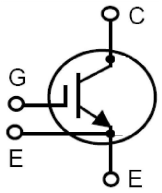
1200V XPT™ Gen 4 IGBT

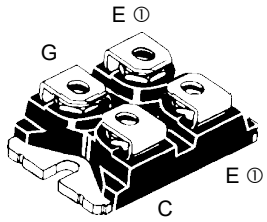
IXYN110N120C4

V_{CES} = 1200V
I_{C110} = 110A
$V_{CE(sat)}$ ≤ 2.40V
$t_{fi(typ)}$ = 37ns

High Speed IGBT for
20-50kHz Switching



SOT-227, 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 175°C		1200	V
V_{CGR}	T_J = 25°C to 175°C, R_{GE} = 1MΩ		1200	V
V_{GES}	Continuous		±20	V
V_{GEM}	Transient		±30	V
I_{C25}	T_C= 25°C (Chip Capability)		220	A
I_{LRMS}	Terminal Current Limit		200	A
I_{C110}	T_C= 110°C		110	A
I_{CM}	T_C = 25°C, 1ms		760	A
SSOA (RBSOA)	V_{GE} = 15V, T_{VJ} = 150°C, R_G = 2Ω Clamped Inductive Load		I_{CM} = 220 0.8 • V_{CES}	A V
P_C	T_C = 25°C		830	W
T_J			-55 ... +175	°C
T_{JM}			175	°C
T_{stg}			-55 ... +175	°C
V_{ISOL}	50/60Hz I_{ISOL} ≤ 1mA	t = 1min 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	1200			V
$V_{GE(th)}$	I_C = 3mA, V_{CE} = V_{GE}	4.5		6.5	V
I_{CES}	V_{CE} = V_{CES}, V_{GE} = 0V			50	μA
	T_J = 150°C			1.5	mA
I_{GES}	V_{CE} = 0V, V_{GE} = ±20V			±100	nA
$V_{CE(sat)}$	I_C = I_{C110}, V_{GE} = 15V, Note 1		1.90	2.40	V
	T_J = 150°C		2.27		V

Features

- International Standard Package
- miniBLOC, with Aluminium Nitride Isolation
- 2500V~ Isolation Voltage
- High Current Handling Capability
- Optimized for 20-50kHZ Switching
- Positive Thermal Coefficient of Vce(sat)

Advantages

- High Power Density
- Low Gate Drive Requirement

Applications

- Power Inverters
- UPS
- Motor Drives
- SMPS
- PFC Circuits
- Battery Chargers
- Welding Machines
- Lamp Ballasts

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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	40	68	S
C_{ies}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz		5420	pF
C_{oes}			335	pF
C_{res}			220	pF
$Q_{g(on)}$	$I_C = I_{C110}$, V_{GE} = 15V, $V_{CE} = 0.5 \bullet V_{CES}$		330	nC
Q_{ge}			55	nC
Q_{gc}			138	nC
$t_{d(on)}$	**Inductive load, T_J = 25°C**		40	ns
t_{ri}	I_C = 50A, V_{GE} = 15V		48	ns
E_{on}	$V_{CE} = 0.5 \bullet V_{CES}$, $R_G = 2\Omega$		3.6	mJ
$t_{d(off)}$	Note 2		320	ns
t_{fi}			37	ns
E_{off}			1.9	mJ
$t_{d(on)}$	**Inductive load, T_J = 150°C**		36	ns
t_{ri}	I_C = 50A, V_{GE} = 15V		37	ns
E_{on}	$V_{CE} = 0.5 \bullet V_{CES}$, $R_G = 2\Omega$		5.3	mJ
$t_{d(off)}$	Note 2		326	ns
t_{fi}			90	ns
E_{off}			3.2	mJ
R_{thJC}				0.18 °C/W
R_{thCS}			0.05	°C/W

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.

