

# High Voltage IGBT

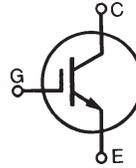
# IXGH10N300

$$V_{CES} = 3000V$$

$$I_{C90} = 10A$$

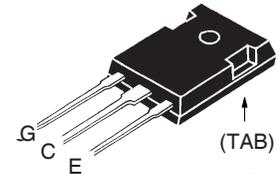
$$V_{CE(sat)} \leq 3.5V$$

For Capacitor Discharge Applications



Symbol	Test Conditions	Maximum Ratings	
$V_{CES}$	$T_J = 25^\circ C$ to $150^\circ C$	3000	V
$V_{CGR}$	$T_J = 25^\circ C$ to $150^\circ C$ , $R_{GE} = 1M\Omega$	3000	V
$V_{GES}$	Continuous	$\pm 20$	V
$V_{GEM}$	Transient	$\pm 30$	V
$I_{C25}$	$T_C = 25^\circ C$	18	A
$I_{C90}$	$T_C = 90^\circ C$	10	A
$I_{CM}$	$T_C = 25^\circ C$ , 1ms	40	A
<b>SSOA</b>	$V_{GE} = 20V$ , $T_{VJ} = 125^\circ C$ , $R_G = 50\Omega$	$I_{CM} = 32$	A
<b>(RBSOA)</b>	Clamped Inductive Load	@ $\leq 1250$	V
$P_C$	$T_C = 25^\circ C$	100	W
$T_J$		-55 ... +150	$^\circ C$
$T_{JM}$		150	$^\circ C$
$T_{stg}$		-55 ... +150	$^\circ C$
$T_L$	Maximum Lead Temperature for Soldering	300	$^\circ C$
$T_{SOLD}$	1.6 mm (0.062in.) from Case for 10s	260	$^\circ C$
$M_d$	Mounting Torque	1.13/10	Nm/lb.in.
<b>Weight</b>		6	g

TO-247 AD



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

## Features

- High Peak Current Capability
- Low Saturation Voltage
- Low Gate Drive Requirement
- Molding Epoxies Meet UL 94 V-0 Flammability Classification

## Applications

- Capacitor Discharge
- Pulser Circuits

## Advantages

- High Power Density
- Easy to Mount

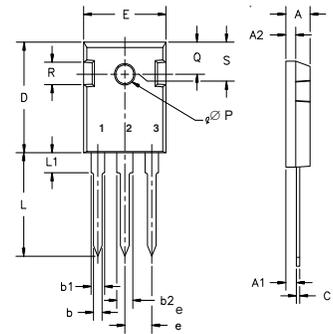
Symbol	Test Conditions ( $T_J = 25^\circ C$ , Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$BV_{CES}$	$I_C = 250\mu A$ , $V_{GE} = 0V$	3000		V
$V_{GE(th)}$	$I_C = 250\mu A$ , $V_{CE} = V_{GE}$	3.0		V
$I_{CES}$	$V_{CE} = 0.8 \cdot V_{CES}$ , $V_{GE} = 0V$ $T_J = 125^\circ C$			25 $\mu A$ 500 $\mu A$
$I_{GES}$	$V_{CE} = 0V$ , $V_{GE} = \pm 20V$			$\pm 100$ nA
$V_{CE(sat)}$	$I_C = 10A$ , $V_{GE} = 15V$ $I_C = 30A$			3.5 V 5.2 V

Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ , Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$g_{fs}$	$I_C = 20\text{A}$ , $V_{CE} = 10\text{V}$ , Note 1	3.6	6.0	S
$I_{C(ON)}$	$V_{GE} = 15\text{V}$ , $V_{CE} = 15\text{V}$ , Note 1		54	A
$C_{ies}$	$V_{CE} = 25\text{V}$ , $V_{GE} = 0\text{V}$ , $f = 1\text{MHz}$		560	pF
$C_{oes}$			24	pF
$C_{res}$			8	pF
$Q_{g(on)}$	$I_C = 10\text{A}$ , $V_{GE} = 15\text{V}$ , $V_{CE} = 0.5 \cdot V_{CES}$		32.0	nC
$Q_{ge}$			7.5	nC
$Q_{gc}$			12.0	nC
$t_{d(on)}$	<b>Resistive Switching Times</b> $I_C = 20\text{A}$ , $V_{GE} = 15\text{V}$ $V_{CE} = 1250\text{V}$ , $R_G = 50\Omega$		72	ns
$t_r$			227	ns
$t_{d(off)}$			154	ns
$t_f$			530	ns
$R_{thJC}$			1.25	$^\circ\text{C/W}$
$R_{thCK}$		0.21		$^\circ\text{C/W}$

**Note**

1. Pulse Test,  $t \leq 300\mu\text{s}$ ; Duty Cycle,  $d \leq 2\%$ .
2. Additional provisions for lead-to-lead voltage isolation are required at  $V_{CE} > 1200\text{V}$ .

