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IXGH30N120C3H1

For any questions, you can email us directly:
sales@integrated-circuit.com

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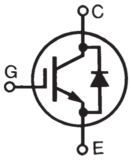
Preliminary Technical Information

GenX3™ 1200V IGBT

IXGH30N120C3H1

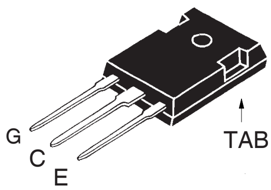
High speed PT IGBTs for 10-50kHz Switching



V_{CES}	=	1200V
I_{C100}	=	24A
$V_{CE(sat)}$	≤	4.2V
$t_{fi(typ)}$	=	42ns

Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_J = 25°C to 150°C	1200	V
V_{CGR}	T_J = 25°C to 150°C, R_{GE} = 1MΩ	1200	V
V_{GES}	Continuous	±20	V
V_{GEM}	Transient	±30	V
I_{C25}	T_C = 25°C	48	A
I_{C100}	T_C = 100°C	24	A
I_{CM}	T_C = 25°C, 1ms	115	A
I_A	T_C = 25°C	20	A
E_{AS}	T_C = 25°C	250	mJ
SSOA	V_{GE}= 15V, T_J = 125°C, R_G = 5Ω	I_{CM} = 60	A
(RBSOA)	Clamped Inductive Load	@V_{CE} ≤ 1200	V
P_C	T_C = 25°C	250	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-247AD



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

Features

- Optimized for Low Conduction and Switching Losses
- Square RBSOA
- Anti-Parallel Ultra Fast Diode
- Avalanche Rated
- International Standard Package

Advantages

- High Power Density
- Low Gate Drive Requirement

Applications

- AC Motor Speed Control
- DC Servo and Robot Drives
- DC Choppers
- Uninterruptible Power Supplies (UPS)
- Switch-Mode and Resonant-Mode Power Supplies

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
BV_{CES}	I_C = 250μA, V_{GE} = 0V	1200			V
$V_{GE(th)}$	I_C = 250μA, V_{CE} = V_{GE}	3.0		5.0	V
I_{CES}	V_{CE} = V_{CES} V_{GE}= 0V			100	μA
	T_J = 125°C			1.5	mA
I_{GES}	V_{CE} = 0V, V_{GE} = ±20V			±100	nA
$V_{CE(sat)}$	I_C = 24A, V_{GE} = 15V, Note 2		3.6	4.2	V
	T_J = 125°C		3.2		V

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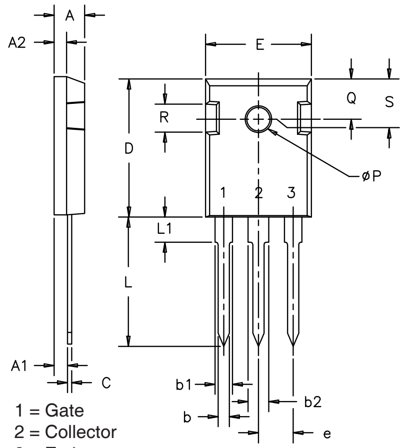
Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	I_C = 24A, V_{CE} = 10V, Note 2	10	17		S
C_{ies}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz		1810		pF
C_{oes}			185		pF
C_{res}			50		pF
Q_g	I_C = 24A, V_{GE} = 15V, V_{CE} = 0.5 • V_{CES}		80		nC
Q_{ge}			11		nC
Q_{gc}			37		nC
$t_{d(on)}$	**Inductive Load, T_J = 25°C**		18		ns
t_{ri}	I_C = 24A, V_{GE} = 15V		33		ns
E_{on}	V_{CE} = 600V, R_G = 5Ω		1.45		mJ
$t_{d(off)}$	Note 1		106		ns
t_{fi}			42		ns
E_{off}			0.47	0.85	mJ
$t_{d(on)}$	**Inductive Load, T_J = 125°C**		20		ns
t_{ri}	I_C = 24A, V_{GE} = 15V		40		ns
E_{on}	V_{CE} = 600V, R_G = 5Ω		2.50		mJ
$t_{d(off)}$	Note 1		135		ns
t_{fi}			280		ns
E_{off}			1.30	2.10	mJ
R_{thJC}				0.50	°C/W
R_{thCK}			0.21		°C/W

