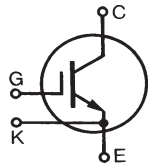
IXYS

GenX3™ 600V IGBT

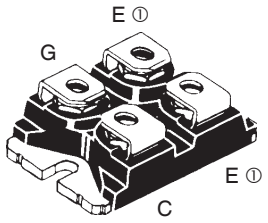
IXGN200N60B3

V_{CES} = 600V
I_{C110} = 200A
$V_{CE(sat)} \leq$ 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		$V_{CE} \leq V_{CES}$	
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~
	$I_{ISOL} \leq$ 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

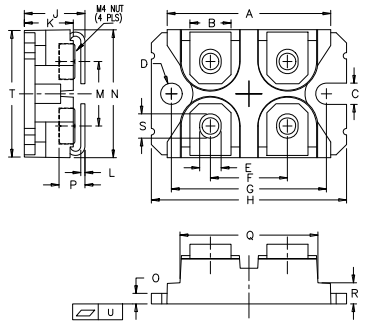
Applications

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

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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** I_C = 100A, V_{GE} = 15V V_{CE} = 300V, R_G = 1Ω		44		ns
t_{ri}			83		ns
E_{on}			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** I_C = 100A, V_{GE} = 15V V_{CE} = 300V, R_G = 1Ω		42		ns
t_{ri}			80		ns
E_{on}			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%.

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IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents: 4,835,592 4,850,072 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

