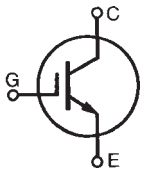
IXYS

Preliminary Technical Information

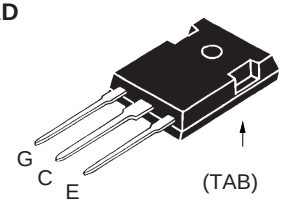
GenX3™ 300V IGBT IXGH85N30C3

V_{CES} = 300V
I_{C110} = 85A
$V_{CE(sat)}$ ≤ 1.9V
t_{fi} typ = 70ns

High Speed PT IGBTs for 50-150kHz switching



TO-247 AD (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)	85	A
I_{CM}	T_C = 25°C, 1ms	420	A
I_A	T_C = 25°C	85	A
E_{AS}	T_C = 25°C	400	mJ
SSOA (RBSOA)	V_{GE} = 15V, T_{VJ} = 125°C, R_G = 3.3Ω Clamped inductive load @ ≤ 300V	I_{CM} = 170	A
P_C	T_C = 25°C	333	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}	1.6 mm (0.062 in.) from case for 10s	260	°C
M_d	Mounting torque (TO-247)	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

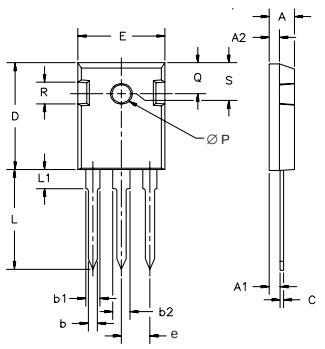
- PFC Circuits
- PDP Systems
- Switched-mode and resonant-mode converters and inverters
- SMPS
- AC motor speed control
- DC servo and robot drives
- DC choppers

Symbol	Test Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified)			
		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}			30	μA
	V_{GE} = 0V, T_J = 125°C			750	μA
I_{GES}	V_{CE} = 0V, V_{GE} = ±20V			±100	nA
$V_{CE(sat)}$	I_C = 85A, V_{GE} = 15V		1.64	1.9	V
	T_J = 125°C		1.67		V

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Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	I_C = 0.5 • I_{C110}, V_{CE} = 10V, Pulse test, t ≤ 300µs; duty cycle, d ≤ 2%.	35	60		S
C_{ies}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz		5100		pF
C_{oes}			310		pF
C_{res}			80		pF
Q_g	I_C = I_{C110}, V_{GE} = 15V, V_{CE} = 0.5 • V_{CES}		136		nC
Q_{ge}			22		nC
Q_{gc}			48		nC
$t_{d(on)}$	**Inductive Load, T_J = 25°C** I_C = 0.5 • I_{C110}, V_{GE} = 15V V_{CE} = 200V, R_G = 3.3Ω		25		ns
t_{ri}			34		ns
E_{on}			0.20		mJ
$t_{d(off)}$			100	160	ns
t_{fi}			70		ns
E_{off}			0.39	0.75	mJ
$t_{d(on)}$	**Inductive Load, T_J = 125°C** I_C = 0.5 • I_{C110}, V_{GE} = 15V V_{CE} = 200V, R_G = 3.3Ω		22		ns
t_{ri}			33		ns
E_{on}			0.36		mJ
$t_{d(off)}$			120		ns
t_{fi}			101		ns
E_{off}			0.48		mJ
R_{thJC}				0.375	°C/W
R_{thCK}			0.21		°C/W

TO-247 AD Outline



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.