**TO-247 (IXGH) Outline**



Terminals: 1 - Gate      2 - Drain  
3 - Source      Tab - Drain

Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.7	5.3	.185	.209
A <sub>1</sub>	2.2	2.54	.087	.102
A <sub>2</sub>	2.2	2.6	.059	.098
b	1.0	1.4	.040	.055
b <sub>1</sub>	1.65	2.13	.065	.084
b <sub>2</sub>	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
S	6.15	BSC	242	BSC

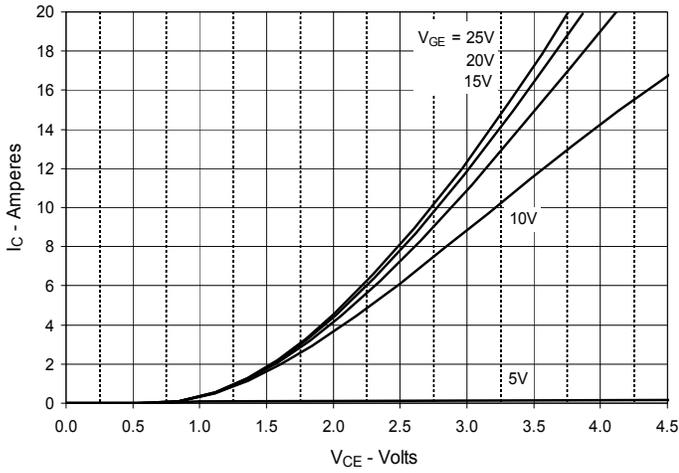
**ADVANCE TECHNICAL INFORMATION**

The product presented herein is under development. The Technical Specifications offered are derived from a subjective evaluation of the design, based upon prior knowledge and experience, and constitute a "considered reflection" of the anticipated result. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

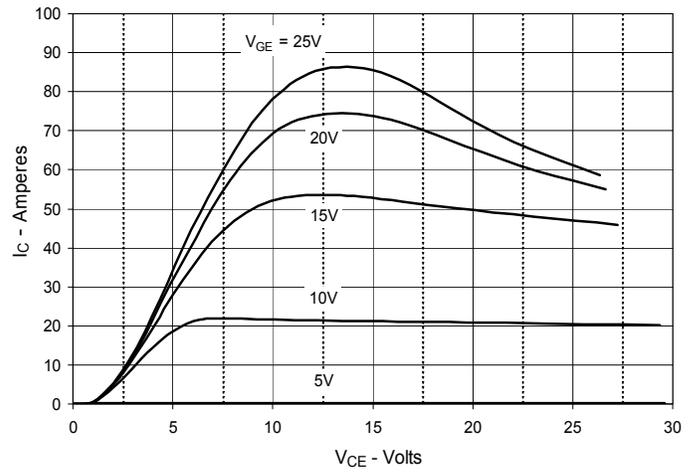
IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.

IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents:	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	7,005,734 B2	7,157,338B2
	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	7,063,975 B2	
	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	7,071,537	

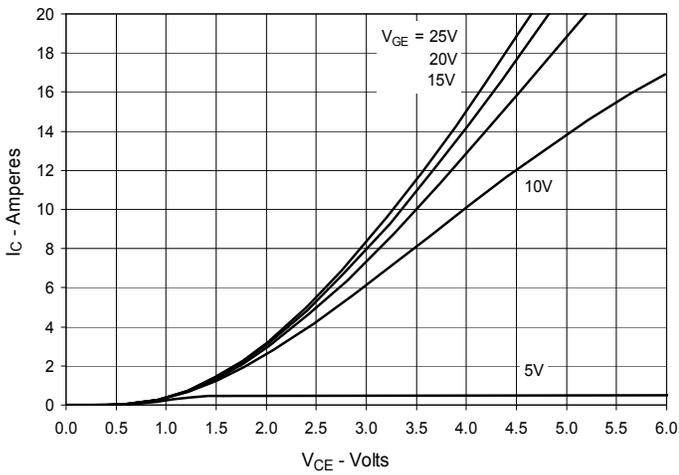
**Fig. 1. Output Characteristics @ 25°C**



