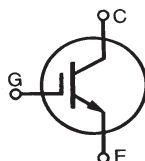
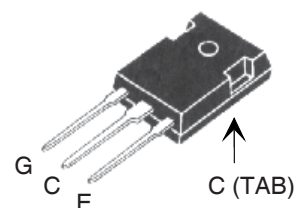


**GenX3™ 600V IGBT**
**IXGH90N60B3**
**Medium speed low V<sub>sat</sub> PT IGBTs 5-40 kHz switching**


<b>V<sub>CES</sub></b>	<b>= 600V</b>
<b>I<sub>C110</sub></b>	<b>= 90A</b>
<b>V<sub>CE(sat)</sub></b>	<b>≤ 1.8V</b>
<b>t<sub>fi(typ)</sub></b>	<b>= 148ns</b>

Symbol	Test Conditions	Maximum Ratings	
<b>V<sub>CES</sub></b>	T <sub>J</sub> = 25°C to 150°C	600	V
<b>V<sub>CGR</sub></b>	T <sub>J</sub> = 25°C to 150°C, R <sub>GE</sub> = 1MΩ	600	V
<b>V<sub>GES</sub></b>	Continuous	±20	V
<b>V<sub>GEM</sub></b>	Transient	±30	V
<b>I<sub>C25</sub></b>	T <sub>C</sub> = 25°C (Limited by leads)	75	A
<b>I<sub>C110</sub></b>	T <sub>C</sub> = 110°C (Chip capability)	90	A
<b>I<sub>CM</sub></b>	T <sub>C</sub> = 25°C, 1ms	500	A
<b>SSOA</b>	V <sub>GE</sub> = 15V, T <sub>VJ</sub> = 125°C, R <sub>G</sub> = 2Ω	I <sub>CM</sub> = 180	A
<b>(RBSOA)</b>	Clamped inductive load @ V <sub>CE</sub> ≤ 600V		
<b>P<sub>C</sub></b>	T <sub>C</sub> = 25°C	660	W
<b>T<sub>J</sub></b>		-55 ... +150	°C
<b>T<sub>JM</sub></b>		150	°C
<b>T<sub>stg</sub></b>		-55 ... +150	°C
<b>M<sub>d</sub></b>	Mounting torque	1.13 / 10	Nm/lb.in.
<b>T<sub>L</sub></b>	Maximum lead temperature for soldering	300	°C
<b>T<sub>SOLD</sub></b>	1.6mm (0.062 in.) from case for 10s	260	°C
<b>Weight</b>		6	g

**TO-247 AD (IXGH)**


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

**Features**

- Optimized for low conduction and switching losses
- Square RBSOA
- International standard package

**Advantages**

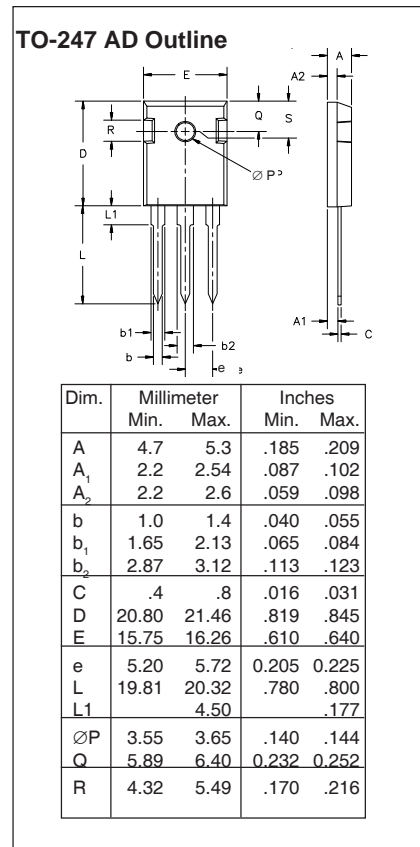
- High power density
- Low gate drive requirement

**Applications**

- Power Inverters
- UPS
- Motor Drives
- SMPS
- PFC Circuits
- Battery Chargers
- Welding Machines
- Lamp Ballasts

