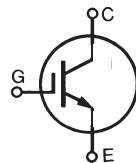


# GenX3™ 600V IGBT

# IXGB200N60B3

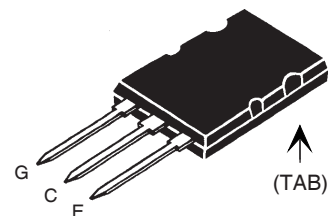
Medium speed low V<sub>sat</sub> PT IGBTs 5-40 kHz switching



**V<sub>CES</sub> = 600V**  
**I<sub>C110</sub> = 200A**  
**V<sub>CE(sat)</sub> ≤ 1.5V**  
**t<sub>fi(typ)</sub> = 183ns**

Symbol	Test Conditions	Maximum Ratings	
V <sub>CES</sub>	T <sub>J</sub> = 25°C to 150°C	600	V
V <sub>CGR</sub>	T <sub>J</sub> = 25°C to 150°C, R <sub>GE</sub> = 1 MΩ	600	V
V <sub>GES</sub>	Continuous	±20	V
V <sub>GEM</sub>	Transient	±30	V
I <sub>C25</sub>	T <sub>C</sub> = 25°C (limited by leads)	75	A
I <sub>C110</sub>	T <sub>C</sub> = 110°C (chip capability)	200	A
I <sub>CM</sub>	T <sub>C</sub> = 25°C, 1ms	600	A
<b>SSOA</b>	V <sub>GE</sub> = 15V, T <sub>VJ</sub> = 125°C, R <sub>G</sub> = 1Ω	I <sub>CM</sub> = 300	A
<b>(RBSOA)</b>	Clamped inductive load @ V <sub>CE</sub> ≤ 600V		
P <sub>C</sub>	T <sub>C</sub> = 25°C	1250	W
T <sub>J</sub>		-55 ... +150	°C
T <sub>JM</sub>		150	°C
T <sub>stg</sub>		-55 ... +150	°C
T <sub>L</sub>	Maximum lead temperature for soldering	300	°C
T <sub>SOLD</sub>	Plastic body for 10s	260	°C
F <sub>C</sub>	Mounting force	30..120/6.7..27	N/lb.
<b>Weight</b>		10	g

## PLUS264™ (IXGB)



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

### Features

- NPT IGBT technology
- Low switching losses
- Low tail current
- No latch up
- Short circuit capability
- Positive temperature coefficient for easy paralleling
- MOS input, voltage controlled
- Optional ultra fast diode
- International standard package

### Advantages

- Space savings
- High power density power supplies
- Low gate charge results in simple drive requirement

### Applications

- High Frequency Inverters
- UPS and Welding
- AC and DC Motor Controls
- Power Supplies and Drivers for Solenoids, Relays and Connectors
- PFC Circuits
- Battery Chargers

Symbol	Test Conditions (T <sub>J</sub> = 25°C, unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
<b>BV<sub>CES</sub></b>	I <sub>C</sub> = 250μA, V <sub>GE</sub> = 0V	600		V
<b>V<sub>GE(th)</sub></b>	I <sub>C</sub> = 250μA, V <sub>CE</sub> = V <sub>GE</sub>	3.0		V
<b>I<sub>CES</sub></b>	V <sub>CE</sub> = V <sub>CES</sub> V <sub>GE</sub> = 0V T <sub>J</sub> = 125°C			25 μA 5.0 mA
<b>I<sub>GES</sub></b>	V <sub>CE</sub> = 0V, V <sub>GE</sub> = ±20V			±100 nA
<b>V<sub>CE(sat)</sub></b>	I <sub>C</sub> = 100A, V <sub>GE</sub> = 15V, Note 1 I <sub>C</sub> = 200A T <sub>J</sub> = 125°C		1.35 1.65 1.75	V V 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	95	160	S
$C_{ies}$ $C_{oes}$ $C_{res}$	$V_{CE} = 25\text{V}, V_{GE} = 0\text{V}, f = 1\text{MHz}$		26	nF
			1260	pF
			97	pF
$Q_{g(on)}$ $Q_{ge}$ $Q_{gc}$	$I_C = 100\text{A}, V_{GE} = 15\text{V}, V_{CE} = 0.5 \cdot V_{CES}$		750	nC
			115	nC
			245	nC
$t_{d(on)}$ $t_{ri}$ $E_{on}$ $t_{d(off)}$ $t_{fi}$ $E_{off}$	Inductive load, $T_J = 25^\circ\text{C}$ $I_C = 100\text{A}, V_{GE} = 15\text{V}$ $V_{CE} = 300\text{V}, R_G = 1\Omega$		44	ns
			83	ns
			1.6	mJ
			310	450 ns
			183	300 ns
			2.9	4.5 mJ
$t_{d(on)}$ $t_{ri}$ $E_{on}$ $t_{d(off)}$ $t_{fi}$ $E_{off}$	Inductive load, $T_J = 125^\circ\text{C}$ $I_C = 100\text{A}, V_{GE} = 15\text{V}$ $V_{CE} = 300\text{V}, R_G = 1\Omega$		42	ns
			80	ns
			2.4	mJ
			430	ns
			300	ns
			4.2	mJ
$R_{thJC}$ $R_{thCS}$		0.13	0.10 $^\circ\text{C/W}$ $^\circ\text{C/W}$	

