IXYSPOWER
Efficiency Through Technology

Product Brief

2000V POWER MOSFETs

For high voltage power conversion systems

MARCH 2015

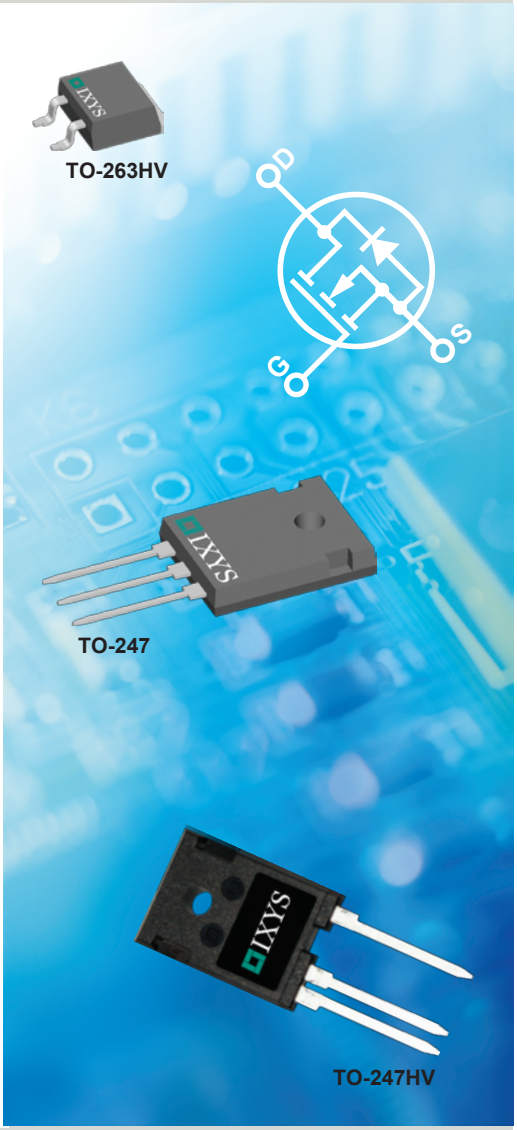
OVERVIEW

IXYS Corporation (NASDAQ: IXYS), a manufacturer of power semiconductors and integrated circuits for energy efficiency, power management, and motor control applications, announces an expansion of its high-voltage Power MOSFET product portfolio: 2000V N-Channel Power MOSFETs. With a current rating of 1A, they are specifically designed for high-voltage, high-speed power conversion applications.

Due to the positive temperature coefficient of their on-state resistance, these high-voltage Power MOSFETs can be operated in parallel, thereby eliminating the need for lower-voltage, series-connected devices and enabling cost-effective power systems. Other benefits include component reduction in gate drive circuitry, simpler design, improved reliability, and PCB space saving.

These new Power MOSFETs are suitable for a wide variety of power switching systems, including high-voltage power supplies, capacitor discharge circuits,pulse circuits, laser and x-ray generation systems, high-voltage automated test equipment, and energy tapping applications from the power grid.

The 2000V Power MOSFETs are available in the following international standard size packages: TO-247, TO-247HV, and TO-263HV. The latter two have increased creepage distances between leads, making them possible to withstand higher voltages. The part numbers include IXTH1N200P3, IXTH1N200P3HV, and IXTA1N200P3HV.



FEATURES

- High blocking voltage
- Proprietary high-voltage packages
- Positive temperature coefficient of $R_{DS(on)}$

ADVANTAGES

- High power density
- Space savings (eliminates multiple series-connected devices)
- Easy mounting

APPLICATIONS

- Capacitor discharge circuits
- High voltage power supplies
- Pulse circuits
- Laser and X-ray generation systems
- High voltage relay disconnect circuits
- CT and MRI scanners
- Ultrasound machines

Available Parts

Part Number	V_{DSS} (V)	I_{D25} T_C = 25°C (A)	$R_{DS(on)}$ max T_J=25°C (Ω)	C_{iss} typ (pF)	$Q_{g(on)}$ typ (nC)	t_{rr} typ (µs)	R_{thJC} max (°C/W)	P_D max (W)	Package Type
IXTA1N200P3HV	2000	1	40	646	23.5	2.3	1	125	TO-263HV
IXTH1N200P3	2000	1	40	646	23.5	2.3	1	125	TO-247
IXTH1N200P3HV	2000	1	40	646	23.5	2.3	1	125	TO-247HV

