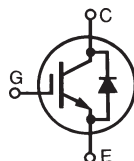


**GenX3™ 1200V  
IGBT w/ Diode**
**IXGN82N120B3H1**

$$V_{CES} = 1200V$$

$$I_{C110} = 64A$$

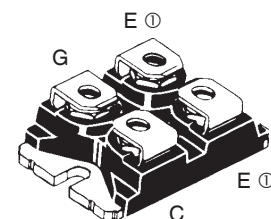
$$V_{CE(sat)} \leq 3.2V$$

 High-Speed Low-V<sub>sat</sub> PT IGBT  
for 3-20 kHz Switching


Symbol	Test Conditions	Maximum Ratings	
$V_{CES}$	$T_J = 25^\circ C$ to $150^\circ C$	1200	V
$V_{CGR}$	$T_J = 25^\circ C$ to $150^\circ C$ , $R_{GE} = 1M\Omega$	1200	V
$V_{GES}$	Continuous	$\pm 20$	V
$V_{GEM}$	Transient	$\pm 30$	V
$I_{C25}$	$T_C = 25^\circ C$ (Chip Capability)	145	A
$I_{C110}$	$T_C = 110^\circ C$	64	A
$I_{F110}$	$T_C = 110^\circ C$	42	A
$I_{CM}$	$T_C = 25^\circ C$ , 1ms	550	A
$I_A$	$T_C = 25^\circ C$	41	A
$E_{AS}$	$T_C = 25^\circ C$	750	mJ
<b>SSOA</b>	$V_{GE} = 15V$ , $T_{VJ} = 125^\circ C$ , $R_G = 2\Omega$	$I_{CM} = 164$	A
<b>(RBSOA)</b>	Clamped Inductive Load	@ $V_{CE} \leq V_{CES}$	
$P_C$	$T_C = 25^\circ C$	595	W
$T_J$		-55 ... +150	$^\circ C$
$T_{JM}$		150	$^\circ C$
$T_{stg}$		-55 ... +150	$^\circ C$
$V_{ISOL}$	50/60Hz	$t = 1min$	2500 V~
	$I_{ISOL} \leq 1mA$	$t = 1s$	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

SOT-227B, miniBLOC

E153432



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

**Features**

- Optimized for Low Conduction and Switching Losses
- Square RBSOA
- High Current Capability
- Isolation Voltage 2500V~
- Anti-Parallel Ultra Fast Diode
- International Standard Package

**Advantages**

- High Power Density
- Low Gate Drive Requirement

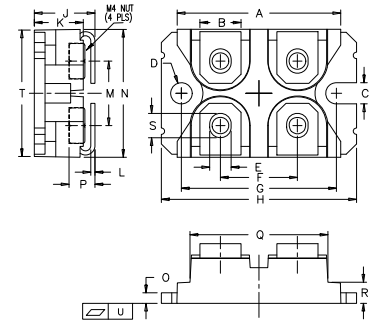
**Applications**

- Power Inverters
- UPS
- SMPS
- PFC Circuits
- Welding Machines
- Lamp Ballasts

Symbol	Test Conditions ( $T_J = 25^\circ C$ , Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$V_{GE(th)}$	$I_C = 1mA$ , $V_{CE} = V_{GE}$	3.0		5.0 V
$I_{CES}$	$V_{CE} = V_{CES}$ , $V_{GE} = 0V$ Note 1, $T_J = 125^\circ C$			50 $\mu A$ 6 mA
$I_{GES}$	$V_{CE} = 0V$ , $V_{GE} = \pm 20V$			$\pm 200$ nA
$V_{CE(sat)}$	$I_C = 82A$ , $V_{GE} = 15V$ , Note 2	2.7	3.2	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 2	35	60	S
$C_{ies}$	$V_{CE} = 25\text{V}$ , $V_{GE} = 0\text{V}$ , $f = 1\text{ MHz}$		7900	pF
$C_{oes}$			640	pF
$C_{res}$			170	pF
$Q_{g(on)}$	$I_C = 82\text{A}$ , $V_{GE} = 15\text{V}$ , $V_{CE} = 0.5 \cdot V_{CES}$		350	nC
$Q_{ge}$			50	nC
$Q_{gc}$			150	nC
$t_{d(on)}$	<b>Inductive load, <math>T_J = 25^\circ\text{C}</math></b> $I_C = 80\text{A}$ , $V_{GE} = 15\text{V}$ $V_{CE} = 600\text{V}$ , $R_G = 2\Omega$ Note 3		30	ns
$t_{ri}$			77	ns
$E_{on}$			5.0	mJ
$t_{d(off)}$			210	ns
$t_{fi}$			100	ns
$E_{off}$			3.3	6.2 mJ
$t_{d(on)}$	<b>Inductive load, <math>T_J = 125^\circ\text{C}</math></b> $I_C = 80\text{A}$ , $V_{GE} = 15\text{V}$ $V_{CE} = 600\text{V}$ , $R_G = 2\Omega$ Note 3		32	ns
$t_{ri}$			80	ns
$E_{on}$			6.8	mJ
$t_{d(off)}$			240	ns
$t_{fi}$			520	ns
$E_{off}$			7.1	mJ
$R_{thJC}$			0.21	$^\circ\text{C/W}$
$R_{thCK}$		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	1.496	1.505	38.00	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

