

Figure 1.1. Top View of AHV24VN10KV5MAW



Figure 1.2. Side View



Figure 1.4. Side View



Figure 1.3. Bottom View



Figure 1.5. Side View

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FEATURES

High precision

Full modulation range on output voltage

Negative voltage output

Linear regulation

Shutdown

APPLICATIONS

This power module, AHV24VN10KV5MAW, 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, nondestructive inspection high voltage power supply, semiconductor manufacturing equipment high voltage power supply, capillary electrophoresis high voltage power supply, nondestructive detection high voltage power supply, particles injection high voltage power supply in semiconductor technology, physical vapor phase deposition high voltage power supply, nanolithography high voltage power supply. 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 24V (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.

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.



Figure 2. The Connecting Lead Wires of AHV24VN10KV5MAW

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SPECIFICATIONS

Table 1. Characteristics.

T_A = 25°C, unless otherwise noted

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit/Note
Input Voltage		V_{VPS}		23	24	25	V
Quiescent Input Current		I_{INQQ}	I_{OUT} = 0mA	260	280	300	mA
Full Load Input Current		I_{INFLD}	I_{OUT} = 5.0mA	2800	2900	3000	mA
Input Voltage Regulation Ratio		$\Delta V_{OUT}/\Delta V_{VPS}$	V_{VPS} = 23V to 25V		0.05		%
Output Voltage		V_{OUT}	I_{OUT} = 0 to 5.0mA	0		-10000	V
Maximum Output Current		I_{OUTMAX}	V_{VPS} = 23V to 25V			5.0	mA
Stability of Reference Voltage		V_{REF}	−20 ~ 50°C	4.95	5	5.05	V
Ripple					<0.05		$\%V_{P-P}$
Load					2		MΩ
Regulation Mode				0 ~ 5V or 10k potentiometer			
Control Input vs. Output Linearity		$\Delta V_{REF}/\Delta V_{OUT}$			<0.1		%
Load Regulation Rate			0 to 5.0mA		≤0.05		%
Instantaneous Short Circuit Current		I_{SC}			<20		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}					V
Full Load Efficiency		η			≥70		%
Temperature Coefficient		TCV_O	−20 ~ 50°C		<0.01		%/°C
Time Drift	Short Time Drift				<0.05	%/ min	%/ min
	Long Time Drift				<0.05	%/h	%/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				140×100×55			mm
Weight					1000		g
					2.21		lbs
					35.27		Oz

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TESTING DATA

I. DC Testing

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

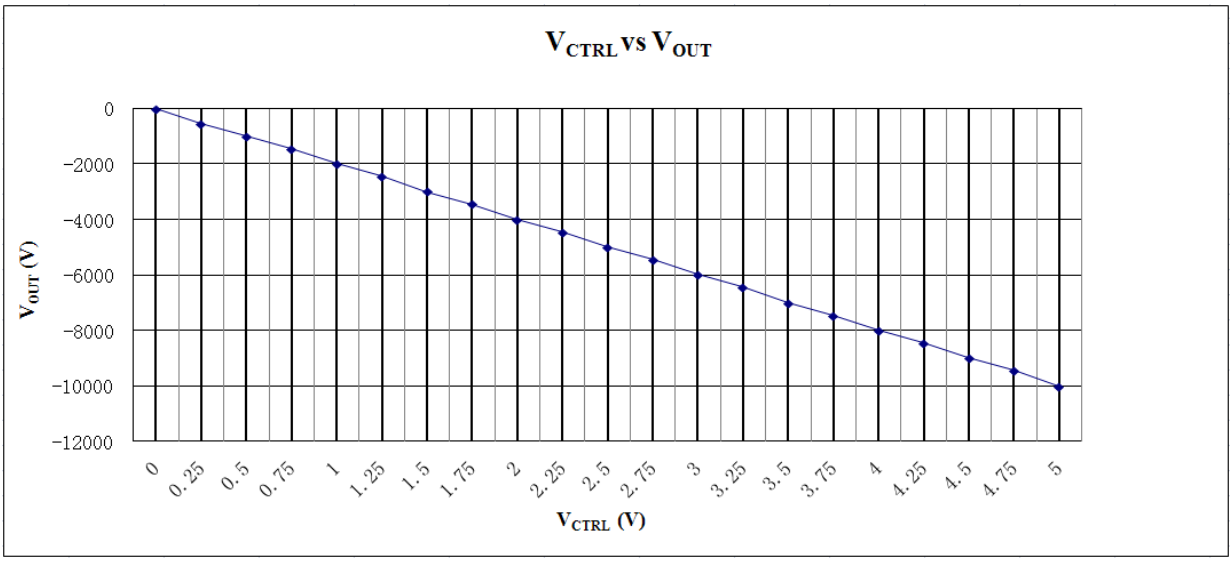


Figure 3. V_{CTRL} vs. V_{OUT}

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 2MΩ load, the output voltage is –490 ~ –10000V.

