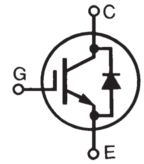
IXYS

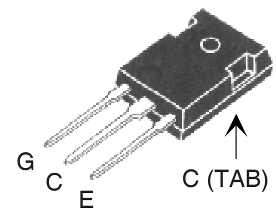
High Voltage, High Gain BIMOSFET™ Monolithic Bipolar MOS Transistor

IXBH6N170
IXBT6N170

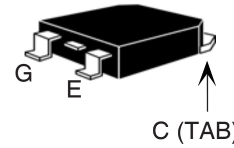
V_{CES} = 1700V
I_{C90} = 6A
$V_{CE(sat)} \leq$ 3.4V



TO-247 (IXBH)



TO-268 (IXBT)



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	12	A
I_{C90}	T_C = 90°C	6	A
I_{CM}	T_C = 25°C, 1ms	36	A
SSOA	V_{GE} = 15V, T_{VJ} = 125°C, R_G = 24Ω	I_{CM} = 16	A
(RBSOA)	Clamped inductive load	$V_{CES} \leq$ 1350	V
P_C	T_C = 25°C	75	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	6	g
	TO-268	4	g

Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)		Characteristic Values Min.	Typ.	Max.	
BV_{CES}	I_C = 250μA, V_{CE} = V_{GE}		1700			V
$V_{GE(th)}$	I_C = 250μA, V_{CE} = V_{GE}		2.5		5.5	V
I_{CES}	V_{CE} = 0.8 • V_{CES}				10	μA
	V_{GE} = 0V	T_J = 125°C			100	μA
I_{GES}	V_{CE} = 0V, V_{GE} = ±20V				±100	nA
$V_{CE(sat)}$	I_C = 6A, V_{GE} = 15V, Note 1			2.84	3.40	V
		T_J = 125°C		3.46		V

Features

- High blocking voltage
- Integrated Anti-parallel diode
- International standard packages
- Low conduction losses

Advantages

- Low gate drive requirement
- High power density

Applications:

- Switched-mode and resonant-mode power supplies
- Uninterruptible power supplies (UPS)
- Laser generator
- Capacitor discharge circuit
- AC switches

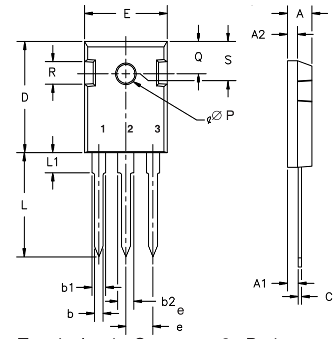
Symbol	Test Conditions (T_J = 25°C unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
g_{fS}	I_C = 6A, V_{CE} = 10V, Note 1	2.0	3.5		S
C_{ies}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz		378		pF
C_{oes}			25		pF
C_{res}			9		pF
Q_g	I_C = 6A, V_{GE} = 15V, V_{CE} = 0.5 • V_{CES}		17.0		nC
Q_{ge}			2.5		nC
Q_{gc}			9.6		nC
$t_{d(on)}$	**Resistive Switching times, T_J = 25°C**		32		ns
t_r	I_C = 6A, V_{GE} = 15V		59		ns
$t_{d(off)}$	V_{CE} = 850V, R_G = 24Ω		105		ns
t_f			690		ns
$t_{d(on)}$	**Resistive Switching times, T_J = 125°C**		35		ns
t_r	I_C = 6A, V_{GE} = 15V		69		ns
$t_{d(off)}$	V_{CE} = 850V, R_G = 24Ω		100		ns
t_f			600		ns
R_{thJC}				1.65	°C/W
R_{thCS}			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 = 6A, V_{GE} = 0V, Note 1			3.0	V
t_{rr}	I_F = 6A, V_{GE} = 0V, $-di_F/dt$ = 100A/μs		1.08		μs
I_{RM}	V_R = 100V, V_{GE} = 0V		12.0		A

