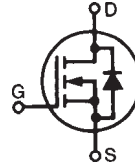


Polar3™ HiPerFET™ Power MOSFETs

IXFA14N60P3
IXFP14N60P3
IXFH14N60P3

$V_{DSS} = 600V$
 $I_{D25} = 14A$
 $R_{DS(on)} \leq 540m\Omega$

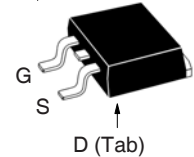
N-Channel Enhancement Mode
Avalanche Rated
Fast Intrinsic Rectifier



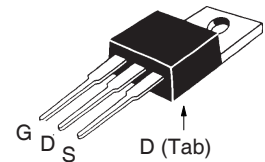
Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^{\circ}C$ to $150^{\circ}C$	600	V
V_{DGR}	$T_J = 25^{\circ}C$ to $150^{\circ}C$, $R_{GS} = 1M\Omega$	600	V
V_{GSS}	Continuous	± 30	V
V_{GSM}	Transient	± 40	V
I_{D25}	$T_C = 25^{\circ}C$	14	A
I_{DM}	$T_C = 25^{\circ}C$, Pulse Width Limited by T_{JM}	35	A
I_A	$T_C = 25^{\circ}C$	7	A
E_{AS}	$T_C = 25^{\circ}C$	700	mJ
dv/dt	$I_S \leq I_{DM}$, $V_{DD} \leq V_{DSS}$, $T_J \leq 150^{\circ}C$	35	V/ns
P_D	$T_C = 25^{\circ}C$	327	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}	Plastic Body 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

Symbol	Test Conditions ($T_J = 25^{\circ}C$, Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
BV_{DSS}	$V_{GS} = 0V$, $I_D = 1mA$	600		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 1mA$	3.0		5.0 V
I_{GSS}	$V_{GS} = \pm 30V$, $V_{DS} = 0V$			± 100 nA
I_{DSS}	$V_{DS} = V_{DSS}$, $V_{GS} = 0V$ $T_J = 125^{\circ}C$			25 μA 750 μA
$R_{DS(on)}$	$V_{GS} = 10V$, $I_D = 0.5 \cdot I_{D25}$, Note 1			540 m Ω

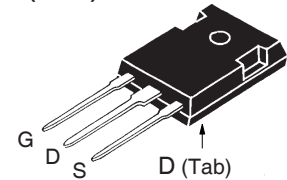
TO-263 (IXFA)



TO-220 (IXFP)



TO-247 (IXFH)



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

Features

- International Standard Packages
- Fast Intrinsic Rectifier
- Avalanche Rated
- Low $R_{DS(ON)}$ and Q_G
- Low Package Inductance

Advantages

- High Power Density
- Easy to Mount
- Space Savings

Applications

- Switch-Mode and Resonant-Mode Power Supplies
- DC-DC Converters
- Laser Drivers
- AC and DC Motor Drives
- Robotics and Servo Controls

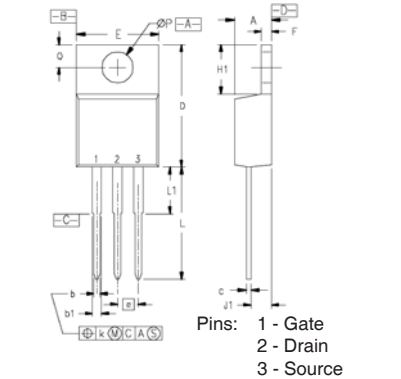
Symbol	Test Conditions ($T_J = 25^\circ\text{C}$, Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max
g_{fs}	$V_{DS} = 20\text{V}$, $I_D = 0.5 \cdot I_{D25}$, Note 1	9	15	S
R_{Gi}	Gate Input Resistance		2.8	Ω
C_{iss}	$V_{GS} = 0\text{V}$, $V_{DS} = 25\text{V}$, $f = 1\text{MHz}$		1480	pF
C_{oss}			178	pF
C_{rss}			7	pF
$t_{d(on)}$	Resistive Switching Times $V_{GS} = 10\text{V}$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 0.5 \cdot I_{D25}$ $R_G = 10\Omega$ (External)		21	ns
t_r			15	ns
$t_{d(off)}$			43	ns
t_f			16	ns
$Q_{g(on)}$	$V_{GS} = 10\text{V}$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 0.5 \cdot I_{D25}$		25	nC
Q_{gs}			6.3	nC
Q_{gd}			11	nC
R_{thJC}				0.38°C/W
R_{thCS}	TO-220		0.50	$^\circ\text{C/W}$
	TO-247		0.21	$^\circ\text{C/W}$

