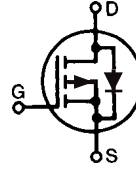


TrenchP™ Power MOSFETs

IXTK120P20T IXTX120P20T

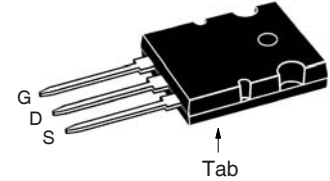
P-Channel Enhancement Mode
Avalanche Rated
Fast Intrinsic Rectifier



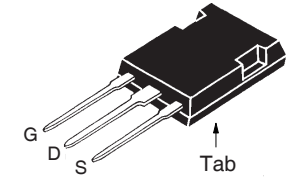
$$\begin{aligned} V_{DSS} &= -200V \\ I_{D25} &= -120A \\ R_{DS(on)} &\leq 30m\Omega \\ t_{rr} &\leq 300ns \end{aligned}$$

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ\text{C}$ to 150°C	- 200	V
V_{DGR}	$T_J = 25^\circ\text{C}$ to 150°C , $R_{GS} = 1M\Omega$	- 200	V
V_{GSS}	Continuous	± 15	V
V_{GSM}	Transient	± 25	V
I_{D25}	$T_C = 25^\circ\text{C}$	-120	A
I_{DM}	$T_C = 25^\circ\text{C}$, Pulse Width Limited by T_{JM}	- 400	A
I_A	$T_C = 25^\circ\text{C}$	-100	A
E_{AS}	$T_C = 25^\circ\text{C}$	3	J
dv/dt	$I_S \leq I_{DM}$, $V_{DD} \leq V_{DSS}$, $T_J \leq 150^\circ\text{C}$	10	V/ns
P_D	$T_C = 25^\circ\text{C}$	1040	W
T_J		-55 ... +150	$^\circ\text{C}$
T_{JM}		150	$^\circ\text{C}$
T_{stg}		-55 ... +150	$^\circ\text{C}$
T_L	1.6mm (0.062 in.) from Case for 10s	300	$^\circ\text{C}$
T_{SOLD}	Plastic Body for 10s	260	$^\circ\text{C}$
M_d	Mounting Torque (TO-264)	1.13/10	Nm/lb.in.
F_C	Mounting Force (PLUS247)	20..120 /4.5..27	N/lb.
Weight	TO-264	10	g
	PLUS247	6	g

TO-264 (IXTK)



PLUS247 (IXTX)



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

Features

- Avalanche Rated
- Extended FBSOA
- Fast Intrinsic Rectifier
- Low $R_{DS(ON)}$ and Q_g

Advantages

- Easy to Mount
- Space Savings
- High Power Density

Applications

- High-Side Switching
- Push Pull Amplifiers
- DC Choppers
- Automatic Test Equipment
- Current Regulators
- Battery Charger Applications

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$ Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
BV_{DSS}	$V_{GS} = 0V$, $I_D = -250\mu A$	- 200		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = -250\mu A$	- 2.5		V
I_{GSS}	$V_{GS} = \pm 15V$, $V_{DS} = 0V$			± 200 nA
I_{DSS}	$V_{DS} = V_{DSS}$, $V_{GS} = 0V$ $T_J = 125^\circ\text{C}$			- 25 μA - 300 μA
$R_{DS(on)}$	$V_{GS} = -10V$, $I_D = 0.5 \cdot I_{D25}$, Note 1			30 m Ω

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$ Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
g_{fs}	$V_{DS} = -10\text{V}$, $I_D = -60\text{A}$, Note 1	85	145	S
C_{iss}	$V_{GS} = 0\text{V}$, $V_{DS} = -25\text{V}$, $f = 1\text{MHz}$		73	nF
C_{oss}			2550	pF
C_{rss}			480	pF
$t_{d(on)}$	Resistive Switching Times $V_{GS} = -10\text{V}$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 0.5 \cdot I_{D25}$ $R_G = 1\Omega$ (External)		90	ns
t_r			85	ns
$t_{d(off)}$			200	ns
t_f			50	ns
$Q_{g(on)}$	$V_{GS} = -10\text{V}$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 0.5 \cdot I_{D25}$		740	nC
Q_{gs}			220	nC
Q_{gd}			120	nC
R_{thJC}				0.12°C/W
R_{thCS}			0.15	$^\circ\text{C/W}$

