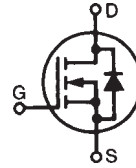


# HiPerFET™ Power MOSFETs

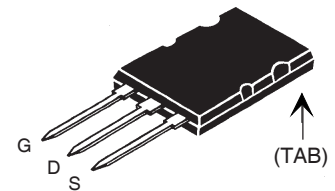
## IXFB 50N80Q2

$V_{DSS} = 800\text{ V}$   
 $I_{D25} = 50\text{ A}$   
 $R_{DS(on)} = 0.15\ \Omega$   
 $t_{rr} \leq 300\text{ ns}$

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



PLUS 264™ (IXFB)



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

Symbol	Test Conditions	Maximum Ratings	
$V_{DSS}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$	800	V
$V_{DGR}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$ ; $R_{GS} = 1\text{ M}\Omega$	800	V
$V_{GS}$	Continuous	$\pm 30$	V
$V_{GSM}$	Transient	$\pm 40$	V
$I_{D25}$	$T_C = 25^\circ\text{C}$	50	A
$I_{DM}$	$T_C = 25^\circ\text{C}$ , pulse width limited by $T_{JM}$	200	A
$I_{AR}$	$T_C = 25^\circ\text{C}$	50	A
$E_{AR}$	$T_C = 25^\circ\text{C}$	60	mJ
$E_{AS}$	$T_C = 25^\circ\text{C}$	5.0	J
$dv/dt$	$I_S \leq I_{DM}$ , $di/dt \leq 100\text{ A}/\mu\text{s}$ , $V_{DD} \leq V_{DSS}$ $T_J \leq 150^\circ\text{C}$ , $R_g = 2\ \Omega$	20	V/ns
$P_D$	$T_C = 25^\circ\text{C}$	890	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 (0.063 in.) from case for 10 s	300	$^\circ\text{C}$
$F_c$	Mounting Force	30...120/7.5...27 N/lb	
<b>Weight</b>		10	g

### 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

Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)		
		min.	typ.	max.
$V_{DSS}$	$V_{GS} = 0\text{ V}$ , $I_D = 1\text{ mA}$	800		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = 8\text{ mA}$	2.5		5.0 V
$I_{GSS}$	$V_{GS} = \pm 30\text{ V}$ , $V_{DS} = 0$			$\pm 200\text{ nA}$
$I_{DSS}$	$V_{DS} = V_{DSS}$ $V_{GS} = 0\text{ V}$			50 $\mu\text{A}$ 3 mA
$R_{DS(on)}$	$V_{GS} = 10\text{ V}$ , $I_D = 0.5 \cdot I_{D25}$ Note 1			0.15 $\Omega$

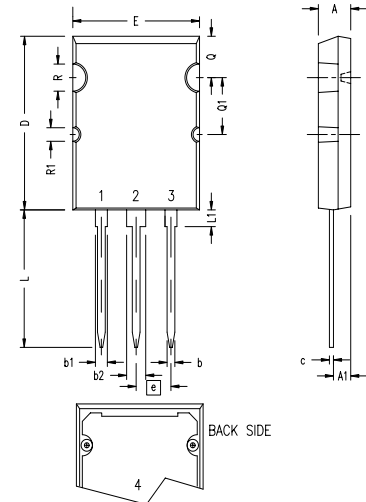
Symbol	Test Conditions	Characteristic Values		
		(T <sub>J</sub> = 25°C, unless otherwise specified)		
		min.	typ.	max.
g <sub>fs</sub>	V <sub>DS</sub> = 20 V; I <sub>D</sub> = 0.5 • I <sub>D25</sub> Note 1	32	48	S
C <sub>iss</sub>	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 25 V, f = 1 MHz		7200	pF
C <sub>oss</sub>			1200	pF
C <sub>rss</sub>			230	pF
t <sub>d(on)</sub>	V <sub>GS</sub> = 10 V, V <sub>DS</sub> = 0.5 • V <sub>DSS</sub> , I <sub>D</sub> = 0.5 • I <sub>D25</sub> R <sub>G</sub> = 1 Ω (External)		26	ns
t <sub>r</sub>			25	ns
t <sub>d(off)</sub>			60	ns
t <sub>f</sub>			13	ns
Q <sub>G(on)</sub>	V <sub>GS</sub> = 10 V, V <sub>DS</sub> = 0.5 • V <sub>DSS</sub> , I <sub>D</sub> = 0.5 • I <sub>D25</sub>		260	nC
Q <sub>GS</sub>			56	nC
Q <sub>GD</sub>			120	nC
R <sub>thJC</sub>			0.14	K/W
R <sub>thCK</sub>			0.13	K/W

