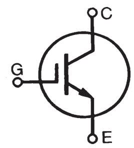
IXYS

GenX3™ 1200V IGBTs

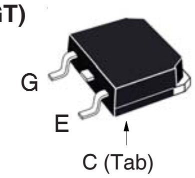
IXGH32N120A3
IXGT32N120A3

V_{CES} = 1200V
I_{C110} = 32A
$V_{CE(sat)} \leq$ 2.35V

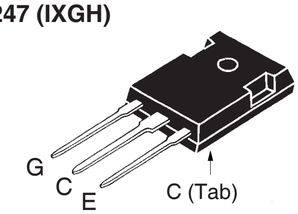
Ultra-Low Vsat PT IGBTs for up to 3 kHz Switching



TO-268 (IXGT)



TO-247 (IXGH)



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

Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_J = 25°C to 150°C	1200	V
V_{CGR}	T_J = 25°C to 150°C, R_{GE} = 1MΩ	1200	V
V_{GES}	Continuous	±20	V
V_{GEM}	Transient	±30	V
I_{C25}	T_C = 25°C	75	A
I_{C110}	T_C = 110°C	32	A
I_{CM}	T_C = 25°C, 1ms	230	A
I_A	T_C = 25°C	20	A
E_{AS}	T_C = 25°C	120	mJ
SSOA	V_{GE}= 15V, T_J = 125°C, R_G = 20Ω	I_{CM} = 150	A
(RBSOA)	Clamped Inductive Load	$V_{CE} \leq 0.8 \bullet V_{CES}$	
P_C	T_C = 25°C	300	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
T_L	1.6mm (0.063in) from Case for 10s	300	°C
T_{SOLD}	Plastic Body for 10s	260	°C
M_d	Mounting Torque (TO-247)	1.13/10	Nm/lb.in.
Weight	TO-247	6.0	g
	TO-268	4.0	g

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
BV_{CES}	I_C = 250μA, V_{GE} = 0V	1200			V
$V_{GE(th)}$	I_C = 250μA, V_{CE} = V_{GE}	3.0		5.0	V
I_{CES}	V_{CE} = V_{CES}, V_{GE} = 0V			50	μA
	T_J = 125°C			1	mA
I_{GES}	V_{CE} = 0V, V_{GE} = ±20V			±100	nA
$V_{CE(sat)}$	I_C = I_{C110}, V_{GE} = 15V, Note 1			2.35	V
	I_C = 400A, V_{GE} = 30V, Note 1		11		V

Features

- Optimized for Low Conduction Losses
- International Standard Packages

Advantages

- High Power Density
- Low Gate Drive Requirement

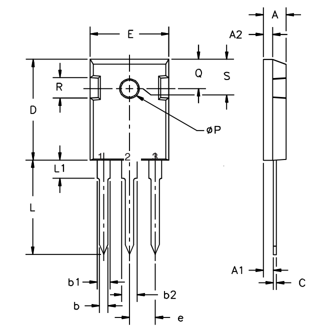
Applications

- Power Inverters
- Capacitor Discharge
- UPS
- Motor Drives
- SMPS
- PFC Circuits
- Battery Chargers
- Welding Machines
- Lamp Ballasts
- Inrush Current Protection Circuits

Symbol	Test Conditions ($T_J = 25°C$, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	$I_C = 50A$, $V_{CE} = 10V$, Note 1	14	20		S
$I_{C(on)}$	$V_{CE} = 10V$, $V_{GE} = 15V$, Note 1		94		A
C_{ies}	$V_{CE} = 25V$, $V_{GE} = 0V$, f = 1MHz		2150		pF
C_{oes}			130		pF
C_{res}			14		pF
Q_g	$I_C = 50A$, $V_{GE} = 15V$, $V_{CE} = 0.5 \bullet V_{CES}$		89		nC
Q_{ge}			15		nC
Q_{gc}			34		nC
$t_{d(on)}$	**Resistive Switching Times, $T_J = 25°C$**		39		ns
t_r	$V_{GE} = 20V$, $V_{CE} = 0.8 \bullet V_{CES}$, $I_C = 100A$		200		ns
$t_{d(off)}$	$R_G = 10\Omega$ (External)		140		ns
t_f			1240		ns
R_{thJC}				0.42	°C/W
R_{thCK}	TO-247		0.21		°C/W

Note 1. Pulse test, $t \leq 300\mu s$, duty cycle, $d \leq 2\%$.

