IXYS

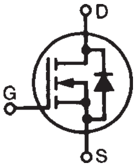
Advance Technical Information

Trench Gate Power MOSFET

IXTA 76N075T
IXTP 76N075T

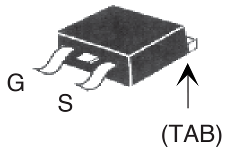
V_{DSS} = 75 V
I_{D25} = 76 A
$R_{DS(on)} \leq$ 12 mΩ

N-Channel Enhancement Mode
Avalanche Rated

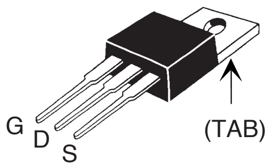


Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C	75	V
V_{DGR}	T_J = 25°C to 150°C; R_{GS} = 1 MΩ	75	V
V_{GSM}	Transient	± 20	V
I_{D25}	T_C = 25°C	76	A
I_{LRMS}	Lead Current Limit, RMS	75	A
I_{DM}	T_C = 25°C, pulse width limited by T_{JM}	210	A
I_{AR}	T_C = 25°C	10	A
E_{AS}	T_C = 25°C	500	mJ
dv/dt	$I_S \leq I_{DM}$, di/dt ≤ 100 A/µs, $V_{DD} \leq V_{DSS}$ $T_J \leq$ 150°C, R_G = 10 Ω	3	V/ns
P_D	T_C = 25°C	176	W
T_J		-55 ... +175	°C
T_{JM}		175	°C
T_{stg}		-55 ... +175	°C
T_L	1.6 mm (0.062 in.) from case for 10 s	300	°C
	Plastic body for 10 seconds	260	°C
M_d	Mounting torque (TO-220)	1.13 / 10	Nm/lb.in.
Weight	TO-220	3	g
	TO-263	2.5	g

TO-263 (IXTA)



TO-220 (IXTP)



G = Gate
D = Drain
S = Source
TAB = Drain

Features

- International standard packages
- Unclamped Inductive Switching (UIS) rated
- Low package inductance
  - easy to drive and to protect

Advantages

- Easy to mount
- Space savings
- High power density

Symbol	Test Conditions (T_J = 25°C unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
BV_{DSS}	V_{GS} = 0 V, I_D = 250 µA	75			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 50 µA	2.0		4.0	V
I_{GSS}	V_{GS} = ± 20 V, V_{DS} = 0 V			± 100	nA
I_{DSS}	$V_{DS} = V_{DSS}$			1	µA
	V_{GS} = 0 V T_J = 125°C			250	µA
$R_{DS(on)}$	V_{GS} = 10 V, I_D = 25 A, Notes 1, 2		9.7	12	mΩ

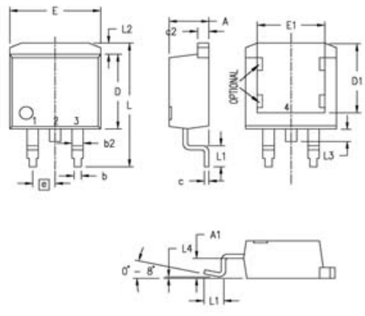
Symbol	Test Conditions (T_J = 25°C unless otherwise specified)	Min.	Typ.	Max.	
g_{fs}	V_{DS}= 10 V; I_D = 0.5 I_{D25}, Note 1	30	55		S
C_{iss}			2580		pF
C_{oss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		390		pF
C_{rss}			90		pF
$t_{d(on)}$	**Resistive Switching Times**		20		ns
t_r	V_{GS} = 10 V, V_{DS} = 0.5 V_{DSS}, I_D = 10 A		40		ns
$t_{d(off)}$	R_G = 10 Ω (External)		38		ns
t_f			33		ns
$Q_{g(on)}$			57		nC
Q_{gs}	V_{GS}= 10 V, V_{DS} = 0.5 V_{DSS}, I_D = 10 A		13.6		nC
Q_{gd}			12.4		nC
R_{thJC}				0.85	K/W
R_{thCH}	TO-220		0.50		K/W

Source-Drain Diode

Symbol	Test Conditions T_J = 25°C unless otherwise specified)	Min.	Typ.	Max.	
I_S	V_{GS} = 0 V			76	A
I_{SM}	Pulse width limited by T_{JM}			240	A
V_{SD}	I_F = 25 A, V_{GS} = 0 V, Note 1			1.1	V
t_{rr}	I_F = 25 A, -di/dt = 100 A/μs V_R = 40 V, V_{GS} = 0 V		80		ns

Notes: 1. Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 %;
2. On through-hole packages, $R_{DS(on)}$ Kelvin test contact location must be 5 mm or less from the package body.

