IXYS

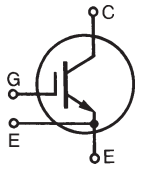
Preliminary Technical Information

650V XPT™ IGBT GenX3™

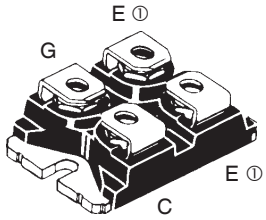
IXYN100N65A3

V_{CES} = 650V
I_{C110} = 100A
$V_{CE(sat)}$ ≤ 1.80V
$t_{fi(typ)}$ = 122ns

Ultra Low-Vsat PT IGBT
for up to 5kHz Switching



SOT-227B, miniBLOC
E153432



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

Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_J = 25°C to 175°C	650	V
V_{CGR}	T_J = 25°C to 175°C, R_{GE} = 1MΩ	650	V
V_{GES}	Continuous	±20	V
V_{GEM}	Transient	±30	V
I_{C25}	T_C = 25°C	170	A
I_{C110}	T_C = 110°C	100	A
I_{CM}	T_C = 25°C, 1ms	460	A
I_A	T_C = 25°C	50	A
E_{AS}	T_C = 25°C	600	mJ
SSOA (RBSOA)	V_{GE} = 15V, T_{VJ} = 150°C, R_G = 2Ω Clamped Inductive Load	I_{CM} = 200 $V_{CE} \leq V_{CES}$	A
t_{sc} (SCSOA)	V_{GE} = 15V, V_{CE} = 360V, T_J = 150°C R_G = 82Ω, Non Repetitive	8	µs
P_C	T_C = 25°C	600	W
T_J		-55 ... +175	°C
T_{JM}		175	°C
T_{stg}		-55 ... +175	°C
V_{ISOL}	50/60Hz t = 1min $I_{ISOL} \leq$ 1mA t = 1s	2500 3000	V~ V~
M_d	Mounting Torque Terminal Connection Torque	1.5/13 1.3/11.5	Nm/lb.in 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	650			V
$V_{GE(th)}$	I_C = 250µA, V_{CE} = V_{GE}	3.5		6.0	V
I_{CES}	V_{CE} = V_{CES}, V_{GE} = 0V			25	µA
	T_J = 150°C			500	µA
I_{GES}	V_{CE} = 0V, V_{GE} = ±20V			±200	nA
$V_{CE(sat)}$	I_C = 70A, V_{GE} = 15V, Note 1		1.44	1.80	V
	T_J = 150°C		1.62		V

Features

- Optimized for Low Conduction Losses
- miniBLOC, with Aluminium Nitride Isolation
- International Standard Package
- Isolation Voltage 2500V~
- Optimized for up to 5kHz Switching
- Square RBSOA
- Avalanche Rated
- Short Circuit Capability
- High Current Handling Capability

Advantages

- High Power Density
- Low Gate Drive Requirement

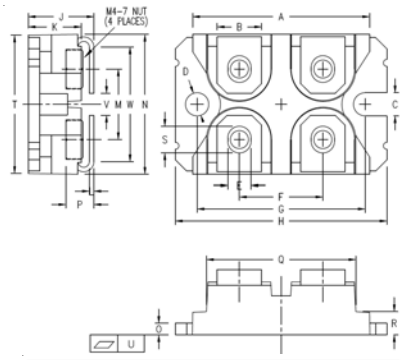
Applications

- UPS
- Motor Drives
- SMPS
- Battery Chargers
- Low Frequency Power Inverters

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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} = 10V, Note 1	32	52	S
C_{ies}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz		4920	pF
C_{oes}			290	pF
C_{res}			100	pF
$Q_{g(on)}$	I_C = 70A, V_{GE} = 15V, V_{CE} = 0.5 • V_{CES}		166	nC
Q_{ge}			35	nC
Q_{gc}			73	nC
$t_{d(on)}$	**Inductive load, T_J = 25°C**		30	ns
t_{ri}	I_C = 50A, V_{GE} = 15V		39	ns
E_{on}	V_{CE} = 400V, R_G = 2Ω		2.0	mJ
$t_{d(off)}$	Note 2		155	ns
t_{fi}			122	ns
E_{off}			1.6	mJ
$t_{d(on)}$	**Inductive load, T_J = 150°C**		28	ns
t_{ri}	I_C = 50A, V_{GE} = 15V		40	ns
E_{on}	V_{CE} = 400V, R_G = 2Ω		2.6	mJ
$t_{d(off)}$	Note 2		200	ns
t_{fi}			160	ns
E_{off}			2.4	mJ
R_{thJC}				0.25 °C/W
R_{thCS}			0.05	°C/W

SOT-227B miniBLOC (IXYN)



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	1.489	1.505	37.80	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
V	.130	.180	3.30	4.57
W	.780	.830	19.81	21.08

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.

