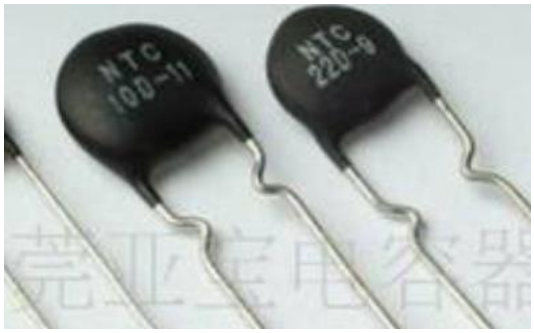
NTC Thermistor：XNP Series

POWER NTC Thermistor for Inrush current limted

XNP Features

1. RoHS & HF compliant
2. Body size: Φ5mm ~ Φ 30mm
3. Radial lead resin coated
4. High power rating
5. Wide resistance range
6. Cost effective
7. Operating temperature range：
   Φ5mm：-40~+150℃
   Φ8~Φ10mm：-40~+170℃
   Φ13mm~Φ30mm：-40~+200℃



■ Recommended Applications

1. Switch mode power supply
2. Electric motor
3. Transformer
4. Adapter
5. Projector
6. Halogen lamp

■ Part Number Code

Φ5mm ~ Φ 15mm

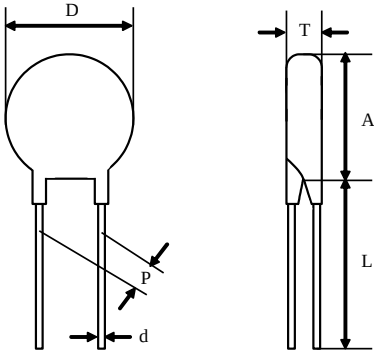
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
X	N	P	1	0	1	0	0	M	P	5	S	A	4	5	0
XINGXIANG POWER THERMISTOR			Size 03:3mm 05:5mm 10:10mm… 40:40mm		Zero Power Resistance at 25℃ (R25) 007:0.7Ω 010:1Ω 090:9Ω 100:10Ω… 101:100Ω			Tolerance of R25 L: 15% M:20%	Maximum steady-state current P5:0.5A 05:5A 10:10A 20:20A		Lead structure S:Straight Lead Y: F kink I: Inner kink O:outside kink	A: braid 12.7 reel B: braid 12.7 box C:short feet	The length of the lead 45:4.5mm A0:10mm		optional suffix

Φ20mm ~ Φ 30mm

1	2	3	4	5	6	7	8	9	10	11	12	13	14
X	N	P	1	0	1	0	0	M	S	A	4	5	0
XINGXIANG POWER THERMISTOR			Size 03:3mm 05:5mm 10:10mm… 40:40mm		Zero Power Resistance at 25℃ (R25) 007:0.7Ω 010:1Ω 090:9Ω 100:10Ω… 101:100Ω			Tolerance of R25 L: 15% M:20%	Lead structure S:Straight Lead Y: F kink I: Inner kink O:outside kink	A: braid 12.7 reel B: braid 12.7 box C:short feet	The length of the lead 45:4.5mm A0:10mm		optional suffix

■ Structure and Dimensions

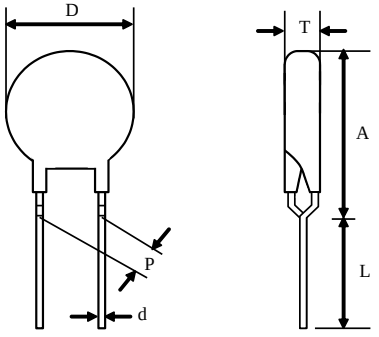
S Type (Straight lead)



(Unit: mm)

Body Size	Dmax.	P.	d	Amax.	Lmin.	Tmax.
ϕ05	6.5	4±0.6	0.8±0.02	6.5	31	5
ϕ08	9.5	5±0.8	0.8±0.02	9.5	31	5
ϕ10	11.5	5±0.8	0.8±0.02	11.5	31	5
ϕ13	14.5	7.5±1	0.8±0.02	14.5	30	6
ϕ15	16.5	7.5±1	1.0±0.02	16.5	29	6
ϕ20	21.5	7.5±1	1.0±0.02	21.5	26	6
ϕ25	29	7.5±1	1.0±0.02	29	25	7
ϕ30	36	7.5±1	1.0±0.02	36	23	8

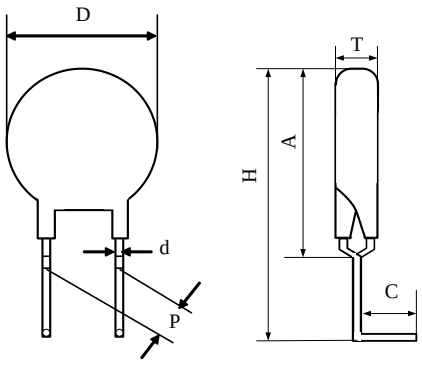
F Type (Y kink lead)



(Unit: mm)

Body Size	Dmax.	P	d	Amax.	Lmin.	Tmax.
ϕ05	6.5	4±0.6	0.8±0.02	11	29	5
ϕ08	9.5	5±0.8	0.8±0.02	13	29	5
ϕ10	11.5	5±0.8	0.8±0.02	15	29	5
ϕ13	14.5	7.5±1	0.8±0.02	17.5	27	6
ϕ15	16.5	7.5±1	1±0.02	19	26	6
ϕ20	21.5	7.5±1	1±0.02	24.5	25	6
ϕ25	29	7.5±1	1±0.02	35	22	7
ϕ30	36	7.5±1	1±0.02	42	22	8

T Type (L kink lead)



(Unit: mm)

