

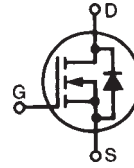
PolarHT™ HiPerFET IXFR 140N20P

Power MOSFET

ISOPLUS247™

(Electrically Isolated Back Surface)

N-Channel Enhancement Mode
Fast Intrinsic Diode
Avalanche Rated



$$V_{DSS} = 200 \text{ V}$$

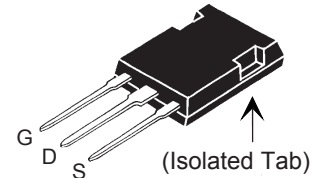
$$I_{D25} = 90 \text{ A}$$

$$R_{DS(on)} \leq 22 \text{ m}\Omega$$

$$t_{rr} \leq 200 \text{ ns}$$

Symbol	Test Conditions	Maximum Ratings		
V_{DSS}	$T_J = 25^\circ\text{C to } 175^\circ\text{C}$	200	V	
V_{DGR}	$T_J = 25^\circ\text{C to } 175^\circ\text{C}; R_{GS} = 1 \text{ M}\Omega$	200	V	
V_{GS}	Continuous	± 20	V	
V_{GSM}	Transient	± 30	V	
I_{D25}	$T_C = 25^\circ\text{C}$	90	A	
$I_{D(RMS)}$	External lead current limit	75	A	
I_{DM}	$T_C = 25^\circ\text{C}$, pulse width limited by T_{JM}	280	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	$^\circ\text{C}$	
T_L	1.6 mm (0.062 in.) from case for 10 s	300	$^\circ\text{C}$	
V_{ISOL}	50/60 Hz, RMS, 1 minute	2500	V~	
M_d	Terminal torque Mounting torque	1.13/10 1.13/10	Nm/lb.in. Nm/lb.in.	
Weight		5	g	
Symbol	Test Conditions ($T_J = 25^\circ\text{C}$, unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
BV_{DSS}	$V_{GS} = 0 \text{ V}$, $I_D = 250 \mu\text{A}$	200		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 4 \text{ mA}$	2.5		5.0 V
I_{GSS}	$V_{GS} = \pm 20 \text{ V}_{DC}$, $V_{DS} = 0$			$\pm 200 \text{ nA}$
I_{DSS}	$V_{DS} = V_{DSS}$ $V_{GS} = 0 \text{ V}$ $T_J = 150^\circ\text{C}$			25 μA
				250 μA
$R_{DS(on)}$	$V_{GS} = 10 \text{ V}$, $I_D = 0.5 I_{D25}$ $V_{GS} = 15 \text{ V}$, $I_D = 140 \text{ A}$ Pulse test, $t \leq 300 \mu\text{s}$, duty cycle $d \leq 2\%$	17		22 $\text{m}\Omega$
				$\text{m}\Omega$

ISOPLUS247 (IXFR)
E153432



G = Gate D = Drain
S = Source

Features

- † International standard isolated package
- † UL recognized package
- † Unclamped Inductive Switching (UIS) rated
- † Low package inductance
- easy to drive and to protect
- † Fast intrinsic diode

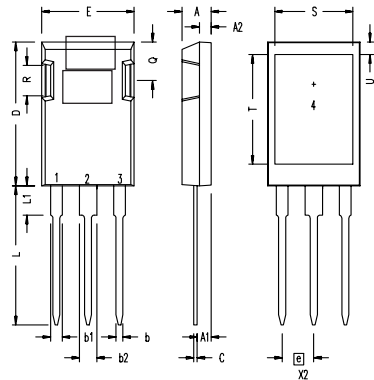
Advantages

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

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	50	84	S
C_{iss}	$V_{GS} = 0\text{ V}$, $V_{DS} = 25\text{ V}$, $f = 1\text{ MHz}$		7500	pF
C_{oss}			1800	pF
C_{rss}			280	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
$Q_{g(on)}$	$V_{GS} = 10\text{ V}$, $V_{DS} = 0.5 V_{DSS}$, $I_D = 0.5 I_{D25}$		240	nC
Q_{gs}			50	nC
Q_{gd}			100	nC
R_{thJC}	ISOPLUS247			0.5 $^\circ\text{C/W}$
R_{thCS}		0.15		$^\circ\text{C/W}$

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		Min.	typ.	Max.
I_s	$V_{GS} = 0\text{ V}$			90 A
I_{SM}	Repetitive			280 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}			0.6	μC
I_{RM}			6	A

ISOPLUS 247 OUTLINE



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

Dim.	Millimeter		Inches	
	Min.	Max.	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

IXYS reserves the right to change limits, test conditions, and dimensions.

