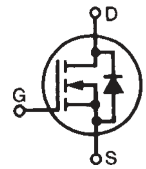
IXYS

HiPerFET™ Power MOSFETs

IXFK24N100
IXFX24N100

V_{DSS} = 1000V
I_{D25} = 24A
$R_{DS(on)}$ ≤ 390mΩ
t_{rr} ≤ 250ns

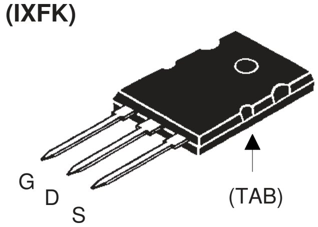
N-Channel Enhancement Mode
Avalanche Rated
Fast Intrisic Diode



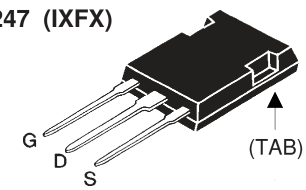
Symbol	Test Conditions		Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C		1000	V
V_{DGR}	T_J = 25°C to 150°C, R_{GS} = 1MΩ		1000	V
V_{GSS}	Continuous		±20	V
V_{GSM}	Transient		±30	V
I_{D25}	T_C = 25°C		24	A
I_{DM}	T_C = 25°C, pulse width limited by T_{JM}		96	A
I_A	T_C = 25°C		24	A
E_{AS}	T_C = 25°C		3	J
dV/dt	$I_S \le I_{DM}$, $V_{DD} \le V_{DSS}$, $T_J \le 150°C$		5	V/ns
P_D	T_C = 25°C		560	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
M_d	Mounting force	(PLUS247)	20..120/4.5..27	N/lb.
	Mounting torque	(TO-264)	1.13/10	Nm/lb.in.
Weight	PLUS247		6	g
	TO-264		10	g

Symbol	Test Conditions (T$_J$ = 25°C, unless otherwise specified)		Characteristic Values Min.	Typ.	Max.	
BV_{DSS}	V_{GS} = 0V, I_D = 3mA		1000			V
$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 8mA		3.0		5.5	V
I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V				±200	nA
I_{DSS}	V_{DS} = V_{DSS}				100	μA
	V_{GS} = 0V	T_J = 125°C			2	mA
$R_{DS(on)}$	V_{GS} = 10V, I_D = 0.5 • I_{D25}, Note 1				390	mΩ

TO-264 (IXFK)



PLUS247 (IXFX)



G = Gate   D = Drain
S = Source   TAB = Drain

Features

- International standard packages
- Low $R_{DS (on)}$ HDMOS™ process
- Rugged polysilicon gate cell structure
- Avalanche rated
- Low package inductance
- Fast intrinsic rectifier

Applications

- DC-DC converters
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- AC motor drives
- Temperature and lighting controls

Advantages

- PLUS 247™ package for clip or spring mounting
- Space savings
- High power density

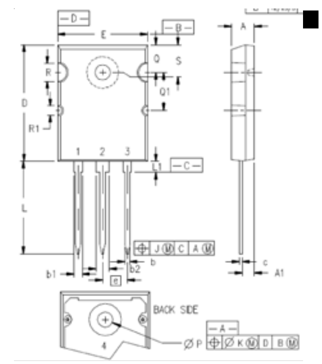
Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	Min.	Typ.	Max.	
g_{fs}	V_{DS} = 10V, I_D = 0.5 • I_{D25}, Note 1	15	27		S
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		8700		pF
C_{oss}			785		pF
C_{rss}			315		pF
$t_{d(on)}$	**Resistive Switching Times** V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 0.5 • I_{D25} R_G = 1Ω (External)		35		ns
t_r			35		ns
$t_{d(off)}$			75		ns
t_f			21		ns
$Q_{g(on)}$	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 0.5 • I_{D25}		267		nC
Q_{gs}			52		nC
Q_{gd}			142		nC
R_{thJC}				0.22	°C/W
R_{thCS}			0.15		°C/W

