Shenzhen Hi-Link Electronics Co., Ltd.

10W DC / DC 12V power supply module series

HLK-10D1205B / HLK-10D1212B / HLK-10D1215B / HLK-10D1224B

Version: V1.0 Revision Date: November 14, 2019

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1. DC / DC power supply module

10W DC / DC power supply module B series output power of 10W, 2: 1 wide input voltage range, efficiency up to 86%, 1500VDC Conventional isolation voltage, allowable working temperature of -40℃ to +85℃, having an output over-current, short circuit protection, is widely used in Medical, industrial, electrical, instrumentation, telecommunications, railway and other fields.

2. Model

model (MODEL)	Size module housing (mm)	Output Power (W)	The output voltage (V)	Output current (MA)	Notes Notes
HLK-10D1205B		10	5	2000	
HLK-10D1212B		10	12	830	
HLK-10D1215B		10	15	660	
HLK-10D1224B	50.8 * 25.4 * 11	10	24	420	

3. Product Performance

1. Ultra-wide input (2: 1), output 10W
2. The conversion efficiency of 86% (Typ)
3. Isolation voltage 1500Vdc
4. The low standby power: 0.3W (typical)
5. The ultra-fast start: 100mS (typ)
6. Working temperature range: -40 ° C ~ + 85 ° C
7. The output short circuit protection, over current
8. The metal shell, low output ripple
9. International standard pins, PCB board mounting line
10. The high quality green waterproof heat conductive potting, moisture, vibration, water and dust to meet IP65 standard
11. A high reliability, long life design, continuous operation for a long time

4. Environmental conditions

project name	Technical Specifications	unit	Remark
Working temperature	--40- + 85	℃	
Storage temperature	--40- + 80	℃	
Relative humidity	5-95	%	
Cooling	Natural cooling		
Atmospheric pressure	80-106	Kpa	
vibration	Shake coefficient 10 ~ 500Hz, 2G10min. / 1cycle, 60min.each along X, Y, Z axes		Meet secondary road transport claim

5. Electrical Characteristics

5.1. Input characteristics

project name	Working conditions	unit	Remark
Rated input voltage	12	Vdc	
Input voltage range	9-18	Vdc	
Maximum input current	≤1.2	A	
Reflected ripple current	60	mA	DC12V Rated input voltage range
Surge voltage	≤30	Vdc	
Starting voltage	9	Vdc	
Input undervoltage protection	- - -	Vdc	
Start-up delay time	100	ms	Rated input voltage and constant resistance lo
Input filter type		PI type	
Hot-swappable		not support	
Remote terminal (Ctrl) *	Module is switched on		-

	Off end module		-		
	When the input current is turned off	mA	-	-	-

Note: room temperature test

5.2 The output characteristics

project name	skills requirement	unit	Remark
Load rated output voltage	5V ± 2%	Vdc	
The maximum output current for a short time	≥2200	mA	
Rated output current	2000	mA	
Voltage Regulation	± 0.5	%	
Load Regulation	± 1	%	
Conversion efficiency	Vin = 24Vdc, Full output 86	%	
Output ripple and noise (MVp-p)	≤100 Purely resistive load, the bandwidth of 20MHz, peak	mV	
Output voltage regulation	-	-	No adjustment end
Output over-current protection	110-200% of the maximum load output	A	
Direct output short circuit protection short-circuit the normal output, automatically resume normal operation after a short circuit removal without damaging the machine			
Output overvoltage protection	- -	Vdc	
Insulation voltage	Input - Output, test time 1 minute, leakage current less than 1mA / 1500V	-	
Insulation Resistance	Input - Output, Test at 500VDC	M Ω	
Isolation Capacitance	Input - Output, 100KHz / 0.1V 1000pF	-	
Note: ① output voltage is ± 5VDC, ± 9VDC product model, 0% - 5% load condition, the output voltage of the fine Of a maximum of ± 5%; ② When pressing the 0% -00% load test operating conditions, load regulation index is ± 5%; ③0% -5% & ripple noise is less than a load equal to 5% Vo Test ripple and noise in twisted pair. assays, can be added to reduce light load capacitive load at the output ripple.			

