

## SILICON PLANAR EPITAXIAL TRANSISTORS

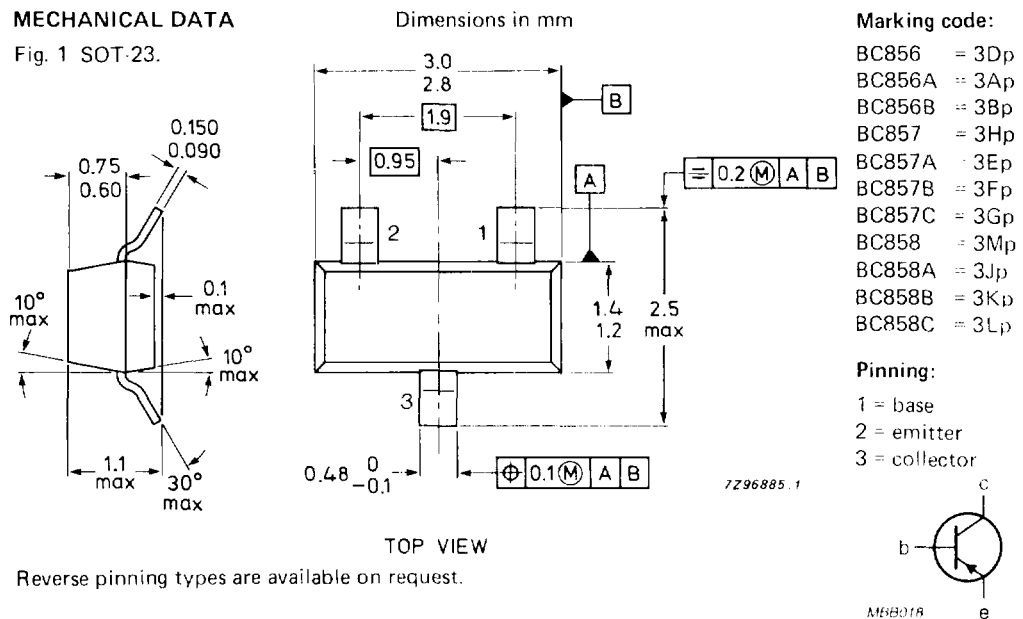
P-N-P transistors, in a SOT-23 plastic package.

### QUICK REFERENCE DATA

		BC856	BC857	BC858
Collector-emitter voltage (+V <sub>BE</sub> = 1 V)	-V <sub>CEX</sub>	max. 80	50	30 V
Collector-emitter voltage (open base)	-V <sub>CEO</sub>	max. 65	45	30 V
Collector current (peak value)	-I <sub>CM</sub>	max.	200	mA
Total power dissipation up to T <sub>amb</sub> = 60 °C	P <sub>tot</sub>	max.	250	mW
Junction temperature	T <sub>j</sub>	max.	150	°C
DC current gain -I <sub>C</sub> = 2 mA; -V <sub>CE</sub> = 5 V	h <sub>fe</sub>		75 to 800	
Transition frequency at f = 100 MHz -I <sub>C</sub> = 10 mA; -V <sub>CE</sub> = 5 V	f <sub>T</sub>	>	100	MHz
Noise figure at R <sub>S</sub> = 2 kΩ -I <sub>C</sub> = 200 μA; -V <sub>CE</sub> = 5 V f = 1 kHz; B = 200 Hz	F	<	10	dB

### MECHANICAL DATA

Fig. 1 SOT-23.



## RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC 134)

		BC856	BC857	BC858
Collector-base voltage (open emitter)	$-V_{CBO}$	max. 80	50	30 V
Collector-emitter voltage (+ $V_{BE} = 1$ V)	$-V_{CEX}$	max. 80	50	30 V
Collector-emitter voltage (open base)	$-V_{CEO}$	max. 65	45	30 V
Emitter-base voltage (open collector)	$-V_{EBO}$	max. 5	5	5 V
Collector current (d.c.)	$-I_C$	max.	100	mA
Collector current (peak value)	$-I_{CM}$	max.	200	mA
Emitter current (peak value)	$I_{EM}$	max.	200	mA
Base current (peak value)	$-I_{BM}$	max.	200	mA
Total power dissipation * up to $T_{amb} = 25$ °C	$P_{tot}$	max.	250	mW
Storage temperature	$T_{stg}$		-65 to +150	°C
Junction temperature	$T_j$	max.	150	°C

## THERMAL CHARACTERISTICS

### Thermal resistance

From junction to ambient	$R_{thj-a}$	=	500	K/W
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## CHARACTERISTICS

$T_j = 25$  °C unless otherwise specified

Collector cut-off current

$I_E = 0; -V_{CB} = 30$ V; $T_j = 25$ °C	$-I_{CBO}$	typ.	1	nA
		<	15	nA
$T_j = 150$ °C	$-I_{CBO}$	<	4	$\mu$ A

### Base-emitter voltage <sup>▲</sup>

$-I_C = 2$ mA; $-V_{CE} = 5$ V	$-V_{BE}$	typ.	650	mV
			600 to 750	mV
$-I_C = 10$ mA; $-V_{CE} = 5$ V	$-V_{BE}$	<	820	mV

<sup>▲</sup>  $-V_{BE}$  decreases by about 2 mV/K with increasing temperature.

\* Mounted on an FR4 printed-circuit board 8 mm x 10 mm x 0.7 mm.

**Saturation voltages \*** $-I_C = 10 \text{ mA}; -I_B = 0,5 \text{ mA}$  $-V_{CEsat}$  typ. 75 mV  
< 300 mV $-V_{BEsat}$  typ. 700 mV $-I_C = 100 \text{ mA}; -I_B = 5 \text{ mA}$  $-V_{CEsat}$  typ. 250 mV  
< 650 mV $-V_{BEsat}$  typ. 850 mV**Knee voltage**Collector capacitance at  $f = 1 \text{ MHz}$  $I_E = I_e = 0; -V_{CB} = 10 \text{ V}$  $C_c$  typ. 4,5 pFTransition frequency at  $f = 100 \text{ MHz}$  $-I_C = 10 \text{ mA}; -V_{CE} = 5 \text{ V}$  $f_T$  > 100 MHzSmall-signal current gain at  $f = 1 \text{ kHz}$  $-I_C = 2 \text{ mA}; -V_{CE} = 5 \text{ V}$  $h_{fe}$  125 to 800Noise figure at  $R_S = 2 \text{ k}\Omega$  $-I_C = 200 \mu\text{A}; -V_{CE} = 5 \text{ V}$  $f = 1 \text{ kHz}; B = 200 \text{ Hz}$  $F$  typ. 2 dB  
< 10 dB

D.C. current gain

 $-I_C = 2 \text{ mA}; -V_{CE} = 5 \text{ V}$  BC856/857

BC858

 $h_{FE}$  125 to 800

BC856A/857A/858A

 $h_{FE}$  125 to 250

BC856B/857B/858B

 $h_{FE}$  220 to 475

BC857C/858C

 $h_{FE}$  420 to 800\*  $-V_{BEsat}$  decreases by about 1,7 mV/K with increasing temperature.