Source-Drain Diode

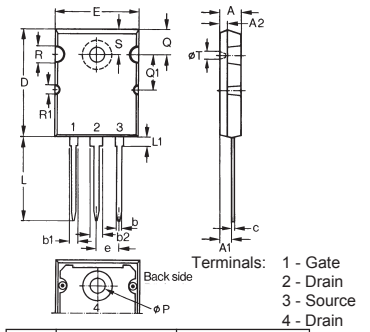
Symbol	Test Conditions ($T_J = 25^\circ\text{C}$ Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
I_S	$V_{GS} = 0\text{V}$			-120 A
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}			-480 A
V_{SD}	$I_F = -100\text{A}$, $V_{GS} = 0\text{V}$, Note 1			-1.4 V
t_{rr}	$I_F = -60\text{A}$, $-di/dt = -100\text{A}/\mu\text{s}$ $V_R = -100\text{V}$, $V_{GS} = 0\text{V}$		3.3	ns
Q_{RM}			25.6	μC
I_{RM}				A

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

ADVANCE TECHNICAL INFORMATION

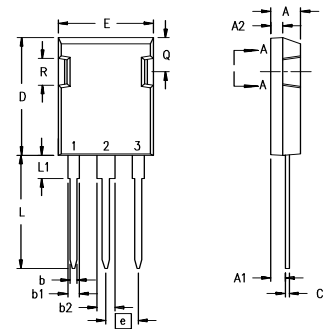
The product presented herein is under development. The Technical Specifications offered are derived from a subjective evaluation of the design, based upon prior knowledge and experience, and constitute a "considered reflection" of the anticipated result. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

TO-264 AA Outline



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.82	5.13	.190	.202
A1	2.54	2.89	.100	.114
A2	2.00	2.10	.079	.083
b	1.12	1.42	.044	.056
b1	2.39	2.69	.094	.106
b2	2.90	3.09	.114	.122
c	0.53	0.83	.021	.033
D	25.91	26.16	1.020	1.030
E	19.81	19.96	.780	.786
e	5.46 BSC		.215 BSC	
J	0.00	0.25	.000	.010
K	0.00	0.25	.000	.010
L	20.32	20.83	.800	.820
L1	2.29	2.59	.090	.102
P	3.17	3.66	.125	.144
Q	6.07	6.27	.239	.247
Q1	8.38	8.69	.330	.342
R	3.81	4.32	.150	.170
R1	1.78	2.29	.070	.090
S	6.04	6.30	.238	.248
T	1.57	1.83	.062	.072

PLUS247™ Outline



Terminals: 1 - Gate
2 - Drain
3 - Source

Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.83	5.21	.190	.205
A1	2.29	2.54	.090	.100
A2	1.91	2.16	.075	.085
b	1.14	1.40	.045	.055
b1	1.91	2.13	.075	.084
b2	2.92	3.12	.115	.123
C	0.61	0.80	.024	.031
D	20.80	21.34	.819	.840
E	15.75	16.13	.620	.635
e	5.45 BSC		.215 BSC	
L	19.81	20.32	.780	.800
L1	3.81	4.32	.150	.170
Q	5.59	6.20	.220	.244
R	4.32	4.83	.170	.190

IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.

IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents:

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	7,005,734 B2	7,157,338B2
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	7,063,975 B2	
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	7,071,537	

