

# NPN Transistor

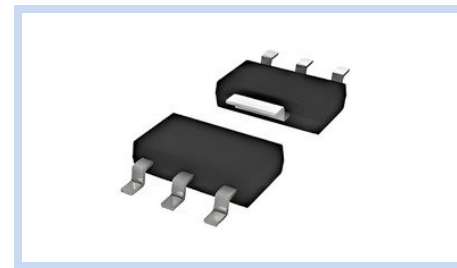
## 40V 1W SOT-223

PZT2222A

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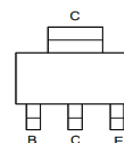
### FEATURE

- Low Collector-Emitter Saturation Voltage
- Capable of 1W Power Dissipation
- Excellent DC Current Gain Characteristics
- High Transition Frequency to 300MHz
- Application: Switching and Control Circuit for Relay, Motor Driver, LED String Driver, Power Supplies



### MECHANICAL DATA

- Case: SOT-223 Package, Molded Epoxy
- Terminals: Solderable per MIL-STD-750, Method 2026



### MAXIMUM RATINGS

| Parameter                                           | Symbol          | Value     | Unit |
|-----------------------------------------------------|-----------------|-----------|------|
| Collector-Base Voltage                              | $V_{CBO}$       | 75        | V    |
| Collector-Emitter Voltage                           | $V_{CEO}$       | 40        | V    |
| Emitter-Base Voltage                                | $V_{EBO}$       | 6         | V    |
| Collector Current                                   | $I_C$           | 600       | mA   |
| Power Dissipation                                   | $P_{tot}$       | 1         | W    |
| Typical Thermal Resistance from Junction to Ambient | $R_{\theta JA}$ | 125       | °C/W |
| Operation Junction and Storage Temperature Range    | $T_J, T_{stg}$  | -55 ~+150 | °C   |

### ELECTRICAL CHARACTERISTICS

| Parameter- ON Characteristic         | Conditions                       | Symbol        | Min. | Typ. | Max. | Unit |
|--------------------------------------|----------------------------------|---------------|------|------|------|------|
| DC Current Gain                      | $V_{CE}=10V, I_C=0.1mA$          | $h_{FE}$      | 35   | -    | -    | -    |
|                                      | $V_{CE}=10V, I_C=1mA$            |               | 50   | -    | -    |      |
|                                      | $V_{CE}=10V, I_C=10mA$           |               | 70   | -    | -    |      |
|                                      | $V_{CE}=10V, I_C=150mA$          |               | 100  | -    | 300  |      |
|                                      | $V_{CE}=1V, I_C=150mA$           |               | 50   | -    | -    |      |
|                                      | $V_{CE}=10V, I_C=500mA$          |               | 40   | -    | -    |      |
| Collector-Emitter Saturation Voltage | $I_C=150mA, I_B=15mA$            | $V_{CE(SAT)}$ | -    | -    | 0.3  | V    |
|                                      | $I_C=500mA, I_B=50mA$            |               | -    | -    | 1.0  |      |
| Base-Emitter Saturation Voltage      | $I_C=150mA, I_B=15mA$            | $V_{BE(SAT)}$ | 0.6  | -    | 1.2  | V    |
|                                      | $I_C=500mA, I_B=50mA$            |               | -    | -    | 2.0  |      |
| Parameter- OFF Characteristics       | Conditions                       | Symbol        | Min. | Typ. | Max. | Unit |
| Collector-Base Breakdown Voltage     | $I_C=10\mu A$                    | $V_{(BR)CBO}$ | 75   | -    | -    | V    |
| Collector-Emitter Breakdown Voltage  | $I_C=10mA$                       | $V_{(BR)CEO}$ | 40   | -    | -    | V    |
| Emitter-Base Breakdown Voltage       | $I_E=10\mu A$                    | $V_{(BR)EBO}$ | 6    | -    | -    | V    |
| Collector-Base Cut-Off Current       | $V_{CB}=60V$                     | $I_{CBO}$     | -    | -    | 10   | nA   |
| Emitter-Base Cut-Off Current         | $V_{EB}=3V$                      | $I_{EBO}$     | -    | -    | 100  | nA   |
| Output Capacitance                   | $V_{CB}=10V, f=1MHz$             | $C_{ob}$      | -    | -    | 8    | pF   |
| Parameter-Small Signal               | Conditions                       | Symbol        | Min. | Typ. | Max. | Unit |
| Current-Gain – Bandwidth Product     | $V_{CE}=20V, I_C=20mA, f=100MHz$ | $f_T$         | 300  | -    | -    | MHz  |

Note:

1.  $T_A=25^{\circ}C$  unless otherwise noted.

