

BRGB75N65AHA

Rev.B Oct.-2025

描述 / Descriptions

TO-247 塑封封装绝缘栅双极晶体管。

Insulated-Gate Bipolar Transistor in a TO-247 Plastic Package

特征 / Features

650V , 75A

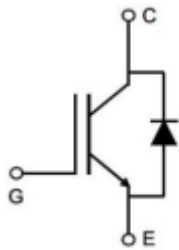
$V_{CE(SAT)} = 1.80V(\text{typ.}) @ V_{GE} = 15V, I_C = 75A$

用途 / Applications

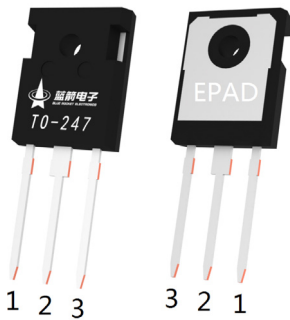
太阳能转换器、不间断电源、焊接转换器、中高范围开关频率转换器。

Solar Converters, Uninterrupted Power Supply, Welding Converters, Mid to High Range Switching Frequency Converters.

内部等效电路 / Equivalent Circuit



引脚排列 / Pinning



PIN1 : G

PIN 2、EPAD : C

PIN 3 : E

印章代码 / Marking

见印章说明。

See Marking Instructions.

极限参数 / Absolute Maximum Ratings($T_a=25^{\circ}\text{C}$)

参数 Parameter		符号 Symbol	数值 Rating	单位 Unit
Collector-Emitter Voltage		V_{CES}	650	V
Gate-Emitter Voltage		V_{GES}	± 30	V
Continuous Collector Current	$T_C=25^{\circ}\text{C}$	I_C	110	A
	$T_C=100^{\circ}\text{C}$		75	A
Pulsed Collector Current , Limited by T_{Jmax}		I_{CM}	300	A
Continuous Diode Forward Current	$T_C=25^{\circ}\text{C}$	I_F	110	A
	$T_C=100^{\circ}\text{C}$		75	A
Power Dissipation	$T_C=25^{\circ}\text{C}$	P_D	385	W
	$T_C=100^{\circ}\text{C}$		192	W
Operating Junction Temperature Range		T_J	-40 to +175	$^{\circ}\text{C}$
Storage Temperature Range		T_{STG}	-55 to +150	$^{\circ}\text{C}$
Maximum Junction-to-Ambient		$R_{\theta JA}$	40	$^{\circ}\text{C/W}$
Maximum IGBT Junction-to-Case		$R_{\theta JC}$	0.39	$^{\circ}\text{C/W}$
Maximum Diode Junction-to-Case		$R_{\theta JC}$	0.41	$^{\circ}\text{C/W}$

电性能参数 / Electrical Characteristics($T_c=25^{\circ}\text{C}$)

参数 Parameter	符号 Symbol	测试条件 Test Conditions	最小值 Min	典型值 Typ	最大值 Max	单位 Unit
Collector-Emitter Breakdown Voltage	BV_{CES}	$I_C=200\mu\text{A}$, $V_{GE}=0\text{V}$	650			V
Zero Gate Voltage Collector current	I_{CES}	$V_{CE}=650\text{V}$, $V_{GE}=0\text{V}$			75	μA
Gate-Emitter Leakage Current	I_{GES}	$V_{CE}=0\text{V}$, $V_{GE}=\pm 30\text{V}$			± 100	nA
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	$V_{CE}=V_{GE}$, $I_C=750\mu\text{A}$	3.2	4.0	4.8	V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$V_{GE}=15\text{V}$, $I_C=75\text{A}$		1.80	2.20	V
		$T_J=125^{\circ}\text{C}$		2.05		
Total Gate Charge	Q_g	$V_{GE}=15\text{V}$, $V_{CC}=520\text{V}$, $I_C=75\text{A}$		118		nC
Gate to Emitter Charge	Q_{ge}			32		
Gate to Collector Charge	Q_{gc}			30		

电性能参数 / Electrical Characteristics(Ta=25°C)

