

DC/DC Converter

IB_XT-W75R3(-TR) Series

MORNSUN®

0.75W Isolated DC-DC converter
Fixed input voltage, regulated single output



CE Report EN 62368-1 UKCA Report BS EN 62368-1 RoHS Patent Protection

FEATURES

- Continuous short-circuit protection
- No-load input current as low as 8mA
- Operating ambient temperature range: -40°C to +85°C
- High efficiency up to 74%
- Compact SMD package
- I/O isolation test voltage: 1.5k VDC
- Industry standard pin-out

IB_XT-W75R3(-TR) series are specially designed for applications where an isolated voltage is required in a distributed power supply system. They are suitable for: pure digital circuits, low frequency analog circuits, relay-driven circuits and 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	IB0503XT-W75R3	5 (4.75-5.25)	3.3	200/20	64/68	2400
	IB0505XT-W75R3		5	150/15	68/72	2400
	IB0509XT-W75R3		9	83/9	68/72	1000
	IB0512XT-W75R3		12	62/7	69/73	560
	IB0515XT-W75R3		15	50/5	70/74	560
--	IB0503XT-W75R3-TR	5 (4.75-5.25)	3.3	200/20	64/68	2400
	IB0505XT-W75R3-TR		5	150/15	68/72	2400
	IB0509XT-W75R3-TR		9	83/9	68/72	1000
	IB0512XT-W75R3-TR		12	62/7	69/73	560
	IB0515XT-W75R3-TR		15	50/5	70/74	560
EN/BS EN	IB1205XT-W75R3	12 (11.4-12.6)	5	150/15	68/72	2400
	IB1212XT-W75R3		12	62/7	69/73	560
	IB1215XT-W75R3		15	50/5	70/74	560

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	5VDC input	3.3VDC/5VDC output	--	221/5	234/--	mA
		9VDC/12VDC output	--	208/12	221/--	
		15VDC output	--	202/18	215/--	
	12VDC input	5VDC output	--	87/8	92/--	
		12VDC output	--	86/8	91/--	
		15VDC output	--	85/8	90/--	
Reflected Ripple Current*			--	15	--	
Input Filter			Capacitance filter			
Hot Plug			Unavailable			

Note: * Refer to DC-DC Converter Application Notes for detailed description of reflected ripple current test method.

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Voltage Accuracy		--	--	±3	%
Linear Regulation	Input voltage change: ±1%	--	--	±0.25	

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Load Regulation	10%-100% load	5VDC input	3.3VDC output	--	--	±3	%
			other output	--	--	±2	
		12VDC input		--	--	±2	
Ripple & Noise*	20MHz bandwidth			--	30	75	mVp-p
Temperature Coefficient	Full load			--	±0.02	--	%/°C
Short-Circuit Protection				Continuous, self-recovery			
Note: * The "parallel cable" method is used for Ripple and Noise test, please refer to DC-DC Converter Application Notes for specific information.							

General Specifications

Item	Operating Conditions			Min.	Typ.	Max.	Unit
Isolation	5VDC input	Input-output Electric Strength Test for 1 minute with a leakage current of 1mA max.		1500	--	--	VDC
		Input-output Electric Strength Test for 1 second with a leakage current of 1mA max.		3000	--	--	
	12VDC input	Input-output electric strength test for 1 minute with a leakage current of 1mA max.		1500	--	--	
Insulation Resistance	Input-output resistance at 500VDC			1000	--	--	M Ω
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℃	5VDC input	3.3VDC output	--	30	--	
			other output	--	25	--	
		12VDC input		--	25	--	
Reflow Soldering Temperature*				Peak temp. ≤245℃, maximum duration time ≤60s over 217℃			
Vibration	12VDC input			10-150Hz, 5G, 0.75mm. along X, Y and Z			
Storage Humidity	Non-condensing		5VDC input	--	--	95	%RH
			12VDC input	5	--	95	
Switching Frequency	Full load, nominal input voltage		5VDC input	--	270	--	kHz
			12VDC input	--	260	--	
MTBF	MIL-HDBK-217F@25℃			3500	--	--	k hours
Moisture Sensitivity Level (MSL)	IPC/JEDEC J-STD-020D.1			Level 1			
Note:*For actual application, please refer to IPC/JEDEC J-STD-020D.1.							

