

# MORNSUN

## H\_RN-2W & H\_LT-2W Series 2W, FIXED INPUT, ISOLATED & UNREGULATED SINGLE OUTPUT DC-DC CONVERTER



### FEATURES

- High Efficiency up to 80%
- DIP/SMD Package
- 6kVDC Isolation
- Temperature Range: -40°C ~ +85°C
- Internal SMD Construction
- No Heatsink Required
- No External Component Required
- Continuous Short Circuit Protection
- Industry Standard Pinout
- RoHS Compliance

### APPLICATIONS

The H\_RN-2W&H\_LT-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.

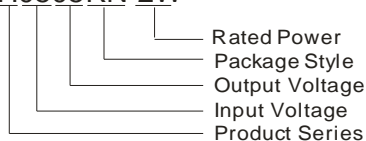
These products apply to:

- 1) Where the voltage of the input power supply is fixed (voltage variation  $\leq \pm 10\%$ );
- 2) Where isolation is necessary between input and output (isolation voltage  $\leq 6000\text{VDC}$ );
- 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

#### H0505RN-2W



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### PRODUCT PROGRAM

Part Number	Input		Output			Efficiency (% , Typ.)	Certificate
	Voltage (VDC)		Voltage (VDC)	Current (mA)			
	Nominal	Range		Max.	Min.		
H0505RN-2W	5	4.5-5.5	5	400	40	76	CE60601
H0512RN-2W			12	167	17	79	CE60601
H0515RN-2W			15	133	13	78	CE60601
H0505LT-2W			5	400	40	76	CE60601
H0512LT-2W			12	167	17	79	CE60601
H0515LT-2W			15	133	13	78	CE60601
H1205RN-2W			12	10.8-13.2	5	400	40
H1212RN-2W	12	167			17	80	CE60601
H1215RN-2W	15	133			13	79	CE60601
H1205LT-2W	5	400			40	76	CE60601
H1212LT-2W	12	167			17	80	CE60601
H1215LT-2W	15	133			13	79	CE60601
H2405RN-2W	24	21.6-26.4			5	400	40
H2412RN-2W			12	167	17	80	CE60601
H2415RN-2W			15	133	13	78	CE60601
H2405LT-2W			5	400	40	77	CE60601
H2412LT-2W			12	167	17	80	CE60601
H2415LT-2W			15	133	13	78	CE60601

### 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			15	25	
Lead temperature	1.5mm from case for 10 seconds			260	
Cooling		Free air convection			
Package material		Epoxy Resin (UL94-V0)			
Short circuit protection		Continuous, automatic recovery			
MTBF		3500			k hours
Weight			3.8		g

### ISOLATION SPECIFICATIONS

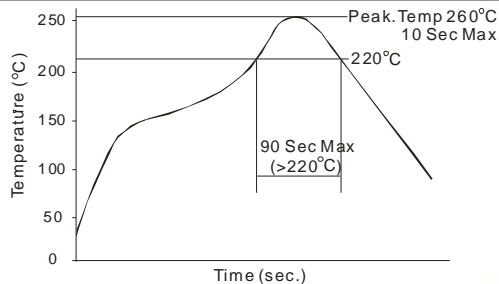
Item	Test Conditions	Min.	Typ.	Max.	Units
Isolation voltage	Tested for 1 minute and 1mA max	6000			VDC
Isolation resistance	Test at 500VDC	1000			MΩ
Isolation capacitance			10		pF

## OUTPUT SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Units
Output power		0.2		2	W
Line regulation	For Vin change of $\pm 1\%$			$\pm 1.2$	%
Load regulation	10% to 100% load (5V output)		12.8	15	
	10% to 100% load (12V output)		6.8	15	
	10% to 100% load (15V output)		6.3	15	
Output voltage accuracy	See tolerance envelope graph				
Temperature drift	100% full load			$\pm 0.03$	$\%/^{\circ}\text{C}$
Ripple & Noise*	20MHz Bandwidth		150	200	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.

## RECOMMENDED REFLOW SOLDERING PROFILE



Remark: The curve applies only to the hot air reflow soldering

## APPLICATION NOTE

### 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 **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.

### 2) Recommended testing and application 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 (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 recommended capacitance of its filter capacitor sees (Table 1).

### 3) Output Voltage Regulation and Over-voltage Protection Circuit

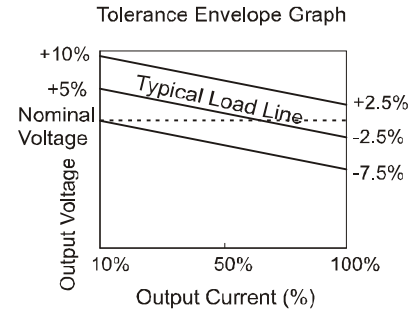
The simplest device for output voltage regulation, over-voltage and over-current protection is a linear voltage regulator with overheat protection that is connected to the input or output end in series (Figure 2).

### 4) Overload Protection

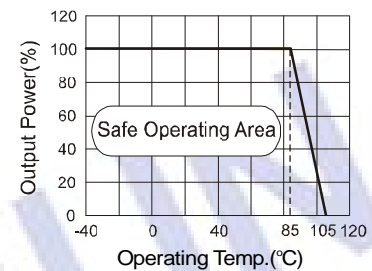
Under normal operating conditions, the output circuit of these products has no protection against overload. The simplest method is to connect a self-recovery fuse in series at the input end or add a circuit breaker to the circuit.

### 5) No parallel connection or plug and play

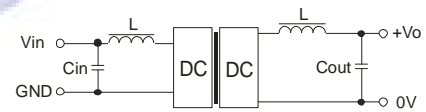
## TYPICAL CHARACTERISTICS



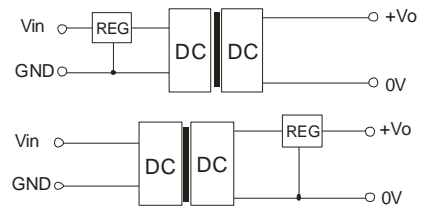
## Temperature Derating Graph



## RECOMMENDED CIRCUIT



(Figure 1)



(Figure 2)

EXTERNAL CAPACITOR TABLE (TABLE 1)

Vin (VDC)	Cin ( $\mu\text{F}$ )	Single Vout (VDC)	Cout ( $\mu\text{F}$ )
5	4.7	5	10
12	2.2	12	2.2
24	1	15	1

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

