

1W Isolated DC to DC Converters - Dual Output

multicomp PRO

1W isolated DC-DC converter
Fixed input voltage, unregulated dual output

**RoHS
Compliant**



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: 1.5kV DC
- Industry standard pin-out

These series are specially designed for applications where an(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.		
MPA1203S-1W	12 (10.8 to 13.2)	±3.3	±152/±15	71/75	1200
MPA1205S-1W		±5	±100/±10	76/80	
MPA1212S-1W		±12	±42/±5	77/81	220
MPA1215S-1W		±15	±34/±4	77/81	
MPA1224S-1W		±24	±21/±3	76/80	100
MPA1505S-1W	15 (13.5 to 16.5)	±5	±100/±10	76/80	1200
MPA1512S-1W		±12	±42/±5	76/80	220
MPA1515S-1W		±15	±34/±4	77/81	
MPA2405S-1W	24 (21.6 to 26.4)	±5	±100/±10	74/80	1200
MPA2412S-1W		±12	±42/±5	75/81	220
MPA2415S-1W		±15	±34/±4	73/79	
MPA2424S-1W		±24	±21/±3	74/80	100

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

Input Specifications						
Item	Operating Conditions	Min.	Typ.	Max.	Unit	
Input Current (full load / no-load)	12VDC input	-	105/8	110/--	mA	
	15VDC input	-	84/8	88/--		
	24VDC input	-	56/8	61/--		
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				

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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	-
		5VDC/9VDC/12VDC/15VDC/24VDC output		-	1.2	
Load Regulation	10% -100% load	3.3VDC output		15	20	%
		5VDC output		10	15	
		9VDC output		6	10	
		12VDC output		5	10	
		15VDC output		5	10	
Ripple & Noise*	20MHz bandwidth	3.3VDC/5VDC/9VDC/12VDC/15VDC output		30	75	mVp-p
		24VDC output		50	100	
Temperature Coefficient	100% 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.

General Specifications

Characteristics	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation	Input-output electric strength test for 1 minute with a leakage current of 1mA max.	1500	-	-	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 ≥ 100°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	%RH
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 6.00 x 10.16mm
Weight	2.1g(Typ.)
Cooling Method	Free air convection

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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 $\pm 6\text{kV}$ perf. Criteria B

