

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

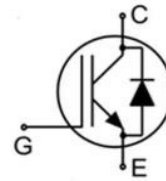
Ordering Information:

Part NO.	ZMBG75N120HD1ACP
Marking	BG75N120HD1A
Packing information	TUBE BULK
Basic ordering unit (pcs)	600

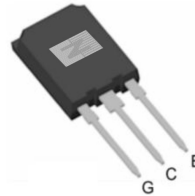
Absolute Maximum Ratings ($T_C=25^\circ\text{C}$)

Parameter	Symbol	Conditions	Value	Unit
Collector-emitter voltage	V_{CE}		1200	V
Gate-emitter voltage	V_{GE}		± 30	V
Collector current	I_C	$T_C=25^\circ\text{C}$	150	A
	I_C	$T_C=100^\circ\text{C}$	75	A
Pulsed collector current	I_{CM}	$T_C=25^\circ\text{C}$	225	A
Diode forward current	I_F	$T_C=25^\circ\text{C}$	150	A
	I_F	$T_C=100^\circ\text{C}$	75	A
	$I_{F,pulse}$	$T_C=25^\circ\text{C}$	225	A
Total power Dissipation	P_D	$T_C=25^\circ\text{C}$	652	W
Total Power Dissipation	P_D	$T_A=25^\circ\text{C}$	3.0	W
Operating Junction Temperature	T_J		-55 to +175	$^\circ\text{C}$
Storage Temperature	T_{STG}		-55 to +175	$^\circ\text{C}$

Product Summary



$V_{CE} = 1200\text{V}$
 $V_{CE(sat)} = 1.7\text{V}$
 $I_C = 75\text{A}$



TO-247P-3



•Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case IGBT	R_{thJC}	-	-	0.23	°C/W
Thermal resistance, junction - case diode	R_{thJC}	-	-	0.55	°C/W
Thermal resistance, junction-ambient	$R_{thJA}^{②}$	-	-	50	°C/W
Soldering temperature (total time<10s)	T_{sold}	-	-	260	°C

•Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Collector-emitter breakdown voltage	$V_{(BR)CES}$	$V_{GE}=0V, I_C=250\mu A$	1200	-	-	V
Collector-emitter saturation voltage	$V_{CE(sat)}$	$V_{GE}=15V, I_C=75A$	-	1.7	2.1	V
		$V_{GE}=15V, I_C=75A, T_J=175^\circ C$	-	2.1	-	
Gate-emitter threshold voltage	$V_{GE(th)}$	$V_{CE}=V_{GE}, I_C=1.5mA$	4.5	5.5	6.5	V
Forward on-voltage	V_F	$IF=75A, T_J=25^\circ C$		2.1	2.5	V
		$IF=75A, T_J=125^\circ C$		1.8	2.2	
		$IF=75A, T_J=175^\circ C$		1.6	2.0	
Zero gate voltage collector current	I_{CES}	$V_{GE}=0V, V_{CE}=1200V, T_J=25^\circ C$	-	-	10.0	μA
Zero gate voltage collector current	I_{CES}	$V_{GE}=0V, V_{CE}=1200V, T_J=175^\circ C$	-	-	10.0	mA
Gate-emitter leakage current	I_{GES}	$V_{GE}=\pm 30V, V_{CE}=0V$	-	-	100	nA

•Dynamic characteristics , at $T_J=25^\circ C$

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Input capacitance	C_{ies}	$f=1MHz, V_{CE}=600V$	-	21920	-	pF
Output capacitance	C_{oes}		-	65	-	
Reverse transfer capacitance	C_{res}		-	37	-	
Total gate charge	Q_g	$V_{CC}=600V, I_C=75A, V_{GE}=15V$	-	691	-	nC
Gate-emitter charge	Q_{ge}		-	142	-	nC
Gate-collector charge	Q_{gc}		-	239	-	nC