Littelfuse 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

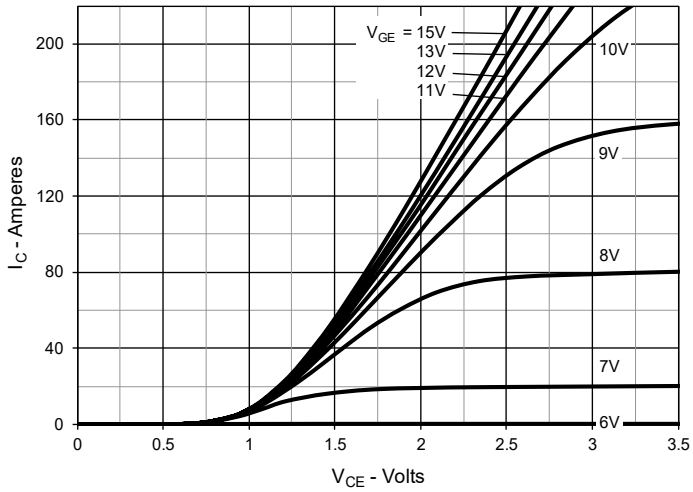

Fig. 2. Extended Output Characteristics @ T_J = 25ºC

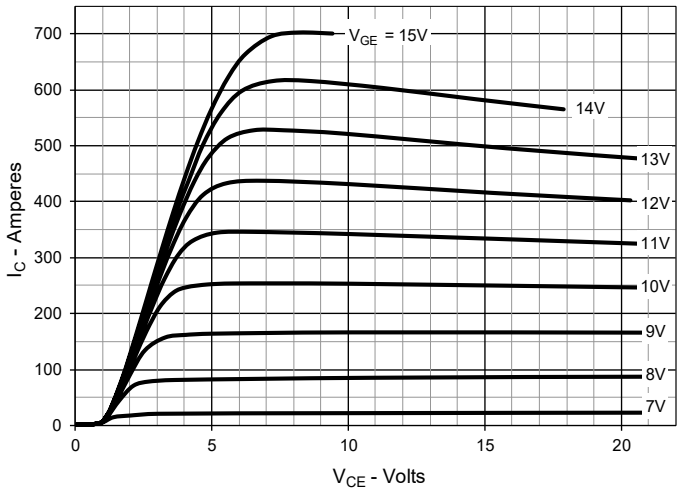

Fig. 3. Output Characteristics @ T_J = 150ºC

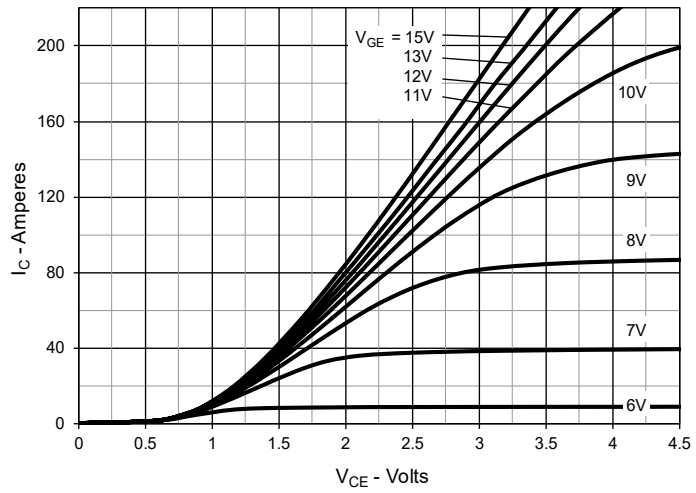

Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

