

**SOT-23 Formed SMD Package**

**BC856 BC857  
BC858**

**SILICON PLANAR EPITAXIAL TRANSISTORS**

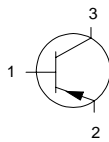
*P-N-P transistors*

**Marking**

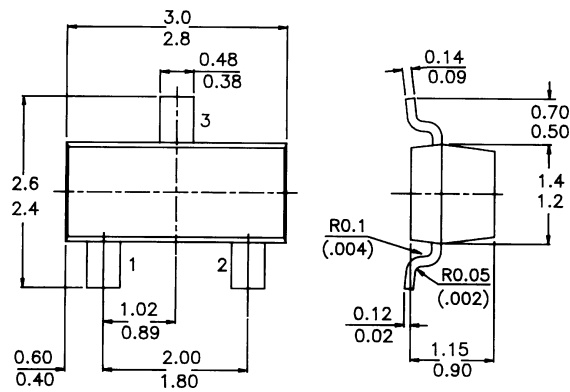
- BC856 = 3D
- BC856A = 3A
- BC856B = 3B
- BC857 = 3H
- BC857A = 3E
- BC857B = 3F
- BC857C = 3G
- BC858 = 3M
- BC858A = 3J
- BC858B = 3K
- BC858C = 3L

**Pin configuration**

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



**PACKAGE OUTLINE DETAILS  
ALL DIMENSIONS IN mm**



**ABSOLUTE MAXIMUM RATINGS**

	<b>BC856</b>	<b>BC857</b>	<b>BC858</b>
Collector-emitter voltage ( $+V_{BE} = 1\text{ V}$ )	$-V_{CEX}$ max. 80	50	30 V
Collector-emitter voltage (open base)	$-V_{CE0}$ max. 65	45	30 V
Collector current (peak value)	$-I_{CM}$ max.	200	mA
Total power dissipation up to $T_{amb} = 60\text{ }^{\circ}\text{C}$	$P_{tot}$ max.	250	mW
Junction temperature	$T_j$ max.	150	$^{\circ}\text{C}$
Small-signal current gain $-I_C = 2\text{ mA}; -V_{CE} = 5\text{ V}; f = 1\text{ kHz}$	$h_{fe}$	75 to 900	
Transition frequency at $f = 100\text{ MHz}$ $-I_C = 10\text{ mA}; -V_{CE} = 5\text{ V}$	$f_T$	> 100	MHz
Noise figure at $R_S = 2\text{ kW}$ $-I_C = 200\text{ mA}; -V_{CE} = 5\text{ V}$ $f = 1\text{ kHz}; B = 200\text{ Hz}$	$F$	< 10	dB

**BC856 BC857  
BC858**

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

Limiting values

		<b>BC856 BC857 BC858</b>		
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

**BC856 BC857  
BC858**

Collector capacitance at $f = 1$ MHz $I_E = I_e = 0$ ; $-V_{CB} = 10$ 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 $R_S = 2$ kW $-I_C = 200$ 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	$h_{FE}$		220 to 475
BC856	$h_{FE}$		125 to 800
BC858/857	$h_{FE}$		125 to 250
BC856A/857A/858A	$h_{FE}$		220 to 475
BC856B/857B/858B	$h_{FE}$		420 to 800
BC857C/858C	$h_{FE}$		

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