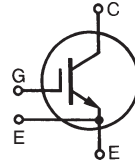


# High Voltage IGBT

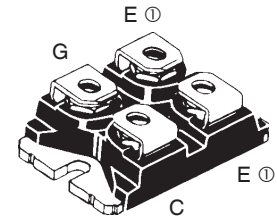
## IXGN200N170



$$\begin{aligned}
 V_{CES} &= 1700V \\
 I_{C90} &= 160A \\
 V_{CE(sat)} &\leq 2.6V \\
 t_{fi(typ)} &= 535ns
 \end{aligned}$$

SOT-227B, miniBLOC

Symbol	Test Conditions	Maximum Ratings	
$V_{CES}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$	1700	V
$V_{CGR}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$ , $R_{GE} = 1M\Omega$	1700	V
$V_{GES}$	Continuous	$\pm 20$	V
$V_{GEM}$	Transient	$\pm 30$	V
$I_{C25}$	$T_C = 25^\circ\text{C}$ (Chip Capability)	280	A
$I_{LRMS}$	Terminal Current Limit	200	A
$I_{C90}$	$T_C = 90^\circ\text{C}$	160	A
$I_{CM}$	$T_C = 25^\circ\text{C}$ , 1ms	1050	A
<b>SSOA (RBSOA)</b>	$V_{GE} = 15V$ , $T_{VJ} = 125^\circ\text{C}$ , $R_G = 1\Omega$ Clamped Inductive Load	$I_{CM} = 300$	A
		1360	V
$P_C$	$T_C = 25^\circ\text{C}$	1250	W
$T_J$		-55 ... +150	$^\circ\text{C}$
$T_{JM}$		150	$^\circ\text{C}$
$T_{stg}$		-55 ... +150	$^\circ\text{C}$
$V_{ISOL}$	50/60Hz $t = 1\text{min}$ $I_{ISOL} \leq 1\text{mA}$ $t = 1\text{s}$	2500	V~
		3000	V~
$M_d$	Mounting Torque	1.5/13	Nm/lb.in
	Terminal Connection Torque	1.3/11.5	Nm/lb.in
<b>Weight</b>		30	g



G = Gate, C = Collector, E = Emitter  
 ① either emitter terminal can be used as Main or Kelvin Emitter

### Features

- miniBLOC, with Aluminium Nitride Isolation
- International Standard Package
- Isolation Voltage 2500V~
- High Current Handling Capability

### Advantages

- High Power Density
- Low Gate Drive Requirement

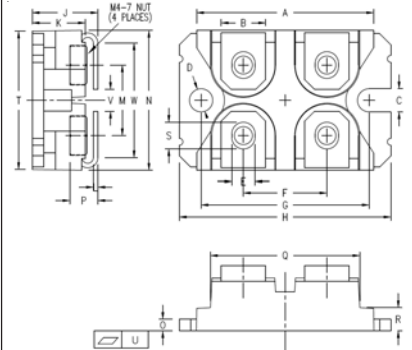
### Applications

- Power Inverters
- UPS
- Motor Drives
- SMPS
- PFC Circuits
- Welding Machines

Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ , Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$BV_{CES}$	$I_C = 3\text{mA}$ , $V_{GE} = 0V$	1700		V
$V_{GE(th)}$	$I_C = 1\text{mA}$ , $V_{CE} = V_{GE}$	3.5		V
$I_{CES}$	$V_{CE} = V_{CES}$ , $V_{GE} = 0V$ $T_J = 125^\circ\text{C}$			25 $\mu\text{A}$
				5 mA
$I_{GES}$	$V_{CE} = 0V$ , $V_{GE} = \pm 20V$			$\pm 200$ nA
$V_{CE(sat)}$	$I_C = 100A$ , $V_{GE} = 15V$ , Note 1 $T_J = 125^\circ\text{C}$	2.1		V
		2.5		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	50	82	S
$C_{ies}$	$V_{CE} = 25\text{V}, V_{GE} = 0\text{V}, f = 1\text{MHz}$		12.5	nF
$C_{oes}$			580	pF
$C_{res}$			220	pF
$Q_{g(on)}$	$I_C = 200\text{A}_0, V_{GE} = 15\text{V}, V_{CE} = 0.5 \cdot V_{CES}$		540	nC
$Q_{ge}$			78	nC
$Q_{gc}$			265	nC
$t_{d(on)}$	<b>Inductive load, <math>T_J = 25^\circ\text{C}</math></b> $I_C = 100\text{A}, V_{GE} = 15\text{V}$ $V_{CE} = 0.5 \cdot V_{CES}, R_G = 1\Omega$ Note 2		37	ns
$t_{ri}$			133	ns
$E_{on}$			28	mJ
$t_{d(off)}$			320	ns
$t_{fi}$			535	ns
$E_{off}$		30	mJ	
$t_{d(on)}$	<b>Inductive load, <math>T_J = 125^\circ\text{C}</math></b> $I_C = 100\text{A}, V_{GE} = 15\text{V}$ $V_{CE} = 0.5 \cdot V_{CES}, R_G = 1\Omega$ Note 2		40	ns
$t_{ri}$			143	ns
$E_{on}$			31	mJ
$t_{d(off)}$			430	ns
$t_{fi}$			610	ns
$E_{off}$		44	mJ	
$R_{thJC}$				0.10 $^\circ\text{C/W}$
$R_{thCS}$		0.05		$^\circ\text{C/W}$

