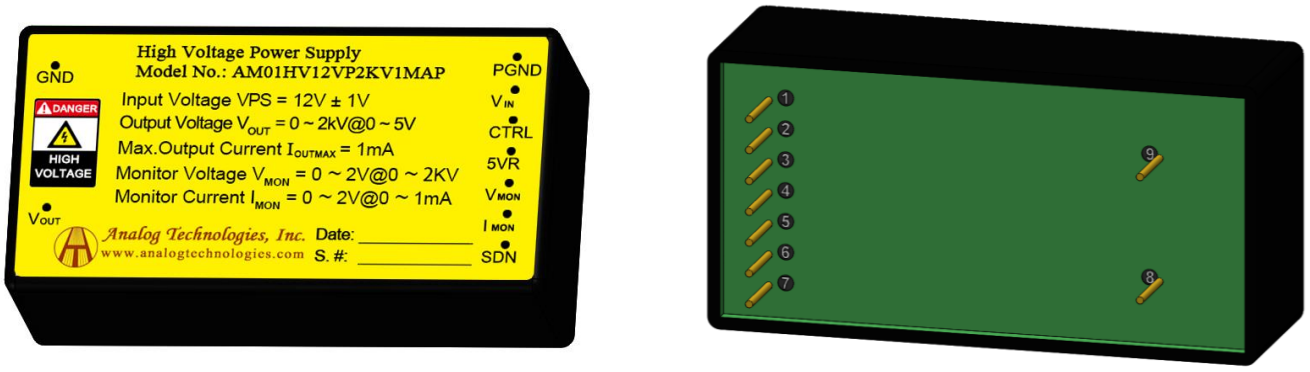


Figure 1. Physical Photo of AM01HV12VP2KV1MAP

FEATURES

- Low Power Consumption
- High Efficiency
- High Stability
- Output current and voltage monitors
- Small Output Ripple, Time Drift, and Temperature Drift
- Overload and Short Circuit Protection
- Continuous Linear Adjustment for Output Voltage
- Metal Enclosure for Zero EMIS
- Easy Control and Installation
- Customizable

APPLICATIONS

AM01HV12VP2KV1MAP is a high stability high voltage power supply, which is widely used in scientific research and other fields including:

- Ideal for photomultiplier tube
- Optical measurement
- Light control technology, detectors
- Ion beam implantation
- Capacitor charging
- Electron beam welding
- Nuclear physics
- Withstand voltage test
- Medical equipment
- Precision instruments

DESCRIPTION

AM01HV12VP2KV1MAP is a combination of switching step-up technology and linear regulation, which converts the low input voltage into a stable high output voltage. It comes with output short-circuit protection and a wide range of output voltage adjustments. This high voltage power supply also features ultra-small size, light weight, moisture proof, shockproof, metal enclosure, and zero EMIs.

SAFETY PRECAUTIONS

The internal protection circuit is provided in the high voltage power supply, but the high voltage short circuit shall be avoided.

Make sure the circuit is insulated perfectly, especially between the high voltage output and the surroundings so as to avoid electronic shock.

