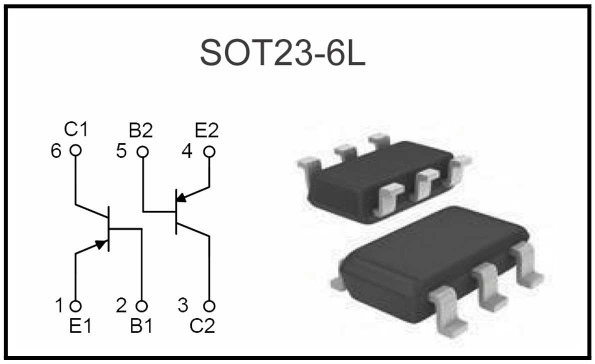
# MMBT5401D

**Dual PNP Plastic-Encapsulate Transistor**

## Features

- $V_{CE}$=-150V
- $I_C$=-0.2A
- $f_T$=100MHZ @$V_{CE}$=-10V, $I_C$=-10mA,f=100MHz

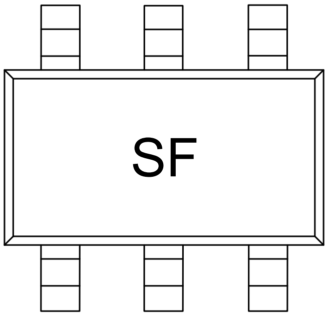
## Package



## Description

- Epitaxial planar die constructio
- SOT23-6L Plastic Package.

## Marking



## Ordering information

| Order code | Package | Marking | Base qty | Delivery mode |
|---|---|---|---|---|
| MMBT5401D | SOT23-6L | SF | 3K | Tape and reel |

## Absolute Maximum Ratings @$T_A$=25°C unless otherwise noted

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $V_{CBO}$ | Collector-Base Voltage | -160 | V |
| $V_{CEO}$ | Collector-Emitter Voltage | -150 | V |
| $V_{EBO}$ | Emitter-Base Voltage | -5 | V |
| $I_C$ | Collector Current | -0.2 | A |
| $P_C$ | Collector Power Dissipation | 200 | mW |
| $R_{\theta JA}$ | Thermal Resistance Junction to Ambient | 400 | °C/W |
| $T_J$ | Junction Temperature | 150 | °C |
| $T_{stg}$ | Storage Temperature | -55 to + 150 | °C |

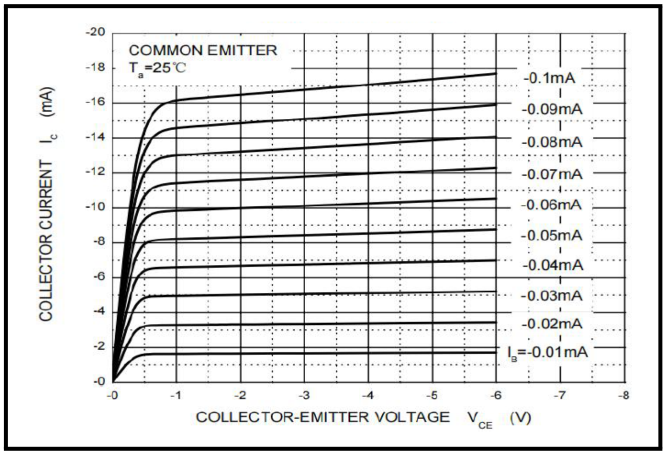
## Electrical Characteristics ($T_A$=+25°C, unless otherwise specified)

| Symbol | Parameter | Test condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $V_{(BR)CBO}$ | Collector-base breakdown voltage | $I_C$=-100μA, $I_E$=0 | -160 | – | – | V |
| $V_{(BR)CEO}$ | Collector-emitter breakdown voltage | $I_C$=-1mA,$I_B$=0 | -150 | – | – | |
| $V_{(BR)EBO}$ | Emitter-base breakdown voltage | $I_E$=-10μA,$I_C$=0 | -5 | – | – | |
| $I_{CBO}$ | Collector cut-off current | $V_{CB}$=-120V,$I_E$=0 | – | – | -50 | nA |
| $I_{EBO}$ | Emitter cut-off current | $V_{EB}$=-4V,$I_C$=0 | – | – | -50 | |
| $h_{FE(1)}$ | DC current gain | $V_{CE}$=-5V,$I_C$=-1mA | 50 | – | – | |
| $h_{FE(2)}$ | | $V_{CE}$=-5V,$I_C$=-10mA | 100 | – | 300 | |
| $h_{FE(3)}$ | | $V_{CE}$=-5V,$I_C$=-50mA | 50 | – | – | |
| $V_{CE(sat)}$ | Collector-emitter saturation voltage | $I_C$=-10mA,$I_B$=-1mA | – | – | -0.2 | V |
| | | $I_C$=-50mA,$I_B$=-5mA | – | – | -0.5 | |
| $V_{BE(sat)}$ | Base-emitter saturation voltage | $I_C$=-10mA,$I_B$=-1mA | – | – | -1.00 | |
| | | $I_C$=-50mA,$I_B$=-5mA | – | – | -1.00 | |
| $f_T$ | Transition frequency | $V_{CE}$=-10V,$I_C$=10mA,f=100MHZ | 100 | – | – | MHZ |
| $C_{ob}$ | Collector output capacitance | $V_{CB}$=-10V,$I_E$=0,f=1MHZ | | | 6 | pF |

