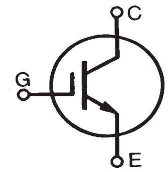
IXYS

GenX3™ B3-Class IGBTs

Medium Speed low Vsat PT IGBTs 5-40 kHz Switching

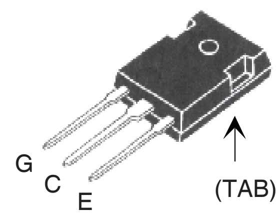
IXGH72N60B3
IXGT72N60B3*

*Obsolete Part Number

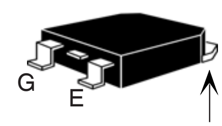


V_{CES}	=	600V
I_{C110}	=	72A
$V_{CE(sat)}$	≤	1.80V
$t_{fi(typ)}$	=	90ns

TO-247 AD (IXGH)



TO-268 (IXGT)



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

Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_J = 25°C to 150°C	600	V
V_{CGR}	T_J = 25°C to 150°C, R_{GE} = 1MΩ	600	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	72	A
I_{CM}	T_C = 25°C, 1ms	400	A
I_A	T_C = 25°C	20	A
E_{AS}	T_C = 25°C	200	mJ
SSOA	V_{GE} = 15V, T_{VJ} = 125°C, R_G = 3Ω	I_{CM} = 240	A
(RBSOA)	Clamped Inductive Load	@ V_{CE} ≤ 600	V
P_C	T_C = 25°C	540	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
M_d	Mounting Torque (TO-247)	1.13 / 10	Nm/lb.in.
T_L	1.6mm (0.062 in.) from Case for 10s	300	°C
T_{SOLD}	Plastic Body for 10 seconds	260	°C
Weight	TO-247	6	g
	TO-268	5	g

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
BV_{CES}	I_C = 250µA, V_{GE} = 0V	600			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			75	µA
	T_J = 125°C			750	µA
I_{GES}	V_{CE} = 0V, V_{GE} = ±20V			±100	nA
$V_{CE(sat)}$	I_C = 60A, V_{GE} = 15V, Note 1		1.51	1.80	V
	T_J = 125°C		1.48		V

Features

- Optimized for Low Conduction and Switching Losses
- Square RBSOA
- Avalanche Rated
- International Standard Packages

Advantages

- High Power Density
- Low Gate Drive Requirement

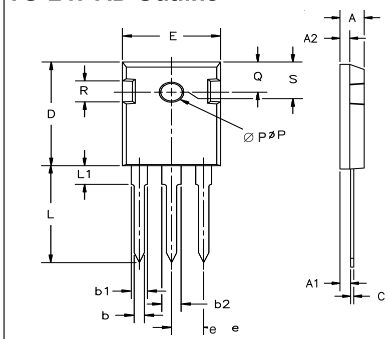
Applications

- 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.	
g_{fs}	I_C = 60A, V_{CE} = 10V, Note 1	50	83		S
C_{ies}	V_{CE}= 25V, V_{GE} = 0V, f = 1MHz		6800		pF
C_{oes}			575		pF
C_{res}			80		pF
Q_g	I_C = 60A, V_{GE} = 15V, V_{CE} = 0.5 • V_{CES}		230		nC
Q_{ge}			40		nC
Q_{gc}			82		nC
$t_{d(on)}$	**Inductive load, T_J = 25°C**		31		ns
t_{ri}	I_C = 50A, V_{GE} = 15V		33		ns
E_{on}	V_{CE} = 480V, R_G = 3Ω		1.38		mJ
$t_{d(off)}$			150	330	ns
t_{fi}			90	160	ns
E_{off}			1.05	2.0	mJ
$t_{d(on)}$	**Inductive load, T_J = 125°C**		29		ns
t_{ri}	I_C = 50A,V_{GE} = 15V		34		ns
E_{on}	V_{CE} = 480V,R_G = 3Ω		2.70		mJ
$t_{d(off)}$			228		ns
t_{fi}			142		ns
E_{off}			2.20		mJ
R_{thJC}				0.23	°C/W
R_{thCS}	(TO-247)		0.25		°C/W

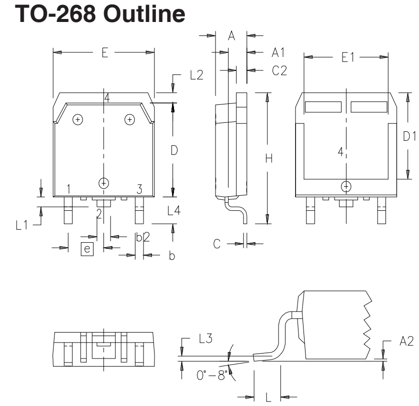
Note 1: Pulse Test, t ≤ 300μs, Duty Cycle, d ≤ 2%.

