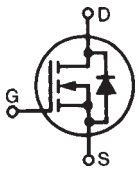
IXYS

PolarHT™ Power MOSFET

IXTQ 200N06P

V_{DSS} = 60 V
I_{D25} = 200 A
$R_{DS(on)}$ ≤ 6.0 mΩ

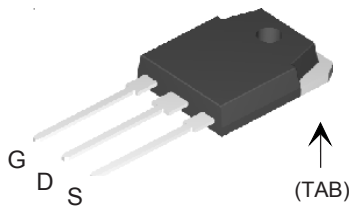
N-Channel Enhancement Mode
Avalanche Rated



Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25° C to 175° C	60	V
V_{DGR}	T_J = 25° C to 175° C; R_{GS} = 1 MΩ	60	V
V_{GS}	Transient	±30	V
V_{GSM}	Continuous	±20	V
I_{D25}	T_C = 25° C	200	A
$I_{D(RMS)}$	External lead current limit	75	A
I_{DM}	T_C = 25° C, pulse width limited by T_{JM}	400	A
I_{AR}	T_C = 25° C	60	A
E_{AR}	T_C = 25° C	80	mJ
E_{AS}	T_C = 25° C	4.0	J
dv/dt	$I_S \le I_{DM}$, di/dt ≤100 A/μs, $V_{DD} \le V_{DSS}$, $T_J \le$150° C, R_G = 4 Ω	10	V/ns
P_D	T_C = 25° C	714	W
T_J		-55 ... +175	°C
T_{JM}		175	°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 (TO-3P)	1.13/10	Nm/lb.in.
Weight	TO-3P	5.5	g

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	60			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 250μA	2.5		5.0	V
I_{GSS}	V_{GS} = ±20 V_{DC}, V_{DS} = 0			±100	nA
I_{DSS}	$V_{DS} = V_{DSS}$			25	μA
	V_{GS} = 0 V, T_J = 150° C			250	μA
$R_{DS(on)}$	V_{GS} = 10 V, I_D = 60A			6.0	mΩ
	V_{GS} = 15 V, I_D = 400A		5.0		mΩ
	Pulse test, t ≤300 μs, duty cycle d ≤ 2 %				

TO-3P (IXTQ)



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

Features

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

Advantages

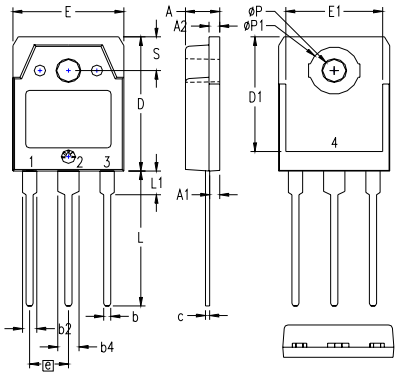
- Easy to mount
- Space savings
- High power density

Symbol	Test Conditions (T_J = 25° C, unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS}= 10 V; I_D = 60A, pulse test	45	65		S
C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		5400		pF
C_{oss}			3550		pF
C_{rss}			1360		pF
$t_{d(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 V_{DSS}, I_D = 60 A R_G = 3.3 Ω (External)		35		ns
t_r			60		ns
$t_{d(off)}$			90		ns
t_f			40		ns
$Q_{g(on)}$	V_{GS}= 10 V, V_{DS} = 0.5 V_{DSS}, I_D = 0.5 I_{D25}		200		nC
Q_{gs}			37		nC
Q_{gd}			110		nC
R_{thJC}				0.21	°C/W
R_{thCS}			0.21		°C/W

Source-Drain Diode

Symbol	Test Conditions (T_J = 25° C, unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
I_S	V_{GS} = 0 V			200	A
I_{SM}	Repetitive			400	A
V_{SD}	I_F = I_S, V_{GS} = 0 V, Pulse test, t ≤300 μs, duty cycle d≤ 2 %			1.5	V
t_{rr}	I_F = 25 A, -di/dt = 100 A/μs		90		ns
Q_{RM}	V_R = 30 V, V_{GS} = 0 V		1.0		μC

TO-3P (IXTQ) Outline



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

SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS 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
øP	.126	.134	3.20	3.40
øP1	.272	.280	6.90	7.10
S	.193	.201	4.90	5.10

All metal area are tin plated.