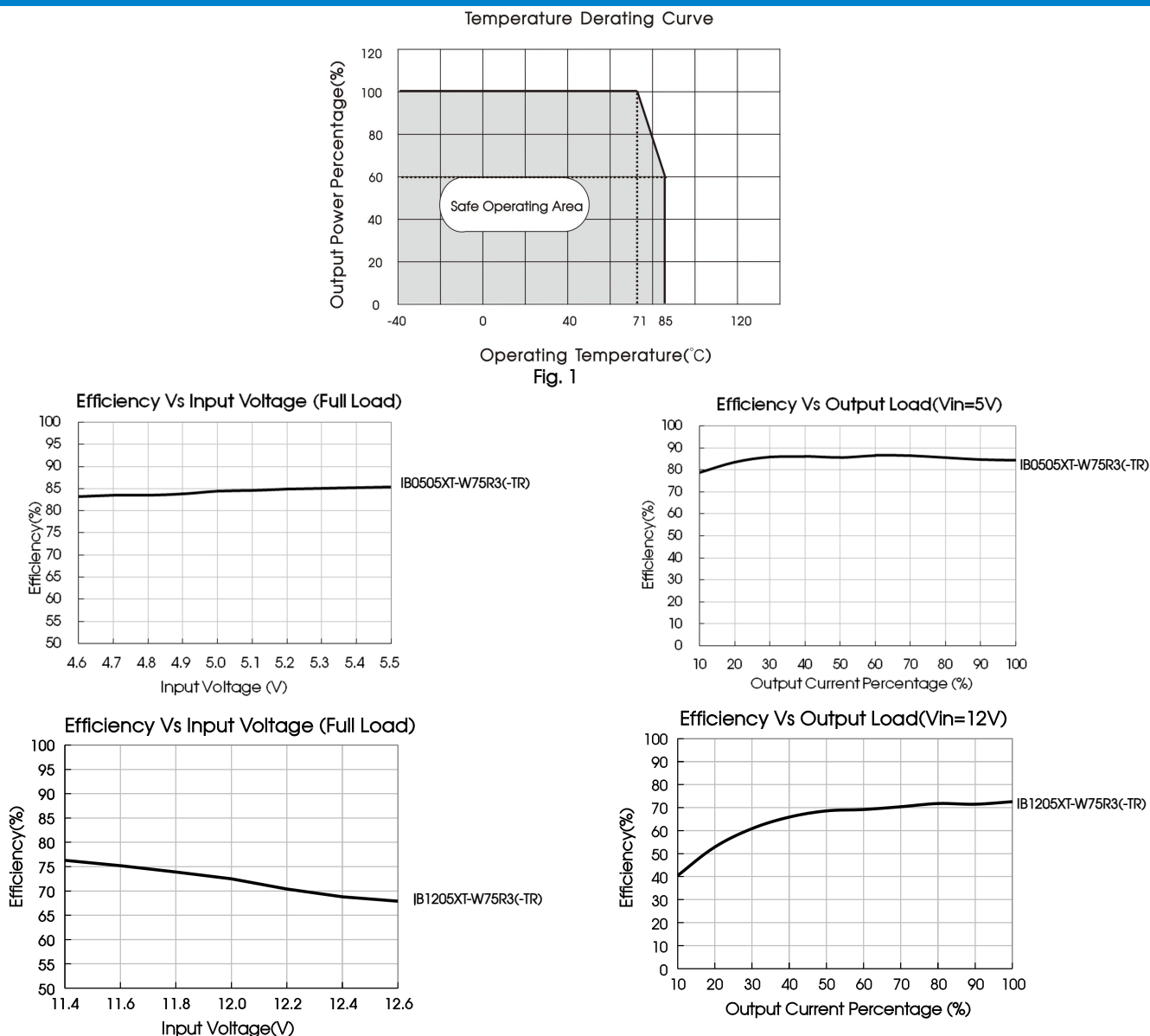
Mechanical Specifications

Case Material	Black plastic; flame-retardant and heat-resistant (UL94 V-0)						
Dimensions	13.20 x 11.40 x 7.25mm						
Weight	1.4g(Typ.)						
Cooling Method	Free air convection						

Electromagnetic Compatibility

Emissions	CE		CISPR32/EN55032 CLASS B			
	RE		CISPR32/EN55032 CLASS B			
Immunity	ESD	5VDC input	IEC/EN61000-4-2	Air ±8kV, Contact ±4kV	perf. Criteria B	
		12VDC input	IEC/EN61000-4-2	Air ±8kV, Contact ±6kV	perf. Criteria B	
Note: Refer to Fig.3 for recommended circuit test.						

Typical Performance Curves



Design Reference

1. Typical application

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	4.7μF/16V	3.3/5VDC	10μF/16V
