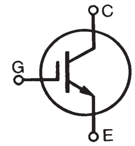
IXYS

Preliminary Technical Information

High Voltage IGBT

IXGH 32N120A3
IXGT 32N120A3

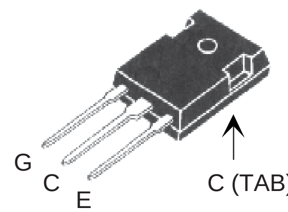
V_{CES} = 1200 V
I_{C25} = 75 A
$V_{CE(sat)} \leq$ 2.35 V



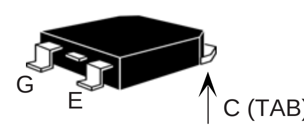
Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_C = 25°C to 150°C	1200	V
V_{CER}	T_J = 25°C to 150°C, R_{GE} = 1 MΩ	1200	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	T_C = 25°C, IGBT chip capability	75	A
I_{C110}	T_C = 90°C	32	A
I_{CM}	$T_J \leq$ 150°C, tp < 300 µs	230	A
I_{AS}	T_C = 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

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

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

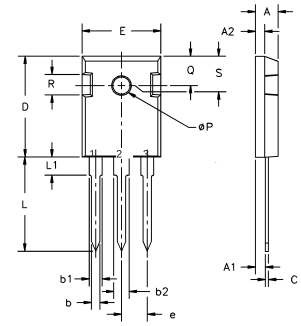
Symbol	Test Conditions	Characteristic Values Min.	Typ.	Max.	
(T_J = 25°C unless otherwise specified)					
g_{fs}	I_C = 50 A, V_{CE} = 10 V, Note 1	14	20		S
$I_{C(ON)}$	V_{CE} = 10 V, V_{GE} = 15 V, Note 1		15		A
C_{ies}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		2150		pF
C_{oes}			130		pF
C_{res}			48	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

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.

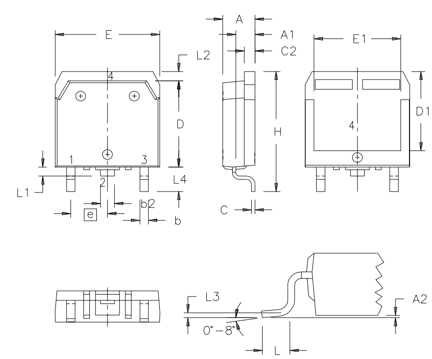
TO-247 AD Outline



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

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 - Drain
3 - Source Tab - Drain

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

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Fig. 1. Output Characteristics @ 25ºC

