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.		
MPE1205XT-1W	12 (10.8 to 13.2)	±5	±100/±10	78/82	1200
MPE1212XT-1W		±12	±42/±5	79/83	220
MPE1215XT-1W		±15	±34/±4	79/83	
MPE1224XT-1W		±24	±21/±3	81/85	100
MPE1515XT-1W	15 (13.5 to 16.5)	±15	±34/±4	79/83	220
MPE2405XT-1W	24 (21.6 to 26.4)	±5	±100/±10	76/82	1200
MPE2412XT-1W		±12	±42/±5	77/83	220
MPE2415XT-1W		±15	±34/±4	77/83	
MPE2424XT-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.

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Voltage Accuracy			See output regulation curves (Fig. 1)			
Linear Regulation	Input voltage change: ±1%		-	-	1.2	-
Load Regulation	10% -100% load	±5VDC output	-	10	15	%
		±9VDC output		8	10	
		±12VDC output		7	10	
		±15VDC output		6	10	
		±24VDC output		5	10	
Ripple & Noise*	20MHz bandwidth	±5VDC/±9VDC/±12VDC/±15VDC output		30	75	mVp-p
		±24VDC output		50	100	
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.						

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≥100°C, (see Fig. 2)	-40	-	105	°C
Storage Temperature		-55	-	125	
Case Temperature Rise	Ta=25°C	-	25	-	
Storage Humidity	Non-condensing	5	-	95	%RH
Reflow Soldering Temperature*		Peak temp.≤245°C, maximum duration time≤60s over 217°C			
Switching Frequency	Full load, nominal input voltage	-	260	-	kHz
MTBF	MIL-HDBK-217F@25°C	3500	-	-	k hours
Moisture Sensitivity Level (MSL)	IPC/JEDEC J-STD-020D.1	Level 1			
Note:*For actual application, please refer to IPC/JEDEC J-STD-020D.1.					

Mechanical Specifications

Case Material	Black plastic; flame-retardant and heat-resistant (UL94 V-0)
Dimensions	15.24 x 11.4 x 7.25 mm
Weight	1.4g(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

