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[IXYS Corporation](#)

[IXGH60N60C3](#)

For any questions, you can email us directly:

sales@integrated-circuit.com

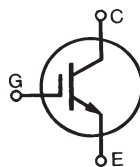


GenX3™ 600V IGBT

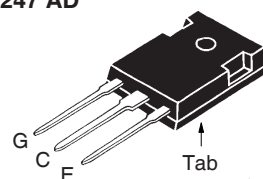
IXGH60N60C3

V_{CES} = 600V
I_{C110} = 60A
V_{CE(sat)} ≤ 2.5V
t_{fi} (typ) = 50ns

High Speed PT IGBT for 40-100kHz Switching



TO-247 AD



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	60	A
I _{CM}	T _C = 25°C, 1ms	360	A
I _A	T _C = 25°C	40	A
E _{AS}	T _C = 25°C	400	mJ
SSOA (RBSOA)	V _{GE} = 15V, T _{VJ} = 125°C, R _G = 3Ω Clamped Inductive Load	I _{CM} = 125 V _{CE} ≤ V _{CES}	A
P _C	T _C = 25°C	380	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 (0.062in.) from Case for 10s	260	°C
M _d	Mounting Torque	1.13/10	Nm/lb.in.
Weight		6	g

Features

- Optimized for Low Switching Losses
- Square RBSOA
- Avalanche rated
- 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

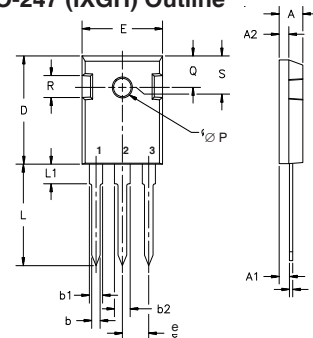
Symbol	Test Conditions (T _J = 25°C, Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
BV _{CES}	I _C = 250μA, V _{GE} = 0V	600		V
V _{GE(th)}	I _C = 250μA, V _{CE} = V _{GE}	3.0		5.5 V
I _{CES}	V _{CE} = V _{CES} , V _{GE} = 0V T _J = 125°C			50 μA 1 mA
I _{GES}	V _{CE} = 0V, V _{GE} = ±20V			±100 nA
V _{CE(sat)}	I _C = 40A, V _{GE} = 15V T _J = 125°C	2.2 1.7	2.5	V V

IXYS

IXGH60N60C3

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$, Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
g_{fs}	$I_C = 40\text{A}, V_{CE} = 10\text{V}$, Note 1	23	38	S
C_{ies}	$V_{CE} = 25\text{V}, V_{GE} = 0\text{V}, f = 1\text{MHz}$		2810	pF
C_{oes}			210	pF
C_{res}			80	pF
Q_g	$I_C = 40\text{A}, V_{GE} = 15\text{V}, V_{CE} = 0.5 \cdot V_{CES}$		115	nC
Q_{ge}			22	nC
Q_{gc}			43	nC
$t_{d(on)}$	Inductive Load, $T_J = 25^\circ\text{C}$ $I_C = 40\text{A}, V_{GE} = 15\text{V}$ $V_{CE} = 480\text{V}, R_G = 3\Omega$ Note 2		21	ns
t_{ri}			33	ns
E_{on}			0.80	mJ
$t_{d(off)}$			70	110 ns
t_{fi}			50	ns
E_{off}		0.45	0.80 mJ	
$t_{d(on)}$	Inductive Load, $T_J = 125^\circ\text{C}$ $I_C = 40\text{A}, V_{GE} = 15\text{V}$ $V_{CE} = 480\text{V}, R_G = 3\Omega$ Note 2		21	ns
t_{ri}			33	ns
E_{on}			1.25	mJ
$t_{d(off)}$			112	ns
t_{fi}			86	ns
E_{off}		0.80	mJ	
R_{thJC}			0.33	$^\circ\text{C/W}$
R_{thCK}		0.21		$^\circ\text{C/W}$

TO-247 (IXGH) Outline



Terminals: 1 - Gate 2 - Collector
3 - Emitted Tab - Collector

Dim.	Millimeter		Inches	
	Min.	Max.	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
ØP	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

Notes:

1. Pulse test, $t \leq 300\mu\text{s}$, duty cycle, $d \leq 2\%$.
2. Switching times & energy losses may increase for higher V_{CE} (Clamp), T_J or R_G .

