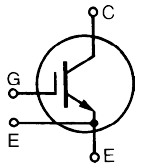
XPT™ 650V IGBT GenX4™

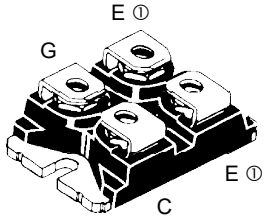
IXXN340N65B4

V_{CES} = 650V
I_{C90} = 340A
$V_{CE(sat)}$ ≤ 1.7V
$t_{fi(typ)}$ = 80ns

Extreme Light Punch Through
IGBT for 10-30kHz 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		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 (Chip Capability)		520	A
I_{LRMS}	Leads Current Limit		200	A
I_{C90}	T_C = 90°C		340	A
I_{CM}	T_C = 25°C, 1ms		1200	A
SSOA	V_{GEC}= 15V, T_{VJ} = 150°C, R_G = 1Ω		I_{CM} = 400	A
(RBSOA)	Clamped Inductive Load		@V_{CE} ≤ V_{CES}	
t_{sc}	V_{GE} = 15V, V_{CE} = 360V, T_J = 150°C		10	µs
(SCSOA)	R_G = 10Ω, Non Repetitive			
P_C	T_C = 25°C		1500	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

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 = 4mA, V_{CE} = V_{GE}	4.0		6.5	V
I_{CES}	V_{CE} = V_{CES}, V_{GE} = 0V			25	µA
	T_J = 150°C			2	mA
I_{GES}	V_{CE} = 0V, V_{GE} = ±20V			±200	nA
$V_{CE(sat)}$	I_C = 160A, V_{GE} = 15V, Note 1		1.4	1.7	V
	T_J = 150°C		1.4		V

Features

- Optimized for Low Conduction and Switching Losses
- miniBLOC, with Aluminium Nitride Isolation
- International Standard Package
- Isolation Voltage 2500V~
- Optimized for 10-30kHz Switching
- Square RBSOA
- Short Circuit Capability
- 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

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	50	85		S
C_{ies}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz		11.25		nF
C_{oes}			670		pF
C_{res}			390		pF
$Q_{g(on)}$	I_C = 200A, V_{GE} = 15V, V_{CE} = 0.5 • V_{CES}		553		nC
Q_{ge}			110		nC
Q_{gc}			253		nC
$t_{d(on)}$	**Inductive load, T_J = 25°C**		62		ns
t_{ri}	I_C = 100A, V_{GE} = 15V		76		ns
E_{on}	V_{CE} = 400V, R_G = 1Ω		4.40		mJ
$t_{d(off)}$	Note 2		245		ns
t_{fi}			80		ns
E_{off}			2.20	3.50	mJ
$t_{d(on)}$	**Inductive load, T_J = 150°C**		54		ns
t_{ri}	I_C = 100A, V_{GE} = 15V		65		ns
E_{on}	V_{CE} = 400V, R_G = 1Ω		5.55		mJ
$t_{d(off)}$	Note 2		236		ns
t_{fi}			110		ns
E_{off}			2.54		mJ
R_{thJC}				0.10	°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 = 25ºC

