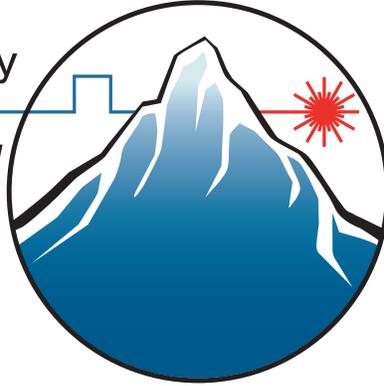


Directed Energy

DEI



High Voltage Pulsed Instruments and Modules

*"Directed Energy is your Pulsed
Power Partner from Lab to Launch"*

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BENCHTOP

PVX-2506



Designed for precision pulsing of semiconductor devices for pulsed I-V characterization, provides fast rise and fall times with minimal overshoot, undershoot, and ringing, and fast settling times. The controlled-voltage waveform allows the device under test (DUT) to stabilize at voltage within a few hundred nanoseconds, allowing I-V measurements to be made before device heating begins.

- Designed for precision pulsing of semiconductor devices for pulsed I-V characterization
- Output Voltage To +50V
- Output Current To 10A
- 50% Maximum Duty Cycle
- Pulse widths from <math><1\mu\text{s}</math> to 100 μs
- Instrument-quality analog voltage and current monitors for data acquisition

PVX-4000-2KV PVX-4000-2kV-EX



Optimized for high impedance capacitive loads, the PVX-4000-2kV-EX is well-suited for driving extraction grids and deflection plates for electrostatic modulation of particle beams in time-of-flight mass spectrometers and accelerators.

Its robust and versatile design also makes it well suited for pulsing or gating power tube grids, Pockels cells and Q Switches, acoustic transducers, microchannel plates, photomultiplier tubes, and image intensifiers.

The PVX-4000-2kV includes the high voltage switching capability as well as a built in high voltage power supplies, pulse engine and front panel pulse control simplifying your setup.

The PVX-4000-2kV-EX includes the high voltage switching capability as well as a built in pulse engine and front panel pulse control simplifying your setup.

- 0 to $\pm 2000\text{ V}$ pulse output
- <math><50\text{ ns}</math> rise and fall times
- Pulse widths from <math><500\text{ ns}</math> to DC
- External trigger
- 40 Hz to 30 kHz pulse repetition frequency
- 2% to 98% Duty Cycle
- Internal trigger
- 0% to 100% Duty Cycle
- Protected against arcs, shorts and load transients
- Voltage monitor and sync outputs
- PVX-4000-2kV provides a single shot to 100 kHz pulse repetition frequency
- PVX-4000-2kV-EX provides a single shot to 600 kHz pulse repetition frequency

PVX-4150



The PVX-4100 Series Pulsers are well suited for driving capacitive loads like extraction grids and deflection plates for electrostatic modulation of particle beams in time-of-flight mass spectrometers and accelerators. Its robust and versatile design also makes it well suited for pulsing or gating power tube grids, Pockels cells and Q Switches, acoustic transducers, microchannel plates, photomultiplier tubes, and image intensifiers.

- 0 to $\pm 1,500\text{ V}$ Pulse Output
- <math><25\text{ ns}</math> Rise and Fall Times, 240 kHz Pulse Repetition Frequency
- Protected Against Arcs, Shorts and Load Transients
- Voltage and Current Monitor Outputs

PVX-4140



- 0 to $\pm 3,500\text{ V}$ Pulse Output
- <math><25\text{ ns}</math> Rise and Fall Times, 30 kHz Pulse Repetition Frequency
- Protected Against Arcs, Shorts and Load Transients
- Voltage and Current Monitor Outputs

PVX-4130



The PVX-4100 Series Pulsers are well suited for driving capacitive loads like extraction grids and deflection plates for electrostatic modulation of particle beams in time-of-flight mass spectrometers and accelerators. Its robust and versatile design also makes it well suited for pulsing or gating power tube grids, Pockels cells and Q Switches, acoustic transducers, microchannel plates, photomultiplier tubes, and image intensifiers.

- 0 to $\pm 6,000\text{ V}$ Pulse Output
- <math><60\text{ ns}</math> Rise and Fall Times, 10 kHz Pulse Repetition Frequency
- Protected Against Arcs, Shorts and Load Transients
- Voltage and Current Monitor Outputs

PVX-4110



- 0 to $\pm 10,000\text{ V}$ Pulse Output
- <math><60\text{ ns}</math> Rise and Fall Times, 10 kHz Pulse Repetition Frequency
- Protected Against Arcs, Shorts and Load Transients
- Voltage and Current Monitor Outputs

Directed Energy also offers a **lab to launch** program. The program provides custom manufactured in an ISO registered facility, tested and ready for installation. Our within early development brings our expertise right to your lab. Contact us today

MODULES

The PVM-4210 is optimized for differential drive of deflection plates for electrostatic modulation of particle beams in time-of-flight mass spectrometers and accelerators. It will also drive any high impedance, capacitive load such as Pockels Cells and Q Switches, electrodes, microchannel plates, acoustic transducers, image intensifiers and photomultiplier tubes.

