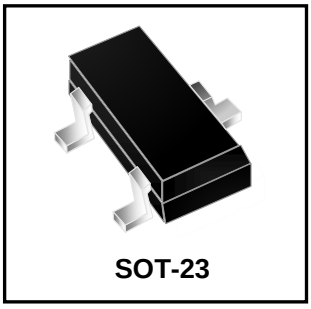
# WT9012

**PNP Silicon Transistor**



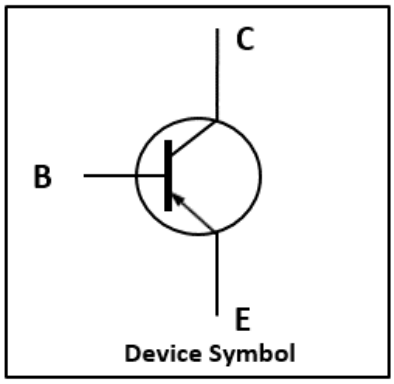

## Features

- High Collector Current
- Complementary to WT9013
- Ideal for Medium Power Amplification and Switching

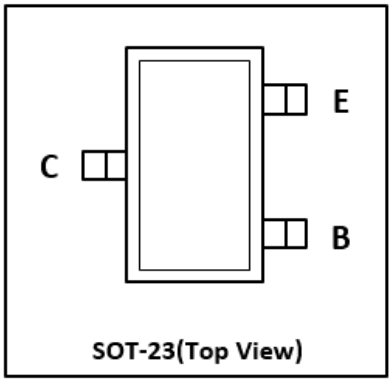
## Mechanical Characteristics

- SOT-23 Package
- Marking : Making Code
- RoHS Compliant & HF
- Device meets MSL3 requirement

## Schematic & PIN Configuration



Device Symbol



SOT-23(Top View)

## Absolute Maximum Rating

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Collector Base Voltage | $V_{CBO}$ | -40 | V |
| Collector Emitter Voltage | $V_{CEO}$ | -25 | V |
| Emitter Base Voltage | $V_{EBO}$ | -5 | V |
| Collector Current | $I_C$ | -500 | mA |
| Collector Power Dissipation | $P_C$ | 300 | mW |
| Junction Temperature Range | $T_j$ | -55 ~ 150 | °C |
| Storage Temperature Range | $T_{stg}$ | -55 ~ 150 | °C |
| Thermal Resistance from Junction to Ambient | $R_{\theta JA}$ | 416 | °C/W |

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## Electrical Characteristics ($T_{amb}$=25°C unless otherwise noted)

| Parameter | Symbol | Test Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Collector-Base Breakdown Voltage | $V_{(BR)CBO}$ | $I_C$ = -100μA, $I_E$ = 0 | -40 | - | - | V |
| Collector-Emitter Breakdown Voltage [1] | $V_{(BR)CEO}$ | $I_C$ = -1mA, $I_B$ = 0 | -25 | - | - | V |
| Emitter-Base Breakdown Voltage | $V_{(BR)EBO}$ | $I_E$ = -100μA, $I_C$ = 0 | -5 | - | - | V |
| Collector Cut-Off Current | $I_{CBO}$ | $V_{CB}$ = -40V, $I_E$ = 0 | - | - | -100 | nA |
| Collector Cut-Off Current | $I_{CEO}$ | $V_{CE}$ = -20V, $I_B$ = 0 | - | - | -100 | nA |
| Emitter Cut-Off Current | $I_{EBO}$ | $V_{EB}$ = -5V, $I_C$ = 0 | - | - | -100 | nA |
| DC current Gain | $h_{FE}$ | $V_{CE}$ = -1V, $I_C$ = -50mA | 200 | - | 350 | - |
| Collector-Emitter Saturation Voltage [1] | $V_{CE(sat)}$ | $I_C$ = -500mA, $I_B$ = -50mA | - | - | -0.6 | V |
| Base-Emitter Saturation Voltage [1] | $V_{BE(sat)}$ | $I_C$ = -500mA, $I_B$ = -50mA | - | - | -1.2 | V |
| Transition Frequency | $f_T$ | $V_{CE}$=-6V,$I_C$=-20mA, f=30MHz | 150 | - | - | MHz |
| Collector Output Capacitance | $C_{ob}$ | $V_{CB}$ = -10V, $I_E$ = 0, f = 1MHz | - | - | 5 | pF |

