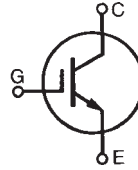


HiPerFAST™ IGBT

B2-Class High Speed IGBTs

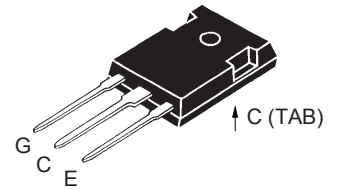
IXGH 50N90B2
IXGT 50N90B2

$$\begin{aligned} V_{CES} &= 900 \text{ V} \\ I_{C25} &= 75 \text{ A} \\ V_{CE(sat)} &= 2.7 \text{ V} \\ t_{fityp} &= 200 \text{ ns} \end{aligned}$$

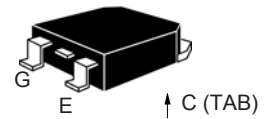


Symbol	Test Conditions	Maximum Ratings	
V_{CES}	$T_J = 25^\circ\text{C}$ to 150°C	900	V
V_{CGR}	$T_J = 25^\circ\text{C}$ to 150°C ; $R_{GE} = 1 \text{ M}\Omega$	900	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	$T_C = 25^\circ\text{C}$ (limited by leads)	75	A
I_{C110}	$T_C = 110^\circ\text{C}$	50	A
I_{CM}	$T_C = 25^\circ\text{C}$, 1 ms	200	A
SSOA (RBSOA)	$V_{GE} = 15 \text{ V}$, $T_{VJ} = 125^\circ\text{C}$, $R_G = 10 \Omega$ Clamped inductive load @ $\leq 600 \text{ V}$	$I_{CM} = 100$	A
P_C	$T_C = 25^\circ\text{C}$	400	W
T_J		-55 ... +150	$^\circ\text{C}$
T_{JM}		150	$^\circ\text{C}$
T_{stg}		-55 ... +150	$^\circ\text{C}$
Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s		300	$^\circ\text{C}$
M_d	Mounting torque (TO-247)	1.13/10Nm/lb.in.	
Weight		TO-247 AD	6 g
		TO-268	4 g

TO-247
(IXGH)



TO-268
(IXGT)



G = Gate,
E = Emitter,

C = Collector,
TAB = Collector

Features

- High frequency IGBT
- High current handling capability
- MOS Gate turn-on
- drive simplicity

Applications

- PFC circuits
- Uninterruptible power supplies (UPS)
- Switched-mode and resonant-mode power supplies
- AC motor speed control
- DC servo and robot drives
- DC choppers

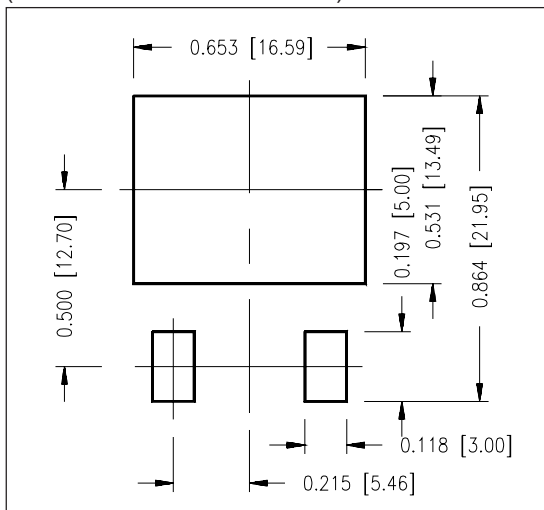
Advantages

- High power density
- Very fast switching speeds for high frequency applications

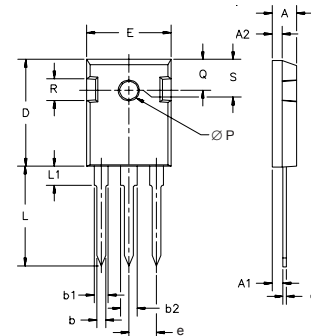
Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
$V_{GE(th)}$	$I_C = 250 \mu\text{A}$, $V_{CE} = V_{GE}$	3.0		5.0 V
I_{CES}	$V_{CE} = V_{CES}$ $V_{GE} = 0 \text{ V}$			50 μA 1 mA
I_{GES}	$V_{CE} = 0 \text{ V}$, $V_{GE} = \pm 20 \text{ V}$			$\pm 100 \text{ nA}$
$V_{CE(sat)}$	$I_C = I_{C110}$, $V_{GE} = 15 \text{ V}$		2.2	2.7 V V
	$T_J = 125^\circ\text{C}$			