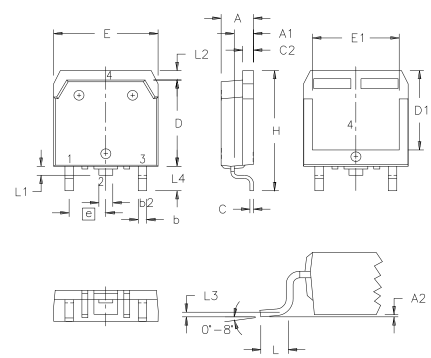
TO-247 AD Outline



Terminals: 1 - Gate 2 - Collector 3 - Emitter

Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	4.7	5.3	.185	.209
A_1	2.2	2.54	.087	.102
A_2	2.2	2.6	.059	.098
b	1.0	1.4	.040	.055
b_1	1.65	2.13	.065	.084
b_2	2.87	3.12	.113	.123
C	.4	.8	.016	.031
D	20.80	21.46	.819	.845
E	15.75	16.26	.610	.640
e	5.20	5.72	0.205	0.225
L	19.81	20.32	.780	.800
L1		4.50		.177
∅P	3.55	3.65	.140	.144
Q	5.89	6.40	0.232	0.252
R	4.32	5.49	.170	.216
S	6.15 BSC		242 BSC	

TO-268 Outline



Terminals: 1 - Gate 2, 4 - Collector 3 - Emitter

SYM	INCHES MIN	MAX	MILLIMETERS MIN	MAX
A	.193	.201	4.90	5.10
A1	.106	.114	2.70	2.90
A2	.001	.010	0.02	0.25
b	.045	.057	1.15	1.45
b2	.075	.083	1.90	2.10
C	.016	.026	0.40	0.65
C2	.057	.063	1.45	1.60
D	.543	.551	13.80	14.00
D1	.488	.500	12.40	12.70
E	.624	.632	15.85	16.05
E1	.524	.535	13.30	13.60
e	.215 BSC		5.45 BSC	
H	.736	.752	18.70	19.10
L	.094	.106	2.40	2.70
L1	.047	.055	1.20	1.40
L2	.039	.045	1.00	1.15
L3	.010 BSC		0.25 BSC	
L4	.150	.161	3.80	4.10

