

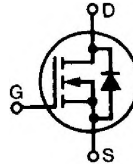
HiPerFET™

Power MOSFETs

N-Channel Enhancement Mode
High dv/dt, Low t_{rr} , HDMOS™ Family

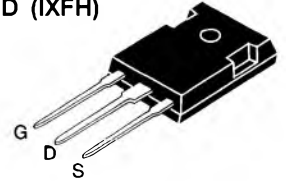
IXFH/FM 21N50
IXFH/FM 24N50
IXFH 26N50

V_{DSS}	I_{D25}	$R_{DS(on)}$	t_{rr}
500 V	21 A	0.25 Ω	250 ns
500 V	24 A	0.23 Ω	250 ns
500 V	26 A	0.20 Ω	250 ns

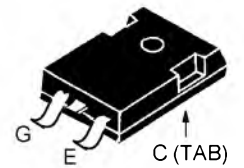


Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ\text{C}$ to 150°C	500	V
V_{DGR}	$T_J = 25^\circ\text{C}$ to 150°C ; $R_{GS} = 1\text{ M}\Omega$	500	V
V_{GS}	Continuous	± 20	V
V_{GSM}	Transient	± 30	V
I_{D25}	$T_C = 25^\circ\text{C}$	21N50 21	A
		24N50 24	A
		26N50 26	A
I_{DM}	$T_C = 25^\circ\text{C}$, pulse width limited by T_{JM}	21N50 84	A
		24N50 96	A
		26N50 104	A
I_{AR}	$T_C = 25^\circ\text{C}$	21N50 21	A
		24N50 24	A
		26N50 26	A
E_{AR}	$T_C = 25^\circ\text{C}$	30	mJ
dv/dt	$I_S \leq I_{DM}$, $di/dt \leq 100\text{ A}/\mu\text{s}$, $V_{DD} \leq V_{DSS}$ $T_J \leq 150^\circ\text{C}$, $R_G = 2\text{ }\Omega$	5	V/ns
P_D	$T_C = 25^\circ\text{C}$	300	W
T_J		-55 ... +150	$^\circ\text{C}$
T_{JM}		150	$^\circ\text{C}$
T_{stg}		-55 ... +150	$^\circ\text{C}$
M_d	Mounting torque	1.13/10	Nm/lb.in.
Weight	TO-204 = 18 g, TO-247 = 6 g		
Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s		300	$^\circ\text{C}$

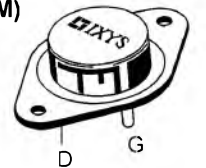
TO-247 AD (IXFH)



TO-247 SMD
("S" Suffix)
(Note 1)



TO-204 AE (IXFM)



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

Features

- International standard packages
- 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
- Synchronous rectification
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- AC motor control
- Temperature and lighting controls
- Low voltage relays

Advantages

- Easy to mount with 1 screw (TO-247) (isolated mounting screw hole)
- Space savings
- High power density

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		Min.	Typ.	Max.
V_{DSS}	$V_{GS} = 0\text{ V}$, $I_D = 250\text{ }\mu\text{A}$	500		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 4\text{ mA}$	2		V
I_{GSS}	$V_{GS} = \pm 20\text{ V}_{DC}$, $V_{DS} = 0$			$\pm 100\text{ nA}$
I_{DSS}	$V_{DS} = 0.8\text{ V}_{DSS}$	$T_J = 25^\circ\text{C}$		200 μA
	$V_{GS} = 0\text{ V}$	$T_J = 125^\circ\text{C}$		1 mA

Symbol	Test Conditions	Characteristic Values		
	($T_J = 25^\circ\text{C}$, unless otherwise specified)	Min.	Typ.	Max.
$R_{DS(on)}$	$V_{GS} = 10\text{ V}$, $I_D = 0.5 I_{D25}$ Pulse test, $t \leq 300\text{ }\mu\text{s}$, duty cycle $\delta \leq 2\%$			
				0.25 Ω
				0.23 Ω
				0.20 Ω
g_{fs}	$V_{DS} = 10\text{ V}$; $I_D = 0.5 I_{D25}$, pulse test	15	21	S
C_{iss}	$V_{GS} = 0\text{ V}$, $V_{DS} = 25\text{ V}$, $f = 1\text{ MHz}$		4200	pF
C_{oss}			450	pF
C_{rss}			135	pF
$t_{d(on)}$	$V_{GS} = 10\text{ V}$, $V_{DS} = 0.5 V_{DSS}$, $I_D = 0.5 I_{D25}$ $R_G = 2\text{ }\Omega$ (External)		16	ns
t_r			33	ns
$t_{d(off)}$			65	ns
t_f			30	ns
$Q_{g(on)}$	$V_{GS} = 10\text{ V}$, $V_{DS} = 0.5 V_{DSS}$, $I_D = 0.5 I_{D25}$		135	nC
Q_{gs}			28	nC
Q_{gd}			62	nC
R_{thJC}			0.25	K/W
R_{thCK}				K/W

