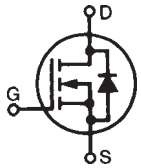
IXYS

Advance Technical Information

High Voltage Power MOSFET

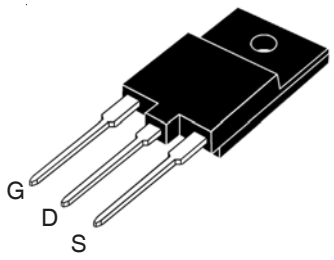
IXTQ3N150M

V_{DSS} = 1500V
I_{D25} = 1.83A
$R_{DS(on)}$ ≤ 7.3Ω



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	1500	V
V_{DGR}	T_J = 25°C to 150°C, R_{GS} = 1 MΩ	1500	V
V_{GSS}	Continuous	± 30	V
V_{GSM}	Transient	± 40	V
I_{D25}	T_C = 25°C	1.83	A
I_{DM}	T_C = 25°C, Pulse Width Limited by T_{JM}	9.00	A
I_A	T_C = 25°C	3	A
E_{AS}	T_C = 25°C	250	mJ
dv/dt	$I_S \le I_{DM}$, $V_{DD} \le V_{DSS}$, T_J =150°C	5	V/ns
P_D	T_C = 25°C	73	W
T_J		- 55 ... +150	°C
T_{JM}		150	°C
T_{stg}		- 55 ... +150	°C
T_L	Maximum Lead Temperature for Soldering	300	°C
T_{SOLD}	1.6 mm (0.062in.) from Case for 10s	260	°C
M_d	Mounting Torque	1.13/10	Nm/lb.in.
Weight		6	g

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
BV_{DSS}	V_{GS} = 0V, I_D = 250μA	1500			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 250μA	2.5		5.0	V
I_{GSS}	V_{GS} = ±30V, V_{DS} = 0V			±100	nA
I_{DSS}	$V_{DS} = V_{DSS}$, V_{GS} = 0V			10	μA
	T_J = 125°C			100	μA
$R_{DS(on)}$	V_{GS} = 10V, I_D = 1.5A, Note 1			7.3	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

- High Voltage Power Supplies
- Capacitor Discharge Applications
- Pulse Circuits

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS} = 20V, I_D = 1.5A, Note 1	2.2	3.6		S
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		1375		pF
C_{oss}			90		pF
C_{rss}			30		pF
R_{Gi}	Gate Input Resistance		3.0		Ω
$t_{d(on)}$	**Resistive Switching Times**		19		ns
t_r	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 1.5A		21		ns
$t_{d(off)}$	R_G = 5Ω (External)		42		ns
t_f			25		ns
$Q_{g(on)}$	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 1.5A		38.6		nC
Q_{gs}			6.5		nC
Q_{gd}			19.0		nC
R_{thJC}				1.7	°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} = 0V, Note1			3	A
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}			12	A
V_{SD}	I_F = I_S, V_{GS} = 0V, Note 1			1.3	V
t_{rr}	I_F = 1.5A, -di/dt = 100A/μs		0.9		μs
Q_{RM}	V_R = 100V		6.7		μC
I_{RM}			15		A

