IXYS

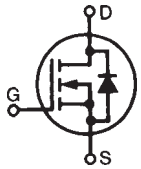
Preliminary Technical Information

TrenchMV™ Power MOSFET

IXTP60N10TM

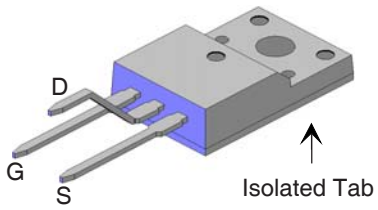
V_{DSS} = 100V
I_{D25} = 33A
$R_{DS(on)}$ ≤ 19mΩ

N-Channel Enhancement Mode
Avalanche Rated



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	33	A
I_{DM}	T_C = 25°C, pulse width limited by T_{JM}	180	A
I_A	T_C = 25°C	10	A
E_{AS}	T_C = 25°C	500	mJ
P_D	T_C = 25°C	60	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
T_{SOLD}	Plastic body for 10 seconds	260	°C
M_d	Mounting torque	1.13/10	Nm/lb.in
Weight		2.5	g

OVERMOLDED TO-220 W/ FORMED LEAD (IXTP...M)



G = Gate D = Drain
S = Source

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 = 50μA	2.5		4.5	V
I_{GSS}	V_{GS} = ± 20V, V_{DS} = 0V			± 100	nA
I_{DSS}	V_{DS} = V_{DSS}			1	μA
	V_{GS} = 0V T_J = 150°C			100	μA
$R_{DS(on)}$	V_{GS} = 10V, I_D = 25A, Notes 1, 2			19	mΩ

Features

- Plastic overmolded tab for electrical isolation
- Low $R_{DS(ON)}$
  - for minimum on-state conduction losses
- Fast switching

Advantages

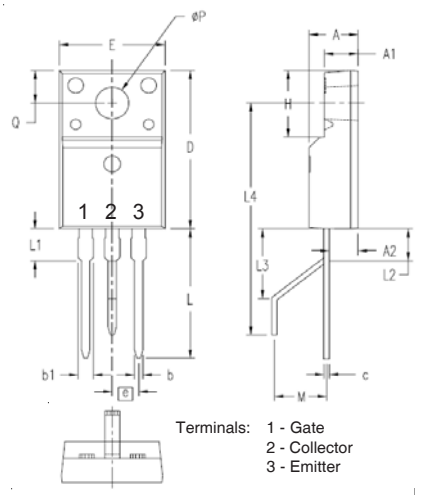
- Easy to mount
- Space savings
- High power density

Applications

- DC-DC converters
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- AC motor drives
- Uninterruptible power supplies
- High speed power switching applications

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	25	42		S
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		2650		pF
C_{oss}			335		pF
C_{rss}			60		pF
$t_{d(on)}$	**Resistive Switching Times**		27		ns
t_r	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 10A		40		ns
$t_{d(off)}$	R_G = 15Ω (External)		43		ns
t_f			37		ns
$Q_{g(on)}$	V_{GS}= 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 10A		49		nC
Q_{gs}			15		nC
Q_{gd}			11		nC
R_{thJC}				2.5	°C/W

OVERMOLDED TO-220 W/ FORMED LEAD (IXTP...M)



Terminals: 1 - Gate
2 - Collector
3 - Emitter

SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.177	.193	4.50	4.90
A1	.092	.108	2.34	2.74
A2	.101	.117	2.56	2.96
b	.028	.035	0.70	0.90
b1	.050	.058	1.27	1.47
c	.016	.024	0.40	0.60
D	.617	.633	15.67	16.07
E	.392	.408	9.96	10.36
e	.100 BSC		2.54 BSC	
H	.255	.271	6.48	6.88
L	.500	.523	12.70	13.30
L1	.119	.135	3.03	3.43
L2	.098	.138	2.50	3.50
L3	.256	.295	6.50	7.50
L4	.906	.945	23.00	24.00
M	.177	.216	4.50	5.50
ØP	.121	.129	3.08	3.28
Q	.126	.134	3.20	3.40

