

## IA\_KS-2W & IA\_S-2W Series 2W, FIXED INPUT, ISOLATED & REGULATED DUAL OUTPUT DC-DC CONVERTER



RoHS

### FEATURES

SIP Package  
1KVDC Isolation  
Temperature Range: -40°C to +85°C  
No Heat sink Required  
Internal SMD Construction  
No External Component Required  
Industry Standard Pinout  
RoHS Compliance

### APPLICATIONS

The IA\_KS-2W & IA\_S-2W Series are specially designed for applications where a group of polar power supplies are isolated from the input power supply in a distributed power supply system on a circuit board.

These products apply to:

- 1) Where the voltage of the input power supply is fixed (voltage variation  $\leq \pm 5\%$ );
- 2) Where isolation is necessary between input and output (isolation voltage  $\leq 1000\text{VDC}$ );
- 3) Where the regulation of the output voltage and the output ripple noise are demanded.

### PRODUCT PROGRAM

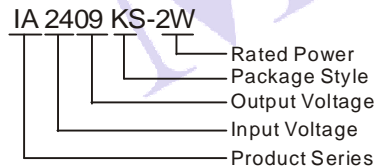
Part Number	Input		Output			Efficiency (% Typ)	Switching frequency (KHz, Typ)
	Voltage (VDC)		Voltage (VDC)	Current (mA)			
	Nominal	Range		Max	Min		
IA0505S-1W5	5	4.75-5.25	$\pm 5$	$\pm 150$	$\pm 15$	69	100
IA0505S-2W			$\pm 5$	$\pm 200$	$\pm 20$	70	55
IA0509KS-2W			$\pm 9$	$\pm 100$	$\pm 10$	62	67
IA0512KS-2W			$\pm 12$	$\pm 83$	$\pm 9$	64	67
IA0515KS-2W			$\pm 15$	$\pm 67$	$\pm 7$	65	200
IA1205S-1W5	12	11.4-12.6	$\pm 5$	$\pm 150$	$\pm 15$	70	83
IA1209KS-2W			$\pm 9$	$\pm 100$	$\pm 10$	63	91
IA1212KS-2W			$\pm 12$	$\pm 83$	$\pm 9$	65	91
IA1215KS-2W *			$\pm 15$	$\pm 67$	$\pm 7$	68	200
IA2405S-1W5	24	22.8-25.2	$\pm 5$	$\pm 150$	$\pm 15$	70	83
IA2409KS-2W			$\pm 9$	$\pm 100$	$\pm 10$	63	100
IA2412KS-2W			$\pm 12$	$\pm 83$	$\pm 9$	67	200
IA2415KS-2W			$\pm 15$	$\pm 67$	$\pm 7$	69	91

\* Designing.

### ISOLATION SPECIFICATION

Item	Test conditions	Min	Typ	Max	Units
Isolation voltage	Tested for 1 minute and 1mA max	1000			VDC
Isolation resistance	Test at 500VDC	1000			MΩ

### MODEL SELECTION



### OUTPUT SPECIFICATIONS

Item	Test Conditions	Min	Typ	Max	Units
Output power		0.2		2	W
Line regulation	For $V_{in}$ change of $\pm 5\%$			$\pm 0.25$	%
Load regulation	10% to 100% full load			$\pm 1$	
Output voltage accuracy	100% full load			$\pm 3$	
Temperature drift	100% full load			0.03	$\%/^{\circ}\text{C}$
Output ripple*	20MHz Bandwidth		20	30	mVp-p
Noise*	20MHz Bandwidth		75	150	

\*Test ripple and noise by "parallel cable" method. See detailed operation instructions at Testing of Power Converter section, application notes.

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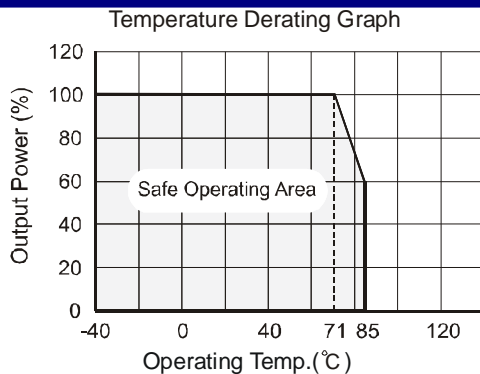
[Http://www.mornsun-power.com](http://www.mornsun-power.com)

## COMMON SPECIFICATIONS

Item	Test conditions	Min	Typ	Max	Units
Storage humidity				95	%
Operating temperature		-40		85	°C
Storage temperature		-55		125	
Temp. rise at full load			20	30	
Lead temperature				300	
Cooling		Free air convection			
Case material		Plastic (UL94-V0)			
Short circuit protection	IAXX05S-2W/1W5	Continuous			
	Others*			1	s
MTBF		3500			K hours
Weight			5.2		g

\*Supply voltage must be discontinued at the end of short circuit duration.

## TYPICAL CHARACTERISTICS



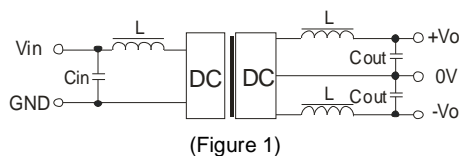
## APPLICATION NOTE

### Requirement on output load

To ensure this module can operate efficiently and reliably, a minimum load is specified for this kind of DC/DC converter in addition to a maximum load (namely full load). During operation, make sure the specified range of input voltage is not exceeded, the minimum output load **could not be less than 10% of the full load**. If the actual output power is very small, please connect a resistor with proper resistance at the output end in parallel to increase the load, or use our company's products with a lower rated output power (IA\_KS-1W/IA\_S-1W series).

