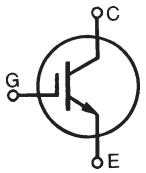
IXYS

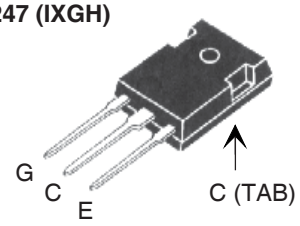
High Voltage IGBT

IXGH10N170
IXGT10N170

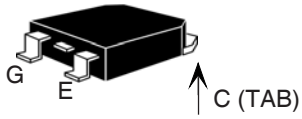
V_{CES} = 1700V
I_{C90} = 10A
$V_{CE(sat)}$ ≤ 4.0V



TO-247 (IXGH)



TO-268 (IXGT)



G = Gate C = Collector
E = Emitter TAB = Collector

Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_C = 25°C to 150°C	1700	V
V_{CGR}	T_J = 25°C to 150°C, R_{GE} = 1MΩ	1700	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	T_C = 25°C	20	A
I_{C90}	T_C = 90°C	10	A
I_{CM}	T_C = 25°C, 1ms	70	A
SSOA (RBSOA)	V_{GE} = 15V, T_{VJ} = 125°C, R_G = 16Ω Clamped inductive load	I_{CM} = 20 @ 0.8 • V_{CES}	A
P_C	T_C = 25°C	110	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
T_L	1.6mm (0.062 in.) from case for 10s	300	°C
T_{SOLD}	Plastic body for 10 seconds	260	°C
M_d	Mounting torque (TO-247)	1.13/10	Nm/lb.in.
Weight	TO-247 TO-268	6 4	g g

Symbol	Test Conditions (T_J = 25°C unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
BV_{CES}	I_C = 250μA, V_{GE} = 0V	1700			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			50 500	μA μA
I_{GES}	V_{CE} = 0V, V_{GE} = ± 20V			±100	nA
$V_{CE(sat)}$	I_C = I_{C90}, V_{GE} = 15V, Note 1 T_J = 125°C		2.7 3.4	4.0	V

Features

- International standard packages JEDEC TO-268 and JEDEC TO-247 AD
- High current handling capability
- MOS Gate turn-on
  - drive simplicity
- Rugged NPT structure
- Molding epoxies meet UL 94 V-0 flammability classification

Applications

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

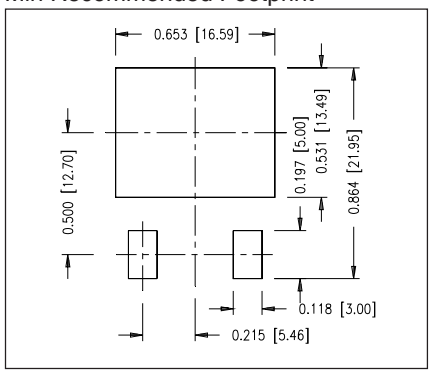
Advantages

- High power density
- Suitable for surface mounting
- Easy to mount with 1 screw, (isolated mounting screw hole)

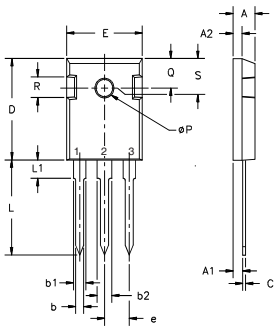
Symbol	Test Conditions (T_J = 25°C unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	I_C = 10A, V_{CE} = 10V, Note 1	3.8	6.3		S
$I_{C(ON)}$	V_{CE} = 10V, V_{GE} = 10V		33		A
C_{ies}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz		700		pF
C_{oes}			40		pF
C_{res}			14		pF
Q_g	I_C = 10A, V_{GE} = 15V, V_{CE} = 0.5 • V_{CES}		32		nC
Q_{ge}			4		nC
Q_{gc}			16		nC
$t_{d(on)}$	**Resistive load, T_J = 25°C**		30		ns
t_r	I_C = 10A, V_{GE} = 15V		69		ns
$t_{d(off)}$	V_{CE} = 850V, R_G = 16Ω		132		ns
t_f			600		ns
$t_{d(on)}$	**Resistive load, T_J = 125°C**		30		ns
t_{ri}	I_C = 10A, V_{GE} = 15V		270		ns
$t_{d(off)}$	V_{CE} = 850V, R_G = 16Ω		135		ns
t_{fi}			495		ns
R_{thJC}				1.1	°C/W
R_{thCS}	(TO-247)		0.25		°C/W

