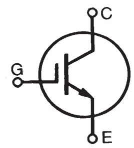
IXYS

GenX3™ 1200V IGBTs

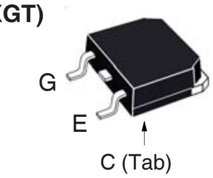
IXGH32N120A3
IXGT32N120A3

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

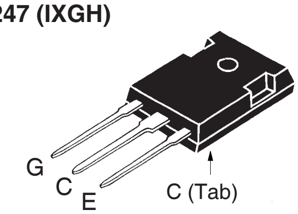
Ultra-Low Vsat PT IGBTs for up to 3 kHz Switching



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

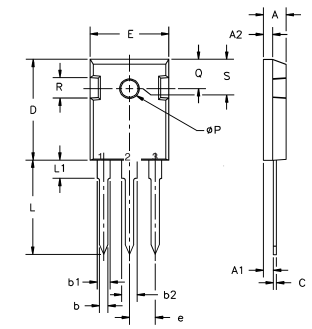
Applications

- 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 • 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 • V_{CES}, I_C = 100A		200		ns
$t_{d(off)}$	R_G = 10Ω (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 ≤ 300μs, duty cycle, d ≤ 2%.

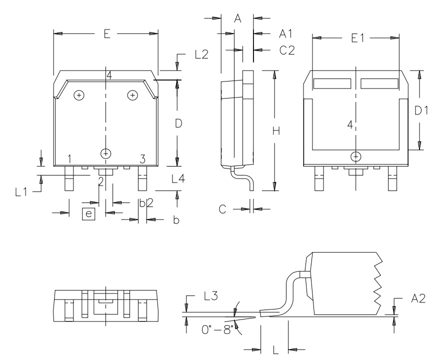
TO-247 AD Outline



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

Fig. 1. Output Characteristics @ T_J = 25ºC

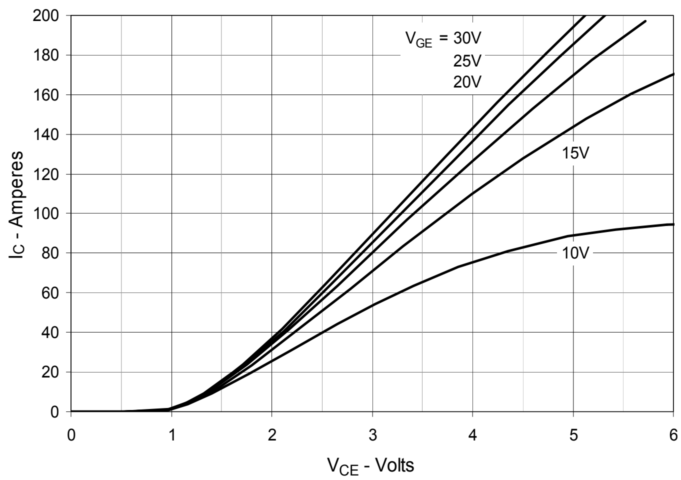


