

Typical Features

- ◆ Fixed input voltage, isolated & regulated, output power 1W
- ◆ Efficiency up to 78% (Typ.)
- ◆ Mini SIP packaging
- ◆ Isolation Voltage 3000VDC
- ◆ 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 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 Volt.		Max. Capacitive Load	Ripple & Noise ^① (20MHz) (mVp-p)	Efficiency (%) @full load/nom. voltage	
		Nom.	Range	Vo (VDC)	Io(mA) Max/Min	Full load	No Load	(uF)	Max/Typ.	Min	Typ.
-	FW1-3V3S15B3A	3.3	3.135 - 3.465	15	67	400	15	560	100/50	68	70
-	FW1-05S3V3B3A	5	4.5 - 5.5	3.3	250	280	10	2400	100/50	64	66
-	FW1-05S05B3A			5	200	279	10	2400	100/50	70	72
-	FW1-05S12B3A			12	83	256	15	560	100/50	76	78
-	FW1-05S15B3A			15	67	256	18	560	100/50	75	77
-	FW1-05S24B3A			24	42	276	18	220	100/50	71	73
-	FW1-12S05B3A	12	10.8 - 13.2	5	200	109	10	2400	100/50	75	77
-	FW1-12S09B3A			9	111	110	12	1000	100/50	75	77
-	FW1-12S12B3A			12	83	107	10	560	100/50	75	77
-	FW1-12S15B3A			15	67	103	10	560	100/50	72	74
-	FW1-12S24B3A			24	42	124	10	220	100/50	65	67
-	FW1-15S05B3A	15	14.25 - 15.75	5	200	94	10	2400	100/50	68	70
-	FW1-15S15B3A			15	67	85	11	560	100/50	76	78
-	FW1-24S3V3B3A	24	22.8 - 25.2	3.3	250	60	10	2400	100/50	67	69
-	FW1-24S05B3A			5	200	57	10	2400	100/50	72	74
-	FW1-24S12B3A			12	83	54	10	560	100/50	74	76
-	FW1-24S15B3A			15	67	53	10	560	100/50	75	77
-	FW1-24S24B3A			24	42	63	10	220	100/50	65	67

Note ①, The ripple and noise are tested by the twisted pair method.

Input Specifications

Item	Operating conditions	Min.	Typ.	Max.	Unit
Input inrush voltage (1Second.max.)	3.3Vdc Input	-0.7	--	7	VDC
	5Vdc Input	-0.7	--	9	
	9Vdc Input	-0.7	--	12	
	12Vdc Input	-0.7	--	18	
	15Vdc Input	-0.7	--	21	
	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 Voltage Regulation	Input Voltage Change ±1%	--	--	±0.25	%
Temperature Drift Coefficient	100% Load	--	--	±0.03	%/°C
Short Circuit Protection	Continuous, self-recovery				

General Specifications

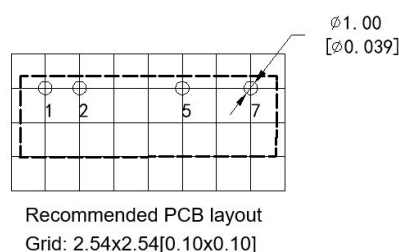
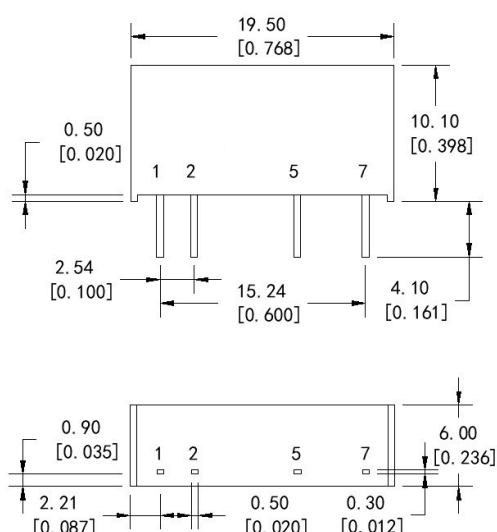
Item	Operating conditions	Min.	Typ.	Max.	Unit
Switching Frequency	Nominal input voltage, full load	--	260	--	KHz
Operating Temperature	Please refer to the temperature derating curve (Figure 1)	-40	--	+85	°C
Storage Temperature		-55	--	+125	
Case temperature rise	Operating at Ta =25°C	--	30°	--	
Pin Soldering Temperature	1.5mm from the case, 10S	--	--	300	
Relative humidity	No condensation	5	--	95	%RH
Isolation Voltage	Input-Output, test 1min, leakage current <1mA	3000	--	--	VDC
Insulation Resistance	Input-Output, @ 500VDC	1000	--	--	MΩ
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	3500	--	--	K hours
Case Material	Plastic in Black, flame class UL94 V-0				

