



Figure 1. The Physical Photo of AHVA1KV2X50MA

MAIN FEATURES

- Built-in High Voltage Converter
- Compact Size: 181.5(L)×149.0(W)×38.3(H) mm
- High Current Capability: Up to 50mA
- High Slew Rate: 100V/μs
- Wide Output Voltage Range: $V_{OUT}=0 \sim 1kV @ V_{IN}=24V$
- 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 AHVA1KV2X50MA 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 0 to 1kV output voltage. The analog output voltage can swing almost from 0 to 1kV 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.

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 to 10V, it indicates the output voltage is from 0 to 1kV. |
| 8 | OFFSO | Analog Input | Output voltage setting. When going from 0 to 10V, it indicates the output voltage is from 0 to 1kV. The pin is controlled by a potentiometer. |
| 9 | GND | Signal Ground | Signal ground pin. Connect ADC and DAC grounds to here. |



| 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 0 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 | | | | | | |
| Input Range | V_{VPS} | | 23 | 24 | 25 | V |
| Input Current | I_{IN} | | 0 | | 4 | A |
| Voltage Output | | | | | | |
| Output Voltage | V_{OUT} | | 0 | | 1000 | V |
| Output Current | I_{OUT} | | 0 | | 50 | 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 | μA |
| 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/ μ s |

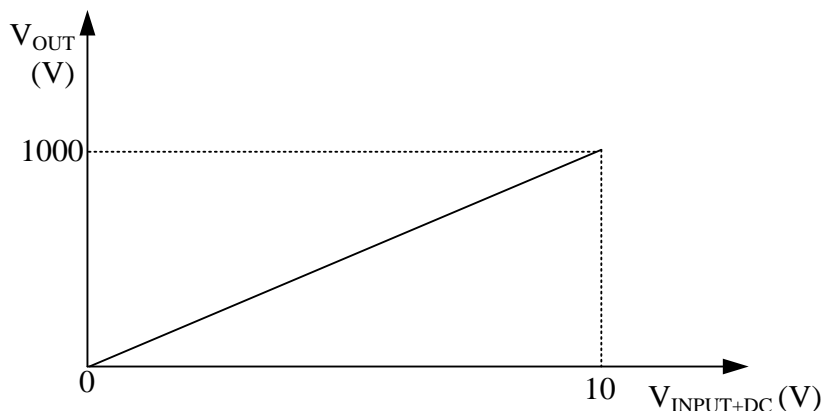


Figure 2. V_{OUT} vs. V_{VIN}

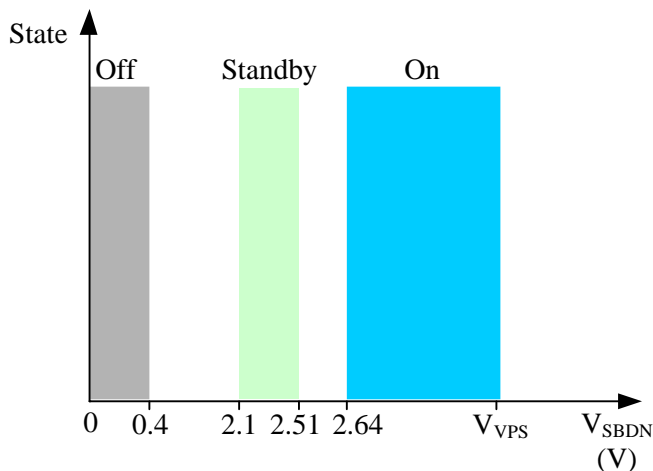
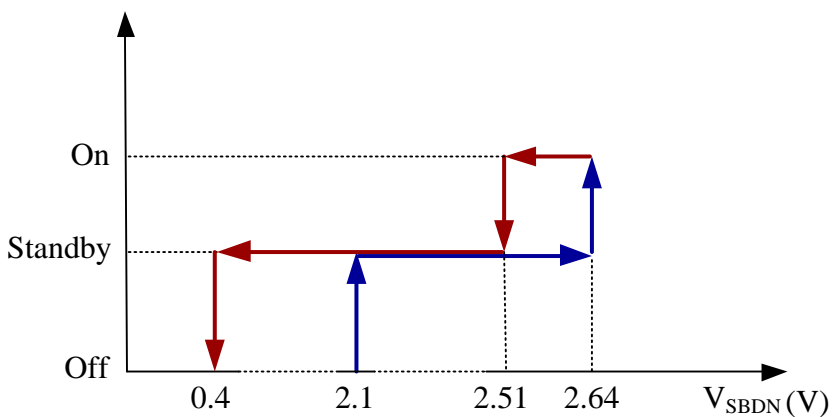


