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SPECIFICATION FOR APPROVAL

CUSTOMER Hwei
 MODEL NO. _____
 PART NO. NTSA0104JZ231(RoHS)
 APPLICATION _____
 CUSTOMER P/N _____
 ISSUE DATE JAN.26.2021
 REV. NO 1.0
 REV. DATE _____

| FOR CUSTOMER APPROVAL | CHECKED BY |
|-----------------------|-------------|
| | Hu Feng |
| | APPROVED BY |
| | FM Chu |

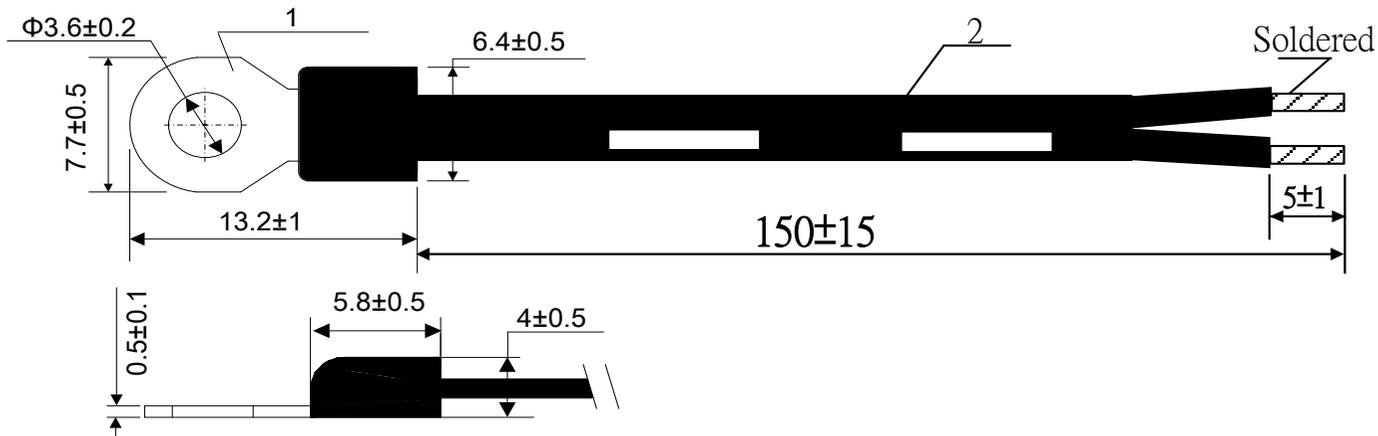


A. Material List

| NO. | ITEM | DESCRIPTION |
|-----|-----------|--|
| 1 | TERMINAL | MA236013BH204P000 |
| 2 | LEAD WIRE | UL4413 #26*2C TS Black (Black wire with White Stripe) |
| * | ELEMENT | NTC THERMISTOR |

B. Electrical Characteristic

| ITEM | VALUE |
|--------|----------------|
| R25 | 100K \pm 5% |
| B25/50 | 4400K \pm 5% |



| | | | | | | | | | | |
|------|-----------|--------------------|--------|--------------|------------|-------------|--|---------------|-------------------|----------|
| | | | | | | | Customer | Okamoto | | |
| | | | | | | | Customer P/N | | | |
| | | | | | | | Thinking P/N | NTSA0104JZ231 | | |
| | | | | | | | Drawing NO. | SA1503035 | | |
| | | | | | | | Date | 2021/1/26 | | |
| | | | | | | | Scale: | | Tol: ± 0.3 mm | Unit: mm |
| 1.0 | 2021/1/26 | NEW DRAWING | | CAO JINA HUI | Hu Feng | FM Chu | THINKING ELECTRONIC INDUSTRIAL CO.,LTD | | | |
| Rev. | Date | Subjects of Change | ECN No | Designed by | Checked by | Approved by | | | | |

