IXYSPOWER
Efficiency Through Technology

Sales Fact Sheet
CONFIDENTIAL

650V Ultra Junction X2-Class Power MOSFETs

Ideal for Power Factor Correction (PFC) circuits and switching power supplies

I. MAIN FEATURES

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

II. KEY TECHNOLOGY ADVANTAGES

Ultra-Junction Technology
These X2-Class Power MOSFETs are developed using a charge compensation principle and proprietary process technology; with significantly reduced on-state resitance and gate charge, they perform better than conventional superjunction devices, especially in hard switching applications.

Better Figure of Merit ($R_{DS(on)}$ x Qg)
A low on-state resistance reduces the conduction losses. It also lowers the energy stored in the output capacitance, thereby minimizing the switching losses. A low gate charge results in higher efficiency at light loads as well as lower gate drive requirements. Efficiency, both at heavy and light loads, is optimized due to a better Figure of Merit.

dv/dt ruggedness and avalanche rating
The Ultra Junction MOSFETs are avalanche rated and display a superior dv/dt performance (50V/ns), exhibiting ruggedness against device failure caused by voltage spikes and turn-on of parasitic bipolar transistors inherent in the MOSFET structure.

III. TARGET APPLICATIONS

Designed for such applications as Power Factor Correction (PFC) circuits, switched-mode and resonant-mode power supplies, DC-DC converters, AC and DC motor drives, robotic and servo control, solar inverters, lighting control, these MOSFETs enable higher efficiency, along with high power density and cooler system performance.

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IV. COMPETITIVE LANDSCAPE

The analyses were performed with devices retaining similar breakdown voltages and drain current ratings.

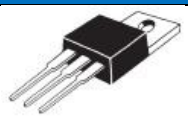
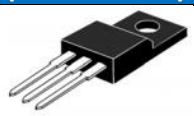
	IXTH34N65X2 (IXYS)	STW45N65M5 (STMicroelectronics)
Technology	Ultra Junction X2-Class	MDmesh™ M5
V_{DSS}	650V	650V
I_D @ T_j=25 °C	34A	35A
$R_{DS(on)}$ (max)	105mΩ	78mΩ
Q_g (typ)	53nC	82nC
t_{rr} (typ)	400ns	392ns
Q_{RM} (typ)	3.5µC	7.4µC
dv/dt	50V/ns	50V/ns
R_{thJC}(max)	0.22 °C/W	0.6 °C/W
P_D	540W	210W
Package type	TO-247	TO-247

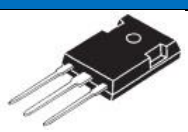
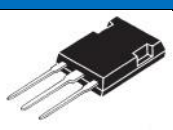
Table 1: IXTH34N65X2 vs. STW45N65M5

Compared to a similar ST Superjunction MOSFET, the IXYS part IXTH34N65X2 has a better (lower) Figure of Merit ($R_{DS(on)}$ x Qg), along with a lower reverse recovery charge (Q_{RM}) and thermal resistance (R_{thJC}), enabling a higher system efficiency and cooler performance.

V. AVAILABLE PACKAGES

The 650V Ultra Junction Power MOSFETs are available in the following international standard size packages: TO-252, TO-220 (standard or overmolded), TO-263, SOT-227, TO-247, PLUS247™, and TO-264. Other standard and non-standard types may be manufactured upon request.

TO-252	TO-220	TO-220 (overmolded)	TO-263
			

SOT-227	TO-247	PLUS247™	TO-264
			

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)
IXTP2N65X2	650	2	2.3	4.3	TO-220	50	$1.92
IXTY2N65X2	650	2	2.3	4.3	TO-252	70	$1.61
IXTA4N65X2	650	4	0.85	8.3	TO-263	50	$2.05
IXTP4N65X2	650	4	0.85	8.3	TO-220	50	$1.92
IXTP8N65X2M	650	4	0.55	12	TO-220 (overmolded)	50	$2.29
IXTY4N65X2	650	4	0.85	8.3	TO-252	70	$1.86
IXTA8N65X2	650	8	0.5	12	TO-263	50	$2.48
IXTP8N65X2	650	8	0.5	12	TO-220	50	$1.61
IXTY8N65X2	650	8	0.5	12	TO-252	70	$2.23
IXTA12N65X2	650	12	0.3	17	TO-263	50	$3.04
IXTH12N65X2	650	12	0.3	17	TO-247	30	$3.70
IXTP12N65X2	650	12	0.3	17	TO-220	50	$2.91
IXTH34N65X2	650	34	0.105	53	TO-247	30	$5.60
IXTH48N65X2	650	48	0.068	77	TO-247	30	$7.10
IXTH62N65X2	650	62	0.052	104	TO-247	30	$8.40
IXTN102N65X2	650	76	0.03	152	SOT-227	10	$23.84
IXTH80N65X2	650	80	0.04	144	TO-247	30	$15.53
IXTK102N65X2	650	102	0.03	152	TO-264	25	$13.77
IXTX102N65X2	650	102	0.03	152	PLUS247™	30	$13.55
IXTK120N65X2	650	120	0.024	240	TO-264	25	$17.78
IXTX120N65X2	650	120	0.024	240	PLUS247™	30	$17.60

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