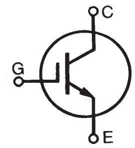
IXYS Preliminary Technical Information

High Voltage IGBT

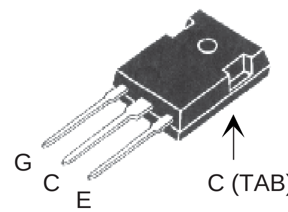
IXGH 32N120A3
IXGT 32N120A3

V_{CES} = 1200 V
I_{C25} = 75 A
$V_{CE(sat)} \leq$ 2.35 V

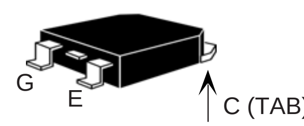


Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_C = 25°C to 150°C	1200	V
V_{CER}	T_J = 25°C to 150°C, R_{GE} = 1 MΩ	1200	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	T_C = 25°C, IGBT chip capability	75	A
I_{C110}	T_C = 90°C	32	A
I_{CM}	$T_J \leq$ 150°C, tp < 300 µs	230	A
I_{AS}	T_C = 25°C	20	A
E_{AS}	T_C = 25°C	120	mJ
SSOA (RBSOA)	V_{GE} = 15 V, T_{VJ} = 150°C, R_G = 20 Ω Clamped inductive load, V_{CE} < 0.8 V_{CES}	I_{CM} = 150	A
P_C	T_C = 25°C	300	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-40 ... +125	°C
Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s		300	°C
Plastic body		260	°C
M_d	Mounting torque (TO-247)	1.3/10	Nm/lb.in.
Weight	TO-257	6	g
	TO-268	4	g

TO-247 (IXGH)



TO-268 (IXGT)



G = Gate C = Collector
E = Emitter TAb = Collector

Features

- International standard packageS
- Low saturation voltage
- Avalanche rated
- MOS Gate turn-on
  - drive simplicity
- Epoxy molding meets UL 94V-O

Applications

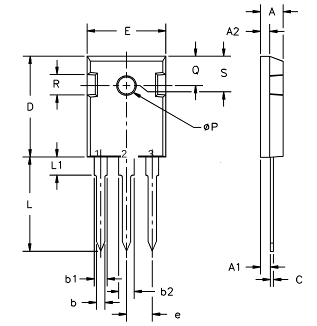
- Pulser circuits
- Capacitor discharge

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

Symbol	Test Conditions	Min.	Typ.	Max.	
Symbol	**Test Conditions**	**Characteristic Values**			
(T_J = 25°C unless otherwise specified)		**Min.**	**Typ.**	**Max.**	
g_{fs}	I_C = 50 A, V_{CE} = 10 V, Note 1	14	20		S
$I_{C(ON)}$	V_{CE} = 10 V, V_{GE} = 15 V, Note 1		15		A
C_{ies}			2150		pF
C_{oes}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		130		pF
C_{res}			48		pF
Q_g			89		nC
Q_{ge}	I_C = 50 A, V_{GE} = 15 V, V_{CE} = 0.5 V_{CES}		15		nC
Q_{gc}			34		nC
$t_{d(on)}$	Resistive load		39		ns
t_{ri}	I_C = 100 A, V_{GE} = 20 V, Note1		200		ns
$t_{d(off)}$	V_{CE} = 960 V, R_G = 10 Ω		140		ns
t_{fi}			1240		ns
R_{thJC}				0.42	K/W
R_{thCH}	(TO-247)		0.21		K/W

