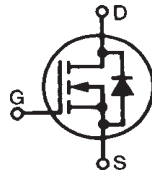


Polar™ Power MOSFET

IXTT170N10P
IXTQ170N10P
IXTK170N10P

$V_{DSS} = 100V$
 $I_{D25} = 170A$
 $R_{DS(on)} \leq 9m\Omega$

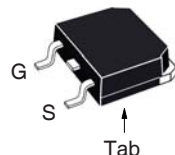
N-Channel Enhancement Mode
Avalanche Rated



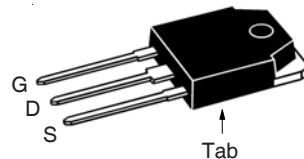
Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ C$ to $175^\circ C$	100	V
V_{DGR}	$T_J = 25^\circ C$ to $175^\circ C$, $R_{GS} = 1M\Omega$	100	V
V_{GSS}	Continuous	± 20	V
V_{GSM}	Transient	± 30	V
I_{D25}	$T_C = 25^\circ C$	170	A
$I_{L(RMS)}$	External Lead Current Limit	160	A
I_{DM}	$T_C = 25^\circ C$, Pulse Width Limited by T_{JM}	350	A
I_A	$T_C = 25^\circ C$	60	A
E_{AS}	$T_C = 25^\circ C$	2	J
dv/dt	$I_S \leq I_{DM}$, $V_{DD} \leq V_{DSS}$, $T_J \leq 175^\circ C$	10	V/ns
P_D	$T_C = 25^\circ C$	715	W
T_J		-55 to +175	$^\circ C$
T_{JM}		+175	$^\circ C$
T_{stg}		-55 to +175	$^\circ C$
T_L	1.6mm (0.063in) from Case for 10s	300	$^\circ C$
T_{SOLD}	Plastic Body for 10s	260	$^\circ C$
M_d	Mounting Torque (TO-264 & TO-3P)	1.13/10	Nm/lb.in.
Weight	TO-268	4.0	g
	TO-3P	5.5	g
	TO-264	10.0	g

Symbol	Test Conditions ($T_J = 25^\circ C$, Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
BV_{DSS}	$V_{GS} = 0V$, $I_D = 250\mu A$	100		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\mu A$	2.5		5.0 V
I_{GSS}	$V_{GS} = \pm 20V$, $V_{DS} = 0V$			± 100 nA
I_{DSS}	$V_{DS} = V_{DSS}$, $V_{GS} = 0V$			25 μA 250 μA $T_J = 150^\circ C$
$R_{DS(on)}$	$V_{GS} = 10V$, $I_D = 0.5 \cdot I_{D25}$, Note 1 $V_{GS} = 15V$, $I_D = 350A$		7	9 m Ω m Ω

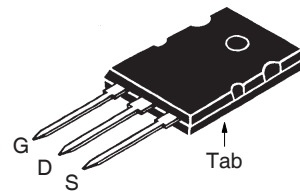
TO-268 (IXTT)



TO-3P (IXTQ)



TO-264 (IXTK)



G = Gate D = Drain
S = Source Tab = Drain

Features

- International Standard Packages
- Fast Intrinsic Rectifier
- Avalanche Rated
- Low $R_{DS(ON)}$ and Q_G
- Low Package Inductance

Advantages

- High Power Density
- Easy to Mount
- Space Savings

Applications

- Switch-Mode and Resonant-Mode Power Supplies
- DC-DC Converters
- Laser Drivers
- AC and DC Motor Drives
- Robotics and Servo Controls