Specification of NTC Thermistor for Temperature Measurement and Control

PART NO. NTSA0104JZ231

CUSTOMER P/N. _____

1. Electrical characteristics

| | Parameter | Symbol | Test Conditions | Min. | Nor. | Max. | Unit. |
|----|---|--------------------|--|-------|----------|--------|-------|
| a. | Resistance At 25°C | R ₂₅ | T _a =25°C±0.05°C P _T ≤0.1mW | 95.00 | 100 | 105.00 | KΩ |
| b. | Resistance At 50°C | R ₅₀ | T _a =50°C±0.05°C P _T ≤0.1mW | ----- | 31.927 | ----- | KΩ |
| c. | R ₂₅ /R ₅₀ | K | ----- | ----- | 3.132 | ----- | ----- |
| d | B Constant | B _{25/50} | (3853.887* LnK) | 4180 | 4400 | 4620 | K |
| e. | Thermal Dissipation Constant | δ | T _a =25°C | ----- | Apporx5 | ----- | mW/°C |
| f. | Thermal Time Constant | τ | 25°C→85°C T ₁ =25+(85-25)*63.2% ₆ =62.9°C | ----- | Apporx15 | ----- | Sec |
| g. | Insulation test | ----- | DC 500 V 3 Sec | 100 | ----- | ----- | MΩ |
| h | Hi-Pot Test (between lead wire and terminal) | ----- | 1500V AC 1Min | ----- | ----- | 10 | mA |

2. Maximun Ratings

| | Parameter | Specification | Unit |
|----|-----------------------------|----------------|------|
| a. | Operation Temperature Range | -20 ----- +125 | °C |

3. Reliability Test

| Item | Test Conditions | Variable |
|--------------------------|---|--|
| Temp. cycle test | -20 °C X 30min → +25 °C X 5min X 5Cycles +125 °C X 30min → +25 °C X 5min | Within ± 3 % |
| High Temperature Storage | 125± 5 °C , 1000 ± 24 hrs | No visible damage ΔR ₂₅ /R ₂₅ ≤ 3 % |
| low Temperature Storage | -20 °C ± 5 °C , 1000 ± 24 hrs | No visible damage ΔR ₂₅ /R ₂₅ ≤ 3 % |
| Humidity test | 40 °C 95 % RH X 1000 HRS | Within ± 3 % |

Install and use

1. Use this product within the specified temperature range.
2. Higher temperature may cause deterioration of the characteristics or the material quality of this product.
3. Do not melt the solder in resin head, when you solder this product. If you melt the solder in resin head, it has possibility that the break of wire, short and insulation damage.
4. Do not touch the resin head directly by solder iron. It may cause the melt of solder in resin head.
5. At least away from resin head 10mm above when lead dividing.
6. In case you cut the lead wire of this product less than 10mm from resin head, the heat of melted solder at lead wire edge is propagated easily to the resin head along the lead wire.
7. Radius of lead bending should be more than 1mm when lead bending.
Holding element by side lead wire is recommended when lead wire is bent or cut.
8. Do not apply an excessive force to the lead. Otherwise, it may cause junction between lead and element to break or crack.
9. The ceramic element of this product is fragile, and care must be taken not to load an excessive press-force or not to give a shock at handling. Such forces may cause cracking or chipping.
10. If you mold by resin this product, please evaluate the quality of this product before you use it.

Warehouse Storage Conditions of Products

To keep solderability of product from declining, the following storage condition is recommended.

1. Storage condition:

Temperature -10°C to +40°C

Humidity less than 75%RH (not dewing condition)

2. Storage term:

Use this product within 1 year after delivery by first-in and first-out stocking system.

3. Handling after unpacking:

After unpacking, reseal product promptly or store it in a sealed container with a drying agent.