TO-247 (IXGH) AD Outline



1 = Gate
2 = Collector
3 = Emitter
Tab = Collector

SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.185	.209	4.7	5.3
A_1	.087	.102	2.2	2.54
A_2	.059	.098	2.2	2.6
b	.040	.055	1.0	1.4
b_1	.065	.084	1.65	2.13
b_2	.113	.123	2.87	3.12
C	.016	.031	.4	.8
D	.819	.845	20.80	21.46
E	.610	.640	15.75	16.26
e	.215 BSC		5.45 BSC	
L	.780	.800	19.81	20.32
L1		.177		4.50
øP	.140	.144	3.55	3.65
Q	.212	.244	5.4	6.2
R	.170	.216	4.32	5.49
S	.242 BSC		6.15 BSC	

Reverse Diode (FRED)

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
V_F	I_F = 20A, V_{GE} = 0V			3.0	V
	T_J = 125°C			2.8	V
I_{RM}	I_F = 20A, -di_F/dt = 750A/μs, V_R = 800V		19		A
t_{rr}	V_{GE} = 0V		70		ns
R_{thJC}				0.9	°C/W

Notes:
1. Switching Times May Increase for V_{CE} (Clamp) > 0.5 • V_{CES}, Higher T_J or Increased R_G.
2. Pulse Test, t ≤ 300μs; Duty Cycle, d ≤ 2%.