参数 Parameter	符号 Symbol	测试条件 Test Conditions	最小值 Min	典型值 Typ	最大值 Max	单位 Unit
Turn-On Delay Time	$t_{d(on)}$	$V_{GE}=15V, V_{CC}=400V$ $I_C=75A, R_G=8\Omega$ Inductive Load $T_C=25^\circ C$		32		ns
Turn-On Rise Time	t_r			91		ns
Turn-Off Delay Time	$t_{d(off)}$			152		ns
Turn-Off Fall Time	t_f			129		ns
Turn-On Energy	E_{on}			1.88		mJ
Turn-Off Energy	E_{off}			2.43		mJ
Total Switching Energy	E_{ts}			4.31		mJ
Input Capacitance	C_{ies}	$V_{GE}=0V, V_{CE}=25V$ $f=1MHz$		3781		pF
Output Capacitance	C_{oes}			355		pF
Reverse Transfer Capacitance	C_{res}			38		pF
Short Circuit Safe Operation Area	SCSOA	$V_{GE}=15V, V_{CC} \leq 400V,$ $T_{J,start} \leq 25^\circ C$	5			μs
Diode Forward Voltage	V_F	$I_F=75A$		$T_J=25^\circ C$ 1.80	2.2	V
				$T_J=150^\circ C$ 1.65		
Diode Reverse Recovery Time	T_{rr}	$V_R=400V, I_F=75A$ $dI_F/dt=500A/\mu s$ $T_C=25^\circ C$		136		ns
Diode Reverse Recovery Charge	Q_{rr}			1.2		μC
Diode Peak Reverse Recovery Current	I_{rm}			14		A

电参数曲线图 / Electrical Characteristic Curve

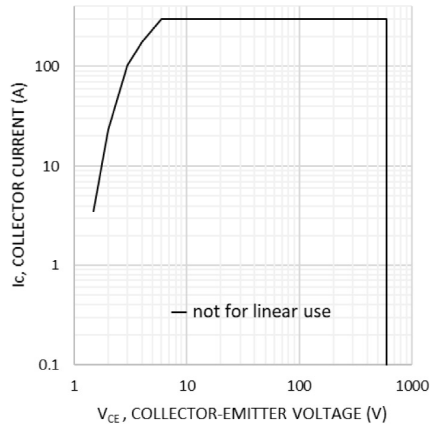


Fig. 1 Forward bias safe operating area (D=0, $T_C=25^\circ\text{C}$, $T_{vj}\leq 175^\circ\text{C}$; $V_{GE}=15\text{V}$. Recommended use at $V_{GE}\geq 7.5\text{V}$)

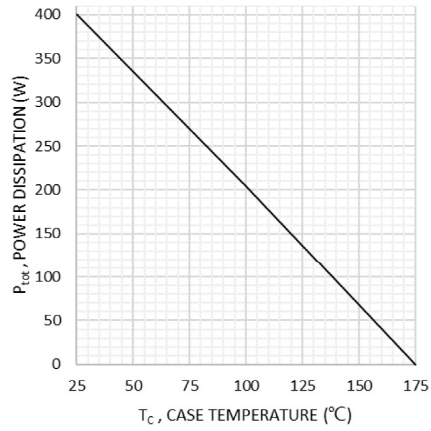


Fig. 2 Power dissipation as a function of case temperature ($T_{vj}\leq 175^\circ\text{C}$)

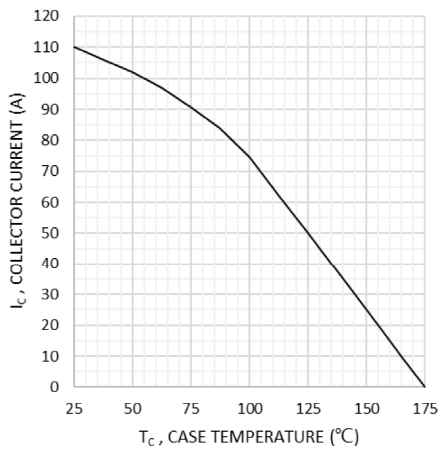


Fig. 3 Collector current as a function of case temperature ($V_{GE}\geq 15\text{V}$, $T_{vj}\leq 175^\circ\text{C}$)

