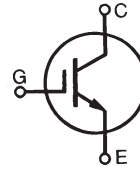
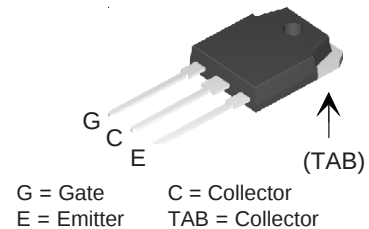


Polar™ High Speed IGBT

for PDP Applications

IXGQ170N30PB

$$\begin{aligned} V_{CES} &= 300 \text{ V} \\ I_{CP} &= 360 \text{ A} \\ V_{CE(sat)} &\leq 1.70 \text{ V} \end{aligned}$$


TO-3P


Features

- International standard package
- Low $V_{CE(sat)}$
 - for minimum on-state conduction losses
- MOS Gate turn-on
 - drive simplicity

Applications

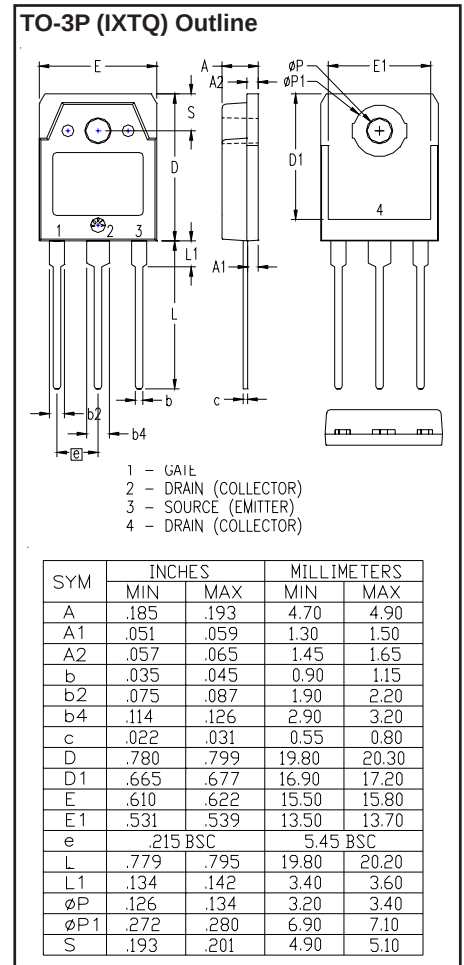
- PDP Screen Drivers

Symbol	Test Conditions	Maximum Ratings	
V_{CES}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}$	300	V
V_{GEM}		± 30	V
I_{C25}	$T_C = 25^\circ\text{C}$, IGBT chip capability	170	A
I_{CP}	$T_J \leq 150^\circ\text{C}$, $t_p < 10 \mu\text{s}$	360	A
$I_{C(RMS)}$	Lead current limit	75	A
SSOA (RBSOA)	$V_{GE} = 15 \text{ V}$, $T_{VJ} = 150^\circ\text{C}$, $R_G = 20 \Omega$ Clamped inductive load, $V_{CE} < 300 \text{ V}$	$I_{CM} = 170$	A
P_C	$T_C = 25^\circ\text{C}$	330	W
T_J		$-55 \dots +150$	$^\circ\text{C}$
T_{JM}		150	$^\circ\text{C}$
T_{stg}		$-55 \dots +150$	$^\circ\text{C}$
T_L	Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s	300	$^\circ\text{C}$
T_{SOLD}	Maximum plastic body temperature for 10 s.	260	$^\circ\text{C}$
M_d	Mounting torque	1.13/10	Nm/lb.in.
Weight		5.5	g

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$ unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
$V_{GE(th)}$	$I_C = 1 \text{ mA}$, $V_{CE} = V_{GE}$	3.0		5.0 V
I_{CES}	$V_{CE} = 300 \text{ V}$			1 μA
	$V_{GE} = 0 \text{ V}$, $T_J = 125^\circ\text{C}$			200 μA
I_{GES}	$V_{CE} = 0 \text{ V}$, $V_{GE} = \pm 20 \text{ V}$			$\pm 100 \text{ nA}$
$V_{CE(sat)}$	$V_{GE} = 15 \text{ V}$, $I_C = 85 \text{ A}$	1.32		1.70 V
	Note 1, $T_J = 125^\circ\text{C}$	1.36		V
	$I_C = 170 \text{ A}$	1.73		V
	$T_J = 125^\circ\text{C}$	1.89		V

