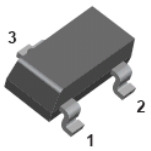
Leading Circuit Protection
Products and Solutions

# MMBT4401
## NPN Silicon Epitaxial Planar Transistor

## FEATURES

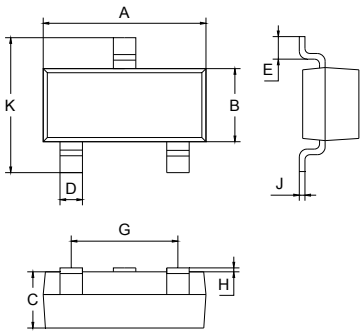
- Epitaxial planar die construction.
- Complementary PNP type available: MMBT4403.
- Ideal for medium power amplification and switching.




1. BASE
2. EMITTER
3. COLLECTOR

## APPLICATIONS

- General purpose application, switching application.




| SOT-23 | | |
|---|---|---|
| Dim | Min | Max |
| A | 2.70 | 3.10 |
| B | 1.10 | 1.50 |
| C | 1.0 Typical | |
| D | 0.4 Typical | |
| E | 0.35 | 0.48 |
| G | 1.80 | 2.00 |
| H | 0.02 | 0.1 |
| J | 0.1 Typical | |
| K | 2.20 | 2.60 |
| All Dimensions in mm | | |

## ORDERING INFORMATION

| Type No. | Marking | Package Code |
|---|---|---|
| MMBT4401 | 2X | SOT-23 |

## MAXIMUM RATING @ $T_a$=25℃ unless otherwise specified

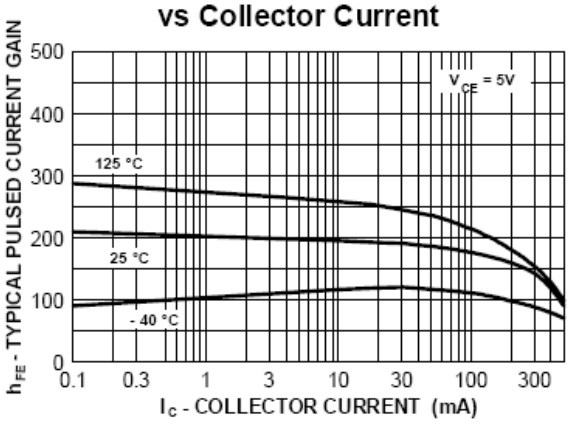
| Symbol | Parameter | Value | Units |
|---|---|---|---|
| $V_{CBO}$ | Collector-Base Voltage | 60 | V |
| $V_{CEO}$ | Collector-Emitter Voltage | 40 | V |
| $V_{EBO}$ | Emitter-Base Voltage | 6 | V |
| $I_C$ | Collector Current -Continuous | 600 | mA |
| $P_C$ | Collector Power Dissipation | 350 | mW |
| $R_{\theta JA}$ | Thermal Resistance,Junction to Ambient | 357 | ℃/W |
| $T_j$,$T_{stg}$ | Junction and Storage Temperature | -55 to +150 | ℃ |

## ELECTRICAL CHARACTERISTICS @ $T_a$=25℃ unless otherwise specified

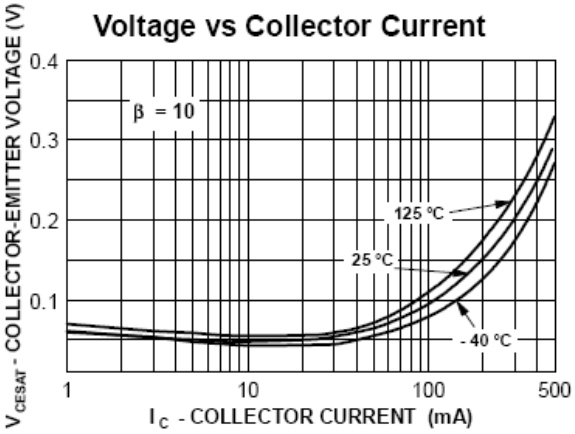
| Parameter | Symbol | Test conditions | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|
| Collector-base breakdown voltage | $V_{(BR)CBO}$ | $I_C$=100μA,$I_E$=0 | 60 | | | V |
| Collector-emitter breakdown voltage | $V_{(BR)CEO}$ | $I_C$=1mA,$I_B$=0 | 40 | | | V |
| Emitter-base breakdown voltage | $V_{(BR)EBO}$ | $I_E$=100μA,$I_C$=0 | 6 | | | V |
| Collector cut-off current | $I_{CEX}$ | $V_{CE}$=35V,$V_{BE}$=-0.4V | | | 0.1 | μA |
| Base cut-off current | $I_{BL}$ | $V_{CE}$=35V,$V_{BE}$=0.4V | | | 0.1 | μA |
| DC current gain | $h_{FE}$ | $V_{CE}$=1V,$I_C$=0.1mA<br>$V_{CE}$=1V,$I_C$=1.0mA<br>$V_{CE}$=1V,$I_C$=10mA<br>$V_{CE}$=1V,$I_C$=150mA<br>$V_{CE}$=2V,$I_C$=500mA | 20<br>40<br>80<br>100<br>40 | | 300 | |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C$=150mA, $I_B$=15mA<br>$I_C$=500mA, $I_B$=50mA | | | 0.4<br>0.75 | V |
| Base-emitter saturation voltage | $V_{BE(sat)}$ | $I_C$=150mA, $I_B$=15mA<br>$I_C$=500mA, $I_B$=50mA | 0.75 | | 0.95<br>1.2 | V |
| Transition frequency | $f_T$ | $V_{CE}$=10V, $I_C$= 20mA<br>f=100MHz | 250 | | | MHz |
| Collector output capacitance | $C_{ob}$ | $V_{CB}$=5V,$I_E$=0,f=1MHz | | | 6.5 | pF |