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

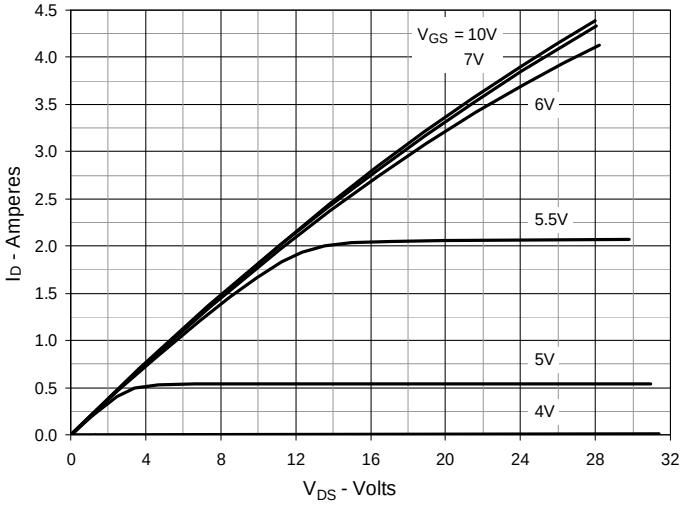


Fig. 2. Output Characteristics @ T_J = 125ºC

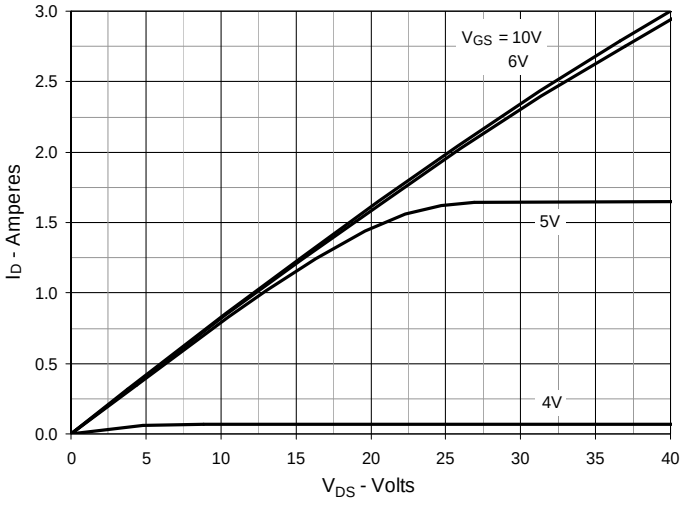


Fig. 3. $R_{DS(on)}$ Normalized to I_D = 1.5A Value vs. Junction Temperature

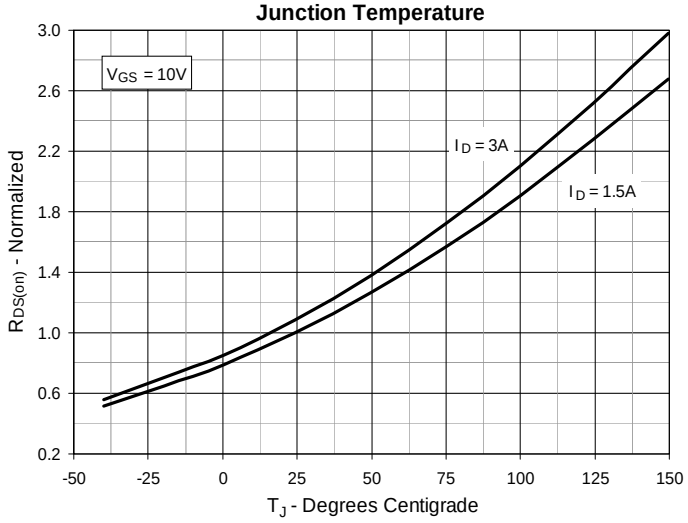


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 1.5A Value vs. Drain Current

