AC/DC Converter

WA40-50-220XXXK1 Series

Typical Features

- ◆Wide Input voltage range 85~265VAC
- ◆Typical Transfer Efficiency 88%
- ◆Switching frequency: 132KHz typ.
- ◆Over current / Short circuit /Over temperature protection, Self-recovery
- ◆Input-output isolated
- ◆PCB Mounting
- ◆Metal case K1

Application Field

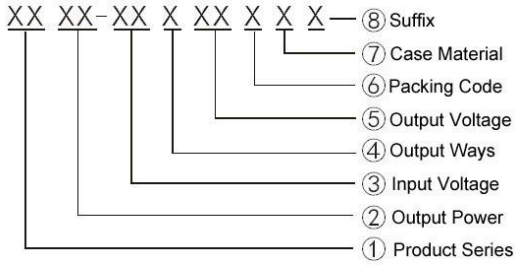
WA40-50-220XXXK1 *Series-----a compact size, high efficient power converter offered by Aipu.*

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

It is widely used in industrial, office and civil applications.

Please refer to this datasheet when module being used in a bad EMC environment.

Product Named Method



Typical Product List

Part No.	Input voltage range	Output voltage / current				Max. Capacitive Load	Ripple & Noise 20MHz	Efficiency @full load, nominal input (TYP)
		Vo1(V)	Io1(m A)	Vo2(V)	Io2(m A)	u F	mVp-p	%
WA40-220S05K1	85~265VAC 120~380VDC	+5V	8000mA			4000	80	78%
WA40-220S12K1		+12V	3300mA			1200	120	85%
WA40-220S24K1		+24V	1660mA			1000	120	87%
WA40-220D05K1		+5V	4000mA	-5V	4000mA	2000	80	82%
WA40-220D12K1		+12V	1660mA	-12V	1660mA	1000	120	88%
WA40-220D24K1		+24V	830mA	-24V	830mA	470	120	90%
WA50-220S05K1		+5V	10000mA			4000	80	82%
WA50-220S12K1		+12V	4200mA			1200	120	86%
WA50-220S24K1		+24V	2080mA			1000	120	88%

WA50-220D05K1		+5V	5000mA	-5V	5000mA	2000	80	82%
WA50-220D12K1		+12V	2080mA	-12V	2080mA	1000	120	88%
WA50-220D24K1		+24V	1040mA	-24V	1040mA	470	120	90%

Note: Due to space limitation, 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℃.

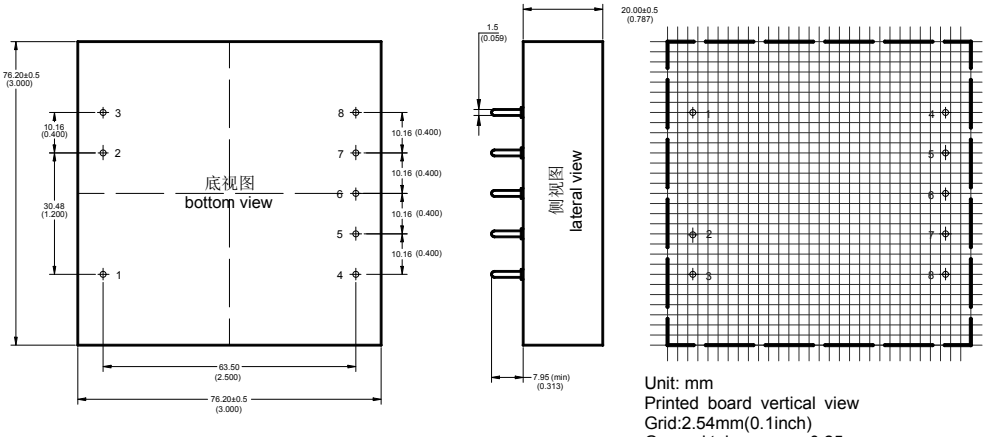
Input Specifications	Min (Vac)	Nom(Vac)	Max(Vac)	Notes
Input Voltage Vac	85(120Vdc)	220	265(380Vdc)	U
Input Frequency range Hz	47		440	
Standby Power Consumption	0.8 W(Max)			
Short-circuit Power Consumption	5.0W(Max)			
Input current	1.210A (Max) @Vin=110Vac		0.545A (Max) @Vin=220Vac	
Surge current	16A (Max) @Vin=110Vac		30A (Max) @Vin=220Vac	