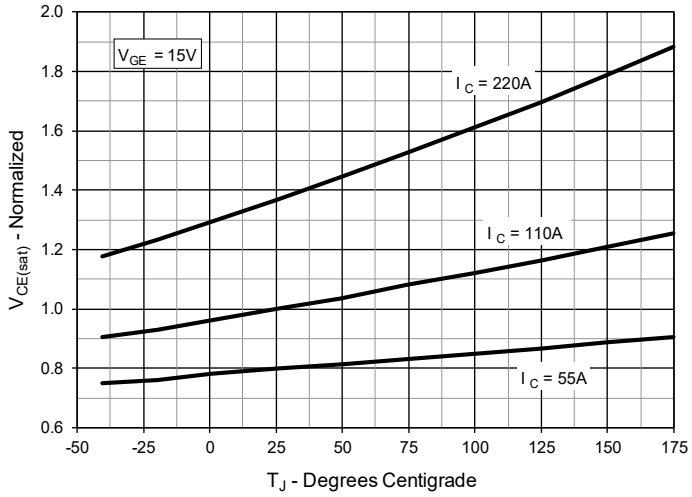

Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

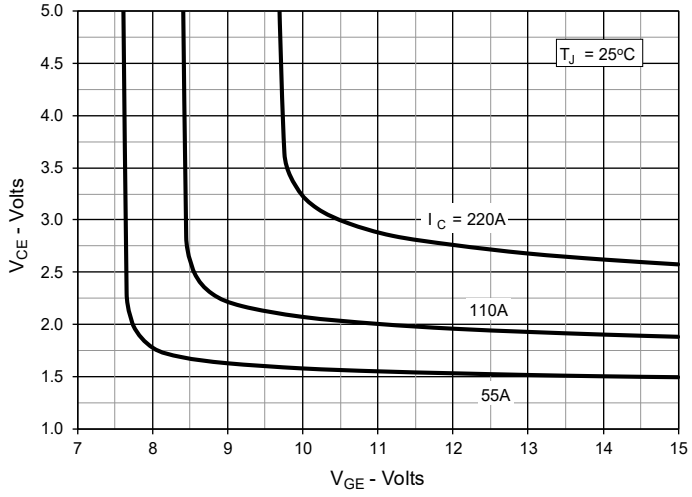

Fig. 6. Input Admittance

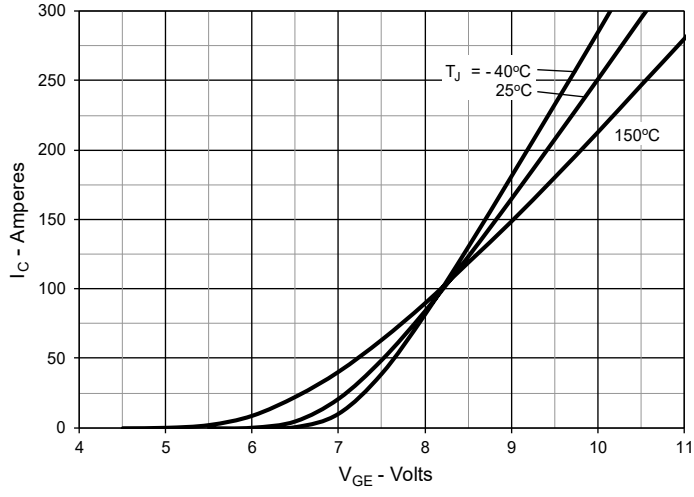

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Fig. 7. Transconductance

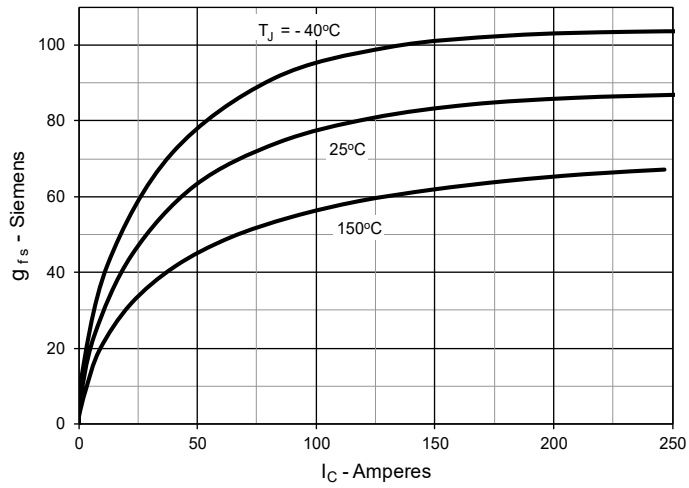

Fig. 8. Gate Charge

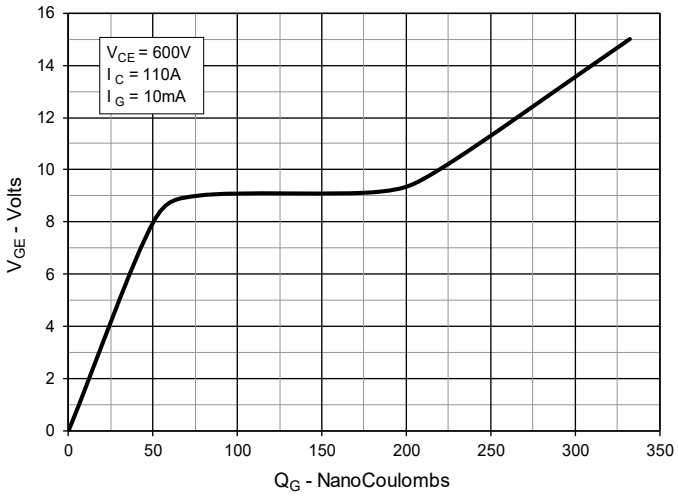

