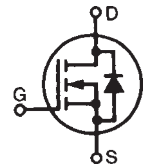
IXYS

PolarHT™ HiPerFET Power MOSFET

IXFH 100N25P

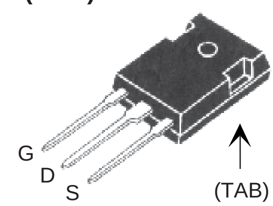
N-Channel Enhancement Mode
Fast Intrinsic Diode
Avalanche Rated



V_{DSS}	=	250	V
I_{D25}	=	100	A
$R_{DS(on)}$	≤	27	mΩ
t_{rr}	≤	200	ns

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C	250	V
V_{DGR}	T_J = 25°C to 150°C; R_{GS} = 1 MΩ	250	V
V_{GS}	Continuous	±20	V
V_{GSM}	Transient	±30	V
I_{D25}	T_C = 25°C	100	A
$I_{D(RMS)}$	External lead current limit	75	A
I_{DM}	T_C = 25°C, pulse width limited by T_{JM}	250	A
I_{AR}	T_C = 25°C	60	A
E_{AR}	T_C = 25°C	60	mJ
E_{AS}	T_C = 25°C	2.0	J
dv/dt	$I_S \le I_{DM}$, di/dt ≤ 100 A/µs, $V_{DD} \le V_{DSS}$, $T_J \le$ 150°C, R_G = 4 Ω	10	V/ns
P_D	T_C = 25°C	600	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		5.5	g

TO-247 (IXFH)



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

Features

- Fast Intrinsic Diode
- International standard packages
- Unclamped Inductive Switching (UIS) rated
- Low package inductance
  - easy to drive and to protect

Advantages

- Easy to mount
- Space savings
- High power density

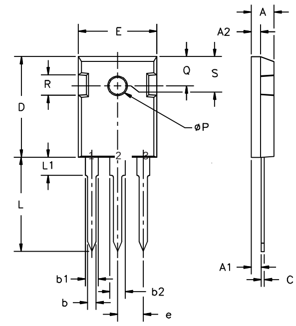
Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
BV_{DSS}	V_{GS} = 0 V, I_D = 250 µA	250			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 4 mA	2.5		5.0	V
I_{GSS}	V_{GS} = ±20 V_{DC}, V_{DS} = 0			±100	nA
I_{DSS}	$V_{DS} = V_{DSS}$, V_{GS} = 0 V			25	µA
	T_J = 125°C			500	µA
$R_{DS(on)}$	V_{GS} = 10 V, I_D = 0.5 I_{D25}; Pulse test, t ≤ 300 µs, duty cycle d ≤ 2 %			27	mΩ

Symbol	Test Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) Min.	Typ.	Max.	
g_{fs}	V_{DS}= 10 V; I_D = 0.5 I_{D25}, pulse test	40	56		S
C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		6300		pF
C_{oss}			1150		pF
C_{rss}			240		pF
$t_{d(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 V_{DSS}, I_D = I_{D25}		25		ns
t_r	R_G = 3.3 Ω (External)		26		ns
$t_{d(off)}$			100		ns
t_f			28		ns
$Q_{g(on)}$	V_{GS}= 10 V, V_{DS} = 0.5 V_{DSS}, I_D = 0.5 I_{D25}		185		nC
Q_{gs}			43		nC
Q_{gd}			91		nC
R_{thJC}				0.21	°C/W
R_{thCS}			0.25		°C/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			100	A
I_{SM}	Repetitive			250	A
V_{SD}	I_F = I_S, V_{GS} = 0 V, Pulse test, t ≤ 300 µs, duty cycle d ≤ 2 %			1.5	V
t_{rr}	I_F = 25 A, -di/dt = 100 A/µs			200	ns
Q_{RM}	V_R = 100 V		0.6		µC
I_{RM}			10		A

