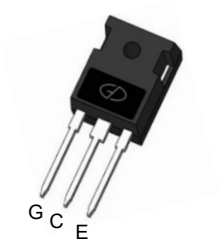
80A,700V Insulated Gate Bipolar Transistor

Features

- Trench FS technology offering
- High speed switching
- Low gate charge and VCE(sat)
- High ruggedness, temperature stable behavior
- Maximum junction temperature 175°C



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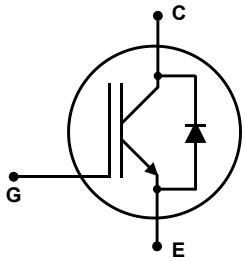
Applications

- Solar Inverters
- Uninterruptible power supplies
- Motor drives
- Air condition



Absolute Maximum Ratings (@T_j=25°C unless otherwise noted)			
Parameter	**Symbol**	**Ratings**	**Unit**
Collector-Emitter Voltage	V_{CES}	700	V
Gate- Emitter Voltage	V_{GES}	±30	V
Collector Current	I_C	160	A
Collector Current @TC = 100 °C		80	
Pulsed Collector Current, tp limited by Tjmax	I_{Cpuls}	320	A
Diode Continuous Forward Current @T_C = 25 °C	I_F	160	A
Diode Continuous Forward Current @T_C = 100 °C		80	
Power Dissipation @ TC = 25°C	P_D	469	W
Power Dissipation @ TC = 100°C		234	W
Operating Junction	T_J	-55 to +175	˚C
Storage Temperature Range	T_{STG}	-55 to +175	˚C

Thermal Characteristics			
Parameter	**Symbol**	**Max**	**Unit**
Thermal Resistance ,Junction-to-Ambient	$R_{\theta JA}$	40	°C/W
Thermal Resistance Junction-to-Case for IGBT	$R_{\theta JC}$	0.32	°C/W
Thermal Resistance Junction-to-Case for Diode	$R_{\theta JC}$	0.44	°C/W

Electrical Characteristics (@T_j=25°C unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector-Emitter Breakdown Voltage	$V_{(BR)CES}$	V_{GE}=0V,I_{CE}=1mA	700	--	--	V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=80A,V_{GE}=15V	--	1.6	1.85	V
Gate Threshold Voltage	$V_{GE(th)}$	I_C=250uA,V_{CE}=V_{GE}	4.5	--	6.5	V
Collector-Emitter Leakage Current	I_{CES}	V_{GE} =0V,V_{CE}=700V	--	--	1	μA
Gate to Emitter Reverse Leakage	I_{GES}	V_{GE}=20V,V_{CE} =0V	--	--	100	nA
		V_{GE}=-20V,V_{CE} =0V	--	--	-100	
Input capacitance	C_{ies}	V_{GS} = 0V,V_{DS} = 25V f = 1MHz	--	7278	--	pF
Output capacitance	C_{oes}		--	248	--	
Reverse transfer capacitance	C_{res}		--	151	--	
Turn-on delay time	$t_{d(on)}$	V_{CC}=400V,I_C=80A, V_{GE}=0/15V, Rg=10Ω	--	56	--	ns
Rise time	t_r		--	82	--	
Turn-Off delay time	$t_{d(off)}$		--	318	--	
Fall time	t_f		--	52	--	
Turn-On Switching Loss	E_{on}		--	3.73	--	mJ
Turn-Off Switching Loss	E_{off}		--	1.72	--	
Total Switching Loss	E_{ts}		--	5.45	--	
Total Gate Charge	Q_g	V_{CC}=480V,I_C=80A, V_{GE}=15V	--	220	--	nC
Gate to Emitter Charge	Q_{ge}		--	50	--	
Gate to Collector Charge	Q_{gc}		--	92	--	
Short circuit collector current Max.1000 short circuits Time between short circuits: ≥1.0s	$I_{C(SC)}$	V_{GE}=15V,V_{CC}≤400V, t_{sc}≤7μs	--	660	--	A