Source-Drain Diode

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$, Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max
I_s	$V_{GS} = 0\text{V}$, Note 1			14 A
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}			56 A
V_{SD}	$I_F = I_s$, $V_{GS} = 0\text{V}$, Note 1			1.4 V
t_{rr}	$I_F = 14\text{A}$, $-di/dt = 50\text{A}/\mu\text{s}$ $V_R = 100\text{V}$			250 ns
Q_{RM}			0.6	μC
I_{RM}			5.7	A

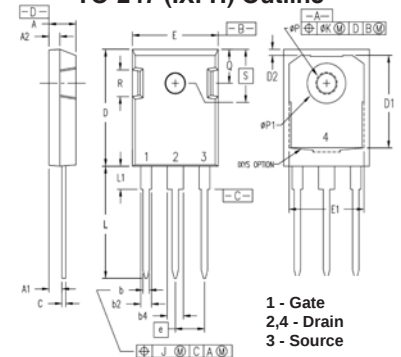
Note 1. Pulse test, $t \leq 300\mu\text{s}$, duty cycle, $d \leq 2\%$.

TO-220 (IXFP) Outline



SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.170	.190	4.32	4.83
b	.025	.040	0.64	1.02
b1	.045	.065	1.15	1.65
c	.014	.022	0.35	0.56
D	.580	.630	14.73	16.00
E	.390	.420	9.91	10.66
e	.100 BSC		2.54 BSC	
F	.045	.055	1.14	1.40
H1	.230	.270	5.85	6.85
J1	.090	.110	2.29	2.79
k	0	.015	0	0.38
L	.500	.550	12.70	13.97
L1	.110	.230	2.79	5.84
ϕP	.139	.161	3.53	4.08
Q	.100	.125	2.54	3.18

TO-247 (IXFH) Outline



Dim.	Millimeter		Inches	
	min	max	min	max
A	4.70	5.30	0.185	0.209
A1	2.21	2.59	0.087	0.102
A2	1.50	2.49	0.059	0.098
b	0.99	1.40	0.039	0.055
b2	1.65	2.39	0.065	0.094
b4	2.59	3.43	0.102	0.135
c	0.38	0.89	0.015	0.035
D	20.79	21.45	0.819	0.845
D1	13.07	-	0.515	-
D2	0.51	1.35	0.020	0.053
E	15.48	16.24	0.610	0.640
E1	13.45	-	0.53	-
E2	4.31	5.48	0.170	0.216
e	5.45 BSC		0.215 BSC	
L	19.80	20.30	0.078	0.800
L1	-	4.49	-	0.177
ϕP	3.55	3.65	0.140	0.144
$\phi P1$	-	7.39	-	0.290
Q	5.38	6.19	0.212	0.244
S	6.14 BSC		0.242 BSC	

TO-263 Outline

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

SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.160	.190	4.06	4.83
A1	.080	.110	2.03	2.79
b	.020	.039	0.51	0.99
b2	.045	.055	1.14	1.40
c	.016	.029	0.40	0.74
c2	.045	.055	1.14	1.40
D	.340	.380	8.64	9.65
D1	.315	.350	8.00	8.89
E	.380	.410	9.65	10.41
E1	.245	.320	6.22	8.13
e	.100 BSC		2.54 BSC	
L	.575	.625	14.61	15.88
L1	.090	.110	2.29	2.79
L2	.040	.055	1.02	1.40
L3	.050	.070	1.27	1.78
L4	0	.005	0	0.13