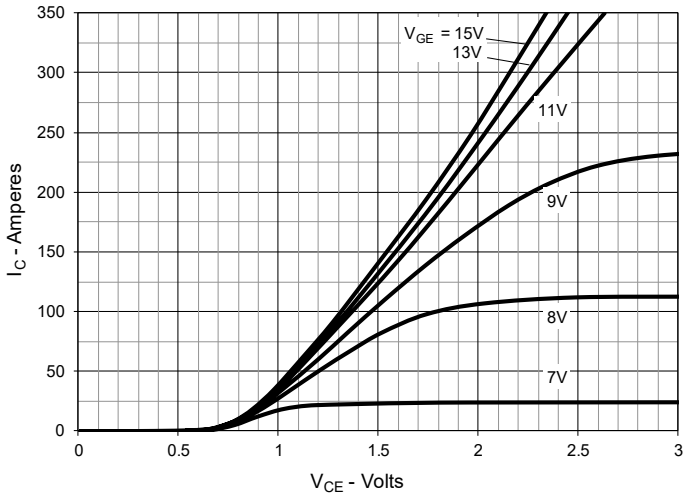


Fig. 2. Extended Output Characteristics @ T_J = 25ºC

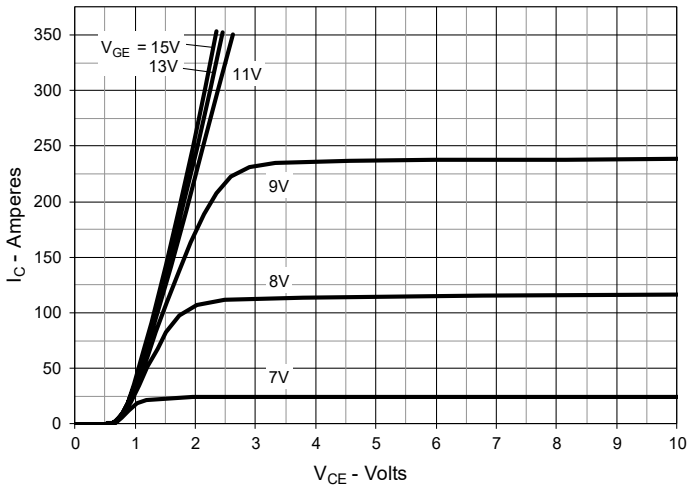


Fig. 3. Output Characteristics @ T_J = 150ºC

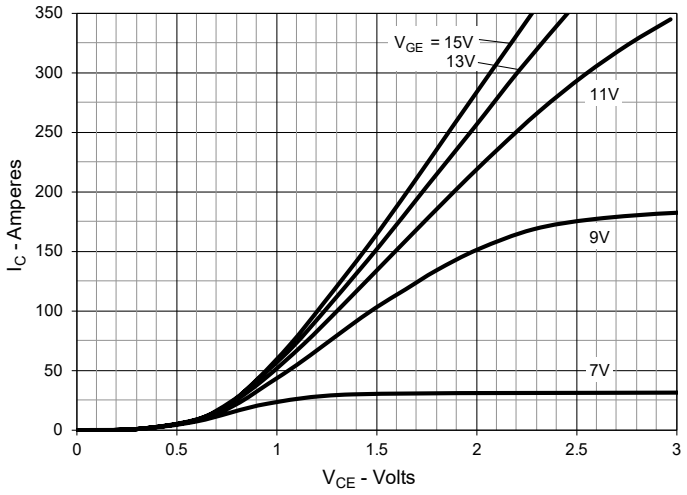


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

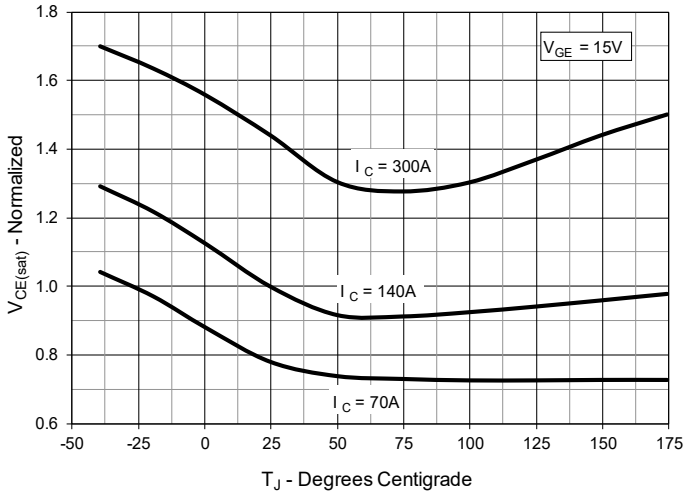


