IXYS

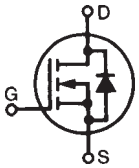
Trench™ Power MOSFET

IXTC110N25T

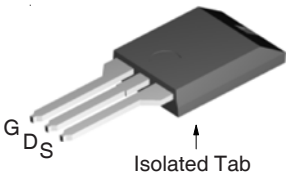
V_{DSS} = 250V
I_{D25} = 50A
$R_{DS(on)}$ ≤ 29mΩ

(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°C to 150°C	250	V
V_{DGR}	T_J = 25°C to 150°C, R_{GS} = 1MΩ	250	V
V_{GSS}	Continuous	±20	V
V_{GSM}	Transient	±30	V
I_{D25}	T_C = 25°C	50	A
I_{DM}	T_C = 25°C, Pulse Width Limited by T_{JM}	300	A
I_A	T_C = 25°C	25	A
E_{AS}	T_C = 25°C	1	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	180	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
T_L	Maximum Lead Temperature for Soldering	300	°C
T_{SOLD}	1.6 mm (0.062in.) from Case for 10s	260	°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

Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
BV_{DSS}	V_{GS} = 0V, I_D = 250μA	250			V
$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 1mA	3.0		5.0	V
I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V			±200	nA
I_{DSS}	V_{DS} = V_{DSS}, V_{GS} = 0V			5	μA
	T_J = 125°C			250	μA
$R_{DS(on)}$	V_{GS} = 10V, I_D = 55A, Notes 1, 2			29	mΩ

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 Moter Drives
- Uninterruptible Power Supplies

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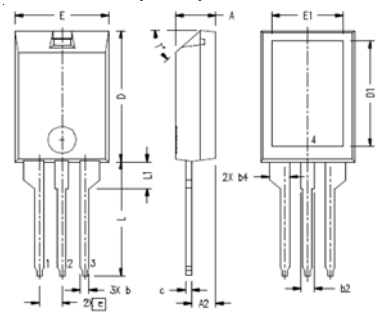
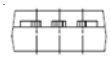
Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS} = 10V, I_D = 55A, Note 1	65	110		S
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		9400		pF
C_{oss}			850		pF
C_{rss}			55		pF
$t_{d(on)}$	**Resistive Switching Times** V_{GS} = 15V, V_{DS} = 0.5 • V_{DSS}, I_D = 55A R_G = 2Ω (External)		19		ns
t_r			27		ns
$t_{d(off)}$			60		ns
t_f			27		ns
$Q_{g(on)}$	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 25A		157		nC
Q_{gs}			40		nC
Q_{gd}			50		nC
R_{thJC}				0.69	°C/W
R_{thCS}			0.21		°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 MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS 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°C Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
I_S	V_{GS} = 0V			110	A
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}			350	A
V_{SD}	I_F = 55A, V_{GS} = 0V, Note 1			1.2	V
t_{rr}	I_F = 55A, -di/dt = 250A/µs V_R = 100V, V_{GS} = 0V		170		ns
I_{RM}			27		A
Q_{RM}			2.3		µC

Notes:

1. Pulse test, t ≤ 300µs, duty cycle, d ≤ 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°C

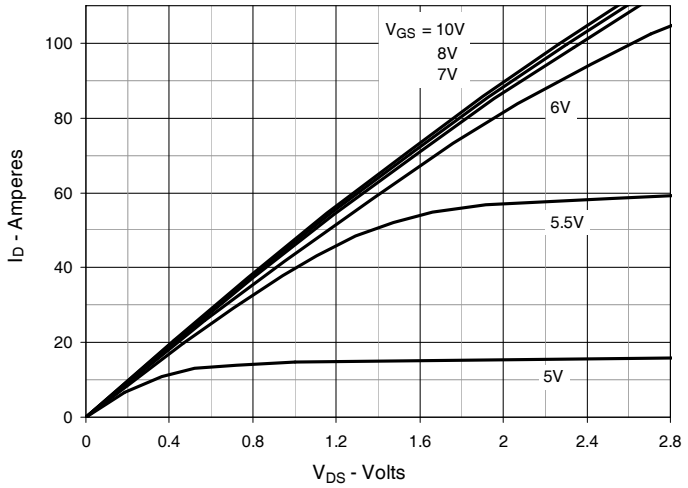


Fig. 2. Extended Output Characteristics @ T_J = 25°C

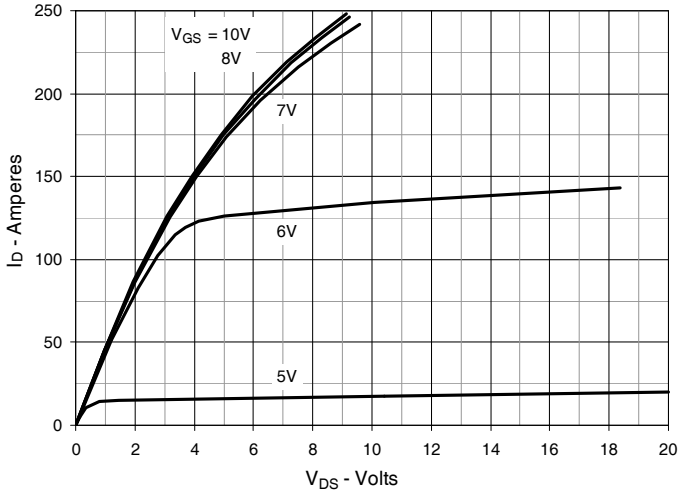


Fig. 3. Output Characteristics @ T_J = 125°C

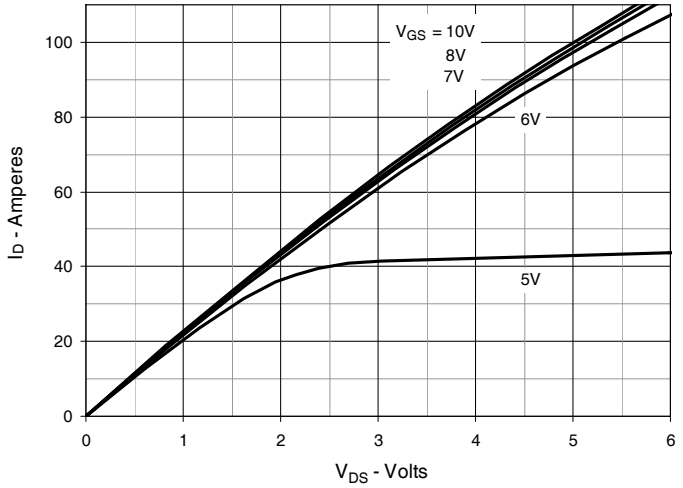


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 55A Value vs. Junction Temperature

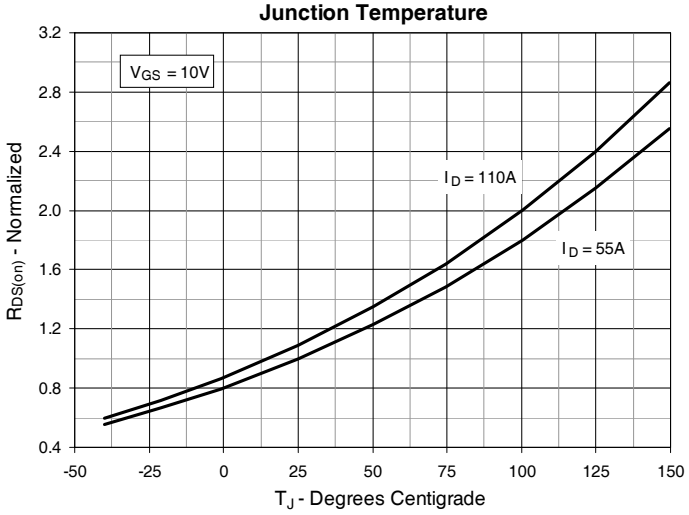


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 55A Value vs. Drain Current