Source-Drain Diode

Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	Min.	Typ.	Max.	
I_S	V_{GS} = 0V			24	A
I_{SM}	Repetitive, pulse width limited by T_{JM}			96	A
V_{SD}	I_F = 24A, V_{GS} = 0V, Note 1			1.5	V
t_{rr}	I_F = 24A, -di/dt = 100A/μs V_R = 100V, V_{GS} = 0V			250	ns
Q_{RM}			1.0		μC
I_{RM}			8.0		A

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

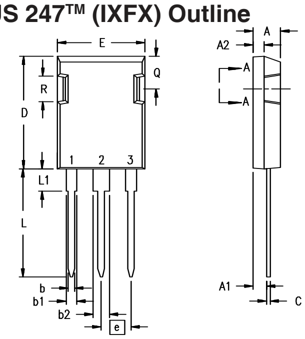
TO-264 (IXFK) Outline



1 – GATE
2, 4 – DRAIN (COLLECTOR)
3 – SOURCE (EMITTER)

SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.185	.209	4.70	5.31
A1	.102	.118	2.59	3.00
b	.037	.055	0.94	1.40
b1	.087	.102	2.21	2.59
b2	.110	.126	2.79	3.20
c	.017	.029	0.43	0.74
D	1.007	1.047	25.58	26.59
E	.760	.799	19.30	20.29
e	.215BSC		5.46 BSC	
J	.000	.010	0.00	0.25
K	.000	.010	0.00	0.25
L	.779	.842	19.79	21.39
L1	.087	.102	2.21	2.59
ØP	.122	.138	3.10	3.51
Q	.240	.256	6.10	6.50
Q1	.330	.346	8.38	8.79
ØR	.155	.187	3.94	4.75
ØR1	.085	.093	2.16	2.36
S	.243	.253	6.17	6.43

PLUS 247™ (IXFX) Outline



Terminals: 1 - Gate
2 - Drain (Collector)
3 - Source (Emitter)
4 - Drain (Collector)

Dim.	Millimeter Min.	Millimeter Max.	Inches Min.	Inches 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	0.244
R	4.32	4.83	.170	.190

