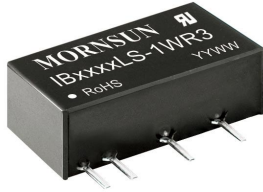


1W isolated DC-DC converter
Fixed input voltage, regulated single output



CB Report

RoHS

Patent Protection

FEATURES

- Continuous short-circuit protection
- No-load input current as low as 5mA
- Operating ambient temperature range: -40°C to +85°C
- High efficiency up to 73%
- I/O isolation test voltage 1.5k VDC
- Industry standard pin-out
- SIP package

UL 62368-1 EN 62368-1 BS EN 62368-1 IEC 62368-1

IB05_LS-1WR3 series is especially designed for distributed power supply systems where an isolated voltage is required. They are suitable for occasions of: 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	IB0503LS-1WR3	5 (4.75-5.25)	3.3	250/25	63/67	2400
UL/EN/BS EN/IEC	IB0505LS-1WR3		5	200/20	66/70	2400
	IB0509LS-1WR3		9	111/12	67/71	1000
	IB0512LS-1WR3		12	84/9	68/72	560
	IB0515LS-1WR3		15	67/7	69/73	560
EN/BS EN	IB0524LS-1WR3		24	41/4	69/73	100

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	3.3VDC/5VDC output	--	286/5	303/10	mA
	9VDC/12VDC output	--	282/12	299/20	
	15VDC/24VDC output	--	274/18	290/30	
Reflected Ripple Current*		--	15	--	
Input Filter		Capacitor 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	
		Others	--	±2	
Ripple & Noise*	20MHz bandwidth	Others	--	30	mVp-p
		24V output	--	50	
Temperature Coefficient	100% 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	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 $\geq 71^{\circ}\text{C}$ (see Fig.1)	-40	--	85	°C	
Storage Temperature		-55	--	125		
Case Temperature Rise	Ta=25°C	3.3VDC output		--		30
		Others		--		25
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds	--	--	300		
Storage Humidity	Non-condensing	--	--	95	%RH	
Vibration		10-150Hz, 5G, 30 Min. along X, Y and Z				
Switching Frequency	100% load, nominal input voltage	--	270	--	kHz	
MTBF	MIL-HDBK-217F@25°C	3500	--	--	k hours	

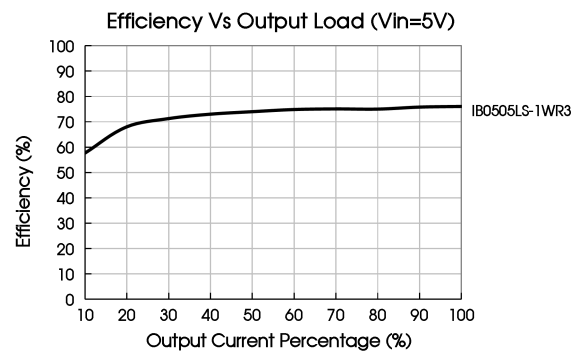
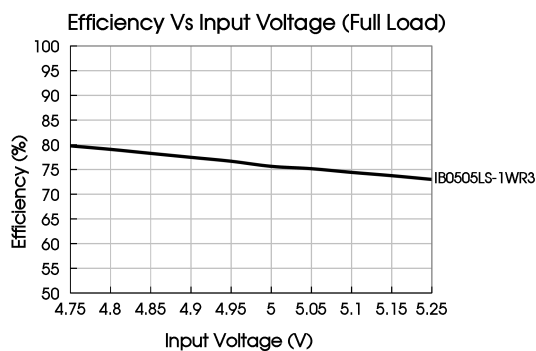
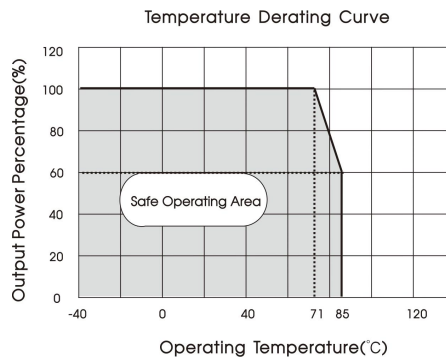
Mechanical Specifications

Case Material	Black plastic; flame-retardant and heat-resistant (UL94V-0)
Dimensions	19.65 x 6.0 x 10.16mm
Weight	2.1g(Typ.)
Cooling Method	Free air convection

Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032	CLASS B (see Fig. 3 for recommended circuit)
	RE	CISPR32/EN55032	CLASS B (see Fig. 3 for recommended circuit)
Immunity	ESD	IEC/EN61000-4-2	Air $\pm 8\text{kV}$, Contact $\pm 4\text{kV}$ perf. Criteria B

Typical Characteristic Curves



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.