Fig. 9. Capacitance

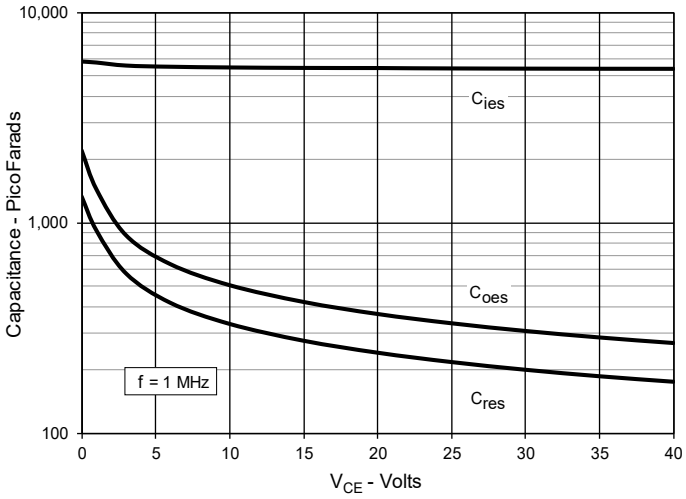

Fig. 10. Reverse-Bias Safe Operating Area

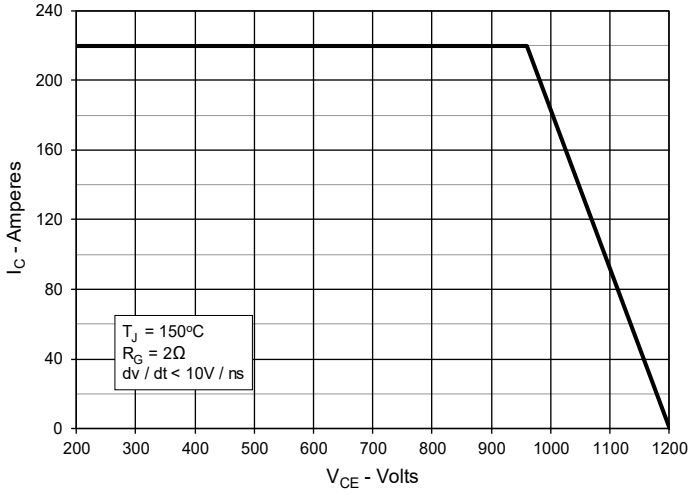

Fig. 11. Maximum Transient Thermal Impedance

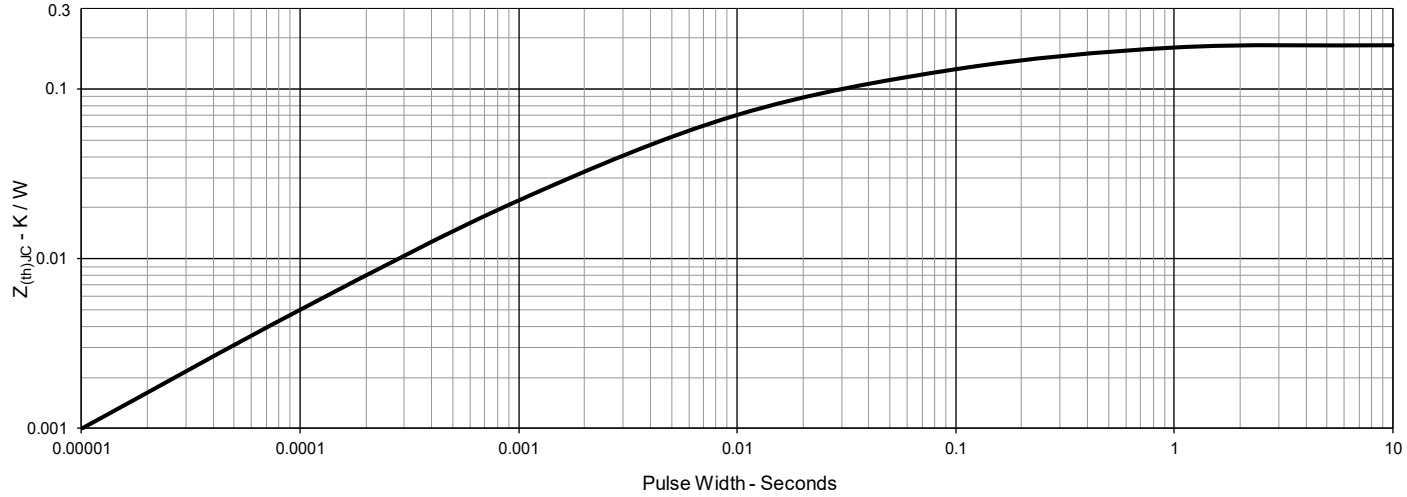

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Fig. 12. Inductive Switching Energy Loss vs. Collector Current

