

### Variables

P = Power (Watt)

I = Current (amp)

R = Resistance (ohm)

W = Watt

J = Joule

S = Second

V = Voltage (volt)

### Equations

Parallel Resistance  $1 / R_{tot} = 1/R1 + 1/R2 \dots$

Voltage Divider  $V_{out} = V_{in} * R2 / R1 + R2$  Voltage at Middle of divider

LED Resistor  $R = (V_s - V_f) / I_f$   $V_s$  = Source Voltage,  $V_f$  = LED Forward Voltage,  $I_f$  = LED desired Current

Capacitor Parallel  $C_{tot} = C1 + C2 + C3 \dots$  Total values are additive

Capacitor Series  $C_{tot} = 1/C1 + 1/C2 + 1/C3 \dots$

Power  $P = I^2 * R$

Ohms Law (Voltage)  $V = I * R$

Ohms Law (Resistance)  $R = V / I$

Ohms Law (Current)  $I = V / R$

Wattage  $W = J / S$

Inverting Op Amp Gain  $Gain = R_f / R_{in}$   $R_{in}$  = input resistor value,  $R_f$  = output resistor value

Noninverting Op Amp Gain  $Gain = 1 + R_f / R_{in}$   $R_{in}$  = input resistor value,  $R_f$  = output resistor value

Conductance  $G = 1 / R$

dB Gain Power  $dB = 10 \log(\text{power ratio})$

db Gain Voltage  $dB = 20 \log(\text{voltage ratio})$

### Units

T tera  $10^{12}$

G giga  $10^9$

M mega  $10^6$

k kilo  $10^3$

m milli  $10^{-3}$

u micro  $10^{-6}$

n nano  $10^{-9}$

p pico  $10^{-12}$

f femto  $10^{-15}$



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