

1W, Fixed input voltage, isolated & unregulated dual/single output

FEATURES

- | DIP package
- | Efficiency up to 81%
- | Operating temperature range: -40°C to +105°C
- | Isolation voltage: 3KVDC
- | Continuous short circuit protection
- | No external component required
- | International standard pin-out



Patent Protection RoHS

E_D-1WR2 & F_D-1WR2 series is specially designed for applications where an isolated voltage is required in a distributed power supply system. It is suitable for:

1. Where the voltage of the input power supply is stable (voltage variation: $\pm 10\%V_{in}$);
2. Where isolation is necessary between input and output (isolation voltage $\leq 3000VDC$);
3. Where do not has high requirement of line regulation and load regulation;
4. Such as: pure digital circuits, low frequency analog circuits, relay-driven circuits and data switching circuits.

Selection Guide

Part No.	Input Voltage (VDC)	Output		Efficiency (% Min./Typ.) @ Full Load	Max. Capacitive Load * (μF)
		Output Voltage (VDC)	Output Current (mA) (Max./Min.)		
F0303D-1WR2	2.97-3.63 (3.3VDC nominal)	3.3	303/31	69/73	220
F0305D-1WR2		5	200/20	74/78	
E0505D-1WR2	4.5-5.5 (5VDC nominal)	± 5	$\pm 100/\pm 10$	75/79	100
E0512D-1WR2		± 12	$\pm 42/\pm 5$	76/80	
E0515D-1WR2		± 15	$\pm 34/\pm 4$	77/81	
E0524D-1WR2		± 24	$\pm 21/\pm 3$	77/81	
F0503D-1WR2		3.3	303/31	71/75	
F0505D-1WR2		5	200/20	76/80	
F0512D-1WR2		12	83/9	76/80	
F0515D-1WR2		15	67/7	77/81	
F0524D-1WR2		24	42/5	77/81	
E1205D-1WR2		10.8-13.2 (12VDC nominal)	± 5	$\pm 100/\pm 10$	76/80
E1212D-1WR2	± 12		$\pm 42/\pm 5$	76/80	
E1215D-1WR2	± 15		$\pm 34/\pm 4$	77/81	
E1224D-1WR2	± 24		$\pm 21/\pm 3$	77/81	
F1203D-1WR2	3.3		303/31	71/75	220
F1205D-1WR2	5		200/20	76/80	
F1212D-1WR2	12		83/9	76/80	
F1215D-1WR2	15		67/7	77/81	
F1224D-1WR2	24		42/5	77/81	
E1505D-1WR2	13.5-16.5 (15VDC nominal)		± 5	$\pm 100/\pm 10$	76/80
E1515D-1WR2		± 15	$\pm 34/\pm 4$	77/81	
F1505D-1WR2		5	200/20	76/80	220
F1515D-1WR2		15	67/7	77/81	
E2405D-1WR2	21.6-26.4 (24VDC nominal)	± 5	$\pm 100/\pm 10$	75/79	100
E2412D-1WR2		± 12	$\pm 42/\pm 5$	77/81	
E2415D-1WR2		± 15	$\pm 34/\pm 4$	77/81	
E2424D-1WR2		± 24	$\pm 21/\pm 3$	77/81	

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		Output Voltage (VDC)	Output Current (mA) (Max./Min.)		
F2403D-1WR2	21.6-26.4 (24VDC nominal)	3.3	303/31	71/75	220
F2405D-1WR2		5	200/20	75/79	
F2412D-1WR2		12	83/9	77/81	
F2415D-1WR2		15	67/7	77/81	
F2424D-1WR2		24	42/5	77/81	

Note: *The capacitive loads of positive and negative outputs are the same.

