

1W Isolated DC to DC Converters

Single and Dual Output

multicomp PRO

1W isolated DC-DC converter Fixed input voltage, unregulated Dual/Single output



Features

- Continuous short-circuit protection
- No-load input current as low as 8mA
- Operating ambient temperature range: -40°C to +105°C
- High efficiency up to 81%
- I/O isolation test voltage: 3k VDC
- Industry standard pin-out

**RoHS
Compliant**

These series are specially designed for applications where two isolated voltage is required in a distributed power supply system. They are suitable for: pure digital circuits, low frequency analog circuits, relay-driven circuits and data switching circuits.

Selection Guide

Part Number	Input Voltage (VDC)	Output		Full Load Efficiency (%) Min./Typ.	Capacitive Load(μF)* Max.
	Nominal (Range)	Voltage (VDC)	Current (mA) Max./Min.		
MPE1203S-1W	12 (10.8 to 13.2)	±3.3	±152/±15	71/75	1200
MPE1205S-1W		±5	±100/±10	76/80	
MPE1212S-1W		±12	±42/±5	77/81	
MPE1215S-1W		±15	±34/±4	77/81	220
MPE1224S-1W		±24	±21/±2	76/80	
MPF1203S-1W		3.3	303/30	71/75	2400
MPF1205S-1W		5	200/20	76/80	
MPF1209S-1W		9	111/12	76/80	1000
MPF1212S-1W		12	83/9	76/80	
MPF1215S-1W		15	67/7	77/81	560
MPF1224S-1W		24	42/5	77/81	
MPE1505S-1W		15 (13.5 to 16.5)	±5	±100/±10	76/80
MPE1512S-1W	±12		±42/±5	76/80	
MPE1515S-1W	±15		±34/±4	77/81	220
MPF1505S-1W	5		200/20	76/80	
MPF1509S-1W	9		111/12	76/80	1000
MPF1512S-1W	12		83/9	76/80	
MPF1515S-1W	15		67/7	77/81	560
MPE2405S-1W	24 (21.6 to 26.4)	±5	±100/±10	74/80	
MPE2412S-1W		±12	±42/±5	75/81	
MPE2415S-1W		±15	±34/±4	73/79	220
MPE2424S-1W		±24	±21/±2	74/80	
MPF2403S-1W		3.3	303/30	69/75	2400
MPF2405S-1W		5	200/20	73/79	
MPF2409S-1W		9	111/12	74/80	1000
MPF2412S-1W		12	83/9	75/81	
MPF2415S-1W		15	67/7	75/81	560
MPF2424S-1W		24	42/5	75/81	

Note: *The specified maximum capacitive load for positive and negative output is identical.

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Input Specifications					
Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	12V input	-	112/8	118/--	mA
	15V input	-	84/8	88/--	
Input Current (full load / no-load)	24V input	-	56/8	59/--	
Reflected Ripple Current*		-	30	--	
Surge Voltage(1sec. max.)	12VDC input	-0.7	-	18	V DC
	15VDC input			21	
	24VDC input			30	
Input Filter		Capacitance filter			
Hot Plug		Unavailable			
Note: * Reflected ripple current testing method please see DC-DC Converter Application Notes for specific operation.					

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Voltage Accuracy			See output regulation curves (Fig. 1)			
Linear Regulation	Input voltage change: ±1%	3.3VDC output	-	-	1.5	-
		Others		-	1.2	
Load Regulation	10% -100% load	3.3VDC output		15	20	%
		5VDC output		10	15	
		Others		8	10	
Ripple & Noise*	20MHz bandwidth	24VDC output		50	100	mVp-p
		Others	30	75		
Temperature Coefficient	Full load			±0.02	-	%/°C
Short-Circuit Protection			Continuous, self-recovery			
Note: * The "parallel cable" method is used for ripple and noise test, please refer to DC-DC Converter Application Notes for specific information.						

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General Specifications					
Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation	Input-output electric strength test for 1 minute with a leakage current of 1mA max.	3000	-	-	VDC
Insulation Resistance	Input-output resistance at 500VDC	1000	-	-	MΩ
Isolation Capacitance	Input-output capacitance at 100kHz/0.1V	-	20	-	pF
Operating Temperature	Derating when operating temperature ≥ 85°C, (see Fig. 2)	-40	-	105	°C
Storage Temperature		-55	-	125	
Case Temperature Rise	Ta=25°C	-	30	-	
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds	-	-	300	
Storage Humidity	Non-condensing	5	-	95	
Vibration		10-150Hz, 5G, 30 Min. along X, Y and Z			
Switching Frequency	Full load, nominal input voltage	-	260	-	kHz
MTBF	MIL-HDBK-217F@25°C	3500	-	-	k hours

Mechanical Specifications	
Case Material	Black plastic; flame-retardant and heat-resistant (UL94 V-0)
Dimensions	19.65 x 6 x 10.16mm
Weight	2.1g(Typ.)
Cooling Method	Free air convection

Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032 CLASS B (see Fig. 4 for recommended circuit)
	RE	CISPR32/EN55032 CLASS B (see Fig. 4 for recommended circuit)
Immunity	ESD	IEC/EN61000-4-2 Contact ±6kV perf. Criteria B

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Typical Performance Curves

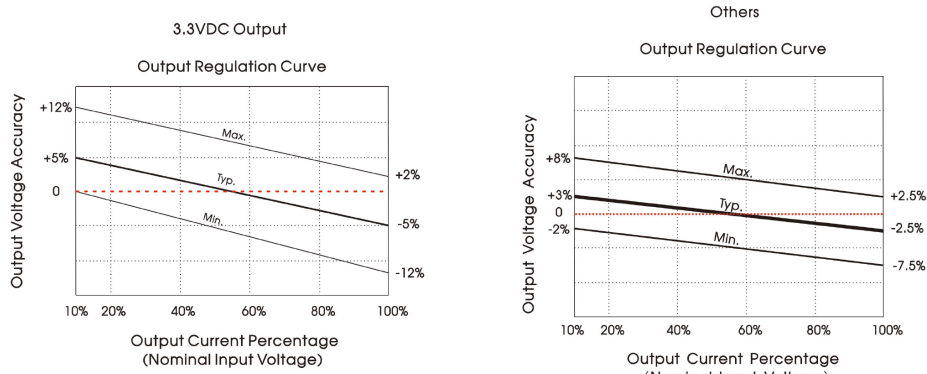


Fig. 1

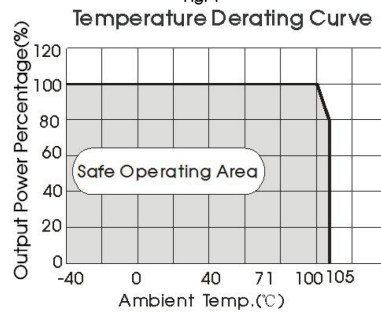
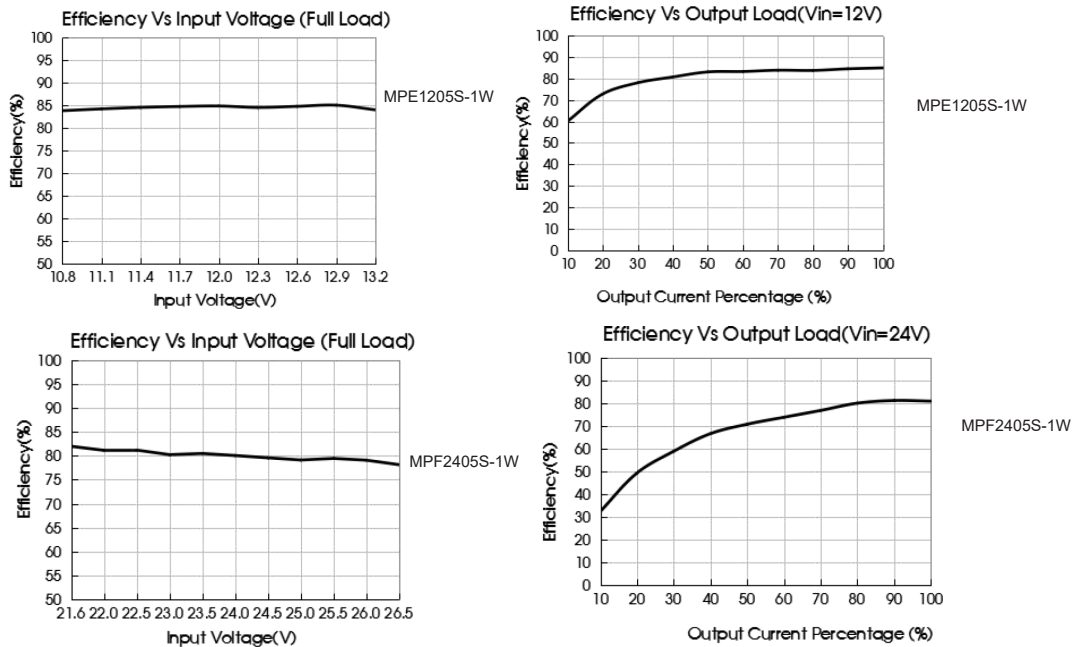


Fig. 2



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Design Reference

Typical application

Input and/or output ripple can be further reduced, by connecting a filter capacitor from the input and/or output terminals to ground as shown in Fig.3.

Choosing suitable filter capacitor values is very important for a smooth operation of the modules, particularly to avoid start-up problems caused by capacitor values that are too high. For recommended input and output capacitor values refer to Table 1.