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

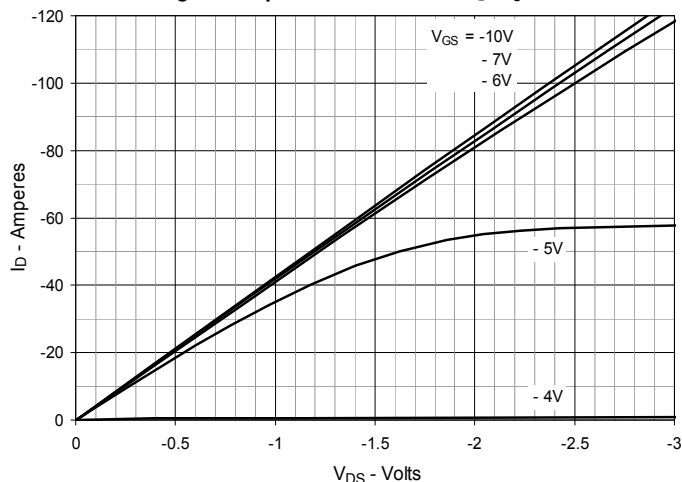


Fig. 2. Extended Output Characteristics @ $T_J = 25^\circ\text{C}$

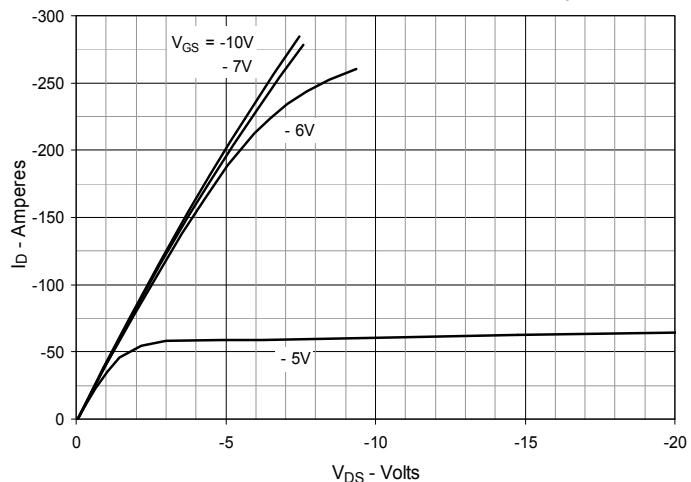


Fig. 3. Output Characteristics @ $T_J = 125^\circ\text{C}$

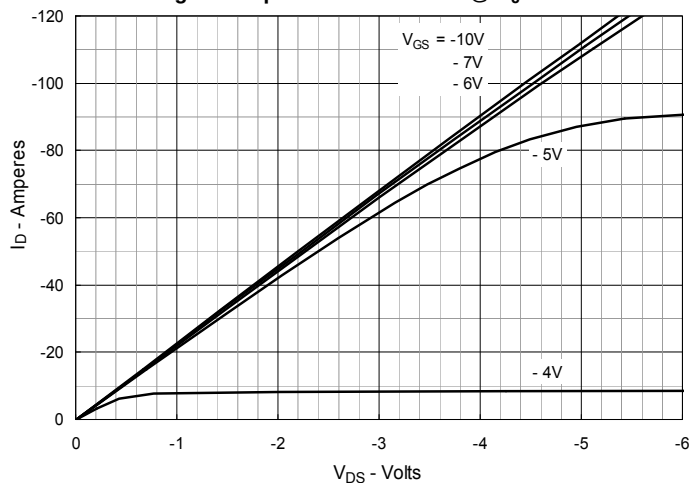


Fig. 4. $R_{DS(on)}$ Normalized to $I_D = -60\text{A}$ vs. Junction Temperature

