

SOT-23 Formed SMD Package

CMBT5088
CMBT5089

NPN SILICON PLANAR EPITAXIAL TRANSISTORS

N-P-N transistors

Marking

CMBT5088 = 1Q

CMBT5089 = 1R

PACKAGE OUTLINE DETAILS

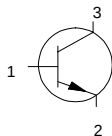
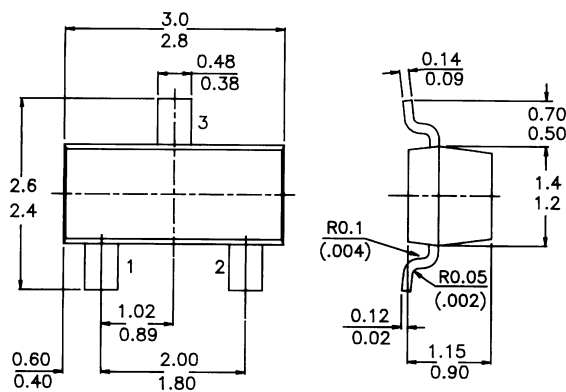
ALL DIMENSIONS IN mm

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	$^\circ\text{C/W}$
---------------	-----	--------------------

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 $R_S = 10\text{ k}\Omega$				
$I_C = 100\text{ }\mu\text{A}; V_{CE} = 5\text{ V}$	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

The product information and the selection guides facilitate selection of the CDIL's Discrete Semiconductor Device(s) best suited for application in your product(s) as per your requirement. It is recommended that you completely review our Data Sheet(s) so as to confirm that the Device(s) meet functionality parameters for your application. The information furnished on the CDIL Web Site/ CD are believed to be accurate and reliable. CDIL however, does not assume responsibility for inaccuracies or incomplete information. Furthermore, CDIL does not assume liability whatsoever, arising out of the application or use of any CDIL product; neither does it convey any license under its patent rights nor rights of others. These products are not designed for use in life saving/support appliances or systems. CDIL customers selling these products (either as individual Discrete Semiconductor Devices or incorporated in their end products), in any life saving/support appliances or systems or applications do so at their own risk and CDIL will not be responsible for any damages resulting from such sale(s).

CDIL strives for continuous improvement and reserves the right to change the specifications of its products without prior notice.



CDIL is a registered Trademark of
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