PRELIMINARY 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	7,157,338B2
	4,860,072	5,017,508	5,063,307	5,381,025	6,259,123B1	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	

Fig. 1. Output Characteristics @ $T_J = 25^\circ\text{C}$

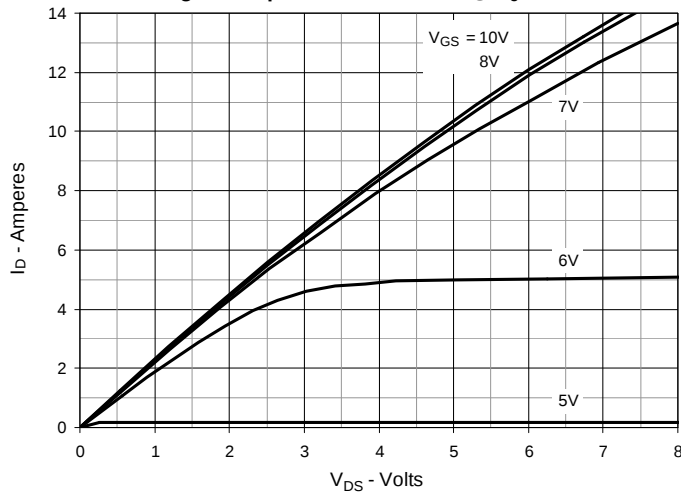


Fig. 2. Extended Output Characteristics @ $T_J = 25^\circ\text{C}$

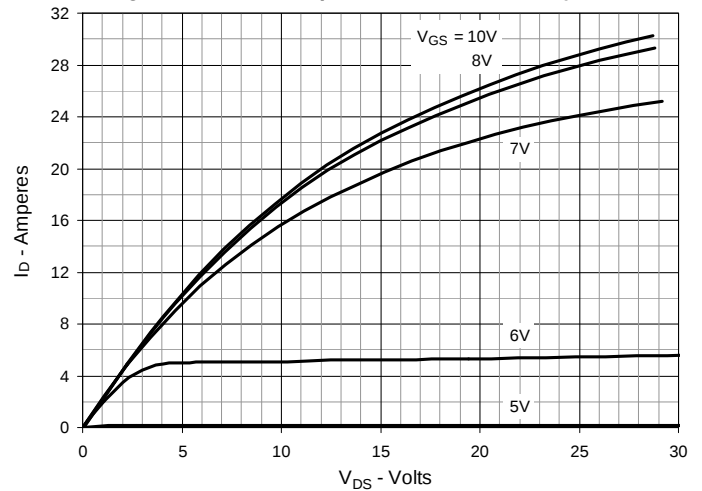


Fig. 3. Output Characteristics @ $T_J = 125^\circ\text{C}$

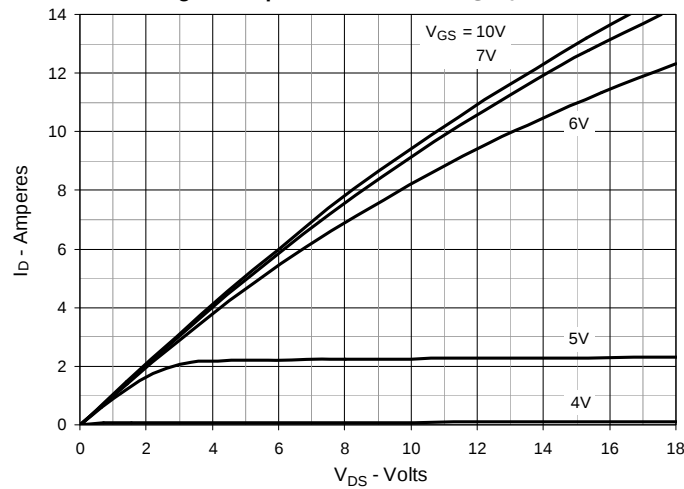


Fig. 4. $R_{DS(on)}$ Normalized to $I_D = 7\text{A}$ Value vs. Junction Temperature

