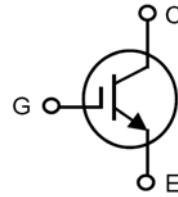


**High Voltage
XPT™ IGBT**
IXYH10N170C


$$V_{CES} = 1700V$$

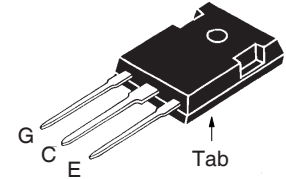
$$I_{C110} = 10A$$

$$V_{CE(sat)} \leq 4.1V$$

$$t_{fi(typ)} = 70ns$$

Symbol	Test Conditions	Maximum Ratings	
V_{CES}	$T_J = 25^\circ C$ to $175^\circ C$	1700	V
V_{CGR}	$T_J = 25^\circ C$ to $175^\circ C$, $R_{GE} = 1M\Omega$	1700	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	$T_C = 25^\circ C$	36	A
I_{C110}	$T_C = 110^\circ C$	10	A
I_{CM}	$T_C = 25^\circ C$, 1ms	84	A
SSOA (RBSOA)	$V_{GE} = 15V$, $T_{VJ} = 150^\circ C$, $R_G = 10\Omega$	$I_{CM} = 40$	A
	Clamped Inductive Load	1360	V
P_C	$T_C = 25^\circ C$	280	W
T_J		-55 ... +175	$^\circ C$
T_{JM}		175	$^\circ C$
T_{stg}		-55 ... +175	$^\circ C$
T_L	Maximum Lead Temperature for Soldering	300	$^\circ C$
T_{SOLD}	1.6 mm (0.062in.) from Case for 10s	260	$^\circ C$
M_d	Mounting Torque	1.13/10	Nm/lb.in.
Weight		6	g

TO-247 AD



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

Features

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

Advantages

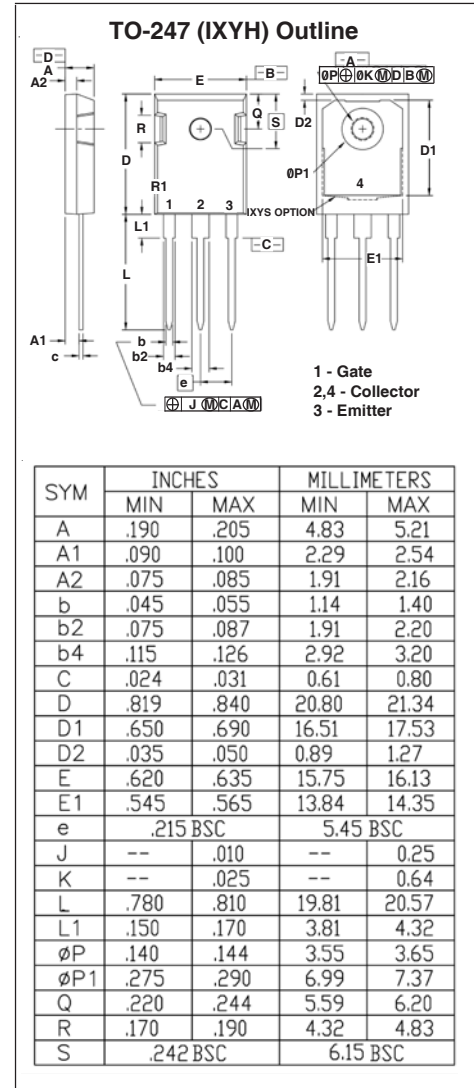
- Low Gate Drive Requirement
- High Power Density

