

Descriptions

10W isolated, DC/DC Converter



Features

- Ultra-wide 4:1 input voltage range
- High efficiency up to 88%
- No-load power consumption as low as 0.12W
- I/O isolation test voltage: 1.5k VDC
- Operating ambient temperature range: -40°C to +85°C
- Input under-voltage protection, output short-circuit, over-current and over-voltage protection
- Meet CISPR32/EN55032 CLASS A, without extra components
- Industry standard pin-out
- Meets EN50155 standards

Applications

- industrial controls
- electric power
- Instrumentation
- communications
- railway

Selection Guide

Certification	Part No.	Input Voltage (VDC)		Output		Full Load Efficiency ^② (%) Min./Typ.	Capacitive Load ^③ (μF)Max.
		Nominal (Range)	Max. ^①	Voltage(VDC)	Current (mA) Max./Min.		
EN/BS EN	DWZP10-B2403	24 (9-36)	40	3.3	2400/0	84/86	1200
	DWZP10-B2405			5	2000/0	85/87	1000
	DWZP10-B2412			12	833/0	85/87	470
	DWZP10-B2415			15	667/0	85/87	330
	DWZP10-B2424			24	416/0	85/87	100
	DWZP10-B4803	48 (18-75)	80	3.3	2400/0	83/85	1200
	DWZP10-B4805			5	2000/0	84/86	1000
	DWZP10-B4812			12	833/0	85/87	470
	DWZP10-B4815			15	667/0	85/87	330
	DWZP10-B4824			24	416/0	86/88	100

Notes:

①Exceeding the maximum input voltage may cause permanent damage;

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

③We suggest to connect an external electrolytic capacitor if there is a spike voltage at the input, details please refer to application circuit.

Specifications

Product Specifications	Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Specifications	Input Current (full load / no-load)	24VDC nominal input series, nominal input voltage	3.3VDC single output	--	380/12	389/25	mA
			5VDC single output	--	474/6	485/15	
			others	--	502/5	515/12	
		48VDC nominal input series, nominal input voltage	3.3VDC single output	--	192/5	197/20	
			5VDC single output	--	240/6	245/15	
			others	--	251/4	258/8	
	Reflected Ripple Current	24VDC nominal input series, nominal input voltage		--	40	--	
		48VDC nominal input series, nominal input voltage		--	30	--	
	Surge Voltage (1sec. max.)	24VDC nominal input series		-0.7	--	50	VDC
		48VDC nominal input series		-0.7	--	100	
	Start-up Voltage	24VDC nominal input series		--	--	9	
		48VDC nominal input series		--	--	18	
	Under-voltage Protection	24VDC nominal input series		5.5	6.5	--	
		48VDC nominal input series		12	15.5	--	
	Input Filter			Pi filter			
	Hot Plug			Unavailable			
Ctrl ^①	Module on		Ctrl pin open or pulled high (3.5-12VDC)				
	Module off		Ctrl pin pulled low to GND (0-1.2VDC)				
	Input current when off		--	6	10	mA	
Output Specifications	Voltage Accuracy ^②	0%-100% load	3.3VDC/5VDC single output	--	± 0.5	± 2	%
			Others	--	±1	±3	
	Linear Regulation	Input voltage variation from low to high at full load	Vo1	--	±0.2	±0.5	
	Load Regulation ^③	5%-100% load	Vo1	--	±0.5	±1	
	Transient Recovery Time			--	300	500	μs
	Transient Response Deviation	25% load step change, nominal input voltage	3.3VDC/5VDC single output	--	±5	±8	%
			Others	--	±3	±5	
	Temperature Coefficient	Full load		--	--	±0.03	%/°C
	Ripple & Noise ^④	20MHz bandwidth		--	40	80	mVp-p
	Over-voltage Protection	Input voltage range		110	--	160	%Vo
	Over-current Protection	Input voltage range	3.3VDC/5VDC single output	110	160	230	%Io
			Others	110	140	190	
	Short-circuit Protection	Input voltage range		Continuous, self-recovery			
General Specifications	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	--	2000	--	pF
	Operating Temperature	See Fig. 1	-40	--	+85	°C
	Storage Temperature		-55	--	+125	
	Storage Humidity	Non-condensing	5	--	95	%RH
	Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds	--	--	+300	°C
	Vibration(EN62368)		10-150Hz, 5G, 0.75mm. along X, Y and Z			
	Vibration(EN50155)		IEC/EN61373 - Category 1, Grade B			
	Switching Frequency ^⑤	PWM mode	--	350	--	kHz
	MTBF	MIL-HDBK-217F@25°C	1000	--	--	k hours
Mechanical Specifications	Case Material	Aluminum alloy				
	Dimensions	32.00 x 20.00 x 10.80mm				
	Weight	12.0g(Typ.)				
	Cooling Method	Free air convection				

