

# ST 2N2222 / 2N2222A

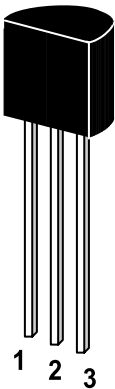
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## NPN Silicon Epitaxial Planar Transistor

for switching and AF amplifier applications.

The transistor is subdivided into one group according to its DC current gain. As complementary type the PNP transistor ST 2N2907 and ST 2N2907A are recommended.

On special request, these transistors can be manufactured in different pin configurations.

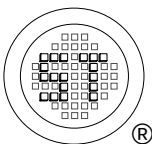


1. Emitter 2. Base 3. Collector

TO-92 Plastic Package  
Weight approx. 0.19g

## Absolute Maximum Ratings ( $T_a = 25^\circ\text{C}$ )

|                           | Symbol    | Value       |            | Unit             |
|---------------------------|-----------|-------------|------------|------------------|
|                           |           | ST 2N2222   | ST 2N2222A |                  |
| Collector Base Voltage    | $V_{CBO}$ | 60          | 75         | V                |
| Collector Emitter Voltage | $V_{CEO}$ | 30          | 40         | V                |
| Emitter Base Voltage      | $V_{EBO}$ | 5           | 6          | V                |
| Collector Current         | $I_C$     | 600         |            | mA               |
| Power Dissipation         | $P_{tot}$ | 625         |            | mW               |
| Junction Temperature      | $T_j$     | 150         |            | $^\circ\text{C}$ |
| Storage Temperature Range | $T_S$     | -55 to +150 |            | $^\circ\text{C}$ |



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ISO/TS 16949 : 2002  
Certificate No. 05103



ISO 14001 : 2004  
Certificate No. 014



ISO 9001 : 2000  
Certificate No. 014

Dated : 05/10/2005

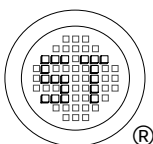
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# ST 2N2222 / 2N2222A

Characteristics at  $T_{amb}=25\text{ }^{\circ}\text{C}$

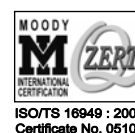
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|                                                                |                                                       | Symbol        | Min. | Typ. | Max. | Unit          |
|----------------------------------------------------------------|-------------------------------------------------------|---------------|------|------|------|---------------|
| DC Current Gain                                                | at $I_C=0.1\text{mA}$ , $V_{CE}=10\text{V}$           | $h_{FE}$      | 35   | -    | -    | -             |
|                                                                | at $I_C=1\text{mA}$ , $V_{CE}=10\text{V}$             | $h_{FE}$      | 50   | -    | -    | -             |
|                                                                | at $I_C=10\text{mA}$ , $V_{CE}=10\text{V}$            | $h_{FE}$      | 75   | -    | -    | -             |
|                                                                | at $I_C=150\text{mA}$ , $V_{CE}=10\text{V}$           | $h_{FE}$      | 100  | -    | 300  | -             |
|                                                                | at $I_C=500\text{mA}$ , $V_{CE}=10\text{V}$ ST 2N2222 | $h_{FE}$      | 30   | -    | -    | -             |
|                                                                | ST 2N2222A                                            | $h_{FE}$      | 40   | -    | -    | -             |
| Collector Cutoff Current                                       | at $V_{CB}=50\text{V}$ ST 2N2222                      | $I_{CBO}$     | -    | -    | 0.01 | $\mu\text{A}$ |
|                                                                | $V_{CB}=60\text{V}$ ST 2N2222A                        | $I_{CBO}$     | -    | -    | 0.01 | $\mu\text{A}$ |
| Collector Base Breakdown Voltage                               | at $I_C=10\mu\text{A}$ ST 2N2222                      | $V_{(BR)CBO}$ | 60   | -    | -    | V             |
|                                                                | ST 2N2222A                                            | $V_{(BR)CBO}$ | 75   | -    | -    | V             |
| Collector Emitter Breakdown Voltage                            | at $I_C=10\text{mA}$ ST 2N2222                        | $V_{(BR)CEO}$ | 30   | -    | -    | V             |
|                                                                | ST 2N2222A                                            | $V_{(BR)CEO}$ | 40   | -    | -    | V             |
| Emitter Base Breakdown Voltage                                 | at $I_E=10\mu\text{A}$ ST 2N2222                      | $V_{(BR)EBO}$ | 5    | -    | -    | V             |
|                                                                | ST 2N2222A                                            | $V_{(BR)EBO}$ | 6    | -    | -    | V             |
| Collector Saturation Voltage                                   | at $I_C=150\text{mA}$ , $I_B=15\text{mA}$ ST 2N2222   | $V_{CE(sat)}$ | -    | -    | 0.4  | V             |
|                                                                | ST 2N2222A                                            | $V_{CE(sat)}$ | -    | -    | 0.3  | V             |
|                                                                | at $I_C=500\text{mA}$ , $I_B=50\text{mA}$ ST 2N2222   | $V_{CE(sat)}$ | -    | -    | 1.6  | V             |
|                                                                | ST 2N2222A                                            | $V_{CE(sat)}$ | -    | -    | 1    | V             |
|                                                                | Base Saturation Voltage                               |               |      |      |      |               |
|                                                                | at $I_C=150\text{mA}$ , $I_B=15\text{mA}$ ST 2N2222   | $V_{BE(sat)}$ | -    | -    | 1.3  | V             |
| Gain Bandwidth Product                                         | ST 2N2222A                                            | $V_{BE(sat)}$ | 0.6  | -    | 1.2  | V             |
|                                                                | at $I_C=500\text{mA}$ , $I_B=50\text{mA}$ ST 2N2222   | $V_{BE(sat)}$ | -    | -    | 2.6  | V             |
|                                                                | ST 2N2222A                                            | $V_{BE(sat)}$ | -    | -    | 2.0  | V             |
|                                                                |                                                       |               |      |      |      |               |
| Gain Bandwidth Product                                         |                                                       | $f_T$         | 250  | -    | -    | MHz           |
| at $I_C=20\text{mA}$ , $V_{CE}=20\text{V}$ , $f=100\text{MHz}$ |                                                       |               |      |      |      |               |
| Collector Output Capacitance                                   |                                                       | $C_{ob}$      | -    | -    | 8    | pF            |
| at $V_{CB}=10\text{V}$ , $f=1\text{MHz}$                       |                                                       |               |      |      |      |               |
| Input Capacitance                                              |                                                       | $C_{ib}$      | -    | -    | 30   | pF            |
| at $V_{CB}=0.5\text{V}$ , $f=1\text{MHz}$                      |                                                       |               |      |      |      |               |



