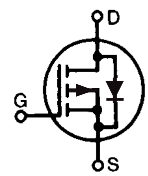
IXYS

Standard Power MOSFET

IXTH 24P20
IXTT 24P20

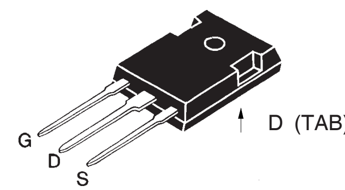
P-Channel Enhancement Mode
Avalanche Rated

V_{DSS} = - 200 V
I_{D25} = - 24 A
$R_{DS(on)}$ ≤ 0.15 Ω

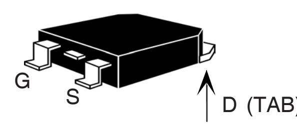


Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C	-200	V
V_{DGR}	T_J = 25°C to 150°C; R_{GS} = 1 MΩ	-200	V
V_{GS}	Continuous	±20	V
V_{GSM}	Transient	±30	V
I_{D25}	T_C = 25°C	-24	A
I_{DM}	T_C = 25°C, pulse width limited by T_J	-96	A
I_{AR}	T_C = 25°C	-24	A
E_{AR}	T_C = 25°C	30	mJ
P_D	T_C = 25°C	300	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
	Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s	400	°C
	Plastic Body for 10s	250	°C
M_d	Mounting torque (TO-247)	1.13/10	Nm/lb.in.
Weight	TO-247	6	g
	TO-268	5	g

TO-247 (IXTH)



TO-268 (IXTT)



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

Symbol	Test Conditions		Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
V_{DSS}	V_{GS} = 0 V, I_D = -250 µA		-200			V
$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250 µA		-3.0		-5.0	V
I_{GSS}	V_{GS} = ±20 V_{DC}, V_{DS} = 0				±100	nA
I_{DSS}	V_{DS} = 0.8 • V_{DSS}	T_J = 25°C			-25	µA
	V_{GS} = 0 V	T_J = 125°C			-1	mA
$R_{DS(on)}$	V_{GS} = -10 V, I_D = 0.5 • I_{D25}				0.15	Ω

Features

- International standard packages
- Low $R_{DS\ (on)}$ HDMOS™ process
- Rugged polysilicon gate cell structure
- Unclamped Inductive Switching (UIS) rated
- Low package inductance (<5 nH)
  - easy to drive and to protect

Applications

- High side switching
- Push-pull amplifiers
- DC choppers
- Automatic test equipment

Advantages

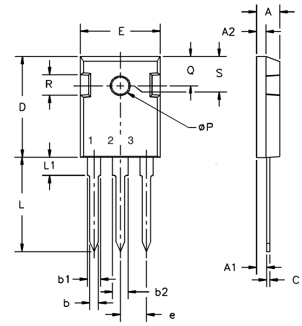
- Easy to mount with 1 screw (isolated mounting screw hole)
- Space savings
- High power density

Symbol	Test Conditions	Characteristic Values ($T_J = 25°C$, unless otherwise specified) min.	typ.	max.	
g_{fs}	V_{DS} = -10 V; $I_D = I_{D25}$, pulse test	10	15		S
C_{iss}	V_{GS} = 0 V, V_{DS} = -25 V, f = 1 MHz		4200		pF
C_{oss}			830		pF
C_{rss}			350		pF
$t_{d(on)}$	V_{GS} = -10 V, $V_{DS} = 0.5\ V_{DSS}$, $I_D = 0.5\ I_{D25}$ R_G = 4.7 Ω (External)		36		ns
t_r			29		ns
$t_{d(off)}$			68		ns
t_f			28		ns
$Q_{g(on)}$	V_{GS} = -10 V, $V_{DS} = 0.5\ V_{DSS}$, $I_D = 0.5\ I_{D25}$		150		nC
Q_{gs}			40		nC
Q_{gd}			70		nC
R_{thJC}				0.42	K/W
R_{thCS}	(TO-247)		0.25		K/W

