

10DPWE_1.5 Series

10W - Single/Dual Output - Wide Input - Isolated & Regulated DC-DC Converter

DC-DC Converter 10 Watt

- + Wide 2:1 input voltage range
- + Input/Output Isolation Voltage: 1.5KVDC
- + Operating Temperature Range: -40°C to +85°C
- + Short circuit protection (SCP)
- + High efficiency up to 88%
- + Input under-voltage, over-current, over-voltage protection
- + Meet CISPR32/EN55032 CLASS A without external components
- + RoHS Compliant
- + International standard pin-out
- + No-load power consumption as low as 0.12W

The 10DPWE Series products are of 10W output power, wide range of voltage input of 9-18VDC, 18-36VDC, 36-75VDC isolation voltage of 1500VDC, input under-voltage protection, output over-voltage, over-current, short circuit protection and EMI meets CISPR32/EN55032 CLASS A without external components.

These products are widely used in fields such as industrial control, electric power, instruments and communication.



Common specifications	
Short circuit protection:	Continuous, automatic recovery
Cooling:	Free air convection
Operation temperature range:	-40°C~85°C
Storage temperature range:	-55°C~+125°C
Switching frequency:	350kHz TYP
Storage humidity range:	95% MAX
Pin welding resistance temperature:	+300°C MAX, 1.5mm away from case, 10sec
Vibration:	10-150Hz, 5G, 0.75mm. along X, Y and Z
Case material:	Aluminium alloy
MTBF (MIL-HDBK-217F @25°C):	1,000,000 hours
Dimensions:	32.00*20.00*10.80mm
Weight:	14g

Input specifications						
Item	Test condition	Min	Typ	Max	Units	
Input current (full load/no load)	<u>12V nominal input</u>					
	• 3.3VDC single output		759/15	776/30		mA
	• 5VDC single output		958/5	980/12		mA
	• others		980/9	1028/15		mA
	<u>24V nominal input</u>					
	• 3.3VDC single output		379/10	388/25		mA
	• 5VDC single output		473/5	484/12		mA
	• others		490/5	515/12		mA
	<u>48V nominal input</u>					
	• 3.3VDC single output		190/8	195/20		mA
	• 5VDC single output		237/5	243/12		mA
	• others		245/4	258/8		mA
Input reflected ripple current	• 12V nominal input		50			mA
	• 24V nominal input		40			mA
	• 48V nominal input		30			mA
Surge voltage (1sec max.)	• 12V nominal input	-0.7		25		VDC
	• 24V nominal input	-0.7		50		VDC
	• 48V nominal input	-0.7		100		VDC
Starting voltage	• 12V nominal input			9		VDC
	• 24V nominal input			18		VDC
	• 48V nominal input			36		VDC
Shutdown voltage	• 12V nominal input	5.5	6.5			VDC
	• 24V nominal input	12	15.5			VDC
	• 48V nominal input	25	30.5			VDC
Start-up time	Nominal Vin and constant resistive load		500			ms
Input filter	Pi filter					
Hot plug	Unavailable					
Ctrl (The voltage of Ctrl pin is relative to input pin GND.)	• Module switch on			Ctrl suspended or connected to TTL high level (3.5-12VDC)		
	• Module switch off			Ctrl pin connected to GND or low level (0-1.2VDC)		
	• Input current when switched off		6	10		mA

Output specifications						
Item	Test condition	Min	Typ	Max	Units	
Output voltage accuracy ¹	0%-100% load					
	• positive output		±0.5	±2		%
	• negative output		±1	±3		%
Line regulation @Full load	from low to high voltage					
	• positive output		±0.2	±0.5		%
	• negative output		±0.5	±1		%
Load regulation ² (5%-100% load)	• positive output		±0.5	±1		%
	• negative output		±0.5	±1.5		%
Cross regulation	Dual output, main circuit 50% load, auxiliary circuit 25%-100% load			±5		%
Transient recovery time	25% load step change		300	500		µs
Transient response deviation	25% load step change					
	• 3.3/5VDC single output		±5	±8		%
	• others		±3	±5		%
Ripple and noise ³	20MHz Bandwidth					
	• 3.3/5VDC single output		40	80		mVp-p
	• others		40	100		mVp-p
Over voltage protection	Input voltage range	110		160		%Vo
Over current protection	Input voltage range					
	• 3.3/5VDC single output	110	160	230		%Io
	• others	110	140	190		%Io

