

Figure 1. Physical Photo of AHV12V1KV1MAP

### FEATURES

- PCB Mountable
- Small Size
- High Efficiency
- High Stability
- Long Life Time
- Low Power Consumption
- 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

### APPLICATIONS

This power module, AHV12V1KV1MAP, is designed for achieving DC-DC conversion from low voltage to high voltage.

### DESCRIPTION

AHV12V1KV1MAP 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. This is a high stability high voltage power supply, ideal for photomultiplier tube, optical measurement, light control technology, nuclear physics, medical equipment, precision instruments, etc.

### SHUTDOWN MODE OPERATION

A logic low  $< 0.8V$  or a  $0V$  on the SDN pin will turn the device off. When SDN is in logic high  $> 1.2V$  or left unconnected, the product is working well.

### 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.  $T_A = 25^\circ\text{C}$ , unless otherwise noted

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit/Note
Input Voltage	VPS		11	12	13	V
Quiescent Input Current	$I_{INQQ}$	$I_{OUT} = 0\text{mA}$	20	30	40	mA
Full Load Input Current	$I_{INFLD}$	$I_{OUT} = 1.0\text{mA}$	120	130	140	mA
Input Voltage Regulation Ratio	$\Delta V_{OUT}/\Delta V_{PS}$	VPS = 11V to 13V		0.2		%
Output Voltage	$V_{OUT}$	$I_{OUT} = 0$ to 1.0mA	0		1000	V
Maximum Output Current	$I_{OUTMAX}$	VPS = 11V to 13V			1.0	mA
Stability of Reference Voltage	$V_{REF}$	$-20 \sim 50^\circ\text{C}$	4.98	5	5.02	V
Load				1		MΩ
Regulation Mode			0 ~ 5V or 10k potentiometer			
Control Input vs. Output Linearity	$\Delta V_{REF}/\Delta V_{OUT}$			<0.2		%
Load Regulation Rate		0 to 1.0mA		≤0.05		%
Instantaneous Short Circuit Current	$I_{SC}$			<500		mA
Shutdown Supply Current	$I_{SHDN}$				18	mA
Shutdown Logic Input Current	$I_{LOGIC}$				3	uA
Shutdown Logic Low	$V_{INL}$				0.8	V
Shutdown Logic High	$V_{INH}$		1.2			V
Full Load Efficiency	$\eta$			≥70		%
Temperature Coefficient	$TCV_O$	$-20 \sim 50^\circ\text{C}$		<0.01		%/°C
Time Drift	Short Time Drift			<0.5		%/ min
	Long Time Drift			<1		%/h
Output Voltage Temperature Stability		$-20 \sim 50^\circ\text{C}$		<±1		%
Operating Temperature Range	$T_{opr}$		-20		55	°C
Storage Temperature Range	$T_{stg}$		-40		85	°C
External Dimensions			55×35×20			mm
Weight				210		g
				0.46		lbs
				7.4		Oz



TESTING DATA

I. DC Testing

High voltage power supply testing data (Test condition: the load is 1 MΩ)

