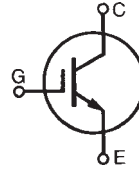


HiPerFAST™ IGBT

B2-Class High Speed IGBTs

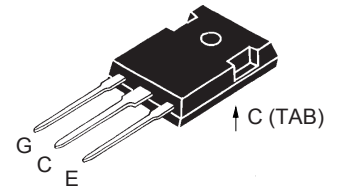
IXGH 50N90B2
IXGT 50N90B2

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

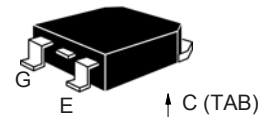


Symbol	Test Conditions	Maximum Ratings	
V_{CES}	$T_J = 25^\circ\text{C}$ to 150°C	900	V
V_{CGR}	$T_J = 25^\circ\text{C}$ to 150°C ; $R_{GE} = 1 \text{ M}\Omega$	900	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	$T_C = 25^\circ\text{C}$ (limited by leads)	75	A
I_{C110}	$T_C = 110^\circ\text{C}$	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

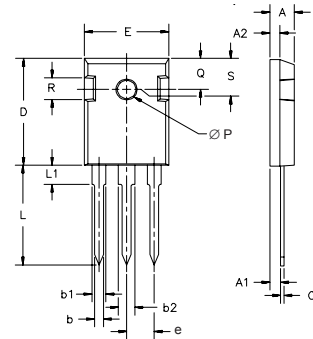
- PFC circuits
- Uninterruptible power supplies (UPS)
- Switched-mode and resonant-mode power supplies
- AC motor speed control
- DC servo and robot drives
- DC choppers

Advantages

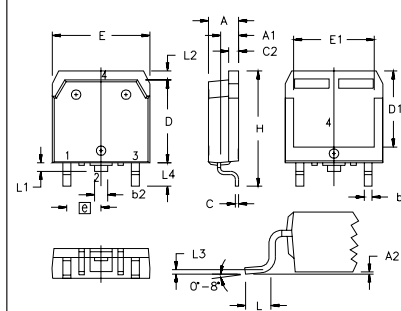
- High power density
- Very fast switching speeds for high frequency applications

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
				$T_J = 125^\circ\text{C}$

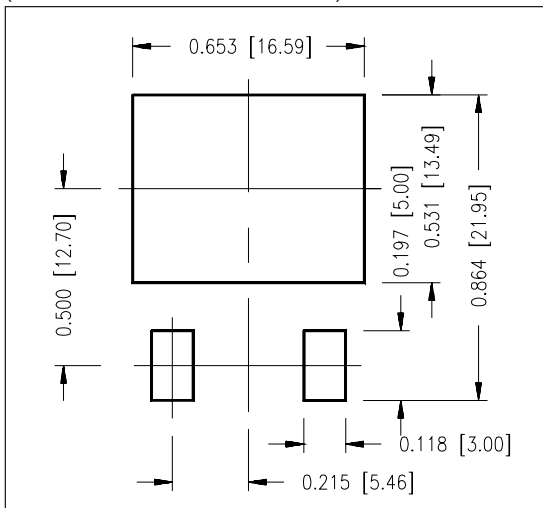
Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)			
		min.	typ.	max.	
g_{fs}	$I_C = I_{C110} \text{ A}; V_{CE} = 10 \text{ V}$, Pulse test, $t \leq 300 \mu\text{s}$, duty cycle $\leq 2\%$	25	40	S	
C_{ies}	$V_{CE} = 25 \text{ V}, V_{GE} = 0 \text{ V}, f = 1 \text{ MHz}$		2500	pF	
C_{oes}			180	pF	
C_{res}			75	pF	
Q_g	$I_C = I_{C110} \text{ A}, V_{GE} = 15 \text{ V}, V_{CE} = 0.5 V_{CES}$		135	nC	
Q_{ge}			23	nC	
Q_{gc}			50	nC	
$t_{d(on)}$	Inductive load, $T_J = 25^\circ\text{C}$ $I_C = I_{C110} \text{ A}, V_{GE} = 15 \text{ V}$ $V_{CE} = 720 \text{ V}, R_G = R_{off} = 5 \Omega$		20	ns	
t_{ri}			28	ns	
$t_{d(off)}$			350	500	ns
t_{fi}			200		ns
E_{off}			4.7	7.5	mJ
$t_{d(on)}$	Inductive load, $T_J = 125^\circ\text{C}$ $I_C = I_{C110} \text{ A}, V_{GE} = 15 \text{ V}$ $V_{CE} = 720 \text{ V}, R_G = R_{off} = 5 \Omega$		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}				0.31 K/W	
R_{thCK}	(TO-247)	0.25		K/W	