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
g_{fs}	$I_C = I_{C110} A$; $V_{CE} = 10\text{ V}$, Pulse test, $t \leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$	25	40	S
C_{ies}	$V_{CE} = 25\text{ V}$, $V_{GE} = 0\text{ V}$, $f = 1\text{ MHz}$		2500	pF
C_{oes}			180	pF
C_{res}			75	pF
Q_g	$I_C = I_{C110} A$, $V_{GE} = 15\text{ V}$, $V_{CE} = 0.5 V_{CES}$		135	nC
Q_{ge}			23	nC
Q_{gc}			50	nC
$t_{d(on)}$	Inductive load, $T_J = 25^\circ\text{C}$ $I_C = I_{C110} A$, $V_{GE} = 15\text{ V}$ $V_{CE} = 720\text{ V}$, $R_G = R_{off} = 5\text{ }\Omega$		20	ns
t_{ri}			28	ns
$t_{d(off)}$			350	ns
t_{fi}			200	ns
E_{off}			4.7	7.5 mJ
$t_{d(on)}$	Inductive load, $T_J = 125^\circ\text{C}$ $I_C = I_{C110} A$, $V_{GE} = 15\text{ V}$ $V_{CE} = 720\text{ V}$, $R_G = R_{off} = 5\text{ }\Omega$		20	ns
t_{ri}			28	ns
E_{on}			0.7	mJ
$t_{d(off)}$			400	ns
t_{fi}			420	ns
E_{off}			8.7	mJ
R_{thJC}	(TO-247)			0.31 KW
R_{thCK}			0.25	KW

Min. Recommended Footprint (Dimensions in inches and mm)

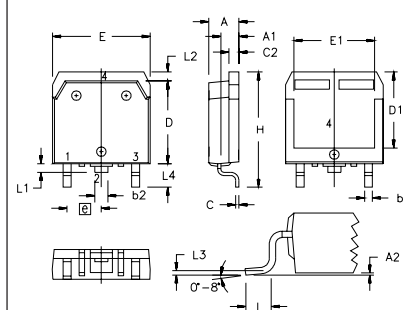


TO-247 AD Outline



Dim.	Millimeter		Inches	
	Min.	Max.	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
L ₁		4.50		.177
ØP	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



SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.193	.201	4.90	5.10
A ₁	.106	.114	2.70	2.90
A ₂	.001	.010	0.02	0.25
b	.045	.057	1.15	1.45
b ₁	.075	.083	1.90	2.10
b ₂	.016	.026	0.40	0.65
C	.057	.063	1.45	1.60
D	.543	.551	13.80	14.00
D ₁	.488	.500	12.40	12.70
E	.624	.632	15.85	16.05
E ₁	.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
L ₁	.047	.055	1.20	1.40
L ₂	.039	.045	1.00	1.15
L ₃	.010	BSC	0.25	BSC
L ₄	.150	.161	3.80	4.10

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

IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents:	4,850,072	4,931,844	5,034,796	5,063,307	5,237,481	5,381,025	6,404,065B1	6,162,665	6,534,343	6,583,505
	4,835,592	4,881,106	5,017,508	5,049,961	5,187,117	5,486,715	6,306,728B1	6,259,123B1	6,306,728B1	6,683,344