4. Storage place:

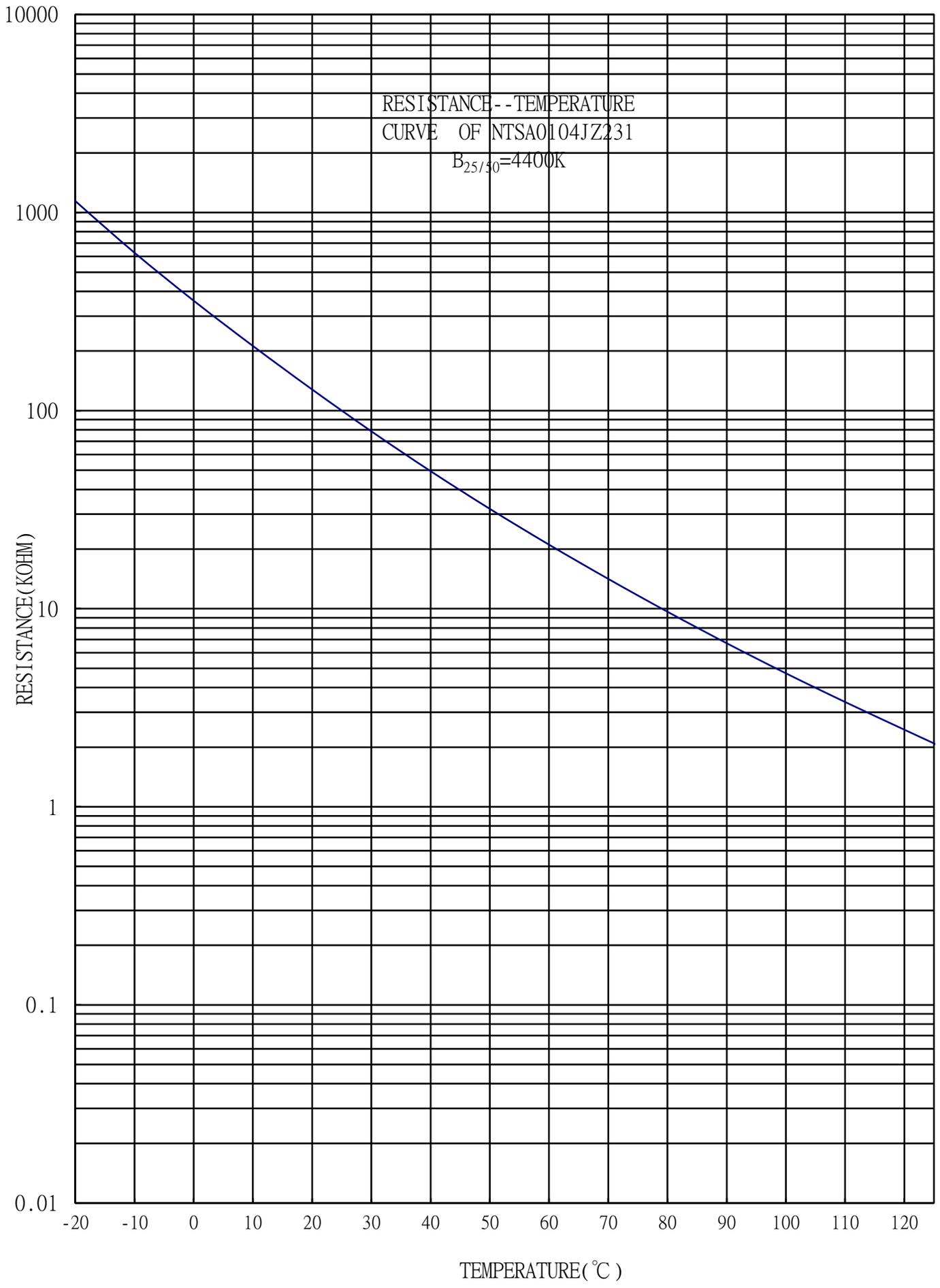
Do not store this product in corrosive gas (Sulfuric acid gas, Chlorine gas, etc.) or in direct sunlight.

Warn and note item

This product is designed for application in an ordinary environment (normal room temperature, humidity and atmospheric pressure).