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

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

Fig. 1. Output Characteristics @ $T_J = 25^\circ\text{C}$

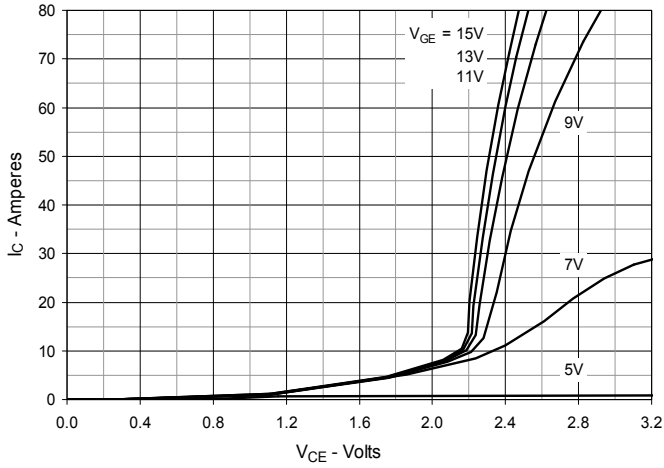


Fig. 2. Extended Output Characteristics @ $T_J = 25^\circ\text{C}$

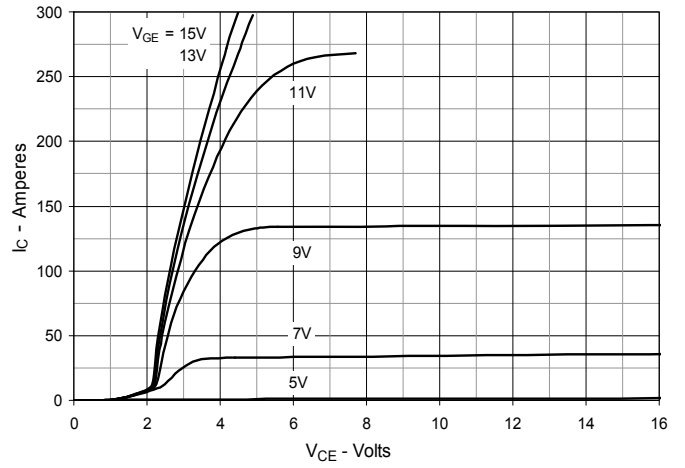


Fig. 3. Output Characteristics @ $T_J = 125^\circ\text{C}$

