



**SOT-323 Plastic-Encapsulate Transistors**

TRANSISTOR (PNP)

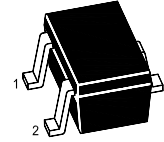
**FEATURES**

- Epitaxial planar die construction
- Complementary PNP Type available(MMBT2222AW)

**MARKING:2F**

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

Symbol	Parameter	Value	Unit
$V_{CBO}$	Collector-Base Voltage	-60	V
$V_{CEO}$	Collector-Emitter Voltage	-60	V
$V_{EBO}$	Emitter-Base Voltage	-5	V
$I_C$	Collector Current -Continuous	-0.6	A
$P_C$	Collector Dissipation	0.2	W
$T_J$	Junction Temperature	150	$^\circ\text{C}$
$T_{stg}$	Storage Temperature	-55 to +150	$^\circ\text{C}$

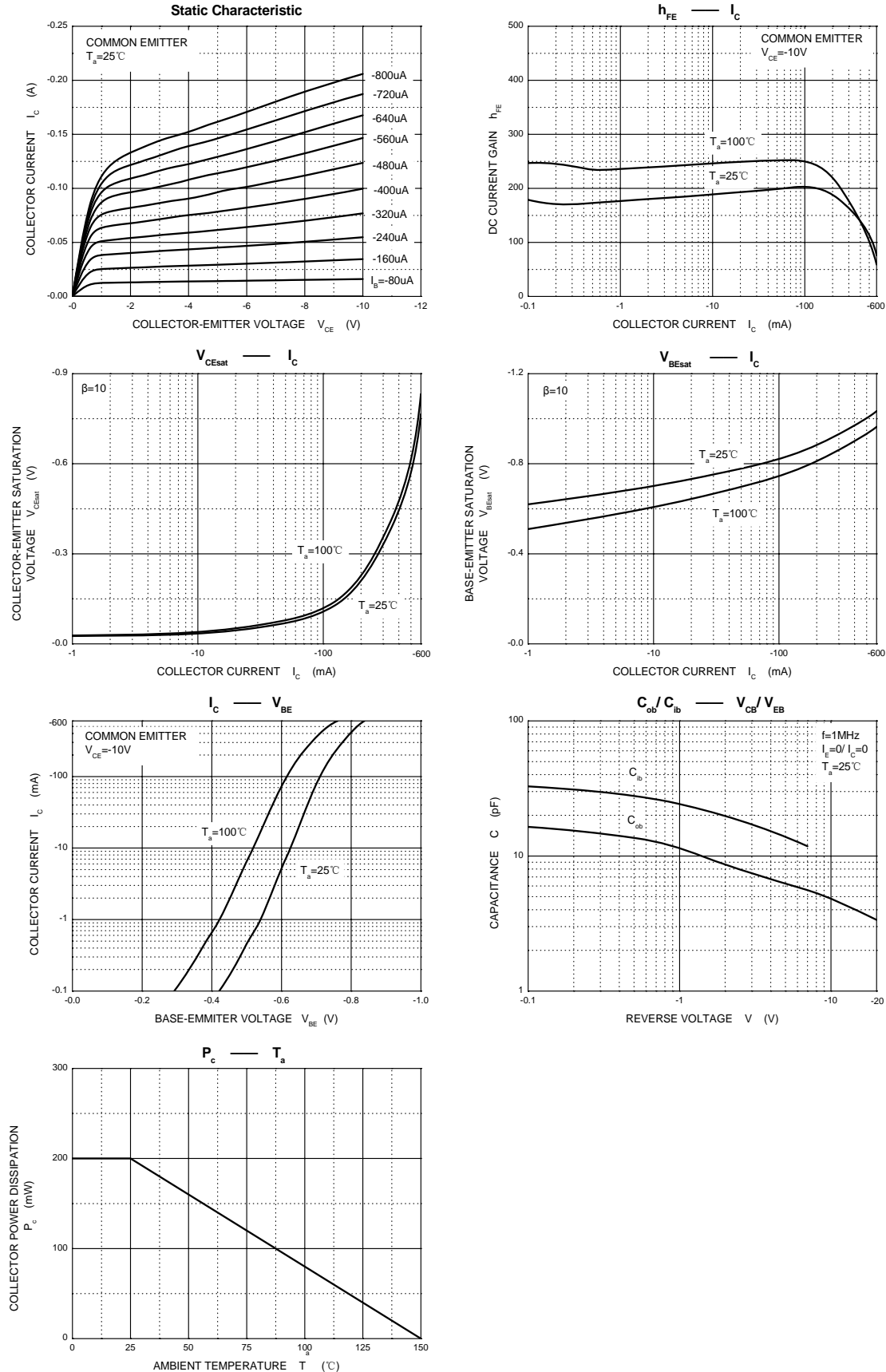


1.Base 2.Emitter 3.Collector  
SOT-323 Plastic Package

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

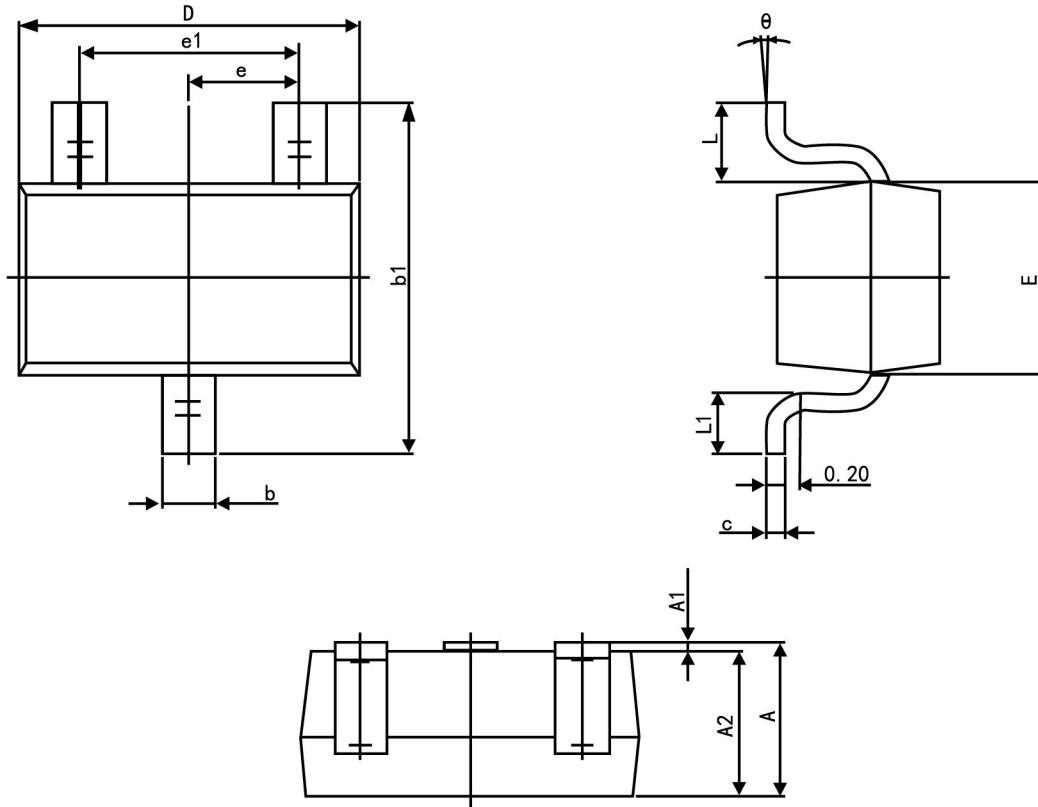
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C=-10\mu\text{A}, I_E=0$	-60			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C=-10\text{mA}, I_B=0$	-60			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=-10\mu\text{A}, I_C=0$	-5			V
Collector cut-off current	$I_{CBO}$	$V_{CB}=-50\text{V}, I_E=0$			-100	nA
Collector cut-off current	$I_{CES}$	$V_{CB}=-30\text{V}, I_B=0$			-100	nA
Emitter cut-off current	$I_{EBO}$	$V_{EB}=-3\text{V}, I_C=0$			-100	nA
DC current gain	$h_{FE(1)}$	$V_{CE}=-10\text{V}, I_C=-0.1\text{mA}$	75			
