IXYS

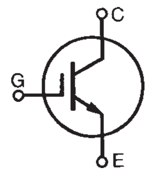
Preliminary Technical Information

GenX3™ 300V IGBT

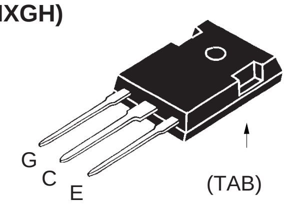
IXGH100N30C3

V_{CES}	=	300V
I_{C110}	=	100A
$V_{CE(sat)}$	≤	1.85V
t_{fi} typ	=	94ns

High Speed PT IGBTs for 50-150kHz switching



TO-247 (IXGH)



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

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 (chip capability)	100	A
I_{CM}	T_C = 25°C, 1ms	500	A
I_A	T_C = 25°C	100	A
E_{AS}	T_C = 25°C	500	mJ
SSOA (RBSOA)	V_{GE}= 15V, T_{VJ} = 125°C, R_G = 2Ω Clamped inductive load @ ≤ 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
T_L	Maximum lead temperature for soldering	300	°C
T_{SOLD}	1.6mm (0.062 in.) from case for 10s	260	°C
M_d	Mounting torque	1.13/10	Nm/lb.in.
Weight		6	g

Features

- High Frequency IGBT
- Square RBSOA
- High avalanche capability
- Drive simplicity with MOS Gate Turn-On
- High current handling capability

Applications

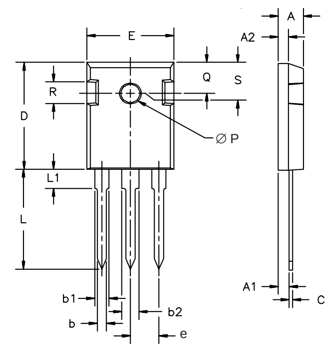
- PFC Circuits
- PDP Systems
- Switched-mode and resonant-mode converters and inverters
- SMPS
- AC motor speed control
- DC servo and robot drives
- DC choppers

Characteristic Values (T_J = 25°C, unless otherwise specified)

Symbol	Test Conditions		Min.	Typ.	Max.	
BV_{CES}	I_C = 250µA, V_{GE} = 0V		300			V
$V_{GE(th)}$	I_C = 250µA, V_{CE} = V_{GE}		2.5		5.0	V
I_{CES}	V_{CE} = V_{CES}				50	µA
	V_{GE} = 0V	T_J = 125°C			1.0	mA
I_{GES}	V_{CE} = 0V, V_{GE} = ± 20V				±100	nA
$V_{CE(sat)}$	I_C = 100A, V_{GE} = 15V			1.53	1.85	V
		T_J = 125°C		1.59		V

Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	Min.	Typ.	Max.	
g_{fs}	I_C = 60A, V_{CE} = 10V, Pulse test, t ≤ 300µs; duty cycle, d ≤ 2%.	40	75		S
C_{ies}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz		6300		pF
C_{oes}			435		pF
C_{res}			115		pF
Q_g	I_C = I_{C110}, V_{GE} = 15V, V_{CE} = 0.5 • V_{CES}		162		nC
Q_{ge}			27		nC
Q_{gc}			60		nC
$t_{d(on)}$	**Inductive Load, T_J = 25°C** I_C = 50A, V_{GE} = 15V V_{CE} = 200V, R_G = 2Ω		23		ns
t_{ri}			38		ns
E_{on}			0.23		mJ
$t_{d(off)}$			105	160	ns
t_{fi}			94		ns
E_{off}			0.52	0.9	mJ
$t_{d(on)}$	**Inductive Load, T_J = 125°C** I_C = 50A, V_{GE} = 15V V_{CE} = 200V, R_G = 2Ω		24		ns
t_{ri}			37		ns
E_{on}			0.35		mJ
$t_{d(off)}$			131		ns
t_{fi}			113		ns
E_{off}			0.75		mJ
R_{thJC}				0.27	°C/W
R_{thCK}			0.21		°C/W

