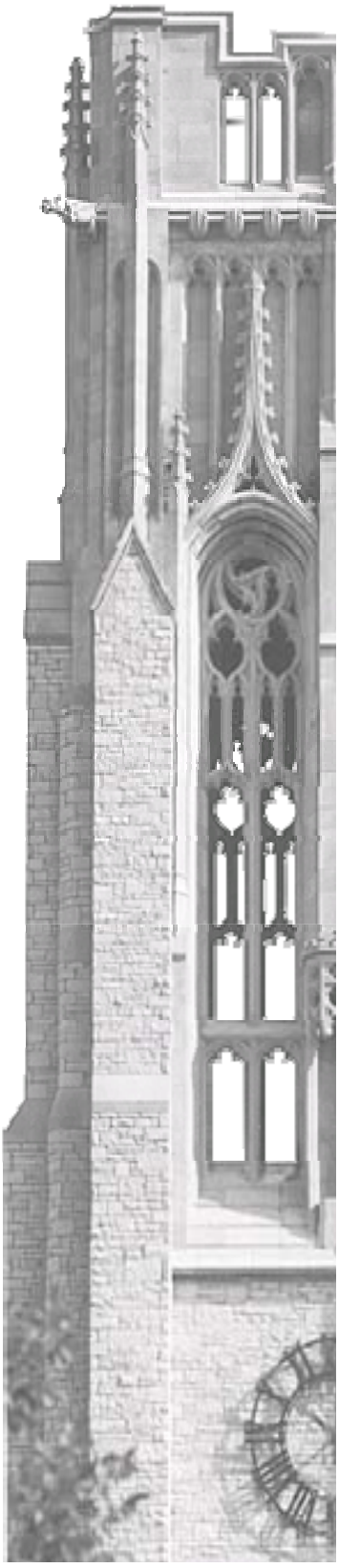
THE UNIVERSITY OF TOLEDO
1872

seeks partner to license

High Efficiency Voltage Converter



DC to DC converters are important in portable electronic devices such as cellular phones and laptop computers, which are supplied with power from batteries. A DC-to-DC converter is a device that accepts a DC input voltage and produces a DC output voltage. Electronic devices often contain several subcircuits with each requiring a unique voltage level different than that supplied by the battery. DC to DC converters offer a method of generating multiple controlled voltages from a single variable battery voltage, thereby saving space instead of using multiple batteries to supply different parts of the device. Power losses often occur when a device turns on, when they turn off, and while they conduct current. These losses cause heat, which ultimately limits the amount of power that can be processed by the converter. The turn on and turn off losses also increase with the switching frequency, and thus they limit the maximum frequency. This limitation is important because higher frequencies allow the use of smaller transformers which reduces the size, weight, and cost of the converter. At power levels above several kilowatts, these restrictions usually dominate the design, making it necessary to use parallel arrays of the devices and/or use more elaborate cooling methods. Therefore a full bridge converter has been developed for converting direct current from one level to another using zero voltage switching for one leg of the bridge and zero current switching for the other leg of the bridge.

The University of Toledo is seeking a company interested in utilizing this full bridge DC to DC converter which provides zero voltage switching (ZVS) for one leg of the bridge and zero current switching (ZCS) for the other leg of the bridge and a significant reduction in the switching losses of the switching devices, which allows for higher power and frequency combinations.

Applications:
Various battery powered devices. This technology will help reduce the size and weight of these devices while increasing their efficiency.

Advantages:
1. Less expensive than current designs
2. Smaller and lighter than current designs
3. Power loss is greatly reduced compared to other designs
4. Capable of operation at high power and high frequency

This invention is protected by issued patent: 5,235,501

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