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

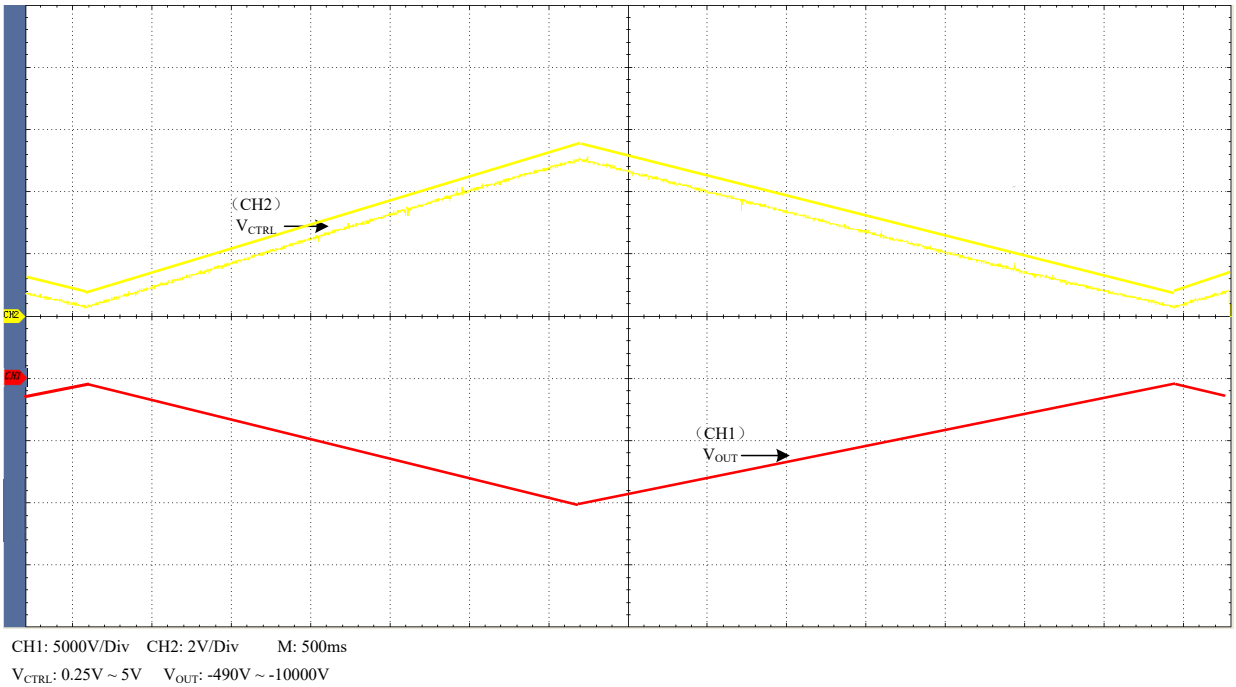
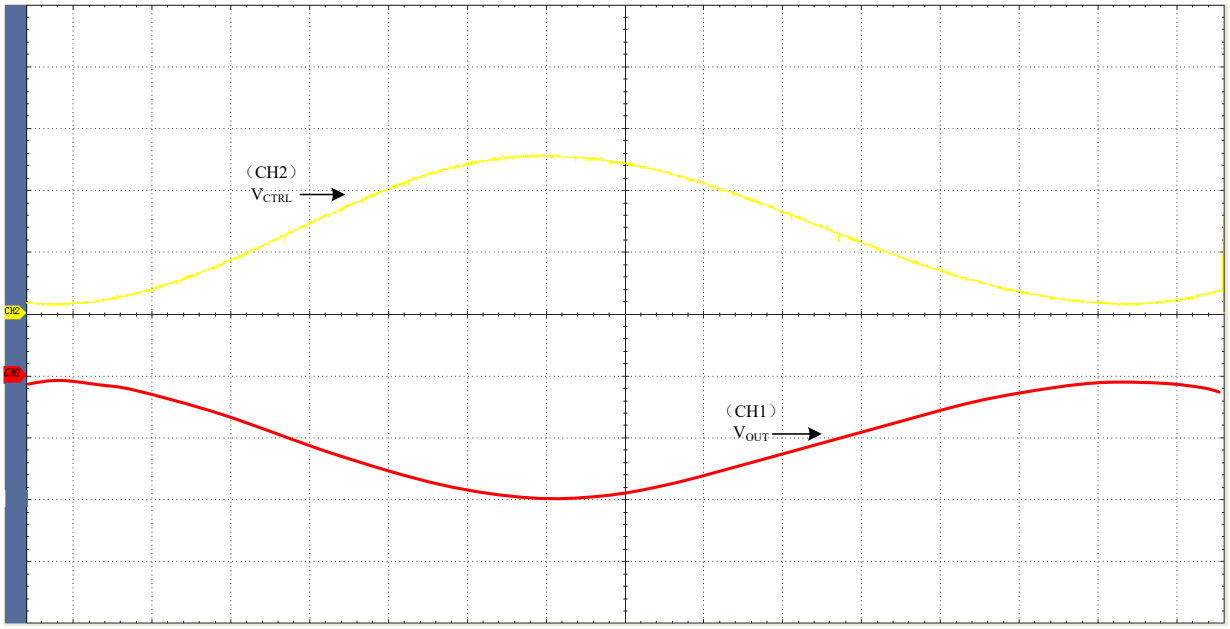


