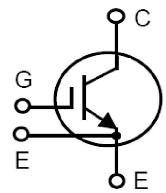
1200V XPT™ IGBT GenX4™

IXYN110N120A4

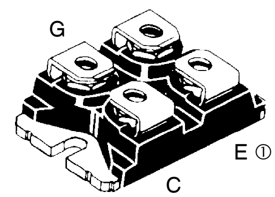
V_{CES}	=	1200V
I_{C110}	=	110A
$V_{CE(sat)}$	≤	1.80V
$t_{fi(typ)}$	=	300ns

Ultra Low-Vsat PT IGBT for up to 5kHz 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 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)		275	A
I_{LRMS}	Terminal Current Limit		200	A
I_{C110}	T_C = 110°C		110	A
I_{CM}	T_C = 25°C, 1ms		950	A
SSOA	V_{GE} = 15V, T_{VJ} = 125°C, R_G = 2Ω		I_{CM} = 220	A
(RBSOA)	Clamped Inductive Load		0.8 • V_{CES}	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	t = 1min	2500	V~
	I_{ISOL} ≤ 1mA	t = 1s	3000	V~
M_d	Mounting Torque		1.5/13	Nm/lb.in
	Terminal Connection Torque		1.3/11.5	Nm/lb.in
Weight			30	g

Features

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

Advantages

- High Power Density
- Low Gate Drive Requirement

Applications

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

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				25	µA
		T_J = 125°C			500	µA
I_{GES}	V_{CE} = 0V, V_{GE} = ±20V				±200	nA
$V_{CE(sat)}$	I_C = I_{C110}, V_{GE} = 15V, Note 1			1.45	1.80	V
		T_J = 150°C		1.60		V

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	48	80		S
C_{ies}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz		6030		pF
C_{oes}			340		pF
C_{res}			225		pF
$Q_{g(on)}$	$I_C = I_{C110}$, V_{GE} = 15V, V_{CE} = 0.5 • V_{CES}		305		nC
Q_{ge}			58		nC
Q_{gc}			148		nC
$t_{d(on)}$	**Inductive load, T_J = 25°C**		42		ns
t_{ri}	I_C = 50A, V_{GE} = 15V		36		ns
E_{on}	V_{CE} = 0.5 • V_{CES}, R_G = 2Ω		2.5		mJ
$t_{d(off)}$	Note 2		550		ns
t_{fi}			300		ns
E_{off}			8.4		mJ
$t_{d(on)}$	**Inductive load, T_J = 150°C**		35		ns
t_{ri}	I_C = 50A, V_{GE} = 15V		33		ns
E_{on}	V_{CE} = 0.5 • V_{CES}, R_G = 2Ω		4.4		mJ
$t_{d(off)}$	Note 2		700		ns
t_{fi}			590		ns
E_{off}			14.0		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.

