



STANDARD RESISTOR DECADE CHART / REFERENCE

| E24 | E12 | E24 | E12 |
|----------|------|----------|------|
| 2% 5% | 10% | 2% 5% | 10% |
| 10.0 | 10.0 | 33.0 | 33.0 |
| 11.0 | | 36.0 | |
| 12.0 | 12.0 | 39.0 | 39.0 |
| 13.0 | | 43.0 | |
| 15.0 | 15.0 | 47.0 | 47.0 |
| 16.0 | | 51.0 | |
| 18.0 | 18.0 | 56.0 | 56.0 |
| 20.0 | | 62.0 | |
| 22.0 | 22.0 | 68.0 | 68.0 |
| 24.0 | | 75.0 | |
| 27.0 | 27.0 | 82.0 | 82.0 |
| 30.0 | | 91.0 | |

Standard resistance values are obtained from the decade table by multiplying by factors of 10. Example: 49.9 can be 49.9 Ω, 499 Ω, 4.99kΩ, 49.9 KΩ, or 499KΩ. For 5% value, 1st two digits are significant. For 1% value, 1st three digits are significant. Last digit is multiplier.

| E192 | E96 | E192 | E96 | E192 | E96 | E192 | E96 | E192 | E96 | E192 | E96 | E192 | E96 | E192 | E96 |
|-----------------------|---------------------|-----------------------|---------------------|-----------------------|---------------------|-----------------------|---------------------|-----------------------|---------------------|-----------------------|---------------------|-----------------------|---------------------|-----------------------|---------------------|
| 0.1% 0.25% 0.5% | 1% 0.25% 0.5% | 0.1% 0.25% 0.5% | 1% 0.25% 0.5% | 0.1% 0.25% 0.5% | 1% 0.25% 0.5% | 0.1% 0.25% 0.5% | 1% 0.25% 0.5% | 0.1% 0.25% 0.5% | 1% 0.25% 0.5% | 0.1% 0.25% 0.5% | 1% 0.25% 0.5% | 0.1% 0.25% 0.5% | 1% 0.25% 0.5% | 0.1% 0.25% 0.5% | 1% 0.25% 0.5% |
| 10.0 | 10.0 | 13.3 | 13.3 | 17.8 | 17.8 | 23.7 | 23.7 | 31.6 | 31.6 | 42.2 | 42.2 | 56.2 | 56.2 | 75.0 | 75.0 |
| 10.1 | | 13.5 | | 18.0 | | 24.0 | | 32.0 | | 42.7 | | 56.9 | | 75.9 | |
| 10.2 | 10.2 | 13.7 | 13.7 | 18.2 | 18.2 | 24.3 | 24.3 | 32.4 | 32.4 | 43.2 | 43.2 | 57.6 | 57.6 | 76.8 | 76.8 |
| 10.4 | | 13.8 | | 18.4 | | 24.6 | | 32.8 | | 43.7 | | 58.3 | | 77.7 | |
| 10.5 | 10.5 | 14.0 | 14.0 | 18.7 | 18.7 | 24.9 | 24.9 | 33.2 | 33.2 | 44.2 | 44.2 | 59.0 | 59 | 78.7 | 78.7 |
| 10.6 | | 14.2 | | 18.9 | | 25.2 | | 33.6 | | 44.8 | | 59.7 | | 79.6 | |
| 10.7 | 10.7 | 14.3 | 14.3 | 19.1 | 19.1 | 25.5 | 25.5 | 34.0 | 34 | 45.3 | 45.3 | 60.4 | 60.4 | 80.6 | 80.6 |
| 10.9 | | 14.5 | | 19.3 | | 25.8 | | 34.4 | | 45.9 | | 61.2 | | 81.6 | |
| 11.0 | 11.0 | 14.7 | 14.7 | 19.6 | 19.6 | 26.1 | 26.1 | 34.8 | 34.8 | 46.4 | 46.4 | 61.9 | 61.9 | 82.5 | 82.5 |
| 11.1 | | 14.9 | | 19.8 | | 26.4 | | 35.2 | | 47.0 | | 62.6 | | 83.5 | |
| 11.3 | 11.3 | 15.0 | 15.0 | 20.0 | 20.0 | 26.7 | 26.7 | 35.7 | 35.7 | 47.5 | 47.5 | 63.4 | 63.4 | 84.5 | 84.5 |
| 11.4 | | 15.2 | | 20.3 | | 27.1 | | 36.1 | | 48.1 | | 64.2 | | 85.6 | |
| 11.5 | 11.5 | 15.4 | 15.4 | 20.5 | 20.5 | 27.4 | 27.4 | 36.5 | 36.5 | 48.7 | 48.7 | 64.9 | 64.9 | 86.6 | 86.6 |
| 11.7 | | 15.6 | | 20.8 | | 27.7 | | 37.0 | | 49.3 | | 65.7 | | 87.6 | |
| 11.8 | 11.8 | 15.8 | 15.8 | 21.0 | 21.0 | 28.0 | 28.0 | 37.4 | 37.4 | 49.9 | 49.9 | 66.5 | 66.5 | 88.7 | 88.7 |
| 12.0 | | 16.0 | | 21.3 | | 28.4 | | 37.9 | | 50.5 | | 67.3 | | 89.8 | |
| 12.1 | 12.1 | 16.2 | 16.2 | 21.5 | 21.5 | 28.7 | 28.7 | 38.3 | 38.3 | 51.1 | 51.1 | 68.1 | 68.1 | 90.9 | 90.9 |
| 12.3 | | 16.4 | | 21.8 | | 29.1 | | 38.8 | | 51.7 | | 69.0 | | 92.0 | |
| 12.4 | 12.4 | 16.5 | 16.5 | 22.1 | 22.1 | 29.4 | 29.4 | 39.2 | 39.2 | 52.3 | 52.3 | 69.8 | 69.8 | 93.1 | 93.1 |
| 12.6 | | 16.7 | | 22.3 | | 29.8 | | 39.7 | | 53.0 | | 70.6 | | 94.2 | |
| 12.7 | 12.7 | 16.9 | 16.9 | 22.6 | 22.6 | 30.1 | 30.1 | 40.2 | 40.2 | 53.6 | 53.6 | 71.5 | 71.5 | 95.3 | 95.3 |
| 12.9 | | 17.2 | | 22.9 | | 30.5 | | 40.7 | | 54.2 | | 72.3 | | 96.5 | |
| 13.0 | 13.0 | 17.4 | 17.4 | 23.2 | 23.2 | 30.9 | 30.9 | 41.2 | 41.2 | 54.9 | 54.9 | 73.2 | 73.2 | 97.6 | 97.6 |
| 13.2 | | 17.6 | | 23.4 | | 31.2 | | 41.7 | | 55.6 | | 74.1 | | 98.8 | |