Symbol	Test Conditions	Characteristic	Values
	($T_J = 25^\circ\text{C}$ unless otherwise specified)	Min.	Typ. Max.
g_{fs}	$I_C = 85\text{ A}, V_{CE} = 10\text{ V}$	50	80 S
C_{ies}	$V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}, f = 1\text{ MHz}$	5140	pF
C_{oes}		315	pF
C_{res}		83	pF
Q_g	$I_C = 85\text{ A}, V_{GE} = 15\text{ V}, V_{CE} = 0.5 V_{CES}$	143	nC
Q_{ge}		26	nC
Q_{gc}		60	nC
$t_{d(on)}$	Resistive load, $T_J = 25^\circ\text{C}$ $I_C = 85\text{ A}, V_{GE} = 15\text{ V}$ $V_{CE} = 240\text{ V}, R_G = 2.4\ \Omega$	24	ns
t_{ri}		71	ns
$t_{d(off)}$		100	ns
t_{fi}		82	ns
$t_{d(on)}$	Resistive load, $T_J = 125^\circ\text{C}$ $I_C = 85\text{ A}, V_{GE} = 15\text{ V}$ $V_{CE} = 240\text{ V}, R_G = 2.4\ \Omega$	22	ns
t_{ri}		81	ns
$t_{d(off)}$		102	ns
t_{fi}		157	ns
R_{thJC}			0.375 K/W
R_{thCS}		0.21	K/W

Note 1: Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$



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.

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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 6,771,478 B2