## Typical Characteristics

Figure 1.Static Characteristics

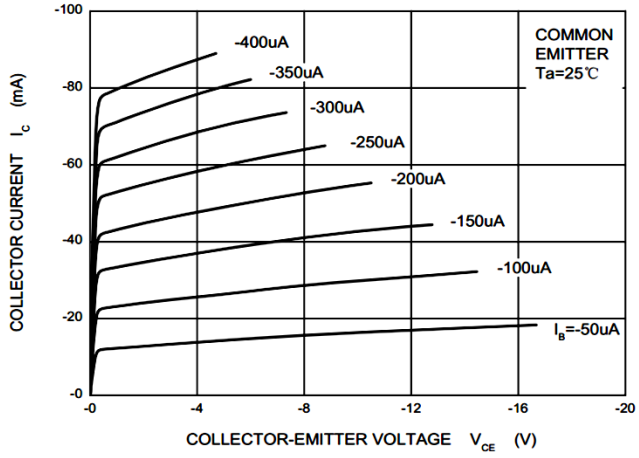



Figure 2. $h_{FE}$ vs. $I_C$

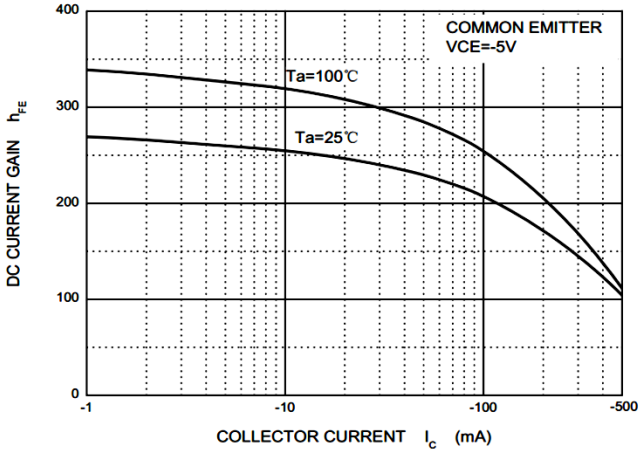


Figure 3. $V_{CE(sat)}$ vs. $I_C$

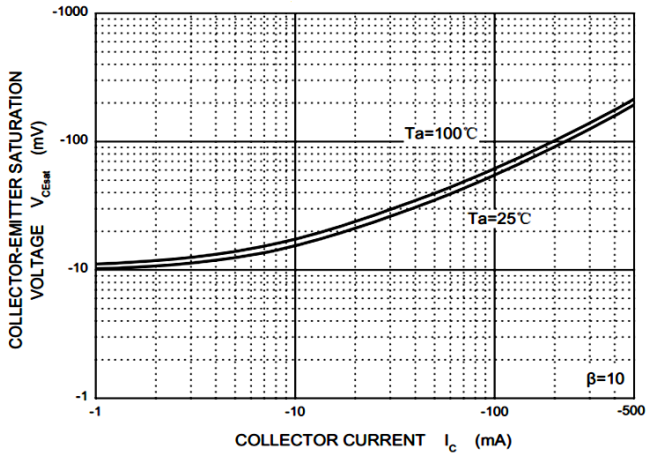



Figure 4. $V_{BE(sat)}$ vs. $I_C$

