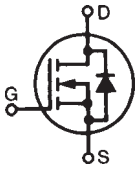
IXYS

Polar™ Power MOSFET

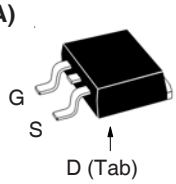
IXTA06N120P
IXTP06N120P

V_{DSS} = 1200V
I_{D25} = 0.6A
$R_{DS(on)}$ ≤ 34Ω

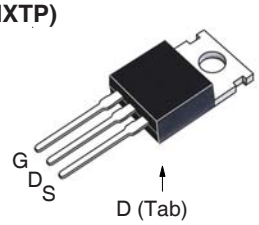
N-Channel Enhancement Mode
Avalanche Rated



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	±30	V
V_{GSM}	Transient	±40	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_{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	Maximum Lead Temperature for Soldering	300	°C
T_{SOLD}	1.6 mm (0.062in.) from Case for 10s	260	°C
F_C	Mounting Force (TO-263)	10..65 / 2.2..14.6	N/lb
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	2.0		4.0	V
I_{GSS}	V_{GS} = ±30V, V_{DS} = 0V			±50	nA
I_{DSS}	V_{DS} = V_{DSS}, V_{GS} = 0V			3	μA
	T_J = 125°C			125	μA
$R_{DS(on)}$	V_{GS} = 10V, I_D = 0.5 • I_{D25}, Note 1		27	34	Ω

Features

- International Standard Packages
- Low Q_G
- Avalanche Rated
- Low Package Inductance
- Fast Intrinsic Rectifier

Advantages

- High Power Density
- Easy to Mount
- Space Savings

Applications

- DC-DC Converters
- Switch-Mode and Resonant-Mode Power Supplies
- AC and DC Motor Drives
- Discharge Circiuts in Lasers, Spark Igniters, RF Generators
- High Voltage Pulse Power Applications

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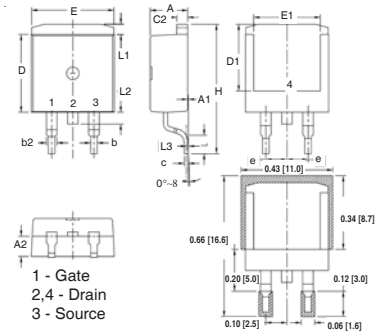
Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS} = 30V, I_D = 0.5 • I_{D25}, Note 1	0.28	0.45		S
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		236		pF
C_{oss}			15		pF
C_{rss}			3.2		pF
$t_{d(on)}$	**Resistive Switching Times**		19		ns
t_r	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 0.5 • I_{D25},		37		ns
$t_{d(off)}$			35		ns
t_f	R_G = 50Ω (External)		34		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		0.50		°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, Pulse Width Limited by T_{JM}			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

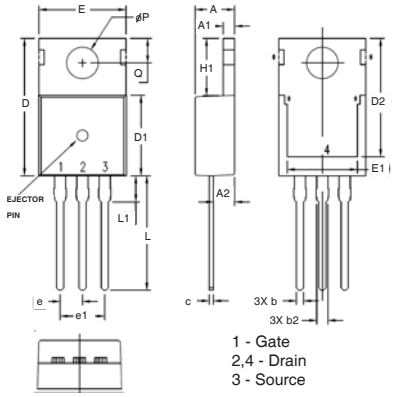
Note: 1. Pulse test, t ≤ 300μs, duty cycle, d ≤ 2%.

