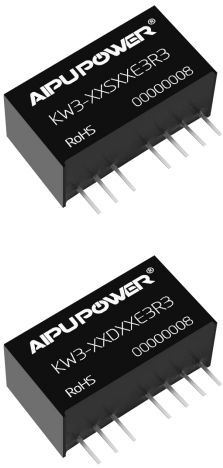
Typical Features

- ◆ Wide input voltage range, isolated & regulated output 3W
- ◆ Efficiency up to 84%(Typ.)
- ◆ With ON/OFF control function
- ◆ Continuous short circuit protection, self-recovery
- ◆ Input under voltage protection & output over current protection
- ◆ Isolation voltage 3000VDC
- ◆ Operating temperature from -40℃ to +105℃
- ◆ Plastic case, flame class UL94-V0



CE
EN62368-1

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	Efficiency @Full load nominal volt.	
		Nominal (VDC)	Range (VDC)	Vo (VDC)	Io (mA)	Full Load	No Load	(uF)	Min (%)	Typ. (%)
CE	KW3-05S3V3E3R3	5	4.5 - 9	3.3	728	696	10	1000	69	71
	KW3-05S05E3R3			5	600	811	6	1000	70	74
	KW3-05S09E3R3			9	333	800	6	680	73	77
	KW3-05S12E3R3			12	250	800	6	330	73	77
	KW3-05S15E3R3			15	200	800	8	220	73	77
	KW3-05S24E3R3			24	125	769	8	100	74	78
	KW3-05D3V3E3R3			±3.3	±364	696	10	1000	69	71
	KW3-05D05E3R3			±5	±300	811	6	470	70	74
	KW3-05D09E3R3			±9	±167	800	6	330	73	77
	KW3-05D12E3R3			±12	±125	800	6	100	73	77
	KW3-05D15E3R3			±15	±100	769	8	100	74	78
	KW3-05D24E3R3			±24	±62	769	8	100	74	78
CE	KW3-24S3V3E3R3	24	9 - 36	3.3	728	134	4	2200	73	75
	KW3-24S05E3R3			5	600	155	4	2200	78	80
	KW3-24S06E3R3			6	500	155	4	2200	78	80
	KW3-24S09E3R3			9	333	152	4	1000	78	80
	KW3-24S12E3R3			12	250	145	4	680	81	83
	KW3-24S15E3R3			15	200	148	5	470	82	84
	KW3-24S18E3R3			18	167	148	5	470	82	84
	KW3-24S24E3R3			24	125	146	5	100	81	83

CE	KW3-24D3V3E3R3	24	9 - 36	±3.3	±364	134	4	1000	73	75
	KW3-24D05E3R3			±5	±300	155	4	1000	78	80
	KW3-24D09E3R3			±9	±167	152	4	680	78	80
	KW3-24D12E3R3			±12	±125	145	4	470	81	83
	KW3-24D15E3R3			±15	±100	148	5	330	82	84
	KW3-24D24E3R3			±24	±62	148	5	100	82	84
CE	KW3-48S3V3E3R3	48	18 - 75	3.3	728	64	5	2200	76	78
	KW3-48S05E3R3			5	600	78	5	2200	78	80
	KW3-48S09E3R3			9	333	78	5	1000	78	80
	KW3-48S12E3R3			12	250	77	5	680	79	81
	KW3-48S15E3R3			15	200	76	5	470	80	82
	KW3-48S24E3R3			24	125	76	5	100	80	82
	KW3-48D3V3E3R3			±3.3	±364	64	5	1000	76	78
	KW3-48D05E3R3			±5	±300	78	5	1000	78	80
	KW3-48D09E3R3			±9	±167	78	5	680	78	80
	KW3-48D12E3R3			±12	±125	77	5	470	79	81
	KW3-48D15E3R3			±15	±100	76	5	330	80	82
	KW3-48D24E3R3			±24	±62	76	5	100	80	82

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.)	Input 4.5-9V	-0.7	--	16	VDC
	Input 9-36V	-0.7	--	50	
	Input 18-75V	-0.7	--	100	
Start-up voltage	Input 4.5-9V	--	3.6	4.5	VDC
	Input 9-36V	--	8	9	
	Input 18-75V	--	16	18	
Start-up current	Input 4.5-9V	1.5	--	--	A
	Input 9-36V	0.7	--	--	
	Input 18-75V	0.3	--	--	
ON/OFF control (Ctrl)	Ctrl terminal no connection or connected to high level, the output is available	3.5	--	50	VDC
	Ctrl terminal connected to low level or the input GND, no output	0	--	1.2	VDC
No load power consumption	0.5W Max.				
Input filter	Capacitor filter				
Hot-plug	Unavailable				

Output Specifications

Item	Test Condition		Min.	Typ.	Max.	Unit
Output power			0.15	--	3	W
Output voltage accuracy	Full input voltage range, 10%-100% load	Positive output	--	--	±2	%
		Negative output	--	--	±3	
	Full input voltage range, No load	Positive output	--	--	±3	%
		Negative output	--	--	±5	
Line voltage regulation	Full input voltage range, 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 50% load, -Vo 25%-100% load		--	--	±5	%
Transient response deviation	25% load change step, nominal input voltage	3.3&5V output	--	±5	±8	%
		Others	--	±3	±5	
Transient recovery time	25% load change step, nominal input voltage		--	300	500	uS
Temperature drift coefficient	100% load		--	--	±0.03	%/°C
Ripple & Noise	5%-100% load, 20MHz bandwidth		--	50	100	mVp-p
Over current protection	Full input voltage range		150	--	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.						

