

1W Isolated DC to DC Converters - Single Output **multicomp**PRO

1W isolated DC-DC converter
Fixed input voltage, unregulated single 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.		
MPB1205XT-1W	12 (10.8 to 13.2)	5	200/20	78/82	2400
MPB1209XT-1W		9	111/12	79/83	1000
MPB1212XT-1W		12	84/9	79/83	560
MPB1215XT-1W		15	67/7	79/83	560
MPB1224XT-1W		24	42/4	81/85	220
MPB1505XT-1W	15 (13.5 to 16.5)	5	200/20	78/82	2400
MPB1515XT-1W		15	67/7	79/83	560
MPB2405XT-1W	24 (21.6 to 26.4)	5	200/20	76/82	2400
MPB2409XT-1W		9	111/12	77/83	1000
MPB2412XT-1W		12	84/9	77/83	560
MPB2415XT-1W		15	67/7	77/83	560
MPB2424XT-1W		24	42/4	79/85	220

1W Isolated DC to DC Converters - Single Output **multicomp** PRO

Input Specifications						
Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	12V DC input	5VDC output	-	102/8	107/--	mA
		9VDC/12VDC/15VDC output	-	101/8	106/--	
		24VDC output	-	99/8	103/--	
	15VDC input	5VDC output	-	82/8	86/--	
		15VDC output	-	81/8	85/--	
	24VDC 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: $\pm 1\%$			-	1.2	-
Load Regulation	10% -100% load	5VDC output	-	10	15	%
		9VDC output		8	15	
		12VDC output		7	10	
		15VDC output		6	10	
		24VDC output		5	10	
Ripple & Noise*	20MHz bandwidth	5VDC/9VDC/12VDC/15V DC output		30	75	mVp-p
		24VDC output		50	100	
Temperature Coefficient	Full load			± 0.02	-	$\%/^{\circ}\text{C}$
Short-Circuit Protection			Continuous, self-recovery			
Notes: * The "parallel cable" method is used for ripple and noise test, please refer to DC-DC Converter Application Notes for specific information.						

1W Isolated DC to DC Converters - Single Output **multicomp** PRO

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 ≥ 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	13.2 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

1W Isolated DC to DC Converters - Single Output



Typical Performance Curves

Output Regulation Curve

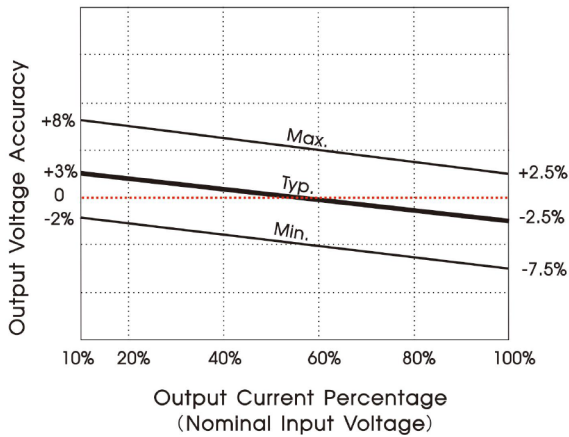


Fig. 1

Temperature Derating Curve

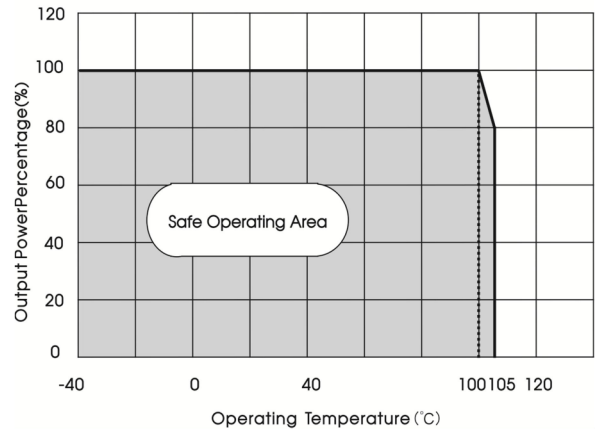
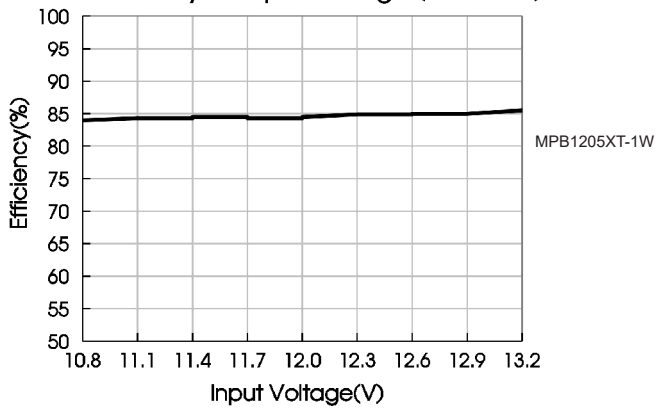
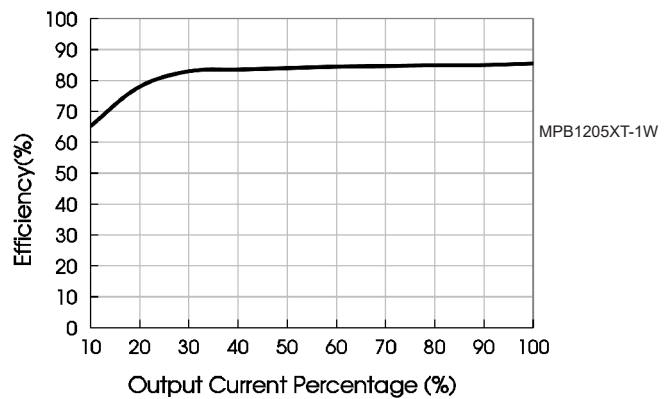


