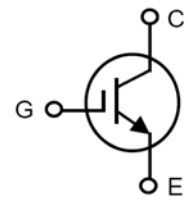
IXYS

High Voltage IGBT

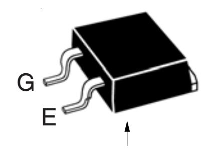
IXGA20N250HV

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	105	A
	10ms	55	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

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

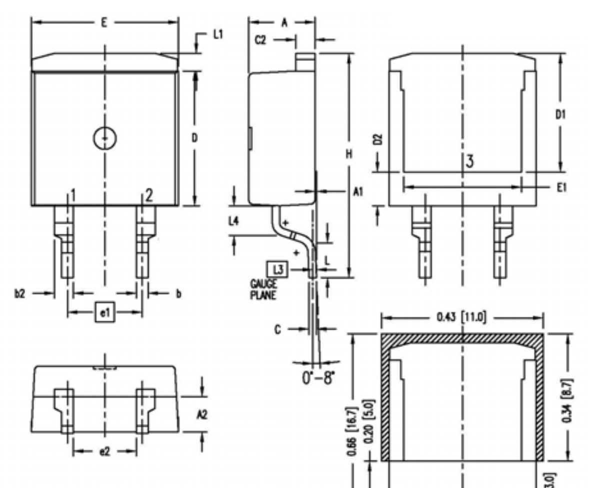
- Capacitor Discharge
- Pulser Circuits

Symbol	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			25	μA
	T_J = 125°C			750	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

Symbol	Test Conditions	Characteristic Values		
(T_J = 25°C, Unless Otherwise Specified)		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		MILLIMETER	
	MIN	MAX	MIN	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

IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.

