MORNSUN
mini power professional

H_S-2W Series

FIXED INPUT ISOLATED & UNREGULATED 2W OUTPUT SINGLE OUTPUT MINIATURE SIP PACKAGE

multi-country patent protection

FEATURES

- Efficiency to 84%
- Singlel Output
- Small Footprint
- SIP Package
- Industry Standard Pinout
- UL94-V0 Package
- No Heat sink Required
- 6kVDC Isolation
- Temperature Range: -40°C -+85°C
- No External Components Required
- RoHS Compliance

APPLICATIONS

The H_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 ≤±10%);
2) Where isolation is necessary between input and output (isolation voltage =6000VDC);
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.

MODEL SELECTION

H0505S-2W

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

PRODUCT PROGRAM

Part Number	Input		Output			Efficiency (%, Typ.)	Package Style
	Voltage (VDC)		Voltage (VDC)	Current (mA)			
	Nominal	Range		Max.	Min.		
H0505S-2W	5	4.5~5.5	5	400	40	80	SIP
H0509S-2W	5	4.5~5.5	9	222	23	81	SIP
H0512S-2W	5	4.5~5.5	12	167	17	84	SIP
H0515S-2W	5	4.5~5.5	15	133	14	84	SIP
H1205S-2W	12	10.8~13.2	5	400	40	81	SIP
H1209S-2W	12	10.8~13.2	9	222	23	82	SIP
H1212S-2W	12	10.8~13.2	12	167	17	80	SIP
H1215S-2W	12	10.8~13.2	15	133	14	84	SIP

COMMON SPECIFICATIONS

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

ISOLATION SPECIFICATIONS

Item	Test conditions	Min	Typ	Max	Units
Isolation voltage	1 minute	6000			VDC
Isolation resistance	500VDC	1000			MΩ

OUTPUT SPECIFICATIONS

Item	Test conditions	Min	Typ	Max	Units
2W Out put power	See above product program	0.2		2	W
Linear regulation**	For Vin change of 1%			±1.2	%
Load regulation	10% to 100% (5V output)			15	%
Load regulation	10% to 100% (12V output)			10	%
Output voltage accuracy	full load	See tolerance envelope graph			
Efficiency at full load	Nominal input voltage		80		%
Temperature drift	full load			0.03	%/°C
2W Output ripple	20MHz Bandwidth		100	200	mVp-p
Switching frequency	Full load, nominal input		250		KHz

Notes:
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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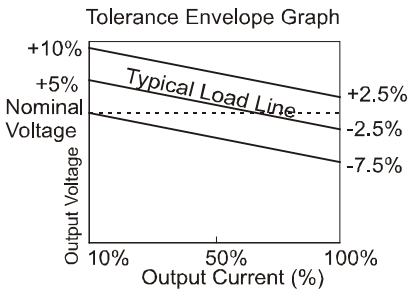
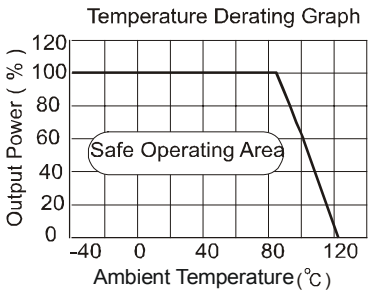
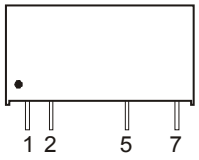
TYPICAL CHARACTERISTICS



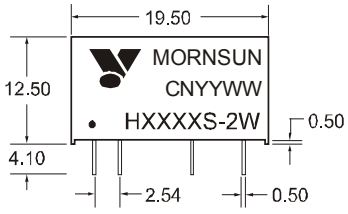


PIN CONNECTIONS

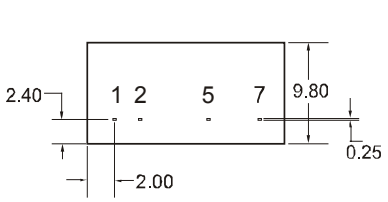


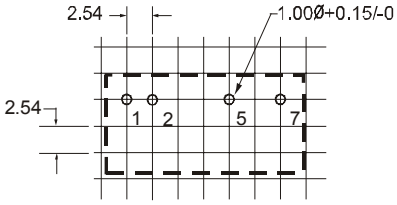
Pin	Function
1	Vin
2	GND
5	0V
7	+Vo

OUTLINE DIMENSIONS& RECONMENDED FOOTPRINT DETAILS



Side View





Bottom View

Note: All Pins on a 2.54mm pitch; all Pin diameters are 0.50mm; all dimensions in mm.

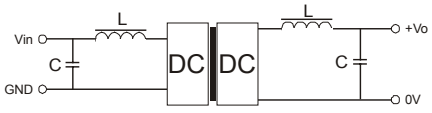
APPLICATION NOTE

Filtering

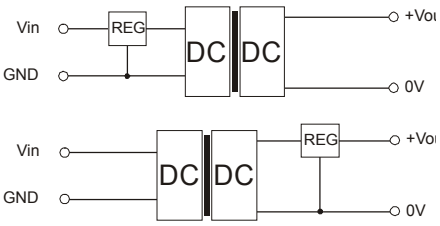
In some circuits which are sensitive to noise and ripple, a filtering capacitor may be added to the DC/DC output end and input end to reduce the noise and ripple. However, the capacitance of the output filter capacitor must be proper. If the capacitance is too big, a startup problem might arise. For every channel of output, provided the safe and reliable operation is ensured, the greatest capacitance of its filter capacitor sees the external capacitor table. To get an extremely 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).

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, and that this product should **not 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 (H_S -1W series).



<Figure 1>



<Figure 2>

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.

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 stabilizer with overheat protection that is connected to the input or output end in series (see Figure 2).

External Capacitor Table

V_{in}	External capacitor	V_{out}	External capacitor
5VDC	4.7uF	5VDC	4.7uF
12VDC	2.2uF	9VDC	2.2uF
24VDC	1uF	12VDC	1uF
--	--	15VDC	0.47uF

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