### SOT-227B miniBLOC (IXGN)



SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	1.240	1.255	31.50	31.88
B	.307	.323	7.80	8.20
C	.161	.169	4.09	4.29
D	.161	.169	4.09	4.29
E	.161	.169	4.09	4.29
F	.587	.595	14.91	15.11
G	1.186	1.193	30.12	30.30
H	1.489	1.505	37.80	38.23
J	.460	.481	11.68	12.22
K	.351	.378	8.92	9.60
L	.030	.033	0.76	0.84
M	.496	.506	12.60	12.85
N	.990	1.001	25.15	25.42
O	.078	.084	1.98	2.13
P	.195	.235	4.95	5.97
Q	1.045	1.059	26.54	26.90
R	.155	.174	3.94	4.42
S	.186	.191	4.72	4.85
T	.968	.987	24.59	25.07
U	-.002	.004	-0.05	0.1
V	.130	.180	3.30	4.57
W	.780	.830	19.81	21.08

#### 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  $R_G$ .

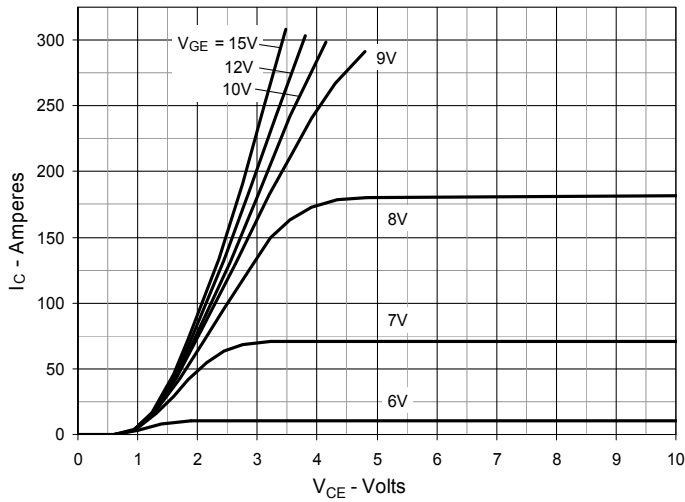
### ADVANCE TECHNICAL INFORMATION

The product presented herein is under development. The Technical Specifications offered are derived from a subjective evaluation of the design, based upon prior knowledge and experience, and constitute a "considered reflection" of the anticipated result. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

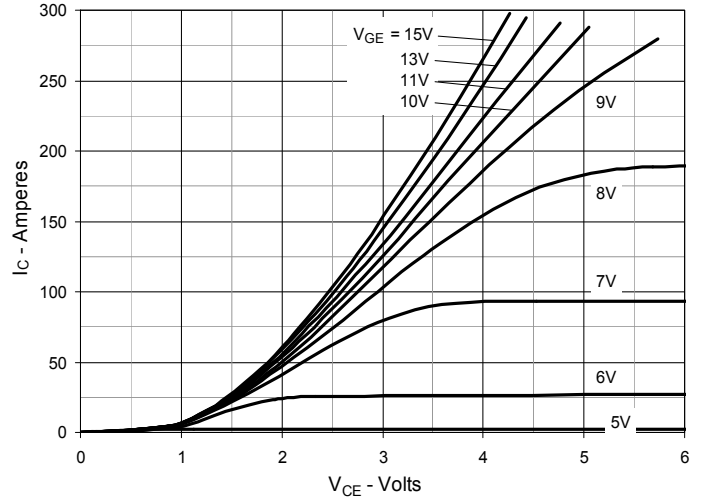
IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.