Body Size	Dmax.	P	d	Amax.	Hmax.	C.	Tmax.
ϕ05	6.5	4±0.6	0.8±0.02	11	15.5	4.0±1	5
ϕ08	9.5	5±0.8	0.8±0.02	13	17.5	4.0±1	5
ϕ10	11.5	5±0.8	0.8±0.02	15	19.5	4.0±1	5
ϕ13	14.5	7.5±1	0.8±0.02	17.5	21.5	4.0±1	6
ϕ15	16.5	7.5±1	1±0.02	19	23.5	4.0±1	6
ϕ20	21.5	7.5±1	1±0.02	24.5	28.5	4.0±1	6

NTC Thermistor：XNP Series

POWER NTC Thermistor for Inrush current limted

■ Electrical Characteristics

Part No.	Zero Power Resistance at 25°C	Max. Current at 25℃	Residual Resistance at 25℃ Imax	Max. Power Rating at 25°C	Dissipation Factor	Thermal Time Constant	Operating Temperature Range
	R_{25}(Ω)	I_{max}(A)	R_{Imax} (Ω)	P_{max} (W)	δ (mW/°C)	τ(Sec.)	T_L~T_U(°C)
XNP05052☐	5	2	0.429	1.8	Approx. 15	Approx. 17	-40 ~ +150
XNP05081☐	8	1	1.089				
XNP05101☐	10	1	1.126				
XNP05121☐	12	1	1.184				
XNP0520X3☐	20	0.3	5.560				
XNP08042☐	4	2	0.441	2.3	Approx. 16	Approx. 38	-40 ~ +170
XNP084R72☐	4.7	2	0.445				
XNP08053☐	5	3	0.261				
XNP08063☐	6	3	0.283				
XNP08073☐	7	3	0.287				
XNP08082☐	8	2	0.520				
XNP08102☐	10	2	0.542				
XNP08152☐	15	2	0.548				
XNP08201☐	20	1	1.544				
XNP0830X☐	30	0.5	4.094				
XNP10015☐	1	5	0.091	2.4	Approx. 17	Approx. 43	-40 ~ +170
XNP101R35☐	1.3	5	0.095				
XNP101R55☐	1.5	5	0.101				
XNP102R55A☐	2.5	5	0.120				
XNP10035☐	3	5	0.127				
XNP10044☐	4	4	0.161				
XNP10054☐	5	4	0.180				
XNP106R83☐	6.8	3	0.270				
XNP10083☐	8	3	0.278				
XNP10103☐	10	3	0.297				
XNP10123☐	12	3	0.301				
XNP10133☐	13	3	0.356				
XNP10152X☐	15	2.5	0.442				
XNP10162X☐	16	2.5	0.471				
XNP10202☐	20	2	0.646				
XNP10222☐	22	2	0.659				
XNP10252☐	25	2	0.674				
XNP10302☐	30	2	0.700				
XNP10472☐	47	2	0.720				
XNP10502☐	50	2	0.813				
XNP10801☐	80	1	2.236				
XNP101001☐	100	1	2.318				
XNP101201☐	120	1	2.406				

NTC Thermistor：XNP Series

POWER NTC Thermistor for Inrush current limted

Part No.	Zero Power Resistance at 25°C	Max. Current at 25℃	Residual Resistance at 25℃ Imax	Max. Power Rating at 25°C	Dissipation Factor	Thermal Time Constant	Operating Temperature Range
	R_{25}(Ω)	I_{max}(A)	R_{Imax}(Ω)	P_{max}(W)	δ(mW/°C)	τ(Sec.)	T_L~T_U(°C)
XNP13013☐	1	3	0.174	3.1	Approx . 18	Approx. 66	-40 ~ +200
XNP131R37☐	1.3	7	0.070				
XNP132R56☐	2.5	6	0.094				
XNP13045☐	4	5	0.132				
XNP134R74☐	4.7	4	0.168				
XNP13055☐	5	5	0.166				
XNP13074☐	7	4	0.184				
XNP13084☐	8	4	0.206				
XNP13104☐	10	4	0.217				
XNP13124☐	12	4	0.230				
XNP13153☐	15	3	0.343				
XNP13163☐	16	3	0.348				
XNP13183☐	18	3	0.365				
XNP13203☐	20	3	0.410				
XNP150R78A☐	0.7	8	0.051	3.6	Approx. 21	Approx. 75	-40 ~ +200
XNP15018☐	1	8	0.054				
XNP151R38☐	1.3	8	0.064				
XNP151R58☐	1.5	8	0.068				
XNP15028☐	2	8	0.078				
XNP152R58☐	2.5	8	0.086				
XNP15037☐	3	7	0.091				
XNP15046☐	4	6	0.117				
XNP15056☐	5	6	0.121				
XNP15065☐	6	5	0.159				
XNP15075☐	7	5	0.161				
XNP15085☐	8	5	0.165				
XNP15105☐	10	5	0.178				
XNP15125☐	12	5	0.185				
XNP15154☐	15	4	0.261				
XNP15164☐	16	4	0.265				
XNP15184☐	18	4	0.273				
XNP15204☐	20	4	0.283				
XNP15224☐	22	4	0.308				
XNP15253☐	25	3	0.425				
XNP15303☐	30	3	0.461				
XNP15333☐	33	3	0.484				
XNP15403☐	40	3	0.511				
XNP15473☐	47	3	0.517				
XNP15802X☐	80	2.5	0.693				
XNP151202☐	120	2	1.010				

