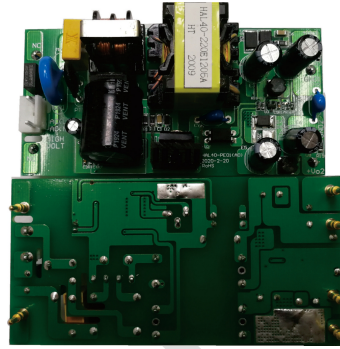


Typical Characteristics

- Wide input range: 85–305VAC/100–432VDC
- No-load power: $\leq 0.3W$
- Conversion efficiency (typ. 86%)
- Switching frequency: 65KHz
- Protection types: Short circuit, overcurrent, overvoltage, overtemperature
- Isolation voltage: 3750Vac
- Open-frame type, plug-in terminals
- Installation method: Through-hole mounting on a PCB
- Standards: Complies with CE and RoHS requirements

40W, Wide-Voltage Input, Dual-Channel
Isolated Output AC-DC Open-Frame Power Supply



RoHS

The HAL40_E-A Series is a compact, high-efficiency open-frame power supply offered by Huizhi Electronics.

This series of power supplies offers a wide range of input voltages, AC/DC compatibility, low ripple, low temperature rise, low power consumption, high efficiency, high reliability, high-level safety isolation, and excellent EMC performance. These products are widely used in various fields, including power, industrial, instrumentation, and smart home applications. When using these products in environments with poor electromagnetic compatibility, please refer to the EMC application circuits provided by our company.

Model Number Description



Product selection table

Certification	Model number	Output specifications					Maximum capacity sexual load	ripple and noise 20MHz (Max)	Efficiency @ full load, 220Vac (Typical)
		Power	Vol. 1	Io 1	Vol. 2	Io 2			
		(W)	Vo1 (V)	Io1 (mA)	Vo2 (V)	Io2 (mA)			
	HAL40-220E1205A	40	12	2500	5	2000	1000 / 2000	80	86

Note 1: Due to space limitations, the above is only a partial list of products. For products not included in the list, please contact our Sales Department.

Note 2: "*" indicates models currently under development.

Note 3: Typical output efficiency values are based on measurements taken after the product has been aged under full load for 30 minutes.

Note 4: The full-load efficiency (% TYP) in the table has a tolerance of $\pm 2\%$. Full-load efficiency is calculated as the total output power divided by the module's input power.

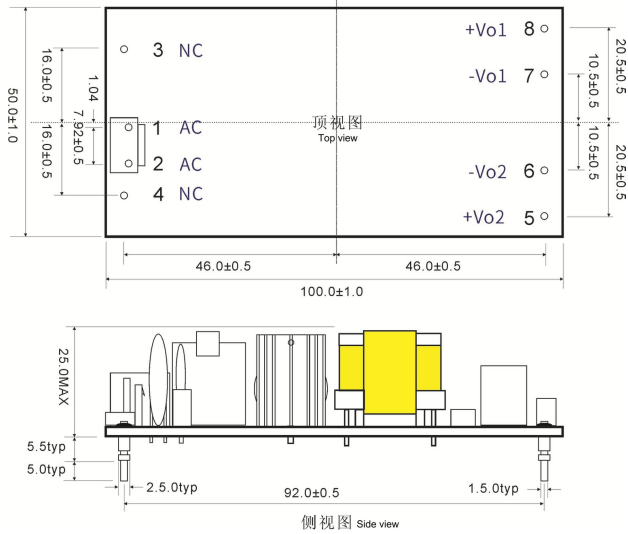
Input characteristics						
Items	Working conditions	Minimum		Typical	Maximum	Unit
Input voltage range	AC input	85		220	305	VAC
	DC input	100		310	432	VDC
Input frequency range	-	47		50	63	Hz
Input current	115VAC	/		/	1.0	A
	220VAC	/		/	0.5	
Surge current	115VAC	/		/	10	
	220VAC	/		/	20	
Leakage current	-	0.5mA TYP/230VAC/50Hz				
External insurance management recommendation value	-	3A-6A/250VAC slow-break fuse				
Hot-swappable	-	Not supported				
Remote control	-	There is no remote control				
Output characteristics						
Items	Working conditions	Minimum		Typical	Maximum	Unit
Voltage accuracy	Input full voltage range	Vo1	-	±1.0	±2.0	%
	Any load (balance load)	Vo2	-	±3.0	±5.0	%
Linear regulation rate	Rated load	Vo1	-	-	±0.5	%
		Vo2	-	balance load	±1.5	%
Load regulation rate	Input nominal voltage 20%~100% load	Vo1	-	-	±1.0	%
		Vo2	-	balance load	±3.0	%
No-load power consumption	Input 115VAC	-		-	0.3	W
	Input 220VAC	-		-		
Minimum load	Single output	0		-	-	%
	Positive and negative dual co-ground output	-		-	10	%
	Positive and negative dual isolated outputs	-		-	10	
Startup delay time	Input rated Voltage	-		1000	-	mS
Power down hold time	Input 115VAC	-		10	-	mS
	Input 220VAC	--		60	-	

