

PolarHT™ Power MOSFET

IXTA 110N055P
IXTP 110N055P
IXTQ 110N055P

$V_{DSS} = 55 \text{ V}$
 $I_{D25} = 110 \text{ A}$
 $R_{DS(on)} \leq 13.5 \text{ m}\Omega$

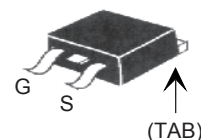
N-Channel Enhancement Mode
Avalanche Rated



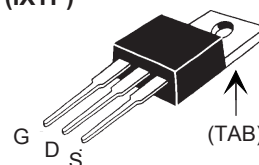
Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25 \text{ }^{\circ}\text{C to } 175 \text{ }^{\circ}\text{C}$	55	V
V_{DGR}	$T_J = 25 \text{ }^{\circ}\text{C to } 175 \text{ }^{\circ}\text{C}; R_{GS} = 1 \text{ M}\Omega$	55	V
V_{GS}	Continuous	± 20	V
V_{GSM}	Transient	± 30	V
I_{D25}	$T_C = 25 \text{ }^{\circ}\text{C}$	110	A
I_{DRMS}	External lead current limit	75	A
I_{DM}	$T_C = 25 \text{ }^{\circ}\text{C}$, pulse width limited by T_{JM}	250	A
I_{AR}	$T_C = 25 \text{ }^{\circ}\text{C}$	110	A
E_{AR}	$T_C = 25 \text{ }^{\circ}\text{C}$	30	mJ
E_{AS}	$T_C = 25 \text{ }^{\circ}\text{C}$	1.0	J
dv/dt	$I_S \leq I_{DM}$, $di/dt \leq 100 \text{ A/s}$, $V_{DD} \leq V_{DSS}$, $T_J \leq 150 \text{ }^{\circ}\text{C}$, $R_G = 10 \text{ }\Omega$	10	V/ns
P_D	$T_C = 25 \text{ }^{\circ}\text{C}$	390	W
T_J		-55 ... +175	$^{\circ}\text{C}$
T_{JM}		175	$^{\circ}\text{C}$
T_{stg}		-55 ... +150	$^{\circ}\text{C}$
T_L	1.6 mm (0.062 in.) from case for 10 s	300	$^{\circ}\text{C}$
T_{SOLD}	Plastic body for 10 s	260	$^{\circ}\text{C}$
M_d	Mounting torque (TO-3P / TO-220)	1.13/10	Nm/lb.in.
Weight	TO-3P	5.5	g
	TO-220	4	g
	TO-263	3	g

Symbol	Test Conditions ($T_J = 25 \text{ }^{\circ}\text{C}$, unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
BV_{DSS}	$V_{GS} = 0 \text{ V}$, $I_D = 250 \text{ A}$	55		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250 \text{ A}$	3.0		5.5 V
I_{GSS}	$V_{GS} = \pm 20 \text{ V}_{DC}$, $V_{DS} = 0$			$\pm 100 \text{ nA}$
I_{DSS}	$V_{DS} = V_{DSS}$			25 A
	$V_{GS} = 0 \text{ V}$, $T_J = 125 \text{ }^{\circ}\text{C}$			250 A
$R_{DS(on)}$	$V_{GS} = 10 \text{ V}$, $I_D = 0.5 I_{D25}$ Pulse test, $t \leq 300 \text{ s}$, duty cycle $d \leq 2 \%$	11	13.5	$\text{m}\Omega$

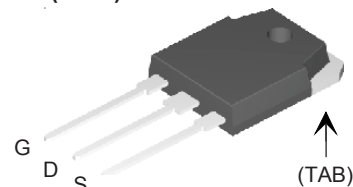
TO-263 (IXTA)



TO-220 (IXTP)



TO-3P (IXTQ)



