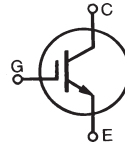


GenX3™ 600V IGBT

IXGH72N60A3
IXGT72N60A3

Ultra Low V_{sat} PT IGBT for
up to 5kHz switching



$$V_{CES} = 600V$$

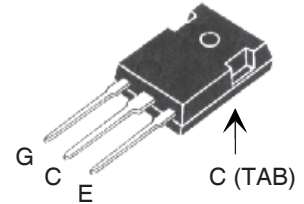
$$I_{C110} = 72A$$

$$V_{CE(sat)} \leq 1.35V$$

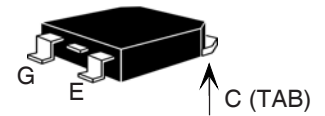
$$t_{fi(typ)} = 250ns$$

Symbol	Test Conditions	Maximum Ratings	
V_{CES}	$T_C = 25^\circ C$ to $150^\circ C$	600	V
V_{CGR}	$T_J = 25^\circ C$ to $150^\circ C$, $R_{GE} = 1M\Omega$	600	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	$T_C = 25^\circ C$ (limited by leads)	75	A
I_{C110}	$T_C = 110^\circ C$	72	A
I_{CM}	$T_C = 25^\circ C$, 1ms	400	A
SSOA (RBSOA)	$V_{GE} = 15V$, $T_{VJ} = 125^\circ C$, $R_G = 3\Omega$ Clamped inductive load @ $\leq 600V$	$I_{CM} = 150$	A
P_C	$T_C = 25^\circ C$	540	W
T_J		-55 ... +150	$^\circ C$
T_{JM}		150	$^\circ C$
T_{stg}		-55 ... +150	$^\circ C$
T_L	1.6mm (0.062 in.) from case for 10s	300	$^\circ C$
T_{SOLD}	Plastic body for 10 seconds	260	$^\circ C$
M_d	Mounting torque (TO-247)	1.13/10	Nm/lb.in.
Weight	TO-247	6	g
	TO-268	4	g

TO-247 (IXGH)



TO-268 (IXGT)



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

Features

- Optimized for low conduction losses
- Square RBSOA
- 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
- Inrush Current Protection Circuits

Symbol	Test Conditions ($T_J = 25^\circ C$ unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
BV_{CES}	$I_C = 250\mu A$, $V_{GE} = 0V$	600		V
$V_{GE(th)}$	$I_C = 250\mu A$, $V_{CE} = V_{GE}$	3.0		5.0 V
I_{CES}	$V_{CE} = V_{CES}$ $V_{GE} = 0V$ $T_J = 125^\circ C$			75 μA 750 μA
I_{GES}	$V_{CE} = 0V$, $V_{GE} = \pm 20V$			± 100 nA
$V_{CE(sat)}$	$I_C = 60A$, $V_{GE} = 15V$, Note 1			1.35 V

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$ unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
g_{fs}	$I_C = 60\text{A}$, $V_{CE} = 10\text{V}$, Note 1	48	76	S
C_{ies}	$V_{CE} = 25\text{V}$, $V_{GE} = 0\text{V}$, $f = 1\text{MHz}$		6600	pF
C_{oes}			360	pF
C_{res}			80	pF
Q_g	$I_C = I_{C110}$, $V_{GE} = 15\text{V}$, $V_{CE} = 0.5 \cdot V_{CES}$		230	nC
Q_{ge}			40	nC
Q_{gc}			78	nC
$t_{d(on)}$	Inductive load, $T_J = 25^\circ\text{C}$ $I_C = 50\text{A}$, $V_{GE} = 15\text{V}$ $V_{CE} = 480\text{V}$, $R_G = 3\Omega$		31	ns
t_{ri}			34	ns
E_{on}		1.38		mJ
$t_{d(off)}$			320	ns
t_{fi}			250	ns
E_{off}			3.5	mJ
$t_{d(on)}$	Inductive load, $T_J = 125^\circ\text{C}$ $I_C = 50\text{A}$, $V_{GE} = 15\text{V}$ $V_{CE} = 480\text{V}$, $R_G = 3\Omega$		29	ns
t_{ri}			32	ns
E_{on}		2.6		mJ
$t_{d(off)}$			510	ns
t_{fi}			375	ns
E_{off}			6.5	mJ
R_{thJC}			0.23	$^\circ\text{C/W}$
R_{thCS}		0.15		$^\circ\text{C/W}$

Note 1: Pulse test, $t \leq 300\mu\text{s}$, duty cycle, $d \leq 2\%$.

