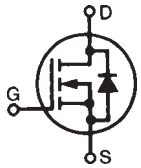
IXYS

Advance Technical Information

Polar™ Power MOSFET

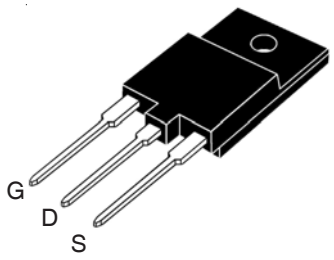
IXTQ69N30PM

V_{DSS} = 300V
I_{D25} = 25A
$R_{DS(on)}$ ≤ 49mΩ



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°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	25	A
I_{DM}	T_C = 25°C, Pulse Width Limited by T_{JM}	200	A
I_A	T_C = 25°C	69	A
E_{AS}	T_C = 25°C	1.5	J
dv/dt	$I_S \le I_{DM}$, $V_{DD} \le V_{DSS}$, T_J =150°C	15	V/ns
P_D	T_C = 25°C	90	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		2.5	g

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

Features

- Plastic Overmolded Tab for Electrical Isolation
- Avalanche Rated
- Fast Intrinsic Diode
- Low Package Inductance

Advantages

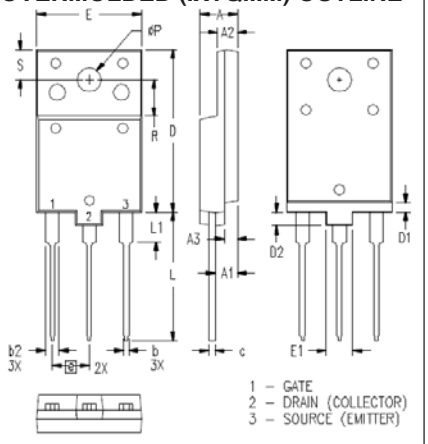
- High Power Density
- Easy to Mount
- Space Savings

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°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS} = 10V, I_D = 34.5A, Note 1	27	45		S
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		4960		pF
C_{oss}			760		pF
C_{rss}			190		pF
$t_{d(on)}$	**Resistive Switching Times**		25		ns
t_r	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 34.5A		25		ns
$t_{d(off)}$	R_G = 4Ω (External)		75		ns
t_f			27		ns
$Q_{g(on)}$	V_{GS}= 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 34.5A		156		nC
Q_{gs}			32		nC
Q_{gd}			79		nC
R_{thJC}				1.38	°C/W

OVERMOLDED (IXTQ...M) OUTLINE



SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS 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

Source-Drain Diode

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

Note 1. Pulse test, t ≤ 300μs, duty cycle, d ≤ 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.

