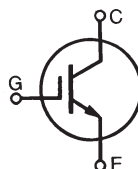


HiPerFAST™ IGBTs

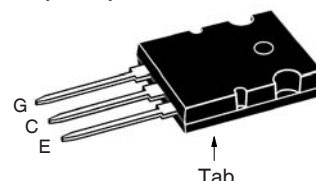
IXGK120N60B IXGX120N60B

$$\begin{aligned} V_{CES} &= 600V \\ I_{C90} &= 120A \\ V_{CE(sat)} &\leq 2.1V \end{aligned}$$

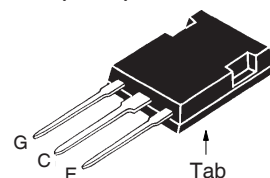


Symbol	Test Conditions	Maximum Ratings	
V_{CES}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}$	600	V
V_{CGR}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}, R_{GE} = 1M\Omega$	600	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	$T_C = 25^\circ\text{C}$ (Chip Capability)	200	A
I_{C90}	$T_C = 90^\circ\text{C}$	120	A
I_{LRMS}	Terminal Current Limit	76	A
I_{CM}	$T_C = 25^\circ\text{C}, 1\text{ms}$	300	A
SSOA (RBSOA)	$V_{GE} = 15V, T_{VJ} = 125^\circ\text{C}, R_G = 2.4\Omega$ Clamped Inductive Load	$I_{CM} = 200$ @ $0.8 \cdot V_{CES}$	A V
P_C	$T_C = 25^\circ\text{C}$	660	W
T_J		-55 ... +150	$^\circ\text{C}$
T_{JM}		150	$^\circ\text{C}$
T_{stg}		-55 ... +150	$^\circ\text{C}$
T_L	Maximum Lead Temperature for Soldering	300	$^\circ\text{C}$
T_{SOLD}	1.6 mm (0.062 in.) from Case for 10	260	$^\circ\text{C}$
M_d	Mounting Torque (IXGK)	1.13/10	Nm/lb.in.
F_C	Mounting Force (IXGX)	20..120/4.5..27	N/lb.
Weight	TO-264	10	g
	PLUS247	6	g

TO-264 (IXGK)



PLUS247 (IXGX)



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

Features

- Very High Current, Fast Switching IGBT
- Low $V_{CE(sat)}$
 - for Minimum On-State Conduction Losses
- MOS Gate turn-on
 - Drive Simplicity

Advantages

- PLUS 247™ Package for Clip or Spring Mounting
- Space Savings
- High Power Density

Applications

- AC Motor Speed Drives
- DC Servo and Robot Drives
- DC Choppers
- Uninterruptible Power Supplies (UPS)
- Switch-Mode and Resonant-Mode Power Supplies

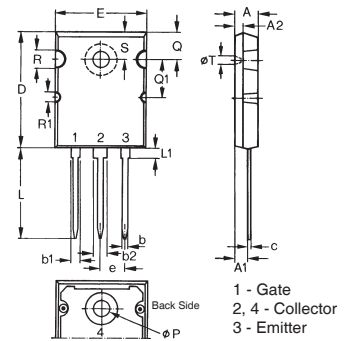
Symbol	Test Conditions ($T_J = 25^\circ\text{C}$, Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
BV_{CES}	$I_C = 1\text{mA}, V_{GE} = 0V$	600		V
$V_{GE(th)}$	$I_C = 4\text{mA}, V_{CE} = V_{GE}$	2.5		5.5 V
I_{CES}	$V_{CE} = V_{CES}, V_{GE} = 0V$ $T_J = 125^\circ\text{C}$			200 μA 2 mA
I_{GES}	$V_{CE} = 0V, V_{GE} = \pm 20V$			± 400 nA
$V_{CE(sat)}$	$I_C = I_{C90}, V_{GE} = 15V, \text{Note 1}$			2.1 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 1	50	75	S
C_{ies}	$V_{CE} = 25\text{V}$, $V_{GE} = 0\text{V}$, $f = 1\text{MHz}$		11	nF
C_{oes}			680	pF
C_{res}			190	pF
Q_g	$I_C = I_{C90}$, $V_{GE} = 15\text{V}$, $V_{CE} = 0.5 \cdot V_{CES}$		350	nC
Q_{ge}			72	nC
Q_{gc}			131	nC
$t_{d(on)}$	Inductive Load, $T_J = 25^\circ\text{C}$ $I_C = 100\text{A}$, $V_{GE} = 15\text{V}$ $V_{CE} = 0.8 \cdot V_{CES}$, $R_G = 2.4\Omega$ Note 2		60	ns
t_{ri}			45	ns
E_{on}			2.4	mJ
$t_{d(off)}$			200	ns
t_{fi}			160	ns
E_{off}			5.5	mJ
$t_{d(on)}$	Inductive Load, $T_J = 125^\circ\text{C}$ $I_C = 100\text{A}$, $V_{GE} = 15\text{V}$ $V_{CE} = 0.8 \cdot V_{CES}$, $R_G = 2.4\Omega$ Note 2		60	ns
t_{ri}			60	ns
E_{on}			4.8	mJ
$t_{d(off)}$			290	ns
t_{fi}			250	ns
E_{off}			8.7	mJ
R_{thJC}			0.15	$^\circ\text{C/W}$
R_{thCS}				$^\circ\text{C/W}$