Isolation specifications						
Item	Test condition	Min	Typ	Max	Units	
Isolation voltage	1 min, leak current lower than 1mA	1500				VDC
Isolation resistance	Test at 500VDC	1000				MΩ
Isolation capacitance	Input-output, 100KHz/0.1V		2000			pF

Example:
10DPWE_2415S1.5
10= 10Watt; D= DIP; P= series; W= wide input (2:1); E= Cost effective;
18-36Vin; 15Vout; S= single output; 1.5= 1500VDC

1. At 0%~5% load, the Max. output voltage accuracy of ±5VDC output converter is ±5%, the Max. output voltage accuracy of 3.3VDC 5VDC output converter is ±3%;
 2. When testing from 0% to 100% load working conditions load regulation index of ±5%;
 3. 0%-5% load ripple & noise is no more than 5%Vo. Ripple and noise are measured by "parallel cable" method.

10DPWE_1.5 Series

10W - Single/Dual Output - Wide Input - Isolated & Regulated
DC-DC Converter

EMC specifications				
EMI	CE	CISPR32/EN55032 CLASS A (Bare component) / CLASS B (See EMC recommended circuit, ②)		
EMI	RE	CISPR32/EN55032 CLASS A (Bare component) / CLASS B (See EMC recommended circuit, ②)		
EMS	ESD	IEC/EN61000-4-2	Contact ±4KV	perf. Criteria B
EMS	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A
EMS	EFT	IEC/EN61000-4-4	±2KV (See EMC recommended circuit, ①)	perf. Criteria B
EMS	Surge	IEC/EN61000-4-5	line to line ±2KV (See EMC recommended circuit, ①)	perf. Criteria B
EMS	CS	IEC/EN61000-4-6	10 Vr.m.s	perf. Criteria A
EMS	Immunities of voltage dip, drop and short interruption	IEC/EN61000-4-29	0%-70%	perf. Criteria B

Part Number	Input Voltage [VDC]		Output Voltage [VDC]	Output Current [mA] Full load	Efficiency ² (% , Min./Typ.) @ Full Load	Max. Capacitive load ³ [µF]
	Nominal (Range)	Max ¹				
10DPWE_1203S1.5	12 (9-18)	20	3.3	2400	85/87	1200
10DPWE_1205S1.5	12 (9-18)	20	5	2000	85/87	1000
10DPWE_1212S1.5	12 (9-18)	20	12	833	85/87	470
10DPWE_1215S1.5	12 (9-18)	20	15	667	85/87	330
10DPWE_1224S1.5	12 (9-18)	20	24	416	86/88	100
10DPWE_2403S1.5	24 (18-36)	40	3.3	2400	85/87	1200
10DPWE_2405S1.5	24 (18-36)	40	5	2000	86/88	1000
10DPWE_2412S1.5	24 (18-36)	40	12	833	85/87	470
10DPWE_2415S1.5	24 (18-36)	40	15	667	85/87	330
10DPWE_2424S1.5	24 (18-36)	40	24	416	86/88	100
10DPWE_4803S1.5	48 (36-75)	80	3.3	2400	85/87	1200
10DPWE_4805S1.5	48 (36-75)	80	5	2000	86/88	1000
10DPWE_4812S1.5	48 (36-75)	80	12	833	85/87	470
10DPWE_4815S1.5	48 (36-75)	80	15	667	85/87	330
10DPWE_4824S1.5	48 (36-75)	80	24	416	86/88	100
10DPWE_1205D1.5	12 (9-18)	20	±5	±1000	81/83	1000
10DPWE_1212D1.5	12 (9-18)	20	±12	±416	85/87	470
10DPWE_1215D1.5	12 (9-18)	20	±15	±333	85/87	330
10DPWE_2405D1.5	24 (18-36)	40	±5	±1000	81/33	1000
10DPWE_2412D1.5	24 (18-36)	40	±12	±416	85/87	470
10DPWE_2415D1.5	24 (18-36)	40	±15	±333	85/87	330
10DPWE_4805D1.5	48 (36-75)	80	±5	±1000	81/83	1000
10DPWE_4812D1.5	48 (36-75)	80	±12	±416	85/87	470
10DPWE_4815D1.5	48 (36-75)	80	±15	±333	85/87	330

