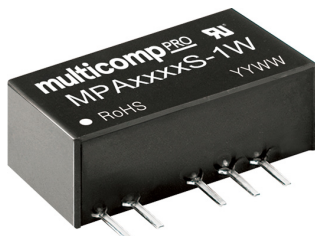


# 1W Isolated DC to DC Converters - Dual Output

**multicomp** PRO

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

**RoHS  
Compliant**



## Features

- Continuous short-circuit protection
- No-load input current as low as 5mA
- Operating ambient temperature range: -40°C to +105°C
- High efficiency up to 85%
- I/O isolation test voltage: 1.5k VDC
- Industry standard pin-out
- SIP package
- IEC62368, UL62368, EN62368 approved

These series are specially designed for applications where an isolated (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.		
MPA0503S-1W	5 (4.5 to 5.5)	±3.3	±152/±15	70/74	1200
MPA0505S-1W		±5	±100/±10	78/82	
MPA0512S-1W		±12	±42/±5	79/83	220
MPA0515S-1W		±15	±34/±4	79/83	
MPA0524S-1W		±24	±21/±3	81/85	

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

## Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Current (full load / no-load)	3.3VDC/5VDC output	-	270/5	286/10	mA
	9VDC/12VDC output	-	241/12	254/20	
	15VDC/24VDC output	-	241/18	254/30	
Reflected Ripple Current*		-	15	-	
Surge Voltage(1sec. max.)	5VDC input	-0.7	-	9	V DC
Input Filter		Capacitance filter			
Hot Plug		Unavailable			

Note: \* Refer to DC-DC Converter Application Notes for detailed description of reflected ripple current test method.

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Farnell.com/multicomp-pro  
Element14.com/multicomp-pro

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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	-
		Others		-	1.2	
Load Regulation	10% -100% load	3.3VDC output		15	20	%
		5VDC output		10	15	
		9VDC output		8	10	
		12VDC output		7	10	
		15VDC output		6	10	
		24VDC output		5	10	
Ripple & Noise*	20MHz bandwidth	Others		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

Item	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 ≥ 85°C, (see Fig. 2)		-40	-	105	°C
Storage Temperature			-55	-	125	
Case Temperature Rise	Ta=25°C	3.3VDC output	-	25	-	
		Others	-	15	-	
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds		-	-	300	
Storage Humidity	Non-condensing		-	-	95	
Switching Frequency	100% load, nominal input voltage		-	270	-	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 × 6 × 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 Air $\pm 8kV$ , Contact $\pm 4kV$ perf. Criteria B

## Typical Performance Curves

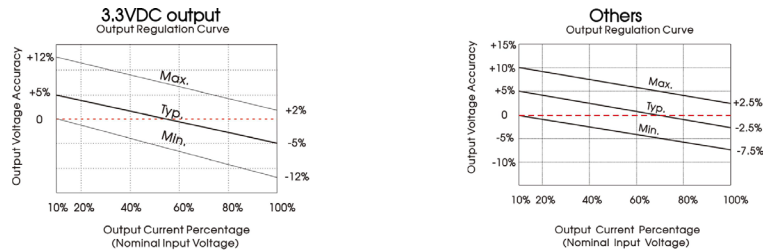


Fig. 1  
Temperature Derating Curve

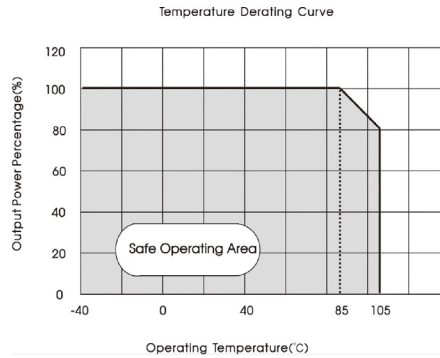
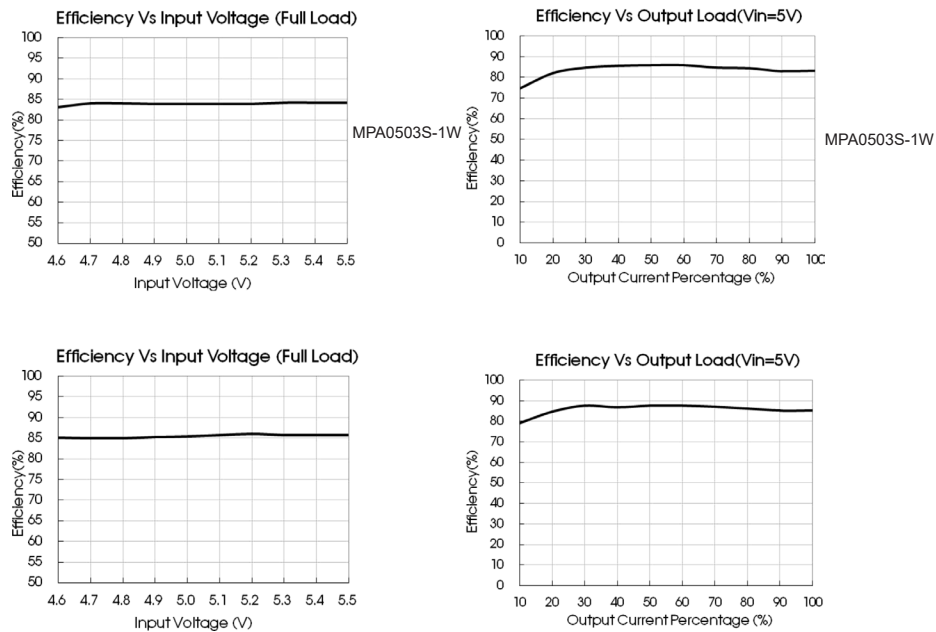