Note 1: Pulse test, t ≤ 300 ms, duty cycle ≤ 2 %

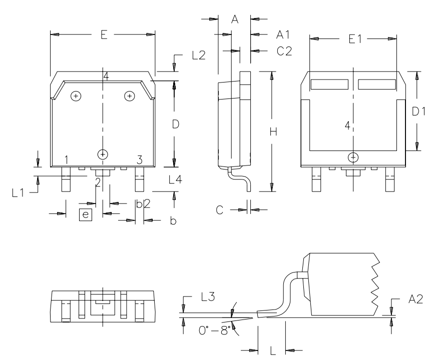
TO-247 AD Outline



Terminals: 1 - Gate 2 - Drain
3 - Source Tab - Drain

Dim.	Millimeter Min.	Millimeter Max.	Inches Min.	Inches 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 - Drain
3 - Source Tab - Drain

SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS 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

PRELIMINARY TECHNICAL INFORMATION

The product presented herein is under development. The Technical Specifications offered are derived from data gathered during objective characterizations of preliminary engineering lots; but also may yet contain some information supplied during a pre-production design evaluation. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

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Fig. 1. Output Characteristics @ 25ºC

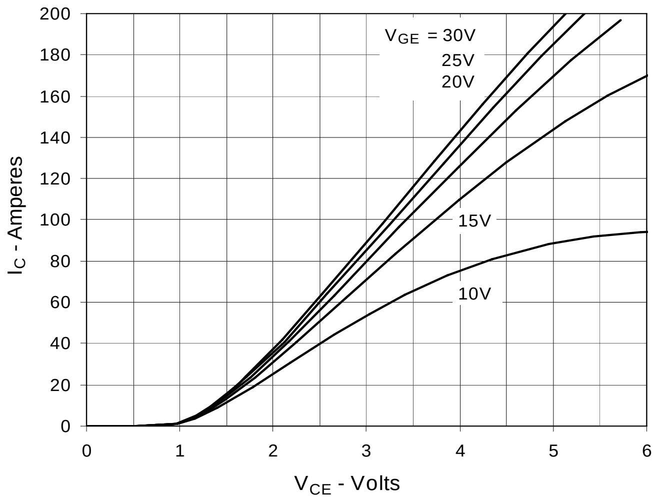

Fig. 2. Exteded Output Characteristics @ 25ºC

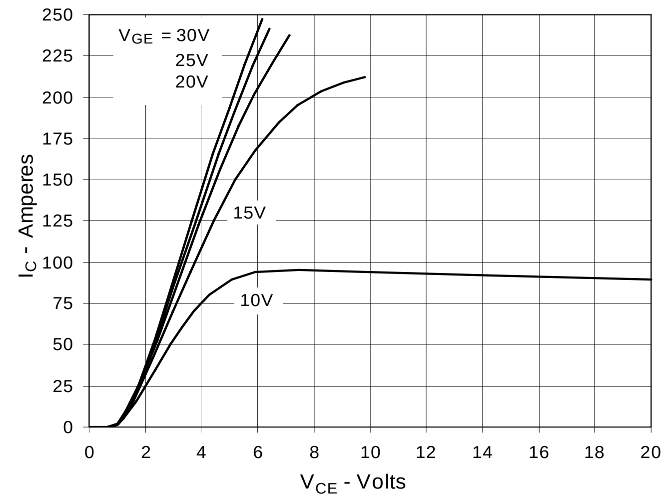

Fig. 3. Output Characteristics @ 125ºC

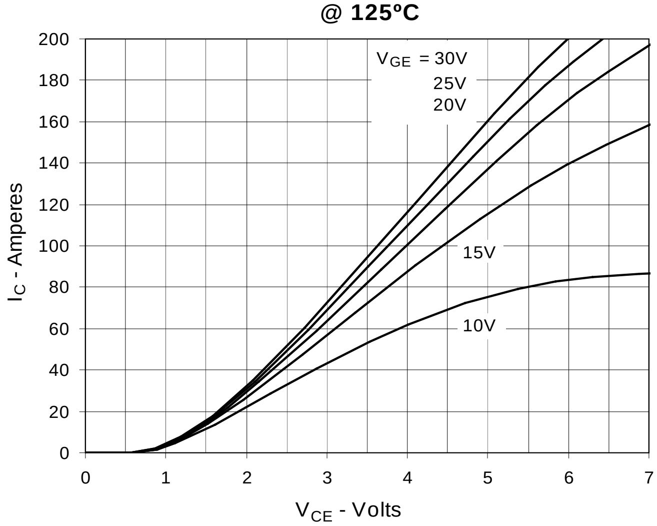

Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

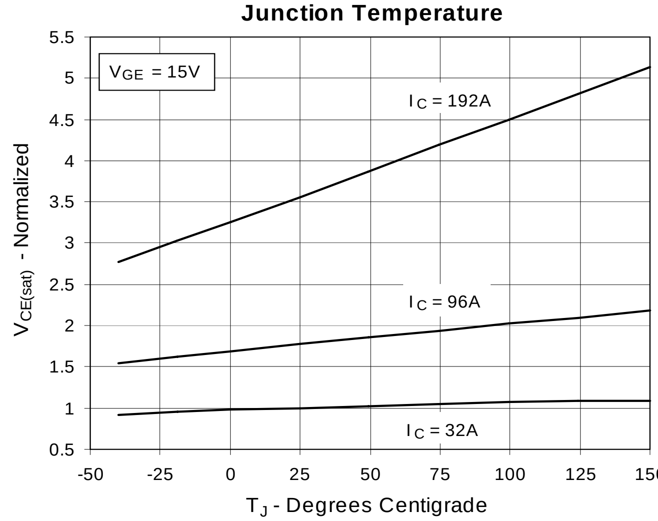

Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

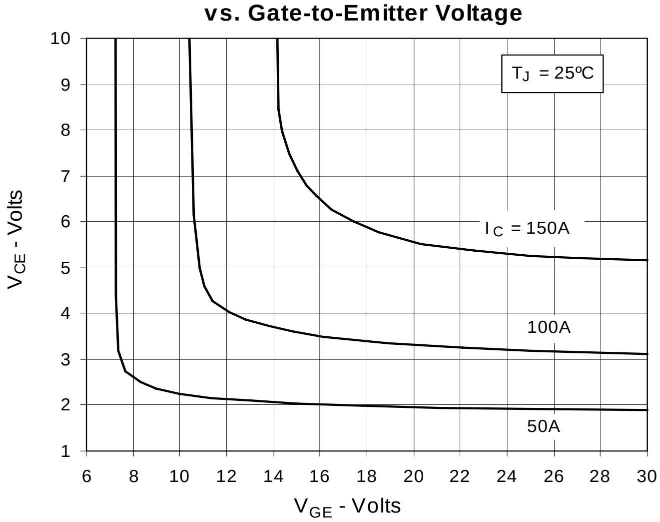

Fig. 6. Input Admittance