		9/12VDC	2.2μF/16V
		15VDC	1μF/25V
12VDC	2.2μF/25V	5VDC	10μF/16V
		12VDC	2.2μF/25V
		15VDC	1μF/25V

2. EMC (CLASS B) compliance circuit

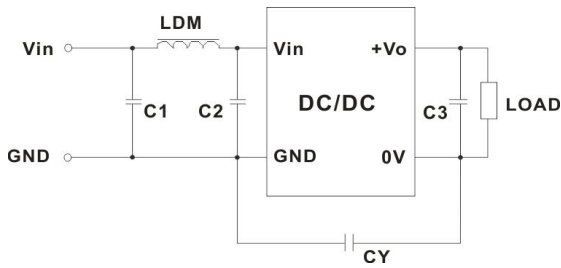


Fig. 3

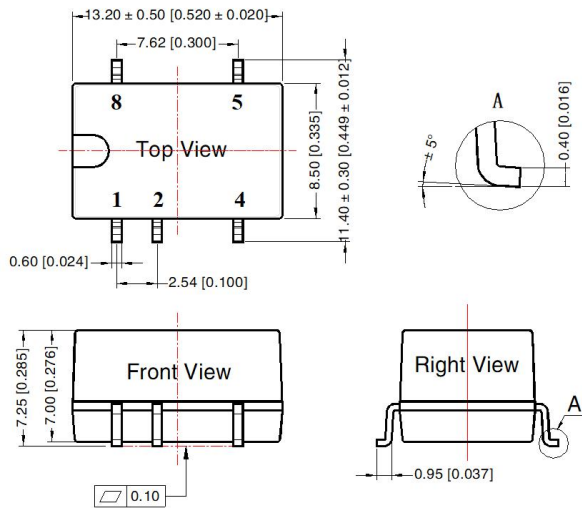
Table3: Recommended EMC filter values

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

Note: We recommend the use of a Y-capacitor CY with a value of 1nF/4kV to help even further reduce emissions.

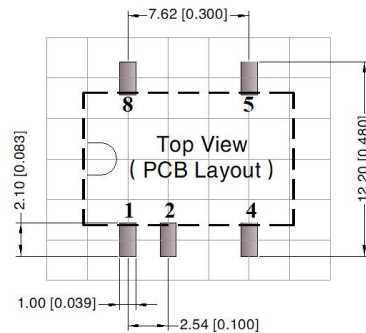
3. For additional information please refer to DC-DC converter application notes on www.mornsun-power.com

Dimensions and Recommended Layout



Note:
Unit: mm[inch]
Pin section tolerances: $\pm 0.10 [\pm 0.004]$
General tolerances: $\pm 0.25 [\pm 0.010]$