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
∅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


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 ₂	.075	.083	1.90	2.10
C	.016	.026	0.40	0.65
C ₂	.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

Min. Recommended Footprint
 (Dimensions in inches and mm)


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

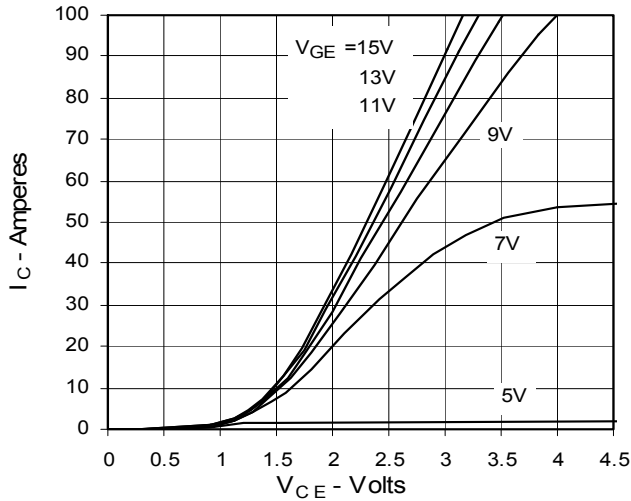


Fig. 2. Extended Output Characteristics