5.3 The output characteristics

project name	skills requirement	unit	Remark
Load rated output voltage	12V ± 2%	Vdc	
The maximum output current for a short time	≥900	mA	
Rated output current	830	mA	
Voltage Regulation	± 0.5	%	
Load Regulation	± 1	%	
Conversion efficiency	Vin = 24Vdc, Full output 86	%	
Output ripple and noise (MVp-p)	≤100 Purely resistive load, the bandwidth of 20MHz, peak	mV	
Output voltage regulation	- -	-	No adjustment end
Output over-current protection	110-200% of the maximum load output	A	
Direct output short circuit protection short-circuit the normal output, automatically resume normal operation after a short circuit removal without damaging the m			
Output overvoltage protection	- -	Vdc	
Insulation voltage	Input - Output, test time 1 minute, leakage current less than 1mA / 1500V	-	
Insulation Resistance	Input - Output, Test at 500VDC	M Ω	
Isolation Capacitance	Input - Output, 100KHz / 0.1V 1000pF	-	
Note: ① output voltage is ± 5VDC, ± 9VDC product model, 0% - 5% load condition, the output voltage of the fine Of a maximum of ± 5%; ② When pressing the 0% -00% load test operating conditions, load regulation index is ± 5%; ③0% -5% & ripple noise is less than a load equal to 5% Vo Test ripple and noise in twisted pair. assays, can be added to reduce light load capacitive load at the output ripple.			

5.4 The output characteristics

project name	skills requirement	unit	Remark
Load rated output voltage	15V ± 2%	Vdc	
The maximum output current for a short time	≥800	mA	
Rated output current	660	mA	

Voltage Regulation	± 0.5	%	
Load Regulation	± 1	%	
Conversion efficiency	Vin = 24Vdc, Full output 86	%	
Output ripple and noise (MVp-p)	≤100 Purely resistive load, the bandwidth of 20MHz, peak	mV	
Output voltage regulation	- -	-	No adjustment end
Output over-current protection	110-200% of the maximum load output	A	
Direct output short circuit protection	short-circuit the normal output, automatically resume normal operation after a short circuit	removal	Without damaging them achine
Output overvoltage protection	- -	Vdc	
Insulation voltage	Input - Output, test time 1 minute, leakage current less than 1mA / 1500V	-	
Insulation Resistance	Input - Output, Test at 500VDC	MΩ	
Isolation Capacitance	Input - Output, 100KHz / 0.1V 1000pF	-	

Note: ① output voltage is ± 5VDC, ± 9VDC product model, 0% - 5% load condition, the output voltage of the fine Of a maximum of ± 5%;

②When pressing the 0%-00% load test operating conditions, load regulation index is ± 5%; ③0%-5% & ripple noise is less than a load equal to 5% Vo Test ripple and noise in twisted pair. assays, can be added to reduce light load capacitive load at the output ripple.

