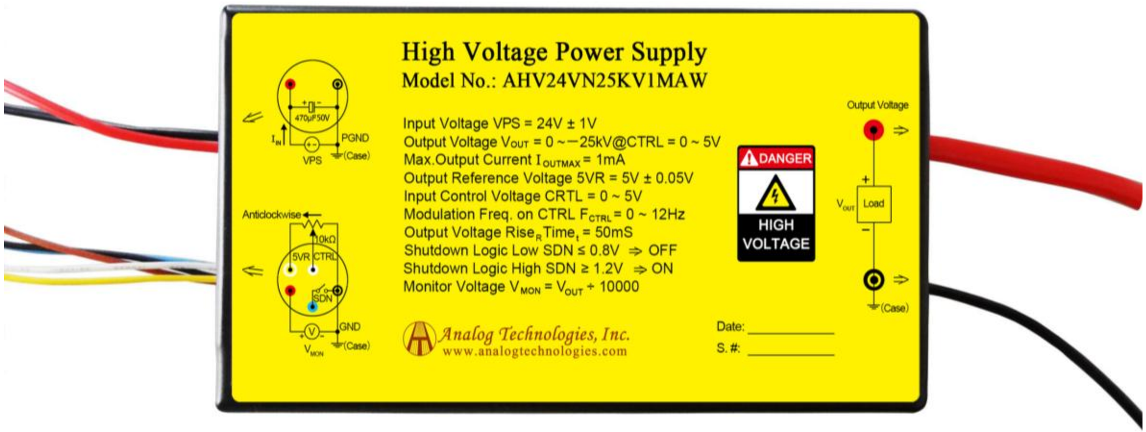


Figure 1. Physical Photo of AHV24VN25KV1MAW

FEATURES

High precision

Full modulation range on output voltage

Linear regulation

Shutdown

APPLICATIONS

This power module, AHV24VN25KV1MAW is designed for achieving DC-DC conversion from low voltage to high voltage. High voltage power supply is widely used in industrial measurement and control, energy spectrum analysis, and medical equipment such as: X-ray machine, vacuum/plasma processing, semiconductor fabrication equipment, analytical instrumentation, medical diagnostic and therapeutic systems, test equipment, and research and academic applications, etc.

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), output high-tension cable (thick red lead), and voltage monitor cable (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.

AHV24VN25KV1MAW converts an input DC voltage of 24V, to an output voltage of 25kV with high efficiency. It allows monitor the output voltage by measuring the voltage of an output voltage monitor port: multiplying the value 10000 times equals the output voltage. The whole converter is shielded by a heavy duty metal enclosure, which blocks EMIs from coming out of the module and going into the module. This feature is particularly important for noise intensive environment.

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 ℃, unless otherwise noted

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit/Note
Input Voltage		VPS		23	24	25	V
Quiescent Input Current		I_{INQ}	I_{OUT} = 0mA	200	250	300	mA
Full Load Input Current		I_{INFLD}	I_{OUT} = 1.0mA	1.5	1.6	1.7	A
Input Voltage Regulation Ratio		$\Delta V_{OUT}/\Delta V_{VPS}$	V_{VPS} = 23V ~ 25V		0.1		%
Output Voltage		V_{OUT}	I_{OUT} = 0 ~ 1.0mA	0		–25000	V
Maximum Output Current		I_{OUTMAX}	V_{VPS} = 23V ~ 25V			1.0	mA
Stability of Reference Voltage		V_{REF}	−20 ~ 50°C	4.95	5	5.05	V
Load					25		MΩ
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 ~ 1.0mA		≤0.05		%
Instantaneous Short Circuit Current		I_{SC}			<150		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
Monitor Voltage Out Impedance		Z_{VMON}			1		MΩ
Monitor Voltage		V_{MON}	V_{OUT} = 0 ~ 30kV	0		3	V
Full Load Efficiency		η			≥70		%
Temperature Coefficient		TCV_O	−20 ~ 50°C		<0.1		%/°C
Time Drift	Short Time Drift				<0.3		%/ min
	Long Time Drift				<0.5		%/h
Output Voltage Temperature Stability			−20 ~ 50°C		< ±0.5		%
Operating Temperature Range		T_{opr}		−20		55	°C
Storage Temperature Range		T_{stg}		−55		85	°C
External Dimensions				140×100×55			mm
Weight					1000		g
					2.21		lbs
					35.27		Oz