Fig. 1. Output Characteristics @ T_J = 25ºC

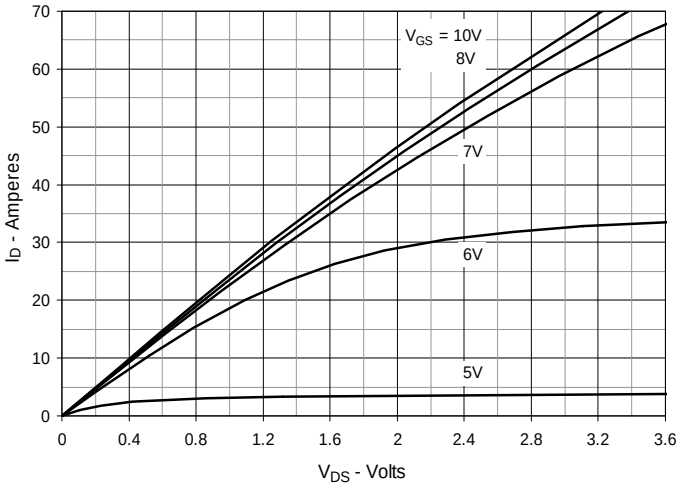


Fig. 2. Extended Output Characteristics @ T_J = 25ºC

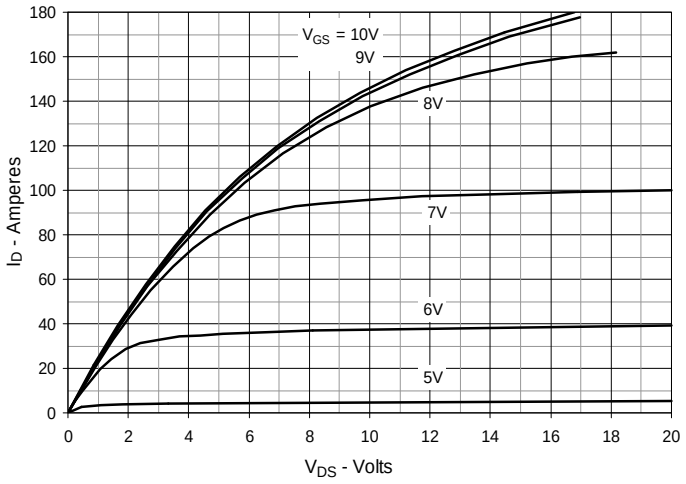


Fig. 3. Output Characteristics @ T_J = 125ºC

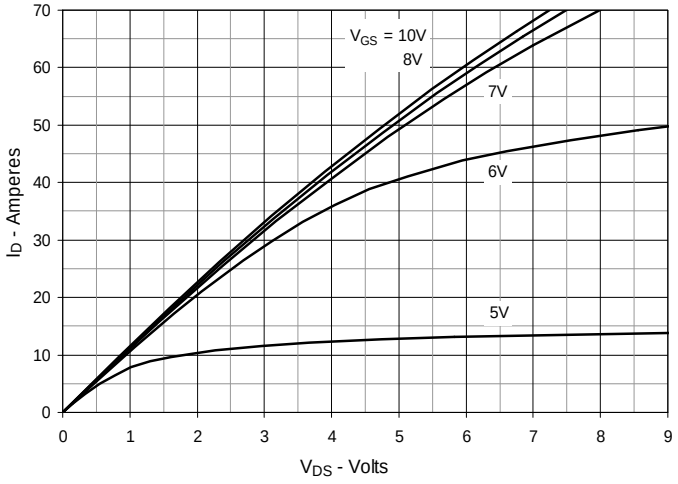


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 34.5A Value vs. Junction Temperature

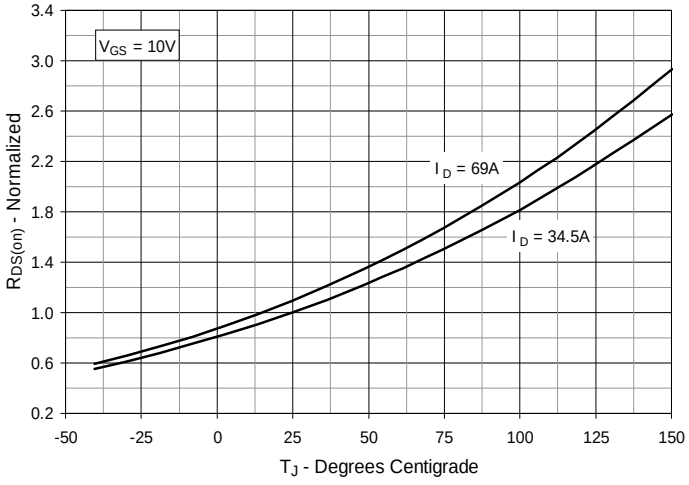


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 34.5A Value vs. Drain Current

