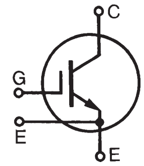
IXYS

GenX3™ 600V IGBT

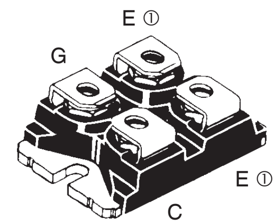
IXGN320N60A3

V_{CES} = 600V
I_{C110} = 170A
$V_{CE(sat)} \leq$ 1.30V

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



SOT-227B, miniBLOC
E153432



G = Gate, C = Collector, E = Emitter

①Either 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 (Chip Capability)		320	A
I_{C110}	T_C = 110°C		170	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} = 320	A
(RBSOA)	Clamped Inductive Load		@0.8 • V_{CES}	
P_C	T_C = 25°C		735	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

Features

- Optimized for Low Conduction Losses
- High Avalanche Capability
- Isolation Voltage 3000 V~
- International Standard Package

Advantages

- High Power Density
- Low Gate Drive Requirement

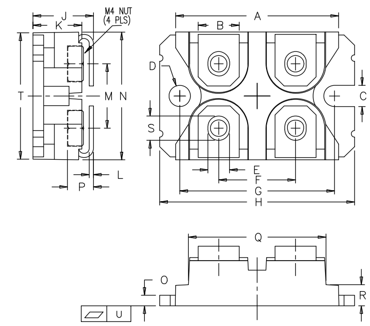
Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)		Characteristic Values Min.	Typ.	Max.	
BV_{CES}	I_C = 1mA, V_{GE} = 0V		600			V
$V_{GE(th)}$	I_C = 4mA, V_{CE} = V_{GE}		3.0		5.5	V
I_{CES}	V_{CE} = V_{CES}, V_{GE} = 0V				150	µA
		T_J = 125°C			1.5	mA
I_{GES}	V_{CE} = 0V, V_{GE} = ±20V				±400	nA
$V_{CE(sat)}$	I_C = 100A, V_{GE} = 15V, Note 1			1.05	1.30	V
	I_C = 320A			1.46		V

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.	
g_{fs}	I_C = 60A, V_{CE} = 10V, Note 1	70	125		S
C_{ies}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz		18		nF
C_{oes}			985		pF
C_{res}			150		pF
$Q_{g(on)}$	I_C = 80V, V_{GE} = 15V, V_{CE} = 0.5 • V_{CES}		560		nC
Q_{ge}			94		nC
Q_{gc}			195		nC
$t_{d(on)}$	**Resistive Load, T_J = 25°C**		63		ns
t_r	I_C = 80A, V_{GE} = 15V		68		ns
$t_{d(off)}$	V_{CE} = 400V, R_G = 1Ω		290		ns
t_f			740		ns
$t_{d(on)}$	**Resistive Load, T_J = 125°C**		62		ns
t_r	I_C = 80A, V_{GE} = 15V		77		ns
$t_{d(off)}$	V_{CE} = 400V, R_G = 1Ω		330		ns
t_f			1540		ns
R_{thJC}				0.17	°C/W
R_{thCK}			0.05		°C/W

SOT-227B miniBLOC (IXGN)



M4 screws (4x) supplied

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%.