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

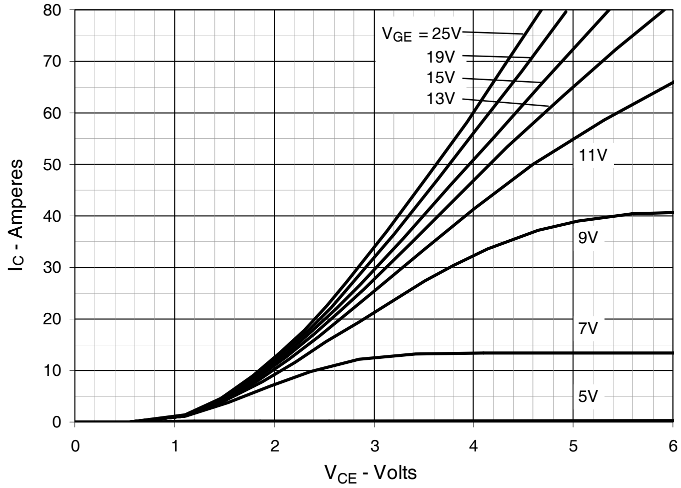


Fig. 2. Extended Output Characteristics @ $T_J = 25^oC$

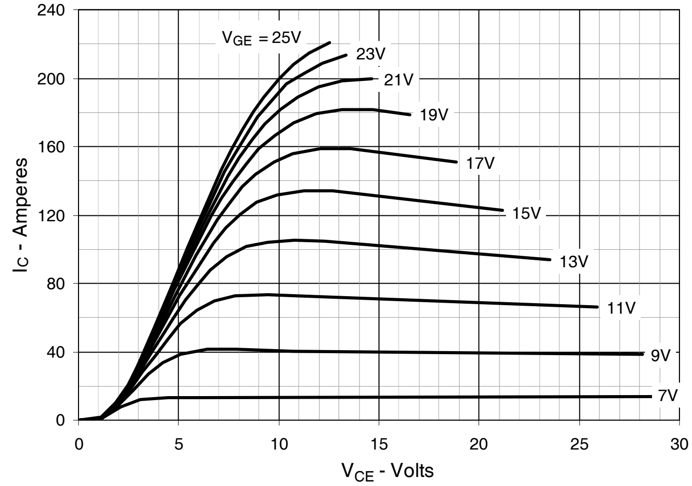


Fig. 3. Output Characteristics @ $T_J = 125^oC$

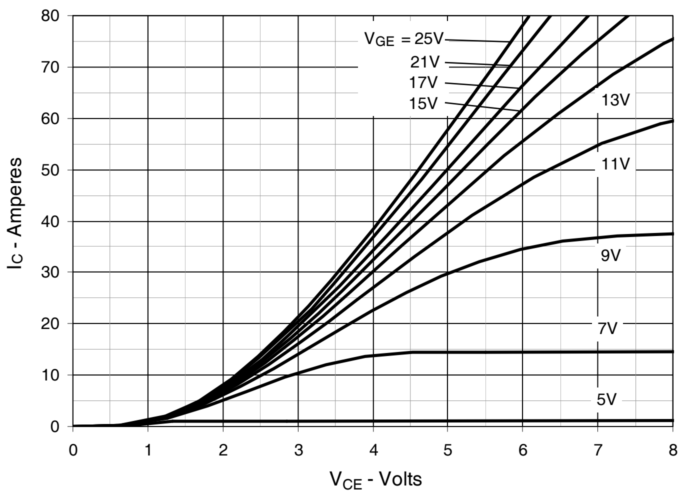


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

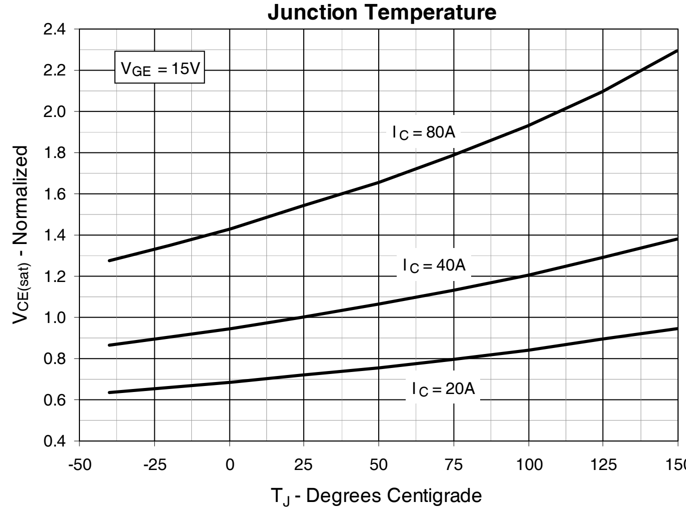


