

TX Series

Thick Film Chip Thermistor



FEATURES

- High mechanical strength and reliability are available due to thermistor film and glass-coated structure on alumina substrate
- Thickness does not change on any resistance value
- High solder ability and heat resistance are available due to triple structure electrodes
- AEC -Q200 is available
- UL1434 can be available in some parts
- Some parts can resist in operating temperature range up to 150°C



SERIES SPECIFICATIONS

| Series | Size | Dissipation Factor* in Air $\theta \leq 1.5 \text{ mW}/^\circ\text{C}$ | Thermal Time | Rated Power (25°C) |
|--------|------|---|---|-----------------------|
| | | | Constant in Air $\tau \leq 5.0 \text{ sec.}$ | |
| TX08 | 0805 | 1.3 mW/°C | 2.5 sec. | 130mW |
| TX06 | 0603 | 1.2 mW/°C | 2.0 sec. | 120mW |
| TX04 | 0402 | 1.1 mW/°C | 1.5 sec. | 110mW |

*Dissipation factor values depend on measurement procedure and materials used.

CHARACTERISTICS

| | |
|-------------------------------|--|
| Resistance Tolerance | ±1%, ±2%, ±3%, ±5%, ±10% |
| B-Value | Determined by zero-power resistance at 25°C and 85°C |
| B-value Tolerance | ±1%, ±2%, ±3%, ±5% |
| Operating Temp. Range | -40 ~ +125°C |
| Max. Permissible Power | 5mW |

Resistance Temperature Characteristics

| Temp. °C | Resistance (25°C) | | | | | | | | | |
|----------|---------------------|--------|--------|---------|---------|---------|---------|-----------|-----------|-----------|
| | 1KΩ | 1KΩ | 1KΩ | 10KΩ | 10KΩ | 10KΩ | 10KΩ | 100KΩ | 100KΩ | 100KΩ |
| | B-value (25°C/85°C) | | | | | | | | | |
| | 2750K | 3000K | 3200K | 3450K | 3700K | 3900K | 4100K | 4300K | 4500K | 4700K |
| -40 | 11,290 | 14,270 | 17,200 | 217,300 | 274,600 | 331,000 | 399,100 | 4,039,000 | 4,870,000 | 5,871,000 |
| -35 | 9,012 | 11,130 | 13,180 | 162,800 | 201,100 | 238,200 | 282,000 | 2,878,000 | 3,408,000 | 4,036,000 |
| -30 | 7,248 | 8,761 | 10,200 | 123,200 | 149,000 | 173,400 | 201,800 | 2,073,000 | 2,413,000 | 2,808,000 |
| -25 | 5,872 | 6,953 | 7,959 | 94,240 | 111,600 | 127,700 | 146,200 | 1,508,000 | 1,727,000 | 1,976,000 |
| -20 | 4,791 | 5,561 | 6,265 | 72,720 | 84,410 | 95,100 | 107,100 | 1,108,000 | 1,248,000 | 1,407,000 |
| -15 | 3,935 | 4,481 | 4,971 | 56,620 | 64,470 | 71,530 | 79,370 | 821,600 | 911,600 | 1,011,000 |
| -10 | 3,253 | 3,636 | 3,975 | 44,450 | 49,690 | 54,330 | 59,400 | 614,500 | 671,900 | 734,600 |
| -5 | 2,705 | 2,971 | 3,202 | 35,170 | 38,630 | 41,640 | 44,890 | 463,500 | 499,700 | 538,600 |
| 0 | 2,262 | 2,443 | 2,597 | 28,040 | 30,280 | 32,200 | 34,240 | 352,500 | 374,800 | 398,500 |
| 5 | 1,902 | 2,020 | 2,120 | 22,520 | 23,920 | 25,100 | 26,340 | 270,100 | 283,400 | 297,40 |
| 10 | 1,608 | 1,681 | 1,741 | 18,210 | 19,040 | 19,730 | 20,440 | 208,500 | 216,000 | 223,900 |
| 15 | 1,366 | 1,406 | 1,439 | 14,820 | 15,260 | 15,620 | 15,990 | 162,100 | 165,900 | 169,800 |
| 20 | 1,166 | 1,183 | 1,196 | 12,130 | 12,310 | 12,450 | 12,600 | 126,900 | 128,400 | 129,800 |
| 25 | 1,000 | 1,000 | 1,000 | 10,000 | 10,000 | 10,000 | 10,000 | 100,000 | 100,000 | 100,000 |
| 30 | 861.3 | 849.5 | 840.1 | 8,286 | 8,172 | 8,082 | 7,993 | 79,300 | 78,430 | 77,570 |
| 35 | 745.0 | 725.0 | 709.4 | 6,903 | 6,718 | 6,573 | 6,432 | 63,280 | 61,920 | 60,580 |
| 40 | 647.0 | 621.5 | 601.8 | 5,782 | 5,554 | 5,378 | 5,208 | 50,790 | 49,190 | 47,630 |
| 45 | 564.1 | 535.1 | 513.0 | 4,867 | 4,617 | 4,426 | 4,243 | 41,010 | 39,310 | 37,690 |
| 50 | 493.6 | 462.6 | 439.2 | 4,116 | 3,858 | 3,663 | 3,477 | 33,290 | 31,610 | 30,010 |
| 55 | 433.5 | 401.5 | 377.7 | 3,498 | 3,240 | 3,047 | 2,866 | 27,170 | 25,560 | 24,040 |
| 60 | 382.1 | 349.9 | 326.1 | 2,986 | 2,734 | 2,548 | 2,375 | 22,300 | 20,780 | 19,360 |
| 65 | 337.9 | 306.0 | 282.6 | 2,560 | 2,318 | 2,141 | 1,978 | 18,390 | 16,980 | 15,690 |
| 70 | 299.8 | 268.6 | 246.0 | 2,203 | 1,974 | 1,808 | 1,656 | 15,240 | 13,960 | 12,780 |
| 75 | 266.8 | 236.5 | 214.8 | 1,904 | 1,688 | 1,533 | 1,392 | 12,690 | 11,530 | 10,470 |
| 80 | 238.2 | 209.0 | 188.3 | 1,652 | 1,450 | 1,306 | 1,177 | 10,620 | 9,566 | 8,617 |
| 85 | 213.3 | 185.3 | 165.6 | 1,439 | 1,251 | 1,118 | 998.8 | 8,927 | 7,978 | 7,130 |
| 90 | 191.5 | 164.8 | 146.2 | 1,258 | 1,083 | 960.2 | 851.5 | 7,537 | 6,684 | 5,928 |
| 95 | 172.4 | 147.0 | 129.4 | 1,103 | 940.9 | 828.2 | 729.0 | 6,392 | 5,626 | 4,953 |