Notes:

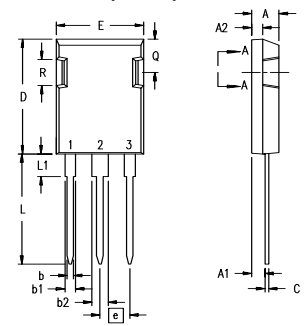
1. Pulse test, $t \leq 300\mu\text{s}$, duty cycle, $d \leq 2\%$.
2. Switching times & energy losses may increase for higher $V_{CE}(\text{Clamp})$, T_J or R_G .

TO-264 AA (IXGK) Outline



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.82	5.13	.190	.202
A1	2.54	2.89	.100	.114
A2	2.00	2.10	.079	.083
b	1.12	1.42	.044	.056
b1	2.39	2.69	.094	.106
b2	2.90	3.09	.114	.122
c	0.53	0.83	.021	.033
D	25.91	26.16	1.020	1.030
E	19.81	19.96	.780	.786
e	5.46 BSC		.215 BSC	
J	0.00	0.25	.000	.010
K	0.00	0.25	.000	.010
L	20.32	20.83	.800	.820
L1	2.29	2.59	.090	.102
P	3.17	3.66	.125	.144
Q	6.07	6.27	.239	.247
Q1	8.38	8.69	.330	.342
R	3.81	4.32	.150	.170
R1	1.78	2.29	.070	.090
S	6.04	6.30	.238	.248
T	1.57	1.83	.062	.072

PLUS247™ (IXGX) Outline



Terminals: 1 - Gate
2 - Collector
3 - Emitter

Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.83	5.21	.190	.205
A1	2.29	2.54	.090	.100
A2	1.91	2.16	.075	.085
b	1.14	1.40	.045	.055
b1	1.91	2.13	.075	.084
b2	2.92	3.12	.115	.123
C	0.61	0.80	.024	.031
D	20.80	21.34	.819	.840
E	15.75	16.13	.620	.635
e	5.45 BSC		.215 BSC	
L	19.81	20.32	.780	.800
L1	3.81	4.32	.150	.170
Q	5.59	6.20	.220	.244
R	4.32	4.83	.170	.190