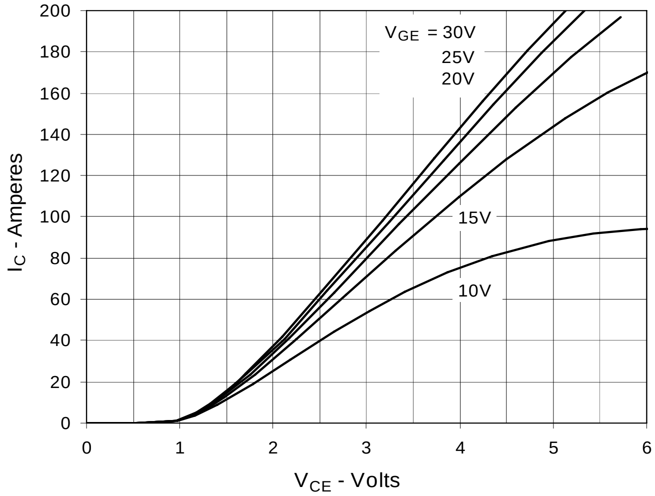


Fig. 2. Exteded Output Characteristics @ 25ºC

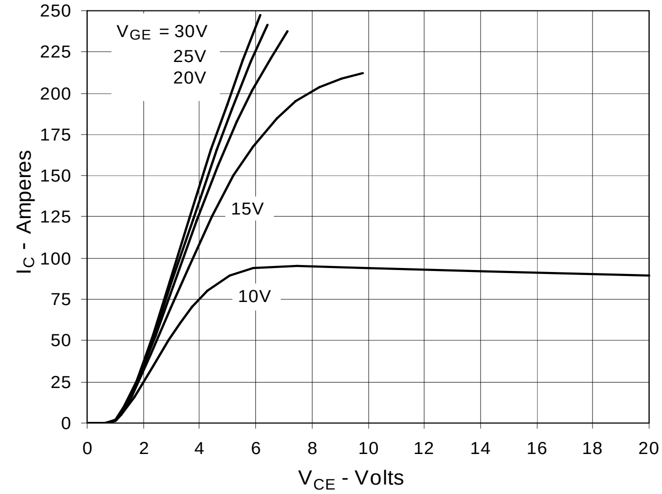


Fig. 3. Output Characteristics @ 125ºC

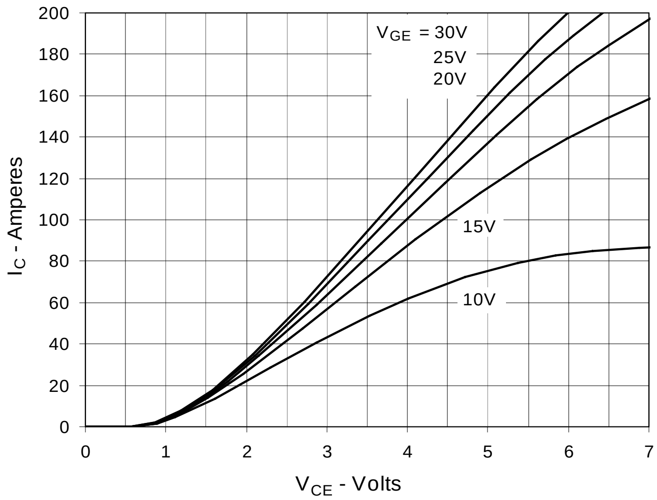


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

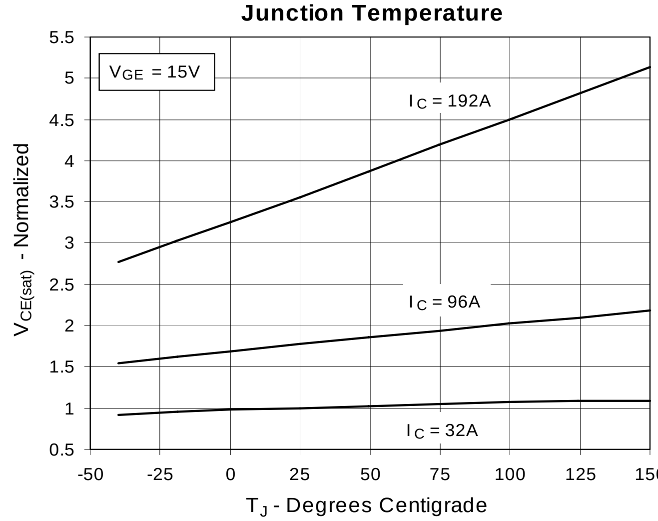


