



Figure 1. The Physical Photos of AHVAN1KV20MA

#### MAIN FEATURES

- Built-in High Voltage Converter
- Compact Size: 176.5(L)×147.0(W)×41.2(H) mm
- High Current Capability: Up to 20mA
- High Slew Rate: 100V/μs

Table 1. Descriptions of Terminal Block Pin Functions

Pin #	Name	Type	Description
1	VPS	Power Input	Power supply 24V.
2	PGND	Power Ground	Power ground pin.
3	SBDN	Digital Input	This is a duplex pin. It sets the amplifier into Off, Standby or On mode.
4	AGND	Signal Ground	Signal ground pin. Connect ADC and DAC grounds to here.
5	10VR	Analog Output	10V voltage reference.
6	IHVMON	Analog Input	-
7	HVMON	Analog Output	Output voltage indication. When going from 0.1V to 10V, it indicates the output voltage is from -10V to -1kV.
8	OFFSO	Analog Output	Output voltage setting. When going from 0.1V to 10V, it indicates the output voltage is from -10V to -1kV. The pin is controlled by a potentiometer.
9	GND	Signal Ground	Signal ground pin. Connect ADC and DAC grounds to here.

- Wide Output Voltage Range:  $V_{OUT} = -10V \sim -1kV$   
@  $V_{IN} = 24V$
- Offset Voltage Range: 10V
- Bandwidth: Up to 10kHz
- Weight: 2.2lb (1.0kg)

#### APPLICATIONS

High voltage amplifications for driving piezos and other high voltage loads.

#### DESCRIPTION

The AHVAN1KV20MA is an electronic module for amplifying an analog input voltage into a high voltage output. Figure 1 shows its physical photo. It comes with a high voltage DC-DC converter, which converts the 24V input voltage into a -1kV to -10V output voltage. The analog output voltage can swing almost from -1kV to -10V when it is powered by a 24V power supply. There is three LEDs indicating if the amplifier works properly.

#### CAUTION

First, set up the AC power supply and fix it stably and firmly. Then make sure that the two switches of the high voltage amplifier are OFF. Connect the 24V DC power supply to the VPS and PGND of the high voltage amplifier. After the connection is complete, turn on the low voltage switch and set the input AC voltage or DC voltage. Then use the output monitor to check whether the input set voltage is correct. Finally turn on the high voltage switch.



Pin #	Name	Type	Description
BNC 1	Input	Analog Input	Output voltage setting. When going from 0.1V to 10V, it indicates the output voltage is from -10V to -1kV.
BNC 2	Input+Offset	Analog Output	Input+Offset input control signal indication.
BNC 3	HVOUT	Analog Output	Output voltage for driving the load.
	OGND	Output Ground	Connect this pin to the load return terminal.

### SPECIFICATIONS

Table 2. Characteristics (Test ambient temperature  $T_A = 25^\circ\text{C}$ )

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Power Supply Input (Pin 1)						
Input Range	$V_{VPS}$		23	24	25	V
Input Current	$I_{IN}$		0		4	A
Voltage Output ( BNC 3)						
Output Voltage	$V_{OUT}$		-1000		-10	V
Output Current	$I_{OUT}$		-20		0	mA
SBDN Pin (Pin 3)						
Off State	$V_{SBDN-OFF}$		0		0.4	V
	$V_{SBDN-OFF-HI}$ Going up from Off to Standby threshold				2.1	V
	$V_{SBDN-OFF-LOW}$ Going down from Standby to Off threshold		0.4			V
SBDN State	$V_{SBDN-STANDBY}$		2.1		2.51	V
	$V_{SBDN-SB-HI}$ Going up from Standby to On threshold				2.64	V
	$V_{SBDN-SB-LOW}$ Going down from On to Standby threshold		2.51			V
On State	$V_{SBDN-ON}$		2.64		$V_{VPS}$	V
SBDN Current	$I_{SBDN}$			10	20	$\mu\text{A}$
10VR Pin (Pin 5)						
Voltage Reference	$V_{REF}$			10		V
Maximum Input Power				200		W
Maximum Slew Rate				100		V/ $\mu\text{s}$

