Descriptions

2W isolated, DC-DC converter



RoHS

3 Years Warranty

CE Report EN62368-1

UKCA Report BS EN62368-1

Features

- Continuous short-circuit protection
- I/O isolation test voltage 1.5k VDC
- Operating ambient temperature range: -40℃ to +85℃
- High efficiency up to 86%
- No-load input current as low as 8mA
- Industry standard pin-out

Applications

- Pure digital circuits
- Low frequency analog circuits
- Relay-driven circuits
- Data switching circuits

Selection Guide

Certification	Part No.	Input Voltage (VDC)	Output		Full Load Efficiency (%) Min./Typ.	Capacitive Load (μF)Max.
		Nominal (Range)	Voltage(VDC)	Current (mA) Max./Min.		
EN/BS EN	DFM2-B0505	5 (4.5-5.5)	5	400/40	77/81	2400
	DFM2-B0509		9	222/22	80/84	1000
	DFM2-B0512		12	167/17	77/81	560
	DFM2-B0515		15	133/13	77/81	560
	DFM2-B0524		24	83/8	80/84	220
	DFM2-B1203	12 (10.8-13.2)	3.3	400/40	75/79	2400
	DFM2-B1205		5	400/40	78/82	2400
	DFM2-B1212		12	167/17	80/84	560
	DFM2-B2405	24 (21.6-26.4)	5	400/40	74/80	2400
	DFM2-B2415		15	133/13	78/84	560
	DFM2-B2424		24	83/8	80/86	220

Notes: *Product images are for reference only; the actual product shall prevail.

Specifications

Product characteristics	Item	Operating Conditions			Min.	Typ.	Max.	Unit
Input Specifications	Input Current (full load / no-load)	5VDC input		5VDC/12VDC/15VDC output	--	494/8	520/--	mA
				9VDC/24VDC output	--	477/8	500/--	
		12VDC input		3.3VDC output	--	140/8	147/--	
				5VDC output	--	204/8	214/--	
				12VDC output	--	199/8	209/--	
		24VDC input		5VDC output	--	105/8	113/--	
				15VDC output	--	100/8	107/--	
				24VDC output	--	97/8	104/--	
	Reflected Ripple Current				--	15	--	
	Surge Voltage (1sec. max.)	5VDC input			-0.7	--	9	VDC
		12VDC input			-0.7	--	18	
		24VDC input			-0.7	--	30	
	Input Filter				Capacitance filter			
	Hot Plug				Unavailable			
Output Specifications	Voltage Accuracy				See output regulation curves (Fig. 1)			
	Linear Regulation	Input voltage change: ±1%		3.3VDC output	--	--	±1.5	--
				Other output	--	--	±1.2	
	Load Regulation	10%-100% load	5VDC input	5VDC output	--	11	20	%
				9VDC/12VDC/15VDC output	--	8	15	
				24VDC output	--	6	15	
			12/24VDC input	3.3VDC output	--	10	20	
				5VDC output	--	7	15	
				12VDC output	--	7	10	
				15VDC output	--	4	10	
				24VDC output	--	3	10	
	Ripple & Noise①	20MHz bandwidth	5VDC input		--	75	200	mVp-p
			12/24VDC input	Other output	--	75	180	
				24VDC output	--	200	300	
	Temperature Coefficient	Full load			--	±0.02	--	%/℃
	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			--	20	--	pF
	Operating Temperature	Derating when operating temperature≥71℃ (see Fig. 2)			-40	--	85	℃
	Storage Temperature				-55	--	125	
	Case Temperature Rise	Ta=25℃			--	25	--	
	Pin Soldering Resistance Temperature②	Soldering spot is 1.5mm away from the case, 10 seconds max.			--	--	+300	
		Wave soldering, maximum 10 seconds			255	260	265	

	Storage Humidity	Non-condensing		5	--	95	%RH
	Vibration			10-150Hz, 5G, 0.75mm. along X, Y and Z			
	Switching Frequency	Full load, nominal input voltage	5VDC input	--	220	--	kHz
			12/24VDC input	--	260	--	
	MTBF	MIL-HDBK-217F@25℃		3500	--	--	k hours
Mechanical Specifications	Case Material	Black plastic; flame-retardant and heat-resistant (UL94V-0)					
	Dimensions	11.60 x 7.55 x 10.16 mm					
	Weight	1.6g(Typ.)					
	Cooling Method	Free air convection					

Note:

①The "parallel cable" method is used for Ripple and Noise test;

②The 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.