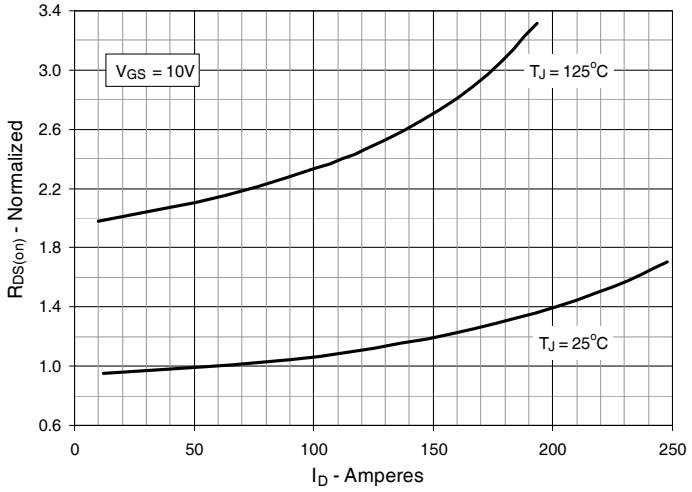


Fig. 6. Drain Current vs. Case Temperature

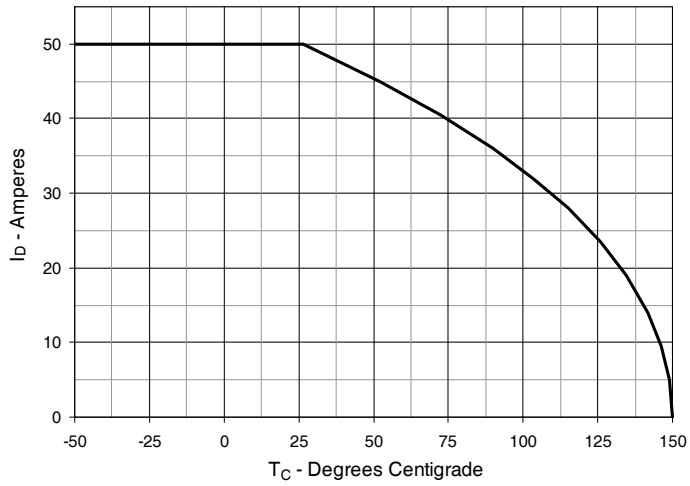


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Fig. 7. Input Admittance

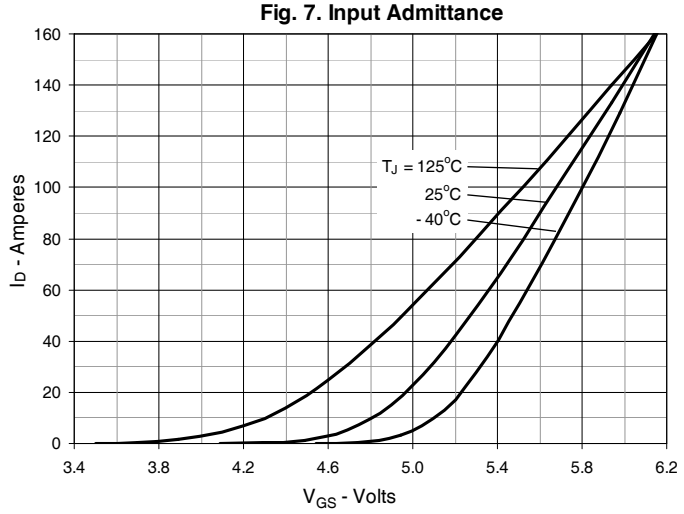

Fig. 8. Transconductance

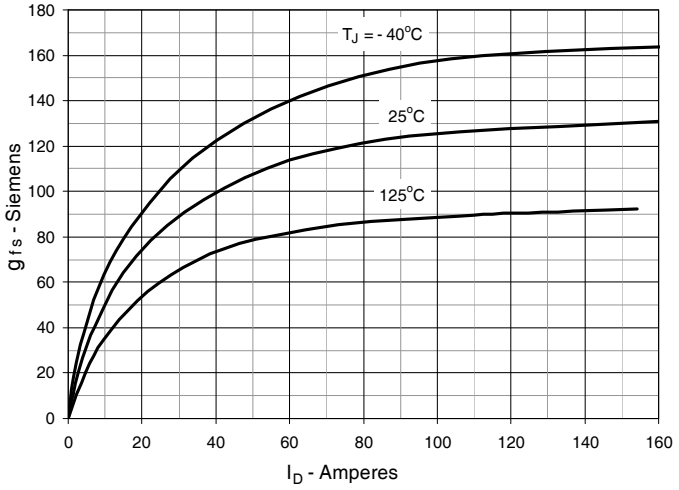

Fig. 9. Forward Voltage Drop of Intrinsic Diode