Applications

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

Symbol	Test Conditions ($T_J = 25^\circ C$, Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
BV_{CES}	$I_C = 250\mu A$, $V_{GE} = 0V$	1700		V
$V_{GE(th)}$	$I_C = 250\mu A$, $V_{CE} = V_{GE}$	3.0		5.0 V
I_{CES}	$V_{CE} = V_{CES}$, $V_{GE} = 0V$ $T_J = 150^\circ C$			10 μA 1 mA
I_{GES}	$V_{CE} = 0V$, $V_{GE} = \pm 20V$			± 100 nA
$V_{CE(sat)}$	$I_C = 10A$, $V_{GE} = 15V$, Note 1 $T_J = 150^\circ C$		3.6 4.9	4.1 V V

Symbol Test Conditions ($T_J = 25^\circ\text{C}$ Unless Otherwise Specified)		Characteristic Values		
		Min.	Typ.	Max.
g_{fs}	$I_C = 10\text{A}, V_{CE} = 10\text{V}$, Note 1	5.4	9.0	S
R_{Gi}	Gate Input Resistance		10	Ω
C_{ies}	$V_{CE} = 25\text{V}, V_{GE} = 0\text{V}, f = 1\text{MHz}$		930	pF
C_{oes}			53	pF
C_{res}			20	pF
$Q_{g(on)}$	$I_C = 10\text{A}, V_{GE} = 15\text{V}, V_{CE} = 0.5 \cdot V_{CES}$		46	nC
Q_{ge}			6	nC
Q_{gc}			22	nC
$t_{d(on)}$	Inductive load, $T_J = 25^\circ\text{C}$ $I_C = 10\text{A}, V_{GE} = 15\text{V}$ $V_{CE} = 0.5 \cdot V_{CES}, R_G = 10\Omega$ Note 2		14	ns
t_{ri}			17	ns
E_{on}			1.4	mJ
$t_{d(off)}$			130	ns
t_{fi}			70	ns
E_{off}			0.7	mJ
$t_{d(on)}$	Inductive load, $T_J = 150^\circ\text{C}$ $I_C = 10\text{A}, V_{GE} = 15\text{V}$ $V_{CE} = 0.5 \cdot V_{CES}, R_G = 10\Omega$ Note 2		15	ns
t_{ri}			6	ns
E_{on}			2.3	mJ
$t_{d(off)}$			166	ns
t_{fi}			94	ns
E_{off}			0.9	mJ
R_{thJC}				0.53 $^\circ\text{C/W}$
R_{thCS}		0.21		$^\circ\text{C/W}$



Notes:

1. Pulse test, $t \leq 300\mu\text{s}$, duty cycle, $d \leq 2\%$.
2. Switching times & energy losses may increase for higher $V_{CE}(\text{clamp})$, 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. Output Characteristics @ $T_J = 25^\circ\text{C}$

