

SOT-23 Formed SMD Package

CMBT4401

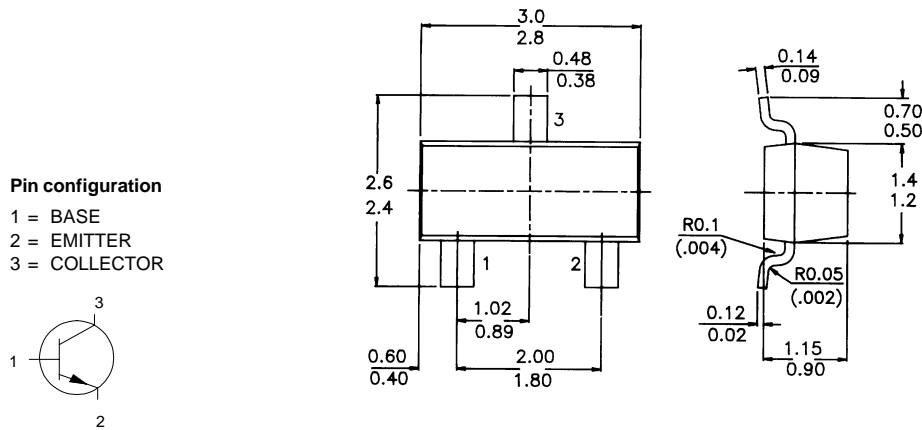
SILICON PLANAR EPITAXIAL TRANSISTOR

N-P-N transistor

Marking

CMBT4401 = 2X

PACKAGE OUTLINE DETAILS
ALL DIMENSIONS IN mm



ABSOLUTE MAXIMUM RATINGS

Collector-emitter voltage	V_{CEO}	max.	40 V
Collector current (DC)	I_C	max.	600 mA
DC current gain	h_{FE}	min.	100
		max.	300
Total power dissipation up to $T_{amb} = 25^\circ C$	P_{tot}	max	250 mW

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

Limiting values

Collector-emitter voltage	V_{CEO}	max.	40 V
Collector-base voltage	V_{CBO}	max.	60 V
Emitter-base voltage	V_{EBO}	max.	6 V
Collector current (DC)	I_C	max.	600 mA
Total power dissipation up to $T_{amb} = 25^\circ C$	P_{tot}	max	250 mW
Storage temperature range	T_{stg}		-55 to +150 °C
Junction temperature	T_j	max.	150 °C

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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

$$I_C = 1.0 \text{ mA}; I_B = 0$$

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

Collector-base breakdown voltage

$$I_C = 100 \text{ } \mu\text{A}; I_E = 0$$

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

Emitter-base breakdown voltage

$$I_E = 100 \text{ } \mu\text{A}; I_C = 0$$

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

Base cut-off current

$$V_{CE} = 35 \text{ V}; V_{EB} = 0.4 \text{ V}$$

$$I_{BEX} < 0.1 \text{ } \mu\text{A}$$

Collector cut-off current

$$V_{CE} = 35 \text{ V}; V_{EB} = 0.4 \text{ V}$$

$$I_{CEX} < 0.1 \text{ } \mu\text{A}$$

D.C. current gain

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

$$h_{FE} > 20$$

$$I_C = 1.0 \text{ mA}; V_{CE} = 1 \text{ V}$$

$$h_{FE} > 40$$

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

$$h_{FE} > 80$$

$$I_C = 150 \text{ mA}; V_{CE} = 1 \text{ V}$$

$$h_{FE} \text{ } 100 \text{ to } 300$$

$$I_C = 500 \text{ mA}; V_{CE} = 2 \text{ V}$$

$$h_{FE} > 40$$

Saturation voltage

$$I_C = 150 \text{ mA}; I_B = 15 \text{ mA}$$

$$V_{CEsat} < 0.4 \text{ V}$$

$$V_{BEsat} \text{ } 0.75 \text{ to } 0.95 \text{ V}$$

$$I_C = 500 \text{ mA}; I_B = 50 \text{ mA}$$

$$V_{CEsat} < 0.75 \text{ V}$$

$$V_{BEsat} < 1.2 \text{ V}$$

Transition frequency

$$f = 100 \text{ MHz}; I_C = 20 \text{ mA}; V_{CE} = 10 \text{ V}$$

$$f_T > 250 \text{ MHz}$$

Collector-base capacitance

$$I_E = 0; V_{CB} = 5 \text{ V}; f = 100 \text{ kHz}$$

$$C_{cb} < 8 \text{ pF}$$

Emitter-base capacitance

$$I_C = 0; V_{BE} = 0.5 \text{ V}; f = 100 \text{ kHz}$$

$$C_{eb} < 30 \text{ pF}$$

Input impedance; $f = 1 \text{ kHz}$;

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

$$h_{ie} \text{ } \begin{matrix} \text{min.} & 1 \text{ k}\Omega \\ \text{max.} & 8 \text{ k}\Omega \end{matrix}$$

Voltage feed-back ratio

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

$$h_{re} \text{ } \begin{matrix} \text{min.} & 0.1 \times 10^{-4} \\ \text{max.} & 30 \times 10^{-4} \end{matrix}$$

Small-signal current gain; $f = 1 \text{ kHz}$;

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

$$h_{fe} \text{ } \begin{matrix} \text{min.} & 40 \\ \text{max.} & 500 \end{matrix}$$

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Output admittance; $f = 1 \text{ kHz}$;

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

h_{oe}	<i>min.</i>	1 μS
	<i>max.</i>	30 μS

Switching times (resistive load)

Turn-on time

$$I_C = 150 \text{ mA}; I_{B1} = 15 \text{ mA};$$

$$V_{CC} = 30 \text{ V}; V_{EB} = 2 \text{ V}$$

delay time

t_d	<i>max.</i>	15 ns
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rise time

t_r	<i>max.</i>	20 ns
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Turn-off time

$$I_C = 150 \text{ mA}; V_{CC} = 30 \text{ V};$$

$$I_{B1} = I_{B2} = 15 \text{ mA}$$

storage time

t_s	<i>max.</i>	225 ns
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fall time

t_f	<i>max.</i>	30 ns
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Disclaimer

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