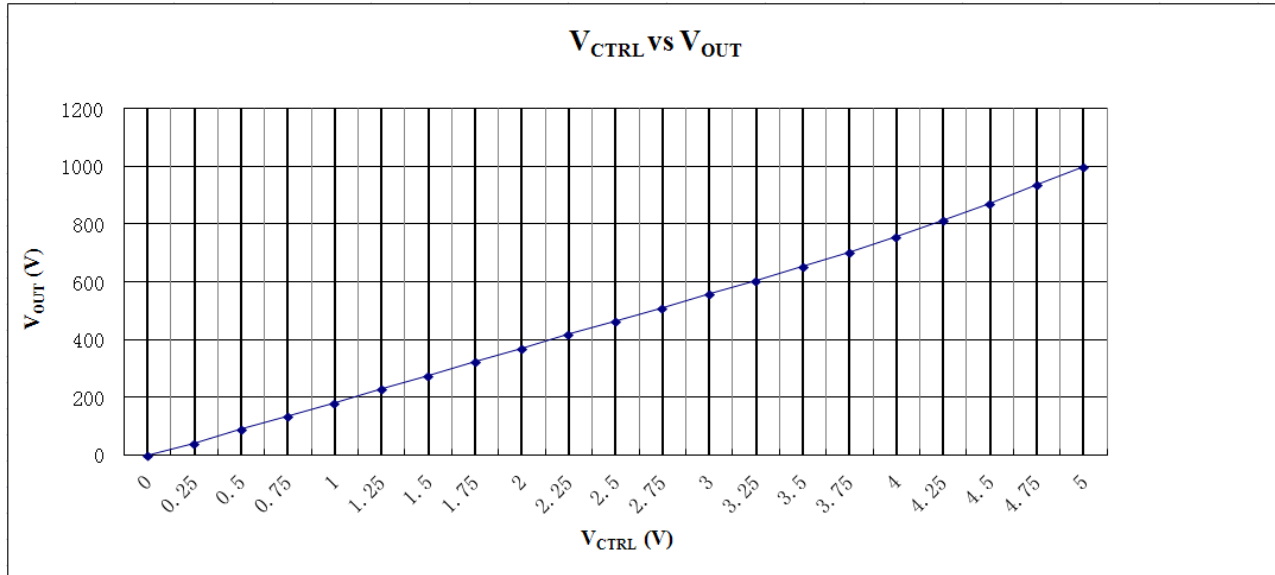


Figure 2. V<sub>CTRL</sub> VS. V<sub>OUT</sub>

II. AC Testing

Waveform curve and rise & fall time are tested by using the control voltage supplied by signal generator. Under the testing condition of modulation frequency 0.1Hz, control voltage 0.25 ~ 5V, and 1MΩ load, the output voltage is 40 ~ 1000V.

Note: as shown in the figures below, the output voltage is represented by yellow line and the control voltage by red line.

