

10W AC/DC Power Modules



Features

Miniaturization Size 53.8mm×28.8mm×19.0mm

Wide Input Range 85Vac to 265Vac

4000Vac Isolation Voltage (input to output)

70kHz Switching Frequency

Short Circuit Protection , Auto Recovery

Ambient Temperature:-40 ~ 70

100% Burn-in

Applications: telecom& datacom ,rail transit, electric power automation, industrial automatic control, instrument, electric vehicles and new energy etc.

Specifications

Unless otherwise specified, all values are given at: 25 °C, one standard atmosphere pressure, rated load, and 220Vac input voltage.

Product Selection				
Model	Output Power	Nominal Output Voltage And Current (Vo/Io)	Efficiency (220Vac,%/typ.)	Maximum Capacitive Load (μF)
YBS10-3W	6.6W	3.3V/2A	71	15000
YBS10-5W	10W	5V/2A	80	10000
YBS10-9W		9V/1.1A	80	5000
YBS10-12W		12V/0.9A	81	2000
YBS10-15W		15V/0.7A	82	1500
YBS10-24W		24V/0.45A	83	500

Input Characteristic					
Item	Conditions	Min	Typ	Max	Unit
Input Voltage Range	Input Voltage (Vac)	85	220	265	Vac
	Input Voltage (Vdc)	100	—	370	Vdc
Input Frequency	—	45	—	65	Hz
Shock Current	220Vac	—	—	25	A

Output Characteristic						
Item	Conditions	Min	Typ	Max	Unit	
Voltage Accuracy	3.3V Output	—	—	±2	% Vo	
	Other	—	—	±1		
Line Regulation	Full Load	—	—	±0.5		
Load Regulation	10%~100% Load	—	—	±1		
Transient Response	Recovery Time	25%-50%-25% Io,nom 和 50%-75%-50% Io,nom; 0.1A/μs	—	—	200	μs
	Voltage Deviation		—	—	±5%Vo	V
Rise Time	—	—	—	20	ms	
Output Overshoot	—	—	—	±10%Vo	V	
Peak to Peak Ripple and Noise	20MHz bandwidth	—	60	120	mV	

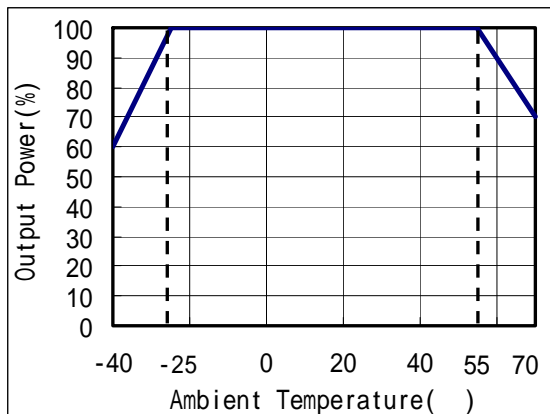
General Characteristic					
Item	Conditions	Min	Typ	Max	Unit
Isolation Voltage	Input to output , t=60s	4000	—	—	Vac
Isolation Resistance	500Vdc, 90%RH	100	—	—	MΩ
Ambient Temperature	—	-40	—	70	
Storage Temperature	—	-40	—	105	
Humidity	—	—	—	90	%RH
Temperature Coefficient	—	—	—	±0.02	%/
Welding Temperature	Wave Soldering	Maximum soldering Temperature < 255 , and duration < 10s			
	Manual Soldering	Maximum soldering Temperature < 425 , and duration < 5s			
Switching Frequency	—	—	70	—	kHz
MTBF	—	3×10 ⁵ h Refer to BELLCORE TR-332,Tc=25			

Physical Characteristic	
Case material	Black flame retardant plastic
Package size	53.8mm×28.8mm×19.0mm
Weight	50g typ.
Cooled mode	Natural air cooling

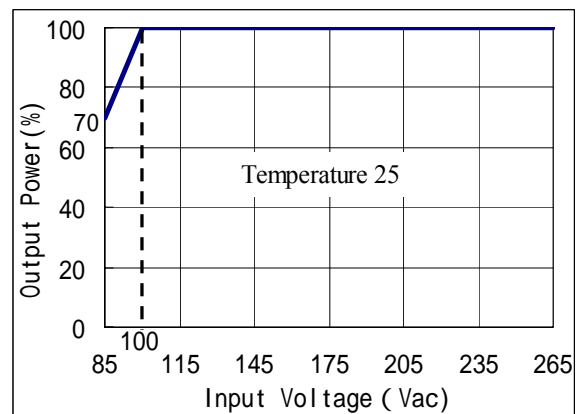
EMC	
Conducted disturbance	CISPR22/EN55022 , CLASSA(Bare machine)
	CISPR22/EN55022 , CLASSB(Recommended circuit followed for EMC Consideration)
Surges	IEC/EN61000-4-5 ±1KV(Bare machine)
	IEC/EN61000-4-5 ±2KV(Recommended circuit followed for EMC Consideration)
Fast transients	IEC/EN61000-4-4 ±2KV(Bare machine)
	IEC/EN61000-4-4 ±4KV(Recommended circuit followed for EMC Consideration)

