

### 描述 / Descriptions

TO-252 塑封封装 NPN 半导体三极管。  
Silicon NPN transistor in a TO-252 Plastic Package.

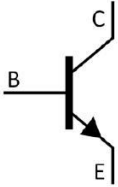
### 特征 / Features

无卤产品。  
HF Product.

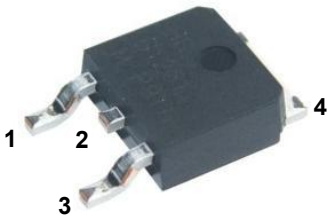
### 用途 / Applications

继电器驱动器、高速逆变器、转换器和其他一般大电流开关应用。  
Relay drivers, high-speed inverters, converters, and other general high-current switching applications.

### 内部等效电路 / Equivalent Circuit



### 引脚排列 / Pinning



PIN1 : Base      PIN 2,4 : Collector      PIN 3 : Emitter

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

$h_{FE}$ Classifications Symbol	Q	R	S	T
$h_{FE}$ Range	70-140	100-200	140-280	200-400

**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	$V_{CBO}$	120	V
Collector to Emitter Voltage	$V_{CEO}$	100	V
Emitter to Base Voltage	$V_{EBO}$	6	V
Collector Current - Continuous	$I_C$	3	A
Collector Current – Continuous(Pulse)	$I_{CP}$	6	A
Collector Power Dissipation	$P_C$	1	W
Collector Power Dissipation	$P_C(T_c=25^\circ C)$	10	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	$V_{CBO}$	$I_C=10\mu A$ $I_E=0$	120			V
Collector to Emitter Breakdown Voltage	$V_{CEO}$	$I_C=1mA$ $I_B=0$	100			V
Emitter to Base Breakdown Voltage	$V_{EBO}$	$I_E=10\mu A$ $I_C=0$	5.0			V
Collector-Base Cut-Off Current	$I_{CBO}$	$V_{CB}=100V$ $I_E=0$			1	$\mu A$
Emitter-Base Cut-Off Current	$I_{EBO}$	$V_{CB}=4V$ $I_C=0$			1	$\mu A$
DC Current Gain	$h_{FE(2)}$	$V_{CE}=5.0V$ $I_C=500mA$	70		400	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=1500mA$ $I_B=150mA$			0.4	V
Base-Emitter Voltage Saturation Voltage	$V_{BE(sat)}$	$I_C=1500mA$ $I_B=150mA$			1.2	V
Transition Frequency	$f_T$	$V_{CE}=10V$ $I_C=500mA$		180		MHz
Collector output capacitance	$C_{ob}$	$V_{CB}=10V$ $I_E=0$ $f=1.0MHz$		25		pF
Turn-on Time	$t_{on}$	$V_{CC}=50V,$ $I_C=1.5A,$ $I_{B1}=-I_{B2}=-150mA$		100		ns
Storage Time	$t_s$			900		ns
Fall Time	$t_f$			50		ns