### Source-Drain Diode

Symbol	Test Conditions	Characteristic Values		
		(T <sub>J</sub> = 25°C, unless otherwise specified)		
		min.	typ.	max.
I <sub>S</sub>	V <sub>GS</sub> = 0 V			50 A
I <sub>SM</sub>	Repetitive; pulse width limited by T <sub>JM</sub>			200 A
V <sub>SD</sub>	I <sub>F</sub> = I <sub>S</sub> , V <sub>GS</sub> = 0 V, Note 1			1.5 V
t <sub>rr</sub>	I <sub>F</sub> = 25A -di/dt = 100 A/μs V <sub>R</sub> = 100 V			300 ns
Q <sub>RM</sub>			1.1	μC
I <sub>RM</sub>			8	A

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

### PLUS 264™ Outline



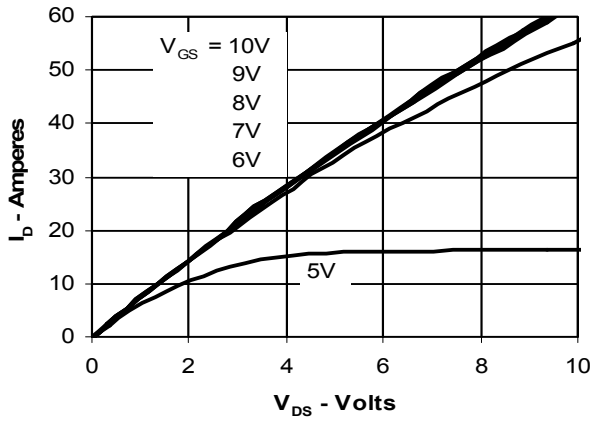
- Terminals: 1 - Gate  
2 - Drain (Collector)  
3 - Source (Emitter)  
4 - Drain (Collector)

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

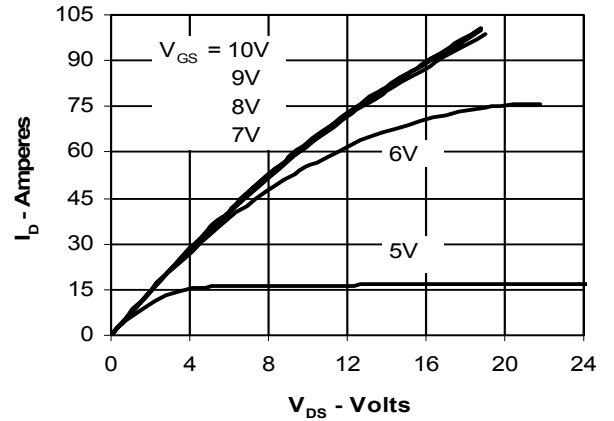
IXYS reserves the right to change limits, test conditions, and dimensions.

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	

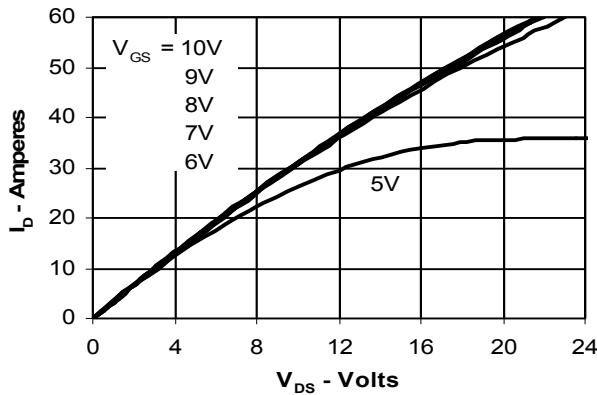
**Fig. 1. Output Characteristics @ 25 Deg. C**



