# **MORNSUN**<sup>®</sup>

# **IF\_S-2W Series**

2W isolated DC-DC converter with Fixed Input Voltage and Regulated Single Output



## CE Patent Protection RoHS

## MODEL SELECTION IF0505S-2W Package Type Output Voltage Input Voltage Product Series

## FEATURES

- Compact size
- SIP Package
- I/O isolation test voltage 3k VDC
- Operating ambient temperature range -40°C to +85°C
- Excellent thermal characteristic
- Internal surface mounted design
- Industry standard pin-out
- No external components required
- RoHS Compliant
- EN60950 Approval

#### **APPLICATIONS**

The IF\_S-2W Series are especially designed for use in on-board distributed power supply systems and applications with high input to output isolation requirements with the following characteristics:

- 1) The voltage of the input power supply is within a range of  $\pm 5\%$  max;
- 2) High input to output isolation of up to 3000VDC is required;
- Applications requiring tight line and load regulation and/or low ripple and noise.

MODEL SELECTION										
Certification	Model	Input Voltage (VDC)		Output Voltage	Output Current (mA)		Input Current, typical (mA)		Full Load Efficiency (%)	
		Nominal	Range	(VDC)	Max.	Min.	Full Load	No Load	Min.	Typ.
CE	IF0505S-2W	5	4.75-5.25	5	400	40	579	25	65	69
	IF1205S-2W	12	11.4-12.6	5	400	40	238	20	66	70
	IF2405S-2W	24	22.8-25.2	5	400	40	119	8	66	70

## **OUTPUT SPECIFICATIONS**

	<u>NO</u>				
Item	Test condition	Min.	Тур.	Max.	Unit
Linear Regulation	Input voltage change: ±5%			±0.5	
Load Regulation	10% to 100% load change		±l	<b>±</b> 2	%
Voltage Accuracy	100% load		_	±3	
Temperature Coefficient	100% load		_	0.03	<b>%/</b> ℃
Ripple*	20MHz Bandwidth		20	30	~~\/~ ~
Noise*	20MHz Bandwidth		50	150	mvp-p

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	Test Conditions	Min.	Тур.	Max.	Unit		
Storage humidity	Non condensing			95	%RH		
Operating Temperature		-40		85			
Storage Temperature		-55		125			
Case Temperature Rise	Ta=25° C		40	60	Ĉ		
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm from case for 10 seconds			300			
Cooling Method		Free air convection					
Case material		Black plastic; flame-retardant and heat-resis (UL94 V-0)		t-resistant			
Short-circuit Protection			Cont	inuous			

Switching Frequency	100% load, nominal input		100	300	KHz
MTBF	MIL-HDBK-217F@25°C	3500			K hours
Weight			2.4		g

ISOLATION					
Item	Test condition	Min.	Тур.	Max.	Unit
Isolation	Input-Output Electric strength test for 1 minute with a leakage current of 1 mA max.	3000		-	VDC
Insulation Resistance	Input-Output resistance at 500VDC	1000			MΩ
Isolation Capacitance	Input-Output capacitance at100kHz/0.1V		60		рF

## TYPICAL CHARACTERISTIC CURVE



## DIMENSIONS AND RECOMMENDED LAYOUT



#### APPLICATION NOTE

#### 1)Minimum Output Load Requirement

For a reliable and efficient operation of the converter, the minimum load should never be below 10% of the rated output load. If the totc required output power is less than 10%, a parallel bleeding resistor is required, ensuring that the sum of the power consumption is alway maintained at 10% minimum.

#### 2)Recommended circuit for Ripple Reduction

Input and/or output ripple can be further reduced by connecting "LC" filters to the input and/or output terminals of the DC-DC converte as shown in Figure 1.



Note: To avoid mutual interference/oscillation the inductance and the frequency of the "LC" filter network should be staggered with the DC-DC converters frequency. Also, the capacitance of the output filter capacitor must be properly selected. If the capacitor value that i too high, the converter may not be able to properly start up. To ensured safe and reliable operation, the specified filter capacitor value in Table 1 must not be exceeded.

Vin	Cin	Vout	Cout
(VDC)	(µF)	(VDC)	(µF)
5	4.7	5	4.7
12	2.2		
24	0.47		

TABLE 1:RECOMMENDED EXTERNAL CAPACITOR VALUES

It is not recommended to use external capacitors for applications where the actual output power is less than 0.5W.

#### 3) Overload Protection

This family of DC-DC converter products does not incorporate any protection against overcurrent and/or short circuit. The best approach for protection the device is to add a self-recovery fuse or a circuit breaker in series to the input.

#### 4) Input Overvoltage Protection Circuit

For input overvoltage protection, simply use a linear voltage regulator with overtemperature protection in front of the DC-DC converter a shown in Figure 2.



#### Figure 2

5) The total output power of the device has to be reduced to 60% or less of the rated output power at ambient temperatures above 71° C.

6) These products are not hot-swappable and do not support parallel connection of their outputs. We recommended the use of a converter with higher output power capability to cover applications with higher power requirements.

Note:

- 1. 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;
- 2. The maximum capacitive load offered were tested at input voltage range and full load;
- 3. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25°C, humidity<75%RH with nominal input voltage and rated output load;
- 4. All index testing methods in this datasheet are based on our Company's corporate standards;
- 5. Non-standard models may have slightly different characteristics than the standard models listed. For details, please contact technical support.
- 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.

### MORNSUN Science & Technology Co.,Ltd.

Address: No. 5, Kehui St. 1, Kehui development center, Science Ave., Guangzhou Science City, Luogang district, Guangzhou, P.R. China.

Tel: 86-20-38601850 Fax: 86-20-38601272 E-mail: sales@mornsun.cn www.mornsun-power.com

The copyright and authority for the interpretation of the products are reserved by MORNSUN IF\_S-2W 2018.09.27-A/5 Page 3 of 3