

HiPerFET™ Power MOSFETs Q-Class

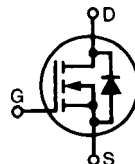
IXFH 4N100Q
IXFT 4N100Q

$$\begin{aligned} V_{DSS} &= 1000 \text{ V} \\ I_{D25} &= 4 \text{ A} \\ R_{DS(on)} &= 3.0 \Omega \end{aligned}$$

$$t_{rr} \leq 250 \text{ ns}$$

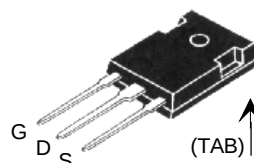
N-Channel Enhancement Mode
Avalanche Rated, Low Q_g , High dv/dt

Preliminary Data Sheet

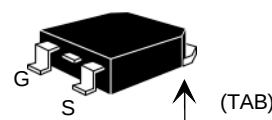


Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ\text{C}$ to 150°C	1000	V
V_{DGR}	$T_J = 25^\circ\text{C}$ to 150°C ; $R_{GS} = 1 \text{ M}\Omega$	1000	V
V_{GS}	Continuous	± 20	V
V_{GSM}	Transient	± 30	V
I_{D25}	$T_C = 25^\circ\text{C}$	4	A
I_{DM}	$T_C = 25^\circ\text{C}$, pulse width limited by T_{JM}	16	A
I_{AR}	$T_C = 25^\circ\text{C}$	4	A
E_{AR}	$T_C = 25^\circ\text{C}$	20	mJ
E_{AS}		700	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	$T_C = 25^\circ\text{C}$	150	W
T_J		-55 to +150	$^\circ\text{C}$
T_{JM}		150	$^\circ\text{C}$
T_{stg}		-55 to +150	$^\circ\text{C}$
T_L	1.6 mm (0.063 in) from case for 10 s	300	$^\circ\text{C}$
M_d	Mounting torque	1.13/10	Nm/lb.in.
Weight	TO-247	6	g
	TO-268	4	g

TO-247 AD (IXFH)



TO-268 (D3) (IXFT)



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

Features

- IXYS advanced low Q_g process
- Low gate charge and capacitances
 - easier to drive
 - faster switching
- International standard packages
- Low $R_{DS(on)}$
- Unclamped Inductive Switching (UIS) rated
- Molding epoxies meet UL 94 V-0 flammability classification

Advantages

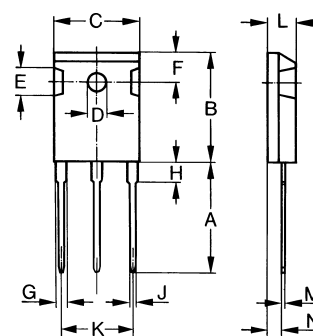
- Easy to mount
- Space savings
- High power density

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
V_{DSS}	$V_{GS} = 0 \text{ V}$, $I_D = 1 \text{ mA}$	1000		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 1.5 \text{ mA}$	3.0		5.0 V
I_{GSS}	$V_{GS} = \pm 20 \text{ V}_{DC}$, $V_{DS} = 0$			$\pm 100 \text{ nA}$
I_{DSS}	$V_{DS} = V_{DSS}$ $V_{GS} = 0 \text{ V}$	$T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$		50 μA
				1 mA
$R_{DS(on)}$	$V_{GS} = 10 \text{ V}$, $I_D = 0.5 I_{D25}$ Pulse test, $t \leq 300 \mu\text{s}$, duty cycle $d \leq 2\%$			3.0 Ω