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 = 25ºC

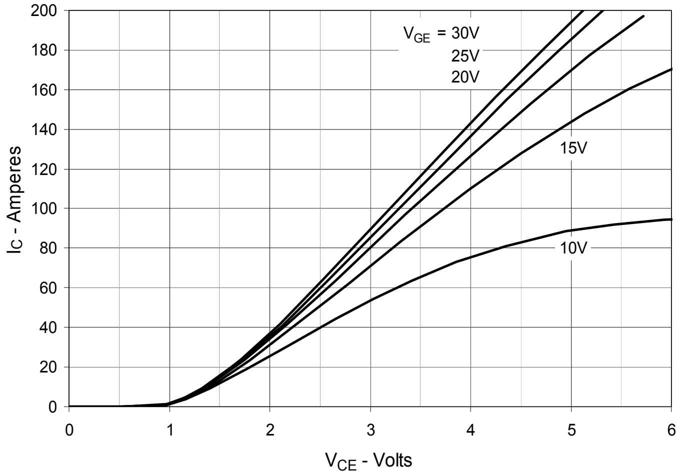


Fig. 2. Extended Output Characteristics @ T_J = 25ºC

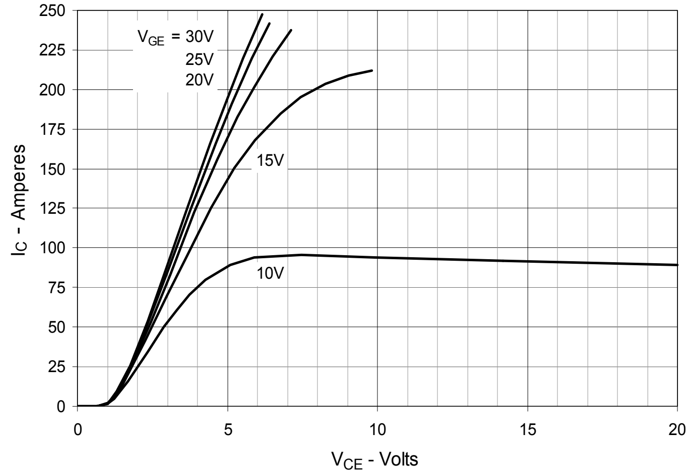


Fig. 3. Output Characteristics @ T_J = 125ºC

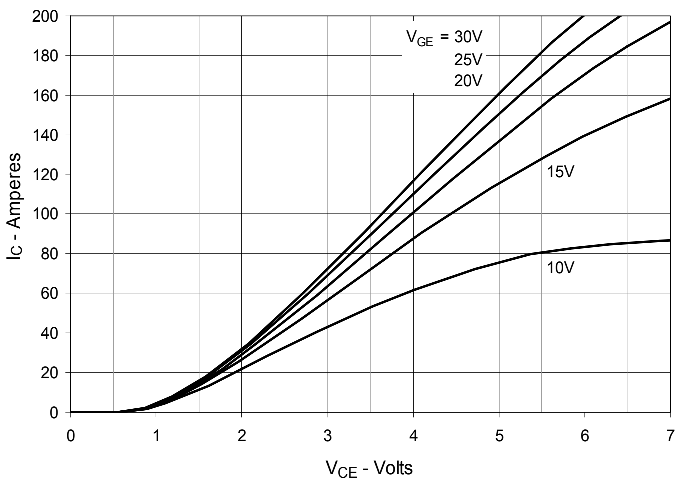


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

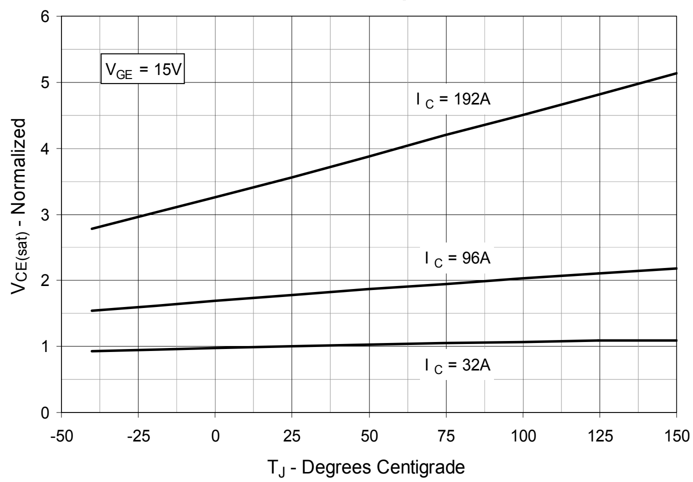


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

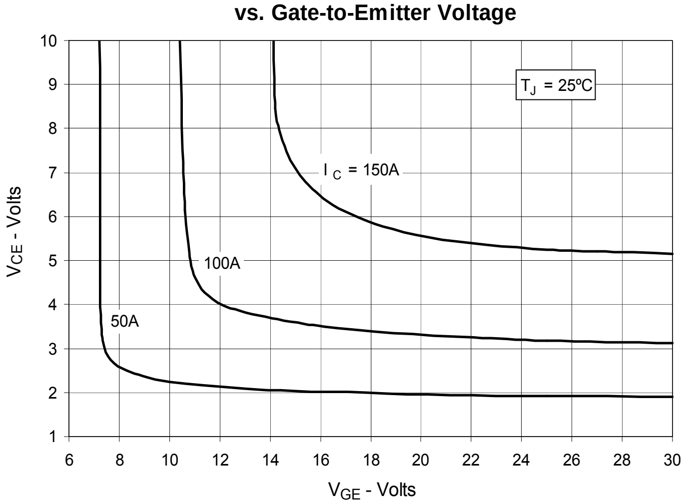
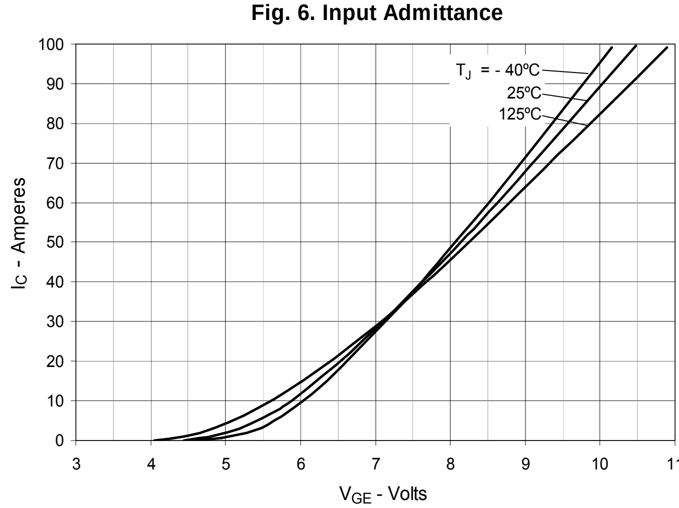


