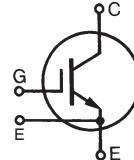


# HiPerFAST™ IGBT

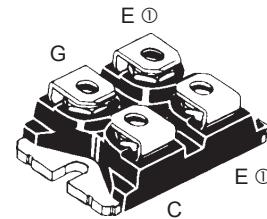
## IXGN 200N60B

$V_{CES}$  = 600 V  
 $I_{C25}$  = 200 A  
 $V_{CE(sat)}$  = 2.1 V



Symbol	Test Conditions	Maximum Ratings	
$V_{CES}$	$T_J$ = 25°C to 150°C	600	V
$V_{CGR}$	$T_J$ = 25°C to 150°C; $R_{GE} = 1 \text{ M}\Omega$	600	V
$V_{GES}$	Continuous	±20	V
$V_{GEM}$	Transient	±30	V
$I_{C25}$	$T_c$ = 25°C	200	A
$I_L$	Terminal Current Limit	100	A
$I_{C90}$	$T_c$ = 90°C	120	A
$I_{CM}$	$T_c$ = 25°C, 1 ms	400	A
<b>SSOA (RBSOA)</b>	$V_{GE} = 15 \text{ V}$ , $T_{VJ} = 125^\circ\text{C}$ , $R_G = 2.4 \Omega$ Clamped inductive load, $L = 30 \mu\text{H}$	$I_{CM} = 200$ @ 0.8 $V_{CES}$	A
$P_c$	$T_c$ = 25°C	600	W
$T_J$		-55 ... +150	°C
$T_{JM}$		150	°C
$T_{stg}$		-55 ... +150	°C
$V_{ISOL}$	50/60 Hz $I_{ISOL} \leq 1 \text{ mA}$	2500 3000	V~
$M_d$	Mounting torque Terminal connection torque (M4)	1.5/13 Nm/lb.in. 1.5/13 Nm/lb.in.	
<b>Weight</b>		30	g

### SOT-227B, miniBLOC



G = Gate, C = Collector, E = Emitter

① either emitter terminal can be used as Main or Kelvin Emitter

### Features

- International standard package miniBLOC
- Aluminium nitride isolation
  - high power dissipation
- Isolation voltage 3000 V~
- Very high current, fast switching IGBT
- Low  $V_{CE(sat)}$ 
  - for minimum on-state conduction losses
- MOS Gate turn-on
  - drive simplicity
- Low collector-to-case capacitance (< 50 pF)
- Low package inductance (< 5 nH)
  - easy to drive and to protect

Symbol	Test Conditions	Characteristic Values		
		( $T_J = 25^\circ\text{C}$ , unless otherwise specified)	min.	typ.
$BV_{CES}$	$I_c = 1 \text{ mA}$ , $V_{GE} = 0 \text{ V}$	600		V
$V_{GE(th)}$	$I_c = 1 \text{ mA}$ , $V_{CE} = V_{GE}$	2.5	5.5	V
$I_{CES}$	$V_{CE} = V_{CES}$ $V_{GE} = 0 \text{ V}$	$T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$	200 2	μA mA
$I_{GES}$	$V_{CE} = 0 \text{ V}$ , $V_{GE} = \pm 20 \text{ V}$		±400	nA
$V_{CE(sat)}$	$I_c = I_{C90}$ , $V_{GE} = 15 \text{ V}$		2.1	V

