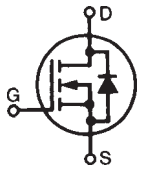
IXYS

Polar™ HiPerFET™ Power MOSFET

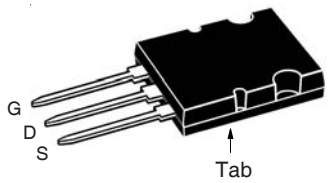
IXFB210N20P

V_{DSS} = 200V
I_{D25} = 210A
$R_{DS(on)}$ ≤ 10.5mΩ
t_{rr} ≤ 200ns

N-Channel Enhancement Mode
Avalanche Rated
Fast Intrinsic Diode



PLUS264™



G = Gate D = Drain
S = Source Tab = Drain

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 175°C	200	V
V_{DGR}	T_J = 25°C to 175°C, R_{GS} = 1MΩ	200	V
V_{GSS}	Continuous	±20	V
V_{GSM}	Transient	±30	V
I_{D25}	T_C = 25°C (Chip Capability)	210	A
I_{LRMS}	Lead Current Limit, RMS	160	A
I_{DM}	T_C = 25°C, Pulse Width Limited by T_{JM}	600	A
I_A	T_C = 25°C	105	A
E_{AS}	T_C = 25°C	4	J
dv/dt	$I_S \le I_{DM}$, $V_{DD} \le V_{DSS}$, $T_J \le 175°C$	20	V/ns
P_D	T_C = 25°C	1500	W
T_J		-55 ... +175	°C
T_{JM}		175	°C
T_{stg}		-55 ... +175	°C
T_L	1.6mm (0.062 in.) from Case for 10s	300	°C
T_{SOLD}	Plastic Body for 10s	260	°C
F_C	Mounting Force	30..120/6.7..27	N/lb.
Weight		10	g

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
BV_{DSS}	V_{GS} = 0V, I_D = 3mA	200			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 8mA	2.5		4.5	V
I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V			±200	nA
I_{DSS}	$V_{DS} = V_{DSS}$, V_{GS} = 0V			25	μA
	T_J = 150°C			2	mA
$R_{DS(on)}$	V_{GS} = 10V, $I_D = 0.5 \bullet I_{D25}$, Note 1			10.5	mΩ

Features

- Low Package Inductance
- Avalanche Rated
- High Current Handling Capability
- Low $R_{DS(ON)}$ and Q_G
- Fast Intrinsic Diode

Advantages

- Easy to Mount
- Space Savings
- High Power Density

Applications

- DC-DC Coverters
- Battery Chargers
- Switch-Mode and Resonant-Mode Power Supplies
- DC Choppers
- AC and DC Motor Drives
- Uninterrupted Power Supplies
- High Speed Power Switching Applications

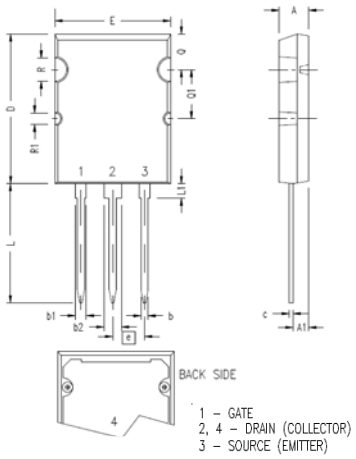
Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS} = 10V, I_D = 60A, Note 1	60	103		S
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		18.6		nF
C_{oss}			3270		pF
C_{rss}			80		pF
$t_{d(on)}$	**Resistive Switching Times**		43		ns
t_r	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D =0.5 • I_{D25}		30		ns
$t_{d(off)}$	R_G = 1Ω (External)		70		ns
t_f			18		ns
$Q_{g(on)}$	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 0.5 • I_{D25}		255		nC
Q_{gs}			94		nC
Q_{gd}			83		nC
R_{thJC}				0.10	°C/W
R_{thCS}			0.13		°C/W

Source-Drain Diode

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
I_S	V_{GS} = 0V			210	A
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}			800	A
V_{SD}	I_F = 105A, V_{GS} = 0V, Note 1			1.3	V
t_{rr}	I_F = 105A, -di/dt = 150A/μs			200	ns
Q_{RM}	V_R = 100V		1.34		μC
I_{RM}			18		A

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

PLUS264™ (IXFB) Outline



SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.185	.209	4.70	5.31
A1	.102	.118	2.59	3.00
b	.037	.055	0.94	1.40
b1	.087	.102	2.21	2.59
b2	.110	.126	2.79	3.20
c	.017	.029	0.43	0.74
D	1.007	1.047	25.58	26.59
E	.760	.799	19.30	20.29
e	.215 BSC		5.46 BSC	
L	.779	.842	19.79	21.39
L1	.087	.102	2.21	2.59
Q	.240	.256	6.10	6.50
Q1	.330	.346	8.38	8.79
ØR	.155	.187	3.94	4.75
ØR1	.085	.093	2.16	2.36

