

# RESISTORS / OHMS LAW

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On behalf of The World Association of Technology Teachers

## W.A.T.T.



World Association of Technology Teachers

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# EXAMINATION QUESTIONS - SYSTEMS

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Yellow 4	violet 7	red 00	red +/- 2%	4K7 +/-2%
green 5	blue 6	black none	gold +/- 5%	56R +/-5%
brown 1	grey 8	green 00000	silver +/- 10%	1M8 +/-10%
orange 3	orange 3	orange 000	none +/- 20%	33K +/-20%

1a. Write the values of the following resistors:

1st BAND	2nd BAND	3rd BAND	VALUE
YELLOW	BLUE	RED	
BROWN	GREY	ORANGE	
GREEN	ORANGE	BLACK	

1b. Explain why there is a fourth band \_\_\_\_\_

2a. Complete the following table:

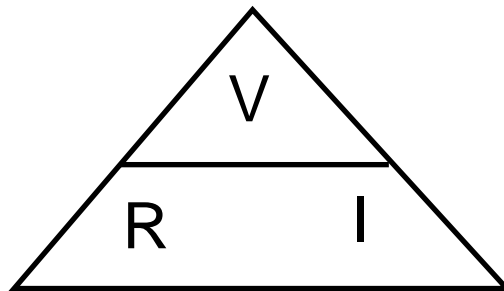
50K means	
5K7 means	
30R means	
5R8 means	
2M2 means	
1R5 means	

## Ohm's Law

Provides us with a very important formula for working out current, resistance and voltage (Potential Difference). In order to use this formula properly you must understand SI Units.

$$\text{Voltage} = V \quad \text{Resistance} = R \quad \text{Current} = I$$

OHMS LAW:



1. If the current through a resistor is 1A and the voltage is 10v what is the resistance ?

$$R = \frac{V}{I} = \frac{10}{1} = 10 \text{ ohms}$$

2. If the current through a resistor is 0.6A and the voltage is 12v what is the resistance ?

$$R = \frac{V}{I} = \frac{12}{0.6} = 20 \text{ ohms}$$

3. A coil has a current of 50mA flowing through it when the voltage is 12v. What is the resistance of the coil ?

$$R = \frac{V}{I} = \frac{12}{0.05} = 240 \text{ ohms}$$

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Yellow 4	violet 7	red 00	red +/- 2%	4K7 +/-2%
green 5	blue 6	black none	gold +/- 5%	56R +/-5%
brown 1	grey 8	green 00000	silver +/- 10%	1M8 +/-10%
orange 3	orange 3	orange 000	none +/- 20%	33K +/-20%

1a. Write the values of the following resistors:

1st BAND	2nd BAND	3rd BAND	VALUE
YELLOW	BLUE	RED	4600 ohms 4K6 ohms
BROWN	GREY	ORANGE	18000 ohms 18K ohms
GREEN	ORANGE	BLACK	53 ohms

1b. Explain why there is a fourth band. The fourth band is the tolerance (accuracy of the value)

2a. Complete the following table:

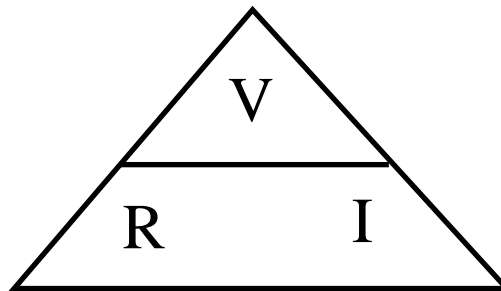
50K means	50000 ohms
5K7 means	5700 ohms
30R means	30 ohms
5R8 means	580 ohms
2M2 means	2200 000 ohms
1R5 means	150 ohms

## Ohm's Law

Provides us with a very important formula for working out current, resistance and voltage (Potential Difference). In order to use this formula properly you must understand SI Units.

$$\text{Voltage} = V \quad \text{Resistance} = R \quad \text{Current} = I$$

## OHMS LAW:



1. If the current through a resistor is 1A and the voltage is 10v what is the resistance ?

$$R = \frac{V}{I} = \frac{10}{1} = 10 \text{ ohms}$$

2. If the current through a resistor is 0.6A and the voltage is 12v what is the resistance ?

$$R = \frac{V}{I} = \frac{12}{0.6} = 20 \text{ ohms}$$

3. A coil has a current of 50mA flowing through it when the voltage is 12v. What is the resistance of the coil ?

$$R = \frac{V}{I} = \frac{12}{50 \times 10^{-3}} = \frac{12}{.05} = 240 \text{ ohms}$$