

PolarHT™ HiPerFET Power MOSFET

IXFH 120N15P
IXFT 120N15P

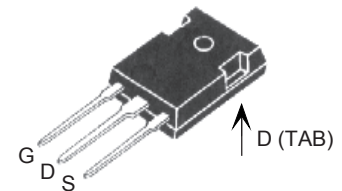
V_{DSS} = 150 V
I_{D25} = 120 A
R_{DS(on)} ≤ 16 mΩ
t_{rr} ≤ 200 ns

N-Channel Enhancement Mode
Avalanche Energy Rated
Fast Intrinsic Diode

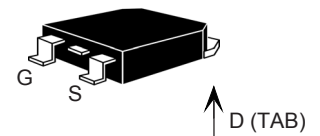


Symbol	Test Conditions	Maximum Ratings	
V _{DSS}	T _J = 25°C to 175°C	150	V
V _{DGR}	T _J = 25°C to 175°C; R _{GS} = 1 MΩ	150	V
V _{DSS}	Continuous	±20	V
V _{GSM}	Transient	±30	V
I _{D25}	T _C = 25°C	120	A
I _{L(RMS)}	External lead current limit	75	A
I _{DM}	T _C = 25°C, pulse width limited by T _{JM}	260	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 ≤ I _{DM} , di/dt ≤ 100 A/μs, V _{DD} ≤ V _{DSS} , T _J ≤ 150°C, R _G = 4 Ω	10	V/ns
P _D	T _C = 25°C	600	W
T _J		-55 ... +175	°C
T _{JM}		175	°C
T _{stg}		-55 ... +150	°C
T _L	1.6 mm (0.062 in.) from case for 10 s	300	°C
T _{SOLD}	Plastic case for 10 s	260	°C
M _d	Mounting torque (TO-3P)	1.13/10	Nm/lb.in.
Weight	TO-247	6.0	g
	TO-268	5.0	g

TO-247 (IXFH)



TO-268 (IXFT)



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

Features

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

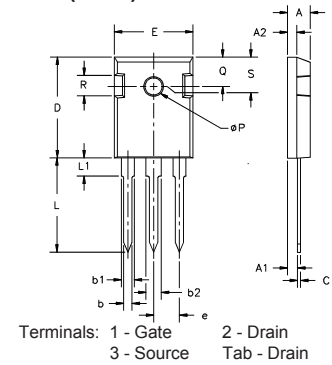
Advantages

- † Easy to mount
- † Space savings
- † High power density

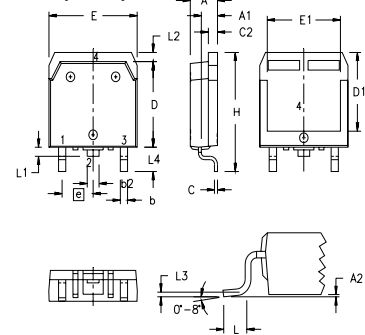
Symbol	Test Conditions	Characteristic Values		
		Min.	Typ.	Max.
BV _{DSS}	V _{GS} = 0 V, I _D = 250 μA	150		V
V _{GS(th)}	V _{DS} = V _{GS} , I _D = 4 mA	3.0		5.0 V
I _{GSS}	V _{GS} = ±20 V _{DC} , V _{DS} = 0			±100 nA
I _{DSS}	V _{DS} = V _{DSS} V _{GS} = 0 V			25 μA
				500 μA
R _{DS(on)}	V _{GS} = 10 V, I _D = 0.5 I _{D25} Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 %			16 mΩ

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		Min.	Typ.	Max.
g_{fs}	$V_{DS} = 10\text{ V}$; $I_D = 0.5 I_{D25}$, pulse test	40	60	S
C_{iss}	$V_{GS} = 0\text{ V}$, $V_{DS} = 25\text{ V}$, $f = 1\text{ MHz}$		4900	pF
C_{oss}			1300	pF
C_{rss}			330	pF
$t_{d(on)}$	$V_{GS} = 10\text{ V}$, $V_{DS} = 0.5 V_{DSS}$, $I_D = 60\text{ A}$ $R_G = 4\ \Omega$ (External)		33	ns
t_r			42	ns
$t_{d(off)}$			85	ns
t_f			26	ns
$Q_{g(on)}$	$V_{GS} = 10\text{ V}$, $V_{DS} = 0.5 V_{DSS}$, $I_D = 0.5 I_{D25}$		150	nC
Q_{gs}			40	nC
Q_{gd}			80	nC
R_{thJC}	(TO-3P)			0.25°C/W
R_{thCS}		0.21		$^\circ\text{C/W}$

