

**High Voltage  
XPT™ IGBT**
**IXYH30N170C**

$$\begin{aligned}
 V_{CES} &= 1700\text{V} \\
 I_{C110} &= 30\text{A} \\
 V_{CE(sat)} &\leq 4.0\text{V} \\
 t_{fi(typ)} &= 95\text{ns}
 \end{aligned}$$



Symbol	Test Conditions	Maximum Ratings	
$V_{CES}$	$T_J = 25^\circ\text{C to } 175^\circ\text{C}$	1700	V
$V_{CGR}$	$T_J = 25^\circ\text{C to } 175^\circ\text{C}, R_{GE} = 1\text{M}\Omega$	1700	V
$V_{GES}$	Continuous	$\pm 20$	V
$V_{GEM}$	Transient	$\pm 30$	V
$I_{C25}$	$T_C = 25^\circ\text{C}$	100	A
$I_{C110}$	$T_C = 110^\circ\text{C}$	30	A
$I_{CM}$	$T_C = 25^\circ\text{C}, 1\text{ms}$	250	A
<b>SSOA (RBSOA)</b>	$V_{GE} = 15\text{V}, T_{VJ} = 150^\circ\text{C}, R_G = 2.7\Omega$ Clamped Inductive Load	$I_{CM} = 120$	A
		1360	V
$P_C$	$T_C = 25^\circ\text{C}$	937	W
$T_J$		-55 ... +175	$^\circ\text{C}$
$T_{JM}$		175	$^\circ\text{C}$
$T_{stg}$		-55 ... +175	$^\circ\text{C}$
$T_L$	Maximum Lead Temperature for Soldering	300	$^\circ\text{C}$
$T_{SOLD}$	1.6 mm (0.062in.) from Case for 10s	260	$^\circ\text{C}$
$M_d$	Mounting Torque	1.13/10	Nm/lb.in
<b>Weight</b>		6	g

**TO-247 AD**


G = Gate                      C = Collector  
 E = Emitter                  Tab = Collector

**Features**

- High Voltage Package
- High Blocking Voltage
- Low Saturation Voltage

**Advantages**

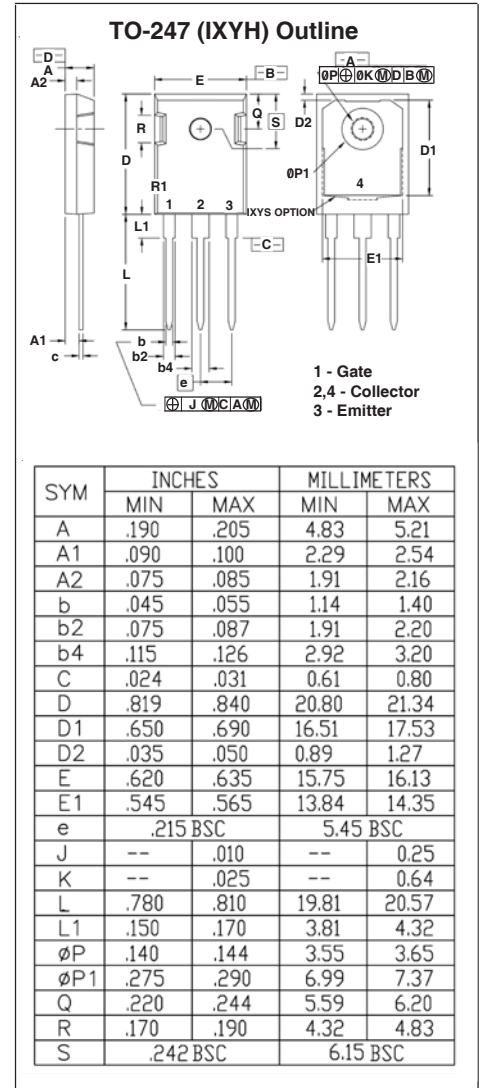
- Low Gate Drive Requirement
- High Power Density

**Applications**

- Switch-Mode and Resonant-Mode Power Supplies
- Uninterruptible Power Supplies (UPS)
- Laser Generators
- Capacitor Discharge Circuits
- AC Switches

Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ , Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$BV_{CES}$	$I_C = 250\mu\text{A}, V_{GE} = 0\text{V}$	1700		V
$V_{GE(th)}$	$I_C = 250\mu\text{A}, V_{CE} = V_{GE}$	3.0		5.0 V
$I_{CES}$	$V_{CE} = V_{CES}, V_{GE} = 0\text{V}$ $T_J = 150^\circ\text{C}$			25 $\mu\text{A}$
				3.5 mA
$I_{GES}$	$V_{CE} = 0\text{V}, V_{GE} = \pm 20\text{V}$			$\pm 100$ nA
$V_{CE(sat)}$	$I_C = 30\text{A}, V_{GE} = 15\text{V}, \text{Note 1}$ $T_J = 150^\circ\text{C}$		3.5	V
			4.6	V

Symbol Test Conditions ( $T_J = 25^\circ\text{C}$ Unless Otherwise Specified)		Characteristic Values		
		Min.	Typ.	Max.
$g_{fs}$	$I_C = 30\text{A}, V_{CE} = 10\text{V}$ , Note 1	17	28	S
$R_{Gi}$	Gate Input Resistance		2.8	$\Omega$
$C_{ies}$	$V_{CE} = 25\text{V}, V_{GE} = 0\text{V}, f = 1\text{MHz}$		3100	pF
$C_{oes}$			150	pF
$C_{res}$			55	pF
$Q_{g(on)}$	$I_C = 30\text{A}, V_{GE} = 15\text{V}, V_{CE} = 0.5 \cdot V_{CES}$		150	nC
$Q_{ge}$			15	nC
$Q_{gc}$			65	nC
$t_{d(on)}$	<b>Inductive load, <math>T_J = 25^\circ\text{C}</math></b> $I_C = 30\text{A}, V_{GE} = 15\text{V}$ $V_{CE} = 0.5 \cdot V_{CES}, R_G = 2.7\Omega$ Note 3		16	ns
$t_{ri}$			33	ns
$E_{on}$			3.6	mJ
$t_{d(off)}$			143	ns
$t_{fi}$			95	ns
$E_{off}$			1.8	mJ
$t_{d(on)}$	<b>Inductive load, <math>T_J = 150^\circ\text{C}</math></b> $I_C = 30\text{A}, V_{GE} = 15\text{V}$ $V_{CE} = 0.5 \cdot V_{CES}, R_G = 2.7\Omega$ Note 3		16	ns
$t_{ri}$			33	ns
$E_{on}$			5.5	mJ
$t_{d(off)}$			193	ns
$t_{fi}$			134	ns
$E_{off}$			3.5	mJ
$R_{thJC}$				0.16 $^\circ\text{C}/\text{W}$
$R_{thCS}$		0.21		$^\circ\text{C}/\text{W}$