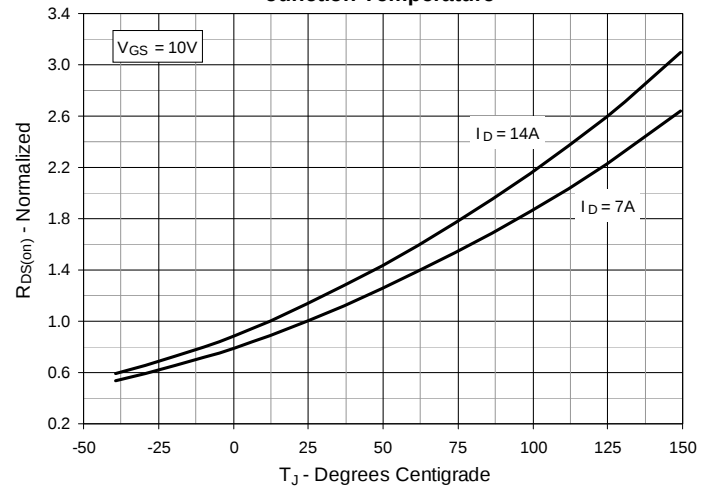


Fig. 5. $R_{DS(on)}$ Normalized to $I_D = 7\text{A}$ Value vs. Drain Current

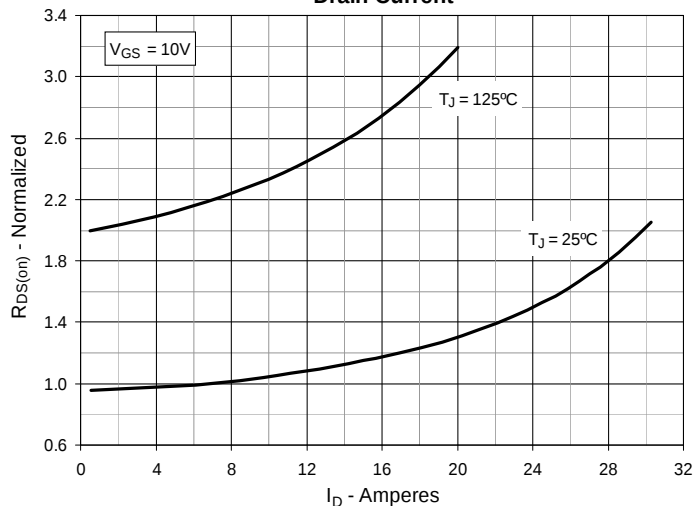


Fig. 6. Maximum Drain Current vs. Case Temperature

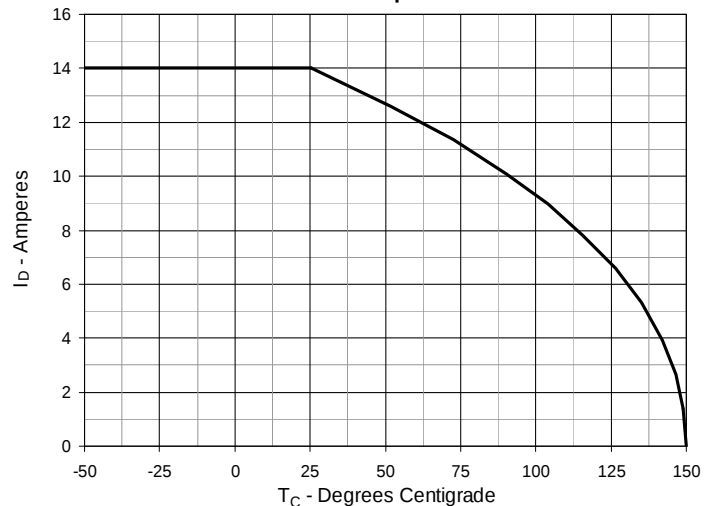