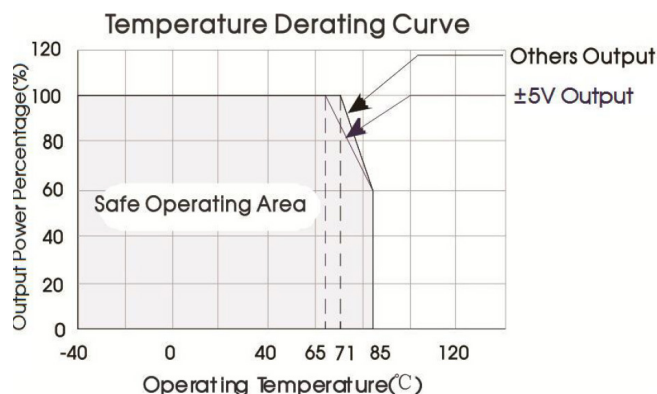
1) Absolute maximum rating without damage on the converter, but it isn't recommended;

2) Efficiency is measured in nominal input voltage and rated output load;

3) The capacitive loads of positive and negative outputs are identical;

4) We suggest to connect an external electrolytic capacitor if there is a spike voltage at the input, details please refer to application circuit.

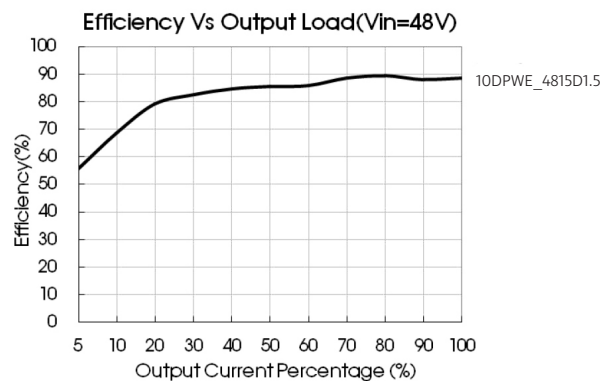
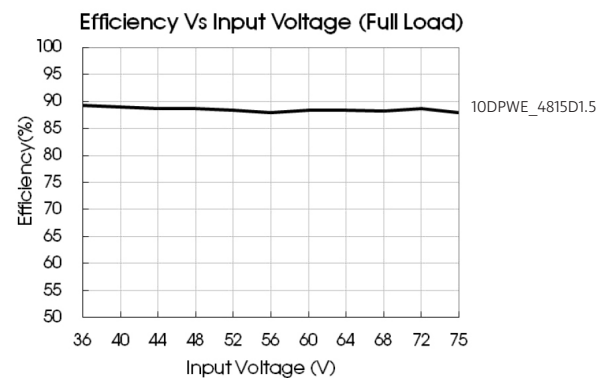
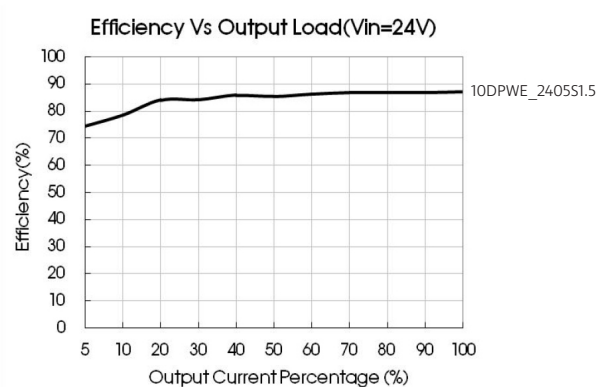
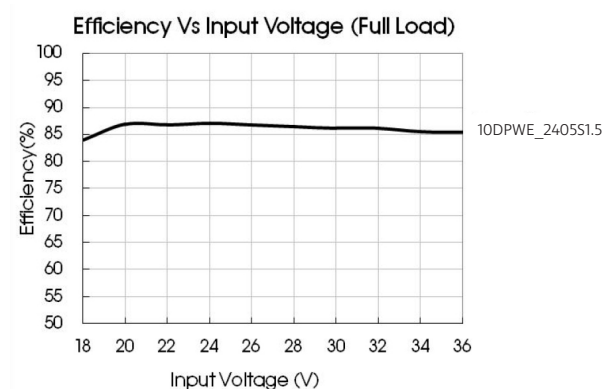
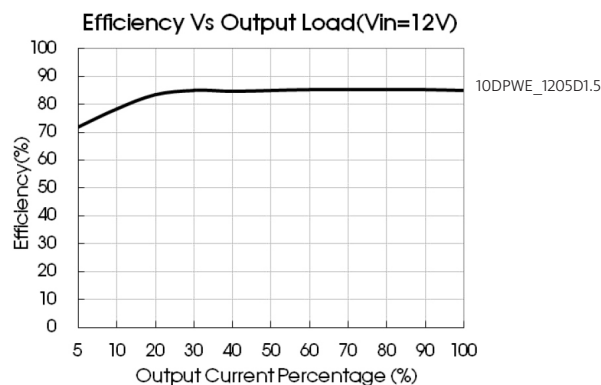