**ISOPLUS264™ (IXGB) Outline**

Note: Bottom heatsink meets 2500Vrms Isolation to the other

Sym	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.190	.205	4.83	5.21
At	.102	.118	2.59	3.00
A2	.046	.055	1.17	1.40
b	.045	.055	1.14	1.40
b1	.087	.102	2.21	2.59
b2	.111	.126	2.82	3.20
c	.020	.029	0.51	0.74
D	1.020	1.040	25.91	26.42
E	.770	.788	19.56	20.29
e	215 BSC		5.46 BSC	
L	.780	.820	19.81	20.83
L1	.080	.102	2.03	2.59
Q	.210	.235	5.33	5.97
Q1	.480	.513	12.45	13.03
R	.150	.180	3.81	4.57
Rt	.100	.130	2.54	3.30
S	.688	.690	16.97	17.53
T	.801	.821	20.34	20.85
U	.085	.080	1.85	2.03

Ref: IXYS CO 0128

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

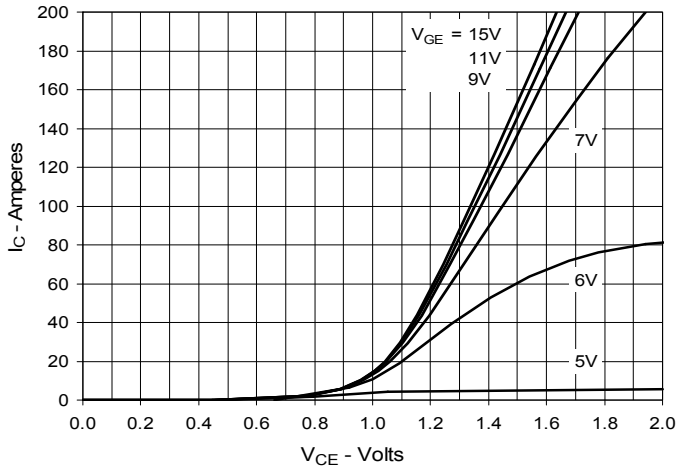
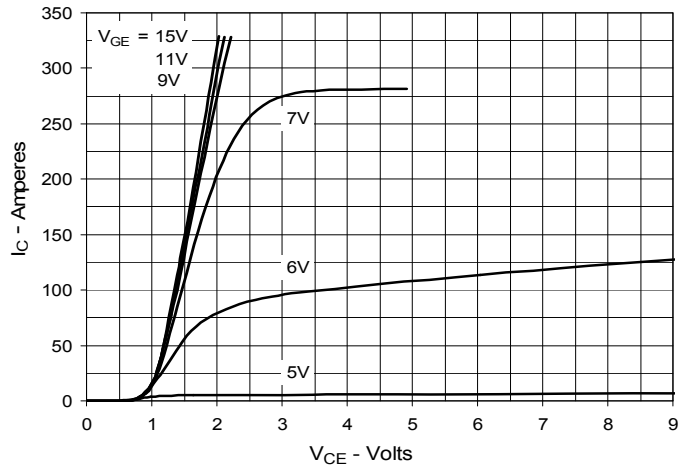
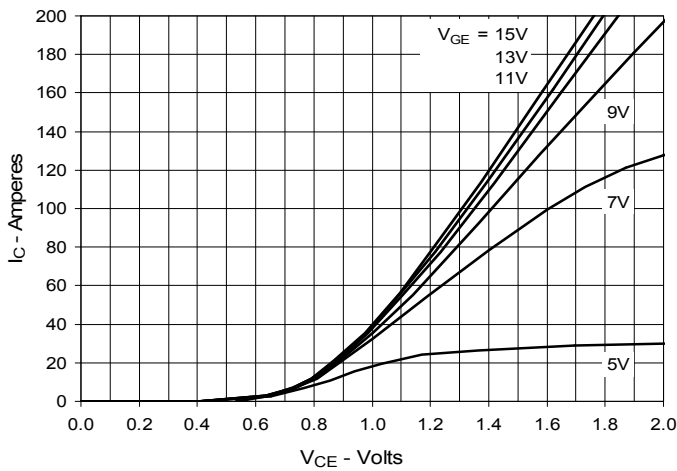
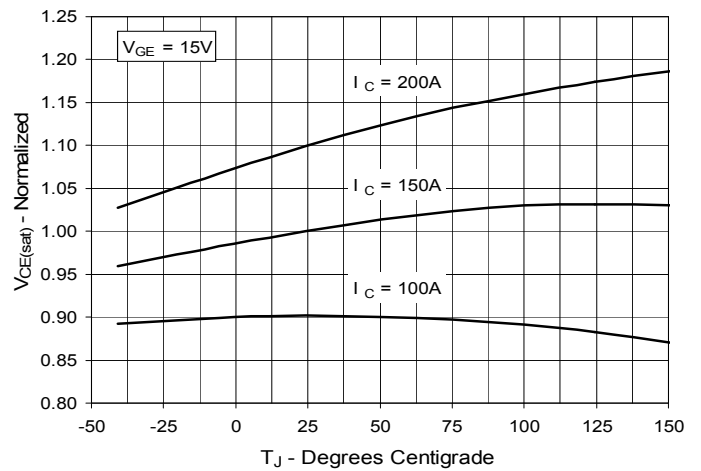
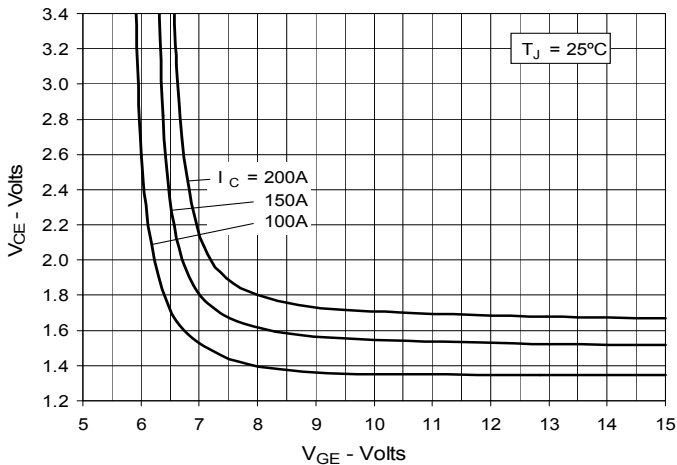
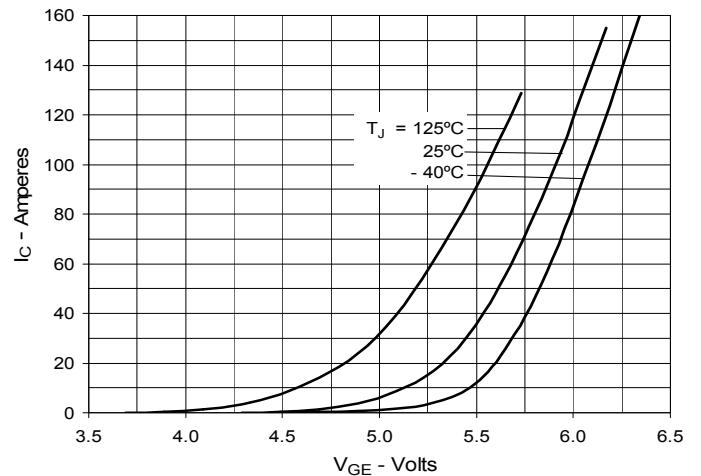
### PRELIMINARY TECHNICAL INFORMATION

