Descriptions

1W isolated, DC-DC converter



RoHS

3 Years Warranty

CE Report EN62368-1

UKCA Report BS EN62368-1

Features

- Continuous short-circuit protection
- No-load input current as low as 5mA
- Operating ambient temperature range: -40℃ to +85℃
- High efficiency up to 71%
- Compact SMD package
- I/O isolation test voltage 1.5k VDC
- Industry standard pin-out

Applications

- Pure digital circuit
- Voltage isolation conversion
- General low frequency analog circuit
- Relay drive circuit

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.		
--	DFXT1-IB0503	5 (4.75-5.25)	3.3	250/25	62/66	2400
EN/BS EN	DFXT1-IB0505		5	200/20	65/69	2400
--	DFXT1-IB0509		9	111/12	66/70	1000
	DFXT1-IB0512		12	84/9	67/71	560
	DFXT1-IB0515		15	67/7	67/71	560
EN/BS EN	DFXT1-IB1205	12 (11.4-12.6)	5	200/20	65/69	2400
	DFXT1-IB1212		12	84/9	67/71	560
	DFXT1-IB1215		15	67/7	67/71	220
	DFXT1-IB1505	15 (14.25-15.75)	5	200/20	64/68	2400
--	DFXT1-IB2405	24 (22.8-25.2)	5	200/20	63/69	2400
	DFXT1-IB2412		12	84/9	65/71	560
	DFXT1-IB2415		15	67/7	65/71	220

Note: *Product 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)	5VDC input	3.3VDC output	--	303/8	323/--	mA
			5VDC output	--	290/8	308/--	
			9VDC output	--	286/8	304/--	
			12VDC/15VDC output	--	282/9	299/--	
		12V input	5VDC output	--	121/8	128/--	
			12VDC/15VDC output	--	117/8	124/--	
		15V input		--	99/8	105/--	
		24V input	5VDC output	--	60/4	66/--	
			12VDC/15VDC output	--	59/4	64/--	
	Reflected Ripple Current			--	30	--	
	Input Filter			Capacitance filter			
	Hot Plug			Unavailable			
Output Specifications	Voltage Accuracy	100% load		--	--	±3	%
	Linear Regulation	Input voltage change: ±1%		--	--	±0.25	
	Load Regulation	10%-100% load	3.3VDC output	--	--	±3	
			All other output voltages	--	--	±2	
	Ripple & Noise①	20MHz bandwidth		--	30	100	mVp-p
	Temperature Coefficient	100% load	5VDC input	--	--	±0.03	%/℃
			12/15/24VDC input	--	±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.1)		-40	--	85	℃
	Storage Temperature			-55	--	125	
	Case Temperature Rise	Ta=25℃	3.3VDC output	--	30	--	
			All other output voltages	--	25	--	
	Pin Welding 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	5VDC input	--	--	95	%RH
			12/15/24VDC input	5	--	95	
	Vibration			10-150Hz, 5G, 30 Min. along X, Y and Z			
	Reflow Soldering Temperature③			Peak temp.≤245℃, maximum duration time≤60s over 217℃			
	Switching Frequency	100% load, nominal input voltage	5VDC input	--	250	--	kHz
			12/15/24VDC input	--	260	--	
	MTBF	MIL-HDBK-217F@25℃		3500	--	--	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 (UL94 V-0)
	Dimensions	15.24 x 11.40 x 7.25 mm
	Weight	1.2g(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;
③Please refer to IPC/JEDEC J-STD-020D.1.

