

描述 / Descriptions

TO-251 塑封封装 双向可控硅。Triac in a TO-251 Plastic Package.

特征 / Features

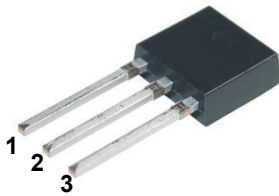
中电流可控硅，低通态压降，高可靠性和稳定性，热敏电阻特性低。

Medium current triac, Low on state voltage drop, High reliability and stability, Low thermal resistance.

用途 / Applications

适用于一般用途交流开关。如固态继电器、加热调节、异步电动机起动电路、电机速度控制器等。

Suitable for general purpose AC switching .Such as static relays, heating regulation, induction motor starting circuits, motor speed controllers, etc.

内部等效电路 / Equivalent Circuit**引脚排列 / Pinning**

PIN1 : Main Terminal 1 PIN 2 : Main Terminal 2 PIN 3: Gate

放大及印章代码 / h_{FE} Classifications & Marking

见印章说明。See Marking Instructions.

极限参数 / Absolute Maximum Ratings(Ta=25°C)

参数 Parameter	符号 Symbol	数值 Rating	单位 Unit
Repetitive peak off-state voltages	$V_{\text{DRM}}/V_{\text{RRM}}$	600 and 800	V
RMS on-state current(full sine wave $T_C=105^\circ\text{C}$)	$I_{\text{T(RMS)}}$	8.0	A
Non repetitive surge peak on-state current(full cycle, T_j initial=25°C)	$I_{\text{TSM}}(F=50\text{Hz}$ $t=20\text{ms})$	80	A
Non repetitive surge peak on-state current(full cycle, T_j initial=25°C)	$I_{\text{TSM}}(F=60\text{Hz}$ $t=16.7\text{ms})$	84	A
I_t^2 Value for fusing	$I_t^2 t_{\text{tp}}(10\text{ms})$	36	A ² s
Critical rate of rise of on-state current I_G $=2 \times I_{\text{GT}} t_r \leq 100 \text{ ns}$ ($F=120\text{Hz}$ $T_j=125^\circ\text{C}$)	di/dt	50	A/ μs
Peak gate current($t_p=20\mu\text{s}$ $T_j=125^\circ\text{C}$)	I_{GM}	4.0	A
Average gate power dissipation($T_j=125^\circ\text{C}$)	$P_{\text{G(AV)}}$	1.0	W
Operating junction temperature range	T_j	-40~125	°C
Storage junction temperature range	T_{stg}	-40~150	°C
Junction to ambient	$R_{\text{th(j-a)}}$	60	°C/W
Junction to case (AC)	$R_{\text{th(j-c)}}$	2.5	°C/W

电性能参数 / Electrical Characteristics(Ta=25°C)**免缓冲器和逻辑电平 (3象限) / Snubberless and logic level (3 quadrants)**

符号 Symbol	测试条件 Test Conditions	信号区 Quadrant		BTB08I				单位 Unit
				TW	SW	CW	BW	
$I_{\text{GT}}^{(1)}$	$V_D=12\text{V}$ $R_L=30\Omega$	I-II-III	Max.	5	10	35	50	mA
V_{GT}	$V_D=12\text{V}$ $R_L=30\Omega$	I-II-III	Max.	1.3				V
V_{GD}	$V_D=V_{\text{DRM}}$ $R_L=3.3\text{K}\Omega$ $T_j=125^\circ\text{C}$	I-II-III	Min.	0.2				V
$I_H^{(2)}$	$I_T=100\text{mA}$		Max.	10	15	35	50	mA
I_L	$I_G=1.2I_{\text{GT}}$	I-III	Max.	10	25	50	70	mA
		II		15	30	60	80	
$(dV/dt)^{(2)}$	$V_D=67\%$ V_{DRM} gate open $T_j=125^\circ\text{C}$		Min.	20	40	400	1000	V/ μs
$(di/dt)^{(2)}$	$(dV/dt)_c=0.1\text{V}/\mu\text{s}$ $T_j=125^\circ\text{C}$		Min.	3.5	5.4	-	-	A/m s
	$(dV/dt)_c=10\text{V}/\mu\text{s}$ $T_j=125^\circ\text{C}$		Min.	1.5	2.98	-	-	
	Without snubber $T_j=125^\circ\text{C}$		Min.	-	-	4.5	7	

Note 1: minimum I_{GT} is guaranteed at 5% of I_{GT} max.