Fig. 1. Extended Output Characteristics @ T_J = 25ºC

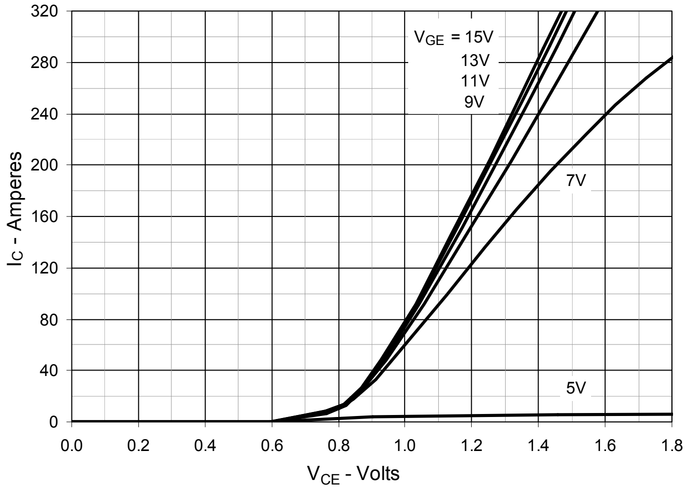


Fig. 2. Output Characteristics @ T_J = 125ºC

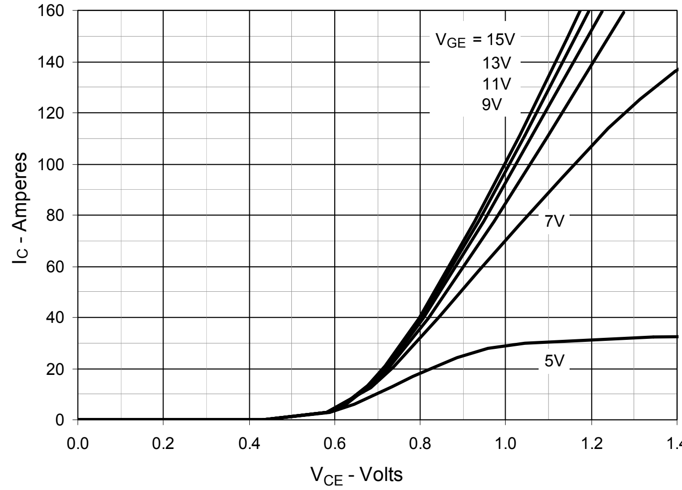


Fig. 3. Dependence of $V_{CE(sat)}$ on Junction Temperature

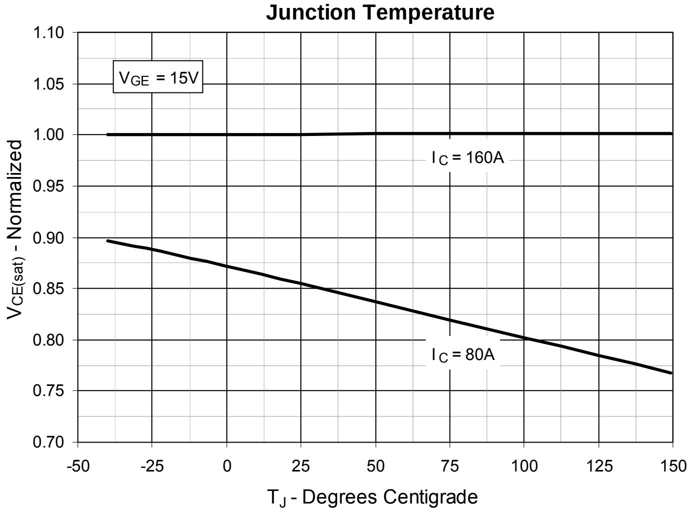


Fig. 4. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

