

Trench™ Power MOSFETs

IXTC110N25T

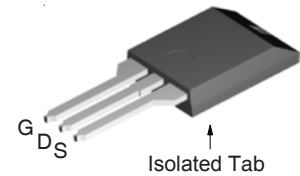
$V_{DSS} = 250V$
 $I_{D25} = 50A$
 $R_{DS(on)} \leq 27m\Omega$

(Electrically Isolated Tab)

N-Channel Enhancement Mode
 Fast Intrinsic Rectifier
 Avalanche Rated



ISOPLUS220
 E153432



G = Gate D = Drain
 S = Source

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ C$ to $150^\circ C$	250	V
V_{DGR}	$T_J = 25^\circ C$ to $150^\circ C$, $R_{GS} = 1M\Omega$	250	V
V_{GSS}	Continuous	± 20	V
V_{GSM}	Transient	± 30	V
I_{D25}	$T_C = 25^\circ C$	50	A
I_{DM}	$T_C = 25^\circ C$, Pulse Width Limited by T_{JM}	300	A
I_A	$T_C = 25^\circ C$	25	A
E_{AS}	$T_C = 25^\circ C$	1	J
dv/dt	$I_S \leq I_{DM}$, $V_{DD} \leq V_{DSS}$, $T_J \leq 150^\circ C$	10	V/ns
P_D	$T_C = 25^\circ C$	180	W
T_J		-55 ... +150	$^\circ C$
T_{JM}		150	$^\circ C$
T_{stg}		-55 ... +150	$^\circ C$
T_L	1.6mm (0.062 in.) from Case for 10s	300	$^\circ C$
T_{SOLD}	Plastic Body for 10s	260	$^\circ C$
V_{ISOL}	50/60 Hz, 1 Minute	2500	V~
F_C	Mounting Force	11..65/2.5..14.6	N/lb.
Weight		4	g

Features

- Silicon Chip on Direct-Copper Bond (DCB) Substrate
- Isolated Mounting Surface
- International Standard Package
- 2500V~ Electrical Isolation
- Fast Intrinsic Rectifier
- Avalanche Rated
- Low $R_{DS(on)}$

Advantages

- High Power Density
- Easy to Mount
- Space Savings

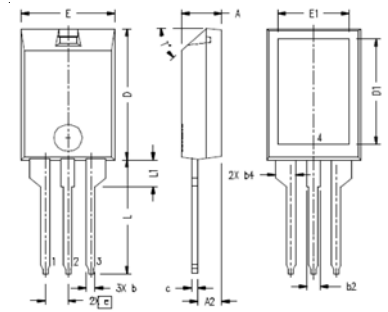
Applications

- DC-DC Converters
- Battery Chargers
- Switch-Mode and Resonant-Mode Power Supplies
- DC Choppers
- AC Motor Drives
- Uninterruptible Power Supplies

Symbol	Test Conditions ($T_J = 25^\circ C$ Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
BV_{DSS}	$V_{GS} = 0V$, $I_D = 250\mu A$	250		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 1mA$	3.0		5.0 V
I_{GSS}	$V_{GS} = \pm 20V$, $V_{DS} = 0V$			± 200 nA
I_{DSS}	$V_{DS} = V_{DSS}$, $V_{GS} = 0V$ $T_J = 125^\circ C$			5 μA 250 μA
$R_{DS(on)}$	$V_{GS} = 10V$, $I_D = 55A$, Notes 1, 2			27 m Ω

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$ Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
g_{fs}	$V_{DS} = 10\text{V}, I_D = 55\text{A}$, Note 1	65	110	S
C_{iss}	$V_{GS} = 0\text{V}, V_{DS} = 25\text{V}, f = 1\text{MHz}$		9400	pF
C_{oss}			850	pF
C_{rss}			55	pF
$t_{d(on)}$	Resistive Switching Times $V_{GS} = 15\text{V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 55\text{A}$ $R_G = 2\Omega$ (External)		19	ns
t_r			27	ns
$t_{d(off)}$			60	ns
t_f			27	ns
$Q_{g(on)}$	$V_{GS} = 10\text{V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 25\text{A}$		157	nC
Q_{gs}			40	nC
Q_{gd}			50	nC
R_{thJC}				0.69°C/W
R_{thCS}		0.21		$^\circ\text{C/W}$

ISOPLUS220 (IXTC) Outline



1. Gate 2. Drain
3. Source 4. Isolated

Note: Bottom heatsink (Pin 4) is electrically isolated from Pins 1, 2, & 3.

SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.157	.197	4.00	5.00
A2	.098	.118	2.50	3.00
b	.035	.051	0.90	1.30
b2	.049	.065	1.25	1.65
b4	.093	.100	2.35	2.55
c	.028	.039	0.70	1.00
D	.591	.630	15.00	16.00
D1	.472	.512	12.00	13.00
E	.394	.433	10.00	11.00
E1	.295	.335	7.50	8.50
e	.100 BASIC		2.55 BASIC	
L	.512	.571	13.00	14.50
L1	.118	.138	3.00	3.50
T*			42.5*	47.5*

Source-Drain Diode

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$ Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
I_S	$V_{GS} = 0\text{V}$			110 A
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}			350 A
V_{SD}	$I_F = 55\text{A}, V_{GS} = 0\text{V}$, Note 1			1.2 V
t_{rr}	$I_F = 55\text{A}, -di/dt = 250\text{A}/\mu\text{s}$ $V_R = 100\text{V}, V_{GS} = 0\text{V}$		170	ns
I_{RM}			27	A
Q_{RM}			2.3	μC

Notes:

1. Pulse test, $t \leq 300\mu\text{s}$, duty cycle, $d \leq 2\%$.
2. On through-hole package, $R_{DS(ON)}$ kelvin test contact location must be 5mm or less from the package body.

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
	4,860,072	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	