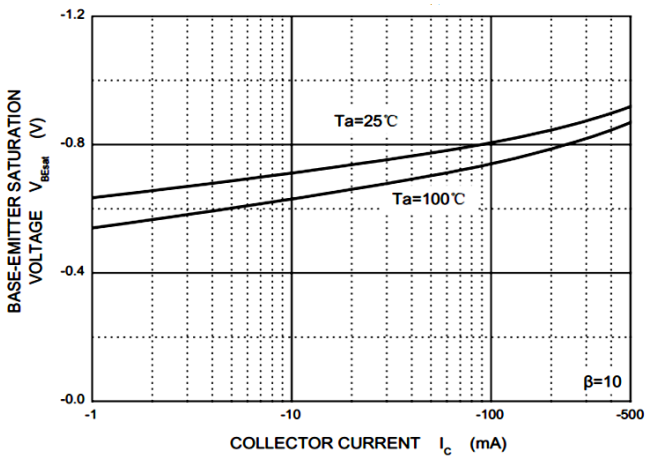



Figure 5. $f_T$ vs. $I_C$

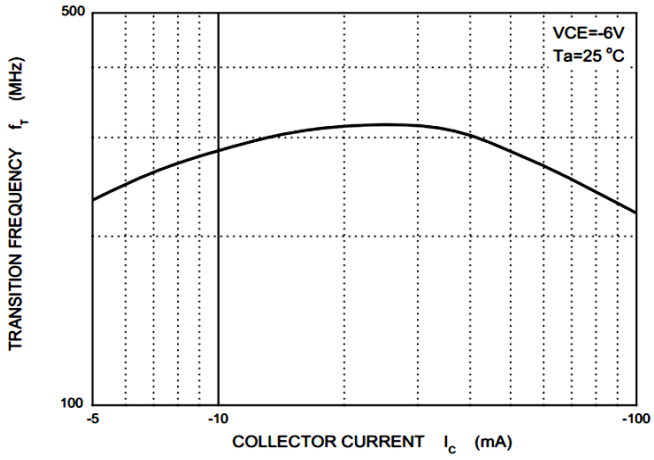



Figure 6. $C_{ob}$ / $C_{ib}$ vs. $V_{CB}$ / $V_{EB}$

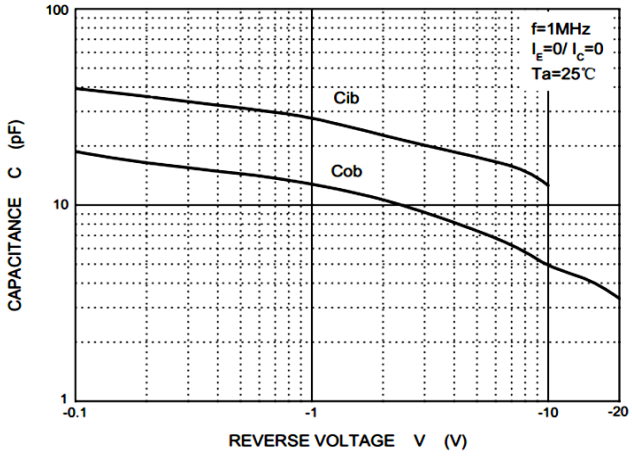
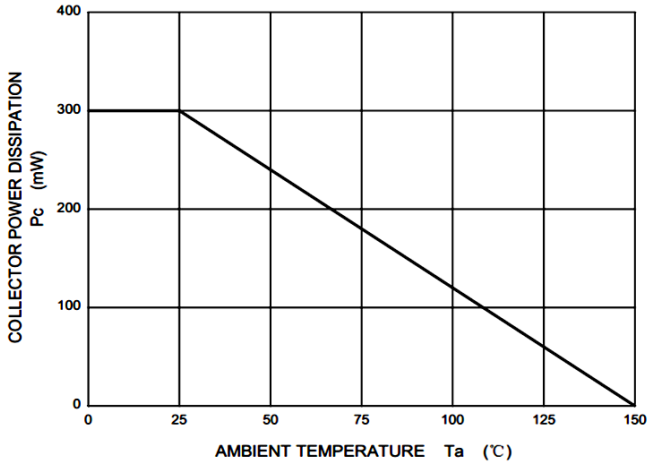
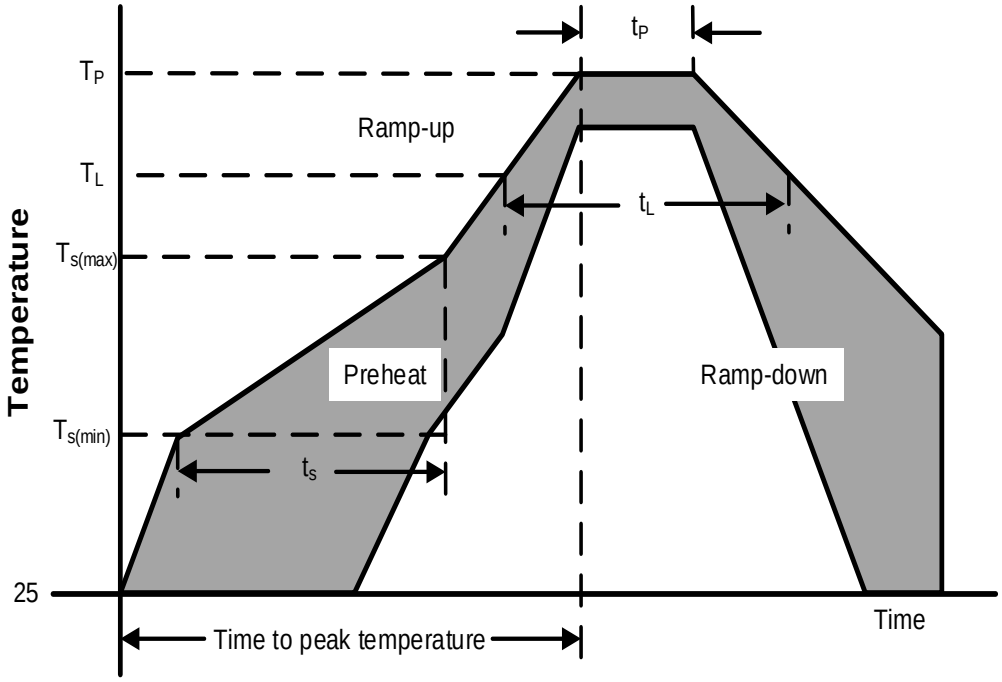