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

Min Recommended Footprint



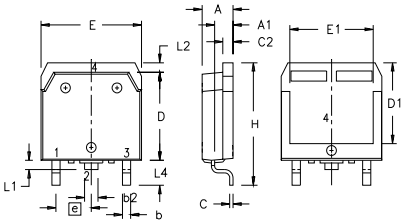
TO-247 AD Outline

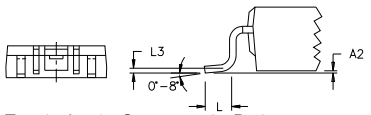


Terminals: 1 - Gate 2 - Drain

Dim.	Millimeter Min.	Max.	Inches 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
L1		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

TO-268 Outline





Terminals: 1 - Gate 2 - Drain

SYM	INCHES MIN	MAX	MILLIMETERS MIN	MAX
A	.193	.201	4.90	5.10
A1	.106	.114	2.70	2.90
A2	.001	.010	0.02	0.25
b	.045	.057	1.15	1.45
b2	.075	.083	1.90	2.10
C	.016	.026	0.40	0.65
C2	.057	.063	1.45	1.60
D	.543	.551	13.80	14.00
D1	.488	.500	12.40	12.70
E	.624	.632	15.85	16.05
E1	.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
L1	.047	.055	1.20	1.40
L2	.039	.045	1.00	1.15
L3	.010 BSC		0.25 BSC	
L4	.150	.161	3.80	4.10

