IXYS

Preliminary Technical Information

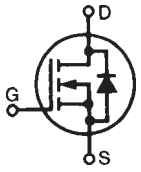
TrenchMV™ Power MOSFET

IXTF200N10T

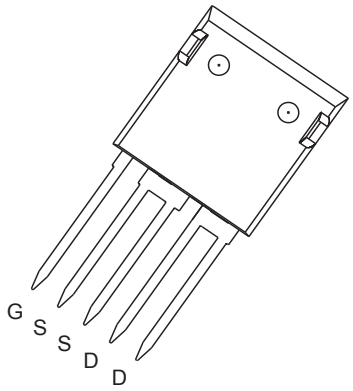
V_{DSS} = 100V
I_{D25} = 90A
$R_{DS(on)}$ ≤ 7mΩ

(Electrically Isolated Back Surface)

N-Channel Enhancement Mode
Avalanche Rated



ISOPLUS i4-Pak™ (5-lead)



G = Gate D = Drain
S = Source

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 175°C	100	V
V_{DGR}	T_J = 25°C to 175°C, R_{GS} = 1MΩ	100	V
V_{GSM}	Transient	±30	V
I_{D25}	T_C = 25°C	90	A
I_{DM}	T_C = 25°C, Pulse Width Limited by T_{JM}	500	A
I_A	T_C = 25°C	40	A
E_{AS}	T_C = 25°C	1.5	J
P_D	T_C = 25°C	156	W
T_J		-55 ... +175	°C
T_{JM}		175	°C
T_{stg}		-55 ... +175	°C
T_L	1.6mm (0.062in.) from Case for 10s	300	°C
	Plastic Body for 10 seconds	260	°C
V_{ISOL}	50/60Hz, t = 1 minute, I_{ISOL} < 1mA, RMS	2500	V
M_d	Mounting Force	120..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	2.5		4.5	V
I_{GSS}	V_{GS} = ± 20V, V_{DS} = 0V			±200	nA
I_{DSS}	$V_{DS} = V_{DSS}$, V_{GS} = 0V			5	μA
	T_J = 150°C			250	μA
$R_{DS(on)}$	V_{GS} = 10V, I_D = 50A, Notes 1			7	mΩ

Features

- Silicon Chip on Direct-Copper Bond (DCB) Substrate
- Isolated Mounting Surface
- Avalanche Rated
- 2500V Electrical Isolation

Advantages

- Easy to Mount
- Space Savings
- High Power Density

Applications

- Automotive
  - Motor Drives
  - High Side Switch
  - 12V Battery
  - ABS Systems
- DC/DC Converters and Off-Line UPS
- Primary - Side Switch
- High Current Switching Applications

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS} = 10V, I_D = 60A, Note 1	60	96		S
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		9400		pF
C_{oss}			1087		pF
C_{rss}			140		pF
$t_{d(on)}$	**Resistive Switching Times**		35		ns
t_r	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 50A		31		ns
$t_{d(off)}$	R_G = 3.3Ω (External)		45		ns
t_f			34		ns
$Q_{g(on)}$	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 50A		152		nC
Q_{gs}			47		nC
Q_{gd}			47		nC
R_{thJC}				0.96	°C/W
R_{thCH}			0.21		°C/W

Source-Drain Diode

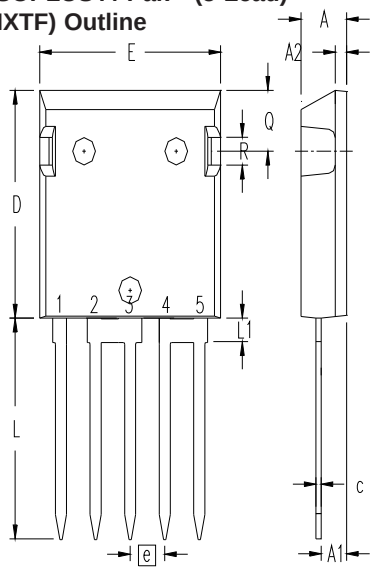
Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
I_S	V_{GS} = 0V			200	A
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}			500	A
V_{SD}	I_F = 50A, V_{GS} = 0V, Note 1			1.0	V
t_{rr}	I_F = 100A, V_{GS} = 0V,-di/dt = 100A/μs		76		ns
Q_{RM}	V_R = 50V		205		nC
I_{RM}			5.4		A

