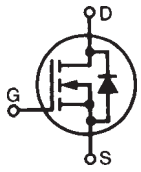
IXYS

Polar™ Power MOSFET IXFC52N30P
HiPerFET™

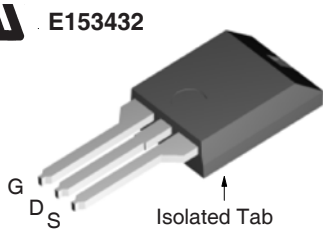
V_{DSS} = 300V
I_{D25} = 24A
$R_{DS(on)}$ ≤ 80mΩ
t_{rr} ≤ 200ns

(Electrically Isolated Back Surface)

N-Channel Enhancement Mode
Avalanche Rated



ISOPLUS220™
E153432



G = Gate D = Drain
S = Source

Symbol	Test Conditions		Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C		300	V
V_{DGR}	T_J = 25°C to 150°C, R_{GS} = 1MΩ		300	V
V_{GSS}	Continuous		±20	V
V_{GSM}	Transient		±30	V
I_{D25}	T_C = 25°C		24	A
I_{DM}	T_C = 25°C, Pulse Width Limited by T_{JM}		150	A
I_A	T_C = 25°C		52	A
E_{AS}	T_C = 25°C		1	J
dv/dt	$I_S \le I_{DM}$, $V_{DD} \le V_{DSS}$, $T_J \le 150°C$		10	V/ns
P_D	T_C = 25°C		100	W
T_J			-55 ... +150	°C
T_{JM}			150	°C
T_{stg}			-55 ... +150	°C
T_L	Maximum Lead Temperature for Soldering		300	°C
T_{SOLD}	Plastic Body for 10s		260	°C
V_{ISOL}	50/60 Hz, RMS	t = 1min	2500	V~
	$I_{ISOL} \le$ 1mA	t = 1s	3000	V~
M_d	Mounting force		11..66 / 2.5..14.6	N/lb.
Weight			2	g

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
BV_{DSS}	V_{GS} = 0V, I_D = 250μA	300			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 4mA	2.5		5.0	V
I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V			±100	nA
I_{DSS}	$V_{DS} = V_{DSS}$, V_{GS} = 0V			25	μA
	T_J = 125°C			1	mA
$R_{DS(on)}$	V_{GS} = 10V, I_D = 26A, Note 1			80	mΩ

Features

- UL Recognized Package
- Silicon Chip on Direct-Copper-Bond Substrate
  - High Power Dissipation
  - Isolated Mounting Surface
  - 2500V~ Electrical Isolation
- Fast Intrinsic Rectifier
- Avalanche Rated
- Low $R_{DS(ON)}$ and Q_G
- Low Package Inductance

Advantages

- High Power Density
- Easy to Mount
- Space Savings

Applications

- Switch-Mode and Resonant-Mode Power Supplies
- DC-DC Converters
- Laser Drivers
- AC and DC Motor Drives
- Robotics and Servo Controls

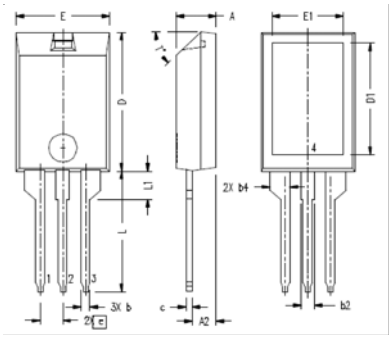
Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS} = 10V, I_D = 26A, Note 1	20	30		S
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		3490		pF
C_{oss}			550		pF
C_{rss}			130		pF
$t_{d(on)}$	**Resistive Switching Times**		24		ns
t_r	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 52A		22		ns
$t_{d(off)}$	R_G = 4Ω (External)		60		ns
t_f			20		ns
$Q_{g(on)}$	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 26A		110		nC
Q_{gs}			25		nC
Q_{gd}			53		nC
R_{thJC}				1.25	°C/W
R_{thCS}			0.21		°C/W

