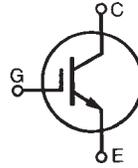


GenX3™ 300V IGBT IXGH85N30C3

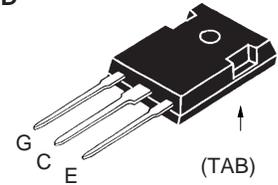
High Speed PT IGBTs for 50-150kHz switching



$$\begin{aligned}
 V_{CES} &= 300V \\
 I_{C110} &= 85A \\
 V_{CE(sat)} &\leq 1.9V \\
 t_{fi\ typ} &= 70ns
 \end{aligned}$$

Symbol	Test Conditions	Maximum Ratings	
V_{CES}	$T_J = 25^\circ\text{C}$ to 150°C	300	V
V_{CGR}	$T_J = 25^\circ\text{C}$ to 150°C , $R_{GE} = 1M\Omega$	300	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	$T_C = 25^\circ\text{C}$ (limited by leads)	75	A
I_{C110}	$T_C = 110^\circ\text{C}$ (chip capability)	85	A
I_{CM}	$T_C = 25^\circ\text{C}$, 1ms	420	A
I_A	$T_C = 25^\circ\text{C}$	85	A
E_{AS}	$T_C = 25^\circ\text{C}$	400	mJ
SSOA (RBSOA)	$V_{GE} = 15V$, $T_{VJ} = 125^\circ\text{C}$, $R_G = 3.3\Omega$ Clamped inductive load @ $\leq 300V$	$I_{CM} = 170$	A
P_C	$T_C = 25^\circ\text{C}$	333	W
T_J		-55 ... +150	$^\circ\text{C}$
T_{JM}		150	$^\circ\text{C}$
T_{stg}		-55 ... +150	$^\circ\text{C}$
T_L	Maximum lead temperature for soldering	300	$^\circ\text{C}$
T_{SOLD}	1.6 mm (0.062 in.) from case for 10s	260	$^\circ\text{C}$
M_d	Mounting torque (TO-247)	1.13/10	Nm/lb.in.
Weight		6	g

TO-247 AD
(IXGH)



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

Features

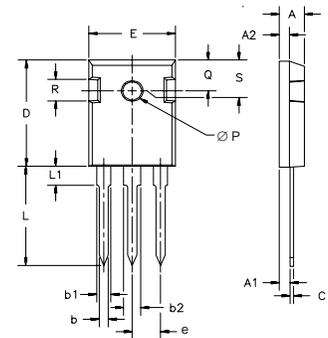
- High Frequency IGBT
- Square RBSOA
- High avalanche capability
- Drive simplicity with MOS Gate Turn-On
- High current handling capability

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 ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		Min.	Typ.	Max.
BV_{CES}	$I_C = 250\mu\text{A}$, $V_{GE} = 0V$	300		V
$V_{GE(th)}$	$I_C = 250\mu\text{A}$, $V_{CE} = V_{GE}$	2.5		V
I_{CES}	$V_{CE} = V_{CES}$ $V_{GE} = 0V$ $T_J = 125^\circ\text{C}$			30 μA 750 μA
I_{GES}	$V_{CE} = 0V$, $V_{GE} = \pm 20V$			± 100 nA
$V_{CE(sat)}$	$I_C = 85A$, $V_{GE} = 15V$ $T_J = 125^\circ\text{C}$	1.64 1.67	1.9	V V

