



Multichannel High Voltage Amplifier

PS2-XX-A

Technical Specifications

| | |
|-------------------------------|---------------------------|
| Part Number | PS2-XX-A |
| Communication | Serial - Micro USB |
| Input Power | 24VDC, 3A AC-DC Converter |
| Control Channels | 2, 4, 6, or 8 Channels |
| Output Voltage | 1500 to 10000 V |
| Maximum Output Power | 30 W |
| Frequency Range | 0-200 Hz |
| Typical Output Current | <3 mA |
| Weight | 600 g |
| Dimensions | 82 x 162 x 54.1 mm |



PS2-08-A shown above

Included Accessories

- Software control program
- Input power adapter
- Terminal block for analog monitors
- High voltage cables
- Micro USB cable and isolator

Features

- Programmable waveforms on up to 8 independent output channels
- Designed for capacitor charging and discharging
- High speed operation (up to 200hz)
- Short-circuit protection
- Analog outputs for voltage & current monitors
- Compact and portable design

High voltage electronics from Artimus Robotics are designed to drive capacitive devices like HASEL actuators. Some aspects of this content are protected by issued or pending patents in the U.S. or other jurisdictions. Additional details are available at artimusrobotics.com/ip.



Electrical Specifications

| Characteristic | Value | Unit |
|--|--------------|-------|
| Input Voltage (Nominal) | +24 | V |
| Input Voltage Range | +23 to +30 | V |
| Maximum Input Current | 3 | A |
| Output Voltage Range | 1500 - 10000 | V |
| Channel Voltage Noise - RMS | 1.74 | V |
| Voltage Monitor ADC Resolution | 12 | V/bit |
| Maximum Total Output Current (Average) | 2.94 | mA |
| Maximum Output Current per Channel (Pulsed) | 5 | mA |
| Maximum Output Current per Channel (Average) | 2.94 | mA |
| Frequency Range | 0-200 | Hz |
| Operating Temperature Range | -40 to +65 | C |
| Storage Temperature Range | -55 to +105 | C |



Voltage and Current Monitors

The PS2-XX-A comes with an HDMI breakout adapter for monitoring the rail voltage, channel voltages, and total output current.

The pinout for the HDMI adapter is shown on the next page.

The analog outputs are 0 – 3.3V range and require the following conversions.¹

Channel Voltage Monitors:

*Actual Channel Voltage (V) = Measured Voltage (V) * 3300*

Rail Voltage Monitor:

If Measured Voltage (V) <= 1.55V, then

*Actual Channel Voltage (V) = Measured Voltage (V) * 3727.75 + 13.93*

If Measured Voltage (V) > 1.55V, then

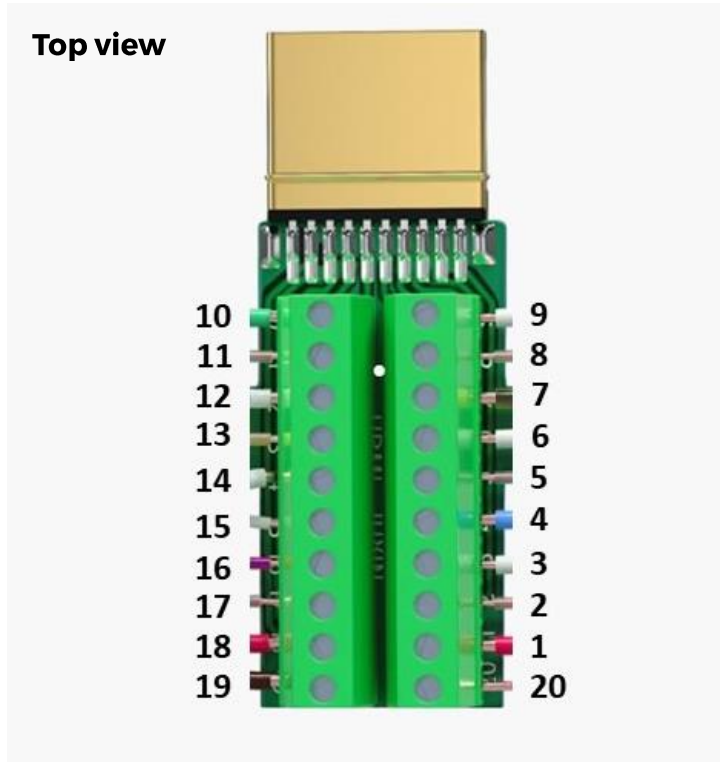
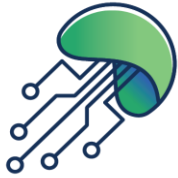
*Actual Channel Voltage (V) = Measured Voltage (V) * 3597.86 + 127.84*