Fig. 1. Output Characteristics @ T_J = 25ºC

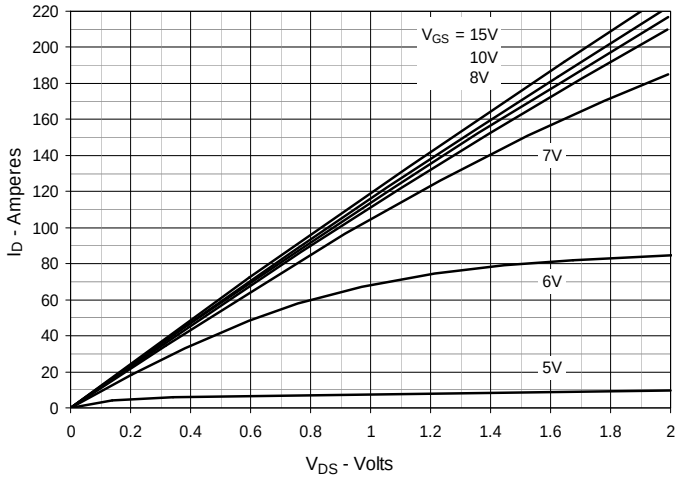


Fig. 2. Extended Output Characteristics @ T_J = 25ºC

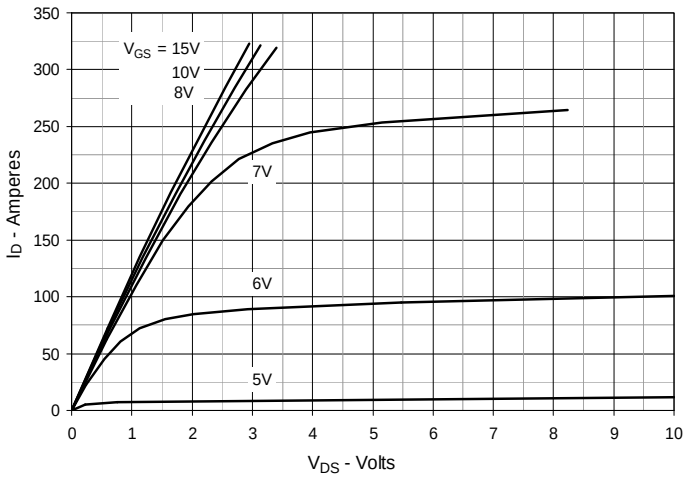


Fig. 3. Output Characteristics @ T_J = 150ºC

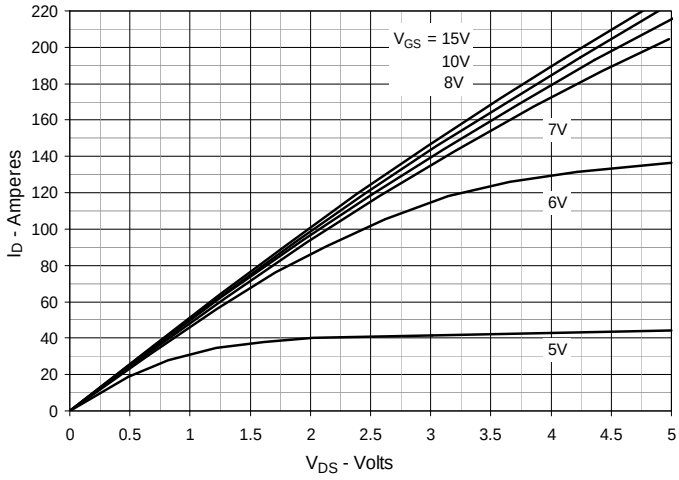


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 105A Value vs. Junction Temperature

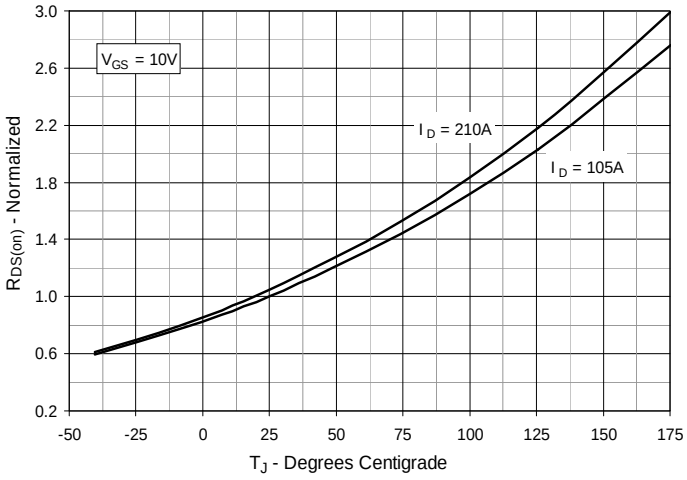


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 105A Value vs. Drain Current