Fig. 6. Input Admittance



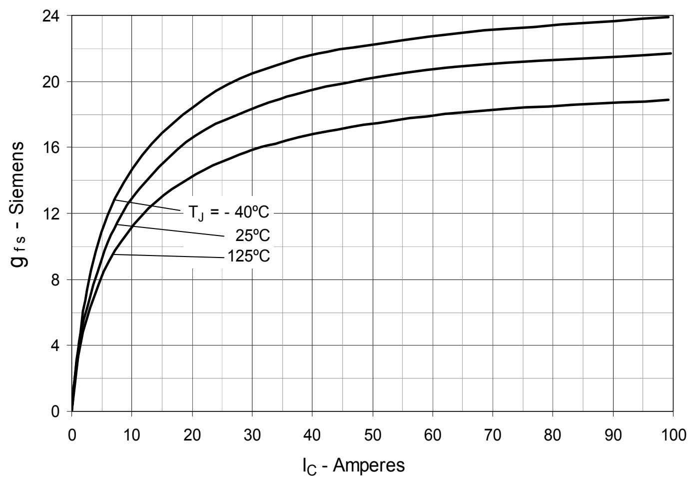


Fig. 7. Transconductance

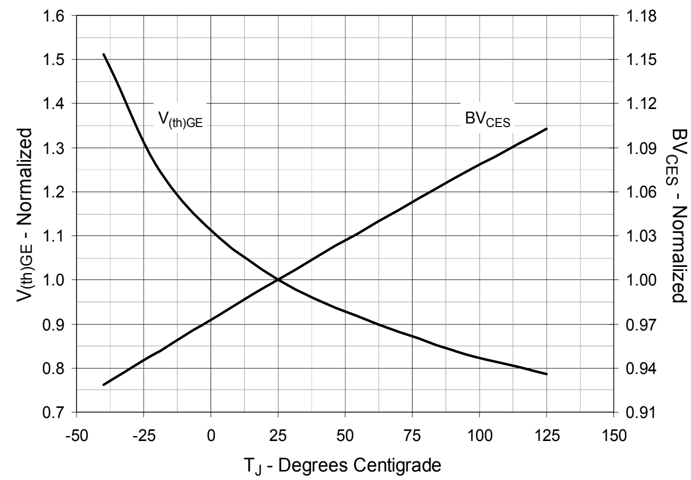


Fig. 8. Dependence of BV_{CES} & $V_{(th)GE}$ on Junction Temperature

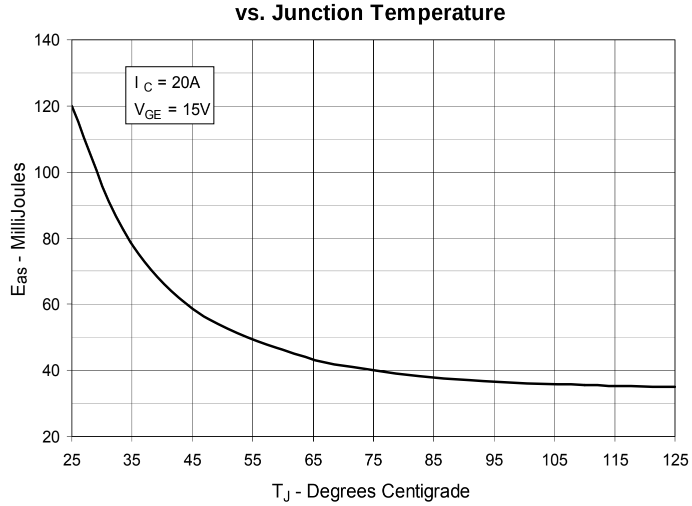


Fig. 9. Single-Pulsed Avalanche Energy vs. Junction Temperature

