

Non-isolated DC-DC converter
Fixed input voltage and regulated adjustable single
high-voltage output



Patent Protection RoHS

FEATURES

- Six-sided metal shielding package
- Continuous output voltage with linear adjustable function
- Output voltage with high stability, low time coefficient and temperature coefficient
- Ultra wide operating ambient temperature range: -40°C to +85°C
- Input under-voltage protection, output short circuit protection, over-current protection
- EMI meet CISPR32/EN55032 CLASS B

HO1-P501LD-50C series offer 25W of output, with ultra wide operating ambient temperature range -40°C to +85°C, input under-voltage protection, output short circuit protection, over-current protection, output short circuit protection, over-current protection, six-sided metal shielding package, low ripple, low time coefficient and temperature coefficient, which are specifically designed for applications in board power systems where high voltages are required and output ripple requirements are high and output voltage stability is critical. They are widely used in fields such as electrophoresis, mass spectrum, light spectrum, electron beam, ion beam, nuclear radiation detection

Certification	Product Type.	Input Voltage (VDC)	Input Current ^① (mA) Full load/No-load	Output Voltage (VDC)			Output Current (mA) Max./Min.
		Nominal (Range)	Max.	Nominal ^②	Range	Guaranteed range ^③	
--	HO1-P501LD-50C	12 (10.8-13.2)	2604/30	500	0~+500	+50~+500	50/0

Note:
① At the nominal input / output voltage.
② The nominal output voltage corresponds to the Vadj control voltage of 5.00VDC (Typ), refer to Figure 3 for the relationship curve between output voltage and control voltage.
③ Product meets the adjust-point tolerance in this range.

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Reflected Ripple Current ^①		--	30	--	mA
Surge Voltage (1sec. max.)		--	--	16	VDC
Input Filter Type		PI filter			
Hot Plug		Unavailable			
(Ctrl) ^②	Module off	Ctrl pin pulled low to GND (0-1.2VDC)			
	Module on	Ctrl pin open or pulled high (3.5-12VDC)			
	Input current when off	--	15	25	mA
Starting voltage	Nominal 12 VDC input	--	--	10.8	VDC
Turn-off Voltage	Nominal 12 VDC input	7.5	--	--	

Note:
① Refer to DC-DC Converter Application Notes for detailed description of reflected ripple current test method.
② The voltage of Ctrl pin is relative to the input pin GND.

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Adjust-point Tolerance	Output voltage guaranteed range: 200-500VDC, see fig.3	--	±1	±2	%
	Output voltage guaranteed range: 0-200VDC, see fig.3	--	±3	±5	
Reference Voltage Accuracy	Input voltage range, 0%-100% load	--	±1	±2	
Linear Regulation	Input voltage range, nominal output voltage, full load	--	±0.3	±0.5	
Load Regulation	Nominal input voltage, nominal output voltage, 10%-100% load	--	±0.3	±0.5	
Overshoot amplitude	Nominal input voltage, nominal output voltage, 0%-100% load	--	--	3	%Vo

Time Coefficient	Nominal input voltage, nominal output voltage, full load, after warming up for 30 minutes	--	±0.001	±0.003	%/H
Temperature Coefficient	Nominal input voltage, nominal output voltage, full load	--	±0.01	±0.03	%/°C
Ripple & Noise	20MHz bandwidth, Input voltage range, 10%-100% load,	--	100	150	mV p-p
	20MHz bandwidth, Input voltage range, 0%-10% load,	--	--	300	
Over-current Protection / Short-circuit Protection	Input voltage range	110	120	160	%Io
		Constant current mode, continuous, self-recovery			

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Operating Temperature	See Fig. 1	-40	--	+85	°C
Storage Temperature		-55	--	+125	
Storage Humidity	Non-condensing	5	--	85	%RH
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds	--	--	300	°C
Vibration		10-150Hz, 5G, 0.75mm. along X, Y and Z			
Switching Frequency	Nominal input voltage, full load	--	150	--	kHz
MTBF	MIL-HDBK-217F@25°C	1000	--	--	k hours

Mechanical Specifications

Case Material	Aluminium alloy
Dimensions	74.60 x 38.10 x 26.00 mm
Weight	110g (Typ.)
Cooling Method	Free air convection

Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032	CLASS B (see Fig.5 for recommended circuit)	
	RE	CISPR32/EN55032	CLASS B (see Fig.5 for recommended circuit)	
Immunity	ESD	IEC/EN61000-4-2	Contact ±4kV	perf. Criteria B
	RS	IEC/EN61000-4-3	10V/m	perf. Criteria B
	EFT	IEC/EN61000-4-4	100KHz ±2kV (see Fig.5 for recommended circuit)	perf. Criteria B
	Surge	IEC/EN61000-4-5	line to line ±2kV (see Fig.5 for recommended circuit)	perf. Criteria B
	CS	IEC/EN61000-4-6	3 Vr.m.s	perf. Criteria B

