

HiPerFET™ Power MOSFETs

Q Class

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

IXFK90N20Q
IXFK90N20QS

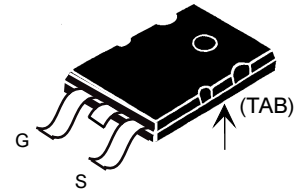
$V_{DSS} = 200\text{ V}$
 $I_{D25} = 90\text{ A}$
 $R_{DS(on)} = 22\text{ m}\Omega$

$t_{rr} \leq 200\text{ ns}$

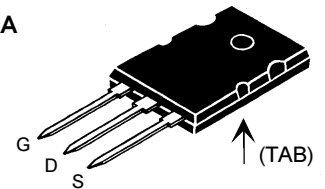


Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ\text{C}$ to 150°C	200	V
V_{DGR}	$T_J = 25^\circ\text{C}$ to 150°C ; $R_{GS} = 1\text{ M}\Omega$	200	V
V_{GS}	Continuous	± 20	V
V_{GSM}	Transient	± 30	V
I_{D25}	$T_C = 25^\circ\text{C}$	90	A
I_{DM}	$T_C = 25^\circ\text{C}$, pulse width limited by T_{JM}	360	A
I_{AR}	$T_C = 25^\circ\text{C}$	100	A
E_{AR}	$T_C = 25^\circ\text{C}$	50	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	$T_C = 25^\circ\text{C}$	500	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	0.9/6	Nm/lb.in.
Weight		10	g

TO-264 AA
(IXFK-S)



TO-264 AA
(IXFK)



G = Gate
S = Source

D = Drain
TAB = Drain

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
V_{DSS}	$V_{GS} = 0\text{ V}$, $I_D = 250\ \mu\text{A}$	200		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 8\text{ mA}$	2		V
I_{GSS}	$V_{GS} = \pm 20\text{ V}_{DC}$, $V_{DS} = 0$			$\pm 100\text{ nA}$
I_{DSS}	$V_{DS} = 0.8 \cdot V_{DSS}$, $V_{GS} = 0\text{ V}$			$200\ \mu\text{A}$ 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 $d \leq 2\%$			0.022 Ω

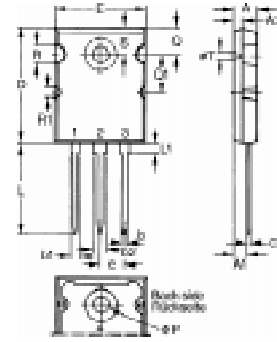
Features

- IXYS advanced low Q_g process
- International standard packages
- Low $R_{DS(on)}$
- Unclamped Inductive Switching (UIS) rated
- Fast intrinsic rectifier
- Fast switching
- Molding epoxies meet UL 94 V-0 flammability classification

Advantages

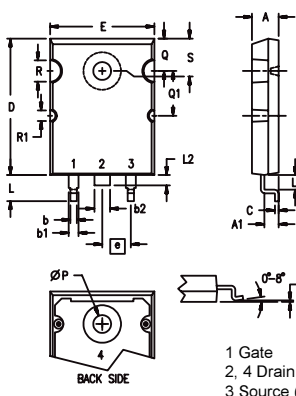
- Easy to mount
- Space savings
- High power density
- S version suitable for surface mounting

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		60	S
C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		11000	pF
C_{oss}			1600	pF
C_{rss}			100	pF
$t_{d(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$ $R_G = 1\ \Omega$ (External),		30	ns
t_r			30	ns
$t_{d(off)}$			55	ns
t_f			12	ns
$Q_{g(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$		190	nC
Q_{gs}			60	nC
Q_{gd}			60	nC
R_{thJC}	TO-264 AA; SMD-264		0.26	K/W
R_{thCK}	TO-264 AA		0.15	K/W

TO-264 AA Outline


Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.82	5.13	.190	.202
A1	2.54	2.89	.100	.114
A2	2.00	2.10	.079	.083
b	1.12	1.42	.044	.056
b1	2.39	2.69	.094	.106
b2	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
L1	2.29	2.59	.090	.102
P	3.17	3.66	.125	.144
Q	6.07	6.27	.239	.247
Q1	8.38	8.69	.330	.342
R	3.81	4.32	.150	.170
R1	1.78	2.29	.070	.090
S	6.04	6.30	.238	.248
T	1.57	1.83	.062	.072

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
I_S	$V_{GS} = 0\text{ V}$			100 A
I_{SM}	Repetitive; pulse width limited by T_{JM}			400 A
V_{SD}	$I_F = 100\text{ A}, V_{GS} = 0\text{ V}$, Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\ \%$			1.3 V
t_{rr}	$I_F = I_S, -di/dt = 100\text{ A}/\mu\text{s}, V_R = 100\text{ V}$		120	200 ns
Q_{RM}			0.7	μC
I_{RM}			10	A

TO-264 SMD Outline


Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.70	5.31	.185	.209
A1	2.59	3.00	.102	.118
b	0.94	1.40	.037	.055
b1	2.21	2.59	.087	.102
b2	2.79	3.20	.110	.126
C	0.43	0.74	.017	.029
D	25.58	26.59	1.007	1.047
E	19.30	20.29	.760	.799
e	5.46 BSC		.215 BSC	
L	4.90	5.10	.193	.201
L1	2.24	2.44	.088	.096
L2	1.90	2.10	.075	.083
L3	0.00	0.10	.000	.004
$\varnothing P$	3.10	3.51	.122	.138
Q	6.10	6.50	.240	.256
Q1	8.38	8.79	.330	.346
$\varnothing R$	3.94	4.75	.155	.187
$\varnothing R1$	2.16	2.36	.085	.093
S	6.17	6.43	.243	.253

Note:

1. This drawing meets dimensions requirement of JEDEC outlines TO-264AA except L, L1, L2, L3. 2. All metal surface are solder plated except trimmed area.

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

IXYS MOSFETS and IGBTs are covered by one or more of the following U.S. patents: 4,835,592 4,881,106 5,017,508 5,049,961 5,187,117 5,486,715
4,850,072 4,931,844 5,034,796 5,063,307 5,237,481 5,381,025