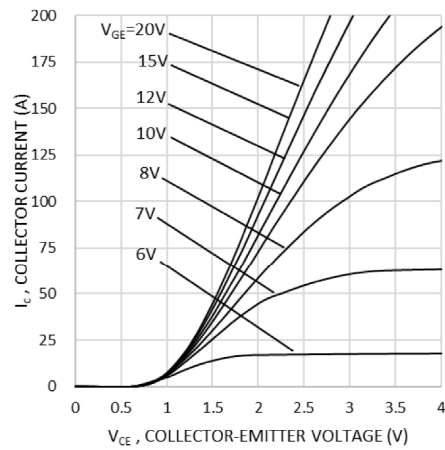


Fig. 4 Typical output characteristic ($T_{vj}=25^\circ\text{C}$)

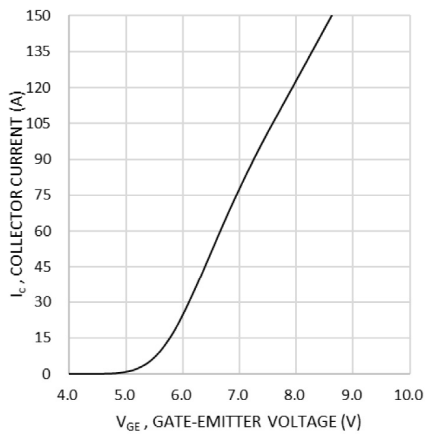


Fig. 5 Typical transfer characteristics ($V_{CE}=20\text{V}$)

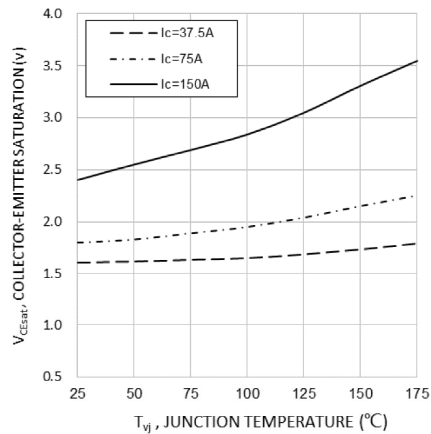


Fig. 6 Typical collector-emitter saturation voltage as a function of junction temperature ($V_{GE}=15\text{V}$)

电参数曲线图 / Electrical Characteristic Curve

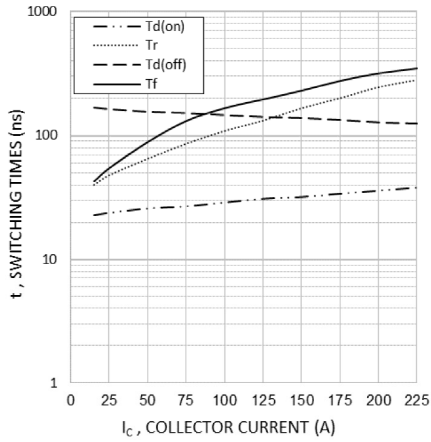


Fig. 7 Typical switching times as a function of collector current (inductive load, $T_{j1}=25^{\circ}\text{C}$, $V_{CE}=400\text{V}$, $V_{GE}=15/0\text{V}$, $r_G=8\Omega$)

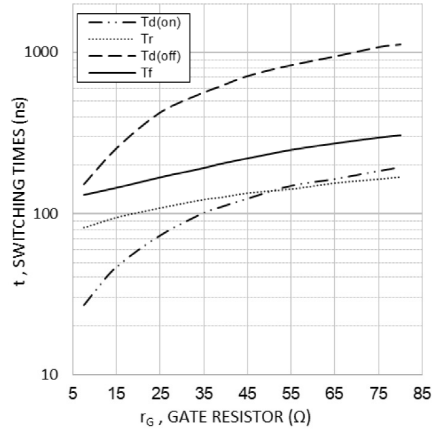


Fig. 8 Typical switching times as a function of gate resistance (inductive load, $T_{j1}=25^{\circ}\text{C}$, $V_{CE}=400\text{V}$, $V_{GE}=15/0\text{V}$, $I_C=75\text{A}$)