TO-247 AD Outline

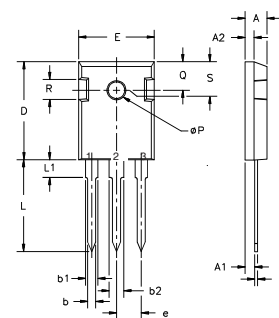


Fig. 1. Output Characteristics
@ 25°C

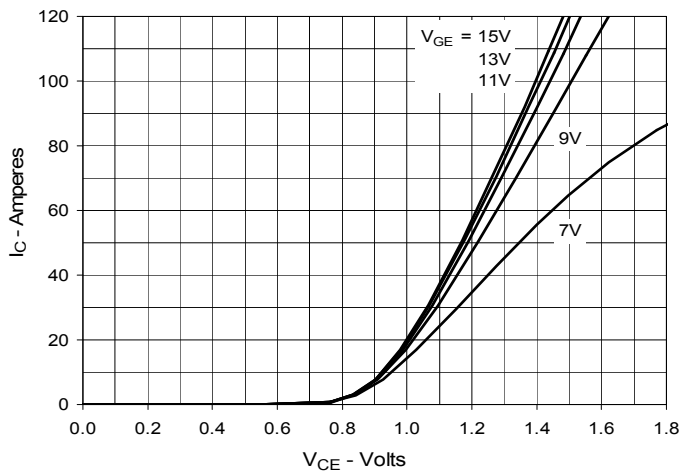


Fig. 2. Extended Output Characteristics
@ 25°C

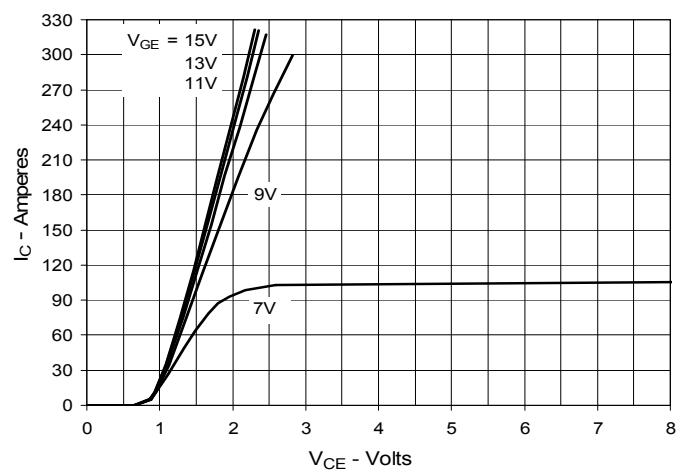


Fig. 3. Output Characteristics
@ 125°C

