

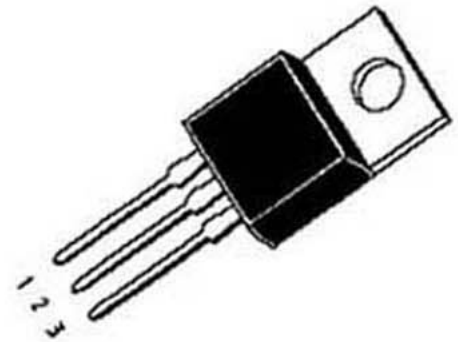
## TO-220 Plastic-Encapsulate Transistors

**D304X** TRANSISTOR(NPN)

## ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

| Characteristic              | Symbol | Value    | Unit |
|-----------------------------|--------|----------|------|
| Collector-Base Voltage      | VCBO   | 700      | V    |
| Collector-Emitter Voltage   | VCEO   | 400      | V    |
| Emitter-Base voltage        | VEBO   | 9        | V    |
| Collector Current           | Ic     | 10       | A    |
| Collector Power Dissipation | Pc     | 80       | W    |
| Junction Temperature        | Tj     | 150      | °C   |
| Storage Temperature         | Tstg   | -55~+150 | °C   |

TO-220



1. Base 2. Collector 3. Emitter

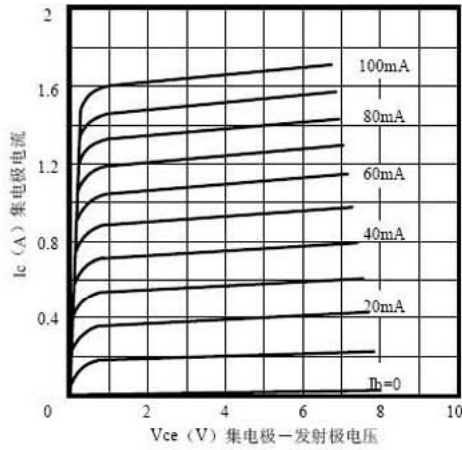
## ELECTRICAL CHARACTERISTICS (Ta=25°C, unless otherwise specified)

| Characteristic                         | Symbol   | Test conditions                 | MIN | TYP | MAX  | Unit |
|--|----------|---------------------------------|-----|-----|------|------|
| Collector -base breakdown voltage      | V(BR)CBO | Ic=1000μA, IE=0                 | 700 |     |      | V    |
| *Collector -emitter Sustaining Voltage | V(BR)CEO | Ic=10mA, IB=0                   | 400 |     |      | V    |
| Emitter cut-off current                | IEBO     | VEB= 9 V, IC=0                  |     |     | 1000 | μA   |
| DC current gain                        | HFE (1)  | VCE=2V, IC=0.5A                 | 8   |     | 40   |      |
|  | HFE (2)  | VCE=10V, IC=0.5m A              | 5   |     |      |      |
| Collector -emitter saturation voltage  | VCE(sat) | IC=1000m A, IB= 250 m A         |     |     | 1    | V    |
| Base-emitter saturation voltage        | VBE(sat) | IC=1000m A, IB= 250m A          |     |     | 1.2  | V    |
| Base Emitter Voltage                   | VBE(ON)  | IE= 2000 m A                    |     |     | 3    | V    |
| Current Gain Bandwidth Product         | fT       | VCE=10V, Ic=100mA<br>f=1MHz     | 5   |     |      | MHZ  |
| Turn On Time                           | TON      | Ic=1A, IB1=IB2=0.2A<br>VCC=100V |     |     |      | μs   |
| Storage Time                           | ts       |                                 |     |     | 0.5  | μs   |
| Fall Time                              | tf       |                                 |     |     | 0.5  | μs   |