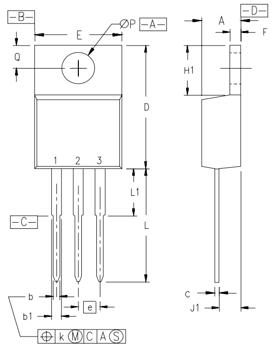
TO-263 (IXTA) Outline



Pins: 1 - Gate 2 - Drain
3 - Source 4, TAB - Drain

Dim.	Millimeter Min.	Millimeter Max.	Inches Min.	Inches Max.
A	4.06	4.83	.160	.190
A1	2.03	2.79	.080	.110
b	0.51	0.99	.020	.039
b2	1.14	1.40	.045	.055
c	0.46	0.74	.018	.029
c2	1.14	1.40	.045	.055
D	8.64	9.65	.340	.380
D1	7.11	8.13	.280	.320
E	9.65	10.29	.380	.405
E1	6.86	8.13	.270	.320
e	2.54	BSC	.100	BSC
L	14.61	15.88	.575	.625
L1	2.29	2.79	.090	.110
L2	1.02	1.40	.040	.055
L3	1.27	1.78	.050	.070
L4	0	0.38	0	.015
R	0.46	0.74	.018	.029

TO-220 (IXTP) Outline



Pins: 1 - Gate 2 - Drain
3 - Source 4, TAB - Drain

SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.170	.190	4.32	4.83
b	.025	.040	0.64	1.02
b1	.045	.065	1.15	1.65
c	.014	.022	0.35	0.56
D	.580	.630	14.73	16.00
E	.390	.420	9.91	10.66
e	.100 BSC		2.54 BSC	
F	.045	.055	1.14	1.40
H1	.230	.270	5.85	6.85
J1	.090	.110	2.29	2.79
k	0	.015	0	0.38
L	.500	.550	12.70	13.97
L1	.110	.230	2.79	5.84
ØP	.139	.161	3.53	4.08
Q	.100	.125	2.54	3.18

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 objective result. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

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Fig. 1. Output Characteristics @ 25ºC

