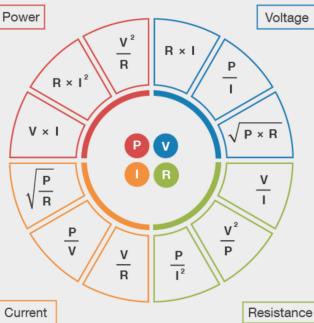


TinkrPostr

ELECTRONICS CHEAT SHEET POSTER

Your quick reference companion in learning, referencing and debugging your electronics projects

Ohm's Law



American Wire Gauge



AWG No.	Diameter (in)	Diameter (mm)	CS Area. (mm²)	Resistance (Ω/km)
4/0	.4600	11.68	107.2	.1608
3/0	.4096	10.40	85.03	.2028
2/0	.3648	9.266	67.43	.2557
1/0	.3249	8.252	53.48	.3224
1	.2893	7.348	42.41	.4066
2	.2576	6.544	33.63	.5127
3	.2294	5.827	26.67	.6465
4	.2043	5.189	21.15	.8152
5	.1819	4.621	16.77	1.028
6	.1620	4.115	13.30	1.296
7	.1443	3.665	10.55	1.634
8	.1285	3.264	8.366	2.061
9	.1144	2.906	6.634	2.599
10	.1019	2.588	5.261	3.277
11	.0907	2.305	4.172	4.132
12	.0808	2.053	3.309	5.211
13	.0720	1.828	2.824	6.571
14	.0641	1.628	2.081	8.286
15	.0571	1.450	1.650	10.45
16	.0508	1.291	1.309	13.17
18	.0403	1.024	.8231	20.95
20	.0320	.8118	.5176	33.31
22	.0253	.6438	.3255	52.96
24	.0201	.5106	.2047	84.22
26	.0159	.4049	.1288	133.9
28	.0126	.3211	.08098	212.9
30	.0100	.2546	.05093	338.6
32	.00795	.2019	.03203	538.3
34	.00630	.1601	.02014	856.0
36	.00500	.1270	.01267	1361
38	.00397	.1007	.00797	2164
40	.00314	.0799	.00501	3441

Other Stuff

Thanks to the Contributors

Books:
Engineer's Mini-Notebook by Forrest Mims III,
Encyclopedia of Electric Components

References

Web Sources:
dangerousprototypes.com
blog.pjrcardarocabral.com
schematic.com
en.wikipedia.org
venkel.com

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Let's Keep in Touch!

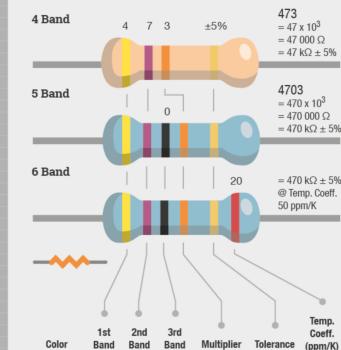
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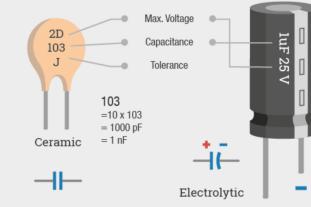
Resistor Color Coding



Color	1st Band	2nd Band	3rd Band	Multiplier	Tolerance	Temp. Coeff. (ppm/K)
Black	0	0	x10 ⁰	0	±5%	250
Brown	1	1	1	x10 ¹	±1%	100
Red	2	2	2	x10 ²	±2%	50
Orange	3	3	3	x10 ³	±15%	15
Yellow	4	4	4	x10 ⁴	±25%	25
Green	5	5	5	x10 ⁵	±50%	20
Blue	6	6	6	x10 ⁶	±25%	10
Violet	7	7	7	x10 ⁷	±10%	5
Grey	8	8	8	x10 ⁸	±05%	1
White	9	9	9	x10 ⁹		
Gold				x10 ⁻¹	±5%	
Silver				x10 ⁻²	±10%	

Capacitor Coding

Common Capacitors



Capacitance Conversion Table

Microfarads (μF)	Nanofarads (nF)	Picofarads (pF)
0.000001 μF	= 0.001 nF	= 1 pF
0.00001 μF	= 0.01 nF	= 10 pF
0.0001 μF	= 0.1 nF	= 100 pF
0.001 μF	= 1 nF	= 1 000 pF
0.01 μF	= 10 nF	= 10 000 pF
0.1 μF	= 100 nF	= 100 000 pF
1 μF	= 1 000 nF	= 1 000 000 pF