5.5 The output characteristics

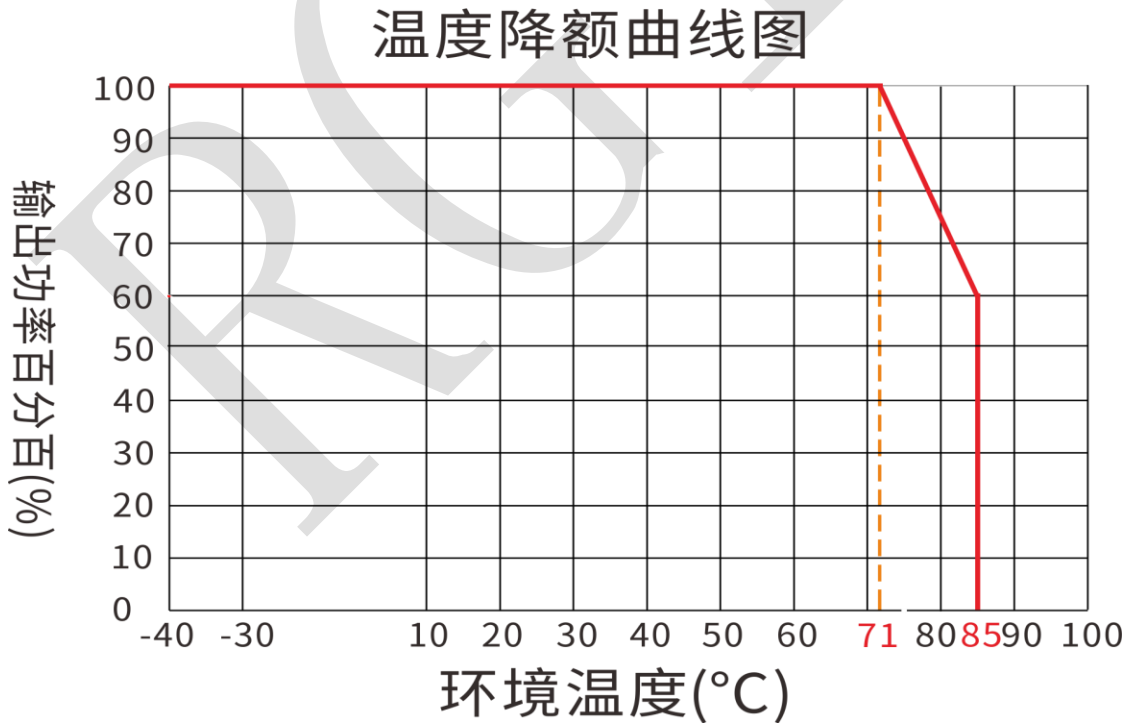
project name	skills requirement	unit	Remark
Load rated output voltage	24V ± 2%	Vdc	
The maximum output current for a short time	≥480	mA	
Rated output current	420	mA	
Voltage Regulation	± 0.5	%	
Load Regulation	± 1	%	
Conversion efficiency	Vin = 24Vdc, Full output 86	%	

Output ripple and noise (MVp-p)	≤100 Purely resistive load, the bandwidth of 20MHz, peak	mV	
Output voltage regulation	- -	-	No adjustment end
Output over-current protection	110-200% of the maximum load output	A	
Direct output short circuit protection	short-circuit the normal output, automatically resume normal operation after a short circuit	removal	Without damaging them machine
Output overvoltage protection	- -	Vdc	
Insulation voltage	Input - Output, test time 1 minute, leakage current less than 1mA / 1500V	-	
Insulation Resistance	Input - Output, Test at 500VDC	MΩ	
Isolation Capacitance	Input - Output, 100KHz / 0.1V 1000pF	-	

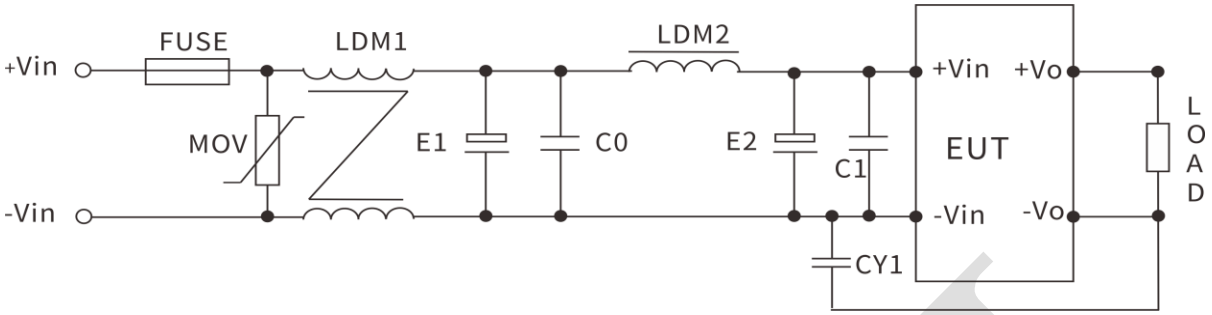
Note: ① output voltage is ± 5VDC, ± 9VDC product model, 0% - 5% load condition, the output voltage of the fine Of a maximum of ± 5%;

②When pressing the 0%-00% load test operating conditions, load regulation index is ± 5%; ③0%-5%&ripple noise is less than a load equal to 5% Vo Test ripple and noise in twisted pair. assays, can be added to reduce light load capacitive load at the output ripple.

