

**SOT-23 Formed SMD Package**

**CMBT4403**

**SILICON PLANAR EPITAXIAL TRANSISTOR**

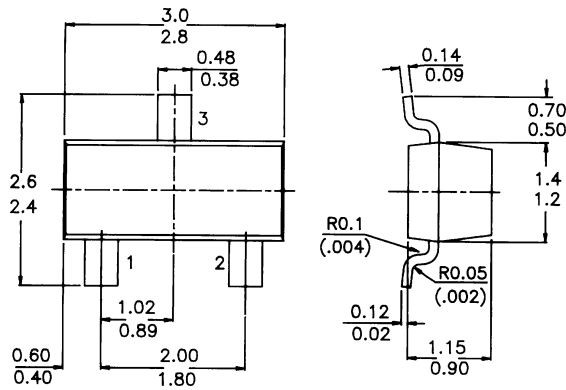
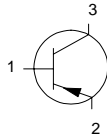
*P-N-P transistor*

**Marking**

CMBT4403 = 2T

**PACKAGE OUTLINE DETAILS**  
ALL DIMENSIONS IN mm

**Pin configuration**  
1 = BASE  
2 = EMITTER  
3 = COLLECTOR



**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 $T_{amb} = 25\text{ }^\circ\text{C}$	$P_{tot}$	max	250 mW

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

*Limiting values*

Collector-emitter voltage	$-V_{CEO}$	max.	40 V
Collector-base voltage	$-V_{CBO}$	max.	40 V
Emitter-base voltage	$-V_{EBO}$	max.	5 V
Collector current (DC)	$-I_C$	max.	600 mA
Total power dissipation up to $T_{amb} = 25\text{ }^\circ\text{C}$	$P_{tot}$	max	250 mW
Storage temperature range	$T_{stg}$		-55 to +150 $^\circ\text{C}$
Junction temperature	$T_j$	max.	150 $^\circ\text{C}$

## CMBT4403

### **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

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

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

Collector-base breakdown voltage

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

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

Emitter-base breakdown voltage

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

$$-V_{(BR)EBO} > 5\ \text{V}$$

Base cut-off current

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

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

Collector cut-off current

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

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

D.C. current gain

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

$$h_{FE} > 30$$

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

$$h_{FE} > 60$$

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

$$h_{FE} > 100$$

$$-I_C = 150\ \text{mA}; -V_{CE} = 2\ \text{V}$$

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

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

$$h_{FE} > 20$$

Saturation voltage

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

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

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

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

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

$$-V_{BEsat} < 1.3\ \text{V}$$

Transition frequency

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

$$f_T > 200\ \text{MHz}$$

Collector-base capacitance

$$I_E = 0; -V_{CB} = 10\ \text{V}; f = 100\ \text{kHz}$$

$$C_{cb} < 8.5\ \text{pF}$$

Emitter-base capacitance

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

$$C_{eb} < 35\ \text{pF}$$

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

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

$$h_{ie} \quad \text{min.}\ 1.5\ \text{k}\Omega$$

$$\text{max.}\ 15\ \text{k}\Omega$$

Voltage feed-back ratio at  $f = 1\ \text{kHz}$ ;

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

$$h_{re} \quad \text{min.}\ 0.1 \times 10^{-4}$$

$$\text{max.}\ 8 \times 10^{-4}$$

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

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

$$h_{fe} \quad \text{min.}\ 60$$

$$\text{max.}\ 500$$

## CMBT4403

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

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

$h_{oe}$	<i>min.</i>	1 $\mu\text{S}$
	<i>max.</i>	100 $\mu\text{S}$

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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Continental Device India Limited

C-120 Naraina Industrial Area, New Delhi 110 028, India.  
Telephone + 91-11-2579 6150, 5141 1112 Fax + 91-11-2579 5290, 5141 1119  
email@cdil.com www.cdilsemi.com