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

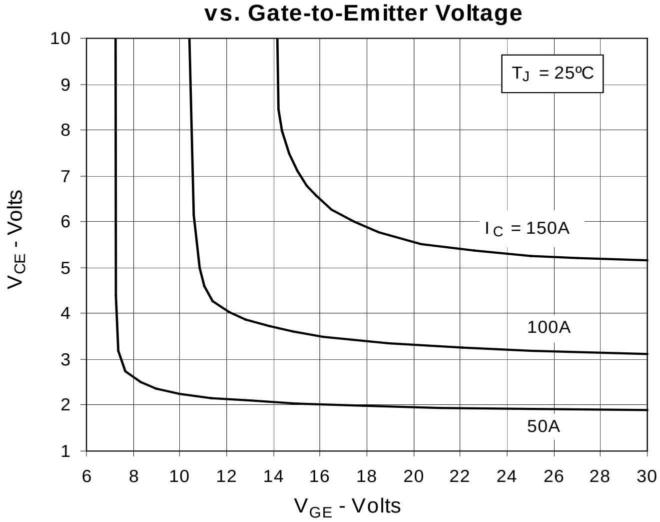


Fig. 6. Input Admittance

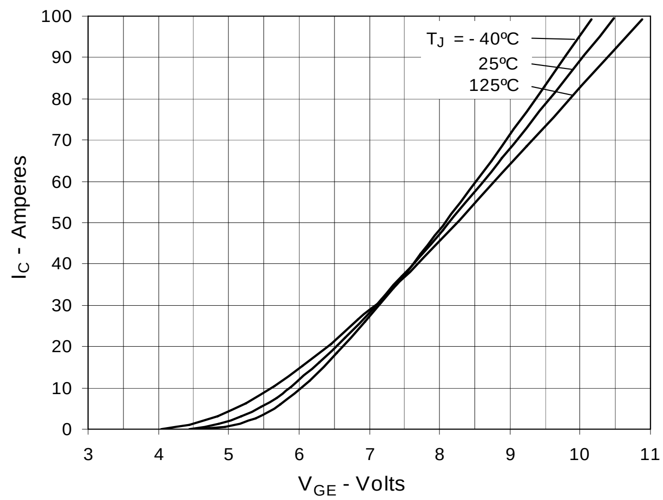


Fig. 7. Transconductance

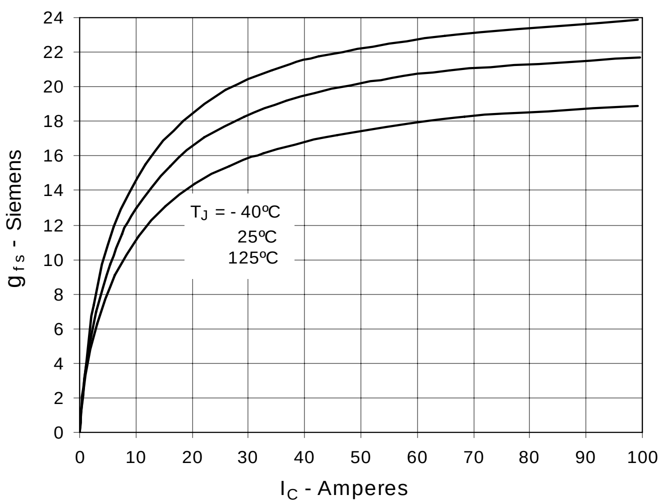


Fig. 8. Dependence of BV_{CES} & $V_{(th)GE}$ on Junction Temperature

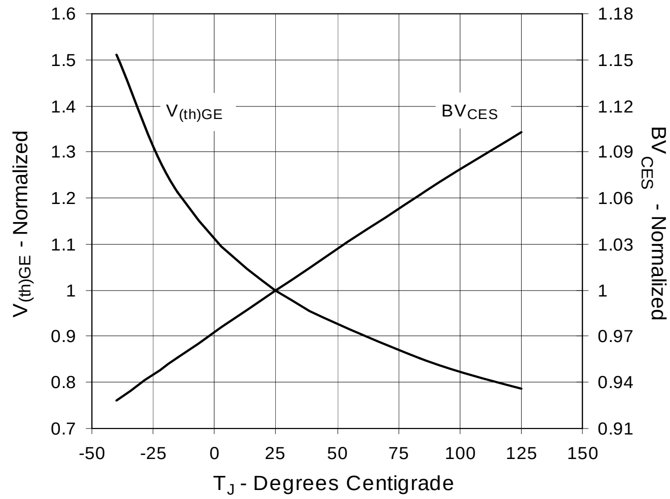


