IXYS

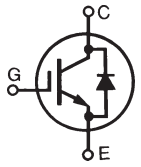
Preliminary Technical Information

High Voltage, High Gain BIMOSFET™

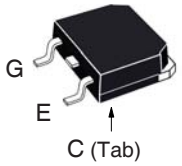
IXBH2N250
IXBT2N250

V_{CES} = 2500V
I_{C110} = 2A
$V_{CE(sat)} \leq$ 3.80V

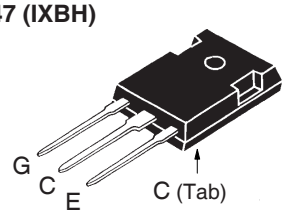
Monolithic Bipolar MOS Transistor



TO-268 (IXBT)



TO-247 (IXBH)



G = Gate D = Drain
S = Source Tab = Drain

G = Gate C = Collector
E = Emitter Tab = Collector

Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_C = 25°C to 150°C	2500	V
V_{CGR}	T_J = 25°C to 150°C, R_{GE} = 1MΩ	2500	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	T_C = 25°C	5	A
I_{C110}	T_C = 110°C	2	A
I_{CM}	T_C = 25°C, 1ms	13	A
SSOA	V_{GE} = 15V, T_{VJ} = 125°C, R_G = 47Ω	I_{CM} = 6	A
(RBSOA)	Clamped Inductive Load	$V_{CE} \leq$ 2000	V
P_C	T_C = 25°C	32	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
T_L	Maximum Lead Temperature for Soldering	300	°C
T_{SOLD}	1.6 mm (0.062in.) from Case for 10s	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}	2500			V
$V_{GE(th)}$	I_C = 250μA, V_{CE} = V_{GE}	3.0		5.5	V
I_{CES}	V_{CE} = 0.8 • V_{CES}, V_{GE} = 0V			10	μA
	T_J = 125°C			100	μA
I_{GES}	V_{CE} = 0V, V_{GE} = ±20V			±100	nA
$V_{CE(sat)}$	I_C = 2A, V_{GE} = 15V, Note 1		3.15	3.80	V
	T_J = 125°C		4.08		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

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Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	I_C = 2A, V_{CE} = 10V, Note 1	0.85	1.40		S
C_{ies}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz		145		pF
C_{oes}			8.7		pF
C_{res}			3.2		pF
Q_g	I_C = 2A, V_{GE} = 15V, V_{CE} = 1kV		10.6		nC
Q_{ge}			0.8		nC
Q_{gc}			6.2		nC
$t_{d(on)}$	**Resistive Switching times, T_J = 25°C** I_C = 2A, V_{GE} = 15V V_{CE} = 2kV, R_G = 47Ω		30		ns
t_r			180		ns
$t_{d(off)}$			70		ns
t_f			182		ns
$t_{d(on)}$	**Resistive Switching times, T_J = 125°C** I_C = 2A, V_{GE} = 15V V_{CE} = 2kV, R_G = 47Ω		30		ns
t_r			280		ns
$t_{d(off)}$			74		ns
t_f			178		ns
R_{thJC}				3.90	°C/W
R_{thCS}			0.21		°C/W

Reverse Diode

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
V_F	I_F = 2A, V_{GE} = 0V, Note 1			2.4	V
t_{rr}	I_F = 2A, V_{GE} = 0V, -di_F/dt = 100A/μs V_R = 100V, V_{GE} = 0V		0.92		μs
I_{RM}			9.80		A
Q_{RM}			4.50		μC