Fig. 1. Output Characteristics
@ 25°C

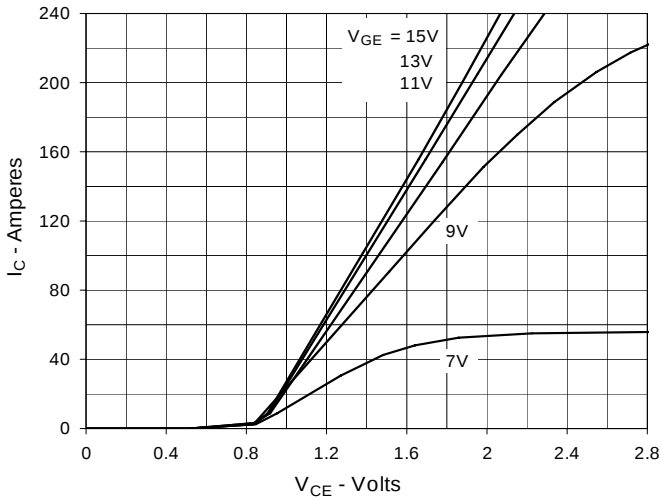


Fig. 2. Extended Output Characteristics
@ 25°C

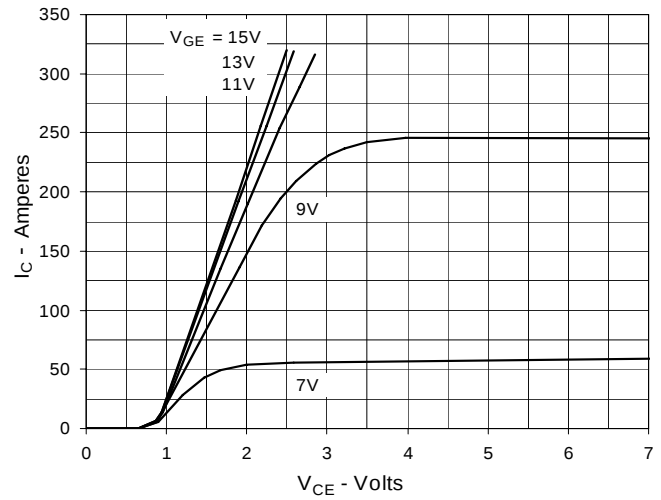


Fig. 3. Output Characteristics
@ 125°C

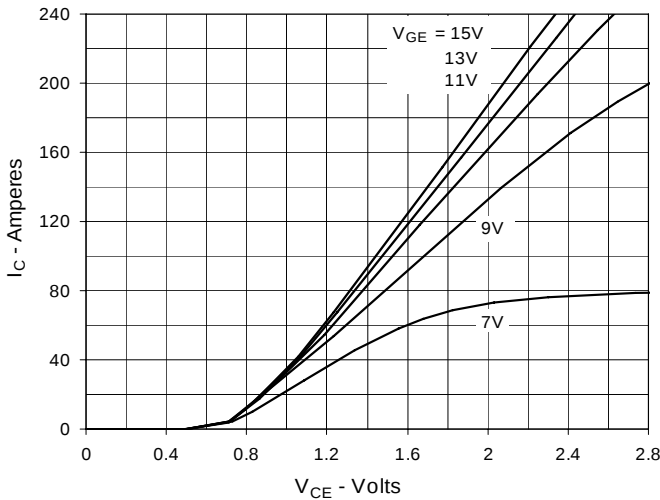


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

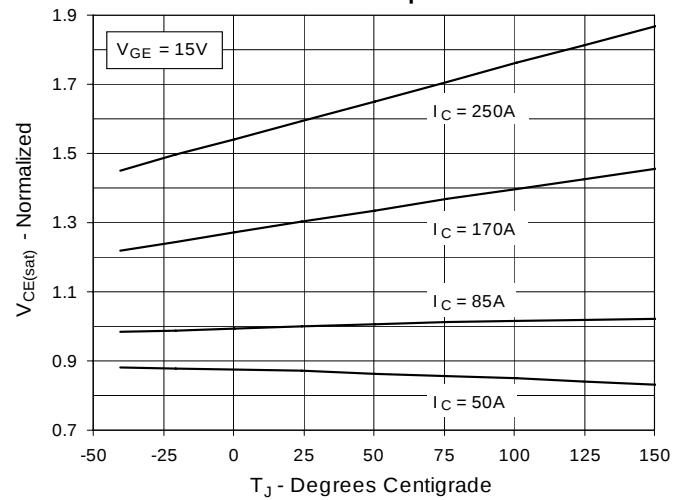