IXYS MOSFETs and IGBTs are covered by 4,835,592 4,931,844 5,049,961 5,237,481 6,162,665 6,404,065 B1 6,683,344 6,727,585
one or more of the following U.S. patents: 4,850,072 5,017,508 5,063,307 5,381,025 6,259,123 B1 6,534,343 6,710,405B2 6,759,692
4,881,106 5,034,796 5,187,117 5,486,715 6,306,728 B1 6,583,505 6,710,463 6,771,478 B2

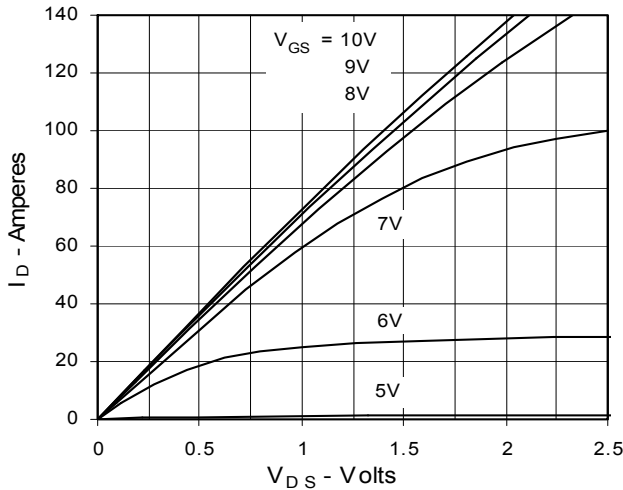
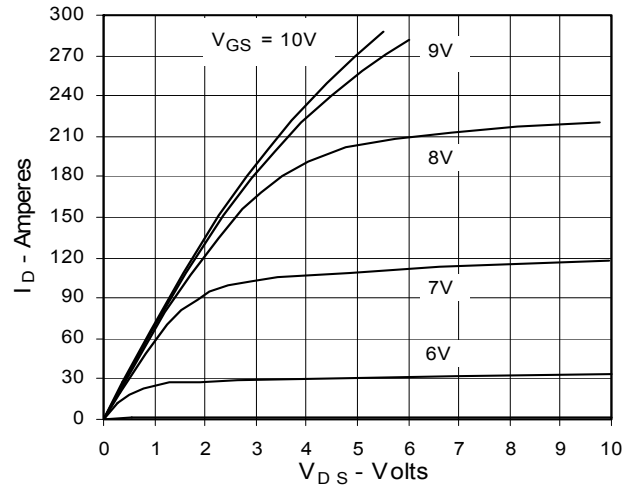
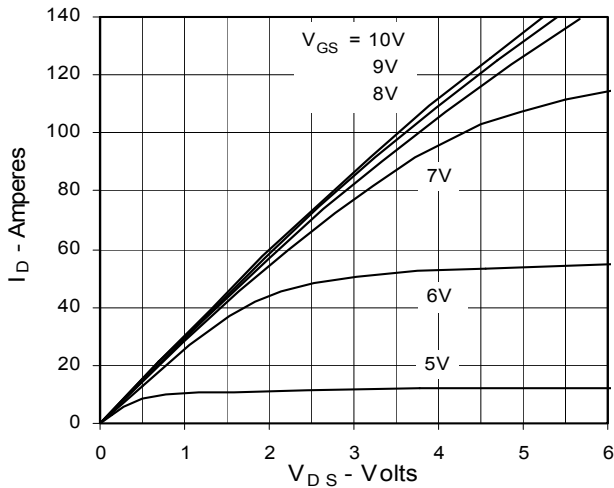
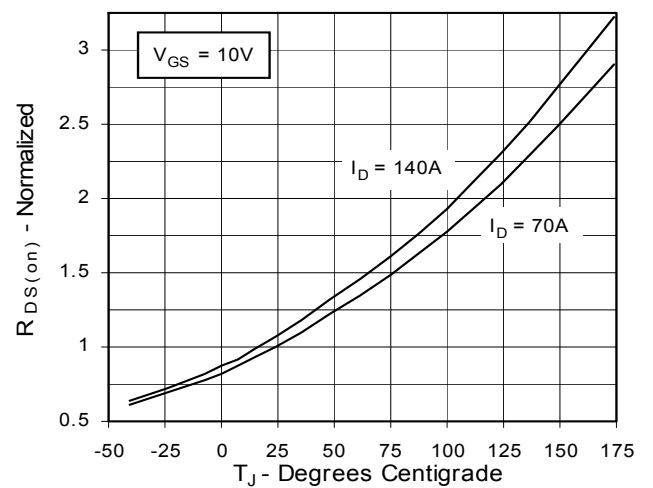
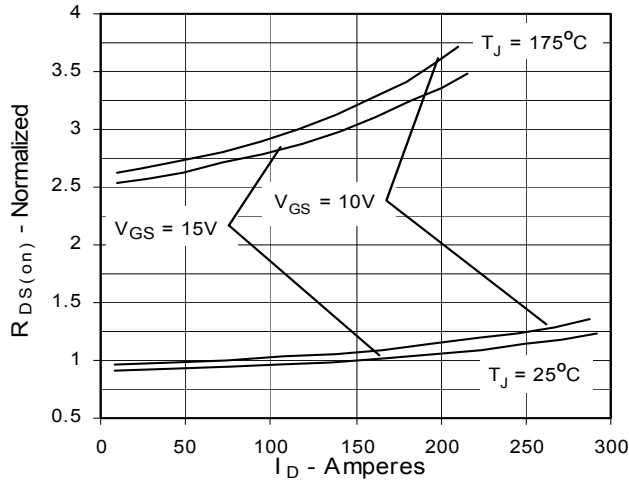
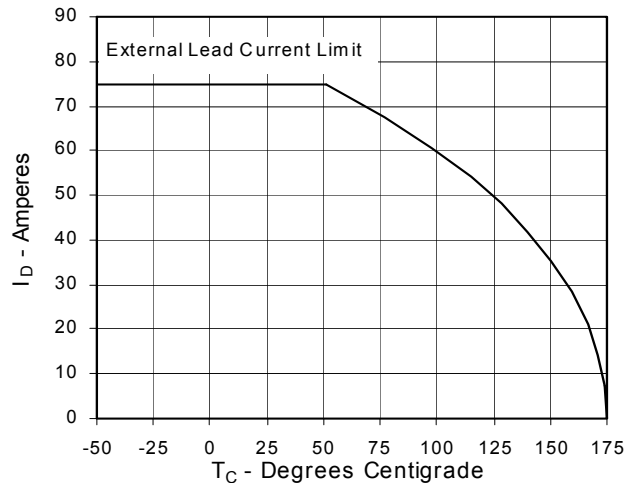
**Fig. 1. Output Characteristics
@ 25°C**

