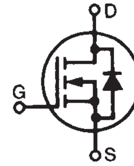
IXYS

HiPerFET™ Power MOSFETs

IXFB 50N80Q2

V_{DSS} = 800 V
I_{D25} = 50 A
$R_{DS(on)}$ = 0.15 Ω
t_{rr} ≤ 300 ns

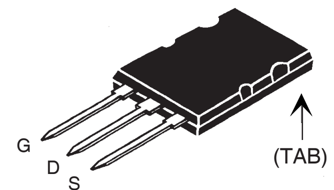
N-Channel Enhancement Mode
Avalanche Rated, Low Q_g, Low Intrinsic R_g
High dV/dt, Low t_{rr}



Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C	800	V
V_{DGR}	T_J = 25°C to 150°C; R_{GS} = 1 MΩ	800	V
V_{GS}	Continuous	±30	V
V_{GSM}	Transient	±40	V
I_{D25}	T_C = 25°C	50	A
I_{DM}	T_C = 25°C, pulse width limited by T_{JM}	200	A
I_{AR}	T_C = 25°C	50	A
E_{AR}	T_C = 25°C	60	mJ
E_{AS}	T_C = 25°C	5.0	J
dv/dt	I_S ≤ I_{DM}, di/dt ≤ 100 A/µs, V_{DD} ≤ V_{DSS} T_J ≤ 150°C, R_G = 2 Ω	20	V/ns
P_D	T_C = 25°C	890	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
T_L	1.6 mm (0.063 in.) from case for 10 s	300	°C
F_c	Mounting Force	30...120/7.5...27	N/lb
Weight		10	g

Symbol	Test Conditions		Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.
V_{DSS}	V_{GS} = 0 V, I_D = 1mA		800		V
$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 8mA		2.5		5.0 V
I_{GSS}	V_{GS} = ±30 V, V_{DS} = 0				±200 nA
I_{DSS}	V_{DS} = V_{DSS} V_{GS} = 0 V	T_J = 25°C T_J = 125°C			50 µA 3 mA
$R_{DS(on)}$	V_{GS} = 10 V, I_D = 0.5 • I_{D25} Note 1				0.15 Ω

PLUS 264™ (IXFB)



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

Features

- Double metal process for low gate resistance
- Unclamped Inductive Switching (UIS) rated
- Low package inductance
  - easy to drive and to protect
- Fast intrinsic rectifier

Applications

- DC-DC converters
- Switched-mode and resonant-mode power supplies, >500kHz switching
- DC choppers
- Pulse generation
- Laser drivers

Advantages

- PLUS 264™ package for clip or spring mounting
- Space savings
- High power density

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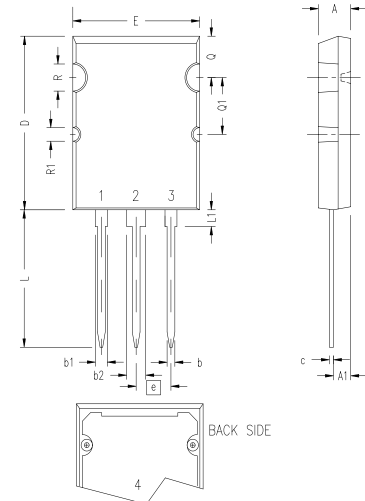
Symbol	Test Conditions		Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
g_{fs}	V_{DS} = 20 V; $I_D = 0.5 \bullet I_{D25}$	Note 1	32	48		S
C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz			7200		pF
C_{oss}				1200		pF
C_{rss}				230		pF
$t_{d(on)}$	V_{GS} = 10 V, $V_{DS} = 0.5 \bullet V_{DSS}$, $I_D = 0.5 \bullet I_{D25}$			26		ns
t_r	R_G = 1 Ω (External)			25		ns
$t_{d(off)}$				60		ns
t_f				13		ns
$Q_{G(on)}$	V_{GS} = 10 V, $V_{DS} = 0.5 \bullet V_{DSS}$, $I_D = 0.5 \bullet I_{D25}$			260		nC
Q_{GS}				56		nC
Q_{GD}				120		nC
R_{thJC}					0.14	K/W
R_{thCK}				0.13		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 V			50	A
I_{SM}	Repetitive; pulse width limited by T_{JM}			200	A
V_{SD}	$I_F = I_S$, V_{GS} = 0 V, Note 1			1.5	V
t_{rr}	I_F = 25A, -di/dt = 100 A/µs, V_R = 100 V			300	ns
Q_{RM}			1.1		µC
I_{RM}			8		A