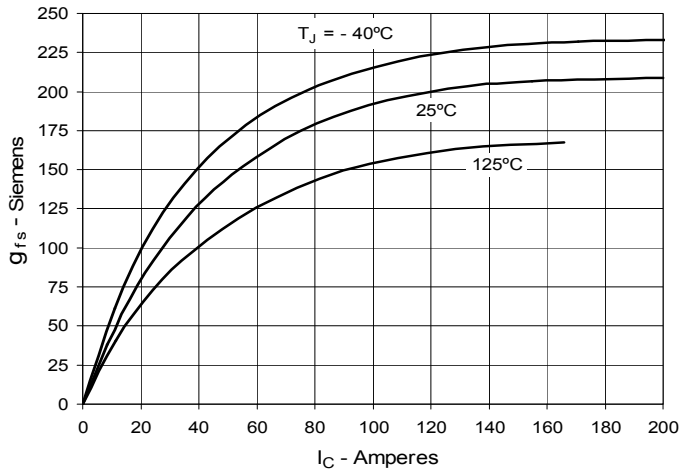
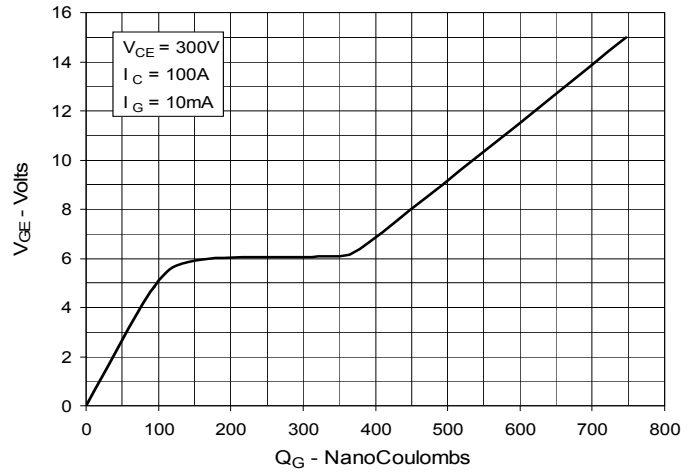
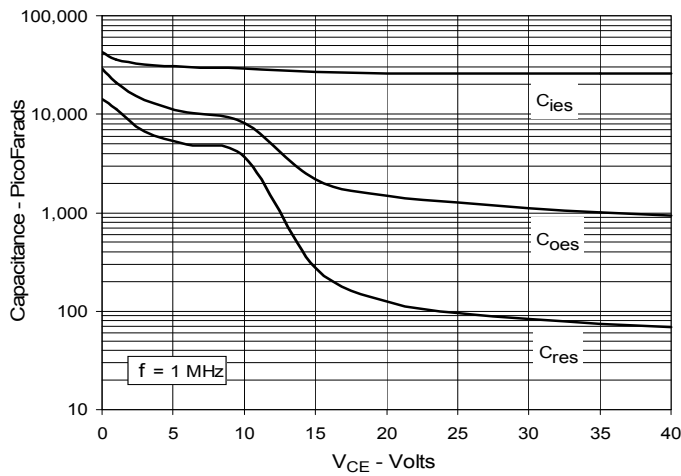
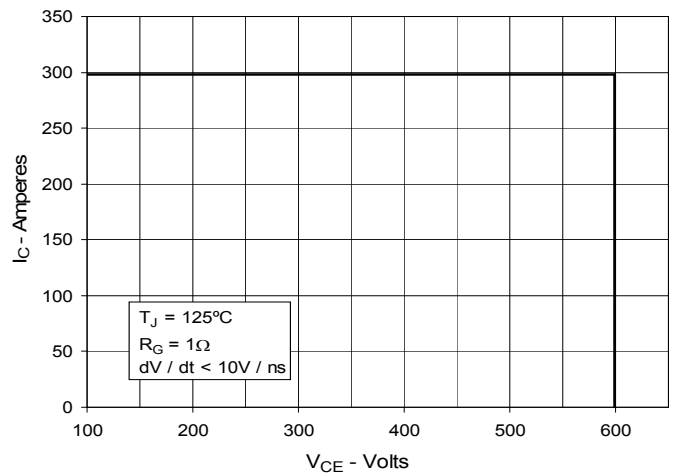
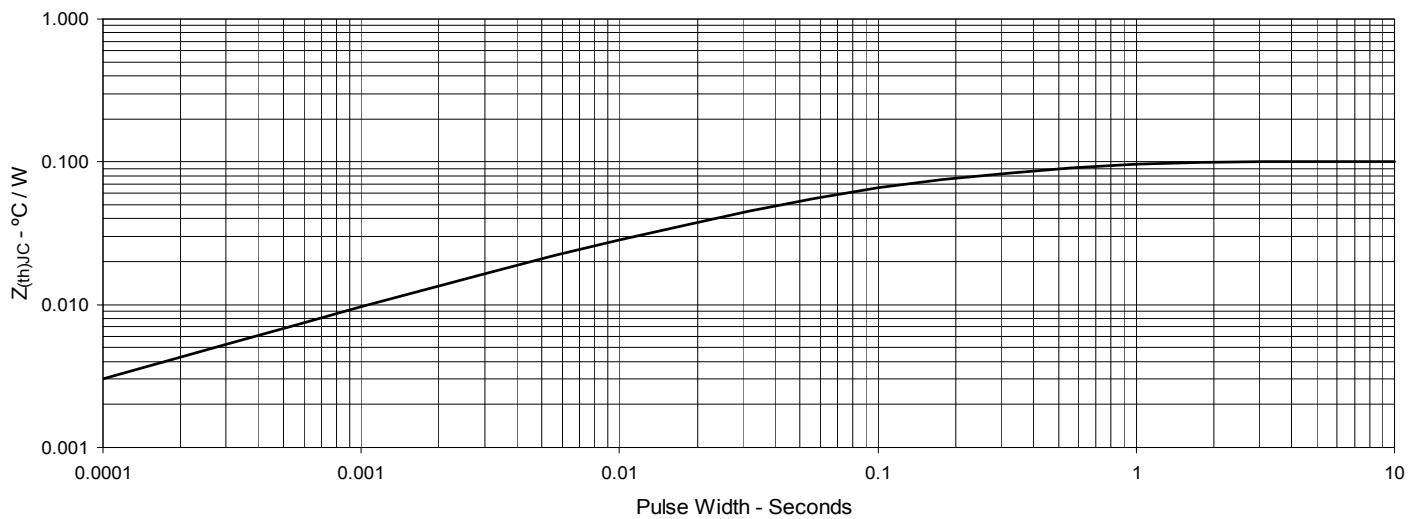
The product presented herein is under development. The Technical Specifications offered are derived from data gathered during objective characterizations of preliminary engineering lots; but also may yet contain some information supplied during a pre-production design evaluation. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

