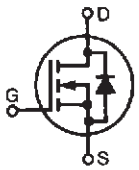
IXYS

PolarHV™ Power MOSFET

IXTA 7N60P
IXTP 7N60P

V_{DSS} = 600 V
I_{D25} = 7 A
$R_{DS(on)}$ ≤ 1.1 Ω

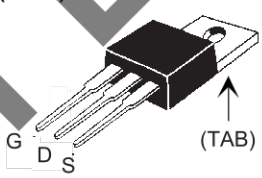
N-Channel Enhancement Mode
Avalanche Rated



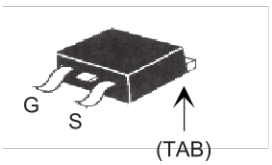
Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25° C to 175° C	600	V
V_{DGR}	T_J = 25° C to 175° C; R_{GS} = 1 MΩ	600	V
V_{GS}	Continuous	±30	V
V_{GSM}	Transient	±40	V
I_{D25}	T_C = 25° C	7	A
I_{DM}	T_C = 25° C, pulse width limited by T_{JM}	14	A
I_{AR}	T_C = 25° C	7	A
E_{AR}	T_C = 25° C	20	mJ
E_{AS}	T_C = 25° C	400	mJ
dv/dt	$I_S \le I_{DM}$, di/dt ≤100 A/μs, $V_{DD} \le V_{DSS}$, T_J ≤150° C, R_G = 18 Ω	10	V/ns
P_D	T_C = 25° C	150	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	260	°C
M_d	Mounting torque (TO-220)	1.13/10	Nm/lb.in.
Weight	TO-220	4	g
	TO-263	3	g

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	600			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 100μA	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			50	μA
$R_{DS(on)}$	V_{GS} = 10 V, $I_D = 0.5\ I_{D25}$ Pulse test, t ≤300 μs, duty cycle d ≤ 2 %			1.1	Ω

TO-220 (IXTP)



TO-263 (IXTA)



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

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

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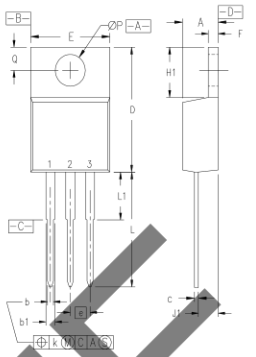
Symbol	Test Conditions (T_J = 25° C, unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS}= 10 V; I_D = 0.5 I_{D25}, pulse test	4	7		S
C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		1080		pF
C_{oss}			110		pF
C_{rss}			11		pF
$t_{d(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 V_{DSS}, I_D = I_{D25} R_G = 18 Ω (External)		20		ns
t_r			27		ns
$t_{d(off)}$			65		ns
t_f			26		ns
$Q_{g(on)}$	V_{GS}= 10 V, V_{DS} = 0.5 V_{DSS}, I_D = 0.5 I_{D25}		20		nC
Q_{gs}			7		nC
Q_{gd}			7		nC
R_{thJC}				0.83	° C/W
R_{thCS}	(TO-220)		0.25		° 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			7	A
I_{SM}	Repetitive			14	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 = 7 A, V_{GS} = 0 V -di/dt = 100 A/µs, V_R = 100 V		500		ns

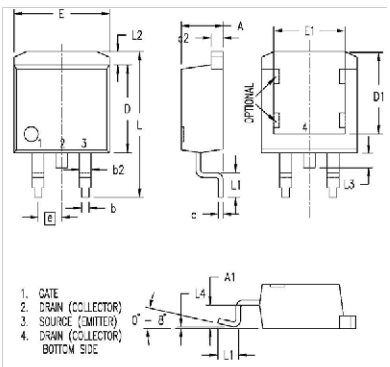
TO-220 (IXTP) Outline



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



Dim.	Millimeter Min.	Millimeter Max.	Inches Min.	Inches Max.
A	4.06	4.83	.160	.190
A1	2.03	2.79	.080	.110
b	0.51	0.99	.020	.039
b2	1.14	1.40	.045	.055
c	0.46	0.74	.018	.029
c2	1.14	1.40	.045	.055
D	8.64	9.65	.340	.380
D1	7.11	8.13	.280	.320
E	9.65	10.29	.380	.405
E1	6.86	8.13	.270	.320
e	2.54	BSC	.100	BSC
L	14.61	15.88	.575	.625
L1	2.29	2.79	.090	.110
L2	1.02	1.40	.040	.055
L3	1.27	1.78	.050	.070
L4	0	0.38	0	.015
R	0.46	0.74	.018	.029

