

60V TrenchT3™ HiPerFET™ Power MOSFETs

Ultra low on-resistance, rugged devices for industrial power conversion applications

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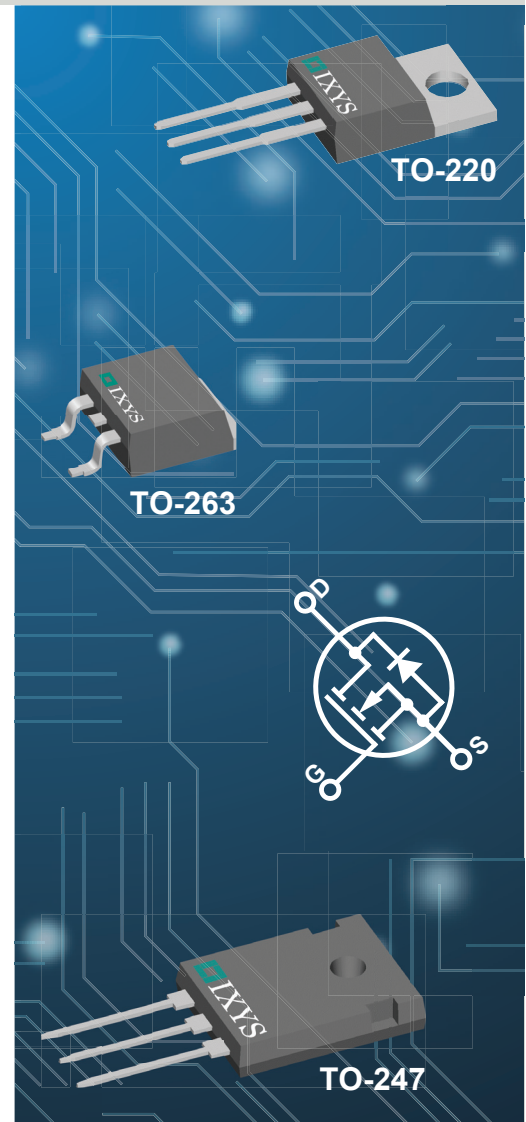
DESCRIPTION

The 60V TrenchT3™ HiPerFET™ Power MOSFETs represent an expansion of the low-voltage Trench MOSFET product lines from IXYS Corporation (NASDAQ: IXYS), a global manufacturer of power semiconductors and integrated circuits (ICs) for energy efficiency, power management, transportation, medical technology, and motor control applications. With on-resistance as low as 3.1 milliohms, these devices are designed for high-power density, switched-mode power conversion applications.

These new MOSFETs can withstand a junction temperature up to 175°C and are avalanche rated at high avalanche current levels, ensuring device ruggedness in demanding industrial applications. Due to their high-current carrying capability, paralleling multiple devices may not be necessary, thereby simplifying the power system and improving its reliability at the same time. In addition, the fast intrinsic body diode helps achieve high efficiency, especially during high-speed switching.

Well-suited industrial applications include brushed motor drive, brushless DC (BLDC) motor drive, synchronous rectification, high-current switching power supplies, primary-side switches, DC-DC converters, off-line uninterruptible power supplies (UPS), electric forklifts, light electric vehicles (LEV), and cordless home appliances and power tools.

These new 60V TrenchT3™ HiPerFET™ Power MOSFETs are available in the following international standard size packages: TO-220, TO-263, and TO-247. Some example part numbers are IXFA220N06T3, IXFH220N06T3, IXFP270N06T3, and IXFH270N06T3; the first two are rated at 220A and the last two 270A.



FEATURES

- Ultra low on-resistance $R_{DS(on)}$
- High current handling capability
- Avalanche rated
- Fast body diode
- 175°C operating temperature
- International standard packages

ADVANTAGES

- High power density
- Easy to mount
- Space savings

APPLICATIONS

- Off-line uninterruptible power supplies (UPS)
- DC-DC converters
- Brushed/brushless DC motor drive
- High-current switching power supplies
- Primary-side switches
- Electric forklifts
- Light electric vehicles (LEV)
- Cordless home appliances and power tools
- Unmanned aerial vehicles (UAV)

