

Typical Features

- ◆ Ultra-wide input voltage range (8:1), output power 3W
- ◆ Continuous short circuit protection, self-recovery
- ◆ Input under voltage protection
- ◆ Output short circuit and over current protections
- ◆ No load power consumption 0.12W Max.
- ◆ Isolation voltage 3000VDC
- ◆ Operating temperature from -40°C to +105°C
- ◆ Plastic case, flame class UL94-V0



Application Field

This series of products can be widely used in the fields of instrument, communication, pure digital circuit, general low frequency analog circuit, relay drive circuit, data exchange circuit, etc.

Typical Product List

Certificate	Part No.	Input Voltage Range		Output Voltage/Current (Vo/Io)		Input Current (mA) Typ. @nominal volt.		Max Capacitive Load (uF)	Efficiency (%) @full load nominal volt.	
		Nominal (VDC)	Range (VDC)	Vo (VDC)	Io (mA)	Full Load	No Load		Min	Typ.
		-	KW3-16S05E3R3	12	4.5 - 36	5	600	325	10	1000
-	KW3-16S12E3R3	12	250			320	10	330	77	79
-	KW3-16S15E3R3	15	200			320	10	220	77	79
-	KW3-16D05E3R3	±5	±300			330	15	470	74	76
-	KW3-16D12E3R3	±12	±125			320	15	220	77	79
-	KW3-16D15E3R3	±15	±100			320	15	100	77	79

Note 1: The maximum capacitive load is the capacitance allowed to be used when the power supply starts up at full load. The converter may not start if the capacitor exceeds this value.

Note 2: The efficiency is tested at the nominal input voltage and the rated load.

Note 3: Please contact Aipu sales for other output voltages requirements of this series but not listed in this table.

Input Specifications

Item	Test Condition	Min.	Typ.	Max.	Unit
Input inrush voltage (1Sec max.)		-0.7	--	50	VDC
Start-up voltage		--	--	4.5	VDC
Under voltage protection		3.5	4	--	VDC
No load power consumption		0.12W Max.			
Input filter		Capacitor Filter			
Hot plug		Unavailable			

Output Specifications						
Item	Test Condition		Min.	Typ.	Max.	Unit
Output power			0.3	--	3	W
Output voltage accuracy	Full input voltage range, 0%-100% load		--	±1	±3	%
Line voltage regulation	100% load	Positive output	--	--	±0.5	%
		Negative output	--	--	±1	
Load regulation	10% - 100% load	Positive output	--	--	±1	%
		Negative output	--	--	±1.5	
Cross regulation	Dual output, +Vo with 50% load, -Vo with 25%-100% load		--	--	±5	%
Transient response deviation	25% load change step, nominal input voltage	5V output	--	±5	±8	%
		Others	--	±3	±5	
Transient recovery time	25% load change step, nominal input voltage		--	300	500	µs
Temperature drift coefficient			--	--	±0.03	%/°C
Ripple & Noise	0%-100% load, 20MHz bandwidth		--	50	100	mVp-p
Over current protection	Full input voltage range		110	--	300	%Io
Short circuit protection	Continuous, self-recovery					

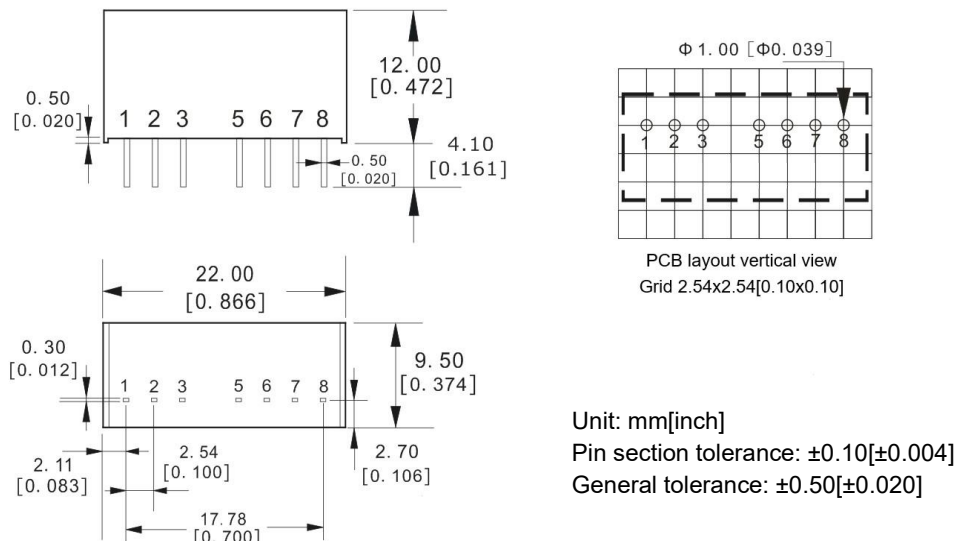
Note: The Ripple & Noise is tested by the Twisted Pair Method, please refer to the following test instruction.