Fig. 1. Output Characteristics
@ 25 °C

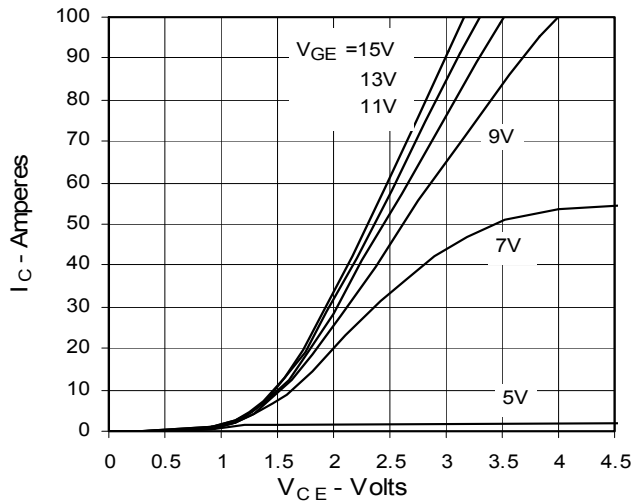


Fig. 2. Extended Output Characteristics
@ 25 °C

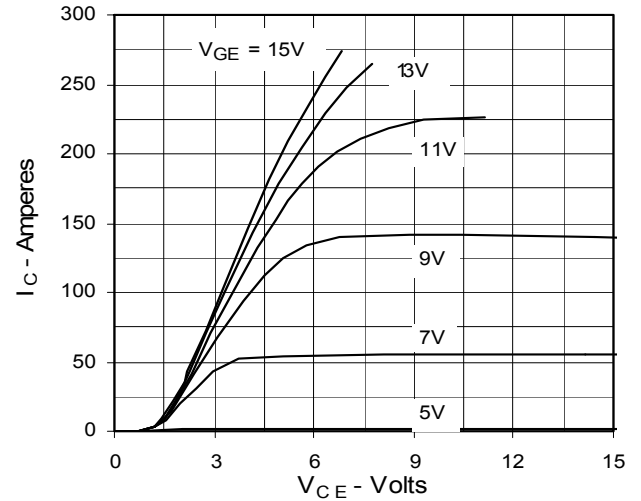


Fig. 3. Output Characteristics
@ 125 °C

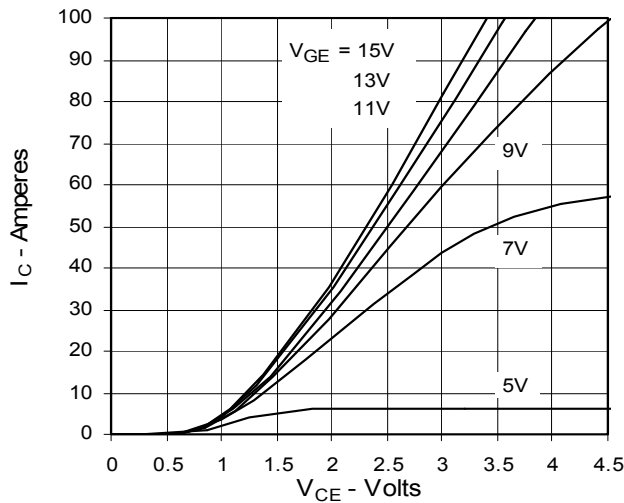


Fig. 4. Dependence of $V_{CE(sat)}$ on Temperature

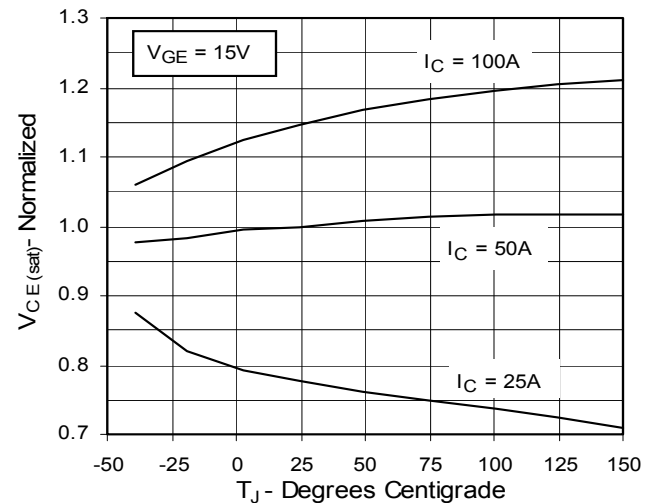


