



Shenzhen Hi-Link Electronic Co., Ltd

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**10W Ultra-Compact Power Module**  
**10M03/10M05/10M09/10M12/10M24**

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## 1. Miniature Series Power supply Module

The 10W ultra-small series power supply module is a small volume, high efficiency power module designed for customers by Hi-Link. It has the advantage of global input voltage range, low temperature rise, low power consumption, high efficiency, high reliability, high security isolation etc.,and has been widely used in smart home, automation control, communication equipment, instruments and other industries.

## 2. Product Model

Type number (MODEL)	Size (mm)	Output Power (W)	Output Voltage (V)	Output Current (mA)	Notes
HLK-10M03	46.9*27.8*21.8	10	3.3	3000	
HLK-10M05		10	5	2000	
HLK-10M09		10	9	1100	
HLK-10M12		10	12	830	
HLK-10M24		10	24	420	

## 3. Product Characteristics

1. Ultra-thin, ultra-small, minimum volume in the industry
2. Universal input voltage (90~245Vac)
3. Low power consumption, environmental protection, no-load loss <0.1W
4. Low ripple and low noise
5. Good output short circuit and over-current protection and self-recovery
6. High efficiency, high power density
7. Input-output isolated voltage-proof 3000Vac
8. 100% full load aging and testing
9. High reliability, long life design, continuous working time more than 100000 hours
10. Meet UL,CE requirements; product design meets EMC and safety test requirements
11. Adopt high quality environmental protection waterproof heat conduction glue to fill seal,

moisture-proof, anti-vibration, meet the IP65 standard of waterproof and dust proof

12. Economic solution, cost-effective

13. Work without an external circuit

14. 1 year warranty

## 4. Environment Condition

Project Name	Technical Criteria	Unit	Remarks
Working Temperature	-25—+60	°C	
Storage Temperature	-40—+80	°C	
Relative Humidity	5—95	%	
Heat Dissipation Mode	natural cooling		
Atmospheric Pressure	80—106	Kpa	
Sea Level Elevation	≤2000	m	
Vibrate	Vibration coefficient 10~500Hz,2G10min./1cycle, 60min.each along X,Y,Z axes		Meet the requirements of secondary road transportation

## 5. Electrical Character

### 5.1. Input characteristics

Project Name	Technical Criteria	Unit	Remarks
Rated Input Voltage	90-245	Vac	
Input Voltage Range	85-264	Vac	Or 70-350Vdc
Maximum input current	≤0.2	A	
Input surge current	≤10	A	

Maximum input voltage	$\leq 270$	Vac	
Input slow start	$\leq 50$	mS	
Input low voltage efficiency	$V_{in}=110V_{ac}$ , output full load $\geq 69$	%	
Input high voltage efficiency	$V_{in}=220V_{ac}$ , output full load $\geq 70$	%	
Long-term reliability	MTBF $\geq 100,000$	h	
External fuse recommendation	0.5A/250Vac		Slow fuse

Note: test at room temperature

## 5.2. Output Characteristic (3.3V/3000mA)

Project Name	Technical Criteria	Unit	Remarks
No-load rated output voltage	$3.3 \pm 0.1$	Vdc	
Full load rated output voltage	$3.3 \pm 0.2$	Vdc	
Short-time maximum output current	$\geq 3000$	mA	
Long time maximum output current	$\geq 3300$	mA	
voltage regulation	$\pm 2$	%	
load regulation	$\pm 0.5$	%	
Output ripple and noise (mVp-p)	$\leq 50$ Rated input voltage, full output load. Using 20MHz bandwidth oscilloscope, Load side and 10uF and 0.1uF capacitors are tested.	mV	
Switching machine overshoot	(rated input voltage, output plus 10% load) $\leq 5$	%V <sub>O</sub>	

amplitude			
Output over-current protection	110-150% of maximum output load	A	
Output short circuit protection	Direct short circuit in normal output and automatic return to normal operation after removal of short circuit		No damage to the whole machine

