

Polar™ HiPerFET Power MOSFET Electrically Isolated Tab

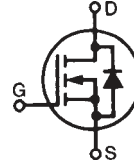
IXTR 200N10P

$$V_{DSS} = 100 \text{ V}$$

$$I_{D25} = 120 \text{ A}$$

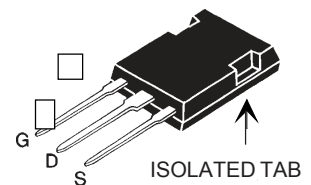
$$R_{DS(on)} \leq 8 \text{ m}\Omega$$

N-Channel Enhancement Mode
Avalanche Rated
Fast Recovery Diode



Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ\text{C}$ to 175°C	100	V
V_{DGR}	$T_J = 25^\circ\text{C}$ to 175°C ; $R_{GS} = 1 \text{ M}\Omega$	100	V
V_{GS}		± 20	V
V_{GSM}		± 30	V
I_{D25}	$T_C = 25^\circ\text{C}$	120	A
$I_{D(RMS)}$	External lead current limit	75	A
I_{DM}	$T_C = 25^\circ\text{C}$, pulse width limited by T_{JM}	400	A
I_{AR}	$T_C = 25^\circ\text{C}$	60	A
E_{AR}	$T_C = 25^\circ\text{C}$	100	mJ
E_{AS}	$T_C = 25^\circ\text{C}$	4	J
dv/dt	$I_S \leq I_{DM}$, $di/dt \leq 100 \text{ A}/\mu\text{s}$, $V_{DD} \leq V_{DSS}$, $T_J \leq 150^\circ\text{C}$, $R_G = 4 \Omega$	10	V/ns
P_D	$T_C = 25^\circ\text{C}$	300	W
T_J		-55 ... +175	$^\circ\text{C}$
T_{JM}		175	$^\circ\text{C}$
T_{stg}		-55 ... +150	$^\circ\text{C}$
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™ (IXTR)
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

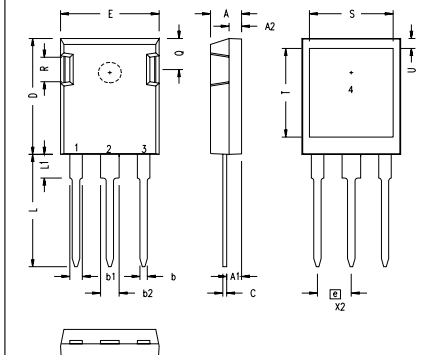
Symbol	Test Conditions ($T_J = 25^\circ\text{C}$, unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
BV_{DSS}	$V_{GS} = 0 \text{ V}$, $I_D = 250 \mu\text{A}$	100		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 500 \mu\text{A}$	3.0		5.0 V
I_{GSS}	$V_{GS} = \pm 30 \text{ V}_{DC}$, $V_{DS} = 0$			$\pm 100 \text{ nA}$
I_{DSS}	$V_{DS} = V_{DSS}$			25 μA
	$V_{GS} = 0 \text{ V}$			250 μA
	$V_{GS} = 0 \text{ V}$			1000 μA
$R_{DS(on)}$	$V_{GS} = 10 \text{ V}$, $I_D = 60 \text{ A}$			8.0 $\text{m}\Omega$
	$V_{GS} = 15 \text{ V}$, $I_D = 400 \text{ A}$	5.5		$\text{m}\Omega$

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		Min.	Typ.	Max.
g_{fs}	$V_{DS} = 10\text{ V}$; $I_D = 100\text{ A}$, Note 1	60	97	S
C_{iss}	$V_{GS} = 0\text{ V}$, $V_{DS} = 25\text{ V}$, $f = 1\text{ MHz}$		7600	pF
C_{oss}			2900	pF
C_{rss}			860	pF
$t_{d(on)}$	$V_{GS} = 10\text{ V}$, $V_{DS} = 0.5 V_{DSS}$, $I_D = 60\text{ A}$ $R_G = 3.3\ \Omega$ (External)		30	ns
t_r			35	ns
$t_{d(off)}$			150	ns
t_f			90	ns
$Q_{g(on)}$	$V_{GS} = 10\text{ V}$, $V_{DS} = 0.5 V_{DSS}$, $I_D = 100\text{ A}$		235	nC
Q_{gs}			50	nC
Q_{gd}			135	nC
R_{thJC}				$0.5\ ^\circ\text{C/W}$
R_{thCS}		0.15		$^\circ\text{C/W}$