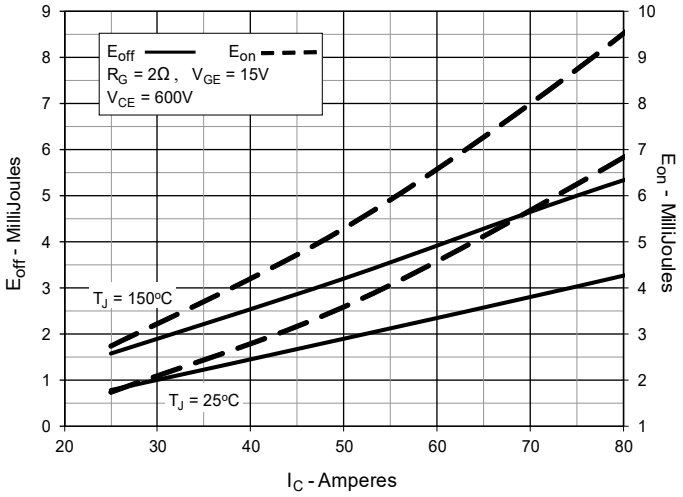

Fig. 13. Inductive Switching Energy Loss vs. Collector-Emitter Voltage

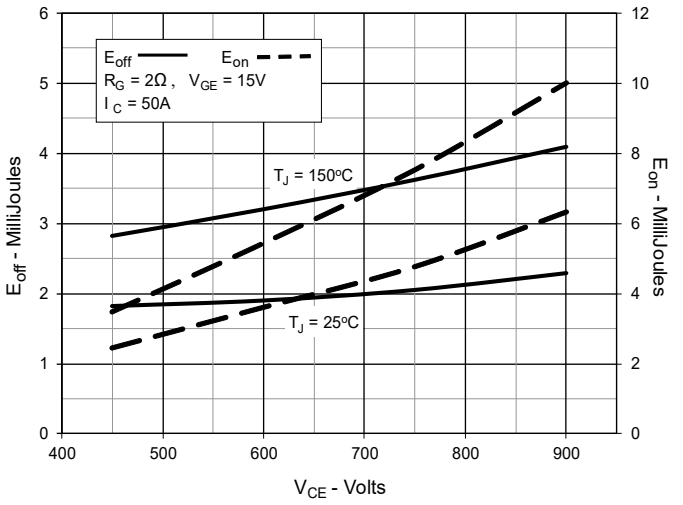

Fig. 14. Inductive Switching Energy Loss vs. Gate Resistance

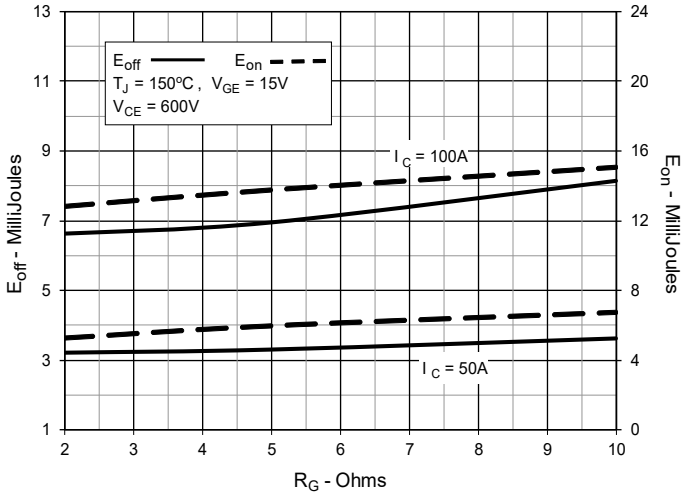

Fig. 15. Inductive Switching Energy Loss vs. Junction Temperature

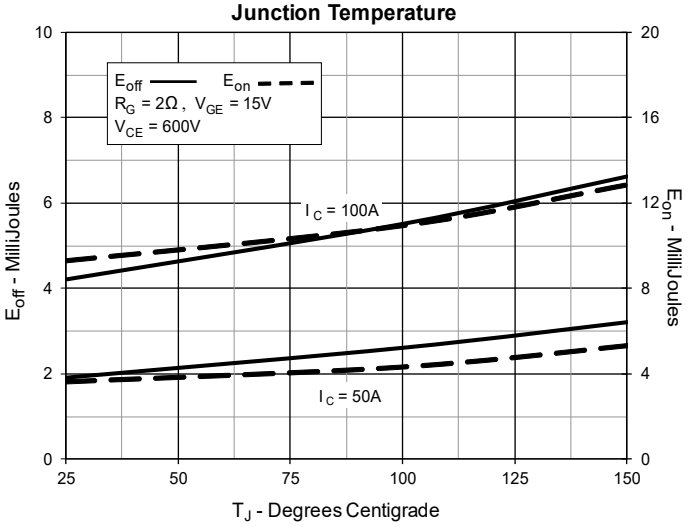

