

**SOT-23 Formed SMD Package**

**CMBT5401**

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

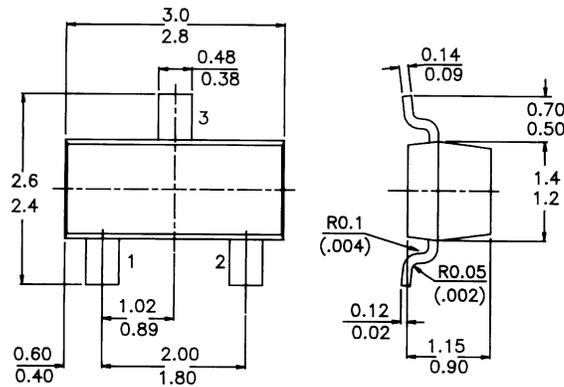
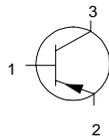
*P-N-P transistor*

**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	$V_{CEsat}$	max.	0.5 V
$I_C = 50 \text{ mA}; I_B = 5 \text{ mA}$			
D.C. current gain	$h_{FE}$		60 to 240
$I_C = 10 \text{ mA}; V_{CE} = -5 \text{ V}$			

**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 $T_{amb} = 25^\circ\text{C}$	$P_{tot}$	<i>max</i>	250 mW
Junction temperature	$T_j$	<i>max.</i>	150 °C
Storage temperature	$T_{stg}$		-55 to +150 °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

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

#### Breakdown voltages

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

#### Saturation voltages

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

#### D.C. current gain

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

#### Small-signal current gain

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

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

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

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

#### Noise figure at $R_S = 10\text{ }\Omega$

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

## Disclaimer

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