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
	4,860,072	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	

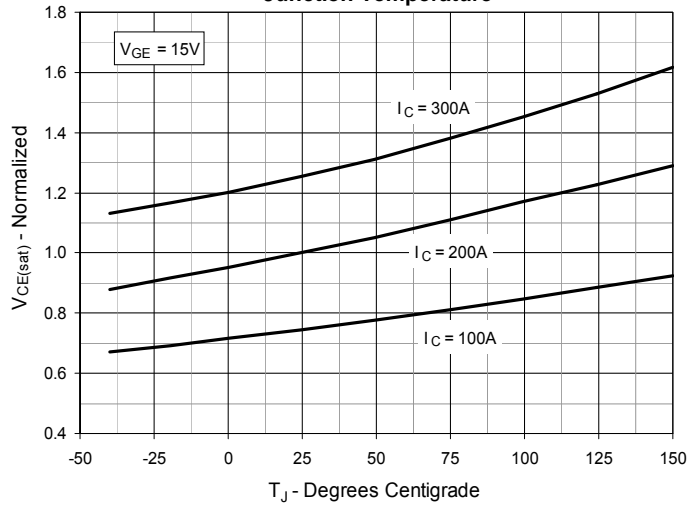
**Fig. 1. Extended Output Characteristics @  $T_J = 25^\circ\text{C}$**



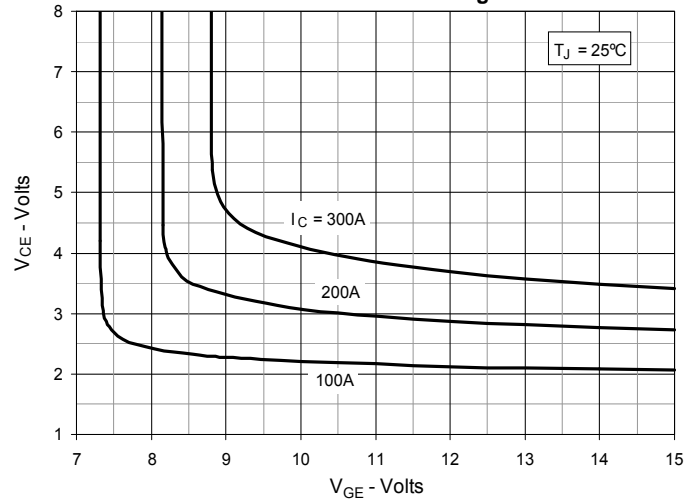
**Fig. 2. Output Characteristics @  $T_J = 125^\circ\text{C}$**



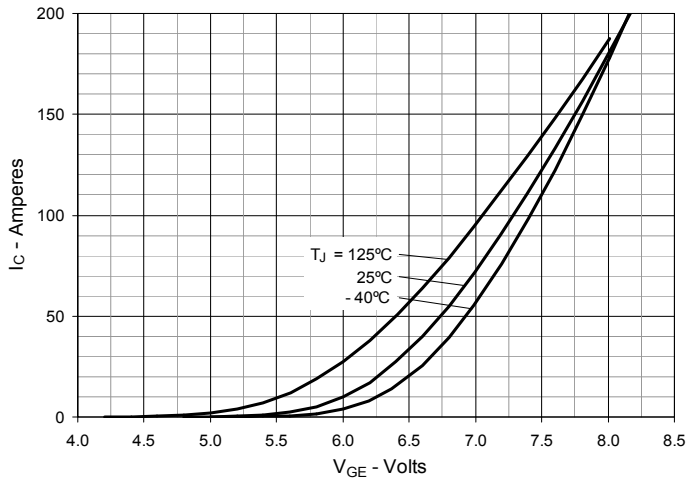
**Fig. 3. Dependence of  $V_{CE(sat)}$  on Junction Temperature**