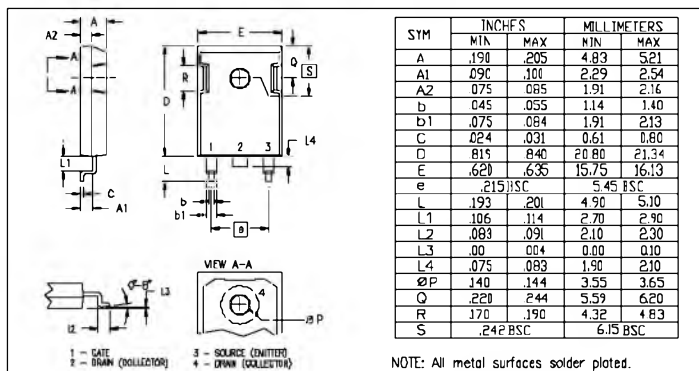
Source-Drain Diode

Characteristic Values
($T_J = 25^\circ\text{C}$, unless otherwise specified)

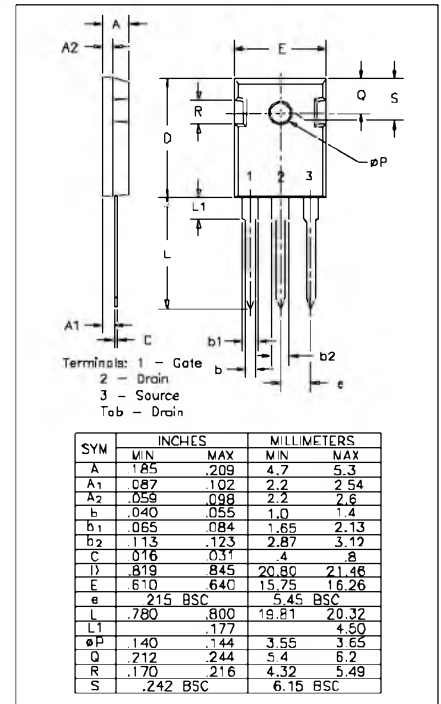
Symbol	Test Conditions	Min.	Typ.	Max.
I_S	$V_{GS} = 0$	21N50 24N50 26N50		21 A 24 A 26 A
I_{SM}	Repetitive; pulse width limited by T_{JM}	21N50 24N50 26N50		84 A 96 A 104 A
V_{SD}	$I_F = I_S$, $V_{GS} = 0\text{ V}$ Pulse test, $t \leq 300\text{ }\mu\text{s}$, duty cycle $\delta \leq 2\%$			1.5 V
t_{rr}	$I_F = I_S$ $-di/dt = 100\text{ A}/\mu\text{s}$, $V_R = 100\text{ V}$	$T_J = 25^\circ\text{C}$		250 ns
		$T_J = 125^\circ\text{C}$		400 ns
Q_{RM}		$T_J = 25^\circ\text{C}$	1	μC
		$T_J = 125^\circ\text{C}$	2	μC
I_{RM}		$T_J = 25^\circ\text{C}$	10	A
		$T_J = 125^\circ\text{C}$	15	A

Note 1: Add "S" suffix for TO-247 SMD PACKAGE OPTION (EX: IXFH24N50S)

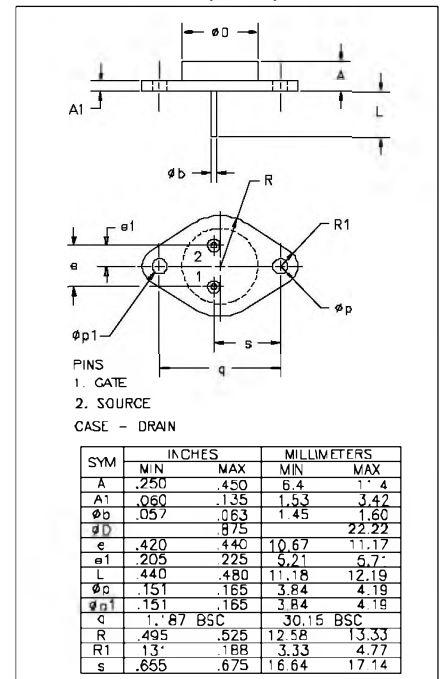
TO-247 SMD Outline



TO-247 AD (IXFH) Outline

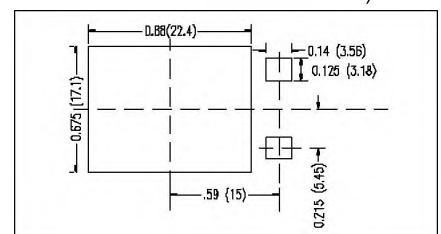


TO-204AE (IXFM) Outline



Min. Recommended Footprint

Dimensions in inches and mm)