Note:

①The Ctrl pin voltage is referenced to input pin GND;

②Output voltage accuracy of 3.3VDC/5VDC output converter is $\pm 3\%$;

③Load regulation for 0% - 100% load increases to $\pm 5\%$;

④Under 0% -5% load conditions, ripple & noise does not exceed 5%Vo;

⑤Switching frequency is measured at full load. The module reduces the switching frequency for light load (below 50%) efficiency improvement.

Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032	CLASS A (without extra components)/ CLASS B (see Fig.3-② for recommended circuit)			
	RE	CISPR32/EN55032	CLASS A (without extra components)/ CLASS B (see Fig.3-② for recommended circuit)			
Immunity	ESD	IEC/EN61000-4-2	Contact $\pm 4\text{kV}$			perf. Criteria B
	RS	IEC/EN61000-4-3	10V/m			perf. Criteria A
	EFT	IEC/EN61000-4-4	$\pm 2\text{kV}$ (see Fig.3-① for recommended circuit)			perf. Criteria B
	Surge	IEC/EN61000-4-5 circuit)	line to line $\pm 2\text{kV}$ (see Fig.3-①for recommended			perf. Criteria B
	CS	IEC/EN61000-4-6	10 Vr.m.s			perf. Criteria A
	Immunities of voltage dip, drop and short interruption	IEC/EN61000-4-29	0%, 70%			perf. Criteria B

Electromagnetic Compatibility (EMC)(EN50155)

EMI	CE	EN50121-3-2	150kHz-500kHz	99dBuV(see Fig.3-② for recommended circuit)	
		EN55016-2-1	500kHz-30MHz	93dBuV(see Fig.3-② for recommended circuit)	
	RE	EN50121-3-2	30MHz-230MHz	40dBuV/m at 10m(see Fig.3-② for recommended circuit)	
		EN55016-2-1	230MHz-1GHz	47dBuV/m at 10m(see Fig.3-② for recommended circuit)	
EMS	ESD	EN50121-3-2	Contact $\pm 6\text{kV}$ /Air $\pm 8\text{kV}$		perf. Criteria B
	RS	EN50121-3-2	20V/m		perf. Criteria A
	EFT	EN50121-3-2	$\pm 2\text{kV}$ 5/50ns 5kHz(see Fig.3-① for recommended circuit)		perf. Criteria A
	Surge	EN50121-3-2	line to line $\pm 1\text{kV}$ (42 Ω , 0.5 μF) (see Fig.3-① for recommended circuit)		perf. Criteria A

CS

EN50121-3-2 0.15MHz-80MHz 10 Vr.m.s

perf. Criteria A

Characteristic Curve

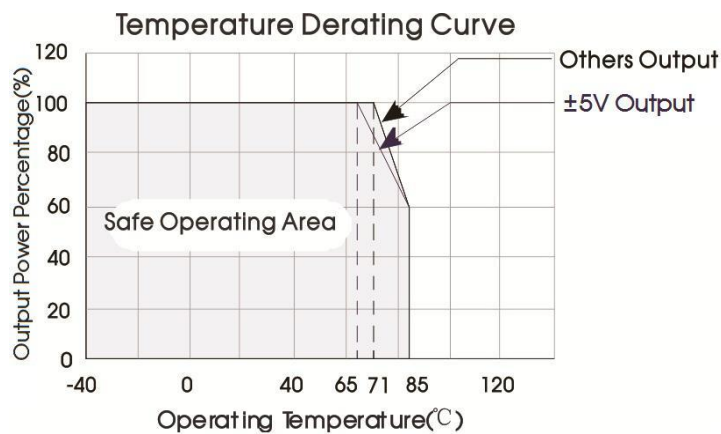
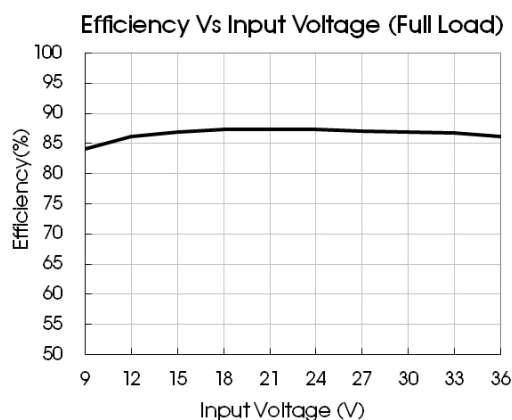
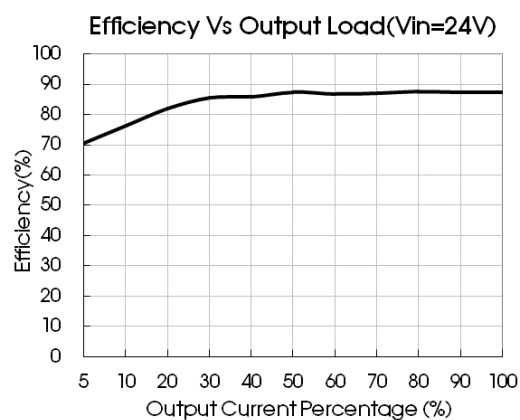