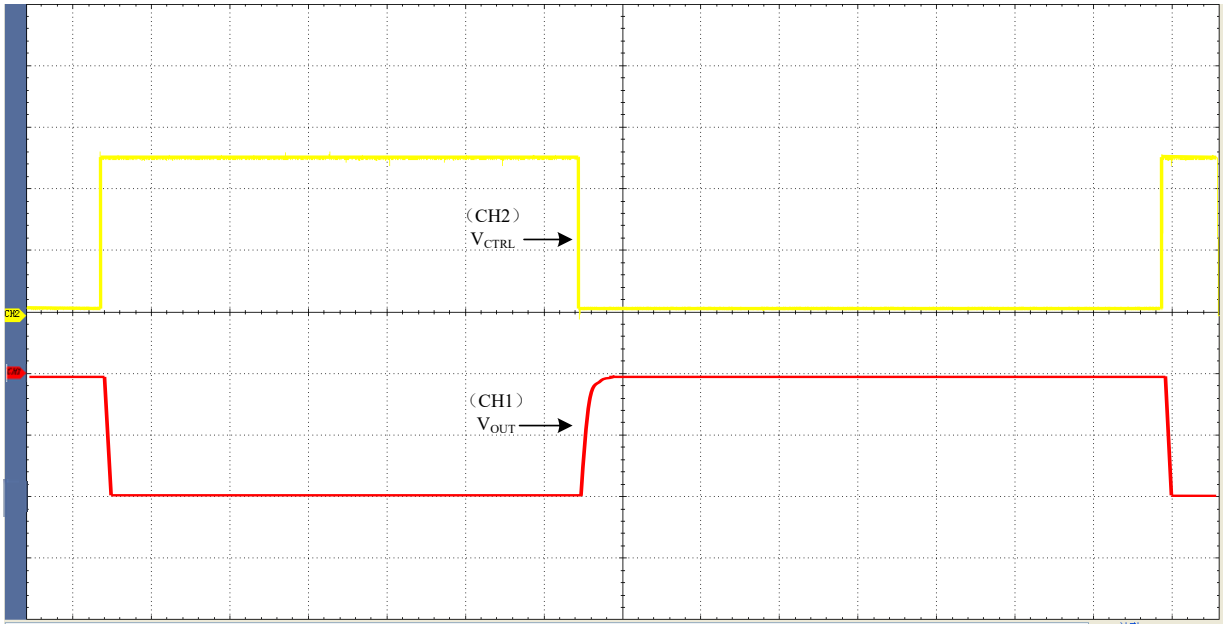
Figure 4. Triangle Wave

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CH1: 5000V/Div CH2: 2V/Div M: 500ms
V_{CTRL}: 0.25V ~ 5V V_{OUT}: -490V ~ -10000V

Figure 5. Sine Wave



CH1: 5000V/Div CH2: 2V/Div M: 500ms
V_{CTRL}: 0.25V ~ 5V V_{OUT}: -490V ~ -10000V