Product Characteristic Curve

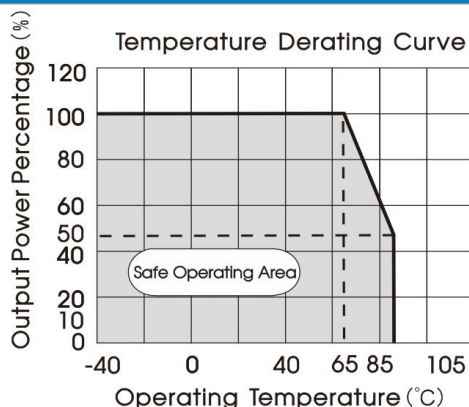
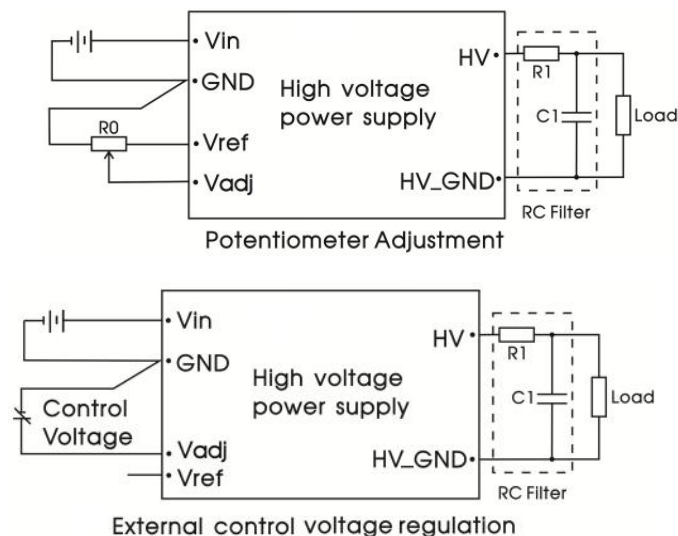


Fig. 1 Temperature derating curve

Design Reference

1. Typical application

The output voltage of the product can be adjusted by an external circuit. There are two adjustment methods, as shown in Fig.2. The relationship curve between output voltage of the product and control voltage is shown in Fig.3. Output ripple can be further reduced by connect the RC filter on the output end of the product.

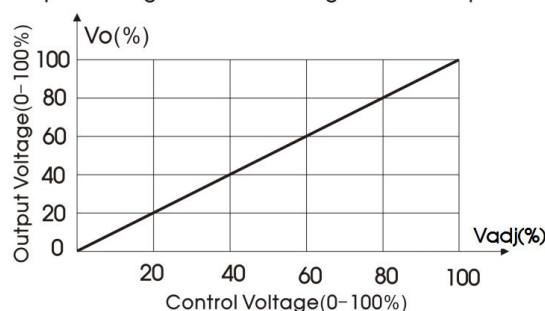


Parameter description:

R0	Adjustable resistance $\geq 10K\Omega$
R1	2K Ω
C1	4.7nF/3000V
Vref	5.15VDC
Control voltage	0-5VDC

Fig. 2 External adjustment method of output voltage

Output Voltage-Control Voltage relationship Curve



(Note: 100% Vadj is equal to 5.00VDC (Typ.))

Fig. 3 The relationship curve of output voltage and control voltage

2. Ripple & Noise testing compliance circuit

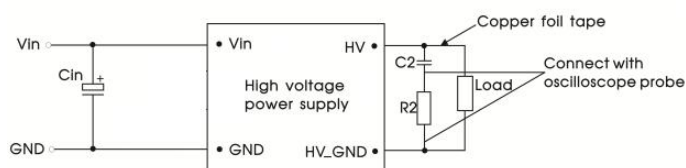


Fig.4 Ripple and noise test recommended circuit

Parameter description:

Cin	100 μ F/50V Aluminum electrolytic capacitor
R2	1k Ω /2W
C2	472K/250VAC Y2capacitor

