VAREN

RoHS Compliant Pb-Free

KNC

Temperature Compensation/Sensing KNC Series (SMD Type)

Features

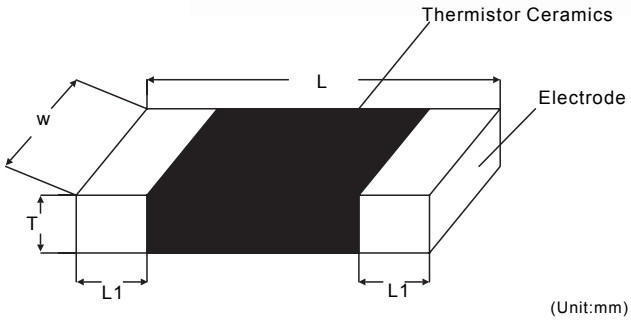
1. EIA size 0402, 0603, 0805, 1206
2. Highly reliable monolithic structure
3. -40 ~ +125 ℃ operating temperature range
4. Wide resistance range
5. Cost effective

Recommended applications

1. Battery pack
2. Mother board/notebook PC
3. Liquid crystal display
4. Cellular phones
5. Bluetooth headset

Approvals

Dimensions



(Unit:mm)

Part no.	Size	L	W	Tmax.	L1
KNC04	0402	1.00±0.15	0.50±0.10	0.6	0.20±0.10
KNC06	0603	1.60±0.15	0.80±0.15	0.95	0.25±0.15
KNC08	0805	2.00±0.20	1.25±0.20	1.2	0.40±0.20
KNC12	1206	3.20±0.30	1.60±0.20	1.5	0.50±0.20

Part number code

K	N	C	0	4	A	1	0	3	J	3	8	J	H	T

Product Code	
KNC	NTC Thermistor KNC Type

Size(EIA)	
04	0402Type
06	0603Type
08	0805Type
12	1206Type

Define of Beta Value	
A	$B_{25/85}$
B	$B_{25/50}$

Zero Power Resistance at 25℃ (R_{25})	
102	1KΩ
103	10KΩ
473	47KΩ

Tolerance of R_{25}	
F	±1%
G	±2%
H	±3%
J	±5%
K	±10%

Beta Value First Two Digits	
30	30
31	31
32	32
⋮	⋮
40	40
41	41
⋮	⋮

Tolerance of Beta Value	
F	±1%
G	±2%
H	±3%
J	±5%

Packaging	
T	Reel
Nil	Bulk

Beta Value Code For Last Two Digits

Code	Beta Value Last Two Digits	Code	Beta Value Last Two Digits	Code	Beta Value Last Two Digits	Code	Beta Value Last Two Digits	Code	Beta Value Last Two Digits
0	98	2	18	4	38	6	58	8	78
	99		19		39		59		79
	00		20		40		60		80
	01		21		41		61		81
	02		22		42		62		82
A	03	C	23	E	43	G	63	J	83
	04		24		44		64		84
	05		25		45		65		85
	06		26		46		66		86
	07		27		47		67		87
1	08	3	28	5	48	7	68	9	88
	09		29		49		69		89
	10		30		50		70		90
	11		31		51		71		91
	12		32		52		72		92
B	13	D	33	F	53	H	73	K	93
	14		34		54		74		94
	15		35		55		75		95
	16		36		56		76		96
	17		37		57		77		97