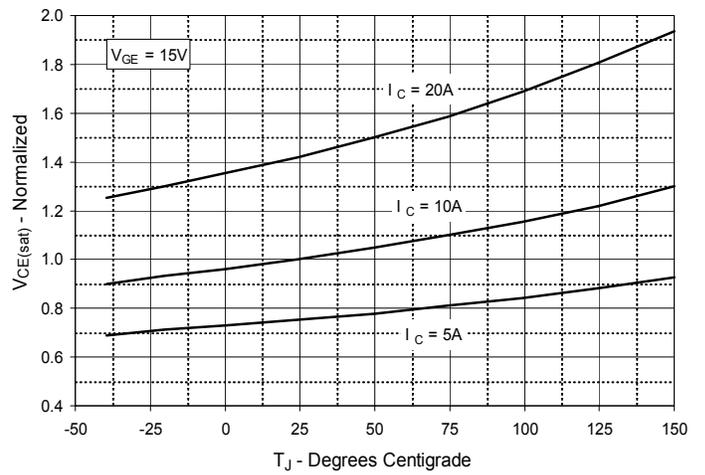
**Fig. 2. Extended Output Characteristics @ 25°C**



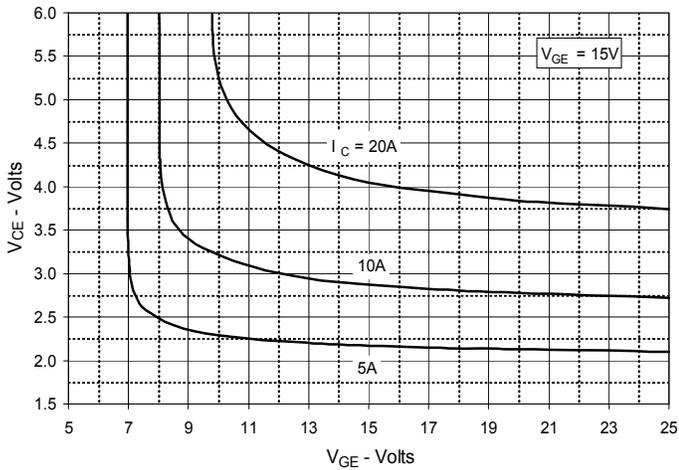
**Fig. 3. Output Characteristics @ 125°C**



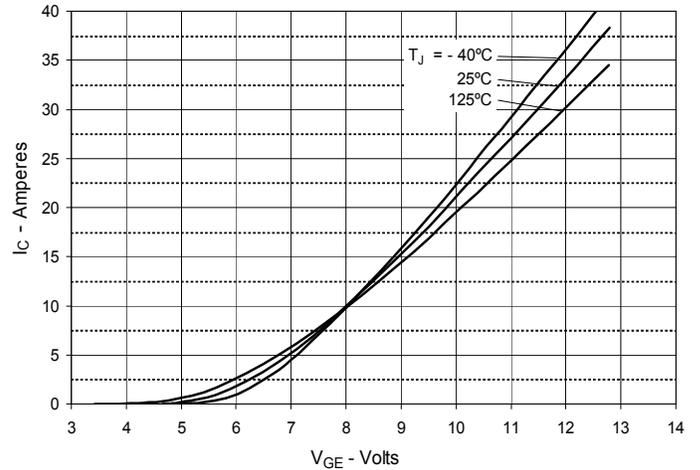
**Fig. 4. Dependence of  $V_{CE(sat)}$  on Junction Temperature**



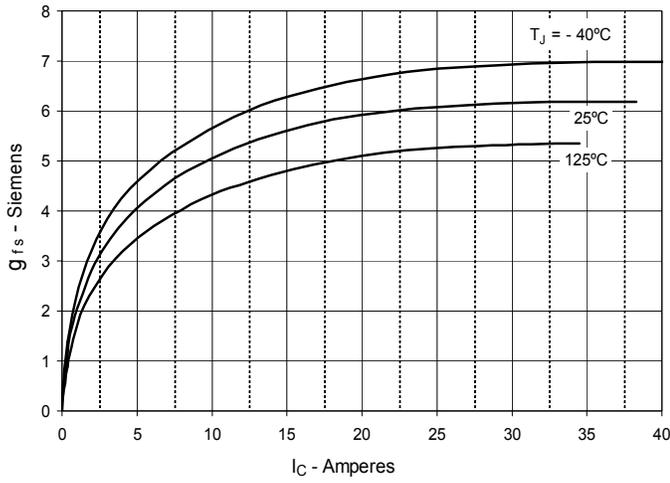
**Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage**



