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PHOTON MPPT

HIGH EFFICIENCY

MPPT designed for the highest possible efficiency across the entire operating range while weighing only 549 grams. Photon has the best efficiency among solar vehicle optimized MPPTs.

DESIGN FLEXIBILITY

The ability to efficiently convert power at ratios of up to 16 to 1 allows for maximum design flexibility. The Photon MPPT will function with a huge variety of solar arrays.

SPECIALIZED DESIGN

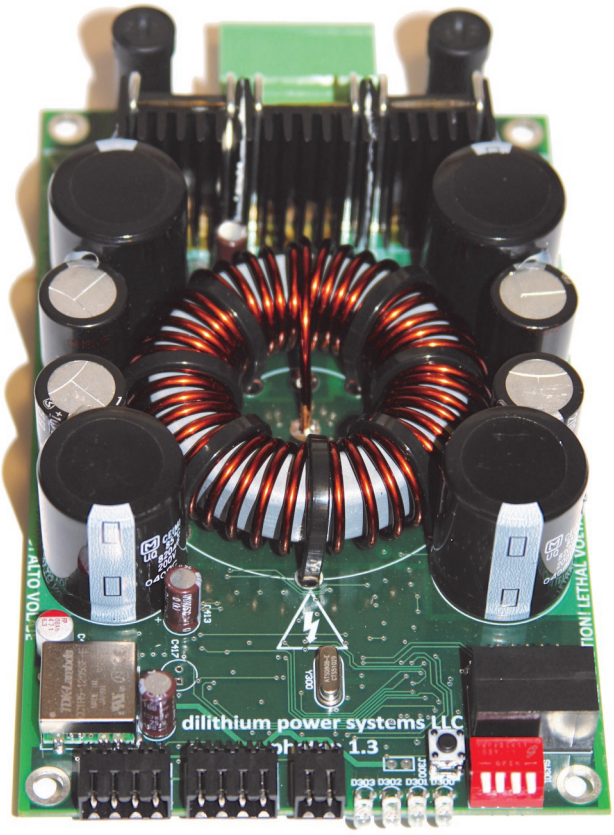
This MPPT is designed specifically for solar vehicles conforming to new 6.00m^2 Silicon cell regulations.

ENCLOSURE OPTION

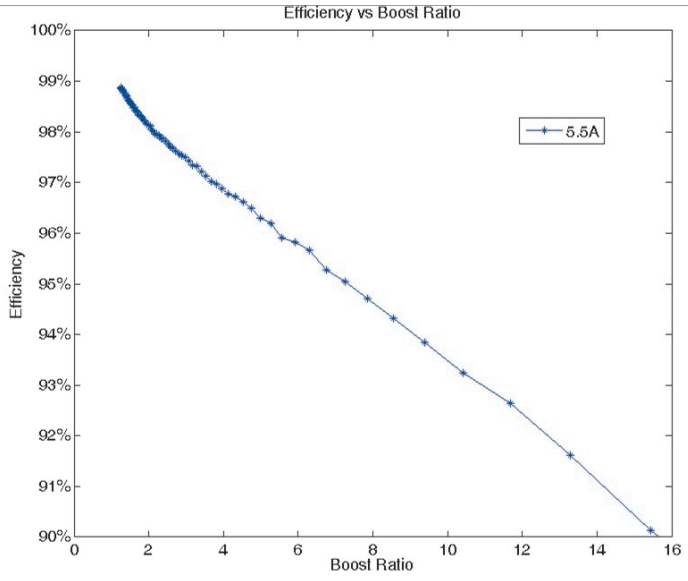
Photon is sold with an optional enclosure. Enclosure is made from Aluminum and can be customized for your color choices.

CONTACT INFO

Dilithium Power Systems LLC
1863 Parkway Drive
Shakopee, MN 55379
info@dilithiumpower.com



- Closed loop maximum point power tracker designed for tracking solar arrays on solar powered vehicles.
- Designed for lower voltage, high efficiency silicon arrays.
- Optimized for SunPower A300, C50 and C60 cell arrays.
- Allowable boost ratio ranges from 1 to 16, with up to 160V battery.
- CAN based communications for remote telemetry monitoring of array performance.
- Logic powered by 12V supplied with CAN bus
- Best available efficiency for maximum array performance.