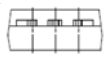
Source-Drain Diode

Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
I_S	V_{GS} = 0V			52	A
I_{SM}	Repetitive, pulse width limited by T_{JM}			150	A
V_{SD}	I_F = 52A, V_{GS} = 0V, Note 1			1.5	V
t_{rr}	I_F = 25A, -di/dt = 100A/μs		160	200	ns
Q_{RM}	V_R = 100V, V_{GS} = 0V		800		nC
I_{RM}			7		A

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

ISOPLUS220™ Outline





Note:
Bottom heatsink (Pin 4) is electrically isolated from Pin 1,2, or 3.

SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.157	.197	4.00	5.00
A2	.098	.118	2.50	3.00
b	.035	.051	0.90	1.30
b2	.049	.065	1.25	1.65
b4	.093	.100	2.35	2.55
c	.028	.039	0.70	1.00
D	.591	.630	15.00	16.00
D1	.472	.512	12.00	13.00
E	.394	.433	10.00	11.00
E1	.295	.335	7.50	8.50
e	.100 BASIC		2.55 BASIC	
L	.512	.571	13.00	14.50
L1	.118	.138	3.00	3.50
T°			42.5°	47.5°

Ref: IXYS CO 0177 R0

Fig. 1. Output Characteristics @ T_J = 25ºC

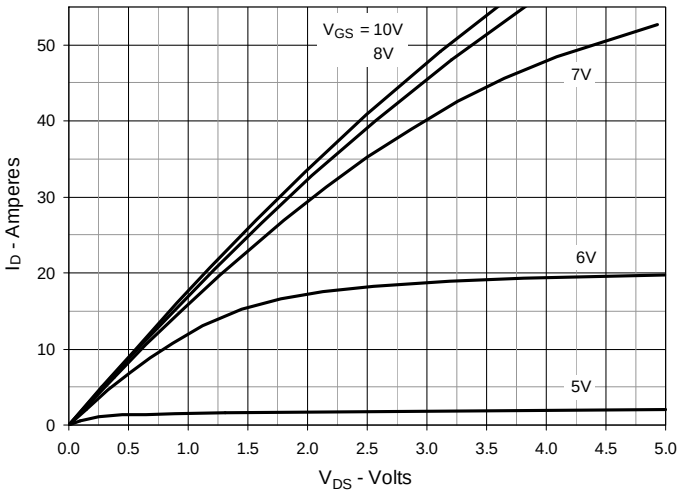


Fig. 2. Extended Output Characteristics @ T_J = 25ºC

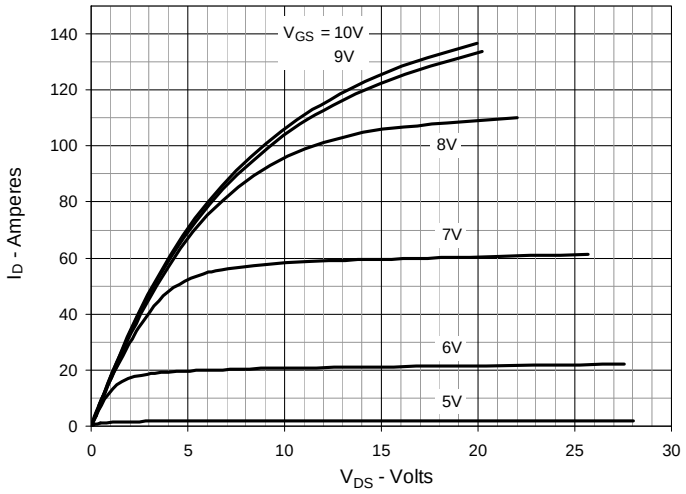


Fig. 3. Output Characteristics @ T_J = 125ºC

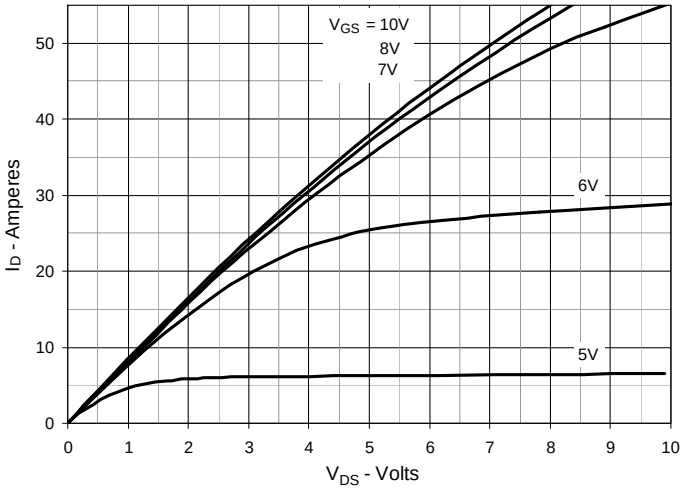


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 26A Value vs. Junction Temperature

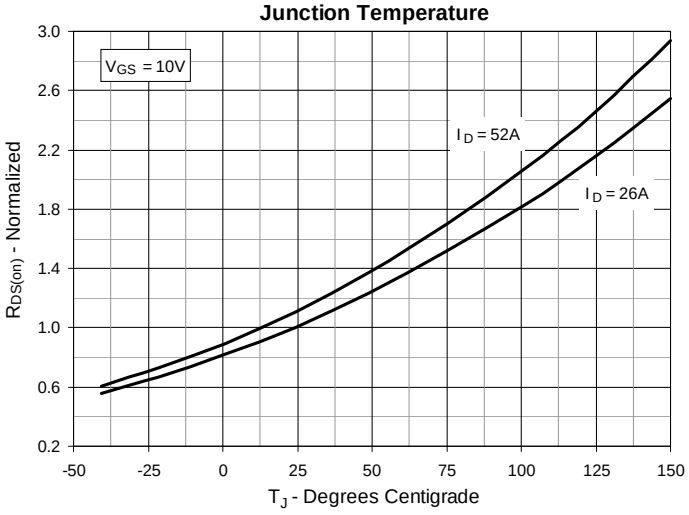


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 26A Value vs. Drain Current

