



Advanced Technical Information

HiPerFET™

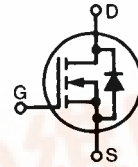
Power MOSFETs

Q-Class

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

IXFH20N80Q
IXFK20N80Q
IXFT20N80Q

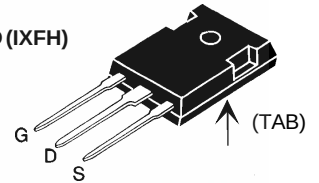
$V_{DSS} = 800 \text{ V}$
 $I_{D25} = 20 \text{ A}$
 $R_{DS(on)} = 0.42 \Omega$



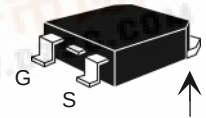
$t_{rr} \leq 250 \text{ ns}$

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ\text{C}$ to 150°C	800	V
V_{DGR}	$T_J = 25^\circ\text{C}$ to 150°C ; $R_{GS} = 1 \text{ M}\Omega$	800	V
V_{GS}	Continuous	± 20	V
V_{GSM}	Transient	± 30	V
I_{D25}	$T_C = 25^\circ\text{C}$	20	A
I_{DM}	$T_C = 25^\circ\text{C}$, pulse width limited by T_{JM}	80	A
I_{AR}	$T_C = 25^\circ\text{C}$	20	A
E_{AR}	$T_C = 25^\circ\text{C}$	45	mJ
E_{AS}	$T_C = 25^\circ\text{C}$	1.5	J
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	$T_C = 25^\circ\text{C}$	360	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 (0.063 in) from case for 10 s	300	$^\circ\text{C}$
M_d	Mounting torque	TO-247 TO-264	1.13/10 0.9/6 Nm/lb.in. Nm/lb.in.
Weight		TO-247 TO-268 TO-264	6 4 10 g g g

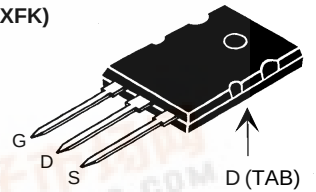
TO-247 AD (IXFH)



TO-268 (D3) (IXFT)



TO-264 AA (IXFK)



G = Gate
S = Source

TAB = Drain

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
V_{DSS}	$V_{GS} = 0 \text{ V}$, $I_D = 250 \mu\text{A}$	800		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 4 \text{ mA}$	2.5		4.5 V
I_{GSS}	$V_{GS} = \pm 20 \text{ V}$, $V_{DS} = 0$			$\pm 200 \text{ nA}$
I_{DSS}	$V_{DS} = V_{DSS}$, $T_J = 25^\circ\text{C}$ $V_{GS} = 0 \text{ V}$, $T_J = 125^\circ\text{C}$			25 μA 1 mA
$R_{DS(on)}$	$V_{GS} = 10 \text{ V}$, $I_D = 0.5 \cdot I_{D25}$ Pulse test, $t \leq 300 \mu\text{s}$, duty cycle $d \leq 2\%$			0.42 Ω

Features

- IXYS advanced low Q_g process
- International standard packages
- Epoxy meet UL 94V-0, flammability classification
- Low $R_{DS(on)}$, low Q_g
- Avalanche energy and current rated
- Fast intrinsic rectifier

