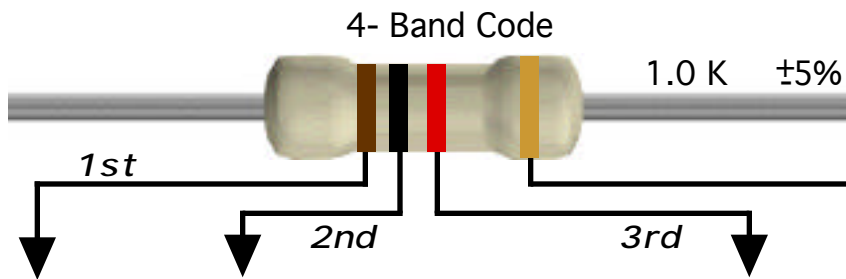
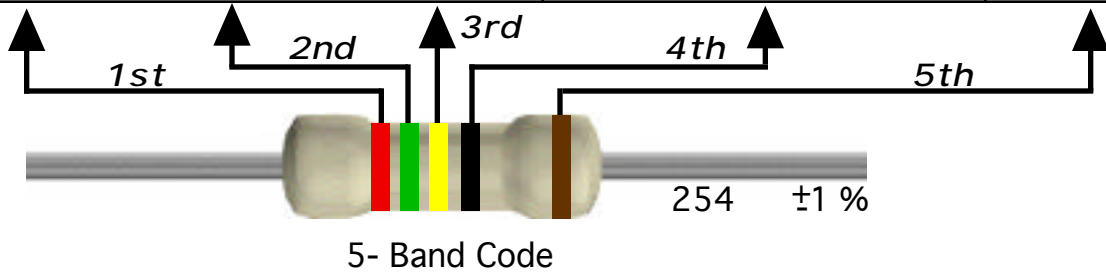


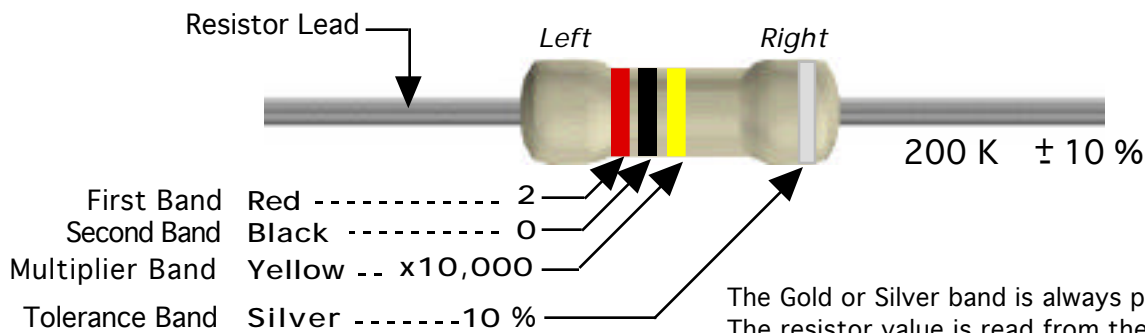
RESISTOR COLOR CODE GUIDE



| Color | 1st Band | 2nd Band | 3rd Band | Decimal Multiplier | | Tolerance |
|--------|----------|----------|----------|--------------------|------------|-----------|
| Black | 0 | 0 | 0 | 1 | 1 | |
| Brown | 1 | 1 | 1 | 10 | 10 | ± 1 % |
| Red | 2 | 2 | 2 | 100 | 100 | ± 2 % |
| Orange | 3 | 3 | 3 | 1K | 1,000 | |
| Yellow | 4 | 4 | 4 | 10K | 10,000 | |
| Green | 5 | 5 | 5 | 100K | 100,000 | |
| Blue | 6 | 6 | 6 | 1M | 1,000,000 | |
| Violet | 7 | 7 | 7 | 10M | 10,000,000 | |
| Gray | 8 | 8 | 8 | 100,000,000 | | |
| White | 9 | 9 | 9 | 1,000,000,000 | | |
| Gold | | | | 0.1 | | ± 5 % |
| Silver | | | | 0.01 | | ± 10 % |
| None | | | | | | ± 20 % |



Calculation



Equation

$$20 \times 10,000 = 200,000$$

$$1,000 = 1K$$

Resistor = 200 K Ω
with a ± 10 % Tolerance

If there is no tolerance band, then find the side that has a band closest to a lead and make that the first band.

