

**SOT-23 Formed SMD Package**

**CMBT5401**

**SILICON P-N-P HIGH-VOLTAGE TRANSISTOR**

*P-N-P transistor*

**Marking**

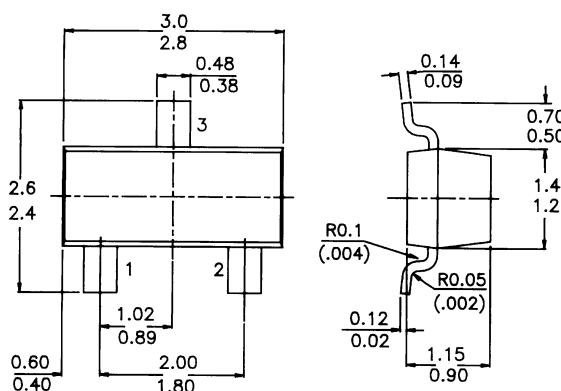
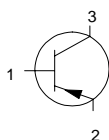
CMBT5401 = 2L

**PACKAGE OUTLINE DETAILS**

ALL DIMENSIONS IN mm

**Pin configuration**

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



**ABSOLUTE MAXIMUM RATINGS**

Collector-base voltage (open emitter)	$-V_{CBO}$	max.	160 V
Collector-emitter voltage (open base)	$-V_{CEO}$	max.	150 V
Collector current	$-I_C$	max.	500 mA
Total power dissipation up to $T_{amb} = 25^\circ C$	$P_{tot}$	max.	250 mW
Collector-emitter saturation voltage			
$I_C = 50 \text{ mA}; I_B = 5 \text{ mA}$	$V_{CEsat}$	max.	0.5 V
D.C. current gain			
$I_C = 10 \text{ mA}; V_{CE} = -5 \text{ V}$	$h_{FE}$		60 to 240

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

*Limiting values*

Collector-base voltage (open emitter)	$-V_{CBO}$	max.	160 V
Collector-emitter voltage (open base)	$-V_{CEO}$	max.	150 V
Emitter-base voltage (open collector)	$-V_{EBO}$	max.	5 V
Collector current	$-I_C$	max.	500 mA

**CMBT5401**

Total power dissipation up to $T_{amb} = 25^{\circ}\text{C}$	$P_{tot}$	max	250 mW
Junction temperature	$T_j$	max.	150 $^{\circ}\text{C}$
Storage temperature	$T_{stg}$		-55 to +150 $^{\circ}\text{C}$

**THERMAL RESISTANCE**

from junction to ambient	$R_{th\ j-a}$		500 K/W
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**CHARACTERISTICS** (at  $T_A = 25^{\circ}\text{C}$  unless otherwise specified)

## Collector cut-off current

$I_E = 0$ ; $-V_{CB} = 120\text{ V}$	$-I_{CBO}$	max.	50 nA
$I_E = 0$ ; $-V_{CB} = 120\text{ V}$ ; $T_{amb} = 150^{\circ}\text{C}$	$-I_{CBO}$	max.	50 $\mu\text{A}$

## Breakdown voltages

$I_C = 1\text{ mA}$ ; $I_B = 0$	$-V_{(BR)CEO}$	min.	150 V
$I_C = 100\ \mu\text{A}$ ; $I_E = 0$	$-V_{(BR)CBO}$	min.	160 V
$I_C = 0$ ; $I_E = 10\ \mu\text{A}$	$-V_{(BR)EBO}$	min.	5 V

## Saturation voltages

$-I_C = 10\text{ mA}$ ; $-I_B = 1\text{ mA}$	$-V_{CEsat}$	max.	0.2 V
	$-V_{BEsat}$	max.	1 V
$-I_C = 50\text{ mA}$ ; $-I_B = 5\text{ mA}$	$-V_{CEsat}$	max.	0.5 V
	$-V_{BEsat}$	max.	1 V

## D.C. current gain

$I_C = 1\text{ mA}$ ; $-V_{CE} = 5\text{ V}$	$h_{FE}$	min.	50
$I_C = 10\text{ mA}$ ; $-V_{CE} = 5\text{ V}$	$h_{FE}$	min.	60
		max.	240
$I_C = 50\text{ mA}$ ; $-V_{CE} = 5\text{ V}$	$h_{FE}$	min.	50

## Small-signal current gain

$I_C = 1\text{ mA}$ ; $-V_{CE} = 10\text{ V}$ ; $f = 1\text{ kHz}$	$h_{fe}$	min.	40
		max.	200

Output capacitance at  $f = 1\text{ MHz}$ 

$I_E = 0$ ; $-V_{CB} = 10\text{ V}$	$C_o$	max.	6 pF
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Transition frequency at  $f = 100\text{ MHz}$ 

$-I_C = 10\text{ mA}$ ; $-V_{CE} = 10\text{ V}$ ; $T_{amb} = 25^{\circ}\text{C}$	$f_T$	min.	100 MHz
		max.	300 MHz

Noise figure at  $R_S = 10\ \Omega$ 

$I_C = 200\ \mu\text{A}$ ; $-V_{CE} = 5\text{ V}$	$F$	max.	8 dB
$f = 10\text{ Hz}$ to $15.7\text{ kHz}$ ; $T_{amb} = 25^{\circ}\text{C}$			

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