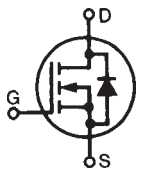
IXYS

PolarHV™ HiPerFET Power MOSFET

IXFA 16N50P
IXFH 16N50P
IXFP 16N50P

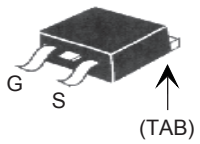
V_{DSS} = 500 V
I_{D25} = 16 A
$R_{DS(on)}$ ≤ 400 mΩ
t_{rr} ≤ 200 ns

N-Channel Enhancement Mode
Avalanche Rated
Fast Intrinsic Diode

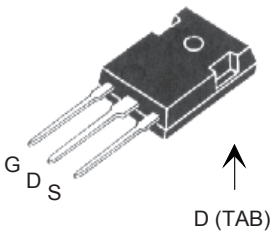


Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C	500	V
V_{DGR}	T_J = 25°C to 150°C; R_{GS} = 1 MΩ	500	V
V_{GS}	Continuous	±30	V
V_{GSM}	Transient	±40	V
I_{D25}	T_C = 25°C	16	A
I_{DM}	T_C = 25°C, pulse width limited by T_{JM}	35	A
I_{AR}	T_C = 25°C	16	A
E_{AR}	T_C = 25°C	25	mJ
E_{AS}	T_C = 25°C	750	mJ
dv/dt	$I_S \le I_{DM}$, di/dt ≤100 A/μs, $V_{DD} \le V_{DSS}$, T_J ≤150°C, R_G = 10 Ω	10	V/ns
P_D	T_C = 25°C	300	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
T_L	1.6 mm (0.062 in.) from case for 10 s	300	°C
T_{SOLD}	Plastic body for 10 s soldering	260	°C
M_d	Mounting torque (TO-247 & TO-220)	1.13/10	Nm/lb.in.
Weight	TO-220	4	g
	TO-263	3	g
	TO-247	5.5	g

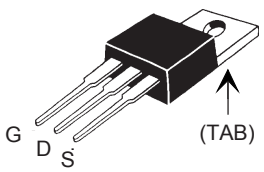
TO-263 (IXTA)



TO-247 (IXFH)



TO-220 (IXTP)



G = Gate D = Drain
S = Source TAB = Drain

Symbol (T_J = 25°C, unless otherwise specified)	Test Conditions	Characteristic Values Min.	Typ.	Max.	
BV_{DSS}	V_{GS} = 0 V, I_D = 250 μA	500			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 2.5 mA	3.0		5.5	V
I_{GSS}	V_{GS} = ±30 V_{DC}, V_{DS} = 0			±100	nA
I_{DSS}	$V_{DS} = V_{DSS}$, V_{GS} = 0 V			5	μA
	T_J = 125°C			250	μA
$R_{DS(on)}$	V_{GS} = 10 V, $I_D = 0.5\ I_{D25}$ Pulse test, t ≤300 μs, duty cycle d ≤ 2 %			400	mΩ

Features

- International standard packages
- Unclamped Inductive Switching (UIS) rated
- Low package inductance
  - easy to drive and to protect

Advantages

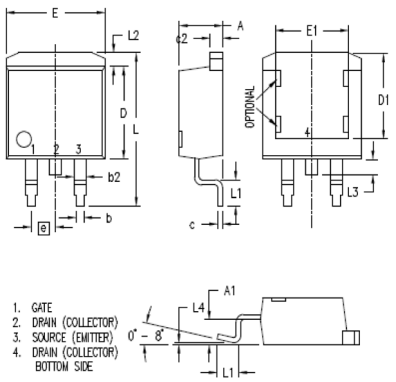
- Easy to mount
- Space savings
- High power density

Symbol	Test Conditions (T_J = 25° C, unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS}= 20 V; I_D = 0.5 I_{D25}, pulse test	8	16		S
C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		2250		pF
C_{oss}			240		pF
C_{rss}			12		pF
$t_{d(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 V_{DSS}, I_D = I_{D25}		23		ns
t_r			25		ns
$t_{d(off)}$	R_G = 10 Ω (External)		70		ns
t_f			22		ns
$Q_{g(on)}$	V_{GS}= 10 V, V_{DS} = 0.5 V_{DSS}, I_D = 0.5 I_{D25}		43		nC
Q_{gs}			15		nC
Q_{gd}			12		nC
R_{thJC}				0.42	° C/W
R_{thCS}	(TO-220)		0.25		° C/W
R_{thCS}	(TO-247)		0.21		° C/W