SwitchingCharacteristic, at $T_J=25^\circ C$

Turn-on delay time	$t_{D(on)}$	$T_J=25^\circ C, V_{CC}=600V, I_C=75A, V_{GE}=-4/15V, R_g=6.2\Omega, L=200\mu H$	-	86	-	ns
Turn-on rise time	t_r		-	124	-	ns
Turn-off delay time	$t_{D(off)}$		-	222	-	ns
Turn-off fall time	t_f		-	143	-	ns
Turn-on energy	E_{on}		-	3.2	-	mJ
Turn-off energy	E_{off}		-	4.4	-	mJ
Total switching energy	E_{ts}		-	7.6	-	mJ

Diode switching characteristics (inductive load)

Reverse recovery time	t_{rr}	$I_F=75A, V_R=600V,$ $di/dt=-950 A/\mu s$ $T_J=25\text{ }^{\circ}C$	-	264	-	ns
Reverse recovery charge	Q_{rr}		-	5.2	-	μC
Reverse recovery current	I_{rrm}		-	35	-	A
Reverse recovery energy	E_{rr}		-	1	-	mJ

Fig.1 Gate-Charge characteristics

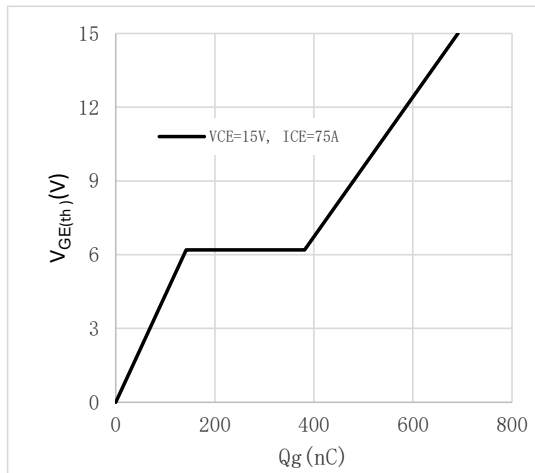


Fig.2 Capacitance characteristics

