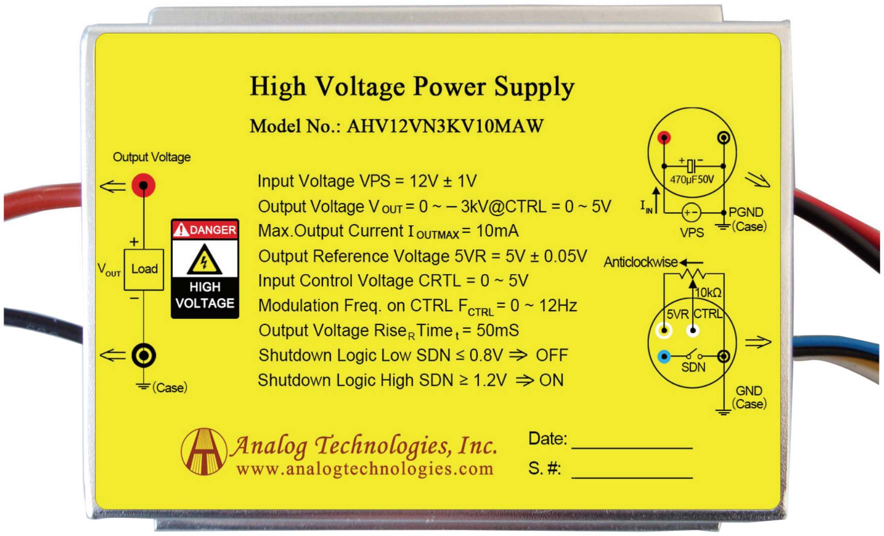

Figure 1. Physical Photo of AHV12VN3KV10MAW

FEATURES

High precision

Full modulation range on output voltage

Negative voltage output

Linear regulation

Shutdown

APPLICATIONS

This power module, AHV12VN3KV10MAW, is designed for achieving DC-DC conversion from low voltage to high voltage. High voltage power supply is widely used in industry, agriculture, national defense, scientific research and other fields including: X-ray machine high voltage power supply, laser high voltage power supply, spectral analysis high voltage power supply, etc. They are widely applied in ion beam deposition, ion beam assisted deposition, electron beam evaporation, electron beam welding, ion source, DC reactive magnetron sputtering, glass / fabric coating, glow discharge, microwave treatment high voltage capacitance test, CRT monitor test, high voltage cable fault test (PD testing), TWT test, and H-POT test. Particle accelerator, free electron laser, neutron source, cyclotron accelerator, capacitor, and inductance pulse generator, Marx high voltage pulse generator, and capacitor charger. Microwave heating, radio frequency amplification, nanotechnology application, electrostatic technology application, electrospinning preparation of nanofiber, high voltage power supply for nuclear power and other products.

DESCRIPTION

Draw a clear distinction between input lead and output lead: input 12V (red lead), ground electrodes (black lead), regulation wire (white lead), reference voltage 5V (yellow lead), shutdown (blue lead), and output high-tension cable (thick brown lead).

While regulating the potentiometer, connect the intermediate tap of the potentiometer with white lead, and connect the other two ends to ground (black lead) and reference voltage (yellow lead) respectively. Switch on the power, and regulate the potentiometer to have the required output voltage.

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.