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter voltage

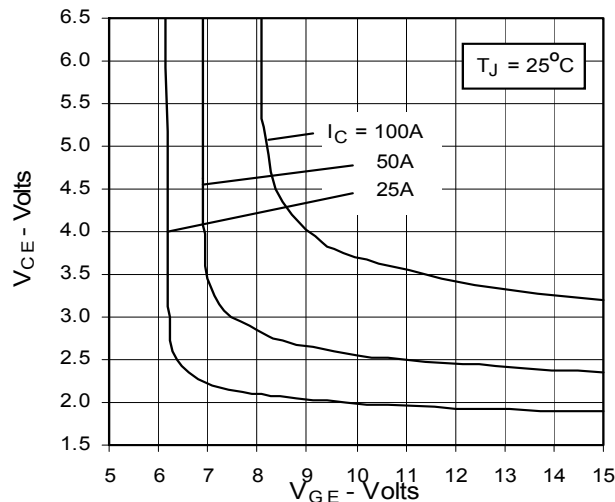


Fig. 6. Input Admittance

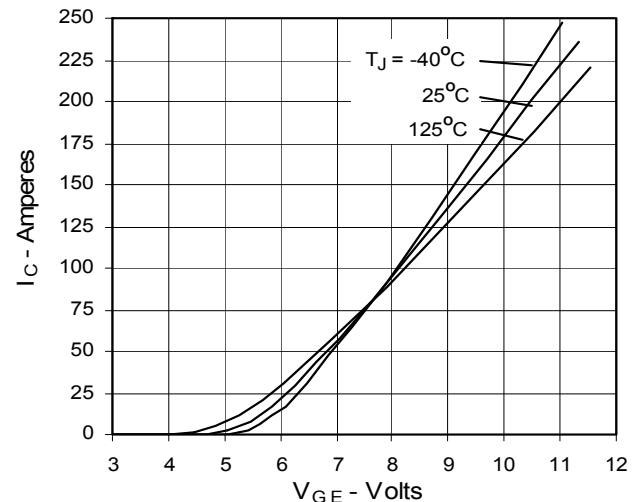
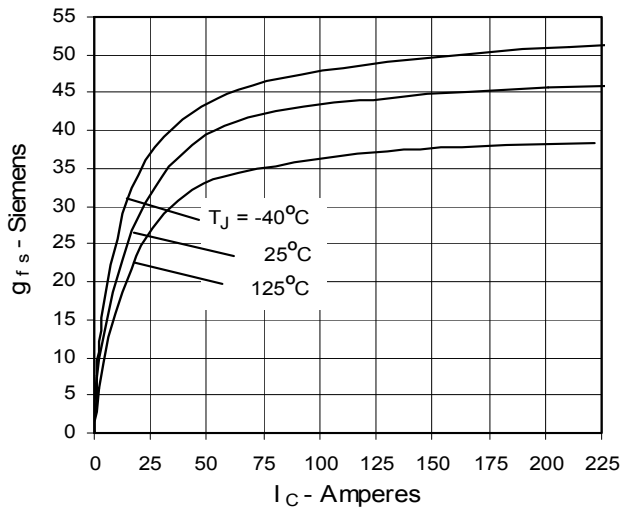
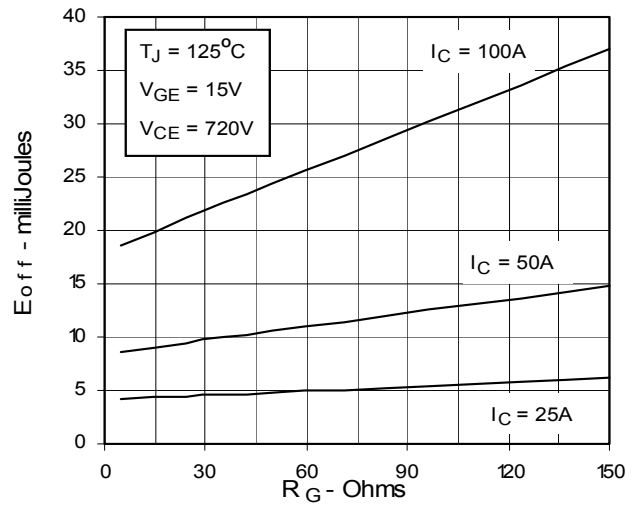
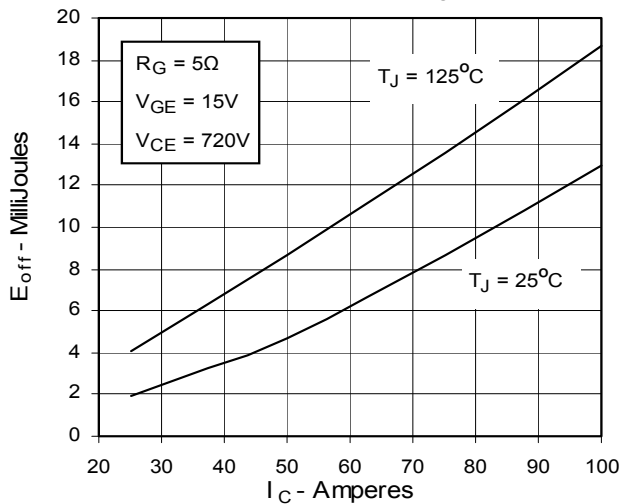
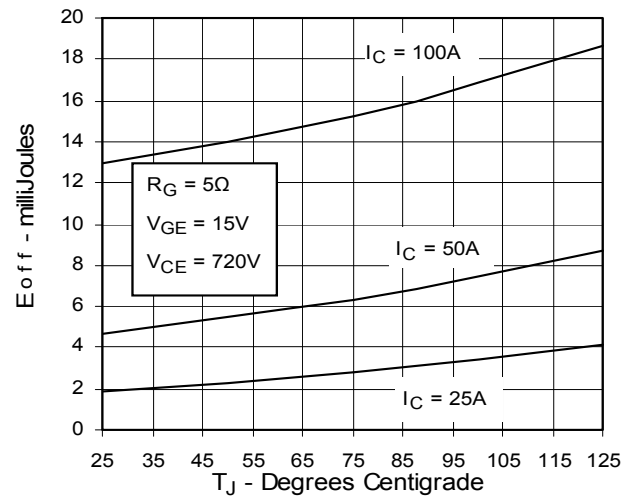
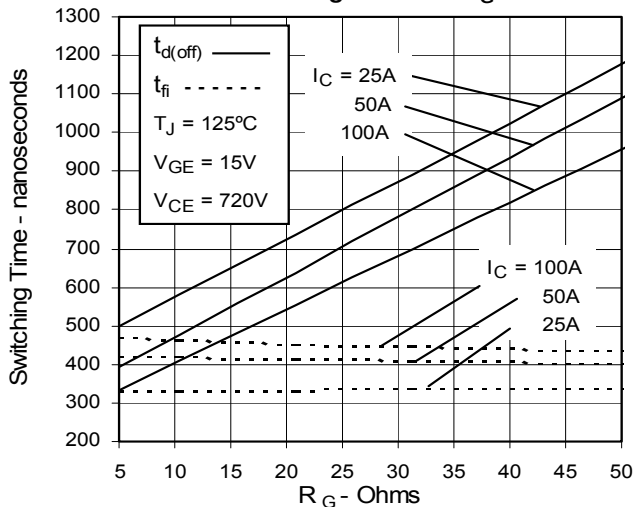