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		Min.	Typ.	Max.
I_s	$V_{GS} = 0\text{ V}$			120 A
I_{SM}	Repetitive			260 A
V_{SD}	$I_F = I_s$, $V_{GS} = 0\text{ V}$, Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$			1.5 V
t_{rr}	$I_F = 25\text{ A}$, $-di/dt = 100\text{ A}/\mu\text{s}$ $V_R = 100\text{ V}$, $V_{GS} = 0\text{ V}$			200 ns
Q_{RM}			600	nC
I_{RM}			6	A

TO-247 (IXFH) Outline


Dim.	Millimeter		Inches	
	Min.	Max.	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
ØP	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 (IXFT) Outline


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

SYM	INCHES		MILLIMETERS	
	MIN	MAX	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.

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Fig. 1. Output Characteristics @ 25°C



Fig. 2. Extended Output Characteristics @ 25°C

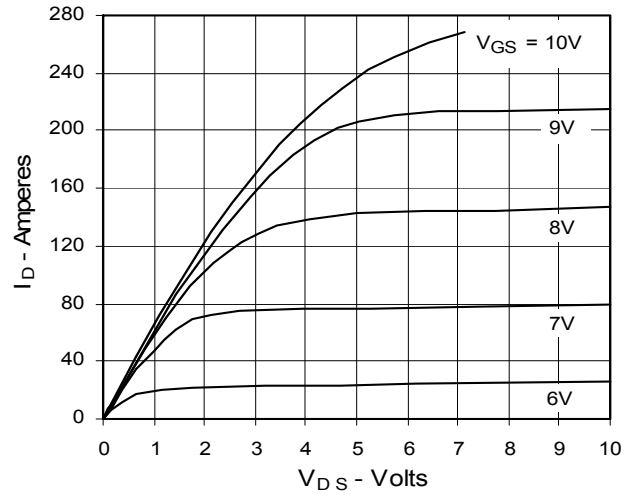


Fig. 3. Output Characteristics @ 150°C

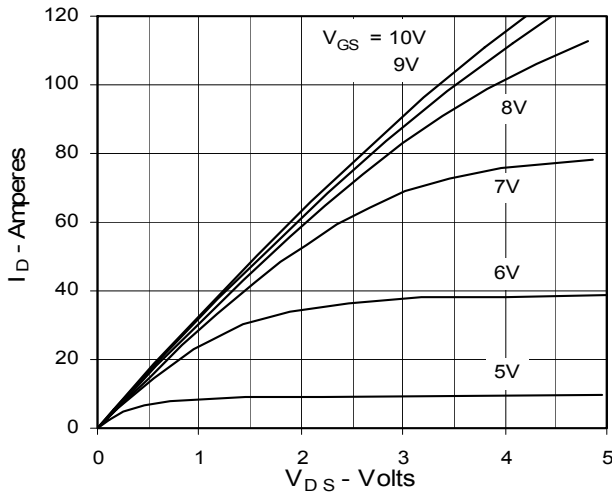


Fig. 4. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. Junction Temperature