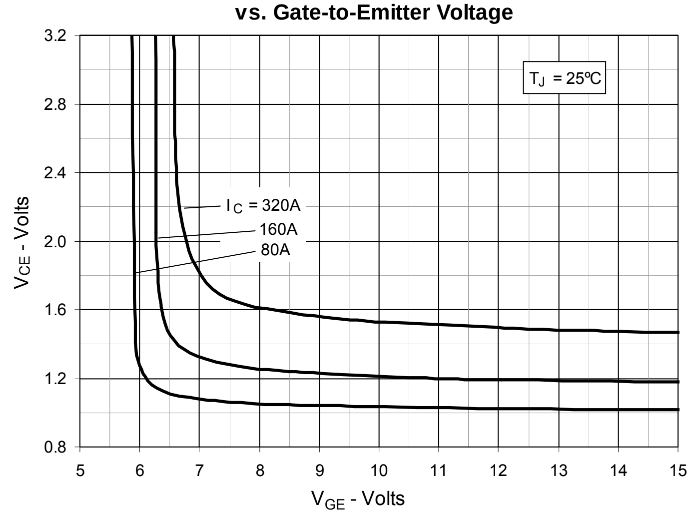


Fig. 5. Input Admittance

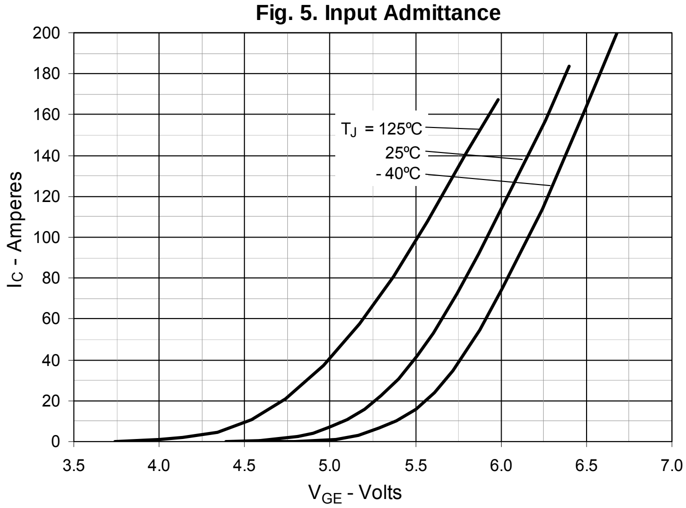


Fig. 6. Transconductance

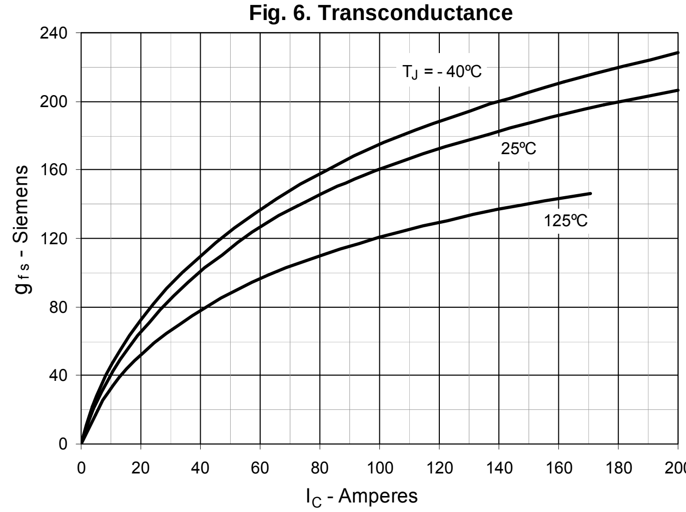


Fig. 7. Gate Charge

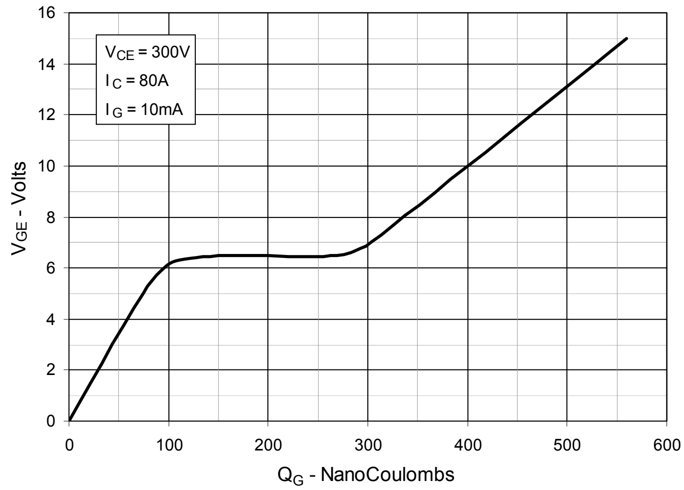


Fig. 8. Capacitance

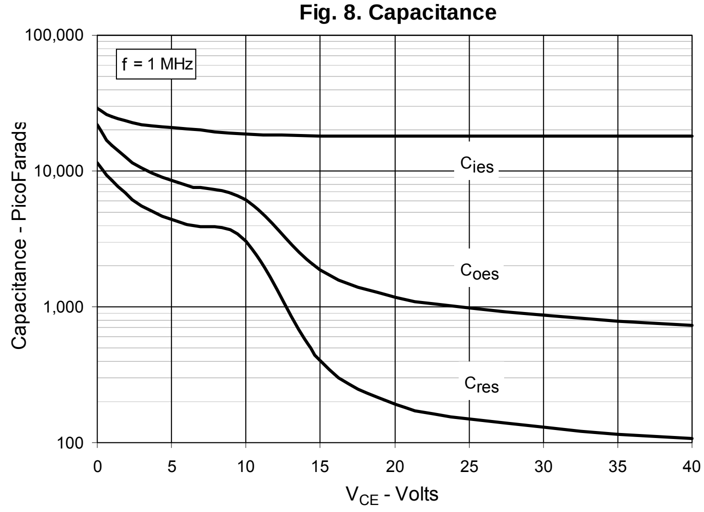


Fig. 9. Reverse-Bias Safe Operating Area