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

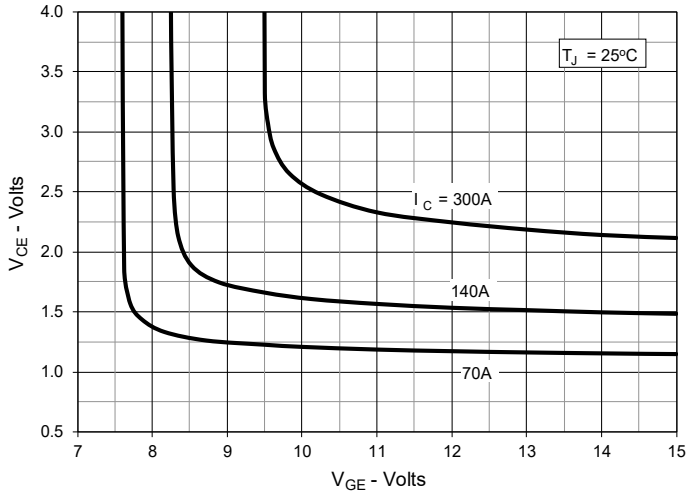


Fig. 6. Input Admittance

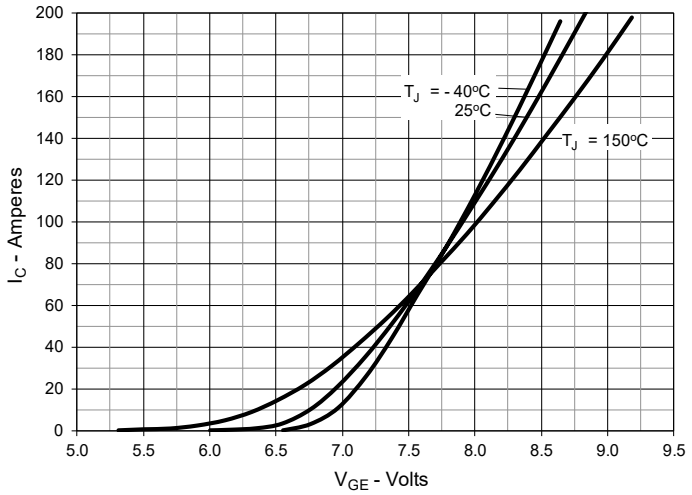


Fig. 7. Transconductance

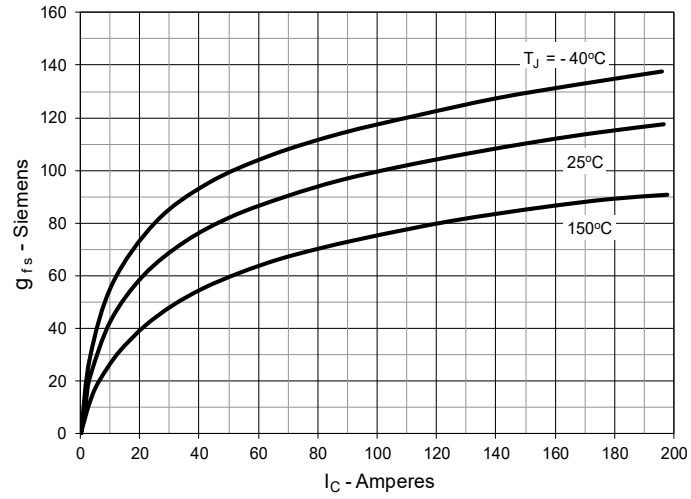


Fig. 8. Gate Charge

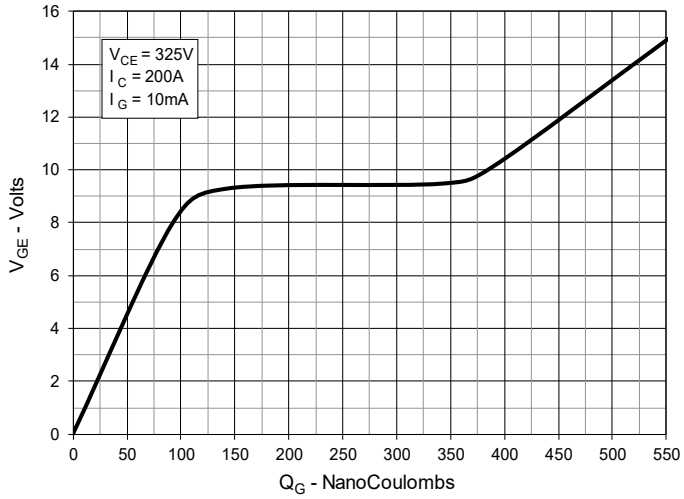


Fig. 9. Capacitance