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$, unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
g_{fs}	$I_C = 0.5 \cdot I_{C110}$, $V_{CE} = 10\text{V}$, Pulse test, $t \leq 300\mu\text{s}$; duty cycle, $d \leq 2\%$.	35	60	S
C_{ies}	$V_{CE} = 25\text{V}$, $V_{GE} = 0\text{V}$, $f = 1\text{MHz}$		5100	pF
C_{oes}			310	pF
C_{res}			80	pF
Q_g	$I_C = I_{C110}$, $V_{GE} = 15\text{V}$, $V_{CE} = 0.5 \cdot V_{CES}$		136	nC
Q_{ge}			22	nC
Q_{gc}			48	nC
$t_{d(on)}$	Inductive Load, $T_J = 25^\circ\text{C}$ $I_C = 0.5 \cdot I_{C110}$, $V_{GE} = 15\text{V}$ $V_{CE} = 200\text{V}$, $R_G = 3.3\Omega$		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, $T_J = 125^\circ\text{C}$ $I_C = 0.5 \cdot I_{C110}$, $V_{GE} = 15\text{V}$ $V_{CE} = 200\text{V}$, $R_G = 3.3\Omega$		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 $^\circ\text{C/W}$
R_{thCK}		0.21		$^\circ\text{C/W}$

TO-247 AD Outline


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
∅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 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	