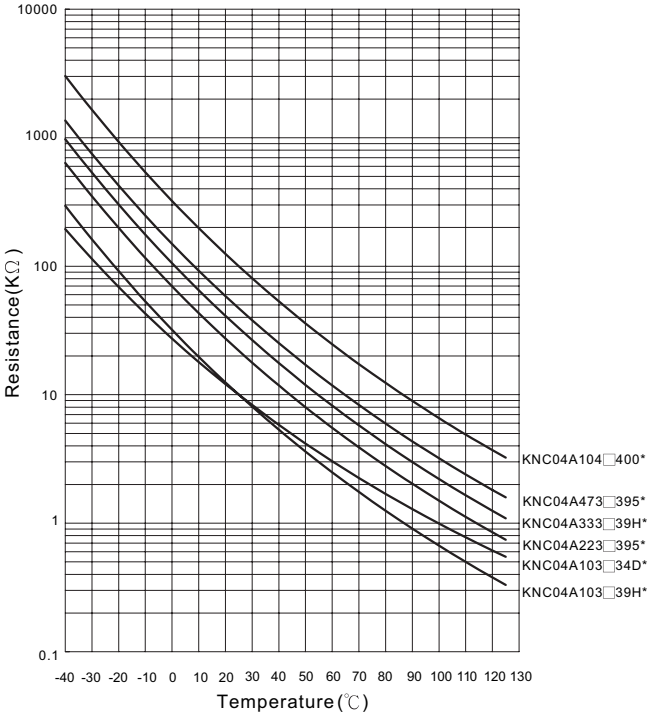
● Characteristics

Part no.	Zero power resistance at 25℃ (KΩ)	Tolerance of resistance (±%)	B value (K)		Tolerance of B value (±%)	Max. power rating at 25℃ (mW)	Thermal dissipation constant (mW/℃)	Thermal time constant (Sec.)	Operating temperature range (℃)
KNC04A103□34D*	10	1、2、3、5、10	25/85	3435	1、2、3	170	1.7	2	-40 ~ +125
KNC04A103□39H*	10			3975					
KNC04A223□395*	22			3950					
KNC04A333□39H*	33			3975					
KNC04A473□395*	47			3950					
KNC04A503□395*	50			3950					
KNC04A104□400*	100			4000					
KNC06A472□34D*	4.7	1、2、3、5、10	25/85	3435	1、2、3	210	2.1	3.1	-40 ~ +125
KNC06A502□34D*	5			3435					
KNC06A103□34D*	10			3435					
KNC06A103□39H*	10			3975					
KNC06A223□392*	22			3920					
KNC06A333□385*	33			3850					
KNC06A473□395*	47			3950					
KNC06A503□395*	50			3950					
KNC06A683□400*	68			4000					
KNC06A104□402*	100			4020					
KNC06A204□39H*	200			3975					
KNC06A224□39H*	220			3975					
KNC08A472□34D*	4.7	1、2、3、5、10	25/85	3435	1、2、3	240	2.4	5.4	-40 ~ +125
KNC08A502□34D*	5			3435					
KNC08A103□34D*	10			3435					
KNC08A103□39H*	10			3975					
KNC08A223□380*	22			3800					
KNC08A473□400*	47			4000					
KNC08A503□400*	50			4000					
KNC08A683□402*	68			4020					
KNC08A104□39H*	100			3975					
KNC08A204□39H*	200			3975					
KNC08A224□39H*	220			3975					
KNC12A472□34D*	4.7	1、2、3、5、10	25/85	3435	1、2、3	320	3.2	6.7	-40 ~ +125
KNC12A502□34D*	5			3435					
KNC12A103□34D*	10			3435					
KNC12A103□39H*	10			3975					
KNC12A223□380*	22			3800					
KNC12A473□400*	47			4000					
KNC12A503□400*	50			4000					
KNC12A683□402*	68			4020					
KNC12A104□39H*	100			3975					
KNC12A204□39H*	200			3975					
KNC12A224□39H*	220			3975					

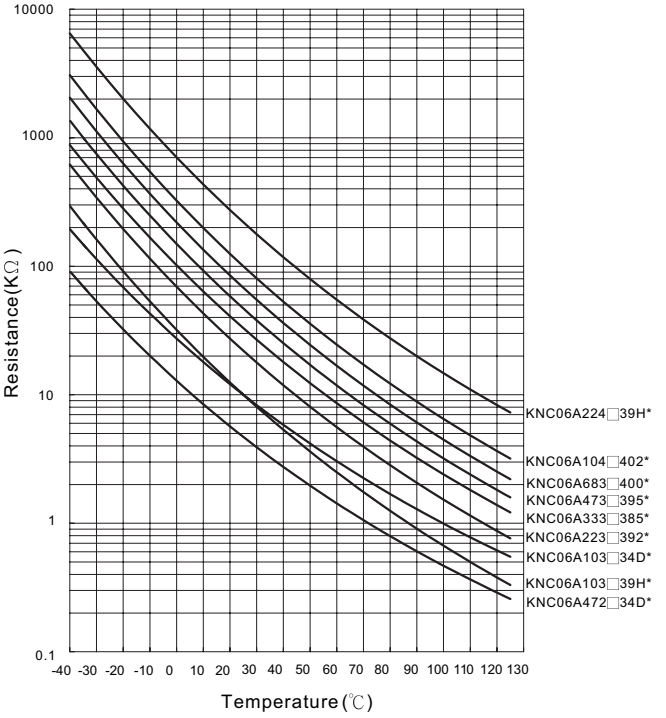
Note 1: □ = Tolerance of resistance
Note 2: * = Tolerance of B value