Source-Drain Diode

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		Min.	Typ.	Max.
I_s	$V_{GS} = 0\text{ V}$			200 A
I_{SM}	Repetitive			400 A
V_{SD}	$I_F = I_s$, $V_{GS} = 0\text{ V}$, Note 1			1.5 V
t_{rr}	$I_F = 25\text{ A}$, $di/dt = 100\text{ A}/\mu\text{s}$		100	ns

Notes: 1. Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$

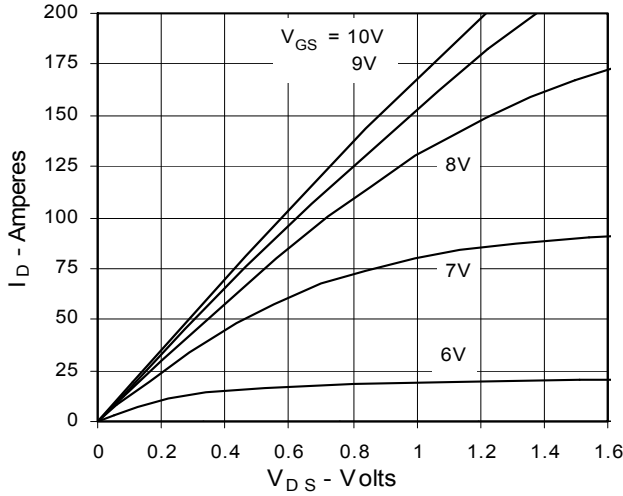
ISOPLUS247 (IXTR) Outline


SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.190	.205	4.83	5.21
A1	.090	.100	2.29	2.54
A2	.075	.085	1.91	2.16
b	.045	.055	1.14	1.40
b1	.075	.084	1.91	2.13
b2	.115	.123	2.92	3.12
C	.024	.031	0.61	0.80
D	.819	.840	20.80	21.34
E	.620	.635	15.75	16.13
e	.215 BSC		5.45 BSC	
L	.780	.800	19.81	20.32
L1	.150	.170	3.81	4.32
Q	.220	.244	5.59	6.20
R	.170	.190	4.32	4.83
S	.520	.540	13.21	13.72
T	.620	.640	15.75	16.26
U	.065	.080	1.65	2.03

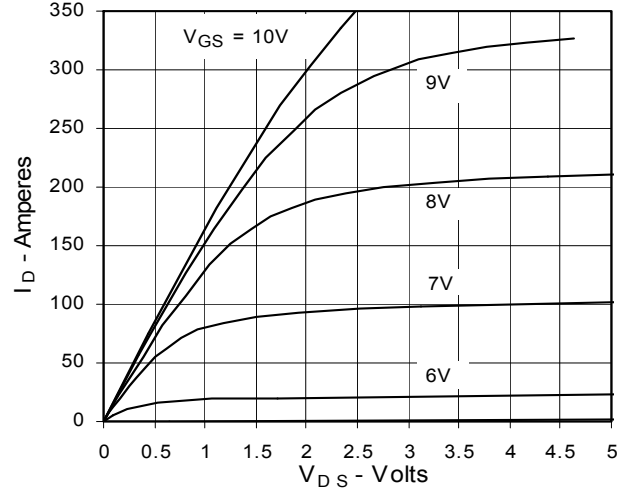
- 1 - GATE
- 2 - DRAIN (COLLECTOR)
- 3 - SOURCE (EMITTER)
- 4 - NO CONNECTION

NOTE: This drawing will meet all dimensions requirement of JEDEC outline TO-247AD except screw hole.

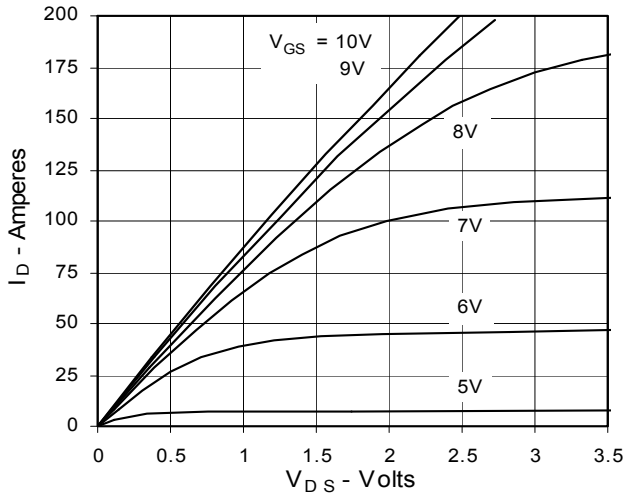
**Fig. 1. Output Characteristics
@ 25°C**