General Specifications						
Item	Test Condition		Min.	Typ.	Max.	Unit
Switching frequency	Nominal input voltage, full load		--	260	--	KHz
Operating temperature	Refer to the Temperature Derating Graph		-40	--	+105	°C
Storage temperature			-55	--	+125	°C
Case temperature rise	Within the operation derating range		--	30°	--	°C
Pin soldering temperature	1.5mm from the case, soldering time 10S		--	--	300	°C
Relative humidity	No condensing		5	--	95	%RH
Isolation voltage	I/P-O/P, test 1 minute, leakage current <1mA		3000	--	--	VDC
Insulation resistance	I/P-O/P, @ 500VDC		1000	--	--	MΩ
Isolation capacitance	I/P-O/P, 100KHz/0.1V		--	50	--	pF
MTBF	MIL-HDBK-217F@25°C		1000	--	--	K hours
Vibration	10-150Hz, 5G, 30 Min. along X, Y and Z					
Case material	Plastic in Black, flame class UL94-V0					
Unit weight	4.5g (Typ.)					
Cooling method	Natural air					
Packing	Tube size (525x12.5x20mm)		22PCS/Tube			
	Carton size (542x110x155mm)		1232PCS/Carton (Total 56 Tubes)			
Unit dimensions	L x W x H	22.00× 9.50 × 12.00 mm	0.866 × 0.374 × 0.472 inch			

EMC Performance

Item		Test Standard	Performance/Class
EMI	CE	CISPR32/EN55032	Class B (with the Recommended EMC circuit)
	RE	CISPR32/EN55032	Class B (with the Recommended EMC circuit)
EMS	ESD	IEC/EN61000-4-2	Contact ±4kV perf. Criteria B
	RS	IEC/EN61000-4-3	10V/m perf. Criteria A
	EFT	IEC/EN61000-4-4	±2kV perf. Criteria B
	Surge	IEC/EN61000-4-5	±2kV perf. Criteria B
	CS	IEC/EN61000-4-6	3 Vr.m.s perf. Criteria A

Mechanical Dimensions

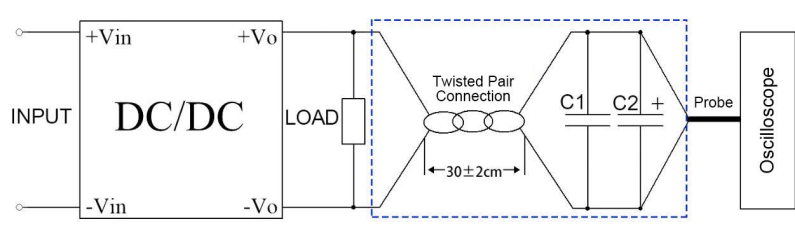


Pin-out Function Description

Pin No.	1	2	3	4	5	6	7	8
Single (S)	GND	+Vin	NC	NP	NC	+Vo	-Vo	CS
Dual (D)	GND	+Vin	NC	NP	NC	+Vo	0V	-Vo

Note 1: NC means No Connection, NP means No Pin, CS refers to the following application instruction.
Note 2: Please take the pin definition on the product label as the right one if it is different than the data sheet description.

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

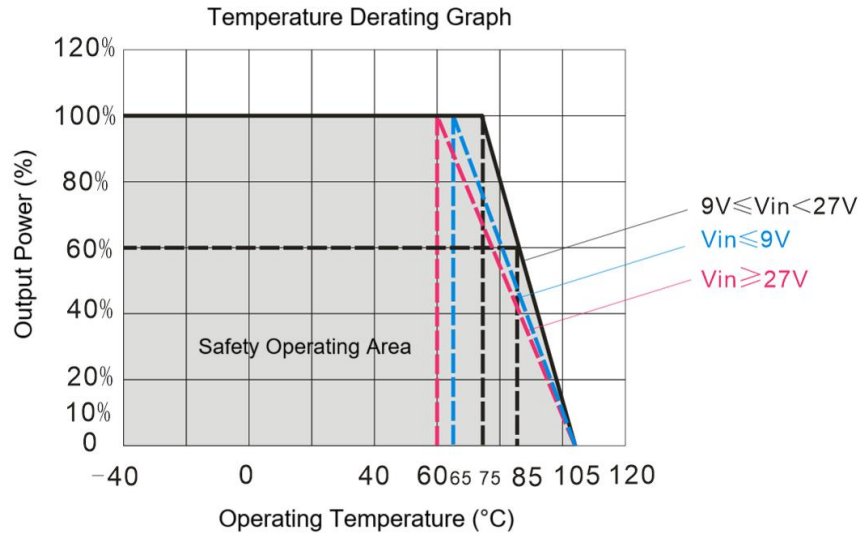


- The Ripple & noise test needs 12# twisted pair cables, an oscilloscope which should be set at the Sample Mode, bandwidth 20MHz. 100M bandwidth probe with cap and ground removed. C1(0.1uF) polypropylene capacitor and C2(10uF) high-frequency low-resistance electrolytic capacitor are connected in parallel with the probes and one side of the twisted pair.
- Refer to the test diagram, the converter output connects to the electronic load by the jig with cables which size should be defined according to the output current value. The other side of the twisted pair (length 30cm±2 cm) should be connected in parallel with the

load. The test can start after the input power on.