R-T characteristic curve (representative)

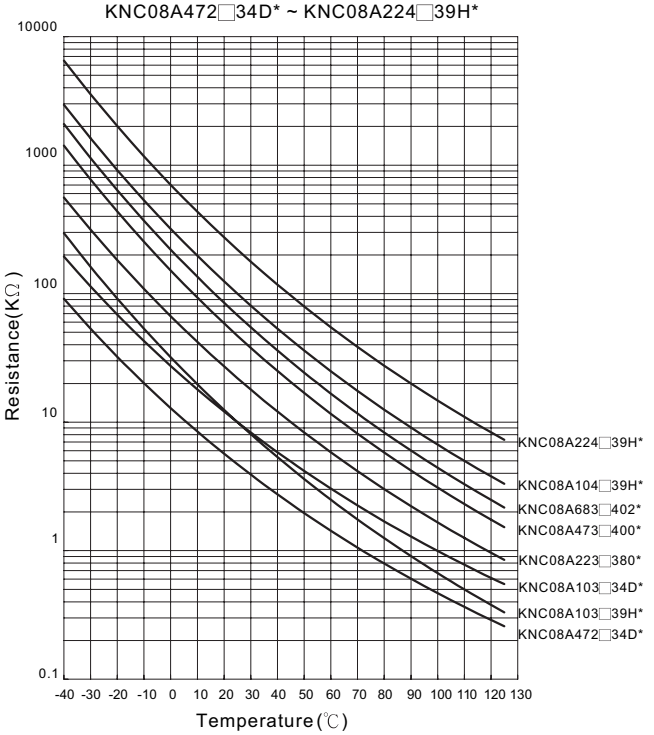
KNC04A103□39H* ~ KNC04A104□400*



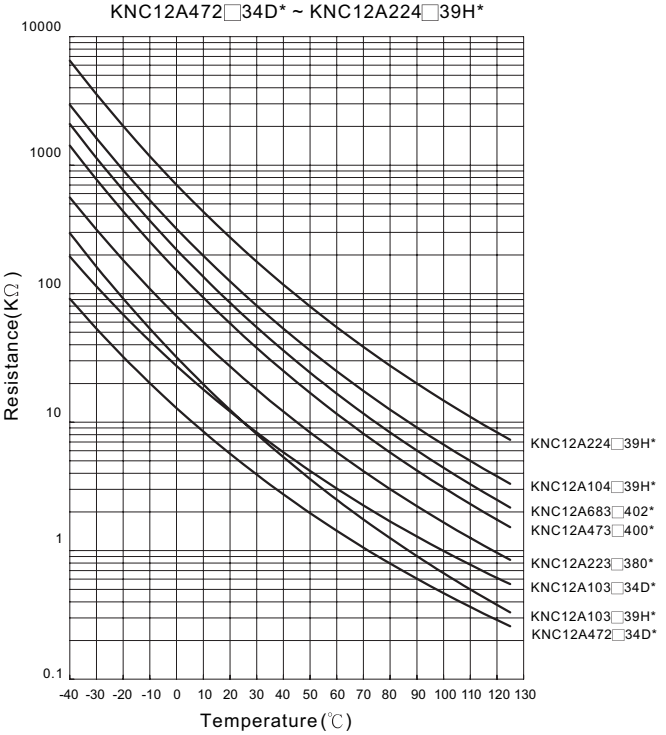
KNC06A472□34D* ~ KNC06A224□39H*



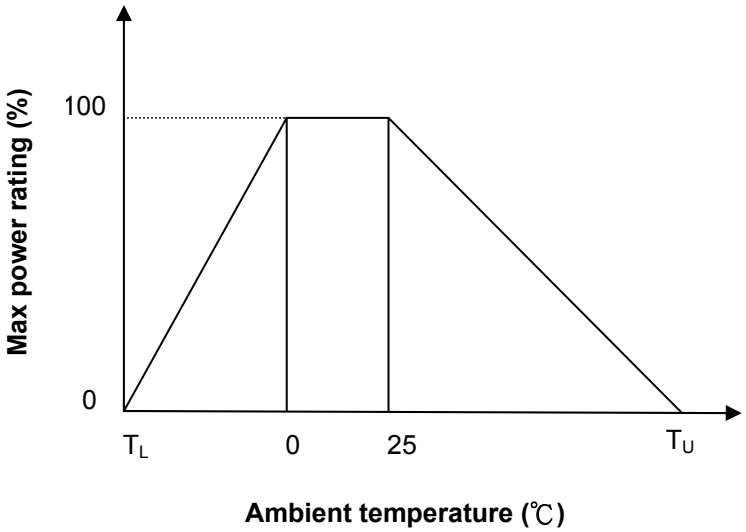
KNC08A472□34D* ~ KNC08A224□39H*



KNC12A472□34D* ~ KNC12A224□39H*



■ Maximum power rating (Pmax)



