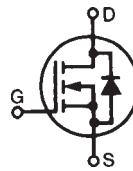


# PolarP2™

## Power MOSFET

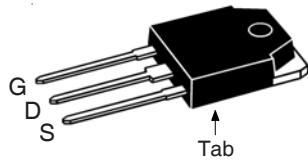
N-Channel Enhancement Mode  
Avalanche Rated  
Fast Intrinsic Diode

### IXTQ480P2



**V<sub>DSS</sub>** = 500V  
**I<sub>D25</sub>** = 52A  
**R<sub>DS(on)</sub>** ≤ 120mΩ  
**t<sub>rr(typ)</sub>** = 400ns

#### TO-3P



G = Gate      D = Drain  
S = Source      Tab = Drain

Symbol	Test Conditions	Maximum Ratings	
V <sub>DSS</sub>	T <sub>J</sub> = 25°C to 150°C	500	V
V <sub>DGR</sub>	T <sub>J</sub> = 25°C to 150°C, R <sub>GS</sub> = 1MΩ	500	V
V <sub>GSS</sub>	Continuous	± 30	V
V <sub>GSM</sub>	Transient	± 40	V
I <sub>D25</sub>	T <sub>C</sub> = 25°C	52	A
I <sub>DM</sub>	T <sub>C</sub> = 25°C, Pulse Width Limited by T <sub>JM</sub>	150	A
I <sub>A</sub>	T <sub>C</sub> = 25°C	52	A
E <sub>AS</sub>	T <sub>C</sub> = 25°C	1.5	J
dv/dt	I <sub>S</sub> ≤ I <sub>DM</sub> , V <sub>DD</sub> ≤ V <sub>DSS</sub> , T <sub>J</sub> ≤ 150°C	10	V/ns
P <sub>D</sub>	T <sub>C</sub> = 25°C	960	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
M <sub>d</sub>	Mounting Torque	1.13/10	Nm/lb.in.
Weight		5.5	g

Symbol	Test Conditions (T <sub>J</sub> = 25°C, Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
BV <sub>DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	500		V
V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	3.0		V
I <sub>GSS</sub>	V <sub>GS</sub> = ± 30V, V <sub>DS</sub> = 0V		± 100	nA
I <sub>DSS</sub>	V <sub>DS</sub> = V <sub>DSS</sub> , V <sub>GS</sub> = 0V T <sub>J</sub> = 125°C		5 50	μA μA
R <sub>DS(on)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 0.5 • I <sub>D25</sub> , Note 1		120	mΩ

#### Features

- Avalanche Rated
- Fast Intrinsic Diode
- Dynamic dv/dt Rated
- 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

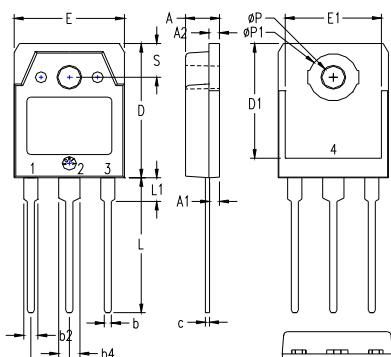
Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$g_{fs}$	$V_{DS} = 20\text{V}$ , $I_D = 0.5 \cdot I_{D25}$ , Note 1	30	48	S
$C_{iss}$			6800	pF
$C_{oss}$	$V_{GS} = 0\text{V}$ , $V_{DS} = 25\text{V}$ , $f = 1\text{MHz}$		680	pF
$C_{rss}$			44	pF
$t_{d(on)}$	<b>Resistive Switching Times</b> $V_{GS} = 10\text{V}$ , $V_{DS} = 0.5 \cdot V_{DSS}$ , $I_D = 0.5 \cdot I_{D25}$ $R_G = 1\Omega$ (External)	22	ns	
$t_r$		11	ns	
$t_{d(off)}$		40	ns	
$t_f$		8	ns	
$Q_{g(on)}$	$V_{GS} = 10\text{V}$ , $V_{DS} = 0.5 \cdot V_{DSS}$ , $I_D = 0.5 \cdot I_{D25}$	108	nC	
$Q_{gs}$		37	nC	
$Q_{gd}$		38	nC	
$R_{thJC}$			0.13	$^\circ\text{C}/\text{W}$
$R_{thCS}$		0.25		$^\circ\text{C}/\text{W}$

### Source-Drain Diode

Symbol	Test Conditions	Characteristic Values		
	( $T_J = 25^\circ\text{C}$ Unless Otherwise Specified)	Min.	Typ.	Max.
$I_s$	$V_{GS} = 0\text{V}$		52	A
$I_{sm}$	Repetitive, Pulse Width Limited by $T_{JM}$		204	A
$V_{SD}$	$I_F = I_s$ , $V_{GS} = 0\text{V}$ , Note 1		1.5	V
$t_{rr}$	$I_F = 26\text{A}$ , $-\text{di}/\text{dt} = 100\text{A}/\mu\text{s}$ $V_R = 100\text{V}$ , $V_{GS} = 0\text{V}$	400		ns

Note 1. Pulse test,  $t \leq 300\mu\text{s}$ , duty cycle,  $d \leq 2\%$ .

### TO-3P (IXTQ) Outline



Pins: 1 - Gate 2 - Drain  
3 - Source 4 - Drain

SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.185	.193	4.70	4.90
A1	.051	.059	1.30	1.50
A2	.057	.065	1.45	1.65
b	.035	.045	0.90	1.15
b2	.075	.087	1.90	2.20
b4	.114	.126	2.90	3.20
c	.022	.031	0.55	0.80
D	.780	.791	19.80	20.10
D1	.665	.677	16.90	17.20
E	.610	.622	15.50	15.80
E1	.531	.539	13.30	13.70
e	.215	BSC	5.45	BSC
L	.779	.795	19.80	20.20
L1	.134	.142	3.40	3.60
$\phi P$	.126	.134	3.20	3.40
$\phi P1$	.272	.280	6.90	7.10
S	.193	.201	4.90	5.10

All metal areas are tin plated.

### PRELIMINARY TECHNICAL INFORMATION

The product presented herein is under development. The Technical Specifications offered are derived from a subjective evaluation of the design, based upon prior knowledge and experience, and constitute a "considered reflection" of the anticipated result. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

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

IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents: 4,835,592 4,931,844 5,049,961 5,237,481 6,162,665 6,404,065 B1 6,683,344 6,727,585 7,005,734 B2 7,157,338 B2  
4,860,072 5,017,508 5,063,307 5,381,025 6,259,123 B1 6,534,343 6,710,405 B2 6,759,692 7,063,975 B2  
4,881,106 5,034,796 5,187,117 5,486,715 6,306,728 B1 6,583,505 6,710,463 6,771,478 B2 7,071,537



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