

**SOT-23 Formed SMD Package**

**CMBT2222  
CMBT2222A**

**SILICON PLANAR EPITAXIAL TRANSISTORS**

*N-P-N silicon transistors*

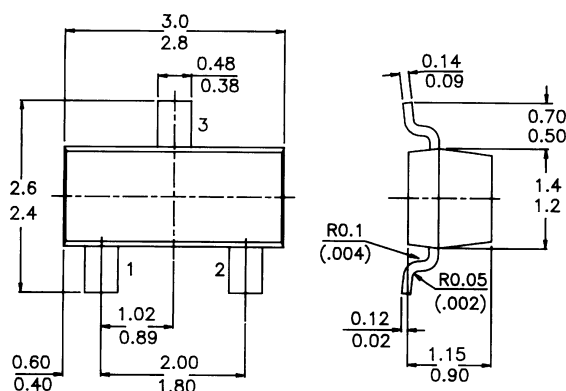
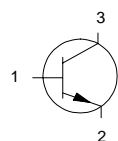
**Marking**

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 $T_{amb} = 25^\circ\text{C}$	$P_{tot}$ max.	250		mW
D.C. current gain				
$I_C = 150\text{mA}; V_{CE} = 10\text{V}$	$h_{FE}$	100 to 300		
$I_C = 500\text{mA}; V_{CE} = 10\text{V}$	$h_{FE} >$	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

		<b>CMBT2222</b>	<b>CMBT2222A</b>	
Collector-base voltage (open emitter)	$V_{CBO}$	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

		<b>CMBT2222</b>	<b>CMBT2222A</b>	
Collector cut-off current				
$I_E = 0; V_{CB} = 50\text{ V}$	$I_{CBO}$	< 0,01	–	mA
$I_E = 0; V_{CB} = 60\text{ V}$	$I_{CBO}$	< –	0,01	mA
$I_E = 0; V_{CB} = 50\text{ V}; T_j = 125^\circ\text{C}$	$I_{CBO}$	< 10	–	mA
$I_E = 0; V_{CB} = 60\text{ V}; T_j = 125^\circ\text{C}$	$I_{CBO}$	< –	10	mA
$V_{EB} = 3\text{ V}; V_{CE} = 60\text{ V}$	$I_{CEX}$	< –	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				
$I_C = 1,0\text{ mA}; I_B = 0$	$V_{(BR)CEO}$	> 30	40	V
$I_C = 100\text{ mA}; I_E = 0$	$V_{(BR)CBO}$	> 60	75	V
$I_C = 0; I_E = 10\text{ mA}$	$V_{(BR)EBO}$	> 5,0	6,0	V

**CMBT2222**  
**CMBT2222A**

		<b>CMBT2222</b>	<b>CMBT2222A</b>
<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{ kW}</math></i>			
$I_C = 100\text{mA}; V_{CE} = 10\text{V}; f = 1 \text{ kHz}$	$F <$	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	
	$h_{fe} <$	300	
$V_{CE} = 10\text{V}; I_C = 10\text{mA}; f = 1 \text{ KHz}$	$h_{fe} >$	75	
	$h_{fe} <$	375	

### Disclaimer

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