Descriptions

3W isolated，DC/DC Converter

RoHS

Report EN62368-1

Report BS EN62368-1

Features

- Ultra-wide 4:1 input voltage range
- High efficiency up to 84%
- No-load power consumption as low as 0.10W
- I/O Isolation test voltage 1.5k VDC
- Input under-voltage protection, output short-circuit protection, over-current protection
- Operating ambient temperature range: -40℃ to +85℃
- Industry standard pin-out

Applications

- Industrial control
- Power
- Instrumentation
- Communication

Selection Guide

Certification	Part No.	Input Voltage (VDC)		Output		Full Load Efficiency② (%) Min./Typ.	Capacitive Load (μF)Max.
		Nominal (Range)	Max. ①	Voltage (VDC)	Current (mA) Max./Min.		
--	DWMT3-B2403	24 (9-36)	40	3.3	728/0	73/75	2200
EN/BS EN	DWMT3-B2405			5	600/0	78/80	2200
--	DWMT3-B2409			9	333/0	78/80	1000
EN/BS EN	DWMT3-B2412			12	250/0	80/82	680
EN/BS EN	DWMT3-B2415			15	200/0	81/83	470
EN/BS EN	DWMT3-B2424			24	125/0	80/82	100
EN/BS EN	DWMT3-B4803	48 (18-75)	80	3.3	728/0	73/75	2200
EN/BS EN	DWMT3-B4805			5	600/0	77/79	2200
EN/BS EN	DWMT3-B4812			12	250/0	80/82	680
EN/BS EN	DWMT3-B4815			15	200/0	82/84	470
EN/BS EN	DWMT3-B4824			24	125/0	80/82	100

Note:
①Exceeding the maximum input voltage may cause permanent damage;
②Efficiency is measured at nominal input voltage and rated output load.

Specifications

Product Specifications	Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Specifications	Input Current (full load / no-load)	24VDC input series nominal input voltage	3.3V Output	--	134/4	138/7	mA
			24V Output	--	152/4	156/12	
			Others	--	154/4	161/7	
		48VDC input series nominal input voltage	3.3V Output	--	67/4	69/7	
			Others	--	77/4	82/7	
	Reflected Ripple Current	Nominal 24VDC input series		--	120	--	
		Nominal 48VDC input series		--	60	--	
	Surge Voltage (1sec. max.)	Nominal 24VDC input series		-0.7	--	50	VDC
		Nominal 48VDC input series		-0.7	--	100	
	Start-up Voltage	Nominal 24VDC input series		--	--	9	
		Nominal 48VDC input series		--	--	18	
	Input Under-voltage Protection	Nominal 24VDC input series		5.5	6.5	--	
		Nominal 48VDC input series		13	15.5	--	
	Start-up Time	Nominal input voltage & constant resistance load		--	10	--	ms
	Input Filter			C filter			
	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
	Hot Plug			Unavailable			
Output Specifications	Voltage Accuracy			--	±1	±3	%
	Linear Regulation	Input voltage variation from low to high at full load		--	±0.2	±0.5	
	Load Regulation	0%-100% load		--	±0.5	±1	
	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 & Noise②	20MHz bandwidth , 5%-100% load		--	30	120	mVp-p
	Over-current Protection	Input voltage range		--	150	250	%Io
	Short-circuit Protection			Continuous			
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	
	Case Temperature Rise	Ta=25℃, nominal input, full load output		--	+40	--	
	Pin Soldering Resistance	Soldering spot is 1.5mm away from case for		--	--	+300	

	Temperature	10 seconds				
	Storage Humidity	Non-condensing	5	--	95	%RH
	Reflow Soldering Temperature		Peak temp.≤245℃, maximum duration time≤ 60s at 217℃. For actual application, please refer to IPC/JEDEC J-STD-020D.1.			
	Vibration		10-55Hz, 10G, 30 Min. along X, Y and Z			
	Switching Frequency ③	PWM Mode	--	350	--	kHz
	MTBF	MIL-HDBK-217F@25℃	1000	--	--	k hours
	Moisture Sensitivity Level (MSL)	IPC/JEDEC J-STD-020D.1	Level 1			
Mechanical Specifications	Case Material	Black plastic; flame-retardant and heat-resistant				
	Dimensions	19.20 x 18.10 x 10.16 mm				
	Weight	3.5g (Typ.)				
	Cooling Method	Free air convection				

Note:

①The Ctrl pin voltage is referenced to input GND.

②Under 0% -5% load conditions, ripple & noise does not exceed 5%Vo. The "parallel cable" method is used for Ripple and Noise test.