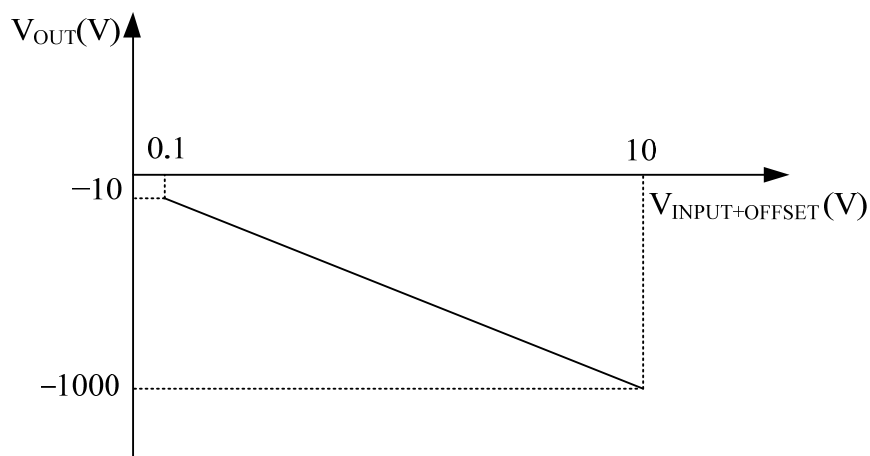


Figure 2.  $V_{\text{INPUT}+\text{OFFSET}}$  vs.  $V_{\text{OUT}}$

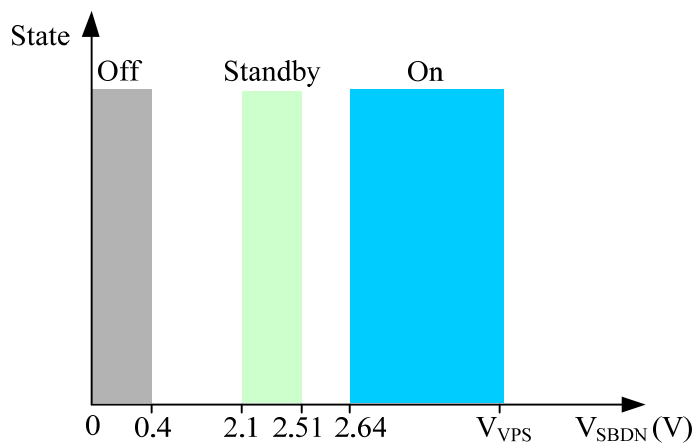
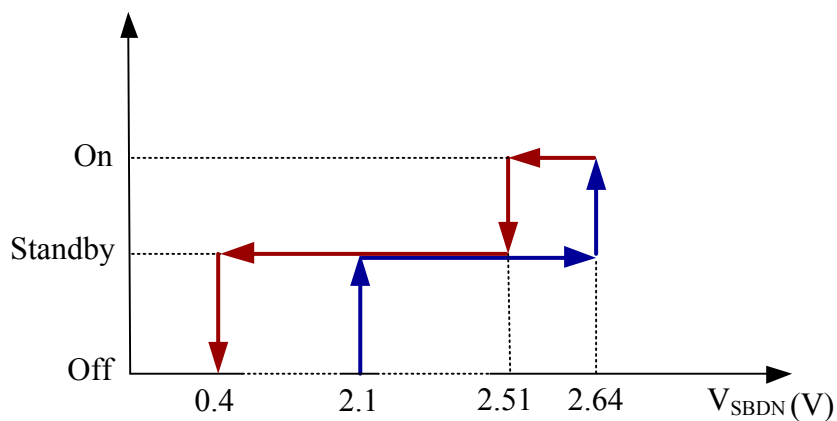


