● General Description

Through advanced trench and field cutoff technology to provide very low $V_{CE(sat)}$, low gate charge, and excellent switching performance.

● Features

■Very low $V_{CE(sat)}$

■Low switching power loss

■Low switching surge and noise

■Low thermal resistance

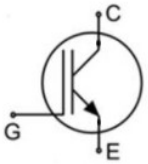
●Application

■Energy Generation

■Industrial power supplies

■Welding

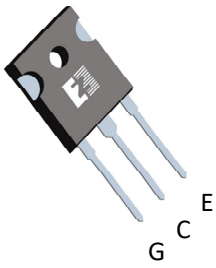
● Product Summary



V_{CE}= 650V

$V_{CE(sat)}$= 1.5V

I_C= 30A



TO-247

RoHS

REACH COMPLIANT

HF

●Ordering Information:

Part NO.	ZMBG30N065T1AC
Marking	BG30N065T1A
Packing information	TUBE BULK
Basic ordering unit (pcs)	600

●Absolute Maximum Ratings (T_C=25℃)

Parameter	Symbol	Conditions	Value	Unit
Collector-emitter voltage	V_{CE}		650	V
Gate-emitter voltage	V_{GE}		±20	V
Collector current	I_C	T_C=25℃	60	A
	I_C	T_C=100℃	30	A
Pulsed collector current	I_{CM}	T_C=25℃	90	A
Total power Dissipation	P_D	T_C=25℃	250	W
Total Power Dissipation	P_D	T_A=25℃	3.8	W
Operating Junction Temperature	T_J		-55 to +175	℃
Storage Temperature	T_{STG}		-55 to +175	℃

●Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case IGBT	R_{thJC}		-	0.6	°C/W
Thermal resistance, junction-ambient	R_{thJA} ②		-	40	°C/W
Soldering temperature（total time<10s)	Tsold		-	260	°C

●Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Collector-emitter breakdown voltage	$V_{(BR)CES}$	V_{GE} =0V, I_C =250uA	650			V
Collector-emitter saturation voltage	$V_{CE(sat)}$	V_{GE} = 15 V, I_C = 30 A		1.5	2.1	V
		V_{GE} = 15 V, I_C = 30 A, T_J = 125 °C		2		
		V_{GE} = 15 V, I_C = 30 A, T_J = 175 °C		2.15		
Gate-emitter threshold voltage	$V_{GE(th)}$	V_{CE} =V_{GE}, I_C =4mA	4.0	5.0	6.0	V
Zero gate voltage collector current	I_{CES}	V_{GE}=0V, V_{CE}=650V			50.0	uA
Gate-emitter leakage current	I_{GES}	V_{GE}=±20V, V_{CE} = 0V			100	nA

●Dynamic characteristics , at T_J=25℃

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Input capacitance	C_{ies}	f = 1MHz, V_{CE}=25V	-	2440	-	pF
Output capacitance	C_{oes}		-	163	-	
Reverse transfer capacitance	C_{res}		-	30	-	
Total gate charge	Q_g	V_{CC}=520V, I_C=30A, V_{GE}=15V	-	82	-	nC
Gate-emitter charge	Q_{ge}		-	18	-	nC
Gate-collector charge	Q_{gc}		-	31	-	nC

SwitchingCharacteristic, at T_J=25℃

Turn-on delay time	$t_{D(on)}$	T_J=25°C, V_{CC}=400V, I_C=30A, V_{GE}=-15/15V, R_g=10Ω, L=105uH	-	20	-	ns
Turn-on rise time	t_r		-	23	-	ns
Turn-off delay time	$t_{D(off)}$		-	65	-	ns
Turn-off fall time	t_f		-	47	-	ns
Turn-on energy	E_{on}		-	730	-	uJ
Turn-off energy	E_{off}		-	435	-	uJ
Total switching energy	E_{ts}		-	1165	-	uJ

SwitchingCharacteristic, at T_J=175℃

Turn-on delay time	$t_{D(on)}$	T_J=175°C, V_{CC}=400V, I_C=30A, V_{GE}=-15/15V, R_g=10Ω, L=105uH	-	19	-	ns
Turn-on rise time	t_r		-	25	-	ns
Turn-off delay time	$t_{D(off)}$		-	70	-	ns
Turn-off fall time	t_f		-	133	-	ns
Turn-on energy	E_{on}		-	846	-	uJ
Turn-off energy	E_{off}		-	849	-	uJ
Total switching energy	E_{ts}		-	1960	-	uJ

