

DATA SHEET

NTC THERMISTOR HIGH SURGE INRUSH CURRENT LIMITER NT SERIES

RoHS compliant & Halogen free



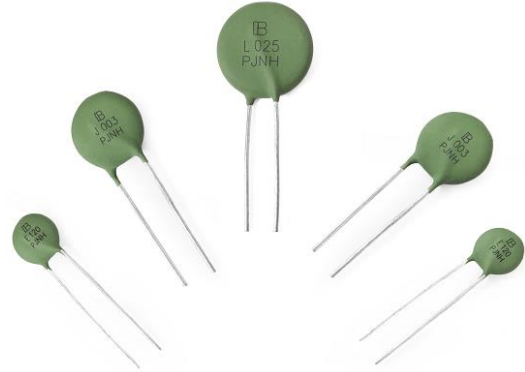
Product specification— November 27, 2023 V.0



NTC Thermistor NT series Data Sheet

Features

- Effectively restrain surge
- Low power loss under the stable state
- Over-current wide control range and fast response
- Thermal and electrical characteristics of with stability
- Wide range of electrical specifications
- RoHS& Halogen Free (HF) compliant
- Safety certification-UL / TUV



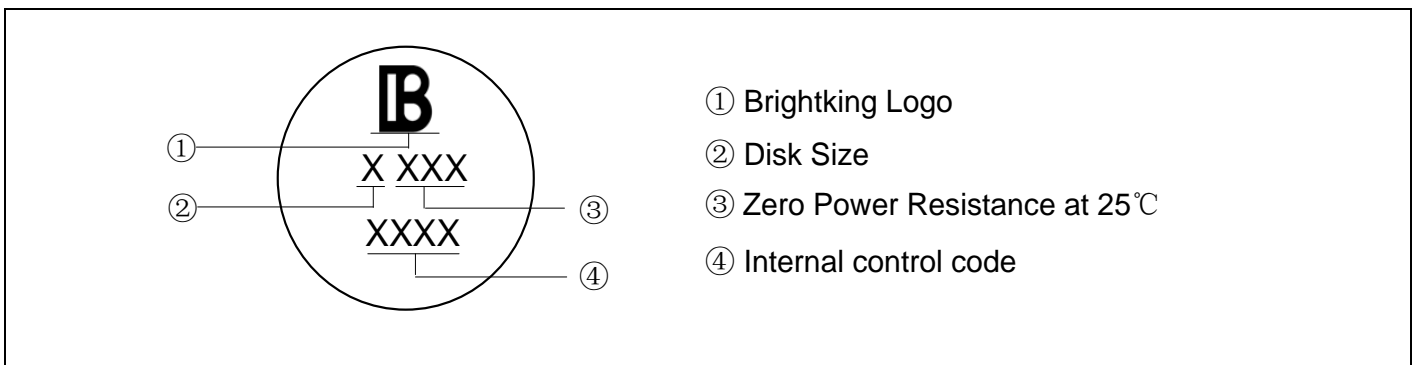
Applications

- Monitor, Sps, Fax, Telecom, Adaptor etc.
- Power supply, Communications equipment etc.

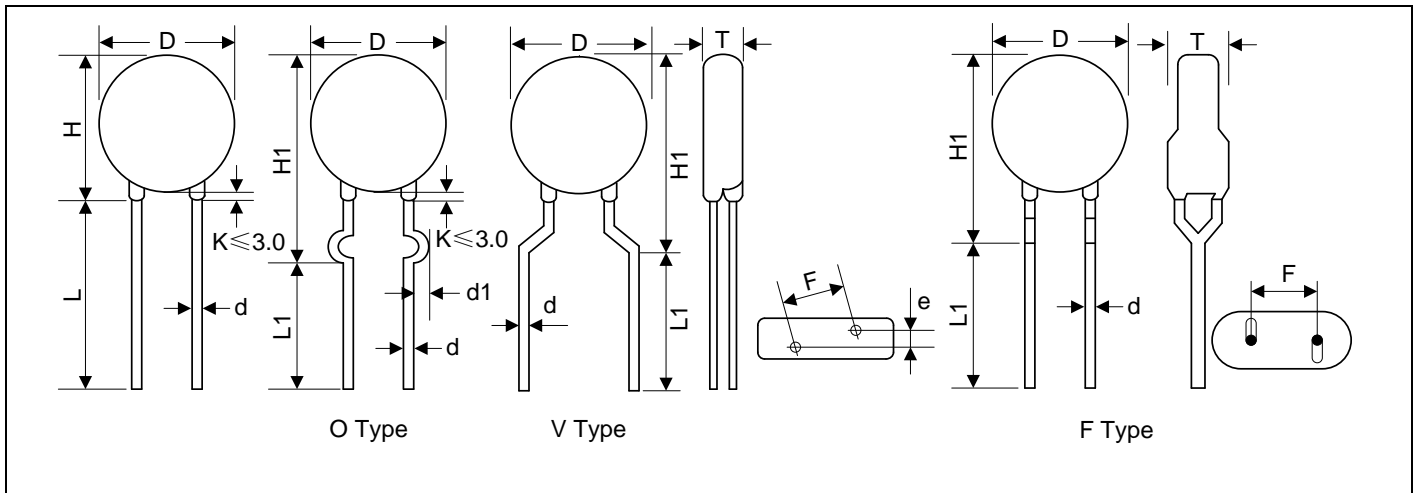
Part Number Code

| NT | E | 04 | — | 010 | M | F | TR |
|---------------------------|--|---------------------------------------|---|---|---------------------|---|--|
| Series code | Nominal Diameter | Max. Steady State Current | | R25 (Nominal Resistance at 25°C) | Tolerance of R25 | Forming Type (Kink) | Packing |
| High Surge NTC Thermistor | B: 5mm, D: 8mm, E: 10mm, G: 13mm, J: 15mm, L: 20mm, | 01~12: 1A~12A R25: 0.25A | | 0R7: 0.7Ω , 1R3: 1.3Ω, 2R5: 2.5 Ω, 001~008: 1~8Ω, 010~080: 10~80Ω, 120: 120Ω | L: ±15%, M: ±20% | No suffix: Straight leads O: Outside crimped leads F: Y Kinked leads, V: Wider kink leads, | No suffix: Bulk, TB: Tape & Box, TR: Tape & Reel |

Marking



Dimensions (Unit: mm)

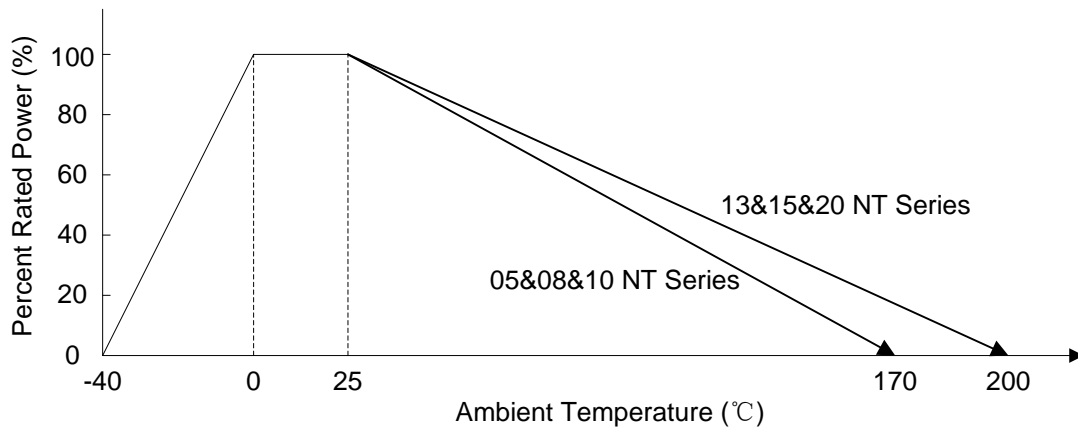


| Disc Φ | D (max.) | H (max.) | H1 (max.) | L (Min.) | L1 (Min.) | d (±0.02) | d1 (±0.4) | T (max.) | F (±0.8) | e (±0.5) | Lead Shape Type | | | |
|-----------|-------------|-------------|--------------|-------------|--------------|--------------|--------------|-------------|-------------|-------------|-----------------|---|---|---|
| | | | | | | | | | | | Straight | O | F | V |
| 5(B) | 7.5 | / | 10.5 | / | 15 | 0.60 | 1.4 | 5.0 | 5.0 | 1.6 | / | / | / | V |
| 8(D) | 11.0 | 13.5 | 14.0 | 20.0 | 15 | 0.80 | 1.4 | 6.0 | 5.0 | 2.0 | Straight | O | F | / |
| 10(E) | 13.5 | 16.0 | 18.0 | 20.0 | 15 | 0.80 | 1.4 | 6.0 | 5.0 | 2.1 | Straight | O | F | / |
| 13(G) | 16.0 | 19.0 | 22.0 | 20.0 | 15 | 1.00 | 1.6 | 6.0 | 7.5 | 2.9 | Straight | O | F | / |
| 15(J) | 18.0 | 21.0 | 25.0 | 20.0 | 15 | 1.00 | 1.6 | 6.5 | 7.5 | 3.1 | Straight | O | F | / |
| 20(L) | 24.0 | 28.0 | 33.0 | 20.0 | 15 | 1.00 | 1.6 | 7.5 | 7.5 | 3.6 | Straight | O | F | / |

Remarks: The default lead shape for 8 Φ (NTD) ~20 Φ (NTL) products is Straight lead shape.

"V" type is only for 5 Φ (NTB) products.

