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IXYS Corporation
IXTH160N15T

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sales@integrated-circuit.com

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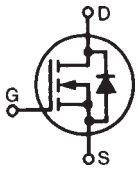
Preliminary Technical Information

TrenchHV™ Power MOSFET

IXTH160N15T

V_{DSS} = 150 V
I_{D25} = 160 A
$R_{DS(on)}$ ≤ 9.6 mΩ

N-Channel Enhancement Mode
Avalanche Rated



Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 175°C	150	V
V_{DGR}	T_J = 25°C to 175°C; R_{GS} = 1MΩ	150	V
V_{GSM}	Transient	± 30	V
I_{D25}	T_C = 25°C	160	A
I_{LRMS}	Lead Current Limit, RMS	75	A
I_{DM}	T_C = 25°C, pulse width limited by T_{JM}	430	A
I_A	T_C = 25°C	5	A
E_{AS}	T_C = 25°C	1.0	J
dv/dt	$I_S \le I_{DM}$, $V_{DD} \le V_{DSS}$, $T_J \le 175°C$	10	V/ns
P_d	T_C = 25°C	830	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 10s	300	°C
T_{SOLD}	Plastic body for 10 seconds	260	°C
M_d	Mounting torque	1.13 / 10	Nm/lb.in.
Weight		6	g

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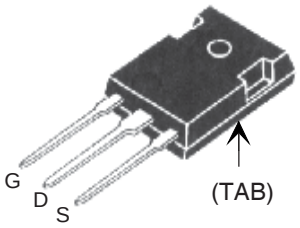

G = Gate D = Drain
S = Source TAB = Drain

Symbol (T_J = 25°C unless otherwise specified)	Test Conditions	Characteristic Values Min.	Typ.	Max.	
BV_{DSS}	V_{GS} = 0 V, I_D = 250 μA	150			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 1 mA	2.5		5.0	V
I_{GSS}	V_{GS} = ± 20 V, V_{DS} = 0 V			± 200	nA
I_{DSS}	$V_{DS} = V_{DSS}$			25	μA
	V_{GS} = 0 V T_J = 150°C			300	μA
$R_{DS(on)}$	V_{GS} = 10 V, $I_D = 0.5 \bullet I_{D25}$, Note 1		8.0	9.6	mΩ

Features
- Unclamped Inductive Switching (UIS) rated
- Low package inductance
  - easy to drive and to protect
- 175 °C Operating Temperature

Advantages
- Easy to mount
- Space savings
- High power density

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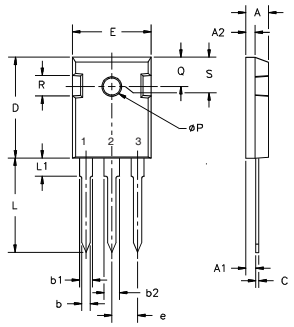
Symbol	Test Conditions (T_J = 25°C unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS}= 10V; I_D = 0.5 • I_{D25}, Note 1	65	105		S
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1 MHz		8800		pF
C_{oss}			1170		pF
C_{rss}			150		pF
$t_{d(on)}$	**Resistive Switching Times**		21		ns
t_r	V_{GS} = 15V, V_{DS} = 0.5 • V_{DSS}, I_D = 0.5 I_{D25}		21		ns
$t_{d(off)}$	R_G = 2.0Ω (External)		60		ns
t_f			31		ns
$Q_{g(on)}$	V_{GS}= 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 25A		160		nC
Q_{gs}			43		nC
Q_{gd}			46		nC
R_{thJC}				0.18	°C/W
R_{thCS}			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			160	A
I_{SM}	Pulse width limited by T_{JM}			430	A
V_{SD}	I_F = 50A, V_{GS} = 0V, Note 1			1.2	V
t_{rr}	I_F = 80A, -di/dt = 200A/µs		115		ns
	V_R = 75V, V_{GS} = 0V				