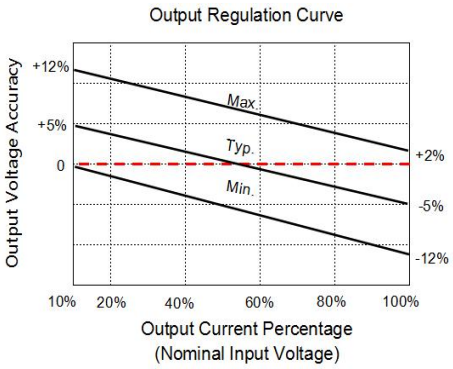
Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032 CLASS B
	RE	CISPR32/EN55032 CLASS B
Immunity	ESD	IEC/EN61000-4-2 Air ±8kV, Contact ±6kV perf. Criteria B

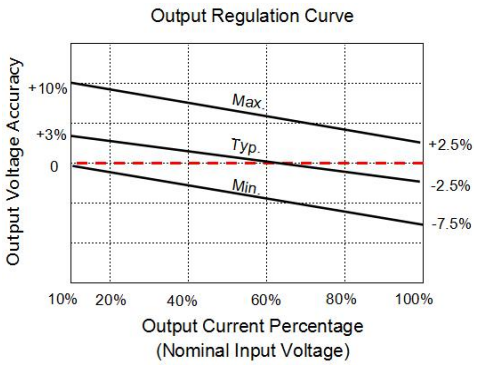
Note: see Fig. 4 for recommended circuit.

Characteristic Curve

3.3V output



5V input & 12/24V input 5V output



Other output

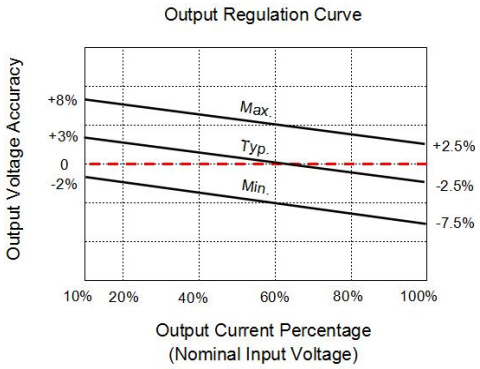


Fig. 1

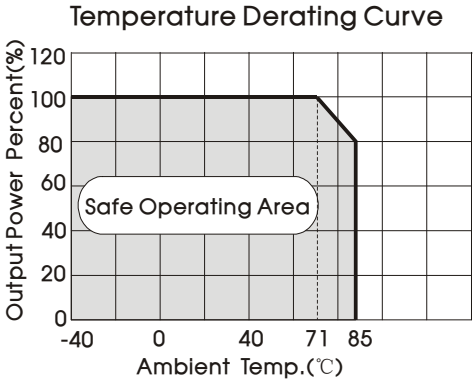
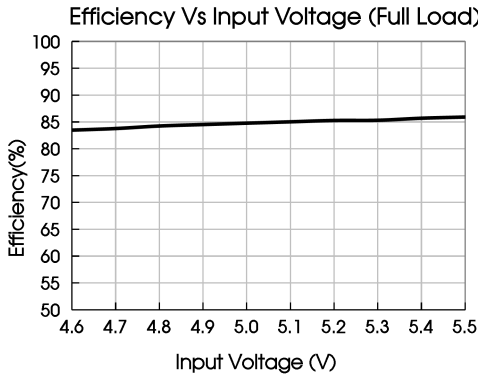
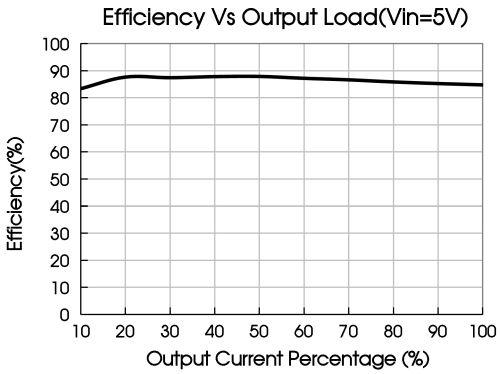
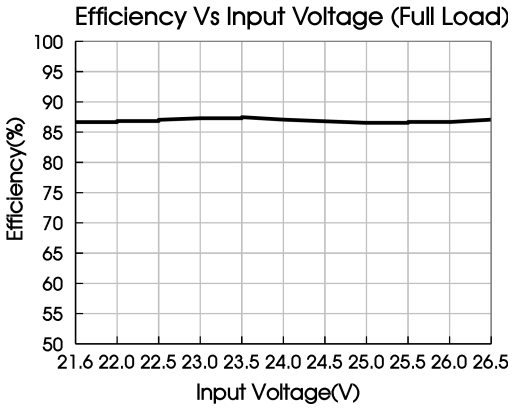


