IXYS

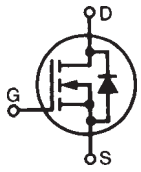
Polar™ Power MOSFET HiPerFET™

IXFR64N50P

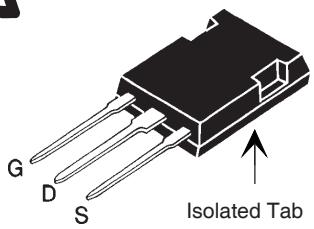
V_{DSS} = 500V
I_{D25} = 37A
$R_{DS(on)}$ ≤ 95mΩ
t_{rr} ≤ 200ns

(Electrically Isolated Back Surface)

N-Channel Enhancement Mode
Avalanche Rated



ISOPLUS247
E153432



G = Gate D = Drain
S = Source

Symbol	Test Conditions		Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C		500	V
V_{DGR}	T_J = 25°C to 150°C, R_{GS} = 1MΩ		500	V
V_{GSS}	Continuous		±30	V
V_{GSM}	Transient		±40	V
I_{D25}	T_C = 25°C		37	A
I_{DM}	T_C = 25°C, pulse width limited by T_{JM}		150	A
I_A	T_C = 25°C		64	A
E_{AS}	T_C = 25°C		2.5	J
dV/dt	$I_S \le I_{DM}$, $V_{DD} \le V_{DSS}$, $T_J \le 150°C$		20	V/ns
P_D	T_C = 25°C		300	W
T_J			-55 ... +150	°C
T_{JM}			150	°C
T_{stg}			-55 ... +150	°C
T_L	1.6mm (0.062 in.) from Case for 10s		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		20..120 / 4.5..27	N/lb.
Weight			5	g

Features

- International Standard Package
- 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

- Switched-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.	
BV_{DSS}	V_{GS} = 0V, I_D = 250μA	500			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 8mA	3.0		5.5	V
I_{GSS}	V_{GS} = ±30V, V_{DS} = 0V			±200	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 = 32A, Note 1			95	mΩ

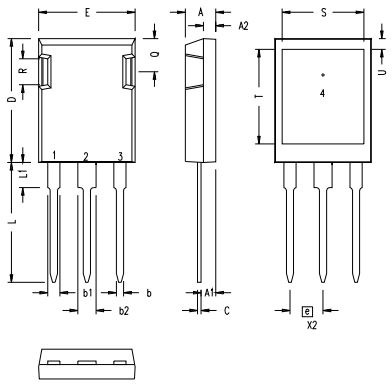
Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.
g_{fs}	V_{DS} = 20V, I_D = 32A, Note 1	30	50	S
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		9700	nF
C_{oss}			970	pF
C_{rss}			30	pF
$t_{d(on)}$	**Resistive Switching Times**		30	ns
t_r	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 32A		25	ns
$t_{d(off)}$	R_G = 2Ω (External)		85	ns
t_f			22	ns
$Q_{g(on)}$	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 32A		150	nC
Q_{gs}			50	nC
Q_{gd}			50	nC
R_{thJC}				0.42 °C/W
R_{thCS}			0.15	°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			64 A
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}			250 A
V_{SD}	I_F = 64A, V_{GS} = 0V, Note 1			1.5 V
t_{rr}	I_F = 25A, -di/dt = 100A/μs			200 ns
Q_{RM}	V_R = 100V, V_{GS} = 0V		0.6	μC
I_{RM}			6.0	A

Note 1: Pulse Test, t ≤ 300μs; Duty Cycle, d ≤ 2%.