### Reverse Diode (FRED)

Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ , Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$V_F$	$I_F = 60\text{A}$ , $V_{GE} = 0\text{V}$ , Note 2 $T_J = 150^\circ\text{C}$	1.85	2.5	V
$t_{rr}$	$I_F = 60\text{A}$ , $V_{GE} = 0\text{V}$ , $-di_F/dt = 350\text{A}/\mu\text{s}$ , $V_R = 600\text{V}$ , $T_J = 100^\circ\text{C}$		200	ns
$I_{RM}$			24.6	A
$R_{thJC}$			0.42	$^\circ\text{C/W}$

#### Notes:

1. Part must be heatsunk for high-temp  $I_{ces}$  measurement.
2. Pulse test,  $t \leq 300\mu\text{s}$ , duty cycle,  $d \leq 2\%$ .
3. Switching times & energy losses may increase for higher  $V_{CE}$  (Clamp),  $T_J$  or  $R_G$ .

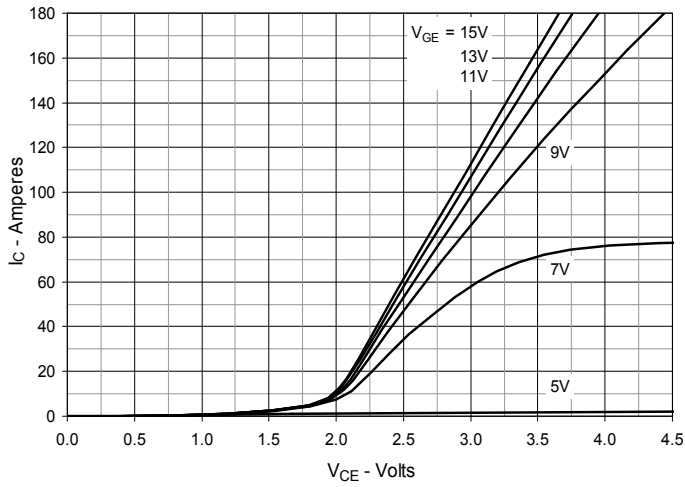
### ADVANCE TECHNICAL INFORMATION

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.

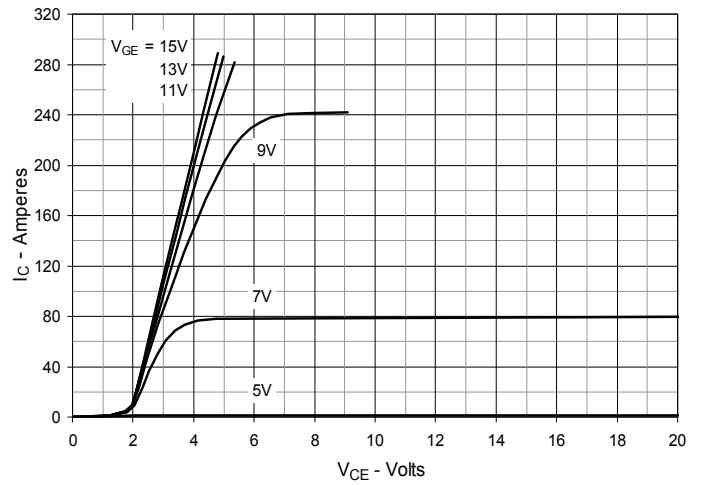
#### IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.

