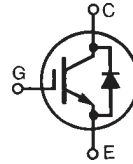


**BiMOSFET™ Monolithic
Bipolar MOS Transistor**
**IXBK75N170
IXBX75N170**

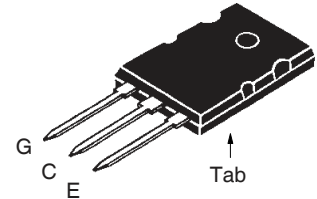
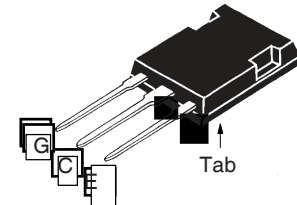
$$V_{CES} = 1700V$$

$$I_{C110} = 75A$$

$$V_{CE(sat)} \leq 3.1V$$



Symbol	Test Conditions	Maximum Ratings	
V_{CES}	$T_J = 25^\circ C$ 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}	$T_C = 25^\circ C$ (Chip Capability)	200	A
I_{LRMS}	$T_C = 25^\circ C$ (Lead RMS Limit)	160	A
I_{C110}	$T_C = 110^\circ C$	75	A
I_{CM}	$T_C = 25^\circ C$, 1ms	580	A
SSOA	$V_{GE} = 15V$, $T_{VJ} = 125^\circ C$, $R_G = 1\Omega$	$I_{CM} = 150$	A
(RBSOA)	Clamped Inductive Load	$V_{CE} \leq 0.8 \cdot V_{CES}$	
P_C	$T_C = 25^\circ C$	1040	W
T_J		-55 ... +150	$^\circ C$
T_{JM}		150	$^\circ C$
T_{stg}		-55 ... +150	$^\circ C$
T_L	Maximum Lead Temperature for Soldering	300	$^\circ C$
T_{SOLD}	1.6 mm (0.062 in.) from Case for 10	260	$^\circ C$
M_d	Mounting Torque (TO-264)	1.13/10	Nm/lb.in.
F_c	Mounting Force (PLUS247)	20..120/4.5..27	N/lb.
Weight	TO-264	10	g
	PLUS247	6	g

TO-264 (IXBK)

PLUS247™ (IXBX)


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

Features

- International Standard Packages
- High Blocking Voltage
- High Current Handling Capability
- Anti-Parallel Diode

Advantages

- High Power Density
- Low Gate Drive Requirement
- Intergrated Diode Can Be Used for Protection

Applications

- Capacitor Discharge
- AC Switches
- Switch-Mode and Resonant-Mode Power Supplies
- UPS
- AC Motor Drives

Symbol	Test Conditions ($T_J = 25^\circ C$, Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
BV_{CES}	$I_C = 250\mu A$, $V_{GE} = 0V$	1700		V
$V_{GE(th)}$	$I_C = 1.5mA$, $V_{CE} = V_{GE}$	2.5		5.5 V
I_{CES}	$V_{CE} = 0.8 \cdot V_{CES}$, $V_{GE} = 0V$ $T_J = 125^\circ C$			25 μA 2 mA
I_{GES}	$V_{CE} = 0V$, $V_{GE} = \pm 20V$			± 100 nA
$V_{CE(sat)}$	$I_C = I_{C110}$, $V_{GE} = 15V$, Note 1 $T_J = 125^\circ C$	2.6 3.1	3.1	V V

Symbol Test Conditions

($T_J = 25^\circ\text{C}$ Unless Otherwise Specified)

Characteristic Values

Symbol	Test Conditions	Characteristic Values		
		Min.	Typ.	Max.
g_{fs}	$I_C = I_{C110}, V_{CE} = 10V$, Note 1	34	56	S
C_{ies}	$V_{CE} = 25V, V_{GE} = 0V, f = 1\text{MHz}$		6930	pF
C_{oes}			400	pF
C_{res}			150	pF
Q_g	$I_C = I_{C110}, V_{GE} = 15V, V_{CE} = 0.5 \cdot V_{CES}$		350	nC
Q_{ge}			50	nC
Q_{gc}			160	nC
$t_{d(on)}$	Resistive load, $T_J = 25^\circ\text{C}$		46	ns
t_r		$I_C = I_{C110}, V_{GE} = 15V$	160	ns
$t_{d(off)}$	$R_G = 1\Omega, V_{CE} = 0.5 \cdot V_{CES}$		260	ns
t_f			440	ns
$t_{d(on)}$	Resistive load, $T_J = 125^\circ\text{C}$		47	ns
t_r		$I_C = I_{C110}, V_{GE} = 15V$	230	ns
$t_{d(off)}$	$R_G = 1\Omega, V_{CE} = 0.5 \cdot V_{CES}$		260	ns
t_f			580	ns
R_{thJC}			0.12	$^\circ\text{C/W}$
R_{thCS}		0.15		$^\circ\text{C/W}$

Reverse Diode

Symbol Test Conditions

($T_J = 25^\circ\text{C}$ Unless Otherwise Specified)

Characteristic Values

Symbol	Test Conditions	Characteristic Values		
		Min.	Typ.	Max.
V_F	$I_F = I_{C110}, V_{GE} = 0V$, Note 1			3.0 V
t_{rr}	$I_F = 37A, V_{GE} = 0V, -di_F/dt = 100A/\mu\text{s}$		1.5	μs
I_{RM}			50	A
Q_{RM}		$V_R = 100V, V_{GE} = 0V$	38.2	μC

Note

1. Pulse test, $t \leq 300\mu\text{s}$, duty cycle, $d \leq 2\%$.

Additional provisions for lead-to-lead isolation are required at $V_{CE} > 1200V$.

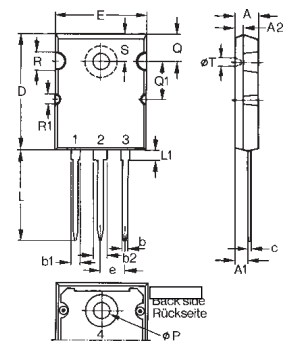
PRELIMINARY TECHNICAL INFORMATION

The product presented herein is under development. The Technical Specifications offered are derived from data gathered during objective characterizations of preliminary engineering lots; but also may yet contain some information supplied during a pre-production design evaluation. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.

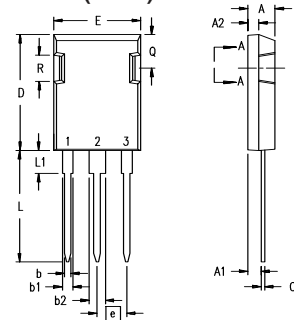
IXYS MOSFETs and IGBTs are covered 4,835,592 4,931,844 5,049,961 5,237,481 6,162,665 6,404,065 B1 6,683,344 6,727,585 7,005,734 B2 7,157,338 B2
by one or more of the following U.S. patents: 4,850,072 5,017,508 5,063,307 5,381,025 6,259,123 B1 6,534,343 6,710,405 B2 6,759,692 7,063,975 B2
4,881,106 5,034,796 5,187,117 5,486,715 6,306,728 B1 6,583,505 6,710,463 6,771,478 B2 7,071,537

TO-264 AA (IXBK) Outline



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.82	5.13	.190	.202
A1	2.54	2.89	.100	.114
A2	2.00	2.10	.079	.083
b	1.12	1.42	.044	.056
b1	2.39	2.69	.094	.106
b2	2.90	3.09	.114	.122
c	0.53	0.83	.021	.033
D	25.91	26.16	1.020	1.030
E	19.81	19.96	.780	.786
e	5.46 BSC		.215 BSC	
J	0.00	0.25	.000	.010
K	0.00	0.25	.000	.010
L	20.32	20.83	.800	.820
L1	2.29	2.59	.090	.102
P	3.17	3.66	.125	.144
Q	6.07	6.27	.239	.247
Q1	8.38	8.69	.330	.342
R	3.81	4.32	.150	.170
R1	1.78	2.29	.070	.090
S	6.04	6.30	.238	.248
T	1.57	1.83	.062	.072

PLUS247™ (IXBX) Outline



Terminals: 1 - Gate
2 - Drain (Collector)
3 - Source (Emitter)

Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.83	5.21	.190	.205
A ₁	2.29	2.54	.090	.100
A ₂	1.91	2.16	.075	.085
b	1.14	1.40	.045	.055
b ₁	1.91	2.13	.075	.084
b ₂	2.92	3.12	.115	.123
C	0.61	0.80	.024	.031
D	20.80	21.34	.819	.840
E	15.75	16.13	.620	.635
e	5.45 BSC		.215 BSC	
L	19.81	20.32	.780	.800
L1	3.81	4.32	.150	.170
Q	5.59	6.20	.220	0.244
R	4.32	4.83	.170	.190

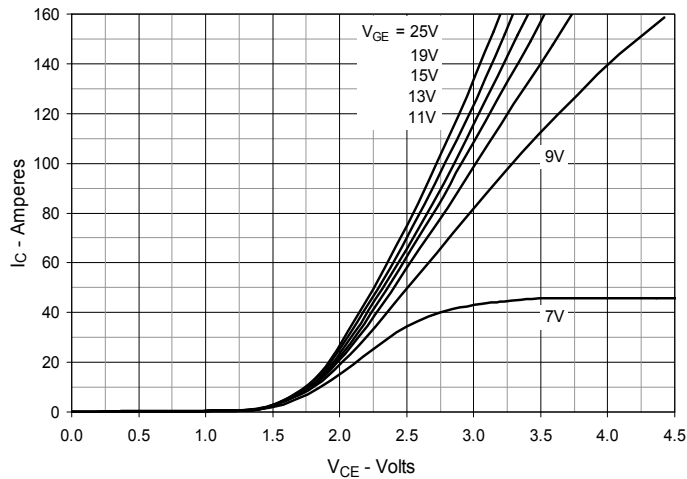
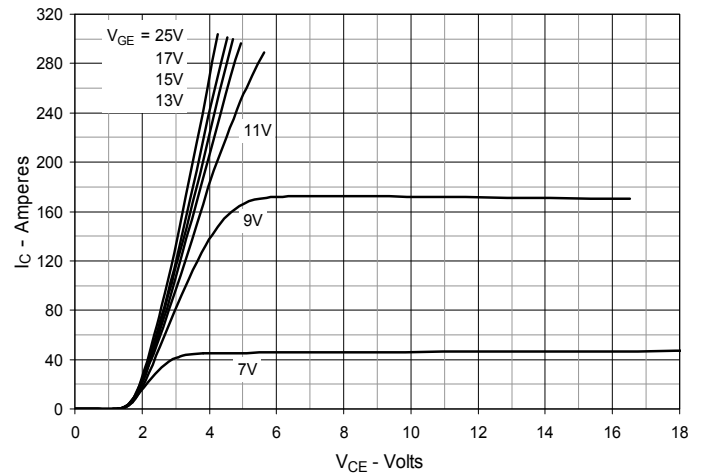
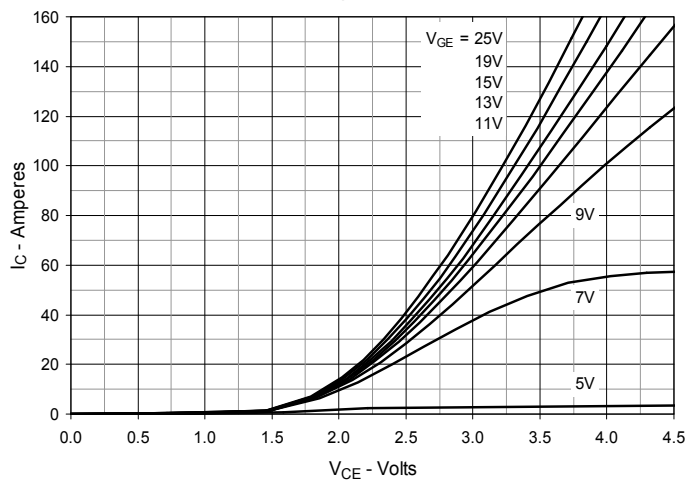
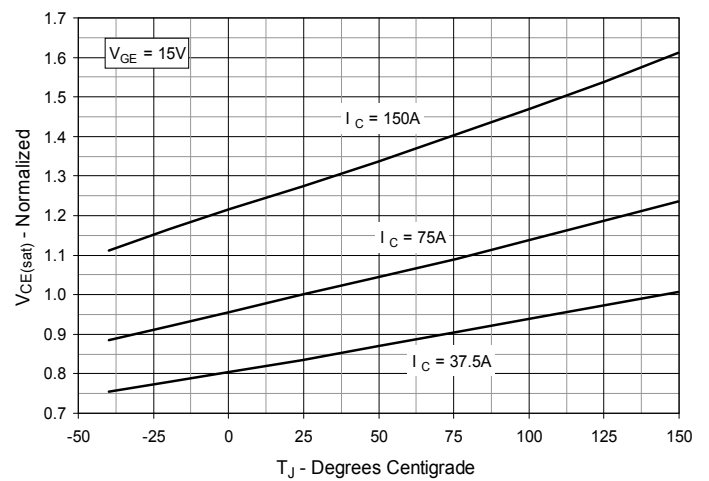
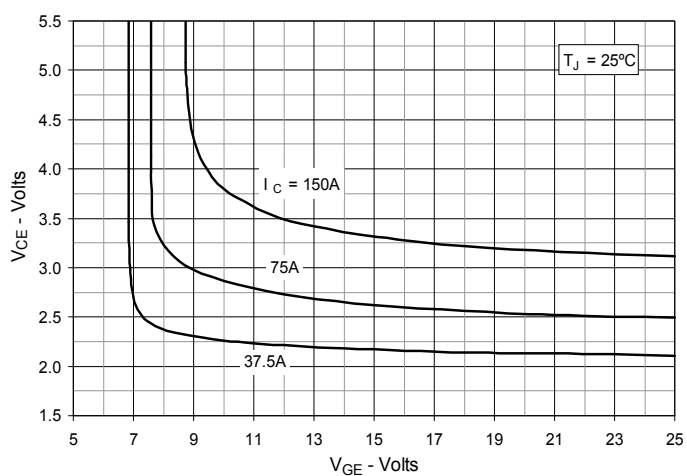
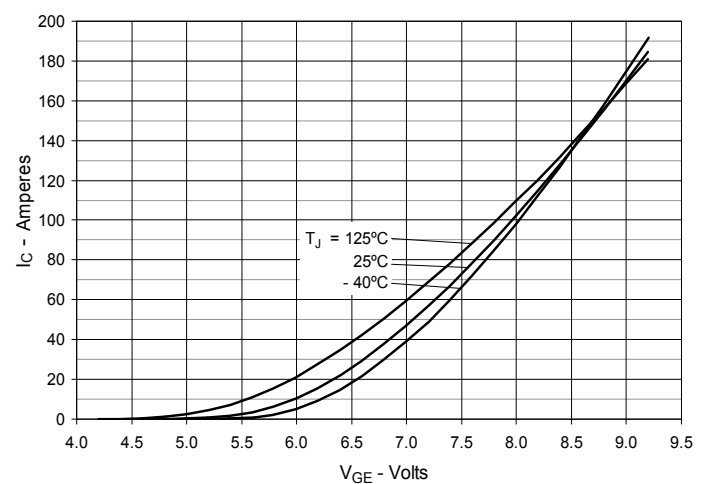
**Fig. 1. Output Characteristics
@ 25°C**

**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

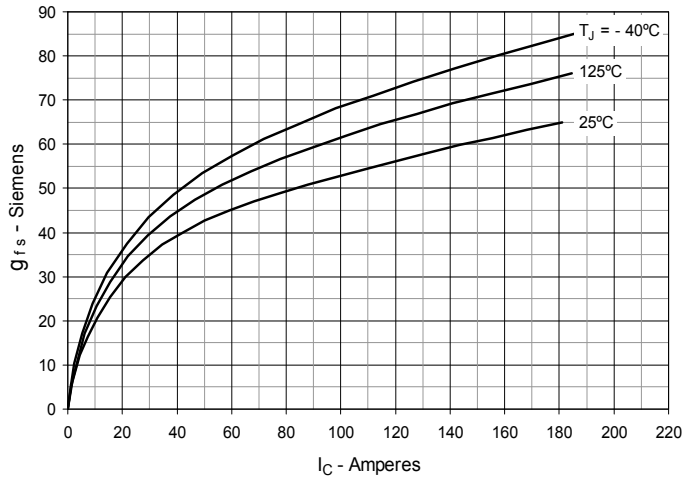


Fig. 8. Forward Voltage Drop of Intrinsic Diode

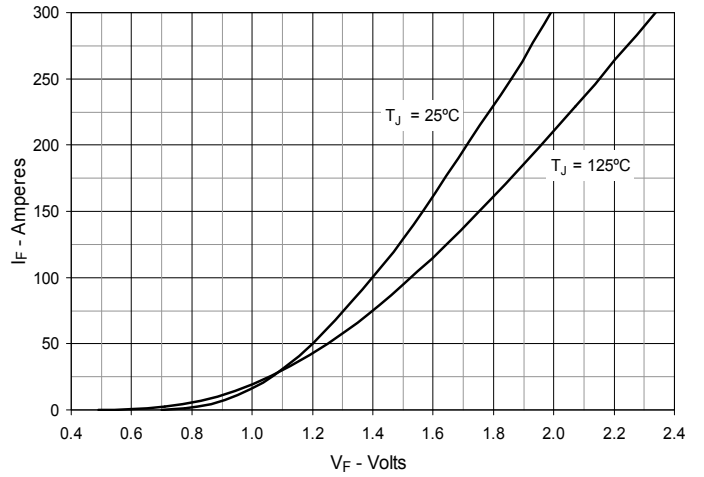


Fig. 9. Gate Charge

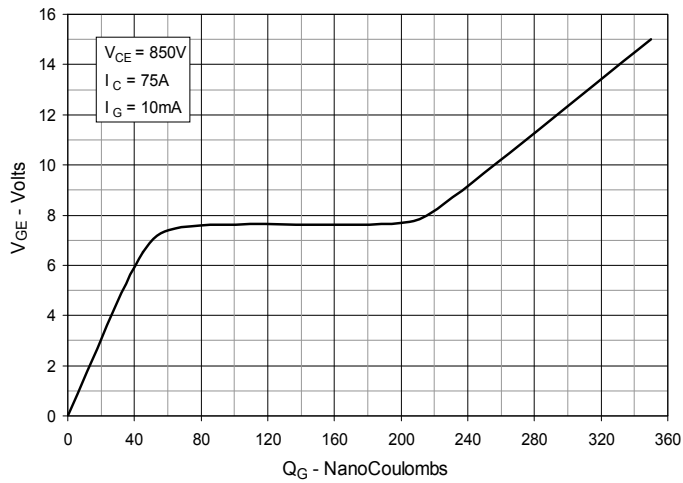


Fig. 10. Capacitance

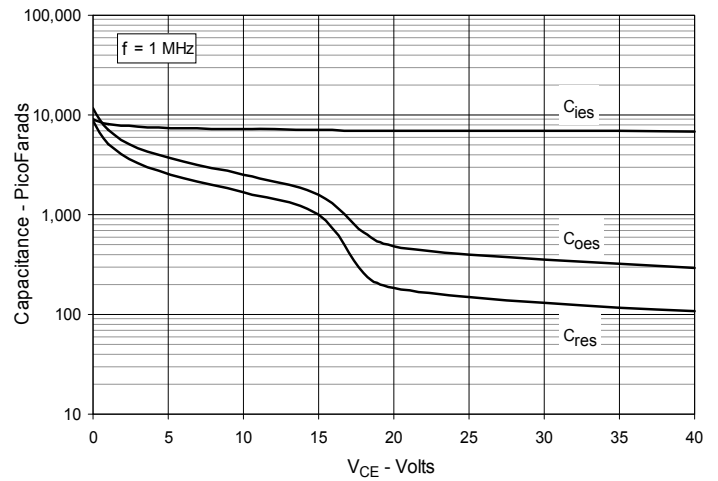


Fig. 11. Reverse-Bias Safe Operating Area

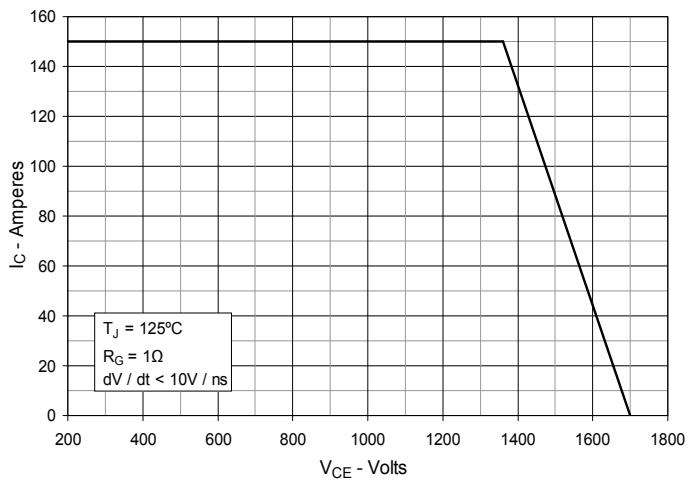
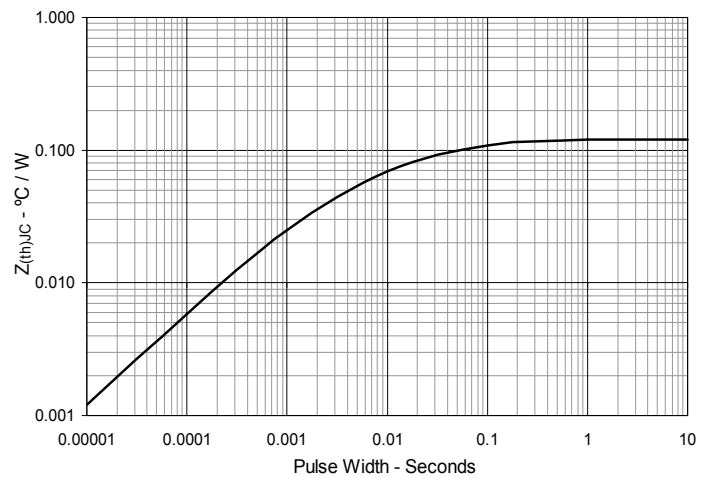
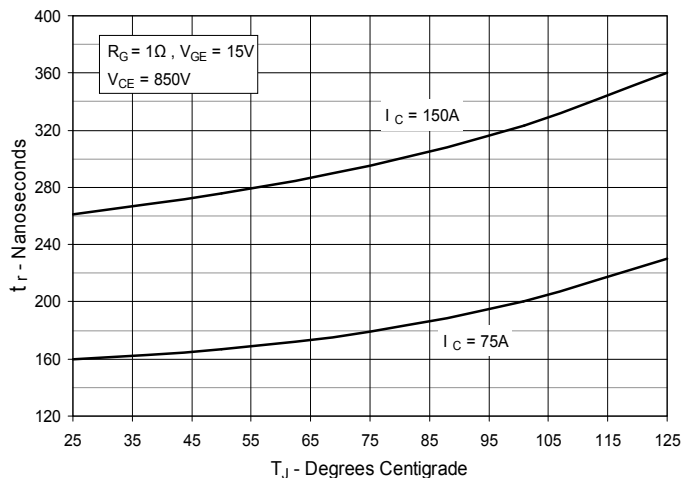


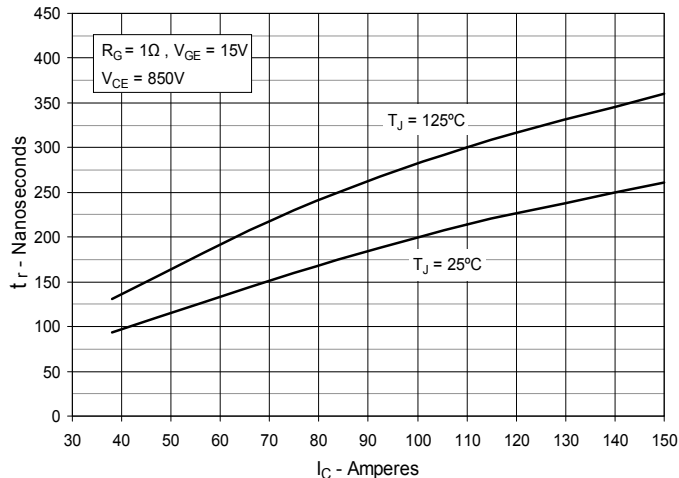
Fig. 12. Maximum Transient Thermal Impedance



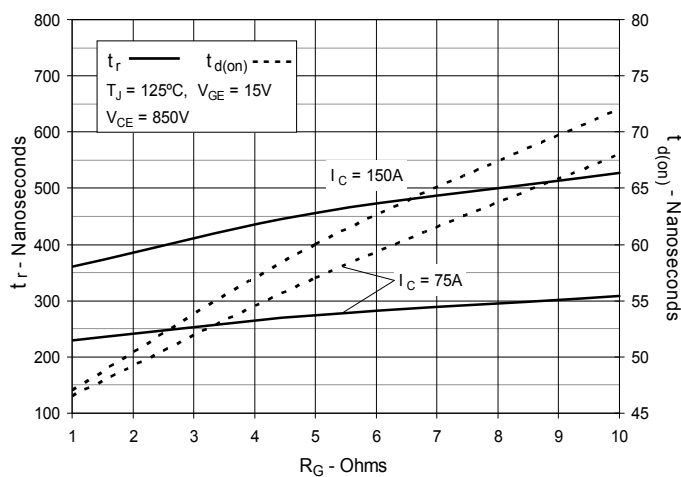
**Fig. 13. Resistive Turn-on
Rise Time vs. Junction Temperature**



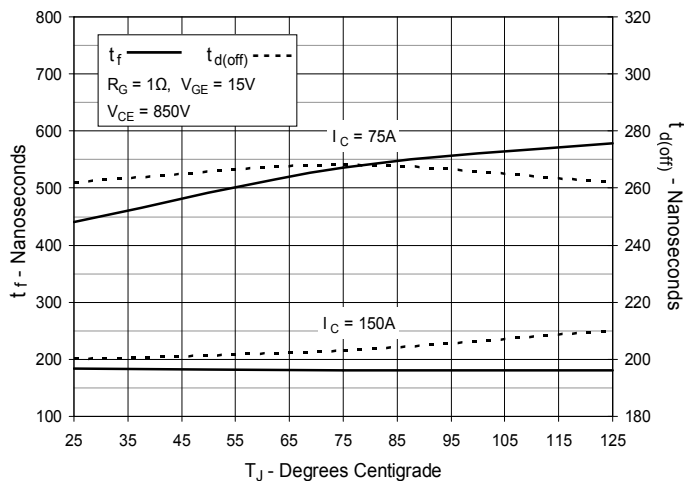
**Fig. 14. Resistive Turn-on
Rise Time vs. Collector Current**



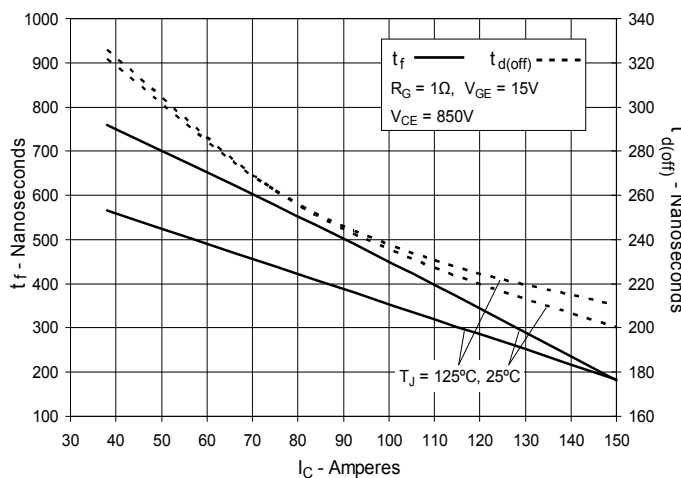
**Fig. 15. Resistive Turn-on
Switching Times vs. Gate Resistance**



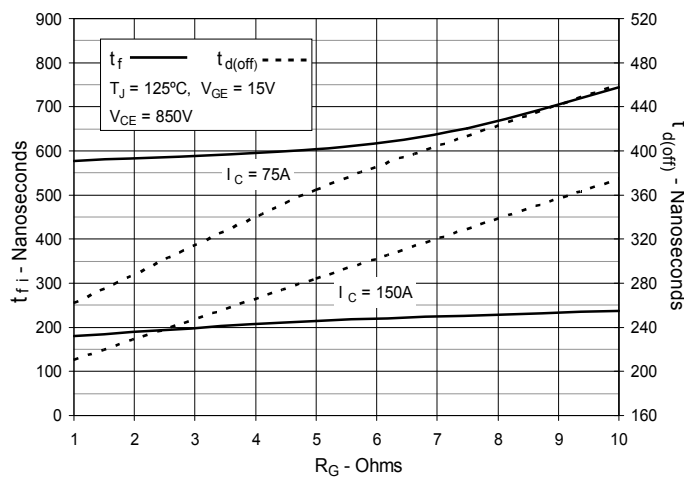
**Fig. 16. Resistive Turn-off
Switching Times vs. Junction Temperature**



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



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





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