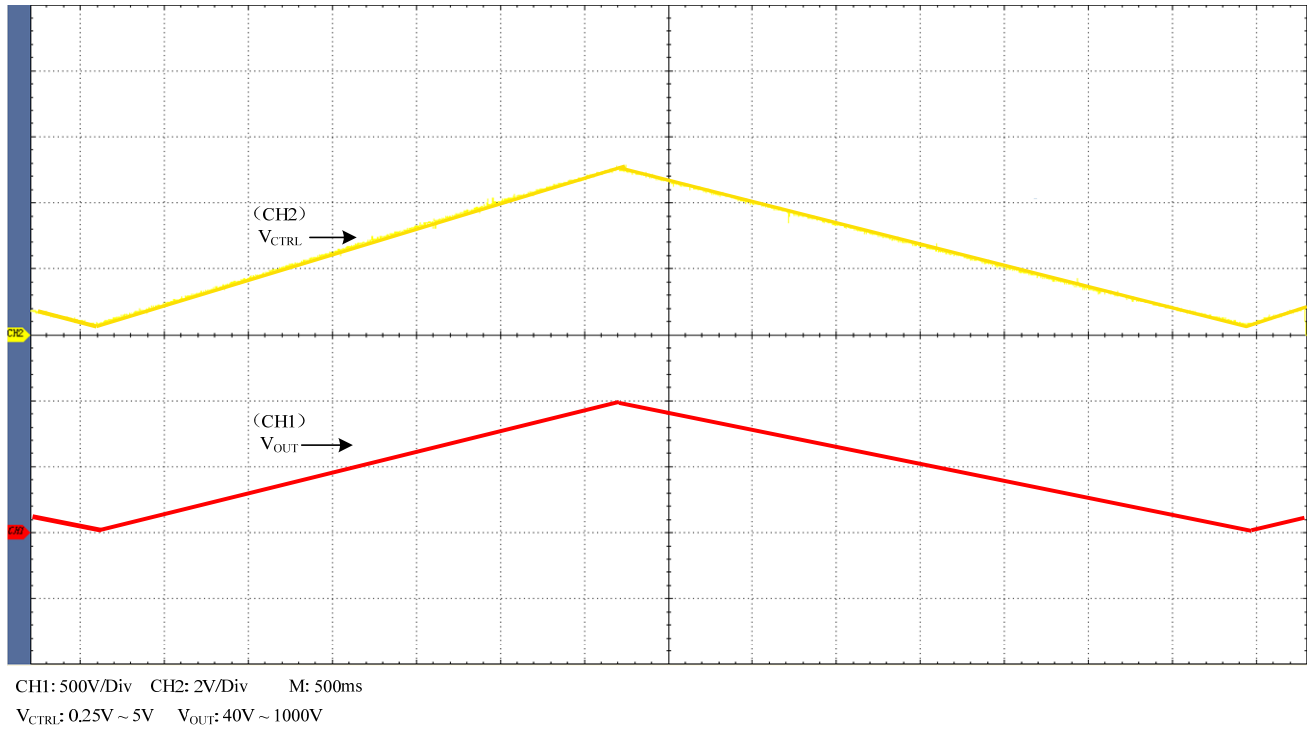


Figure 3. Triangle Wave

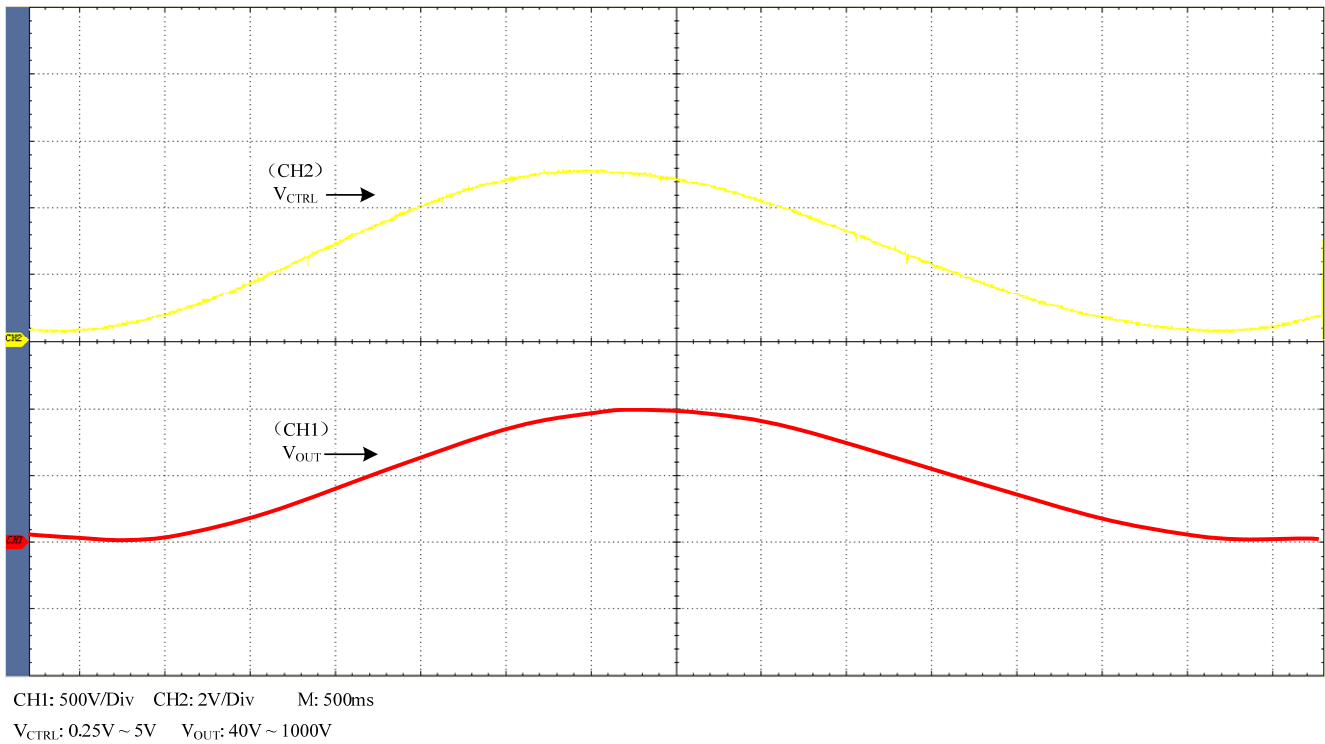
