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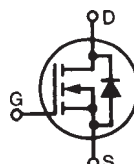


PolarHV™ Power MOSFET

IXTP 1R4N60P
IXTU 1R4N60P
IXTY 1R4N60P

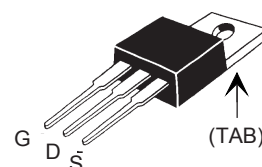
V_{DSS} = 600 V
I_{D25} = 1.4 A
R_{DS(on)} ≤ 9.0 Ω

N-Channel Enhancement Mode
Avalanche Rated

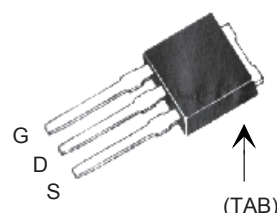


Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T _J = 25° C to 175° C	600	V
V_{DGR}	T _J = 25° C to 175° C; R _{GS} = 1 MΩ	600	V
V_{GS}	Continuous	±30	V
V_{GSM}	Transient	±40	V
I_{D25}	T _C = 25° C	1.4	A
I_{DM}	T _C = 25° C, pulse width limited by T _{JM}	2.1	A
I_{AR}	T _C = 25° C	1.4	A
E_{AR}	T _C = 25° C	5	mJ
E_{AS}	T _C = 25° C	75	mJ
dv/dt	I _S ≤ I _{DM} , di/dt ≤ 100 A/μs, V _{DD} ≤ V _{DSS} , T _J ≤ 150° C, R _G = 20 Ω	10	V/ns
P_D	T _C = 25° C	50	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
T_L	1.6 mm (0.062) from case for 10 s	300	°C
T_{SOLD}	Plastic body for 10 s	260	°C
Weight	TO-220	4.0	g
	TO-252	0.35	g
	TO-251	0.4	g

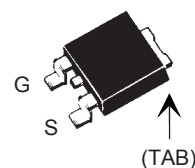
TO-220 (IXTP)



TO-251 (IXTU)



TO-252 (IXTY)



G = Gate
S = Source

D = Drain
TAB = Drain

Symbol	Test Conditions (T _J = 25° C, unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
BV_{DSS}	V _{GS} = 0 V, I _D = 25 μA	600		V
V_{GS(th)}	V _{DS} = V _{GS} , I _D = 25 μA	3.0		5.5 V
I_{GSS}	V _{GS} = ±30 V _{DC} , V _{DS} = 0			±50 nA
I_{DSS}	V _{DS} = V _{DSS}			1 μA
	V _{GS} = 0 V, T _J = 125° C			20 μA
R_{DS(on)}	V _{GS} = 10 V, I _D = 0.5 I _{D25} Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 %			9.0 Ω

Features

- International standard packages
- Unclamped Inductive Switching (UIS) rated
- Low package inductance
- easy to drive and to protect

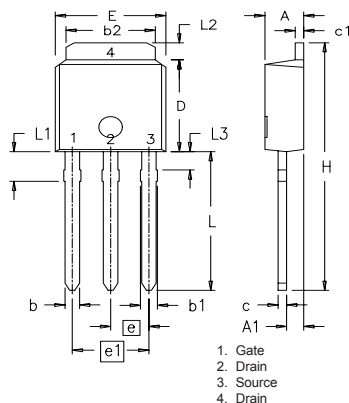
Advantages

- Easy to mount
- Space savings
- High power density

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	0.7	1.1	S
C_{iss}	V _{GS} = 0 V, V _{DS} = 25 V, f = 1 MHz		140	pF
C_{oss}			17	pF
C_{rss}			2.4	pF
t_{d(on)}	V _{GS} = 10 V, V _{DS} = 0.5 V _{DSS} , I _D = 0.5 I _{D25} R _G = 50 Ω (External)		10	ns
t_r			16	ns
t_{d(off)}			25	ns
t_f			16	ns
Q_{g(on)}	V _{GS} = 10 V, V _{DS} = 0.5 V _{DSS} , I _D = 0.5 I _{D25}		5.2	nC
Q_{gs}			1.34	nC
Q_{gd}			5.2	nC
R_{thJC}				2.5 °C/W
R_{thCS}	(TO-220)		0.25	°C/W
R_{thCS}	(TO-251)		1.0	°C/W