Fig.1 Gate-Charge characteristics

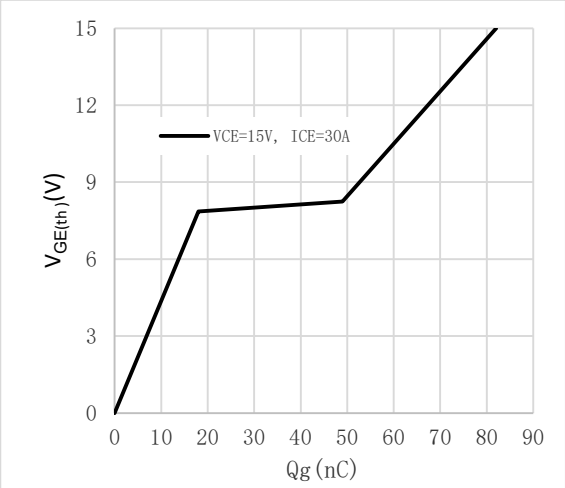


Fig.2 Capacitance characteristics

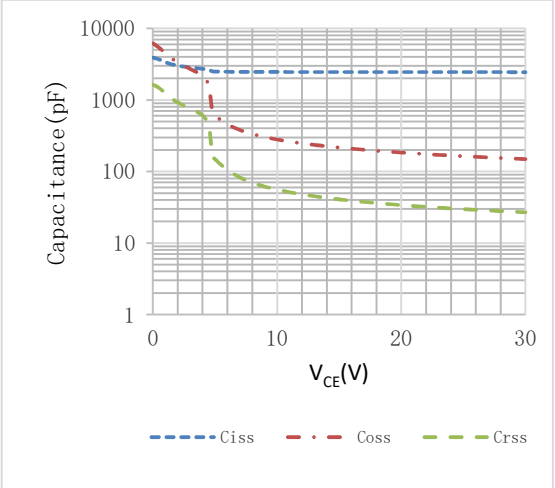


Fig.3 Power dissipation

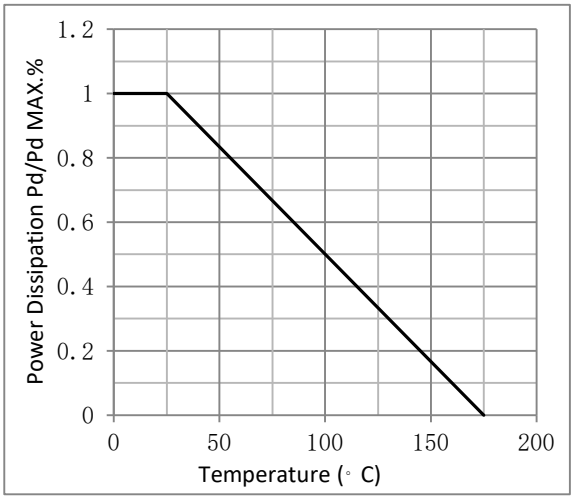


Fig.4 Typical output characteristics

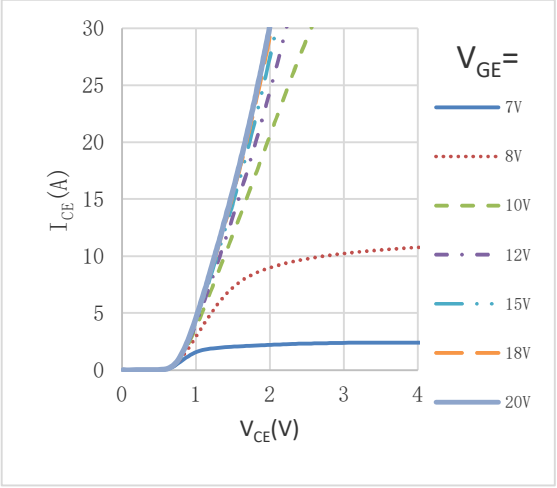


Fig.5 Threshold voltage V.S junction temperature

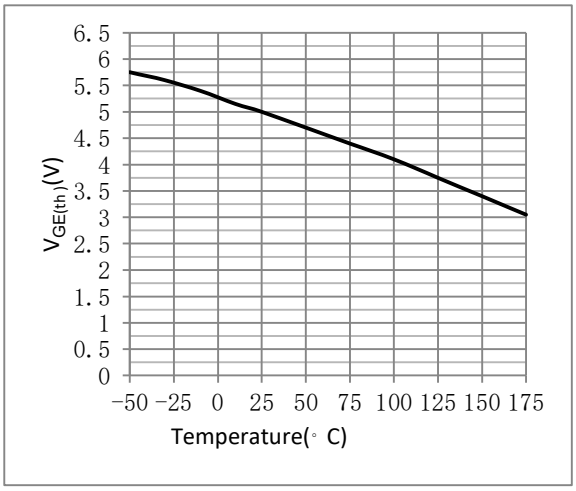


Fig.6 IC vs. Junction Temperature③

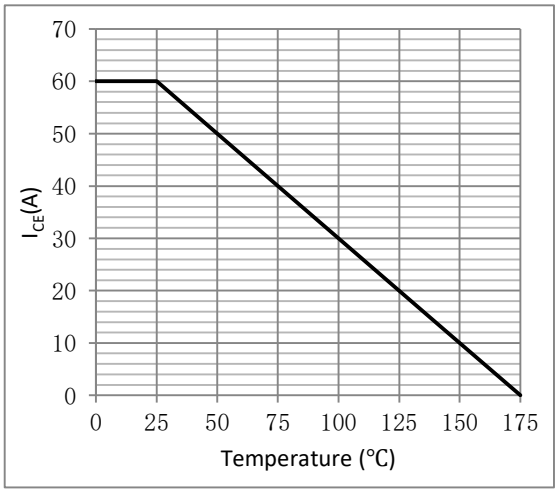


Fig.7 Collector-Emitter VS gate source voltage

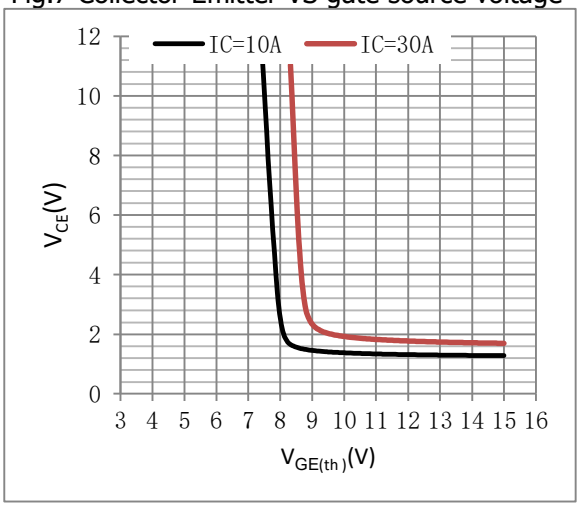


Figure 8. Transfer characteristics