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

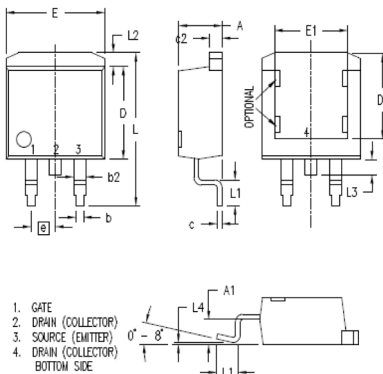
Advantages

- Easy to mount
- Space savings
- High power density

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		Min.	Typ.	Max.
g_{fs}	$V_{DS} = 10\text{ V}$; $I_D = 0.5 I_{D25}$, pulse test	23	36	S
C_{iss}	$V_{GS} = 0\text{ V}$, $V_{DS} = 25\text{ V}$, $f = 1\text{ MHz}$		2210	pF
C_{oss}			1400	pF
C_{rss}			550	pF
$t_{d(on)}$	$V_{GS} = 10\text{ V}$, $V_{DS} = 0.5 V_{DSS}$, $I_D = 0.5 I_{D25}$ $R_G = 10\ \Omega$ (External)		27	ns
t_r			53	ns
$t_{d(off)}$			66	ns
t_f			45	ns
$Q_{g(on)}$	$V_{GS} = 10\text{ V}$, $V_{DS} = 0.5 V_{DSS}$, $I_D = 0.5 I_{D25}$		76	nC
Q_{gs}			17	nC
Q_{gd}			33	nC
R_{thJC}	(TO-3P) (TO-220)		0.21	0.38 C/W
R_{thCS}				C/W

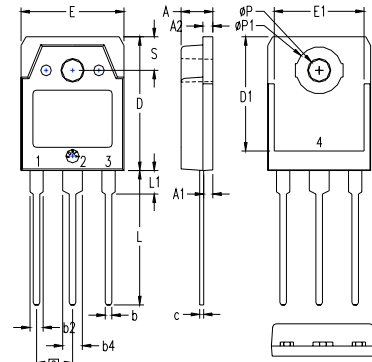
Source-Drain Diode		Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
Symbol	Test Conditions	Min.	Typ.	Max.
I_S	$V_{GS} = 0\text{ V}$			110 A
I_{SM}	Repetitive			250 A
V_{SD}	$I_F = I_S$, $V_{GS} = 0\text{ V}$, Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$			1.5 V
t_{rr}	$I_F = 25\text{ A}$, $-di/dt = 100\text{ A/s}$		80	ns
Q_{RM}	$V_R = 25\text{ V}$, $V_{GS} = 0\text{ V}$		1.4	C

TO-263 (IXTA) Outline



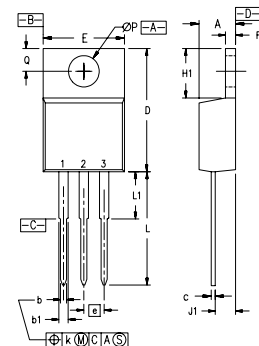
SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.160	.190	4.06	4.83
A1	.080	.110	2.03	2.79
b	.020	.039	0.51	0.99
b2	.045	.055	1.14	1.40
c	.016	.029	0.40	0.74
c2	.045	.055	1.14	1.40
D	.340	.380	8.64	9.65
D1	.315	.350	8.00	8.89
E	.380	.410	9.65	10.41
E1	.245	.320	6.22	8.13
e	.100 BSC		2.54 BSC	
L	.575	.625	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-3P (IXTQ) Outline



SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.185	.193	4.70	4.90
A1	.051	.059	1.30	1.50
A2	.057	.065	1.45	1.65
b	.035	.045	0.90	1.15
b2	.075	.087	1.90	2.20
b4	.114	.126	2.90	3.20
c	.022	.031	0.55	0.80
D	.780	.799	19.80	20.30
D1	.665	.677	16.90	17.20
E	.610	.622	15.50	15.80
E1	.531	.539	13.50	13.70
e	.215 BSC		5.45 BSC	
L	.779	.795	19.80	20.20
L1	.134	.142	3.40	3.60
ØP	.126	.134	3.20	3.40
ØP1	.272	.280	6.90	7.10
S	.193	.201	4.90	5.10