Fig. 16. Inductive Turn-off Switching Times vs. Gate Resistance

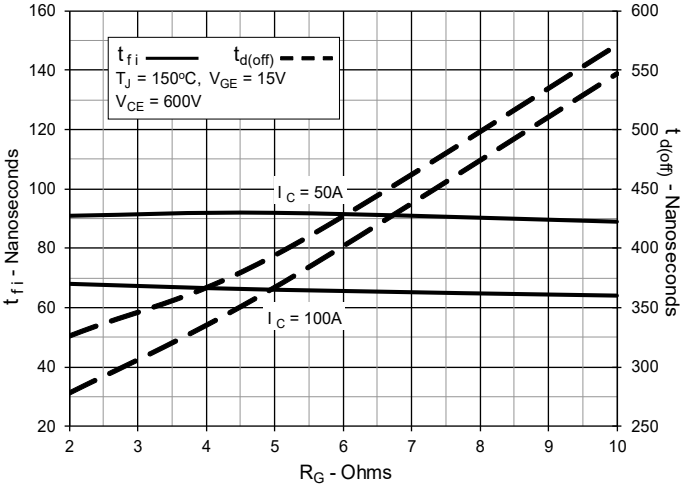

Fig. 17. Inductive Turn-off Switching Times vs. Collector Current

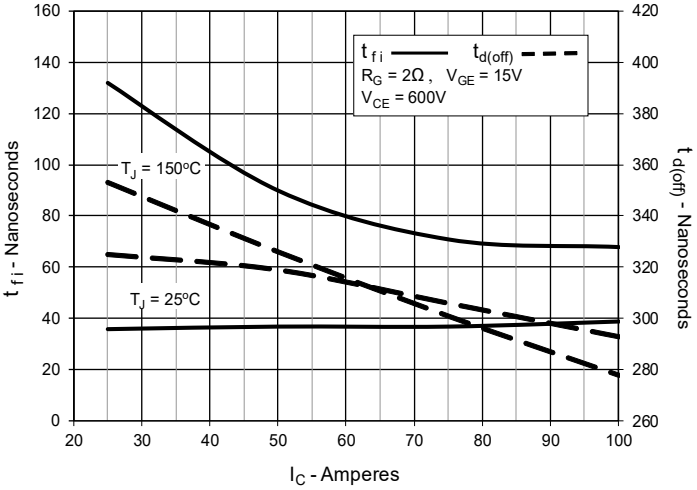

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Fig. 18. Inductive Turn-off Switching Times vs. Junction Temperature

