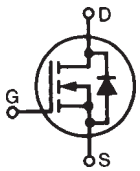
IXYS

Power MOSFETs
F-Class: MegaHertz Switching

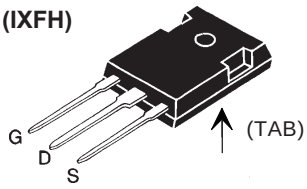
IXFH 6N100F
IXFT 6N100F

V_{DSS} = 1000 V
I_{D25} = 6 A
$R_{DS(on)}$ = 1.9 Ω
$t_{rr} \leq$ 250 ns

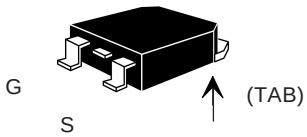
N-Channel Enhancement Mode
Avalanche Rated, Low Q_g, Low Intrinsic R_g
High dV/dt, Low t_{rr}



TO-247 AD (IXFH)



TO-268 (IXFT) Case Style



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

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} = 1 MΩ		1000	V
V_{GS}	Continuous		±20	V
V_{GSM}	Transient		±30	V
I_{D25}	T_C = 25°C		6	A
I_{DM}	T_C = 25°C, pulse width limited by T_{JM}		24	A
I_{AR}	T_C = 25°C		6	A
E_{AR}	T_C = 25°C		20	mJ
E_{AS}	T_C = 25°C		500	mJ
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		15	V/ns
P_D	T_C = 25°C		180	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	TO-247	1.13/10	Nm/lb.in.
Weight		TO-247	6	g
		TO-268	4	g

Symbol	Test Conditions		Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
V_{DSS}	V_{GS} = 0 V, I_D = 500uA		1000			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 2.5 mA		3.0		5.5	V
I_{GSS}	V_{GS} = ±20 V, V_{DS} = 0				±100	nA
I_{DSS}	$V_{DS} = V_{DSS}$				50	µA
	V_{GS} = 0 V	T_J = 125°C			1	mA
$R_{DS(on)}$	V_{GS} = 10 V, $I_D = 0.5 \bullet I_{D25}$ Note 1				1.9	Ω

Features
- RF capable MOSFETs
- Double metal process for low gate resistance
- 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
- Switched-mode and resonant-mode power supplies, >500kHz switching
- DC choppers
- 13.5 MHz industrial applications
- Pulse generation
- Laser drivers
- RF amplifiers

Advantages
- Space savings
- High power density

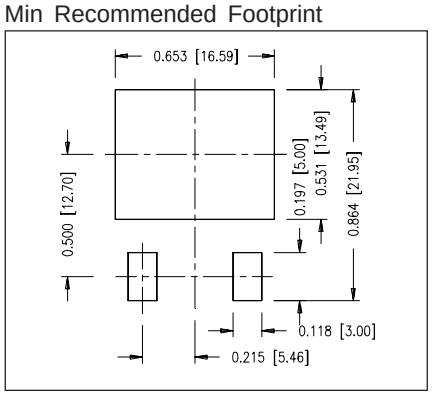
Symbol	Test Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
g_{fs}	V_{DS} = 20 V; I_D = 0.5 • I_{D25} Note 1	3	5.5		S
C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		1770		pF
C_{oss}			186		pF
C_{rss}			53		pF
$t_{d(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 • V_{DSS}, I_D = 0.5 • I_{D25} R_G = 2.0 Ω (External),		11		ns
t_r			8.6		ns
$t_{d(off)}$			21		ns
t_f			8.3		ns
$Q_{g(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 • V_{DSS}, I_D = 0.5 • I_{D25}		54		nC
Q_{gs}			14		nC
Q_{gd}			27		nC
R_{thJC}				0.65	K/W
R_{thCK}	(TO-247)		0.25		K/W

Source-Drain Diode

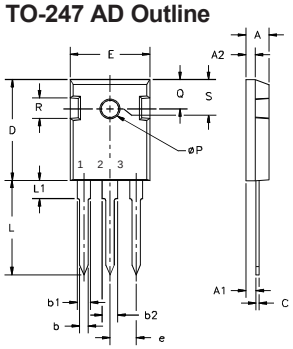
Symbol	Test Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
I_S	V_{GS} = 0 V			6	A
I_{SM}	Repetitive; pulse width limited by T_{JM}			24	A
V_{SD}	$I_F = I_S$, V_{GS} = 0 V, Note 1			1.5	V
t_{rr}	$I_F = I_S$,-di/dt = 100 A/µs, V_R = 100 V			250	ns
Q_{RM}			0.6		µC
I_{RM}			4		A

