IXYS

HiPerFET™ Power MOSFETs

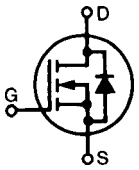
IXFX 50N50
IXFX 55N50

V_{DSS}	I_{D25}	$R_{DS(on)}$
500 V	50 A	100 mΩ
500 V	55 A	80 mΩ

$t_{rr} \leq 250$ ns

Single Die MOSFET

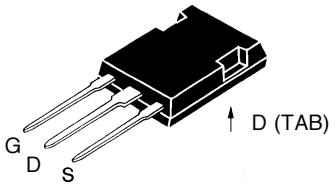
Preliminary data sheet



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} = 1 MΩ		500	V
V_{GS}	Continuous		±20	V
V_{GSM}	Transient		±30	V
I_{D25}	T_C = 25°C	50N50	50	A
		55N50	55	A
I_{DM}	T_C = 25°C, pulse width limited by T_{JM}	50N50	200	A
		55N50	220	A
I_{AR}	T_C = 25°C	50N50	50	A
		55N50	55	A
E_{AR}	T_C = 25°C		60	mJ
E_{AS}	T_C = 25°C		3	J
dv/dt	$I_S \leq I_{DM}$, di/dt ≤ 100 A/μs, $V_{DD} \leq V_{DSS}$ $T_J \leq 150$°C, R_G = 2 Ω		5	V/ns
P_D	T_C = 25°C		520	W
T_J			-55 ... +150	°C
T_{JM}			150	°C
T_{stg}			-55 ... +150	°C
T_L	1.6 mm (0.063 in.) from case for 10 s		300	°C
M_d	Mounting torque		1.13/10	Nm/lb.in.
Weight			6	g

Symbol	Test Conditions		Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
V_{DSS}	V_{GS} = 0 V, I_D = 1mA		500			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 8mA		2.5		4.5	V
I_{GSS}	V_{GS} = ±20 V, V_{DS} = 0				±200	nA
I_{DSS}	$V_{DS} = V_{DSS}$	T_J = 25°C			25	μA
	V_{GS} = 0 V	T_J = 125°C			2	mA
$R_{DS(on)}$	V_{GS} = 10 V, I_D = 0.5 I_{D25}	50N50			100	mΩ
	Note 1	55N50			80	mΩ

PLUS 247™ (IXFX)



Features

- International standard package
- Low $R_{DS(on)}$ HDMOS™ process
- Rugged polysilicon gate cell structure
- Unclamped Inductive Switching (UIS) rated
- Low package inductance
  - easy to drive and to protect
- Fast intrinsic rectifier

Applications

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

Advantages

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

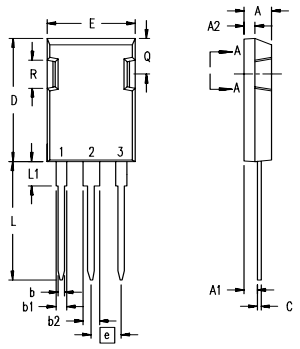
Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	min.	typ.	max.	
g_{fs}	V_{DS} = 10 V; I_D = 0.5 I_{D25} Note 1		45		S
C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		9400		pF
C_{oss}			1280		pF
C_{rss}			460		pF
$t_{d(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 V_{DSS}, I_D = 0.5 I_{D25} R_G = 2 Ω (External),		45		ns
t_r			60		ns
$t_{d(off)}$			120		ns
t_f			45		ns
$Q_{g(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 V_{DSS}, I_D = 0.5 I_{D25}		330		nC
Q_{gs}			55		nC
Q_{gd}			155		nC
R_{thJC}				0.22	K/W
R_{thCK}			0.15		K/W

Source-Drain Diode

Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)		min.	typ.	max.	
I_S	V_{GS} = 0 V	55N50			55	A
		50N50			50	A
I_{SM}	Repetitive; pulse width limited by T_{JM}	55N50			220	A
		50N50			200	A
V_{SD}	I_F = I_S, V_{GS} = 0 V Note 1				1.5	V
t_{rr}	I_F =25 A,-di/dt = 100 A/µs, V_R = 100 V				250	ns
Q_{RM}				1.0		µC
I_{RM}				10		A