Fig. 1. Output Characteristics @ 25ºC

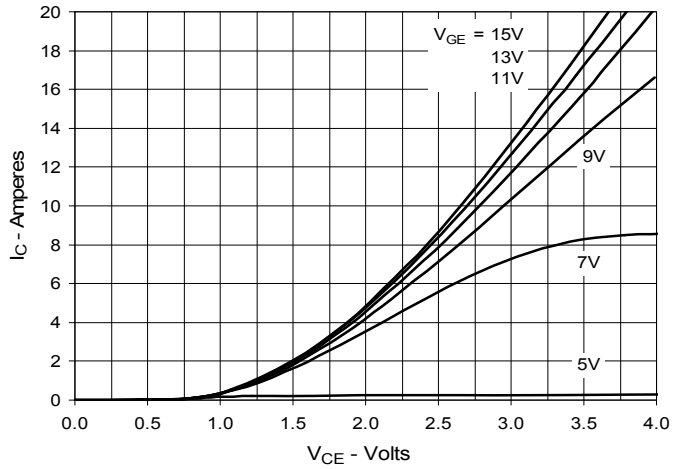


Fig. 2. Extended Output Characteristics @ 25ºC

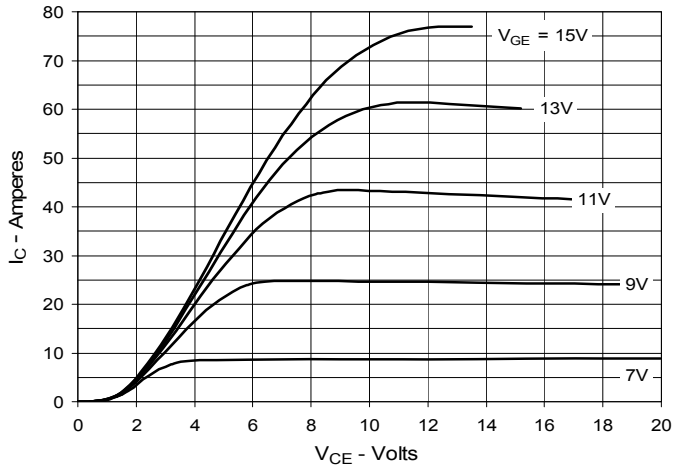


Fig. 3. Output Characteristics @ 125ºC

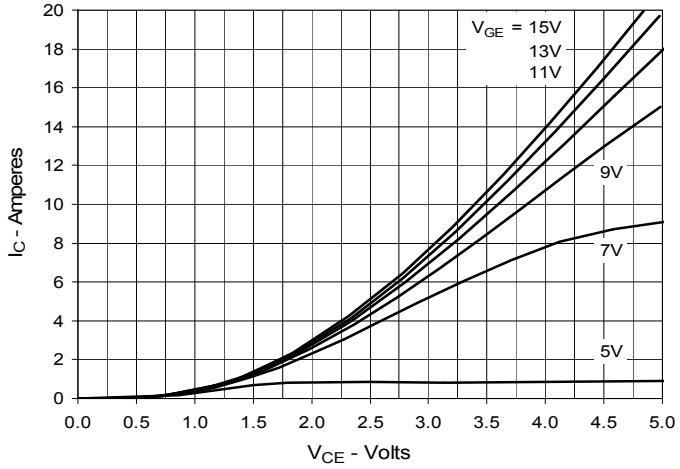


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

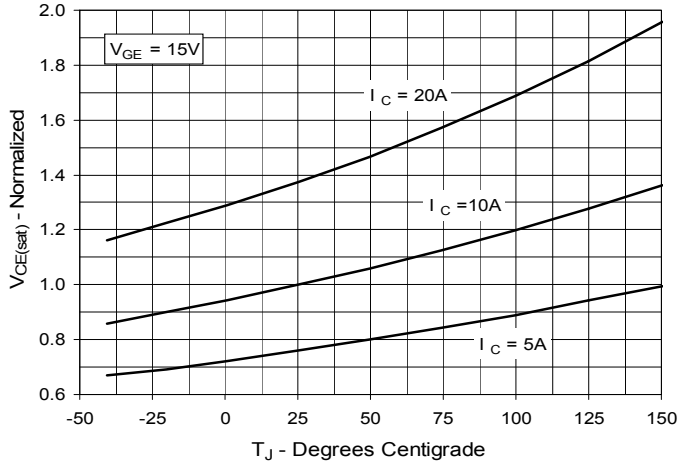


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

