter Specification

Part No.	$R_{25^{\circ}\text{C}}$ ($\text{K}\Omega$)	B(K)	Rated Power @25°C (mW)	Dissipation Factor(δ) (mW/°C)	Thermal Time Constant (S)
FT502□3435B	5.0	3435	3.5	0.7	≤5
FT103□3435A	10.0	3435			
FT503□3950A	50.0	3950			
FT104□4390B	100	4390			

- ◆The B-tolerance is $\pm 1\%$ when R-tolerance within $\pm 3\%$, others are $\pm 2\%$.
- ◆Special part number could be custom designed.

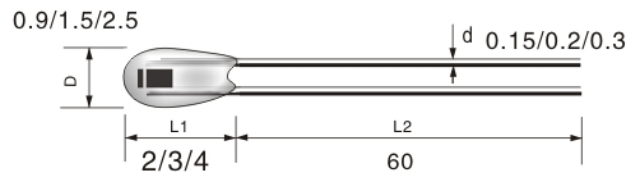
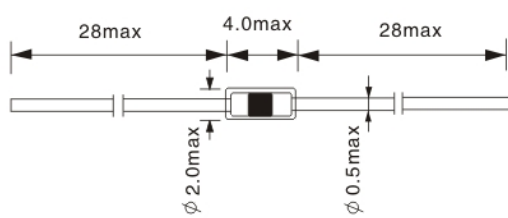
GT Series--Glass Sealed NTC Thermistor



-A (AXIAL)



-R (RADIAL)



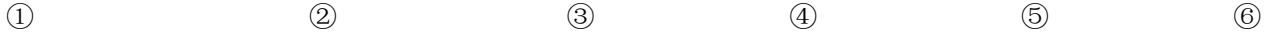
FEATURES

- High reliability, stability, high sensitivity
- Wide range of resistance: 0.5 ~ 1000K Ω
- Usable in high-temperature and high-moisture environments due to the glass wrapping
- Small, light, firm structure, convenient automatic installation on PCB
- Rapid response time
- Operating temp. -55 $^{\circ}\text{C}$ ~ +250 $^{\circ}\text{C}$

APPLICATION

- Temperature compensation and detection for Office automation facilities (e.g. Copiers, printers etc.)
- Industrial, medical, environmental protection, weather and food processing equipment
- Household appliances (air conditioners, microwave ovens, electric fans, electric heaters)
- Liquid level display and flow water measurement
- Apparatus coils, integrated circuits, quartz crystal oscillators and thermocouples
- Electronics Thermometer
- Medical instrument

Part Number Identification



Product Series Code		Resistance @25°C		Tolerance		B Constance	Test Temp. of B		Shape	
GT	Glass Type NTC Thermistor	202	20×10 ² Ω	A	±1%	3435: B=3435	A	25°C/50°C	A : AXIAL	
				B	±2%					
				D	±3%					
			103	10×10 ³ Ω	F	±5%	4100: B=4100	B	25°C/85°C	R : RADIAL
			473	47×10 ³ Ω	G	±10%				

AXIAL Type Electronic Parameter Specification

Parameter	Characteristics	Condition
R ₂₅	500 Ω ~ 1M Ω	25 °C ± 0.05 °C
Tolerance of R ₂₅ (%)	±1%、±2%、±3%、±5%、±10%	25 °C ± 0.05 °C
B constance	2500 ~ 5000K	25 °C ± 0.05 °C 50 °C ± 0.05 °C
Tolerance of B constance	±0.5%、±1%、±2%	50°C ± 0.05 °C 25 °C ± 0.05 °C
Dissipation factor(δ)	≥ 1.5 mW/ °C	In still air
Thermal time constance (τ)	≤ 17S	In still air
Operating temperature	- 55°C ~ + 250°C	
Power rating	50 mW	@maximum operating temperature

Dimension



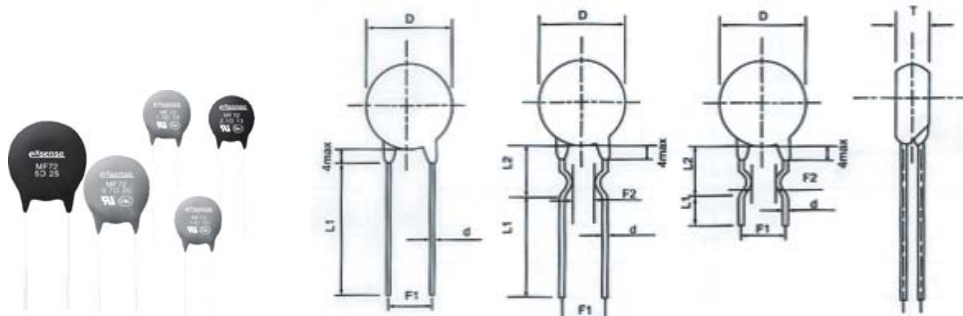
Part No.	D max	L 1 max	L 2 min	d ±0.05
R1	2.5	4	60	0.3
R2	1.5	3	60	0.2
R3	0.9	2	60	0.15

