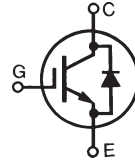


**High Voltage, High Gain
BIMOSFET™ Monolithic
Bipolar MOS Transistor**

**IXBH6N170
IXBT6N170**



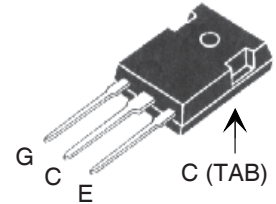
$V_{CES} = 1700V$

$I_{C90} = 6A$

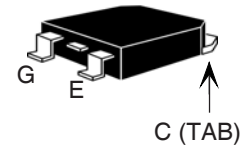
$V_{CE(sat)} \leq 3.4V$

Symbol	Test Conditions	Maximum Ratings	
V_{CES}	$T_C = 25^\circ C$ to $150^\circ C$	1700	V
V_{CGR}	$T_J = 25^\circ C$ to $150^\circ C$, $R_{GE} = 1M\Omega$	1700	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	$T_C = 25^\circ C$	12	A
I_{C90}	$T_C = 90^\circ C$	6	A
I_{CM}	$T_C = 25^\circ C$, 1ms	36	A
SSOA	$V_{GE} = 15V$, $T_{VJ} = 125^\circ C$, $R_G = 24\Omega$	$I_{CM} = 16$	A
(RBSOA)	Clamped inductive load	$V_{CES} \leq 1350$	V
P_C	$T_C = 25^\circ C$	75	W
T_J		-55 ... +150	$^\circ C$
T_{JM}		150	$^\circ C$
T_{stg}		-55 ... +150	$^\circ C$
T_L	1.6mm (0.062 in.) from case for 10s	300	$^\circ C$
T_{SOLD}	Plastic body for 10 seconds	260	$^\circ C$
M_d	Mounting torque (TO-247)	1.13/10	Nm/lb.in.
Weight	TO-247	6	g
	TO-268	4	g

TO-247 (IXBH)



TO-268 (IXBT)



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

Features

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

Advantages

- Low gate drive requirement
- High power density

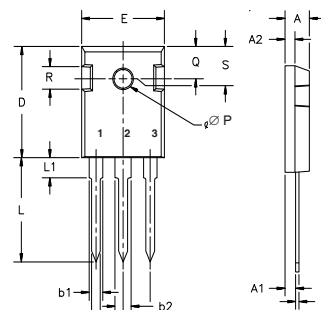
Applications:

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

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

Symbol	Test Conditions	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	$I_C = 6A, V_{GE} = 15V, V_{CE} = 0.5 \cdot V_{CES}$		17.0	nC
Q_{ge}			2.5	nC
Q_{gc}			9.6	nC
$t_{d(on)}$	Resistive Switching times, $T_J = 25^\circ C$ $I_C = 6A, V_{GE} = 15V$ $V_{CE} = 850V, R_G = 24\Omega$		32	ns
t_r			59	ns
$t_{d(off)}$			105	ns
t_f			690	ns
$t_{d(on)}$	Resistive Switching times, $T_J = 125^\circ C$ $I_C = 6A, V_{GE} = 15V$ $V_{CE} = 850V, R_G = 24\Omega$		35	ns
t_r			69	ns
$t_{d(off)}$			100	ns
t_f			600	ns
R_{thJC}			1.65	$^\circ C/W$
R_{thCS}		0.25		$^\circ C/W$

TO-247 (IXBH) Outline



Terminals: 1 - Gate
2 - Drain
3 - Source

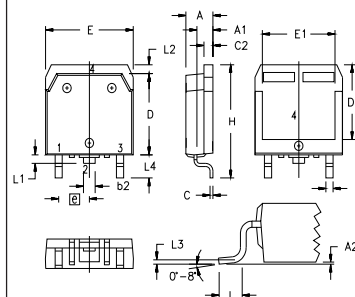
Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.7	5.3	.185	.209
A ₁	2.2	2.54	.087	.102
A ₂	2.2	2.6	.059	.098
b	1.0	1.4	.040	.055
b ₁	1.65	2.13	.065	.084
b ₂	2.87	3.12	.113	.123
C	.4	.8	.016	.031
D	20.80	21.46	.819	.845
E	15.75	16.26	.610	.640
e	5.20	5.72	0.205	0.225
L	19.81	20.32	.780	.800
L ₁		4.50		.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