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

IXYS MOSFETs and IGBTs are covered by one or moreof the following U.S. patents: 4,835,592 4,850,072 4,881,106 4,931,844 5,017,508 5,034,796 5,049,961 5,063,307 5,187,117 5,237,481 5,381,025 5,486,715 6,162,665 6,259,123 B1 6,306,728 B1 6,404,065 B1 6,534,343 6,583,505 6,683,344 6,710,405 B2 6,710,463 6,727,585 6,759,692 6,771,478 B2 7,005,734 B2 7,063,975 B2 7,071,537 7,157,338B2

Fig. 1. Output Characteristics @ 25ºC

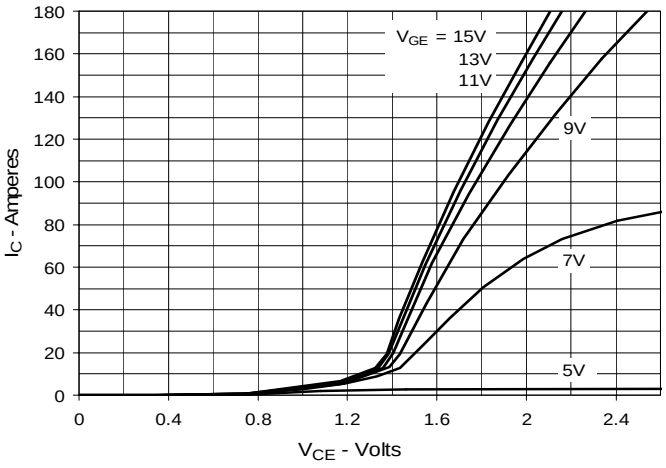


Fig. 2. Extended Output Characteristics @ 25ºC

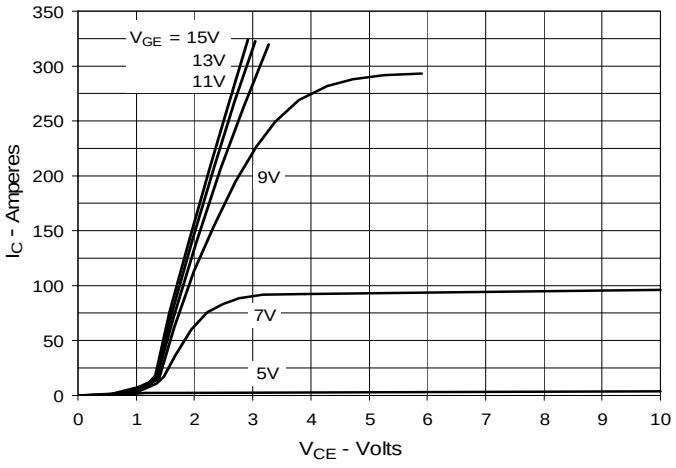


Fig. 3. Output Characteristics @ 125ºC

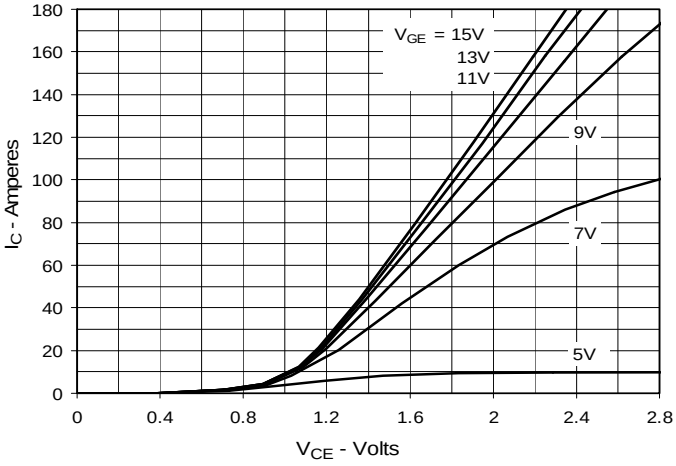


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

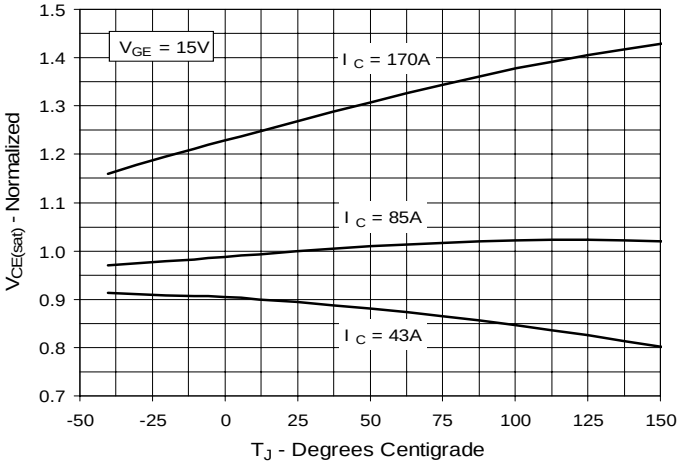


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

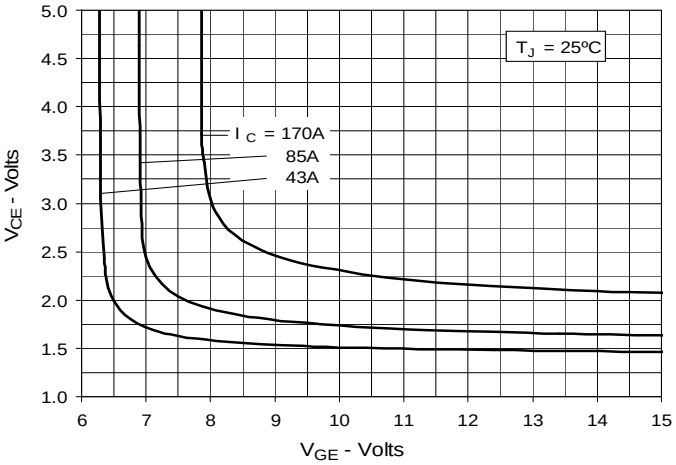
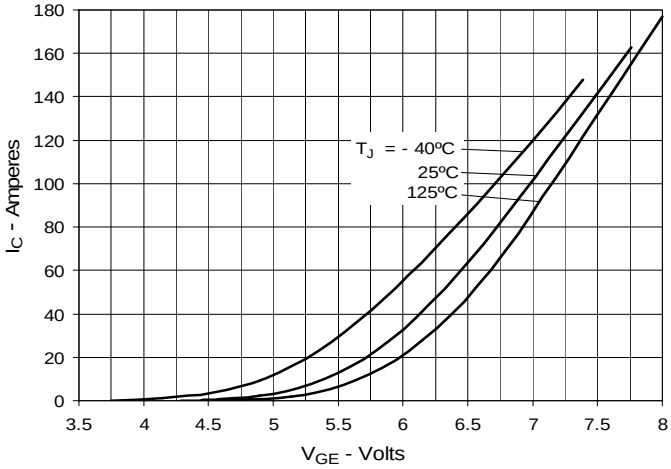