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

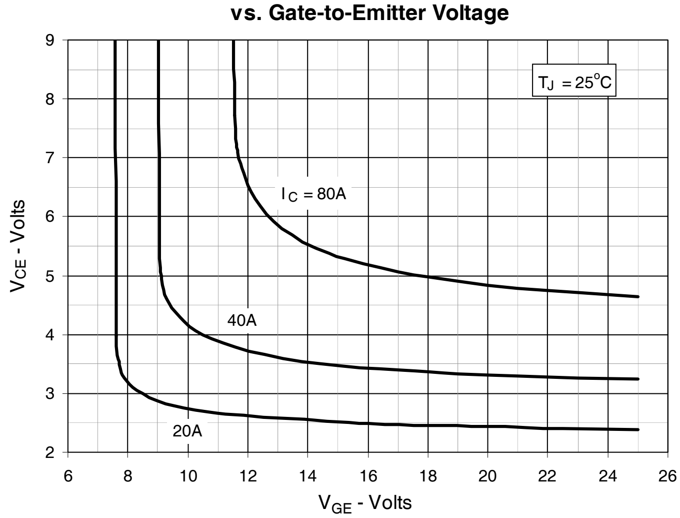


Fig. 6. Input Admittance

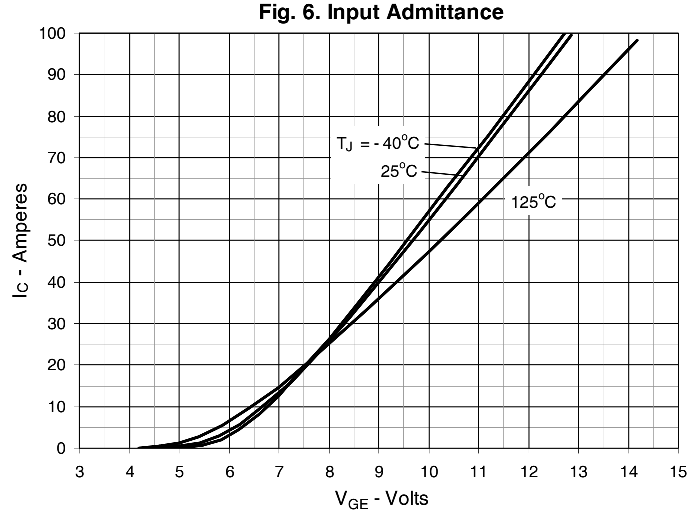


Fig. 7. Transconductance

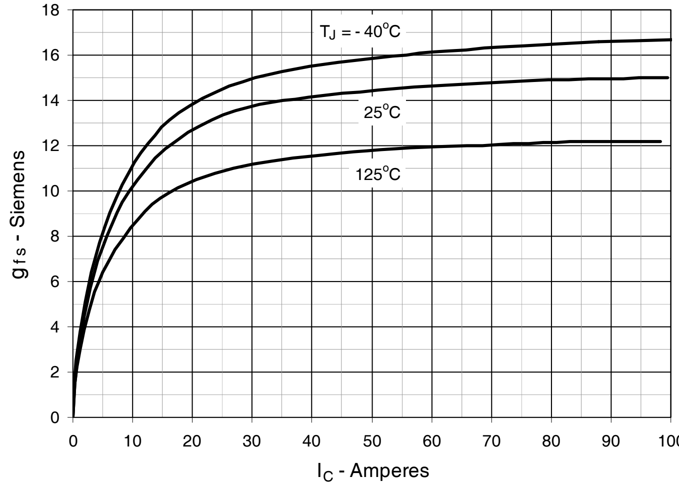


Fig. 8. Gate Charge

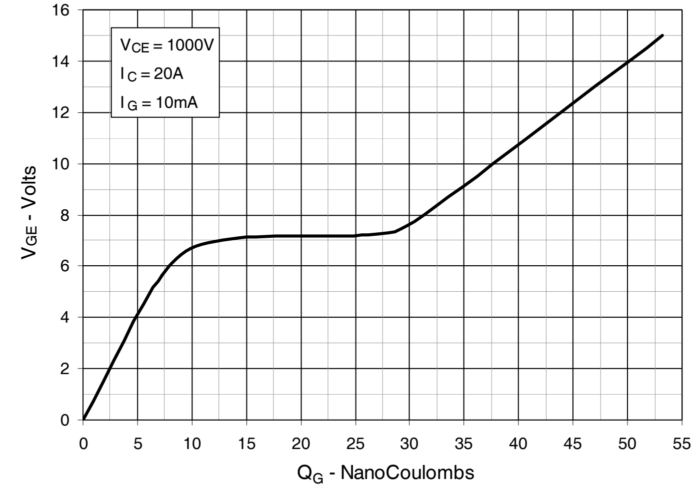


Fig. 9. Reverse-Bias Safe Operating Area

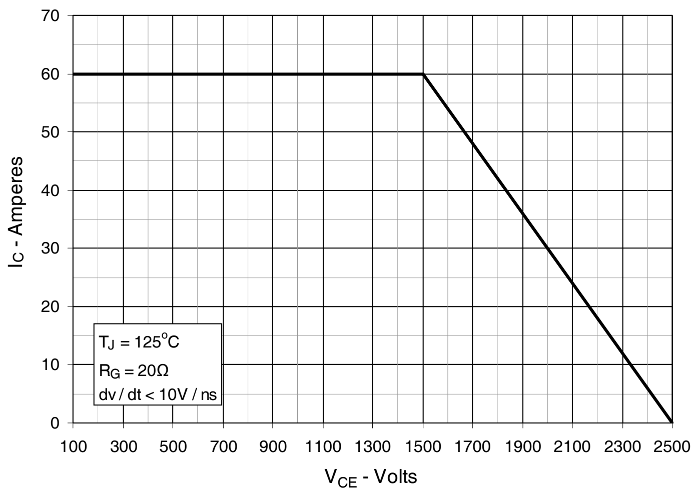