**Notes:**

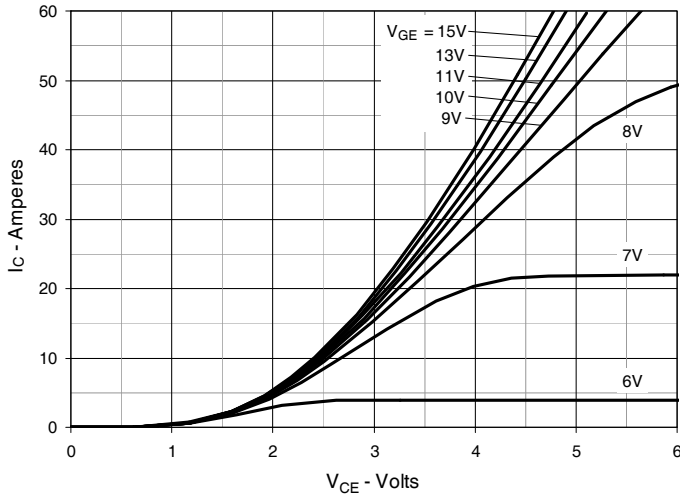
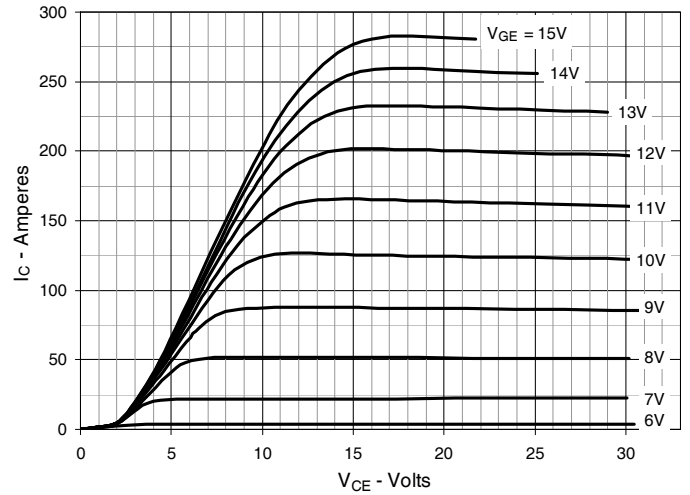
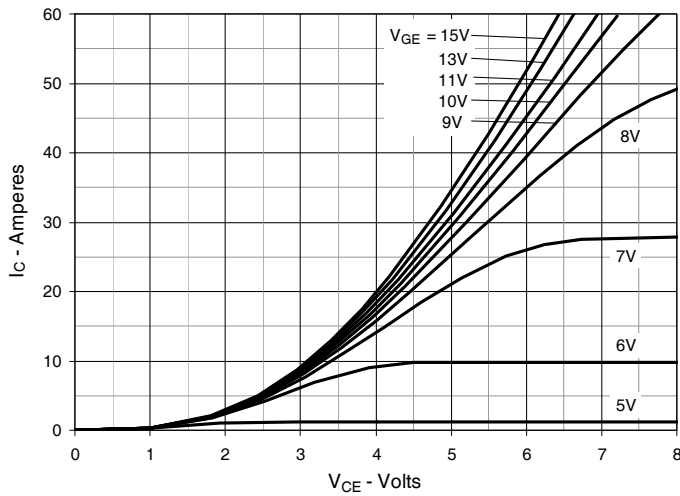
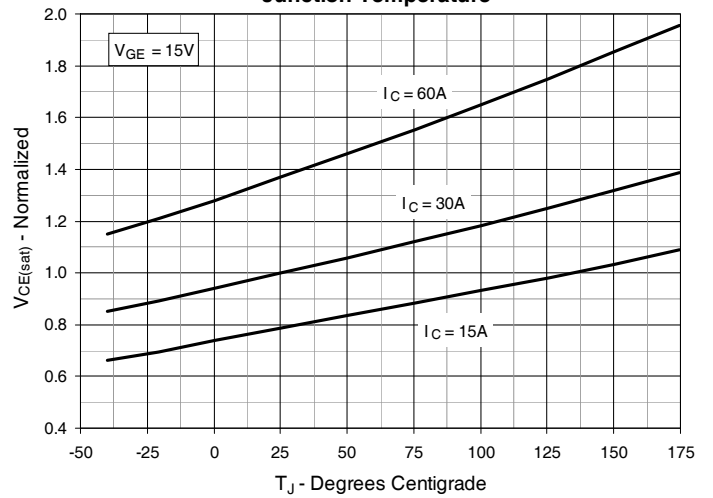
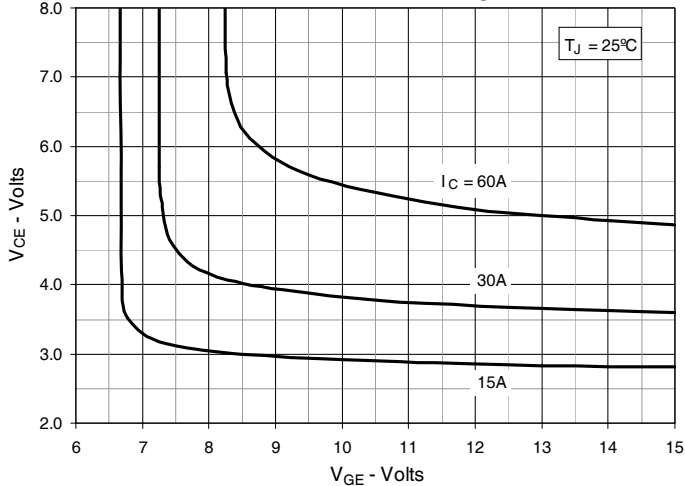
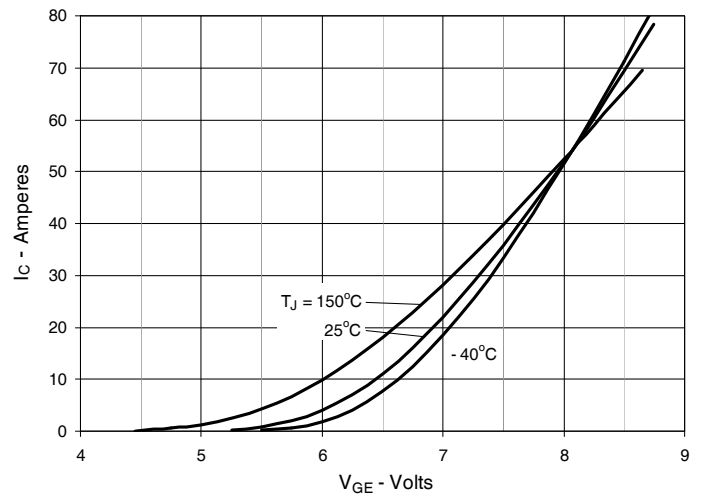
1. Pulse test,  $t \leq 300\mu\text{s}$ , duty cycle,  $d \leq 2\%$ .
2. Switching times & energy losses may increase for higher  $V_{CE}$  (clamp),  $T_J$  or  $R_G$ .