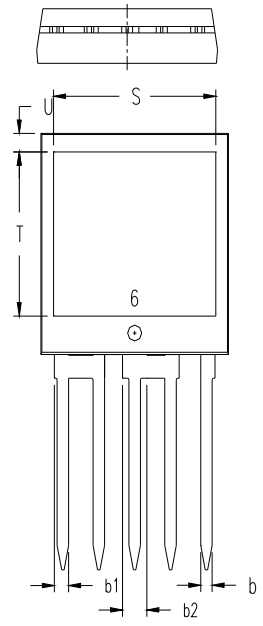
Notes: 1. Pulse Test, t ≤ 300μs; Duty Cycle, d ≤ 2%.

PRELIMINARY TECHNICAL INFORMATION

The product presented herein is under development. The Technical Specifications offered are derived from data gathered during objective characterizations of preliminary engineering lots; but also may yet contain some information supplied during a pre-production design evaluation. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

ISOPLUS i4-Pak™ (5-Lead) (IXTF) Outline





Leads:
1. Gate;
2, 3. Source;
4, 5. Drain
6. Isolated.

SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.190	.205	4.83	5.21
A1	.102	.118	2.59	3.00
A2	.046	.085	1.17	2.16
b	.045	.055	1.14	1.40
b1	.058	.068	1.47	1.73
b2	.100	.110	2.54	2.79
C	.020	.029	0.51	0.74
D	.819	.840	20.80	21.34
E	.770	.799	19.56	20.29
e	.150 BSC		3.81 BSC	
L	.780	.840	19.81	21.34
L1	.083	.102	2.11	2.59
Q	.210	.244	5.33	6.20
R	.100	.180	2.54	4.57
S	.660	.690	16.76	17.53
T	.590	.620	14.99	15.75
U	.065	.080	1.65	2.03

All leads and tab are tin plated.