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

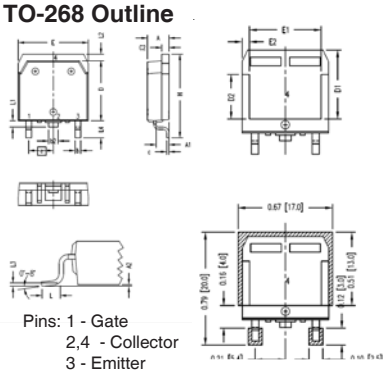
PRELIMINARY TECHNICAL INFORMATION

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 4,860,072 4,881,106 4,931,844 5,017,508 5,034,796 5,049,961 5,063,307 5,187,117 5,237,481 5,381,025 5,486,715 6,162,665 6,259,123 B1 6,306,728 B1 6,404,065 B1 6,534,343 6,583,505 6,683,344 6,710,405 B2 6,710,463 6,727,585 6,759,692 6,771,478 B2 7,005,734 B2 7,063,975 B2 7,071,537 7,157,338B2

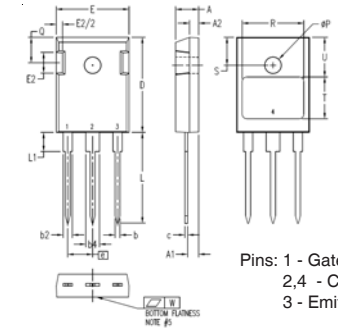
TO-268 Outline



Pins: 1 - Gate
2,4 - Collector
3 - Emitter

SYMBOL	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS 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
D2	.320	.335	8.13	8.50
E	.624	.632	15.85	16.05
E1	.524	.535	13.30	13.60
E2	.045	.055	1.14	1.39
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

TO-247 Outline



Pins: 1 - Gate
2,4 - Collector
3 - Emitter

SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.190	.205	4.83	5.21
A1	.087	.100	2.21	2.54
A2	.075	.085	1.91	2.16
b	.045	.055	1.14	1.40
b2	.075	.085	1.91	2.16
b4	.115	.126	2.92	3.20
c	.023	.033	0.58	0.84
D	.820	.840	20.83	21.34
E	.620	.635	15.75	16.13
E2	.175	.195	4.44	4.95
e	.215 BSC		5.45 BSC	
L	.780	.810	19.81	20.57
L1	.160	.177	4.06	4.50
Q	.220	.240	5.59	6.10
R	.520	.540	13.21	13.72
S	.242 BSC		6.15 BSC	
T	.355	.375	9.02	9.53
U	.345	.370	8.76	9.40
øP	.140	.144	3.55	3.66
W	.000	.004	0.00	0.10

