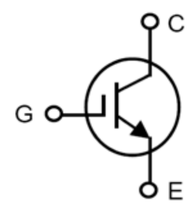
IXYS

High Voltage IGBT

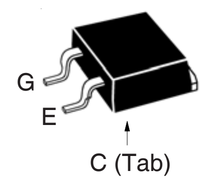
IXGA20N250HV

V_{CES} = 2500V
I_{C110} = 12A
$V_{CE(sat)}$ ≤ 3.1V

For Capacitor Discharge Applications



TO-263HV



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

Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_J = 25°C to 150°C	2500	V
V_{CGR}	T_J = 25°C to 150°C, R_{GE} = 1MΩ	2500	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	T_C = 25°C	30	A
I_{C110}	T_C = 110°C	12	A
I_{CM}	T_C = 25°C, V_{GE} = 19V, 1ms 10ms	105 55	A A
SSOA	V_{GE} = 15V, T_{VJ} = 125°C, R_G = 20Ω	I_{CM} = 60	A
(RBSOA)	Clamped Inductive Load	1500	V
P_C	T_C = 25°C	150	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
T_L	Maximum Lead Temperature for Soldering	300	°C
T_{SOLD}	1.6 mm (0.062in.) from Case for 10s	260	°C
V_{ISOL}	50/60Hz, 1 Minute	4000	V~
Weight		2.3	g

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
BV_{CES}	I_C = 250μA, V_{GE} = 0V	2500			V
$V_{GE(th)}$	I_C = 250μA, V_{CE} = V_{GE}	3.0		5.0	V
I_{CES}	V_{CE} = 0.8 • V_{CES}, V_{GE} = 0V T_J = 125°C			25 750	μA μA
I_{GES}	V_{CE} = 0V, V_{GE} = ±20V			±100	nA
$V_{CE(sat)}$	I_C = 20A, V_{GE} = 15V, Note 1			3.1	V

Features

- International Standard Package
- High Voltage Package
- Electrically Isolated Tab
- High Peak Current Capability
- Low Saturation Voltage
- Molding Epoxies Meet UL 94 V-0 Flammability Classification

Advantages

- High Power Density
- Easy to Mount

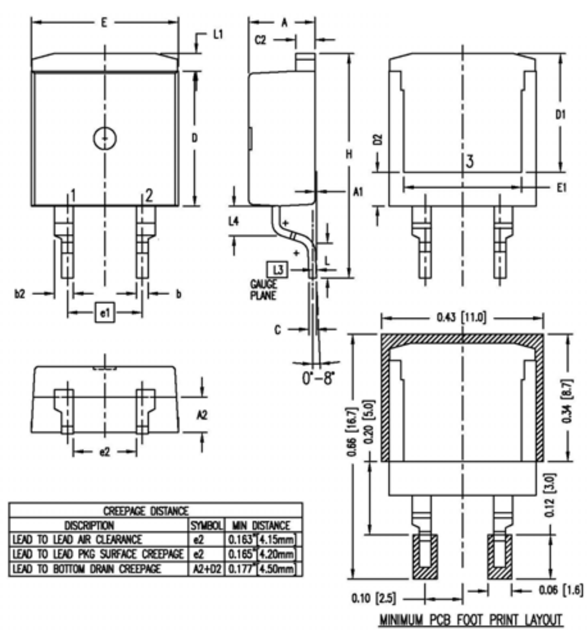
Applications

- Capacitor Discharge
- Pulser Circuits

Symbol (T$_J$ = 25°C, Unless Otherwise Specified)	Test Conditions	Characteristic Values Min.	Typ.	Max.
g_{fs}	I_C = 20A, V_{CE} = 10V, Note 1	8	13	S
$I_{C(ON)}$	V_{GE} = 20V, V_{CE} = 15V, Note 1		190	A
C_{ies}	V_{CE} = 15V, V_{GE} = 25V, f = 1MHz		1190	pF
C_{oes}			53	pF
C_{res}			18	pF
Q_g	I_C = 20A, V_{GE} = 15V, V_{CE} = 1000V		53	nC
Q_{ge}			8	nC
Q_{gc}			22	nC
$t_{d(on)}$	**Resistive Switching Times**		57	ns
t_r	I_C = 40A, V_{GE} = 15V, Note 1		160	ns
$t_{d(off)}$	V_{CE} = 1250V, R_G = 10Ω		136	ns
t_f			930	ns
R_{thJC}				0.83 °C/W

