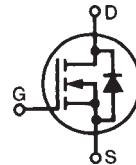


PolarHT™ Power MOSFET

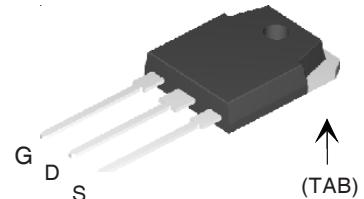
IXTK 88N30P IXTQ 88N30P

V_{DSS} = 300 V
 I_{D25} = 88 A
 $R_{DS(on)}$ = 40 mΩ

N-Channel Enhancement Mode

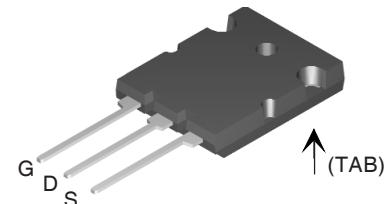


TO-3P (IXTQ)



Symbol	Test Conditions	Maximum Ratings		
V_{DSS}	$T_J = 25^\circ\text{C}$ to 150°C	300	V	
V_{DGR}	$T_J = 25^\circ\text{C}$ to 150°C ; $R_{GS} = 1 \text{ M}\Omega$	300	V	
V_{GSM}		± 20	V	
I_{D25}	$T_c = 25^\circ\text{C}$	88	A	
$I_{D(\text{RMS})}$	External lead current limit	75	A	
I_{DM}	$T_c = 25^\circ\text{C}$, pulse width limited by T_{JM}	220	A	
I_{AR}	$T_c = 25^\circ\text{C}$	60	A	
E_{AR}	$T_c = 25^\circ\text{C}$	60	mJ	
E_{AS}	$T_c = 25^\circ\text{C}$	2.0	J	
dv/dt	$I_s \leq I_{DM}$, $di/dt \leq 100 \text{ A}/\mu\text{s}$, $V_{DD} \leq V_{DSS}$, $T_J \leq 150^\circ\text{C}$, $R_G = 4 \Omega$	10	V/ns	
P_D	$T_c = 25^\circ\text{C}$	600	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	
M_d	Mounting torque	1.13/10	Nm/lb.in.	
Weight	TO-264 TO-268	10 5	g g	

TO-264(SP) (IXTK)



G = Gate
S = Source
D = Drain
TAB = Drain

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$, unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
V_{DSS}	$V_{GS} = 0 \text{ V}$, $I_D = 250 \mu\text{A}$	300		V
$V_{GS(\text{th})}$	$V_{DS} = V_{GS}$, $I_D = 250 \mu\text{A}$	2.5		5.0 V
I_{GSS}	$V_{GS} = \pm 20 \text{ V}_{DC}$, $V_{DS} = 0$		± 100	nA
I_{DSS}	$V_{DS} = V_{DSS}$ $V_{GS} = 0 \text{ V}$		25 250	μA
$R_{DS(on)}$	$V_{GS} = 10 \text{ V}$, $I_D = 0.5 I_{D25}$ Pulse test, $t \leq 300 \mu\text{s}$, duty cycle $d \leq 2 \%$		40	mΩ

Features

- International standard packages
- Unclamped Inductive Switching (UIS) rated
- Low package inductance
 - easy to drive and to protect

Advantages

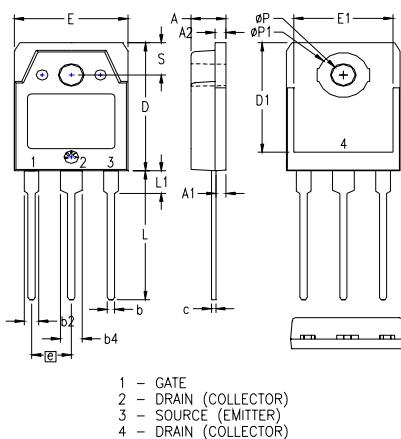
- Easy to mount
- Space savings
- High power density

PolarHT™ DMOS transistors utilize proprietary designs and process. US patent is pending.