NTC Thermistor：XNP Series

POWER NTC Thermistor for Inrush current limted

Part No.	Zero Power Resistance at 25°C	Max. Current at 25℃	Residual Resistance at 25℃ Imax	Max. Power Rating at 25°C	Dissipation Factor	Thermal Time Constant	Operating Temperature Range
	R_{25}(Ω)	I_{max}(A)	R_{Imax}(Ω)	P_{max}(W)	δ(mW/°C)	τ(Sec.)	T_L~T_U(°C)
XNP200R7☐	0.7	15	0.035	4.9	Approx. 28	Approx. 113	-40 ~ +200
XNP201R0☐	1	13	0.034				
XNP201R5☐	1.5	10.5	0.041				
XNP202R0☐	2	10	0.062				
XNP202R5☐	2.5	9	0.083				
XNP203R0☐	3	8.5	0.078				
XNP204R0☐	4	8	0.080				
XNP204R7☐	4.7	7.5	0.114				
XNP205R0☐	5	7.5	0.118				
XNP206R0☐	6	7	0.120				
XNP206R8☐	6.8	6.5	0.130				
XNP207R0☐	7	6.5	0.132				
XNP208R0☐	8	6	0.161				
XNP20100☐	10	5.5	0.196				
XNP20120☐	12	5	0.197				
XNP20130☐	13	5	0.213				
XNP20150☐	15	4.5	0.258				
XNP20160☐	16	4.5	0.276				
XNP20180☐	18	4	0.280				
XNP20200☐	20	4	0.306				
XNP251R0☐	1	20	0.020	7.0	Approx. 30	Approx. 130	-40 ~ +200
XNP251R5☐	1.5	18.5	0.023				
XNP252R0☐	2	18	0.025				
XNP252R5☐	2.5	15	0.032				
XNP253R0☐	3	14.5	0.042				
XNP254R0☐	4	14	0.044				
XNP254R7☐	4.7	13	0.052				
XNP255R0☐	5	12	0.061				
XNP256R8☐	6.8	10.5	0.082				
XNP257R0☐	7	10	0.092				
XNP258R0☐	8	9	0.115				
XNP25100☐	10	8	0.141				
XNP25120☐	12	7.5	0.164				
XNP25150☐	15	6.5	0.210				
XNP25180☐	18	5.5	0.231				
XNP25200☐	20	5	0.270				

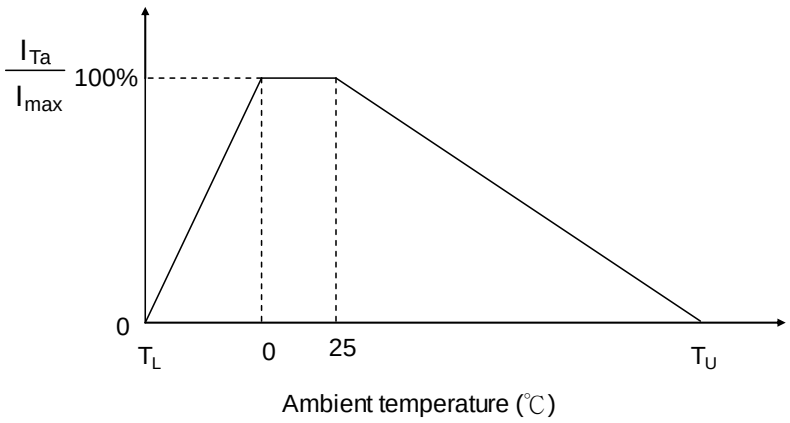
NTC Thermistor：XNP Series

POWER NTC Thermistor for Inrush current limted

Part No.	Zero Power Resistance at 25°C	Max. Current at 25℃	Residual Resistance at 25℃ Imax	Max. Power Rating at 25°C	Dissipation Factor	Thermal Time Constant	Operating Temperature Range
	R_{25}(Ω)	I_{max}(A)	R_{Imax}(Ω)	P_{max}(W)	δ(mW/°C)	τ(Sec.)	T_L~T_U(°C)
XNP301R0☐	1	30	0.016	8.0	Approx. 40	Approx. 190	-40 ~ +200
XNP301R5☐	1.5	25	0.020				
XNP302R0☐	2	23	0.022				
XNP302R5☐	2.5	18	0.030				
XNP303R0☐	3	17	0.035				
XNP304R0☐	4	16	0.048				
XNP304R7☐	4.7	15	0.055				
XNP305R0☐	5	14	0.057				
XNP306R8☐	6.8	12	0.077				
XNP307R0☐	7	11.5	0.084				
XNP308R0☐	8	10.5	0.100				
XNP30100☐	10	10	0.115				
XNP30120☐	12	9	0.142				
XNP30150☐	15	8	0.175				
XNP30180☐	18	7	0.210				
XNP30200☐	20	6	0.233				

Note1 : ☐ = Tolerance of R_{25}

■ Max. Current Derating Curve



T_U：Maximum operating temperature (℃)

T_L：Minimum operating temperature (℃)