③Switching 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 B (see Fig.3-② for recommended circuit)	
	RE	CISPR32/EN55032	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.3-① for 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

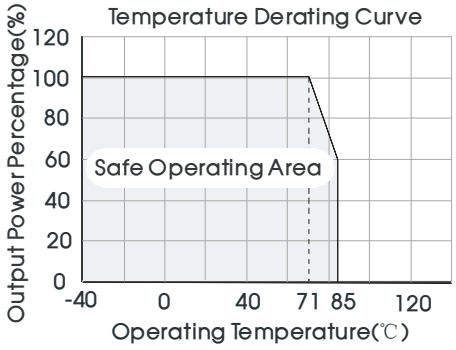
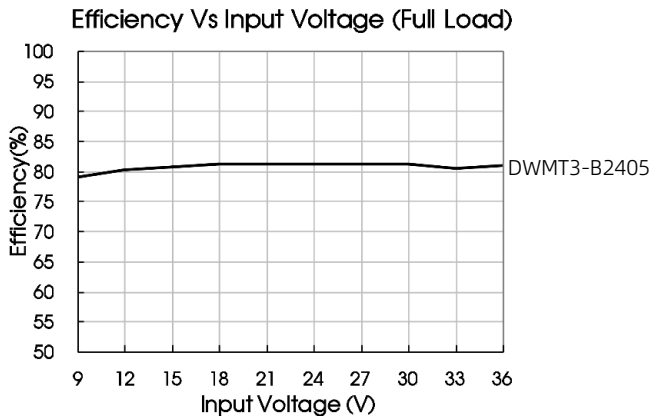
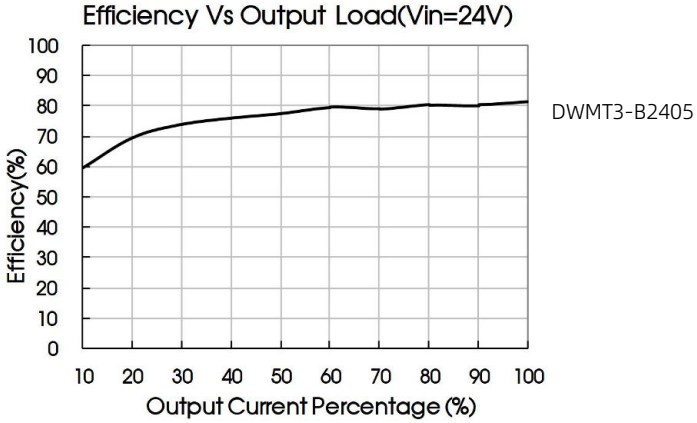
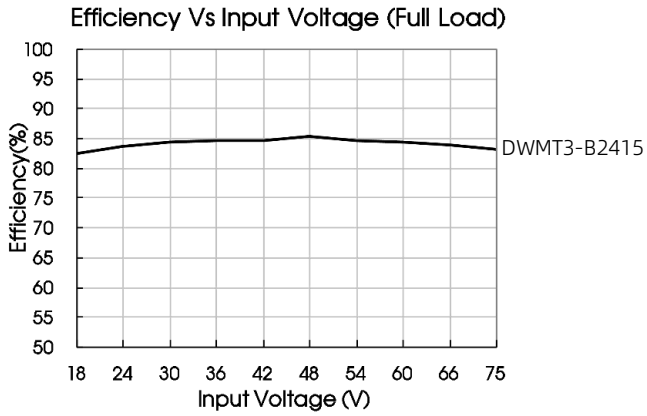
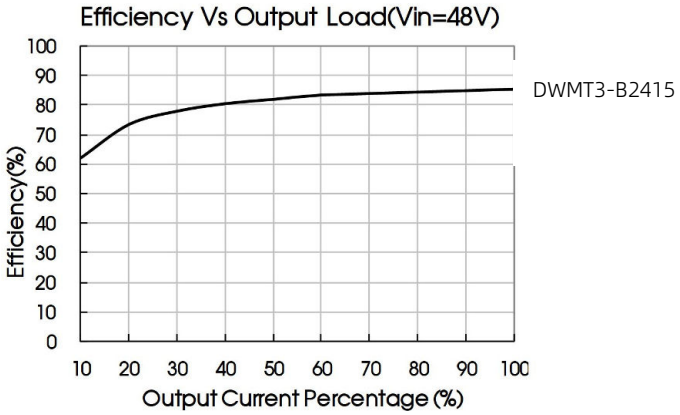


Fig. 1









Design Reference

1. 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.