Note 1. Pulse test, t < 300μs, duty cycle, d < 2%.

TO-263HV Outline



CREEPAGE DISTANCE			
DISCRIPTION	SYMBOL	MIN DISTANCE	
LEAD TO LEAD AIR CLEARANCE	e2	0.163"	4.15mm
LEAD TO LEAD PKG SURFACE CREEPAGE	e2	0.165"	4.20mm
LEAD TO BOTTOM DRAIN CREEPAGE	A2+D2	0.177"	4.50mm

SYM	INCHES MIN	INCHES MAX	MILLIMETER MIN	MILLIMETER MAX
A	.170	.185	4.30	4.70
A1	.000	.008	0.00	0.20
A2	.091	.098	2.30	2.50
b	.028	.035	0.70	0.90
b2	.046	.054	1.18	1.38
C	.018	.024	0.45	0.60
C2	.049	.055	1.25	1.40
D	.354	.370	9.00	9.40
D1	.311	.327	7.90	8.30
D2	.083	.098	2.10	2.50
E	.386	.402	9.80	10.20
E1	.307	.323	7.80	8.20
e1	.200 BSC		5.08 BSC	
(e2)	.163	.174	4.13	4.43
H	.591	.614	15.00	15.60
L	.079	.102	2.00	2.60
L1	.039	.055	1.00	1.40
L3	.010 BSC		0.254 BSC	
(L4)	.071	.087	1.80	2.20

NOTE:
1. These dimensions do not inclue mold protusion.
2. ( ) is reference dimension only.
3. Metal finish — Matte pure tin plating except trim area.
4. Pin call out: 1- Gate; 2 - Emitter; 3 - Collector