PRELIMANARY 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.

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

IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents: 4,835,592 4,860,072 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

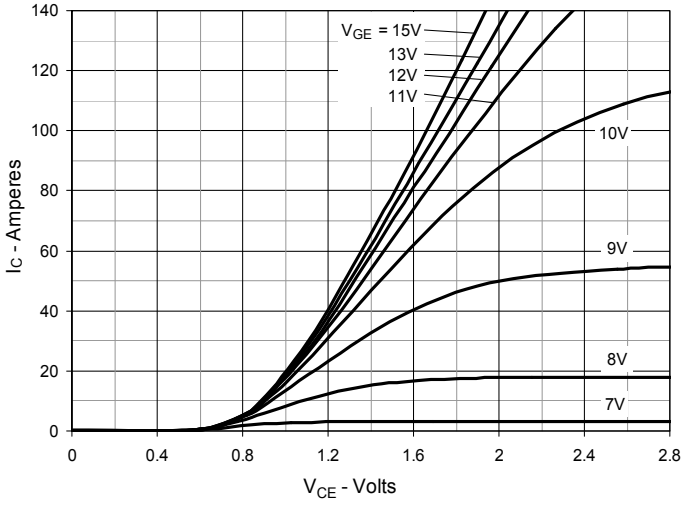


Fig. 2. Extended Output Characteristics @ T_J = 25ºC

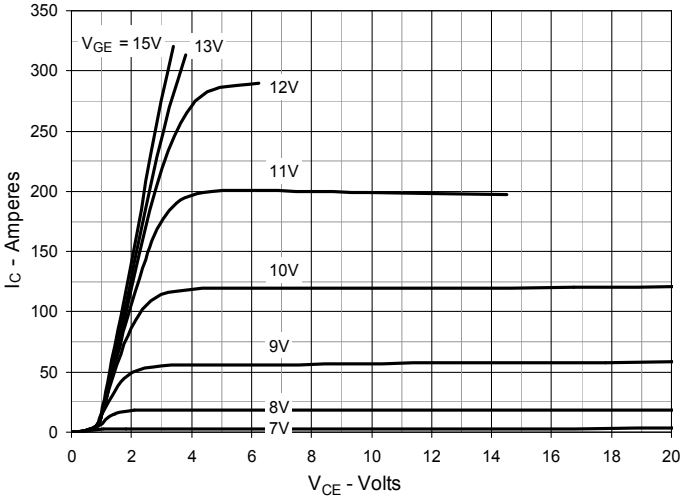


Fig. 3. Output Characteristics @ T_J = 150ºC

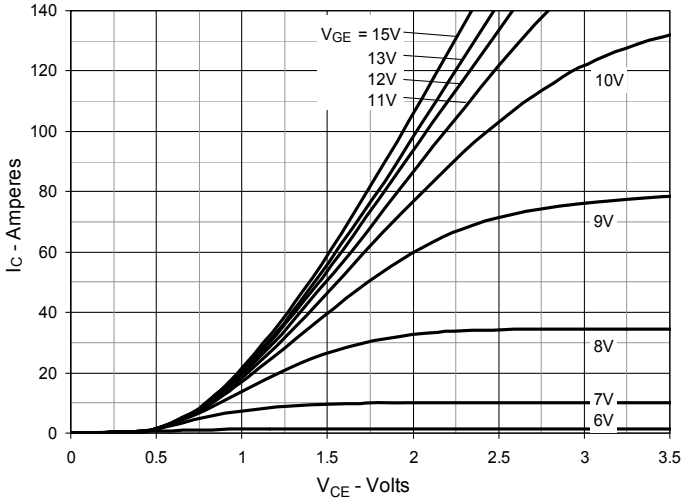


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

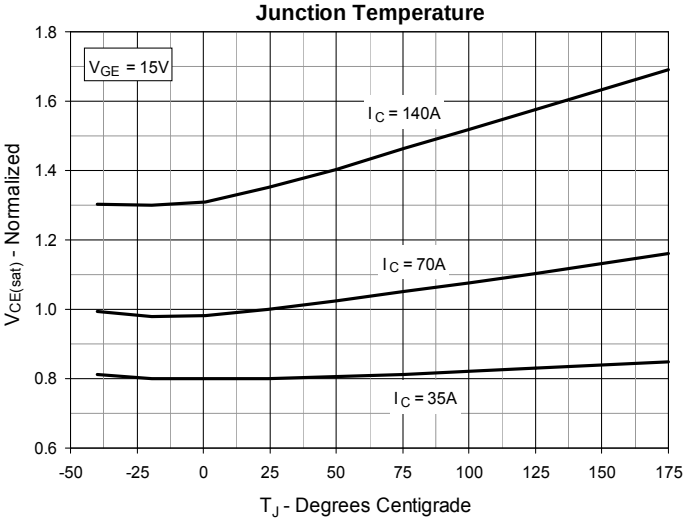


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

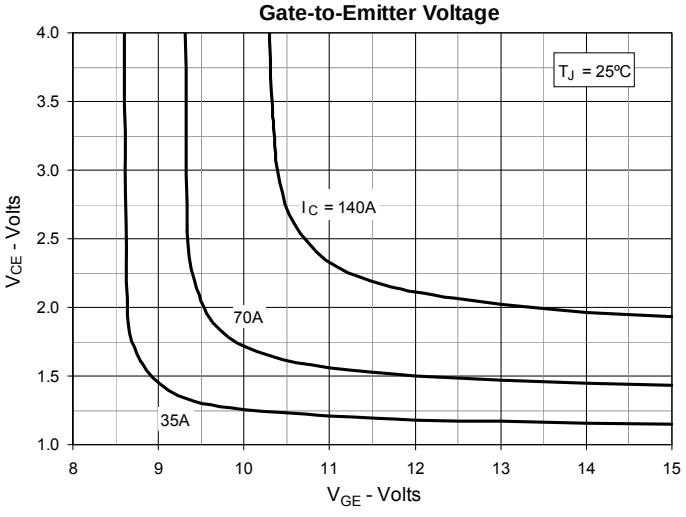
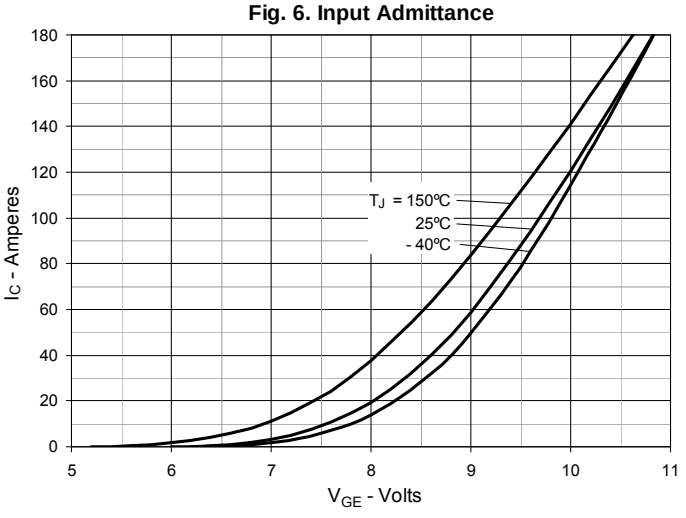


