描述 / Descriptions

TO-92LM 塑封封装 NPN 半导体三极管。Silicon NPN transistor in a TO-92LM Plastic Package.

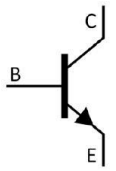
特征 / Features

耐压高，快速转换。
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 / hFE Classifications & Marking

见印章说明。See Marking Instructions.

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

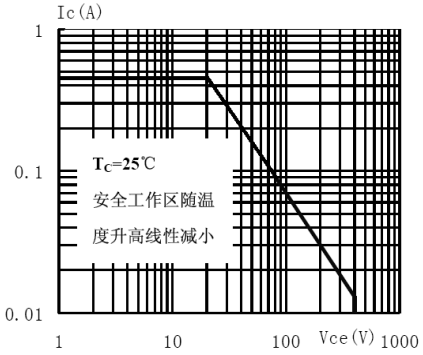
参数 Parameter	符号 Symbol	数值 Rating	单位 Unit
Collector to Base Voltage	V_{CBO}	600	V
Collector to Emitter Voltage	V_{CEO}	400	V
Emitter to Base Voltage	V_{EBO}	9.0	V
Collector Current - Continuous	I_C	0.45	A
Collector Power Dissipation	P_C	1.0	W
Junction Temperature	T_j	150	℃
Storage Temperature Range	T_{stg}	-55～150	℃

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

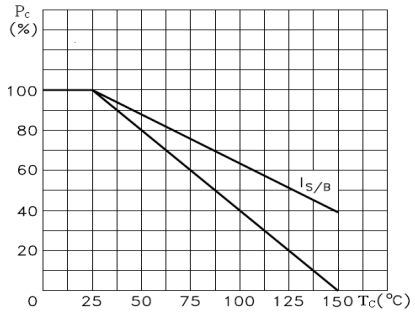
参数 Parameter	符号 Symbol	测试条件 Test Conditions	最小值 Min	典型值 Typ	最大值 Max	单位 Unit
Collector to Base Breakdown Voltage	V_{CBO}	I_C=1mA I_E=0	600			V
Collector to Emitter Breakdown Voltage	V_{CEO}	I_C=10mA I_B=0	400			V
Emitter to Base Breakdown Voltage	V_{EBO}	I_E=1mA I_C=0	9.0			V
Collector Cut-Off Current	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
Emitter Base Cut-Off Current	I_{EBO}	V_{EB}=9.0V I_C=0			0.1	mA
DC Current Gain	h_{FE}	V_{CE}=5.0V I_C=100mA	10		40	
Collector to Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=100mA I_B=20mA			0.5	V
Base to Emitter Saturation Voltage	$V_{BE(sat)}$	I_C=100mA I_B=20mA			1.2	V
Transition Frequency	f_T	V_{CE}=10V I_C=50A f=1.0MHz	5.0			MHz
Fall time	t_f	V_{CE}=5V I_C=100mA (UI9600)			0.6	μs
Storage time	t_s				3.0	μs

电参数曲线图 / Electrical Characteristic Curve

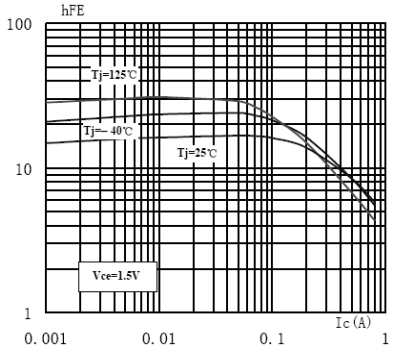
SOA(DC)



