

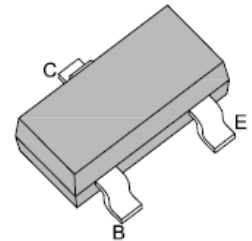
SMD General Purpose Transistor (NPN)

Features

- NPN Silicon Epitaxial Planar Transistor for Switching and Amplifier Applications

Mechanical Data

Case:	SOT-23, Plastic Package
Terminals:	Solderable per MIL-STD-202G, Method 208
Weight:	0.008 gram



SOT-23



Maximum Ratings ($T_{Ambient}=25^{\circ}\text{C}$ unless noted otherwise)

Symbol	Description	MMBT4401	Unit	Conditions
	Marking Code	2X		
V_{CB0}	Collector-Base Voltage	60	V	
V_{CEO}	Collector-Emitter Voltage	40	V	
V_{EB0}	Emitter-Base Voltage	6.0	V	
I_c	Collector Current	0.6	A	
P_{tot}	Power Dissipation above 25°C	250	mW	
R_{θJA}	Thermal Resistance, Junction to Ambient	357	° C /W	Note 1
T_J	Junction Temperature	150	° C	
T_{STG}	Storage Temperature Range	-55 to +150	° C	

Note: (1) Device mounted on FR-4 PCB 1.6" x 1.6" x 0.06"

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MMBT4401

Electrical Characteristics ($T_{Ambient}=25^{\circ}C$ unless noted otherwise)

Symbol	Description	Min.	Max.	Unit	Conditions
hFE	D.C. Current Gain	20	-		$V_{CE}=1V, I_C=0.1mA$
		40	-		$V_{CE}=1V, I_C=1mA$
		80	-		$V_{CE}=1V, I_C=10mA$
		100	300		$V_{CE}=1V, I_C=150mA$
		40	-		$V_{CE}=2V, I_C=500mA$
V(BR)CBO	Collector-Base Breakdown Voltage	60	-	V	$I_C=0.1mA, I_E=0$
V(BR)CEO	Collector-Emitter Breakdown Voltage*	40	-	V	$I_C=1mA, I_B=0$
V(BR)EBO	Emitter-Base Breakdown Voltage	6.0	-	V	$I_E=0.1mA, I_C=0$
VCEsat	Collector-Emitter Saturation Voltage	-	0.40	V	$I_C=150mA, I_B=15mA$
		-	0.75		$I_C=500mA, I_B=50mA$
VBEsat	Base-Emitter Saturation Voltage	0.75	0.95	V	$I_C=150mA, I_B=15mA$
		-	1.20		$I_C=500mA, I_B=50mA$
ICEV	Collector Cut-off Current	-	0.1	μA	$V_{EB}=0.4V, V_{CE}=35V$
IBEV	Base Cut-off Current	-	0.1	μA	$V_{EB}=0.4V, V_{CE}=35V$
hie	Input Impedance	1.0	15	k Ω	$V_{CE}=10V, I_C=1mA$ $f=1KHz,$
hre	Voltage Feedback Ratio	0.1	8.0	$\times 10^{-4}$	$V_{CE}=10V, I_C=1mA$ $f=1KHz,$
hoe	Output Admittance	1.0	30	μS	$V_{CE}=10V, I_C=1mA$ $f=1KHz,$
hfe	Small Signal Current Gain	40	500		$V_{CE}=10V, I_C=1mA$ $f=1KHz,$
fr	Current Gain-Bandwidth Product	250	-	MHz	$V_{CE}=10V, I_C=20mA,$ $f=100MHz$
CcBO	Output Capacitance	-	6.5	pF	$V_{CB}=5V, f=1.0MHz,$ $I_E=0$
CEBO	Input Capacitance	-	30	pF	$V_{EB}=0.5V, f=1.0MHz,$ $I_C=0$
td	Delay Time	-	15	nS	$I_{B1}=15mA$ $I_C=150mA$ $V_{CC}=30V$ $V_{EB}=2V$
tr	Rise Time	-	20		
ts	Storage Time	-	225		
tf	Fall Time	-	30		

*Pulse Test Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2.0\%$

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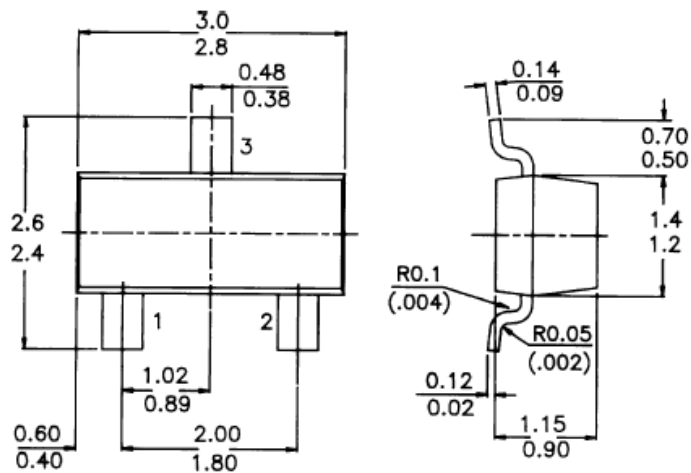
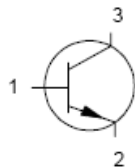
MMBT4401

Dimensions in mm

SOT-23

Pin configuration

- 1 = BASE
- 2 = EMITTER
- 3 = COLLECTOR



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