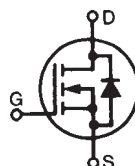


Polar™ Power MOSFET

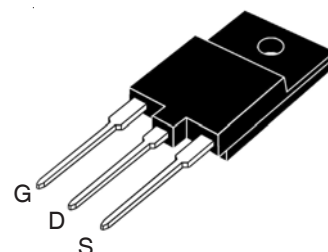
IXTQ69N30PM

$$\begin{aligned} V_{DSS} &= 300V \\ I_{D25} &= 25A \\ R_{DS(on)} &\leq 49m\Omega \end{aligned}$$

N-Channel Enhancement Mode
Avalanche Rated
Fast Intrinsic Diode



OVERMOLDED
(IXTQ...M) OUTLINE



G = Gate D = Drain
S = Source

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}$	300	V
V_{DGR}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}, R_{GS} = 1 \text{ M}\Omega$	300	V
V_{GSS}	Continuous	± 20	V
V_{GSM}	Transient	± 30	V
I_{D25}	$T_C = 25^\circ\text{C}$	25	A
I_{DM}	$T_C = 25^\circ\text{C}$, Pulse Width Limited by T_{JM}	200	A
I_A	$T_C = 25^\circ\text{C}$	69	A
E_{AS}	$T_C = 25^\circ\text{C}$	1.5	J
dv/dt	$I_S \leq I_{DM}$, $V_{DD} \leq V_{DSS}$, $T_J = 150^\circ\text{C}$	15	V/ns
P_D	$T_C = 25^\circ\text{C}$	90	W
T_J		- 55 ... +150	$^\circ\text{C}$
T_{JM}		150	$^\circ\text{C}$
T_{stg}		- 55 ... +150	$^\circ\text{C}$
T_L	1.6 mm (0.062 in.) from Case for 10 s	300	$^\circ\text{C}$
T_{SOLD}	Plastic Body for 10 s	260	$^\circ\text{C}$
M_d	Mounting Torque	1.13/10	Nm/lb.in.
Weight		2.5	g

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$, Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
BV_{DSS}	$V_{GS} = 0V$, $I_D = 250\mu\text{A}$	300		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\mu\text{A}$	2.5		5.0 V
I_{GSS}	$V_{GS} = \pm 20V$, $V_{DS} = 0V$			$\pm 100 \text{ nA}$
I_{DSS}	$V_{DS} = V_{DSS}$, $V_{GS} = 0V$ $T_J = 125^\circ\text{C}$			5 μA 100 μA
$R_{DS(on)}$	$V_{GS} = 10V$, $I_D = 34.5A$, Note 1			49 m Ω

Features

- Plastic Overmolded Tab for Electrical Isolation
- Avalanche Rated
- Fast Intrinsic Diode
- 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}	$V_{DS} = 10\text{V}$, $I_D = 34.5\text{A}$, Note 1	27	45	S
C_{iss}	$V_{GS} = 0\text{V}$, $V_{DS} = 25\text{V}$, $f = 1\text{MHz}$		4960	pF
C_{oss}			760	pF
C_{rss}			190	pF
$t_{d(on)}$	Resistive Switching Times $V_{GS} = 10\text{V}$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 34.5\text{A}$ $R_G = 4\Omega$ (External)		25	ns
t_r			25	ns
$t_{d(off)}$			75	ns
t_f			27	ns
$Q_{g(on)}$	$V_{GS} = 10\text{V}$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 34.5\text{A}$		156	nC
Q_{gs}			32	nC
Q_{gd}			79	nC
R_{thJC}				1.38 $^\circ\text{C/W}$