TO-220 (IXTP) Outline

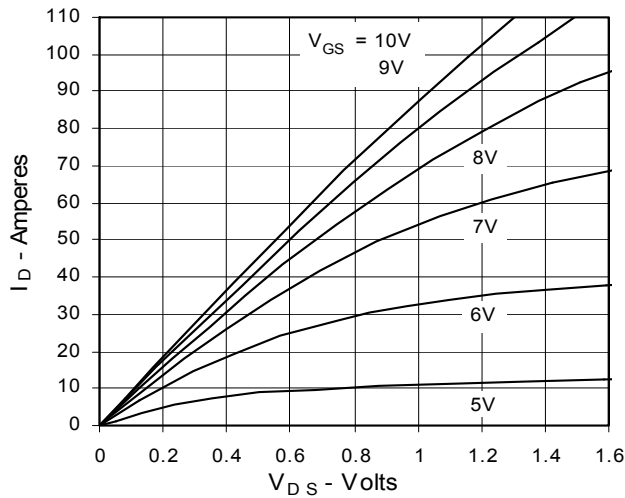


SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.170	.190	4.32	4.83
b	.025	.040	0.64	1.02
b1	.045	.065	1.15	1.65
c	.014	.022	0.35	0.56
D	.580	.630	14.73	16.00
E	.390	.420	9.91	10.66
e	.100 BSC		2.54 BSC	
F	.045	.055	1.14	1.40
H1	.230	.270	5.85	6.85
J1	.090	.110	2.29	2.79
k	0	.015	0	0.38
L	.500	.550	12.70	13.97
L1	.110	.230	2.79	5.84
ØP	.139	.161	3.53	4.08
Q	.100	.125	2.54	3.18

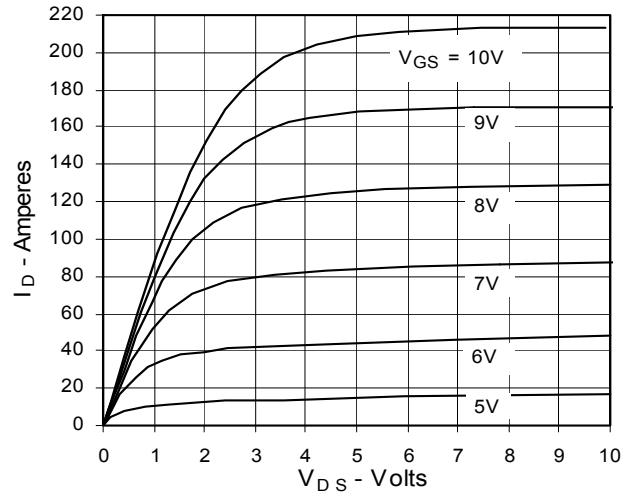
IXYS reserves the right to change limits, test conditions, and dimensions.

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

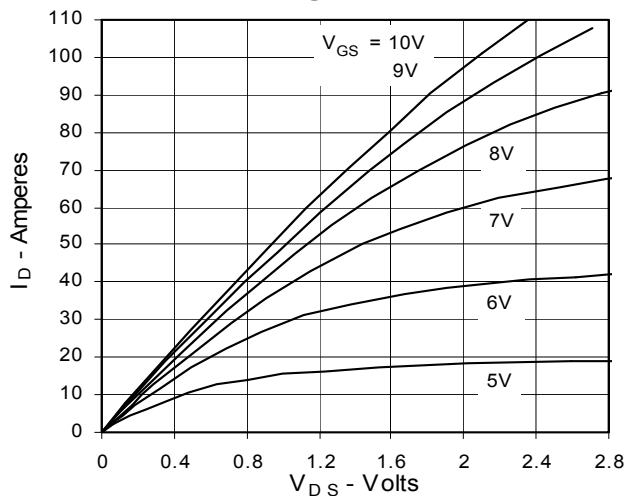
**Fig. 1. Output Characteristics
@ 25°C**



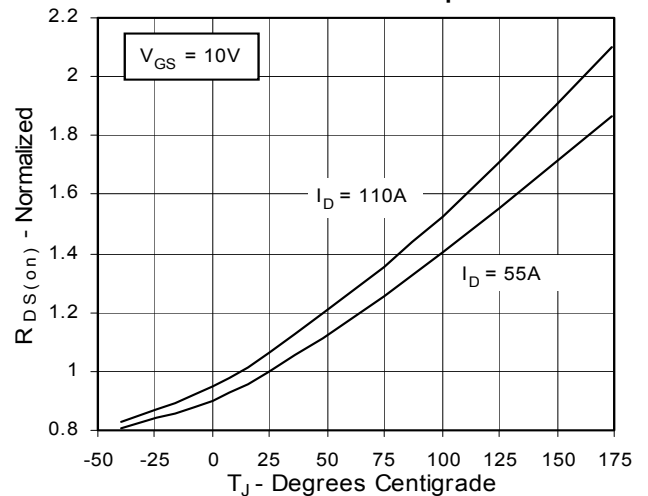
**Fig. 2. Extended Output Characteristics
@ 25°C**



