IXYS

Preliminary Technical Information

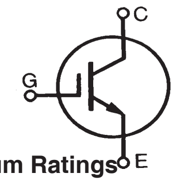
GenX3™ 300V IGBT

IXGH100N30B3*

*Obsolete Part Number

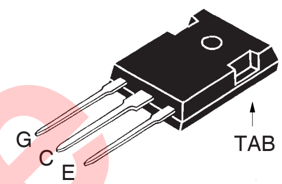
V_{CES} = 300V
I_{C110} = 100A
$V_{CE(sat)}$ ≤ 1.7V
$t_{fi(typ)}$ = 33ns

Medium speed low Vsat PT IGBTs for 10-50 kHz switching



Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_J = 25°C to 150°C	300	V
V_{CGR}	T_J = 25°C to 150°C, R_{GE} = 1MΩ	300	V
V_{GES}	Continuous	±20	V
V_{GEM}	Transient	±30	V
I_{C25}	T_C = 25°C (limited by leads)	75	A
I_{C110}	T_C = 110°C	100	A
I_{CM}	T_C = 25°C, 1ms	400	A
SSOA (RBSOA)	V_{GE}= 15V, T_J = 125°C, R_G = 2Ω Clamped inductive load @V_{CE}≤ 300V	I_{CM} = 200	A
P_C	T_C = 25°C	460	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
M_d	Mounting torque	1.13 / 10	Nm/lb.in.
T_L	Maximum lead temperature for soldering	300	°C
T_{SOLD}	1.6mm (0.062 in.) from case for 10s	260	°C
Weight		6	g

TO-247 (IXGH)



G = Gate C = Collector
E = Emitter TAB = Collector

Features

- Optimized for low switching losses
- Square RBSOA
- International standard package

Advantages

- High power density
- Low gate drive requirement

Applications

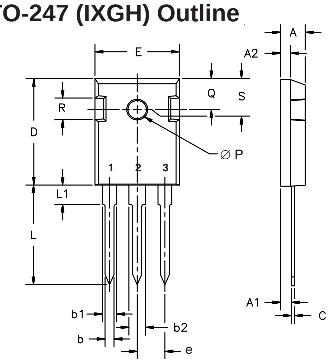
- High Frequency Power Inverters
- UPS
- Motor Drives
- SMPS
- PFC Circuits
- Battery Chargers
- Welding Machines
- Lamp Ballasts

Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)		Characteristic Values Min.	Typ.	Max.	
BV_{CES}	I_C = 250μA, V_{GE} = 0V		300			V
$V_{GE(th)}$	I_C = 250μA, V_{CE} = V_{GE}		3.0		5.0	V
I_{CES}	V_{CE} = V_{CES}				10	μA
	V_{GE} = 0V	T_J = 125°C			500	μA
I_{GES}	V_{CE} = 0V, V_{GE} = ±20V				±100	nA
$V_{CE(sat)}$	I_C = 100A, V_{GE} = 15V, Note 1			1.35	1.7	V
		T_J = 125°C		1.40		V

Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	Characteristic Values Min.	Typ.	Max.
g_{fs}	I_C = 50A, V_{CE} = 10V, Note 1	45	77	S
C_{ies}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz		5010	pF
C_{oes}			370	pF
C_{res}			93	pF
Q_g	I_C = 100A, V_{GE} = 15V, V_{CE} = 0.5 • V_{CES}		166	nC
Q_{ge}			30	nC
Q_{gc}			65	nC
$t_{d(on)}$	**Resistive load, T_J = 25°C**		27	ns
t_r	I_C = 50A, V_{GE} = 15V		51	ns
$t_{d(off)}$	V_{CE} = 240V, R_G = 2Ω		110	ns
t_f			33	ns
$t_{d(on)}$	**Resistive load, T_J = 125°C**		24	ns
t_r	I_C = 50A, V_{GE} = 15V		61	ns
$t_{d(off)}$	V_{CE} = 240V, R_G = 2Ω		124	ns
t_f			148	ns
R_{thJC}				0.27 °C/W
R_{thCK}			0.21	°C/W

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

TO-247 (IXGH) 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
∅P	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.