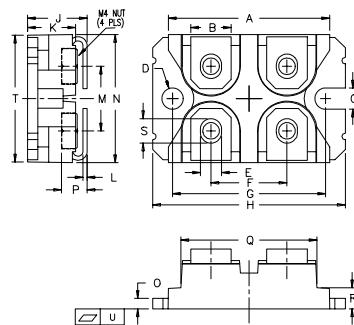
### Applications

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

### Advantages

- Easy to mount with 2 screws
- Space savings
- High power density

Symbol	Test Conditions	Characteristic Values			
		( $T_J = 25^\circ\text{C}$ , unless otherwise specified)	min.	typ.	max.
$g_{fs}$	$I_C = 60 \text{ A}; V_{CE} = 10 \text{ V},$ Pulse test, $t \leq 300 \mu\text{s}$ , duty cycle $\leq 2 \%$	50	75	S	
$C_{ies}$ $C_{oes}$ $C_{res}$	$V_{CE} = 25 \text{ V}, V_{GE} = 0 \text{ V}, f = 1 \text{ MHz}$	11000		pF	
		680		pF	
		190		pF	
$Q_g$ $Q_{ge}$ $Q_{gc}$	$I_C = I_{C90}, V_{GE} = 15 \text{ V}, V_{CE} = 0.5 V_{CES}$	350		nC	
		72		nC	
		131		nC	
$t_{d(on)}$ $t_{ri}$ $E_{on}$ $t_{d(off)}$  $t_{ri}$ $E_{off}$	<b>Inductive load, <math>T_J = 25^\circ\text{C}</math></b>  $I_C = 100\text{A}, V_{GE} = 15 \text{ V}$ $V_{CE} = 0.8 V_{CES}, R_G = R_{off} = 2.4 \Omega$  Remarks: Switching times may increase for $V_{CE}$ (Clamp) $> 0.8 \cdot V_{CES}$ , higher $T_J$ or increased $R_G$	60		ns	
		45		ns	
		2.4		mJ	
		200	360	ns	
		160	280	ns	
		5.5	9.6	mJ	
$t_{d(on)}$ $t_{ri}$ $E_{on}$ $t_{d(off)}$ $t_{ri}$ $E_{off}$	<b>Inductive load, <math>T_J = 125^\circ\text{C}</math></b>  $I_C = 100\text{A}, V_{GE} = 15 \text{ V}$ $V_{CE} = 0.8 V_{CES}, R_G = R_{off} = 2.4 \Omega$  Remarks: Switching times may increase for $V_{CE}$ (Clamp) $> 0.8 \cdot V_{CES}$ , higher $T_J$ or increased $R_G$	60		ns	
		60		ns	
		4.8		mJ	
		290		ns	
		250		ns	
		8.7		mJ	
$R_{thJC}$			0.21	K/W	
$R_{thCK}$		0.05		K/W	

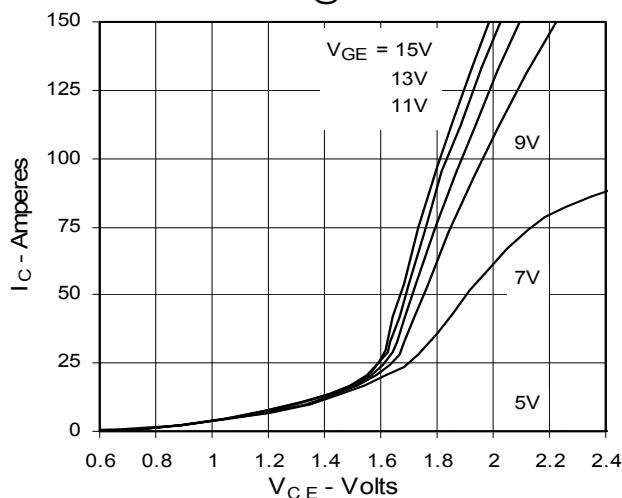
**SOT-227B miniBLOC**


SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.1240	.1255	31.50	31.88
B	.307	.323	7.80	8.20
C	.161	.169	4.09	4.29
D	.161	.169	4.09	4.29
E	.161	.169	4.09	4.29
F	.587	.595	14.91	15.11
G	1.186	1.193	30.12	30.30
H	1.496	1.505	38.00	38.23
J	.460	.481	11.68	12.22
K	.351	.378	8.92	9.60
L	.030	.033	0.76	0.84
M	.496	.506	12.60	12.85
N	.990	1.001	25.15	25.42
O	.078	.084	1.98	2.13
P	.195	.235	4.95	5.97
Q	1.045	1.059	26.54	26.90
R	.155	.174	3.94	4.42
S	.186	.191	4.72	4.85
T	.968	.987	24.59	25.07
U	-.002	.004	-0.05	0.1