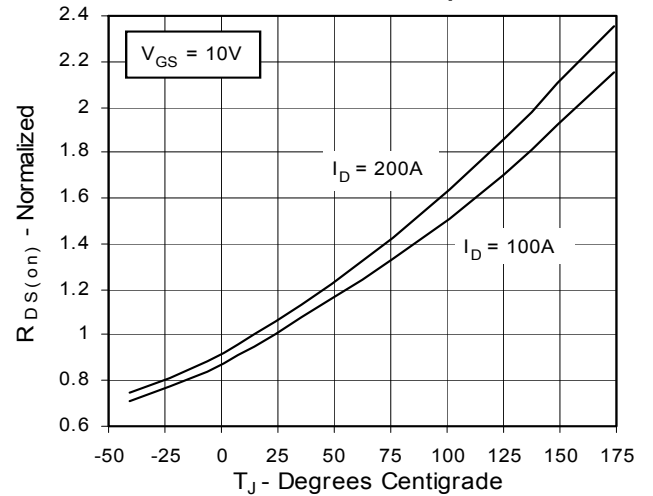
**Fig. 2. Extended Output Characteristics
@ 25°C**



**Fig. 3. Output Characteristics
@ 150°C**



**Fig. 4. $R_{DS(on)}$ Normalized to $I_D = 100A$
Value vs. Junction Temperature**



**Fig. 5. $R_{DS(on)}$ Normalized to $I_D = 100A$
Value vs. Drain Current**

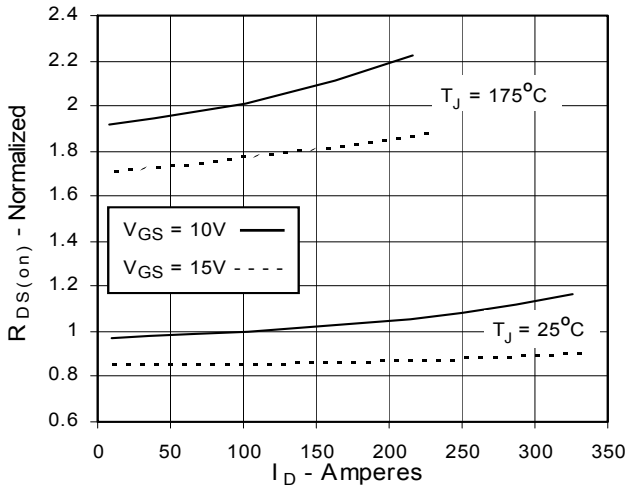


