Powerex Expands HVIGBT Line

Powerex is in the process of expanding its already broad line of High Voltage Insulated Gate Bipolar Transistors (HVIGBT) with several additions in the 1700V range.

In 2002, this leader in the power semiconductor industry will build on what is already considered the broadest line of HVIGBT’s, ranging from 1700V to 4500V. (Powerex IGBT’s cover an even broader scope, ranging from 250V to 4500V.)

Featuring low switching and conduction losses, the applications of high voltage IGBT’s typically include inverters, converters, DC choppers, induction heating and DC-DC converters. These modules provide improved performance, simplified design and increased reliability. The full range of Powerex HVIGBT’s is shown in the chart on this page.

Recently, Powerex again added to its HVIGBT line by expanding it to include a 600A, 1700V dual module and an 800A, 1700V dual module. Both products, which are designated as CM600DY-34H and CM800DZ-34H respectively, are currently in mass production. Further expansion in the 1700V range is planned for later this year.

Samples are available for two new HVIGBT types, the 1600A, 1700V single module, designated CM1600HC-34H, and the 1800A, 1700V single module, CM1800HC-34H. Availability of production quantities is scheduled for the third quarter 2002.

The Powerex 1700V IGBT family was also expanded last year with the introduction of the KA-Series module. Designed for high-voltage medium power industrial applications, the KA-Series, available in ratings from 50A to 400A, features a new innovative light punch-through (LPT) chip technology while also utilizing the U-Package technology associated with the popular Powerex F-Series IGBT’s.

Introduced by Powerex’ strategic partner Mitsubishi Electric in 1996, U-Package technology incorporates an insert-molded case that reduces inductance by 60 percent and a superior ALN ceramic isolation substrate that reduces thermal impedance and leakage capacitance to the baseplate, a major source of EMI.
Powerex recently launched a new Product Development Kit program, aimed at helping customers speed up their IGBT gate drive design. The kits include samples of Powerex hybrid gate drivers, DC-DC converters, a prototype PC board, along with technical literature recommending all parts to complete the gate drive circuit.

To kick off the program, Powerex has offered four kits containing its BG1A Universal High Power IGBT Module Gate Driver Board and its BG2B Universal Dual IGBT Module Gate Driver Board, each available for compatibility with Powerex F-Series and KA-Series IGBT modules.

BG1A is a fully isolated gate drive circuit board designed for use with high current single IGBT modules. When the board is populated, gate drive is supplied by a M57962L or M57160AL hybrid gate driver with complimentary emitter follower power booster to provide efficient switching of modules rated up to 1200A. The hybrid gate drivers also provide protection against unexpected short circuit conditions. Isolated control power for the driver is supplied by an onboard M57145L regulated DC-DC converter. The fault feedback signal is also optically isolated.

BG2B is a fully isolated gate drive circuit board designed for use with dual IGBT modules. When the board is populated, gate drive is supplied by M57159L, M57959L, M57962L or M57160AL hybrid gate drivers to provide efficient switching of modules rated up to 400A. The hybrid gate drivers also provide protection against unexpected short circuit conditions. Isolated control power for the driver is supplied by a pair of onboard M57145L-01 regulated DC-DC converters. As with the BG1A, the fault feedback signals are optically isolated.

The BG1A (single configuration) and BG2B (dual configuration) kits are available for compatibility with both the F-Series and KA-Series Powerex IGBT modules.

To order a kit, please call 1-800-451-1415 and request one of the following kits by name: BG1A-F; BG1A-KA; BG2B-F; or BG2B-KA.

Expansion of Powerex SGCT Line Scheduled for Third Quarter

Having introduced the first Symmetric Gate Commutated Thyristor (SGCT) to market in 2000, Powerex will again expand on this innovation by adding a 400A SGCT later this year.

Over the past few years, the industry has seen the gate turn-off thyristor (GTO) be replaced by the Gate Commutated Thyristor (GCT) as the device of choice for many medium voltage (MV) applications where a bipolar thyristor structure offers advantages over high voltage IGBTs. In particular, the low ON state voltage drop at high blocking voltage ratings and the capability to block reverse voltage (SGCT) are driving the expanding use of these devices.