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	3.3V input	--	404/30	--	mA
	5V input	--	256/20	--	
	12V input	--	106/15	--	
	15V input	--	84/10	--	
	24V input	--	54/7	--	
Surge Voltage (1sec. max.)	3.3V input	-0.7	--	5	VDC
	5V input	-0.7	--	9	
	12V input	-0.7	--	18	
	15V input	-0.7	--	21	
	24V input	-0.7	--	30	
Reflected Ripple Current		--	15	--	mA
Input Filter		Capacitance Filter			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit	
Output Voltage Accuracy		See tolerance envelope graph (Fig. 1)				
Linear Regulation	Input voltage change: ±1%	3.3VDC output	--	--	±1.5	%
		Other output	--	--	±1.2	
Load Regulation	10%-100% load	3.3VDC output	--	18	--	
		5VDC output	--	12	--	
		12VDC output	--	8	--	
		15VDC output	--	7	--	
		24VDC output	--	6	--	
Ripple & Noise*	20MHz bandwidth	--	60	--	mVp-p	
Temperature Coefficient	100% load	--	--	±0.03	%/°C	
Short Circuit Protection		Continuous, self-recovery				

Note: *Ripple and noise are measured by "parallel cable" method, please see DC-DC Converter Application Notes for specific operation.

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Insulation Voltage	Input-output, with the test time of 1 minute and the leak current lower than 1mA	3000	--	--	VDC
Insulation Resistance	Input-output, Isolation voltage 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output, 100KHz/0.1V	--	20	--	pF
Operating Temperature	Derating when operating temperature up to 85°C, (see Fig.2)	-40	--	105	°C
Storage Temperature		-55	--	125	
Casing Temperature Rise During Operating	Ta=25°C	--	25	--	
Hand Soldering	Welding spot is 1.5mm away from the casing, 10 seconds	--	--	300	

Storage Humidity	Non-condensing	--	--	95	%
Switching Frequency	100% load, nominal input voltage	--	100	300	KHz
MTBF	MIL-HDFK-217F@25°C	3500	--	--	K hours

Physical Specifications

Casing Material	Epoxy resin (UL94-V0)
Dimensions	20.00*10.00*7.00mm
Weight	2.1g(Typ.)
Cooling	Free convection

EMC Specifications

EMI	Conducted emission	CISPR22/EN55022 CLASS B (see Fig. 4 for recommended circuit)			
	Radiated emission	CISPR22/EN55022 CLASS B (see Fig. 4 for recommended circuit)			
EMS	Electrostatic discharge	E_D-1WR2	IEC/EN61000-4-2	Contact ±6KV	perf. Criteria B
		F_D-1WR2	IEC/EN61000-4-2	Contact ±8KV	perf. Criteria B