Fig. 6. Drain Current vs. Case Temperature

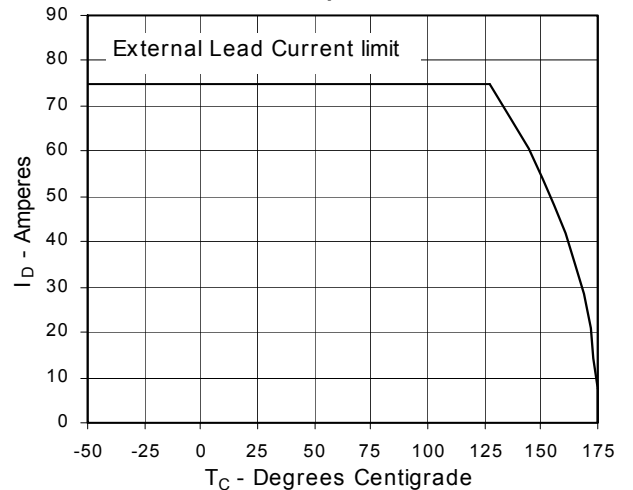


Fig. 7. Input Admittance

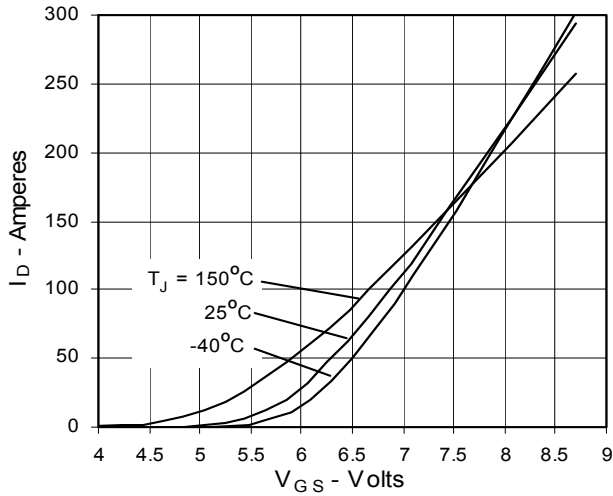


Fig. 8. Transconductance

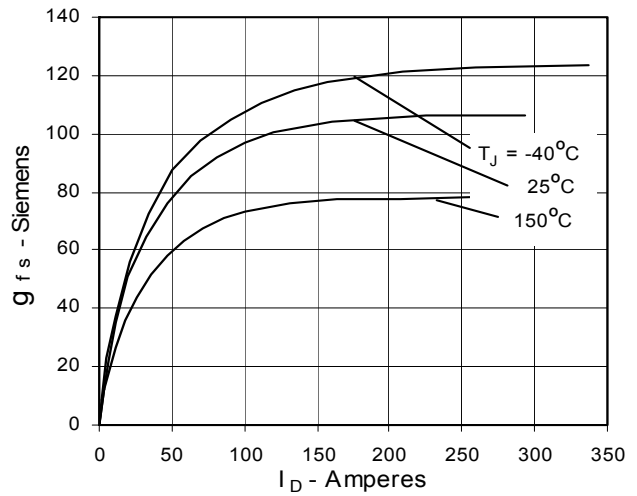


Fig. 9. Source Current vs. Source-To-Drain Voltage

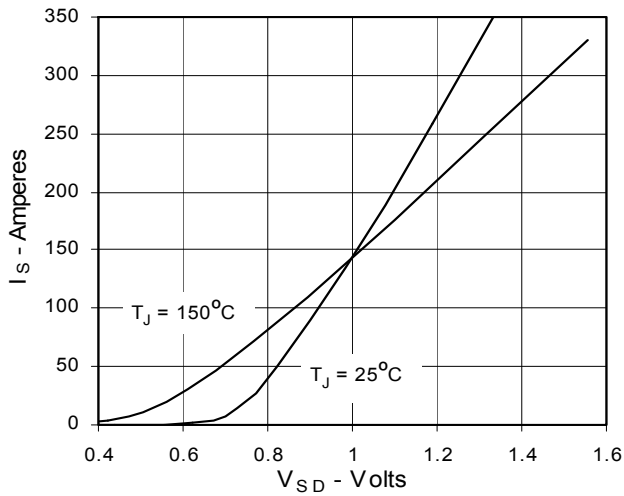


Fig. 10. Gate Charge