Fig. 1. Output Characteristics @ 25ºC

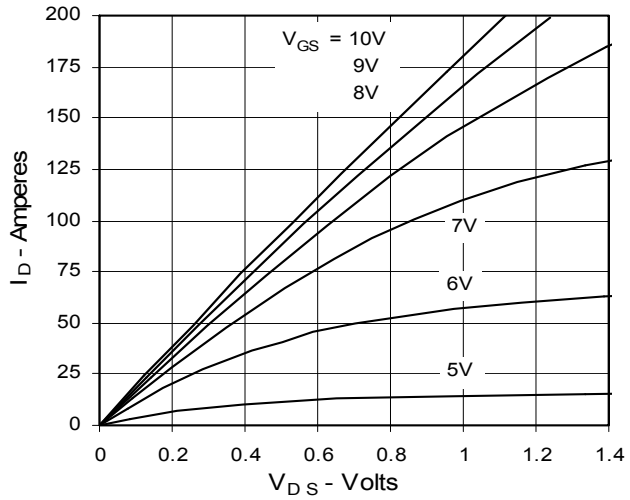


Fig. 2. Extended Output Characteristics @ 25ºC

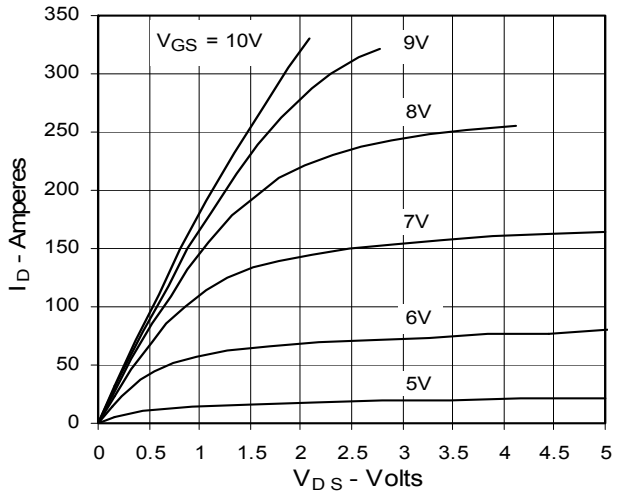


Fig. 3. Output Characteristics @ 150ºC

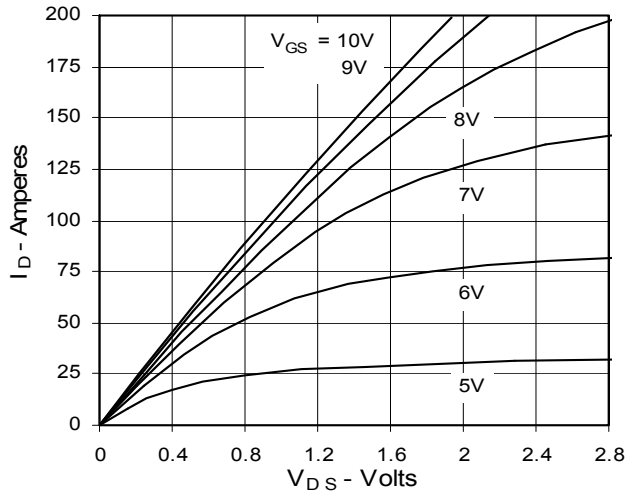


Fig. 4. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. Junction Temperature