Fig. 1. Output Characteristics @ T_J = 25°C

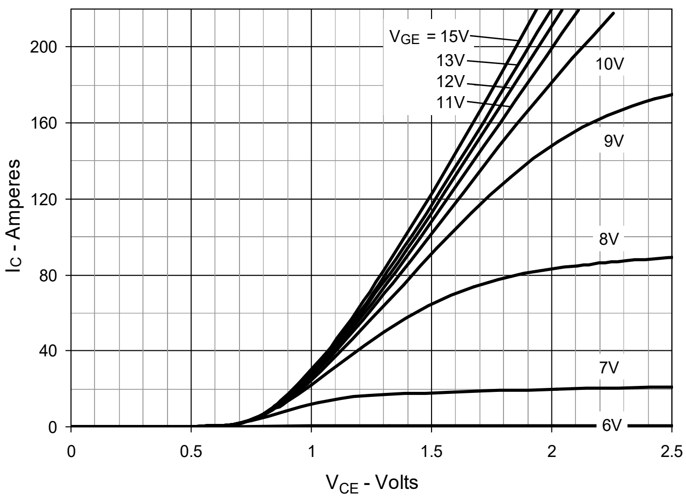


Fig. 2. Extended Output Characteristics @ T_J = 25°C

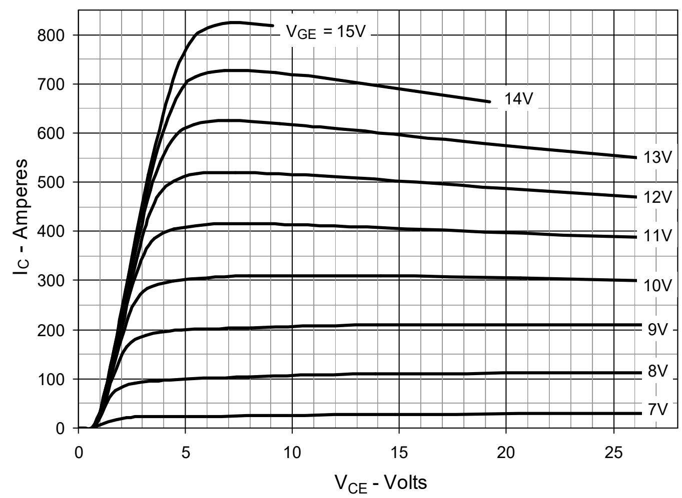


Fig. 3. Output Characteristics @ T_J = 150°C

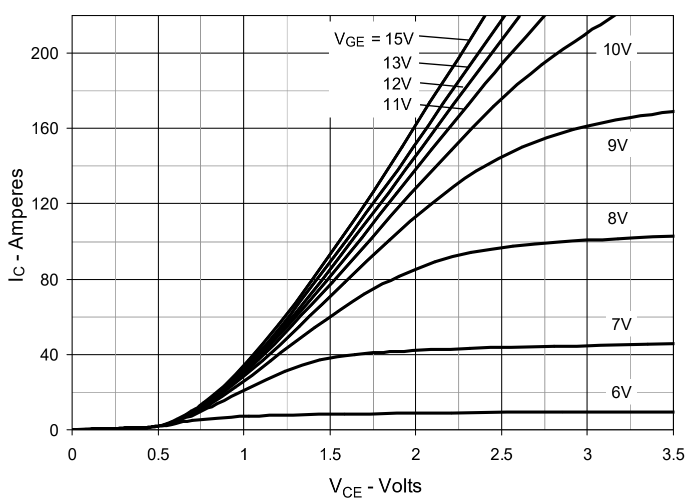