TO-247 AD Outline



Dim.	Millimeter Min.	Millimeter Max.	Inches Min.	Inches 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

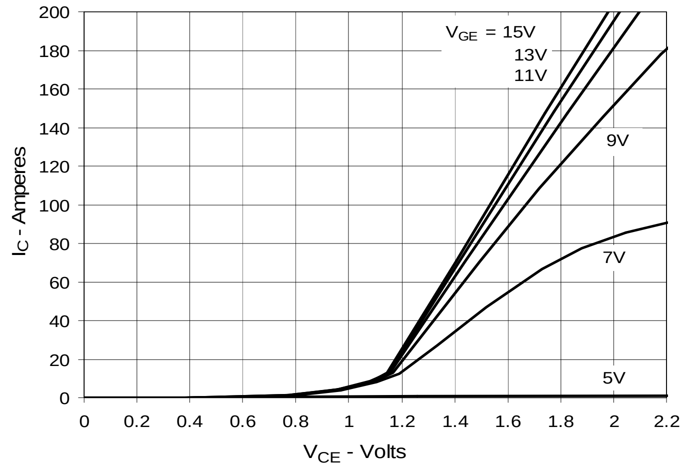


Fig. 2. Extended Output Characteristics @ 25ºC

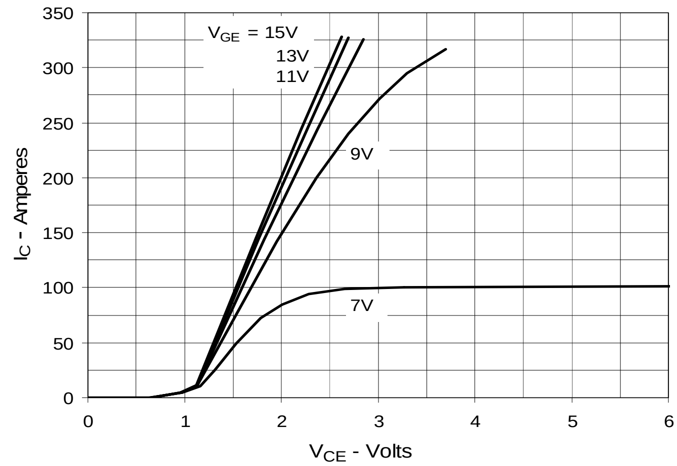


Fig. 3. Output Characteristics @ 125ºC

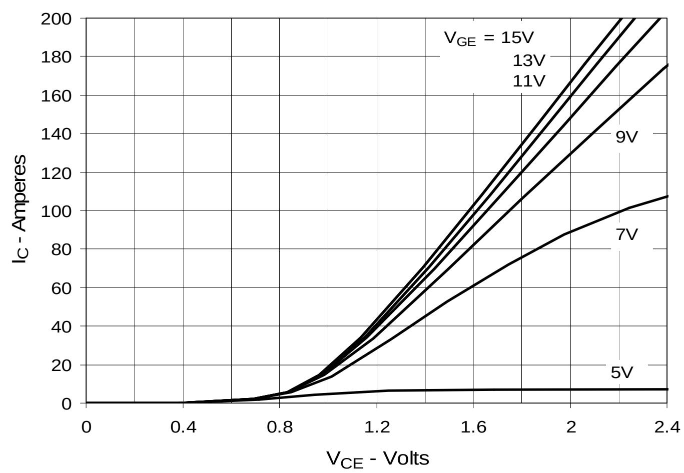


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

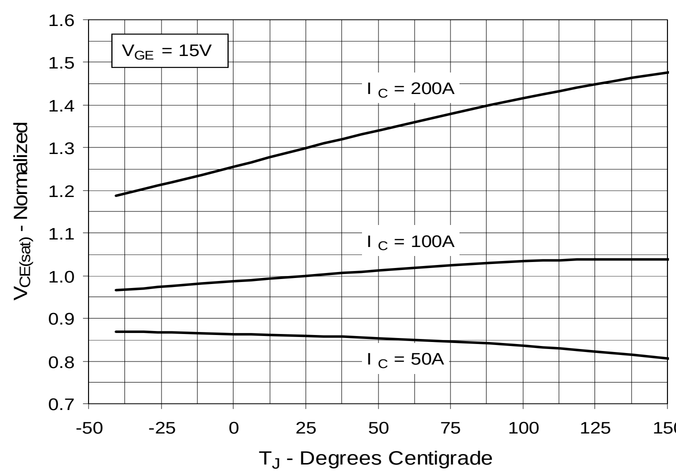


