



Figure 1. The Physical Photos of AHVAN1KV20MA

### MAIN FEATURES

- Built-in High Voltage Converter
- Compact Size: 181.5(L)×149.0(W)×38.3(H) mm
- High Current Capability: Up to 20mA

Table 1. Descriptions of Terminal Block Pin Functions

Pin #	Name	Type	Description
1	VPS	Power Input	Power supply 24V.
2	LPGD	Digital Output	Loop good indication. When the amplifier is working properly, this pin goes high; otherwise, it goes low.
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 to 10V, it indicates the output voltage is from -1kV to 0.
8	OFFSO	Analog Input	Output voltage setting. When going from 0 to 10V, it indicates the output voltage is from -1kV to 0. The pin is controlled by a potentiometer.
9	GND	Signal Ground	Signal ground pin. Connect ADC and DAC grounds to here.

- High Slew Rate: 100V/μs
- Wide Output Voltage Range:  $V_{OUT}=0\sim-1kV@V_{IN}=24V$
- Offset Voltage Range: 10V
- Bandwidth: Up to 40kHz
- 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 0 output voltage. The analog output voltage can swing almost from -1kV to 0 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 to 10V, it indicates the output voltage is from -1kV to 0.
BNC 2	INPUT+DC	Analog Input	INPUT+DC input control signal indication.
BNC 3	VOUT	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						
Input Range	$V_{VPS}$		23	24	25	V
Input Current	$I_{IN}$		0		4	A
Voltage Output						
Output Voltage	$V_{OUT}$		-1000		0	V
Output Current	$I_{OUT}$		0		18	mA
SBDN Pin (Pin 4)						
SBDN Voltage	$V_{SBDN-ON}$		2.64		$V_{VPS}$	V
	$V_{SBDN-STANDBY}$		2.1		2.5	V
	$V_{SBDN-OFF}$		0		0.4	V
	$V_{SBDN-SB-HI}$ Going up from Standby to On threshold voltage		2.508		2.64	V
	$V_{SBDN-SB-LOW}$ Going down from On to Standby threshold voltage		2.5		2.6	V
	$V_{SBDN-OFF-HI}$ Going up from Off to Standby threshold voltage				2.1	V
	$V_{SBDN-OFF-LOW}$ Going down from Standby to Off threshold voltage		0.4			V
SBDN Current	$I_{SBDN}$			10	20	$\mu\text{A}$
LPGD Pin (Pin 3)						
LPGD Voltage	$V_{LPGD-LOW}$	$V_{DD} = 5\text{V}$ Sourcing current = 8mA			0.6	V
	$V_{LPGD-HI}$	$V_{DD} = 5\text{V}$ Sourcing current = 3.5mA	$V_{DD} - 0.7$			V



Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
10VR Pin (Pin 6)						
Voltage Reference	$V_{REF}$			10		V
Maximum Input Power				20		W
Maximum Slew Rate				100		V/ $\mu$ s

