

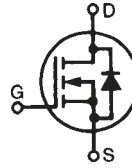
PolarHT™ HiPerFET IXFR 140N20P

Power MOSFET

ISOPLUS247™

(Electrically Isolated Back Surface)

N-Channel Enhancement Mode
Fast Intrinsic Diode
Avalanche Rated



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

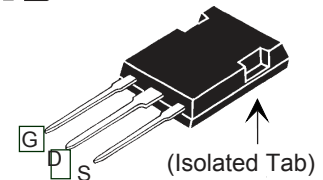
$$I_{D25} = 90 \text{ A}$$

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

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

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

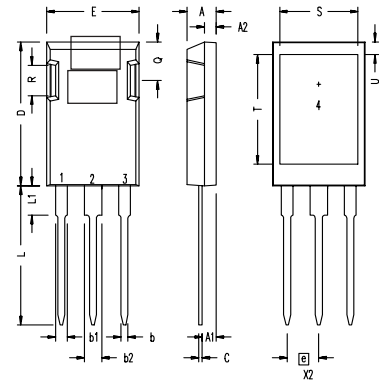
Advantages

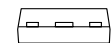
- † Easy to mount
- † Space savings
- † High power density

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
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 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

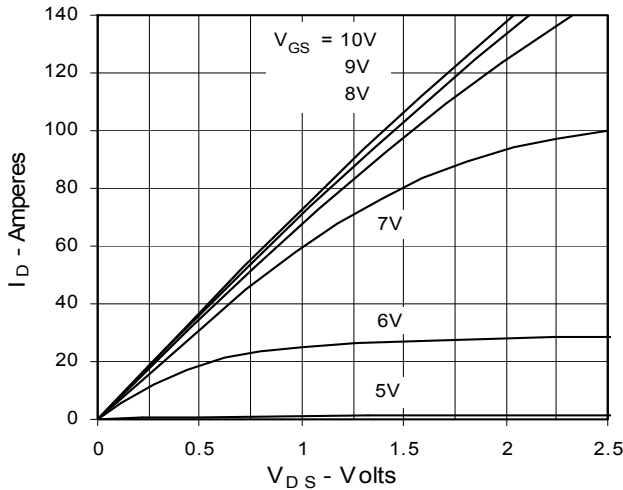
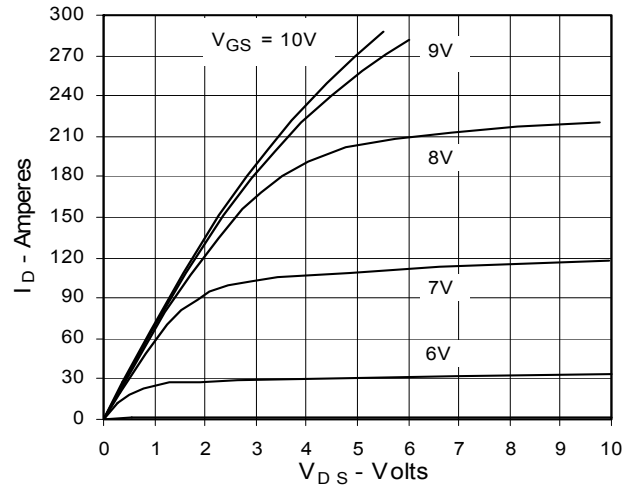
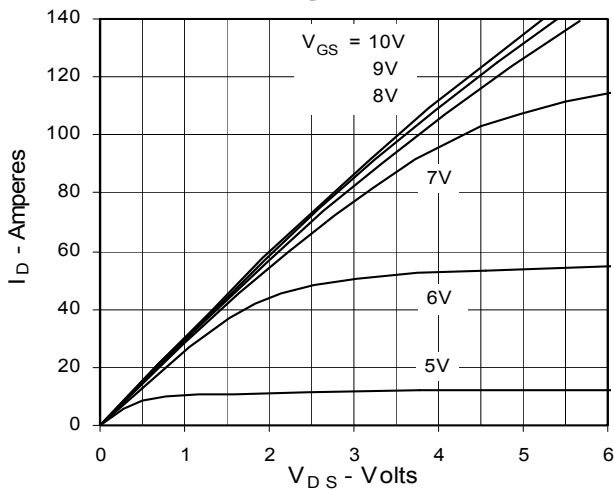
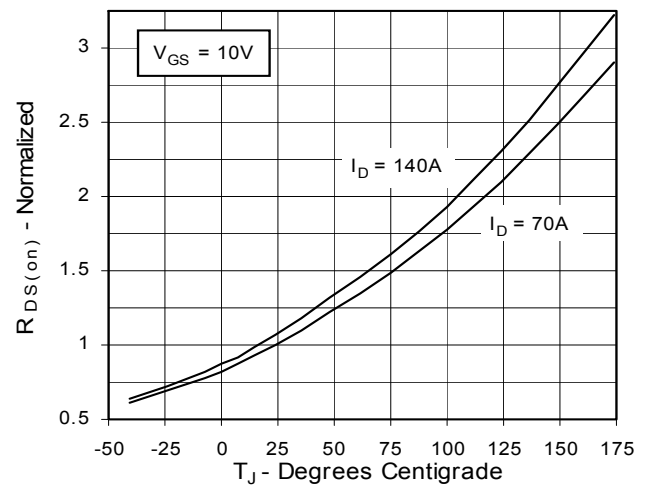
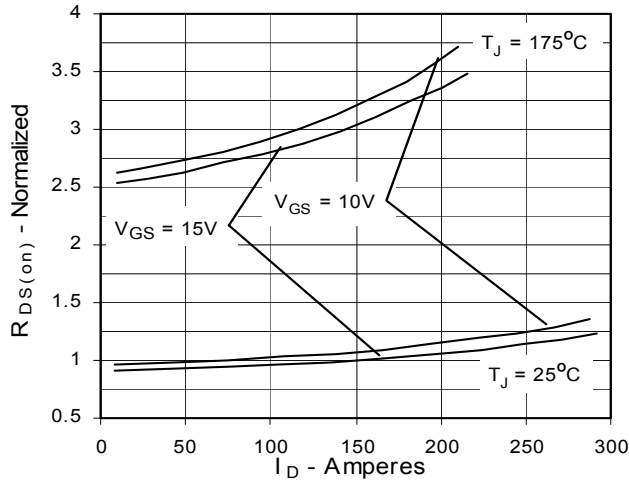
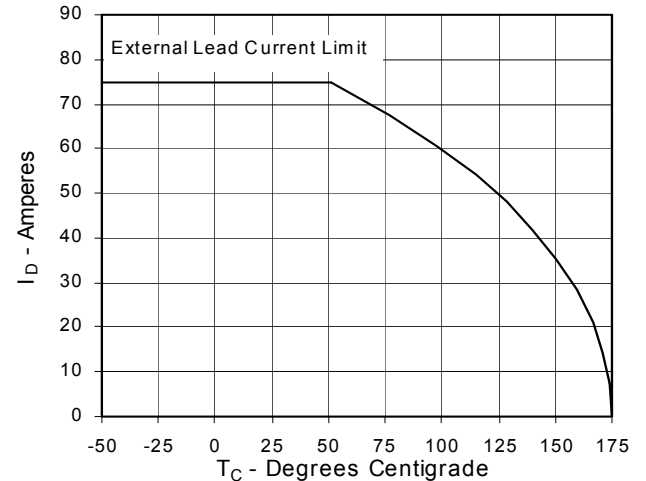
**Fig. 1. Output Characteristics
@ 25°C**