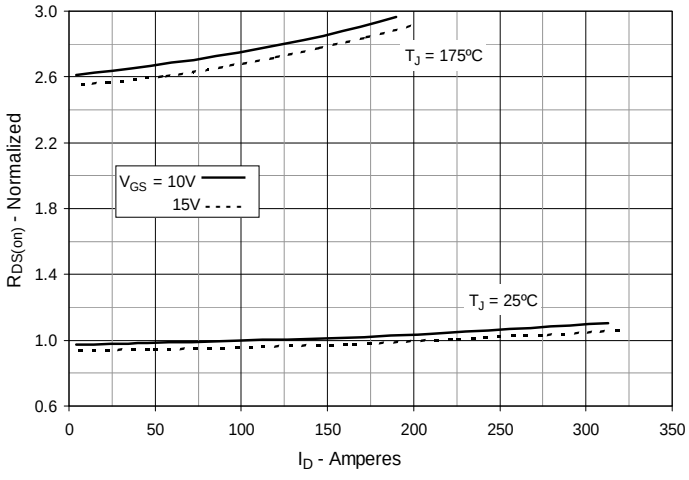


Fig. 6. Maximum Drain Current vs. Case Temperature

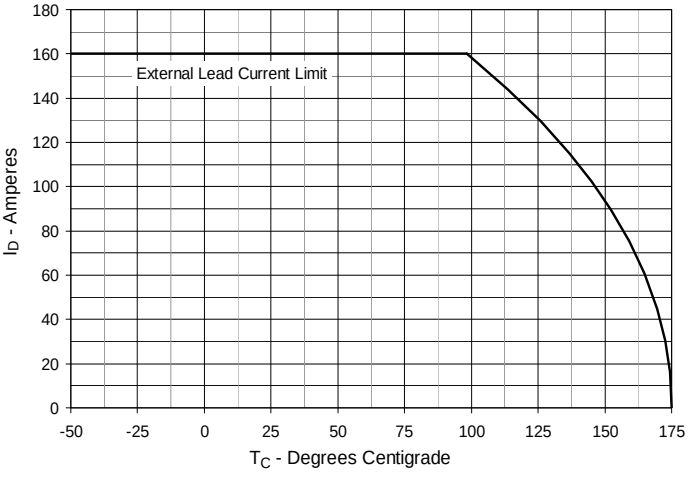


Fig. 7. Input Admittance

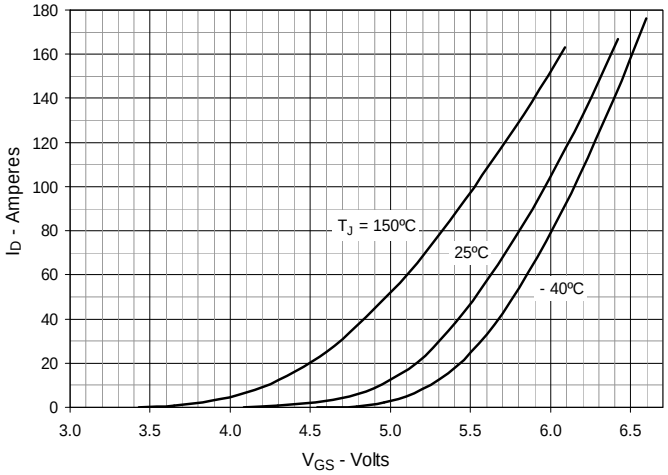


Fig. 8. Transconductance

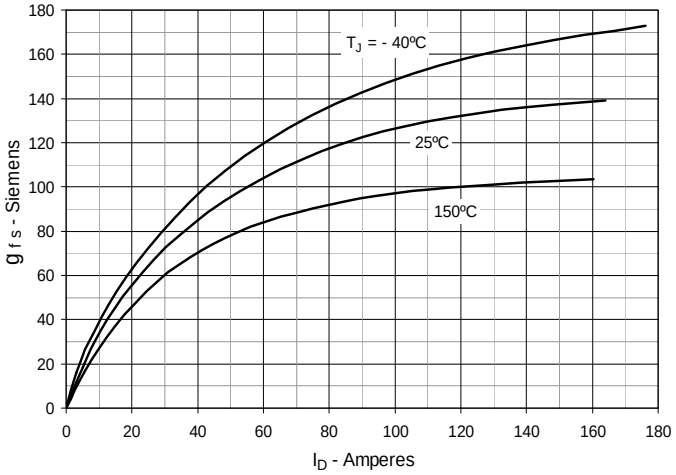


Fig. 9. Forward Voltage Drop of Intrinsic Diode

