

SOT-23 Formed SMD Package

**CMBT5088
CMBT5089**

NPN SILICON PLANAR EPITAXIAL TRANSISTORS

N-P-N transistors

**PACKAGE OUTLINE DETAILS
ALL DIMENSIONS IN mm**

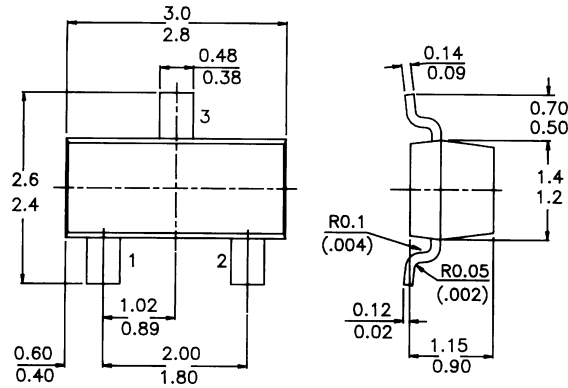
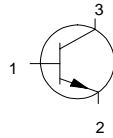
Marking

CMBT5088 = 1Q

CMBT5089 = 1R

Pin configuration

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



ABSOLUTE MAXIMUM RATINGS

		5088	5089
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 max. 900	400 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 = $1.0 \times 0.75 \times 0.062\text{ in.}$

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

Limiting values

		5088	5089
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

		5088	5089
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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