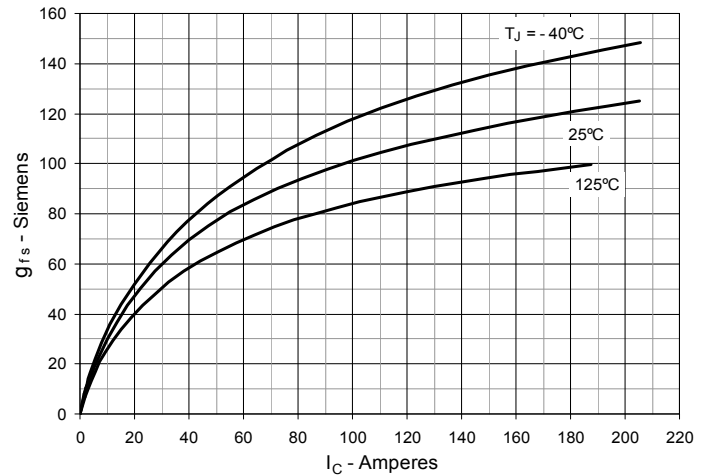
**Fig. 4. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage**

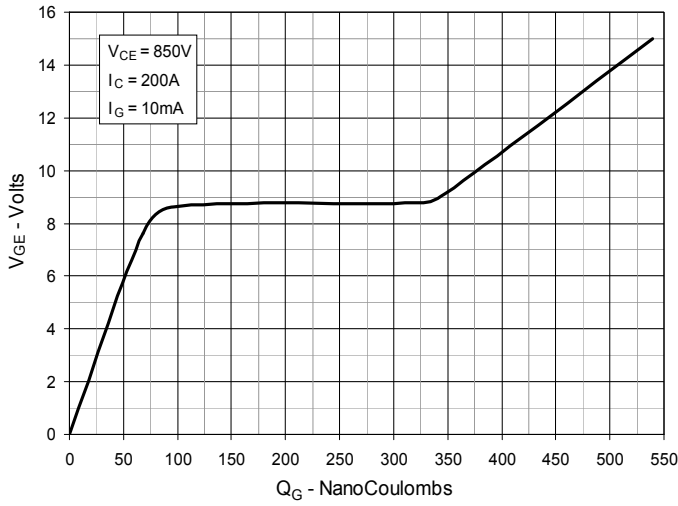
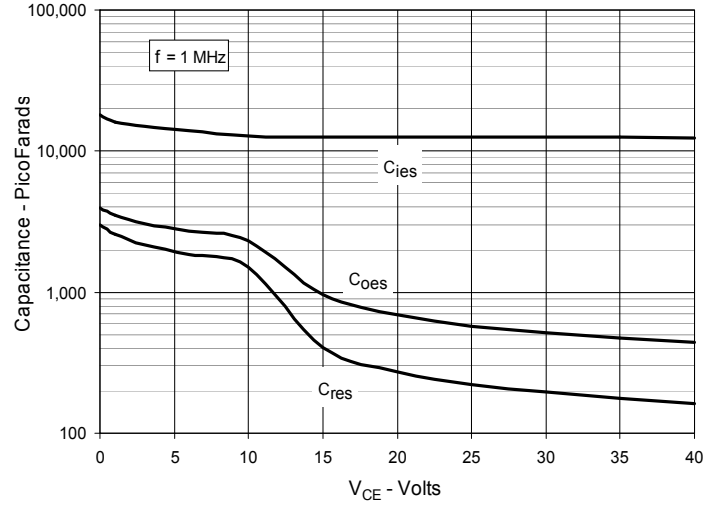
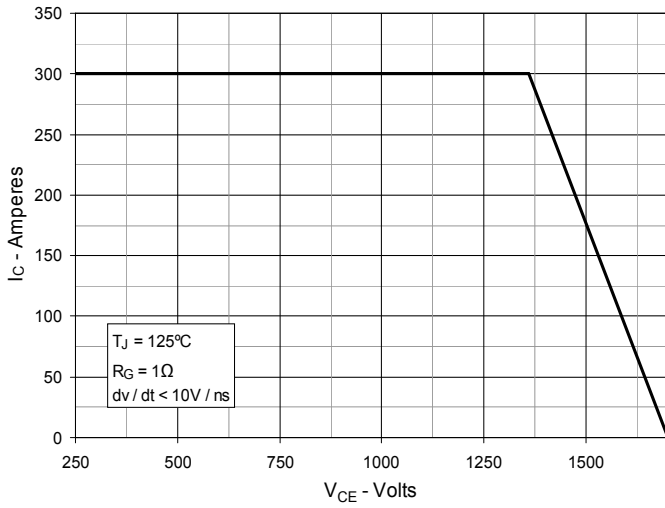
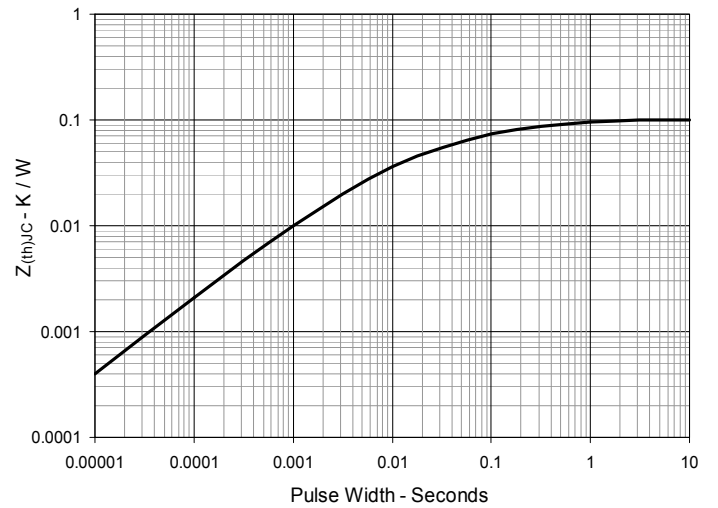