Symbol	Test Conditions	Characteristic Values		
$(T_J = 25^\circ\text{C}, \text{ Unless Otherwise Specified})$		Min.	Typ.	Max.
g_{fs}	$V_{DS} = 10\text{V}, I_D = 0.5 \cdot I_{D25}, \text{ Note 1}$	50	72	S
C_{iss}	$V_{GS} = 0\text{V}, V_{DS} = 25\text{V}, f = 1\text{MHz}$		6000	pF
C_{oss}			2340	pF
C_{rss}			730	pF
$t_{d(on)}$	Resistive Switching Times $V_{GS} = 10\text{V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 60\text{A}$ $R_G = 3.3\Omega \text{ (External)}$		35	ns
t_r			50	ns
$t_{d(off)}$			90	ns
t_f			33	ns
$Q_{g(on)}$	$V_{GS} = 10\text{V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$		198	nC
Q_{gs}			39	nC
Q_{gd}			107	nC
R_{thJC}				0.21 $^\circ\text{C/W}$
R_{thCS}	(TO-3P)		0.25	$^\circ\text{C/W}$
	(TO-264)		0.15	$^\circ\text{C/W}$

Source-Drain Diode

Symbol	Test Conditions	Characteristic Values		
$(T_J = 25^\circ\text{C}, \text{ Unless Otherwise Specified})$		Min.	Typ.	Max.
I_S	$V_{GS} = 0\text{V}$			170 A
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}			350 A
V_{SD}	$I_F = I_S, V_{GS} = 0\text{V}, \text{ Note 1}$			1.5 V
t_{rr}	$I_F = 25\text{A}, -di/dt = 100\text{A}/\mu\text{s},$ $V_R = 50\text{V}, V_{GS} = 0\text{V}$		120	ns
Q_{RM}			2.0	μC

Note 1. Pulse test, $t \leq 300\mu\text{s}$, duty cycle, $d \leq 2\%$.

TO-268 (IXTT) Outline

Technical drawing of the TO-268 (IXTT) package showing three views: top, side, and detail.

- Top View:** Shows dimensions E (total width), D (height), L1 (lead width), L2 (lead length), L3 (lead thickness), L4 (lead width), and b (lead width).
- Side View:** Shows dimensions A (lead height), A1 (lead height), C2 (lead height), H (height), D1 (height), and C (lead length).
- Detail View:** Shows dimensions L3 (lead thickness), L (lead length), and A2 (lead width).

SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.193	.201	4.90	5.10
A1	.106	.114	2.70	2.90
A2	.001	.010	0.02	0.25
b	.045	.057	1.15	1.45
b2	.075	.083	1.90	2.10
C	.016	.026	0.40	0.65
C2	.057	.063	1.45	1.60
D	.543	.551	13.80	14.00
D1	.488	.500	12.40	12.70
E	.624	.632	15.85	16.05
E1	.524	.535	13.30	13.60
e	.215 BSC		5.45 BSC	
H	.736	.752	18.70	19.10
L	.094	.106	2.40	2.70
L1	.047	.055	1.20	1.40
L2	.039	.045	1.00	1.15
L3	.010 BSC		0.25 BSC	
L4	.150	.161	3.80	4.10

