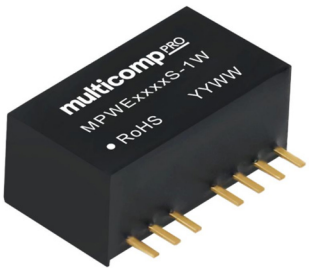
3W Isolated DC to DC Converters
Single and Dual Output

3W isolated DC-DC converter in SIP package
Ultra-wide input and regulated single/dual output

RoHS Compliant



Features

- Ultra-wide 8:1 input voltage range
- High efficiency up to 79%
- No-load power consumption as low as 0.12W
- I/O isolation test voltage 3K VDC
- Input under-voltage protection, output short circuit, over-current protection
- Operating ambient temperature range: -40°C to +105°C
- Industry standard pin-out
- EN62368 approved

These series of isolated 3W DC-DC products with an ultra-wide 8:1 input voltage range. They feature efficiencies of up to 79%, 3000VDC input to output isolation, operating ambient temperature range of -40°C to +105°C, input under-voltage protection, output over-current, short circuit protection and they are widely used in applications such as medical care, industrial control, electric power, instruments and communication fields.

Selection Guide

Part Number	Input Voltage (VDC)		Output		Full Load Efficiency (%) Min./Typ.	Capacitive Load(μF)* Max.
	Nominal (Range)	Max.	Voltage (VDC)	Current (mA) Max./Min.		
MPWE1205S-3W	12 (4.5 to 36)	40	±5	±300	75/77	470
MPWE1212S-3W			±12	±125	77/79	220
MPWE1215S-3W			±15	±100	77/79	100
MPWF1205S-3W			5	600	75/77	1000
MPWF1212S-3W			12	250	77/79	330
MPWF1215S-3W			15	200	77/79	220

Note: 1. Exceeding the maximum input voltage may cause permanent damage;
2. Efficiency is measured at nominal input voltage and rated output load;
3. 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)	5V/±5V output	--	324/8	334/16	mA
	Others	--	316/8	325/16	
		--	50	--	
Reflected Ripple Current		-0.7	--	50	V DC
Surge Voltage(1sec. max.)		--	--	4.5	
Start-up Voltage		2.5	3.5	--	
Input Under-voltage Protection					
Input Filter		Capacitance filter			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Voltage Accuracy	0% -100% load			±1	±3	%
Linear Regulation	Input voltage variation from low to high at full load	Vo1		--	±0.5	
		Vo2		--	±1	
Load Regulation	5% -100% load	Vo1		--	±1	
		Vo2		--	±1.5	
Cross Regulation	Dual outputs, Vo1 load at 50%, Vo2 load at range of 25%-100%		-	--	±5	
Transient Recovery Time	25% load step change, nominal input voltag			300	500	μs
Transient Response Deviation	25% load step change, nominal input voltage	5V/±5V output		±5	±8	%
		Others		±3	±5	
Temperature Coefficient	Full load			--	±0.03	%/°C
Ripple & Noise*	20MHz bandwidth, 5% -100% load			60	100	mVp-p
Over-current Protection	Input voltage range		110	--	300	%/°C
Short-Circuit Protection			Continuous, self-recovery			

Note: 1. Ripple & Noise at <5% load is 5%Vo max. 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	-	40	-	pF
Operating Temperature	See Fig. 1	-40	-	+105	°C
Storage Humidity	Without condensation	5	-	95	
Storage Temperature		-55	-	+125	
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds	-	-	+300	
Vibration		10-150Hz, 5G, 0.75mm. along X, Y and Z			
Switching Frequency	PWM mode	-	300	-	kHz
MTBF	MIL-HDBK-217F@25°C	1000	-	-	k hours

Note:*Switching frequency is measured at full load. The module reduces the switching frequency for light load (below 50%) efficiency improvement.