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

TO-268 Outline



SYM	INCHES MIN	MAX	MILLIMETERS MIN	MAX
A	.193	.201	4.90	5.10
A1	.106	.114	2.70	2.90
A2	.001	.010	0.02	0.25
b	.045	.057	1.15	1.45
b2	.075	.083	1.90	2.10
C	.016	.026	0.40	0.65
C2	.057	.063	1.45	1.60
D	.543	.551	13.80	14.00
D1	.488	.500	12.40	12.70
E	.624	.632	15.85	16.05
E1	.524	.535	13.30	13.60
e	.215 BSC		5.45 BSC	
H	.736	.752	18.70	19.10
L	.094	.106	2.40	2.70
L1	.047	.055	1.20	1.40
L2	.039	.045	1.00	1.15
L3	.010 BSC		0.25 BSC	
L4	.150	.161	3.80	4.10

IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.

Fig. 1. Output Characteristics @ 25ºC

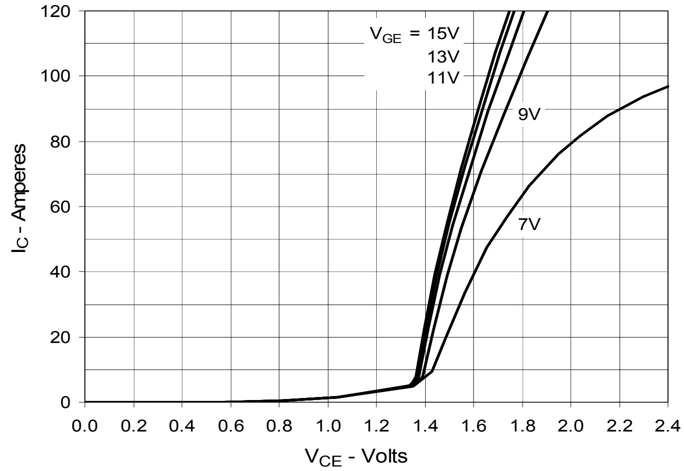


Fig. 2. Extended Output Characteristics @ 25ºC

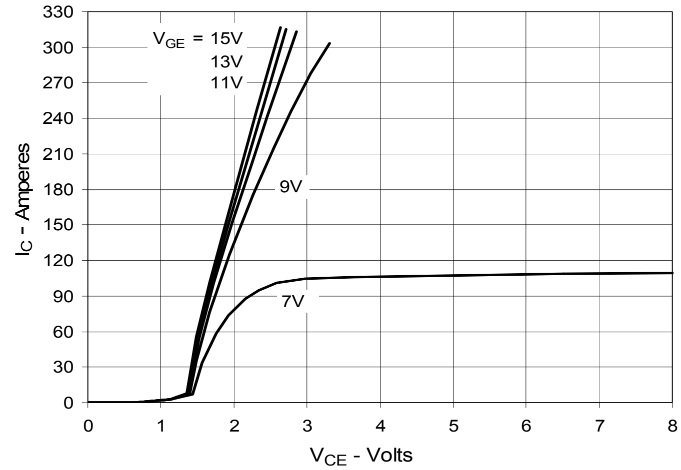


Fig. 3. Output Characteristics @ 125ºC