Fig. 1. Output Characteristics @ $T_J = 25^oC$

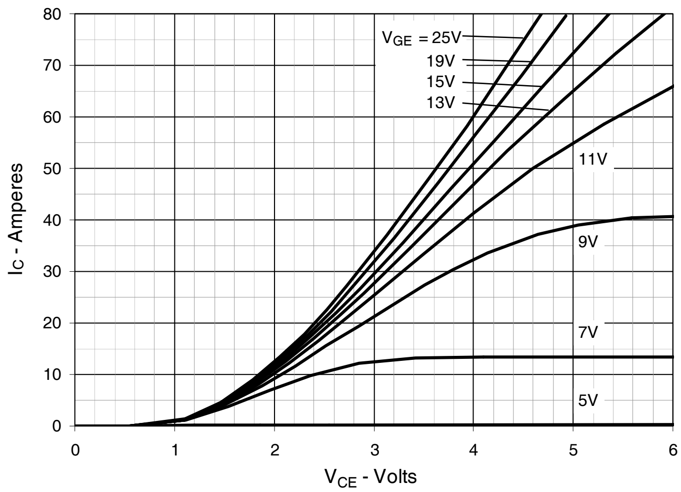


Fig. 2. Extended Output Characteristics @ $T_J = 25^oC$

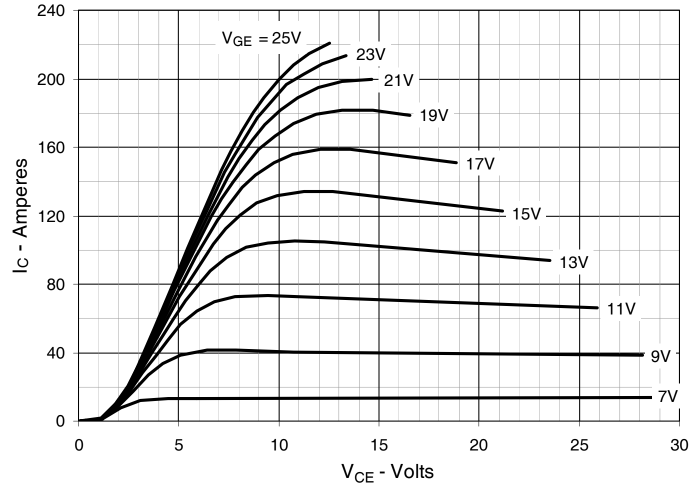


Fig. 3. Output Characteristics @ $T_J = 125^oC$

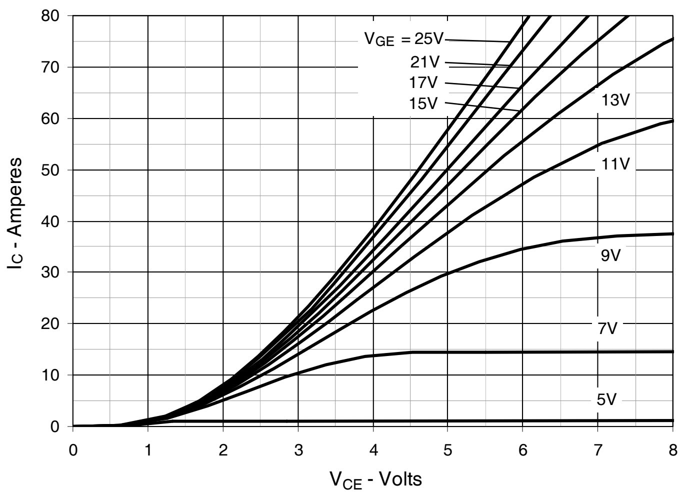