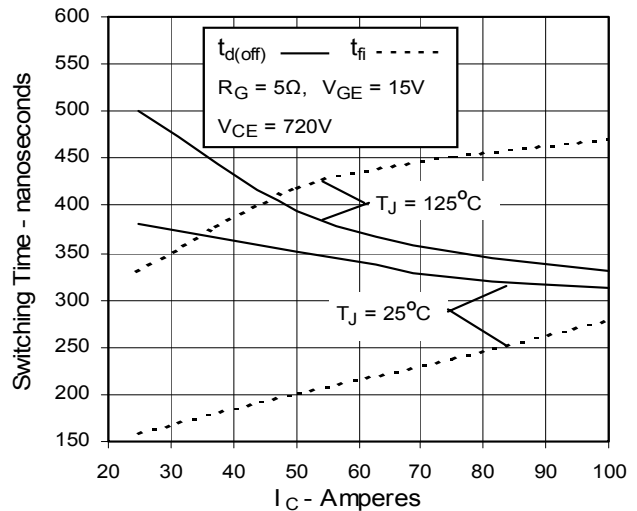


Fig. 7. Transconductance

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


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4,850,072	4,931,844	5,034,796	5,063,307	5,237,481	5,381,025	6,404,065B1	6,162,665	6,534,343	6,583,505
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Fig. 13. Dependence of Turn-off Switching Time on Temperature