Reverse Diode

Symbol	Test Conditions	Characteristic Values		
		Min.	Typ.	Max.
V_F	$I_F = 6A, V_{GE} = 0V$, Note 1			3.0 V
t_{rr}	$I_F = 6A, V_{GE} = 0V, -di_F/dt = 100A/\mu s$ $V_R = 100V, V_{GE} = 0V$		1.08	μs
I_{RM}			12.0	A

Note 1: Pulse test, $t \leq 300\mu s$, duty cycle, $d \leq 2\%$.

TO-268 (IXBT) Outline



SYM	INCHES		MILLIMETERS	
	MIN	MAX	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

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IXYS MOSFETs and IGBTs are covered 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
by one or more of the following U.S. patents: 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

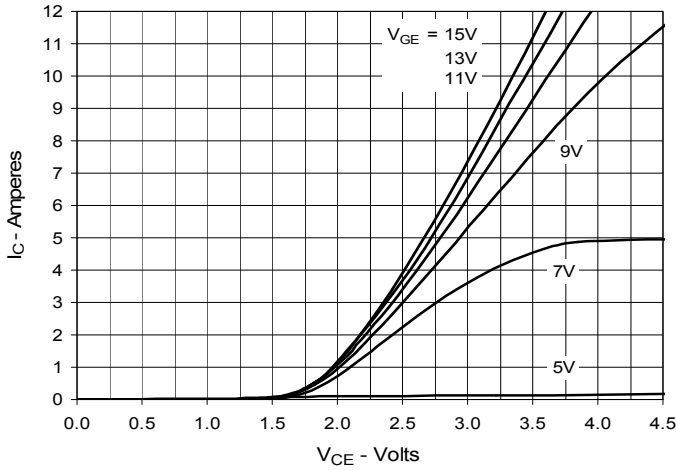


Fig. 2. Extended Output Characteristics @ 25°C

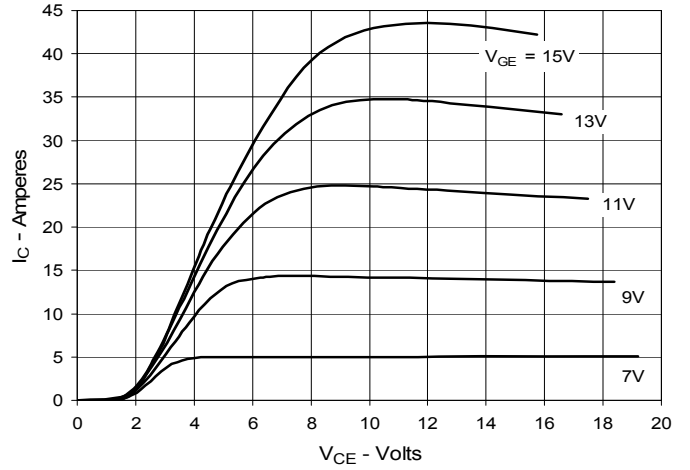


Fig. 3. Output Characteristics @ 125°C

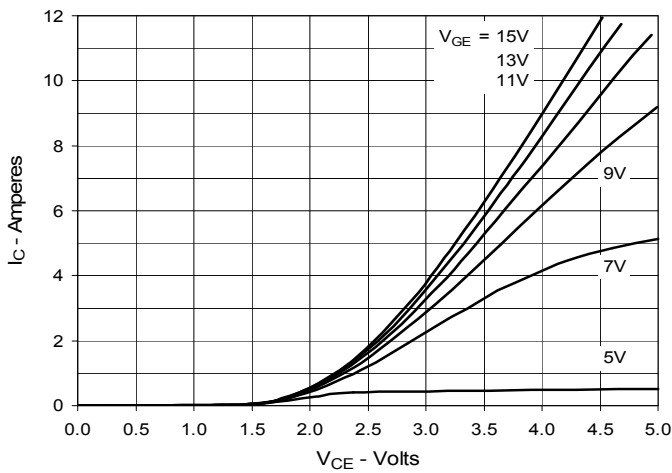


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

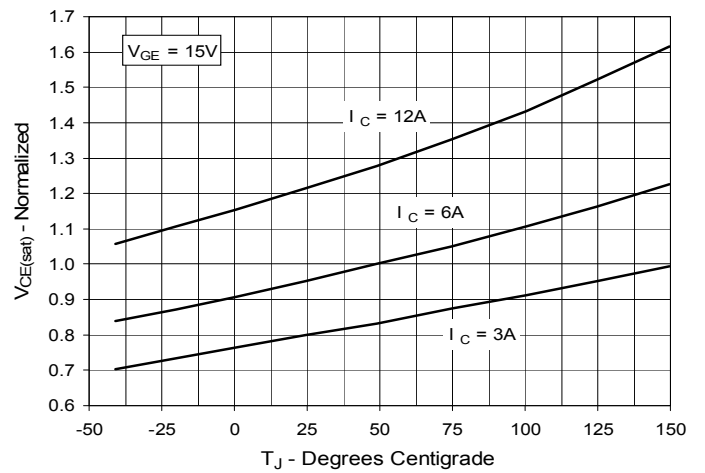


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