Characteristic Curves

Derating Of Temperature

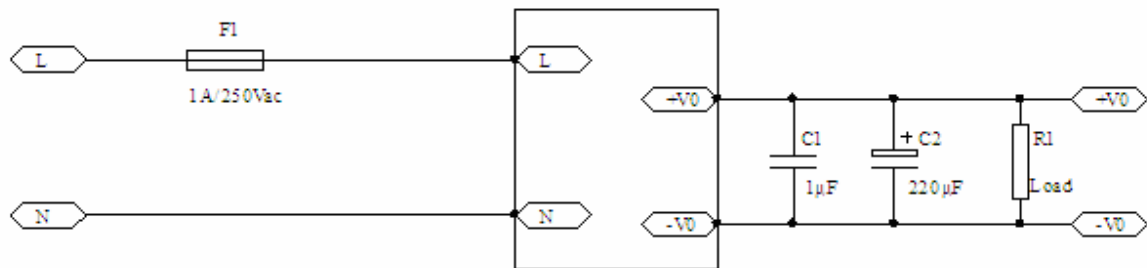


Derating Of Input Voltage



Design Considerations

Basic Connection



Thermal Consideration

The converters operate in a variety of thermal environments; however, sufficient cooling should be provided to ensure reliable operation of the unit. Heat is removed by conduction, convection and radiation to the surrounding environment.

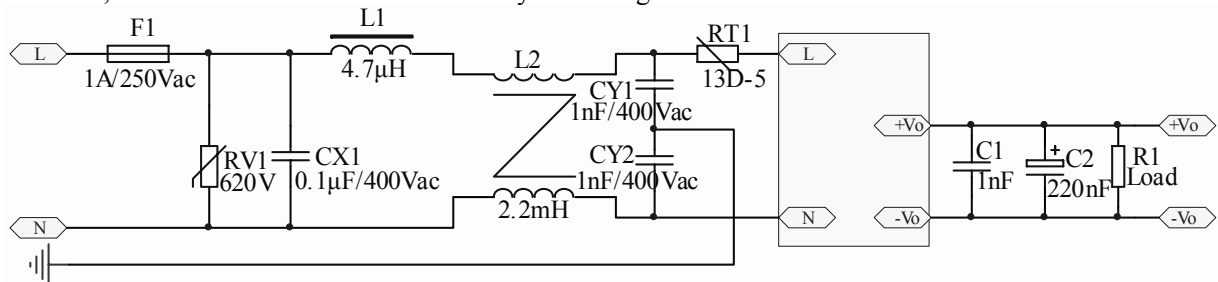
When ambient temperature is higher than the permitted operating, the derating curves should be referred or external heat dissipation measures. Forced air cooling or heatsink, should be used. The air tunnel should be considered for forced air cooling, to avoid heated air be hindered or forming swirl.

Safety Consideration

To avoid fire and be protected when short circuit occurred, it is recommended that a fast blow fuse with rating no less than 1A(Inrush current suppression circuit is required for greater filter capacitance at input terminal, or it will result in the disoperation of the fuse.) .

EMC Consideration

Conductive Interference will be emphasized in the following consideration, surge, EFT、conducted interference generated from the converter to power supply system, and so on. Some tests, like static, radiation, should be considered in the whole system design.



F1 in the figure is slow fuse of 1A/250Vac ,RT1、RV1 in the figure are thermistor and VDR respectively, for the suppression of the differential mode interference conducted along with the wire. The maximum surge current of the VDR and Impulse Discharge Current of the discharge tube, I_{max} should not less than 3KA, Varistor voltage or DC Spark over Voltage:500V to 650V.