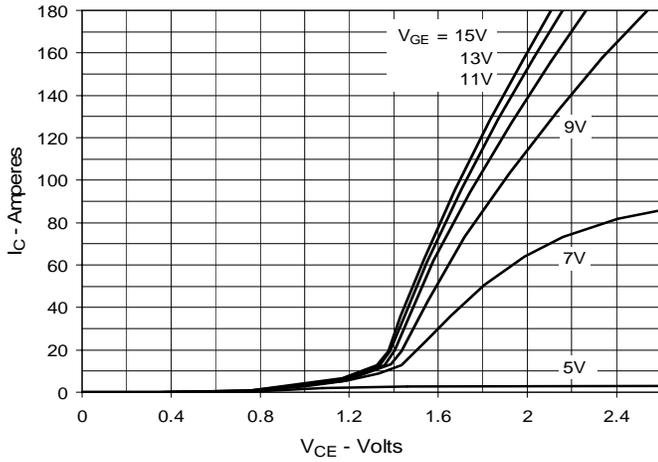
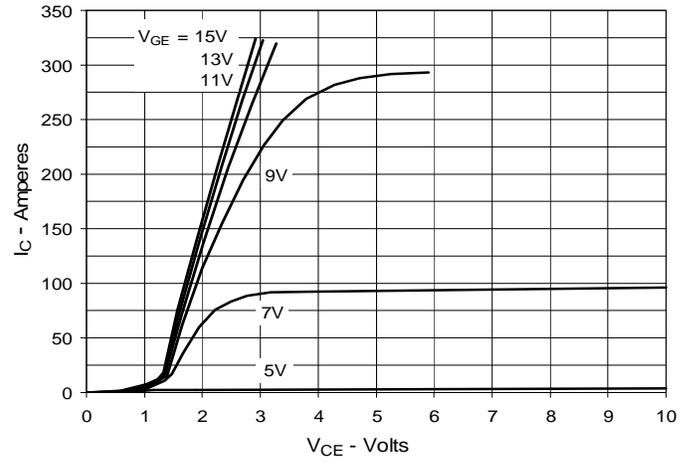
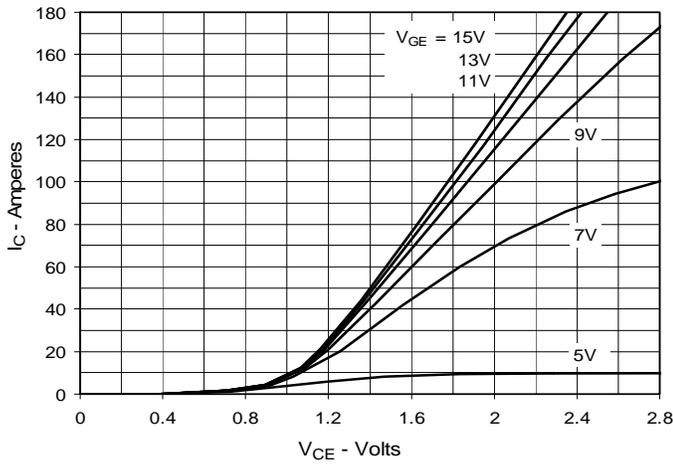
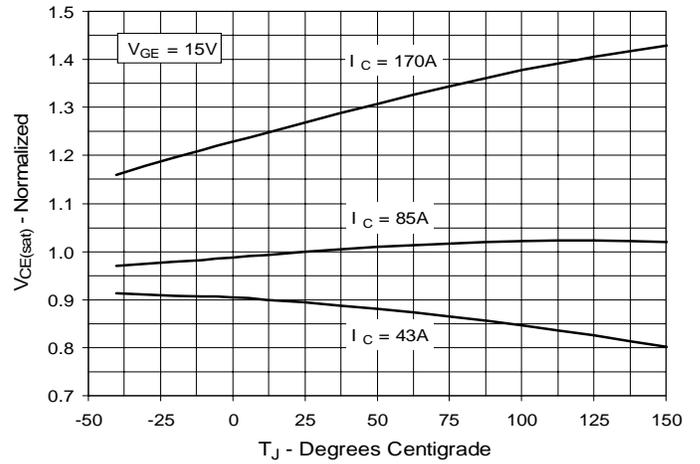
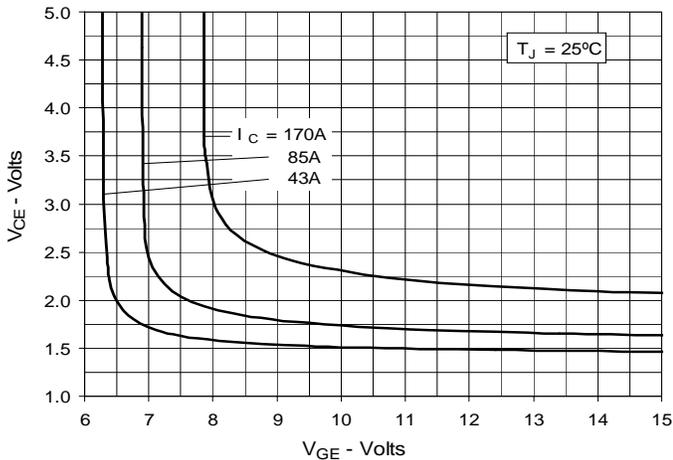
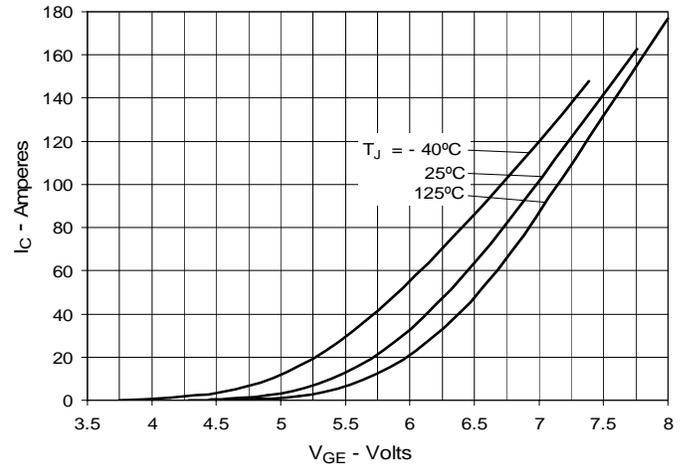
**Fig. 1. Output Characteristics
@ 25°C**