Dynamic response	25%~50%~25% 50%~75%~50%	Overshoot amplitude (%): $\leq \pm 5.0$			%
		Recovery time (mS): ≤ 5.0			mS
Output overshoot		$\leq 10\%V_o$			%
Short-circuit protection	Input full voltage range	It can be short-circuited for a long time and self-recovering			Barrier type
Drift coefficient	-	-	$\pm 0.03\%$	-	%/°C
Overcurrent protection	Input full voltage range	$\geq 150\% I_o$ is self-recoverable			Barrier type
Ripple Noise	-	-	80	100	mV
	Note: The test method for ripple and noise uses the twisted-pair test method. For specific test procedures and equipment requirements, please refer to the section below (Ripple & Noise Test Instructions).				

General characteristics

Items	Working conditions	Minimum	Typical	Maximum	Unit
Switching frequency	-	-	65	-	KHz
Operating temperature	-	-25	-	+65	°C
Storage temperature	-	-40	-	+85	
Soldering temperature	Wave soldering	$260 \pm 4^\circ\text{C}$, time: 5-10S			
	Hand soldering	$360 \pm 8^\circ\text{C}$, interval 4-7S			
Relative humidity	-	10	-	90	%RH
Isolation voltage	Input-output, test for 1 minute, leakage current $\leq 5\text{mA}$	3750	-		VAC
Insulation resistance	Input-output @ apply DC500V	100	-		MΩ
Safety standards	-	EN60950、IEC60950			
Vibration	-	10-55Hz, 10G, 30Min, along X, Y, Z			
Safety level	-	CLASS II			
Enclosure grade	-	UL94V-0			
Mean time between failures MTBF	-	MIL-HDBK-217F@25°C > 300,000H			

Package Dimensions



Package code

L x W x H

A

100x50x25mm

3.937x1.969x0.984inch

Pin Definition

Pin	1	2	3	4	5	6	7	8
Single isolation (E)	AC(L) Input wire	AC(N) Input neutral wire	NC No electricity	NC No electricity	+Vo2 Output positive terminal 2	-Vo2 Output negative terminal 2	-Vo1 Output negative terminal 1	+Vo1 Output positive terminal 1

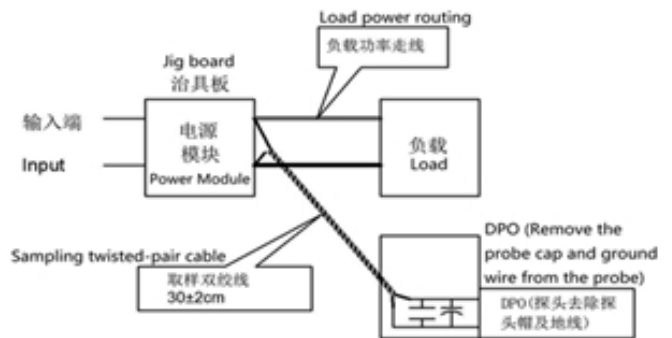
Note: If the pin assignments of the power module differ from those in the selection guide, refer to the labels on the actual unit.

Ripple & Noise Test Instructions (Twisted Pair Method 20MHz Bandwidth)

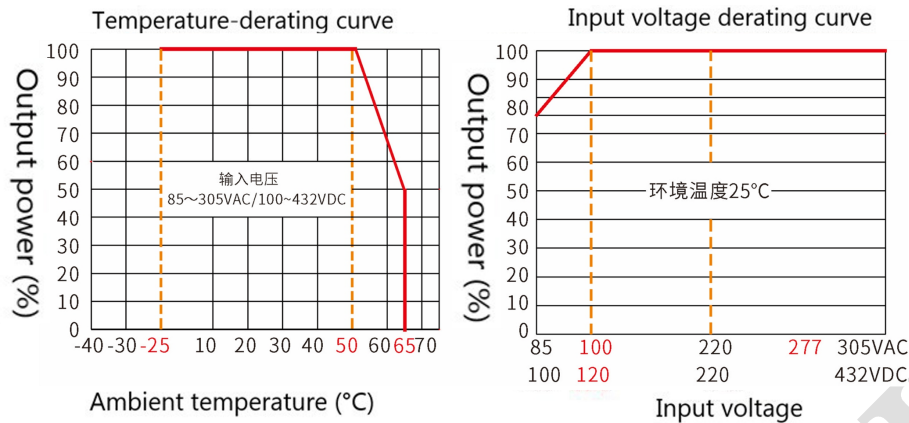
Test Method:

- Ripple noise is connected by 12# twisted pair wire, the oscilloscope bandwidth is set to 20MHz, the 100M bandwidth probe is set, and the 0.1uF polypropylene capacitor and 10uF high-frequency low-resistance electrolytic capacitor are connected in parallel on the probe end, & the oscilloscope sampling uses the Sample sampling mode.
- Schematic diagram for output ripple and noise testing:

Connect the power supply input to the input power source. Connect the power supply output to the electronic load via the fixture board. For testing, use a 30 cm ± 2 cm test lead to take a direct sample from the power supply output port. Select insulated wires with an appropriate gauge based on the magnitude of the output current.