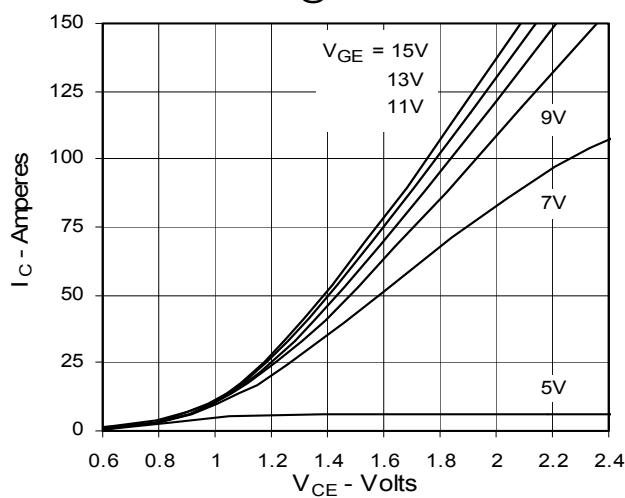
IXYS reserves the right to change limits, test conditions, and dimensions.

IXYS MOSFETs and IGBTs are covered by 4,835,592 4,931,844 5,049,961 5,237,481 6,162,665 6,404,065 B1 6,683,344 6,727,585 one or more of the following U.S. patents: 4,850,072 5,017,508 5,063,307 5,381,025 6,259,123 B1 6,534,343 6,710,405 B2 6,759,692 4,881,106 5,034,796 5,187,117 5,486,715 6,306,728 B1 6,583,505 6,710,463

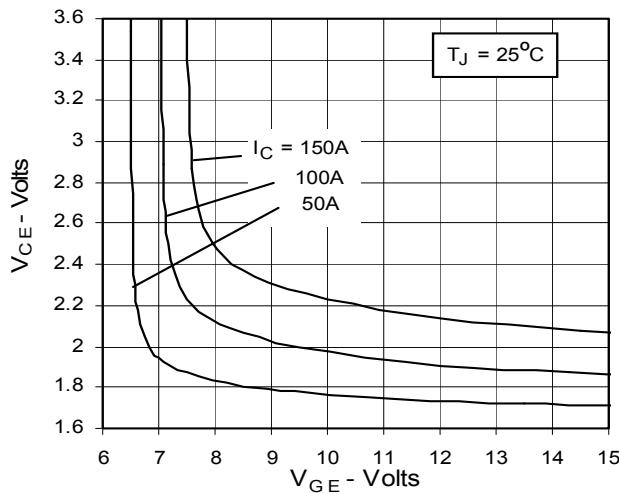
**Fig. 1. Output Characteristics  
@ 25 °C**



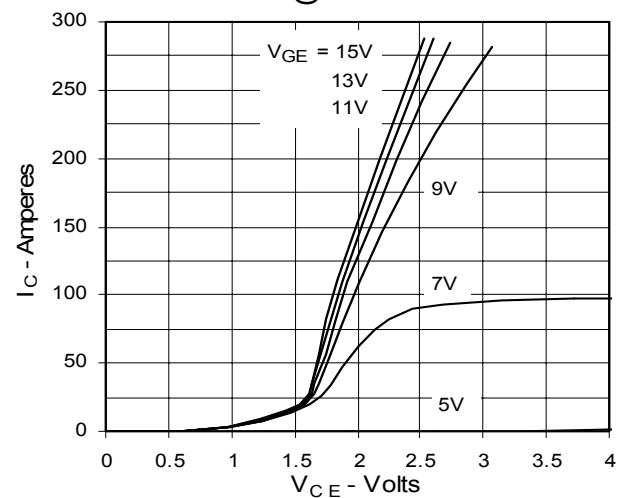
**Fig. 3. Output Characteristics  
@ 125 °C**



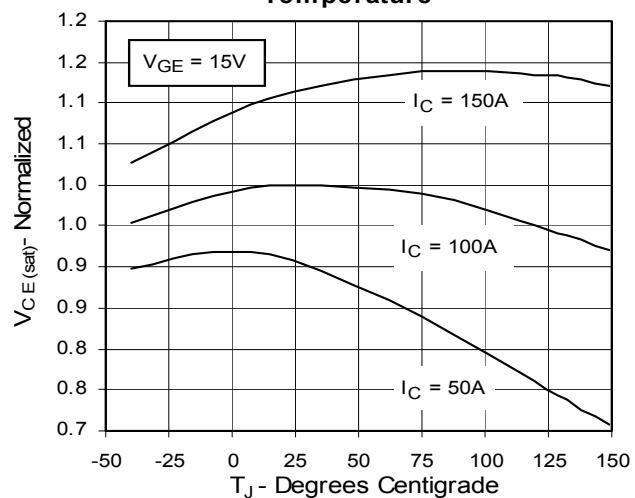
**Fig. 5. Collector-to-Emitter Voltage  
vs. Gate-to-Emitter voltage**