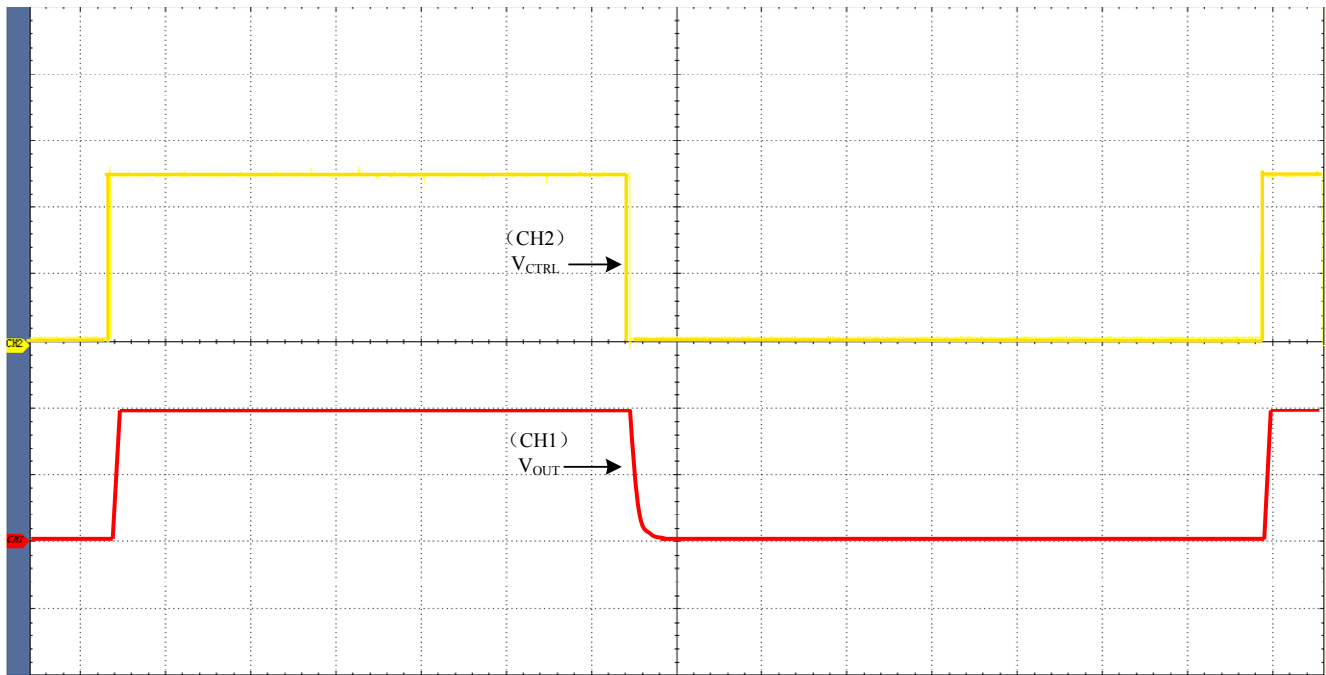
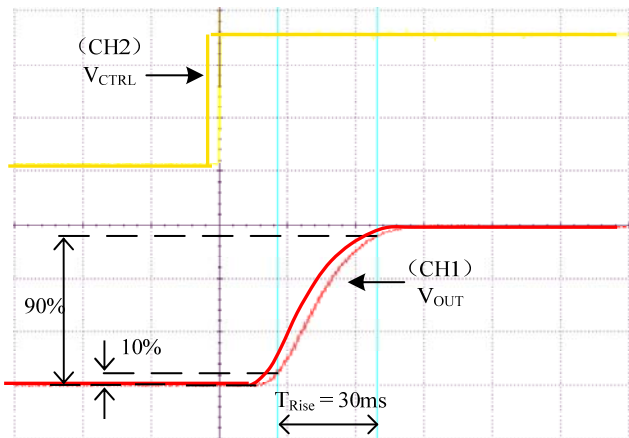