电参数曲线图 / Electrical Characteristic Curve

Fig. 1 - Static Characteristics

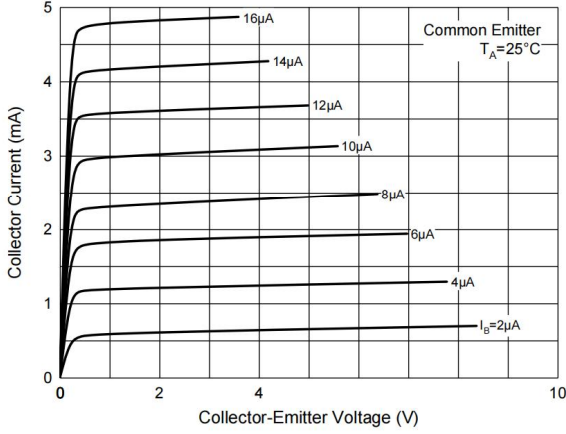


Fig. 2 - DC Current Gain Characteristics

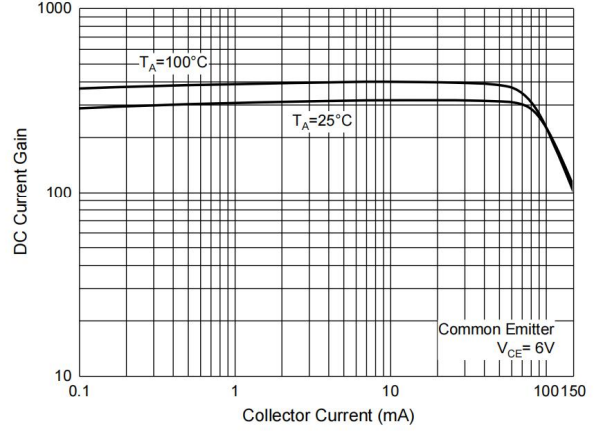


Fig. 3 - Collector-Emitter Saturation Voltage Characteristics

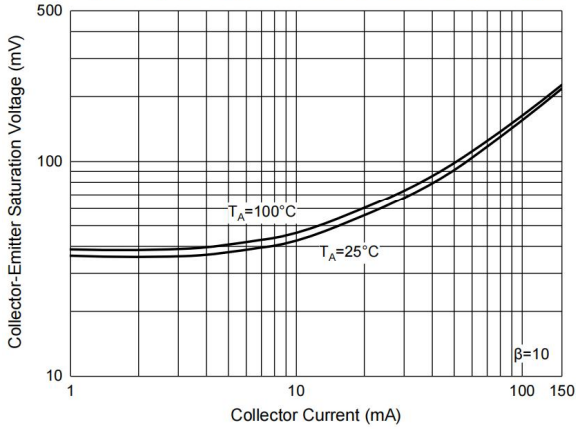