**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

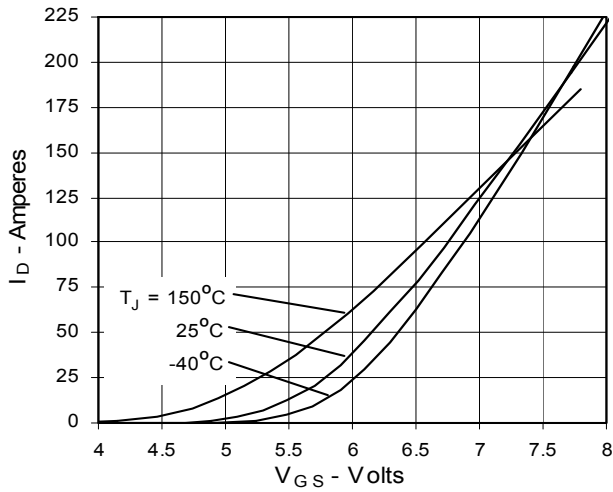


Fig. 8. Transconductance

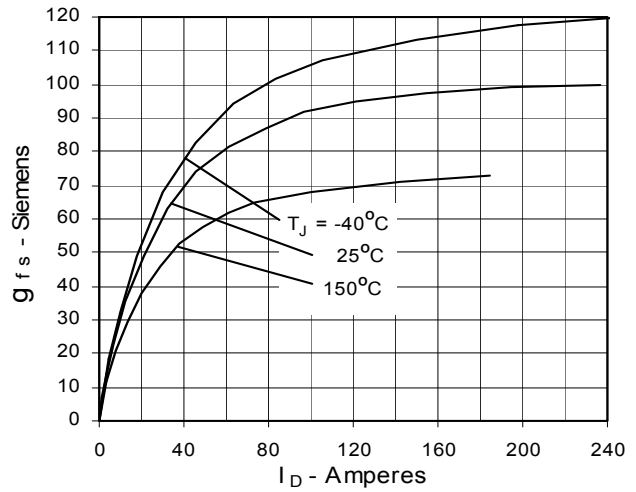


Fig. 9. Source Current vs. Source-To-Drain Voltage

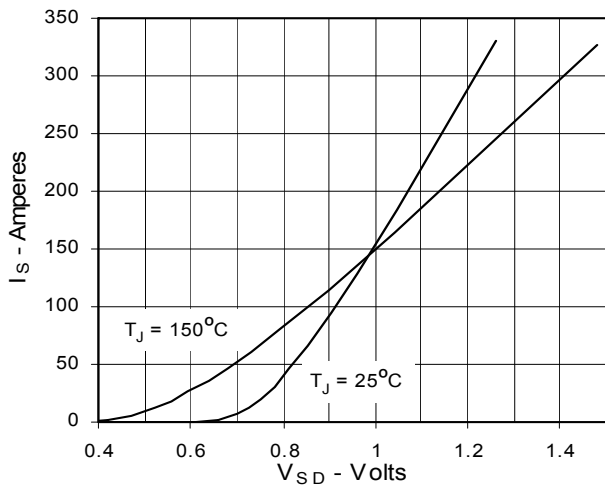


Fig. 10. Gate Charge

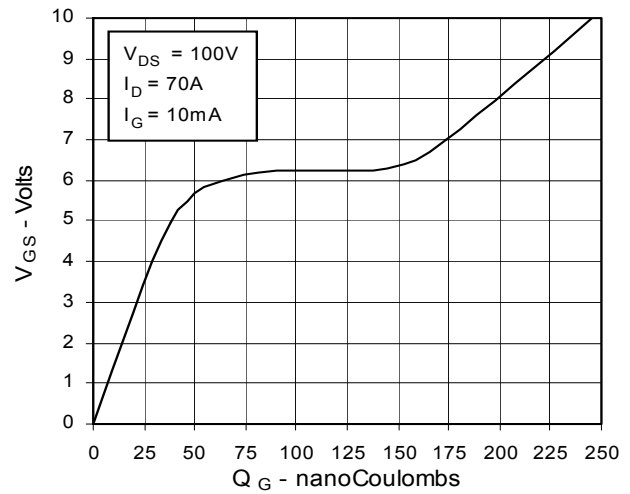


