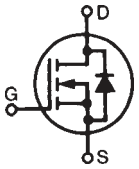
IXYS

Polar VHV™ Power MOSFET

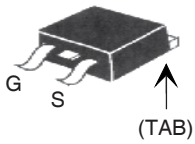
IXTA06N120P
IXTP06N120P

V_{DSS} = 1200V
I_{D25} = 0.6A
$R_{DS(on)}$ ≤ 32Ω

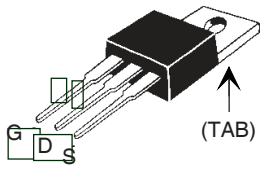
N-Channel Enhancement Mode
Avalanche Rated



TO-263 (IXTA)



TO-220 (IXTP)



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

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C	1200	V
V_{DGR}	T_J = 25°C to 150°C, R_{GS} = 1MΩ	1200	V
V_{GSS}	Continuous	±20	V
V_{GSM}	Transient	±30	V
I_{D25}	T_C = 25°C	0.6	A
I_{DM}	T_C = 25°C, pulse width limited by T_{JM}	1.2	A
I_A	T_C = 25°C	0.6	A
E_{AR}	T_C = 25°C	5	mJ
E_{AS}	T_C = 25°C	50	mJ
dV/dt	$I_S \le I_{DM}$, $V_{DD} \le V_{DSS}$, $T_J \le 150°C$	10	V/ns
P_D	T_C = 25°C	42	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
T_L	1.6mm (0.062) from case for 10s	300	°C
T_{SOLD}	Plastic body for 10s	260	°C
M_d	Mounting torque (TO-220)	1.13 / 10	Nm/lb.in.
Weight	TO-263	2.5	g
	TO-220	3.0	g

Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
BV_{DSS}	V_{GS} = 0V, I_D = 250μA	1200			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 50μA	2.5		4.5	V
I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V			±50	nA
I_{DSS}	$V_{DS} = V_{DSS}$			3	μA
	V_{GS} = 0V T_J = 125°C			125	μA
$R_{DS(on)}$	V_{GS} = 10V, $I_D = 0.5 \bullet I_{D25}$, Note 1		27	32	Ω

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

Applications:

- Switched-mode and resonant-mode power supplies
- DC-DC Converters
- Laser Drivers
- AC and DC motor controls
- Robotics and servo controls

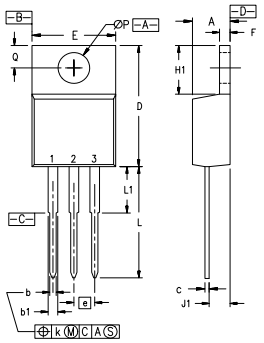
Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	Characteristic Values Min.	Typ.	Max.
g_{fs}	V_{DS}= 30V, I_D = 0.5 • I_{D25}, Note 1	0.28	0.45	S
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		270	pF
C_{oss}			19	pF
C_{rss}			3.2	pF
$t_{d(on)}$	**Resistive Switching Times**		20	ns
t_r	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 0.5 • I_{D25}		24	ns
$t_{d(off)}$	R_G = 50Ω (External)		50	ns
t_f			27	ns
$Q_{g(on)}$	V_{GS}= 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 0.5 • I_{D25}		13.3	nC
Q_{gs}			2.4	nC
Q_{gd}			7.8	nC
R_{thJC}				3.0 °C/W
R_{thCS}	(TO-220)		0.5	°C/W

Source-Drain Diode

Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	Characteristic Values Min.	Typ.	Max.
I_S	V_{GS} = 0V			0.6 A
I_{SM}	Repetitive			1.8 A
V_{SD}	I_F = I_S, V_{GS} = 0V, Note 1			1.5 V
t_{rr}	I_F = 0.6A, -di/dt = 100A/μs, V_R = 100V, V_{GS} = 0V		900	ns

Note 1: Pulse test, t ≤ 300 μs; duty cycle, d ≤ 2%.

