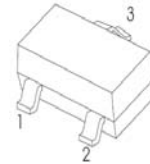


## MMBT5401

### FEATURES

- Complementary to MMBT5551
- Ideal for Medium Power Amplification and Switching

SOT - 23



1. BASE  
2. EMITTER  
3. COLLECTOR

### MARKING: 2L

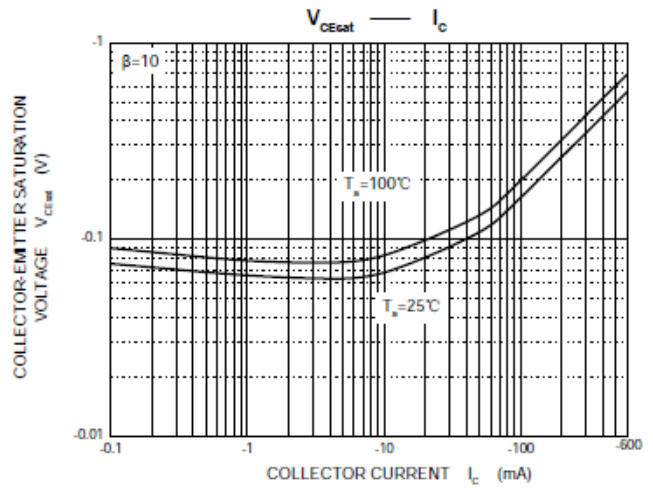
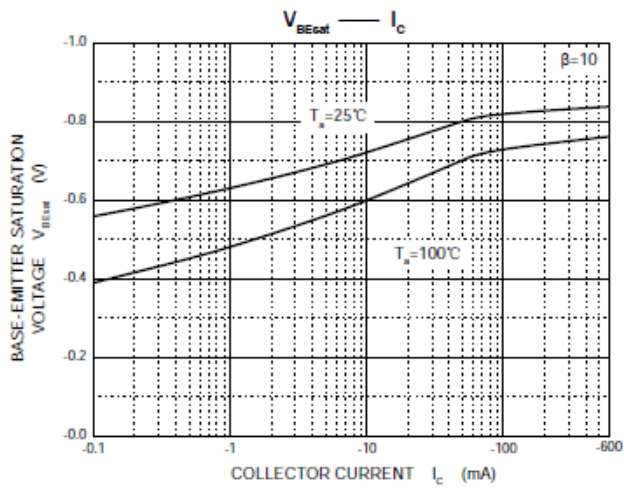
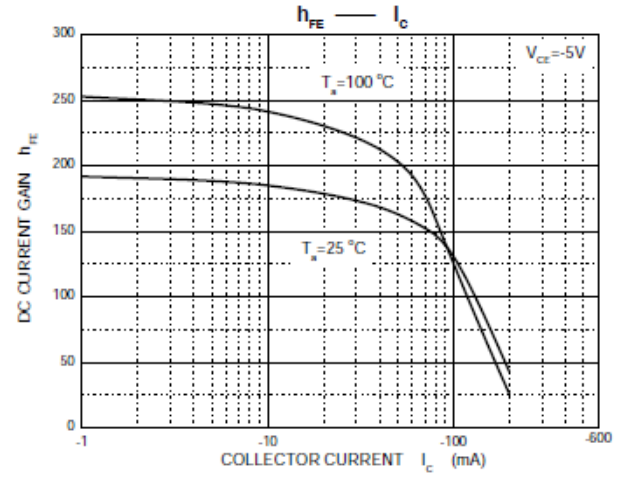
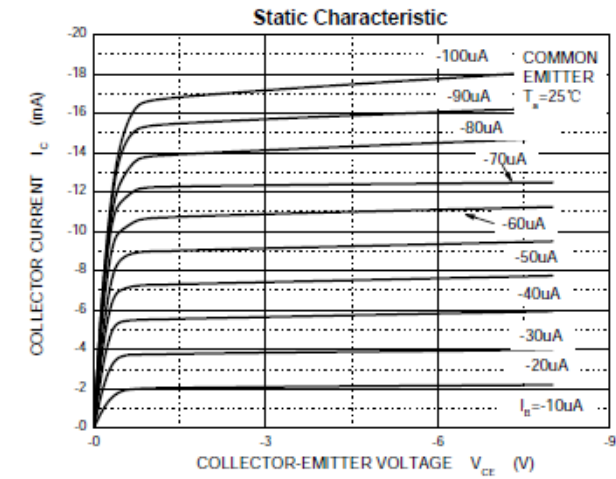
### MAXIMUM RATINGS ( $T_a=25^\circ\text{C}$ unless otherwise noted)