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

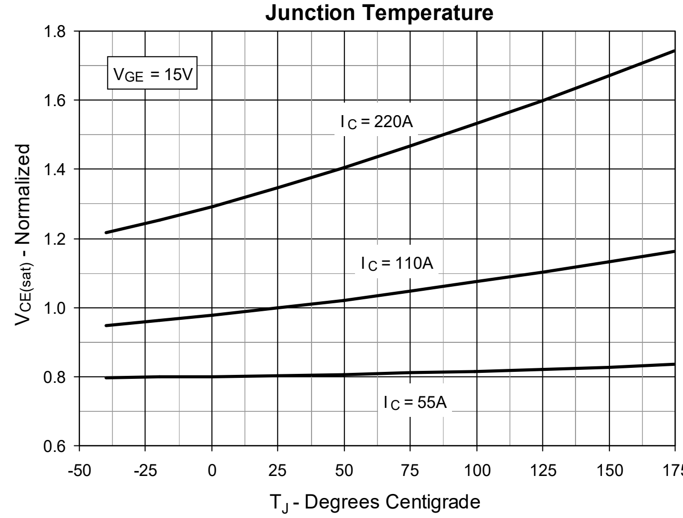


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

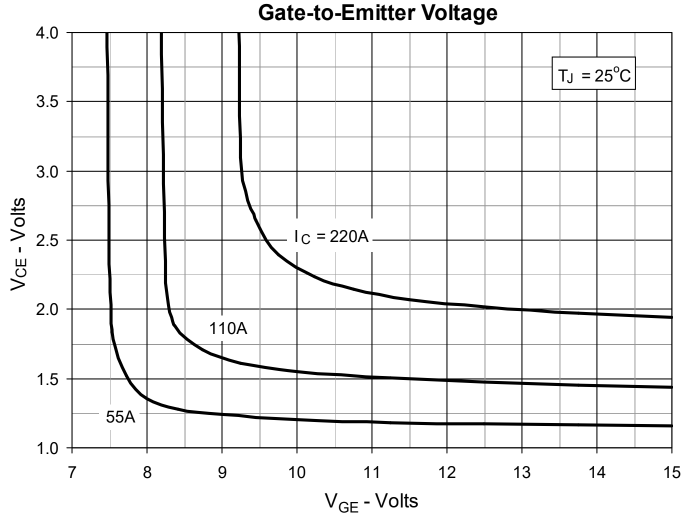


Fig. 6. Input Admittance

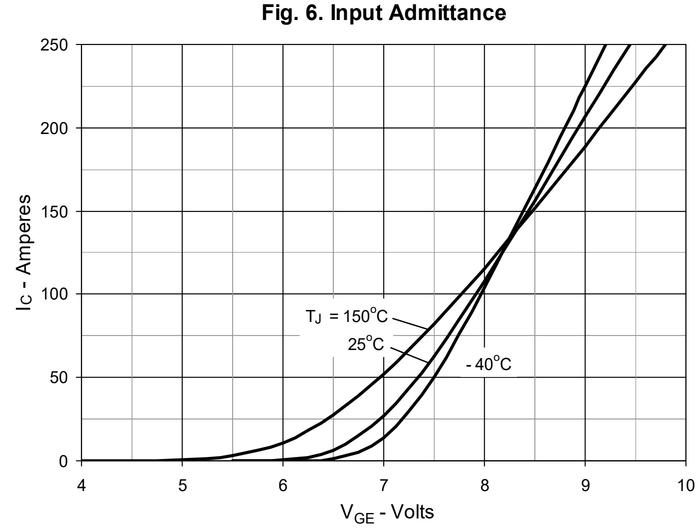


Fig. 7. Transconductance

