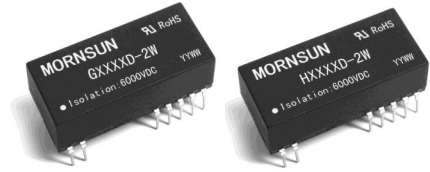


# MORNSUN



## G\_D-2W & H\_D-2W Series

2W, FIXED INPUT, 6000V ISOLATED & UNREGULATED  
DUAL/SINGLE OUTPUT DC-DC CONVERTER



### FEATURES

- High Efficiency up to 81%
- 6KVDC Isolation
- DIP Package
- Low Isolation capacitance
- Temperature Range -40°C to +85°C
- No Heat Sink Require
- Internal SMD Construction
- No External Component Required
- Continuous short circuit protection
- Industry Standard Pinout
- RoHS Compliance

### APPLICATIONS

The G\_D-2W & H\_D-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.

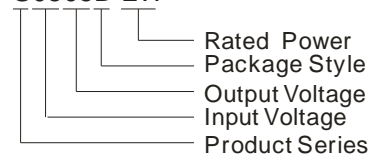
These products apply to:

- 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 demanded.

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

### MODEL SELECTION

G0505D-2W



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### PRODUCT PROGRAM

Part Number	Input		Output			Efficiency (% Typ)	Certificate		
	Voltage (VDC)		Voltage (VDC)	Current (mA)					
	Nominal	Range		Max	Min				
H0505D-2W	5	4.5-5.5	5	400	40	75	UL		
H0509D-2W			9	222	23	76	UL		
H0512D-2W			12	167	17	78	UL		
H0515D-2W			15	133	13	77	UL		
G0505D-2W			$\pm 5$	$\pm 200$	$\pm 20$	75	UL		
G0509D-2W			$\pm 9$	$\pm 111$	$\pm 12$	77	UL		
G0512D-2W			$\pm 12$	$\pm 84$	$\pm 9$	79	UL		
G0515D-2W			$\pm 15$	$\pm 67$	$\pm 7$	78	UL		
H1205D-2W			12	10.8-13.	5	400	40	75	UL
H1209D-2W					9	222	23	78	UL
H1212D-2W	12	167			17	80	UL		
H1215D-2W	15	133			14	78	UL		
G1205D-2W	$\pm 5$	$\pm 200$			$\pm 20$	76	UL		
G1209D-2W	$\pm 9$	$\pm 111$			$\pm 12$	78	UL		
G1212D-2W	$\pm 12$	$\pm 84$			$\pm 9$	80	UL		
G1215D-2W	$\pm 15$	$\pm 67$			$\pm 7$	78	UL		
H2405D-2W	24	21.6-26.4			5	400	40	77	
H2409D-2W					9	222	23	78	
H2412D-2W			12	167	17	81			
H2415D-2W*			15	133	14	80			
G2405D-2W*			$\pm 5$	$\pm 200$	$\pm 20$	77			
G2409D-2W*			$\pm 9$	$\pm 111$	$\pm 12$	78			
G2412D-2W*			$\pm 12$	$\pm 84$	$\pm 9$	81			
G2415D-2W*			$\pm 15$	$\pm 67$	$\pm 7$	80			

\*Designing.

Note: The G\_D-1W/H\_D-1W series also are available in our company.

### 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			3.5		pF

### 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	30	
Lead temperature	1.5mm from case for 10 seconds			300	
Short circuit protection		Continuous			
Cooling		Free air convection			
Case material		Plastic(UL94-V0)			
MTBF		3500			K hours
Weight			8.2		g

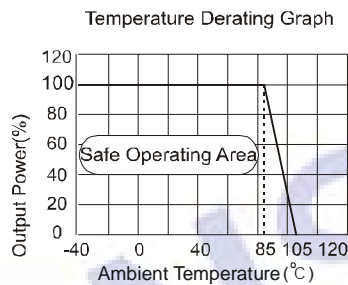
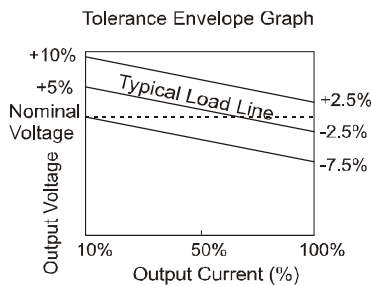
## OUTPUT SPECIFICATIONS

Item	Test conditions	Min	Typ	Max	Units
Output power		0.2		2	W
Line regulation	For Vin change of 1%			±1.2	
Load regulation	10% to 100% load	5V output	10	15	%
		9V output	8.3	15	
		12V output	6.8	15	
		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	250	mVp-p
Switching frequency	Full load, nominal input	5V input	35		KHz
		12V,24V input	50		

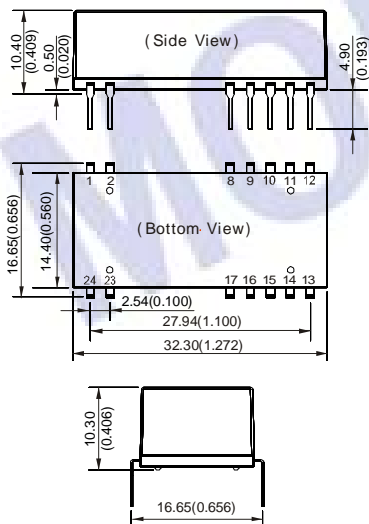
\*Test ripple and noise by "parallel cable" method. See detailed operation instructions at Testing of Power Converter section, application notes.

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

## TYPICAL CHARACTERISTICS

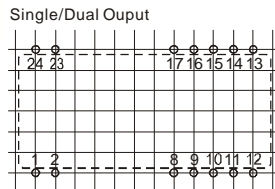


## OUTLINE DIMENSIONS & PIN CONNECTIONS



First Angle Projection

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



### 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)

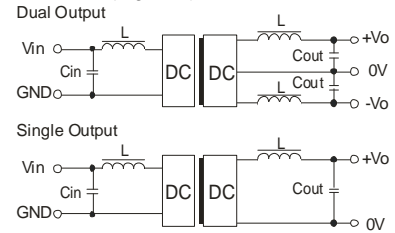
## APPLICATION NOTE

### 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(G/H\_D-1W Series)

## 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).

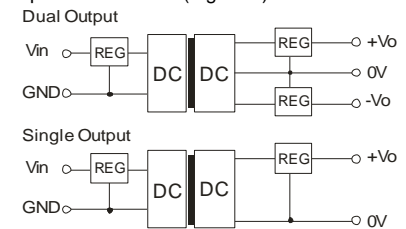
### EXTERNAL CAPACITOR TABLE (Table 1)

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 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 (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:

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