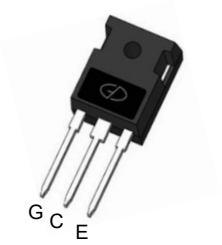
50A,700V Insulated Gate Bipolar Transistor

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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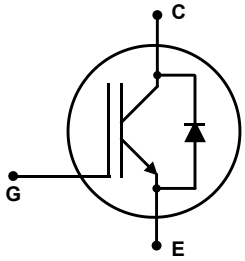
Applications

- 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	100	A
Collector Current @TC = 100 °C		50	
Pulsed Collector Current, tp limited by Tjmax	I_{Cpuls}	200	A
Diode Continuous Forward Current @T_C = 25 °C	I_F	100	A
Diode Continuous Forward Current @T_C = 100 °C		50	
Power Dissipation @ TC = 25°C	P_D	296	W
Power Dissipation @ TC = 100°C		150	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	$R_{\theta JC}$	0.5	°C/W
Thermal Resistance Junction-to-Case for Diode	$R_{\theta JC}$	0.63	°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=50A,V_{GE}=15V	--	1.75	1.9	V
Gate Threshold Voltage	$V_{GE(th)}$	I_C=250uA,V_{CE}=V_{GE}	4	--	6	V
Collector-Emitter Leakage Current	I_{CES}	V_{GE} =0V,V_{CE}=700V	--	--	1	μA
Gate to Emitter Reverse Leakage	I_{GES}	V_{GE}=25V,V_{CE} =0V	--	--	100	nA
		V_{GE}=-25V,V_{CE} =0V	--	--	-100	
Input capacitance	C_{ies}	V_{GS} = 0V,V_{DS} = 25V f = 1MHz	--	2750	--	pF
Output capacitance	C_{oes}		--	120	--	
Reverse transfer capacitance	C_{res}		--	68	--	
Turn-on delay time	$t_{d(on)}$	V_{CC}=400V,I_C=50A, V_{GE}=0/15V, Rg=10Ω	--	29	--	ns
Rise time	t_r		--	51	--	
Turn-Off delay time	$t_{d(off)}$		--	150	--	
Fall time	t_f		--	61	--	
Turn-On Switching Loss	E_{on}		--	1.18	--	mJ
Turn-Off Switching Loss	E_{off}		--	0.79	--	
Total Switching Loss	E_{ts}		--	1.97	--	
Total Gate Charge	Q_g	V_{CC}=480V,I_C=50A, V_{GE}=15V	--	155	--	nC
Gate to Emitter Charge	Q_{ge}		--	35	--	
Gate to Collector Charge	Q_{gc}		--	65	--	
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}≤5μs	--	340	--	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=50A	--	1.77	2.5	V
Reverse Recovery Time	t_{rr}	I_F =50A, di/dt=200A/μs,	--	83	--	ns
Reverse Recovery Charge	Q_{rr}		--	0.79	--	μC
Diode Peak Reverse Recovery Current	I_{RRM}		--	18.2	--	A

Ratings and Characteristics Curves

(T_A = 25℃ unless otherwise noted)