Fig. 9. Single-Pulsed Avalanche Energy vs. Junction Temperature

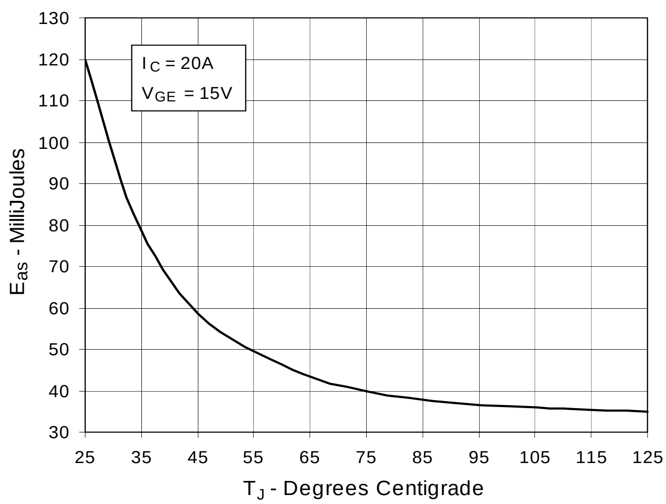


Fig. 10. Resistive Turn-on Rise Time vs. Gate Voltage

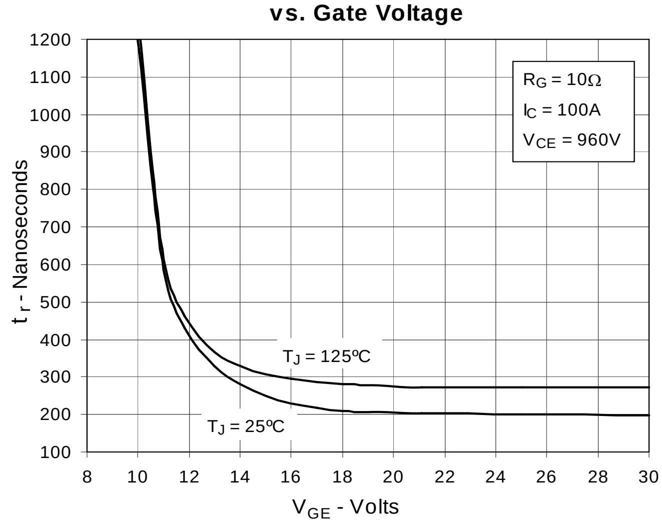


Fig. 11. Resistive Turn-on Rise Time vs. Junction Temperature

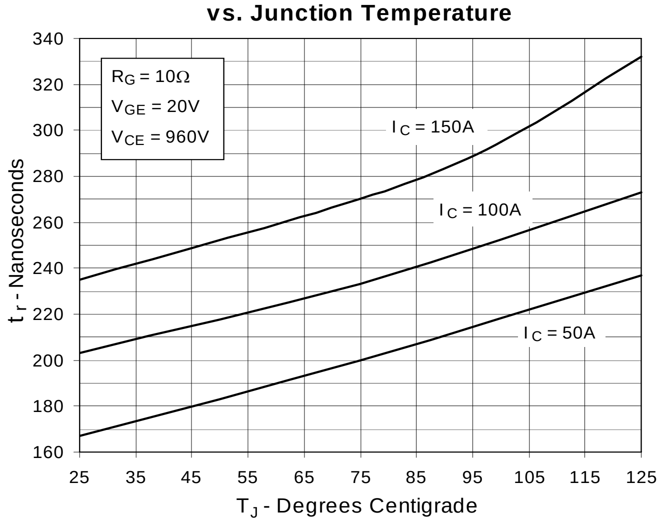
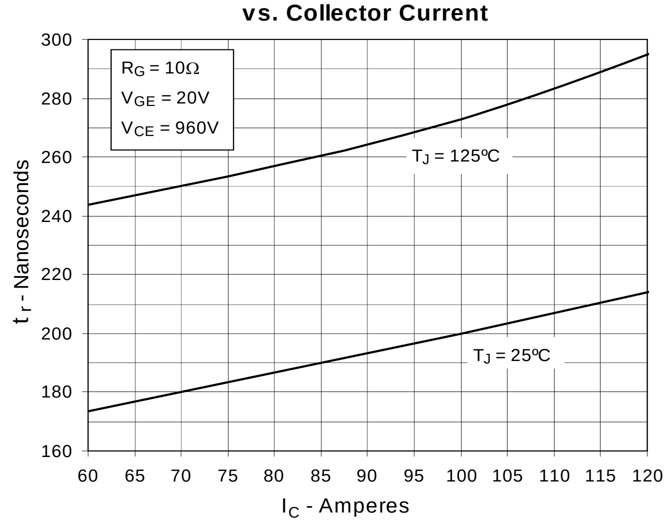