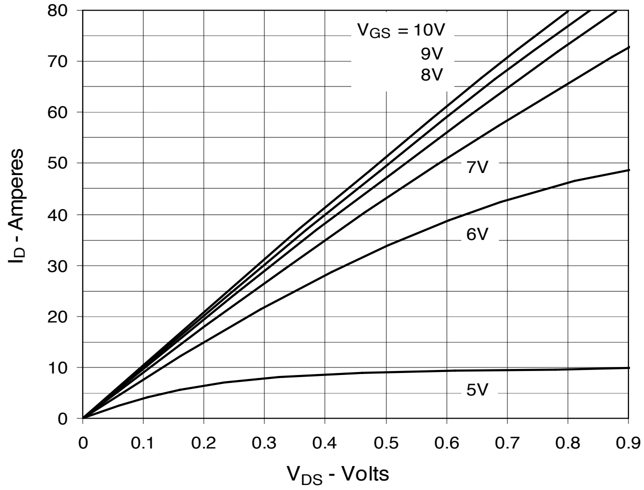

Fig. 2. Extended Output Characteristics @ 25ºC

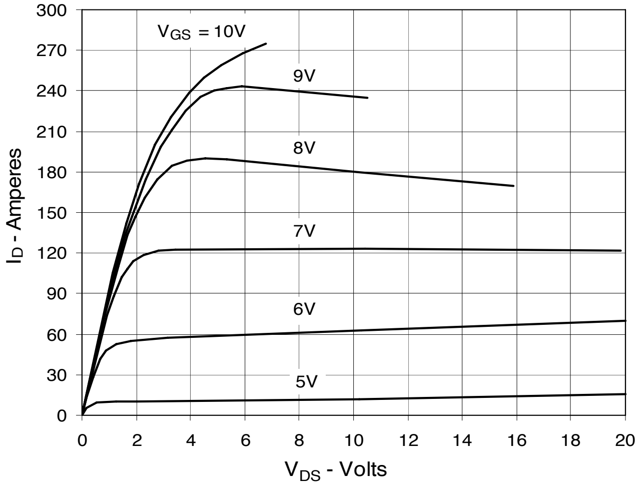

Fig. 3. Output Characteristics @ 150ºC

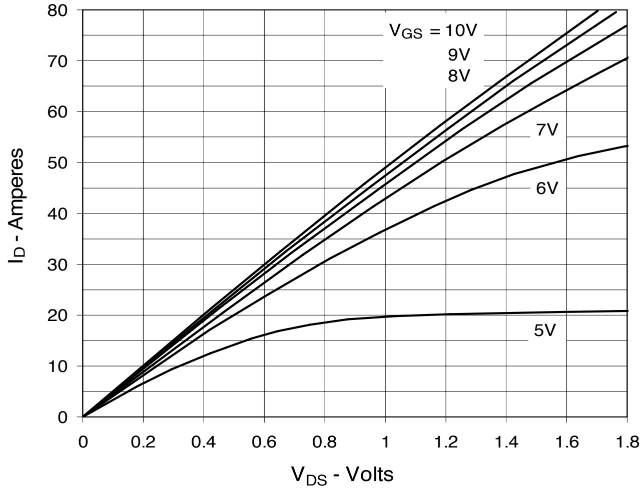

Fig. 4. $R_{DS(on)}$ Normalized to I_D = 38A Value vs. Junction Temperature

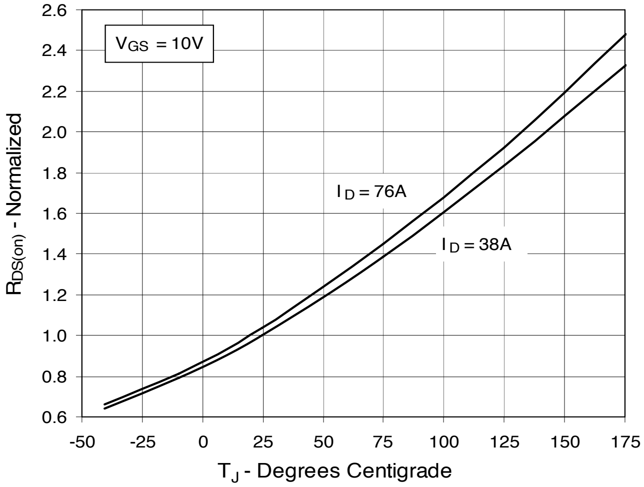

Fig. 5. $R_{DS(on)}$ Normalized to I_D = 38A Value vs. Drain Current