Symbol	Test Conditions	Characteristic Values		
		Min.	Typ.	Max.
g_{fs}	$V_{DS} = 10 \text{ V}; I_D = 0.5 I_{D25}$, pulse test	45	60	S
C_{iss} C_{oss} C_{rss}	$V_{GS} = 0 \text{ V}, V_{DS} = 25 \text{ V}, f = 1 \text{ MHz}$	6300	pF	
		950	pF	
		190	pF	
$t_{d(on)}$ t_r $t_{d(off)}$ t_f	$V_{GS} = 10 \text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = 60 \text{ A}$ $R_G = 3.3 \Omega$ (External)	25	ns	
		24	ns	
		96	ns	
		25	ns	
$Q_{g(on)}$ Q_{gs} Q_{gd}	$V_{GS} = 10 \text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = 0.5 I_{D25}$	180	nC	
		44	nC	
		90	nC	
R_{thJC}			0.21	K/W
R_{thCK}	(TO-3P) (TO-264)	0.21 0.15		K/W

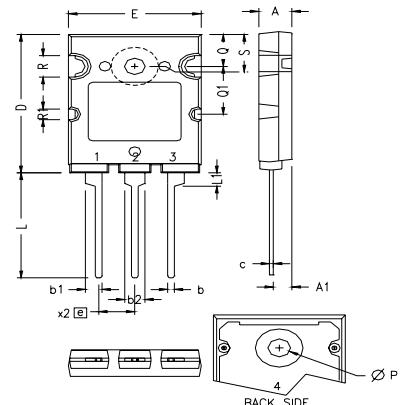
Source-Drain Diode
Characteristic Values
 $(T_J = 25^\circ\text{C}, \text{unless otherwise specified})$

Symbol	Test Conditions	Min.	typ.	Max.
I_s	$V_{GS} = 0 \text{ V}$			88 A
I_{SM}	Repetitive			220 A
V_{SD}	$I_F = I_s, V_{GS} = 0 \text{ V},$ Pulse test, $t \leq 300 \mu\text{s}$, duty cycle $d \leq 2 \%$			1.5 V
t_{rr} Q_{RM}	$I_F = 25 \text{ A}$ $-di/dt = 100 \text{ A}/\mu\text{s}$ $V_R = 100 \text{ V}$	250	ns	
				3.3 μC

TO-3P (IXTQ) Outline

 1 - GATE
 2 - DRAIN (COLLECTOR)
 3 - SOURCE (EMITTER)
 4 - DRAIN (COLLECTOR)

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	13.50	13.70
e	.215 BSC		5.45 BSC	
L	.779	.795	19.80	20.20
L1	.134	.142	3.40	3.60
ϕP	.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.

TO-264(SP) Outline (IXFK)


SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.185	.209	4.70	5.30
A1	.102	.118	2.60	3.00
b	.035	.049	0.90	1.25
b1	.091	.106	2.30	2.70
b2	.110	.126	2.80	3.20
c	.020	.033	0.50	0.85
D	1.012	1.035	25.70	26.30
E	.776	.799	19.70	20.30
e	.215BSC		5.46 BSC	
L	.768	.807	19.50	20.50
L1	.091	.106	2.30	2.70
ϕR	.122	.138	3.10	3.50
Q	.228	.244	5.80	6.20
Q1	.346	.362	8.80	9.20
$\phi R1$.150	.165	3.80	4.20
S	.228	.244	5.80	6.20

 1 - GATE
 2, 4 - DRAIN (COLLECTOR)
 3 - SOURCE (EMITTER)

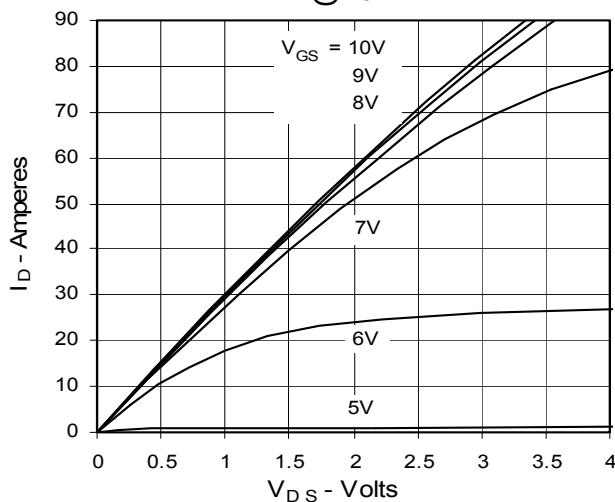
NOTE: Leads and back heatsink are solder plated.

