

SOT-23 Formed SMD Package

CMBT5088
CMBT5089

NPN SILICON PLANAR EPITAXIAL TRANSISTORS

N-P-N transistors

Marking

CMBT5088 = 1Q

CMBT5089 = 1R

PACKAGE OUTLINE DETAILS

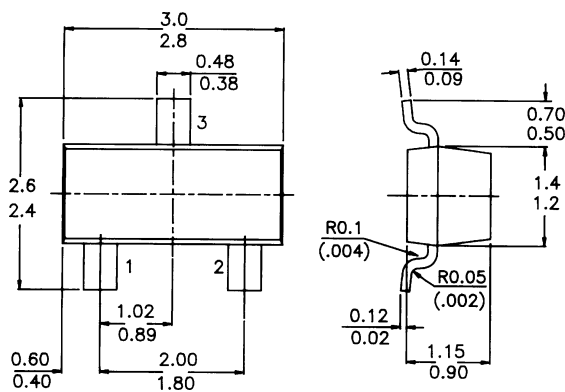
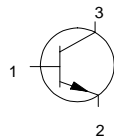
ALL DIMENSIONS IN mm

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 $T_{amb} = 25^\circ\text{C}$	P_{tot}^* max.	225	mW
Junction temperature	T_j max.	150	$^\circ\text{C}$
Collector-emitter saturation voltage	V_{CEsat} max.	0.5	V
$I_C = 10\text{ mA}; I_B = 1\text{ mA}$			
D.C. current gain	h_{FE} min.	300	400
$I_C = 100\text{ }\mu\text{A}; V_{CE} = 5\text{ V}$	h_{FE} max.	900	1200
Transition frequency at $f = 20\text{ MHz}$	f_T min.	50	MHz
$I_C = 500\text{ }\mu\text{A}; V_{CE} = 5\text{ V}$			

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

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

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