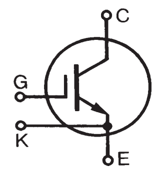
IXYS

GenX3™ 600V IGBT

IXGN200N60B3

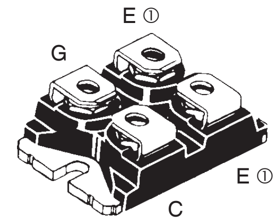
V_{CES} = 600V
I_{C110} = 200A
$V_{CE(sat)}$ ≤ 1.50V

Medium-Speed Low-Vsat PT IGBT for 5-40kHz Switching



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	600	V
V_{CGR}	T_J = 25°C to 150°C, R_{GE} = 1MΩ	600	V
V_{GES}	Continuous	±20	V
V_{GEM}	Transient	±30	V
I_{C25}	T_C = 25°C	300	A
I_{C110}	T_C = 110°C	200	A
I_{LRMS}	Terminal Current Limit	200	A
I_{CM}	T_C = 25°C, 1ms	1200	A
SSOA	V_{GE}= 15V, T_{VJ} = 125°C, R_G = 1Ω	I_{CM} = 300	A
(RBSOA)	Clamped Inductive Load	$V_{CE} \le V_{CES}$	
P_C	T_C = 25°C	830	W
T_J		- 55 ... +150	°C
T_{JM}		150	°C
T_{stg}		- 55 ... +150	°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.	
$V_{GE(th)}$	I_C = 250µA, V_{CE} = V_{GE}	3.0		5.0	V
I_{CES}	V_{CE} = V_{CES}, V_{GE} = 0V			50	µA
	T_J = 125°C			5	mA
I_{GES}	V_{CE} = 0V, V_{GE} = ±20V			±100	nA
$V_{CE(sat)}$	I_C = 100A, V_{GE} = 15V, Note 1		1.35	1.50	V
	I_C = 200A,		1.65		V
	T_J = 125°C		1.75		V

Features

- International Standard Package miniBLOC
- UL Recognized
- Aluminium Nitride Isolation
  - High Power Dissipation
- Isolation Voltage 3000 V~
- Very High Current IGBT
- Low $V_{CE(sat)}$ for Minimum on-state Conduction Losses
- MOS Gate Turn-On
  - Drive Simplicity
- Low Collector-to-Case Capacitance (< 50 pF)
- Low Package Inductance (< 5 nH)
  - Easy to Drive and to Protect

Advantages

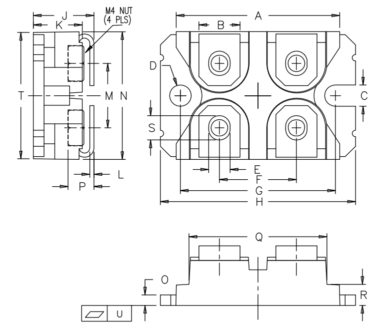
- High Power Density
- Low Gate Drive Requirement

Applications

- Switch-Mode and Resonant-Mode Power Supplies
- Uninterruptible Power Supplies (UPS)
- DC Choppers
- AC Motor Speed Drives
- DC Servo and Robot Drives

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	I_C = 60A, V_{CE} = 10 V, Note 1	95	160		S
C_{ies}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		26		nF
C_{oes}			1260		pF
C_{res}			97		pF
$Q_{g(on)}$	I_C = 100V, V_{GE} = 15 V, V_{CE} = 0.5 • V_{CES}		750		nC
Q_{ge}			115		nC
Q_{gc}			245		nC
$t_{d(on)}$	**Inductive load, T_J = 25°C**		44		ns
t_{ri}	I_C = 100A, V_{GE} = 15V		83		ns
E_{on}	V_{CE} = 300V, R_G = 1Ω		1.6		mJ
$t_{d(off)}$			310	450	ns
t_{fi}			183	300	ns
E_{off}			2.9	4.5	mJ
$t_{d(on)}$	**Inductive load, T_J = 125°C**		42		ns
t_{ri}	I_C = 100A, V_{GE} = 15V		80		ns
E_{on}	V_{CE} = 300V, R_G = 1Ω		2.4		mJ
$t_{d(off)}$			430		ns
t_{fi}			300		ns
E_{off}			4.2		mJ
R_{thJC}				0.15	°C/W
R_{thCK}			0.05		°C/W

SOT-227B miniBLOC



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

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

Fig. 1. Output Characteristics @ T_J = 25ºC

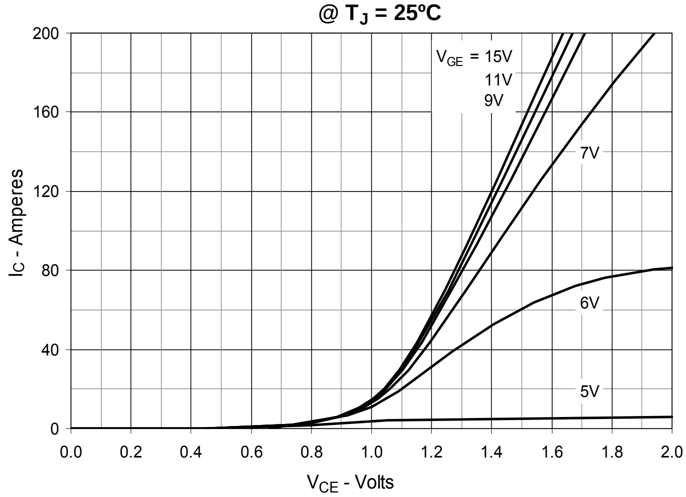


Fig. 2. Extended Output Characteristics @ T_J = 25ºC

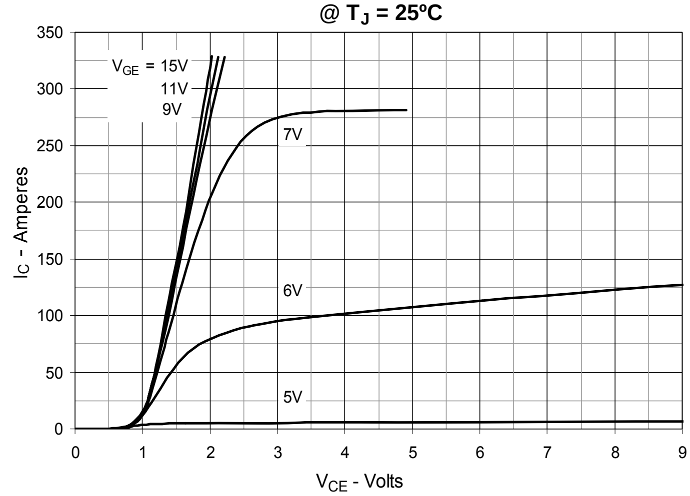


Fig. 3. Output Characteristics @ T_J =125ºC

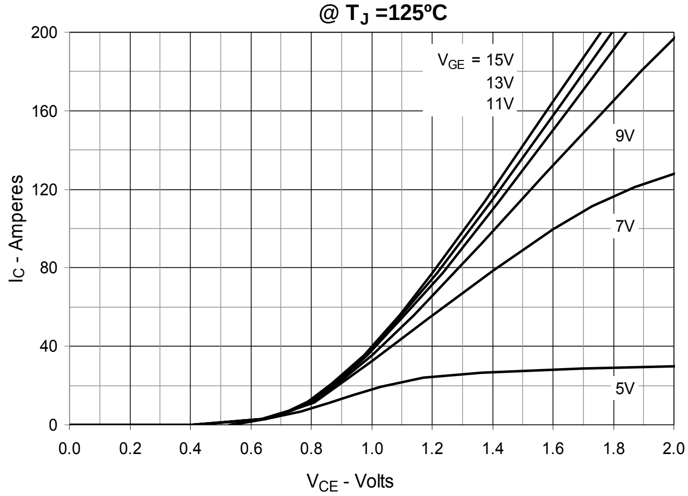


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

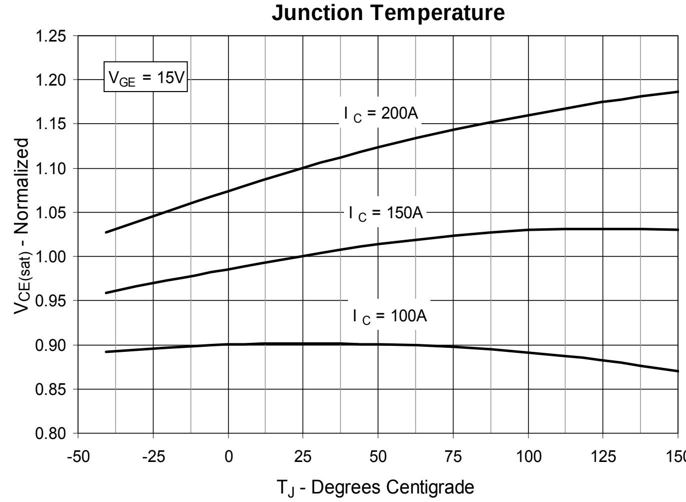


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

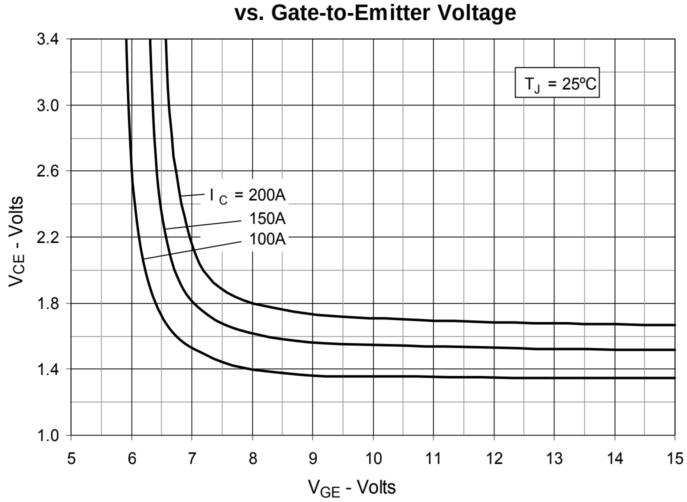
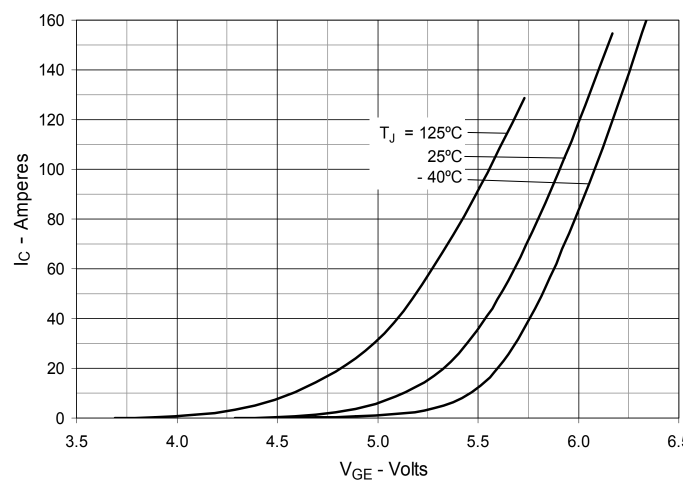


Fig. 6. Input Admittance



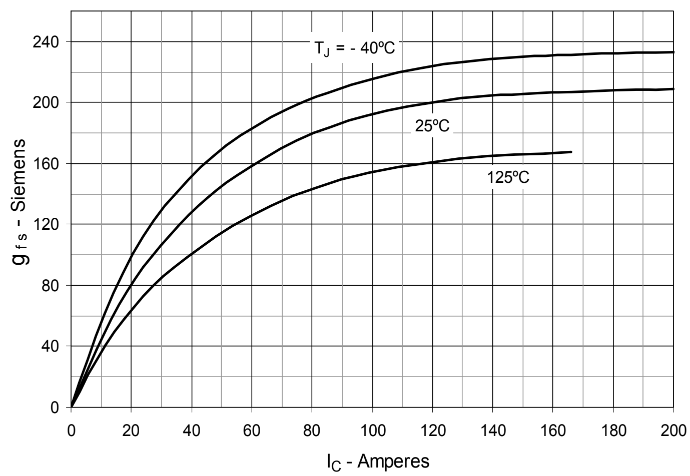


Fig. 7. Transconductance

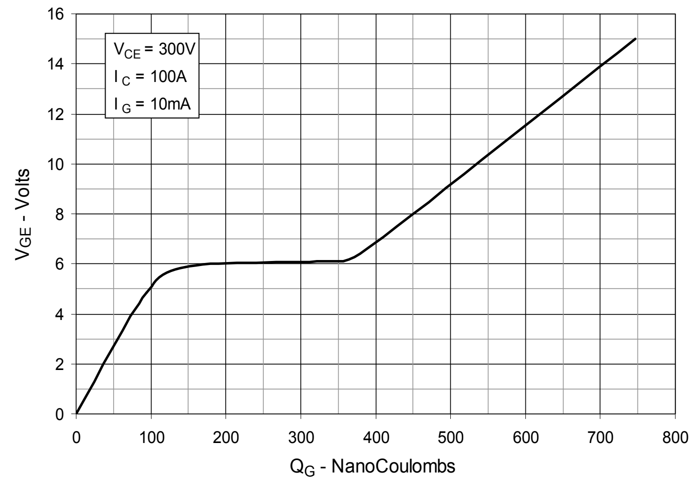


Fig. 8. Gate Charge

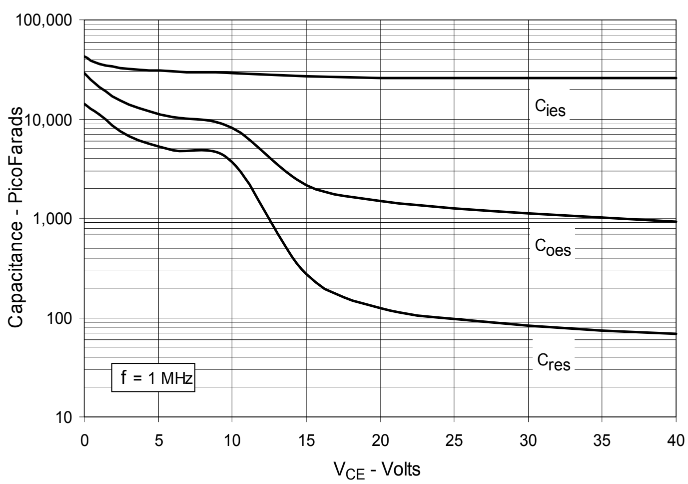


Fig. 9. Capacitance

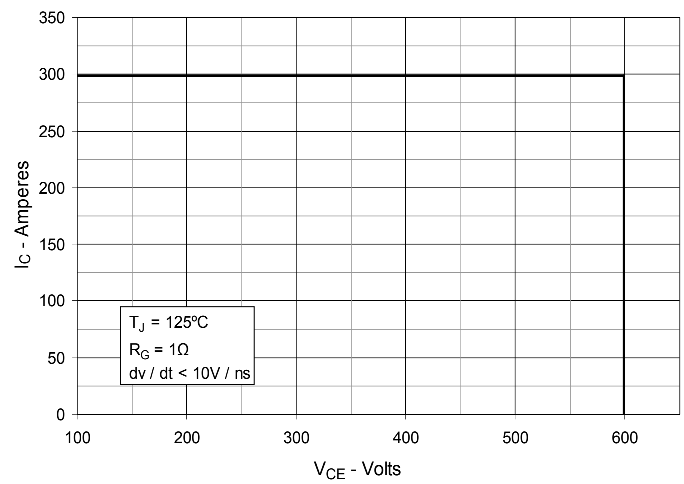


Fig. 10. Reverse-Bias Safe Operating Area

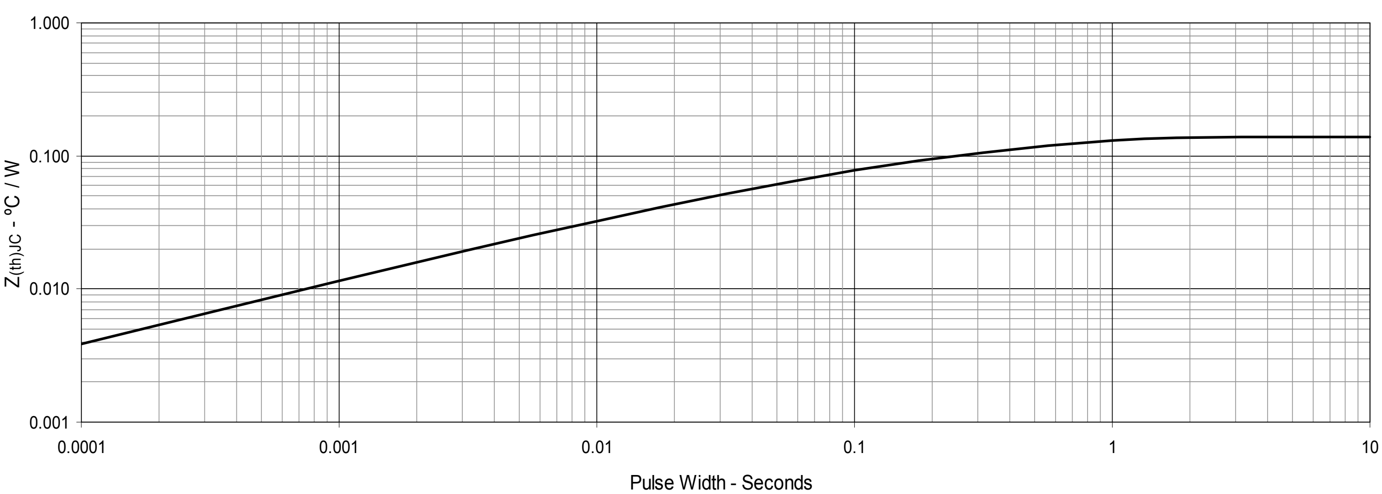


Fig. 11. Maximum Transient Thermal Impedance

Fig. 12. Inductive Switching Energy Loss vs. Gate Resistance

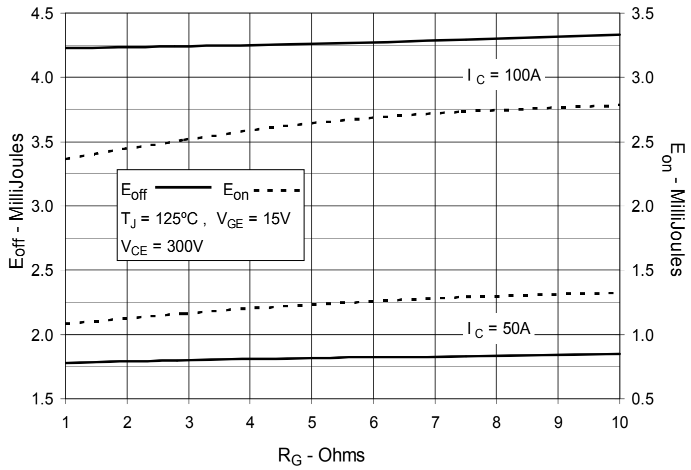


Fig. 13. Inductive Switching Energy Loss vs. Collector Current

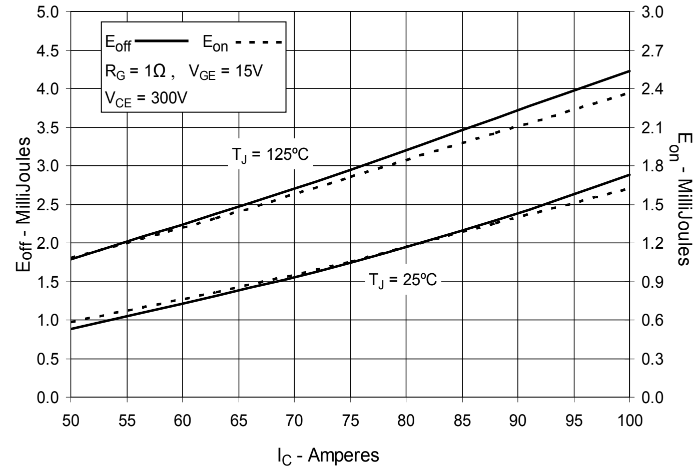


Fig. 14. Inductive Switching Energy Loss vs. Junction Temperature

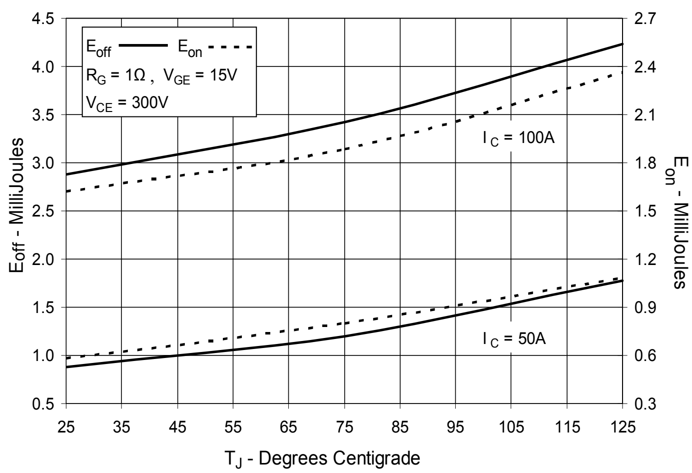


Fig. 15. Inductive Turn-off Switching Times vs. Gate Resistance

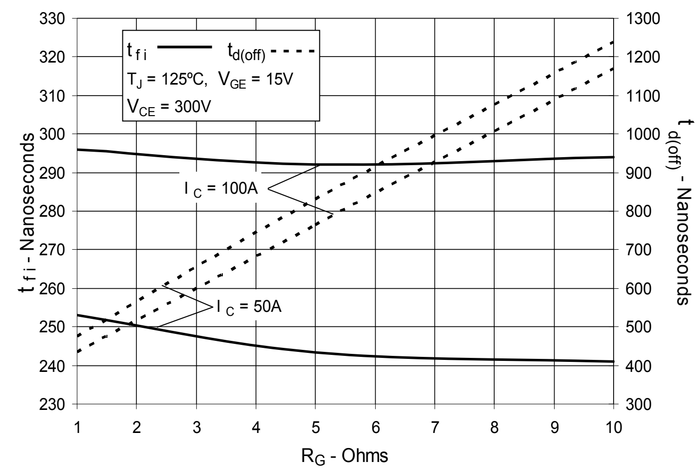


Fig. 16. Inductive Turn-off Switching Times vs. Collector Current

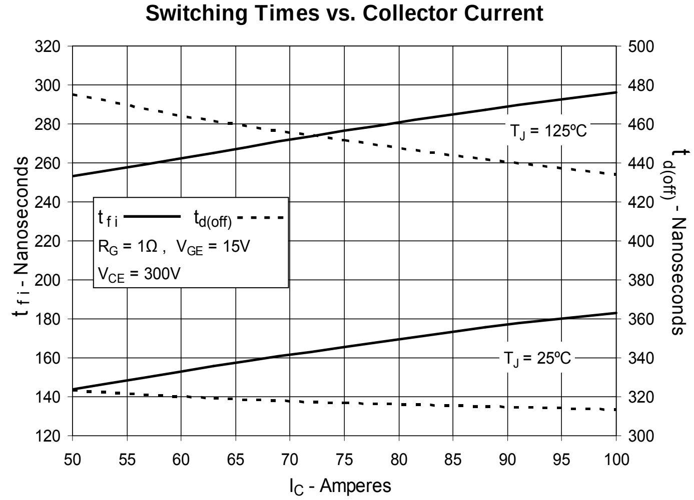


Fig. 17. Inductive Turn-off Switching Times vs. Junction Temperature

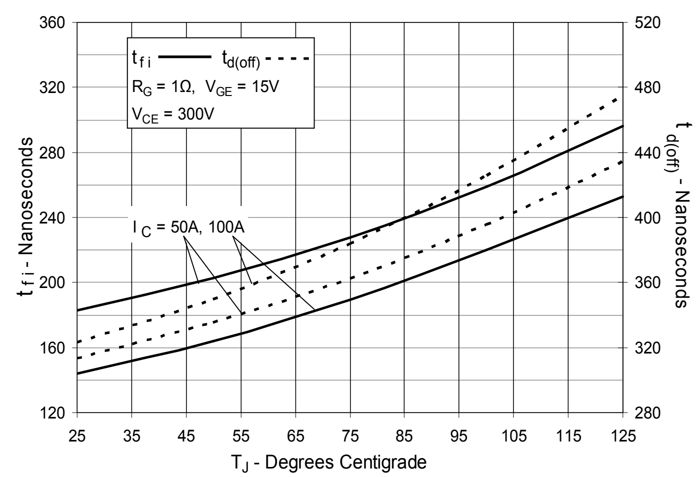


Fig. 18. Inductive Turn-on Switching Times vs. Gate Resistance

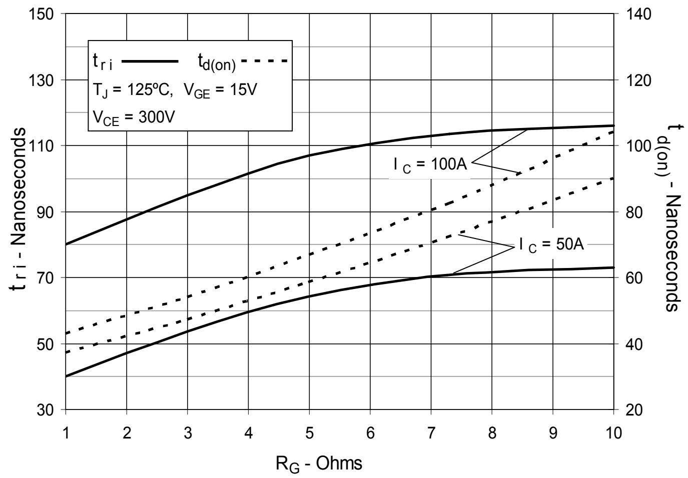


Fig. 19. Inductive Turn-on Switching Times vs. Collector Current

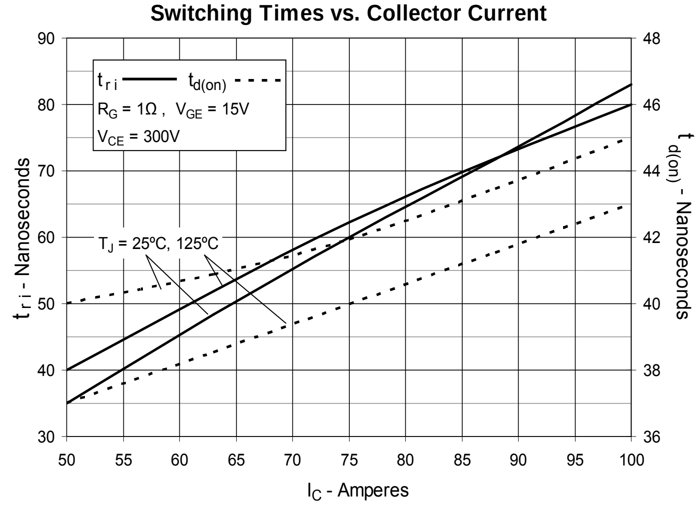


Fig. 20. Inductive Turn-on Switching Times vs. Junction Temperature