

**SOT-23 Formed SMD Package**

**CMBT2222  
CMBT2222A**

*SILICON PLANAR EPITAXIAL TRANSISTORS*

*N-P-N silicon transistors*

**Marking**

CMBT2222 = 1B

CMBT2222A = 1P

**PACKAGE OUTLINE DETAILS**

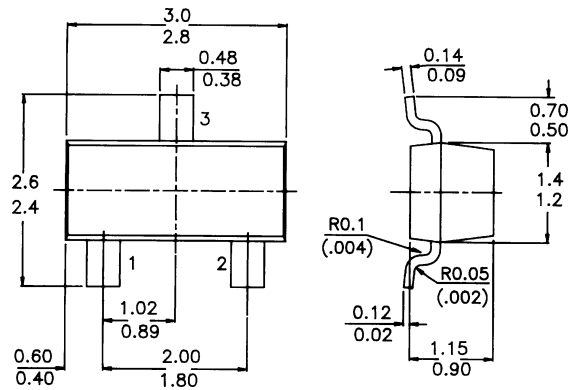
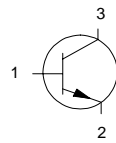
ALL DIMENSIONS IN mm

**Pin configuration**

1 = BASE

2 = EMITTER

3 = COLLECTOR



**ABSOLUTE MAXIMUM RATINGS**

		CMBT2222	CMBT2222A
Collector-base voltage (open emitter)	$V_{CB0}$ max.	60	75 V
Collector-emitter voltage (open base)	$V_{CE0}$ max.	30	40 V
Emitter base voltage (open collector)	$V_{EB0}$ max.	5,0	6,0 V
Collector current (d.c.)	$I_C$ max.	600	mA
Total power dissipation up to $T_{amb} = 25\text{ }^\circ\text{C}$	$P_{tot}$ max.	250	mW
D.C. current gain		100 to 300	
$I_C = 150\text{mA}; V_{CE} = 10\text{V}$	$h_{FE}$		
$I_C = 500\text{mA}; V_{CE} = 10\text{V}$	$h_{FE} >$	30	40
Transition frequency at $f = 100\text{ MHz}$			
$I_C = 20\text{ mA}; V_{CE} = 20\text{ V}$	$f_T >$	250	300 MHz

**CMBT2222**  
**CMBT2222A**

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

Limiting values

		CMBT2222	CMBT2222A	
Collector-base voltage (open emitter)	$V_{CB0}$ max.	60	75	V
Collector-emitter voltage (open base)	$V_{CEO}$ max.	30	40	V
Emitter-base voltage (open collector)	$V_{EBO}$ max.	5,0	6,0	V
Collector current (d.c.)	$I_C$ max.	600		mA
Total power dissipation up to $T_{amb} = 25^\circ\text{C}$	$P_{tot}$ max.	250		mW
Storage temperature range	$T_{stg}$	-55 to +150		$^\circ\text{C}$
Junction temperature	$T_j$ max.	150		$^\circ\text{C}$

**THERMAL RESISTANCE**

From junction to ambient	$R_{th\ j-a}$	500	K/W
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**CHARACTERISTICS**