Fig. 4 - Base-Emitter Saturation Voltage Characteristics

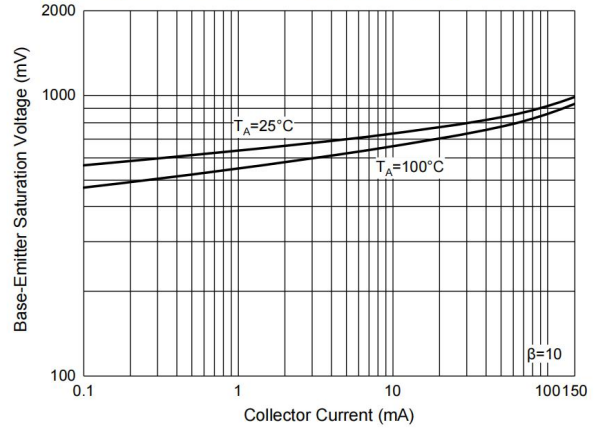


Fig. 5 - Base-Emitter Voltage Characteristics

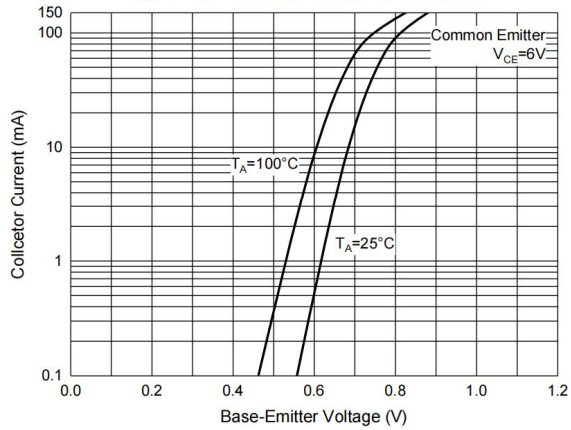
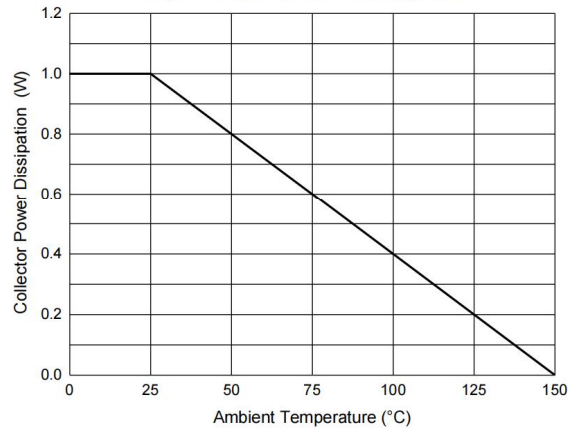
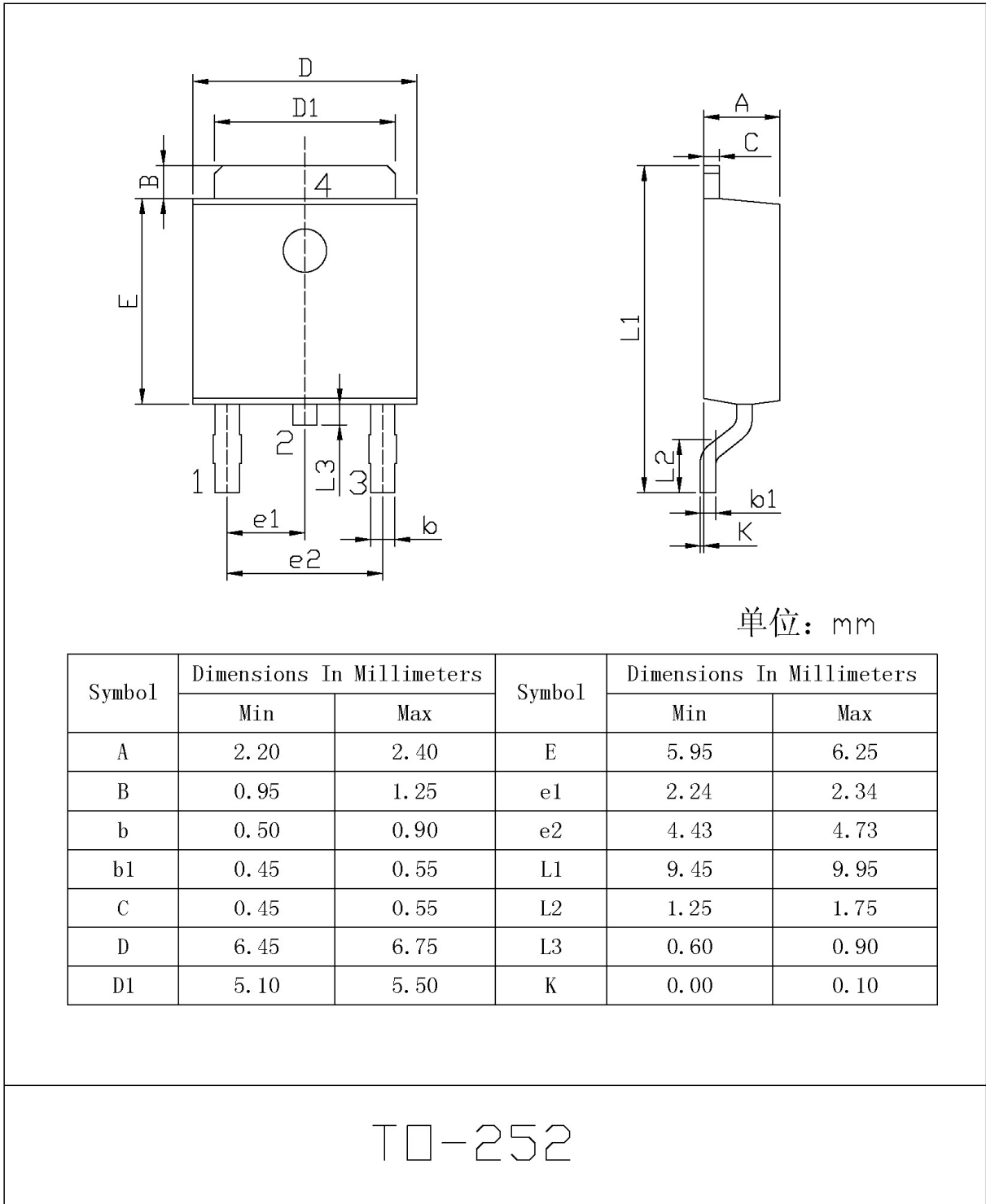