Fig. 1. Output Characteristics @ $T_J = 25^\circ\text{C}$

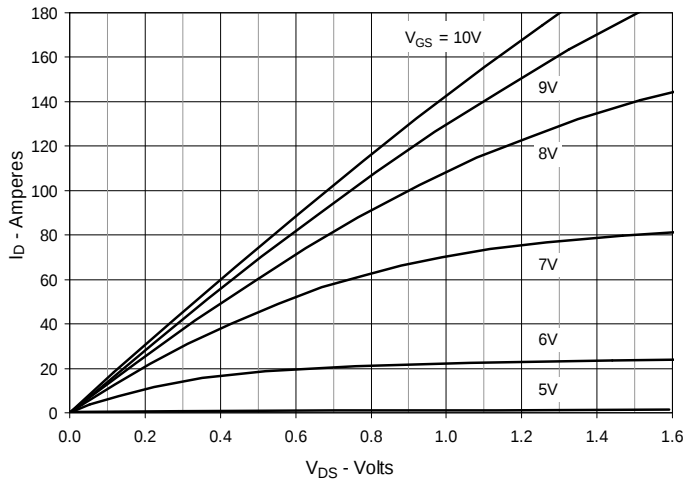


Fig. 2. Extended Output Characteristics @ $T_J = 25^\circ\text{C}$

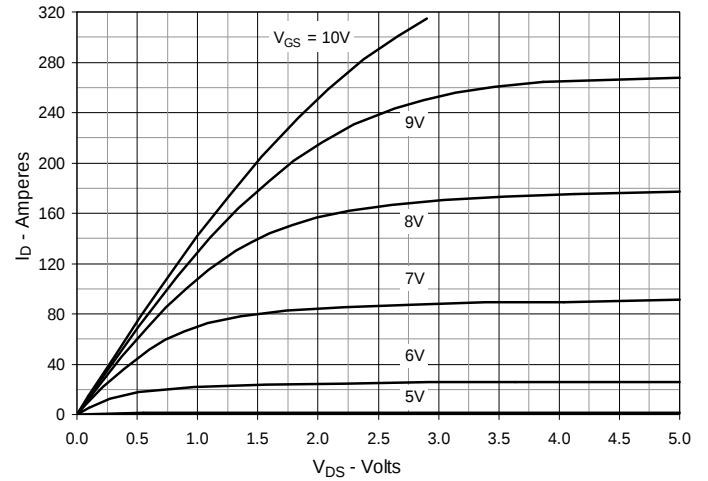


Fig. 3. Output Characteristics @ $T_J = 150^\circ\text{C}$

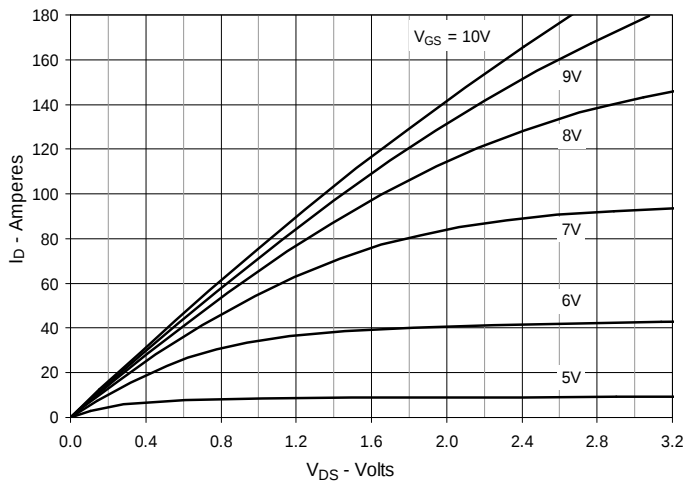


Fig. 4. $R_{DS(on)}$ Normalized to $I_D = 85\text{A}$ Value vs. Junction Temperature

