



SHENZHEN HAOLIN ELECTRONICS TECHNOLOGY CO., LTD

## SOT-23 Plastic-Encapsulate Transistors

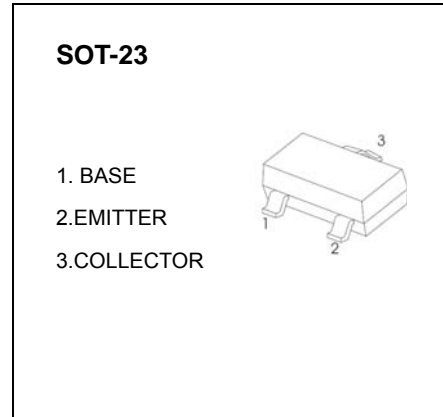
### MMBT2222A TRANSISTOR (NPN)

#### FEATURES

- Epitaxial planar die construction
- Complementary PNP Type available(MMBT2907A)

MARKING: 1P

MAXIMUM RATINGS ( $T_a=25^\circ\text{C}$  unless otherwise noted)



Symbol	Parameter	Value	Units
$V_{CBO}$	Collector-Base Voltage	75	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 Dissipation	250	mW
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	500	$^\circ\text{C}/\text{W}$
$T_J$	Junction Temperature	150	$^\circ\text{C}$
$T_{stg}$	Storage Temperature	-55to+150	$^\circ\text{C}$

#### ELECTRICAL CHARACTERISTICS ( $T_a=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C=10\mu\text{A}, I_E=0$	75			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}^*$	$I_C=10\text{mA}, I_B=0$	40			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=10\mu\text{A}, I_C=0$	6			V
Collector cut-off current	$I_{CBO}$	$V_{CB}=60\text{V}, I_E=0$			0.01	$\mu\text{A}$
Collector cut-off current	$I_{CEX}$	$V_{CE}=30\text{V}, V_{BE(off)}=3\text{V}$			0.01	$\mu\text{A}$
Emitter cut-off current	$I_{EBO}$	$V_{EB}=3\text{V}, I_C=0$			0.1	$\mu\text{A}$
DC current gain	$h_{FE(1)}^*$	$V_{CE}=10\text{V}, I_C=150\text{mA}$	100		300	
	$h_{FE(2)}$	$V_{CE}=10\text{V}, I_C=0.1\text{mA}$	40			
	$h_{FE(3)}^*$	$V_{CE}=10\text{V}, I_C=500\text{mA}$	42			
Collector-emitter saturation voltage	$V_{CE(sat)}^*$	$I_C=500\text{mA}, I_B=50\text{mA}$ $I_C=150\text{mA}, I_B=15\text{mA}$			1 0.3	V
Base-emitter saturation voltage	$V_{BE(sat)}^*$	$I_C=500\text{mA}, I_B=50\text{mA}$ $I_C=150\text{mA}, I_B=15\text{mA}$			2.0 1.2	V
Transition frequency	$f_T$	$V_{CE}=20\text{V}, I_C=20\text{mA}, f=100\text{MHz}$	300			MHz
Delay time	$t_d$	$V_{CC}=30\text{V}, V_{BE(off)}=-0.5\text{V}$			10	nS
Rise time	$t_r$	$I_C=150\text{mA}, I_{B1}=15\text{mA}$			25	nS
Storage time	$t_s$	$V_{CC}=30\text{V}, I_C=150\text{mA}$			225	nS
Fall time	$t_f$	$I_{B1}=-I_{B2}=15\text{mA}$			60	nS

\*pulse test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .