

Voltage Sources

Batteries **BATT1**

Voltage Nodes

BJTs **Q1**

n-Channel MOSFETs **Q1**

p-Channel MOSFETs **Q1**

Logic Gates

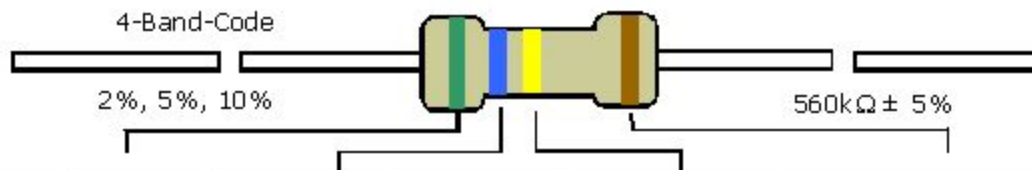
Integrated Circuits **IC1** **U1**

Microcontrollers

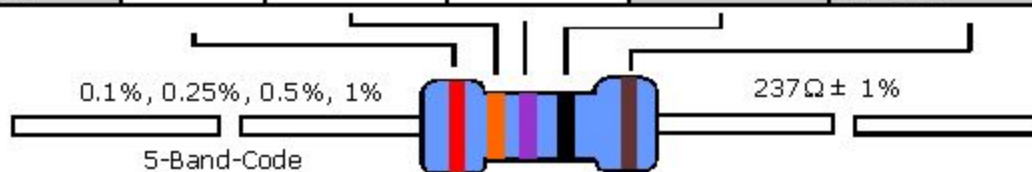
Component drawing courtesy SparkFun.

Component	Marking	Units
Resistor	R1 R1	Ohm (Ω , K Ω , or K)
Capacitor	C1 C1	Farad μ F or mF
Diode	D1 D1 LED1	
Inductor	L1 L1	Henry (μ H or mH)
Transistor (BJT)	Q1 Q1	
Integrated Circuit (IC)	IC1 IC1 U1 U1	
Crystal	Y1 Y1	Hertz (Hz)
Transformer	T1 T1	
Component	Label	Value
Resistor	2.2K 2K2	2,200 Ω
Power Supply	3V3	3.3v
	Vcc	Use the spec sheet





COLOR	1st BAND	2nd BAND	3rd BAND	MULTIPLIER	TOLERANCE
Black	0	0	0	1Ω	
Brown	1	1	1	10Ω	± 1% (F)
Red	2	2	2	100Ω	± 2% (G)
Orange	3	3	3	1KΩ	
Yellow	4	4	4	10KΩ	
Green	5	5	5	100KΩ	±0.5% (D)
Blue	6	6	6	1MΩ	±0.25% (C)
Violet	7	7	7	10MΩ	±0.10% (B)
Grey	8	8	8		±0.05%
White	9	9	9		
Gold				0.1	± 5% (J)
Silver				0.01	± 10% (K)



Courtesy <http://electtechnician.blogspot.com/2010/09/resistor-color-code.html>

tera (T) 1,000,000,000,000
 giga (G) 1,000,000,000
 mega (M) 1,000,000
 kilo (k) 1,000
 hecto (h) 100
 deca (da) 10



plainphysics.com

deci (d) 0.1
 centi (c) 0.01
 milli (m) 0.001
 micro (μ) 0.000 001
 nano (n) 0.000 000 001
 pico (p) 0.000 000 000 001

Courtesy
<https://plainphysics.com/category/ordinary-physics/mechanics/si-units>

Identifying Ceramic, Non-polarized Capacitors

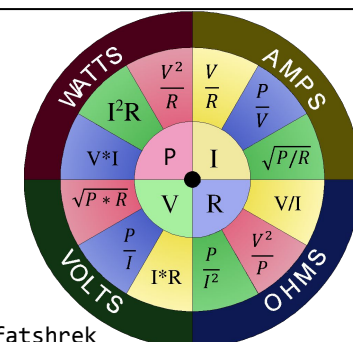
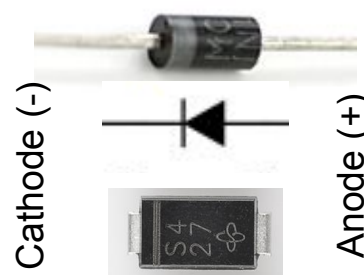
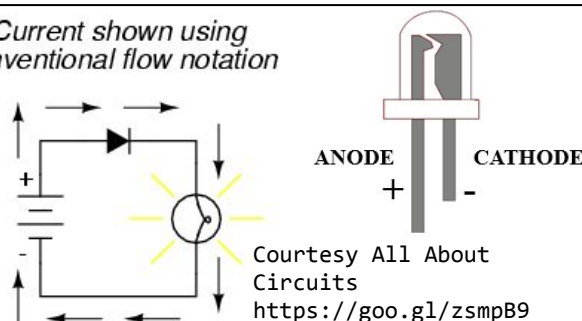
Copy first 2 digits
 Suffix with 4 Zeros

104 = 10 × 10⁴

10 0000 pf

Courtesy
<https://learn.sparkfun.com/tutorials/capacitor-kit-identification-guide>

Current shown using conventional flow notation



Courtesy
<https://imgur.com/user/fatshrek>