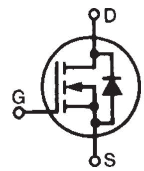
IXYS
Preliminary Technical Information

PolarHV™ HiPerFET Power MOSFET
(Electrically Isolated Tab)

IXFP 3N50PM

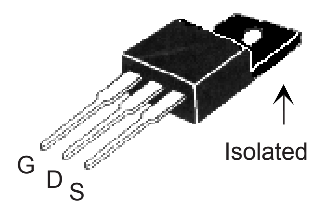
V_{DSS} = 500 V
I_{D25} = 2.7 A
$R_{DS(on)}$ ≤ 2.0 Ω
t_{rr} ≤ 200 ns

N-Channel Enhancement Mode
Avalanche Rated
Fast Intrinsic Diode



Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25° C to 150° C	500	V
V_{DGR}	T_J = 25° C to 150° C; R_{GS} = 1 MΩ	500	V
V_{GSS}	Continuous	± 30	V
V_{GSM}	Transient	± 40	V
I_{D25}	T_C = 25° C	2.7	A
I_{DM}	T_C = 25° C, pulse width limited by T_{JM}	8	A
I_{AR}	T_C = 25° C	3	A
E_{AR}	T_C = 25° C	10	mJ
E_{AS}	T_C = 25° C	100	mJ
dv/dt	$I_S \leq I_{DM}$, di/dt ≤100 A/μs, $V_{DD} \leq V_{DSS}$, $T_J \leq$150° C, R_G = 50 Ω	10	V/ns
P_D	T_C = 25° C	36	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
T_L	1.6 mm (0.062 in.) from case for 10 s	300	°C
T_{SOLD}	Plastic body for 10 s	260	°C
M_d	Mounting torque	1.13/10	Nm/lb.in.
Weight		4	g

OVERMOLDED TO-220 (IXTP...M) OUTLINE



G = Gate D = Drain
S = Source

Features

- Plastic overmolded tab for electrical isolation
- Fast intrinsic diode
- International standard package
- Unclamped Inductive Switching (UIS) rated
- Low package inductance
  - easy to drive and to protect

Advantages

- Easy to mount
- Space savings
- High power density

Symbol	Test Conditions (T_J = 25° C, unless otherwise specified)		Characteristic Values Min.	Typ.	Max.	
BV_{DSS}	V_{GS} = 0 V, I_D = 250 μA		500			V
$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 μA		3.0		5.5	V
I_{GSS}	V_{GS} = ±30 V_{DC}, V_{DS} = 0				±100	nA
I_{DSS}	V_{DS} = V_{DSS}				5	μA
	V_{GS} = 0 V	T_J = 125° C			200	μA
$R_{DS(on)}$	V_{GS} = 10 V, I_D = 1.8 A Note 1				2.0	Ω

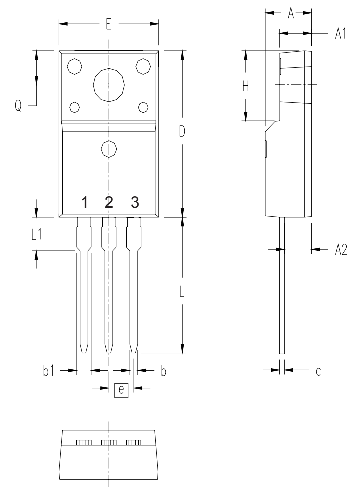
Symbol	Test Conditions	Min.	Typ.	Max.	
	Characteristic Values (T_J = 25° C, unless otherwise specified)				
g_{fs}	V_{DS}= 10 V; I_D = 1.8 A, Note 1		3.5		S
C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		409		pF
C_{oss}			48		pF
C_{rss}			6.1		pF
$t_{d(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 V_{DSS}, I_D = 3.6 A		25		ns
t_r	R_G = 50 Ω (External)		28		ns
$t_{d(off)}$			63		ns
t_f			29		ns
$Q_{g(on)}$	V_{GS}= 10 V, V_{DS} = 0.5 V_{DSS}, I_D = 1.8		9.3		nC
Q_{gs}			3.3		nC
Q_{gd}			3.4		nC
R_{thJC}				3.5	°C/W

Source-Drain Diode

Symbol	Test Conditions	Min.	Typ.	Max.	
	Characteristic Values (T_J = 25° C unless otherwise specified)				
I_S	V_{GS} = 0 V			3.6	A
I_{SM}	Repetitive			5	A
V_{SD}	I_F = I_S, V_{GS} = 0 V, Note 1			1.5	V
t_{rr}	I_F = 3.6 A, -di/dt = 100 A/µs,			200	ns
Q_{RM}	V_R = 100 V, V_{GS} = 0 V		0.1		µC
I_{RM}			0.5		A

Notes:
1) Pulse test, t ≤300 µs, duty cycle d≤ 2 %
2) Test current I_T = 2.5 A

ISOLATED TO-220 (IXTP...M)



Terminals: 1 - Gate
2 - Drain (Collector)
3 - Source (Emitter)

SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.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
c	.018	.024	0.45	0.60
D	.617	.633	15.67	16.07
E	.392	.408	9.96	10.36
e	.100 BSC		2.54 BSC	
H	.255	.271	6.48	6.88
L	.499	.523	12.68	13.28
L1	.119	.135	3.03	3.43
ØP	.121	.129	3.08	3.28
Q	.126	.134	3.20	3.40

PRELIMINARY TECHNICAL INFORMATION

The product presented herein is under development. The Technical Specifications offered are derived from data gathered during objective characterizations of preliminary engineering lots; but also may yet contain some information supplied during a pre-production design evaluation. IXYS reserves the right to change limits, test conditions, and dimensions without notice.