Figure 7. $P_C$ vs. $T_a$



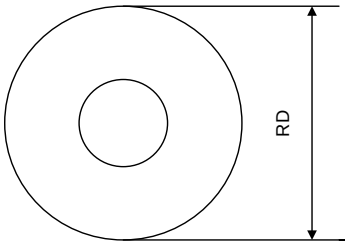
## Soldering Parameters

| Reflow Condition | | Pb – Free assembly |
|---|---|---|
| Pre Heat | Temperature Min ($T_{s(min)}$) | 150°C |
| | Temperature Max ($T_{s(max)}$) | 200°C |
| | Time (min to max) (ts ) | 60 – 190 secs |
| Average ramp up rate (Liquidus Temp) ($T_L$) to peak | | 5°C/second max |
| $T_{S(max)}$ to $T_L$——Ramp-up Rate | | 5°C/second max |
| Reflow | Temperature ($T_L$) (Liquidus) | 217°C |
| | Temperature ($t_L$) | 60 – 150 seconds |
| Peak Temperature ($T_P$) | | 260+0/-5 °C |
| Time within actual peak Temperature ($t_p$ ) | | 20 – 40 seconds |
| Ramp-down Rate | | 5°C/second max |
| Time 25°C to peak Temperature ($T_P$) | | 8 minutes Max. |
| Do not exceed | | 280°C |

