

SOT-23 Formed SMD Package

CMBT3906

SILICON EPITAXIAL TRANSISTOR

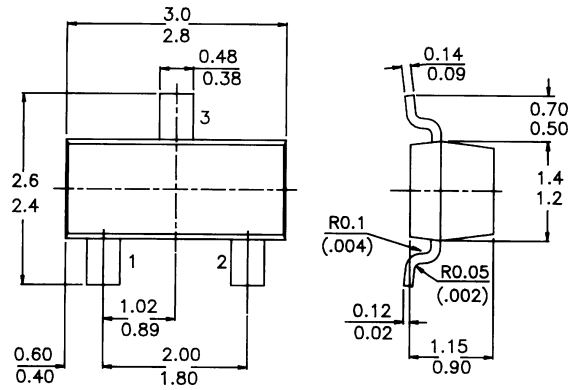
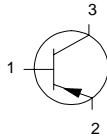
P-N-P transistor

Marking

CMBT3906 = 2A

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)	$-V_{CE0}$	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 $T_{amb} = 25\text{ }^{\circ}\text{C}$	P_{tot}	max.	250 mW
D.C. current gain	h_{FE}		100 to 300
Transition frequency at $f = 100\text{ MHz}$	f_T	min.	250 MHz
$-I_C = 10\text{ mA}; -V_{CE} = 1\text{ V}$			
$-I_C = 10\text{ mA}; -V_{CE} = 20\text{ V}$			

CMBT3906**RATINGS***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 $T_{amb} = 25\text{ }^{\circ}\text{C}$	P_{tot}	max.	250 mW
Storage temperature	T_{stg}		-55 to +150 $^{\circ}\text{C}$

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*

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

CHARACTERISTICS $T_{amb} = 25\text{ }^{\circ}\text{C}$ 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

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

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

Emitter-base breakdown voltage

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

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

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

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

$$-V_{CEsat}\text{ max. } 0,25\text{ V}$$

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

$$-V_{CEsat}\text{ max. } 0,4\text{ V}$$

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

$$-V_{BEsat}\text{ max. } 0,85\text{ V}$$

$$\text{min. } 0,65\text{ V}$$

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

$$-V_{BEsat}\text{ max. } 0,95\text{ V}$$

D.C. current gain

$$-I_C = 0,1\text{ mA}; -V_{CE} = 1\text{ V}$$

$$h_{FE}\text{ min. } 60$$

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

$$h_{FE}\text{ min. } 80$$

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

$$h_{FE}\text{ min. } 100$$

$$\text{max. } 300$$

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$-I_C = 50 \text{ mA}; -V_{CE} = 1 \text{ V}$	h_{FE}	<i>min.</i>	60
$-I_C = 100 \text{ mA}; -V_{CE} = 1 \text{ V}$	h_{FE}	<i>min.</i>	30
Transition frequency at $f = 100 \text{ MHz}$			
$-I_C = 10 \text{ mA}; -V_{CE} = 20 \text{ V}$	f_T	<i>min.</i>	250 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>	100
		<i>max.</i>	400

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