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

Fig.1. Output Characteristics

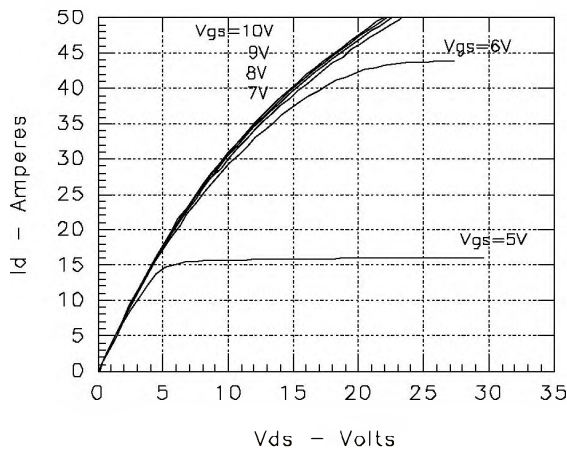


Fig. 2. Input Admittance

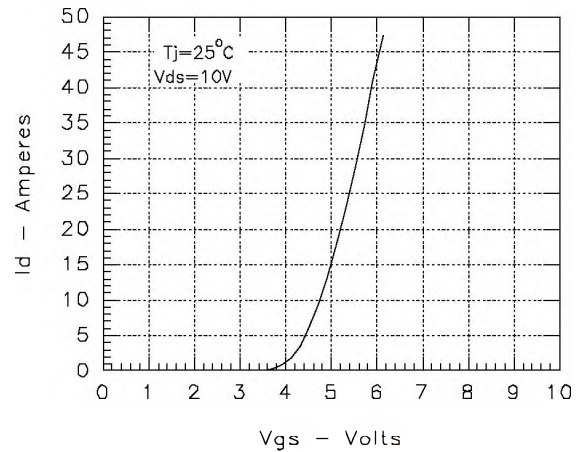
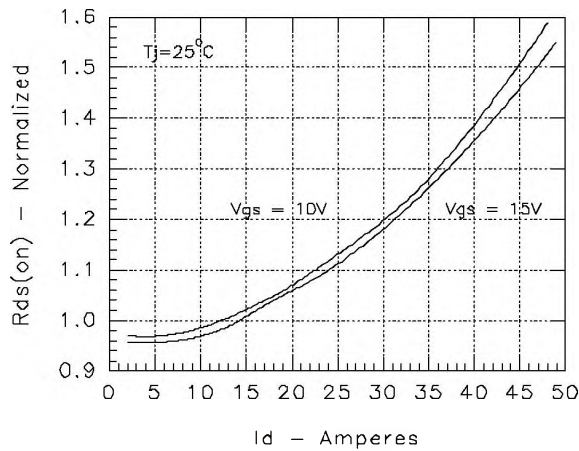