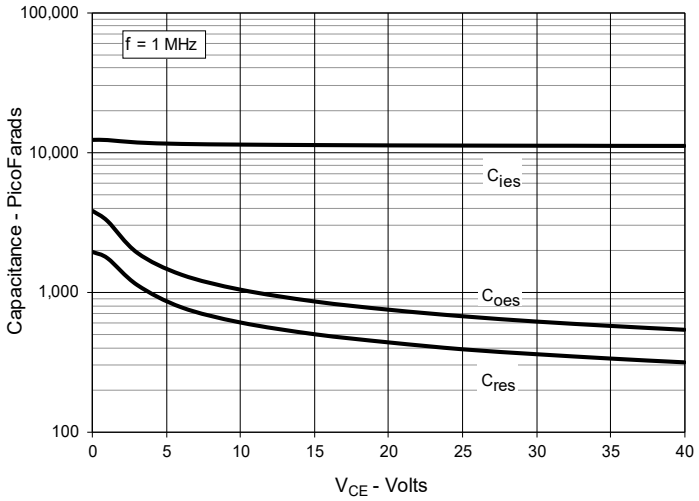


Fig. 10. Reverse-Bias Safe Operating Area

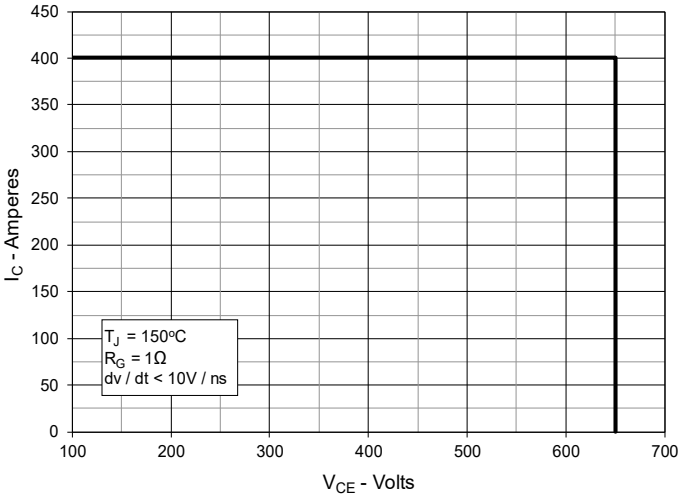


Fig. 11. Maximum Transient Thermal Impedance

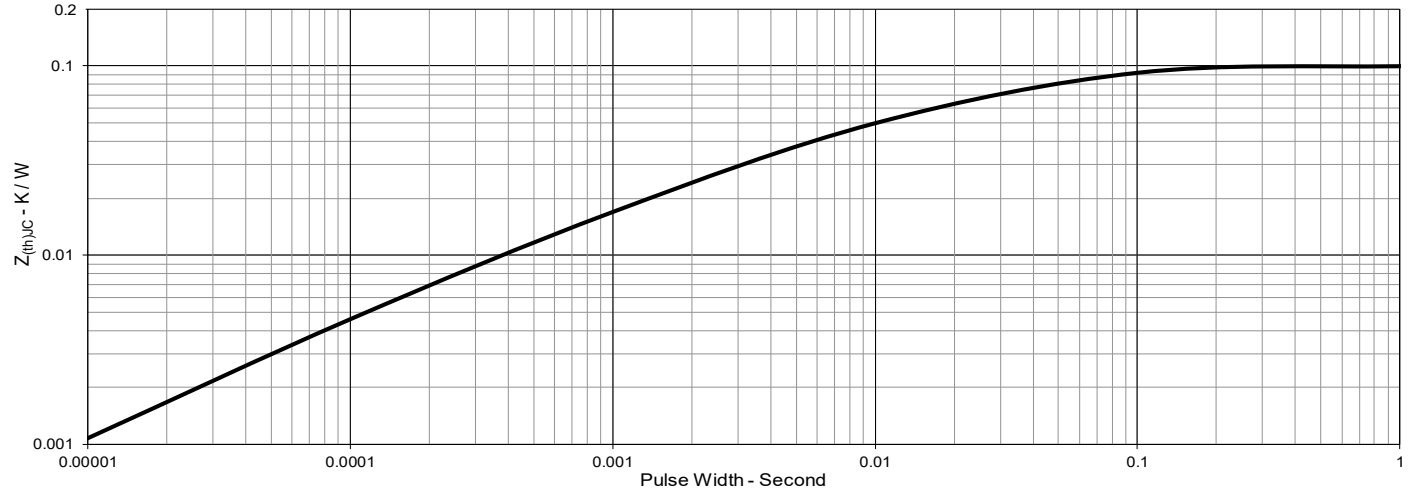


Fig. 12. Inductive Switching Energy Loss vs. Gate Resistance

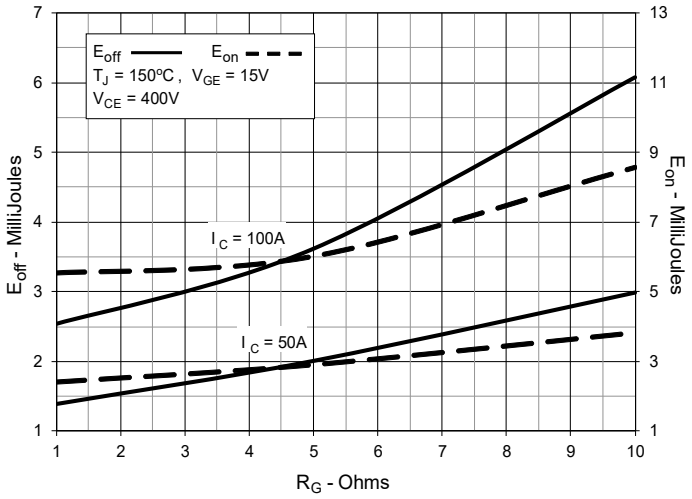