Electromagnetic Compatibility (EMC)

Emissions (EMI)	CE	CISPR32/EN55032 CLASS B (see Fig. 3 for recommended circuit)	
	RE	CISPR32/EN55032 CLASS B (see Fig. 3 for recommended circuit)	
Immunity (EMS)	ESD	IEC/EN61000-4-2 Air ±8kV, Contact ±6kV	perf. Criteria B

Characteristic Curve

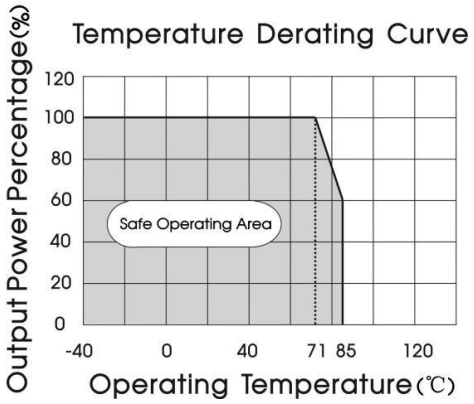
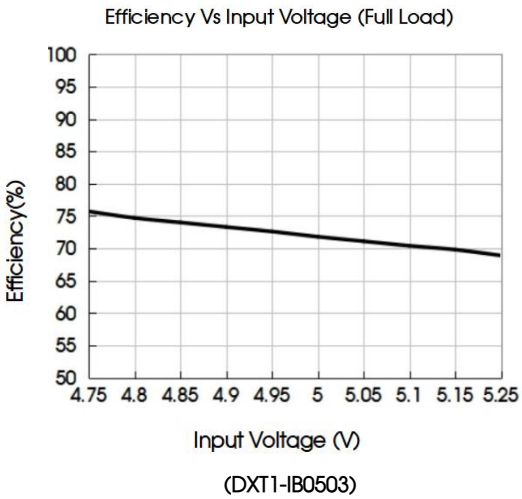
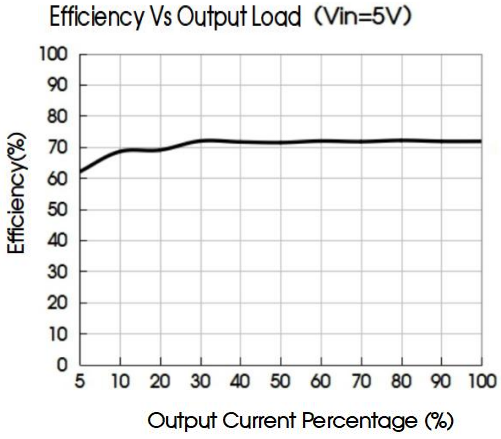


