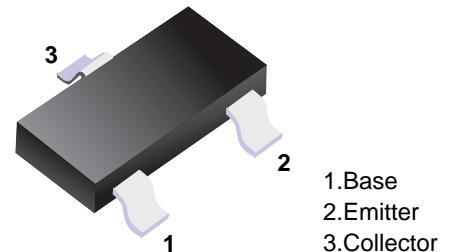


## ■ PNP Transistors



### ■ Features

- High Voltage Transistors
- Pb-Free Packages are Available

### ■ Simplified outline(SOT-23)

### ■ Absolute Maximum Ratings Ta = 25°C

| Parameter                        | Symbol                            | Rating      | Unit |
|----------------------------------|-----------------------------------|-------------|------|
| Collector-base voltage           | V <sub>CBO</sub>                  | -160        | V    |
| Collector-emitter voltage        | V <sub>CEO</sub>                  | -150        | V    |
| Emitter-base voltage             | V <sub>EBO</sub>                  | -5          | V    |
| Collector current-continuous     | I <sub>C</sub>                    | -0.6        | A    |
| Collector Power Dissipation      | P <sub>C</sub>                    | 300         | mW   |
| Junction and storage temperature | T <sub>J</sub> , T <sub>stg</sub> | -55 to +150 | °C   |