-R RADIAL Type Electronic Parameter Specification

Part No.	Rated Resistance R ₂₅		B Value (25/80°C)		Operating Temp. (°C)
	KΩ	Tolerance	K	Tolerance	
GT□□3450-R	2~10	±1% ±2% ±3% ±5%	3450	±0.5% ±1% ±2%	-20 ~ +250
GT□□3750-R	8~10		3750		
GT□□3950-R	10~50		3950		
GT□□4150-R	50~100		4150		
GT□□4200-R	100~350		4200		
GT□□4350-R	870~980		4350		
GT□□4450-R	1000~1500		4450		

Parameter	Characteristics			Condition
	R1	R2	R3	
Dissipation factor(δ)	1.2~1.3	0.7~0.8	0.4~0.5	In still air
Thermal time constance (τ)	10~11	4~5	2.3	In still air
Power rating	≤50	≤35	≤15	@maximum operating temperature

PT Series--Power Type NTC Thermistor



unit : mm

PT series NTC thermistor has to be connected in series to the power source circuit to avoid the surge current at the instant when the electronic circuits are turned on. The device can effectively suppress the surge current, and its resistance and power consumption can be greatly reduced after that through the continuous effect of the current so as not to affect the normal work current. Therefore the Power NTC thermistor is the most convenient and efficient instrument to curb the surge current and protect the electronic devices from being damaged.

FEATURES

- Strong power and strong capability of surge current protection.
- Fast response to the rapidly surge.
- Big material constance(B value),Small remain resistance
- High reliability.
- Integral series, Extensive operating range.
- Operating temp. $-55^{\circ}\text{C} \sim +200^{\circ}\text{C}$

APPLICATION

- Switching power supply
- UPS power supply
- Electric heaters
- Electric heaters electronic energy-saving lamps
- Filament protection of color tubes
- Incandescent lamps and other lights
- Electronic ballasts

Part Number Identification

NTC	□	D □	①	②		③		
①	②	③	Product Code		R _{25°C}		Max. Dia.	
			NTC	Power NTC Thermistor	5	5Ω	D5	5mm
					33	33Ω	D11	11mm
					120	120Ω	D13	13mm

Electronic Parameter Specification

Part No.	R _{25°C} (Ω)	Max. Steady State Current (A)	Approx.R @ Max.Cur (Ω)	Dissipation Factor (δ)(mW/°C)	Thermal Time Constant (S)
NTC-5D5	5	1	0.353	6	20
NTC-10D5	10	0.7	0.771	6	20
NTC-60D5	60	0.5	1.878	6	18
NTC-200D5	200	0.1	6.259	6	18
NTC-5D7	5	2	0.283	10	30
NTC-8D7	8	1	0.539	9	28
NTC-10D7	10	1	0.616	9	27
NTC-12D7	12	1	0.816	9	27
NTC-16D7	16	0.7	1.003	9	27
NTC-22D7	22	0.6	1.108	9	27
NTC-33D7	33	0.5	1.485	10	28
NTC-200D7	200	0.2	6.233	11	28
NTC-3D9	3	4	0.120	11	35
NTC-4D9	4	3	0.190	11	35
NTC-5D9	5	3	0.210	11	34
NTC-6D9	6	2	0.315	11	34
NTC-8D9	8	2	0.400	11	32
NTC-10D9	10	2	0.458	11	32
NTC-12D9	12	1	0.652	11	32
NTC-16D9	16	1	0.802	11	31
NTC-20D9	20	1	0.864	11	30
NTC-22D9	22	1	0.950	11	30
NTC-30D9	30	1	1.022	11	30
NTC-33D9	33	1	1.124	11	30
NTC-50D9	50	1	1.252	11	30
NTC-60D9	60	0.8	1.502	11	30
NTC-80D9	80	0.8	2.010	11	30
NTC-120D9	120	0.8	3.015	11	30
NTC-200D9	200	0.5	5.007	11	32
NTC-400D9	400	0.2	9.852	11	32
NTC-2.5D11	2.5	5	0.095	13	43
NTC-3D11	3	5	0.100	13	43