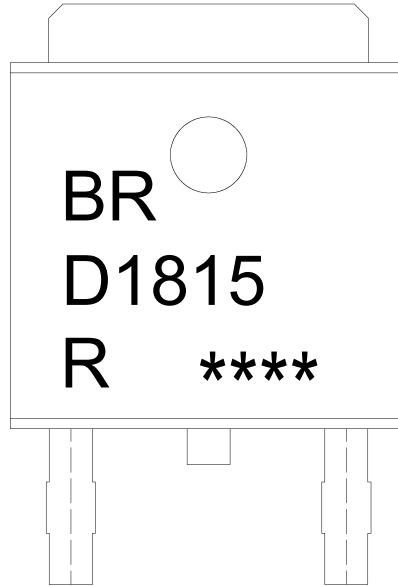
Fig. 6 - Collector Power Derating Curve



外形尺寸图 / Package Dimensions



印章说明 / Marking Instructions



说明：

BR： 为公司代码

D1815： 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:

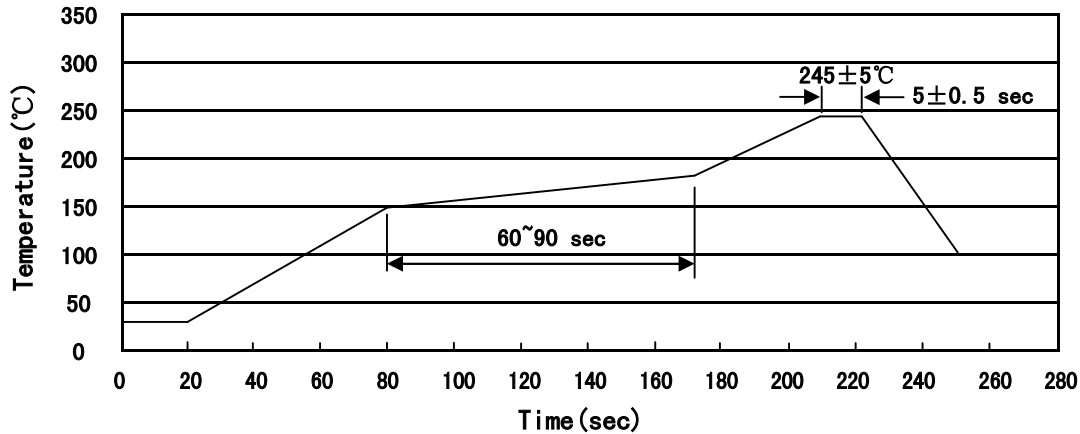
BR: Company Code

D1815: Product Type.

R:  $h_{FE}$  Classifications Symbol

\*\*\*\*: Lot No. Code, code change with Lot No

**回流焊温度曲线图(无铅) / Temperature Profile for IR Reflow Soldering(Pb-Free)**



说明：

- 1、预热温度 150~180°C，时间 60~90sec;
- 2、峰值温度 245±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:150~180°C, Time:60~90sec.
- 2.Peak Temp.:245±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：260±5°C      时间：10±1 sec.      Temp.:260±5°C      Time:10±1 sec

**包装规格 / Packaging SPEC.**

卷盘包装 / REEL

Package Type 封装形式	Units 包装数量					Dimension 包装尺寸 (unit: mm <sup>3</sup> )		
	Units/Reel 只/卷盘	Reels/Inner Box 卷盘/盒	Units/Inner Box 只/盒	Inner Boxes/Outer Box 盒/箱	Units/Outer Box 只/箱	Reel	Inner Box 盒	Outer Box 箱
TO-252	2,500	2	5,000	6	30,000	13" ×16	360×360×50	380×335×366

套管包装 / TUBE

Package Type 封装形式	Units 包装数量					Dimension 包装尺寸 (unit: mm <sup>3</sup> )		
	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**