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

Fig. 1. Output Characteristics @ 25ºC

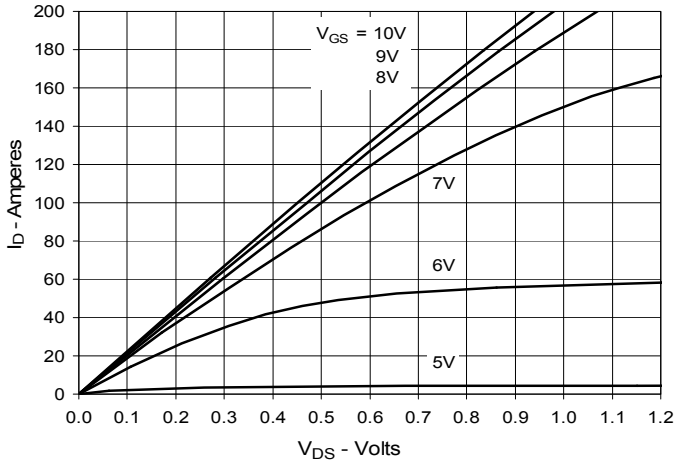


Fig. 2. Extended Output Characteristics @ 25ºC

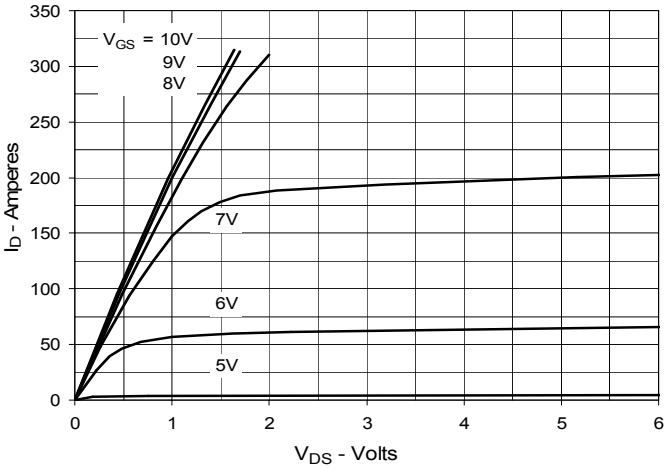


Fig. 3. Output Characteristics @ 150ºC

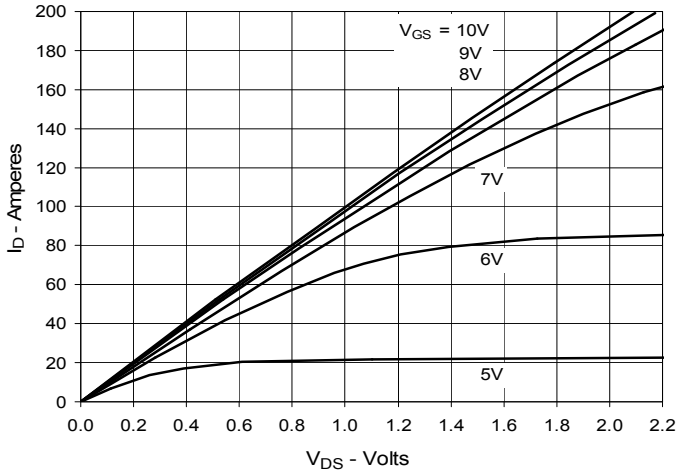


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 100A Value vs. Junction Temperature

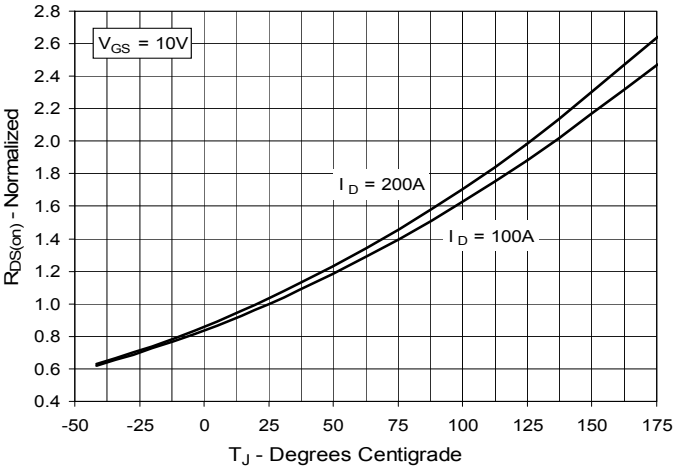


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 100A Value vs. Drain Current