NTC-4D11	4	4	0.150	13	44
NTC-5D11	5	4	0.156	13	45
NTC-6D11	6	3	0.240	13	45
NTC-8D11	8	3	0.255	14	47
NTC-10D11	10	3	0.275	14	47
NTC-12D11	12	2	0.462	14	48
NTC-16D11	16	2	0.470	14	50
NTC-20D11	20	2	0.512	15	52
NTC-22D11	22	2	0.563	15	52
NTC-30D11	30	1.5	0.667	15	52
NTC-33D11	33	1.5	0.734	15	52
NTC-50D11	50	1.5	1.021	15	52
NTC-60D11	60	1.5	1.215	15	52
NTC-80D11	80	1.2	1.656	15	52
NTC-1.3D13	1.3	7	0.062	13	60
NTC-1.5D13	1.5	7	0.073	13	60
NTC-2.5D13	2.5	6	0.088	13	60
NTC-3D13	3	6	0.092	14	60
NTC-4D13	4	5	0.120	15	67
NTC-5D13	5	5	0.125	15	68
NTC-6D13	6	4	0.170	15	65
NTC-7D13	7	4	0.188	15	65
NTC-8D13	8	4	0.194	15	60
NTC-10D13	10	4	0.206	15	65
NTC-12D13	12	3	0.316	16	65
NTC-15D13	15	3	0.335	16	60
NTC-16D13	16	3	0.338	16	60
NTC-20D13	20	3	0.372	16	65
NTC-30D13	30	2.5	0.517	16	65
NTC-47D13	47	2	0.810	17	65
NTC-120D13	120	1.5	2.124	16	65
NTC-1.3D15	1.3	8	0.048	18	68
NTC-1.5D15	1.5	8	0.052	19	69
NTC-3D15	3	7	0.075	18	76
NTC-5D15	5	6	0.112	20	76
NTC-6D15	6	5	0.155	20	80
NTC-7D15	7	5	0.173	20	80
NTC-8D15	9	5	0.178	20	80
NTC-10D15	10	5	0.180	20	75
NTC-12D15	12	4	0.250	20	75
NTC-15D15	15	4	0.268	21	85
NTC-16D15	16	4	0.276	21	70
NTC-20D15	20	4	0.288	17	86
NTC-30D15	30	3.5	0.438	18	75
NTC-47D15	47	3	0.680	21	86
NTC-120D15	120	2.5	1.652	22	87
NTC-0.7D20	0.7	12	0.018	25	112
NTC-1.3D20	1.3	9	0.037	24	113
NTC-3D20	3	8	0.055	24	113
NTC-5D20	5	7	0.087	23	112
NTC-6D20	6	6	0.113	25	114

NTC-8D20	8	6	0.142	25	115
NTC-10D20	10	6	0.162	24	113
NTC-12D20	12	5	0.195	24	114
NTC-16D20	16	5	0.212	25	113
NTC-0.7D25	0.7	13	0.014	30	151
NTC-1.5D25	1.5	10	0.027	30	152
NTC-3D25	3	9	0.044	32	150
NTC-5D25	5	8	0.070	32	151
NTC-8D25	8	7	0.114	33	151
NTC-10D25	10	7	0.130	32	150
NTC-12D25	12	6	0.156	32	150
NTC-16D25	16	6	0.160	35	152

Dimension

Part No.	D $\begin{matrix} +1 \\ -2 \end{matrix}$	Tmax	d ± 0.05	F 1 ± 1	F 2 ± 1.5	Streight Lead	Curve Lead	
						Lmin	b L 1 min	L 2 ± 2
NTC-□D5	6.5	5	0.6/0.45	5/2.5	3	25	17/5	8
NTC-□D7	8.5	5	0.6	5	3			
NTC-□D9	10.5	5.5	0.8/0.6	7.5/5	5/3			
NTC-□D11	12.5	5.5	0.8	7.5/5	5/3			
NTC-□D13	14.5	6	0.8	7.5	5			
NTC-□D15	16.5	6	0.8	10/7.5	5			
NTC-□D20	21.5	7	1.0	10/7.5	/		/	/
NTC-□D25	26.5	8	1.0	10	/	/	/	

◆ “□”: zero-power resistance.

◆ 17/5: “17” for curve shaped long lead, “5” for curve shaped short lead.

TS Series--NTC Temperature Sensor



FEATURES

- Fast response, High delicacy
- Good coherence and Interchange capability, high precision of resistance and B value
- Double packaging technics, Good quality of insulation and package, High capability of colliding and bending, High stability

APPLICATION

- Air conditioners, Refrigerators, Freezers
- Water heaters, Potable water heaters, Air warmers, Washers, Disinfection cases
- Washing machines, Driers, Thermotanks

