



Figure 1. Photos of AHVA2KV2KVF2X10MA

## FEATURES

- Built-in High Voltage Converter
- Compact Size: 232.5(L)×230(W)×61(H) mm
- High Current Capability: Up to 10mA
- High Slew Rate: 150V/μs
- Wide Output Voltage Range:  $V_{OUT} = -2kV \sim 2kV @ V_{IN} = 24V$
- Offset Voltage Range:  $-10V \sim 10V$
- Bandwidth: Up to 20kHz

## APPLICATIONS

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

## DESCRIPTION

The AHVA2KV2KVF2X10MA is an electronic module for amplifying an analog input voltage into a high voltage output. It comes with a high voltage DC-DC converter, which converts the 24V input voltage into a  $-2kV$  to  $2kV$  output voltage. The analog output voltage can swing almost from  $-2kV$  to  $2kV$  when it is powered by a 24V power supply. There is three LEDs indicating if the amplifier works properly. Figure 1 shows its photos.



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	-10VR	Analog Output	-10V voltage reference.
7	AC+DC	Analog Input	AC+DC input control signal indication.
8	BIASO	Analog Input	Output voltage setting. When going from -10V to 10V, it indicates the output voltage is from -2kV to 2kV. The pin is controlled by a potentiometer.
9	GND	Signal Ground	Signal ground pin. Connect ADC and DAC grounds to here.
BNC 1	ACIN	Analog Input	Output voltage setting. When going from -10V to 10V, it indicates the output voltage is from -2kV to 2kV.
BNC 2	ACO	Analog Output	Output voltage indication. When going from -10V to 10V, it indicates the output voltage is from -2kV to 2kV.
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<sub>A</sub> = 25°C)**

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Power Supply Input						
Input Range	V <sub>VPS</sub>		23	24	25	V
Input Current	I <sub>IN</sub>		0		4	A
Voltage Output						
Output Voltage	V <sub>OUT</sub>		-2000		2000	V
Output Current	I <sub>OUT</sub>		0		9	mA
SBDN Pin (Pin 4)						
SBDN Voltage	V <sub>SBDN-ON</sub>		2.64		V <sub>VPS</sub>	V
	V <sub>SBDN-STANDBY</sub>		2.1		2.5	V
	V <sub>SBDN-OFF</sub>		0		0.4	V
	V <sub>SBDN-SB-HI</sub> Going up from Standby to On threshold voltage		2.508		2.64	V
	V <sub>SBDN-SB-LOW</sub> Going down from On to Standby threshold voltage		2.5		2.6	V
	V <sub>SBDN-OFF-HI</sub> Going up from Off to Standby threshold voltage				2.1	V
	V <sub>SBDN-OFF-LOW</sub> Going down from Standby to Off threshold voltage			0.4		
SBDN Current	I <sub>SBDN</sub>			10	20	μA
LPGD Pin (Pin 3)						
LPGD Voltage	V <sub>LPGD-LOW</sub>	V <sub>DD</sub> = 5V Sourcing current = 8mA			0.6	V
	V <sub>LPGD-HI</sub>	V <sub>DD</sub> = 5V Sourcing current = 3.5mA	V <sub>DD</sub> - 0.7			V
10VR/-10VR Pin (Pin 6 and Pin 7)						
Voltage Reference	V <sub>REF</sub>			-10/+10		V
Maximum Input Power				100		W
Maximum Slew Rate				150		V/μs

