Descriptions

10W isolated，DC-DC Converter



RoHS

3 Years Warranty

c UL us Report UL62368-1

CE Report EN62368-1

UKCA Report BS EN62368-1

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 voltage1.5k VDC
- Input under-voltage protection, output short-circuit, over-current, over-voltage protection
- Operating ambient temperature range: -40℃ to +85℃
- Meets CISPR32/EN55032 CLASS A, without extra components
- Input reverse polarity protection available with Chassis (E2S) or 35mm DIN-Rail mounting (D4S) version
- Meets EN50155 railway standard
- Industry standard pin-out

Applications

- Industrial Control,
- Electric Power
- Instruments
- Communication
- Railway

Selection Guide

Certification	Part No. ①	Input Voltage (VDC)		Output		Full Load Efficiency④ (%)Min./Typ.	Capacitive Load⑤ (μF)Max.
		Nominal② (Range)	Max. ③	Voltage (VDC)	Current (mA) Max./Min.		
EN/BS EN	*DWMD10-A2405	24 (9-36)	40	±5	±1000/0	81/83	1000
--	*DWMD10-A2405H(E2S/D4S)						
EN/BS EN	DWMD10-A2409			±9	±555/0	84/86	680
UL	DWMD10-A2409H(E2S/D4S)						
UL/EN/BS EN	*DWMD10-A2412			±12	±416/0	85/87	470
UL	*DWMD10-A2412(H)(E2S/D4S)						
UL/EN/BS EN	DWMD10-A2415(D4S)			±15	±333/0	85/87	330
UL	DWMD10-A2415H(E2S/D4S)						
EN/BS EN	*DWMD10-A2424			±24	±208/0	85/87	100
--	*DWMD10-A2424H(E2S/D4S)						
EN/BS EN	DWMD10-B2403			3.3	2400/0	75/77	2200
--	DWMD10-B2403H(E2S/D4S)						
UL/EN/BS EN	DWMD10-B2405(D4S)			5	2000/0	80/82	2200
UL	DWMD10-B2405H(E2S/D4S)						
EN/BS EN	DWMD10-B2409			9	1111/0	83/85	680
--	DWMD10-B2409H(E2S/D4S)						
UL/EN/BS EN	DWMD10-B2412(E2S/D4S)			12	833/0	84/86	470
UL	DWMD10-B2412H(E2S/D4S)						
EN/BS EN	DWMD10-B2415			15	667/0	84/86	330
--	DWMD10-B2415H(E2S/D4S)						
EN/BS EN	DWMD10-B2424			24	416/0	86/88	100
UL	DWMD10-B2424(H)(E2S/D4S)						
EN/BS EN	*DWMD10-A4805	48 (18-75)	80	±5	±1000/0	81/83	1000
--	*DWMD10-A4805H(E2S/D4S)						
EN/BS EN	*DWMD10-A4812			±12	±416/0	85/87	470
--	*DWMD10-A4812H(E2S/D4S)						
EN/BS EN	*DWMD10-A4815			±15	±333/0	85/87	330
--	*DWMD10-A4815H(E2S/D4S)						
EN/BS EN	*DWMD10-A4824			±24	±208/0	85/87	100
--	*DWMD10-A4824H(E2S/D4S)						
EN/BS EN	*DWMD10-B4803			3.3	2400/0	77/79	2200
--	*DWMD10-B4803H(E2S/D4S)						
EN/BS EN	*DWMD10-B4805(E2S)			5	2000/0	81/83	2200
--	*DWMD10-B4805H(D4S)						
EN/BS EN	*DWMD10-B4812			12	833/0	85/87	470
--	*DWMD10-B4812H(E2S/D4S)						
EN/BS EN	*DWMD10-B4815			15	667/0	85/87	330
--	*DWMD10-B4815H(E2S/D4S)						
EN/BS EN	*DWMD10-B4824(D4S)			24	416/0	86/88	100

--	*DWMD10-B4824H(E2S)						

Notes:
①Use "H" suffix for heat sink mounting, "E2S" suffix for chassis mounting and "D4S" suffix for DIN-Rail mounting;
②The E2S and D4S Model's start-up and minimum input voltages are increased by 1VDC due to the input reverse polarity protection circuit;
③Exceeding the maximum input voltage may cause permanent damage;
④Efficiency is measured at nominal input voltage and rated output load; efficiencies for E2S and D4S Model's is decreased by 2% due to the input reverse polarity protection circuit;
⑤The specified maximum capacitive load value for positive and negative output is identical;
⑥Products marked with "*" need an input capacitor in order to meet conducted specifications of CISPR32/EN55032 CLASS A;
⑦Product images are for reference only; the actual product shall prevail.