Source-Drain Diode

Symbol	Test Conditions (T_J = 25°C unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
I_S	V_{GS} = 0V			60	A
I_{SM}	Repetitive, pulse width limited by T_{JM}			240	A
V_{SD}	I_F = 25A, V_{GS} = 0V, Note 1			1.2	V
t_{rr}	I_F = 30A, V_{GS} = 0V		59		ns
I_{RM}	-di/dt = 100A/μs		3.8		A
Q_{RM}	V_R = 50V		112		nC

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 5mm or less from the package body.

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.

Fig. 1. Output Characteristics @ 25ºC

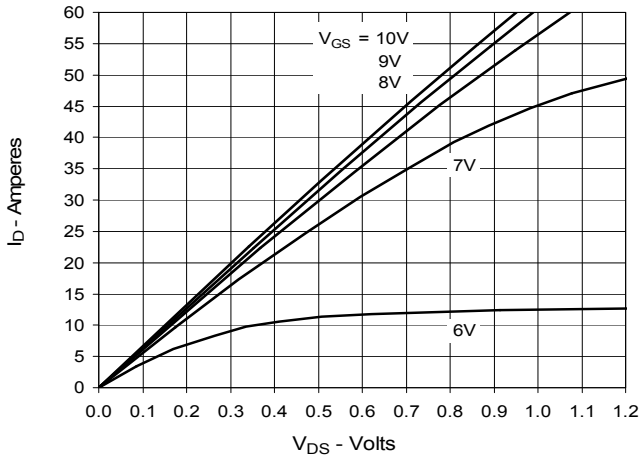


Fig. 2. Extended Output Characteristics @ 25ºC

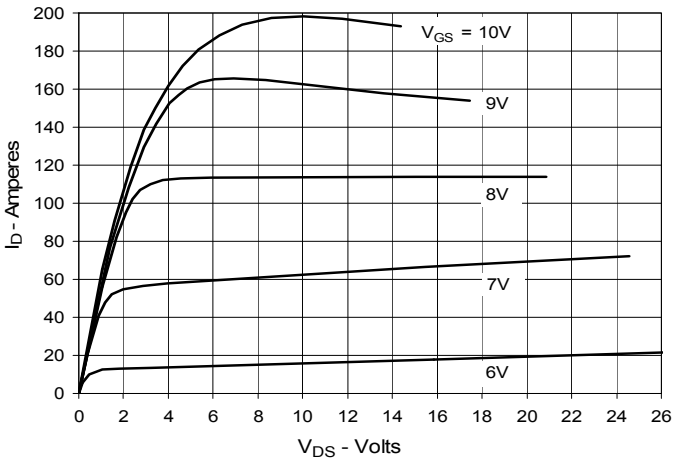


Fig. 3. Output Characteristics @ 150ºC

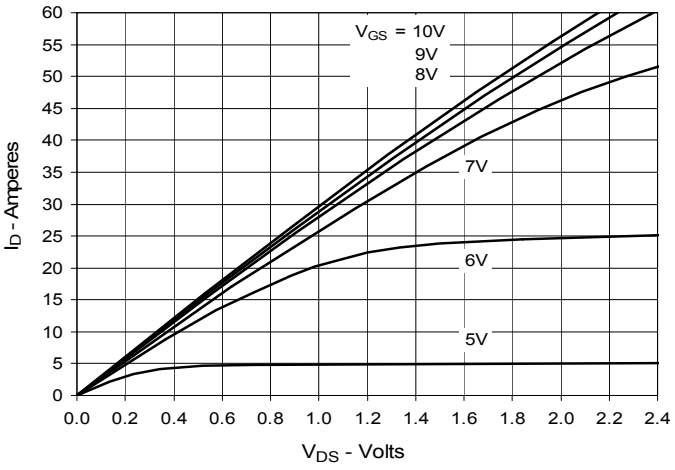


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 30A Value vs. Junction Temperature