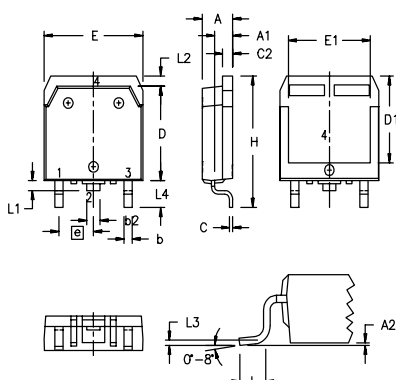
Symbol	Test Conditions	Characteristic Values (T _j = 25°C, unless otherwise specified)		
		min.	typ.	max.
g_{fs}	V _{DS} = 20 V; I _D = 0.5 • I _{D25} , pulse test	1.5	2.5	S
C_{iss} C_{oss} C_{rss}	$\left. \begin{array}{l} \\ \\ \end{array} \right\} V_{GS} = 0 \text{ V}, V_{DS} = 25 \text{ V}, f = 1 \text{ MHz}$		1050	pF
			120	pF
			30	pF
t_{d(on)} t_r t_{d(off)} t_f	$\left. \begin{array}{l} \\ \\ \\ \end{array} \right\} V_{GS} = 10 \text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$ $R_G = 4.7 \, \Omega \text{ (External),}$		17	ns
			15	ns
			32	ns
			18	ns
Q_{g(on)} Q_{gs} Q_{gd}	$\left. \begin{array}{l} \\ \\ \end{array} \right\} V_{GS} = 10 \text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$		39	nC
			9	nC
			22	nC
R_{thJC} R_{thCK}	(TO-247)		0.25	0.8 K/W K/W

Source-Drain Diode		Characteristic Values (T _J = 25°C, unless otherwise specified)			
Symbol	Test Conditions	min.	typ.	max.	
I _S	V _{GS} = 0 V			4	A
I _{SM}	Repetitive; pulse width limited by T _{JM}			16	A
V _{SD}	I _F = I _S , V _{GS} = 0 V, Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 %			1.5	V
t _{rr} Q _{RM} I _{RM}	$\left. \begin{array}{l} \\ \\ \end{array} \right\} I_F = I_S, -di/dt = 100 \text{ A}/\mu\text{s}, V_R = 100 \text{ V}$			250	ns
				0.52 1.8	μC 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-268AA (D³ PAK)

Dim.	Millimeter		Inches	
	Min.	Max.	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	.025 BSC		.010 BSC	
L4	3.80	4.10	.150	.161