Symbol	Test Conditions	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		5.0 V
<b>I<sub>CES</sub></b>	V <sub>CE</sub> = V <sub>CES</sub> V <sub>GE</sub> = 0V			75 μA 750 μA
<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> = 90A, V <sub>GE</sub> = 15V, Note 1		1.55 1.62	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	55	90	S
$C_{ies}$ $C_{oes}$ $C_{res}$	$V_{CE} = 25\text{V}, V_{GE} = 0\text{V}, f = 1\text{MHz}$		8285	pF
			525	pF
			140	pF
$Q_g$ $Q_{ge}$ $Q_{gc}$	$I_C = 90\text{A}, V_{GE} = 15\text{V}, V_{CE} = 0.5 \cdot V_{CES}$		172	nC
			28	nC
			63	nC
$t_{d(on)}$ $t_{ri}$ $E_{on}$ $t_{d(off)}$ $t_{fi}$ $E_{off}$	<b>Inductive load, <math>T_J = 25^\circ\text{C}</math></b> $I_C = 60\text{A}, V_{GE} = 15\text{V}$ $V_{CE} = 480\text{V}, R_G = 2\Omega$		31	ns
			47	ns
			1.32	mJ
			150	ns
			148	250 ns
			1.37	2.40 mJ
$t_{d(on)}$ $t_{ri}$ $E_{on}$ $t_{d(off)}$ $t_{fi}$ $E_{off}$	<b>Inductive load, <math>T_J = 125^\circ\text{C}</math></b> $I_C = 60\text{A}, V_{GE} = 15\text{V}$ $V_{CE} = 480\text{V}, R_G = 2\Omega$		29	ns
			43	ns
			1.93	mJ
			220	ns
			253	ns
			2.80	mJ
$R_{thJC}$ $R_{thCS}$		0.21	0.19 $^\circ\text{C}/\text{W}$ $^\circ\text{C}/\text{W}$	