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

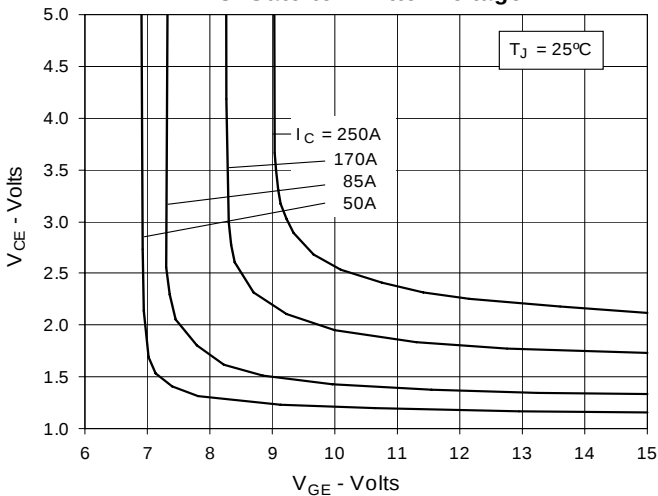


Fig. 6. Input Admittance

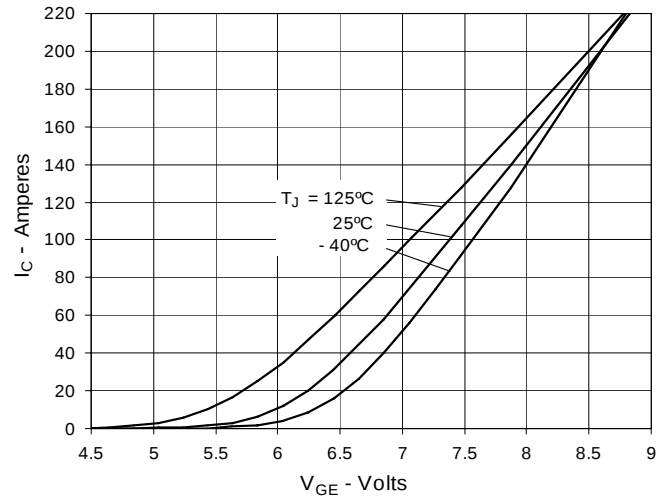


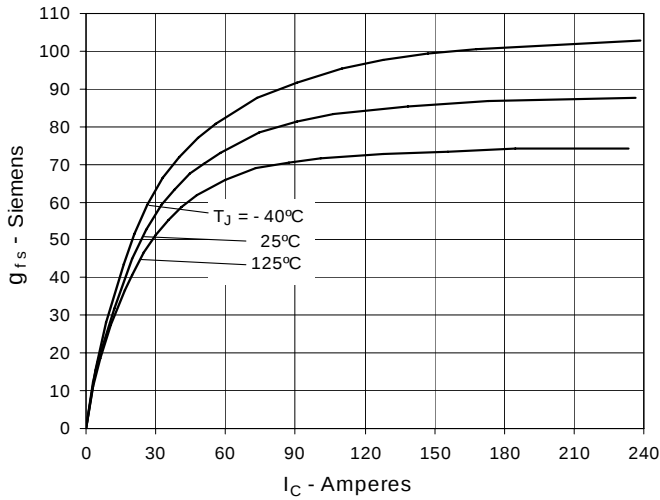
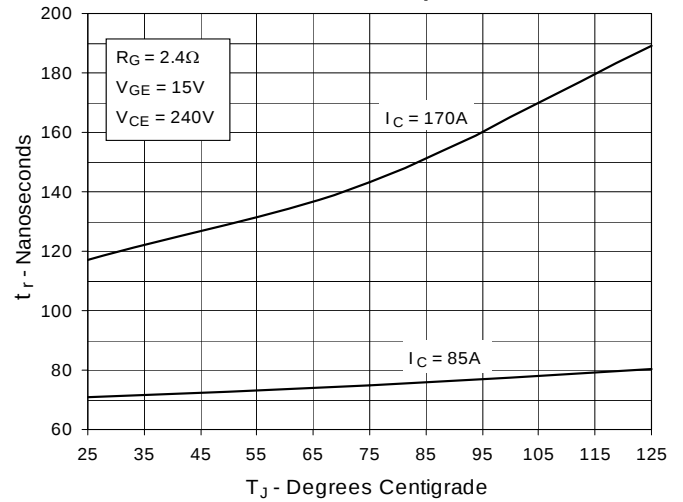
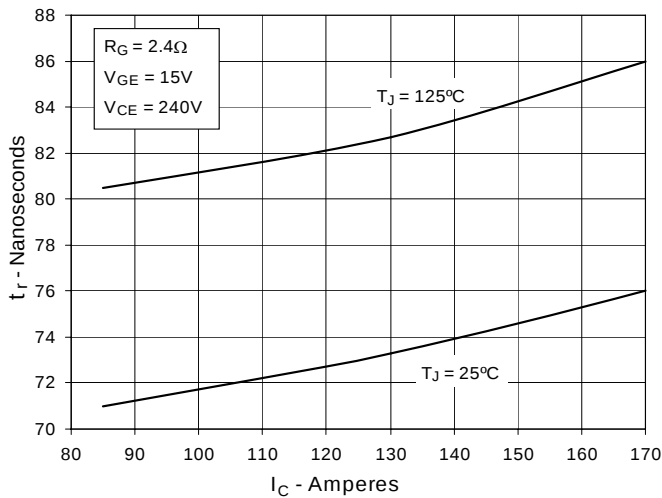
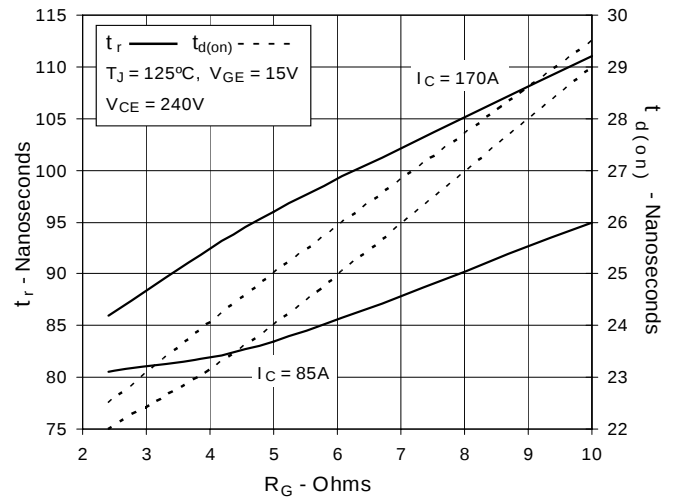
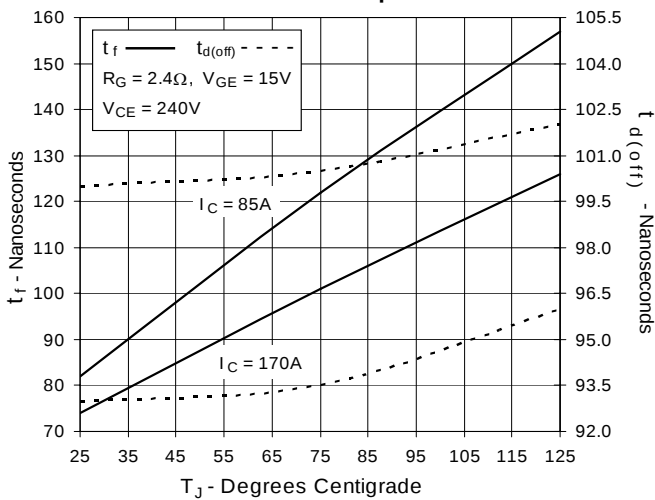