Note 2: for both polarities of A2 referenced to A1.

电性能参数 / Electrical Characteristics(Ta=25°C)**标准 (4象限) / Standard (4 quadrants)**

符号 Symbol	测试条件 Test Conditions	信号区 Quadrant		BTB08I		单位 Unit
				C	B	
$I_{GT}^{(1)}$	$V_D=12V$ $R_L=30\Omega$	I-II-III IV	Max.	25 50	50 100	mA
V_{GT}	$V_D=12V$ $R_L=30\Omega$	ALL	Max.	1.3		V
V_{GD}	$V_D=V_{DRM}$ $R_L=3.3K\Omega$ $T_j=125^\circ C$	ALL	Min.	0.2		V
$I_H^{(2)}$	$I_T=500mA$		Max.	25	50	mA
I_L	$I_G=1.2I_{GT}$	I-III- IV	Max.	40	50	mA
		II		80	100	
$(dV/dt)^{(2)}$	$V_D=67\%$ V_{DRM} gate open $T_j=125^\circ C$		Min.	200	400	V/ μs
$(dV/dt)c^{(2)}$	$(dI/dt)c=5.3A/ms$ $T_j=125^\circ C$		Min.	5.0	10	

Note 1: minimum I_{GT} is guaranteed at 5% of I_{GT} max.

Note 2: for both polarities of A2 referenced to A1.

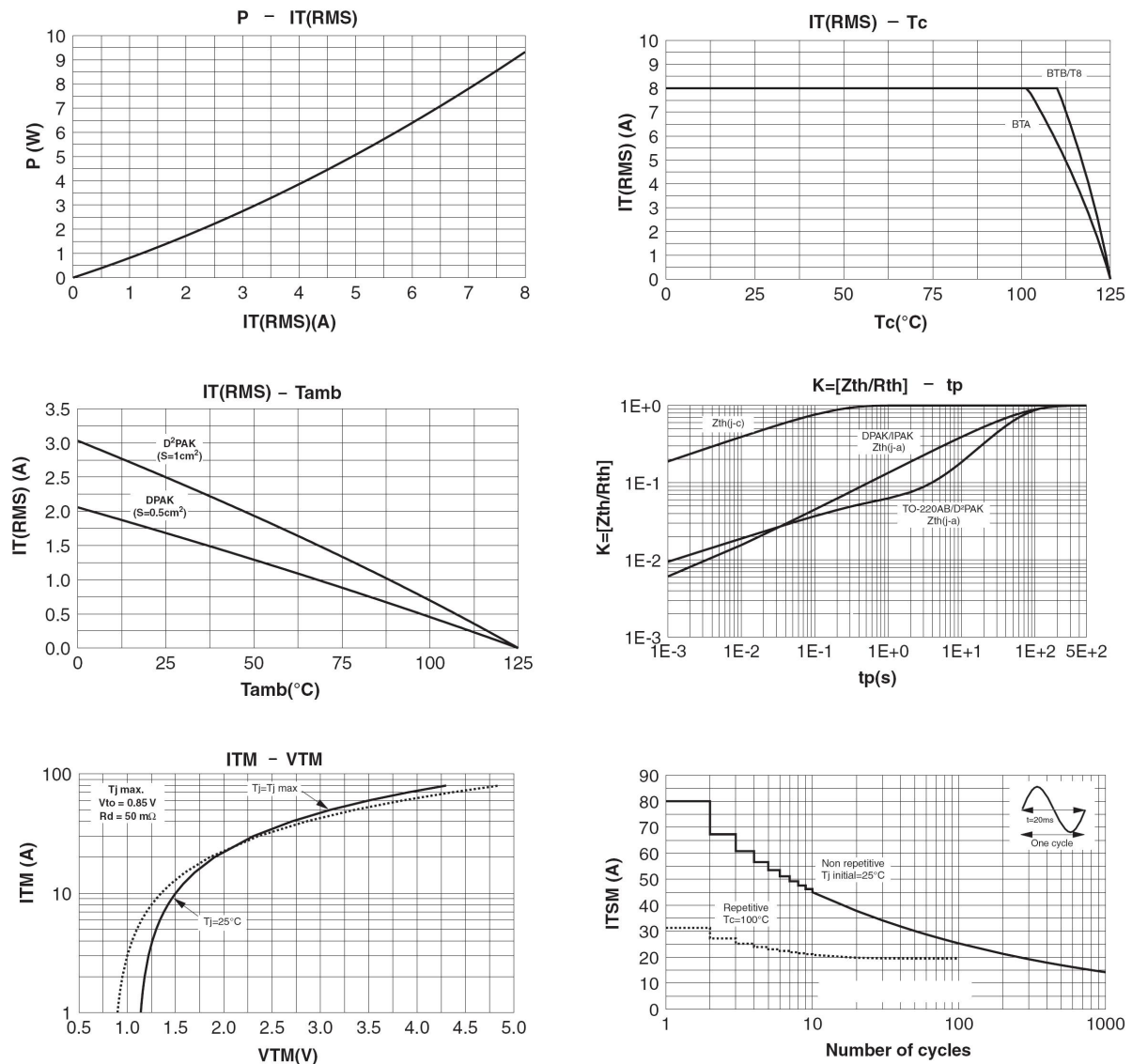
电性能参数 / Electrical Characteristics(Ta=25°C)