Fig. 1. Output Characteristics @ T_J = 25°C

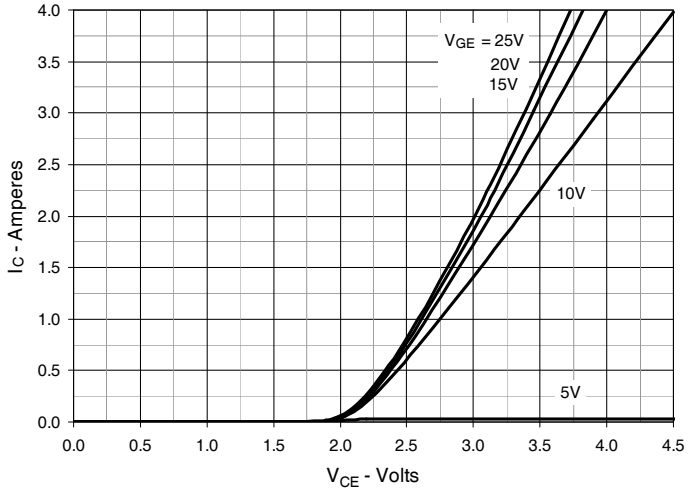


Fig. 2. Extended Output Characteristics @ T_J = 25°C

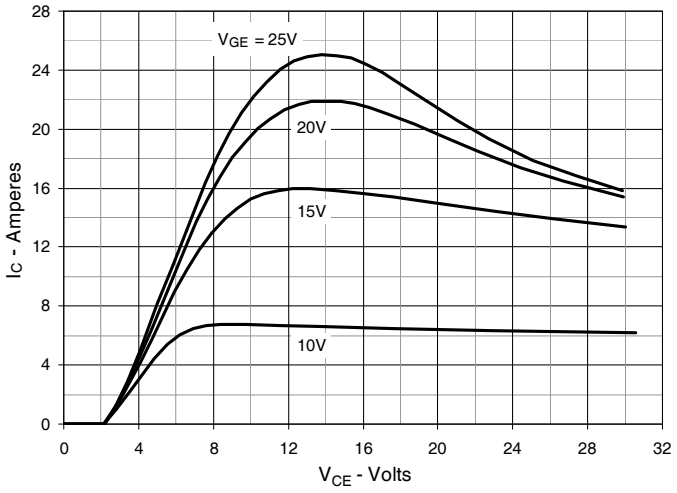


Fig. 3. Output Characteristics @ T_J = 125°C

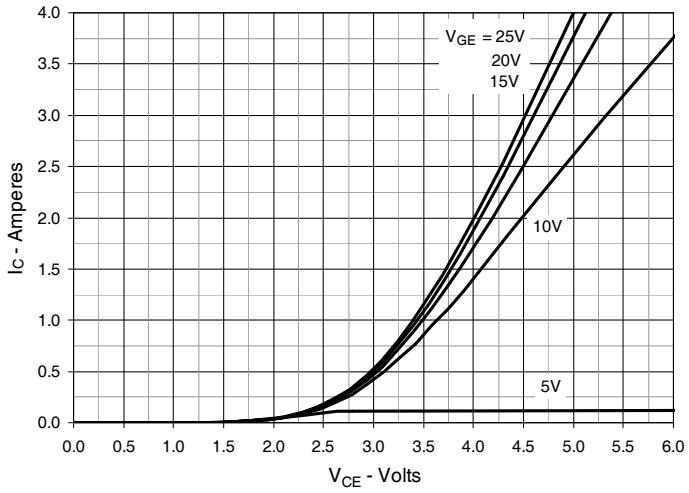