Figure 4. Sine Wave



CH1: 500V/Div CH2: 2V/Div M: 500ms  
 $V_{CTRL}$ : 0.25V ~ 5V  $V_{OUT}$ : 40V ~ 1000V

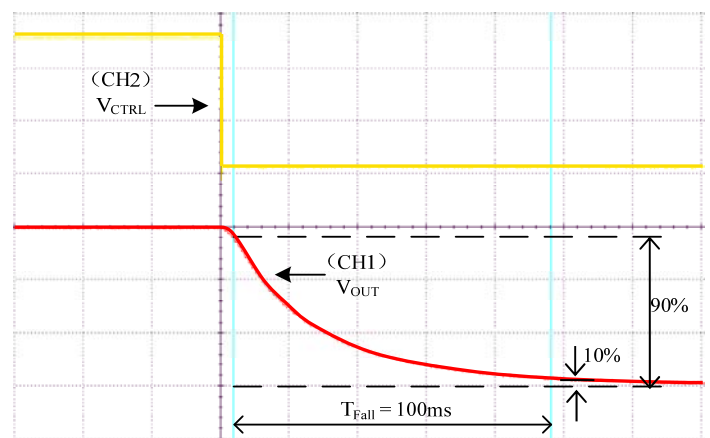
Figure 5. Square Wave



$V_{CTRL}$ : 0.25V ~ 5V  $V_{OUT}$ : 40V ~ 1000V

Figure 6. Rise Time

As shown in Figure 6, when a square wave of 0.25V ~ 5V,  $F=0.10Hz$  is applied to Control, measure the waveform. The rise time is about 30ms.