**Fig. 5. Input Admittance**

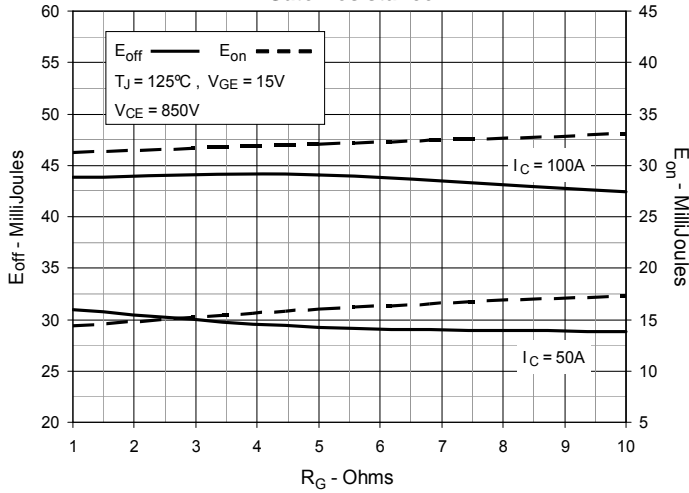


**Fig. 6. Transconductance**

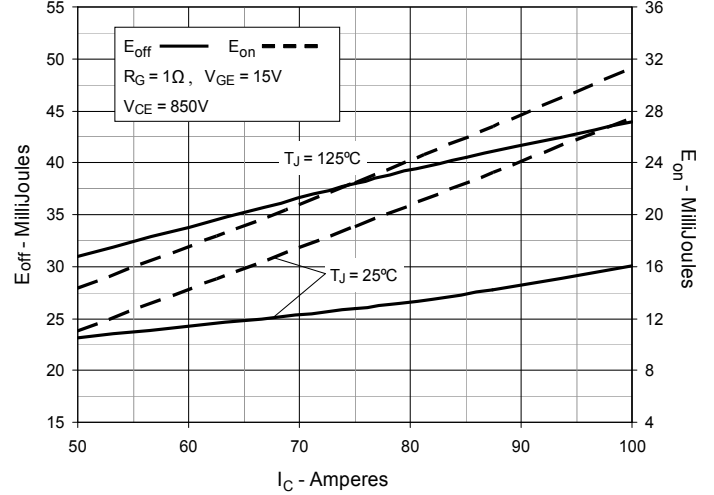


**Fig. 7. Gate Charge**

**Fig. 8. Capacitance**

**Fig. 9. Reverse-Bias Safe Operating Area**

**Fig. 10. Maximum Transient Thermal Impedance**


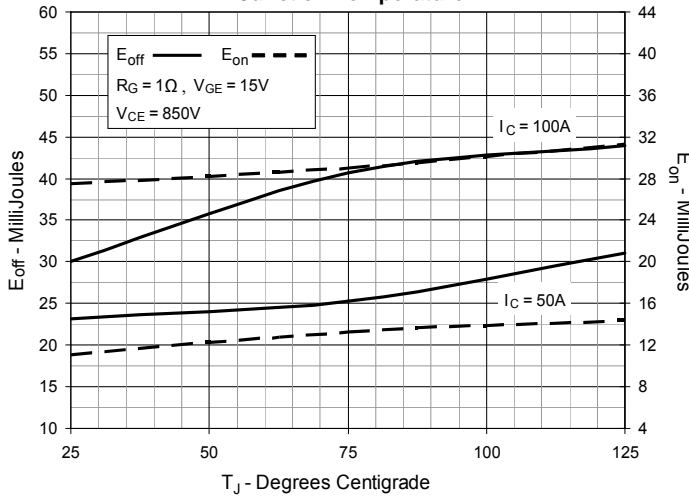