### 5.3. Output Characteristic (5V/2000mA)

Project Name	Technical Criteria	Unit	Remarks
No-load rated output voltage	$5 \pm 0.1$	Vdc	
Full load rated output voltage	$5 \pm 0.2$	Vdc	
Short-time maximum output current	$\geq 2200$	mA	
Long time maximum output current	$\geq 2000$	mA	
voltage regulation	$\pm 0.2$	%	
load regulation	$\pm 0.5$	%	
Output ripple and noise (mVp-p)	$\leq 50$ Rated input voltage, full output load. Using 20MHz bandwidth oscilloscope, Load side and 10uF and 0.1uF capacitors are tested.	mV	
Switching machine overshoot amplitude	(rated input voltage, output plus 10% load) $\leq 5$	%V <sub>O</sub>	

Output over-current protection	110-150% of maximum output load	A	
Output short circuit protection	Direct short circuit in normal output and automatic return to normal operation after removal of short circuit		No damage to the whole machine

#### 5.4. Output Characteristic (9V/1100mA)

Project Name	Technical Criteria	Unit	Remarks
No-load rated output voltage	9±0.1	Vdc	
Full load rated output voltage	9±0.2	Vdc	
Short-time maximum output current	≥1200	mA	
Long time maximum output current	≥1100	mA	
voltage regulation	±2	%	
load regulation	±0.5	%	
Output ripple and noise (mVp-p)	≤70 Rated input voltage, full output load. Using 20MHz bandwidth oscilloscope, Load side and 10uF and 0.1uF capacitors are tested.	mV	
Switching machine overshoot amplitude	(rated input voltage, output plus 10% load)≤5	%V <sub>O</sub>	
Output over-current	110-150% of maximum output load	A	

protection			
Output short circuit protection	Direct short circuit in normal output and automatic return to normal operation after removal of short circuit		No damage to the whole machine

### 5.5. Output Characteristic (12V/830mA)

Project Name	Technical Criteria	Unit	Remarks
No-load rated output voltage	12±0.1	Vdc	
Full load rated output voltage	12±0.2	Vdc	
Short-time maximum output current	≥900	mA	
Long time maximum output current	≥830	mA	
voltage regulation	±2	%	
load regulation	±0.5	%	
Output ripple and noise (mVp-p)	≤70 Rated input voltage, full output load. Using 20MHz bandwidth oscilloscope, Load side and 10uF and 0.1uF capacitors are tested.	mV	
Switching machine overshoot amplitude	(rated input voltage, output plus 10% load)≤5	%V <sub>O</sub>	
Output over-current protection	110-150% of maximum output load	A	



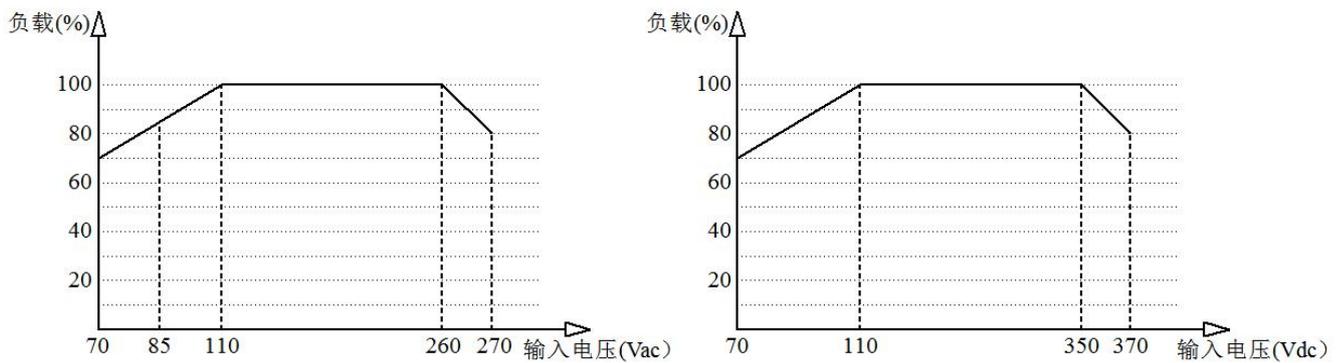
Output short circuit protection	Direct short circuit in normal output and automatic return to normal operation after removal of short circuit		No damage to the whole machine
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## 5.6. Output Characteristic (24V/420mA)