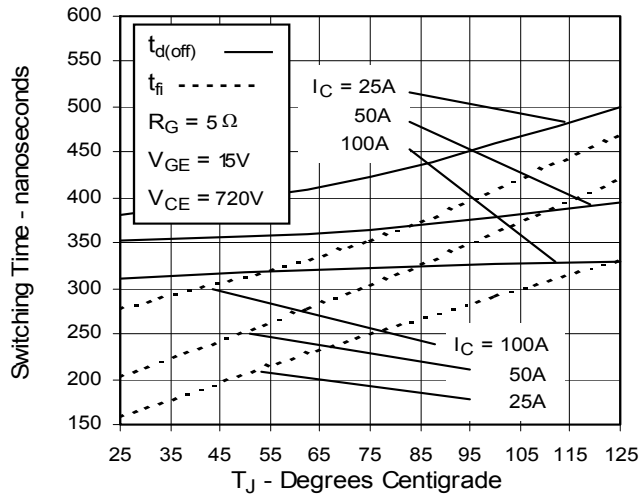


Fig. 14. Gate Charge

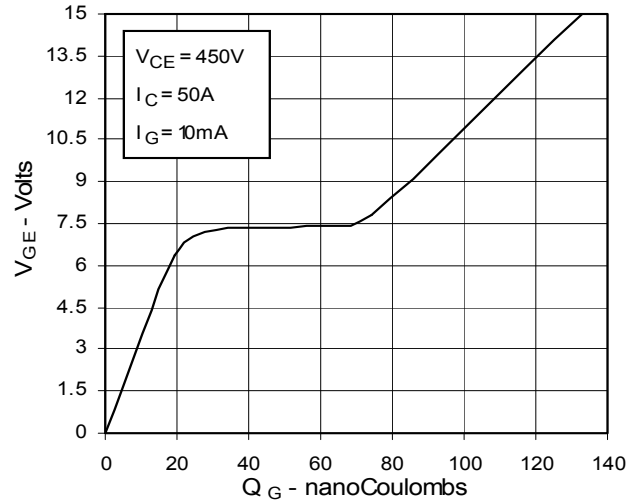


Fig. 15. Capacitance

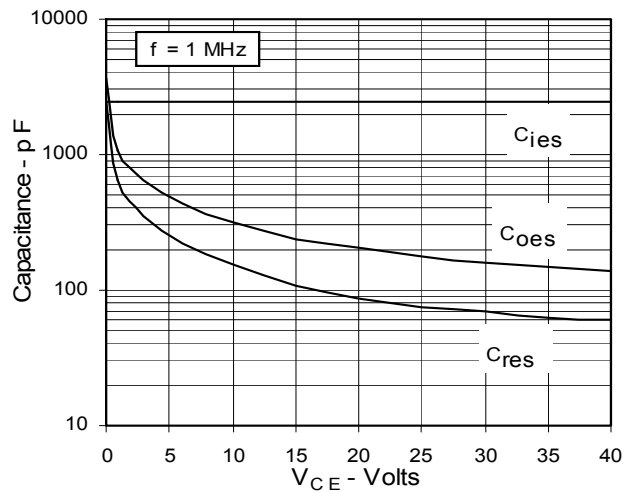


Fig. 16. Reverse-Bias Safe Operating Area

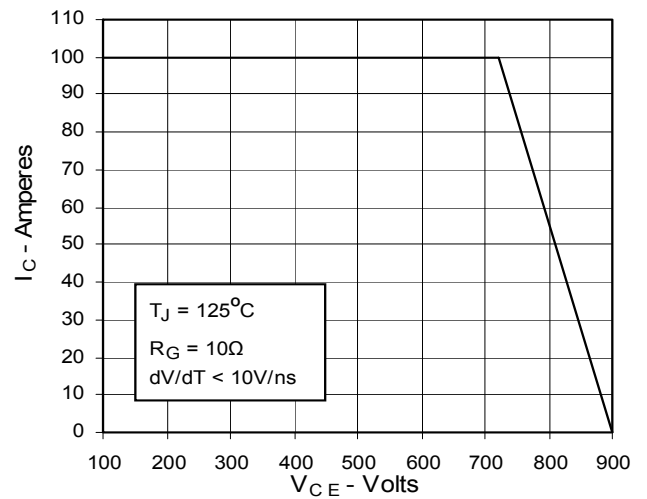


Fig. 17. Maximum Transient Thermal Resistance