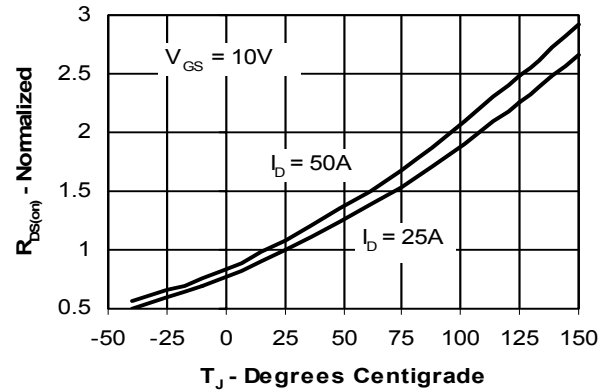
**Fig. 2. Extended Output Characteristics @ 25 deg. C**



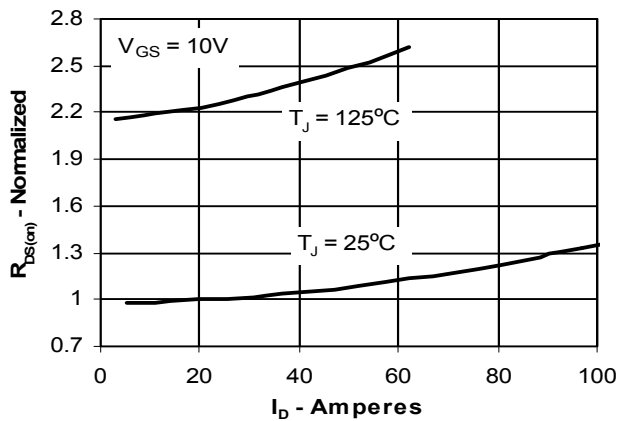
**Fig. 3. Output Characteristics @ 125 Deg. C**



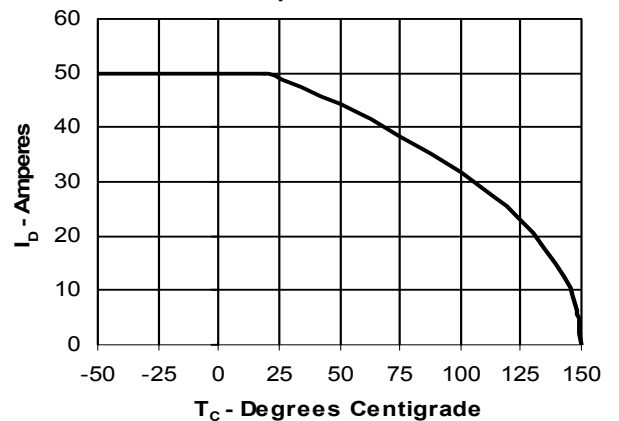
**Fig. 4.  $R_{DS(on)}$  Normalized to  $I_{D25}$  Value vs. Junction Temperature**