Figure 3.  $V_{\text{SBDN}}$  vs. Amplifier States

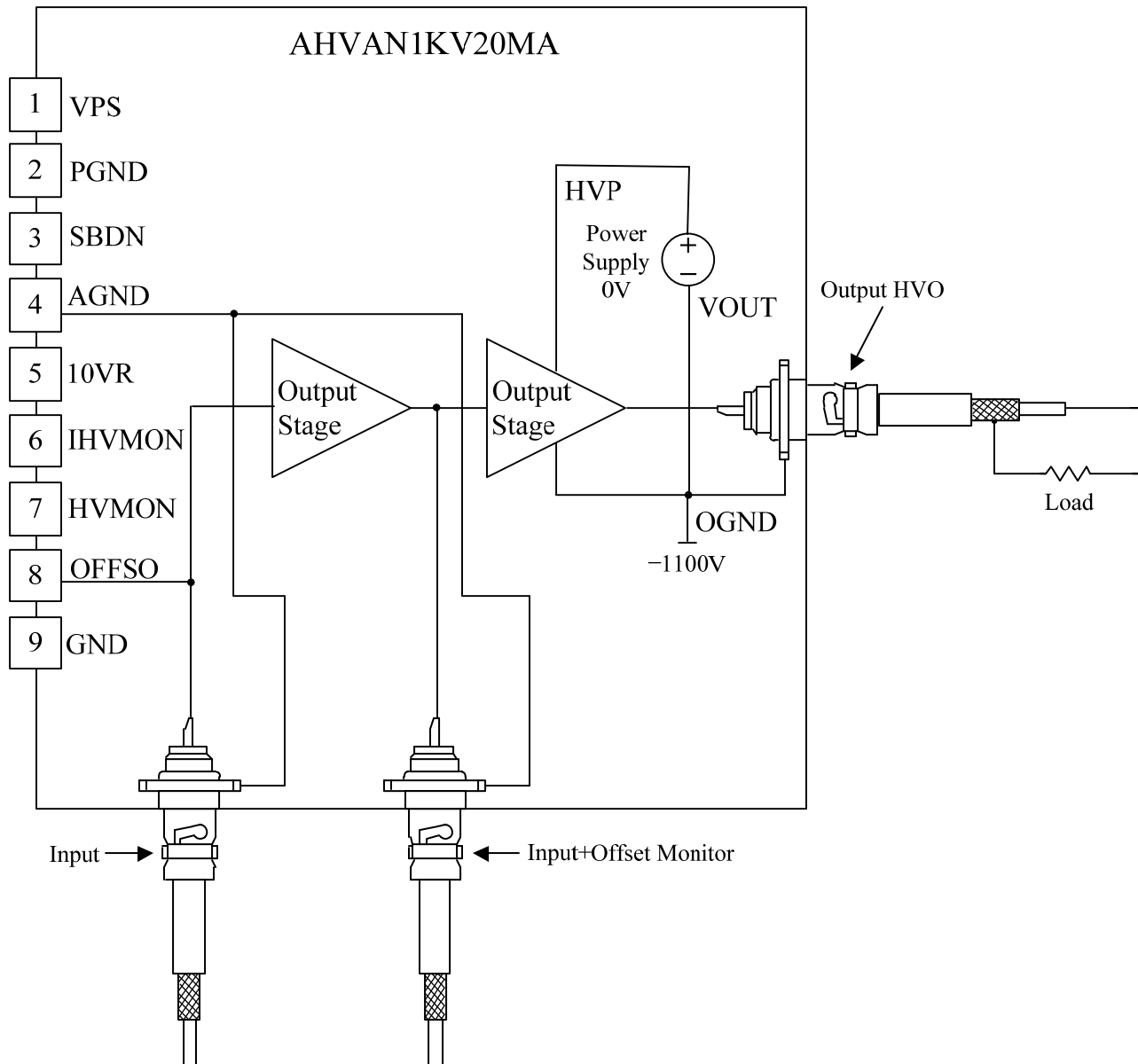
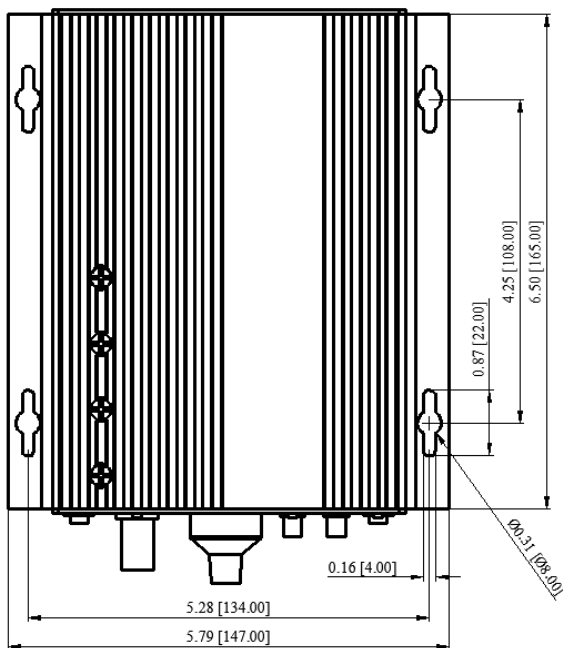
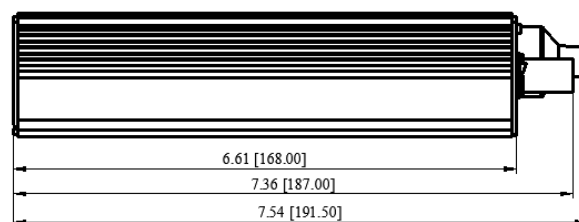


Figure 4. Schematic for Driving the Load



End View	Side View
Top View	Unit: inch [mm]

## ORDERING INFORMATION

Part Number	Description
AHVAN1KV20MA	−1kV high voltage amplifier, with 20mA output current



#### NOTICE

1. It is important to carefully read and follow the warnings, cautions, and product-specific notes provided with electronic components. These instructions are designed to ensure the safe and proper use of the component and to prevent damage to the component or surrounding equipment. Failure to follow these instructions could result in malfunction or failure of the component, damage to surrounding equipment, or even injury or harm to individuals. Always take the necessary precautions and seek professional assistance if unsure about proper use or handling of electronic components.
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