

Delphi Series HD0SR Half Brick Family Full Digital Control DC/DC Power Modules: 192~400V In, 600W Out

The Delphi Series HD0SR, 192~400V input, isolated single output, Half Brick, are full digital control DC/DC converters, and are the latest offering from a world leader in power systems technology and manufacturing — Delta Electronics, Inc. The HD0SR series provide up to 600 watts power conversion in a small Half Brick package size; It has high conversion efficiency, 95% Half Load efficiency and 94% Full load efficiency. Three kinds of package, open frame, with heatspread and with potting, are provide for different cooling environment application. There is a built-in digital PWM controller in the HD0SR series, which is used to complete the V_o feedback, PWM signal generation, current sharing, fault protection, and PWBUS communications, and so on. With the digital control, many design and application flexibility, advanced performance, and reliability are obtained; and the HD0SR series can be connected in parallel directly for higher power without add external oring-fet

FEATURES

- ♦ High efficiency: 95% @ 50% Load
94% @ 100% Load
- ♦ Size:
72.5 x 65.6 x 12.7mm (2.84"x2.58"x0.5")
- ♦ -40%~10% trim range
- ♦ Parallel able application
- ♦ Monotonic startup into normal and Pre-biased loads
- ♦ PMBus Rev.1.2 compliance
- ♦ Input UVLO, Output OCP & OVP, OTP
- ♦ Reinforce insulation
- ♦ 4242V isolation voltage
- ♦ No minimum load required
- ♦ ISO 9001, TL 9000, ISO 14001, QS 9000, OHSAS 18001 certified manufacturing facility
- ♦ UL/cUL 60950-1 (US & Canada) to be recognized

OPTIONS

- ♦ Open frame
- ♦ With Heatspread
- ♦ With Potting
- ♦ Short pin lengths available

APPLICATIONS

- ♦ Telecom / DataCom
- ♦ Wireless Networks
- ♦ Optical Network Equipment
- ♦ Server and Data Storage
- ♦ Industrial/Test Equipment

TECHNICAL SPECIFICATIONS

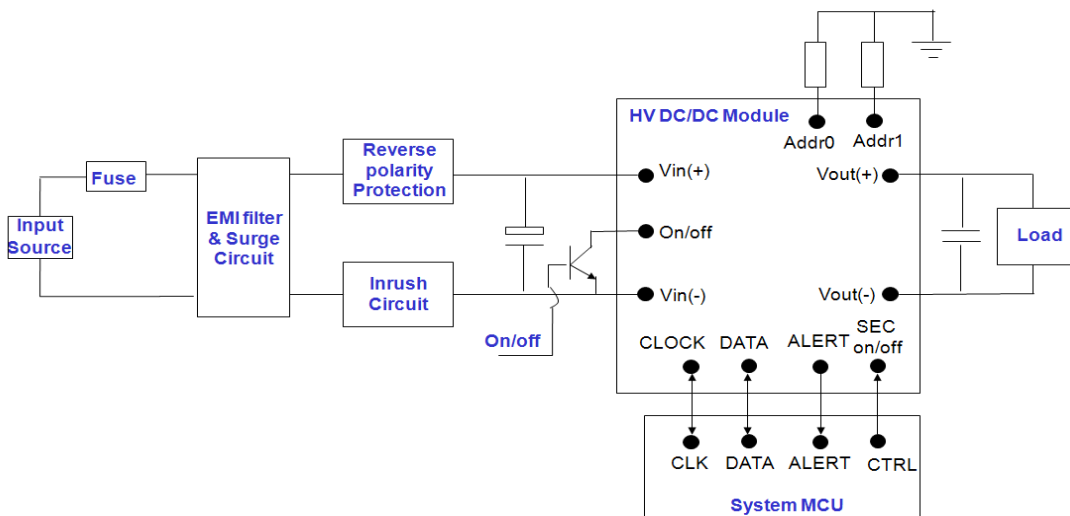
($T_A=25^{\circ}\text{C}$, airflow rate=300 LFM, $V_{in}=375\text{Vdc}$, nominal V_{out} unless otherwise noted.)

