DC/DC Converter

IB_S-W75R3 Series

MORNSUN®

0.75W isolated DC-DC converter

Fixed input voltage, regulated single output

Continuous Short Circuit Protection

3 years Warranty

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℃ to +85℃
- High efficiency up to 74%
- I/O isolation test voltage 1.5k VDC

IB_S-W75R3 series are especially designed for distributed power supply systems where an isolated voltage is required. They are suitable for: pre-interference isolation, ground interference elimination, pure digital circuit, voltage isolation conversion, general low frequency analog circuit, relay drive circuit, etc.

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	IB0503S-W75R3	5 (4.75-5.25)	3.3	200/20	64/68	2400
	IB0505S-W75R3		5	150/15	68/72	2400
	IB0509S-W75R3		9	83/9	68/72	1000
	IB0512S-W75R3		12	62/7	69/73	560
	IB0515S-W75R3		15	50/5	70/74	560
EN/BS EN	IB1203S-W75R3	12 (11.4-12.6)	3.3	200/20	64/68	2400
	IB1205S-W75R3		5	150/15	68/72	2400
	IB1212S-W75R3		12	62/7	69/73	560
	IB1215S-W75R3		15	50/5	70/74	560
	IB2403S-W75R3	24 (22.8-25.2)	3.3	200/20	62/68	2400
	IB2405S-W75R3		5	150/15	66/72	2400
	IB2412S-W75R3		12	62/7	67/73	560
	IB2415S-W75R3		15	50/5	68/74	560

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	5V input	3.3VDC/5VDC output	--	209/8	221/--	mA
		9VDC/12VDC output	--	208/12	221/--	
		15VDC output	--	202/18	215/--	
	12V input	3.3VDC output	--	92/8	98/--	
		5VDC output	--	87/8	92/--	
		12VDC output	--	86/8	91/--	
		15VDC output	--	85/8	90/--	
	24V input	3.3VDC output	--	46/8	51/--	
		5VDC output	--	44/8	48/--	
		12VDC output	--	43/8	47/--	
		15VDC output	--	43/8	46/--	

Reflected Ripple Current*		--	15	--	mA
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	
Load Regulation	10%-100% load	3.3VDC output		--	--	±3	
		Other output		--	--	±2	
Ripple & Noise*	20MHz bandwidth	5VDC input		--	30	75	mVp-p
		12/24VDC input	3.3/5/12VDC output	--	30	100	
			15VDC output	--	80	150	
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.		1500	--	--	VDC
	5VDC input, Input-output electric strength test for 1 second with a leakage current of 1mA max.		3000	--	--	
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	--	
		Other output	--	25	--	
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds		--	--	300	
Storage Humidity	Non-condensing	5VDC input	--	--	95	%RH
		12/24VDC input	5	--	95	
Vibration	5VDC input		10-150Hz, 5G, 30Min. along X, Y and Z			
	12/24VDC input		10-150Hz, 5G, 0.75mm. along X, Y and Z			
Switching Frequency	100% load, nominal input voltage	5VDC input	--	270	--	kHz
		12/24VDC input	--	260	--	
MTBF	MIL-HDBK-217F@25℃		3500	--	--	k hours

Mechanical Specifications

Case Material	Black plastic; flame-retardant and heat-resistant (UL94V-0)
Dimensions	11.60 x 6.00 x 10.16 mm
Weight	1.3g(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

