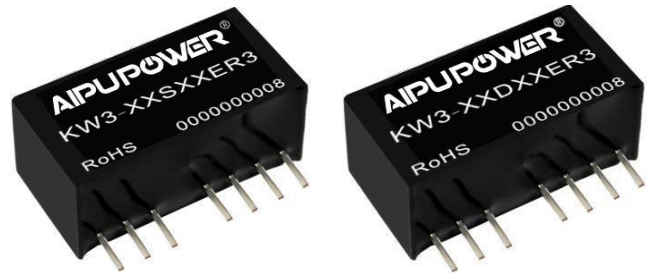


### Typical Features

- ◆ Wide input voltage range (4:1), output power 3W
- ◆ Efficiency up to 84% (Typ.)
- ◆ With ON/OFF control function
- ◆ Continuous short circuit protection, self-recovery
- ◆ Input under voltage & output over current protections
- ◆ Isolation voltage 1500VDC
- ◆ Operating temperature from -40°C to +85°C
- ◆ Plastic case, flame class UL94-V0



**Test Condition:** Unless otherwise specified, all parameter values had been tested at nominal input voltage, pure resistive rated load, and at room temperature 25°C.

### 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 (VDC)		Output Voltage/ Current (Vo/Io)		Input Current (mA) Typ. @Nominal Voltage		Max. Capacitive Load uF	Ripple & Noise (20MHz) Max/Typ. mVp-p	Efficiency (%) @full load/nom. voltage	
		Nom.	Range	Vo (VDC)	Io(mA) Max	Full load	No Load			Min	Typ.
-	KW3-24S3V3ER3	24	9 - 36	3.3	728	134	4	2200	100/50	73	75
-	KW3-24S05ER3			5	600	155	4	2200	100/50	78	80
-	KW3-24S06ER3			6	500	155	4	2200	100/50	78	80
-	KW3-24S09ER3			9	333	152	4	1000	100/50	78	80
-	KW3-24S12ER3			12	250	145	4	680	100/50	81	83
-	KW3-24S15ER3			15	200	148	5	470	100/50	82	84
-	KW3-24S18ER3			18	167	148	5	470	100/50	82	84
-	KW3-24S24ER3			24	125	146	5	100	100/50	81	83
-	KW3-24D3V3ER3	24	9 - 36	±3.3	±364	134	4	1000	100/50	73	75
-	KW3-24D05ER3			±5	±300	155	4	1000	100/50	78	80
-	KW3-24D09ER3			±9	±167	152	4	680	100/50	78	80
-	KW3-24D12ER3			±12	±125	145	4	470	100/50	81	83
-	KW3-24D15ER3			±15	±100	148	5	330	100/50	82	84
-	KW3-24D24ER3			±24	±62	148	5	100	100/50	82	84
-	KW3-48S3V3ER3	48	18 - 75	3.3	728	64	5	2200	100/50	76	78
-	KW3-48S05ER3			5	600	78	5	2200	100/50	78	80
-	KW3-48S09ER3			9	333	78	5	1000	100/50	78	80
-	KW3-48S12ER3			12	250	77	5	680	100/50	79	81

-	KW3-48S15ER3	48	18 - 75	15	200	76	5	470	100/50	80	82
-	KW3-48S24ER3			24	125	76	5	100	100/50	80	82
-	KW3-48D3V3ER3			±3.3	±364	64	5	1000	100/50	76	78
-	KW3-48D05ER3			±5	±300	78	5	1000	100/50	78	80
-	KW3-48D09ER3			±9	±167	78	5	680	100/50	78	80
-	KW3-48D12ER3			±12	±125	77	5	470	100/50	79	81
-	KW3-48D15ER3			±15	±100	76	5	330	100/50	80	82
-	KW3-48D24ER3			±24	±62	76	5	100	100/50	80	82

Note: The Ripple & Noise is tested by the twisted pair method.

