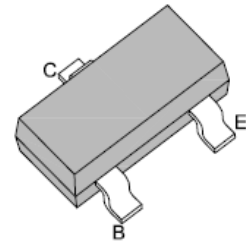


### SMD General Purpose Transistor (NPN)

#### Features

- NPN Silicon Epitaxial Planar Transistor for Switching and Amplifier Applications
- RoHS compliance



#### Mechanical Data

SOT-23



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

#### Maximum Ratings *(T<sub>Ambient</sub>=25°C unless noted otherwise)*

Symbol	Description	MMBT2222A	Unit
	Marking Code	1P	
<b>V<sub>CB0</sub></b>	Collector-Base Voltage	75	V
<b>V<sub>CEO</sub></b>	Collector-Emitter Voltage	40	V
<b>V<sub>EBO</sub></b>	Emitter-Base Voltage	6.0	V
<b>I<sub>C</sub></b>	Collector Current	0.6	A
<b>P<sub>tot</sub></b>	Power Dissipation above 25°C (note 1)	350	mW
		2.8	mW/°C
<b>R<sub>θJA</sub></b>	Thermal Resistance, Junction to Ambient	357	°C/W
<b>T<sub>J</sub></b>	Junction Temperature	150	°C
<b>T<sub>STG</sub></b>	Storage Temperature Range	-55 to +150	°C

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

# SMD General Purpose Transistor (NPN)

## MMBT2222A

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

Symbol	Description	Min.	Max.	Unit	Conditions
<b>hFE</b>	D.C. Current Gain	35	-		$V_{CE}=10V, I_C=0.1mA$
		50	-		$V_{CE}=10V, I_C=1mA$
		75	-		$V_{CE}=10V, I_C=10mA$
		35	-		$V_{CE}=10V, I_C=10mA$ $T_a=-55^{\circ}C$
		100	300		$V_{CE}=10V, I_C=150mA^*$
		40	-		$V_{CE}=10V, I_C=500mA^*$
		50	-		$V_{CE}=1.0V, I_C=150mA^*$
<b>V(BR)CBO</b>	Collector-Base Breakdown Voltage	75	-	V	$I_C=10\mu A, I_E=0$
<b>V(BR)CEO</b>	Collector-Emitter Breakdown Voltage*	40	-	V	$I_C=10mA, I_B=0$
<b>V(BR)EBO</b>	Emitter-Base Breakdown Voltage	6.0	-	V	$I_E=10\mu A, I_C=0$
<b>VCEsat</b>	Collector-Emitter Saturation Voltage*	-	0.3	V	$I_C=150mA, I_B=15mA$
		-	1.0		$I_C=500mA, I_B=50mA$
<b>VBEsat</b>	Base-Emitter Saturation Voltage*	0.6	1.2	V	$I_C=150mA, I_B=15mA$
		-	2.0		$I_C=500mA, I_B=50mA$
<b>ICEX</b>	Collector Cut-off Current	-	10	nA	$V_{EB}=3V, V_{CE}=60V$
<b>ICBO</b>	Collector Cut-off Current	-	10	nA	$V_{CB}=60V, I_E=0$
			10	$\mu A$	$V_{CB}=60V, I_E=0,$ $T_a=125^{\circ}C$
<b>IBL</b>	Base Cut-off Current	-	20	nA	$V_{EB}=3V, V_{CE}=60V$
<b>IEBO</b>	Emitter Cut-off Current	-	10	nA	$V_{EB}=3V, I_C=0$
<b>fr</b>	Current Gain-Bandwidth Product	300	-	MHz	$V_{CE}=20V, I_C=20mA,$ $f=100MHz$
<b>Cobo</b>	Output Capacitance	-	8.0	pF	$V_{CB}=10V, f=1.0MHz,$ $I_E=0$
<b>Cibo</b>	Input Capacitance	-	25	pF	$V_{EB}=0.5V, f=1.0MHz,$ $I_C=0$
<b>NF</b>	Noise Figure	-	4.0	dB	$V_{CE}=10V, I_C=100\mu A,$ $R_s=1k\Omega, f=1kHz$
<b>rb'Cc</b>	Collector Base Time Constant	-	150	ps	$V_{CB}=20V, I_C=20mA,$ $f=31.8MHz$
<b>td</b>	Delay Time	-	10	ns	$I_{B1}=15mA$ $I_C=150mA$ $V_{CC}=30V$ $V_{EB}=0.5V$
<b>tr</b>	Rise Time	-	25		
<b>ts</b>	Storage Time	-	225		
<b>tf</b>	Fall Time	-	60		

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

# SMD General Purpose Transistor (NPN)

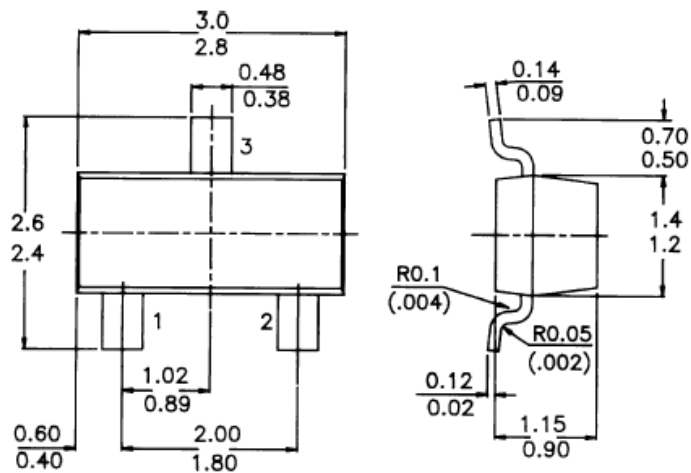
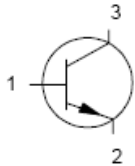
## MMBT2222A

Dimensions in mm

### SOT-23

**Pin configuration**

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



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