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

Fig. 1. Output Characteristics
@ 25 °C

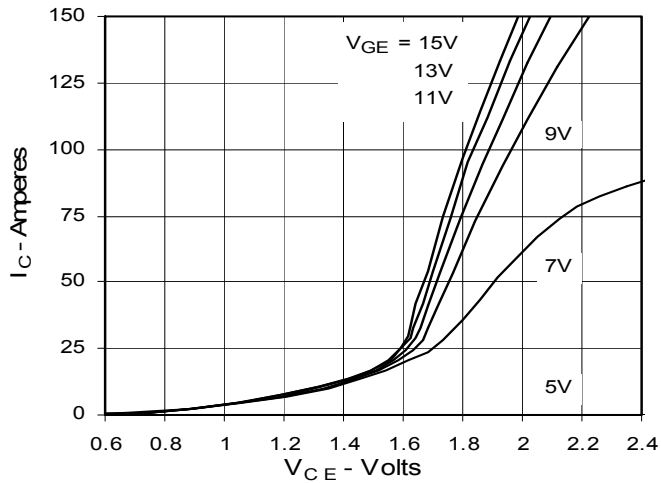


Fig. 2. Extended Output Characteristics
@ 25 °C

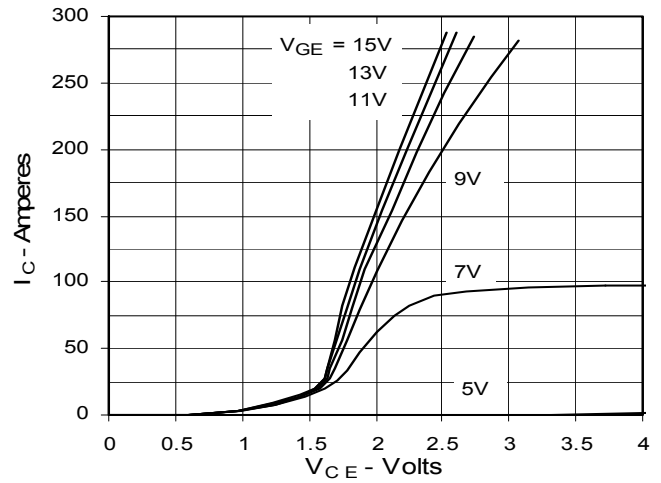


Fig. 3. Output Characteristics
@ 125 °C