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
	4,850,072	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	

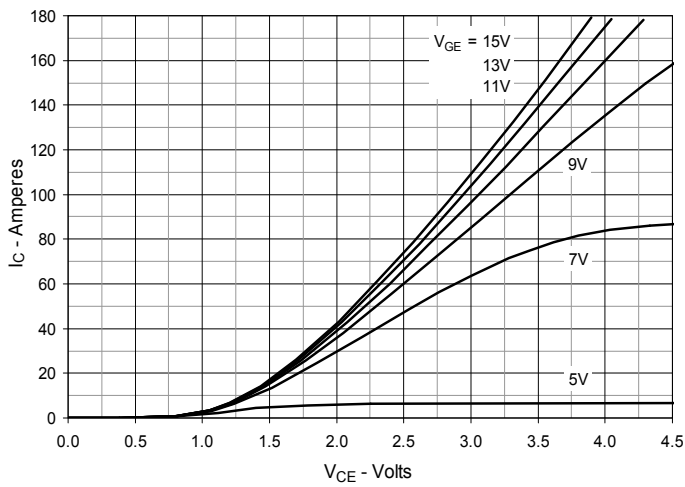
**Fig. 1. Output Characteristics @  $T_J = 25^\circ\text{C}$**



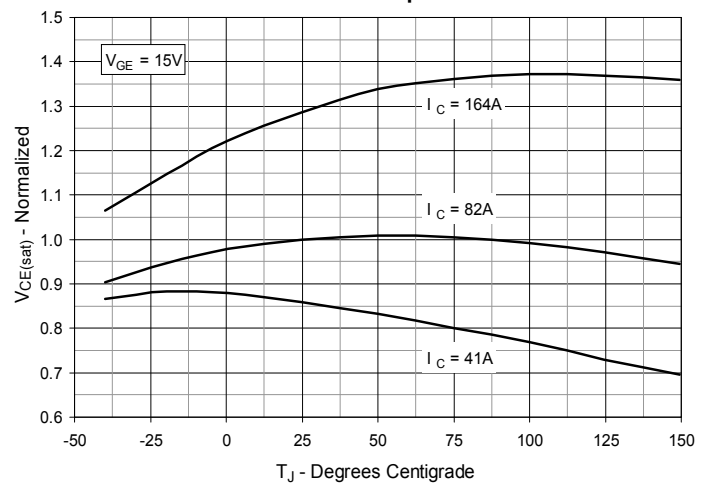
**Fig. 2. Extended Output Characteristics @  $T_J = 25^\circ\text{C}$**



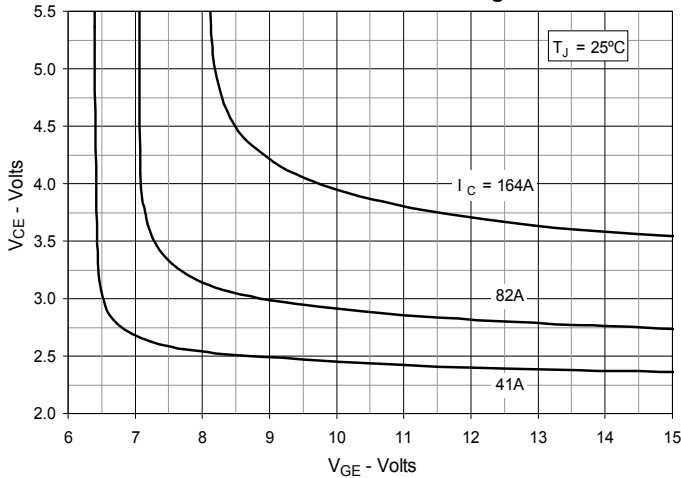
**Fig. 3. Output Characteristics @  $T_J = 125^\circ\text{C}$**