Notes: 1. Pulse test, t ≤ 300 ms, duty cycle, d ≤ 2 %

TO-247AD Outline



Terminals: 1 - Gate 2 - Drain
3 - Source Tab - Drain

Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	4.7	5.3	.185	.209
A_1	2.2	2.54	.087	.102
A_2	2.2	2.6	.059	.098
b	1.0	1.4	.040	.055
b_1	1.65	2.13	.065	.084
b_2	2.87	3.12	.113	.123
C	.4	.8	.016	.031
D	20.80	21.46	.819	.845
E	15.75	16.26	.610	.640
e	5.20	5.72	0.205	0.225
L	19.81	20.32	.780	.800
L1		4.50		.177
ÆP	3.55	3.65	.140	.144
Q	5.89	6.40	0.232	0.252
R	4.32	5.49	.170	.216
S	6.15 BSC		242 BSC	

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.

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Fig. 1. Output Characteristics @ 25ºC

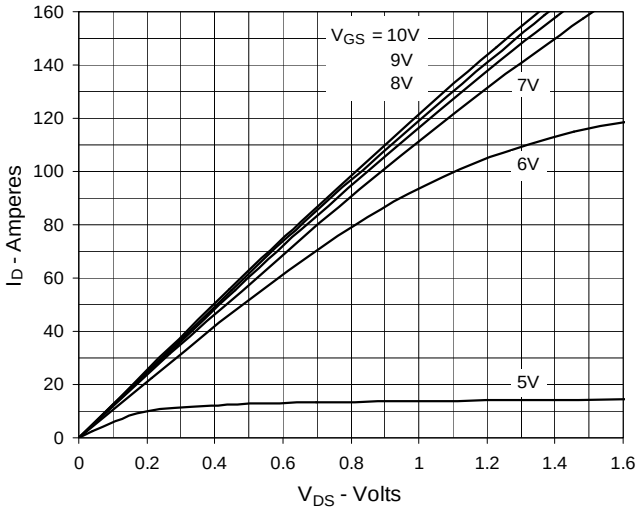

Fig. 2. Extended Output Characteristics @ 25ºC

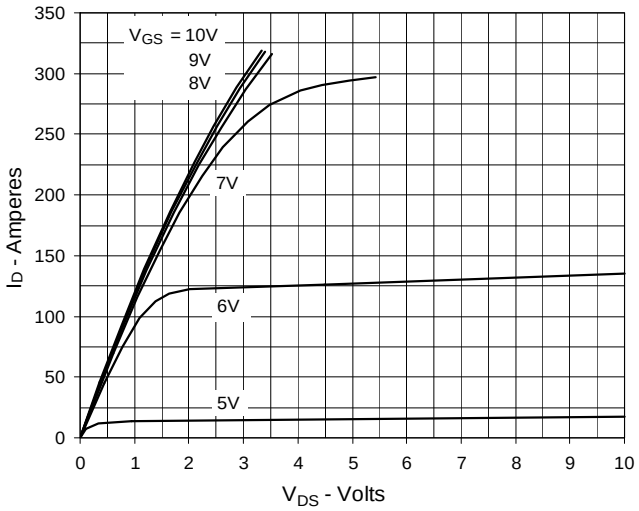

Fig. 3. Output Characteristics @ 150ºC

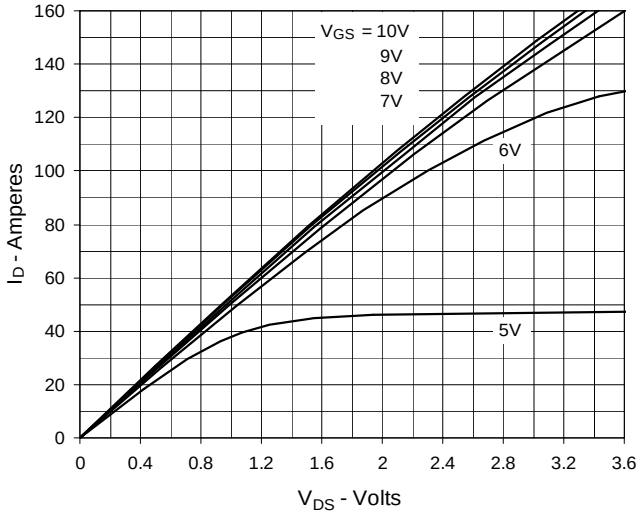