ISOPLUS247 (IXFR) Outline



SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS 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 @ 25ºC

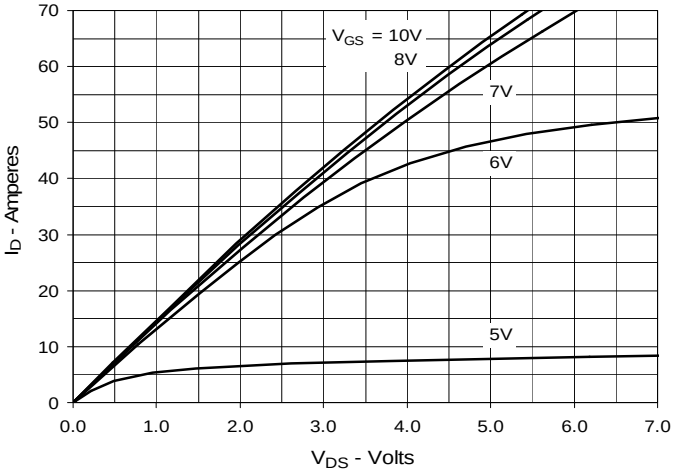


Fig. 2. Extended Output Characteristics @ 25ºC

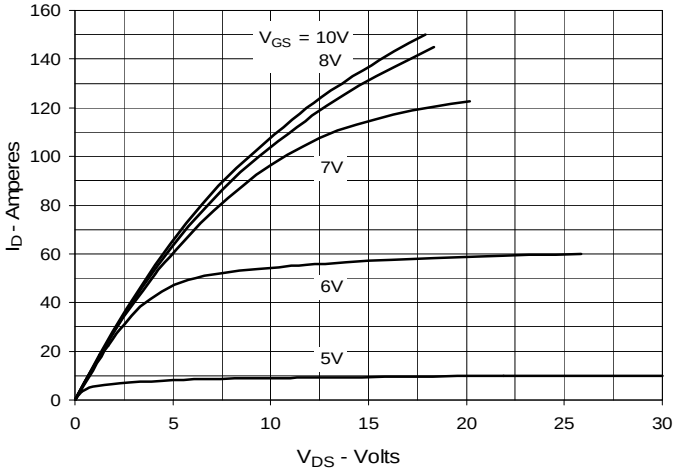


Fig. 3. Output Characteristics @ 125ºC

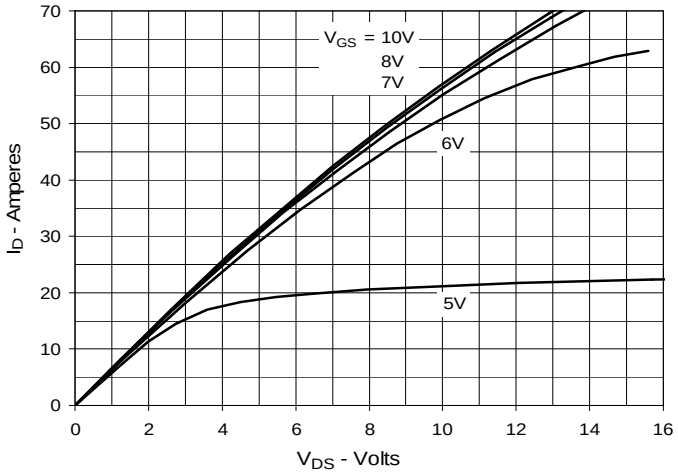


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 32A Value vs. Junction Temperature

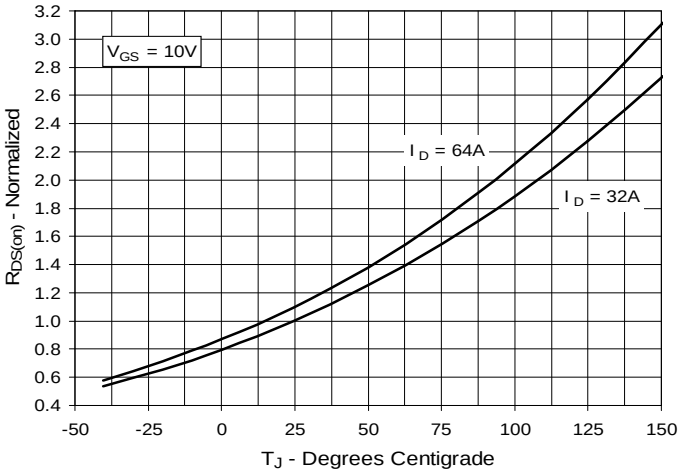


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 32A Value vs. Drain Current