Fig. 6. Input Admittance



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Fig. 7. Transconductance

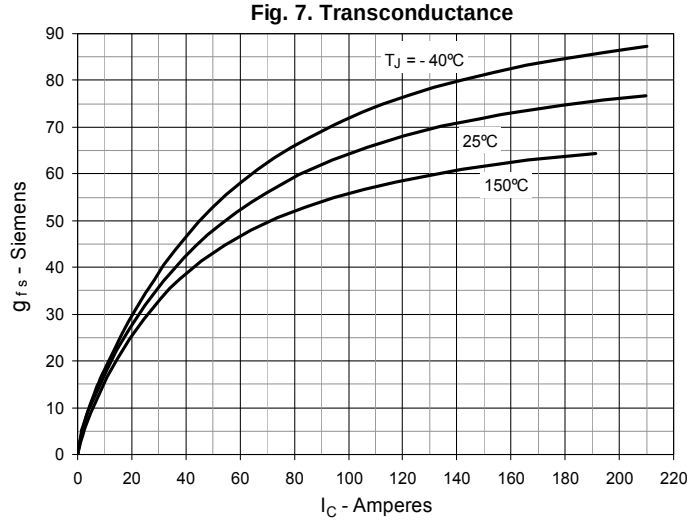


Fig. 8. Gate Charge

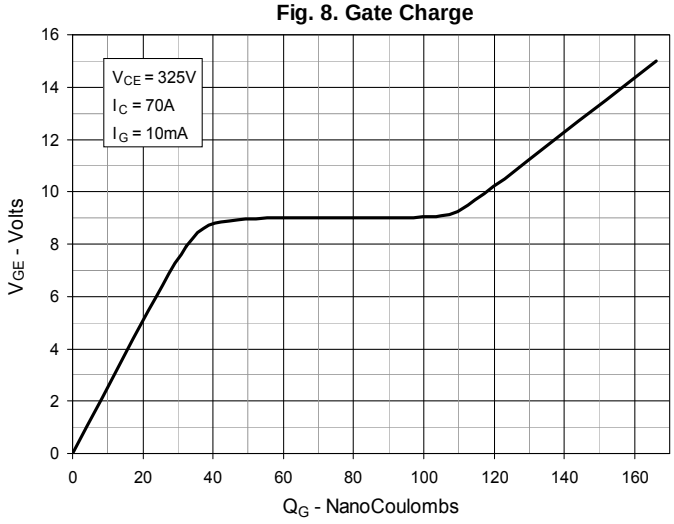


Fig. 9. Capacitance

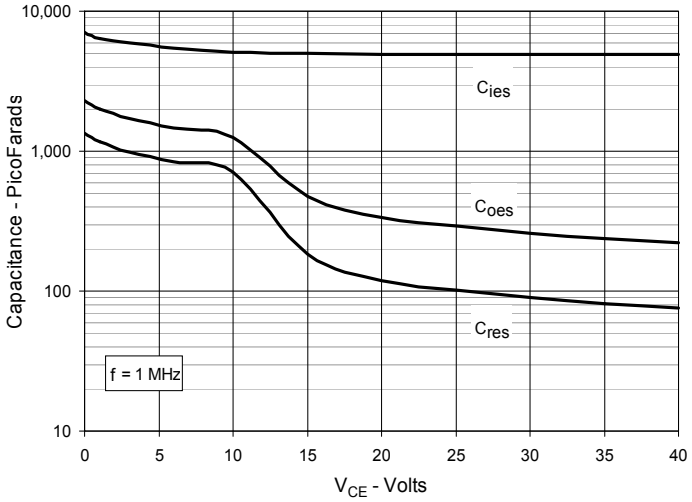


Fig. 10. Reverse-Bias Safe Operating Area