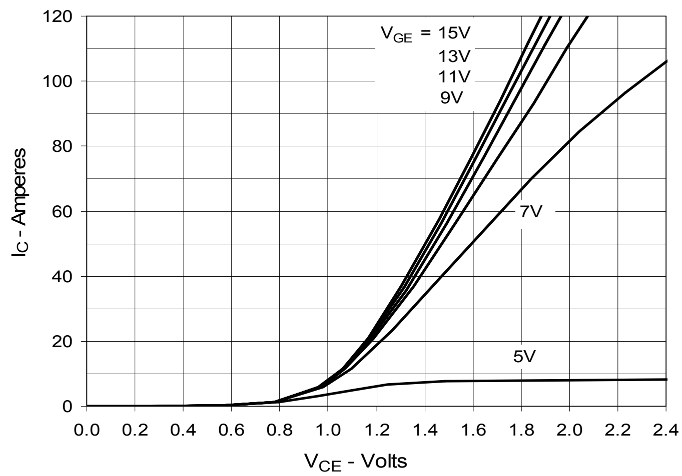


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

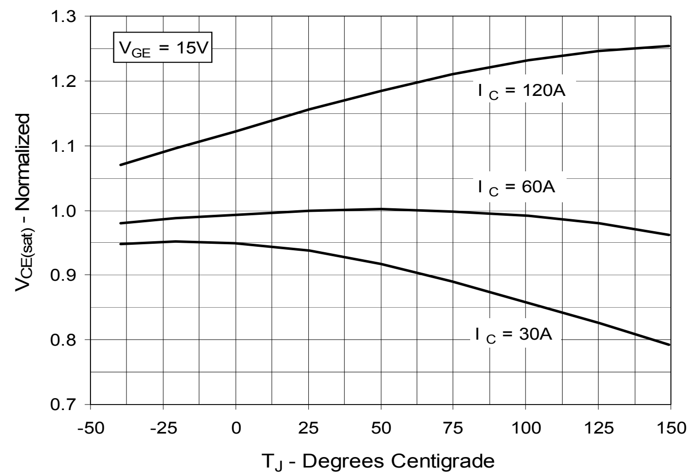


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

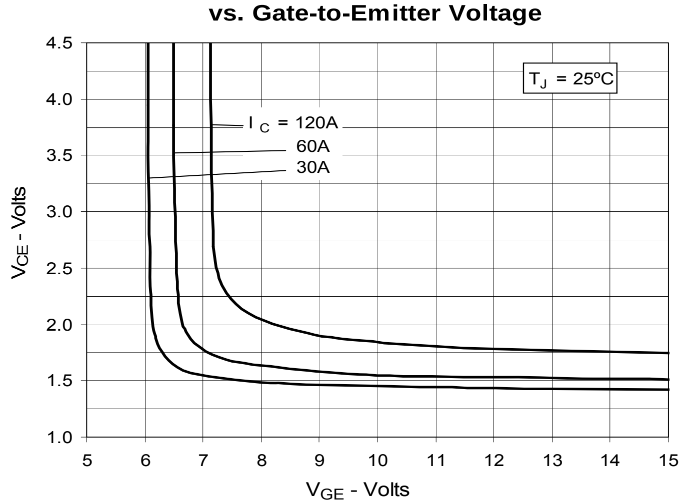


Fig. 6. Input Admittance

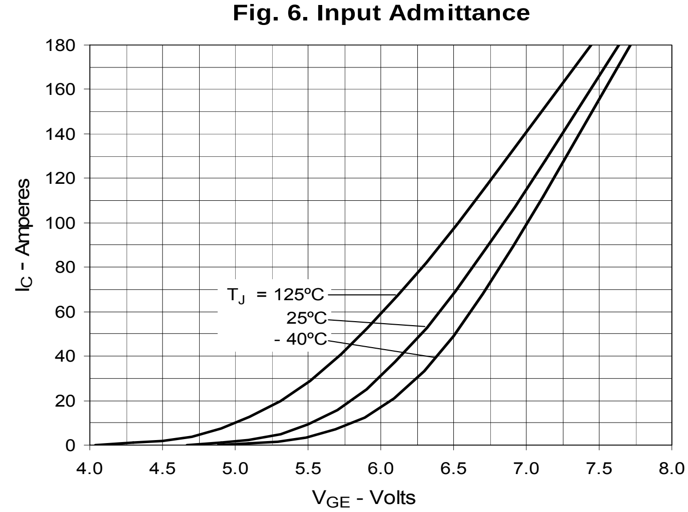


Fig. 7. Transconductance

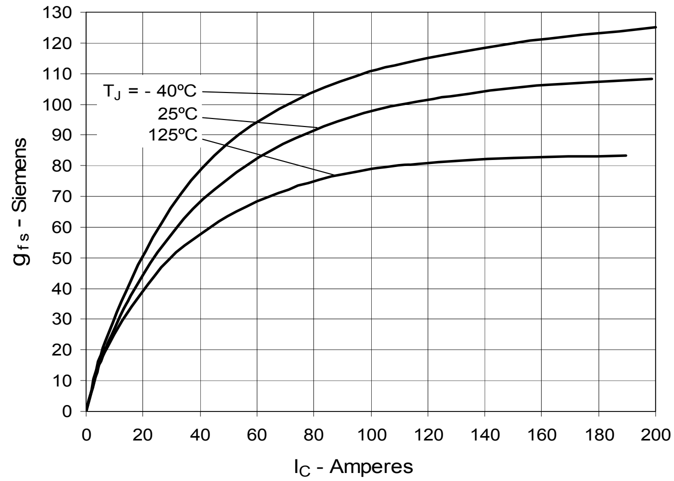


Fig. 8. Gate Charge