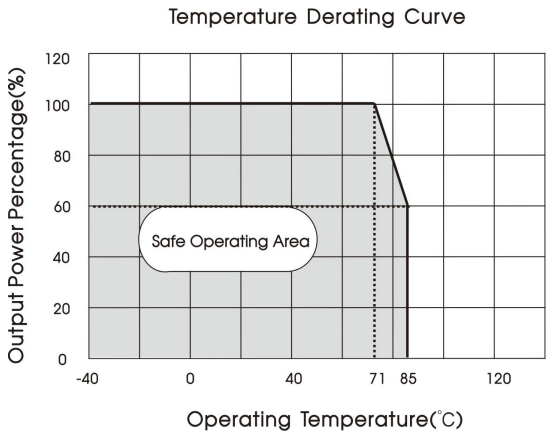
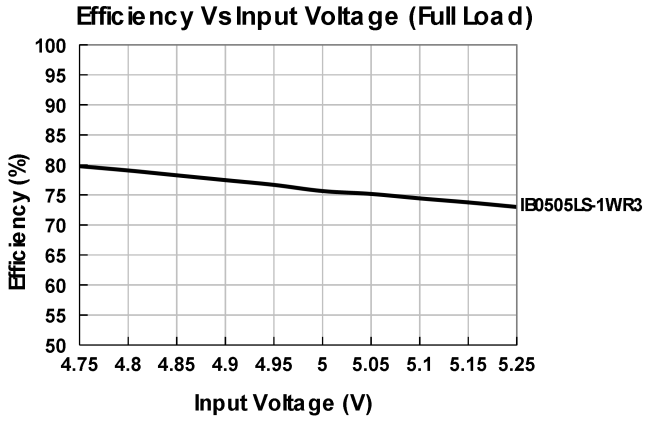
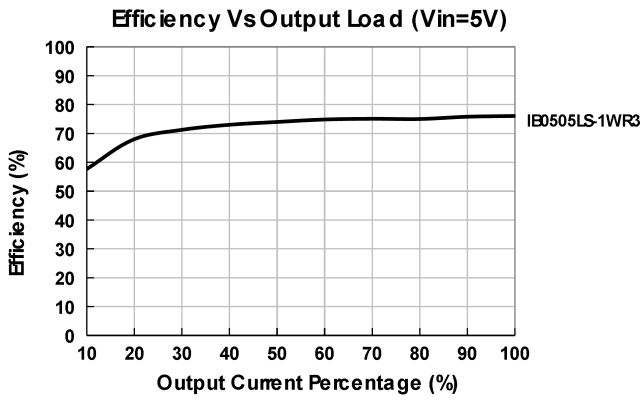
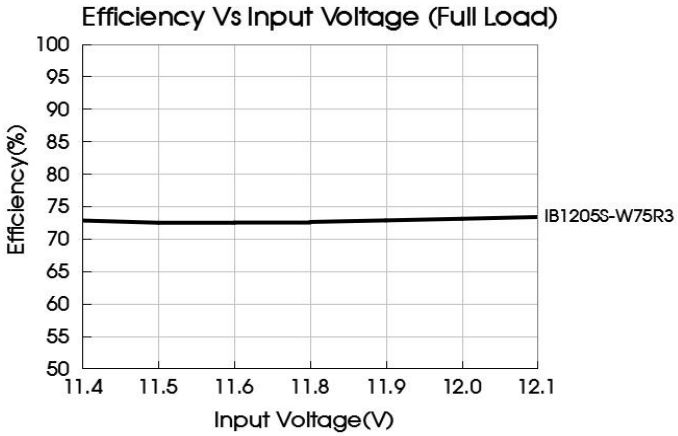
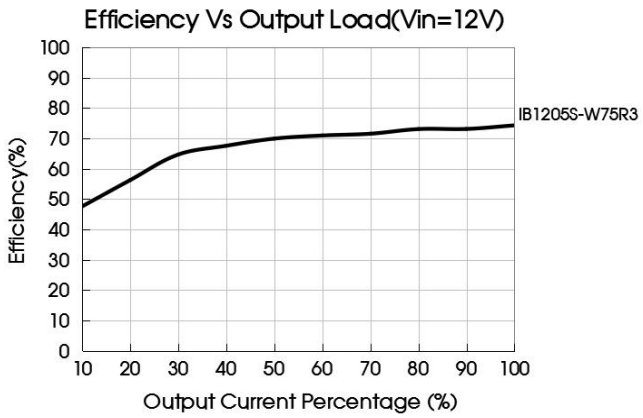


Fig. 1









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.