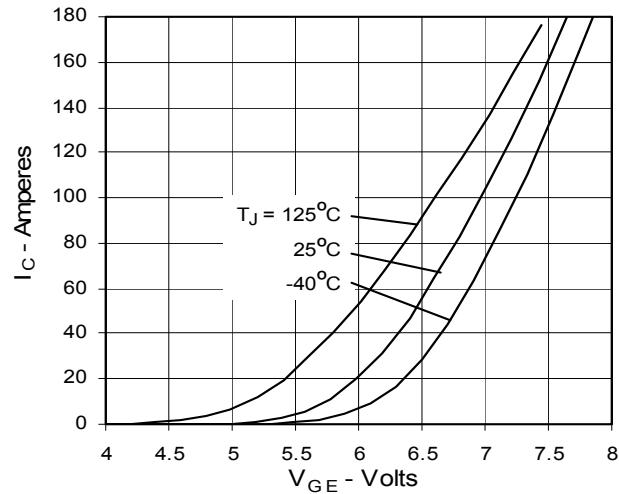
**Fig. 2. Extended Output Characteristics  
@ 25 °C**

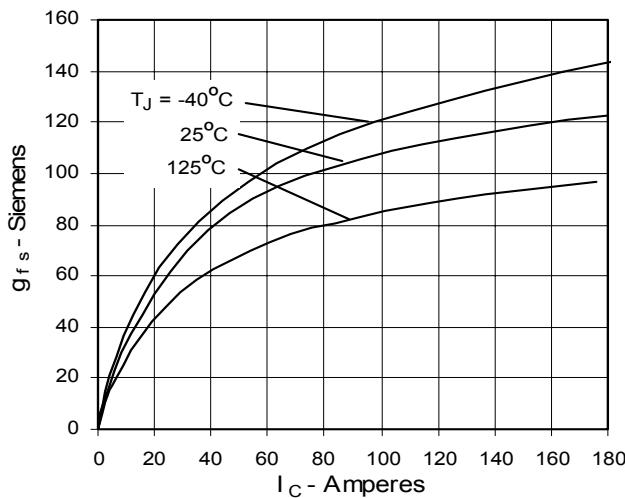
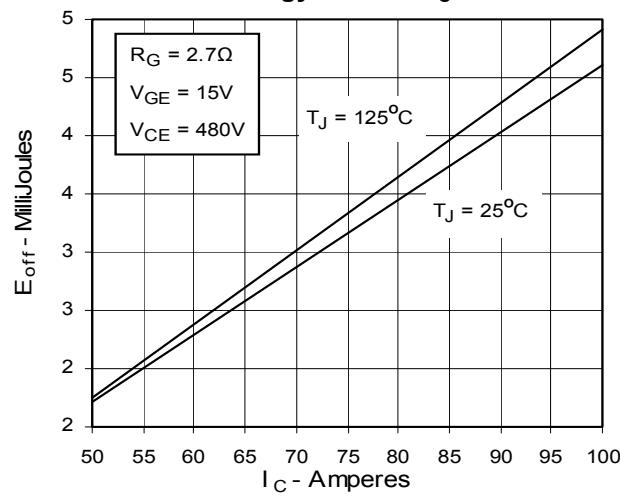