Source-Drain Diode

Symbol	Test Conditions	Characteristic Values ($T_J = 25°C$, unless otherwise specified) min.	typ.	max.	
I_S	V_{GS} = 0			-24	A
I_{SM}	Repetitive; pulse width limited by T_{JM}			-96	A
V_{SD}	$I_F = I_S$, V_{GS} = 0 V, Pulse test, t ≤ 300 µs, duty cycle d ≤ 2 %			-3	V
t_{rr}	$I_F = I_S$, di/dt = 100 A/µs, V_R = -50 V		250		ns

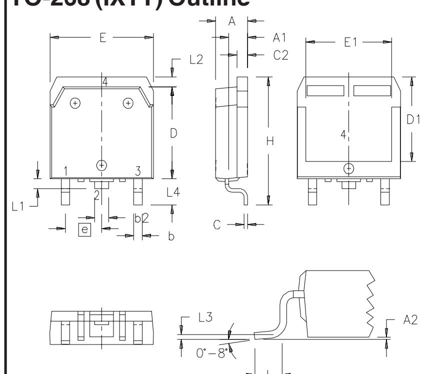
TO-247 (IXTH) Outline



Terminals: 1 - Gate 2 - Drain
3 - Source Tab - Drain

Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	4.7	5.3	.185	.209
A_1	2.2	2.54	.087	.102
A_2	2.2	2.6	.059	.098
b	1.0	1.4	.040	.055
b_1	1.65	2.13	.065	.084
b_2	2.87	3.12	.113	.123
C	.4	.8	.016	.031
D	20.80	21.46	.819	.845
E	15.75	16.26	.610	.640
e	5.20	5.72	0.205	0.225
L	19.81	20.32	.780	.800
L1		4.50		.177
∅P	3.55	3.65	.140	.144
Q	5.89	6.40	0.232	0.252
R	4.32	5.49	.170	.216
S	6.15 BSC		242 BSC	

TO-268 (IXTT) Outline



SYM	INCHES MIN	MAX	MILLIMETERS MIN	MAX
A	.193	.201	4.90	5.10
A1	.106	.114	2.70	2.90
A2	.001	.010	0.02	0.25
b	.045	.057	1.15	1.45
b2	.075	.083	1.90	2.10
C	.016	.026	0.40	0.65
C2	.057	.063	1.45	1.60
D	.543	.551	13.80	14.00
D1	.488	.500	12.40	12.70
E	.624	.632	15.85	16.05
E1	.524	.535	13.30	13.60
e	.215 BSC		5.45 BSC	
H	.736	.752	18.70	19.10
L	.094	.106	2.40	2.70
L1	.047	.055	1.20	1.40
L2	.039	.045	1.00	1.15
L3	.010 BSC		0.25 BSC	
L4	.150	.161	3.80	4.10

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 4,850,072 4,881,106 4,931,844 5,017,508 5,034,796 5,049,961 5,063,307 5,187,117 5,237,481 5,381,025 5,486,715 6,162,665 6,259,123 B1 6,306,728 B1 6,404,065 B1 6,534,343 6,583,505 6,683,344 6,710,405B2 6,710,463 6,727,585 6,759,692 6771478 B2