Source-Drain Diode

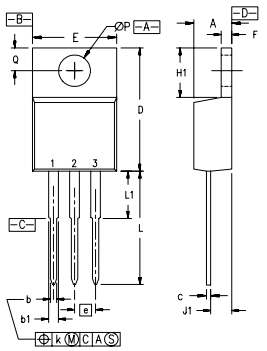
Symbol	Test Conditions (T_J = 25° C, unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
I_S	V_{GS} = 0 V			16	A
I_{SM}	Repetitive			35	A
V_{SD}	I_F = I_S, V_{GS} = 0 V, Pulse test, t ≤300 μs, duty cycle d≤ 2 %			1.5	V
t_{rr}	I_F = 16 A, -di/dt = 100 A/μs		130	200	ns
I_{RM}	V_R = 100 V		6		A
Q_{RM}			0.6		μC

TO-263 (IXTA) Outline



SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS 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

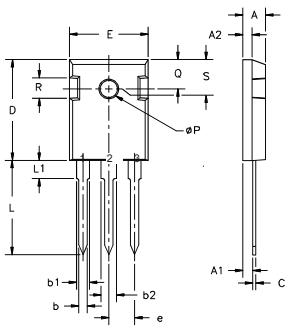
TO-220 (IXTP) Outline



Pins: 1 - Gate 2 - Drain
3 - Source 4 - Drain

SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS 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
ØP	.139	.161	3.53	4.08
Q	.100	.125	2.54	3.18

TO-247 (IXFH) Outline



Terminals: 1 - Gate 2 - Drain
3 - Source Tab - Drain

Dim.	Millimeter Min.	Millimeter Max.	Inches Min.	Inches Max.
A	4.7	5.3	.185	.209
A_1	2.2	2.54	.087	.102
A_2	2.2	2.6	.059	.098
b	1.0	1.4	.040	.055
b_1	1.65	2.13	.065	.084
b_2	2.87	3.12	.113	.123
C	.4	.8	.016	.031
D	20.80	21.46	.819	.845
E	15.75	16.26	.610	.640
e	5.20	5.72	0.205	0.225
L	19.81	20.32	.780	.800
L1		4.50		.177
ØP	3.55	3.65	.140	.144
Q	5.89	6.40	0.232	0.252
R	4.32	5.49	.170	.216
S	6.15 BSC		242 BSC	