3. EMC compliance circuit

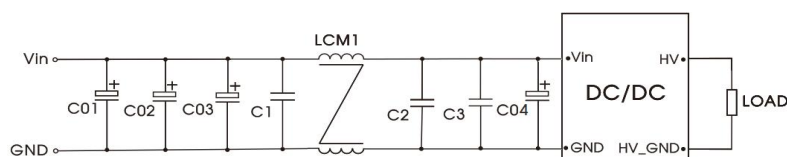


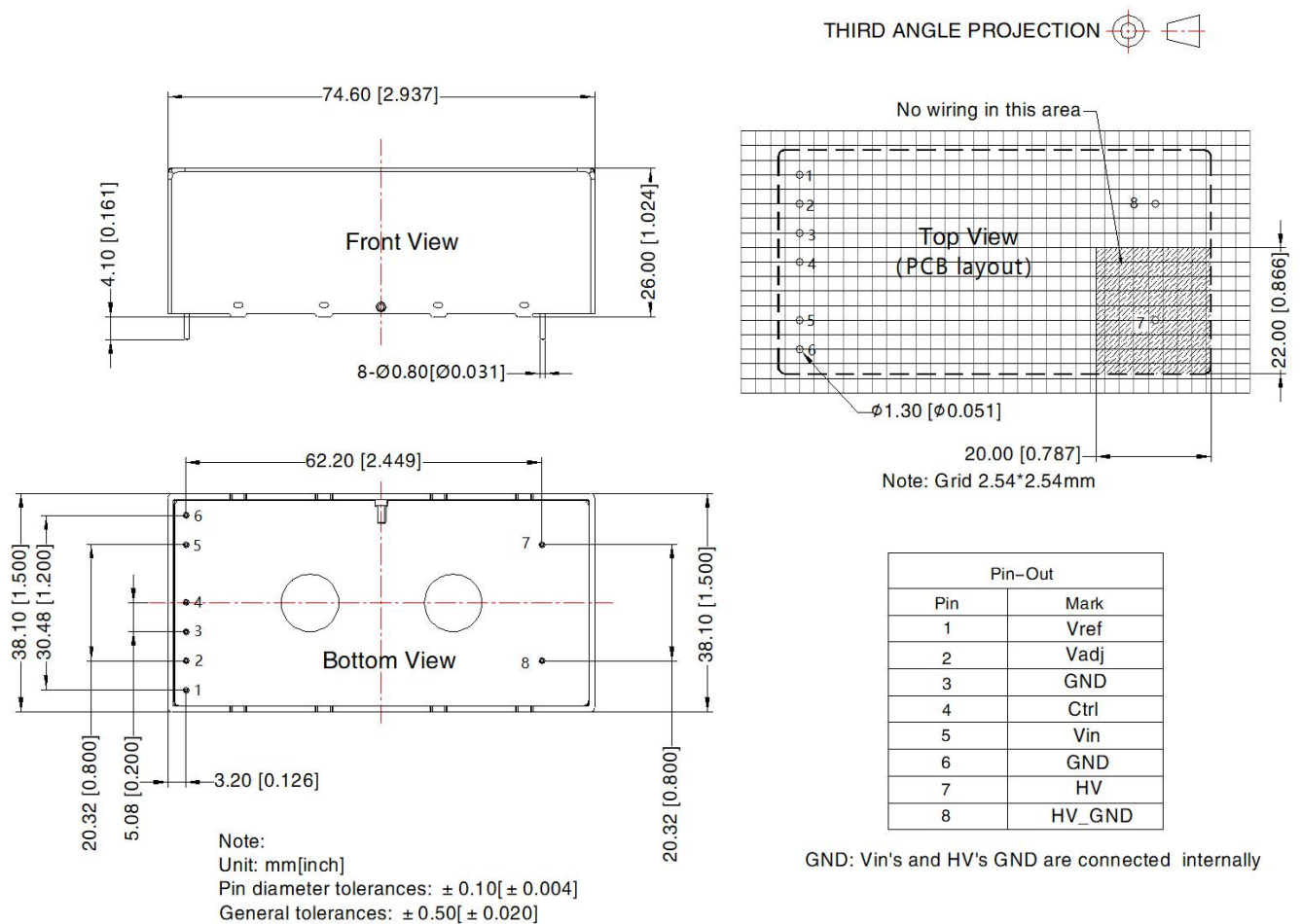
Fig. 5 EMC compliance circuit

Parameter description:

C01	2200μF/50V Aluminum electrolytic capacitor
C02	1000μF/50V Aluminum electrolytic capacitor
C03	470μF/50V Aluminum electrolytic capacitor
C04	330μF/50V Aluminum electrolytic capacitor
C1/C2/C3	475K/50V
LCM1	4.7mH (FL2D-30-472 common mode filter can be selected)

4. For additional information please refer to DC-DC converter application notes on www.mornsun-power.com

Dimensions and Recommended Layout



Notes:

1. For additional information please refer to Product Packaging Information. Packaging bag number: 58210157;
2. If the product is not operated within the required load range, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
3. Unless otherwise specified, parameters in this datasheet were measured under the conditions of $T_a=25^{\circ}\text{C}$, humidity<75%RH with nominal input voltage and rated output load;
4. All index testing methods in this datasheet are based on our company corporate standards;
5. We can provide product customization service;
6. Products are related to laws and regulations: see "Features" and "EMC";
7. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

Mornsun Guangzhou Science & Technology Co., Ltd.

Address: No. 5, Kehui St. 1, Kehui Development Center, Science Ave., Guangzhou Science City, Huangpu District, Guangzhou, P. R. China
Tel: 86-20-38601850 Fax: 86-20-38601272 E-mail: info@mornsun.cn www.mornsun-power.com