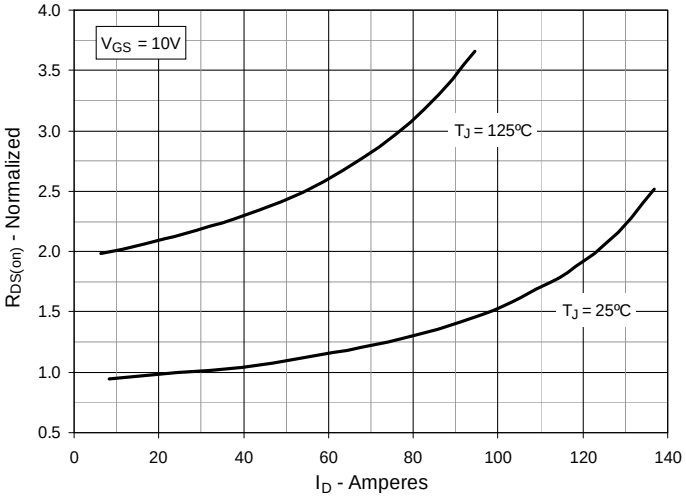


Fig. 6. Maximum Drain Current vs. Case Temperature

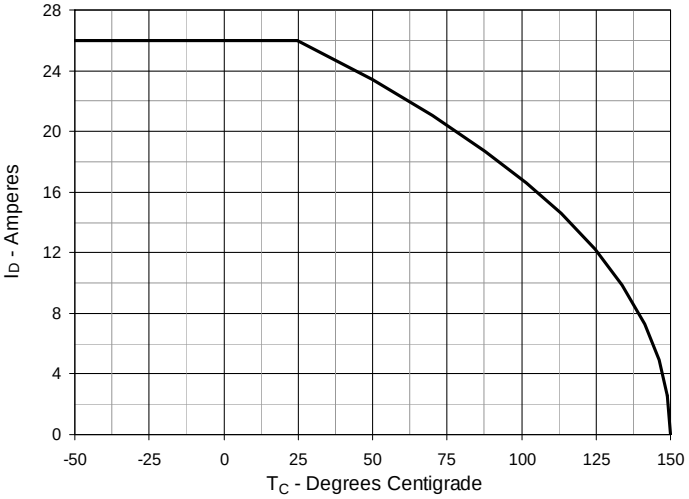


Fig. 7. Input Admittance

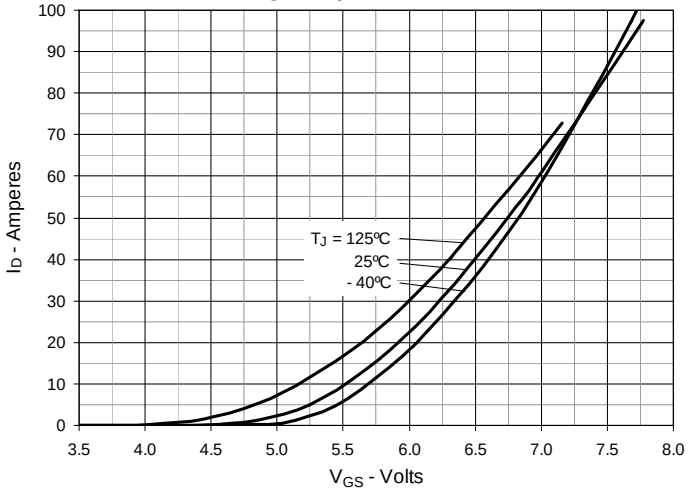


Fig. 8. Transconductance

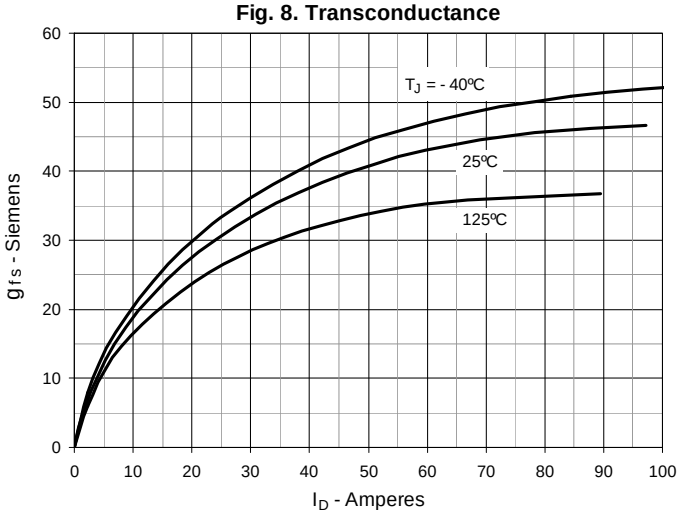


Fig. 9. Forward Voltage Drop of Intrinsic Diode