### Filtering

To get an extreme low ripple, an "LC" filtering network may be connected to the input and output ends of the DC/DC converter, which may produce a more significant filtering effect. It should also be noted that the inductance and the frequency of the "LC" filtering network should be staggered with the DC/DC frequency to avoid mutual interference (see figure 1).



In some circuits which are sensitive to noise and ripple, a filtering capacitor may be added to the DC/DC output end and input end to reduce the noise and ripple. However, the capacitance of the output filter capacitor must be proper. If the capacitance is too big, a startup problem might arise. For every channel of output, provided the safe and reliable operation is ensured, the greatest capacitance of its filter capacitor sees the EXTERNAL CAPACITOR TABLE (see Table 1).

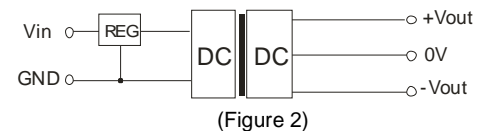
EXTERNAL CAPACITOR TABLE (Table 1)

Vin (VDC)	Cin (uF)	Vout (VDC)	Cout (uF)
5	4.7	±5	4.7
12	2.2	±9	2.2
24	1	±12	1
--	--	±15	0.47

It's not recommend to connect any external capacitor in the application field with less than 0.5 watt output.

### Input Over-voltage Protection Circuit

The simplest device for input over-voltage protection is a linear voltage regulator with overheat protection that is connected to the input end in series (Figure 2).



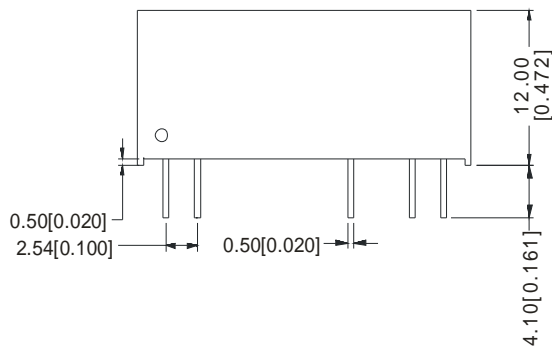
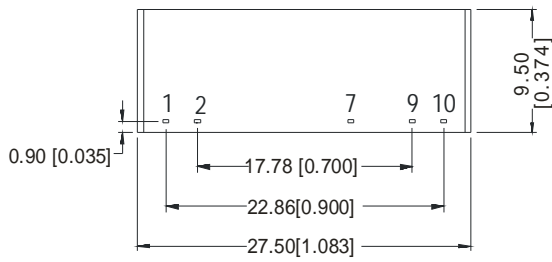
**When the environment temperature is higher than 71°C, the product output power should be less then 60% of the rated power.**

**No parallel connection or plug and play.**

**Use dual output simultaneously, forbid opening output pin(0V) to use as single output.**

# OUTLINE DIMENSIONS & PIN CONNECTIONS

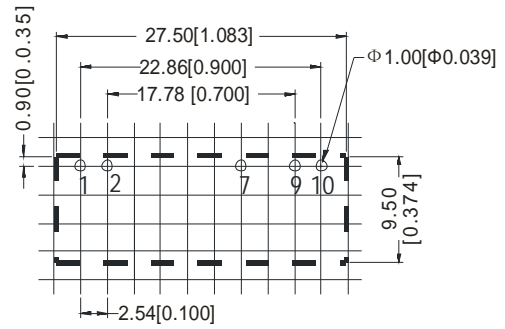
## MECHANICAL DIMENSIONS



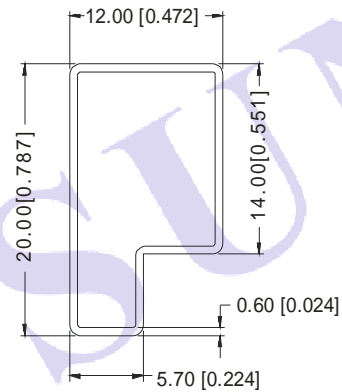
Note:  
 Unit: mm[inch]  
 Pin tolerances:  $\pm 0.10\text{mm} [\pm 0.004\text{inch}]$   
 General tolerances:  $\pm 0.25\text{mm} [\pm 0.010\text{inch}]$

FOOTPRINT DETAILS	
Pin	Function
1	Vin
2	GND
7	+Vo
9	-Vo
10	0V

## RECOMMENDED FOOTPRINT



## TUBE OUTLINE DIMENSIONS



Note:  
 Unit :mm[inch]  
 General tolerances:  $\pm 0.50\text{mm} [\pm 0.020\text{inch}]$   
 L=530mm[20.866inch] Devices per tube quantity: 18pcs  
 L=220mm[8.661inch] Devices per tube quantity: 7pcs  
 Short tube inner packaging dimensions: L\*W\*H=255\*170\*80mm  
 Short tube outer packaging dimensions: L\*W\*H=375\*280\*270mm  
 Long tube inner packaging dimensions: L\*W\*H=580\*200\*100mm  
 Long tube outer packaging dimensions(with two inner packaging boxes):  
 L\*W\*H= 600\*215\*220mm  
 Long tube outer packaging dimensions(with three inner packaging boxes):  
 L\*W\*H=600\*215\*325mm

Note:

1. Operation under minimum load will not damage the converter; However, they may not meet all specification listed, and that will reduce the life of product.
2. All specifications measured at  $T_a=25^\circ\text{C}$ , humidity<75%, nominal input voltage and rated output load unless otherwise specified.
3. Only typical models listed, other models may be different, please contact our technical person for more details.
4. In this datasheet, all the test methods of indications are based on corporate standards.