

## 描述 / Descriptions

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

## 特征 / Features

电流大,饱和压降低。

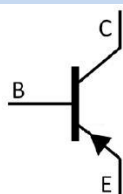
High  $I_C$  ,low  $V_{CE(sat)}$ .

## 用途 / Applications

用于充电器的开关电源,偏置电路的电压调整。

Switching regulator in battery charger ,voltage regulation in bias supply circuits.

## 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°C)

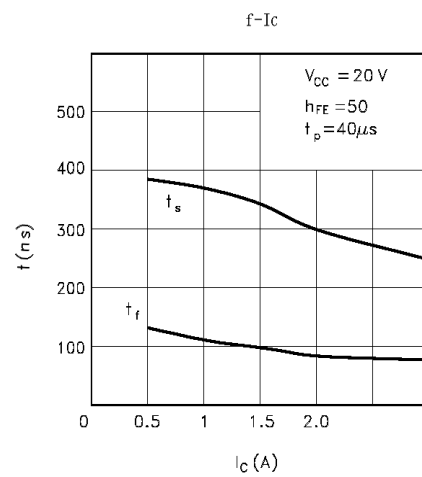
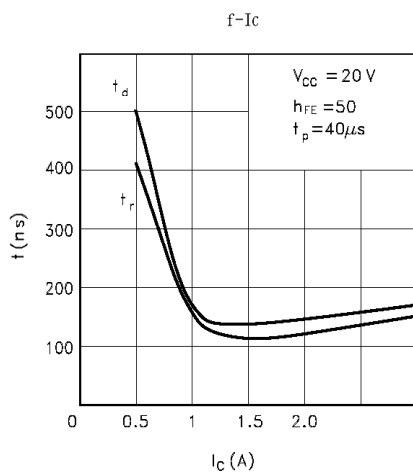
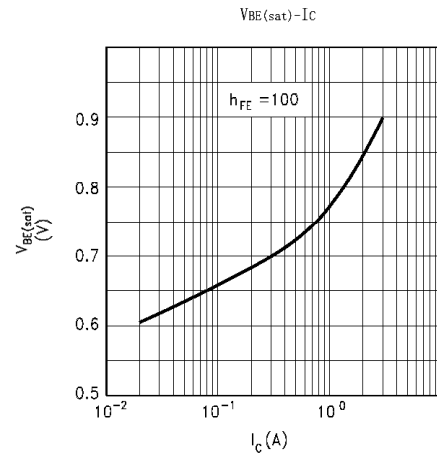
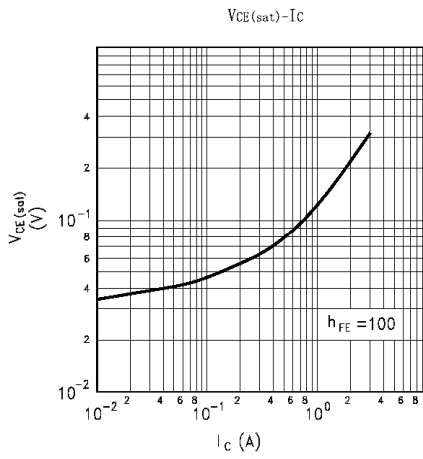
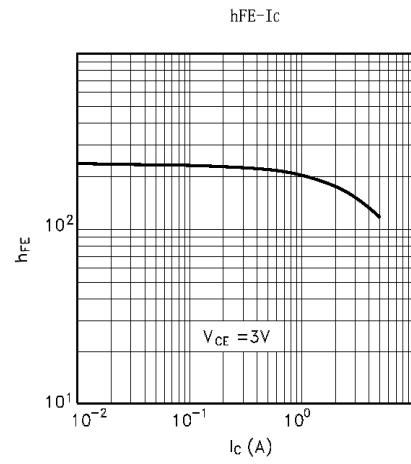
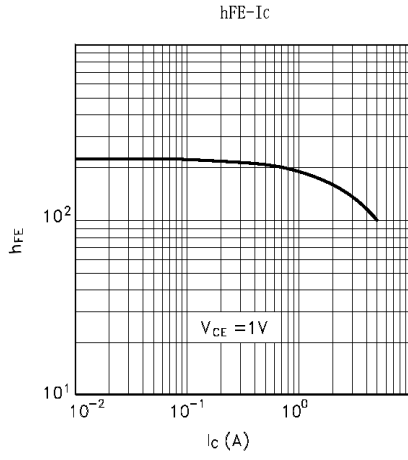
参数 Parameter	符号 Symbol	数值 Rating	单位 Unit
Collector to Base Voltage	$V_{CBO}$	-60	V
Collector to Emitter Voltage	$V_{CEO}$	-60	V
Emitter to Base Voltage	$V_{EBO}$	-5.0	V
Collector Current - Continuous	$I_C$	-3.0	A
Peak Collector Current- Continuous	$I_{CM}$	-6.0	A
Collector Power Dissipation	$P_C$	0.9	W
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 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	$V_{CBO}$	$I_C=-100\mu A$ $I_E=0$	-60			V
Collector to Emitter Breakdown Voltage*	* $V_{CEO}$	$I_C=-10mA$ $I_B=0$	-60			V