**Fig. 11. Inductive Switching Energy Loss vs. Gate Resistance**



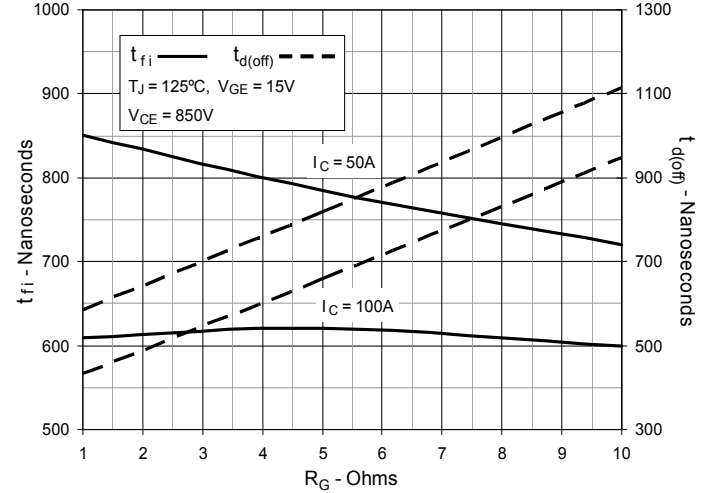
**Fig. 12. Inductive Switching Energy Loss vs. Collector Current**



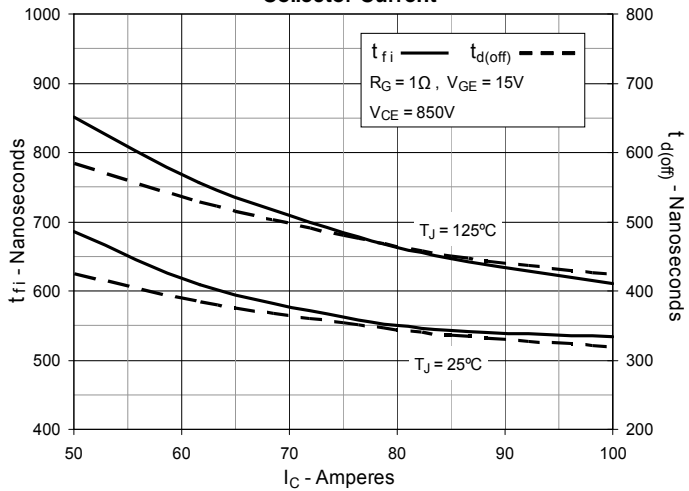
**Fig. 13. Inductive Switching Energy Loss vs. Junction Temperature**



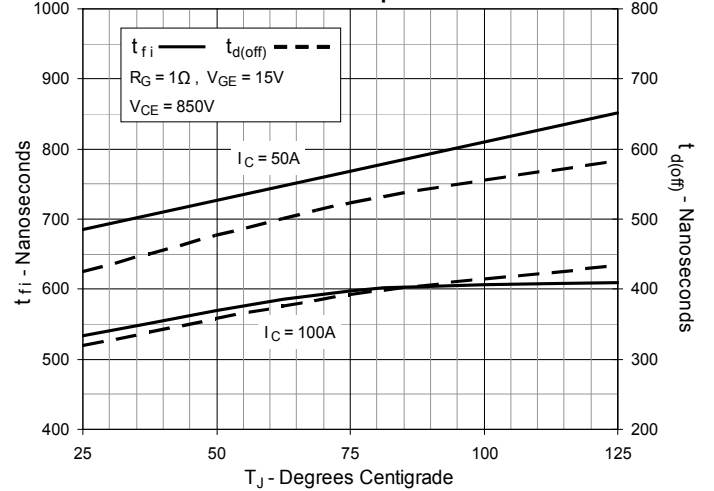
**Fig. 14. Inductive Turn-off Switching Times vs. Gate Resistance**