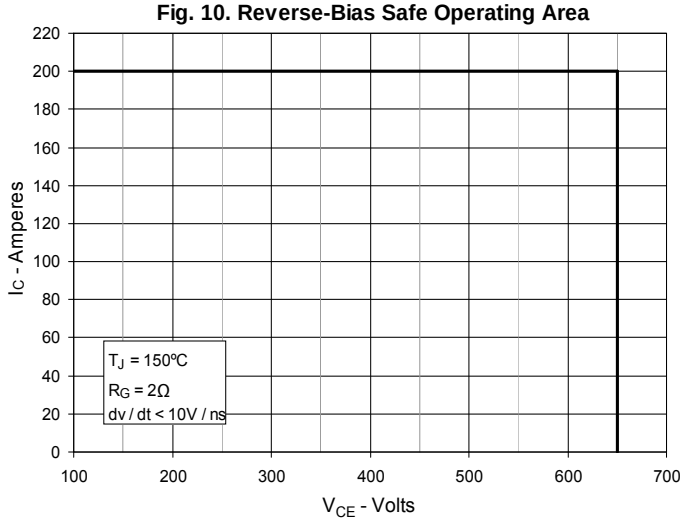


Fig. 11. Forward-Bias Safe Operating Area

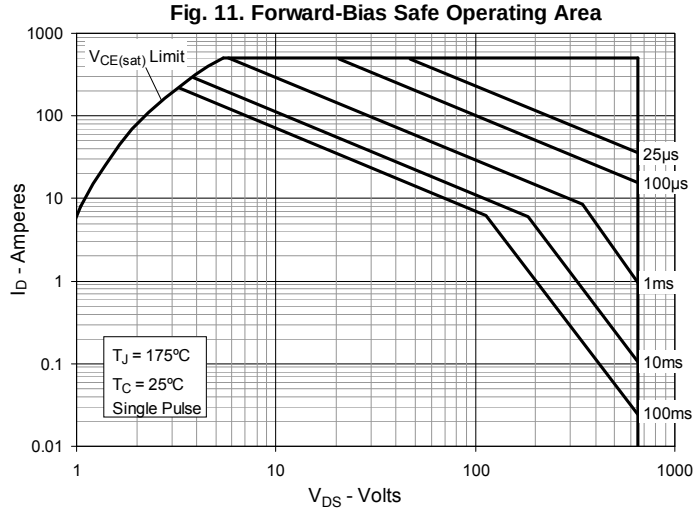
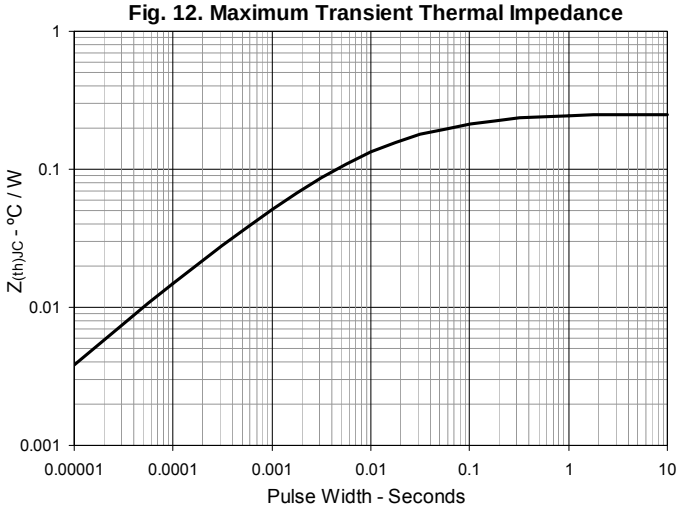


Fig. 12. Maximum Transient Thermal Impedance



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Fig. 13. Inductive Switching Energy Loss vs. Gate Resistance