Source-Drain Diode

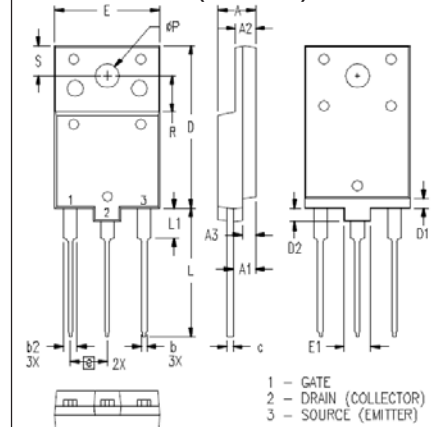
Symbol	Test Conditions ($T_J = 25^\circ\text{C}$, Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
I_S	$V_{GS} = 0\text{V}$			69 A
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}			270 A
V_{SD}	$I_F = I_S$, $V_{GS} = 0\text{V}$, Note 1			1.5 V
t_{rr}	$I_F = 25\text{A}$, $-di/dt = 100\text{A}/\mu\text{s}$ $V_R = 100\text{V}$, $V_{GS} = 0\text{V}$		250	ns
Q_{RM}			3.0	μC

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

ADVANCE 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.

OVERMOLDED (IXTQ...M) OUTLINE



SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.213	.228	5.40	5.80
A1	.122	.138	3.10	3.50
A2	.114	.130	2.90	3.30
A3	.075	.091	1.90	2.30
b	.026	.037	0.65	0.95
b2	.075	.091	1.90	2.30
c	.031	.043	0.80	1.10
D	.957	.972	24.30	24.70
D1	.051	.067	1.30	1.70
D2	.071	.087	1.80	2.20
E	.606	.622	15.40	15.80
E1	.154	.169	3.90	4.30
e	.215 BSC		5.45 BSC	
L	.748	.768	19.00	19.50
L1	.169	.185	4.30	4.70
øP	.134	.150	3.40	3.80
R	.209	.224	5.30	5.70
S	.169	.185	4.30	4.70

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	7,157,338B2
	4,850,072	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	

