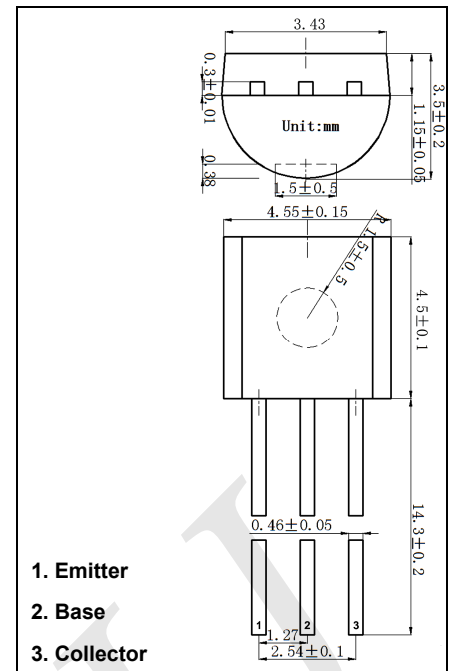


## TO-92 Plastic-Encapsulate Transistors

### 2N2222A-338 NPN Transistors

#### Features

- Complementary NPN Type available (2N2907A)



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

| Symbol    | Parameter                   | Value      | Unit               |
|-----------|-----------------------------|------------|--------------------|
| $V_{CB0}$ | Collector Base Voltage      | 75         | V                  |
| $V_{CE0}$ | Collector Emitter Voltage   | 40         | V                  |
| $V_{EB0}$ | Emitter Base Voltage        | 6          | V                  |
| $I_c$     | Collector Current           | 600        | mA                 |
| $P_c$     | Collector Power Dissipation | 625        | mW                 |
| $T_j$     | Junction Temperature        | 150        | $^{\circ}\text{C}$ |
| $T_{stg}$ | Storage Temperature         | -55 ~ +150 | $^{\circ}\text{C}$ |