TO-263 Outline



SYM	INCHES MIN	INCHES MAX	MILLIMETER MIN	MILLIMETER MAX
A	.170	.185	4.30	4.70
A1	.000	.008	0.00	0.20
A2	.091	.098	2.30	2.50
b	.028	.035	0.70	0.90
b2	.046	.060	1.18	1.52
C	.018	.024	0.45	0.60
C2	.049	.060	1.25	1.52
D	.340	.370	8.63	9.40
D1	.300	.327	7.62	8.30
E	.380	.410	9.65	10.41
E1	.270	.330	6.86	8.38
e	.100 BSC		2.54 BSC	
H	.580	.620	14.73	15.75
L	.075	.105	1.91	2.67
L1	.039	.060	1.00	1.52
L2	—	.070	—	1.77
L3	.010 BSC		0.254 BSC	

TO-220 Outline



SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.169	.185	4.30	4.70
A1	.047	.055	1.20	1.40
A2	.079	.106	2.00	2.70
b	.024	.039	0.60	1.00
b2	.045	.057	1.15	1.45
c	.014	.026	0.35	0.65
D	.587	.626	14.90	15.90
D1	.335	.370	8.50	9.40
(D2)	.500	.531	12.70	13.50
E	.382	.406	9.70	10.30
(E1)	.283	.323	7.20	8.20
e	.100 BSC		2.54 BSC	
e1	.200 BSC		5.08 BSC	
H1	.244	.268	6.20	6.80
L	.492	.547	12.50	13.90
L1	.110	.154	2.80	3.90
ØP	.134	.150	3.40	3.80
Q	.106	.126	2.70	3.20

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

IXYS MOSFETs and IGBTs are covered by one or moreof the following U.S. patents: 4,835,592 4,931,844 5,049,961 5,237,481 6,162,665 6,404,065 B1 6,683,344 6,727,585 7,005,734 B2 7,157,338B2 4,860,072 5,017,508 5,063,307 5,381,025 6,259,123 B1 6,534,343 6,710,405 B2 6,759,692 7,063,975 B2 4,881,106 5,034,796 5,187,117 5,486,715 6,306,728 B1 6,583,505 6,710,463 6,771,478 B2 7,071,537