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

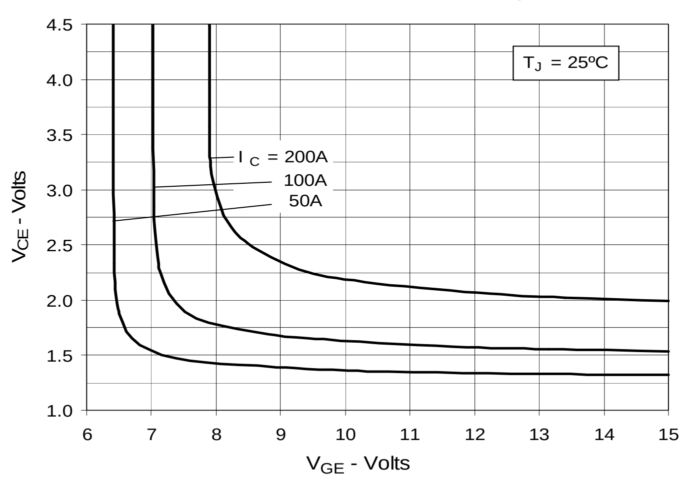


Fig. 6. Input Admittance

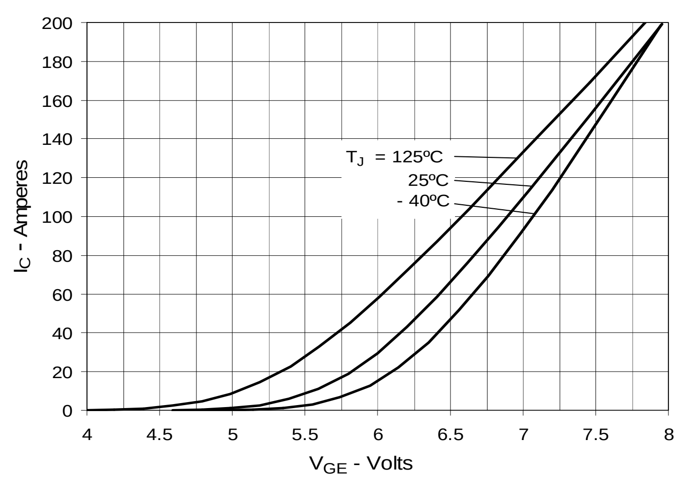


Fig. 7. Transconductance

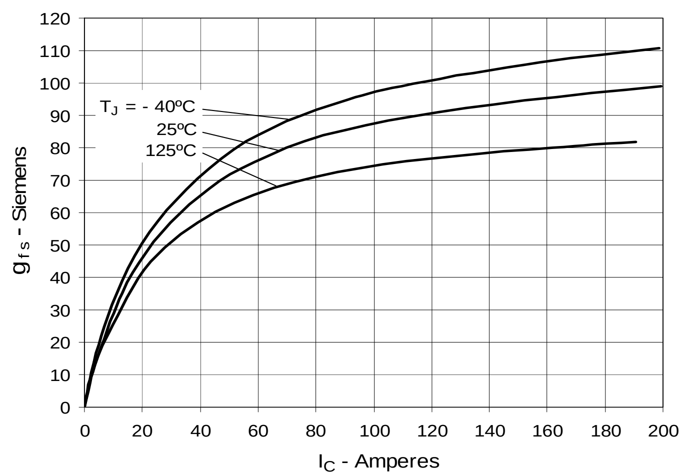


Fig. 8. Gate Charge

