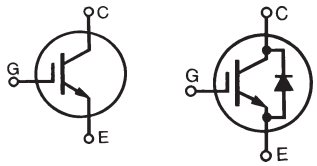
IXYS

Trench Gate High Speed IGBT

IXGA150N33TC
IXGQ150N33TC
IXGQ150N33TCD1

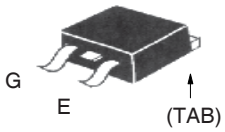
V_{CES} = 330V
I_{CP} = 400A
$V_{CE(sat)}$ ≤ 1.8V

For PDP Applications

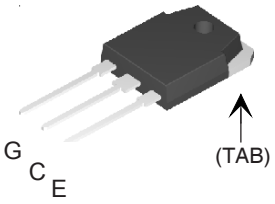


150N33TC 150N33TCD1

TO-263 (IXGA)



TO-3P (IXGQ)



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

Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_C = 25°C to 150°C	330	V
V_{GEM}	Transient	± 30	V
I_{C25}	T_C = 25°C, IGBT chip capability	150	A
I_{CP}	T_J ≤ 150°C, tp < 10 µs	400	A
I_{DP}	T_J ≤ 150°C, tp < 10 µs	40	A
$I_{C(RMS)}$	Lead current limit	75	A
P_C	T_C = 25°C	300	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-220)(TO-3P)	1.13/10	Nm/lb.in.
Weight	TO-263	2.5	g
	TO-3P	5.5	g

Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)		Characteristic Values Min.	Typ.	Max.	
BV_{CES}	I_C = 250µA, V_{GE} = 0V		330			V
$V_{GE(th)}$	I_C = 250µA, V_{CE} = V_{GE}		3.0		5.0	V
I_{CES}	V_{CE} = 330 V				1	µA
	V_{GE} = 0 V	T_J = 125°C			200	µA
I_{GES}	V_{CE} = 0 V, V_{GE} = ±20 V				±100	nA
$V_{CE(sat)}$	V_{GE} = 15V, I_C = 75A			1.48	1.8	V
		T_J = 125°C		1.49		V
	I_C = 150A			1.83		V
		T_J = 125°C		1.97		V

Features

- International standard packages
- Low $V_{CE(sat)}$
  - for minimum on-state conduction losses
- Fast switching

Applications

- PDP Screen Drivers

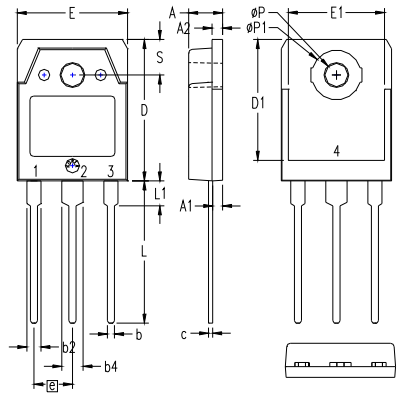
Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	I_C = 75A, V_{CE} = 10V, Note 1	65	103		S
C_{ies}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		4270		pF
C_{oes}			308		pF
C_{res}			49		pF
Q_g	I_C = 75A, V_{GE} = 15V, V_{CE} = 0.5 • V_{CES}		118		nC
Q_{ge}			25		nC
Q_{gc}			25		nC
$t_{d(on)}$	**Resistive load, T_J = 25°C**		17		ns
t_{ri}	I_C = 75A, V_{GE} = 15V		29		ns
$t_{d(off)}$	V_{CE} = 240V, R_G = R_{off} = 3.3Ω		42		ns
t_{fi}			54		ns
$t_{d(on)}$	**Resistive load, T_J = 125°C**		17		ns
t_{ri}	I_C = 75A, V_{GE} = 15V		25		ns
$t_{d(off)}$	V_{CE} = 240V, R_G = R_{off} = 3.3Ω		59		ns
t_{fi}			73		ns
R_{thJC}				0.42	°C/W
R_{thCH}	TO-3P		0.25		°C/W

Reverse Diode

Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
V_F	I_F = 20A, V_{GE} = 0V			2.0	V
R_{thJC}				2.5	°C/W