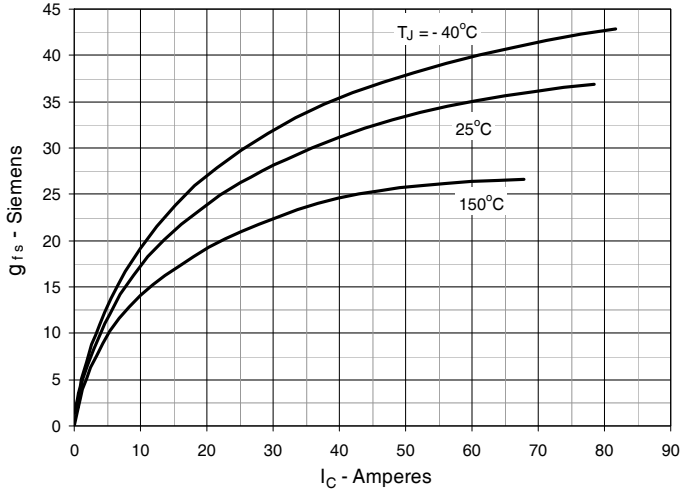
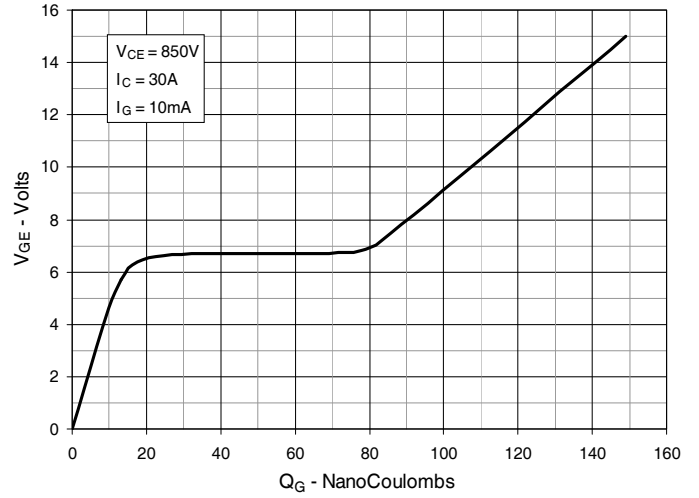
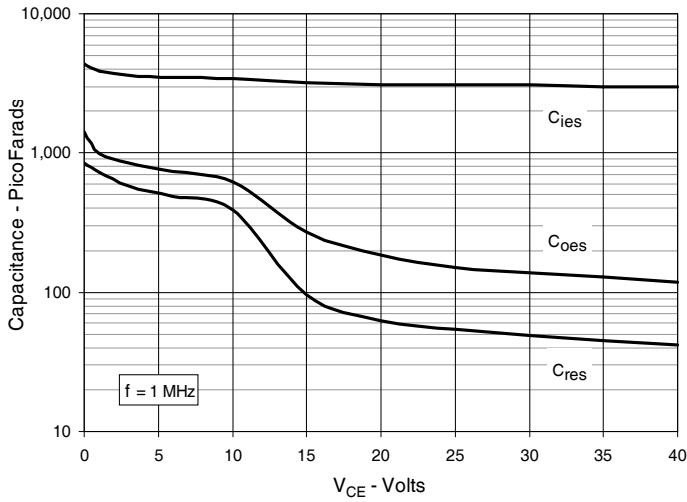
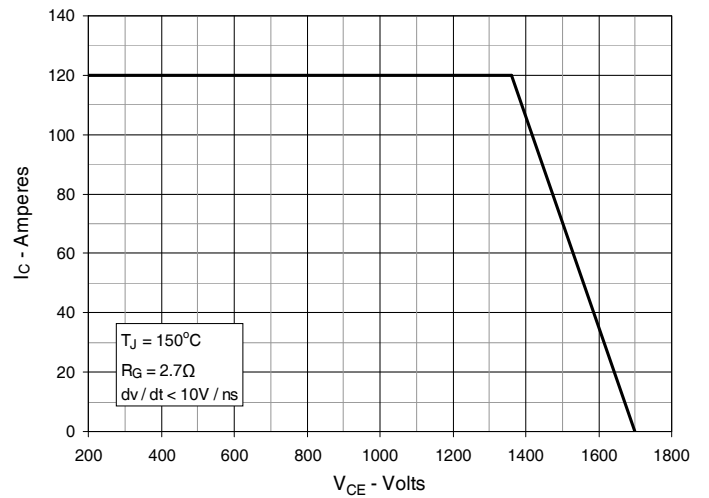
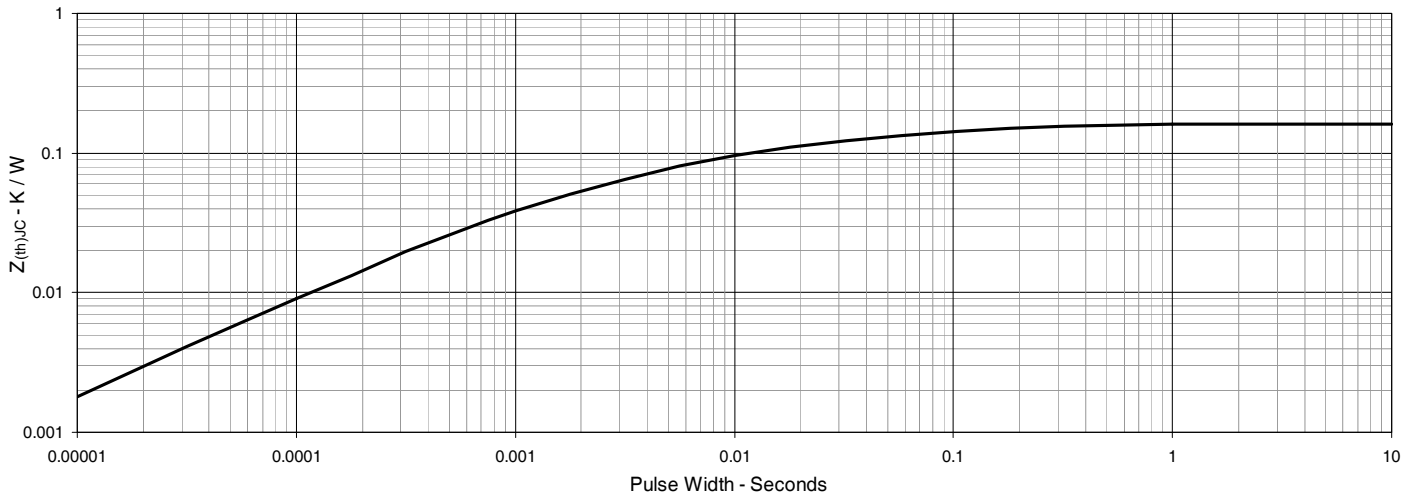
**PRELIMINARY TECHNICAL INFORMATION**