Standard Resistance Range @25°C

| B-value (25°C/85°C) | TX08 | TX06 | TX04 |
|---------------------|----------|----------|----------|
| 4510~4800K | 25K~500K | 50K~2M | 75K~1M |
| 4410~4500K | 15K~400K | 20K~1M | 45K~500K |
| 4210~4400K | 10K~100K | 15K~200K | 30K~100K |
| 4010~4200K | 3K~100K | 5K~200K | 8K~100K |
| 3810~4000K | 1K~50K | 2K~100K | 4K~50K |
| 3610~3800K | 500~30K | 1K~50K | 1.5K~30K |
| 3410~3600K | 500~30K | 1K~50K | 1.5K~30K |
| 3210~3400K | 500~30K | 1K~50K | 1.5K~30K |
| 3010~3200K | 400~10K | 650~20K | 1.2K~10K |
| 2810~3000K | 250~5K | 400~10K | 750~5K |
| 2610~2800K | 80~2K | 100~5K | 270~2K |
| 2410~2600K | 50~1K | 80~2K | 150~1K |

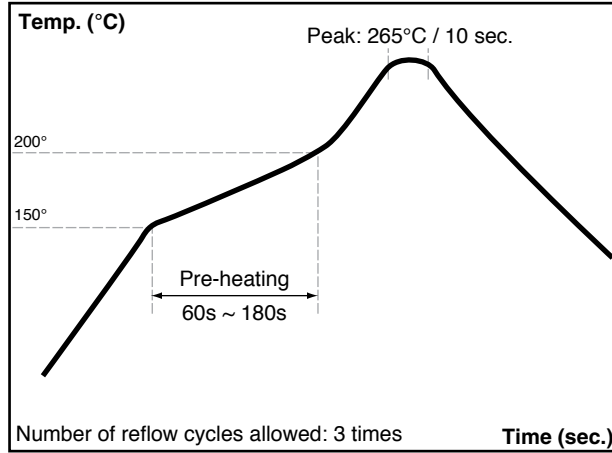
TX Series

Thick Film Chip Thermistor

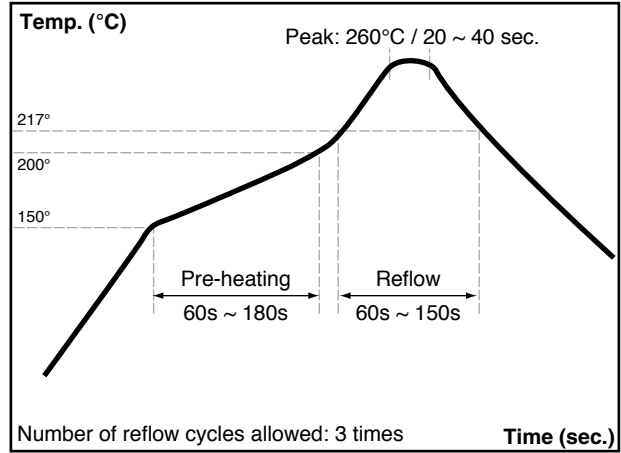
SOLDERING

Solder: Pb-free solder Sn-3.0Ag-0.5Cu

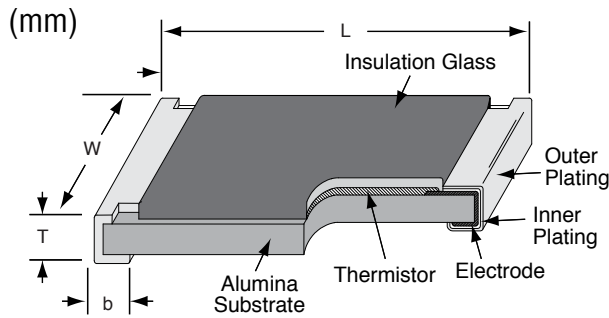
Flow



Reflow



DIMENSIONS



| Type | Inch size | L | W | t | b | Qty/reel |
|------|-----------|------------|------------|------------|------------------|----------|
| TX08 | 0805 | 2.00 ±0.20 | 1.25 ±0.20 | 0.55 ±0.10 | 0.40 ±0.20 | 5,000 |
| TX06 | 0603 | 1.60 ±0.15 | 0.80 ±0.15 | 0.50 ±0.10 | 0.30 ±0.20 | 5,000 |
| TX04 | 0402 | 1.00 ±0.05 | 0.50 ±0.05 | 0.35 ±0.05 | 0.25 +0.05/-0.10 | 10,000 |

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PACKAGING

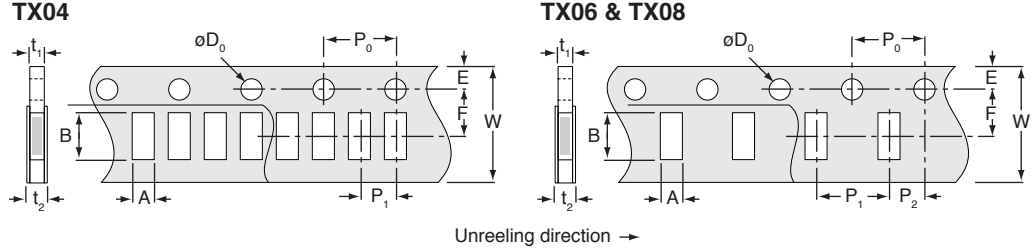
(mm)

Type: Rectangular punched carrier system

Carrier tape: Paper

Top cover tape: Thermal adhesion plastics

Bottom cover tape: Thermal adhesion paper

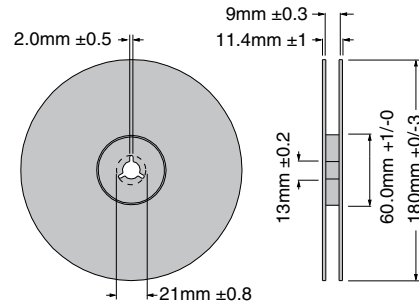
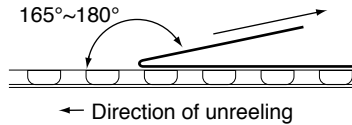