For example：

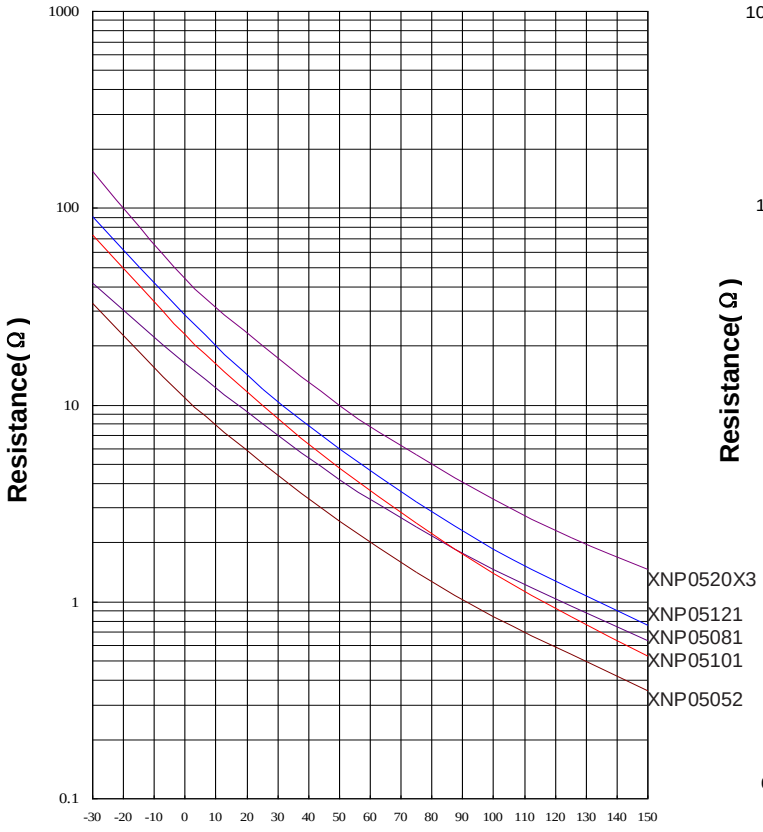
Ambient temperature(Ta)＝60℃

Maximum operating temperature(T_U)＝200℃

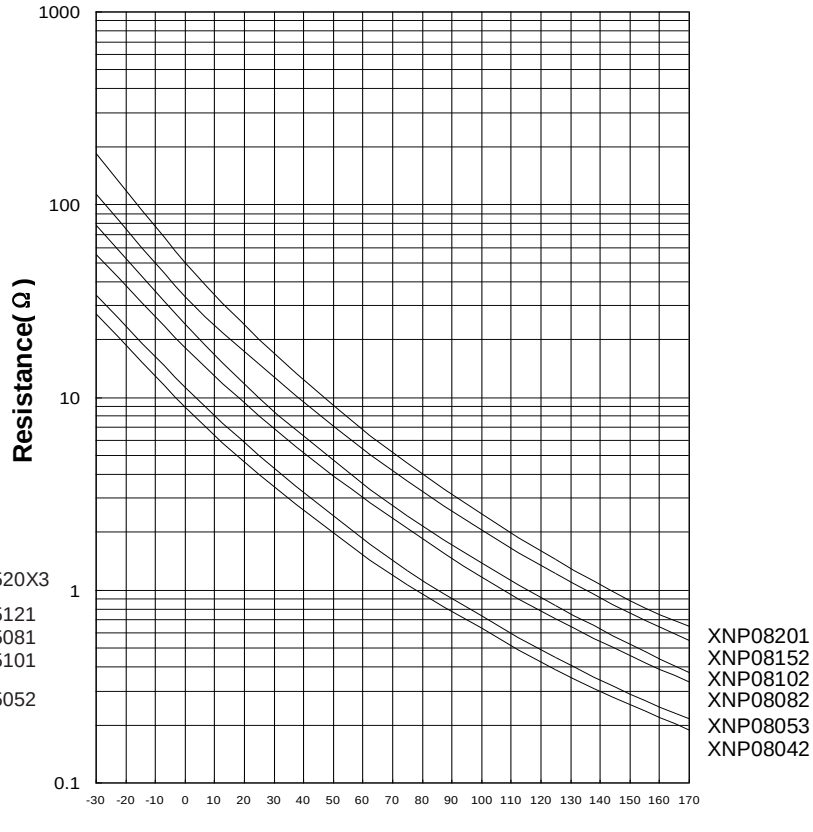
I_{Ta}=[1-(Ta-25)/(Tu-25)]×Imax=80%Imax.

■ R-T Characteristic Curves (representative)

