

ISOLATED DC/DC CONVERTERS

48V Input 3.3V/60A, 5V/40A, 12V/17A Output



07HB-D0T Series PRELIMINARY

- Isolated
- High Efficiency
- High Power Density
- Excellent Thermal Performance
- Low Cost
- Input Under Voltage Lockout
- Fixed frequency(315KHz)
- Output Over Voltage Shutdown
- OCP/SCP
- Over Temperature Protection
- Remote On/Off
- Output Voltage Trim
- Positive/Negative Remote Sense

Description

The 07HB-D0T Series are isolated DC/DC converters that operate from a nominal 48V source. These units provide up to 200W of output power from a nominal 48V input. These units are designed to be highly efficient and low cost. Features include remote on/off, over current protection and under voltage lockout. These converters are provided in an industry standard half-brick package.

Part Selection

Output Voltage	Input Voltage	Max. Output Current	Max. Output Power	Typical Efficiency	Model Number Active High	Model Number Active Low
12.0V	48V	17A	200W	93%	07HB-D0T120	07HB-D0T12L
5.0V	48V	40A	200W	93%	07HB-D0T050	07HB-D0T05L
3.3V	48V	60A	200W	92%	07HB-D0T033	07HB-D0T03L

Note: Add "G" suffix at the end of the model number to indicate Tray Packaging.

Absolute Maximum Ratings

Parameter	Min	Typ	Max	Notes
Input Voltage (continuous)	-0.3V	-	80V	
Remote On/Off	-0.3V	-	18V	
I/O Isolation Voltage	-	-	2000V	
Ambient Temperature	-40°C	-	85°C	
Storage Temperature	-55°C	-	125°C	

Input Specifications

Parameter	Min	Typ	Max	Notes
Input Voltage	36V	48V	75V	
Input Current (full load)	-	-	6.4A	
Input Current (no load)	-	120mA	180mA	
Remote Off Input Current		5mA	10mA	
Input Reflected Ripple Current (pk-pk)	-	20mA	40mA	Tested with simulated source impedance of 10uH, 5Hz to 20MHz; use a 100uF/100V electrolytic capacitor with ESR = 1 ohm max. at 200KHz at 25°C.
Input Reflected Ripple Current (RMS)	-	5mA	10mA	
I^2t Inrush Current Transient	-	0.05A ² s	0.1A ² s	
Turn-on Voltage Threshold	32V	34V	35V	
Turn-off Voltage Threshold	30V	32V	33V	

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Output Specifications

Parameter	Min	Typ	Max	Notes
Output Voltage Set Point				Vin=48V, Io=50% full load, Ta=25°C.
Vo=12.0V	11.820V	12.0V	12.180V	
Vo=5.0V	4.925V	5.0V	5.075V	
	Vo=3.3V	3.3V	3.350V	
Line Regulation				
Vo=12.0V	-	±12mV	±24mV	
Vo=5.0V	-	±5mV	±10mV	
Vo=3.3V	-	±3mV	±7mV	
Load Regulation				
Vo=12.0V	-	±30mV	±60mV	
Vo=5.0V	-	±10mV	±20mV	
Vo=3.3V	-	±7mV	±15mV	
Regulation Over Temperature (-40°C to +85°C)				
Vo=12.0V	-	±60mV	±100mV	
Vo=5.0V	-	±45mV	±75mV	
Vo=3.3V	-	±30mV	±50mV	
Output Current				
Vo=12.0V	0A	-	17A	
Vo=5.0V	0A	-	40A	
Vo=3.3V	0A	-	60A	
Current Limit Threshold				
Vo=12.0V	20A	24A	28A	
Vo=5.0V	48A	54A	60A	
Vo=3.3V	72A	81A	90A	
Short Circuit Surge Transient	-	3A ² s	5A ² s	
Ripple and Noise (RMS)				Test conditions: 0-20MHz BW, with a 1uF ceramic capacitor and a 10uF Tantalum capacitor at the output.
Vo=12.0V	-	25mV	50mV	
Vo=5.0V	-	25mV	50mV	
	Vo=3.3V	-	15mV	30mV
Ripple and Noise (pk-pk)				
Vo=12.0V	-	100mV	150mV	
Vo=5.0V	-	100mV	150mV	
Vo=3.3V	-	55mV	100mV	
Turn on Time	-	15mS	30mS	
Overshoot at Turn on	-	0%	5%	
Output Capacitance				
Vo=12.0V	0uF	-	1000uF	
Vo=5.0V	0uF	-	10000uF	
Vo=3.3V	0uF	-	20000uF	