SPECIFICATIONS

Table 1. Characteristics. T_A = 25°C, unless otherwise noted

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit/Note
Input Power Voltage	V_{VPS}		11	12	13	V
Input Power Quiescent Current	I_{VPS_QC}	I_{VOUT} = 0mA	40	50	60	mA
Input Power Current at Full Load	I_{VPS_FL}	I_{VOUT} = 1.0mA	200	250	300	mA
Input Power Current at Shutdown	I_{VPS_SHDN}	T_A = −10°C ~ 55°C		18		mA
Power Supply Rejection Ratio	PSRR (1)	V_{VPS} = 11V ~ 13V V_{CTRL} = V_{5VR} = 5V V_{VOUT} = 5kV I_{VOUT} = 1.0mA		TBD		dB
Modulation Voltage Range Frequency on CTRL	f_{CTRL}		0		12	Hz
Shutdown Port Current	I_{SDNL}	V_{SDNL} < 0.8V	−5		−4.2	μA
	I_{SDNH}	1.2V < V_{SDNL} < 5V	0		3.8	μA
Shutdown Voltage Logic Low	V_{SDNL}		0		0.8	V
Shutdown Voltage Logic High	V_{SDNH}		1.2		5	V
Output Voltage	V_{VOUT}	I_{VOUT} = 0 ~ 1.0mA	0		2000	V
Output Current Range	$I_{VOUTMAX}$	V_{VPS} = 11V ~ 13V	0		1.0	mA
Reference Voltage Output Range	V_{5VR}	T_A = −10°C ~ 55°C I_{5VR} ≤ 5mA	4.95	5	5.05	V
Output Load Range			2		∞	MΩ
Output Voltage Ripple	V_{VOUT_RP}	Bandwidth = 1MHz R_{LOAD} = 2MΩ	≤1			V_{P-P}
Output Voltage Ripple Frequency	f_{VOUT_RP}		TBD			Hz
Output Voltage Temperature Coefficient	TCV_{VOUT} (2)	V_{VPS} = 12V V_{CTRL} = V_{5VR} = 5V V_{VOUT} = 2kV I_{VOUT} = 1mA T_A = −10°C ~ 55°C		≤0.01		%/°C
Output Voltage Range v.s. Temperature	V_{VOUT}(T)	V_{VPS} = 12V V_{CTRL} = V_{5VR} = 5V V_{VOUT} = 2kV I_{VOUT} = 1mA T_A = −10°C ~ 55°C	0.99V_{VOUT}	V_{VOUT}	1.01V_{VOUT}	V

Output Voltage Drift	Short Term Drift	$\frac{\lvert\Delta V_{VOUT}/V_{VOUT}\rvert}{\Delta t\ (h)}$	V_{VPS} = 12V V_{CTRL} = V_{5VR} = 5V V_{VOUT} = 2kV I_{VOUT} = 1mA T_A = −10°C ~ 55°C After 30 min. warm-up		≤0.01		%/h
	Long Term Drift	$\frac{\lvert\Delta V_{VOUT}/V_{VOUT}\rvert}{\Delta t\ (d)}$			≤0.05		%/d
Output Voltage Rise Time		t_r	V_{VOUT} (t_1) = 200V V_{VOUT} (t_2) = 1800V No-Load		30		ms
			V_{VOUT} (t_1) = 200V V_{VOUT} (t_2) = 1800V R_{Load} =2MΩ		TBD		ms
Output Voltage Fall Time		t_f	V_{VOUT} (t_2) = 1800V V_{VOUT} (t_3) = 200V No-Load		100		ms
			V_{VOUT} (t_2) = 1800V V_{VOUT} (t_3) = 200V R_{Load} =2MΩ		TBD		ms
Monitor Voltage		V_{MON}	V_{OUT} = 0 ~ 2kV	0		2	V
Monitor Current		I_{MON}	I_{OUT} = 0 ~ 1.0mA	0		2	V
Mean Time Between Failure		MTBF			TBD		h
Instantaneous Short Circuit Current at the Output		I_{VOUT_SC}			≤500		mA
Load Regulation		$\frac{\lvert\Delta V_{VOUT}/V_{VOUT}\rvert}{\Delta I_{VOUT}}$	V_{VOUT} = 5kV I_{VOUT} = 1mA		≤0.01		%/mA
Full Load Efficiency		η (3)	V_{VPS} = 12V V_{VOUT} = 5kV I_{VOUT} = 1mA		≥80		%
Operating Temperature Range		T_{opr}		0		55	°C
Storage Temperature Range		T_{stg}		−40		85	°C
Thermal resistance housing-ambient		θ_{HA} (4)	V_{VPS} = 12V V_{CTRL} = V_{5VR} = 5V V_{VOUT} = 5kV I_{VOUT} = 1mA		7.5		°C/W
External Dimensions				50×35×20			mm
				1.97×1.38×0.79			inch

Weight				30		g
				0.07		lbs
				1.06		Oz

Note 1: $PSRR = 20\log_{10}\frac{\Delta V_{VOUT}/V_{VOUT}}{\Delta V_{VPS}/V_{VPS}}$ (dB)