Fig. 1. Output Characteristics @ 25ºC

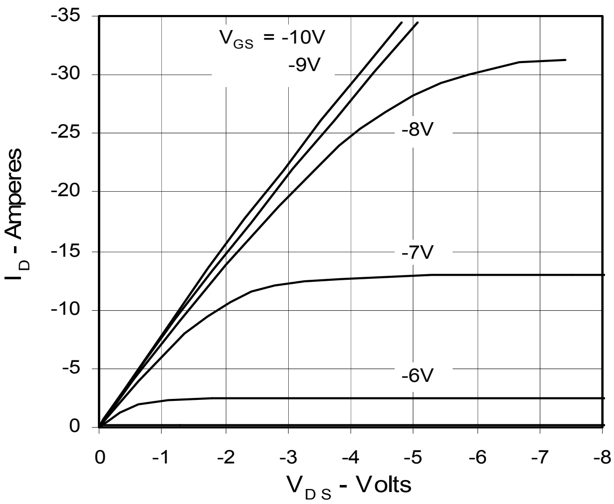


Fig. 2. Output Characteristics @ 125ºC

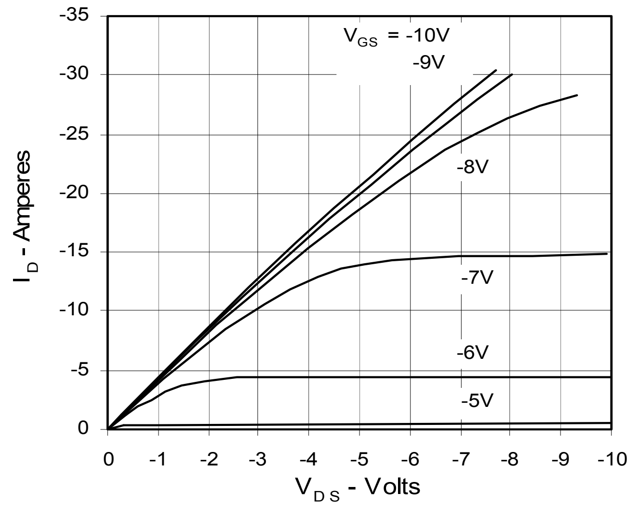


Fig. 3. $R_{DS(on)}$ Normalized to I_{D25} Value vs. Junction Temperature

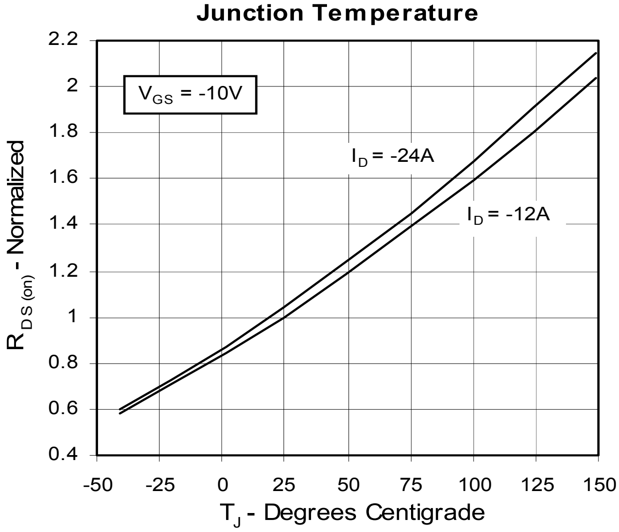


Fig. 4. $R_{DS(on)}$ Normalized to I_{D25} Value vs. I_D

