

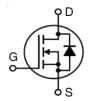
# X3-Class HiPerFET™ Power MOSFET

# IXFJ80N25X3

 $V_{DSS} = 250V$   $I_{D25} = 44A$   $R_{DS(ar)} \le 18m\Omega$ 

### (Electrically Isolated Tab)

N-Channel Enhancement Mode Avalanche Rated



ISO TO-247 <sup>™</sup>	
//	
G D	
D S	Isolated Tab

G = Gate	D	= Drain
S = Source		

Symbol	ymbol Test Conditions		Maximum Ratings	
V <sub>DSS</sub>	$T_{J} = 25^{\circ}C \text{ to } 150^{\circ}C$	250	V	
V <sub>DGR</sub>	$T_{_{ m J}}$ = 25°C to 150°C, $R_{_{ m GS}}$ = 1M $\Omega$	250	V	
V <sub>GSS</sub>	Continuous	±20	V	
V <sub>GSM</sub>	Transient	±30	V	
I <sub>D25</sub>	T <sub>c</sub> = 25°C	44	A	
I <sub>DM</sub>	$T_{\rm c}$ = 25°C, Pulse Width Limited by $T_{\rm JM}$	220	Α	
I <sub>A</sub>	T <sub>c</sub> = 25°C	40	A	
E <sub>as</sub>	$T_{c} = 25^{\circ}C$	1.2	J	
dv/dt	$I_{S} \leq I_{DM}, V_{DD} \leq V_{DSS}, T_{J} \leq 150^{\circ}C$	50	V/ns	
$P_{D}$	T <sub>c</sub> = 25°C	104	W	
T <sub>J</sub>		-55 +150	°C	
T <sub>JM</sub>		150	°C	
T <sub>stg</sub>		-55 +150	°C	
T <sub>L</sub>	Maximum Lead Temperature for Soldering	300	°C	
T <sub>SOLD</sub>	Plastic Body for 10s	260	°C	
F <sub>c</sub>	Mounting Torque	1.13 / 10	Nm/lb.in	
V <sub>ISOL</sub>	50/60 Hz, RM, t = 1min	2500	V~	
Weight		5	g	

#### Symbol **Characteristic Values Test Conditions** (T<sub>J</sub> = 25°C, Unless Otherwise Specified) Max. Min. Тур. $\mathbf{BV}_{\mathrm{DSS}}$ $V_{GS} = 0V, I_{D} = 250 \mu A$ 250 $V_{\underline{GS(th)}}$ $V_{DS} = V_{GS}, I_{D} = 1.5 \text{mA}$ 2.5 ٧ 4.5 $V_{GS} = \pm 20V, V_{DS} = 0V$ ±100 nA l<sub>gss</sub> $\mathbf{I}_{\mathrm{DSS}}$ $V_{DS} = V_{DSS}, V_{GS} = 0V$ 5 μΑ T<sub>.1</sub> = 125°C 350 μΑ $V_{GS} = 10V, I_{D} = 40A, Note 1$ 18 $m\Omega$ $\mathbf{R}_{\mathrm{DS}(\underline{\mathrm{on}})}$

#### **Features**

- Silicon Chip on Direct-Copper Bond (DCB) Substrate
- Isolated Mounting Surface
- 2500V~ Electrical Isolation
- Avalanche Rated
- Low  $R_{DS(ON)}$  and  $Q_{G}$
- Low Package Inductance

### **Advantages**

- High Power Density
- Easy to Mount
- Space Savings

#### **Applications**

- Switch-Mode and Resonant-Mode Power Supplies
- DC-DC Converters
- Laser Drivers
- AC and DC Motor Drives
- Robotics and Servo Controls