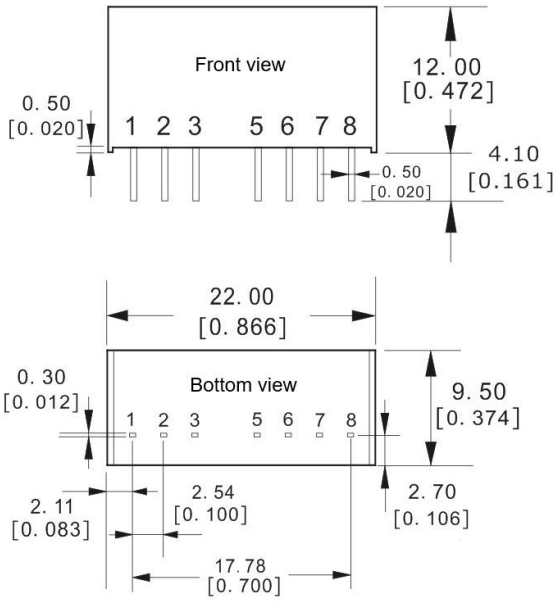
General Specifications

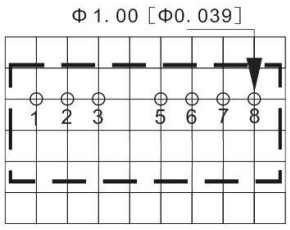
Item	Test Condition		Min.	Typ.	Max.	Unit
Switching frequency	Nominal input voltage, full load	5V input	--	550	--	KHz
		Others	--	330	--	
Operating temperature	Refer to the Temperature Derating Graph		-40	--	+105	℃
Storage temperature			-55	--	+125	℃
Case temperature rise	Ta=25°C		--	35°	--	°k
Pin soldering temperature	1.5mm from the case, soldering time 10S		--	--	300	℃
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℃		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 part ②)
	RE	CISPR32/EN55032	Class B (with the recommended EMC circuit part ②)
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 (with the recommended EMC circuit part ①)
	Surge	IEC/EN61000-4-5	±2kV perf. Criteria B (with the recommended EMC circuit part ①)
	CS	IEC/EN61000-4-6	3 Vr.m.s perf. Criteria A

Mechanical Dimensions





PCB layout vertical view
Grid 2.54x2.54[0.10x0.10]

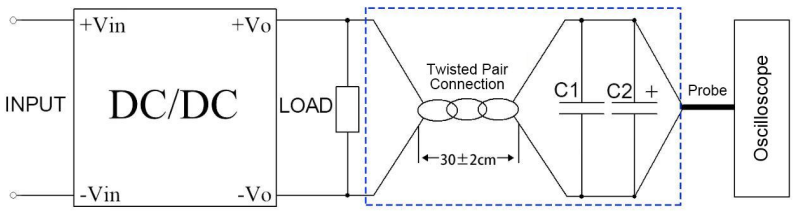
Unit: mm[inch]
Pin section tolerance: ±0.10[±0.004]
General tolerance: ±0.50[±0.020]

Pin-out Function Description

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

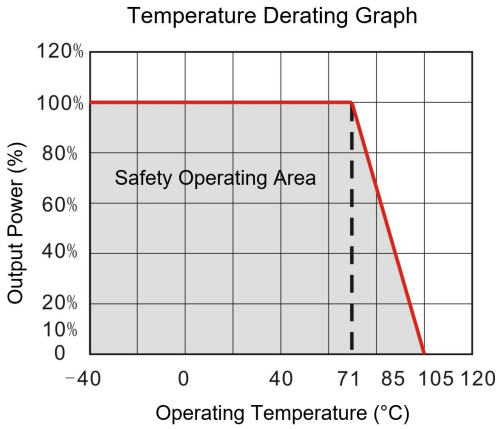


1. The Ripple & noise test needs 12# twisted pair cables, an oscilloscope which should be set at the Sample Mode, bandwidth 20MHz. 100M bandwidth probe with cap and ground removed. C1(0.1uF) polypropylene capacitor and C2(10uF) high frequency low impedance electrolytic capacitor are connected in parallel with the probes and one side of the twisted pair.

2. 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 ≥5% load or a high frequency low impedance electrolytic capacitor (≥100uF) load to the output to avoid the output ripple increasing.

Product Characteristics Graph



Recommended Circuits for Application

1. CS Terminal

This terminal has connected with the converter internal main filtering capacitor (positive). It is recommended to use a low ESR capacitor (≤47uF) between CS and Pin 7 (negative) to improve the output Ripple and Noise performance.