Project Name	Technical Criteria	Unit	Remarks
No-load rated output voltage	24±0.1	Vdc	
Full load rated output voltage	24±0.2	Vdc	
Short-time maximum output current	≥480	mA	
Long time maximum output current	≥420	mA	
voltage regulation	±2	%	
load regulation	±0.5	%	
Output ripple and noise (mVp-p)	≤70 Rated input voltage, full output load. Using 20MHz bandwidth oscilloscope, Load side and 10uF and 0.1uF capacitors are tested.	mV	
Switching machine overshoot amplitude	(rated input voltage, output plus 10% load)≤5	%V <sub>O</sub>	
Output over-current protection	110-150% of maximum output load	A	
Output short circuit	Direct short circuit in normal output and		No

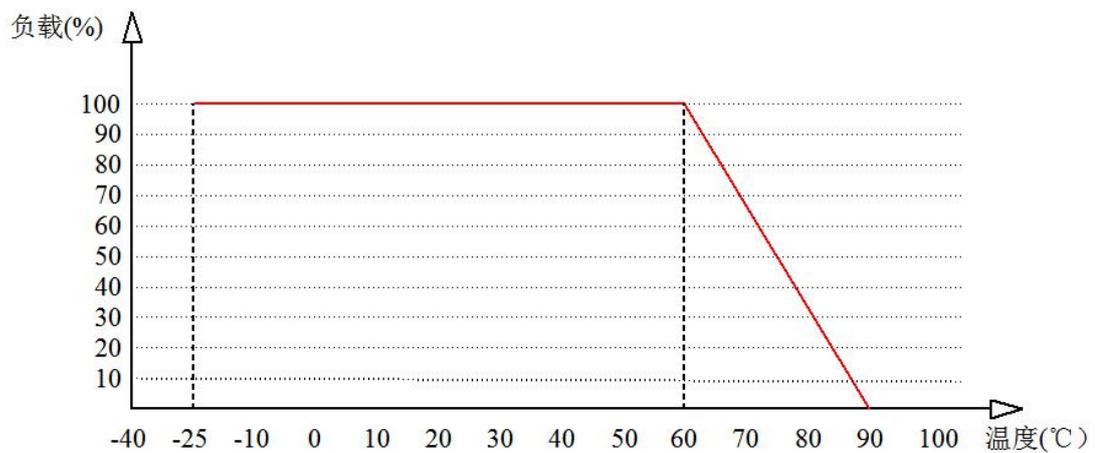
protection	automatic return to normal operation after removal of short circuit	damage to the whole machine
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## 6. Input voltage and load characteristics



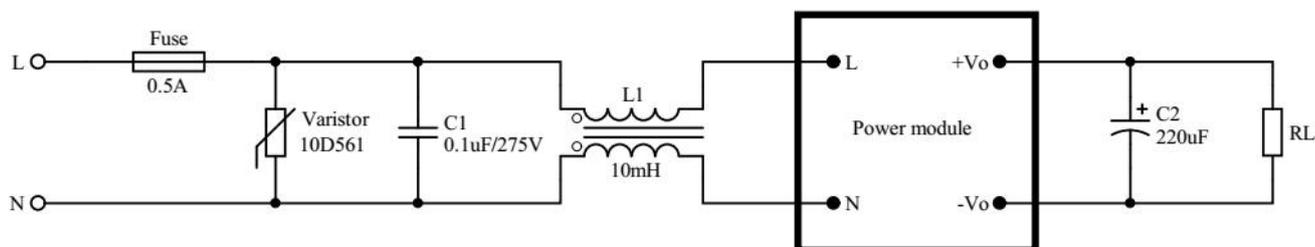
Input voltage and load characteristic curve

## 7. Working environment temperature and load characteristics



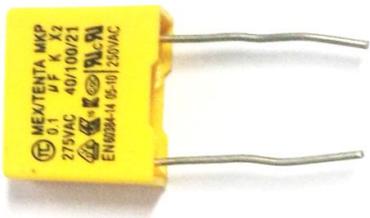
Ambient temperature and load characteristic curve

## 8. Typical application circuit



### Input section

Component bit number / recommended device	Function	Recommended value
Fuse	Protect the circuit from damage when the module is abnormal	0.5A/250Vac slow fuses.
Varistor	The cumulative surge is to protect the module from damage	10D561K
C1/ Safety capacitance	Filtering, Security Protection (EMC Authentication)	0.1uF/275Vac
L1/ common-mode inductance	EMI filter	Inductive value 10-15mH, current 70-500mA



Safety capacitance



Common-mode inductance

Remarks:

Fuse and varistor are basic protective circuits.