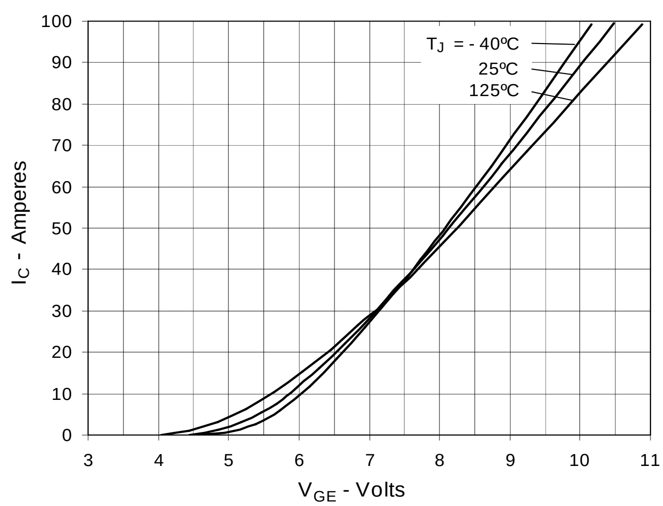

Fig. 7. Transconductance

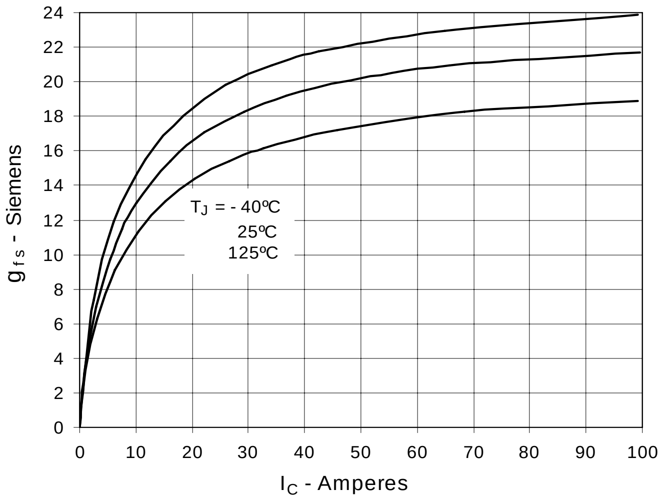

Fig. 8. Dependence of BV_{CES} & $V_{(th)GE}$ on Junction Temperature

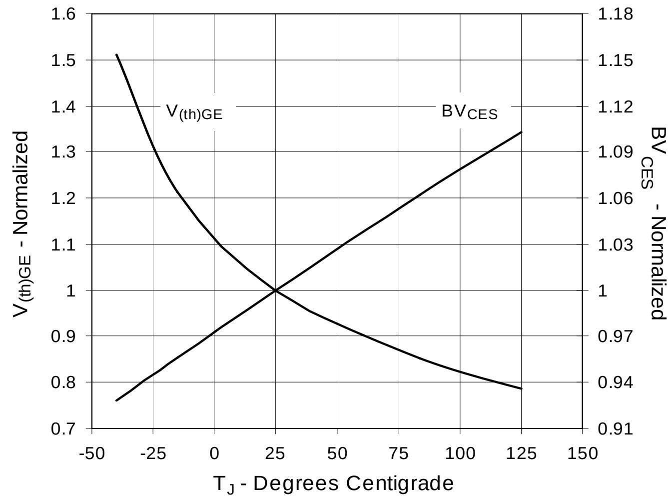

Fig. 9. Single-Pulsed Avalanche Energy vs. Junction Temperature

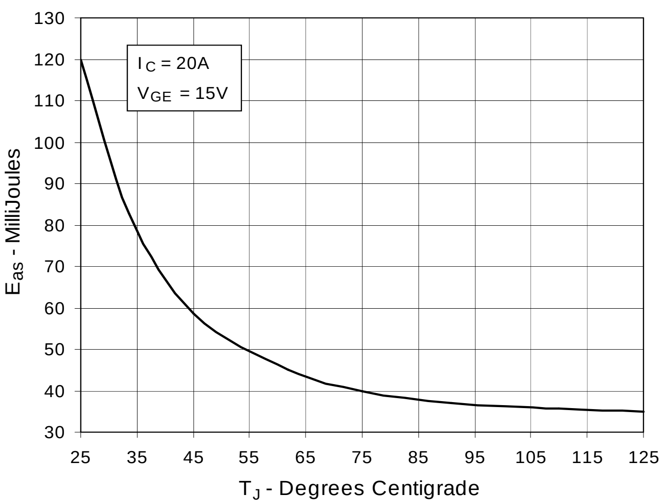

Fig. 10. Resistive Turn-on Rise Time vs. Gate Voltage

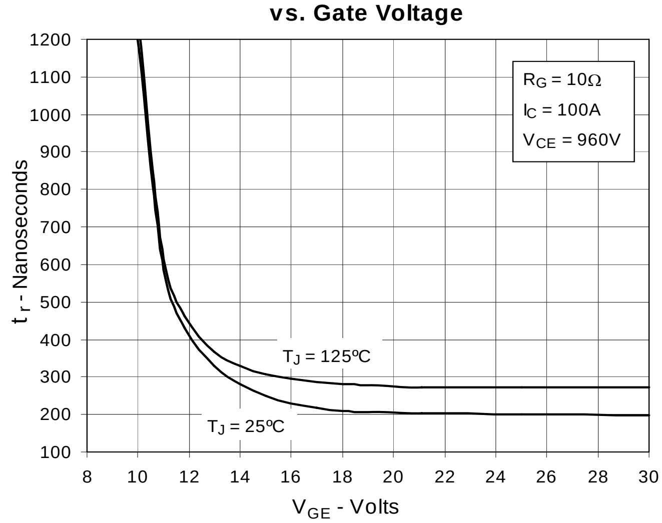

