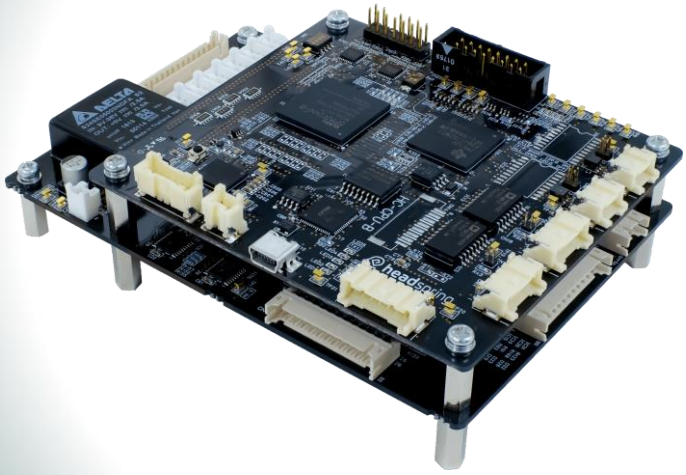
headspring
Sustainable Energy Solutions

Power Electronics Embedded Controller

HECS-B/A

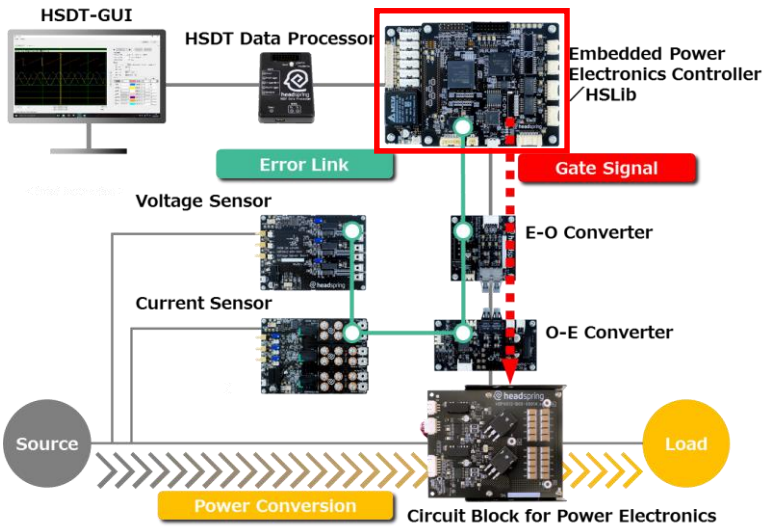


High-ended and Compact Power Electronics Controller for R&D and Mass-production. 2 three-phase Inverter can be Driven with one Controller.

Abstract

- Equipped with High-ended Micro Processer TI TMS320F28377S (200MHz) enabling Real-time Control by Trigonometric Function
- Equipped with FPGA Xilinx XC6SLX45. Various pulse pattern generation by customizing the logic, feedback control with external AD converter available.
- 12 Gate output enable parallel drive of 2 of three-phase inverter or 3 of single-phase inverter.
- CAN / RS232C / RS485 / USB-Port for various embedded system.
- Debug by HSDT (Development Toolset)

Connection Image



Features

Designed for Power Electronics R&D

- Enabling Efficient Product Development by High-ended Specification and Functions
- Library for debug and development of control programs

Flexible Design with Separated CPU Board and I/F Board

- Various Platform can be realized by Tiny Customize of I/F Board and Library

"Error Link" Function

- Error State Sharing with Other Headspring Platform Products with Attached Cable
- Automatic and Hardware-level Gate Shutdown Function