Fig. 1. Output Characteristics @ $T_J = 25^\circ\text{C}$

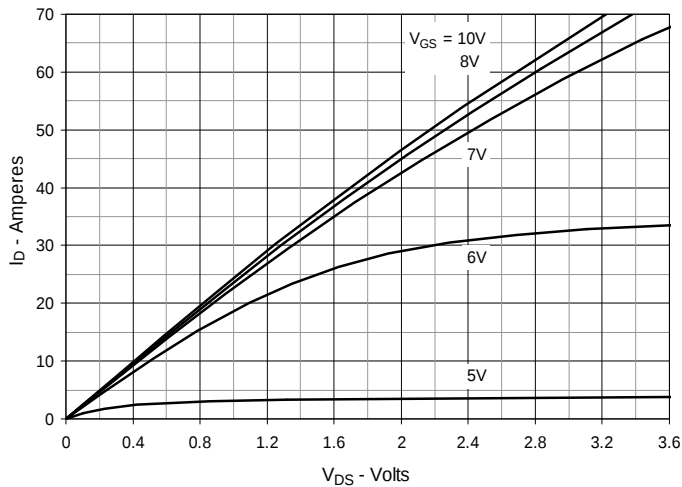


Fig. 2. Extended Output Characteristics @ $T_J = 25^\circ\text{C}$

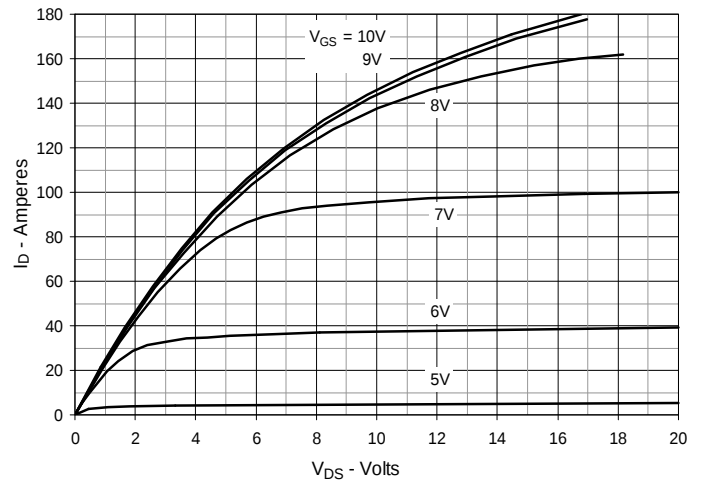


Fig. 3. Output Characteristics @ $T_J = 125^\circ\text{C}$

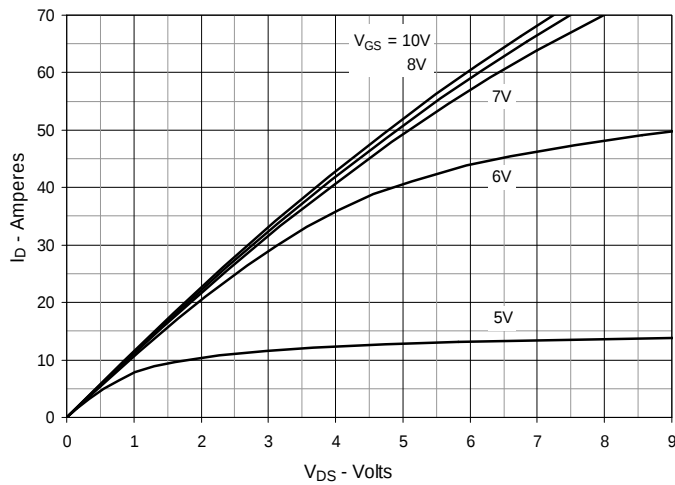


Fig. 4. $R_{DS(on)}$ Normalized to $I_D = 34.5\text{A}$ Value vs. Junction Temperature