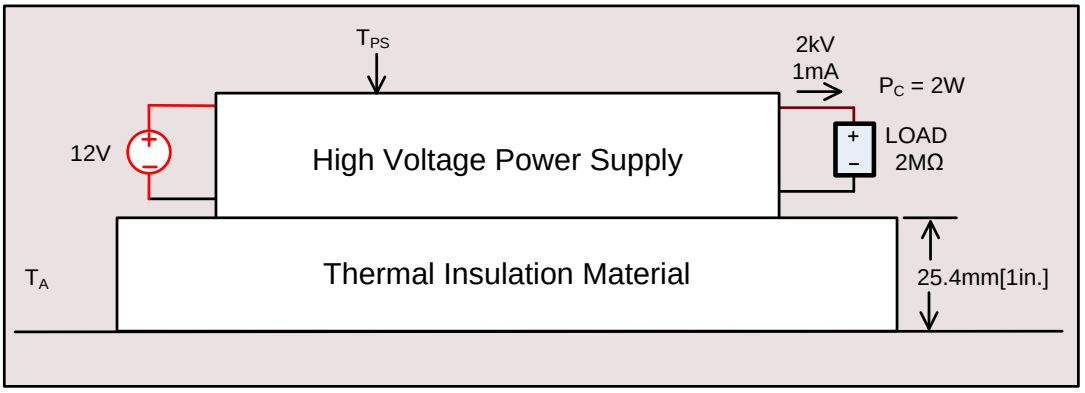
$\Delta V_{VOUT} = V_{VOUT}$ (V_{VPS} = 12.5V) − V_{VOUT} (V_{VPS} = 11.5V), $V_{VOUT} = V_{VOUT}$ (V_{VPS} = 12V)

ΔV_{VPS} = 12.5V − 11.5V, V_{VPS} = 12V

Note 2: $TCV_{VOUT} = \frac{|\Delta V_{VOUT}|}{V_{VOUT} \times \Delta T}$

Note 3: $\eta = \frac{V_{VOUT} \times I_{VOUT}}{V_{VPS} \times I_{VPS}}$

Note 4:



T_{PS} = 29°C, T_A = 14°C, $T_r = T_{PS} - T_A$ = 15°C,

$P_C = P_{VOUT} - P_{VPS}$ = 2W, $\theta_{HA} = T_r/P_C$ = 15°C/2W = 7.5°C/W.

TESTING DATA

High voltage power supply testing data (Test condition: the load is 2 MΩ)