@ 25 °C

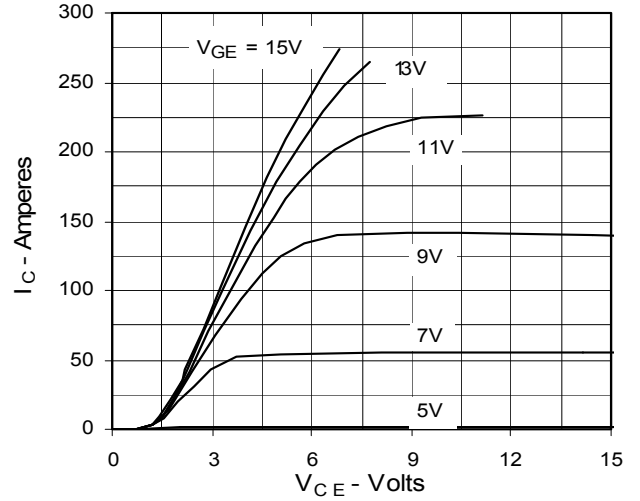


Fig. 3. Output Characteristics
@ 125 °C

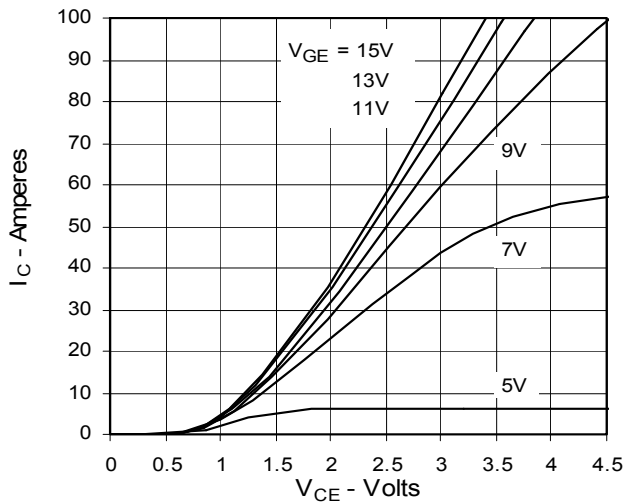


Fig. 4. Dependence of $V_{CE(sat)}$ on Temperature

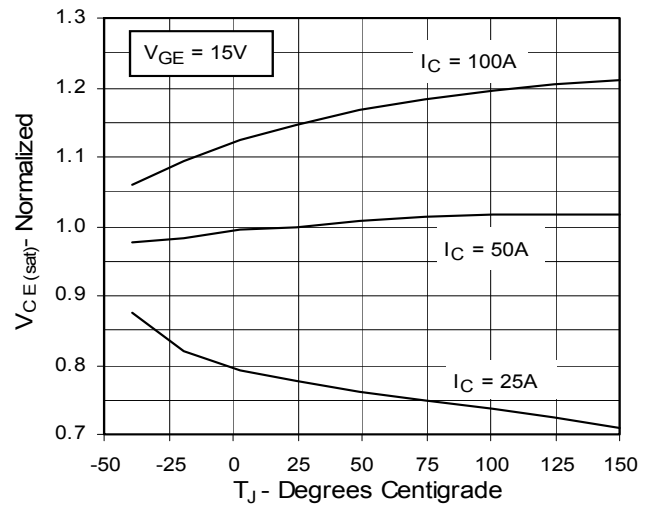


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter voltage

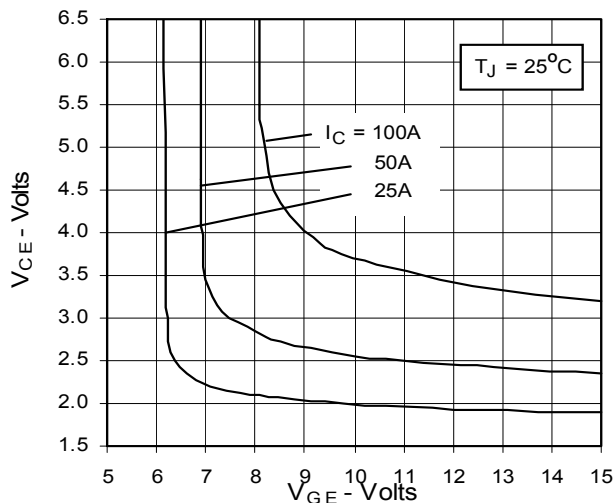


Fig. 6. Input Admittance

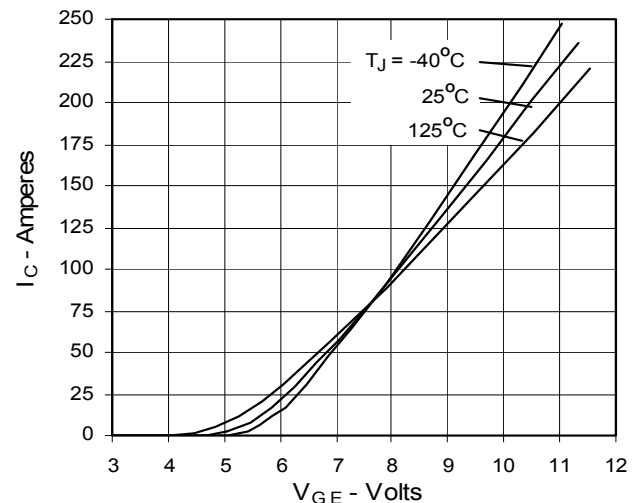


Fig. 7. Transconductance