Resistor Color Code 4 Band

Quick Guide

| Color | Value |
|------------|------------|
| Black | 0 |
| Brown | 1 |
| Red | 2 |
| Orange | 3 |
| Yellow | 4 |
| Green | 5 |
| Blue | 6 |
| Violet | 7 |
| Gray | 8 |
| White | 9 |
| Gold (G) | \pm 5 % |
| Silver (s) | \pm 10 % |
| None | \pm 20 % |

| Band 3 | Divide by |
|--------|-----------|
| Gold | 1 |
| Silver | 100 |

| Tolerance | |
|-----------|------------|
| Brown | \pm 1 % |
| Red | \pm 2 % |
| Gold | \pm 5 % |
| Silver | \pm 10 % |
| None | \pm 20 % |

| Resistance | Notation | Band 1 | Band 2 | Band 3 | Tolerance |
|------------|----------|--------|--------|--------|------------|
| .22 ohm | R22 | Red | Red | Silver | S, G, R, B |
| .27 ohm | R27 | Red | Purple | Silver | S, G, R, B |
| .33 ohm | R33 | Orange | Orange | Silver | S, G, R, B |
| .39 ohm | R39 | Orange | White | Silver | S, G, R, B |
| .47 ohm | R47 | Yellow | Purple | Silver | S, G, R, B |
| .56 ohm | R56 | Green | Blue | Silver | S, G, R, B |
| .68 ohm | R68 | Blue | Gray | Silver | S, G, R, B |
| .82 ohm | R82 | Gray | Red | Silver | S, G, R, B |
| 1.0 ohm | 1R0 | Brown | Black | Gold | S, G, R, B |
| 1.1 ohm | 1R1 | Brown | Brown | Gold | S, G, R, B |
| 1.2 ohm | 1R2 | Brown | Red | Gold | S, G, R, B |
| 1.3 ohm | 1R3 | Brown | Orange | Gold | S, G, R, B |
| 1.5 ohm | 1R5 | Brown | Green | Gold | S, G, R, B |
| 1.6 ohm | 1R6 | Brown | Blue | Gold | S, G, R, B |
| 1.8 ohm | 1R8 | Brown | Gray | Gold | S, G, R, B |
| 2.0 ohm | 2R0 | Red | Black | Gold | S, G, R, B |
| 2.2 ohm | 2R2 | Red | Red | Gold | S, G, R, B |
| 2.4 ohm | 2R2 | Red | Yellow | Gold | S, G, R, B |
| 2.7 ohm | 2R7 | Red | Purple | Gold | S, G, R, B |
| 3.0 ohm | 3R0 | Orange | Black | Gold | S, G, R, B |
| 3.3 ohm | 3R3 | Orange | Orange | Gold | S, G, R, B |
| 3.6 ohm | 3R6 | Orange | Blue | Gold | S, G, R, B |
| 3.9 ohm | 3R9 | Orange | White | Gold | S, G, R, B |
| 4.3 ohm | 4R3 | Yellow | Orange | Gold | S, G, R, B |
| 4.7 ohm | 4R7 | Yellow | Purple | Gold | S, G, R, B |
| 5.1 ohm | 5R1 | Green | Brown | Gold | S, G, R, B |
| 5.6 ohm | 5R6 | Green | Blue | Gold | S, G, R, B |
| 6.2 ohm | 6R2 | Blue | Red | Gold | S, G, R, B |
| 6.8 ohm | 6R8 | Blue | Gray | Gold | S, G, R, B |
| 7.5 ohm | 7R5 | Purple | Green | Gold | S, G, R, B |
| 8.2 ohm | 8R2 | Gray | Red | Gold | S, G, R, B |
| 9.1 ohm | 9R1 | White | Brown | Gold | S, G, R, B |
| 10 ohm | 10R | Brown | Black | Black | S, G, R, B |
| 11 ohm | 11R | Brown | Brown | Black | S, G, R, B |
| 12 ohm | 12R | Brown | Red | Black | S, G, R, B |
| 13 ohm | 13R | Brown | Orange | Black | S, G, R, B |
| 15 ohm | 15R | Brown | Green | Black | S, G, R, B |
| 16 ohm | 16R | Brown | Blue | Black | S, G, R, B |
| 18 ohm | 18R | Brown | Gray | Black | S, G, R, B |
| 20 ohm | 20R | Red | Black | Black | S, G, R, B |
| 22 ohm | 22R | Red | Red | Black | S, G, R, B |
| 24 ohm | 24R | Red | Yellow | Black | S, G, R, B |
| 27 ohm | 27R | Red | Purple | Black | S, G, R, B |