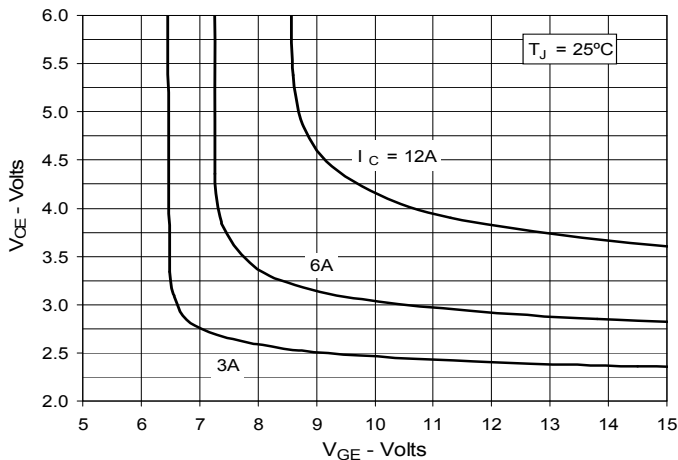


Fig. 6. Input Admittance

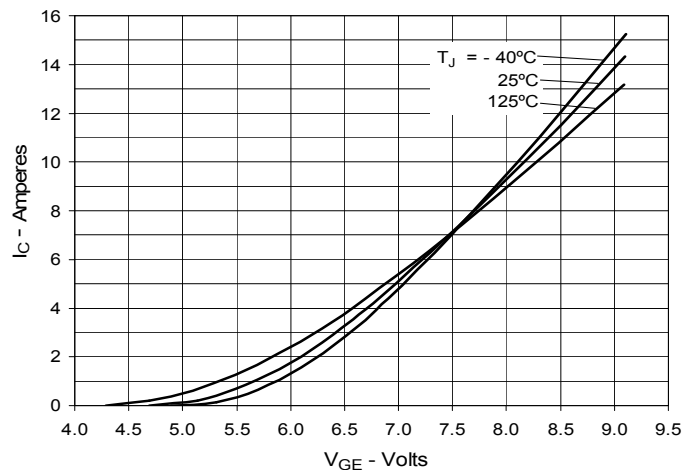


Fig. 7. Transconductance

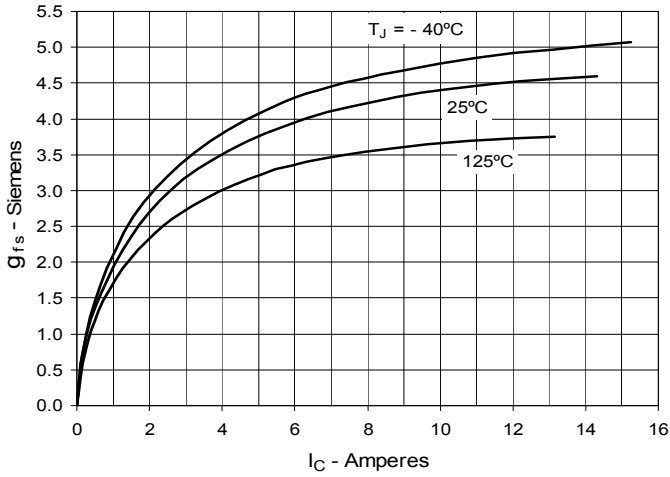


Fig. 8. Forward Voltage Drop of Intrinsic Diode

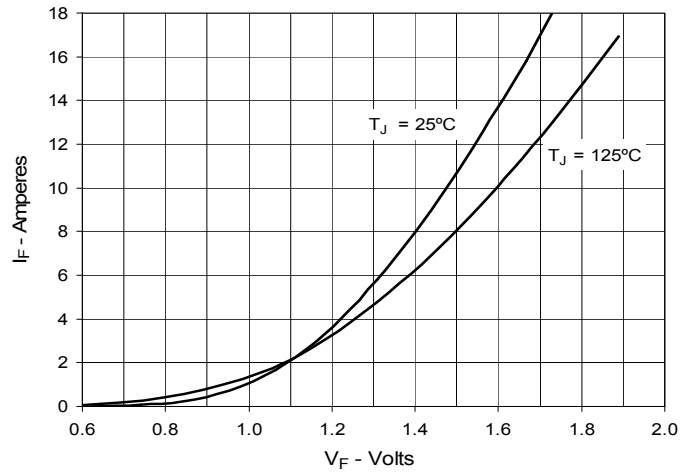


Fig. 9. Gate Charge

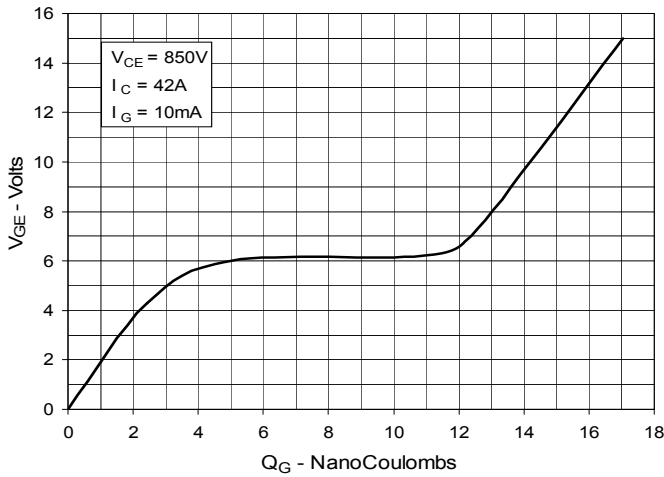


Fig. 10. Capacitance

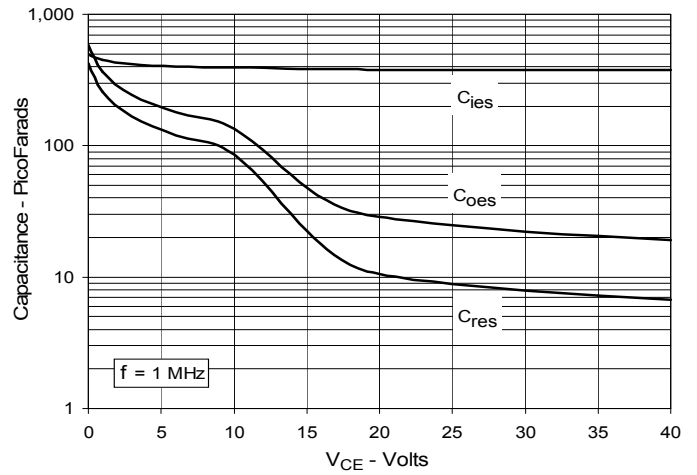


Fig. 11. Reverse-Bias Safe Operating Area

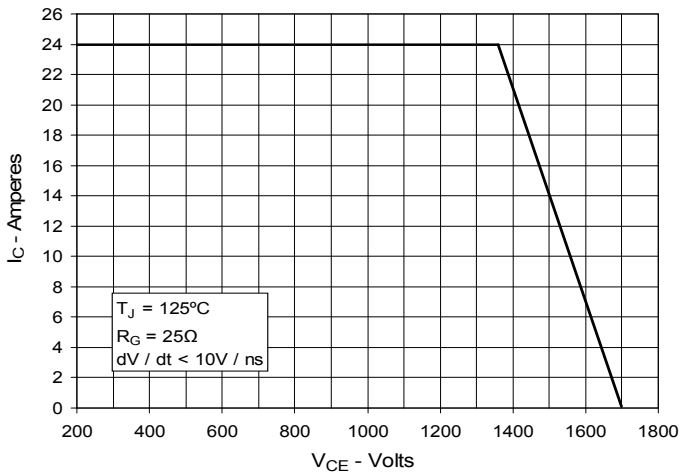
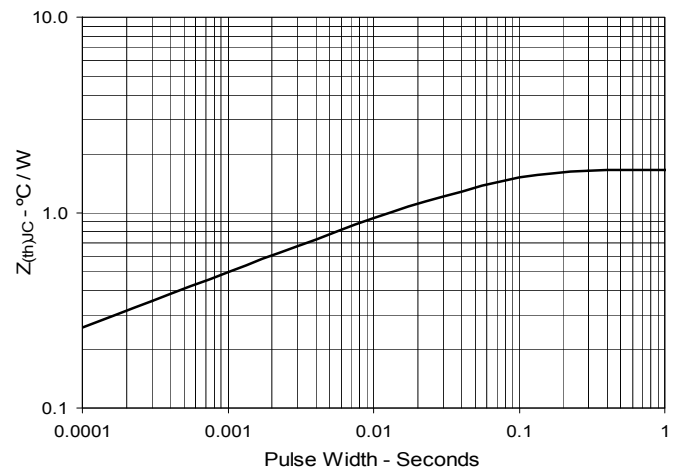


