











Beer and Vodka Can Help You Select a Terminating Resistor

Thanks to [Chipkin Automation Systems](#)

Try this mnemonic if you are trying to remember the resistor color codes:

Bad		(0) Black
Beer		(1) Brown
Rots		(2) Red
Our		(3) Orange
Young		(4) Yellow
Guts		(5) Green
But		(6) Blue
Vodka		(7) Violet
Goes		(8) Grey
Well		(9) White
		(0.1) Gold
		(0.01) Silver

Note: If you're missing a tolerance band that implies that the tolerance is 20%.

Which end do you start reading the color bands?

There are usually two ways:

- 1) If one of the bands at the end of the sequence is further apart then that is the tolerance band – start from the opposite end.
- 2) If all the bands are closer to one side of the resistor then start from that end – the tolerance band is the last one you read.

What should you carry with you to site? (for communication networks purposes)

For Terminations

Value Tolerance

75 Ohms 5%

100 Ohms 5%

120 Ohms 5%

For Biasing

Value

10k Ohms

4k7 Ohms

2k4 Ohms

1k Ohms

560 Ohms

30 Ohms

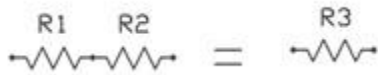
How to buy resistors

Buy a series – E12 or E24 (they come in packs and provide a comprehensive range of resistors).

How to make a resistance value even if you don't have the correct resistor in your toolbox.

By placing resistors in series or parallel you can create new values.

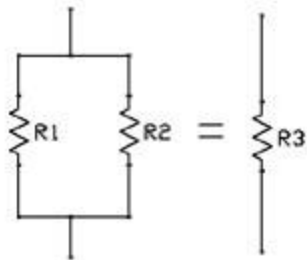
Series



$$R_3 = R_1 + R_2$$

- R1 and R2 connected in series could be replaced with one resistor of resistance R3.
- Using 2 or more resistors instead of one allows you to achieve custom resistances.
- Less resistors are required when used in series to achieve greater resistance than when used in parallel

Parallel



$$\frac{1}{R_3} = \frac{1}{R_1} + \frac{1}{R_2}$$

- R1 and R2 connected in parallel act as one resistor with a custom resistance of R3.
- This method allows you to get custom resistances using the formula.
- R3 will always be smaller than R1 and R2, so more resistors are required to achieve higher custom resistances.

Find Tolerance Band (Usually Separated) and work from other side



1st 2nd Multiplier Tolerance

0	Black	Black	Black	Black	0		
1	Brown	Brown	Brown	Brown	1	Brown	1%
2	Red	Red	Red	Red	2	Red	2%
3	Orange	Orange	Orange	Orange	3		
4	Yellow	Yellow	Yellow	Yellow	4		
5	Green	Green	Green	Green	5		
6	Blue	Blue	Blue	Blue	6		
7	Violet	Violet	Violet	Violet	7		
8	Grey	Grey	Grey	Grey	8		
9	White	White	White	White	9		
				Gold	0.1	Gold	5%
				Silver	0.01	Silver	10%

1st 2nd 3rd Multiplier Tolerance



560k Ohm 10%