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

Fig. 1. Output Characteristics @ 25ºC

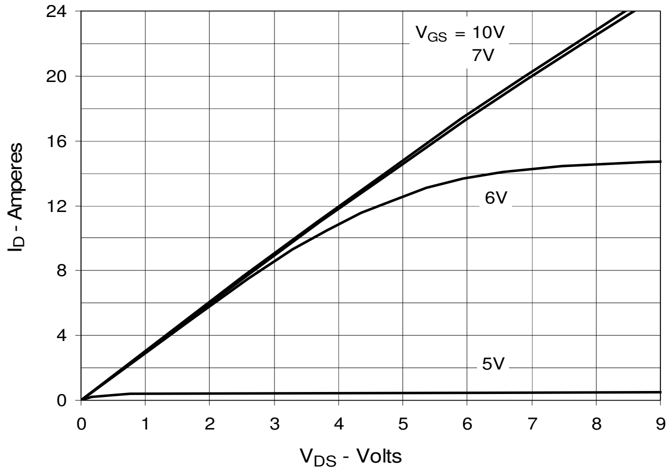


Fig. 2. Extended Output Characteristics @ 25ºC

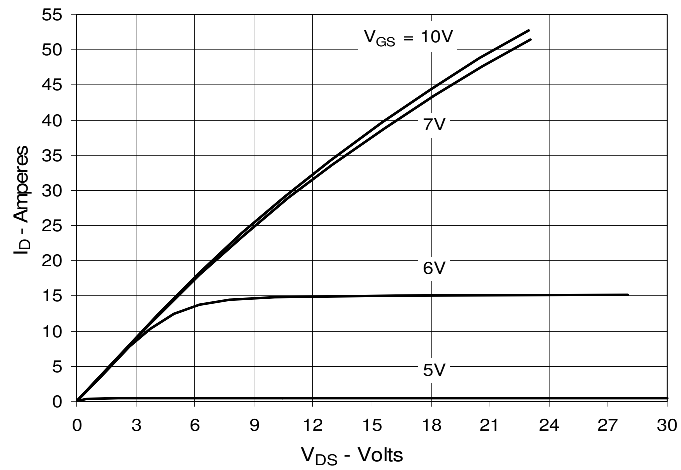


Fig. 3. Output Characteristics @ 125ºC

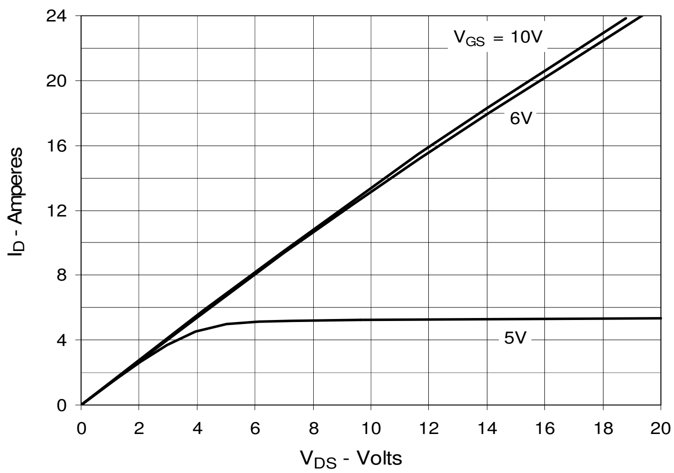


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 12A Value vs. Junction Temperature

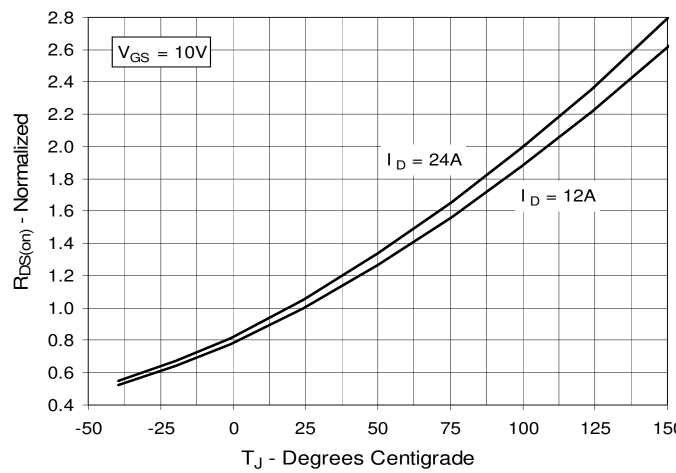


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 12A Value vs. Drain Current