Fig. 10. Capacitance

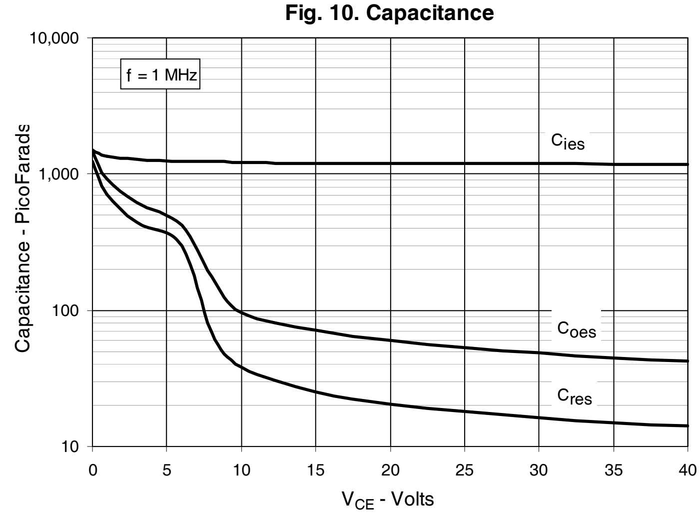


Fig. 11. Maximum Transient Thermal Impedance

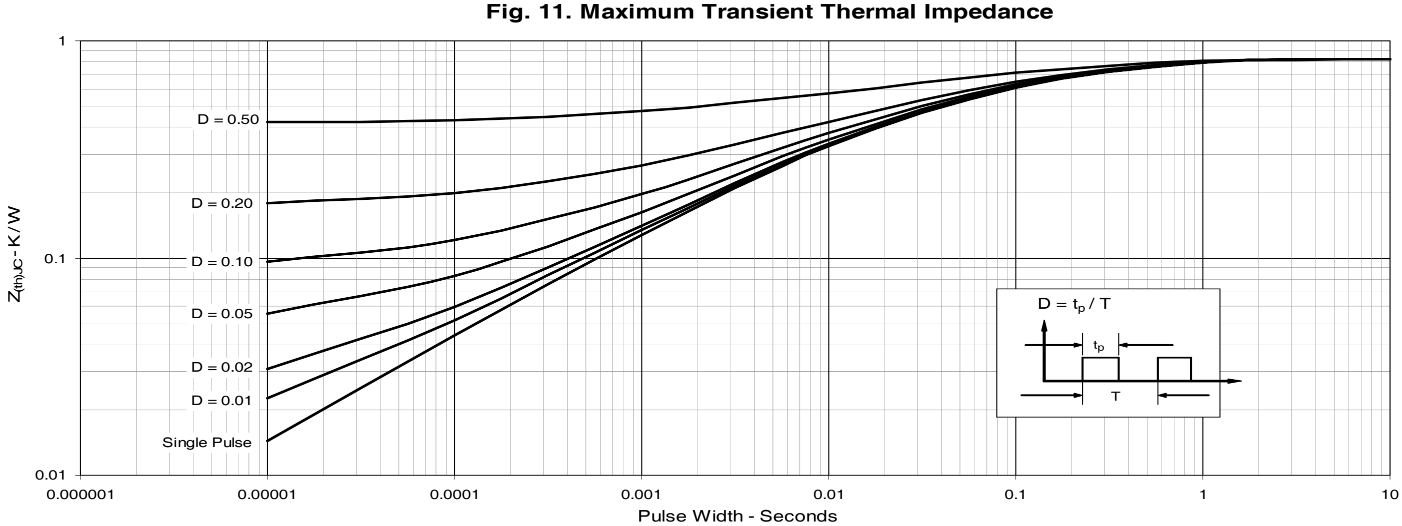


Fig. 12. Resistive Turn-on Rise Time vs. Junction Temperature

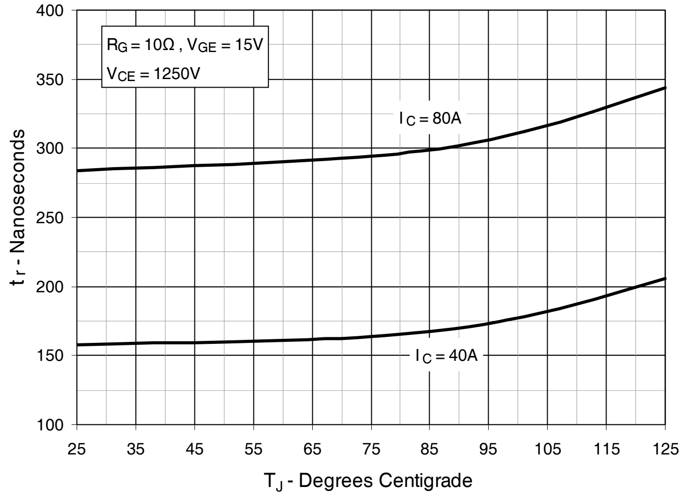


Fig. 13. Resistive Turn-on Rise Time vs. Collector Current

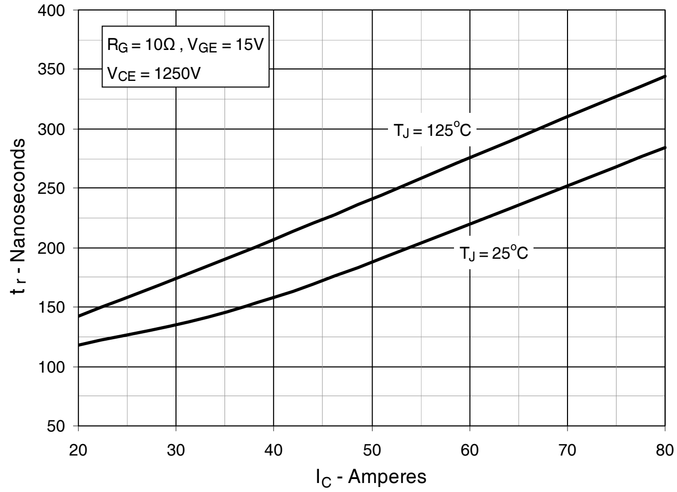