Part Number Identification

TS	103	F	3435	A	-	M	L 100
①	②	③	④	⑤		⑥	Length(mm)
①	②	③	④	⑤		⑥	

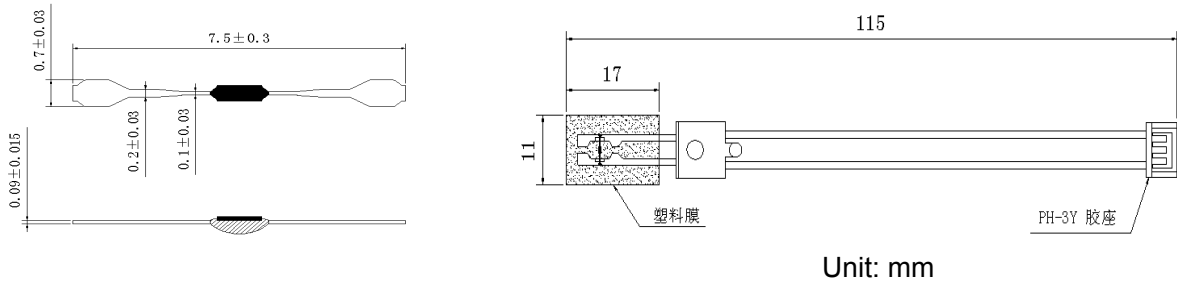
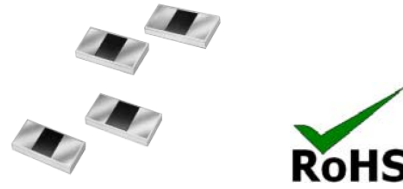
Series	Resistance @25°C		Tolerance		B Constance	Test Temp. of B		Head Material	
	202	20×10 ² Ω	A	±0.02°C		A	25°C/50°C	M	Metal tube
TS NTC Temperature Sensor	103	10×10 ³ Ω	B	±0.05°C	3435: B=3435	B	25°C/85°C	N	Metal fixed
			F	±1%		C	0°C/25°C	P	Plastic tube
	473	47×10 ³ Ω	G	±2%	4100: B=4100	D	0°C/50°C	E	Epoxy
			H	±3%		E	0°C/100°C		
						F	25°C/100°C	S	Special

Common Products Electronic Parameter Specification

Part No.	R _{25°C} (KΩ)	B(K) 25/50°C	Rated Power @25°C (mW)	Dissipation Factor(δ) (mW/°C)	Thermal Time Constant (S)
TS502□3274A	5.0	3274 ±1%	10-20	2-4	5-20
TS502□3435B	5.0	3435 ±1%			
TS502□3470A	5.0	3470 ±1%			
TS502□3950A	5.0	3950 ±1%			
TS103□3274A	10.0	3274 ±1%			
TS103□3435B	10.0	3435 ±1%			
TS103□3470A	10.0	3470 ±1%			
TS103□3950A	10.0	3950 ±1%			
TS103□4100A	10.0	4100 ±1%			
TS153□3950A	15.0	3950 ±1%			
TS153□4100A	15.0	4100 ±1%			
TS203□3950A	20.0	3950 ±1%			
TS203□4100A	20.0	4100 ±1%			
TS223□4200A	22.0	4200 ±1%			
TS403□3928A	40.27	3928 ±1%			
TS503□3950A	50.0	3950 ±1%			
TS503□4100A	50.0	4100 ±1%			
TS104□3950A	100	3950 ±1%			
TS104□4100A	100	4100 ±1%			
TS104□4400A	100	4400 ±1%			

◆Special part number could be custom designed.

OT Series--OA (Office Automation) NTC Thermistor & Temperature Sensor



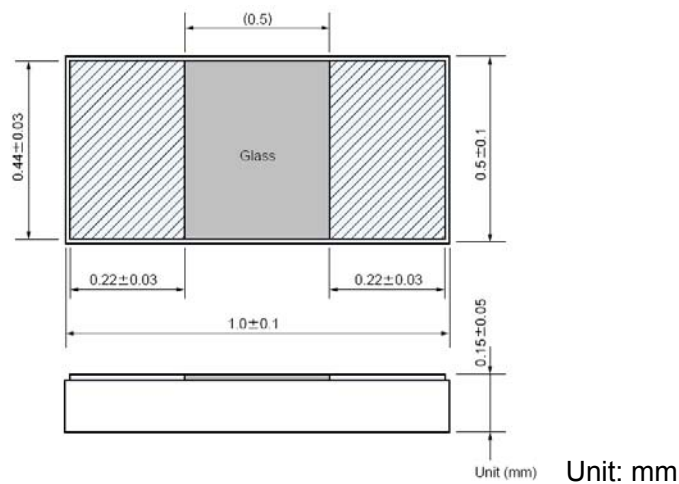
FEATURES

- Fast response: thermal time constant: 2S max in still air
- High stability
- Excellent thermal cycle endurance
- Operating ranges: -50°C ~ +250°C

APPLICATION

- OA Machine: Printer, Copier, Fax machine
- Fast response application

DIMENSION



Part Number Identification

OT	103	F	3435	A	AU
①	②	③	④	⑤	⑥

①		②		③		④		⑤		⑥	
Product Series Code		Resistance @25°C		Tolerance		B Constance		Test Temp. of B		Termination	
OT	OA	103	$10 \times 10^3 \Omega$	F	±1%	3435: B=3435		A	25°C/50°C	Au	
	Thermistor & Temperature Sensor	364	$36 \times 10^4 \Omega$	G	±2%	3370: B=3370		B	25°C/85°C	Pt	
				H	±3%					Ag	
J	±5%										

Electronic Parameter Specification

Part No.	R _{25°C} (KΩ)	B(K)	Rated Power @25°C (mW)	Dissipation Factor(δ) (mW/°C)	Thermal Time Constant (S)
OT103□3435A	10	3435	1.5	0.3	≤2.0
OT103□3370A	10	3370			
OT503□3435A	50	3435			
OT503□3370A	50	3370			
OT364□3435A	360	3435			
OT364□3370A	360	3370			

◆The B-tolerance is ±1% when R-tolerance within ±3%, others are ±2%.

