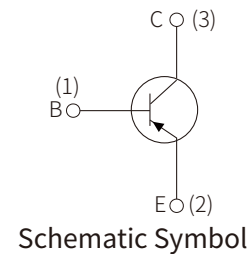


## FEATURES

- Power Dissipation of 200mW
- High Stability and High Reliability

## MECHANICAL DATA

- SOT-323 small outline plastic package
- Epoxy UL: 94V-0
- Mounting position: Any



## APPROVALS

|      |                                    |
|------|------------------------------------|
| RoHS | Compliance with 2011/65/EU         |
| HF   | Compliance with IEC61249-2-21:2003 |

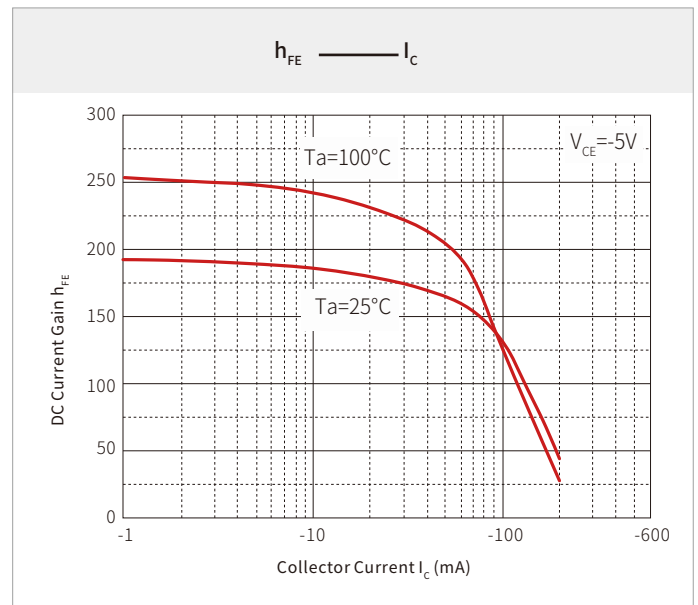
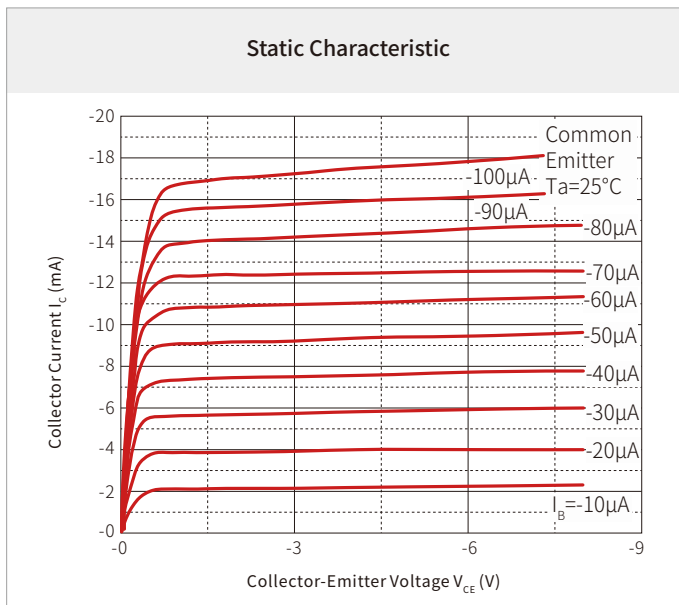
## MAXIMUM RATINGS ( $T_A=25^{\circ}\text{C}$ )