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

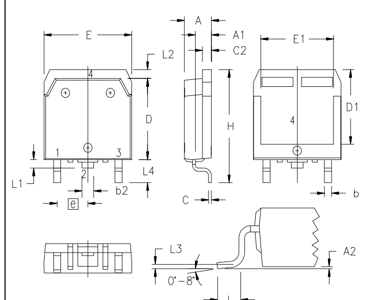
TO-247 (IXBH) Outline



Terminals: 1 - Gate 2 - Drain
3 - Source Tab - 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
S	6.15 BSC		242 BSC	

TO-268 (IXBT) Outline



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

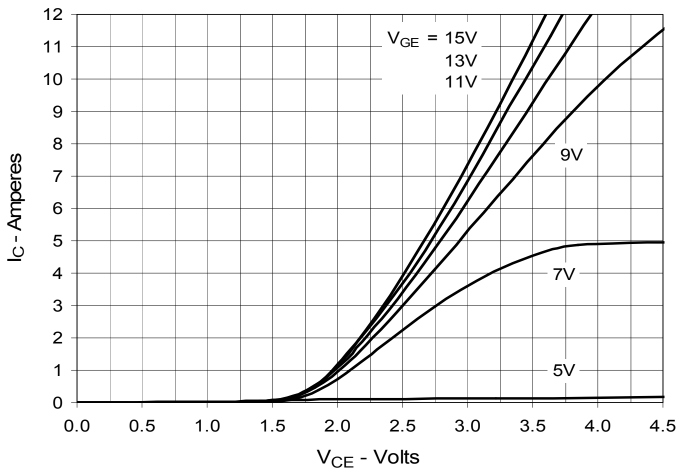