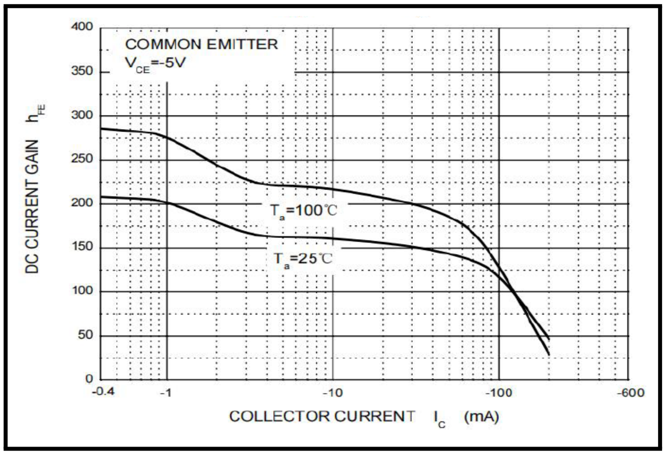
Note:Pulse test: pulse width≤300us, duty cycle≤2.0%

## Typical Performance Characteristics($T_J$ = 25 °C, unless otherwise noted)

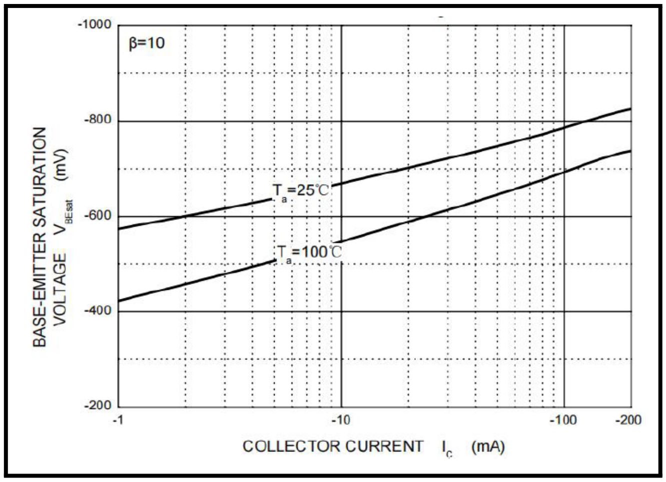
### Figure 1 : Static Characteristic



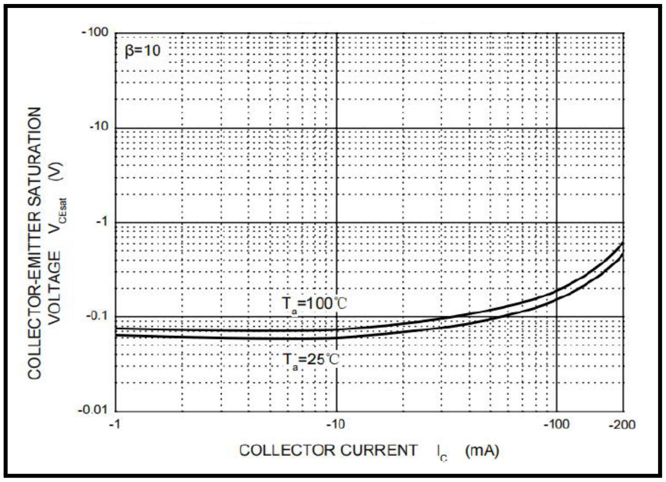