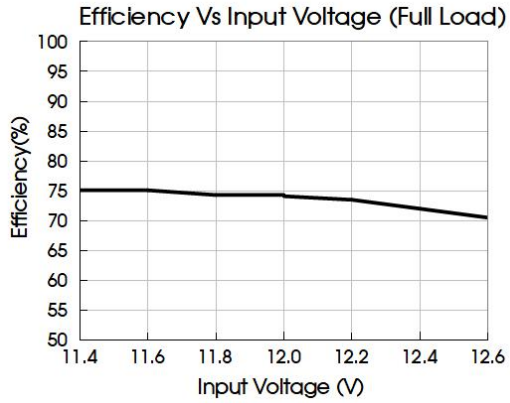
Fig. 1



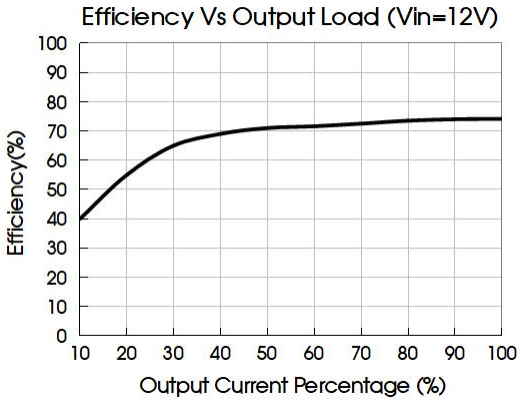
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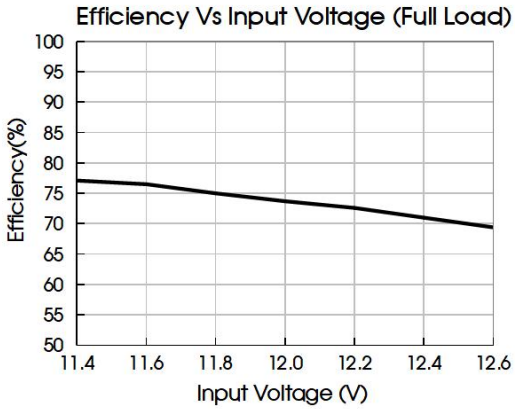
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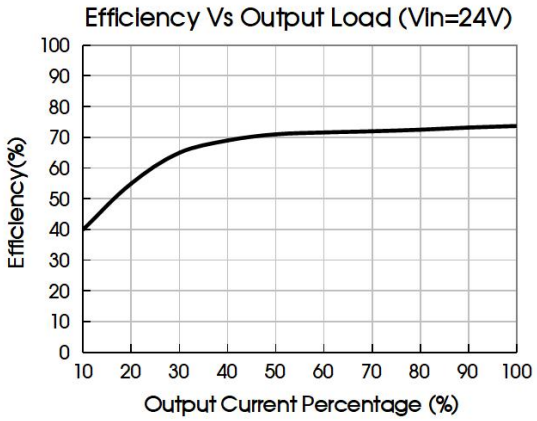
(DFXT1-IB1205)



(DFXT1-IB1205)



(DFXT1-IB2405)



(DFXT1-IB2405)

Design Reference

1. Typical application circuit

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.2.

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.

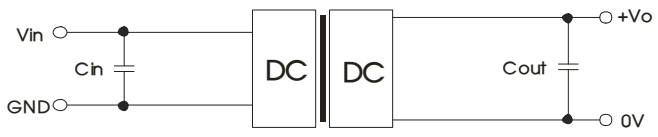


Fig.2

Table 1: Recommended input and output capacitor values

Vin	Cin	Vo	Cout
5VDC	4.7V	3.3/5VDC	10μF/16V
		9/12VDC	2.2μF/25V
		15VDC	1μF/25V
12VDC	2.2μF/16V	5VDC	10μF/16V
		12VDC	2.2μF/25V
		15VDC	0.47μF/50V
15VDC	1μF/25V	5VDC	10μF/16V
24VDC	1μF/50V	5VDC	10μF/16V
		12VDC	2.2μF/25V
		15VDC	0.47μF/50V

2.EMC compliance circuit

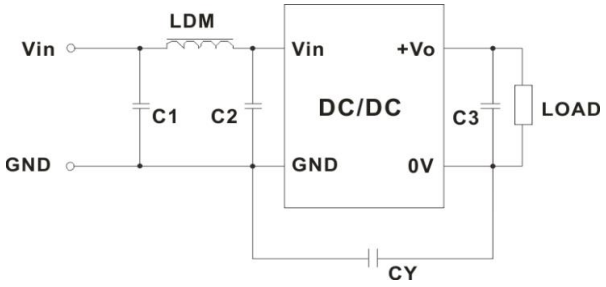


Fig. 3

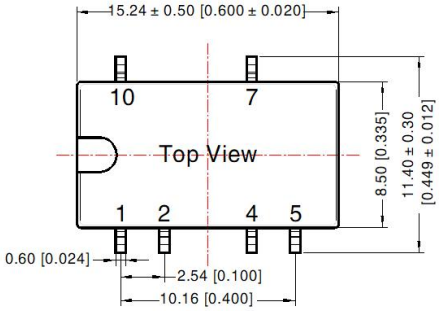
Table 2: Recommended EMC filter values

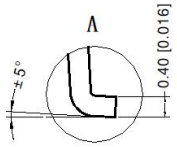
Input voltage		5VDC		12/15/24VDC
Output voltage		3.3/5/9VDC	12/15VDC	5/12/15VDC
EMI	C1/C2	4.7μF /25V	4.7μF /50V	4.7μF /50V
	CY	47pF/2000 VDC	1nF/2000 VDC	270pF /2kVDC
	C3	Refer to the Cout in table 1		
	LDM	6.8μH		