Maximum Power Rating



Electrical Characteristics

| Nominal Diameter (mm) | Part Number | Zero Power Resistance at 25°C | Maximum Steady State Current at 25°C | Residual Resistance at 25°C I _{max} R _{max} | Typical value | | Recommend Capacitance 240Vac | Maximum Steady Power | Operating Temperature Range | UL | TUV |
|-----------------------|-------------|-------------------------------|--------------------------------------|---|-----------------------|------------------------------|------------------------------|----------------------|-----------------------------|----|-----|
| | | | | | Thermal Time Constant | Thermal Dissipation Constant | | | | | |
| | | (Ω) | (A) | (Ω) | (s) | (mW/°C) | (μF) | (W) | (°C) | | |
| 5(B) | NTB02-005□ | 5 | 2 | 0.325 | 35 | 7 | 60 | 1.5 | -40~+170 | V | V |
| | NTB02-006□ | 6 | 2 | 0.350 | 35 | 7 | 60 | 1.5 | -40~+170 | V | V |
| | NTB02-007□ | 7 | 2 | 0.375 | 35 | 7 | 60 | 1.5 | -40~+170 | V | V |
| | NTB02-008□ | 8 | 2 | 0.400 | 35 | 7 | 60 | 1.5 | -40~+170 | V | V |
| | NTB02-009□ | 9 | 2 | 0.425 | 35 | 7 | 60 | 1.5 | -40~+170 | V | V |
| | NTB02-010□ | 10 | 2 | 0.450 | 35 | 7 | 60 | 1.5 | -40~+170 | V | V |
| | NTB01-012□ | 12 | 1 | 1.250 | 35 | 7 | 60 | 1.5 | -40~+170 | V | V |
| | NTBR25-045□ | 45 | 0.25 | 7.720 | 35 | 7 | 40 | 1.5 | -40~+170 | V | V |
| 8(D) | NTD04-003□ | 3 | 4 | 0.150 | 48 | 12 | 220 | 2.3 | -40~+170 | V | V |
| | NTD04-004□ | 4 | 4 | 0.166 | 48 | 12 | 220 | 2.3 | -40~+170 | V | V |
| | NTD04-005□ | 5 | 4 | 0.182 | 48 | 9 | 220 | 2.3 | -40~+170 | V | V |
| | NTD04-006□ | 6 | 4 | 0.191 | 48 | 9 | 220 | 2.3 | -40~+170 | V | V |
| | NTD03-007□ | 7 | 3 | 0.195 | 48 | 9 | 220 | 2.3 | -40~+170 | V | ∕ |
| | NTD03-008□ | 8 | 3 | 0.278 | 45 | 12 | 220 | 2.3 | -40~+170 | V | V |
| | NTD03-009□ | 9 | 3 | 0.283 | 45 | 12 | 220 | 2.3 | -40~+170 | V | V |
| | NTD03-010□ | 10 | 3 | 0.288 | 45 | 12 | 220 | 2.3 | -40~+170 | V | V |
| 10(E) | NTE05-001□ | 1 | 5 | 0.082 | 59 | 12 | 330 | 2.5 | -40~+170 | V | V |
| | NTE05-002□ | 2 | 5 | 0.094 | 59 | 12 | 330 | 2.5 | -40~+170 | V | V |
| | NTE05-003□ | 3 | 5 | 0.098 | 59 | 12 | 330 | 2.5 | -40~+170 | V | V |
| | NTE04-005□ | 5 | 4 | 0.152 | 59 | 12 | 330 | 2.5 | -40~+170 | V | V |
| | NTE04-006□ | 6 | 4 | 0.166 | 59 | 12 | 330 | 2.5 | -40~+170 | V | V |
| | NTE04-007□ | 7 | 3 | 0.180 | 59 | 12 | 330 | 2.5 | -40~+170 | V | V |
| | NTE04-008□ | 8 | 4 | 0.194 | 59 | 12 | 330 | 2.5 | -40~+170 | V | V |
| | NTE04-009□ | 9 | 4 | 0.195 | 59 | 12 | 330 | 2.5 | -40~+170 | V | V |
| | NTE04-010□ | 10 | 4 | 0.196 | 59 | 12 | 330 | 2.5 | -40~+170 | V | V |
| | NTE03-011□ | 11 | 3 | 0.293 | 58 | 11 | 270 | 2.5 | -40~+170 | V | V |
| | NTE03-012□ | 12 | 3 | 0.296 | 58 | 11 | 270 | 2.5 | -40~+170 | V | V |
| | NTE03-013□ | 13 | 3 | 0.299 | 58 | 11 | 270 | 2.5 | -40~+170 | V | V |
| | NTE03-014□ | 14 | 3 | 0.302 | 58 | 11 | 270 | 2.5 | -40~+170 | V | V |
| | NTE03-015□ | 15 | 3 | 0.305 | 62 | 11 | 270 | 2.5 | -40~+170 | V | V |
| | NTE03-016□ | 16 | 3 | 0.308 | 62 | 11 | 270 | 2.5 | -40~+170 | V | V |
| | NTE03-017□ | 17 | 3 | 0.311 | 62 | 11 | 270 | 2.5 | -40~+170 | V | V |
| | NTE03-018□ | 18 | 3 | 0.314 | 62 | 11 | 270 | 2.5 | -40~+170 | V | V |
| | NTE03-019□ | 19 | 3 | 0.317 | 62 | 11 | 270 | 2.5 | -40~+170 | V | V |
| | NTE03-020□ | 20 | 3 | 0.320 | 62 | 11 | 270 | 2.5 | -40~+170 | V | V |
| | NTE03-021□ | 21 | 3 | 0.323 | 62 | 11 | 270 | 2.5 | -40~+170 | V | V |
| | NTE03-022□ | 22 | 3 | 0.326 | 62 | 11 | 270 | 2.5 | -40~+170 | V | V |