Unit Weight	2.1 g (Typ.)		
Cooling Method	Natural air		
Packing	Tube size (525*18*10mm)	25PCS/Tube	
	Carton size (542*110*155mm)	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

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 Air±8kV / Contact±6kV perf.Criteria B

Mechanical Dimensions



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

Pin Function definition

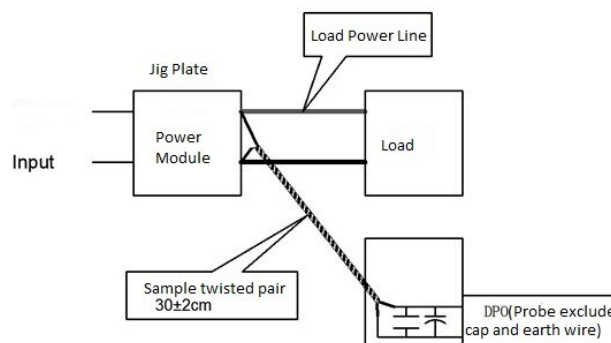
Pin No.	1	2	3, 4	5	6	7
Single(S)	+Vin	GND	No Pin	-Vout	No Pin	+Vout

Note - Please take the pin definition on the product label as the right one if there is any difference between the data sheet and the one printed on the product label.

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

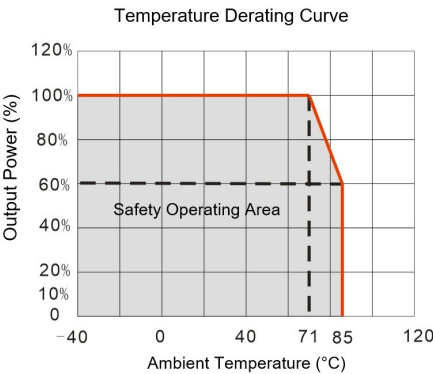


Figure 1

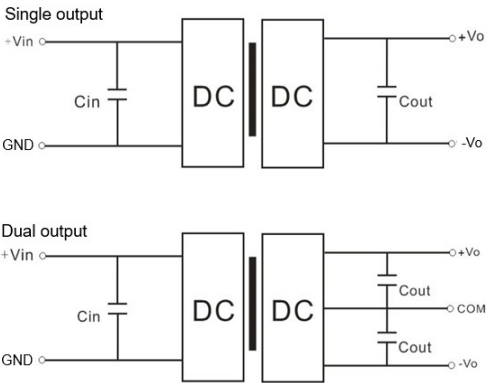
Recommended Circuits for Application

1. Requirement for Output load

The maximum capacitive load was tested at the rated full load. The converter may not start or be damaged if the output capacitors exceed this value.

2. Typical application circuit

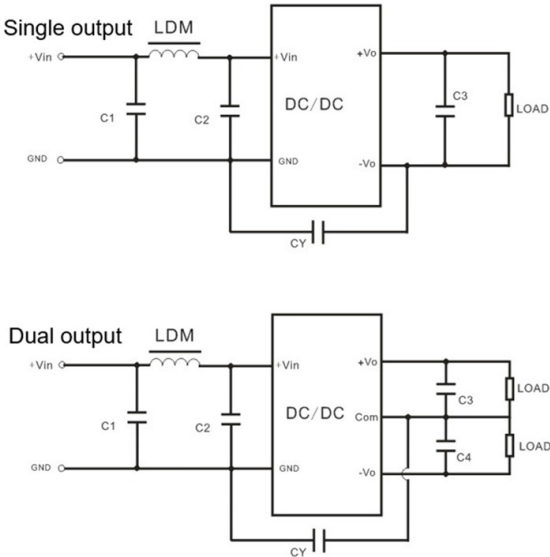
To ensure effectively decrease the input and output ripple and noise, a capacitor filter can be connected at the input and output, the application circuit is shown in the figure below. The suitable filter capacitors should be chosen as the recommended capacitive load values in Table 1. The converter 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/4KV	270pF/4KV
	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/4KV	270pF/4KV
	C3/C4	Refer to Cout in Table 1	
	LDM	6.8 μH	6.8 μH

Application Notice

- 1.This series of converters should not be used in parallel, and they do not support hot-plugging.
- 2.The product performance in this datasheet cannot be guaranteed if it works at a lower load than the minimum load condition.
3. All values or indicators in this datasheet had been tested based on Aipupower test specifications.

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