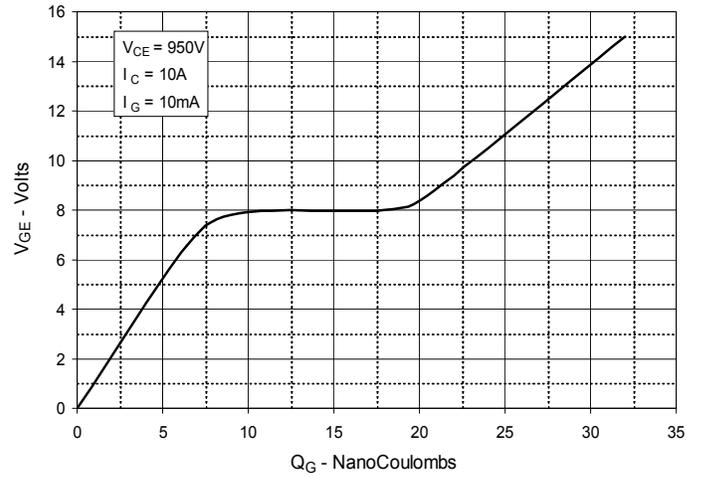
**Fig. 6. Input Admittance**



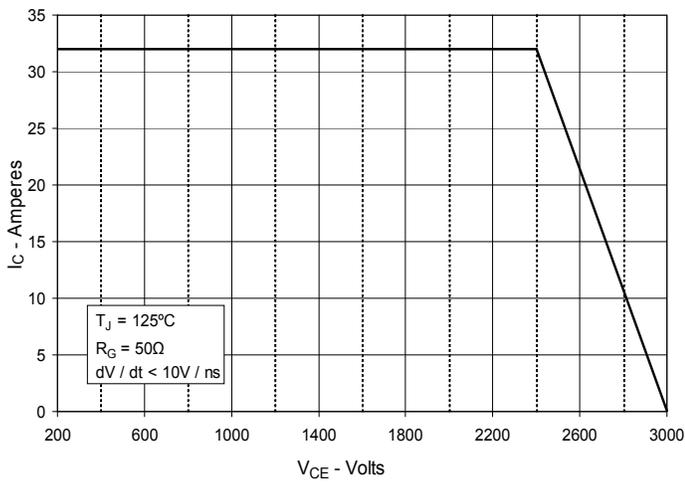
**Fig. 7. Transconductance**



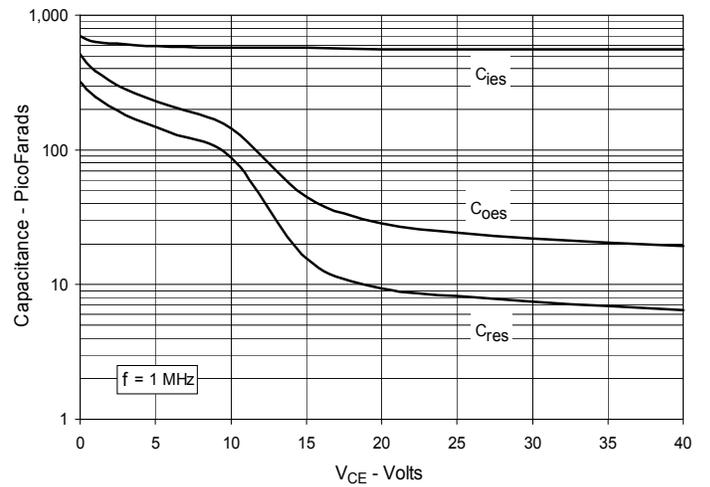
**Fig. 8. Gate Charge**



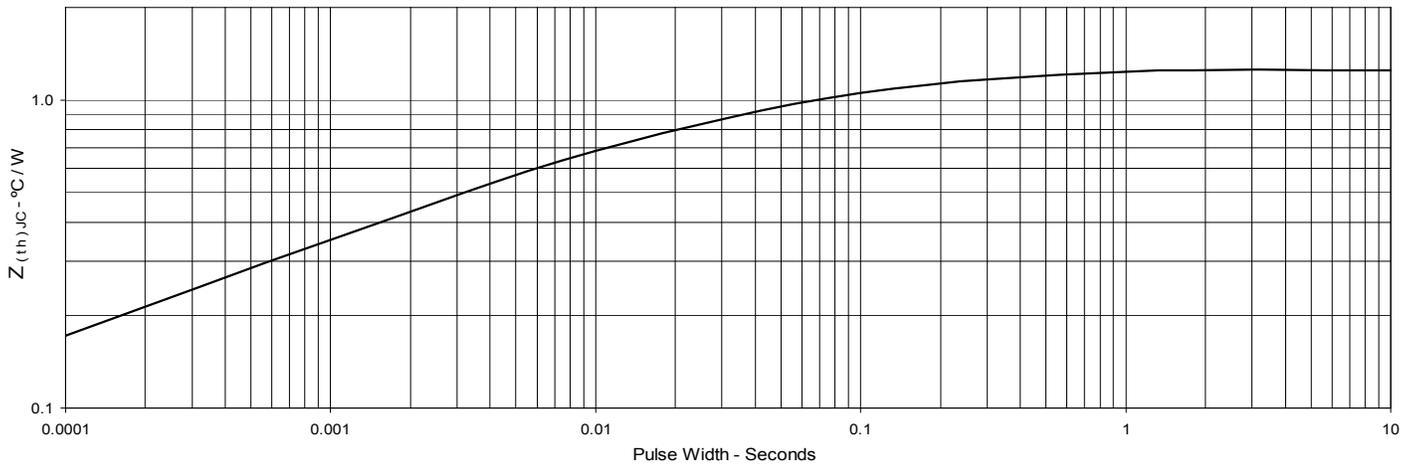