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IXYS MOSFETs and IGBTs are covered by one or moreof the following U.S. patents: 4,835,592 4,850,072 4,881,106 4,931,844 5,017,508 5,034,796 5,049,961 5,063,307 5,187,117 5,237,481 5,381,025 5,486,715 6,162,665 6,259,123 B1 6,306,728 B1 6,404,065 B1 6,534,343 6,583,505 6,683,344 6,710,405B2 6,710,463 6,727,585 6,759,692 6,771,478 B2

Fig. 1. Output Characteristics @ 25°C

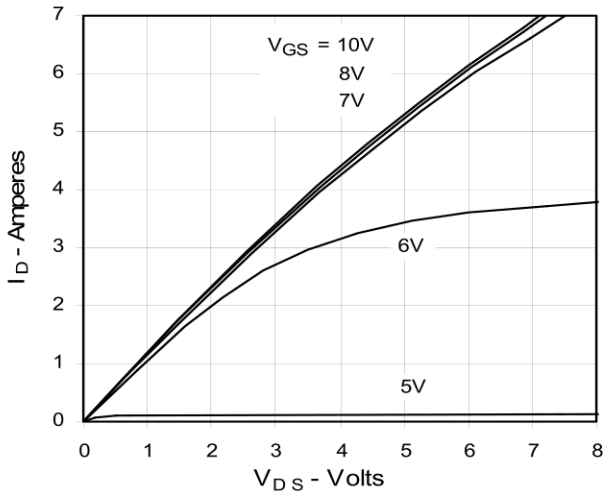

Fig. 2. Extended Output Characteristics @ 25°C

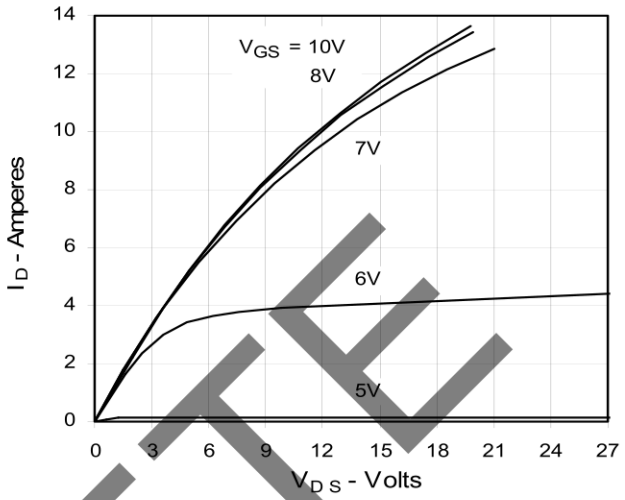

Fig. 3. Output Characteristics @ 125°C

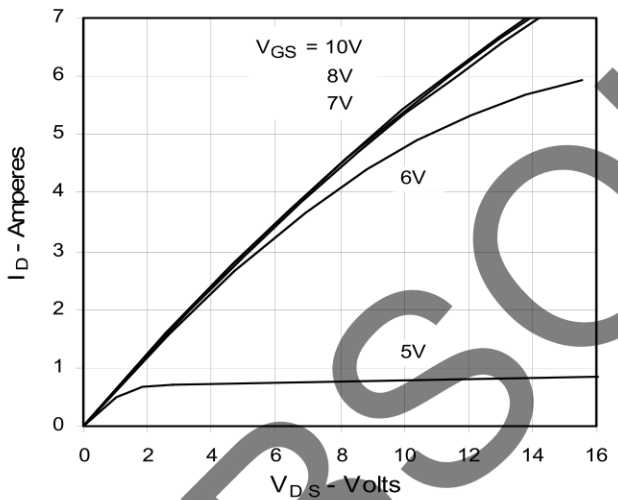

Fig. 4. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. Junction Temperature