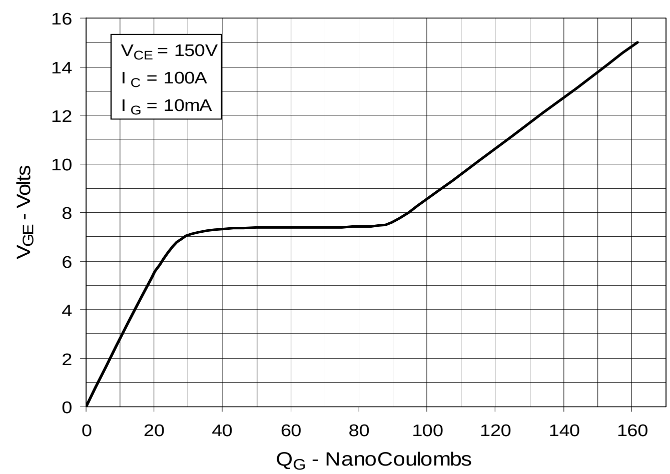


Fig. 9. Capacitance

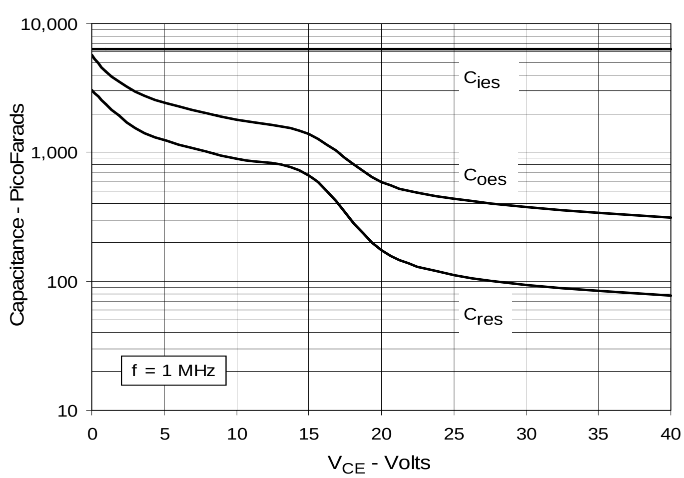


Fig. 10. Reverse-Bias Safe Operating Area

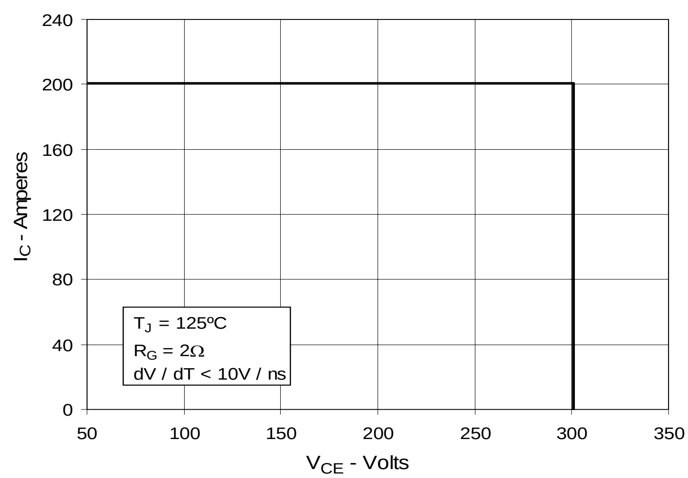
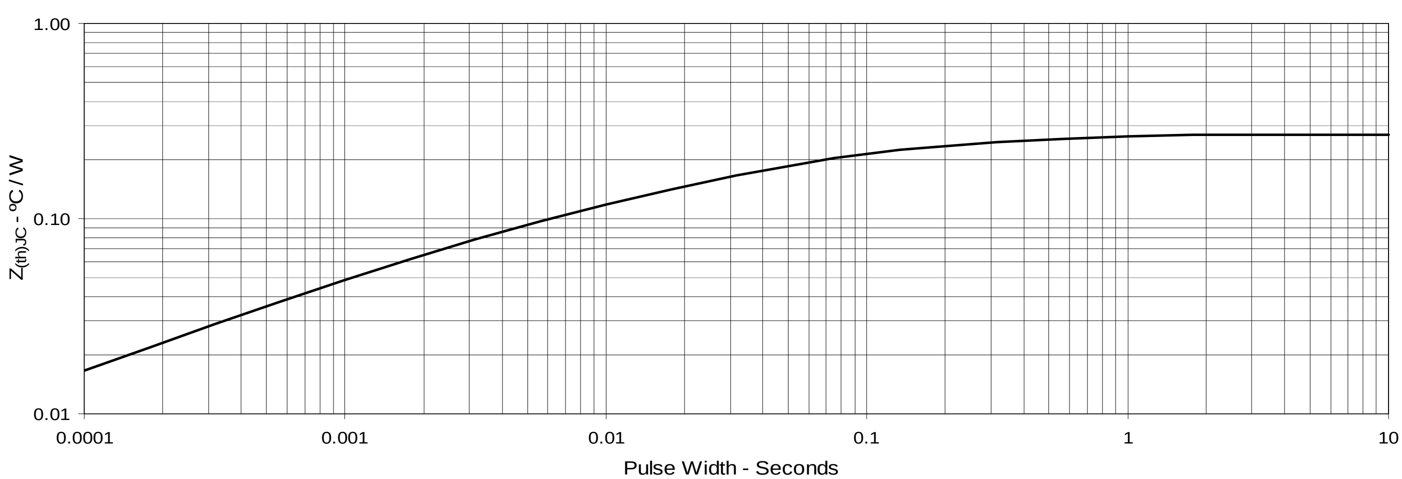