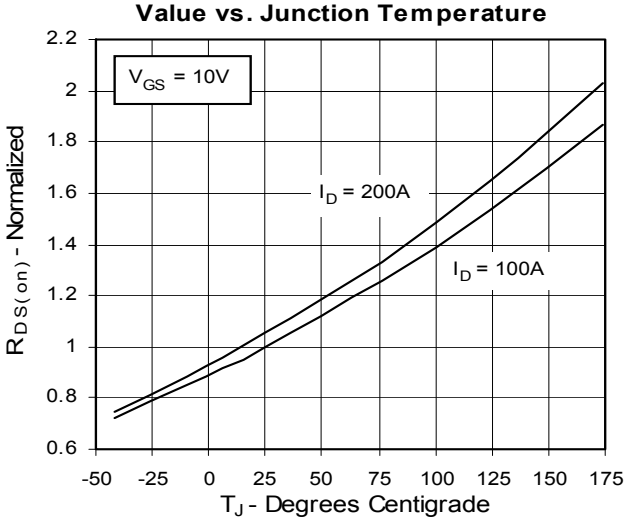


Fig. 5. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. Drain Current

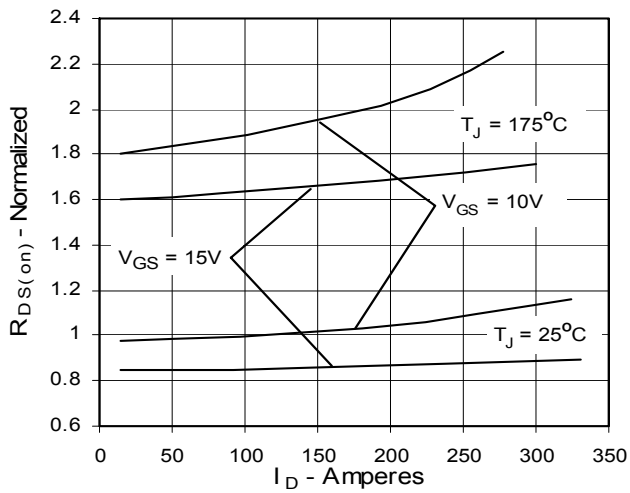


Fig. 6. Drain Current vs. Case Temperature

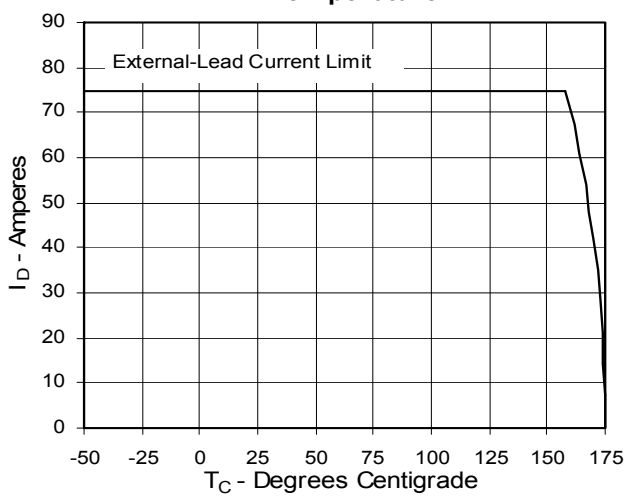


Fig. 7. Input Admittance

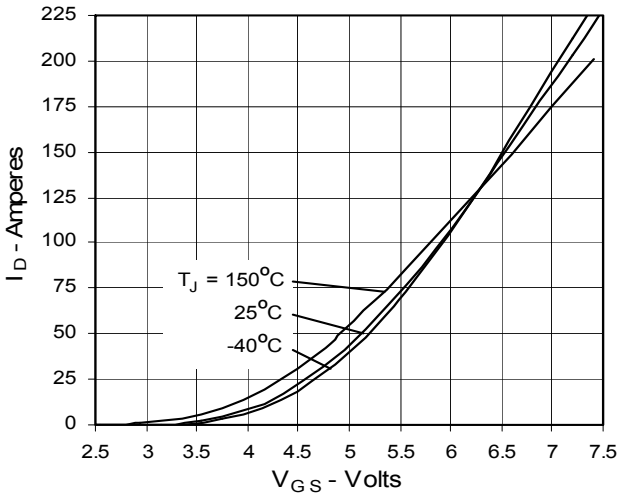


Fig. 8. Transconductance

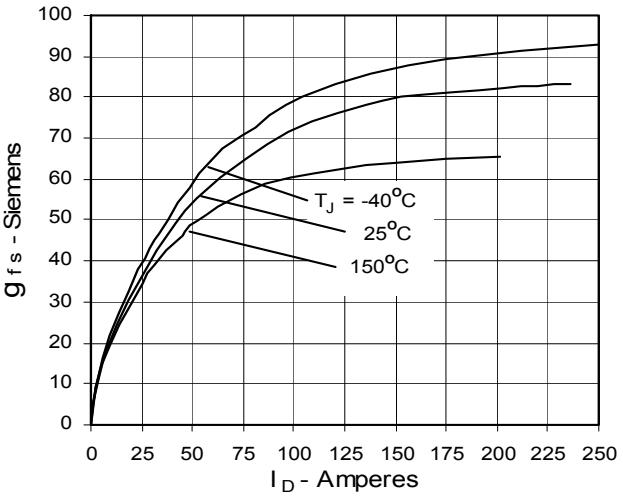