TESTING DATA

I. DC Testing

High voltage power supply testing data (Test condition: the load is 25 MΩ)

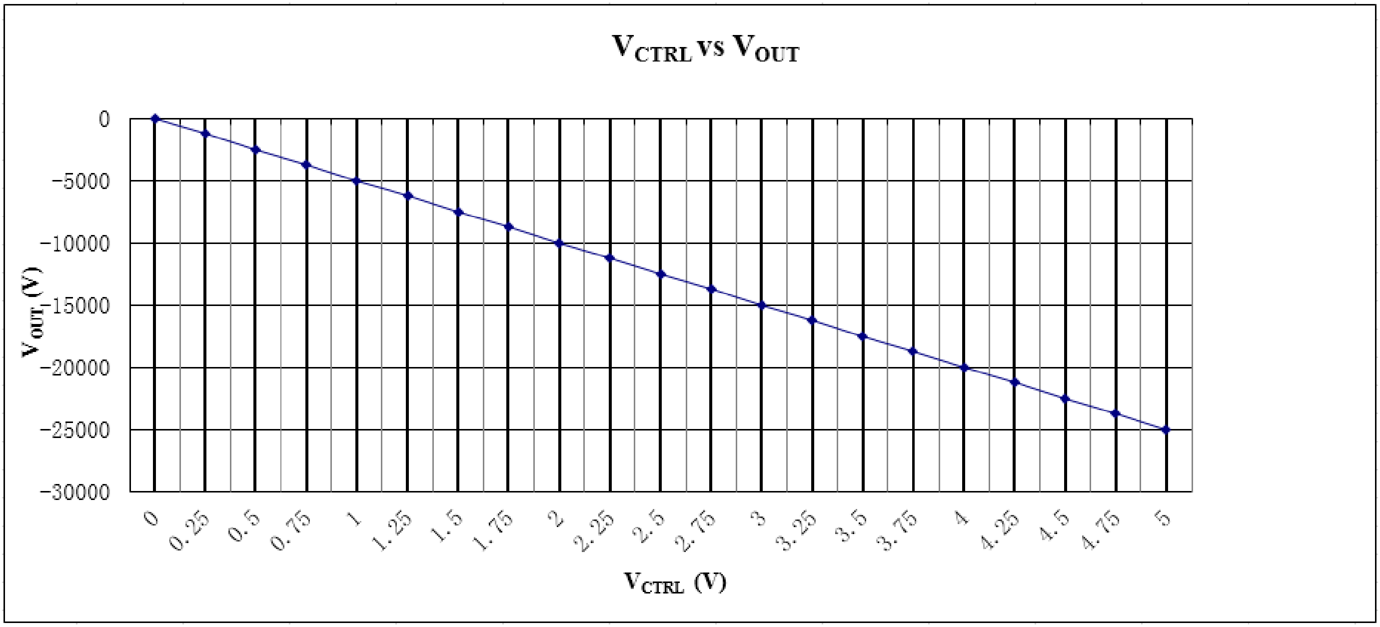


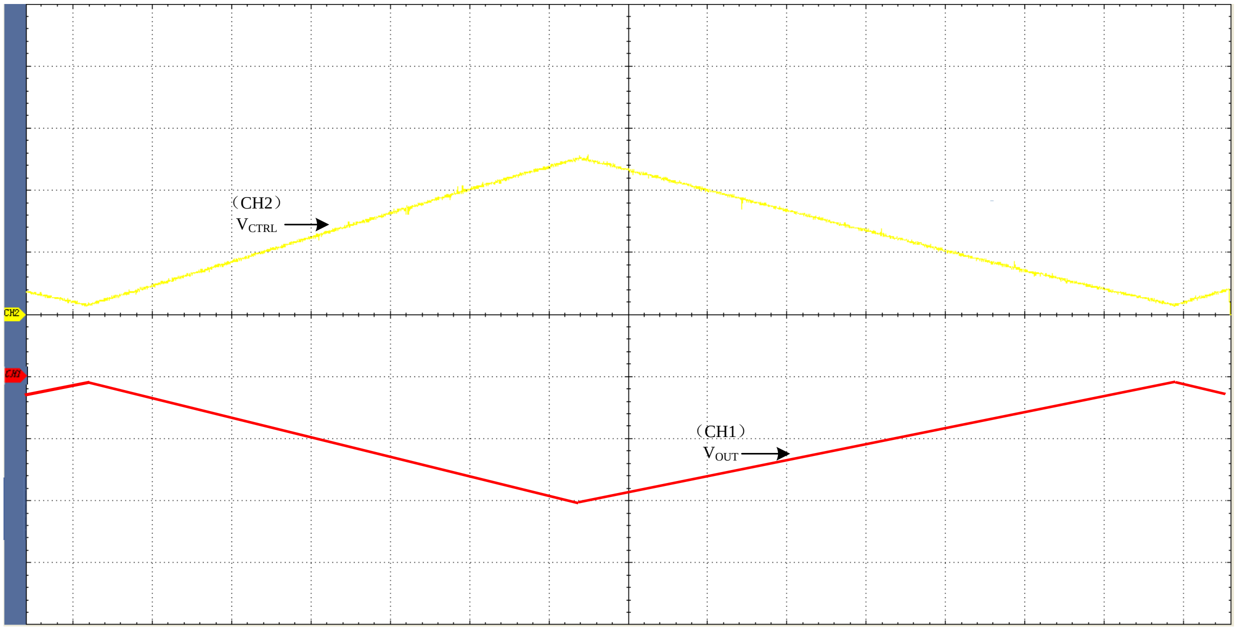
Figure 2. V_{CTRL} vs. V_{OUT}

