

**SOT-23 Formed SMD Package**

**CMBT3905**

**SILICON EPITAXIAL TRANSISTOR**

*P-N-P transistor*

**Marking**

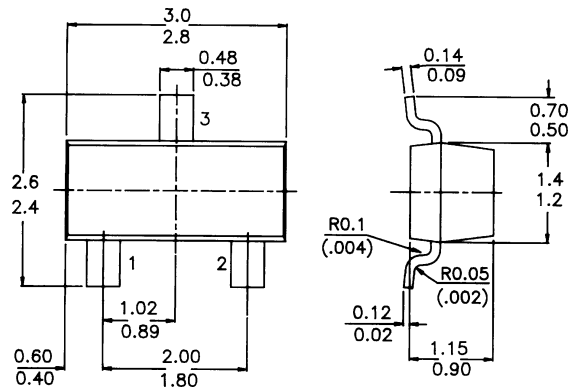
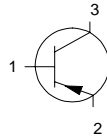
*CMBT3905 = 2Y*

**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 °C/W
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### **CHARACTERISTICS** (at $T_A = 25^\circ\text{C}$ unless otherwise specified)

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

#### Collector-emitter breakdown voltage

$-I_C = 1\text{ mA}; I_B = 0$	$-V_{(BR)CE0}$	min.	40 V
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#### Collector-base breakdown voltage

$-I_C = 10\ \mu\text{A}; I_E = 0$	$-V_{(BR)CB0}$	min.	40 V
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#### Emitter-base breakdown voltage

$-I_E = 10\ \mu\text{A}; I_C = 0$	$-V_{(BR)EB0}$	min.	5 V
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#### Collector cut-off current

$-V_{CE} = 30\text{ V}; -V_{EB} = 3\text{ V}$	$-I_{CEX}$	max.	50 nA
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#### Base current

with reverse biased emitter junction	$-I_{BEX}$	max.	50 nA
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#### Output capacitance at $f = 100\text{ kHz}$

$I_E = 0; -V_{CB} = 5\text{ V}$	$C_c$	max.	4.5 pF
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#### Input capacitance at $f = 100\text{ kHz}$

$I_C = 0; -V_{BE} = 0,5\text{ V}$	$C_e$	max.	10 pF
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#### Saturation voltages

$-I_C = 10\text{ mA}; -I_B = 1\text{ mA}$	$-V_{CEsat}$	max.	0,25 V
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$-I_C = 50\text{ mA}; -I_B = 5\text{ mA}$	$-V_{CEsat}$	max.	0,4 V
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$-I_C = 10\text{ mA}; -I_B = 1\text{ mA}$	$-V_{BEsat}$	min.	0,65 V
		max.	0,85 V

$-I_C = 50\text{ mA}; -I_B = 5\text{ mA}$	$-V_{BEsat}$	max.	0,95 V
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#### D.C. current gain

$-I_C = 0,1\text{ mA}; -V_{CE} = 1\text{ V}$	$h_{FE}$	min.	30
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$-I_C = 1\text{ mA}; -V_{CE} = 1\text{ V}$	$h_{FE}$	min.	40
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$-I_C = 10\text{ mA}; -V_{CE} = 1\text{ V}$	$h_{FE}$	min.	50
		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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