描述 / Descriptions

TO-220 塑封封装 NPN 半导体三极管。Silicon NPN transistor in a TO-220 Plastic Package.

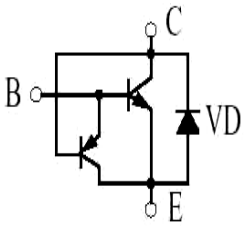
特征 / Features

耐压高,开关速度快。
High voltage capability, high speed switching.

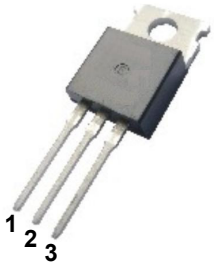
用途 / Applications

主要用于节能灯、日光灯电子镇流器及其它开关、振荡电路。
High frequency electronic lighting ballast applications,converters, inverters switching regulators, etc .

内部等效电路 / Equivalent Circuit



引脚排列 / Pinning



PIN1：Base　　PIN 2：Collector　　PIN 3：Emitter

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℃)

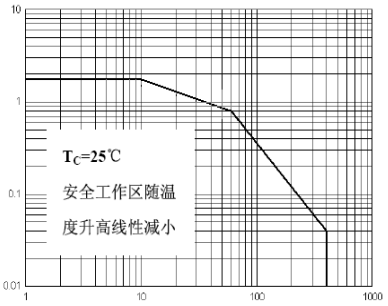
参数 Parameter	符号 Symbol	数值 Rating	单位 Unit
Collector to Base Voltage	V_{CBO}	600	V
Collector to Emitter Voltage	V_{CEO}	400	V
Emitter to Base Voltage	V_{EBO}	9	V
Collector Current - Continuous	I_C	1.75	A
Collector Power Dissipation	P_C	2.0	W
Collector Power Dissipation	P_C(Tc=25℃)	50	W
Junction Temperature	T_j	150	℃
Storage Temperature Range	T_{stg}	-55～150	℃

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

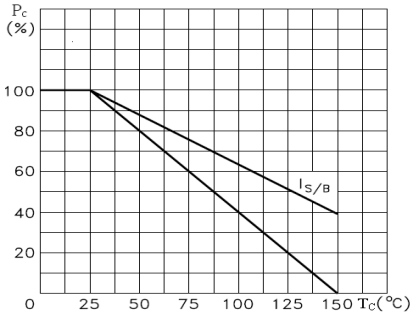
参数 Parameter	符号 Symbol	测试条件 Test Conditions		最小值 Min	典型值 Typ	最大值 Max	单位 Unit
Collector to Base Breakdown Voltage	V_{CBO}	I_C=1mA	I_E=0	600			V
Collector to Emitter Breakdown Voltage	V_{CEO}	I_C=10mA	I_B=0	400			V
Emitter to Base Breakdown Voltage	V_{EBO}	I_E=1mA	I_C=0	9			V
Emitter Base Cut-Off Current	I_{CBO}	V_{CB}=600V	I_E=0			0.1	mA
Collector Cut-Off Current	I_{CEO}	V_{CE}=400V	I_B=0			0.1	mA
Collector cut-off current	I_{EBO}	V_{EB}=9V	I_C=0			0.1	mA
DC Current Gain	h_{FE}	V_{CE}=5V	I_C=0.2A	10		40	
Collector to Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=1A	I_B=0.25A			0.9	V
Base to Emitter Saturation Voltage	$V_{BE(sat)}$	I_C=1A	I_B=0.5A			1.2	V
Transition Frequency	f_T	V_{CE}=10V f=1MHz	I_C=0.1A	5			MHz
Storage time	t_s	V_{CE}=5V (UI9600)	I_C=250mA			4	μs
Fall time	t_f					0.8	μs

电参数曲线图 / Electrical Characteristic Curve

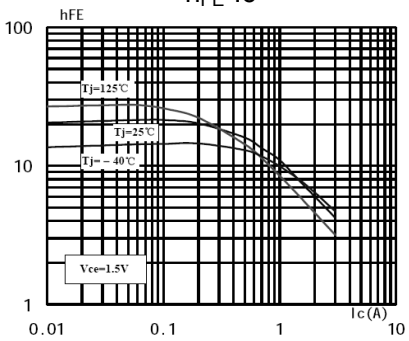
SOA(DC)