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

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

**Fig. 4. $R_{DS(on)}$ Normalized to $I_D = 70A$
Value vs. Junction Temperature**

**Fig. 5. $R_{DS(on)}$ Normalized to
 $I_D = 70A$ Value vs. Drain Current**

**Fig. 6. Drain Current vs. Case
Temperature**


Fig. 7. Input Admittance

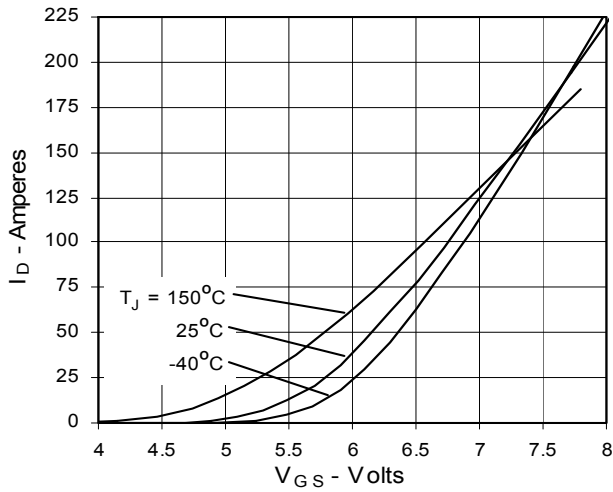


Fig. 8. Transconductance

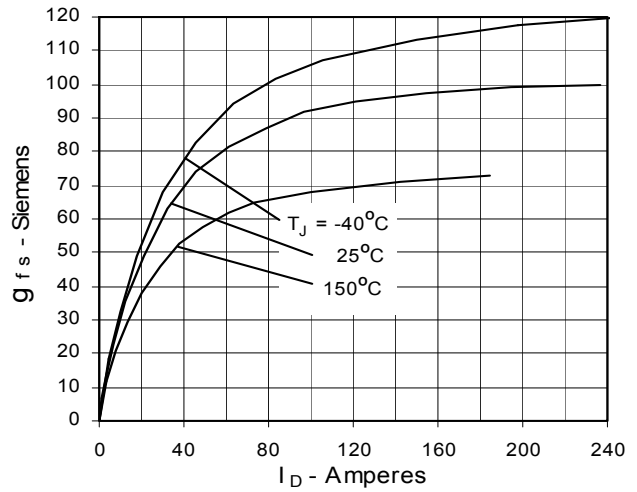