Compact Design

- Not only in Laboratory, but also Embedded System can be Realized Easily

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Specifications

Subject	Specification	Notes
Micro Processor	TI TMS320F28377S	200 MHz Clock Frequency
FPGA	XC6SLX45	Spartan-6
Gate Signal output	12 port	5V TTL
Error-Link I/F	4ch	5V TTL
AD Input	16ch	+/- 5V, 100kHz
Digital Input	16ch	5V
Digital Output	16ch	DC5~30V/50mA
Dim(mm)	W90×D130×H30	
Operational Temperature	0~50℃	No Condensing
Power Supply	DC10.8~26.4V	
Power Consumption	Less than 18W	

Related Function with Other Platform Product

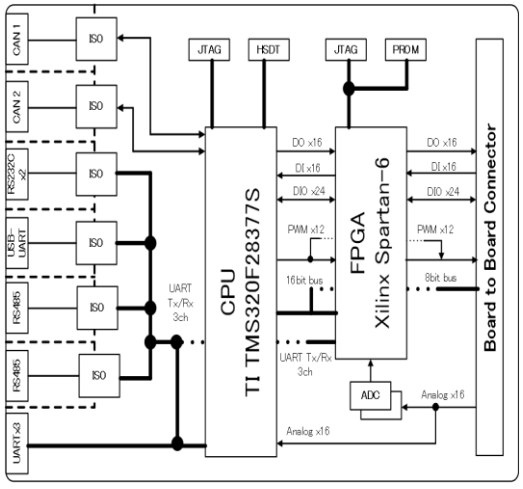
Function	Description
Circuit Block I/F (6ch)	Interface directly to Circuit Block Maximum 6 Blocks Provision of Gate, Error and Reset Signal and 5V Power Supply
Error Link I/F (4ch)	Interface for Error Link Function with other platform products. Maximum 4 links. In/Out of Error State, Reset signal
HSDT I/F	Interface to HSDT-DataProcessor. Download of Embedded Program, HSDT Debug Function available

Equipped Function (Excerpt)

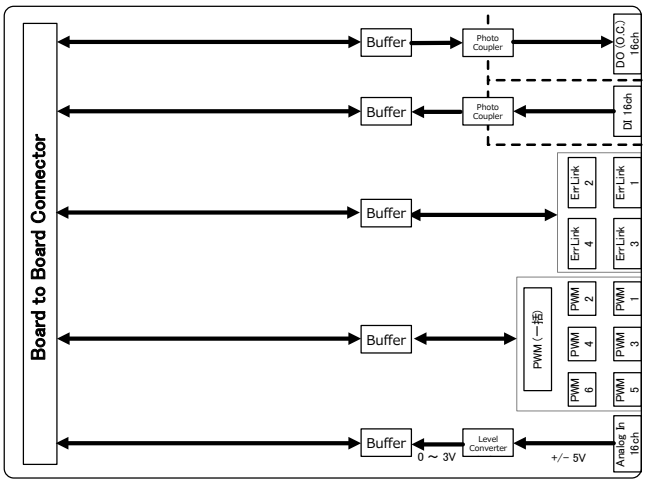
Functions	Description
PWM Generator (12 port)	Complement PWM Generator with Dead-time Function. PWM generation is done by carrier comparison selected from sine-wave, saw-tooth-wave and reverse saw-tooth-wave. Multiple PWM can be synchronized.
Digital In/Out (16ch each)	Isolated Universal Digital Input / Output. Read / Write by Library available.
AD Conversion (16ch)	12bit AD Conversion Function. Start time Control by PWM Generation timer, Periodic timer are available
Comparator (8ch)	Comparing input voltage with upper and lower threshold to activate Gate Block function. Threshold can be defined using Library.
Universal LED (Yellow/Red x 4)	Controlled by embedded program and FPGA
Universal Dip Switch	Read by embedded program and FPGA
Asynchronous Serial Com Port (3ch)	Isolated Asynchronous Serial Com with RS485, RS232C and USB-UART. All the port are Isolated from circuit board.
CAN Com Port	CAN port isolated from circuit board
EEPROM	512kbit EEPROM for embedded program with I2C connection

Block Diagram

●CPU Board



●I/F Board



＊Specifications and Design are subject to change

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