Fig. 1. Output Characteristics @ T_J = 25ºC

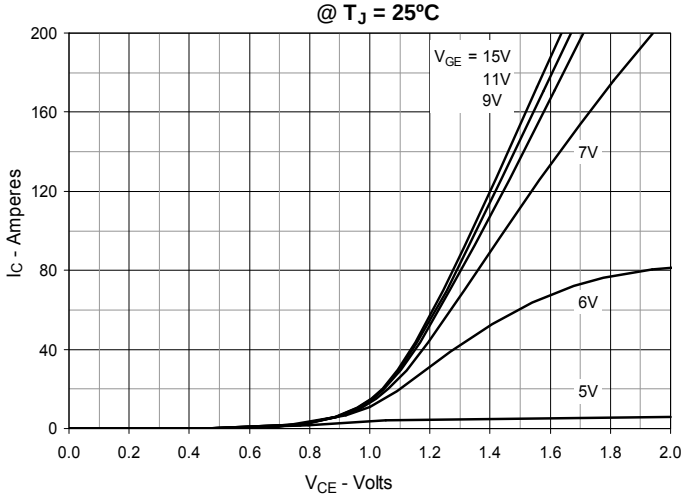


Fig. 2. Extended Output Characteristics @ T_J = 25ºC

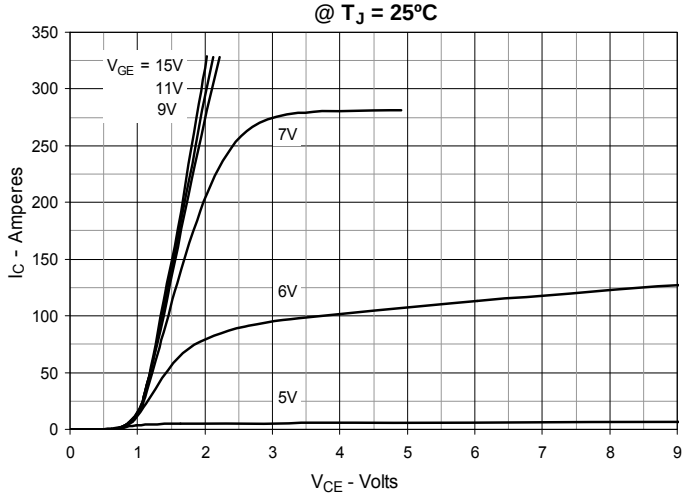


Fig. 3. Output Characteristics @ T_J =125ºC

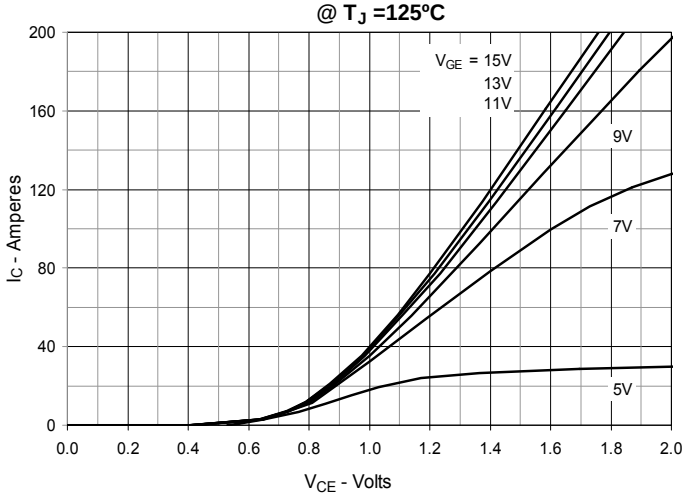


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

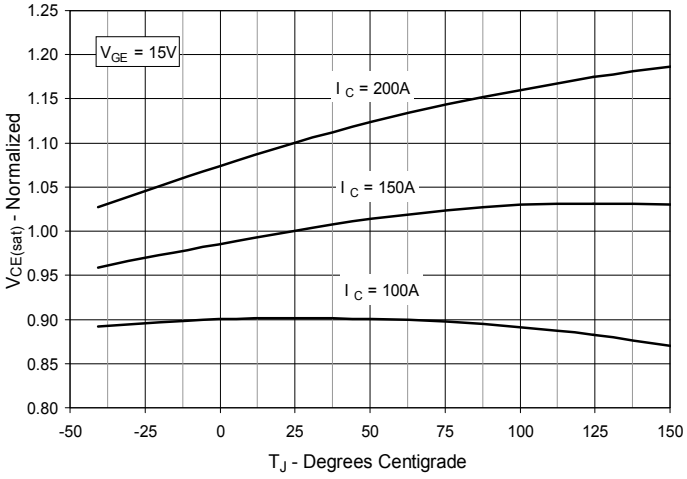


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

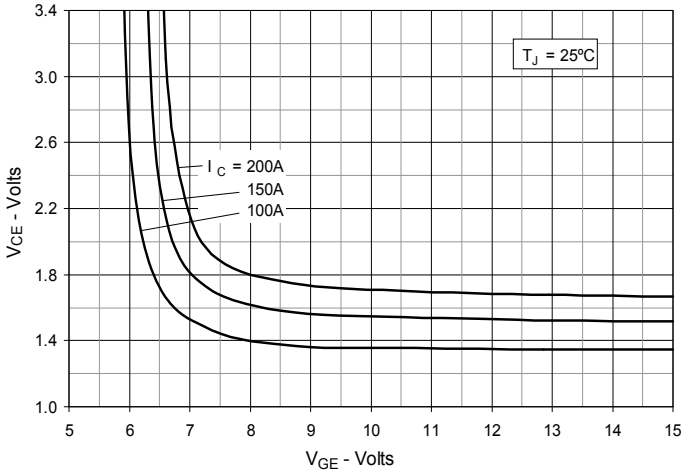
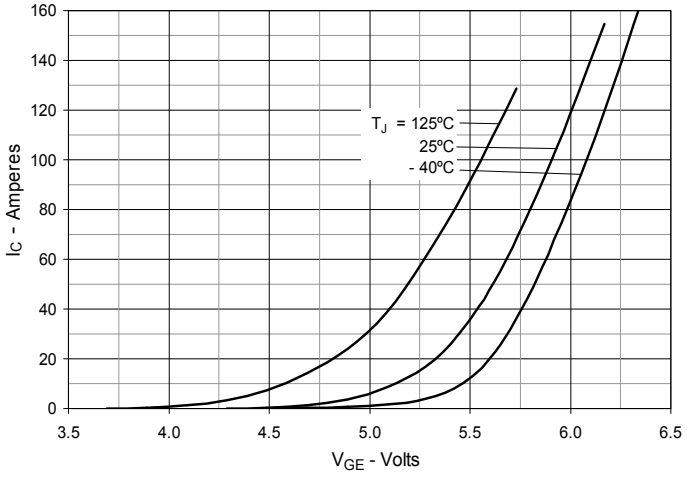


Fig. 6. Input Admittance



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Fig. 7. Transconductance

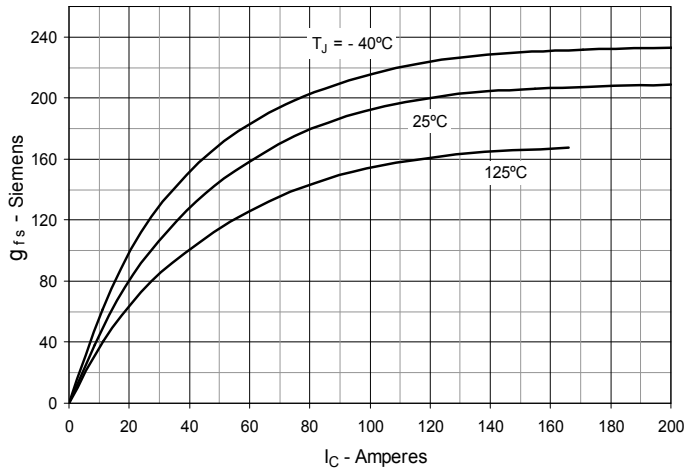


Fig. 8. Gate Charge

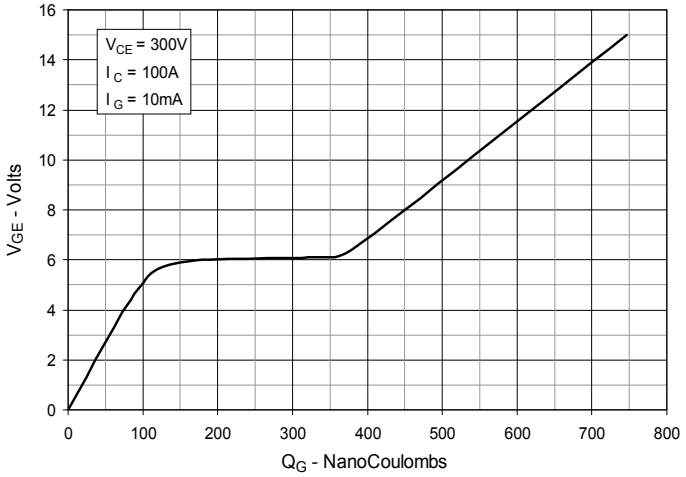


Fig. 9. Capacitance

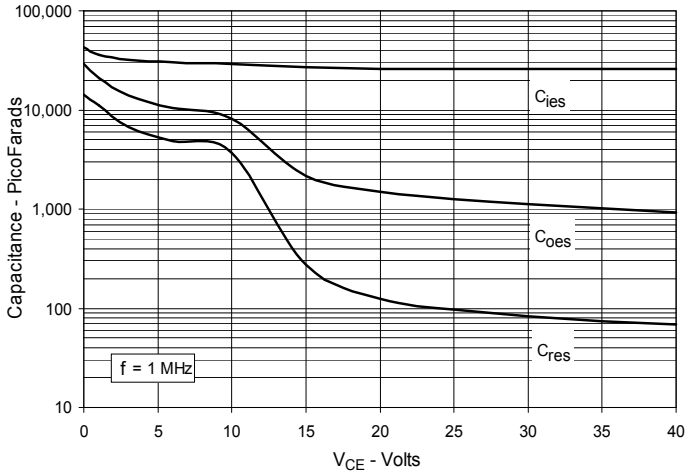


Fig. 10. Reverse-Bias Safe Operating Area

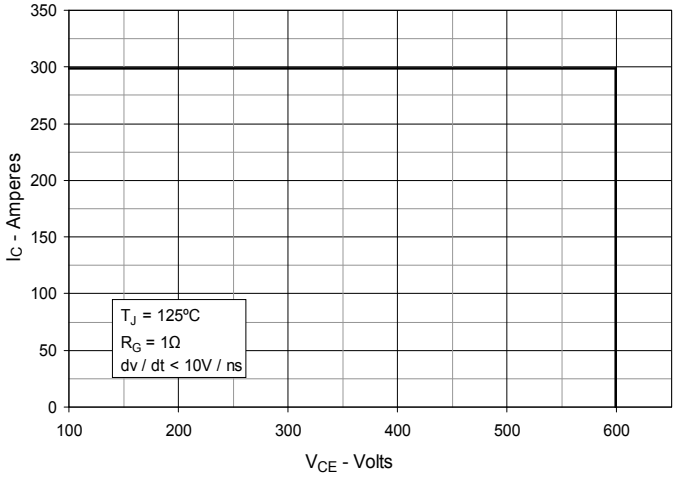
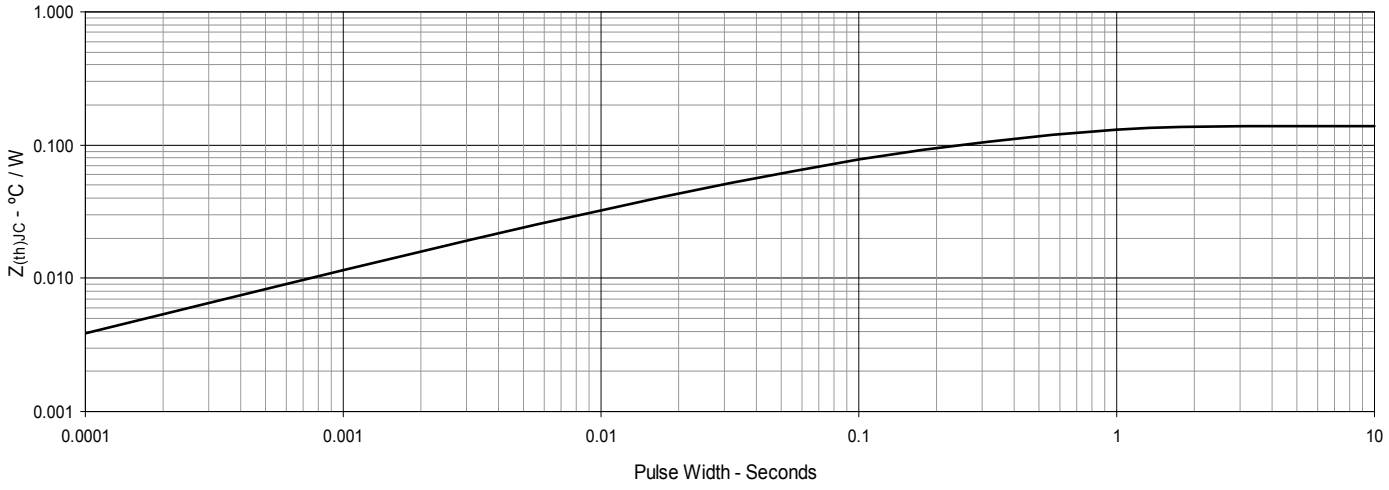