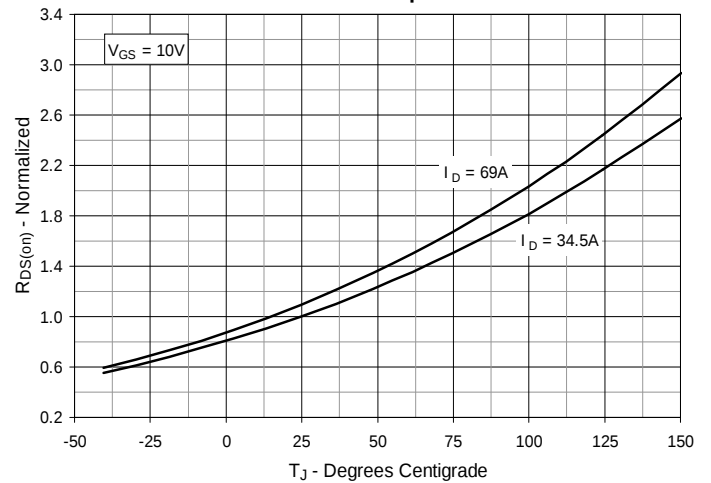


Fig. 5. $R_{DS(on)}$ Normalized to $I_D = 34.5\text{A}$ Value vs. Drain Current

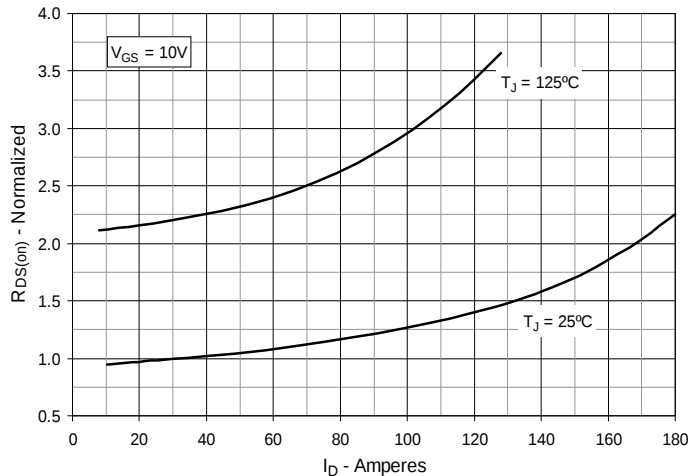


Fig. 6. Maximum Drain Current vs. Case Temperature

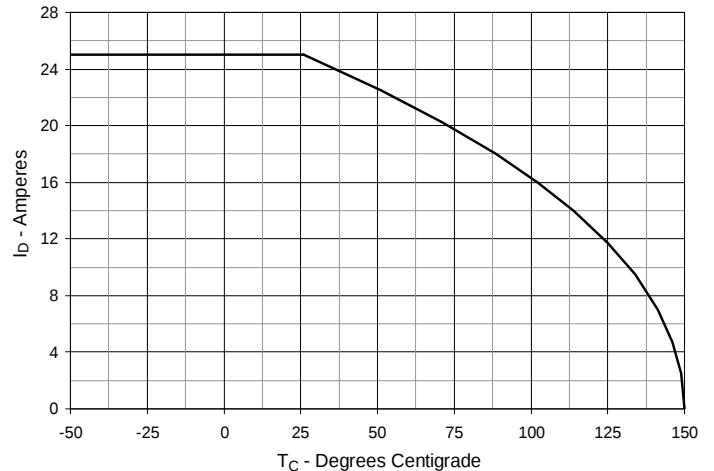


Fig. 7. Input Admittance