IXYS reserves the right to change limits, test conditions, and dimensions.

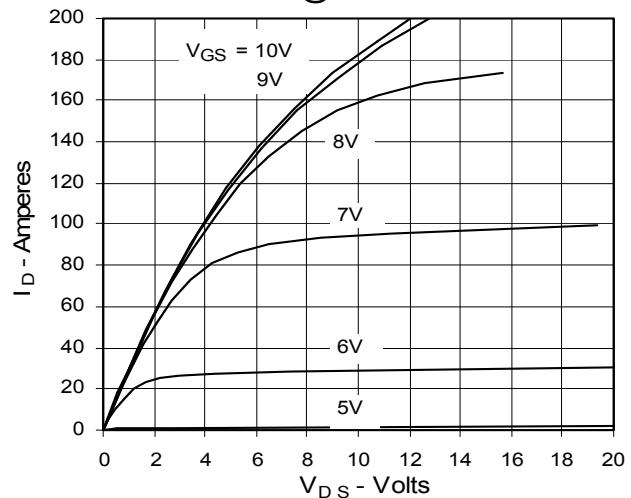
IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents:

 4,835,592 4,881,106 5,017,508 5,049,961 5,187,117 5,486,715 6,306,728B1 6,259,123B1 6,306,728B1
 4,850,072 4,931,844 5,034,796 5,063,307 5,237,481 5,381,025 6,404,065B1 6,162,665 6,534,343

**Fig. 1. Output Characteristics
@ 25°C**



**Fig. 2. Extended Output Characteristics
@ 25°C**



**Fig. 3. Output Characteristics
@ 125°C**

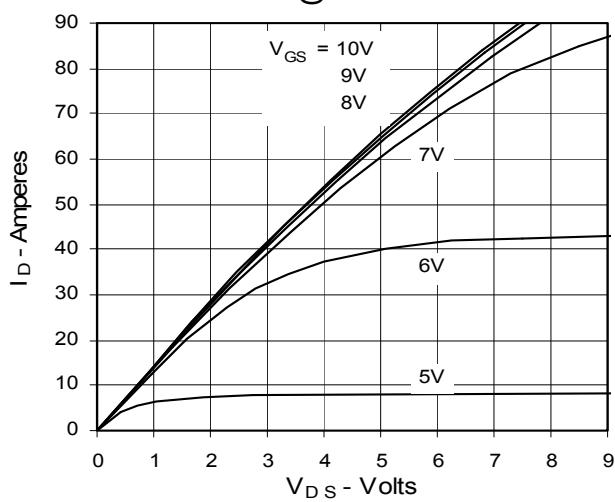


Fig. 4. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. Junction Temperature