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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	Condition	Min.	Typ.	Max.	Unit/Note
Input Voltage	VPS		11	12	13	V
Quiescent Input Current	I_{INQQ}	I_{OUT} = 0mA	60	70	80	mA
Full Load Input Current	I_{INFLD}	I_{OUT} = 10mA	300	350	400	mA
Input Voltage Regulation Ratio	$\Delta V_{OUT}/\Delta VPS$	VPS = 11V ~ 13V		0.1		%
Output Voltage	V_{OUT}	I_{OUT} = 0 ~ 10mA	0		–3000	V
Maximum Output Current	I_{OUTMAX}	VPS = 11V ~ 13V			10	mA
Stability of Reference Voltage	V_{REF}	−20 ~ 50°C	4.95	5	5.05	V
Load				300		kΩ
Regulation Mode				0 ~ 5V or 10k potentiometer		
Control Input vs. Output Linearity	$\Delta V_{REF}/\Delta V_{OUT}$			<0.2		%
Load Regulation Rate		I_{OUT} = 0 ~ 10mA		≤0.05		%
Instantaneous Short Circuit Current	I_{SC}			<500		mA
Shutdown Supply Current	I_{SHDN}				15	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	η			≥70		%
Temperature Coefficient	TCV_O	−20 ~ 50°C		<0.01		%/°C
Time Drift / Short Time Drift				<0.5		%/ min
Time Drift / Long Time Drift				<1		%/h
Output Voltage Temperature Stability		−20 ~ 50°C		<±1		%
Operating Temperature Range	T_{opr}		−20		50	°C
Storage Temperature Range	T_{stg}		−55		100	°C
External Dimensions				100×90×30		mm
Weight				320		g
				0.71		lbs
				11.29		Oz

TESTING DATA

I. DC Testing

High voltage power supply testing data (Test condition: the load is 300kΩ)