Fig. 11. Maximum Transient Thermal Impedance



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

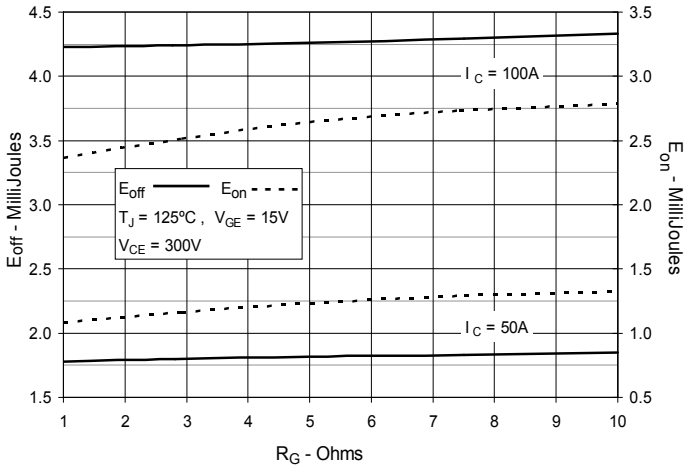


Fig. 13. Inductive Switching Energy Loss vs. Collector Current

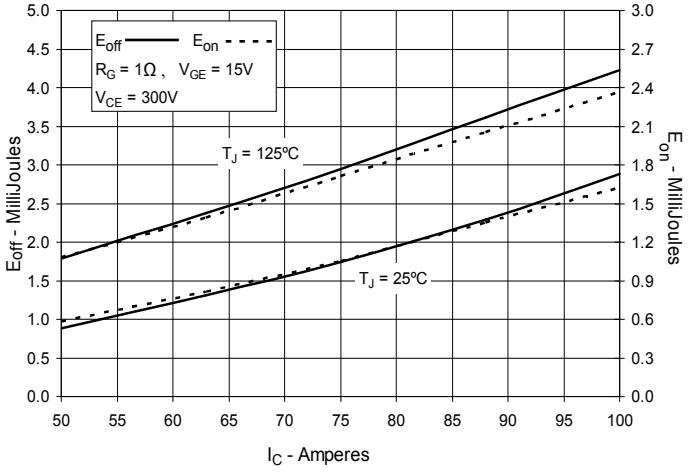


Fig. 14. Inductive Switching Energy Loss vs. Junction Temperature

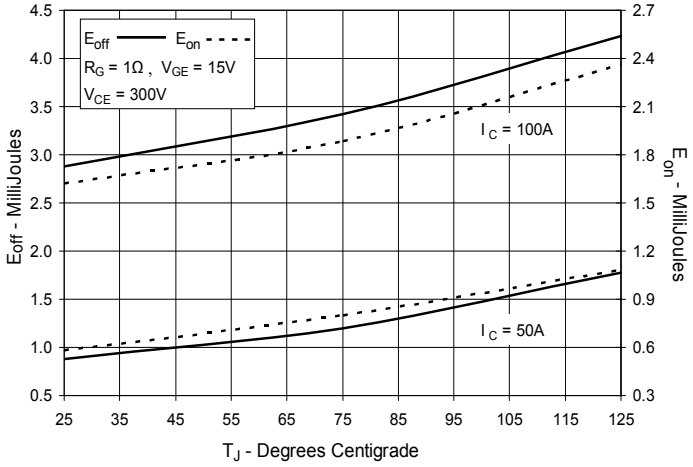


Fig. 15. Inductive Turn-off Switching Times vs. Gate Resistance

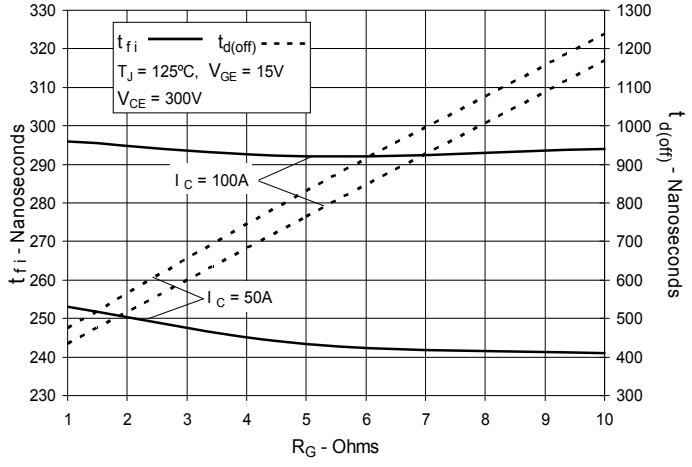


Fig. 16. Inductive Turn-off Switching Times vs. Collector Current

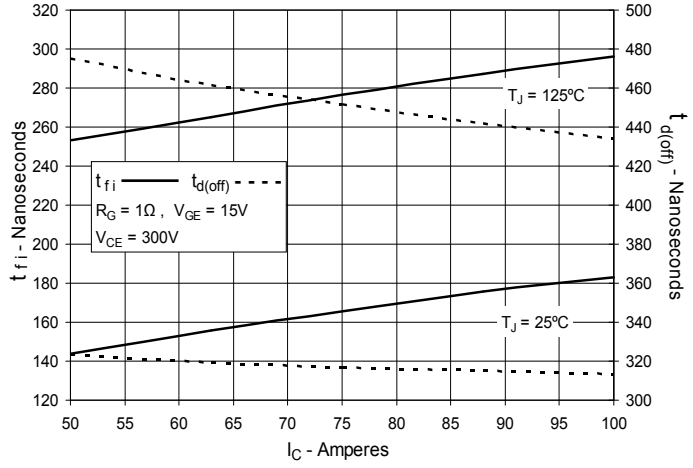
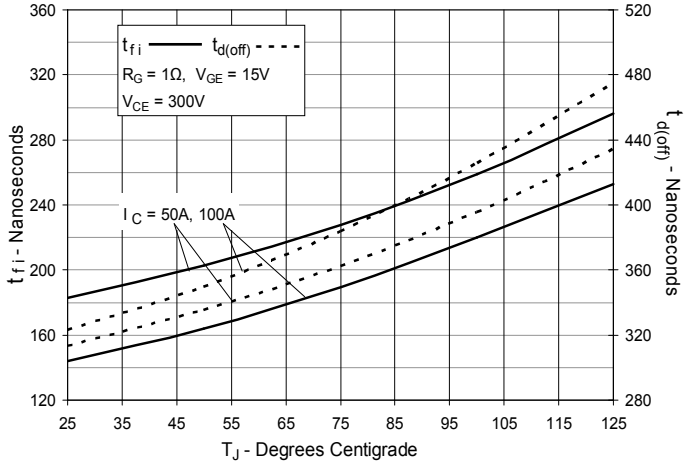