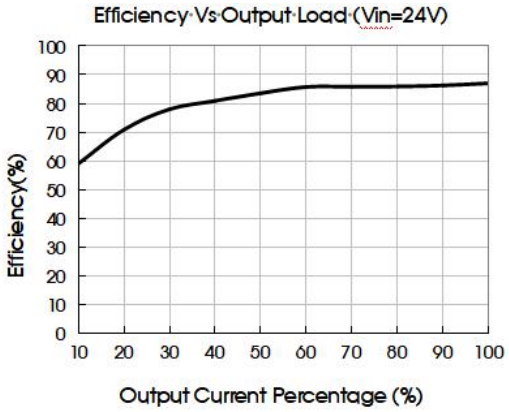
Fig. 2





DFM2-B0505





DFM2-B2415

Design Reference

1. Typical application

①Input and/or output ripple can be further reduced, by connecting a filter capacitor from the input and/or output terminals to ground as shown in Fig.3.

②Choosing suitable filter capacitor values is very important for a smooth operation of the modules, particularly to avoid start-up problems caused by capacitor values that are too high. For recommended input and output capacitor values refer to Table 1.



Fig.3

Table 1: Recommended input and output capacitor values

Vin	Cin	Vo	Cout
5VDC	4.7μF/16V	3.3VDC/5V	10μF/16V
12VDC	1μF/25V	9VDC	2.2μF/25V
24VDC	1μF/50V	12VDC/15V	1μF/25V
--	--	24VDC	1μF/50V

2. EMC compliance circuit

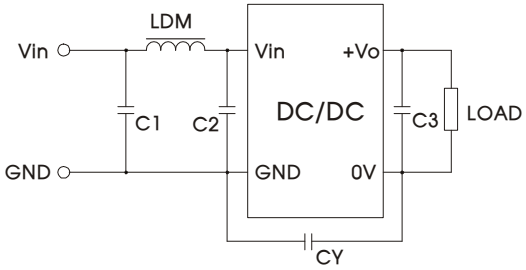
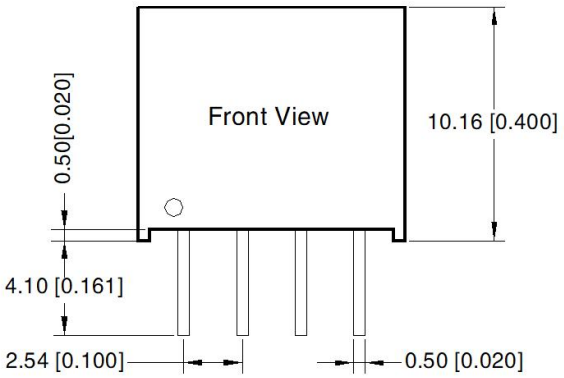


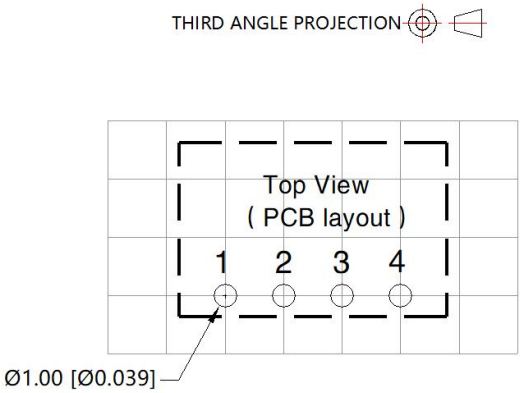
Fig. 4

Table 2: Recommended EMC filter values

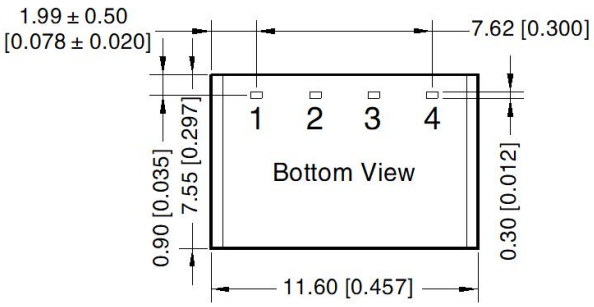
Input Voltage (VDC)		5V Input	12V/24V Input
Emissions	C1/C2	4.7μF /50V	4.7μF /50V
	CY	270pF /2kV	270pF /2kV
	C3	Refer to Cout in Fig. 3	
	LDM	6.8μH	6.8μH

Dimensions and Recommended





Note: Grid 2.54*2.54mm



Pin	Mark
1	GND
2	Vin
3	0V
4	+Vo

Note:
Unit: mm[inch]
Pin section tolerances: ± 0.10[± 0.004]
General tolerances: ± 0.25[± 0.010]

Notes:

1. If the product is not operated within the required load range, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
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 our company corporate standards;
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.