TO-247 (IXFH) 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	

Fig. 1. Output Characteristics @ 25ºC

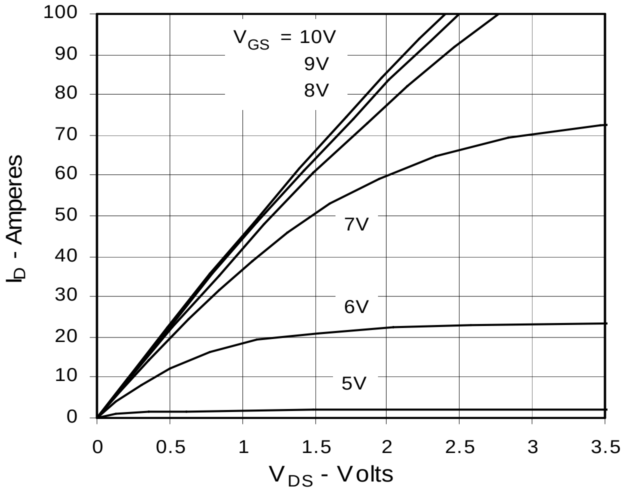


Fig. 2. Extended Output Characteristics @ 25ºC

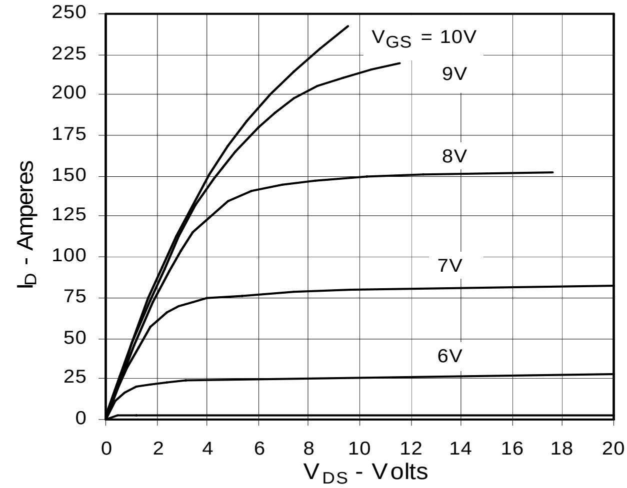


Fig. 3. Output Characteristics @ 125ºC

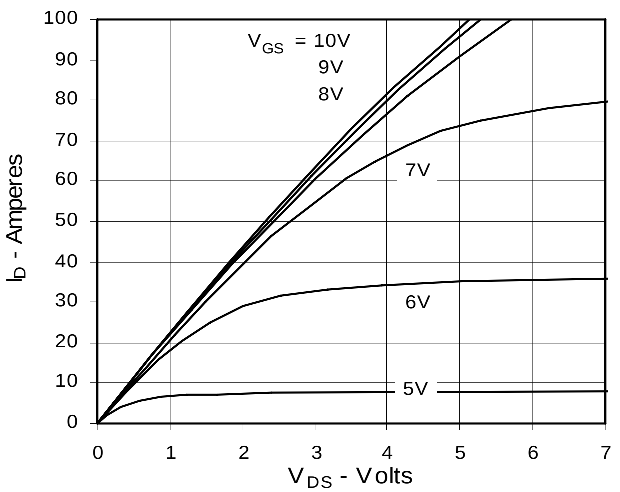


Fig. 4. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. Junction Temperature