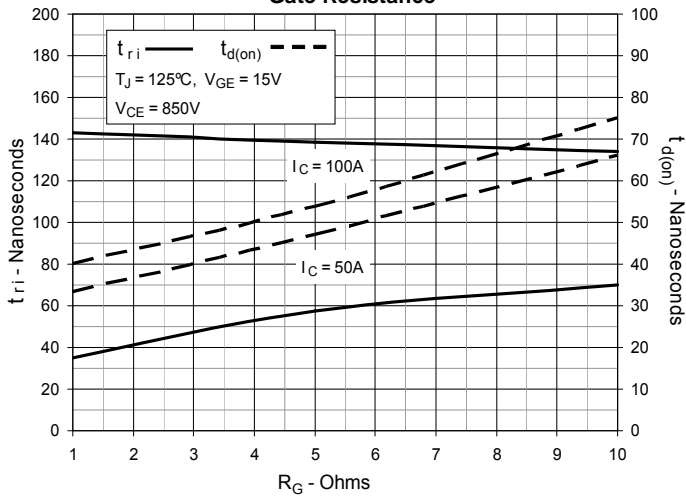
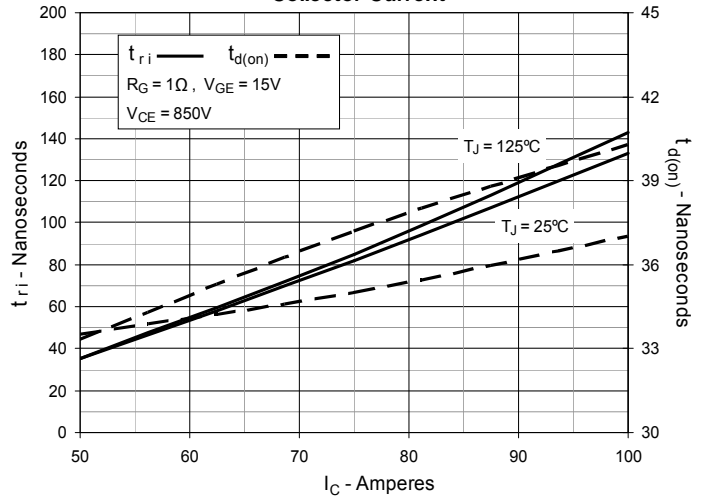
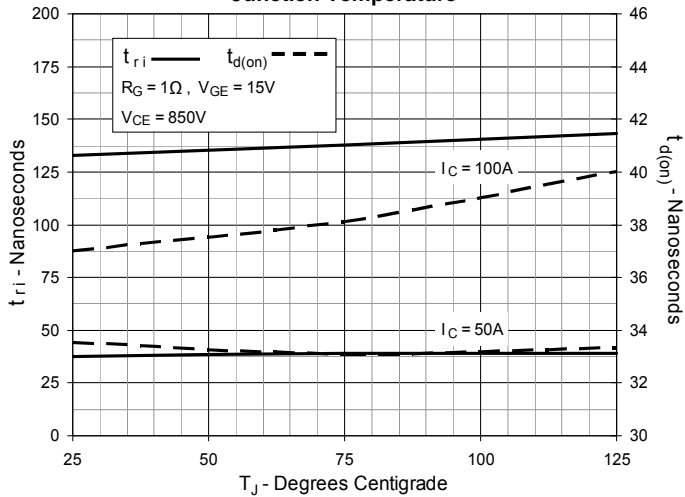


**Fig. 15. Inductive Turn-off Switching Times vs. Collector Current**



**Fig. 16. Inductive Turn-off Switching Times vs. Junction Temperature**



**Fig. 17. Inductive Turn-on Switching Times vs. Gate Resistance**

**Fig. 18. Inductive Turn-on Switching Times vs. Collector Current**

**Fig. 19. Inductive Turn-on Switching Times vs. Junction Temperature**




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