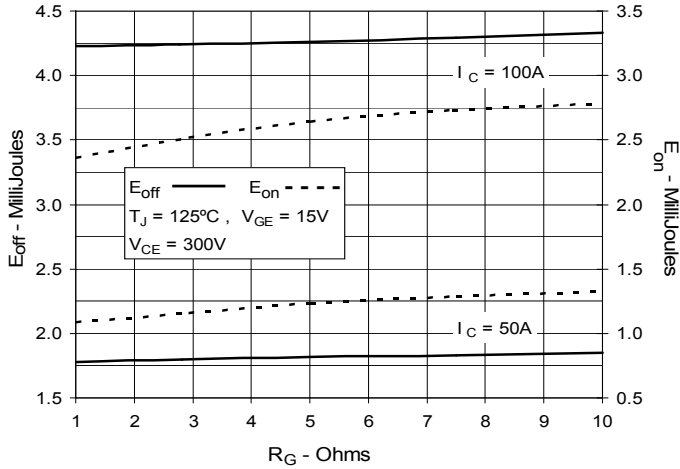
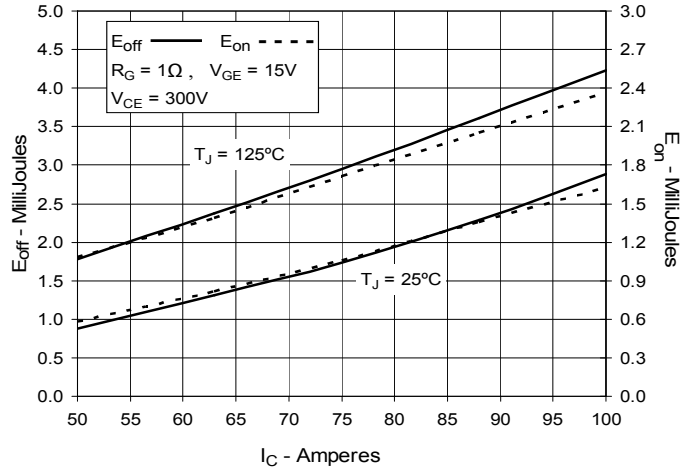
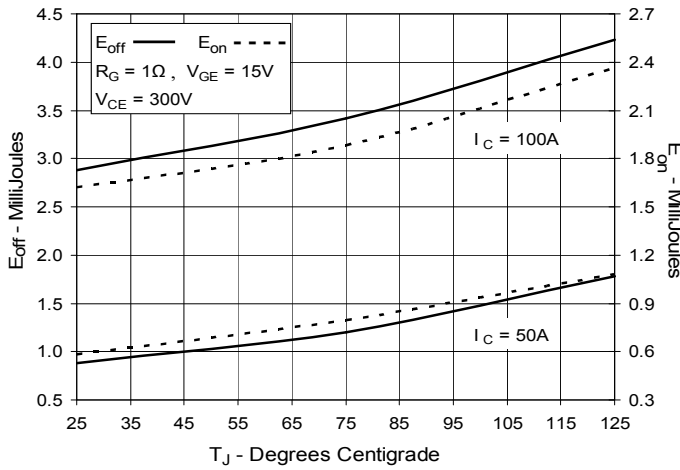
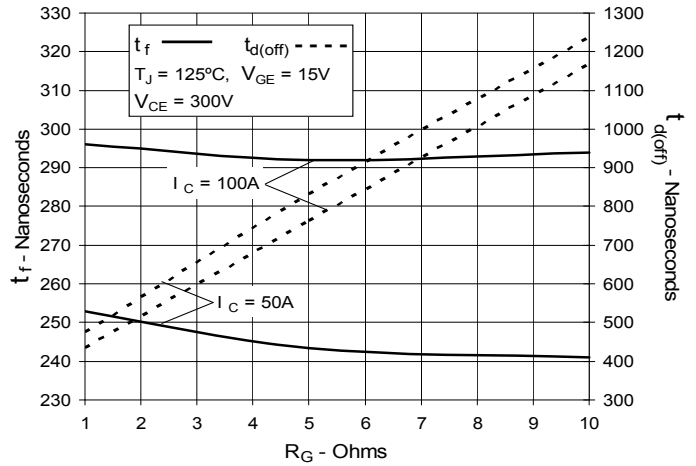
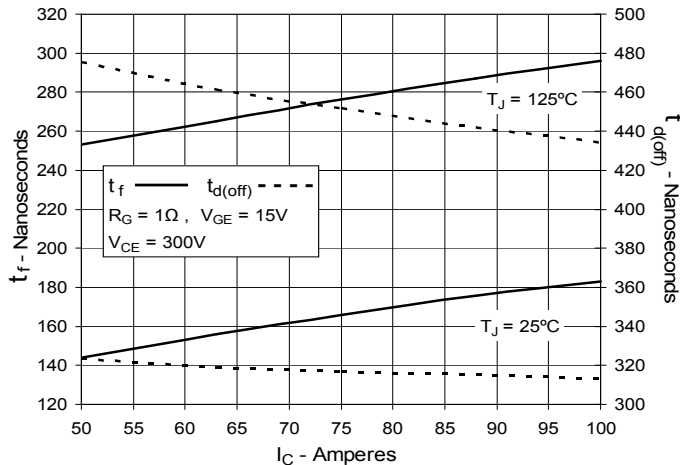
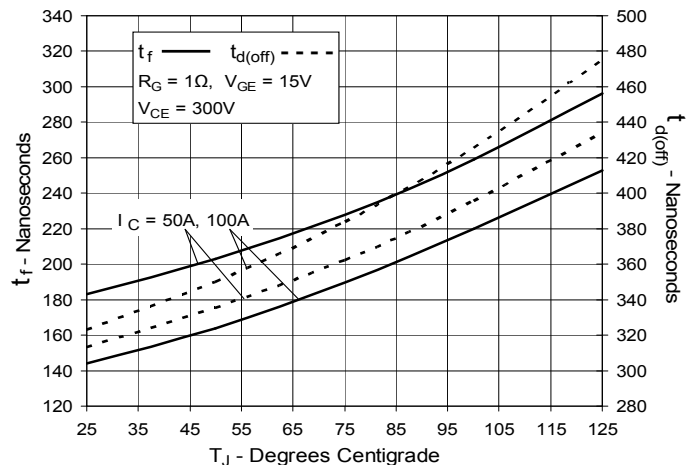
IXYS reserves the right to change limits, test conditions, and dimensions.

IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents:

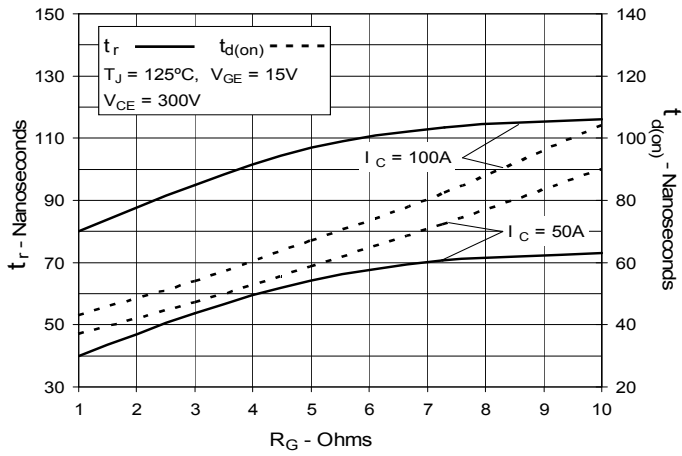
4,835,592	4,931,844	5,049,961	5,237,481	6,162,665	6,404,065 B1	6,683,344	6,727,585	7,005,734 B2	7,157,338B2
4,850,072	5,017,508	5,063,307	5,381,025	6,259,123 B1	6,534,343	6,710,405 B2	6,759,692	7,063,975 B2	
4,881,106	5,034,796	5,187,117	5,486,715	6,306,728 B1	6,583,505	6,710,463	6,771,478 B2	7,071,537	

**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**


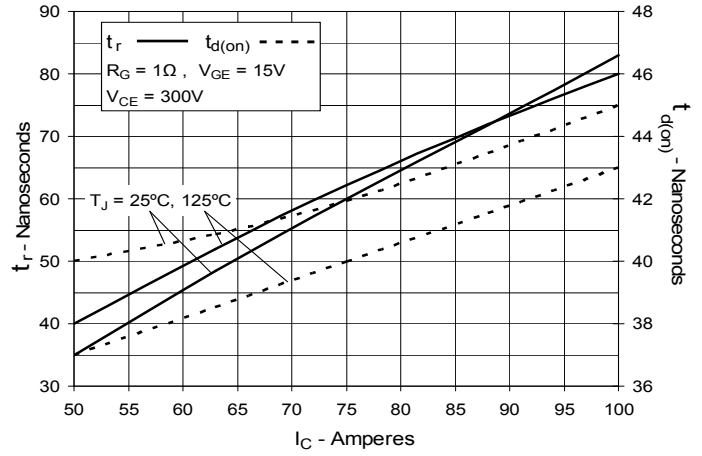
**Fig. 7. Transconductance**

**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**


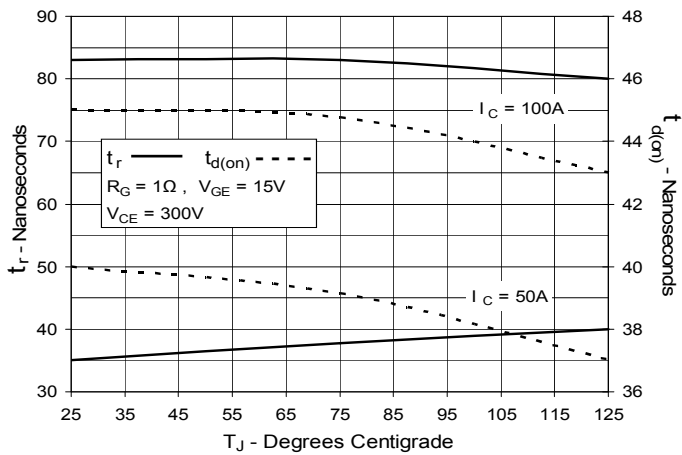
**Fig. 18. Inductive Turn-on  
Switching Times vs. Gate Resistance**



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



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





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