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

TO-3P (IXGQ) Outline

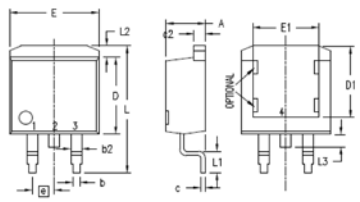


Pins: 1 - Gate 2 - Drain
3 - Source 4, TAB - Drain

SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.185	.193	4.70	4.90
A1	.051	.059	1.30	1.50
A2	.057	.065	1.45	1.65
b	.035	.045	0.90	1.15
b2	.075	.087	1.90	2.20
b4	.114	.126	2.90	3.20
c	.022	.031	0.55	0.80
D	.780	.791	19.80	20.10
D1	.665	.677	16.90	17.20
E	.610	.622	15.50	15.80
E1	.531	.539	13.50	13.70
e	.215 BSC		5.45 BSC	
L	.779	.795	19.80	20.20
L1	.134	.142	3.40	3.60
øP	.126	.134	3.20	3.40
øP1	.272	.280	6.90	7.10
S	.193	.201	4.90	5.10

All metal area are tin plated.

TO-263 (IXGA) Outline



SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.160	.190	4.06	4.83
A1	.080	.110	2.03	2.79
b	.020	.039	0.51	0.99
b2	.045	.055	1.14	1.40
c	.016	.029	0.40	0.74
c2	.045	.055	1.14	1.40
D	.340	.380	8.64	9.65
D1	.315	.350	8.00	8.89
E	.380	.410	9.65	10.41
E1	.245	.320	6.22	8.13
e	.100 BSC		2.54 BSC	
L	.575	.625	14.61	15.88
L1	.090	.110	2.29	2.79
L2	.040	.055	1.02	1.40
L3	.050	.070	1.27	1.78
L4	0	.005	0	0.13