T_U：Maximum operating temperature

T_L：Minimum operating temperature

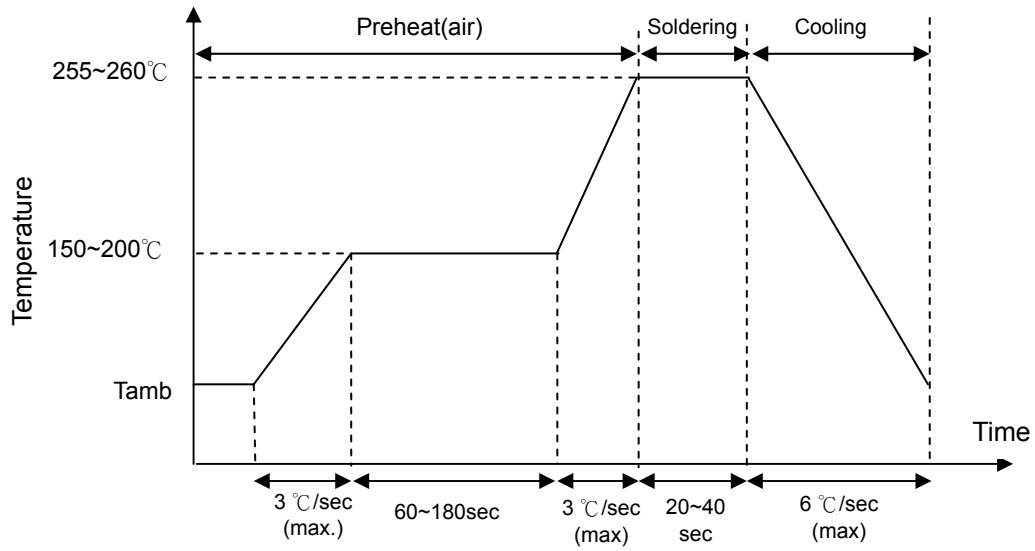
For example：Ambient temperature(Ta)=55℃

Maximum operating temperature(Tu)＝125℃

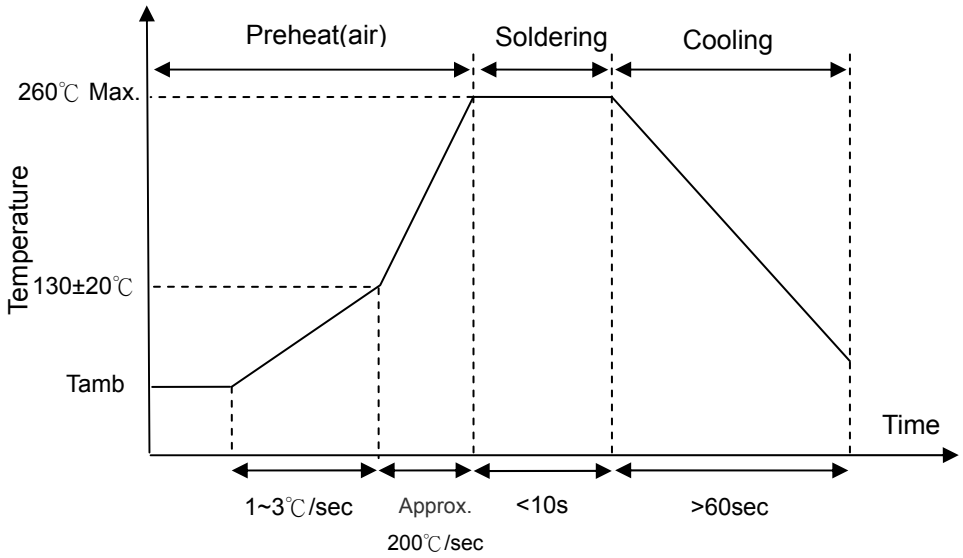
P_{Ta}=(Tu-Ta)/(Tu-25)xPmax＝70% Pmax

■ Soldering Recommendation

● IR-Reflow Soldering Profile



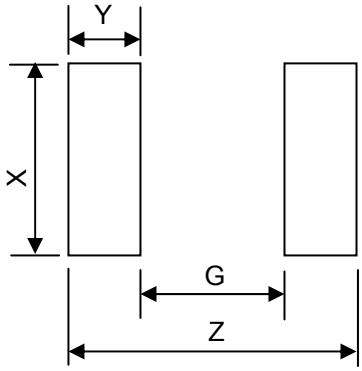
- **Wave Flow Soldering Profile**



- **Reworking Conditions With Soldering Iron**

Item	Conditions
Temperature of Soldering Iron-tip	360℃ (max.)
Diameter of Soldering Iron-tip	Φ3mm (max.)
Soldering Time	3 sec (max.)

■ **Recommended Pad dimensions**



Size	Z (mm)	G (mm)	X (mm)	Y (mm)
0402	2.1~2.2	0.4~0.5	0.6~0.7	0.9~1.0
0603	2.7~2.8	0.6~0.7	0.9~1.0	1.0~1.1
0805	3.1~3.2	0.6~0.7	1.4~1.5	1.2~1.3
1206	4.3~4.4	1.2~1.3	1.7~1.8	1.5~1.6

Followed Standard:IPC-SM-782A

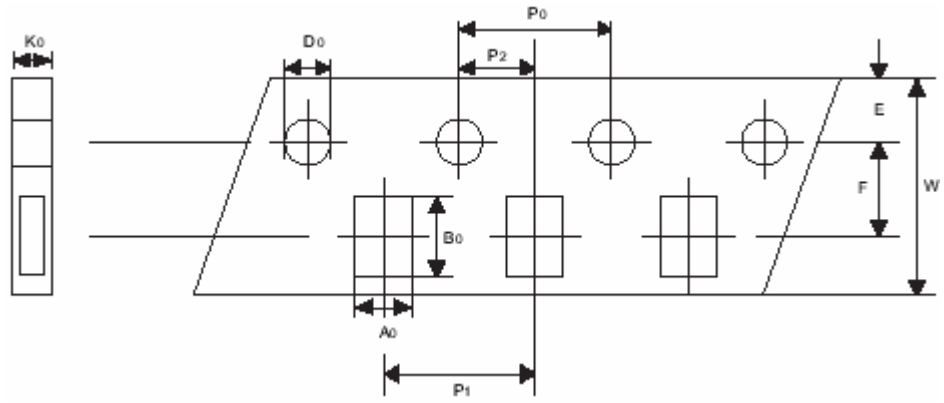
■ Reliability test

Item	Standard	Test Conditions / Methods	Specifications