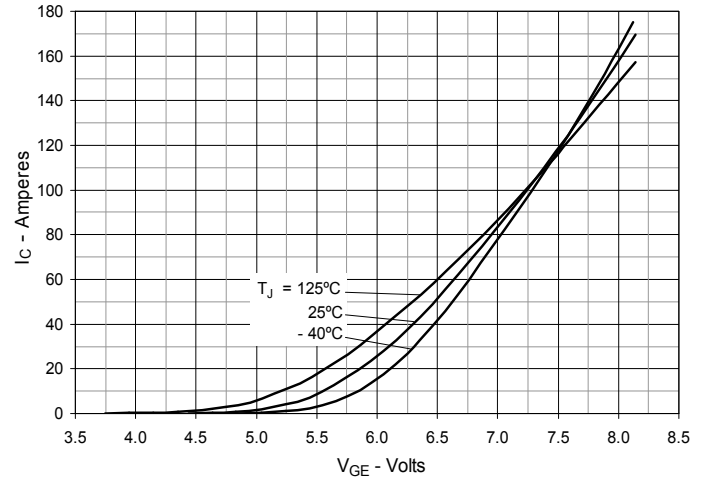
**Fig. 4. Dependence of  $V_{CE(sat)}$  on Junction Temperature**



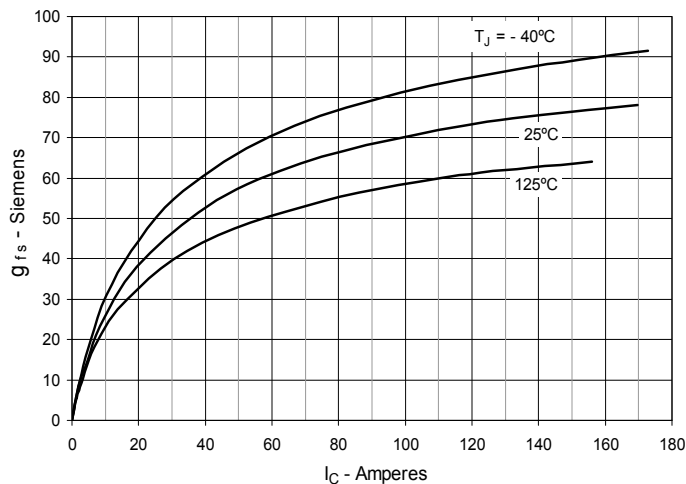
**Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage**