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

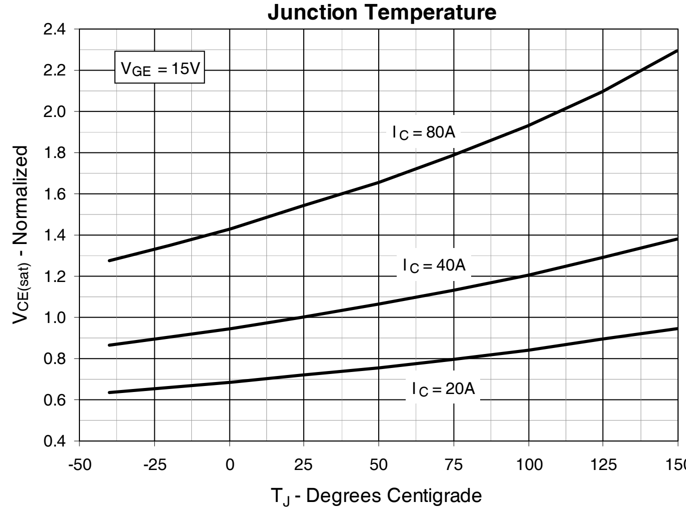


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

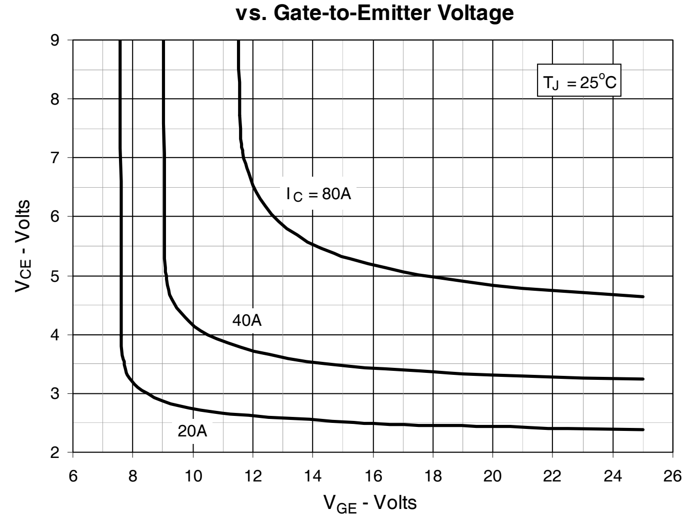


Fig. 6. Input Admittance

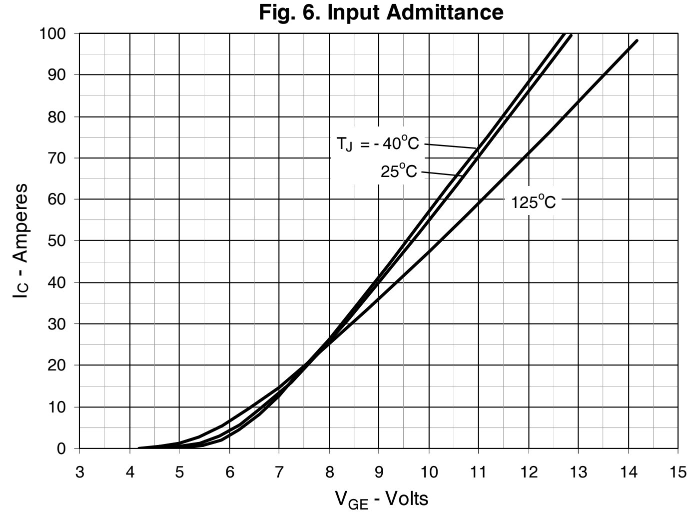


Fig. 7. Transconductance

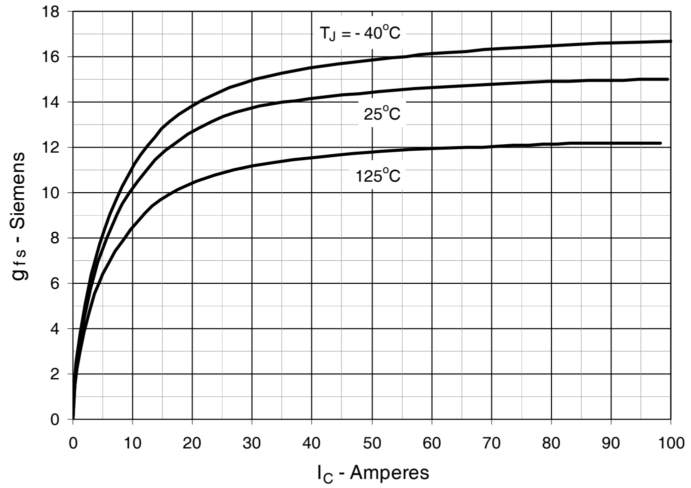


