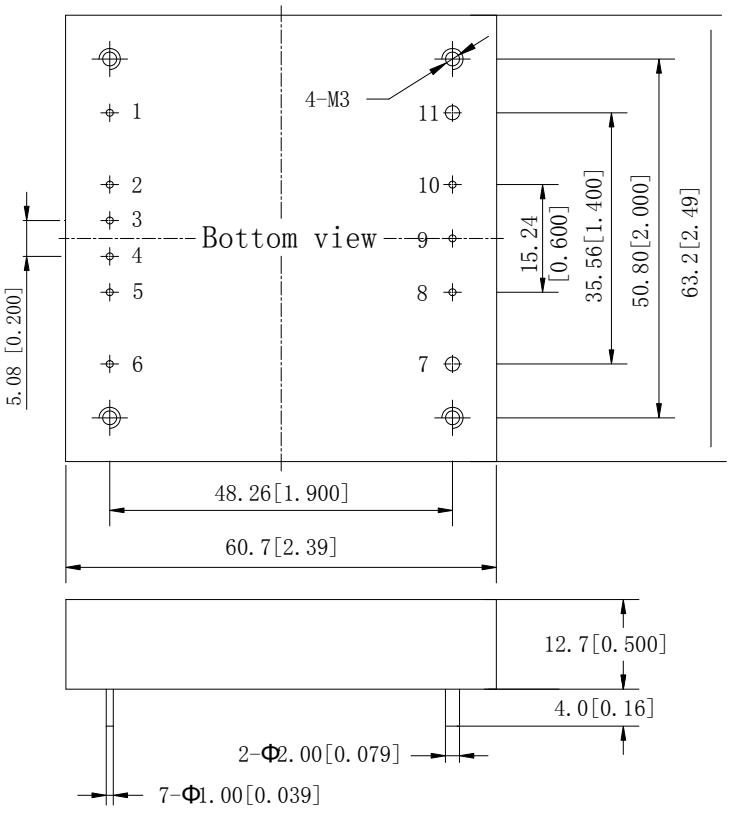
DC/DC ZDH500-24S48C

IN:18～36V OUT:48V/10.4A Half brick

Features

- Half Brick（60.7mm×63.2mm×12.7mm）
- Input Under Voltage Protection（13.0 to 17.5Vdc Turn off）
- Positive Logic Control（6.5V to 15V or floating Turn on）
- Output Voltage Adjust Range: 70%~110% of the rated output voltage
- Output Over Voltage, Output Over Current Protection
- 110℃ Typ. Over Temperature Protection
- Output Short-circuit Protection, automatic recovery
- High Efficiency up to 92.5%（24V,full load）
- 500Vdc Min. Isolation Voltage (Adjustable)
- Operation Ambient Temperature: -40℃ to +85℃
- Operation Baseplate Temperature:-40℃ to +100℃
- Applications： Telecommunication equipments data exchange servers and distributed power; Industry electronics and equipment.

Outline Diagram



Pin	Symbol	Function
1	-Vin	Negative Input
2、3	NC	Must be left open
4	NP	No Pin
5	CNT	Remote Control Pin
6	+Vin	Positive Input
7	+Vo	Positive output
8	+S	Positive Remote Sense
9	TRIM	Output voltage adjust
10	-S	Negative Remote Sense
11	-Vo	Negative Output

Notes:all dimensions in mm(inches)
Tolerances:X.X±0.5mm(X.XX±0.02)
X.XX±0.25mm(X.XXX±0.010)

Specification

Unless otherwise specified, all values are given at: 25℃, one standard atmosphere pressure, pure resistive load and basic connection.

Input		Symbol	Min	Typ	Max	Unit	Conditions
Input Voltage		V_{in}	18	24	36	Vdc	—
Input Current		I_{in}	—	—	32	A	V_{in}=18Vdc, I_O=10.4A
Positive Logic Remote Control	ON	—	6.5	—	15	V	Refer to –V_{in} Also turn on when CNT floating.
	OFF	—	-0.7	—	1.5	V	Refer to –V_{in}
	Current	—	—	—	1.0	mA	—
Start-up Delay Time		T_{delay}	—	—	—	ms	—
Under Voltage Threshold		V_{UVLO}	13.0	—	17.5	Vdc	50% load test
Under Voltage Protection Hysteresis		$\triangle V_{UVLO}$	—	1.5	—	Vdc	—