Fig. 6. Input Admittance



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Fig. 7. Transconductance

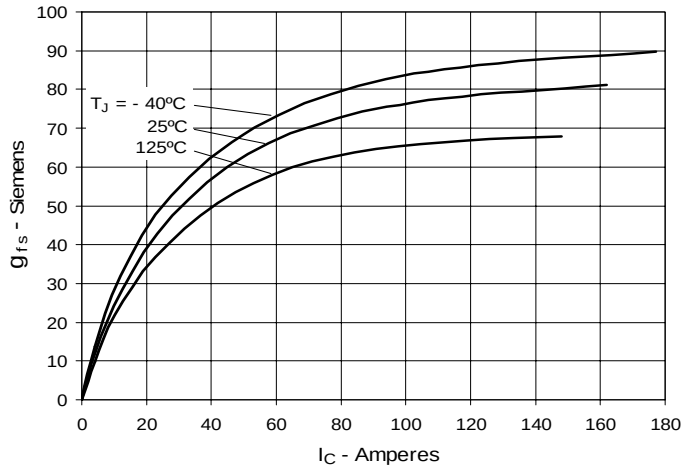


Fig. 8. Gate Charge

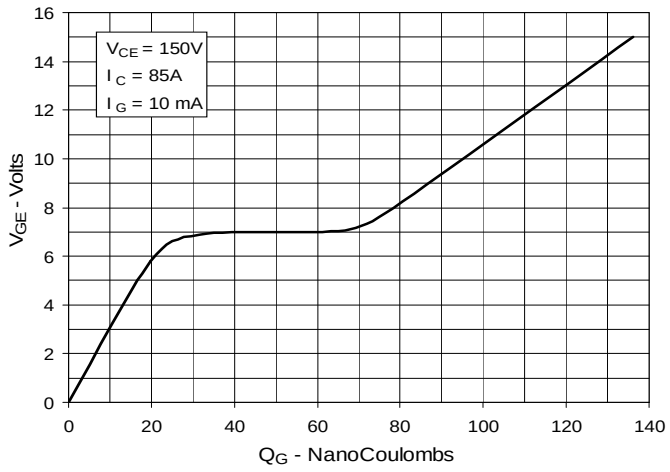


Fig. 9. Capacitance

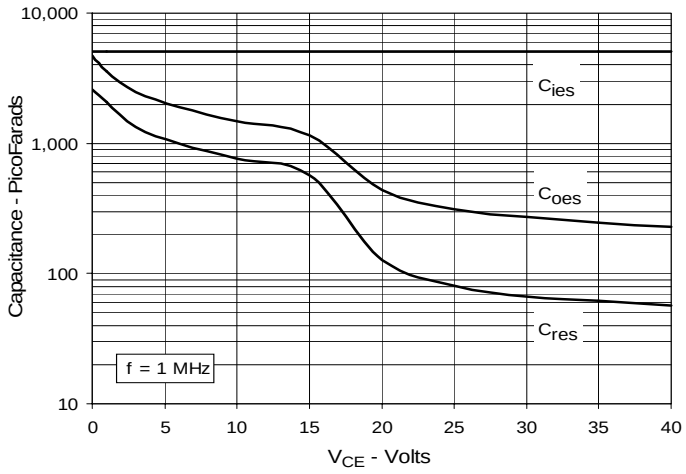


Fig. 10. Reverse-Bias Safe Operating Area

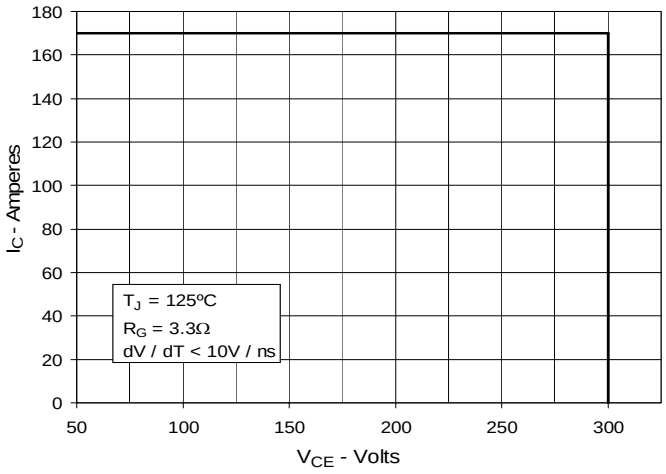
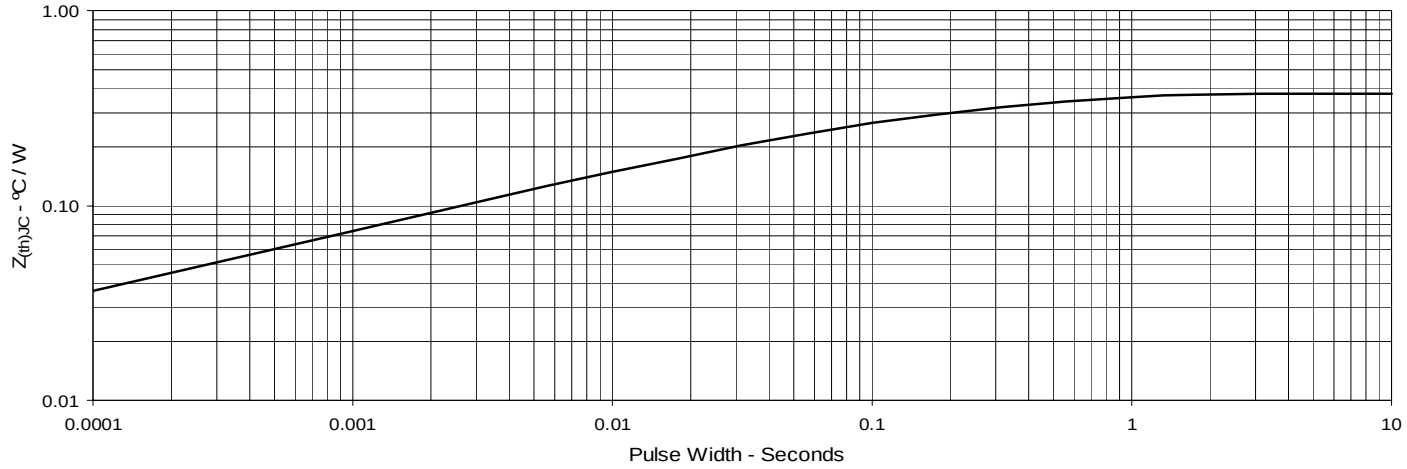


