

X3-Class HiPerFET™ **Power MOSFET**

IXFP72N30X3M

300V **72A** $19m\Omega$

(Electrically Isolated Tab)

N-Channel Enhancement Mode



OVERMOLDED TO-220	
G D S	Isolated Tab

G = Gate	D = Drain
S = Source	

Test Conditions	Maximum Ra	atings
$T_{_{\rm J}}$ = 25°C to 150°C	300	V
$T_{_{ m J}}$ = 25°C to 150°C, $R_{_{ m GS}}$ = 1M Ω	300	V
Continuous	±20	V
Transient	±30	V
T _c = 25°C, Limited by T _{IM}	72	A
$T_c = 25$ °C, Pulse Width Limited by T_{JM}	150	Α
T _c = 25°C	36	A
$T_{\rm C} = 25^{\circ}{\rm C}$	1	J
$I_{S} \le I_{DM}, V_{DD} \le V_{DSS}, T_{J} \le 150^{\circ}C$	50	V/ns
T _c = 25°C	36	W
	-55 +150	°C
	150	°C
	-55 +150	°C
Maximum Lead Temperature for Soldering	300	°C
1.6 mm (0.062in.) from Case for 10s	260	°C
50/60 Hz, 1 Minute	2500	٧~
Mounting Torque	1.13 / 10	Nm/lb.in
	2.5	g
	$\begin{split} &T_{_J}=25^\circ\text{C to }150^\circ\text{C}\\ &T_{_J}=25^\circ\text{C to }150^\circ\text{C}, R_{_{GS}}=1\text{M}\Omega\\ &\text{Continuous}\\ &\text{Transient}\\ &T_{_C}=25^\circ\text{C}, \text{Limited by }T_{_{JM}}\\ &T_{_C}=25^\circ\text{C}, \text{Pulse Width Limited by }T_{_{JM}}\\ &T_{_C}=25^\circ\text{C}\\ &T_{_C}=25^\circ\text{C}\\ &I_{_S}\leq I_{_{DM}}, V_{_{DD}}\leq V_{_{DSS}}, T_{_J}\leq 150^\circ\text{C}\\ &T_{_C}=25^\circ\text{C}\\ &I_{_C}=25^\circ\text{C}\\ &I$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$

Features

- International Standard Package
- Plastic Overmolded Tab
- Low R_{DS(ON)} and Q_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

			teristic Values Typ. Max.		
BV _{DSS}	$V_{GS} = 0V, I_{D} = 250\mu A$	300		V	
$V_{\rm GS(th)}$	$V_{DS} = V_{GS}$, $I_{D} = 1.5 \text{mA}$	2.5		4.5 V	
I _{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			±100 nA	
I _{DSS}	$V_{DS} = V_{DSS}, V_{GS} = 0V$ $T_{J} = 125^{\circ}C$			5 μA 750 μA	
R _{DS(on)}	$V_{GS} = 10V, I_{D} = 36A, Note 1$		15	19 mΩ	





SymbolTest ConditionsC $(T_J = 25^{\circ}\text{C}, \text{Unless Otherwise Specified})$ Mi			acteristic	Values Max
g _{fs}	$V_{DS} = 10V, I_{D} = 36A, \text{ Note 1}$	3	60	S
R_{gi}	Gate Input Resistance		1.7	Ω
C _{iss}			5400	pF
C _{oss}	$V_{GS} = 0V, V_{DS} = 25V, f = 1MHz$		800	pF
C _{rss}			2	pF
	Effective Output Capacitance			
$C_{o(er)}$	Energy related $V_{GS} = 0V$		310	pF
$C_{o(tr)}$	Time related $\int V_{DS}^{ac} = 0.8 \cdot V_{DSS}$		1200	pF
t _{d(on)}	Resistive Switching Times		22	ns
t,	$V_{GS} = 10V, V_{DS} = 0.5 \cdot V_{DSS}, I_{D} = 36A$		25	ns
t _{d(off)}	$R_{\rm G} = 5\Omega$ (External)		86	ns
t,	Ti _G = 012 (External)		11	ns
Q _{g(on)}			82	nC
Q _{gs}	$V_{GS} = 10V$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_{D} = 36A$		25	nC
Q _{gd}			25	nC
R _{thJC}				3.5 °C/W
R _{thCS}			0.50	°C/W

OVERMOLDED TO-220 (IXFP...M) BYM INCHES MILLIMETERS

MYZ	INCHES		MILLIMETERS		
	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	.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

		cteristic Typ.	Values Max		
I _s	V _{GS} = 0V			72	Α
I _{SM}	Repetitive, Pulse Width Limited by $\mathrm{T}_{_{\mathrm{JM}}}$			288	Α
V _{SD}	$I_F = I_S$, $V_{GS} = 0V$, Note 1			1.4	V
$\left. egin{array}{c} \mathbf{t}_{rr} & \ \mathbf{Q}_{RM} & \ \mathbf{I}_{RM} & \end{array} ight. ight.$	$I_F = 36A$, -di/dt = 100A/ μ s $V_R = 100V$		100 750 15		ns nC A