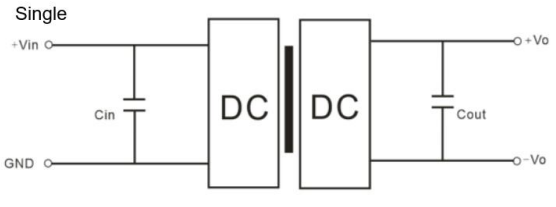
2. Requirement for the output load

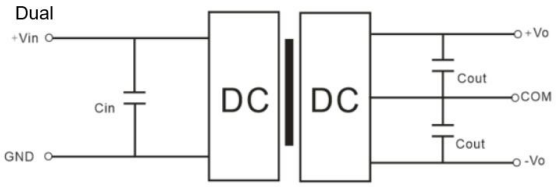
a. To ensure the converter operates efficiently and reliably, its minimum load should not be less than 5% of the rated load. It is recommended to connect a resistor to the output to achieve the real load ≥5%. For dual output application the load balance of the outputs should not be too much deviated, or else the output voltage accuracy could be out of range.

b. The maximum capacitive load is tested at the 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 filtering net can be used at the input and output, the application circuits are shown below. 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.

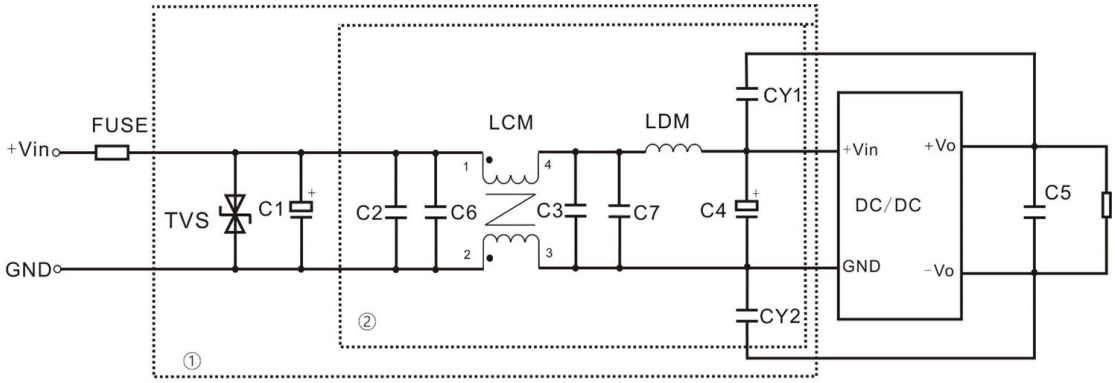




Recommended Capacitive Load Values (Table 1)

Vin (Vdc)	Cin	Single Vout (Vdc)	Cout	Dual Vout (Vdc)	Cout
5	10uF/16V	3.3	10uF/16V	±3.3	4.7uF/16V
24	2.2uF/50V	5, 6	10uF/16V	±5	4.7uF/16V
48	1uF/100V	9	2.2uF/25V	±9	2.2uF/25V
-	-	12	2.2uF/25V	±12	1uF/50V
-	-	15	1uF/50V	±15	1uF/50V
-	-	18, 24	1uF/50V	±24	0.47uF/50V

4. Recommended EMC circuit diagram

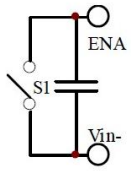
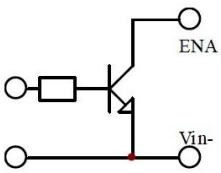
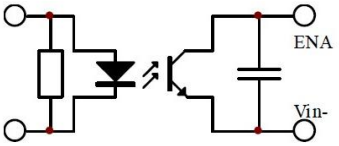
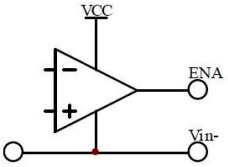


Note: The part ① circuit is for EMS test, part ② for EMI filtering, both can be adjusted according to the actual situation.

	5V input	24V input	48V input
FUSE	TBD by the actual input current		
TVS	SMCJ12CA	SMCJ40CA	SMCJ80CA
C1	1000uF/50V	1000uF/50V	680uF/100V
C2/C3	10uF/50V	4.7uF/50V	4.7uF/100V
C6/C7	470nF/50V	470nF/50V	470nF/100V
C4	330uF/25V	100uF/50V	100uF/100V
C5	22uF/50V	22uF/50V	22uF/50V
LCM	1.5mH	2.2mH	2.2mH
LDM	2.2uH	4.7uH	6.8uH
CY1/CY2	1nF/4KV	1nF/4KV	1nF/4KV

5. ON/OFF Control

Positive logic: The Ctrl terminal no connection or connected to high level, the converter is switched ON with normal output. The Ctrl terminal connected to input GND or the low level, the converter is switched OFF.

			
Switch control method	Transistor control method	Isolation control method	TTL/CMOS control method

Application Notice

1.This series of products cannot be used in parallel, 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 Ta=25℃, 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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