Fig. 2

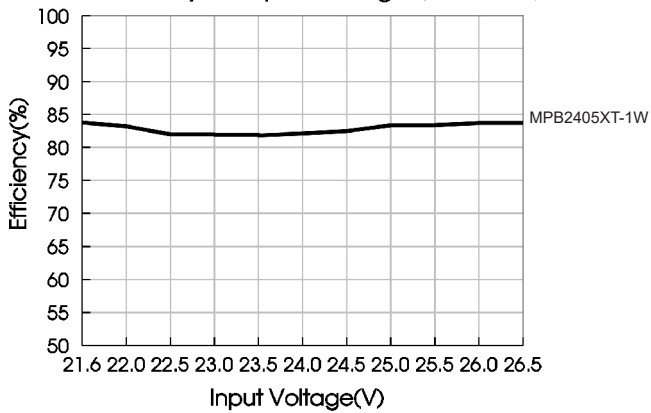
Efficiency Vs Input Voltage (Full Load)



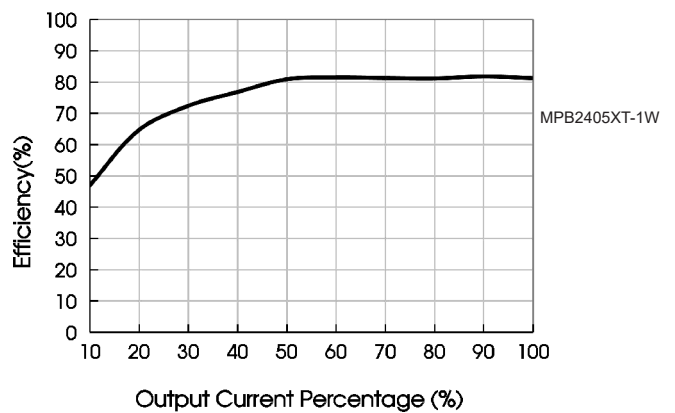
Efficiency Vs Output Load (Vin=12V)



Efficiency Vs Input Voltage (Full Load)



Efficiency Vs Output Load (Vin=24V)



1W Isolated DC to DC Converters - Single 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	10µF/16V
15VDC	2.2µF/25V	9VDC	2.2µF/16V
24VDC	1µF/50V	12VDC	2.2µF/25V
-	-	15VDC	1µF/25V
-	-	24VDC	1µF/50V

