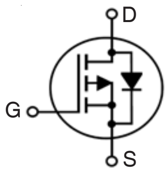
IXYS

PolarP™ Power MOSFET

IXTR90P10P

V_{DSS} = - 100V
I_{D25} = - 57A
$R_{DS(on)}$ ≤ 27mΩ

P-Channel Enhancement Mode
Avalanche Rated



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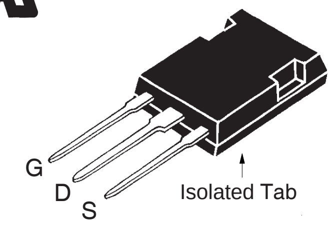


G = Gate D = Drain
S = Source

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C	- 100	V
V_{DGR}	T_J = 25°C to 150°C, R_{GS} = 1MΩ	- 100	V
V_{GSS}	Continuous	±20	V
V_{GSM}	Transient	±30	V
I_{D25}	T_C = 25°C	- 57	A
I_{DM}	T_C = 25°C, Pulse Width Limited by T_{JM}	- 225	A
I_A	T_C = 25°C	- 90	A
E_{AS}	T_C = 25°C	2.5	J
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	190	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
T_L	1.6mm (0.062 in.) from Case for 10s	300	°C
T_{SOLD}	Plastic Body for 10s	260	°C
V_{ISOL}	50/60 H_z, RMS t = 1min	2500	V~
M_d	Mounting Force	20..120/4.5..27	N/lb.
Weight		6	g

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	 Typ.	 Max.	
BV_{DSS}	V_{GS} = 0V, I_D = - 250µA	-100			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = - 250µA	- 2.0		- 4.0	V
I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V			±100	nA
I_{DSS}	$V_{DS} = V_{DSS}$, V_{GS} = 0V			- 25	µA
	T_J = 125°C			- 200	µA
$R_{DS(on)}$	V_{GS} = -10V, I_D = - 45A, Note 1			27	mΩ

Features

- Silicon Chip on Direct-Copper Bond (DCB) Substrate
  - UL Recognized Package
  - Isolated Mounting Surface
  - 2500V~ Electrical Isolation
- Avalanche Rated
- High Current Handling Capability
- Fast Intrinsic Diode
- The Rugged PolarP™ Process
- Low Q_G
- Low Drain-to-Tab capacitance
- Low Package Inductance

Advantages

- Easy to Mount
- Space Savings
- High Power Density

Applications

- High-Side Switches
- Push Pull Amplifiers
- DC Choppers
- Automatic Test Equipment
- Current Regulators

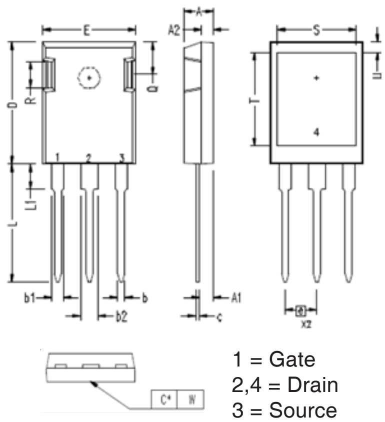
Symbol	**Test Conditions** (T$_J$ = 25°C, Unless Otherwise Specified)	**Characteristic Values** Min.	Typ.	Max.
g$_{fs}$	V$_{DS}$ = -10V, I$_D$ = - 45A, Note 1	22	37	S
C$_{iss}$	V$_{GS}$ = 0V, V$_{DS}$ = - 25V, f = 1MHz		5800	pF
C$_{oss}$			1990	pF
C$_{rss}$			510	pF
t$_{d(on)}$	**Resistive Switching Times** V$_{GS}$ = -10V, V$_{DS}$ = 0.5 • V$_{DSS}$, I$_D$ = - 45A R$_G$ = 3Ω (External)		25	ns
t$_r$			77	ns
t$_{d(off)}$			54	ns
t$_f$			60	ns
Q$_{g(on)}$	V$_{GS}$ = -10V, V$_{DS}$ = 0.5 • V$_{DSS}$, I$_D$ = - 45A		120	nC
Q$_{gs}$			23	nC
Q$_{gd}$			60	nC
R$_{thJC}$				0.66 °C/W
R$_{thCS}$			0.15	°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			- 90	A
I$_{SM}$	Repetitive, Pulse Width Limited by T$_{JM}$			- 360	A
V$_{SD}$	I$_F$ = - 45A, V$_{GS}$ = 0V, Note 1			- 3.3	V
t$_{rr}$	I$_F$ = - 45A, -di/dt = -100A/µs V$_R$ = - 50V, V$_{GS}$ = 0V		144		ns
Q$_{RM}$			0.92		µC
I$_{RM}$			-12.8		A