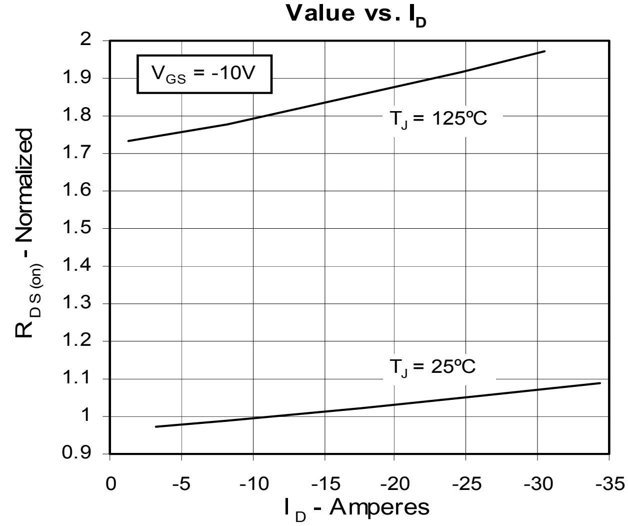


Fig. 5. Drain Current vs. Case Temperature

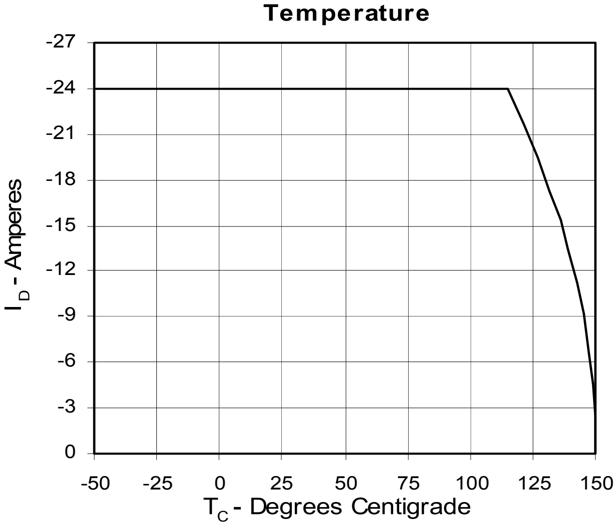


Fig. 6. Input Admittance

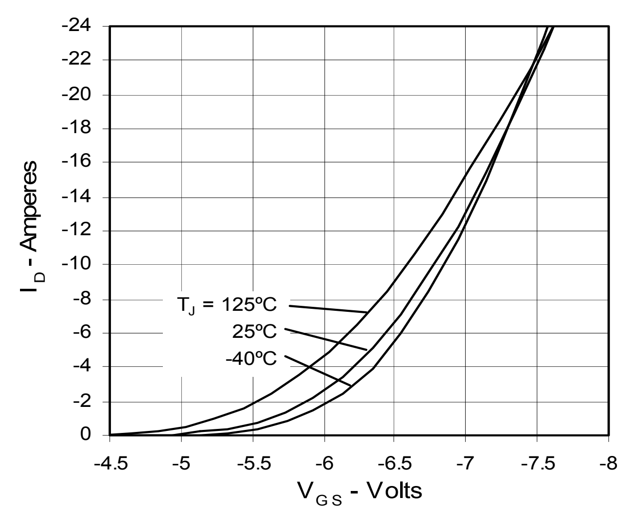


Fig. 7. Transconductance

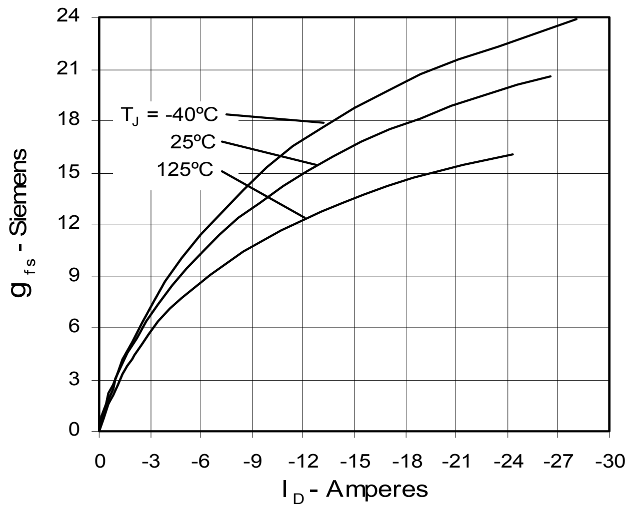


Fig. 8. Source Current vs. Source-To-Drain Voltage

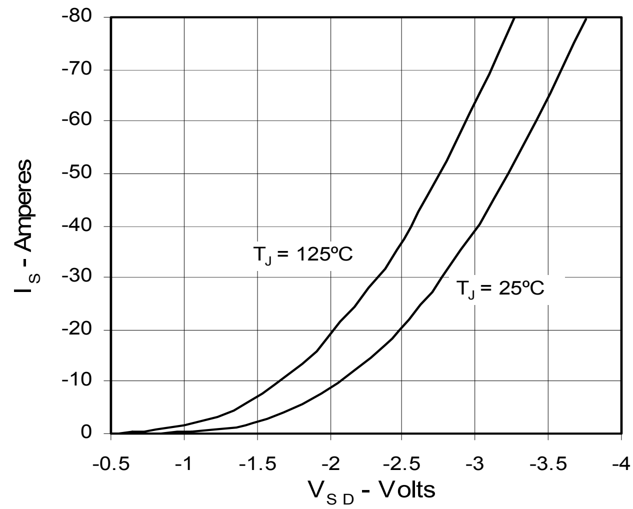


Fig. 9. Gate Charge