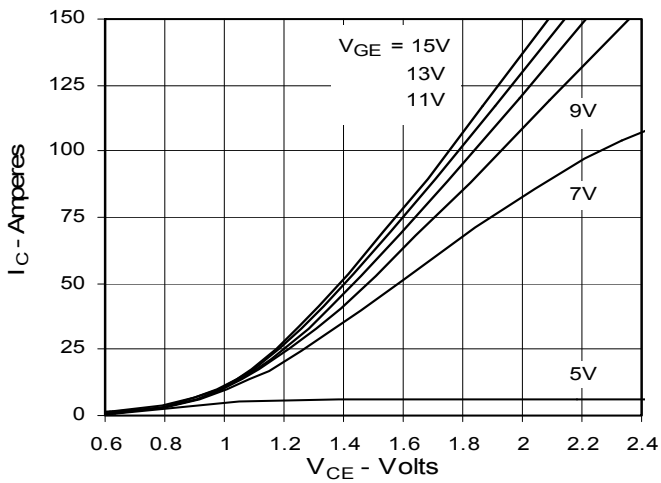


Fig. 4. Dependence of $V_{CE(sat)}$ on Temperature

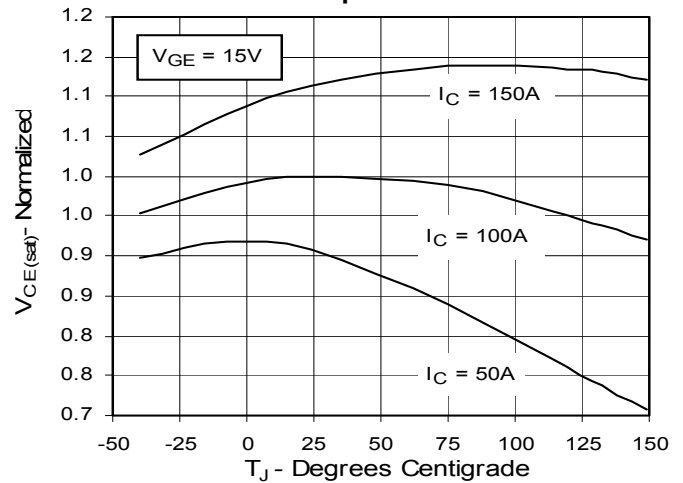


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter voltage

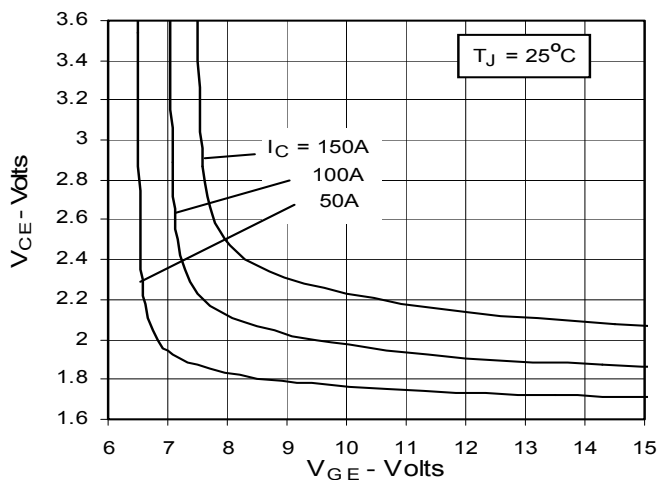


Fig. 6. Input Admittance

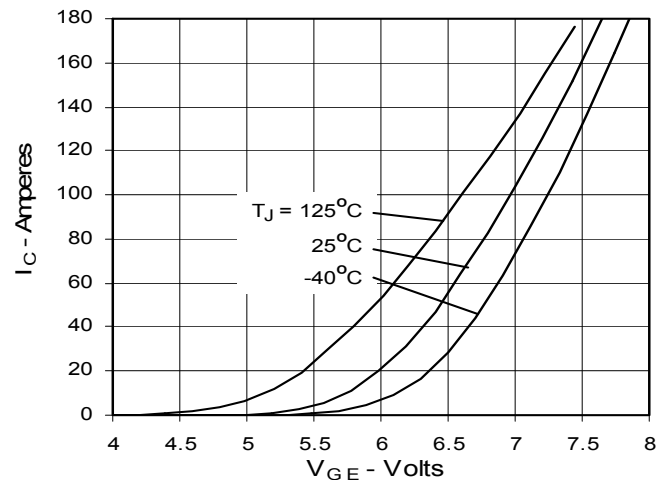


