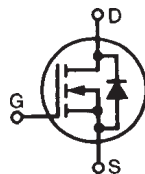


PolarHV™ HiperFET Power MOSFET

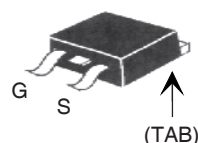
IXFA16N50P
IXFP16N50P
IXFH16N50P

N-Channel Enhancement Mode
Avalanche Rated
Fast Intrinsic Diode

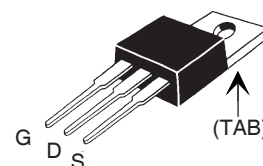


$$\begin{aligned} V_{DSS} &= 500V \\ I_{D25} &= 16A \\ R_{DS(on)} &\leq 400m\Omega \\ t_{rr} &\leq 200ns \end{aligned}$$

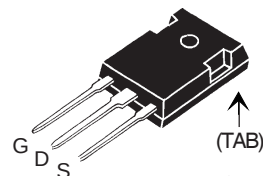
TO-263



TO-220



TO-247



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

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 $R_{GS} = 1M\Omega$	500	V
V_{GSS}	Continuous	± 30	V
V_{GSM}	Transient	± 40	V
I_{D25}	$T_C = 25^\circ\text{C}$	16	A
I_{DM}	$T_C = 25^\circ\text{C}$, Pulse Width Limited by T_{JM}	35	A
I_A	$T_C = 25^\circ\text{C}$	16	A
E_{AS}	$T_C = 25^\circ\text{C}$	750	mJ
dV/dt	$I_S \leq I_{DM}$, $V_{DD} \leq V_{DSS}$, $T_J \leq 150^\circ\text{C}$	10	V/ns
P_D	$T_C = 25^\circ\text{C}$	300	W
T_J		-55 ... +150	$^\circ\text{C}$
T_{JM}		150	$^\circ\text{C}$
T_{stg}		-55 ... +150	$^\circ\text{C}$
T_L	1.6mm (0.062 in.) from Case for 10s	300	$^\circ\text{C}$
T_{SOLD}	Plastic Body for 10 Seconds	260	$^\circ\text{C}$
M_d	Mounting Torque (TO-220 & TO-247)	1.13 / 10	Nmlb.in.
F_C	Mounting Force (TO-263)	10..65 / 2.2..14.6	N/lb.
Weight	TO-263	2.5	g
	TO-220	3.0	g
	TO-247	6.0	g

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$ Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
BV_{DSS}	$V_{GS} = 0V$, $I_D = 250\mu A$	500		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 2.5mA$	3.0		5.5 V
I_{GSS}	$V_{GS} = \pm 30V$, $V_{DS} = 0V$			± 100 nA
I_{DSS}	$V_{DS} = V_{DSS}$, $V_{GS} = 0V$ $T_J = 125^\circ\text{C}$			15 μA 250 μA
$R_{DS(on)}$	$V_{GS} = 10V$, $I_D = 0.5 \cdot I_{D25}$, Note 1			400 m Ω

Features

- International Standard Packages
- Avalanche Rated
- Fast Intrinsic Diode
- Low Package Inductance

Advantages

- High Power Density
- Easy to Mount
- Space Savings

Applications

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

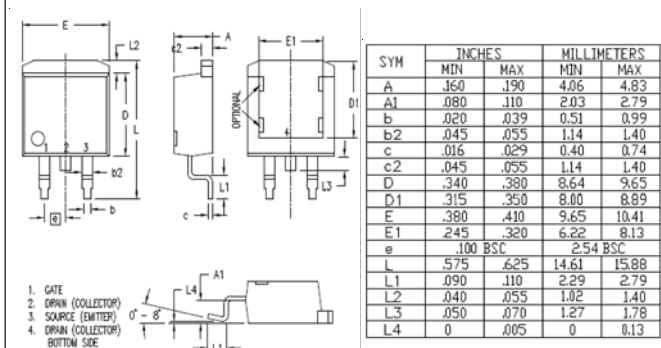
Symbol	Test Conditions	Characteristic Values		
(T _J = 25°C Unless Otherwise Specified)		Min.	Typ.	Max.
g_{fs}	V _{DS} = 20V, I _D = 0.5 • I _{D25} , Note 1	9	16	S
C_{iss}	V _{GS} = 0V, V _{DS} = 25V, f = 1MHz		2480	pF
C_{oss}			237	pF
C_{rss}			18	pF
t_{d(on)}	Resistive Switching Times V _{GS} = 10V, V _{DS} = 0.5 • V _{DSS} , I _D = 0.5 • I _{D25} R _G = 10Ω (External)		23	ns
t_r			25	ns
t_{d(off)}			70	ns
t_f			22	ns
Q_{g(on)}	V _{GS} = 10V, 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_{thCH}	(TO-220)	0.50		°C/W
	(TO-247)	0.21		°C/W

