

**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**

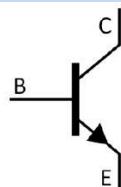
$V_{CEO}$  高, 可与 2SA1013 互补

High  $V_{CEO}$ , complementary pair with 2SA1013.

**用途 / Applications**

用于彩电帧输出,伴音输出。

Color TV class B sound output applications..

**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<sub>FE</sub> Classifications & Marking**

| $h_{FE}$ Classifications<br>Symbol | R      | O       | Y       |
|------------------------------------|--------|---------|---------|
| $h_{FE}$ Range                     | 60~120 | 100~200 | 160~320 |

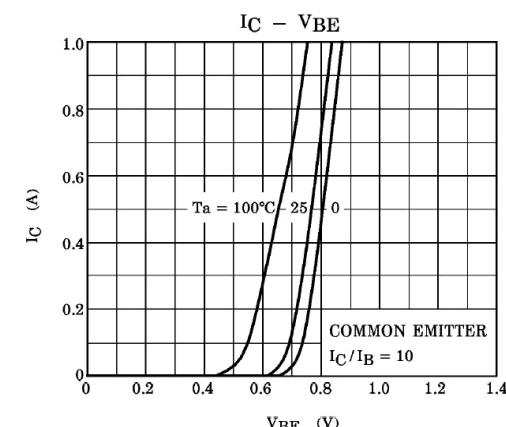
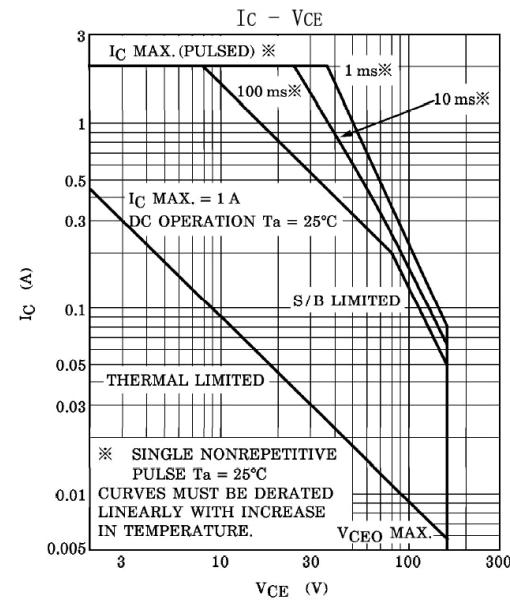
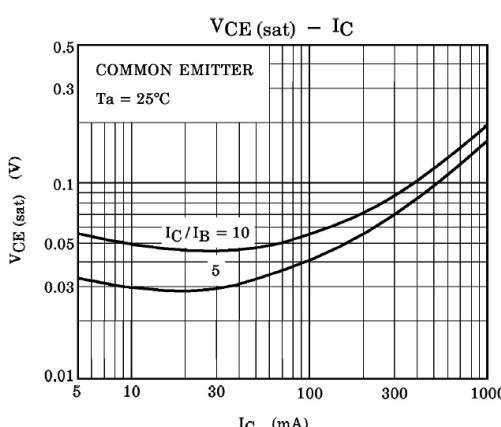
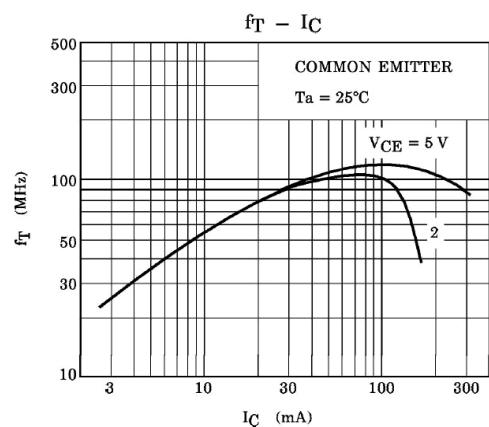
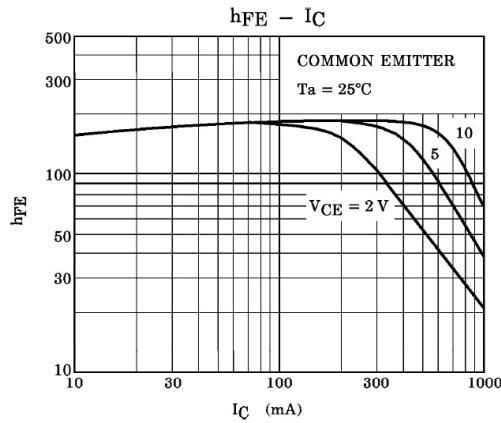
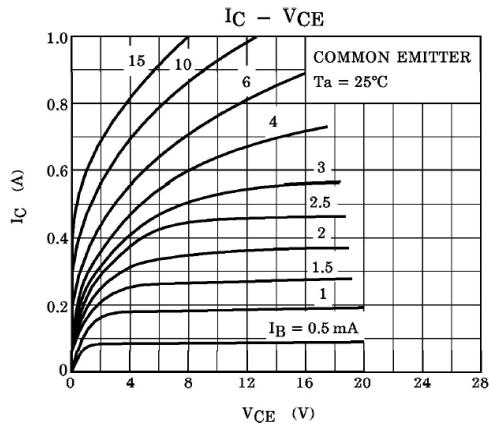
**极限参数 / Absolute Maximum Ratings(Ta=25°C)**