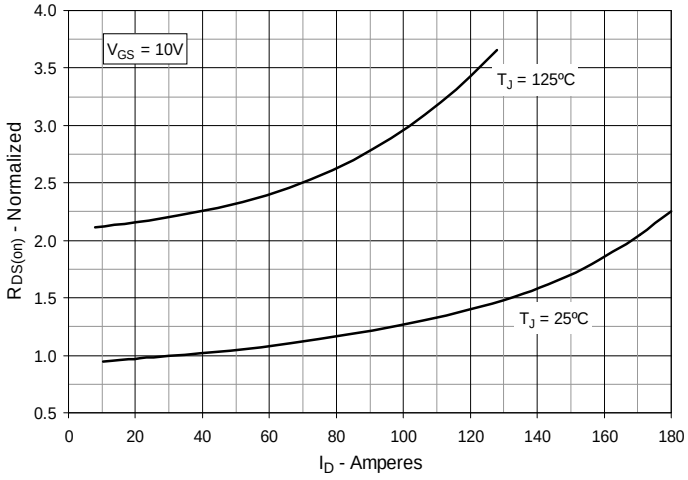


Fig. 6. Maximum Drain Current vs. Case Temperature

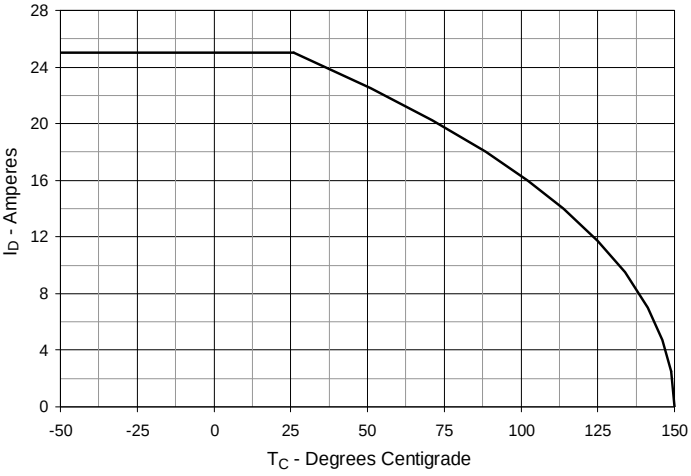


Fig. 7. Input Admittance

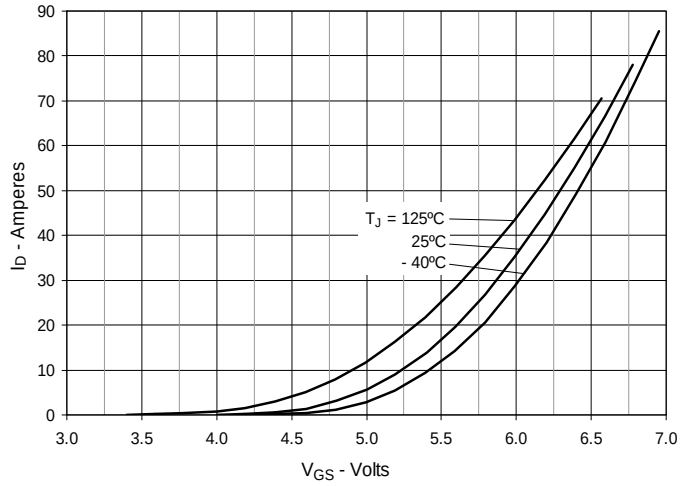


Fig. 8. Transconductance

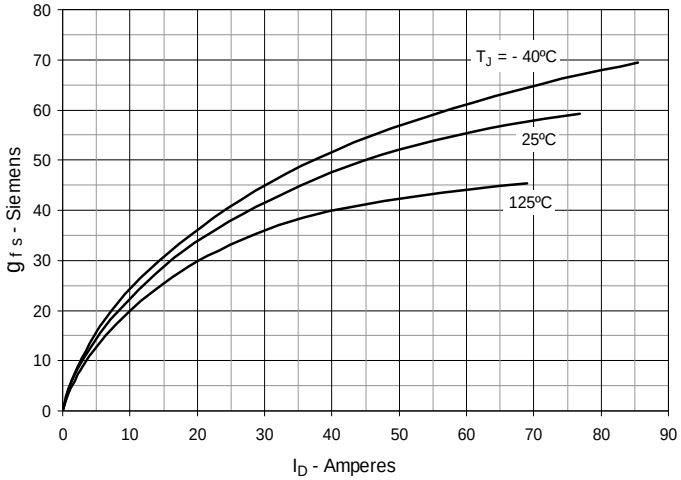


Fig. 9. Forward Voltage Drop of Intrinsic Diode