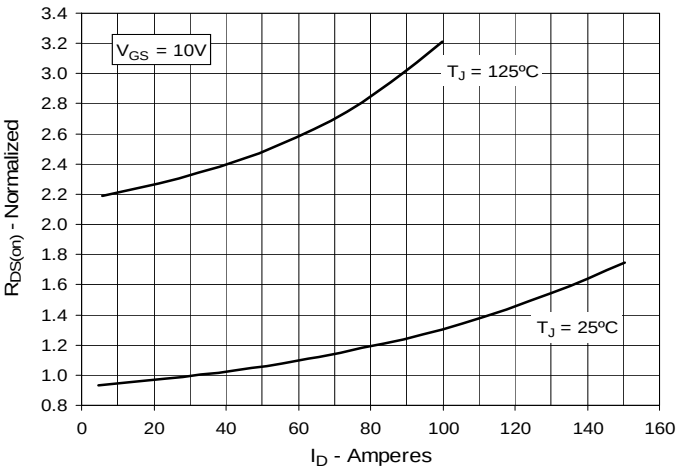


Fig. 6. Maximum Drain Current vs. Case Temperature

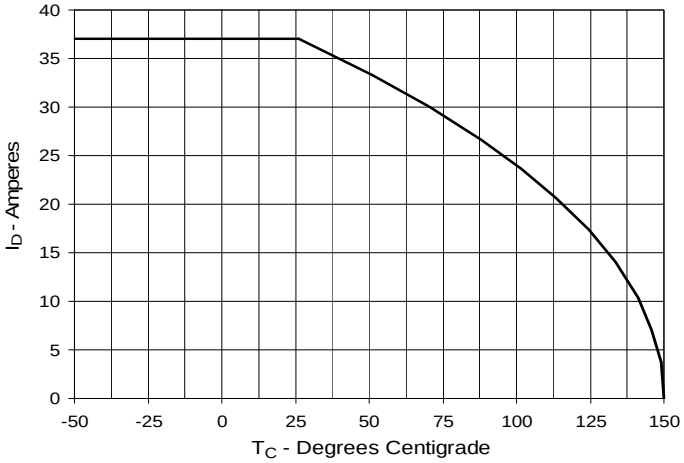


Fig. 7. Input Admittance

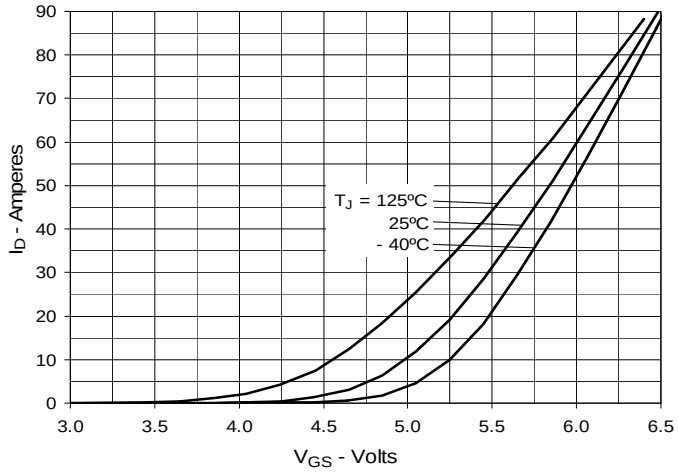


Fig. 8. Transconductance

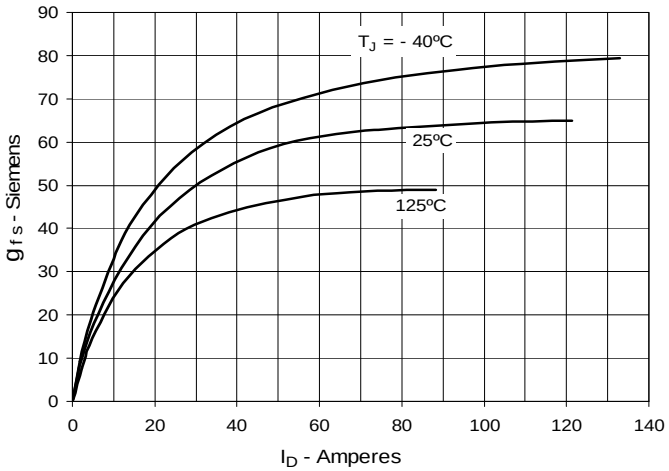


