



IA_KS-1W & IA_S-1W Series

1W FIXED INPUT ISOLATED & REGULATED DUAL OUTPUT DC-DC CONVERTER

multi-country patent protection **RoHS**

FEATURES

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

APPLICATIONS

The IA_KS-1W & IA_S-1W 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.

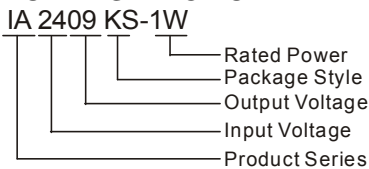
These products apply to:

- 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.

These products don't apply to:

- 1) Where the input supply voltage varied (variation $\geq \pm 5\%$), otherwise our company's WRA series is recommended;
- 2) When the isolation voltage than 1000VDC, the IE_KS-1W series are recommended.

MODEL SELECTION



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PRODUCT PROGRAM

Part Number	Input		Output			Efficiency (% Typ)
	Voltage (VDC)		Voltage (VDC)	Current (mA)		
	Nominal	Range		Max	Min	
IA0505S-1W	5	4.75-5.25	± 5	± 100	± 10	69
IA0505KS-1W			± 5	± 100	± 10	54
IA0509KS-1W			± 9	± 56	± 6	63
IA0512KS-1W			± 12	± 42	± 5	63
IA0515KS-1W*			± 15	± 33	± 4	65
IA1205S-1W	12	11.4-12.6	± 5	± 100	± 10	72
IA1205KS-1W			± 5	± 100	± 10	56
IA1209KS-1W			± 9	± 56	± 6	62
IA1212KS-1W			± 12	± 42	± 5	65
IA1215KS-1W	24	22.8-25.2	± 15	± 33	± 4	66
IA2405S-1W			± 5	± 100	± 10	72
IA2405KS-1W			± 5	± 100	± 10	54
IA2409KS-1W			± 9	± 56	± 6	62

* Designing.

COMMON SPECIFICATION

Operating temperature range	-40°C to +85°C
Storage temperature range	-55°C to +125°C
Storage humidity range	$\leq 95\%$
Cooling	Free air convection
Lead temperature	300°C (1.5mm from case for 10 seconds)
Temperature rise at full load	25°C Max, 15°C Typ
Short circuit protection	1 second
Case material	Plastic (UL94-V0)
MTBF	>3,500,000 hours
Weigh	5.2g

OUTPUT SPECIFICATIONS

Item	Test Conditions	Min	Typ	Max	Units
Output power		0.1		1	W
Line regulation	For V_{in} change of 5%			± 0.25	%
Load regulation	10% to 100% full load			± 1	
Output voltage accuracy	100% full load			± 3	
Temperature drift	100% full load			0.03	%/°C
Output ripple	20MHz Bandwidth		10	20	mVp-p
Noise	20MHz Bandwidth		50	100	
Switching frequency	Full load, nominal input		100		KHz

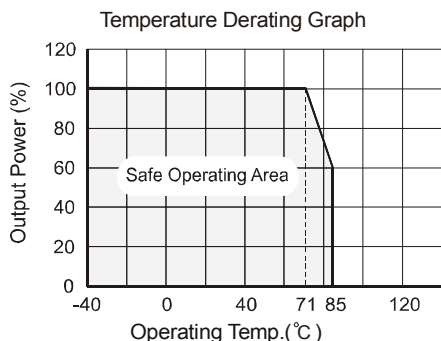
Note:

1. All specifications measured at $T_A=25^\circ\text{C}$, humidity < 75%, nominal input voltage and rated output load unless otherwise specified.
2. See below recommended circuits for more details.

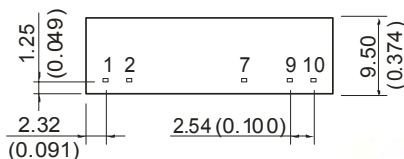
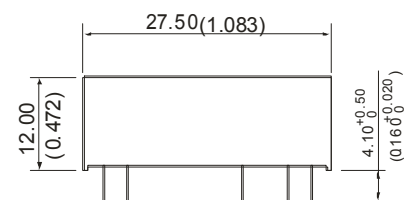
ISOLATION SPECIFICATIONS

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

TYPICAL CHARACTERISTICS

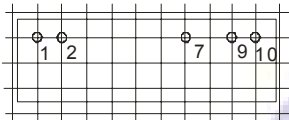


OUTLINE DIMENSIONS & PIN CONNECTIONS



Note:
Unit:mm(inch)
Pin section:0.50*0.3mm(0.020*0.012inch)
General tolerances:±0.25mm(±0.010inch)

RECOMMENDED FOOTPRINT
Bottom view, grid:2.54mm(0.1inch),
diameter:1.00mm(0.039inch)



FOOTPRINT DETAILS

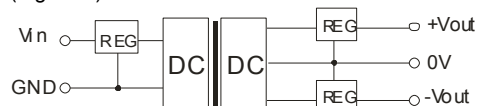
Pin	Function
1	Vin
2	GND
7	+Vo
9	-Vo
10	0V

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 is **not less than 10%** of the full load, that this product should never be operated under no 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.

Output Voltage Regulation and Over-voltage Protection Circuit

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



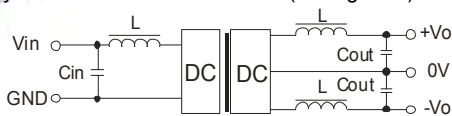
(Figure 2)

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

APPLICATION NOTE

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).



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

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

Overload Protection

Under normal operating conditions, the output circuit of these products has no protection against over-current and short-circuits. The simplest method is to connect a self-recovery fuse in series at the input end or add a circuit breaker to the circuit.