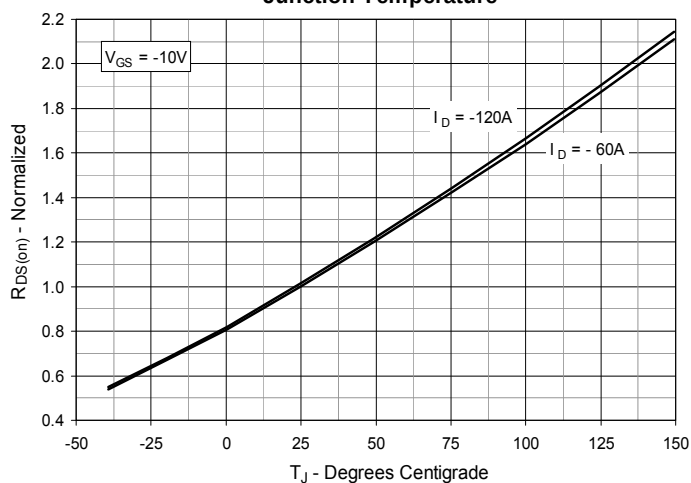


Fig. 5. $R_{DS(on)}$ Normalized to $I_D = -60\text{A}$ vs. Drain Current

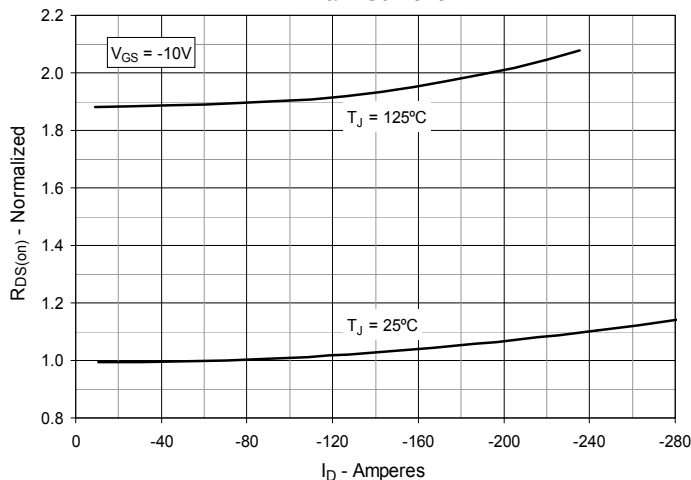


Fig. 6. Maximum Drain Current vs. Case Temperature

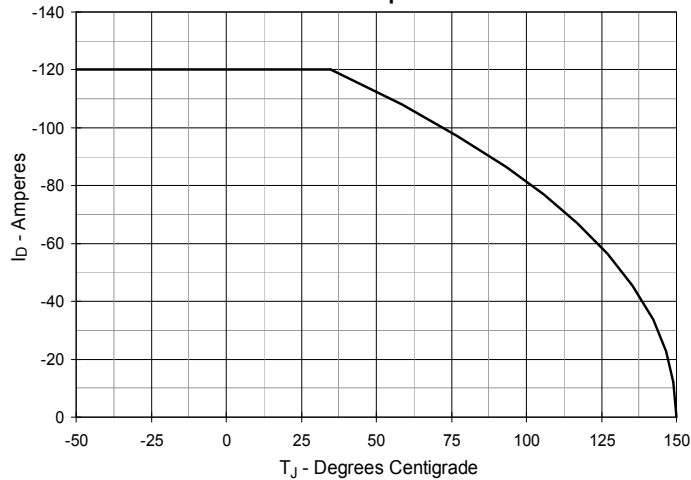


Fig. 7. Input Admittance

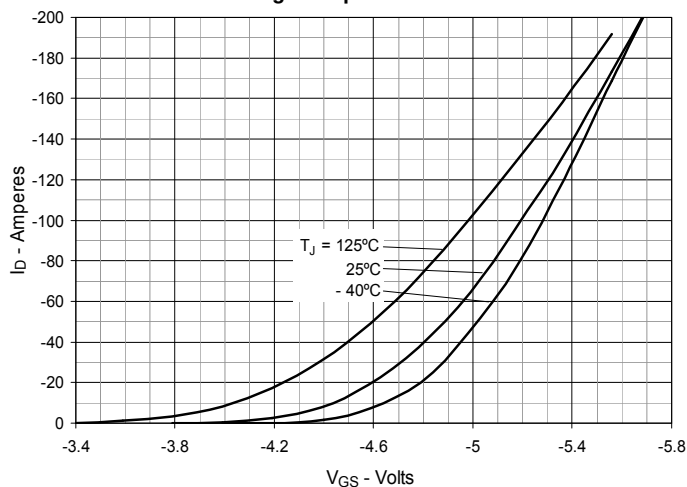