Typical Performance Curves

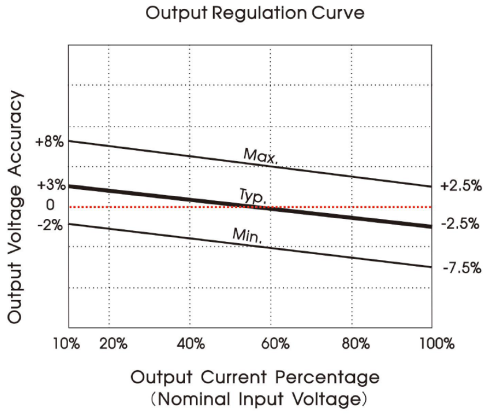


Fig. 1

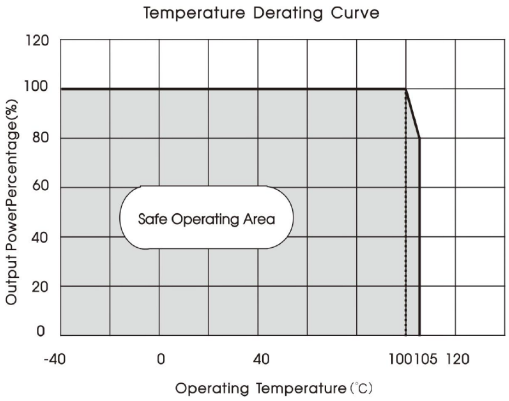
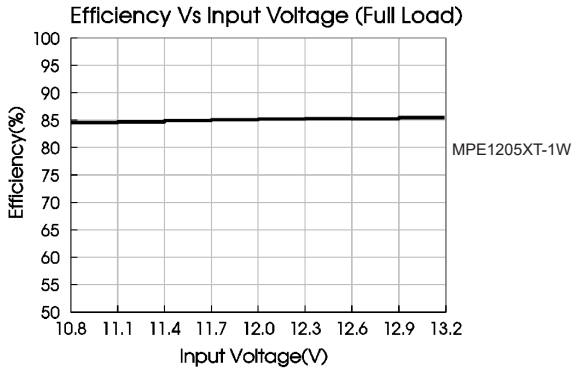
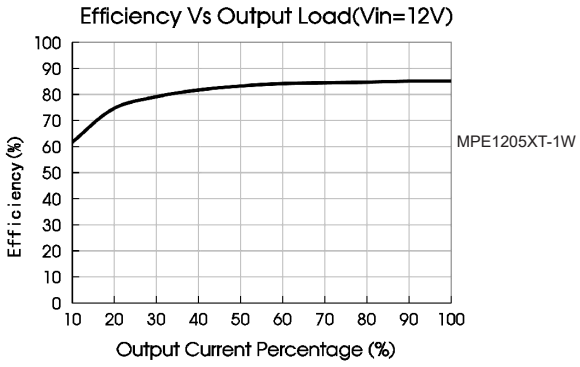
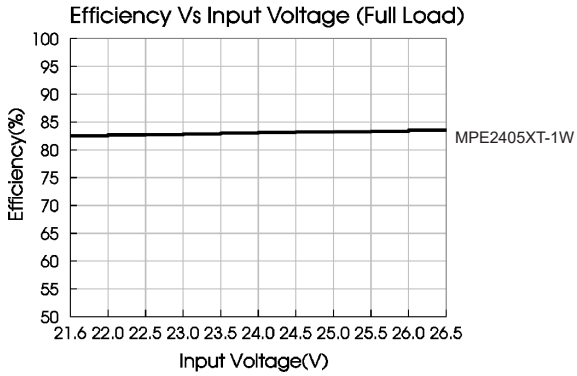
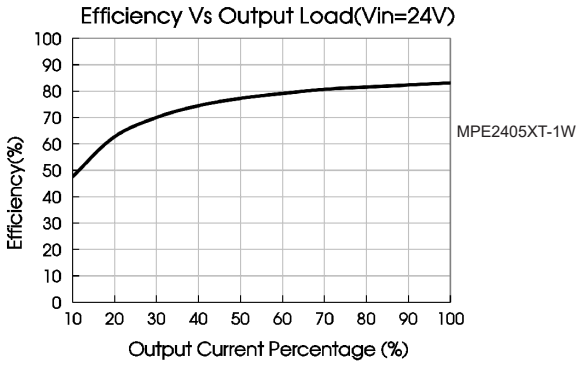


Fig. 2









Design Reference

1. 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(μF)	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