XNP05052~XNP0520X3



XNP08042~XNP08201

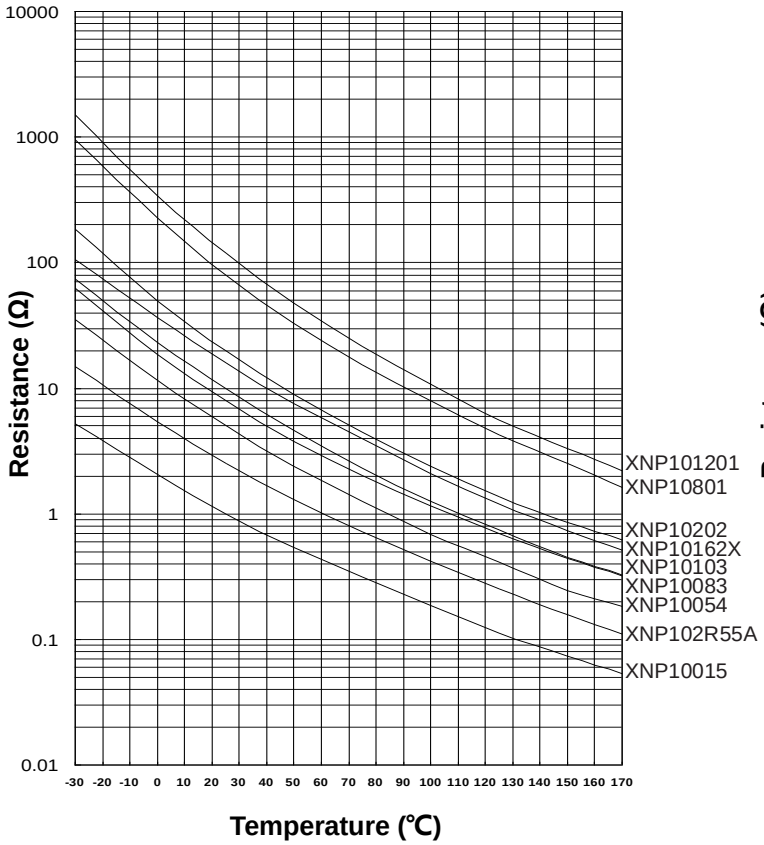


NTC Thermistor：XNP Series

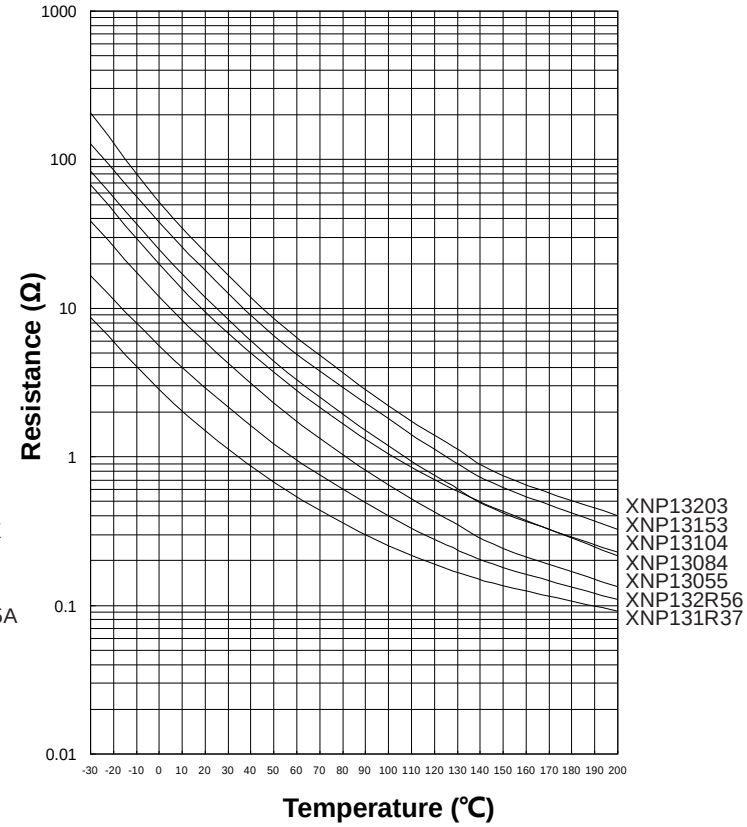
POWER NTC Thermistor for Inrush current limted

■ R-T Characteristic Curves (representative)