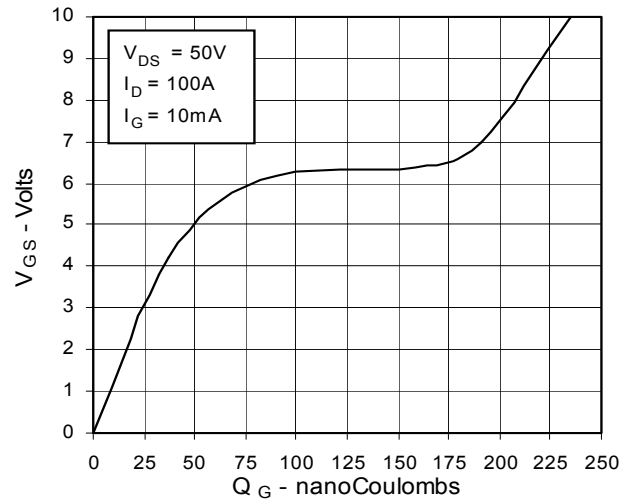


Fig. 11. Capacitance

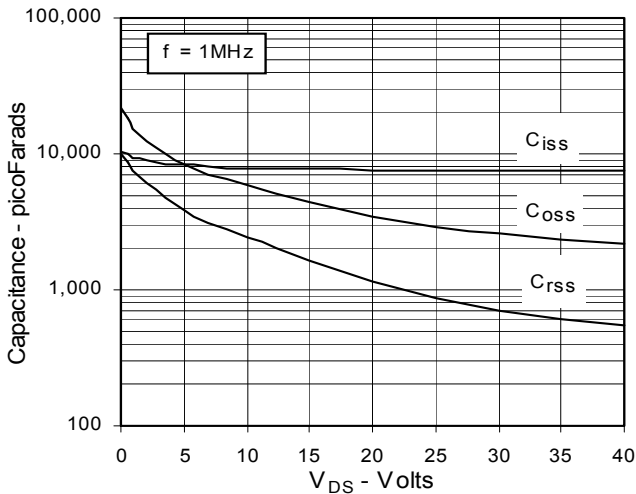


Fig. 12. Forward-Bias Safe Operating Area

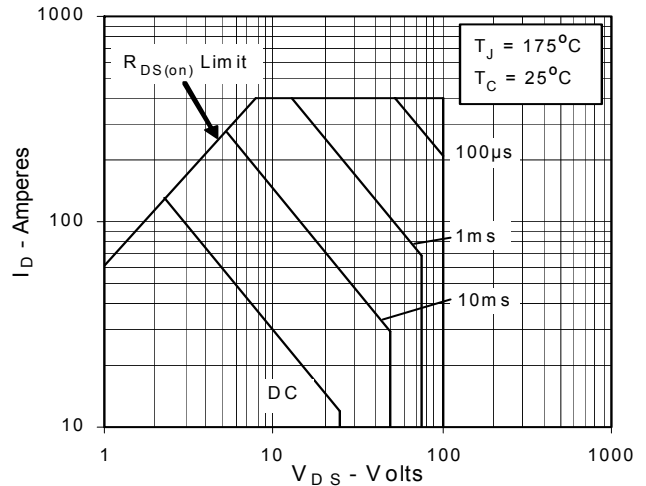
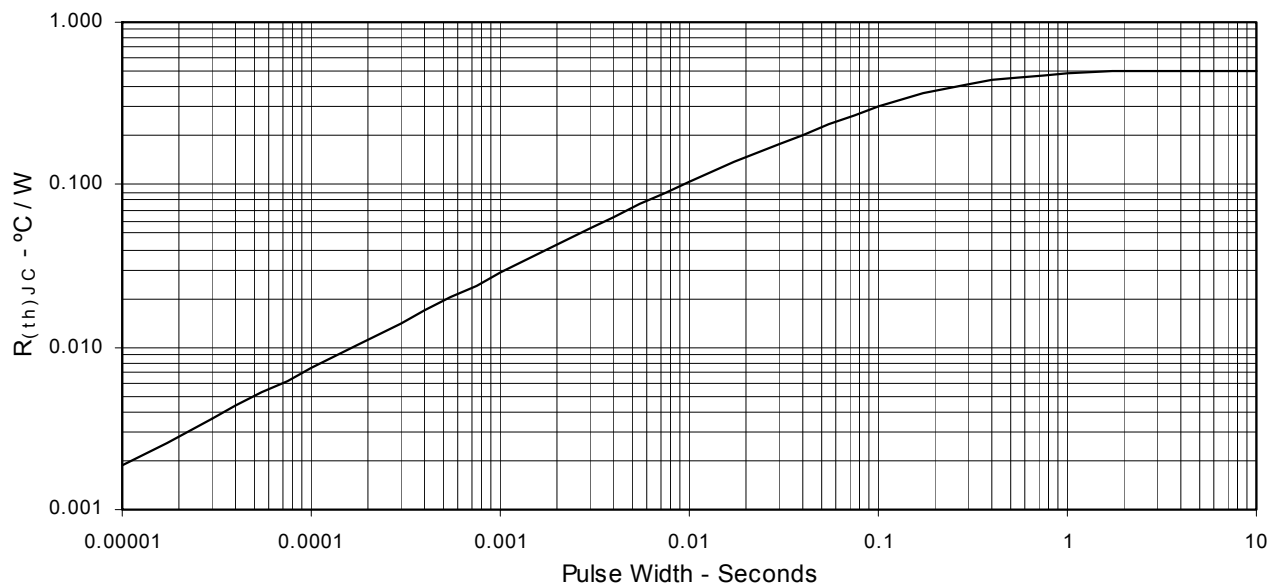


Fig. 13. Maximum Transient Thermal Resistance





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