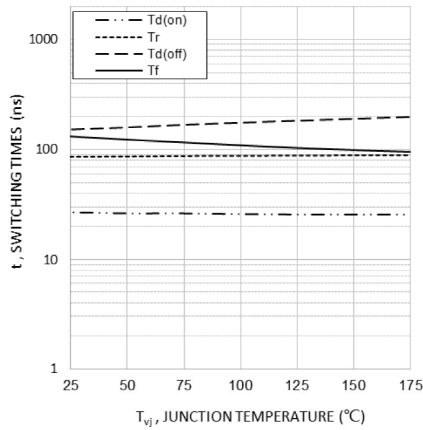


Fig. 9 Typical switching times as a function of junction temperature (inductive load, $V_{CE}=400\text{V}$, $V_{GE}=15/0\text{V}$, $I_C=75\text{A}$, $r_G=8\Omega$)

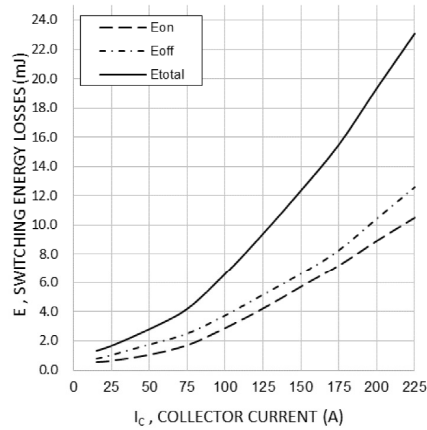


Fig. 10 Typical switching energy losses as a function of collector current (inductive load, $T_{j1}=25^{\circ}\text{C}$, $V_{CE}=400\text{V}$, $V_{GE}=15/0\text{V}$, $r_G=8\Omega$)

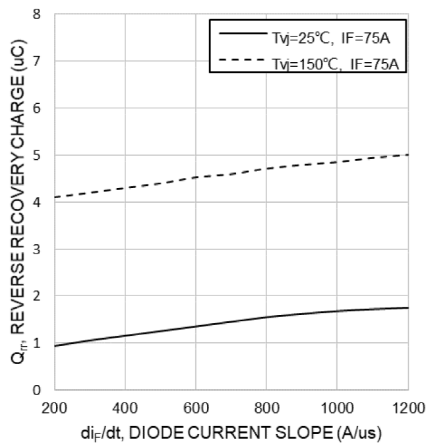


Fig. 11 Typical reverse recovery charge as a function of diode current slope ($V_R=400\text{V}$)

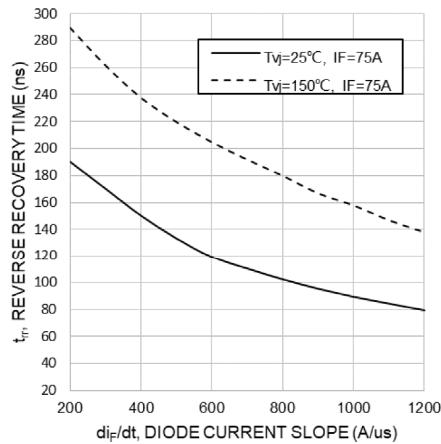


Fig. 12 Typical reverse recovery time as a function of diode current slope ($V_R=400\text{V}$)

电参数曲线图 / Electrical Characteristic Curve

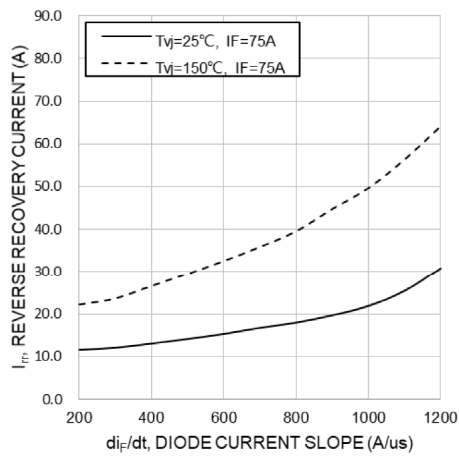


Fig. 13 Typical reverse recovery current as a function of diode current slope ($V_R=400V$)

