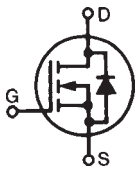
IXYS

PolarHV™ Power MOSFET

IXTA 6N50P
IXTP 6N50P

V_{DSS} = 500 V
I_{D25} = 6 A
$R_{DS(on)}$ ≤ 1.1 Ω

N-Channel Enhancement Mode
Avalanche Rated

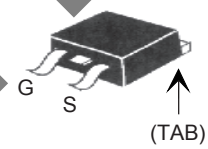


OBSOLETE

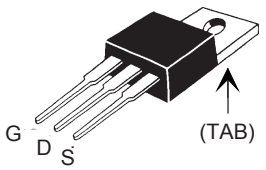
Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25° C to 150° C	500	V
V_{DGR}	T_J = 25° C to 150° C; R_{GS} = 1 MΩ	500	V
V_{GSS}	Continuous	± 30	V
V_{GSM}	Transient	± 40	V
I_{D25}	T_C = 25° C	6	A
I_{DM}	T_C = 25° C, pulse width limited by T_{JM}	15	A
I_{AR}	T_C = 25° C	6	A
E_{AR}	T_C = 25° C	20	mJ
E_{AS}	T_C = 25° C	250	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	100	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	500			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 50μA	3.0		5.0	V
I_{GSS}	V_{GS} = ±30 V, V_{DS} = 0V			±100	nA
I_{DSS}	$V_{DS} = V_{DSS}$			5	μA
	V_{GS} = 0 V, 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-263 (IXTA)



TO-220 (IXTP)



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

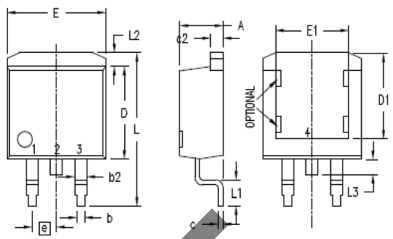
© 2006 IXYS All rights reserved

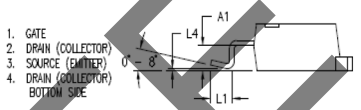
Symbol	Test Conditions	Characteristic Values (T_J = 25° C, unless otherwise specified) Min.	Typ.	Max.	
g_{fs}	V_{DS}= 20 V; I_D = 0.5 I_{D25}, pulse test	3.5	5.5		S
C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		740		pF
C_{oss}			85		pF
C_{rss}			8		pF
$t_{d(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 V_{DSS}, I_D = 0.5 I_{D25} R_G = 18 Ω (External)		26		ns
t_r			28		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}		14.6		nC
Q_{gs}			4.8		nC
Q_{gd}			5.6		nC
R_{thJC}				1.25	° 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			6	A
I_{SM}	Repetitive			18	A
V_{SD}	I_F = I_S, V_{GS} = 0 V, -di/dt = 100 A/µs			1.5	V
t_{rr}	Pulse test, t ≤300 µs, duty cycle d≤ 2 %		400		ns

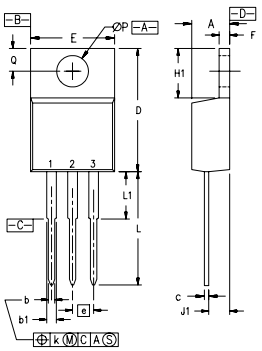
TO-263 (IXTA) Outline





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

OBSOLETE

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 4,850,072 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