Fig. 2. Extended Output Characteristics @ 25ºC

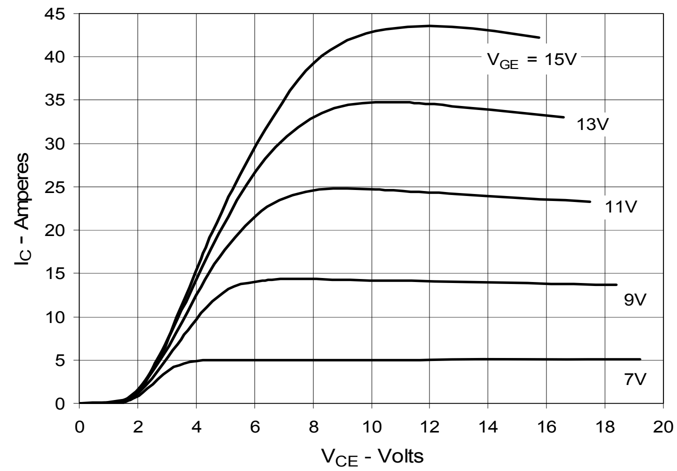


Fig. 3. Output Characteristics @ 125ºC

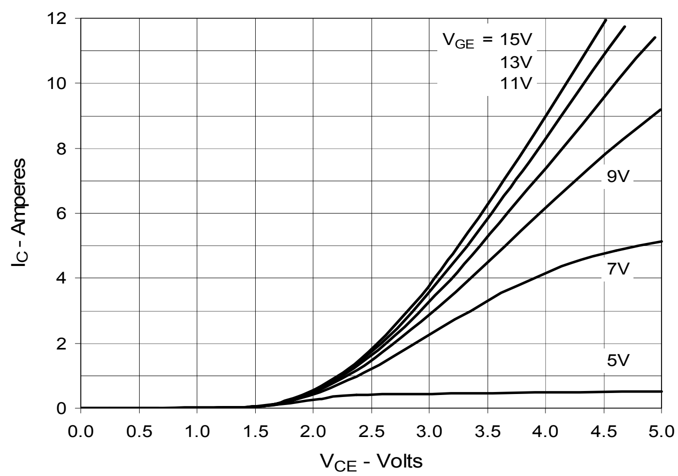


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

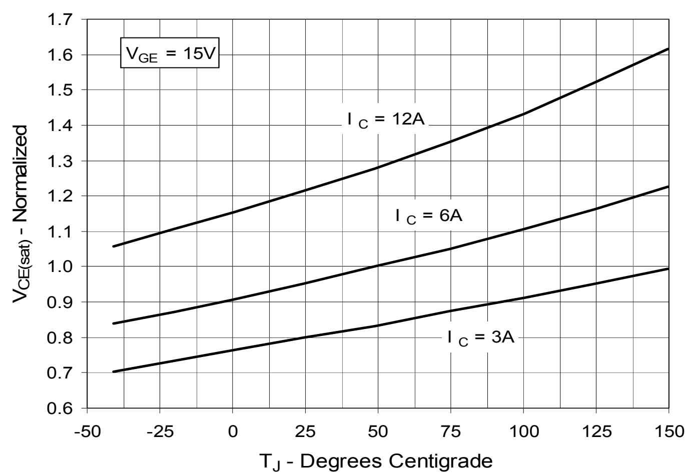


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

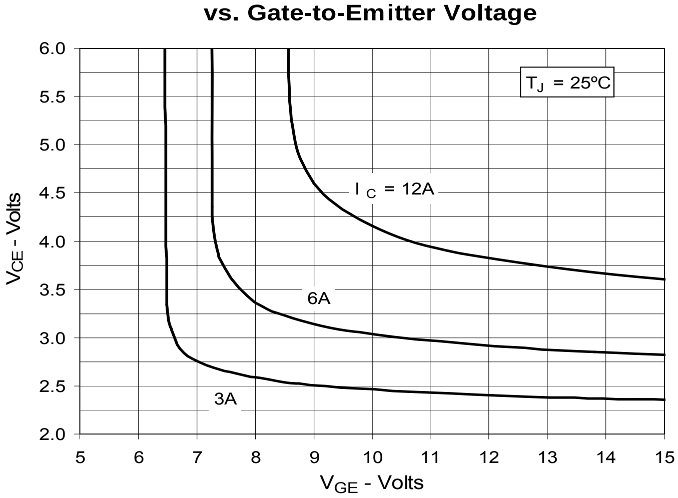