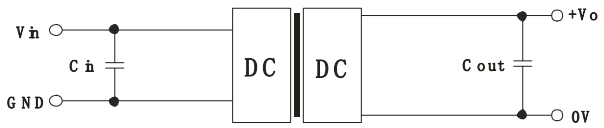


Fig. 2

Table 1：Recommended input and output capacitor values

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

2. EMC (CLASS B) compliance circuit

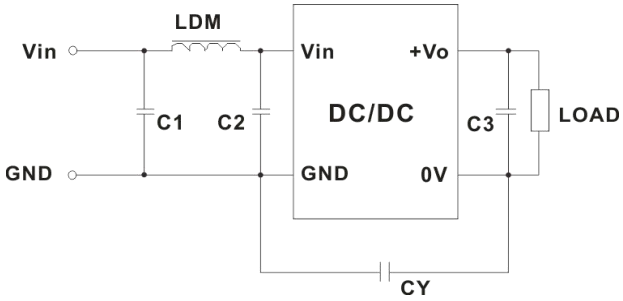


Fig. 3

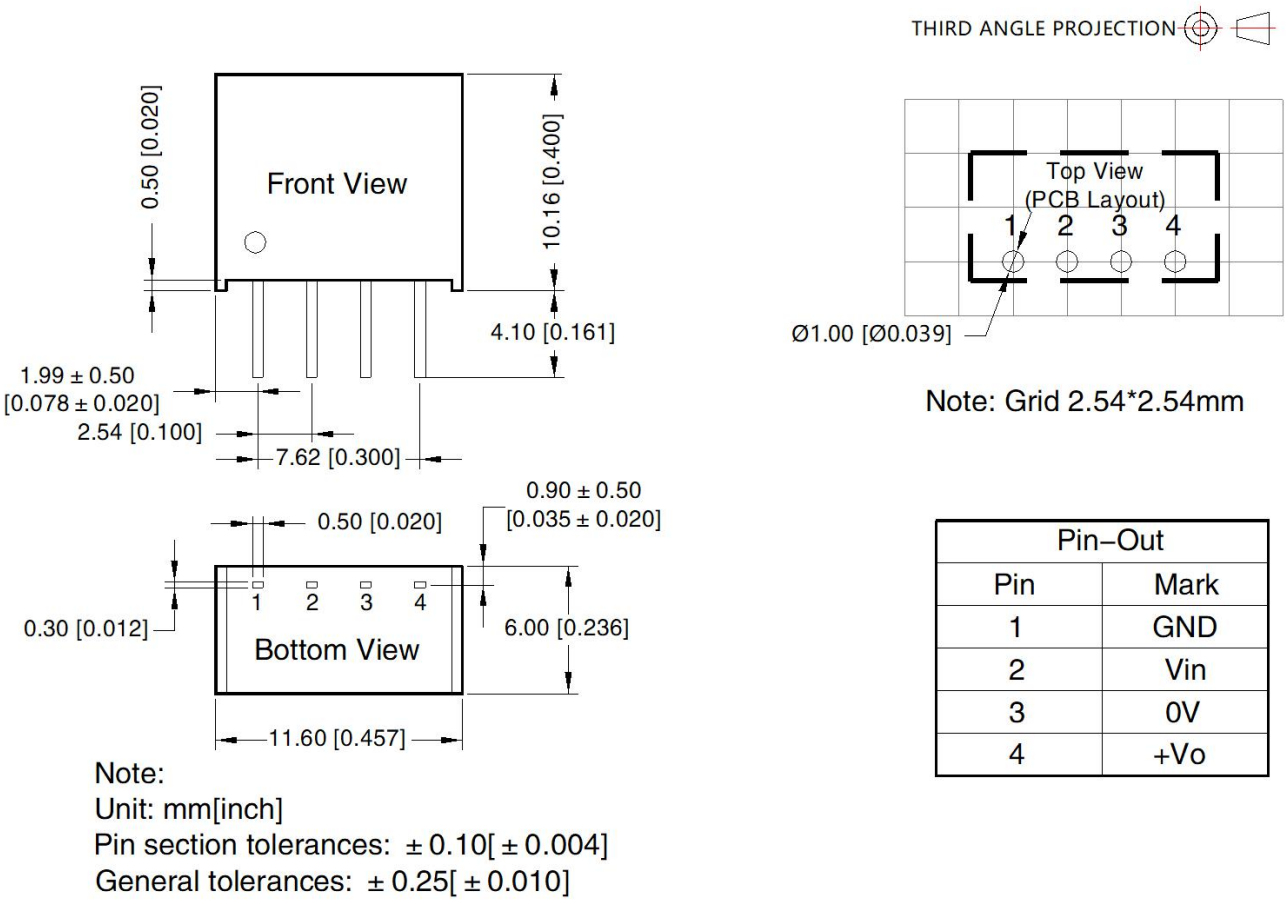
Table 2: Recommended EMC filter values

Input voltage		5DVC		12/24VDC
Output voltage		3.3/5/9VDC	12/15VDC	--
EMI	C1/C2	4.7μF/25V	4.7μF/25V	4.7μF /50V
	CY	--	1nF /4kVDC VISHAY HGZ102MBP TDK CD45-E2GA102M-GKA	270pF /2kV
	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



Pin–Out	
Pin	Mark
1	GND
2	Vin
3	0V
4	+Vo

Notes:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58200003;
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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