Figure 6. Square Wave

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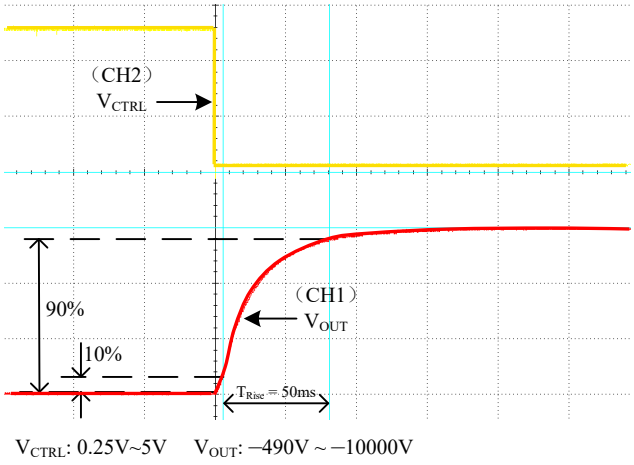


Figure 7. Rise Time

As shown in Figure 7, when a square wave of 0.25V ~ 5V, F=0.10Hz is applied to Control, measure the waveform. The rise time is about 30ms.

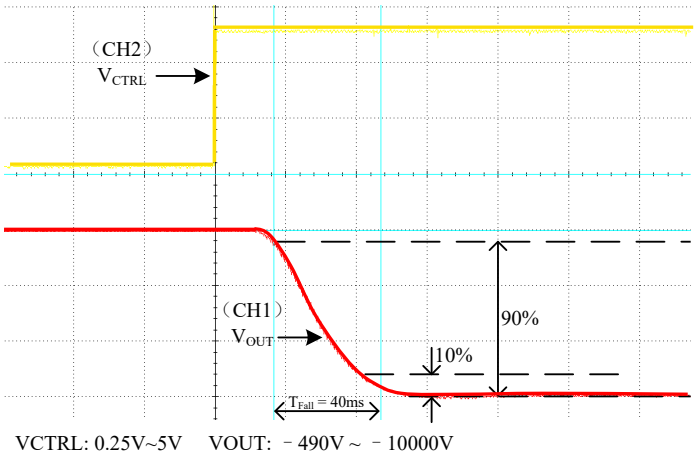


Figure 8. Fall Time

As shown in Figure 8, 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 AHV24VN10KV5MAW.