Transient Response

25% ~ 50% Max Load	Overshoot	Vo=12.0V	-	200mV	400mV	Test conditions: di/dt = 0.1A/uS, Vin=48V, Ta=25°C with a 1uF ceramic capacitor and a 10uF Tantalum capacitor at the output.	
	Settling Time		-	250uS	400uS		
50% ~ 25% Max Load	Overshoot		-	200mV	400mV		
	Settling Time		-	250uS	400uS		
25% ~ 50% Max Load	Overshoot		Vo=5.0V	-	150mV		300mV
	Settling Time			-	200uS		300uS
50% ~ 25% Max Load	Overshoot	-		150mV	300mV		
	Settling Time	-		200uS	300uS		
25% ~ 50% Max Load	Overshoot	Vo=3.3V		-	100mV		200mV
	Settling Time			-	200uS		300uS
50% ~ 25% Max Load	Overshoot		-	100mV	200mV		
	Settling Time		-	200uS	300uS		

Note: All specifications are typical at nominal input, full load at 25°C unless noted.

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General Specifications

Parameter	Min	Typ	Max	Notes
Efficiency				Vin=48V, full load, Ta=25°C
Vo=12.0V	90%	93%	-	
Vo=5.0V	90%	93%	-	
Vo=3.3V	89%	92%	-	
Switching Frequency	280KHz	315KHz	350KHz	
Isolation capacitance	-	1500pF	-	
Output Voltage Trim Range	80%Vo	-	110%Vo	
Over Temperature Protection	-	125°C	-	
Over Voltage Protection	117%Vo	122%Vo	127%Vo	
MTBF	TBD			Calculated Per Bell Core TR-332 (Io = Nominal; Ta = 25°C)
Dimensions	Inches 2.28 x 2.4 x 0.42 millimeters 57.51 x 60.98 x 10.67			
Weight	-	76g	-	

Control Specifications

Parameter	Min	Typ	Max	Notes	
Remote On/Off					
Signal Low (Unit On)	Active Low	-0.3V	-	0.8V	07HB-D0TxxL. The remote on/off pin open, Unit on.
Signal High (Unit Off)		2.4V	-		
Signal Low (Unit Off)	Active High	-0.3V	-	0.8V	
Signal High (Unit On)		2.4V	-		
Current Sink		0mA	-	0.75mA	

Output Trim Equations

Equations for calculating the trim resistor (in kΩ) are shown below. The Trim Down resistor should be connected between the Trim pin and Ground pin. The Trim Up resistor should be connected between the Trim pin and the Vout. Only one of the resistors should be used for any given application.

$$R_{trimdown} = \frac{100}{|\delta|} - 2 [k\Omega]$$

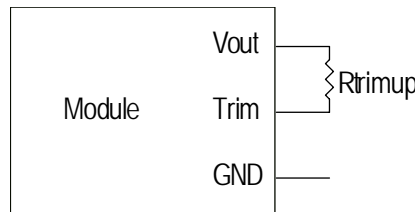
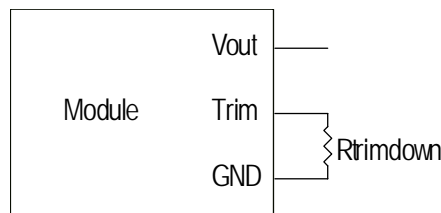
$$R_{trimup} = \frac{(100 + \delta) \cdot V_o - 122.5}{1.225 \cdot \delta} - 2 [k\Omega]$$

Notes:

$$\delta = \frac{(V_o_{req} - V_o)}{V_o} \times 100 [\%]$$

Vo_req=Desired(trimmed) output voltage[V]

Output voltage Vo=3.308V for 3.3V output; Vo=5.000V for 5.0V; Vo=12.000V for 12V output