## TYPICAL CHARACTERISTICS @ $T_a$=25℃ unless otherwise specified

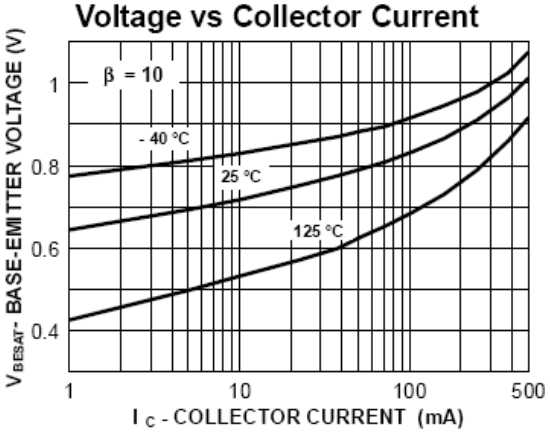
Typical Pulsed Current Gain vs Collector Current



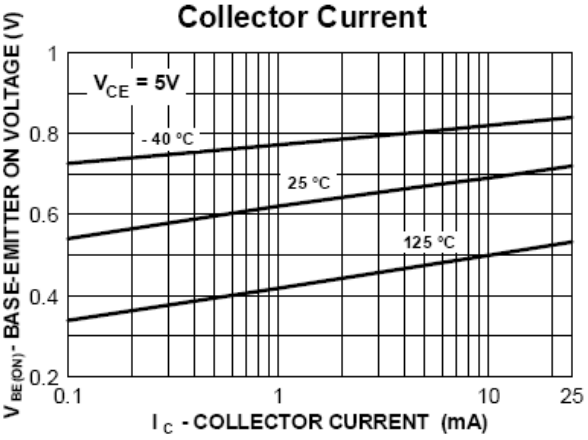

Collector-Emitter Saturation Voltage vs Collector Current



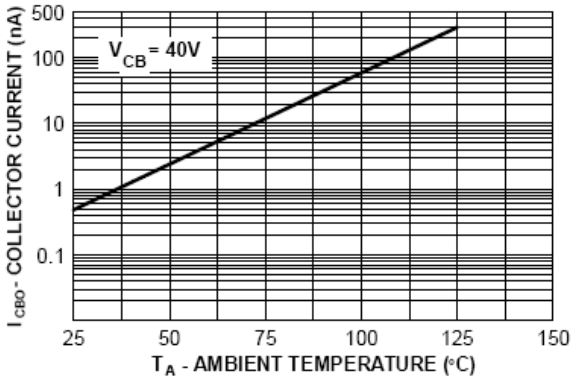

Base-Emitter Saturation Voltage vs Collector Current



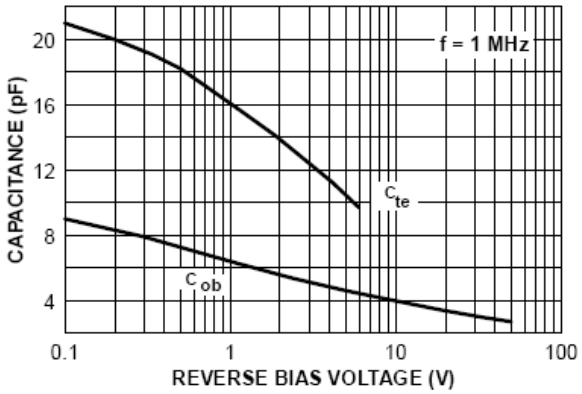

Base-Emitter ON Voltage vs Collector Current




Collector-Cutoff Current vs Ambient Temperature




Emitter Transition and Output Capacitance vs Reverse Bias Voltage




| Device | Package | Shipping |
|---|---|---|
| MMBT4401 | SOT-23 | 3000/Tape&Reel |