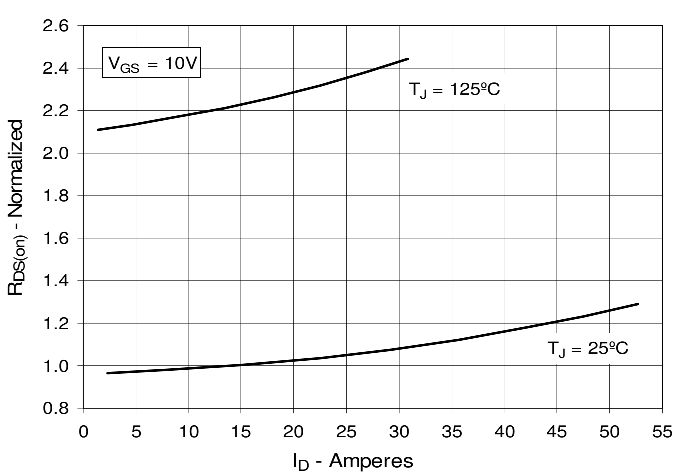


Fig. 6. Maximum Drain Current vs. Case Temperature

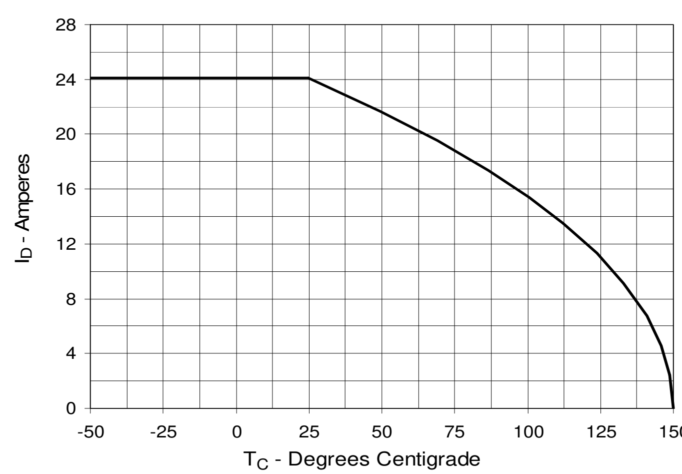


Fig. 7. Input Admittance

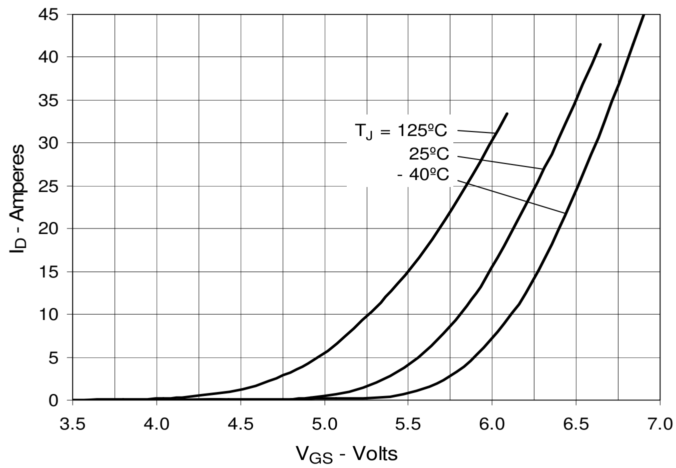


Fig. 8. Transconductance

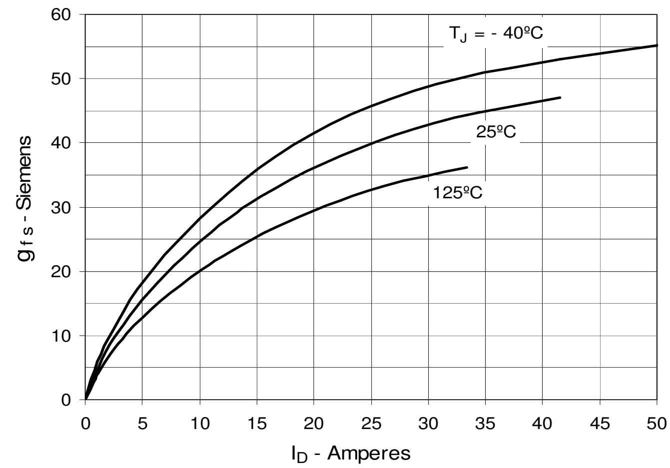


Fig. 9. Forward Voltage Drop of Intrinsic Diode