$T_j = 25^\circ\text{C}$  unless otherwise specified

		CMBT2222	CMBT2222A	
Collector cut-off current				
$I_E = 0; V_{CB} = 50\text{ V}$	$I_{CBO} <$	0,01		$\mu\text{ A}$
$I_E = 0; V_{CB} = 60\text{ V}$	$I_{CBO} <$	-	0,01	$\mu\text{ A}$
$I_E = 0; V_{CB} = 50\text{ V}; T_j = 125^\circ\text{C}$	$I_{CBO} <$	10	-	$\mu\text{ A}$
$I_E = 0; V_{CB} = 60\text{ V}; T_j = 125^\circ\text{C}$	$I_{CBO} <$	-	10	$\mu\text{ A}$
$V_{EB} = 3\text{ V}; V_{CE} = 60\text{ V}$	$I_{CEX} <-$	-	10	nA
Base current				
with reverse biased emitter junction				
$V_{FB} = 3\text{ V}; V_{CE} = 60\text{ V}$	$I_{BEX} <$	-	20	nA
Emitter cut-off current				
$I_C = 0; V_{EB} = 3\text{ V}$	$I_{EBO} <$	-	10	nA
Saturation voltages				
$I_C = 150\text{ mA}; I_B = 15\text{ mA}$	$V_{CEsat} <$	400	300	mV
	$V_{BEsat} <$	1.3	-	V
	$V_{BEsat}$	-	0,6 to 1,2	V
$I_C = 500\text{ mA}; I_B = 50\text{ mA}$	$V_{CEsat} <$	1.6	1.0	V
	$V_{BEsat} <$	2.6	2.0	V
Breakdown voltages				
$I_C = 1,0\mu\text{ A}; I_B = 0$	$V_{(BR)CEO} >$	30	40	V
$I_C = 100\mu\text{ A}; I_E = 0$	$V_{(BR)CBO} >$	60	75	V
$I_C = 0; I_E = 10\mu\text{ A}$	$V_{(BR)EBO} >$	5,0	6,0	V

**CMBT2222**  
**CMBT2222A**

		<u>CMBT2222</u>		<u>CMBT2222A</u>	
<i>D.C. current gain</i>					
$I_C = 0,1 \text{ mA}; V_{CE} = 10\text{V}$	$h_{FE}$	>	35		
$I_C = 1 \text{ mA}; V_{CE} = 10\text{V}$	$h_{FE}$	>	50		
$I_C = 10 \text{ mA}; V_{CE} = 10 \text{ V}$	$h_{FE}$	>	75		
$I_C = 10 \text{ mA}; V_{CE} = 10 \text{ V}; T_{amb} = -55 \text{ }^\circ\text{C}$	$h_{FE}$	>	35		
$I_C = 150\text{mA}; V_{CE} = 10\text{V}$	$h_{FE}$		100 to 300		
$I_C = 150 \text{ mA}; V_{CE} = 1 \text{ V}$	$h_{FE}$	>	50		
$I_C = 500 \text{ mA}; V_{CE} = 10 \text{ V}$	$h_{FE}$	>	30	40	
<i>Transition frequency at <math>f = 100 \text{ MHz}</math></i>					
$I_C = 20 \text{ mA}; V_{CE} = 20 \text{ V}$	$f_T$	>	250	300	MHz
<i>Output capacitance at <math>f = 1 \text{ MHz}</math></i>					
$I_E = 0; V_{CB} = 10\text{V}$	$C_o$	<	8,0		pF
<i>Input capacitance at <math>f = 1 \text{ MHz}</math></i>					
$I_C = 0; V_{EB} = 0,5\text{V}$	$C_i$	<	30	25	pF
<i>Noise figure at <math>R_S = 1 \text{ k}\Omega</math></i>					
$I_C = 100\mu\text{A}; V_{CE} = 10\text{V}; f = 1 \text{ kHz}$	$F$	<	4,0		dB
<i>Switching times (between 10% and 90% levels)</i>					
<i>Turn-on time switched to <math>I_C = 150 \text{ mA}</math></i>					
delay time	$t_d$	<	10		ns
rise time	$t_r$	<	25		ns
<i>Turn-off time switched from <math>I_C = 150 \text{ mA}</math></i>					
storage time	$t_s$	<	225		ns
fall time	$t_f$	<	60		ns
<i>Small Signal Current Gain</i>					
$V_{CE} = 10\text{V}; I_C = 1 \text{ mA}; f = 1 \text{ KHz}$	$h_{fe}$	>	50		
		<	300		
$V_{CE} = 10\text{V}; I_C = 10\text{mA}; f = 1 \text{ KHz}$	$h_{fe}$	>	75		
		<	375		

## Disclaimer

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