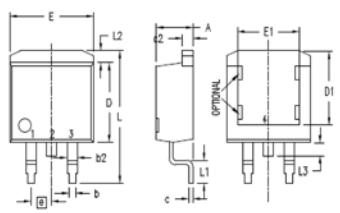
TO-220 (IXTP) Outline



Pins: 1 - Gate 2 - 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-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

Fig. 1. Output Characteristics @ 25ºC

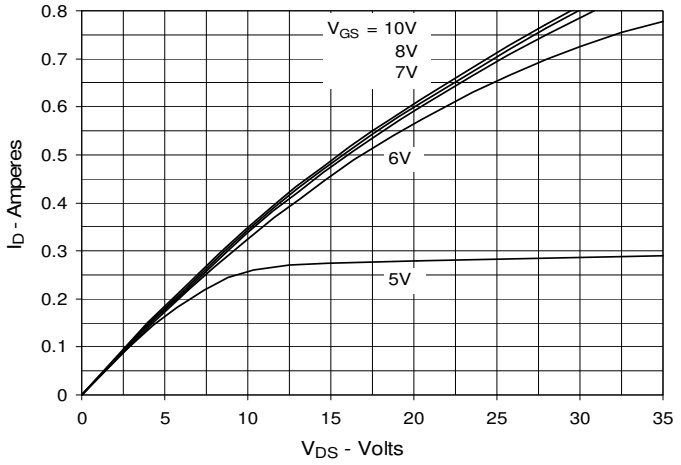


Fig. 2. Output Characteristics @ 125ºC

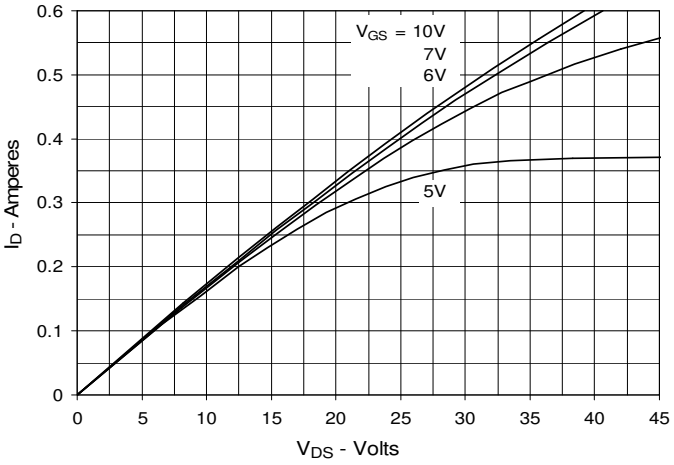


Fig. 3. $R_{DS(on)}$ Normalized to I_D = 0.3A Value vs. Junction Temperature

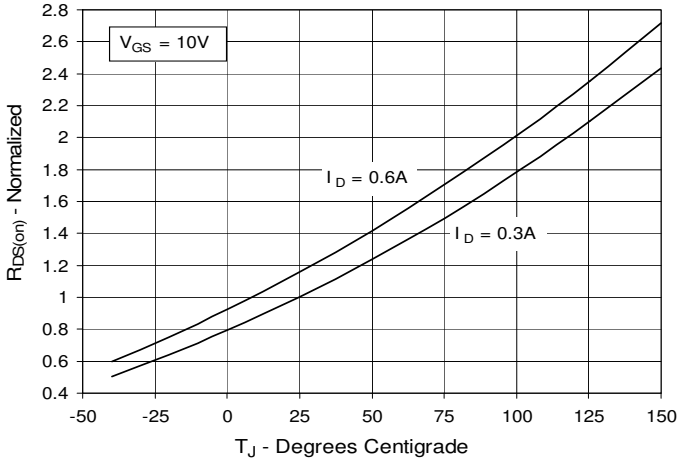


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 0.3A Value vs. Drain Current