Fig. 8. Gate Charge

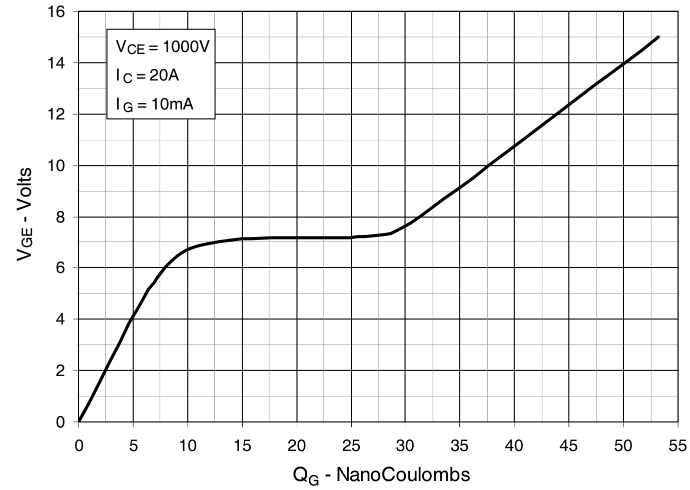


Fig. 9. Reverse-Bias Safe Operating Area

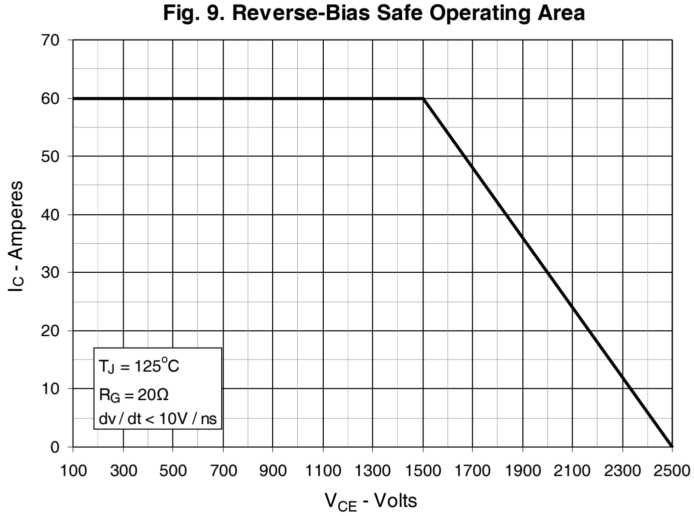


Fig. 10. Capacitance

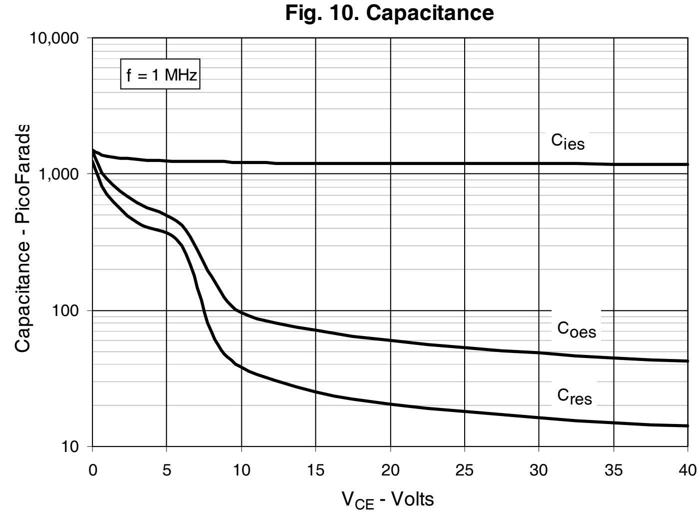


Fig. 11. Maximum Transient Thermal Impedance

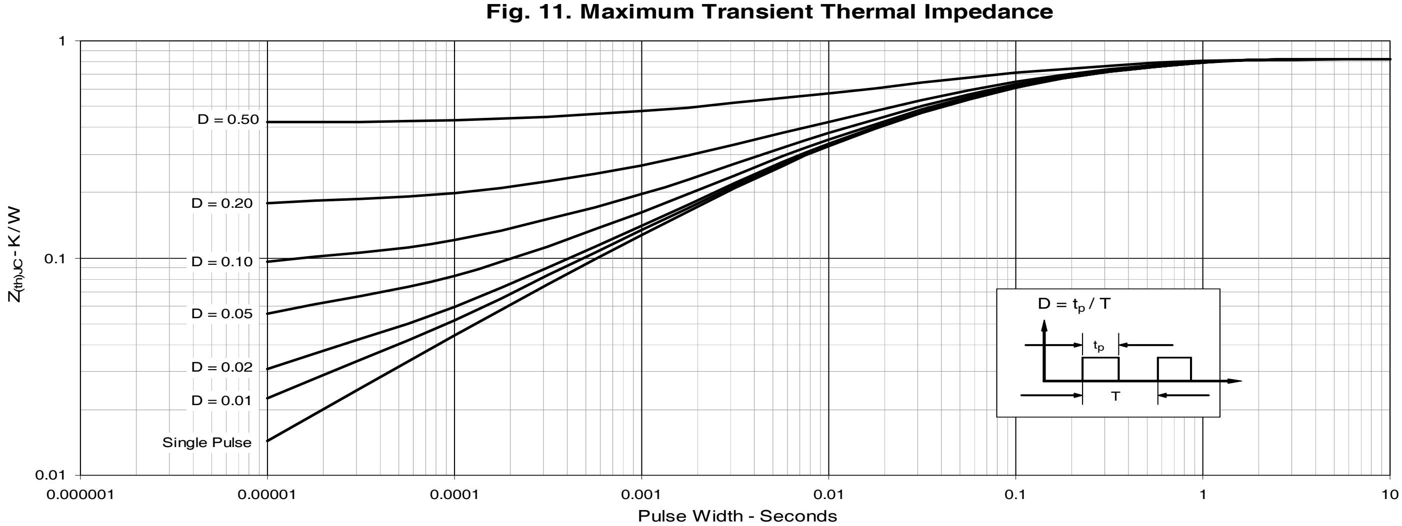