Output Specifications			
Output Voltage accuracy	Vo1±1.0%TYP,2.0%Max, Vo2±1.0%TYP,2.0%Max		
Line Regulation	Nominal Load, full voltage range	Vo1; Vo2	±0.2%; ±0.5%
Load Regulation	20% ~ 100% nominal load	Vo1; Vo2	±0.5%; ±3.0%
Minimum Load	Single Output		0%Load 10% Load 10% 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.)	
Start-up 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 Switch-off	Hiccup
Output Over Voltage Protection	≤1.5Vo	5VDC output 12VDC output 24VDC output	≤6.5VDC ≤16VDC ≤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 2.50KVac ≤ 3mA/1min; Input- case/FG Input-FG 1.5KVac ≤ 5mA/1min		
MTBF	>300,000H @25℃		
Class of Case Material	UL94V-0		

Packing Dimension



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

Packing Code	L x W x H	
K1	76.2x 76.20 x 20.00 mm	3.000 × 3.000 × 0.787inch

Pin Definition

Pin	1	2	3	4	5	6	7	8
Single(S)	FG	AC(N)	AC(L)	-S	TRIM	+S	GND	Vout
Dual(D)	FG	AC(N)	AC(L)	-Vout	NP	COM	NP	+Vout

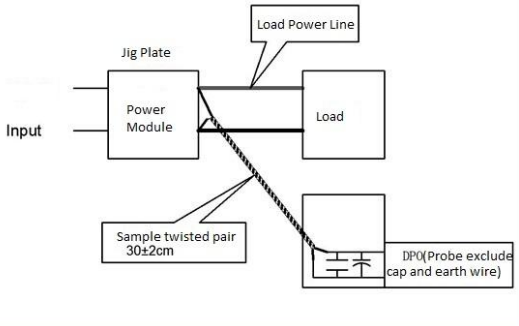
Note: If the definition of pin is not in accordance with the model selection manual, please refer to the label on actual item.

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.



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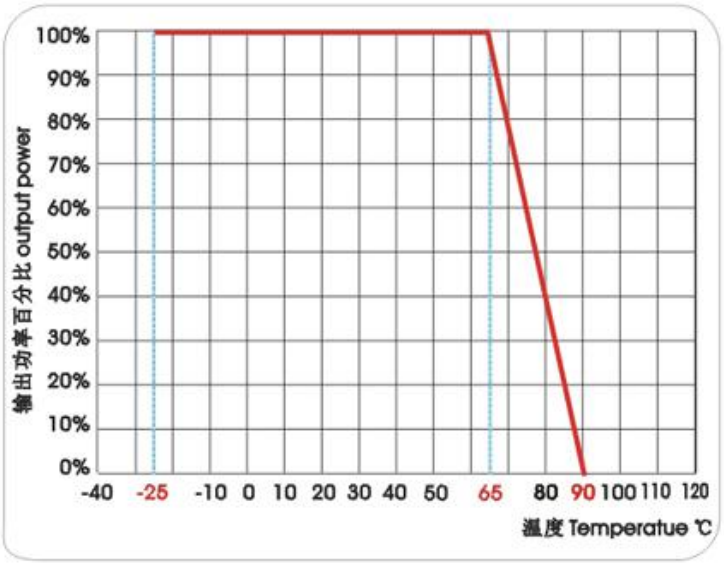
Operating Temperature VS Load Curve