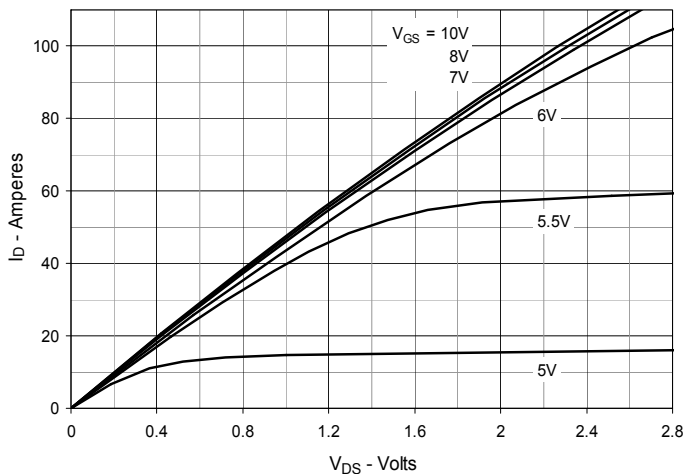
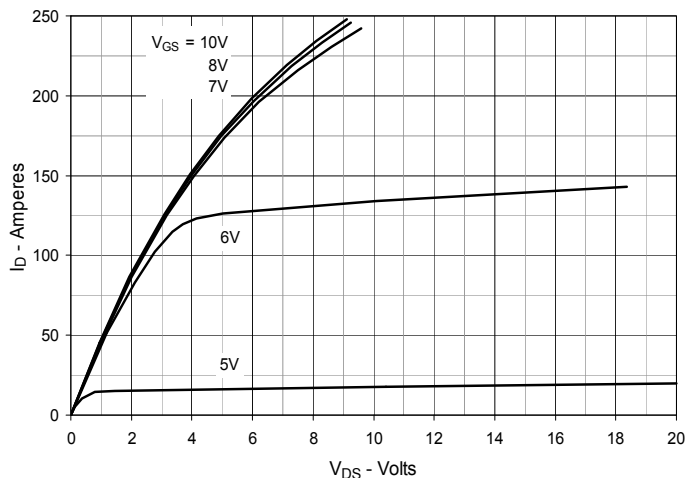
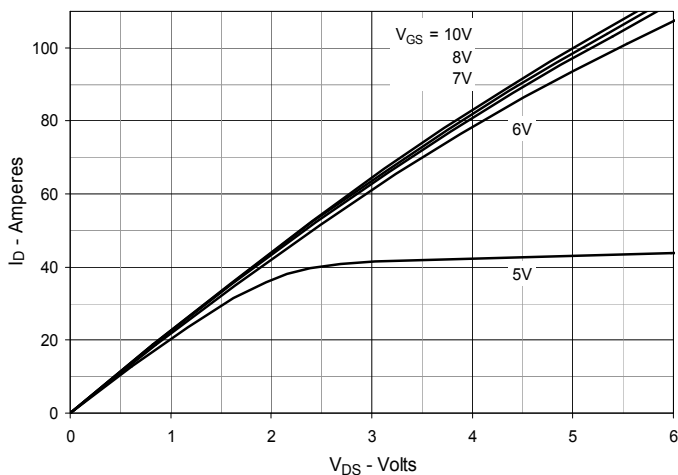
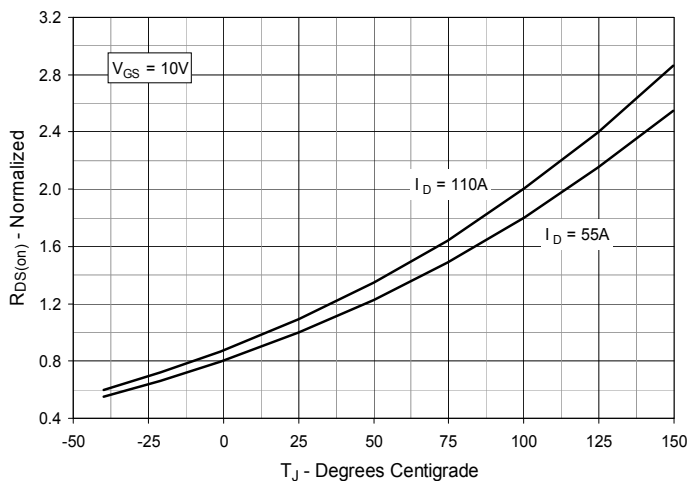
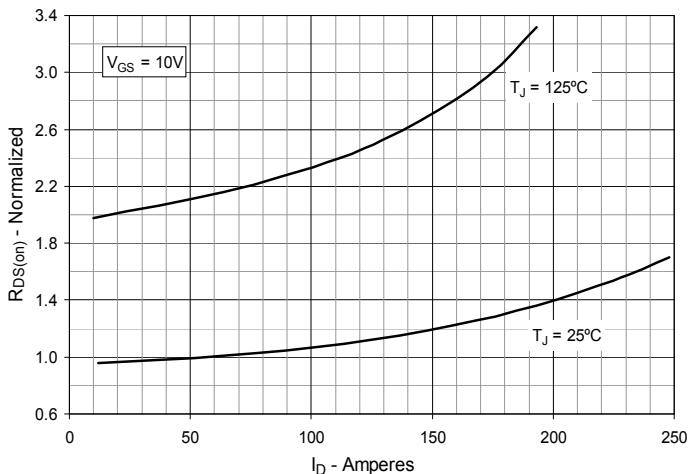
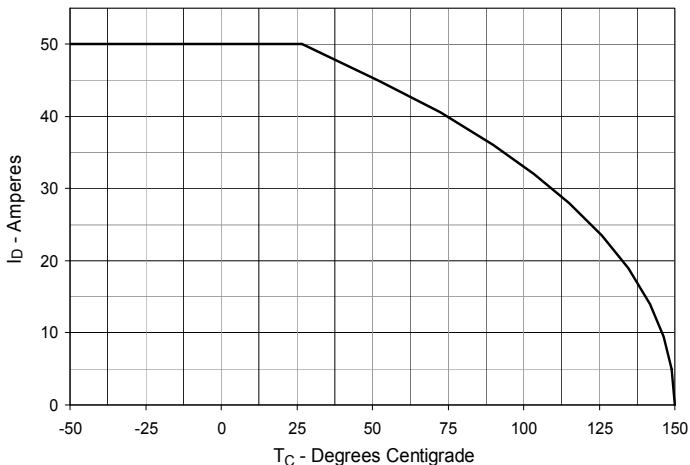
Fig. 1. Output Characteristics @ $T_J = 25^\circ\text{C}$

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 $I_D = 55\text{A}$ Value vs. Junction Temperature