Note: 1. Pulse test, t ≤ 300 µs, duty cycle d ≤ 2 %

PLUS 264™ Outline

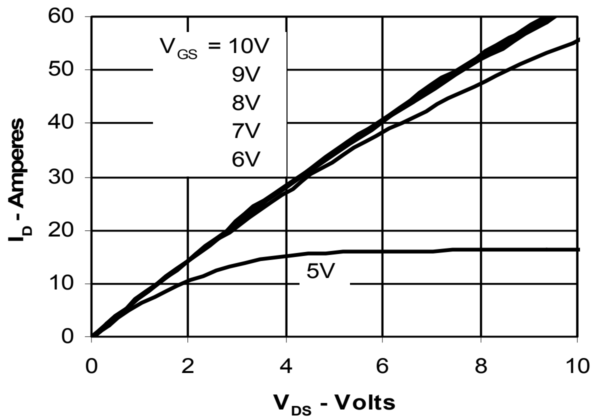


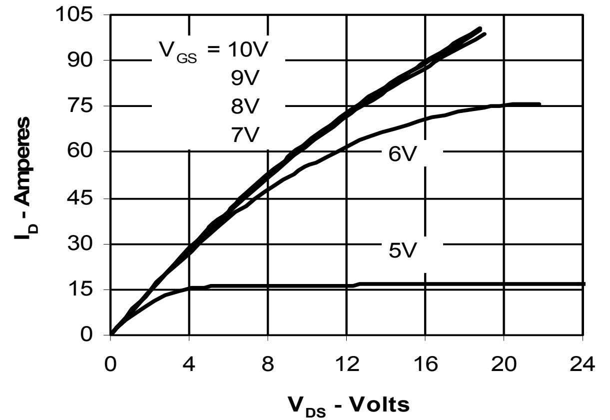
Terminals: 1 - Gate
2 - Drain (Collector)
3 - Source (Emitter)
4 - Drain (Collector)

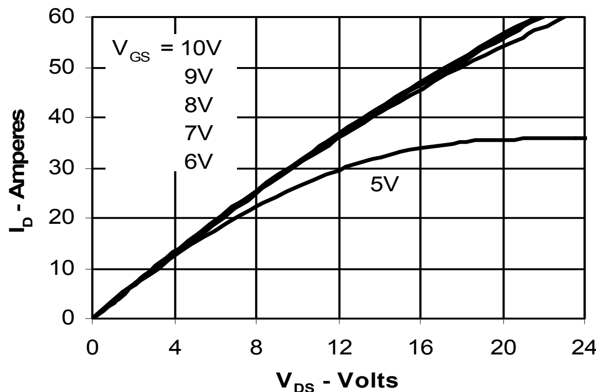
SYM	INCHES MIN	MAX
A	.185	.209
A1	.102	.118
b	.037	.055
b1	.087	.102
b2	.110	.126
c	.017	.029
D	1.007	1.047
E	.760	.799
e	.215 BSC	
L	.779	.842
L1	.087	.102
Q	.240	.256
Q1	.330	.346
ØR	.155	.187
ØR1	.085	.093

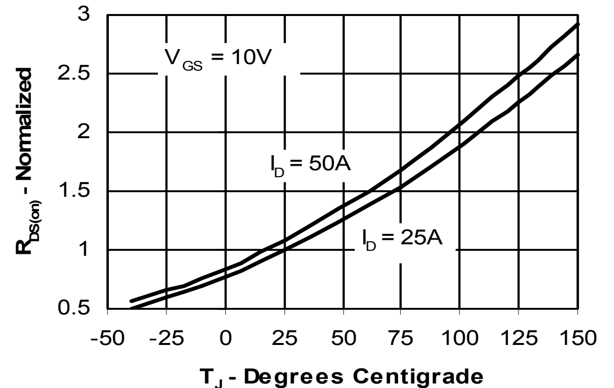
IXYS reserves the right to change limits, test conditions, and dimensions.