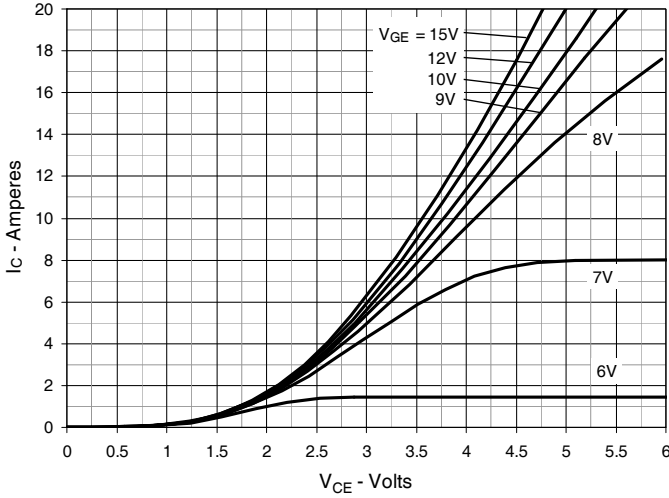


Fig. 2. Extended Output Characteristics @ $T_J = 25^\circ\text{C}$

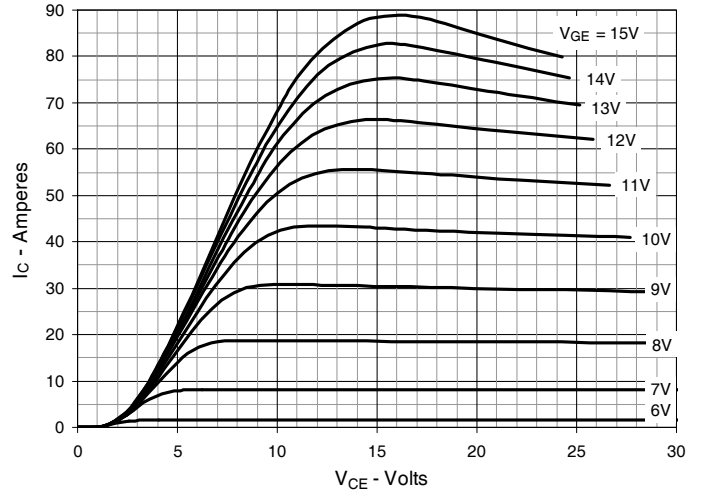


Fig. 3. Output Characteristics @ $T_J = 150^\circ\text{C}$

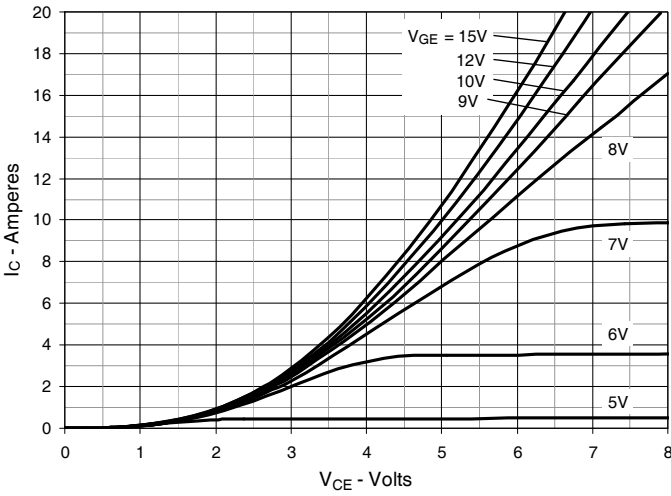