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 output	--	429/5	440/12	mA
			Others	--	502/5	521/12	
		48VDC nominal input series, nominal input voltage	3.3VDC output	--	190/4	215/8	
			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	
	Input Under-voltage Protection	24VDC nominal input series		5.5	6.5	--	
		48VDC nominal input series		12	15.5	--	
	Start-up Time	Nominal input voltage & constant resistance load		--	10	--	ms
	Input Filter			Pi filter			
	Hot Plug			Unavailable			
	Ctrl①	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 Accuracy②	0%-100% load		--	±1	±3	%
	Linear Regulation	Input voltage variation from low to high at full load	Vo1	--	±0.2	±0.5	
			Vo2	--	±0.5	±1	
	Load Regulation③	5%-100% load	Vo1	--	±0.5	±1	
			Vo2	--	±0.5	±1.5	
	Cross Regulation	Dual output, Vo1 load at 50%, Vo2 load at range of 10%-100%		--	--	±5	
	Transient Recovery Time	25% load step change, nominal input voltage		--	300	500	μs
	Transient Response Deviation			--	±3	±5	%

	Temperature Coefficient	Full load	--	--	±0.03	%/℃
	Ripple & Noise④	20MHz bandwidth, 5%-100% load	--	40	80	mVp-p
	Over-voltage Protection	Input voltage range	110	--	160	%Vo
	Over-current Protection		110	140	190	%Io
	Short-circuit Protection		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	--	1000	--	pF
	Operating Temperature	See Fig. 1	-40	--	+85	℃
	Storage Temperature		-55	--	+125	
	Storage Humidity	Non-condensing	5	--	95	%RH
	Pin Soldering Resistance Temperature⑤	Soldering spot is 1.5mm away from the case, 10 seconds max.	--	--	+300	℃
		Wave soldering, maximum 10 seconds	255	260	265	
	Vibration		IEC/EN61373 - Category 1, Grade B			
	Switching Frequency⑥	PWM mode	--	350	--	kHz
	MTBF	MIL-HDBK-217F@25℃	1000	--	--	k hours

Mechanical Specifications	Case Material	Aluminum alloy		
	Dimensions	Horizontal package (without heat sink)		25.40 × 25.40 × 11.70 mm
		Horizontal package (with heat sink)		25.40 × 25.40 × 16.20 mm
		E2S chassis mounting		76.00 × 31.50 × 21.20 mm
		D4S DIN-rail mounting		76.00 × 31.50 × 25.80 mm
	Weight	without heat sink	Horizontal package/E2S chassis mounting/D4S DIN-Rail mounting	12.5g/36.0g/56.0g (Typ.)
		with heat sink	Horizontal package	17.0g(Typ.)
	Cooling method	Free air convection		

Note:
①The Ctrl pin voltage is referenced to input GND;
②Output voltage accuracy of ±5VDC/±9VDC output converter for 0%-5% load is ±5% max;
③Load regulation for 0%-100% load is ±5%;
④Under 0% -5% load conditions, ripple & noise does not exceed 5%Vo. The "parallel cable" method is used for Ripple and Noise test;
⑤The pin soldering temperature tolerance is not the actual temperature set by the soldering iron but the temperature required for proper solder joints. The actual temperature set by the customer should be determined comprehensively based on factors such as PCB thickness, copper coverage, soldering iron power, and soldering iron tip selection;
⑥Switching frequency is measured at full load. The module reduces the switching frequency for light load (below 50%) efficiency improvement.

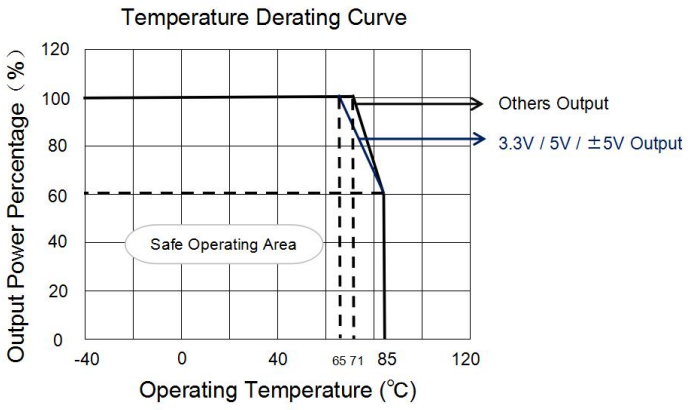
Electromagnetic Compatibility (EMC)