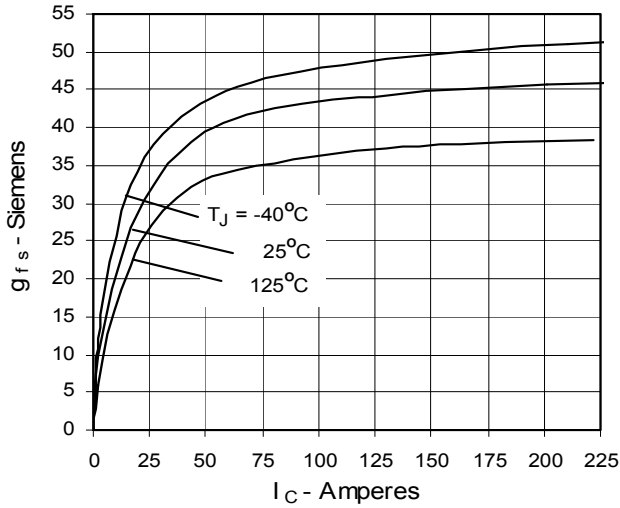


Fig. 8. Dependence of Turn-off Energy Loss on R_G

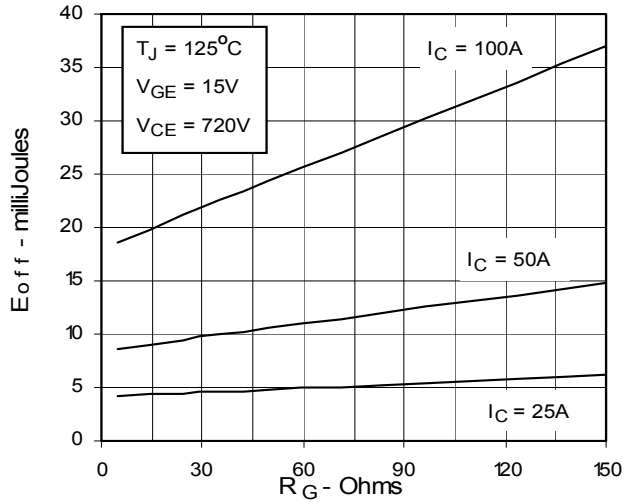


Fig. 9. Dependence of Turn-Off Energy Loss on I_C

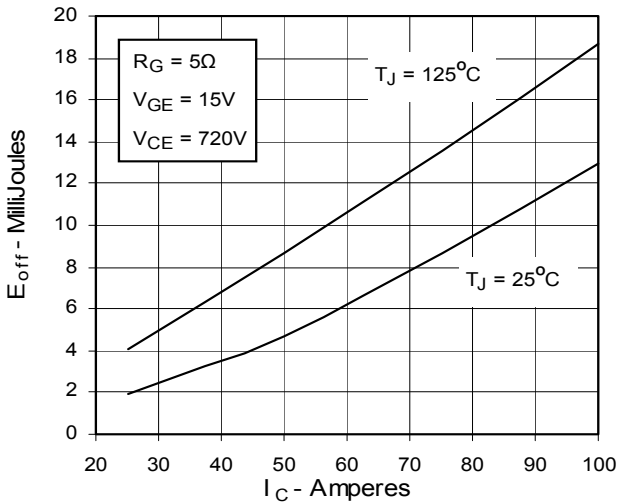


Fig. 10. Dependence of Turn-off Energy Loss on Temperature

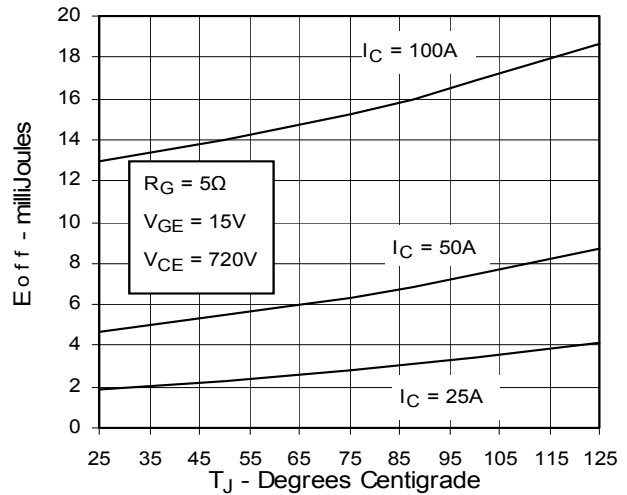


Fig. 11. Dependence of Turn-off Switching Time on R_G

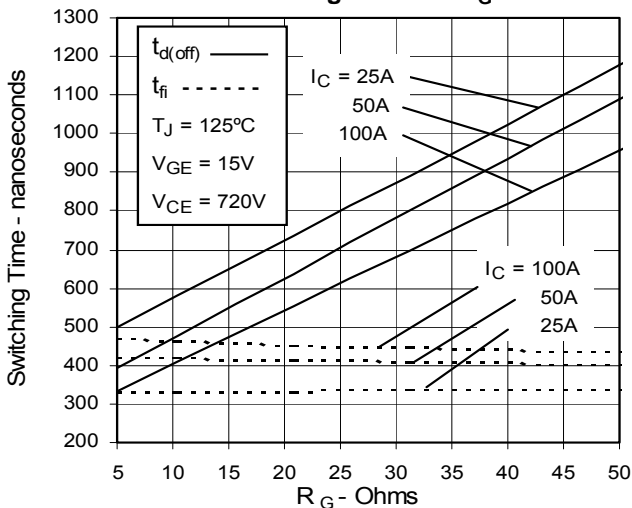
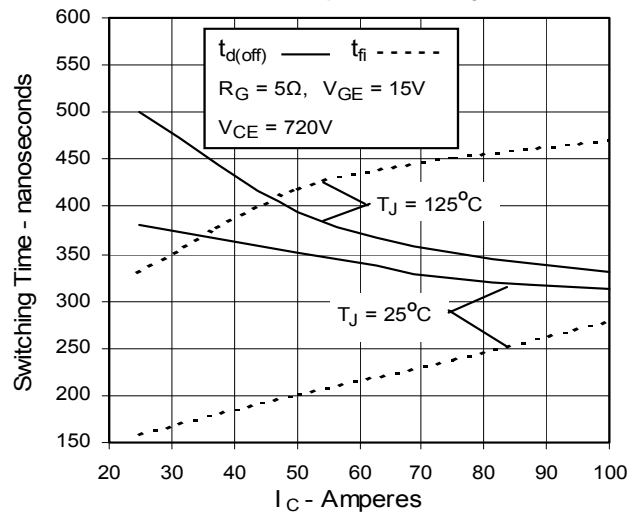