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

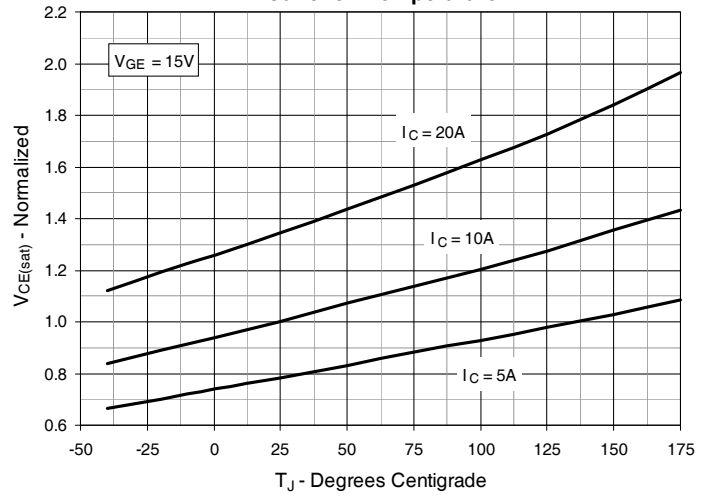


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

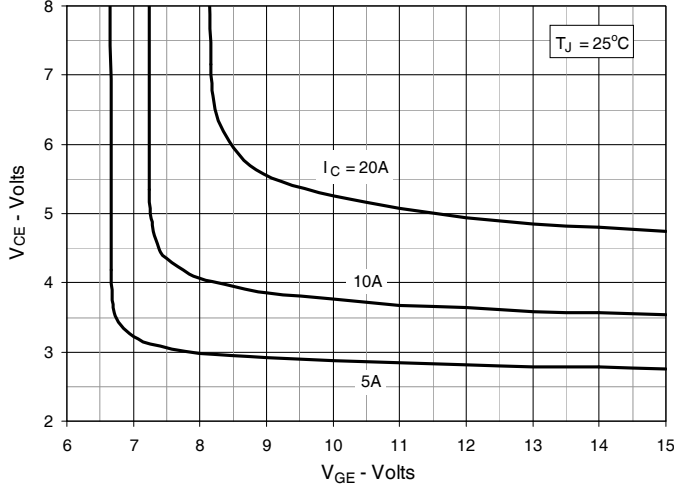


Fig. 6. Input Admittance

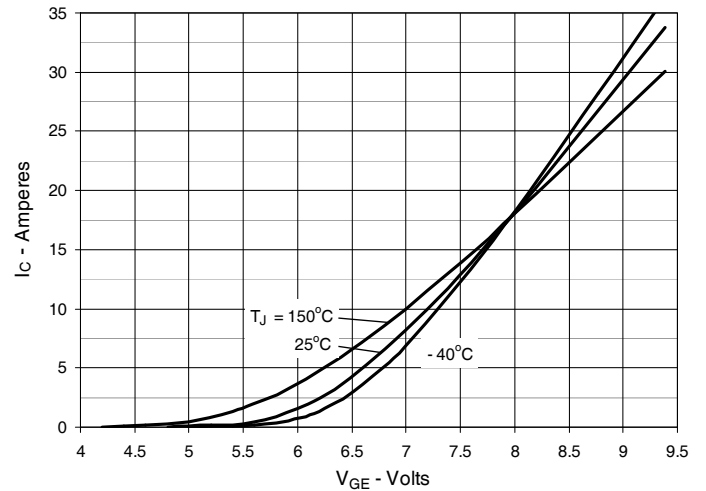