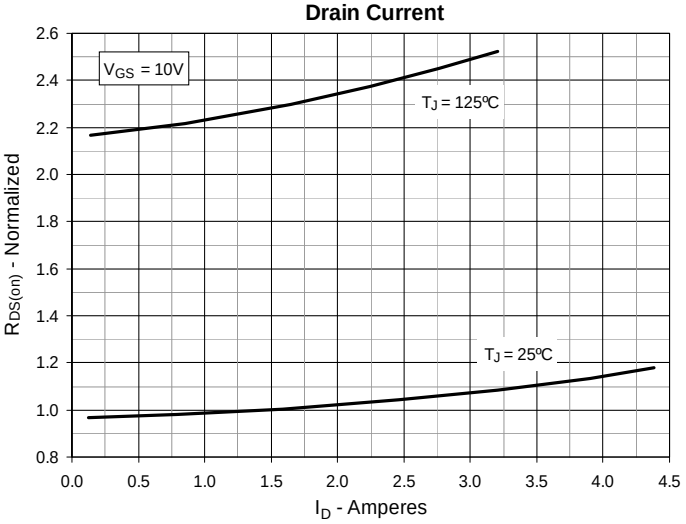


Fig. 5. Maximum Drain Current vs. Case Temperature

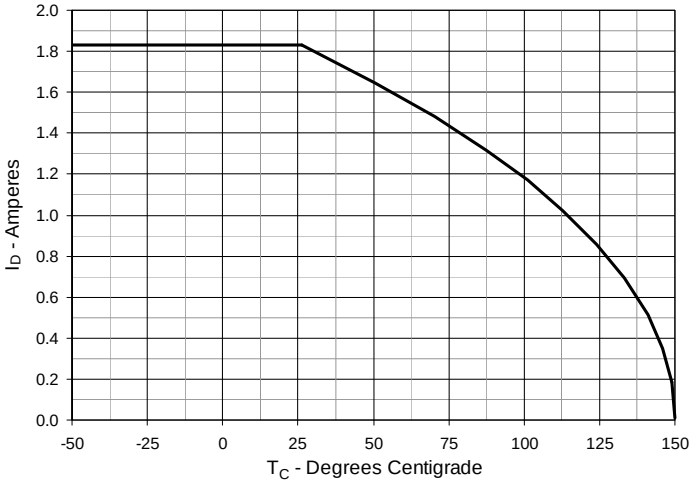


Fig. 6. Input Admittance

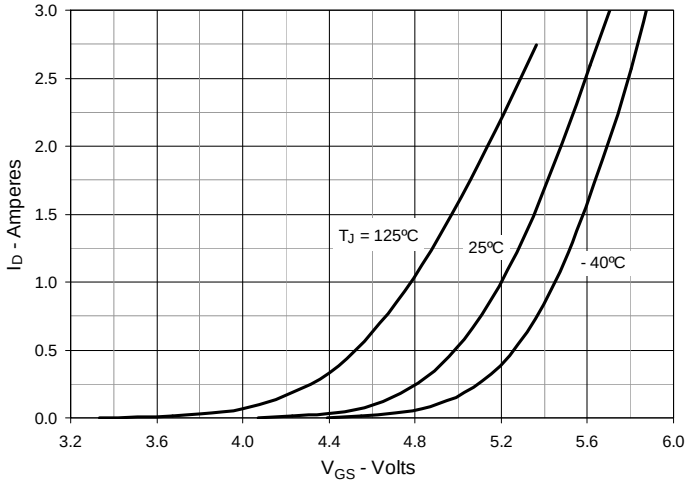


Fig. 7. Transconductance

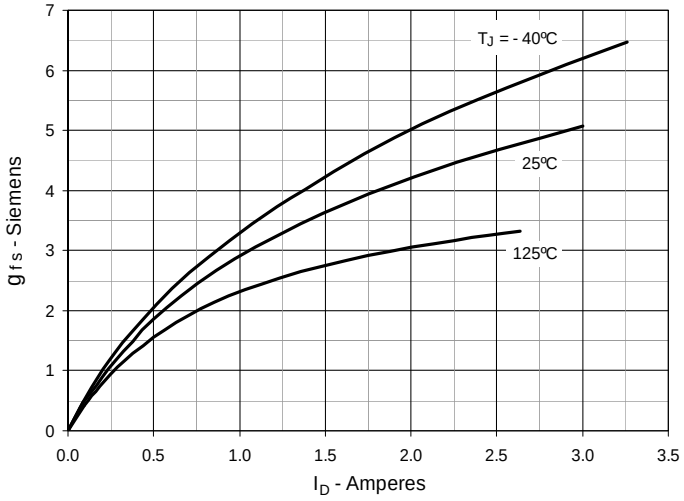


Fig. 8. Forward Voltage Drop of Intrinsic Diode

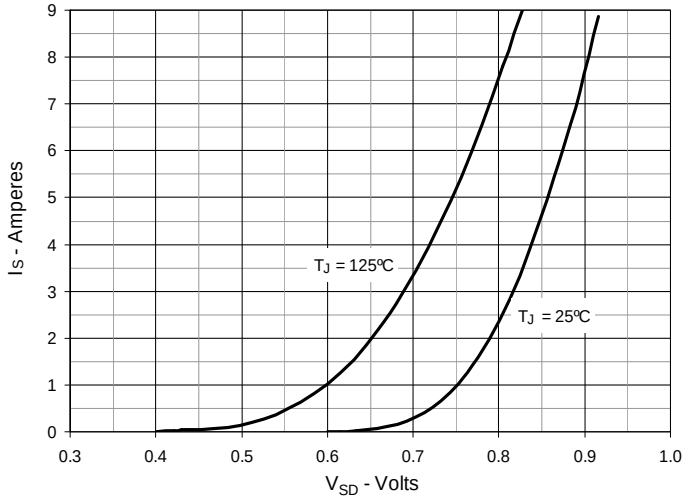


Fig. 9. Gate Charge

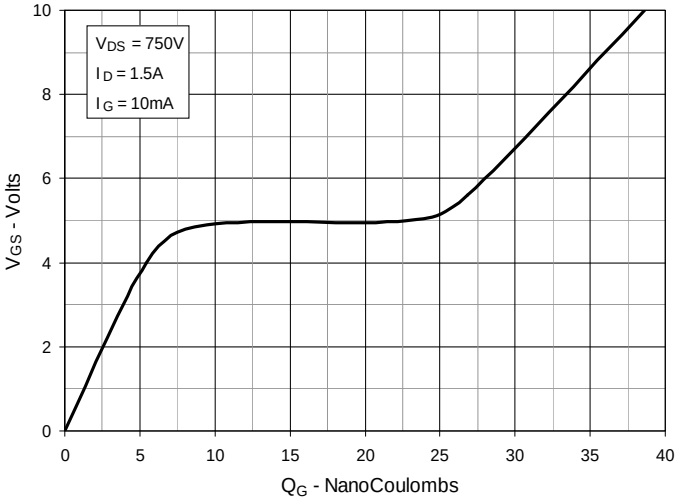