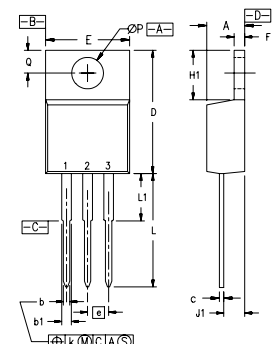
Source-Drain Diode		Characteristic Values (T _J = 25° C, unless otherwise specified)		
Symbol	Test Conditions	Min.	Typ.	Max.
I_S	V _{GS} = 0 V			1.4 A
I_{SM}	Repetitive			4 A
V_{SD}	I _F = I _S , V _{GS} = 0 V, Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 %			1.5 V
t_{rr}	I _F = 1.5 A, -di/dt = 100 A/μs V _R = 100 V, V _{GS} = 0 V		500	ns

TO-251 (IXTU) Outline



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	2.19	2.38	.086	.094
A1	0.89	1.14	0.35	.045
b	0.64	0.89	.025	.035
b1	0.76	1.14	.030	.045
b2	5.21	5.46	.205	.215
c	0.46	0.58	.018	.023
c1	0.46	0.58	.018	.023
D	5.97	6.22	.235	.245
E	6.35	6.73	.250	.265
e	2.28	BSC	.090	BSC
e1	4.57	BSC	.180	BSC
H	17.02	17.78	.670	.700
L	8.89	9.65	.350	.380
L1	1.91	2.28	.075	.090
L2	0.89	1.27	.035	.050

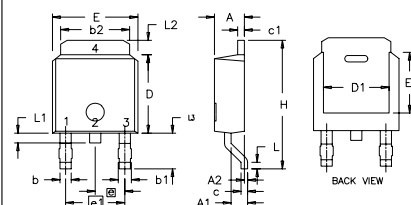
TO-220 (IXTP) Outline



Pins: 1 - Gate 2,4 - Drain
3 - Source

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
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-252 AA (IXTY) Outline



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	2.19	2.38	0.086	0.094
A1	0.89	1.14	0.035	0.045
A2	0	0.13	0	0.005
b	0.64	0.89	0.025	0.035
b1	0.76	1.14	0.030	0.045
b2	5.21	5.46	0.205	0.215
c	0.46	0.58	0.018	0.023
c1	0.46	0.58	0.018	0.023
D	5.97	6.22	0.235	0.245
D1	4.32	5.21	0.170	0.205
E	6.35	6.73	0.250	0.265
E1	4.32	5.21	0.170	0.205
e	2.28	BSC	0.090	BSC
e1	4.57	BSC	0.180	BSC
H	9.40	10.42	0.370	0.410
L	0.51	1.02	0.020	0.040
L1	0.64	1.02	0.025	0.040
L2	0.89	1.27	0.035	0.050
L3	2.54	2.92	0.100	0.115

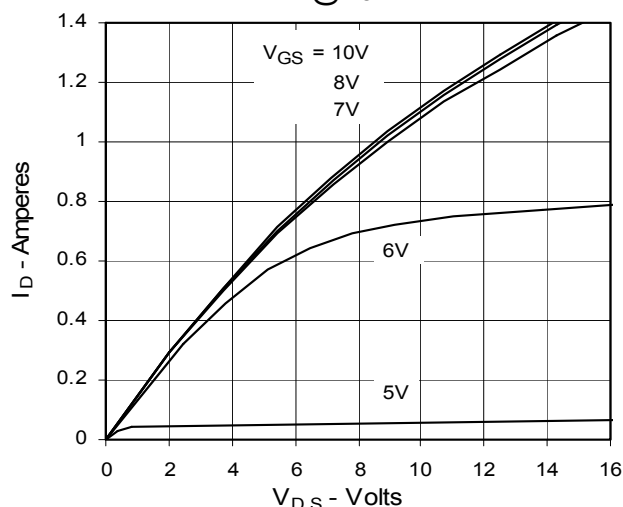
IXYS reserves the right to change limits, test conditions, and dimensions.