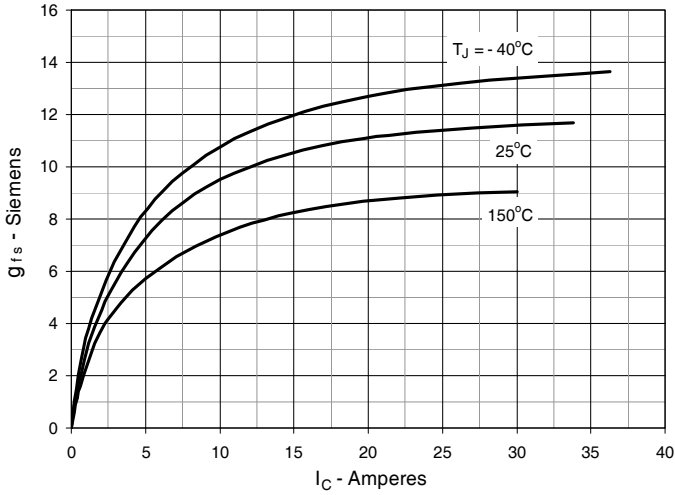
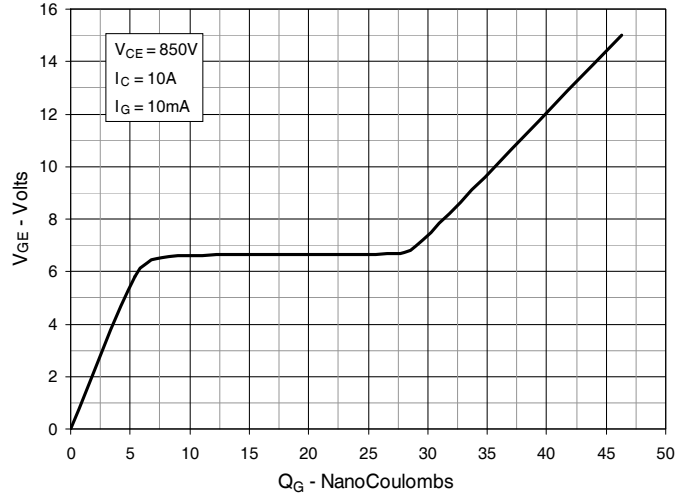
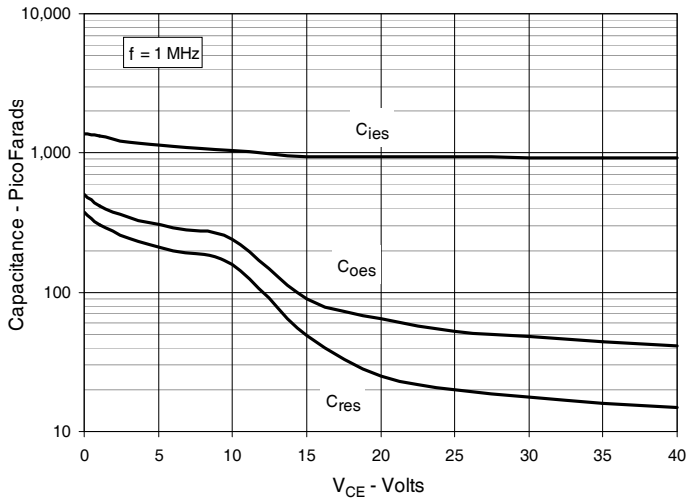
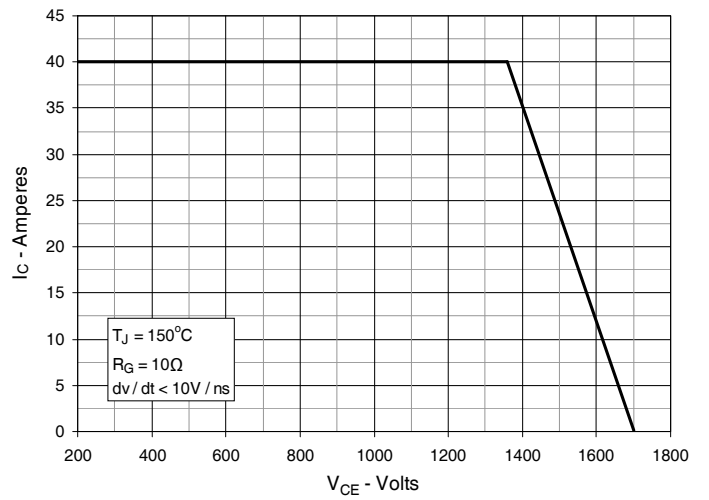
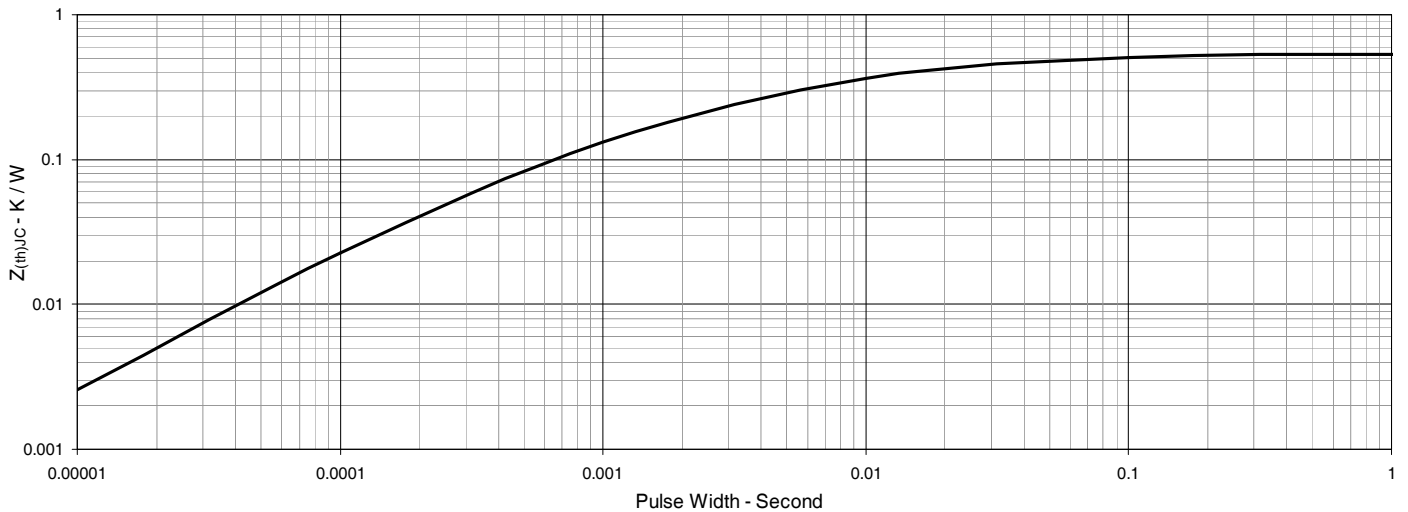
Fig. 7. Transconductance