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

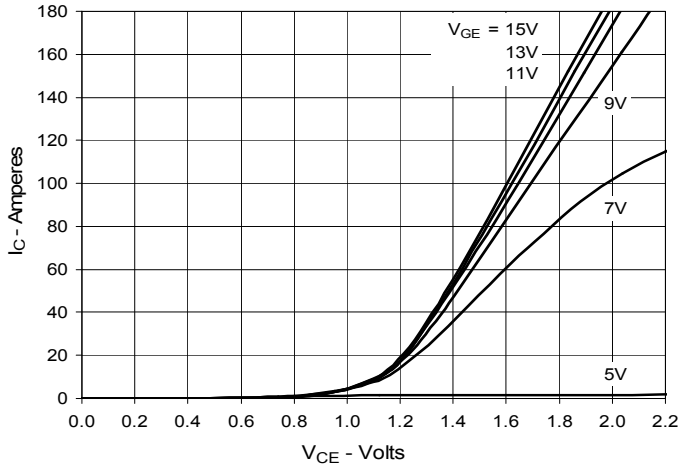
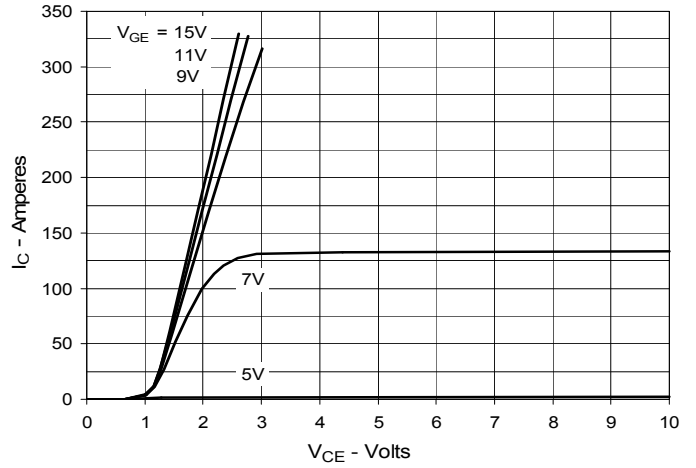
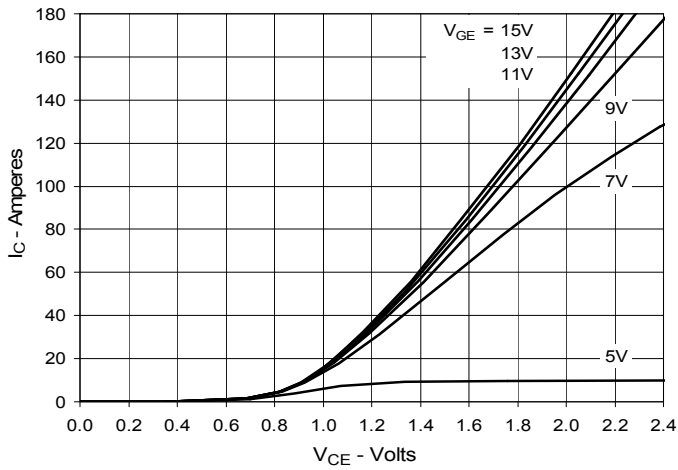
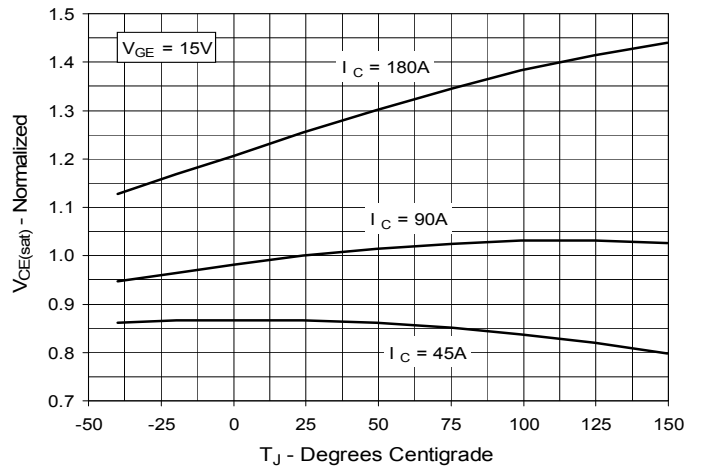
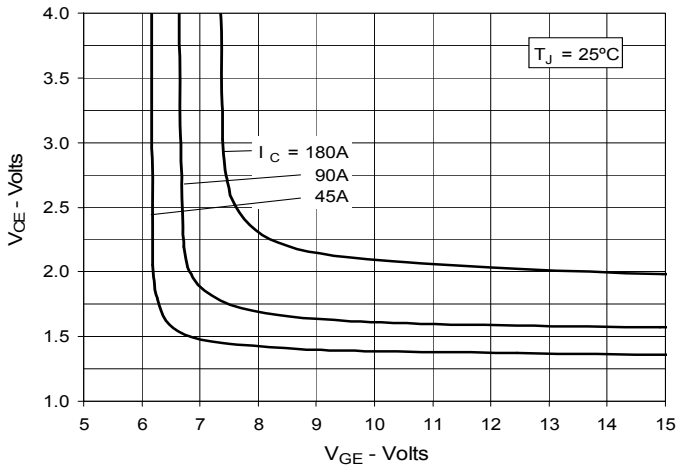
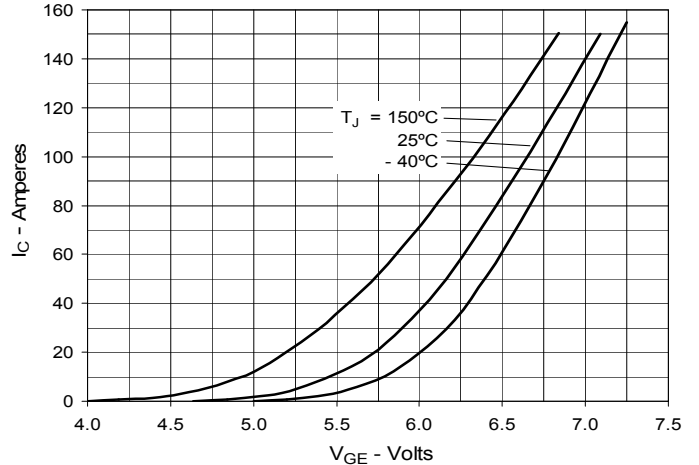
### PRELIMINARY TECHNICAL INFORMATION

