Typical Features

- ◆ Wide Input voltage range
- ◆ Typical Efficiency (Typ. 88%)
- ◆ Switching frequency:132KHz typ.
- ◆ Over current / Short circuit /Over temperature protection, Self-furbish
- ◆ Input-Output Isolated
- ◆ PCB Mounting
- ◆ Metal Case K1

Application Field

WA60-220XXXK1B Series*----a compact size, high efficient power converter offered by Aipu.*

It features universal input voltage range, AC and DC dual-use, low ripple, low temperature rise, low power consumption, high efficiency, high reliability, safer isolation.

The series widely used for industry, office and civil application.

The application circuit in the datasheet is strongly recommended for harsh EMC environment.

Typical Product List

Part No.	Input voltage range	Output voltage / current				Max. Capacitive Load	Ripple& Noise 20MHz	Efficiency @ Full Load, Nominal Input Voltage (Typical)
		Vo1(V)	Io1(m A)	Vo2(V)	Io2(m A)	u F	mVp-p	%
WA60-220S05K1B	85~265VAC 120~380VDC	+5.0 V	12000m A	-	-	4000	80	82%
WA60-220S09K1B		+9.0 V	6666 m A	-	-	1200	120	88%
WA60-220S12K1B		+12.0 V	5000m A	-	-	1000	120	88%
WA60-220S15K1B		+15.0 V	4000 m A	-	-	820	120	88%
WA60-220S24K1B		+24.0 V	2500 m A	-	-	470	120	88%

Note: Due to space limitations, above is only a part of our product list, please contact our sales team for more items.

Technical Parameters Test Condition: Unless otherwise specified, data in the datasheet should be tested under the conditions of inputting nominal voltage, pure resistance rated load and Ta=25℃.

Input Specifications	Min (Vac)	Nom(Vac)	Max(Vac)	Notes
Input voltage Vac	85(120Vdc)	220	265(380Vdc)	U
Input Frequency range Hz	47		440	
Standby power consumption	0.8 W(Max)			
Short-circuit power consumption	5.0W(Max)			
Input current	1.30A (Max) @Vin=110Vac		0.545A (Max) @Vin=220Vac	

Surge current	16A (Max) @Vin=110Vac		30A (Max) @Vin=220Vac

Output Specifications

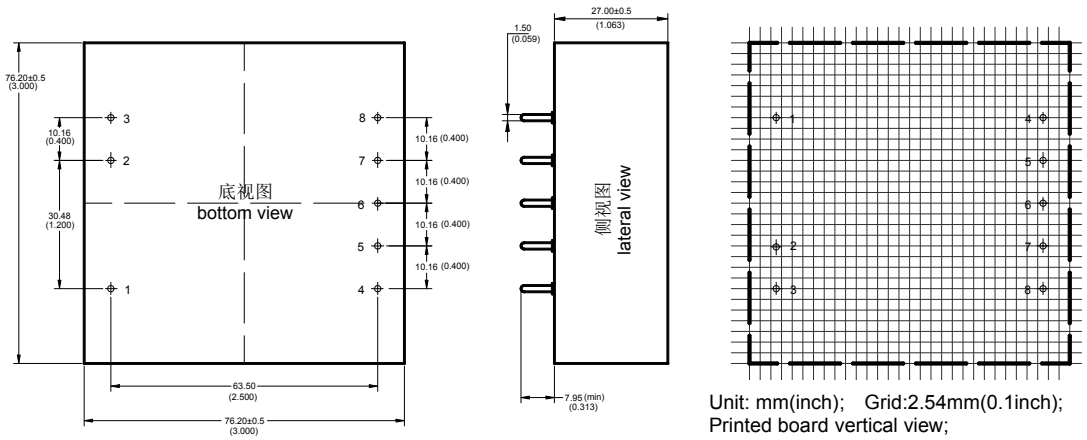
Output voltage accuracy	Vo1±1.0%TYP,2.0%Max		
Line regulation	Nominal Load, full voltage range	Vo1	±0.2%
Load regulation	20% ~ 100% nominal load	Vo1	±0.5%
Minimum Load	Single output		0% Load
Ripple & noise	20MHz BM full load , Vo≤5.0V, ≤80mVp-p, Other≤120 mVp-p		
Turn-on delay time	Nominal input voltage, full load	≤100mS	
Power off holding time	Nominal input voltage, full load	60ms(typ.)	
Startup Output Overshoot		≤10%Vo	
Output Dynamic characteristics	25%-50%-25%, 50%-75%-50%	Overshoot range(%)≤±5%; Recovery time (mS) ≤5.0mS:	
Output short circuit protection	Continuous, Self-recovery	Output Switched-off	Hiccup
Output over voltage protection	≤1.5Vo	5VDC Output 9VDC Output 12VDC Output 15VDC Output 24VDC Output	≤6.5VDC ≤12VDC ≤16VDC ≤20VDC ≤30VDC