Fig. 8. Gate Charge

Fig. 9. Capacitance

Fig. 10. Reverse-Bias Safe Operating Area

Fig. 11. Maximum Transient Thermal Impedance


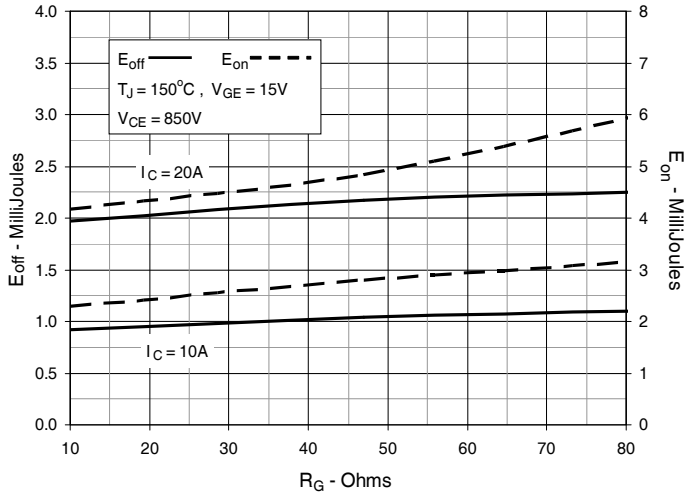
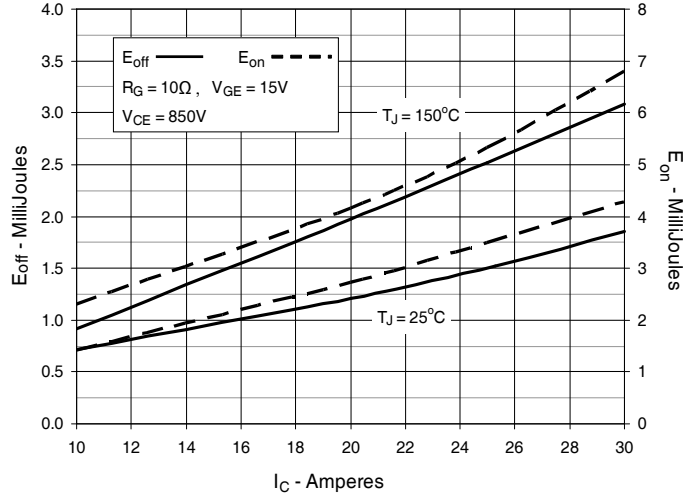