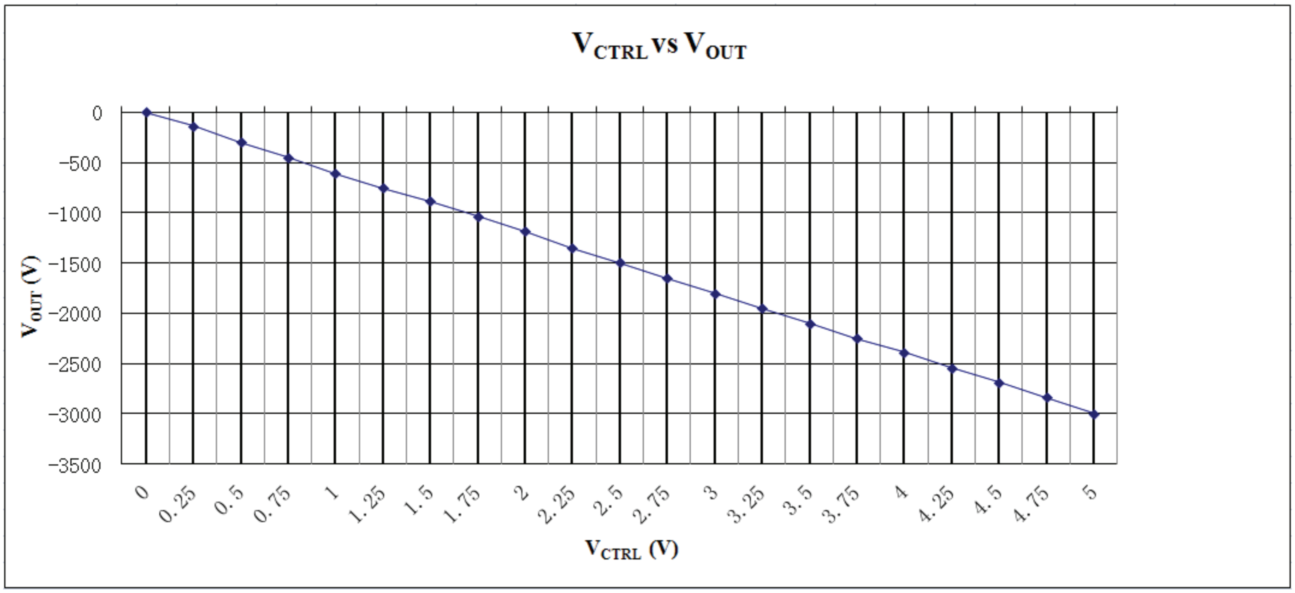


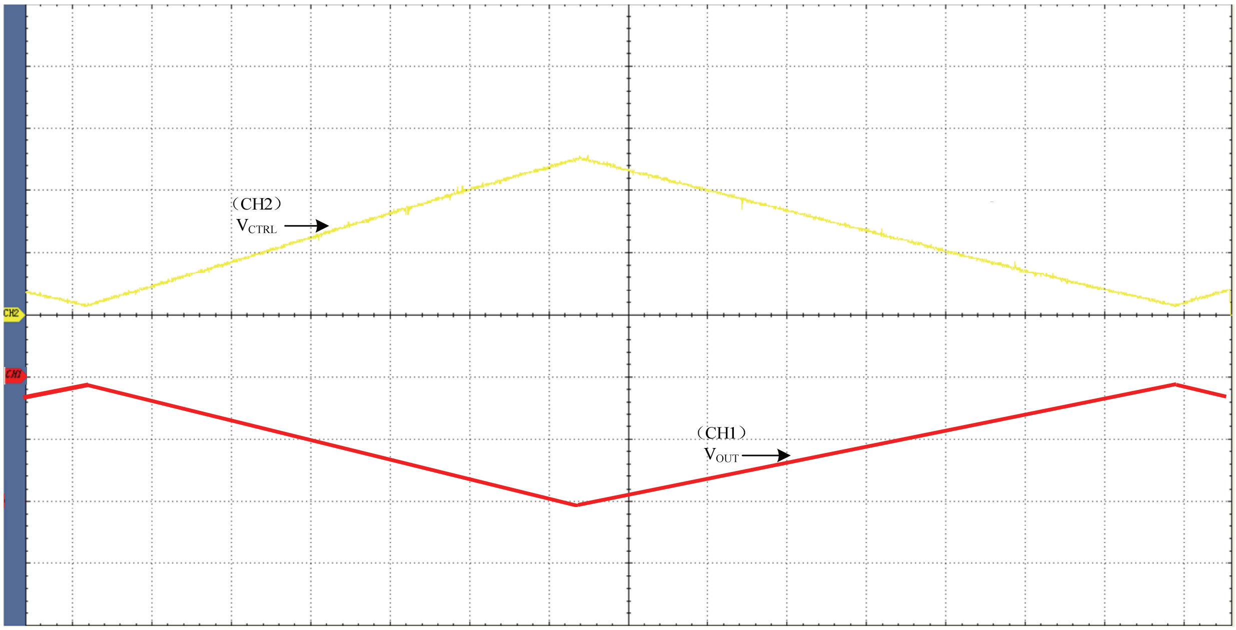
Figure 2. V_{CTRL} vs. V_{OUT}

II. AC Testing

Waveform curve and rise & fall time are tested by using the control voltage supplied by signal generator.