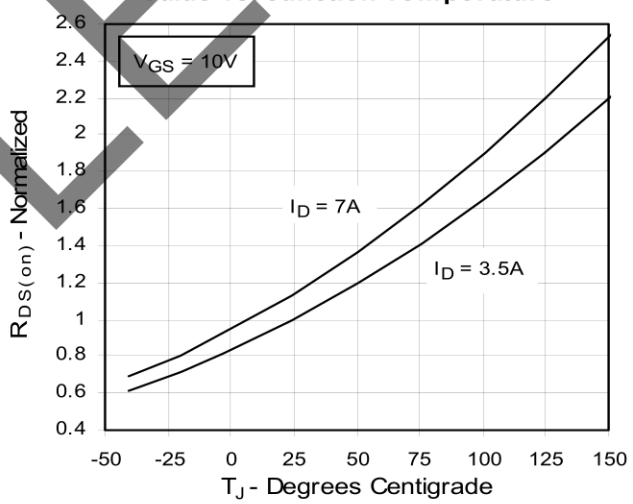

Fig. 5. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. I_D

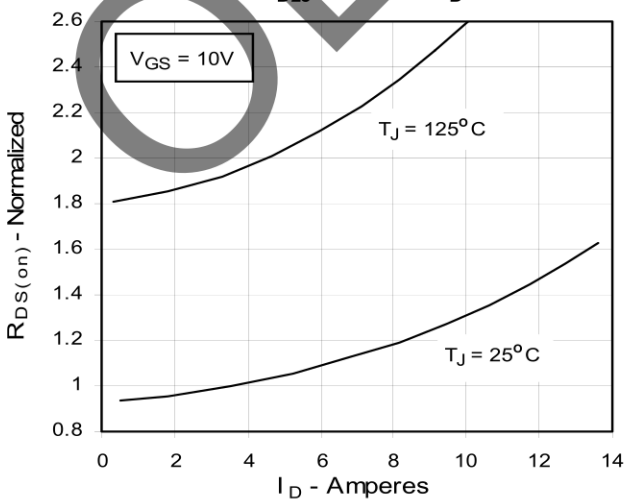

Fig. 6. Drain Current vs. Case Temperature

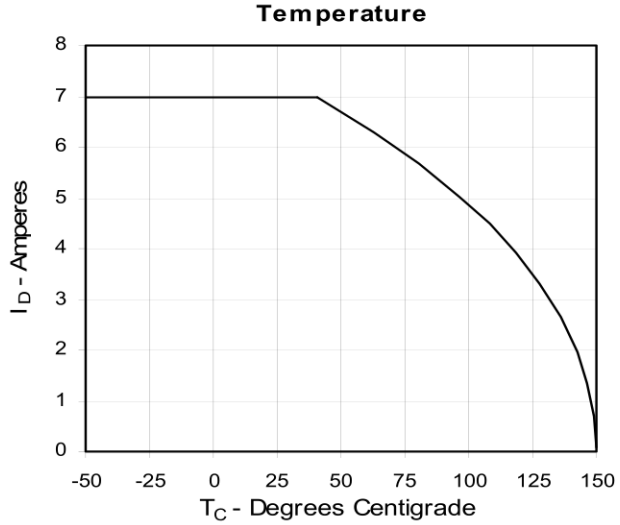

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Fig. 7. Input Admittance

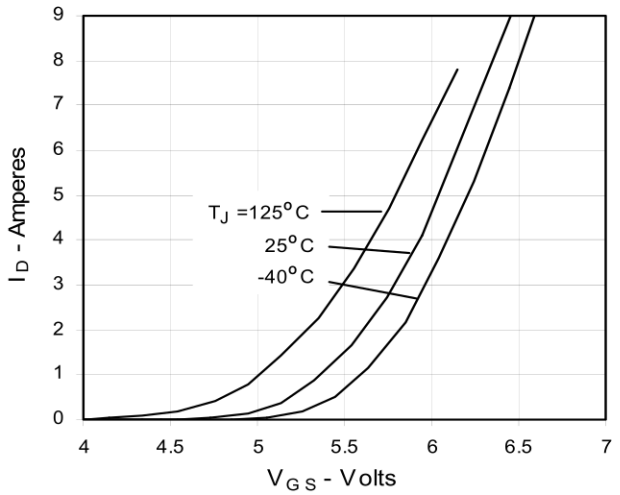


Fig. 8. Transconductance