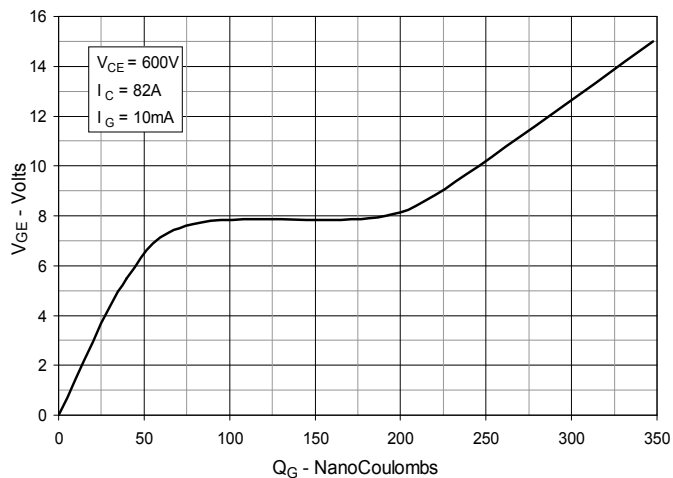
**Fig. 6. Input Admittance**



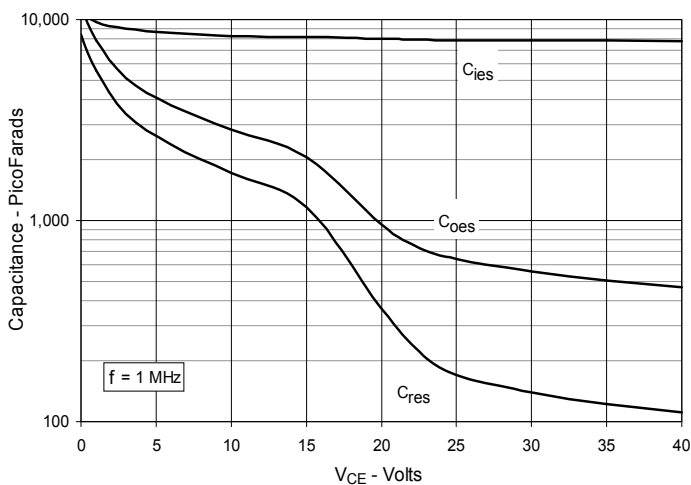
**Fig. 7. Transconductance**



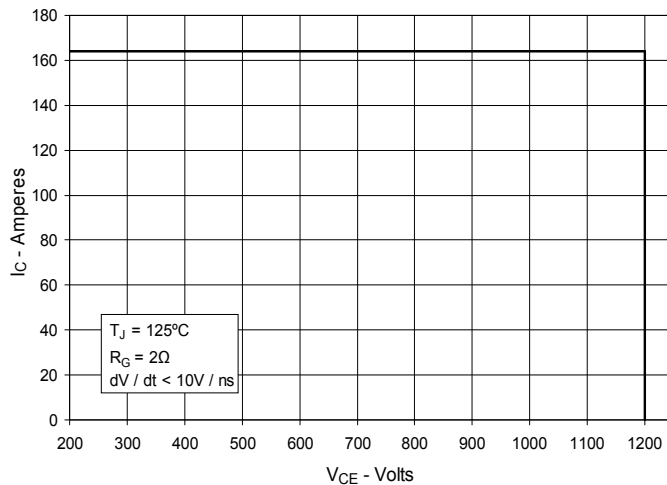
**Fig. 8. Gate Charge**



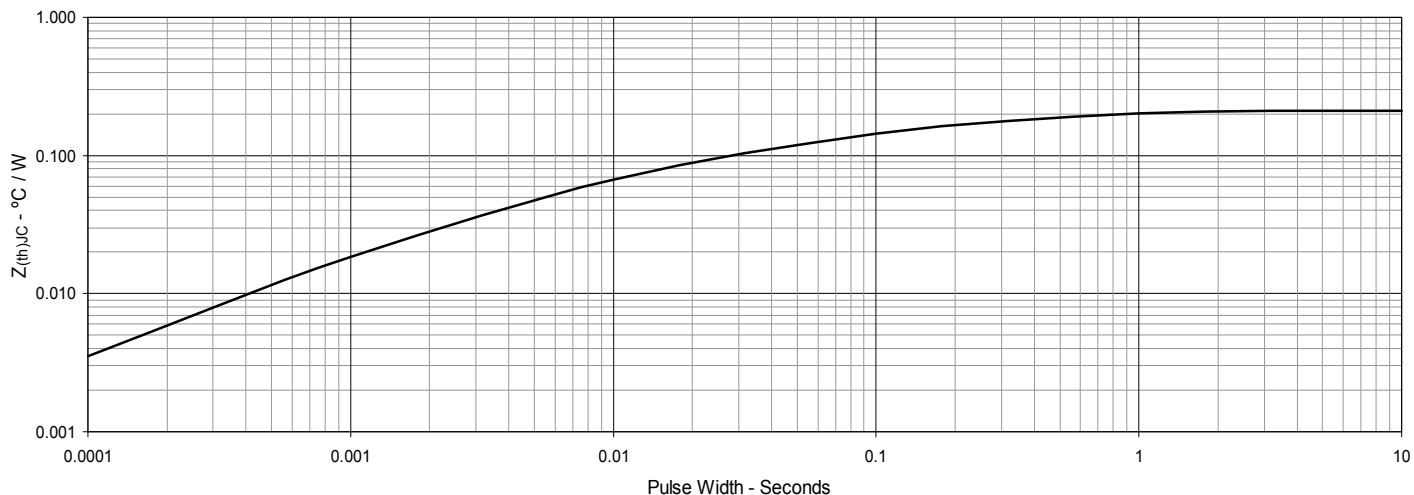