6. derating curve



Typical application circuit 7.



7.1 EMC data recommendations

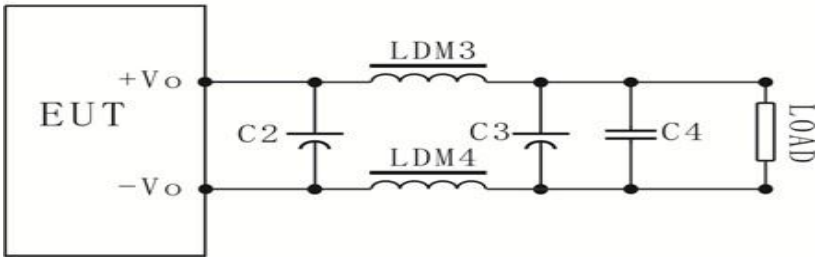
Components number / device recommended	effect	Recommended value
FUSE / Fuse	When the module is abnormal, a protection circuit from harm corresponding fuse according to customer demand access	
MOV / Varistor	It is accumulated in the surge protection module from damage	14D333K
LDM1 / common mode inductance	EMI filter	Inductance: 2mH
C0, C1 ceramic capacitors	Filter capacitor	1uF/ 50V
E1, E2 electrolytic capacitor	Filter capacitor	470uF/ 50V
LDM2 / differential mode inductance	EMI filter	4.7-68uH
CY1 / Y2 capacitance		1nF/ 250Vac

Remarks:

- Fuses and substantially varistor protective circuit (will take).
- For certified safety common mode inductance and capacitance can not be omitted.

Output filtering section 7.2

单路输出产品



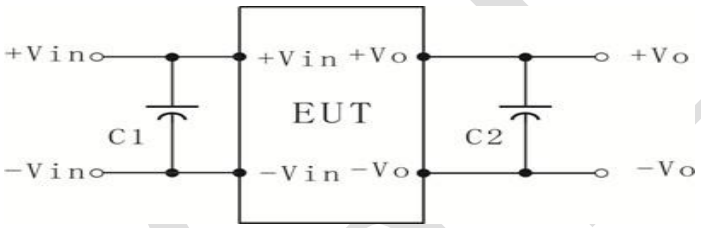
Components number / device recommended	effect	Recommended value
LDM3 / common mode inductance	Adjusting the output voltage ripple	Inductance: 0.47-4.7uH according to the debugging results
LDM4 / common mode inductance	Adjusting the output voltage ripple	Inductance: 0.47-4.7uH according to the debugging results
C2, C3 electrolytic capacitor	Filtering voltage ripple	68-220uF/ 50V
Ceramic capacitor C4	Filtering voltage ripple	1uF/ 50V

8. Test Application

8.1. DC / DC test circuit

It is recommended capacitance: 47uF-100uF / 50V

All the series DC/DC converter in the factory, are tested according to (below) recommended test circuit. If the input to further decrease the output ripple, input and output can be external capacitors C1, C2 or choose to increase the equivalent series resistance value small capacitance, but the capacitance can not exceed 330uF.