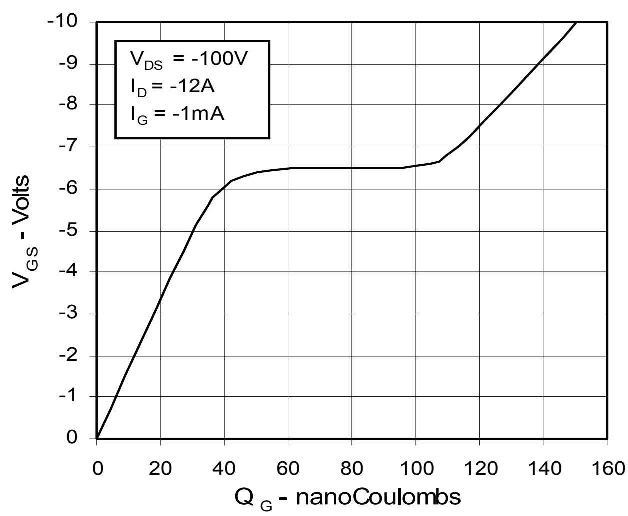


Fig. 10. Temperature dependence of Breakdown and Threshole Voltage

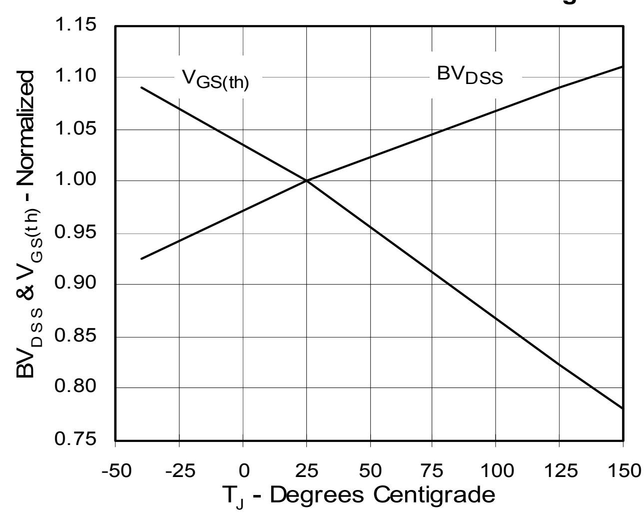


Fig. 11. Capacitance

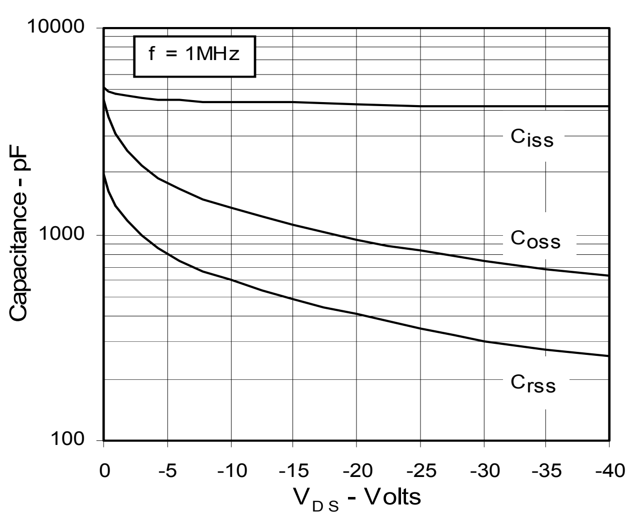


Fig. 12. Forward-Bias Safe Operating Area

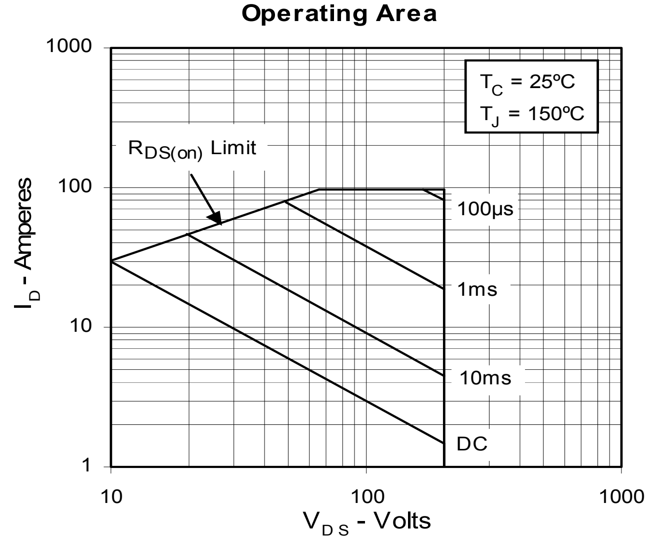


Fig. 13. Maximum Transient Thermal Resistance