Fig. 3. $R_{ds(on)}$ vs. Drain Current


Fig. 4. Temperature Dependence of Drain to Source Resistance

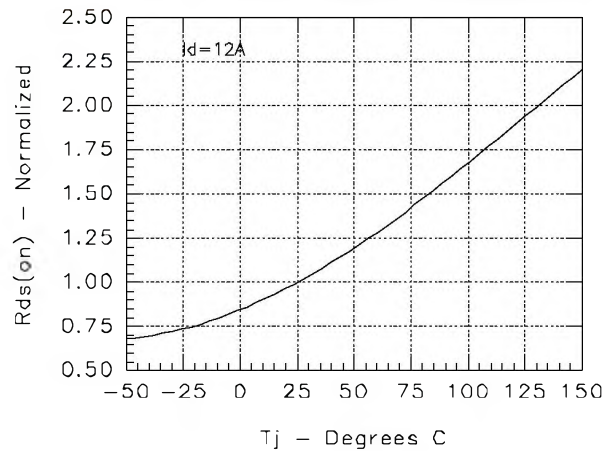


Fig. 5. Drain Current vs. Case Temperature

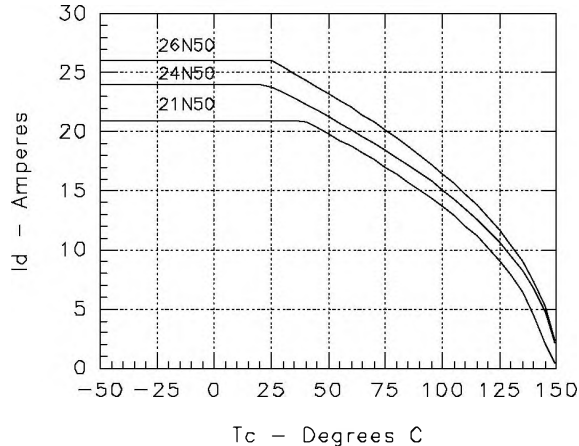


Fig. 6. Temperature Dependence of Breakdown Voltage and Threshold Voltage

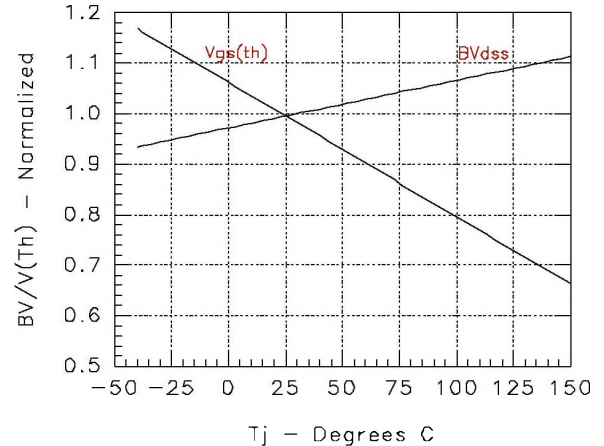


Fig. 7. Gate Charge

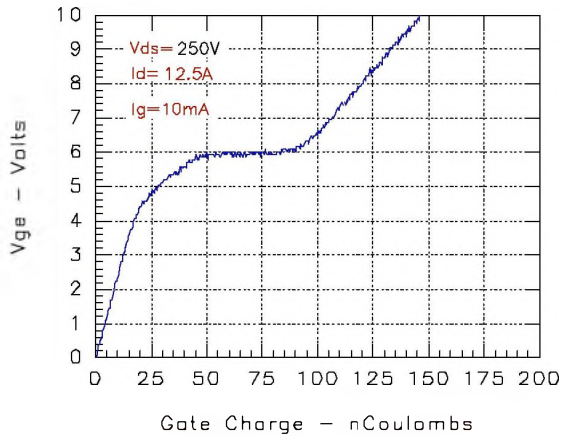


Fig. 8. Forward Bias Safe Operating Area

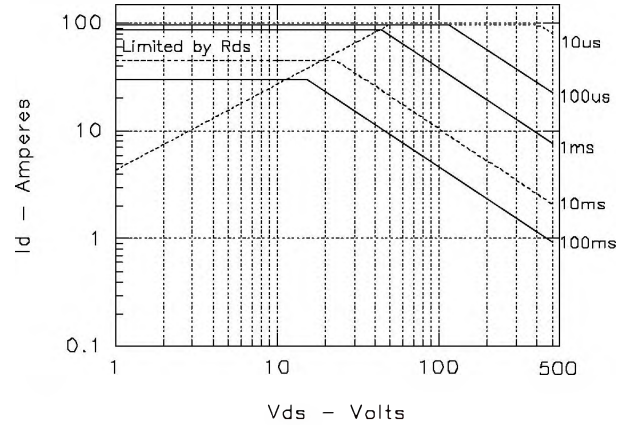


Fig. 9. Capacitance Curves

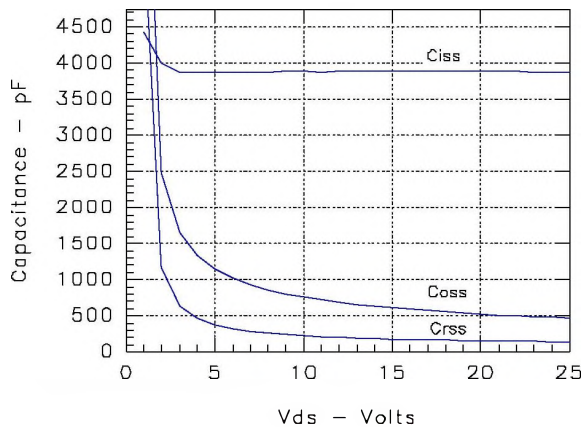


Fig. 10. Source Current vs. Source to Drain Voltage

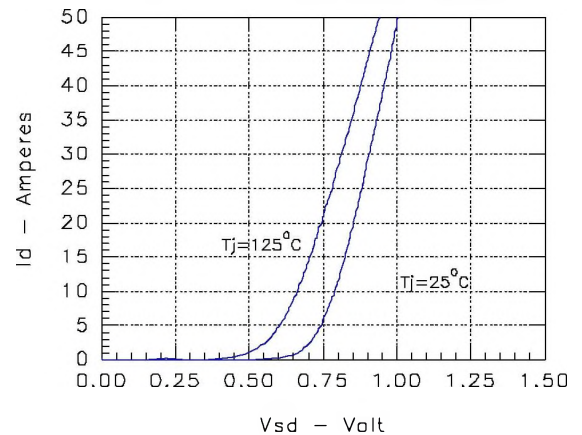


Fig. 11. Transient Thermal Impedance