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Figure 1. DC Current Gain

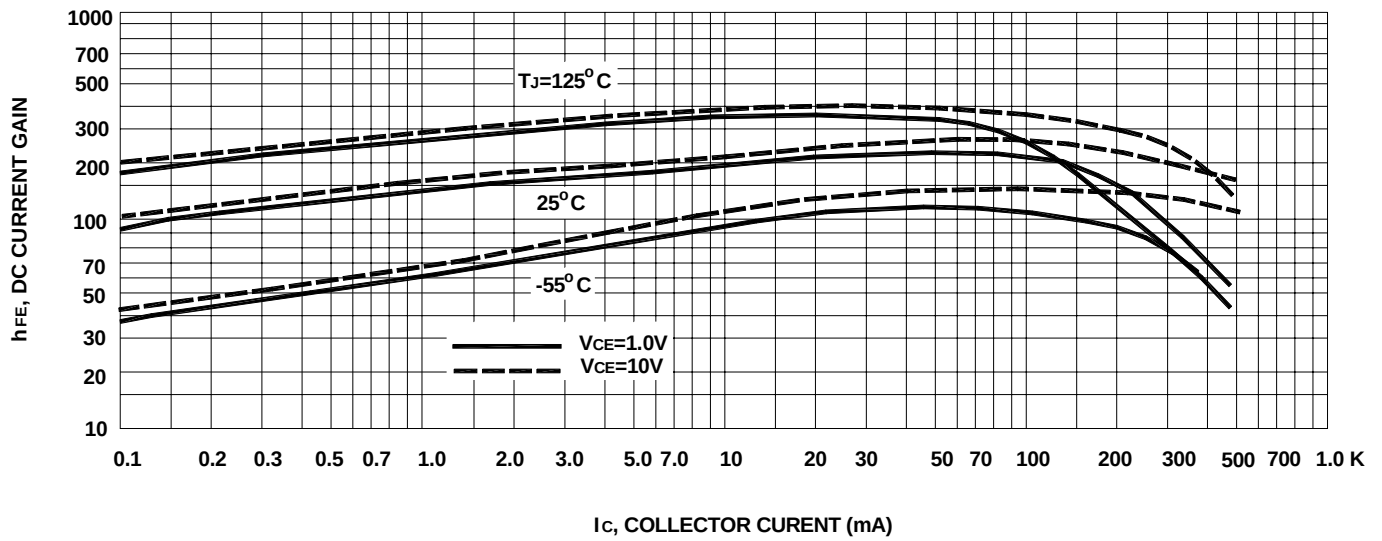
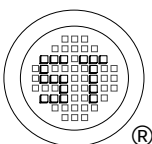
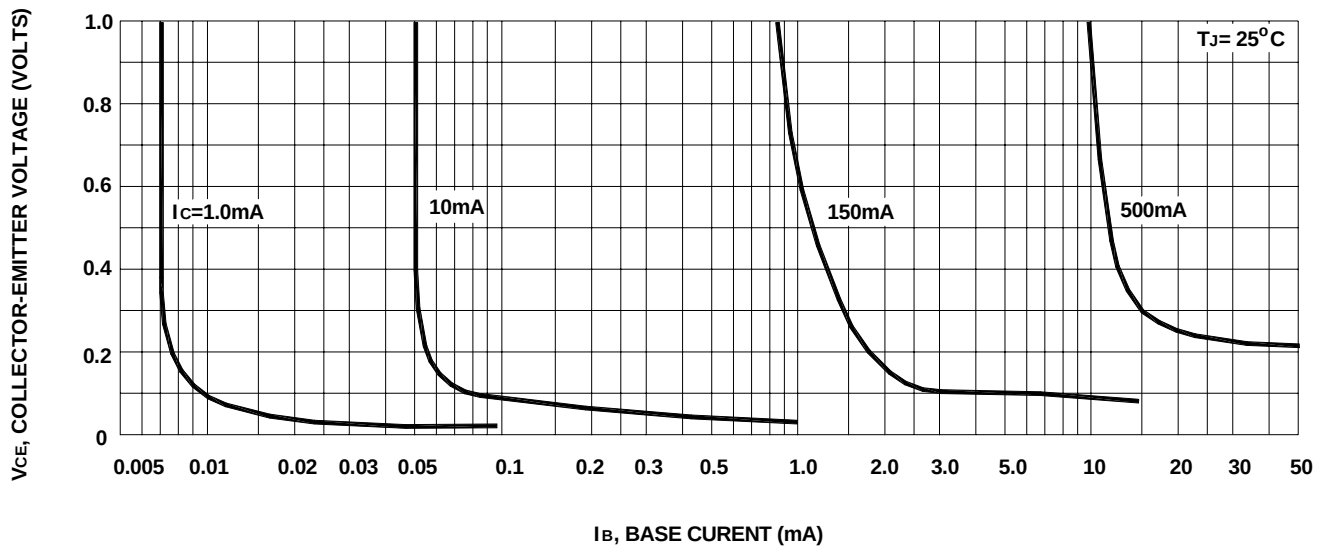
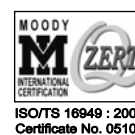