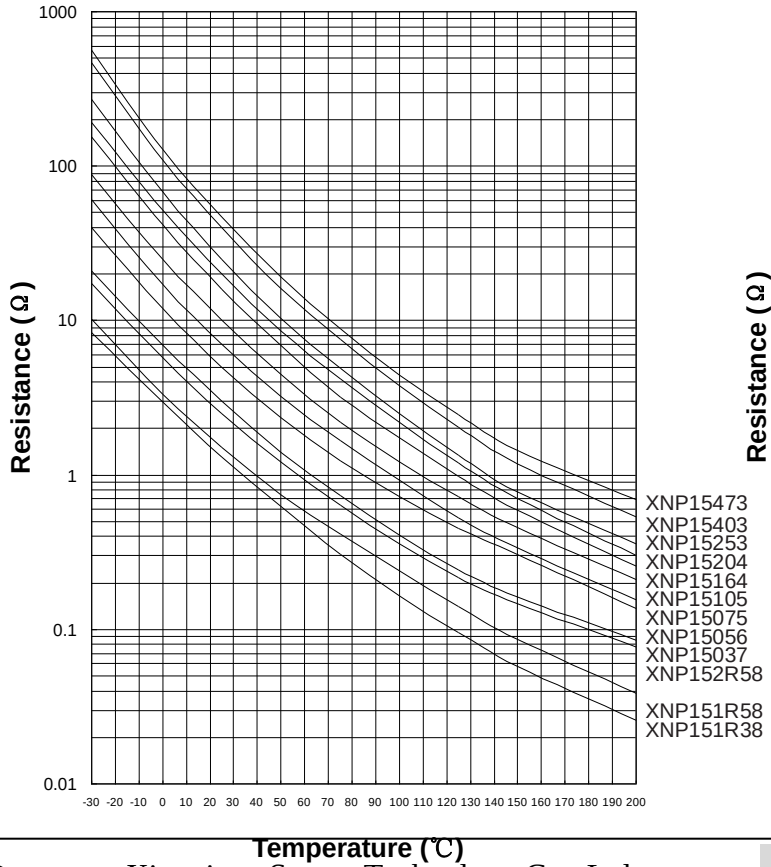
XNP10015~XNP101201



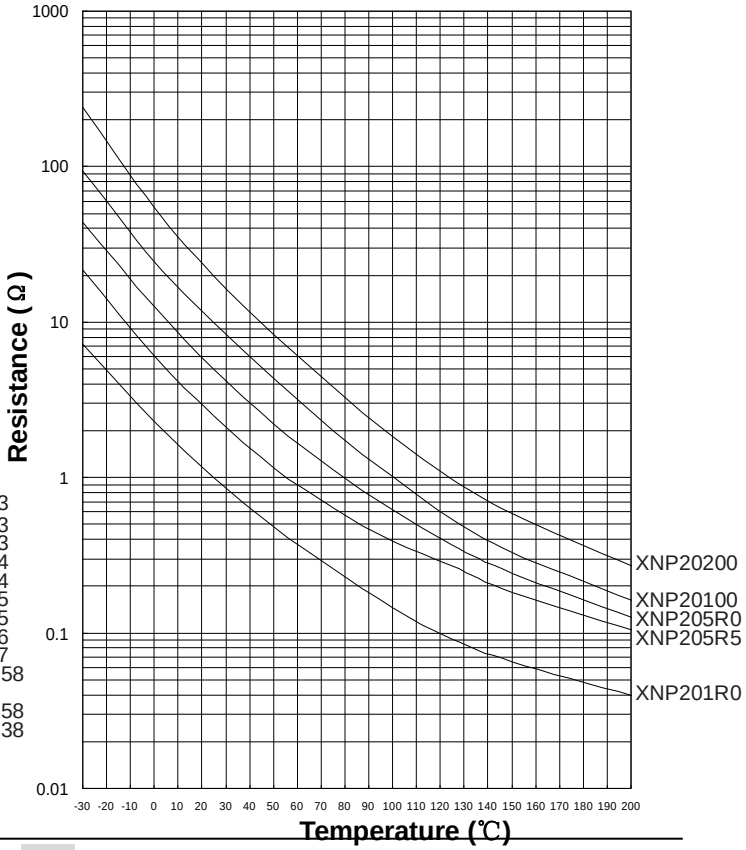
XNP131R37~XNP13203



XNP151R38~XNP15473

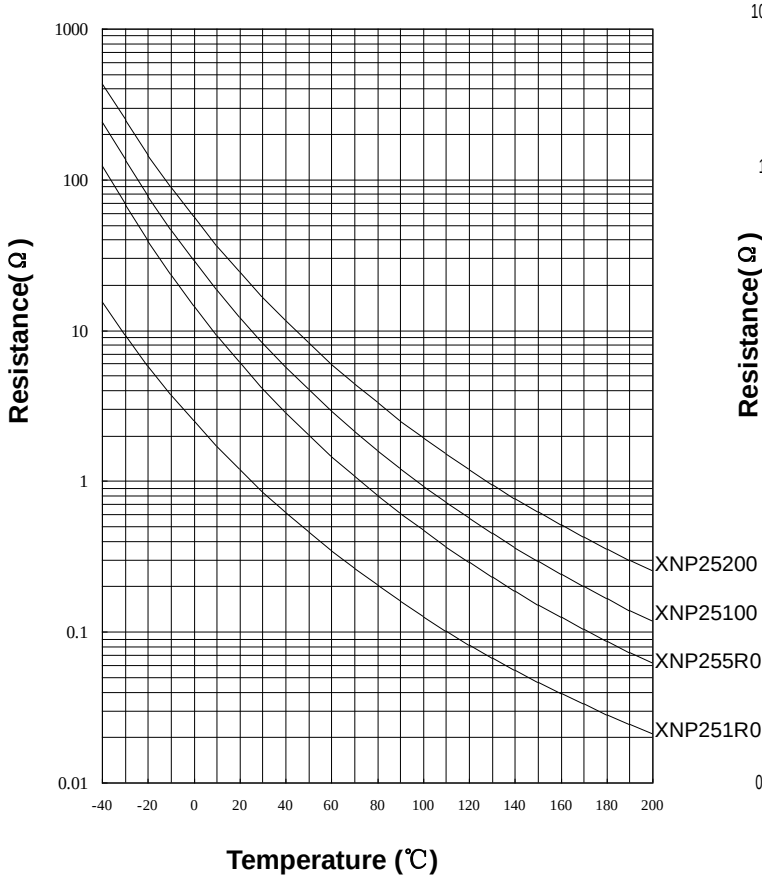


XNP201R0~XNP20200

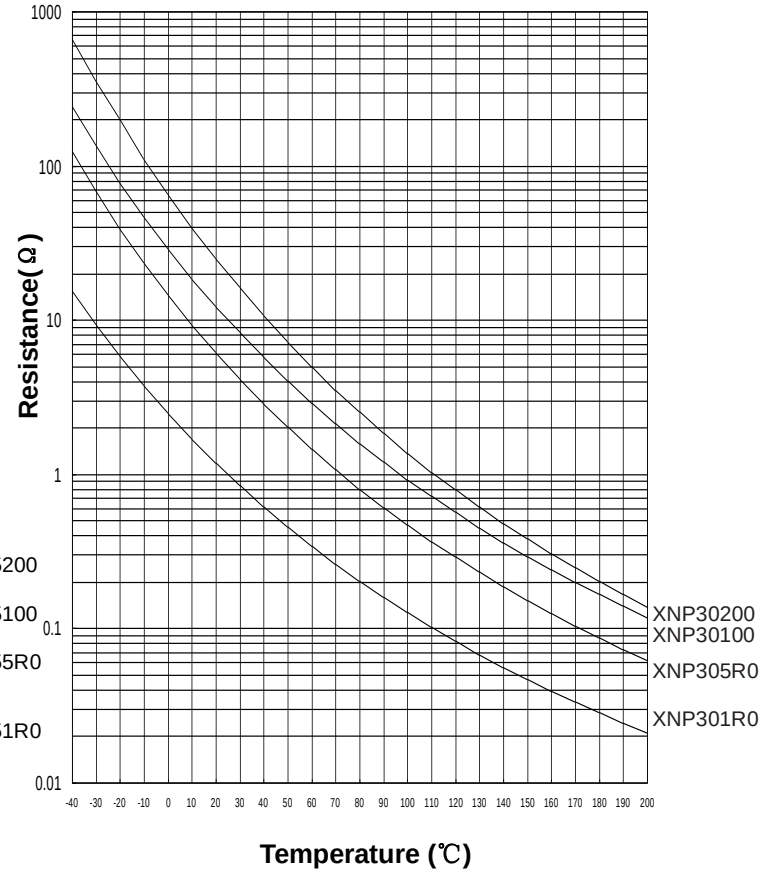


■ R-T Characteristic Curves (representative)