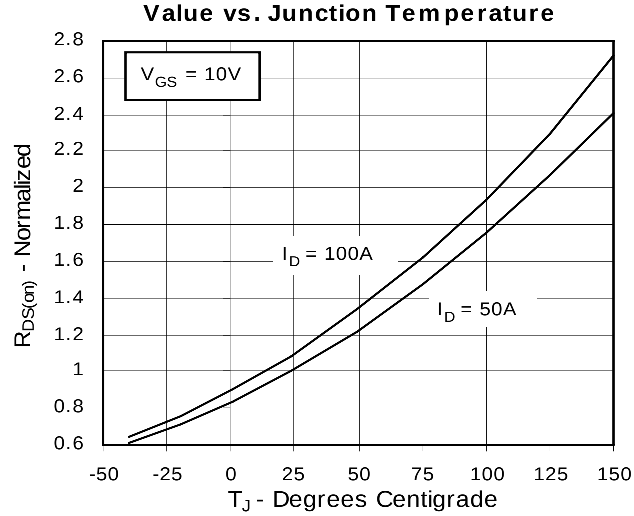


Fig. 5. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. I_D

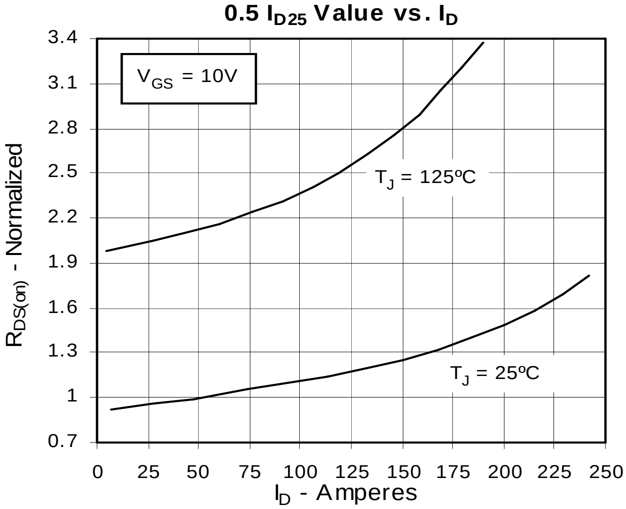
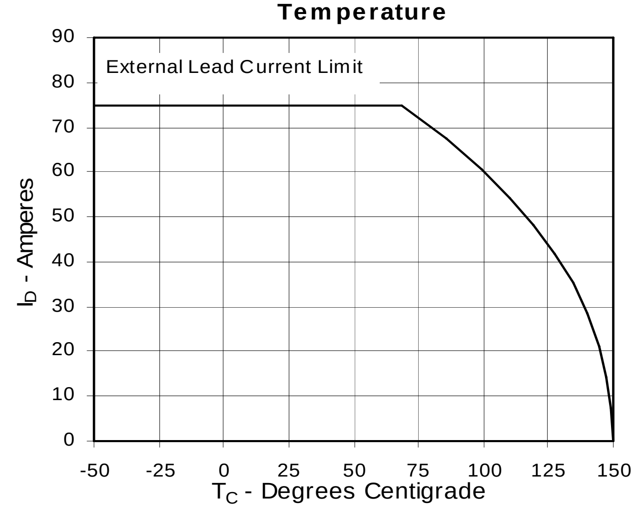


Fig. 6. Drain Current vs. Case Temperature



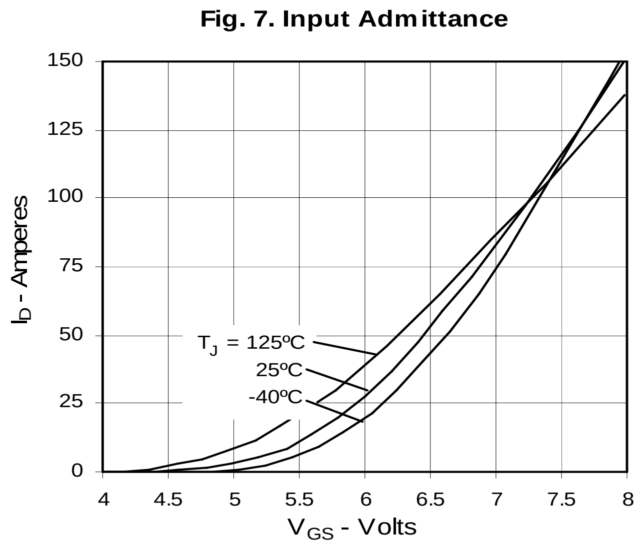


Fig. 7. Input Admittance
T_J = 125ºC
25ºC
-40ºC
I_D - Amperes
V_{GS} - Volts
0
25
50
75
100
125
150
4
4.5
5
5.5
6
6.5
7
7.5
8