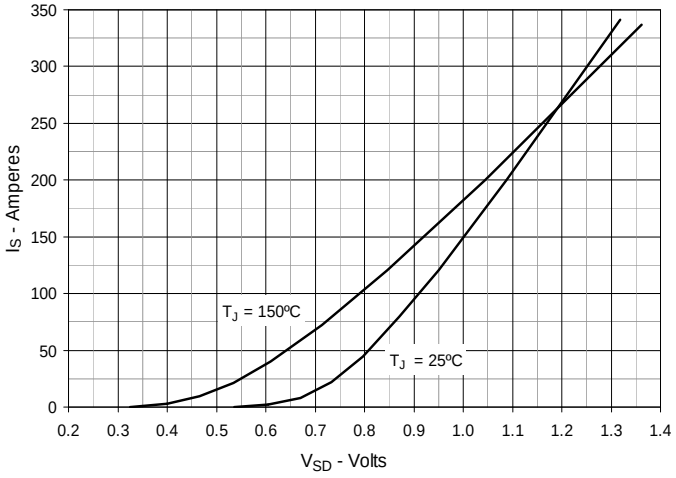


Fig. 10. Gate Charge

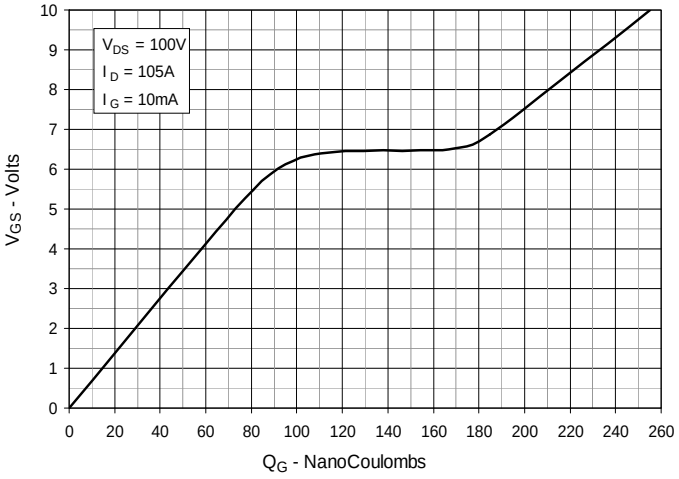


Fig. 11. Capacitance

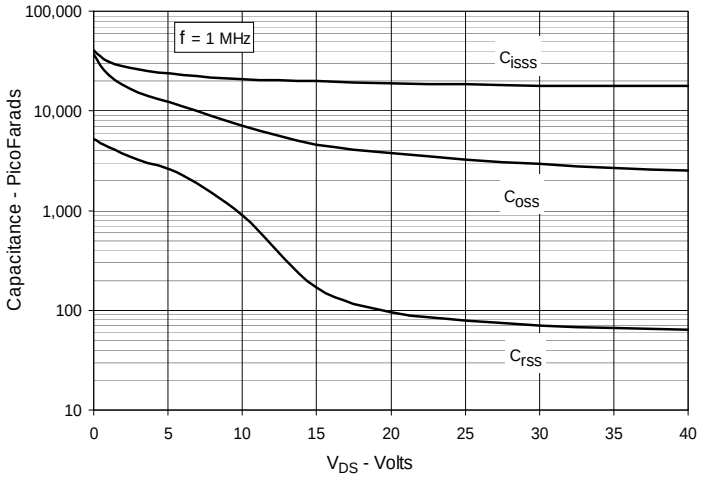


Fig. 12. Forward-Bias Safe Operating Area

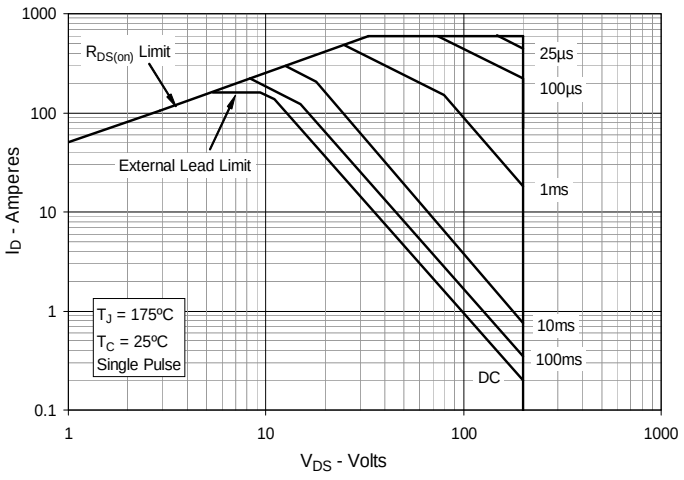


Fig. 13. Maximum Transient Thermal Impedance