Fig. 12. Resistive Turn-on Rise Time vs. Junction Temperature

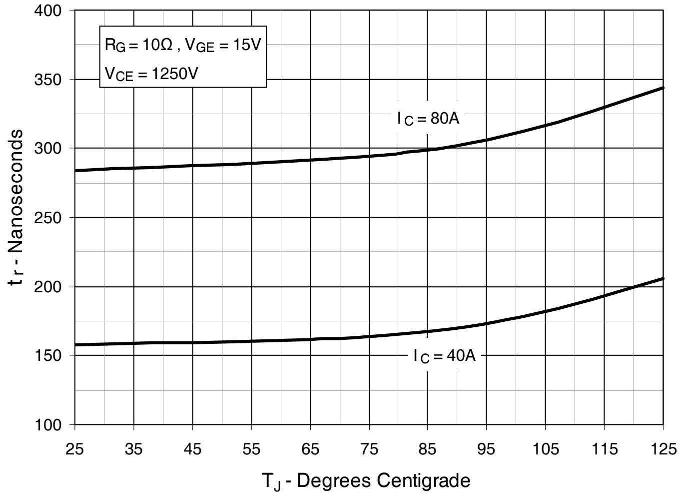


Fig. 13. Resistive Turn-on Rise Time vs. Collector Current

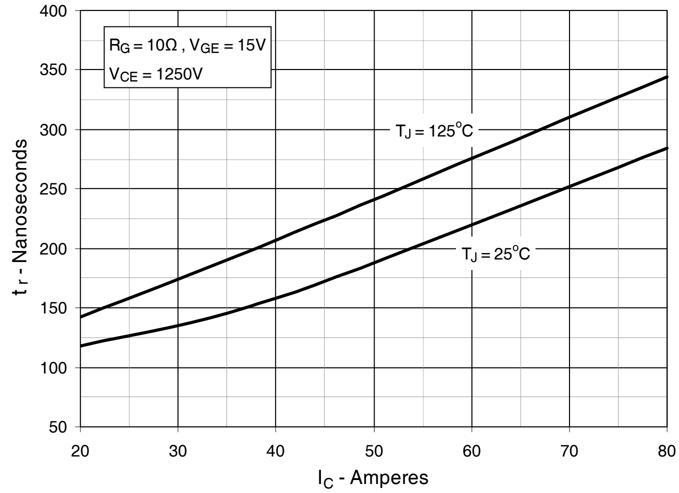


Fig. 14. Resistive Turn-on Switching Times vs. Gate Resistance

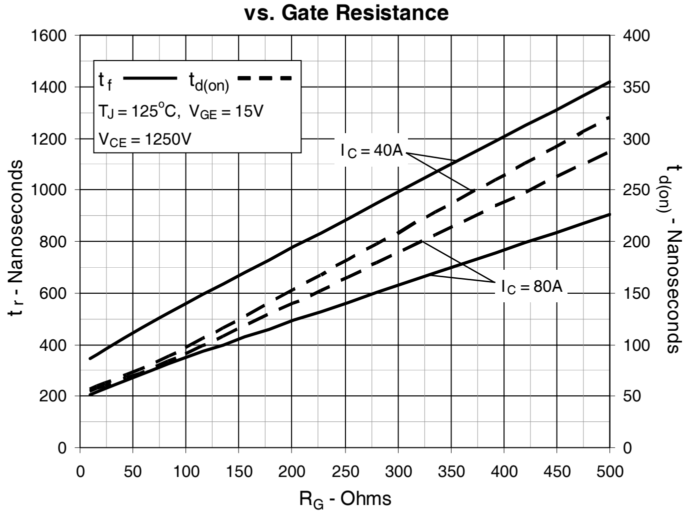