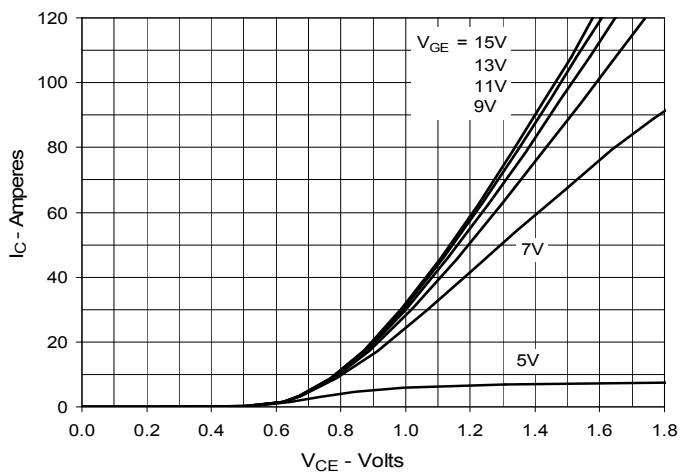


Fig. 4. Dependence of $V_{CE(sat)}$ on
Junction Temperature

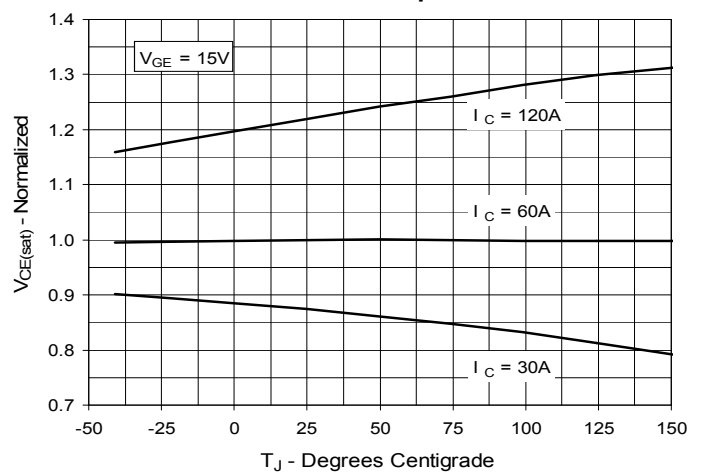


Fig. 5. Collector-to-Emitter Voltage
vs. Gate-to-Emitter Voltage

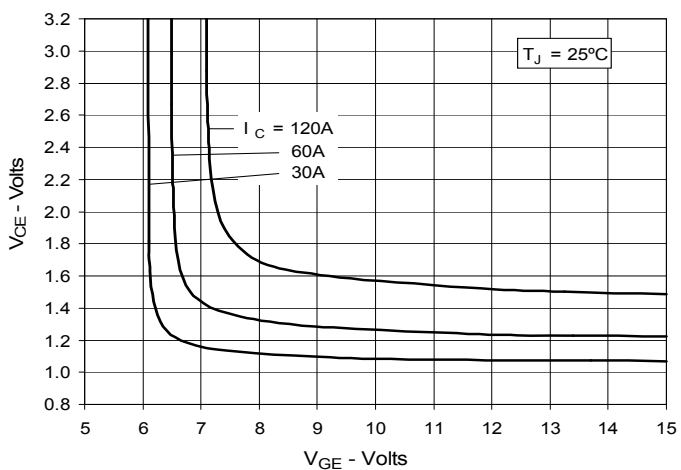


Fig. 6. Input Admittance