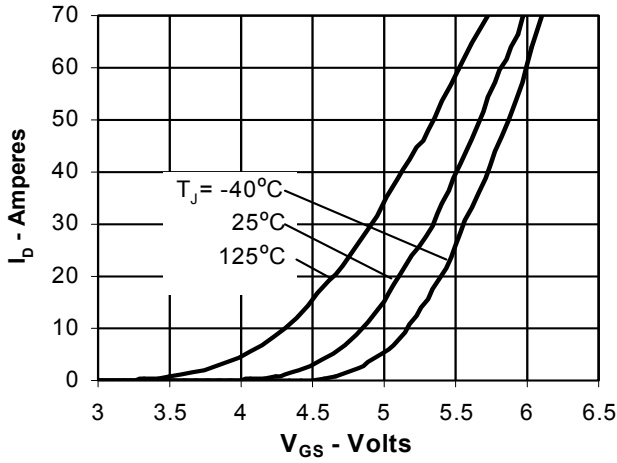
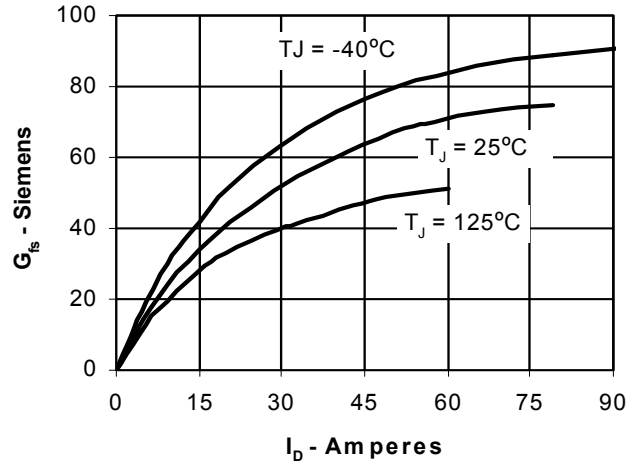
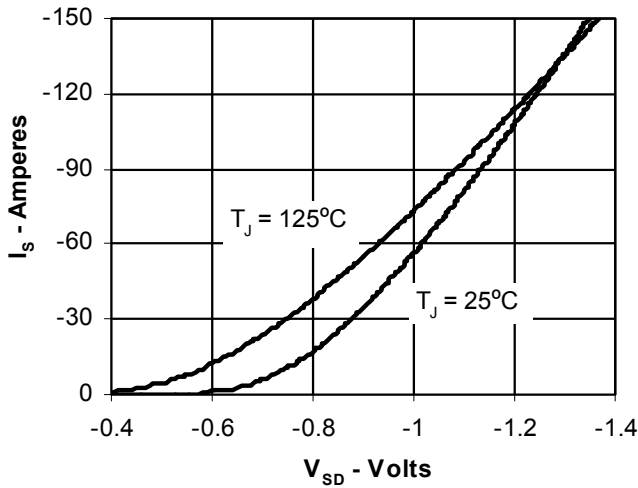
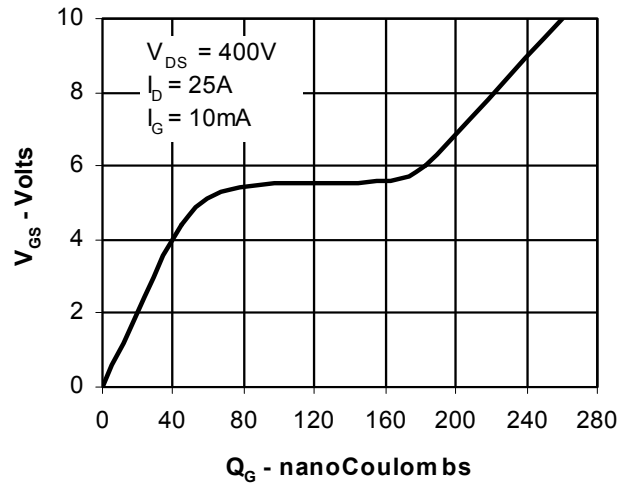
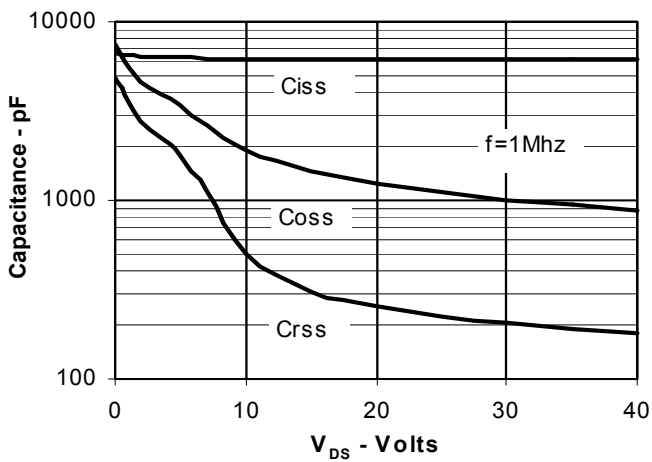


**Fig. 5.  $R_{DS(on)}$  Normalized to  $I_{D25}$  Value vs.  $I_D$**



**Fig. 6. Drain Current vs. Case Temperature**



**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**