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

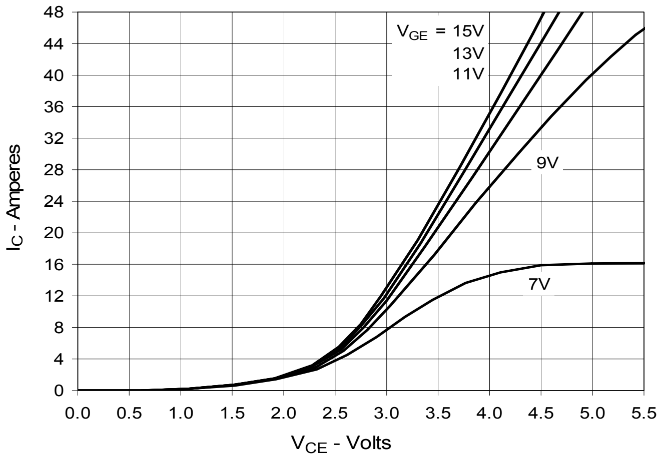


Fig. 2. Extended Output Characteristics @ 25ºC

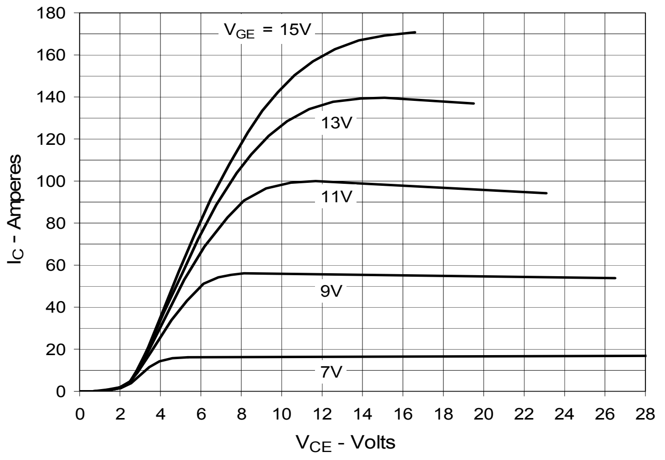


Fig. 3. Output Characteristics @ 125ºC

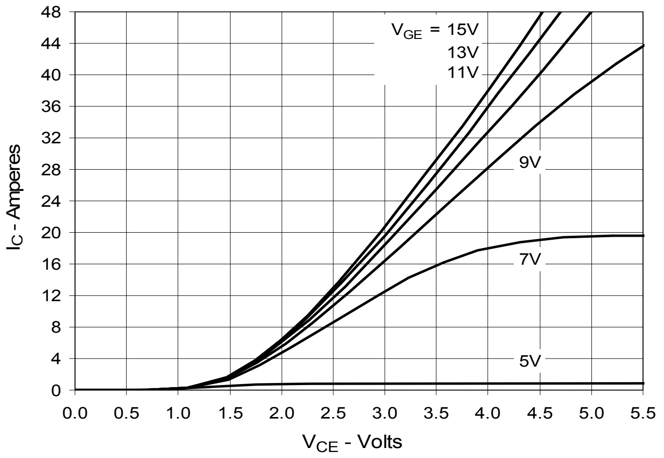