| 参数<br>Parameter              | 符号<br>Symbol | 数值<br>Rating | 单位<br>Unit |
|------------------------------|--------------|--------------|------------|
| Collector to Base Voltage    | $V_{CBO}$    | 160          | V          |
| Collector to Emitter Voltage | $V_{CEO}$    | 160          | V          |
| Emitter to Base Voltage      | $V_{EBO}$    | 6.0          | V          |
| Collector Current (DC)       | $I_C$        | 1.0          | A          |
| Base Current                 | $I_B$        | 0.5          | A          |
| Collector Power Dissipation  | $P_C$        | 900          | mW         |
| Junction Temperature         | $T_j$        | 150          | °C         |
| Storage Temperature Range    | $T_{stg}$    | -55~150      | °C         |

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

| 参数<br>Parameter                         | 符号<br>Symbol         | 测试条件<br>Test Conditions                  |                    | 最小值<br>Min | 典型值<br>Typ | 最大值<br>Max | 单位<br>Unit    |
|-----------------------------------------|----------------------|------------------------------------------|--------------------|------------|------------|------------|---------------|
| Collector to Emitter Breakdown Voltage  | $V_{CEO}$            | $I_C=10\text{mA}$                        | $I_B=0$            | 160        |            |            | V             |
| Collector to Base Breakdown Voltage     | $V_{CBO}$            | $I_C=100\mu\text{A}$                     | $I_B=0$            | 160        |            |            | V             |
| Collector Cut-Off Current               | $I_{CBO}$            | $V_{CB}=150\text{V}$                     | $I_E=0$            |            |            | 1.0        | $\mu\text{A}$ |
| Emitter Cut-Off Current                 | $I_{EBO}$            | $V_{EB}=6.0\text{V}$                     | $I_C=0$            |            |            | 1.0        | $\mu\text{A}$ |
| DC Current Gain                         | $h_{FE}$             | $V_{CE}=5.0\text{V}$                     | $I_C=200\text{mA}$ | 60         |            | 320        |               |
| Base to Emitter Voltage                 | $V_{BE}$             | $V_{CE}=5.0\text{V}$                     | $I_C=5.0\text{mA}$ | 0.45       |            | 0.75       | V             |
| Collector to Emitter Saturation Voltage | $V_{CE(\text{sat})}$ | $I_C=500\text{mA}$                       | $I_B=50\text{mA}$  |            |            | 1.5        | V             |
| Base to Emitter Saturation Voltage      | $V_{BE(\text{sat})}$ | $I_C=500\text{mA}$                       | $I_B=50\text{mA}$  |            |            | 1.2        | V             |
| Transition Frequency                    | $f_T$                | $V_{CE}=5.0\text{V}$                     | $I_C=200\text{mA}$ | 20         | 100        |            | MHz           |
| Collector output capacitance            | $C_{ob}$             | $V_{CB}=10\text{V}$<br>$f=1.0\text{MHz}$ | $I_E=0$            |            |            | 20         | pF            |