Fig. 1. Output Characteristics @ 25ºC

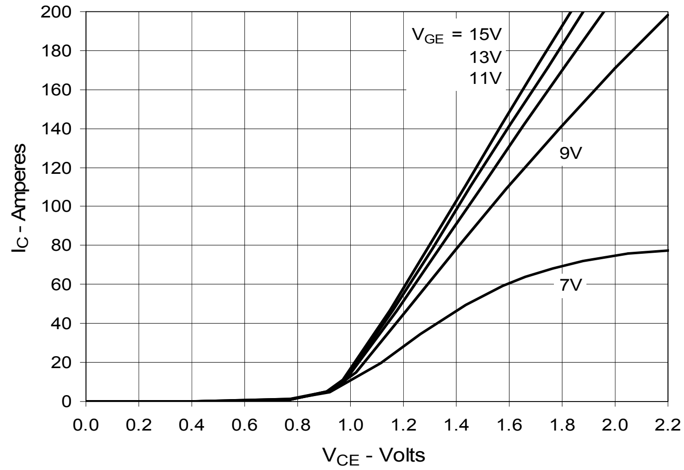


Fig. 2. Extended Output Characteristics @ 25ºC

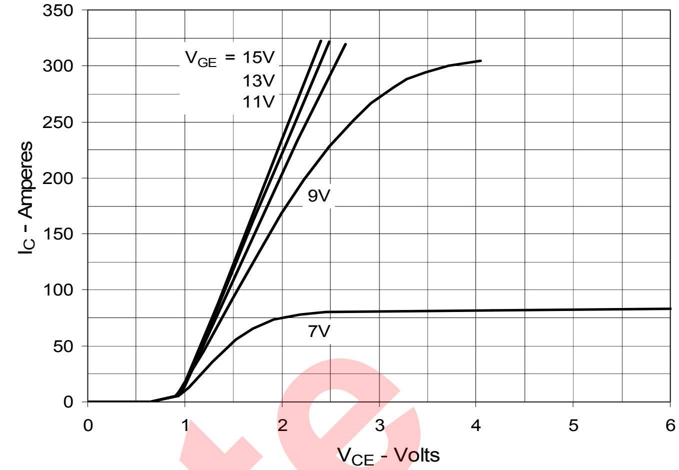


Fig. 3. Output Characteristics @ 125ºC

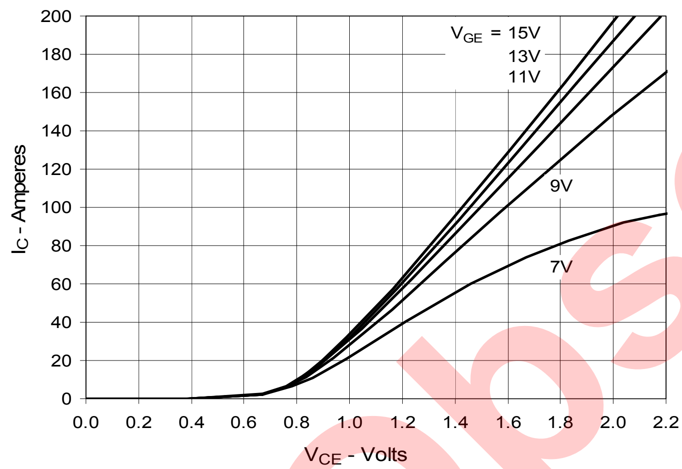


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

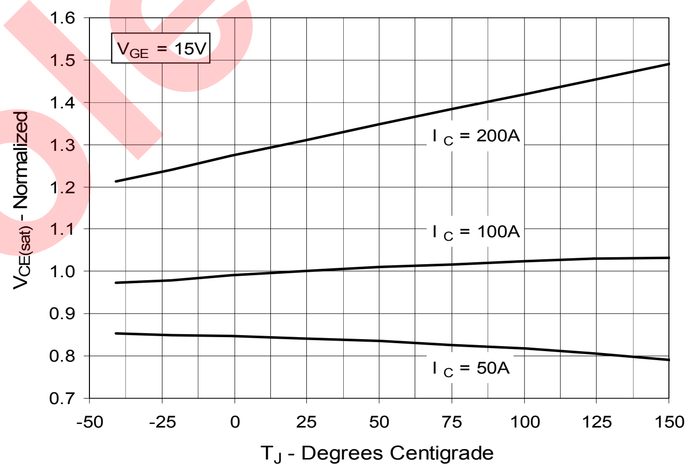