**Input Specifications**

Item	Operating conditions	Min.	Typ.	Max.	Unit
Input Inrush Voltage (1Sec. Max)	9 - 36V input	-0.7	--	50	VDC
	18 - 75V input	-0.7	--	100	
Start-up Voltage	9 - 36V input	--	8	9	
	18 - 75V input	--	16	18	
ON/OFF Control (Ctrl)	No connection or connected to high voltage level to turn ON	3.5	--	50	VDC
	Connected to input GND or low voltage level to turn OFF	0	--	1.2	
Standby Power Consumption	0.5W Max.				
Input Filter	Capacitor Filter				
Hot Plug	Unavailable				

Note: The voltage of Ctrl is related to the input GND.

**Output Specifications**

Positive Output Accuracy	Full input voltage range, 10%-100% load	≤ ±2.0%	
Negative Output Accuracy		≤ ±3.0%	
Output Accuracy @no load	Full input voltage range, no load	+Vo: ≤ ±3.0%; -Vo: ≤ ±5.0%	
Voltage Regulation	Full input voltage range, rated load	+Vo: ≤ ±0.2%; -Vo: ≤ ±0.5%	
Load Regulation	10% - 100% load	+Vo: ≤ ±0.5%; -Vo: ≤ ±3%	
Cross Regulation	Dual output, +Vo with 50% load, -Vo with 25%-100% load	≤ ±5.0%	
Dynamic Response	25% load step change	ΔVo/Δt	≤ ±5.0%/0.5 mS (Typ.)
Ripple & Noise	Nominal input voltage, rated load		≤100mVp-p (20MHz bandwidth)
Temperature Drift Coefficient	100% Load		±0.03%/°C
Short Circuit Protection	Continuous, self-recovery		

Note 1: Dual output loads should be balanced at ±5.0%.

Note 2: The Ripple & noise is tested by the twisted pair method, please refer to the following test instruction.

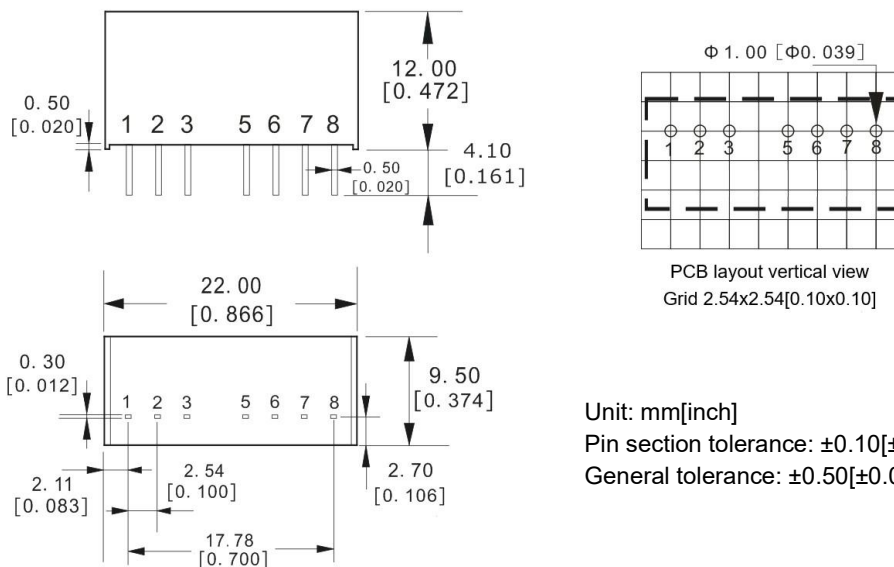
**General Specifications**

Item	Operating conditions	Min.	Typ.	Max.	Unit
Switching Frequency	Nominal input voltage, full load	--	260	--	KHz
Operating Temperature	Please refer to the temperature derating graph	-40	--	+85	°C
Storage Temperature		-55	--	+125	
Case temperature rise	Operating at Ta =25°C	--	30°	--	
Pin Soldering Temperature	1.5mm from the case, 10S	--	--	300	
Relative humidity	No condensation	5	--	95	%RH
Isolation Voltage	I/P-O/P, test 1min, leakage current <1mA	1500	--	--	VDC
Insulation Resistance	I/P-O/P, @ 500VDC	1000	--	--	MΩ
Isolation Capacitor	I/P-O/P, 100KHz/0.1V	--	50	--	pF
Vibration		10-150Hz, 5G, 30 Min. along X, Y and Z			
MTBF	MIL-HDBK-217F@25°C	1000	--	--	K hours
Case Material	Plastic in Black, flame class UL94-V0				
Unit Weight	4.5 g (Typ.)				
Cooling Method	Natural air				
Packing	Tube size (526x12.5x20mm)	22PCS/Tube			
	Carton size (542.5x110x155mm)	1232PCS (Total 56 Tubes)			
Unit Dimensions	L x W x H	22.0×9.5×12.0 mm		0.866×0.374×0.472 inch	