Min. Recommended Footprint

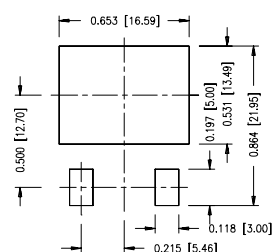


Figure 1. Output Characteristics at 25°C

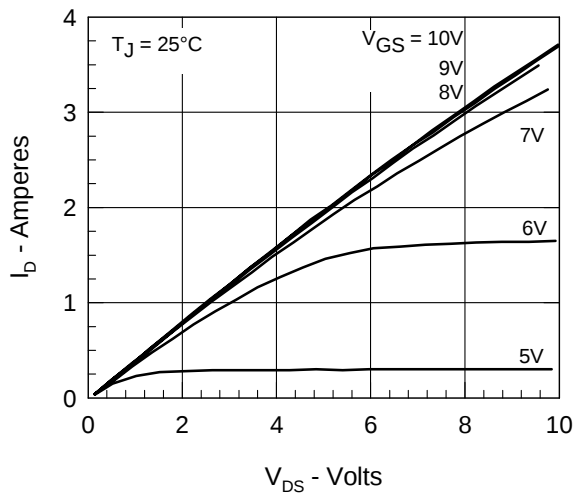


Figure 2. Extended Output Characteristics at 125°C

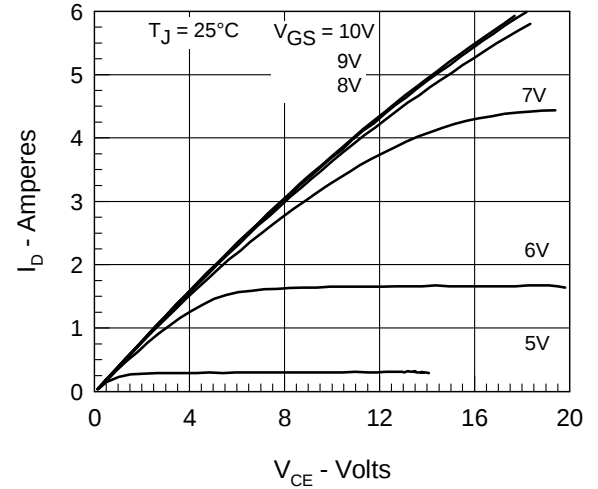


Figure 3. $R_{DS(on)}$ normalized to 0.5 I_{D25} value vs. I_D

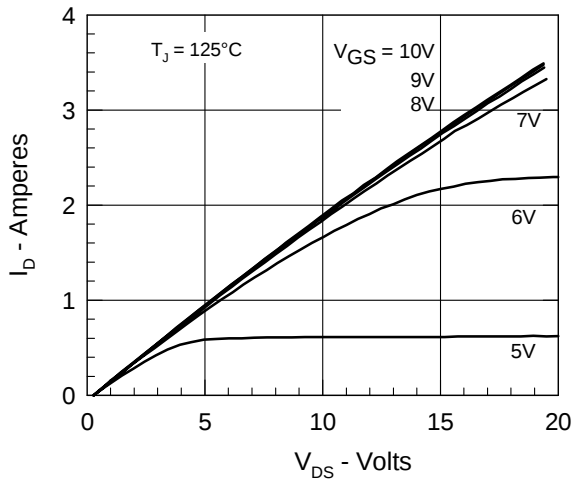


Figure 4. Admittance Curves

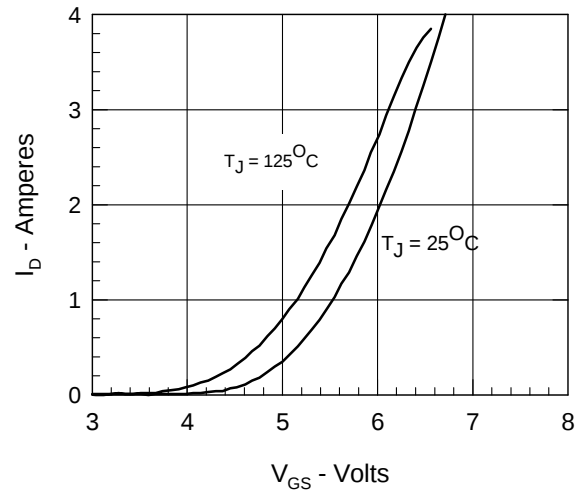


Figure 5. $R_{DS(on)}$ normalized to 0.5 I_{D25} value vs. I_D

