Descriptions

1W isolated DC-DC converter

RoHS

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
--	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
EN/BS EN	DFXT1-IB1212		12	84/9	67/71	560
EN/BS EN	DFXT1-IB1215		15	67/7	67/71	220
EN/BS EN	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

Specifications

Product Specifications	Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Specifications	Input Current (full load / no-load)	5VDC input	3.3VDC output	--	303/5	323/--	mA
			5VDC output	--	290/5	308/--	
			9VDC output	--	286/6	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		--	±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	--	
	Storage Humidity	Non-condensing		5	--	95	%RH
	Vibration			10-150Hz, 5G, 30 Min. along X, Y and Z			
	Reflow Soldering Temperature②			Peak temp.≤245℃, maximum duration time≤60s over 217℃			
	Switching Frequency	100% load, nominal input voltage		--	260	--	kHz
	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.
②Please refer to IPC/JEDEC J-STD-020D.1.

Electromagnetic Compatibility (EMC)

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

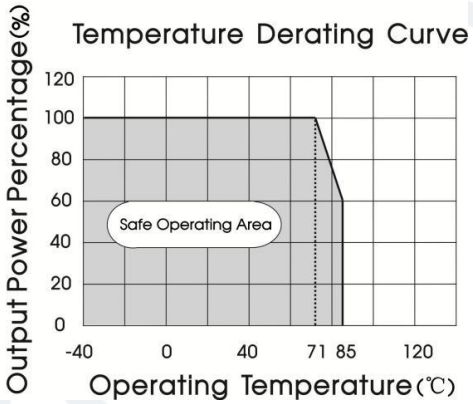
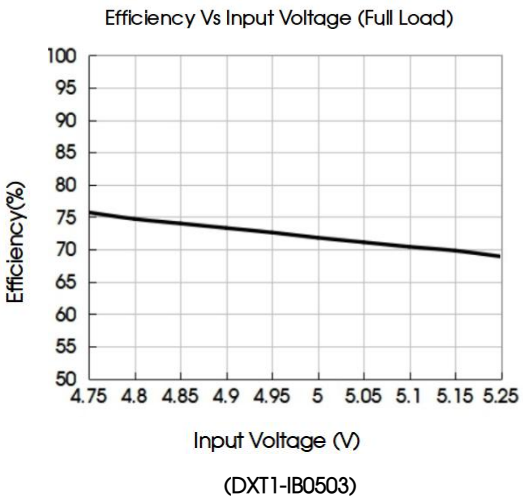
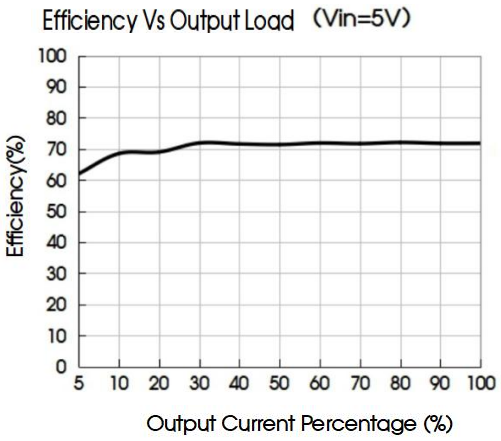


Fig. 1



(DXT1-IB0503)



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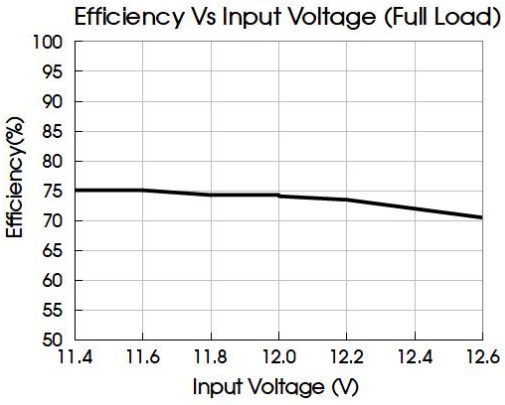