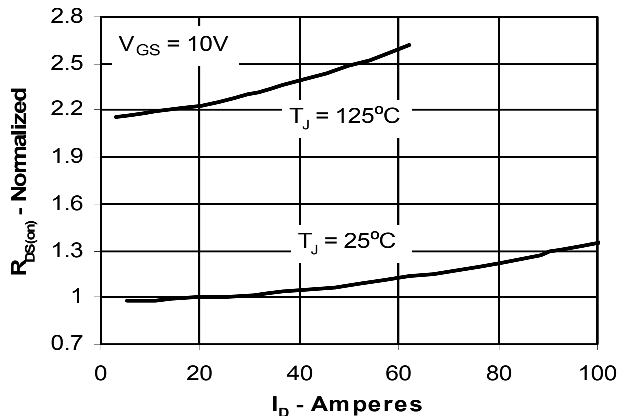
IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents: 4,835,592 4,931,844 5,049,961 5,237,481 6,162,665 6,404,065B1 6,683,344 6,727,585 4,850,072 5,017,508 5,063,307 5,381,025 6,259,123B1 6,534,343 6,710,405B2 6,759,692 4,881,106 5,034,796 5,187,117 5,486,715 6,306,728 B1 6,583,505 6,710,463











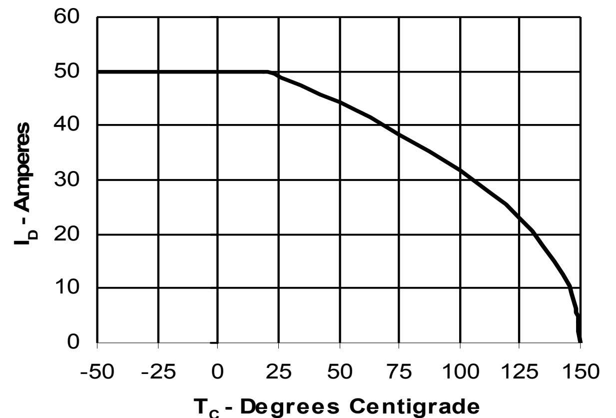


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Fig. 7. Input Admittance