Mechanical Specifications

Case Material	Black plastic; flame-retardant and heat-resistant (UL94-V0)
Dimensions	22mm × 9.5mm × 12mm
Weight	4.5g (Typ.)
Cooling Method	Free air convection

Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032	CLASS B (see Fig.3-2 for recommended circuit)/CLASS A (see Fig.4 for recommended circuit)	
	RE	CISPR32/EN55032	CLASS B (see Fig.3-2 for recommended circuit)/CLASS A (see Fig.4 for recommended circuit)	
Immunity	ESD	IEC/EN61000-4-2	Contact ±4KV	perf. Criteria B
	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4	±2KV (see Fig.3-1 for recommended circuit)	perf. Criteria B
	Surge	IEC/EN61000-4-5	line to line ±2KV (see Fig.3-1 for recommended circuit)	perf. Criteria B
	CS	IEC/EN61000-4-6	3 Vr.m.s	perf. Criteria A

Typical Characteristic Curves

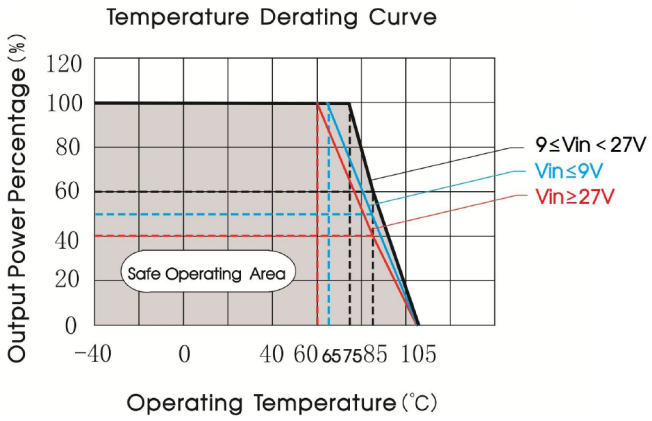


Fig. 1

Design Reference

Typical application

All the DC/DC converters of this series are tested before delivery using the recommended circuit shown in Fig. 2.

Input and/or output ripple can be further reduced by appropriately increasing the input & output capacitor values Cin and Cout and/or by selecting capacitors with a low ESR (equivalent series resistance). Also make sure that the capacitance is not exceeding the specified max. capacitive load value of the product.

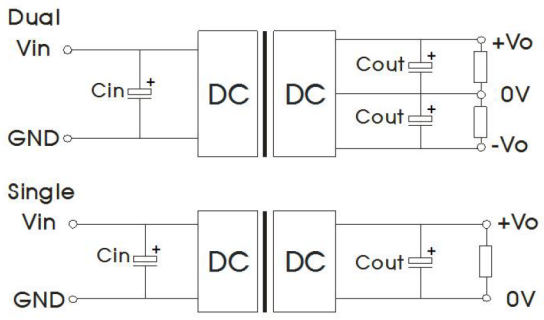


Fig. 2

Parameter description:

Single Vout (VDC)	Cout (μF)	Cin (μF)	Dual Vout (VDC)	Cout (μF)	Cin (μF)
5/12/15	22 (25V)	100 (50V)	±5/±12/±15	22 (25V)	100 (50V)

EMC compliance circuit

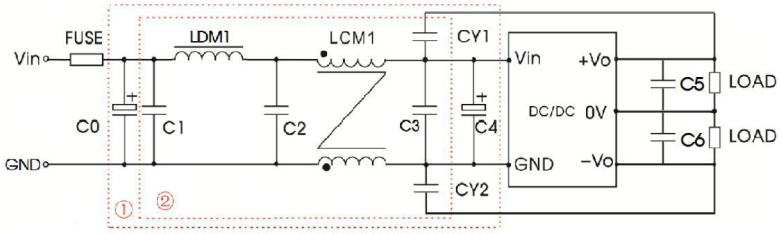


Fig. 3

Notes: For EMC tests we use Part ① in Fig. 3 for immunity and part ② for emissions test. Selecting based on needs

Parameter description:

Components	Vin:12V
FUSE	Choose according to actual input current
C0	1000μF/50V
C4	330μF/50V
C1/C2/C3	10μF/50V
LCM1	3.3mH, recommended to use MORNSUN's FL2D-10-332
LDM1	4.7μH
CY1/CY2	1nF/3KV
C5/C6	Refer to the Cout in Fig.2

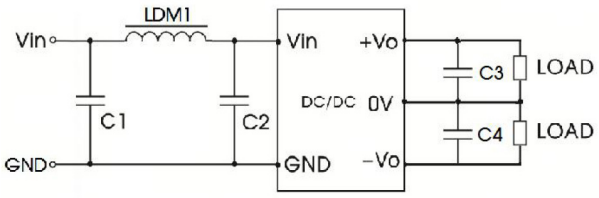
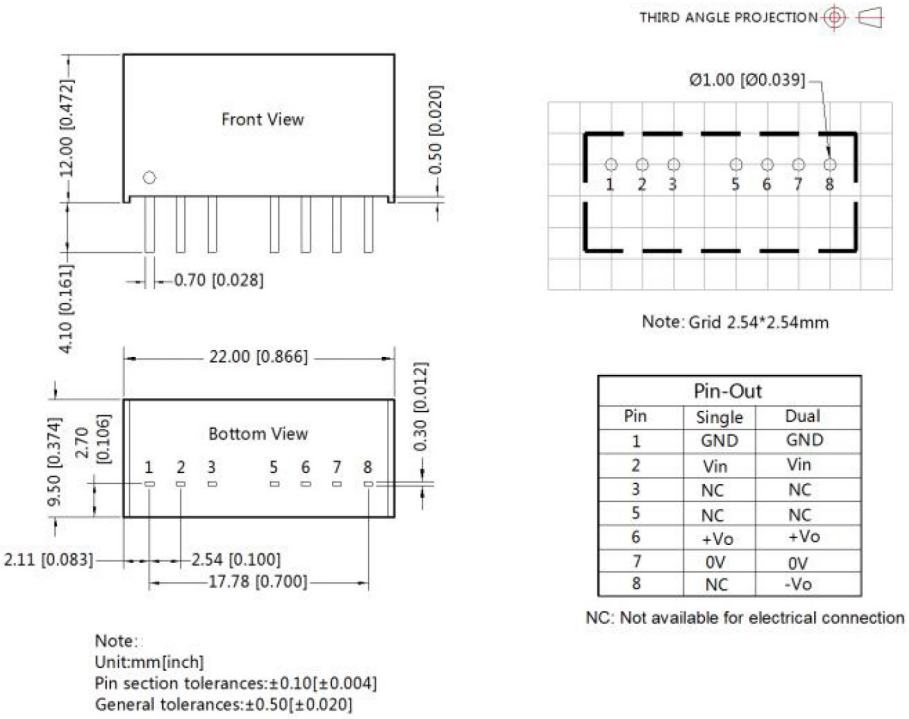


Fig. 4

Parameter description:

Components	Vin:12V
FUSE	Choose according to actual input current
C1/C2	10μF/50V
LDM1	22μH
C3/C4	Refer to the Cout in Fig.2

Dimensions and Recommended Layout



Note: Grid 2.54*2.54mm

Pin-Out		
Pin	Single	Dual
1	GND	GND
2	Vin	Vin
3	NC	NC
5	NC	NC
6	+Vo	+Vo
7	0V	0V
8	NC	-Vo

NC: Not available for electrical connection

Note:
Unit:mm[inch]
Pin section tolerances:±0.10[±0.004]
General tolerances:±0.50[±0.020]

Notes:

1.The maximum capacitive load offered were tested at input voltage range and full load;
2. 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;
3. All index testing methods in this datasheet are based on company corporate standards;
4. We can provide product customization service, please contact our technicians directly for specific information;
5. Products are related to laws and regulations: see “Features” and “EMC”;
6. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.