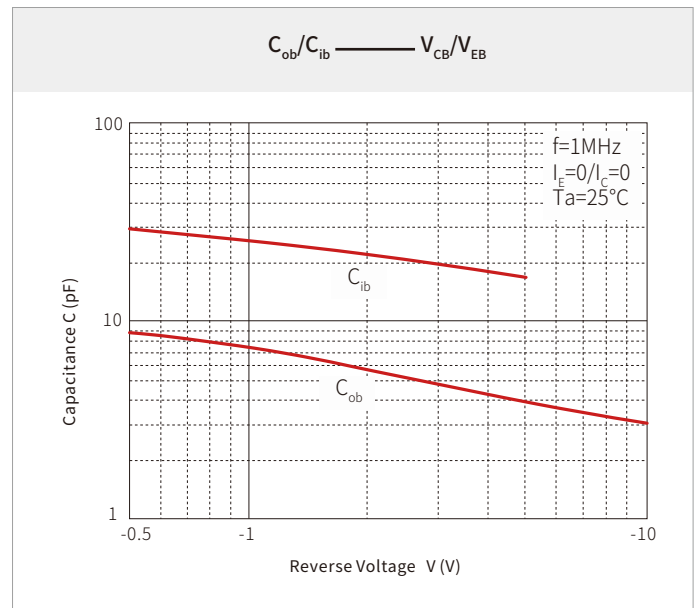
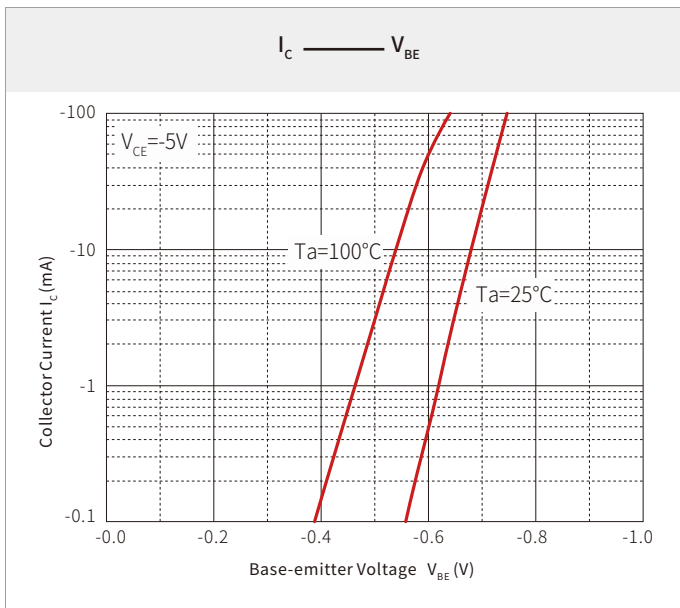
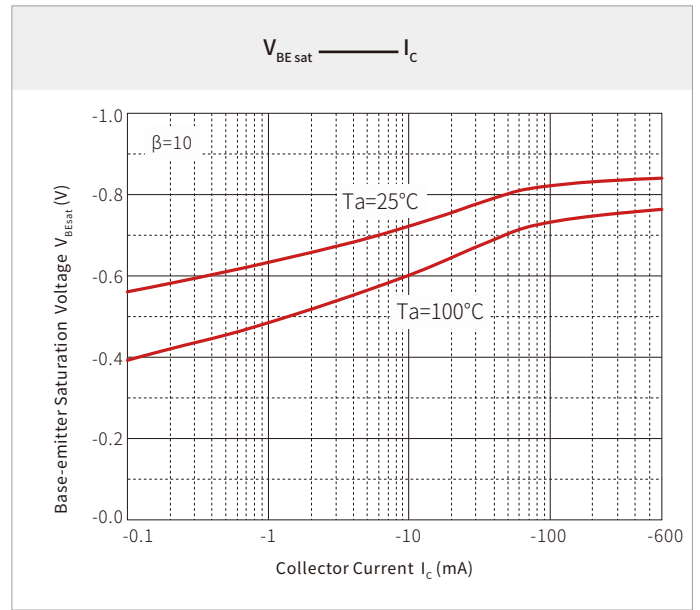
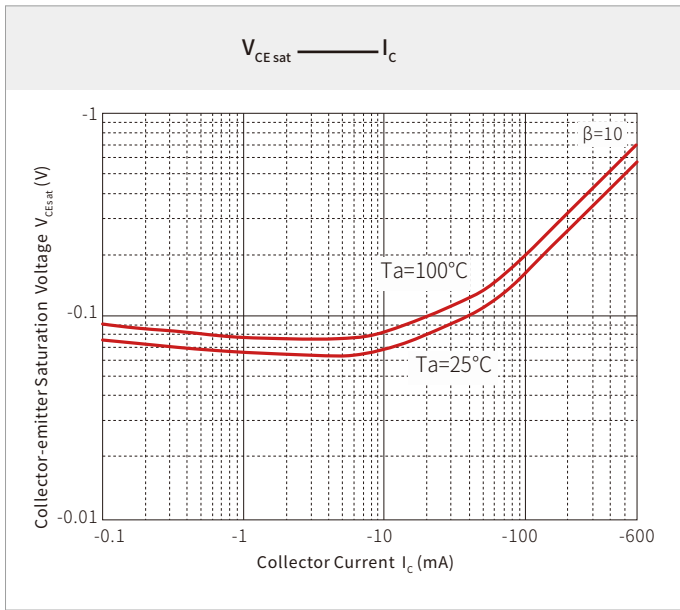
| Parameter                                   | Symbol          | Value    | Unit                 |
|---------------------------------------------|-----------------|----------|----------------------|
| Collector-Base Voltage                      | $V_{CBO}$       | -160     | V                    |
| Collector-Emitter Voltage                   | $V_{CEO}$       | -150     |                      |
| Emitter-Base Voltage                        | $V_{EBO}$       | -5       |                      |
| Collector Current-Continuous                | $I_C$           | -0.6     | A                    |
| Collector Power Dissipation                 | $P_C$           | 200      | mW                   |
| Thermal resistance From junction to ambient | $R_{\theta JA}$ | 625      | $^{\circ}\text{C/W}$ |
| Junction Temperature                        | $T_J$           | -55~+150 | $^{\circ}\text{C}$   |
| Storage Temperature                         | $T_{STG}$       | -55~+150 | $^{\circ}\text{C}$   |

## ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C)

| Parameter                            | Symbol               | Test Conditions                                      | Min. | Typ. | Max. | Unit |
|--------------------------------------|----------------------|------------------------------------------------------|------|------|------|------|
| Collector-base breakdown voltage     | V <sub>(BR)CBO</sub> | I <sub>C</sub> =-100μA, I <sub>E</sub> =0            | -160 |      |      | V    |
| Collector-emitter breakdown voltage  | V <sub>(BR)CEO</sub> | I <sub>C</sub> =-1mA, I <sub>B</sub> =0              | -150 |      |      |      |
| Emitter-base breakdown voltage       | V <sub>(BR)EBO</sub> | I <sub>E</sub> =-10μA, I <sub>C</sub> =0             | -5   |      |      |      |
| Collector cut-off current            | I <sub>CBO</sub>     | V <sub>CB</sub> =-35V, I <sub>E</sub> =0             |      |      | -100 | nA   |
| Emitter cut-off current              | I <sub>EBO</sub>     | V <sub>EB</sub> =-4V, I <sub>C</sub> =0              |      |      | -100 |      |
| DC current gain                      | h <sub>FE(1)</sub>   | V <sub>CE</sub> =-5V, I <sub>C</sub> =-10mA          | 100  |      | 300  |      |
|                                      | h <sub>FE(2)</sub>   | V <sub>CE</sub> =-5V, I <sub>C</sub> =-50mA          | 30   |      |      |      |
| Collector-emitter saturation voltage | V <sub>CE(sat)</sub> | I <sub>C</sub> =-50mA, I <sub>B</sub> =-5mA          |      |      | -0.5 | V    |
| Base-emitter saturation voltage      | V <sub>BE(sat)</sub> | I <sub>C</sub> =-50mA, I <sub>B</sub> =-5mA          |      |      | -1.0 |      |
| Transition frequency                 | f <sub>T</sub>       | V <sub>CE</sub> =-5V, I <sub>C</sub> =-10mA, f=30MHz | 100  |      |      | MHz  |

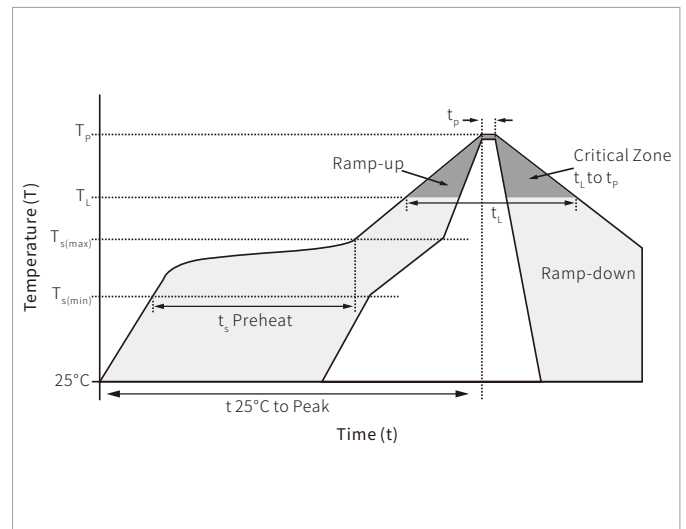
## TYPICAL CHARACTERISTICS



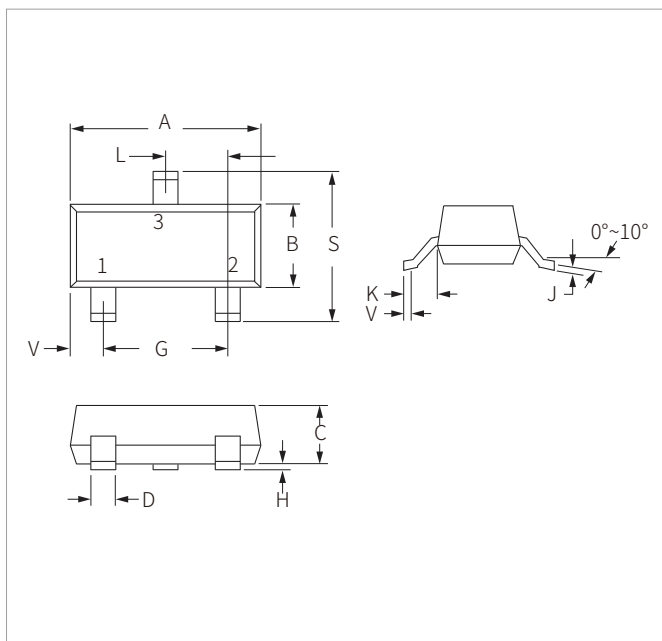


## SOLDERING PARAMETERS

| Reflow Condition                                      |                                  | Lead-free assembly |
|-------------------------------------------------------|----------------------------------|--------------------|
| Pre Heat                                              | Temperature Max ( $T_{s(min)}$ ) | 150°C              |
|                                                       | Temperature Max ( $T_{s(max)}$ ) | 200°C              |
|                                                       | Time (min to max) ( $t_s$ )      | 60 – 180 secs      |
| Average ramp up rate (Liquidus Temp ( $T_L$ ) to peak |                                  | 3°C/second max     |
| $T_{s(max)}$ to $T_L$ - Ramp-up Rate                  |                                  | 3°C/second max     |
| Reflow                                                | Temperature ( $T_L$ ) (Liquidus) | 217°C              |
|                                                       | Time (min to max) ( $t_L$ )      | 60 – 150 seconds   |
| Peak Temperature ( $T_p$ )                            |                                  | 260°C              |
| Time within 5°C of actual peak Temperature ( $t_p$ )  |                                  | 20 – 40 seconds    |
| Ramp-down Rate                                        |                                  | 6°C/second max     |
| Time 25°C to peak Temperature ( $T_p$ )               |                                  | 8 minutes max.     |
| Do not exceed                                         |                                  | 260°C              |

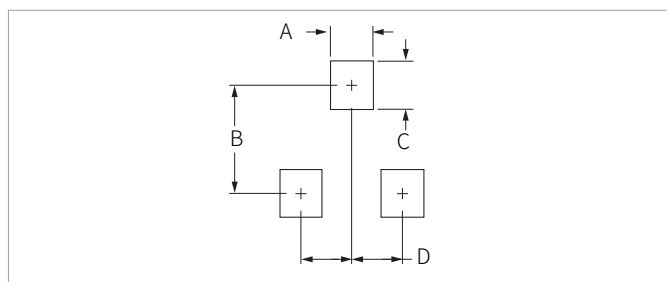


## SOT-323 PACKAGE INFORMATION



| Ref. | Millimeters |      | Inches   |       |
|------|-------------|------|----------|-------|
|      | Min.        | Max. | Min.     | Max.  |
| A    | 2.00        | 2.20 | 0.079    | 0.087 |
| B    | 1.15        | 1.35 | 0.045    | 0.053 |
| C    | 0.80        | 1.10 | 0.031    | 0.043 |
| D    | 0.20        | 0.40 | 0.008    | 0.016 |
| G    | 1.20        | 1.40 | 0.047    | 0.055 |
| H    | 0.00        | 0.10 | 0.000    | 0.004 |
| J    | 0.08        | 0.15 | 0.003    | 0.006 |
| K    | 0.525REF    |      | 0.021REF |       |
| L    | 0.650TYP    |      | 0.026TYP |       |
| S    | 2.15        | 2.45 | 0.085    | 0.096 |
| V    | 0.26        | 0.46 | 0.010    | 0.018 |

## RECOMMENDED PAD LAYOUT DIMENSIONS



| Ref. | Millimeters | Inches |
|------|-------------|--------|
|      | NOR         | NOR    |
| A    | 0.50        | 0.020  |
| B    | 2.20        | 0.087  |
| C    | 0.80        | 0.031  |
| D    | 1.30        | 0.051  |

## ORDERING INFORMATION

| Part Number | Component Package | QTY/Reel | Reel Size |
|-------------|-------------------|----------|-----------|
| MMST5401    | SOT-323           | 3000PCS  | 7"        |

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