Product Characteristic Curve

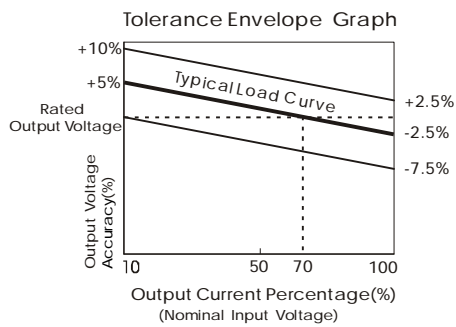


Fig. 1

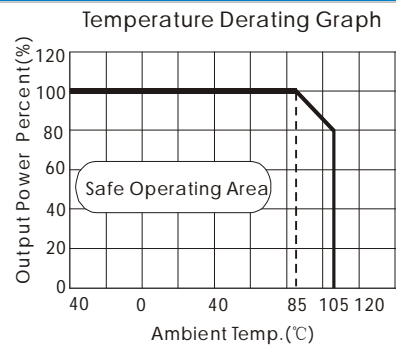
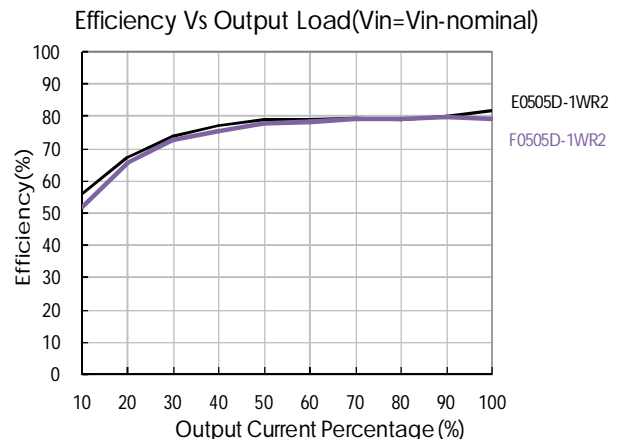
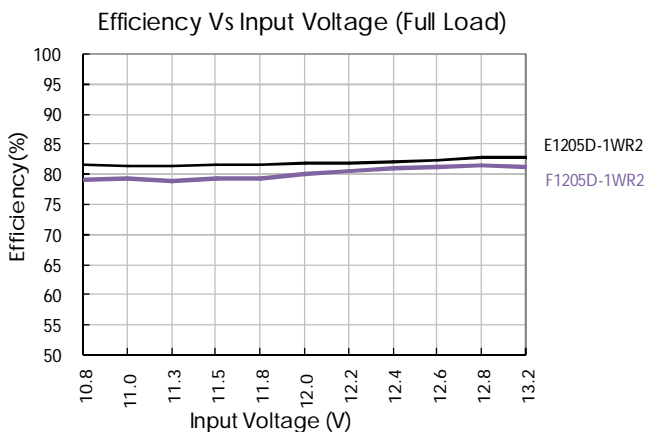
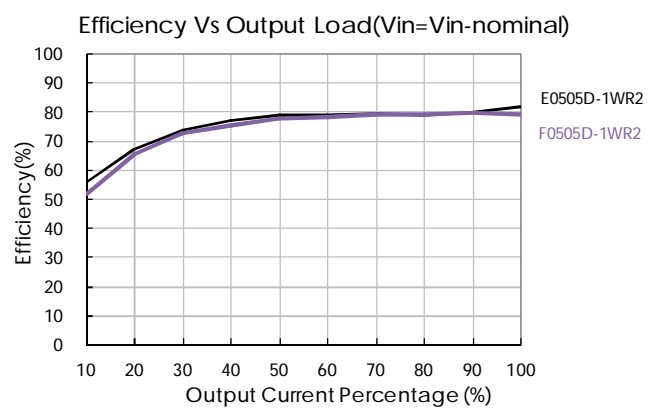
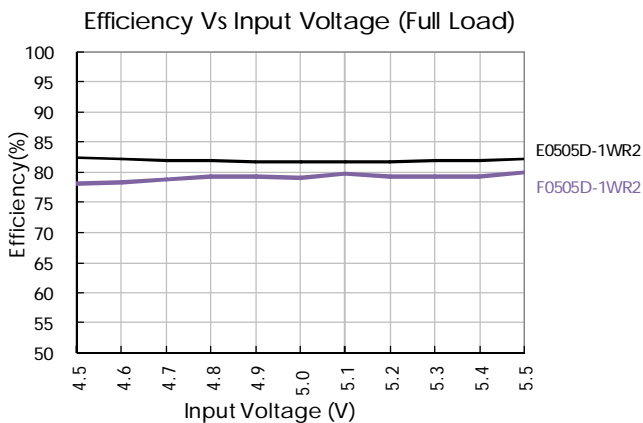


Fig. 2



Design Reference

1. Typical application

If it is required to further reduce input and output ripple, a filter capacitor can be connected to the input and output terminals, see Fig.3. Moreover, choosing suitable filter capacitor is very important, start-up problems may be caused by too large capacitance. To ensure the modules running well, the recommended capacitive load values as shown in Table 1.