| Type | A | B | W | F | E | P1 | P2 | P0 | D0 | t1 | t2 | Qty./reel |
|------|------------|------------|------------|------------|------------|------------|------------|------------|------------|---------|---------|-----------|
| TX04 | 0.65 ±0.10 | 1.15 ±0.10 | 8.00 ±0.20 | 3.50 ±0.05 | 1.75 ±0.10 | 2.00 ±0.05 | | 4.00 ±0.10 | 1.55 ±0.05 | 0.50max | 1.00max | 10,000 |
| TX06 | 1.10 ±0.20 | 1.90 ±0.20 | 8.00 ±0.20 | 3.50 ±0.05 | 1.75 ±0.10 | 4.00 ±0.10 | 2.00 ±0.05 | 4.00 ±0.10 | 1.55 ±0.05 | 1.00max | 1.40max | 5,000 |
| TX08 | 1.65 ±0.20 | 2.40 ±0.20 | 8.00 ±0.20 | 3.50 ±0.05 | 1.75 ±0.10 | 4.00 ±0.10 | 2.00 ±0.05 | 4.00 ±0.10 | 1.55 ±0.05 | 1.00max | 1.40max | 5,000 |

Pitch tolerance over any 10 pitches of P0 is ±0.2mm

Strength of carrier tape and cover tape: 10N(1.02kgf) or more

Peel force of top cover tape: 5~70gf (Peeling angle = 165~180°, peeling speed = about 200mm/min.)



ORDERING INFORMATION

| TX series | Size | Res. Tolerance | Resistance | B-value | Tape & Reel |
|-----------|------|----------------|------------|---------|-------------|
| TX08 | J | 4 | 72 | H | 3480 |
| | | | | | ER |

04 = 0402
 06 = 0603
 08 = 0805
 F = ±1%
 G = ±2%
 H = ±3%
 J = ±5%
 K = ±10%

Standard Part Numbers

| Part Number | B25/85 |
|-----------------|--------|
| TX04F103F3435ER | 3435K |
| TX04G104F4100ER | 4100K |
| TX04G303G3950ER | 3950K |
| TX04F103F3380ER | 3380K |
| TX06F103F3435ER | 3435K |
| TX06F104F4100ER | 4100K |
| TX06F473H4500ER | 4500K |
| TX06H302F3990ER | 3990K |
| TX06F104F4390ER | 4390K |
| TX08F103F3435ER | 3450K |
| TX08J472H3480ER | 3480K |

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