DC/DC Converter
IF_XT-1WR3-TR Series

MORNSUN®

1W isolated DC-DC converter
Fixed input voltage, regulated single output

Continuous Short Circuit Protection

3 years Warranty

EN 62368-1 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℃ to +85℃
- 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	IF1205XT-1WR3-TR	12 (11.4-12.6)	5	200/20	65/69	2400
	IF1212XT-1WR3-TR		12	84/9	67/71	560
	IF1215XT-1WR3-TR		15	67/7	67/71	220
	IF2405XT-1WR3-TR	24 (22.8-25.2)	5	200/20	63/69	2400
	IF2412XT-1WR3-TR		12	84/9	65/71	560
	IF2415XT-1WR3-TR		15	67/7	65/71	220

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	12V input	5VDC output	--	121/8	128/--	mA
		12VDC/15VDC output	--	117/8	124/--	
	24V input	5VDC output	--	60/4	66/--	
		12VDC/15VDC output	--	59/4	64/--	
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	100% load	--	--	±3	%
Linear Regulation	Input voltage change: ±1%	--	--	±0.25	
Load Regulation	10%-100% load	--	--	±2	
Ripple & Noise*	20MHz bandwidth	--	30	100	mVp-p
Temperature Coefficient	100% load	--	±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℃ (see Fig.1)	-40	--	85	℃
Storage Temperature		-55	--	125	
Case Temperature Rise	Ta=25℃	--	25	--	
Storage Humidity	Non-condensing	5	--	95	%RH
Vibration		10-150Hz, 5G, 0.75mm. along X, Y and Z			
Reflow Soldering Temperature*		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			
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 (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: Refer to Fig. 3 for recommended circuit test.		

Typical Characteristic Curves

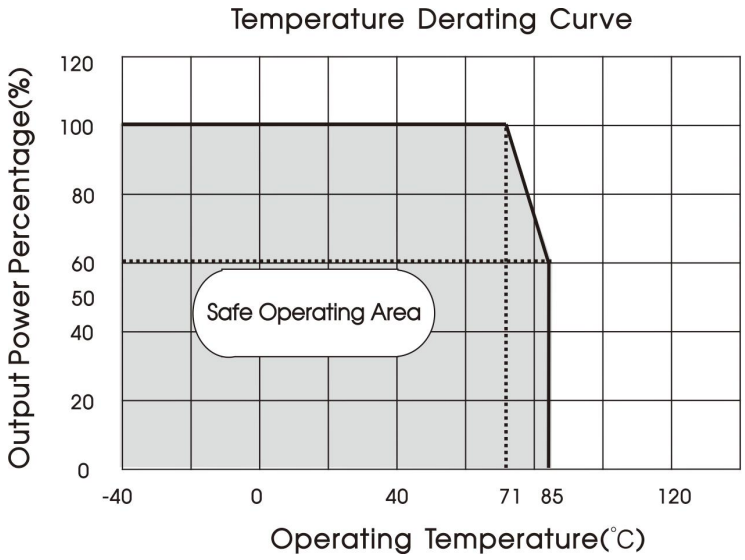
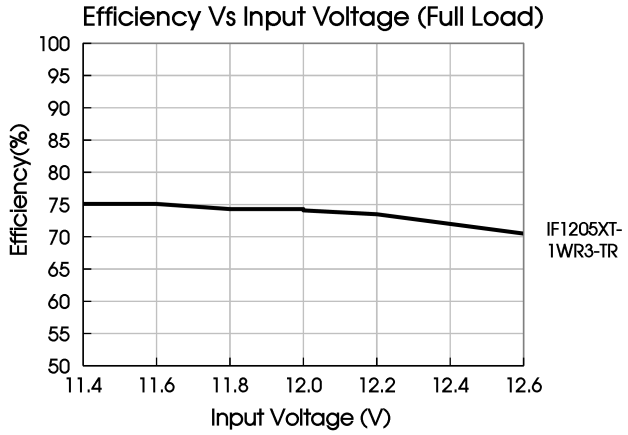
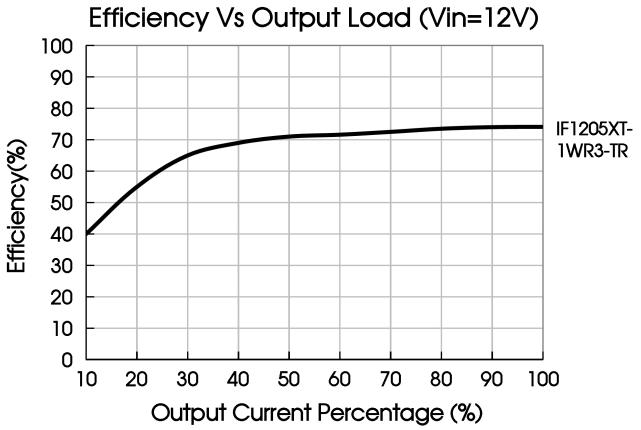
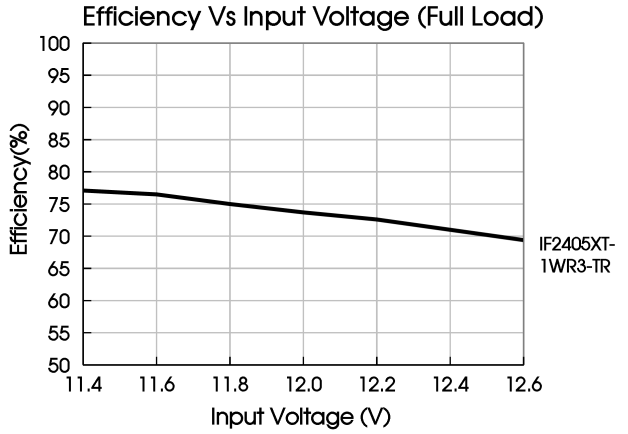
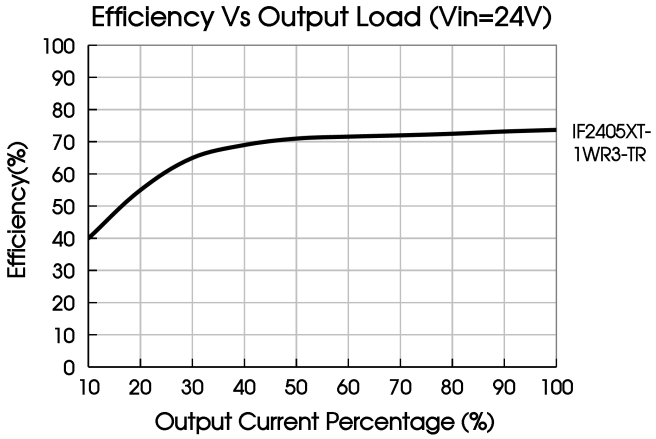


