Variable Power Supply Brick

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Abstract**:**

This final project will attempt to integrate two different charging ports (Standard USB and USB-C) into a shared switching power supply or brick. An efficient and safe bridge wave rectifier will be built to convert the AC voltage from the wall outlet at 120V RMS 60 Hertz to an appropriate voltage and current amount such that whichever devices that are connected to the ports are safely charged. The strategy to undertake this power electronics project is to develop a simple working rectifier circuit to convert AC voltage to DC voltage. After confirming its operation, the rectifier will be improved in terms of efficiency of power. We will need to build separate circuits to implement USB and USB-C because each has its own requirements for current and wattage. We will test the power supply by looking at the charging of a USB Power bank or some other device. Our goal is to compare this with the industry standards. When each module's performance is verified, we will try to combine both into one circuit. Some concerns that we have are the limited documentation and resources due to manufacturer variations of specifications.