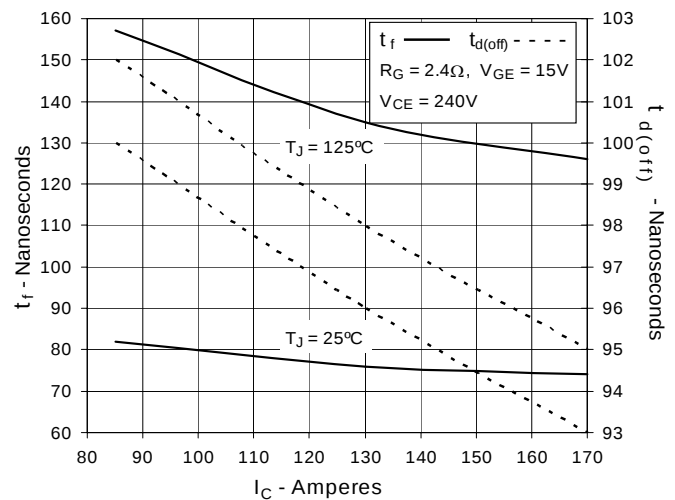
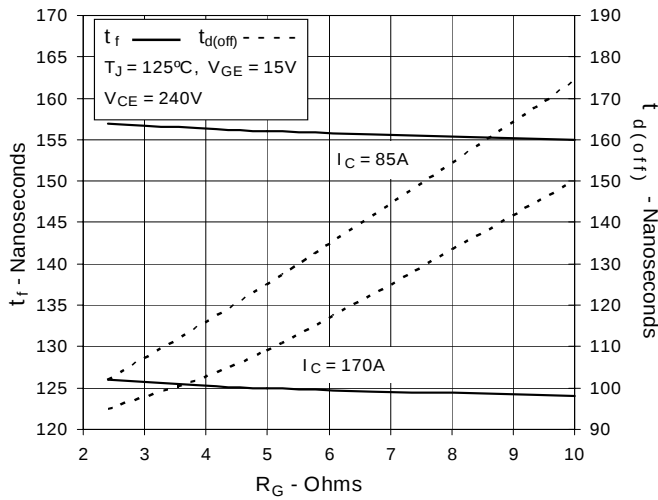
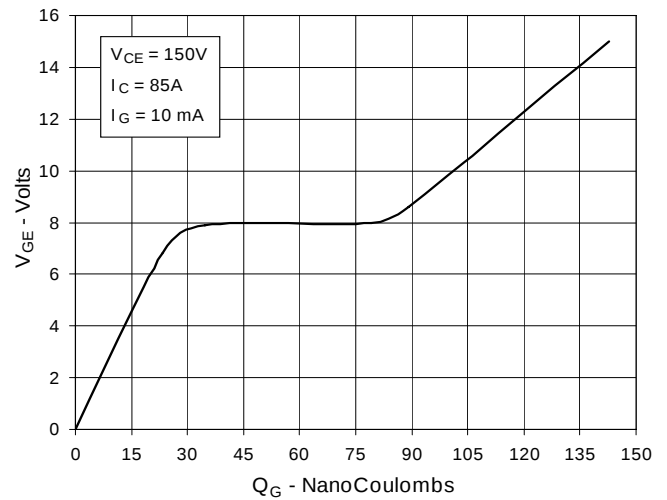
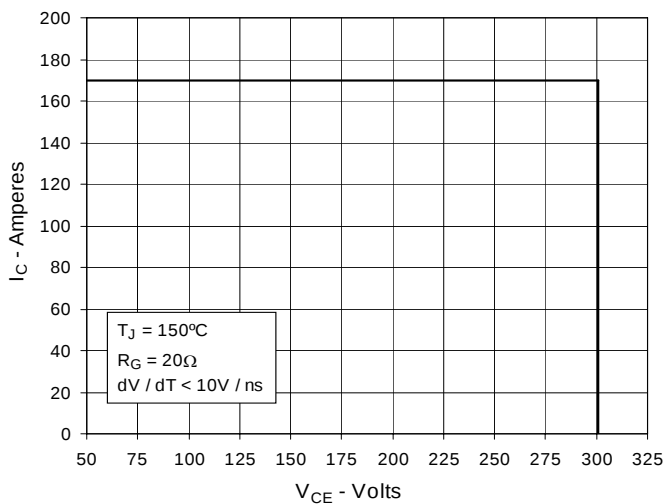
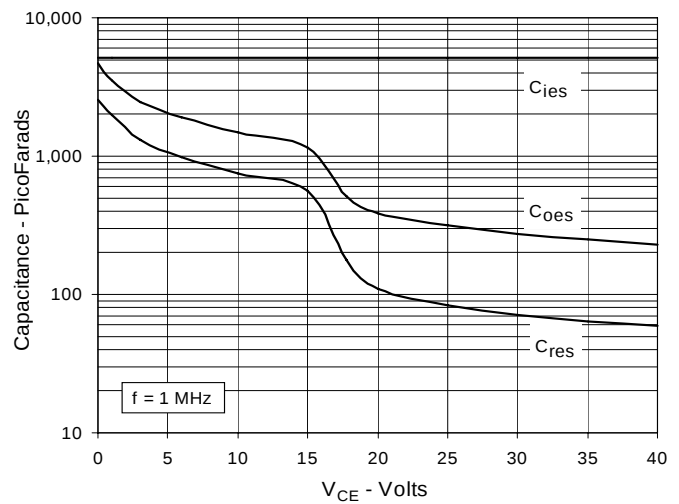
Fig. 7. Transconductance

Fig. 8. Resistive Turn-on Rise Time vs. Junction Temperature

Fig. 9. Resistive Turn-on Rise Time vs. Collector Current

Fig. 10. Resistive Turn-on Switching Times vs. Gate Resistance

Fig. 11. Resistive Turn-off Switching Times vs. Junction Temperature

Fig. 12. Resistive Turn-off Switching Times vs. Collector Current


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

Fig. 14. Gate Charge

Fig. 15. Reverse-Bias Safe Operating Area

Fig. 16. Capacitance

Fig. 17. Maximum Transient Thermal Resistance