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

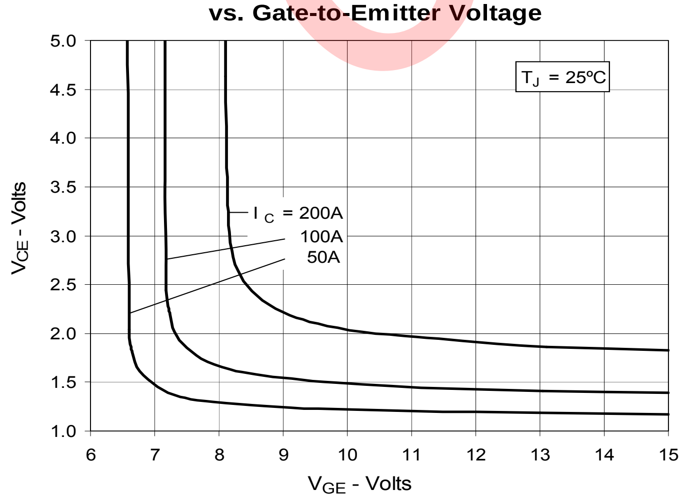


Fig. 6. Input Admittance

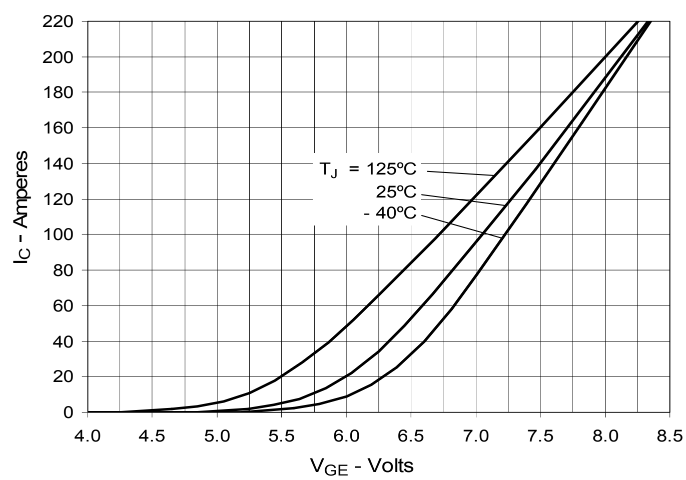


Fig. 7. Transconductance

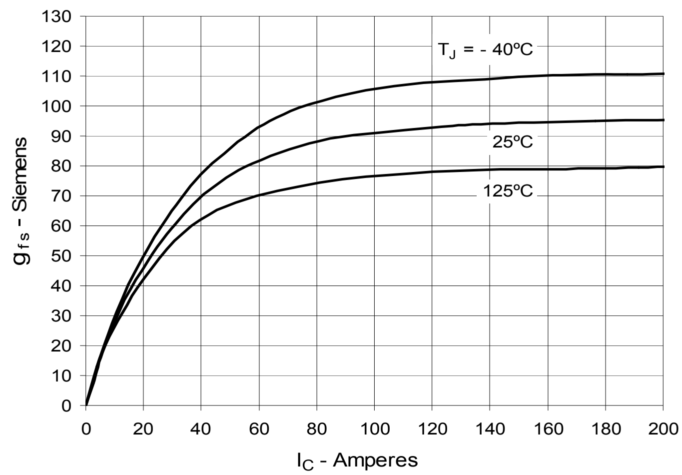


Fig. 8. Gate Charge

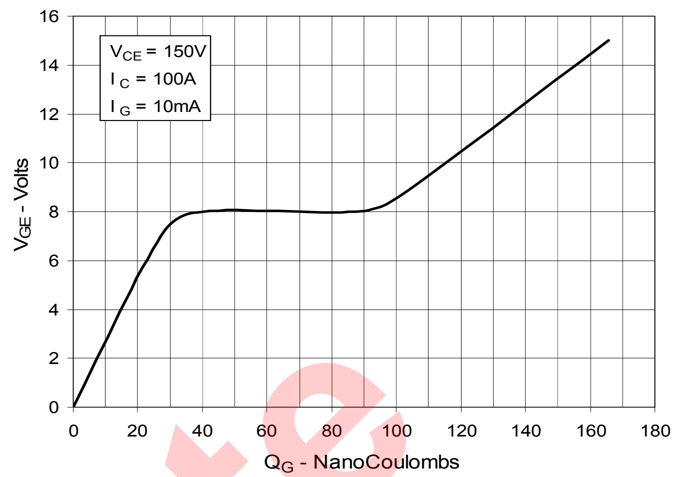


Fig. 9. Reverse-Bias Safe Operating Area