Fig. 8. Transconductance

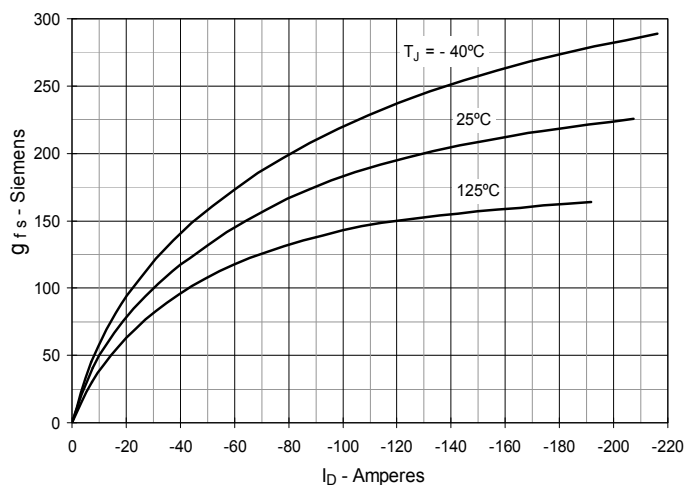


Fig. 9. Forward Voltage Drop of Intrinsic Diode

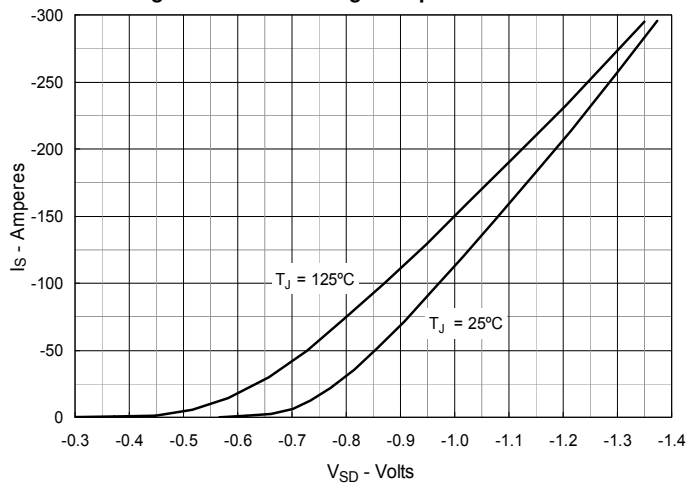


Fig. 10. Gate Charge

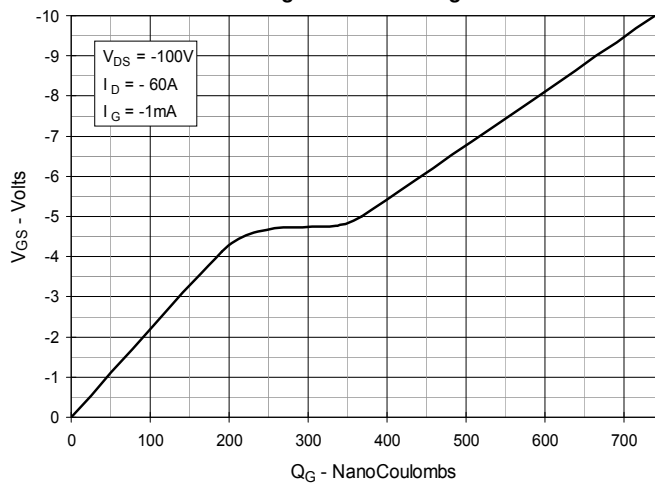


Fig. 11. Capacitance

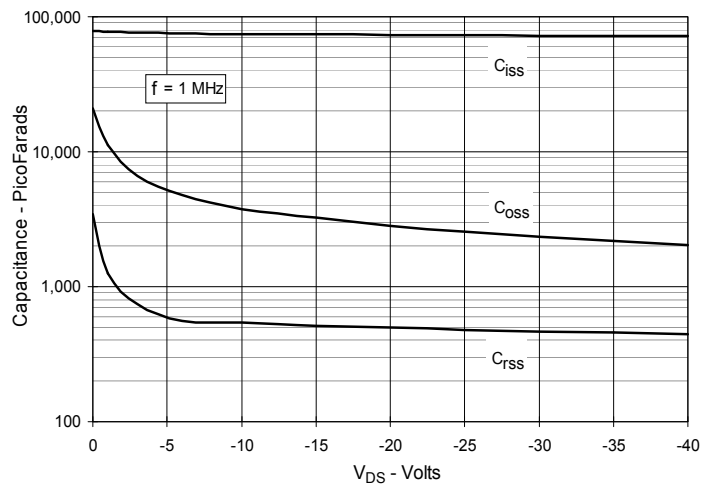


Fig. 12. Forward-Bias Safe Operating Area