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

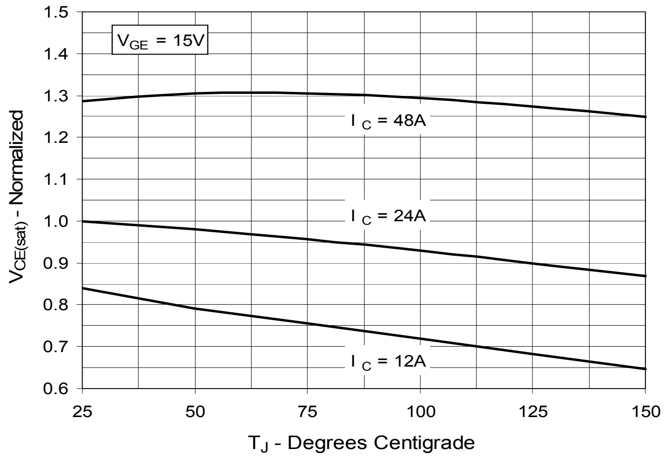


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

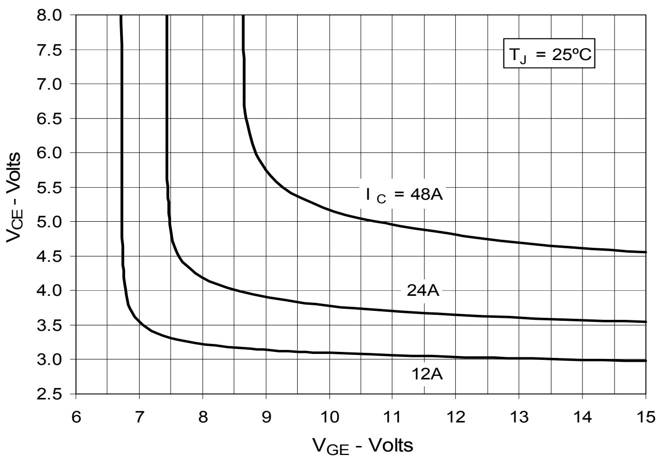


Fig. 6. Input Admittance

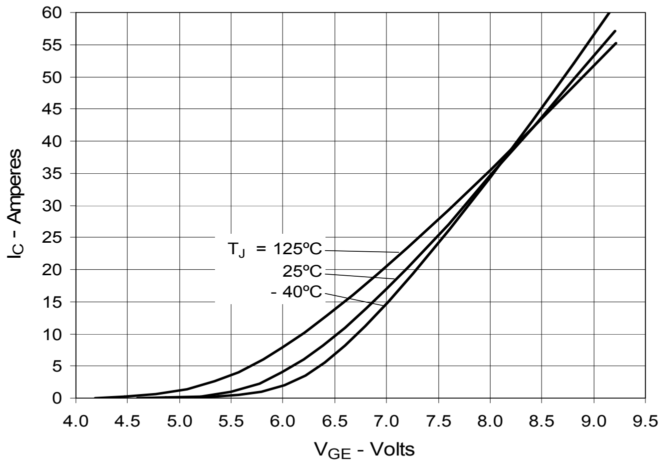


Fig. 7. Transconductance