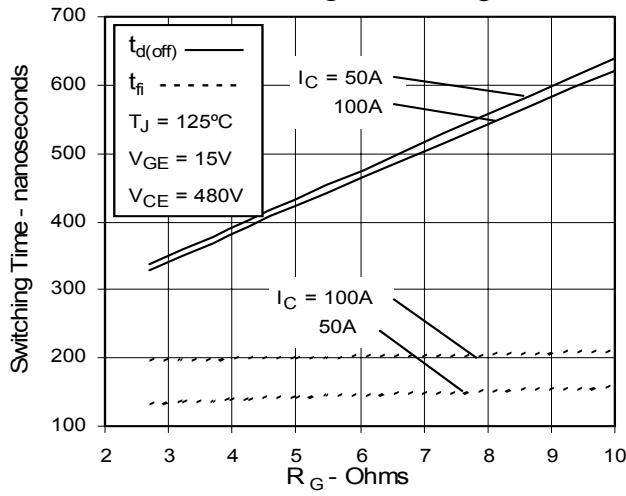
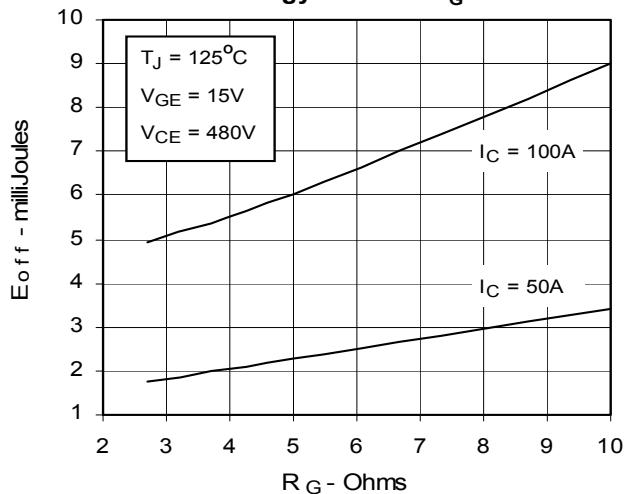
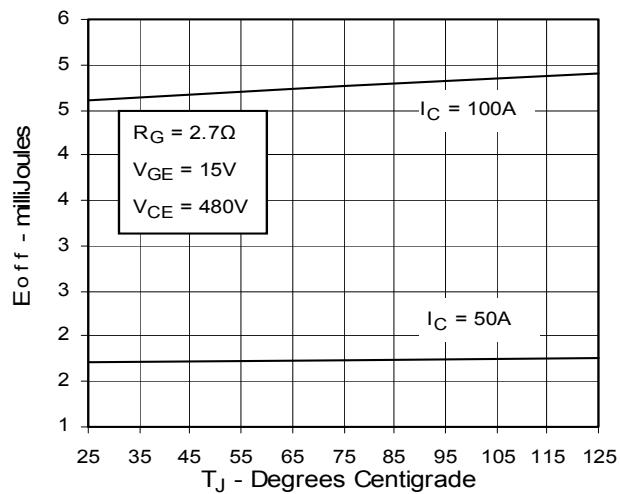
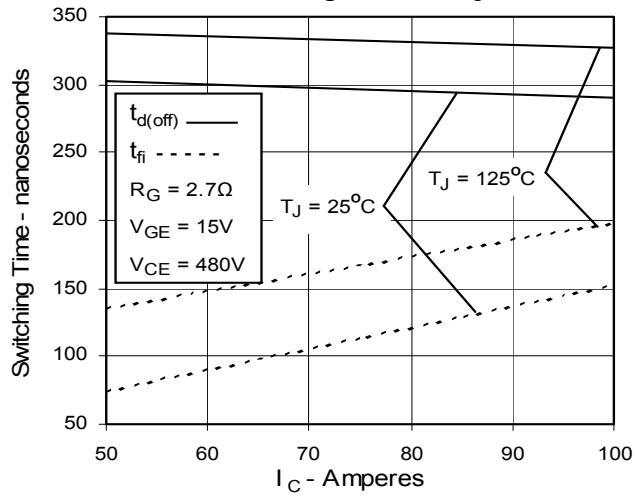