Max. Operating Voltage

1H	50 V	2E	250 V
2A	100 V	2G	400 V
2T	150 V	2L	630 V
2D	200 V		

Tolerance

B	±0.1 pF	H	±3%
C	±2.5 pF	J	±5%
D	±50 pF	K	±10%
F	±1%	M	±20%
G	±2%	Z	+80% / -20%

Electrical Units

Basic Electrical Units

Quantity	Abbrev. / Unit	Quantity	Abbrev. / Unit
Capacitance	F Farad	Inductance	H Henry
Charge	C Coulomb	Magnetic Flux	Wb Weber
Current	A Ampere	Potential	V Volt
Energy	J Joule	Power	W Watt
Force	N Newton	Resistance	Ω Ohm
Frequency	Hz Hertz		

Metric Prefixes

Tera-	T × 10 ¹²	1 000 000 000 000
Giga-	G × 10 ⁹	1 000 000 000
Mega-	M × 10 ⁶	1 000 000
Kilo-	K × 10 ³	1 000
Hecto-	H × 10 ²	100
Deka-	D × 10 ¹	10
(base)	- × 10 ⁰	1
Deci-	d × 10 ⁻¹	0.1
Centi-	c × 10 ⁻²	0.01
Milli-	m × 10 ⁻³	0.001
Micro-	μ × 10 ⁻⁶	0.000 001
Nano-	n × 10 ⁻⁹	0.000 000 001
Pico-	p × 10 ⁻¹²	0.000 000 000 001

Light Emitting Diode (LED)

Typical LED Characteristics

Color	Wavelength (nm)	Typical Forward Voltage (V) @ 20 mA
Red	630 - 660	1.8
Orange	605 - 620	2.0
Yellow	585 - 595	2.2
Green	550 - 570	3.5
Blue	430 - 505	3.6
White	450	4.0
Ultraviolet	850 - 940	1.2

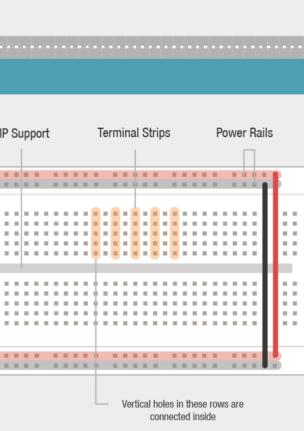
Surface Mount Devices (SMDs)

SMD Resistor Markings

3 Digit	4 Digit
473	4702
	= 47 × 10 ³
	= 47 000 Ω
	= 47 kΩ
with Radix Point	with Radix Point
4R7	4R7
	= 4.7 Ω
OR47	OR47
	= 0.47 Ω

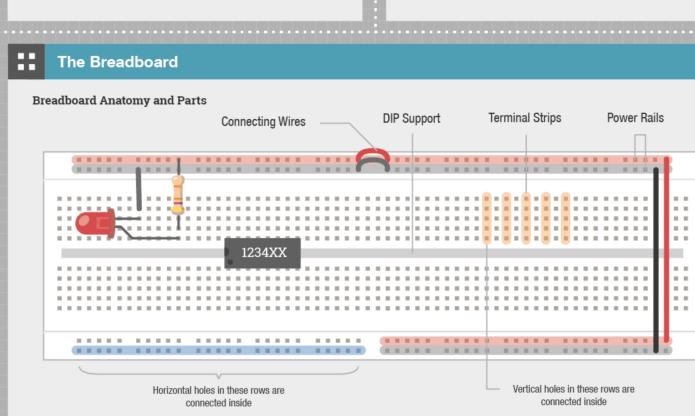
SMD Capacitor Markings

Tantalum	473	473	473
	16V	16V	16V
		= 47 × 10 ³ pF	= 47 nF @ 16V
		= 47 000 pF	= 47 nF
		Electrolytic Capacitor	
		473	16V



The Breadboard

Breadboard Anatomy and Parts



555 IC

555 IC Pinout

8 Pin DIP	Ground 1	Trigger 2	Output 1 3	Reset 4
	8 Vcc	7 Discharge	6 Threshold	5 Control

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