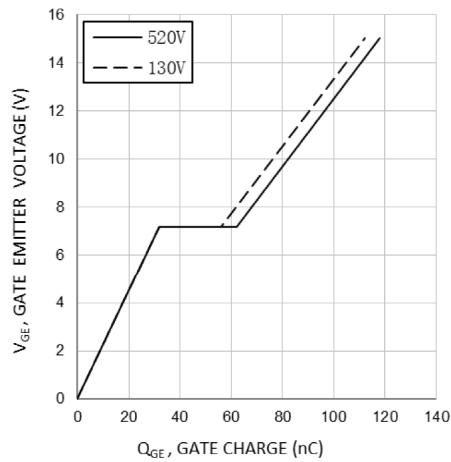


Fig. 14 Typical gate charge ($I_c=75A$)

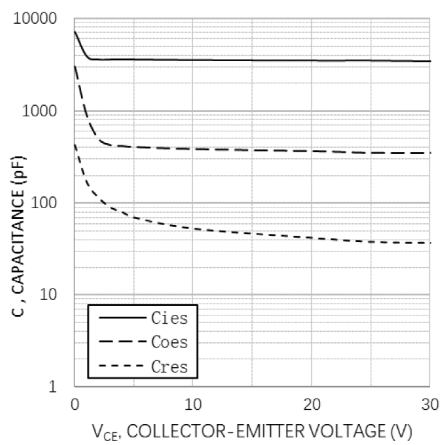


Fig. 15 Typical capacitance as a function of collector-emitter voltage ($V_{GE}=0V$, $f=1MHz$)

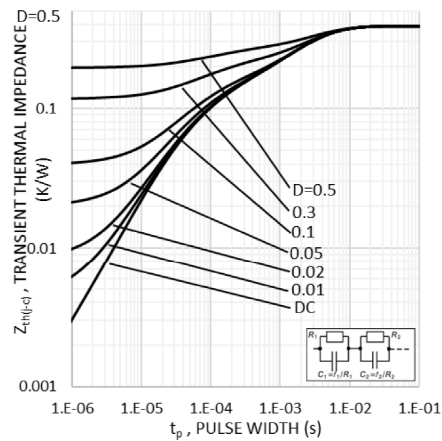
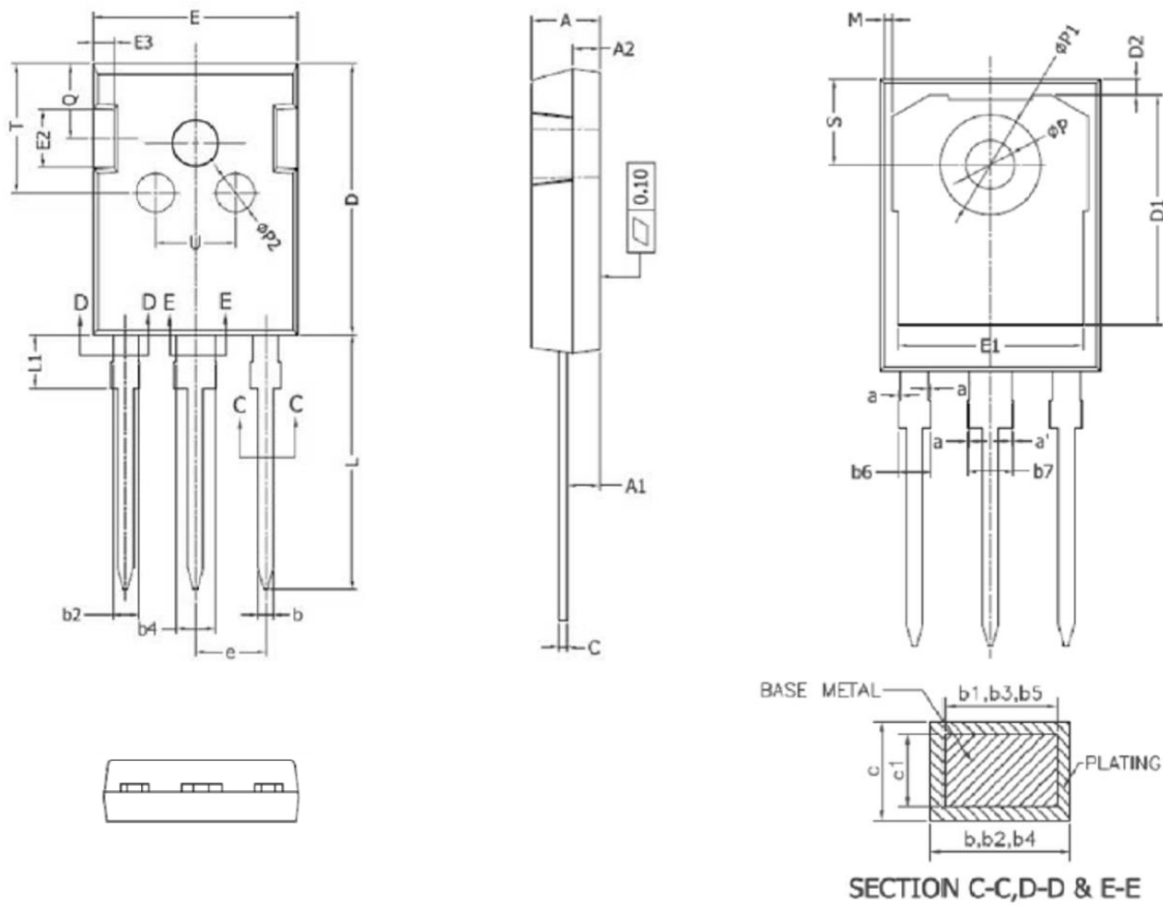