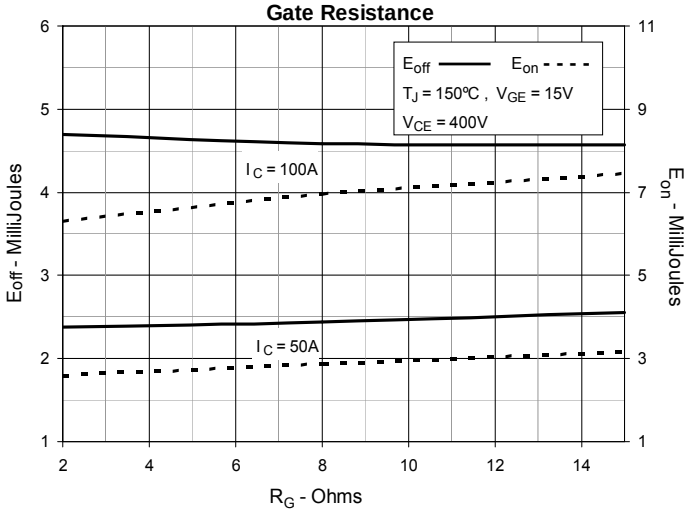


Fig. 14. Inductive Switching Energy Loss vs. Collector Current

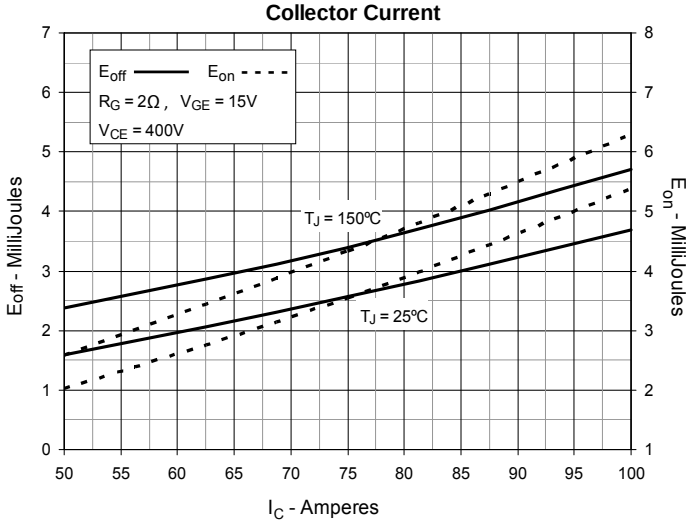


Fig. 15. Inductive Switching Energy Loss vs. Junction Temperature

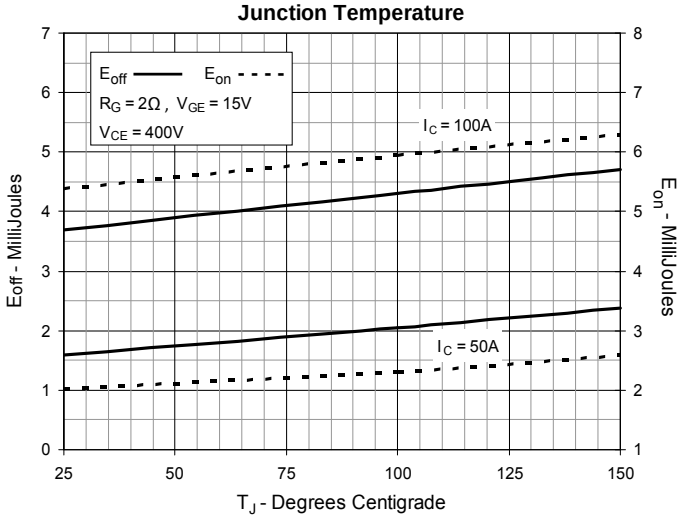


