IXYS

Advanced Technical Information

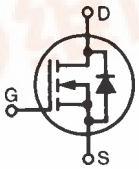
Polar™ HiPerFET Power MOSFET

Electrically Isolated Tab

IXTR 200N10P

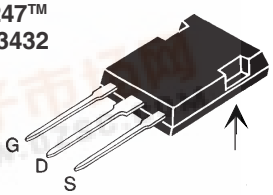
V_{DSS} = 100 V
I_{D25} = 133 A
$R_{DS(on)}$ = 8 mΩ

N-Channel Enhancement Mode
Fast Recovery Diode, Avavanche Rated



Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 175°C	100	V
V_{DGR}	T_J = 25°C to 175°C; R_{GS} = 1 MΩ	100	V
V_{GS}		±20	V
V_{GSM}		±30	V
I_{D25}	T_C = 25°C	133	A
$I_{D(RMS)}$	External lead current limit	75	A
I_{DM}	T_C = 25°C, pulse width limited by T_{JM}	400	A
I_{AR}	T_C = 25°C	60	A
E_{AR}	T_C = 25°C	100	mJ
E_{AS}	T_C = 25°C	4	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	350	W
T_J		-55 ... +175	°C
T_{JM}		175	°C
T_{stg}		-55 ... +150	°C
V_{ISOL}	50/60 Hz, RMS, 1 minute	2500	V~
F_C	Mounting Force	20..120/4.6..20	Nm/lb
Weight		5	g

ISOPLUS 247™
E153432



G = Gate D = Drain
S = Source

Features

- Silicon chip on Direct-Copper-Bond substrate
  - High power dissipation
  - Isolated mounting surface
  - 2500V electrical isolation
- Low drain to tab capacitance(<30pF)
- Avalanche voltage rated
- Fast recovery intrinsic diode

Applications

- DC-DC converters
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- AC motor control

Advantages

- Easy assembly
- Space savings
- High power density

Symbol (T_J = 25°C, unless otherwise specified)	Test Conditions	Characteristic Values Min.	Typ.	Max.	
V_{DSS}	V_{GS} = 0 V, I_D = 250 µA	100			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 500µA	3.0		5.0	V
I_{GSS}	V_{GS} = ±30 V_{DC}, V_{DS} = 0			±100	nA
I_{DSS}	$V_{DS} = V_{DSS}$, V_{GS} = 0 V, T_J = 150°C			25	µA
	V_{GS} = 0 V, T_J = 150°C			250	µA
	V_{GS} = 0 V, T_J = 175°C			1000	µA
$R_{DS(on)}$	V_{GS} = 10 V, I_D = 60 A			8.0	mΩ
	V_{GS} = 15 V, I_D = 400A		5.5		mΩ

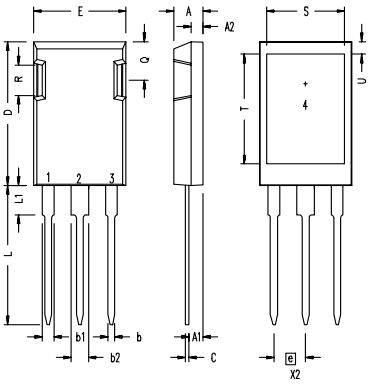
Symbol	Test Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) Min.	Typ.	Max.	
g_{fs}	V_{DS}= 10 V; I_D = 100 A, Note 1	60	97		S
C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		7600		pF
C_{oss}			2900		pF
C_{rss}			860		pF
$t_{d(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 V_{DSS}, I_D = 60 A R_G = 3.3 Ω (External)		30		ns
t_r			35		ns
$t_{d(off)}$			150		ns
t_f			90		ns
$Q_{g(on)}$	V_{GS}= 10 V, V_{DS} = 0.5 V_{DSS}, I_D = 100 A		240		nC
Q_{gs}			50		nC
Q_{gd}			135		nC
R_{thJC}				.42	K/W
R_{thCK}			0.15		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			200	A
I_{SM}	Repetitive			400	A
V_{SD}	I_F = I_S, V_{GS} = 0 V, Note 1			1.5	V
t_{rr}	I_F = 25 A, dI/dt = 100 A/µs		100	140	ns