**Electrical Characteristics (T<sub>a</sub>=25°C unless otherwise specified)**

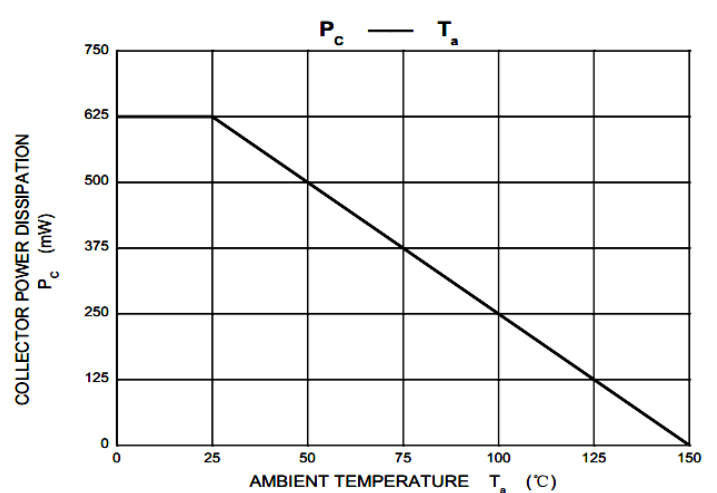
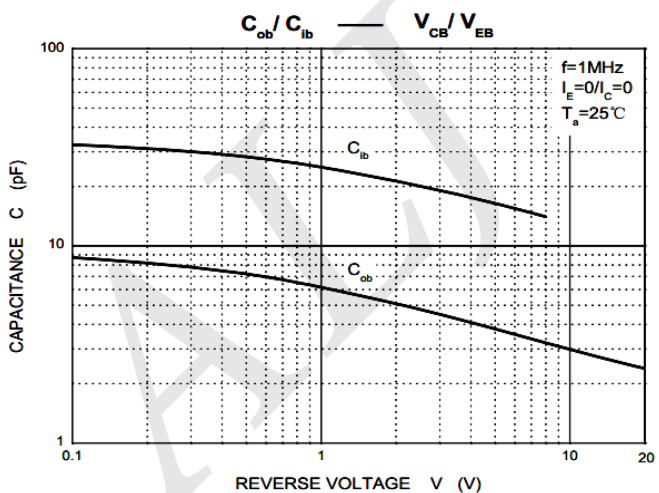
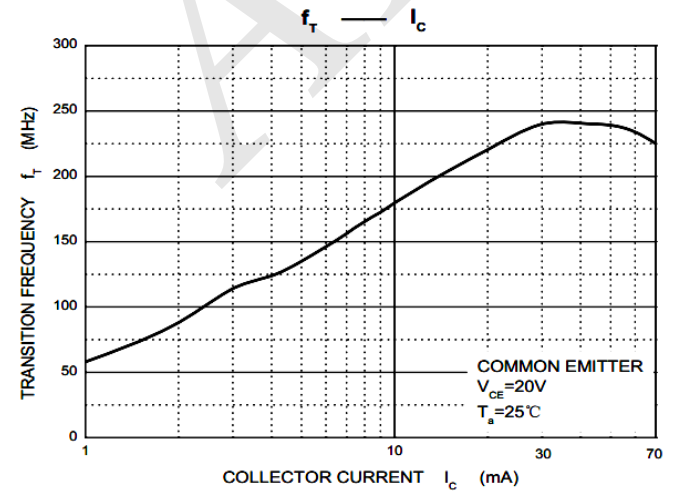
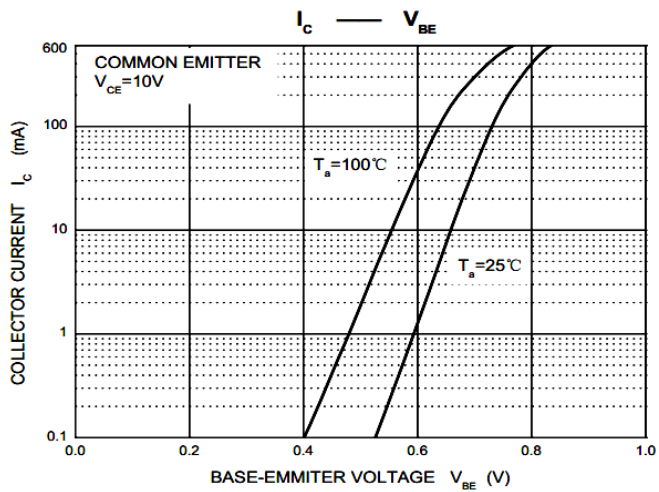
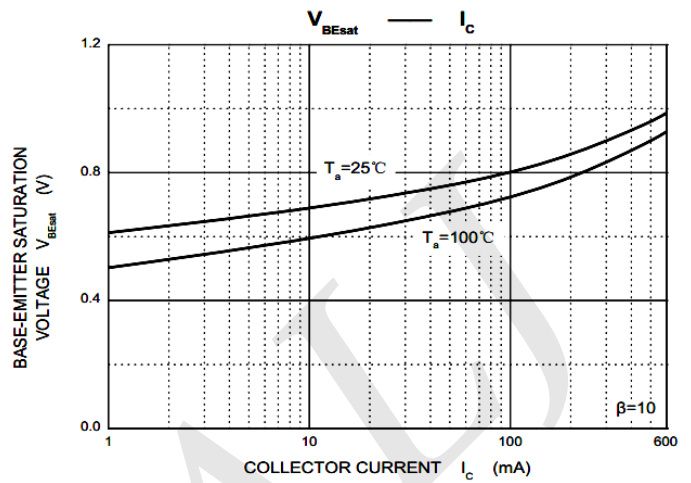
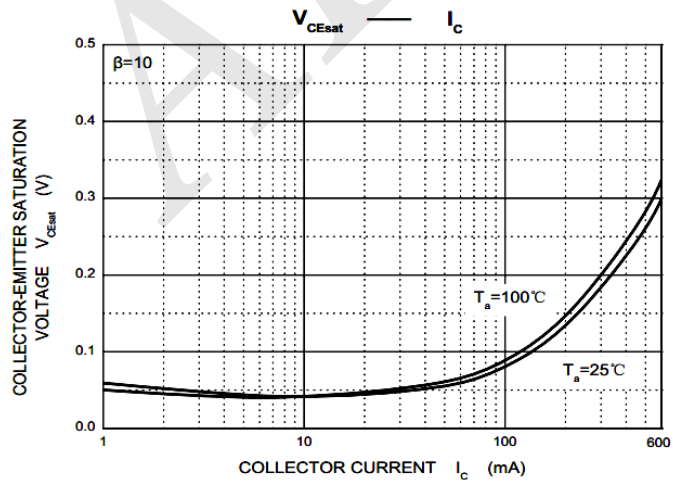
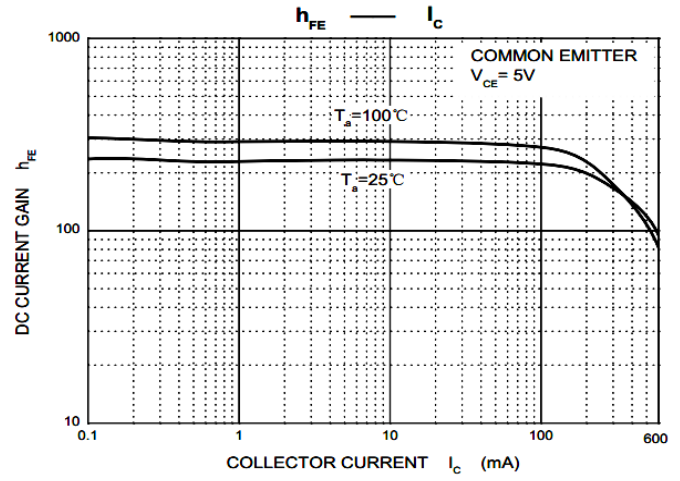
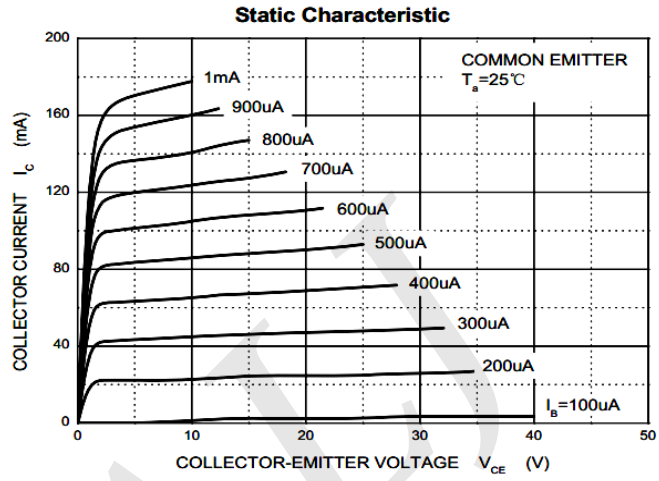
| Symbol                | Parameter                            | Test Conditions  | Min | Typ | Max | Unit |
|-----------------------|--------------------------------------|--|-----|-----|-----|------|
| V <sub>(BR)CBO</sub>  | Collector-base breakdown voltage     | I <sub>C</sub> = 10μA, I <sub>E</sub> = 0  | 75  |     |     | V    |
| V <sub>(BR)CEO*</sub> | Collector-emitter breakdown voltage  | I <sub>C</sub> = 10mA, I <sub>B</sub> = 0  | 40  |     |     | V    |
| V <sub>(BR)EBO</sub>  | Emitter-base breakdown voltage       | I <sub>E</sub> = 10μA, I <sub>C</sub> = 0  | 6   |     |     | V    |
| I <sub>CBO</sub>      | Collector cut-off current            | V <sub>CB</sub> = 60V, I <sub>E</sub> = 0  |     |     | 10  | nA   |
| I <sub>CEx</sub>      | Collector cut-off current            | V <sub>CE</sub> = 60V, V <sub>EB(Off)</sub> = 3V   |     |     | 10  | nA   |
| I <sub>EBO</sub>      | Emitter cut-off current              | V <sub>EB</sub> = 3V, I <sub>C</sub> = 0   |     |     | 100 | nA   |
| h <sub>FE(1)</sub>    | DC current gain                      | V <sub>CE</sub> = 5V, I <sub>C</sub> = 1mA   | 100 |     |     |      |
| h <sub>FE(2)</sub>    |                                      | V <sub>CE</sub> = 10V, I <sub>C</sub> = 150mA  | 100 |     | 300 |      |
