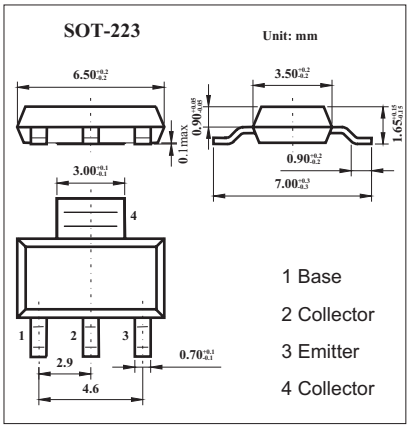
# NPN Switching Transistor

# KZT2222A

## Features

- High current (max. 600 mA)
- Low voltage (max.40 V).

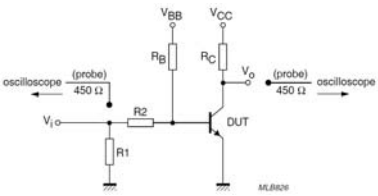



## Absolute Maximum Ratings Ta = 25℃

| Parameter | Symbol | Rating | 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 |
| Peak collector current | $I_{CM}$ | 800 | mA |
| Peak base current | $I_{BM}$ | 200 | mA |
| Total power dissipation Ta≤25℃ | $P_{tot}$ | 1 | W |
| Storage temperature | $T_{stg}$ | -65 to +150 | ℃ |
| Junction temperature | $T_j$ | 150 | ℃ |
| Operating ambient temperature | $T_{amb}$ | -65 to +150 | ℃ |
| Thermal resistance from junction to ambient | $R_{th(j-a)}$ | 109 | K/W |
| Thermal resistance from junction to soldering point | $R_{th(j-s)}$ | 28 | K/W |

# KZT2222A

■ Electrical Characteristics Ta = 25℃

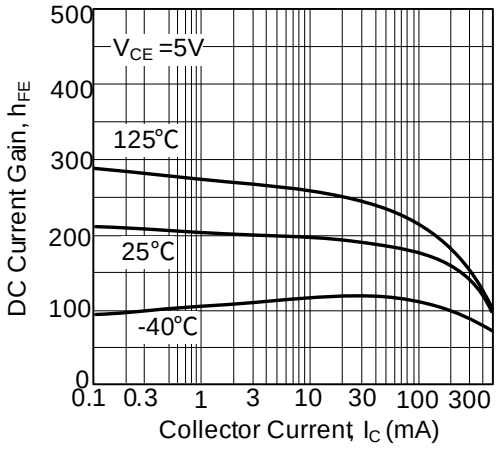
| Parameter | Symbol | Testconditons | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Collector cutoff current | $I_{CBO}$ | $I_E$ = 0; $V_{CB}$ = 60 V | | | 10 | nA |
| | | $I_E$ = 0; $V_{CB}$ = 60 V; $T_j$ = 125 ℃ | | | 10 | μA |
| Emitter cutoff current | $I_{EBO}$ | $I_C$ = 0; $V_{EB}$ = 5 V | | | 10 | nA |
| DC current gain | $h_{FE}$ | $I_C$ = 0.1 mA; $V_{CE}$ = 10 V | 35 | | | |
| | | $I_C$ = 1 mA; $V_{CE}$ = 10 V | 50 | | | |
| | | $I_C$ = 10 mA; $V_{CE}$ = 10 V | 75 | | | |
| | | $I_C$ = 10 mA; $V_{CE}$ = 10 V;$T_a$ = -55 ℃ | 35 | | | |
| | | $I_C$ = 150 mA; $V_{CE}$ = 1 V * | 50 | | | |
| | | $I_C$ = 150 mA; $V_{CE}$ = 10 V * | 100 | | 300 | |
| | | $I_C$ = 500 mA; $V_{CE}$ = 10 V * | 40 | | | |
| collector-emitter saturation voltage | $V_{CEsat}$ | $I_C$ = 150 mA; $I_B$ = 15 mA | | | 300 | mV |
| | | $I_C$ = 500 mA; $I_B$ = 50 mA | | | 1 | V |
| base-emitter saturation voltage | $V_{BEsat}$ | $I_C$ = 150 mA; $I_B$ = 15 mA | 0.6 | | 1.2 | V |
| | | $I_C$ = 500 mA; $I_B$ = 50 mA | | | 2 | V |
| Collector capacitance | $C_c$ | $I_E$ = $i_E$ = 0; $V_{CB}$ = 10 V; f = 1 MHz | | | 8 | pF |
| Emitter capacitance | $C_e$ | $I_C$ = $i_C$ = 0; $V_{EB}$ = 500 mV; f = 1 MHz | | | 25 | pF |
| Turn-on time | $t_{on}$ | $I_{Con}$ = 150 mA; $I_{Bon}$ = 15 mA; $I_{Boff}$ = -15 mA | | | 35 | ns |
| Delay time | $t_d$ |  | | | 10 | ns |
| Rise time | $t_r$ | | | | 25 | ns |
| Turn-off time | $t_{off}$ | | | | 250 | ns |
| Storage time | $t_s$ | $V_i$ = 9.5 V; T = 500 μs; $t_p$ = 10 μs; $t_r$ = $t_f$ ≤ 3 ns. R1 = 68 Ω; R2 = 325 Ω; $R_B$ = 325 Ω; $R_C$ = 160 Ω. | | | 200 | ns |
| Fall time | $t_f$ | $V_{BB}$ = −3.5 V; $V_{CC}$ = 29.5 V. Oscilloscope input impedance $Z_i$ = 50 Ω. | | | 60 | ns |
| Transition frequency | $f_T$ | $I_C$ = 20 mA; $V_{CE}$ = 20 V; f = 100 MHz | 300 | | | MHz |



