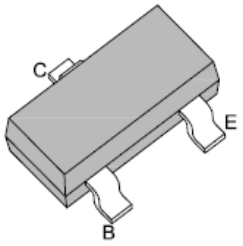
SMD General Purpose Transistor (NPN)



SOT-23

RoHS Compliant

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

Maximum Ratings *(T Ambient=25ºC unless noted otherwise)*

Symbol	Description	MMBT4401	Unit	Conditions
	Marking Code	2X		
V_{CBO}	Collector-Base Voltage	60	V	
V_{CEO}	Collector-Emitter Voltage	40	V	
V_{EBO}	Emitter-Base Voltage	6.0	V	
I_C	Collector Current	0.6	A	
P_{tot}	Power Dissipation above 25°C	250	mW	
$R_{\theta JA}$	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 *($T_{Ambient}$=25ºC unless noted otherwise)*

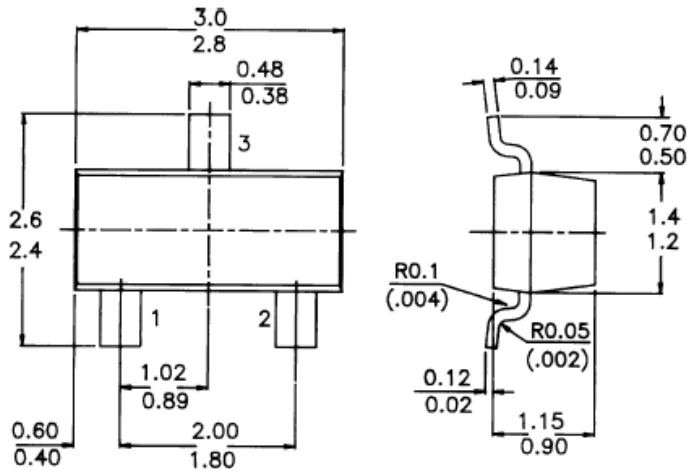
Symbol	Description	Min.	Max.	Unit	Conditions
h_{FE}	D.C. Current Gain	20	-		V_{CE}=1V, I_C=0.1mA
		40	-		V_{CE}=1V, I_C=1mA
		80	-		V_{CE}=1V, I_C=10mA
		100	300		V_{CE}=1V, I_C=150mA
		40	-		V_{CE}=2V, I_C=500mA
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	60	-	V	I_C=0.1mA, I_E=0
$V_{(BR)CEO}$	Collector-Emitter 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
V_{CEsat}	Collector-Emitter Saturation Voltage	-	0.40	V	I_C=150mA, I_B=15mA
		-	0.75		I_C=500mA, I_B=50mA
V_{BEsat}	Base-Emitter Saturation Voltage	0.75	0.95	V	I_C=150mA, I_B=15mA
		-	1.20		I_C=500mA, I_B=50mA
I_{CEV}	Collector Cut-off Current	-	0.1	µA	V_{EB}=0.4V, V_{CE}=35V
I_{BEV}	Base Cut-off Current	-	0.1	µA	V_{EB}=0.4V, V_{CE}=35V
h_{ie}	Input Impedance	1.0	15	kΩ	V_{CE}=10V, I_C=1mA f=1KHz,
h_{re}	Voltage Feedback Ratio	0.1	8.0	$x10^{-4}$	V_{CE}=10V, I_C=1mA f=1KHz,
h_{oe}	Output Admittance	1.0	30	µS	V_{CE}=10V, I_C=1mA f=1KHz,
h_{fe}	Small Signal Current Gain	40	500		V_{CE}=10V, I_C=1mA f=1KHz,
f_T	Current Gain-Bandwidth Product	250	-	MHz	V_{CE}=10V, I_C=20mA, f=100MHz
C_{CBO}	Output Capacitance	-	6.5	pF	V_{CB}=5V, f=1.0MHz, I_E=0
C_{EBO}	Input Capacitance	-	30	pF	V_{EB}=0.5V, f=1.0MHz, I_C=0
t_d	Delay Time	-	15	nS	I_{B1}=15mA I_C=150mA V_{CC}=30V V_{EB}=2V
t_r	Rise Time	-	20		
t_s	Storage Time	-	225		I_{B1}=I_{B2}=15mA I_C=150mA V_{CC}=30V
t_f	Fall Time	-	30		

*Pulse Test Pulse Width ⩽ 300µs, Duty Cycle ⩽2.0%

MMBT4401

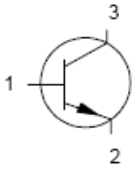
Dimensions in mm

SOT-23



Pin configuration

1 = BASE
2 = EMITTER
3 = COLLECTOR



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