Fig. 1. Output Characteristics @ T_J = 25°C

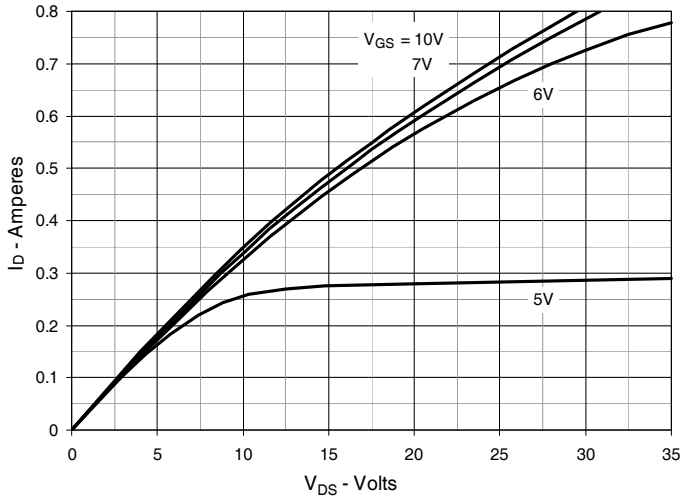


Fig. 2. Output Characteristics @ T_J = 125°C

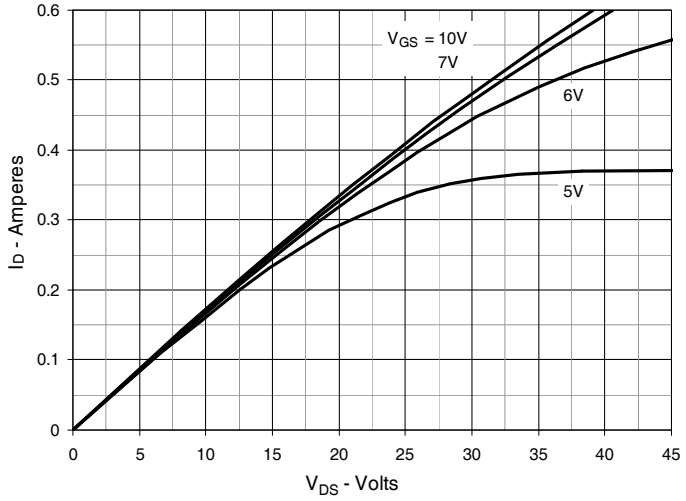


Fig. 3. $R_{DS(on)}$ Normalized to I_D = 0.3A Value vs. Junction Temperature

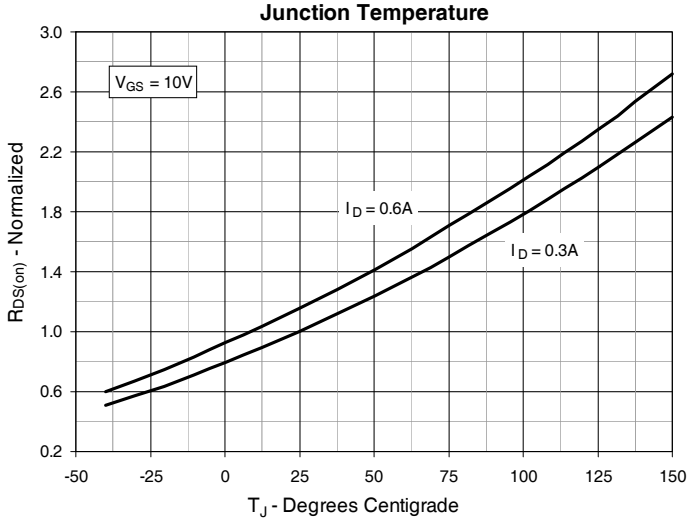


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 0.3A Value vs. Drain Current