Current Monitor²:

*Actual Current (mA) = 2.015 * Measured Voltage (V) + 0.0369*

¹ Rail Voltage Monitor results have +/- 100V accuracy, or 1% at 10kV. Channel Voltage Accuracy is 0.5%

² NOTE: The current monitor is only accurate from DC – 2Hz. Contact Artimus' engineering team if you wish to accurately measure current at high speeds.



| Pin | Signal | Pin | Signal |
|-----|----------------------|-----|--------|
| 1 | Current Monitor | 11 | NC |
| 2 | Rail Voltage Monitor | 12 | NC |
| 3 | Channel 5 Voltage | 13 | NC |
| 4 | Channel 6 Voltage | 14 | NC |
| 5 | Channel 3 Voltage | 15 | NC |
| 6 | Channel 4 Voltage | 16 | NC |
| 7 | Channel 7 Voltage | 17 | NC |
| 8 | Channel 2 Voltage | 18 | NC |
| 9 | Channel 1 Voltage | 19 | NC |
| 10 | Channel 8 Voltage | 20 | Ground |



Frequency Characteristics

It should be noted that the recommended maximum output frequency of each channel depends on the load capacitance and the duration of the test, as well as the rail voltage.

Figure 1 highlights the safe operating conditions to avoid overheating, voltage and current derating, or power supply failure. Ensure your operating conditions fall on or below these curves.

If you are unsure if your load/application falls under the recommended guidelines shown in the figures below, reach out to the Artimus Engineering team, and we can provide recommendations for your application.

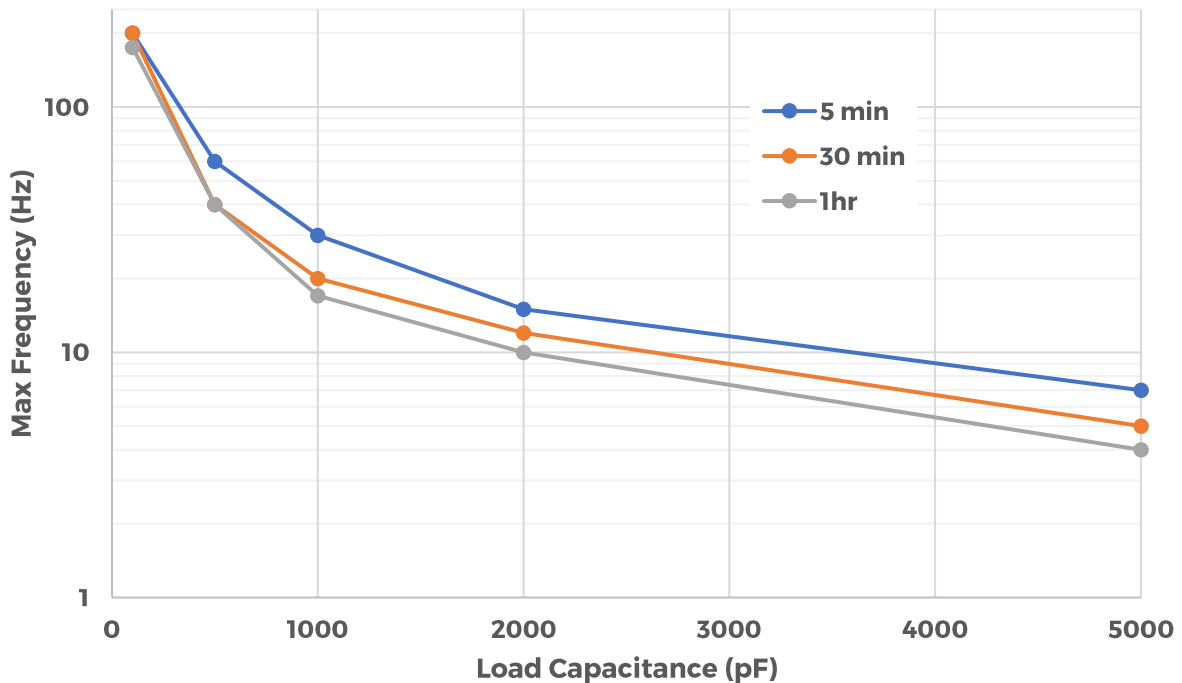


Figure 1 - Maximum operating frequency for each channel as a function of the load capacitance for various durations of continuous operation. All data was taken at room temperature with 10 kV rail voltage and the maximum charge/discharge rate. Note that y-axis is log scale.



| Load Capacitance | 5-minute Duration | 30-minute Duration | 60-minute Duration |
|------------------|-------------------|--------------------|--------------------|
| 100 pF | 200 Hz | 200 Hz | 175 Hz |
| 500 pF | 60 Hz | 40 Hz | 40 Hz |
| 1 nF | 30 Hz | 20 Hz | 17 Hz |
| 2 nF | 15 Hz | 12 Hz | 10 Hz |
| 5 nF | 7 Hz | 5 Hz | 4 Hz |

Table 1 - Maximum operating frequency as a function of the load capacitance for each output channel.