Fig. 12. Maximum Transient Thermal Impedance



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

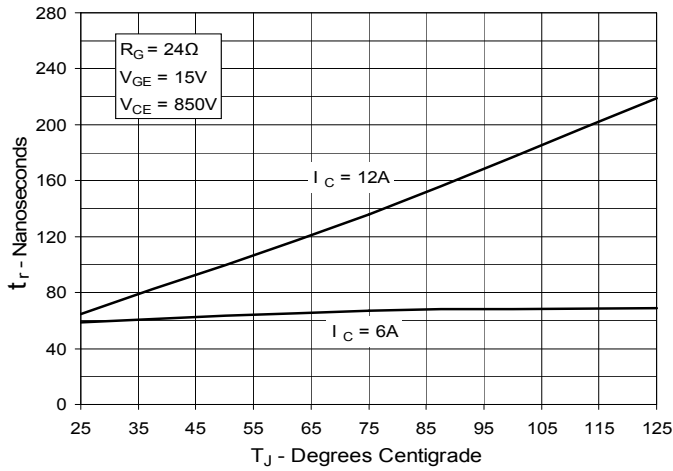


Fig. 14. Resistive Turn-on Rise Time vs. Drain Current

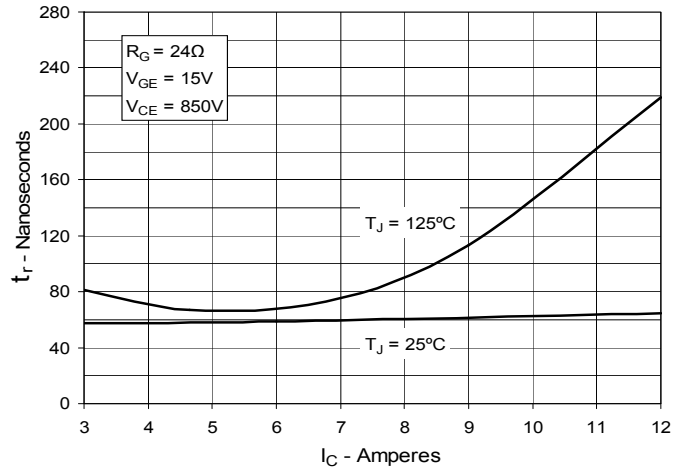


Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance

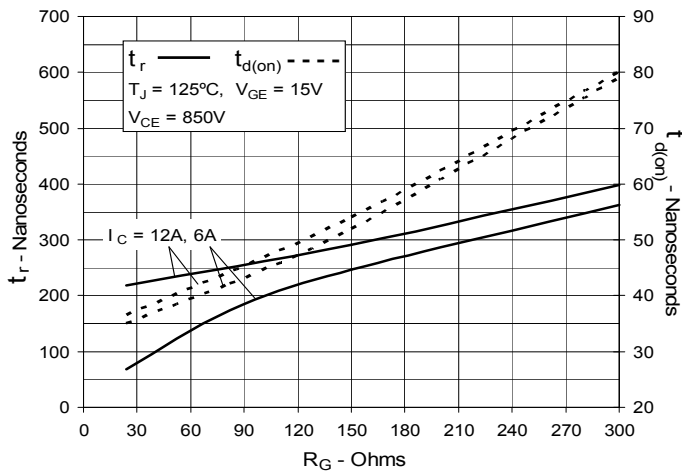