**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


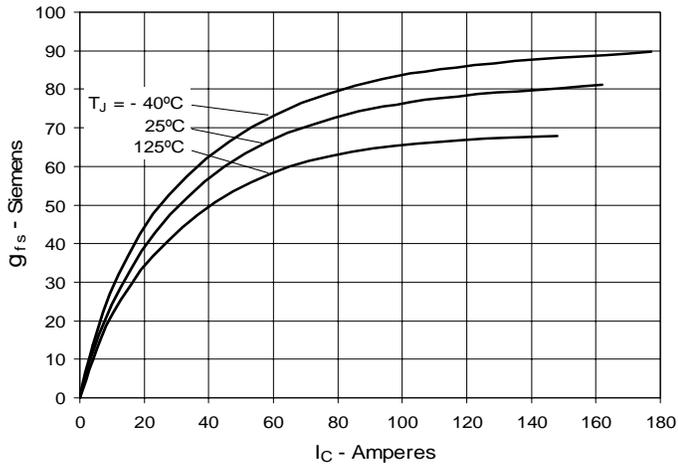
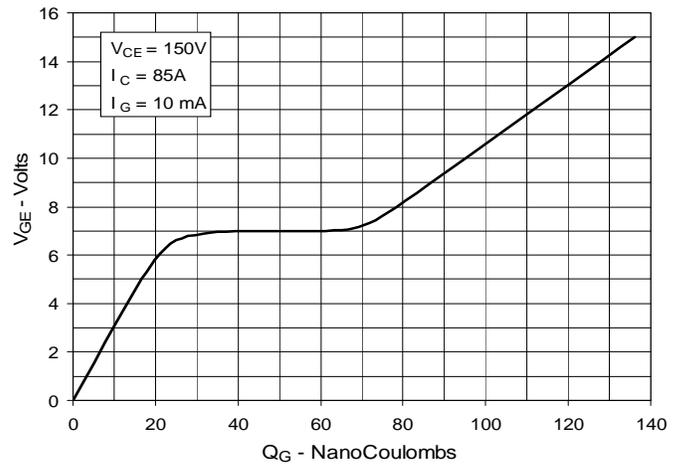
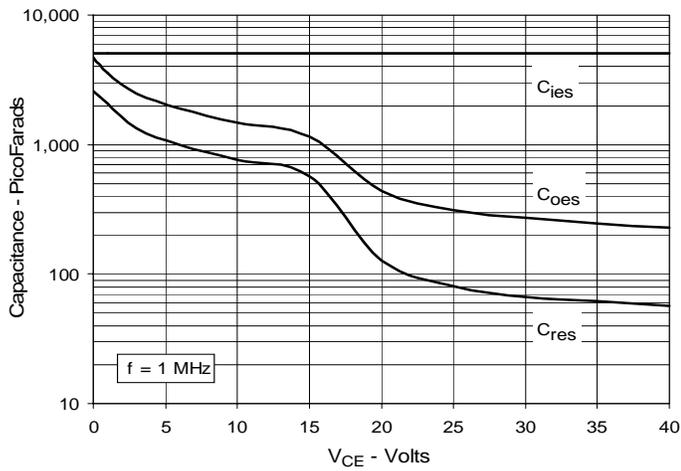
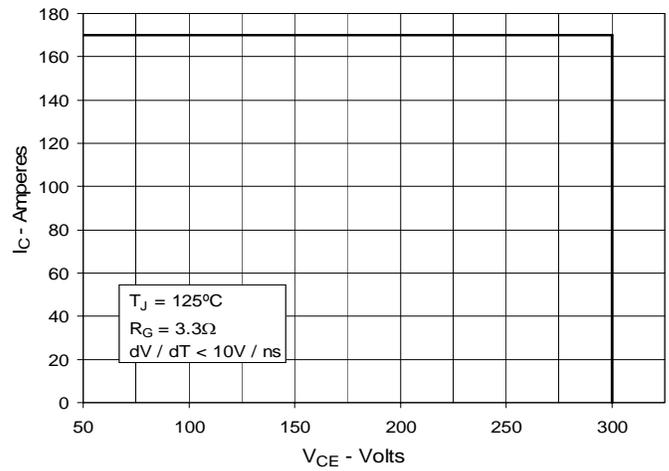
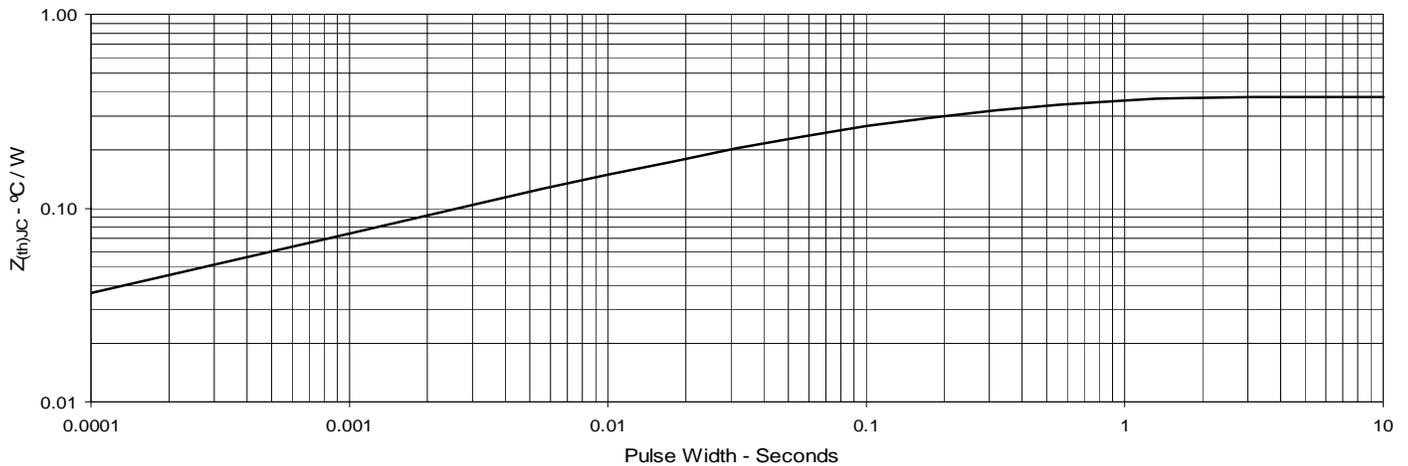
Fig. 7. Transconductance