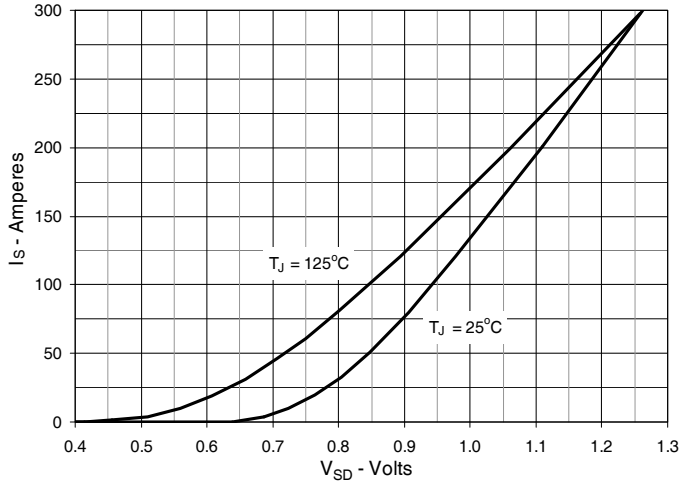

Fig. 10. Gate Charge

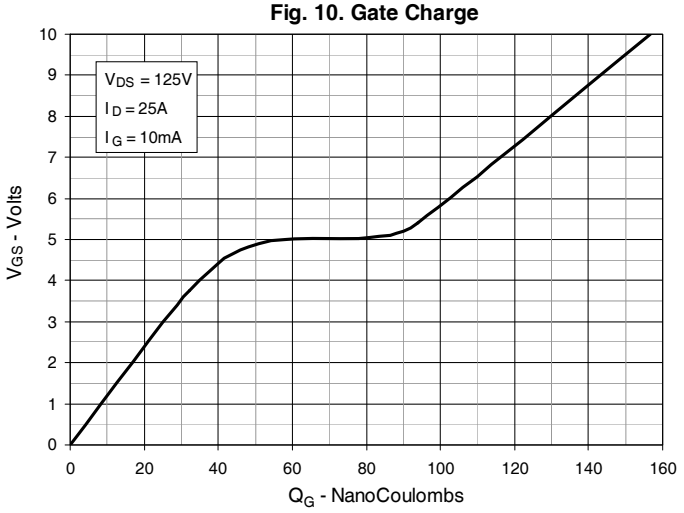

Fig. 11. Capacitance

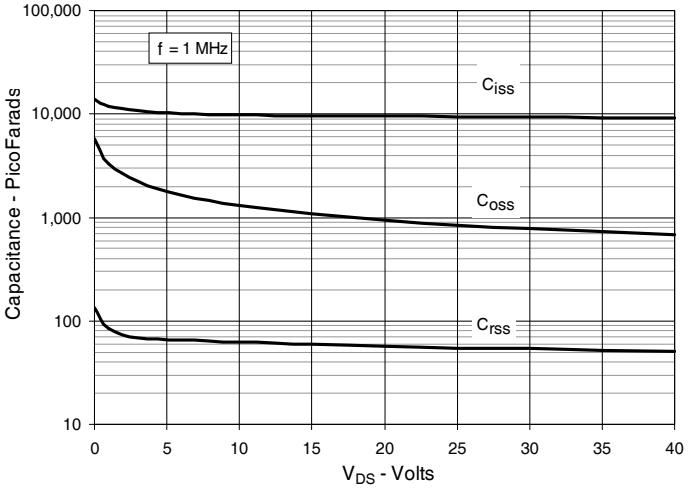

Fig. 12. Maximum Transient Thermal Impedance

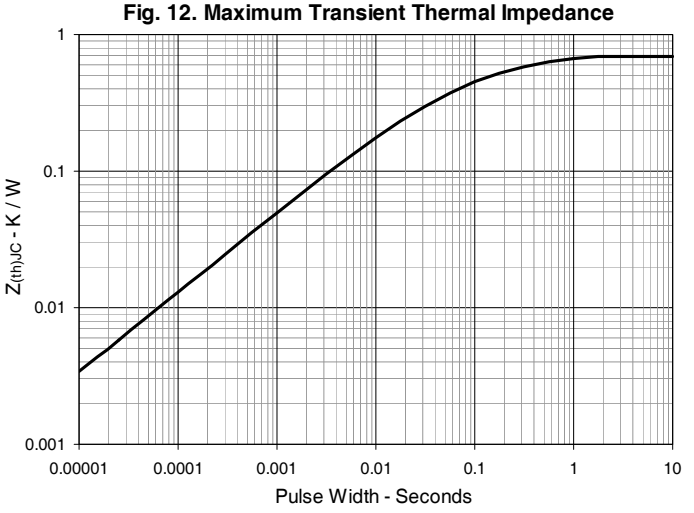

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Fig. 13. Resistive Turn-on Rise Time vs. Junction Temperature