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 ±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.3-①for recommended circuit)	perf. Criteria B
	CS	IEC/EN61000-4-6	3 Vr.m.s	perf. Criteria A
	Voltage dips, short interruptions and voltage variations immunity	IEC/EN61000-4-29	0%, 70%	perf. Criteria B

Electromagnetic Compatibility (EMC) (EN50155)

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 ±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.3-①for recommended circuit)	perf. Criteria B
	CS	IEC/EN61000-4-6	3 Vr.m.s	perf. Criteria A
	Voltage dips, short interruptions and voltage variations immunity	IEC/EN61000-4-29	0%, 70%	perf. Criteria B

Typical Characteristic Curves



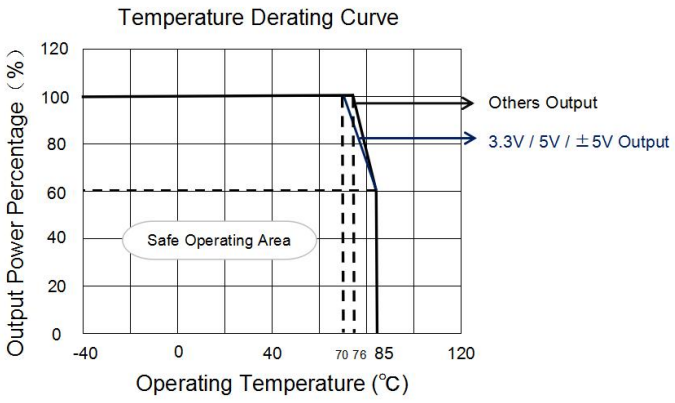
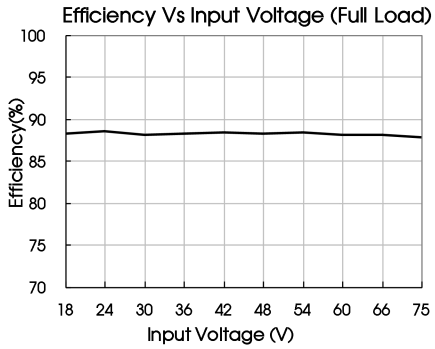
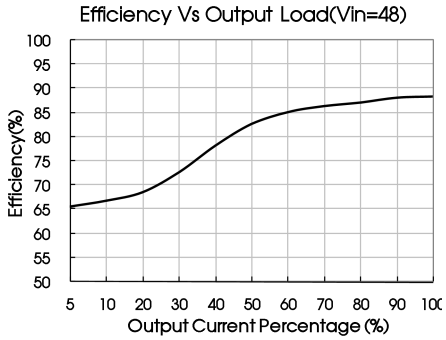


Fig. 1

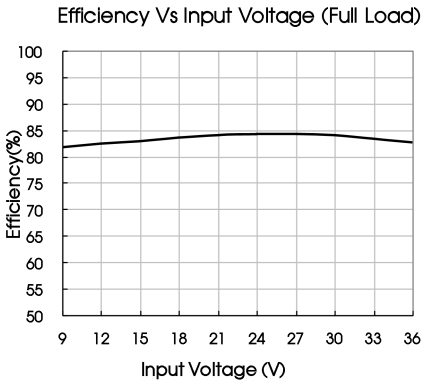
DWMD10-A4815



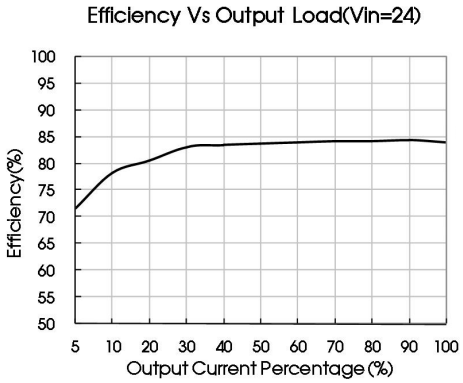
DWMD10-A4815



DWMD10-B2405



DWMD10-B2405



Design Reference

1. Typical application

①All the DC/DC converters of this series are tested before delivery using the recommended circuit shown in Fig. 2.

②Input 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.