Quick Guide

Resistor Color Code 4 Band

| Color | Value |
|------------|--------|
| Black | 0 |
| Brown | 1 |
| Red | 2 |
| Orange | 3 |
| Yellow | 4 |
| Green | 5 |
| Blue | 6 |
| Violet | 7 |
| Gray | 8 |
| White | 9 |
| Gold (G) | ± 5 % |
| Silver (s) | ± 10 % |
| None | ± 20 % |

| Band 3 Divide by | |
|------------------|-----|
| Gold | 10 |
| Silver | 100 |

| Tolerance | |
|-----------|--------|
| Brown | ± 1 % |
| Red | ± 2 % |
| Gold | ± 5 % |
| Silver | ± 10 % |
| None | ± 20 % |

| | | | | | |
|---------|------|--------|--------|-------|---------|
| 30 ohm | 30R | Orange | Black | Black | S,G,R,B |
| 33 ohm | 33R | Orange | Orange | Black | S,G,R,B |
| 36 ohm | 36R | Orange | Blue | Black | S,G,R,B |
| 39 ohm | 39R | Orange | White | Black | S,G,R,B |
| 43 ohm | 43R | Yellow | Orange | Black | S,G,R,B |
| 47 ohm | 47R | Yellow | Purple | Black | S,G,R,B |
| 51 ohm | 51R | Green | Brown | Black | S,G,R,B |
| 56 ohm | 56R | Green | Blue | Black | S,G,R,B |
| 62 ohm | 62R | Blue | Red | Black | S,G,R,B |
| 68 ohm | 68R | Blue | Gray | Black | S,G,R,B |
| 75 ohm | 75R | Purple | Green | Black | S,G,R,B |
| 82 ohm | 82R | Gray | Red | Black | S,G,R,B |
| 91 ohm | 91R | White | Brown | Black | S,G,R,B |
| 100 ohm | 100R | Brown | Black | Brown | S,G,R,B |
| 110 ohm | 110R | Brown | Brown | Brown | S,G,R,B |
| 120 ohm | 120R | Brown | Red | Brown | S,G,R,B |
| 130 ohm | 130R | Brown | Orange | Brown | S,G,R,B |
| 150 ohm | 150R | Brown | Green | Brown | S,G,R,B |
| 160 ohm | 160R | Brown | Blue | Brown | S,G,R,B |
| 180 ohm | 180R | Brown | Gray | Brown | S,G,R,B |
| 200 ohm | 200R | Red | Black | Brown | S,G,R,B |
| 220 ohm | 220R | Red | Red | Brown | S,G,R,B |
| 240 ohm | 240R | Red | Yellow | Brown | S,G,R,B |
| 270 ohm | 270R | Red | Purple | Brown | S,G,R,B |
| 300 ohm | 300R | Orange | Black | Brown | S,G,R,B |
| 330 ohm | 330R | Orange | Orange | Brown | S,G,R,B |
| 360 ohm | 360R | Orange | Blue | Brown | S,G,R,B |
| 390 ohm | 390R | Orange | White | Brown | S,G,R,B |
| 430 ohm | 430R | Yellow | Orange | Brown | S,G,R,B |
| 470 ohm | 470R | Yellow | Purple | Brown | S,G,R,B |
| 510 ohm | 510R | Green | Brown | Brown | S,G,R,B |
| 560 ohm | 560R | Green | Blue | Brown | S,G,R,B |
| 620 ohm | 620R | Blue | Red | Brown | S,G,R,B |
| 680 ohm | 680R | Blue | Gray | Brown | S,G,R,B |
| 750 ohm | 750R | Purple | Green | Brown | S,G,R,B |
| 820 ohm | 820R | Gray | Red | Brown | S,G,R,B |
| 910 ohm | 910R | White | Brown | Brown | S,G,R,B |
| 1.0 k | 1K0 | Brown | Black | Red | S,G,R,B |
| 1.1 k | 1K1 | Brown | Brown | Red | S,G,R,B |
| 1.2 k | 1K2 | Brown | Red | Red | S,G,R,B |
| 1.3 k | 1K3 | Brown | Orange | Red | S,G,R,B |
| 1.5 k | 1K5 | Brown | Green | Red | S,G,R,B |
| 1.6 k | 1K6 | Brown | Blue | Red | S,G,R,B |
| 1.8 k | 1K8 | Brown | Gray | Red | S,G,R,B |

