THE DATASHEET OF

IXBH2N250

IXYS

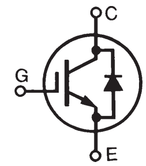
Preliminary Technical Information

High Voltage, High Gain BIMOSFET™

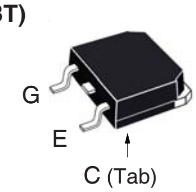
IXBH2N250
IXBT2N250

Monolithic Bipolar MOS Transistor

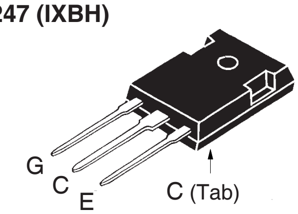
V_{CES} = 2500V
I_{C110} = 2A
$V_{CE(sat)}$ ≤ 3.80V



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} ≤ 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

IXYS

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IXBT2N250

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**		30		ns
t_r	I_C = 2A, V_{GE} = 15V		180		ns
$t_{d(off)}$	V_{CE} = 2kV, R_G = 47Ω		70		ns
t_f			182		ns
$t_{d(on)}$	**Resistive Switching times, T_J = 125°C**		30		ns
t_r	I_C = 2A, V_{GE} = 15V		280		ns
$t_{d(off)}$	V_{CE} = 2kV, R_G = 47Ω		74		ns
t_f			178		ns
R_{thJC}				3.90	°C/W
R_{thCS}			0.21		°C/W

Reverse Diode

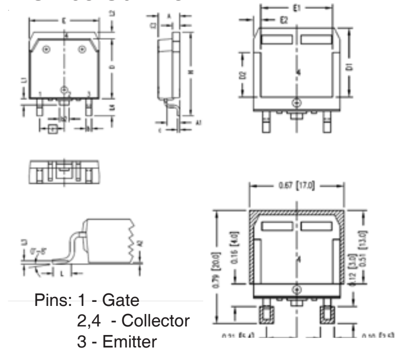
Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
V_F	I_F = 2A, V_{GE} = 0V, Note 1			2.4	V
t_{rr}	I_F = 2A, V_{GE} = 0V, -di_F/dt = 100A/μs		0.92		μs
I_{RM}	V_R = 100V, V_{GE} = 0V		9.80		A
Q_{RM}			4.50		μC

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.

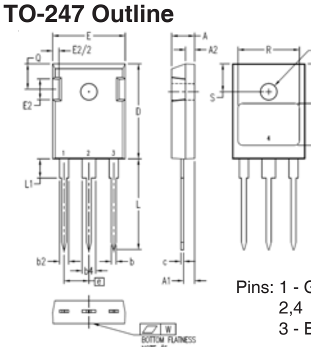
TO-268 Outline



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

SYMBOL	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
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	MAX	MILLIMETERS MIN	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 @ $T_J = 25^oC$

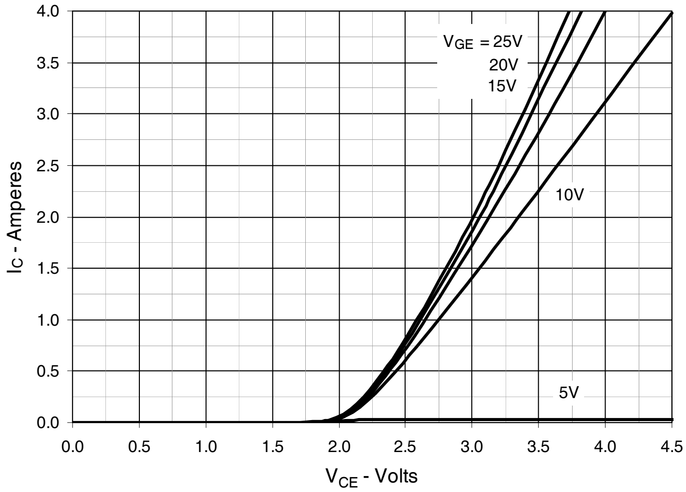


Fig. 2. Extended Output Characteristics @ $T_J = 25^oC$

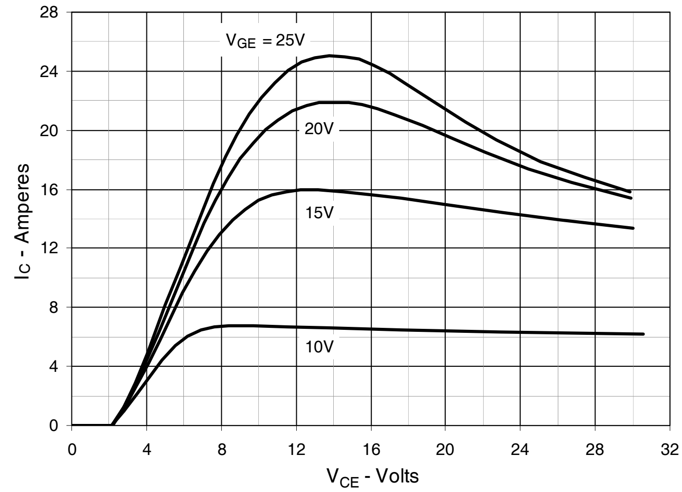


Fig. 3. Output Characteristics @ $T_J = 125^oC$

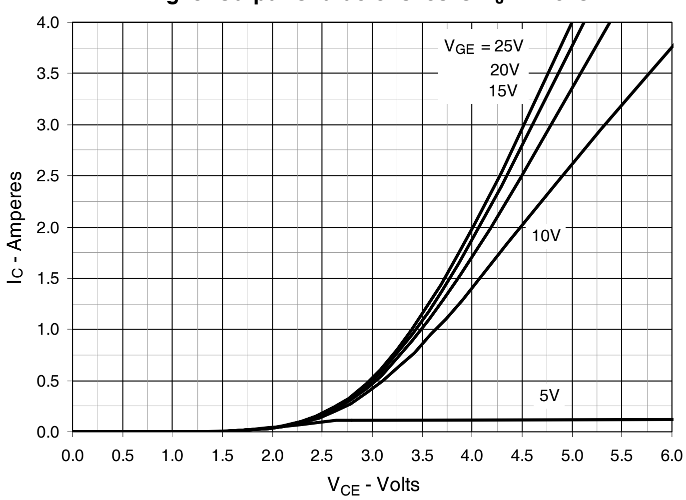


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

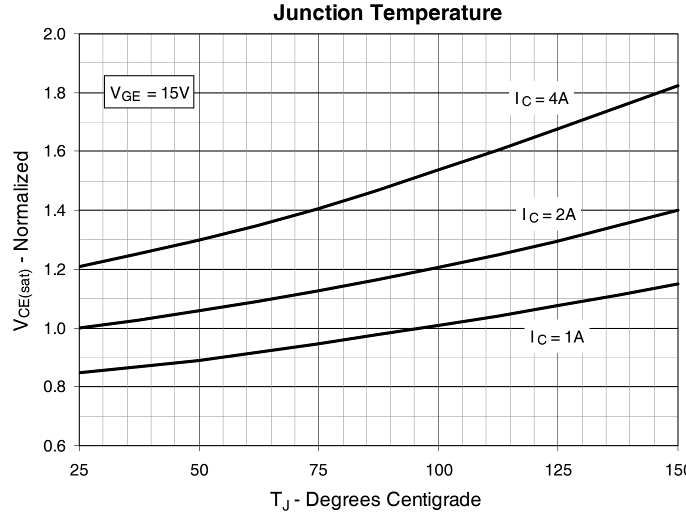


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

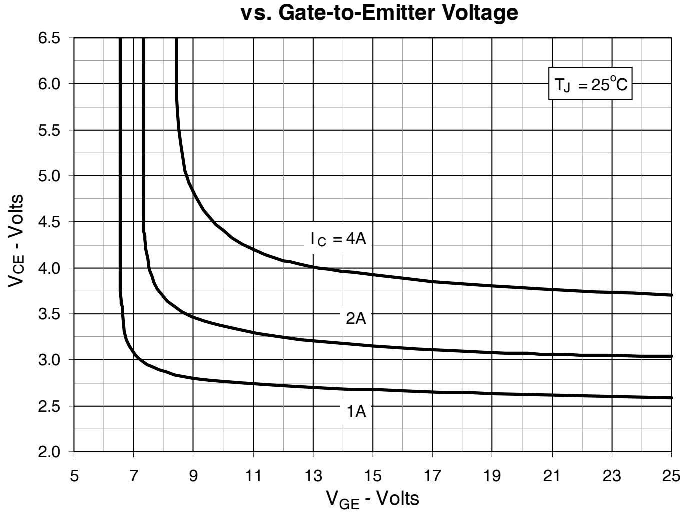


Fig. 6. Input Admittance

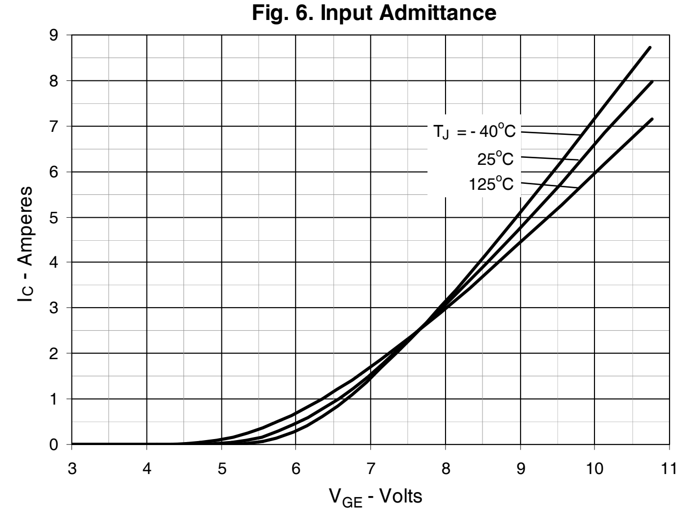


Fig. 7. Transconductance

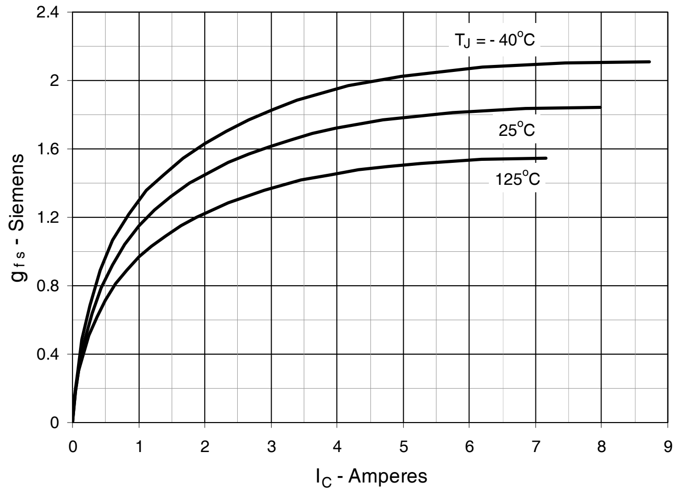


Fig. 8. Forward Voltage Drop of Intrinsic Diode

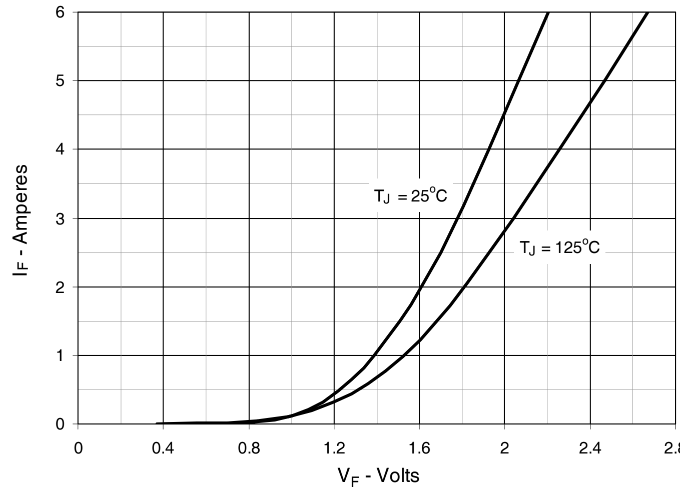


Fig. 9. Gate Charge

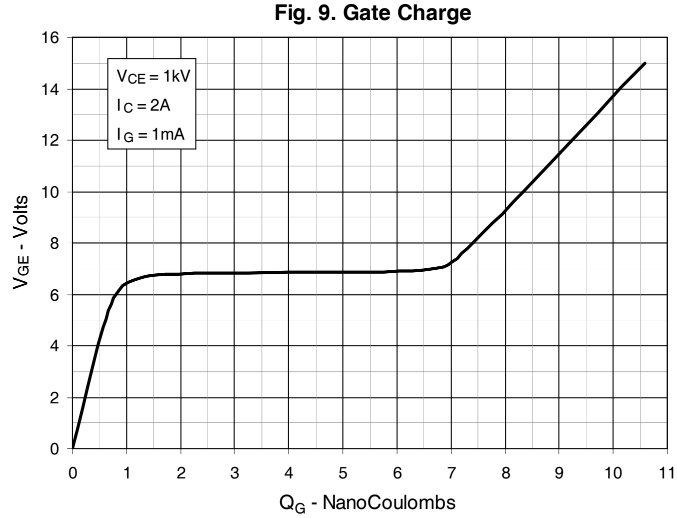


Fig. 10. Capacitance

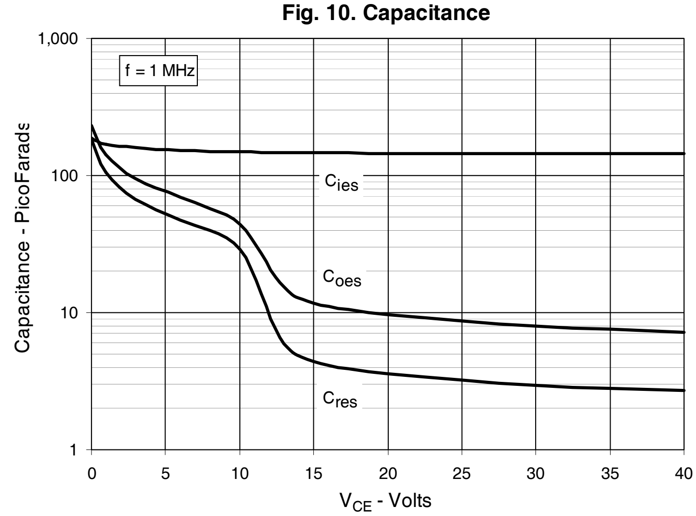


Fig. 11. Reverse-Bias Safe Operating Area

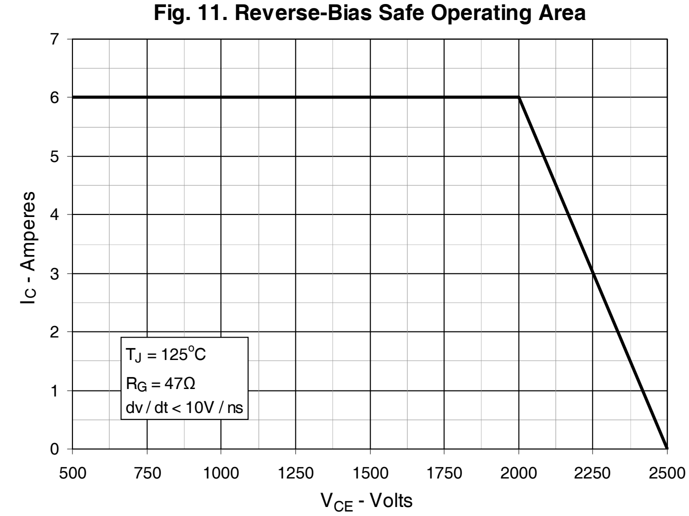


Fig. 12. Maximum Transient Thermal Impedance