Fig. 11. Maximum Transient Thermal Impedance



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

Fig. 12. Inductive Switching Energy Loss vs. Gate Resistance

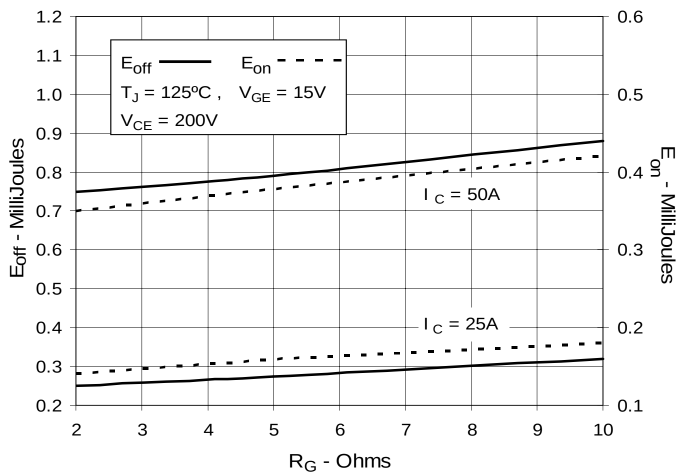


Fig. 13. Inductive Swiching Energy Loss vs. Collector Current

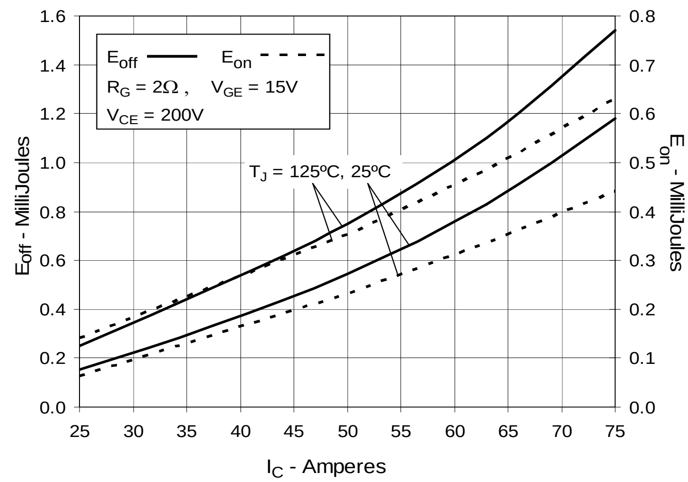


Fig. 14. Inductive Swiching Energy Loss vs. Junction Temperature

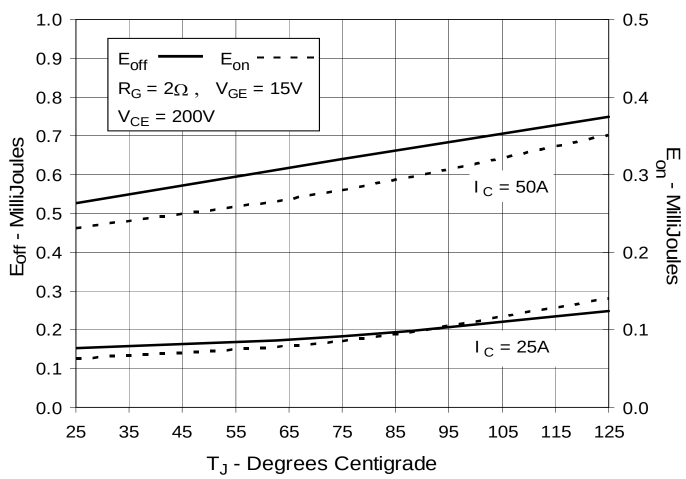


Fig. 15. Inductive Turn-off Switching Times vs. Gate Resistance

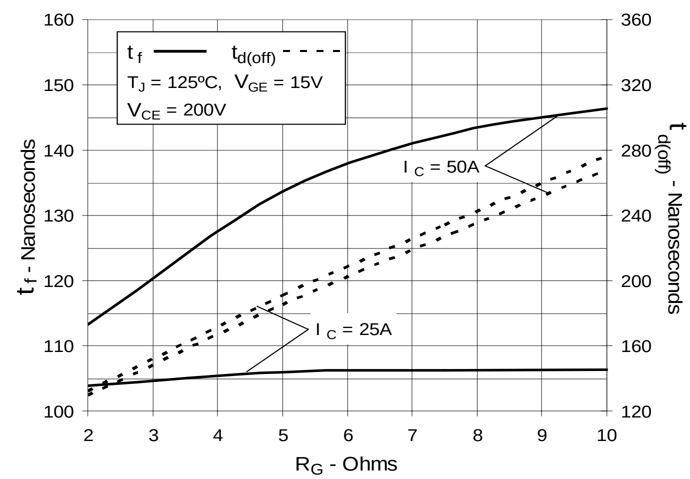


