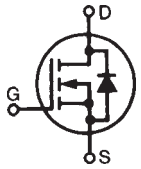
IXYS

PolarHT™ Power MOSFET

IXTK 102N30P

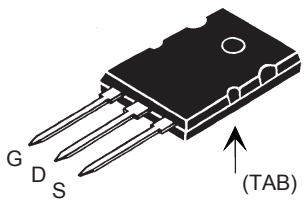
V_{DSS} = 300 V
I_{D25} = 102 A
$R_{DS(on)}$ ≤ 33 mΩ

N-Channel Enhancement Mode
Avalanche Rated



Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25° C to 150° C	300	V
V_{DGR}	T_J = 25° C to 150° C; R_{GS} = 1 MΩ	300	V
V_{GSS}	Continuous	±20	V
V_{GSM}	Transient	±30	V
I_{D25}	T_C = 25° C	102	A
$I_{D(RMS)}$	External lead current limit	75	A
I_{DM}	T_C = 25° C, pulse width limited by T_{JM}	250	A
I_{AR}	T_C = 25° C	60	A
E_{AR}	T_C = 25° C	60	mJ
E_{AS}	T_C = 25° C	2.5	J
dv/dt	$I_S \le I_{DM}$, di/dt ≤100 A/μs, $V_{DD} \le V_{DSS}$, T_J ≤150° C, R_G = 4 Ω	10	V/ns
P_D	T_C = 25° C	700	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	TO-264	10	g

TO-264 (IXTK)



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

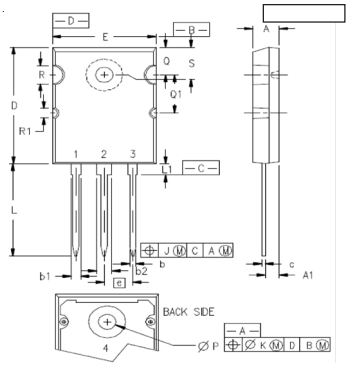
Symbol	Test Conditions (T_J = 25° C, unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
BV_{DSS}	V_{GS} = 0 V, I_D = 250 μA	300			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 500μA	2.5		5.0	V
I_{GSS}	V_{GS} = ±20 V_{DC}, V_{DS} = 0			±200	nA
I_{DSS}	$V_{DS} = V_{DSS}$ V_{GS} = 0 V			25	μA
	T_J = 125° C			250	μA
$R_{DS(on)}$	V_{GS} = 10 V, I_D = 0.5 I_{D25} Pulse test, t ≤300 μs, duty cycle d ≤ 2 %			33	mΩ

Symbol	Test Conditions (T_J = 25° C, unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS}= 10 V; I_D = 0.5 I_{D25}, pulse test	45	57		S
C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		7500		pF
C_{oss}			1150		pF
C_{rss}			230		pF
$t_{d(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 V_{DSS}, I_D = 60 A R_G = 3.3 Ω (External)		30		ns
t_r			28		ns
$t_{d(off)}$			130		ns
t_f			30		ns
$Q_{g(on)}$	V_{GS}= 10 V, V_{DS} = 0.5 V_{DSS}, I_D = 0.5 I_{D25}		224		nC
Q_{gs}			50		nC
Q_{gd}			110		nC
R_{thJC}				0.18	° C/W
R_{thCS}			0.15		° 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			102	A
I_{SM}	Repetitive			250	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		250		ns
Q_{RM}	V_R = 100 V, V_{GS} = 0 V		3.3		µC

TO-264 (IXTK) Outline



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

SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.185	.209	4.70	5.31
A1	.102	.118	2.59	3.00
b	.037	.055	0.94	1.40
b1	.087	.102	2.21	2.59
b2	.110	.126	2.79	3.20
c	.017	.029	0.43	0.74
D	1.007	1.047	25.58	26.59
E	.760	.799	19.30	20.29
e	.215BSC		5.46 BSC	
J	.000	.010	0.00	0.25
K	.000	.010	0.00	0.25
L	.779	.842	19.79	21.39
L1	.087	.102	2.21	2.59
ØP	.122	.138	3.10	3.51
Q	.240	.256	6.10	6.50
Q1	.330	.346	8.38	8.79
ØR	.155	.187	3.94	4.75
ØR1	.085	.093	2.16	2.36
S	.243	.253	6.17	6.43