Fig. 8. Gate Charge

Fig. 9. Capacitance

Fig. 10. Reverse-Bias Safe Operating Area

Fig. 11. Maximum Transient Thermal Impedance


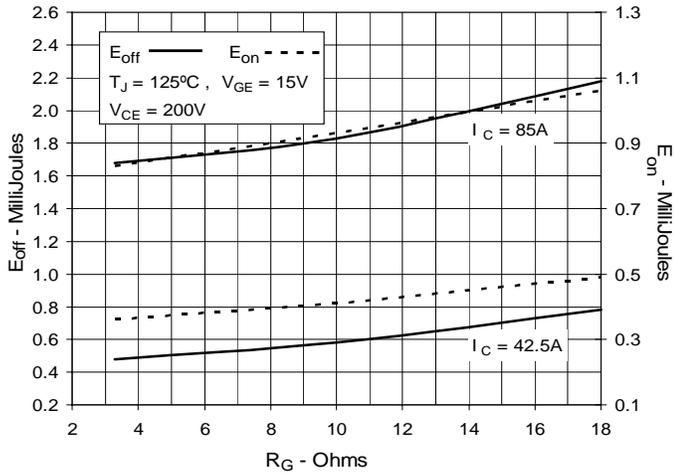
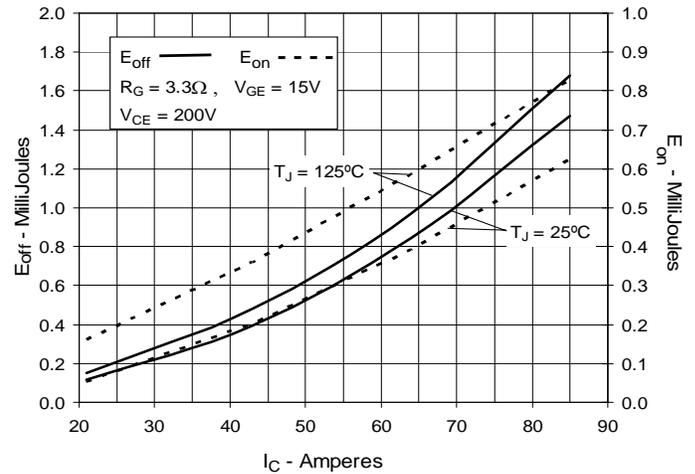