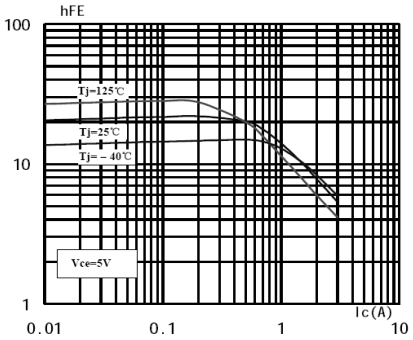
P_C-T_C



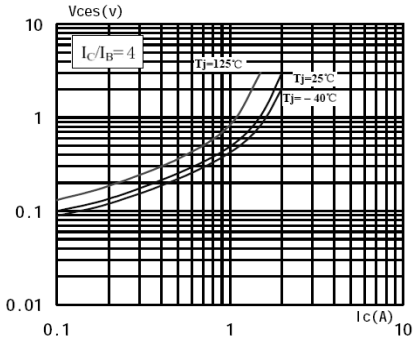
h_{FE}-Ic



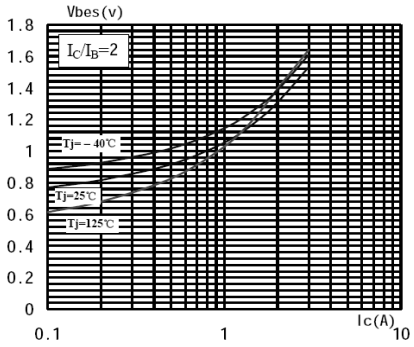
h_{FE}-Ic



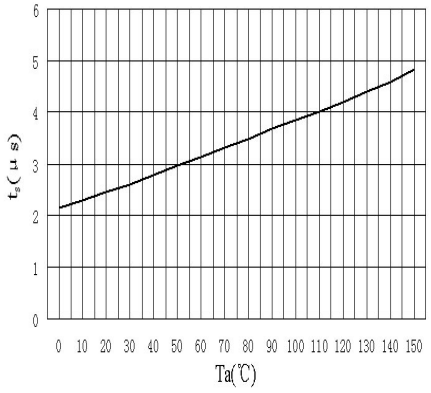
Vces-I_C



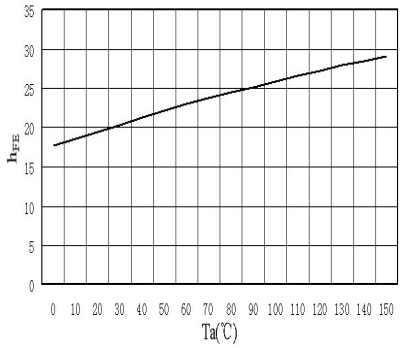
Vbes-I_C



t_S-Ta

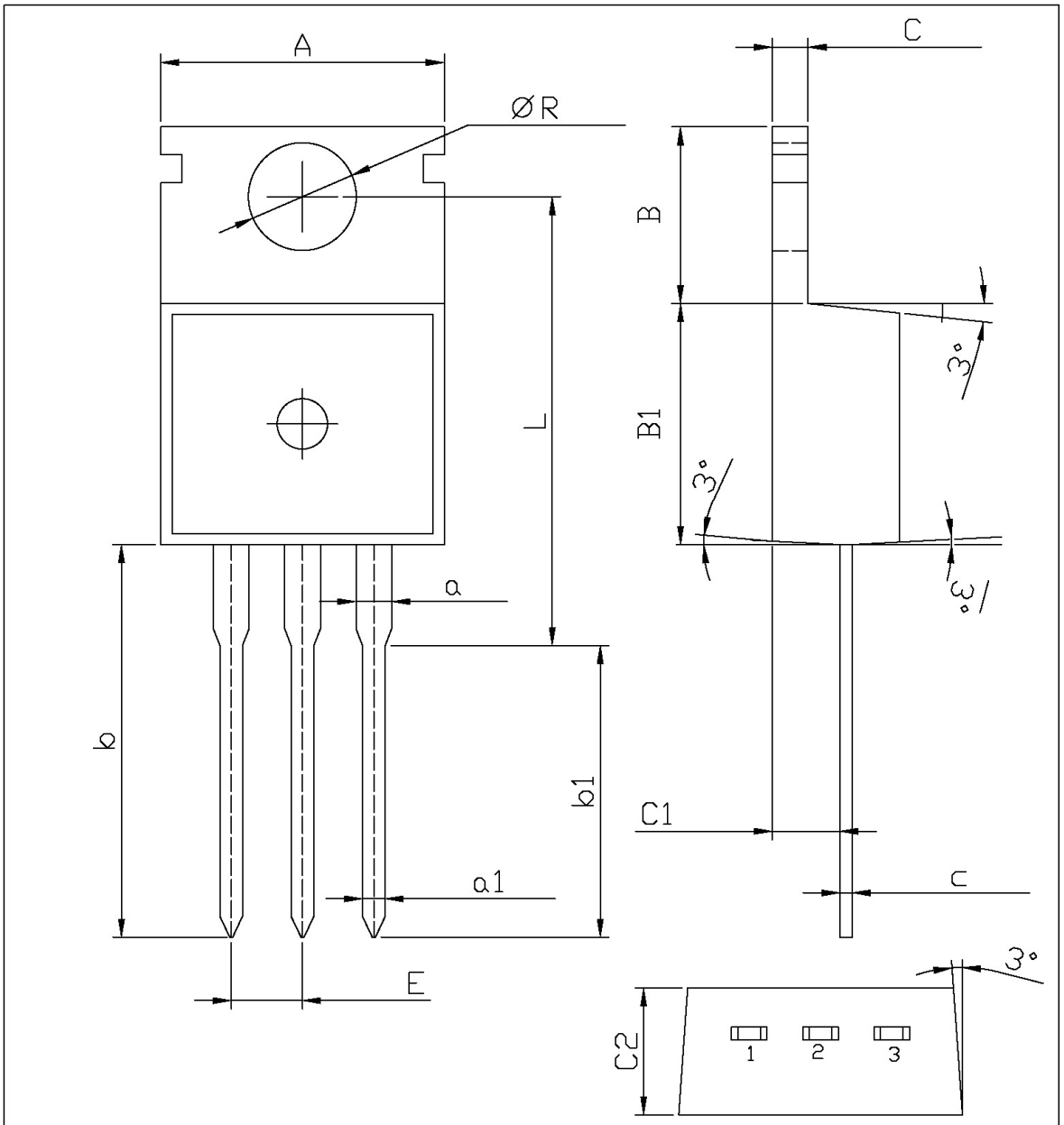


h_{FE}-Ta



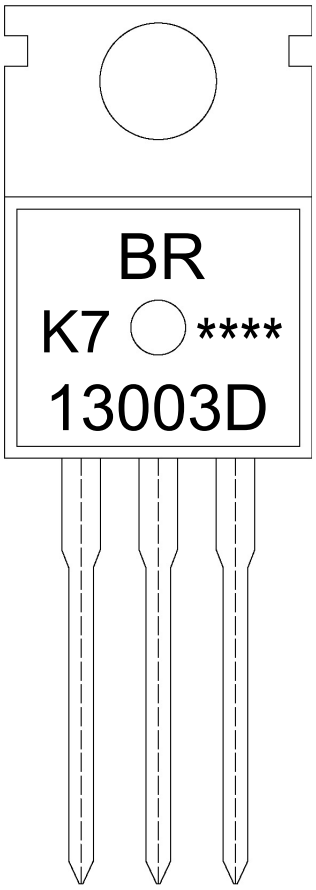
外形尺寸图 / Package Dimensions

TO-220 单位：mm



Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
A	9.8	10.2	C	1.2	1.4
R	3.56	3.64	B	6.3	6.7
L	15.7	16.1	B1	9.0	9.4
b	12.6	13.6	C1	2.2	2.6
b1	9.6	10.6	a1	0.7	0.9
a	1.22	1.32	c	0.4	0.6
E	2.34	2.74	C2	4.3	4.7