**Fig. 9. Reverse-Bias Safe Operating Area**



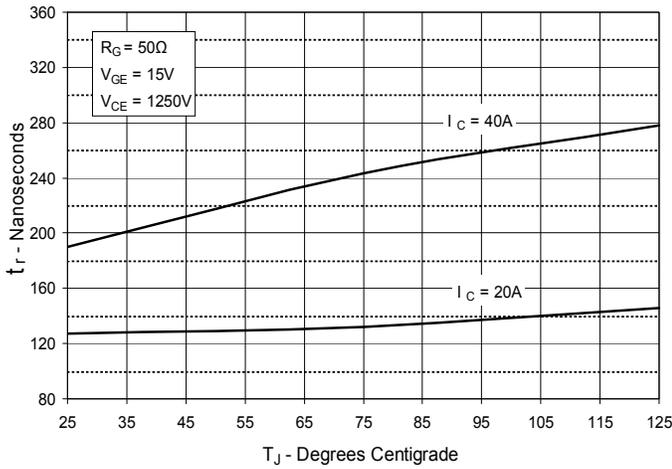
**Fig. 10. Capacitance**



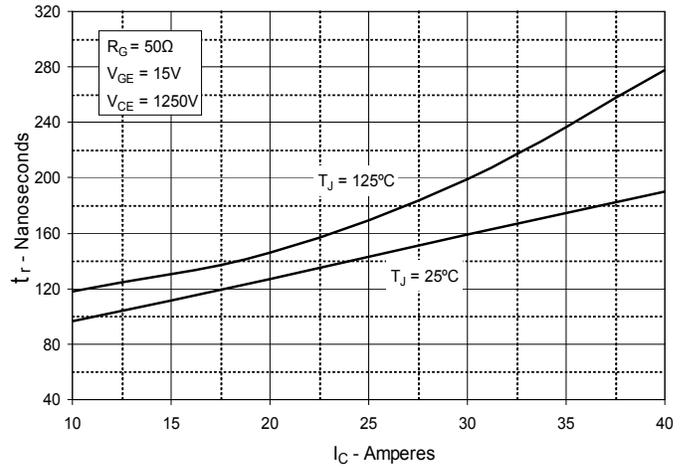
**Fig. 11. Maximum Transient Thermal Impedance**



