Typical Features

- Fixed input voltage, isolated & regulated output power 1W
- Operating temperature from -40℃ to +85℃
- Continuous short circuit protection
- Efficiency up to 83%
- No load current as low as 4mA
- Isolation voltage 1500VDC
- No additional component required
- 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	Ripple & Noise (20MHz) Max/Typ.	Efficiency (%) @full load/nom. voltage	
		Nom.	Range	Vo (VDC)	Io(mA) Max	Full load	No Load	uF	mVp-p	Min	Typ.
-	NW1-05D05DR3	5	4.75 - 5.25	±5	±100	258	11	2000	100/50	78	81
-	NW1-05D09DR3			±9	±56	246	14	2000	100/50	77	80
-	NW1-05D12DR3			±12	±42	238	17	2000	100/50	79	82
-	NW1-05D15DR3			±15	±33	246	25	2000	100/50	77	80
-	NW1-12D05DR3	12	11.4 - 12.6	±5	±100	104	5	2000	100/50	77	80
-	NW1-12D09DR3			±9	±56	102	6	2000	100/50	80	83
-	NW1-12D12DR3			±12	±42	102	8	2000	100/50	78	81
-	NW1-12D15DR3			±15	±33	98	11	2000	100/50	80	83
-	NW1-24D05DR3	24	22.8 - 25.2	±5	±100	52	4	2000	100/50	77	80
-	NW1-24D12DR3			±12	±42	51	6	2000	100/50	79	82
-	NW1-24D15DR3			±15	±33	51	8	2000	100/50	80	83

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)	5Vdc input	-0.7	--	9	VDC
	12Vdc input	-0.7	--	18	

	24Vdc input	-0.7	--	30	
Input Filter	Capacitor Filter				
Hot Plug	Unavailable				

Output Specifications

Item	Operating conditions	Min.	Typ.	Max.	Unit
Output Power		0.1	--	1	W
Output Voltage Accuracy	Nominal input voltage, full load	--	±2	±3	%
Load Regulation	10% ~ 100% load	--	--	±3	
Line Regulation	Input voltage change ±1%	--	--	±0.25	%
Temperature Drift Coefficient	100% Load	--	--	±0.03	%/℃
Short Circuit Protection	Continuous, self-recovery				

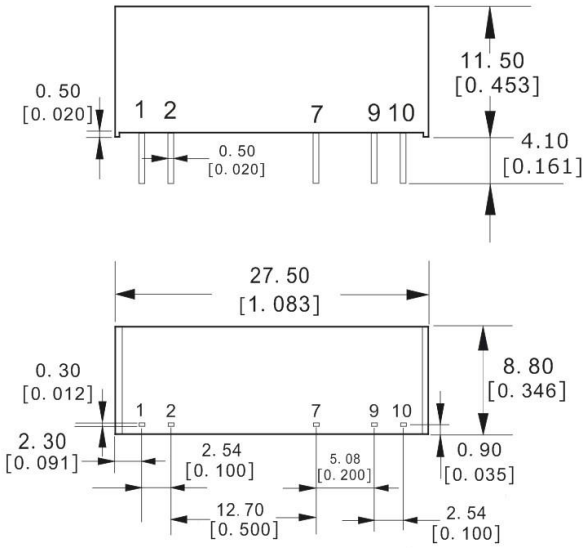
General Specifications

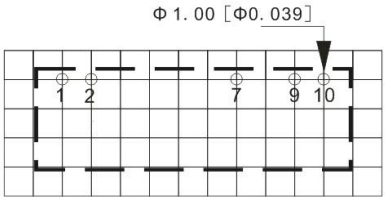
Item	Operating conditions	Min.	Typ.	Max.	Unit
Switching Frequency	Nominal input voltage, full load	--	260	--	KHz
Operating Temperature	Refer to the temperature derating graph	-40	--	+85	℃
Storage Temperature		-55	--	+125	
Case temperature rise	Operating at Ta =25℃	--	30°	--	
Pin Soldering Temperature	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 Capacitance	I/P – O/P,100KHz/0.1V	--	20	--	pF
Vibration		10-150Hz, 5G, 30 Min. along X, Y and Z			
MTBF	MIL-HDBK-217F@25℃	3500	--	--	K hours
Case Material	Plastic in Black, flame class UL94-V0				
Unit Weight	4.5g (Typ.)				
Cooling Method	Natural air				
Packing	Tube size (525x20x12.5 mm)	17PCS/Tube			
	Carton size (542x110x155 mm)	952PCS (Total 56 Tubes)			
Unit Dimensions	L x W x H	27.50×8.80×11.50 mm		1.083×0.346×0.453 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 ±6KV, Air ±6kV 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