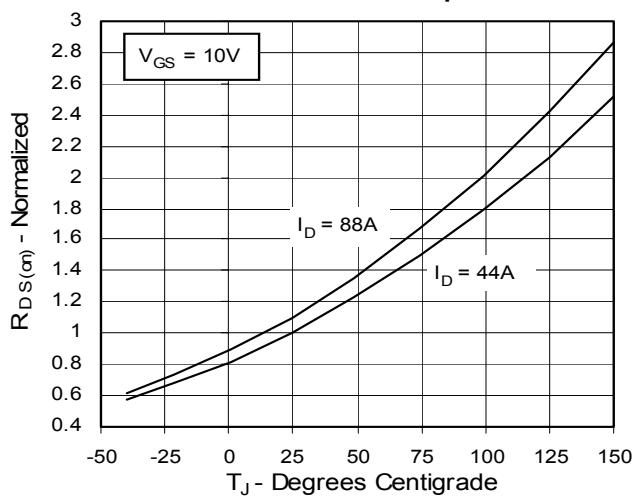


Fig. 5. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. I_D

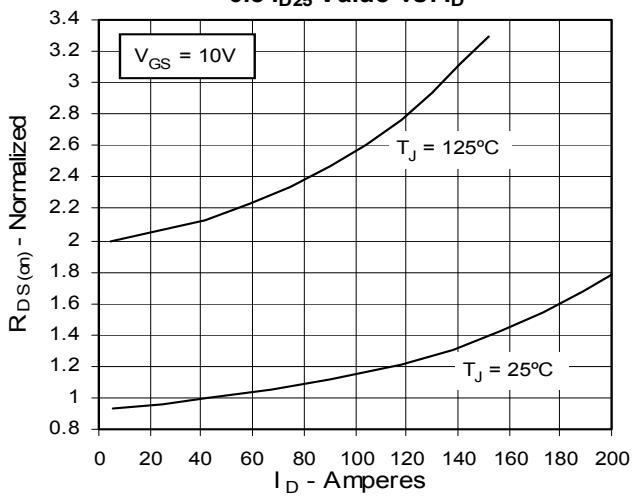


Fig. 6. Drain Current vs. Case Temperature

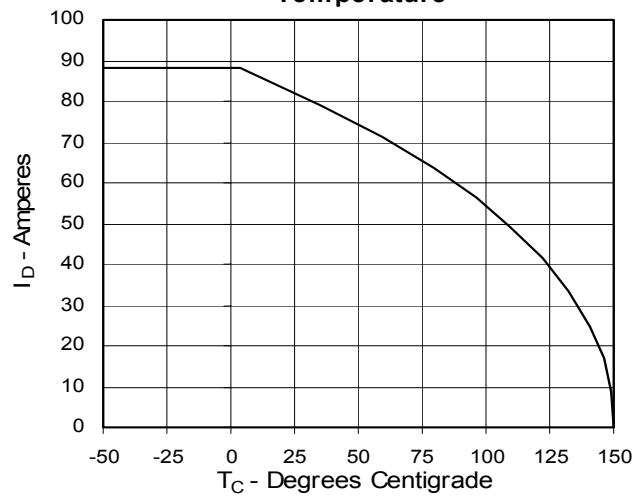


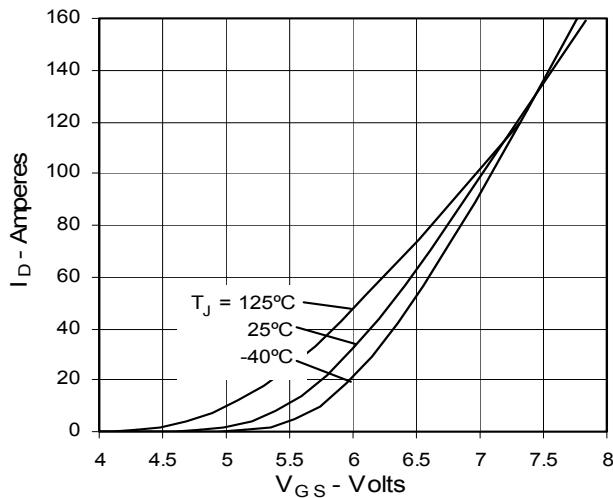
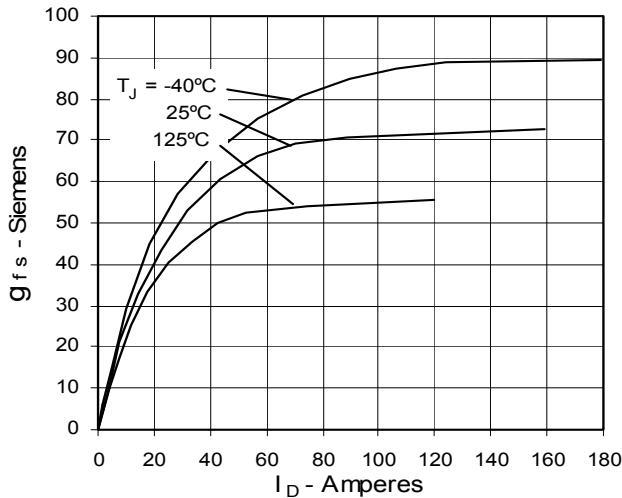
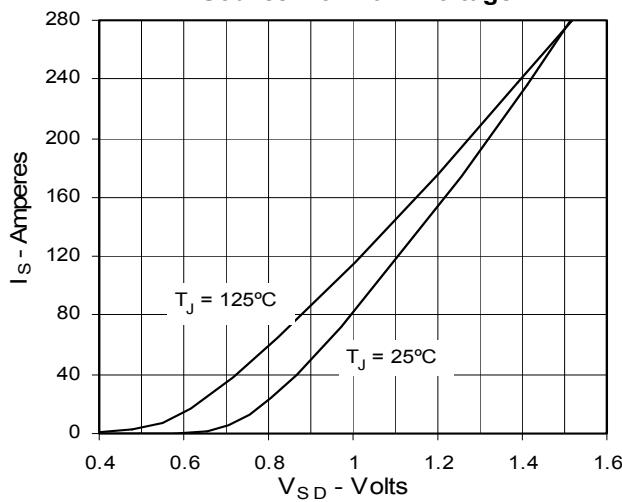