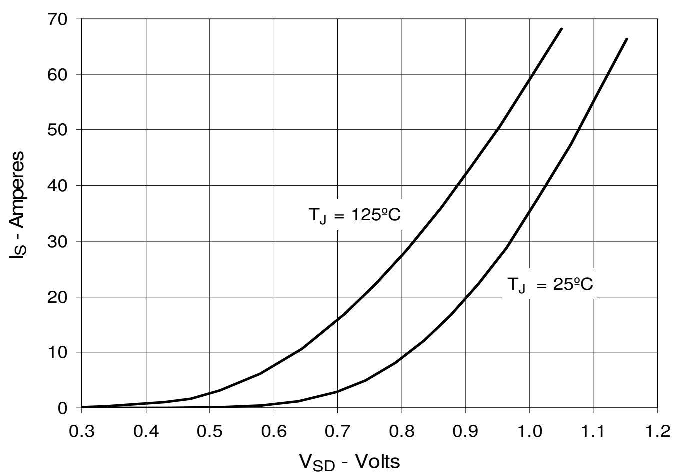


Fig. 10. Gate Charge

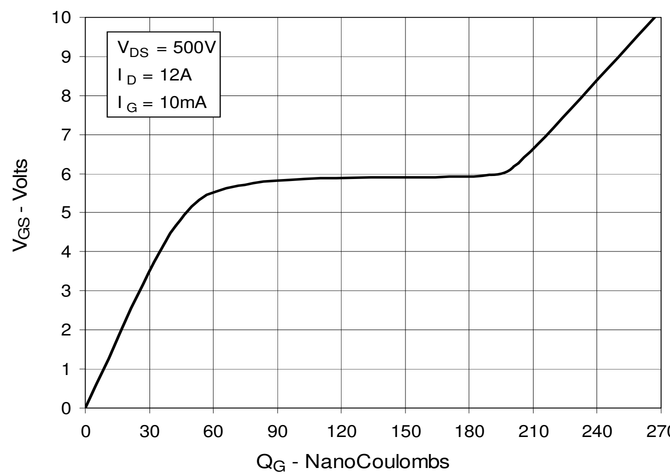


Fig. 11. Capacitance

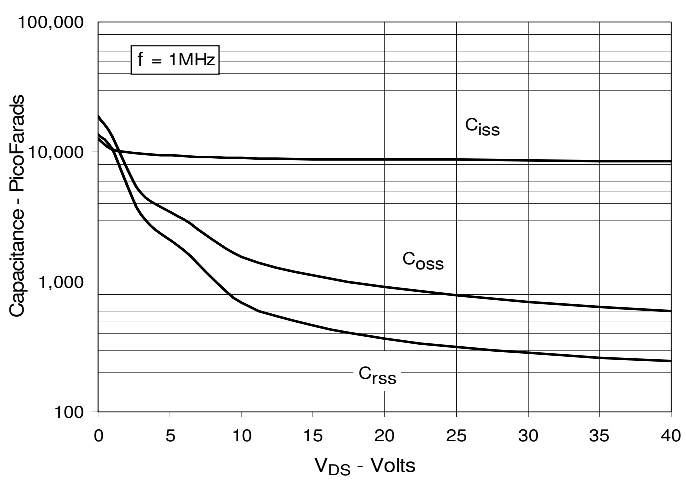
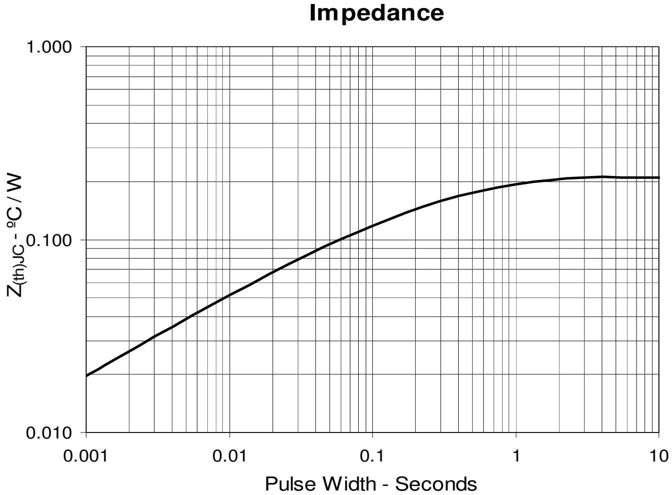


Fig. 12. Maximum Transient Thermal Impedance



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