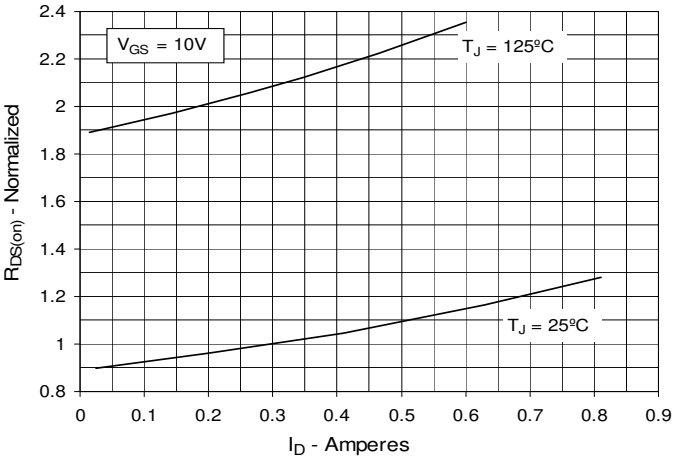


Fig. 5. Maximum Drain Current vs. Case Temperature

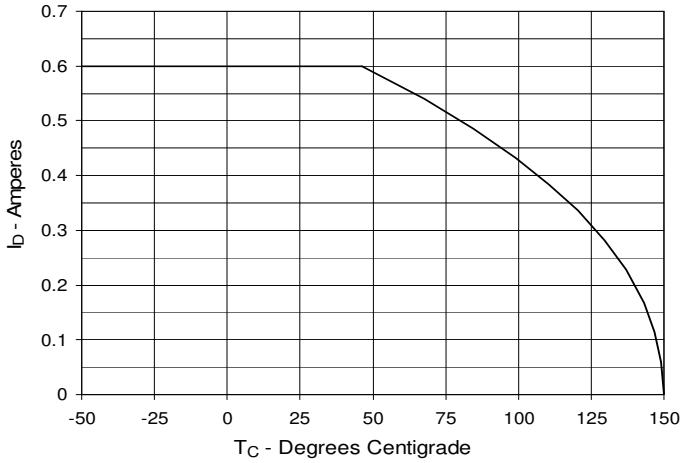


Fig. 6. Input Admittance

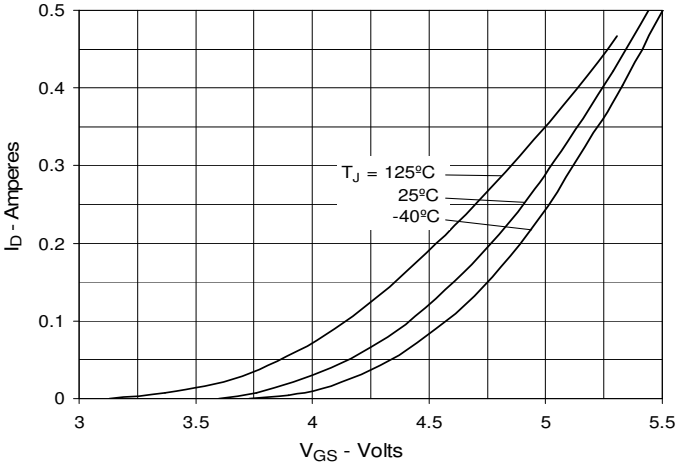


Fig. 7. Transconductance

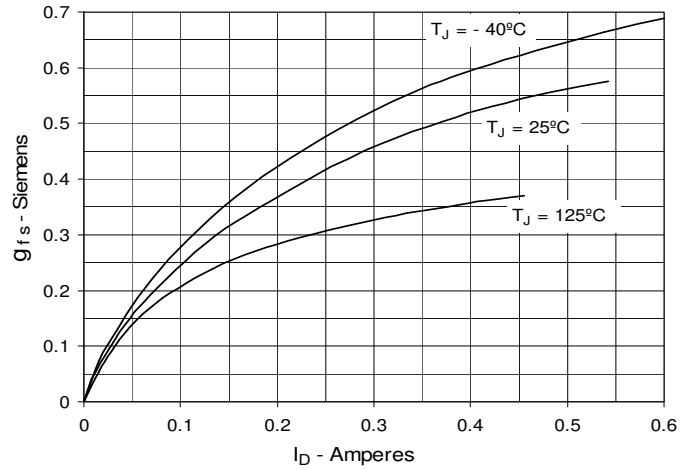


