

SOT-23 Formed SMD Package

**CMBT5088
CMBT5089**

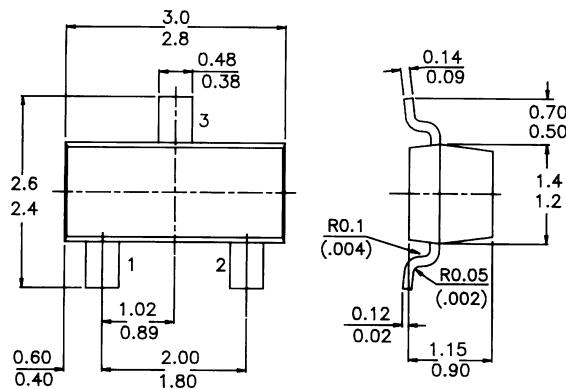
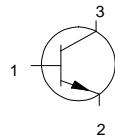
NPN SILICON PLANAR EPITAXIAL TRANSISTORS

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 $I_C = 10\text{ mA}; I_B = 1\text{ mA}$	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 × 0.75 × 0.062 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)	$VEBO$	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	°C
Junction temperature	T_J	max. 150	°C

THERMAL RESISTANCE

From junction to ambient	$R_{th\ j-a}$	417	°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
$I_E = 0; V_{CB} = 15\text{ V}$		< -	50 nA
Emitter cut-off current			
$I_C = 0; V_{EB} = 3\text{ V}$	I_{EBO}	< 50	- nA
$I_C = 0; V_{EB} = 4.5\text{ V}$		< -	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			
$I_C = 0.1\text{ }\mu\text{A}; V_{CE} = 5\text{ V}$	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
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 $f = 20\text{ MHz}$			
$I_C = 500\text{ }\mu\text{A}; V_{CE} = 5\text{ V}$	f_T	> 50	MHz
Noise figure at $R_S = 10\text{ k}\Omega$			
$I_C = 100\text{ }\mu\text{A}; V_{CE} = 5\text{ V}$ $f = 10\text{ Hz to }15.7\text{ Hz}$	N_F	< 3.0	2.0 dB

*FR-5 Board = 1.0 × 0.75 × 0.62 in.

Disclaimer

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Continental Device India Limited

C-120 Naraina Industrial Area, New Delhi 110 028, India.
Telephone + 91-11-2579 6150, 5141 1112 Fax + 91-11-2579 5290, 5141 1119
email@cdil.com www.cdilsemi.com