Fig. 10. Capacitance

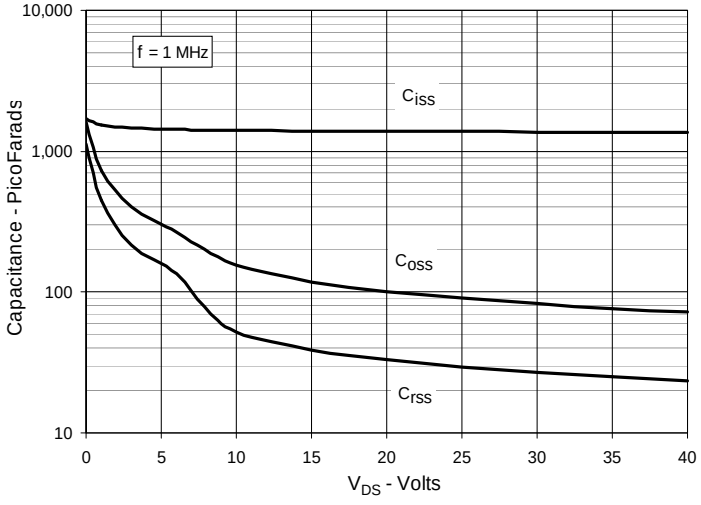


Fig. 11. Maximum Transient Thermal Impedance

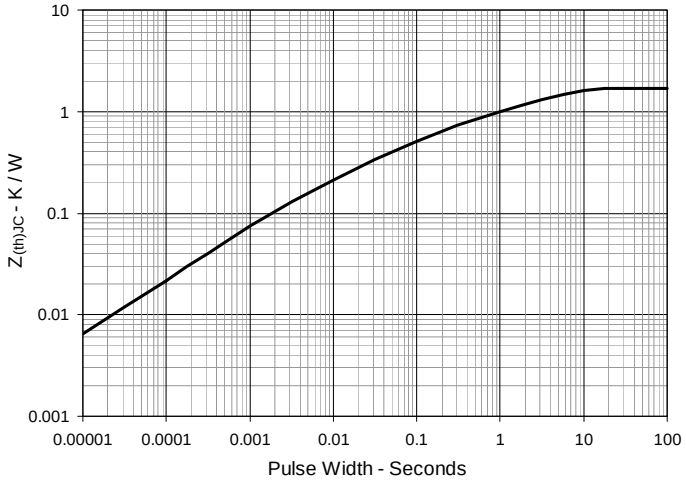
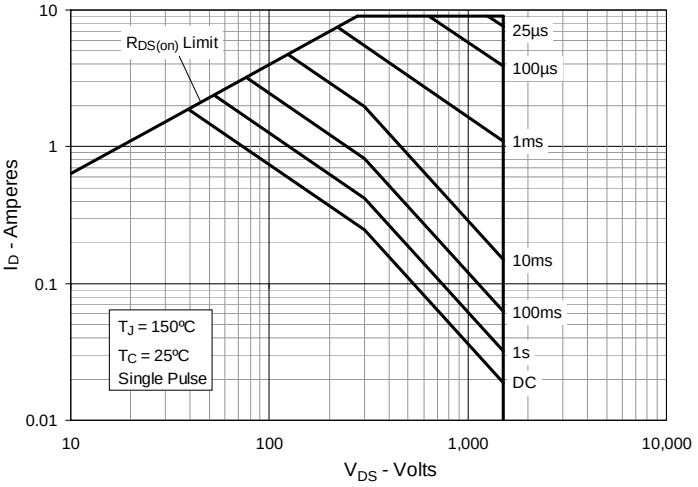
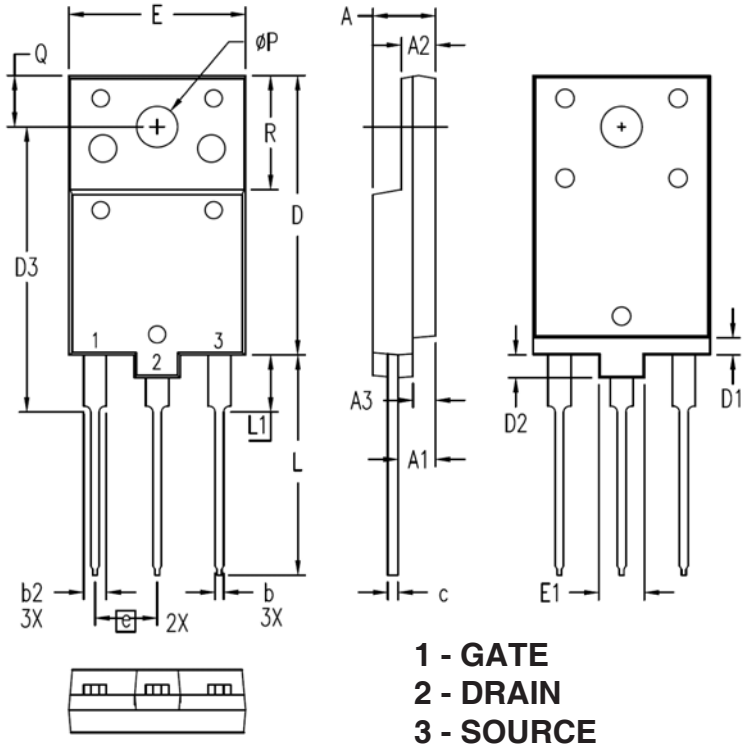


Fig. 12. Forward-Bias Safe Operating Area



OVERMOLDED (IXTQ...M) OUTLINE



1 - GATE
2 - DRAIN
3 - SOURCE

SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.208	.224	5.30	5.70
A1	.122	.138	3.10	3.50
A2	.110	.126	2.80	3.20
A3	.071	.087	1.80	2.20
b	.026	.037	0.65	0.95
b2	.071	.087	1.80	2.20
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
D3	.972	.996	24.70	25.30
E	.602	.618	15.30	15.70
E1	.150	.165	3.80	4.20
e	.215 BSC		5.45 BSC	
L	.744	.772	18.90	19.60
L1	.189	.205	4.80	5.20
øP	.134	.150	3.40	3.80
Q	.169	.185	4.30	4.70
R	.386	.401	9.80	10.20

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