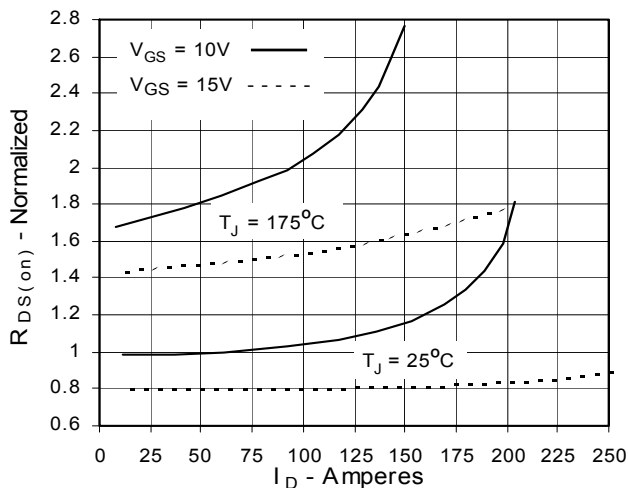
**Fig. 3. Output Characteristics
@ 150°C**



**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. Drain Current**



**Fig. 6. Drain Current vs. Case
Temperature**

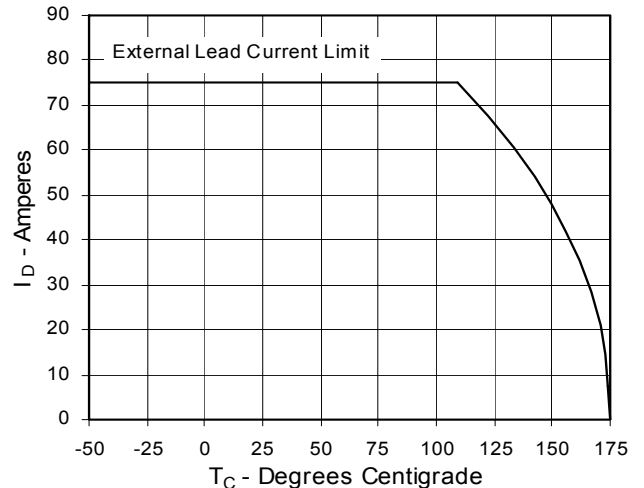


Fig. 7. Input Admittance

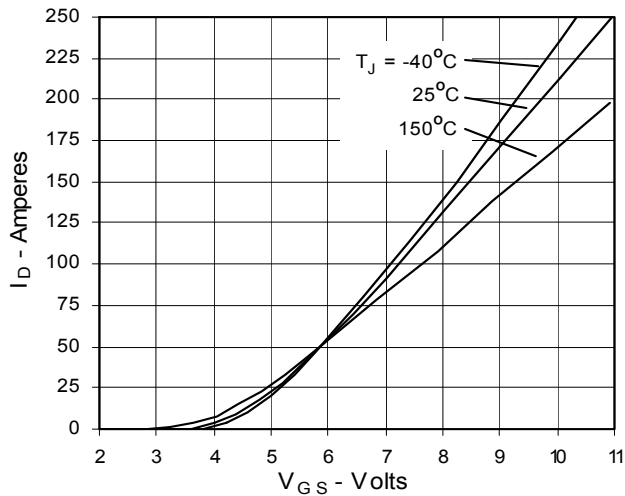


Fig. 8. Transconductance

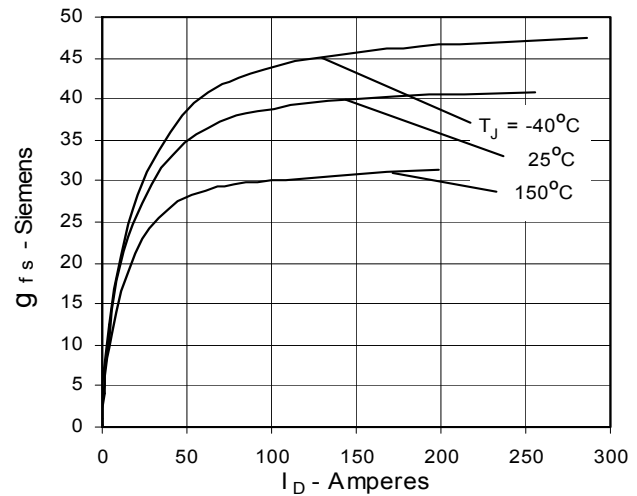