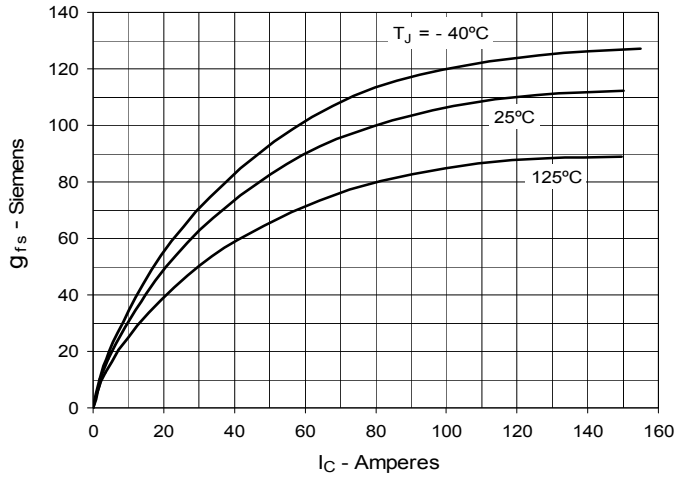
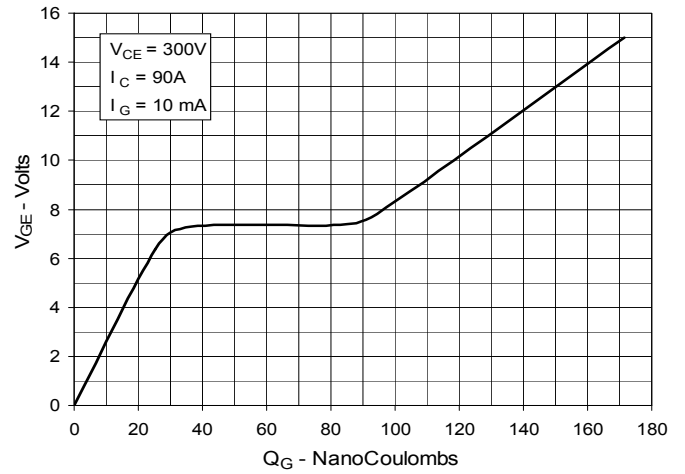
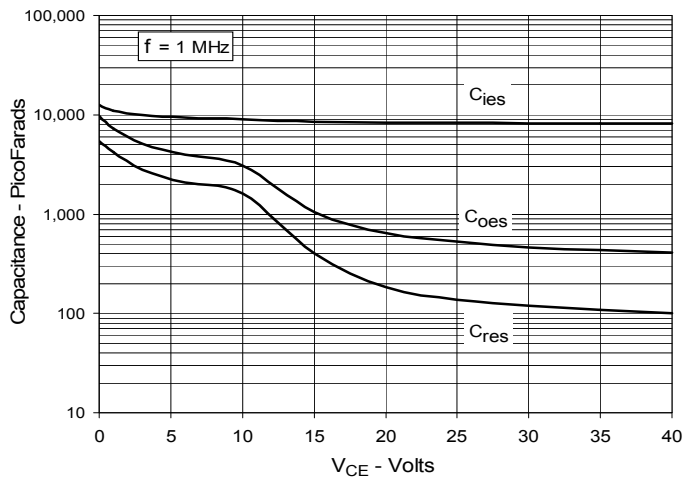
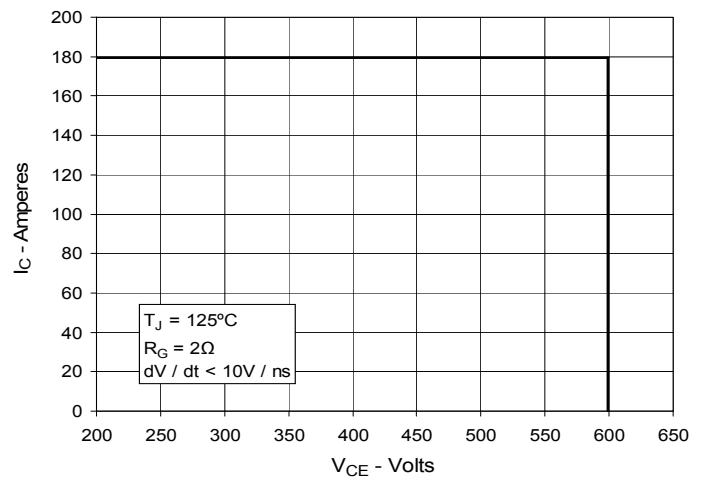
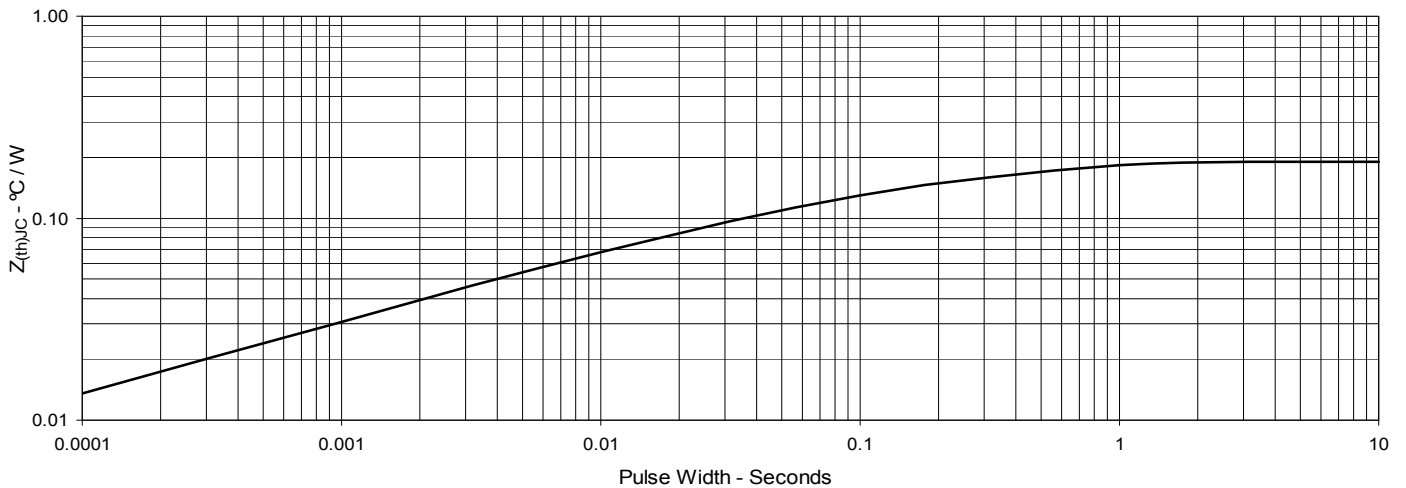
The product presented herein is under development. The Technical Specifications offered are derived from data gathered during objective characterizations of preliminary engineering lots; but also may yet contain some information supplied during a pre-production design evaluation. IXYS reserves the right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

