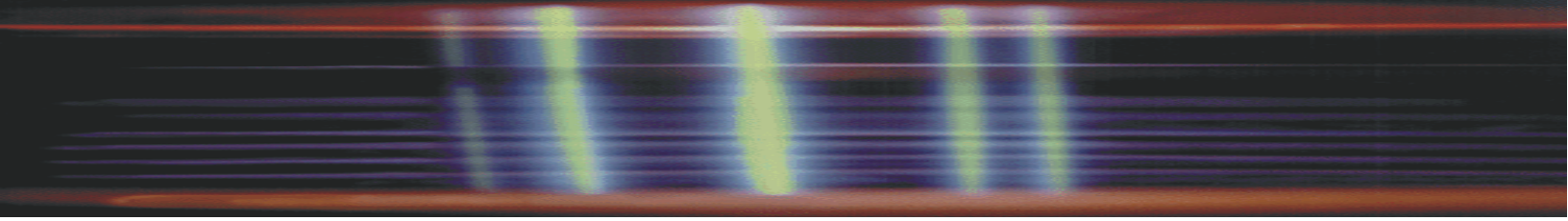


DIVERSIFIED TECHNOLOGIES, INC.

Founded in 1987 by MIT graduates, Diversified Technologies, Inc. (DTI) designs, manufactures, and markets the patented PowerMod™ line of solid-state, pulsed power modulators and switching power supplies. DTI's PowerMod™ technology is the recipient of prestigious local and national awards, and is recognized as a true breakthrough in electronics design. DTI employees boast extensive backgrounds in research and applied engineering in high power RF electronics, and are leaders in their fields for creativity and the development of unique solutions in high power design. The company's customers include the Department of Energy, Department of Defense, leading universities, and private sector companies in semiconductor fabrication, medical electronics, and radar systems. DTI is headquartered in Bedford, Massachusetts.

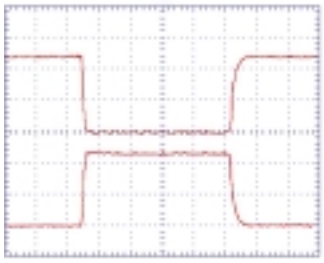
Essentially, PowerMod™ technology provides a high voltage, high power, solid state opening and closing switch. Therefore, power can be completely removed from the load when the switch is 'off', or open. Previously, these types of systems required large, fragile, and inefficient vacuum tubes.

At the core of DTI's success lies its expertise in the application of solid state devices, such as IGBTs and FETs, to high power, high voltage switching. To use such devices, they must be cascaded in series, and gate drives must be highly synchronized. DTI's patented, PowerMod™ technology achieves the formidable task of ensuring that the load is shared equally between devices, so that no single device sees harmful or destructive voltages. Synchronization has been demonstrated for up to 160 IGBTs in series, and up to six IGBTs in parallel.

DTI's products produce the flat top pulses which are critical to the performance of pulsed power applications. In ion implantation, for example, the voltage droop and pulse to pulse voltage variation must be minimized to achieve uniform processing. This requires very fast rise and fall times to minimize the energy provided at voltages other than the desired pulse voltage. It also requires a very 'flat-top' for the pulse, with no ripple or droop. Generating pulses which most closely approach the ideal pulse waveform is, therefore, a critical objective of high pulsed power system design.

The drawbacks of conventional, vacuum tube high voltage switching, include inefficiency, limited tube lifetime, and lack of pulse flexibility. These are eliminated using PowerMod™ technology. DTI's solid state systems offer better performance and reliability than switch tubes and PFNs. Further, they enable new applications, such as Megawatt switching power supplies, and high frequency pulsed power systems. The nearly ideal switch performance available from DTI's solid state technology is spurring a wave of innovative design for future high power systems.

DTI is the winner of 1997 and 1999 R&D 100 Awards for Innovations in Pulsed Power



A Nearly Ideal Pulse from a PowerMod™ 20-150. 20 kV, 100A, 1 s/cm. Upper Trace is Voltage; Lower Trace is Current.

PowerMod™ HVPM 20-150

PowerMod™ Features

- Frequencies to 400 kHz+
- 1-200 kV
- 10-3000 A
- Compact Modular Design
- Very High Efficiencies
- High Reliability
- Switches are both opening & closing

Why DTI?

- Innovative and Proven Leader in High Power Technology
- World-Class R&D Staff
- Record of On-Time Delivery

DIVERSIFIED TECHNOLOGIES, INC.®

♦ 35 Wiggins Avenue Bedford, MA 01730 ♦ (781)-275-9444 ♦ www.divtecs.com

The Power You Need

Solid State Switch Module

PowerMod™

DTI's PowerMod™ Solid State Switch Module is a patented solid-state high voltage switch capable of rapidly opening and closing under precise external control.The basic building blocks are compact switches capable of switching 9.0 kV, 30A to 5.0 kV, 100A at frequencies to 400 kHz. Switch Modules may be combined in series, allowing the switching of up to 100 kV of power at very high speed, thereby meeting a wide range of performance specifications. The new modules make conventional high voltage vacuum switching tubes virtually obsolete.