Fig. 16. Inductive Turn-off Switching Times vs. Collector Current

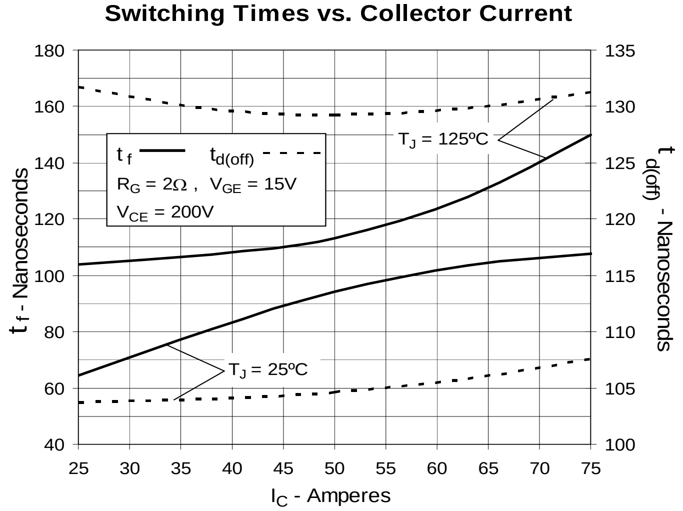


Fig. 17. Inductive Turn-off Switching Times vs. Junction Temperature

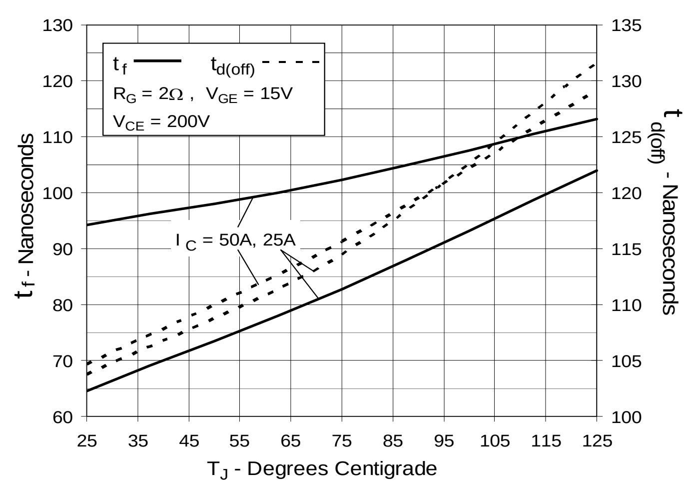


Fig. 18. Inductive Turn-on Switching Times vs. Gate Resistance

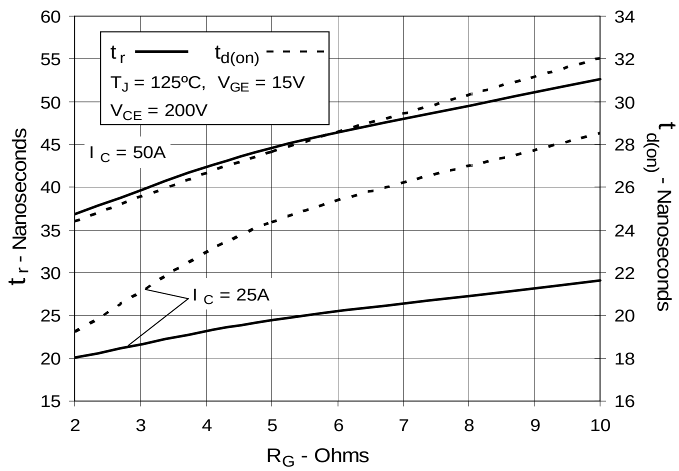


Fig. 19. Inductive Turn-on Switching Times vs. Collector Current

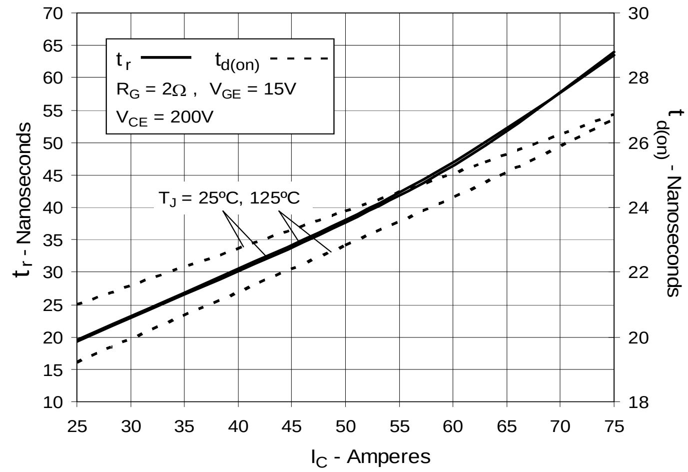


Fig. 20. Inductive Turn-on Switching Times vs. Junction Temperature