Fig. 11. Capacitance

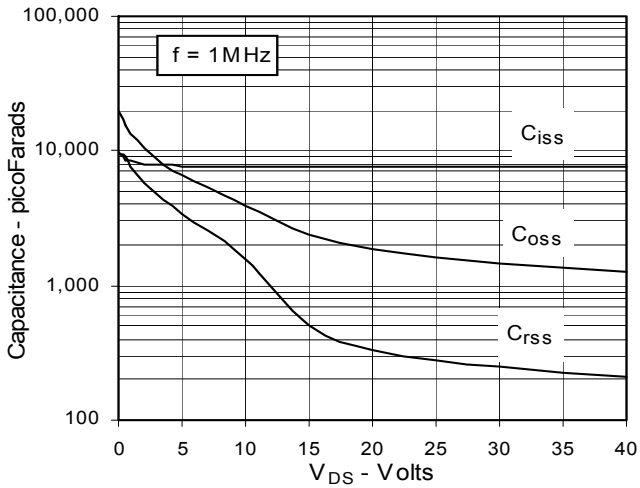


Fig. 12. Forward-Bias Safe Operating Area

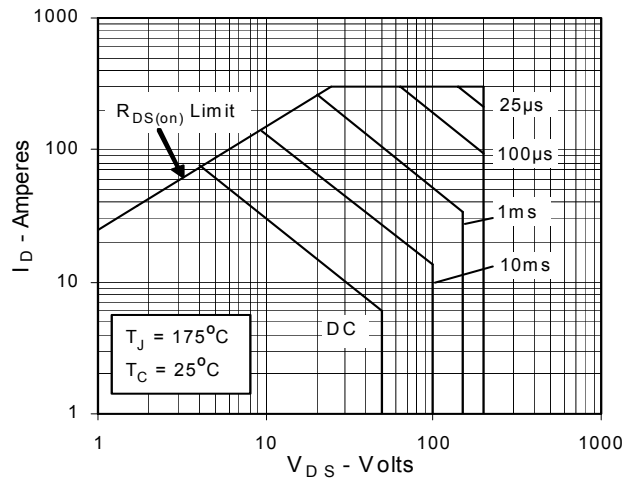
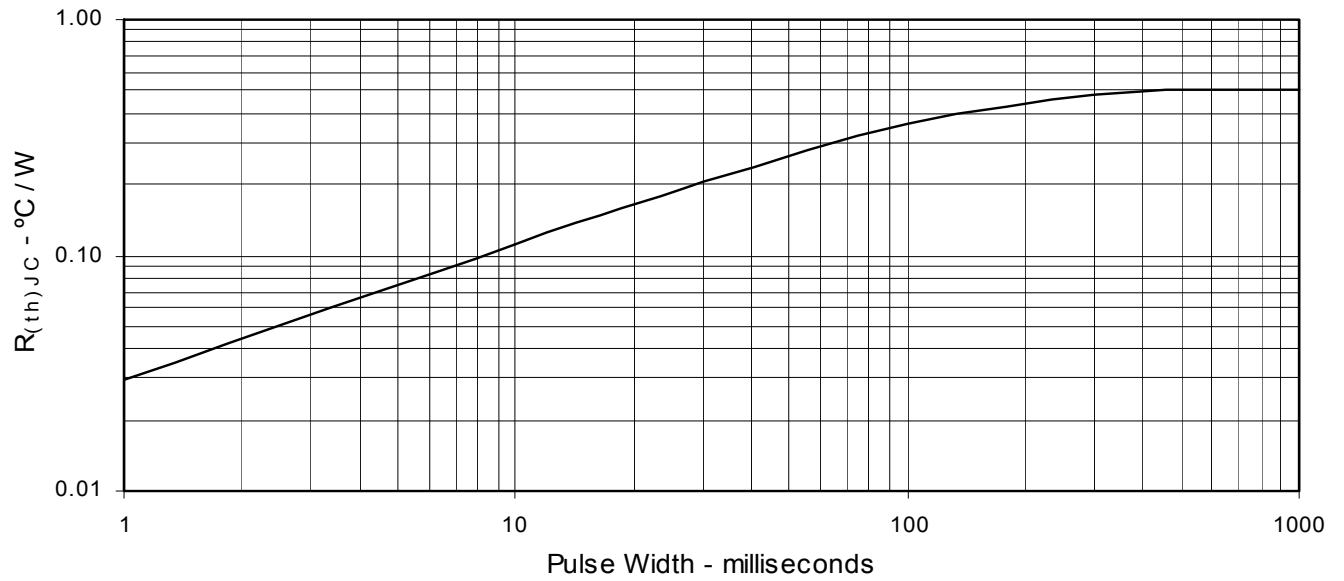


Fig. 13. Maximum Transient Thermal Resistance





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