

HiPerFET™

Power MOSFETs

Q Class

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

IXFK90N20Q
IXFK90N20QS

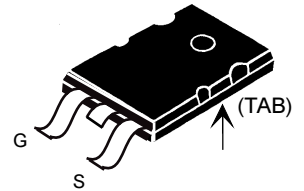
$V_{DSS} = 200 \text{ V}$
 $I_{D25} = 90 \text{ A}$
 $R_{DS(on)} = 22 \text{ m}\Omega$

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

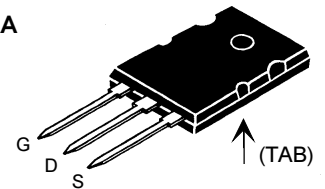


Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ\text{C}$ to 150°C	200	V
V_{DGR}	$T_J = 25^\circ\text{C}$ to 150°C ; $R_{GS} = 1 \text{ M}\Omega$	200	V
V_{GS}	Continuous	± 20	V
V_{GSM}	Transient	± 30	V
I_{D25}	$T_C = 25^\circ\text{C}$	90	A
I_{DM}	$T_C = 25^\circ\text{C}$, pulse width limited 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		4 V
I_{GSS}	$V_{GS} = \pm 20 \text{ V}$, $V_{DS} = 0$			$\pm 100 \text{ nA}$
I_{DSS}	$V_{DS} = 0.8 \cdot V_{DSS}$, $V_{GS} = 0 \text{ V}$ $T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$			200 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 $d \leq 2 \%$			0.022 Ω

Features

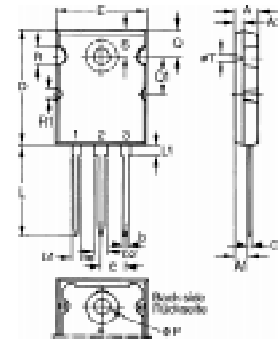
- IXYS advanced low Q_g process
- International standard packages
- Low $R_{DS(on)}$
- Unclamped Inductive Switching (UIS) rated
- Fast intrinsic rectifier
- Fast switching
- Molding epoxies meet UL 94 V-0 flammability classification

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	KW
R_{thCK}	TO-264 AA		0.15	KW

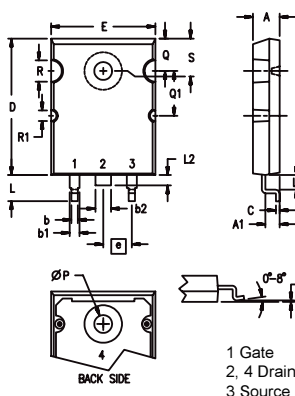
TO-264 AA Outline



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	ns
Q_{RM}			0.7	μC
I_{RM}			10	A

TO-264 SMD Outline



- 1 Gate
2, 4 Drain (collector)
3 Source (emitter)

Note:

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

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
ØP	3.10	3.51	.122	.138
Q	6.10	6.50	.240	.256
Q1	8.38	8.79	.330	.346
ØR	3.94	4.75	.155	.187
ØR1	2.16	2.36	.085	.093
S	6.17	6.43	.243	.253

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