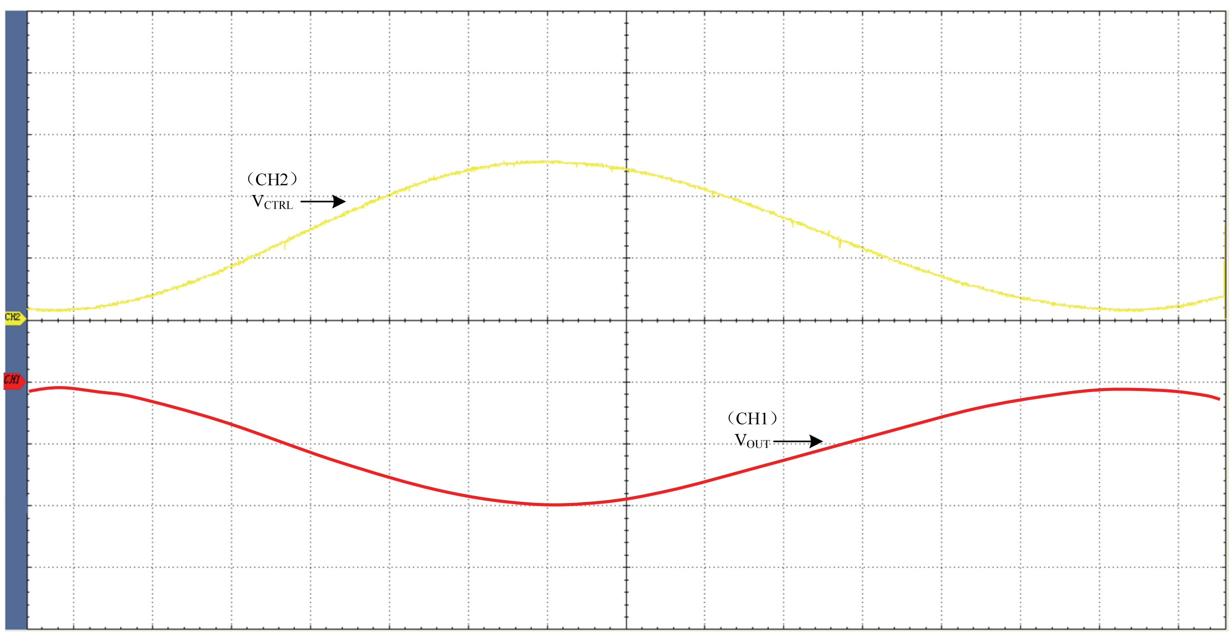
Under the testing condition of modulation frequency 0.1Hz, control voltage 0.25 ~ 5V, and 300kΩ load, the output voltage is –150 ~ -3000V.