Fig. 5. $R_{DS(on)}$ Normalized to $I_D = 55\text{A}$ Value vs. Drain Current

Fig. 6. Maximum Drain Current vs. Case Temperature


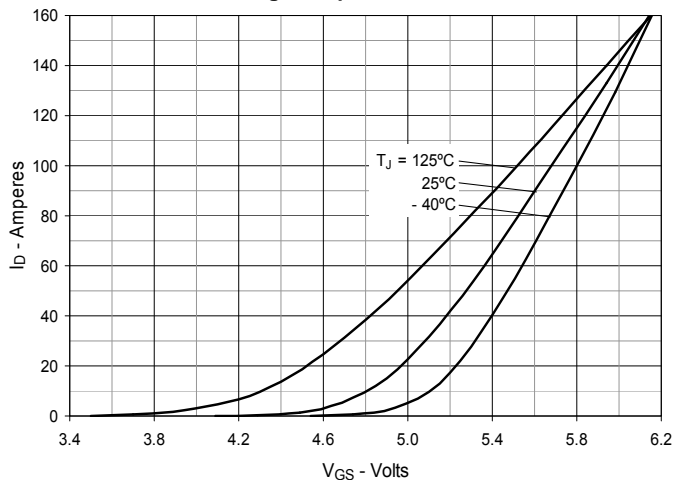
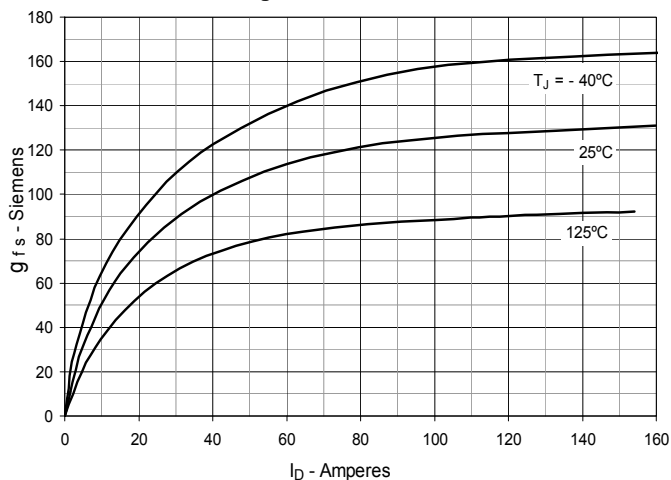