Competitive Landscape

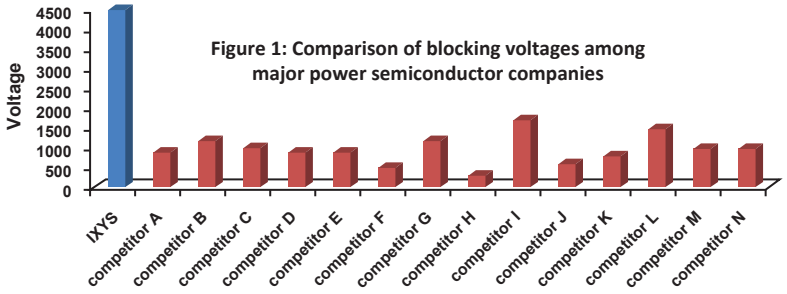
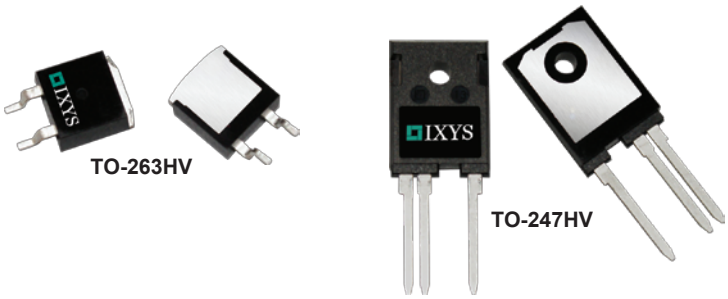


Figure 1 clearly shows the dominance of IXYS when it comes to very high voltage discrete Power MOSFETs. There are very few, if any, competitors above 1700V.

Proprietary High-Voltage Packages



- Increased creepage distance between leads
- Arc-prevention in high voltage applications
- Simplification and reduction in gate drive circuitry
- High power density
- Best-in-class power and temperature cycling

Application Circuits

Application Circuits Legend

IXYSPOWER Efficiency Through Technology | zilog Embedded in Life An IXYS Company | IXYS Integrated Circuits Division

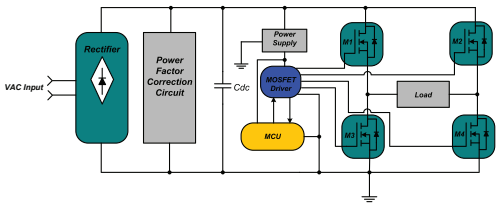


Figure 1: Full-bridge switched-mode converter

Figure 1 depicts a basic switched-mode power supply for industrial applications. This circuit topology consists of a primary rectifier, power factor correction circuit, control unit (power supply, MCU, and MOSFET Driver), full-bridge DC-DC converter and load. An AC power source is converted into a DC value via the bridge rectifier stage. This DC value is then processed via the PFC boost stage to keep the main current and voltage in phase and provide a DC bus voltage which is normally higher than the rectified output. This DC voltage is then fed into a full-bridge converter to drive a load. Four 2000V power MOSFETs **(IXTH1N200P3HV)** are used to implement the full-bridge converter stage (M1-M4), providing an energy-efficient power switching operation.

Figure 2 describes a generic pulse circuit where two 2000V Power MOSFETs **IXTA1N200P3HV** (S1, S2) in parallel are utilized to control the power delivered to the pulsed load. The capacitor bank is charged by the DC power supply, and the stored energy is switched to the load.

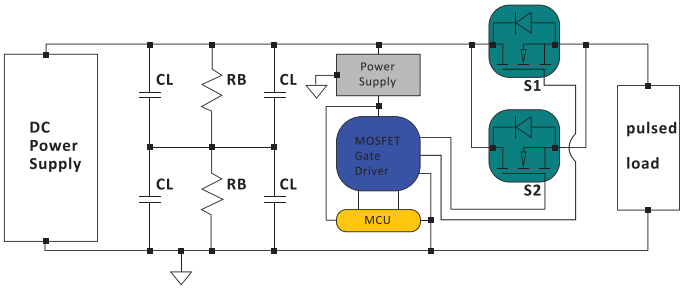


Figure 2: Pulse circuit