

HiPerFET™ Power MOSFETs

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

	V_{DSS}	I_{D25}	$R_{DS(on)}$
IXFK33N50	500 V	33 A	0.16 Ω
IXFK35N50	500 V	35 A	0.15 Ω

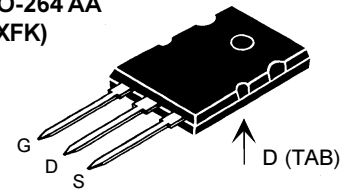
$t_{rr} \leq 250$ ns



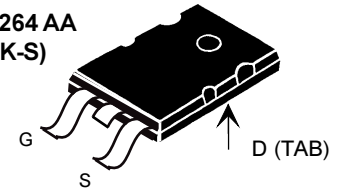
Preliminary data

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ\text{C}$ to 150°C	500	V
V_{DGR}	$T_J = 25^\circ\text{C}$ to 150°C ; $R_{GS} = 1$ M Ω	500	V
V_{GS}	Continuous	± 20	V
V_{GSM}	Transient	± 30	V
I_{D25}	$T_C = 25^\circ\text{C}$	33N50	33 A
		35N50	35 A
I_{DM}	$T_C = 25^\circ\text{C}$, pulse width limited by T_{JM}	33N50	132 A
		35N50	140 A
I_{AR}	$T_C = 25^\circ\text{C}$	33N50	30 A
		35N50	35 A
E_{AS}	$I_D = 32$ A	2.5	J
E_{AR}	$T_C = 25^\circ\text{C}$	45	mJ
dv/dt	$I_S \leq I_{DM}$, $di/dt \leq 100$ A/ μs , $V_{DD} \leq V_{DSS}$, $T_J \leq 150^\circ\text{C}$, $R_G = 2$ Ω	5	V/ns
P_D	$T_C = 25^\circ\text{C}$	416	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	TO-264 AA	10	g
	TO-264 SMD	8	g

TO-264 AA
(IXFK)



TO-264 AA
(IXFK-S)



G = Gate
S = Source

D = Drain
TAB = Drain

Features

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

Applications

- DC-DC converters
- Synchronous rectification
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- Temperature and lighting controls

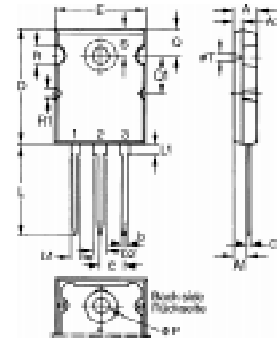
Advantages

- 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.
V_{DSS}	$V_{GS} = 0$ V, $I_D = 1$ mA V_{DSS} temperature coefficient	500	0.102	V %/K
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 4$ mA $V_{GS(th)}$ temperature coefficient	2	-0.206	V %/K
I_{GSS}	$V_{GS} = \pm 20$ V _{DC} , $V_{DS} = 0$			± 200 nA
I_{DSS}	$V_{DS} = 0.8 \cdot V_{DSS}$ $V_{GS} = 0$ V	$T_J = 25^\circ\text{C}$		200 μA
		$T_J = 125^\circ\text{C}$		2 mA
$R_{DS(on)}$	$V_{GS} = 10$ V, $I_D = 16.5$ A Pulse test, $t \leq 300$ μs , duty cycle $d \leq 2$ %	33N50		0.16 Ω
		35N50		0.15 Ω

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	18	28	S
C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$	5200		5700 pF
C_{oss}		640		750 pF
C_{rss}		240		310 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),		35	45 ns
t_r			42	50 ns
$t_{d(off)}$			110	140 ns
t_f			23	35 ns
$Q_{g(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$		227	nC
Q_{gs}			29	nC
Q_{gd}			110	nC
R_{thJC}	TO-264 AA; SMD-264			0.3 K/W
R_{thCK}	TO-264 AA		0.15	K/W

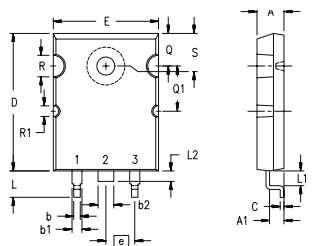
TO-264 AA Outline



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	5.46BSC		.215BSC	
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	$V_{GS} = 0\text{ V}$			33 A
I_{SM}	Repetitive; pulse width limited by T_{JM}			132 A
V_{SD}	$I_F = 100\text{ A}, V_{GS} = 0\text{ V}$, Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$			1.5 V
t_{rr}	$I_F = I_S, -di/dt = 100\text{ A}/\mu\text{s}, V_R = 100\text{ V}$		TBD	250 ns
Q_{RM}			TBD	μC
I_{RM}			TBD	A

TO-264 SMD Outline



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

Note:

1. This drawing meets of 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	5.46BSC		.215BSC	
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

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