Fig. 12. Resistive Turn-on Rise Time vs. Collector Current



IXYS reserves the right to change limits, test conditions and dimensions.

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

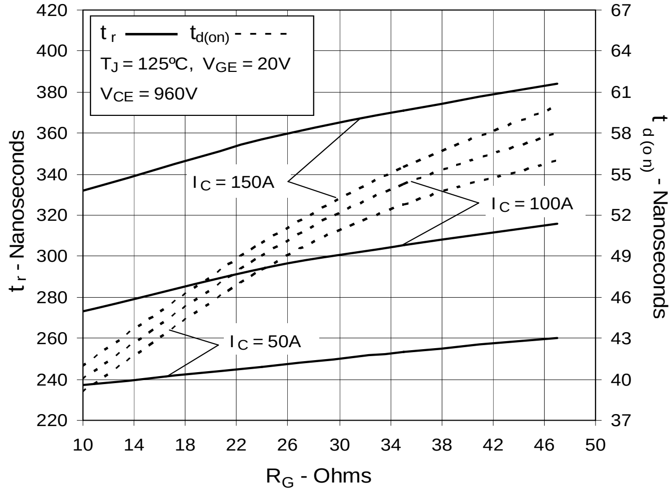


Fig. 14. Resistive Turn-off Switching Times vs. Junction Temperature

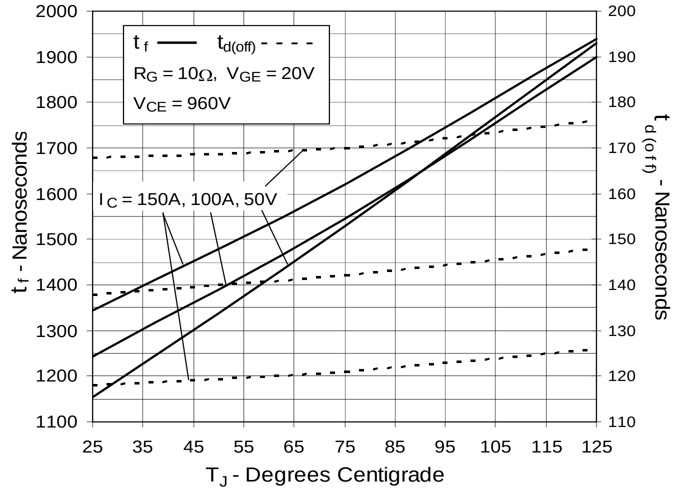