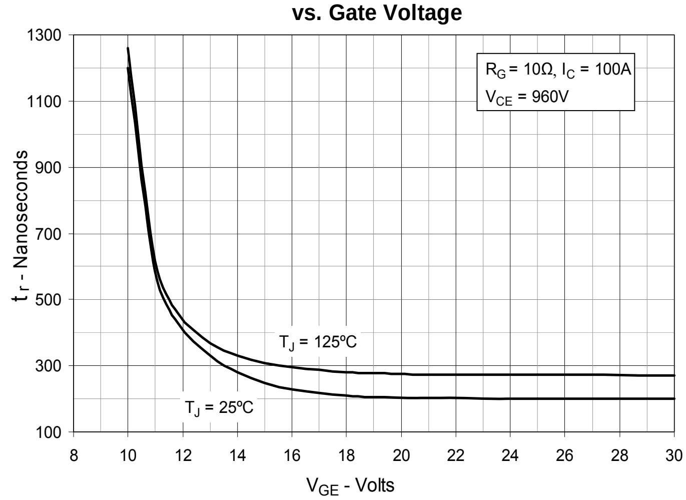


Fig. 10. Resistive Turn-on Rise Time vs. Gate Voltage

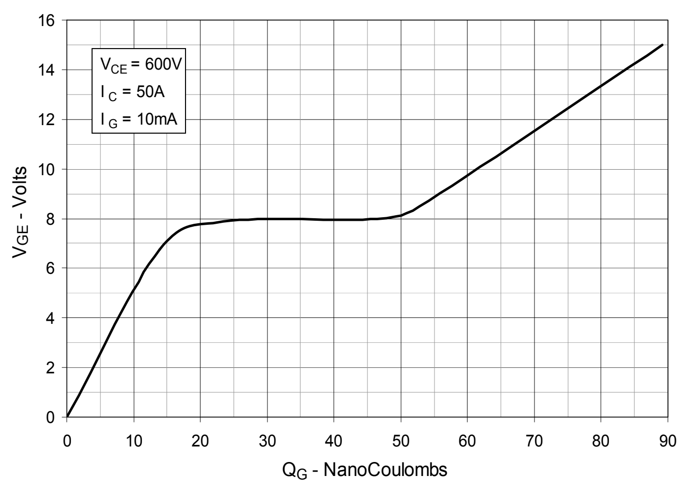


Fig. 11. Gate Charge

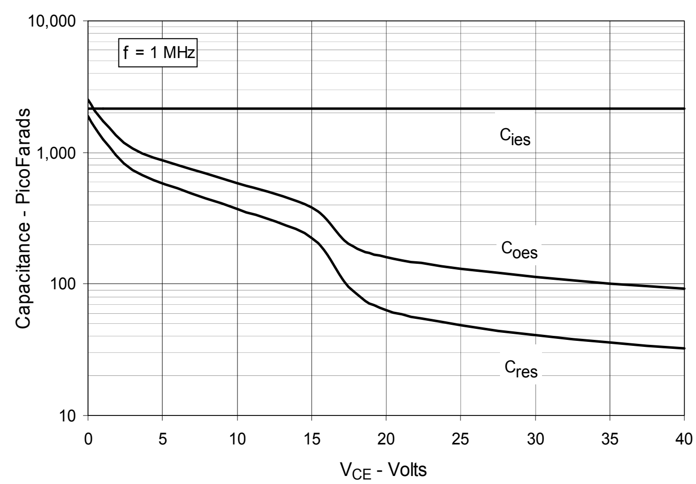


Fig. 12. Capacitance

Fig. 13. Resistive Turn-on Switching Times vs. Gate Resistance

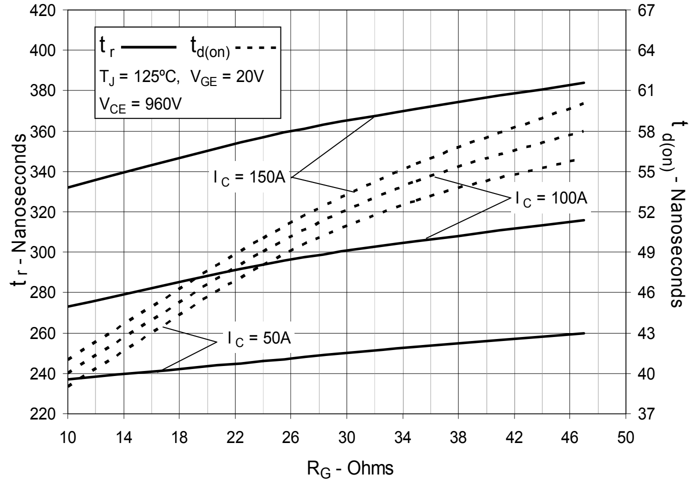