Key features include:

- Compact solid state circuitry
- Thousands of times higher reliability than vacuum switch tubes
- 10X faster switching frequency (PRF) than vacuum switch tubes at high voltage
- 10-100X more efficient than vacuum tubes
- Multiple modules easily configurable in series for high voltage operation
- Modules are completely self-contained without external power supplies or protection circuitry.

Contact DTI today for more information, and to explore how PowerMod™ technology can meet your high voltage, high frequency switching needs.

Compare PowerMod™ Technology

	PowerMod™ Solid State Switch Modules	Vacuum Switch Tubes (Triodes, Tetrodes)
• **Reliability**	>> Switch Tubes	Thousands of Hours
• **Voltage Capability**	Up to 100 kV with multiple modules in series	< 100 kV, typically tens of kV
• **Current Capability**	1-100 A opening & closing	1-200 A opening & closing
• **Speed (PRF)**	DC - 400 kHz	DC - 5 kHz
• **Switch Efficiency**	> 99%	80% - 90% peak
• **Switching Time**	< 100 ns	10 ns - 500 ns
• **Infrastructure Requirements**	Gate Drive	•Filament/grid supplies •Tube sockets •Active cooling •Protection circuits
• **Life Cycle Cost**	Very Low	High

Figure 1: 9.0 kV, 30 A Solid-State Switch Module

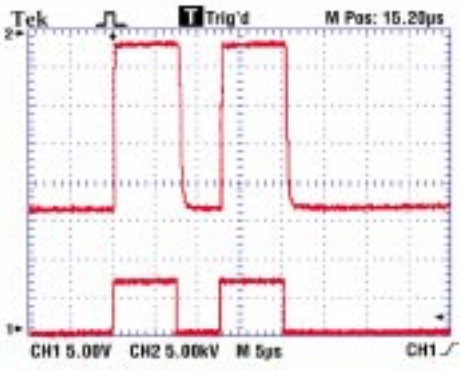


Figure 2: Switch Assembly Pulse: 22 kV, 80 A into Resistive Load

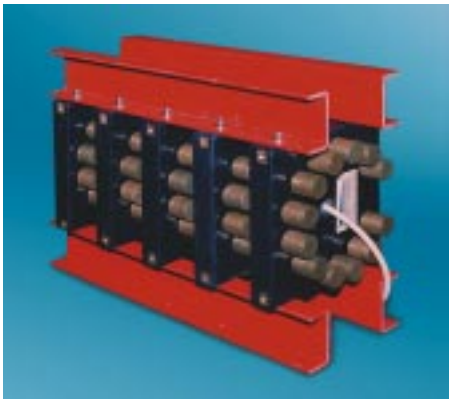


Figure 3: 45 kV, 30 A, Solid State Switch Assembly

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(781) 275-9444 x140 Fax: (781) 275-6081

35 Wiggins Avenue•Bedford, MA 01730•info@divtecs.com•www.divtecs.com

PowerMod™

The Power You Need

PowerMod™ HVPM 20-150

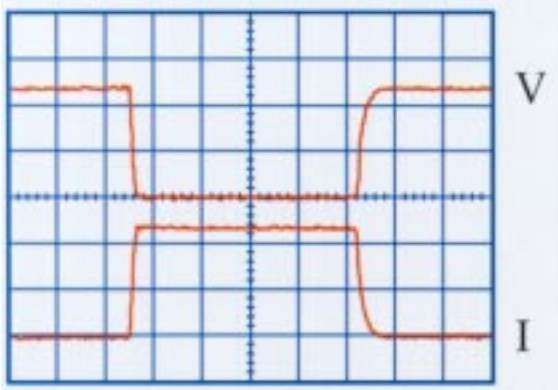
DTI's PowerMod™ HVPM 20-150 brings the breakthrough advantages of solid-state high power switching to demanding pulsed power applications world wide.

- Fast rise and fall times and outstanding pulse stability
- Modular design for high reliability
- Ultra-fast opening and closing switch streamlines system design
- Full internal self-protection against overvoltage and overcurrent conditions

The PowerMod™ HVPM 20-150 employs DTI's patented technology to deliver up to 3MW peak pulses (20kV,150A), at up to 30 kHz in a 19" rack-mount package. This technology was selected by R&D Magazine as one of the 100 Most Significant New Products of the year for 1997.

DTI has pioneered the state-of-the-art in solid-state electronics since 1987. The PowerMod™ line of high power, high current modulators from 2-200 kV at up to 2000A, offers the most cost-effective switching available. High efficiency, enhanced reliability, and increased pulse flexibility are inherent in the PowerMod™ design. PowerMod™ modulators are essential components in ion implantation, high energy physics, semiconductor and flat panel display manufacturing, and other cutting-edge applications.

Put DTI's expertise to work in configuring your pulsed power system.



HVPM 20-150 Pulse: 20kV, 100A; 1µs/cm

PowerMod™ HVPM 20-150 Solid State Modulator

HVPM 20-150 Specifications

Control Voltage	110V 50-60 Hz AC
High Voltage Input:	1-20 kV DC
Average Pulse Current:	75A
1 µs Peak Current	150A
Rise Time*:	0.5µs
Fall Time*:	0.5µs
Nominal Pulse Width:	1 µs - 100 µs
Nominal Pulse Frequency:	0-30,000 Hz
Dimensions:	19" x 30" x 24" rack mount
Weight:	Approximately 100 lbs.
Cooling:	Forced Air

*into resistive load

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