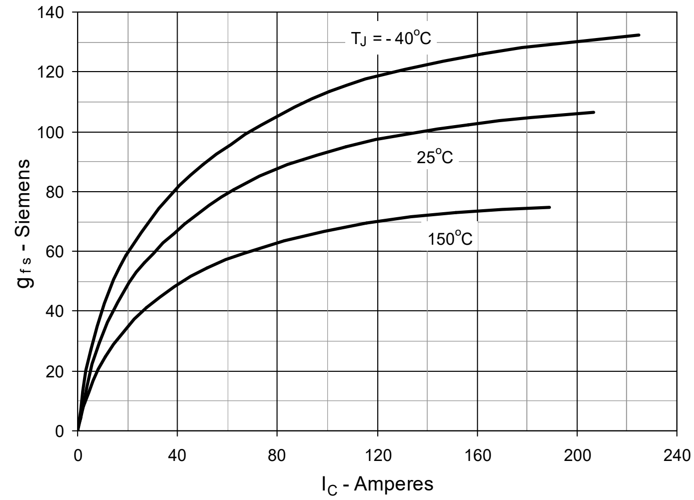


Fig. 8. Gate Charge

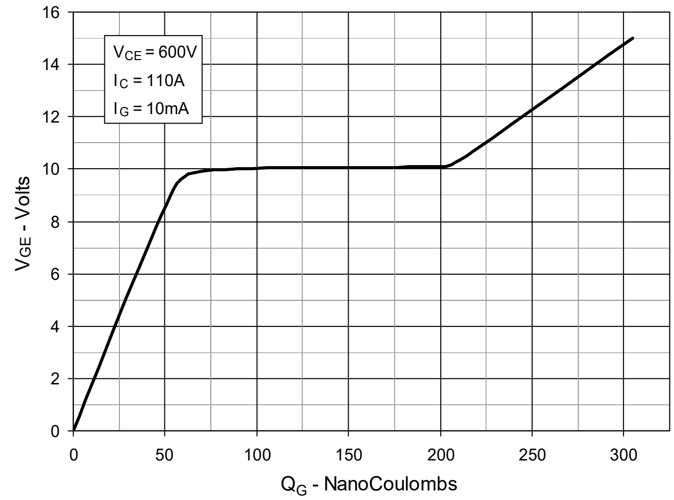


Fig. 9. Capacitance

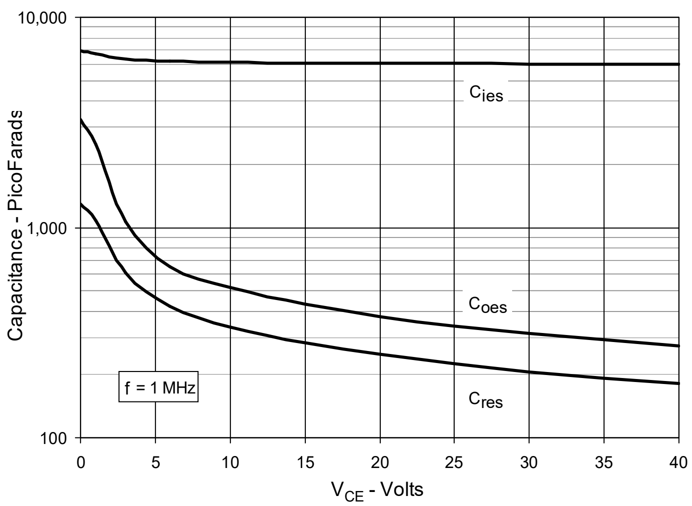


Fig. 10. Reverse-Bias Safe Operating Area

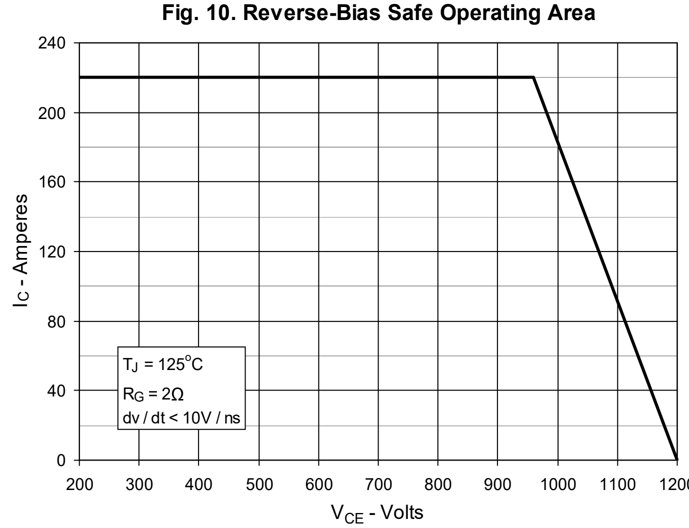
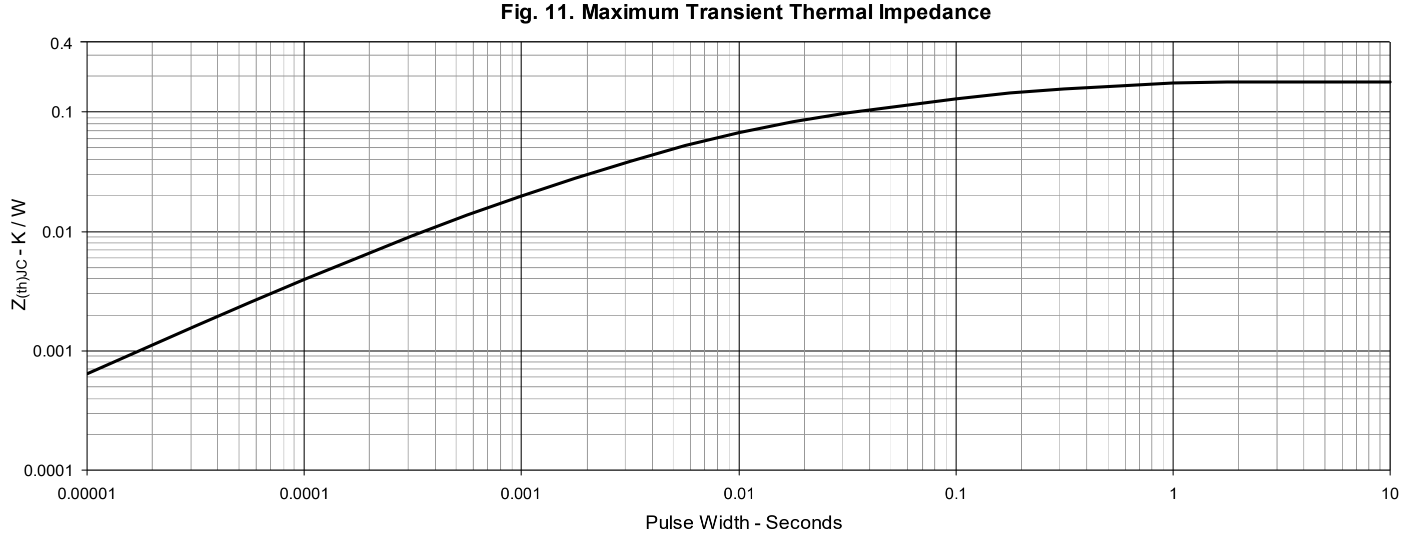