Fig. 8. Forward Voltage Drop of Intrinsic Diode

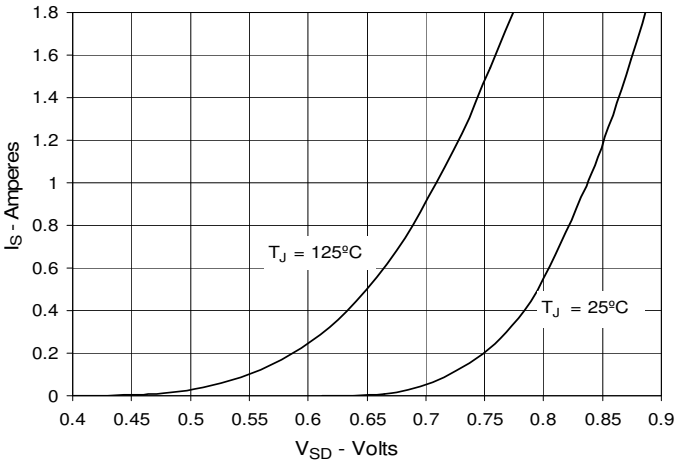


Fig. 9. Gate Charge

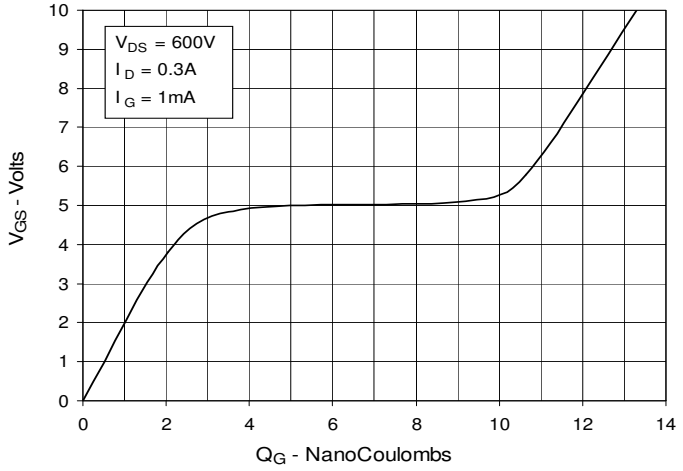


Fig. 10. Capacitance

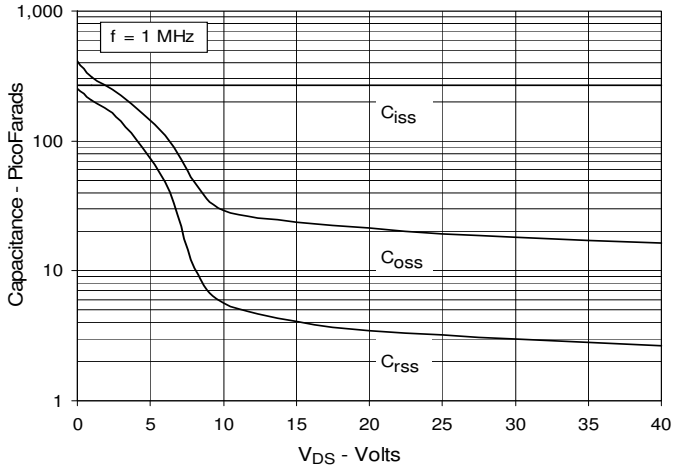


Fig. 11. Maximum Transient Thermal Impedance