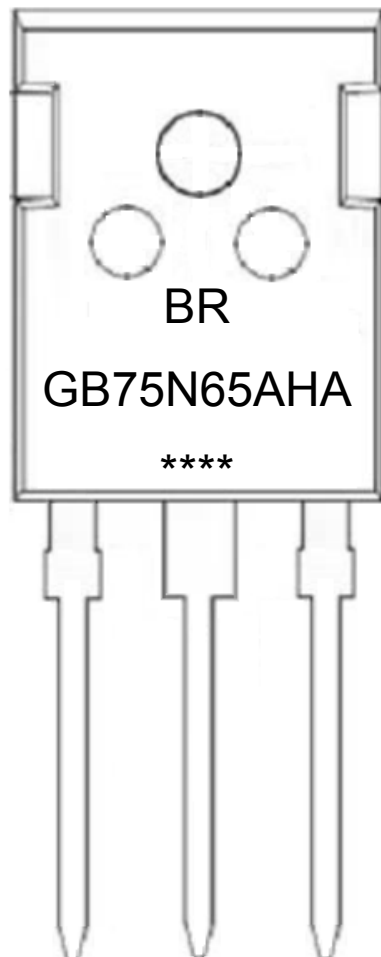
Fig. 16 IGBT transient thermal impedance ($D=t_p/T$)

外形尺寸图 / Package Dimensions



Symbol	Dimensions In Millimeters			Symbol	Dimensions In Millimeters		
	MIN.	NOM.	MAX.		MIN.	NOM.	MAX.
A	4.90	5.00	5.10	E	15.70	15.80	15.90
A1	2.31	2.41	2.51	E1	13.10	13.30	13.50
A2	1.90	2.00	2.10	E2	4.40	4.50	4.60
a	0.00	-	0.15	E3	1.50	1.60	1.70
a'	0.00	-	0.15	e	5.436 BSC		
b	1.16	-	1.26	L	19.80	19.92	20.10
b1	1.15	1.20	1.22	L1	-	-	4.30
b2	1.96	-	2.06	M	0.35	-	0.95
b3	1.95	2.00	2.02	P	3.40	3.50	3.60
b4	2.96	-	3.06	P1	7.00	-	7.40
b5	2.96	3.00	3.02	P2	2.40	2.50	2.60
b6	-	-	2.25	Q	5.60	-	6.00
b7	-	-	3.25	S	6.05	6.15	6.25
c	0.59	-	0.66	T	9.80	-	10.20
c1	0.58	0.60	0.62	U	6.00	-	6.40
D	20.90	21.00	21.10				
D1	16.25	16.55	16.85				
D2	1.05	1.17	1.35				

