

# HiPerFET™ Power MOSFETs

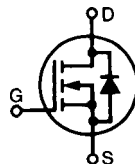
~~IXFH/IXFM6N90~~  
~~IXFH/IXFM6N100~~

$V_{DSS}$	$I_{D25}$	$R_{DS(on)}$
900 V	6 A	1.8 $\Omega$
1000 V	6 A	2.0 $\Omega$

$t_{rr} \leq 250$  ns

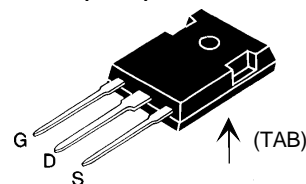
N-Channel Enhancement Mode  
High dv/dt, Low  $t_{rr}$ , HDMOS™ Family

Obsolete:  
IXFM6N90  
IXFM6N100



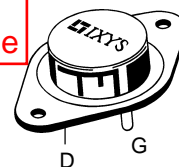
Symbol	Test Conditions	Maximum Ratings	
$V_{DSS}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$	6N90	900 V
$V_{DGR}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$ ; $R_{GS} = 1\text{ M}\Omega$	6N100	1000 V
$V_{GS}$	Continuous		$\pm 20$ V
$V_{GSM}$	Transient		$\pm 30$ V
$I_{D25}$	$T_C = 25^\circ\text{C}$		6 A
$I_{DM}$	$T_C = 25^\circ\text{C}$ , pulse width limited by $T_{JM}$		24 A
$I_{AR}$	$T_C = 25^\circ\text{C}$		6 A
$E_{AR}$	$T_C = 25^\circ\text{C}$		18 mJ
dv/dt	$I_S \leq I_{DM}$ , $di/dt \leq 100\text{ A}/\mu\text{s}$ , $V_{DD} \leq V_{DSS}$ , $T_J \leq 150^\circ\text{C}$ , $R_G = 2\ \Omega$		5 V/ns
$P_D$	$T_C = 25^\circ\text{C}$		180 W
$T_J$			-55 ... +150 $^\circ\text{C}$
$T_{JM}$			150 $^\circ\text{C}$
$T_{stg}$			-55 ... +150 $^\circ\text{C}$
$T_L$	1.6 mm (0.062 in.) from case for 10 s		300 $^\circ\text{C}$
$M_d$	Mounting torque		1.13/10 Nm/lb.in.
Weight			TO-204 = 18 g, TO-247 = 6 g

TO-247 AD (IXFH)



TO-204 AA (IXFM)

Package  
unavailable



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

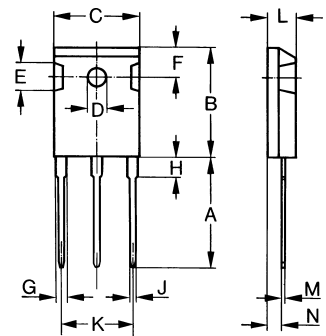
### Advantages

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

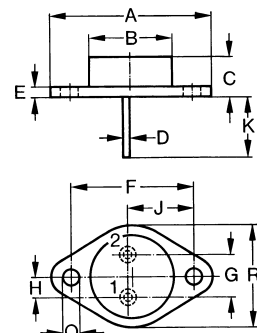
Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)		
		min.	typ.	max.
$V_{DSS}$	$V_{GS} = 0\text{ V}$ , $I_D = 3\text{ mA}$	6N90 6N100	900 1000	V
$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = 2.5\text{ mA}$		2.0	4.5 V
$I_{GSS}$	$V_{GS} = \pm 20\text{ V}_{DC}$ , $V_{DS} = 0$			$\pm 100$ nA
$I_{DSS}$	$V_{DS} = 0.8 \cdot V_{DSS}$ , $V_{GS} = 0\text{ V}$	$T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$		250 $\mu\text{A}$ 1 mA
$R_{DS(on)}$	$V_{GS} = 10\text{ V}$ , $I_D = 0.5 \cdot I_{D25}$	6N90 6N100		1.8 $\Omega$ 2.0 $\Omega$
	Pulse test, $t \leq 300\ \mu\text{s}$ , duty cycle $d \leq 2\%$			

Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)		
		min.	typ.	max.
$g_{fs}$	$V_{DS} = 10\text{ V}; I_D = 0.5 \cdot I_{D25}$ , pulse test	4	6	S
$C_{iss}$	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		2600	pF
$C_{oss}$			180	pF
$C_{rss}$			45	pF
$t_{d(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$ $R_G = 4.7\ \Omega$ (External)		35	100 ns
$t_r$			40	110 ns
$t_{d(off)}$			100	200 ns
$t_f$			60	100 ns
$Q_{g(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$		88	130 nC
$Q_{gs}$			21	30 nC
$Q_{gd}$			38	70 nC
$R_{thJC}$			0.7	K/W
$R_{thCK}$		0.25		K/W

Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)		
		min.	typ.	max.
$I_S$	$V_{GS} = 0\text{ V}$			6 A
$I_{SM}$	Repetitive; pulse width limited by $T_{JM}$			24 A
$V_{SD}$	$I_F = I_S, V_{GS} = 0\text{ V}$ , Pulse test, $t \leq 300\ \mu\text{s}$ , duty cycle $d \leq 2\%$			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
$Q_{RM}$	$I_F = I_S$ $-di/dt = 100\text{ A}/\mu\text{s}$ , $V_R = 100\text{ V}$	$T_J = 25^\circ\text{C}$	0.5	$\mu\text{C}$
		$T_J = 125^\circ\text{C}$	1.0	$\mu\text{C}$
$I_{RM}$	$I_F = I_S$ $-di/dt = 100\text{ A}/\mu\text{s}$ , $V_R = 100\text{ V}$	$T_J = 25^\circ\text{C}$	7.5	A
		$T_J = 125^\circ\text{C}$	9.0	A

**TO-247 AD (IXFH) Outline**


Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	19.81	20.32	0.780	0.800
B	20.80	21.46	0.819	0.845
C	15.75	16.26	0.610	0.640
D	3.55	3.65	0.140	0.144
E	4.32	5.49	0.170	0.216
F	5.4	6.2	0.212	0.244
G	1.65	2.13	0.065	0.084
H	-	4.5	-	0.177
J	1.0	1.4	0.040	0.055
K	10.8	11.0	0.426	0.433
L	4.7	5.3	0.185	0.209
M	0.4	0.8	0.016	0.031
N	1.5	2.49	0.087	0.102

**TO-204 AA (IXFM) Outline**


Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	38.61	39.12	1.520	1.540
B	19.43	19.94	-	0.785
C	6.40	9.14	0.252	0.360
D	0.97	1.09	0.038	0.043
E	1.53	2.92	0.060	0.115
F	30.15	BSC	1.187	BSC
G	10.67	11.17	0.420	0.440
H	5.21	5.71	0.205	0.225
J	16.64	17.14	0.655	0.675
K	11.18	12.19	0.440	0.480
Q	3.84	4.19	0.151	0.165
R	25.16	25.90	0.991	1.020