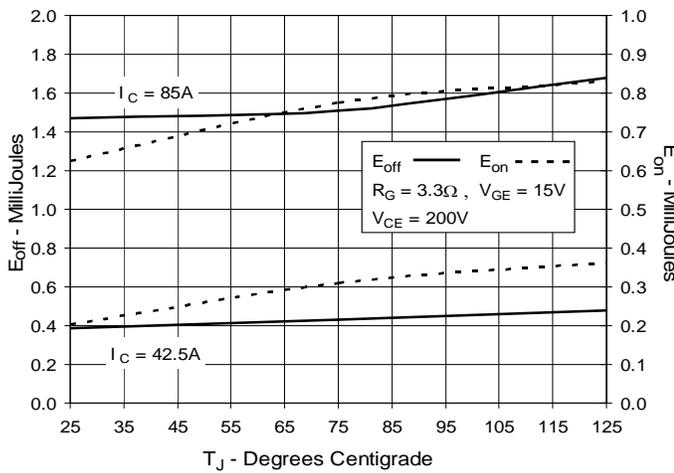
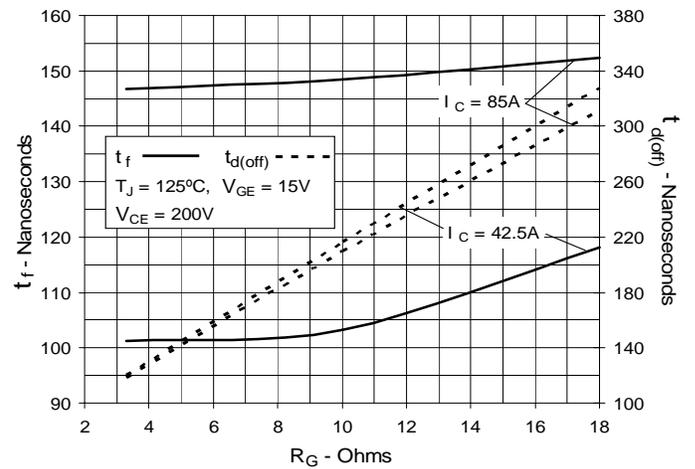
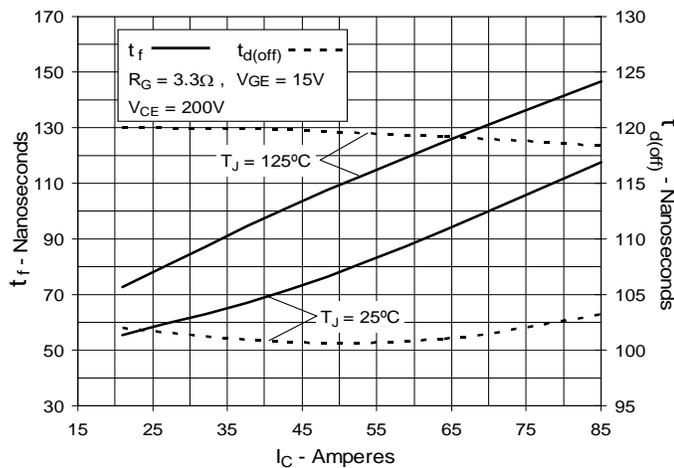
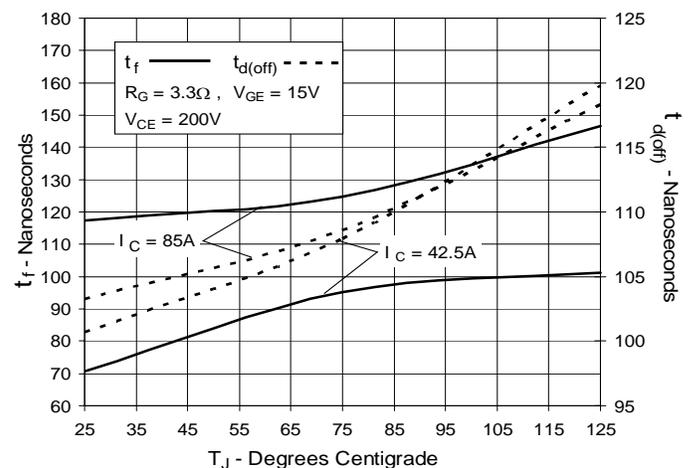
Fig. 12. Inductive Switching Energy Loss vs. Gate Resistance