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

ISOPLUS 247 OUTLINE



1 Gate, 2 Drain (Collector)
3 Source (Emitter)
4 no connection

Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	4.83	5.21	.190	.205
A_1	2.29	2.54	.090	.100
A_2	1.91	2.16	.075	.085
b	1.14	1.40	.045	.055
b_1	1.91	2.13	.075	.084
b_2	2.92	3.12	.115	.123
C	0.61	0.80	.024	.031
D	20.80	21.34	.819	.840
E	15.75	16.13	.620	.635
e	5.45 BSC		.215 BSC	
L	19.81	20.32	.780	.800
L1	3.81	4.32	.150	.170
Q	5.59	6.20	.220	.244
R	4.32	4.83	.170	.190

Fig. 1. Output Characteristics @ 25ºC

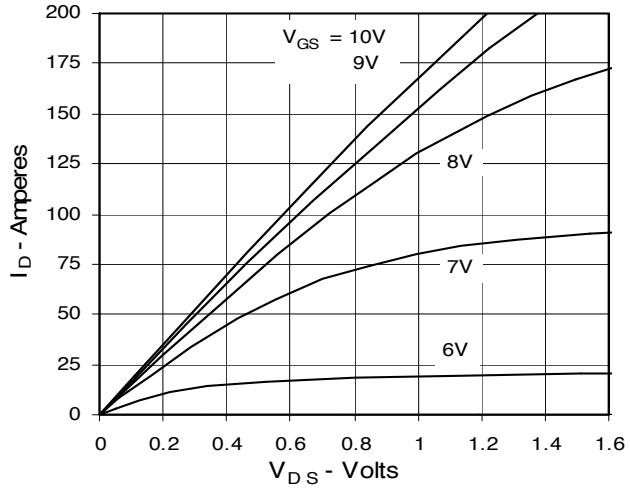


Fig. 2. Extended Output Characteristics @ 25ºC

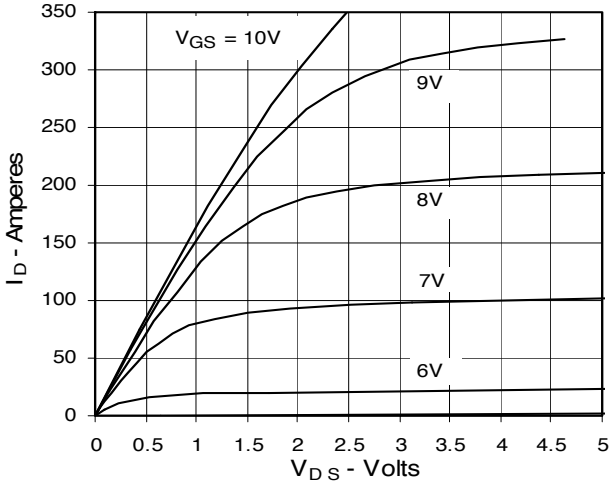


Fig. 3. Output Characteristics @ 150ºC

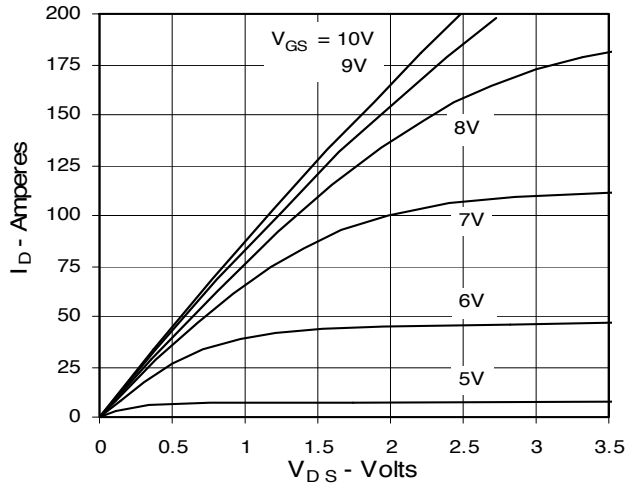


Fig. 4. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. Junction Temperature