### Figure 2 :$h_{FE}$—$I_C$



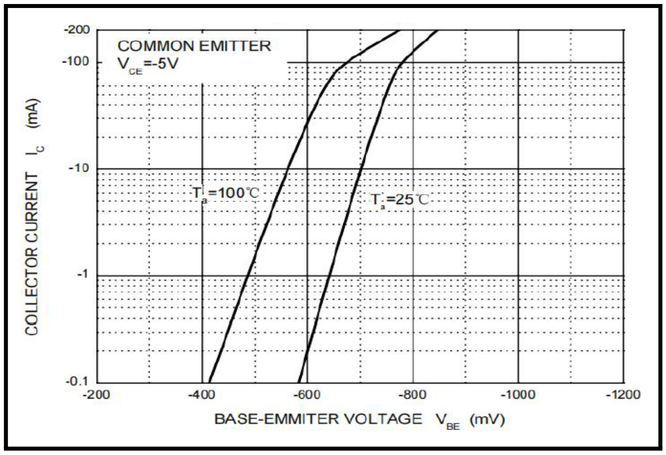
### Figure 3 : $V_{BE(sat)}$— $I_C$



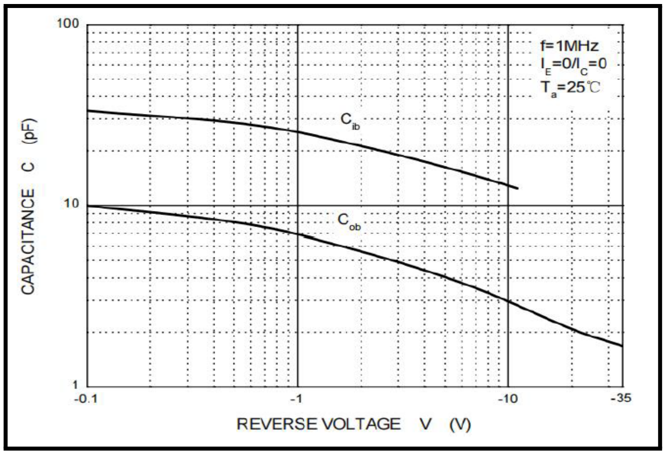
### Figure 4 : $V_{CE(sat)}$—$I_C$



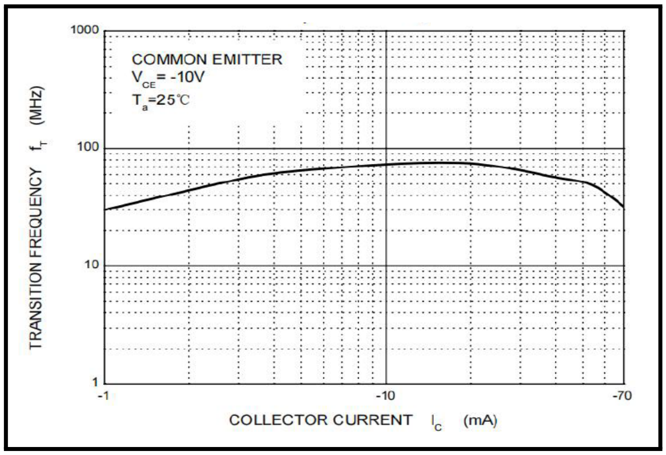
### Figure 5 :$I_C$ —$V_{BE}$



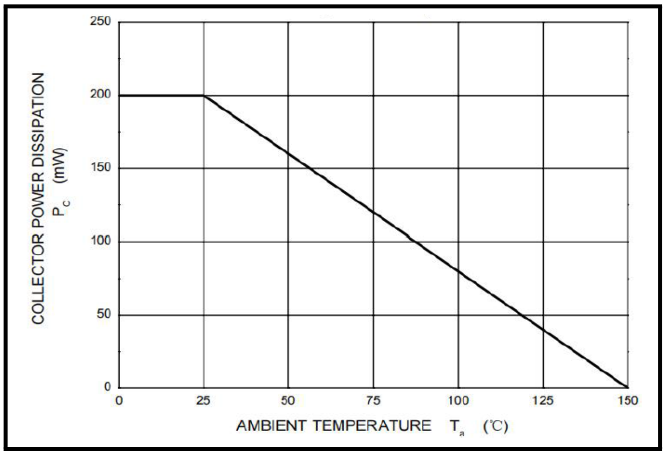
### Figure 6 : $C_{ob}$/$C_{ib}$— $V_{CB}$/$V_{EB}$