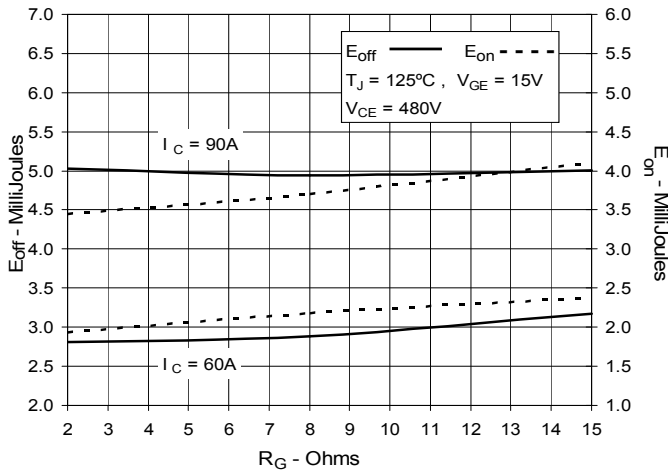
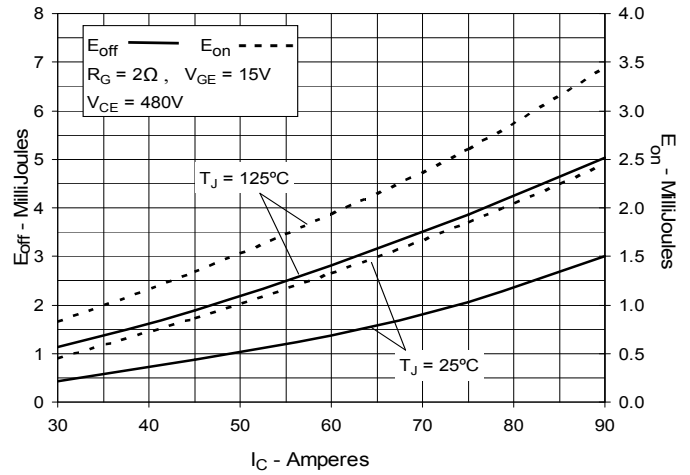
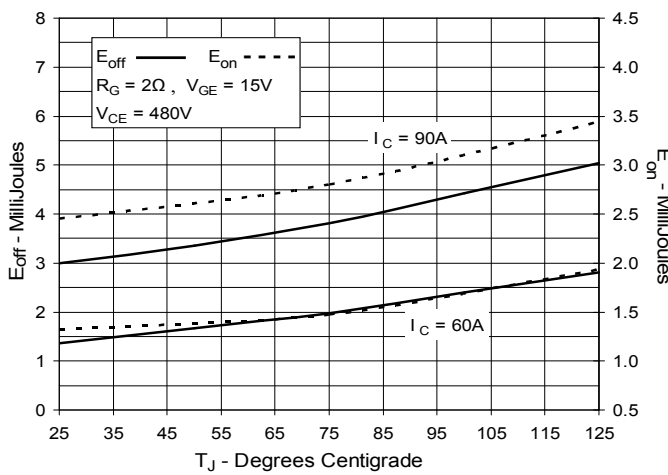
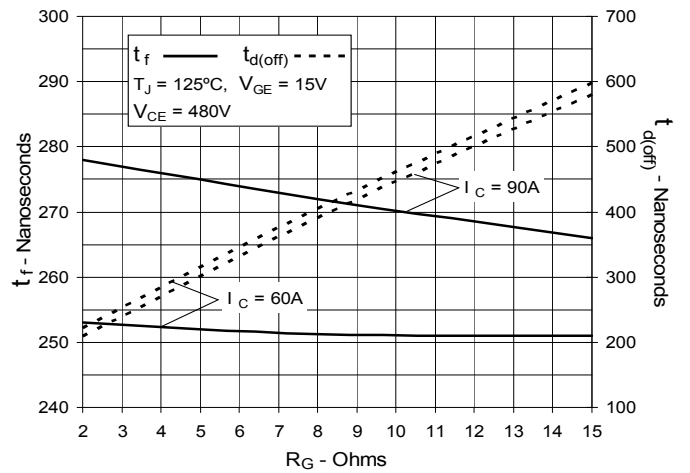
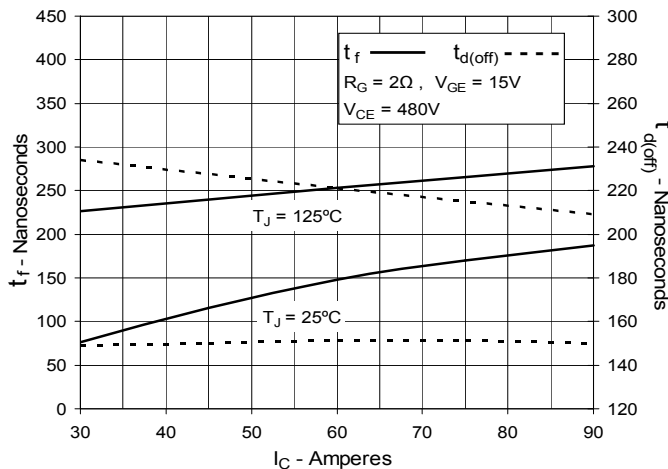
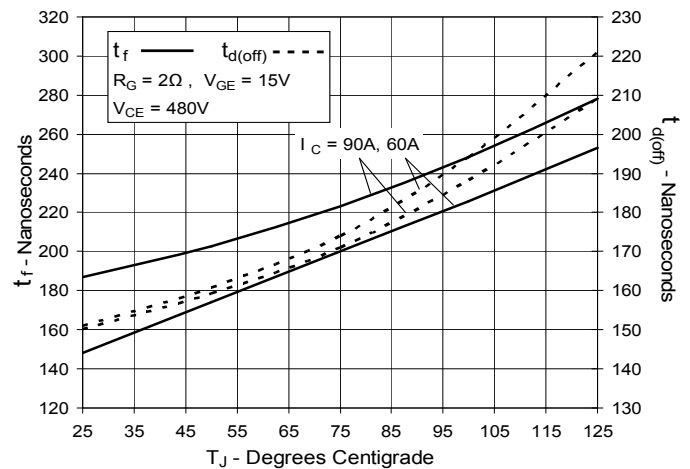
IXYS reserves the right to change limits, test conditions, and dimensions.