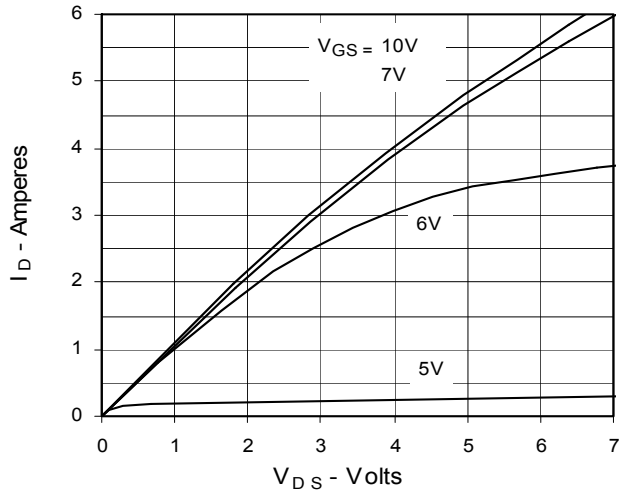


Fig. 2. Extended Output Characteristics @ 25°C

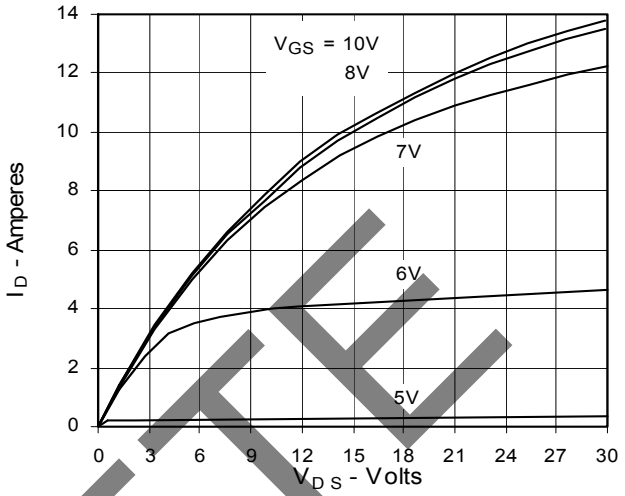


Fig. 3. Output Characteristics @ 125°C

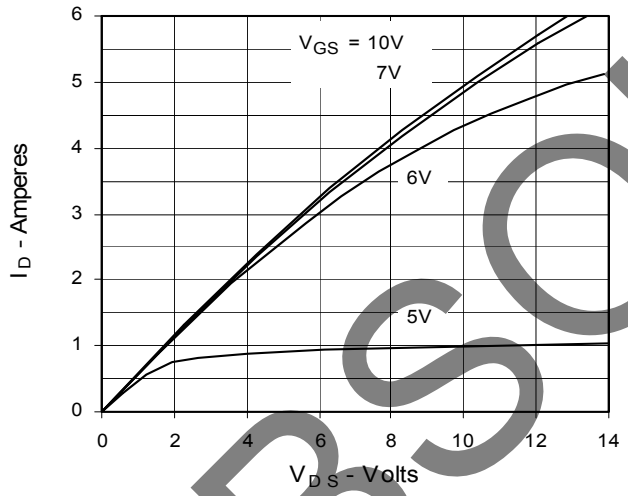


Fig. 4. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. Junction Temperature

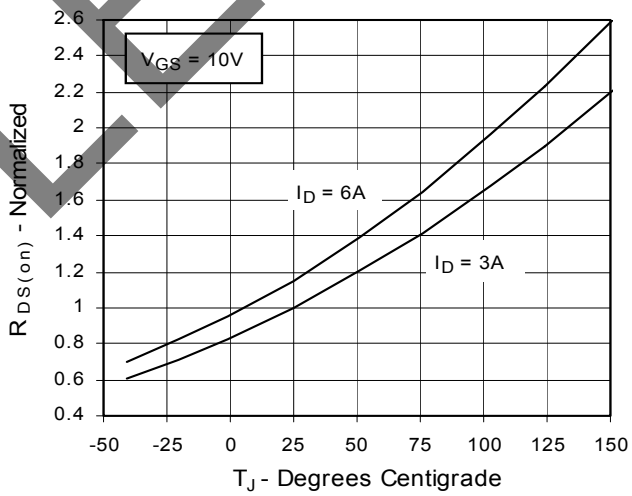


Fig. 5. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. I_D

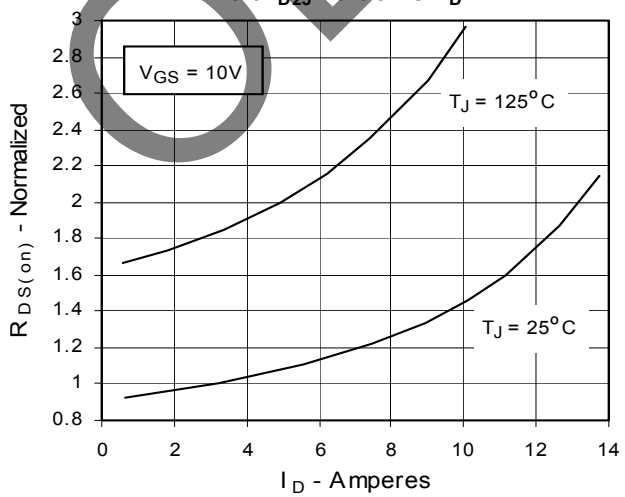
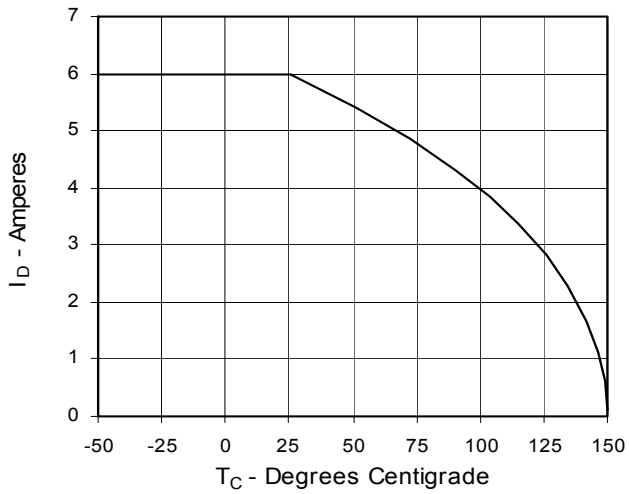