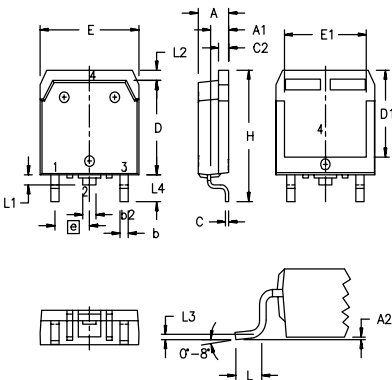
Advantages

- Easy to mount
- Space savings
- High power density

Symbol	Test Conditions	Characteristic Values (T _j = 25°C, unless otherwise specified)		
		min.	typ.	max.
g_{fs}	V _{DS} = 10 V; I _D = 0.5 • I _{D25} , pulse test	11	19	S
C_{iss}	V _{GS} = 0 V, V _{DS} = 25 V, f = 1 MHz		5100	pF
C_{oss}			500	pF
C_{rss}			170	pF
t_{d(on)}	V _{GS} = 10 V, V _{DS} = 0.5 • V _{DSS} , I _D = 0.5 • I _{D25} R _G = 1.5 Ω (External),		28	ns
t_r			27	ns
t_{d(off)}			74	ns
t_f			14	ns
Q_{g(on)}	V _{GS} = 10 V, V _{DS} = 0.5 • V _{DSS} , I _D = 0.5 • I _{D25}		150	nC
Q_{gs}			34	nC
Q_{gd}			80	nC
R_{thJC}			0.35	K/W
R_{thCK}	TO-247		0.25	K/W
	TO-264		0.15	K/W

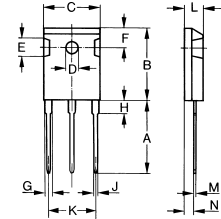
Source-Drain Diode		Characteristic Values (T _j = 25°C, unless otherwise specified)		
Symbol	Test Conditions	min.	typ.	max.
I_S	V _{GS} = 0 V			20 A
I_{SM}	Repetitive; pulse width limited by T _{JM}			80 A
V_{SD}	I _F = I _S , V _{GS} = 0 V, Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 %			1.5 V
t_{rr}	I _F = I _S - di/dt = 100 A/μs, V _R = 100 V		1	250 ns
Q_{RM}				μC
I_{RM}				A

TO-268AA (IXFT) (D³ PAK)



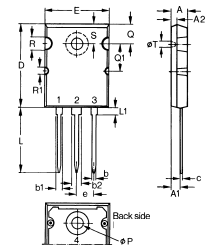
Dim.	Millimeter Min. Max.	Inches Min. Max.
A	4.9 5.1	.193 .201
A ₁	2.7 2.9	.106 .114
A ₂	.02 .25	.001 .010
b	1.15 1.45	.045 .057
b ₂	1.9 2.1	.75 .83
C	.4 .65	.016 .026
D	13.80 14.00	.543 .551
E	15.85 16.05	.624 .632
E ₁	13.3 13.6	.524 .535
e	5.45 BSC	.215 BSC
H	18.70 19.10	.736 .752
L	2.40 2.70	.094 .106
L ₁	1.20 1.40	.047 .055
L ₂	1.00 1.15	.039 .045
L ₃	0.25 BSC	.010 BSC
L ₄	3.80 4.10	.150 .161

TO-247 AD (IXFH) Outline



Dim.	Millimeter Min. Max.	Inches 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-264 AA (IXFK) Outline



Dim.	Millimeter Min. Max.	Inches Min. Max.
A	4.82 5.13	.190 .202
A ₁	2.54 2.89	.100 .114
A ₂	2.00 2.10	.079 .083
b	1.12 1.42	.044 .056
b ₁	2.39 2.69	.094 .106
b ₂	2.90 3.09	.114 .122
c	0.53 0.83	.021 .033
D	25.91 26.16	1.020 1.030
E	19.81 19.96	.780 .786
e	5.46 BSC	.215 BSC
J	0.00 0.25	.000 .010
K	0.00 0.25	.000 .010
L	20.32 20.83	.800 .820
L ₁	2.29 2.59	.090 .102
P	3.17 3.66	.125 .144
Q	6.07 6.27	.239 .247
Q ₁	8.38 8.69	.330 .342
R	3.81 4.32	.150 .170
R ₁	1.78 2.29	.070 .090
S	6.04 6.30	.238 .248
T	1.57 1.83	.062 .072

Min. Recommended Footprint