Fig. 15. Resistive Turn-off Switching Times vs. Junction Temperature

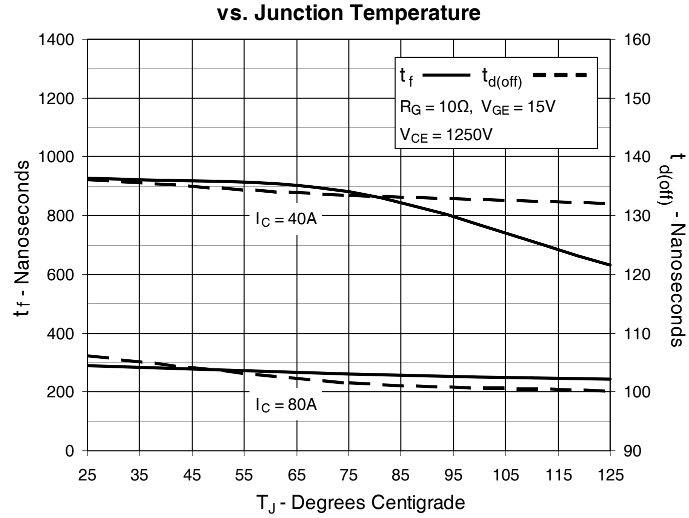


Fig. 16. Resistive Turn-off Switching Times vs. Collector Current

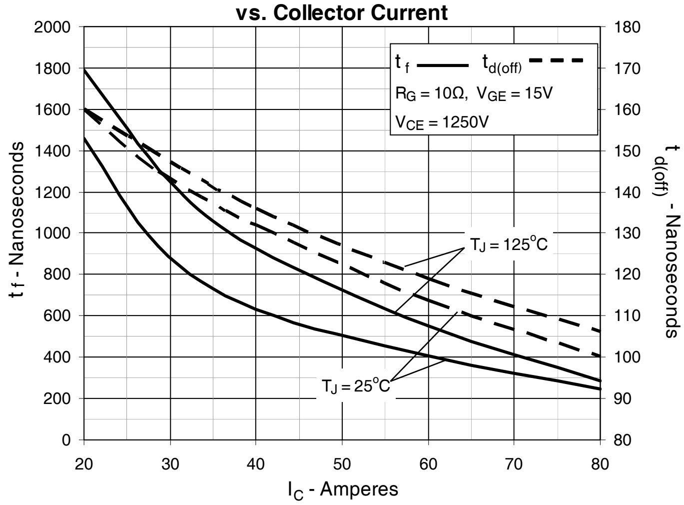


Fig. 17. Resistive Turn-off Switching Times vs. Gate Resistance