

DC/DC Converter

IF_XT-1WR3(-TR) Series

MORNSUN®

1W 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 4mA
- Operating ambient temperature range: -40°C to +85°C
- High efficiency up to 71%
- Compact SMD package
- I/O isolation test voltage 3k VDC
- Industry standard pin-out

IF_XT-1WR3(-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	IF0503XT-1WR3	5 (4.75-5.25)	3.3	250/25	62/66	2400
	IF0505XT-1WR3		5	200/20	65/69	2400
	IF0509XT-1WR3		9	111/12	66/70	1000
	IF0512XT-1WR3		12	84/9	67/71	560
	IF0515XT-1WR3		15	67/7	67/71	560
BS EN	IF0503XT-1WR3-TR	5 (4.75-5.25)	3.3	250/25	62/66	2400
	IF0505XT-1WR3-TR		5	200/20	65/69	2400
	IF0509XT-1WR3-TR		9	111/12	66/70	1000
	IF0512XT-1WR3-TR		12	84/9	67/71	560
	IF0515XT-1WR3-TR		15	67/7	67/71	560
EN/BS EN	IF1205XT-1WR3	12 (11.4-12.6)	5	200/20	65/69	2400
	IF1212XT-1WR3		12	84/9	67/71	560
	IF1215XT-1WR3		15	67/7	67/71	220
	IF1205XT-1WR3-TR		5	200/20	65/69	2400
	IF1212XT-1WR3-TR		12	84/9	67/71	560
	IF1215XT-1WR3-TR		15	67/7	67/71	220
—	IF1505XT-1WR3	15 (14.25-15.75)	5	200/20	64/68	2400
EN/BS EN	IF2405XT-1WR3	24 (22.8-25.2)	5	200/20	63/69	2400
	IF2412XT-1WR3		12	84/9	65/71	560
	IF2415XT-1WR3		15	67/7	65/71	220
	IF2405XT-1WR3-TR		5	200/20	63/69	2400
	IF2412XT-1WR3-TR		12	84/9	65/71	560
	IF2415XT-1WR3-TR		15	67/7	65/71	220

Note: * Product model suffix "-TR" indicates reel packaging.

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
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/—	
	12VDC input	5VDC output	—	121/8	128/—	
		12VDC/15VDC output	—	117/8	124/—	

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Input Current (full load / no-load)	15VDC input		--	99/8	105/--	mA
	24VDC input	5VDC output	--	60/4	66/--	
		12VDC/15VDC output		--	59/4	
Reflected Ripple Current*	5VDC input		--	30	--	
	12VDC/15VDC/24VDC input		--	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	100% load			--	--	±3	%
Linear Regulation	Input voltage change: ±1%			--	--	±0.25	
Load Regulation	10%-100% load	5VDC input	3.3VDC output	--	--	±3	
			other output	--	--	±2	
		12VDC/15VDC/24VDC input		--	--	±2	
Ripple & Noise*	20MHz bandwidth			--	30	100	mVp-p
Temperature Coefficient	100% load	5VDC input		--	--	±0.03	% / °C
		12VDC/15VDC/24VDC input		--	±0.02	--	
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	Input-output electric strength test for 1 minute with a leakage current of 1mA max.		3000	--	--	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 °C (see Fig.1)		-40	--	85	°C
Storage Temperature			-55	--	125	
Case Temperature Rise	Ta=25 °C	5VDC input	--	30	--	
		3.3VDC output	--	25	--	
		12VDC/15VDC/24VDC input	--	25	--	
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds	5VDC input	--	--	300	%RH
Storage Humidity	Non-condensing	5VDC input	--	--	95	
		12VDC/15VDC/24VDC input	5	--	95	
Vibration	12VDC/15VDC/24VDC input		10-150Hz, 5G, 0.75mm. along X, Y and Z			
Reflow Soldering Temperature*			Peak temp. ≤ 245 °C, maximum duration time ≤ 60s over 217 °C			
Switching Frequency	100% load, nominal input voltage	5VDC input	--	250	--	kHz
		12VDC/15VDC/24VDC input	--	260	--	
MTBF	MIL-HDBK-217F@25 °C		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 (UL94V-0)
Dimensions	15.24 x 11.40 x 7.25 mm
Weight	1.2g(Typ.)
Cooling Method	Free air convection

Electromagnetic Compatibility

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: Refer to Fig. 3 for recommended circuit test.