NTC Inrush Current Limiter

NT series

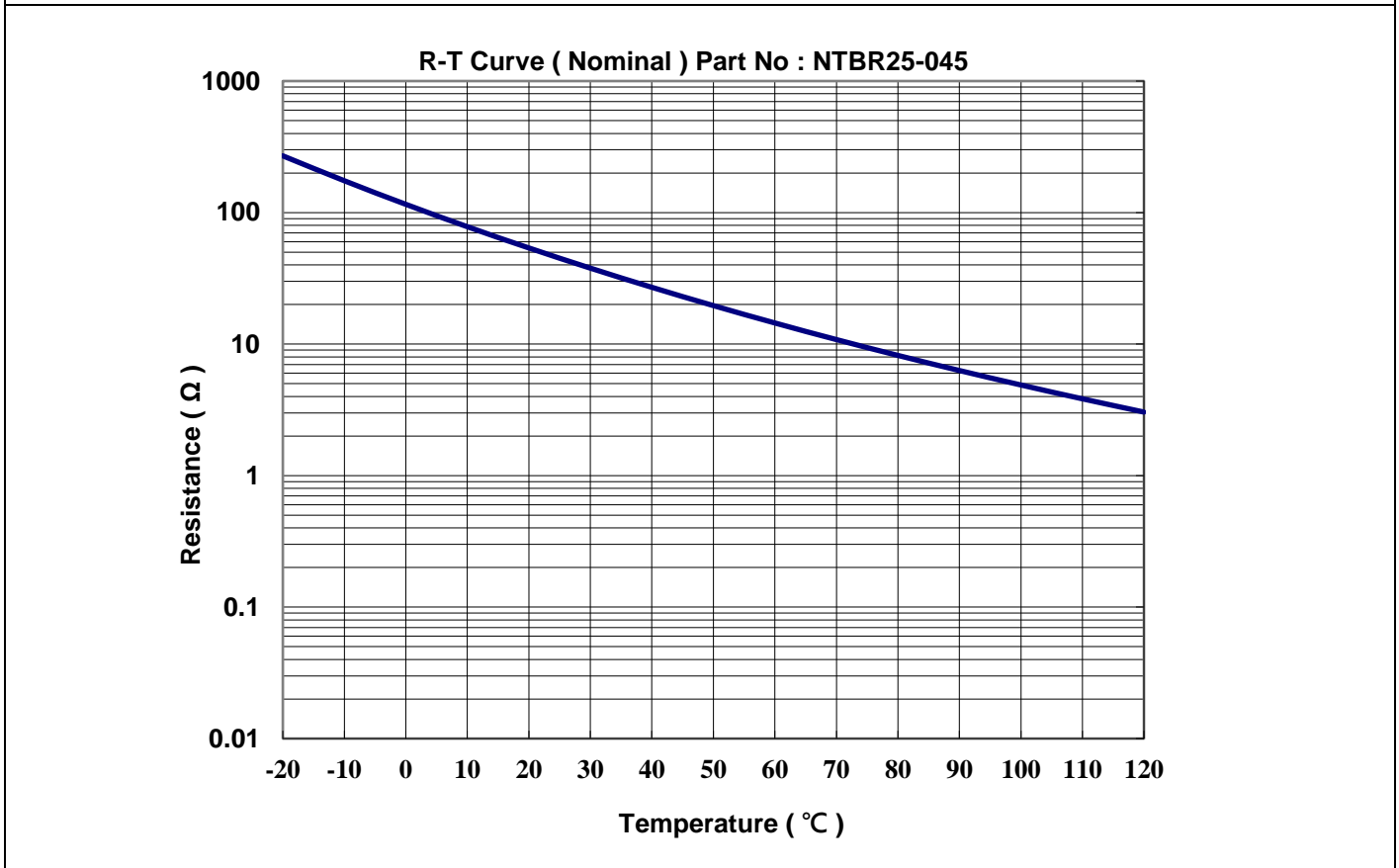
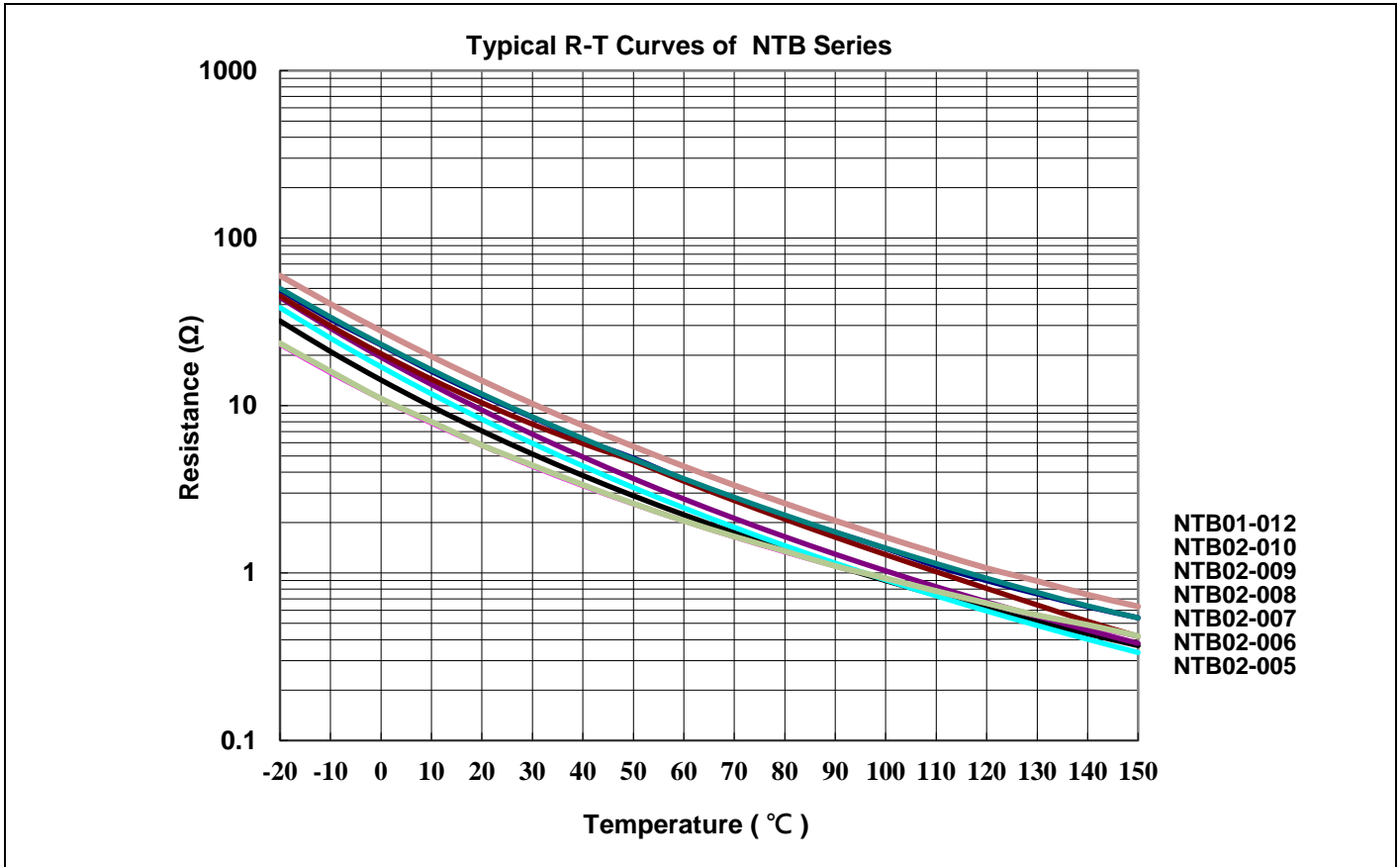
| Nominal Diameter (mm) | Part Number | Zero Power Resistance at 25°C | Maximum Steady State Current at 25°C | Residual Resistance at 25°C I _{max} R _{Imax} | Typical value | | Recommend Capacitance 240Vac | Maximum Steady Power | Operating Temperature Range | U _L | T _{UV} |
|-----------------------|-------------|-------------------------------|--------------------------------------|--|-----------------------|------------------------------|------------------------------|----------------------|-----------------------------|----------------|-----------------|
| | | | | | Thermal Time Constant | Thermal Dissipation Constant | | | | | |
| | | | | | (s) | (mW/°C) | | | | | |
| | | (Ω) | (A) | (Ω) | (s) | (mW/°C) | (μF) | (W) | (°C) | | |
| 13(G) | NTG07-001□ | 1 | 7 | 0.074 | 85 | 18 | 680 | 3 | -40~+200 | V | V |
| | NTG07-002□ | 2 | 7 | 0.074 | 85 | 18 | 680 | 3 | -40~+200 | V | V |
| | NTG07-003□ | 3 | 7 | 0.074 | 85 | 18 | 680 | 3 | -40~+200 | V | V |
| | NTG06-005□ | 5 | 6 | 0.120 | 93 | 17 | 560 | 3 | -40~+200 | V | V |
| | NTG05-006□ | 6 | 5 | 0.163 | 90 | 17 | 560 | 3 | -40~+200 | V | V |
| | NTG05-007□ | 7 | 5 | 0.171 | 80 | 19 | 560 | 3 | -40~+200 | V | V |
| | NTG05-008□ | 8 | 5 | 0.155 | 91 | 15 | 560 | 3 | -40~+200 | V | V |
| | NTG05-009□ | 9 | 5 | 0.163 | 89 | 15 | 560 | 3 | -40~+200 | V | V |
| | NTG05-010□ | 10 | 5 | 0.171 | 87 | 14 | 560 | 3 | -40~+200 | V | V |
| | NTG04-011□ | 11 | 4 | 0.241 | 87 | 14 | 560 | 3 | -40~+200 | V | V |
| | NTG04-012□ | 12 | 4 | 0.243 | 87 | 14 | 560 | 3 | -40~+200 | V | V |
| | NTG04-013□ | 13 | 4 | 0.244 | 87 | 14 | 560 | 3 | -40~+200 | V | V |
| | NTG04-014□ | 14 | 4 | 0.245 | 87 | 14 | 560 | 3 | -40~+200 | V | V |
| | NTG04-015□ | 15 | 4 | 0.247 | 87 | 14 | 560 | 3 | -40~+200 | V | V |
| | NTG04-016□ | 16 | 4 | 0.250 | 87 | 15 | 560 | 3 | -40~+200 | V | V |
| | NTG04-017□ | 17 | 4 | 0.255 | 87 | 15 | 560 | 3 | -40~+200 | V | V |
| | NTG04-018□ | 18 | 4 | 0.260 | 87 | 15 | 560 | 3 | -40~+200 | V | V |
| | NTG04-019□ | 19 | 4 | 0.265 | 87 | 15 | 560 | 3 | -40~+200 | V | V |
| | NTG04-020□ | 20 | 4 | 0.270 | 87 | 15 | 560 | 3 | -40~+200 | V | V |
| | 15(J) | NTJ09-001□ | 1 | 9 | 0.051 | 104 | 20 | 1000 | 4 | -40~+200 | V |
| NTJ09-002□ | | 2 | 9 | 0.056 | 104 | 20 | 820 | 4 | -40~+200 | V | V |
| NTJ09-2R5□ | | 2.5 | 9 | 0.063 | 104 | 20 | 820 | 4 | -40~+200 | V | V |
| NTJ09-003□ | | 3 | 9 | 0.059 | 106 | 20 | 820 | 4 | -40~+200 | V | V |
| NTJ08-005□ | | 5 | 8 | 0.082 | 110 | 20 | 820 | 4 | -40~+200 | V | V |
| NTJ06-008□ | | 8 | 6 | 0.142 | 99 | 15 | 680 | 4 | -40~+200 | V | V |
| NTJ06-009□ | | 9 | 6 | 0.143 | 99 | 16 | 680 | 4 | -40~+200 | V | V |
| NTJ06-010□ | | 10 | 6 | 0.145 | 99 | 19 | 680 | 4 | -40~+200 | V | V |
| NTJ06-011□ | | 11 | 6 | 0.148 | 99 | 19 | 680 | 4 | -40~+200 | V | V |
| NTJ06-012□ | | 12 | 6 | 0.149 | 99 | 21 | 680 | 4 | -40~+200 | V | V |
| NTJ06-013□ | | 13 | 6 | 0.152 | 99 | 19 | 680 | 4 | -40~+200 | V | V |
| NTJ06-014□ | | 14 | 6 | 0.156 | 99 | 19 | 680 | 4 | -40~+200 | V | V |
| NTJ06-015□ | | 15 | 6 | 0.159 | 99 | 17 | 680 | 4 | -40~+200 | V | V |
| NTJ04-040□ | 40 | 4 | 0.292 | 101 | 20 | 680 | 4 | -40~+200 | V | V | |
| 20(L) | NTL12-0R7□ | 0.7 | 12 | 0.039 | 160 | 28 | 1200 | 5 | -40~+200 | V | V |
| | NTL12-001□ | 1 | 12 | 0.039 | 160 | 28 | 1200 | 5 | -40~+200 | V | V |
| | NTL12-002□ | 2 | 12 | 0.041 | 160 | 28 | 1200 | 5 | -40~+200 | V | V |
| | NTL12-2R5□ | 2.5 | 12 | 0.046 | 120 | 24 | 1200 | 5 | -40~+200 | V | V |
| | NTL12-003□ | 3 | 12 | 0.050 | 130 | 24 | 1200 | 5 | -40~+200 | V | V |
| | NTL10-005□ | 5 | 10 | 0.068 | 144 | 24 | 1200 | 5 | -40~+200 | V | V |
| | NTL10-006□ | 6 | 10 | 0.072 | 144 | 24 | 1200 | 5 | -40~+200 | V | V |