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

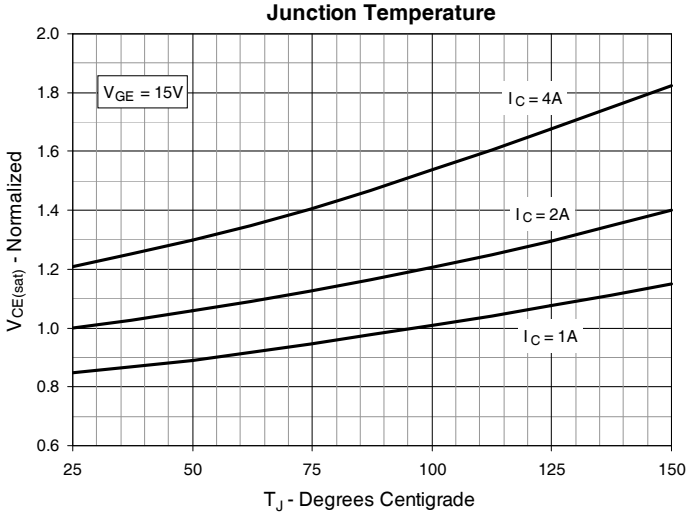


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

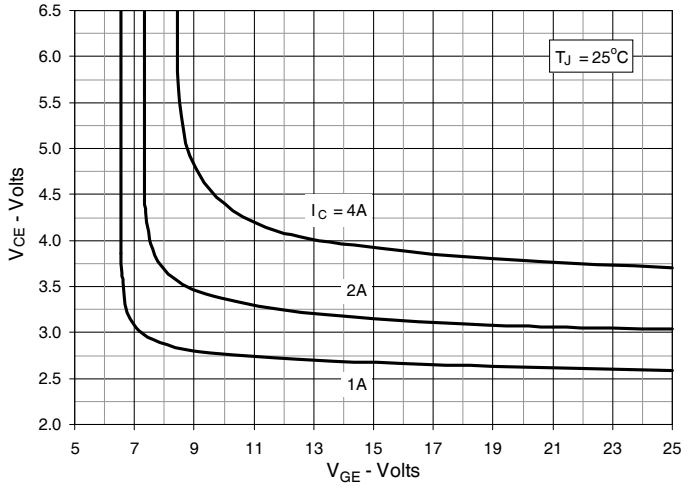
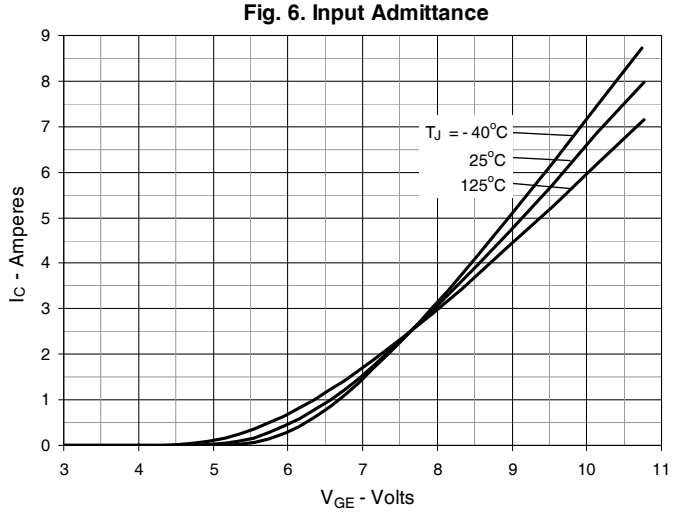