◆Special part number could be custom designed.

VT Series--NTC Thermistor for Vehicle Temperature Sensor & Thermo Switch Making



FEATURES

- Excellent thermal cycle endurance
- High stability
- Operating ranges: -40°C ~ +150°C

APPLICATION

- For various kinds of vehicle temperature sensor making, e.g.: Automotive, Moto-Bicycle, Train,

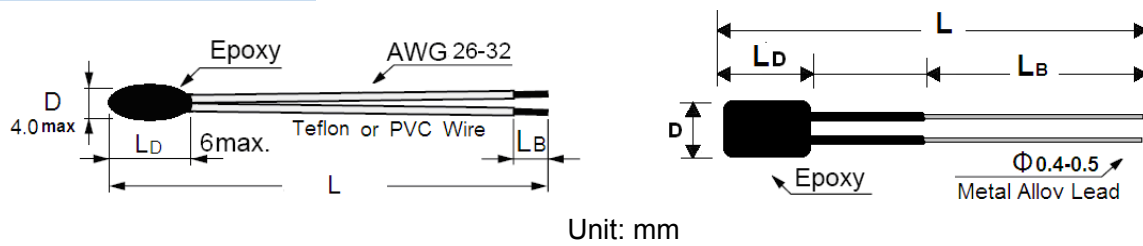
Part Number Identification

	2K051									
VT	353R5	G	B	80C	3435B	—	L25	T	5	D5
	3V305									
①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	

① Product Series Code		② Resistance @ ⑤ °C		③ Tolerance		④ Temperature Gradient		⑤ Test Temp.		⑥ B Constance	
		Voltage @ ⑤ °C									
VT	Vehicle Thermistor	2K051	2.051KΩ	F	±1%	O	-0%	25C	25°C	3435: B=3435	
		353R5	353.5Ω	G	±2%	A	-1%	80C	80°C	A	25°C/50°C
		3V305	3.305V	H	±3%	B	-2%	90C	90°C	B	25°C/85°C
				J	±5%	C	-3%	100C	100°C	F	25°C/100°C
									G	50°C/100°C	

⑦ Total Length		⑧ Lead Material		⑨ Bare Lead	⑩ Detector Dimension
L25: 25mm	T	Teflon		5: 5mm	D5: 5mm
	P	PVC			
	C	CP		10: 10mm	D8: 8mm
	E	Epoxy CP			

DIMENSION



Electronic Parameter Specification

Part No.	Nominal Value	B (K)	Rated Power @25°C (mW)	Dissipation Factor (δ) (mW/°C)	Thermal Time Constant (S)
VT249R1□□90C3588G	249.1Ω	3588	10-200 (depends on size)	2-50 (depends on size)	≤15 (depends on size)
VT108R8□□90C3565G	108.8Ω	3565			
VT120R0□□100C4230G	120.0Ω	4230			
VT310R0□□80C4010G	310.0Ω	4010			
VT340R0□□80C4010G	340.0Ω	4010			
VT244R8□□90C4110G	244.8Ω	4110			
VT4K000□□80C4010G	4000Ω	4010			
VT4K200□□80C4262G	4200Ω	4262			
VT374R0□□80C3495G	374.0Ω	3495			
VT930R0□□90C4010G	930.0Ω	4010			
VT334R0□□80C4305G	334.0Ω	4305			
VT778R0□□50C3245G	778.0Ω	3245			
VT362R0□□80C4180G	362.0Ω	4180			
VT320R0□□80C3218G	320.0Ω	3218			
VT316R0□□80C3765G	316.0Ω	3765			
VT1V250□□80C3650A	1.25V	3650			
VT2V300□□80C3740A	2.30V	3740			
VT2V500□□80C4050A	2.50V	4050			
VT3V300□□80C4050A	3.30V	4050			

◆ Special part number could be custom designed.

VTS Series--Vehicle Temperature Sensor & Thermo Switch



FEATURES

- Excellent thermal cycle endurance
- High stability
- Operating ranges: -40 °C ~ +150 °C

APPLICATION

- For various kinds of vehicle temperature sensing.