Fig. 11. Maximum Transient Thermal Impedance



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

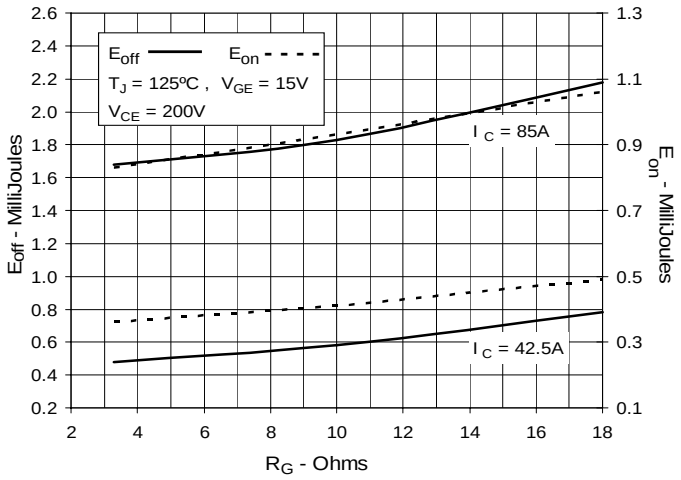


Fig. 13. Inductive Swiching Energy Loss vs. Collector Current

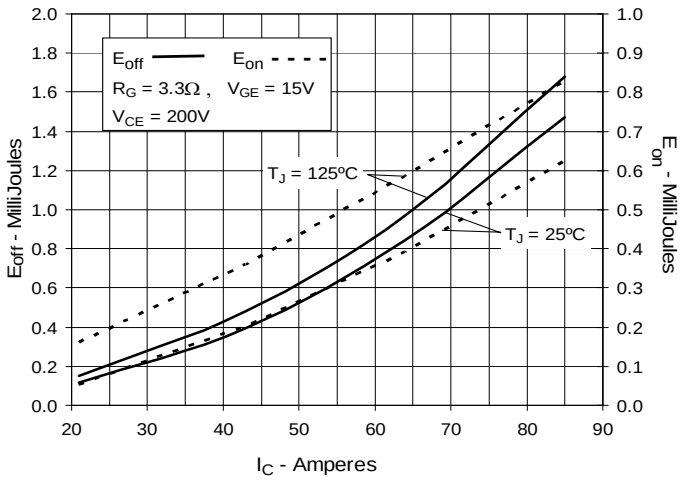


Fig. 14. Inductive Swiching Energy Loss vs. Junction Temperature