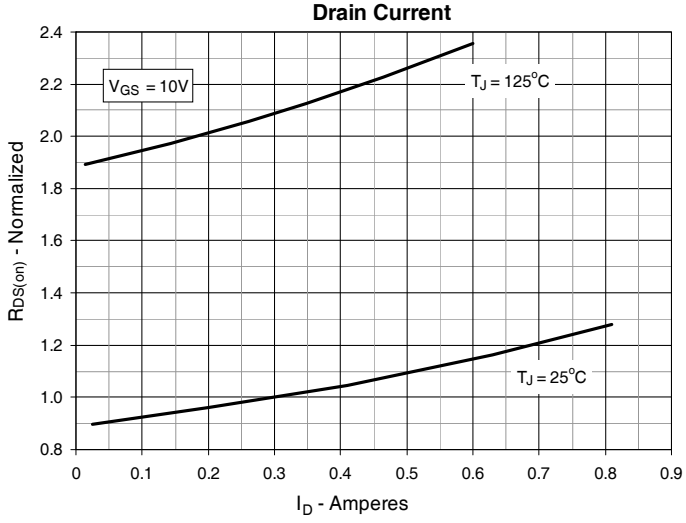


Fig. 5. Maximum Drain Current vs. Case Temperature

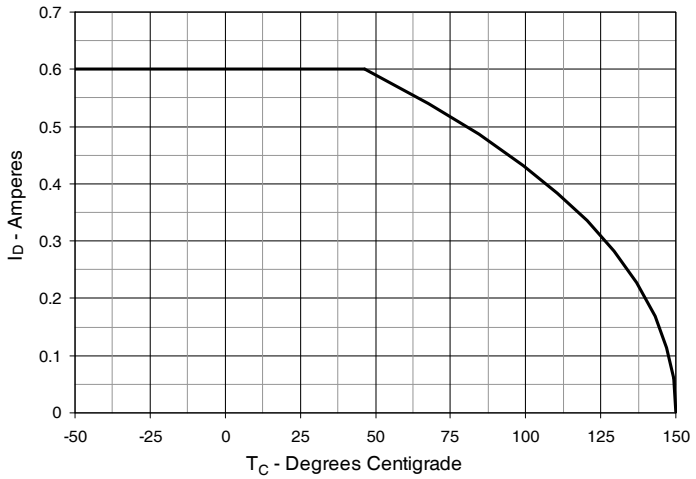


Fig. 6. Input Admittance

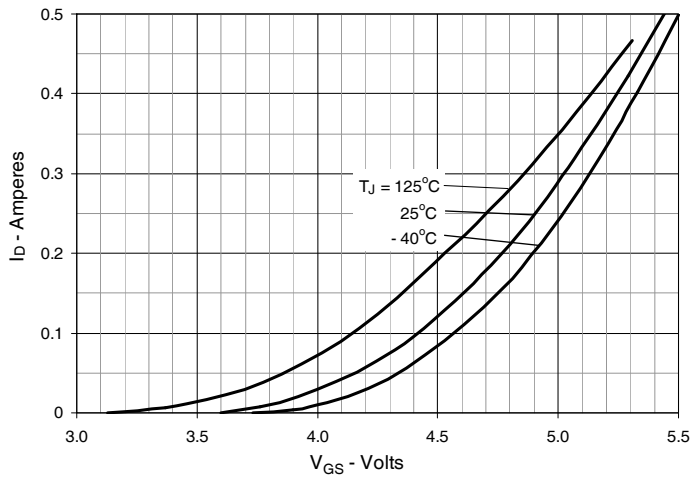


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Fig. 7. Transconductance

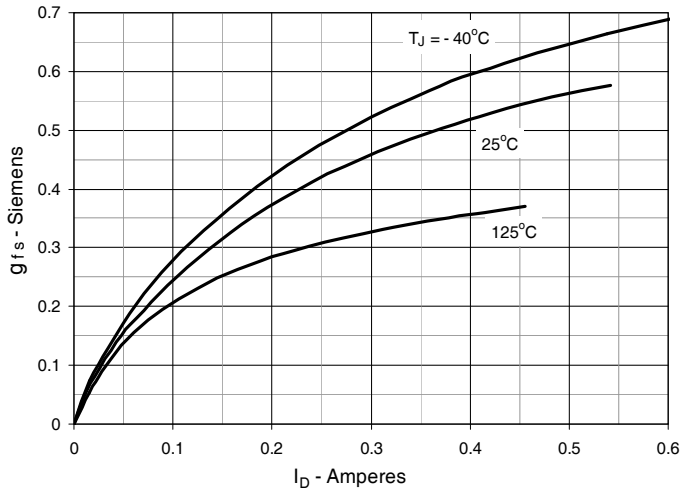


Fig. 8. Forward Voltage Drop of Intrinsic Diode