$V_{CTRL}$ : 0.25V ~ 5V  $V_{OUT}$ : 40V ~ 1000V

Figure 7. Fall Time

As shown in Figure 7, when a square wave of 0.25V ~ 5V,  $F=0.10Hz$  is applied to Control, measure the waveform. The fall time is about 100ms.



**THE CONNECTION DIAGRAM OF MODULE'S PERIPHERAL CIRCUIT**

The leads colors in the figures below are identical with those in the physical AHV12V1KV1MAP.

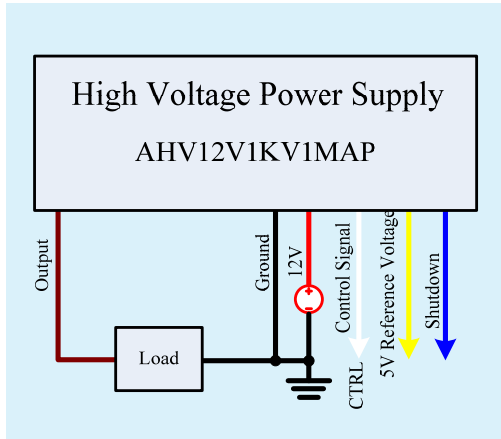


Figure 8. Control by External Signal Source

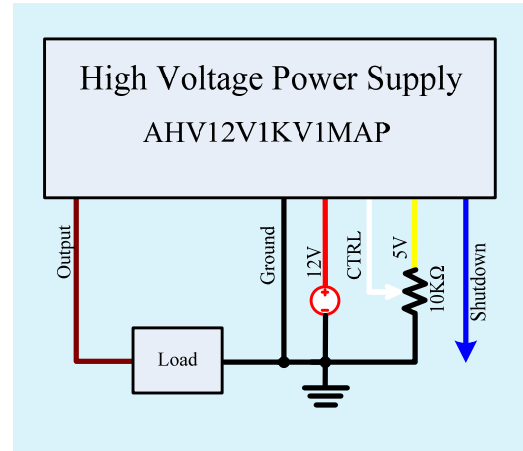


Figure 9. Constant Output Voltage

**NAMING PRINCIPLE**

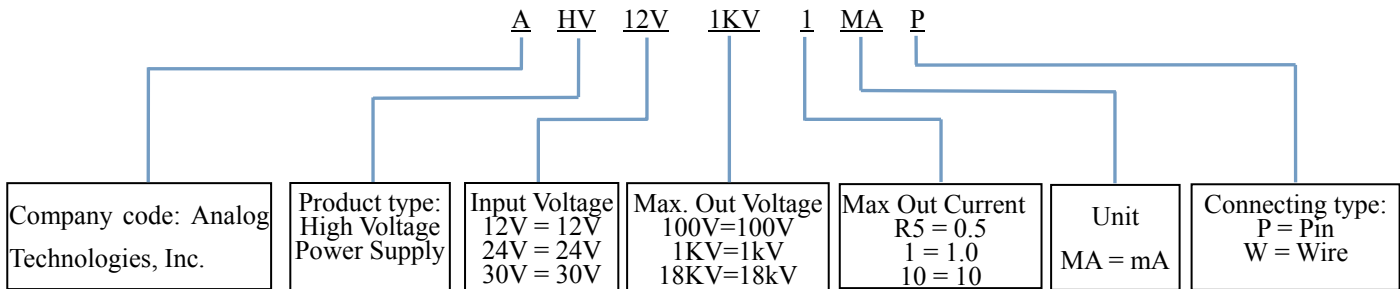


Figure 10. Naming Principle of AHV12V1KV1MAP

**DIMENSIONS**

I. Pin layout

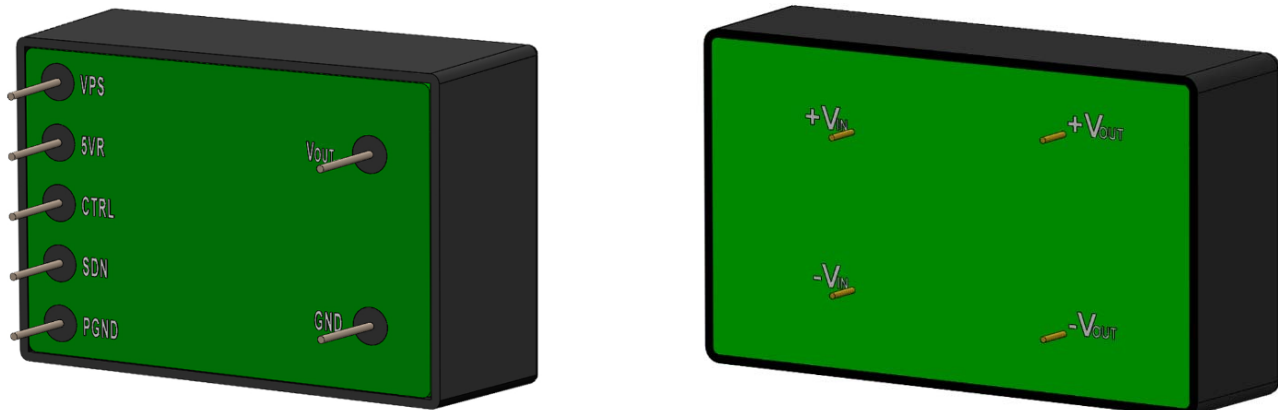


Figure 11. Pin Layout for AHV12V1KV1MAP



II. Dimension of AHV12V1KV1MAP.

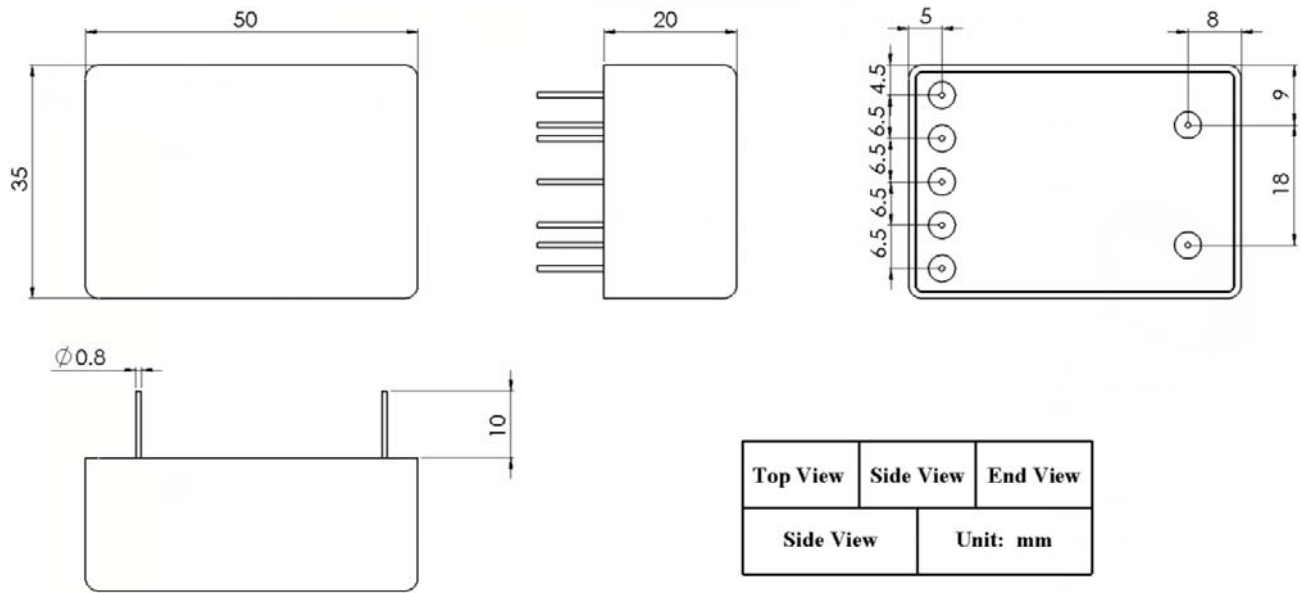


Figure 12. Dimensions for AHV12V1KV1MAP

PRICES

Quantity	1~9pcs	10~49pcs	50~99pcs	≥100pcs
AHV12V1KV1MAP	\$115	\$105	\$95	\$85



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