General Specifications

Transfer Efficiency	Nominal input voltage, full load	Vo≤5.0V,82% typical	Vo>9.0V, 88% typical
Switching frequency			132KHz typical
Operating temperature			-25℃ ~ +65℃
Temperature drift			0.02%/℃ (main circuit)
Storage temperature			-40℃ ~ +105℃
Max case temperature			+95℃
Relative humidity			10%~90%
Case material			Plastic/ Metal case
Isolation Voltage	Input-output 3.00KVac ≤ 3.0mA/1min; Input- case/ Input-FG 1.5KVac ≤ 3mA/1min		
MTBF	>300,000H @25℃		
EMC / EMI	Line Conducted Emission	CISPR22/EN55022 CLASSA（Bare Board）	
		CISPR22/EN55022 CLASSB（See typical application circuit 2）	
	Radiated Emission	CISPR22/EN55022 CLASSB (Bare Board)	

	EMS	ESD	IEC/EN61000-4-2 Contact ±4KV (Bare Board)
		Radiated Susceptibility	IEC/EN61000-4-3 10V/m (Bare Board)
		EFT	IEC/EN61000-4-4 ±2KV (Bare Board)
			IEC/EN61000-4-4 ±4KV （See typical application circuit 2）
		Surge Immunity	IEC/EN 61000-4-5 ±2KV/±4KV (Bare Board)
			IEC/EN 61000-4-5 ±4KV/±4KV （See typical application circuit 2）
		Conduction harassment immunity	IEC/EN61000-4-8 10Vr.m.s (Bare Board)
		Falling voltage sag and short supply interruption immunity	IEC/EN61000-4-11 0%-70% (Bare Board)
MTBF		>300,000H @25℃	
Case Material		UL94V-0	

Dimension



Unit: mm(inch); Grid:2.54mm(0.1inch);
Printed board vertical view;
General tolerances: ±0.25mm(±0.01inch);
Pin tolerances: ±0.10mm(0.004inch)

Packing Code	L x W x H	
K1B	76.2 x76.2 x 27.0 mm	3.000 × 3.000 ×1.063inch

Pin Definition

Pin-out	1	2	3	4	5	6	7	8
Single(S)	⏚	AC(N)	AC(L)	NP	+Vo	-Vo	NC	NP

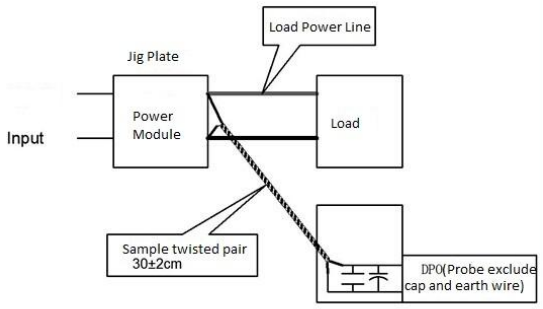
Note: If the definition of pin is not in accordance with the model selection manual, please refer to the label on actual item.

