

SOT-23 Formed SMD Package

CMBT3905

SILICON EPITAXIAL TRANSISTOR

P-N-P transistor

Marking

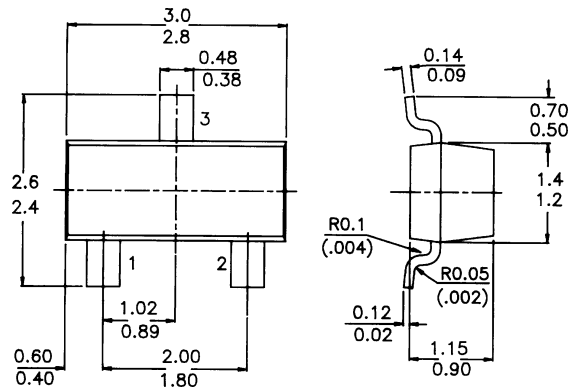
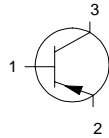
CMBT3905 = 2Y

PACKAGE OUTLINE DETAILS

ALL DIMENSIONS IN mm

Pin configuration

- 1 = BASE
- 2 = EMITTER
- 3 = COLLECTOR



ABSOLUTE MAXIMUM RATINGS

Collector-base voltage (open emitter)	$-V_{CB0}$	max.	40 V
Collector-emitter voltage (open base)	$-V_{CEO}$	max.	40 V
Emitter-base voltage (open collector)	$-V_{EBO}$	max.	5 V
Collector current (d.c.)	$-I_C$	max.	200 mA
Total power dissipation up to $T_{amb} = 60\text{ }^\circ\text{C}$	P_{tot}	max.	250 mW
D.C. current gain	h_{FE}		50 to 150
Transition frequency at $f = 100\text{ MHz}$	f_T	min.	200 MHz
$-I_C = 10\text{ mA}; -V_{CE} = 1\text{ V}$			
$-I_C = 10\text{ mA}; -V_{CE} = 20\text{ V}$			

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RATINGS (at $T_A = 25^\circ\text{C}$ unless otherwise specified)

Limiting values

Collector-base voltage (open emitter)	$-V_{CB0}$	max.	40 V
Collector-emitter voltage (open base)	$-V_{CE0}$	max.	40 V
Emitter-base voltage (open collector)	$-V_{EB0}$	max.	5 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	T_{stg}		-55 to +150 °C

THERMAL CHARACTERISTICS

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

Thermal resistance

from junction to ambient

$$R_{th\ j-a} = 200\ ^\circ\text{C/W}$$

CHARACTERISTICS (at $T_A = 25^\circ\text{C}$ unless otherwise specified)

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

Collector-emitter breakdown voltage

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

$$-V_{(BR)CE0}\ \text{min.}\ 40\ \text{V}$$

Collector-base breakdown voltage

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

$$-V_{(BR)CB0}\ \text{min.}\ 40\ \text{V}$$

Emitter-base breakdown voltage

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

$$-V_{(BR)EB0}\ \text{min.}\ 5\ \text{V}$$

Collector cut-off current

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

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

Base current

with reverse biased emitter junction

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

Output capacitance at $f = 100\ \text{kHz}$

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

$$C_c\ \text{max.}\ 4.5\ \text{pF}$$

Input capacitance at $f = 100\ \text{kHz}$

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

$$C_e\ \text{max.}\ 10\ \text{pF}$$

Saturation voltages

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

$$-V_{CEsat}\ \text{max.}\ 0.25\ \text{V}$$

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

$$-V_{CEsat}\ \text{max.}\ 0.4\ \text{V}$$

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

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

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

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

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

D.C. current gain

$-I_C = 0.1\ \text{mA}; -V_{CE} = 1\ \text{V}$

$$h_{FE}\ \text{min.}\ 30$$

$-I_C = 1\ \text{mA}; -V_{CE} = 1\ \text{V}$

$$h_{FE}\ \text{min.}\ 40$$

$-I_C = 10\ \text{mA}; -V_{CE} = 1\ \text{V}$

$$h_{FE}\ \text{min.}\ 50$$

$$\text{max.}\ 150$$

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$-I_C = 50 \text{ mA}; -V_{CE} = 1 \text{ V}$	h_{FE}	<i>min.</i>	30
$-I_C = 100 \text{ mA}; -V_{CE} = 1 \text{ V}$	h_{FE}	<i>min.</i>	15
Transition frequency at $f = 100 \text{ MHz}$			
$-I_C = 10 \text{ mA}; -V_{CE} = 20 \text{ V}$	f_T	<i>min.</i>	200 MHz
Noise figure at $R_S = 1 \text{ k}\Omega$			
$-I_C = 100 \mu\text{A}; -V_{CE} = 5 \text{ V}$	F	<i>max.</i>	4 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}	<i>min.</i>	50
		<i>max.</i>	200

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