

### Units

pico	p	÷1 000 000 000 000	10 <sup>-12</sup>
nano	n	÷1 000 000 000	10 <sup>-9</sup>
micro	μ	÷1 000 000	10 <sup>-6</sup>
milli	m	÷1 000	10 <sup>-3</sup>
kilo	k	•1 000	10 <sup>3</sup>
mega	M	•1 000 000	10 <sup>6</sup>
giga	G	•1 000 000 000	10 <sup>9</sup>

### Resistor Color Codes

Color	Digit	Multiplier	Tolerance
Black	0	• 1	
Brown	1	• 10	1%
Red	2	• 100	2%
Orange	3	• 1000	
Yellow	4	• 10 000	
Green	5	• 100 000	
Blue	6	• 1 000 000	
Violet	7	• 10 000 000	
Grey	8	• 100 000 000	
White	9	• 1 000 000 000	
Gold			5%
Silver			10%

### Ohm's Law

$V = IR$   
Volts = Amperes • Ohms

### Kirchoff's Laws

#### Kirchoff's Current Law:

$I_{IN} = I_{OUT}$

#### Kirchoff's Voltage Law(1)

The voltage between any two points in a circuit is equal to the sum of the voltage drops along any path connecting those points

#### Kirchoff's Voltage Law(2)

The sum of the voltage drops around any closed circuit is zero

### Resistors in Series

$V_1 = IR_1$  Ohm's Law

$V_2 = IR_2$

$V_{TOTAL} = V_1 + V_2$  Kirchoff's Voltage Law

$\therefore V_{TOTAL} = IR_1 + IR_2$

$\therefore V_{TOTAL} = I(R_1 + R_2)$

### Resistors in Parallel

$I_1 = V/R_1$  Ohm's Law

$I_2 = V/R_2$

$I_{TOTAL} = I_1 + I_2$  Kirchoff's Current Law

$\therefore I_{TOTAL} = V/R_1 + V/R_2$

Applying Oh's Law to the whole circuit:

$V/R_{PARALLEL} = I_{TOTAL} = V/R_1 + V/R_2$

$\therefore 1/R_{PARALLEL} = 1/R_1 + 1/R_2$

### Bands

160 Meter	1.8 MHz	
80 Meter	3.5 MHz	
40 Meter	7 MHz	
20 Meter	14 MHz	
17 Meter	18 MHz	
15 Meter	21 MHz	
12 Meter	24 MHz	
10 Meter	28 MHz	
6 Meter	50 MHz	
2 Meter	144 MHz	144-146 MHz
70 cm	420 MHz	430-440MHz



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