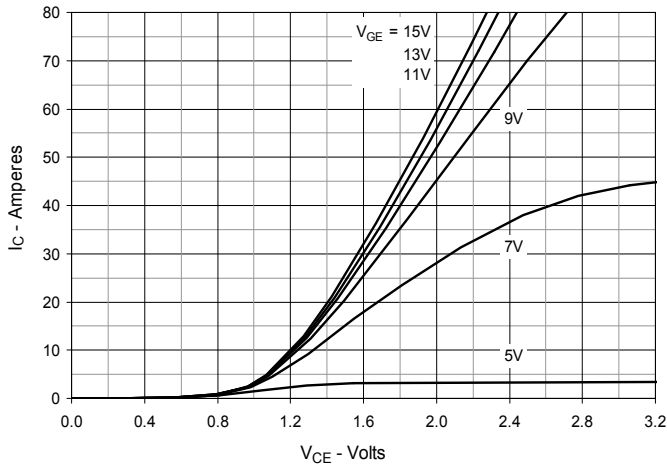


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

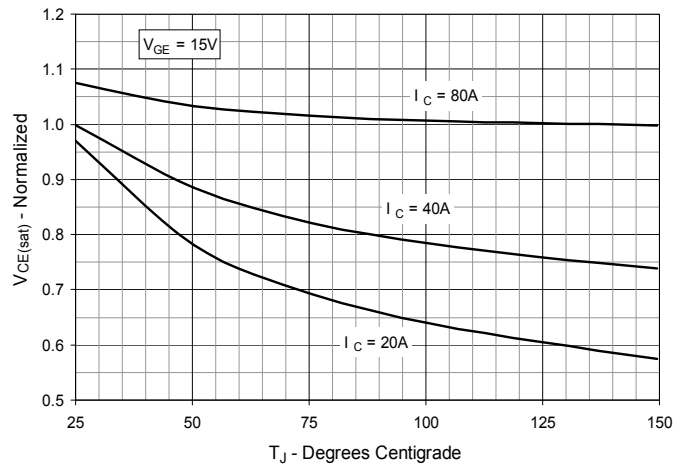


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

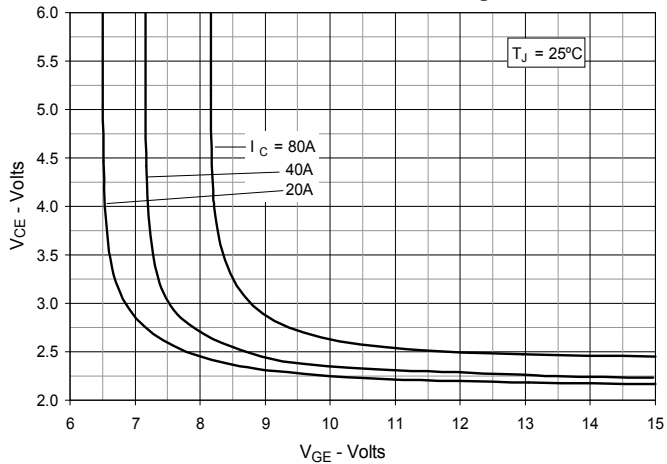


Fig. 6. Input Admittance

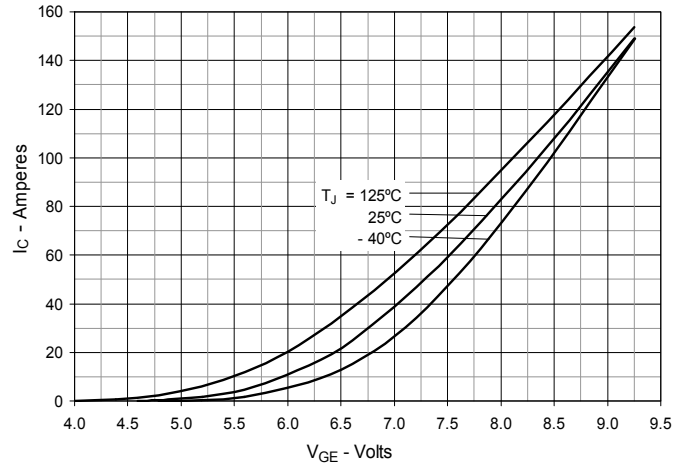


Fig. 7. Transconductance

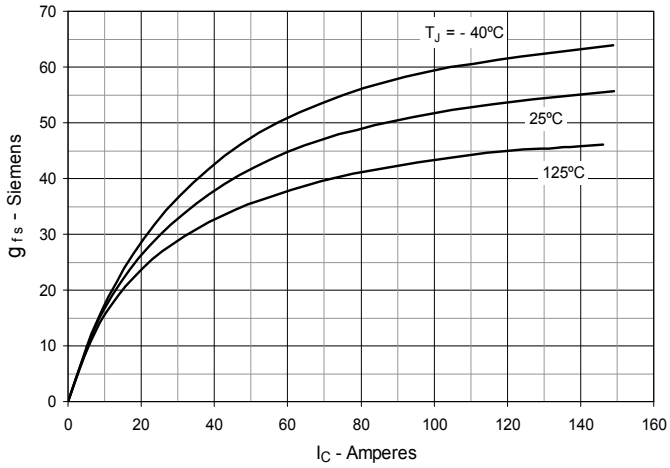


Fig. 8. Gate Charge