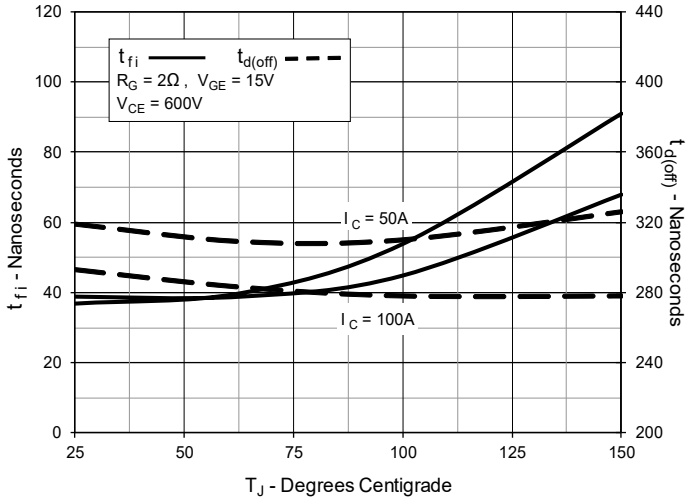


Fig. 19. Inductive Turn-on Switching Times vs. Gate Resistance

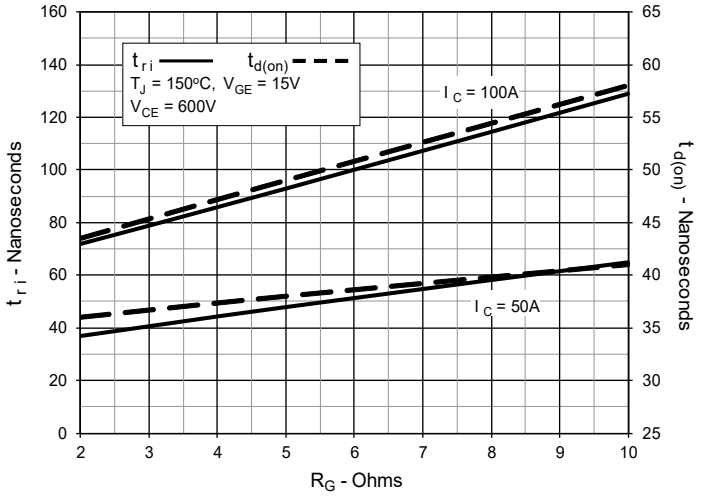


Fig. 20. Inductive Turn-on Switching Times vs. Collector Current

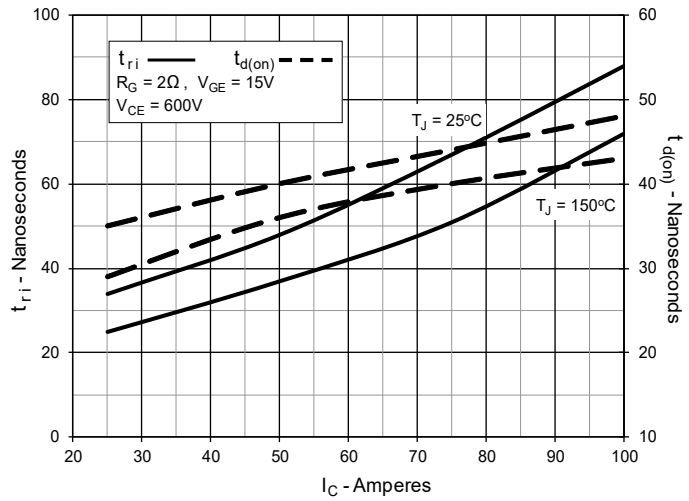
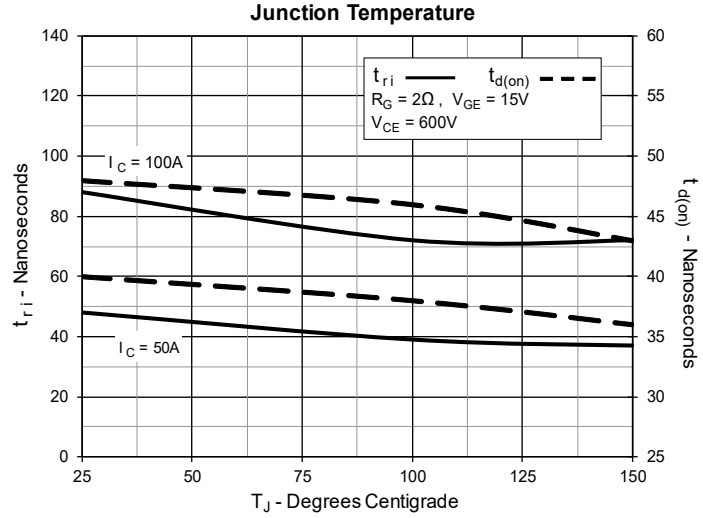


Fig. 21. Inductive Turn-on Switching Times vs. Junction Temperature



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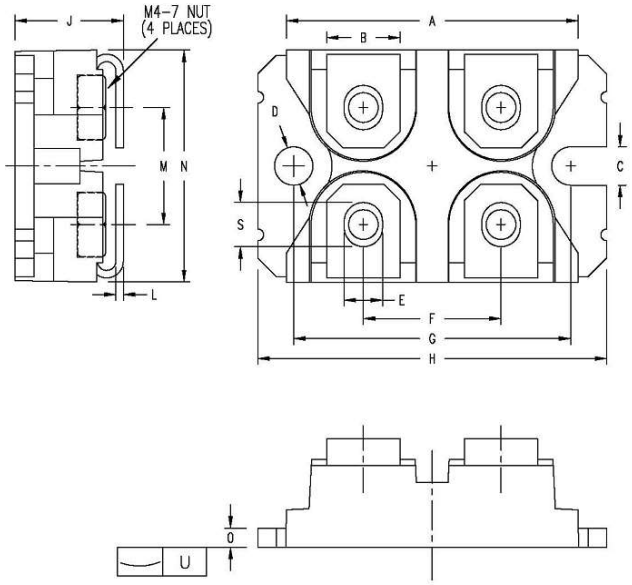
SOT-227 miniBLOC



SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	1.224	1.260	31.10	32.00
B	.303	.327	7.70	8.30
C	.161	.173	4.10	4.40
D	.161	.173	4.10	4.40
E	.161	.173	4.10	4.40
F	.587	.598	14.90	15.20
G	1.181	1.201	30.00	30.50
H	1.488	1.508	37.80	38.30
J	.461	.484	11.70	12.30
L	.030	.033	0.75	0.85
M	.492	.512	12.50	13.00
N	.984	1.004	25.00	25.50
O	.075	.087	1.90	2.20
S	.181	.193	4.60	4.90
U	.000	.005	0.00	0.13

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