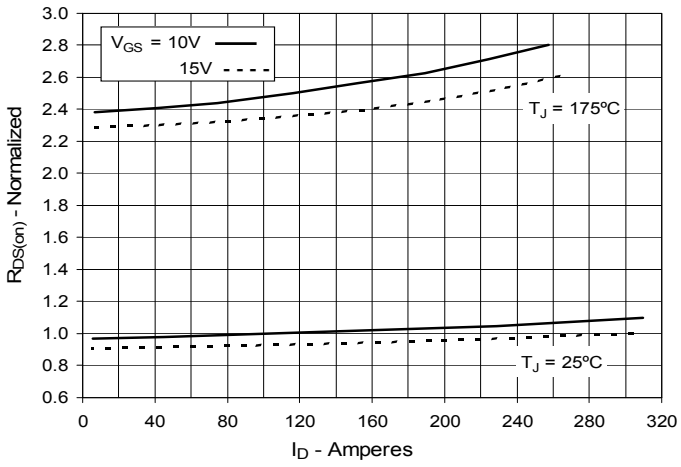


Fig. 6. Drain Current vs. Case Temperature

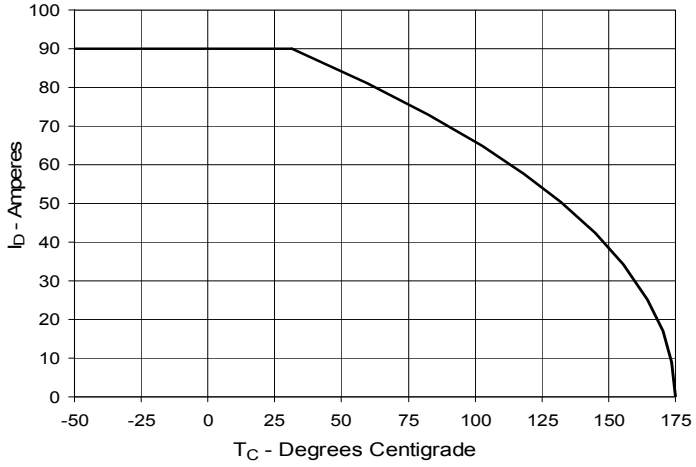


Fig. 7. Input Admittance

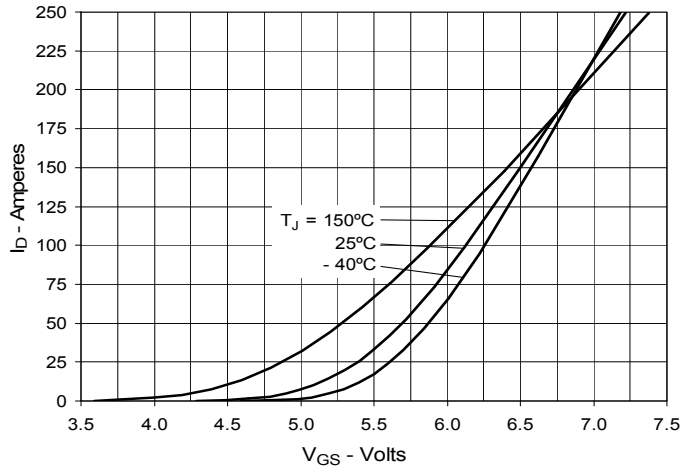


Fig. 8. Transconductance

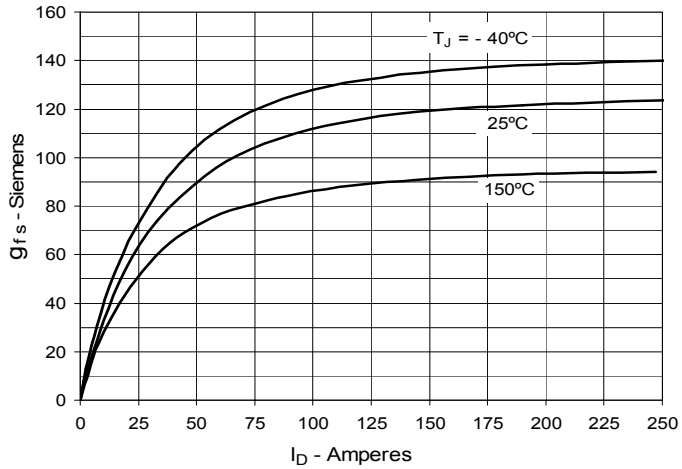


Fig. 9. Forward Voltage Drop of Intrinsic Diode

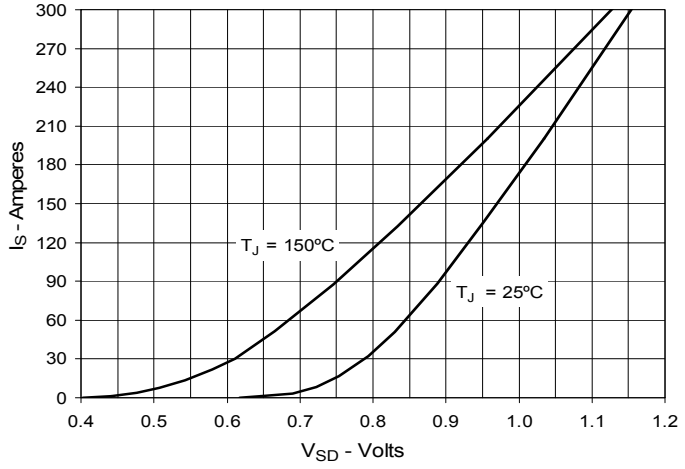


Fig. 10. Gate Charge