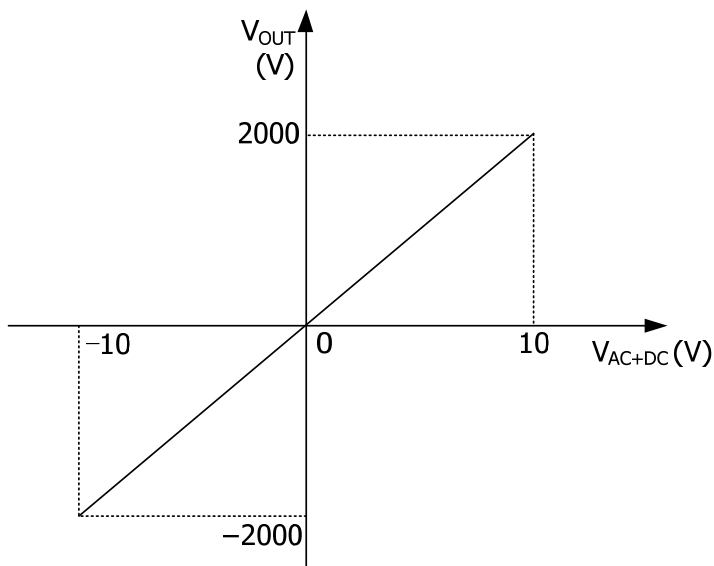


Figure 1.  $V_{OUT}$  vs.  $V_{VIN}$

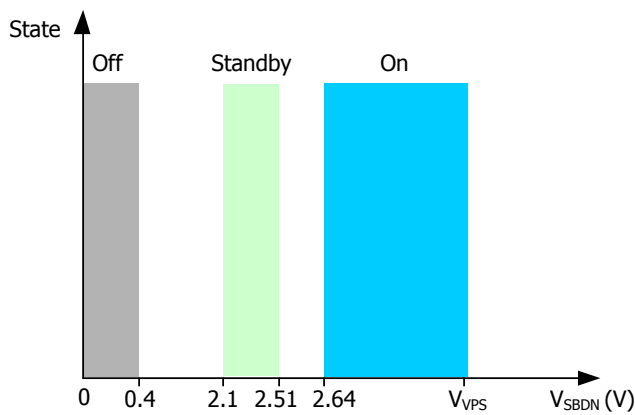
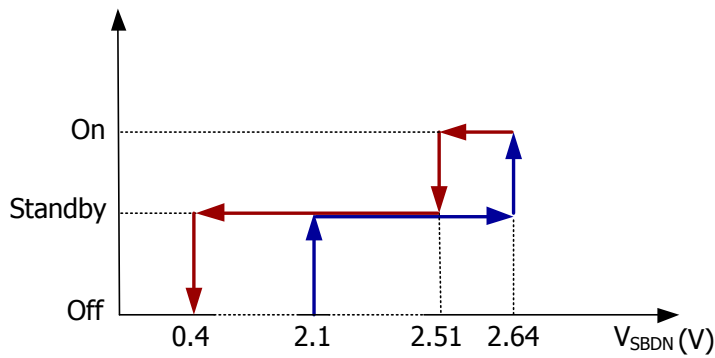