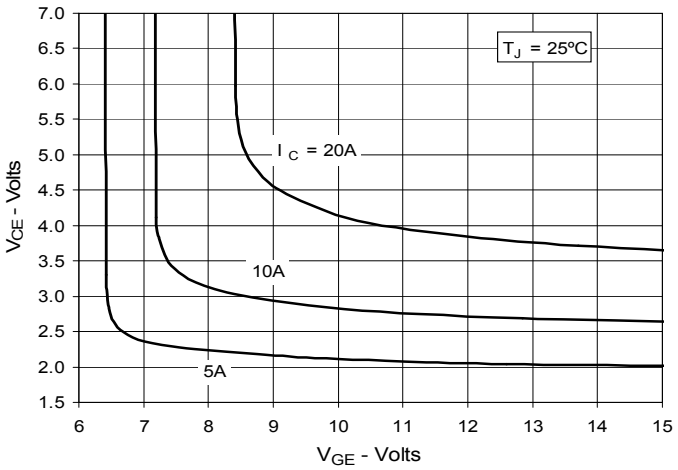


Fig. 6. Input Admittance

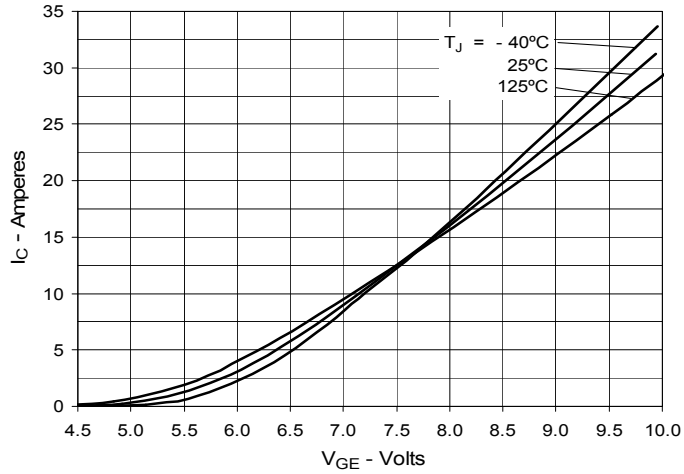


Fig. 7. Transconductance

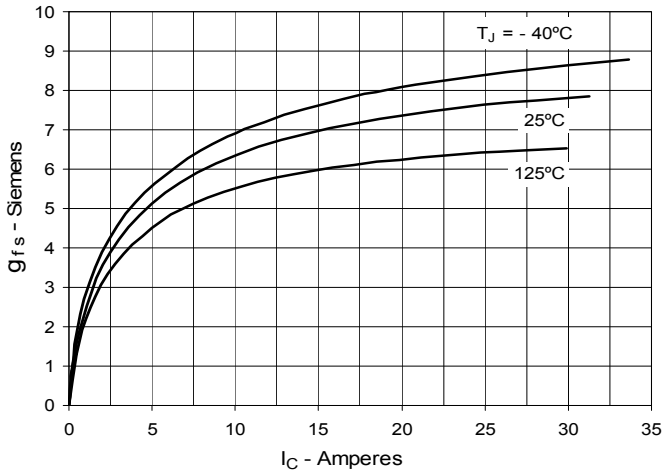


Fig. 8. Gate Charge

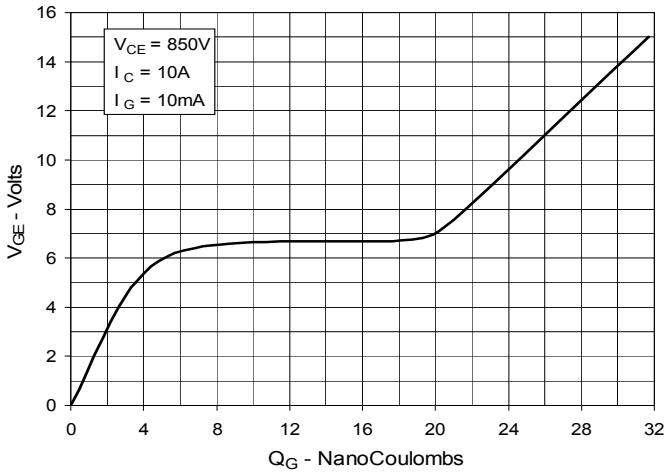


Fig. 9. Reverse-Bias Safe Operating Area

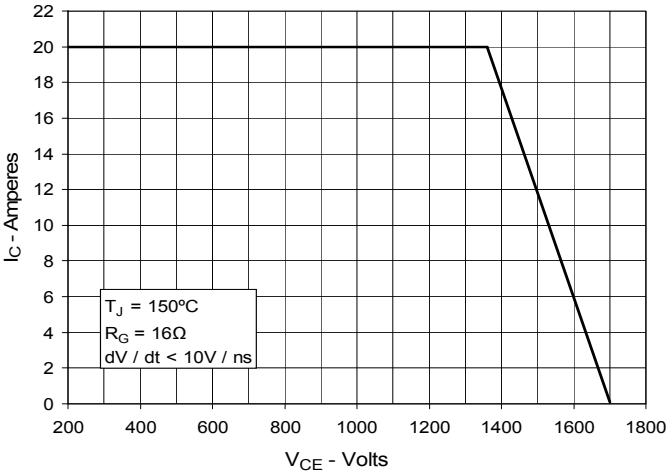


Fig. 10. Capacitance

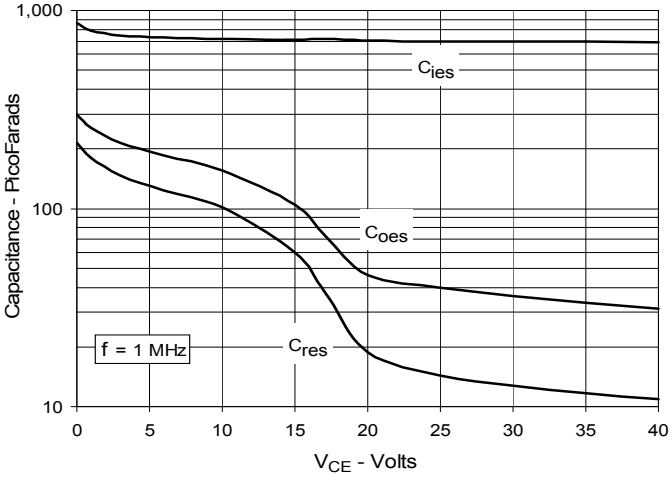