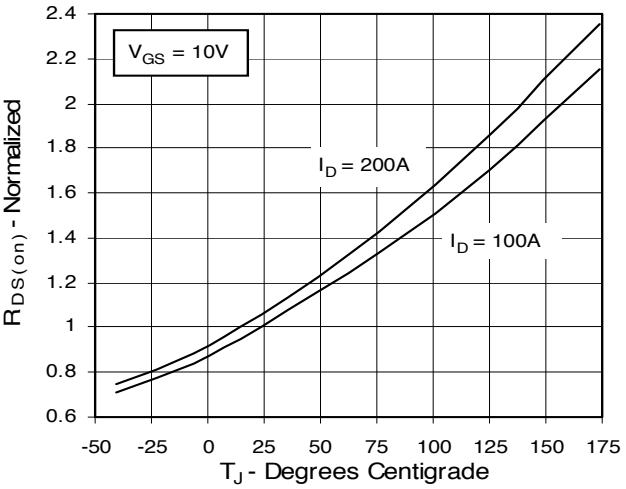


Fig. 5. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. Drain Current

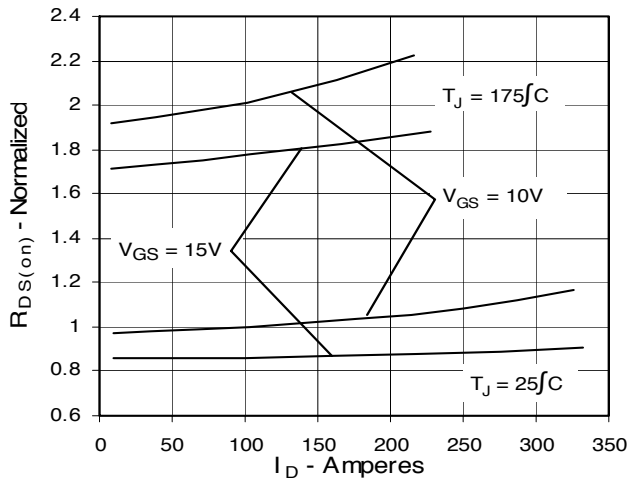


Fig. 6. Drain Current vs. Case Temperature

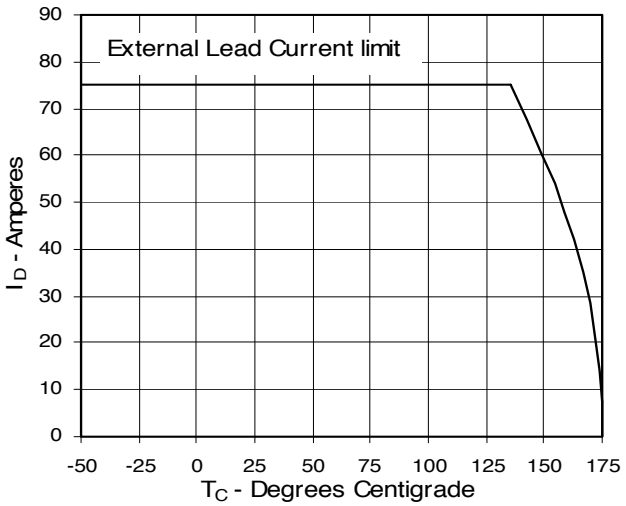


Fig. 7. Input Admittance

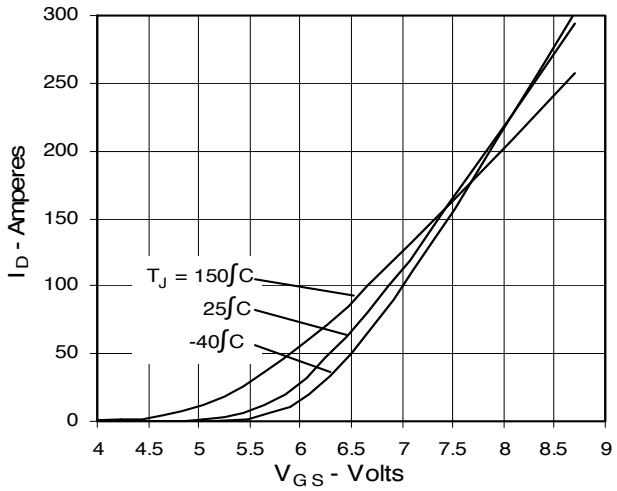


Fig. 8. Transconductance

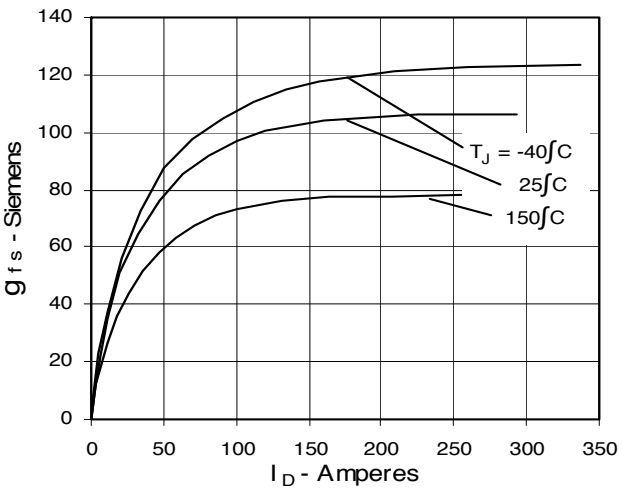