### ■ Electrical Characteristics Ta = 25°C

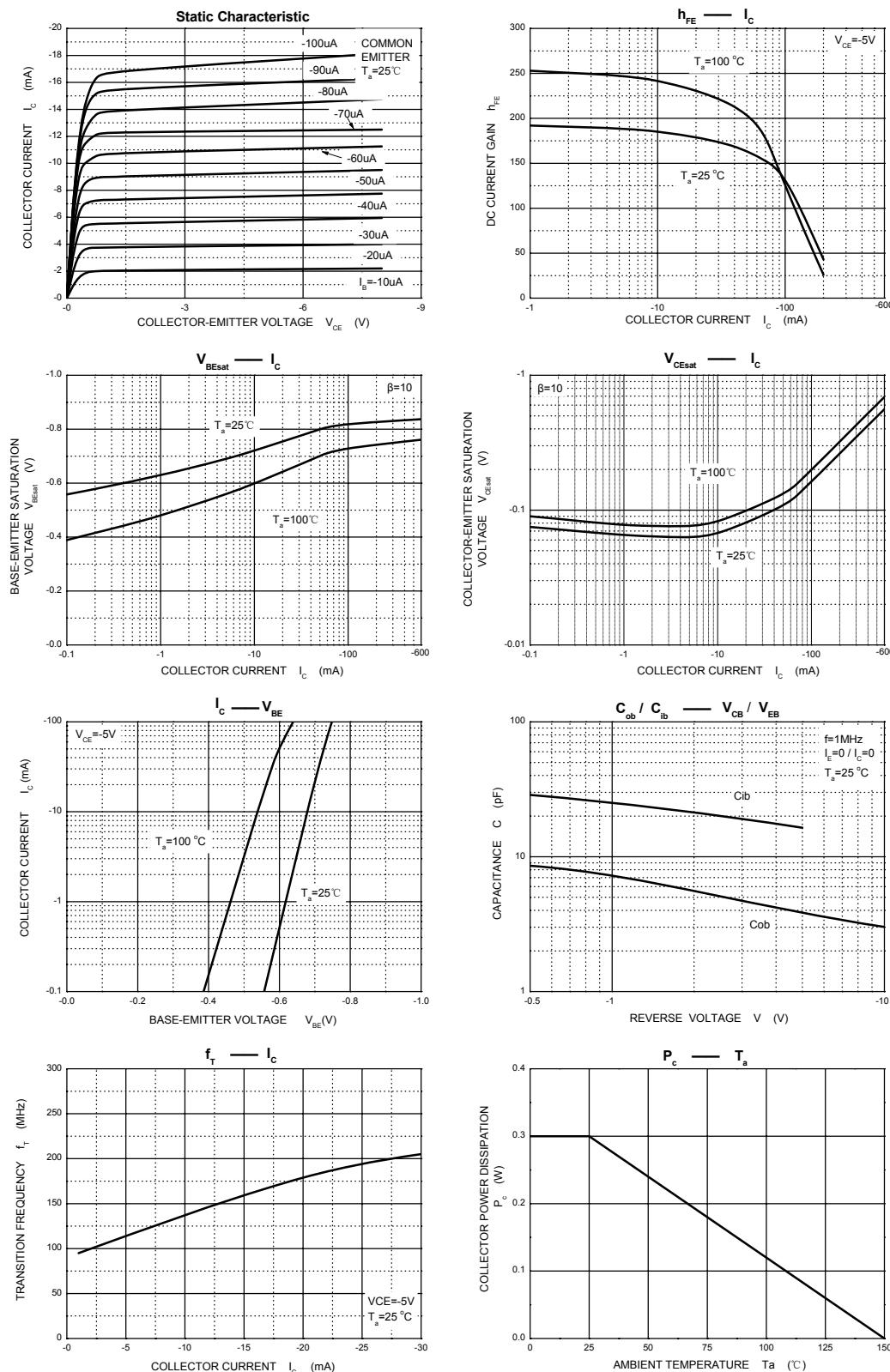
| Parameter                              | Symbol                | Testconditions                                     | Min  | Typ | Max  | Unit |
|--|-----------------------|--|------|-----|------|------|
| Collector-base breakdown voltage       | V <sub>CBO</sub>      | I <sub>C</sub> = -100 μA, I <sub>E</sub> = 0       | -160 |     |      | V    |
| Collector-emitter breakdown voltage *  | V <sub>CEO</sub>      | I <sub>C</sub> = -1.0 mA, I <sub>B</sub> = 0       | -150 |     |      | V    |
| Emitter-base breakdown voltage         | V <sub>EBO</sub>      | I <sub>E</sub> = -10 μA, I <sub>C</sub> = 0        | -5   |     |      | V    |
| Collector cutoff current               | I <sub>CBO</sub>      | V <sub>CB</sub> = -120 V, I <sub>E</sub> = 0       |      |     | -0.1 | μA   |
| Emitter cutoff current                 | I <sub>EBO</sub>      | V <sub>EB</sub> = -4.0 V, I <sub>C</sub> = 0       |      |     | -0.1 | μA   |
| DC current gain *                      | h <sub>FE</sub>       | I <sub>C</sub> = -1.0 mA, V <sub>CE</sub> = -5 V   | 80   |     |      |      |
|  |                       | I <sub>C</sub> = -10 mA, V <sub>CE</sub> = -5 V    | 100  |     | 300  |      |
|  |                       | I <sub>C</sub> = -50 mA, V <sub>CE</sub> = -5 V    | 50   |     |      |      |
| Collector-emitter saturation voltage * | V <sub>CES(sat)</sub> | I <sub>C</sub> = -50 mA, I <sub>B</sub> = -5.0 mA  |      |     | -0.5 | V    |
| Base-emitter saturation voltage *      | V <sub>BES(sat)</sub> | I <sub>C</sub> = -50 mA, I <sub>B</sub> = -5.0 mA  |      |     | -1.0 | V    |
| Transistor frequency                   | f <sub>T</sub>        | V <sub>CE</sub> =-5V,I <sub>C</sub> =-10mA,f=30MHz | 100  |     |      | MHz  |

\* Pulse Test: Pulse Width = 300 μs, Duty Cycle=2.0%.