Fig. 2. Extended Output Characteristics @ T_J = 25ºC

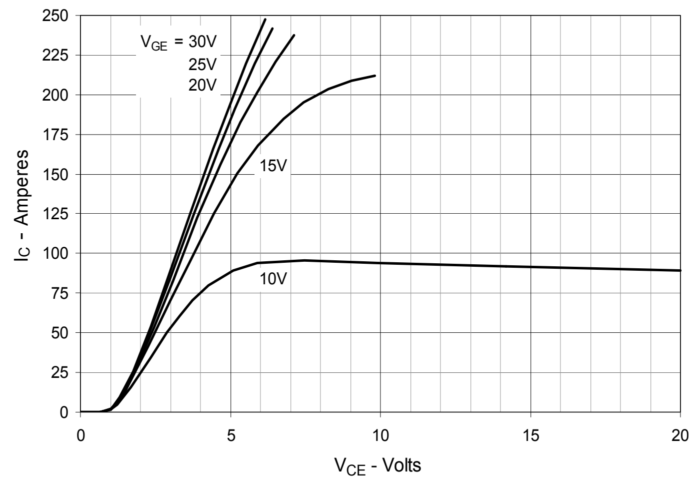


Fig. 3. Output Characteristics @ T_J = 125ºC

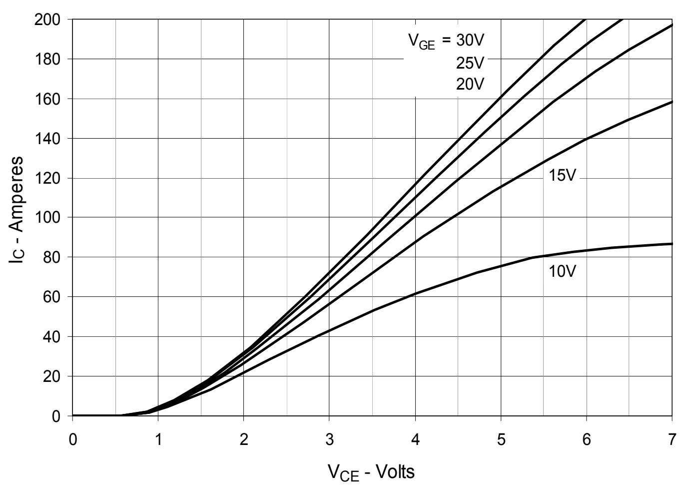


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

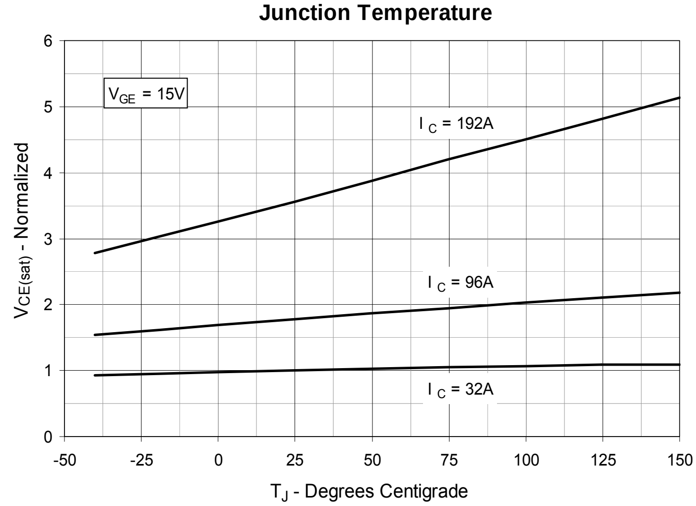


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

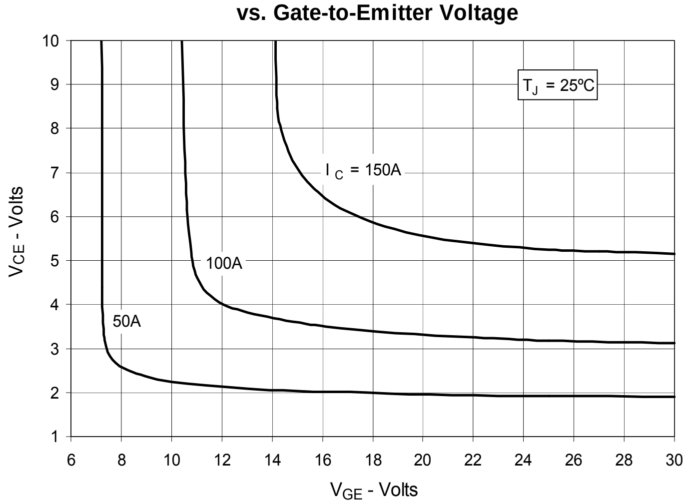


Fig. 6. Input Admittance

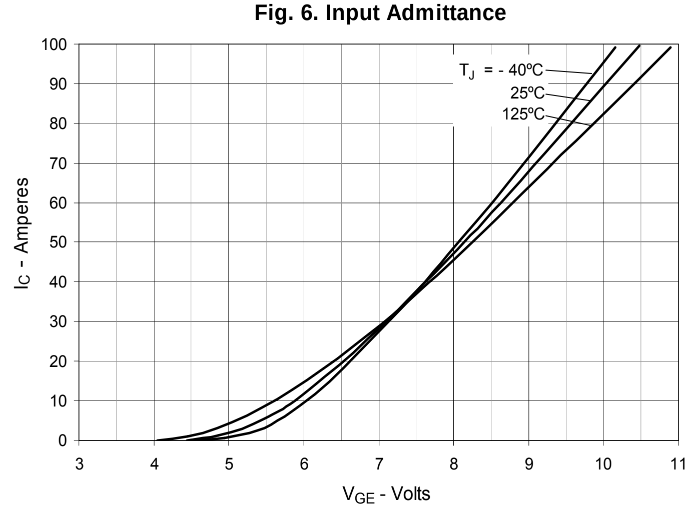