Remarks: □ means tolerance of R25 , L: ± 15%, M: ± 20%,

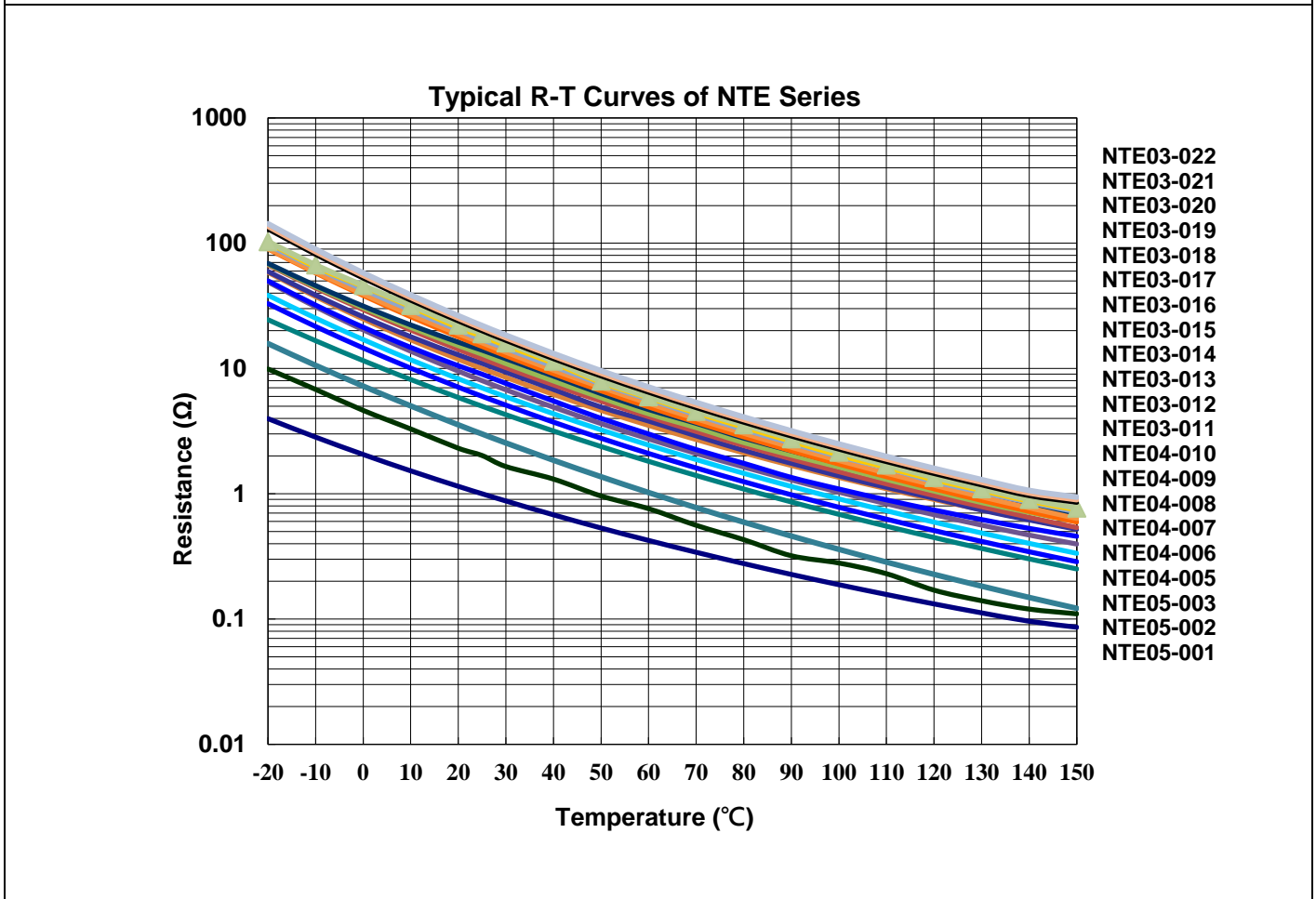
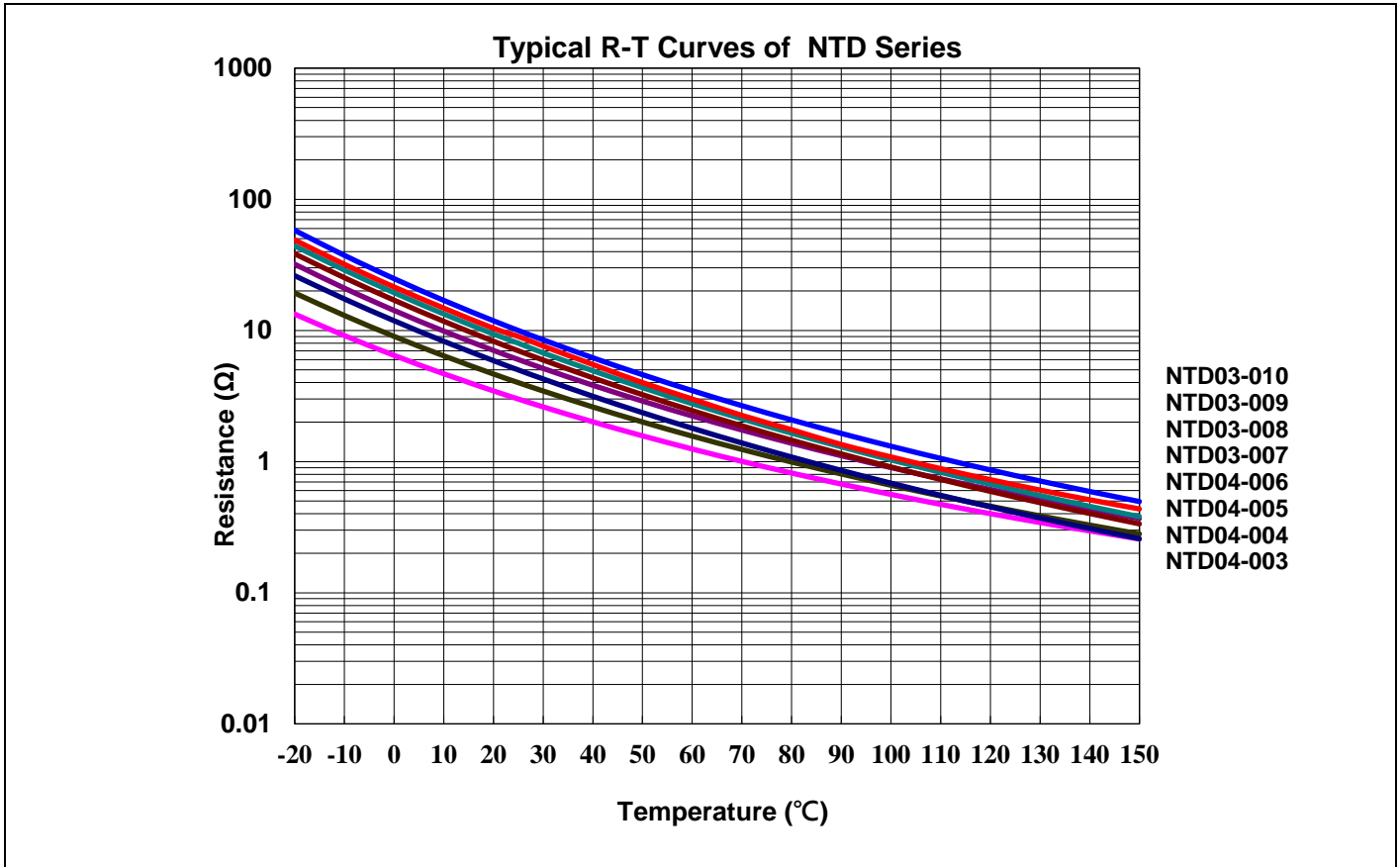
Reliability Test Requirements

| Test items Reference standard | Test conditions | | Criterion |
|---|--|--------------------|--|
| High Temperature Storage IEC 60068-2-2 | T _U ±5℃, 1000±24hrs | | No visible damage ΔR25/R25 ≦ 20% |
| Damp Heat, Steady State IEC 60068-2-78 | 40±2℃,90~95%RH , 1000±24hrs | | No visible damage ΔR25/R25 ≦ 20% |
| Endurance IEC 60539-1 | 25±5℃ , I _{max} .1000±24hrs | | No visible damage ΔR25/R25 ≦ 20% |
| Rapid Change of Temperature IEC 60068-2-14 | Step | Temperature (℃) | No visible damage ΔR25/R25 ≦ 20% |
| | 1 | T _L ± 5 | |
| | 2 | Room | |
| | 3 | T _U ± 5 | |
| | 4 | Room | |
| 5 Cycles | | | |
| Capacitance test standard specifications | 25±5℃ , C _{th} , interval 2mins. , Number of cycles: 1000 , C _{th} =Capacitance at 340 VDC | | No visible damage ΔR25/R25 ≦ 20% |
| Cyclic endurance IEC 60539-1 | 25±5℃ ,I _{max} .1min ON/5min OFF*1000cycles; | | No visible damage ΔR25/R25 ≦ 20% |
| Insulation Test MIL-STD-202F-Method 302 | 1000 VDC,1min | | No visible damage |
| Tensile Strength of Terminals IEC 60068-2-21 | Gradually applying the force specified and keeping the unit fixed for 10±1 sec. | | No visible damage ΔR25/R25 ≦ 10 % |
| | Terminal diameter (mm) | Force (kg) | |
| | 0.5<d ≦ 0.8 | 1.0 | |
| | 0.8<d ≦ 1.25 | 2.0 | |
| Bending Strength of Terminals IEC60068-2-21 | Follow spec: Hold specimen and apply the force specified below to each lead. Bend the specimen to 90°, then return to the original position. Repeat the procedure in the opposite direction. | | No visible damage ΔV/V1mA ≦ 5% |
| | Terminal diameter (mm) | Force (kg) | |
| | 0.5<d ≦ 0.8 | 0.5 | |
| | 0.8<d ≦ 1.25 | 1.0 | |
| | 1.25<d | 2.0 | |
| Solderability IEC 60068-2-20 | 245 ± 3 ℃ , 3 ± 0.3 sec | | ≧ 95% |
| Resistance to Soldering Heat IEC 60068-2-20 | 260 ± 3 ℃ ,10 ± 1 sec | | ΔR/R ≦ 5 % |