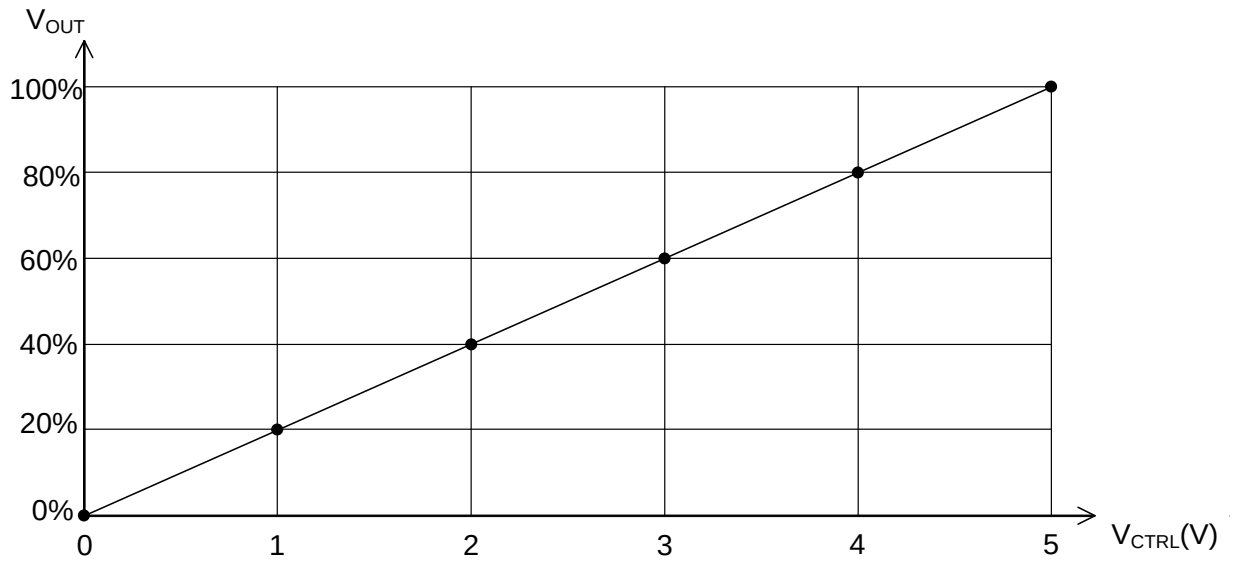
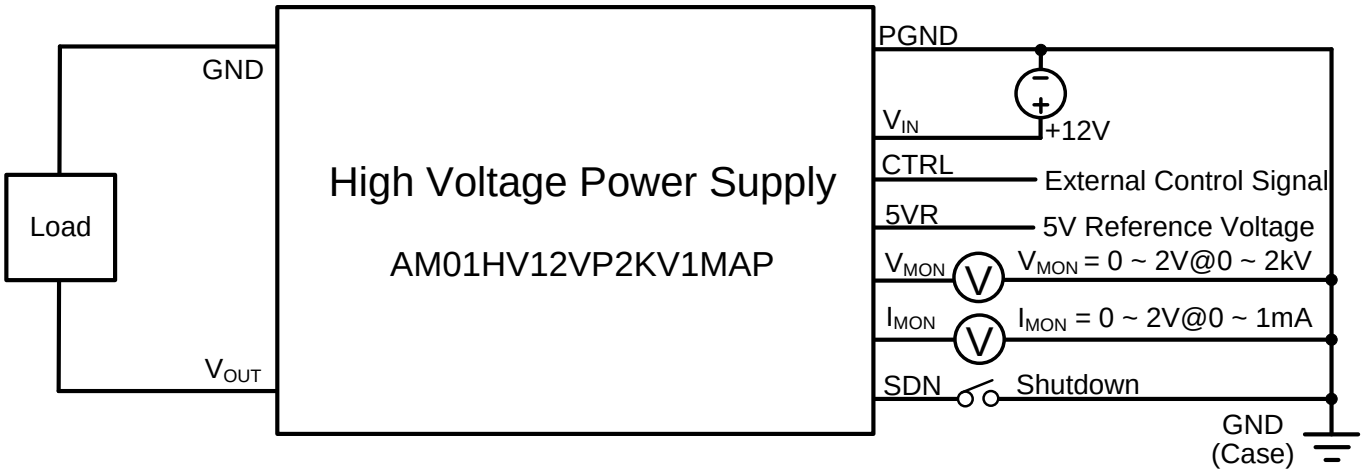