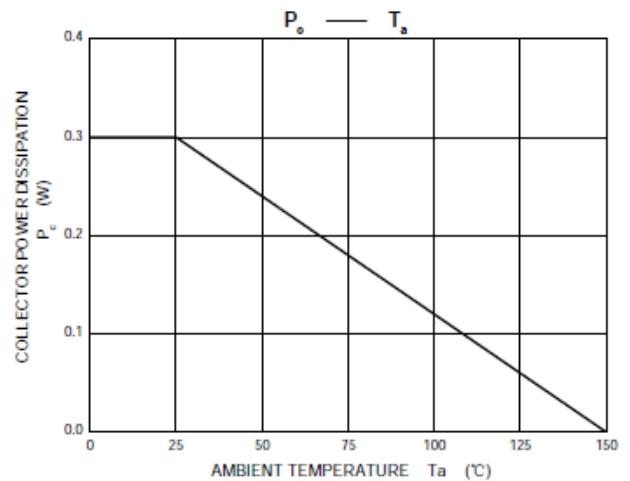
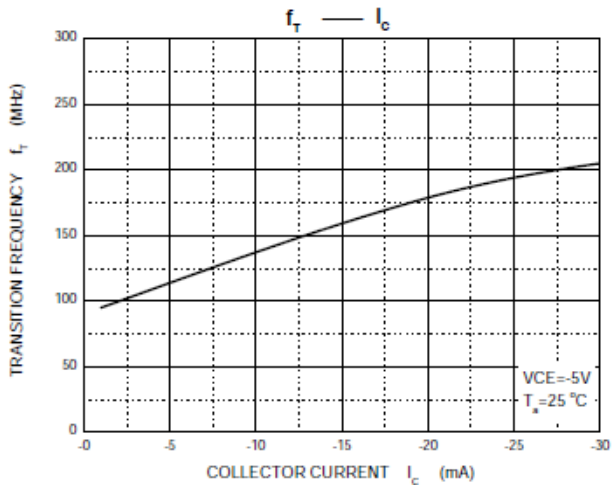
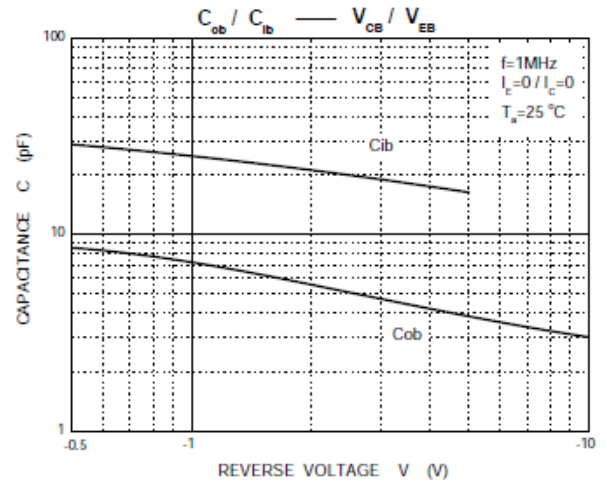
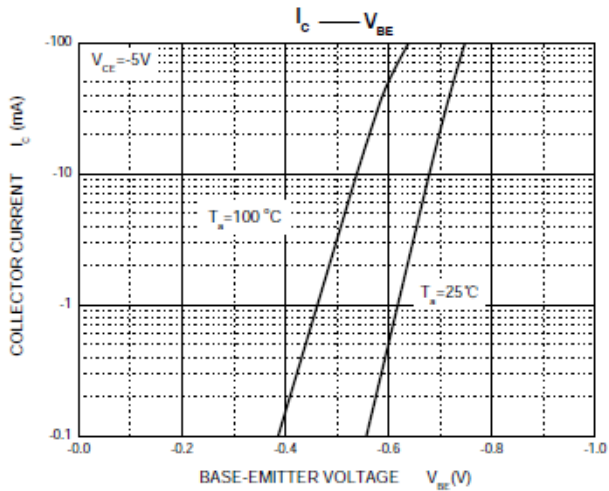
| Symbol          | Parameter                                        | Value    | Unit                      |
|-----------------|--------------------------------------------------|----------|---------------------------|
| $V_{CBO}$       | Collector-Base Voltage                           | -160     | V                         |
| $V_{CEO}$       | Collector-Emitter Voltage                        | -150     | V                         |
| $V_{EBO}$       | Emitter-Base Voltage                             | -5       | V                         |
| $I_C$           | Collector Current                                | -0.6     | A                         |
| $P_C$           | Collector Power Dissipation                      | 0.3      | W                         |
| $R_{\theta JA}$ | Thermal Resistance from Junction to Ambient      | 416      | $^\circ\text{C}/\text{W}$ |
| $T_J, T_{stg}$  | Operation Junction and Storage Temperature Range | -55~+150 | $^\circ\text{C}$          |