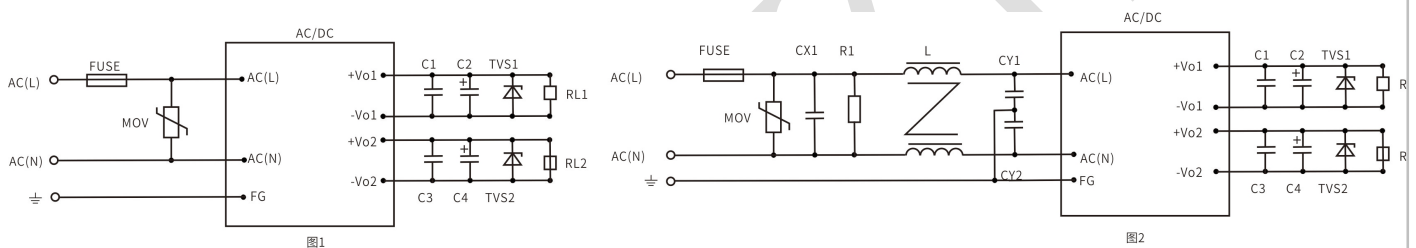
Product characteristic curve



Note 1: The input voltage is 85 - 100 VAC.
Voltage derating must be performed based on the input voltage derating curve.

Note 2: This product is designed for use in naturally ventilated environments. Please contact us if you intend to use it in an enclosed environment.

Typical application circuit diagram and recommended parameters



Note:

- The output filter capacitors C1 and C3 are used to eliminate high-frequency noise. We recommend using 1 μ F ceramic capacitors with a voltage rating derated by more than 80%.
- The output filter capacitors C2 and C4 are electrolytic capacitors. We recommend using high-frequency, low-impedance electrolytic capacitors with a rating of 100 μ F and 1A output current. The capacitors should have a voltage rating derated by more than 80%.
- TVS diodes are recommended to protect the downstream circuitry (in case of module malfunction). Recommended 600W models: For 5V output, use SMBJ7.0A; for 9V output, use SMBJ12.0A; for 12V output, use SMBJ20A; for 15V output, use SMBJ20.0A; for 24V output, use SMBJ30.0A; for 48V output, use SMBJ64A.
- MOV stands for Metal Oxide Varistor. Recommended models: 10D561K (1000V surge) or 14D561K (2000V surge). Its function is to protect the module from damage during lightning surges.
- For general application requirements, use the circuit recommended in Figure 1. If higher EMC requirements are needed, use the circuit recommended in Figure 2. The specific recommended values for Figure 2 are as follows:
 - Varistor (MOV): Recommended model: 14D-561K. Its function is to protect the module from damage during lightning surges.
 - Safety capacitors CY1 and CY2: 1000 pF/400 VAC;
 - Safety capacitors CX: 0.1 μ F/275 VAC;
 - Common-mode choke LCM: 20mH - 30mH;
 - FUSE (fuse): Mandatory; recommended rating is 3.15 A/250 V, slow-blow (if the fuse rating is too low, it is prone to damage during surges; if too high, it loses its protective function).

Notes

1. The product must be used within the specified parameters; otherwise, it may be permanently damaged.
2. A fuse must be installed at the product's input terminal.
3. If the product operates below the minimum required load, we cannot guarantee that all performance specifications listed in this manual will be met;
4. If the product operates outside its rated load range, we cannot guarantee that all performance specifications listed in this manual will be met;
5. Unless otherwise specified, all data above was measured at $T_a=25^{\circ}\text{C}$, humidity $<75\%$, with nominal input voltage and rated output load (pure resistive load);
6. All test methods for the above specifications are based on our company's standards;
7. The above specifications apply to the product models listed in this manual. Certain specifications for non-standard models may exceed the requirements listed above; please contact our technical staff directly for details;
8. We offer product customization;
9. Product specifications are subject to change without notice; please refer to the latest version of the manual published on our official website.

Contact

GDHUIZHI®

广东汇智电子技术有限公司

[Guangdong Huizhi Electronic Technology Co., Ltd.](http://www.huizhi-elec.com)

地址：广东省肇庆市端州区 11 区肇庆大道北侧厂房、办公楼(二期)3 楼

Address: 3rd floor, factory and office building (phase II) on the north side of Zhaoqing Avenue,
District 11, Duanzhou District, Zhaoqing City, Guangdong Province, China

Homepage: www.huizhi-elec.com/www.chinaebizal.com

Tel: +86 -758 - 2566 585

E-mail: sales@huizhi-elec.com