If you need to pass the authentication, the Anchorage capacitance and common-mode inductance must not be omitted.

## Output Part

Component bit number / recommended device	Function	Recommended value
C2/filter capacitance	Filter, output ripple can be controlled in 30mV after adding this capacitor	Aluminium electrolytic capacitance, capacity 100-220 UF, voltage reduction greater than 75%
RL/ load	load	

Note: C2 filter capacitor can reduce the output ripple from the original 50mV to the 30mV.

## 9. Safety Characteristic

### 9.1. Certification

Product design complies with UL, CE safety certification requirements. (UL, CE certification is done by customers themselves.)

### 9.2. Safety and electromagnetic compatibility:

- The input design adopts UL certification 1A insurance;
- The PCB board is made of double-sided copper clad foil, and the material fire resistance grade is 94-V0 grade;
- Safety standards comply with UL1012, EN60950, UL60950
- Insulation voltage: I/P-O/P: 2500Vac
- Insulation resistance: I/P-O/P > 100M Ohms/500Vdc 25°C 70% RH
- Conduction and radiation conformance to EN55011, EN55022 (CISPR22)
- Electrostatic discharge: IEC/EN 61000-4-2 level 4 8kV/15kV
- Radio frequency radiation immunity: IEC/EN 61000-4-3

### 9.3. Temperature rise safety design:

The maximum temperature rise of the internal surface of the power supply capacitor and the main converter is not more than 90 °C at room temperature, and the maximum temperature rise of the shell surface is not more than 60 °C.

## 10. Marking, packing, transportation, storage

### 10.1. Marking

#### 10.1.1. Product marking

A unique bar code label is affixed to ensure the trace ability of information such as the production date and batch of each piece of product. Its content conforms to the national standard, the industry standard stipulation.

#### 10.1.2. Packing marking

The packing boxes are marked with the name of the manufacturer, site, zip code, product model, factory year, month, day;

Marked "up", "moisture-proof", "careful light" and other transport signs, all signs are in accordance with the GB 191 requirements.

### 10.2. Packing

The product uses the special absorption plastic box to separate the packing, has the vibration proof function, and conforms to the GB 3873 stipulation.

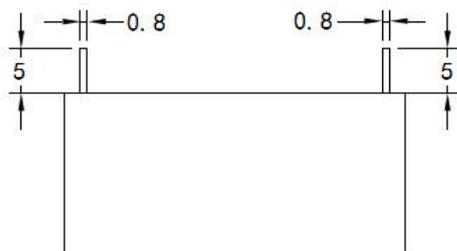
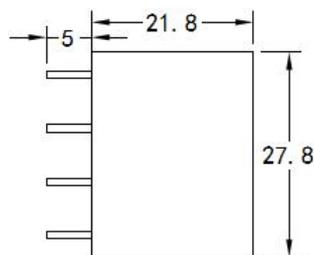
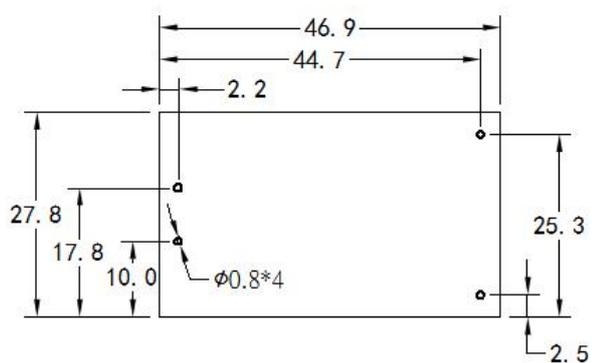
### 10.3. Transportation

The packaged products can be transported by any means of transportation, should be covered in the transportation, should not be violent vibration, impact, etc.

### 10.4. Storage

Products shall be stored in accordance with GB 3873.

## 11. Weight and Dimensions



**引脚功能**

1	AC
2	AC
3	-V <sub>O</sub>
4	+V <sub>O</sub>

重量: 40±2g

单位: 毫米 (mm)

**Size Error**

- 1, length, width, height and pin spacing error  $\pm 8\%$
- 2, pin length error  $\pm 1\text{mm}$
- 3, pin diameter error  $-0.2\text{mm}$