Fig. 16. Inductive Turn-off Switching Times vs. Gate Resistance

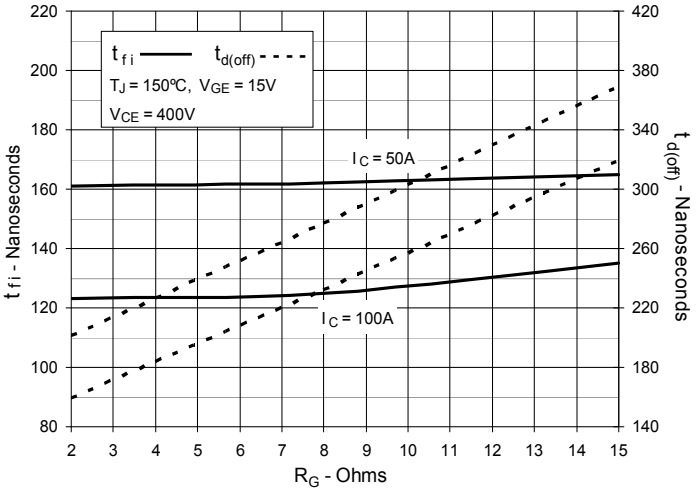


Fig. 17. Inductive Turn-off Switching Times vs. Collector Current

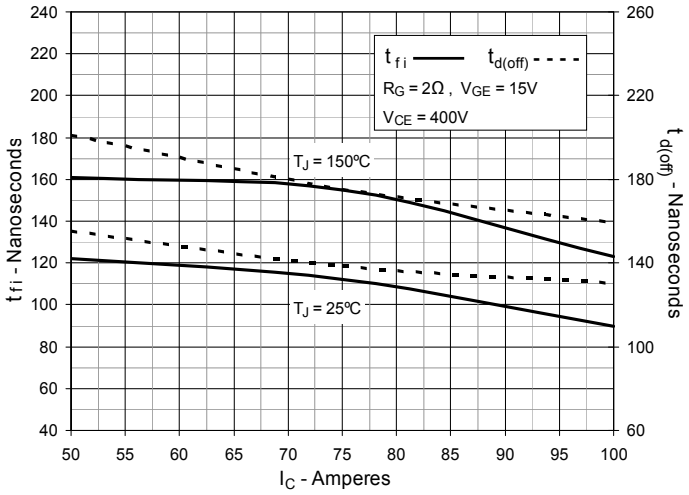
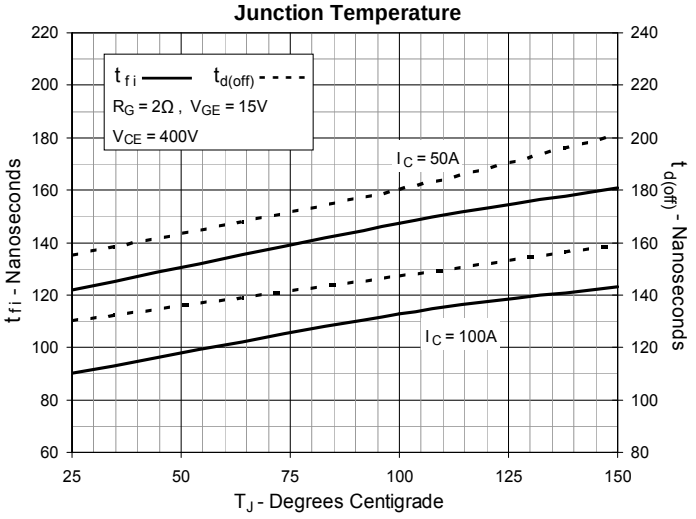