**Fig. 9. Capacitance**



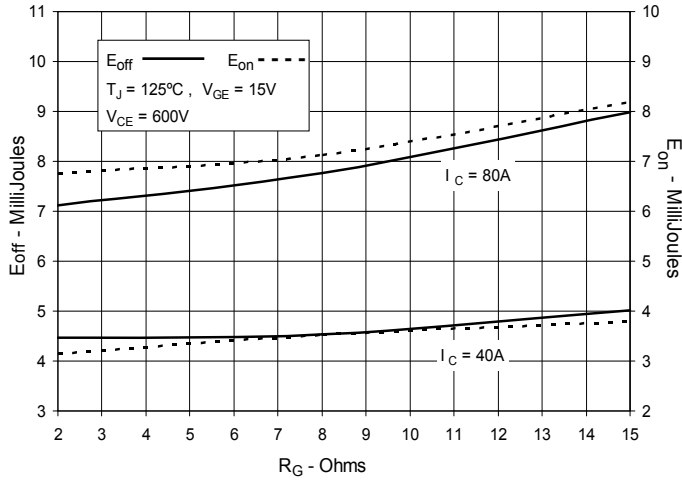
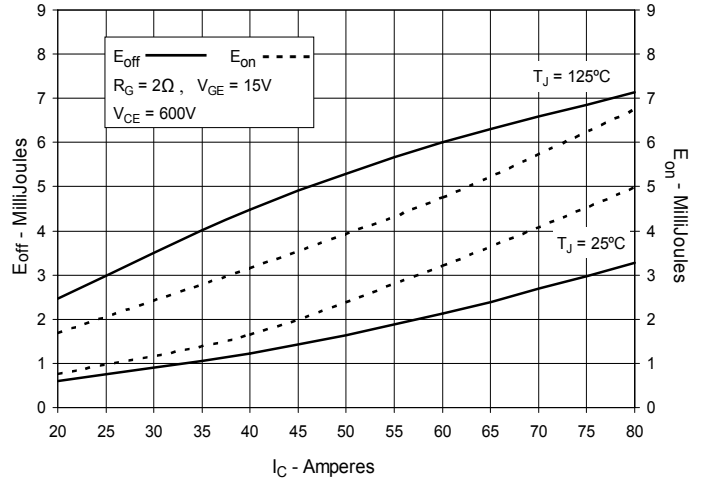
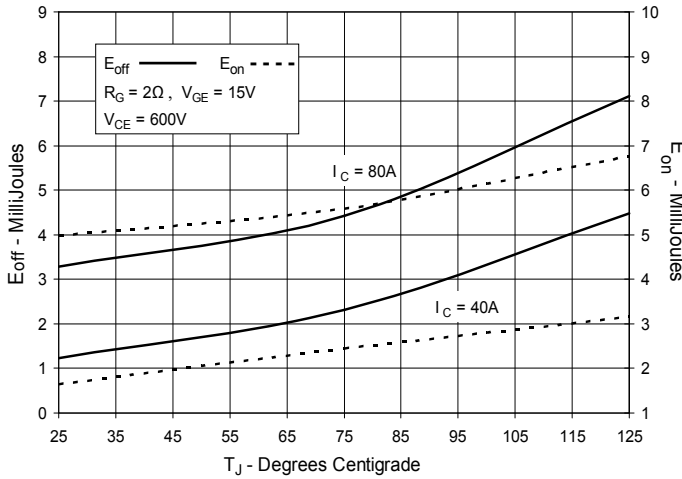
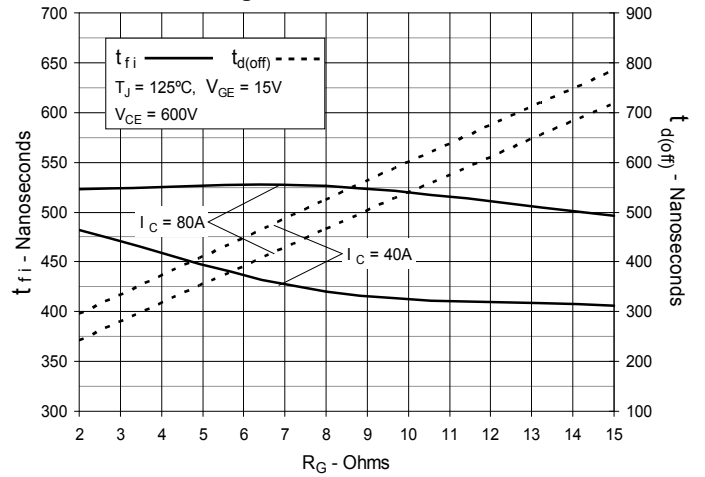
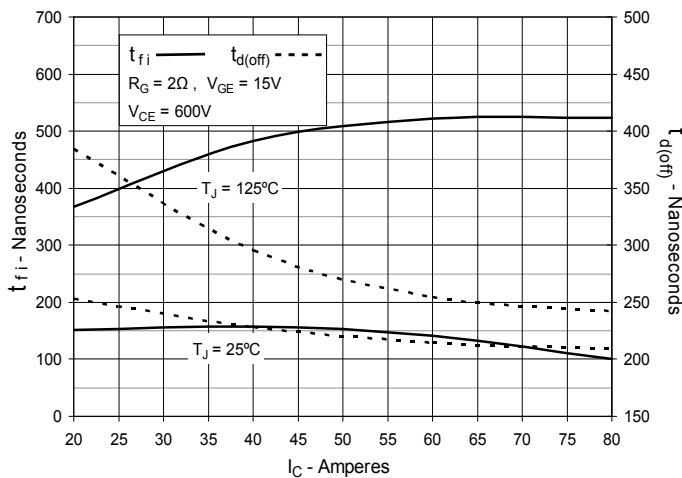
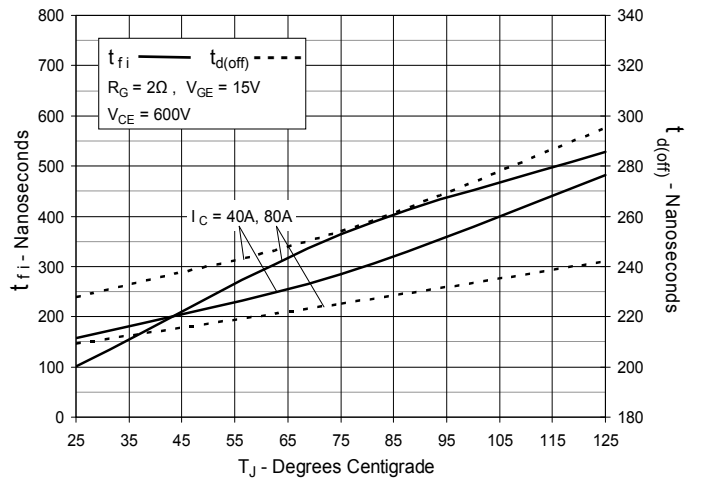
**Fig. 10. Reverse-Bias Safe Operating Area**