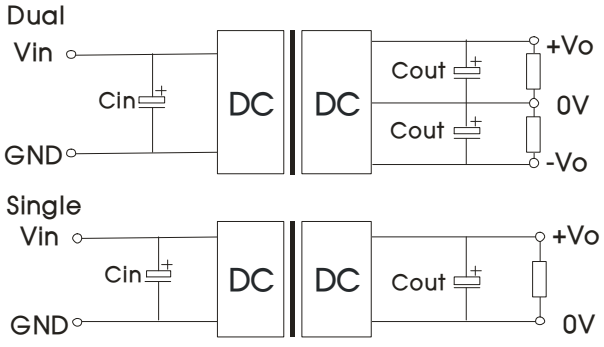


Fig. 2

Vin(VDC)	Vout(VDC)	Cin	Cout
24	3.3/5/±5	100μF/50V	10μF/16V
	9/12/15/±9/ ±12/±15		10μF/25V
	24/±24		10μF/50V
48	3.3/5/±5	10μF - 47μF/100V	10μF/16V
	9/12/15/±9/ ±12/±15		10μF/25V
	24/±24		10μF/50V

2. EMC compliance circuit

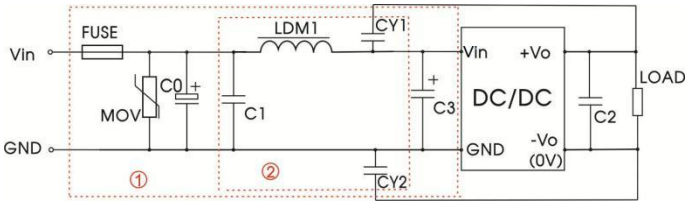


Fig. 3

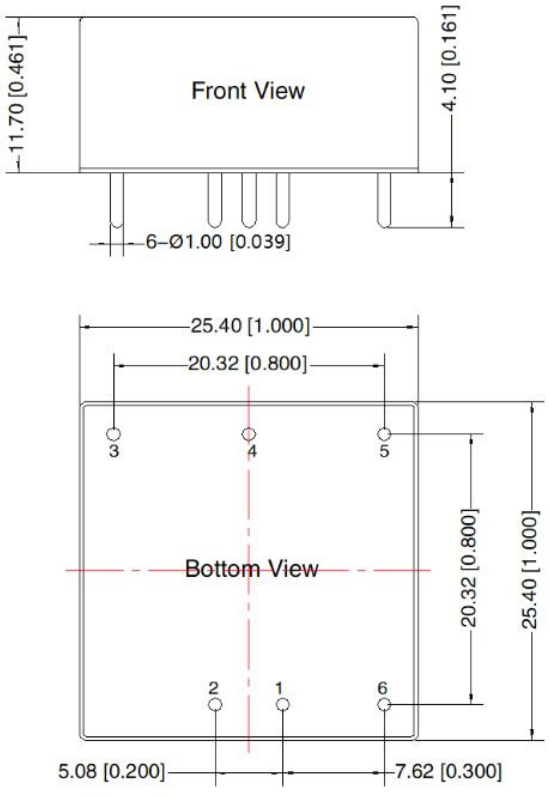
Notes: For EMC tests we use Part ① in Fig. 3 for immunity and part ② for emissions test. Selecting based on needs.

Parameter description:

Model	Vin: 24VDC	Vin: 48VDC
FUSE	Choose according to actual input current	
MOV	S20K30	S14K60
C0, C3	330μF/50V	330μF/100V
C1	1μF/50V	1μF/100V
C2	Refer to the Cout in Fig.2	
LDM1	4.7μH	
CY1, CY2	1nF/2kV	

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

DWMD10-A&Bxxxx Horizontal Package (without heat sink) Dimensions

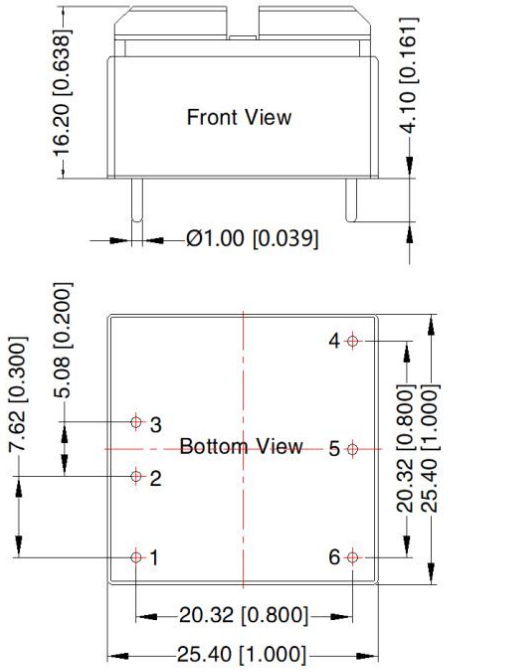


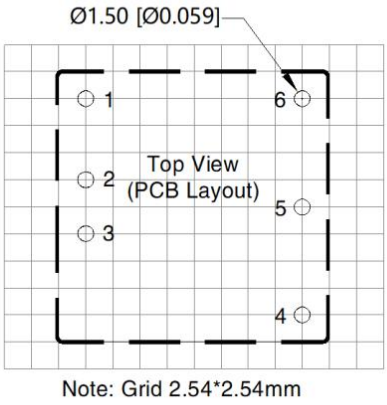
Pin-Out		
Pin	Single	Dual
1	GND	GND
2	Vin	Vin
3	+Vo	+Vo
4	No Pin	0V
5	0V	-Vo
6	Ctrl	Ctrl