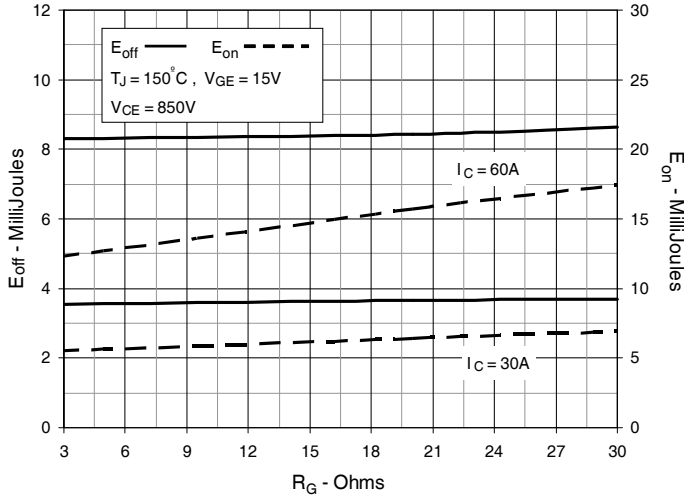
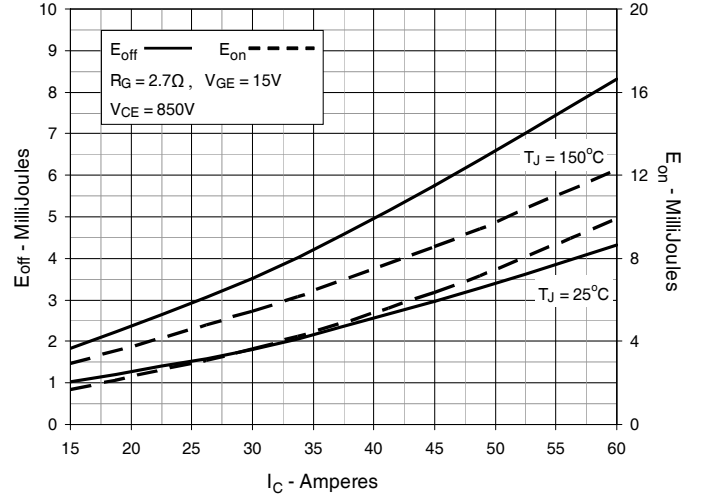
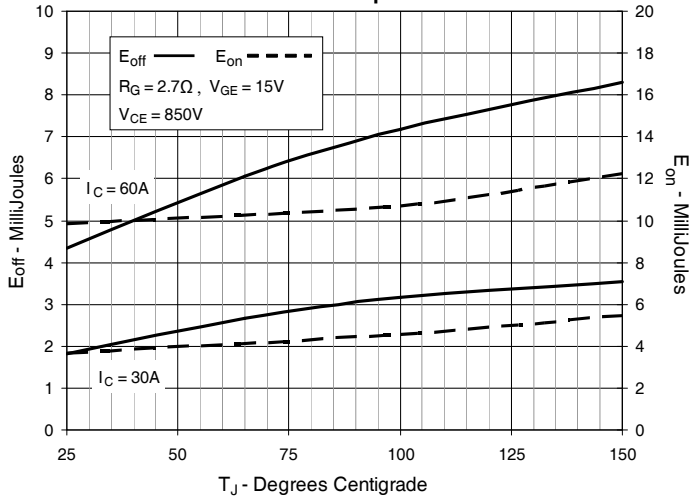
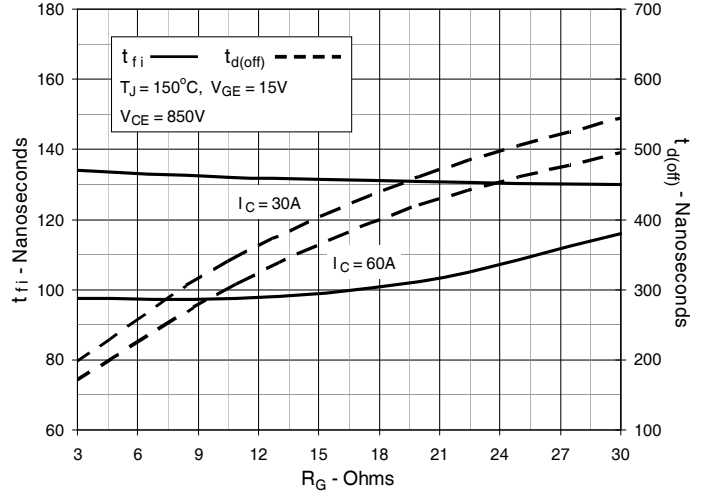
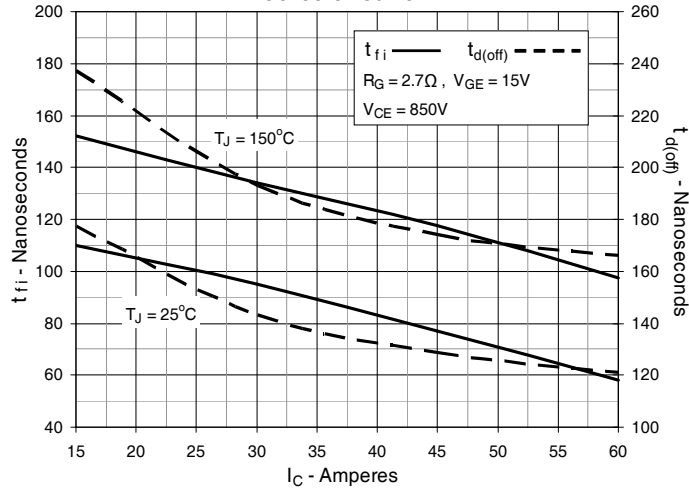
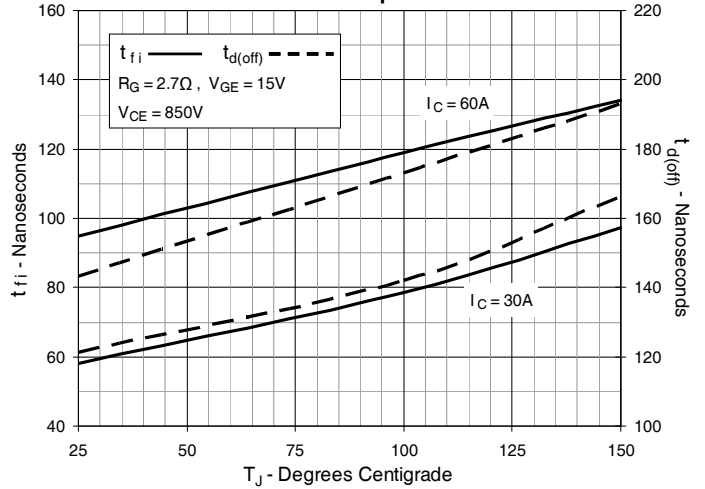
The product presented herein is under development. The Technical Specifications offered are derived from a subjective evaluation of the design, based upon prior knowledge and experience, and constitute a "considered reflection" of the anticipated result. IXYS reserves the right to change limits, test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

