

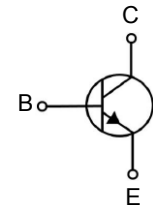
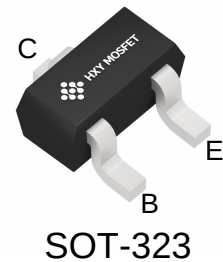


## Features

- Collector Current Capability  $I_C=0.2A$
- Collector Emitter Voltage  $V_{CEO}=40V$

## Package Marking and Ordering Information

| Product ID         | Pack    | Marking | Qty(PCS) |
|--------------------|---------|---------|----------|
| CMST3904 TR PBFREE | SOT-323 | K2N     | 3000     |



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

| Parameter                                   | Symbol          | Rating     | Unit          |
|---------------------------------------------|-----------------|------------|---------------|
| Collector - Base Voltage                    | $V_{CBO}$       | 60         | V             |
| Collector - Emitter Voltage                 | $V_{CEO}$       | 40         |               |
| Emitter - Base Voltage                      | $V_{EBO}$       | 5          |               |
| Collector Current - Continuous              | $I_C$           | 200        | mA            |
| Collector Power Dissipation                 | $P_C$           | 200        | mW            |
| Thermal Resistance From Junction To Ambient | $R_{\theta JA}$ | 625        | $^{\circ}C/W$ |
| Junction Temperature                        | $T_J$           | 150        | $^{\circ}C$   |
| Storage Temperature Range                   | $T_{stg}$       | -55 to 150 |               |

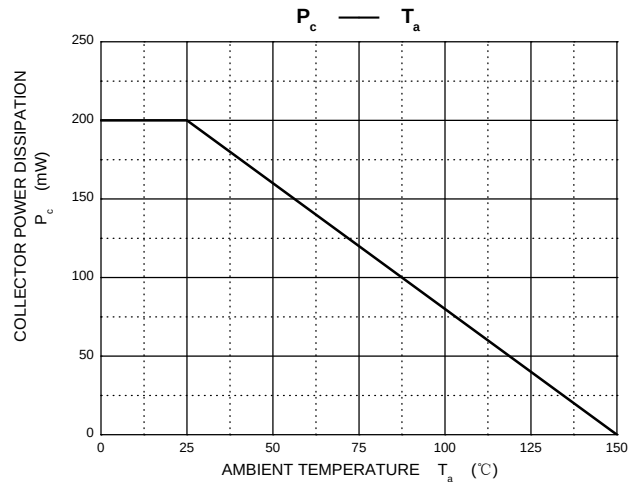
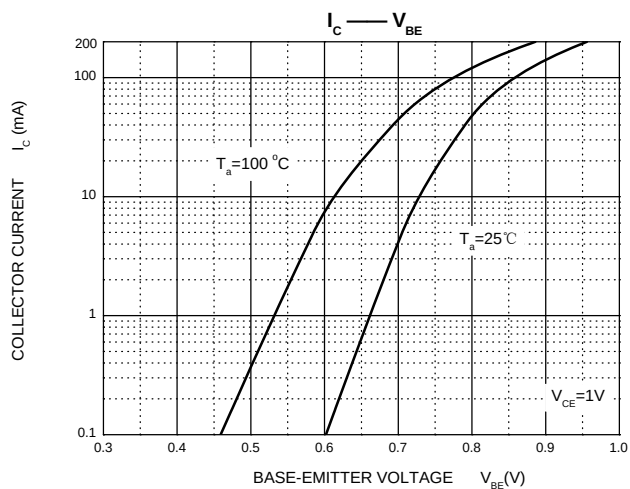
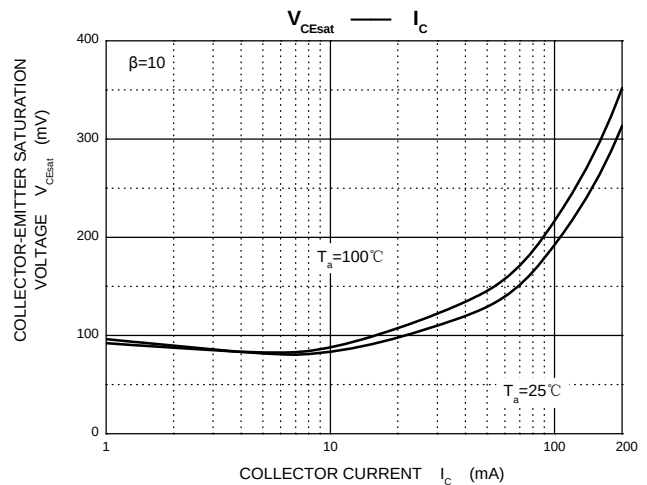
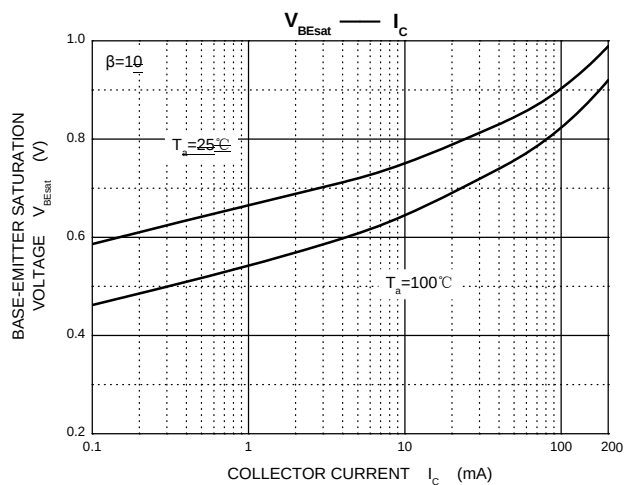
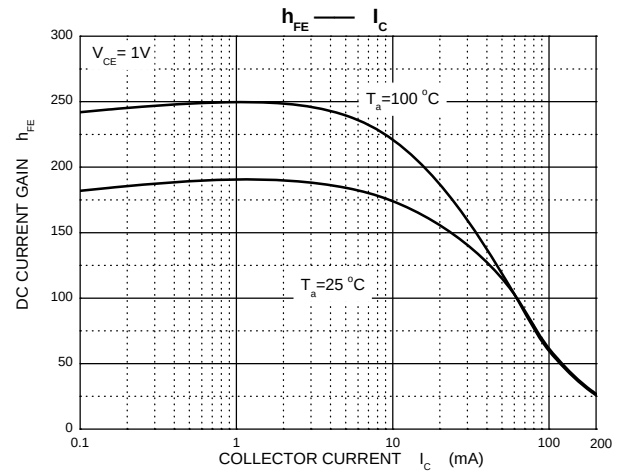
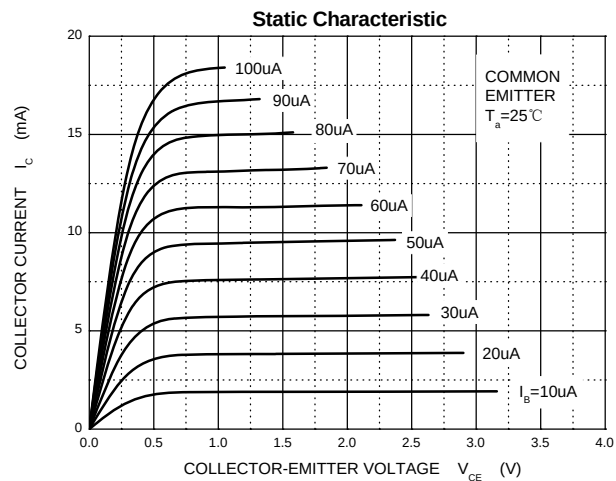
## Electrical Characteristics( $T_a=25^{\circ}C$ unless otherwise specified)