2. EMC (CLASS B) compliance circuit

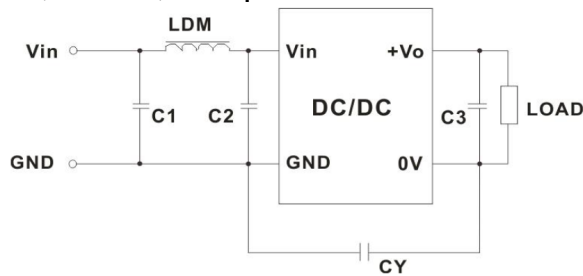


Fig.4

Table 2: EMC recommended circuit value table

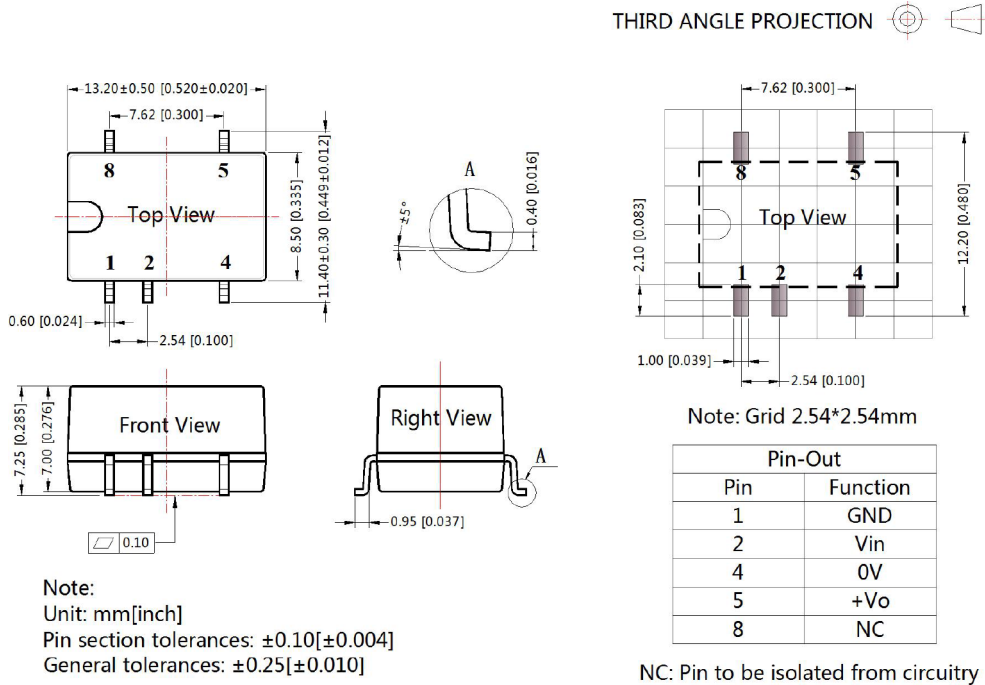
EMI	C1	4.7µF /50V
	C2	4.7µF /50V
	CY	270pF/2kV
	C3	Refer to the Cout in table 1
	LDM	6.8µH

Minimum Output Load Requirement

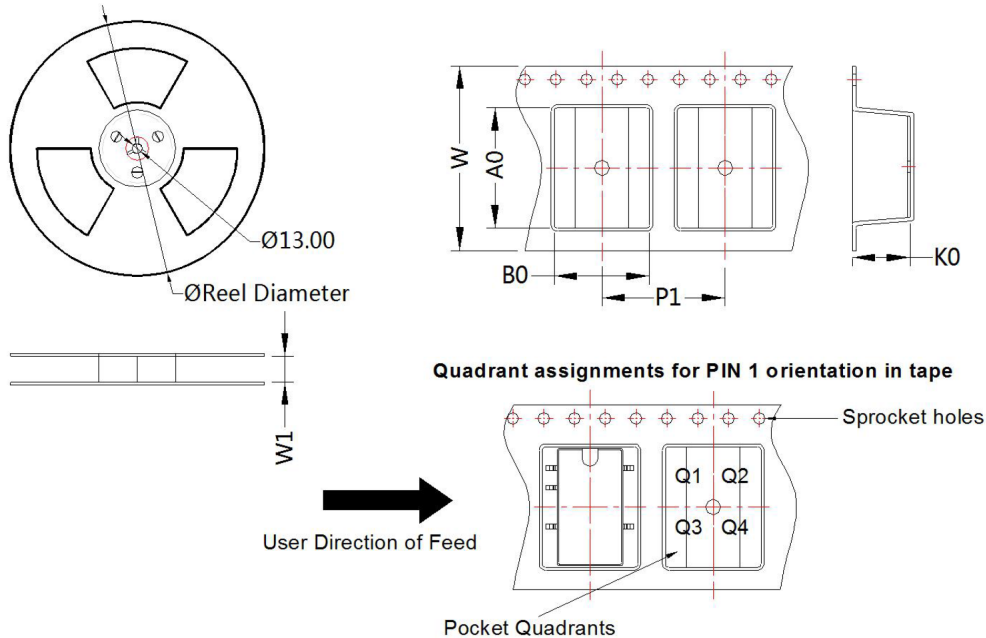
For a reliable and efficient operation of the converter, the minimum load should never be less than 1% of the rated output load. If the total required output power is below 1%, a parallel bleeding resistor is required on the output, ensuring that the sum of the power consumption is always maintained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

1W Isolated DC to DC Converters - Single Output **multicomp**PRO

Dimensions and Recommended Layout



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	5	500	330.0	24.5	13.4	11.7	7.5	16.0	24.0	Q1

1W Isolated DC to DC Converters - Single Output **multicomp**^{PRO}

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.

Important Notice : This data sheet and its contents (the "Information") belong to the members of the AVNET group of companies (the "Group") or are licensed to it. No licence is granted for the use of it other than for information purposes in connection with the products to which it relates. No licence of any intellectual property rights is granted. The Information is subject to change without notice and replaces all data sheets previously supplied. The Information supplied is believed to be accurate but the Group assumes no responsibility for its accuracy or completeness, any error in or omission from it or for any use made of it. Users of this data sheet should check for themselves the Information and the suitability of the products for their purpose and not make any assumptions based on information included or omitted. Liability for loss or damage resulting from any reliance on the Information or use of it (including liability resulting from negligence or where the Group was aware of the possibility of such loss or damage arising) is excluded. This will not operate to limit or restrict the Group's liability for death or personal injury resulting from its negligence. Multicomp Pro is the registered trademark of Premier Farnell Limited 2019.

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

multicomp^{PRO}