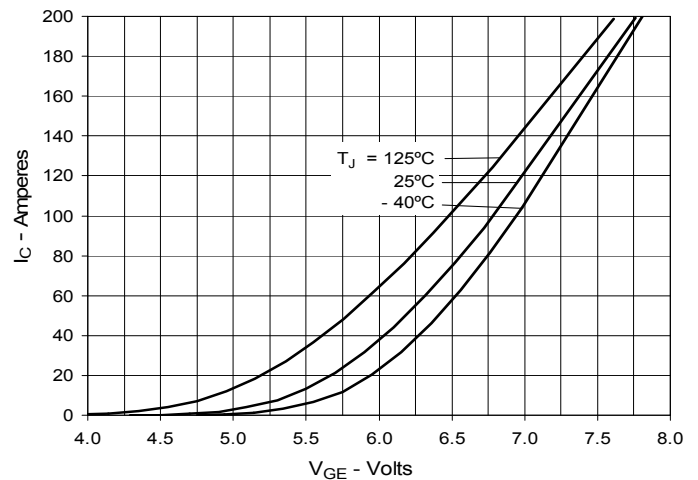


Fig. 7. Transconductance

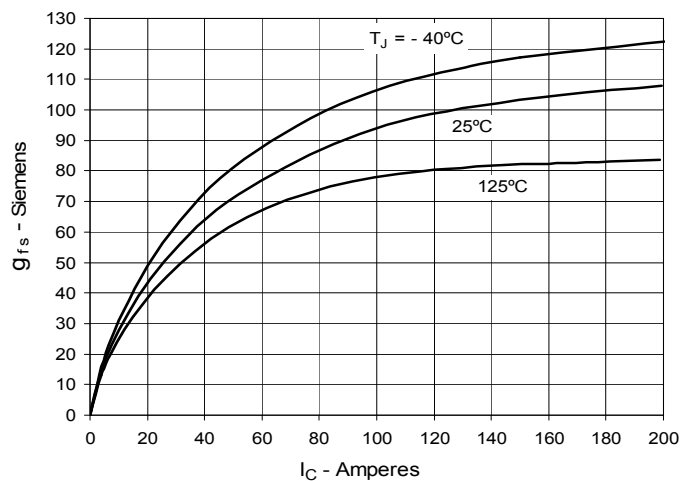


Fig. 8. Gate Charge

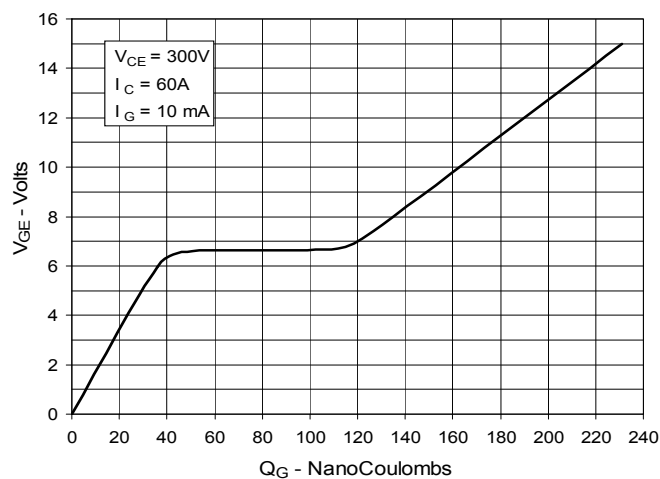


Fig. 9. Capacitance

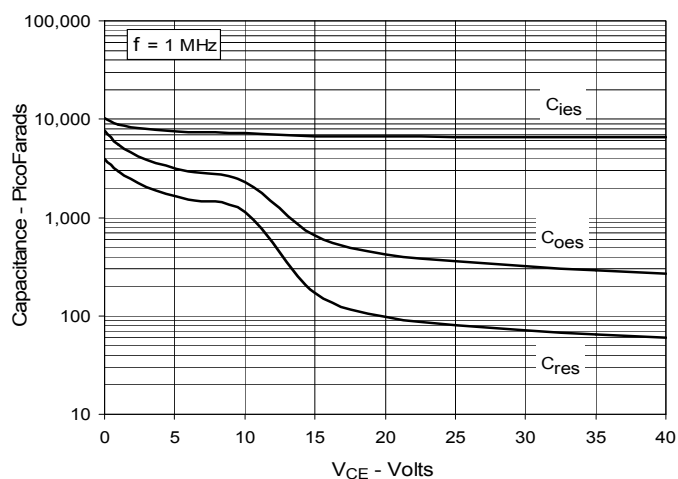


Fig. 10. Reverse-Bias Safe Operating Area