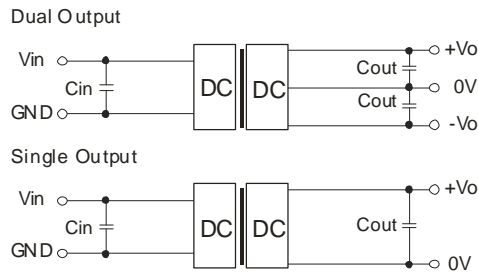


Fig.3

Recommended capacitive load value table (Table 1)

Vin(VDC)	Cin (μF)	Single Vout (VDC)	Cout (μF)	Dual Vout (VDC)	Cout (μF)
3.3/5	4.7	3.3/5	10	±5	4.7
12	2.2	12	2.2	±12	1
15	2.2	15/24	1	±15/±24	0.47
24	1	--	--	--	--

It is not recommended to connect any external capacitor when output power is less than 0.5W.

2. EMC typical recommended circuit (CLASS B)

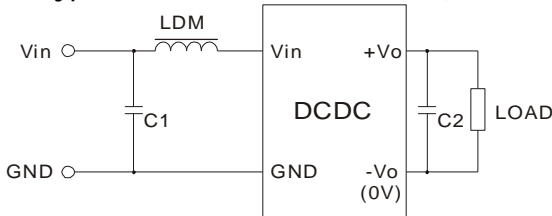


Fig. 4

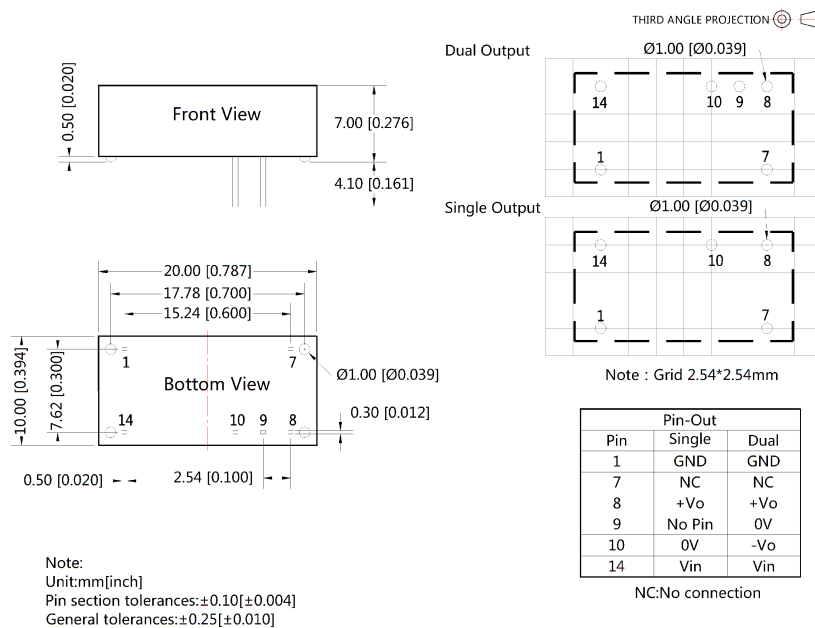
Input voltage (V)		3.3/5/12/15/24
EMI	C1	4.7μF /50V
	C2	Refer to the Cout in Fig.3
	LDM	6.8μH

3. Output load requirements

To ensure the module work efficiently and reliably, during the operation, the min. output load should be no less than 10% of the full load. If the actual output power is low, please connect a resistor to the output terminal in parallel, with a recommended resistance which is 10% of the rated power, and derating is required during operation.

4. For more information please find DC-DC converter application notes on www.mornsun-power.com

Dimensions and Recommended Layout



Note:

1. Packing information please refer to "Product Packing Information ".Packing bag number: 58200009;
2. If the product is operated out of the min. load requirement, the product performance may not meet all parameter indexes in this datasheet;
3. The max. capacitive load offered is tested at nominal input voltage and full load;
4. Unless otherwise specified, parameter indexes in this datasheet is measured under the conditions of $T_a=25^{\circ}\text{C}$, humidity<75% with nominal input voltage and rated output load;
5. All testing methods in this datasheet are based on our Company's corporate standards;
6. The parameter indexes above are for the modules listed in this datasheet, for non-standard module's parameter indexes, please contact our technicians for specific information;
7. We can provide custom design;
8. Specifications are subject to change without prior notice.

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