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





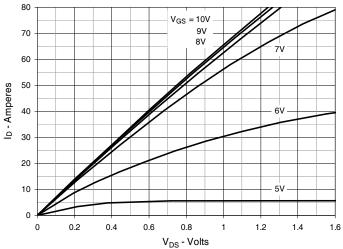


Fig. 2. Extended Output Characteristics @ T_J = 25°C

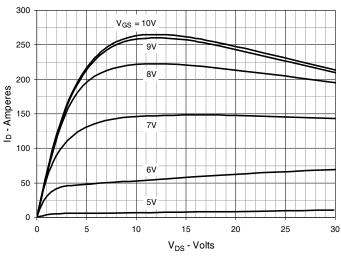


Fig. 3. Output Characteristics @ T_J = 125°C

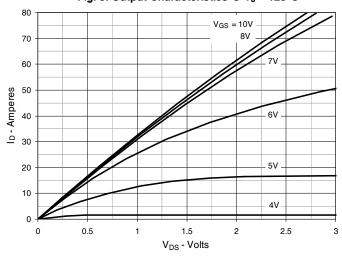


Fig. 4. $R_{DS(on)}$ Normalized to $I_D = 36A$ Value vs.

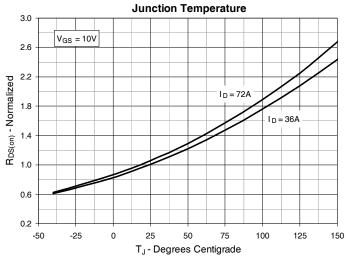


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 36A Value vs.

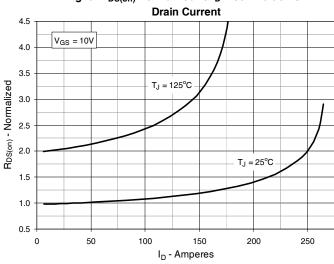
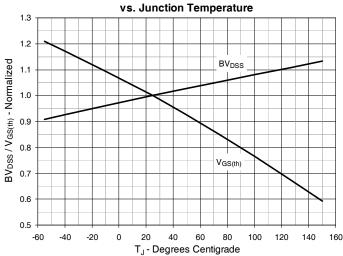
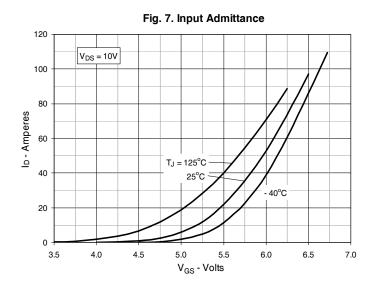
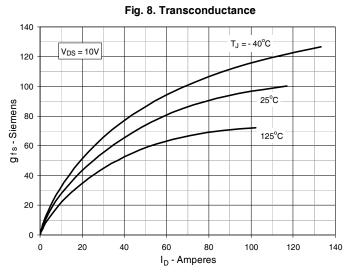


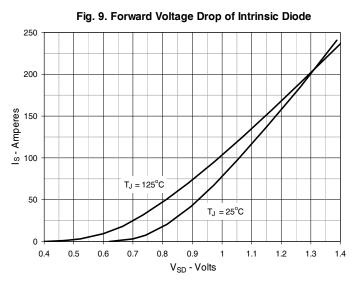
Fig. 6. Normalized Breakdown & Threshold Voltages

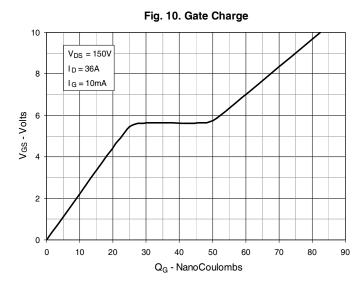


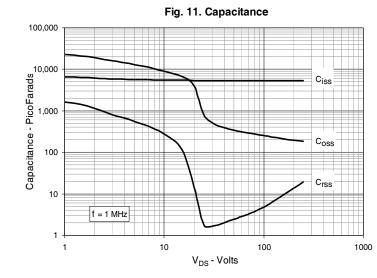


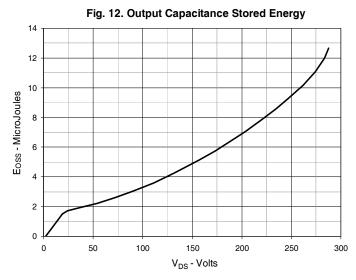




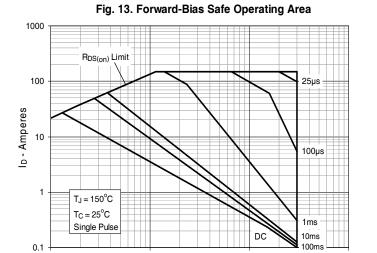








IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.



 $V_{\rm DS}$ - Volts

100

10

Fig. 14. Maximum Transient Thermal Impedance

0.01

Pulse Width - Seconds

0.1

10

100

0.001

0.0001

0.00001

1,000

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