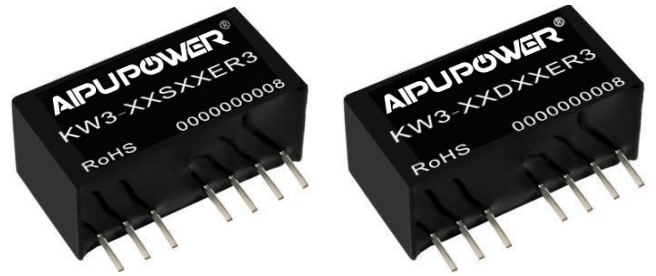


Typical Features

- ◆ Wide Input Voltage Range (4:1), Output Power 3W
- ◆ Efficiency 84% (Typ.)
- ◆ With remote control function
- ◆ Continuous Short Circuit protection, Self-recovery
- ◆ Input under voltage protection & output over current protection
- ◆ Isolation Voltage 1500VDC
- ◆ Operating Temperature from -40°C to +85°C
- ◆ Plastic Case, flame class UL94 V-0



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 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) 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/Min	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
-	KW3-24S09ER3			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
-	KW3-24D05ER3	24	9 - 36	±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

Note - The Ripple & Noise are 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

Start-up voltage	9 - 36V input	7	8.3	9	VDC
Remote control (Ctrl)	No connection or connect to high voltage level to turn-on	3.5	--	50	VDC
	Connect to input GND or low voltage level to shut 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

Item	Operating conditions		Min.	Typ.	Max.	Unit
Output +Vo Accuracy	Full input voltage range		≤ ±2.0%			
Output -Vo Accuracy			≤ ±3.0%			
Output Accuracy @ 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

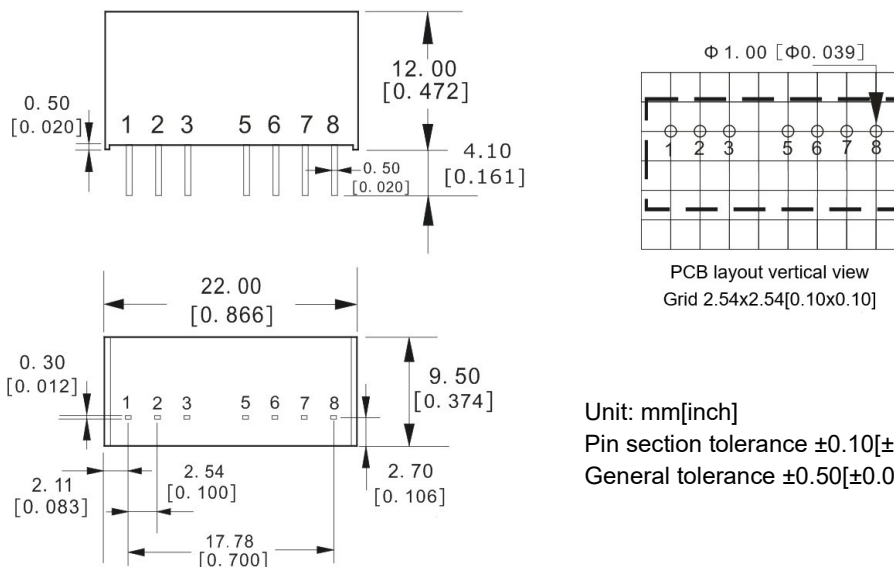
Item	Operating conditions		Min.	Typ.	Max.	Unit
Switching Frequency	Nominal input voltage, full load		--	260	--	KHz
Operating Temperature	Please refer to the temperature derating curve		-40	--	+85	°C
Storage Temperature			-55	--	+125	
Case temperature rise	Operating at Ta =25°C		--	30°	--	
Pin Soldering Temperature	1.5mm from the case, 10S		--	--	300	
Relative humidity	No condensation		5	--	95	%RH
Isolation Voltage	Input-Output, test 1min, leakage current<1mA		1500	--	--	VDC
Insulation Resistance	Input-Output, @ 500Vdc		1000	--	--	M Ω
Isolation Capacitor	Input/Output,100KHz/0.1V		--	20	--	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 V-0		
Unit Weight	4.5 g (Typ.)		
Cooling Method	Natural air		
Packing	Tube size (225x20.5x12.5mm)	9PCS/Tube	
	Carton size (245x155x85mm)	432PCS (Total 48 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 recommended EMC circuit)
	RE	CISPR32/EN55032 CLASS B (With recommended EMC circuit)
EMS	ESD	IEC/EN61000-4-2 Contact±4kV perf.Criteria B

