SOT-23 Formed SMD Package

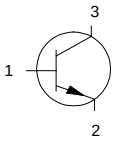
CMBT3903
CMBT3904

SILICON EPITAXIAL TRANSISTORS

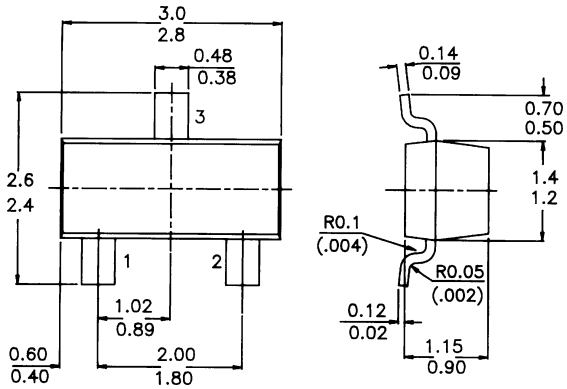
N–P–N transistors

Marking
CMBT3903 = 1Y
CMBT3904 = 1A

Pin configuration
1 = BASE
2 = EMITTER
3 = COLLECTOR



PACKAGE OUTLINE DETAILS
ALL DIMENSIONS IN mm



ABSOLUTE MAXIMUM RATINGS

Collector–base voltage (open emitter)		V_{CB0}	*max.*	*60*	*V*
Collector–emitter voltage (open base)		V_{CE0}	*max.*	*40*	*V*
Emitter–base voltage (open collector)		V_{EB0}	*max.*	*6*	*V*
Collector current (DC)		I_C	*max.*	*200*	*mA*
Total power dissipation up to T_{amb} *= 25 °C*		P_{tot}	*max.*	*250*	*mW*
DC current gain	*CMBT3903*		>	*50*	
I_C *= 10 mA;* V_{CE} *= 1 V*		h_{FE}	<	*150*	
	CMBT3904		>	*100*	
I_C *= 10 mA;* V_{CE} *= 1 V*		h_{FE}	<	*300*	
Transition frequency at f = 35 MHz					
I_C *= 10 mA;* V_{CE} *= 20 V*		f_T	>	*300*	MHz

RATINGS *(at T_A = 25°C unless otherwise specified)*

Limiting values			
Collector–base voltage (open emitter)	V_{CB0}	*max.*	*60 V*
Collector–emitter voltage (open base)	V_{CE0}	*max.*	*40 V*
Emitter–base voltage (open collector)	V_{EB0}	*max.*	*6 V*
Collector current (d.c.)	I_C	*max.*	*200 mA*
Total power dissipation			
up to T_{amb} = 25 °C	P_{tot}	*max.*	*250 mW*
Storage temperature	T_{stg}	*–55 to +150*	
° C			
Junction temperature	T_j	*max.*	*150 ° C*

THERMAL RESISTANCE

$T_j = P (R_{th\ j–t} + R_{th\ t–s} + R_{th\ s–a}) + T_{amb}$

Thermal resistance			
from junction to ambient	$R_{th\ j–a}$	=	*500* K/W

CHARACTERISTICS

T_{amb} = 25 °C unless otherwise specified

Collector–emitter breakdown voltage			
I_C = 1 mA; l_B = 0	$V_{(BR)CEO}$	*min.*	*40 V*
Collector–base breakdown voltage			
I_C = 10µA; I_E = 0	$V_{(BR)CBO}$	*min.*	*60 V*
Emitter–base breakdown voltage			
I_E = 10µA; I_C = 0	$V_{(BR)EBO}$	*min.*	*6 V*
Collector cut–off current			
V_{CE} = 30 V; V_{EB} = 3 V	I_{CEX}	*max.*	*50 nA*
Output capacitance at f = 1 MHz			
I_E = 0; V_{CB} = 5 V	C_c	*max.*	*4 pF*
Input capacitance at f = 1 MHz			
I_C = 0; V_{BE} = 0,5 V	C_e	*max.*	*8 pF*
Base current			
with reverse biased emitter junction			
V_{EB} = 3 V; V_{CE} = 30 V	I_{BEX}	*max.*	*50 nA*
Saturation voltages			
I_C = 10 mA; l_B = 1 mA	V_{CEsat}	*max.*	*0.2 V*
I_C = 50 mA; 1_B = 5 mA	V_{CEsat}	*max.*	*0.3 V*
I_C = 10 mA; l_B = 1 mA	V_{BEsat}	*min.*	*0.65 V*
		max.	*0.85 V*
I_C = 50 mA; l_B = 5 mA	V_{BEsat}	*max.*	*0.95 V*

			CMBT3903	CMBT3904	
*D.C. current gain **					
I_C = 0,1 mA; V_{CE} = 1 V	h_{FE}	>	20	40	
I_C = 1 mA; V_{CE} = 1 V	h_{FE}	>	35	70	
I_C = 10 mA; V_{CE} = 1 V	h_{FE}	>	50	100	
		<	150	300	
I_C = 50 mA; V_{CE} = 1 V	h_{FE}	>	30	60	
I_C = 100 mA; V_{CE} = 1 V	h_{FE}	>	15	30	
Transition frequency at f = 100 MHz					
I_C = 10 mA; V_{CE} = 20 V	f_T	min.	250	300	MHz
Noise figure at R_S = 1 kΩ					
I_C = 100 µA; V_{CE} = 5 V					
f = 10 Hz to 15,7 kHz	F	max.	6	5	dB
Small Signal Current Gain					
V_{CE} = 10V; I_C = 1 mA; f = 1 KHz	h_{fe}	min.	50	100	
		max.	200	400	

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