Fig. 7. Transconductance

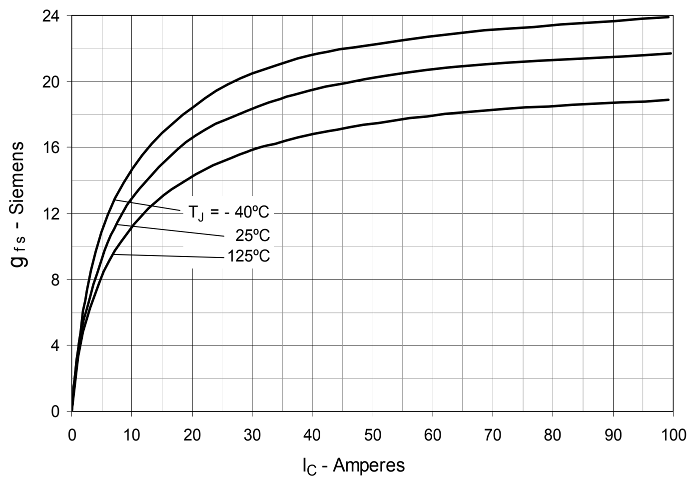


Fig. 8. Dependence of BV_{CES} & $V_{(th)GE}$ on Junction Temperature

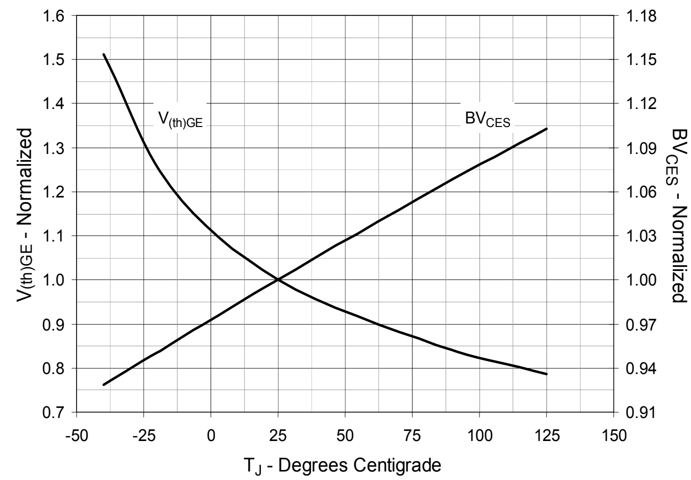


Fig. 9. Single-Pulsed Avalanche Energy vs. Junction Temperature

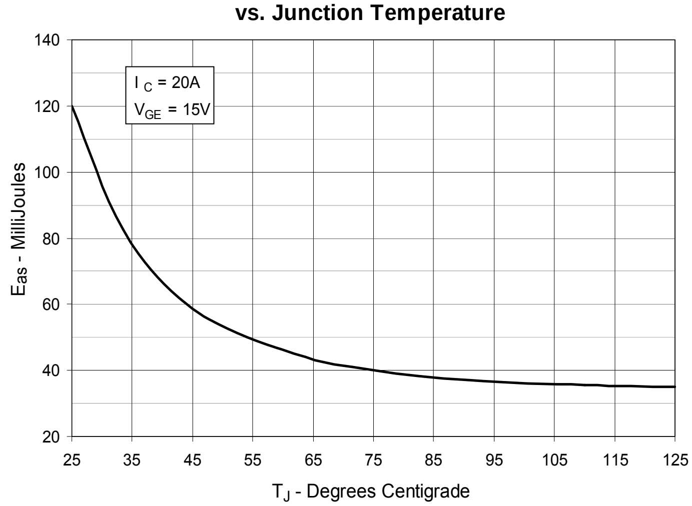


Fig. 10. Resistive Turn-on Rise Time vs. Gate Voltage

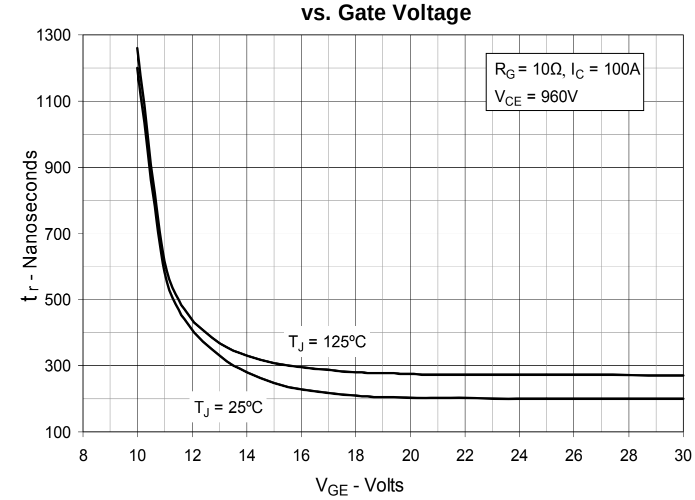


Fig. 11. Gate Charge