Fig. 11. Resistive Turn-on Rise Time vs. Junction Temperature

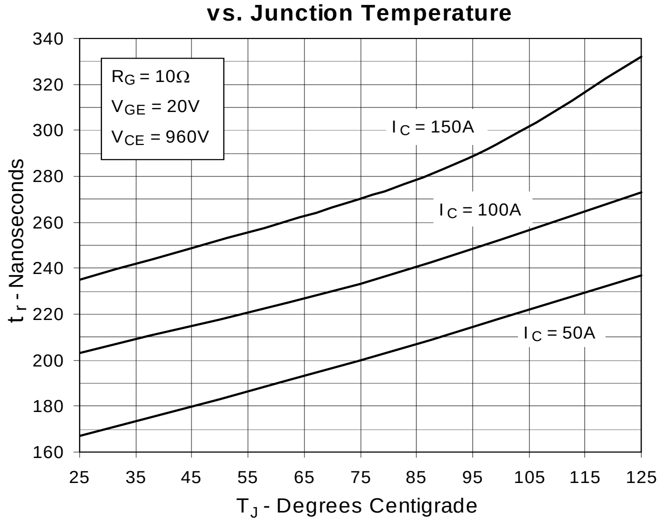

Fig. 12. Resistive Turn-on Rise Time vs. Collector Current

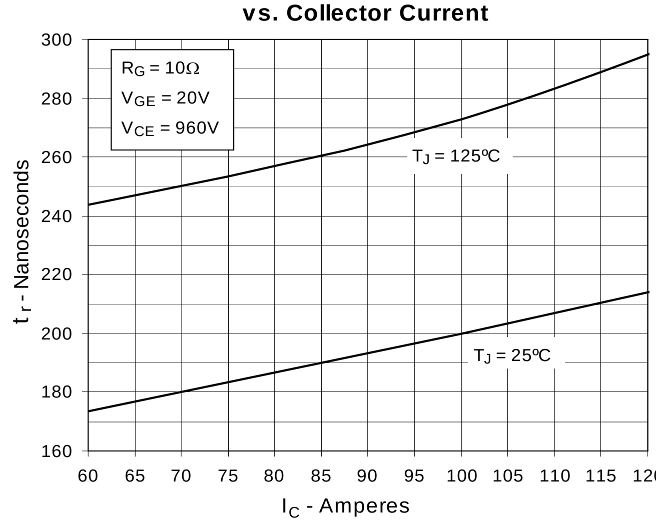

Fig. 13. Resistive Turn-on Switching Times vs. Gate Resistance

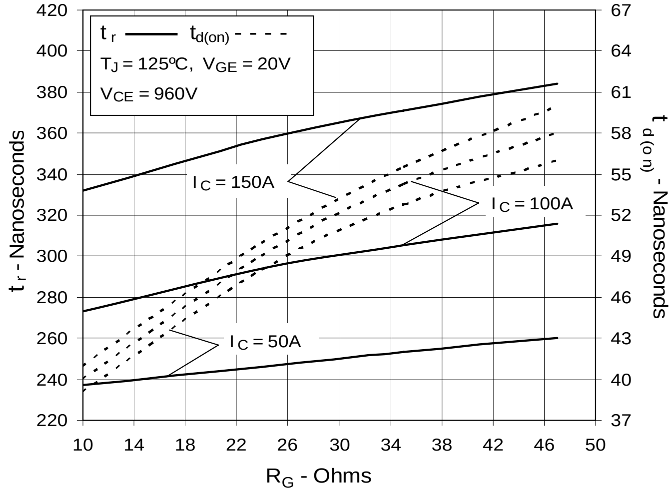

Fig. 14. Resistive Turn-off Switching Times vs. Junction Temperature

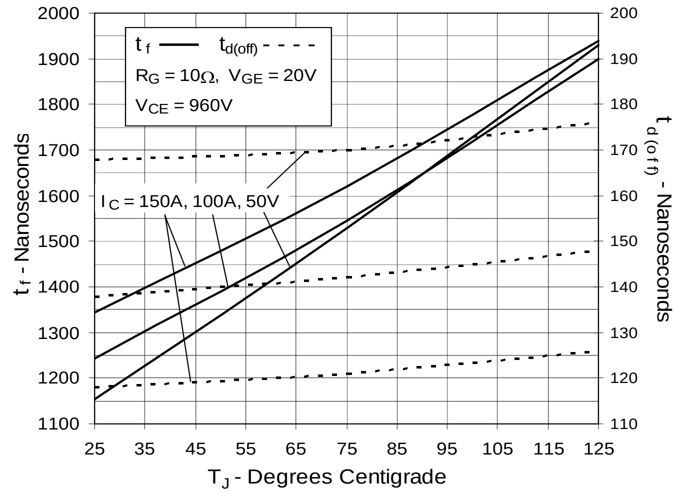

Fig. 15. Resistive Turn-off Switching Times vs. Collector Current