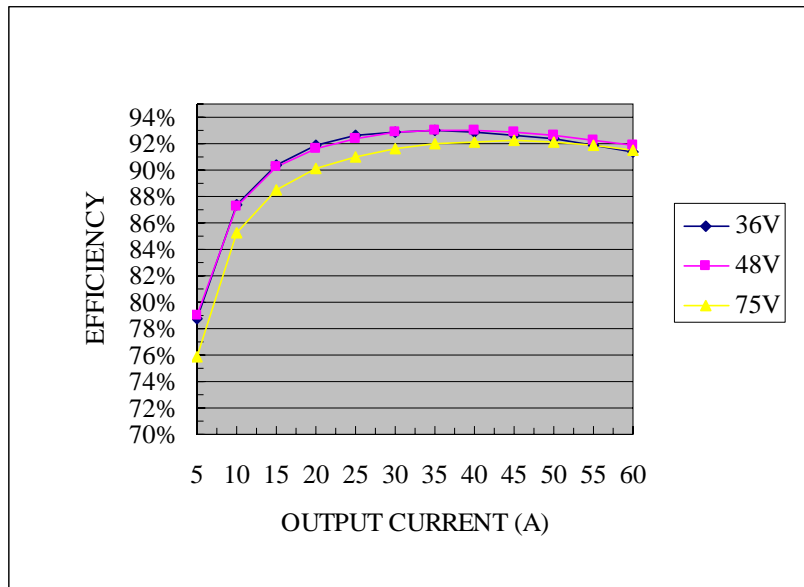


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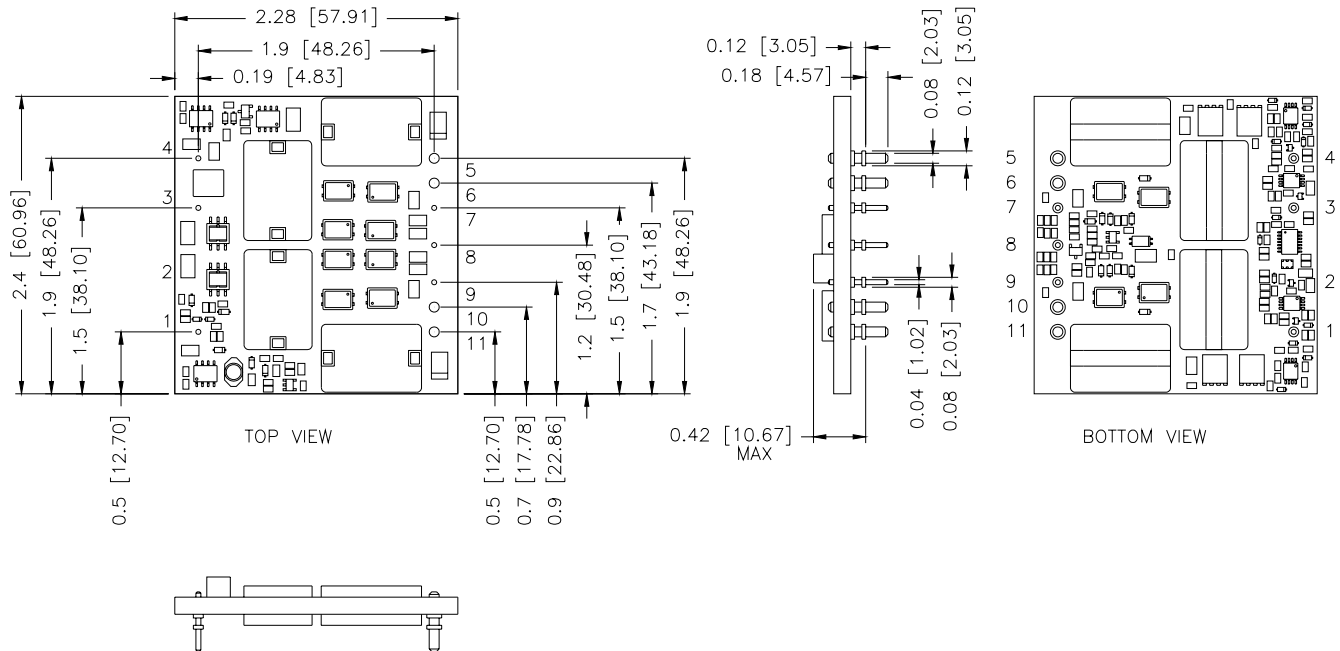
Efficiency Data



Vo=3.3V

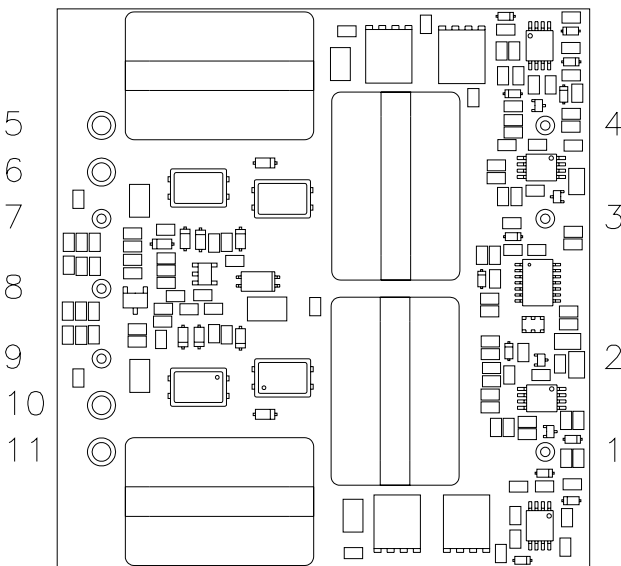
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Pin Connections

pin#	function	pin size
1	-Input	0.04"
2	N/A	
3	On/Off	0.04"
4	+Input	0.04"
5	+Output	0.08"
6	+Output	0.08"
7	+Sense	0.04"
8	Trim	0.04"
9	-Sense	0.04"
10	-Output	0.08"
11	-Output	0.08"



BOTTOM VIEW

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