Fig. 16. Resistive Turn-off Switching Times vs. Junction Temperature

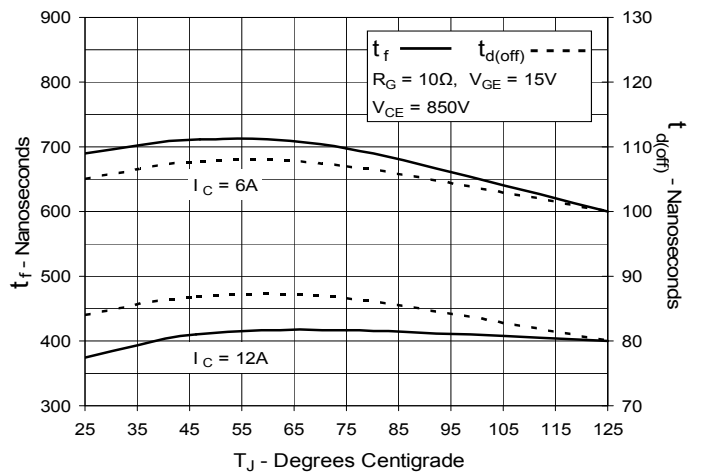


Fig. 17. Resistive Turn-off Switching Times vs. Drain Current

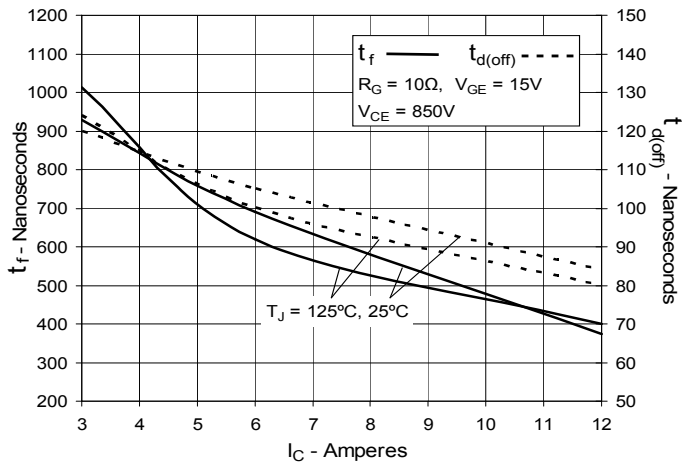
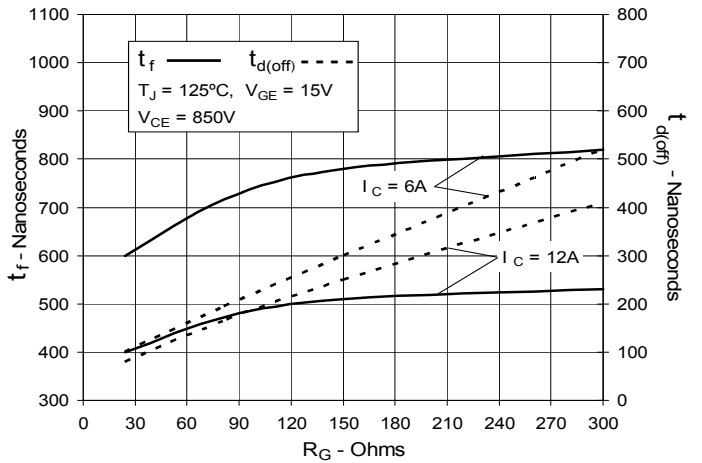


Fig. 18. Resistive Turn-off Switching Times vs. Gate Resistance





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