Fig. 15. Resistive Turn-off Switching Times vs. Collector Current

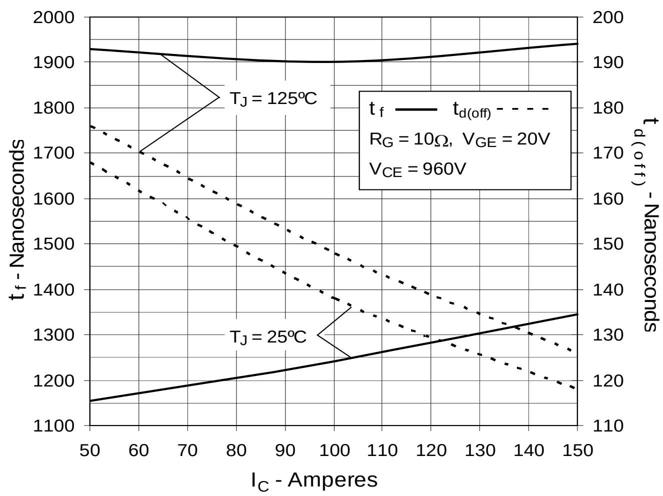


Fig. 16. Resistive Turn-off Switching Times vs. Gate Resistance

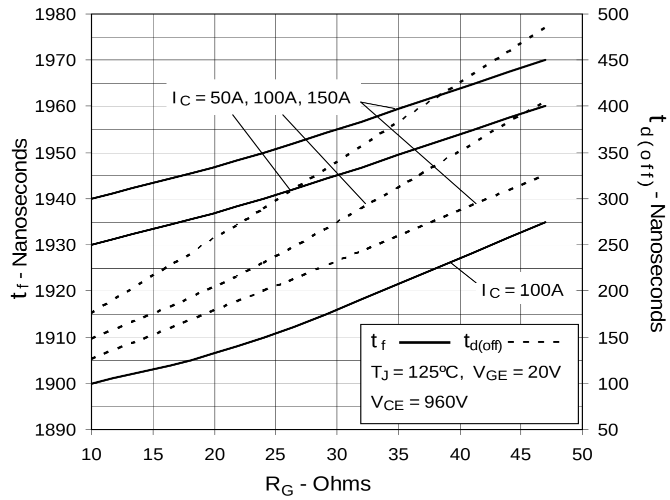


Fig. 17. Gate Charge

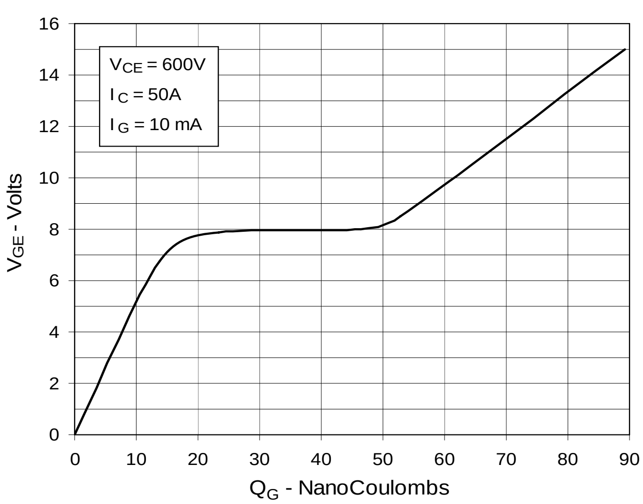
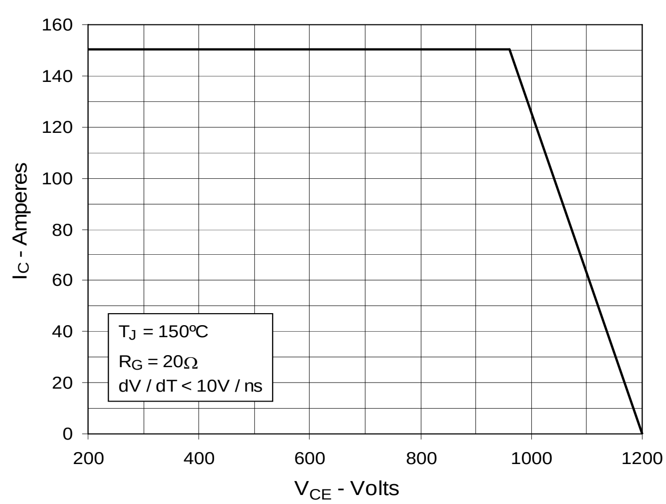