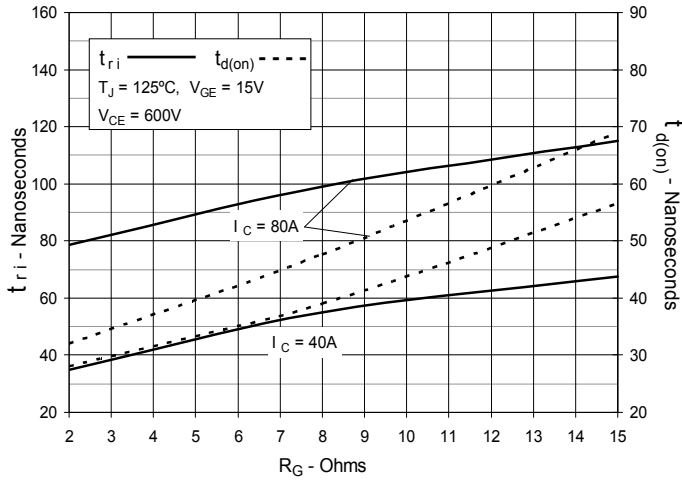
**Fig. 11. Maximum Transient Thermal Impedance**



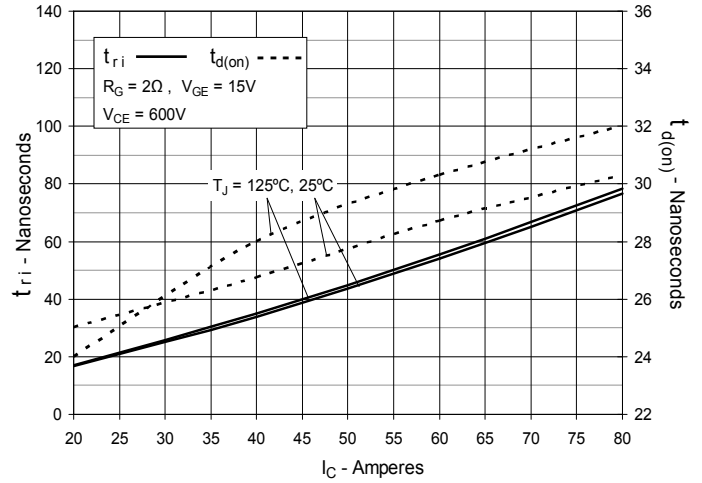
IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.