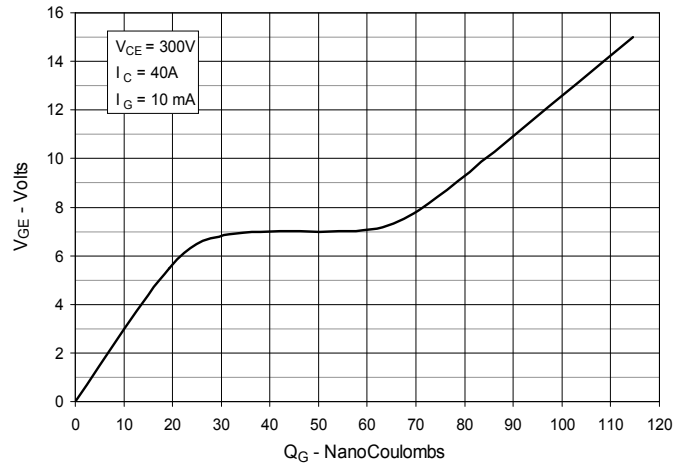


Fig. 9. Capacitance

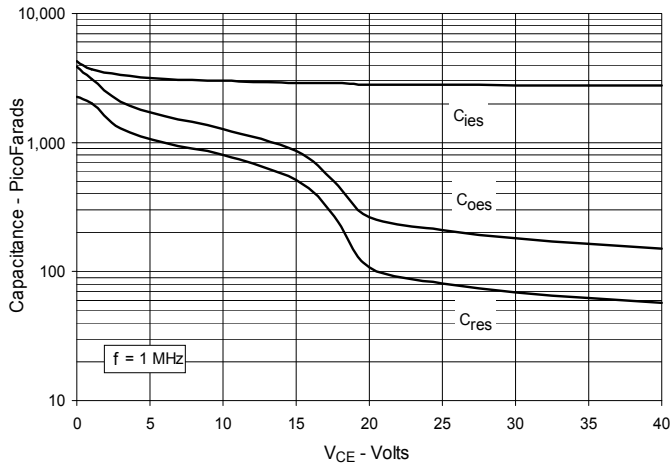


Fig. 10. Reverse-Bias Safe Operating Area

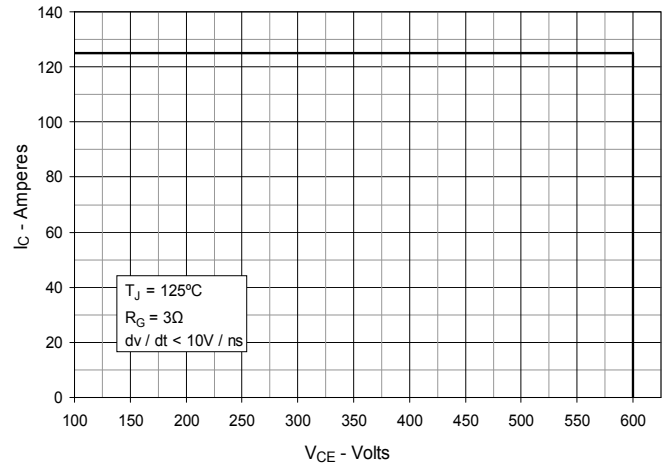


Fig. 11. Maximum Transient Thermal Impedance

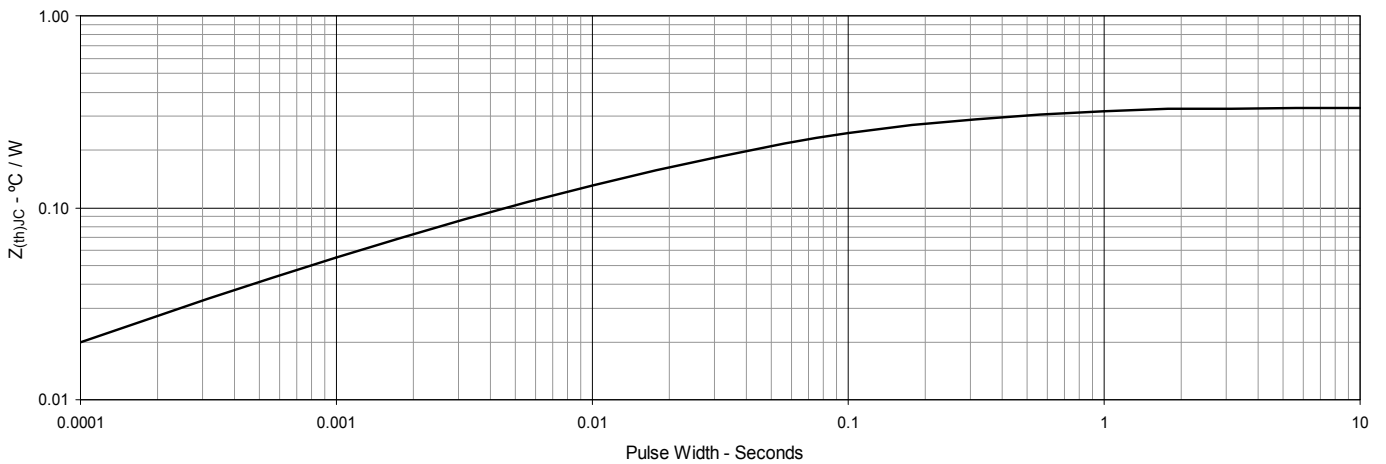


Fig. 12. Inductive Switching Energy Loss vs. Gate Resistance

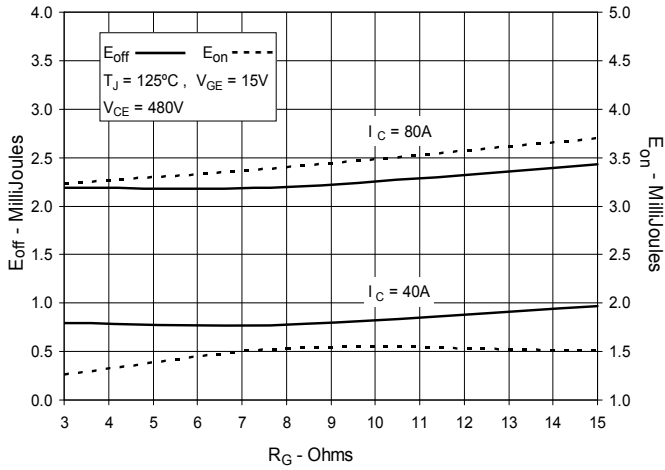


Fig. 13. Inductive Switching Energy Loss vs. Collector Current