Fig. 1









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.

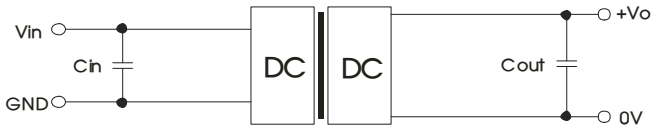


Fig. 2

Table 1: Recommended input and output capacitor values

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

2. EMC compliance circuit

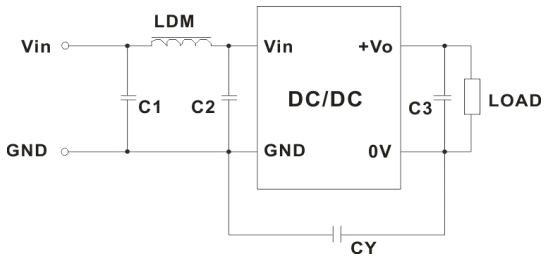


Fig. 3

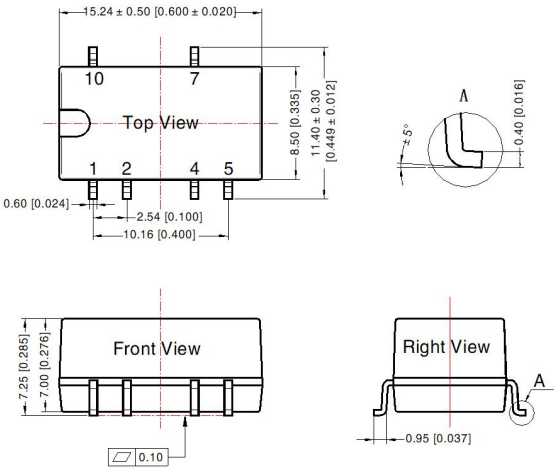
Table 2: Recommended EMC filter values

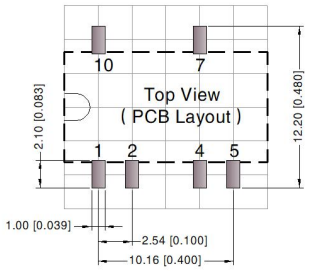
Output voltage		5/12/15VDC
Emissions	C1/C2	4.7μF /50V
	CY	270pF /3kVDC
	C3	Refer to the Cout in table 1
	LDM	6.8μH

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

Dimensions and Recommended Layout

THIRD ANGLE PROJECTION





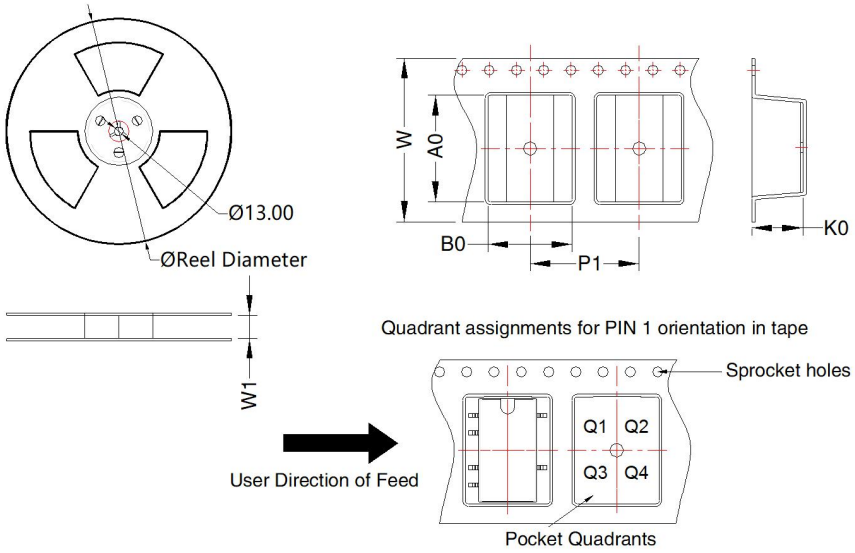
Note: Grid 2.54*2.54mm

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

NC: Pin to be isolated from circuitry

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

Tape and Reel Info



Device	Package Type	Pin	MPQ	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. 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 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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