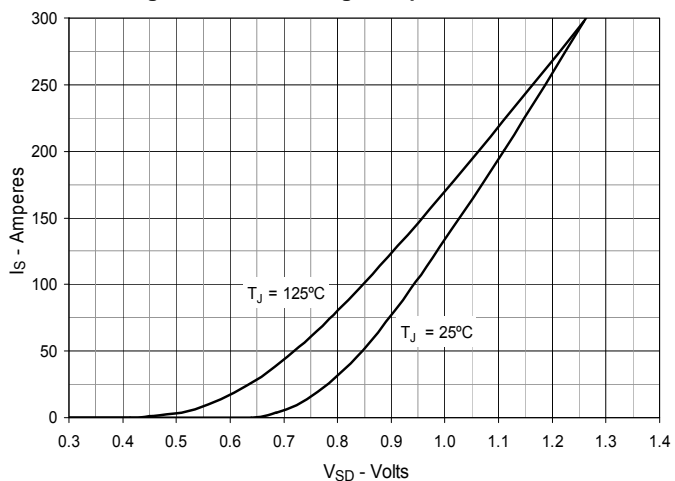
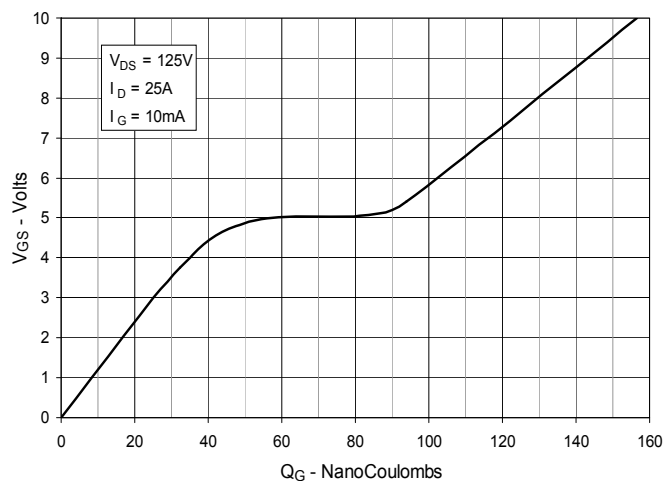
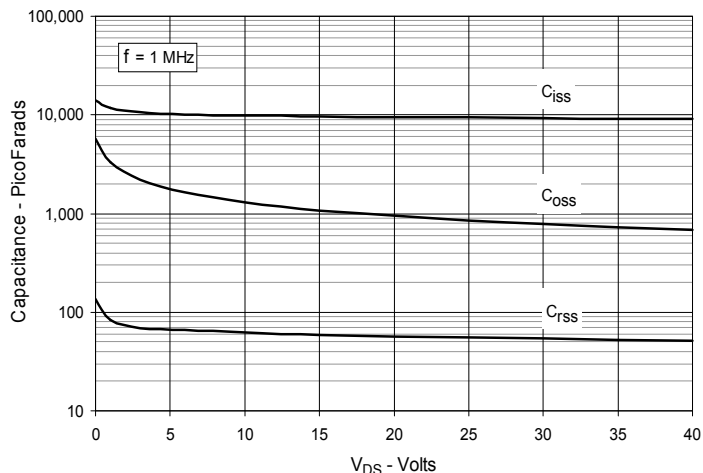
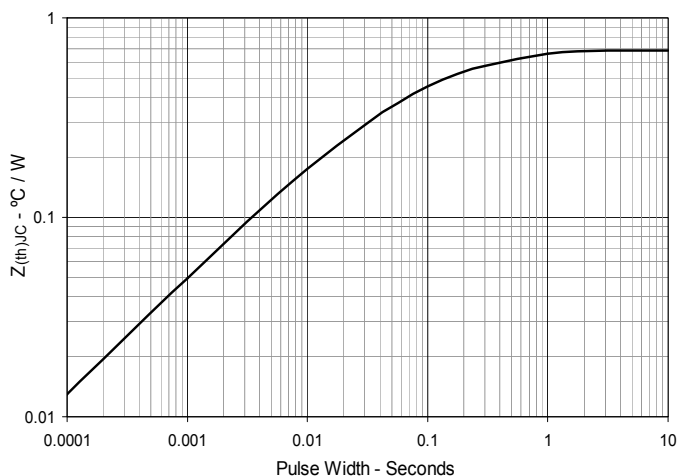
Fig. 7. Input Admittance