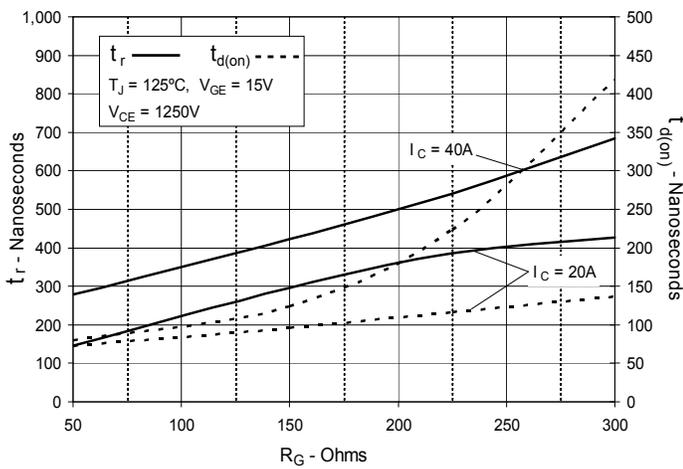
**Fig. 12. Resistive Turn-on Rise Time vs. Junction Temperature**



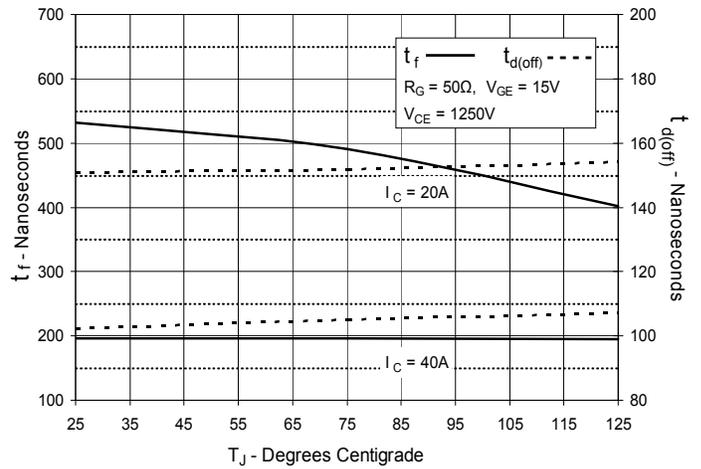
**Fig. 13. Resistive Turn-on Rise Time vs. Collector Current**



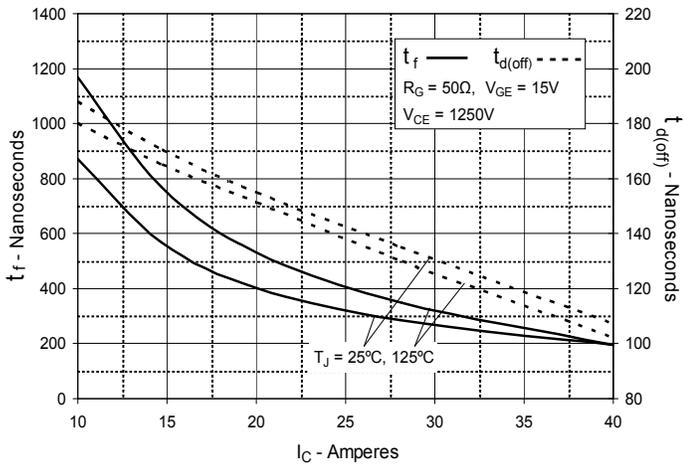
**Fig. 14. Resistive Turn-on Switching Times vs. Gate Resistance**



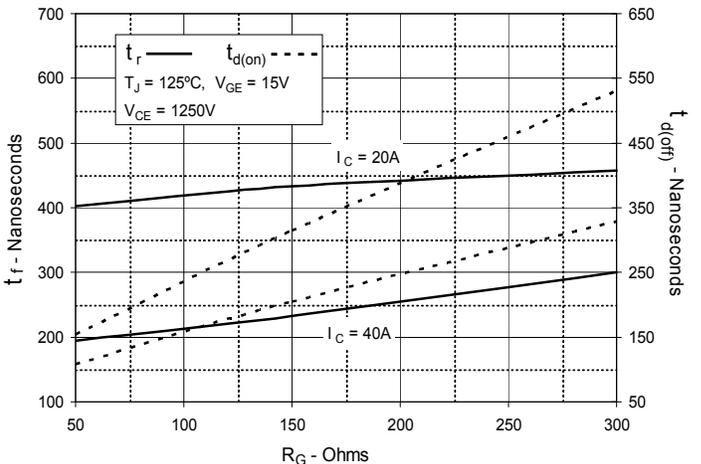
**Fig. 15. Resistive Turn-off Switching Times vs. Junction Temperature**



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



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



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