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 25MΩ load, the output voltage is -1250 ~ - 25000V.

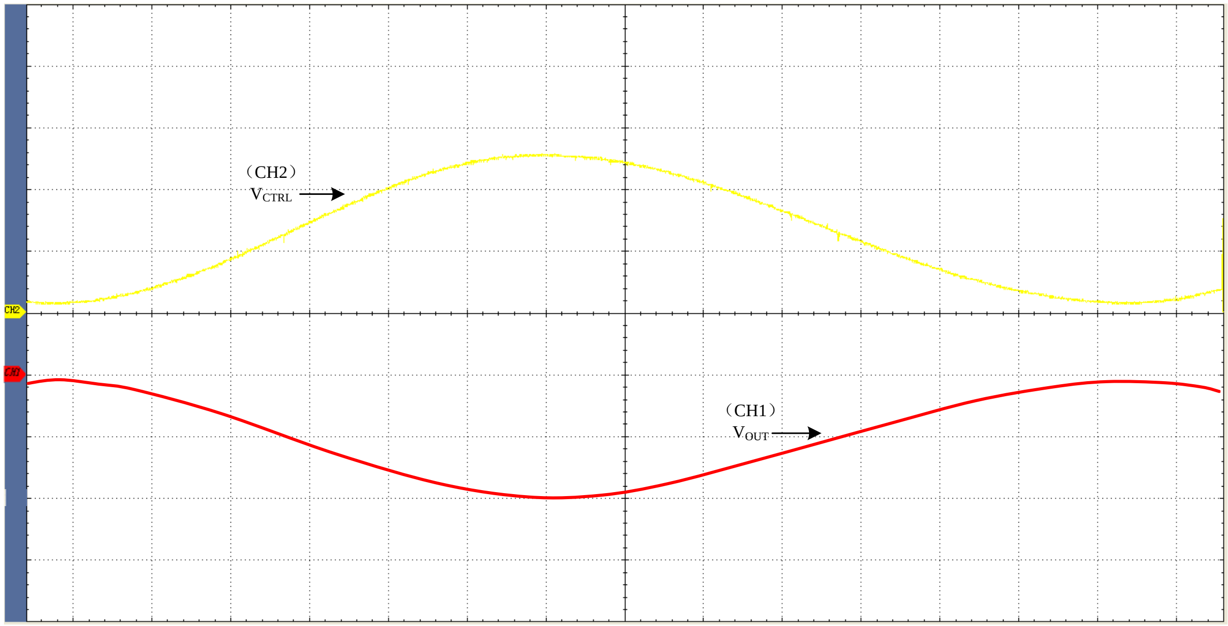
Note: as shown in the figures below, the output voltage is represented by yellow line and the control voltage by red line.