| Tolerance Code | Tolerance |
|----------------|-----------|
| T | ±0.01% |
| Q | ±0.02% |
| A | ±0.05% |
| B | ±0.10% |
| C | ±0.25% |
| D | ±0.5% |
| F | ±1% |
| G | ±2% |
| J | ±5% |
| K | ±10% |

| TC Code | Temperature Coefficient |
|---------|-------------------------|
| A | ±5 ppm |
| B | ±10 ppm |
| F | ±15 ppm |
| E | ±25 ppm |
| C | ±50 ppm |
| D | ±100 ppm |
| J | ±150 ppm |
| B | ±350 ppm |

| COLOR | Significant Figures | | | Multiplier | Tolerance | | TC |
|--------|---------------------|-----|-----|------------|-----------|-------|--------|
| | 1st | 2nd | 3rd | 4th | 5th | 6th | |
| Black | 0 | 0 | 0 | 1 | | | |
| Brown | 1 | 1 | 1 | 10 | ± 1% | (F) | 100ppm |
| Red | 2 | 2 | 2 | 100 | ± 2% | (G) | 50ppm |
| Orange | 3 | 3 | 3 | 1,000 | | | 15ppm |
| Yellow | 4 | 4 | 4 | 10,000 | | | 25ppm |
| Green | 5 | 5 | 5 | 100,000 | ± 0.5% | (D) | |
| Blue | 6 | 6 | 6 | 1,000,000 | ± 0.25% | (C) | |
| Violet | 7 | 7 | 7 | 10,000,000 | ± 0.10% | (B) | |
| Gray | 8 | 8 | 8 | | ± 0.05% | (A) | |
| White | 9 | 9 | 9 | | | | |
| Gold | - | - | - | | ± 5% | (J) | |
| Silver | - | - | - | | ± 10% | (K) | |

| 4-Band Color Code | 5-Band Color Code | 6-Band color code |
|---------------------------------|---------------------------------|--|
| 2-Digits, Multiplier, Tolerance | 3-Digits, Multiplier, Tolerance | 3-Digits, Multiplier, Tolerance, Temperature Coefficient |

| SURFACE MOUNT RESISTOR CASE SIZE | | | |
|----------------------------------|--------|----------------|----------------|
| (EIA) | Metric | Length | Width |
| 0402 | 1005 | 1.0mm (0.04") | 0.5mm (0.02") |
| 0603 | 1608 | 1.6mm (0.063") | 0.8mm (0.032") |
| 0805 | 2012 | 2.0mm (0.079") | 1.2mm (0.049") |
| 1206 | 3216 | 3.2mm (0.126") | 1.6mm (0.063") |
| 1210 | 3225 | 3.2mm (0.126") | 2.5mm (0.098") |
| 2010 | 5026 | 5.0mm (0.197") | 2.6mm (0.102") |
| 2512 | 5764 | 6.4mm (0.248") | 3.2mm (0.126") |