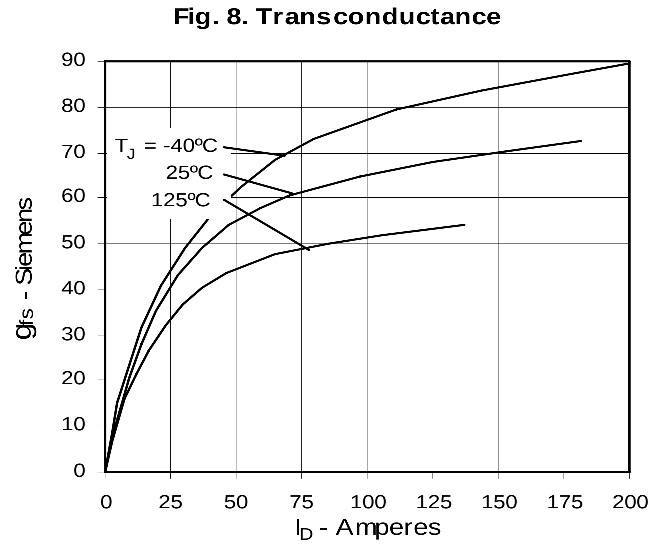


Fig. 8. Transconductance
T_J = -40ºC
25ºC
125ºC
g_{fs} - Siemens
I_D - Amperes
0
10
20
30
40
50
60
70
80
90
0
25
50
75
100
125
150
175
200

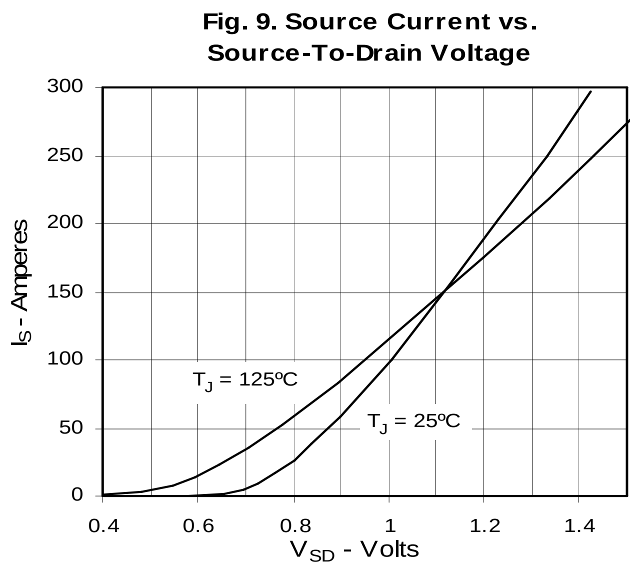


Fig. 9. Source Current vs. Source-To-Drain Voltage
T_J = 125ºC
T_J = 25ºC
I_S - Amperes
V_{SD} - Volts
0
50
100
150
200
250
300
0.4
0.6
0.8
1
1.2
1.4