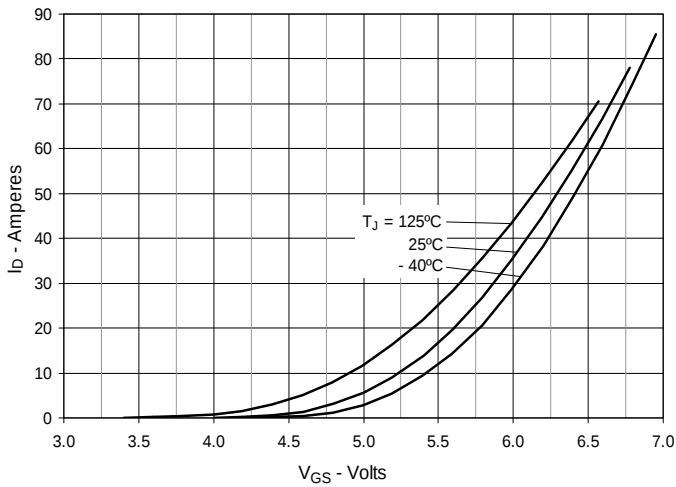


Fig. 8. Transconductance

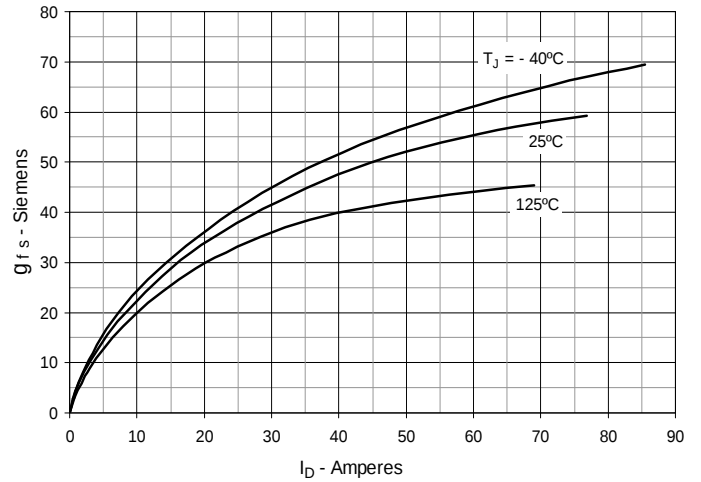


Fig. 9. Forward Voltage Drop of Intrinsic Diode

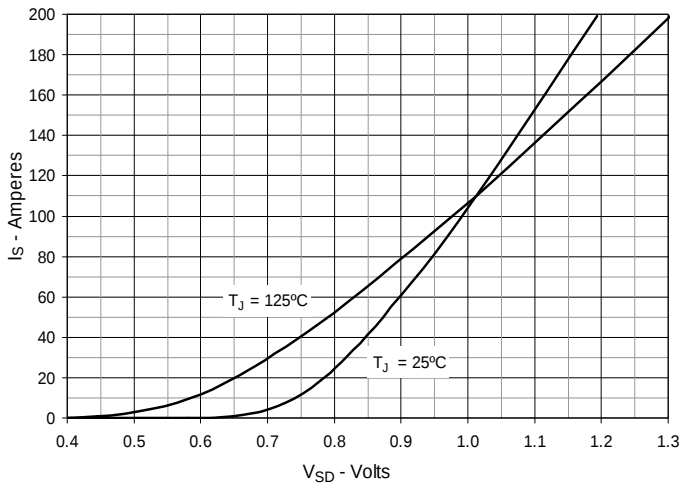


Fig. 10. Gate Charge

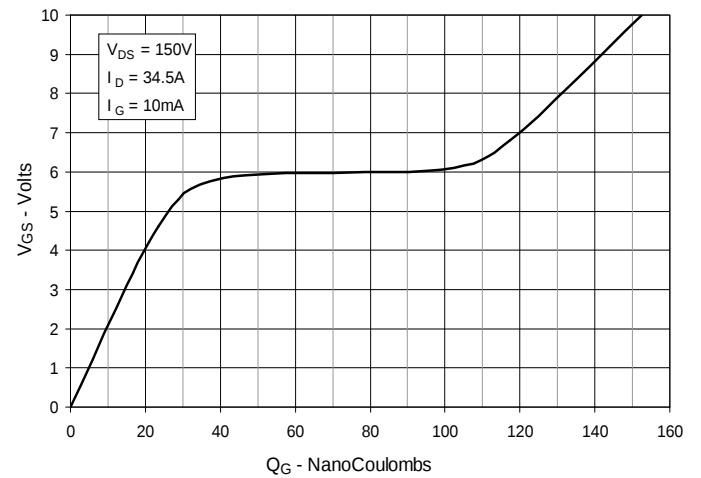