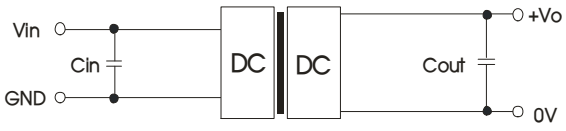


Fig. 2

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

2. EMC solution-recommended circuit

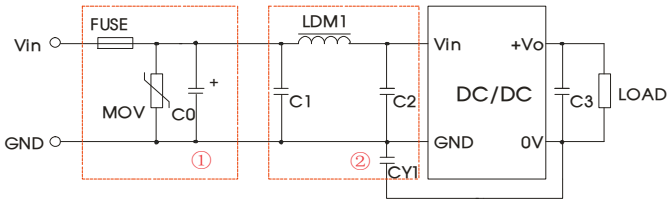


Fig. 3

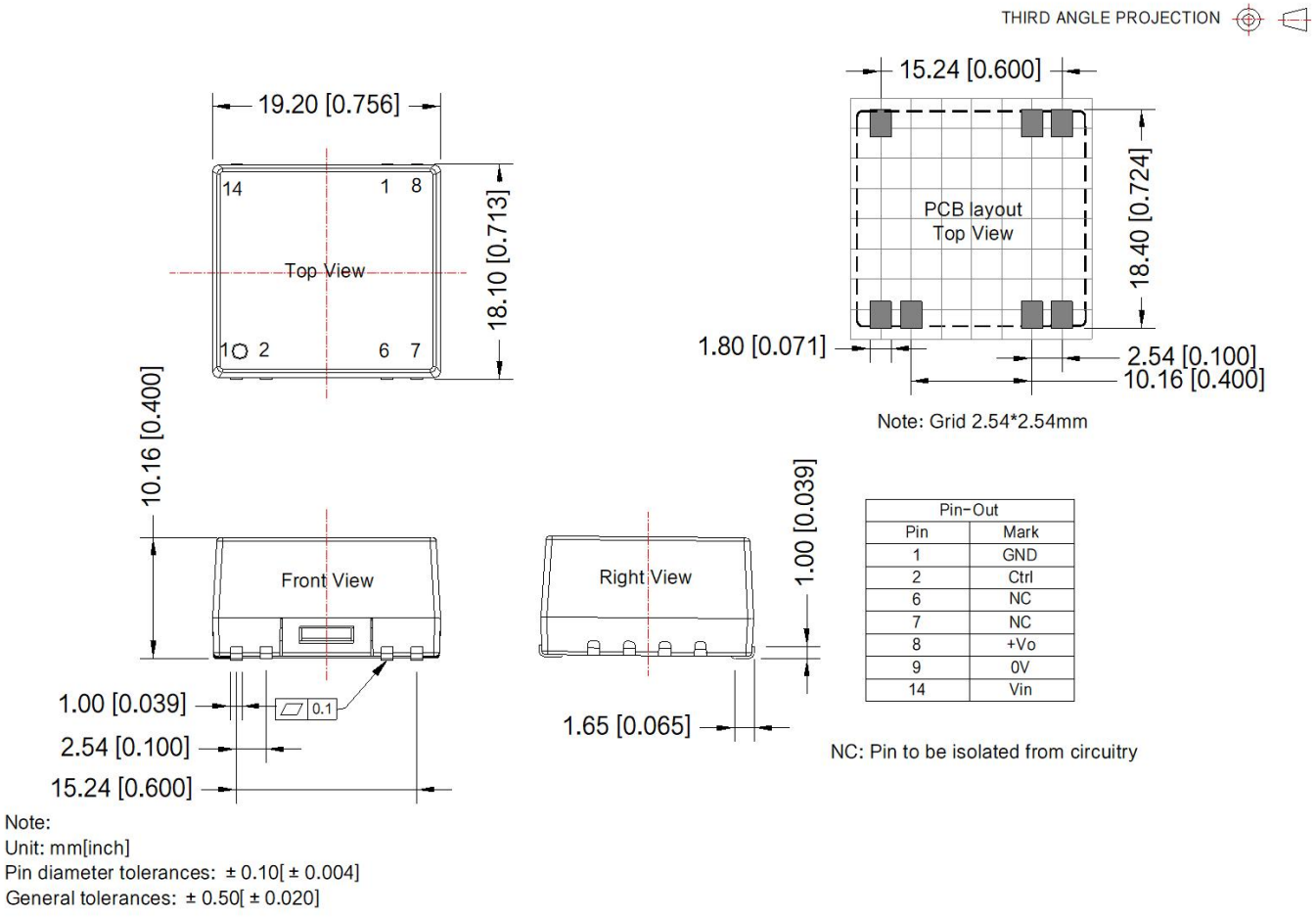
Notes: We use Part ① in Fig. 3 for immunity and part ② for emissions test. Selecting based on needs.

Parameter description:

Model	Vin: 24VDC	Vin: 48VDC
FUSE	Choose according to actual input current	
MOV	S20K30	S14K60
C0	680μF/50V	680μF/100V
C1/C2	4.7μF/50V	4.7μF/100V
C3	Refer to the Cout in Fig.2	
LDM1	12μH	
CY1	1nF/2kV	

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

Dimensions and Recommended Layout



Pin-Out	
Pin	Mark
1	GND
2	Ctrl
6	NC
7	NC
8	+Vo
9	0V
14	Vin

NC: Pin to be isolated from circuitry

Note:

1. Recommend to use module with more than 5% load, if not, the ripple of the product may exceeds the specification, but does not affect the reliability of the product;
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 Ta=25℃, humidity<75%RH with nominal input voltage and rated output load;
4. All index testing methods in this datasheet are based on 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.