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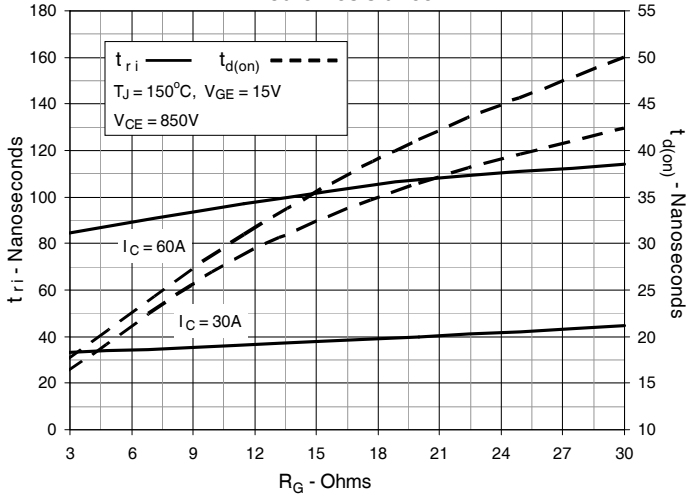
IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents:	4,835,592	4,931,844	5,049,961	5,237,481	6,162,665	6,404,065 B1	6,683,344	6,727,585	7,005,734 B2	7,157,338B2
	4,860,072	5,017,508	5,063,307	5,381,025	6,259,123 B1	6,534,343	6,710,405 B2	6,759,692	7,063,975 B2	
	4,881,106	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. Output Characteristics @  $T_J = 25^\circ\text{C}$** 