### ■ Classification of h<sub>FE</sub>(2)

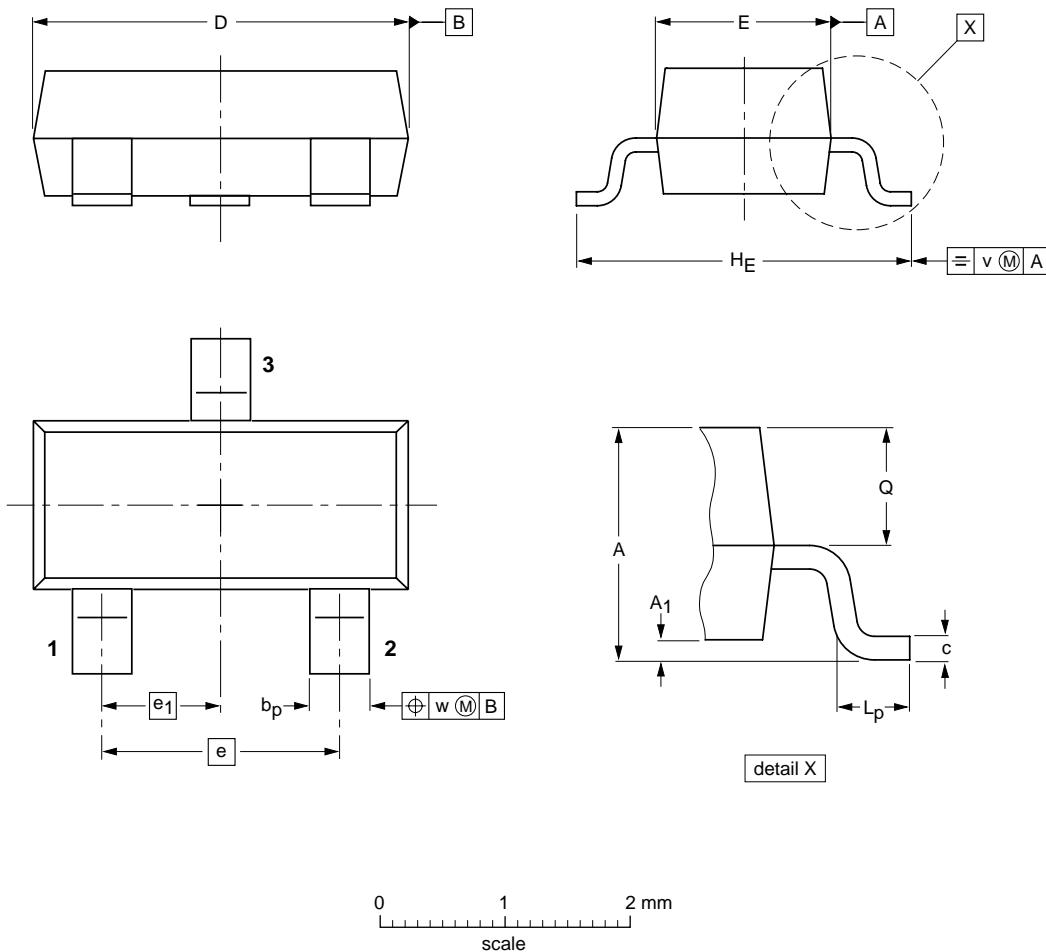
| Type    | MMBT5401 | MMBT5401-L | MMBT5401-H |
|---------|----------|------------|------------|
| Range   | 100-300  | 100-200    | 200-300    |
| Marking | 2L       |            |            |

■ Typical Characteristics



**Package Outline**

**SOT-23**



**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>0.9 | 0.1                    | 0.48<br>0.38   | 0.15<br>0.09 | 3.0<br>2.8 | 1.4<br>1.2 | 1.9 | 0.95           | 2.5<br>2.1     | 0.45<br>0.15   | 0.55<br>0.45 | 0.2 | 0.1 |

**Summary of Packing Options**

| Package | Packing Description | Packing Quantity | Industry Standard |
|---------|---------------------|------------------|-------------------|
| SOT-23  | Tape/Reel,7"reel    | 3000             | EIA-481-1         |

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