Fig. 7. Input Admittance

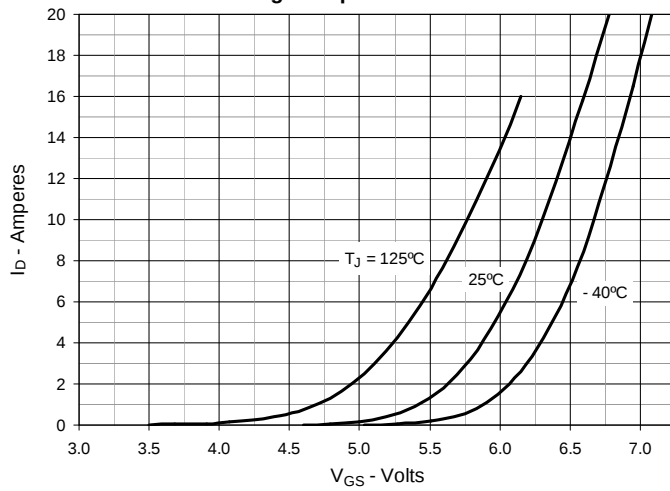


Fig. 8. Transconductance

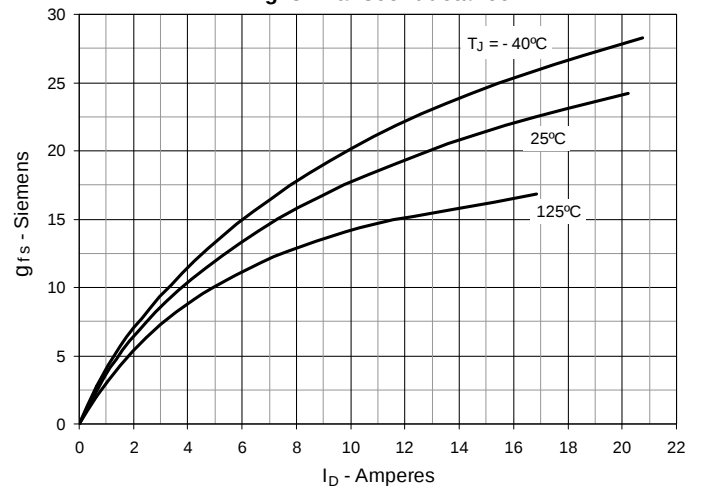


Fig. 9. Forward Voltage Drop of Intrinsic Diode

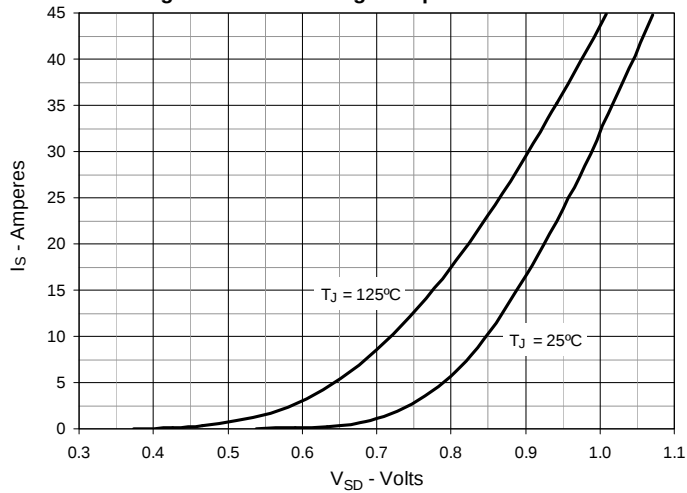


Fig. 10. Gate Charge

