

SOT-23 Formed SMD Package

CMBT3903
CMBT3904

SILICON EPITAXIAL TRANSISTORS

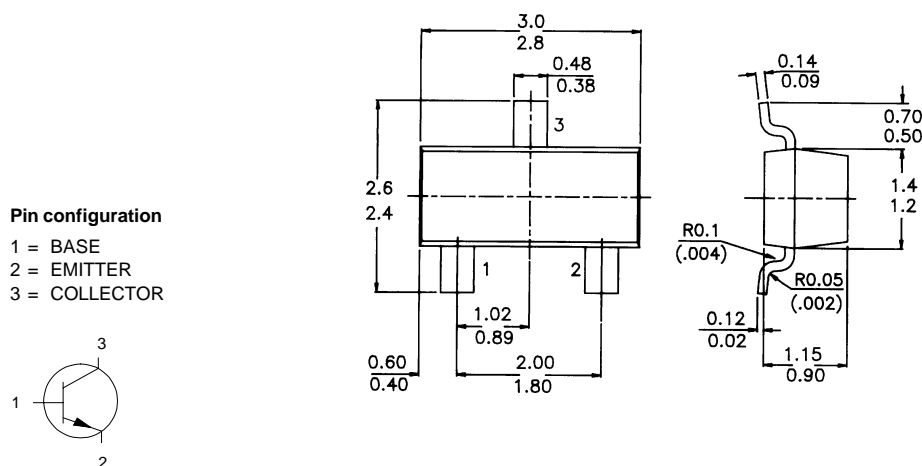
N-P-N transistors

Marking

$$CMBT3903 = 1Y$$
$$CMBT3904 = 1A$$

PACKAGE OUTLINE DETAILS

ALL DIMENSIONS IN mm



ABSOLUTE MAXIMUM RATINGS

Collector-base voltage (open emitter)

Collector-emitter voltage (open base)

Emitter-base voltage (open collector)

Collector current (DC)

Total power dissipation up to $T_{amb} = 25\text{ }^{\circ}\text{C}$

DC current gain

$$I_C = 10 \text{ mA}; V_{CE} = 1 \text{ V}$$
$$I_C = 10 \text{ mA}; V_{CE} = 1 \text{ V}$$
Transition frequency at $f = 35$ MHz
$$I_C = 10 \text{ mA}; V_{CE} = 20 \text{ V}$$
 $V_{CB0} \quad max. \quad 60 \text{ V}$
$$V_{CE0} \quad max. \quad 40 \text{ V}$$
$$V_{EB0} \quad max. \quad 6 \text{ V}$$
$$I_C \quad \text{max.} \quad 200 \text{ mA}$$

P_{tot} max. 250 mW

CMBT3903 > 50

$$h_{FE} < 150$$
$$CMBT3904 \quad > \quad 100$$
$$h_{FE} < 300$$
$$f_T > 300 \text{ MHz}$$

CMBT3903
CMBT3904

RATINGS (at $T_A = 25^\circ\text{C}$ 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 $T_{amb} = 25^\circ\text{C}$	P_{tot}	max.	250 mW
Storage temperature $^\circ\text{C}$	T_{stg}	-55 to +150	
Junction temperature	T_j	max.	150 $^\circ\text{C}$

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

$$R_{th\ j-a} = 500\ \text{K/W}$$

CHARACTERISTICS

$T_{amb} = 25^\circ\text{C}$ unless otherwise specified

Collector-emitter breakdown voltage

$$I_C = 1\ \text{mA}; I_B = 0$$

$$V_{(BR)CEO} \text{ min. } 40\ \text{V}$$

Collector-base breakdown voltage

$$I_C = 10\ \mu\text{A}; I_E = 0$$

$$V_{(BR)CBO} \text{ min. } 60\ \text{V}$$

Emitter-base breakdown voltage

$$I_E = 10\ \mu\text{A}; I_C = 0$$

$$V_{(BR)EBO} \text{ min. } 6\ \text{V}$$

Collector cut-off current

$$V_{CE} = 30\ \text{V}; V_{EB} = 3\ \text{V}$$

$$I_{CEX} \text{ max. } 50\ \text{nA}$$

Output capacitance at $f = 1\ \text{MHz}$

$$I_E = 0; V_{CB} = 5\ \text{V}$$

$$C_c \text{ max. } 4\ \text{pF}$$

Input capacitance at $f = 1\ \text{MHz}$

$$I_C = 0; V_{BE} = 0.5\ \text{V}$$

$$C_e \text{ max. } 8\ \text{pF}$$

Base current

with reverse biased emitter junction

$$V_{EB} = 3\ \text{V}; V_{CE} = 30\ \text{V}$$

$$I_{BEX} \text{ max. } 50\ \text{nA}$$

Saturation voltages

$$I_C = 10\ \text{mA}; I_B = 1\ \text{mA}$$

$$V_{CEsat} \text{ max. } 0.2\ \text{V}$$

$$I_C = 50\ \text{mA}; I_B = 5\ \text{mA}$$

$$V_{CEsat} \text{ max. } 0.3\ \text{V}$$

$$I_C = 10\ \text{mA}; I_B = 1\ \text{mA}$$

$$V_{BEsat} \text{ min. } 0.65\ \text{V}$$

$$\text{max. } 0.85\ \text{V}$$

$$I_C = 50\ \text{mA}; I_B = 5\ \text{mA}$$

$$V_{BEsat} \text{ max. } 0.95\ \text{V}$$

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

Disclaimer

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