

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 85%
- I/O isolation test voltage: 1.5k VDC
- Industry standard pin-out

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.		
MPA1205XT-1W	12 (10.8 to 13.2)	±5	±100/±10	78/82	1200
MPA1212XT-1W		±12	±42/±5	79/83	220
MPA1215XT-1W		±15	±34/±4	79/83	220
MPA1224XT-1W		±24	±21/±3	81/85	100
MPA1515XT-1W	15 (13.5 to 16.5)	±15	±34/±4	79/83	220
MPA2405XT-1W	24 (21.6 to 26.4)	±5	±100/±10	76/82	1200
MPA2412XT-1W		±12	±42/±5	77/83	220
MPA2415XT-1W		±15	±34/±4	77/83	220
MPA2424XT-1W		±24	±21/±3	79/85	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)	12V input	±5VDC output	-	102/8	107/--	mA
		±9VDC/±12VDC/±15VDC output	-	101/8	106/--	
		±24VDC output	-	99/8	103/--	
	15V input	-	81/8	85/--		
	24V input	±5VDC/±9VDC/±12VDC/±15VDC output	-	51/8	55/--	
±24VDC output		-	50/8	53/--		
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.

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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: $\pm 1\%$		-	1.2	-	
Load Regulation	10% -100% load	-	$\pm 5\text{VDC}$ output	10	15	%
			$\pm 9\text{VDC}$ output	8	10	
			$\pm 12\text{VDC}$ output	7	10	
			$\pm 15\text{VDC}$ output	6	10	
			$\pm 24\text{VDC}$ output	5	10	
Ripple & Noise*	20MHz bandwidth	-	$\pm 5\text{VDC}/\pm 9\text{VDC}/\pm 12\text{VDC}/\pm 15\text{VDC}$ output	30	75	mVp-p
			$\pm 24\text{VDC}$ output	50	100	
Temperature Coefficient	100% load		± 0.02	-	%/ $^{\circ}\text{C}$	
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	-	-	M Ω
Isolation Capacitance	Input-output capacitance at 100kHz/0.1V	-	20	-	pF
Operating Temperature	Derating when operating temperature $\geq 100^{\circ}\text{C}$, (see Fig. 2)	-40	-	105	$^{\circ}\text{C}$
Storage Temperature		-55	-	125	
Case Temperature Rise	Ta=25 $^{\circ}\text{C}$	-	30	-	
Storage Humidity	Non-condensing	5	-	300	
Reflow Soldering Temperature*		Peak temp. $\leq 245^{\circ}\text{C}$, maximum duration time $\leq 60\text{s}$ over 217 $^{\circ}\text{C}$			
Switching Frequency	Full load, nominal input voltage	-	260	-	kHz
MTBF	MIL-HDBK-217F@25 $^{\circ}\text{C}$	3500	-	-	k hours
Moisture Sensitivity Level (MSL)	IPC/JEDEC J-STD-020D.1	Level 1			

Mechanical Specifications

Case Material	Black plastic; flame-retardant and heat-resistant (UL94 V-0)
Dimensions	15.24 x 11.40 x 7.25 mm
Weight	1.4g(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