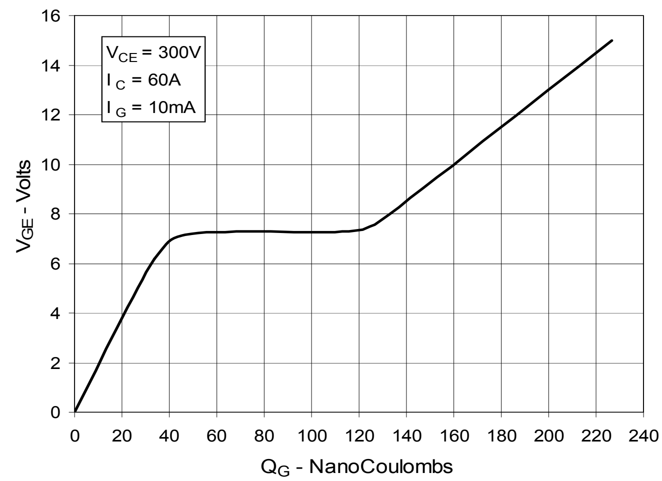


Fig. 9. Capacitance

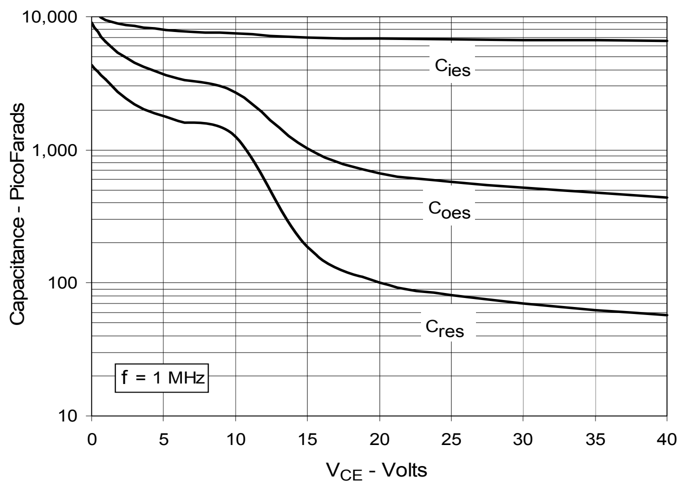


Fig. 10. Reverse-Bias Safe Operating Area

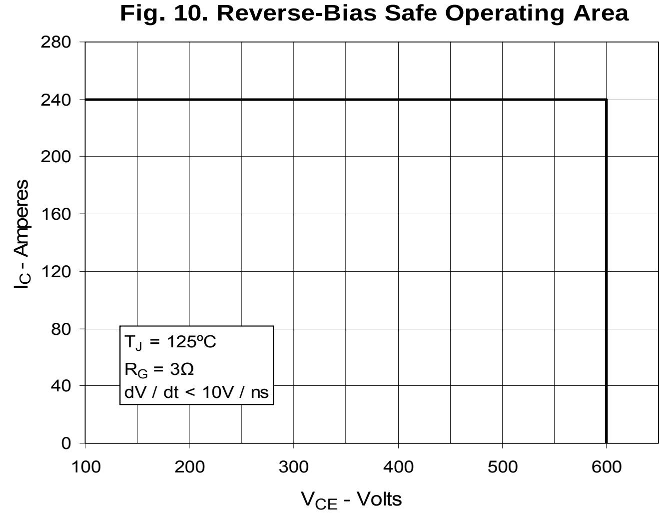


Fig. 11. Maximum Transient Thermal Impedance

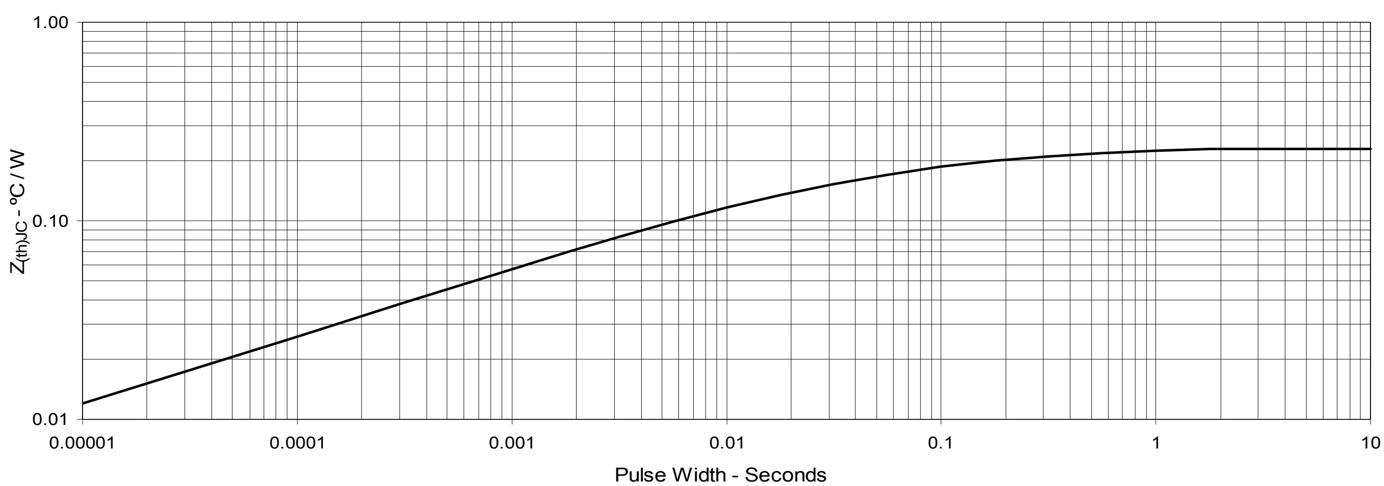


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Fig. 12. Inductive Switching Energy Loss vs. Gate Resistance