Fig. 1 Output Characteristics

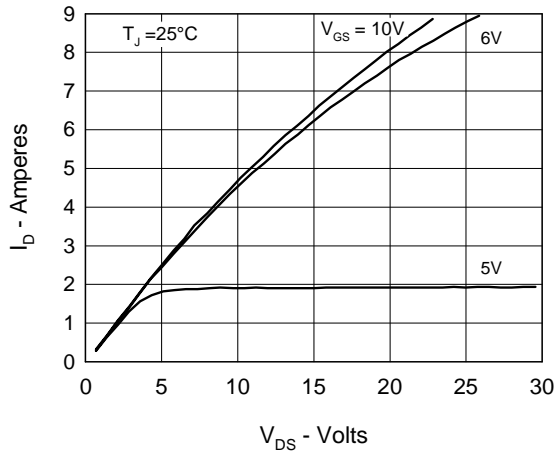


Fig. 2 Input Admittance

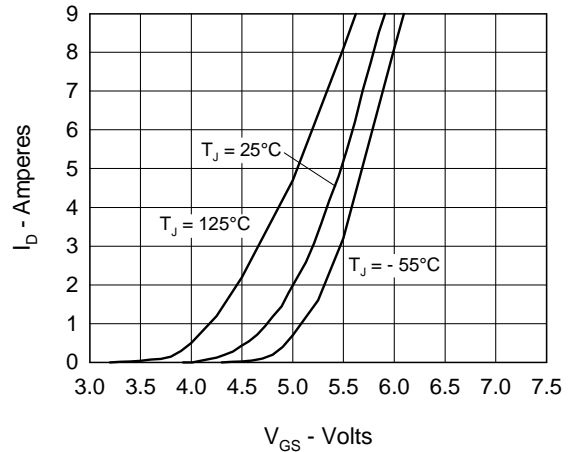


Fig. 3  $R_{DS(on)}$  vs. Drain Current

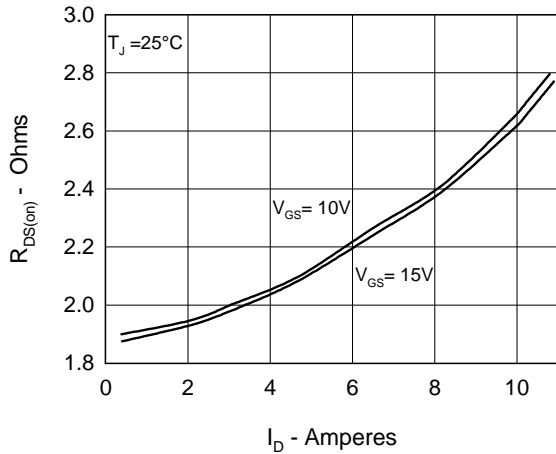


Fig. 4 Temperature Dependence of Drain to Source Resistance

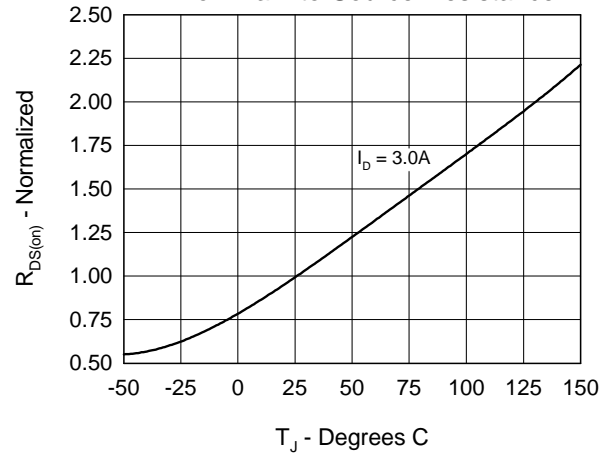


Fig. 5 Drain Current vs. Case Temperature

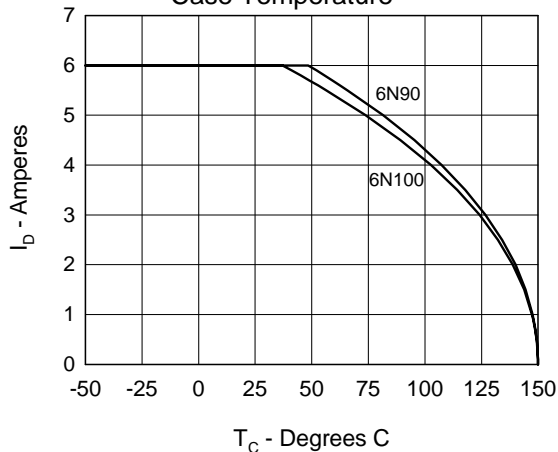


Fig. 6 Temperature Dependence of Breakdown and Threshold Voltage