XNP251R0~XNP25200

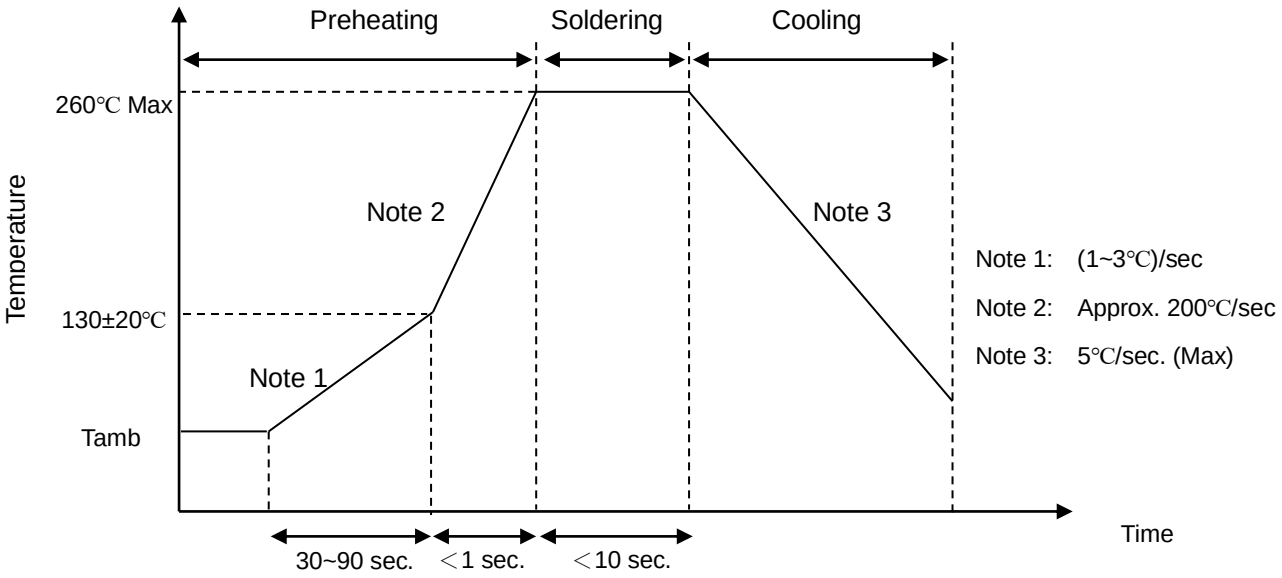


XNP301R0~XNP30200



Soldering Recommendation

- **Wave Soldering Profile**



- **Recommended Reworking Conditions with Soldering Iron**

Item	Conditions
Temperature of Soldering Iron-tip	360℃ (max.)
Soldering Time	3 sec (max.)
Distance from Thermistor	2 mm (min.)

■ Reliability

<table>
<tr><th>Item</th><th>Standard</th><th>Test conditions / Methods</th><th>Specifications</th></tr>
<tr><td>Tensile Strength of Terminals</td><td>IEC60068-2-21</td><td>Gradually applying the force specified and keeping the unit fixed for 10±1 sec.

Terminal diameter (mm) | Force (Kg)
0.5<d≦0.80 | 1.0
0.8<d≦1.25 | 2.0</td><td>No visible damage</td></tr>
<tr><td>Solderability</td><td>IEC60068-2-20</td><td>245 ± 5℃, 3 ± 0.3 sec.</td><td>At least 95% of terminal electrode is covered by new solder</td></tr>
<tr><td>Resistance to Soldering Heat</td><td>IEC60068-2-20</td><td>260 ± 3℃, 10 ± 1 sec.</td><td>No visible damage
$|\triangle R_{25}/R_{25}| \leqq 10\ \%$</td></tr>
<tr><td>High Temperature Storage</td><td>IEC60068-2-2</td><td>Tu ± 5 ℃ x 1000± 24 hrs</td><td>No visible damage
$|\triangle R_{25}/R_{25}| \leqq 20\ \%$</td></tr>
<tr><td>Damp Heat, Steady State</td><td>IEC60068-2-3</td><td>40 ± 2℃, 90~95% RH, 1000 ± 24 hrs</td><td>No visible damage
$|\triangle R_{25}/R_{25}| \leqq 20\ \%$</td></tr>
<tr><td>Rapid Change of Temperature</td><td>IEC60068-2-14</td><td>The conditions shown below shall be repeated 5 cycles
<table><tr><th>Step</th><th>Temperature (℃)</th><th>Period (minutes)</th></tr><tr><td>1</td><td>T_L ± 5</td><td>30 ± 3</td></tr><tr><td>2</td><td>Room temperature</td><td>5 ± 3</td></tr><tr><td>3</td><td>T_U ± 5</td><td>30 ± 3</td></tr><tr><td>4</td><td>Room temperature</td><td>5 ± 3</td></tr></table></td><td>No visible damage
$|\triangle R_{25}/R_{25}| \leqq 20\ \%$</td></tr>
<tr><td>Max. Current</td><td>IEC60539-1</td><td>25 ± 5℃, Imax. x 1000± 24 hrs</td><td>No visible damage
$|\triangle R_{25}/R_{25}| \leqq 20\ \%$</td></tr>
<tr><td>Endurance</td><td>UL1434</td><td>25 ± 5℃, Imax. , C_T , 1min ON / 5 mins OFF x 1000 cycles
C_T= Capacitance at 240 Vac</td><td>No visible damage
$|\triangle R_{25}/R_{25}| \leqq 20\ \%$</td></tr>
<tr><td>Insulation Test</td><td>MIL-STD-202F -Method 302</td><td>1000 V_{DC} 1 min</td><td>No visible damage
≧500 MΩ</td></tr>
</table>

■ Packaging

● Taping Specification

For S (Straight lead) type and F (Y kink lead) type

Figure A.

For S lead and F lead Φ8 to Φ10 Type.

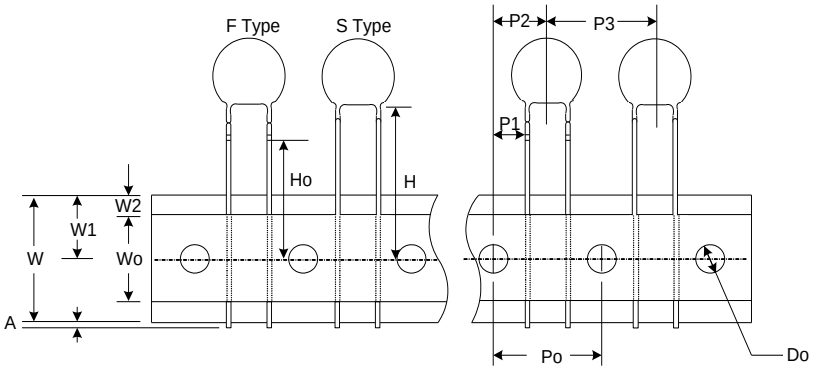


Figure B.