Fig. 6. Input Admittance



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Fig. 7. Transconductance

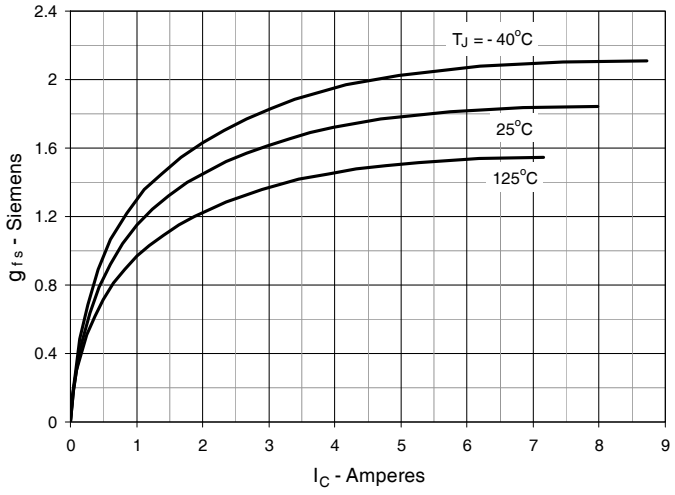


Fig. 8. Forward Voltage Drop of Intrinsic Diode

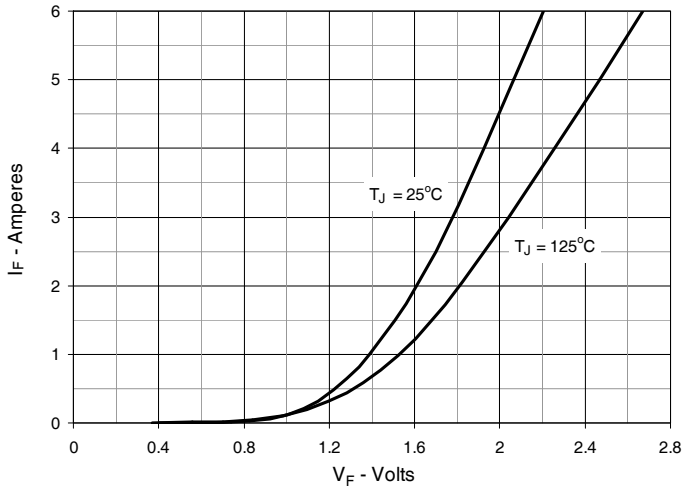


Fig. 9. Gate Charge

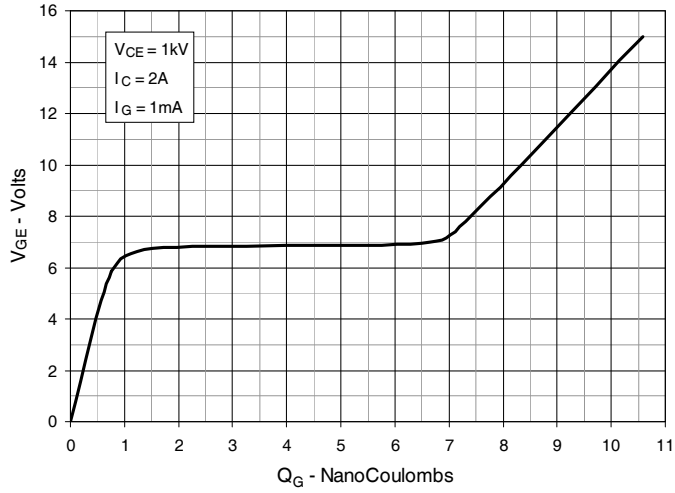


Fig. 10. Capacitance

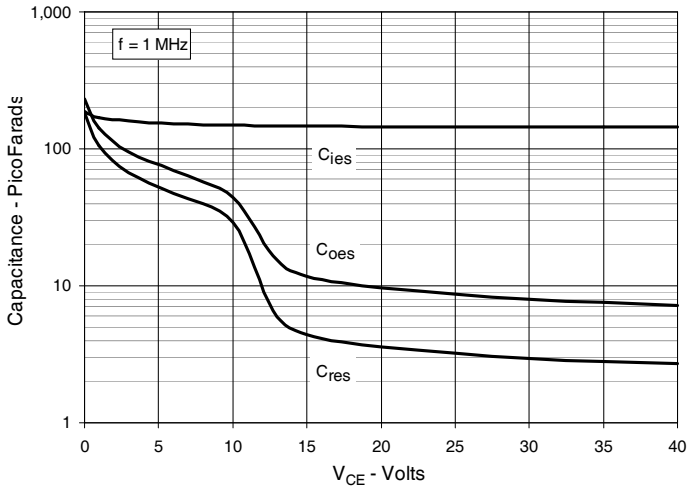


Fig. 11. Reverse-Bias Safe Operating Area

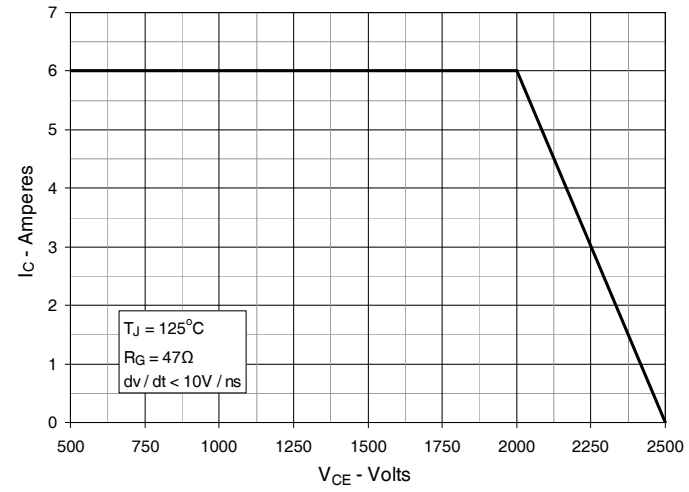
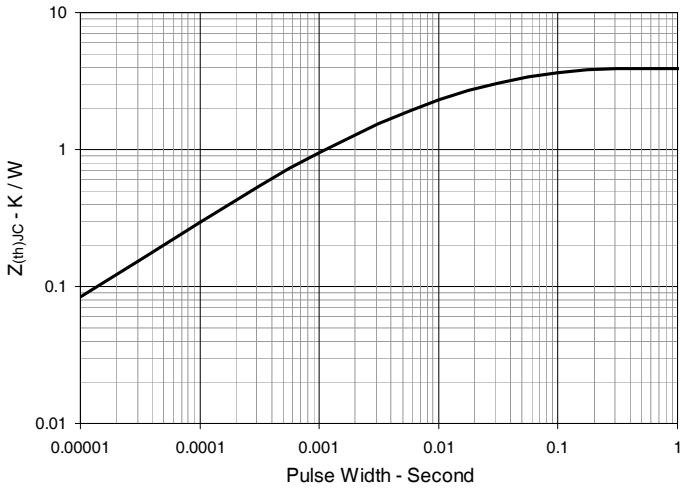