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

ISOPLUS247 (IXTR) Outline



1 = Gate
2,4 = Drain
3 = Source

SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.190	.205	4.83	5.21
A1	.090	.100	2.29	2.54
A2	.075	.085	1.91	2.16
b	.045	.055	1.14	1.40
b1	.075	.085	1.91	2.15
b2	.115	.126	2.92	3.20
C	.024	.033	0.61	0.83
D	.819	.840	20.80	21.34
E	.620	.635	15.75	16.13
e	.215 BSC		5.45 BSC	
L	.780	.811	19.81	20.60
L1	.150	.172	3.81	4.38
Q	.220	.244	5.59	6.20
R	.170	.191	4.32	4.85
S	.520	.540	13.21	13.72
T	.620	.640	15.75	16.26
U	.065	.080	1.65	2.03
W	0	.004	0	0.10

Fig. 1. Output Characteristics @ T_J = 25ºC

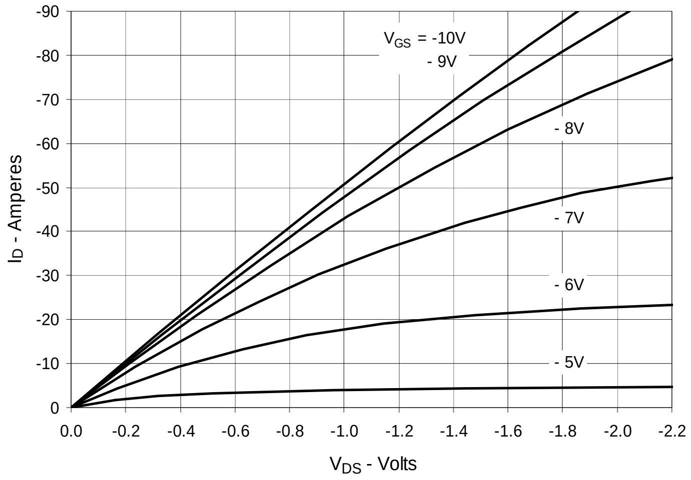


Fig. 2. Extended Output Characteristics @ T_J = 25ºC

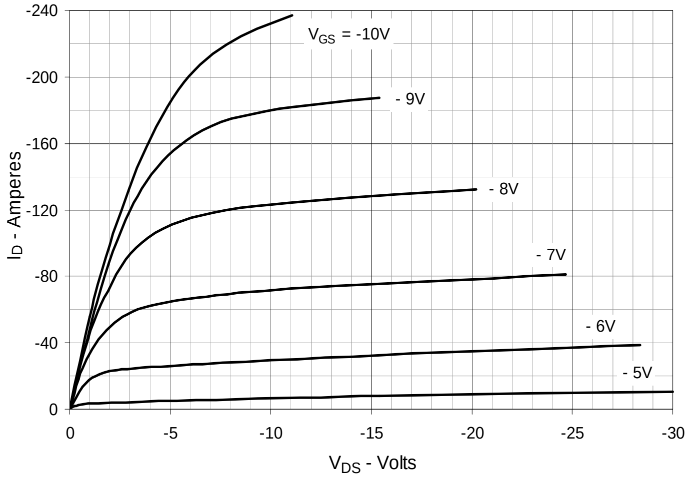


Fig. 3. Output Characteristics @ T_J = 125ºC

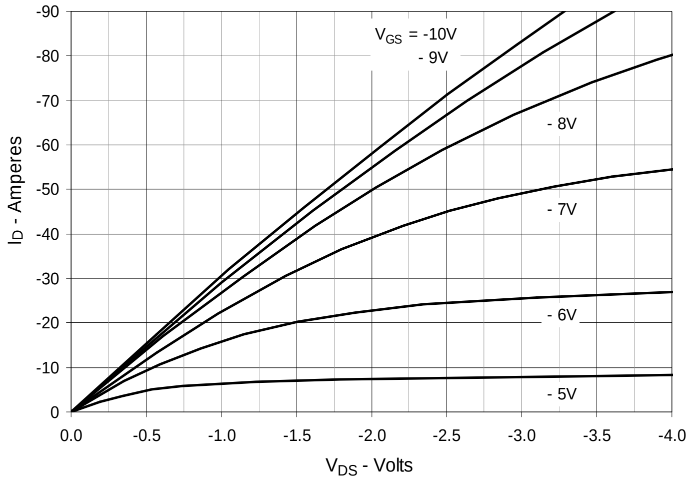