Fig. 4. $R_{DS(on)}$ Normalized to I_D = 80A Value vs. Junction Temperature

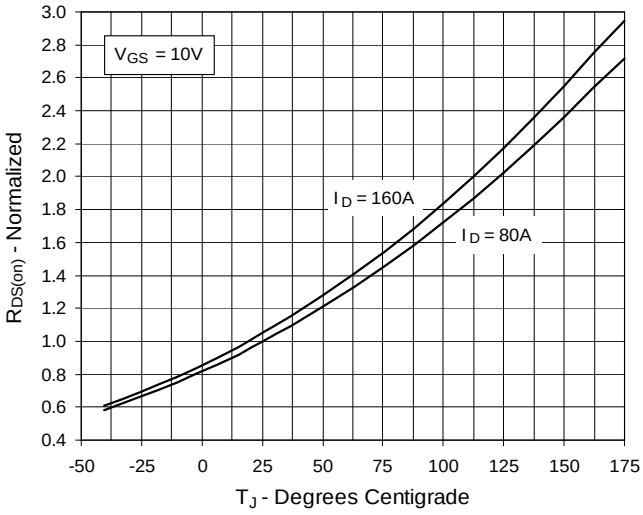

Fig. 5. $R_{DS(on)}$ Normalized to I_D = 80A Value vs. Drain Current

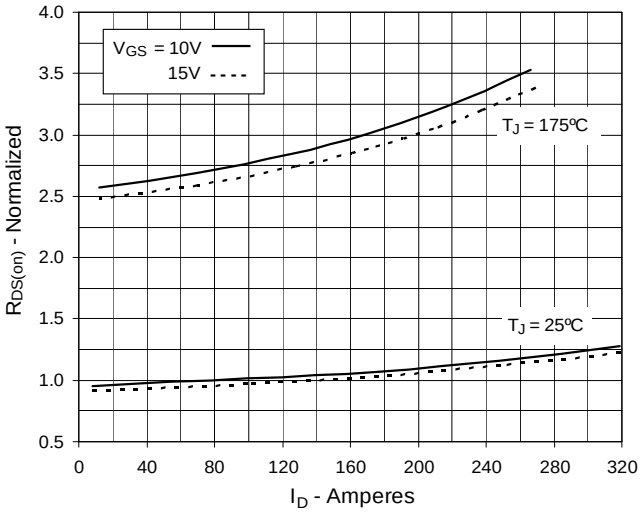

Fig. 6. Drain Current vs. Case Temperature

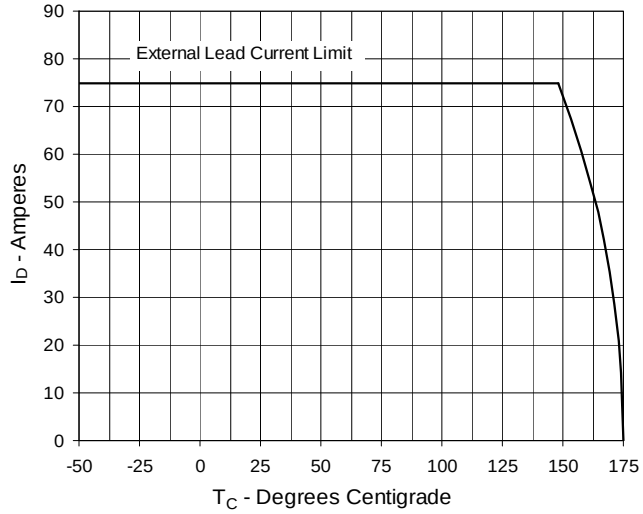

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Fig. 7. Input Admittance

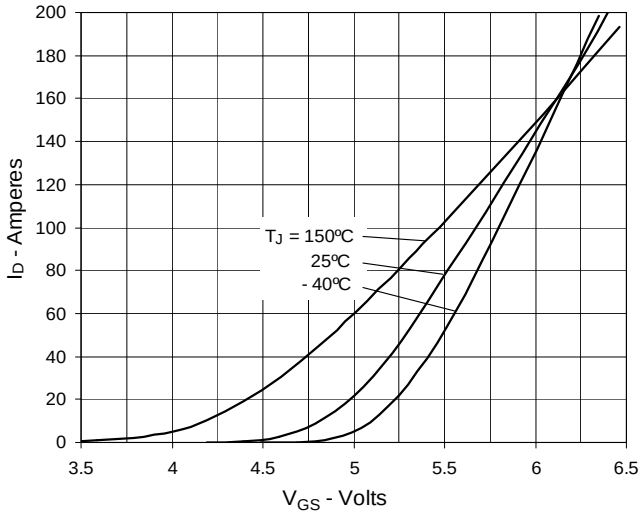

Fig. 8. Transconductance