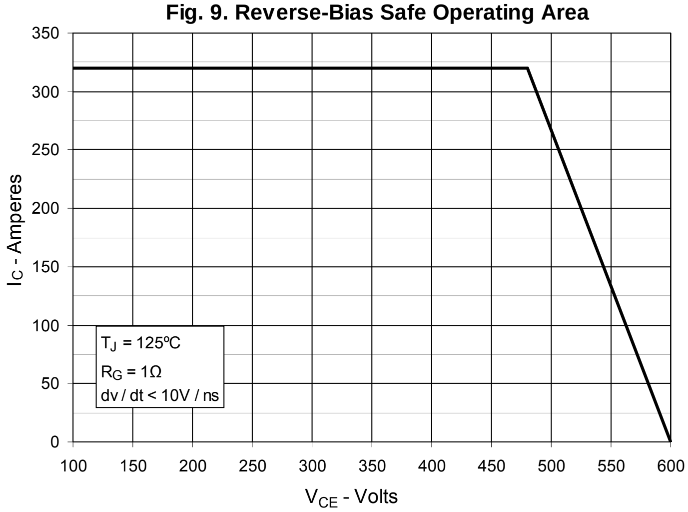


Fig. 10. Maximum Transient Thermal Impedance

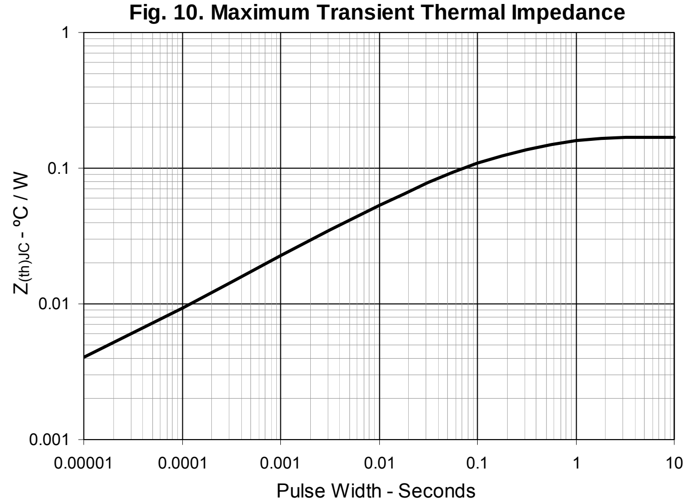


Fig.11. Resistive Turn-on Rise Time vs. Junction Temperature

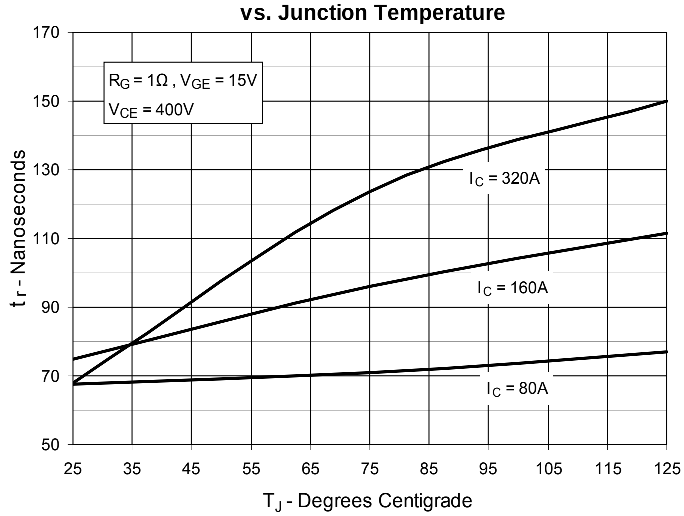


Fig. 12. Resistive Turn-on Rise Time vs. Collector Current

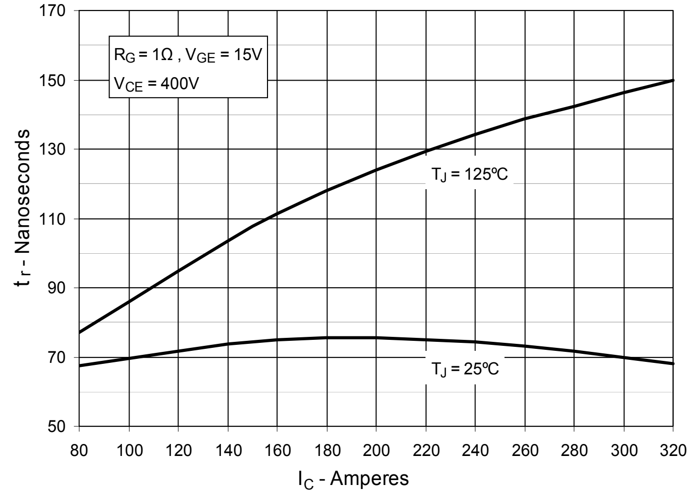


Fig. 13. Resistive Turn-on Switching Times vs. Gate Resistance

