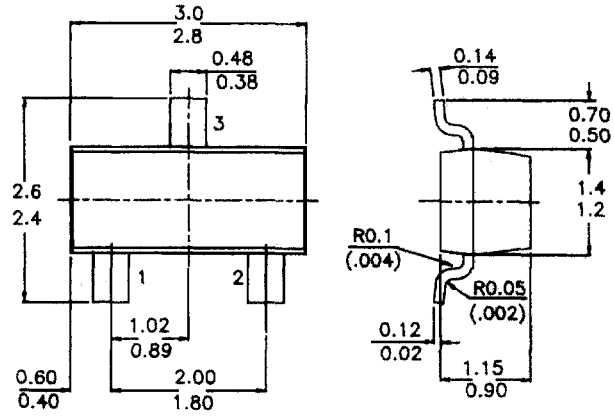
NPN SILICON PLANAR EPITAXIAL TRANSISTORS

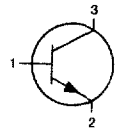
N–P–N transistors

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.