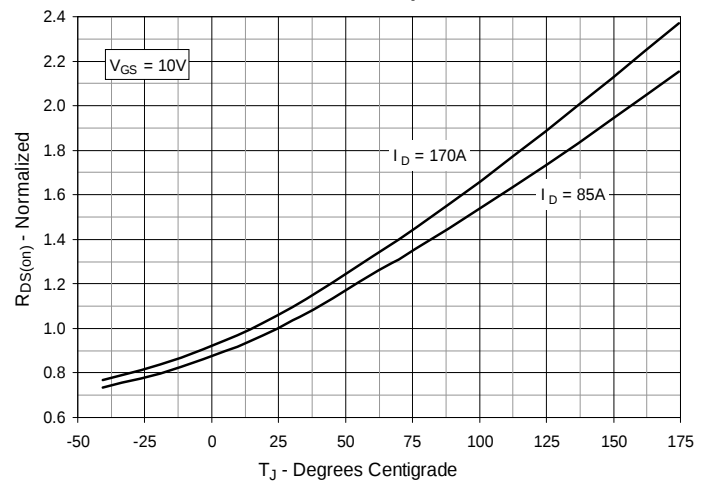


Fig. 5. $R_{DS(on)}$ Normalized to $I_D = 85\text{A}$ Value vs. Drain Current

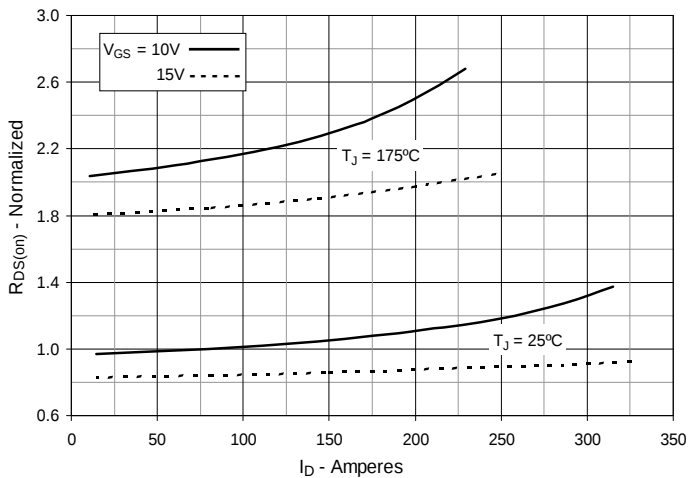


Fig. 6. Maximum Drain Current vs. Case Temperature

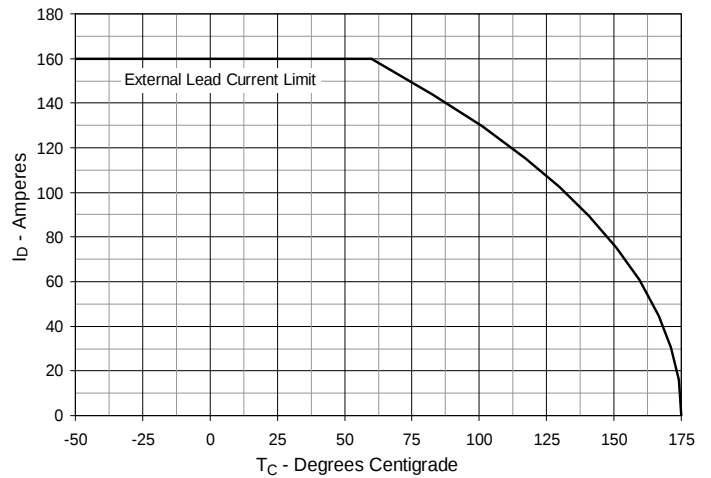


Fig. 7. Input Admittance