**EMC Performance**

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			

**Mechanical Dimensions**



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

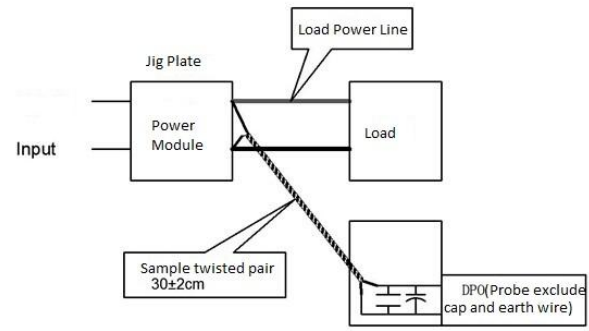
**Pin-out Function Description**

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

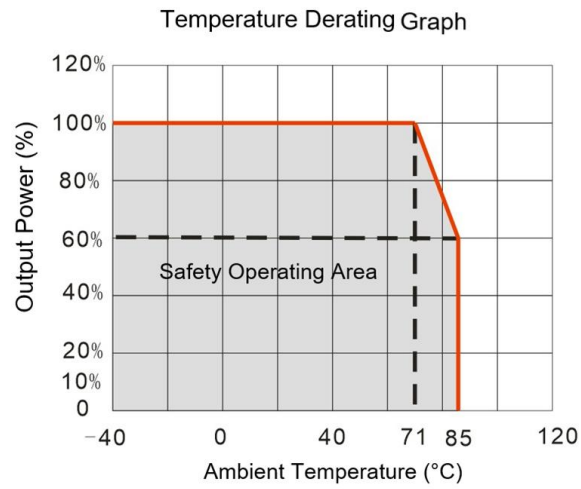
Note 1: Please take the pin definition on the product label as the right one if it is different than the description on the data sheet.  
 Note 2: Single output terminal CS function refer to the following instruction.

**Ripple & Noise Test Instruction (Twisted Pair Method, 20MHz Bandwidth)**

1) The Ripple & noise test needs 12# twisted pair cables, an oscilloscope which bandwidth should be set to 20MHz, 0.1uF polypropylene capacitor and 10uF high-frequency low-resistance electrolytic capacitor are connected in parallel with the probes (100M bandwidth). The oscilloscope should be set at the Sample Mode.  
 2) The test diagram is shown on the right. 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 twisted pair (length 30cm±2 cm) should be connected in parallel with the load, the location is as close as possible to the output pins or terminals. The test can be start after the input power on.