2. Device is mounted on FR-4 substrate PC board, 2oz copper, with 1 in<sup>2</sup> copper plate.

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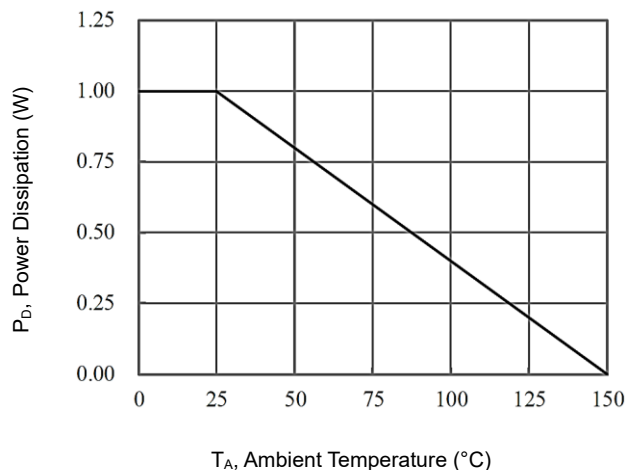
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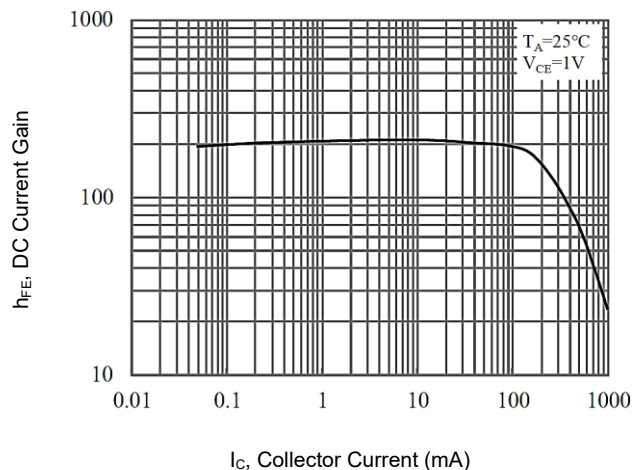
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### CHARACTERISTIC CURVES

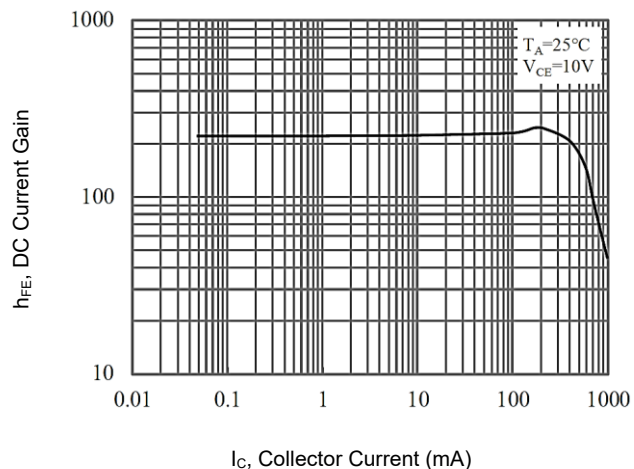
Power Derating Curve



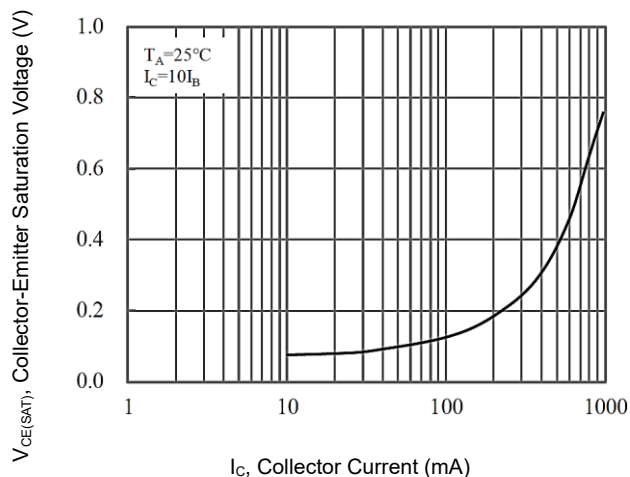
DC Current Gain



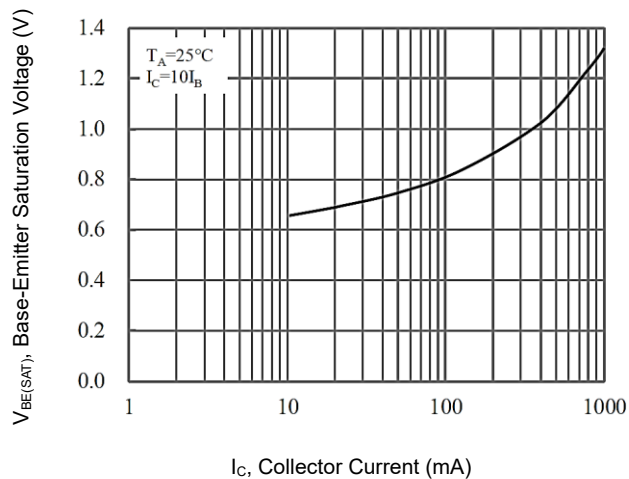
DC Current Gain



Collector-Emitter Saturation Voltage



Base-Emitter Saturation Voltage



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**40V 1W SOT-223**

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**DIMENSIONS**

| Item | Min (mm) | Max (mm) |
|------|----------|----------|
| A    | 1.50     | 1.80     |
| b    | 0.60     | 0.80     |
| b1   | 2.90     | 3.10     |
| c    | 0.22     | 0.32     |
| D    | 6.30     | 6.70     |
| e    | 4.60     |          |
| e1   | 2.30     |          |
| E    | 3.30     | 3.70     |
| E1   | 6.70     | 7.30     |
| L    | 0.70     | 1.10     |
| X    | 1.20     |          |
| X1   | 3.30     |          |
| Y    | 1.60     |          |
| Y1   | 1.60     |          |
| Y2   | 8.00     |          |
| c    | 2.30     |          |
| c1   | 6.40     |          |

