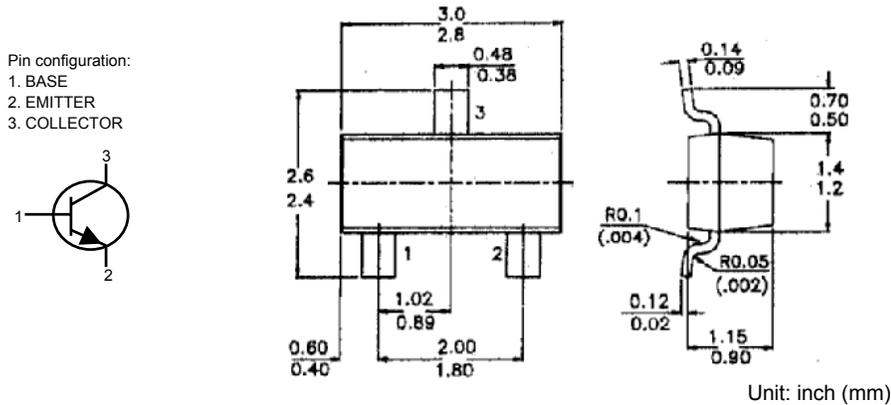


**NPN SOT23 Silicon Planar Epitaxial Transistors**



**Absolute Maximum Ratings**

	Symbol	Value	UNIT
Collector-base voltage (open emitter)	$V_{CBO}$	min 75	V
Collector-emmitter voltage (open base)	$V_{CEO}$	min 40	V
Emmitter base voltage (open collector)	$V_{EBO}$	min 6.0	V
Collector current (d.c.)	$I_C$	max 600	mA
Total power dissipation up to $T_{amb} = 25^{\circ}C$	$P_{tot}$	max 300	mW
D.C. current gain $I_C = 150mA; V_{CE} = 10V$ $I_C = 500mA; V_{CE} = 10V$	$h_{FE}$	100 to 300 > 40	
Transition frequency at $f = 100MHz$ $I_C = 20mA; V_{CE} = 20V$	$f_T$	> 300	MHz

**Ratings (at  $T_A = 25^{\circ}C$  unless otherwise specified)**

	Symbol	Value	UNIT
Collector-base voltage (open emitter)	$V_{CBO}$	min 75	V
Collector-emitter voltage (open base)	$V_{CEO}$	min 40	V
Emitter-base voltage (open collector)	$V_{EBO}$	min 6.0	V
Collector current (d.c.)	$I_C$	max 600	mA
Total power dissipation up to $T_{amb} = 25 C$	$P_{tot}$	max 250	mW
Storge Temperature	$T_{stg}$	-55 to +150	$^{\circ}C$
Junction Temperature	$T_j$	max 150	$^{\circ}C$
Thermal Resistance from junction to Ambient	$R_{th\ j-a}$	500	K/W

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**CMBT2222A**  
**MMBT2222A**

**Characteristics** (at  $T_j=25\text{ }^\circ\text{C}$  unless otherwise specified)

	Symbol	Value	UNIT
Collector cut-off current $I_E = 0; V_{CB} = 60V$	$I_{CBO}$	< 0.01	uA
$I_E = 0; V_{CB} = 60V; T = 125\text{ }^\circ\text{C}$	$I_{CBO}$	< 10	
$V_{EB} = 3V; V_{CE} = 60V$	$I_{CEX}$	< 10	
Base current with reverse biased emitter junction $V_{FB} = 3V; V_{CE} = 60V$	$I_{BEX}$	< 20	nA
Emitter-base cut-off current $I_C = 0; V_{EB} = 3V$	$I_{EBO}$	< 10	nA
Saturation voltage $I_C = 150mA; I_B = 15m$	$V_{CEsat}$	< 300	mV
	$V_{BEsat}$	0.6 to 1.2	V
$I_C = 500mA; I_B = 50m$	$V_{CEsat}$	< 1.0	V
	$V_{BEsat}$	< 2.0	V
Breakdown voltages $I_C = 1.0mA; I_B = 0$	$V_{(BR)CEO}$	> 40	V
$I_C = 100uA; I_E = 0$	$V_{(BR)CBO}$	> 75	
$I_C = 0; I_E = 10u$	$V_{(BR)EBO}$	> 6.0	
D.C. current gain $I_C = 0.1mA; V_{CE} = 10V$	$h_{FE}$	> 35	
$I_C = 1mA; V_{CE} = 10V$		> 50	
$I_C = 10mA; V_{CE} = 10V$		> 75	
$I_C = 10mA; V_{CE} = 10V; T_{amb} = -55^\circ\text{C}$		> 35	
$I_C = 150mA; V_{CE} = 10V$		100 to 300	
$I_C = 150mA; V_{CE} = 1V$		> 50	
$I_C = 500mA; V_{CE} = 10V$		> 40	
Transition frequency at $f = 100\text{ MHz}$ $I_C = 20mA; V_{CE} = 20V$	$f_T$	> 300	MHz
Output capacitance at $f = 1\text{ MHz}$ $I_E = 0; V_{CB} = 10V$	$C_O$	< 8.0	pF
Input capacitance at $f = 1\text{ MHz}$ $I_E = 0; V_{EB} = 0.5V$	$C_i$	< 25	pF
Noise figure at $R_S = 1K\text{ ohm}$ $I_C = 100uA; V_{CE} = 10V; f = 1kHz$	F	< 4.0	dB
Switching times (between 10% and 90% levels) Turn-on time switched to $I_C = 150mA$			ns
delay time	$t_d$	< 10	
rise time	$t_r$	< 25	
Turn-off time switched from $I_C = 150mA$			
storage time	$t_s$	< 225	
fall time	$t_f$	< 60	

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