Typical Features

- ◆ Fixed input voltage, isolated & unregulated output 1W
- ◆ Efficiency 84% (Typ.)
- ◆ Mini size SIP package
- ◆ Isolation voltage 1500VDC between input & output, 1000VDC between Vo1 & Vo2
- ◆ Continuous short circuit protection, self-recovery
- ◆ Operating temperature from -40℃ to +105℃
- ◆ 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				Input Current (mA) Typ. @nominal volt.		Max Capacitive Load	Efficiency (%) @full load nominal volt.	
		Nominal	Range	Voltage (VDC)		Current (mA)		Full Load	No Load	(uF)	Min	Typ.
		(VDC)	(VDC)	Vo1	Vo2	Io1	Io2					
-	NN1-05E05BA	5	4.5 - 5.5	5	5	100	100	230	10	680	80	84

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.)	5Vdc Input	-0.7	--	9	VDC
Input filter	Capacitor Filter				
Hot plug	Unavailable				

Output Specifications

Item	Test Condition	Min.	Typ.	Max.	Unit
Output power		0.1	--	1	W
Output voltage accuracy	Please refer to the Output Voltage Deviation Graph (Figure 1)				
Load regulation	10% - 100% load	--	10	15	%
Line regulation	Input voltage change ±1%	--	--	1.2	%

Temperature drift coefficient	--	--	--	±0.03	%/°C
Ripple & Noise	0%-100% load, 20MHz bandwidth	--	30	75	mVp-p
Short circuit protection	Continuous, self-recovery				
Note: The Ripple & Noise is tested by the Twisted Pair Method, please refer to the following test instruction.					

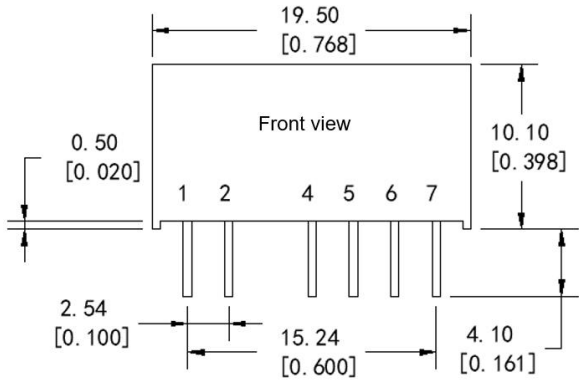
General Specifications

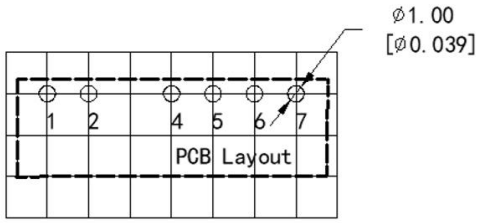
Item	Test Condition		Min.	Typ.	Max.	Unit
Switching frequency	Nominal input voltage, full load		--	260	--	KHz
Operating temperature	Refer to the Temperature Derating Graph (Figure 2)		-40	--	105	℃
Storage temperature			-55	--	+125	℃
Case temperature rise	Within the operation derating range		--	30°	--	℃
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	1500	--	--	VDC
	Vo1-Vo2	Test 1 minute, leakage current <1mA	1000	--	--	
Insulation resistance	I/P-O/P	@ 500VDC	1000	--	--	MΩ
Isolation capacitance	I/P-O/P	100KHz/0.1V	--	20	--	pF
MTBF	MIL-HDBK-217F@25℃		3500	--	--	K hours
Vibration	10-150Hz, 5G, 30 Min. along X, Y and Z					
Case material	Plastic in Black, flame class UL94-V0					
Unit weight	2.1g (Typ.)					
Cooling method	Natural air					
Packing	Tube size (525x18x10mm)		25PCS/Tube			
	Carton size (542x110x155mm)		2000PCS/Carton (Total 80 Tubes)			
Unit dimensions	L x W x H	19.50× 6.00 × 10.10 mm	0.768 × 0.236 × 0.398 inch			

EMC Performance

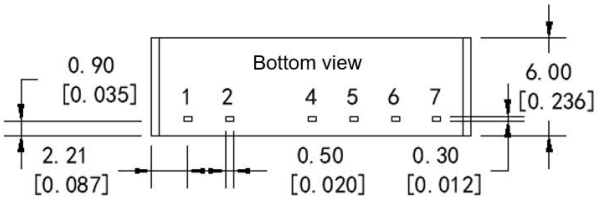
Item		Standards	Performance/Class
EMI	CE	CISPR32/EN55032	Class B (with the Recommended EMC circuit)
	RE	CISPR32/EN55032	Class B (with the Recommended EMC circuit)
EMS	ESD	IEC/EN61000-4-2	Contact ±6kV, Air ±8kV perf. Criteria B

Mechanical Dimensions





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



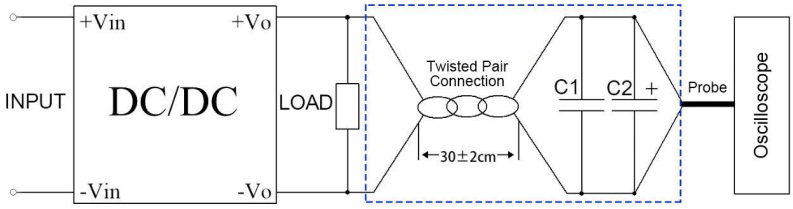
Unit: mm[inch]
Pin section tolerance: ±0.10[±0.004]
General tolerance: ±0.50[±0.020]