	$h_{FE(2)}$	$V_{CE}=-10\text{V}, I_C=-1\text{mA}$	100			
	$h_{FE(3)}$	$V_{CE}=-10\text{V}, I_C=-10\text{mA}$	100			
	$h_{FE(4)}$	$V_{CE}=-10\text{V}, I_C=-150\text{mA}$	100		300	
	$h_{FE(5)}$	$V_{CE}=-10\text{V}, I_C=-500\text{mA}$	50			
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C=-150\text{mA}, I_B=-15\text{mA}$			-0.4	V
	$V_{CE(sat)}$	$I_C=-500\text{mA}, I_B=-50\text{mA}$			-1.6	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C=-150\text{mA}, I_B=-15\text{mA}$	-0.6		-1.3	V
	$V_{BE(sat)}$	$I_C=-500\text{mA}, I_B=-50\text{mA}$			-2.6	V
Transition frequency	$f_T$	$V_{CE}=-20\text{V}, I_C=-50\text{mA}, f=100\text{MHz}$	200			MHz
Output capacitance	$C_{ob}$	$V_{CB}=-10\text{V}, I_E=0, f=0.1\text{MHz}$			8	pF
Input capacitance	$C_{ib}$	$V_{EB}=-2\text{V}, I_C=0, f=0.1\text{MHz}$			30	pF
Delay time	$t_d$	$V_{CC}=-30\text{V}, V_{BE(off)}=-1.5\text{V}, I_C=-150\text{mA}$ $I_{B1}=-15\text{mA}$			10	ns
Rise time	$t_r$				40	ns
Storage time	$t_s$	$V_{CC}=-30\text{V}, I_C=-150\text{mA}, I_{B1}=-I_{B2}=-15\text{mA}$			80	ns
Fall time	$t_f$				30	ns

## Typical Characteristics





## SOT-323 Package Outline Dimensions



Symbol	Dimension in Millimeters	
	Min	Max
A	0.900	1.100
A1	0.000	0.100
A2	0.900	1.000
b	0.200	0.400
c	0.080	0.150
D	2.000	2.200
E	1.150	1.350
E1	2.150	2.450
e	0.650 TYP.	
e1	1.200	1.400
L	0.525 REF.	
L1	0.260	0.460
theta	0°	8°