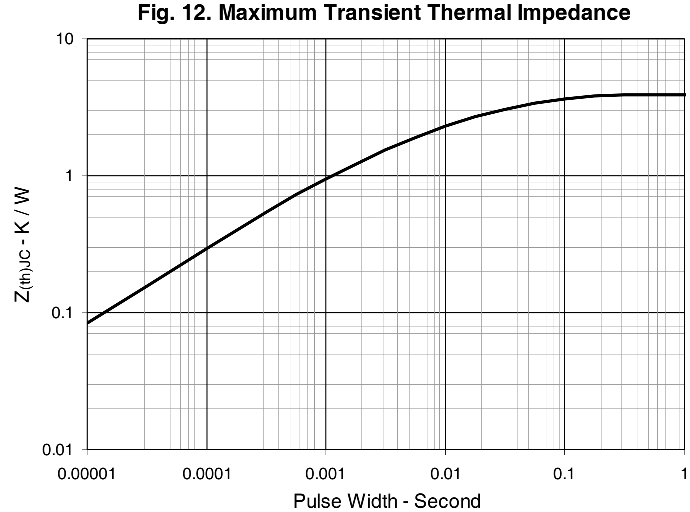


Fig. 13. Resistive Turn-on Rise Time vs. Junction Temperature

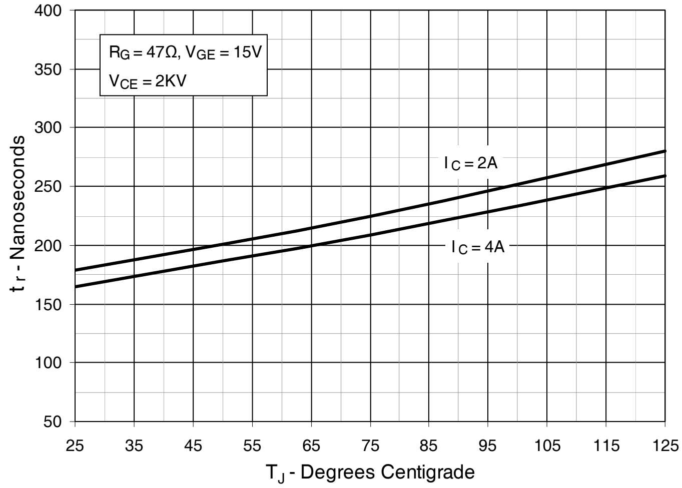


Fig. 14. Resistive Turn-on Rise Time vs. Collector Current

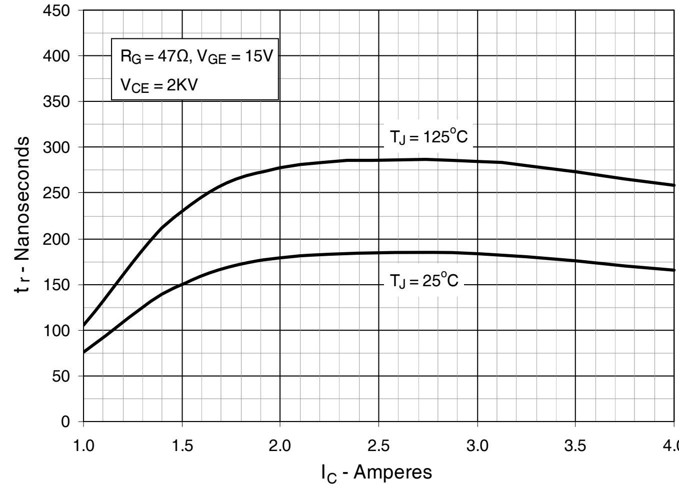


Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance

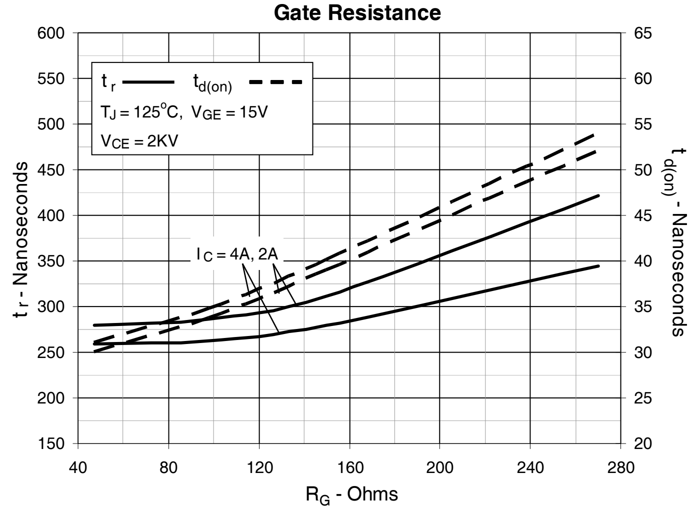


Fig. 16. Resistive Turn-off Switching Times vs. Junction Temperature

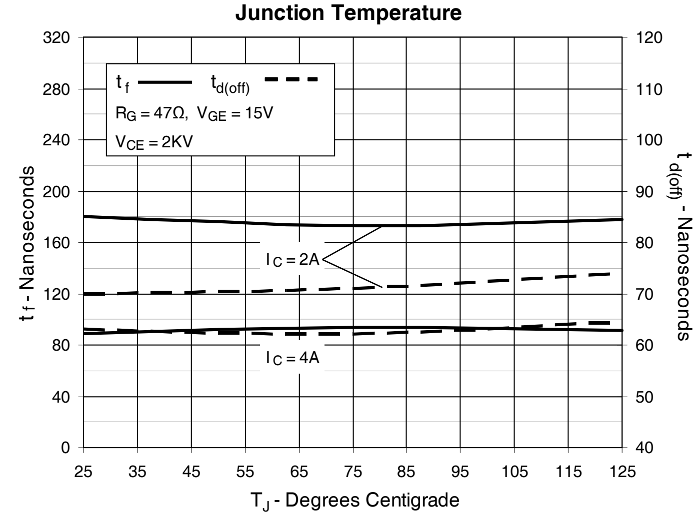


Fig. 17. Resistive Turn-off Switching Times vs. Collector Current

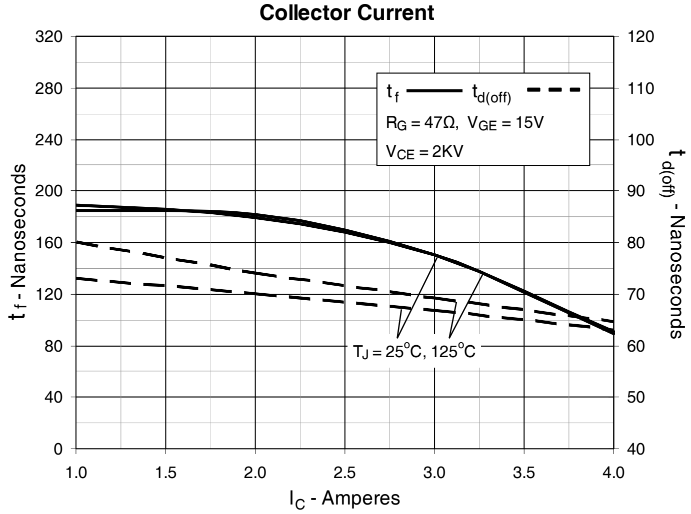


Fig. 18. Resistive Turn-off Switching Times vs. Gate Resistance