Fig. 11. Maximum Transient Thermal Impedance



Littelfuse reserves the right to change limits, test conditions, and dimensions.

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

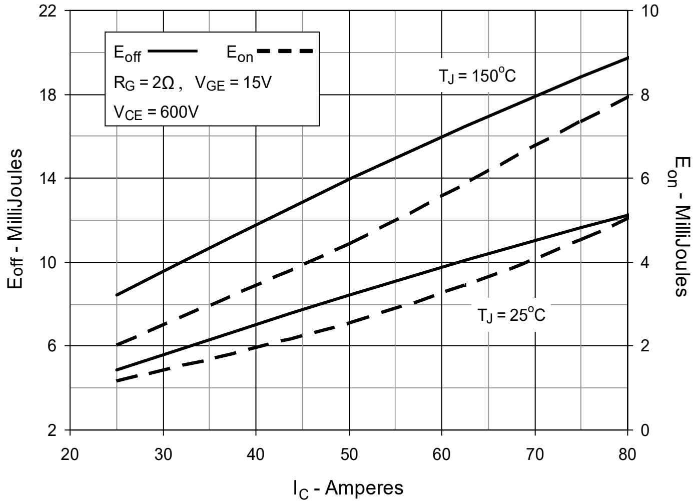


Fig. 13. Inductive Switching Energy Loss vs. Collector-Emitter Voltage

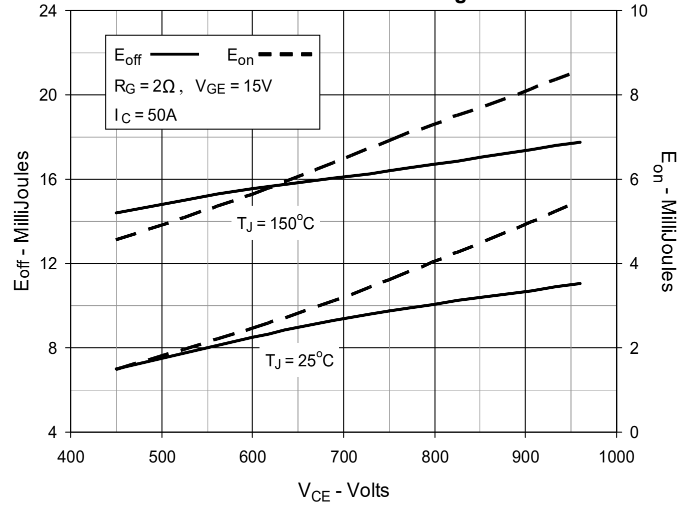


Fig. 14. Inductive Switching Energy Loss vs. Gate Resistance