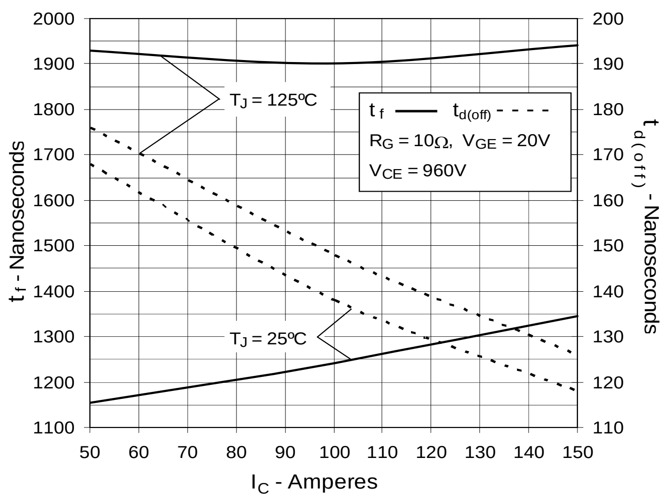

Fig. 16. Resistive Turn-off Switching Times vs. Gate Resistance

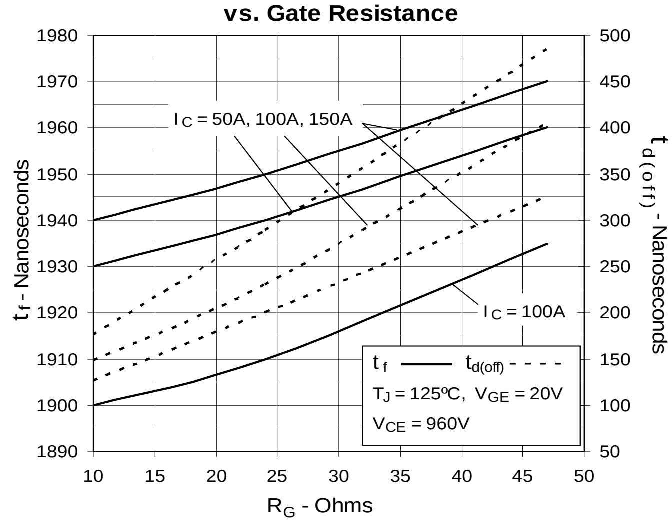

Fig. 17. Gate Charge

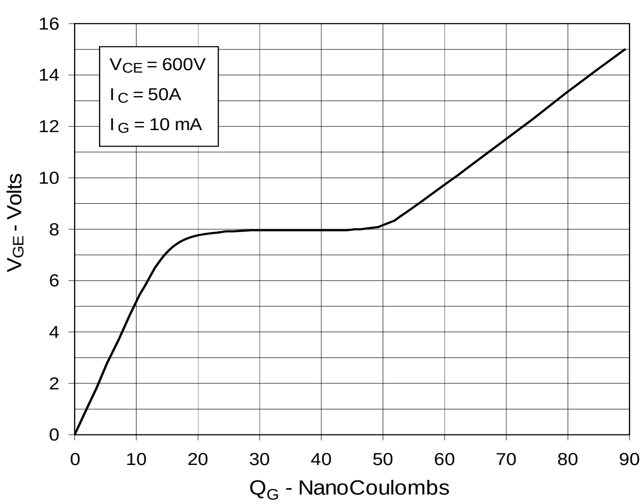

Fig. 18. Reverse-Bias Safe Operating Area

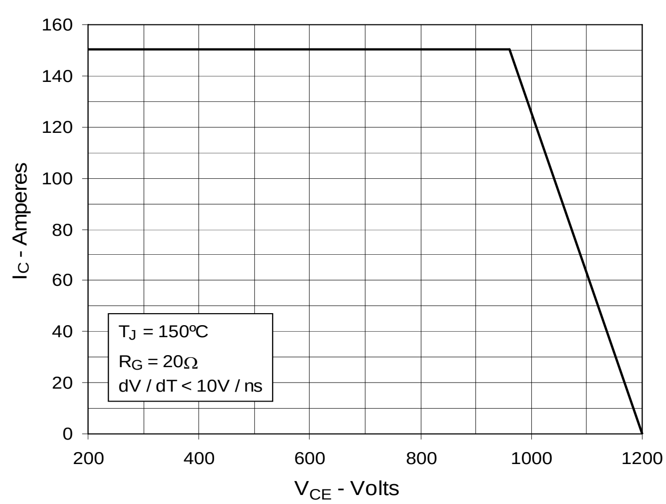

Fig. 19. Capacitance

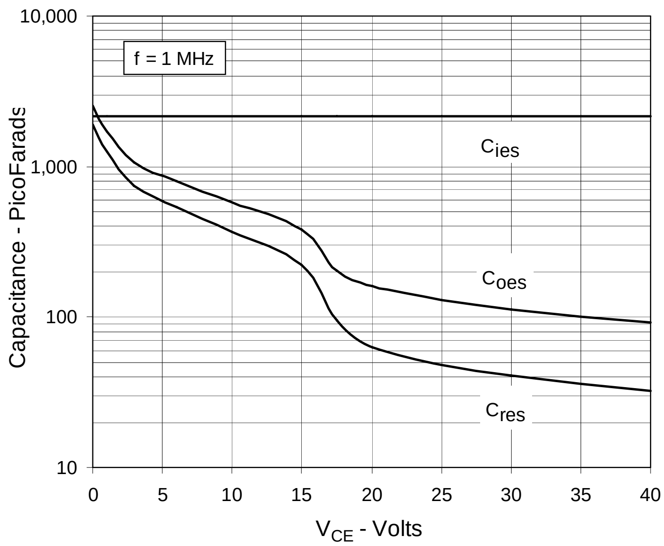

Fig. 20. Maximum Transient Thermal Resistance