Source-Drain Diode

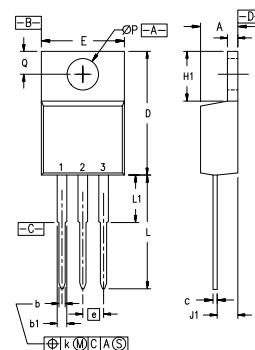
Symbol	Test Conditions	Characteristic Values		
(T _J = 25°C Unless Otherwise Specified)		Min.	Typ.	Max.
I_S	V _{GS} = 0V			16 A
I_{SM}	Repetitive, Pulse Width Limited by T _{JM}			64 A
V_{SD}	I _F = I _S , V _{GS} = 0V, Note 1			1.5 V
t_{rr}	I _F = 16A, -di/dt = 100A/μs V _R = 100V, V _{GS} = 0V		6.0	200 ns
I_{RM}				A
Q_{RM}				nC

Note 1: Pulse test, t ≤ 300μs; Duty Cycle, d ≤ 2%.

TO-263 (IXFA) Outline



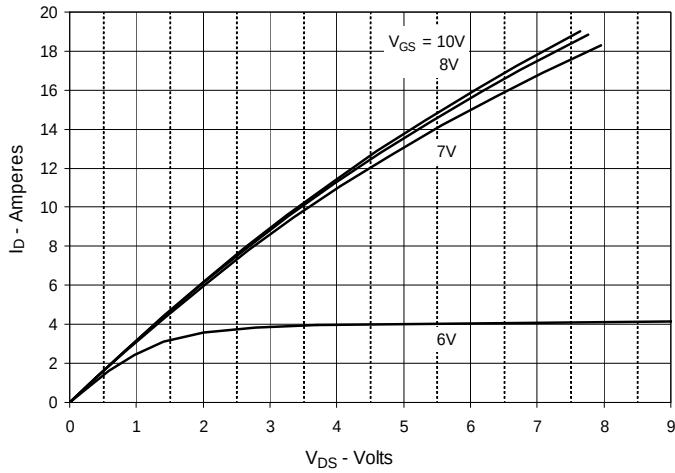
TO-220 (IXFP) Outline



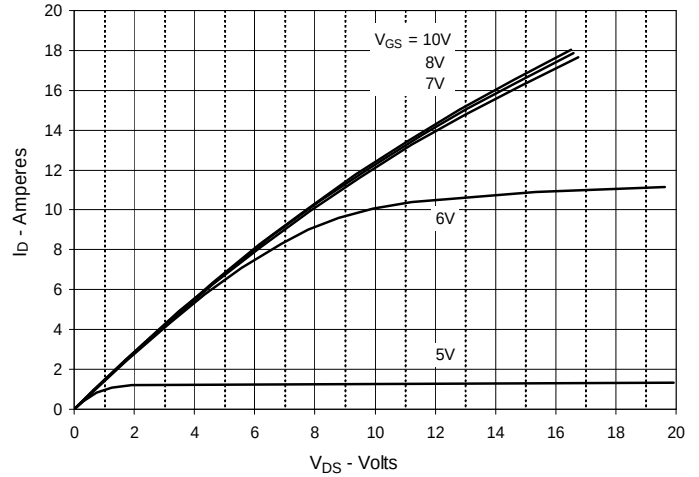
Pins: 1 - Gate 2 - Drain

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	

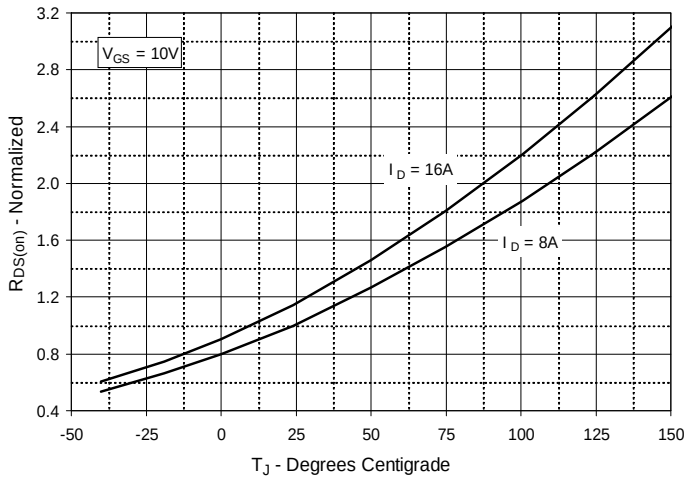
**Fig. 1. Output Characteristics
@ 25°C**