Fig. 6. Drain Current vs. Case Temperature



OBSOLETE

© 2006 IXYS All rights reserved

Fig. 7. Input Admittance

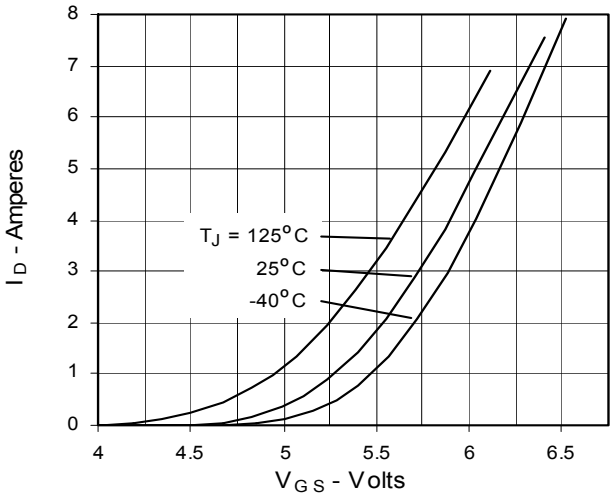


Fig. 8. Transconductance

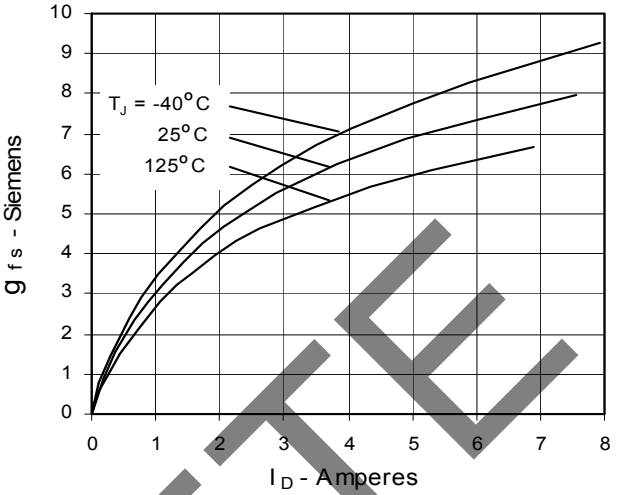


Fig. 9. Source Current vs. Source-To-Drain Voltage

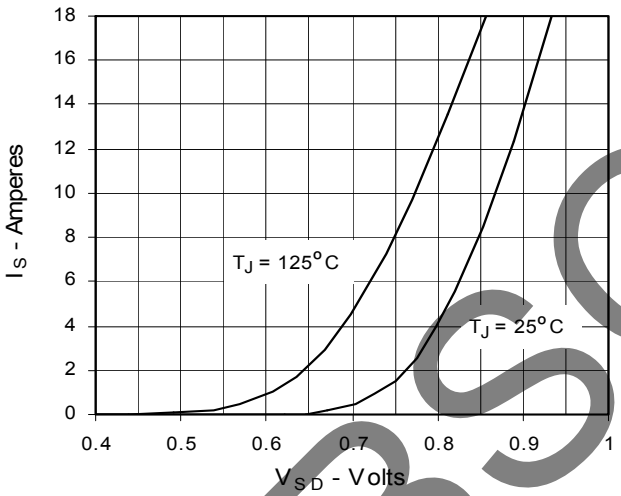


Fig. 10. Gate Charge

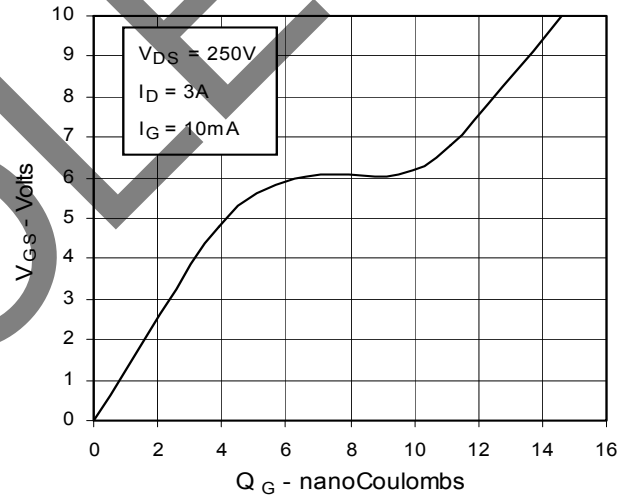


Fig. 11. Capacitance