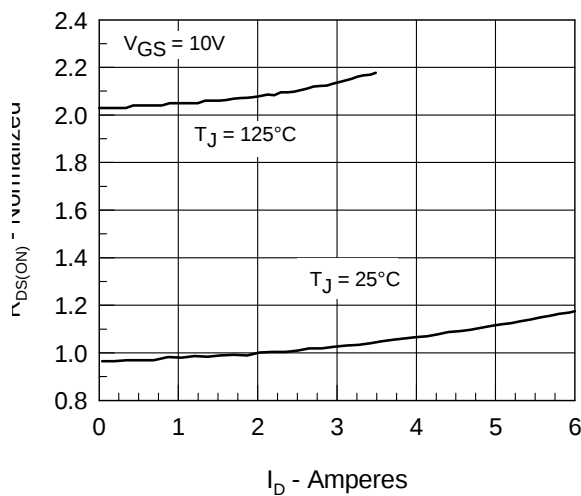


Figure 6. $R_{DS(on)}$ normalized to 0.5 I_{D25} value vs. T_J

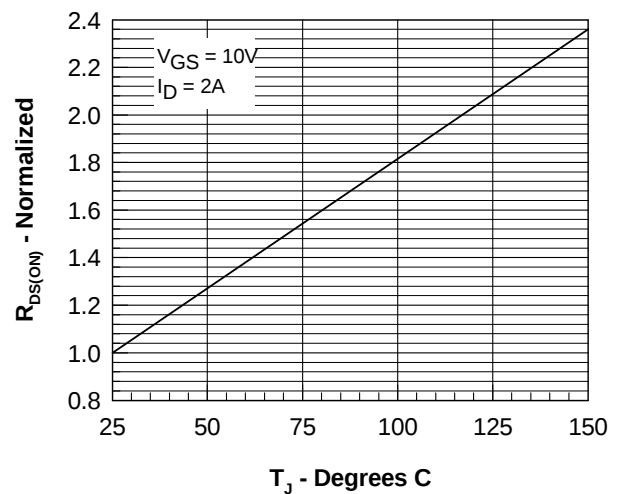


Figure 7. Gate Charge

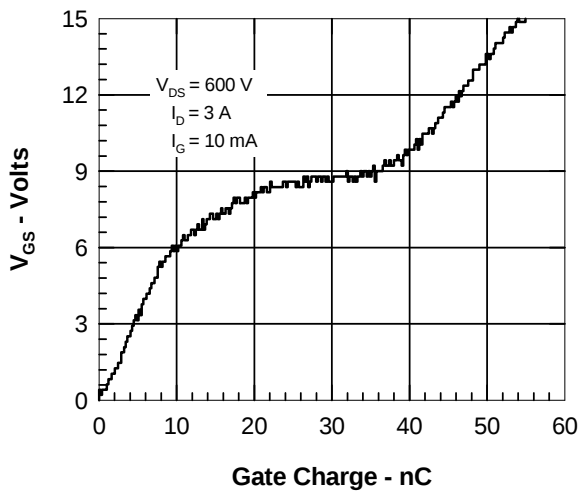


Figure 8. Capacitance Curves

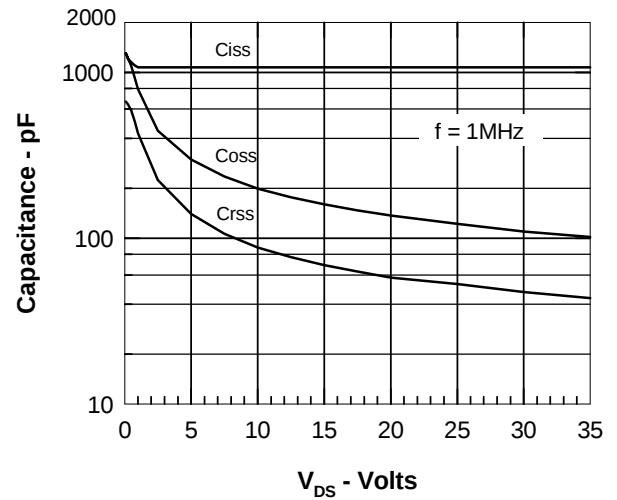


Figure 9. Forward Voltage Drop of the Intrinsic Diode

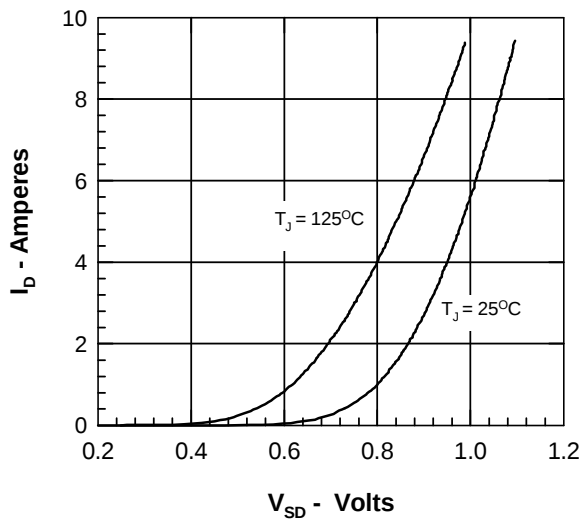


Figure 10. Drain Current vs. Case Temperature

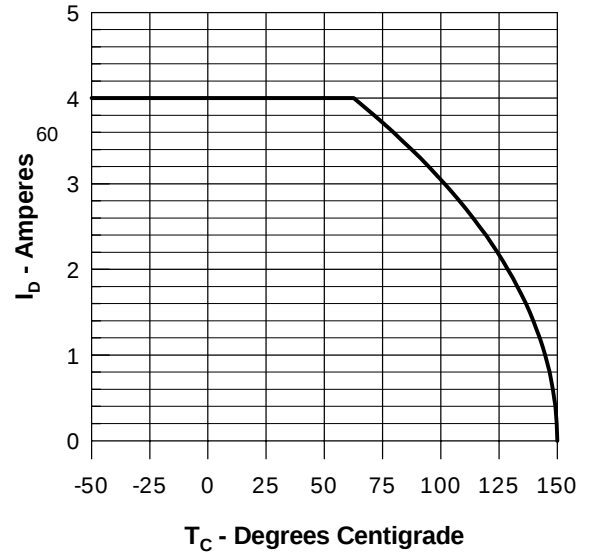


Figure 11. Transient Thermal Resistance