THIRD ANGLE PROJECTION

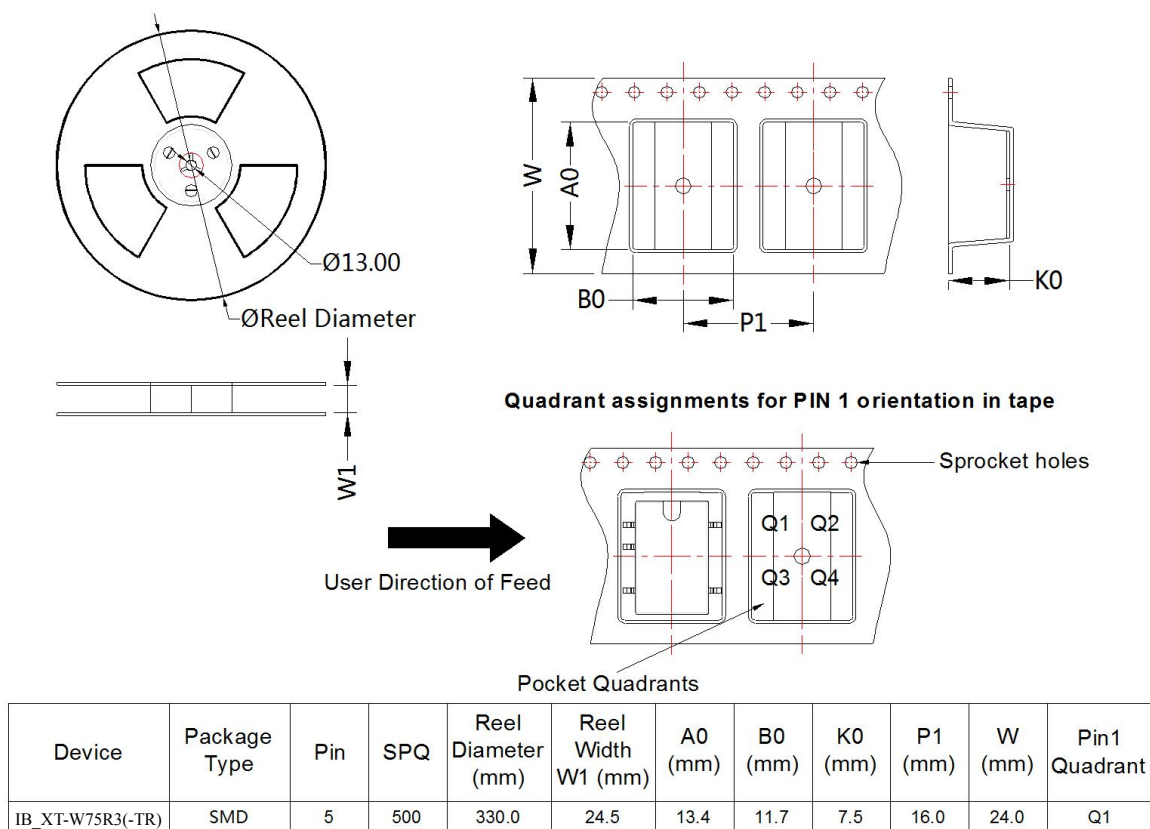


Note: Grid 2.54*2.54mm

Pin-Out	
Pin	Mark
1	GND
2	Vin
4	0V
5	+Vo
8	NC

NC: Pin to be isolated from circuitry

Tape and Reel Info



Notes:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Tube Packaging bag number: 58210024, Roll Packaging bag number: 58200054;
2. 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;
3. The maximum capacitive load offered were tested at input voltage range and full load;
4. 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;
5. All index testing methods in this datasheet are based on our company corporate standards;
6. We can provide product customization service, please contact our technicians directly for specific information;
7. Products are related to laws and regulations: see "Features" and "EMC";
8. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

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