## Figure 7 :$f_T$——$I_C$



## Figure 8 : $P_C$——$T_a$



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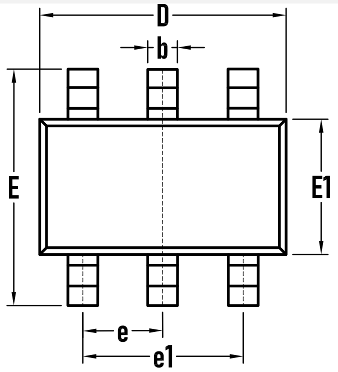
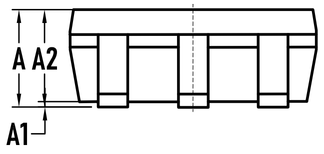
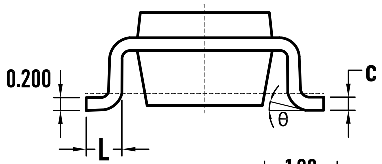
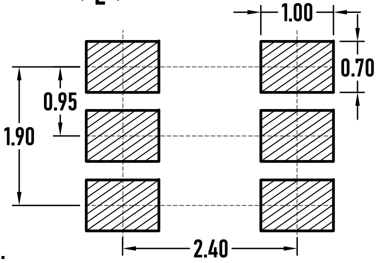
## Outline Drawing - SOT23-6L





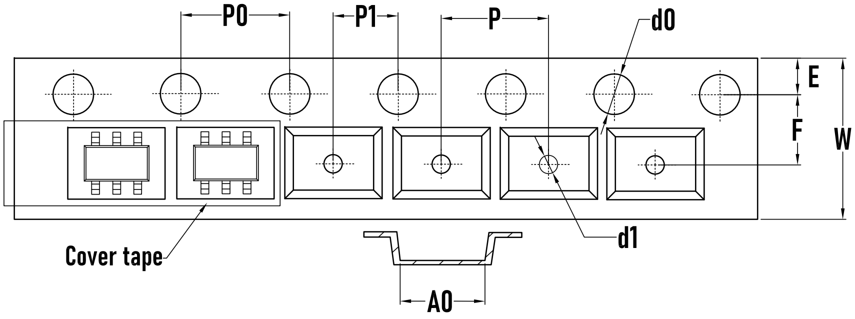


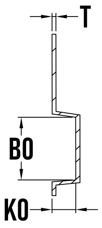


Note:
(1)dimension:In millimeters

| SYMBOL | MILLIMETER | | Inches | |
|---|---|---|---|---|
| | MIN | MAX | MIN | MAX |
| A | 1.050 | 1.250 | 0.041 | 0.049 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 1.050 | 1.150 | 0.041 | 0.045 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| C | 0.100 | 0.200 | 0.004 | 0.008 |
| D | 2.820 | 3.020 | 0.111 | 0.119 |
| E1 | 1.500 | 1.700 | 0.059 | 0.067 |
| E | 2.650 | 2.950 | 0.104 | 0.116 |
| e | 0.950(BSC) | | 0.037(BSC) | |
| e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| L | 0.300 | 0.600 | 0.012 | 0.024 |
| θ | 0° | 8° | 0° | 8° |

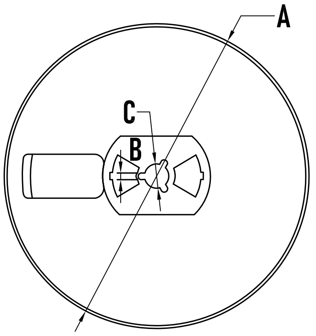
## Packaging Tape - SOT23-6L

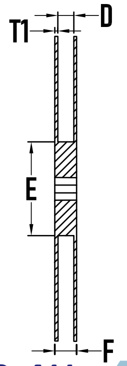


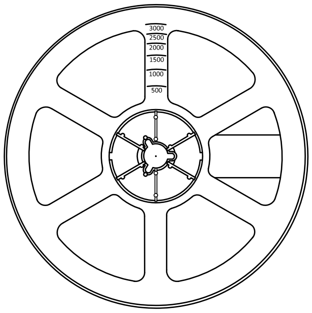


| SYMBOL | MILLIMETER |
|---|---|
| A0 | 3.25±0.1 |
| B0 | 3.3±0.1 |
| d0 | 1.55±0.1 |
| d1 | 1.0±0.1 |
| E | 1.75±0.1 |
| F | 3.50±0.1 |
| K0 | 1.38±0.1 |
| P | 4.00±0.1 |
| P0 | 4.00±0.1 |
| P1 | 2.00±0.1 |
| W | 8.00±0.2 |
| T | 0.2±0.02 |

## Packaging Reel







| SYMBOL | MILLIMETER |
|---|---|
| A | 177.8±0.2 |
| B | 2.7±0.2 |
| C | 13.5±0.2 |
| D | 9.6±0.3 |
| E | 54.5±0.2 |
| F | 12.3±0.3 |
| T1 | 1.0±0.2 |
| Quantity | 3000PCS |