Emitter to Base Breakdown Voltage	$V_{EBO}$	$I_E=-100\mu A$ $I_C=0$	-5.0			V
Collector Cut-Off Current	$I_{CBO}$	$V_{CB}=-30V$ $I_E=0$			-0.1	$\mu A$
Emitter Cut-Off Current	$I_{EBO}$	$V_{EB}=-4.0V$ $I_C=0$			-1.0	$\mu A$
DC Current Gain	* $h_{FE(1)}$	$V_{CE}=-2.0V$ $I_C=-500mA$	100	200	300	
	* $h_{FE(2)}$	$V_{CE}=-2.0V$ $I_C=-10mA$	100	200		
	* $h_{FE(3)}$	$V_{CE}=-1.0V$ $I_C=-3.0A$	90	130		
Collector to Emitter Saturation Voltage	* $V_{CE(sat)(1)}$	$I_C=-0.5A$ $I_B=-50mA$			-0.15	V
	* $V_{CE(sat)(2)}$	$I_C=-1.0A$ $I_B=-100mA$			-0.3	V
	* $V_{CE(sat)(3)}$	$I_C=-2.0A$ $I_B=-200mA$			-0.5	V
	* $V_{CE(sat)(4)}$	$I_C=-3.0A$ $I_B=-300mA$			-0.7	V
Base to Emitter Saturation Voltage*	* $V_{BE(sat)}$	$I_C=-1.0A$ $I_B=-100mA$		-0.8	-1.0	V
Base to Emitter Voltage	$V_{BE}$	$V_{CE}=-2.0V$ $I_C=-1.0A$		-0.8	-1.0	V
Transition Frequency	$f_T$	$V_{CE}=-5.0V$ $I_C=-50mA$ $f=50MHz$	100			V
Delay Time	$t_d$	$V_{CC}=-20V$ $I_C=-3.0A$ $I_{B1}=-I_{B2}=-60mA$		180	220	ns
Rise Time	$t_r$	$V_{CC}=-20V$ $I_C=-3.0A$ $I_{B1}=-I_{B2}=-60mA$		160	210	ns
Storage Time	$t_s$	$V_{CC}=-20V$ $I_C=-3.0A$ $I_{B1}=-I_{B2}=-60mA$		250	300	ns
Fall Time	$t_f$	$V_{CC}=-20V$ $I_C=-3.0A$ $I_{B1}=-I_{B2}=-60mA$		80	100	ns