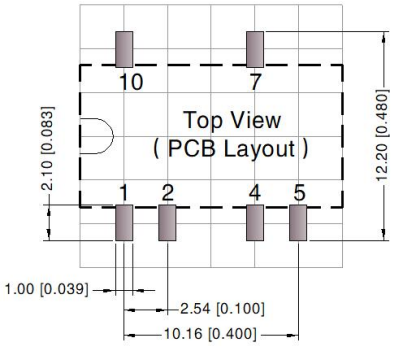
Note: To further improve EMI performance, we recommend the use a Y-capacitor CY

Dimensions and Recommended

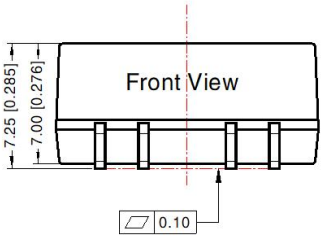
THIRD ANGLE PROJECTION

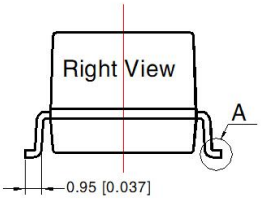






Note: Grid 2.54*2.54mm



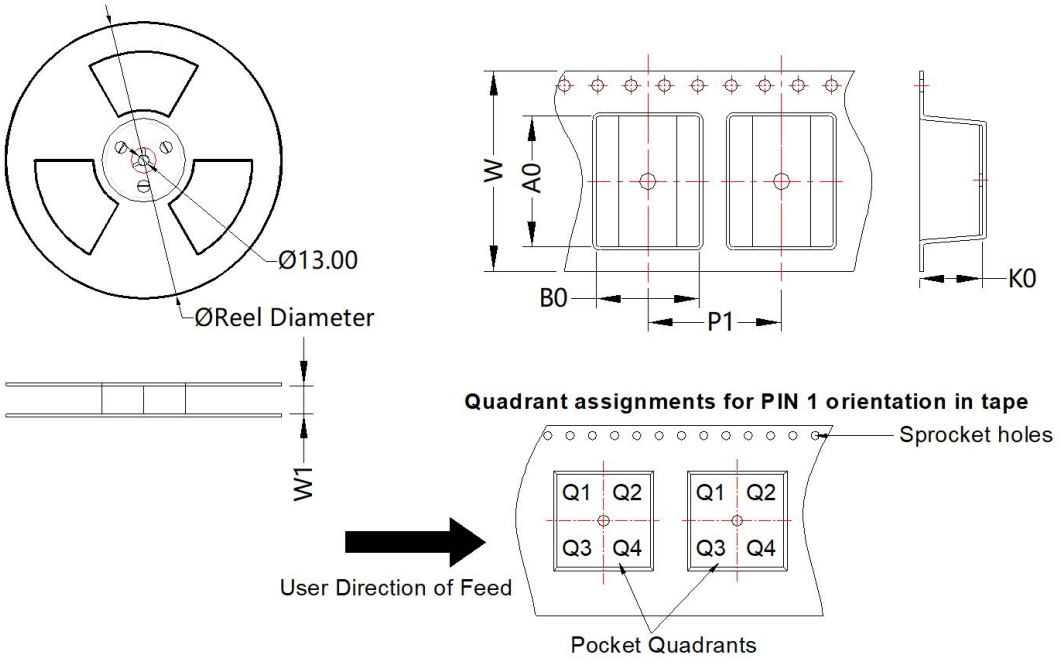


Note:
Unit: mm[inch]
Pin section tolerances: ± 0.10[± 0.004]
General tolerances: ± 0.25[± 0.010]

Pin–Out	
Pin	Mark
1	GND
2	Vin
4	0V
5	0V
7	+Vo
10	NC

NC: Pin to be isolated from circuitry

Tape/Reel packaging:



Package Type	Pin	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
SMD	6	500	330.0	24.5	15.64	12.4	7.45	16.0	24.0	Q1

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.