

# X2-Class Power MOSFET

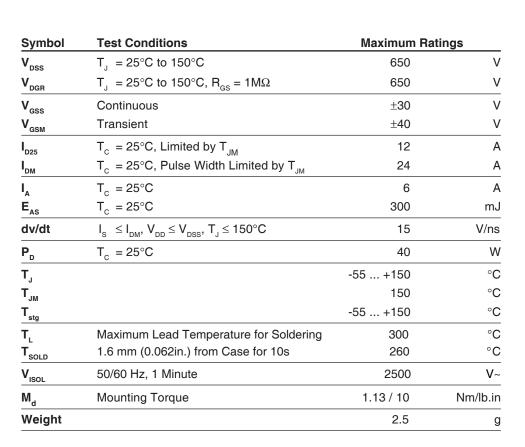
## IXTP12N65X2M

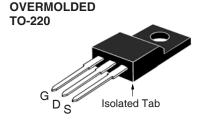
# (Electrically Isolated Tab)

N-Channel Enhancement Mode



$V_{\rm DSS}$	=	650V
I <sub>D25</sub>	=	12A
R <sub>DS(on)</sub>	≤	$300$ m $\Omega$





G = Gate	D = Drain
S = Source	

#### **Features**

- International Standard Package
- Plastic Overmolded Tab
- $\bullet$  Low  $\mathbf{R}_{\mathrm{DS}(\mathrm{ON})}$  and  $\mathbf{Q}_{\mathrm{G}}$
- Avalanche Rated
- 2500V~ Electrical Isolation
- Low Package Inductance

## **Advantages**

- High Power Density
- Easy to Mount
- Space Savings

### **Applications**

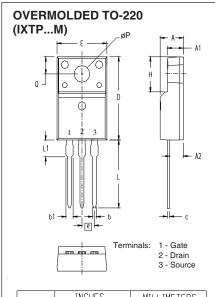
- Switch-Mode and Resonant-Mode Power Supplies
- DC-DC Converters
- PFC Circuits
- · AC and DC Motor Drives
- Robotics and Servo Controls

SymbolTest ConditionsCharacteristics $(T_J = 25^{\circ}C, Unless Otherwise Specified)$ Min.		teristic Values Typ. <sub> </sub> Max.			
BV <sub>DSS</sub>	$V_{GS} = 0V$ , $I_D = 250\mu A$	650			V
$V_{\rm GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.5		4.5	V
I <sub>GSS</sub>	$V_{GS} = \pm 30V, V_{DS} = 0V$			±100	nA
l <sub>DSS</sub>	$V_{DS} = V_{DSS}$ , $V_{GS} = 0V$ $T_{J} = 125^{\circ}C$			5 50	μ <b>Α</b> μ <b>Α</b>
R <sub>DS(on)</sub>	$V_{GS} = 10V$ , $I_D = 6A$ , Note 1			300	mΩ





<u>-</u>		Chai Min.	racteristic Typ.	Values Max
g <sub>fs</sub>	$V_{DS} = 10V, I_{D} = 6A, Note 1$	6.6	11.0	S
$R_{Gi}$	Gate Input Resistance		4.0	Ω
C <sub>iss</sub>			1100	pF
C <sub>oss</sub>	$V_{GS} = 0V, V_{DS} = 25V, f = 1MHz$		830	pF
C <sub>rss</sub>			1.5	pF
	Effective Output Capacitance			
C <sub>o(er)</sub>	Energy related $\begin{cases} V_{GS} = 0V \\ V_{DS} = 0.8 \cdot V_{DSS} \end{cases}$		53	pF
C <sub>o(tr)</sub>	Time related $V_{DS} = 0.8 \cdot V_{DSS}$		190	pF
t <sub>d(on)</sub>	Resistive Switching Times		23	ns
t <sub>r</sub>	$V_{GS} = 10V, V_{DS} = 0.5 \cdot V_{DSS}, I_{D} = 6A$		24	ns
t <sub>d(off)</sub>			52	ns
t <sub>f</sub>	$R_{\rm G} = 20\Omega$ (External)		16	ns
Q <sub>g(on)</sub>			17.7	nC
Q <sub>gs</sub>	$V_{gs} = 10V, V_{DS} = 0.5 \cdot V_{DSS}, I_{D} = 6A$		5.5	nC
Q <sub>gd</sub>			5.5	nC
R <sub>thJC</sub>				3.10 °C/W
R <sub>thCS</sub>			0.50	°C/W



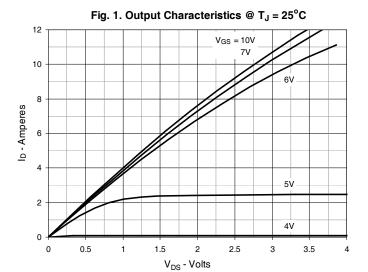
SYM	INCHES		MILLIMETERS		
2114	MIN	MAX	MIN	MAX	
Α	.177	.193	4.50	4.90	
A1	.092	.108	2.34	2.74	
A2	.101	.117	2.56	2.96	
b	.028	.035	0.70	0.90	
b1	.050	.058	1.27	1.47	
С	.018	.024	0.45	0.60	
D	.617	.633	15.67	16.07	
E	.392	.408	9.96	10.36	
е	.100 BSC		2.54 BSC		
Н	.255	.271	6.48	6.88	
L	.499	.523	12.68	13.28	
L1	.119	.135	3.03	3.43	
ØΡ	.121	.129	3.08	3.28	
Q	.126	.134	3.20	3.40	