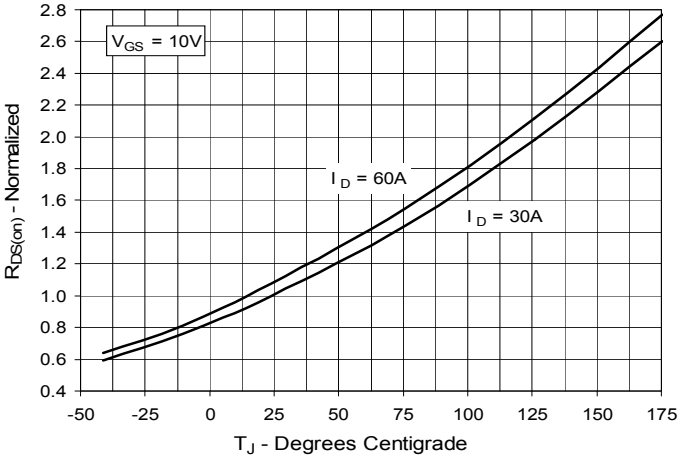


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 30A Value vs. Drain Current

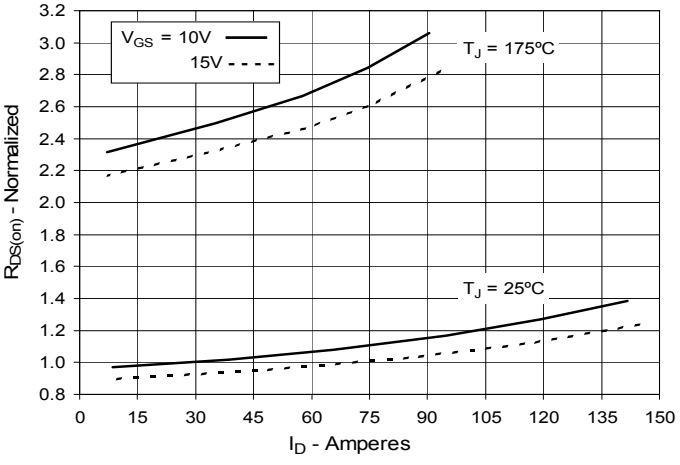


Fig. 6. Drain Current vs. Case Temperature

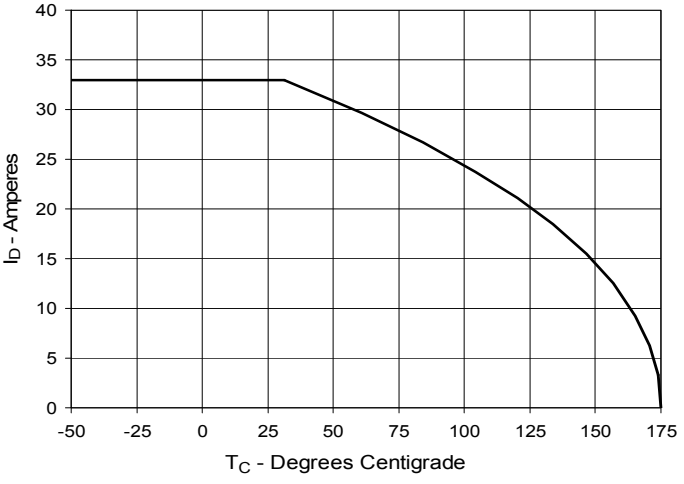


Fig. 7. Input Admittance

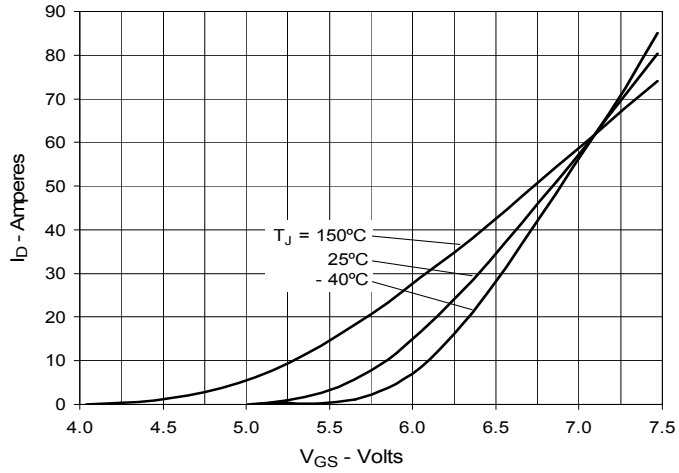