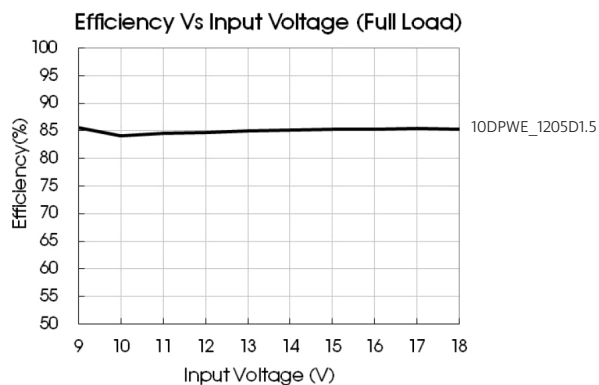
Typical characteristics



10DPWE_1.5 Series

10W - Single/Dual Output - Wide Input - Isolated & Regulated DC-DC Converter

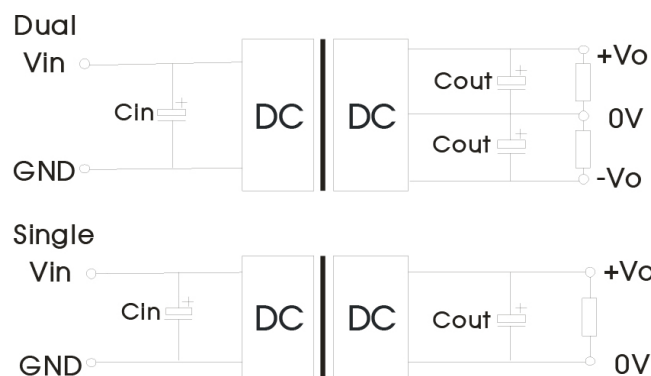
Recommended test circuit



Typical application

All the DC/DC converters of this series are tested according to the recommended circuit (see Fig. on the right) before delivery. If it is required to further reduce input and output ripple, properly increase the input & output of additional capacitors C_{in} and C_{out} or select capacitors of low equivalent impedance provided that the capacitance is no larger than the max. capacitive load of the product.