Electrical Characteristics of the Diode (@T_j=25°C unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Diode Forward Voltage	V_{FM}	I_F=80A	--	1.72	3	V
Reverse Recovery Time	t_{rr}	I_F=80A,V_R=400V VGE=0/15V	--	162	--	ns
Reverse Recovery Charge	Q_{rr}		--	1.53	--	μC
Diode Peak Reverse Recovery Current	I_{RRM}		--	16.3	--	A

Ratings and Characteristics Curves

(T_A = 25℃ unless otherwise noted)

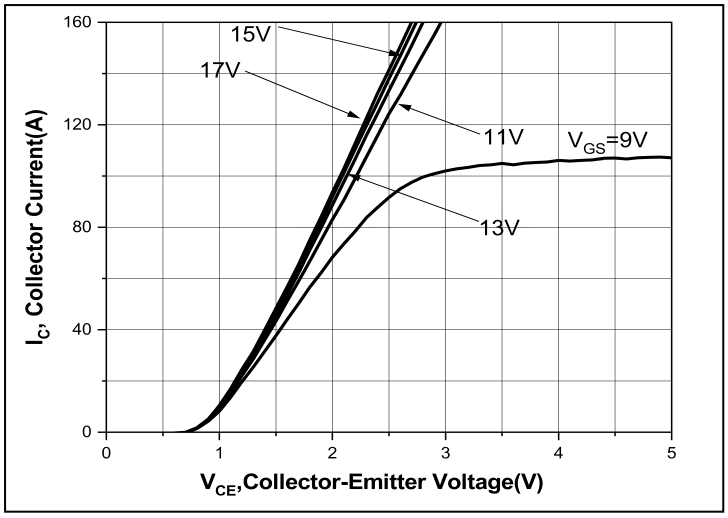


Figure1. Typical Output Characteristics

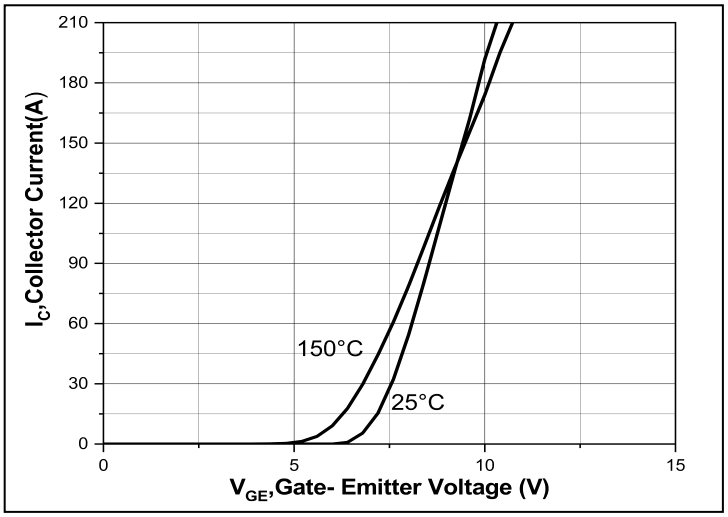


Figure2. Typical Transfer Characteristics

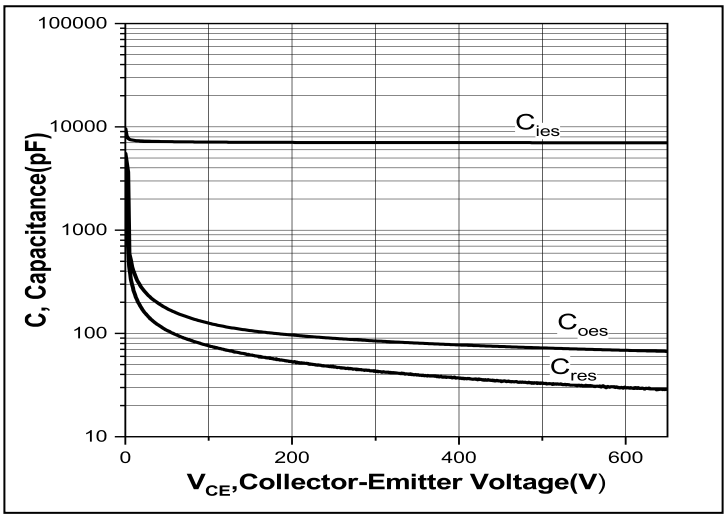


Figure3.Typical Capacitance

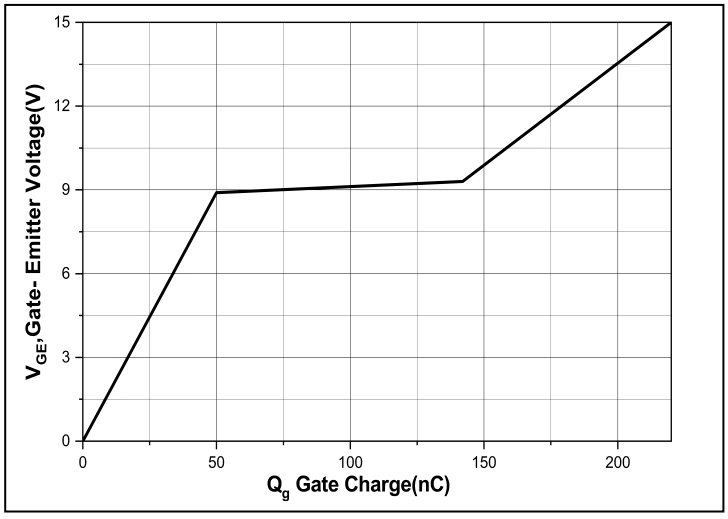


Figure4. Typical Gate Charge

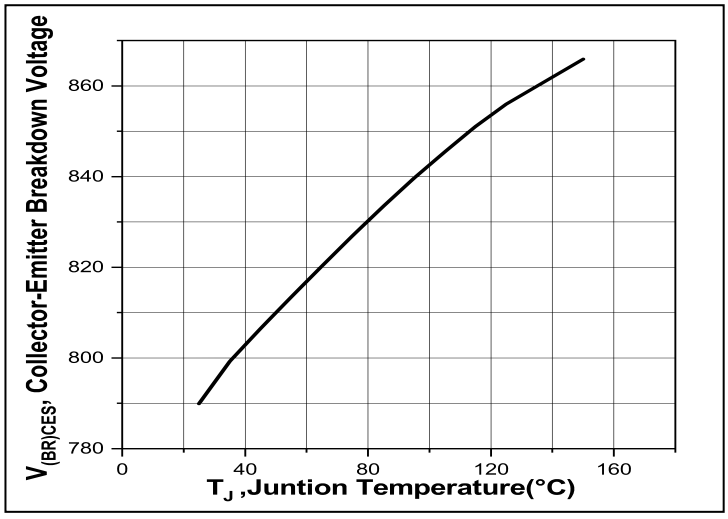