Fig. 14. Resistive Turn-on Rise Time vs. Junction Temperature

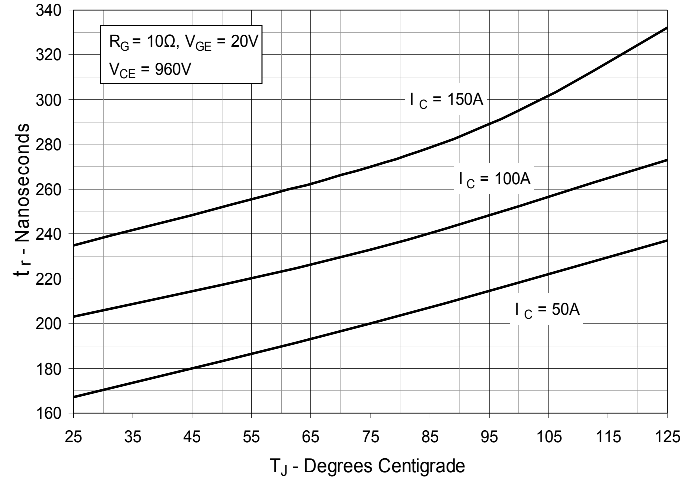


Fig. 15. Resistive Turn-on Rise Time vs. Collector Current

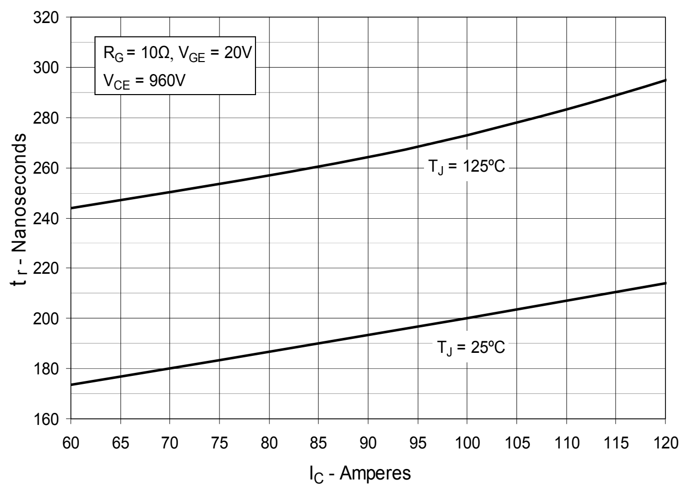


Fig. 16. Resistive Turn-off Switching Times vs. Gate Resistance

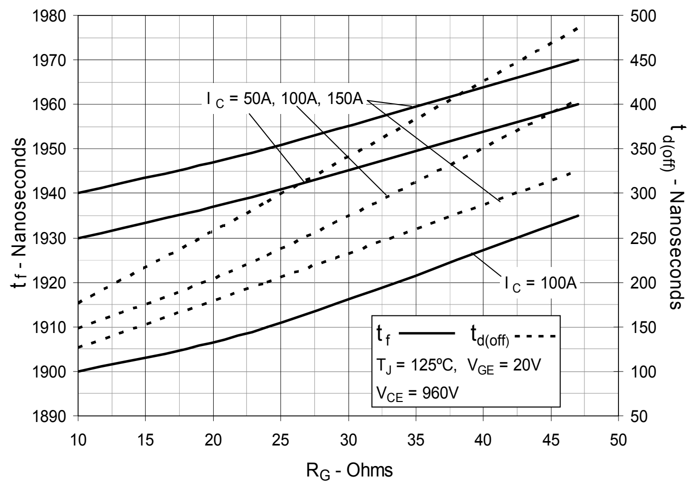