Fig. 1. Output Characteristics @ 25ºC

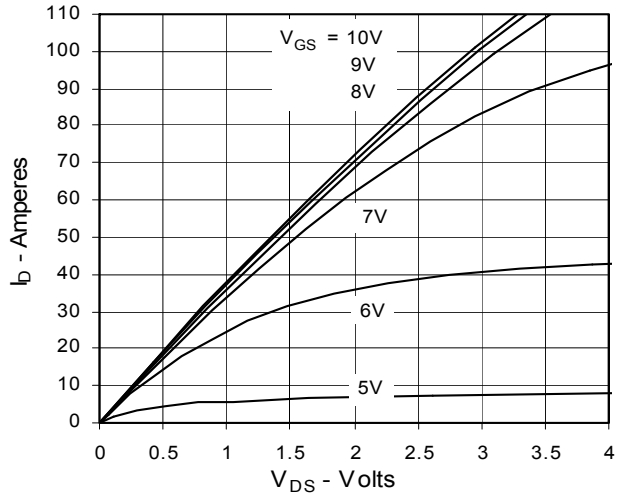


Fig. 2. Extended Output Characteristics @ 25ºC

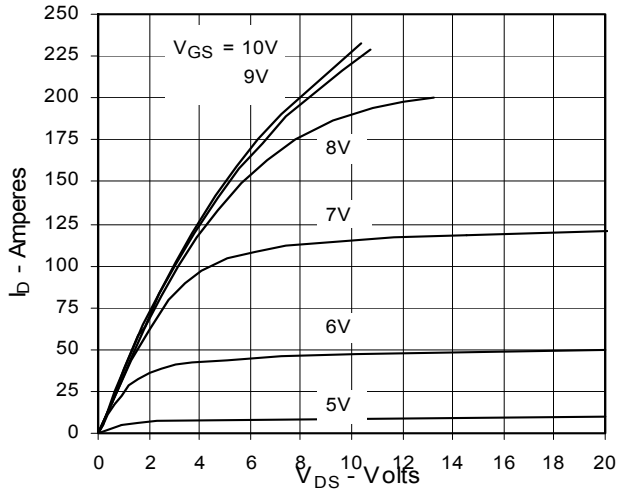


Fig. 3. Output Characteristics @ 125ºC

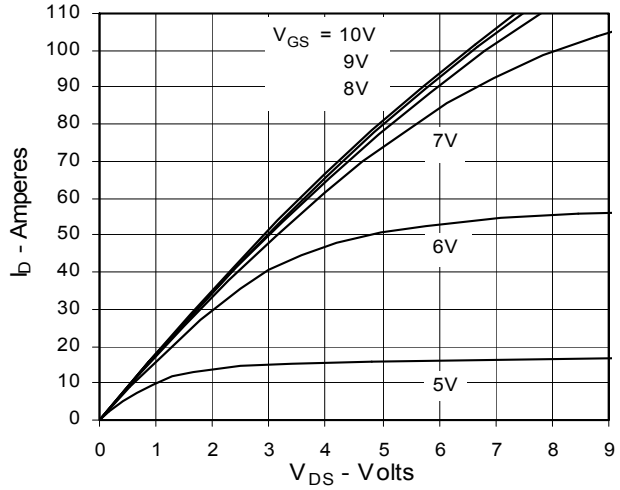


Fig. 4. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. Junction Temperature