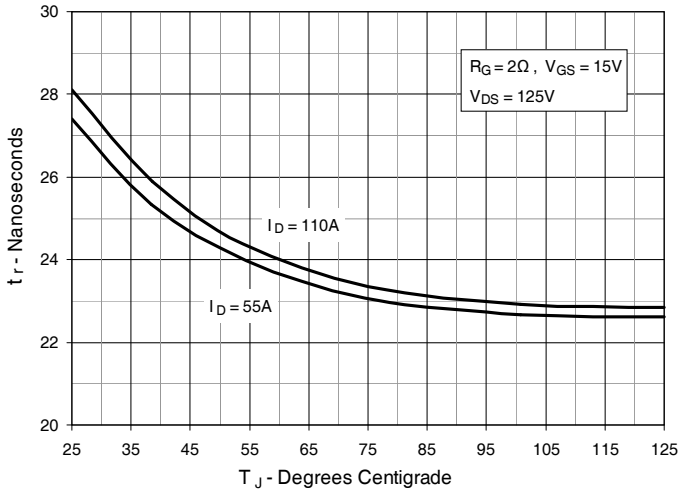


Fig. 14. Resistive Turn-on Rise Time vs. Drain Current

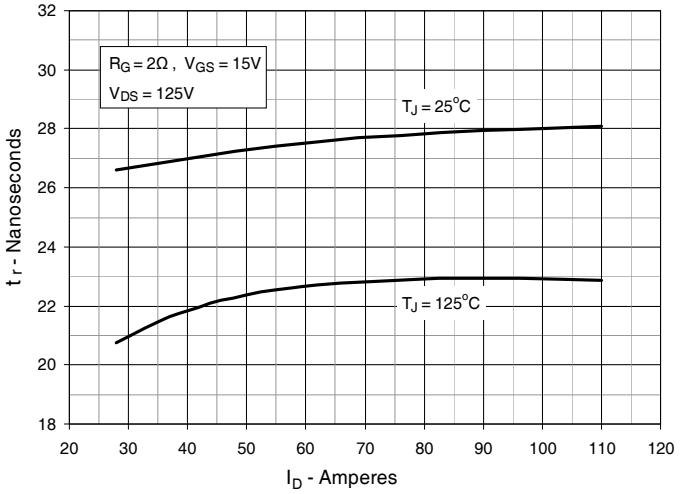


Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance

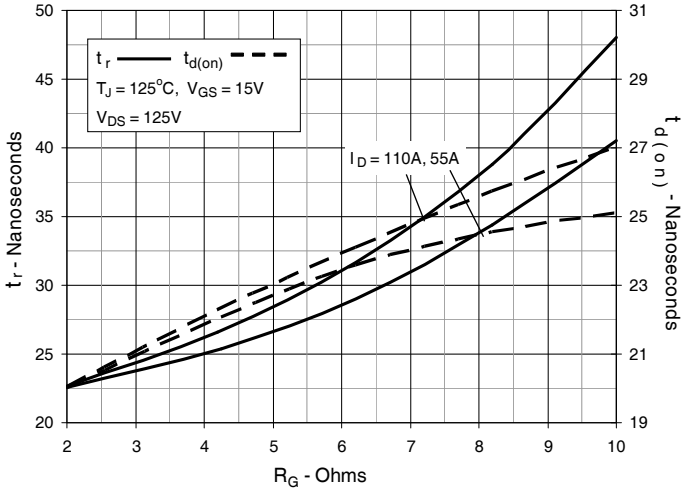


Fig. 16. Resistive Turn-off Switching Times vs. Junction Temperature