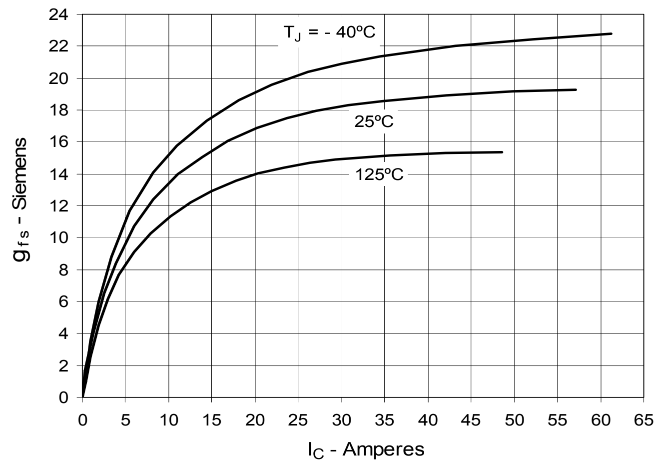


Fig. 8. Gate Charge

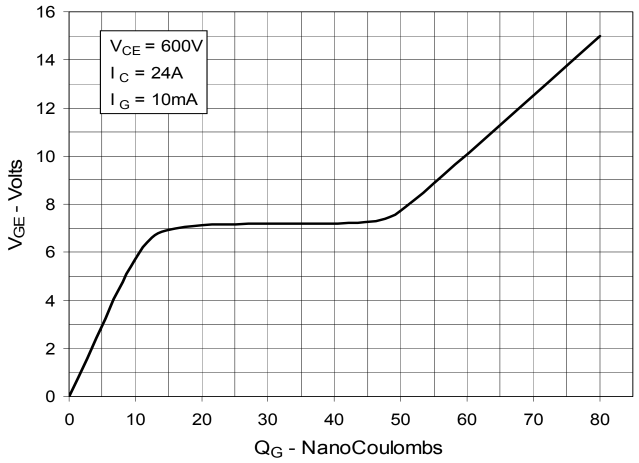


Fig. 9. Capacitance

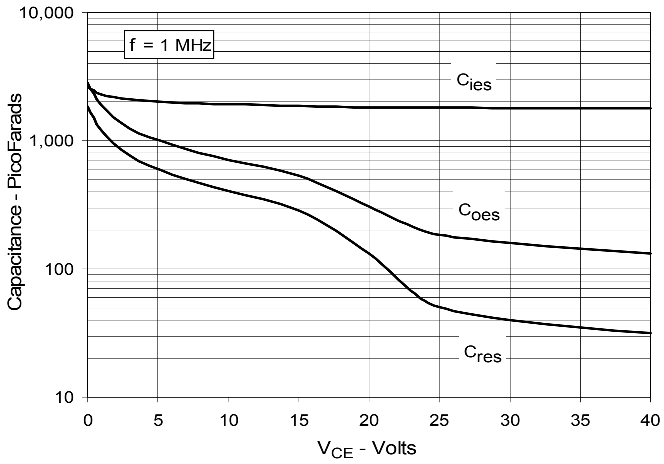


Fig. 10. Reverse-Bias Safe Operating Area

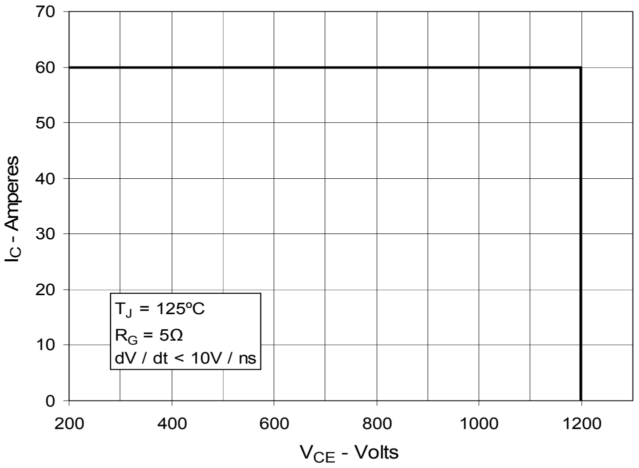
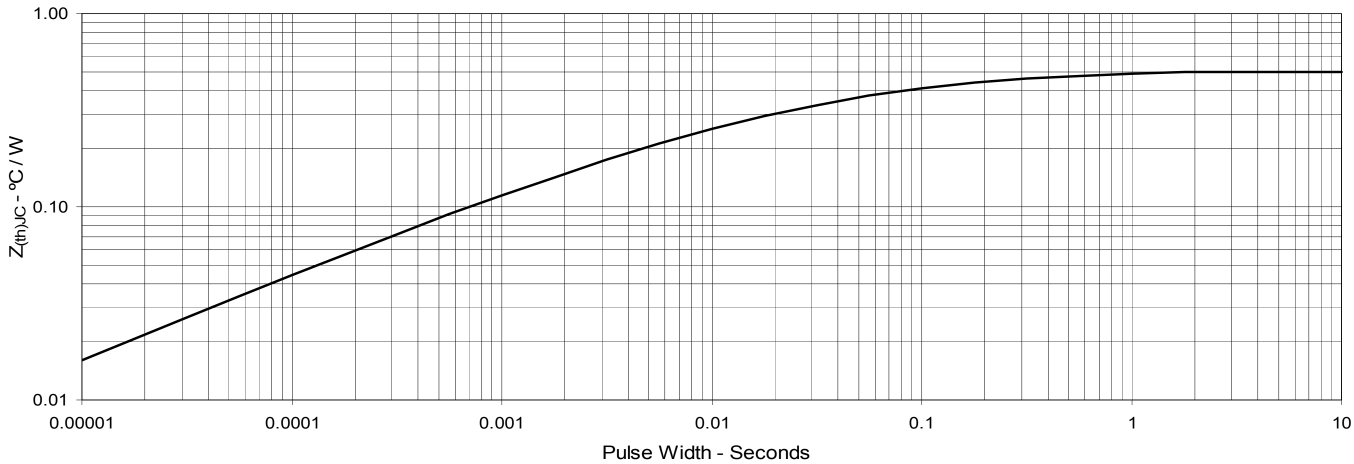