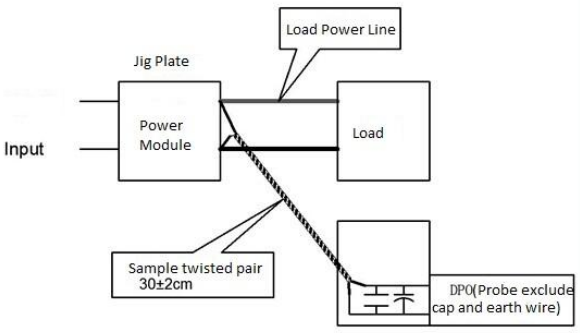
Pin No.	1	2	3, 4, 5, 6, 8	7	9	10
Dual output (D)	+Vin	GND	No Pin	+Vout	-Vout	COM(0V)

Note: Please take the pin function definition on the product label as the right one if it is different than the data sheet description.

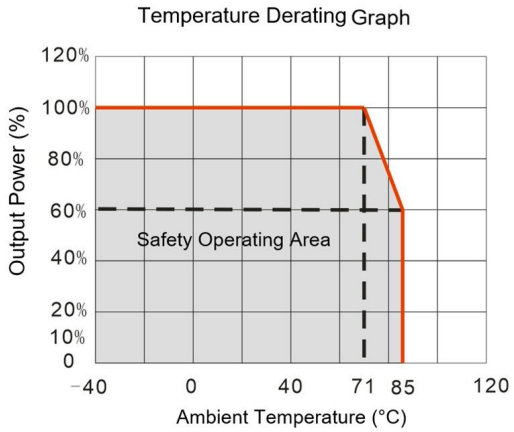
Ripple & Noise Test Instruction (Twisted Pair Method, 20MHz Bandwidth)

1) The Ripple & noise test needs 12# twisted pair cables, an oscilloscope which 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 input power on.



Product Characteristics Graph



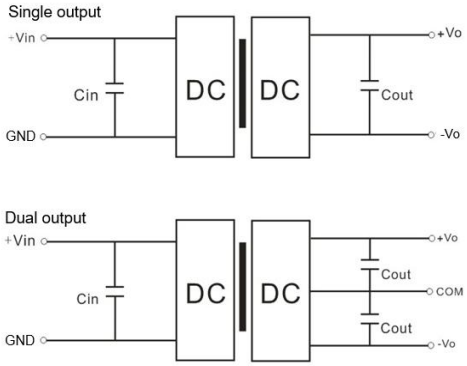
Recommended Circuits for Application

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 output capacitor exceeds this value.

2. Typical application circuits

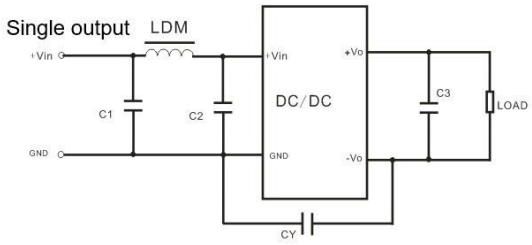
To effectively decrease the input and output ripple and noise, a capacitor filter can be connected at the input and output as the application circuit shown in the figure below. The suitable filtering capacitors should be chosen as the recommended capacitive load values in Table 1. The converter could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



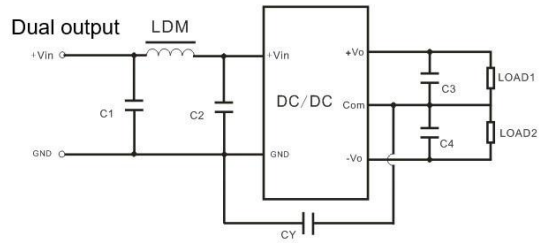
Recommended Capacitive Load Value Table (Table 1)

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

3. Recommended EMC Circuit Diagram



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	6.8μH	6.8μH



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	6.8μH	6.8μH

Application Notice

1.This product cannot be used in parallel, 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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