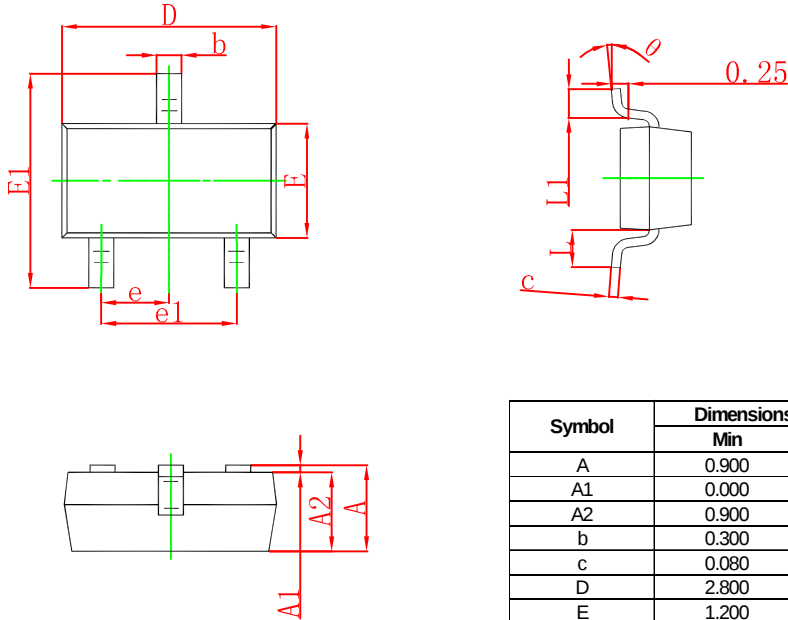
### ELECTRICAL CHARACTERISTICS ( $T_a=25^\circ\text{C}$ unless otherwise specified)