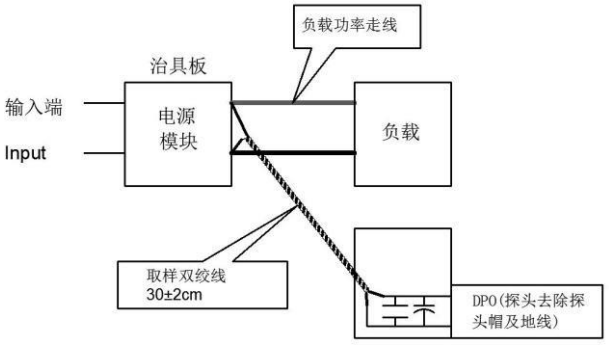


8.2. Ripple and noise test

(20MHZ bandwidth of twisted-pair method)

Test Method:

1) # ripple noise is the use of twisted pair 12 is connected to the oscilloscope bandwidth is set to 20MHz, 100M bandwidth of the probe, and parallel capacitor 0.1uF polypropylene and low resistance 47uF electrolytic capacitor in the high frequency end of the probe, using the sampling oscilloscope sampling mode Sample. 2) a schematic view of output ripple noise test:



The power input terminal connected to the input power, the power output is connected to an electronic load through a fixture, the test alone 30cm ± 2 cm sample directly from the power line sampled output port. Select power line with a respective insulation of the wire diameter according to the magnitude of the output current.

9. Signs, packaging, transportation, storage

10.1. Logo

9.1.1. Product Mark

In place of the product a unique bar code flag has the product to ensure that each production date, production batch, etc. Information traceability. It complies with national standards, industry standards.

9.1.2 Packing logo

Product packaging is marked with manufacturer's name, address, zip code, product type, manufactured year, month, day; marked "up", "moisture" "handle with care" and other transport signs, all signs are consistent with the provisions of GB 191 .

9.2. Products

It takes a special separate plastic boxes packed with anti-vibration function, and in line with GB 3873 Provisions.

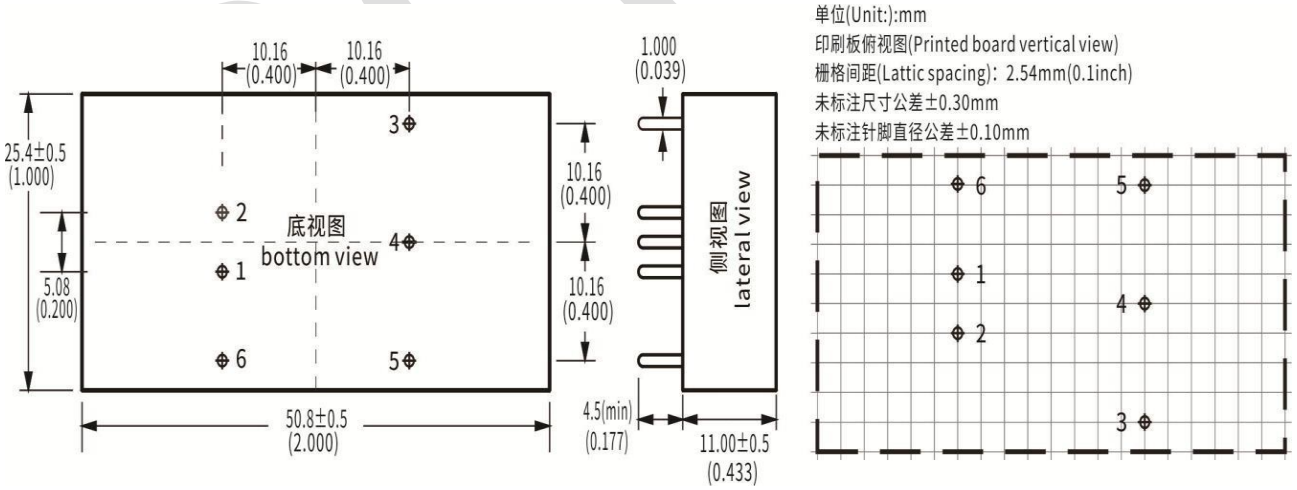
9.3. Packaging

Packaged products can be transported in any vehicle, the awning should transport, there should be no severe vibration, impact or the like.

9.4. Products

Product storage should be consistent GB 3873 Provisions.

10 Dimensions and weight



1	2	3	4	5	6
VIN-	VIN +	VO +	NC	GND	NC
The negative input	Input +	Output positive	---	Output negative	---