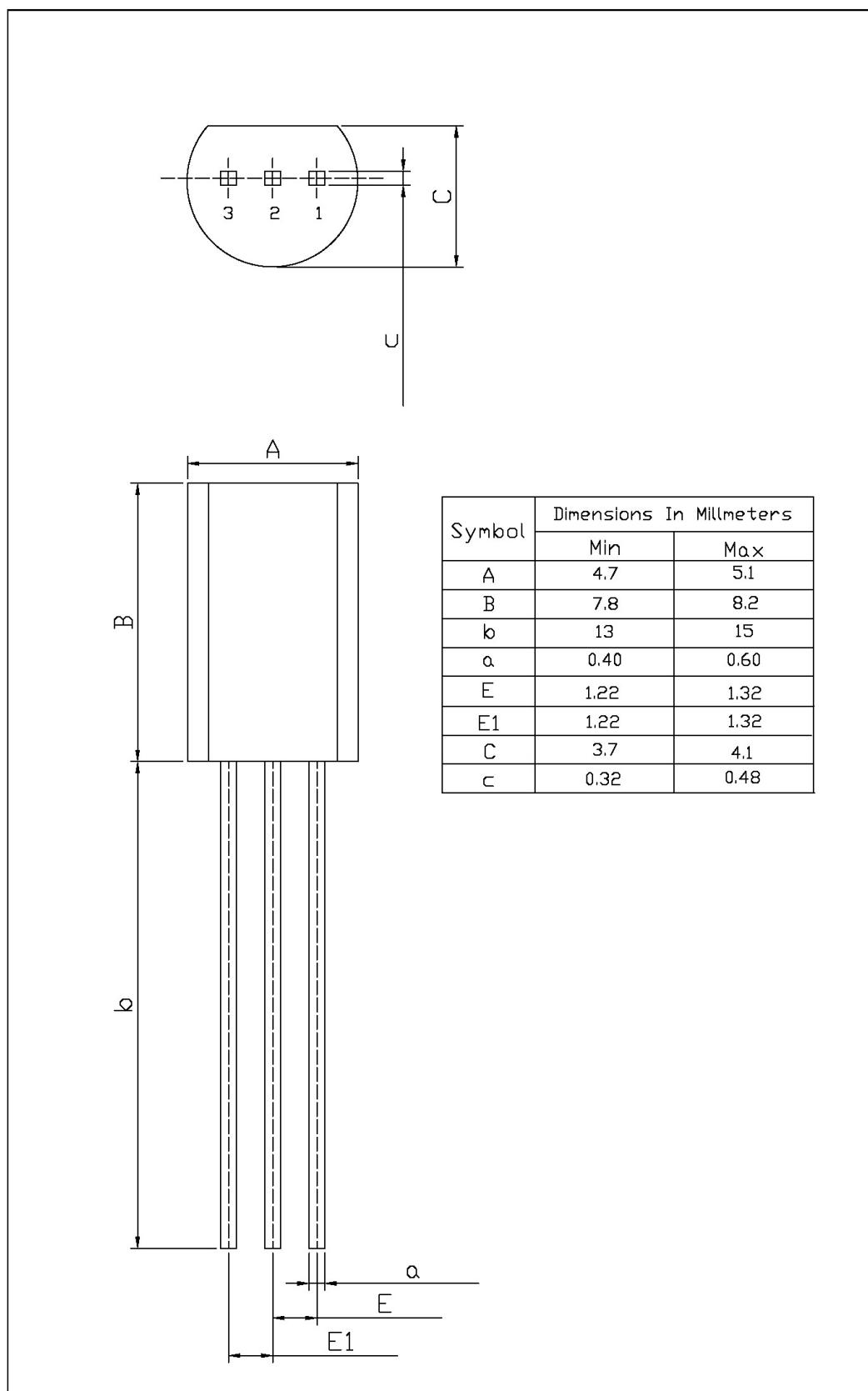
## 电参数曲线图 / Electrical Characteristic Curve