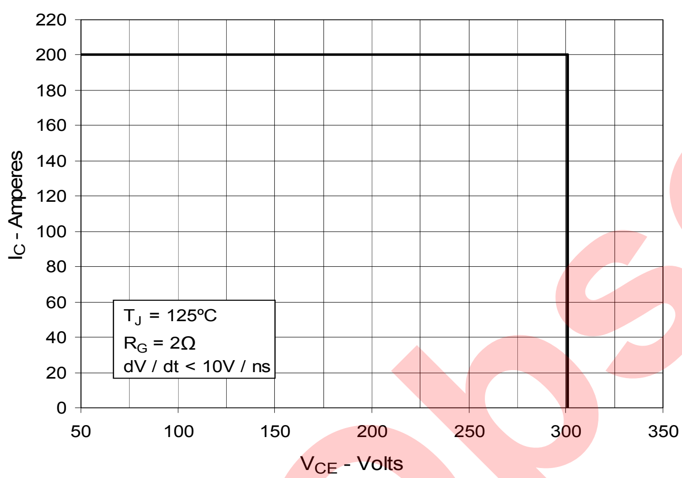


Fig. 10. Capacitance

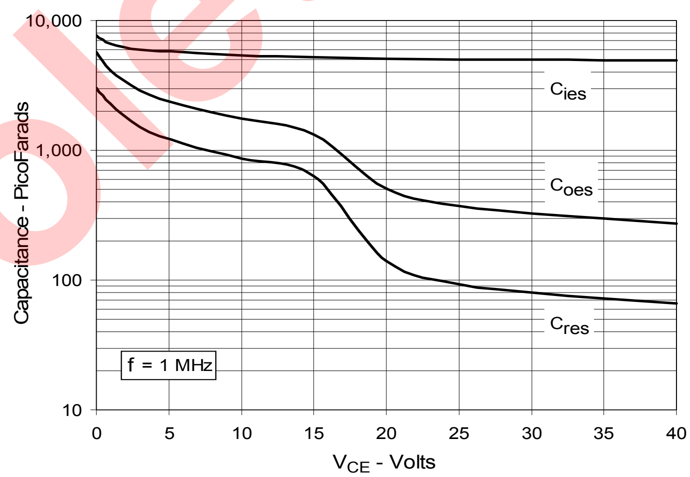


Fig. 11. Forward-Bias Safe Operating Area

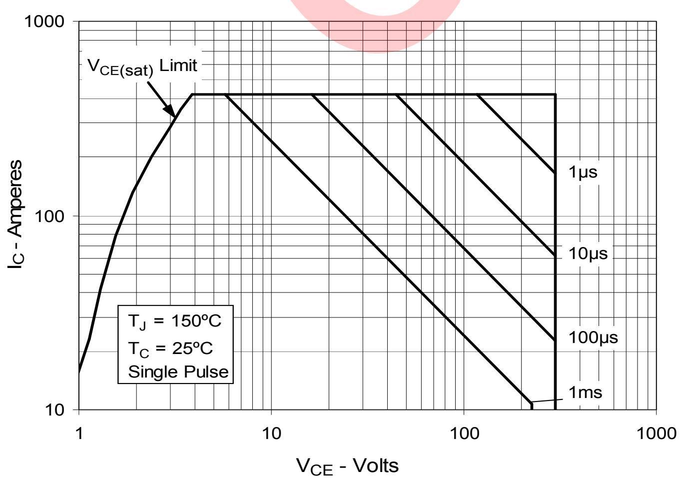
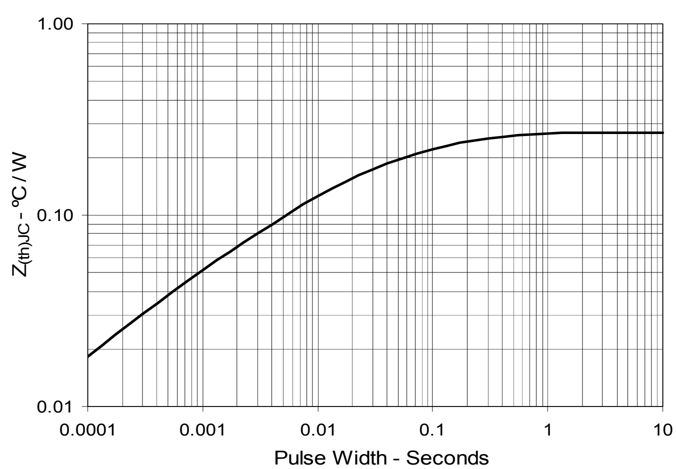


Fig. 12. Maximum Transient Thermal Impedance



IXYS reserves the right to change limits, test conditions, and dimensions.