Fig. 8. Transconductance

Fig. 9. Forward Voltage Drop of Intrinsic Diode

Fig. 10. Gate Charge

Fig. 11. Capacitance

Fig. 12. Maximum Transient Thermal Impedance


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

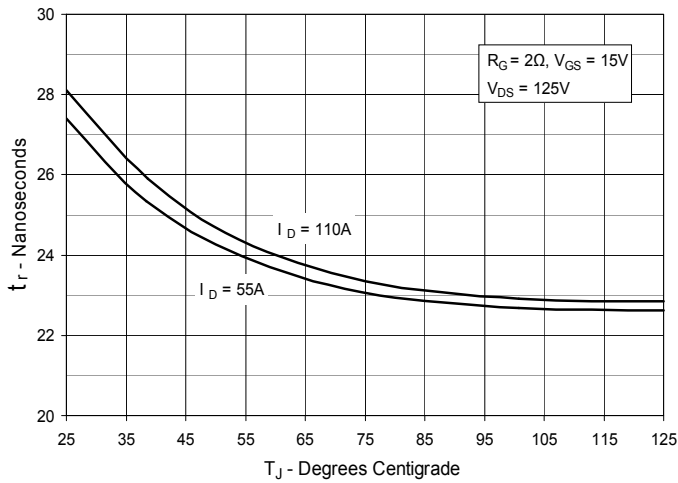


Fig. 14. Resistive Turn-on Rise Time vs. Drain Current

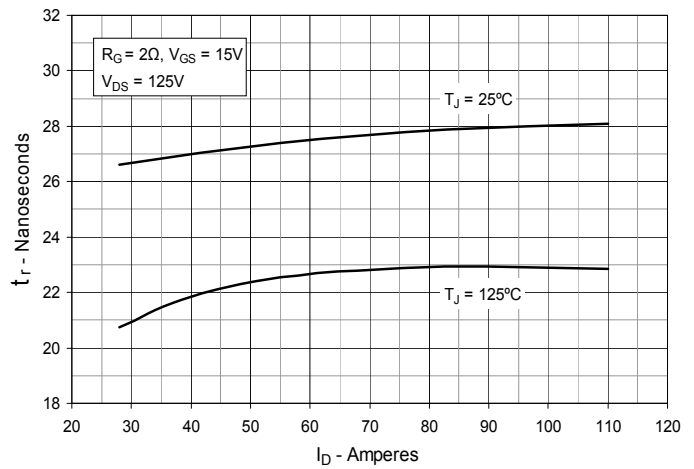


Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance

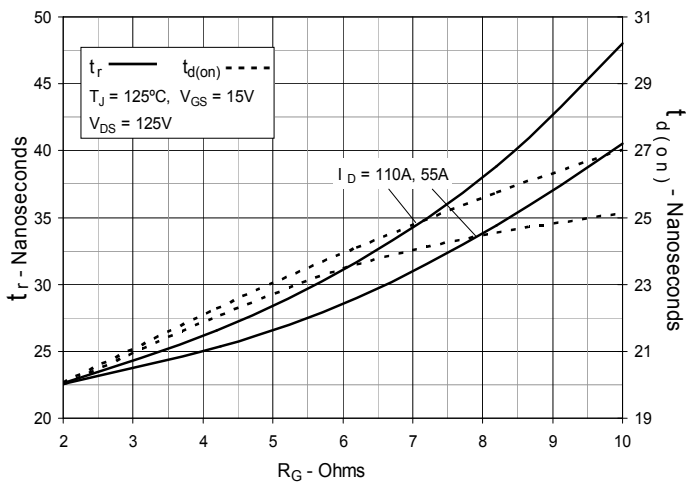


Fig. 16. Resistive Turn-off Switching Times vs. Junction Temperature

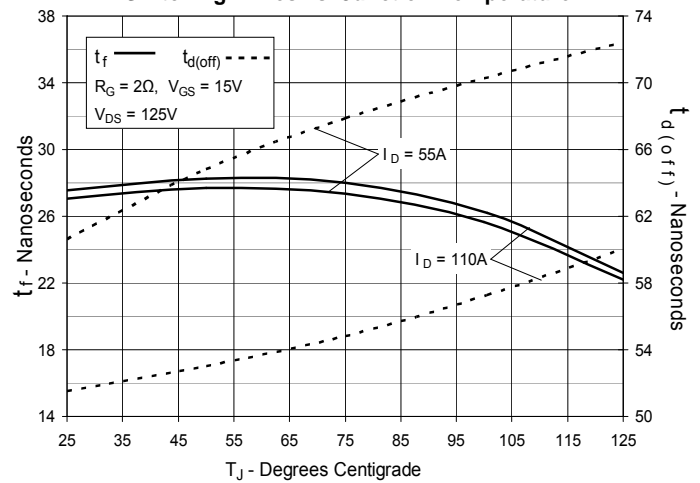


Fig. 17. Resistive Turn-off Switching Times vs. Drain Current

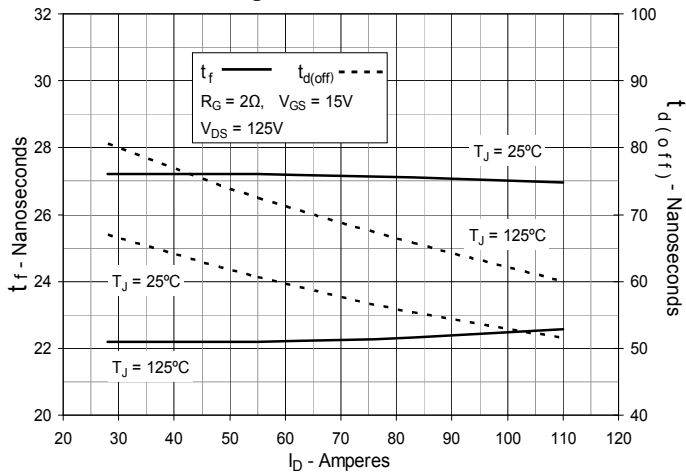


Fig. 18. Resistive Turn-off Switching Times vs. Gate Resistance