Figure 3. The States of Amplifier vs. V_{SBDN}

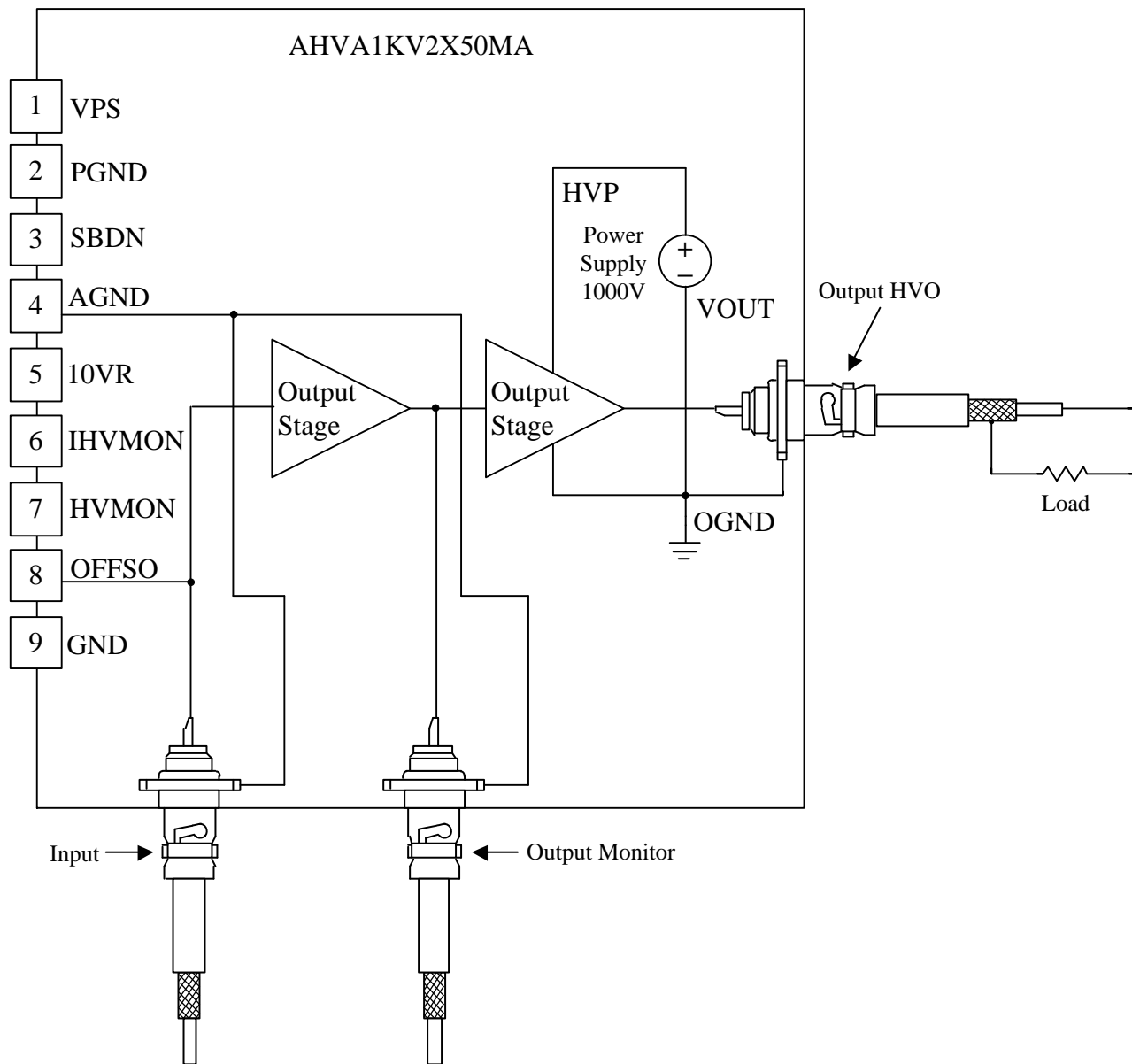
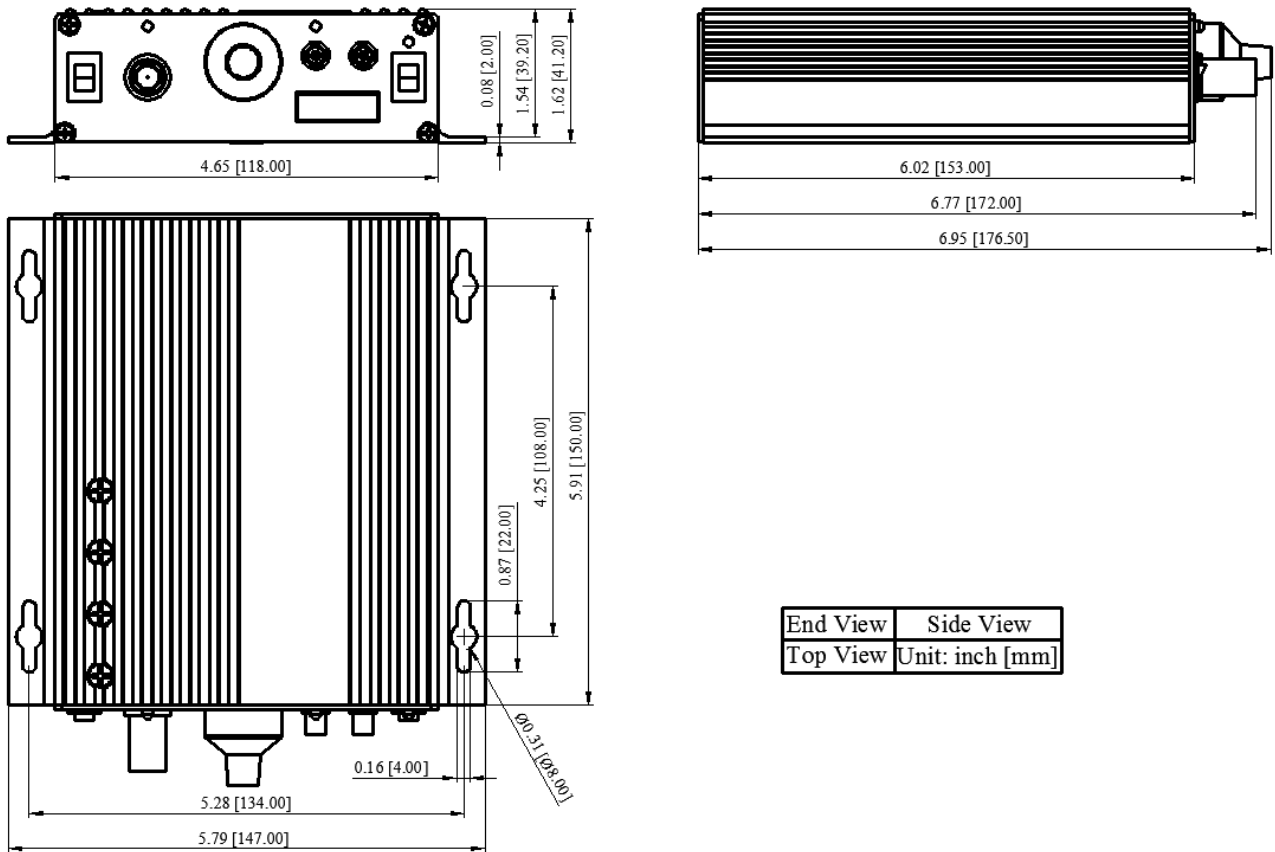


Figure 4. Schematic for Driving the Load



DIMENSIONS



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

Figure 6. Dimensions of AHVA1KV2X50MA

ORDERING INFORMATION

Table 3. Part Number

| Part Number | Description |
|---------------|--|
| AHVA1KV2X50MA | 1kV high voltage amplifier, with 50mA output current |



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