Fig. 4. $R_{DS(on)}$ Normalized to I_D = - 45A Value vs. Junction Temperature

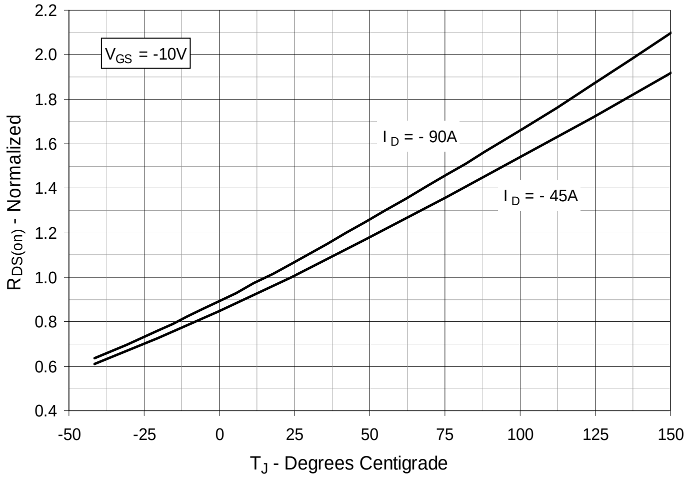


Fig. 5. $R_{DS(on)}$ Normalized to I_D = - 45A value vs. Drain Current

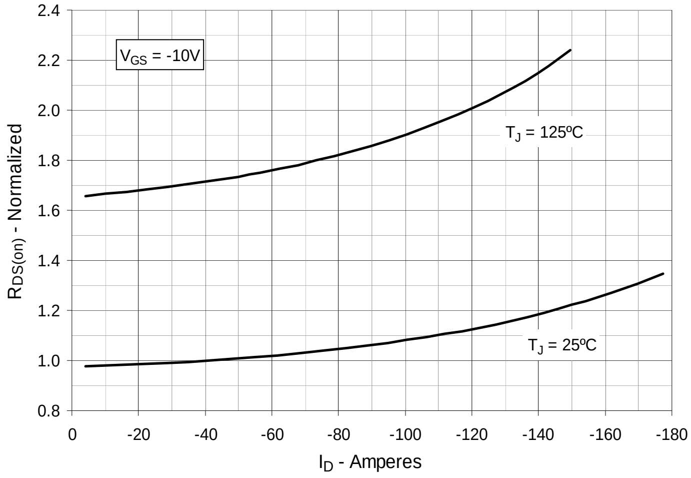


Fig. 6. Maximum Drain Current vs. Case Temperature

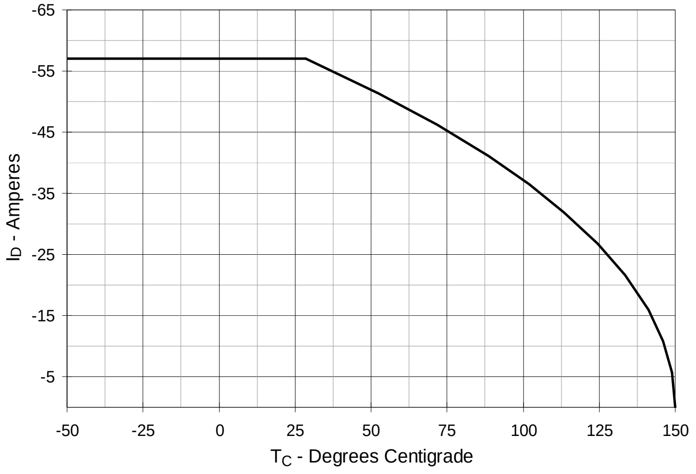


Fig. 7. Input Admittance

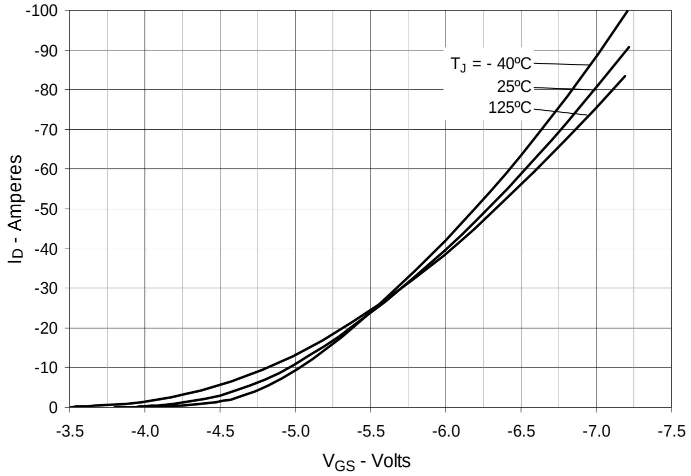


Fig. 8. Transconductance

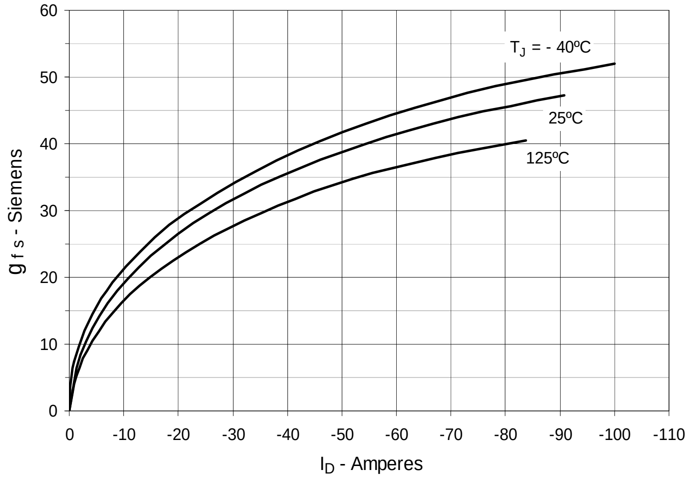