Typical Characteristic Curves

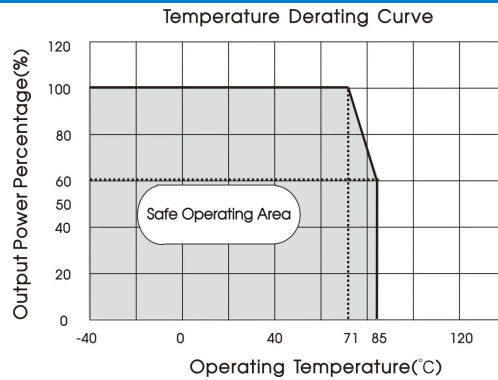
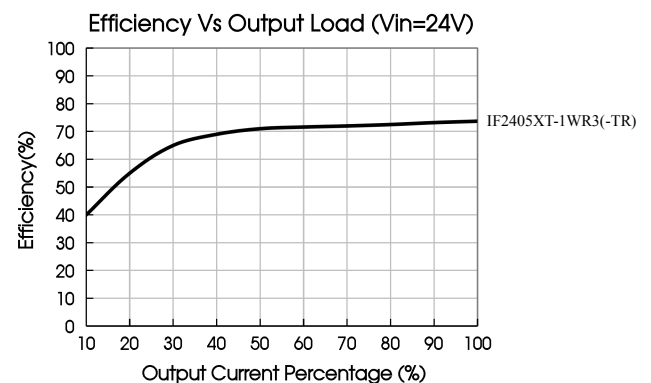
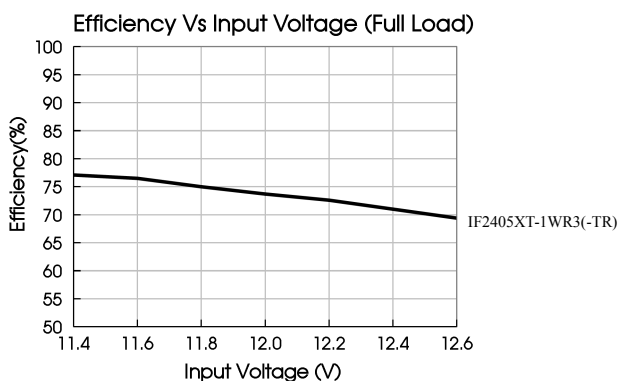
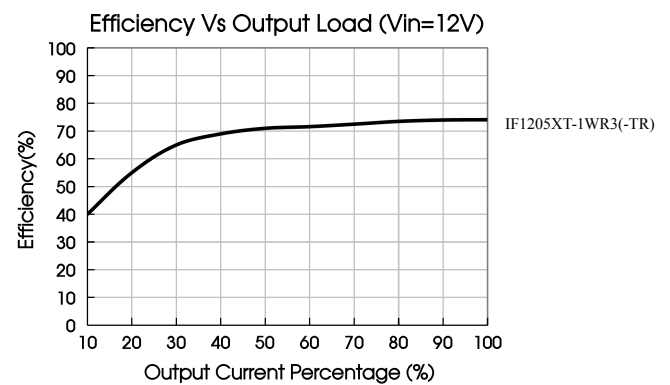
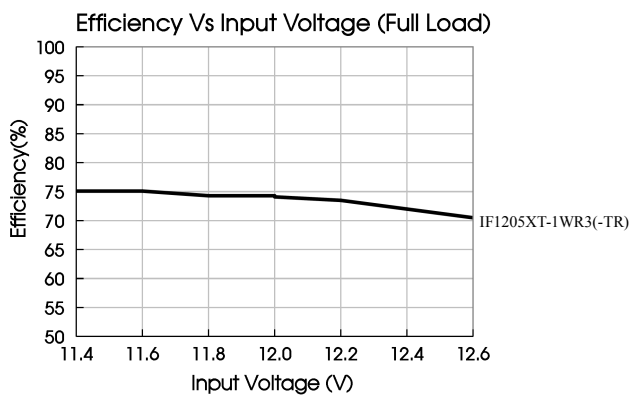
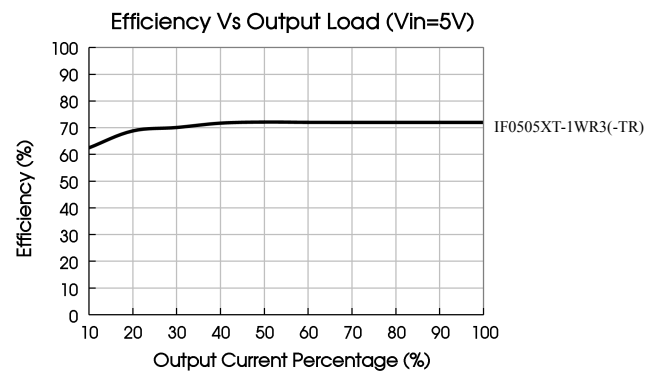
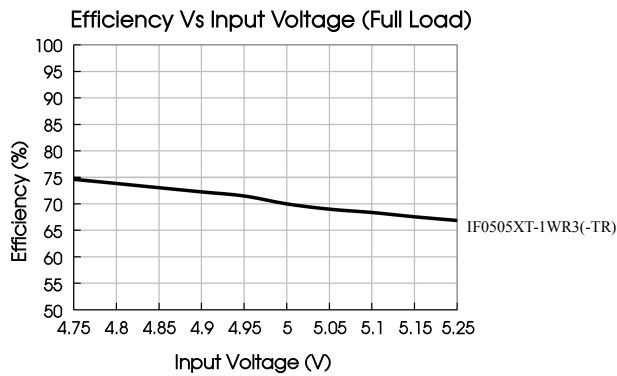