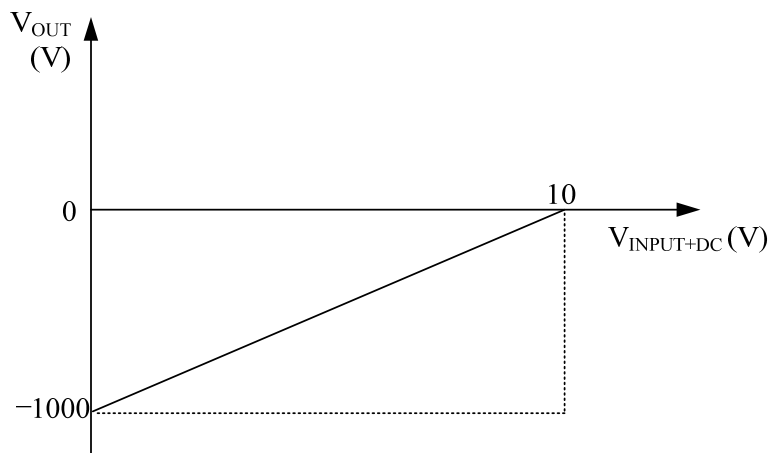


Figure 2.  $V_{OUT}$  vs.  $V_{VIN}$

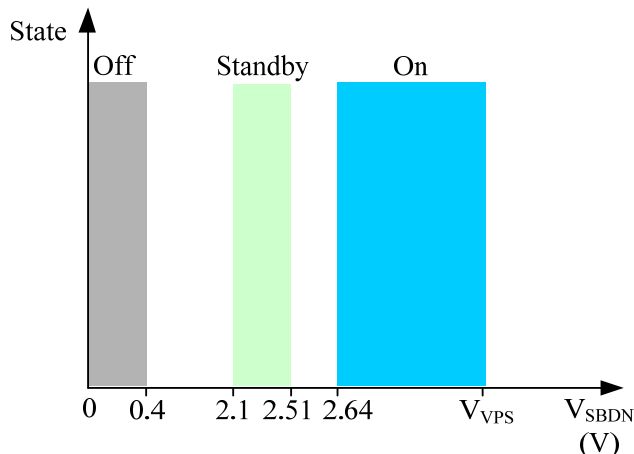
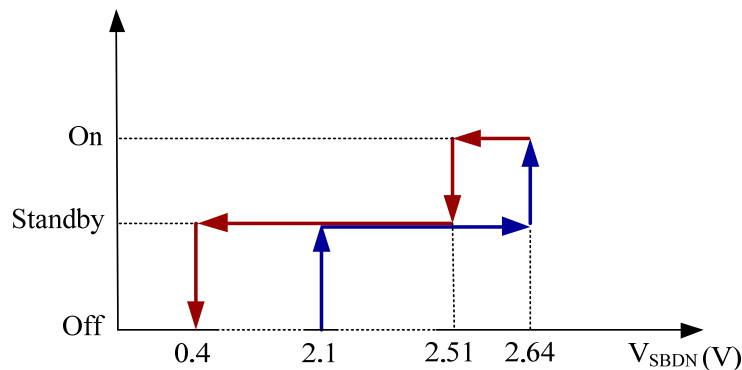