Fig. 1. Output Characteristics @ 25ºC

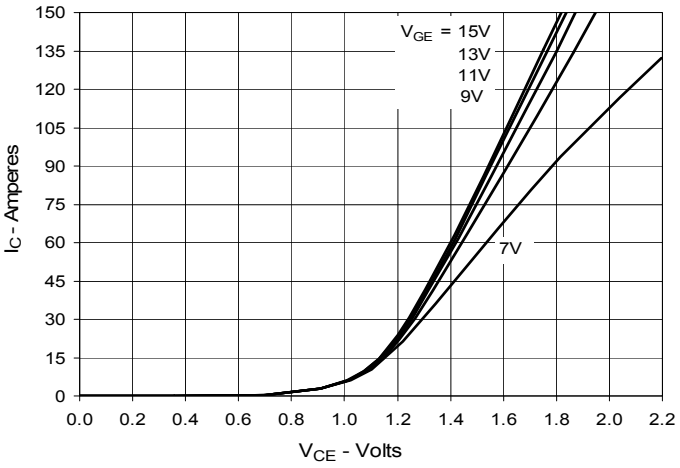


Fig. 2. Extended Output Characteristics @ 25ºC

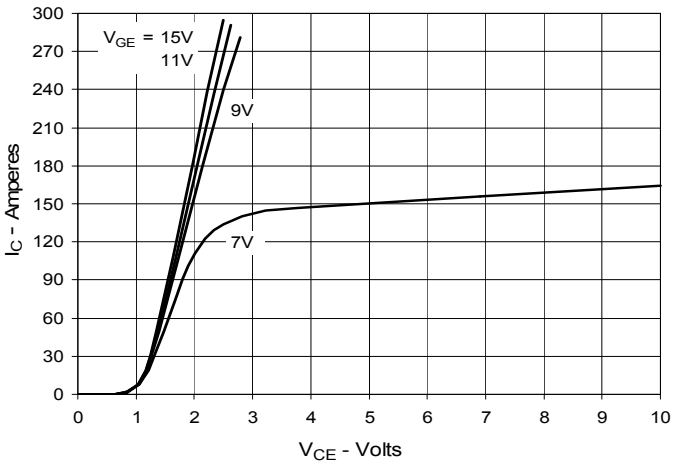


Fig. 3. Output Characteristics @ 125ºC

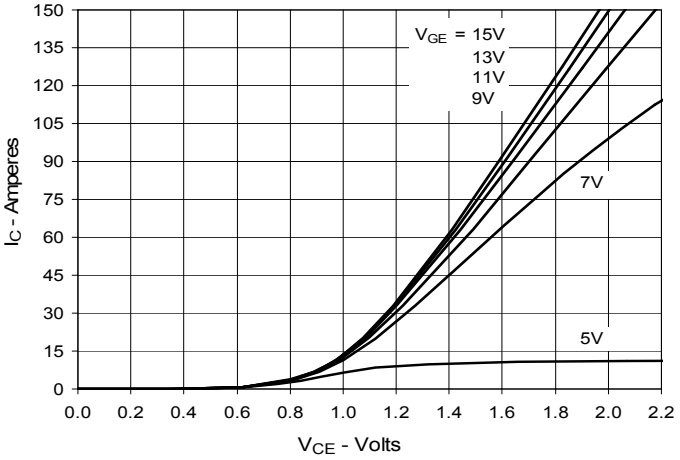


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

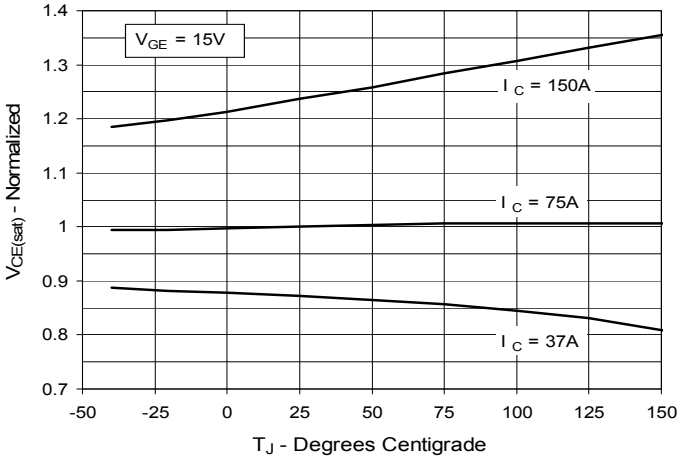


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