Figure 2. V_{CTRL} vs. V_{OUT}

THE CONNECTION DIAGRAM OF MODULE'S PERIPHERAL CIRCUIT

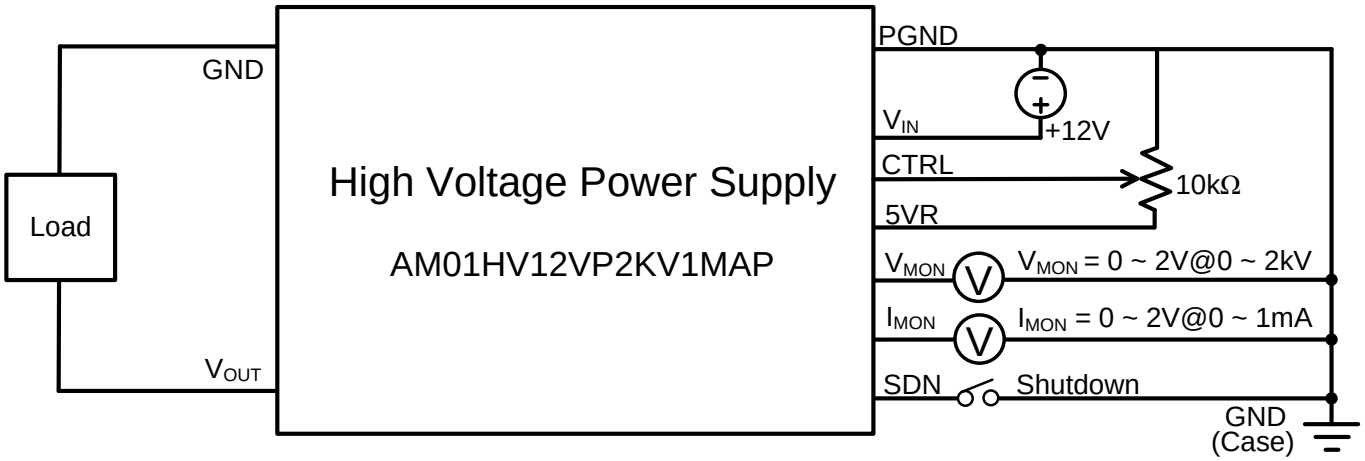


*5VR: 5V reference voltage can only be used as the power supply for the potentiometer, not for any other parts.

*SDN: Shutdown Logic Low SDN ＜ 0.8V or 0V on the SDN pin will turn off the high voltage output.
Shutdown Logic High SDN ＞ 1.2V or left unconnected will turn on the high voltage output.

*The PGND and GND are connected inside with the case and should be well grounded.

Figure 3. Controlled by External Source



*5VR: 5V reference voltage can only be used as the power supply for the potentiometer, not for any other parts.
*SDN: Shutdown Logic Low SDN ＜ 0.8V or 0V on the SDN pin will turn off the high voltage output.
Shutdown Logic High SDN ＞ 1.2V or left unconnected will turn on the high voltage output.
*The PGND and GND are connected inside with the case and should be well grounded.