IXYS MOSFETs and IGBTs are covered by 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
one or more of the following U.S. patents: 4,850,072 5,017,508 5,063,307 5,381,025 6,259,123 B1 6,534,343 6,710,405 B2 6,759,692
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

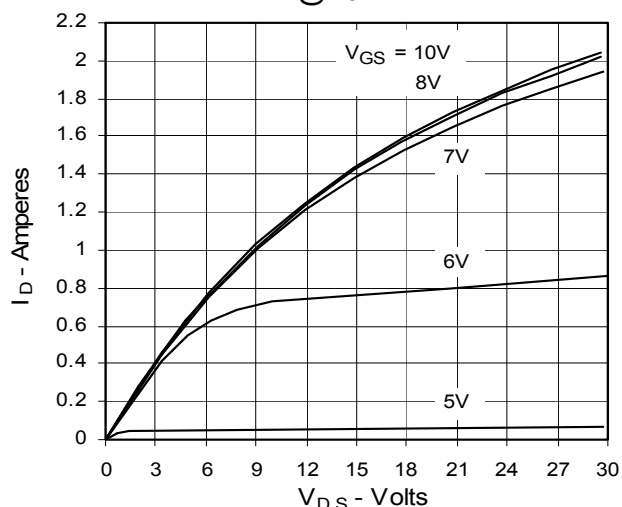


**IXTP 1R4N60P IXTU 1R4N60P
IXTY 1R4N60P**

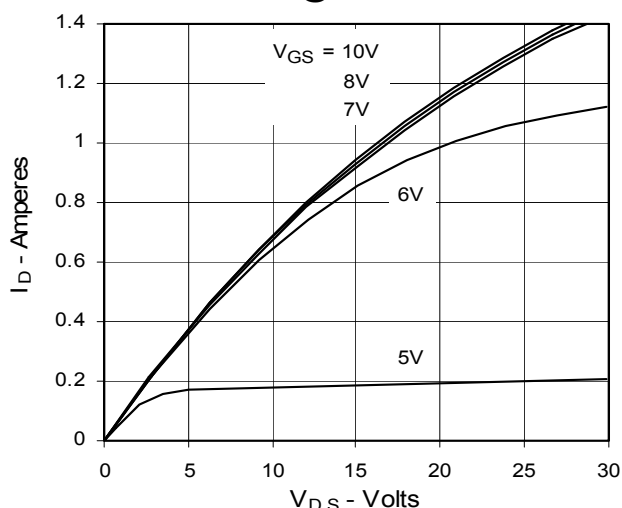
**Fig. 1. Output Characteristics
@ 25°C**



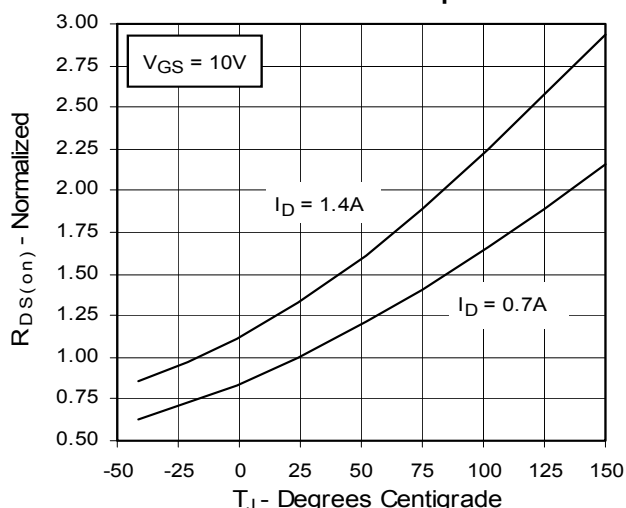
**Fig. 2. Extended Output Characteristics
@ 25°C**