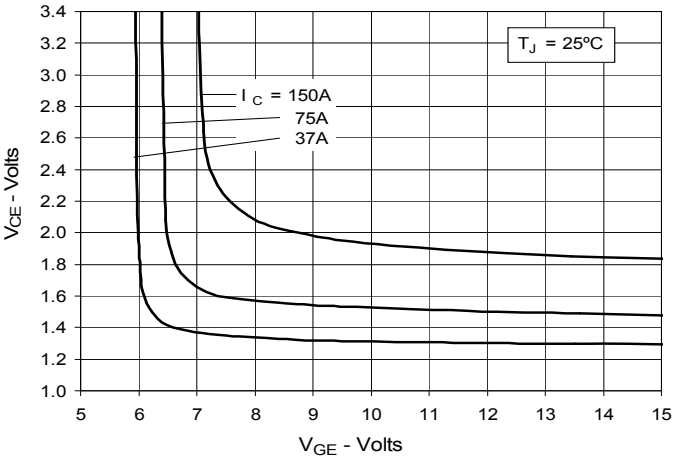


Fig. 6. Input Admittance

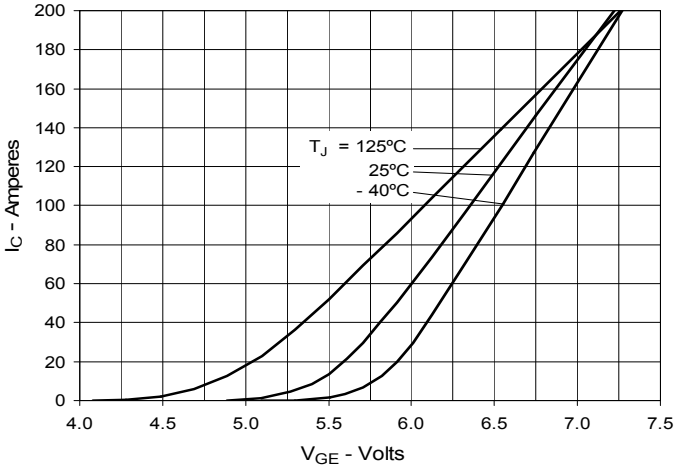


Fig. 7. Transconductance

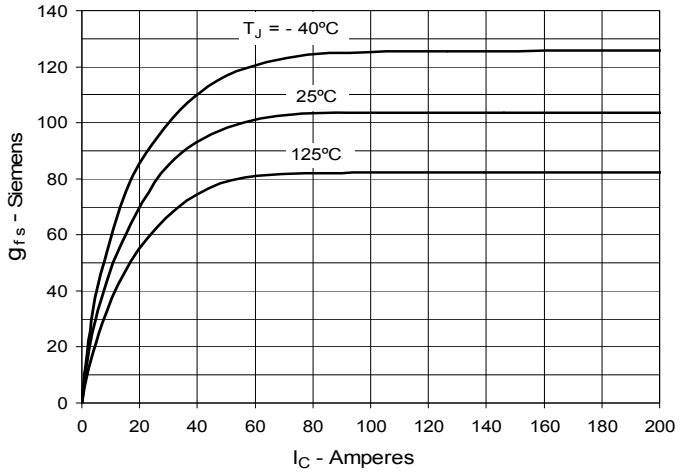


Fig. 8. Gate Charge

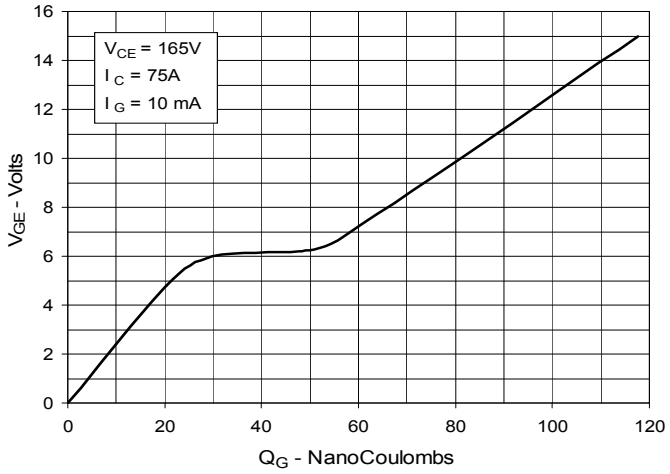


Fig. 9. Reverse-Bias Safe Operating Area

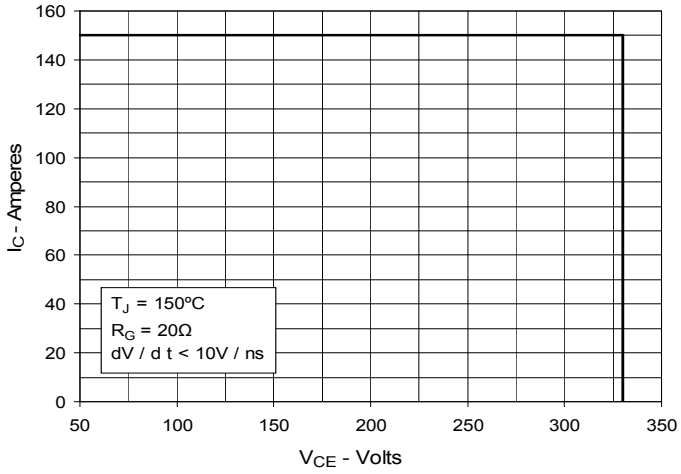


Fig. 10. Capacitance

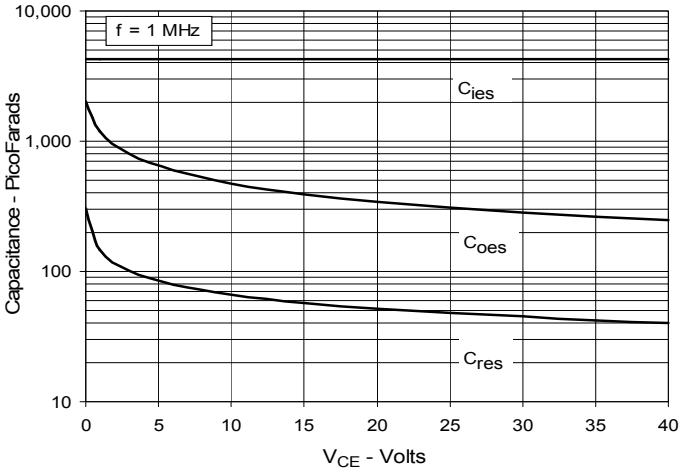