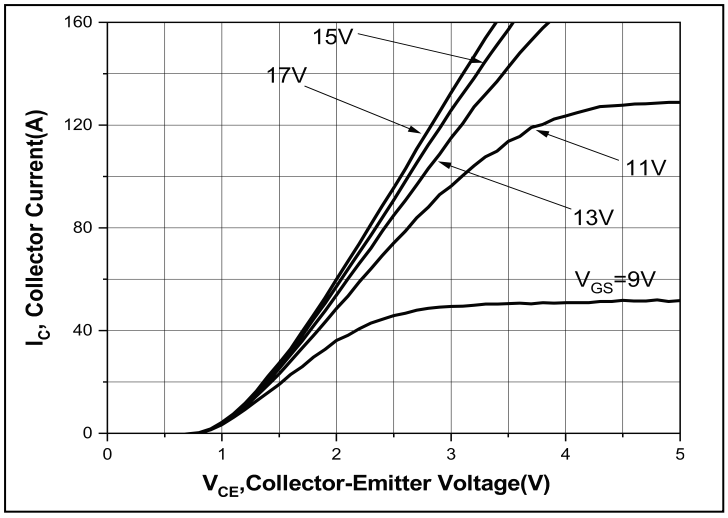


Figure1. Typical Output Characteristics

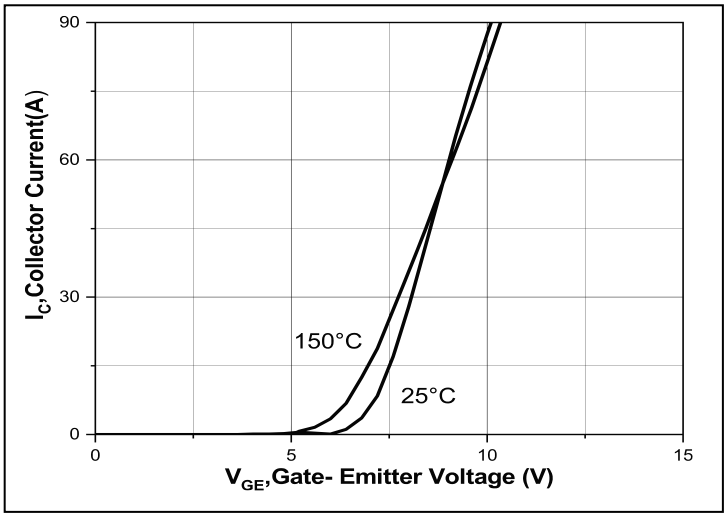


Figure2. Typical Transfer Characteristics

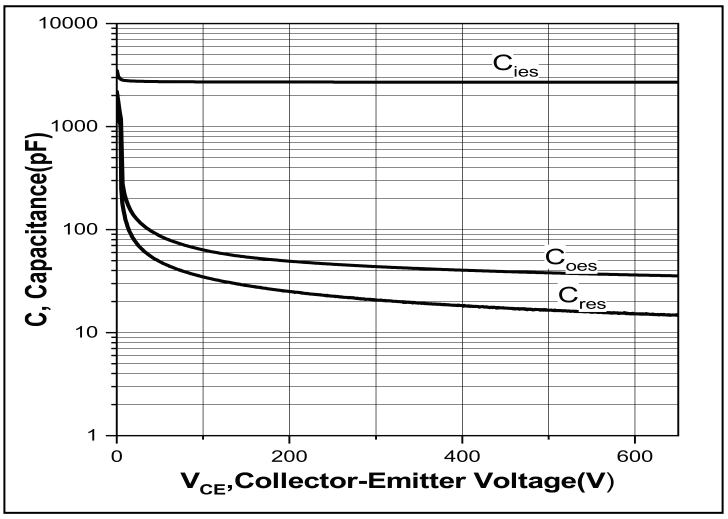


Figure3.Typical Capacitance

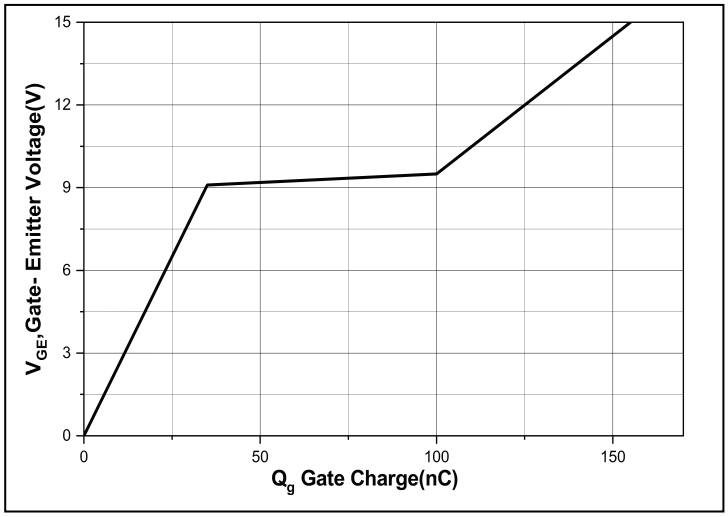


Figure4. Typical Gate Charge

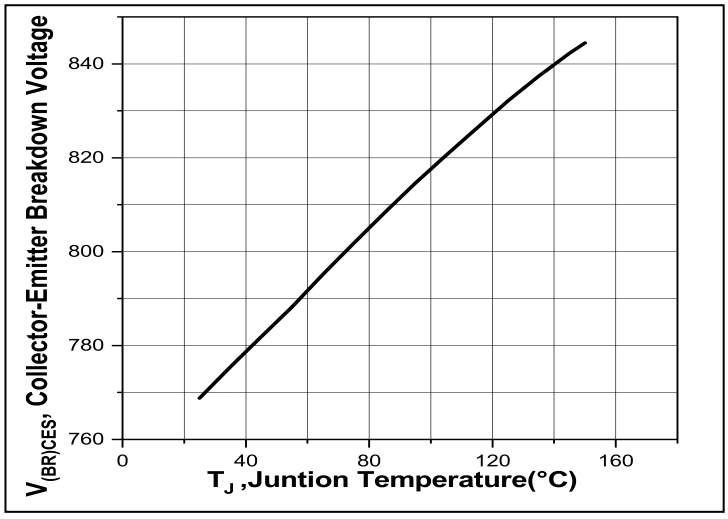


Figure5.Collector-Emitter Breakdown Voltage vs. Temperature

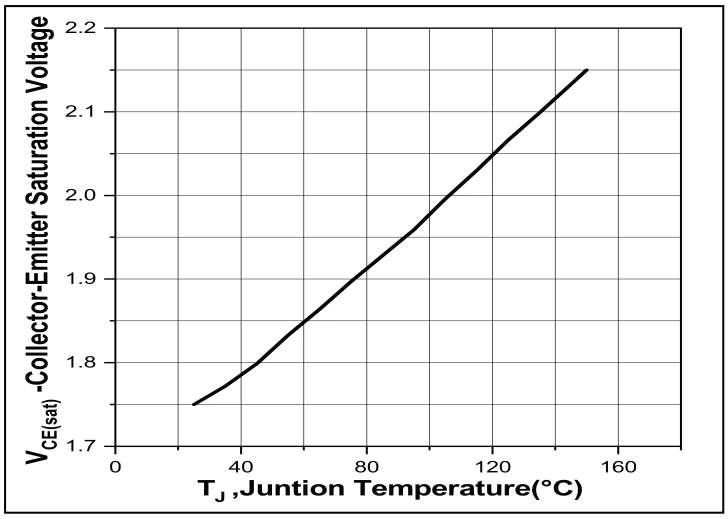


Figure6. Collector-Emitter Saturation Voltage vs. Temperature

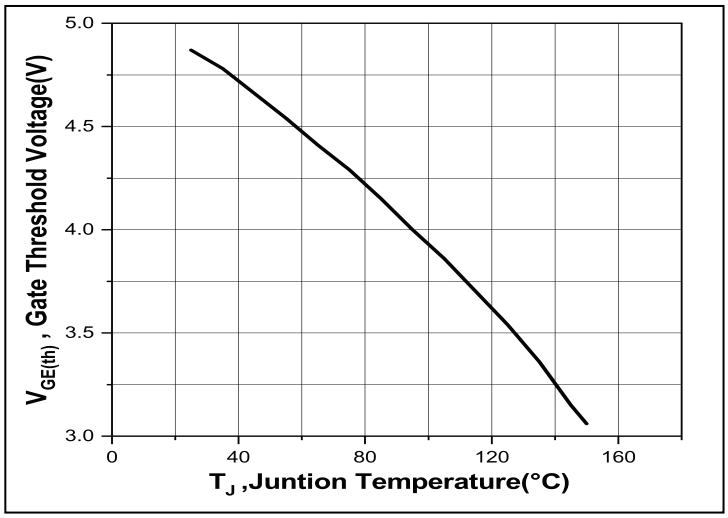


Figure7.Gate Threshold Voltage vs. Temperature

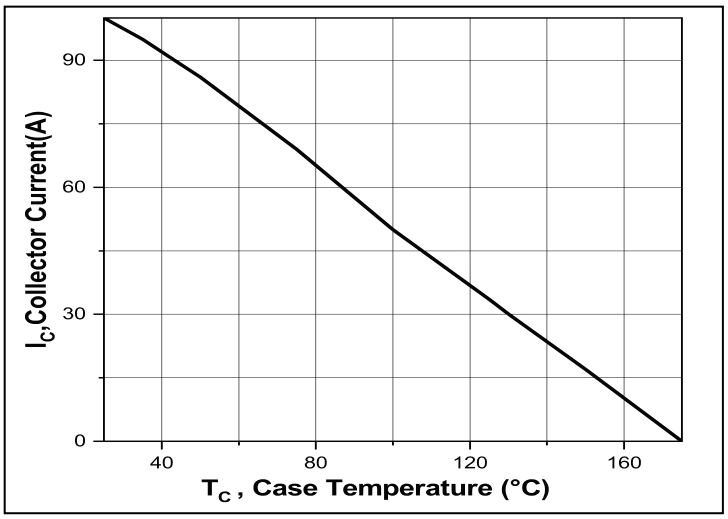