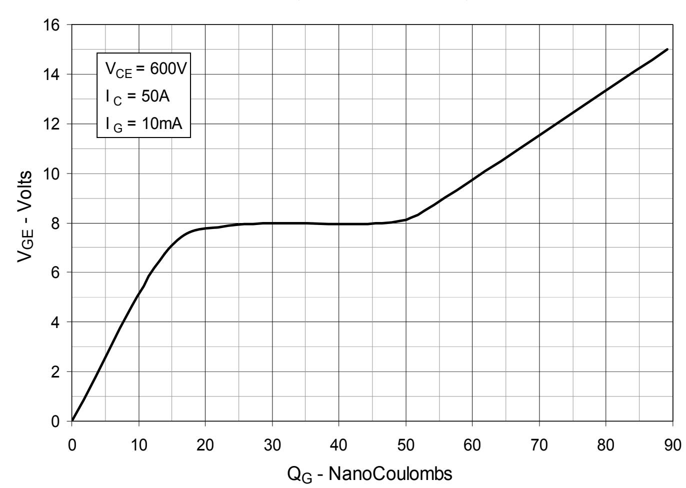


Fig. 12. Capacitance

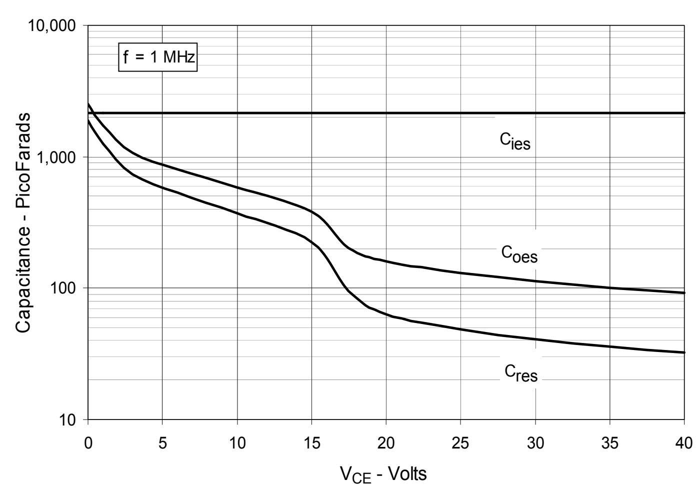


Fig. 13. Resistive Turn-on Switching Times vs. Gate Resistance

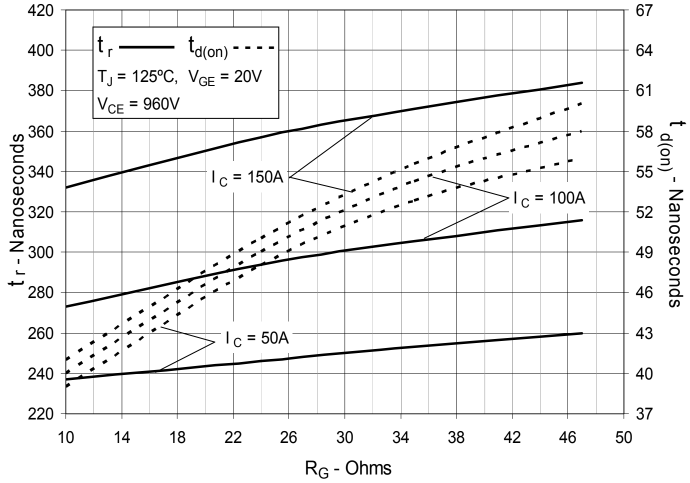


Fig. 14. Resistive Turn-on Rise Time vs. Junction Temperature

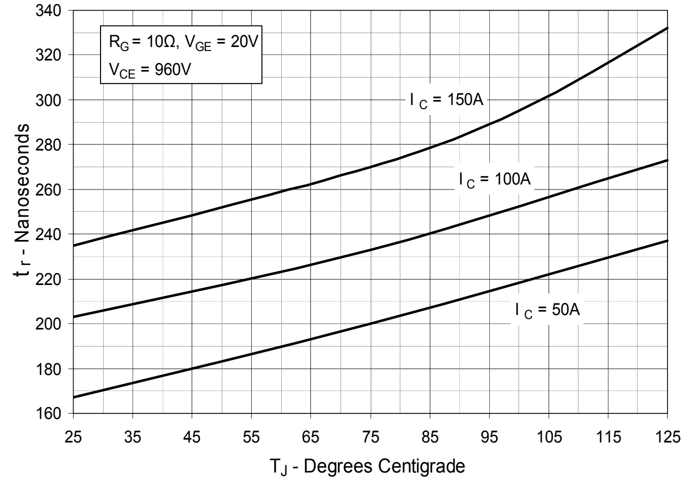


Fig. 15. Resistive Turn-on Rise Time vs. Collector Current

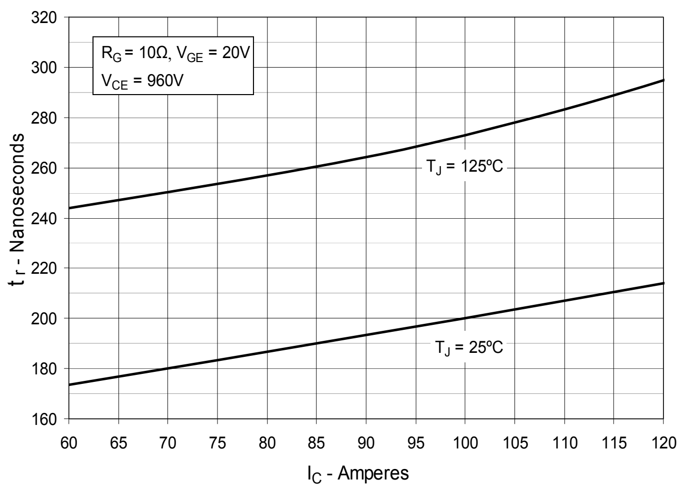