| Parameter                                     | Symbol        | Test Conditions                                     | Min | Typ | Max  | Unit |
|-----------------------------------------------|---------------|-----------------------------------------------------|-----|-----|------|------|
| Collector- base breakdown voltage             | $V_{CBO}$     | $I_C=100\mu A, I_E=0$ (Note.1)                      | 60  |     |      | V    |
| Collector- emitter breakdown voltage          | $V_{CEO}$     | $I_C=1mA, I_B=0$ (Note.1)                           | 40  |     |      |      |
| Emitter - base breakdown voltage              | $V_{EBO}$     | $I_E=100\mu A, I_C=0$ (Note.1)                      | 5   |     |      |      |
| Collector-base cut-off current                | $I_{CBO}$     | $V_{CB}=60V, I_E=0$ (Note.1)                        |     |     | 60   | nA   |
| Collector- emitter cut-off current            | $I_{CEO}$     | $V_{CE}=40V, I_E=0$ (Note.1)                        |     |     | 700  |      |
| Collector- emitter cut-off current            | $I_{CEX}$     | $V_{CE}=30V, V_{BE(off)}=3V$                        |     |     | 50   |      |
| Emitter cut-off current                       | $I_{EBO}$     | $V_{EB}=5V, I_C=0$                                  |     |     | 100  | V    |
| Collector-emitter saturation voltage (Note.1) | $V_{CE(sat)}$ | $I_C=10mA, I_B=1mA$                                 |     |     | 0.25 |      |
|                                               |               | $I_C=50mA, I_B=5mA$                                 |     |     | 0.3  |      |
| Base - emitter saturation voltage (Note.1)    | $V_{BE(sat)}$ | $I_C=10mA, I_B=1mA$                                 |     |     | 0.85 |      |
|                                               |               | $I_C=50mA, I_B=5mA$                                 |     |     | 0.95 |      |
| DC current gain (Note.1)                      | $h_{FE(1)}$   | $V_{CE}=1V, I_C=100\mu A$                           | 40  |     |      |      |
|                                               | $h_{FE(2)}$   | $V_{CE}=1V, I_C=1mA$                                | 70  |     |      |      |
|                                               | $h_{FE(3)}$   | $V_{CE}=1V, I_C=10mA$                               | 100 |     | 300  |      |
|                                               | $h_{FE(4)}$   | $V_{CE}=1V, I_C=50mA$                               | 60  |     |      |      |
| Delay time                                    | $t_d$         | $V_{CC}=3V, V_{BE(off)}=0.5V, I_C=10mA, I_{B1}=1mA$ |     |     | 35   | nS   |
| Rise time                                     | $t_r$         |                                                     |     |     | 35   |      |
| Storage time                                  | $t_s$         | $V_{CC}=3V, I_C=10mA, I_{B1}=I_{B2}=1mA$            |     |     | 225  |      |
| Fall time                                     | $t_f$         |                                                     |     |     | 75   |      |
| Collector input capacitance                   | $C_{ib}$      | $V_{EB}=0.5V, I_E=0, f=1MHz$                        |     |     | 8    | pF   |
| Collector output capacitance                  | $C_{ob}$      | $V_{CB}=5V, I_E=0, f=1MHz$                          |     |     | 4    |      |
| Transition frequency                          | $f_r$         | $V_{CE}=20V, I_C=10mA, f=100MHz$                    | 300 |     |      | MHz  |