Fig. 1



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 capacitive load value table

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

2. EMC compliance circuit

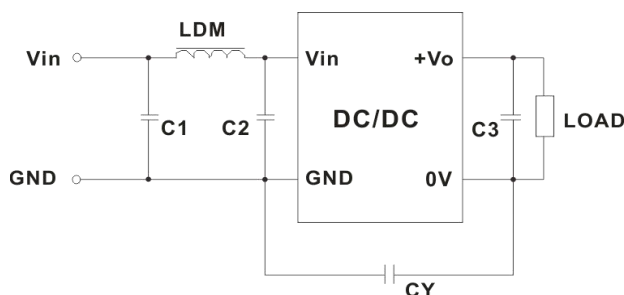


Fig. 3

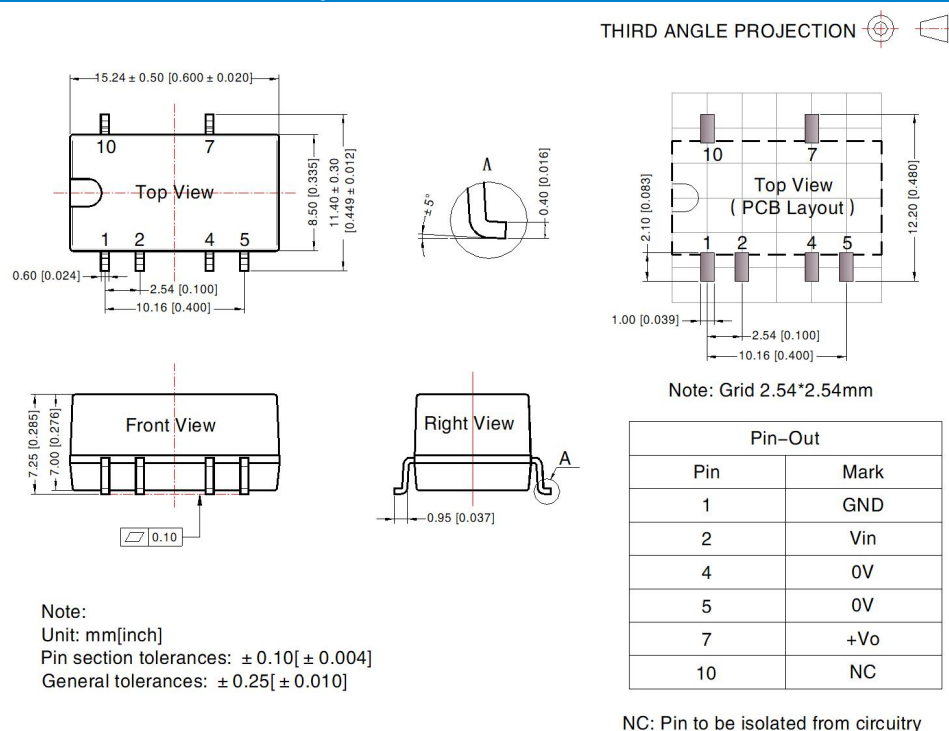
Table 2: Recommended EMC filter values

Input voltage		5VDC		12VDC/15VDC/24VDC
Output voltage		3.3/5/9VDC	12/15VDC	--
Emissions	C1/C2	4.7μF /25V	4.7μF /25V	4.7μF /50V
	CY	100pF/4kVDC	1nF /4kVDC VISHAY HGZ102MBP TDK CD45-E2GA102M-GKA	270pF /3kVDC
	C3	Refer to the Cout in table 1		Refer to the Cout in table 1
	LDM	6.8μH		6.8μH

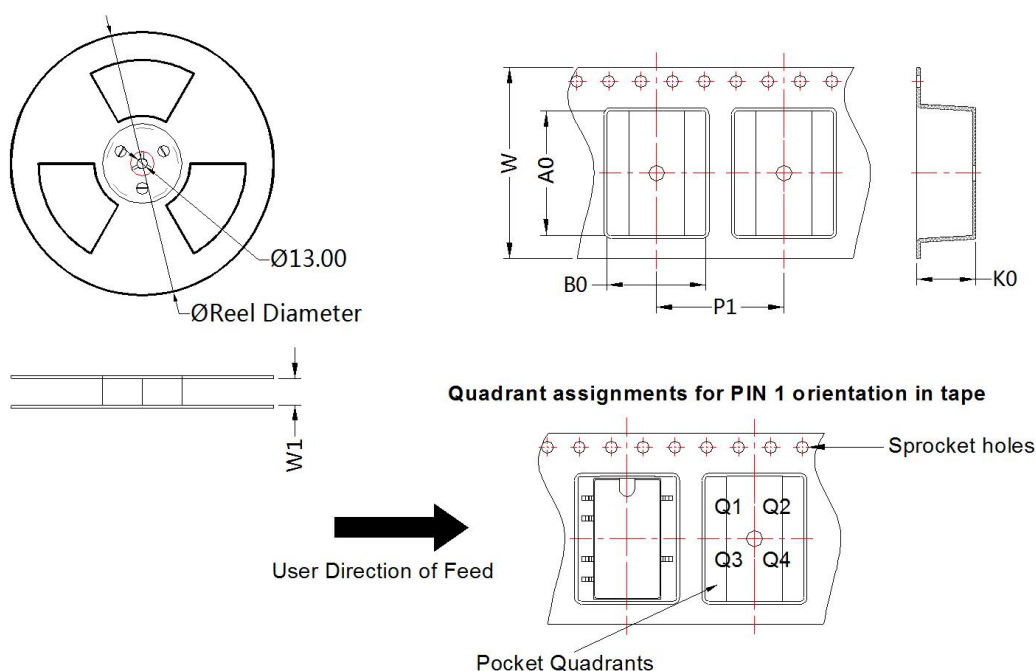
Note: In the case of actual use, the requirements for EMI are high, it is subject to CY (1nF/4kV).

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

Dimensions and Recommended Layout



Tape and Reel Info



Device	Package Type	Pin	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
IF_XT-1WR3(-TR)	SMD	6	500	330.0	24.5	15.64	12.4	7.45	16.0	24.0	Q1

Notes:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Tube Packaging bag number: 58210023 , Roll Packaging bag number: 58210034 ;
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 $T_a=25^{\circ}\text{C}$, 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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