Fig. 8. Transconductance

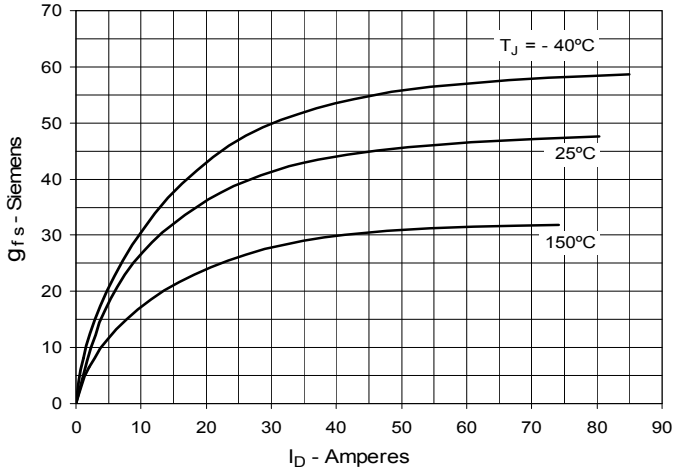


Fig. 9. Forward Voltage Drop of Intrinsic Diode

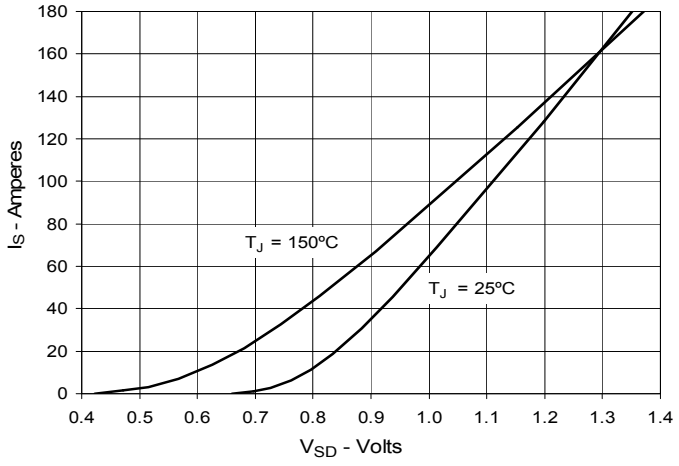


Fig. 10. Gate Charge

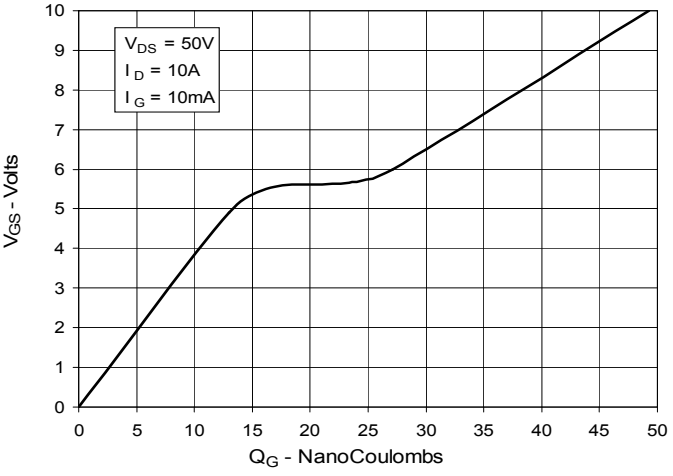


Fig. 11. Capacitance

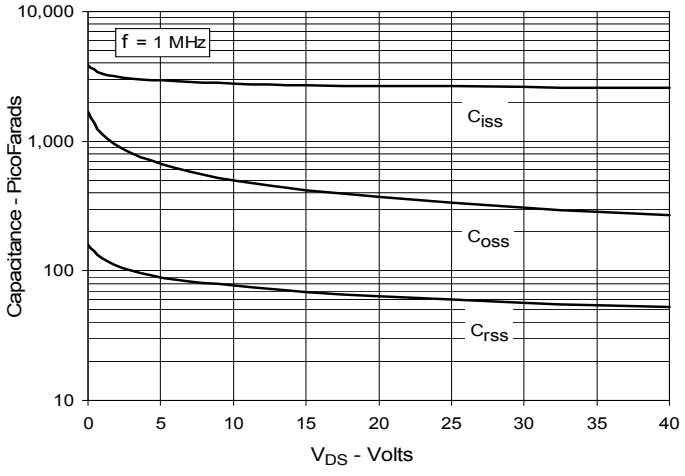


Fig. 12. Maximum Transient Thermal Impedance