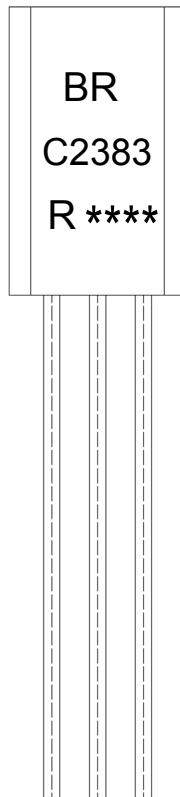


## 外形尺寸图 / Package Dimensions

TO-92LM

Unit: mm



**印章说明 / Marking Instructions****说明 :**

BR: 为公司代码

C2383 : 为型号代码

R: 为  $h_{FE}$  分档代码

\*\*\*\* : 为生产批号代码 , 随生产批号变化。

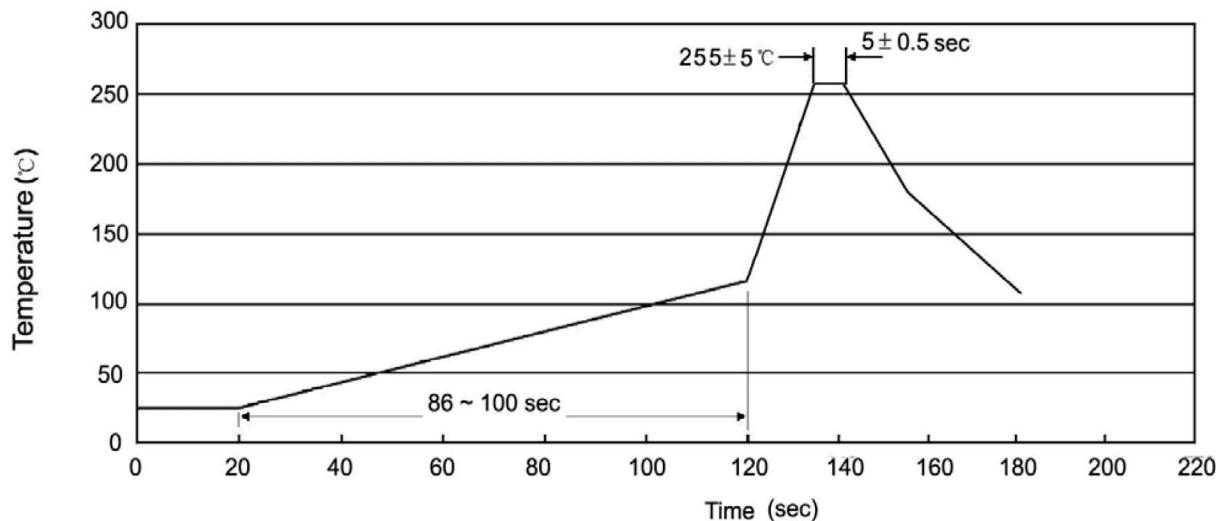
**Note:**

BR: Company Code.

C2383: Product Type.

R:  $h_{FE}$  Classifications Symbol

\*\*\*\*: 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<br>封装形式 | Units 包装数量       |                       |                        |                              |                        | Dimension | 包装尺寸 (unit: mm <sup>3</sup> ) |
|----------------------|------------------|-----------------------|------------------------|------------------------------|------------------------|-----------|-------------------------------|
|                      | Units/Bag<br>只/袋 | Bags/Inner Box<br>袋/盒 | Units/Inner Box<br>只/盒 | Inner Boxes/Outer Box<br>盒/箱 | Units/Outer Box<br>只/箱 |           |                               |
| TO-92LM              | 1,000            | 8                     | 8,000                  | 5                            | 40,000                 | 135×190   | 237×172×102                   |

**编带包装 / AMMO**

| Package Type<br>封装形式 | Units 包装数量         |                        |                         |                              |                        | Dimension  | 包装尺寸 (unit: mm <sup>3</sup> )    |
|----------------------|--------------------|------------------------|-------------------------|------------------------------|------------------------|------------|----------------------------------|
|                      | Units/tape<br>只/纸带 | Tape/Inner Box<br>纸带/盒 | Rows/Inner Box<br>纸带层/盒 | Inner Boxes/Outer Box<br>盒/箱 | Units/Outer Box<br>只/箱 |            |                                  |
| TO-92LM              | 2,500              | 1                      | 100                     | 10                           | 25,000                 | 328×230×42 | 小箱 480×346×235<br>大箱 547×407×268 |

**使用说明 / Notices**