符号 Symbol	测试条件 Test Conditions			数值 Value	单位 Unit
$V_{TM}^{(2)}$	$I_{TM}=11A$ $t_p=380\mu s$ $T_j=25^\circ C$		Max.	1.55	V
$V_{to}^{(2)}$	Threshold voltage $T_j=125^\circ C$		Max.	0.85	V
$R_d^{(2)}$	Dynamic resistance $T_j=125^\circ C$		Max.	50	m Ω
I_{DRM} I_{RRM}	$V_{DRM} = V_{RRM}$	$T_j=25^\circ C$	Max.	5.0	μA
		$T_j=125^\circ C$	Max.	1.0	mA

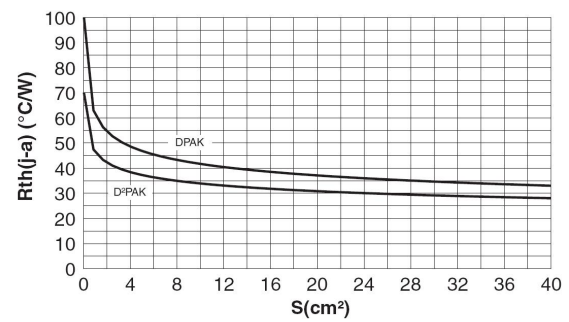
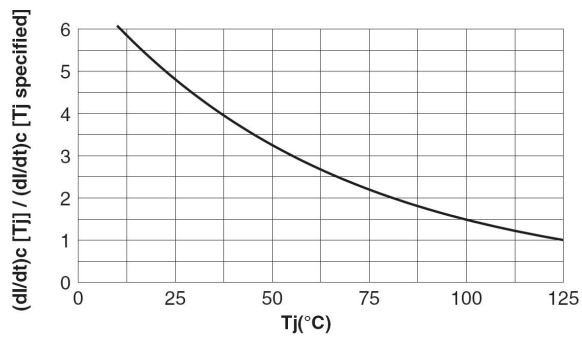
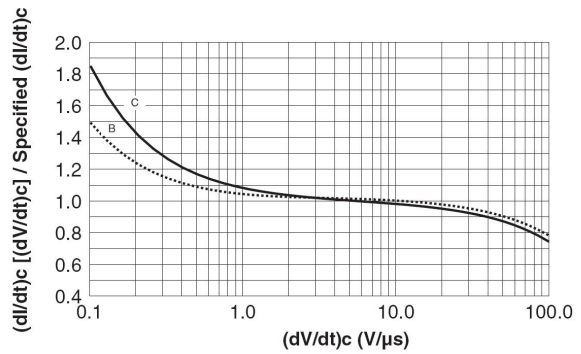
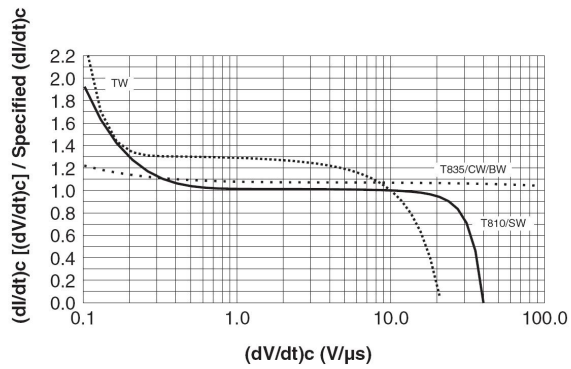
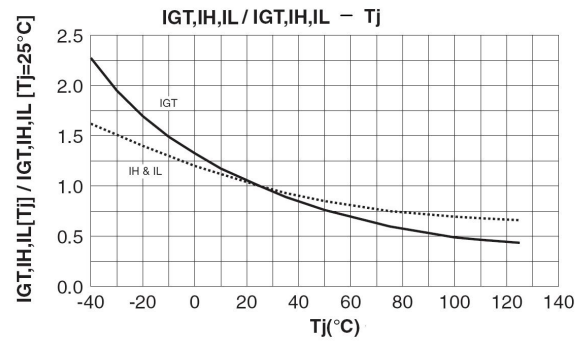
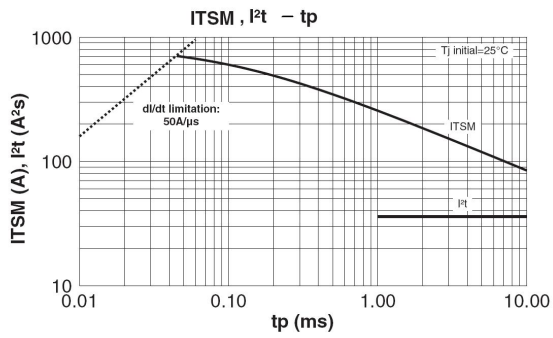
Note 2: for both polarities of A2 referenced to A1.