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

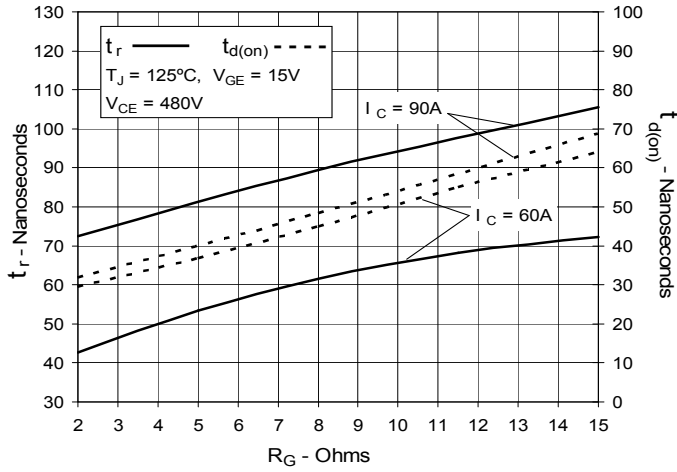
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4,850,072	5,017,508	5,063,307	5,381,025	6,259,123 B1	6,534,343	6,710,405 B2	6,759,692	7,063,975 B2	
4,881,106	5,034,796	5,187,117	5,486,715	6,306,728 B1	6,583,505	6,710,463	6,771,478 B2	7,071,537	

**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**


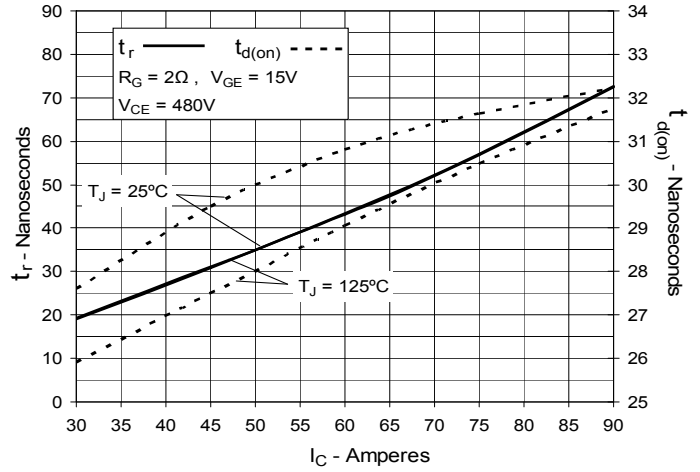
**Fig. 7. Transconductance**

**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**