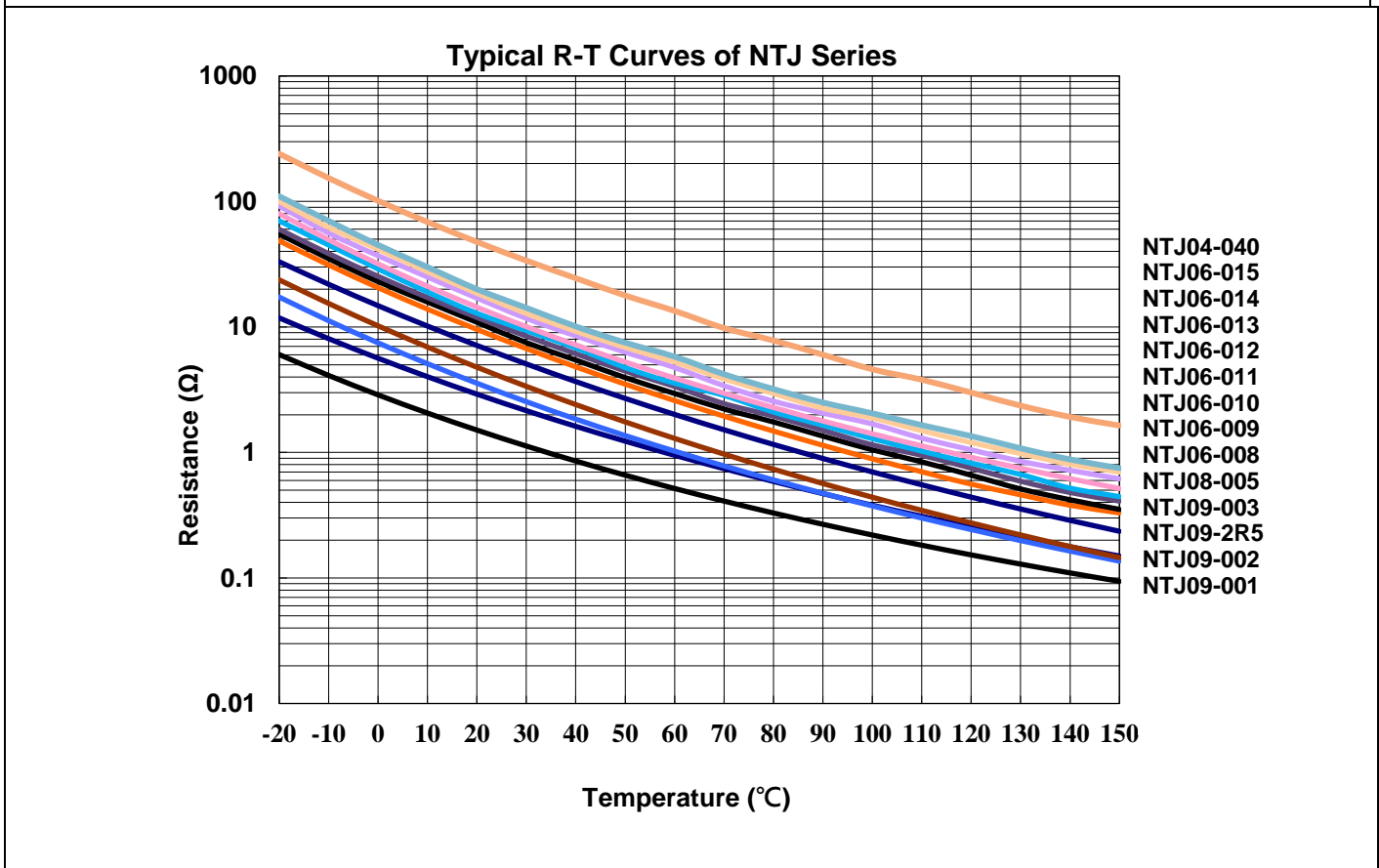
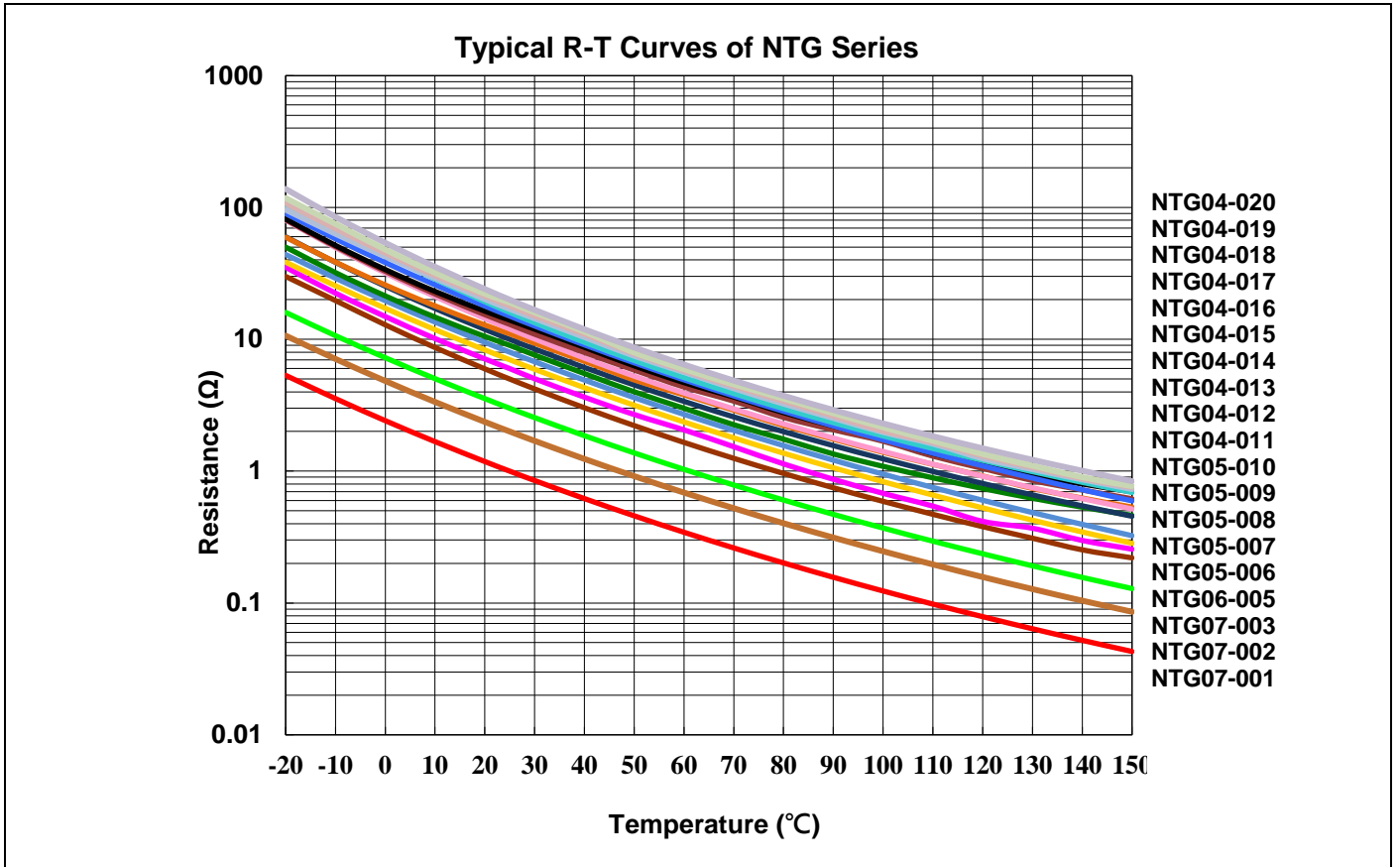
Resistance–Temperature Characteristic Curves



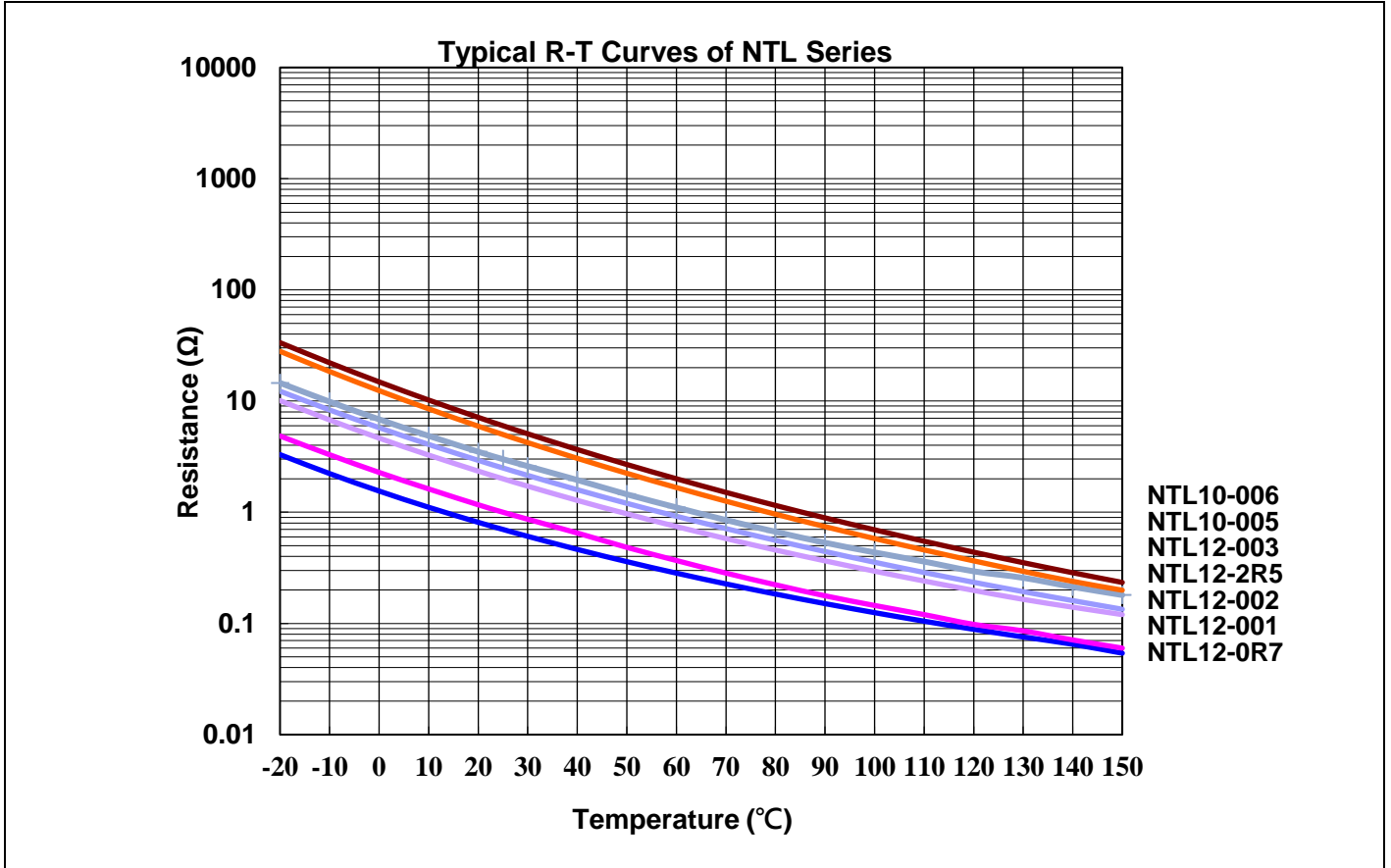
Resistance–Temperature Characteristic Curves



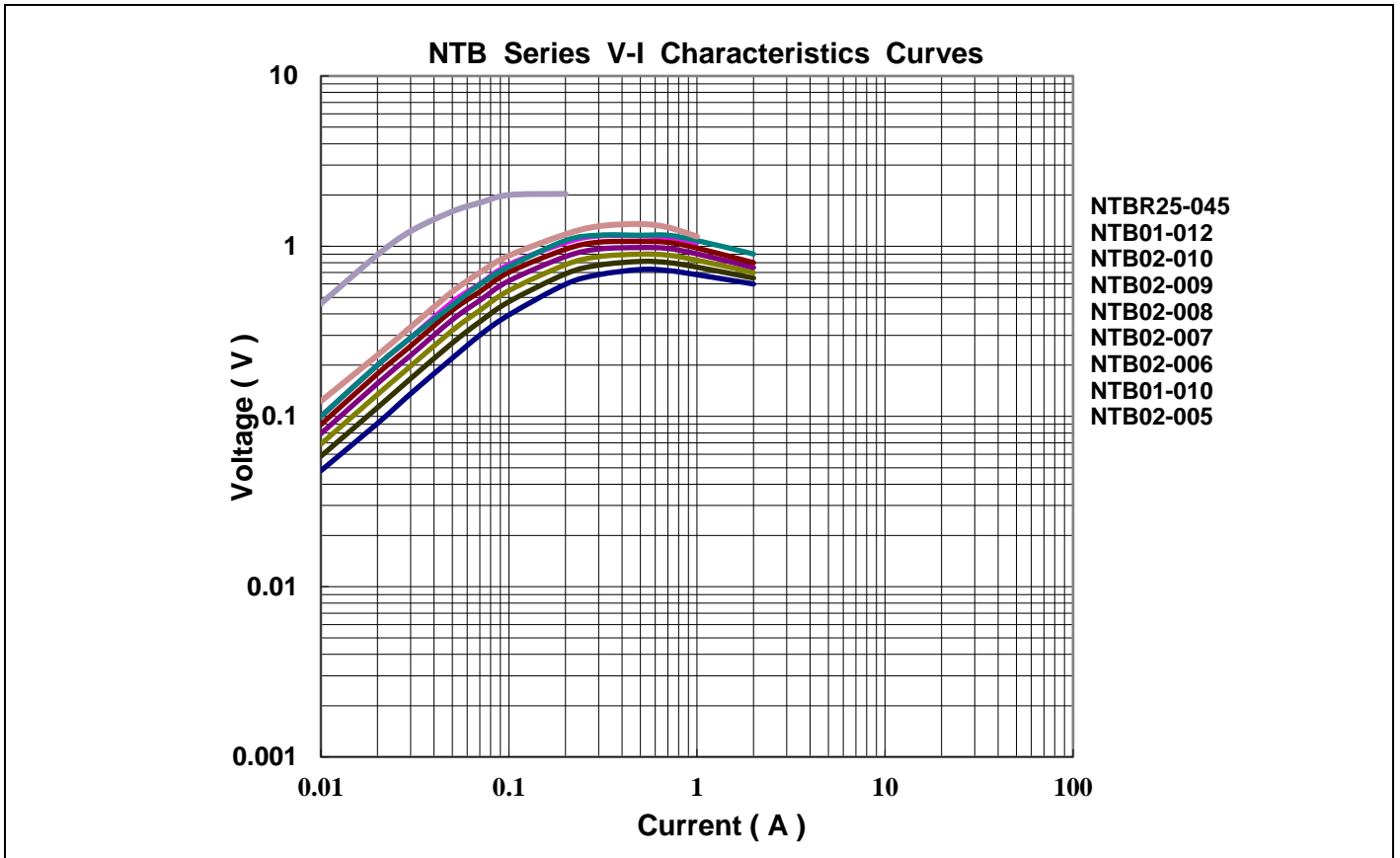
Resistance–Temperature Characteristic Curves