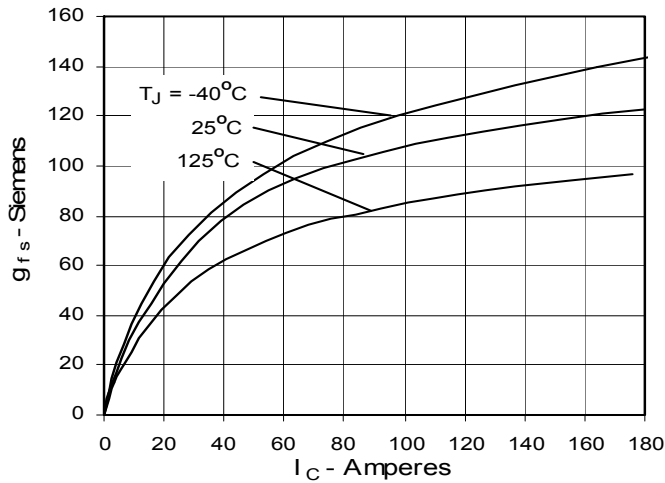
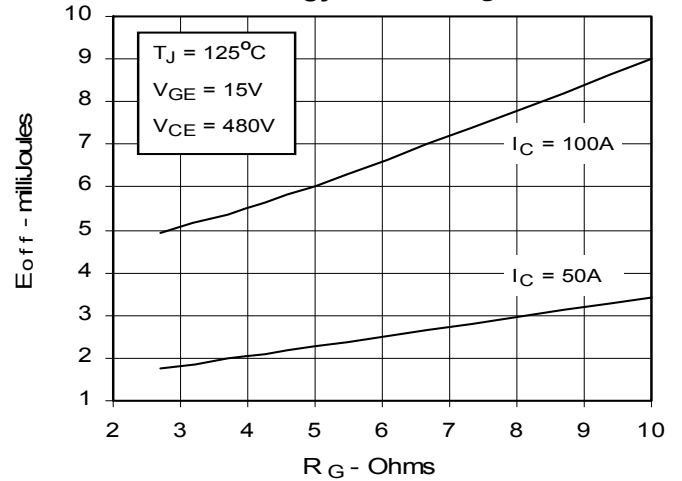
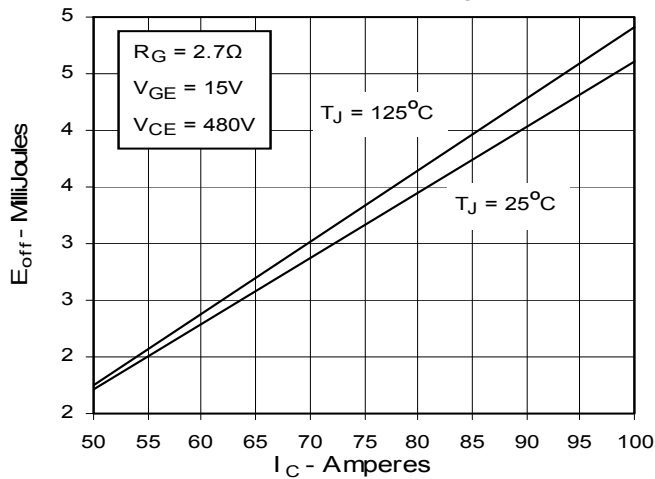
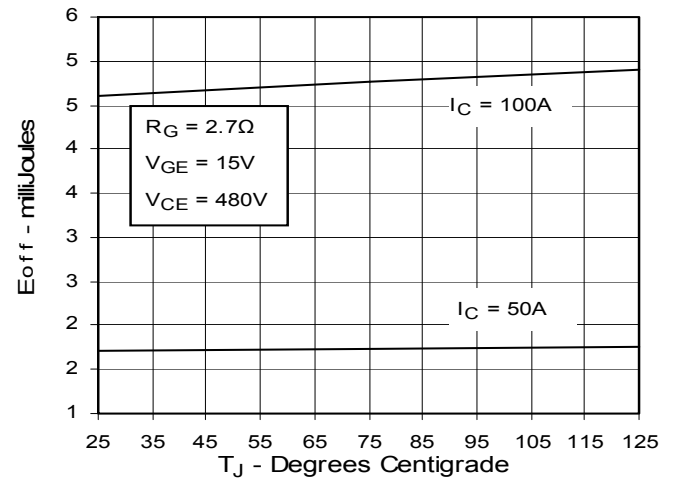
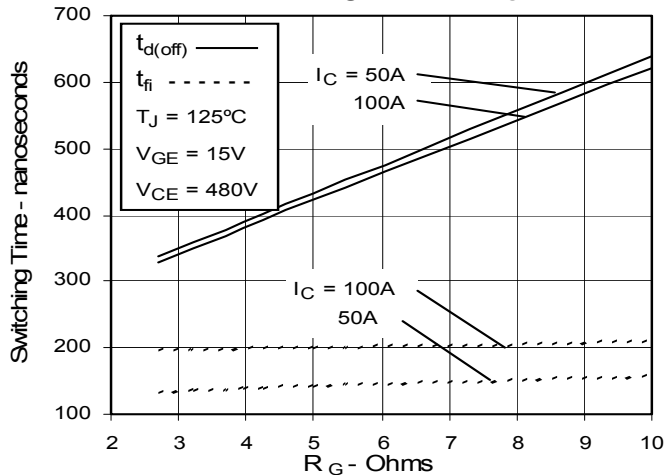
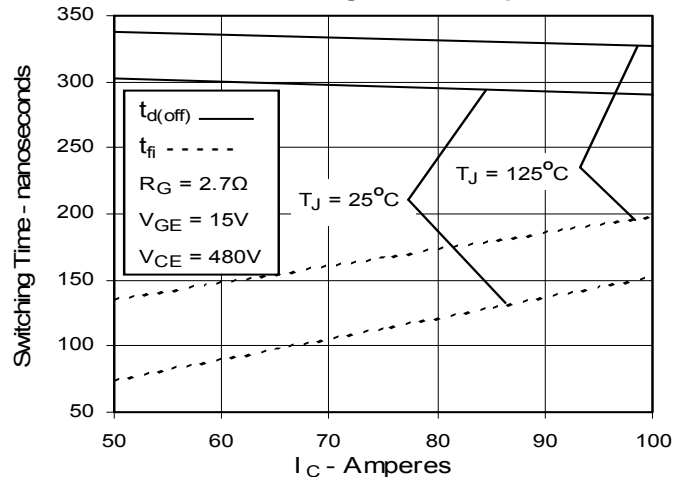
Fig. 7. Transconductance