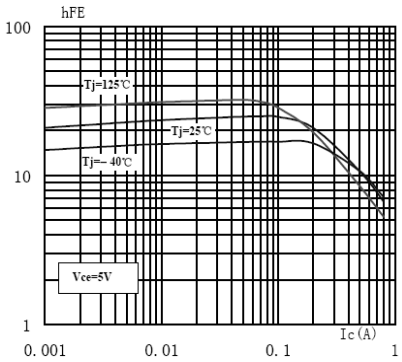
P_C-T_C



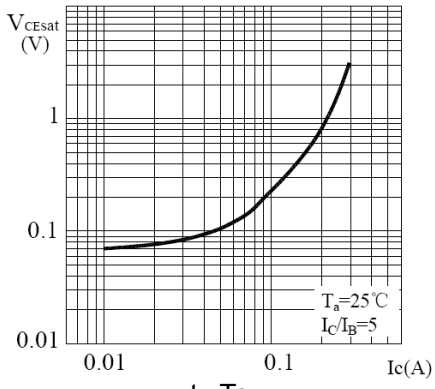
h_{FE}-Ic



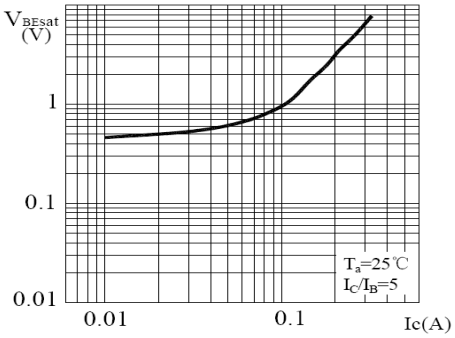
h_{FE}-Ic



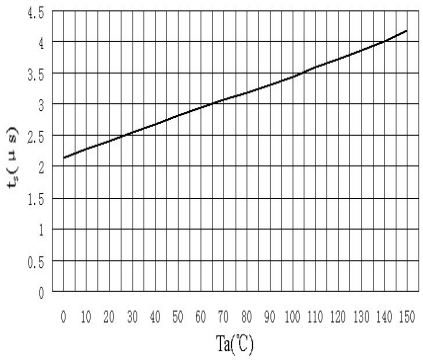
Vces-I_C



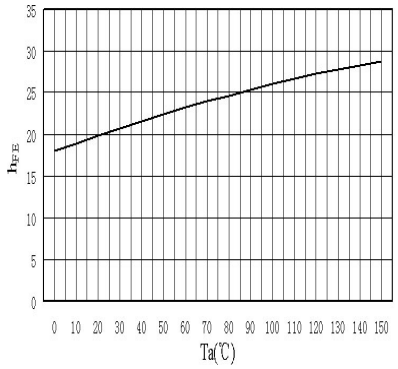
Vbes-I_C



t_S-Ta

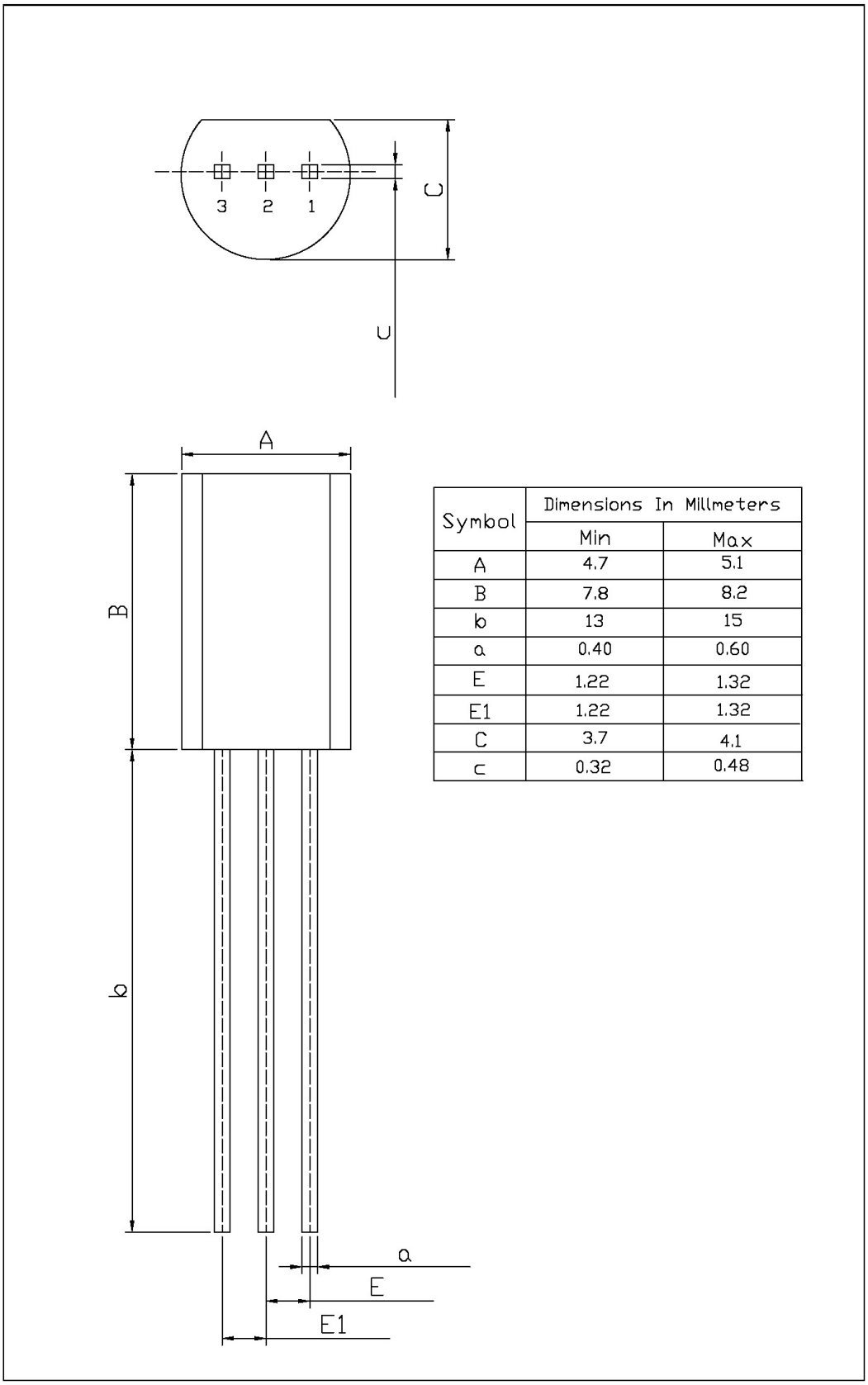


h_{FE}-Ta



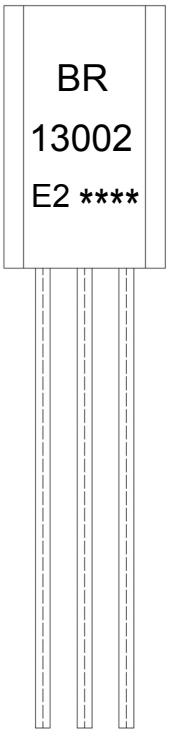
外形尺寸图 / Package Dimensions

TO-92LM Unit: mm



Symbol	Dimensions In Millmeters	
	Min	Max
A	4.7	5.1
B	7.8	8.2
b	13	15
a	0.40	0.60
E	1.22	1.32
E1	1.22	1.32
C	3.7	4.1
c	0.32	0.48

印章说明 / Marking Instructions