For S lead Φ13 to Φ20 type and F lead Φ13 to Φ20 type

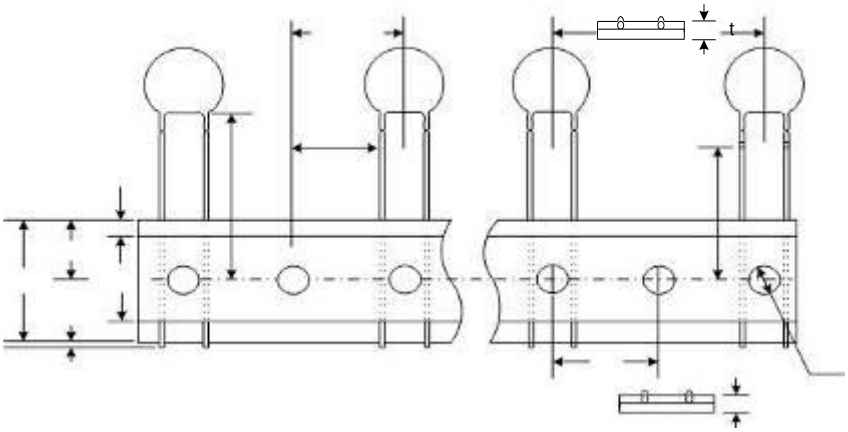
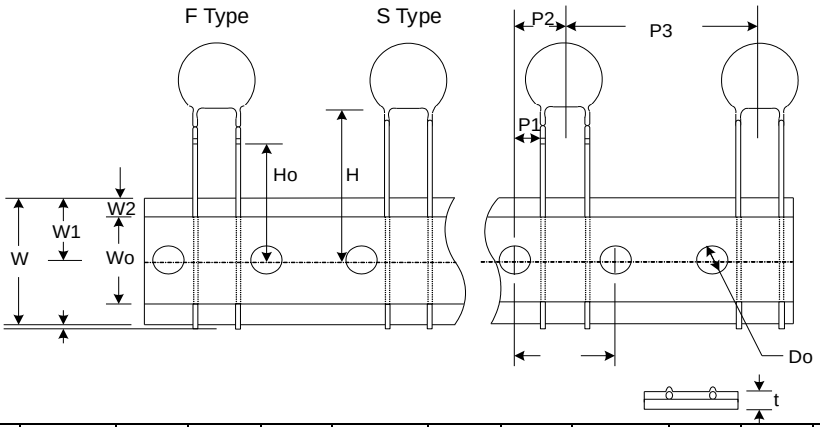


Figure C.

For S lead Φ13 to Φ20 type and F lead Φ13 to Φ20 type



(Unit: mm)

Taping Code	Body Size	P_0 ±0.5	P_1 ±0.7	P_2 ±1.3	P_3 ±0.5	H +2/-0	H_0 ±0.5	W_0 ±1	W_1 ±0.5	W_2 Max.	W ±0.5	A Max.	D_0 ±0.2	t ±0.2	Figure
A (P_0=12.7)	Φ08	12.7	3.45	6.35	12.7	18	16	12	9	3	18	1	4	0.6	A
	Φ10	12.7	3.45	6.35	12.7	18	16	12	9	3	18	1	4	0.6	A
	Φ13	12.7	8.55	12.7	25.4	18	16	12	9	3	18	1	4	0.6	B
	Φ15	12.7	8.45	12.7	25.4	18	16	12	9	3	18	1	4	0.6	B
	Φ20	12.7	8.45	12.7	25.4	18	16	12	9	3	18	1	4	0.6	B
E (P_0=15.0)	Φ08	15	4.6	7.5	15	18	16	12	9	3	18	1	4	0.6	A
	Φ10	15	4.6	7.5	15	18	16	12	9	3	18	1	4	0.6	A
	Φ13	15	3.35	7.5	30	18	16	12	9	3	18	1	4	0.6	C
	Φ15	15	3.25	7.5	30	18	16	12	9	3	18	1	4	0.6	C
	Φ20	15	3.25	7.5	30	18	16	12	9	3	18	1	4	0.6	C

■ Quantity

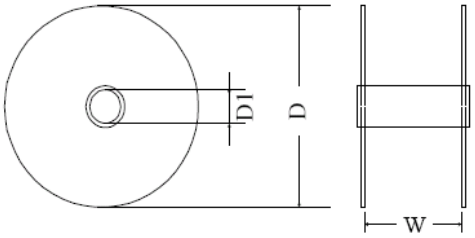
● Bulk Packing

Body Size/mm	Quantity (pcs/bag)
Φ05	200
Φ08	200
Φ10	200
Φ13	100
Φ15	100
Φ20	50
Φ25	168 (pcs/ box*)
Φ30	168 (pcs/ box*)

* Bulk packaging material in the form of cardboard strips

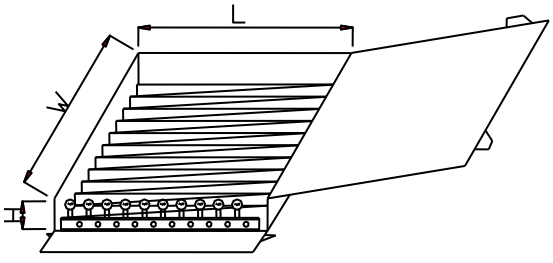
● Reel Packing

Body Size/mm	D (mm)	D1 (mm)	W (mm)	Quantity (pcs/reel)
Φ05	340±10	31±1	40±1	2,500
Φ08			55±1	1,500
Φ10				1,500
Φ13				750
Φ15				750
Φ20				500



● Ammo Packing

Body Size/mm	Quantity (pcs/box)
Φ05	1,000
Φ08	1,000
Φ10	1,000
Φ13	500
Φ13	500
Φ15	500
Φ20	500



(Unit: mm)

Body Size	W	L	H
Φ5~Φ15	348	275	60

■ Storage Conditions of Products

- Storage Conditions：
  1. Storage Temperature：-10℃~+40℃
  2. Relative Humidity：≦75%RH
  3. Keep away from corrosive atmosphere and sunlight.
- Shelf life：1 year