Fig. 9. Source Current vs. Source-To-Drain Voltage

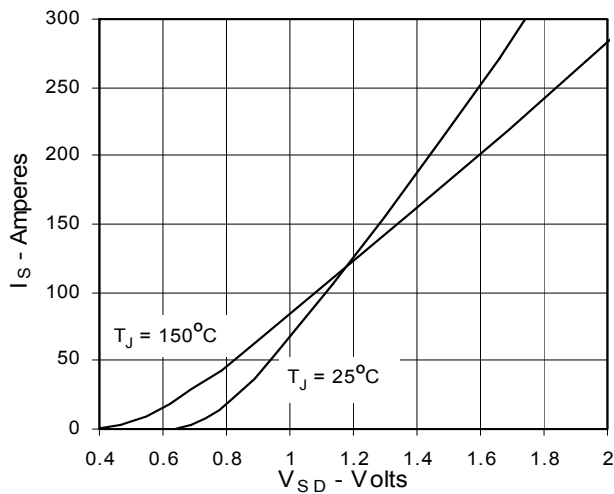


Fig. 10. Gate Charge

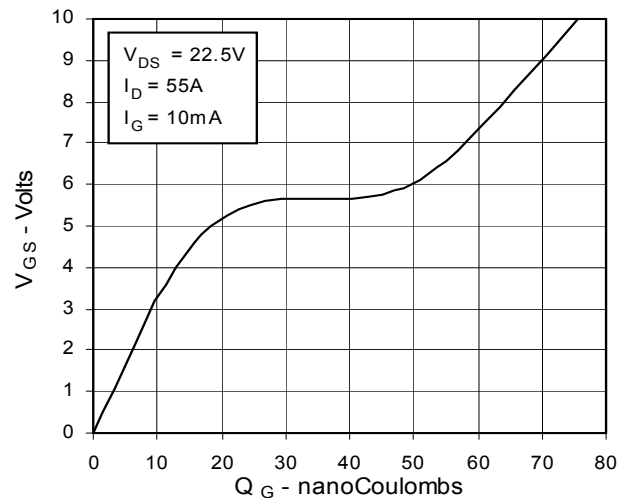


Fig. 11. Capacitance

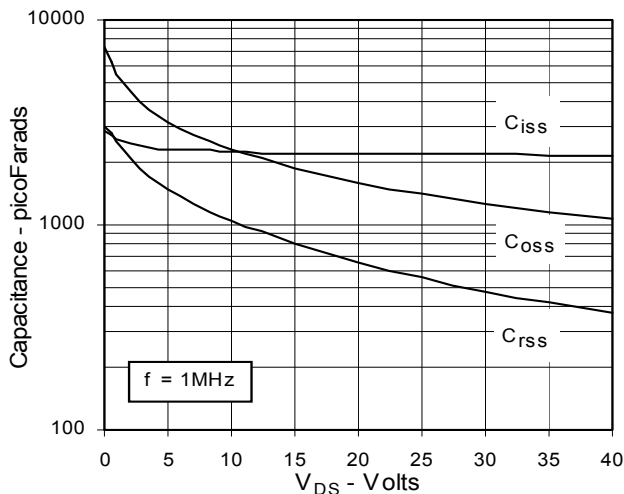


Fig. 12. Forward-Bias Safe Operating Area

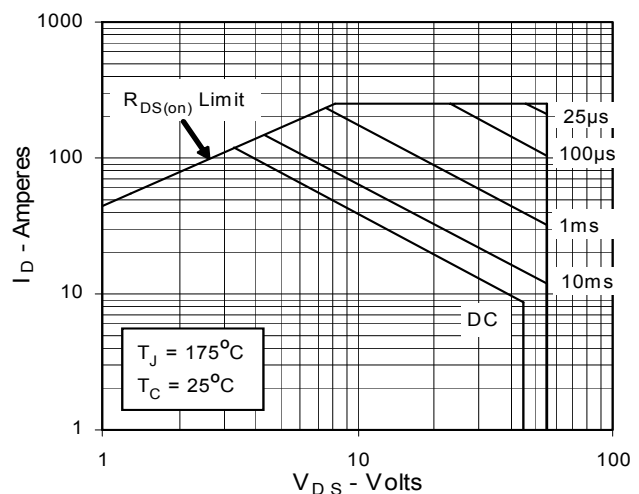


Fig. 13. Maximum Transient Thermal Resistance