**Fig. 2. Extended Output Characteristics @  $T_J = 25^\circ\text{C}$** 

**Fig. 3. Output Characteristics @  $T_J = 150^\circ\text{C}$** 

**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**


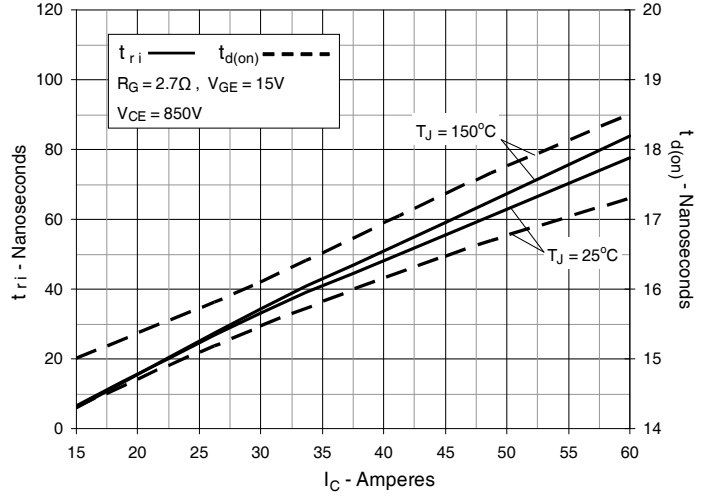
**Fig. 7. Transconductance**

**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**


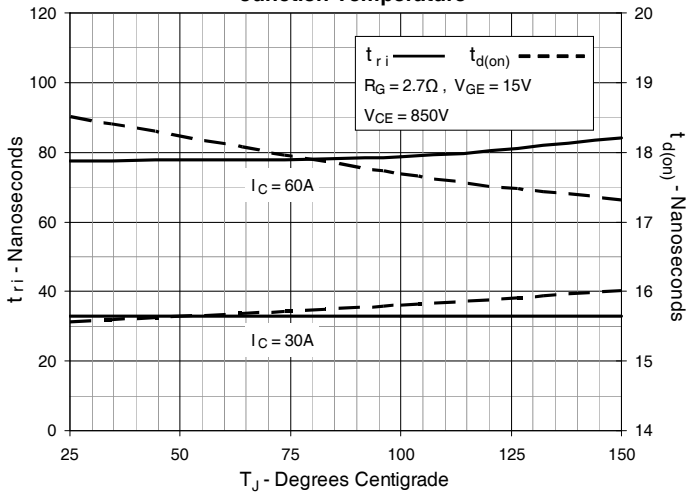
**Fig. 18. Inductive Turn-on Switching Times vs. Gate Resistance**



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



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



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