| Parameter                            | Symbol           | Test conditions                                       | Min  | Typ | Max  | Unit          |
|--------------------------------------|------------------|-------------------------------------------------------|------|-----|------|---------------|
| Collector-base breakdown voltage     | $V_{(BR)CBO}$    | $I_C=-100\mu\text{A}, I_E=0$                          | -160 |     |      | V             |
| Collector-emitter breakdown voltage  | $V_{(BR)CEO}^*$  | $I_C=-1\text{mA}, I_B=0$                              | -150 |     |      | V             |
| Emitter-base breakdown voltage       | $V_{(BR)EBO}$    | $I_E=-10\mu\text{A}, I_C=0$                           | -5   |     |      | V             |
| Collector cut-off current            | $I_{CBO}$        | $V_{CB}=-120\text{V}, I_E=0$                          |      |     | -0.1 | $\mu\text{A}$ |
| Emitter cut-off current              | $I_{EBO}$        | $V_{EB}=-4\text{V}, I_C=0$                            |      |     | -0.1 | $\mu\text{A}$ |
| DC current gain                      | $h_{FE(1)}^*$    | $V_{CE}=-5\text{V}, I_C=-1\text{mA}$                  | 80   |     |      |               |
|                                      | $h_{FE(2)}^*$    | $V_{CE}=-5\text{V}, I_C=-10\text{mA}$                 | 100  |     | 300  |               |
|                                      | $h_{FE(3)}^*$    | $V_{CE}=-5\text{V}, I_C=-50\text{mA}$                 | 50   |     |      |               |
| Collector-emitter saturation voltage | $V_{CE(sat)1}^*$ | $I_C=-10\text{mA}, I_B=-1\text{mA}$                   |      |     | -0.2 | V             |
|                                      | $V_{CE(sat)2}^*$ | $I_C=-50\text{mA}, I_B=-5\text{mA}$                   |      |     | -0.5 | V             |
| Base-emitter saturation voltage      | $V_{BE(sat)1}^*$ | $I_C=-10\text{mA}, I_B=-1\text{mA}$                   |      |     | -1   | V             |
|                                      | $V_{BE(sat)2}^*$ | $I_C=-50\text{mA}, I_B=-5\text{mA}$                   |      |     | -1   | V             |
| Transition frequency                 | $f_T$            | $V_{CE}=-5\text{V}, I_C=-10\text{mA}, f=30\text{MHz}$ | 100  |     |      | MHz           |

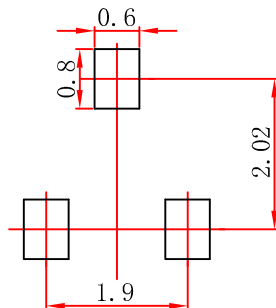
\*Pulse test: pulse width  $\leq 300\mu\text{s}$ , duty cycles  $\leq 2.0\%$ .





**SOT-23 Package Outline Dimensions**


| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min                       | Max   | Min                  | Max   |
| A      | 0.900                     | 1.150 | 0.035                | 0.045 |
| A1     | 0.000                     | 0.100 | 0.000                | 0.004 |
| A2     | 0.900                     | 1.050 | 0.035                | 0.041 |
| b      | 0.300                     | 0.500 | 0.012                | 0.020 |
| c      | 0.080                     | 0.150 | 0.003                | 0.006 |
| D      | 2.800                     | 3.000 | 0.110                | 0.118 |
| E      | 1.200                     | 1.400 | 0.047                | 0.055 |
| E1     | 2.250                     | 2.550 | 0.089                | 0.100 |
| e      | 0.950 TYP                 |       | 0.037 TYP            |       |
| e1     | 1.800                     | 2.000 | 0.071                | 0.079 |
| L      | 0.550 REF                 |       | 0.022 REF            |       |
| L1     | 0.300                     | 0.500 | 0.012                | 0.020 |
| θ      | 0°                        | 8°    | 0°                   | 8°    |

**SOT-23 Suggested Pad Layout**


Note:  
 1. Controlling dimension: in millimeters.  
 2. General tolerance:  $\pm 0.05\text{mm}$ .  
 3. The pad layout is for reference purposes only.