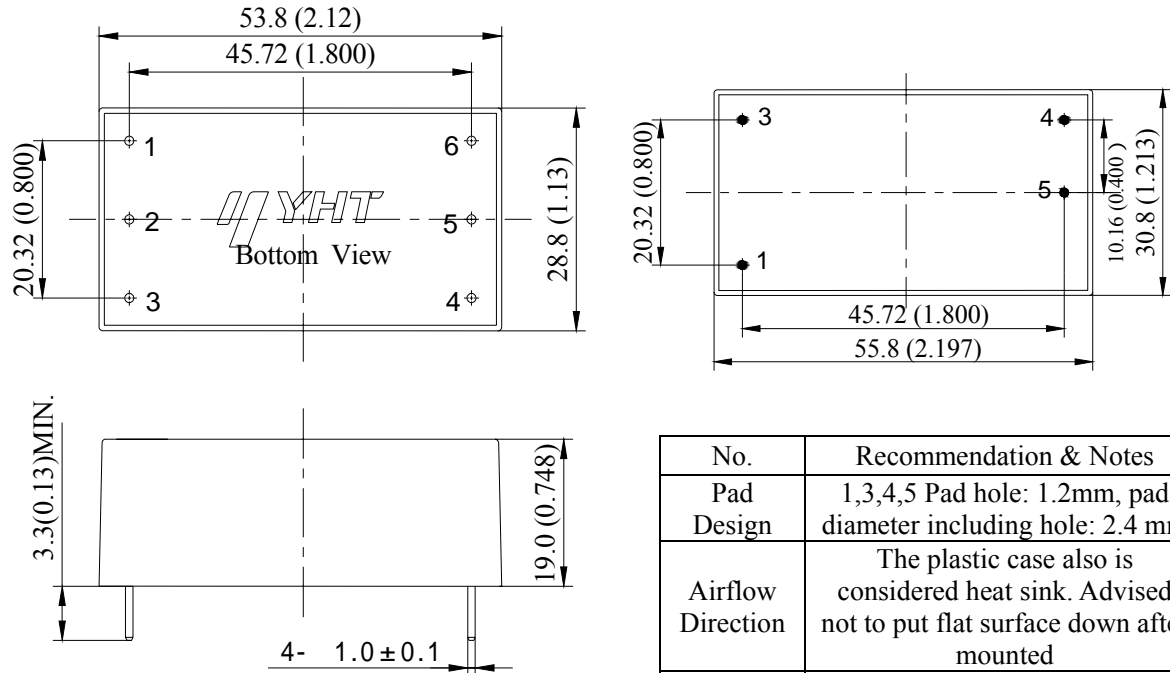
L1(4.7µH) ,L2(2.2mH) ,CY1、CY2(1nF/400Vac),CX1(0.1µF/400Vac) and other main role is to filter out the differential mode and common mode interference. Ceramic capacitance C1 to remove High-frequency noise,C2 for High-frequency and low resistance electrolytic capacitance.

Series and Parallel Operation

The modules should not be paralleled directly to increase power, but they can be paralleled each other through o-ring switches or diodes. Make sure that every module's maximum load current should not exceed the rated current at anytime.

The modules can operate in series. To prevent against start-up failure due to start up time difference, SBD with low voltage difference can be paralleled at the output pins(SBD negative terminal connect to the positive pin of the output) for each module.

Outline Diagram and Recommended Layout



1	L	AC Input, Live Line
2 , 6	NP	No Pin
3	N	AC Input, Neutral Line
4	+Vo	Positive Output Voltage
5	-Vo	Negative Output Voltage
Notes:mm (inches)		
Tolerances:X.X±0.5 (X.XX±0.02)		
X.XX±0.25(X.XXX±0.010)		

No.	Recommendation & Notes
Pad Design	1,3,4,5 Pad hole: 1.2mm, pad diameter including hole: 2.4 mm
Airflow Direction	The plastic case also is considered heat sink. Advised not to put flat surface down after mounted
Safety	Isolated module, care to the spacing between input and output
Electrical	The Vin(-) and Vo(-) planes should be placed under of the module separately. Avoid routing sensitive signal or high disturbance AC signal under the module

Application Data

Cleaning Notice

The converter case is not a hermetically-sealed construction, a sufficient drying process is required after the converter cleaning, make sure the liquid congregated is removed, or it will damage the converter or degradation of performance.

After surface treatment, the appearance of the converter may be affected by the organic solvent, protection measures should be taken before cleaning when appearance is concerned.

Delivery Package Information

Package material is multiple wall corrugated , internal material is anti-static foam , it's surface resistance is from $10^5 \Omega$ to $10^{12} \Omega$. Tray capacity: $16 \times 1 = 16$ PCS/box, Tray weight: 0.87kg; Carton capacity: $15 \times 16 = 240$ PCS/box, Carton weight: 13.5kg.

Quality Statement

The modules are manufactured in accordance with ISO 9001 system requirements, in compliant with YD/T1376-2005, and are monitored 100% by auto-testing system, 100% burn in.

The warranty for the modules is 2-year.

Contact Information

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