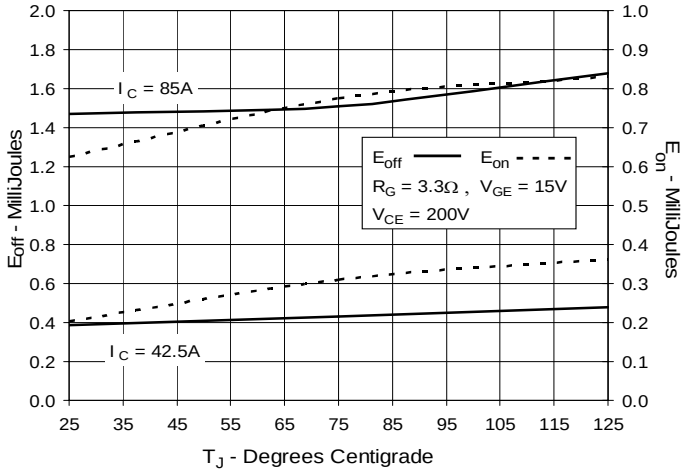


Fig. 15. Inductive Turn-off Switching Times vs. Gate Resistance

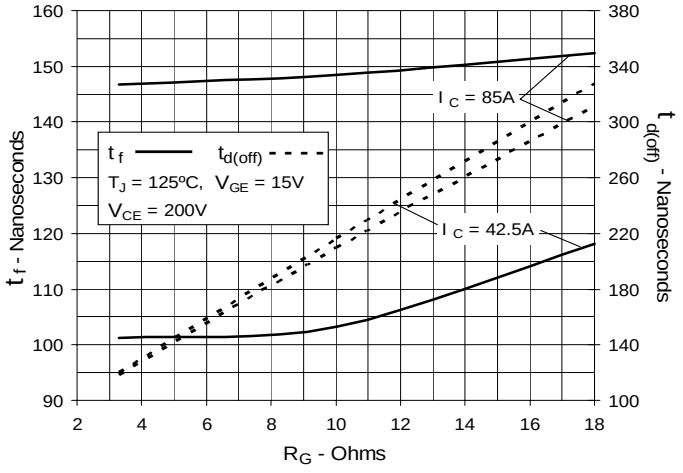


Fig. 16. Inductive Turn-off Switching Times vs. Collector Current

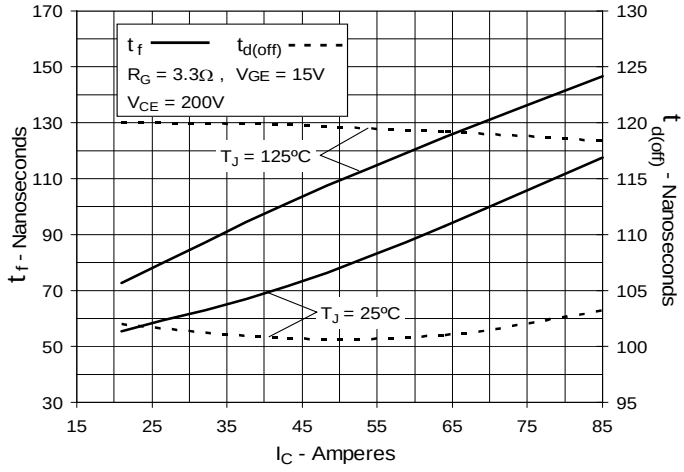
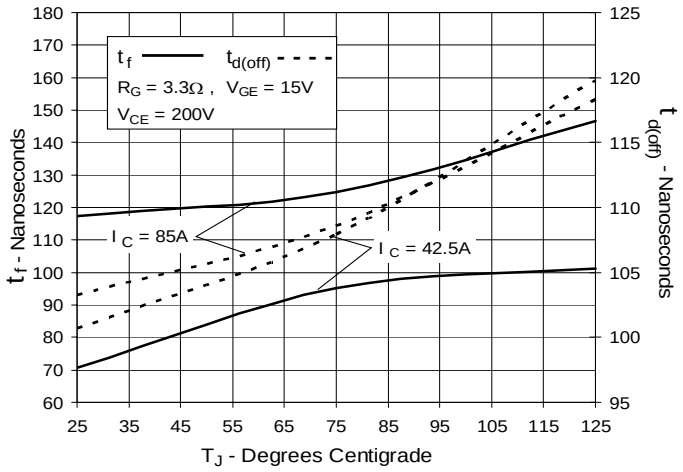