Do not use under the following conditions because all of these factors can deteriorate the product characteristics or cause failures and burn-out

1. Corrosive gas or deoxidizing gas (Chlorine gas, Hydrogen sulfide gas, Ammonia gas, Sulfuric acid gas, Nitric oxide gas, etc.)
2. Volatile or flammable gas
3. Dusty conditions
4. Under vacuum, or under high or low pressure
5. Wet or humid locations; soak in the liquid or wash with liquid
6. Places with salt water, oils, chemical liquids or organic solvents and do not use directly with quick-drying glue.
7. Strong vibrations
8. Other places where similar hazardous conditions exist
9. Be sure to provide an appropriate fail-safe function on your product to prevent secondary damages that may be caused by the abnormal function or the failure of our product.



R - T Table

Part No. : NTSA0104JZ231

R25=100KΩ ±5%

B25/50 = 4400 K ± 5%

| Temperature (°C) | Rmax. (KΩ) | Rnor. (KΩ) | Rmin. (KΩ) | Temperature Tol. (°C) | |
|---------------------|---------------|---------------|---------------|--------------------------|------|
| -20 | 1357.51 | 1144.52 | 962.533 | -2.90 | 2.65 |
| -19 | 1272.18 | 1075.90 | 907.624 | -2.86 | 2.62 |
| -18 | 1192.59 | 1011.70 | 856.095 | -2.82 | 2.59 |
| -17 | 1118.38 | 951.650 | 807.750 | -2.78 | 2.56 |
| -16 | 1049.19 | 895.494 | 762.401 | -2.74 | 2.53 |
| -15 | 984.691 | 842.985 | 719.867 | -2.70 | 2.51 |
| -14 | 924.560 | 793.885 | 679.976 | -2.66 | 2.48 |
| -13 | 868.497 | 747.971 | 642.561 | -2.63 | 2.45 |
| -12 | 816.219 | 705.029 | 607.464 | -2.59 | 2.43 |
| -11 | 767.456 | 664.857 | 574.533 | -2.55 | 2.40 |
| -10 | 721.957 | 627.263 | 543.626 | -2.52 | 2.38 |
| -9 | 679.484 | 592.068 | 514.608 | -2.48 | 2.35 |
| -8 | 639.817 | 559.103 | 487.350 | -2.45 | 2.32 |
| -7 | 602.751 | 528.212 | 461.733 | -2.41 | 2.30 |
| -6 | 568.093 | 499.246 | 437.645 | -2.38 | 2.27 |
| -5 | 535.667 | 472.069 | 414.982 | -2.34 | 2.24 |
| -4 | 505.310 | 446.555 | 393.645 | -2.30 | 2.21 |
| -3 | 476.870 | 422.586 | 373.545 | -2.26 | 2.18 |
| -2 | 450.208 | 400.054 | 354.598 | -2.23 | 2.14 |
| -1 | 425.196 | 378.858 | 336.725 | -2.19 | 2.11 |
| 0 | 401.716 | 358.906 | 319.856 | -2.15 | 2.08 |
| 1 | 379.659 | 340.113 | 303.925 | -2.10 | 2.04 |
| 2 | 358.927 | 322.401 | 288.869 | -2.06 | 2.01 |
| 3 | 339.428 | 305.699 | 274.633 | -2.02 | 1.97 |
| 4 | 321.078 | 289.939 | 261.165 | -1.98 | 1.93 |
| 5 | 303.801 | 275.061 | 248.417 | -1.93 | 1.90 |
| 6 | 287.525 | 261.008 | 236.344 | -1.89 | 1.86 |
| 7 | 272.185 | 247.729 | 224.906 | -1.84 | 1.82 |
| 8 | 257.722 | 235.176 | 214.066 | -1.80 | 1.78 |
| 9 | 244.080 | 223.305 | 203.787 | -1.75 | 1.74 |
| 10 | 231.208 | 212.075 | 194.039 | -1.70 | 1.70 |
| 11 | 219.058 | 201.448 | 184.790 | -1.66 | 1.66 |
| 12 | 207.588 | 191.389 | 176.013 | -1.61 | 1.61 |
| 13 | 196.756 | 181.865 | 167.682 | -1.56 | 1.57 |
| 14 | 186.524 | 172.847 | 159.773 | -1.52 | 1.53 |
| 15 | 176.857 | 164.305 | 152.262 | -1.47 | 1.49 |
| 16 | 167.723 | 156.213 | 145.129 | -1.42 | 1.45 |
| 17 | 159.091 | 148.547 | 138.355 | -1.38 | 1.40 |
| 18 | 150.932 | 141.282 | 131.919 | -1.33 | 1.36 |
| 19 | 143.219 | 134.398 | 125.804 | -1.28 | 1.32 |
| 20 | 135.927 | 127.873 | 119.995 | -1.23 | 1.27 |
| 21 | 129.033 | 121.688 | 114.475 | -1.19 | 1.23 |
| 22 | 122.513 | 115.825 | 109.229 | -1.14 | 1.19 |
| 23 | 116.347 | 110.267 | 104.243 | -1.09 | 1.14 |
| 24 | 110.516 | 104.997 | 99.5042 | -1.05 | 1.10 |
| 25 | 105.000 | 100.000 | 95.0000 | -1.00 | 1.06 |