The GCT is a new thyristor device that is similar to a GTO. The development of the GCT was driven by the need to reduce the cost and improve the reliability of the gate drive and snubbers required in GTO applications. The basic idea behind the GCT is to commutate the entire cathode current to the gate at turn-off. By doing this, a smooth transition from SCR (latching operation) to transistor operation is achieved. In contrast, conventional GTOs have an unstable transition at turn-off that necessitates the use of large dv/dt snubbers. An added advantage of the GCT is that turn-off losses and storage delay time are reduced thereby allowing increased operating frequencies.

The key to the GCT is its gate driver and package design. In order to obtain snubberless turn-off capability, the driver must abruptly divert the entire cathode current to the gate. The speed at which the
**Powerex Introduces**

Unique Hybrid Driver

*Hybrid Power IC Supplies Gate Drive for IGBT Modules*

A simplified board design and a reduced use of real estate are features built into M57161L-01, a new hybrid integrated circuit with a built-in DC-DC converter recently launched by Powerex.

This gate driver, specifically designed for driving the Powerex F-Series (Trench Gate) IGBT modules, converts logic level control signals into high current gate drive with suitable on and off bias voltages. Electrical isolation of the input control signal is provided by an integrated high-speed optocoupler. A built-in isolated DC-DC converter supplies gate drive power.

A feature of M57161L-01 is a high output current (+) 7A peak and an isolated DC-DC converter, providing +15.5V/-5V drive. It also boasts short-circuit and under voltage protection as well as a fault status feedback signal.

M57161L-01 was designed as a gate driver for IGBT modules with internal Real Time Control (RTC) circuit. It is recommended for use with the Powerex 600V and 1200V F-Series IGBT Modules.

Powerex F-Series IGBT modules have a built-in RTC, which limits short-circuit current and maintains a 10us short-circuit withstanding capability. The RTC circuit limits the current by actively reducing the gate voltage when excessive collector current is present.

"As a result of its simplified design, the M57161L-01 takes up less real estate"

Ron Williams
Powerex Diamond Power Products Vice President

The M57161L-01 gate driver uses a gate voltage detection circuit to sense the activation of the RTC circuit inside the F-Series IGBT module. "The protection provided by the M57161L-01 is superior to conventional desaturation detection, because it avoids the need for a high voltage detection diode and reduces spacing requirements on the gate drive printed circuit board," notes Ron Williams, Powerex Diamond Power Products Vice President. In addition, noise immunity is improved, because the driver is not connected to the high voltage on the IGBT’s collector.

For more detailed information on this product, log onto the Powerex web site at [www.pwrx.com](http://www.pwrx.com) or call 1-800-451-1415.

---

For more information on the Powerex line of SGCT’s, log onto the Powerex web site at [www.pwrx.com](http://www.pwrx.com) or call 1-800-451-1415.
Jerry Wolfgang, Powerex National OEM Sales Manager, is also serving as the interim manager for the Upper New York State area. Jerry recently took over this territory after the retirement of Phil Parenti.

Our area managers work closely with a network of Powerex manufacturers representatives that covers the United States, Canada and Mexico.

For a complete listing of Powerex manufacturers representatives and distributors, visit the Powerex web site at www.pwrx.com

If you would like to add or delete yourself or someone else from our mailing list, please contact Kelly Brainard (kbrainard@pwrx.com)

**Powerex Territory Management**

- **Jerry Wolfgang**, Office Location: Youngwood, PA
- **Gregg Ehler**, Office Location: New Berlin, WI
- **Jim Lang**, Office Location: Youngwood, PA
- **Kurt Rasmussen**, Office Location: La Jolla, CA
- **Jeff Kauf**, Office Location: Horsham, PA
- **Gregg Ehler**, Office Location: New Berlin, WI
- **Jerry Wolfgang**, Office Location: Youngwood, PA

**Office Locations:**
- Mid-West Area Manager: New Berlin, WI
- Mid-Central and Florida Area Manager: Youngwood, PA
- Western Area Manager: La Jolla, CA
- Eastern Area Sales Manager: Horsham, PA
- Interim Upper New York State Area Manager: Youngwood, PA

If you would like to add or delete yourself or someone else from our mailing list, please contact Kelly Brainard (kbrainard@pwrx.com)

**Address Service Requested**

US Postage Paid
200 E. Hill Street
Youngwood, Pennsylvania 15697-1800
Phone: 724-925-7272
Fax: 724-925-4393

Continuing innovations for the advanced products of tomorrow.