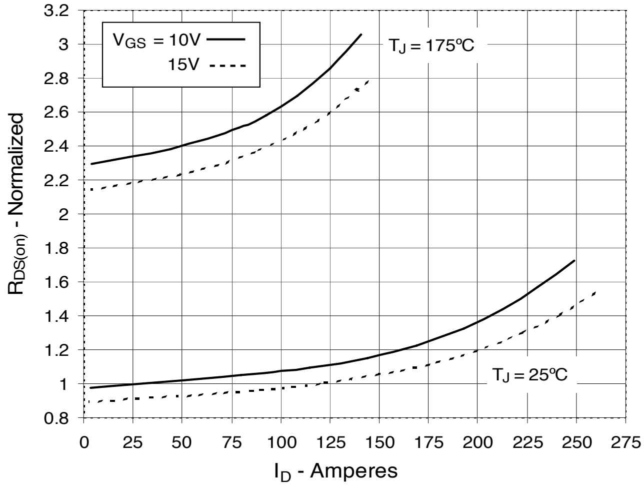

Fig. 6. Drain Current vs. Case Temperature

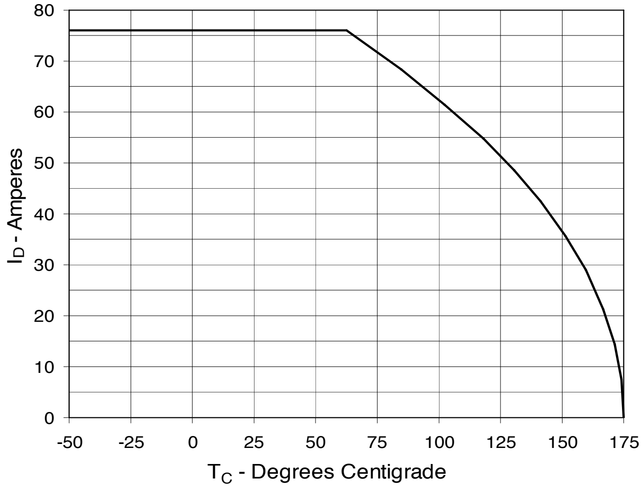

Fig. 7. Input Admittance

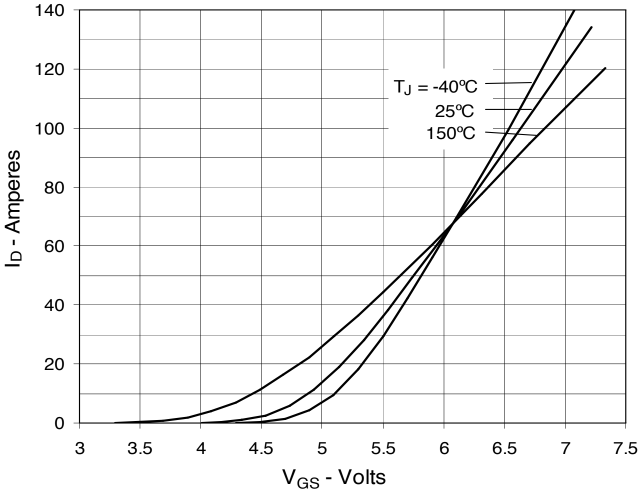

Fig. 8. Transconductance

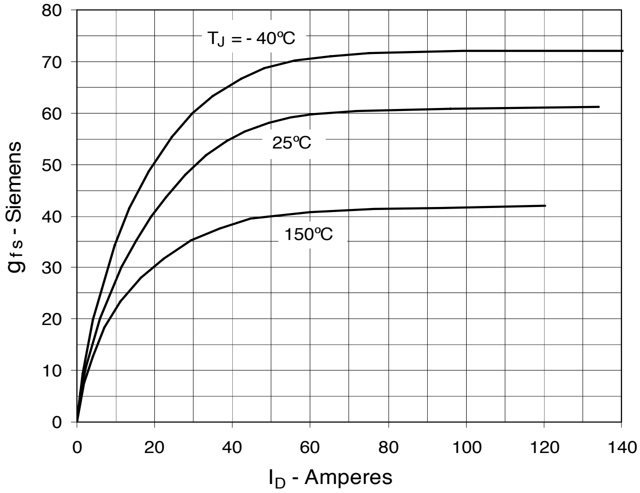

Fig. 9. Forward Voltage Drop of Intrinsic Diode

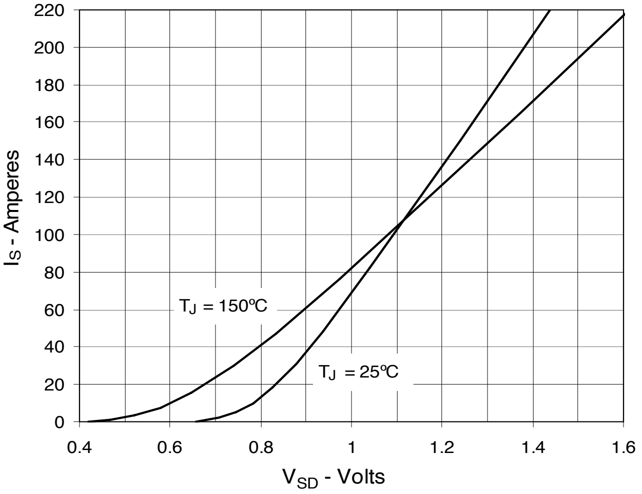

Fig. 10. Gate Charge