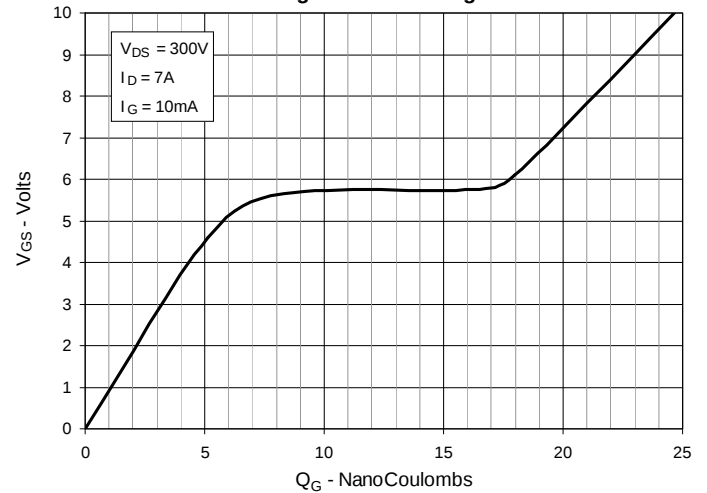


Fig. 11. Capacitance

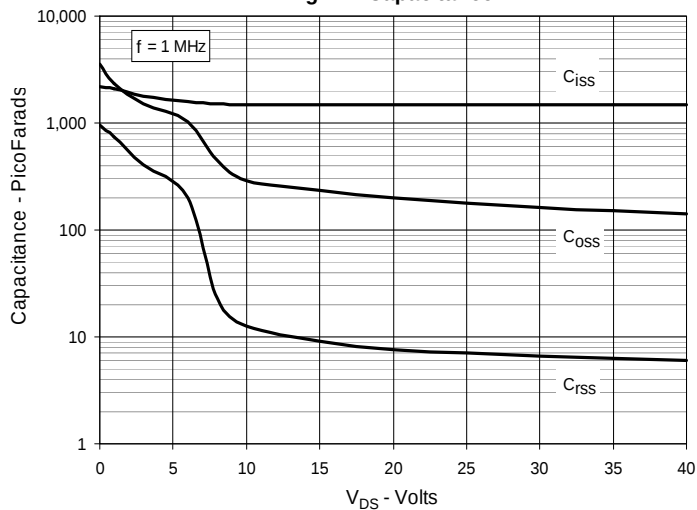


Fig. 12. Forward-Bias Safe Operating Area

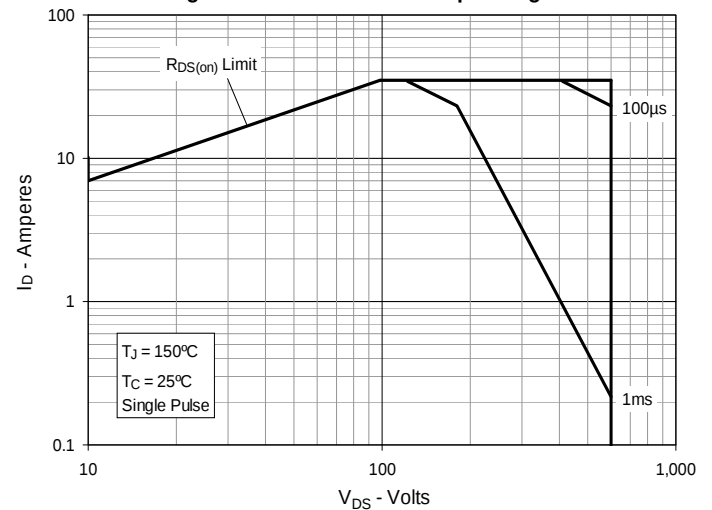


Fig. 13. Maximum Transient Thermal Impedance

