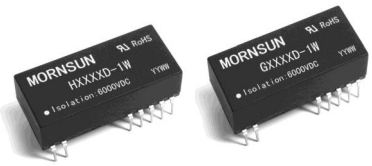
MORNSUN

G_D-1W & H_D-1W Series

1W, FIXED INPUT, 6000V ISOLATED & UNREGULATED DUAL/SINGLE OUTPUT DC-DC CONVERTER



multi-country patent protection **RoHS**

FEATURES

Small Footprint
DIP Package
6KVDC Isolation
Temperature Range: -40°C to+85°C
No Heat Sink Require
No External Component Require
Internal SMD Construction
Industry Standard Pinout
RoHS Compliance

APPLICATIONS

The G_D-1W & H_D-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 ≤6000VDC);

3) Where the regulation of the output voltage and the output ripple noise are not demanded.

Such as: purely digital circuits, ordinary low frequency analog circuits, and IGBT power device driving circuits.

MODEL SELECTION

H0505D-1W

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

PRODUCT PROGRAM

Part Number	Input		Output			Efficiency (%, Typ)	Certificate
	Voltage (VDC)		Voltage (VDC)	Current (mA)			
	Nominal	Range		Max	Min		
H0505D-1W	5	4.5-5.5	5	200	20	70	UL
H0509D-1W			9	111	12	72	UL
H0512D-1W			12	84	9	73	UL
H0515D-1W*			15	67	7	74	UL
G0505D-1W			±5	±100	±10	70	UL
G0509D-1W			±9	±56	±6	71	UL
G0512D-1W			±12	±42	±5	72	UL
G0515D-1W*			±15	±33	±4	73	UL
H1205D-1W	12	10.8-13.2	5	200	20	70	UL
H1209D-1W			9	111	12	71	UL
H1212D-1W			12	84	9	72	UL
H1215D-1W			15	67	7	74	UL
G1205D-1W			±5	±100	±10	70	UL
G1209D-1W			±9	±56	±6	71	UL
G1212D-1W			±12	±42	±5	72	UL
G1215D-1W			±15	±33	±4	75	UL

* Designing.

ISOLATION SPECIFICATIONS

Item	Test Conditions	Min	Typ	Max	Units
Isolation voltage	Tested for 1 minute and 1mA max	6000			VDC
Isolation resistance	Test at 1000VDC	1000			MΩ
Isolation capacitance			3.5		pF

COMMON SPECIFICATIONS

Item	Test Conditions	Min	Typ	Max	Units
Storage humidity range				95	%
Operating temperature		-40		85	°C
Storage temperature		-55		125	
Temp. rise at full load			15	30	
Lead temperature	1.5mm from case for 10 seconds			300	
Short circuit protection*	5V input voltage			1	s
	12V input voltage	Continuous			
Cooling		Free air convection			
Case material		Plastic(UL94-V0)			
MTBF		3500			K hours
Weight			8.2		g

* When input voltage (Nominal) is 5V, Supply voltage must be discontinued at the end of short circuit duration.

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OUTPUT SPECIFICATIONS

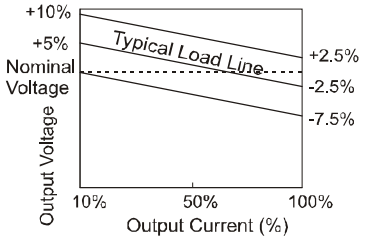
Item	Test conditions		Min	Typ	Max	Units
Output power			0.1		1	W
Line regulation	For Vin change of 1%				±1.2	%
Load regulation	10% to 100% load 5V output			10	15	%
	10% to 100% load 9V output			8.3	15	%
	10% to 100% load 12V output			6.8	15	%
	10% to 100% load 15V output			6.3	15	%
Output voltage accuracy	See tolerance envelope graph					
Temperature drift	100% full load				0.03	%/°C
Ripple & Noise*	20MHz Bandwidth			150	200	mVp-p
Switching frequency	Full load nominal input	5V input		250		KHz
		12V input		50		KHz

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

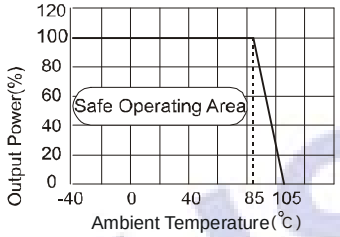
Note: Dual output models unbalanced load: ±5%.

TYPICAL CHARACTERISTICS

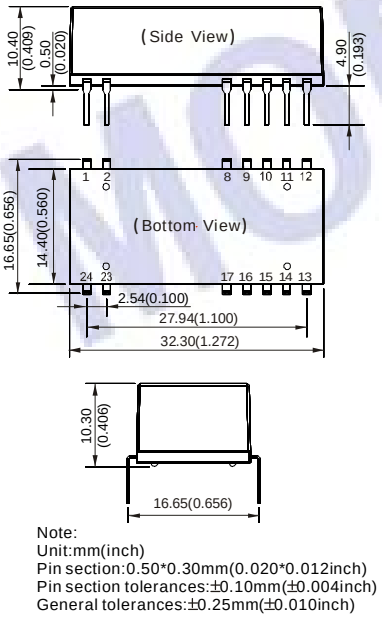
Tolerance Envelope Graph



Temperature Derating Graph

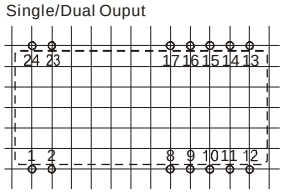


OUTLINE DIMENSIONS & PIN CONNECTIONS



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

Single/Dual Ouput



FOOTPRINT DETAILS

Pin	Single	Dual
1	Vin	Vin
2	GND	GND
8, 17	NC	-Vo
10, 15	0V	0V
12,13	+Vo	+Vo
Others	NC	NC

NC: No connection

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)

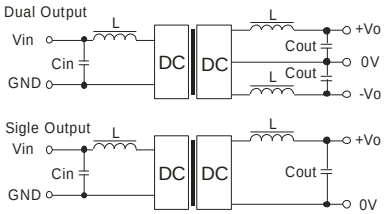
APPLICATION NOTE

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 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).



(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).

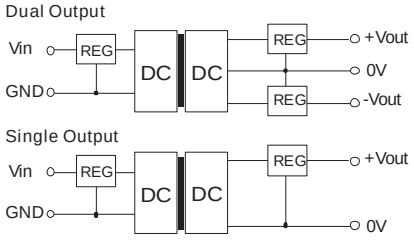
EXTERNAL CAPACITOR TABLE (Table 1)

Vin (VDC)	Cin (uF)	Single Vout (VDC)	Cout (uF)	Dual Vout (VDC)	Cout (uF)
5	4.7	5	10	±5	4.7
12	2.2	9	4.7	±9	2.2
24	1	12	2.2	±12	1
-	-	15	1	±15	1

It's not recommend 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 (Figure 2).



(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

Note:
1. All specifications measured at Ta=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
2. Only typical models listed, other models may be different, please contact our technical person for more details.
3. Operation under minimum load will not damage the converter; However, they may not meet all specification listed.

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