MORNSUN
Industrial DC&AC converter professional

E_KS-1W5 Series

1.5W, FIXED INPUT ISOLATED & UNREGULATED OUTPUT SIP PACKAGE DC-DC CONVERTER

multi-country patent protection **RoHS**

FEATURES

Small Footprint
SIP Package
High Power Density
3KVDC Isolation
Temperature Range: -40°C to +85°C
No External Component Required
Internal SMD construction
RoHS Compliance

APPLICATIONS

The E_KS-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 ≤ ±10%);
2) Where isolation is necessary between input and output (isolation voltage ≤3000VDC);
3) Where the regulation of the output voltage and the output ripple noise are not demanding. Such as: purely digital circuits, ordinary low frequency analog circuits, and IGBT power device driving circuits.

PRODUCT PROGRAM

Part Number	Input		Output			Efficiency (%)(Typ.)
	Voltage (VDC)		Voltage (VDC)	Current (mA)		
	Nominal	Range		Max	Min	
E0305KS-1W5	3.3	3.0-3.6	±5	±150	±15	81

ISOLATION SPECIFICATIONS

Item	Test Conditions	Min	Typ	Max	Units
Isolation voltage	Tested for 1 minute and 1mA max	3000			VDC
Isolation resistance	Test at 500VDC	1000			MΩ
Isolation capacitance			40		pF

MODEL SELECTION

E03 05KS-1W5

- Rated Power
- Package Style
- Output Voltage
- Input Voltage
- Product Series

OUTPUT SPECIFICATIONS

Item	Test Conditions	Min	Typ	Max	Units
Output power		0.15		1.5	W
Line regulation	For Vin change of 1%			±1.2	%
Load regulation	10%to100% load		10	15	
Output voltage accuracy		See tolerance envelope graph			
Temperature drift	100% full load			0.03	%/°C
Output ripple &Noise*	20MHz Bandwidth		100	150	mVp-p
Switching frequency	Full load, nominal input		50		KHz

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

Note:
1. 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.

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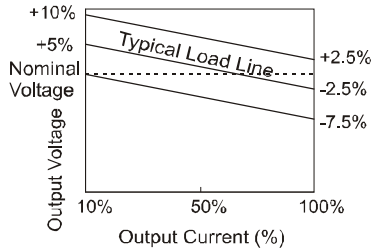
COMMON SPECIFICATIONS

Item	Test conditions	Min	Typ	Max	Units
Storage humidity				95	%
Operating temperature		-40		85	°C
Storage temperature		-55		125	
Lead temperature	1.5mm from case for 10 seconds			300	
Temp. rise at full load			15	25	
Short circuit protection*				1	S
package material		Free air convection			
Cooling		Plastic (UL94-V0)			
MTBF		3500			K hours
Weight			2.1		g

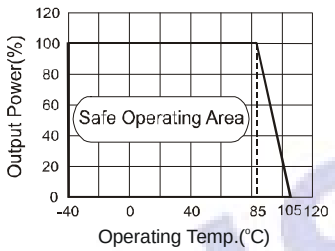
*Supply voltage must be discontinued at the end of short circuit duration.

TYPICAL CHARACTERISTICS

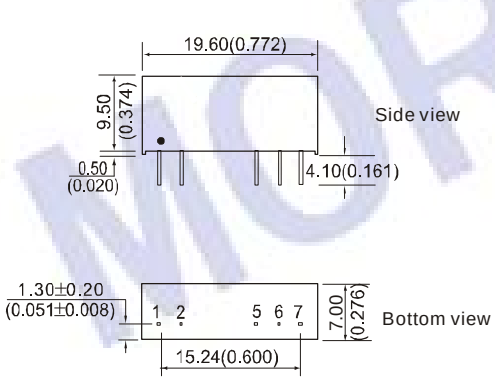
Tolerance Envelope Graph



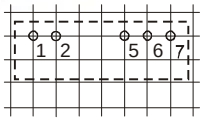
Temperature Derating Graph



RECOMMENDED REFLOW SOLDERING PROFILE



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



FOOTPRINT DETAILS

Pin	Function
1	Vin
2	GND
5	-Vo
6	0V
7	+Vo

Note:
Unit:mm(inch)
Pin section:0.50*0.30mm(0.020*0.012inch)
Pinsection tolerances:±0.10mm(±0.004inch)
General tolerances:±0.25mm(±0.010inch)

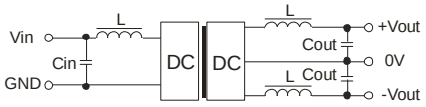
APPLICATION NOTE

Requirement on output load

To ensure this module can operate efficiently and reliably, During operation, the minimum output load is ***not less than 10%*** of the full load, and 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.

Recommended testing circuit

If you want to further decrease the input/output ripple, an "LC" filtering network may be connected to the input and output ends of the DC/DC converter, see (Figure1).



(Figure 1)

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. 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 (Table 1).

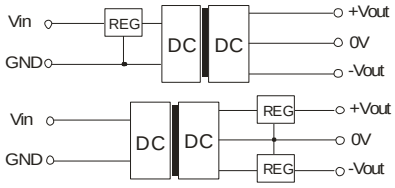
EXTERNAL CAPACITOR TABLE (TABLE 1)

Vin (VDC)	Cin (uF)	Dual Vout (VDC)	Cout (uF)
3.3	4.7	±5	4.7

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

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 (Figure2).



(Figure 2)

Overload Protection

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

No parallel connection or plug and play.