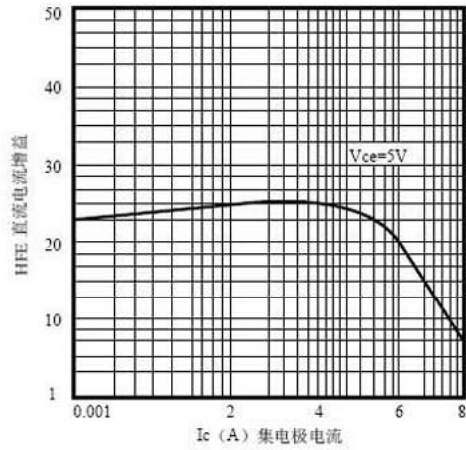
## Typical Characteristics

# D304X

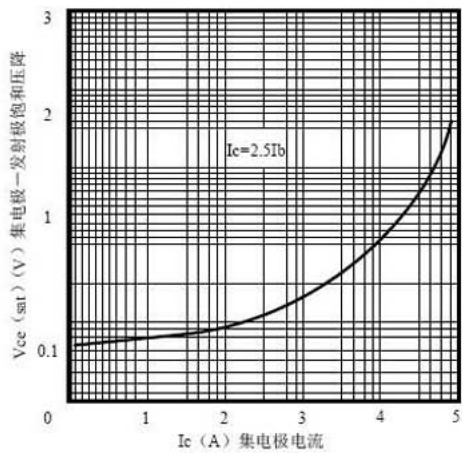
静态输出特性



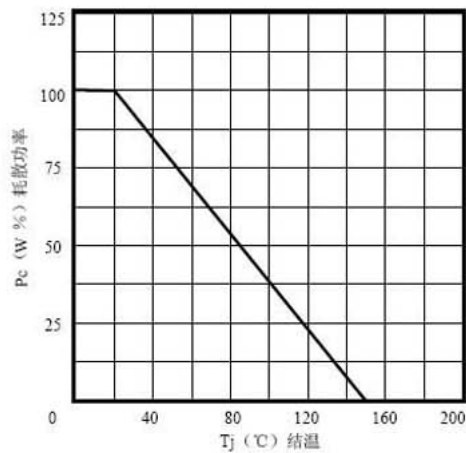
HFE 直流电流增益 -  $I_c$  集电极电流



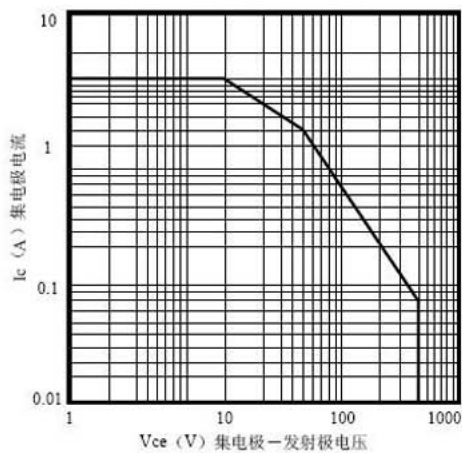
$V_{ce(sat)}$  集电极-发射极饱和压降 -  $I_c$  集电极电流



$P_c$  耗散功率 -  $T_j$  结温

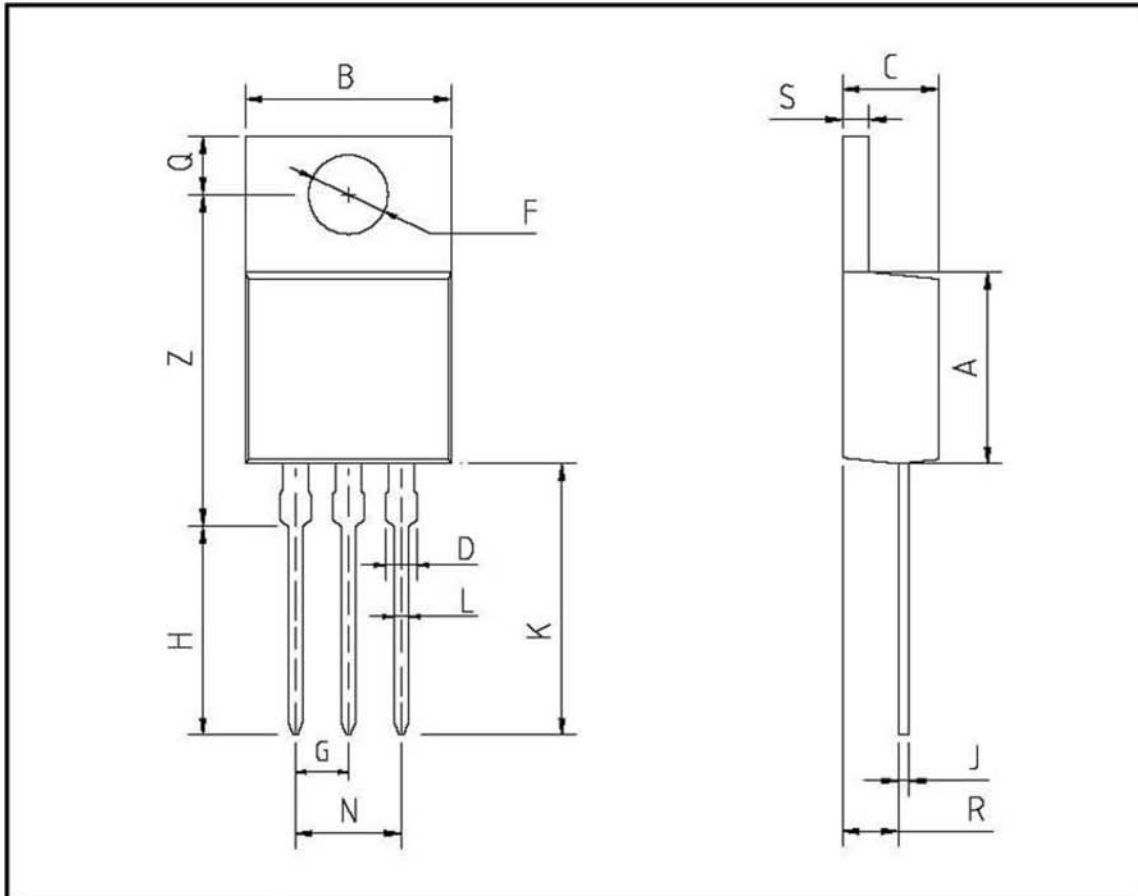


SOA (DC) 安全工作区



## TO-220 外形尺寸图

单位: mm



| 符号 | 最小值  | 典型值  | 最大值  |
|----|------|------|------|
| A  | 8.8  | 9    | 9.2  |
| B  | 9.5  | 10   | 10.5 |
| C  | 4.2  | 4.5  | 4.8  |
| D  | 1.2  | 1.25 | 1.3  |
| F  | φ3.4 | φ3.6 | φ3.8 |
| G  |      | 2.54 |      |
| H  | 9.5  | 10   | 10.5 |
| J  | 0.43 | 0.45 | 0.47 |
| K  | 13   | 13.5 | 14   |
| L  | 0.75 | 0.8  | 0.85 |
| N  |      | 5.08 |      |
| P  |      |      |      |
| Q  | 2.7  | 2.8  | 2.9  |
| R  | 2.7  | 2.75 | 2.8  |
| S  | 1.2  | 1.25 | 1.3  |
| Z  | 15.7 | 15.9 | 16.1 |