

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



Patent Protection

RoHS



FEATURES

- Continuous output voltage with linear adjustable function
- Six-sided metal shielding package, output ripple as low as 15mV
- Output voltage with high stability, low time coefficient and temperature coefficient
- Ultra wide operating ambient temperature range: -40°C to +105°C
- Input reverse polarity protection, control voltage over-voltage protection
- Output short-circuit protection, over-current protection
- EMI meet CISPR32/EN55032 CLASS B
- Meet EN62368 standards

HO1-P401V-5C offers output power 2W, it features with ultra wide operating ambient temperature range -40°C to +105°C, input reverse polarity protection, control voltage over-voltage 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 ultrasonic crack detection, ultrasonic thickness measurement, avalanche diodes, solid-state detector, piezoelectric equipment.

Selection Guide

Certification	Part No.	Input Voltage (VDC)	Input Current ^① (mA) Full load/No-load		Output Voltage (VDC)			Current (mA) Max./Min.
		Nominal (Range)	Typ.	Max.	Nominal ^②	Range	Guaranteed range ^③	
--	HO1-P401V-5C	12 (10.8-13.2)	280/10	300/20	400	0~+400	+40~+400	5/0

Note:
 ① At the nominal input voltage and nominal output voltage.
 ② When the Vadj control voltage is equal to 2.5VDC (Typ.), the output voltage is 400V. The relationship curve between output voltage and control voltage is shown in Fig.3;
 ③ Within this range, the product meets the adjust-point tolerance.

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Reflected Ripple Current ^①		--	30	--	mA
Surge Voltage (1sec. max.)		--	--	18	VDC
R/S pin enable control	Module on	R/S pin pulled high (3-12VDC)			
	Module off	R/S pin open or pulled low (0-2VDC)			
Input Filter Type		PI filter			
Hot Plug		Unavailable			

Note:
 ① Refer to DC-DC Converter Application Notes for detailed description of reflected ripple current test method.

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Adjust-point Tolerance	Output voltage guaranteed range, see fig.3	--	±1	±2	%
Reference Voltage Accuracy	0%-100% load, reference 2.56VDC output	--	±1	±2	
Linear Regulation	Input voltage range, nominal output voltage, full load	--	±0.01	±0.05	
Load Regulation	Nominal input voltage, nominal output voltage, 10%-100% load	--	±0.01	±0.05	
Time Coefficient	Nominal input voltage, nominal output voltage, full load, after warming up for 30 minutes	--	±0.001	±0.003	%/Hr
Temperature Coefficient	Nominal input voltage, nominal output voltage, full load	--	±300	--	PPM/°C
Ripple & Noise ^①	20MHz bandwidth, nominal input voltage, 0%-100% load	--	15	--	mVp-p

Over-current Protection / Short-circuit Protection	Input voltage range	110	140	180	%Io
		Constant current mode, continuous, self-recovery			
Over-voltage Protection of Vadj ^②	Input voltage range	2.5	2.6	2.7	VDC
Maximum allowable voltage of Vadj ^③	Input voltage range	--	--	10	

Note:

- ① Please refer to fig.4 for the test method of ripple and noise, the product is working by the linear power source;
- ② When the Vadj voltage is greater than or equal to the over-voltage protection voltage point of Vadj, the product without output;
- ③ Vadj voltage can not exceed its maximum allowable voltage of 10V, otherwise the product will be permanently damaged.

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Operating Temperature	See Fig. 1	-40	--	+105	°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	--	200	--	kHz
MTBF	MIL-HDBK-217F@25°C	1000	--	--	k hours

Mechanical Specifications

Case Material	Aluminum alloy
Dimensions	45.50 x 23.00 x 12.50 mm
Weight	20.0g (Typ.)
Cooling Method	Free air convection

Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032	CLASS B (With external 47uF/25V MLCC capacitor at the input)
	RE	CISPR32/EN55032	CLASS B (Without extra components)
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

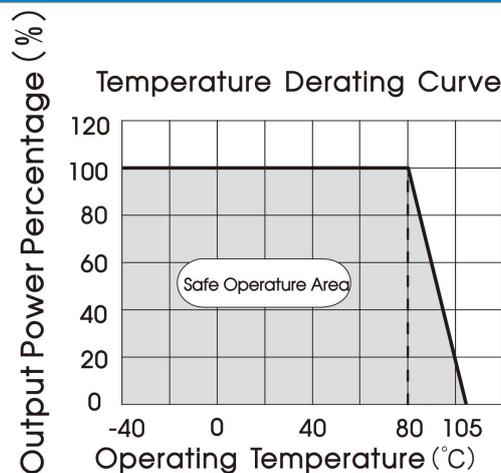
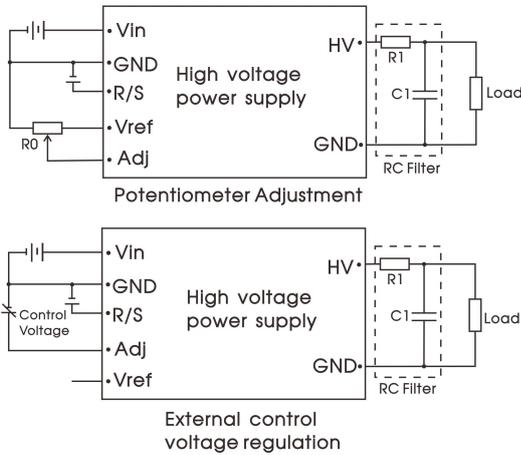


Fig. 1

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.