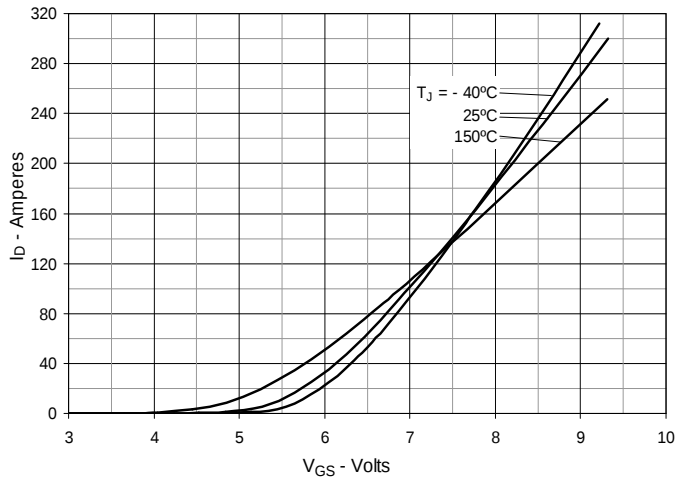


Fig. 8. Transconductance

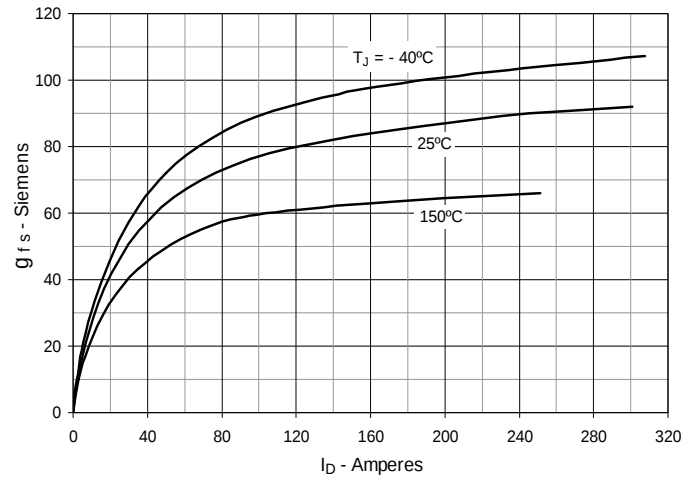


Fig. 9. Forward Voltage Drop of Intrinsic Diode

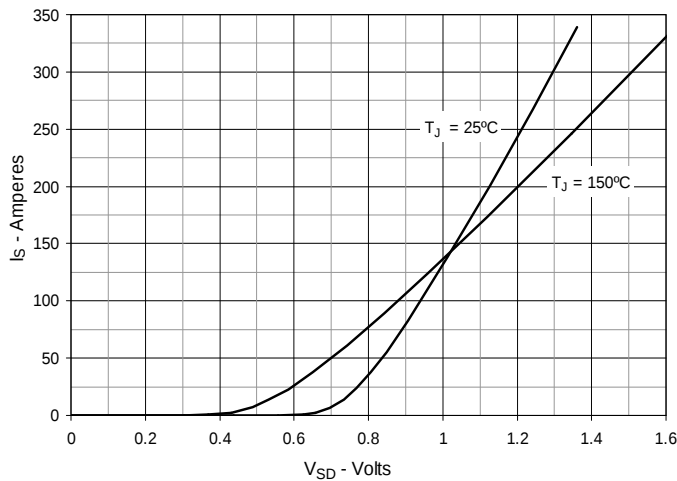


Fig. 10. Gate Charge

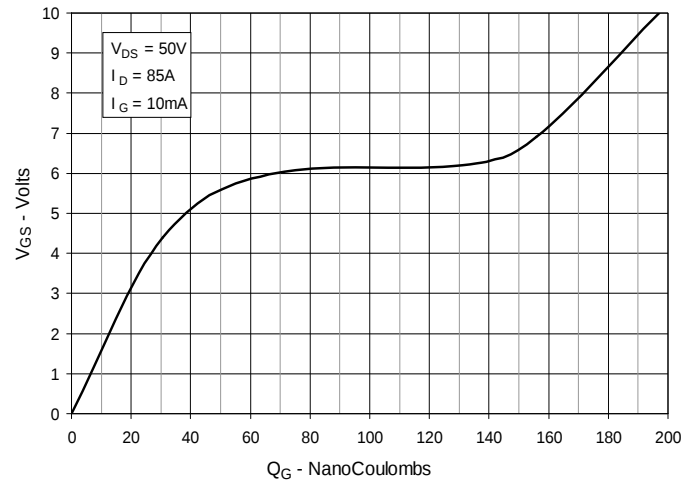


Fig. 11. Capacitance