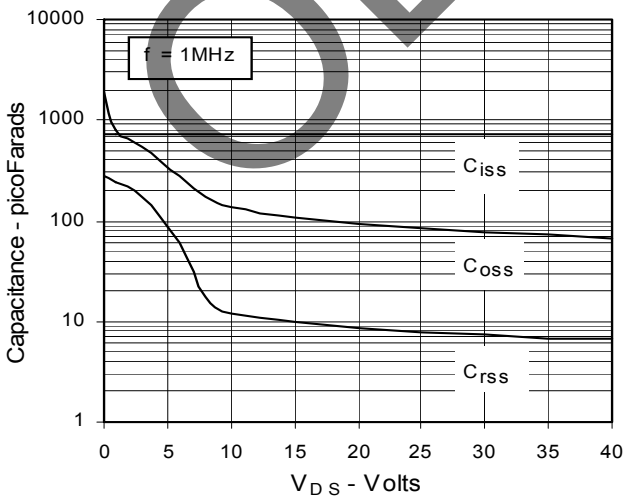
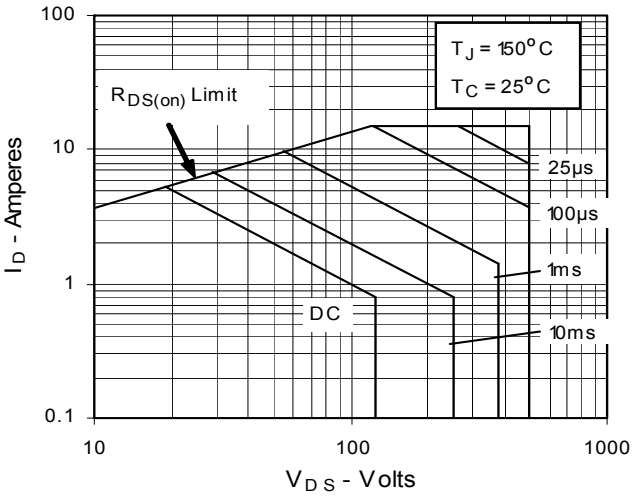
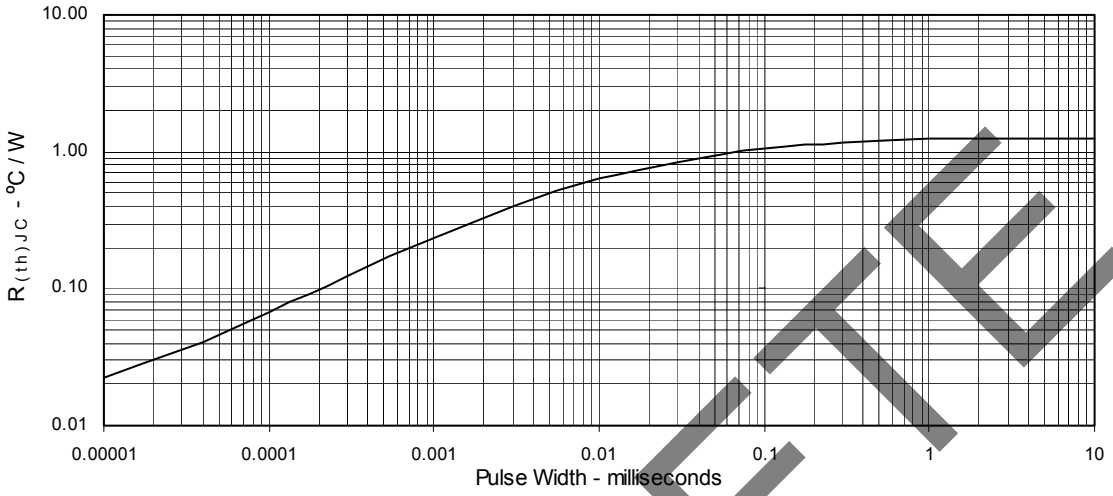


Fig. 12. Forward-Bias Safe Operating Area



OBSOLETE

Fig. 13. Maximum Transient Thermal Resistance



OBSOLETE

© 2006 IXYS All rights reserved



Disclaimer Notice - Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at www.littelfuse.com/disclaimer-electronics.