Fig. 17. Inductive Turn-off Switching Times vs. Junction Temperature



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

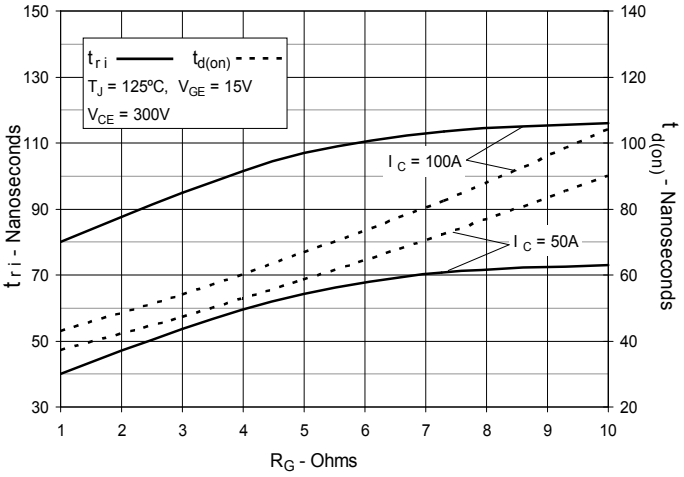


Fig. 19. Inductive Turn-on Switching Times vs. Collector Current

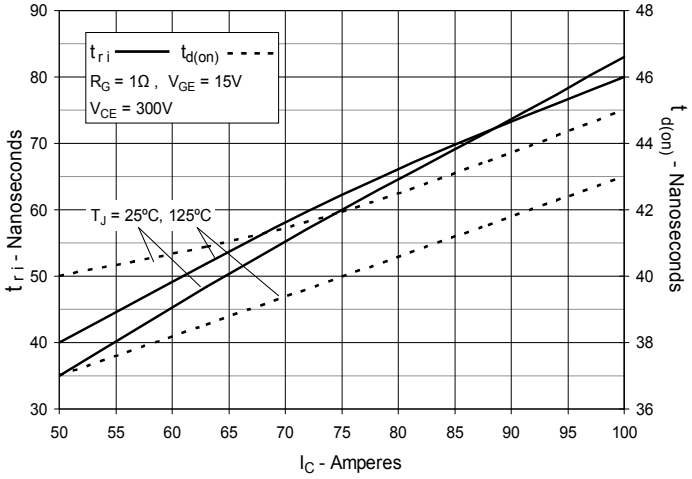
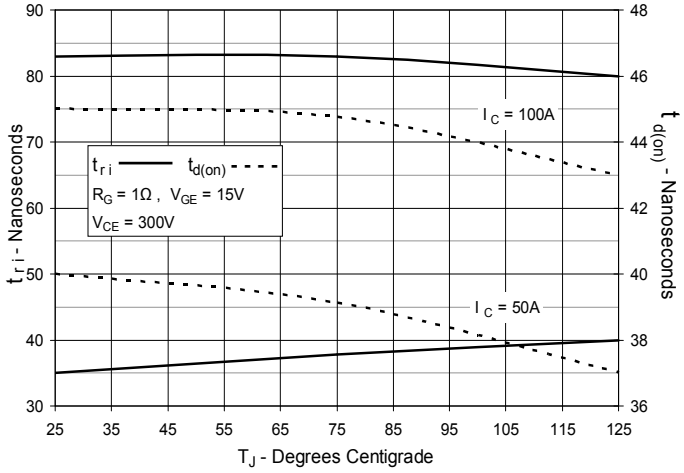


Fig. 20. Inductive Turn-on Switching Times vs. Junction Temperature



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