CH1: 12500V/Div CH2: 2V/Div M: 500ms

V_{CTRL}: 0.25V ~ 5V V_{OUT}: -1250V ~ -25000V

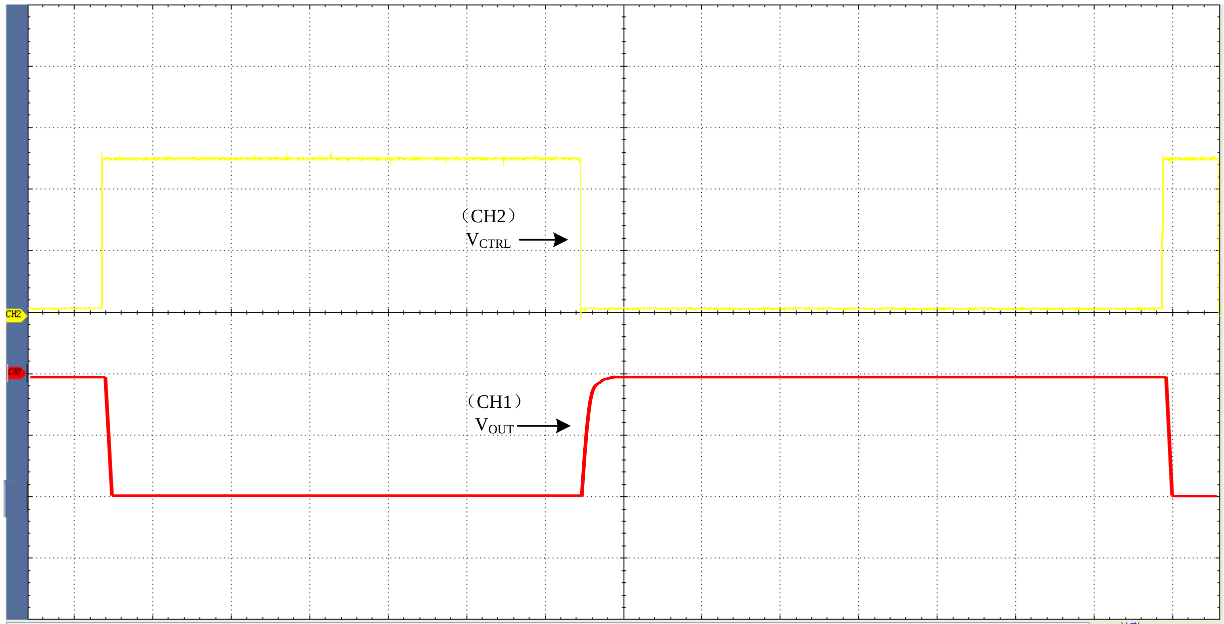
Figure 3. Triangle Wave



CH1: 12500V/Div CH2: 2V/Div M: 500ms

V_{CTRL}: 0.25V ~ 5V V_{OUT}: -1250V ~ -25000V

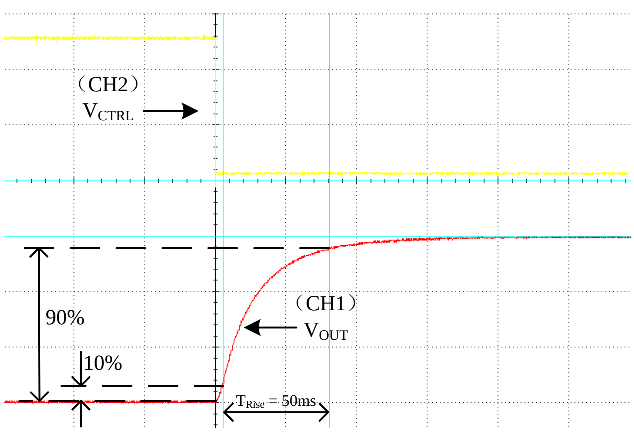
Figure 4. Sine Wave



CH1: 12500V/Div CH2: 2V/Div M: 500ms

V_{CTRL}: 0.25V ~ 5V V_{OUT}: -1250V ~ -25000V

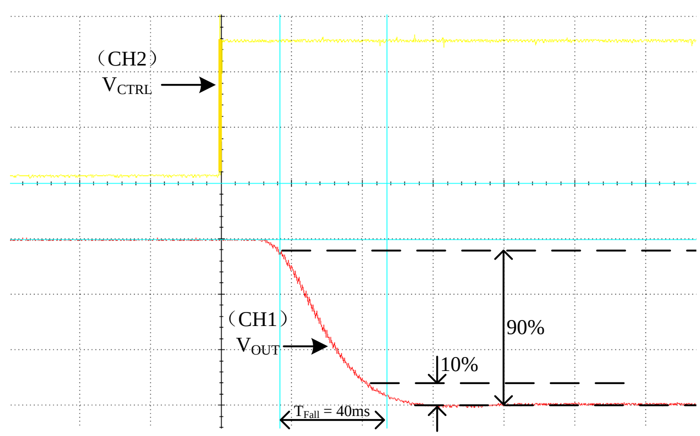
Figure 5. Square Wave



V_{CTRL}: 0.25V~5V V_{OUT}: –1250V ~ –25000V

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}: –1250V ~ –25000V

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 AHV24VN25KV1MAW.