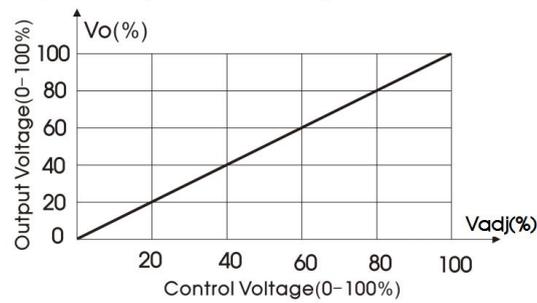


Parameter description:

R0	Adjustable resistance $\geq 10k \Omega$
R1	2k Ω
C1	472K/630V
Vref	2.56VC
Control Voltage	0-2.5VDC

Fig. 2 External adjustment method of output voltage

Output Voltage-Control Voltage relationship Curve



(Note: 100% Vadj is equal to 2.5VDC (Typ.))

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

2. Ripple & Noise testing compliance circuit

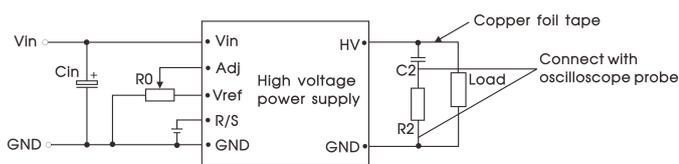


Fig.4 Ripple and noise test recommended circuit

Parameter description:

Cin	100 μ F/50V Aluminum electrolytic capacitor
R0	Adjustable resistance $\geq 10k \Omega$
R2	1k Ω /2W
C2	472K/630V

3. EMC compliance circuit

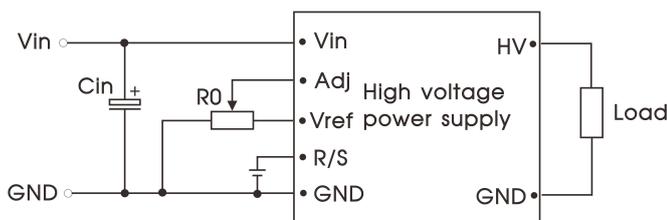


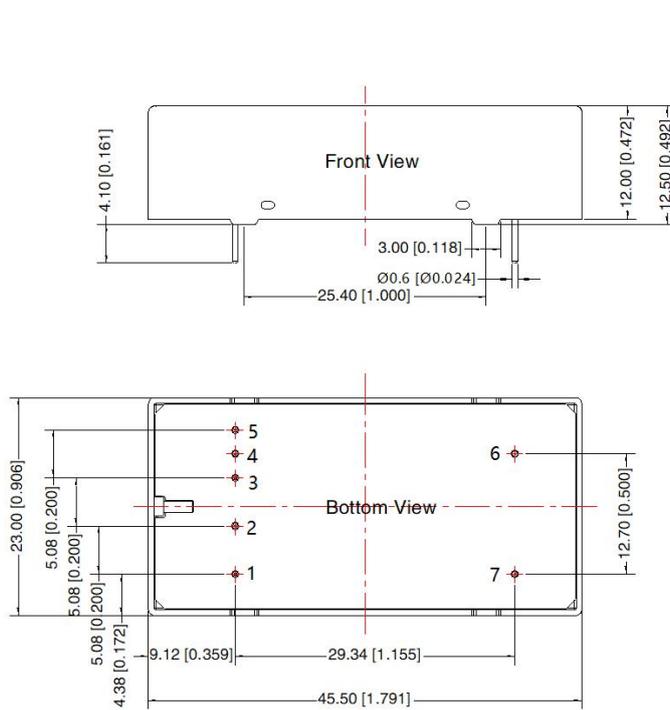
Fig. 5 EMC compliance circuit

Parameter description:

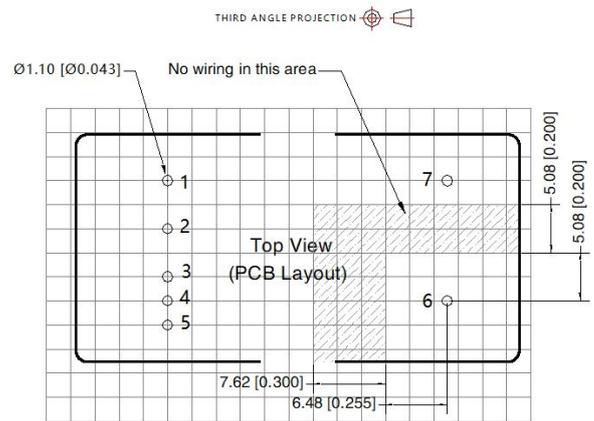
Cin	680 μ F/50V Aluminum electrolytic capacitor
R0	Adjustable resistance $\geq 10k \Omega$

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

Dimensions and Recommended Layout



Note:
Unit: mm[inch]
Pin diameter tolerances: ± 0.10 [± 0.004]
General tolerances: ± 0.50 [± 0.020]



Note: Grid 2.54*2.54mm

Pin-Out	
Pin	Function
1	Vin
2	GND
3	R/S
4	Vadj
5	Vref
6	HV
7	GND

GND: Vin's and HV's GND are connected internally

Notes:

1. For additional information please refer to Product Packaging Information. Packaging bag number: 58210107;
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.

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