Figure 2. Collector Saturation Region



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Figure 3. Capacitances

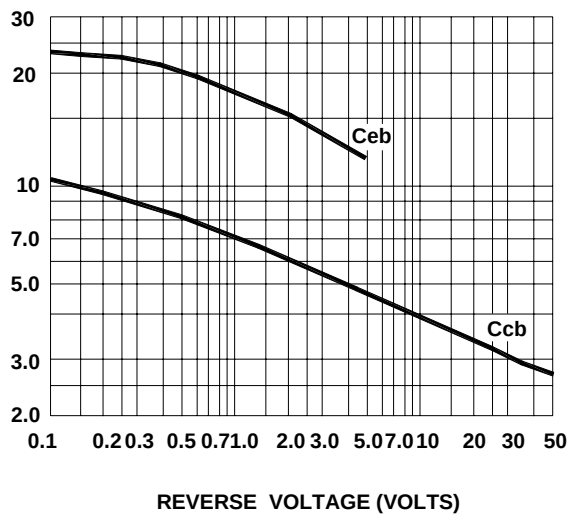
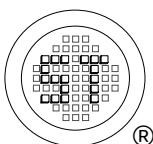
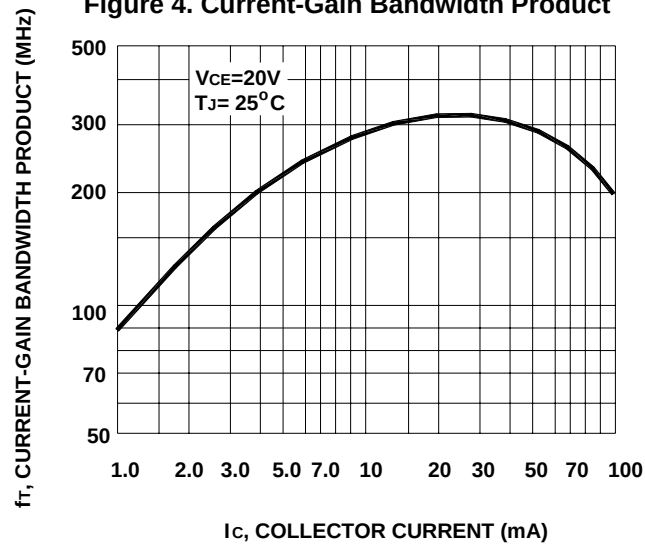
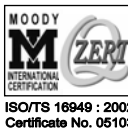


Figure 4. Current-Gain Bandwidth Product



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