

# IE\_KS-1W & IE\_S-1W Series 1W FIXED INPUT ISOLATED & REGULATED DUAL OUTPUT DC-DC CONVERTER



## multi-country patent protection RoHS

# Low ripple and good EMC features Good dynamic feature 3KVDC Isolation SIP Package

Temperature Range: -40°C to +85°C Internal SMD construction

**FEATURES** 

No Heat sink Required No External Component Required RoHS Compliance

#### **APPLICATIONS**

The IE\_KS-1W&IE\_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:

- Where the voltage of the input power supply is fixed (voltage variation ≤±5%);
- Where isolation is necessary between input and output (isolation voltage ≤3000VDC);
- Where the regulation of the output voltage and the output ripple noise are demanded.

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PRODUCT F	PROGRA	AM					
_	Input		Output				Switching
Part Number	Voltage (VDC)		Voltage	Current (mA)		Efficiency (%, Typ)	frequency
	Nominal	Range	(VDC)	Max	Min	(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	(KHz,Typ
IE0505S-1W			±5	±100	±10	69	83
IE0505KS-1W*			±5	±100	±10	54	83
IE0509KS-1W*	5	4.75-5.25	±9	±56	±6	61	83
IE0512KS-1W			±12	±42	±5	62	83
IE0515KS-1W			±15	±33	±4	64	250
IE1205S-1W			±5	±100	±10	72	100
IE1205KS-1W*			±5	±100	±10	54	83
IE1209KS-1W*	12	11.4-12.6	±9	±56	±6	61	83
IE1212KS-1W*		- 45	±12	±42	±5	63	83
IE1215KS-1W*			±15	±33	±4	64	83
IE2405S-1W	100		±5	±100	±10	72	83
IE2405KS-1W			±5	±100	±10	54	83
IE2409KS-1W*	24	22.8-25.2	±9	±56	±6	60	83
IE2412KS-1W	100		±12	±42	±5	63	83
IE2415KS-1W	\ \X		±15	±33	±4	64	300
-01							
1 10	70						
N. P							
* Designing.					1		

ISOLATION SPECIFICATIONS					
Item	Test conditions	Min	Тур	Max	Units
Isolation voltage	Tested for 1 minute and 1 mA max	3000			VDC
Isolation resistance	Test at 500VDC	1000			ΜΩ

# MODEL SELECTION IE0505KS-1W Rated Power Package Style Output Voltage Input Voltage Product Series

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http://www.mornsun-power.com

OUTPUT SPECIFICATIONS						
Item	Test conditions	Min	Тур	Max	Units	
Output power		0.1		1	W	
Line regulation	For Vin 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	
Output noise*	20MHz Bandwidth		50	100		

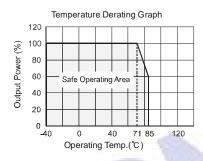
\*Test ripple and noise by "parallel cable" method. See detailed operation instructions at testing of Power Converter section, application notes.

#### Note:

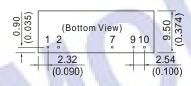
- All specifications measured at TA=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
- 2. See below recommended circuits for more details.

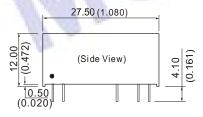
COMMON SPECIFICATIONS						
Item	Test conditions	Min	Тур	Max	Units	
Storage humidity				95	%	
Operating temp. range		-40		85		
Storage temp. range		-55 125		°C		
Temp. rise at full load			20	30		
Lead temperature	1.5mm from case for 10 seconds			300		
Cooling		Free air convection				
Case material		Plastic (UL94-V0)				
Chart aircuit protection	IEXXXXS-1W	Continuous				
Short circuit protection	IEXXXXKS-1W *			1	s	
MTBF		3500			K hours	
Weight			5.2		g	
*Supply voltage must be discontinued at the end of short circuit duration.						

# **TYPICAL CHARACTERISTICS**



# **OUTLINE DIMENSIONS**



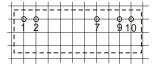


Note: Unit:mm(inch) Pin section:0.50\*0.30mm(0.020\*0.012inch)

Pin section tolerances:±0.10mm(±0.004inch) General tolerances:±0.25mm(±0.010inch)

# First Angle Projection 🕣 🕀

RECOMMENDED FOOTPRINT Top 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		

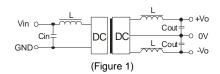
# APPLICATION NOTE

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

#### **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 proper. If the capacitance is too big, a startup problem might arise. For every channel of output, providing the safe and reliable operation is ensured, the greatest capacitance of its filter capacitor refer to the external capacitor table (table1).

#### **EXTERNAL CAPACITOR TABLE (TABLE1)**

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. The simplest method is to connect a self-recovery fuse in series at the input end or add a circuit breaker to the circuit.

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.