Fig. 13. Inductive Switching Energy Loss vs. Collector Current

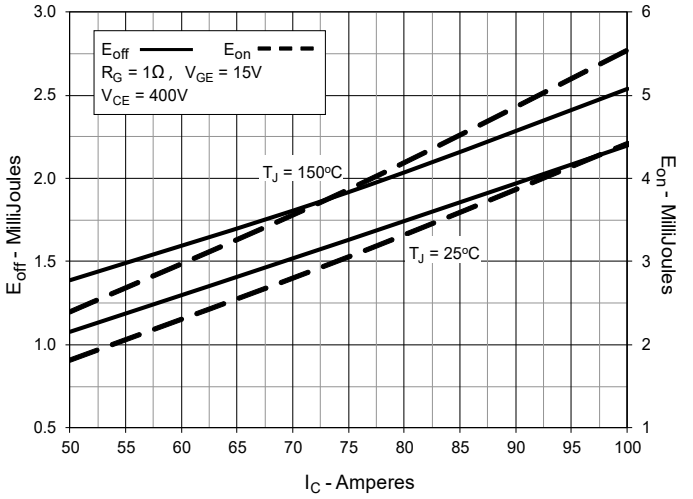


Fig. 14. Inductive Switching Energy Loss vs. Junction Temperature

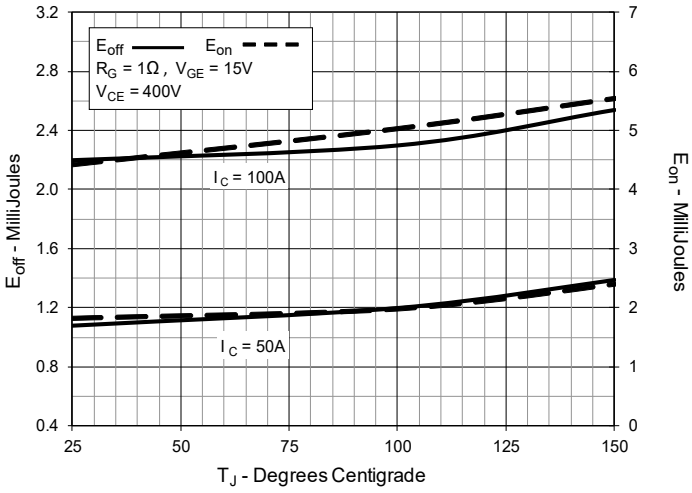


Fig. 15. Inductive Turn-off Switching Times vs. Gate Resistance

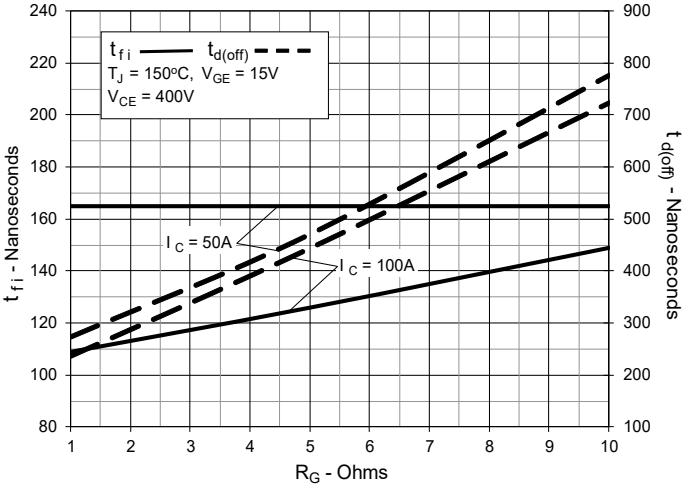