Fig. 6. Input Admittance

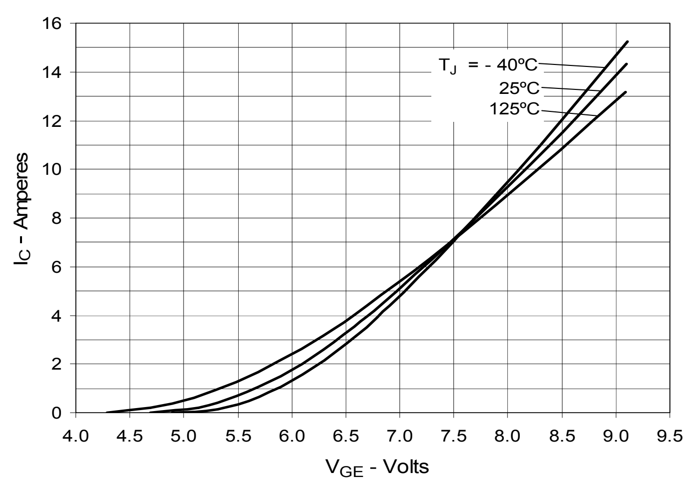


Fig. 7. Transconductance

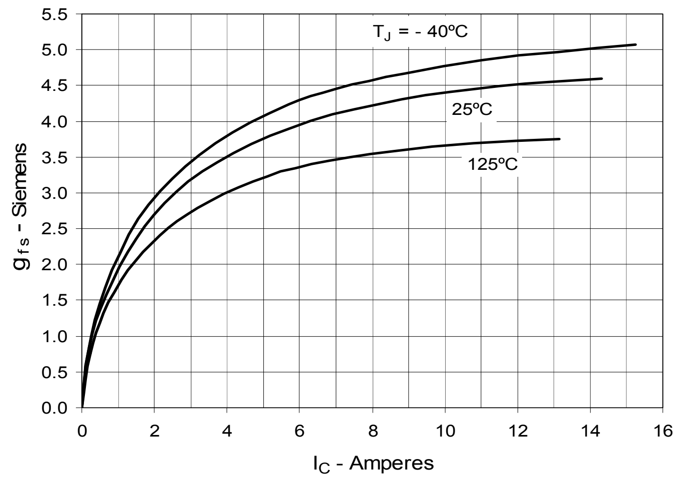


Fig. 8. Forward Voltage Drop of Intrinsic Diode

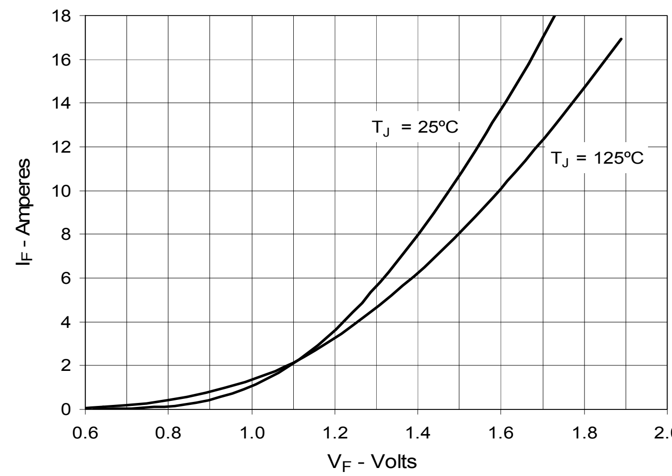


Fig. 9. Gate Charge

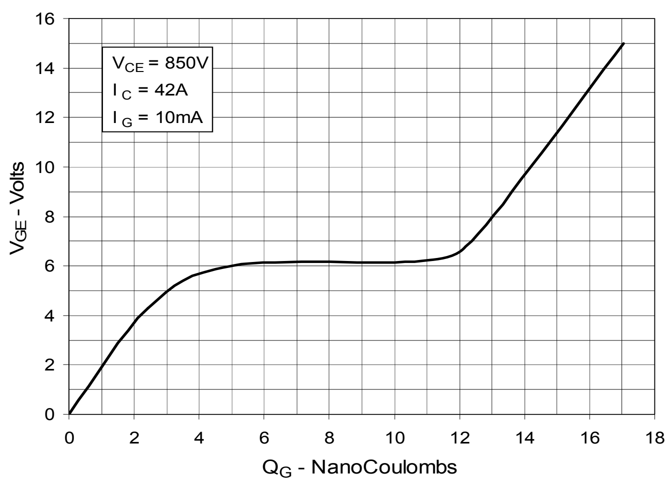


Fig. 10. Capacitance

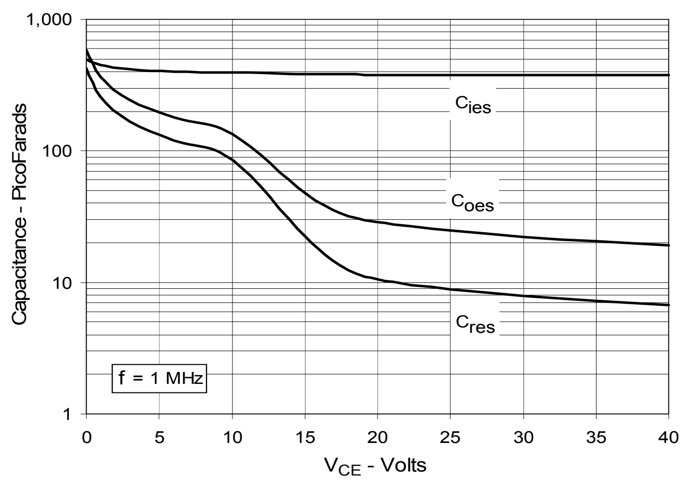