印章说明 / Marking Instructions



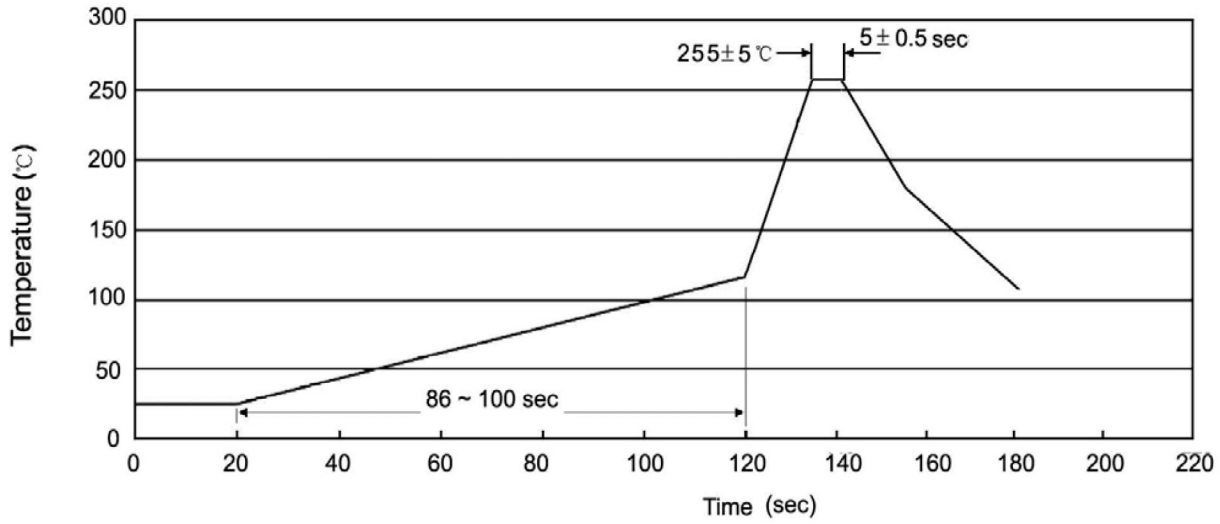
说明：

BR：	为公司代码
13003D：	为型号代码
K7:	为规格代码
****：	为生产批号代码，随生产批号变化。

Note:

BR:	Company Code
13003D：	Product Type.
K7:	Specification 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.

散件包装 / BULK

Package Type 封装形式	Units 包装数量					Dimension 包装尺寸 (unit: mm³)		
	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-220/F	200	10	2,000	5	10,000	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: mm³)		
	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-220/F	50	20	1,000	5	5,000	532×31.4×5.5	555×164×50	575×290×180

使用说明 / Notices