R - T Table

Part No. : NTSA0104JZ231

R25=100KΩ ±5%

B25/50 = 4400 K ± 5%

| Temperature (°C) | Rmax. (KΩ) | Rnor. (KΩ) | Rmin. (KΩ) | Temperature Tol. (°C) | |
|---------------------|---------------|---------------|---------------|--------------------------|------|
| 26 | 100.268 | 95.2614 | 90.2789 | -1.06 | 1.11 |
| 27 | 95.7684 | 90.7673 | 85.8123 | -1.11 | 1.16 |
| 28 | 91.4907 | 86.5047 | 81.5859 | -1.17 | 1.22 |
| 29 | 87.4231 | 82.4612 | 77.5864 | -1.23 | 1.27 |
| 30 | 83.5549 | 78.6250 | 73.8010 | -1.29 | 1.33 |
| 31 | 79.8759 | 74.9851 | 70.2178 | -1.34 | 1.38 |
| 32 | 76.3763 | 71.5309 | 66.8255 | -1.40 | 1.44 |
| 33 | 73.0469 | 68.2524 | 63.6133 | -1.46 | 1.49 |
| 34 | 69.8789 | 65.1402 | 60.5711 | -1.52 | 1.55 |
| 35 | 66.8641 | 62.1854 | 57.6894 | -1.58 | 1.60 |
| 36 | 63.9946 | 59.3794 | 54.9593 | -1.64 | 1.66 |
| 37 | 61.2627 | 56.7142 | 52.3721 | -1.71 | 1.71 |
| 38 | 58.6615 | 54.1822 | 49.9198 | -1.77 | 1.77 |
| 39 | 56.1841 | 51.7762 | 47.5949 | -1.83 | 1.83 |
| 40 | 53.8241 | 49.4895 | 45.3903 | -1.90 | 1.89 |
| 41 | 51.5756 | 47.3157 | 43.2991 | -1.96 | 1.94 |
| 42 | 49.4326 | 45.2485 | 41.3150 | -2.02 | 2.00 |
| 43 | 47.3898 | 43.2823 | 39.4321 | -2.09 | 2.06 |
| 44 | 45.4419 | 41.4118 | 37.6447 | -2.15 | 2.12 |
| 45 | 43.5842 | 39.6316 | 35.9474 | -2.22 | 2.17 |
| 46 | 41.8119 | 37.9371 | 34.3353 | -2.29 | 2.23 |
| 47 | 40.1207 | 36.3236 | 32.8036 | -2.35 | 2.29 |
| 48 | 38.5064 | 34.7868 | 31.3479 | -2.42 | 2.35 |
| 49 | 36.9652 | 33.3227 | 29.9641 | -2.49 | 2.41 |
| 50 | 35.4932 | 31.9274 | 28.6481 | -2.56 | 2.47 |
| 51 | 34.0870 | 30.5974 | 27.3963 | -2.62 | 2.52 |
| 52 | 32.7434 | 29.3291 | 26.2052 | -2.69 | 2.58 |
| 53 | 31.4591 | 28.1195 | 25.0715 | -2.76 | 2.64 |
| 54 | 30.2312 | 26.9653 | 23.9922 | -2.83 | 2.70 |
| 55 | 29.0569 | 25.8639 | 22.9643 | -2.90 | 2.76 |
| 56 | 27.9335 | 24.8125 | 21.9850 | -2.97 | 2.82 |
| 57 | 26.8587 | 23.8085 | 21.0519 | -3.04 | 2.87 |
| 58 | 25.8299 | 22.8495 | 20.1625 | -3.11 | 2.93 |
| 59 | 24.8450 | 21.9334 | 19.3145 | -3.18 | 2.99 |
| 60 | 23.9019 | 21.0578 | 18.5058 | -3.25 | 3.05 |
| 61 | 22.9986 | 20.2210 | 17.7344 | -3.32 | 3.11 |
| 62 | 22.1332 | 19.4208 | 16.9983 | -3.39 | 3.17 |
| 63 | 21.3039 | 18.6556 | 16.2957 | -3.46 | 3.22 |
| 64 | 20.5090 | 17.9236 | 15.6250 | -3.53 | 3.28 |
| 65 | 19.7470 | 17.2233 | 14.9846 | -3.60 | 3.34 |
| 66 | 19.0163 | 16.5531 | 14.3730 | -3.68 | 3.40 |
| 67 | 18.3155 | 15.9117 | 13.7887 | -3.75 | 3.46 |
| 68 | 17.6433 | 15.2975 | 13.2305 | -3.82 | 3.51 |
| 69 | 16.9983 | 14.7095 | 12.6970 | -3.89 | 3.57 |
| 70 | 16.3794 | 14.1462 | 12.1870 | -3.97 | 3.63 |
| 71 | 15.7854 | 13.6068 | 11.6995 | -4.04 | 3.69 |

