

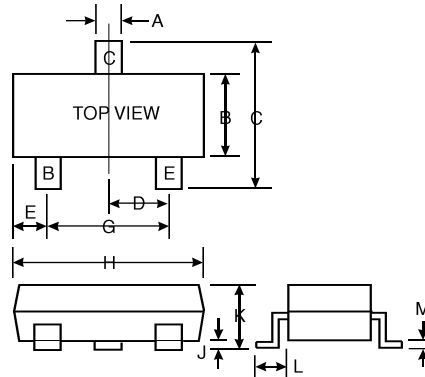


### Features

Epitaxial Planar Die Construction  
Complementary NPN Type Available (MMBT4401)  
Ideal for Medium Power Amplification and Switching

### Mechanical Data

Case: SOT-23, Molded Plastic  
Terminals: Solderable per MIL-STD-202, Method 208  
Terminal Connections: See Diagram  
Marking: K2T, R2T  
Weight: 0.008 grams (approx.)



SOT-23		
Dim	Min	Max
A	0.37	0.51
B	1.19	1.40
C	2.10	2.50
D	0.89	1.05
E	0.45	0.61
G	1.78	2.05
H	2.65	3.05
J	0.013	0.15
K	0.89	1.10
L	0.45	0.61
M	0.076	0.178
All Dimensions in mm		

### Maximum Ratings @ T<sub>A</sub> = 25 C unless otherwise specified

Characteristic	Symbol	MMBT4403	Unit
Collector-Base Voltage	V <sub>CB0</sub>	-40	V
Collector-Emitter Voltage	V <sub>CE0</sub>	-40	V
Emitter-Base Voltage	V <sub>EB0</sub>	-5.0	V
Collector Current - Continuous (Note 1)	I <sub>C</sub>	-600	mA
Power Dissipation (Note 1)	P <sub>d</sub>	350	mW
Thermal Resistance, Junction to Ambient (Note 1)	R <sub>JA</sub>	357	K/W
Operating and Storage and Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	C

Note: 1. Valid provided that terminals are kept at ambient temperature.  
2. Pulse test: Pulse width 300 s, duty cycle 2%.

## Electrical Characteristics @ $T_A = 25\text{ C}$ unless otherwise specified

Characteristic	Symbol	Min	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 2)					
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-40		V	$I_C = -100\text{ A}, I_E = 0$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	-40		V	$I_C = -1.0\text{mA}, I_B = 0$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	-5.0		V	$I_E = -100\text{ A}, I_C = 0$
Collector Cutoff Current	$I_{CEX}$		-100	nA	$V_{CE} = -35\text{V}, V_{EB(OFF)} = -0.4\text{V}$
Base Cutoff Current	$I_{BL}$		-100	nA	$V_{CE} = -35\text{V}, V_{EB(OFF)} = -0.4\text{V}$
ON CHARACTERISTICS (Note 2)					
DC Current Gain	$h_{FE}$	30 60 100 100 20	300		$I_C = -100\mu\text{A}, V_{CE} = -1.0\text{V}$ $I_C = -1.0\text{mA}, V_{CE} = -1.0\text{V}$ $I_C = -10\text{mA}, V_{CE} = -1.0\text{V}$ $I_C = -150\text{mA}, V_{CE} = -2.0\text{V}$ $I_C = -500\text{mA}, V_{CE} = -2.0\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$		-0.40 -0.75	V	$I_C = -150\text{mA}, I_B = -15\text{mA}$ $I_C = -500\text{mA}, I_B = -50\text{mA}$
Base- Emitter Saturation Voltage	$V_{BE(SAT)}$	-0.75	-0.95 -1.30	V	$I_C = -150\text{mA}, I_B = -15\text{mA}$ $I_C = -500\text{mA}, I_B = -50\text{mA}$
SMALL SIGNAL CHARACTERISTICS					
Output Capacitance	$C_{cb}$		8.5	pF	$V_{CB} = -10\text{V}, f = 1.0\text{MHz}, I_E = 0$
Input Capacitance	$C_{eb}$		30	pF	$V_{EB} = -0.5\text{V}, f = 1.0\text{MHz}, I_C = 0$
Input Impedance	$h_{ie}$	1.5	15	k	$V_{CE} = -10\text{V}, I_C = -1.0\text{mA}, f = 1.0\text{kHz}$
Voltage Feedback Ratio	$h_{re}$	0.1	8.0	$\times 10^{-4}$	
Small Signal Current Gain	$h_{fe}$	60	500		
Output Admittance	$h_{oe}$	1.0	100	S	
Current Gain-Bandwidth Product	$f_T$	200		MHz	
SWITCHING CHARACTERISTICS					
Delay Time	$t_d$		15	ns	$V_{CC} = -30\text{V}, I_C = -150\text{mA}, V_{BE(off)} = -2.0\text{V}, I_{B1} = -15\text{mA}$
Rise Time	$t_r$		20	ns	
Storage Time	$t_s$		225	ns	$V_{CC} = -30\text{V}, I_C = -150\text{mA}, I_{B1} = I_{B2} = -15\text{mA}$
Fall Time	$t_f$		30	ns	

- Note:
- Valid provided that terminals are kept at ambient temperature.
  - Pulse test: Pulse width 300  $\mu\text{s}$ , duty cycle 2%.