\* Pulse test: pulse width =300  $\mu s$ , duty cycle  $\leq 1.5\%$ . 脉冲测试:脉宽=300 $\mu s$ ,占空比 $\leq 1.5\%$ 。

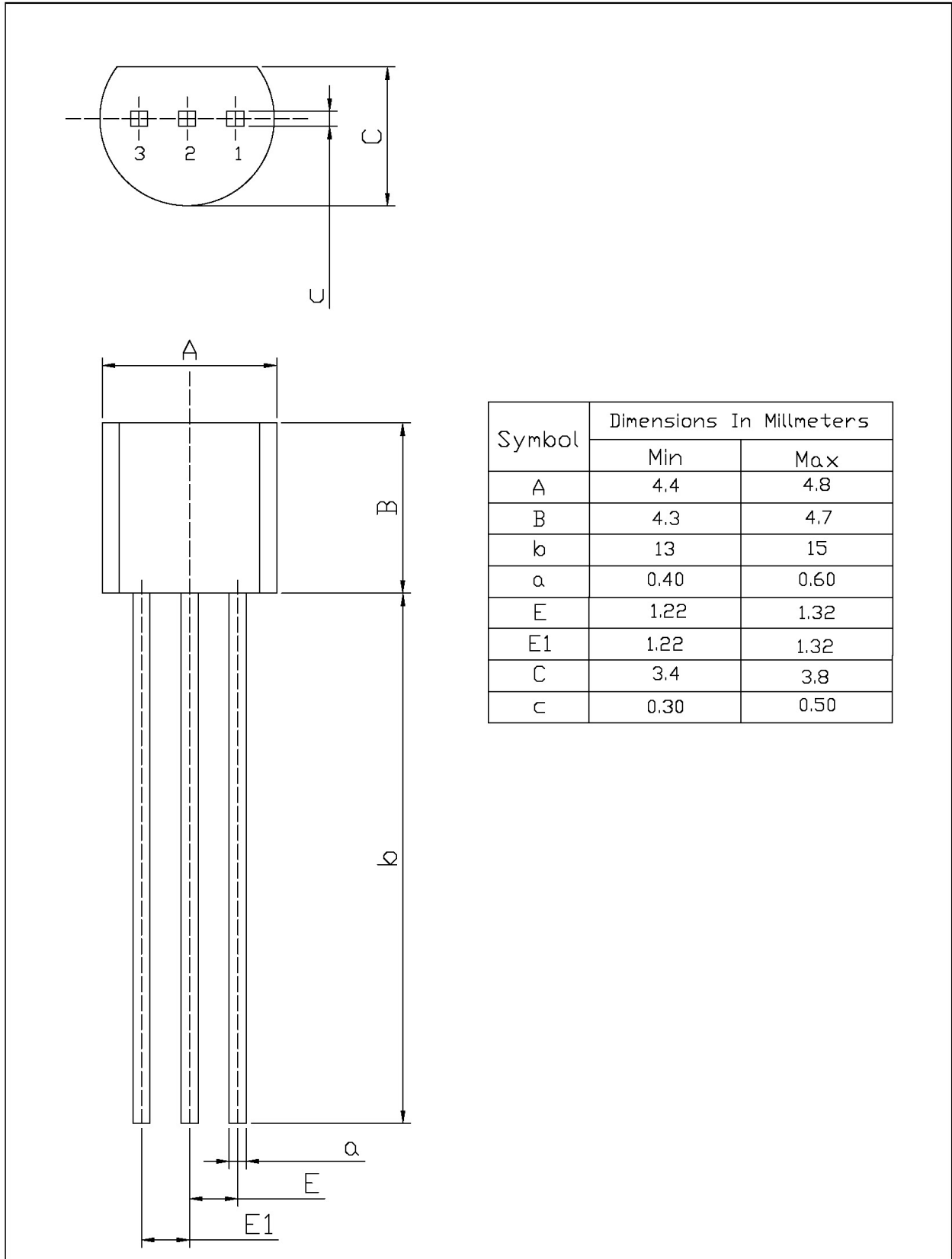
**电参数曲线图 / Electrical Characteristic Curve**



外形尺寸图 / Package Dimensions

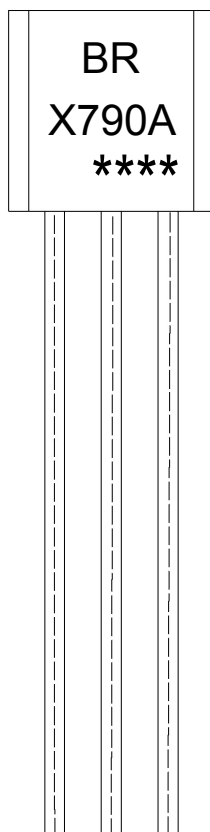
TO-92

Unit: mm



Symbol	Dimensions In Millimeters	
	Min	Max
A	4.4	4.8
B	4.3	4.7
b	13	15
a	0.40	0.60
E	1.22	1.32
E1	1.22	1.32
C	3.4	3.8
c	0.30	0.50

印章说明 / Marking Instructions



说明：

BR: 为公司代码

X790A : 为型号代码

\*\*\*\* : 为生产批号代码，随生产批号变化。

Note:

BR: Company Code.

X790A: Product Type.

\*\*\*\*: 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: 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-92	1,000	10	10,000	5	50,000	135×190	237×172×102	560×245×195
	1,000	10	10,000	10	100,000	135×190	237×172×102	560×245×375

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-92	3,000	1	120	10	30,000	328×230×42	小箱 480×346×235, 大箱 547×407×268

**使用说明 / Notices**