Slew Rate

The maximum slew rate is dependent on the capacitance of the load, as shown below in Figure 2.

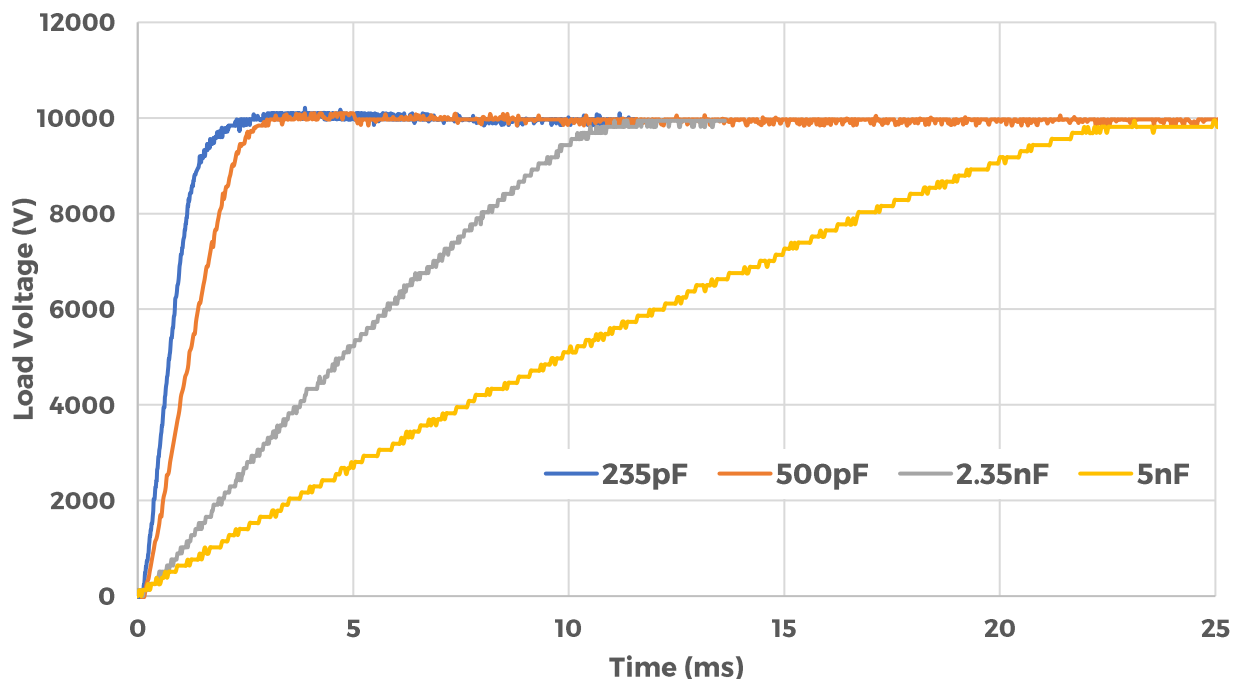
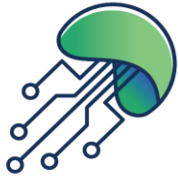


Figure 2 - Voltage rise as a function of load capacitance. Slew rate was measured with the rise time required for the load voltage to increase from 10% to 90% of the rail voltage. All data was taken at a rail voltage of 10 kV.



| Load Capacitance | Maximum Slew Rate (V/ms) | Minimum Rise Time (ms) |
|------------------|--------------------------|------------------------|
| 235 pF | 6828 | 1.17 |
| 500 pF | 4328 | 1.85 |
| 2.35 nF | 972 | 8.23 |
| 5 nF | 444 | 18.01 |

Table 2 – Maximum slew rate as a function of load capacitance. Slew rate was measured with the rise time required for the load voltage to increase from 10% to 90% of the rail voltage.

Ordering Information

| Part Number | Variation |
|-------------|-------------------------------|
| PS2-02-A | 2 Channel, Barrel Jack Supply |
| PS2-04-A | 4 Channel, Barrel Jack Supply |
| PS2-06-A | 6 Channel, Barrel Jack Supply |
| PS2-08-A | 8 Channel, Barrel Jack Supply |



Mechanical Drawings - PS2-XX-A

ALL UNITS IN MM