Typical Application Circuit

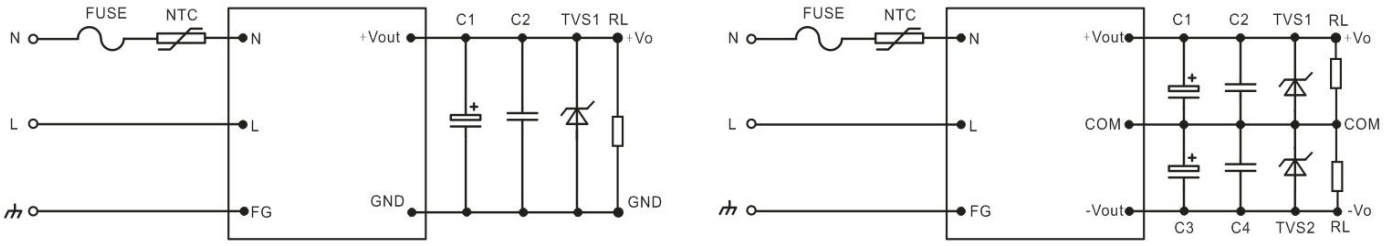
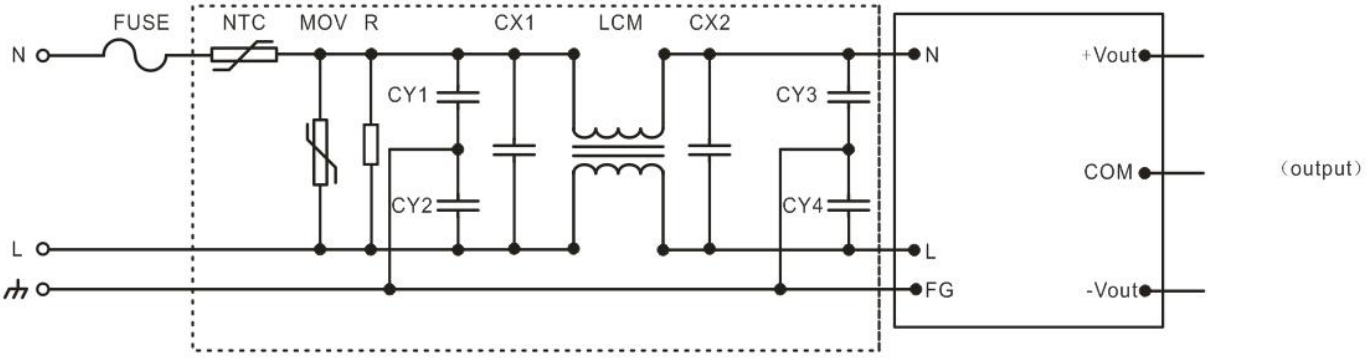


Photo 1



EMC recommended application circuit

Photo 2

Note:

1. Output filtering capacitor C1/C3 are electrolytic capacitor, recommend to use high frequency low resistance electrolytic capacitor, capacitance as100uF/1A output current. Capacitance withstand voltage derating bigger than 80%.
2. Output filtering capacitor C2/C4 filters high frequency noise, recommend to use 1μF ceramic capacitor, Capacitance withstand voltage derating bigger than 80%.
3. TVS is a recommended component to protect post-circuit if converter fails. Recommend to use 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, recommend model:5D-14, to protect converter from damage when lightning surge.
5. MOV is voltage dependent resistor, recommend model: 20-D471, to protect converter from damage when lightning surge.
6. For customer's normal application please use Photo 1 recommended circuit, If has EMC request, recommended to use Photo 2 recommended circuit. The specifications for Photo 2 circuit are as below:

1)MOV: voltage dependent resistor, recommend model: 20D-471K, to protect converter from damage when lightning surge.
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, recommend spec as 6.25A/250V, slow fusing.

