**Harold’s DC Circuits**

**Cheat Sheet**

11 October 2025

**Circuit Laws**

|  |  |  |
| --- | --- | --- |
| **Circuit Law** | **Formula** | |
| **Kirchhoff’s Current Law (KCL)** |  |  |
| The total current flowing into a node or junction must equal the total current flowing out of the node or junction.  (conservation of charge) | |
| **Kirchhoff’s Voltage Law (KVL)** |  |  |
| The sum of all voltages around a circuit loop is equal to zero.  (conservation of energy) | |
| **Ohm’s Law** |  | A circular diagram of electrical symbols  Description automatically generated with medium confidence |
| **Power** |  | An across (V) times a through (I) variable. |
| **Electrical Energy** |  |  |

**Components**

|  |  |  |  |
| --- | --- | --- | --- |
| **Element** | **Battery** | **Ground** | **Current Source** |
| **Component** | Arduino misconceptions 6: a 9V battery is a good power source | The mystery of the 3 prong cord - Air ... | CS580 Current Source |
| **Symbol** | Battery Symbol | Ground Symbol Clip Art at Clker.com - vector clip art online, royalty free  & public domain | Ammeter Symbol Symbol |
| **Denoted by** |  |  |  |
| **Units** | V (Volt) |  | A (Ampere) |
| **Series** |  | NA |  |
| **Parallel** |  | NA |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Element** | **Resistor** | **Capacitor** | **Inductor** |
| **Component** | Close-up of a resistor  AI-generated content may be incorrect. | Toshin Kogyo 220μF Electrolytic Capacitor 63V dc, Radial, Through Hole -  1JUTSJ221M0 | A close up of a coil  AI-generated content may be incorrect. |
| **Symbol** | Vector clip art of RSA electronics capacitor symbol | Public domain vectors | A black symbols with a plus and a curved line  AI-generated content may be incorrect. | A black line with a white background  AI-generated content may be incorrect. |
| **Denoted by** |  |  |  |
| **Units** | Ω (Ohm) | F (Farad) | H (Henry) |
| **Equation** |  |  |  |
| **Series** | A diagram of a circuit  AI-generated content may be incorrect. | A diagram of a circuit  AI-generated content may be incorrect. | A diagram of a circuit  AI-generated content may be incorrect. |
|  |  |  |
| **Parallel** | A diagram of a circuit  AI-generated content may be incorrect. | A math equation with numbers and symbols  AI-generated content may be incorrect. | A diagram of a circuit  AI-generated content may be incorrect. |
|  |  |  |

**Electrical Symbols**

A group of electrical symbols

AI-generated content may be incorrect.

**Sources**

* Electrical Technology (2020 Oct). Resistance, Capacitance & Inductance in Series-Parallel – Equation & Formulas. <https://www.electricaltechnology.org/2020/10/resistance-inductance-capacitance-series-parallel-formulas.html>
* ForumElectrical.Com (2025). Electrical Symbols. <https://forumelectrical.com/basic-electric-symbols/>
* LibreTexts Physics (2024). 9.6: Electrical Energy and Power. <https://phys.libretexts.org/Bookshelves/University_Physics/University_Physics_(OpenStax)/University_Physics_II_-_Thermodynamics_Electricity_and_Magnetism_(OpenStax)/09%3A_Current_and_Resistance/9.06%3A_Electrical_Energy_and_Power>
* Tech Web (2024). Resonant Circuits: Resonant Frequency and Q Factor. <https://techweb.rohm.com/product/power-device/si/18332/>