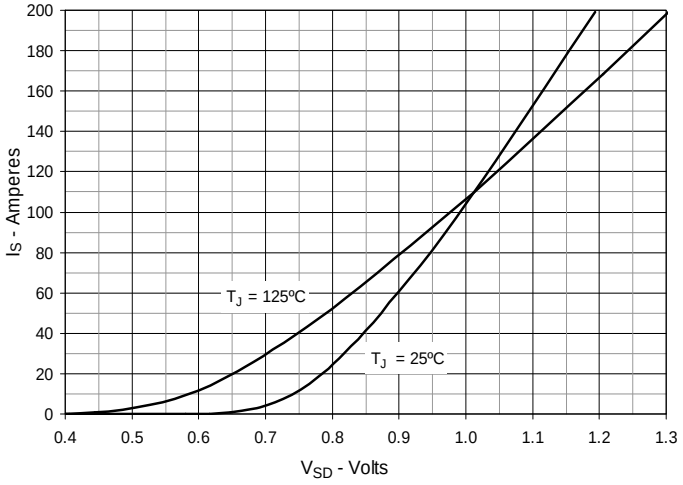


Fig. 10. Gate Charge

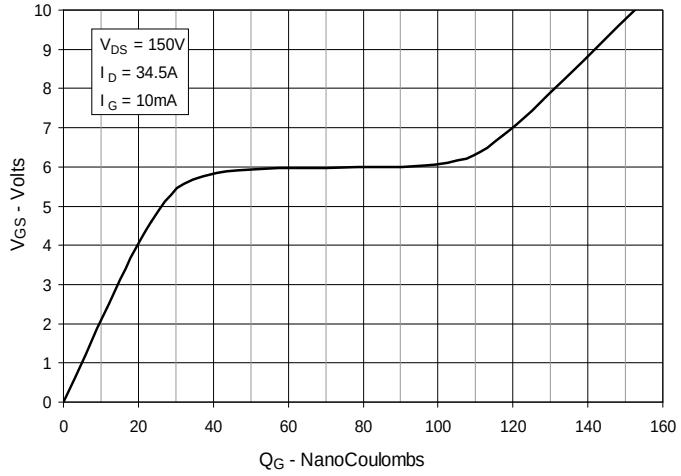


Fig. 11. Capacitance

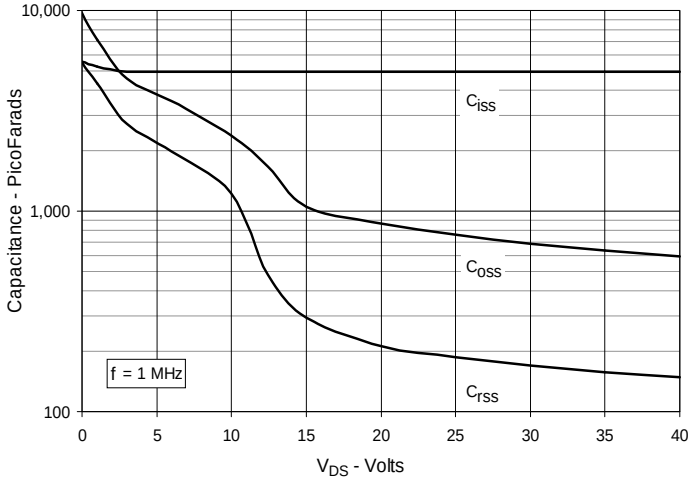


Fig. 12. Forward-Bias Safe Operating Area

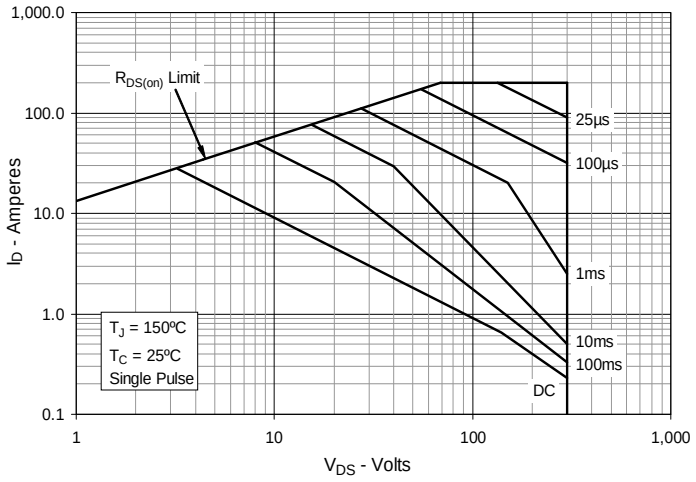


Fig. 13. Maximum Transient Thermal Impedance