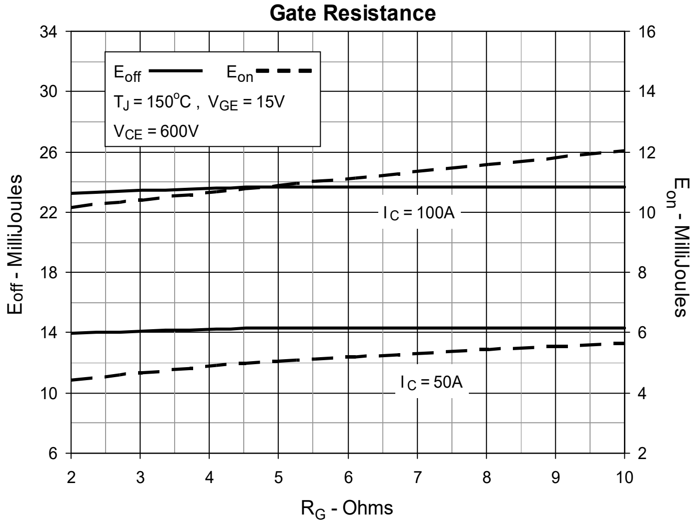


Fig. 15. Inductive Switching Energy Loss vs. Junction Temperature

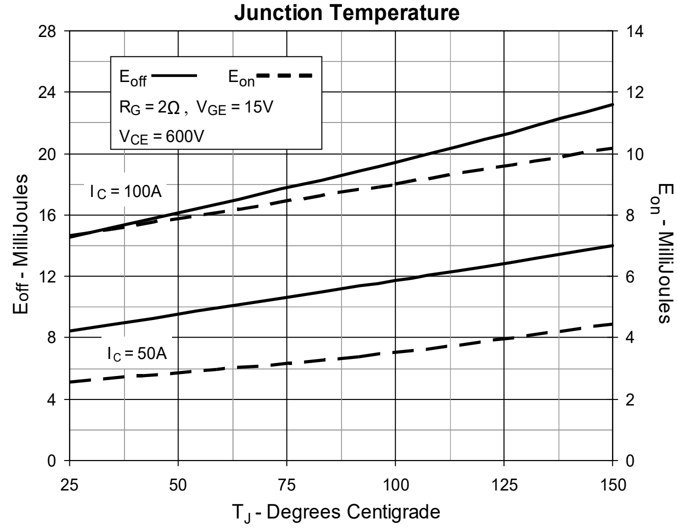


Fig. 16. Inductive Turn-off Switching Times vs. Gate Resistance

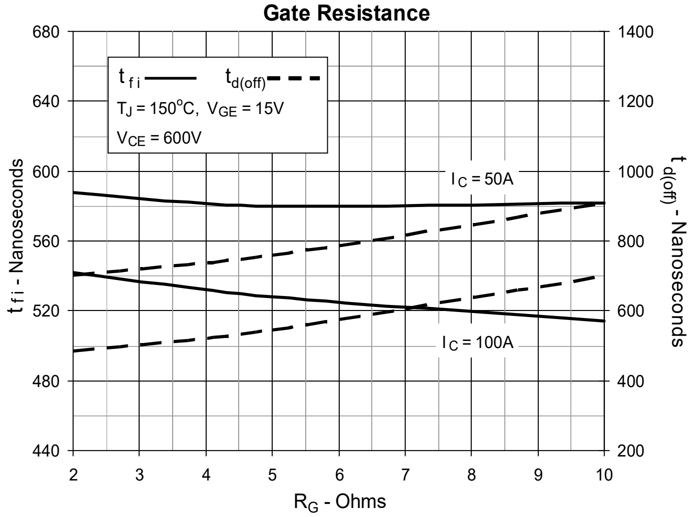


Fig. 17. Inductive Turn-off Switching Times vs. Collector Current

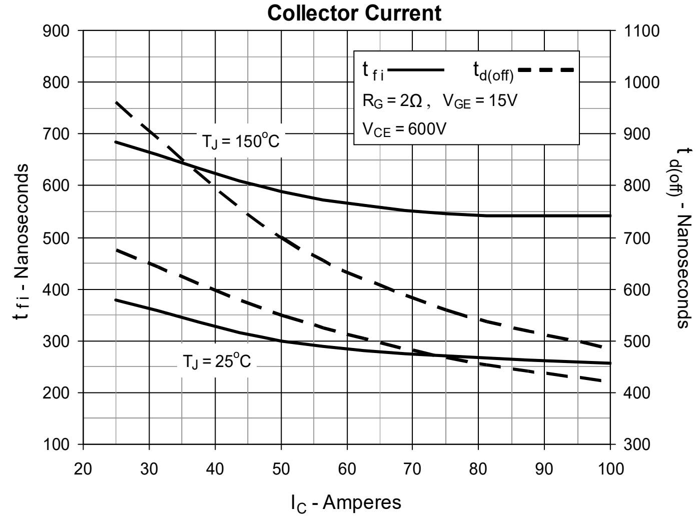