Output	Symbol	Min	Typ	Max	Unit	Conditions
Output Voltage	V_O	47.52	48.00	48.48	Vdc	V_{intyp} ， Io,nom
Output Current	$I_{O,nom}$	—	10.4	—	A	—
Output Voltage Adjust Range	V_{trim}	70	—	110	% V_O	Io≤10.4A Po≤500W
Line Regulation	S_V	—	—	±0.5	% V_O	V_{in}: 18～36Vdc, I_O=10.4A
Load Regulation	S_I	—	—	±0.5	% V_O	V_{in}=V_{intyp}， I_O: 0A～10.4A
Output Over Voltage Protection Set Point	$V_{ov,set}$	55	—	75	Vdc	V_{in}=V_{intyp}
Output Over Current Protection Range	$I_{O,lim}$	11	—	16.5	A	V_{in}=V_{intyp}
Output Short-circuit Protection	automatic recovery					V_{in}=V_{intyp}
Peak to Peak Ripple and Noise	$\triangle V_{pp}$	—	—	250	mV	V_{in}=V_{intyp}, Io,nom , 20MHz bandwidth, a 10μF Tantalum capacitor and a 1μF ceramic capacitor applied at output
Rise Time	T_{rise}	—	45	—	ms	V_{in}=V_{intyp} ， ,$I_{O,nom}$,pure resistive load
Output Overshoot	V_{TO}	0	—	5.0	Vdc	V_{in}=V_{intyp},$I_{O,nom}$， pure resistiveload
Capacitive Load	C_O	0	—	1000	μF	pure resistive load
Remote Sense Compensation Range	V_{sense}	0	—	0.5	V	+S and -S twisted Pair， length is less than 20cm

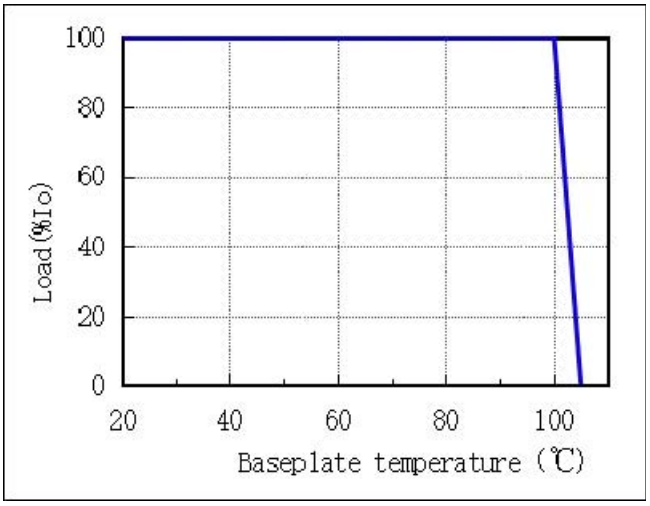
General		Symbol	Min	Typ	Max	Unit	Conditions
Load Transient	Voltage Deviation	$\triangle V_{tr}$	—	±5	—	% V_O	25%～50%～25%Io,nom or 50%～75%～50%Io,nom; 0.1A/μs
	Recovery Time	t_{tr}	—	500	—	μs	
Efficiency		η	91	92.5	—	%	V_{in}=V_{intyp}， Io,nom
Switching Frequency		f_s	—	250	—	kHz	—
Isolation Resistance		R_{iso}	50	—	—	MΩ	—