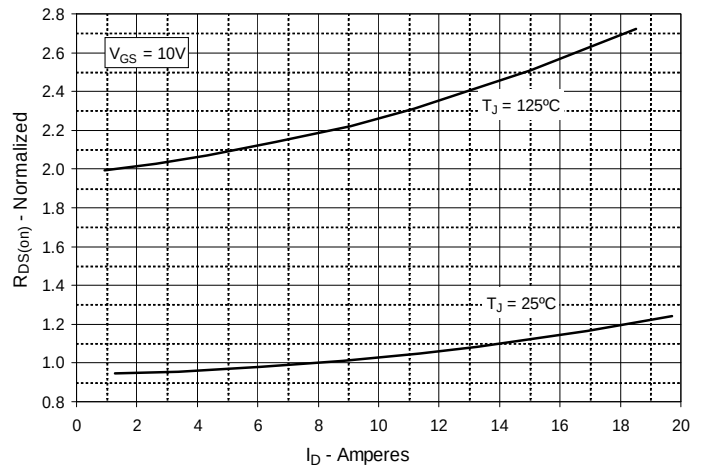
**Fig. 2. Output Characteristics
@ 125°C**



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



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



**Fig. 5. Maximum Drain Current vs.
Case Temperature**

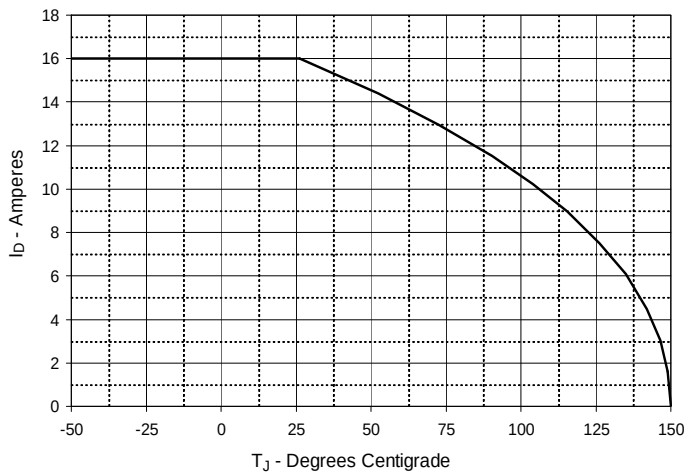


Fig. 6. Input Admittance

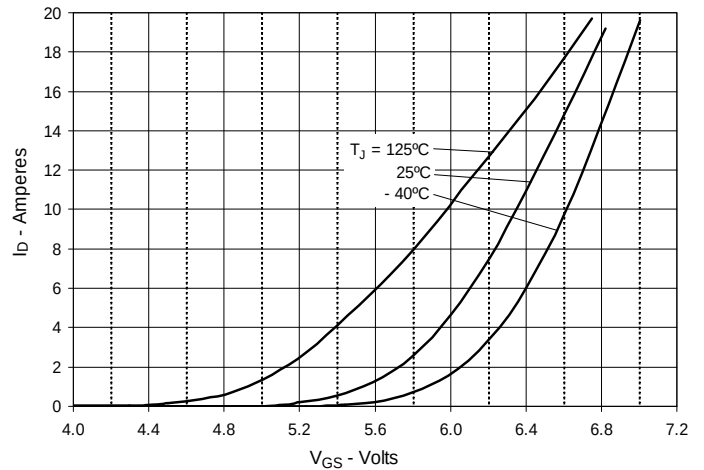


Fig. 7. Transconductance