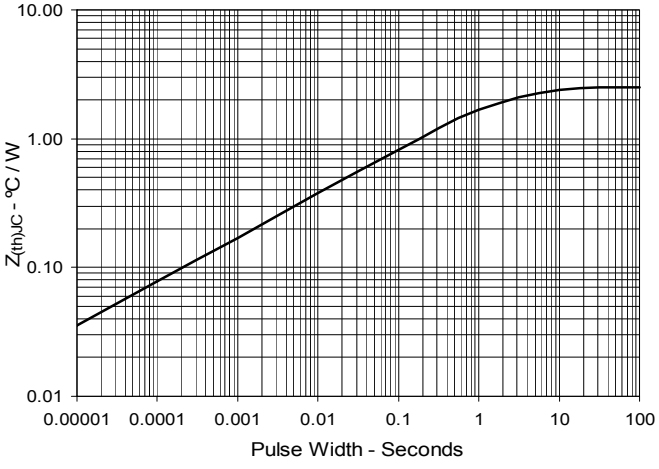


Fig. 13. Resistive Turn-on Rise Time vs. Junction Temperature

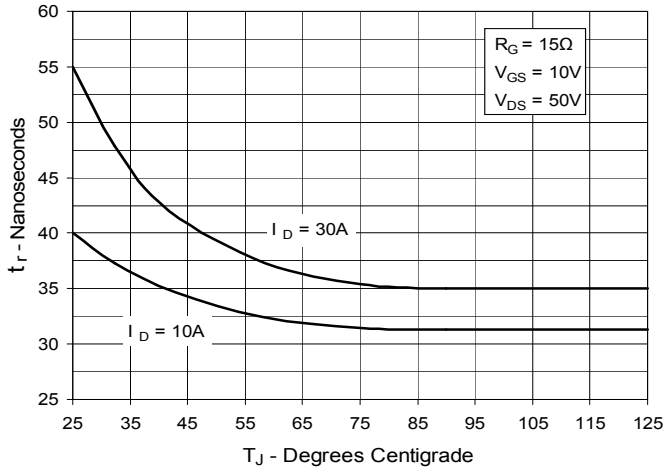


Fig. 14. Resistive Turn-on Rise Time vs. Drain Current

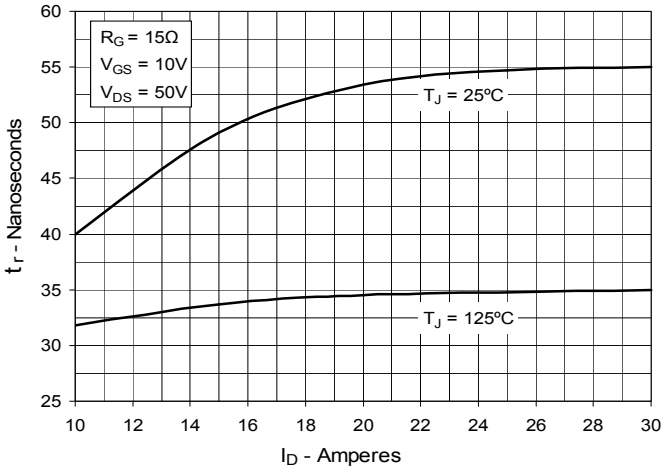


Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance

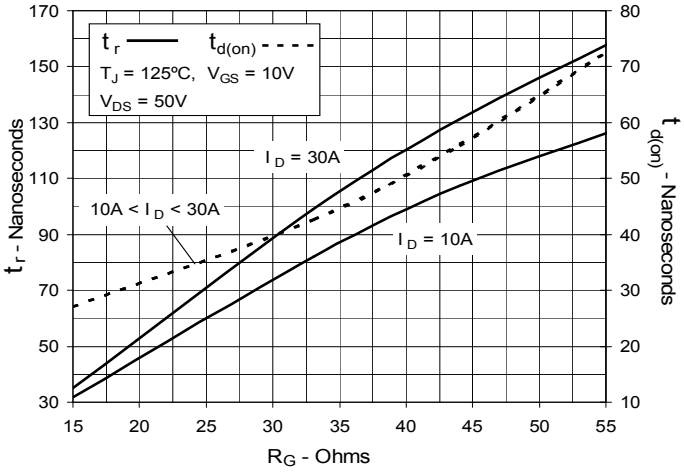


Fig. 16. Resistive Turn-off Switching Times vs. Junction Temperature

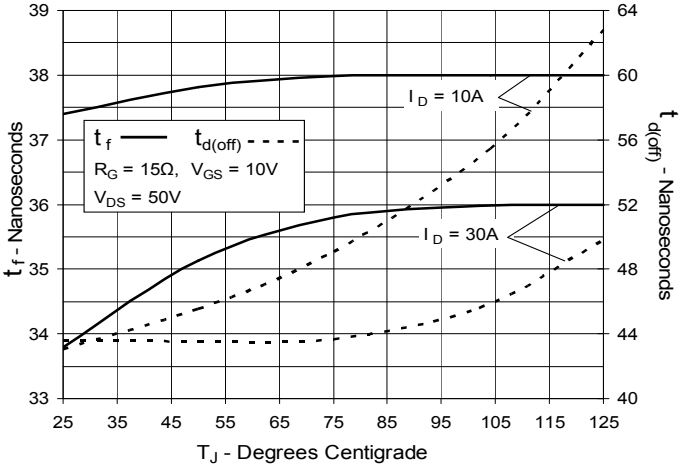


Fig. 17. Resistive Turn-off Switching Times vs. Drain Current

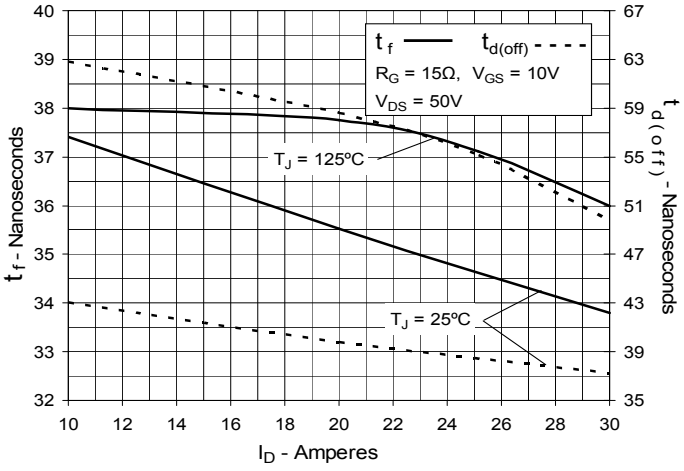


Fig. 18. Resistive Turn-off Switching Times vs. Gate Resistance