Pin-out Function Description

Pin No.	1	2	3	4	5	6	7
Dual (D)	+Vin	GND	No Pin	+Vo1	-Vo1	+Vo2	-Vo2

Note: 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. The power supply output connects to the load by the cables. The other side of the twisted pair (length 30cm±2 cm) should be connected in parallel with the load, the polarity of the output and the oscilloscope probe should not be reversed. The test can start after 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 Graphs

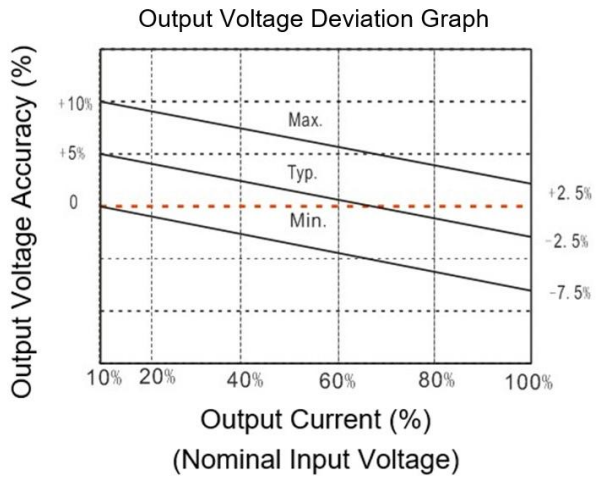


Figure 1

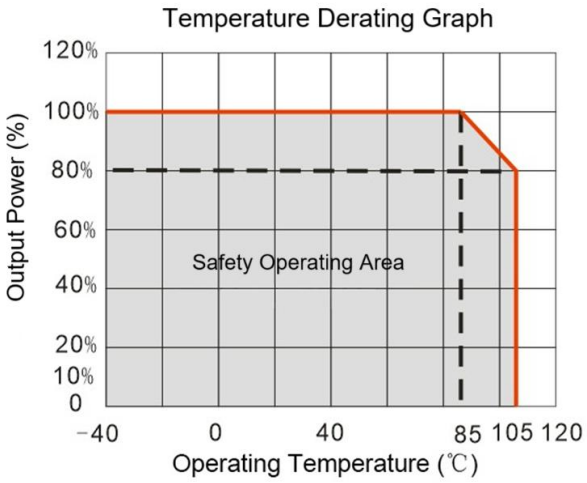


Figure 2

Recommended Circuits for Application

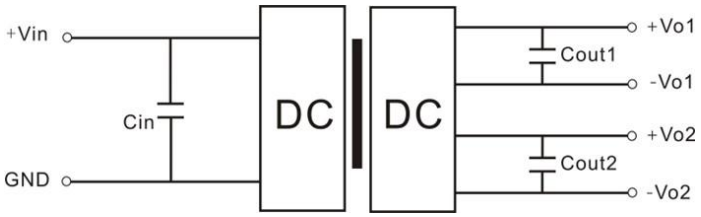
1. Requirement for the output load

a. To ensure the converter operates efficiently and reliably, its minimum load should not be less than 10% of the rated load. It is recommended to connect a resistor in parallel to the output when the real load is less than 10% (the sum of the power consumed should be bigger than or equal to 10% of the rated power).

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

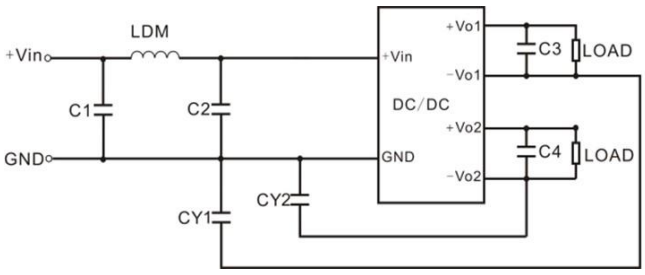
2. Typical application circuits

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 diagrams are shown below. 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 Values (Table 1)			
Vin (Vdc)	Cin	Dual Vout (Vdc)	Cout
5	10uF/16V	5	4.7uF/16V

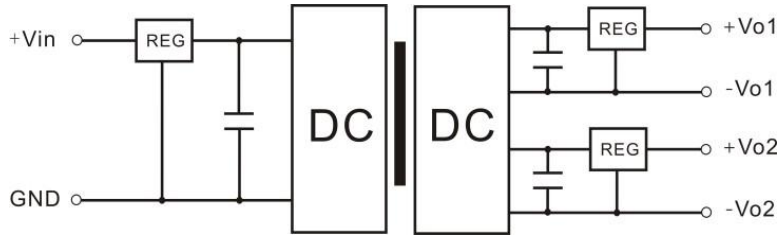
3. Recommended EMC circuit diagram



Input Volt. (dual)		5Vdc
EMI	C1/C2	4.7uF/16V
	CY1/CY2	270pF/2KVdc
	C3/C4	Refer to Cout value in Table 1
	LDM	6.8uH

4. Output voltage regulation and overvoltage protection

The simple solution to achieve the output regulated voltage, over voltage and over current protections is to use a linear regulator with overheat protection at input or output, and a capacitor filtering net connected in parallel as below circuits diagrams. Filter capacitive value recommended see table 1, Linear regulator should be chosen according to the actual voltage & current for operating. Or Aipu NW series products are recommended instead.



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 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.

Guangzhou Aipu Electron Technology Co., Ltd

Address: Building 4, HEDY Park, No.63, Punan Road, Huangpu Dist, Guangzhou, China.

Tel: 86-20-84206763 Fax: 86-20-84206762 HOTLINE: 400-889-8821

E-mail: sales@aipu-elec.com Website: https://www.aipupower.com