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

PLUS 247™ Outline



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

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

Figure 1. Output Characteristics at 25°C

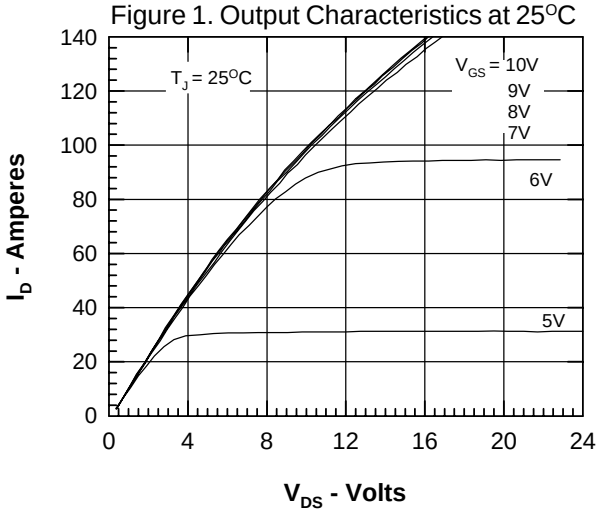


Figure 2. Output Characteristics at 125°C

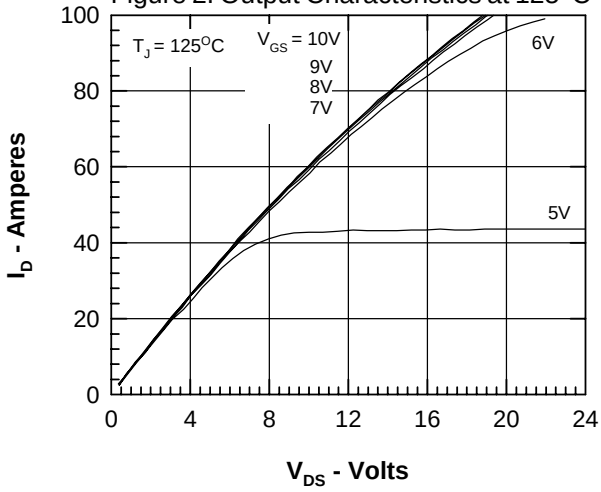


Figure 3. $R_{DS(on)}$ normalized to 0.5 I_{D25} value vs. I_D

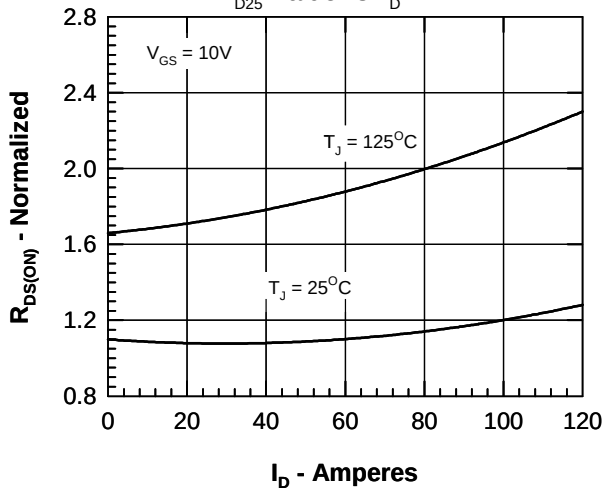


Figure 4. $R_{DS(on)}$ normalized to 0.5 I_{D25} value vs. T_J