PARAMETER	HD0SR48013	HD0SR28022	HD0SR12050
INPUT CHARACTERISTICS			
Nominal V_{in}	240V & 380V	240V & 380V	240V & 380V
Operating Input Voltage	192~400V	192~400V	192~400V
OUTPUT CHARACTERISTICS			
Output Voltage Set Point	48V	28.0V	12.0V
Output Voltage Regulation			
Over Load	+/- 80mV max	+/- 40mV max	+/- 20mV max
Over Line	+/- 80mV max	+/- 40mV max	+/- 20mV max
Over Temperature	-480mV max	-240mV max	-120mV max
Total Output Voltage Range	47.2~48.8V	27.6~28.4V	11.8~12.2V
50% Load Efficiency	95% typical	95% typical	95% typical
100% Load Efficiency	94% typical	94% typical	94% typical
V_o Trim range	-40%~+10%	-40%~+10%	-40%~+10%
Current sharing accuracy	+/-10% max	+/-10% max	+/-10% max
Others			
Insulation	Reinforce Insulation	Reinforce Insulation	Reinforce Insulation
Hipot voltage	4242V DC Max	4242V DC Max	4242V DC Max
Size	72.5 x 65.6 x 12.7mm (2.84"x2.58"x0.5")	72.5 x 65.6 x 12.7mm (2.84"x2.58"x0.5")	72.5 x 65.6 x 12.7mm (2.84"x2.58"x0.5")

PIN DEFINITION

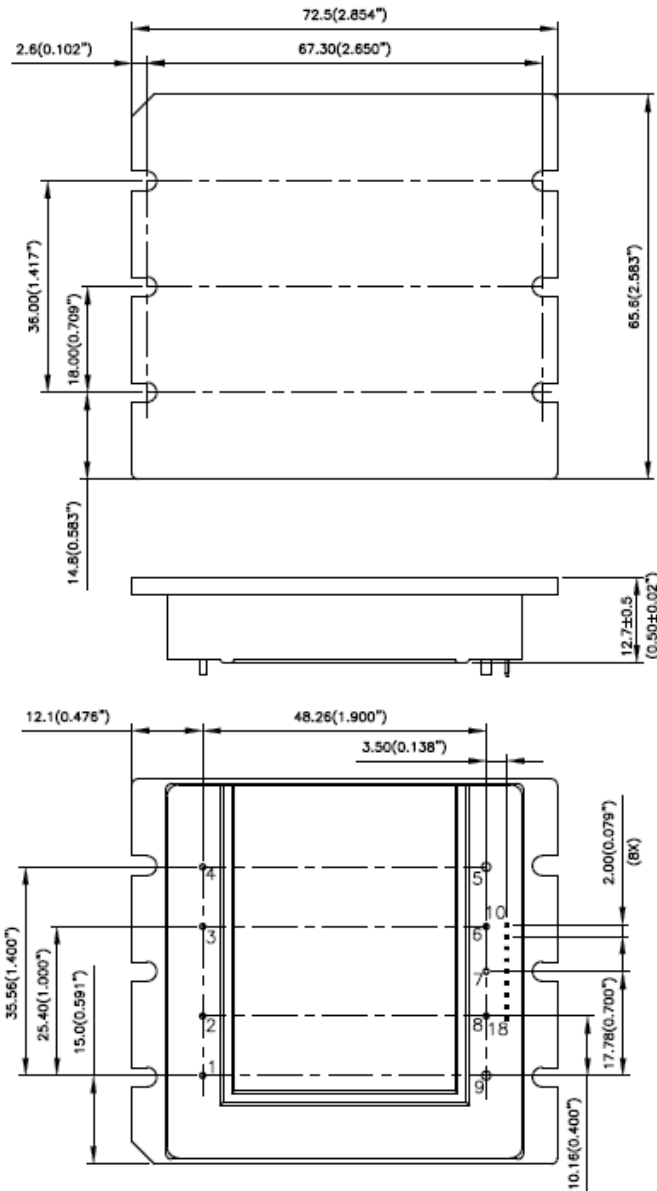
Pin#	Name	Function	Pin#	Name	Function
1	VIN(+)		10	SHARING BUS	Sharing bus pin for active current sharing; By short this pin of the parallel module to realize current sharing.
2	ON/OFF	Primary on/off control pin	11	SEC on/off	Secondary on/off control pin
3	CASE	Case pin of the module	12	SGnd	Signal ground
4	VIN(-)		13	Data	PMBus data line
5	VOU(-)		14	Alert	PMBus SMBAlert line
6	SENSE(-)	Sense $V_o(-)$ Voltage	15	Clock	PMBus clock line
7	TRIM	Adjust V_o set point voltage	16	Addr1	ADDR1 pin sets the high order digit of the address.
8	SEMSE(+)	Sense $V_o(+)$ Voltage	17	Addr0	ADDR0 pin sets the low order digit of the address.
9	VOU(+)		18	NC	