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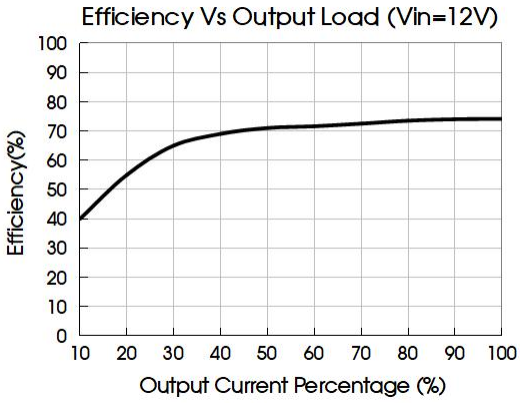

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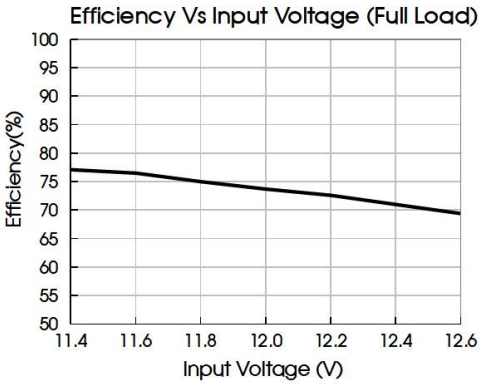
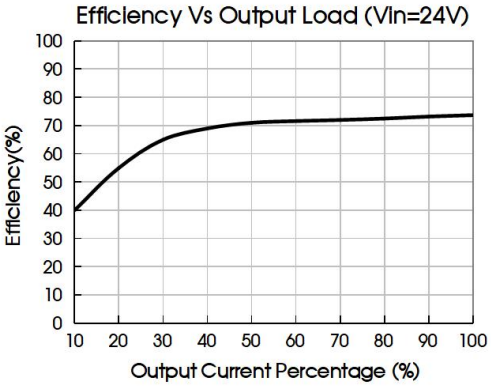


(DFXT1-IB2405)



(DFXT1-IB2405)

Design Reference

1. Typical application circuit

Input 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.

Choosing 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.