Resistor Color Code 4 Band

Quick Guide

| Color | Value |
|------------|--------|
| Black | 0 |
| Brown | 1 |
| Red | 2 |
| Orange | 3 |
| Yellow | 4 |
| Green | 5 |
| Blue | 6 |
| Violet | 7 |
| Gray | 8 |
| White | 9 |
| Gold (G) | ± 5 % |
| Silver (s) | ± 10 % |
| None | ± 20 % |

| Band 3 Divide by | |
|------------------|-----|
| Gold | 10 |
| Silver | 100 |

| Tolerance | |
|-----------|--------|
| Brown | ± 1 % |
| Red | ± 2 % |
| Gold | ± 5 % |
| Silver | ± 10 % |
| None | ± 20 % |

| | | | | | |
|-------|------|--------|--------|--------|------------|
| 2.0 k | 2K0 | Red | Black | Red | S, G, R, B |
| 2.2 k | 2K2 | Red | Red | Red | S, G, R, B |
| 2.4 k | 2K4 | Red | Yellow | Red | S, G, R, B |
| 2.7 k | 2K7 | Red | Purple | Red | S, G, R, B |
| 3.0 k | 3K0 | Orange | Black | Red | S, G, R, B |
| 3.3 k | 3K3 | Orange | Orange | Red | S, G, R, B |
| 3.6 k | 3K6 | Orange | Blue | Red | S, G, R, B |
| 3.9 k | 3K9 | Orange | White | Red | S, G, R, B |
| 4.3 k | 4K3 | Yellow | Orange | Red | S, G, R, B |
| 4.7 k | 4K7 | Yellow | Purple | Red | S, G, R, B |
| 5.1 k | 5K1 | Green | Brown | Red | S, G, R, B |
| 5.6 k | 5K6 | Green | Blue | Red | S, G, R, B |
| 6.2 k | 6K2 | Blue | Red | Red | S, G, R, B |
| 6.8 k | 6K8 | Blue | Gray | Red | S, G, R, B |
| 7.5 k | 7K5 | Purple | Green | Red | S, G, R, B |
| 8.2 k | 8K2 | Gray | Red | Red | S, G, R, B |
| 9.1 k | 9K1 | White | Brown | Red | S, G, R, B |
| 10 k | 10K | Brown | Black | Orange | S, G, R, B |
| 11 k | 11K | Brown | Brown | Orange | S, G, R, B |
| 12 k | 12K | Brown | Red | Orange | S, G, R, B |
| 13 k | 13K | Brown | Orange | Orange | S, G, R, B |
| 15 k | 15K | Brown | Green | Orange | S, G, R, B |
| 16 k | 16K | Brown | Blue | Orange | S, G, R, B |
| 18 k | 18K | Brown | Gray | Orange | S, G, R, B |
| 20 k | 20K | Red | Black | Orange | S, G, R, B |
| 22 k | 22K | Red | Red | Orange | S, G, R, B |
| 24 k | 24K | Red | Yellow | Orange | S, G, R, B |
| 27 k | 27K | Red | Purple | Orange | S, G, R, B |
| 30 k | 30K | Orange | Black | Orange | S, G, R, B |
| 33 k | 33K | Orange | Orange | Orange | S, G, R, B |
| 36 k | 36K | Orange | Blue | Orange | S, G, R, B |
| 39 k | 39K | Orange | White | Orange | S, G, R, B |
| 43 k | 43K | Yellow | Orange | Orange | S, G, R, B |
| 47 k | 47K | Yellow | Purple | Orange | S, G, R, B |
| 51 k | 51K | Green | Brown | Orange | S, G, R, B |
| 56 k | 56K | Green | Blue | Orange | S, G, R, B |
| 62 k | 62K | Blue | Red | Orange | S, G, R, B |
| 68 k | 68K | Blue | Gray | Orange | S, G, R, B |
| 75 k | 75K | Purple | Green | Orange | S, G, R, B |
| 82 k | 82K | Gray | Red | Orange | S, G, R, B |
| 91 k | 91K | White | Brown | Orange | S, G, R, B |
| 100 k | 100K | Brown | Black | Yellow | S, G, R, B |
| 110 k | 110K | Brown | Brown | Yellow | S, G, R, B |
| 120 k | 120K | Brown | Red | Yellow | S, G, R, B |

