SOT-23 Formed SMD Package

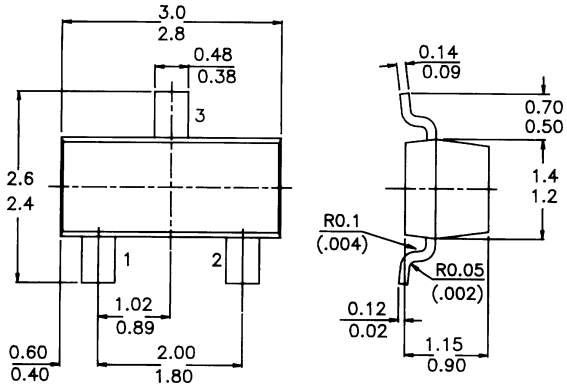
CMBT5088
CMBT5089

NPN SILICON PLANAR EPITAXIAL TRANSISTORS

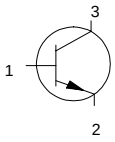
N–P–N transistors

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

**FR-5 Board = 1.0 × 0.75 × 0.062 in.*

RATINGS *(at T_A = 25°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 °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

CHARACTERISTICS

T_{amb} = 25 °C unless otherwise specified			***5088***	***5089***
Collector cut–off current				
I_E = 0; V_{CB} = 20 V	I_{CBO}	<	*50*	*– nA*
I_E = 0; V_{CB} = 15V		<	*–*	*50 nA*
Emitter cut–off current				
I_C = 0; V_{EB} = 3 V	I_{EBO}	<	*50*	*– nA*
I_C = 0; V_{EB} = 4.5V		<	*–*	*100 nA*
Saturation voltages				
I_C = 10 mA; I_B = 1 mA	V_{CEsat}	<	*500*	*mV*
	V_{BEsat}	<	*800*	*mV*
Collector capacitance at f = 100 KHz				
Emitter guarded				
I_E = 0; V_{CB} = 5V	C_{cb}	<	*4.0*	*pF*
Emitter capacitance at f = 100 KHz				
Emitter guarded				
I_C = 0; V_{EB} = 0.5V	C_{eb}	<	*10*	*pF*
D.C. current gain				
I_C = 0.1 µA; V_{CE} = 5 V	h_{FE}		*300-900*	*400-1200*
I_C = 1.0 mA; V_{CE} = 5 V	h_{FE}	>	*350*	*450*
I_C = 10 mA; V_{CE} = 5 V	h_{FE}	>	*300*	*400*
Small signal current gain				
I_C = 1 mA; V_{CE} = 5V; f = 1 KHz	h_{fe}		*350-1400*	*450-1800*
Transition frequency at f = 20 MHz				
I_C = 500 µA; V_{CE} = 5 V	f_T	>	*50*	MHz
Noise figure at R_S = 10 kΩ				
I_C = 100 µA; V_{CE} = 5 V	N_F	<	*3.0*	*2.0 dB*
f = 10 Hz to 15.7 Hz				

**FR-5 Board = 1.0 × 0.75 × 0.62 in.*

Customer Notes

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