Solderability	IEC68-2-20	235 ± 5℃ , 2 ± 0.5 sec	At least 95% of terminal electrode is covered by new solder
Resistance to Soldering Heat	IEC68-2-20	260 ± 5℃ , 10 ± 1 sec	No visible damage $\lvert \triangle R_{25}/R_{25} \rvert \leqq 3\ \%$
High Temperature Storage	IEC68-2-2 UL1434	Tmax ± 5℃ , 1000 ± 24 HRS	No visible damage $\lvert \triangle R_{25}/R_{25} \rvert \leqq 5\ \%$
Damp Heat	IEC68-2-3 UL1434	40 ± 2℃ , 90~95% RH , 1000 ± 24HRS	No visible damage $\lvert \triangle R_{25}/R_{25} \rvert \leqq 3\ \%$
Thermal Shock	IEC68-2-14 UL1434	The thermal shock conditions shown below shall be repeated 5 cycles Step 1: -40 ± 5, 30 ± 3 Step 2: Room temperature, 5 ± 3 Step 3: 125 ± 5, 30 ± 3 Step 4: Room temperature, 5 ± 3	No visible damage $\lvert \triangle R_{25}/R_{25} \rvert \leqq 3\ \%$
Life Test	CNS5550	25 ± 5℃, Pmax. , 1000 ± 24 HRS	No visible damage $\lvert \triangle R_{25}/R_{25} \rvert \leqq 5\ \%$