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

Min Recommended Footprint



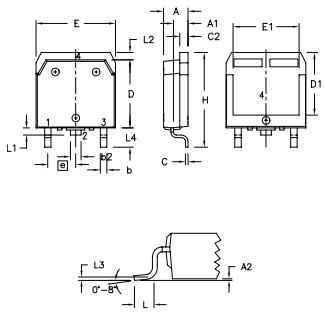
TO-247 AD Outline



Terminals:
1 - Gate
2 - Drain
3 - Source
Tab - Drain

Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	4.7	5.3	.185	.209
A_1	2.2	2.54	.087	.102
A_2	2.2	2.6	.059	.098
b	1.0	1.4	.040	.055
b_1	1.65	2.13	.065	.084
b_2	2.87	3.12	.113	.123
C	.4	.8	.016	.031
D	20.80	21.46	.819	.845
E	15.75	16.26	.610	.640
e	5.20	5.72	0.205	0.225
L	19.81	20.32	.780	.800
L1		4.50		.177
∅P	3.55	3.65	.140	.144
Q	5.89	6.40	0.232	0.252
R	4.32	5.49	.170	.216
S	6.15 BSC		242 BSC	

TO-268 Outline



Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	4.9	5.1	.193	.201
A_1	2.7	2.9	.106	.114
A_2	.02	.25	.001	.010
b	1.15	1.45	.045	.057
b_2	1.9	2.1	.75	.83
C	.4	.65	.016	.026
D	13.80	14.00	.543	.551
E	15.85	16.05	.624	.632
E_1	13.3	13.6	.524	.535
e	5.45 BSC		.215 BSC	
H	18.70	19.10	.736	.752
L	2.40	2.70	.094	.106
L1	1.20	1.40	.047	.055
L2	1.00	1.15	.039	.045
L3	0.25 BSC		.010 BSC	
L4	3.80	4.10	.150	.161