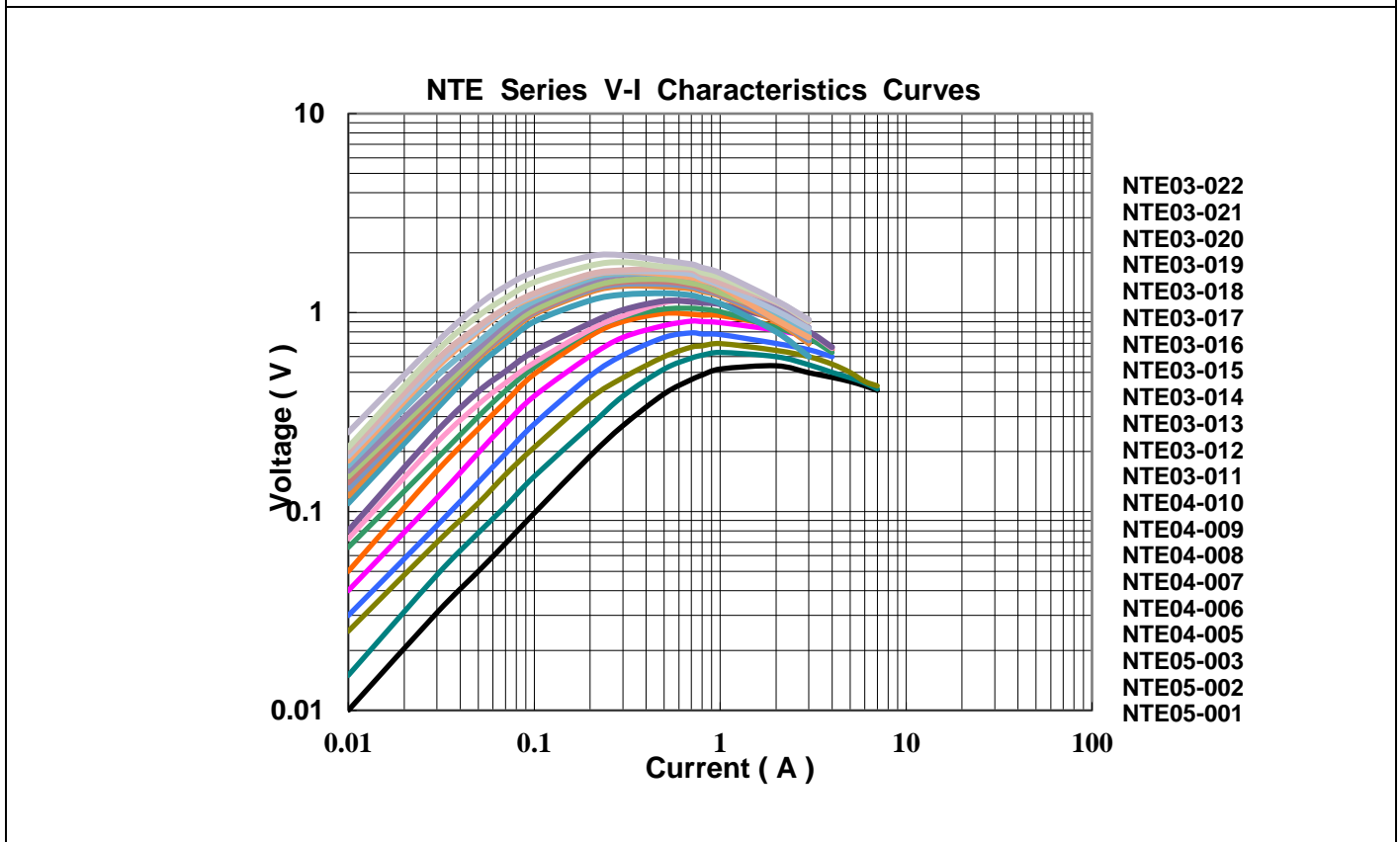
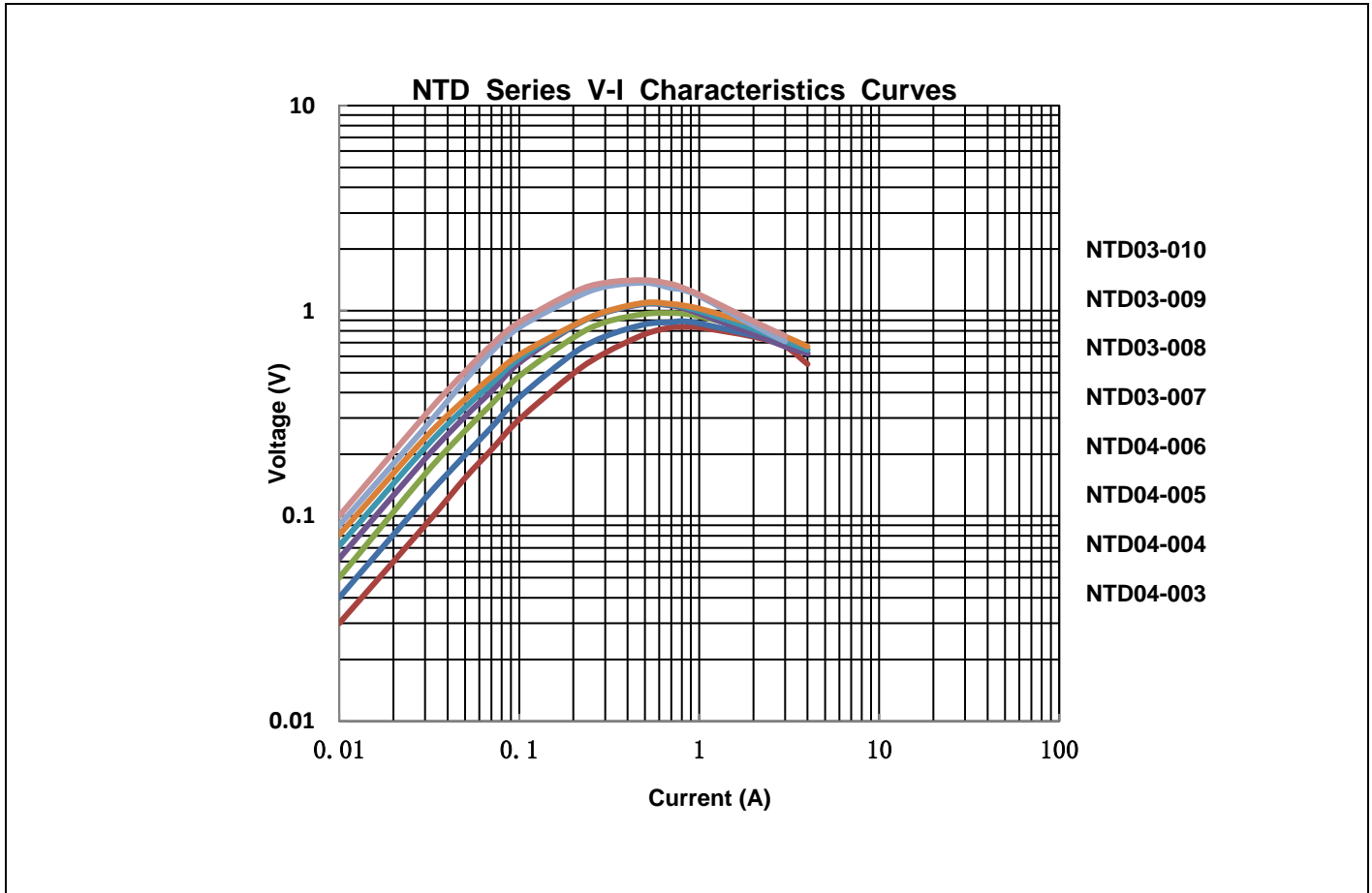
Resistance–Temperature Characteristic Curves