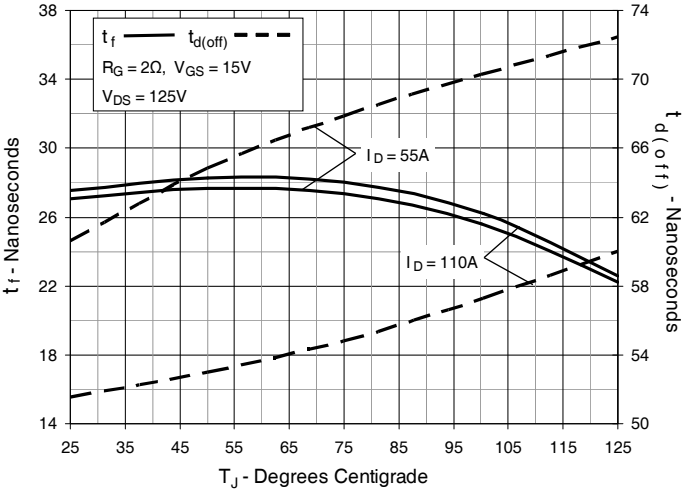


Fig. 17. Resistive Turn-off Switching Times vs. Drain Current

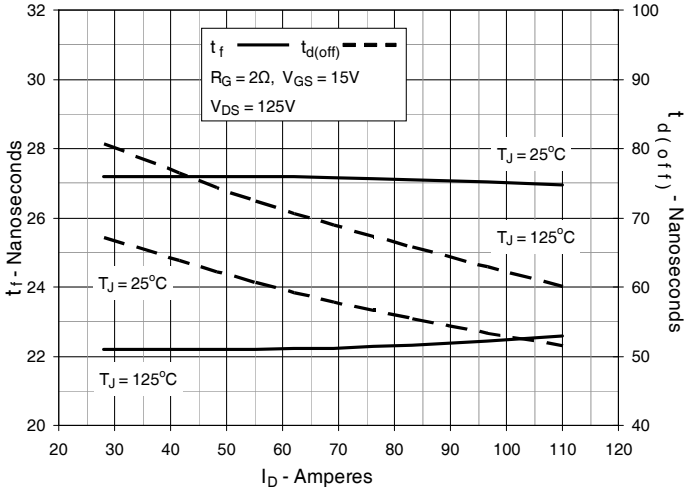
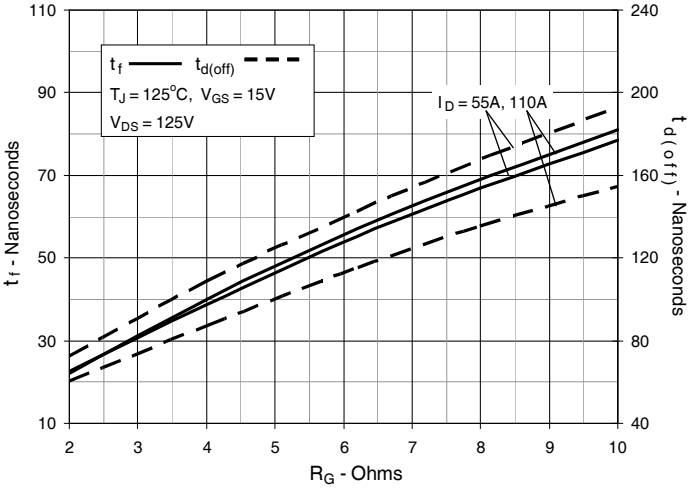


Fig. 18. Resistive Turn-off Switching Times vs. Gate Resistance



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