Fig. 18. Reverse-Bias Safe Operating Area



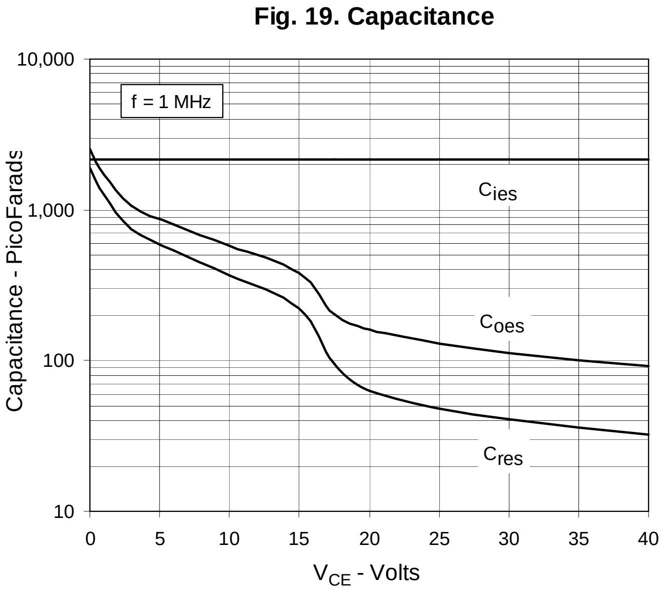


Fig. 19. Capacitance
f = 1 MHz
Cies
Coes
Cres
10,000
1,000
100
10
0
5
10
15
20
25
30
35
40
Capacitance - PicoFarads
VCE - Volts

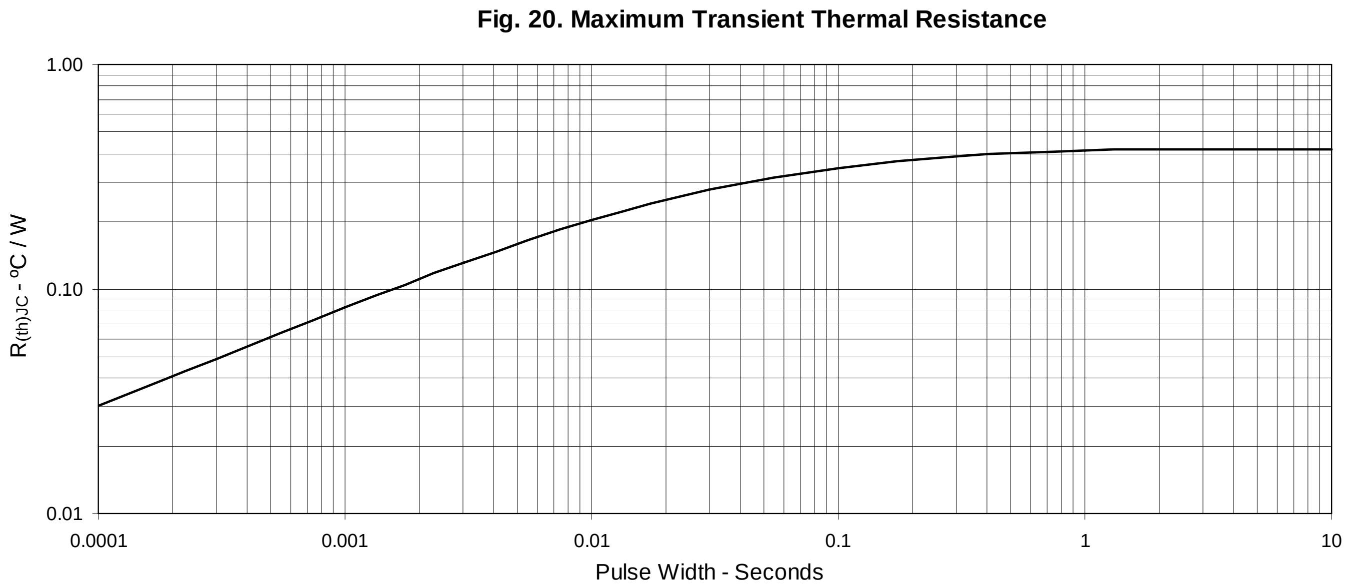


Fig. 20. Maximum Transient Thermal Resistance
1.00
0.10
0.01
0.0001
0.001
0.01
0.1
1
10
R(th)JC - ºC / W
Pulse Width - Seconds