Fig. 9. Source Current vs. Source-To-Drain Voltage

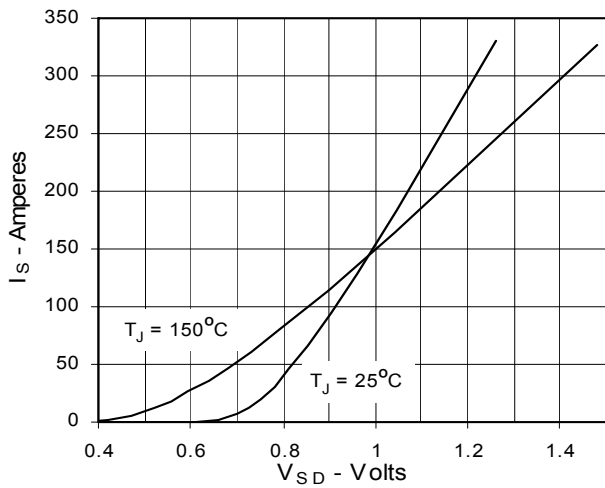


Fig. 10. Gate Charge

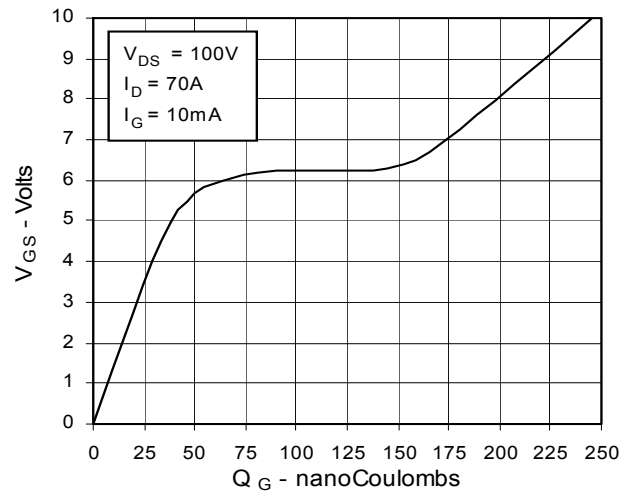


Fig. 11. Capacitance

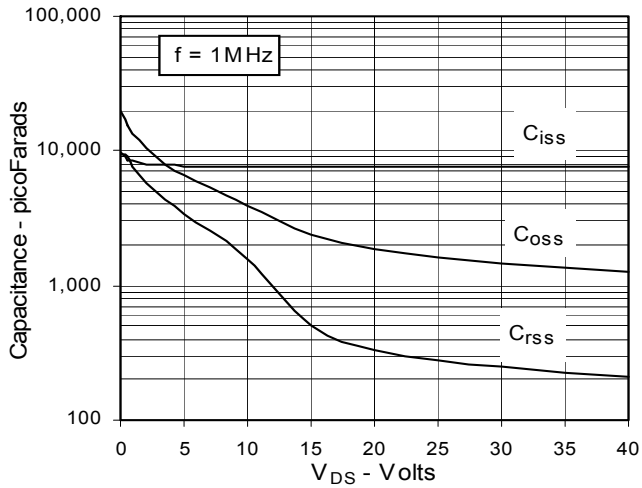


Fig. 12. Forward-Bias Safe Operating Area

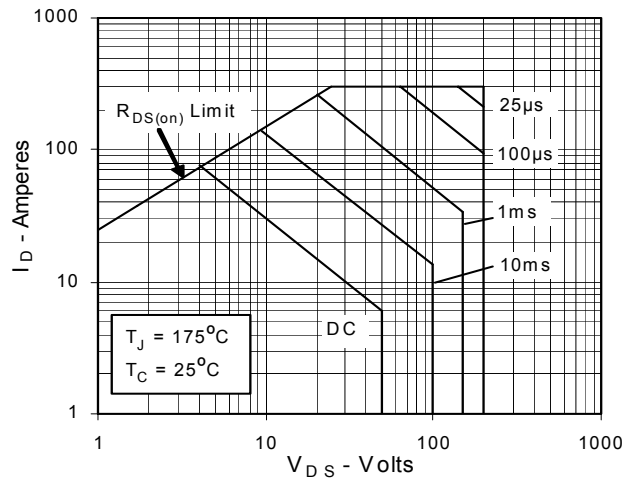
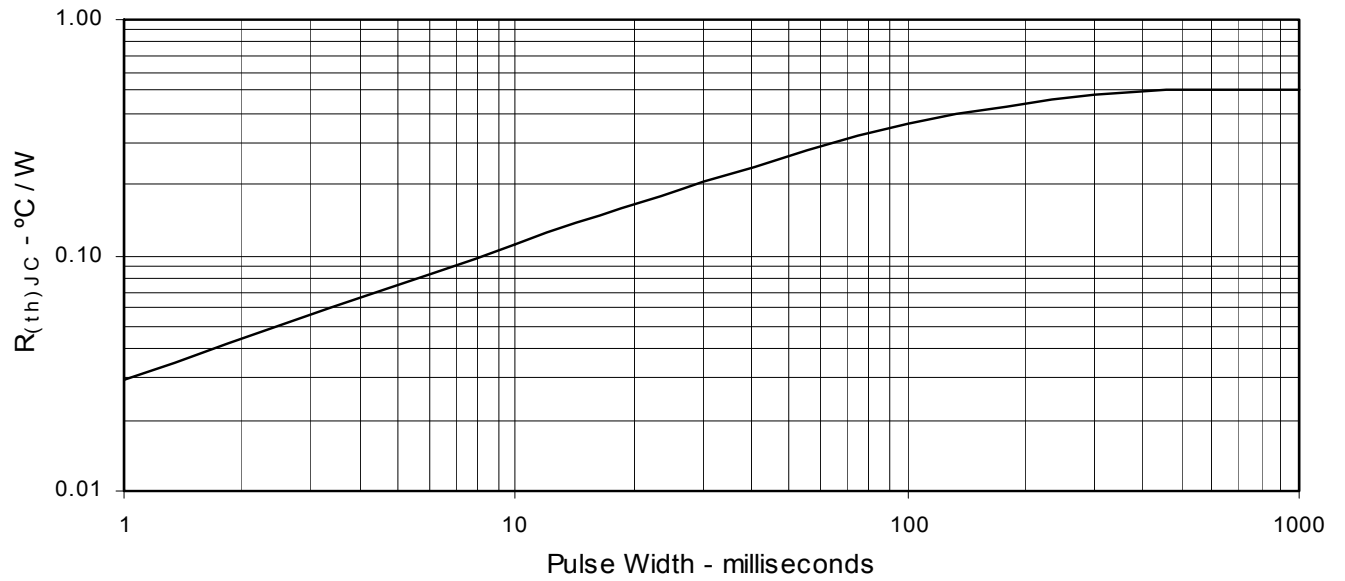


Fig. 13. Maximum Transient Thermal Resistance





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