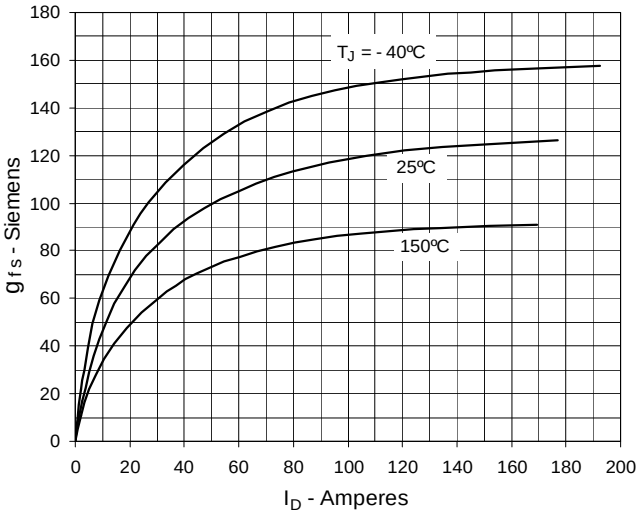

Fig. 9. Forward Voltage Drop of Intrinsic Diode

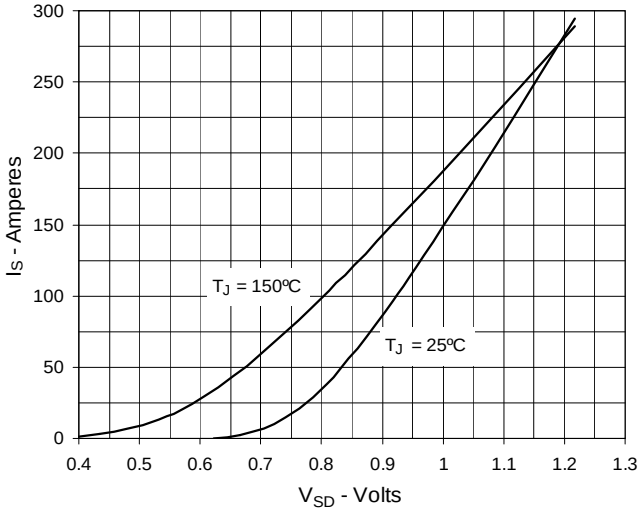

Fig. 10. Gate Charge

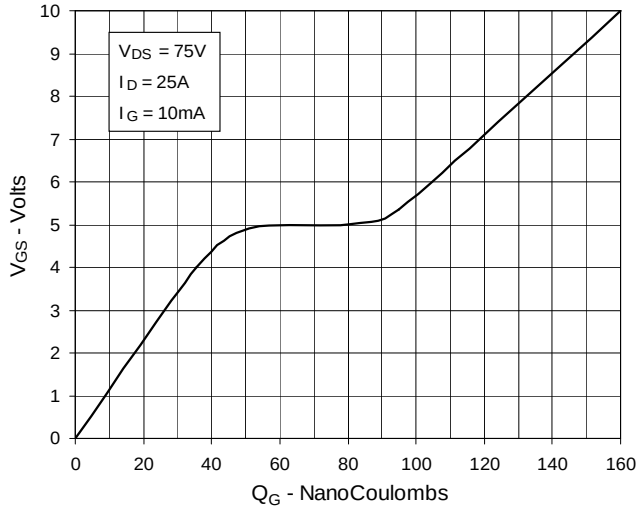

Fig. 11. Capacitance

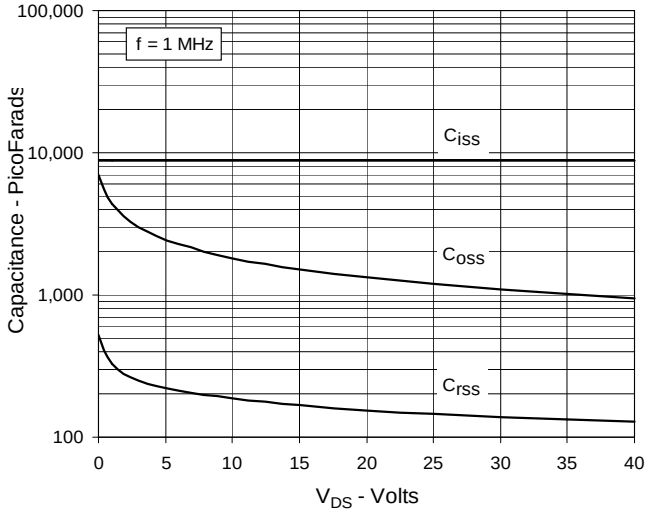

Fig. 12. Maximum Transient Thermal Impedance

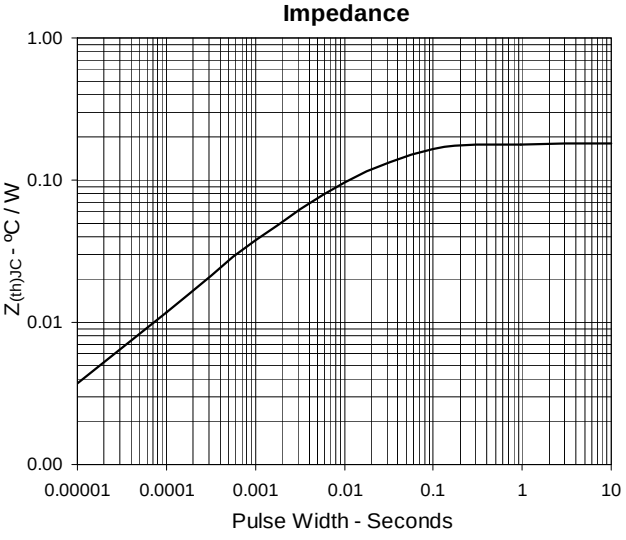

Fig. 13. Resistive Turn-on Rise Time vs. Junction Temperature

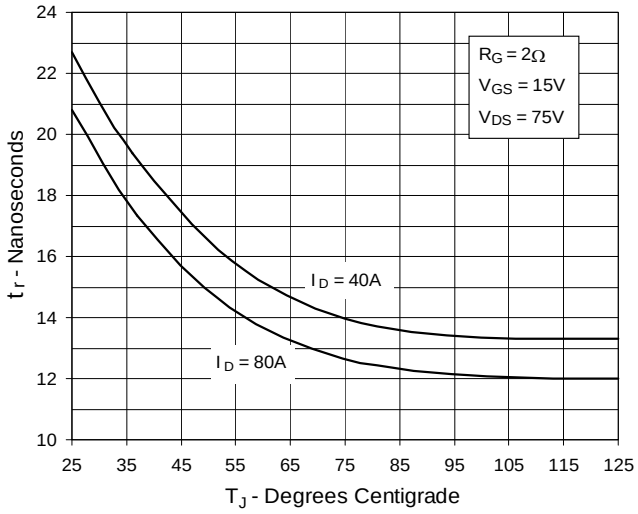