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



CH1: 1500V/Div CH2: 2V/Div M: 500ms
V_{CTRL}: 0.25V ~ 5V V_{OUT}: -150V ~ -3000V

Figure 3. Triangle Wave



CH1: 1500V/Div CH2: 2V/Div M: 500ms
V_{CTRL}: 0.25V ~ 5V V_{OUT}: -150V ~ -3000V

Figure 4. Sine Wave

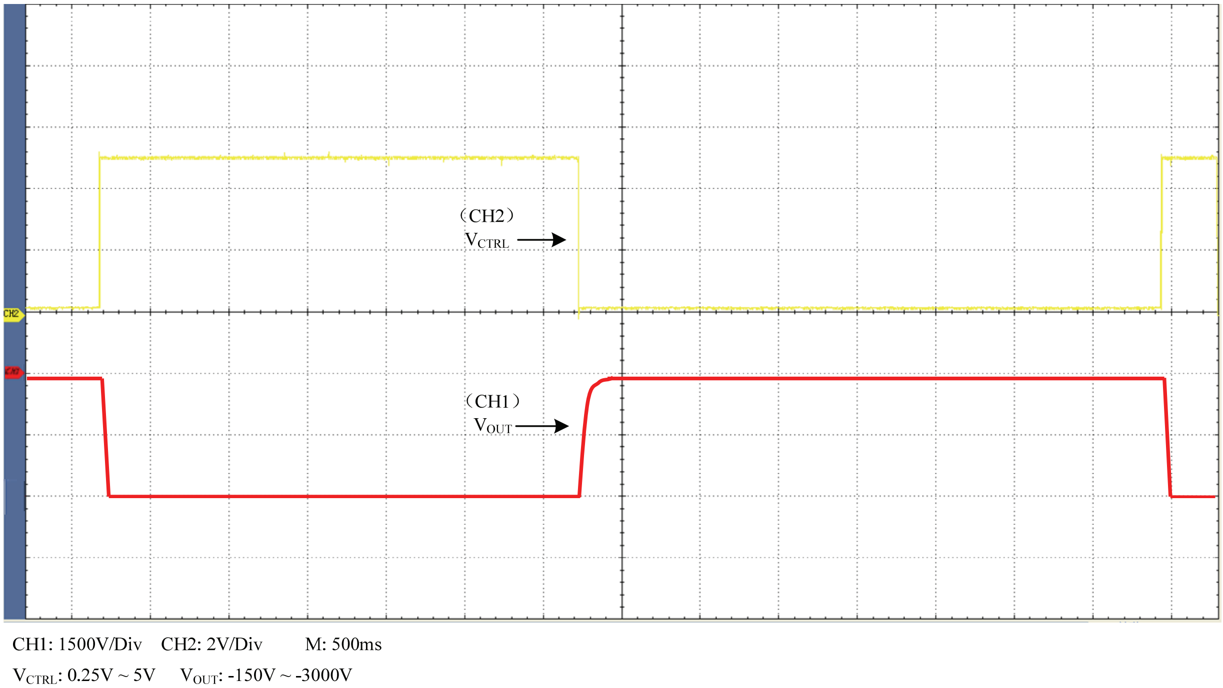


Figure 5. Square Wave

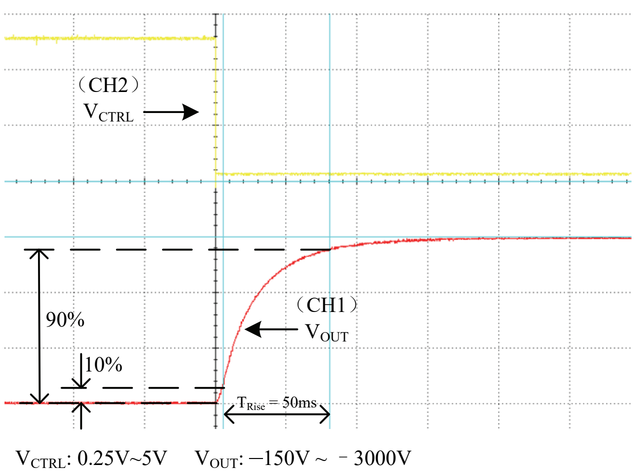


Figure 6. Rise Time

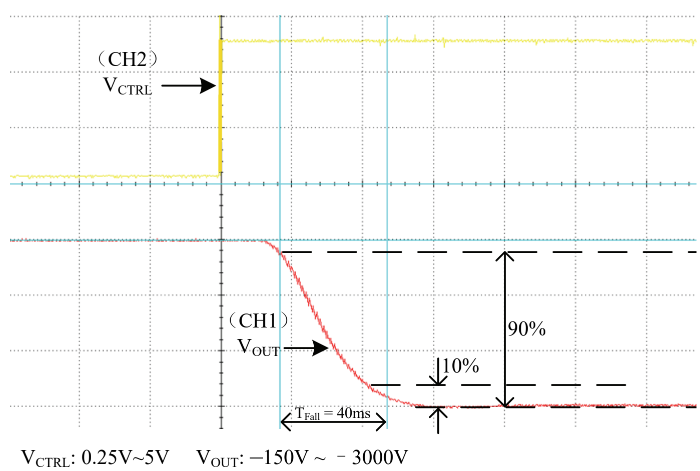


Figure 7. Fall Time

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.

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 AHV12VN3KV10MAW.