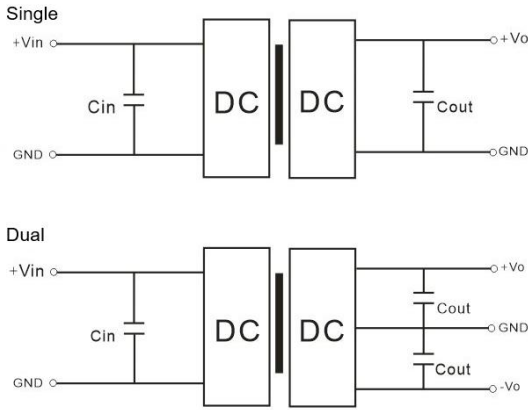


**Product Characteristics Graph**



**Recommended Circuits for Application**

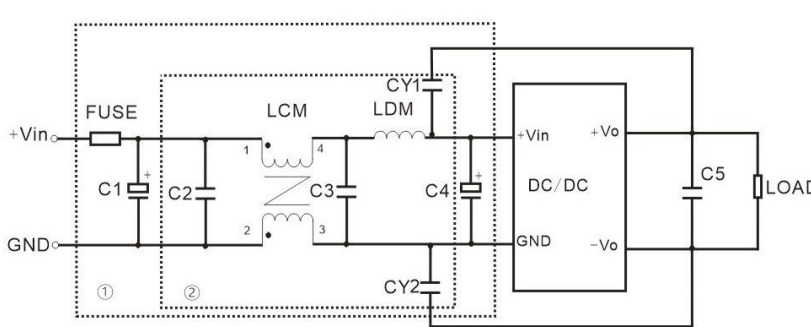
- 1. CS Terminal**  
 This terminal has connected with the converter internal main filter capacitor (positive). It is recommended to connect a low ESR capacitor ( $\leq 47\mu\text{F}$ ) between CS and Pin #7 (negative) to improve the output Ripple and Noise performance.
- 2. Requirement for Output load**  
 The maximum capacitive load of the product was tested at the Rated full load. The converter may not start or be damaged if the capacitor exceeds this value.
- 3. Recommended application circuit**  
 To effectively decrease the input and output ripple and noise, a capacitor filter can be connected at the input and output as the application circuit shown in the figure below. The suitable filter capacitors should be chosen as the recommended capacitive load values in Table 1. The converter may not start if the capacitance is too big.



Recommended Capacitive Load Value Table (Table 1)

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

**4. Recommended EMC circuit diagram**

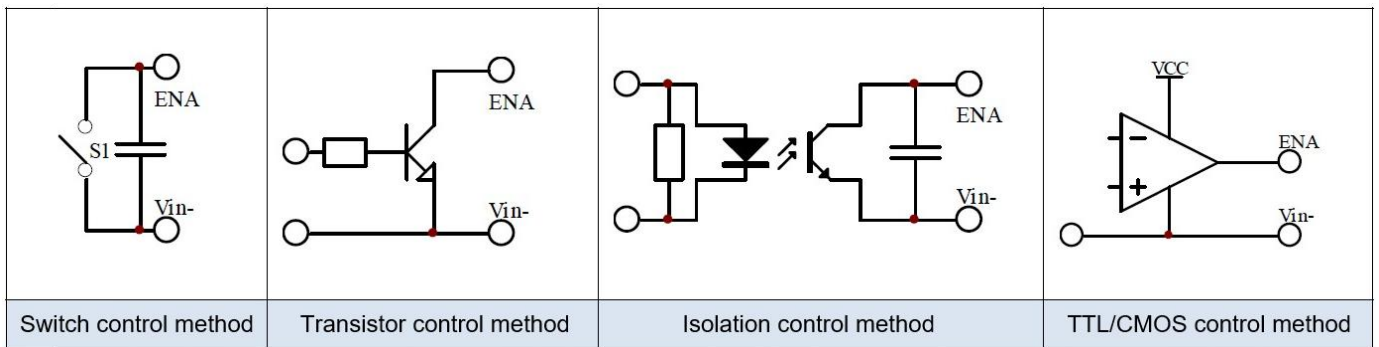


	Vin=24V	Vin=48V
FUSE	TBD based on the input current	
C1	1000 μF/50V	1000 μF/100V
C2/C3	4.7 μF/50V	4.7 μF/100V
C4	100 μF/50V	100 μF/100V
C5	Refer to the Cout values in Table 1	
LCM	2.2mH	2.2mH
LDM	6.8 μH	6.8 μH
CY1/CY2	1nF/3KV	1nF/3KV

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

**5. ON/OFF Control**

Positive logic mode, Control terminal no connection or connected to high voltage level to turn ON the converter for normal operating, it is connected to input GND or low voltage level to turn OFF the converter.



**Application Notice**

- 1.This product cannot be used in parallel connected, and it does not support hot-plug.
- 2.The product performance in this manual cannot be guaranteed if it works at a lower load than the minimum load condition.
3. All values or indicators in this manual had been tested based on Aipupower test specifications.

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