Continue

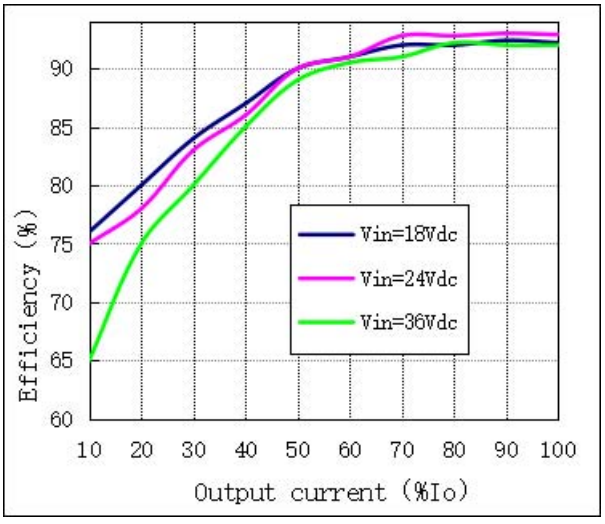
General	Symbol	Min	Typ	Max	Unit	Conditions
Isolation Voltage	V_{iso}	500	—	—	Vdc	Input to output Leak Current: 1mA
		500	—	—	Vdc	Input to case Leak Current: 1mA
		500	—	—	Vdc	Output to case Leak Current: 1mA
MTBF	—	—	2×10^6	—	h	BELLCORE TR-332,
Operating Ambient Temperature	—	-40	—	+85	℃	See the derating curve
Storage Temperature	—	-55	—	+125	℃	—
Temperature Coefficient	S_T	—	—	±0.02	%/℃	—
Relative Humidity	—	10	—	90	%	No condensing，40℃±2℃
Over Temperature Protection Reference Point	T_{ref}	105	110	115	℃	See Over Temperature Protection consideration
Over Temperature Protection Hysteresis	$\triangle T_{ref}$	—	10	—	℃	
Hand Soldering	Maximum soldering Temperature < 425℃， and duration < 5s					
Wave Soldering	Maximum soldering Temperature < 255℃， and duration < 10s					

Characteristic Curves

Derating

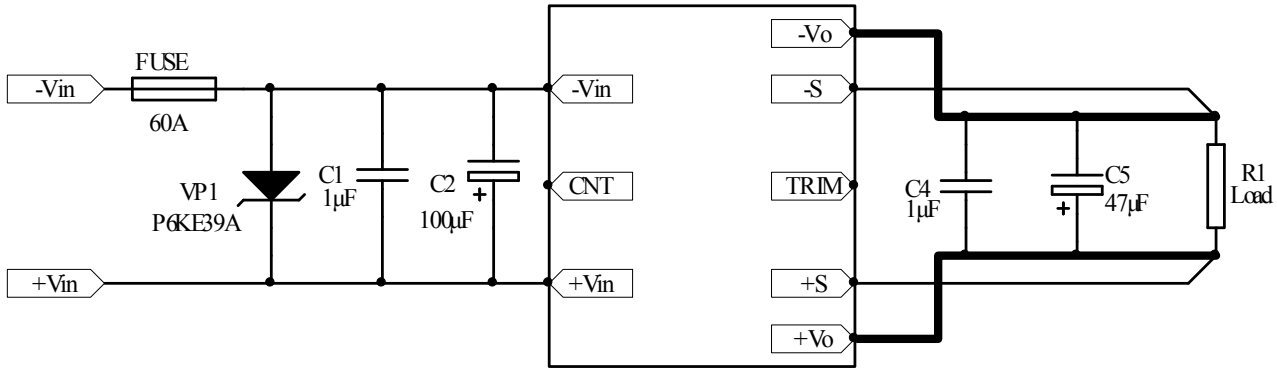


Efficiency vs Io & Vin



Design Considerations

Basic Connection



Notes: The basic connection indicates the basic requirements that the power module can provide rated output voltage and rated power only. Please refer the instruction followed for further information.

Input Voltage Range

The input voltage range of the DC/DC converter is 18V to 36V。The input impedance of the converter looks like a negative resistor, which can interact with the reactance of the power bus (including any filter elements that have been added to the input of the converter), causes an unstable condition. Depending on the internal transformer's impedance, the external impedance usually should not exceed the 10% of the internal. So, the source impedance of the Power bus should be kept as low as possible.

The method to determine whether the impedance of the power bus too high or not is to decrease the converter's input voltage from higher to lower gradually, if the output voltage decreases (unstable sometime) with the lower input voltage, it will be considered the impedance too large. For further confirmation, one electrolytic capacitor can be paralleled to the converter pins after the converter shuts down (one 1μF ceramic capacitor may be required to be paralleled with the electrolytic capacitor), if the output getting better, it will be sure that the impedance is too large.

External Capacitance

Unless special purpose (i.e. prolonging hold-up time, input impedance matching), the recommended input filter's capacitance ranges 100μF-220μF, which not only offers a stable system, and reduces the cost, but also lessens the inrush current when the power supplies.

When larger capacitance is required, a circuit of suppressing the inrush current is recommended when the regulator start-up and a discharge circuit is recommended when the output dropped, ensuring the reliability and safety of other equipments in the system.

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