Fig. 8. Dependence of Turn-off Energy Loss on R_G

Fig. 9. Dependence of Turn-Off Energy Loss on I_C

Fig. 10. Dependence of Turn-off Energy Loss on Temperature

Fig. 11. Dependence of Turn-off Switching Time on R_G

Fig. 12. Dependence of Turn-off Switching Time on I_C


Fig. 13. Dependence of Turn-off Switching Time on Temperature

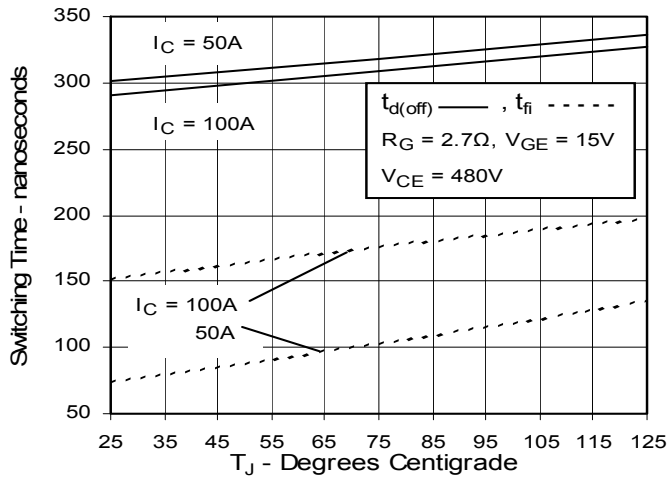


Fig. 14. Gate Charge

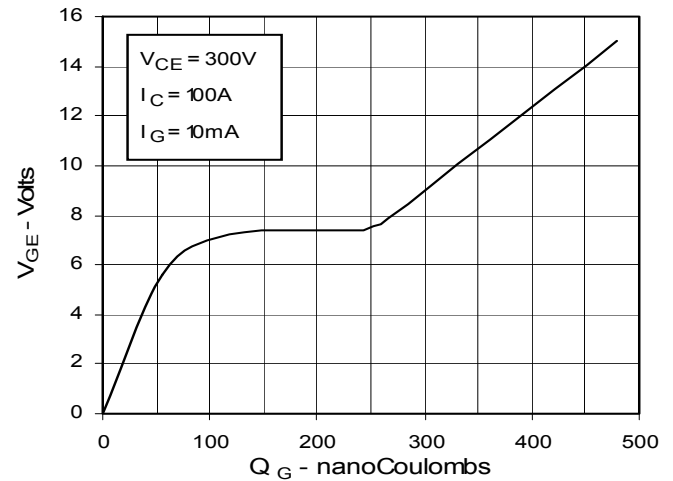


Fig. 15. Capacitance

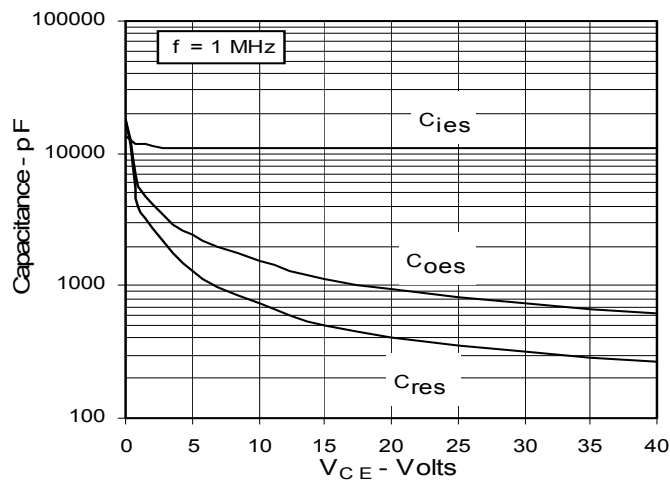


Fig. 16. Reverse-Bias Safe Operating Area

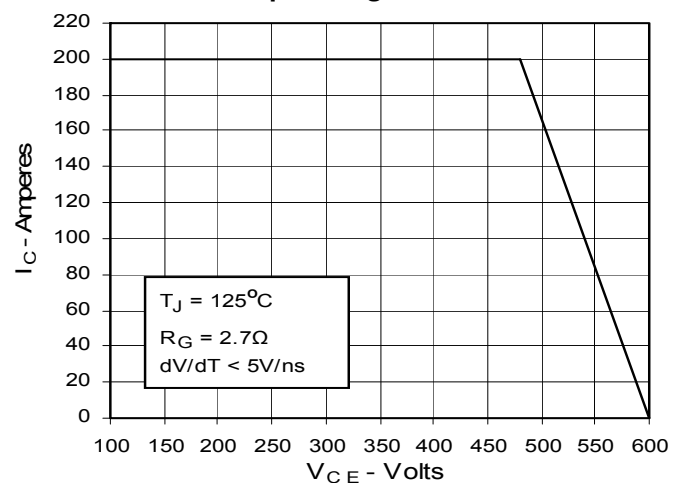


Fig. 17. Maximum Transient Thermal Resistance