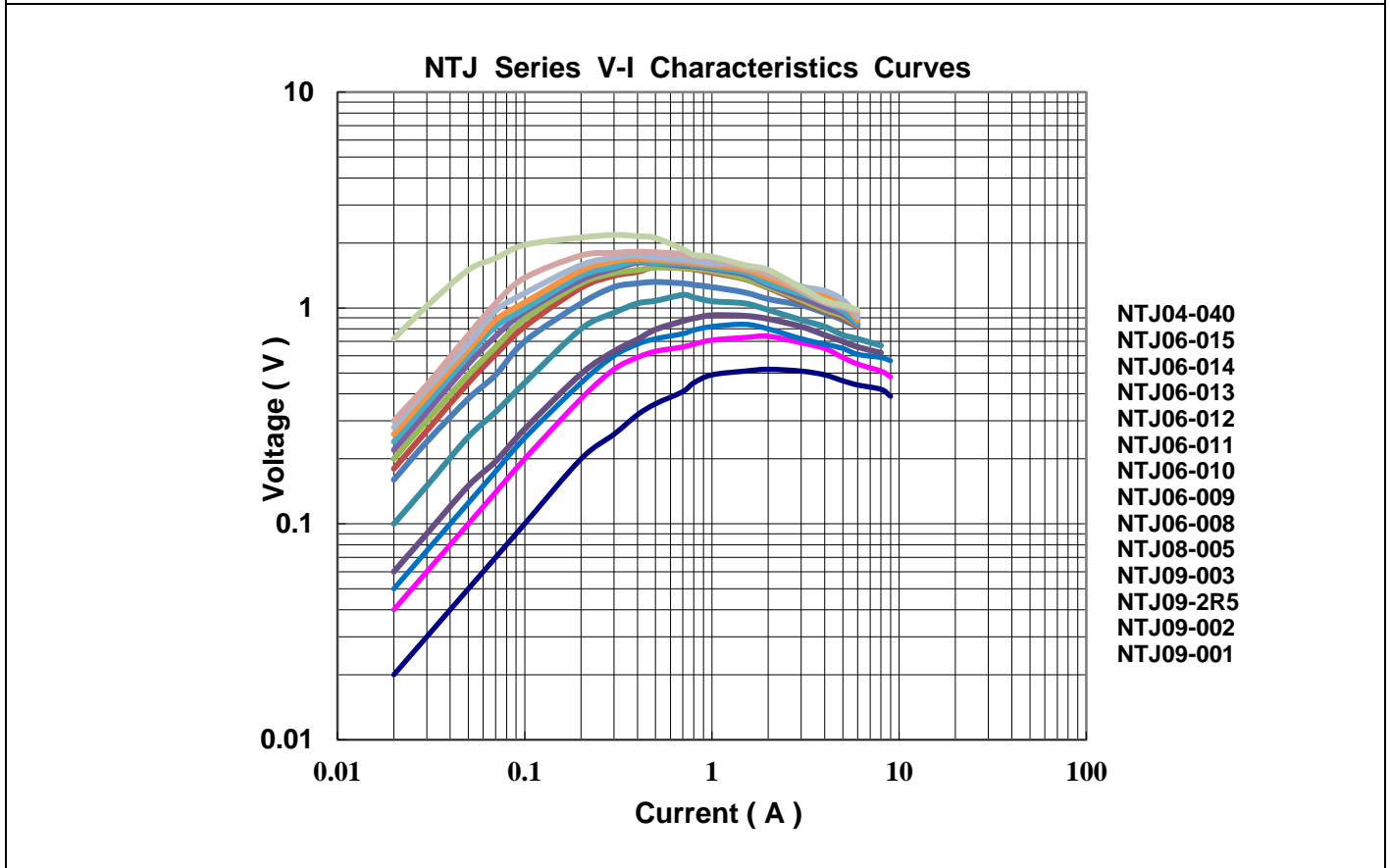
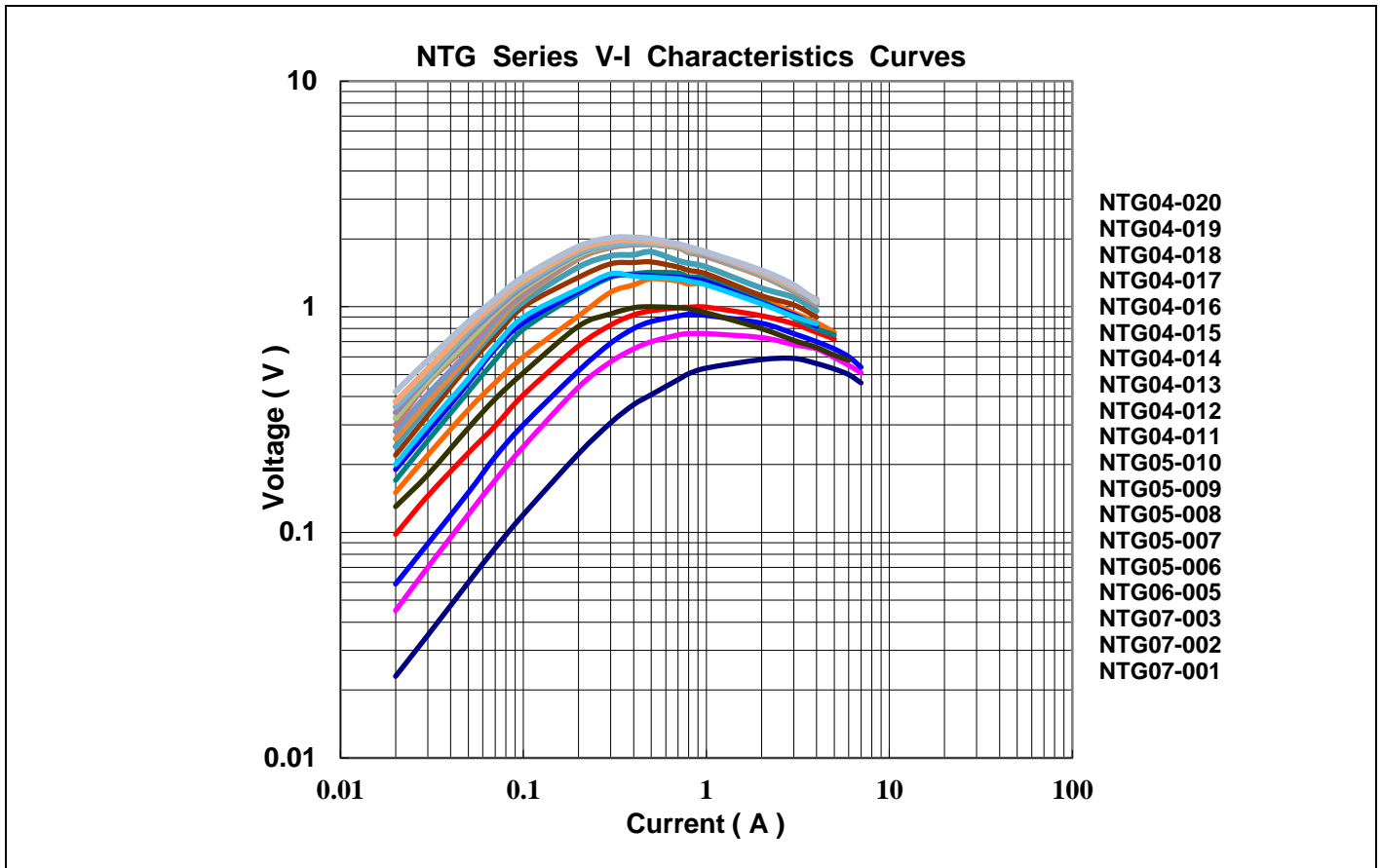
V–I Characteristic Curves