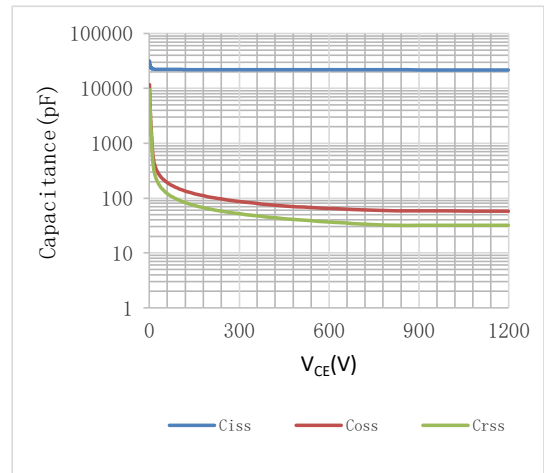


Fig.3 Power dissipation

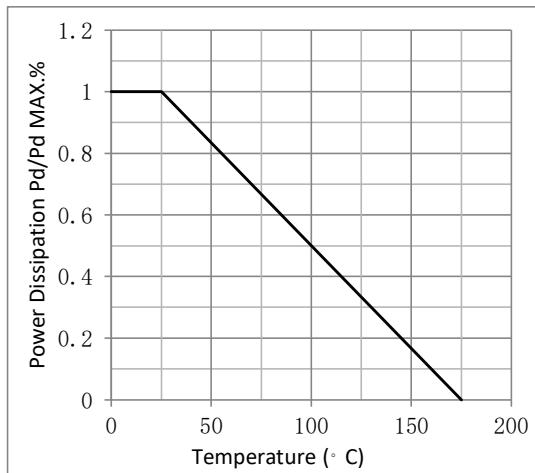


Fig.4 Typical output characteristics

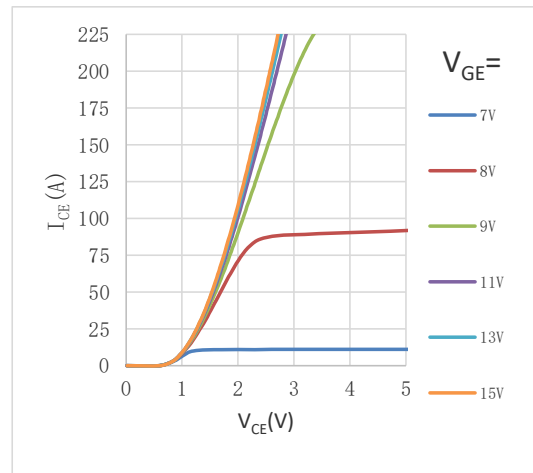


Fig.5 Threshold voltage V.S junction temperature

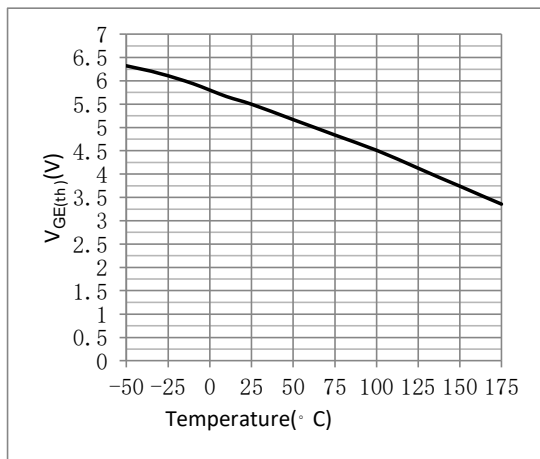


Fig.6 IC vs. Junction Temperature^③

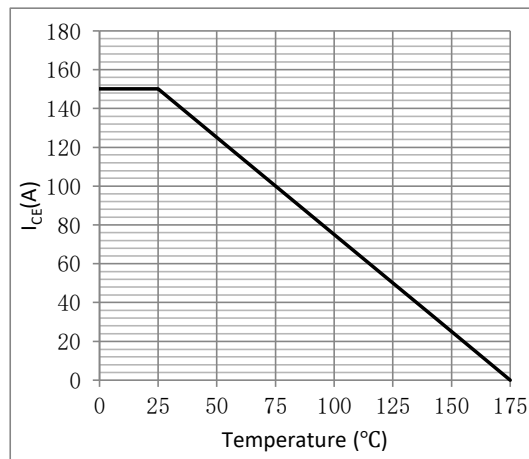


Fig.7 Collector-Emitter VS gate source voltage

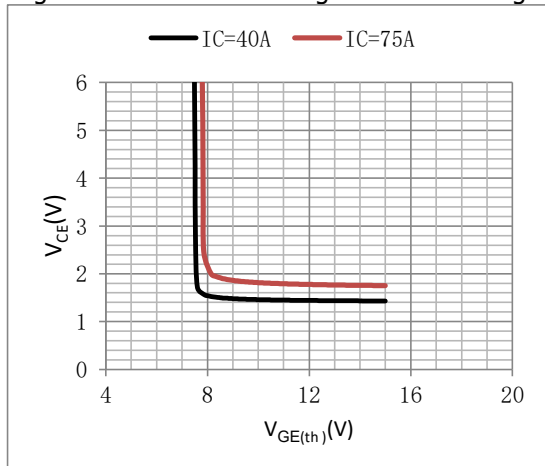
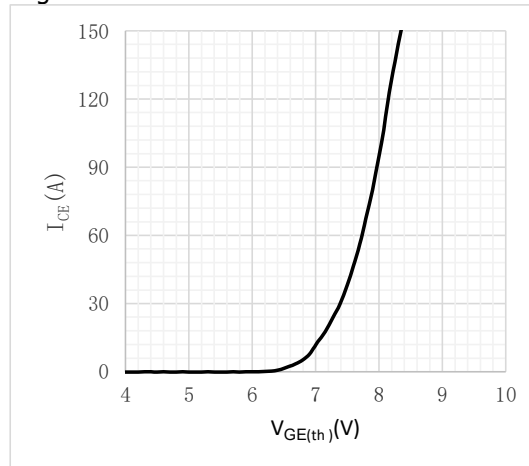
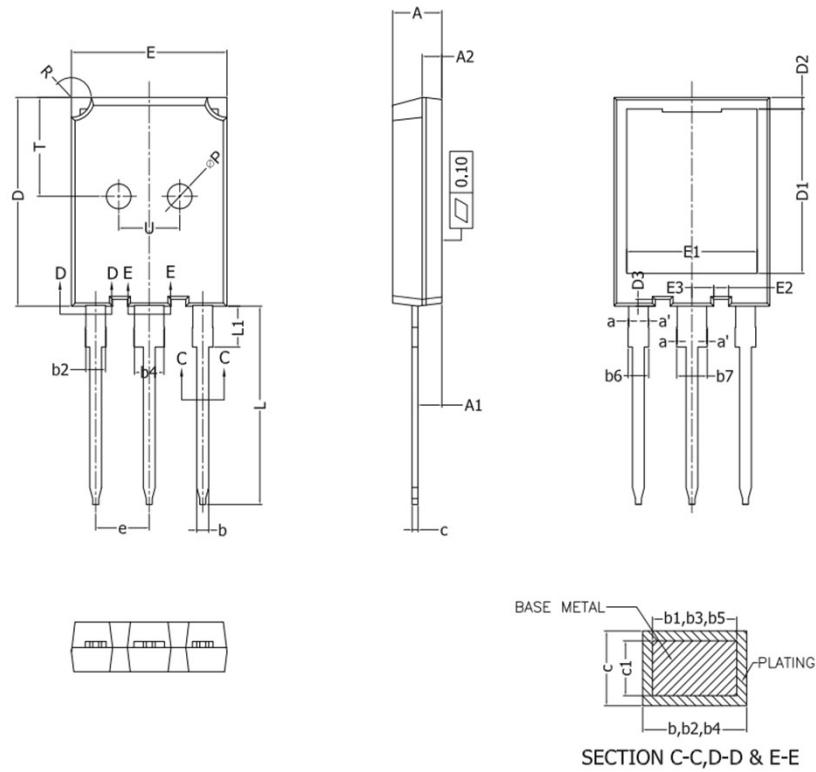


Figure 8. Transfer characteristics



•TO-247P-3 Package Outline



COMMON DIMENSIONS
(UNITS OF MEASURE =MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	4.90	5.00	5.10
A1	2.31	2.41	2.51
A2	1.90	2.00	2.10
a	0	---	0.15
a'	0	---	0.15
b	1.16	---	1.26
b1	1.15	1.2	1.22
b2	1.96	---	2.06
b3	1.95	2.00	2.02
b4	2.96	---	3.06
b5	2.96	3.00	3.02
b6	---	---	2.25
b7	---	---	3.25
c	0.59	---	0.66
c1	0.59	0.60	0.66
D	20.90	21.00	21.10
D1	16.25	16.55	16.85
D2	1.05	1.17	1.35
D3	0.58	---	0.78
E	15.70	15.80	15.90
E1	13.10	13.30	13.50
E2	1.40	1.50	1.60
E3	2.12	2.22	2.32
e	5.436 BSC		
L	19.80	19.95	20.10
L1	---	---	4.30
P	2.40	2.50	2.60
R	1.90	---	2.10
T	9.80	---	10.20
U	6.00	---	6.40

Note:

① Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$, Accumulation time ≤ 50 hours; For DC , the following test conditions can be passed: $V_{GE}=20V/-10V$, $T_j=175^\circ\text{C}$, $t=1000$ hours;

② Practically the current will be limited by PCB, thermal design and operating temperature.
 $V_{GE}=15V$.

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Revision History

Version	Date	Change
A	2024/12/10	New