Fig. 11. Forward-Bias Safe Operating Area

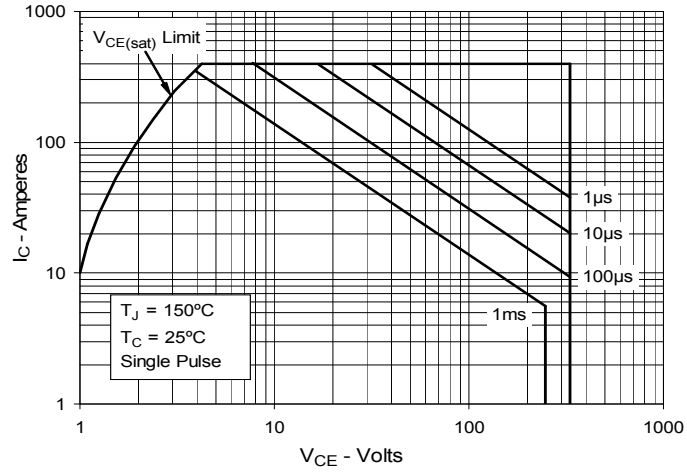


Fig. 12. Maximum Transient Thermal Impedance

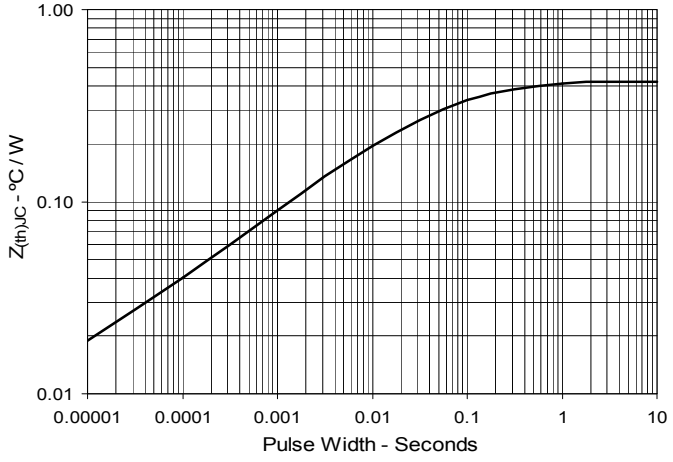


Fig. 13. Resistive Turn-on Rise Time vs. Junction Temperature

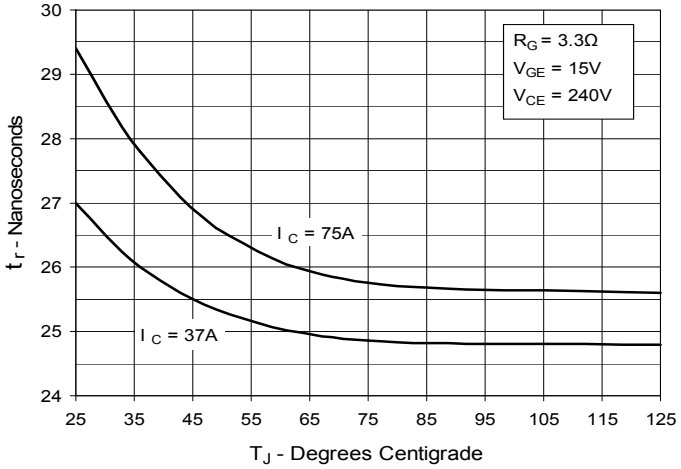


Fig. 14. Resistive Turn-on Rise Time vs. Collector Current

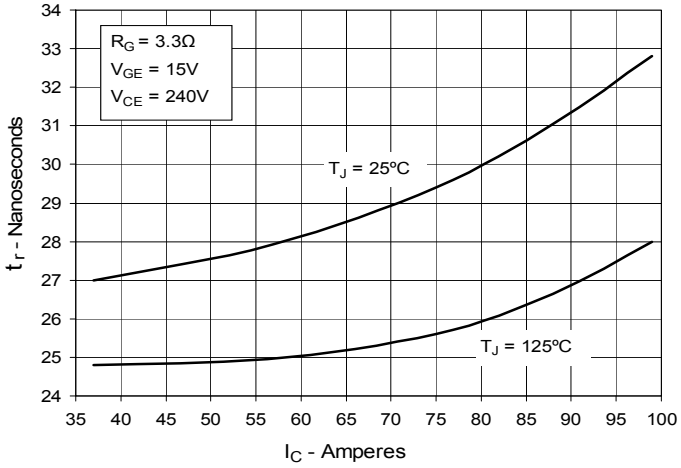


Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance

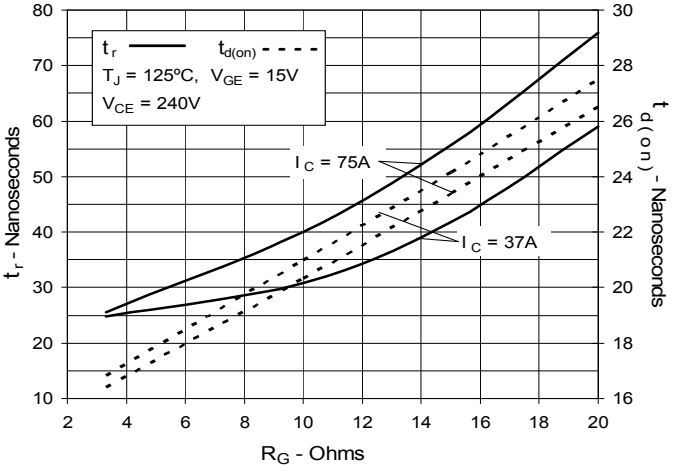


Fig. 16. Resistive Turn-off Switching Times vs. Junction Temperature

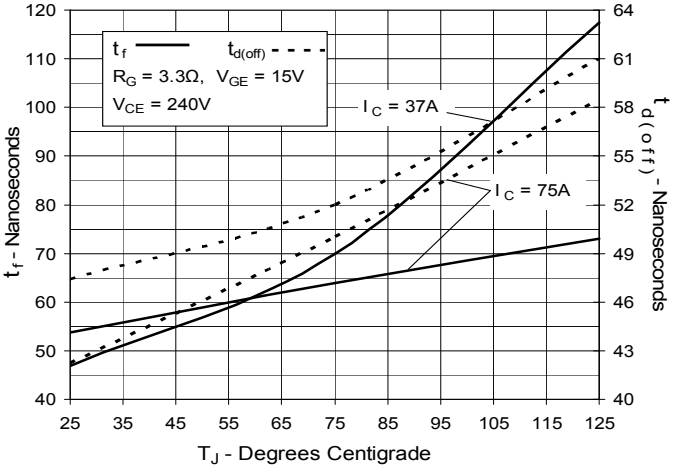


Fig. 17. Resistive Turn-off Switching Times vs. Collector Current

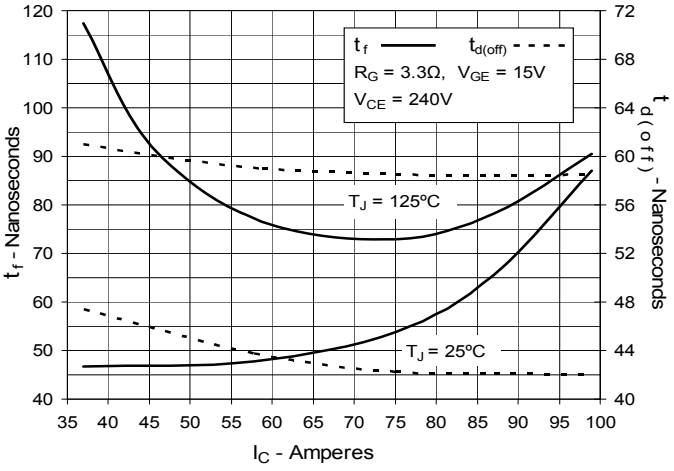


Fig. 18. Resistive Turn-off Switching Times vs. Gate Resistance