Ripple& Noise Test: (Twisted Pair Method 20MHZ bandwidth)

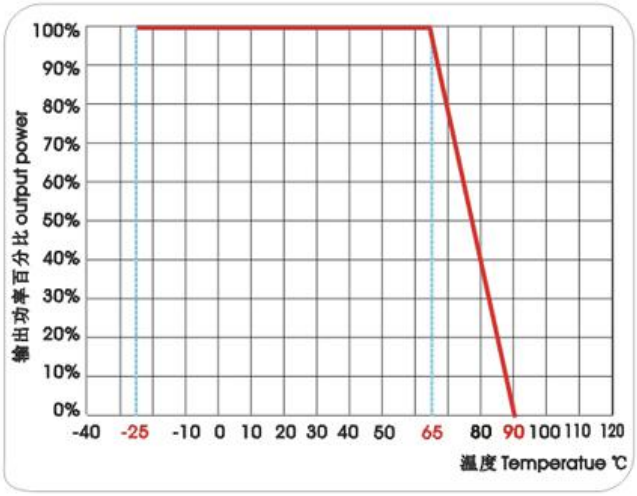
Test Method:

(1) 12# twisted pair to connect, Oscilloscope bandwidth set as 20MHz, 100M bandwidth probe, terminated with 0.1uF polypropylene capacitor and 47uF high frequency low resistance electrolytic capacitor in parallel, oscilloscope set as Sample pattern.

(2) Input terminal connect to power supply, output terminal connect to electronic load through jig plate, Use 30cm±2 cm sampling line, Power line selected from corresponding diameter wire with insulation according to the flow of output current.



Operating Temperature VS Load Curve



Typical Application Circuit

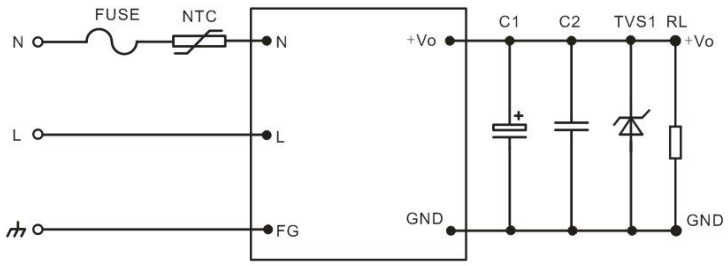


Photo 1

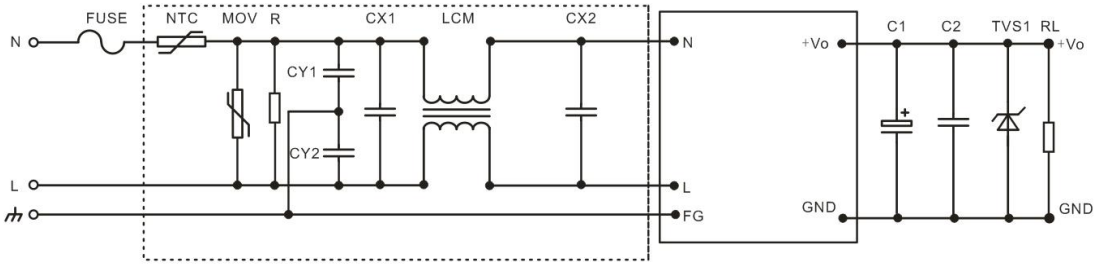


Photo 2 EMC recommended application circuit

Note:

1. Output filtering capacitor C1 is electrolytic capacitor, recommended to use high frequency low resistance ones, capacitance as 100uF/1A output current. Capacitance withstand voltage derating should be 80% or above.

2. Output filtering capacitor C2 filter high frequency noise, recommend 1μF ceramic capacitor, capacitance withstand voltage derating ＞80%.

3. TVS is a recommended component to protect post-circuits (if converter fails), recommend 600W model.

5V output recommend: SMBJ7.0A，9V output recommend: SMBJ12.0A, 12V output recommend:SMBJ20A, 15V output recommend: SMBJ20.0A, 24V output recommend: SMBJ30.0A, 48V output recommend:SMBJ64A.

4. NTC is thermistors, recommended model:5D-14, to protect converter from damage when lighting surge..

5. MOV is voltage dependent resistor, recommended model: 20D-471K, to protect converter from lightning surge damage.

6. Photo 1 circuit recommended for customer with normal application request, if have higher request for EMC, recommended to use Photo 2 recommended circuit. Below are the recommended value for Photo 2:

1)MOV: voltage dependent resistor, recommend model:20D-471K, to protect converter from lightning surge damage.

2)R: 510KΩ/3W, metal film resistor;

3)CY1, CY2, CY3,CY4: 1000pF/400VAC;

4)CX:0.22μF/275VAC;

5)LCM:10mH-30mH;

6). FUSE: necessary, recommended specification as 6.25A/250V, slow fusing.