Fig. 16. Inductive Turn-off Switching Times vs. Collector Current

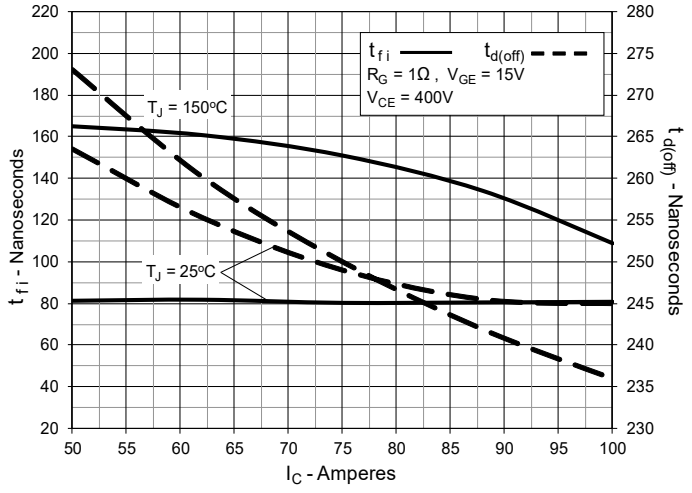


Fig. 17. Inductive Turn-off Switching Times vs. Junction Temperature

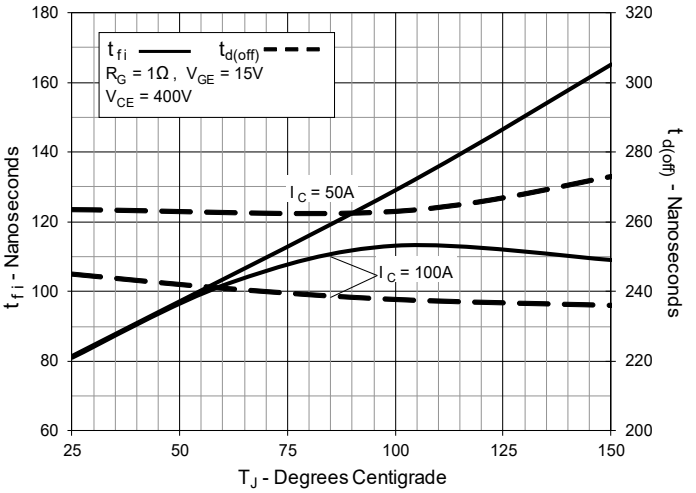


Fig. 18. Inductive Turn-on Switching Times vs. Gate Resistance

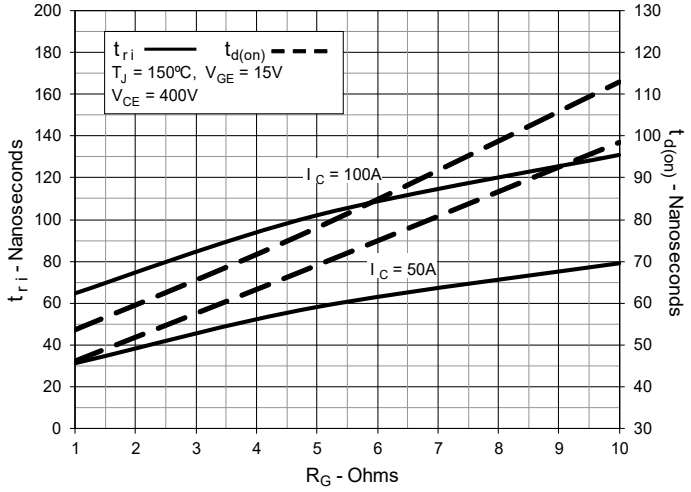