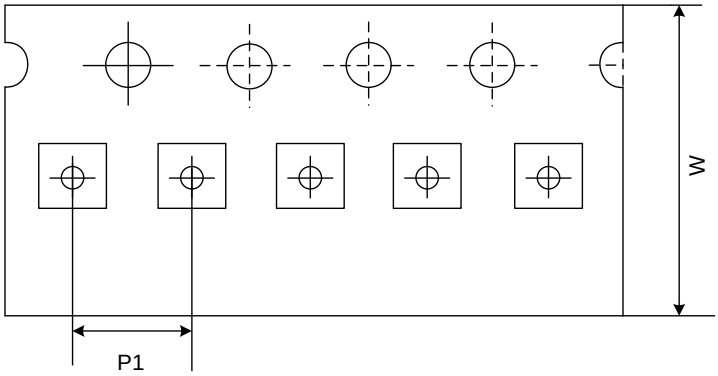


# Tape And Reel Information

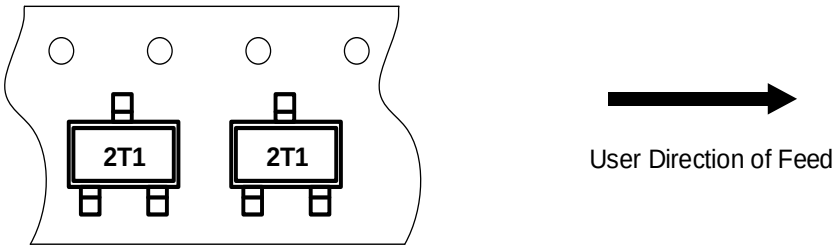
**Reel Dimensions**




**Tape Dimensions**



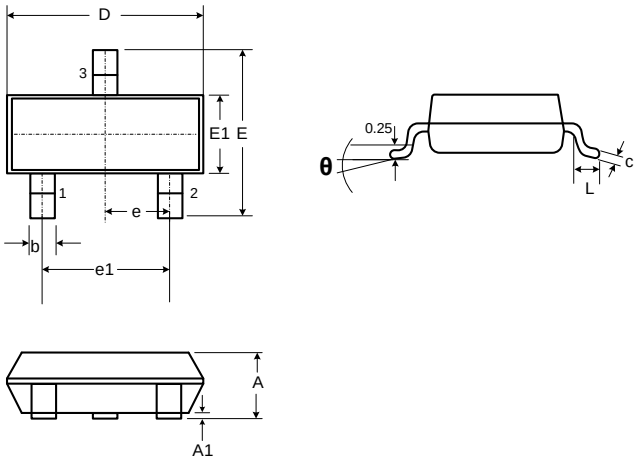

**Quadrant Assignments For PIN1 Orientation In Tape**

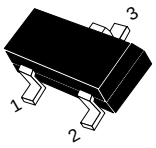



| | | |
|---|---|---|
| RD | Reel Dimensions | 7 inch |
| W | Overall width of the carrier tape | 8 mm |
| P1 | Pitch between successive cavity centers | 4 mm |

## Outline Drawing – SOT-23

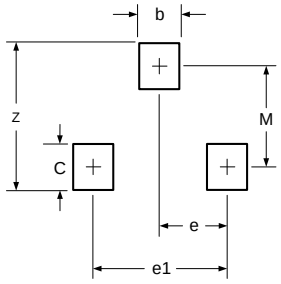
### PACKAGE OUTLINE




SOT-23

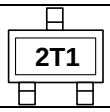
| SYMBOL | MILLIMETERS | |
|---|---|---|
| | MIN | MAX |
| A | 0.90 | 1.15 |
| A1 | 0.00 | 0.15 |
| b | 0.30 | 0.55 |
| c | 0.07 | 0.20 |
| D | 2.80 | 3.10 |
| E | 2.10 | 2.65 |
| E1 | 1.20 | 1.40 |
| e | 0.95 BSC | |
| e1 | 1.78 | 2.05 |
| L | 0.30 | 0.50 |
| θ | 0° | 8° |




| DIMENSIONS | | |
|---|---|---|
| DIM | INCHES | MILLIMETERS |
| M | 0.0795 | 2.02 |
| C | 0.0315 | 0.80 |
| Z | 0.111 | 2.82 |
| e | 0.037 BSC | 0.95 BSC |
| e1 | 0.075 BSC | 1.9 BSC |
| b | 0.0315 | 0.80 |

**Notes:**
Controlling Dimension: Millimeter.

## Marking Codes

| Part Number | WT9012 |
|---|---|
| Marking Code |  |



## Package Information

Qty：3k/Reel

### CONTACT INFORMATION

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WAYON website: **http://www.way-on.com**
For additional information, please contact your local Sales Representative.

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1. The product specification aims to provide users with a reference regarding various product parameters, performance, and usage. It presents certain aspects of the product's performance in graphical form and is intended solely for users to select product and make product comparisons, enabling users to better understand and evaluate the characteristics and advantages of the product. It does not constitute any commitment, warranty, or guarantee.

2. The product parameters described in the product specification are numerical values, characteristics, and functions obtained through actual testing or theoretical calculations of the product in an independent or ideal state. Due to the complexity of product applications and variations in test conditions and equipment, there may be slight fluctuations in parameter test values. WAYON shall not guarantee that the actual performance of the product when installed in the customer's system or equipment will be entirely consistent with the product specification, especially concerning dynamic parameters. It is recommended that users consult with professionals for product selection and system design. Users should also thoroughly validate and assess whether the actual parameters and performance when installed in their respective systems or equipment meet their requirements or expectations. Additionally, users should exercise caution in verifying product compatibility issues, and WAYON assumes no responsibility for the application of the product.

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5. The design of the product is intended to meet civilian needs and is not guaranteed for use in harsh environments or precision equipment. It is not recommended for use in systems or equipment such as medical devices, aircraft, nuclear power, and similar systems, where failures in these systems or equipment could reasonably be expected to result in personal injury. WAYON shall assume no responsibility for any consequences resulting from such usage.

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