

SOT-23 Formed SMD Package

**BC859
BC860**

SILICON PLANAR EPITAXIAL TRANSISTORS

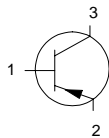
P-N-P transistors

Marking

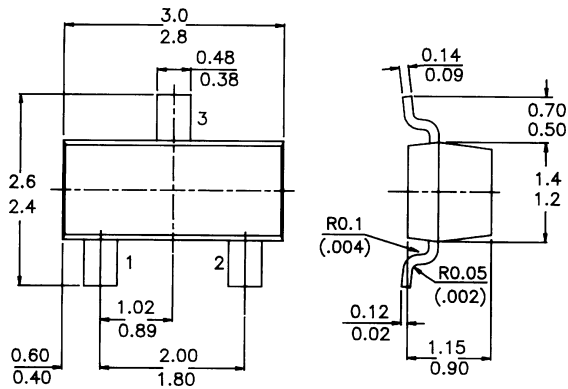
- BC859 = 4D
- BC859A = 4A
- BC859B = 4B
- BC859C = 4C
- BC860 = 4H
- BC860A = 4E
- BC860B = 4F
- BC860C = 4G

Pin configuration

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



**PACKAGE OUTLINE DETAILS
ALL DIMENSIONS IN mm**



ABSOLUTE MAXIMUM RATINGS

	BC859	BC860	
Collector-emitter voltage (+V _{BE} = 1 V)	-V _{CEX} max.	30	50 V
Collector-emitter voltage (open base)	-V _{CEO} max.	30	45 V
Collector current (peak value)	-I _{CM} max.	200	200 mA
Total power dissipation up to T _{amb} = 60 °C	P _{tot} max.	250	250 mW
Junction temperature	T _j max.	150	150 °C
Small-signal current gain		> 125	125
-I _C = 2 mA; -V _{CE} = 5 V; f = 1 kHz	h _{fe}	< 900	900
Transition frequency			
-I _C : 10 mA; -V _{CE} = 5 V; f = 100 MHz	f _T	> 100	100 MHz
Noise figure at R _S = 2 kΩ			
-I _C = 200 μA; -V _{CE} = 5 V			
f = 30 Hz to 15 kHz	F	typ. 1,2	1 dB
		< 4	3 dB
f = 1 KHz; B = 200 Hz	F	< 4	4 dB

BC859
BC860

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

Limiting values		BC859	BC860
Collector-base voltage (open emitter)	$-V_{CB0}$ max.	30	50 V
Collector-emitter voltage ($+V_{BE} = 1$ V)	$-V_{CEX}$ max.	30	50 V
Collector-emitter voltage (open base)	$-V_{CE0}$ max.	30	45 V
Emitter-base voltage (open collector)	$-V_{EB0}$ max.	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

$-I_C = 2$ 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
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Saturation voltages

$-I_C = 10$ mA; $-I_B = 0,5$ mA	$-V_{CEsat}$ typ.	75	mV
	<	300	mV
	$-V_{BEsat}$ typ.	700	mV

$-I_C = 100$ mA; $-I_B = 5$ mA	$-V_{CEsat}$ typ.	250	mV
	<	650	mV
	$-V_{BEsat}$ typ.	850	mV

Collector capacitance at $f = 1$ MHz

$I_E = I_e = 0; -V_{CB} = 10$ V	C_c typ.	4,5	pF
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**BC859
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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

$-I_C = 200$ μ A; $-V_{CE} = 5$ V

$f = 30$ Hz to 15 kHz

		BC859	BC860
F	typ.	1,2	1 dB
	<	4	3 dB

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

F	typ.	1	1 dB
	<	4	4 dB

Equivalent noise voltage at $R_S = 2$ k Ω

$-I_C = 200$ μ A; $-V_{CE} = 5$ V

$f = 10$ Hz to 50 Hz; $T_{amb} = 25^\circ$ C

$V_n < - 0,11$ mV

D.C. current gain

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

$h_{FE} 125$ to 800

A selections

$h_{FE} 125$ to 250

B selections

$h_{FE} 220$ to 475

C selections

$h_{FE} 420$ to 800

Disclaimer

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