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

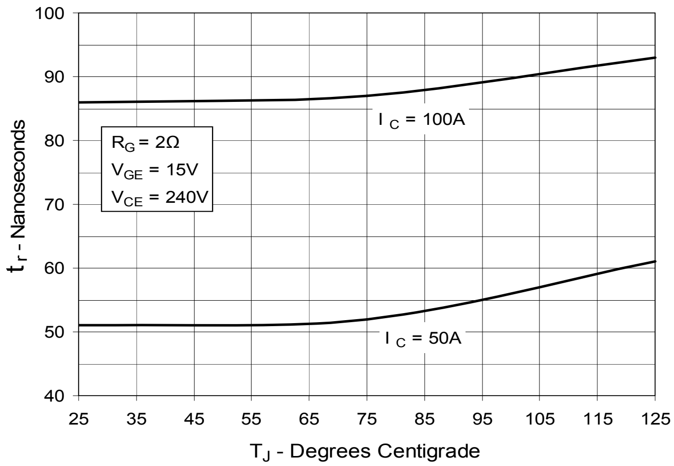


Fig. 14. Resistive Turn-on Rise Time vs. Collector Current

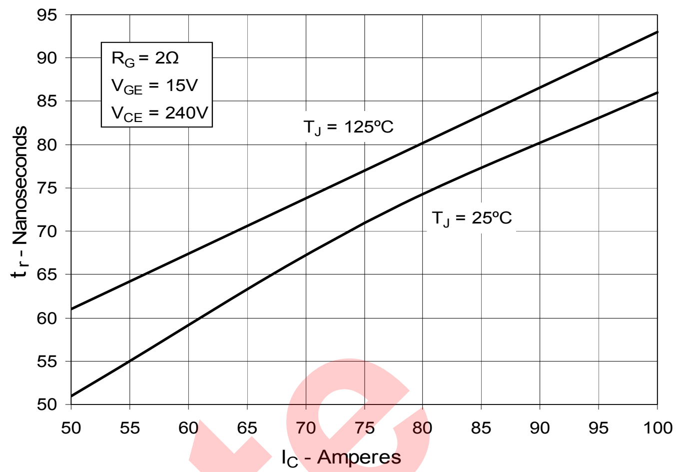


Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance

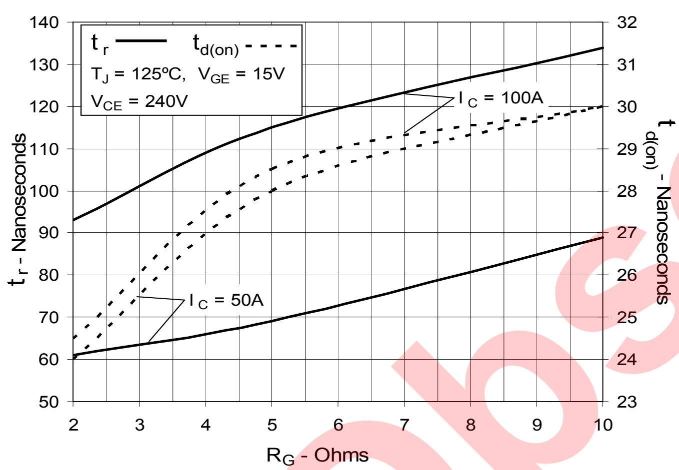


Fig. 16. Resistive Turn-off Switching Times vs. Junction Temperature