**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**


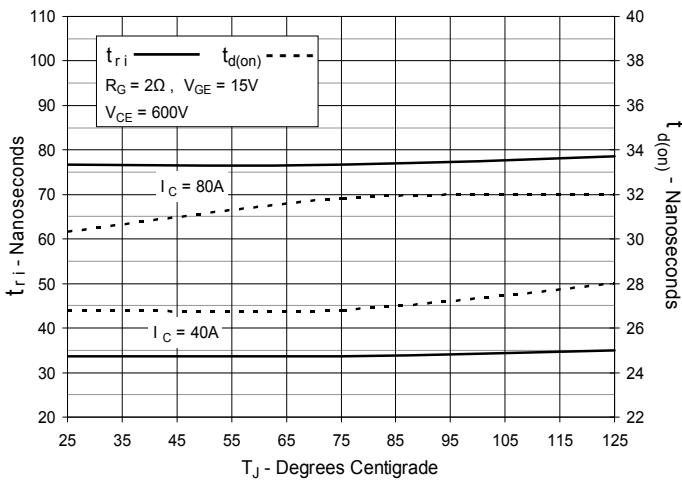
**Fig. 18. Inductive Turn-on  
Switching Times vs. Gate Resistance**



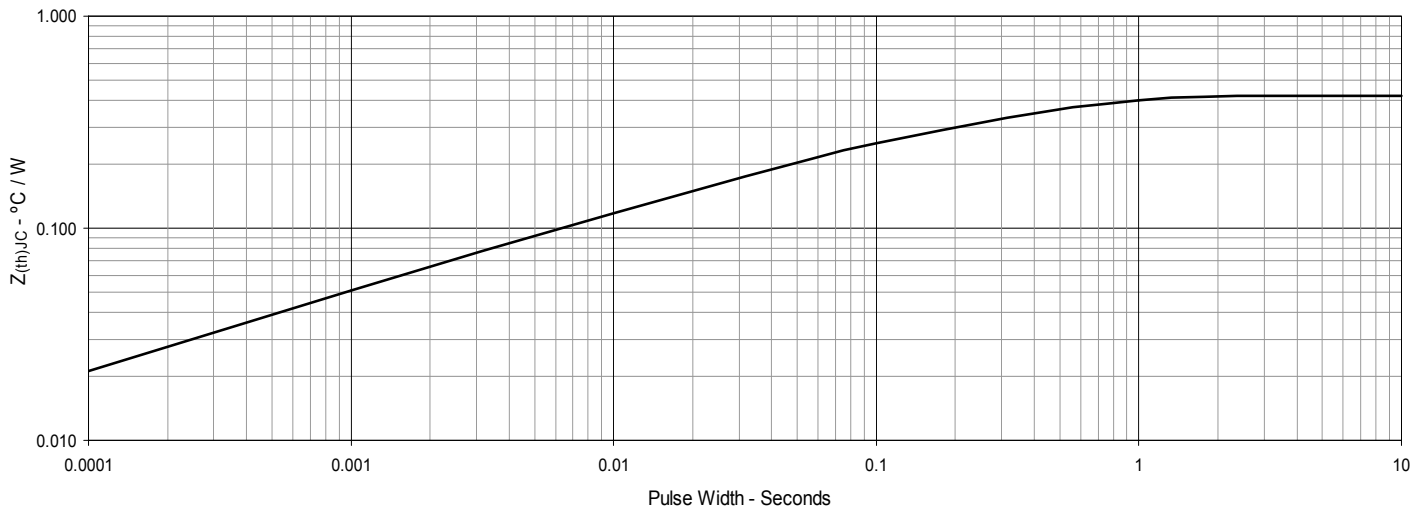
**Fig. 19. Inductive Turn-on  
Switching Times vs. Collector Current**



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



**Fig. 21. Maximum Transient Thermal Impedance**



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