Figure 2. The States of Amplifier vs.  $V_{SBDN}$

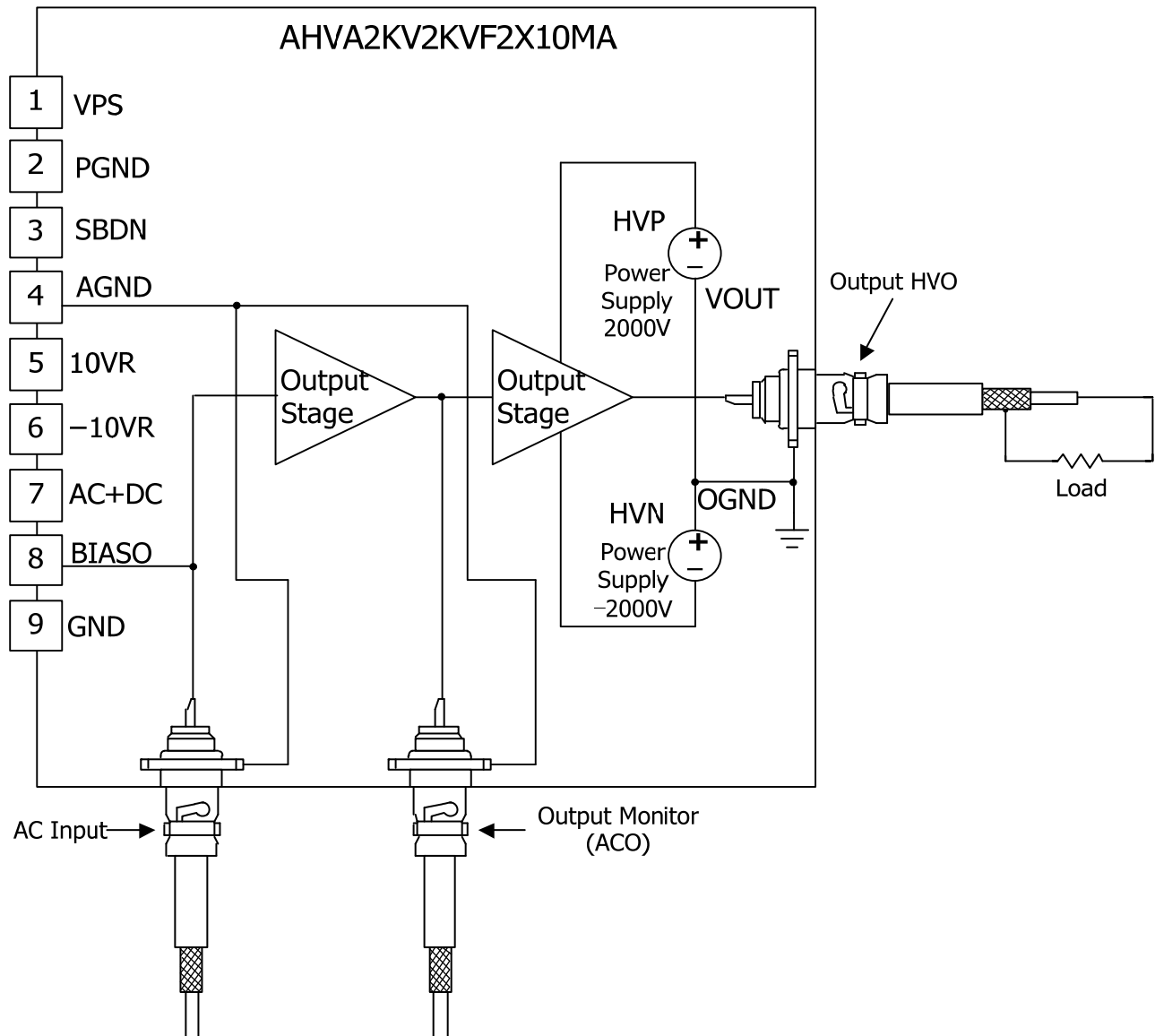


Figure 3. Schematic for Driving the Load

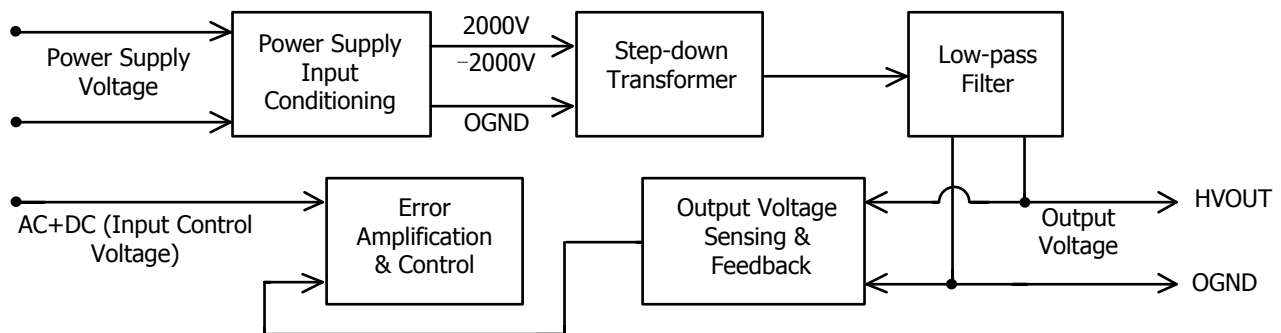


Figure 4. Block Diagram

## MECHANICAL DIMENSIONS

Figure 5 shows the dimensions of this high voltage amplifier.

