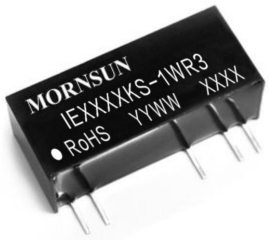
DC/DC Converter

IE_KS-1WR3 Series

MORNSUN®

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



Continuous Short Circuit Protection

3 years Warranty

FEATURES

- Continuous short-circuit protection
- No-load input current as low as 8mA
- Operating ambient temperature range: -40℃ to +85℃
- High efficiency up to 70%
- I/O isolation test voltage 3k VDC
- Industry standard pin-out

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

IE_KS-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	IE0505KS-1WR3	5 (4.75-5.25)	±5	±100/±10	64/68	1200
	IE0509KS-1WR3		±9	±56/±6	65/69	470
	IE0512KS-1WR3		±12	±42/±4	66/70	100
--	IE2405KS-1WR3	24 (22.8-25.2)	±5	±100/±10	64/70	1200
	IE2412KS-1WR3		±12	±42/±5	64/70	220
	IE2415KS-1WR3		±15	±33/±3	64/70	220

Note: *The specified maximum capacitive load for positive and negative output is identical.

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	5VDC input	5VDC output	--	294/11	313/--	mA
		9VDC output	--	290/8	308/--	
		12DC output	--	285/20	303/--	
	24VDC input		--	60/8	66/--	
Reflected Ripple Current*	5VDC input		--	30	--	
	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		--	--	±2	
Ripple & Noise*	20MHz bandwidth		--	30	100	mVp-p
Temperature Coefficient	100% load	5VDC input	--	--	±0.03	%/℃
		12VDC 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.

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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	--	
Pin Soldering Resistance Temperature*	Soldering spot is 1.5mm away from case for 10 seconds		--	--	300	
Storage Humidity	Non-condensing	5VDC input	--	--	95	%RH
		24VDC input	5	--	95	
Vibration	24VDC input		10-150Hz, 5G, 0.75mm. along X, Y and Z			
Switching Frequency	100% load, nominal input voltage	5VDC input	--	250	--	kHz
		24VDC input	--	260	--	
MTBF	MIL-HDBK-217F@25℃		3500	--	--	k hours

Note:②The pin resistance temperature is not the actual set temperature of the soldering iron, but the temperature required for a good solder joint. The actual set temperature by the customer needs to be determined based on the thickness of the PCB, the size of the copper cladding, the power of the soldering iron, and the selection of the soldering iron tip.

Mechanical Specifications

Case Material	Black plastic; flame-retardant and heat-resistant (UL94V-0)
Dimensions	27.50 x 9.50 x 12.00mm
Weight	5.2g(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

Temperature Derating Curve

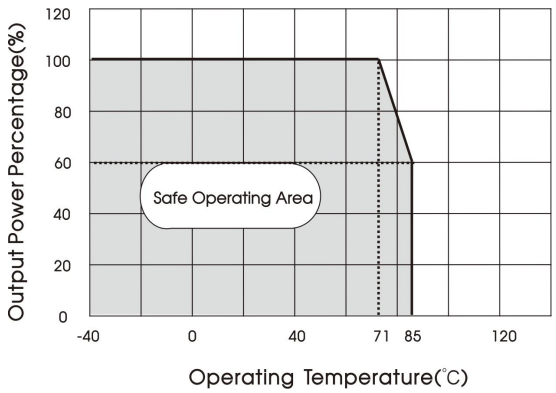
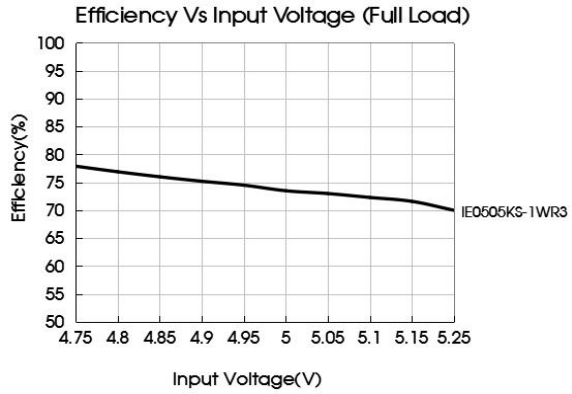
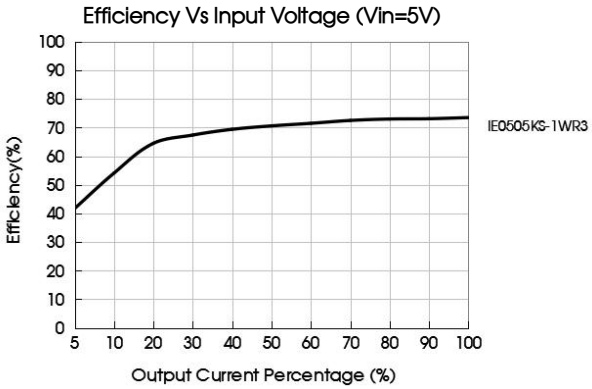


Fig. 1

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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.