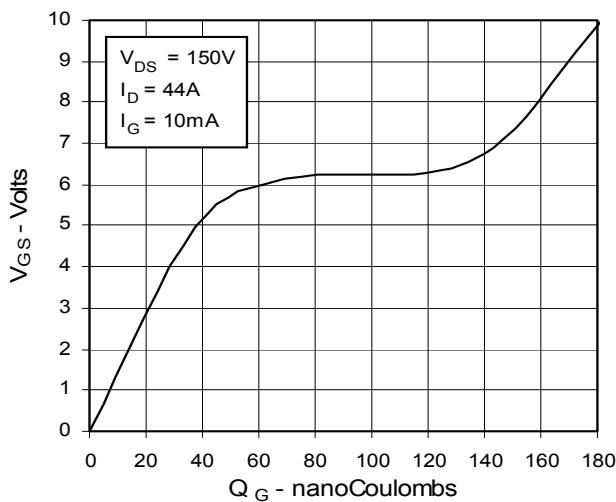
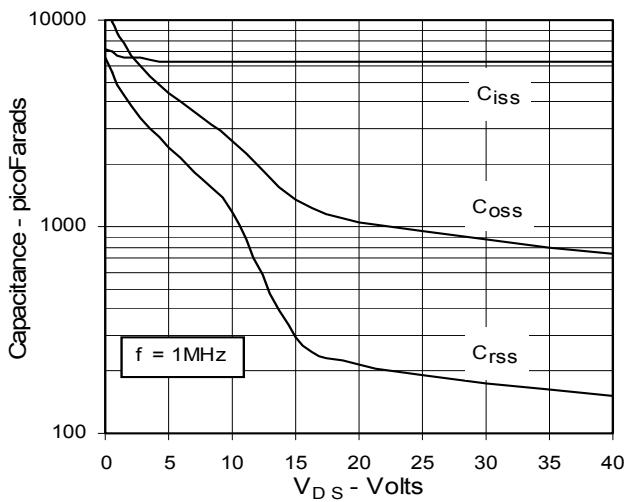
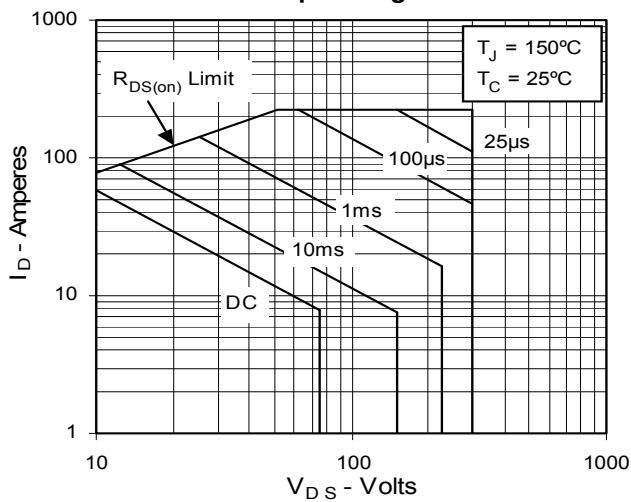
Fig. 7. Input Admittance

Fig. 8. Transconductance

Fig. 9. Source Current vs. Source-To-Drain Voltage

Fig. 10. Gate Charge

Fig. 11. Capacitance

Fig. 12. Forward-Bias Safe Operating Area


Fig. 13. Maximum Transient Thermal Resistance