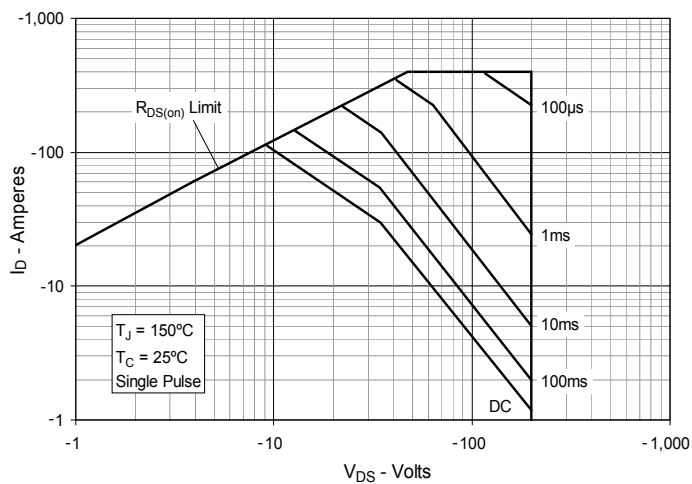


Fig. 13. Resistive Turn-on Rise Time vs. Junction Temperature

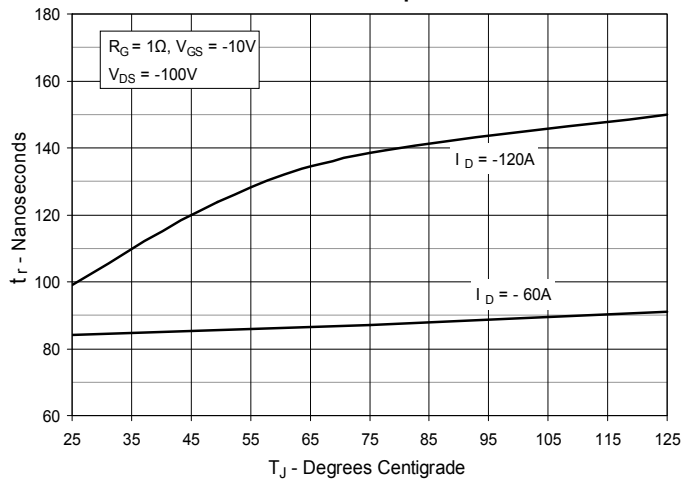


Fig. 14. Resistive Turn-on Rise Time vs. Drain Current

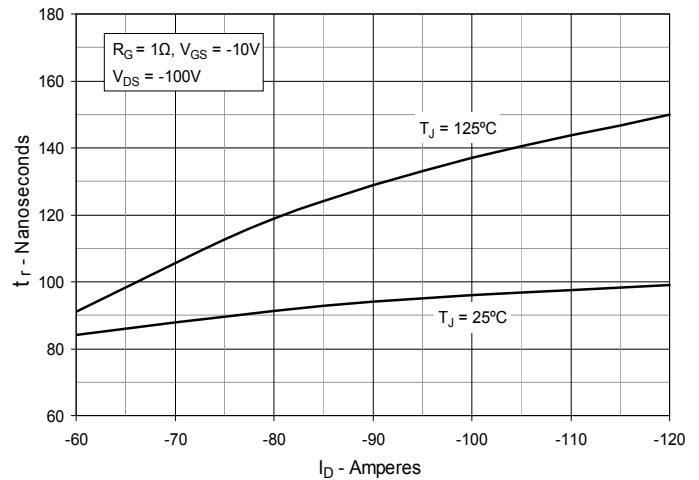


Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance

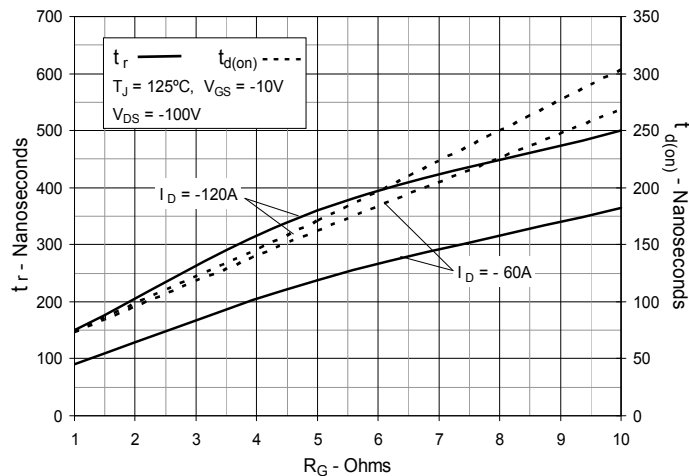


