

**SOT-23 Formed SMD Package**

**CMBT5088  
CMBT5089**

***NPN SILICON PLANAR EPITAXIAL TRANSISTORS***

*N-P-N transistors*

**PACKAGE OUTLINE DETAILS  
ALL DIMENSIONS IN mm**

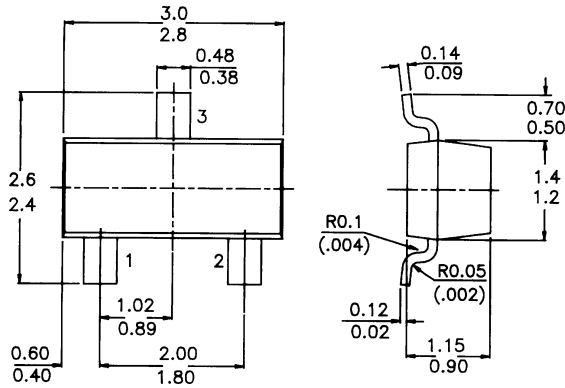
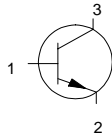
**Marking**

*CMBT5088 = 1Q*

*CMBT5089 = 1R*

**Pin configuration**

- 1 = BASE
- 2 = EMITTER
- 3 = COLLECTOR



**ABSOLUTE MAXIMUM RATINGS**

		<b>5088</b>	<b>5089</b>
Collector-base voltage (open emitter)	$V_{CB0}$ max.	35	30 V
Collector-emitter voltage (open base)	$V_{CE0}$ max.	30	25 V
Collector current	$I_C$ max.	50	mA
Total power dissipation up to $T_{amb} = 25\text{ }^\circ\text{C}$	$P_{tot}^*$ max.	225	mW
Junction temperature	$T_j$ max.	150	$^\circ\text{C}$
Collector-emitter saturation voltage $I_C = 10\text{ mA}; I_B = 1\text{ mA}$	$V_{CEsat}$ max.	0.5	V
D.C. current gain $I_C = 100\text{ }\mu\text{A}; V_{CE} = 5\text{ V}$	$h_{FE}$ min.	300	400
	$h_{FE}$ max.	900	1200
Transition frequency at $f = 20\text{ MHz}$ $I_C = 500\text{ }\mu\text{A}; V_{CE} = 5\text{ V}$	$f_T$ min.	50	MHz

\*FR-5 Board = 1.0 × 0.75 × 0.062 in.

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

## Limiting values

		<b>5088</b>	<b>5089</b>
Collector-base voltage (open emitter)	$V_{CBO}$ max.	35	30 V
Collector-emitter voltage (open base)	$V_{CEO}$ max.	30	25 V
Emitter-base voltage (open collector)	$V_{EBO}$ max.	4.5	V
Collector current (d.c.)	$I_C$ max.	50	mA
Total power dissipation up to $T_{amb} = 25^\circ\text{C}$	$P_{tot}^*$ max.	225	mW
Storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$
Junction temperature	$T_j$ max.	150	$^\circ\text{C}$

**THERMAL RESISTANCE**

From junction to ambient	$R_{th\ j-a}$	417	$^\circ\text{C/W}$
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**CHARACTERISTICS** $T_{amb} = 25^\circ\text{C}$  unless otherwise specified

		<b>5088</b>	<b>5089</b>
Collector cut-off current			
$I_E = 0; V_{CB} = 20\text{ V}$	$I_{CBO} <$	50	- nA
$I_E = 0; V_{CB} = 15\text{ V}$	$I_{CBO} <$	-	50 nA
Emitter cut-off current			
$I_C = 0; V_{EB} = 3\text{ V}$	$I_{EBO} <$	50	- nA
$I_C = 0; V_{EB} = 4.5\text{ V}$	$I_{EBO} <$	-	100 nA
Saturation voltages			
$I_C = 10\text{ mA}; I_B = 1\text{ mA}$	$V_{CEsat} <$	500	mV
	$V_{BEsat} <$	800	mV
Collector capacitance at $f = 100\text{ KHz}$			
Emitter guarded			
$I_E = 0; V_{CB} = 5\text{ V}$	$C_{cb} <$	4.0	pF
Emitter capacitance at $f = 100\text{ KHz}$			
Emitter guarded			
$I_C = 0; V_{EB} = 0.5\text{ V}$	$C_{eb} <$	10	pF
D.C. current gain			
$I_C = 0.1\ \mu\text{A}; V_{CE} = 5\text{ V}$	$h_{FE}$	300-900	400-1200
$I_C = 1.0\text{ mA}; V_{CE} = 5\text{ V}$	$h_{FE} >$	350	450
$I_C = 10\text{ mA}; V_{CE} = 5\text{ V}$	$h_{FE} >$	300	400
Small signal current gain			
$I_C = 1\text{ mA}; V_{CE} = 5\text{ V}; f = 1\text{ KHz}$	$h_{fe}$	350-1400	450-1800
Transition frequency at $f = 20\text{ MHz}$			
$I_C = 500\ \mu\text{A}; V_{CE} = 5\text{ V}$	$f_T >$	50	MHz
Noise figure at $R_S = 10\text{ k}\Omega$			
$I_C = 100\ \mu\text{A}; V_{CE} = 5\text{ V}$	$N_F <$	3.0	2.0 dB
$f = 10\text{ Hz to }15.7\text{ Hz}$			

\*FR-5 Board =  $1.0 \times 0.75 \times 0.62\text{ in.}$

## Disclaimer

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