Fig. 17. Inductive Turn-off Switching Times vs. Junction Temperature



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

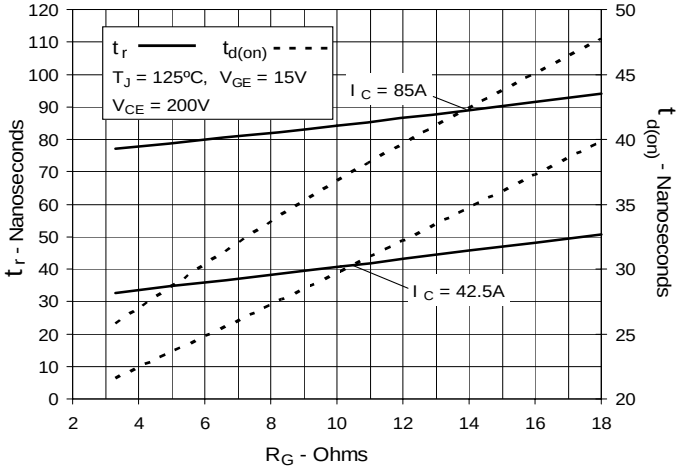


Fig. 19. Inductive Turn-on Switching Times vs. Collector Current

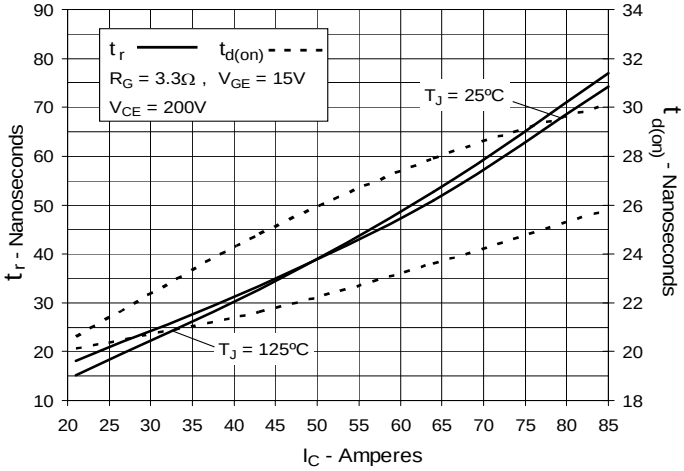
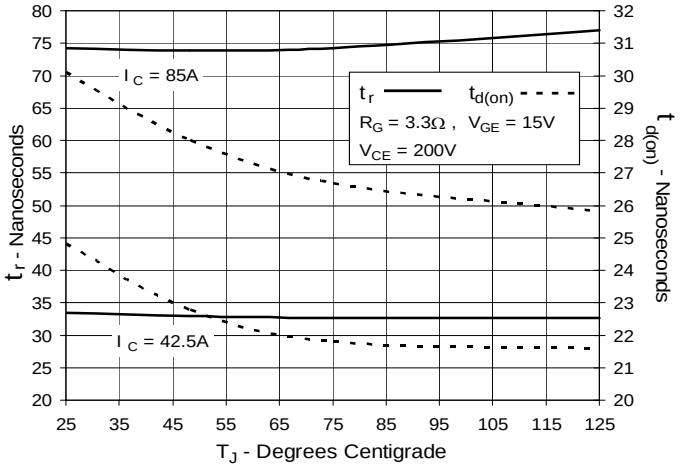


Fig. 20. Inductive Turn-on Switching Times vs. Junction Temperature



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