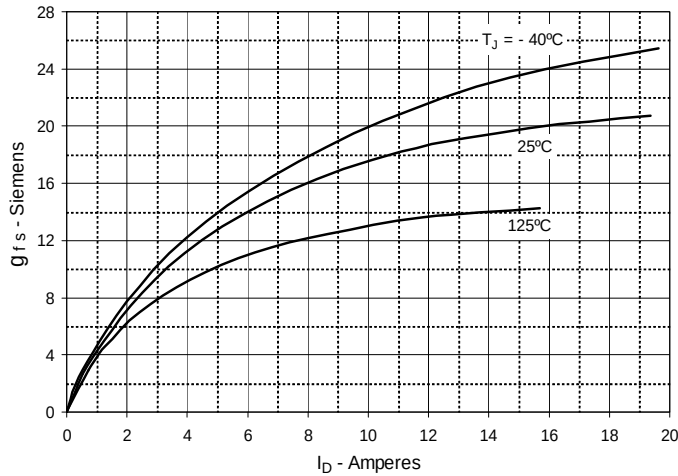


Fig. 8. Forward Voltage Drop of Intrinsic Diode

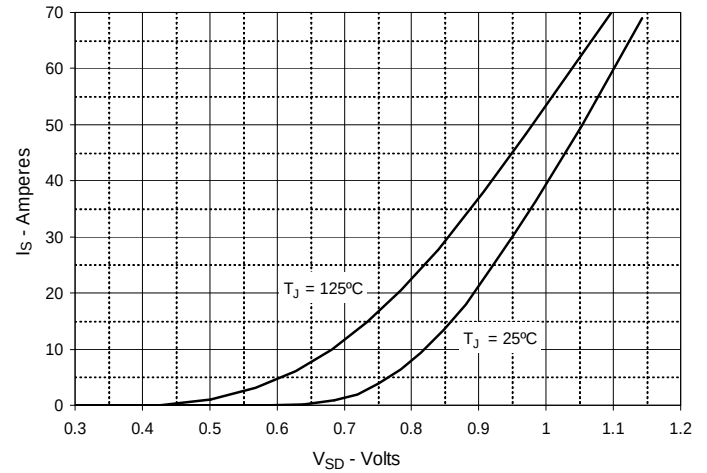


Fig. 9. Gate Charge

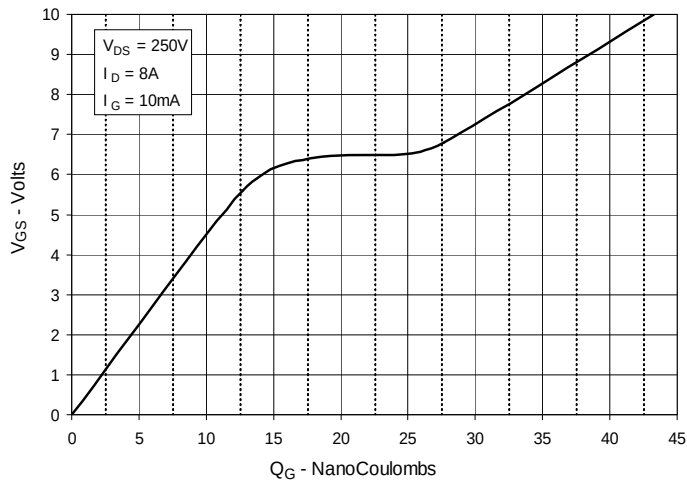


Fig. 10. Capacitance

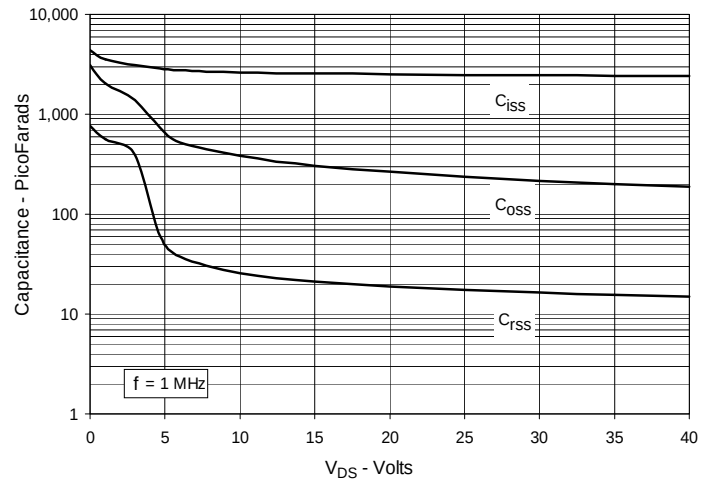


Fig. 11. Forward-Bias Safe Operating Area

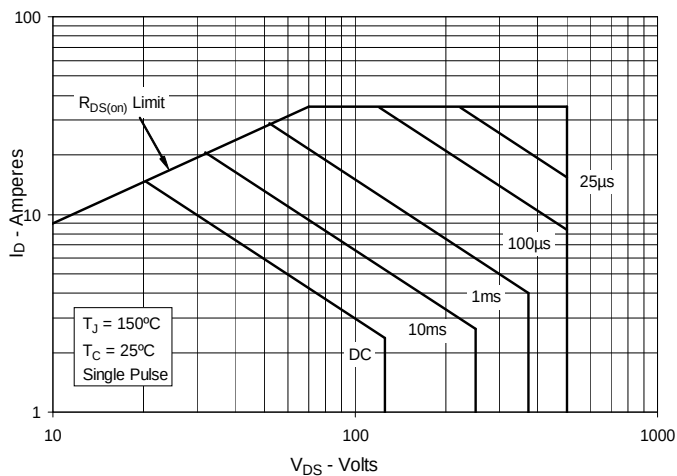


Fig. 12. Maximum Transient Thermal Impedance