Fig. 12. Maximum Transient Thermal Impedance



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

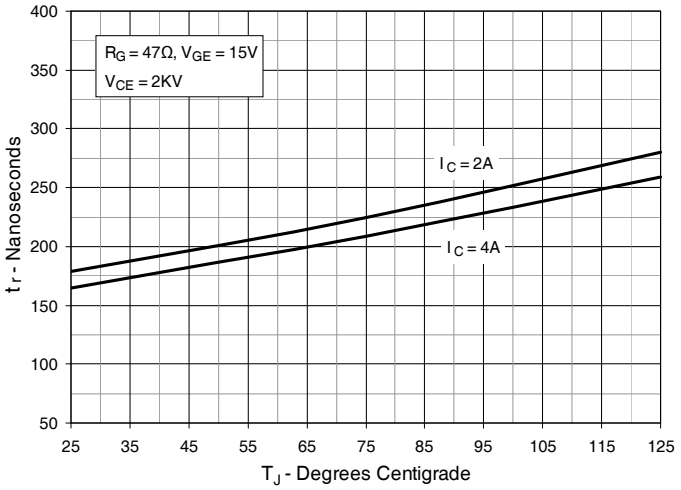


Fig. 14. Resistive Turn-on Rise Time vs. Collector Current

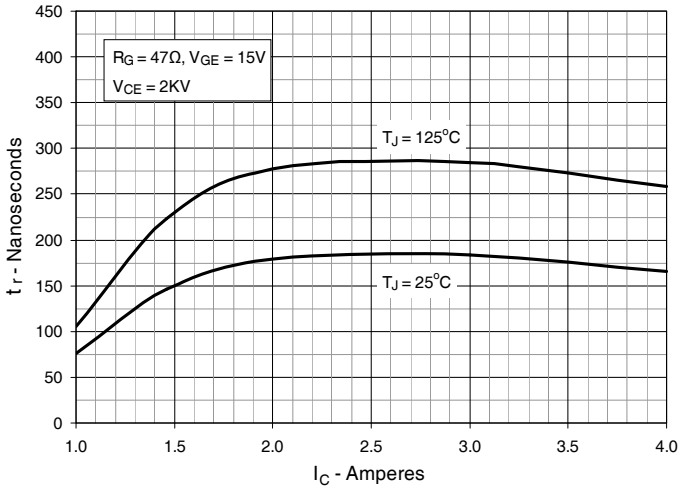


Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance

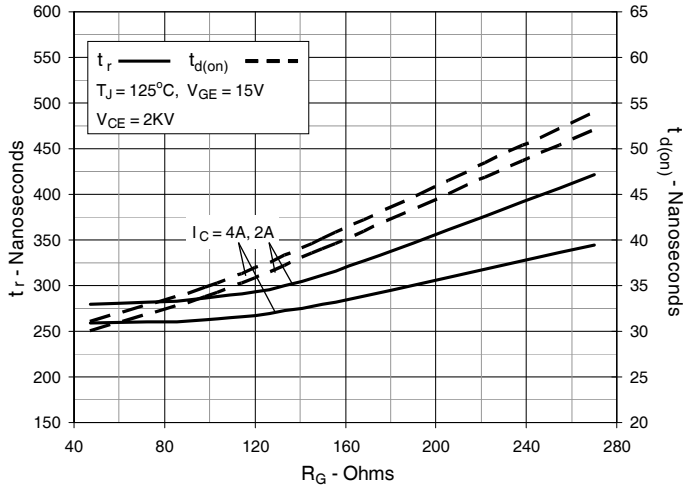