Vin (VDC)	Cin	Cout
12/24	100 μ F	10 μ F
48	10 μ F~47 μ F	10 μ F

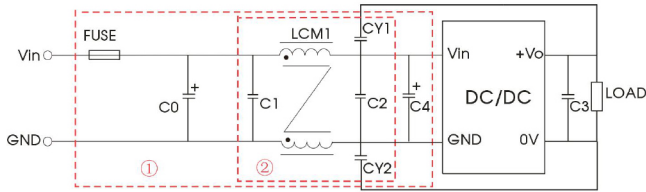


10DPWE_1.5 Series

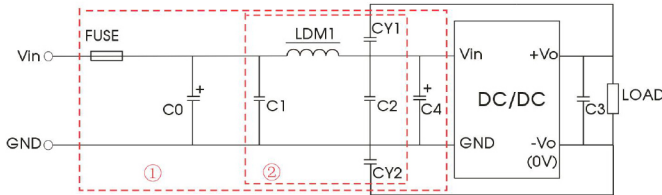
10W - Single/Dual Output - Wide Input - Isolated & Regulated DC-DC Converter

EMC solution recommended circuit

3.3VDC/5VDC single output:



others:



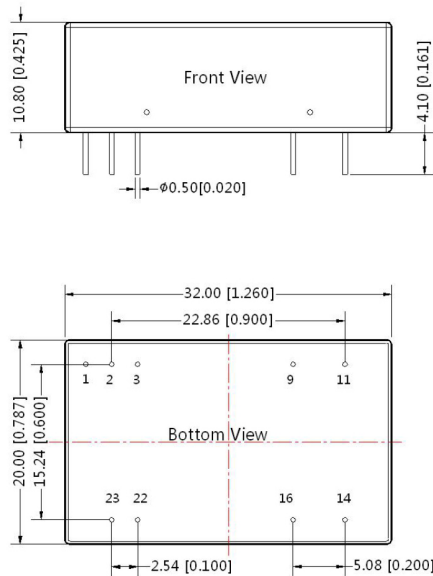
Notes: Part ① is used for EMC test and part ② for EMI filtering; selected based on needs.

Parameter description:

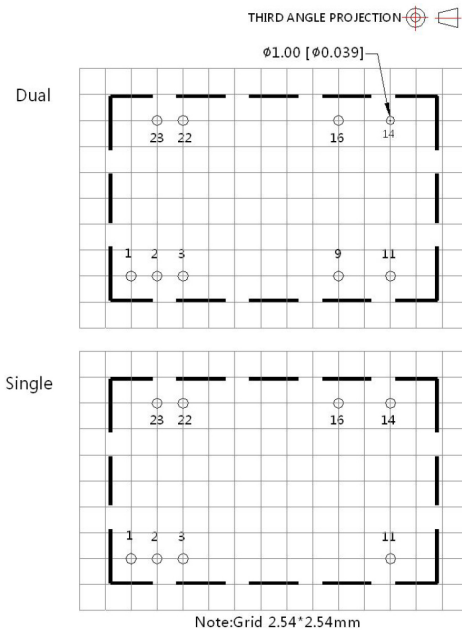
Model	Vin:12V	Vin:24V	Vin:48V
FUSE	Choose according to actual input current		
C0, C4	470μF/35V	330μF/50V	330μF/100V
C1, C2	10μF/50V		10μF/100V
C3	Refer to the Cout in Fig.2		
LDM1	10μH		
LCM1	1.4-1.7mH (TN150P-RH12.7*12.7*7.9)		
CY1, CY2	1nF/2KV		

The product does not support output in parallel with power per liter.

Mechanical dimensions



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



Pin-Out		
Pin	Single	Dual
1	Ctrl	Ctrl
2,3	GND	GND
9	No Pin	0V
11	NC	-Vo
14	+Vo	+Vo
16	0V	0V
22,23	Vin	Vin

NC: Pin to be isolated from circuit

Note:

- The maximum capacitive load offered were tested at input voltage range and full load;
- This series of products using reduced frequency technology, the switching frequency is test value of full load,When the load is reduced to below 50%, the switching frequency decreases with decreasing load.
- 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;
- All index testing methods in this datasheet are based on Company's corporate standards;
- We can provide product customization service, please contact our technicians directly for specific information;
- Products are related to laws and regulations: see „Features“ and „EMC“;
- Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.