Fig. 1. Output Characteristics @ 25ºC

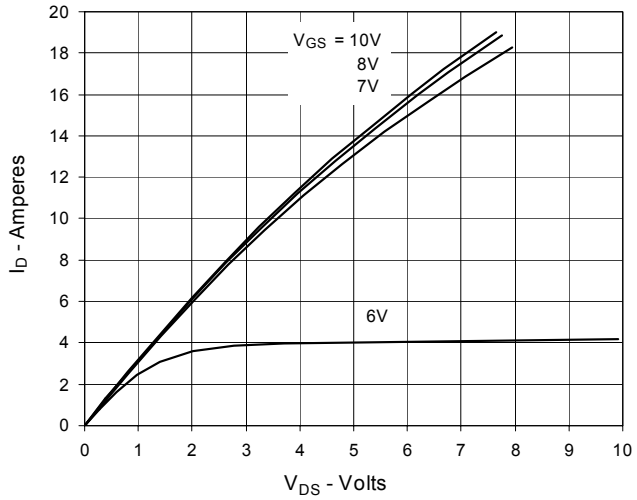


Fig. 2. Output Characteristics @ 125ºC

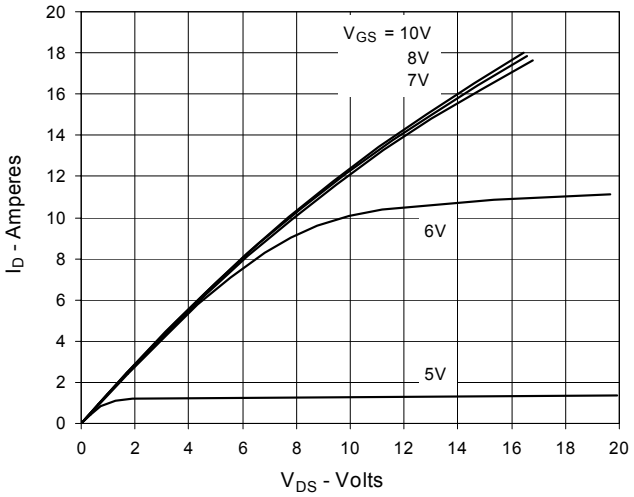


Fig. 3. $R_{DS(on)}$ Normalized to I_D = 8A vs. Junction Temperature

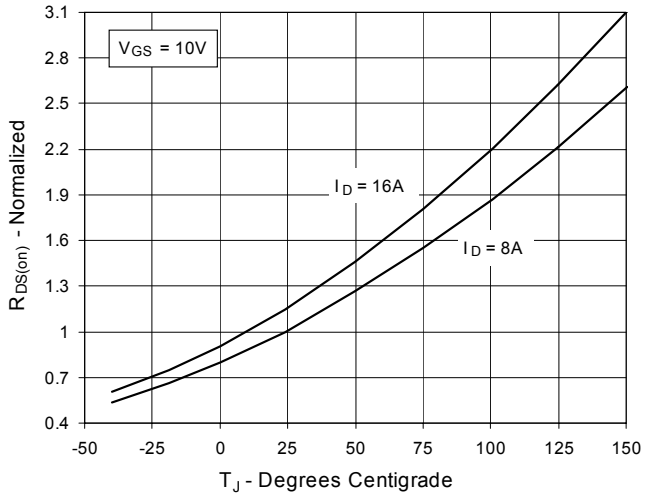


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 8A vs. Drain Current

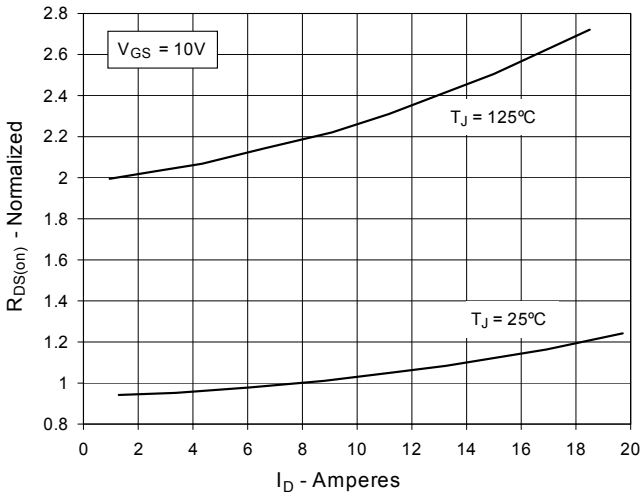


Fig. 5. Maximum Drain Current vs. Case Temperature

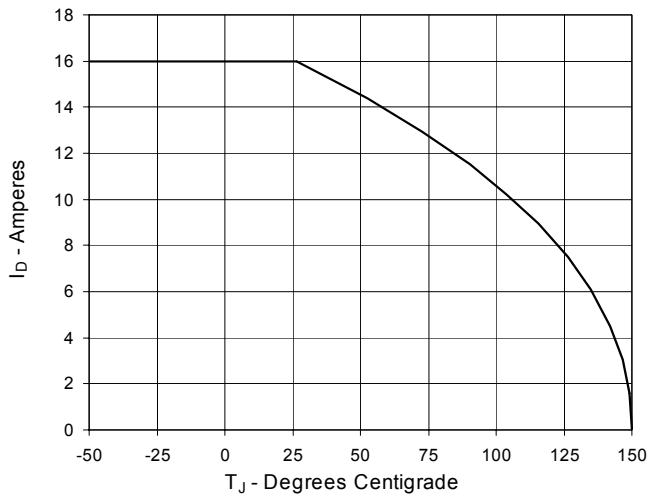