Fig. 18. Inductive Turn-off Switching Times vs. Junction Temperature

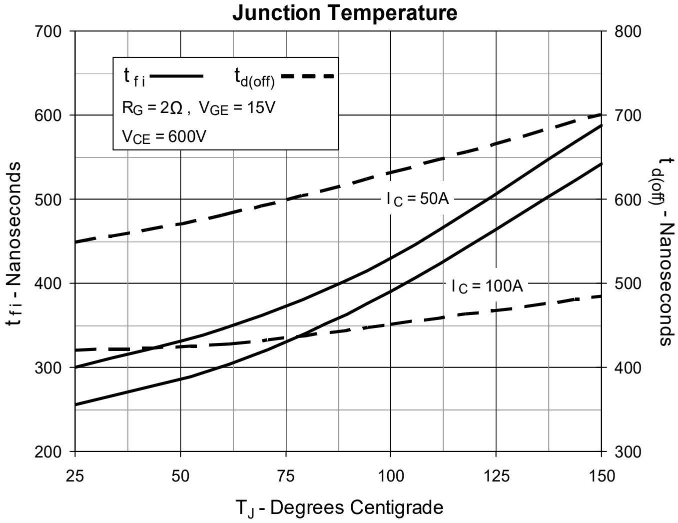


Fig. 19. Inductive Turn-on Switching Times vs. Gate Resistance

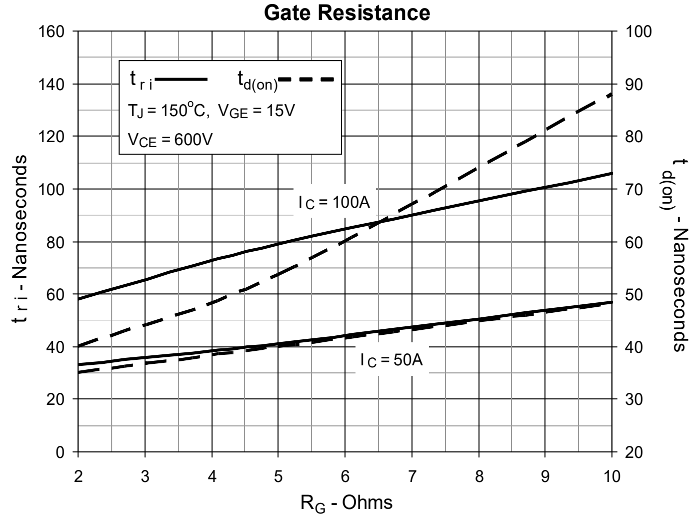


Fig. 20. Inductive Turn-on Switching Times vs. Collector Current

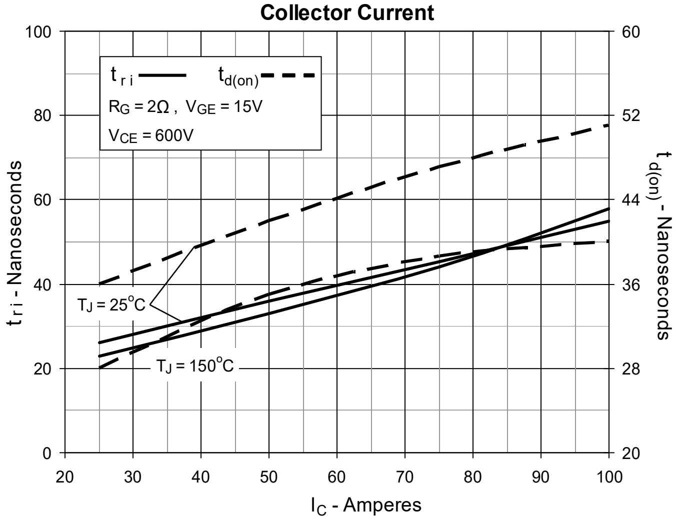
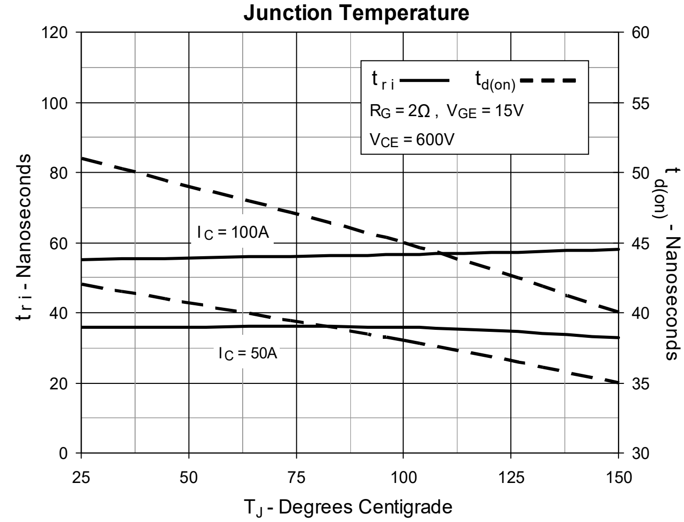