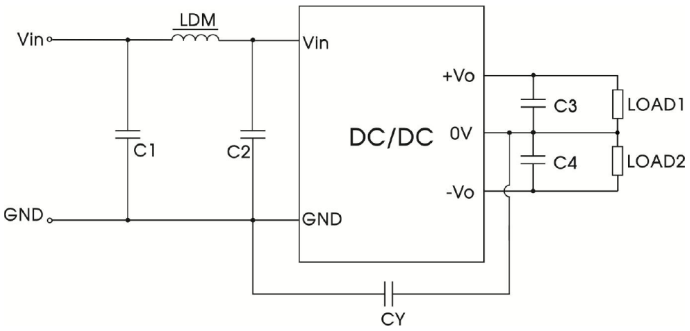


Fig.4

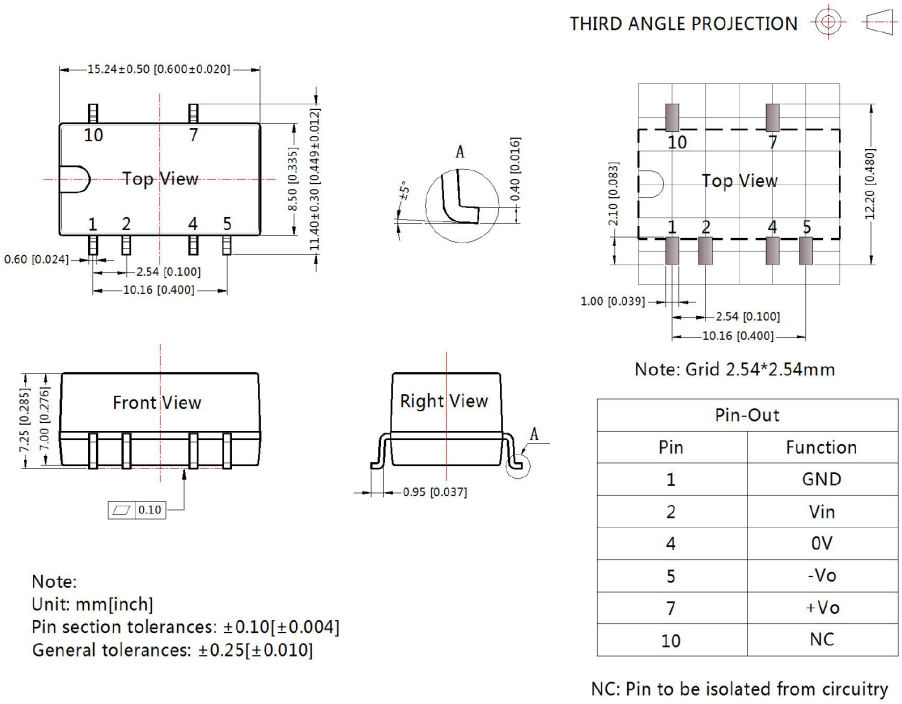
Table 2: EMC recommended circuit value table

Emissions	C1	4.7μF /50V
	C2	4.7μF /50V
	CY	270pF/3kV
	C3	Refer to the Cout in table 1
	C4	Refer to the Cout in table 1
	LDM	6.8μH

Minimum Output Load Requirement

For a reliable and efficient operation of the converter, the minimum load should never be less than 1% of the rated output load. If the total required output power is below 1%, a parallel bleeding resistor is required on the output, ensuring that the sum of the power consumption is always maintained at 1% minimum.

Dimensions and Recommended Layout

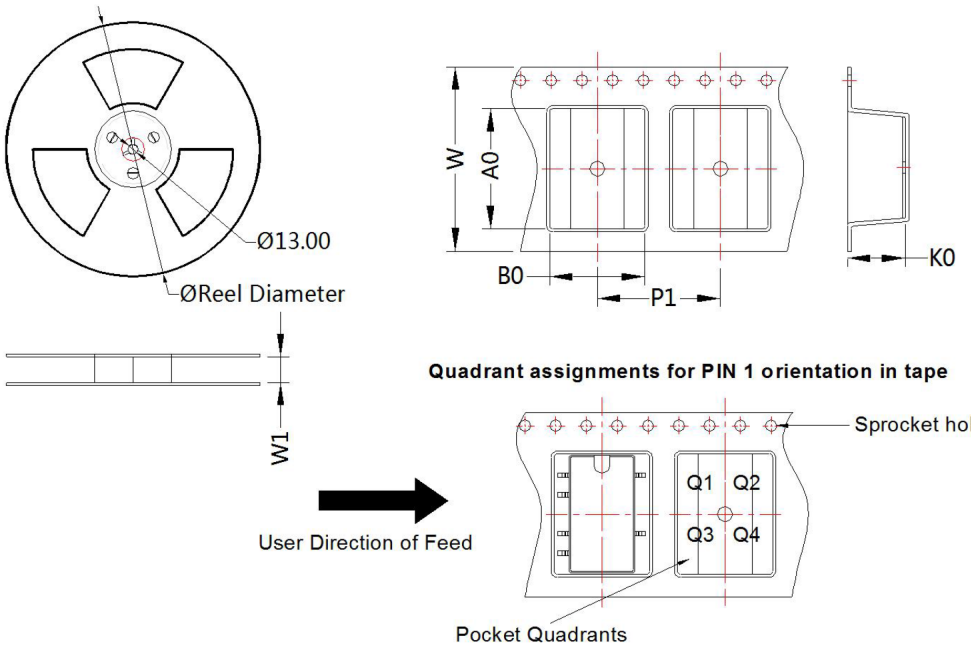


Note: Grid 2.54*2.54mm

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

NC: Pin to be isolated from circuitry

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



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 Ta=25°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.