印章说明 / Marking Instructions



说明：

BR： 为公司代码

GB75N65AHA： 为型号代码

****： 为生产批号代码，随生产批号变化

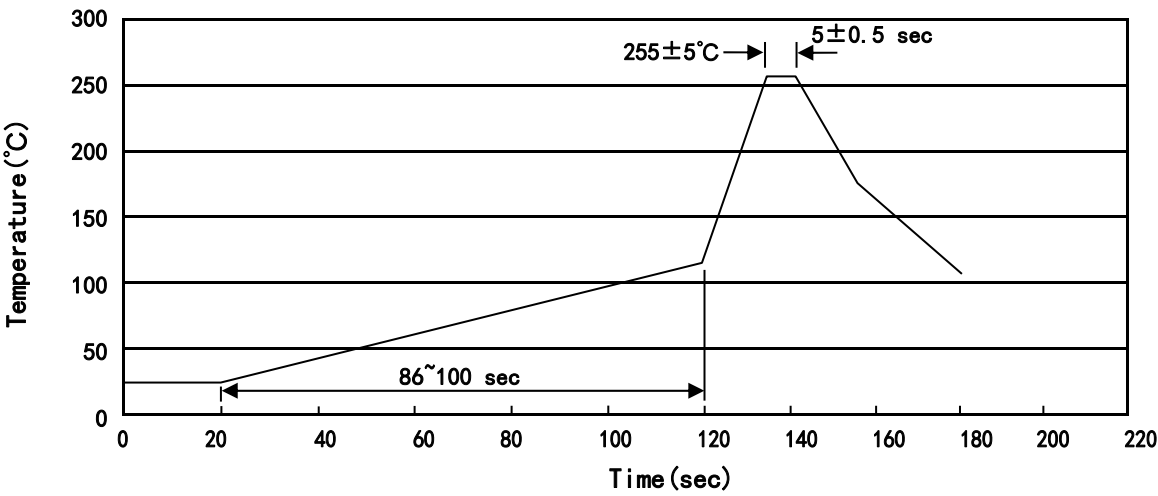
Note:

BR: Company Code

GB75N65AHA: Product Type Code

****: Lot No. Code, code change with Lot No.

波峰焊温度曲线图(无铅) / Temperature Profile for Dip Soldering(Pb-Free)



- 说明 :
- 1、预热温度 25 ~ 150℃ , 时间 60 ~ 90sec;
 - 2、峰值温度 255±5℃ , 时间持续为 5±0.5sec;
 - 3、焊接制程冷却速度为 2 ~ 10℃/sec.
- Note:
- 1.Preheating:25~150℃, Time:60~90sec.
 - 2.Peak Temp.:255±5℃, Duration:5±0.5sec.
 3. Cooling Speed: 2~10℃/sec.

耐焊接热试验条件 / Resistance to Soldering Heat Test Conditions

温度 : 270±5℃ 时间 : 10±1 sec. Temp.:270±5℃ Time:10±1 sec

包装规格 / Packaging SPEC.

套管包装 / TUBE

Package Type 封装形式	Units 包装数量					Dimension 包装尺寸 (unit: mm ³)		
	Units/Tube 只/套管	Tubes/Inner Box 套管/盒	Units/Inner Box 只/盒	Inner Boxes/Outer Box 盒/箱	Units/Outer Box 只/箱	Tube 套管	Inner Box 盒	Outer Box 箱
TO-247	30	15	450	5	2250	520×44×6	580×158×55	595×300×178

使用说明 / Notices

本文档中提供的所有信息均受法律免责声明的约束。
All information provided in this document is subject to legal disclaimers.