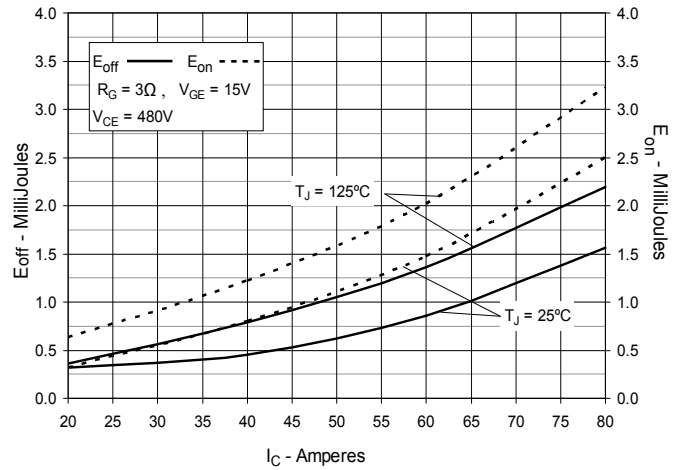


Fig. 14. Inductive Switching Energy Loss vs. Junction Temperature

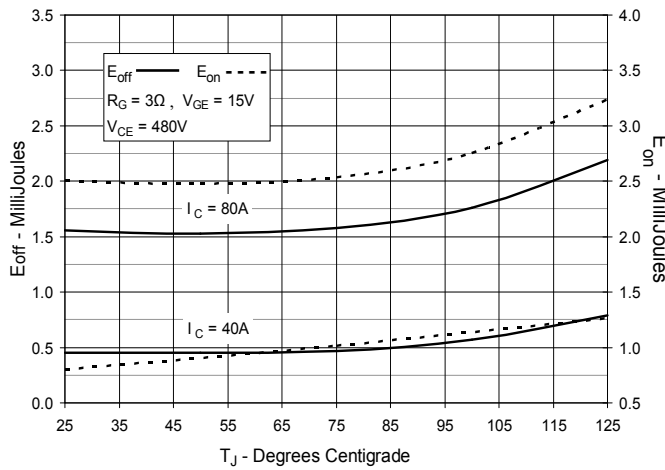


Fig. 15. Inductive Turn-off Switching Times vs. Gate Resistance

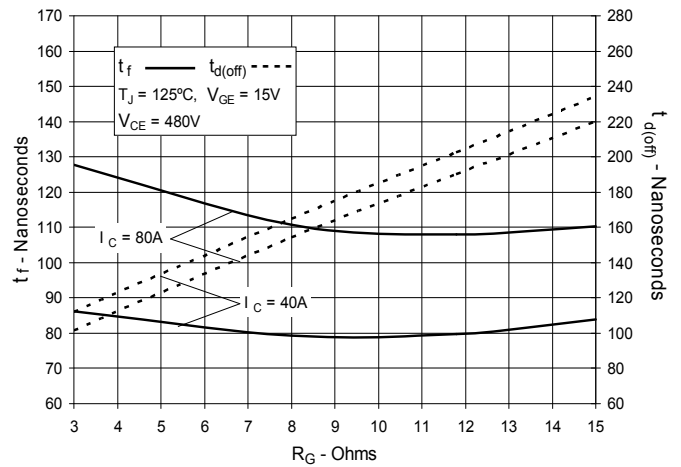


Fig. 16. Inductive Turn-off Switching Times vs. Collector Current

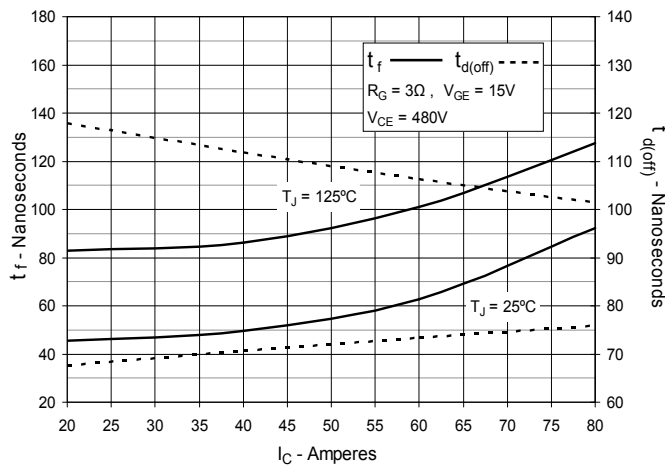