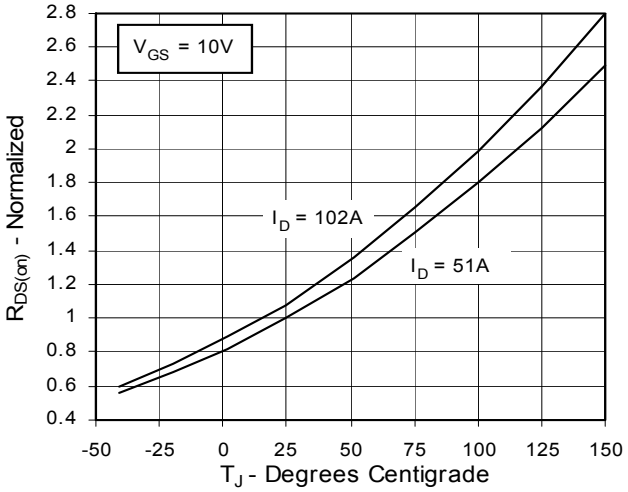


Fig. 5. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. I_D

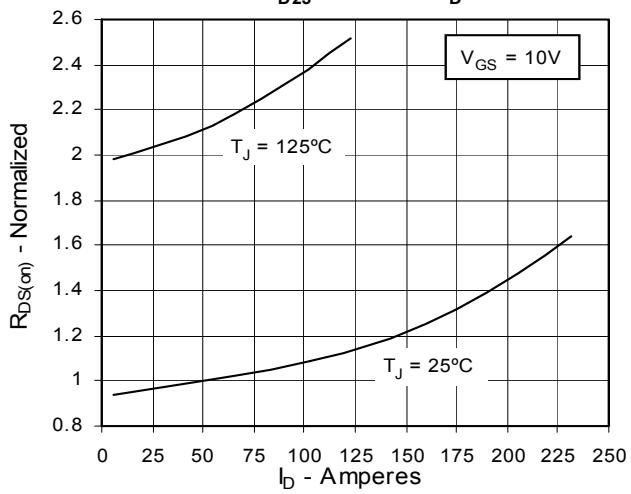


Fig. 6. Drain Current vs. Case Temperature

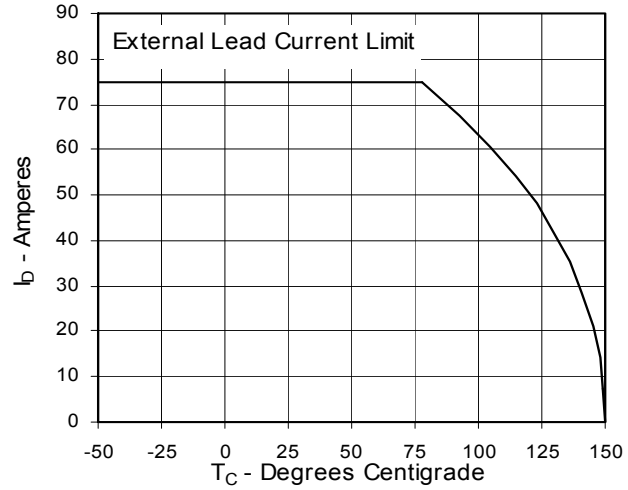


Fig. 7. Input Admittance

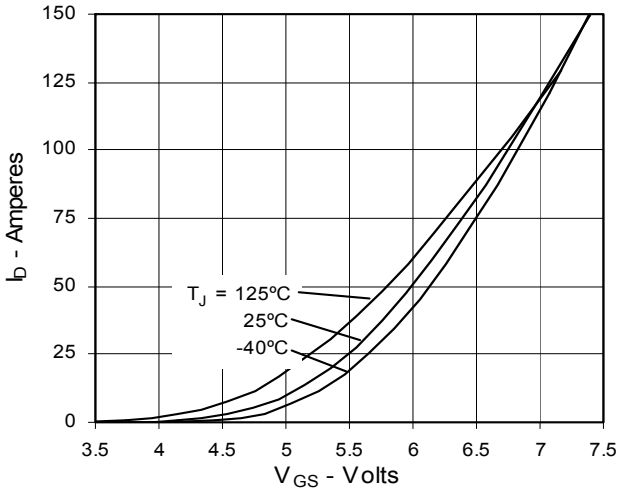


Fig. 8. Transconductance

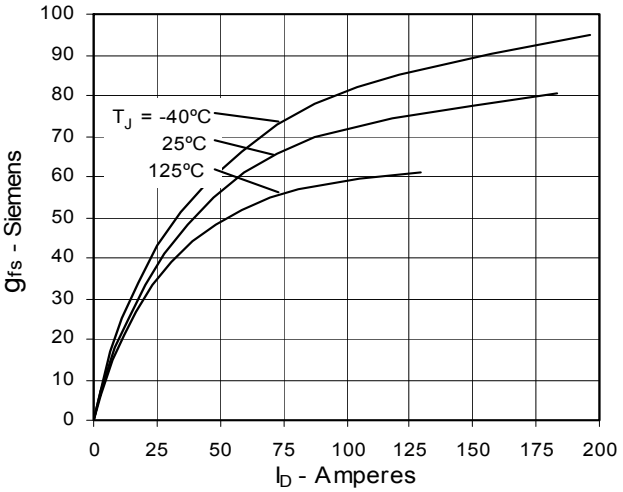