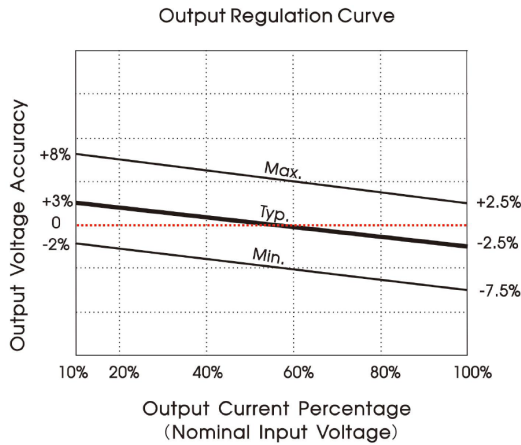


Fig. 1

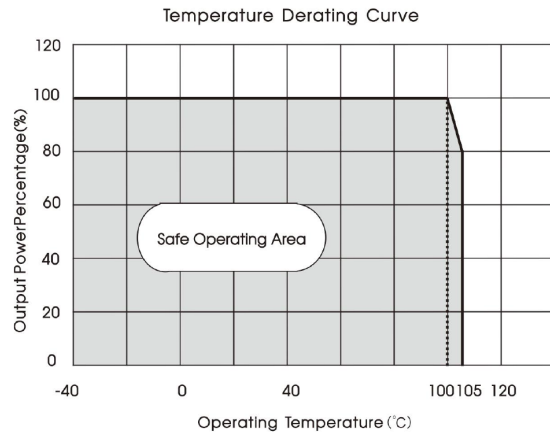
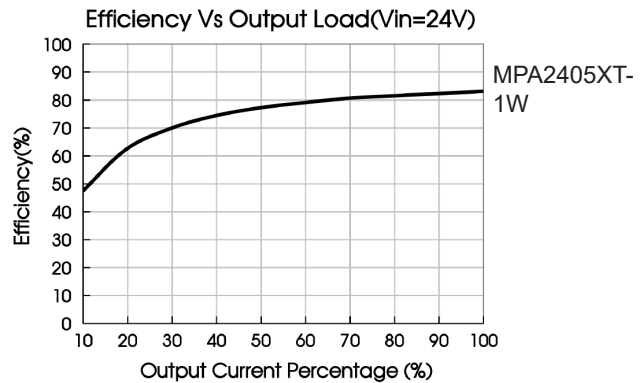
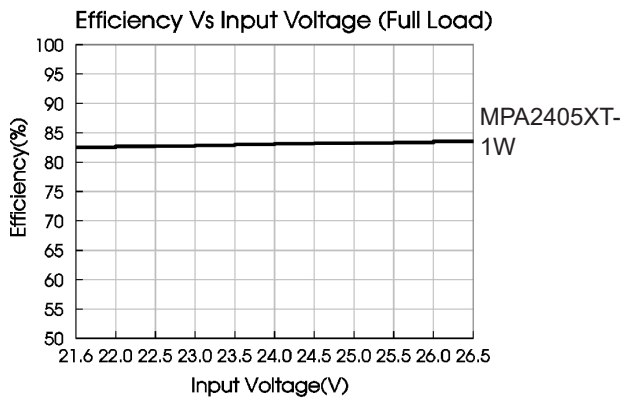
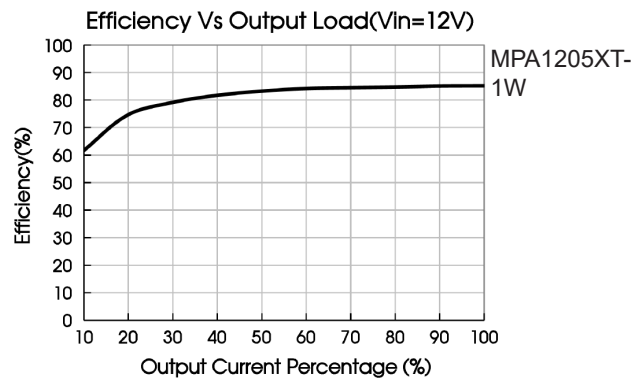
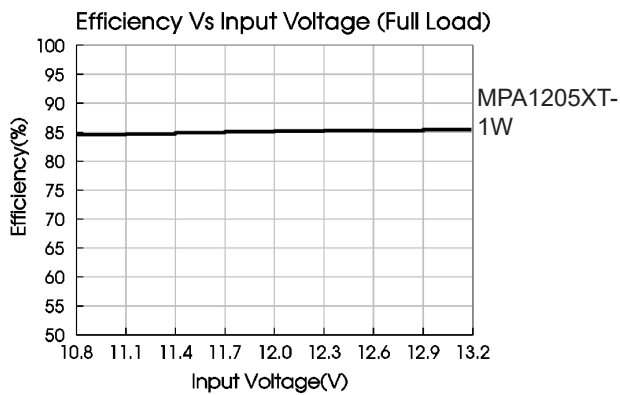


Fig. 2



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.

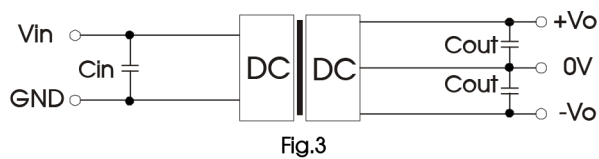


Fig.3

Table 1: Recommended input and output capacitor values

Vin	Cin	Vo	Cout
12VDC	2.2µF/25V	±5VDC	4.7µF/16V
15VDC	2.2µF/25V	±9VDC	1µF/16V
24VDC	1µF/50V	±12VDC	1µF/25V
-	-	±15VDC	0.47µF/25V
-	-	±24VDC	0.47µF/50V

2. EMC (CLASS B) compliance circuit

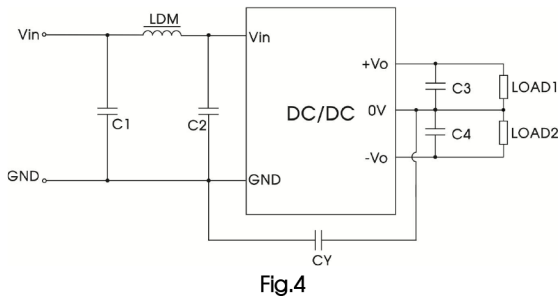
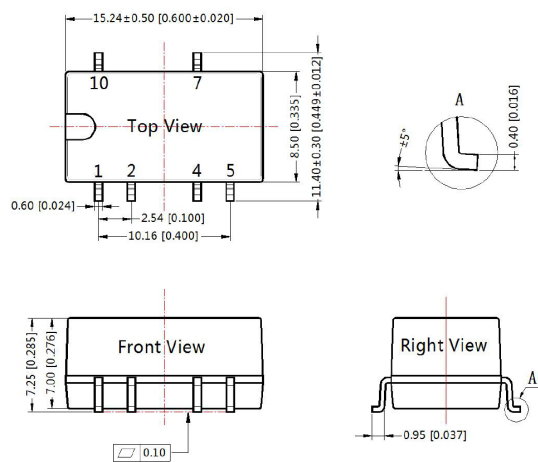