Fig. 11. Maximum Transient Thermal Impedance

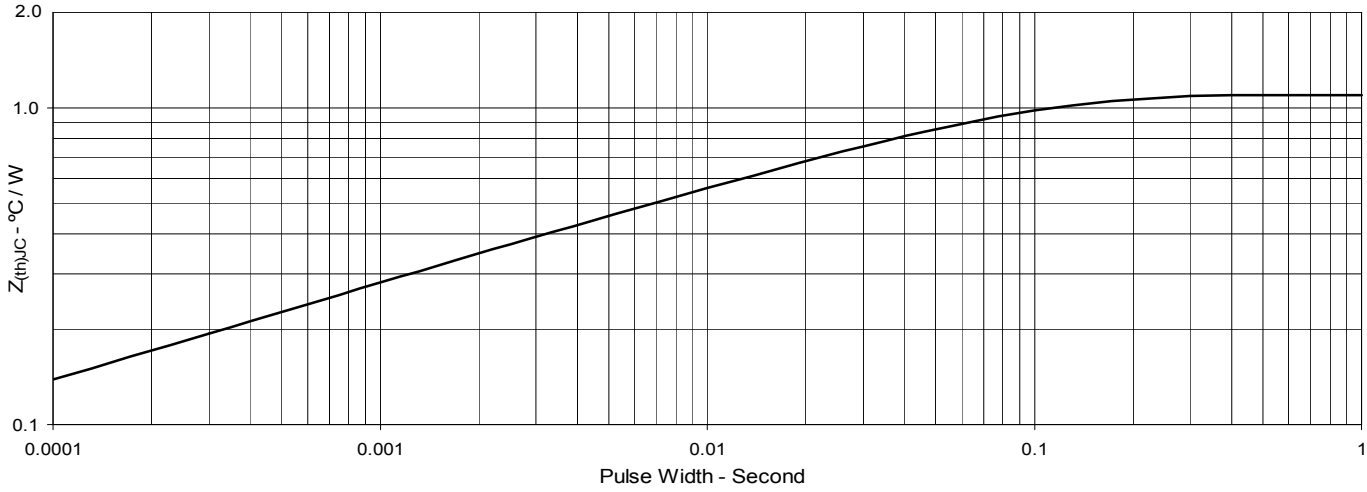


Fig. 12. Resistive Turn-on Rise Time vs. Junction Temperature

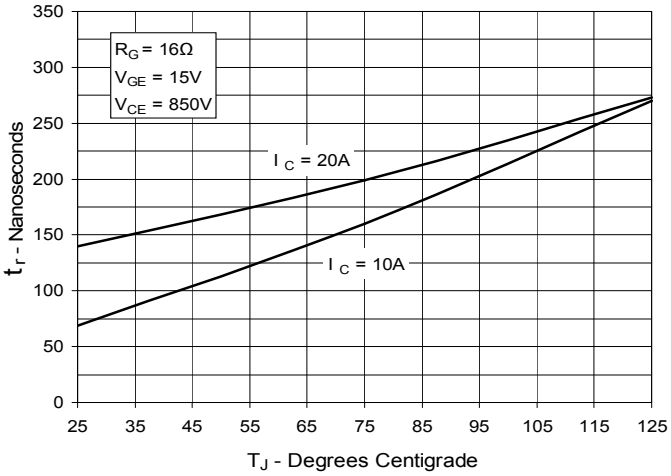


Fig. 13. Resistive Turn-on Rise Time vs. Collector Current

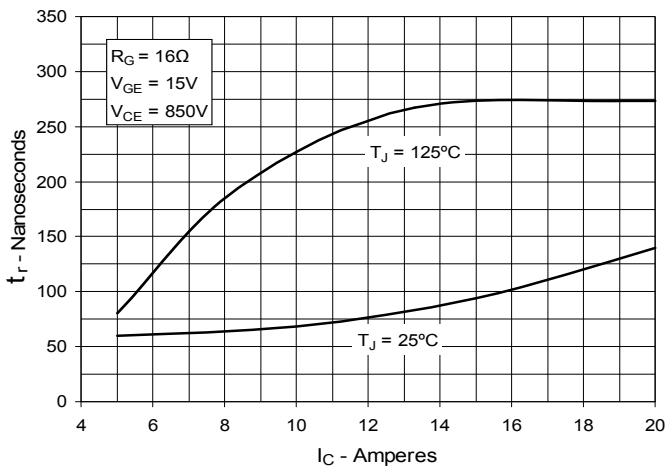


Fig. 14. Resistive Turn-on Switching Times vs. Gate Resistance

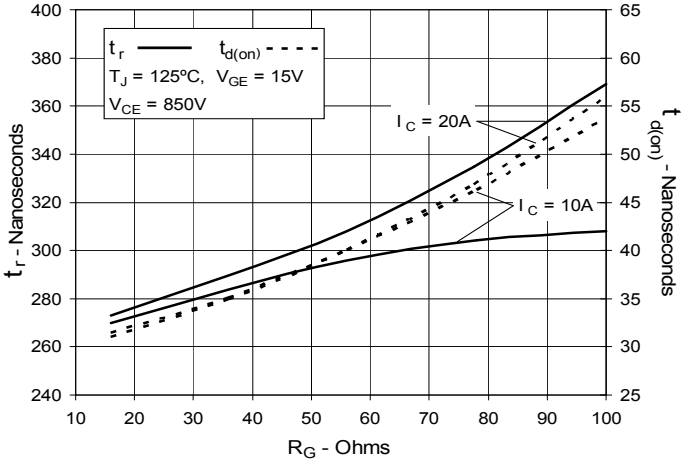