Fig. 11. Maximum Transient Thermal Impedance



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

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

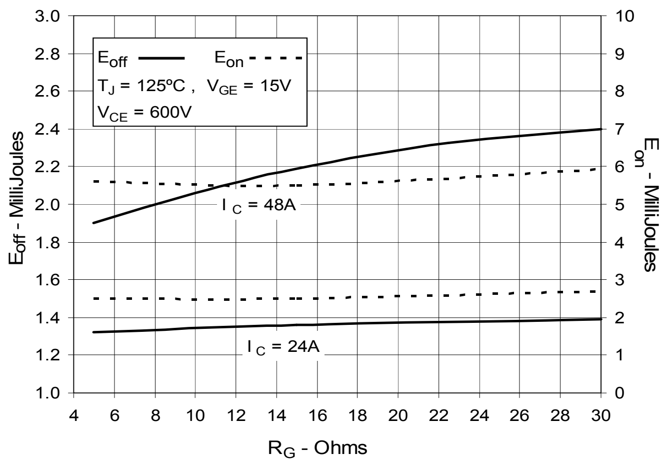


Fig. 13. Inductive Switching Energy Loss vs. Collector Current

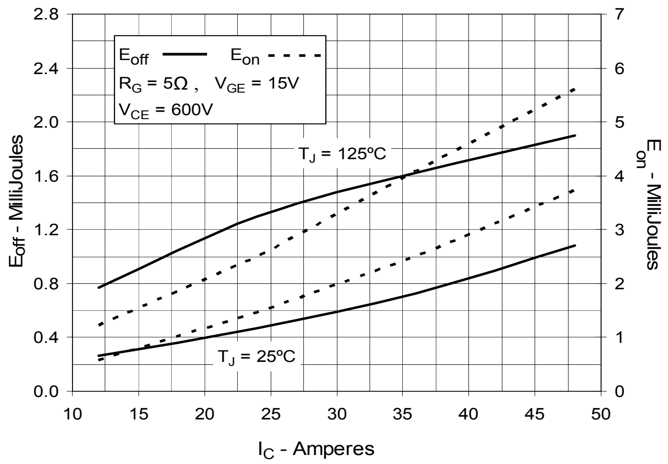


Fig. 14. Inductive Switching Energy Loss vs. Junction Temperature

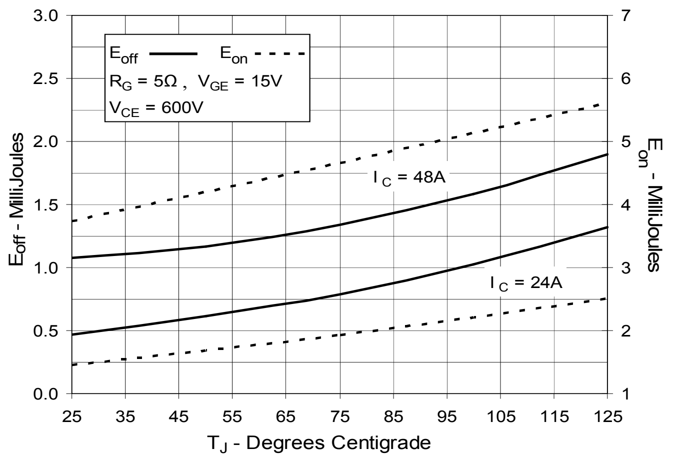


Fig. 15. Inductive Turn-off Switching Times vs. Gate Resistance

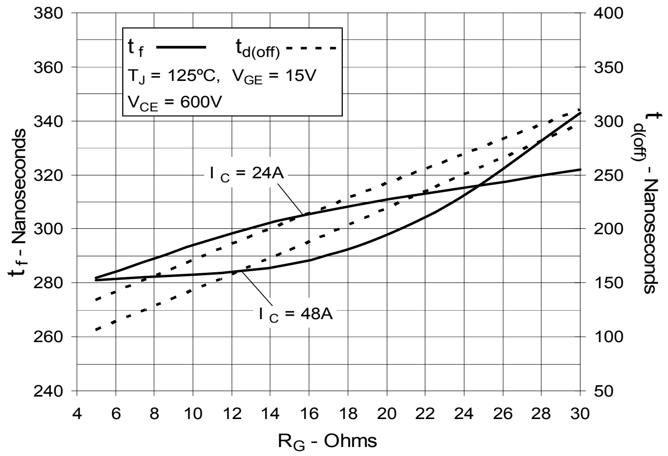