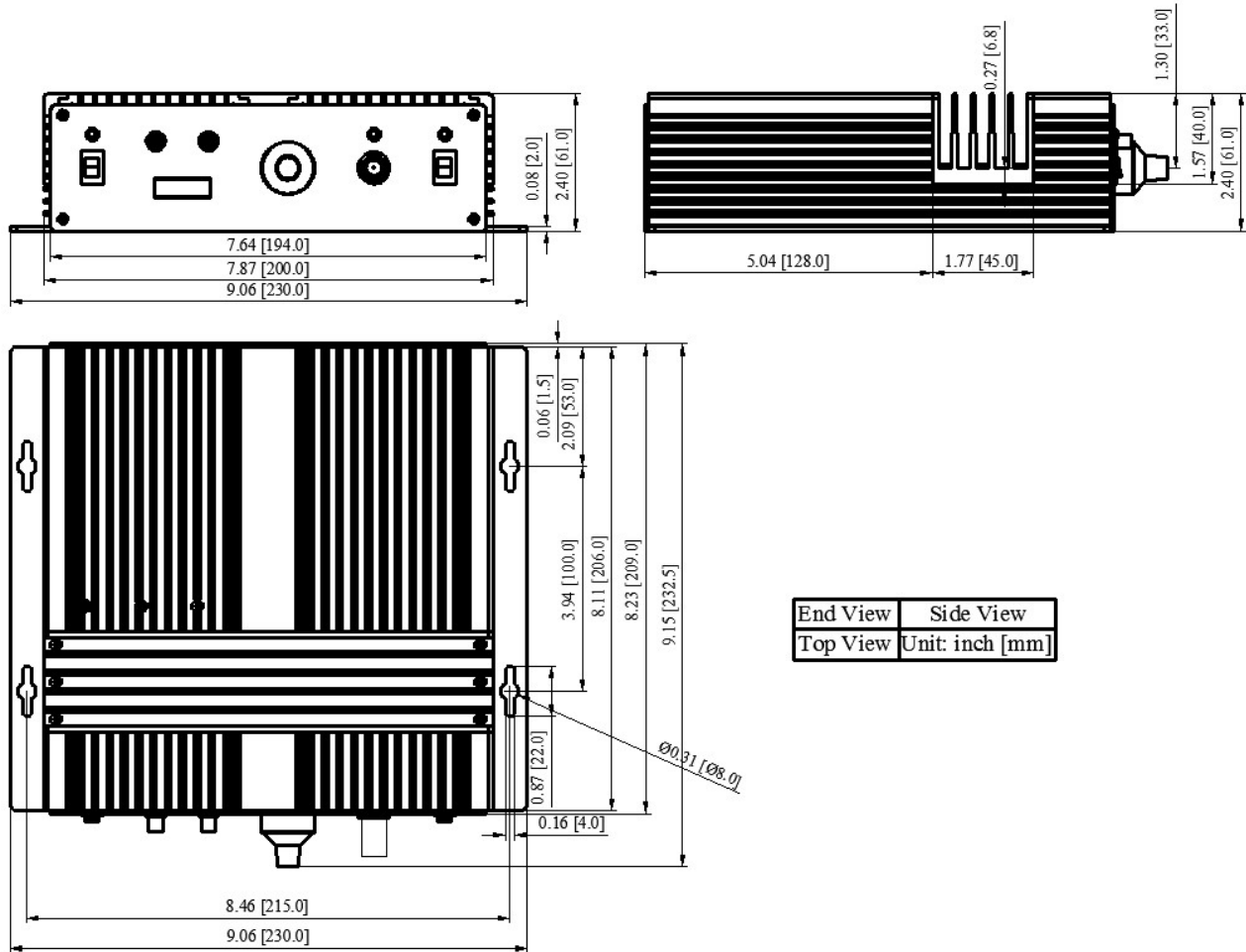


Figure 5. Dimensions of AHVA2KV2KVF2X10MA

## ORDERING INFORMATION

Table 3. Part Number

Part Number	Description
AHVA2KV2KVF2X10MA	±2kV high voltage amplifier



## NOTICE

1. ATI warrants performance of its products for one year to the specifications applicable at the time of sale, except for those being damaged by excessive abuse. Products found not meeting the specifications within one year from the date of sale can be exchanged free of charge.
2. ATI reserves the right to make changes to its products or to discontinue any product or service without notice, and advise customers to obtain the latest version of relevant information to verify, before placing orders, that the information being relied on is current and complete.
3. All products are sold subject to the terms and conditions of sale supplied at the time of order acknowledgment, including those pertaining to warranty, patent infringement, and limitation of liability. Testing and other quality control techniques are utilized to the extent ATI deems necessary to support this warranty. Specific testing of all parameters of each device is not necessarily performed, except those mandated by government requirements.
4. Customers are responsible for their applications using ATI products. In order to minimize risks associated with the customers' applications, adequate design and operating safeguards must be provided by the customers to minimize inherent or procedural hazards. ATI assumes no liability for applications assistance or customer product design.
5. ATI does not warrant or represent that any license, either express or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right of ATI covering or relating to any combination, machine, or process in which such products or services might be or are used. ATI's publication of information regarding any third party's products or services does not constitute ATI's approval, warranty or endorsement thereof.
6. IP (Intellectual Property) Ownership: ATI retains the ownership of full rights for special technologies and/or techniques embedded in its products, the designs for mechanics, optics, plus all modifications, improvements, and inventions made by ATI for its products and/or projects.