Fig. 19. Inductive Turn-on Switching Times vs. Collector Current

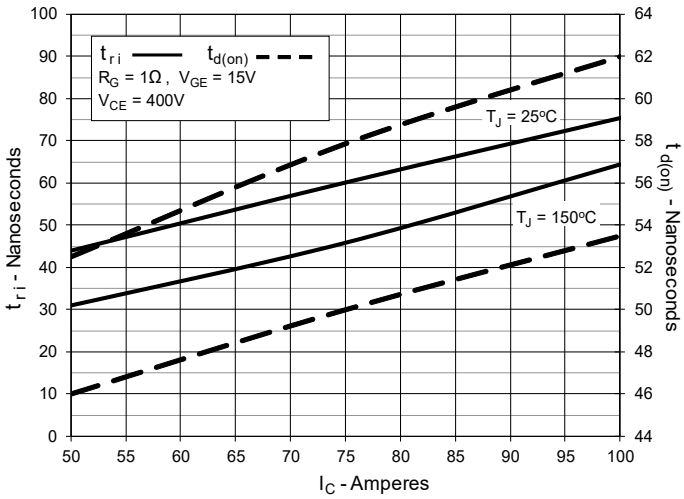
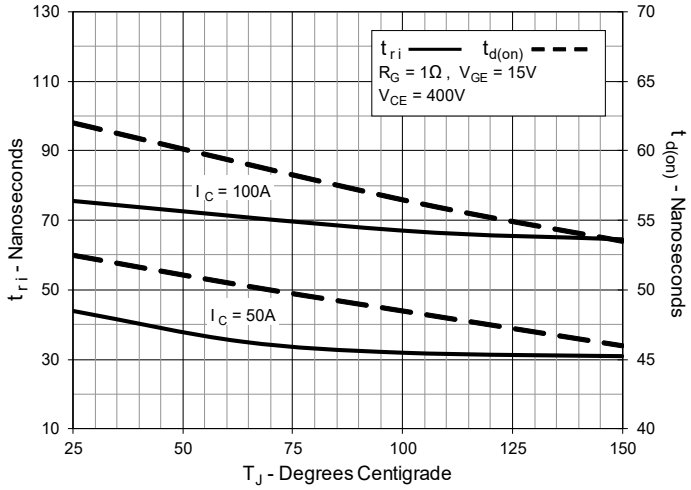
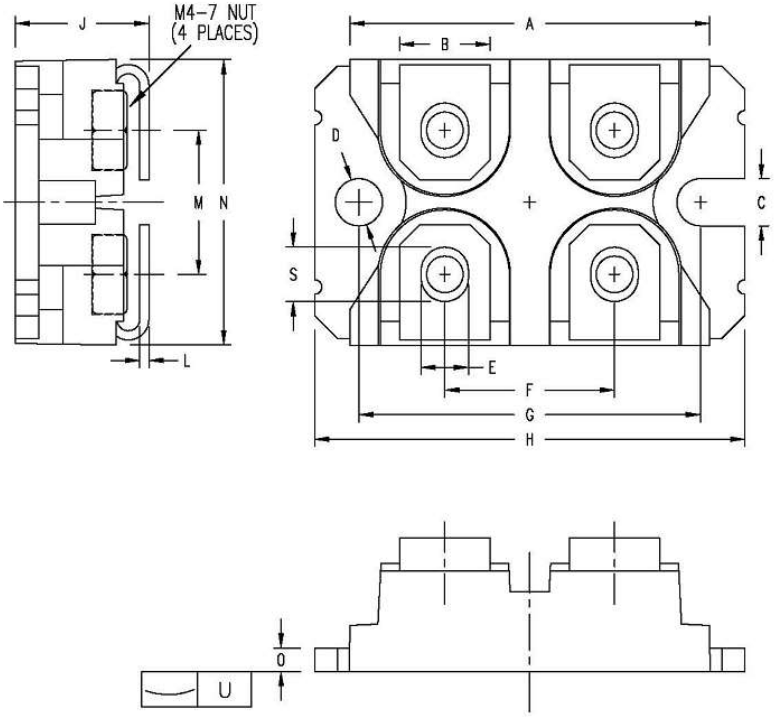


Fig. 20. Inductive Turn-on Switching Times vs. Junction Temperature



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.