

SOT-23 Formed SMD Package

**BC856 BC857
BC858**

SILICON PLANAR EPITAXIAL TRANSISTORS

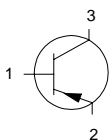
P-N-P transistors

Marking

BC856 = 3D
BC856A = 3A
BC856B = 3B
BC857 = 3H
BC857A = 3E
BC857B = 3F
BC857C = 3G
BC858 = 3M
BC858A = 3J
BC858B = 3K
BC858C = 3L

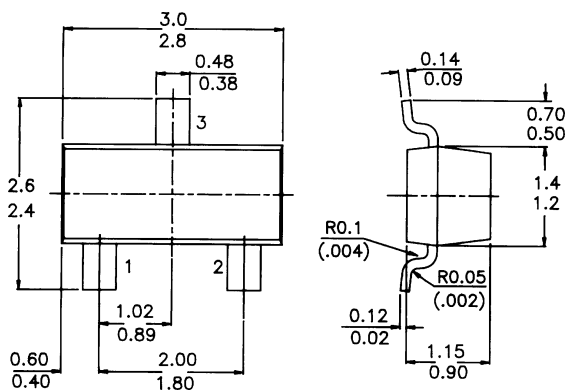
Pin configuration

1 = BASE
2 = EMITTER
3 = COLLECTOR



PACKAGE OUTLINE DETAILS

ALL DIMENSIONS IN mm



ABSOLUTE MAXIMUM RATINGS

Collector-emitter voltage ($+V_{BE} = 1\text{ V}$)

Collector-emitter voltage (open base)

Collector current (peak value)

Total power dissipation

up to $T_{amb} = 60\text{ }^{\circ}\text{C}$

Junction temperature

Small-signal current gain

$-I_C = 2\text{ mA}$; $-V_{CE} = 5\text{ V}$; $f = 1\text{ kHz}$

Transition frequency at $f = 100\text{ MHz}$

$-I_C = 10\text{ mA}$; $-V_{CE} = 5\text{ V}$

Noise figure at $R_S = 2\text{ kW}$

$-I_C = 200\text{ mA}$; $-V_{CE} = 5\text{ V}$

$f = 1\text{ kHz}$; $B = 200\text{ Hz}$

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$-V_{CEX}\text{ max.}$	80	50	30 V
$-V_{CE0}\text{ max.}$	65	45	30 V
$-I_{CM}\text{ max.}$		200	mA
$P_{tot}\text{ max.}$		250	mW
$T_j\text{ max.}$		150	$^{\circ}\text{C}$
h_{fe}		75 to 900	
f_T	>	100	MHz
F	<	10	dB

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

Limiting values

			BC856	BC857	BC858
Collector-base voltage (open emitter)	$-V_{CBO}$	max.	80	50	30 V
Collector-emitter voltage ($+V_{BE} = 1\text{ V}$)	$-V_{CEX}$	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 $T_{amb}: 60^\circ\text{C}$	P_{tot}	max.		250	mW
Storage temperature	T_{stg}			-55 to +150	$^\circ\text{C}$
Junction temperature	T_j	max.		150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

$$T_j = P_X (R_{th\ j-t} + R_{th\ t-s} + R_{th\ s-a}) + T_{amb}$$

Thermal resistance

From junction to tab	$R_{th\ j-t}$	=	60	KW
From tab to soldering points	$R_{th\ t-s}$	=	280	KW
From soldering points to ambient	$R_{th\ s-a}$	=	90	KW

CHARACTERISTICS

$T_j = 25^\circ\text{C}$ unless otherwise specified

Collector cut-off current

$I_E = 0; -V_{CB} = 30\text{V}; T_j = 25^\circ\text{C}$	$-I_{CBO}$	typ.	1	nA
		<	15	nA
$T_j = 150^\circ\text{C}$	$-I_{CBO}$	<	4	mA

Base-emitter voltage

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

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

$-I_C = 10\text{ mA}; -I_B = \text{value for which}$				
$-I_C = 11\text{ mA at } -V_{CE} = 1\text{ V}$	$-V_{CEK}$	typ.	250	mV
		<	600	mV

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Collector capacitance at $f = 1$ MHz

$I_E = I_C = 0; -V_{CB} = 10$ V

C_c typ. 4,5 pF

Transition frequency at $f = 100$ MHz

$-I_C = 10$ mA; $-V_{CE} = 5$ V

f_T > 100 MHz

Small-signal current gain at $f = 1$ kHz

$-I_C = 2$ mA; $-V_{CE} = 5$ V

h_{fe} 125 to 800

Noise figure at $R_S = 2$ k Ω

$-I_C = 200$ mA; $-V_{CE} = 5$ V

$f = 1$ kHz; $B = 200$ Hz

F typ. 2 dB
< 10 dB

D.C. current gain

$-I_C = 2$ mA; $-V_{CE} = 5$ V BC856

h_{FE} 220 to 475

BC858/857

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

Disclaimer

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