R - T Table

Part No. : NTSA0104JZ231

R25=100KΩ ±5%

B25/50 = 4400 K ± 5%

| Temperature (°C) | Rmax. (KΩ) | Rnor. (KΩ) | Rmin. (KΩ) | Temperature Tol. (°C) | |
|---------------------|---------------|---------------|---------------|--------------------------|------|
| 72 | 15.2152 | 13.0899 | 11.2333 | -4.11 | 3.75 |
| 73 | 14.6678 | 12.5946 | 10.7874 | -4.19 | 3.81 |
| 74 | 14.1422 | 12.1200 | 10.3610 | -4.26 | 3.87 |
| 75 | 13.6374 | 11.6650 | 9.95299 | -4.34 | 3.93 |
| 76 | 13.1525 | 11.2289 | 9.56263 | -4.41 | 3.98 |
| 77 | 12.6868 | 10.8107 | 9.18907 | -4.49 | 4.04 |
| 78 | 12.2393 | 10.4098 | 8.83154 | -4.56 | 4.10 |
| 79 | 11.8094 | 10.0252 | 8.48930 | -4.64 | 4.16 |
| 80 | 11.3963 | 9.65638 | 8.16166 | -4.72 | 4.22 |
| 81 | 10.9992 | 9.30256 | 7.84795 | -4.80 | 4.29 |
| 82 | 10.6176 | 8.96313 | 7.54755 | -4.87 | 4.35 |
| 83 | 10.2507 | 8.63744 | 7.25985 | -4.95 | 4.41 |
| 84 | 9.89805 | 8.32491 | 6.98429 | -5.03 | 4.47 |
| 85 | 9.55896 | 8.02497 | 6.72031 | -5.11 | 4.53 |
| 86 | 9.23289 | 7.73708 | 6.46740 | -5.20 | 4.59 |
| 87 | 8.91932 | 7.46073 | 6.22507 | -5.28 | 4.66 |
| 88 | 8.61773 | 7.19542 | 5.99284 | -5.36 | 4.72 |
| 89 | 8.32764 | 6.94069 | 5.77027 | -5.44 | 4.78 |
| 90 | 8.04857 | 6.69608 | 5.55693 | -5.53 | 4.85 |
| 91 | 7.78008 | 6.46115 | 5.35241 | -5.61 | 4.91 |
| 92 | 7.52173 | 6.23551 | 5.15631 | -5.70 | 4.98 |
| 93 | 7.27311 | 6.01875 | 4.96827 | -5.79 | 5.04 |
| 94 | 7.03383 | 5.81050 | 4.78793 | -5.87 | 5.11 |
| 95 | 6.80350 | 5.61039 | 4.61494 | -5.96 | 5.18 |
| 96 | 6.58176 | 5.41808 | 4.44899 | -6.05 | 5.24 |
| 97 | 6.36826 | 5.23323 | 4.28975 | -6.14 | 5.31 |
| 98 | 6.16265 | 5.05553 | 4.13693 | -6.23 | 5.38 |