Dual



Single



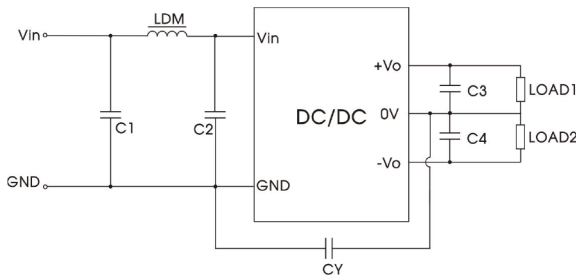
Fig. 3

Table 1: Recommended input and output capacitor values

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

EMC (CLASS B) compliance circuit

Dual



Single

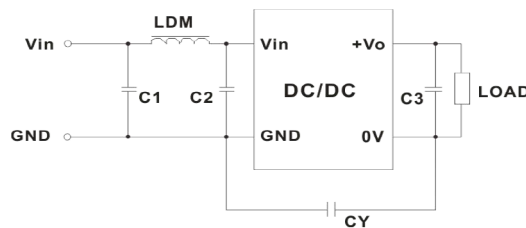


Fig.4

Table 2: EMC recommended circuit value table

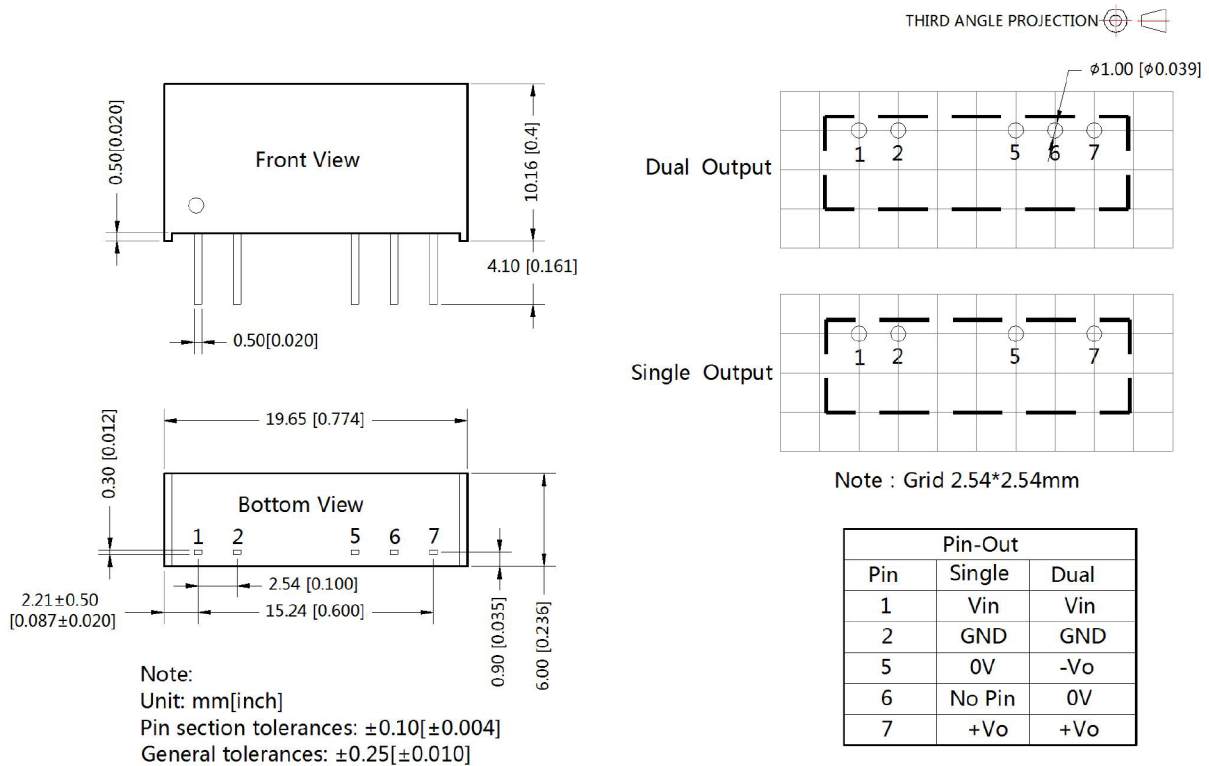
EMI	C1	4.7μF/50V
	C2	4.7μF/50V
	CY	270pF/3000VDC
	C3/C4	Refer to the Cout in table 1
	LDM	6.8μH

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Dimensions and Recommended Layout



Notes:

1. If the product is not operated within the required load range, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
2. The maximum capacitive load offered were tested at input voltage range and full load;
3. Unless otherwise specified, parameters in this datasheet were measured under the conditions of $T_a=25^\circ\text{C}$, humidity $<75\%\text{RH}$ with nominal input voltage and rated output load;
4. All index testing methods in this datasheet are based on our company corporate standards;
5. We can provide product customization service, please contact our technicians directly for specific information;
6. Products are related to laws and regulations: see "Features" and "EMC";
7. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

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