Fig. 1. Output Characteristics at 25°C

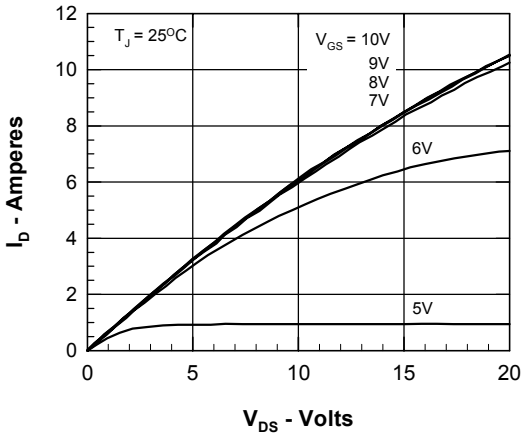


Fig. 2. Output Characteristics at 125°C

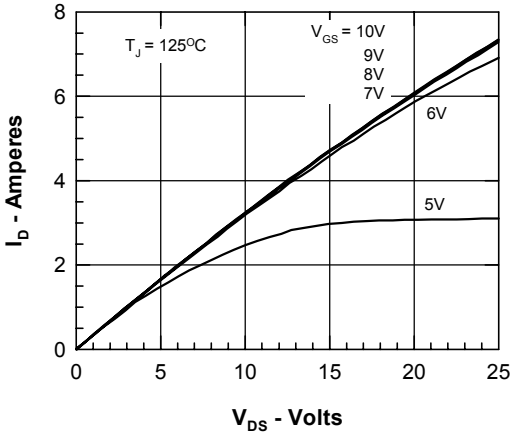


Fig. 3. $R_{DS(ON)}$ vs. Drain Current

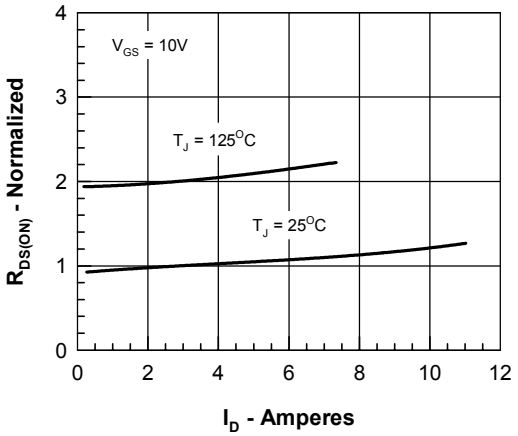


Fig. 4. $R_{DS(ON)}$ vs. T_J

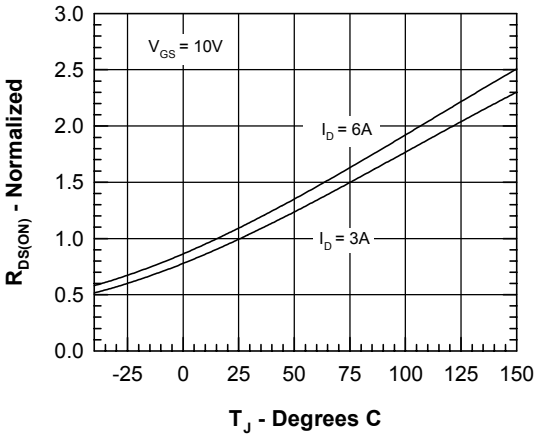


Fig. 5. Drain Current vs. Case Temperature

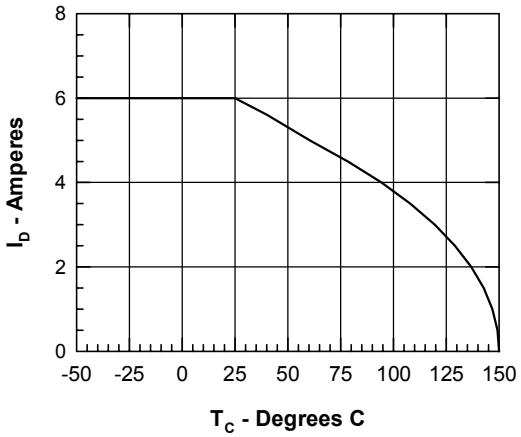


Fig. 6. Admittance Curves

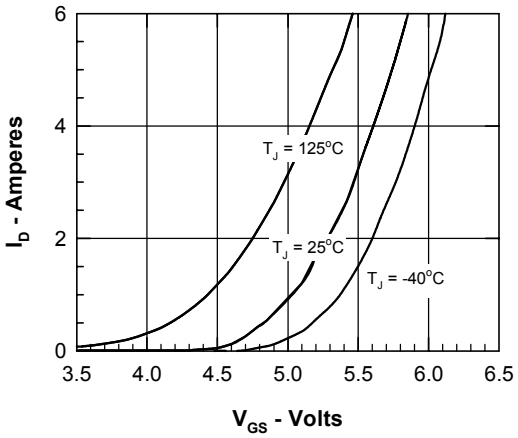


Fig. 7. Gate Charge Characteristic Curve

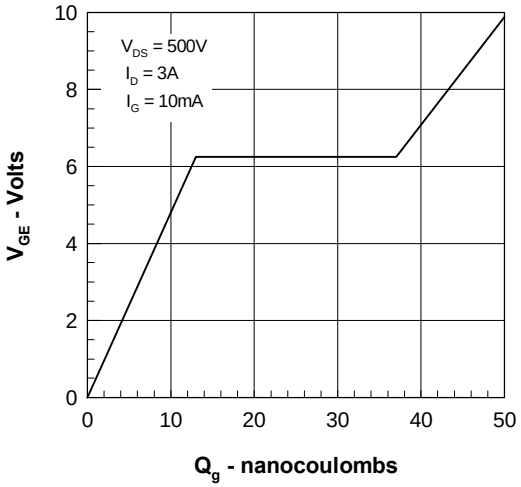


Fig. 8. Capacitance Curves

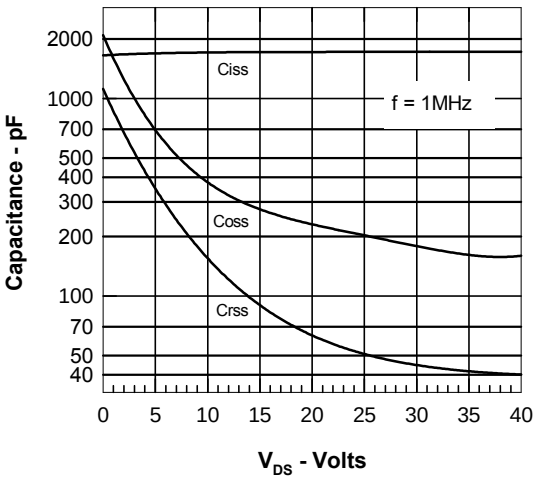


Fig. 9. Source Current vs. Source to Drain Voltage

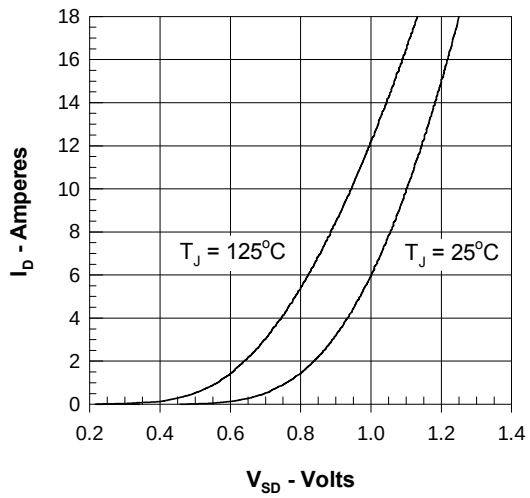


Fig. 10. Thermal Impedance