Mechanical Dimensions



Pin Function definition

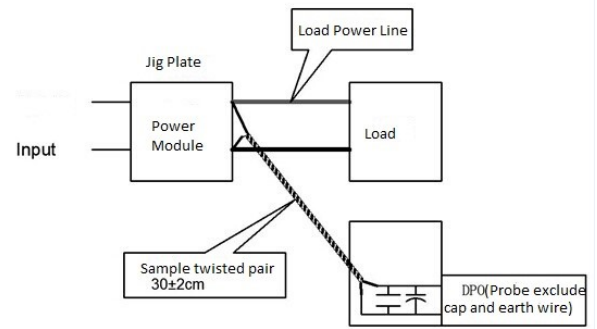
Pin No.	1	2	3	4	5	6	7	8
Single (S)	GND	+Vin	Ctrl	NP	NC	+Vo	0V	CS
	Input GND	Input V+	Remote control	No Pin	No connection	Output V+	Output 0V	External Capacitor
Dual (D)	GND	+Vin	Ctrl	NP	NC	+Vo	0V	-Vo
	Input GND	Input V+	Remote control	No Pin	No connection	Output V+	Output 0V	Output V-

Note - Please take the pin definition on the product label as the right one if it is different than the definition in this data sheet.

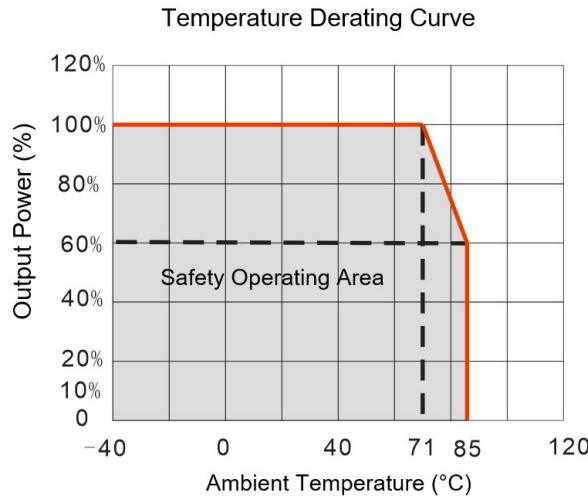
Ripple & Noise Test Instructions (Twisted Pair Method, 20MHz Bandwidth)

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 started after input power on.



Product Performance Curve



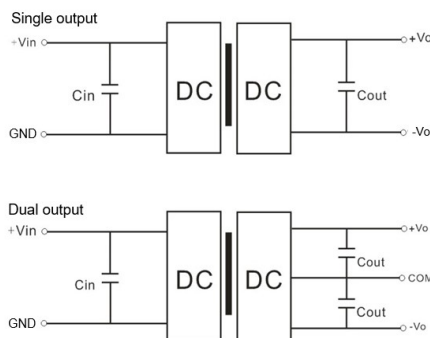
Recommended Circuits for Application

1. 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.

2. Recommended application circuit

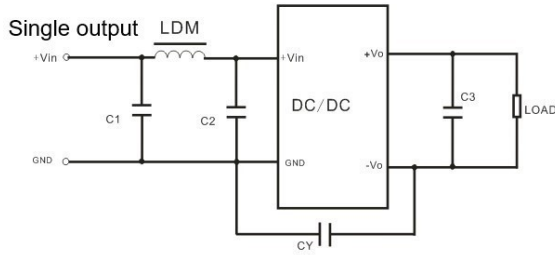
To effectively decrease the input and output ripple and noise, a capacitor filter can be connected at the input and output as the application circuit shown in the figure below. The suitable filter capacitors should be chosen as the recommended capacitive load values in Table 1. The converter could not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



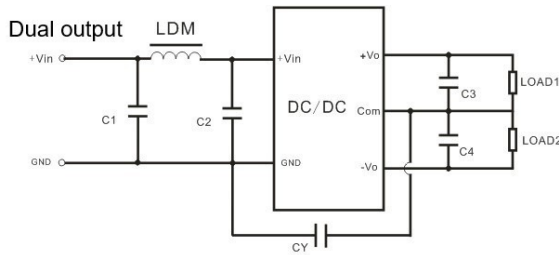
Recommended Capacitive Load Value Table (Table 1)

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
--	--	15	1 μF/25V	±15	1 μF/16V
--	--	24	1 μF/50V	±24	0.47 μF/50V

3. Recommended EMC Circuit



Input voltage		5VDC	12/ 15/ 24VDC
EMI	C1/ C2	4. 7μF/16V	4. 7μF/50V
	CY	270pF/2KV	270pF/2KV
	C3	Refer to Cout in Table 1	
	LDM	6. 8 μH	6. 8 μH



Input voltage		5VDC	12/ 15/ 24VDC
EMI	C1/ C2	4. 7μF/16V	4. 7μF/50V
	CY	270pF/2KVdc	270pF/2KVdc
	C3/ C4	Refer to Cout in Table 1	
	LDM	6. 8 μH	6. 8 μH

4. Remote Control

Positive logic mode, Control terminal no connection or connects to high voltage level to turn on the converter for normal operating, it connects to input GND or low voltage level to shut off the converter.

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

Application Notice

1. This product cannot be used in parallel, and it does not support hot-plugging.
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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