Typical Performance Curves

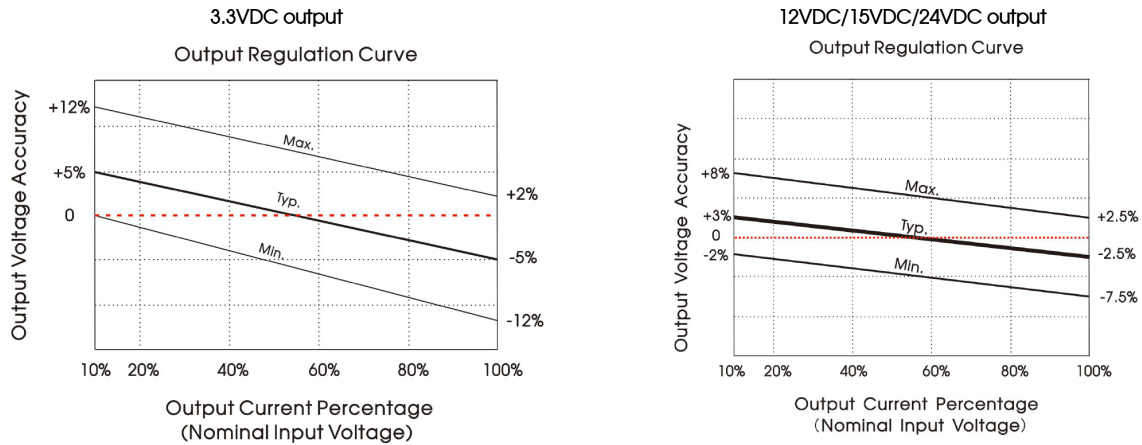


Fig. 1

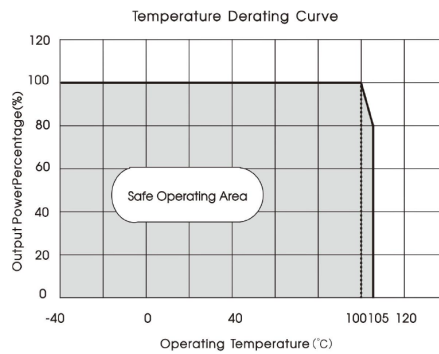
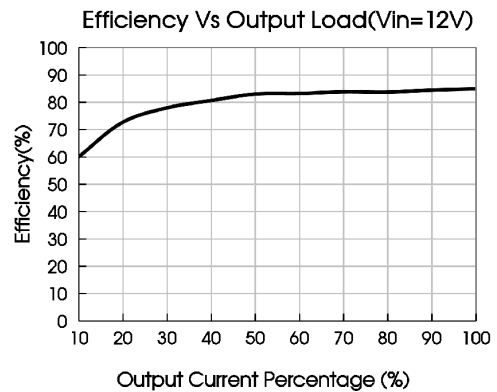
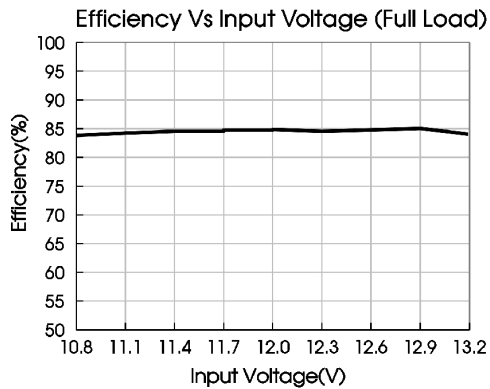
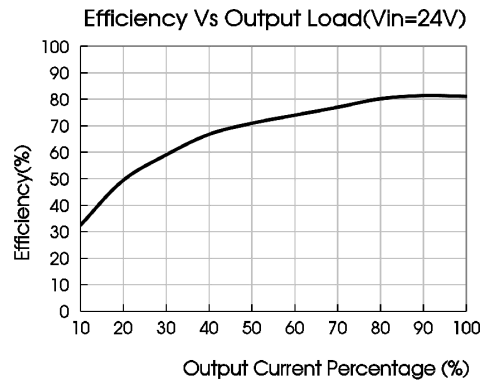
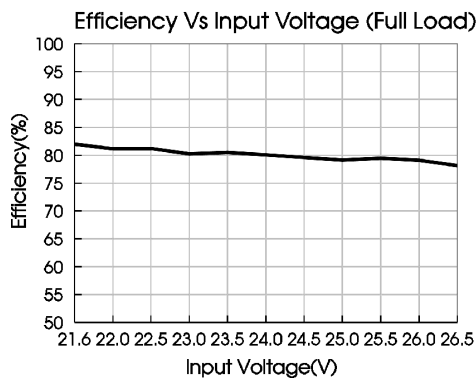


Fig. 2



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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.



Table 1: Recommended input and output capacitor values

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

2. EMC (CLASS B) compliance circuit

Dual

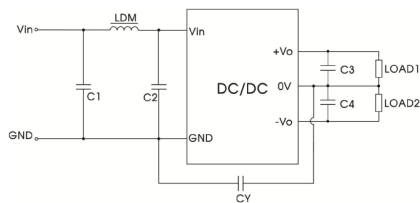


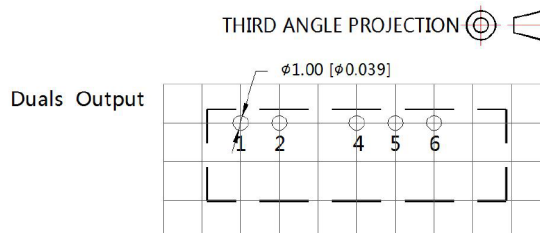
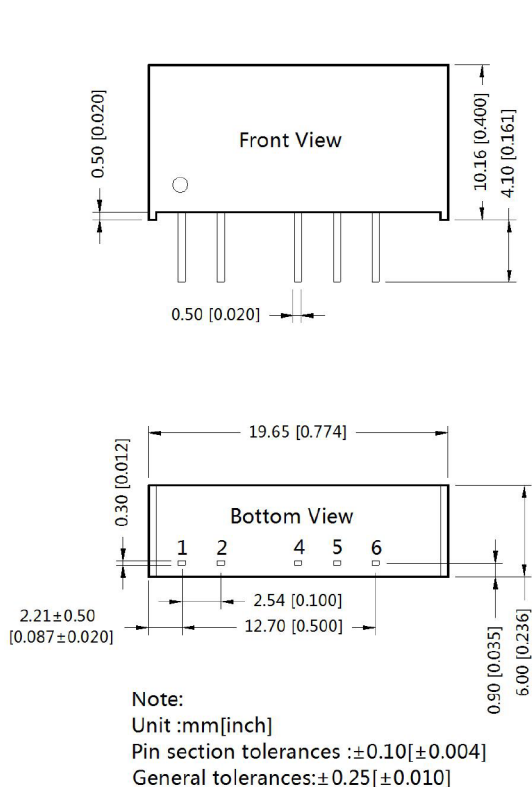
Table 2: EMC recommended circuit value table

Emissions	C1	4.7µF /50V
	C2	4.7µF /50V
	CY	270pF/2kV
	C3	Refer to the Cout in table 1
	C4	Refer to the Cout in table 1
	LDM	6.8µH

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Dimensions and Recommended Layout



Pin-Out	
Pin	Duals
1	Vin
2	GND
4	-Vo
5	OV
6	+Vo

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%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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