Resistor Color Code 4 Band

Quick Guide

| Color | Value |
|------------|--------|
| Black | 0 |
| Brown | 1 |
| Red | 2 |
| Orange | 3 |
| Yellow | 4 |
| Green | 5 |
| Blue | 6 |
| Violet | 7 |
| Gray | 8 |
| White | 9 |
| Gold (G) | ± 5 % |
| Silver (s) | ± 10 % |
| None | ± 20 % |

| Band 3 Divide by | |
|------------------|-----|
| Gold | 10 |
| Silver | 100 |

| Tolerance | |
|-----------|--------|
| Brown | ± 1 % |
| Red | ± 2 % |
| Gold | ± 5 % |
| Silver | ± 10 % |
| None | ± 20 % |

| | | | | | |
|-------|------|--------|--------|--------|------------|
| 130 k | 130K | Brown | Orange | Yellow | S, G, R, B |
| 150 k | 150K | Brown | Green | Yellow | S, G, R, B |
| 160 k | 160K | Brown | Blue | Yellow | S, G, R, B |
| 180 k | 180K | Brown | Gray | Yellow | S, G, R, B |
| 200 k | 200K | Red | Black | Yellow | S, G, R, B |
| 220 k | 220K | Red | Red | Yellow | S, G, R, B |
| 240 k | 240K | Red | Yellow | Yellow | S, G, R, B |
| 270 k | 270K | Red | Purple | Yellow | S, G, R, B |
| 300 k | 300K | Orange | Black | Yellow | S, G, R, B |
| 330 k | 330K | Orange | Orange | Yellow | S, G, R, B |
| 360 k | 360K | Orange | Blue | Yellow | S, G, R, B |
| 390 k | 390K | Orange | White | Yellow | S, G, R, B |
| 430 k | 430K | Yellow | Orange | Yellow | S, G, R, B |
| 470 k | 470K | Yellow | Purple | Yellow | S, G, R, B |
| 510 k | 510K | Green | Brown | Yellow | S, G, R, B |
| 560 k | 560K | Green | Blue | Yellow | S, G, R, B |
| 620 k | 620K | Blue | Red | Yellow | S, G, R, B |
| 680 k | 680K | Blue | Gray | Yellow | S, G, R, B |
| 750 k | 750K | Purple | Green | Yellow | S, G, R, B |
| 820 k | 820K | Gray | Red | Yellow | S, G, R, B |
| 910 k | 910K | White | Brown | Yellow | S, G, R, B |
| 1 M | 1M0 | Brown | Black | Green | S, G, R, B |
| 1.1 M | 1M1 | Brown | Brown | Green | S, G, R, B |
| 1.2 M | 1M2 | Brown | Red | Green | S, G, R, B |
| 1.3 M | 1M3 | Brown | Orange | Green | S, G, R, B |
| 1.5 M | 1M5 | Brown | Green | Green | S, G, R, B |
| 1.6 M | 1M6 | Brown | Blue | Green | S, G, R, B |
| 2.0 M | 2M0 | Red | Black | Green | S, G, R, B |
| 2.2 M | 2M2 | Red | Red | Green | S, G, R, B |
| 2.4 M | 2M4 | Red | Yellow | Green | S, G, R, B |
| 2.7 M | 2M7 | Red | Purple | Green | S, G, R, B |
| 3.0 M | 3M0 | Orange | Black | Green | S, G, R, B |
| 3.3 M | 3M3 | Orange | Orange | Green | S, G, R, B |
| 3.6 M | 3M6 | Orange | Blue | Green | S, G, R, B |
| 3.9 M | 3M9 | Orange | White | Green | S, G, R, B |
| 4.3 M | 4M3 | Yellow | Orange | Green | S, G, R, B |
| 4.7 M | 4M7 | Yellow | Purple | Green | S, G, R, B |
| 5.1 M | 5M1 | Green | Brown | Green | S, G, R, B |
| 5.6 M | 5M6 | Green | Blue | Green | S, G, R, B |
| 6.2 M | 6M2 | Blue | Red | Green | S, G, R, B |
| 6.8 M | 6M8 | Blue | Gray | Green | S, G, R, B |
| 7.5 M | 7M5 | Purple | Green | Green | S, G, R, B |
| 8.2 M | 8M2 | Gray | Red | Green | S, G, R, B |
| 9.1 M | 9M1 | White | Brown | Green | S, G, R, B |
| 10 M | 10M | Brown | Black | Blue | S, G, R, B |