Figure8. Collector Current vs. Temperature

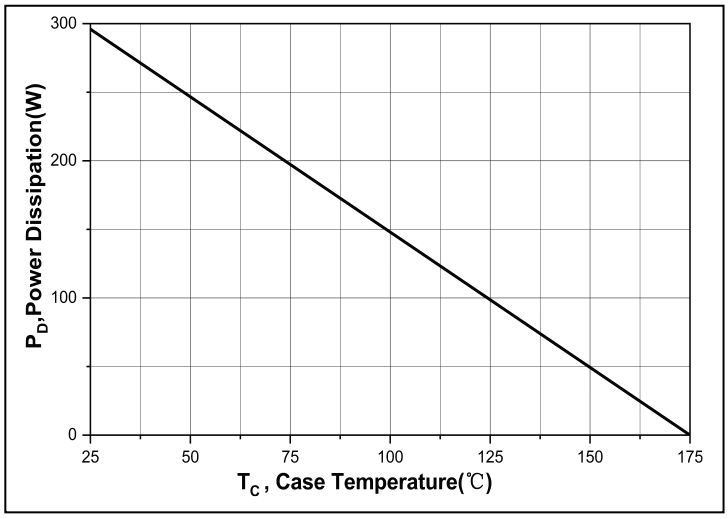


Figure9. Power Dissipation vs. Case Temperature

Package Outline Dimensions (Unit: millimeters)

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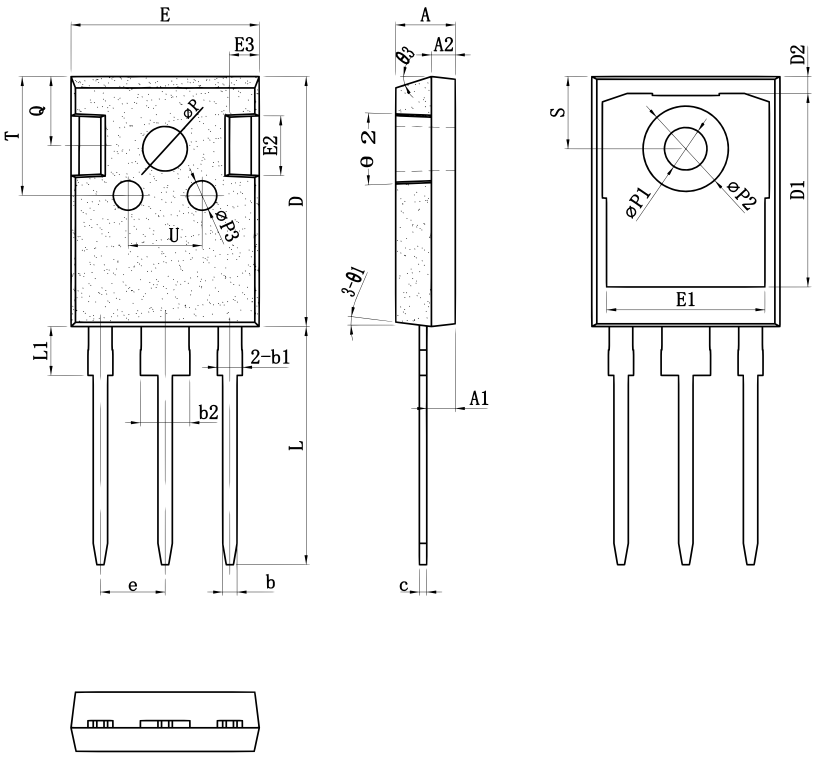
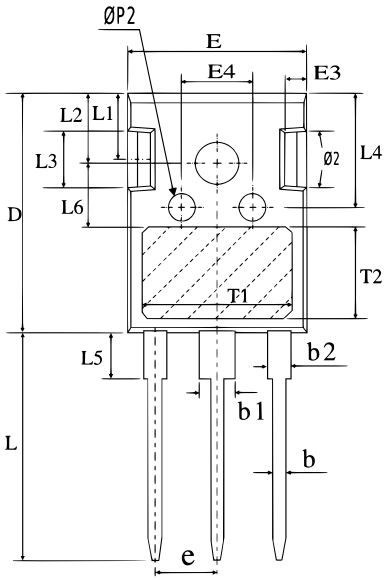
Option B:

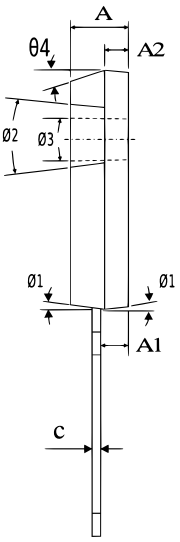


SYMBOL	mm		
	MIN	NOM	MAX
*A	4.90	5.00	5.10
*A1	2.31	2.41	2.51
A2	1.90	2.00	2.10
*b	1.15	1.20	1.25
*b1	1.95	2.10	2.25
*b2	2.95	3.10	3.25
*c	0.55	0.60	0.65
*D	20.90	21.00	21.10
D1	16.35	16.55	16.75
D2	1.05	1.20	1.35
*E	15.70	15.80	15.90
E1	13.10	13.25	13.40
E2	4.90	5.00	5.10
E3	2.40	2.50	2.60
*e	5.40	5.44	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°

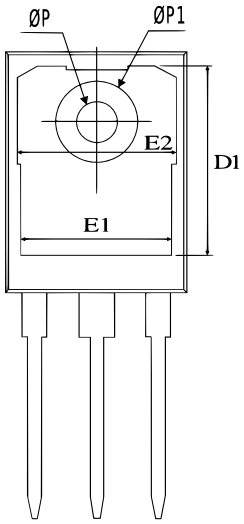
Option H:



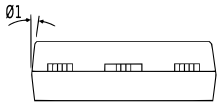
TOP VIEW



SIDE VIEW



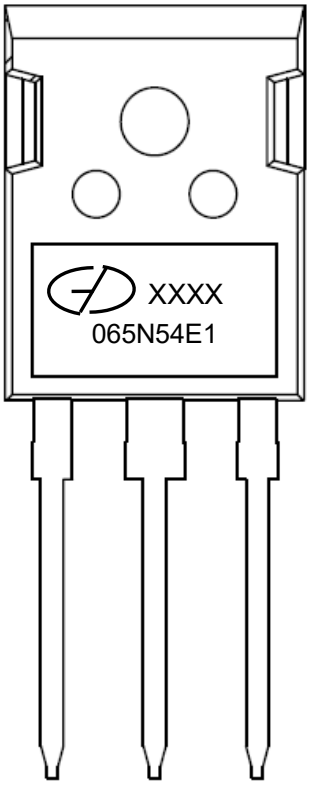
BOTTOM VIEW



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: GIT065N54E1

1. Logo Mark:
2. P/N Mark: 065N54E1
3. Date Code: XXXX

Revision History

Version	Date	Major Changes
Rev.A	2025.01.17	Official Release

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