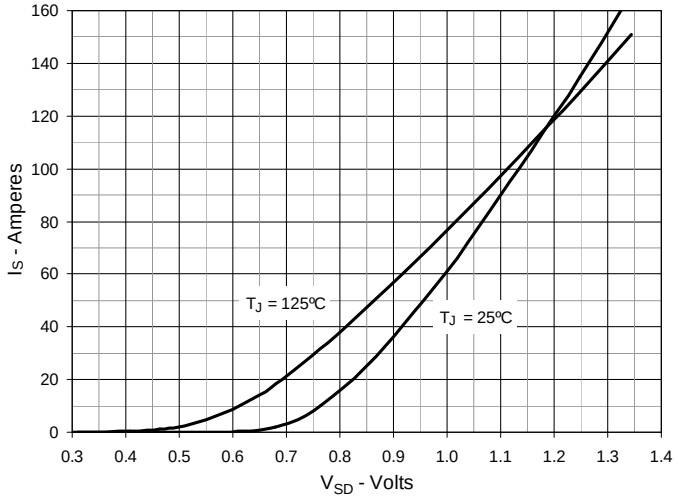


Fig. 10. Gate Charge

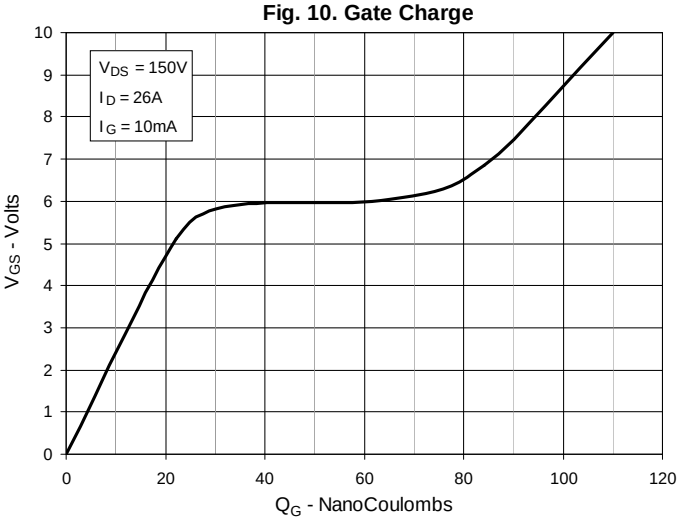


Fig. 11. Capacitance

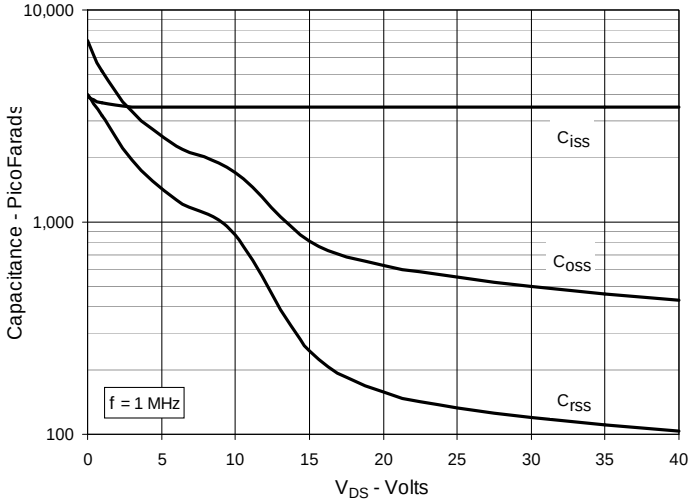


Fig. 12. Forward-Bias Safe Operating Area

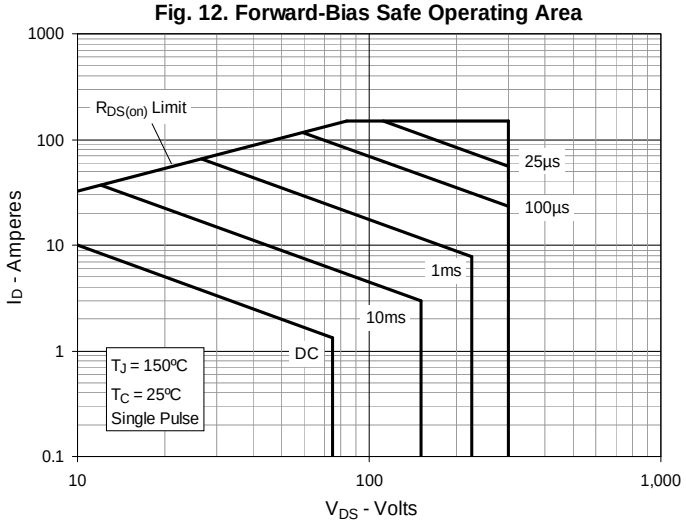


Fig. 13. Maximum Transient Thermal Impedance