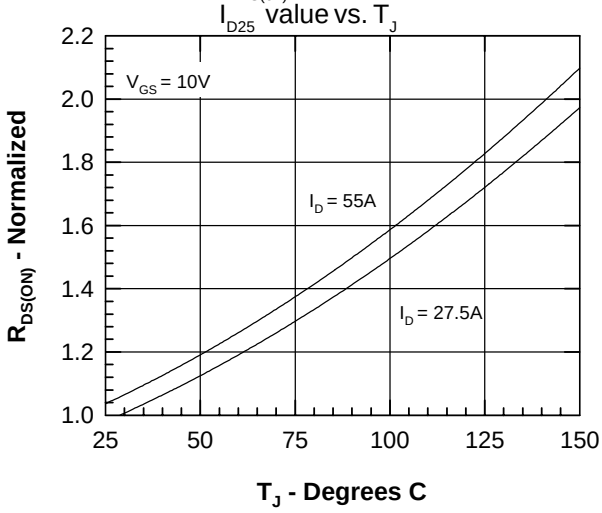


Figure 5. Drain Current vs. Case Temperature

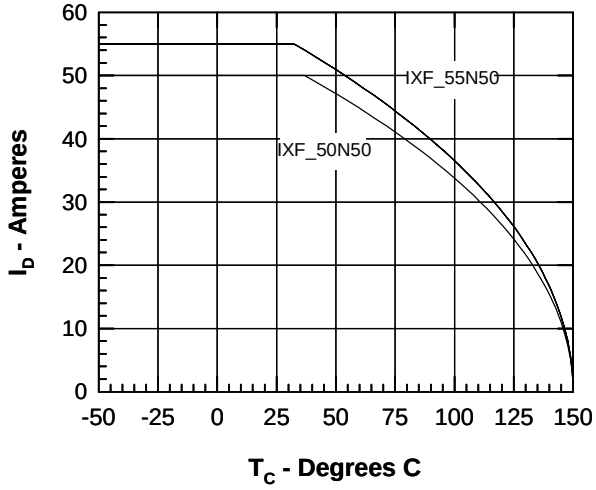


Figure 6. Admittance Curves

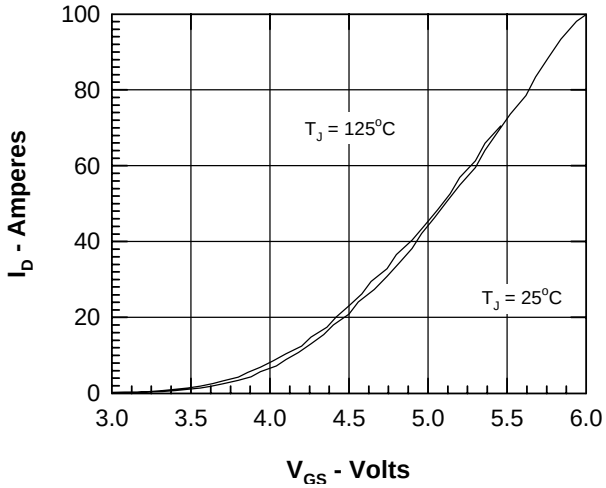


Figure 7. Gate Charge

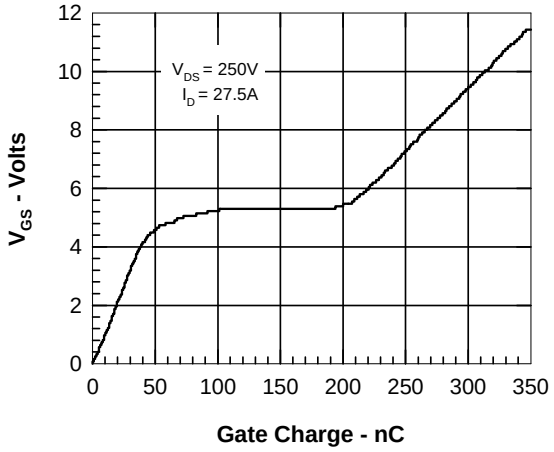


Figure 8. Capacitance Curves

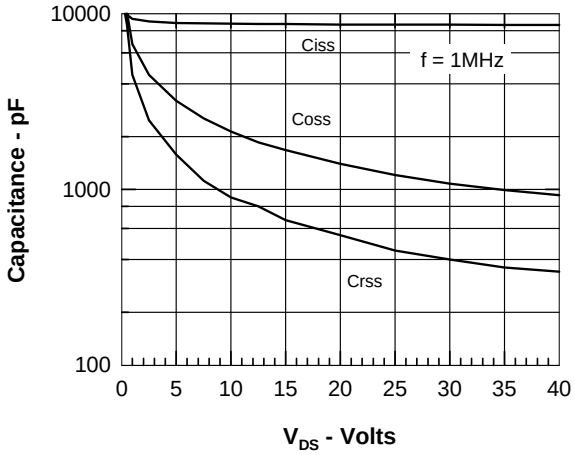


Figure 9. Forward Voltage Drop of the Intrinsic Diode

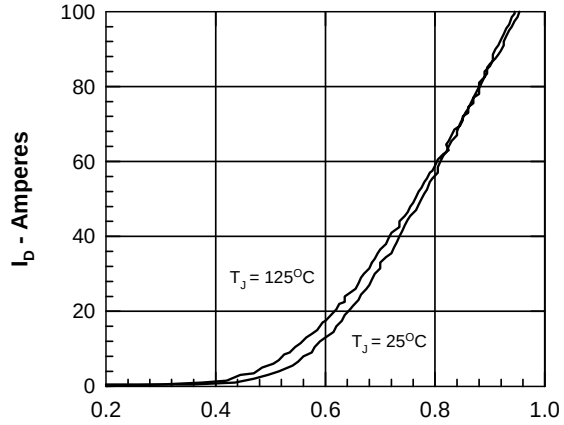


Figure10. Forward Bias Safe Operating Area