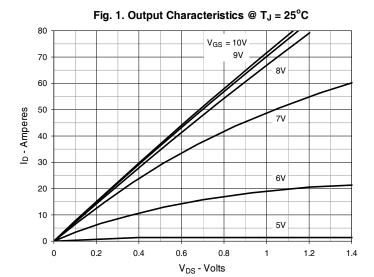
<b>Symbol</b> (T <sub>J</sub> = 25°C, U	Test Conditions Unless Otherwise Specified)	Characteristic Values Min.   Typ.   Max		
g <sub>fs</sub>	V <sub>DS</sub> = 10V, I <sub>D</sub> = 40A, Note 1	38	64	S
$R_{gi}$	Gate Input Resistance		1.6	Ω
C <sub>iss</sub>			5430	pF
C <sub>oss</sub>	$V_{GS} = 0V, V_{DS} = 25V, f = 1MHz$		890	pF
C <sub>rss</sub>			1.6	pF
	Effective Output Capacitance			
$C_{o(er)}$	Energy related $V_{GS} = 0V$		320	pF
$\mathbf{C}_{o(tr)}$	Time related $\int V_{DS}^{GS} = 0.8 \cdot V_{DSS}$		1410	pF
t <sub>d(on)</sub>	Pacietiva Switching Times		30	ns
t <sub>r</sub>	Resistive Switching Times		17	ns
t <sub>d(off)</sub>	$V_{GS} = 10V$ , $V_{DS} = 0.5 \cdot V_{DSS}$ , $I_D = 40A$		65	ns
$\mathbf{t}_{r}^{\text{doff}}$ $\mathbf{R}_{G} = 5\Omega \text{ (External)}$		8	ns	
$Q_{g(on)}$			83	nC
Q <sub>as</sub>	$Q_{gs}$ $V_{GS} = 10V, V_{DS} = 0.5 \cdot V_{DSS}, I_{D} = 40A$		27	nC
$\mathbf{Q}_{gd}$			24	nC
R <sub>thJC</sub>				1.20 °C/W
R <sub>thCS</sub>			0.30	°C/W

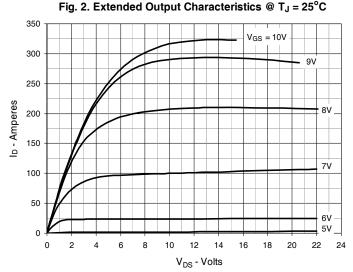
### Source-Drain Diode

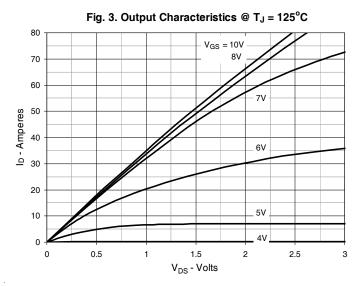
Symbol (T <sub>J</sub> = 25°C, l		Chara Min.	cteristic Typ.	Values Max	
I <sub>s</sub>	V <sub>GS</sub> = 0V			80	Α
I <sub>SM</sub>	Repetitive, Pulse Width Limited by $T_{JM}$			320	Α
V <sub>SD</sub>	$I_F = I_S$ , $V_{GS} = 0V$ , Note 1			1.4	V
$\left\{egin{array}{c} \mathbf{t}_{rr} & \\ \mathbf{Q}_{RM} & \\ \mathbf{I}_{RM} & \end{array} ight\}$	$I_F = 40A$ , -di/dt = 100A/ $\mu$ s $V_R = 100V$		120 600 10		ns nC A

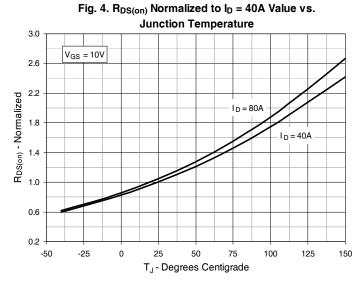
Note 1. Pulse test,  $t \le 300\mu s$ , duty cycle,  $d \le 2\%$ .