Fig. 9. Source Current vs. Source-To-Drain Voltage

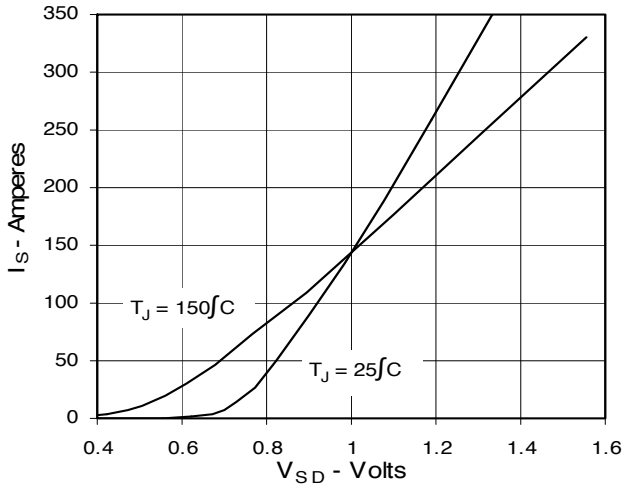


Fig. 10. Gate Charge

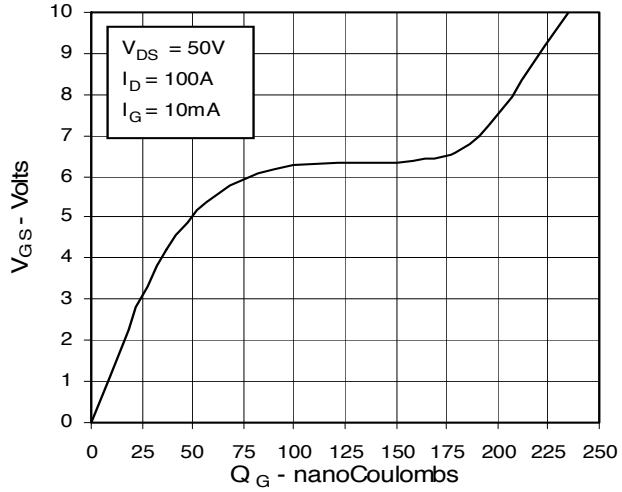


Fig. 11. Capacitance

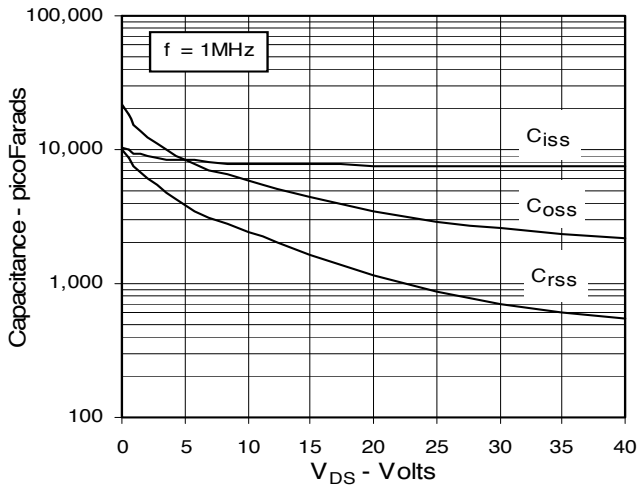


Fig. 12. Forward-Bias Safe Operating Area

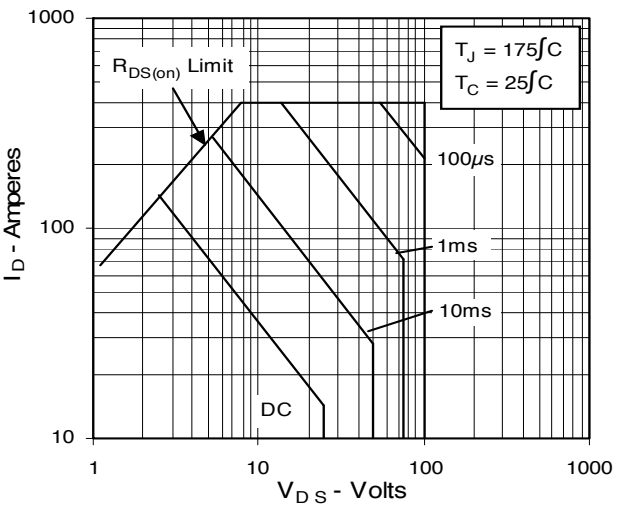


Fig. 13. Maximum Transient Thermal Resistance