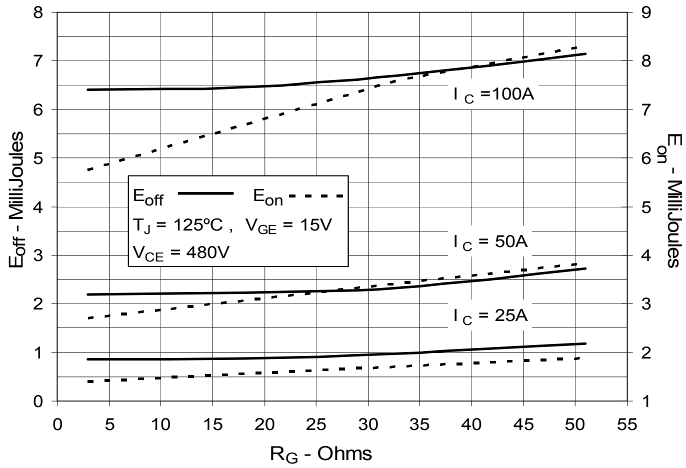

Fig. 13. Inductive Switching Energy Loss vs. Collector Current

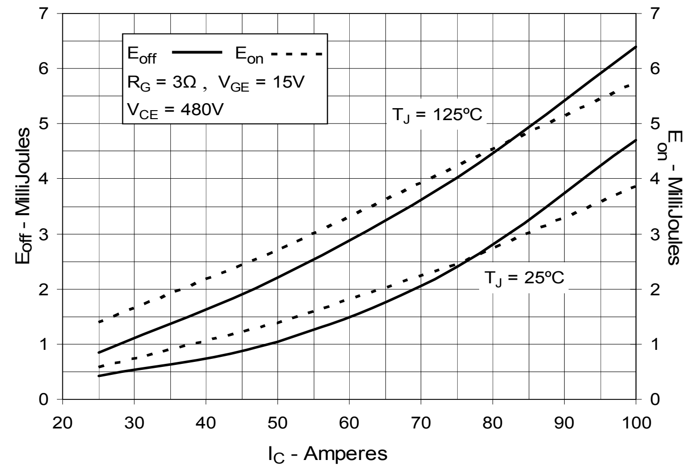

Fig. 14. Inductive Switching Energy Loss vs. Junction Temperature

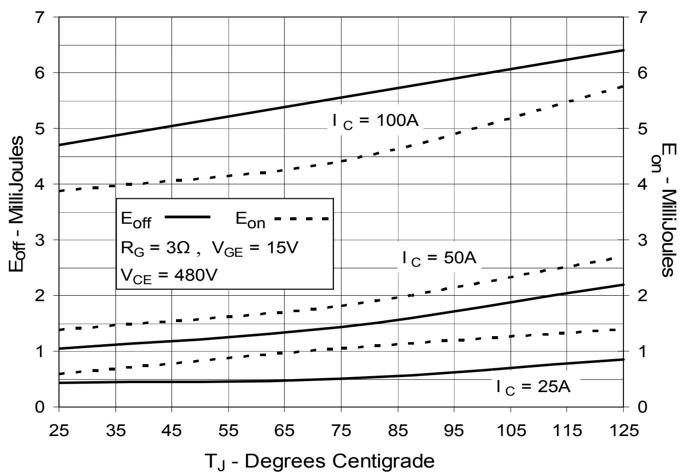

Fig. 15. Inductive Turn-off Switching Times vs. Gate Resistance

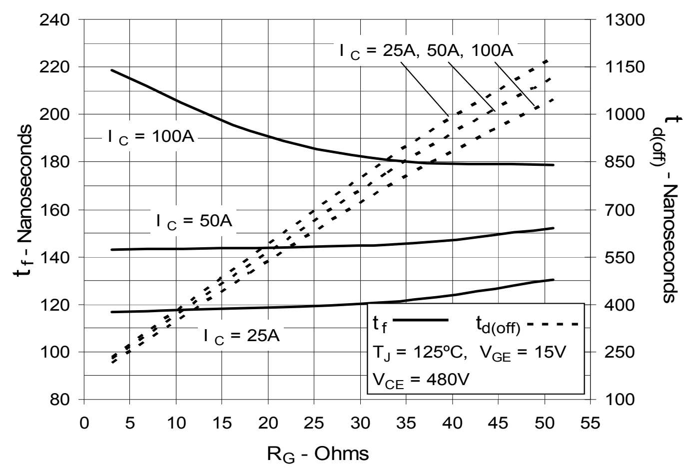

Fig. 16. Inductive Turn-off Switching Times vs. Collector Current