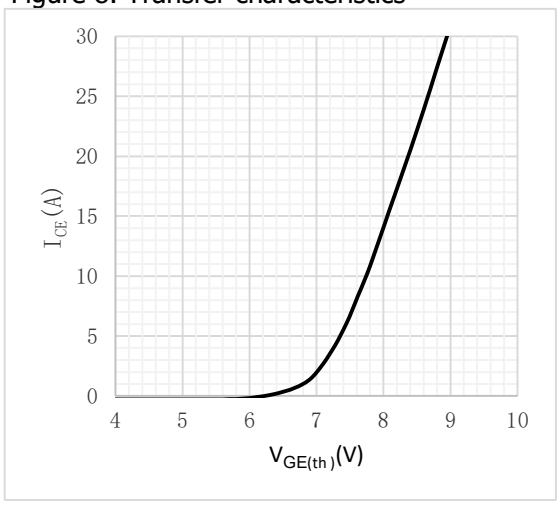


Fig.9 Safe operating area

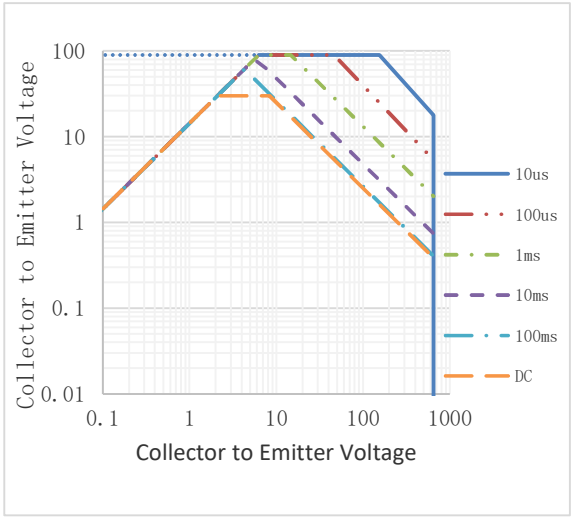
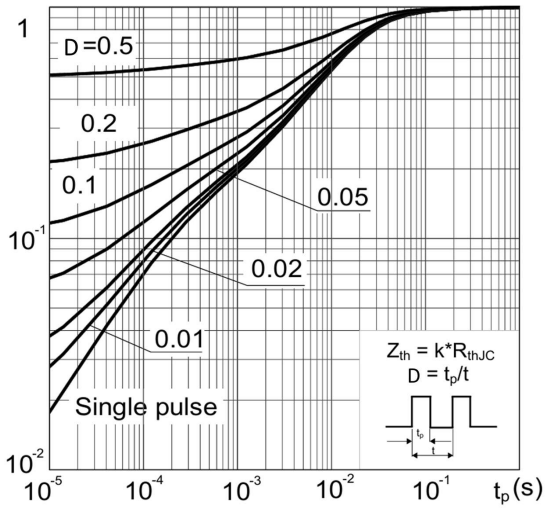
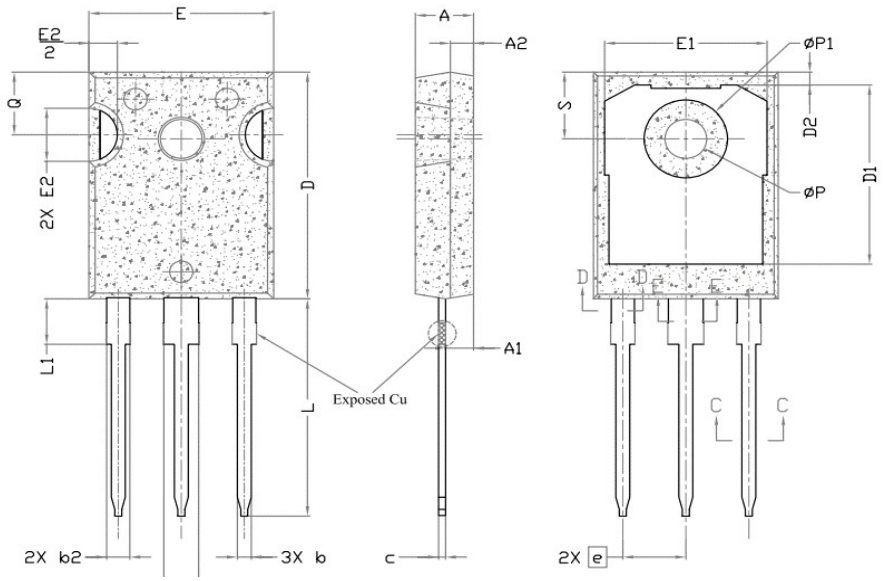


Fig.10 Max transient thermal impedance for IGBT



●TO-247 Package Outline



SYMBOL	DIMENSIONS			NOTES
	MIN.	NOM.	MAX.	
A	4.83	5.02	5.21	
A1	2.29	2.41	2.55	
A2	1.50	2.00	2.49	
b	1.12	1.20	1.33	
b1	1.12	1.20	1.28	
b2	1.91	2.00	2.39	6
b3	1.91	2.00	2.34	
b4	2.87	3.00	3.22	6, 8
b5	2.87	3.00	3.18	
c	0.55	0.60	0.69	6
c1	0.55	0.60	0.65	
D	20.80	20.95	21.10	4
D1	16.25	16.55	17.65	5
D2	0.51	1.19	1.35	
E	15.75	15.94	16.13	4
E1	13.46	14.02	14.16	5
E2	4.32	4.91	5.49	3
e	5.44BSC			
L	19.81	20.07	20.32	
L1	4.10	4.19	4.40	6
ØP	3.56	3.61	3.65	7
ØP1	7.19REF.			
Q	5.39	5.79	6.20	
S	6.04	6.17	6.30	

Note:

① Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%, Accumulation time ≤50 hours; For DC， the following test conditions can be passed: VGE=20V/-10V, Tj=175℃, t=1000 hours；

② Practically the current will be limited by PCB, thermal design and operating temperature. VGE=15V.

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Revision History

Version	Date	Change
A	2024/11/26	New