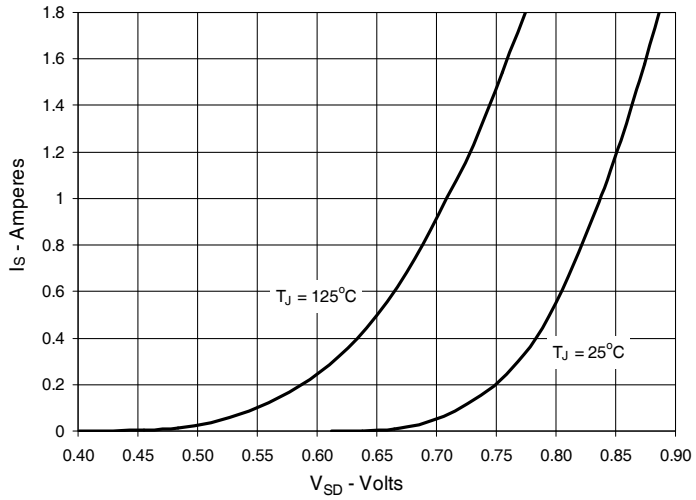


Fig. 9. Gate Charge

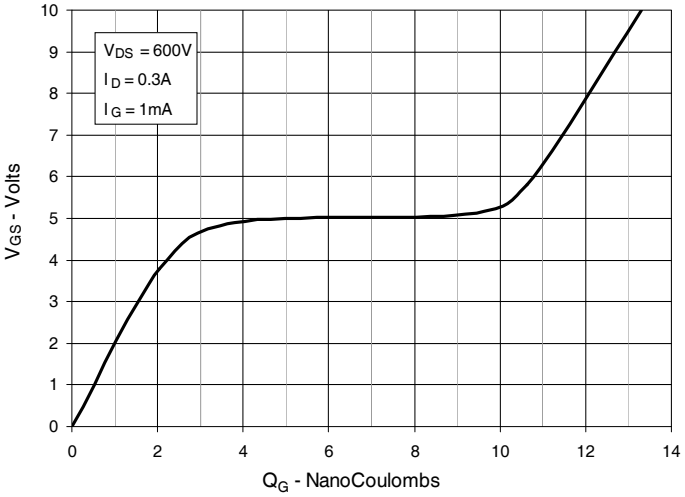


Fig. 10. Capacitance

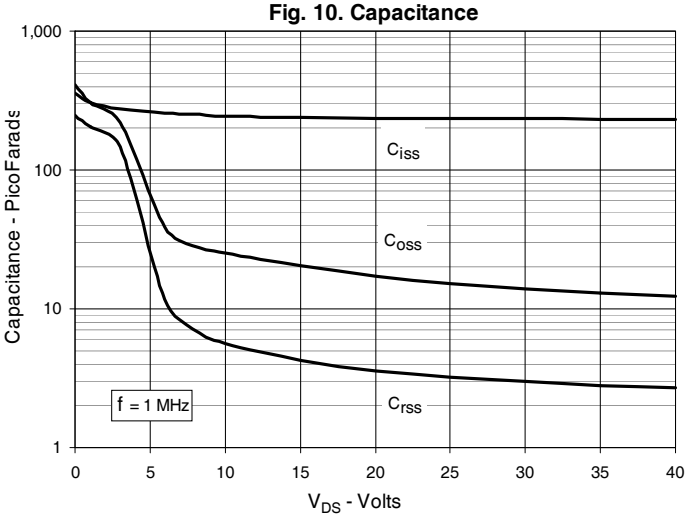


Fig. 11. Forward-Bias Safe Operating Area

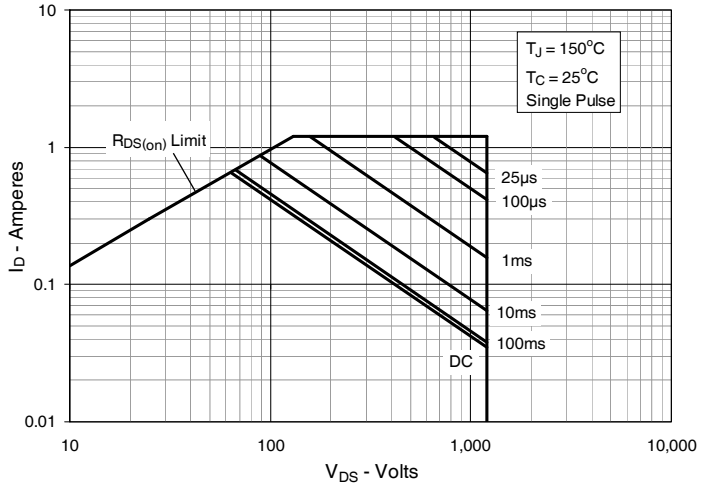
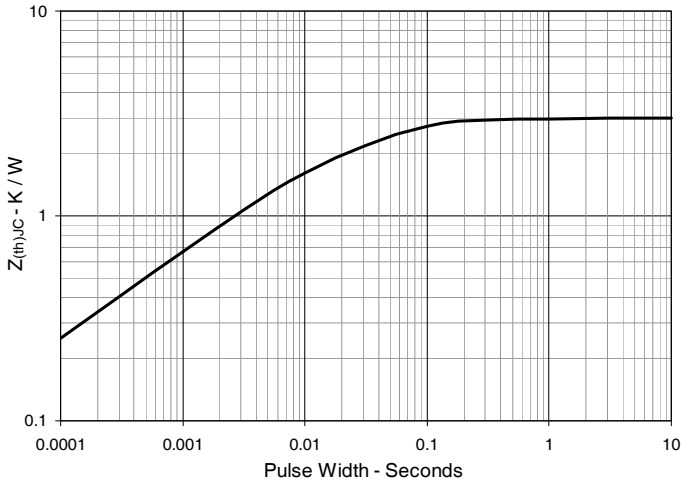


Fig. 12. Maximum Transient Thermal Impedance



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