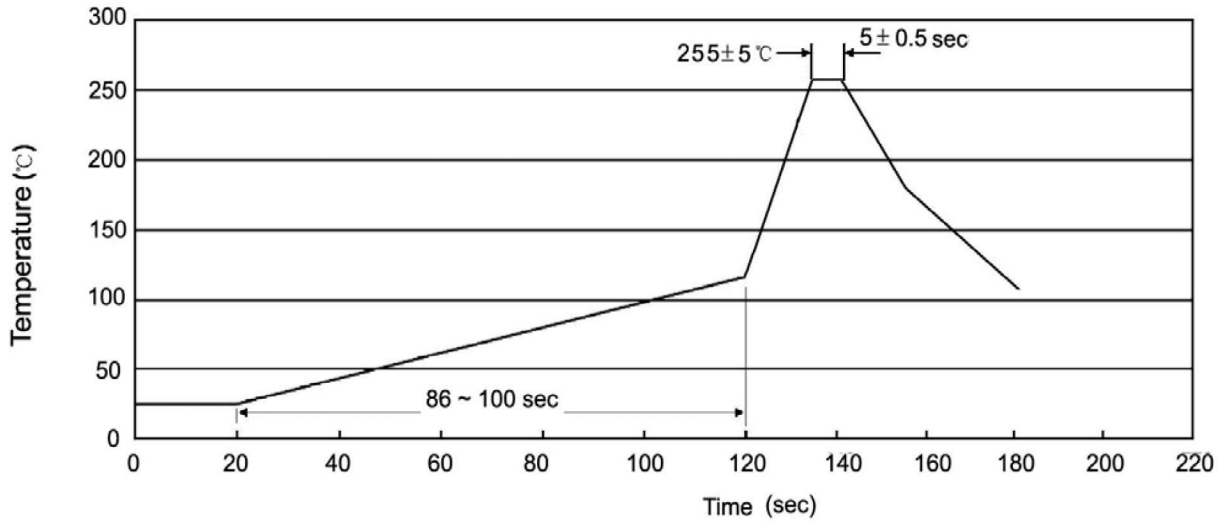
说明：

BR:	为公司代码
13002：	为型号代码
E2:	规格代码
****：	为生产批号代码，随生产批号变化。

Note:

BR:	Company Code.
13002:	Product Type.
E2:	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-92LM	1,000	8	8,000	5	40,000	135×190	237×172×102	560×245×195

编带包装 / AMMO

Package Type 封装形式	Units 包装数量					Dimension 包装尺寸 (unit: mm3)	
	Units/tape 只/纸带	Tape/Inner Box 纸带/盒	Rows/Inner Box 纸带层/盒	Inner Boxes/Outer Box 盒/箱	Units/Outer Box 只/箱	Inner Box 盒	Outer Box 箱
TO-92LM	2,500	1	100	10	25,000	328×230×42	小箱 480×346×235 大箱 547×407×268

使用说明 / Notices