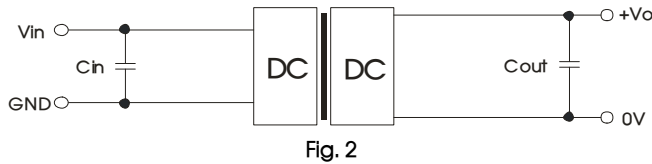


Table 1: Recommended input and output capacitor values

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

2. EMC compliance circuit

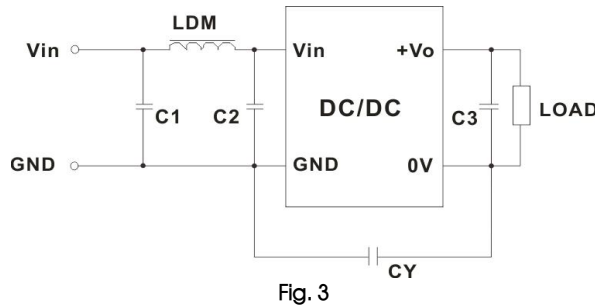


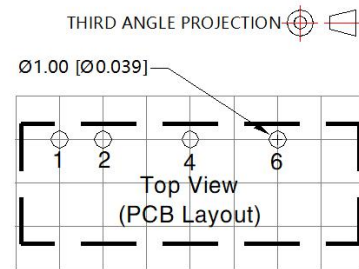
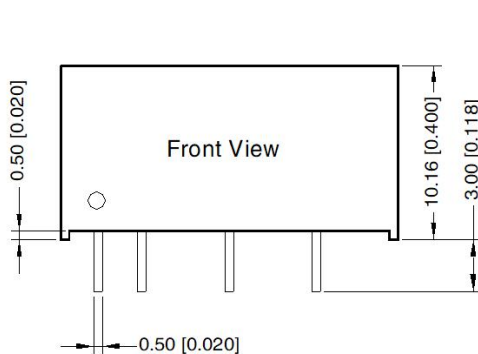
Table 2: Recommended EMC filter values

Input voltage 5VDC	Emissions	Output voltage	3.3/5/9 VDC	12/15/24 VDC
		C1/C2	4.7µF /25V	4.7µF /25V
	CY	--	1nF /2kVDC VISHAY HGZ102MBP TDK CD45-E2GA102M-GKA	
	C3	Refer to the Cout in table 1		
	LDM	6.8µH	6.8µH	

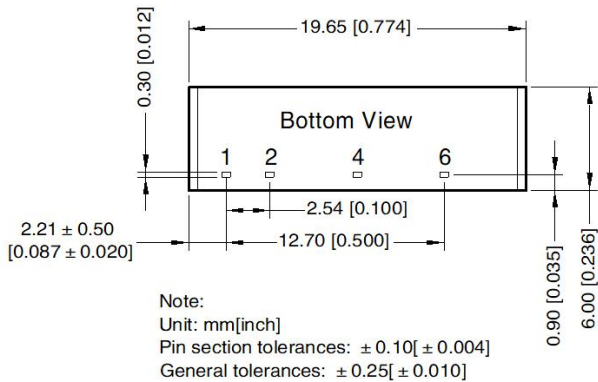
Note: We recommend the use of a Y-capacitor CY with a value of 1nF/4kV to help even further reduce emissions.

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

Dimensions and Recommended Layout



Note: Grid 2.54*2.54mm



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

Pin-Out	
Pin	Mark
1	Vin
2	GND
4	0V
6	+Vo

Notes:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58200001;
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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