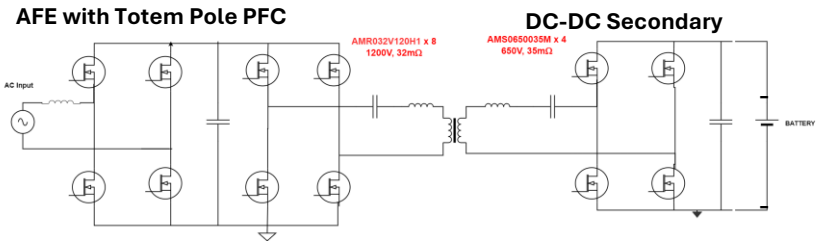
Application Brief

Leveraging SiC to Enable High Efficiency Bidirectional Converters

Analog Power Conversion Electronics, LLC

Applications

- PSUs
- BESS
- UPS Systems
- EV Charging



Highlighted Products***

- **AAR032V120H1**– SiC MOSFET, 1200V, 32mOhm
- AMS0650035M - SiC MOSFET, 650V, 35mOhm

SiC Benefits

- SiC MOSFET's Fast Body Diode reduces switching losses
- High Frequency of Operation reduces size of components
- Enables Active front end topologies for higher efficiency

Why APC

- State of the Art SiC manufacturing per latest Industry standards
- Amongst industry's shortest lead time
- Designed in the U.S., Built in the Philippines.

Background

Bidirectional converters are increasingly becoming common place due to renewable energy systems and electric vehicles. In these systems power is transferred in two directions from source to load and vice versa. DC-DC bidirectional converters typically operate between two different voltage levels such as used in BESS and hybrid/electric vehicles. AC-DC bidirectional converters convert between AC and DC and allow bidirectional current flow. They are primarily found in grid-tied systems where energy can flow to and from the grid such as in Rectifier/inverter configurations. AC-AC bidirectional converters handle bidirectional energy exchange between AC systems typically found in industrial drives or microgrid applications and power backup systems.

References

[1] A Comprehensive Review of the Bidirectional Converter Topologies for the Vehicle-to-Grid System

[2] AC/DC, DC-DC bi-directional converters for energy storage and EV applications

*** You can purchase samples of Luminus Power Semiconductor products **here.** Our authorized distributors are Avnet Electronics, Mouser and Digikey.