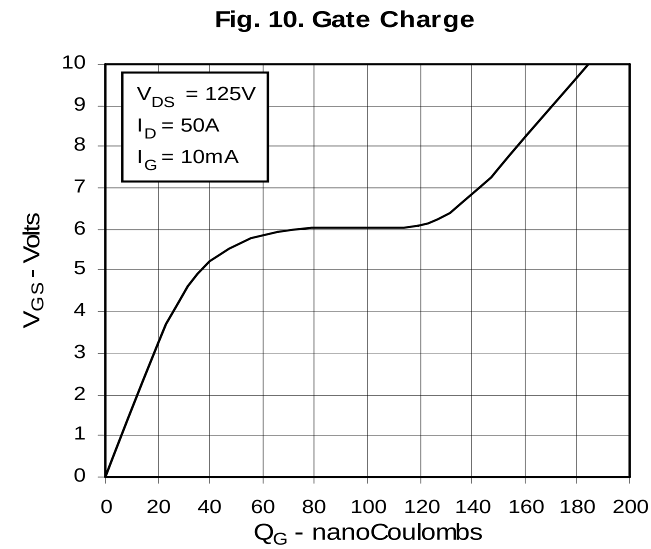


Fig. 10. Gate Charge
V_{DS} = 125V
I_D = 50A
I_G = 10mA
V_{GS} - Volts
Q_G - nanoCoulombs
0
1
2
3
4
5
6
7
8
9
10
0
20
40
60
80
100
120
140
160
180
200

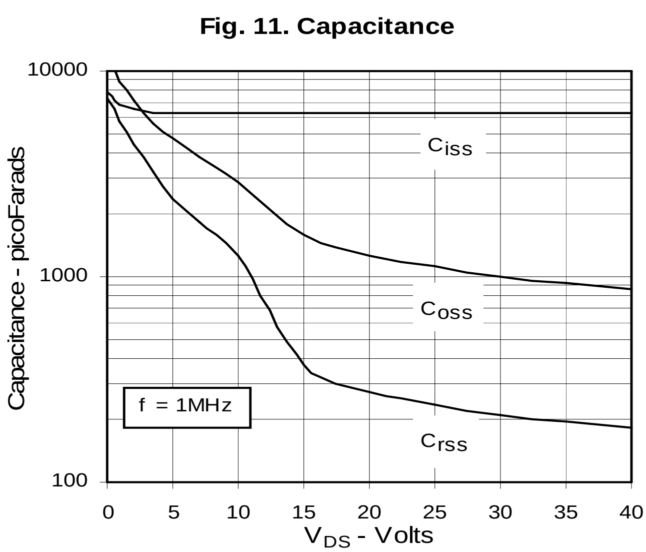


Fig. 11. Capacitance
C_{iss}
C_{oss}
C_{rss}
f = 1MHz
Capacitance - picoFarads
V_{DS} - Volts
100
1000
10000
0
5
10
15
20
25
30
35
40

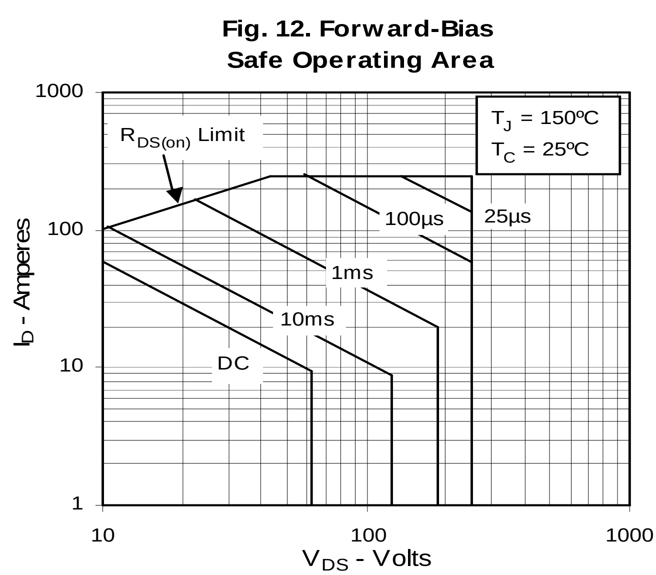


Fig. 12. Forward-Bias Safe Operating Area
$R_{DS(on)}$ Limit
T_J = 150ºC
T_C = 25ºC
25µs
100µs
1ms
10ms
DC
I_D - Amperes
V_{DS} - Volts
1
10
100
1000
10
100
1000

Fig. 13. Maximum Transient Thermal Resistance