3. It is recommended to connect a $\geq 5\%$ load or a high-frequency low resistance electrolytic capacitor ($\geq 100\mu\text{F}$) load to the output to avoid the output ripple increasing.

Product Characteristics Graphs



Recommended Circuits for Application

1. CS Terminal

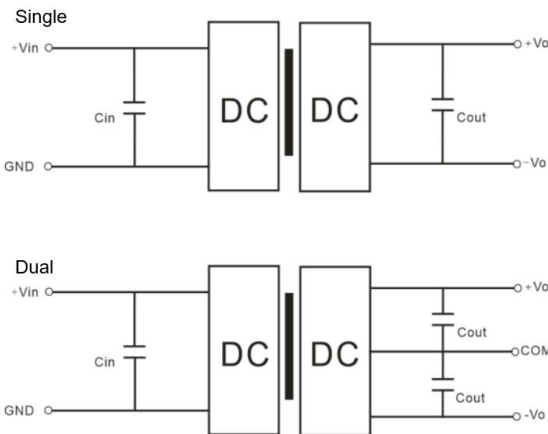
This terminal has connected with the converter internal main filter capacitor (positive). It is recommended to use a low ESR capacitor ($\leq 47\mu\text{F}$) between CS and Pin 7 (negative) to improve the output Ripple and Noise performance.

2. Requirement for the output load

The maximum capacitive load is tested at rated full load. The converter may not start or be damaged at the capacitive over-load.

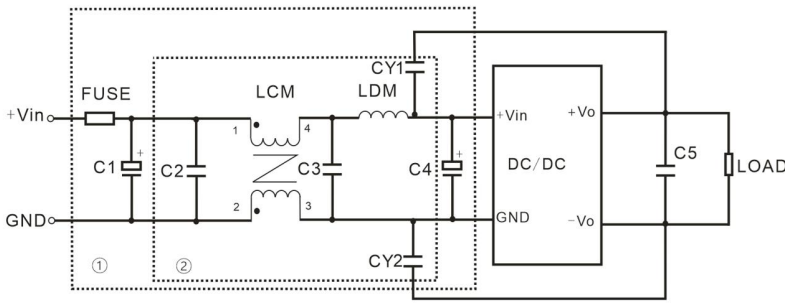
3. Typical application circuits

To ensure effectively decrease the input and output ripple and noise, a capacitor filter can be connected at the input and output, the application circuits are shown below. The suitable filtering capacitors should be chosen as the recommended capacitive load values in Table 1. The converter could not start if the capacitance is too big.



V_{in} (Vdc)	C_{in}	Single V_{out} (Vdc)	C_{out}	Dual V_{out} (Vdc)	C_{out}
12	4.7 $\mu\text{F}/50\text{V}$	5	22 $\mu\text{F}/16\text{V}$	± 5	10 $\mu\text{F}/16\text{V}$
		12	10 $\mu\text{F}/25\text{V}$	± 12	4.7 $\mu\text{F}/25\text{V}$
		15	10 $\mu\text{F}/25\text{V}$	± 15	4.7 $\mu\text{F}/25\text{V}$

4. Recommended EMC circuit diagram



FUSE	By actual current
C1	1000uF/50V
C2/C3	4.7uF/50V
C4	100uF/50V
C5	22uF/50V
LCM	2.2mH
LDM	6.8uH
CY1/CY2	1nF/3KV

Note: The part ① circuit is for EMS test, part ② for EMI filtering, both can be adjusted according to the actual situation.

Application Notice

1. This series of products cannot be connected in parallel to increase the output power, and do not support hot-plug.
2. The product should be used according to the specifications, otherwise it could be permanently damaged.
3. The product performance cannot be guaranteed if it works at a lower load than the minimum load defined.
4. The product performance cannot be guaranteed if it works under the over-load condition.
5. Unless otherwise specified, all values or indicators on this datasheet are tested at $T_a=25^{\circ}\text{C}$, humidity<75%RH, nominal input voltage and rated load (pure resistance load).
6. All values or indicators on this datasheet have been tested based on Aipupower test specifications.
7. The specifications are specially for the parts listed on this datasheet, any other non-standard model performances could be out of the specifications. Please contact our technician for specific requirements.
8. Aipupower can provide customization service.

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