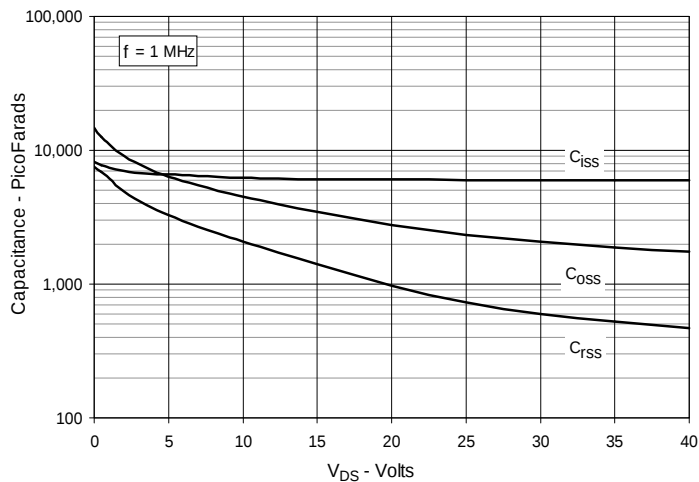


Fig. 12. Forward-Bias Safe Operating Area

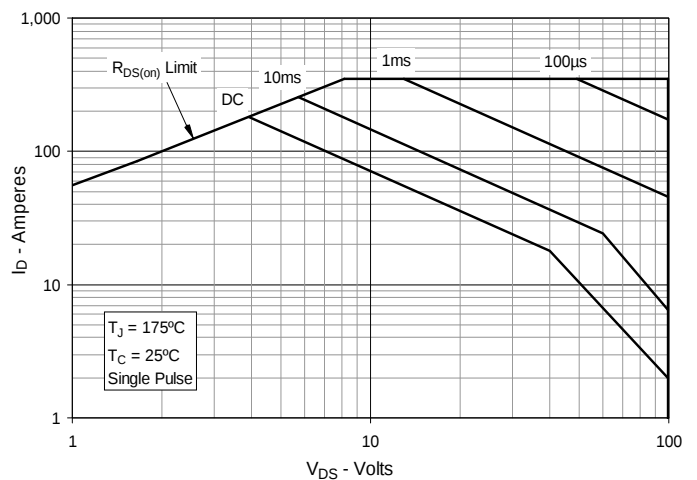
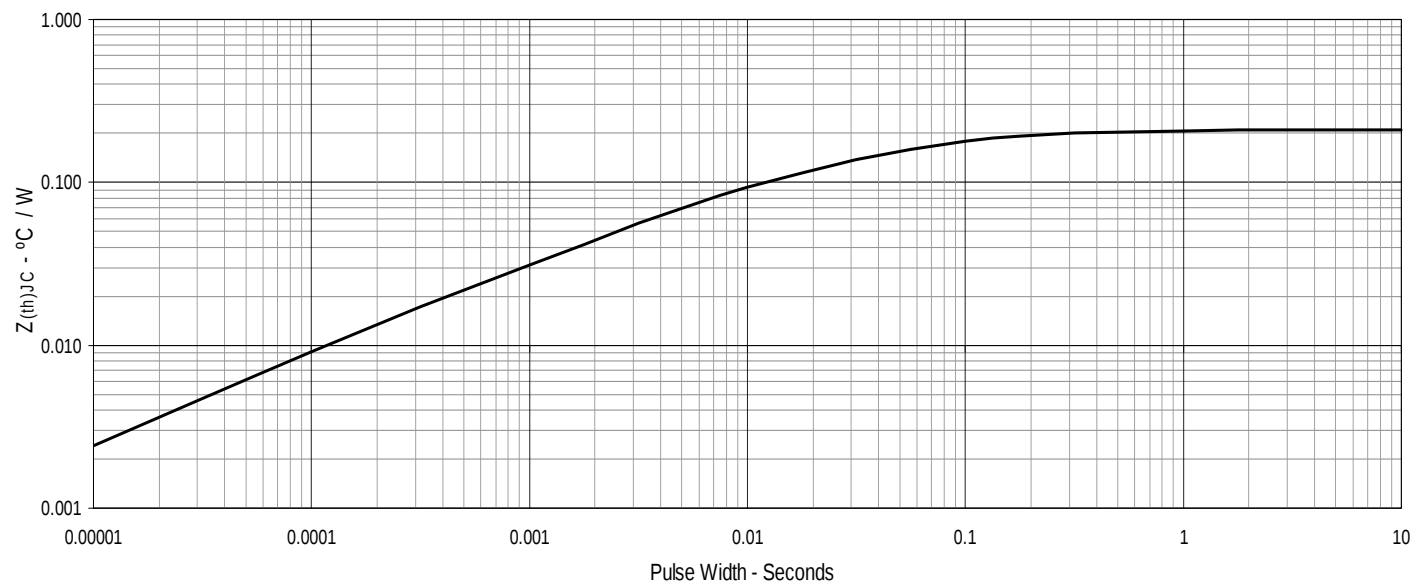


Fig. 13. Maximum Transient Thermal Impedance





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.