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Specifications	Min	Max	Nominal	Units
Array Voltage	5	Battery V - 1		Volts
Array Current	0.75	12	5.5	Amps
Battery Voltage	5	160	108	Volts
Operating Temp	0	70	25	Centigrade
Boost Ratio	1	16	1	-
CAN Supply Voltage	10	16	12	Volts
CAN Supply Current			90	Milliamps
CAN Baudrate			125k	Bits/s
Length (PCB)			160	mm
Width (PCB)			100	mm
Height (PCB)			40	mm
Length (With Box)			164.5	mm
Width (Box, No Feet)			108.5	mm
Width (Box, With Feet)			140.8	mm
Height (Box)			45	mm
Mass (PCB)			549	Grams
Mass (With Box)			881	Grams

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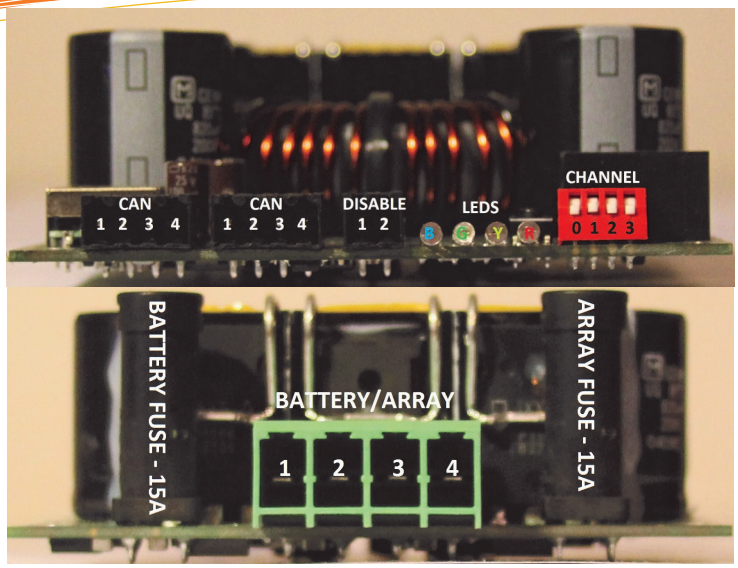

Connector/Pin/Item	Function	Note
CAN		
1	CAN V+	10-16VDC
2	CAN H	
3	CAN L	
4	CAN GND	Isolated from Array/Battery
DISABLE		
1	CAN GND	Isolated from Array/Battery
2	DISABLE	Float for enable, short to CAN GND to disable
BATTERY/ARRAY		
1	BATTERY-	Do not short between Battery- and Array-
2	BATTERY+	5 to 160VDC
3	ARRAY+	Must be lower then Battery voltage to track
4	ARRAY-	Do not short between Battery- and Array-
LEDS		
Blue	Output Enabled	If on solid, the tracker's power circuit is running
Green	Tracking Algorithm	Blinks at 2hz to indicate state machine is running
Yellow	Curve Tracing	On during curve tracing and initialization
Red	Error	Indicates an error state - flashes out error code
CHANNEL		
0-3	Set CAN Address	Sets offset from base address - binary encoded, Down = 0, Up = 1

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CAN Header	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB
RTR 0x600 + Channel	Array Voltage		Array Current		Battery Voltage		Temperature	
0x610 + Channel	Enable							

- Photon MPPT uses a very simple CAN structure
- An RTR packet issued by a host to the base address of 0x600 plus the binary encoded channel number selected with the channel selection DIP switches will cause the MPPT to issue the data packet. This is an 8 byte packet with array voltage, array current, battery voltage and MPPT temperature information over the bus.
    - Scaling is simplified and standardized.
    - Array voltage is scaled by 100, or 1 count = 10mV
        - Value 12345 = 123.45V
    - Array current is scaled by 1000, or 1 count = 1mA
        - Value 12345 = 12.345A
    - Battery voltage is scaled by 100 or 1 count = 10mV
        - Value 12345 = 123.45V
    - MPPT Temperature is scaled by 100 or 1 count = 10mC
        - Value 12345 = 123.45C
- By issuing a one byte packet to address 0x610 plus the binary encoded channel number the MPPT can be enabled or disabled over the CAN network. Data 0x01 will enable the MPPT. Data 0x00 will disable the MPPT. The MPPT starts up default in the enabled state. Note: this MPPT uses a non-isolating topology and thus turns into a diode when either disabled or off. Array voltage will be passed through to the output even when off.

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