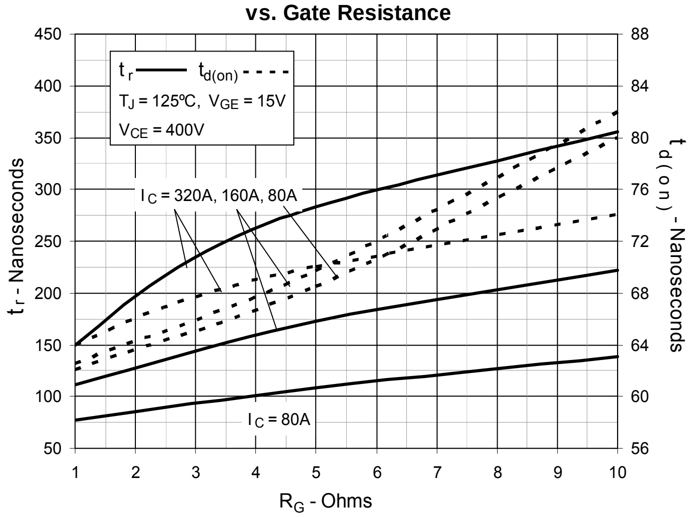


Fig. 14. Resistive Turn-off Switching Times vs. Junction Temperature

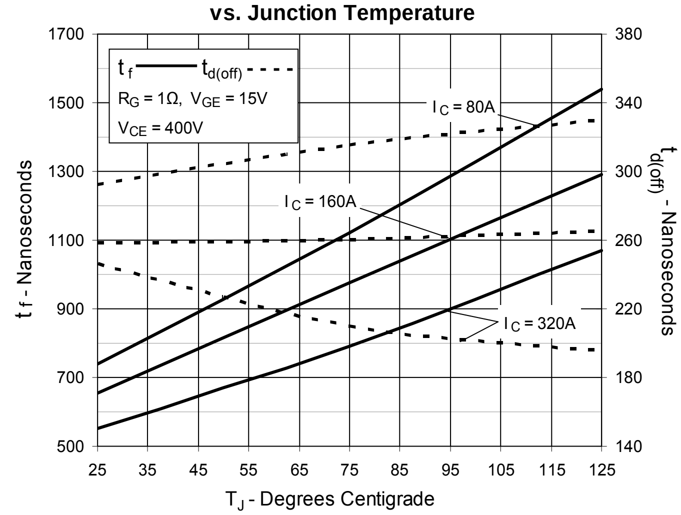


Fig. 15. Resistive Turn-off Switching Times vs. Collector Current

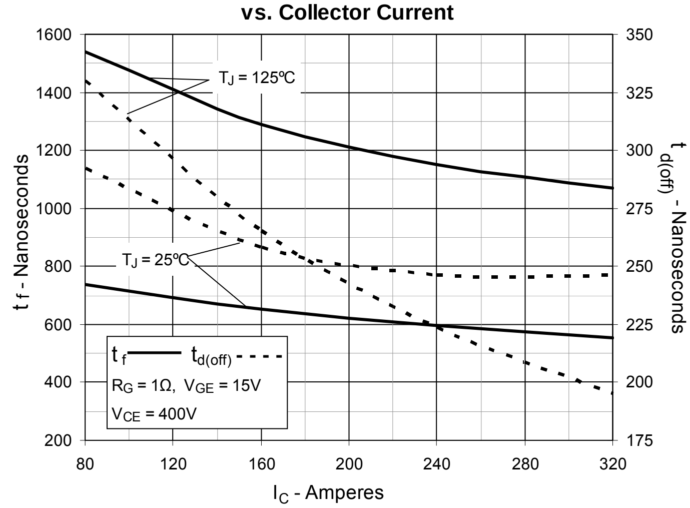


Fig. 16. Resistive Turn-off Switching Times vs. Gate Resistance