Figure 4. Controlled by Potentiometer

NAMING INSTRUCTIONS

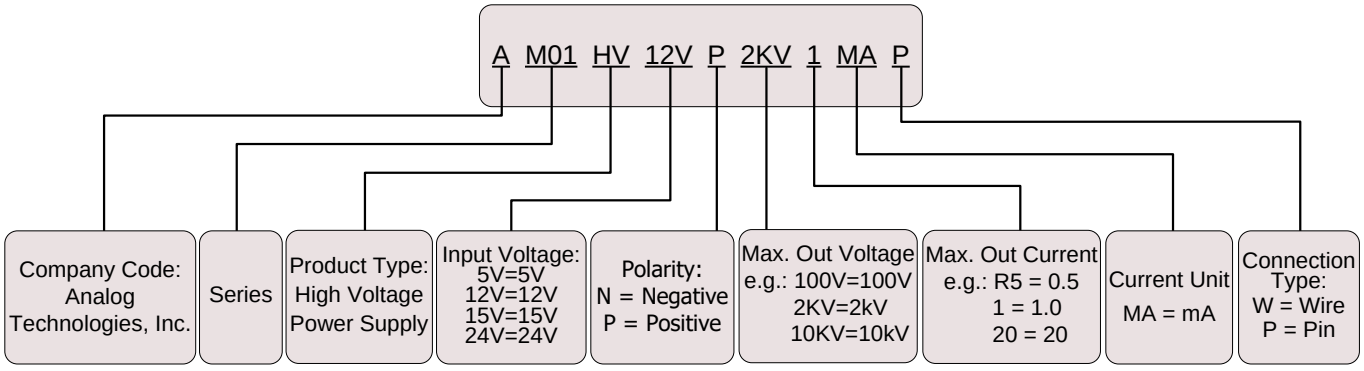


Figure 5. Naming Rules of AM01HV12VP2KV1MAP

DIMENSION

I. Pin layout

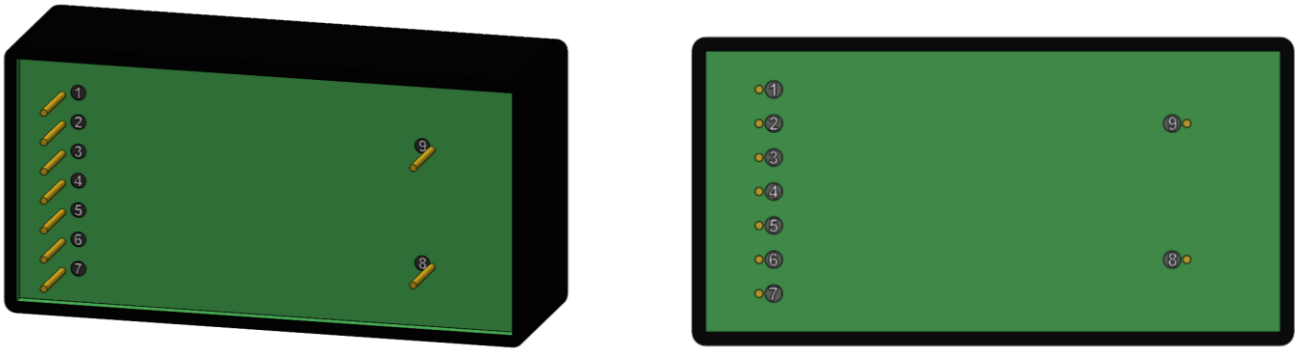


Figure 6. Pin Layout for AM01HV12VP2KV1MAP

II. Dimension of AM01HV12VP2KV1MAP.

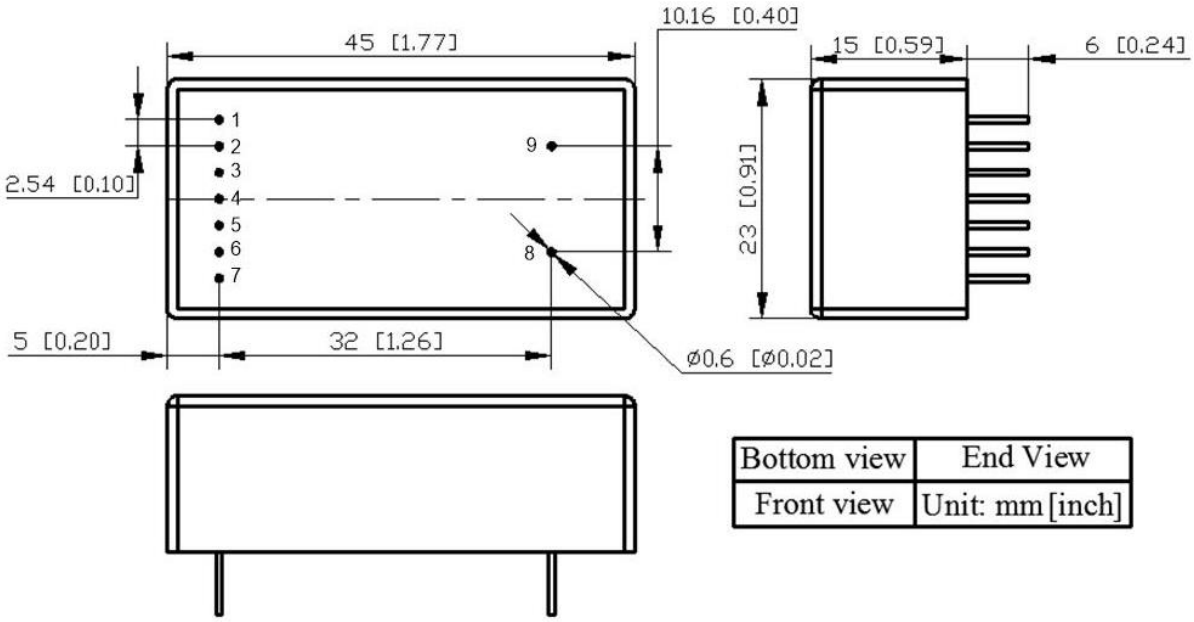


Figure 7. Dimensions for AM01HV12VP2KV1MAP

Table 2. Pin Names, Functions and Specifications.

No.	Name	Type	Description	Min.	Typ.	Max.
1	PGND	power signals	Ground electrode		0V	
2	V_{IN}	Power input	Input voltage		12V	
3	CTRL	Analog input	Regulation	0V		5V
4	5VR	Analog output	Reference voltage		5V	
5	V_{MON}	Analog output	Monitor Voltage	0V		5V
6	I_{MON}	Analog output	Monitor Current	0V		10mA
7	SDN	Digital input	Shutdown logic low	0V		0.8V
			Shutdown logic high	1.2V		5V
8	V_{OUT}	Power output	Output high voltage	0V		2kV
9	GND	power signals	Ground electrode		0V	

ORDERING INFORMATION

Quantity	1~9pcs	10~49pcs	50~99pcs	≥100pcs
AM01HV12VP2KV1MAP	$139	$129	$119	$109

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