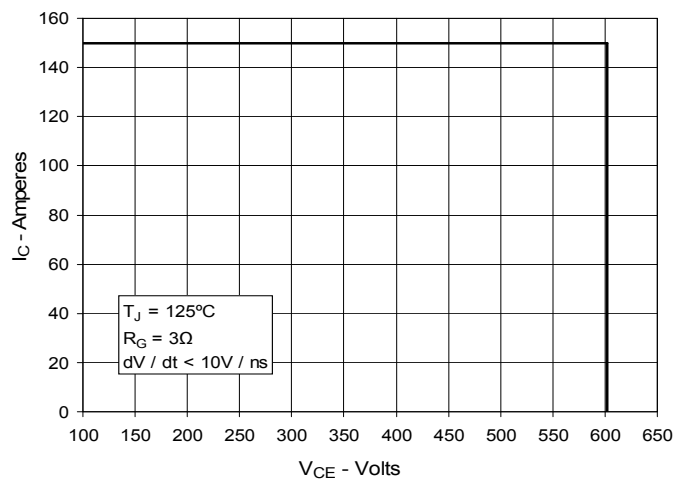
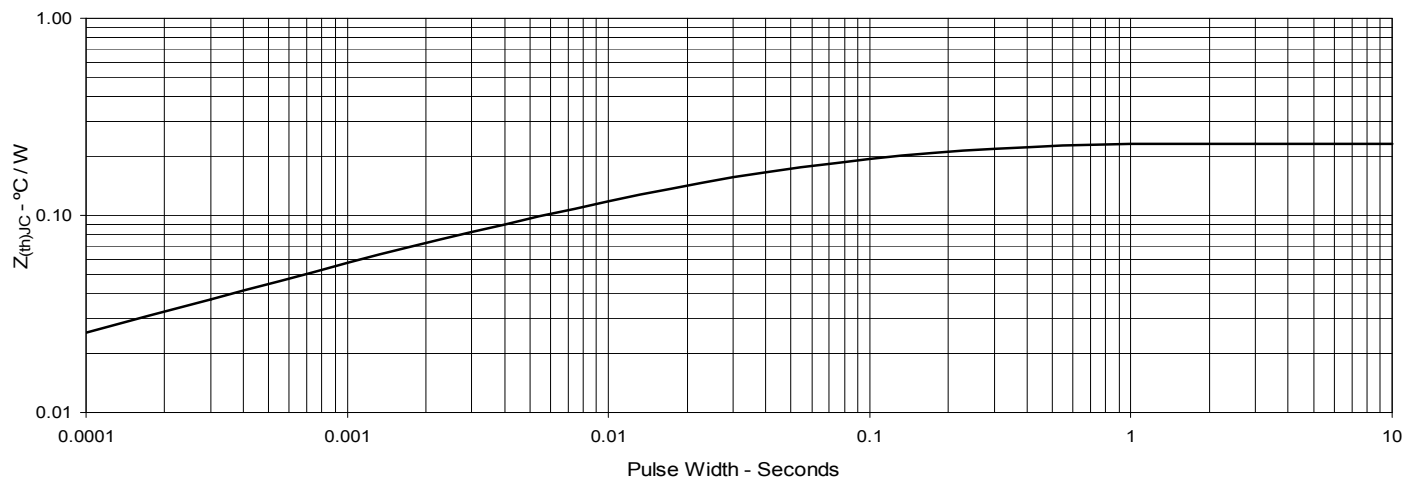
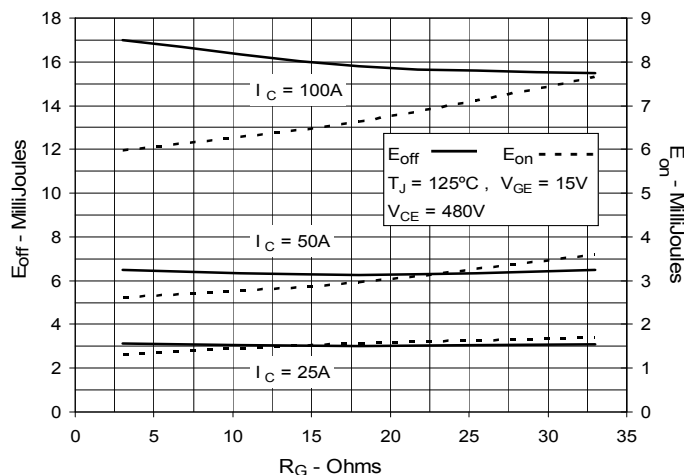


Fig. 11. Maximum Transient Thermal Impedance

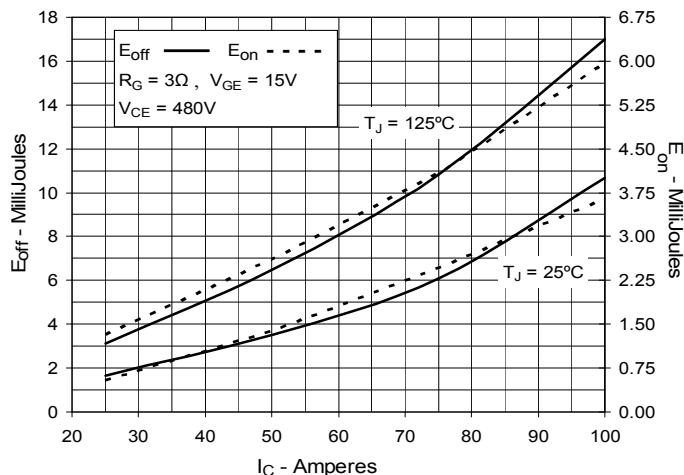


IXYS reserves the right to change limits, test conditions and dimensions.