**Fig. 4. Dependence of  $V_{CE(sat)}$  on  
Temperature**

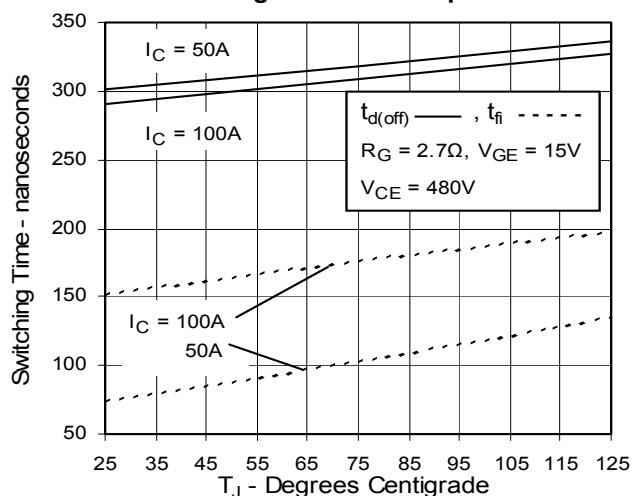


**Fig. 6. Input Admittance**

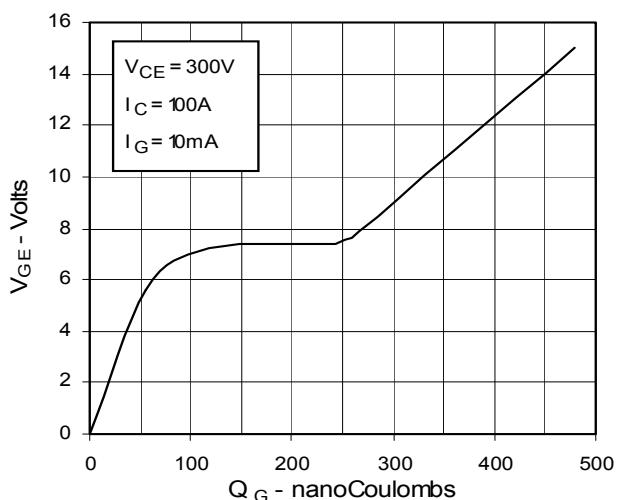


**Fig. 7. Transconductance**

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

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

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

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

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


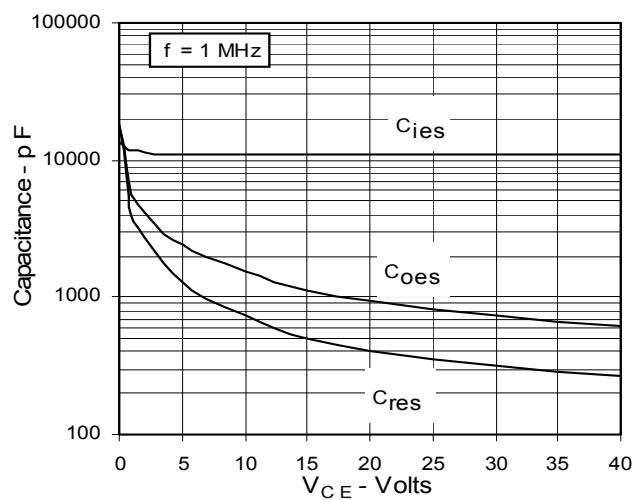
**Fig. 13. Dependence of Turn-off  
Switching Time on Temperature**



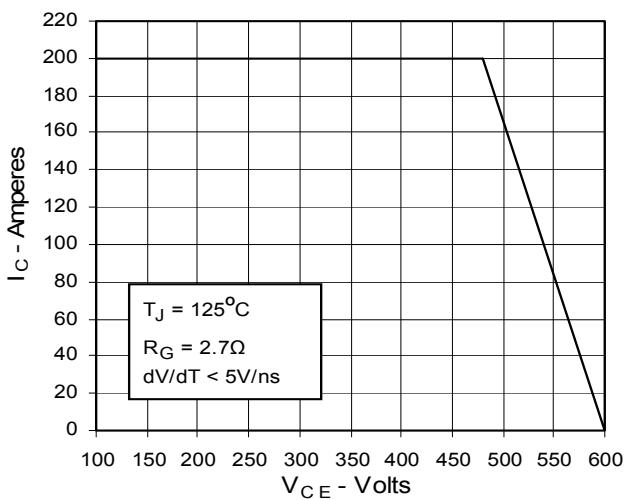
**Fig. 14. Gate Charge**



**Fig. 15. Capacitance**



**Fig. 16. Reverse-Bias Safe  
Operating Area**



**Fig. 17. Maximum Transient Thermal Resistance**