VTS 7 018 ****

①

②

③

④

①

②























③

④

Product Series Code		Series Code		Part No.	Customer Special Code
VTS	Vehicle	7	Automotive		Customer's Special Request
	Temperature	8	Vessel		
	Sensor & Thermo Switch	9	Plane		

Electronic Parameter Specification

Temperature Sensor

			
VTS7011	VTS7012	VTS7013	VTS7014
			
VTS7015	VTS7016	VTS7017	VTS7018
			
VTS7019	VTS7020	VTS7021	VTS7022
			
VTS7023	VTS7024	VTS7025	VTS7026
			
VTS7027	VTS7028	VTS7029	VTS7030
			
VTS7031	VTS7032	VTS7033	VTS7034

Temperature Sensor



VTS7035



VTS7036



VTS7037



VTS7038



VTS7039



VTS7040



VTS7041



VTS7042



VTS7043



VTS7044



VTS7045



VTS7046



VTS7047



VTS7048



VTS7049



VTS7050



VTS7051



VTS7052



VTS7053



VTS7054



VTS7055



VTS7056



VTS7057



VTS7058

Temperature Sensor



VTS7059



VTS7060



VTS7061



VTS7062



VTS7063



VTS7064



VTS7065



VTS7066



VTS7067



VTS7068



VTS7069



VTS7070



VTS7071



VTS7072



VTS7073



VTS7074



VTS7075



VTS7076



VTS7077



VTS7078



VTS7079



VTS7080



VTS7081



VTS7082

Thermo Switch



VTS7611



VTS7612



VTS7613



VTS7614



VTS7615



VTS7616



VTS7617



VTS7618



VTS7619



VTS7620



VTS7621



VTS7622



VTS7623



VTS7624



VTS7625



VTS7626



VTS7627



VTS7628



VTS7629



VTS7630



VTS7631



VTS7632



VTS7633



VTS7634

Thermo Switch



VTS7635



VTS7636



VTS7637



VTS7638



VTS7639



VTS7640



VTS7641



VTS7642



VTS7643



VTS7644



VTS7645



VTS7646



VTS7647



VTS7648



VTS7649



VTS7650



VTS7651



VTS7652



VTS7653



VTS7654



VTS7655



VTS7656

- ◆ The B-tolerance is $\pm 1\%$ when R-tolerance within $\pm 3\%$, others are $\pm 2\%$.
- ◆ Special part number could be custom designed.

MT Series--NTC Thermistor for Medical Temperature Sensor

Making



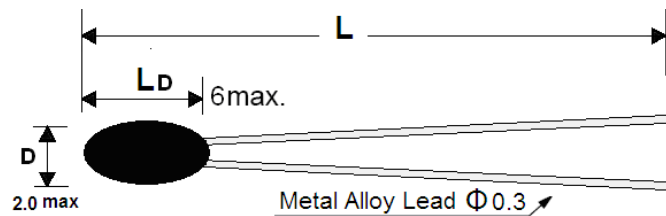
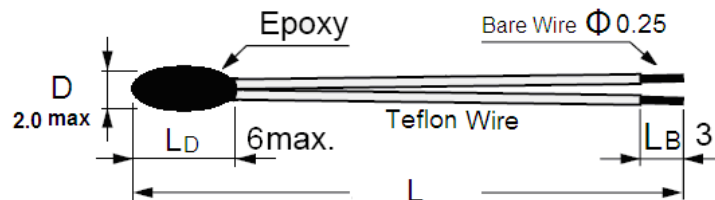
FEATURES

- Fast response: thermal time constant: 3.5S max in still air
- High stability
- Excellent thermal cycle endurance
- High accuracy: tolerance up to $\pm 0.02^{\circ}\text{C}$

APPLICATION

- For various kinds of medical temperature sensor making, e.g.: Skine/ Coelom / Body Temperature Sensor

DIMENSION



Unit: mm

Part Number Identification

MT 2K252 B 25C 3977A L40 T 0.3 D2.2

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②

③

④

⑤

⑥

⑦

⑧

⑨

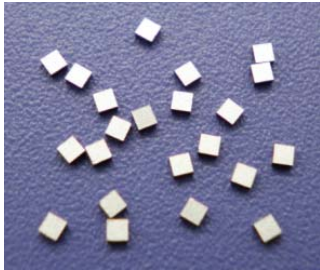
①	②	③		④	⑤		⑥	⑦	⑧	⑨
Product Series Code	Resistance @④°C	20-45°C Temp. Tolerance		Test Temp.	B Constance		Lead Length	Lead Wire	Wire Φ	Detector
MT Medical Thermistor	2K252:	A	$\pm 0.02^{\circ}\text{C}$	25C:25°C	3977: B=3977		L25: L=25mm	T: Teflon	0.3: $\Phi 0.3$ mm	D5: 5mm
	2.252K Ω	B	$\pm 0.05^{\circ}\text{C}$		A	25°C/50°C		B: Bare		
	10K00:	C	$\pm 0.1^{\circ}\text{C}$	B	25°C/85°C	Metal				
	10.0K Ω	D	$\pm 0.2^{\circ}\text{C}$	D	0°C/50°C					