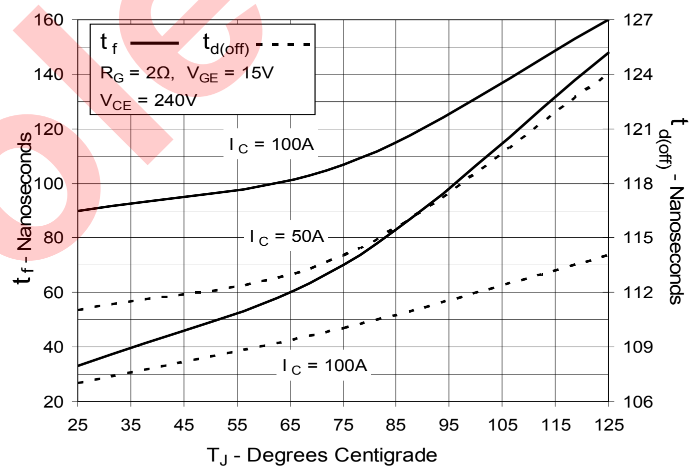


Fig. 17. Resistive Turn-off Switching Times vs. Collector Current

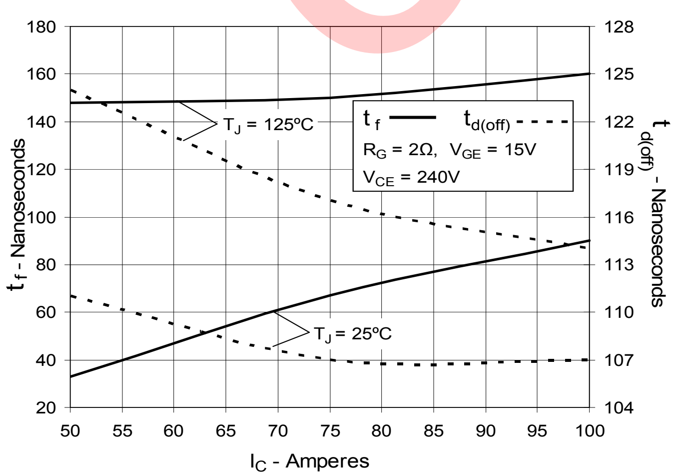
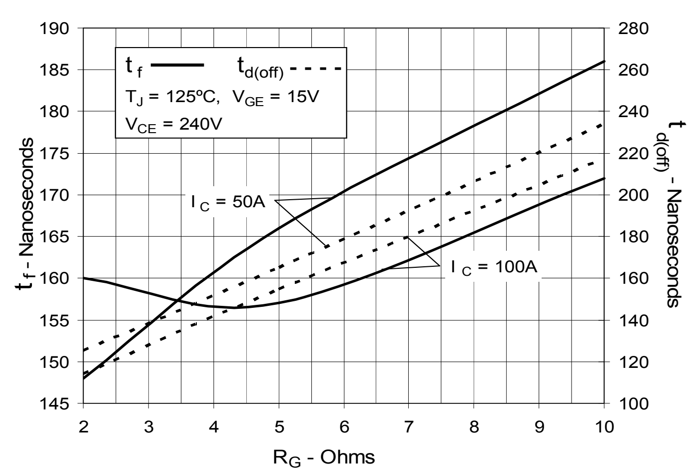


Fig. 18. Resistive Turn-off Switching Times vs. Gate Resistance



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