Fig. 16. Resistive Turn-off Switching Times vs. Gate Resistance

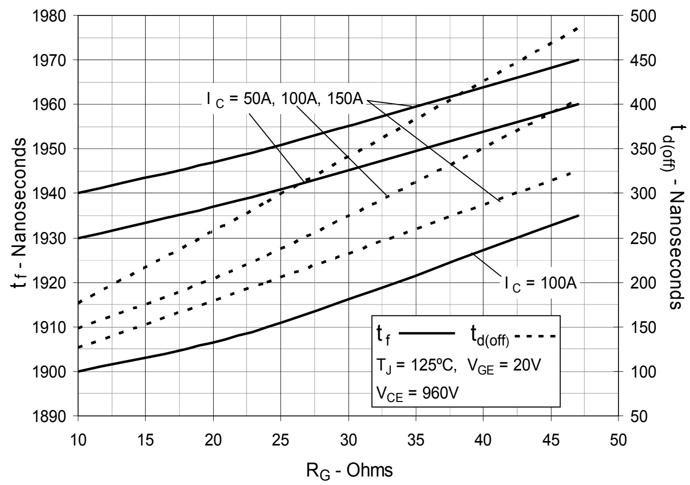


Fig. 17. Resistive Turn-off Switching Times vs. Junction Temperature

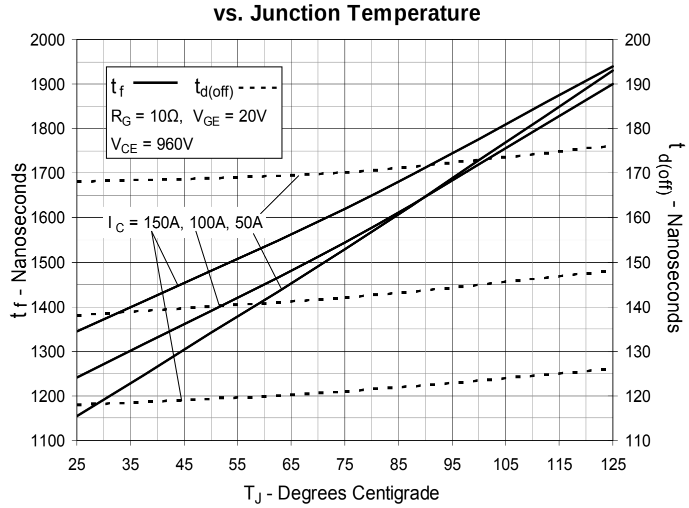


Fig. 18. Resistive Turn-off Switching Times vs. Collector Current

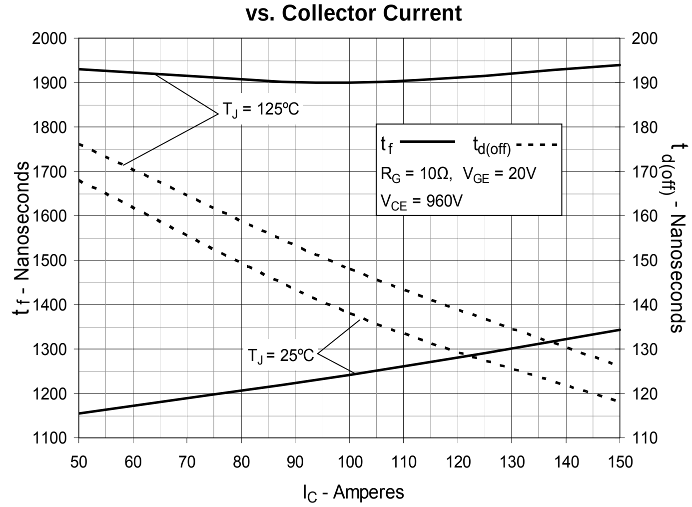


Fig. 19. Reverse-Bias Safe Operating Area

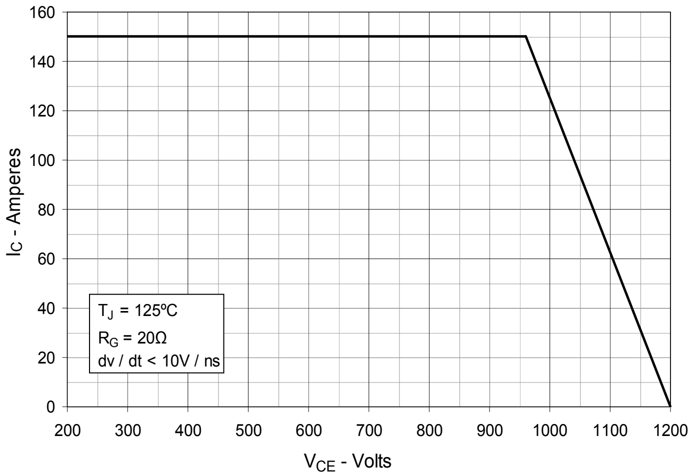


Fig. 20. Maximum Transient Thermal Impedance