Electronic Parameter Specification

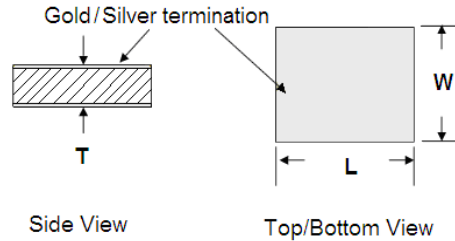
Part No.	$R_{25^{\circ}\text{C}}$ (K Ω)	$R_{37^{\circ}\text{C}}$ (K Ω)	B(K)	Rated Power @25°C (mW)	Dissipation Factor(δ) (mW/°C)	Thermal Time Constant (S)
MT1K000□25C3977B	1.0	0.6016	3977	≤20	2	≤3.5 (depends on size)
MT2K252□25C3935A	2.252	1.355	3935			
MT6K000□25C3935A	6.0	3.610	3935			
MT10K00□25C3977B	10.0	6.016	3977			
MT10K00□25C3935A	10.0	6.016	3935			
MT10K00□25C3695B	10.0	6.258	3695			
MT20K00□25C4262B	20.0	11.628	4262			
MT30K00□25C3935A	30.0	18.048	3935			

◆ Special part number could be custom designed.

DT Series--Die (Bare Chip) NTC Thermistor



DIMENSION :



FEATURES

DT series NTC thermistor is the newest development in chip NTC thermistors. The miniature package is designed for hybrid applications where bonding wire or Au/Sn solder is used as the attachment method. The terminations on the top and bottom of the thermistor are gold (Au) plated for the ultimate in hybrid designs and construction.

- High accuracy tolerances to $\pm 0.1^\circ\text{C}$
- Excellent thermal cycle endurance
- High stability
- Operating ranges from $-50^\circ\text{C} \sim +200^\circ\text{C}$

APPLICATION

- Hybrid designs and construction
- High Precision NTC Temperature sensor

Part Number Identification

DT	1 0 3	F	3 4 3 5	A
①	②	③	④	⑤

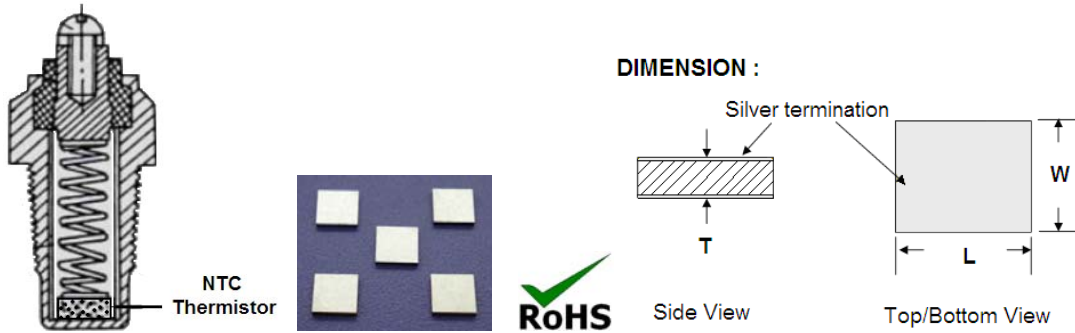
①		②		③		④		⑤	
Product Series Code		Resistance @25°C		R Tolerance		B Constance		Test Temp. of B	
DT	Die (Bare Chip) NTC Thermistor	202	$20 \times 10^2 \Omega$	F	$\pm 1\%$	3435: B=3435	A	$25^\circ\text{C}/50^\circ\text{C}$	
				G	$\pm 2\%$		B	$25^\circ\text{C}/85^\circ\text{C}$	
		103	$10 \times 10^3 \Omega$	H	$\pm 3\%$	4100: B=4100	C	$0^\circ\text{C}/25^\circ\text{C}$	
473	$47 \times 10^3 \Omega$	J	$\pm 5\%$	D	$0^\circ\text{C}/50^\circ\text{C}$				
					E		$0^\circ\text{C}/100^\circ\text{C}$		
						G	$50^\circ\text{C}/100^\circ\text{C}$		

Electronic Parameter Specification

Part No.	R _{25°C} (KΩ)	B(K)	Rated Power @25°C (mW)	Dissipation Factor(δ) (mW/°C)	Thermal Time Constant (S)
DT102□3150A	1.0	3150	15	2.5	≤15
DT202□3150A	2.0	3150			
DT502□3274A	5.0	3274			
DT502□3435B	5.0	3435			
DT502□3470A	5.0	3470			
DT502□3950A	5.0	3950			
DT103□3274A	10.0	3274			
DT103□3435B	10.0	3435			
DT103□3470A	10.0	3470			
DT103□3950A	10.0	3950			
DT103□4100A	10.0	4100			
DT153□3950A	15.0	3950			
DT153□4100A	15.0	4100			
DT203□3950A	20.0	3950			
DT203□4100A	20.0	4100			
DT223□4200A	22.0	4200			
DT333□3950A	33.0	3950			
DT403□3928A	40.27	3928			
DT473□3950A	47.0	3950			
DT473□4100A	47.0	4100			
DT503□3950A	50.0	3950			
DT503□4100A	50.0	4100			
DT104□3950A	100	3950			
DT104□4100A	100	4100			
DT104□4400A	100	4400			

- ◆ The B-tolerance is ±1% when R--tolerance within ±3%, others are ±2%.
- ◆ Special part number could be custom designed.