Figure5.Collector-Emitter Breakdown Voltage vs. Temperature

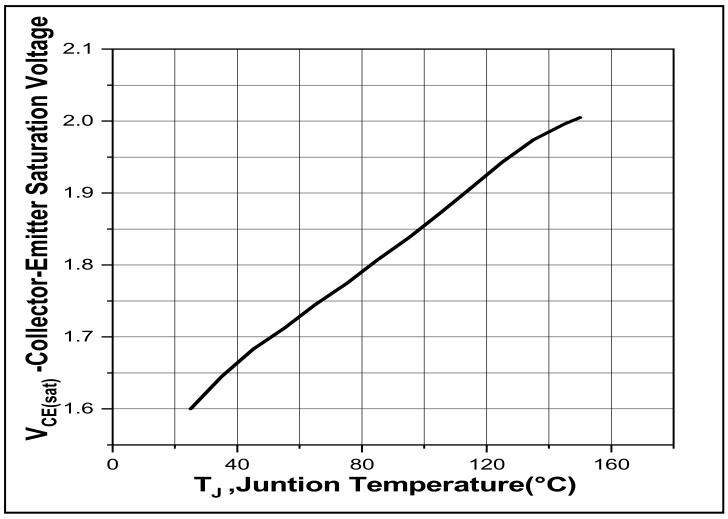


Figure6. Collector-Emitter Saturation Voltage vs. Temperature

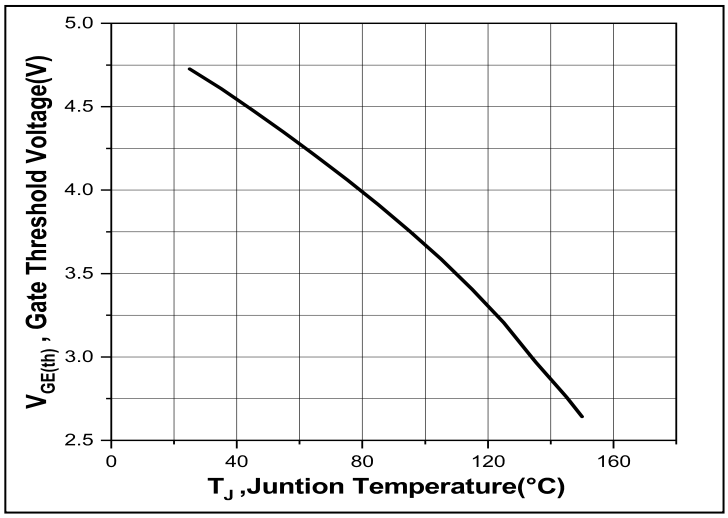


Figure7.Gate Threshold Voltage vs. Temperature

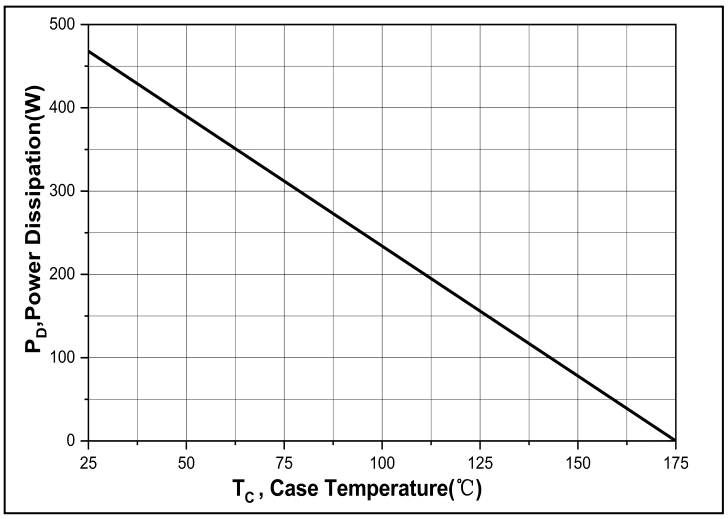


Figure8. Power Dissipation vs. Case Temperature

