

650V Ultra Junction X2-Class HiPerFET™ Power MOSFETs *Optimized for soft-switching applications*

I. MAIN FEATURES

- Low on-resistance $R_{DS(on)}$ and gate charge Q_g
- Fast body diode
- dv/dt ruggedness
- Avalanche rated
- High power density
- Low package inductance
- Space savings
- Easy mounting
- International standard packages

II. KEY TECHNOLOGY ADVANTAGES

Ultra-Junction Technology

Like other Ultra Junction MOSFETs from IXYS, these new devices have been developed using a charge compensation principle and proprietary process technology, resulting in Power MOSFETs with significantly reduced on-resistance and gate charge. A higher efficiency, both at heavy and light loads, is achieved due to a better Figure of Merit ($R_{DS(on)} \times Q_g$). Also, thanks to the positive temperature coefficient of their on-state resistance, these devices can be operated in parallel to meet higher current requirements.

Optimized Fast Body Diode

The intrinsic fast body diodes HiPerFETs™ of the MOSFETs display very soft recovery characteristics, minimizing electromagnetic interference (EMI), especially in half or full-bridge switching topologies. With low reverse recovery charge and time, the body diodes can be utilized to make sure that all the energies are removed during high-speed switching to avoid device failure and achieve high efficiency.

dv/dt ruggedness and avalanche rating

The new Ultra Junction HiPerFET™ MOSFETs exhibit a superior dv/dt performance (50V/ns) and are avalanche rated as well. They are robust against device failure caused by voltage spikes and turn-on of parasitic bipolar transistors inherent in the MOSFET structure.

III. TARGET APPLICATIONS

Suitable applications include resonant-mode power supplies, high intensity discharge (HID) lamp ballast, AC and DC motor drives, DC-DC converters, robotic and servo control, battery chargers, 3-level solar inverters, LED lighting, and Unmanned Aerial Vehicles (UAVs).

IV. COMPETITIVE LANDSCAPE

The following comparisons were done using devices retaining similar breakdown voltages and drain current ratings.


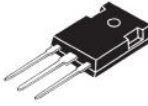
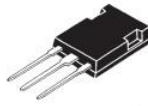

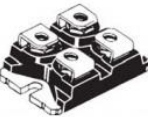

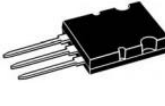
	IXFA22N65X2 (IXYS)	IPB65R150CFD (Infineon)
Technology	Ultra Junction X2 HiPerFET™	CoolMOS™ CFD2
V _{DSS}	650V	650V
I _D @ T _j =25 °C	22A	22.4A
R _{DS(on)} (max)	145mΩ	150mΩ
Q _g (typ)	37nC	86nC
t _{rr} (typ)	145ns	140ns
Q _{RM} (typ)	0.89μC	7μC
dv/dt	50V/ns	50V/ns
E _{AS} (max)	1J	0.614J
R _{thJC} (max)	0.32 °C/W	0.64 °C/W
P _D	390W	195.3W
Package type	TO-263	TO-263

Table 1: IXFA22N65X2 vs. IPB65R150CFD

Compared with the 650V CoolMOS™ IPB65R150CFD from Infineon, the IXYS part IXFA22N65X2 has a better (lower than half) Figure of Merit ($R_{DS(on)} \times Q_g$) and a lower thermal resistance (R_{thJC}), enabling a higher system efficiency and cooler performance. Though the body diode reverse recovery times are comparable, 145ns (IXYS) and 140ns (Infineon), the IXYS part shows a superior ruggedness with a better avalanche rating E_{AS} of 1 joule.

V. AVAILABLE PACKAGES

The 650V Ultra Junction X2-Class HiPerFET™ Power MOSFETs are available in the following international standard size packages: TO-220, TO-263, SOT-227, TO-247, PLUS247™, TO-264, and PLUS264™. Other standard and non-standard types may be manufactured upon request.

TO-220	TO-247	PLUS247™	TO-263	SOT-227	TO-264	PLUS264™
						

VI. PRICING

Part Number	V _{DSS} (V)	I _{D25} T _c =25°C (A)	R _{DS(on)} max. T _j =25°C (Ω)	Q _g typ. (nC)	Package Style	Pack Quantity	Average Selling Price (1 unit) (USD)
IXFA22N65X2	650	22	0.145	37	TO-263	50	\$3.98
IXFH22N65X2	650	22	0.145	37	TO-247	30	\$4.93
IXFP22N65X2	650	22	0.145	37	TO-220	50	\$3.81
IXFH34N65X2	650	34	0.100	56	TO-247	30	\$6.38
IXFH46N65X2	650	46	0.069	98	TO-247	30	\$7.25
IXFH60N65X2	650	60	0.052	108	TO-247	30	\$8.65
IXFH80N65X2	650	80	0.038	140	TO-247	30	\$16.02
IXFK100N65X2	650	100	0.03	183	TO-264	25	\$13.20
IXFX100N65X2	650	100	0.03	183	PLUS247	30	\$12.98
IXFN120N65X2	650	108	0.024	240	SOT-227	10	\$27.96
IXFK120N65X2	650	120	0.024	240	TO-264	25	\$18.13
IXFX120N65X2	650	120	0.024	240	PLUS247	30	\$13.20
IXFN150N65X2	650	145	0.017	355	SOT-227	10	\$34.36
IXFB150N65X2	650	150	0.017	355	PLUS264	25	\$23.60