Fig. 11. Reverse-Bias Safe Operating Area

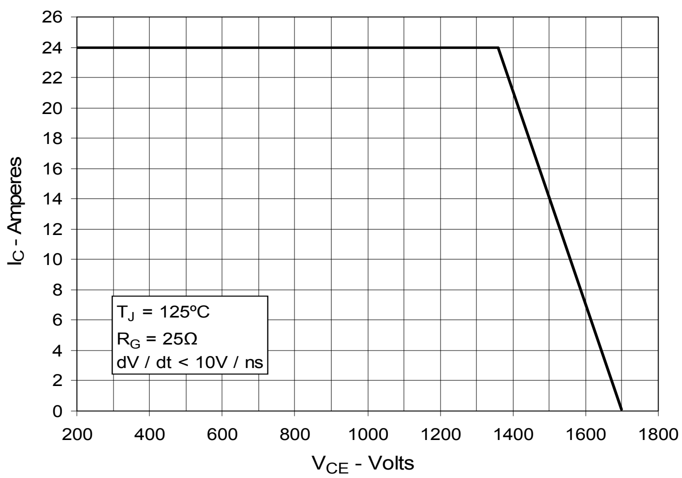


Fig. 12. Maximum Transient Thermal Impedance

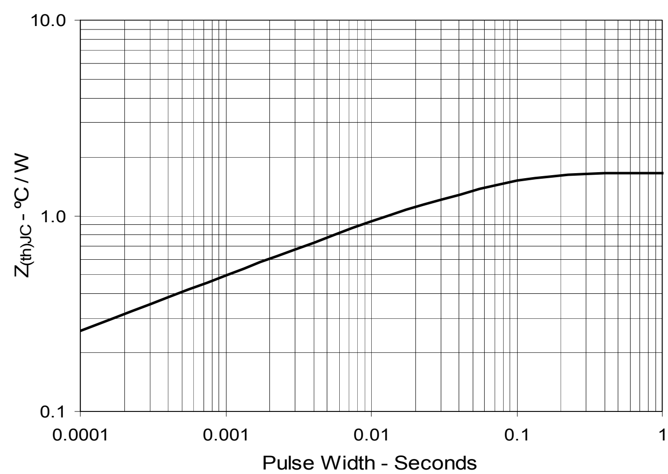


Fig. 13. Resistive Turn-on Rise Time vs. Junction Temperature

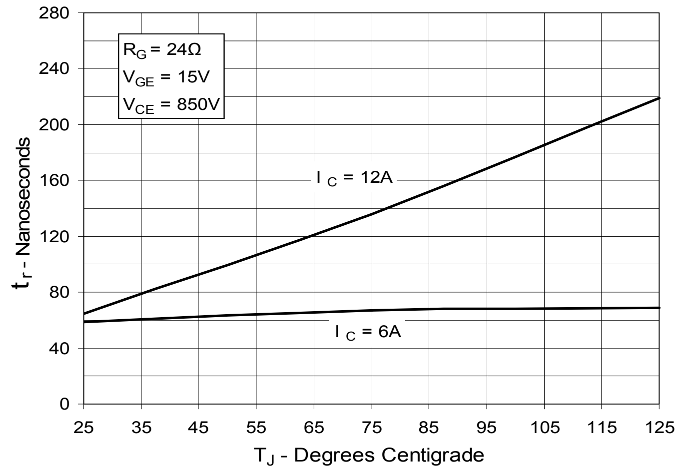


Fig. 14. Resistive Turn-on Rise Time vs. Drain Current

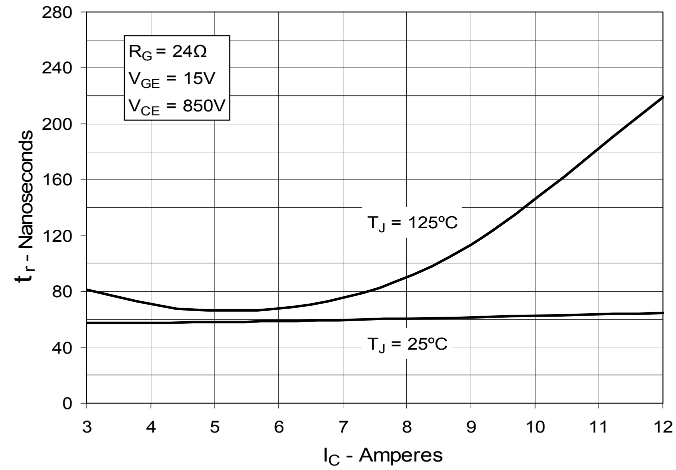


Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance

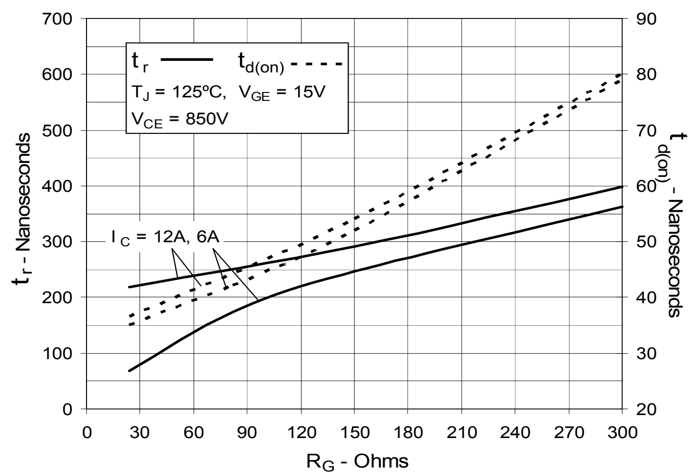


Fig. 16. Resistive Turn-off Switching Times vs. Junction Temperature

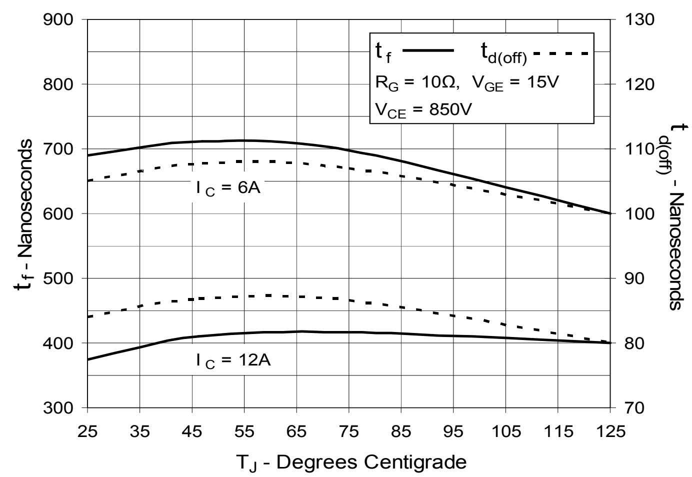


Fig. 17. Resistive Turn-off Switching Times vs. Drain Current

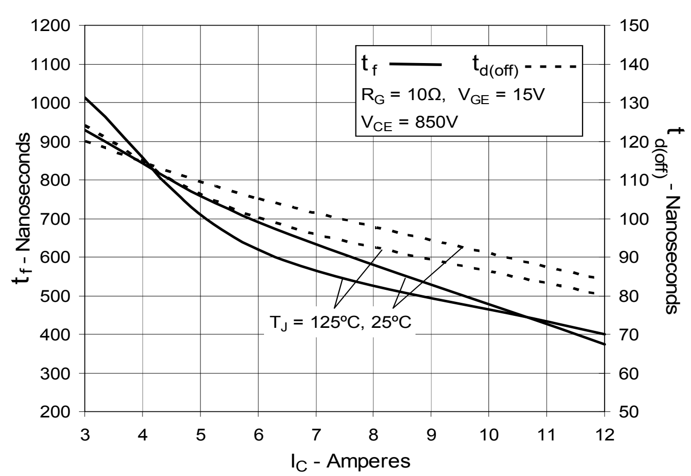


Fig. 18. Resistive Turn-off Switching Times vs. Gate Resistance