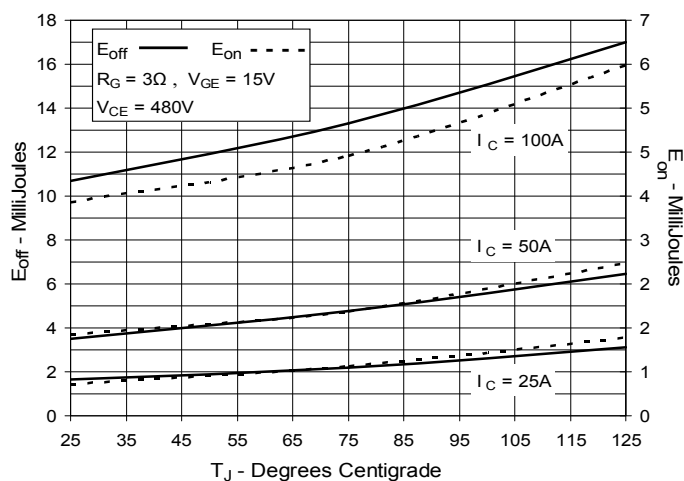
**Fig. 12. Inductive Switching
Energy Loss vs. Gate Resistance**



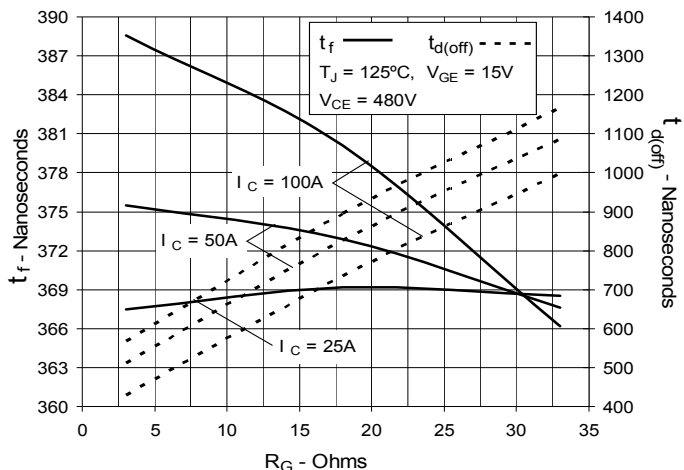
**Fig. 13. Inductive Switching
Energy Loss vs. Collector Current**



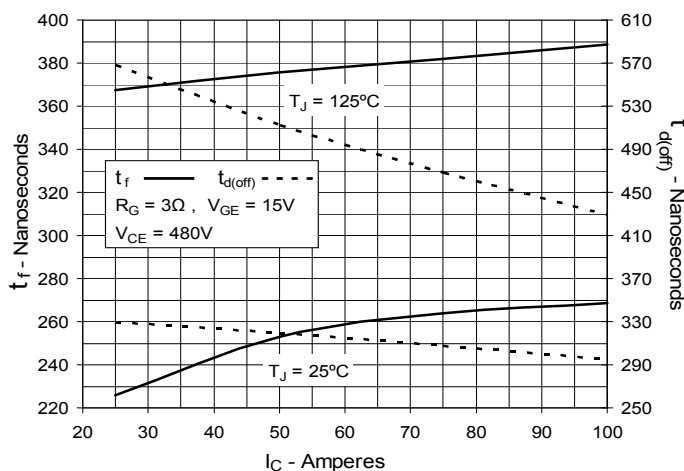
**Fig. 14. Inductive Switching
Energy Loss vs. Junction Temperature**



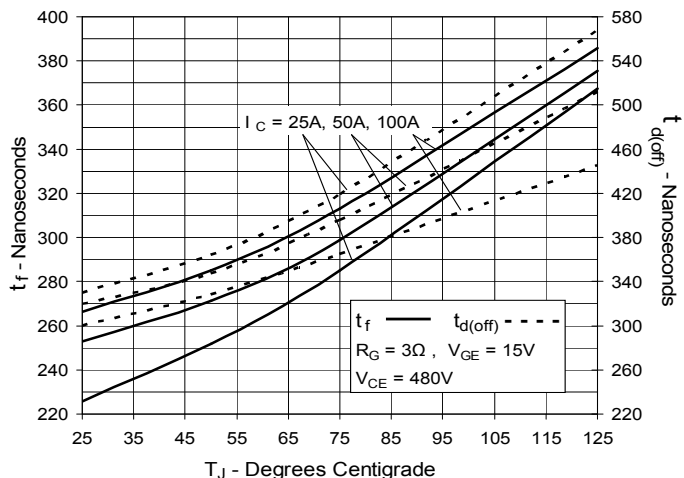
**Fig. 15. Inductive Turn-off
Switching Times vs. Gate Resistance**