Fig. 1

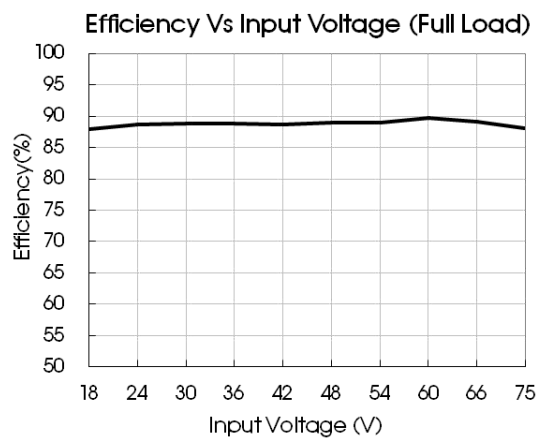
DWZP10-B2405



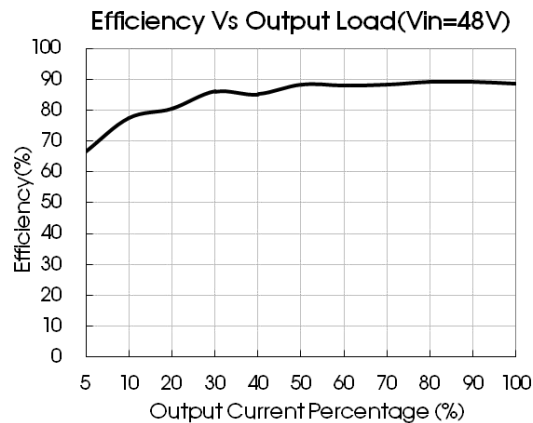
DWZP10-B2405



DWZP10-B4815



DWZP10-B4815



Design Reference

1. Typical application

All 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 C_{in} and C_{out} and/or by selecting capacitors with a low ESR (equivalent series resistance). Also make sure that the capacitance is not exceeding the max. capacitive load value of the product.



Fig. 2

Vin(VDC)	Vout(VDC)	Cin	Cout
24	3/5	100μF/50V	10μF/16V
	12/15		10μF/25V
	24		10μF/50V
48	3/5	10μF - 47μF/100V	10μF/16V
	12/15		10μF/25V
	24		10μF/50V

2. EMC compliance circuit

3.3VDC/5VDC single output:

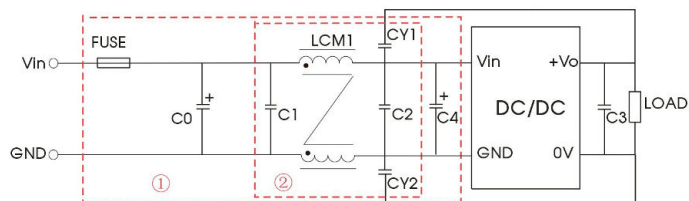
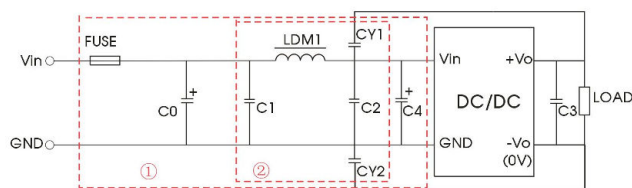


Fig. 3

Parameter description:

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

Others:



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

3. The products do not support parallel connection of their output