Fig. 6. Input Admittance

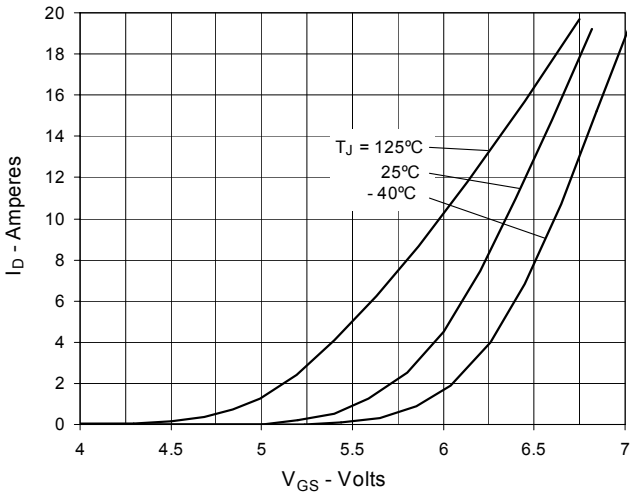


Fig. 7. Transconductance

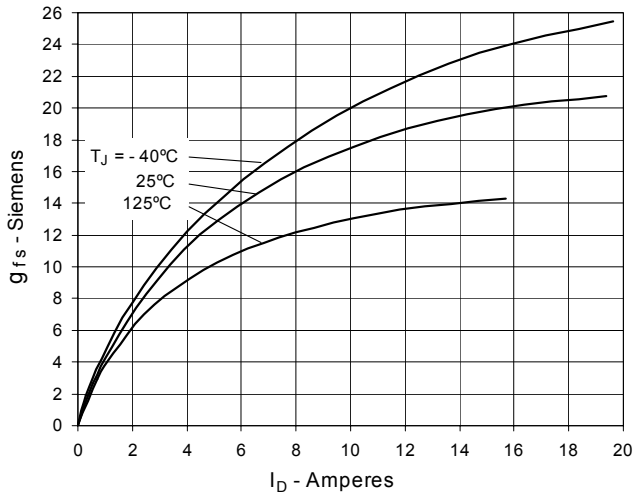


Fig. 8. Forward Voltage Drop of Intrinsic Diode

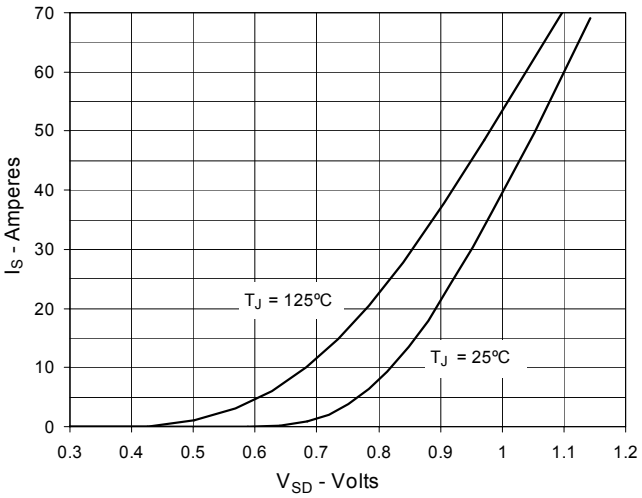


Fig. 9. Gate Charge

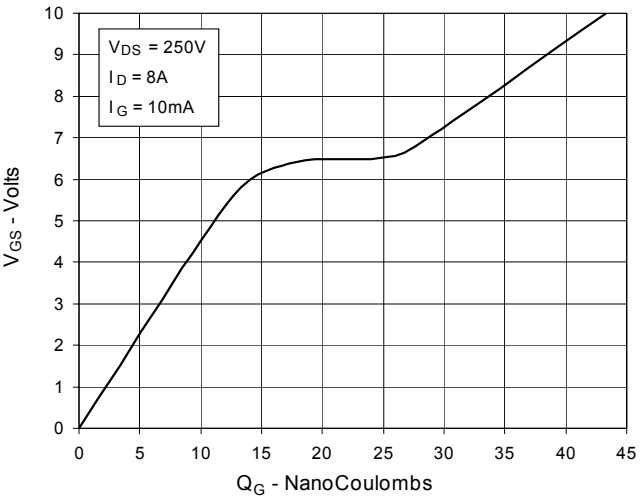


Fig. 10. Capacitance

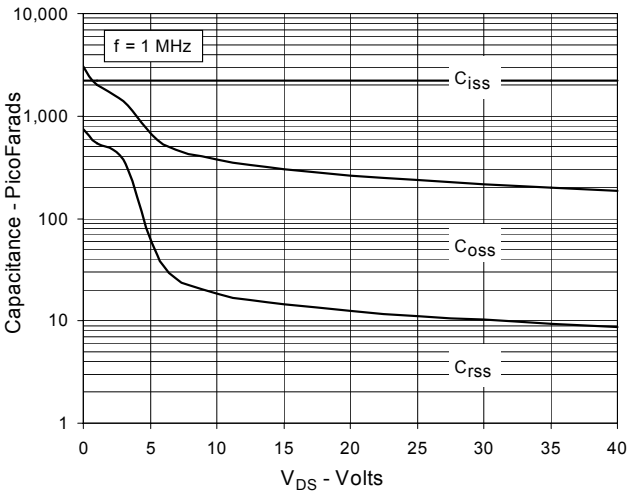


Fig. 11. Forward-Bias Safe Operating Area

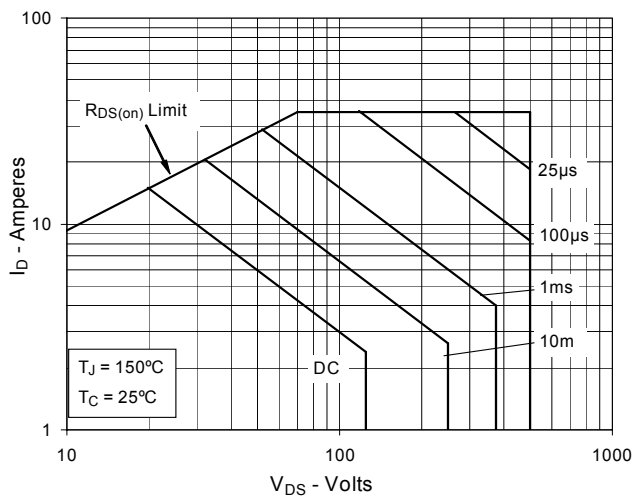


Fig. 12. Maximum Transient Thermal Resistance