

Features

- Bi-directional 1 kW inverter
- 96.7% peak efficiency
- Four quadrant operation
- Uses Solantro's advanced Digital Power chipset and SiC FET technology to achieve high performance
- HDLC communications over USB control interface
- Fast switching between inverter and charger mode less than 1 grid cycle.
- Developed to demonstrate 48 V battery systems, it is easily adapted to other battery systems.

Benefits

- High power density and low component count
- SA4041 digital power processor
- Digital control methods allow for further housekeeping, switch control, and telemetry custom functions to be added by on top of base control firmware.
- Advanced Digital Power controller to support advanced functions including:
 - Active anti-islanding method
 - Grid forming when off-grid applications
 - AC-coupled power sharing between parallel inverters in off-grid mode.

Applications

- Base platform for EV OBC system development, eliminates burden of using HV battery. Easily reconfigured to work with HV battery.
- Self-forming power grid systems
- PV energy storage
- UPS for backup systems for data centers, lighting, automation, and municipal applications.
- Peak demand limiting in off-grid renewable systems.

Includes:

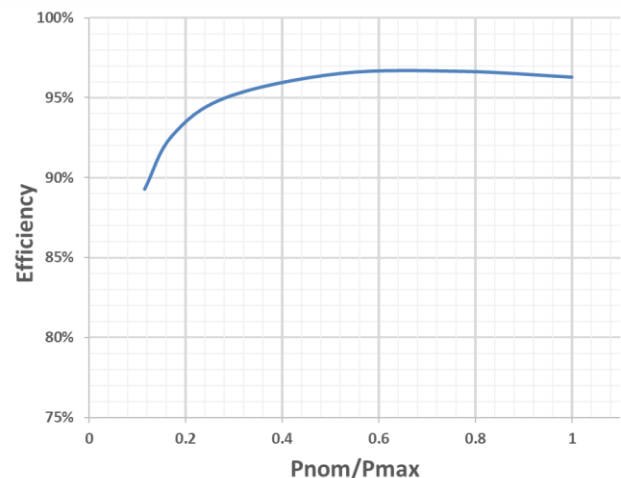
- AB-1KACBI Evaluation board with installed firmware
- Helios Test and Control Software
- Reference Source code to implement ACBI functions

Description

The Solantro AB-1KACBI Evaluation Board facilitates the development of AC battery inverter solutions. The platform implements a bi-directional AC battery inverter design capable of addressing a wide range of AC-coupled energy storage requirements.

Solantro's Digital Power chipset can support a wide range of battery technologies and grid specifications for North American and international applications. The AB-1KACBI Development Platform includes two UART ports allowing the the SA4041 digital power processor to communicate with the Helios debug environment and standard terminal window (PuTTY). This solution allows customers to develop products with quick time-to-market requirements.

Figure 1 - AB-1KACBI Platform with efficiency curve



The diagram illustrates a power management system for a 48V battery. The main components and their interconnections are as follows:

- BMS (Battery Management System):** Connected to the Solid state transformer.
- Solid state transformer:** Connected to the Bi-directional current source.
- Bi-directional current source:** Connected to the High efficiency H-bridge inverter.
- High efficiency H-bridge inverter:** Connected to the EMI filter.
- EMI filter:** Connected to the output of the inverter.
- Solantro dP2 Chipset:** A central control unit connected to the Solid state transformer, Bi-directional current source, and High efficiency H-bridge inverter.
- Solantro APM SA1002:** MOSFET drivers with advanced power supply, voltage dividers.
- Solantro IXC2 SA4041:** Microcontroller with advanced timing features for managing real-time power converters.

Key specifications and features:

- Power - 1000W
- Switching time between charge / discharge and discharge / charge - less than 1 grid cycle (configurable)

Parameter	Value	Units
AC output		
AC voltage range	212 – 264	Vrms
AC frequency range	55 – 65	Hz
Continuous, maximum rated power	1	kW
THD at Max Power	1	%
Power factor range	0.03 to 1.0	%, inductive or capacitive
Efficiency (Peak) DC to AC	96.6	%
Max. AC Current (Continuous)	4.6	Arms
DC output		
Battery voltage range Based on 48V battery	42 - 54	Vdc (scalable with higher voltage batteries)
Max Battery current	-24	A
Efficiency (peak) AC to DC	95	%

Part Number	Description
AB-1KACBI-DS-01	Development kit for the 1 kW bi-directional AC battery inverter platform (includes board with no enclosure and cabling for communication)

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