- Simultaneous Positive And Negative 0 To +950 V and 0 To -950 V
- >20 kHz Pulse Repetition Frequency
- Internal High Voltage Power Supplies

PVM-4210



Typical applications are instrument calibration, component testing, beam steering as well as photo multiplier tube (PMT) and microchannel plate (MCP) gating. The PVM-1001 can achieve zero to 950 V in less than 10 ns (Rise Time). This adjustable pulsed voltage source is capable of providing pulse widths from 55 ns to 10,000 ns with a standard frequency range up to 1 MHz. The PVM-1001 can also provide a 5 MHz burst. The module is designed for a 50 ohm resistive load.

- Output Voltage Range 0 V to +950 V
- Frequency Range ≤ 1 MHz
- Burst Mode ≤ 5 MHz
- Trigger pulse width 55 ns \leq Pulse Width $\leq 10,000$ ns
- Rise Time ≤ 8 ns @ 200 V to 950 V
- Positive or Negative polarity modules available
- Maximum Output Power 208 W
- Simple to set up and use

PVM-1001-P



Typical applications are instrument calibration, component testing as well as photo multiplier tube (PMT) and microchannel plate (MCP) gating. The PVM-1001 can achieve zero to -950 V in less than 10 ns (Rise Time). This adjustable pulsed voltage source is capable of providing pulse widths from 55 ns to 10,000 ns with a standard frequency range up to 1 MHz. The PVM-1001 can also provide a 5 MHz burst. The module is designed for a 50 ohm resistive load.

- Output Voltage Range 0 V to -950 V
- Frequency Range ≤ 1 MHz
- Burst Mode ≤ 5 MHz
- Trigger pulse width 55 ns \leq Pulse Width $\leq 10,000$ ns
- Rise Time ≤ 8 ns @ 200 V to 950 V
- Positive or Negative polarity modules available
- Maximum Output Power 208 W
- Simple to set up and use

PVM-1001-N



NOTES

From OEM pulsed and high voltage/high power solutions. Designed by experts, PVM Modules save you and your company time, effort and cost. Working together for more information.



ABOUT US

Directed Energy (DEI) was founded in 1987 as Directed Energy, Incorporated by George Krausse, Dave Adamson, and Ron Sherwood. The goal was simple; bring RF Power MOSFETs to the industry and provide uncompromising performance through our patented DE-Series low inductance, high speed, high power density package. As we worked with customers we realized that there was also a need for system and module products that provided high power and/or high voltage pulses at high speed. We developed the instrument product line to fill satisfy this need and help customers fulfill their end requirements without the need to develop, manufacture or maintain this niche technology.

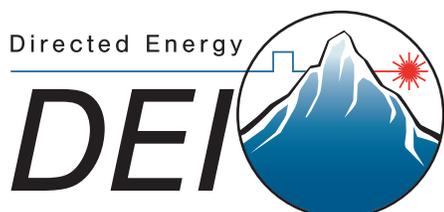
Designing the original DE-Series package to achieve the extreme performance improvements meant using our patented low inductance design along with BeO, Aluminum Nitride ceramic components along with other specialized materials. As the technology became more widely accepted, we realized that many markets that were not currently using our device would benefit from the high performance of our package design but we would have to find a way to reduce the cost (and later remove BeO).

During this time, one of our best suppliers of silicon die was IXYS Corporation, whose die we used in many of the original DE-Series devices. We approached IXYS with a proposed partnership to reduce cost by taking our packaging concept to a more traditional semiconductor manufacturing process. After discussing the idea the IXYS management team responded with an offer to purchase Directed Energy and on May 16th, 2000 Directed Energy, became a wholly owned subsidiary of IXYS.

The DEI brand continues to serve customers around the world with pulsed laser diode drivers and high voltage pulsers in benchtop, rackmount and module configurations to address a broad spectrum of customer needs. We feature a Lab to Launch program that allows us to work closely with customer development teams to reduce overall development cost by leveraging our expertise in pulsed power. The end result is an OEM module or instrument that is tailored to the needs of the customer's application or product.

In 2018 Littelfuse purchased IXYS and the merger of the two companies allowed Stephen Krausse the opportunity to acquire Directed Energy and return the pulsed laser diode drivers, current sources and high voltage pulser instruments and modules to private ownership. Our Colorado facility is focused on customer service, research and development and logistics.

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