

Resistor Values (ohms), Standard E24 range

E12 range **bold**

<u>1</u>	1.1	<u>1.2</u>	1.3	<u>1.5</u>	1.6	<u>1.8</u>
2.0	<u>2.2</u>	2.4	<u>2.7</u>			
3.0	<u>3.3</u>	3.6	<u>3.9</u>			
4.3	<u>4.7</u>					
5.1	<u>5.6</u>					
6.2	<u>6.8</u>					
7.5						
<u>8.2</u>						
9.1						

Multiply the above values by 10, 100, 1000, 10,000, 100,000, or 1,000,000.
The largest standard resistor is 10,000,000 ohms.

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Deciphering the Colour Code

To find the resistance of the resistor, follow the steps:

Step 1. Use the chart to make a number out of the first two colour bands.

Step 2. Add the number of zeros specified by the number from the third colour band.

Step 3. Add the tolerance from the chart specified by the fourth colour band.

Numeric Code

Some resistors and most small capacitors use a numeric code based on the colour code. In numeric code there are no colours, just the numbers that make up the code. You follow the first two steps shown above to derive the value of the part.

The numeric code for 4 700 Ohms would be 472. Here's how it works:

Using the first step above, take the first two digits to make the number 47.

Next, use the third digit as the multiplier, in this case 2 gives the multiplier of 100, and therefore the value becomes 47×100 or 4 700 Ohms.

Or, use the digit 2 as a reminder to add 2 zeros to the end of the number (which is the same as multiplying by 100).

On capacitors, the value is specified in picofarads (10^{-12} Farads). So, if you saw the code 472 on a capacitor, the value would be 4 700 pF, or 4.7 nF (nanofarads, the equivalent of 1000 pF).

Helpful Hints

People in electronics like short forms. Rather than write out 4 700 Ohms they'll use the metric prefix "k" for 1 000. So, 4 700 Ohms becomes 4.7k Ohms.

Larger resistors might use the metric prefix M for 1 000 000, like 1.2M Ohms.

Sometimes you'll find the metric prefix replacing the decimal so that 4.7 k Ohms is written as 4k7 Ohms. That's because most electronic diagrams start out on large paper and get photocopied onto smaller sheets. A photocopy might lose the dot that was the decimal point, but a "k" is much harder to lose.

You can easily use a mnemonic device to help you remember the order of the colours in the colour code. The one I use is ***Bad Beer Rots Our Young Guts But Vodka Goes Well***, where Bad represents black, Beer represents brown, etc.

Rather than multiply with the multiplier, you can just add the number of zeros specified by the number in the digit column. For our example, 47 was multiplied by 100 to get 4 700. If you have 47 and add 2 0's to the end of the number (because red has the digit 2), you get 4 700 Ohms. **Note:** This method doesn't work if the multiplier is gold or silver.

Deciphering the Colour Code

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