Note.1: Pulse test: pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2.0\%$ .

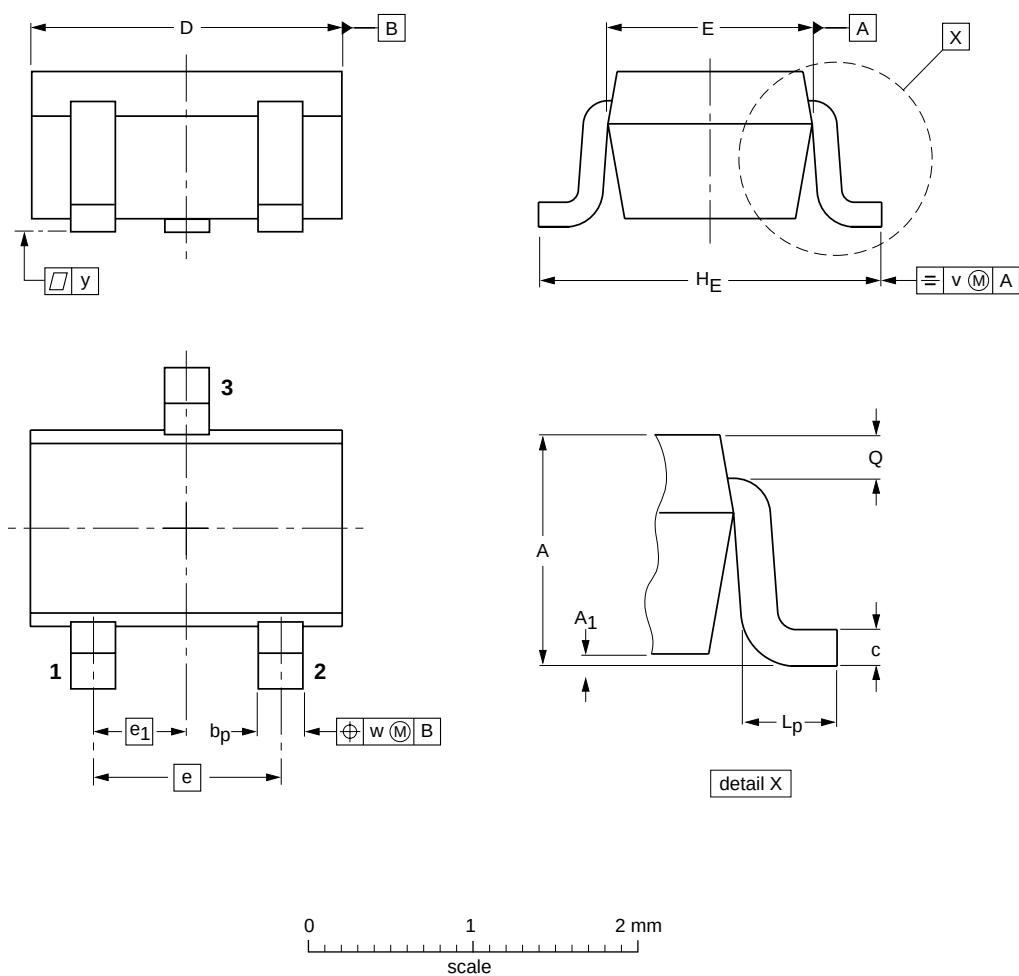


## Typical Characteristics





## SOT-323 Package Outline Dimensions



DIMENSIONS (mm are the original dimensions)

| UNIT | A          | A <sub>1</sub><br>max | b <sub>p</sub> | c            | D          | E            | e   | e <sub>1</sub> | H <sub>E</sub> | L <sub>p</sub> | Q            | v   | w   |
|------|------------|-----------------------|----------------|--------------|------------|--------------|-----|----------------|----------------|----------------|--------------|-----|-----|
| mm   | 1.1<br>0.8 | 0.1                   | 0.4<br>0.3     | 0.25<br>0.10 | 2.2<br>1.8 | 1.35<br>1.15 | 1.3 | 0.65           | 2.2<br>2.0     | 0.45<br>0.15   | 0.23<br>0.13 | 0.2 | 0.2 |



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