Fig. 16. Inductive Turn-off Switching Times vs. Collector Current

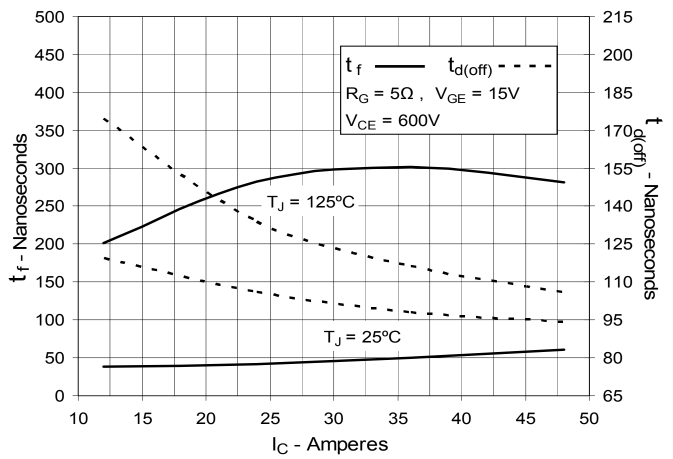


Fig. 17. Inductive Turn-off Switching Times vs. Junction Temperature

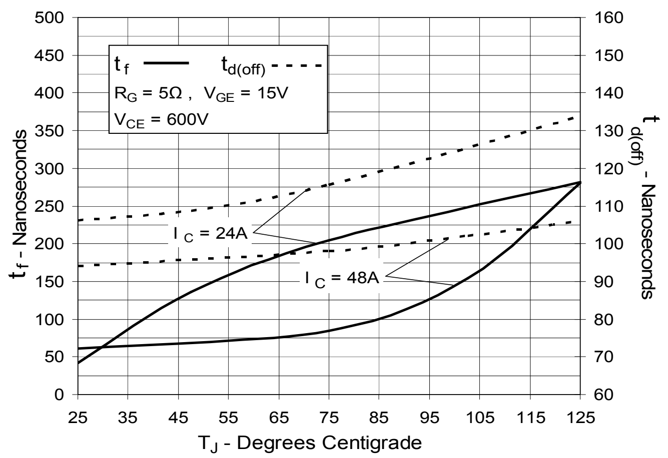


Fig. 18. Inductive Turn-on Switching Times vs. Gate Resistance

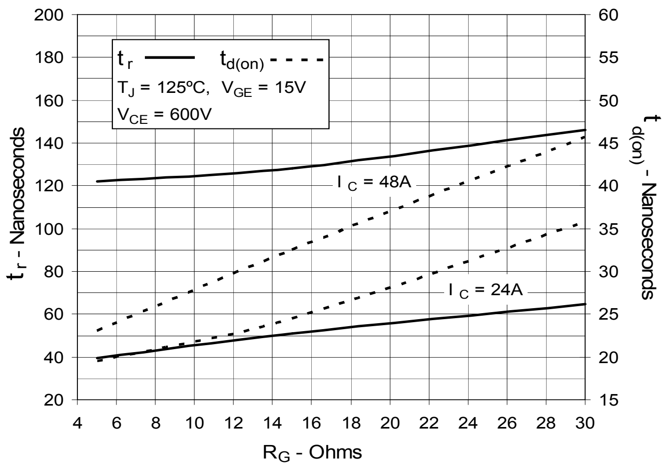


Fig. 19. Inductive Turn-on Switching Times vs. Collector Current

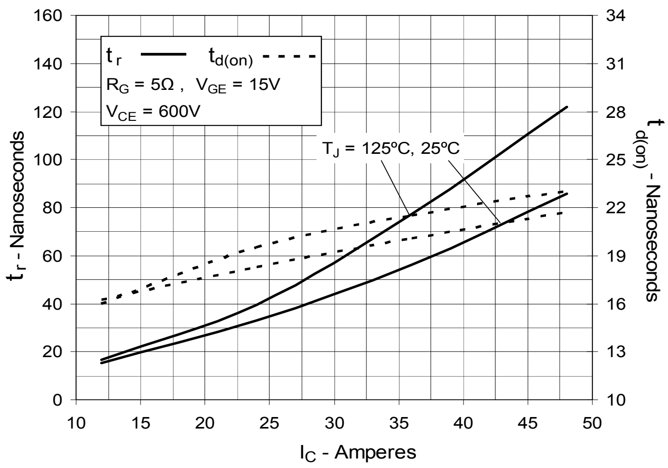


Fig. 20. Inductive Turn-on Switching Times vs. Junction Temperature