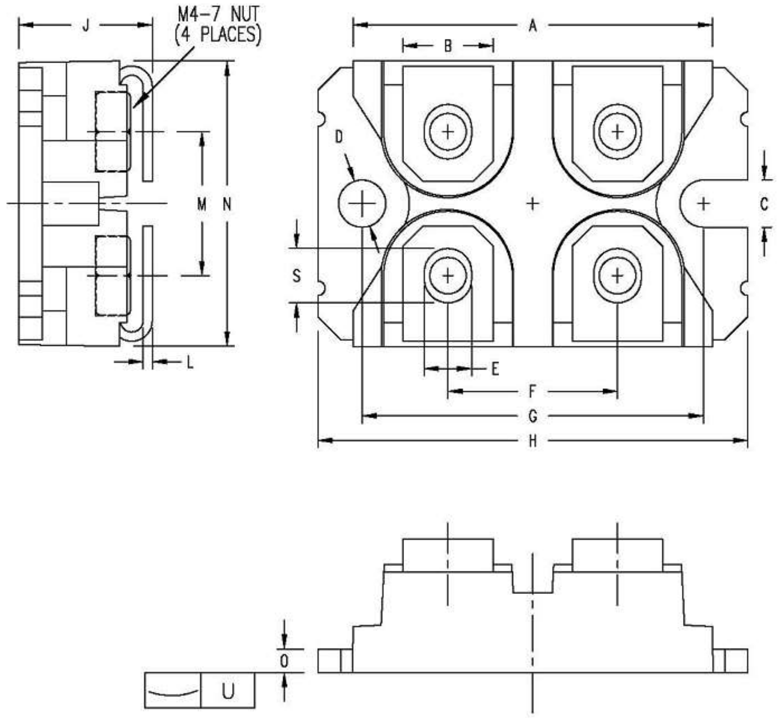


Fig. 21. Inductive Turn-on Switching Times vs. Junction Temperature



SOT-227B miniBLOC (IXYN)



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

1. NUT MATERIAL:
   STANDARD – Low carbon steel with Ni plating.
   OPTIONAL: – Brass Nut is available.
   PART NUMBER–BN
2. ALL METAL SURFACE ARE PRE NI PLATED EXCEPT TRIM AREA.

A Littelfuse Technology