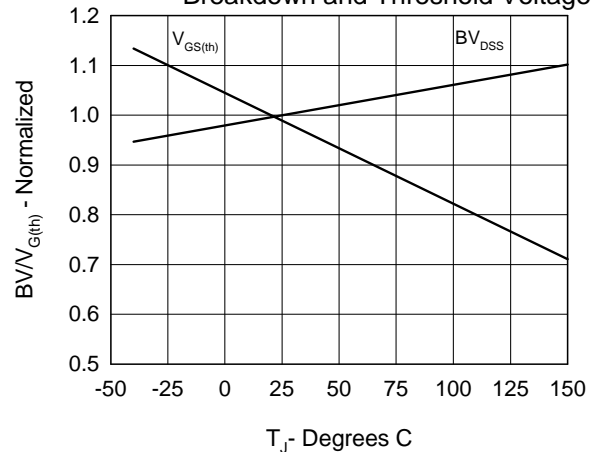


Fig.7 Gate Charge Characteristic Curve

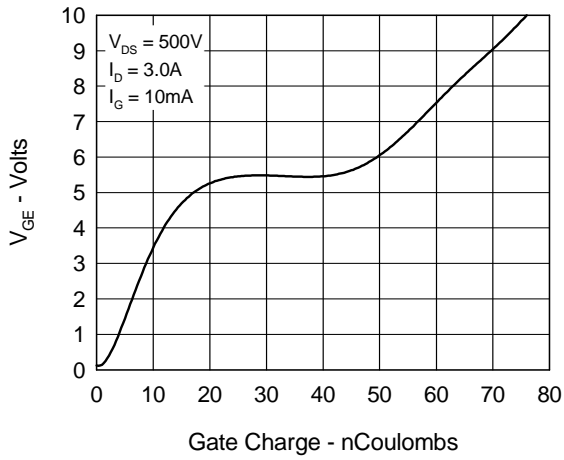


Fig.9 Capacitance Curves

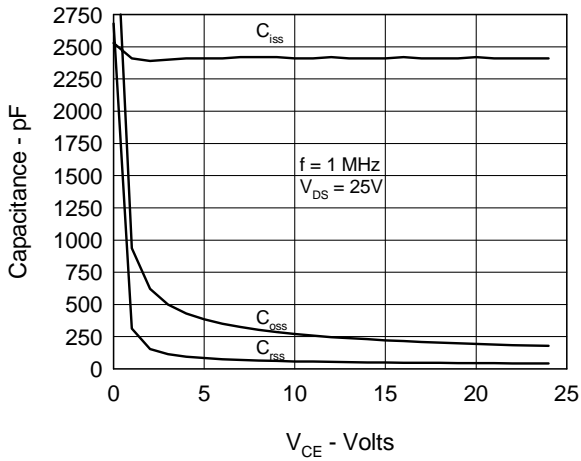


Fig.11 Transient Thermal Impedance

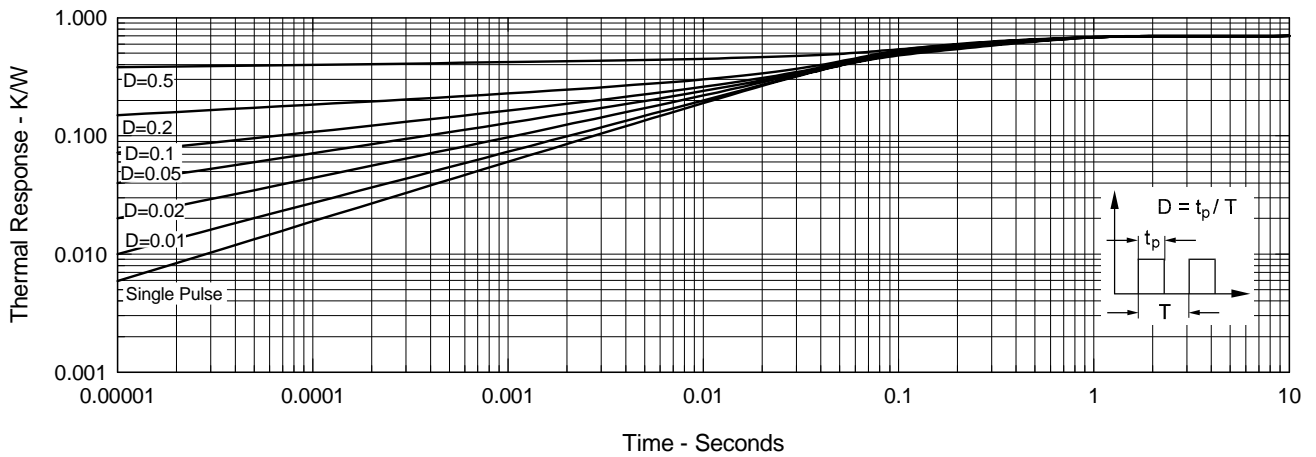


Fig.8 Forward Bias Safe Operating Area

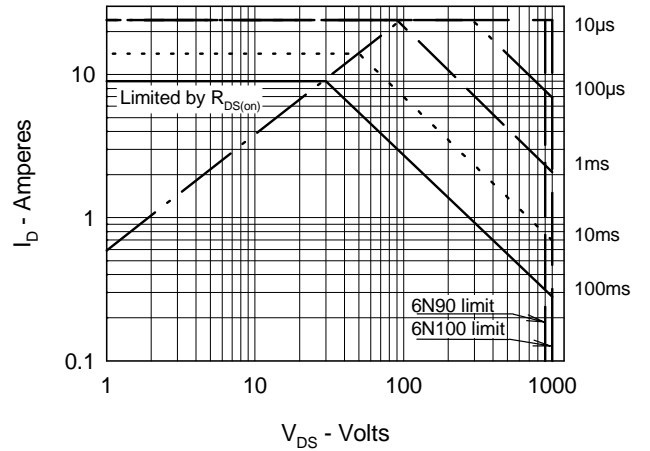
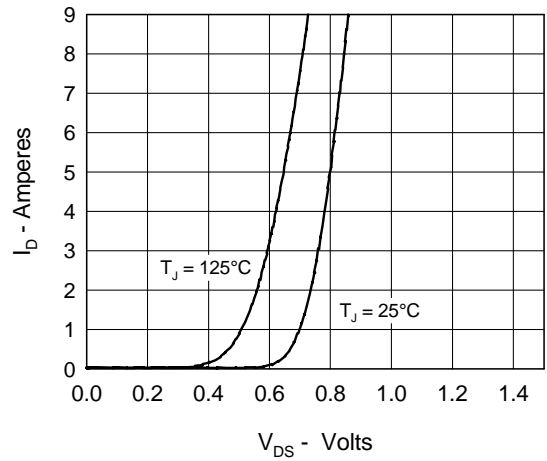


Fig.10 Source Current vs. Source to Drain Voltage





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