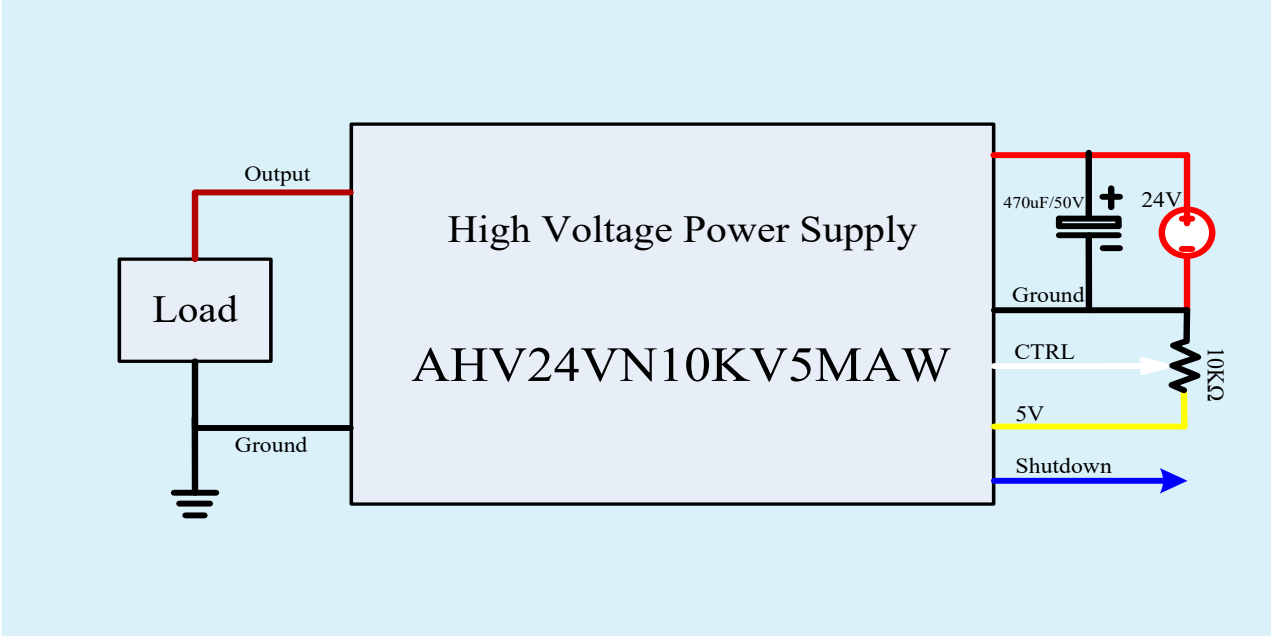


Figure 8. Control by External Signal Source

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NAMING INSTRUCTIONS

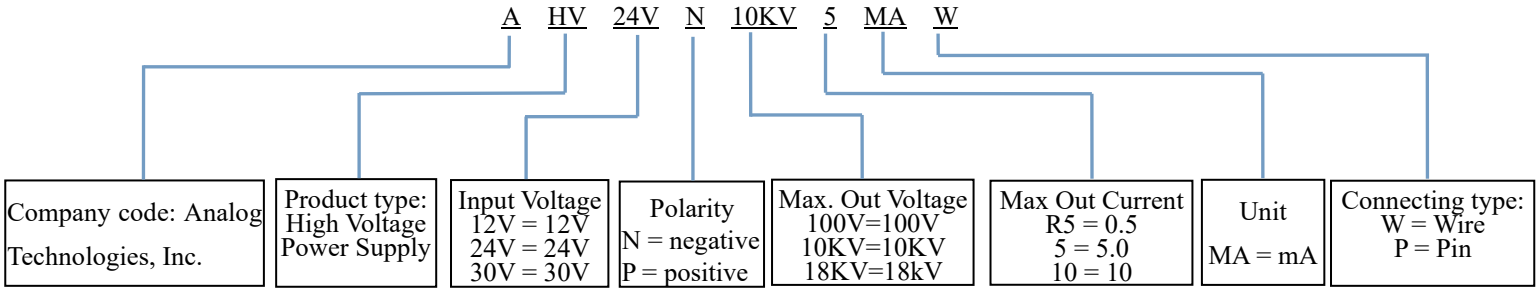


Figure 9. Physical Photo of AHV24VN10KV5MAW

DIMENSIONS

I. Dimension of the leads.