Fig. 15. Resistive Turn-off Switching Times vs. Junction Temperature

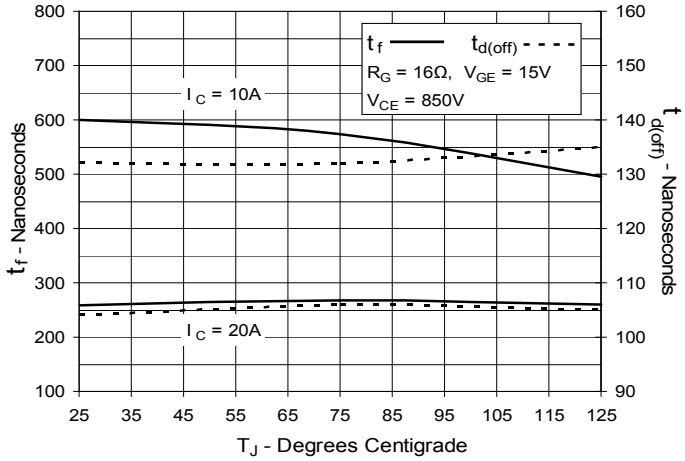


Fig. 16. Resistive Turn-off Switching Times vs. Collector Current

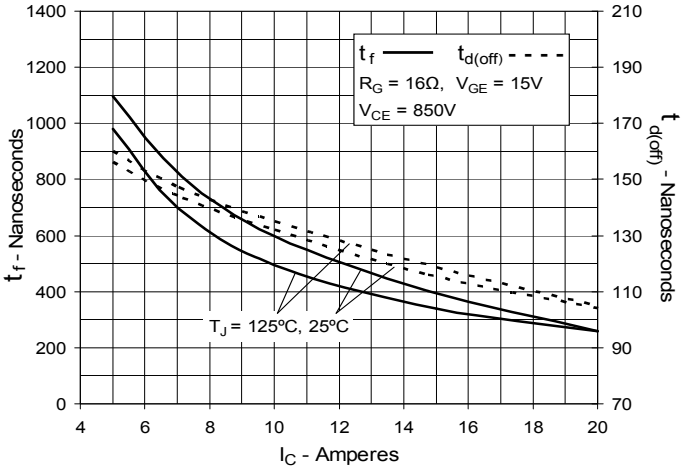
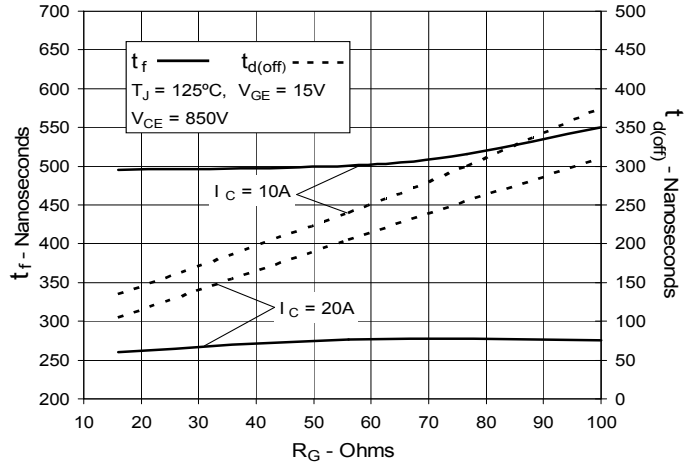


Fig. 17. Resistive Turn-off Switching Times vs. Gate Resistance



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