| h <sub>FE(3)</sub>    |                                      | V <sub>CE</sub> = 10V, I <sub>C</sub> = 0.1mA  | 40  |     |     |      |
| h <sub>FE(4)*</sub>   |                                      | V <sub>CE</sub> = 10V, I <sub>C</sub> = 500mA  | 42  |     |     |      |
| V <sub>CE(sat)*</sub> | Collector-emitter saturation voltage | I <sub>C</sub> = 150mA, I <sub>B</sub> = 15mA  |     |     | 0.3 | V    |
|                       |                                      | I <sub>C</sub> = 500mA, I <sub>B</sub> = 50mA  |     |     | 0.6 | V    |
| V <sub>BE(sat)*</sub> | Base-emitter saturation voltage      | I <sub>C</sub> = 500mA, I <sub>B</sub> = 50mA  |     |     | 1.2 | V    |
| f <sub>r</sub>        | Transition frequency                 | V <sub>CE</sub> =20V, I <sub>C</sub> =20mA, f=100MHz   | 300 |     |     | MHz  |
| t <sub>d</sub>        | Delay time                           | V <sub>CC</sub> = 30V, V <sub>EB(Off)</sub> = -0.5V,<br>I <sub>C</sub> = 150mA, I <sub>B1</sub> = 15mA |     |     | 10  | ns   |
| t <sub>r</sub>        | Rise time                            |  |     |     | 25  | ns   |
| t <sub>s</sub>        | Storage time                         | V <sub>CC</sub> = 30V, I <sub>C</sub> = 150mA,<br>I <sub>B1</sub> = I <sub>B2</sub> = 15mA             |     |     | 225 | ns   |
| t <sub>f</sub>        | Fall time                            |  |     |     | 60  | ns   |

\*pulse test

**Classification OF h<sub>FE(1)</sub>**

| Rank  | L       | H       |
|-------|---------|---------|
| Range | 100-200 | 200-300 |

# Typical Characteristics



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