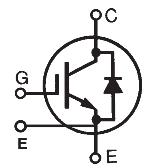
IXYS

BiMOSFET™ Monolithic Bipolar MOS Transistor

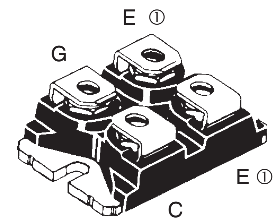
IXBN75N170A

V_{CES} = 1700V
I_{C90} = 42A
$V_{CE(sat)}$ ≤ 6.00V
$t_{fi(typ)}$ = 60ns



SOT-227B, miniBLOC

E153432



G = Gate, C = Collector, E = Emitter
① either emitter terminal can be used as Main or Kelvin Emitter

Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_J = 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	75	A
I_{C90}	T_C = 90°C	42	A
I_{CM}	T_C = 25°C, 1ms	350	A
SSOA	V_{GE}= 15V, T_{VJ} = 125°C, R_G = 1Ω	I_{CM} = 100	A
(RBSOA)	Clamped Inductive Load	$V_{CE} \le 0.8 \cdot V_{CES}$	
P_C	T_C = 25°C	625	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 (0.062 in.) from Case for 10	260	°C
V_{ISOL}	50/60Hz t = 1min	2500	V~
	$I_{ISOL} \le$ 1mA t = 1s	3000	V~
M_d	Mounting Torque	1.5/13	Nm/lb.in.
	Terminal Connection Torque (M4)	1.3/11.5	Nm/lb.in.
Weight		30	g

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
BV_{CES}	I_C = 250μA, 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 • V_{CES}, V_{GE} = 0V			50	μA
	T_J = 125°C			3	mA
I_{GES}	V_{CE} = 0V, V_{GE} = ± 20V			±100	nA
$V_{CE(sat)}$	I_C = I_{C90}, V_{GE} = 15V, Note 1		4.95	6.00	V
	T_J = 125°C		5.15		V

Features

- International Standard Package
- High Blocking Voltage
- Fast Switching
- Isolation Voltage 3000 V~
- High Current Handling Capability
- Anti-Parallel Diode

Advantages

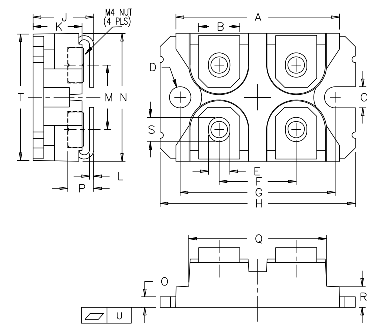
- High Power Density
- Low Gate Drive Requirement
- Easy to Mount with 2 Screws
- Intergrated Diode Can Be Used for Protection

Applications

- Switched-Mode and Resonant-Mode Power Supplies
- UPS
- AC Motor Drives
- Substitutes for High Voltage MOSFET

Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Min.	Typ.	Max.	Unit
g_{fS}	$I_C = I_{C90}$, V_{CE} = 10V, Note 1	28	48		S
C_{ies}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz		7200		pF
C_{oes}			450		pF
C_{res}			150		pF
Q_g	$I_C = I_{C90}$, V_{GE} = 15V, $V_{CE} = 0.5 \bullet V_{CES}$		358		nC
Q_{ge}			46		nC
Q_{gc}			148		nC
$t_{d(on)}$	**Inductive load, T_J = 25°C** $I_C = I_{C90}$, V_{GE} = 15V, $V_{CE} = 0.8 \bullet V_{CES}$, $R_G = 1\Omega$, Note 2		26		ns
t_{ri}			40		ns
$t_{d(off)}$			418		ns
t_{fi}			60	110	ns
E_{off}			3.80	7.00	mJ
$t_{d(on)}$	**Inductive load, T_J = 125°C** $I_C = I_{C90}$, V_{GE} = 15V, $V_{CE} = 0.8 \bullet V_{CES}$, $R_G = 1\Omega$, Note 2		27		ns
t_{ri}			38		ns
$t_{d(off)}$			420		ns
t_{fi}			175		ns
E_{off}			6.35		mJ
R_{thJC}				0.20	°C/W
R_{thCS}			0.05		°C/W

SOT-227B miniBLOC (IXBN)



SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	1.240	1.255	31.50	31.88
B	.307	.323	7.80	8.20
C	.161	.169	4.09	4.29
D	.161	.169	4.09	4.29
E	.161	.169	4.09	4.29
F	.587	.595	14.91	15.11
G	1.186	1.193	30.12	30.30
H	1.496	1.505	38.00	38.23
J	.460	.481	11.68	12.22
K	.351	.378	8.92	9.60
L	.030	.033	0.76	0.84
M	.496	.506	12.60	12.85
N	.990	1.001	25.15	25.42
O	.078	.084	1.98	2.13
P	.195	.235	4.95	5.97
Q	1.045	1.059	26.54	26.90
R	.155	.174	3.94	4.42
S	.186	.191	4.72	4.85
T	.968	.987	24.59	25.07
U	-.002	.004	-0.05	0.1

Reverse Diode

Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Min.	Typ.	Max	Unit
V_F	$I_F = I_{C90}$, V_{GE} = 0V, Note 1			5.5	V
t_{rr}	$I_F = I_{C90}$, V_{GE} = 0V, $-di_F/dt$ = 100A/µs, V_R = 100V, V_{GE} = 0V		360		ns
I_{RM}			19		A
Q_{RM}			3.5		µC

Notes:

1. Pulse test, t ≤ 300µs; duty cycle, d ≤ 2%.
2. Switching times & energy losses may increase for higher V_{CE}(Clamp), T_J or R_G.

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

Fig. 1. Output Characteristics @ T_J = 25ºC

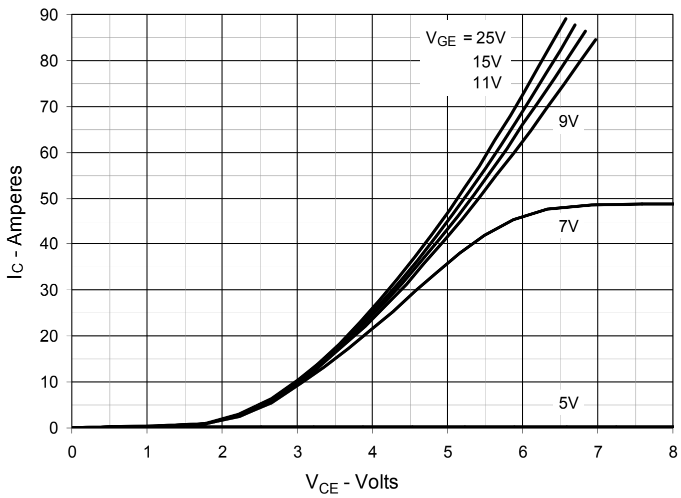


Fig. 2. Extended Output Characteristics @ T_J = 25ºC

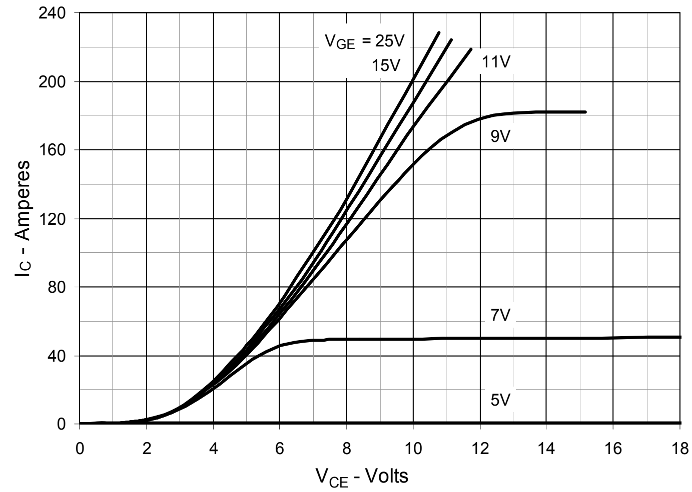


Fig. 3. Output Characteristics @ T_J = 125ºC

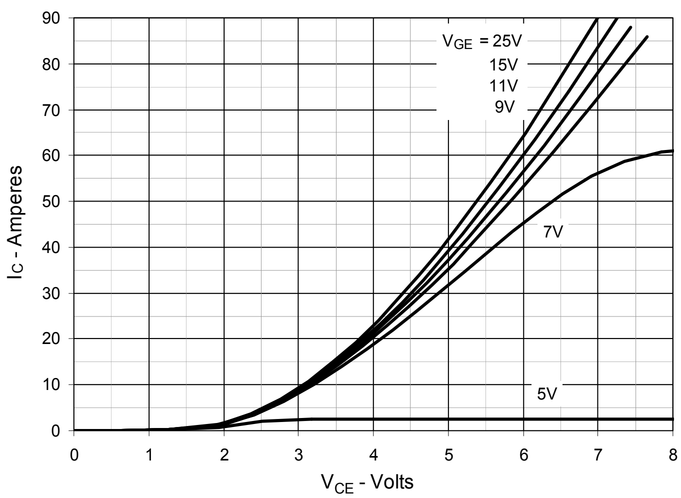


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

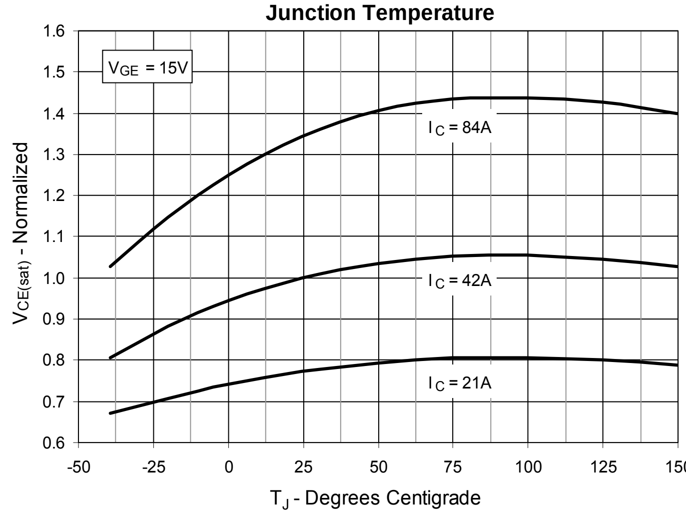


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

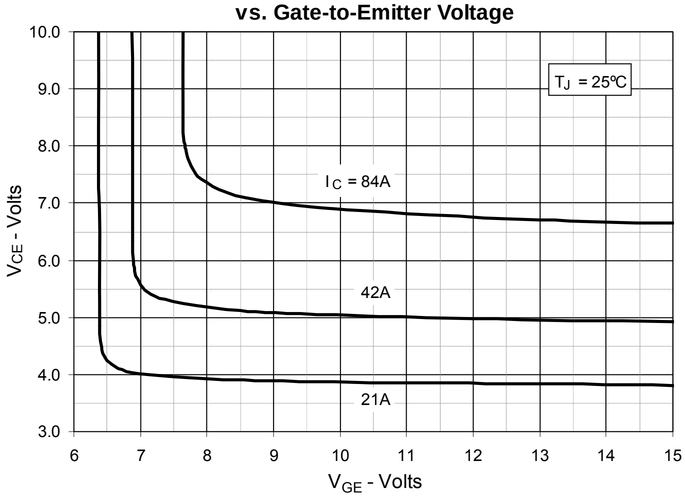


Fig. 6. Input Admittance

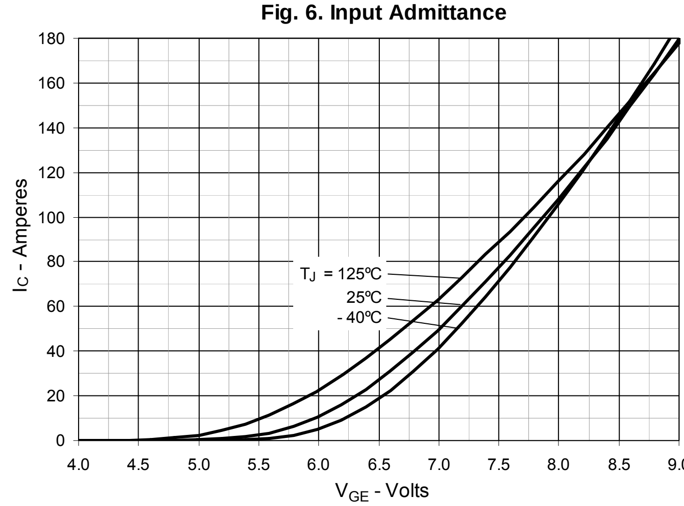


Fig. 7. Transconductance

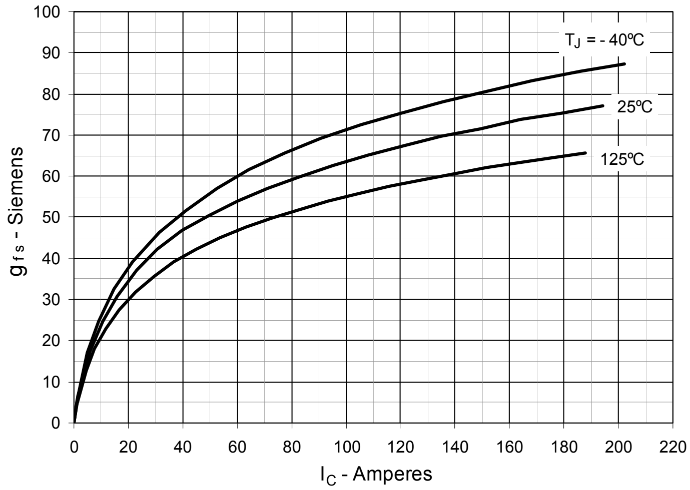


Fig. 8. Gate Charge

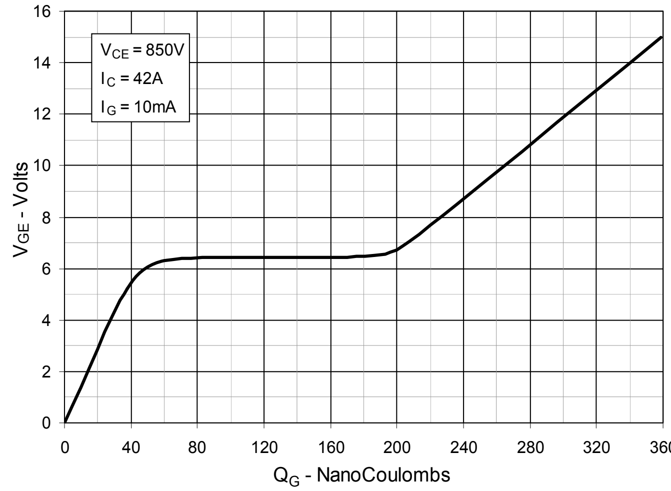


Fig. 9. Forward Voltage Drop of Intrinsic Diode

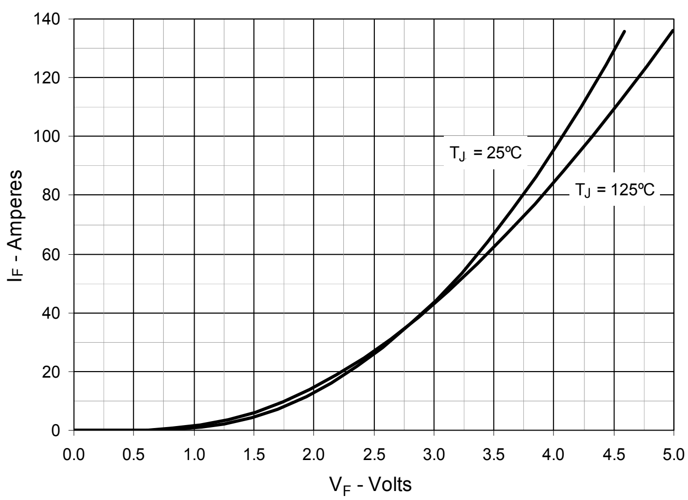


Fig. 10. Capacitance

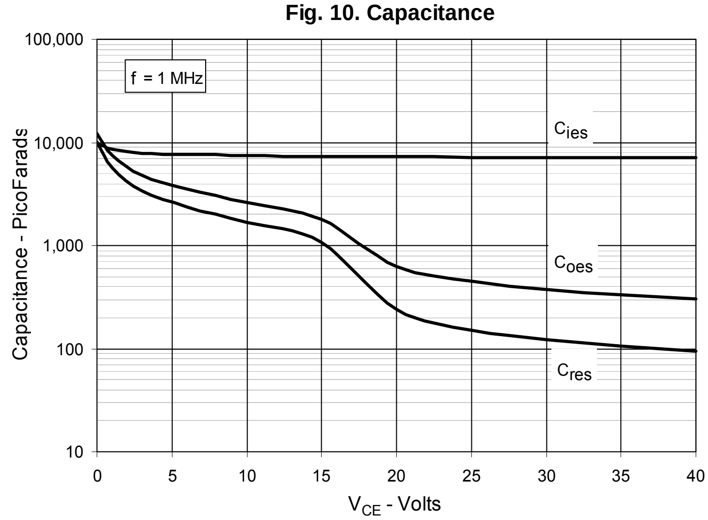


Fig. 11. Reverse-Bias Safe Operating Area

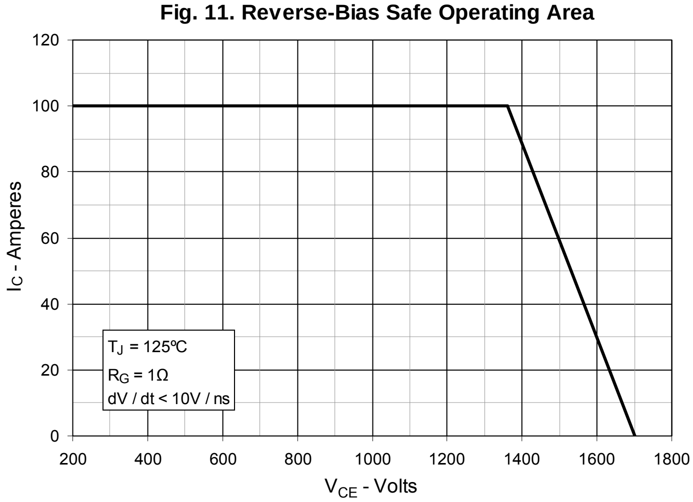
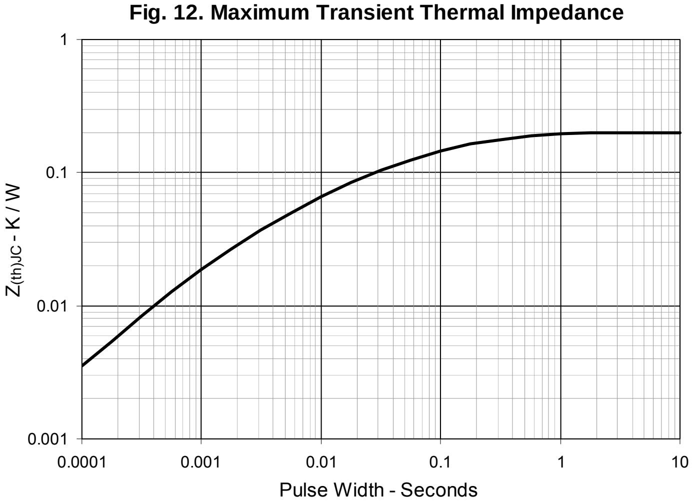


Fig. 12. Maximum Transient Thermal Impedance



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

Fig. 13. Inductive Turn-off Switching Energy Loss vs. Gate Resistance

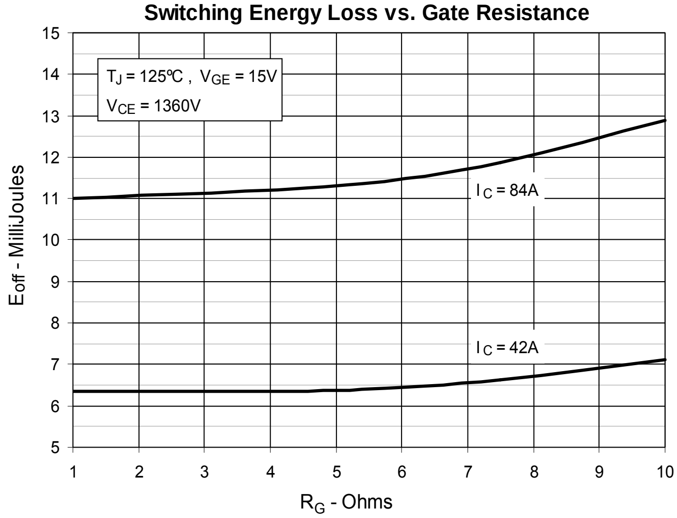


Fig. 14. Inductive Turn-off Switching Energy Loss vs. Collector Current

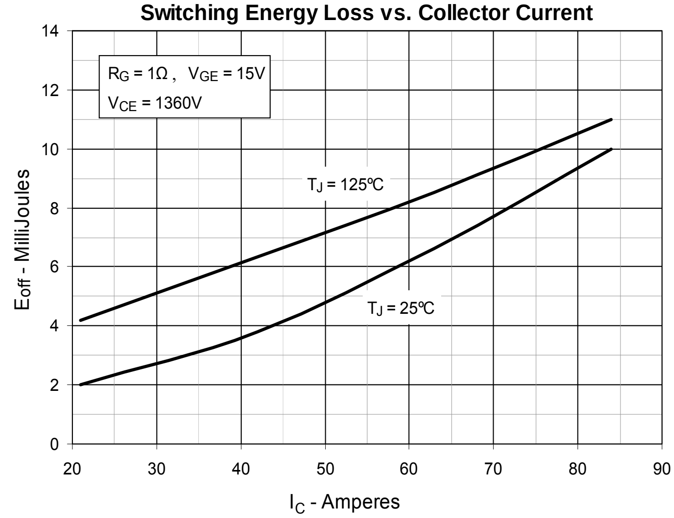


Fig. 15. Inductive Turn-off Switching Energy Loss vs. Junction Temperature

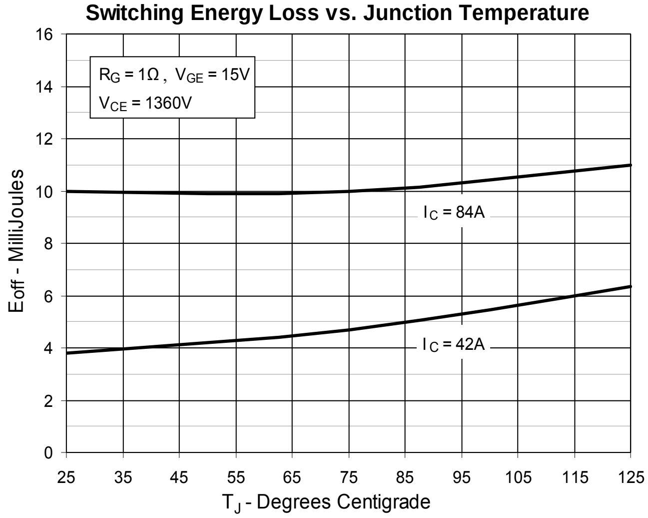


Fig. 16. Inductive Turn-off Switching Times vs. Gate Resistance

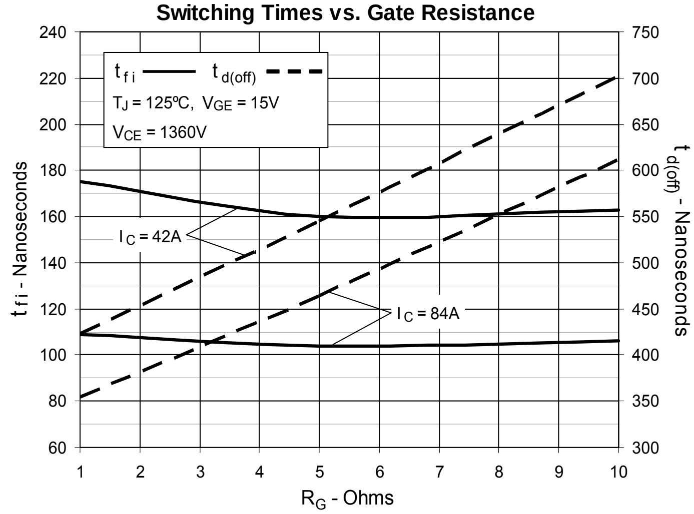


Fig. 17. Inductive Turn-off Switching Times vs. Collector Current

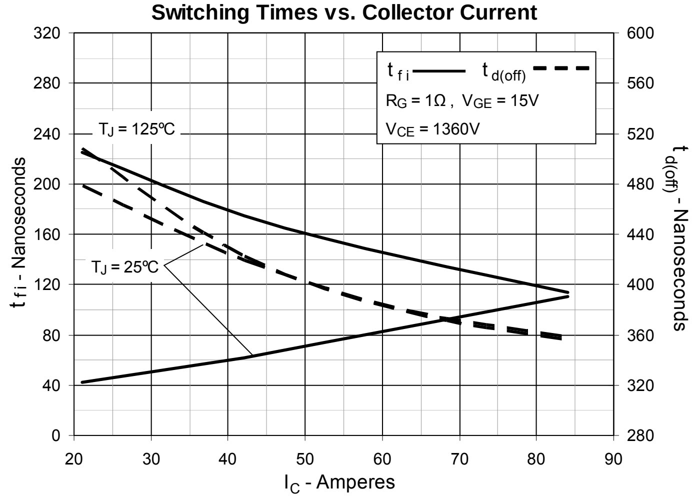


Fig. 18. Inductive Turn-off Switching Times vs. Junction Temperature

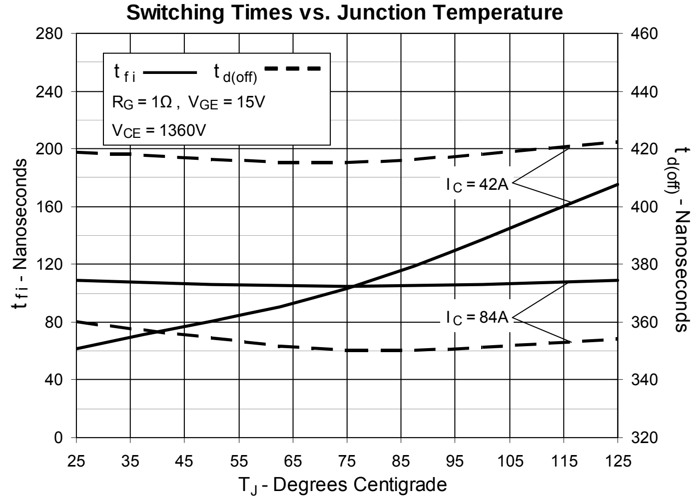


Fig. 19. Inductive Turn-on Switching Times vs. Gate Resistance

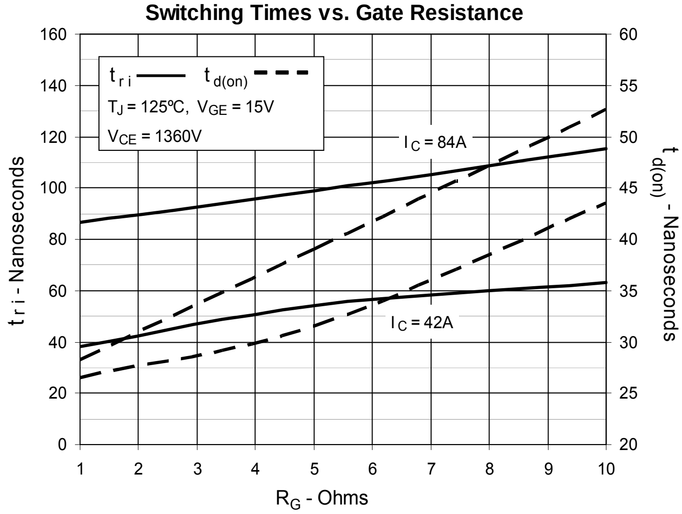


Fig. 20. Inductive Turn-on Switching Times vs. Collector Current

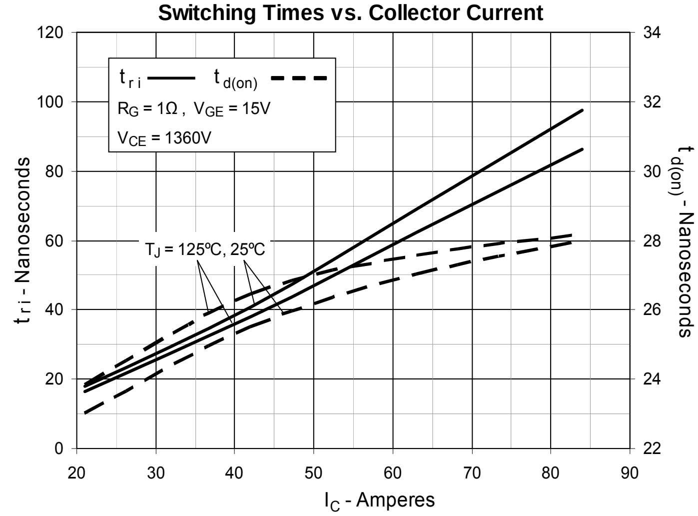


Fig. 21. Inductive Turn-on Switching Times vs. Junction Temperature