Figure 3. The States of Amplifier vs.  $V_{SBDN}$

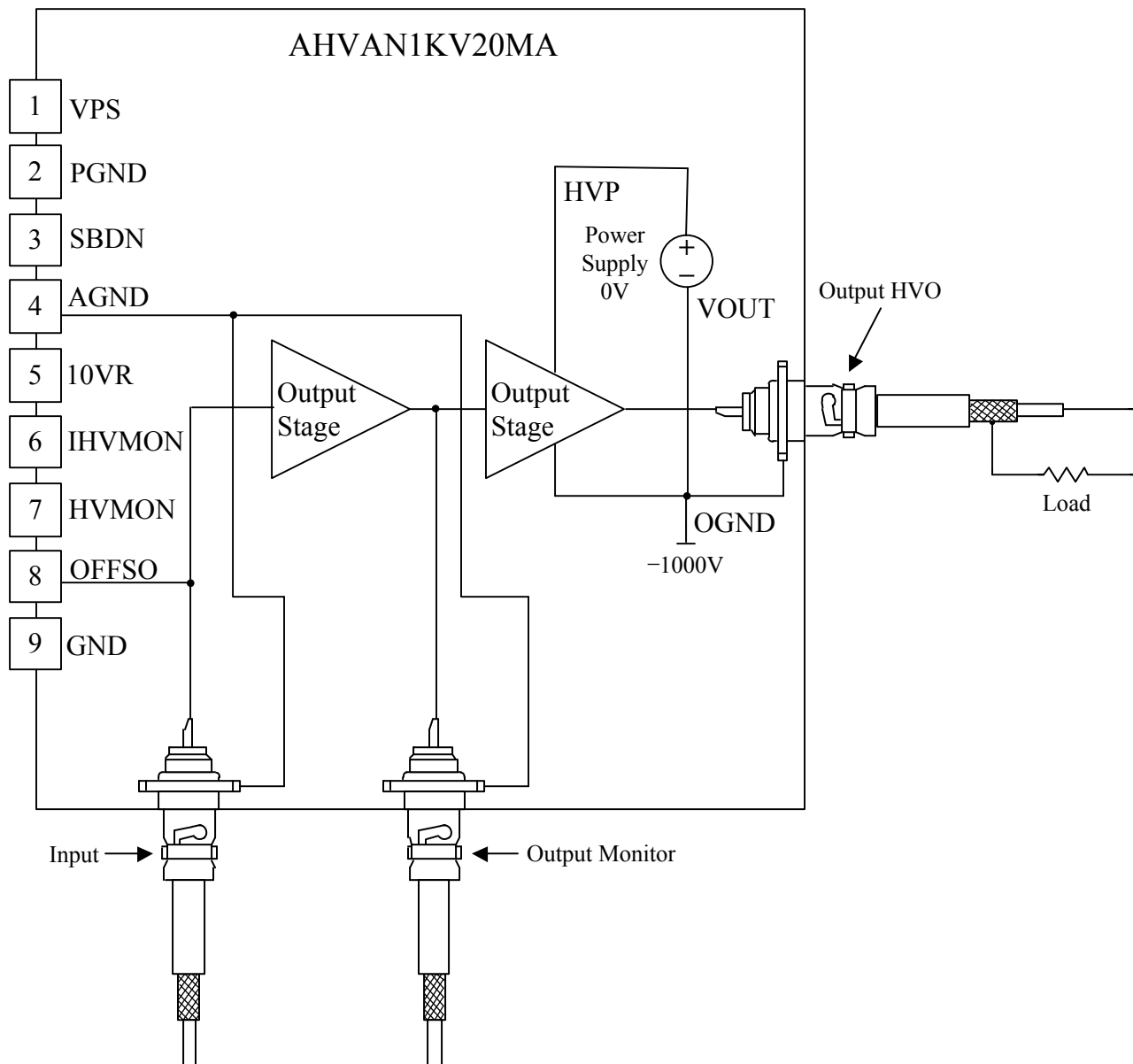


Figure 4. Schematic for Driving the Load AHVAN1KV20MA

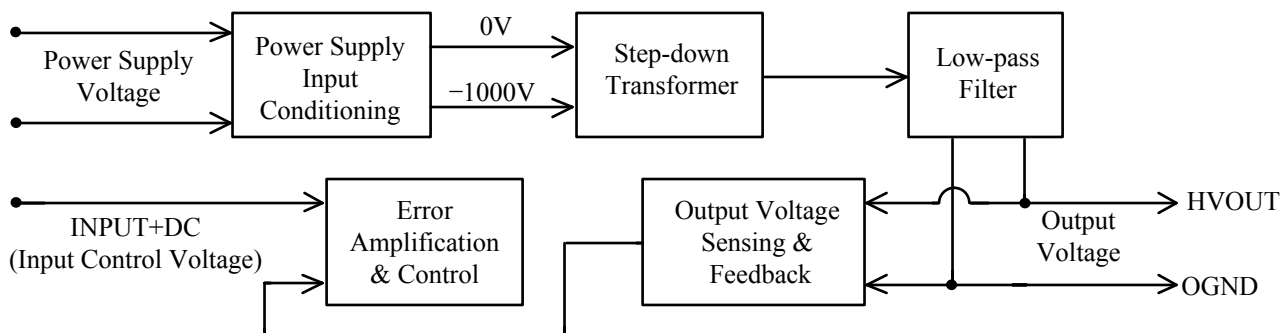


Figure 5. Block Diagram

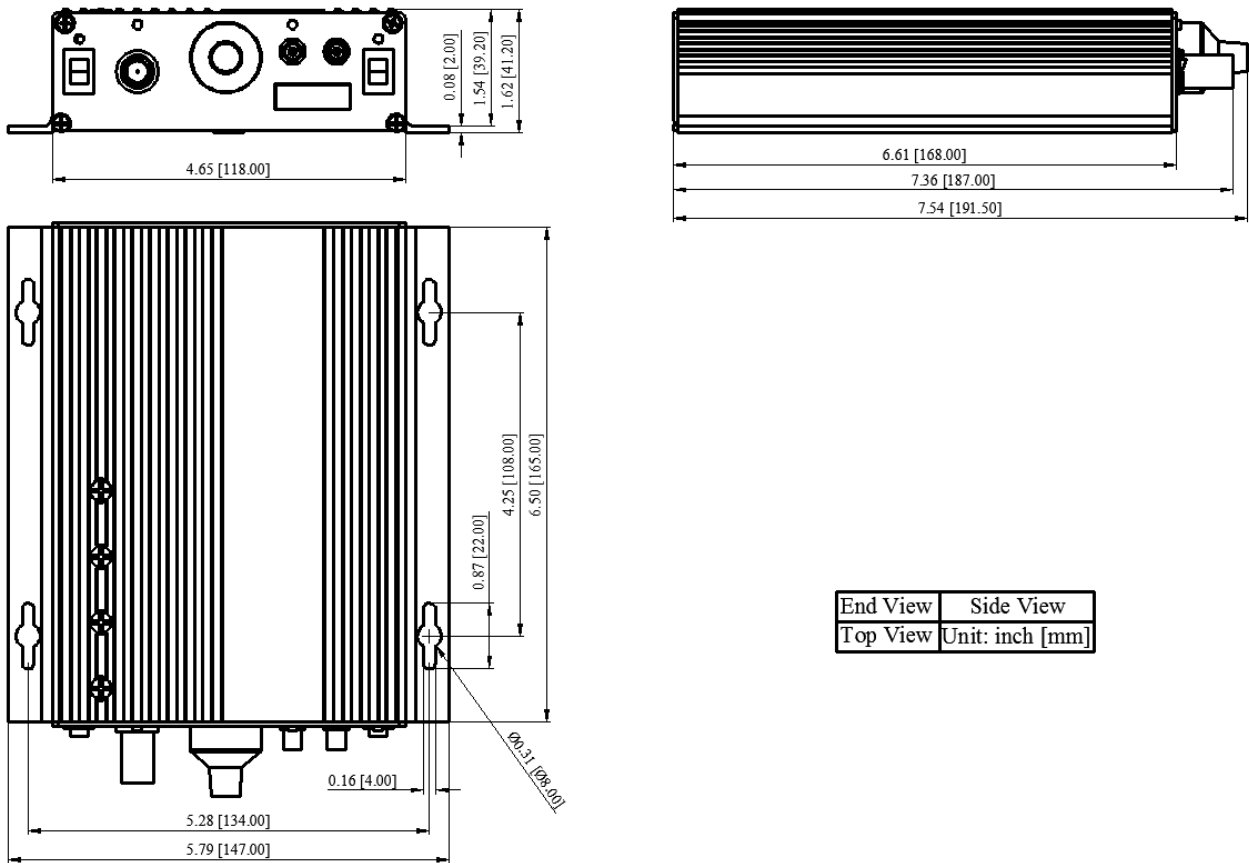
**DIMENSIONS**


Figure 6. Dimensions of AHVAN1KV20MA

**ORDERING INFORMATION**
**Table 3. Part Number**

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

**Table 4. Unit Price**

Quantity (pcs)	1 – 4	5 – 8	9 – 12	13 – 16	17 – 20	≥21
Unit Price	\$1099	\$1049	\$999	\$949	\$899	\$849



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