Fig. 14. Resistive Turn-on Switching Times vs. Gate Resistance

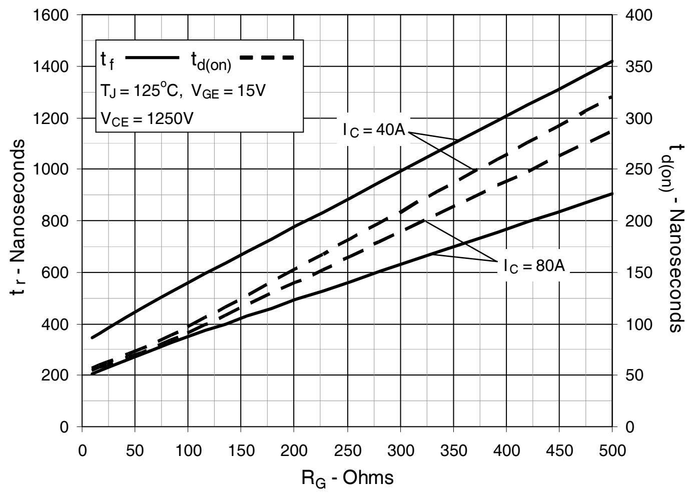


Fig. 15. Resistive Turn-off Switching Times vs. Junction Temperature

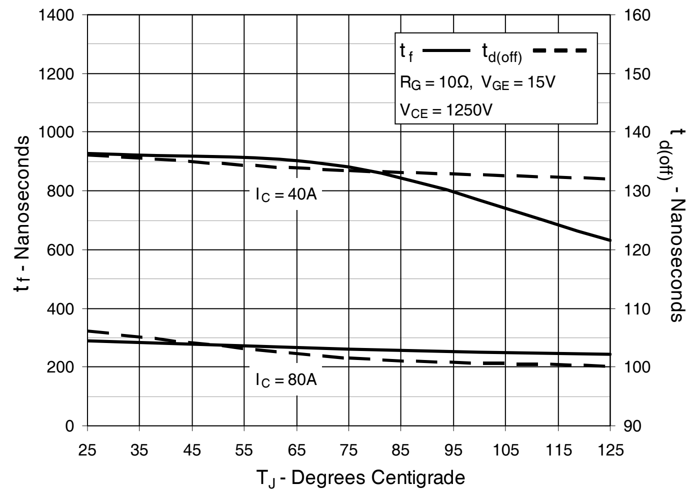


Fig. 16. Resistive Turn-off Switching Times vs. Collector Current

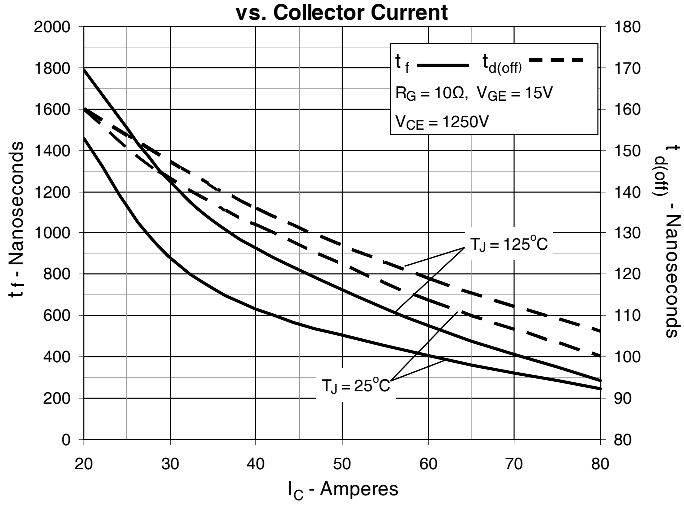


Fig. 17. Resistive Turn-off Switching Times vs. Gate Resistance