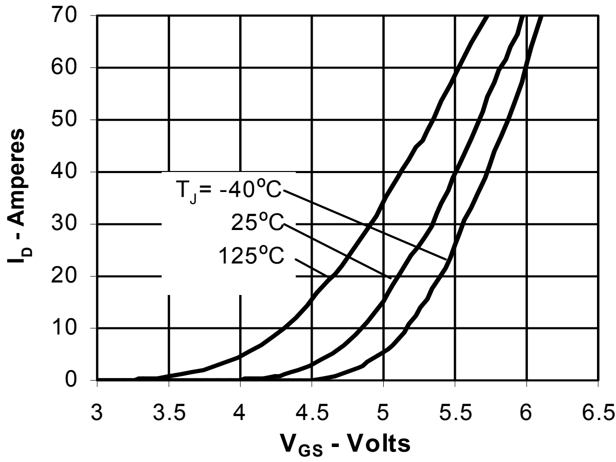


Fig. 8. Transconductance

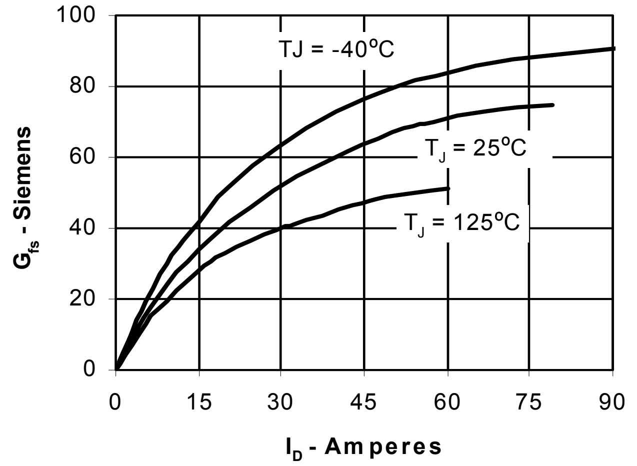


Fig. 9. Source Current vs. Source-To-Drain Voltage

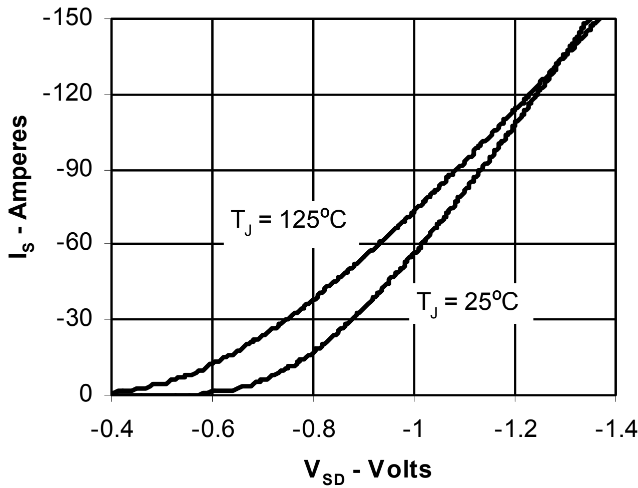


Fig. 10. Gate Charge

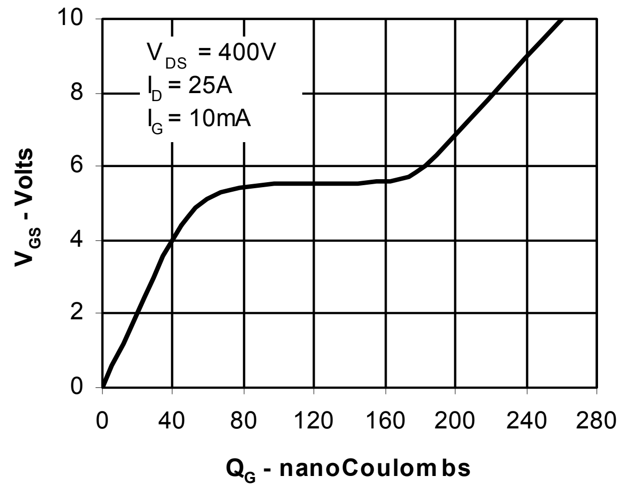


Fig. 11. Capacitance

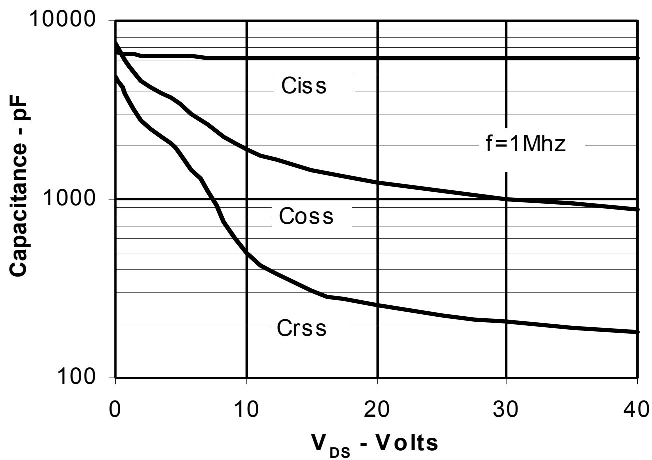
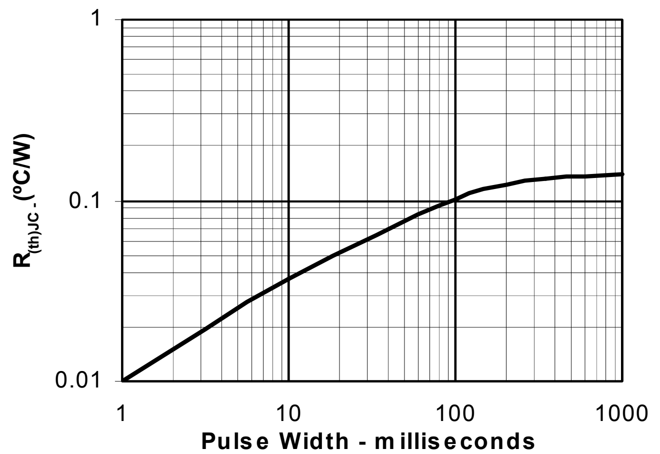


Fig. 12. Maximum Transient Thermal Resistance



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