Fig. 14. Resistive Turn-on Rise Time vs. Drain Current

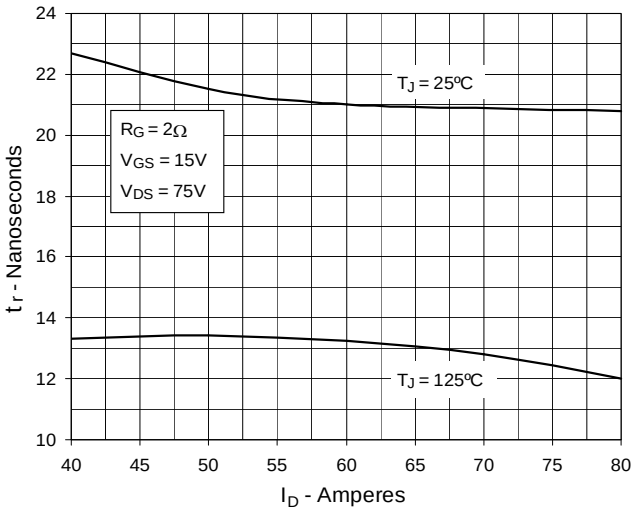

Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance

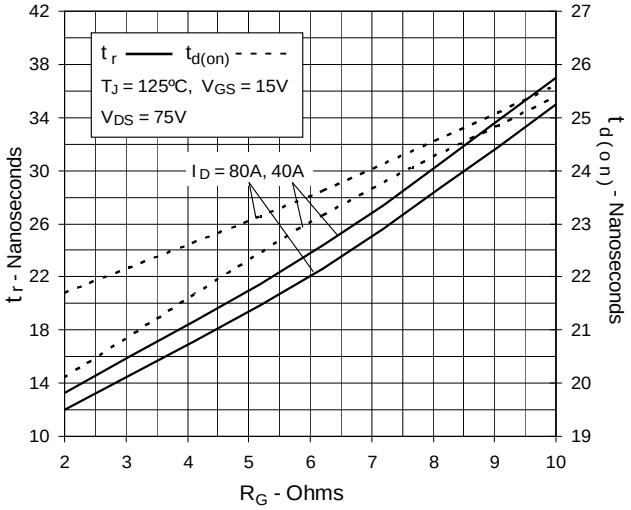

Fig. 16. Resistive Turn-off Switching Times vs. Junction Temperature

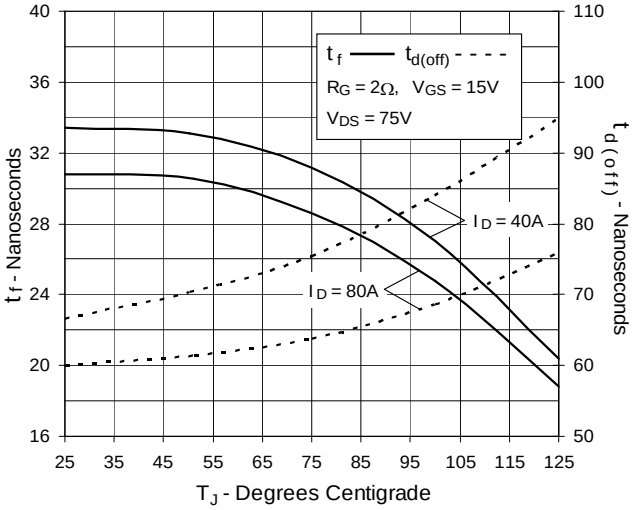

Fig. 17. Resistive Turn-off Switching Times vs. Drain Current

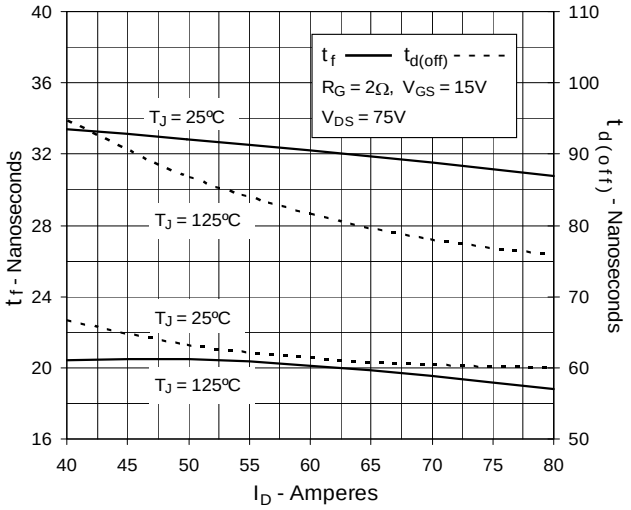

Fig. 18. Resistive Turn-off Switching Times vs. Gate Resistance