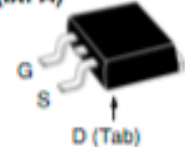


**X2-Class HiPerFET™
Power MOSFET**
**IXFA22N65X2
IXFP22N65X2
IXFH22N65X2**
 $V_{DSS} = 650V$
 $I_{D25} = 22A$
 $R_{DS(on)} \leq 160m\Omega$

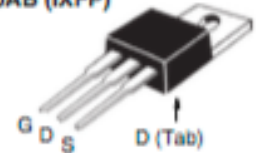
 N-Channel Enhancement Mode
 Avalanche Rated
 Fast Intrinsic Diode


Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ C$ to $150^\circ C$	650	V
V_{DGR}	$T_J = 25^\circ C$ to $150^\circ C$, $R_{GS} = 1M\Omega$	650	V
V_{OSS}	Continuous	± 30	V
V_{OSM}	Transient	± 40	V
I_{D25}	$T_C = 25^\circ C$	22	A
I_{DM}	$T_C = 25^\circ C$, Pulse Width Limited by T_{JM}	44	A
I_A	$T_C = 25^\circ C$	5	A
E_{AS}	$T_C = 25^\circ C$	1	J
dv/dt	$I_D \leq I_{DM}$, $V_{DS} \leq V_{OSS}$, $T_J \leq 150^\circ C$	50	V/ns
P_D	$T_C = 25^\circ C$	390	W
T_J		-55 ... +150	$^\circ C$
T_{JM}		150	$^\circ C$
T_{stg}		-55 ... +150	$^\circ C$
T_L	Maximum Lead Temperature for Soldering	300	$^\circ C$
T_{SOLD}	1.6 mm (0.062in.) from Case for 10s	260	$^\circ C$
F_C	Mounting Force (TO-263)	10.65 / 2.2.. 14.6	N/lb
M_d	Mounting Torque (TO-220 & TO-247)	1.13 / 10	Nm/lb.in
Weight	TO-263	2.5	g
	TO-220	3.0	g
	TO-247	6.0	g

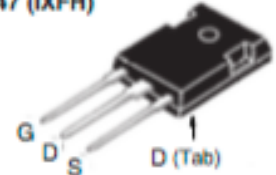
TO-263 AA (IXFA)



TO-220AB (IXFP)



TO-247 (IXFH)


 G = Gate D = Drain
 S = Source Tab = Drain

Features

- International Standard Packages
- Low $R_{DS(on)}$ and Q_o
- Avalanche Rated
- Low Package Inductance

Advantages

- High Power Density
- Easy to Mount
- Space Savings

Applications

- Switch-Mode and Resonant-Mode Power Supplies
- DC-DC Converters
- PFC Circuits
- AC and DC Motor Drives
- Robotics and Servo Controls

Symbol	Test Conditions ($T_J = 25^\circ C$, Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
BV_{DSS}	$V_{GS} = 0V$, $I_D = 250\mu A$	650		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 1.5mA$	2.7		5.5 V
I_{GSS}	$V_{GS} = \pm 30V$, $V_{DS} = 0V$			± 100 nA
I_{OSS}	$V_{DS} = V_{DSS}$, $V_{GS} = 0V$ $T_J = 125^\circ C$			25 μA 2.0 mA
$R_{DS(on)}$	$V_{GS} = 10V$, $I_D = 0.5 \cdot I_{D25}$ Note 1			160 m Ω

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$, Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max
g_{fs}	$V_{GS} = 10\text{V}$, $I_D = 0.5 \cdot I_{DSS}$, Note 1	8	14	S
R_{Gi}	Gate Input Resistance		1.0	Ω
C_{iss}	$V_{GS} = 0\text{V}$, $V_{DS} = 25\text{V}$, $f = 1\text{MHz}$		2310	pF
C_{oss}			1530	pF
C_{rss}			1.5	pF
$t_{d(on)}$	Resistive Switching Times $V_{GS} = 10\text{V}$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 0.5 \cdot I_{DSS}$ $R_G = 10\Omega$ (External)		38	ns
t_r			35	ns
$t_{d(off)}$			33	ns
t_f			10	ns
$Q_{g(on)}$	$V_{GS} = 10\text{V}$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 0.5 \cdot I_{DSS}$		38	nC
Q_{gs}			20	nC
Q_{gf}			9	nC
$R_{\theta JC}$				0.32 $^\circ\text{C/W}$
$R_{\theta CS}$	TO-220		0.50	$^\circ\text{C/W}$
	TO-247		0.25	$^\circ\text{C/W}$

Source-Drain Diode

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$, Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max
I_S	$V_{GS} = 0\text{V}$			22 A
I_{SM}	Repetitive, pulse Width Limited by T_{JM}			88 A
V_{SD}	$I_F = I_S$, $V_{GS} = 0\text{V}$, Note 1			1.4 V
t_{rr}	$I_F = 11\text{A}$, $-di/dt = 100\text{A}/\mu\text{s}$ $V_R = 100\text{V}$		145	ns
Q_{RRM}			870	nC
I_{RSM}			12	A

Note 1. Pulse test, $t \leq 300\mu\text{s}$, duty cycle, $d \leq 2\%$.