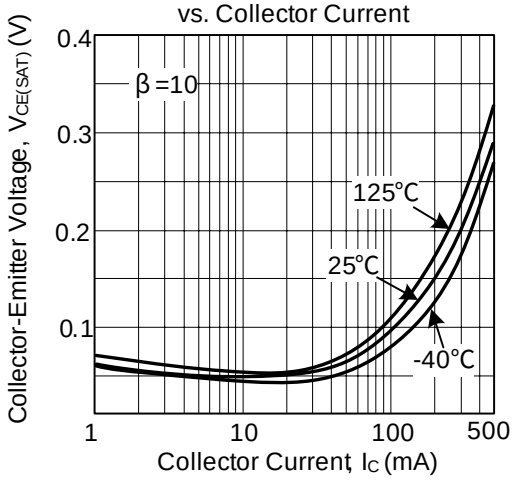
* Pulse test: tp ≤ 300 μs; δ ≤ 0.02.

## ■ TYPICAL CHARACTERISTICS

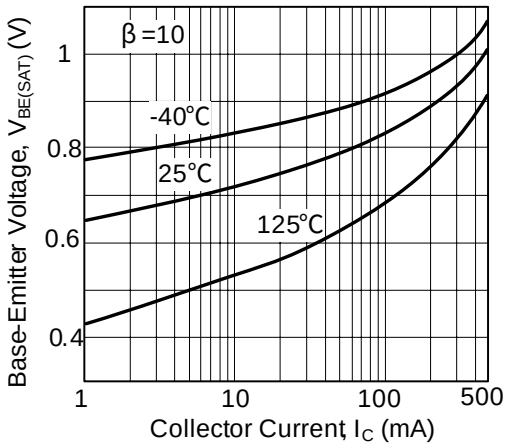
DC Current Gain
vs. Collector Current



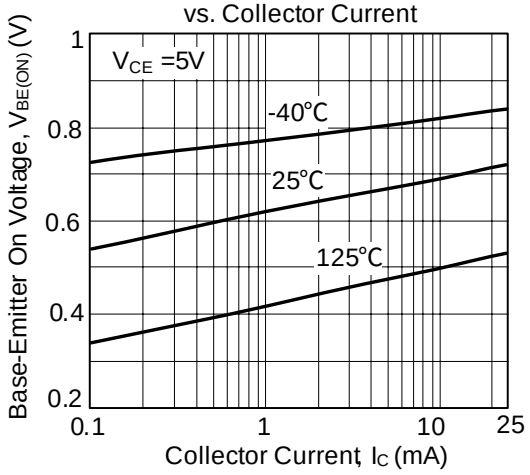

Collector-Emitter Saturation Voltage
vs. Collector Current



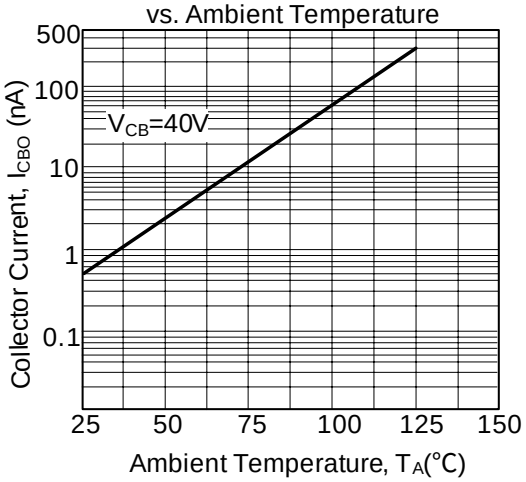

Base-Emitter Saturation Voltage
vs. Collector Current



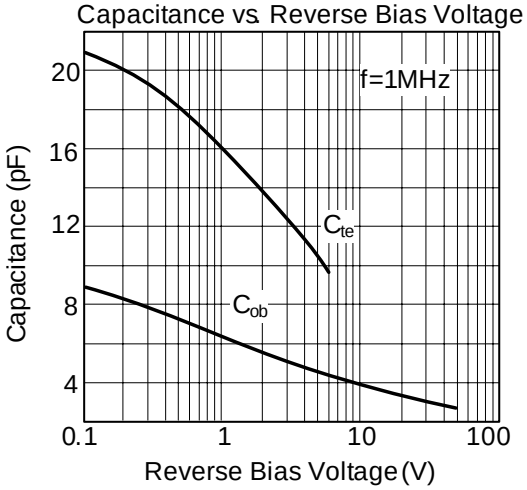

Base-Emitter On Voltage
vs. Collector Current




Collector-Cutoff Current
vs. Ambient Temperature




Emitter Transition and Output
Capacitance vs. Reverse Bias Voltage



## ■ TYPICAL CHARACTERISTICS