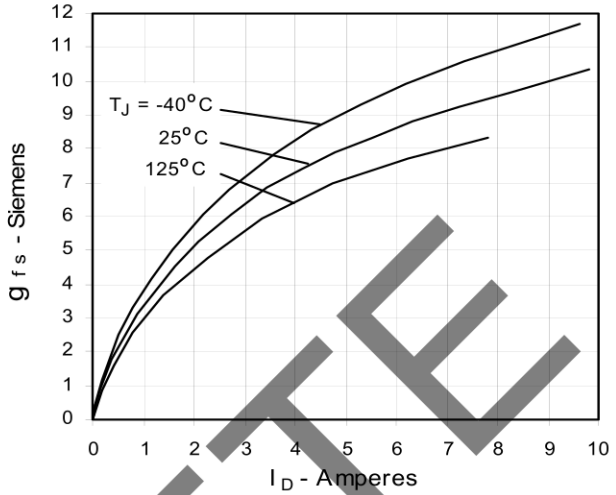


Fig. 9. Source Current vs. Source-To-Drain Voltage

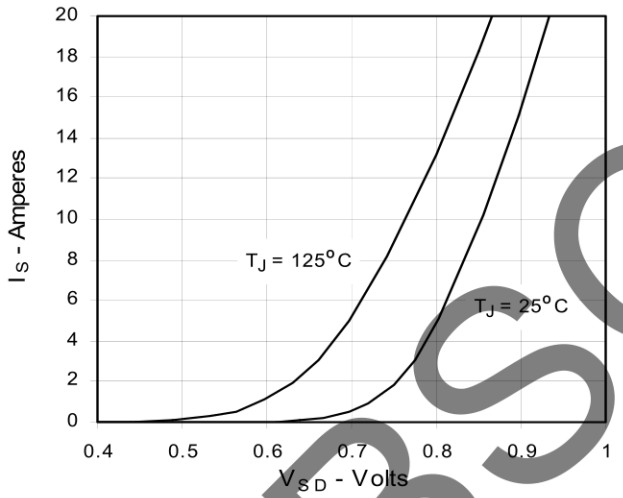


Fig. 10. Gate Charge

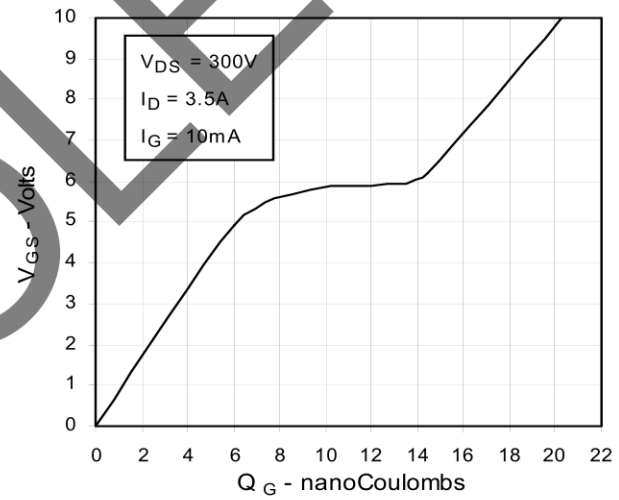


Fig. 11. Capacitance

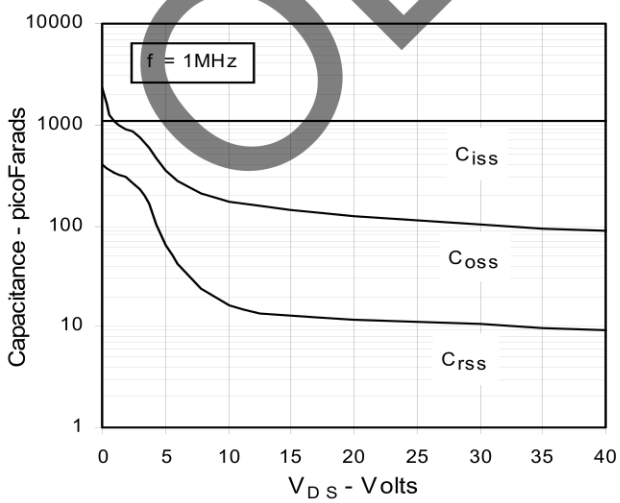
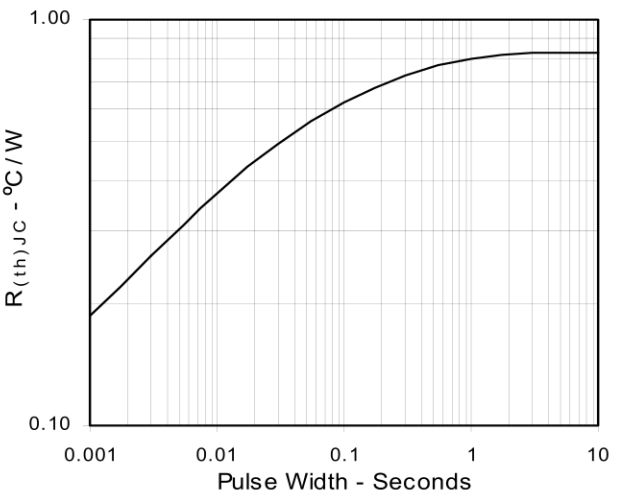


Fig. 12. Maximum Transient Thermal Resistance



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