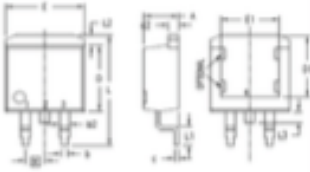
ADVANCE TECHNICAL INFORMATION

The product presented herein is under development. The Technical Specifications offered are derived from a subjective evaluation of the design, based upon prior knowledge and experience, and constitute a "considered reflection" of the anticipated result. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.

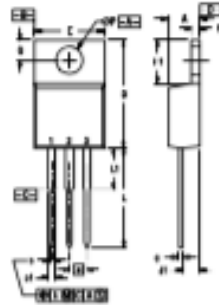
IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents:

4,835,592	4,931,844	5,049,961	5,237,481	6,162,665	6,404,065B1	6,683,344	6,727,585	7,005,734B2	7,157,336B2
4,860,072	5,017,508	5,063,307	5,381,025	6,209,123B1	6,534,343	6,710,405B2	6,759,692	7,063,975B2	
4,881,106	5,034,796	5,187,117	5,486,715	6,306,728B1	6,583,505	6,710,463	6,771,478B2	7,071,537	

TO-263 Outline


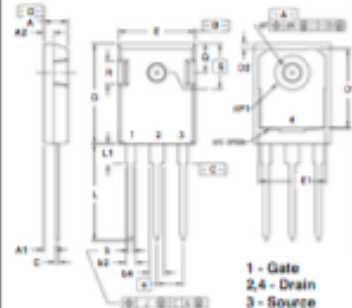
- 1 = Gate
- 2 = Drain
- 3 = Source
- 4 = Drain

SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.260	.290	4.06	4.83
A1	.080	.110	2.03	2.79
b	.020	.030	0.51	0.99
b2	.040	.050	1.14	1.40
c	.016	.020	0.40	0.74
c2	.040	.050	1.14	1.40
D	.140	.160	3.54	4.05
D1	.170	.220	4.30	5.60
E	.380	.430	9.65	10.91
E1	.240	.320	6.10	8.13
e	.100 BSC		2.54 BSC	
L	.570	.620	14.51	15.88
L1	.090	.110	2.29	2.79
L2	.140	.160	3.54	4.05
L3	.050	.070	1.27	1.78
L4	0	.005	0	0.13

TO-220 Outline


- Pins: 1 - Gate
- 2 - Drain
- 3 - Source

SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.170	.190	4.30	4.83
b	.025	.040	0.64	1.02
b1	.045	.065	1.15	1.65
c	.054	.082	1.35	2.06
D	.580	.630	14.73	16.01
E	.390	.420	9.91	10.66
e	.100 BSC		2.54 BSC	
f	.045	.050	1.14	1.40
H1	.230	.270	5.85	6.85
J1	.090	.150	2.29	3.79
k	0	.015	0	0.38
L	.560	.590	14.23	14.97
L1	.110	.230	2.79	5.84
OP	.139	.161	3.53	4.08
Q	.180	.125	4.54	3.18

TO-247 Outline


- 1 - Gate
- 2,4 - Drain
- 3 - Source

Dim.	Millimeter		Inches	
	min	max	min	max
A	4.70	5.30	0.185	0.209
A1	2.21	2.50	0.087	0.100
A2	1.50	2.40	0.059	0.094
b	0.99	1.40	0.039	0.055
b2	1.65	2.30	0.065	0.091
b4	2.50	3.40	0.100	0.135
c	0.30	0.80	0.015	0.035
D	20.70	21.45	0.819	0.845
D1	13.07	-	0.515	-
D2	0.51	1.35	0.020	0.053
E	15.40	16.24	0.610	0.640
E1	13.45	-	0.53	-
E2	4.91	5.40	0.170	0.215
e	.100 BSC		2.54 BSC	
L	19.80	20.30	0.779	0.800
L1	-	4.40	-	0.177
OP	3.55	3.65	0.140	0.144
OP1	-	7.30	-	0.290
Q	5.30	6.10	0.212	0.244
S	6.14 BSC		0.242 BSC	