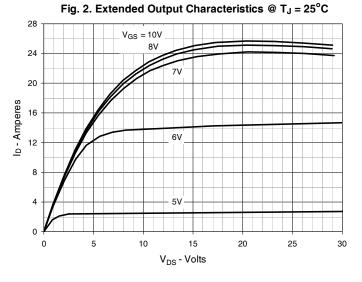
#### Source-Drain Diode

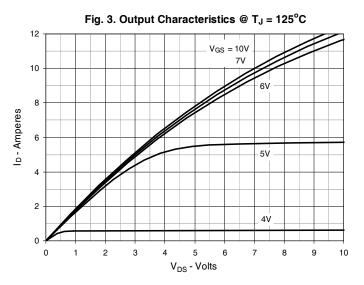
Symbol Test Conditions		<b>Characteristic Values</b>			
$(T_J = 25^{\circ}C, L)$	Inless Otherwise Specified)	Min.	Тур.	Max	
Is	$V_{GS} = 0V$			12	Α
I <sub>SM</sub>	Repetitive, pulse Width Limited by $T_{_{JM}}$			48	Α
V <sub>SD</sub>	$I_F = I_S$ , $V_{GS} = 0V$ , Note 1			1.4	V
t <sub>rr</sub>	$I_F = 6A$ , -di/dt = 100A/ $\mu$ s		270		ns
Q <sub>RM</sub>	$I_{F} = 6A, -di/dt = 100A/\mu s$ $V_{R} = 100V$		2.5 18.5		μC A
KM /					

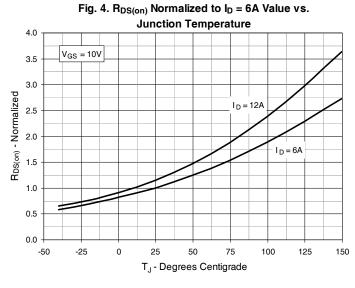
Note 1. Pulse test,  $t \le 300\mu s$ , duty cycle,  $d \le 2\%$ .

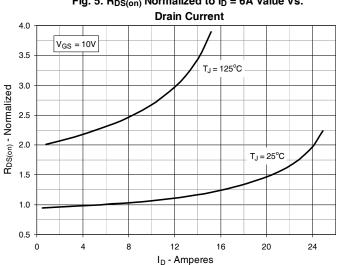












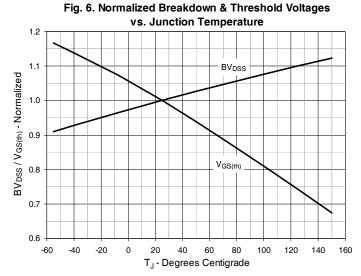
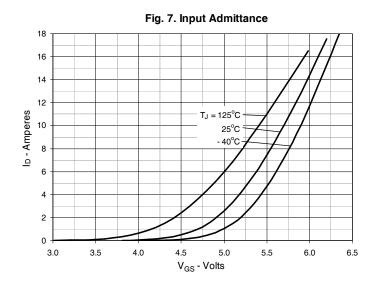
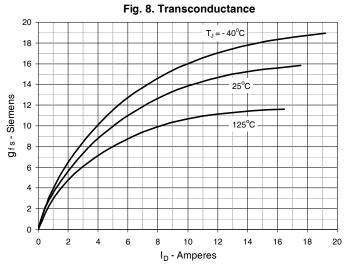
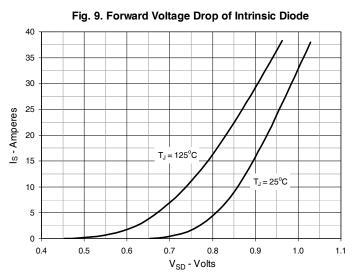


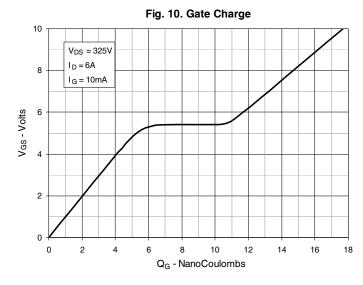
Fig. 5.  $R_{DS(on)}$  Normalized to  $I_D = 6A$  Value vs.

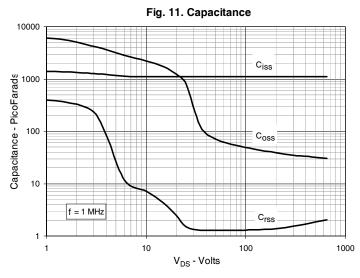


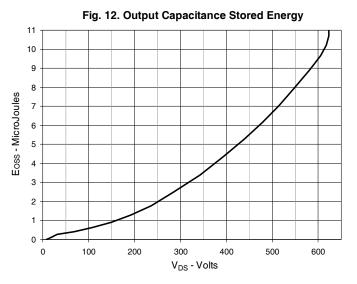












IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.



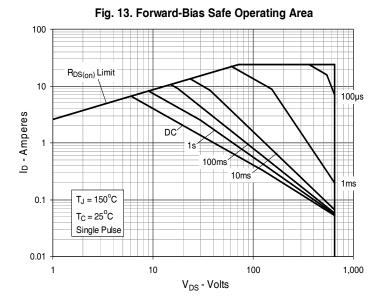


Fig. 14. Maximum Transient Thermal Impedance