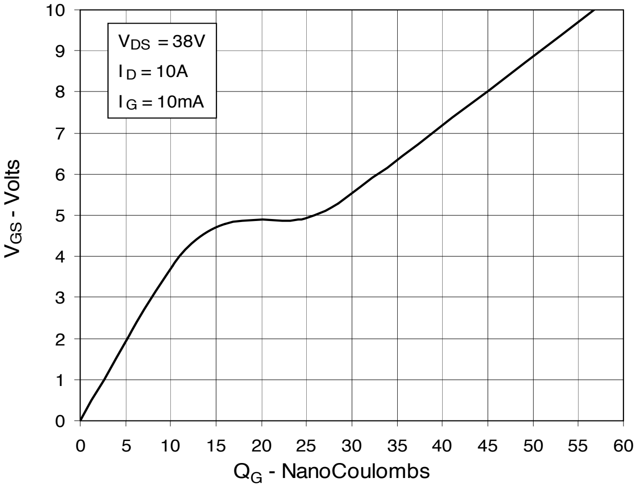

Fig. 11. Capacitance

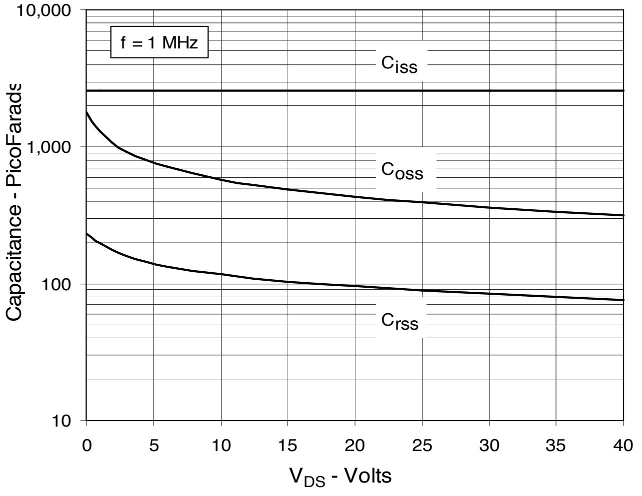

Fig. 12. Maximum Transient Thermal Resistance

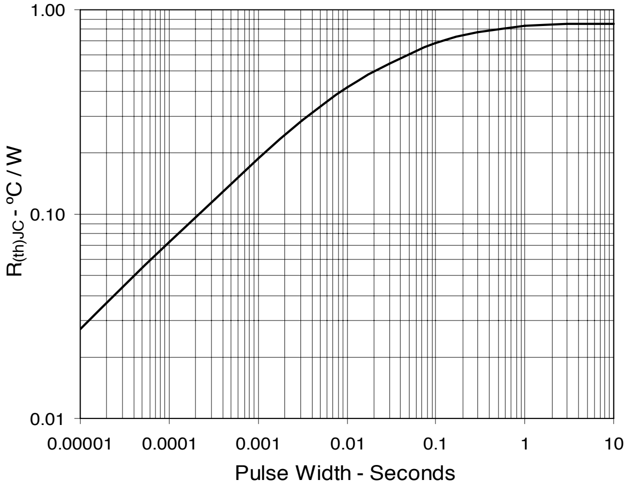

Fig. 13. Resistive Turn-on Rise Time vs. Junction Temperature

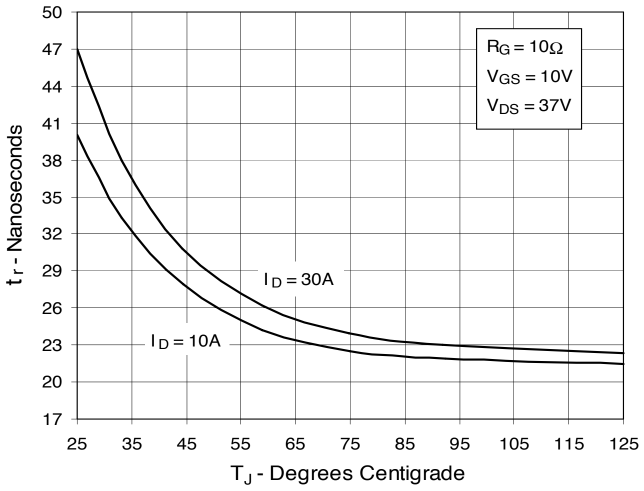

Fig. 14. Resistive Turn-on Rise Time vs. Drain Current

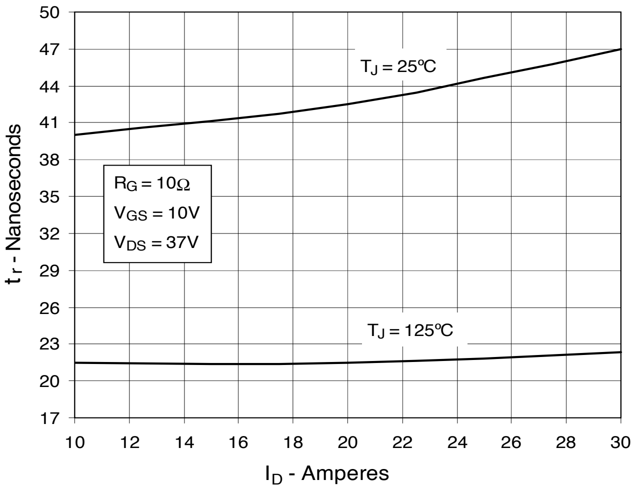

Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance

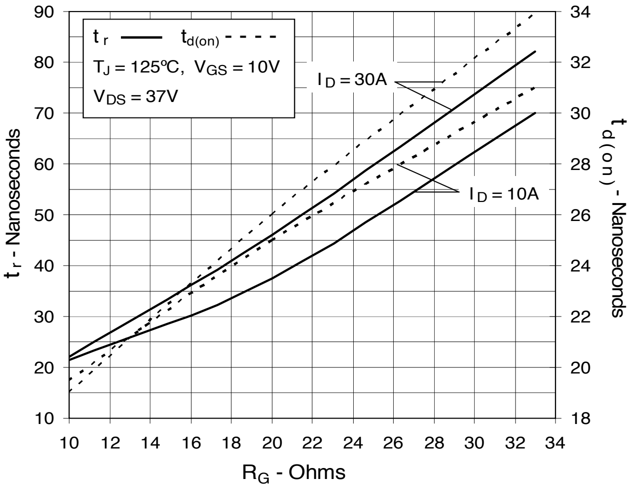

Fig. 16. Resistive Turn-off Switching Times vs. Junction Temperature

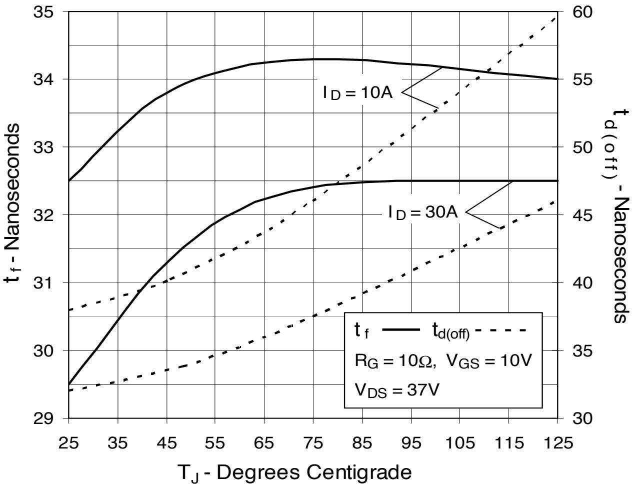

Fig. 17. Resistive Turn-off Switching Times vs. Drain Current

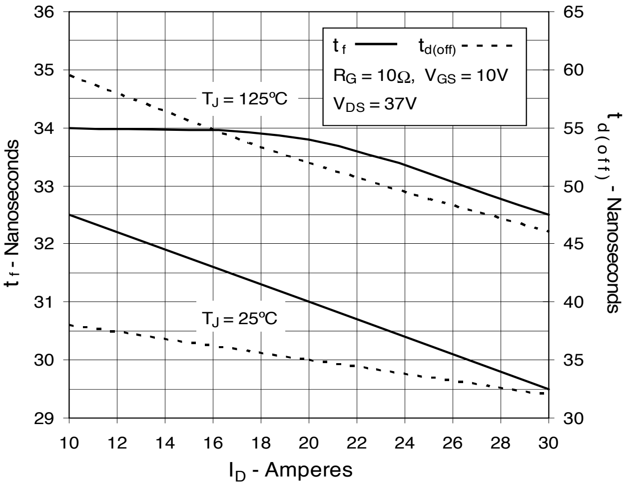

Fig. 18. Resistive Turn-off Switching Times vs. Gate Resistance