Fig. 17. Resistive Turn-off Switching Times vs. Junction Temperature

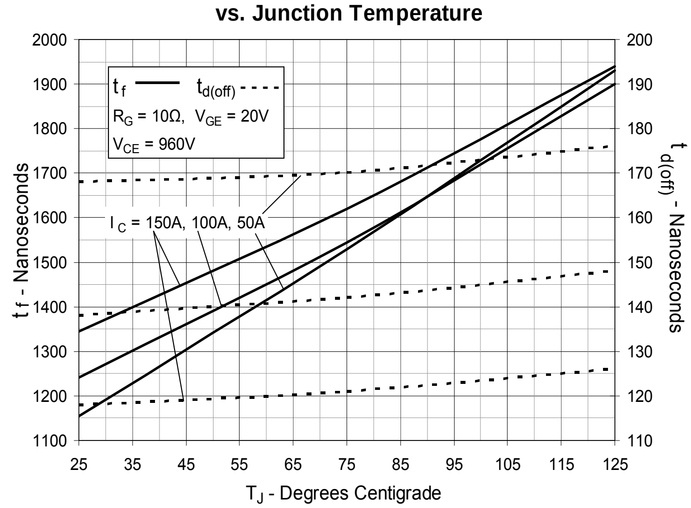


Fig. 18. Resistive Turn-off Switching Times vs. Collector Current

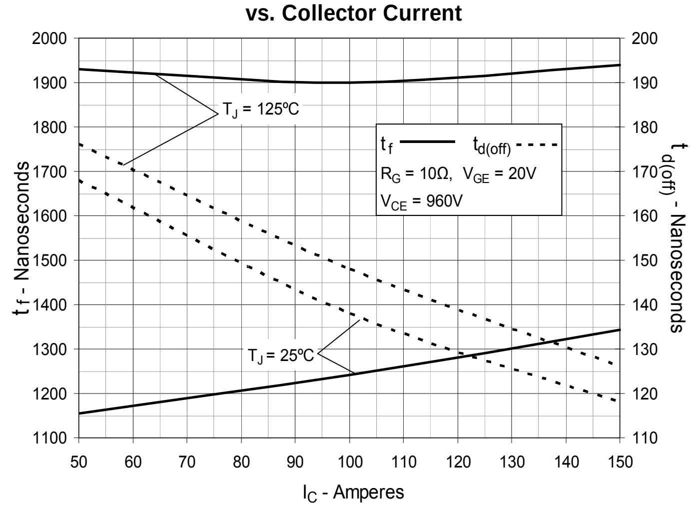


Fig. 19. Reverse-Bias Safe Operating Area

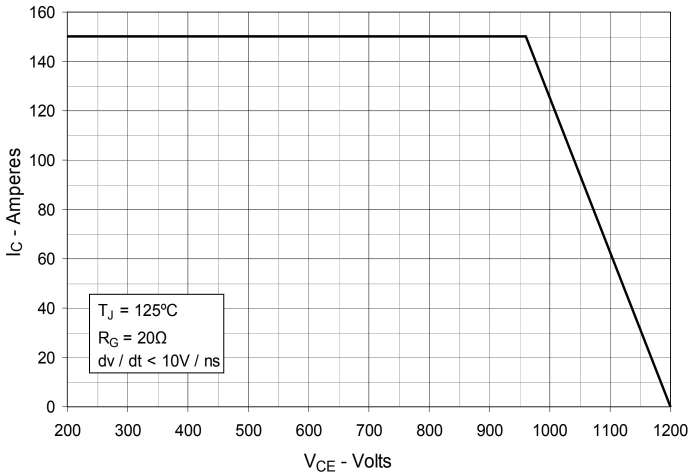


Fig. 20. Maximum Transient Thermal Impedance