Fig. 11. Capacitance

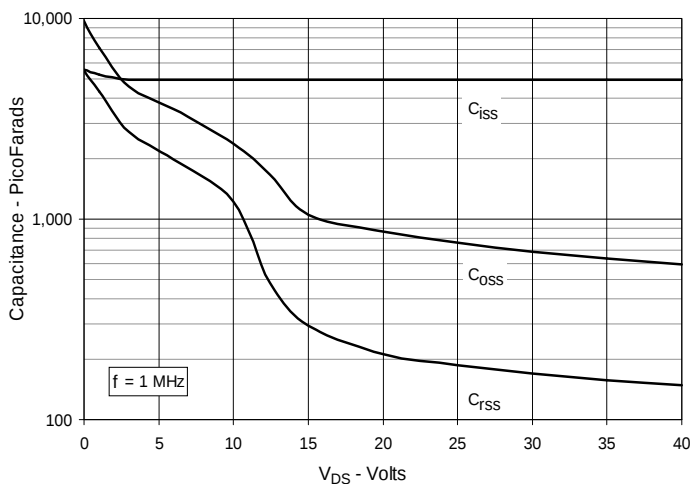


Fig. 12. Forward-Bias Safe Operating Area

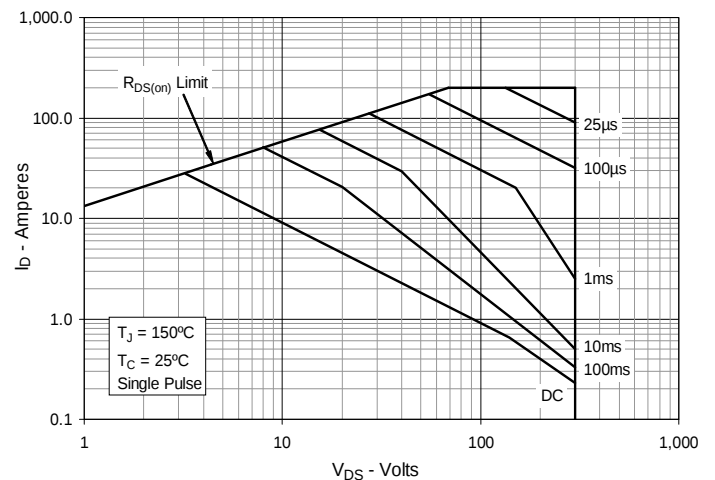
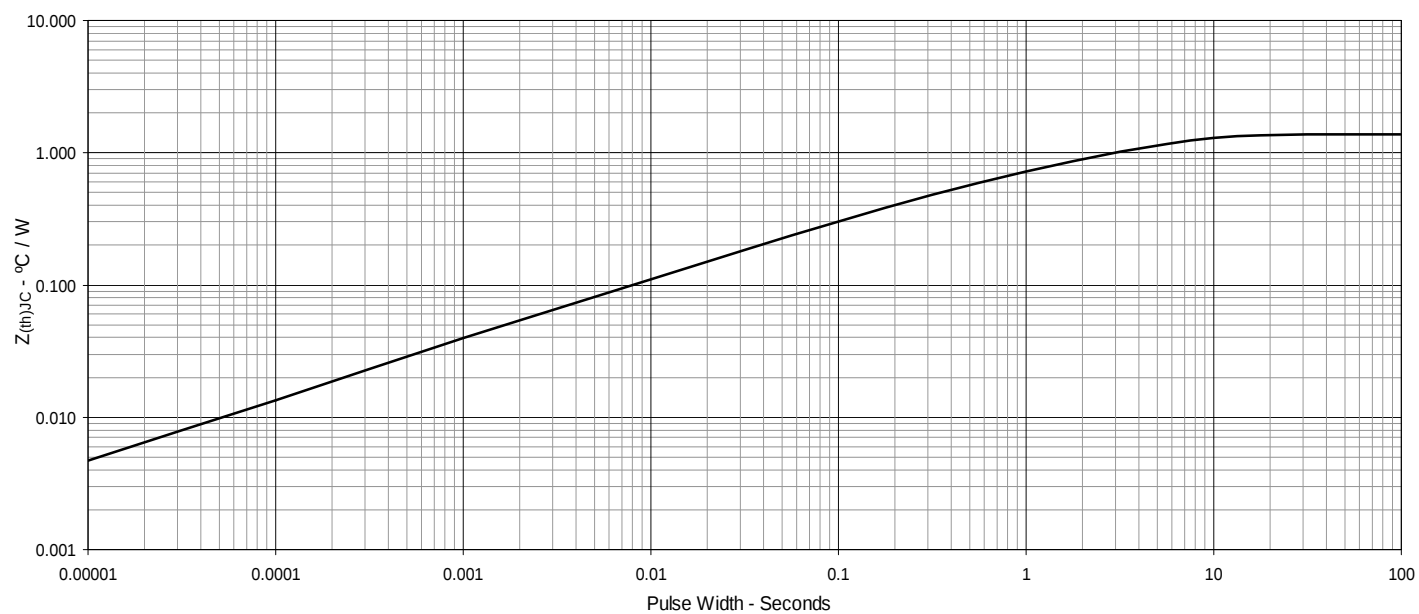


Fig. 13. Maximum Transient Thermal Impedance





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