Fig. 12. Dependence of Turn-off Switching Time on I_C



IXYS reserves the right to change values, specifications, 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. 13. Dependence of Turn-off Switching Time on Temperature

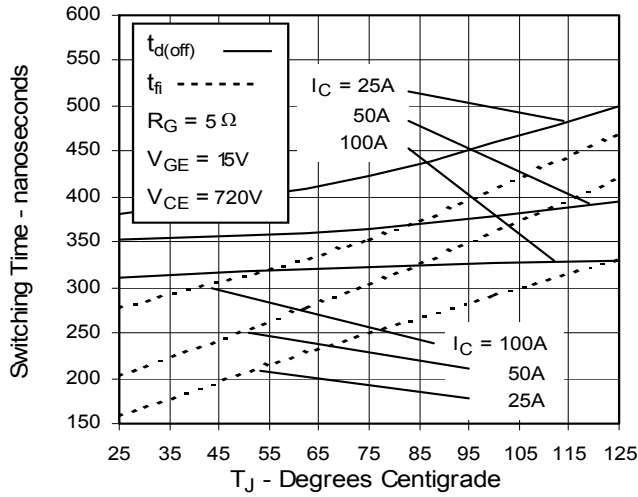


Fig. 14. Gate Charge

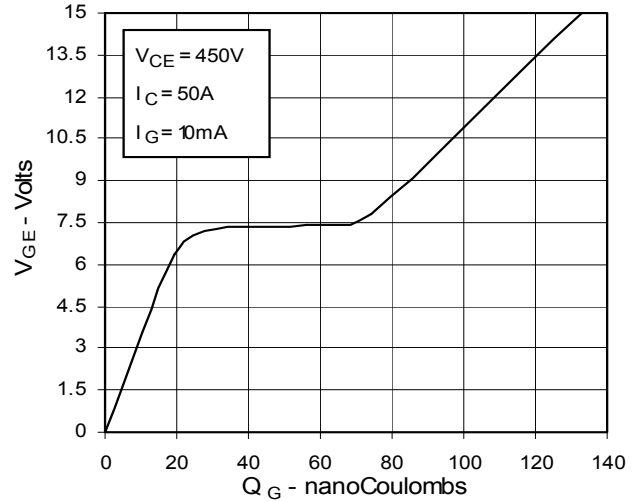


Fig. 15. Capacitance

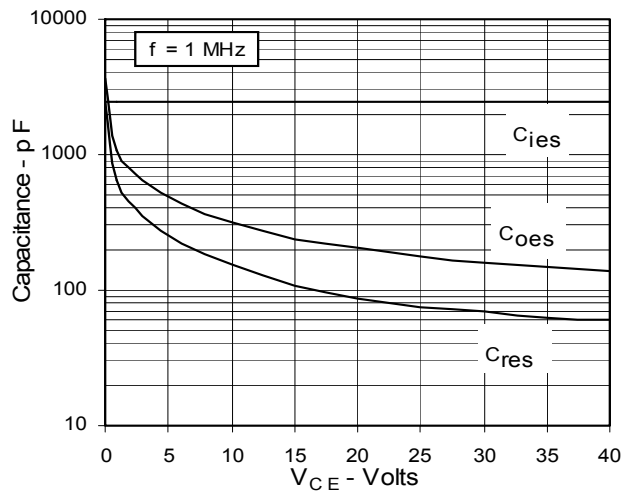


Fig. 16. Reverse-Bias Safe Operating Area

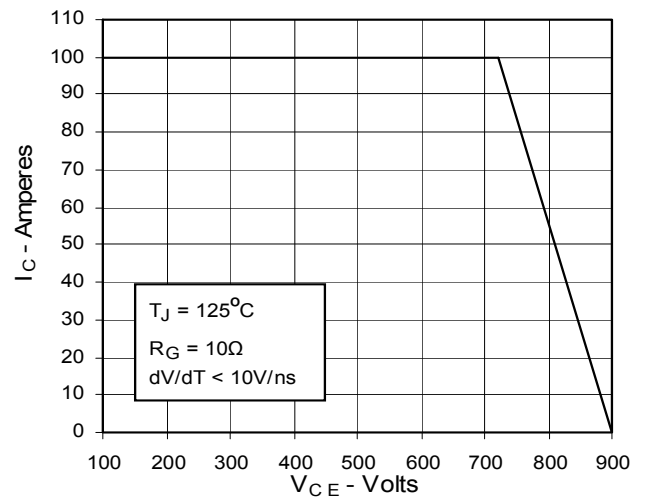


Fig. 17. Maximum Transient Thermal Resistance