Fig. 18. Inductive Turn-off Switching Times vs. Junction Temperature



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

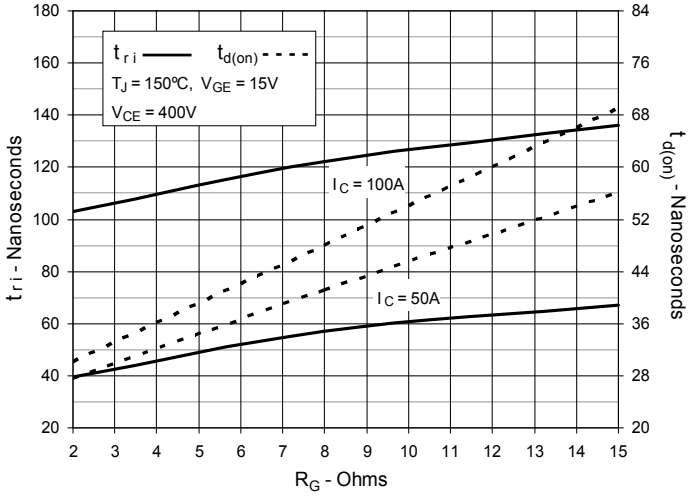


Fig. 20. Inductive Turn-on Switching Times vs. Collector Current

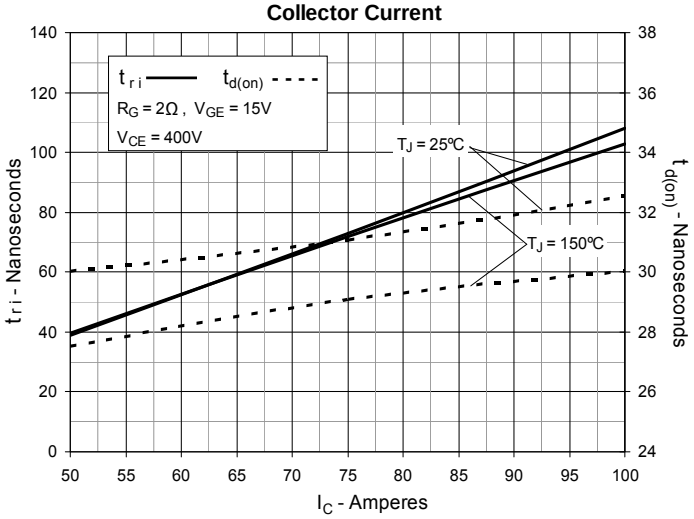
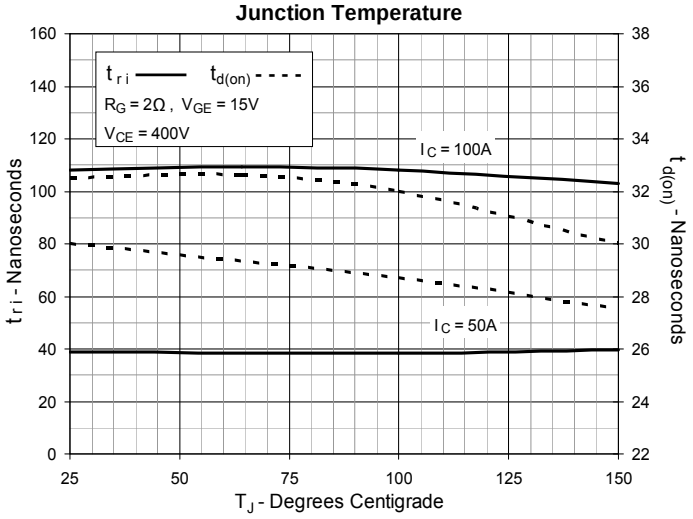


Fig. 21. Inductive Turn-on Switching Times vs. Junction Temperature





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