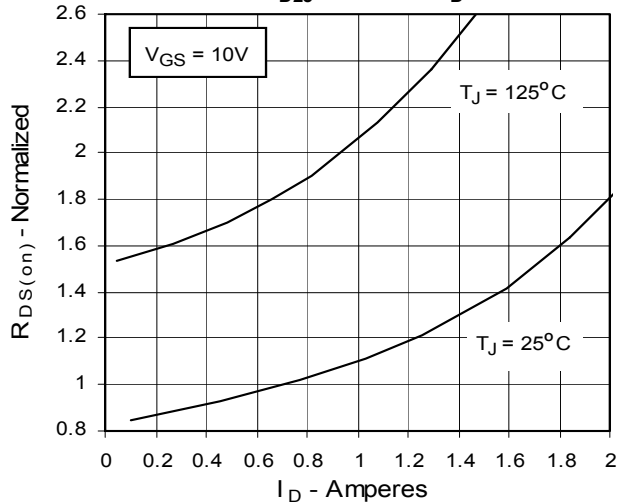
**Fig. 3. Output Characteristics
@ 125°C**



**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**

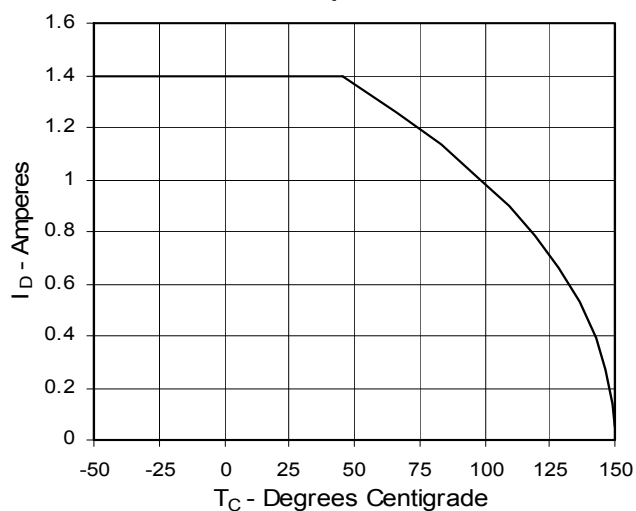


Fig. 7. Input Admittance

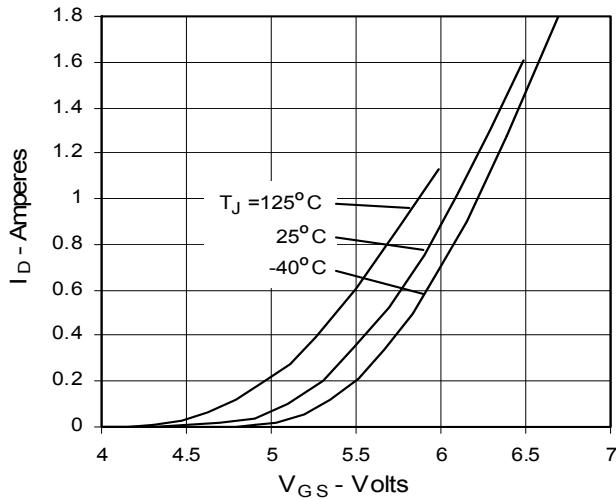


Fig. 8. Transconductance