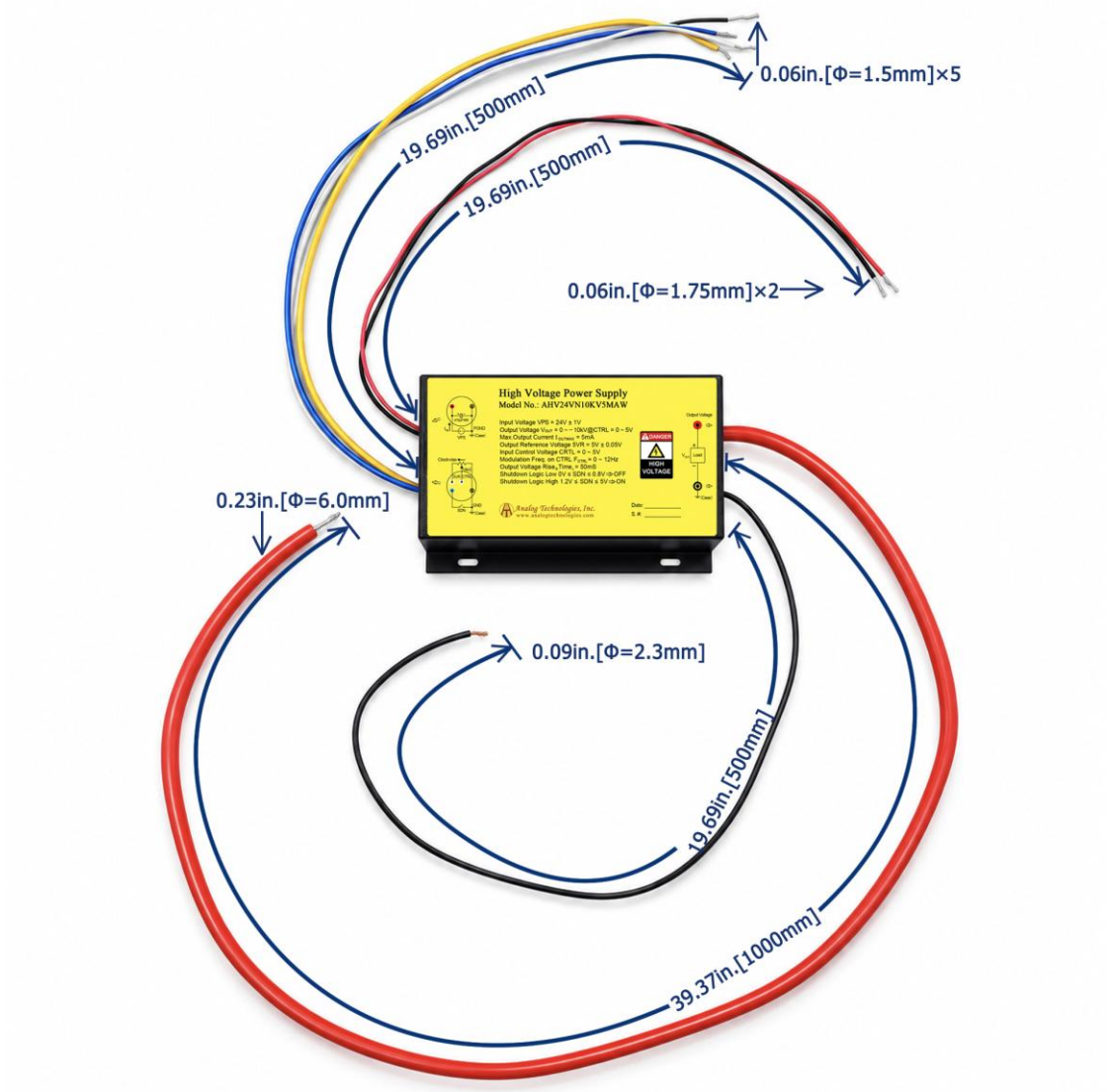


Figure 10. Leads of AHV24VN10KV5MAW

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II. Dimension of AHV24VN10KV5MAW.

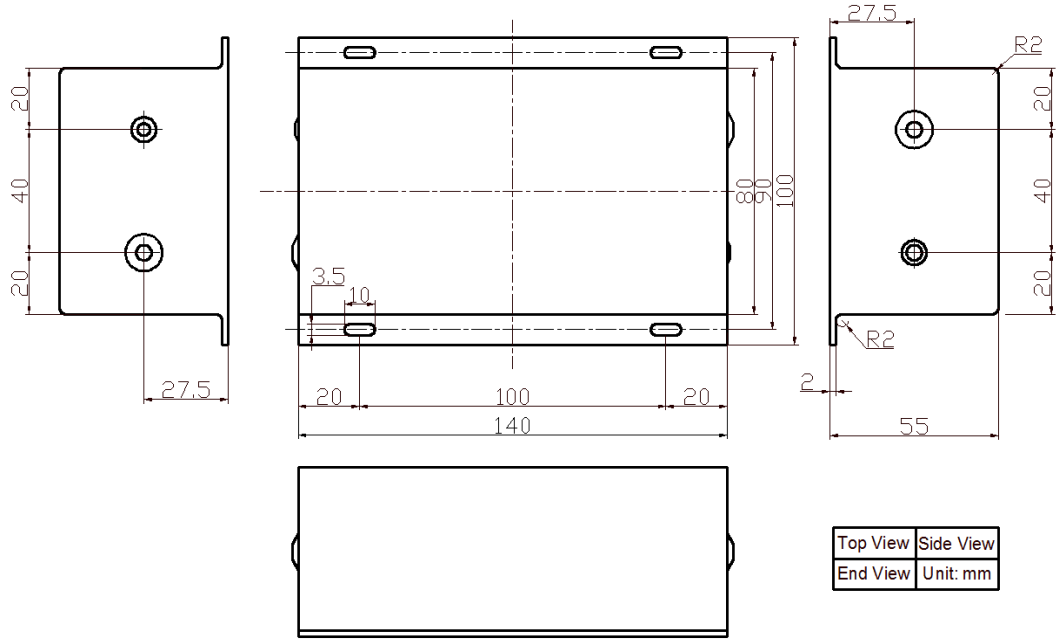


Figure 11. Dimensions for AHV24VN10KV1MAW

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