Fig. 9. Source Current vs. Source-To-Drain Voltage

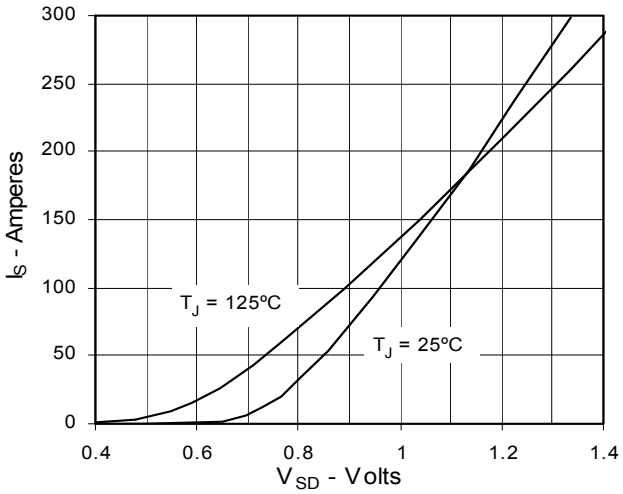


Fig. 10. Gate Charge

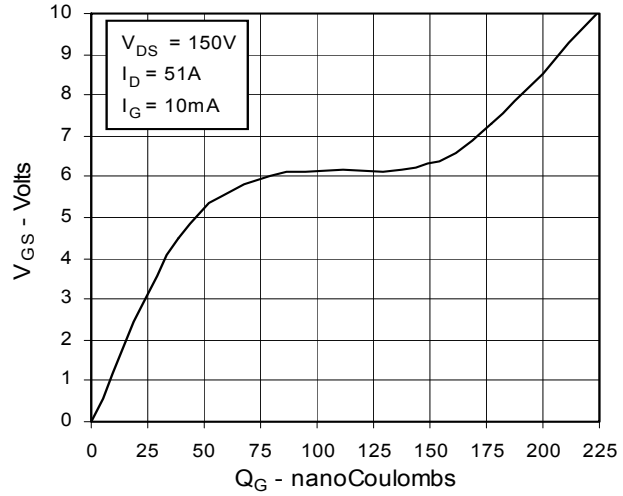


Fig. 11. Capacitance

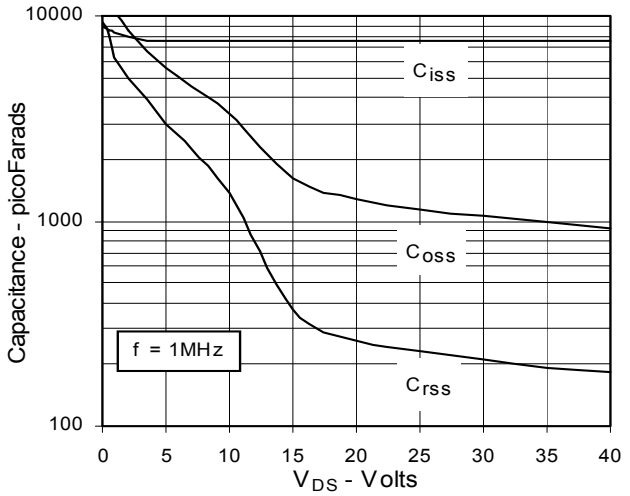


Fig. 12. Forward-Bias Safe Operating Area

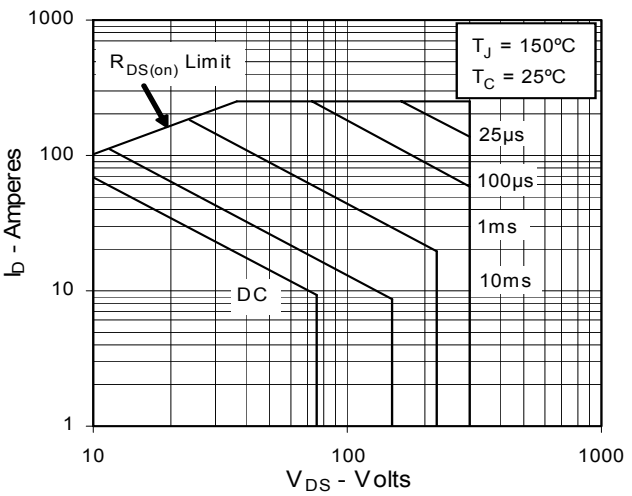


Fig. 13. Maximum Transient Thermal Resistance