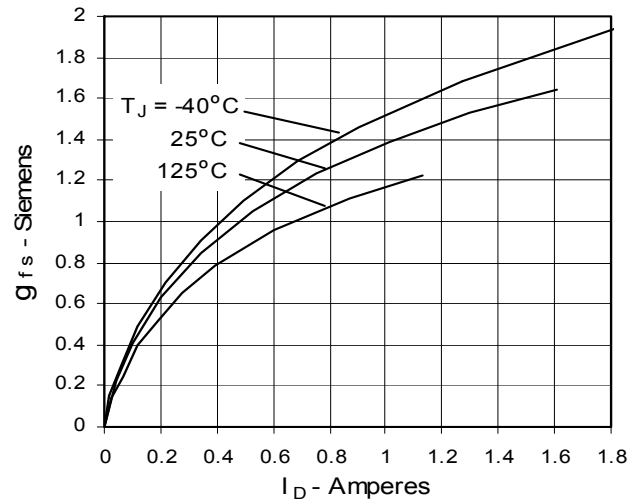


Fig. 9. Source Current vs. Source-To-Drain Voltage

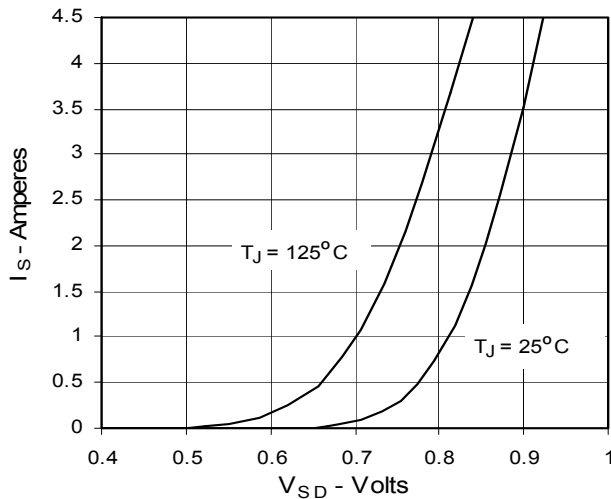


Fig. 10. Gate Charge

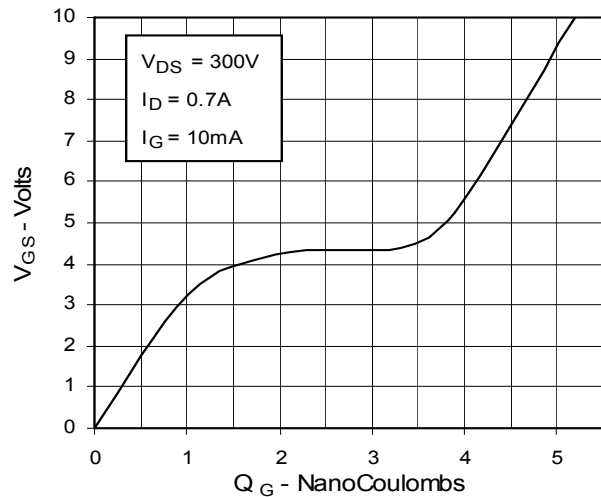


Fig. 11. Capacitance

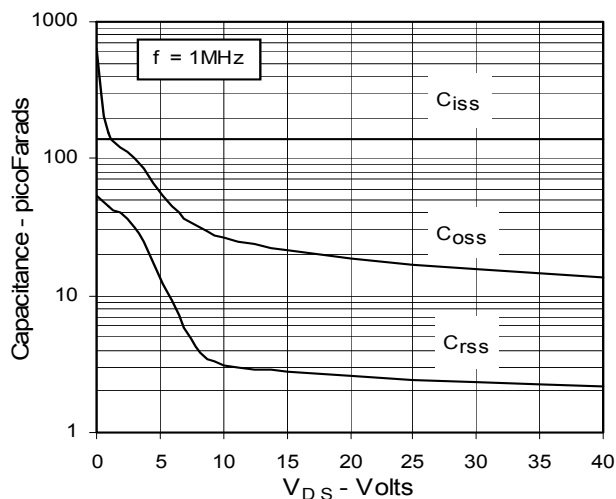


Fig. 12. Maximum Transient Thermal Resistance