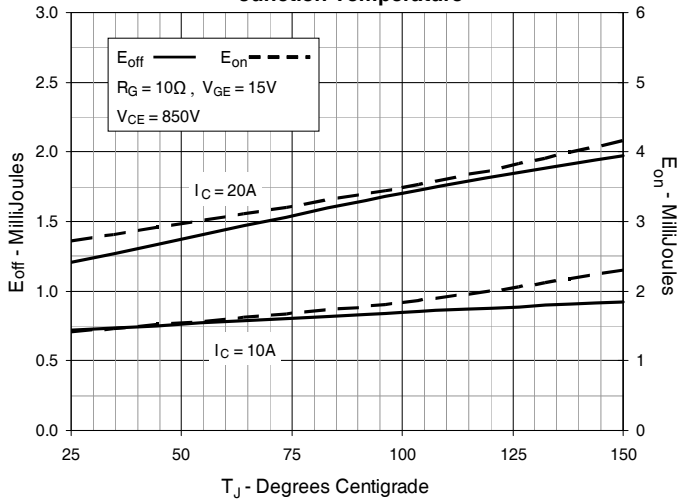
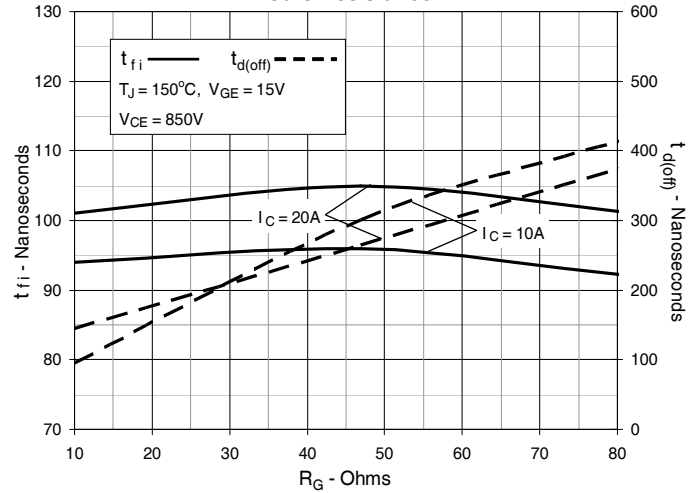
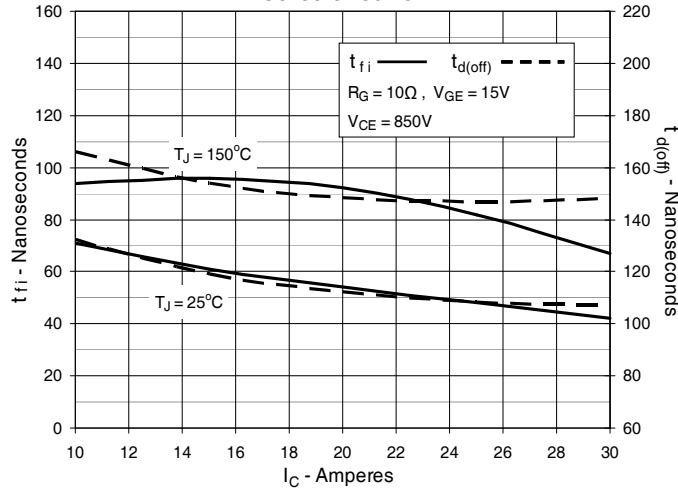
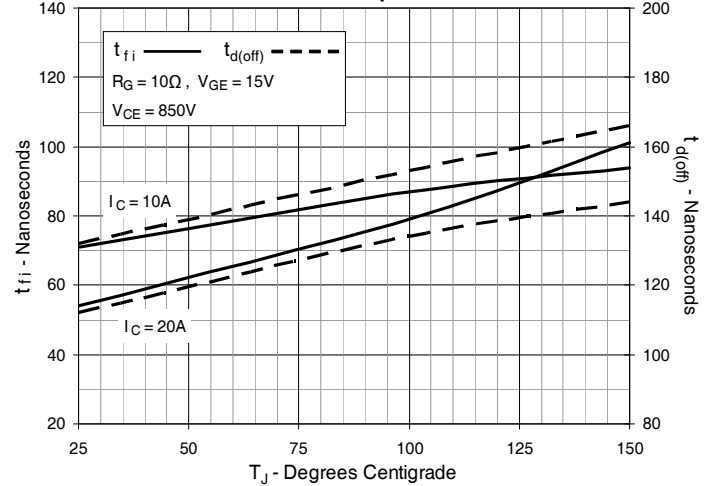
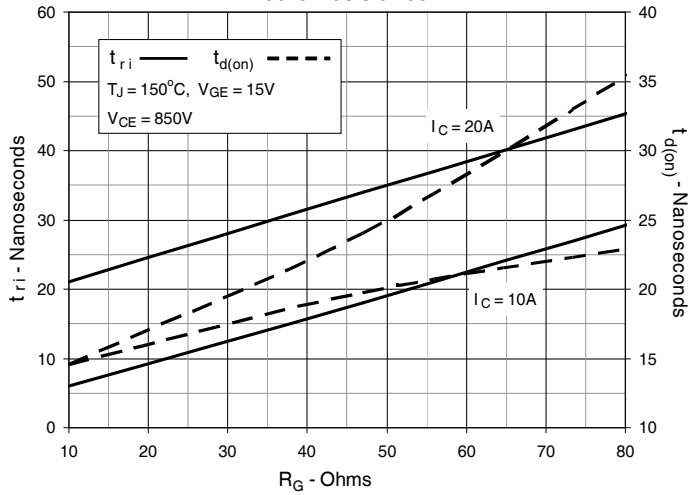
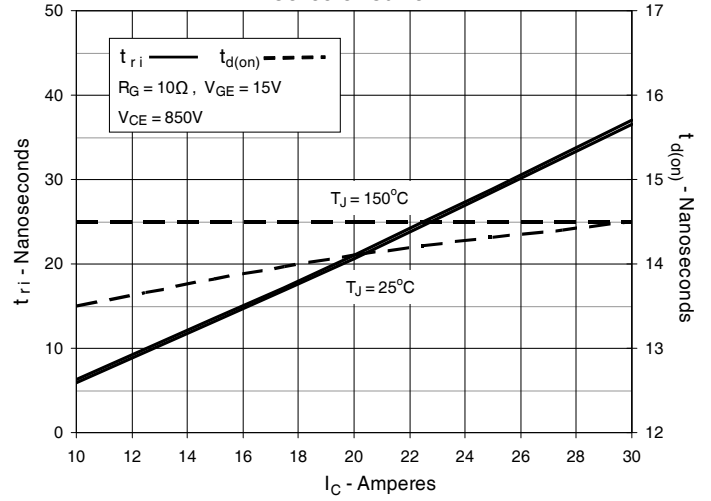
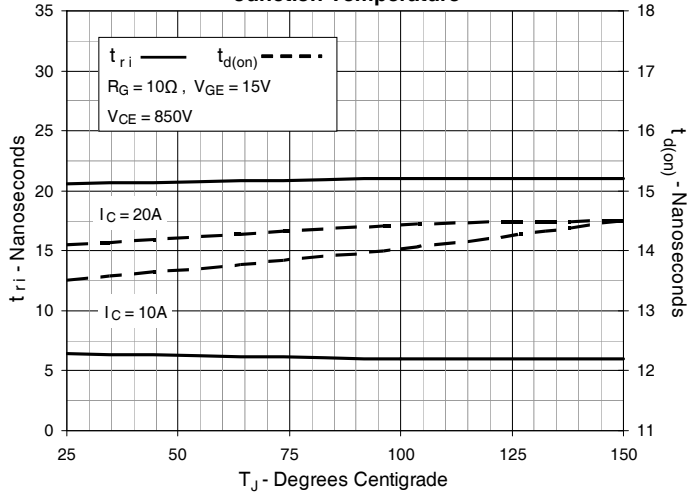
Fig. 12. Inductive Switching Energy Loss vs. Gate Resistance

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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