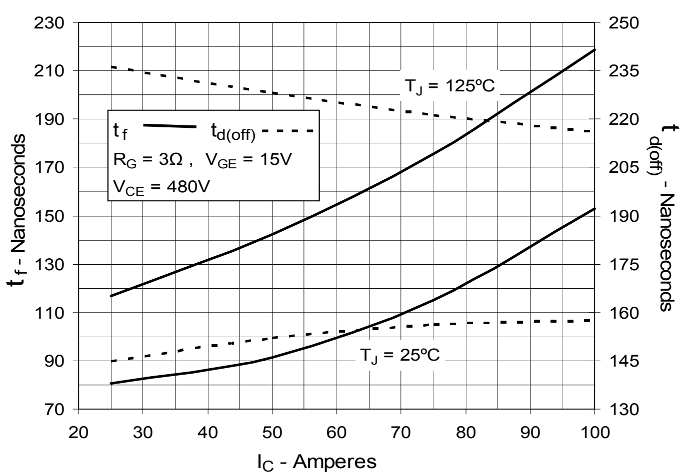

Fig. 17. Inductive Turn-off Switching Times vs. Junction Temperature

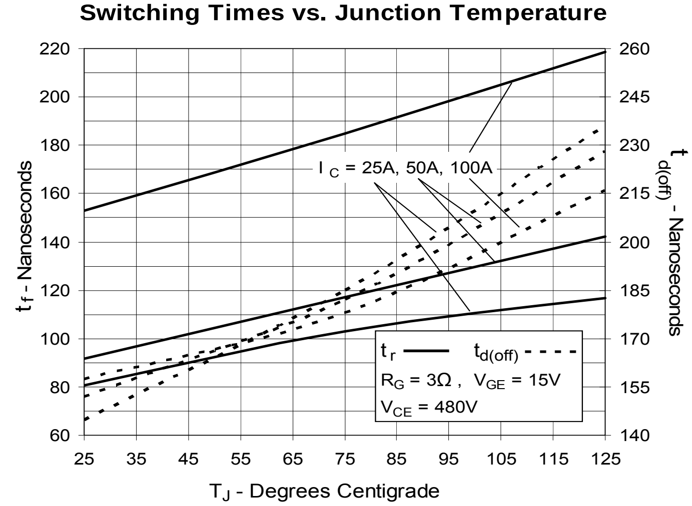

Fig. 18. Inductive Turn-on Switching Times vs. Gate Resistance

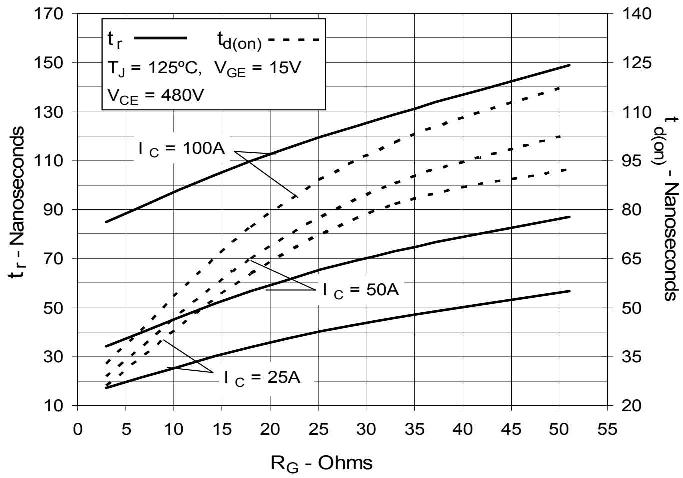

Fig. 19. Inductive Turn-on Switching Times vs. Collector Current

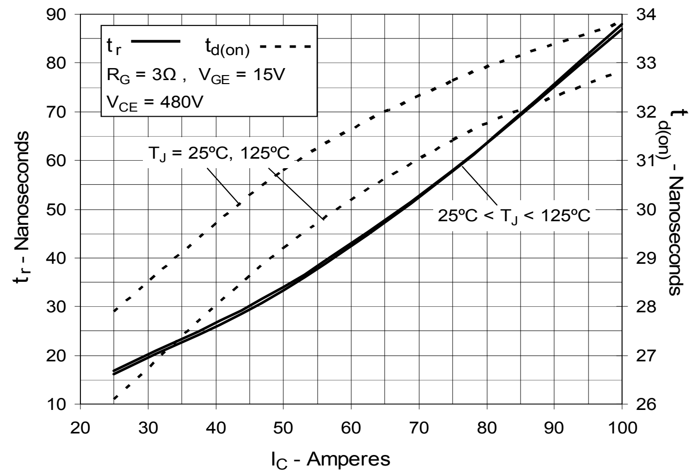

Fig. 20. Inductive Turn-on Switching Times vs. Junction Temperature