Fig. 9. Forward Voltage Drop of Intrinsic Diode

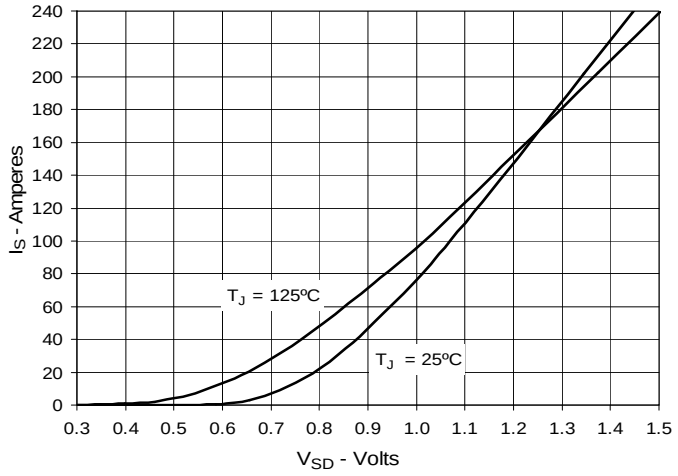


Fig. 10. Gate Charge

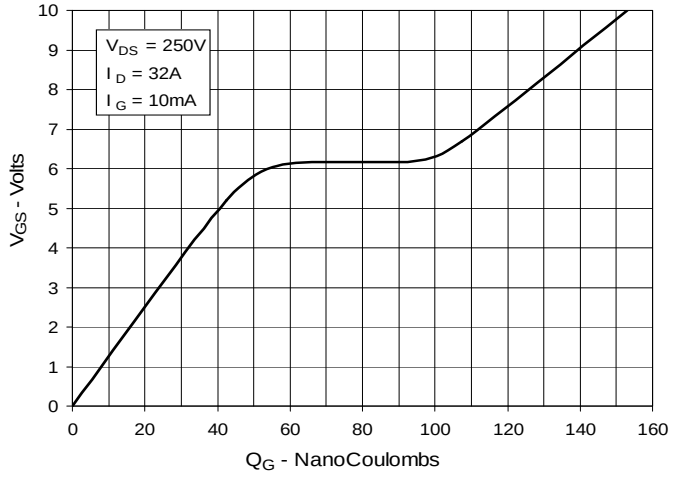


Fig. 11. Capacitance

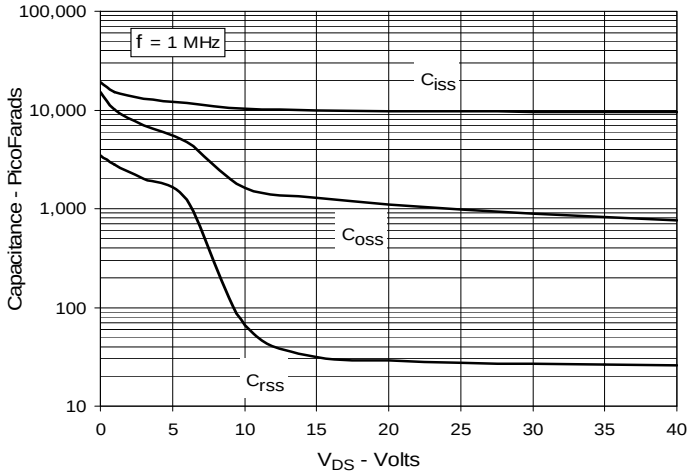


Fig. 12. Maximum Transient Thermal Impedance