Fig. 9. Source Current vs. Source-To-Drain Voltage

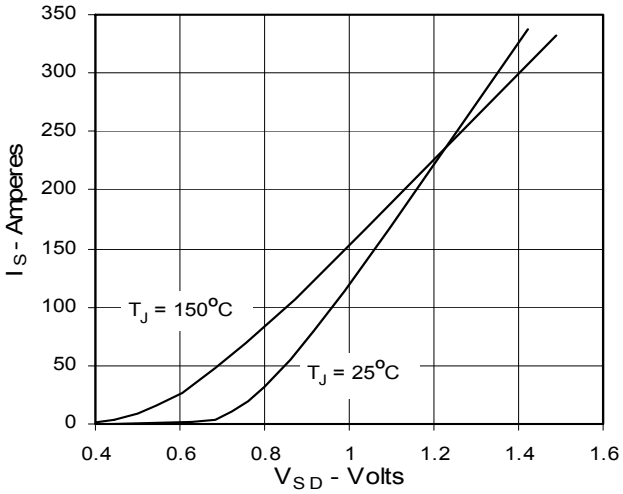


Fig. 10. Gate Charge

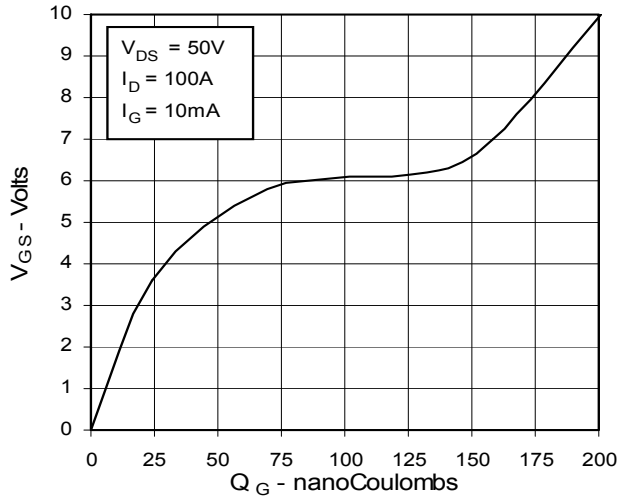


Fig. 11. Capacitance

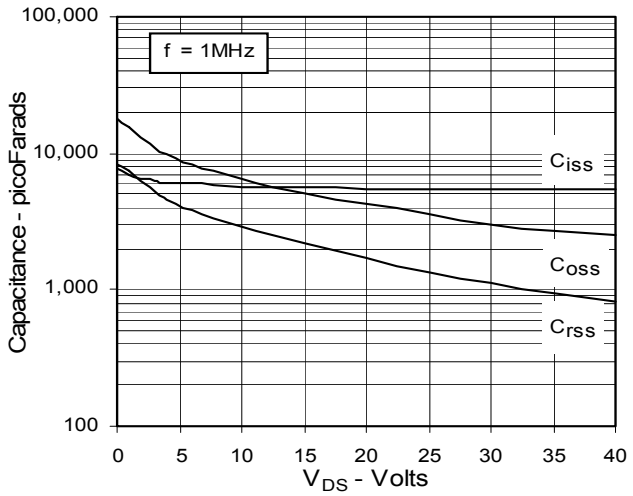


Fig. 12. Forward-Bias Safe Operating Area

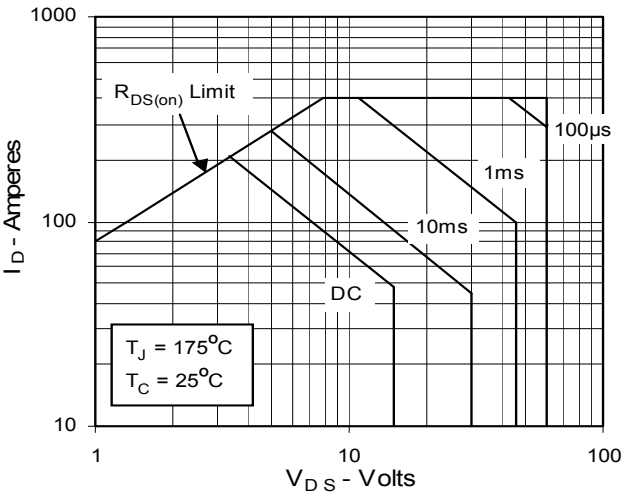


Fig. 13. Maximum Transient Thermal Resistance