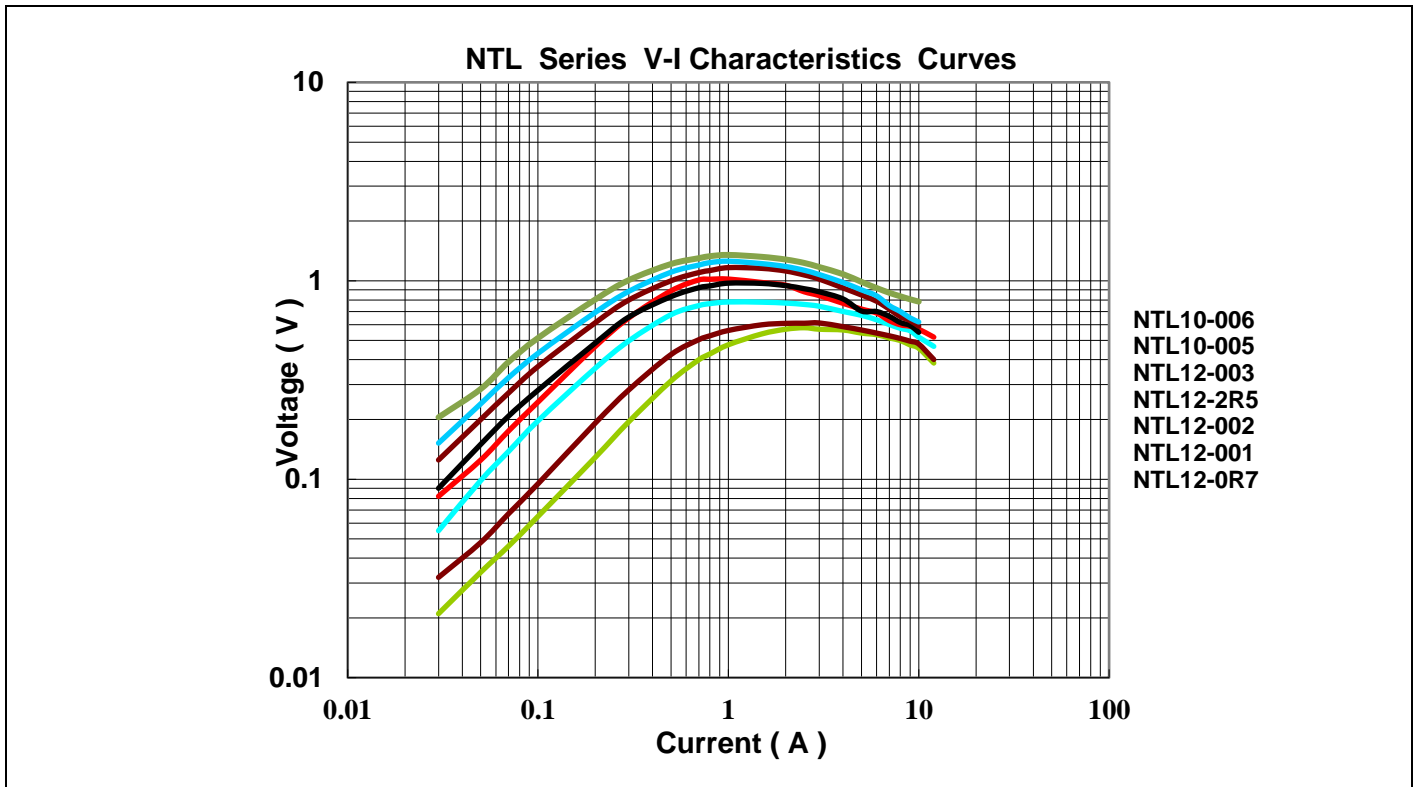
V-I Characteristic Curves



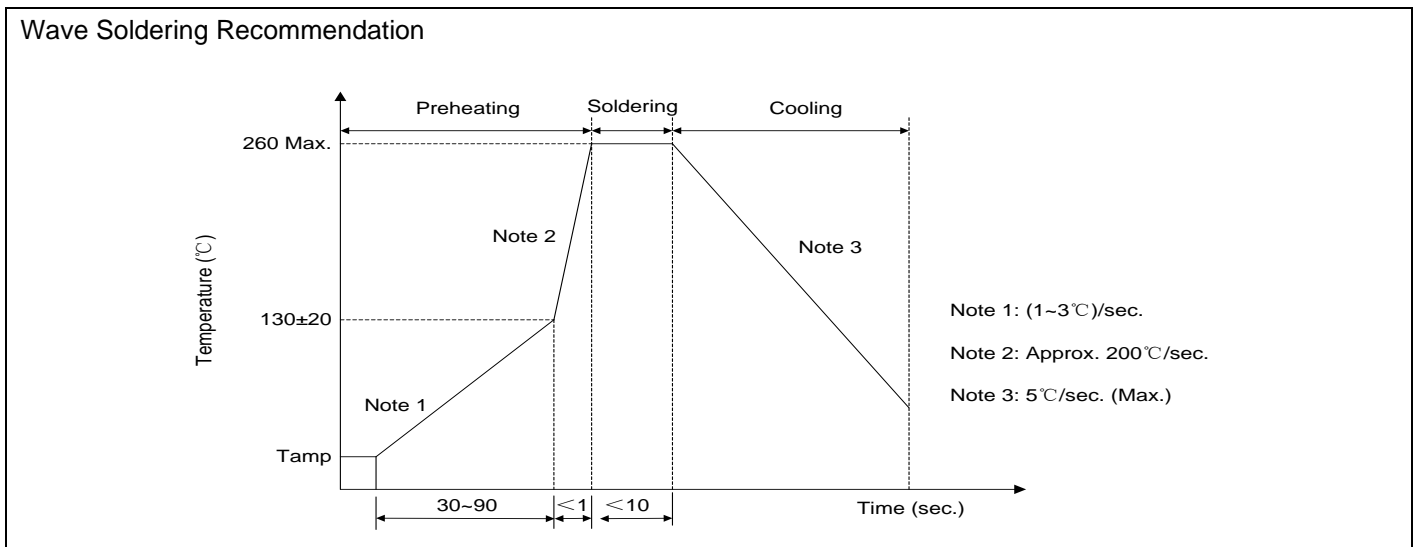
V-I Characteristic Curves



V-I Characteristic Curves



Soldering Recommendation

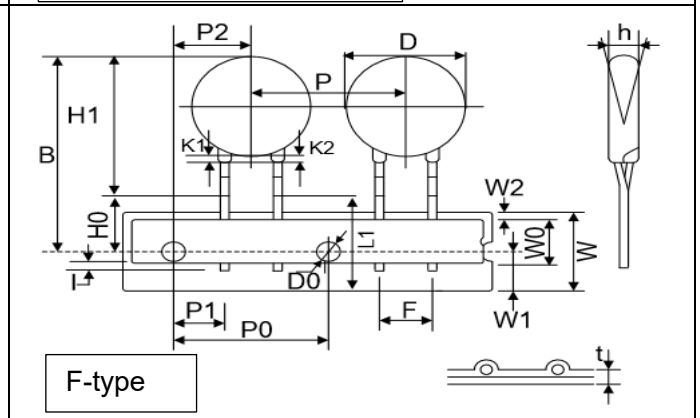
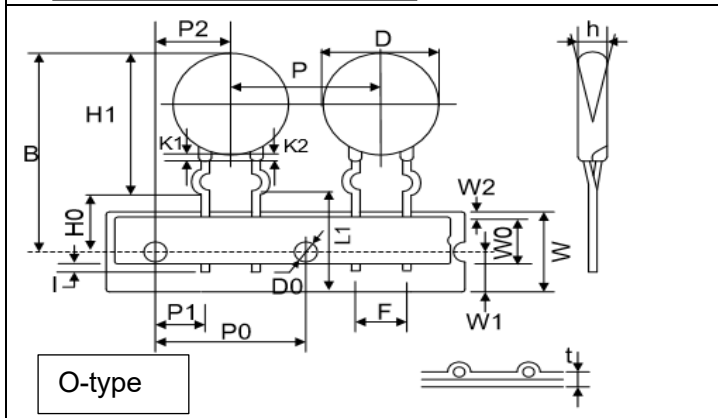
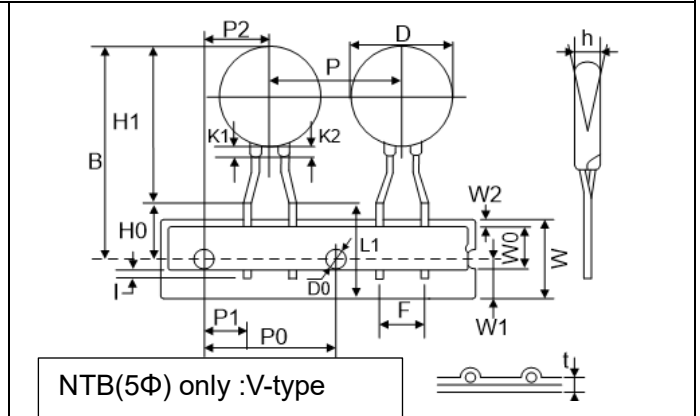
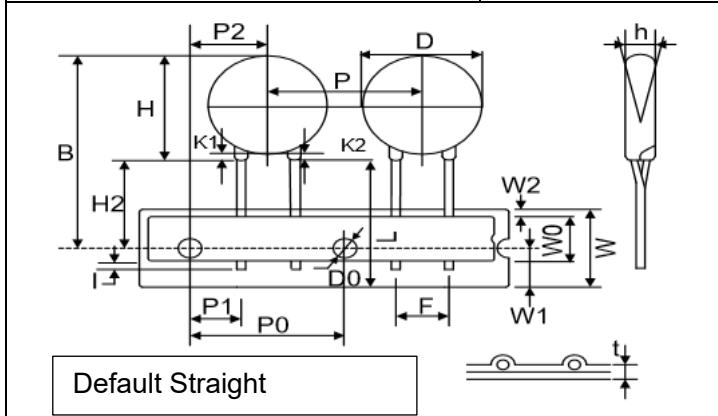
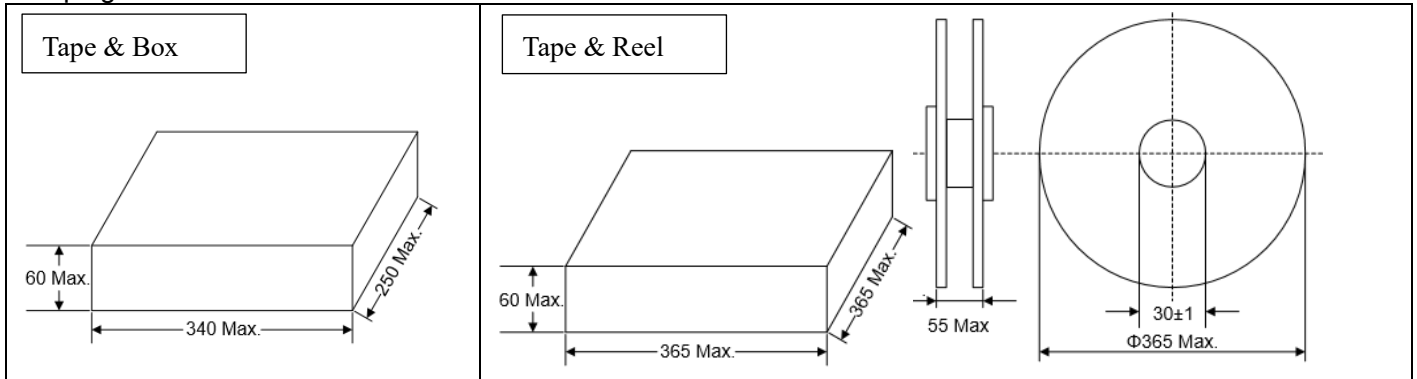


Recommendation Reworking Conditions with Soldering Iron

| Item | Conditions |
|-----------------------------------|------------------|
| Temperature of Soldering Iron-tip | 360°C (max.) |
| Soldering Time | 3 seconds (max.) |
| Distance from Thermistor | 2mm (min.) |

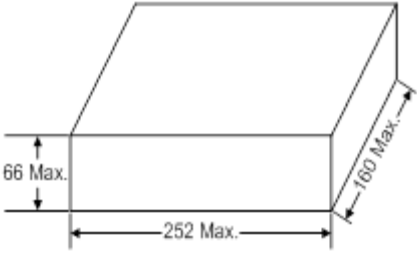
Packaging

■ Taping



| Dimensions | W | W0 | W1 | W2 | H0 | H2 | D0 | t | l |
|------------|--------------|--------------|-----------------|-------------|--------------|--------------|-------------|-------------------|---------------|
| (Unit: mm) | 18.0 ±1.0 | 12.0 ±1.0 | 9.0 +0.5/-0 | Max 3.0 | 16.0 ±1.0 | 20.0 ±2.0 | 4.0 ±0.2 | 0.6 ±0.1 | Max 2 |
| Disc Φ | P0 | P1 (±0.7) | P2 (+1.3/-0) | P (+1.0) | H (±1.0) | B (Max) | | SPQ P0: 12.7mm | |
| | | | | | | | | Taping & Box | Taping & Reel |
| 5(B) | 12.7±0.3 | 3.85 | 6.35 | 12.7 | 0±2 | 32 | | 1500pcs/Box | 1500pcs/Box |
| 8(D) | 12.7±0.3 | 3.85 | 6.35 | 12.7 | 0±2 | 33 | | 1500pcs/Box | 1500pcs/Box |
| 10(E) | 12.7±0.3 | 3.85 | 6.35 | 25.4 | 0±2 | 36 | | 500pcs/Box | 600pcs/Box |
| 13(G) | 12.7±1.0 | 8.95 | 12.7 | 25.4 | 0±4 | 40 | | 500pcs/Box | 600pcs/Box |
| 15(J) | 12.7±1.0 | 8.95 | 12.7 | 25.4 | 0±4 | 42 | | 500pcs/Box | 600pcs/Box |
| 20(L) | / | / | / | / | / | / | | / | / |

■ Bulk Packing

| Bulk (Unit: mm) | Disc Φ | SPQ (pcs / Bag) | Quantity | |
|---|--------------|--------------------|--------------|-------------|
| | | | (Bags / Box) | (pcs / Box) |
|  | Φ5 (NTB) | 700 | 2 | 1400 |
| | Φ8 (NTD) | 500 | 2 | 1000 |
| | Φ10 (NTE) | 500 | 2 | 1000 |
| | Φ13 (NTG) | 300 | 2 | 600 |
| | Φ15 (NTJ) | 125 | 4 | 500 |
| | Φ20 (NTL) | 75 | 4 | 300 |

Warehouse Storage Conditions

- Storage temperature: -10°C~+40°C.
- Relative humidity: ≤80%RH.
- Keep away from corrosive atmosphere and sunlight.
- Period of Storage: 1 year.