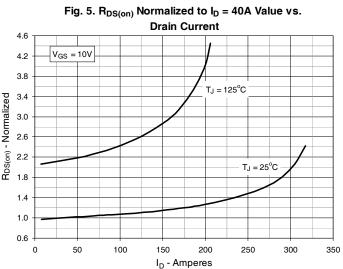


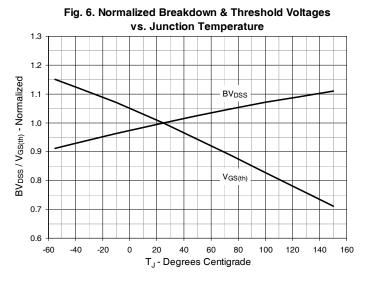






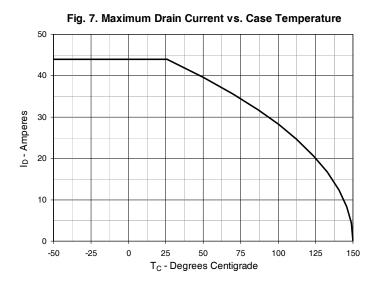


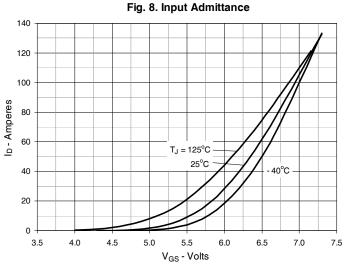


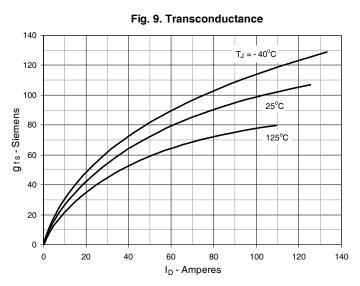


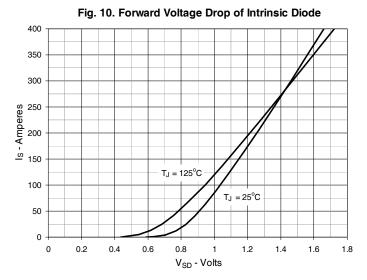
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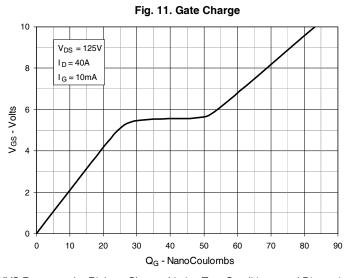


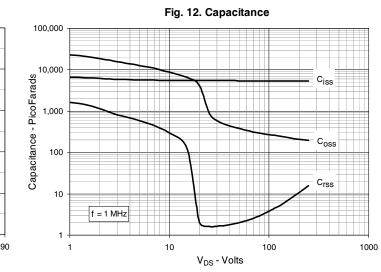




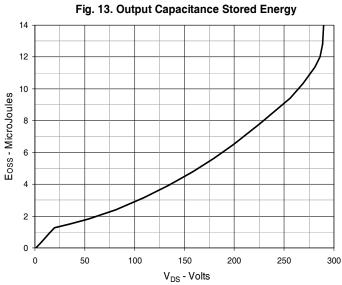


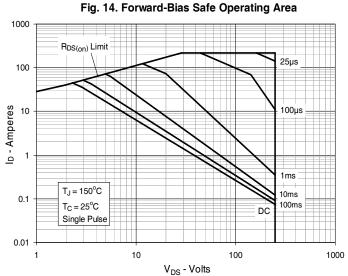


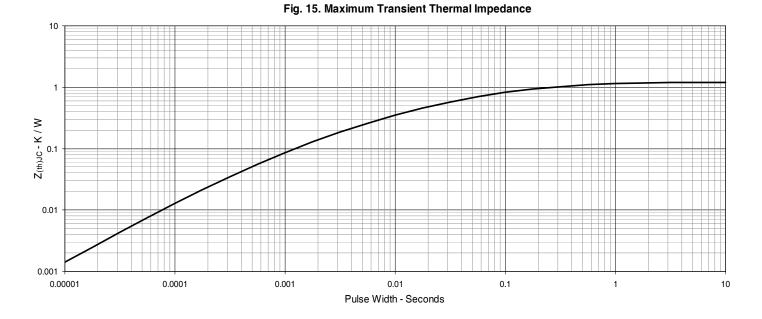




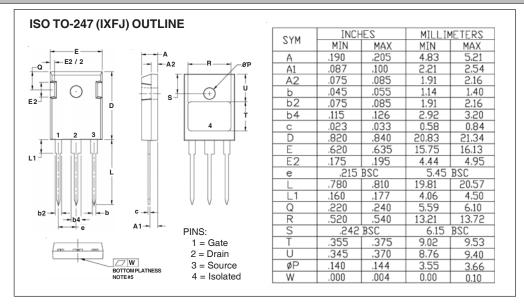
 $\ensuremath{\mathsf{IXYS}}$  Reserves the Right to Change Limits, Test Conditions, and Dimensions.

















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