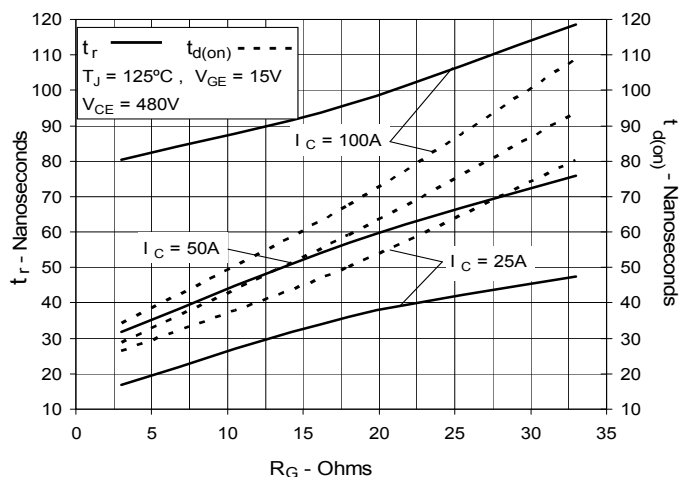
**Fig. 16. Inductive Turn-off
Switching Times vs. Collector Current**



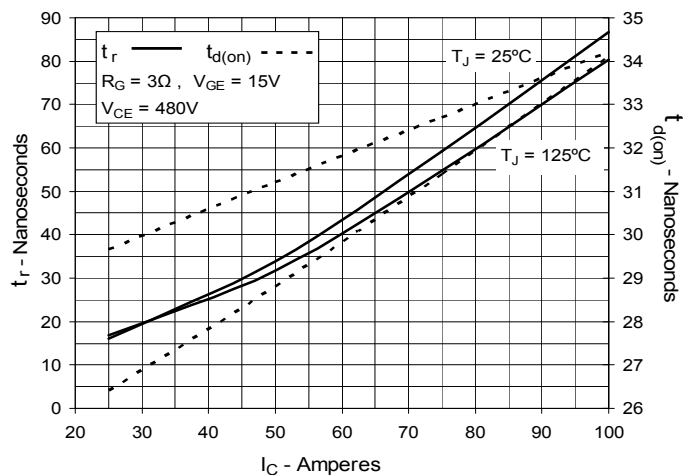
**Fig. 17. Inductive Turn-off
Switching Times vs. Junction Temperature**



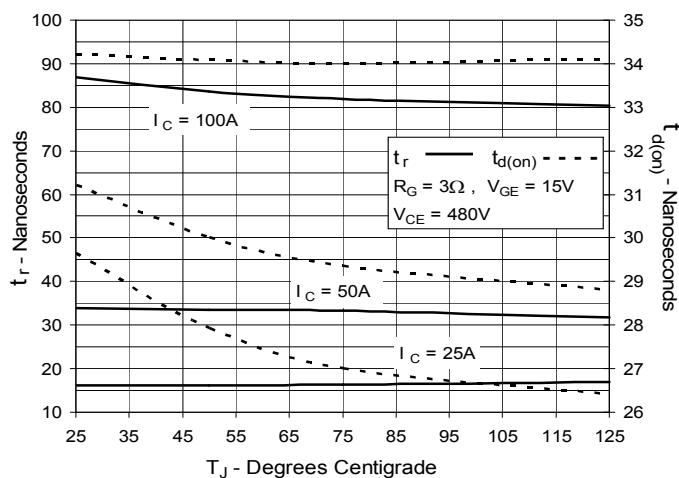
**Fig. 18. Inductive Turn-on
Switching Times vs. Gate Resistance**



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



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





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