■ Package

● Taping Specification

◆ 0402 & 0603 & 0805 Type



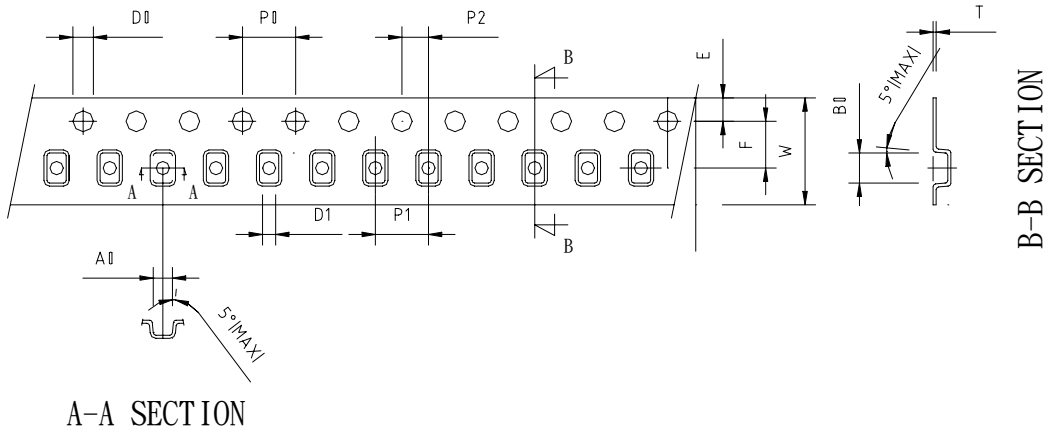
(Unit: mm)

Type \ Index	A_0 ±0.05	B_0 ±0.12	W ±0.2	E ±0.1	F ±0.05	P_1 ±0.1	P_2 ±0.05	P_0 ±0.1	D_0 ±0.1	K_0 ±0.1
0402	0.62	1.12	8	1.75	3.5	2	2	4	1.55	0.60

(Unit: mm)

Type \ Index	A_0 ±0.2	B_0 ±0.2	W ±0.2	E ±0.1	F ±0.05	P_1 ±0.1	P_2 ±0.05	P_0 ±0.1	D_0 ±0.1	K_0 ±0.1
0603	1.1	1.9	8	1.75	3.5	4	2	4	1.55	0.95
0805	1.5	2.3	8	1.75	3.5	4	2	4	1.55	0.95

◆ **1206 Type**

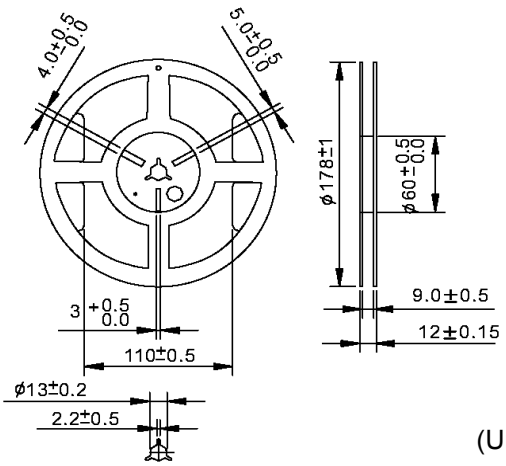


A-A SECTION

(Unit: mm)

Index / Type	A_0 ±0.2	B_0 ±0.2	W ±0.2	E ±0.1	F ±0.05	P_1 ±0.1	P_2 ±0.05	P_0 ±0.1	D_0 ±0.1	D_1 ±0.1	T ±0.1
1206	1.85	3.45	8	1.75	3.5	4	2	4	1.55	1	0.25

■ Quantity



(Unit:

Type	Quantity (pcs/reel)
0402	10000
0603	4000
0805	3500
1206	2500

■ Storage condition of products

- Storage Conditions :

  1.Storage Temperature : -10℃~+40℃

  2.Relative humidity : ≦75%RH

  3.Thermistors must be kept away from sunlight and stored in a non-corrosive atmosphere.

- Period of Storage : 1 year