Electronic Devices and Circuits I [ELECENG 2EI4]
Project #2A

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Properties of an Ideal Switch

1. There is no limit to the forward or reverse current when the switch is in the ON state.
2. No limit to the amount of voltage across the switch when in OFF state.
3. No voltage drop when in ON-state.
4. Infinite OFF-state resistance.
5. Infinitely fast switching times (instant ON to OFF or vice-versa).
6. Zero power is lost.
7. Zero inductance when ON.
8. Zero capacitance when ON.
9. Zero resistance when in ON.

Quantitative Non-Idealities of a Real Switch

1. Limited current when ON (Max I = max power / R^2) and limited voltage drop (max voltage depends on gap between contacts and dielectric breakdown properties of insulator) when OFF.
2. Finite time to switch states (t > 0)
3. R > 0, V drop > 0.
4. Power losses = V drop * I