Fig. 2



# 1W Isolated DC to DC Converters - Dual Output

## 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



Table 1: Recommended input and output capacitor values

Vin (VDC)	Cin (μF)	Cout (μF)	Dual Vout (VDC)	Cout (μF)
5	4.7	10	±5	4.7
-	-	2.2	±9/±12	1
-	-	1	±15/±24	0.47

### EMC (CLASS B) compliance circuit

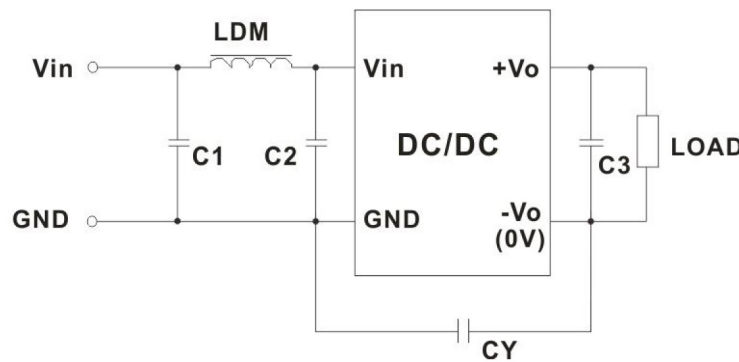


Fig. 4

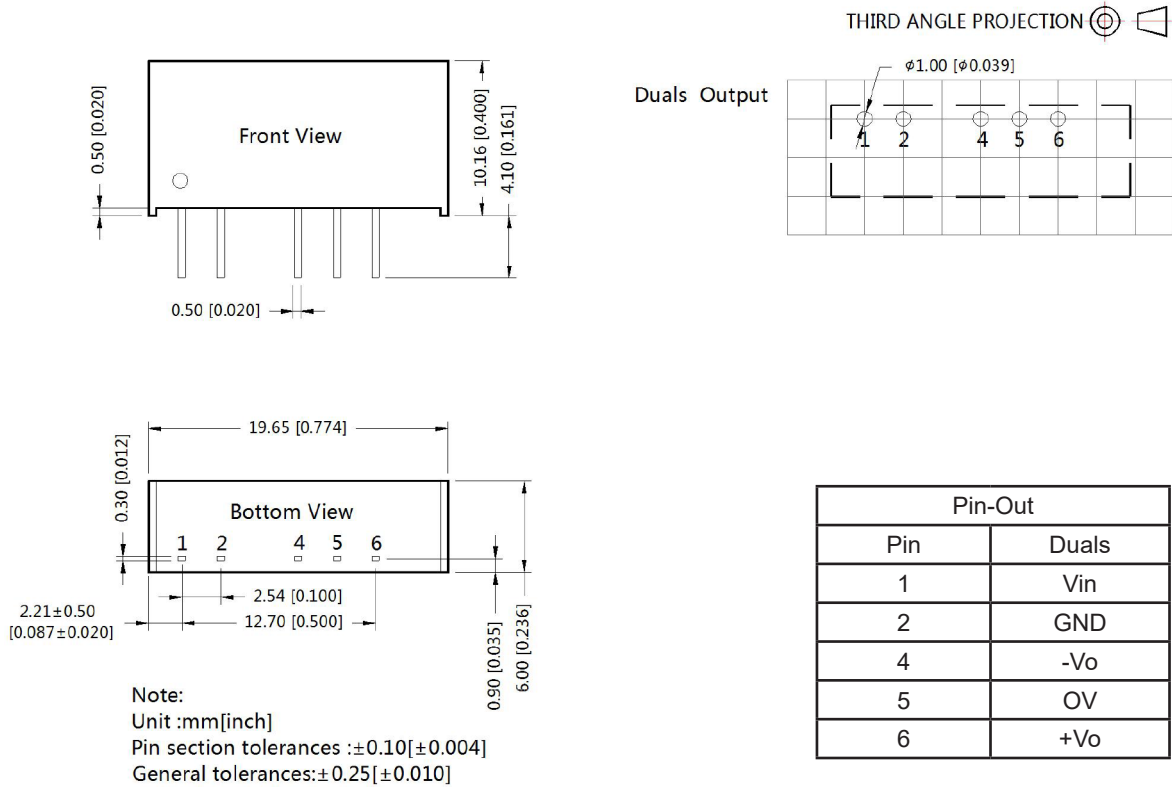
EMC recommended circuit value table (Table 2)

Input voltage 5VDC	Output voltage (VDC)	3.3/5/9	12/15/24
	C1/C2	4.7μF /25V	4.7μF /25V
	CY	-	1nF/4KVDC VISHAY HGZ102MBP TDK CD45-E2GA102M-GKA
	C3	Refer to the Cout in table 1	
	LDM	6.8μH	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%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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