Note:
Unit: mm[inch]
PIN1/2/3/4/5/6: ϕ 1.0mm
Pin diameter tolerances: ±0.10[±0.004]
General tolerances: ±0.50[±0.020]

DWMD10-A&BxxxxH Horizontal Package (with heat sink) Dimensions

THIRD ANGLE PROJECTION





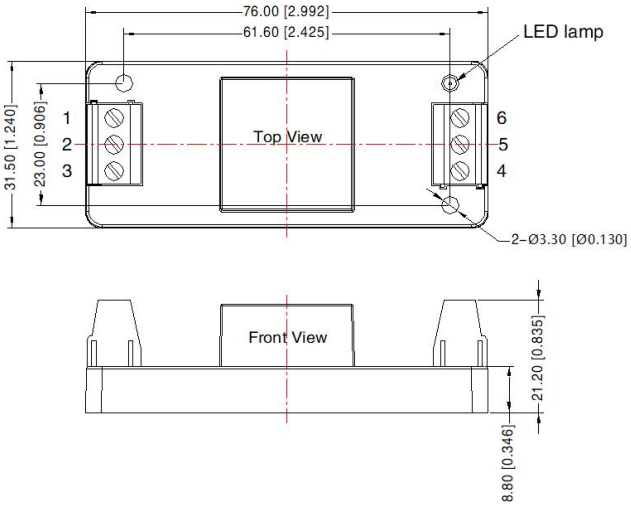
Note: Grid 2.54*2.54mm

Pin–Out		
Pin	Single	Double
1	Ctrl	Ctrl
2	GND	GND
3	Vin	Vin
4	+Vo	+Vo
5	No Pin	0V
6	0V	–V0

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

DWMD10-A&BxxxxE2S Dimensions

THIRD ANGLE PROJECTION

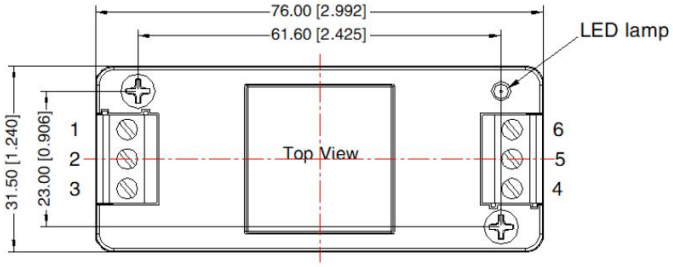


Pin–Out						
Pin	1	2	3	4	5	6
Single	Ctrl	GND	Vin	+Vo	NC	0V
Dual	Ctrl	GND	Vin	+Vo	0V	–Vo

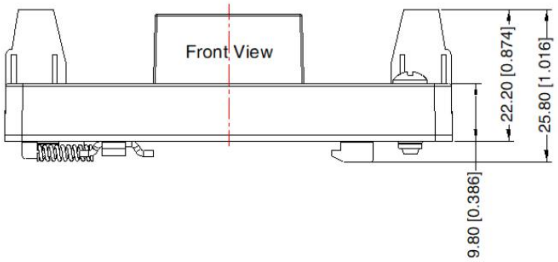
Note:
Unit: mm[inch]
Wire range: 24–12 AWG
Tightening torque: Max 0.4 N ▪ m
General tolerances: ± 1.00[± 0.039]

DWMD10-A&BxxxxD4S Dimensions

THIRD ANGLE PROJECTION



Pin–Out						
Pin	1	2	3	4	5	6
Single	Ctrl	GND	Vin	+Vo	NC	0V
Dual	Ctrl	GND	Vin	+Vo	0V	–Vo



Note:
Unit: mm[inch]
Mounting rail: TS35
Wire range: 24–12 AWG
Tightening torque: Max 0.4 N ▪ m
General tolerances: ± 1.00[± 0.039]

Note:

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℃, humidity<75%RH with nominal input voltage and rated output load;
3. All index testing methods in this datasheet are based on our 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;
7. The image certification marks are for reference only; please refer to the selection table for actual specifications. Certification is based on the physical mark or packaging label.