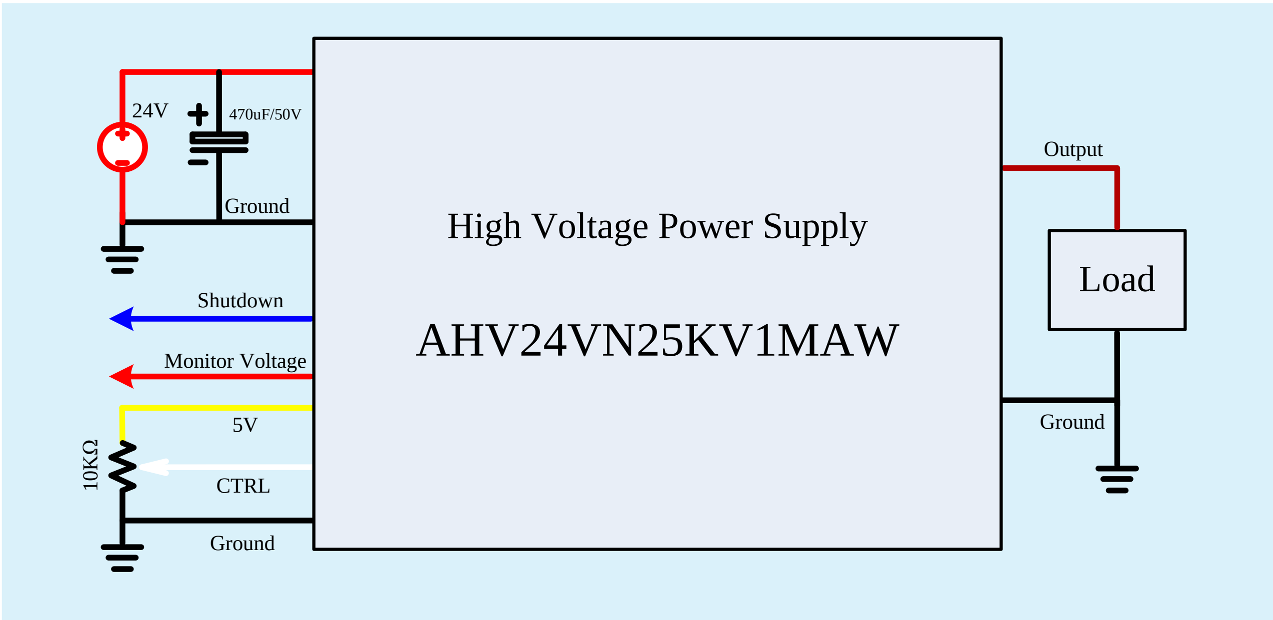


Figure 8. Figure 8. Control by External Signal Source

NAMING INSTRUCTIONS

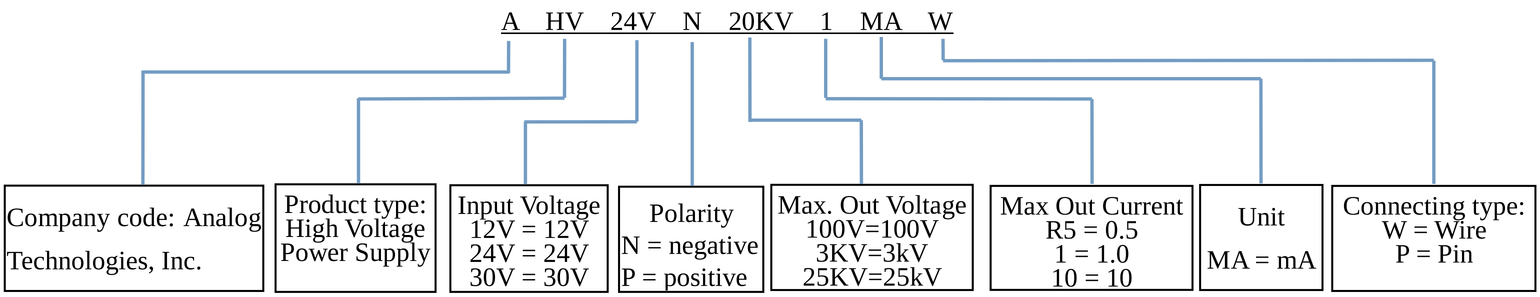


Figure 9. Naming Rules of AHV24VN25KV1MAW

DIMENSIONS

I. Dimension of the leads.

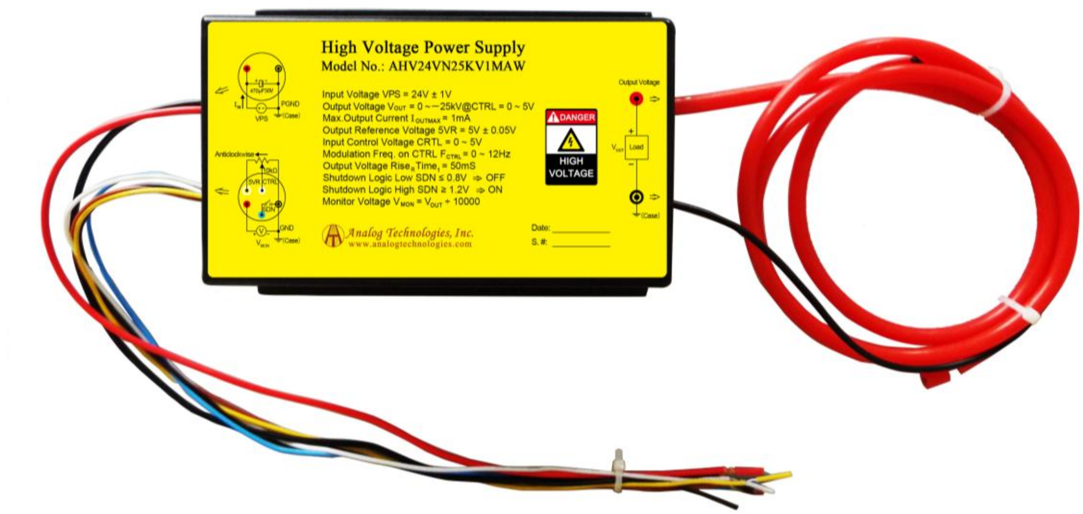


Figure 10. Leads of AHV24VN25KV1MAW

Leads	Diameter (mm)	Length (mm)