SIMPLIFIED APPLICATION CIRCUIT



MECHANICAL DRAWING (WITH HEATSPREAD)

**For modules with through-hole pins, they are intended for wave soldering assembly onto system boards, please do not subject such modules through reflow temperature profile.*



Pin#	Function
1	VIN(+)
2	ON/OFF
3	CASE
4	VIN(-)
5	VOUT(-)
6	SENSE(-)
7	TRIM
8	SENSE(+)
9	VOUT(+)
10	SHARING BUS
11	SEC ON/OFF
12	SGND
13	DATA
14	DIGITAL ALERT
15	CLK
16	ADDR1
17	ADDR0
18	NC

NOTE:
 ALL DIMENSIONS ARE IN MILLIMETERS AND [INCHES]
 TOLERANCE: X.Xmm±0.5mm [X.XX in ±0.02in]
 X.XXmm±0.025mm [X.XXX in±0.010in]

Pin Specification:

- Pins 1-4 & 6-8 1.00mm (0.040") diameter (All pins are copper with matte Tin plating over Nickel under plating)
- Pins 5 & 9 1.50mm (0.059") diameter (All pins are copper with matte Tin plating over Nickel under plating)
- Pins 10-18 SQ 0.50mm(0.020") (All pins are copper with gold flash plating)



PART NUMBERING SYSTEM

H	D0	S	R	480	13	N	R	F	A
Type of Product	Input Voltage	Number of Outputs	Product Series	Output Voltage	Output Current	ON/OFF Logic	Pin Length /Type		Option Code
H - Half Brick	D0 - 192~400V	S - Single	R - Series number	480 - 48V	13 - 13A	N - Negative	K - 0.110" N - 0.145" R - 0.170"	F - RoHS 6/6 (Lead Free)	A - Open frame H - With heatspread C - With heatspread and Potting

MODEL LIST

MODEL NAME	INPUT	OUTPUT	EFF @ 50% LOAD
HD0SR48013NRFA	192~400V	4.5A 48V	95%
HD0SR48013NRFH	192~400V	4.5A 48V	95%
HD0SR48013NRFC	192~400V	4.5A 48V	95%
HD0SR28022NRFA	192~400V	4.5A 28V	95%
HD0SR28022NRFH	192~400V	4.5A 28V	95%
HD0SR28022NRFC	192~400V	4.5A 28V	95%
HD0SR24025NRFA	192~400V	4.5A 24V	95%
HD0SR24025NRFH	192~400V	4.5A 24V	95%
HD0SR24025NRFC	192~400V	4.5A 24V	95%
HD0SR12050NRFA	192~400V	4.5A 12V	95%
HD0SR12050NRFH	192~400V	4.5A 12V	95%
HD0SR12050NRFC	192~400V	4.5A 12V	95%

Default remote on/off logic is negative and pin length is 0.170"

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