DTV Series--Die (Bare Chip) NTC Thermistor for Vehicle Temperature Sensor & Thermo Switch Making



FEATURES

- High accuracy tolerances to +/-1%
- Excellent thermal cycle endurance, High stability
- Operating ranges from -50°C ~ +200°C

APPLICATION

- Vehicle water temperature sensor making

Part Number Identification

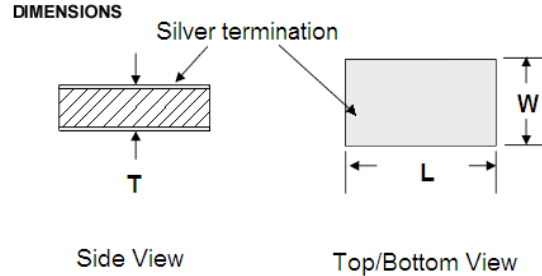
		2K051								
DTV		353R5		J	A	80C	3435B			
		3V305								
①		②		③	④	⑤		⑥		
①		②		③	④	⑤		⑥		
Product Series Code		Resistance @ ⑤ °C		Tolerance	Temperature Gradient		Test Temp.	B Constance		
		Voltage @ ⑤ °C								
DTV	Die Vehicle Thermistor	2K051	2.051KΩ	F	±1%	O	-0%	25C: 25°C	B=3435	
		353R5	353.5Ω	G	±2%	A	-1%		A	25°C/50°C
		3V305	3.305V	H	±3%	B	-2%	80C: 80°C	B	25°C/85°C
				J	±5%	C	-3%		F	25°C/100°C
							G	50°C/100°C		

Electronic Parameter Specification

Part No.	Nominal Value	B(K)	Rated Power @25°C (mW)	Dissipation Factor(δ) (mW/°C)	Thermal Time Constant (S)
DTV249R1□□90C3588G	249.1Ω	3588	10-200 (depends on size)	2-50 (depends on size)	≤15 (depends on size)
DTV108R8□□90C3565G	108.8Ω	3565			
DTV120R0□□100C4230G	120.0Ω	4230			
DTV310R0□□80C4010G	310.0Ω	4010			
DTV340R0□□80C4010G	340.0Ω	4010			
DTV244R8□□90C4110G	244.8Ω	4110			
DTV4K000□□80C4010G	4000Ω	4010			
DTV4K200□□80C4262G	4200Ω	4262			
DTV374R0□□80C3495G	374.0Ω	3495			
DTV930R0□□90C4010G	930.0Ω	4010			
DTV334R0□□80C4305G	334.0Ω	4305			
DTV778R0□□50C3245G	778.0Ω	3245			
DTV362R0□□80C4180G	362.0Ω	4180			
DTV320R0□□80C3218G	320.0Ω	3218			
DTV316R0□□80C3765G	316.0Ω	3765			
DTV1V250□□80C3650A	1.25V	3650			
DTV2V300□□80C3740A	2.30V	3740			
DTV2V500□□80C4050A	2.50V	4050			
DTV3V300□□80C4050A	3.30V	4050			

◆ Special part number could be custom designed.

DTM Series--Die (Bare Chip) NTC Thermistor for Medical Temperature Sensor Making



FEATURES

- High accuracy tolerances to +/-0.05°C
- High stability
- Operating ranges: -20 °C ~ +100 °C

APPLICATION

- High precision medical temperature sensor

Part Number Identification

DTM	2K252	J	A	25C	3935A	
	30K00					
①	②	③	④	⑤	⑥	
①		②		③	④	⑤
						⑥

Product Series Code		Resistance @④°C		Tolerance		Adjust Gradient		Test Temp.	B Constance	
DTM	Die Medical Thermistor	2K252	2.252KΩ	F	±1%	D	-4%	25C: 25°C	B=3935	
				G	±2%	E	-5%			
		30K00	30.00KΩ	H	±3%	F	-6%	80C: 80°C	A	25°C/50°C
				J	±5%	G	-7%		B	25°C/85°C
							F	25°C/100°C		

Electronic Parameter Specification

Part No.	R _{25°C} (K Ω)	R _{37°C} (K Ω)	B(K)	Rated Power @25°C (mW)	Dissipation Factor(δ) (mW/°C)	Thermal Time Constant (S)
DTM1K000□25C3977B	1.0	0.6016	3977	≤15	2	≤3.5
DTM2K252□25C3935A	2.252	1.355	3935			
DTM6K000□25C3935A	6.0	3.610	3935			
DTM10K00□25C3977B	10.0	6.016	3977			
DTM10K00□25C3935A	10.0	6.016	3935			
DTM10K00□25C3695B	10.0	6.258	3695			
DTM20K00□25C4262B	20.0	11.628	4262			
DTM30K00□25C3935A	30.0	18.048	3935			

◆ Special part number could be custom designed.