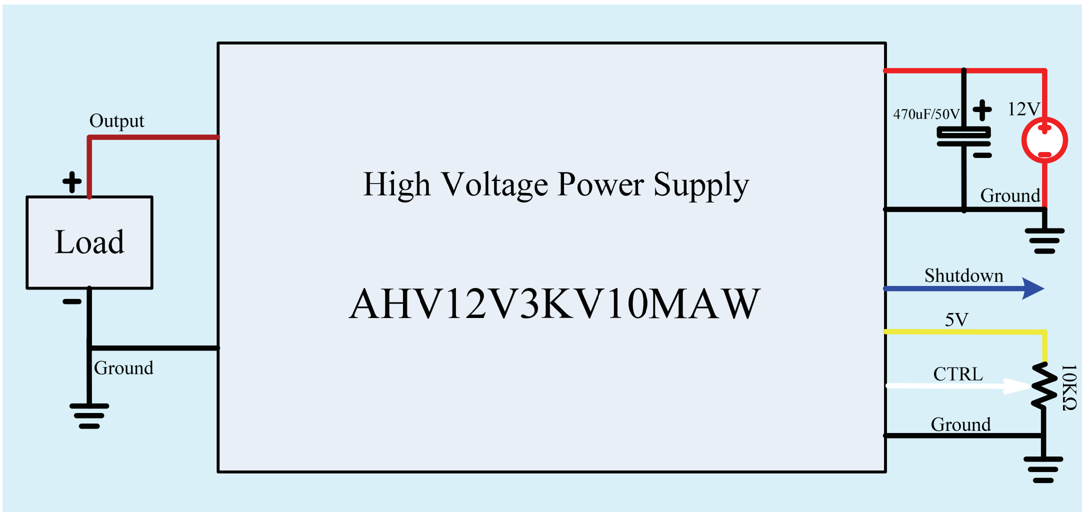


Figure 8. Control by External Signal Source

BLOCK DIAGRAM

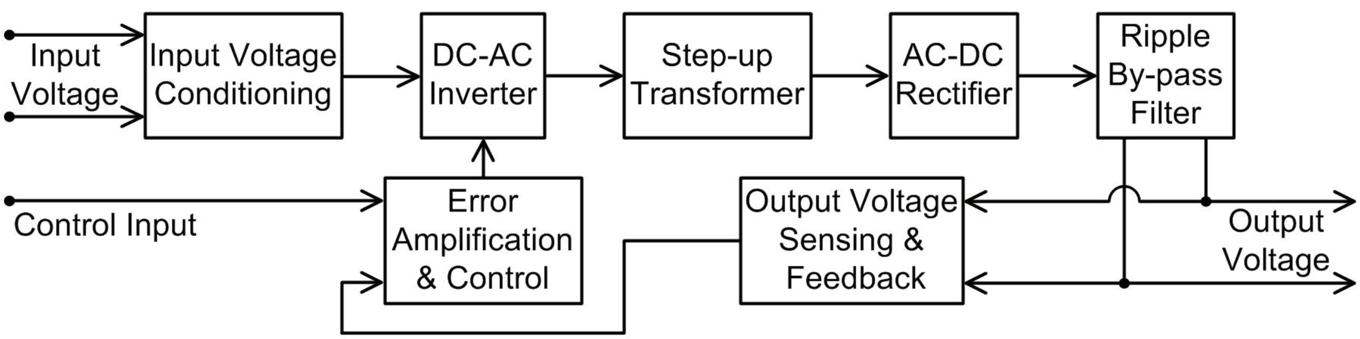


Figure 9. Block Diagram

NAMING INSTRUCTIONS

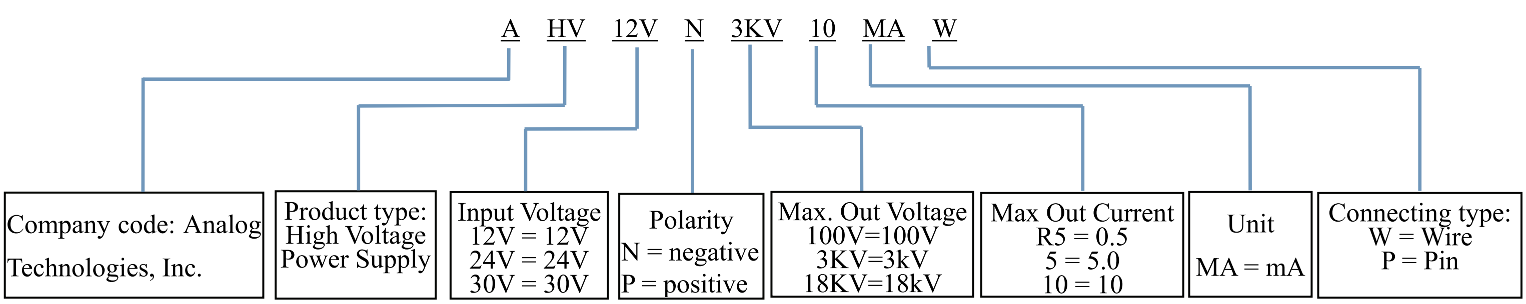


Figure 10. Naming Rules of AHV12VN3KV10MAW

DIMENSIONS

I. Dimension of the leads.