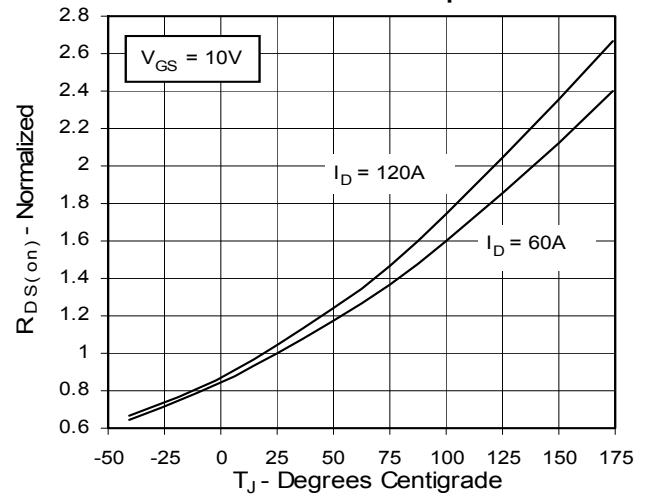


Fig. 5. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. Drain Current



Fig. 6. Drain Current vs. Case Temperature

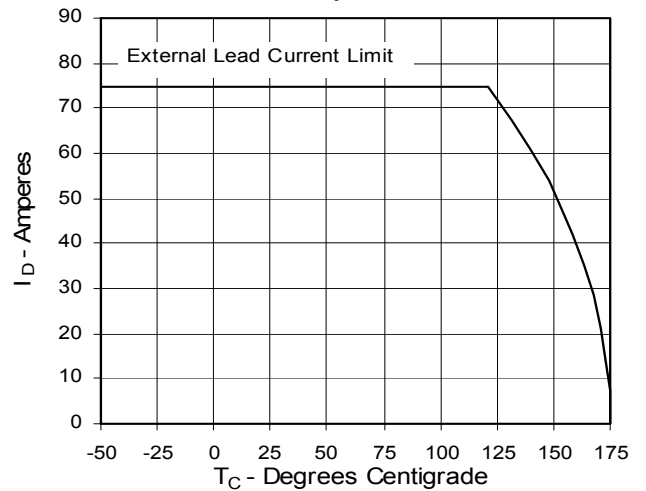


Fig. 7. Input Admittance

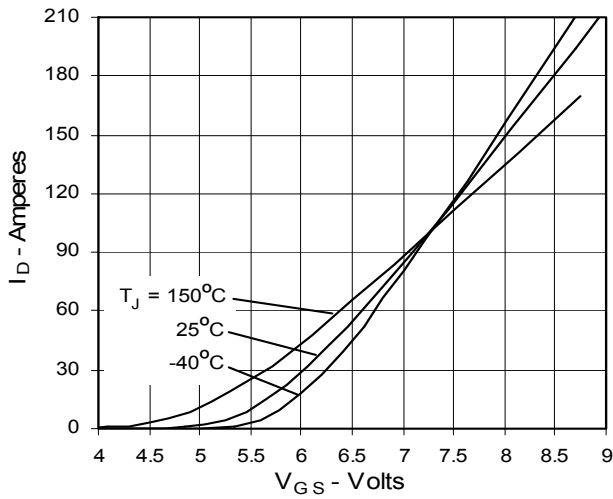


Fig. 8. Transconductance

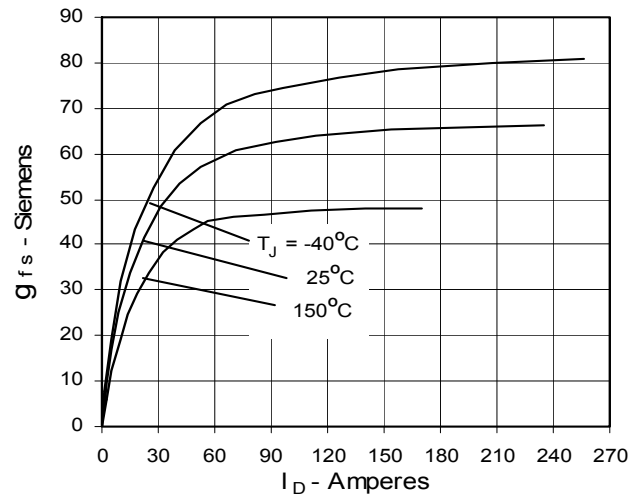


Fig. 9. Source Current vs. Source-To-Drain Voltage

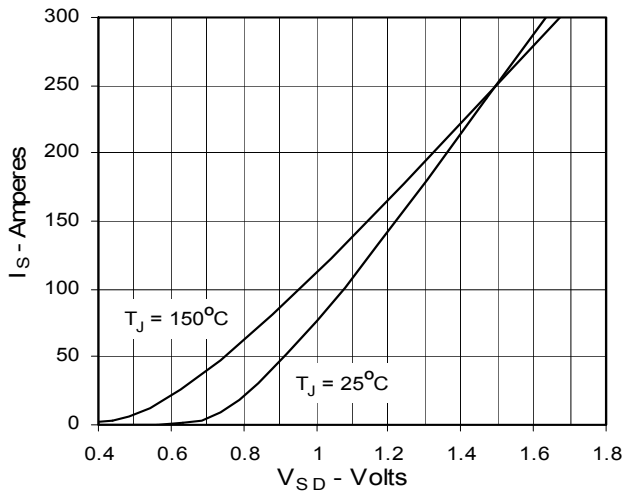


Fig. 10. Gate Charge

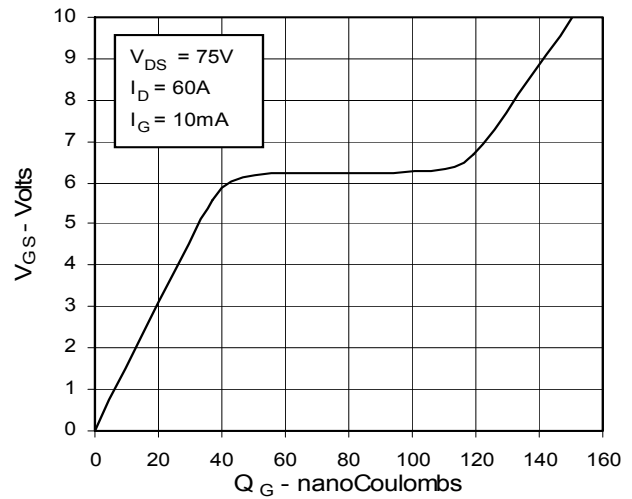


Fig. 11. Capacitance

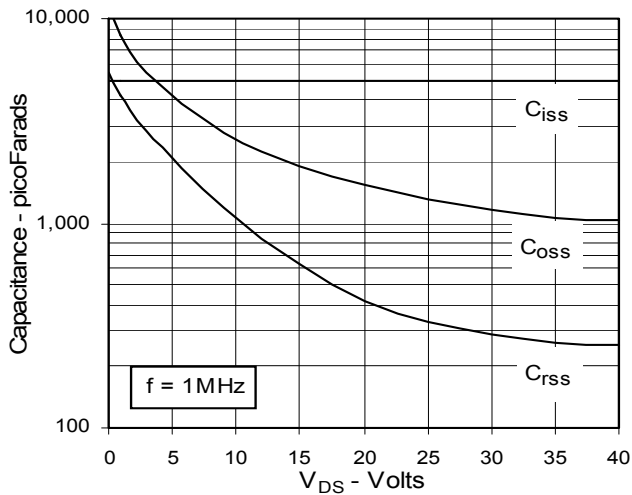


Fig. 12. Forward-Bias Safe Operating Area

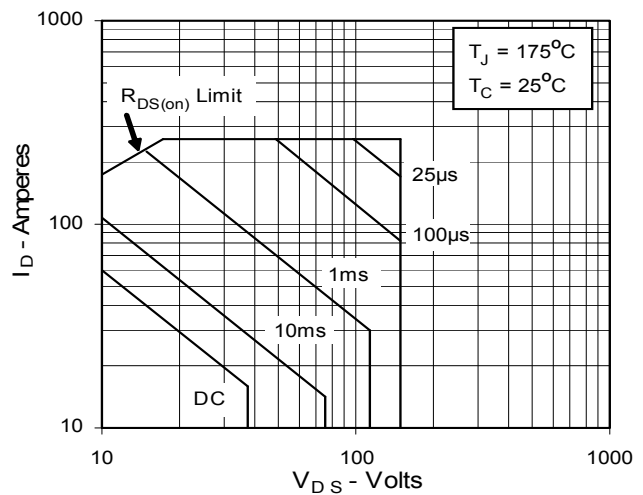
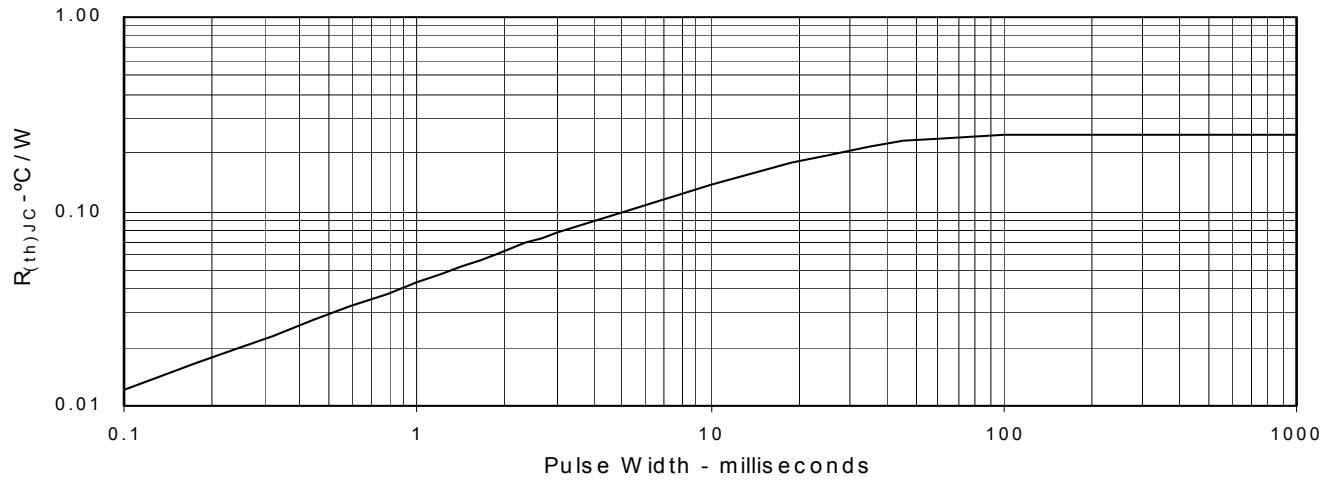


Fig. 13. Maximum Transient Thermal Resistance





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