Fig. 16. Resistive Turn-off Switching Times vs. Junction Temperature

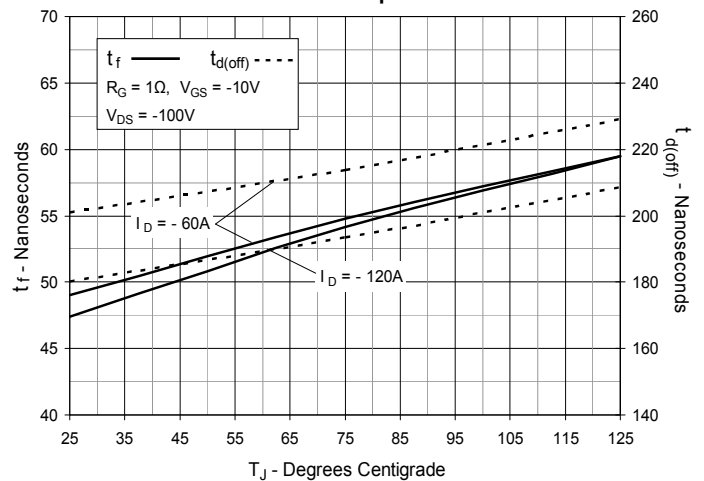


Fig. 17. Resistive Turn-off Switching Times vs. Drain Current

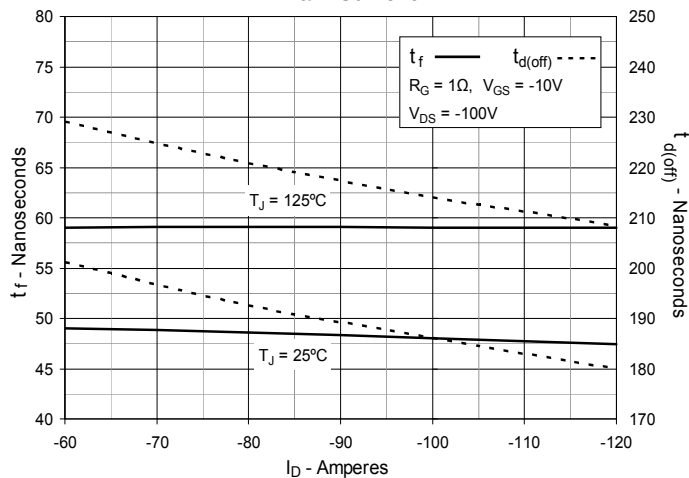


Fig. 18. Resistive Turn-off Switching Times vs. Gate Resistance

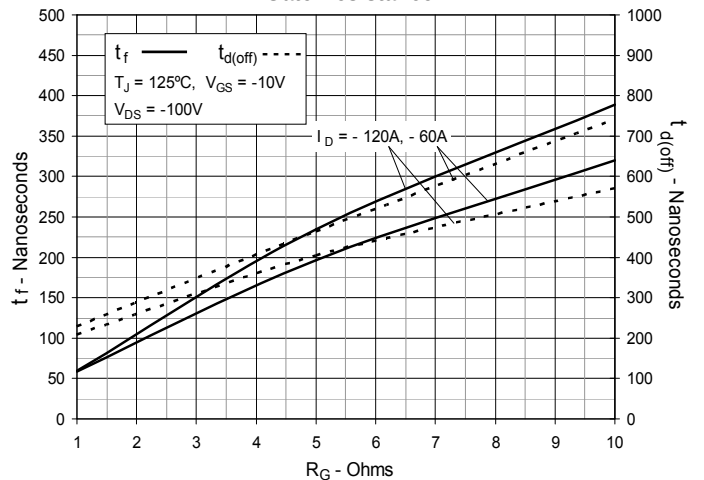


Fig. 19. Maximum Transient Thermal Impedance