Fig.4

Table 2: EMC recommended circuit value table

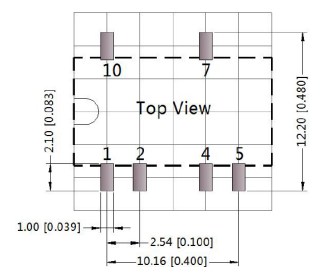
Emissions	C1	4.7µF /50V
	C2	4.7µF /50V
	CY	270pF/2kV
	C3	Refer to the Cout in table 1
	C4	Refer to the Cout in table 1
	LDM	6.8µH

Dimensions and Recommended Layout



Note:
Unit: mm[inch]
Pin section tolerances: ±0.10[±0.004]
General tolerances: ±0.25[±0.010]

THIRD ANGLE PROJECTION



Note: Grid 2.54*2.54mm

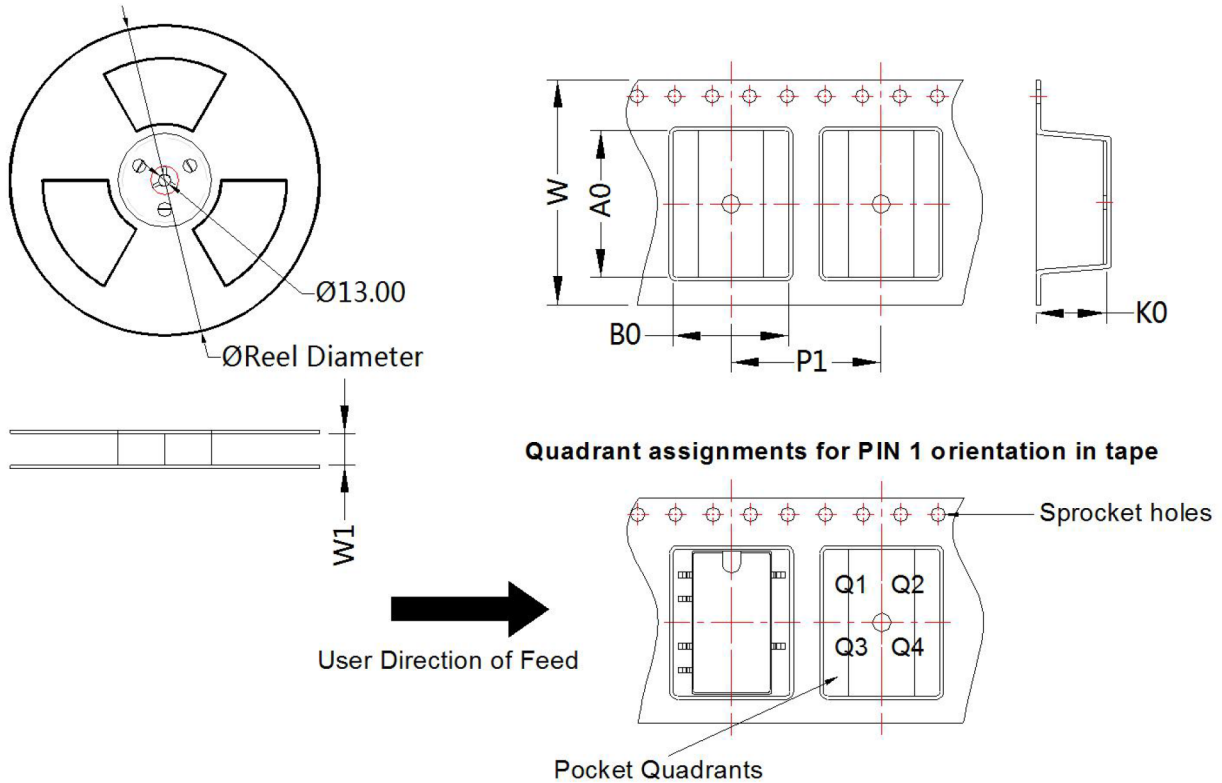
Pin-Out	
Pin	Function
1	GND
2	Vin
4	0V
5	-Vo
7	+Vo
10	NC

NC: Pin to be isolated from circuitry

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Tape and Reel Info



Package Type	Pin	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
SMD	6	500	330.0	24.5	15.64	12.4	7.45	16.0	24.0	Q1

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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