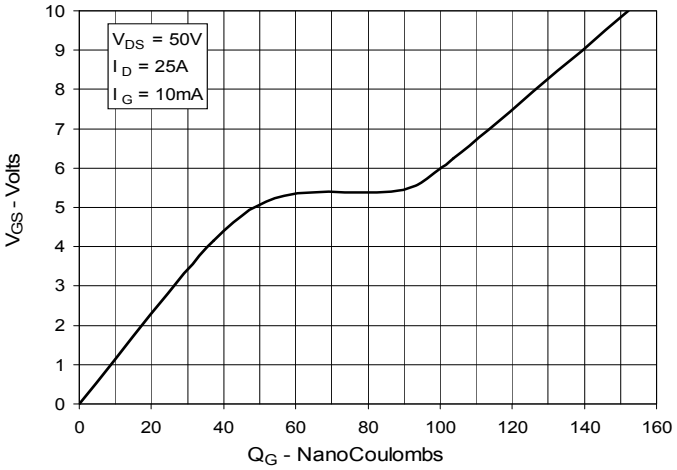


Fig. 11. Capacitance

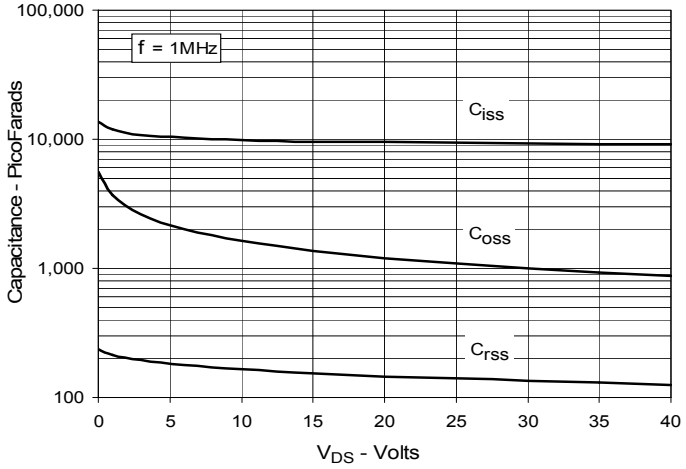


Fig. 12. Maximum Transient Thermal Impedance

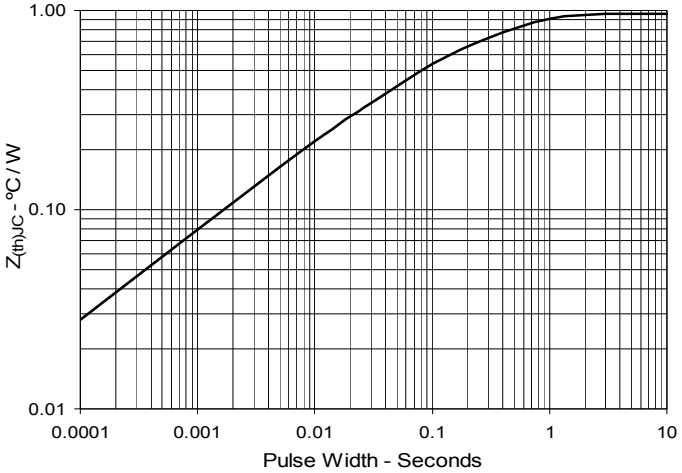


Fig. 13. Resistive Turn-on Rise Time vs. Junction Temperature

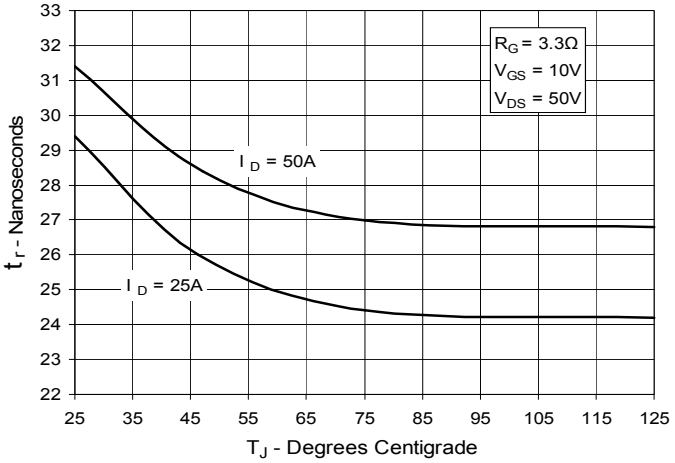


Fig. 14. Resistive Turn-on Rise Time vs. Drain Current

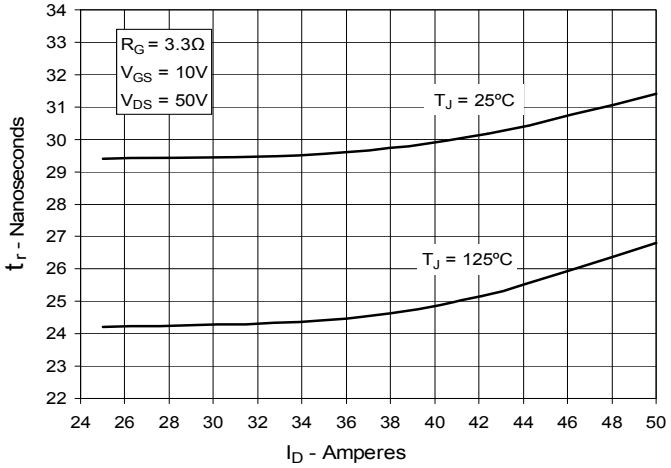


Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance

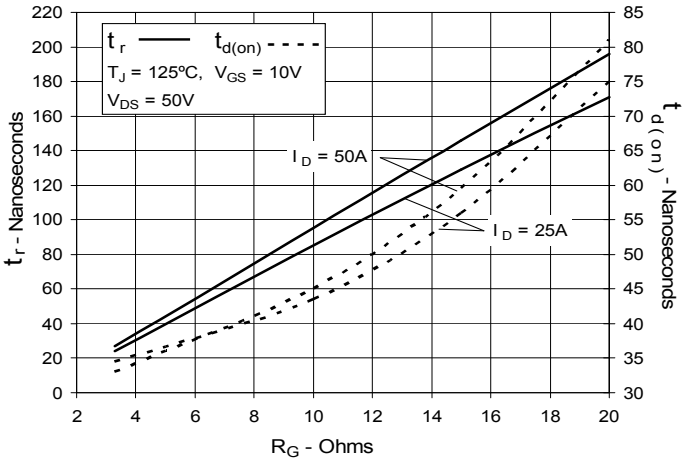


Fig. 16. Resistive Turn-off Switching Times vs. Junction Temperature

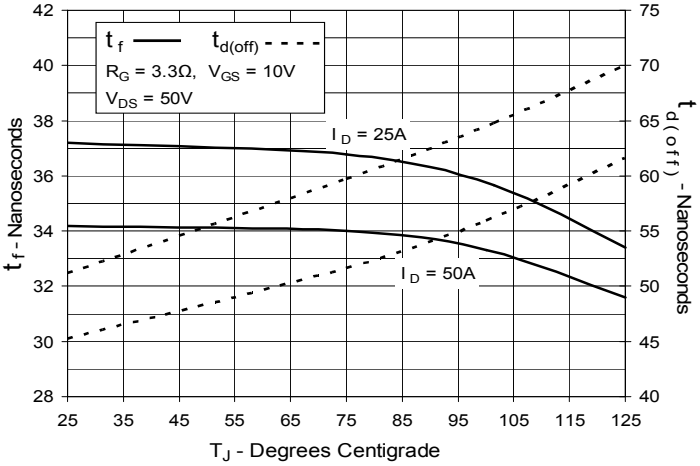


Fig. 17. Resistive Turn-off Switching Times vs. Drain Current

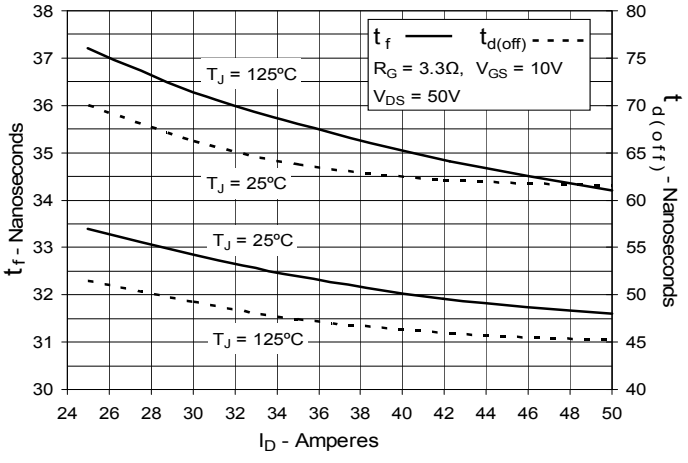


Fig. 18. Resistive Turn-off Switching Times vs. Gate Resistance