Thick brown lead	4.5	120
Yellow, red, blue, black and white leads	1.5	23

II. Dimension of AHV24VN25KV1MAW.

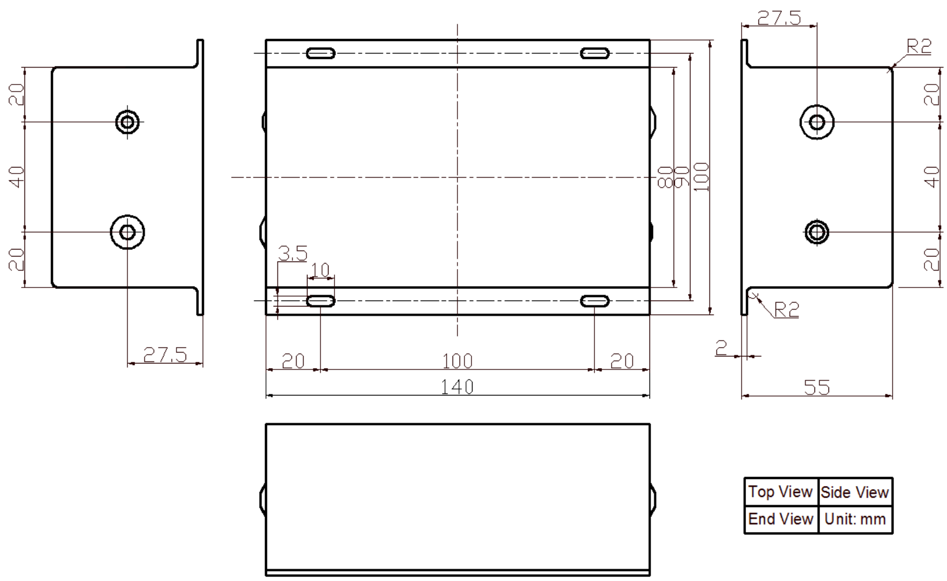


Figure 11. Dimensions for AHV24VN25KV1MAW

PRICES

Quantity (pcs)	1~9	10~49	50~99	≥100
AHV24VN25KV1MAW	$419	$409	$399	$389

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