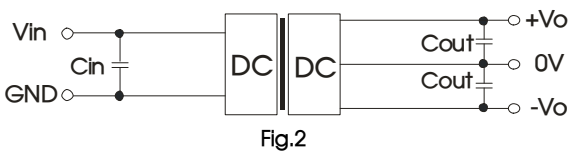


Fig.2

Table 1: Recommended input and output capacitor values

Vin	Cin	Vo	Cout
5VDC	4.7μF/16V	±5VDC	4.7μF/16V
		±9/±12VDC	2.2μF/25V
24VDC	2.2μF/50V	±5VDC	4.7μF/16V
		±12VDC	1μF/25V
		±15VDC	1μF/25V

2. EMC compliance circuit

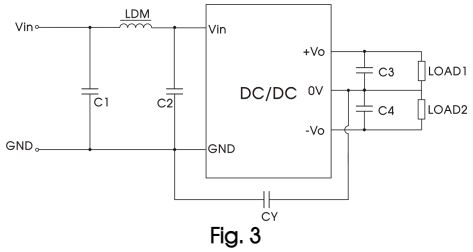


Fig. 3

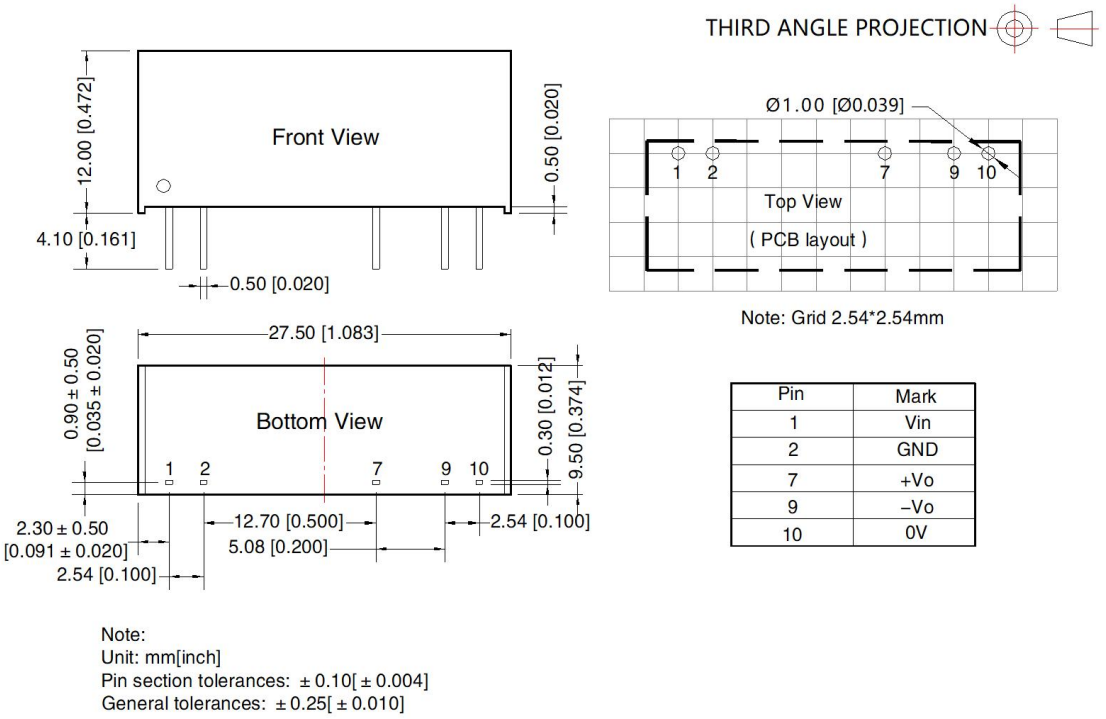
Table 2: Recommended EMC filter values

Input voltage		5DVC		24DVC
Output voltage		5/9VDC	12VDC	--
Emissions	C1/C2	4.7μF /25V	4.7μF /25V	4.7μF /50V
	CY	100pF/3kV	1000pF/3kV	270pF/3kV
	C3/C4	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.

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Dimensions and Recommended Layout



Pin	Mark
1	Vin
2	GND
7	+Vo
9	–Vo
10	0V

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

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 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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