Available Parts

Part Number	V_{DSS} (V)	I_{D25} $T_c = 25^\circ\text{C}$ (A)	$R_{DS(on)}$ max $T_j = 25^\circ\text{C}$ (m Ω)	$Q_{g(on)}$ typ (nC)	C_{iss} typ (pF)	t_{rr} typ (ns)	R_{thjc} max ($^\circ\text{C}/\text{W}$)	P_D max (W)	Package Type
IXFA220N06T3	60	220	4	136	8500	38	0.34	440	TO-263
IXFH220N06T3	60	220	4	136	8500	38	0.34	440	TO-247
IXFP220N06T3	60	220	4	136	8500	38	0.34	440	TO-220
IXFA270N06T3	60	270	3.1	200	12600	47	0.31	480	TO-263
IXFH270N06T3	60	270	3.1	200	12600	47	0.31	480	TO-247
IXFP270N06T3	60	270	3.1	200	12600	47	0.31	480	TO-220

Application Examples

Application Circuits Legend

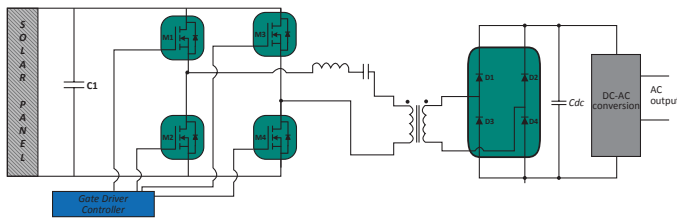


Figure 1: Solar micro-inverter

Figure 2 demonstrates a brushless DC (BLDC) motor drive typically used in cordless power tools. Six TrenchT3™ HiPerFET™ IXFP270N06T3 MOSFETs (M1, M2, M3, M4, M5, and M6) are utilized to form a 3-phase inverter stage that drives a brushless DC motor. These high avalanche current rated MOSFETs ensure the ruggedness of the system.

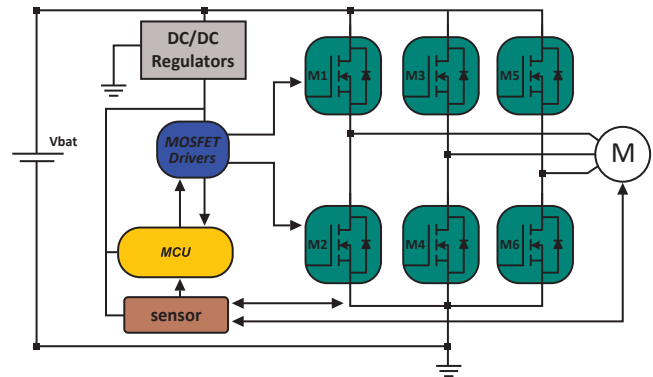


Figure 2: Brushless DC (BLDC) motor

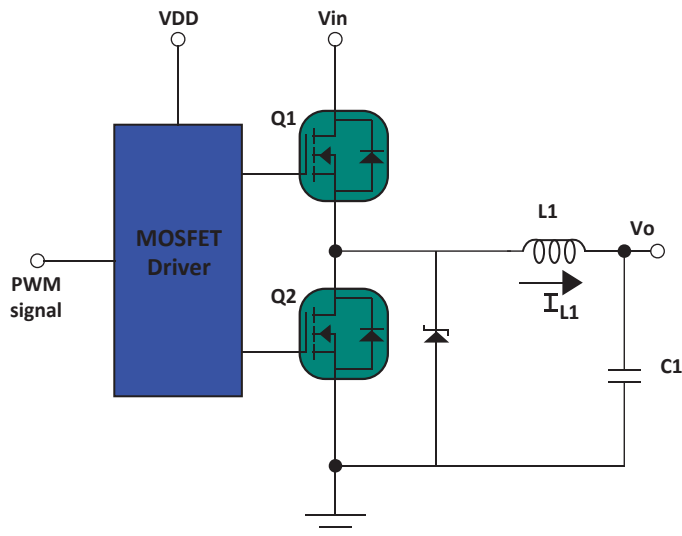


Figure 3: Synchronous buck converter

Figure 3 represents a DC-DC synchronous buck converter circuit which makes use of the TrenchT3™ IXTA220N06T3 (Q1 and Q2). Q1 functions as the high-side switch and Q2 the low-side synchronous switch in place of a diode. With an $R_{DS(on)}$ of 4m Ω , the IXFA220N06T3 enables the converter to achieve a higher efficiency.



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