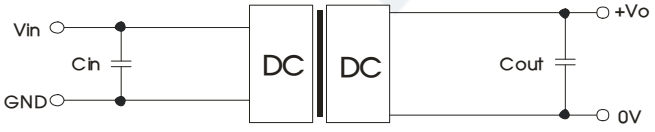


Fig.2

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

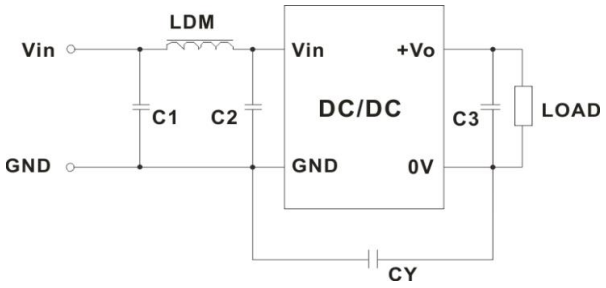


Fig. 3

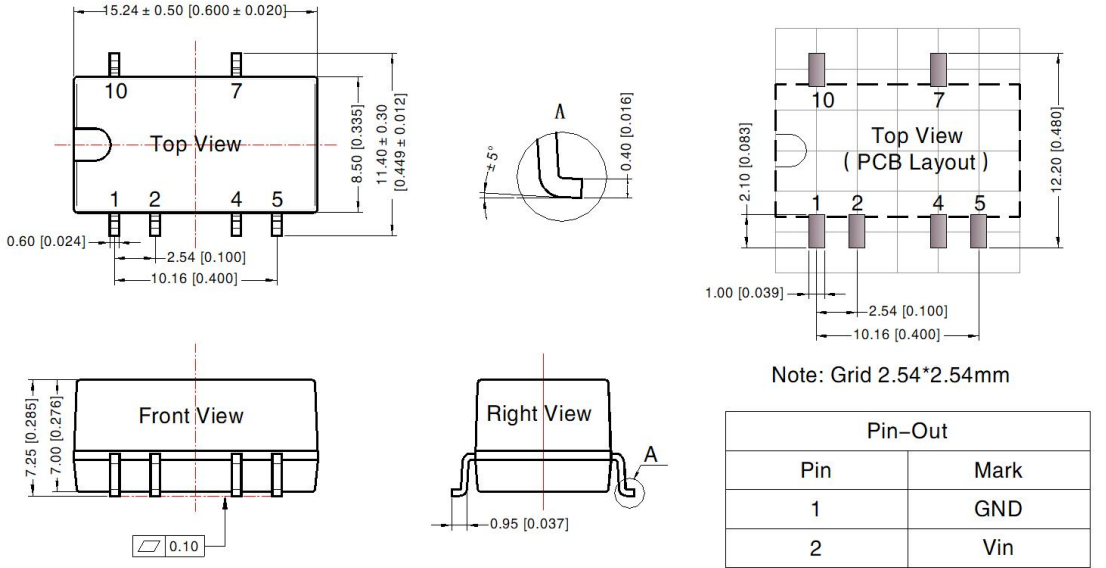
Table 2: Recommended EMC filter values

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/2000V DC	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



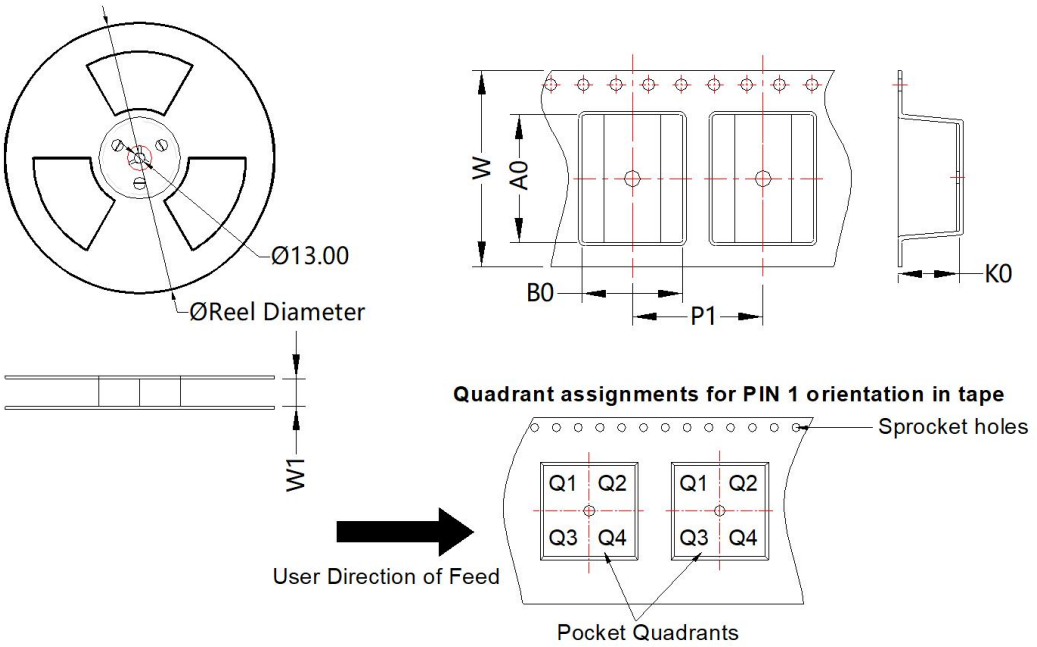
Note: Grid 2.54*2.54mm

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.