| 99 | 5.96462 | 4.88467 | 3.99025 | -6.32 | 5.44 |
| 100 | 5.77385 | 4.72036 | 3.84944 | -6.41 | 5.51 |
| 101 | 5.59004 | 4.56231 | 3.71422 | -6.50 | 5.58 |
| 102 | 5.41291 | 4.41027 | 3.58436 | -6.59 | 5.65 |
| 103 | 5.24218 | 4.26396 | 3.45961 | -6.69 | 5.71 |
| 104 | 5.07758 | 4.12315 | 3.33975 | -6.78 | 5.78 |
| 105 | 4.91886 | 3.98759 | 3.22455 | -6.87 | 5.85 |
| 106 | 4.76576 | 3.85706 | 3.11381 | -6.96 | 5.91 |
| 107 | 4.61807 | 3.73134 | 3.00733 | -7.05 | 5.98 |
| 108 | 4.47554 | 3.61021 | 2.90491 | -7.14 | 6.04 |
| 109 | 4.33796 | 3.49349 | 2.80638 | -7.23 | 6.11 |
| 110 | 4.20512 | 3.38097 | 2.71155 | -7.32 | 6.17 |
| 111 | 4.07682 | 3.27247 | 2.62025 | -7.41 | 6.23 |
| 112 | 3.95286 | 3.16782 | 2.53234 | -7.50 | 6.29 |
| 113 | 3.83306 | 3.06684 | 2.44765 | -7.59 | 6.35 |
| 114 | 3.71723 | 2.96937 | 2.36603 | -7.67 | 6.41 |
| 115 | 3.60522 | 2.87525 | 2.28735 | -7.76 | 6.47 |
| 116 | 3.49684 | 2.78434 | 2.21148 | -7.84 | 6.52 |
| 117 | 3.39194 | 2.69649 | 2.13827 | -7.92 | 6.57 |



R - T Table

Part No. : NTSA0104JZ231

R25=100KΩ ±5%

B25/50 = 4400 K ± 5%

| Temperature (°C) | Rmax. (KΩ) | Rnor. (KΩ) | Rmin. (KΩ) | Temperature Tol. (°C) | |
|---------------------|---------------|---------------|---------------|--------------------------|------|
| 118 | 3.29038 | 2.61157 | 2.06762 | -7.99 | 6.62 |
| 119 | 3.19200 | 2.52944 | 1.99940 | -8.07 | 6.67 |
| 120 | 3.09667 | 2.44999 | 1.93350 | -8.14 | 6.72 |
| 121 | 3.00424 | 2.37307 | 1.86982 | -8.21 | 6.76 |
| 122 | 2.91460 | 2.29860 | 1.80826 | -8.27 | 6.80 |
| 123 | 2.82762 | 2.22645 | 1.74870 | -8.33 | 6.83 |
| 124 | 2.74318 | 2.15651 | 1.69108 | -8.39 | 6.86 |
| 125 | 2.66116 | 2.08870 | 1.63528 | -8.44 | 6.89 |