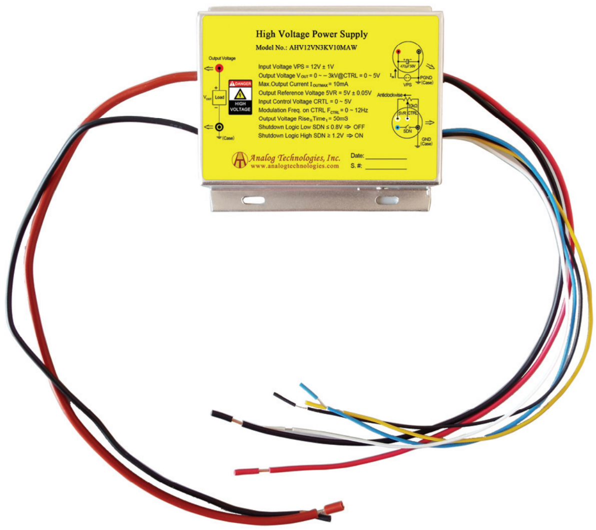


Figure 11. Leads of AHV12VN3KV10MAW

Leads	Diameter (mm)	Length (mm)
Thick brown lead	4.5	26
Yellow, red, blue, black and white leads	1.5	23

II. Dimension of AHV12VN3KV10MAW.

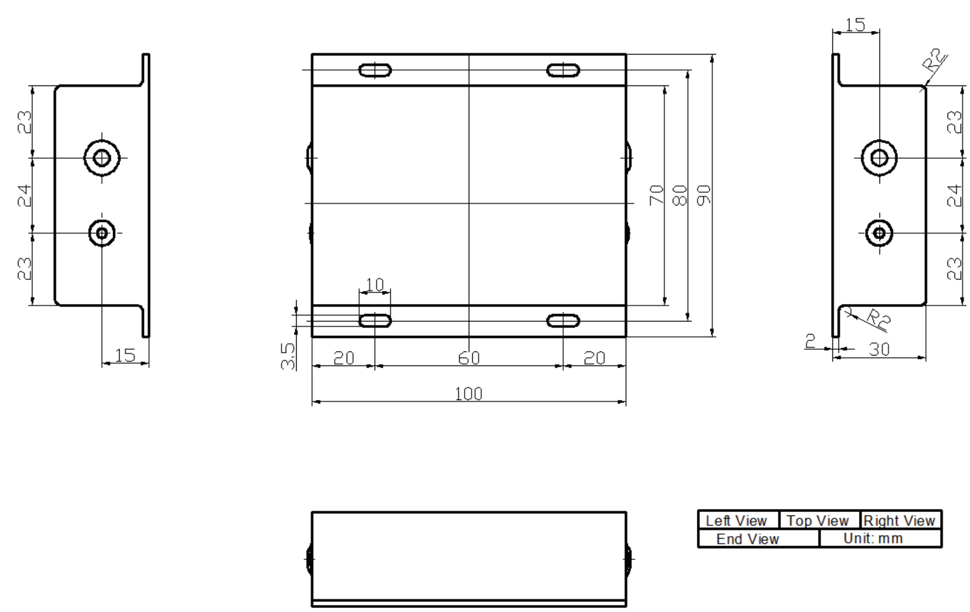


Figure 12. Dimensions for AHV12VN3KV10MAW

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