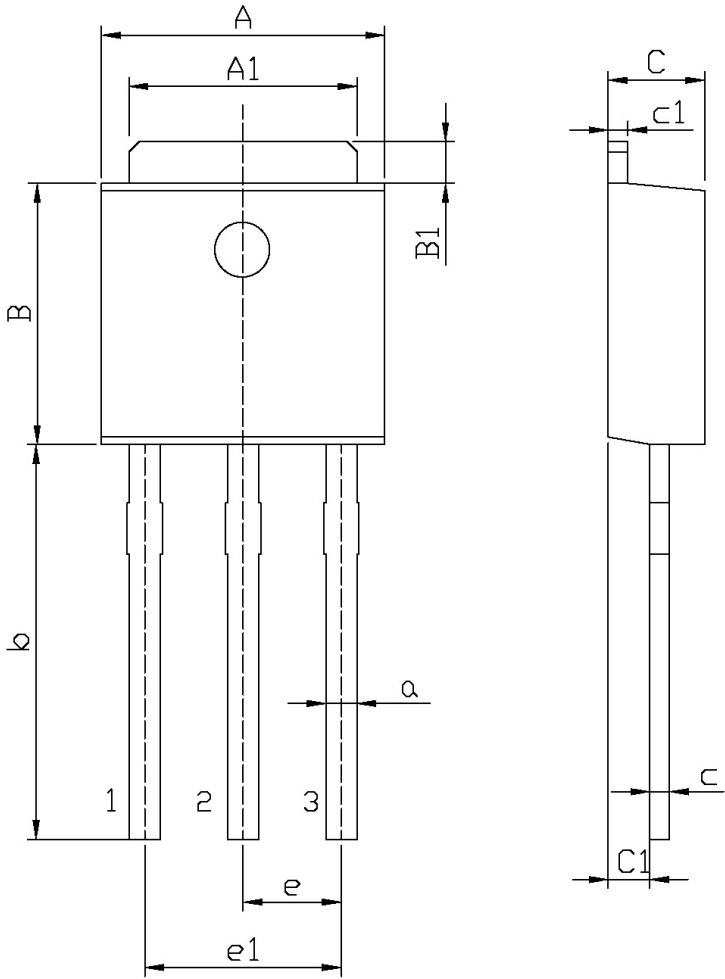
电参数曲线图 / Electrical Characteristic Curve