Fig. 17. Inductive Turn-off Switching Times vs. Junction Temperature

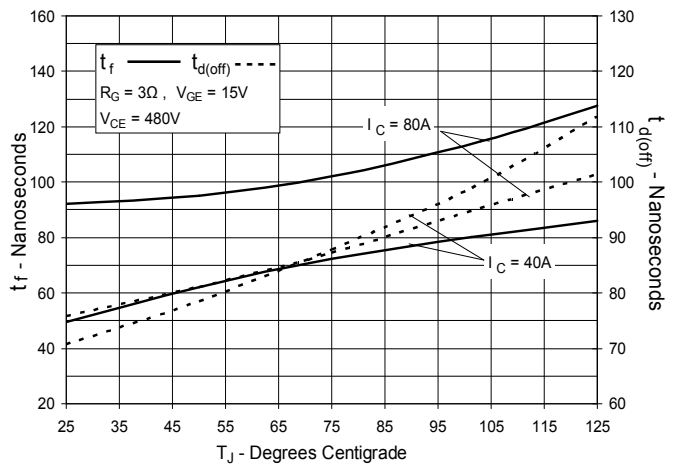


Fig. 18. Inductive Turn-on Switching Times vs. Gate Resistance

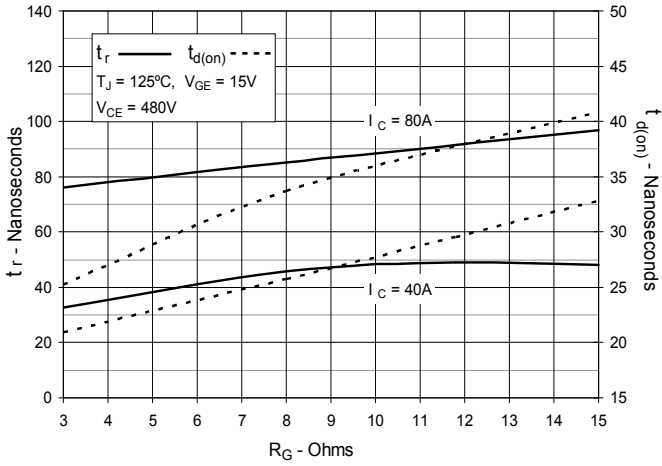


Fig. 19. Inductive Turn-on Switching Times vs. Collector Current

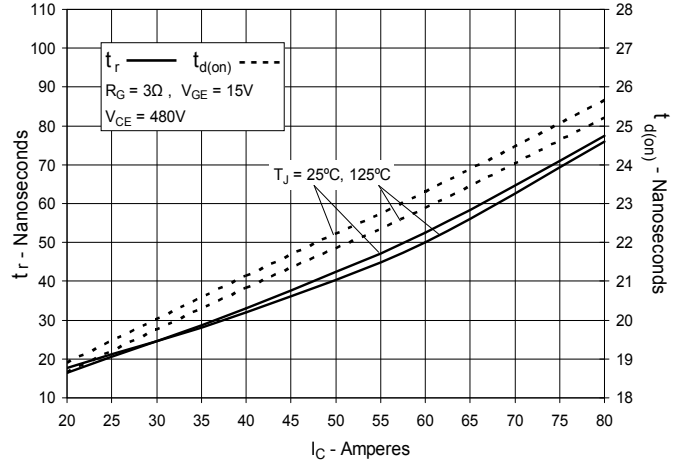


Fig. 20. Inductive Turn-on Switching Times vs. Junction Temperature