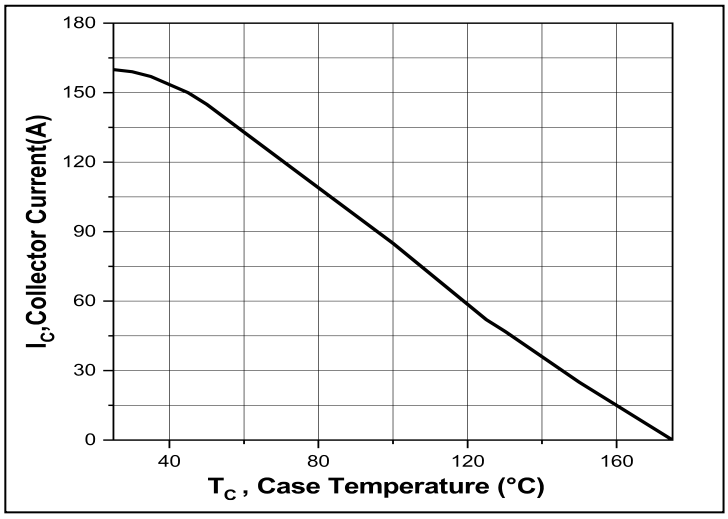


Figure9. Collector Current vs. Temperature

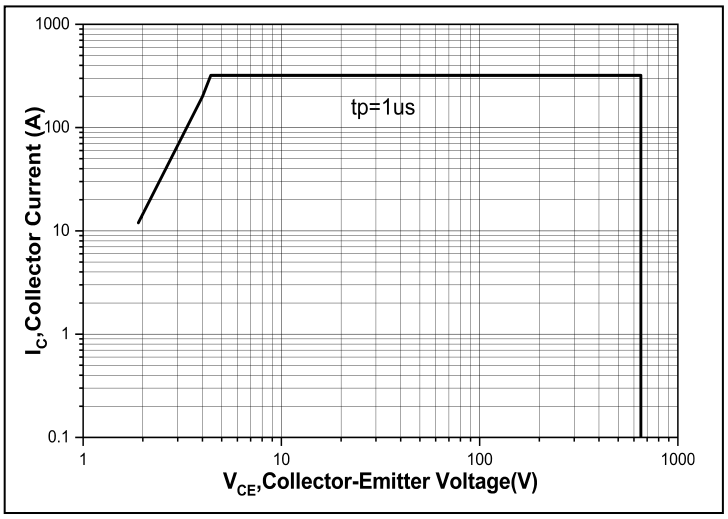


Figure10. Forward Bias Safe Operating Area

Package Outline Dimensions (Unit: millimeters)

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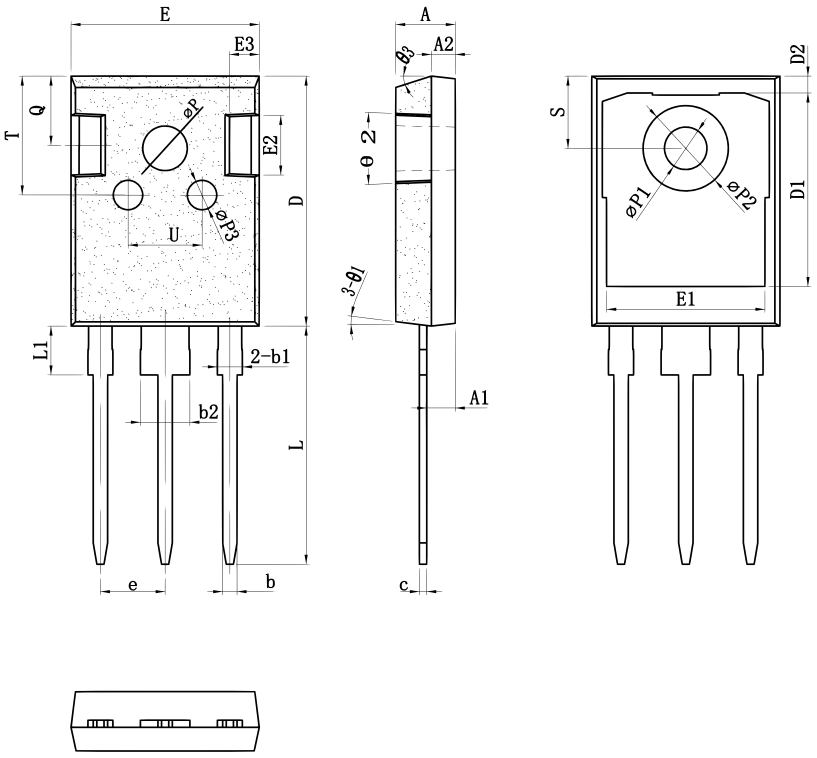
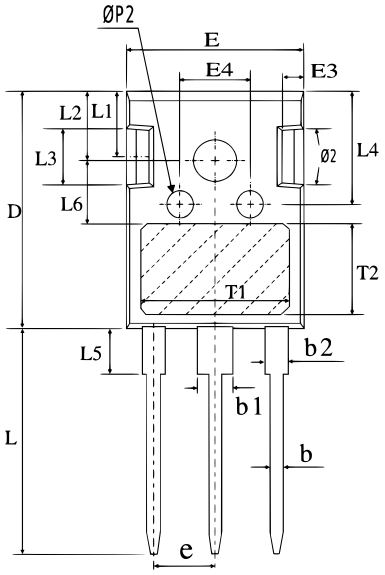
Option B:

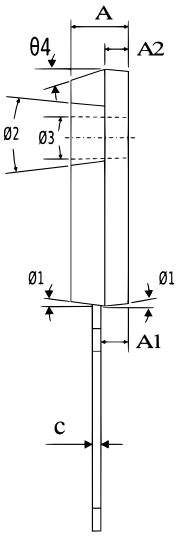


SYMBOL	mm		
	MIN	NOM	MAX
✱A	4.90	5.00	5.10
✱A1	2.31	2.41	2.51
A2	1.90	2.00	2.10
✱b	1.15	1.20	1.25
✱b1	1.95	2.10	2.25
✱b2	2.95	3.10	3.25
✱c	0.55	0.60	0.65
✱D	20.90	21.00	21.10
D1	16.35	16.55	16.75
D2	1.05	1.20	1.35
✱E	15.70	15.80	15.90
E1	13.10	13.25	13.40
E2	4.90	5.00	5.10
E3	2.40	2.50	2.60
✱e	5.40	5.44	5.48
✱L	19.80	19.98	20.15
✱L1	–	–	4.30
✱ ΦP	3.60	3.70	3.80
✱ ΦP1	3.45	3.55	3.65
ΦP2	7.03	7.18	7.33
ΦP3	2.40	2.50	2.60
Q	5.60	5.80	6.00
✱S	6.05	6.15	6.25
T	9.80	10.00	10.20
U	6.00	6.20	6.40
θ1	5°	7°	9°
θ2	1°	3°	5°
θ3	13°	15°	17°

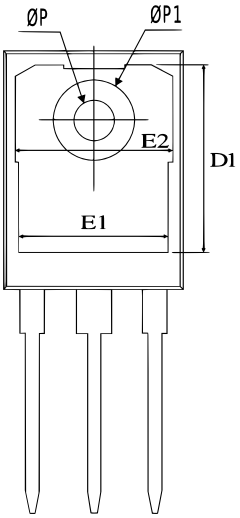
Option H:



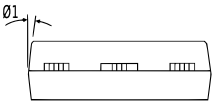
TOP VIEW



SIDE VIEW



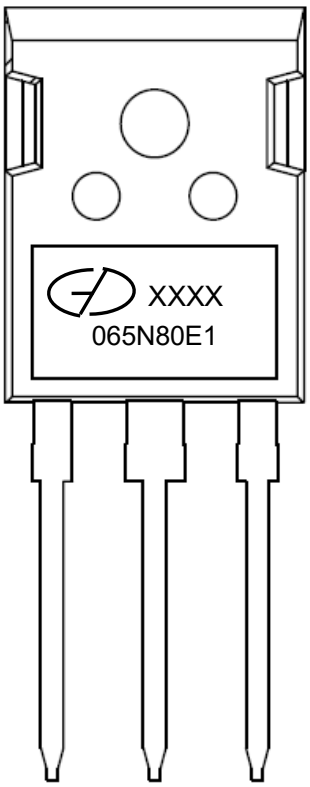
BOTTOM VIEW



SIDE VIEW

SYMBOL	MIN	NOM	MAX
A	4.80	5.00	5.20
A1	2.20	2.40	2.60
A2	1.85	2.00	2.15
b	1.10	1.20	1.30
b1	2.80	3.00	3.20
b2	1.80	2.00	2.20
C	0.52	0.62	0.72
D	20.35	20.65	20.95
D1	16.35	16.55	16.75
E	15.50	15.80	16.10
E1	13.10	13.30	13.50
E2	13.80	14.00	14.20
E3	1.45	1.60	1.75
E4	6.00	6.20	6.40
L	19.80	20.00	20.20
L1	5.88	5.98	6.08
L2	5.88	5.98	6.08
L3	4.90	5.00	5.10
L4	9.70	9.80	9.90
L5	4.10	4.30	4.50
Ø1	4°	7°	10°
Ø2	11°	14°	17°
Ø3	1°	--	2°
Ø4	10°	15°	20°
ØP	3.35	3.60	3.85
ØP1	--	--	7.30
ØP2	2.25	2.50	2.75
e	5.44BSC		
T1	12.80REF		
T2	7.80REF		
L6	5.50REF		

Marking Outline



Part Name: GIT065N80E1

1. Logo Mark:
2. P/N Mark: 065N80E1
3. Date Code: XXXX

Revision History

Version	Date	Major Changes
Rev.A	2025.01.15	Official Release

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