Fig. 16. Resistive Turn-off Switching Times vs. Junction Temperature

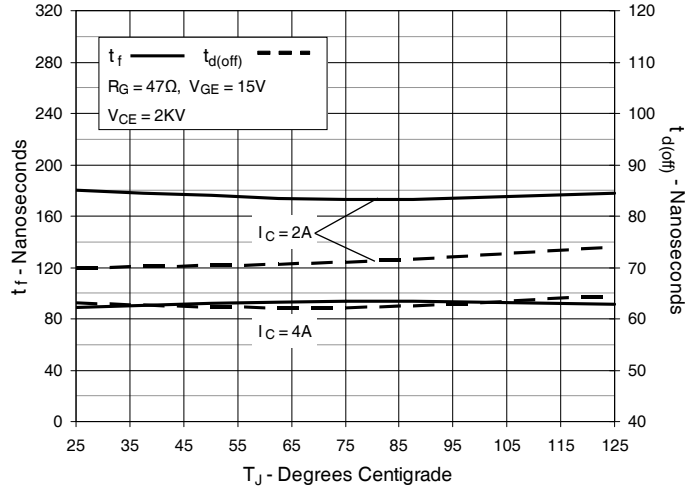


Fig. 17. Resistive Turn-off Switching Times vs. Collector Current

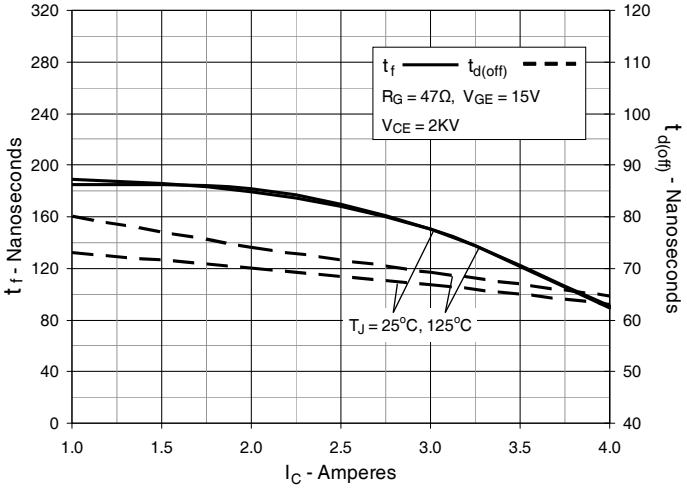
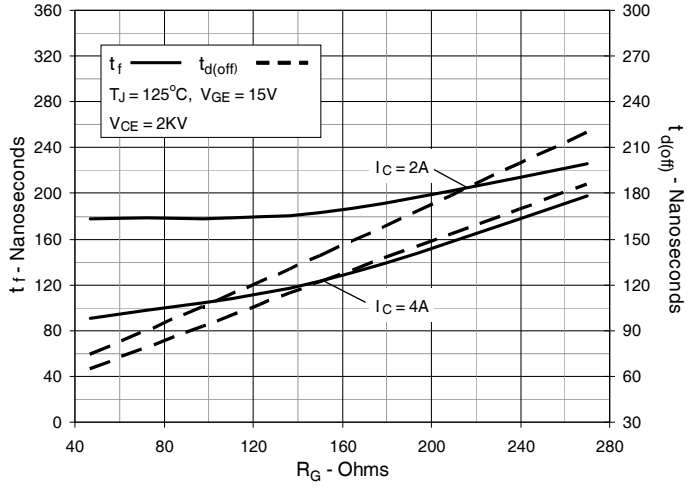


Fig. 18. Resistive Turn-off Switching Times vs. Gate Resistance



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