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

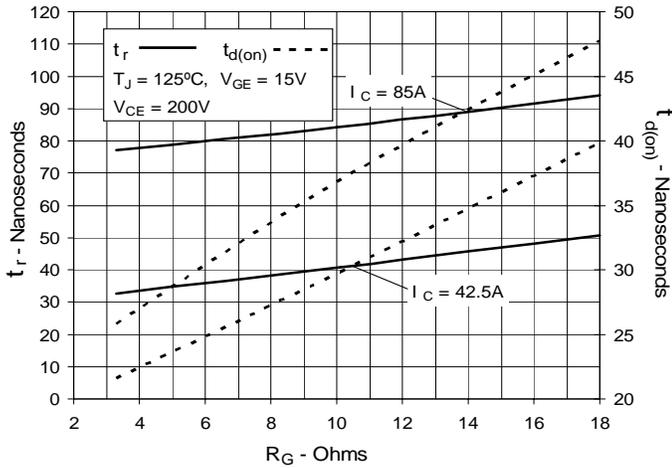


Fig. 19. Inductive Turn-on Switching Times vs. Collector Current

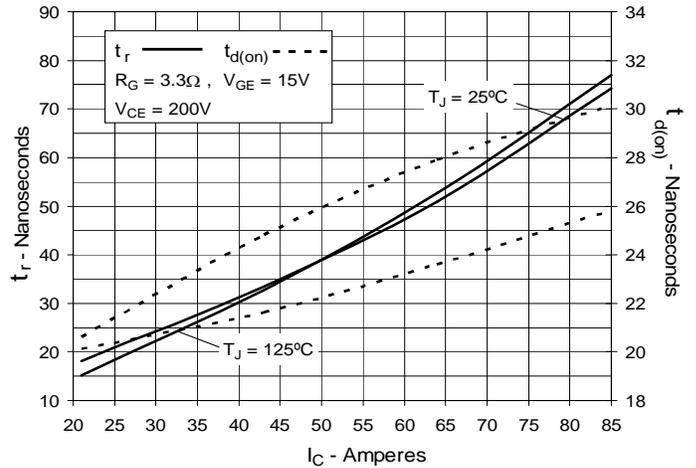
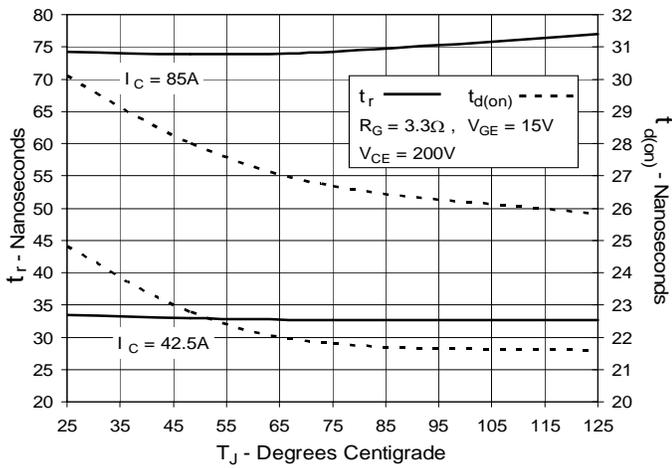


Fig. 20. Inductive Turn-on Switching Times vs. Junction Temperature



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