电参数曲线图 / Electrical Characteristic Curve



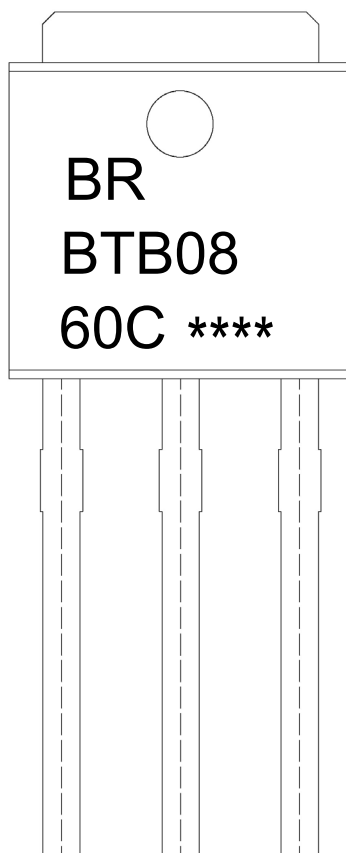
外形尺寸图 / Package Dimensions



单位: mm

Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
A	6.45	6.75	a	0.50	0.70
A1	5.10	5.50	b	9.00	9.40
B	5.95	6.25	c	0.45	0.55
B1	0.95	1.25	c1	0.45	0.55
C	2.20	2.40	e	2.24	2.34
C1	0.95	1.15	e1	4.43	4.73

TO-251

印章说明 / Marking Instructions

说明：

BR： 为公司代码

BTB08： 为产品型号

60C： 为 V_{RRM} 和 I_{GT} 分档代码

****： 为生产批号代码，随生产批号变化。

Note:

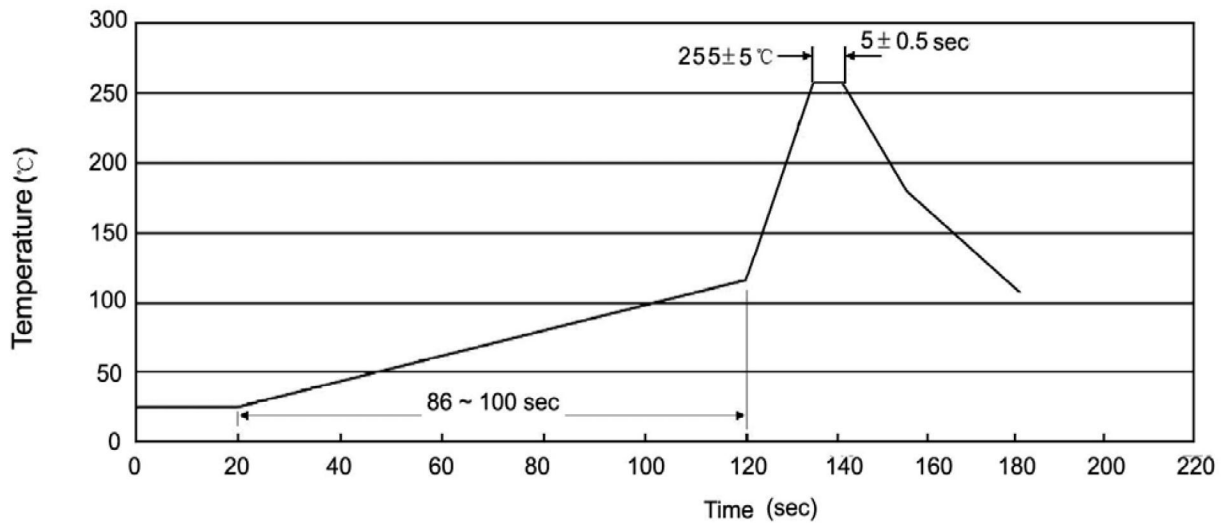
BR: Company Code

BTB08: Product Type.

60C: V_{RRM} 、 I_{GT} Bracket 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°C，时间 60 ~ 90sec;
2. 峰值温度 255±5°C，时间持续为 5±0.5sec;
3. 焊接制程冷却速度为 2 ~ 10°C/sec.

Note:

1. Preheating: 25~150°C, Time: 60~90sec.
2. Peak Temp.: 255±5°C, Duration: 5±0.5sec.
3. Cooling Speed: 2~10°C/sec.

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

温度：270±5°C

时间：10±1 sec.

Temp.: 270±5°C

Time: 10±1 sec

包装规格 / Packaging SPEC.

散件包装 / BULK

Package Type 封装形式	Units 包装数量					Dimension 包装尺寸 (unit: mm ³)		
	Units/Bag 只/袋	Bags/Inner Box 袋/盒	Units/Inner Box 只/盒	Inner Boxes/Outer Box 盒/箱	Units/Outer Box 只/箱	Bag 袋	Inner Box 盒	Outer Box 箱
TO-251	1,000	10	10,000	5	50,000	135×190	237×172×102	560×245×195

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-251/252	75	48	3,600	5	18,000	526×20.5×5.25	555×164×50	575×290×180

使用说明 / Notices