Fig. 9. Forward Voltage Drop of Intrinsic Diode

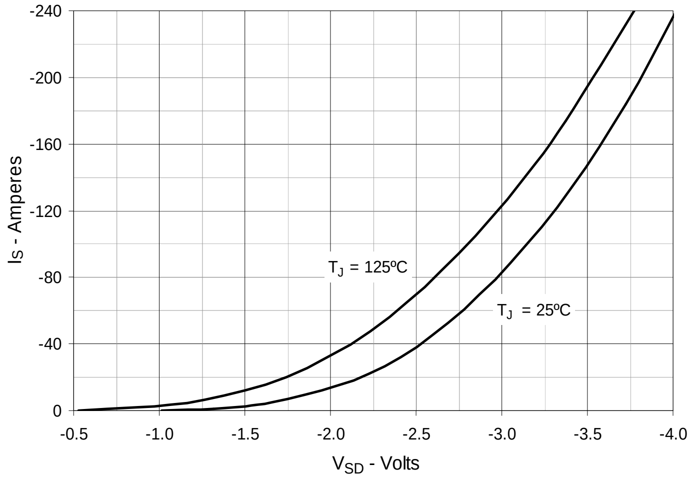


Fig. 10. Gate Charge

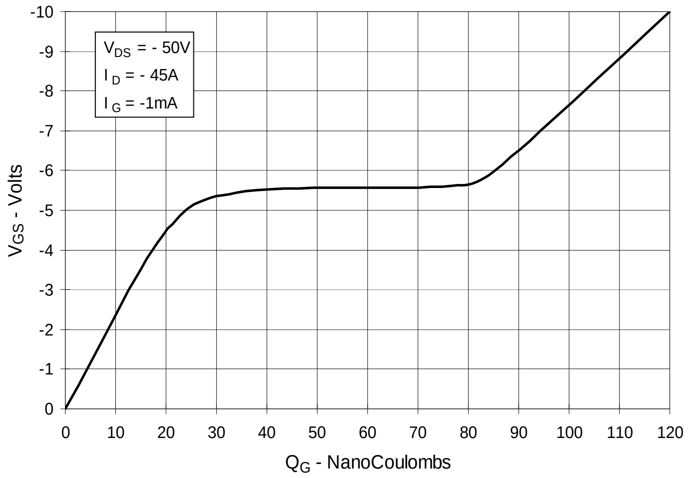


Fig. 11. Capacitance

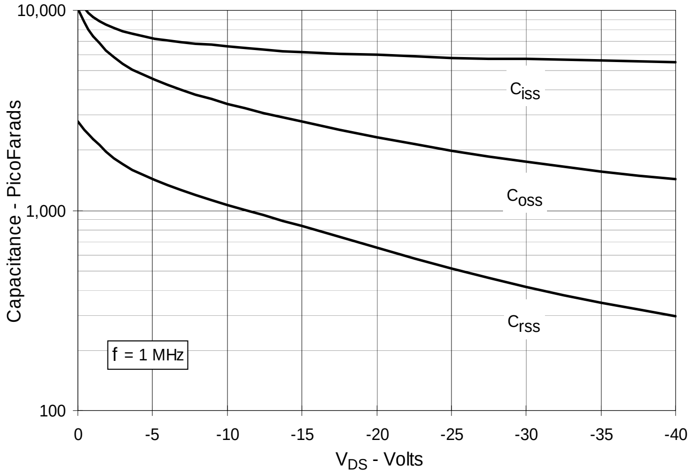
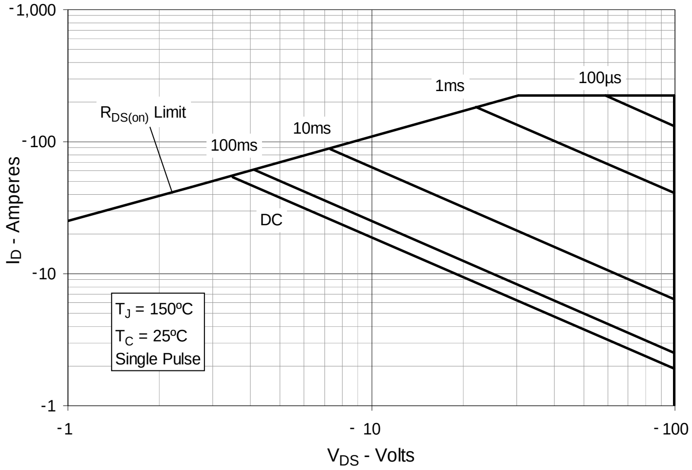


Fig. 12. Forward-Bias Safe Operating Area



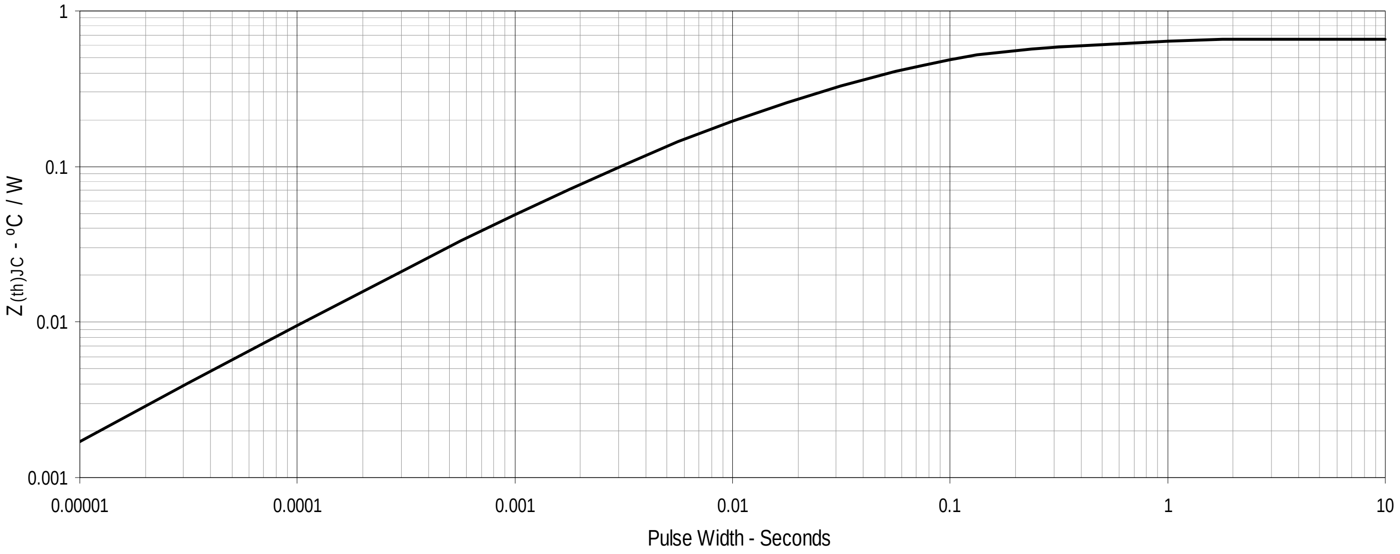


Fig. 13. Maximum Transient Thermal Impedance

IXYS REF: T_90P10P(B7) 5-13-08