

SOT-23 Formed SMD Package

**BC859
BC860**

SILICON PLANAR EPITAXIAL TRANSISTORS

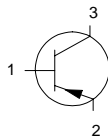
P-N-P transistors

Marking

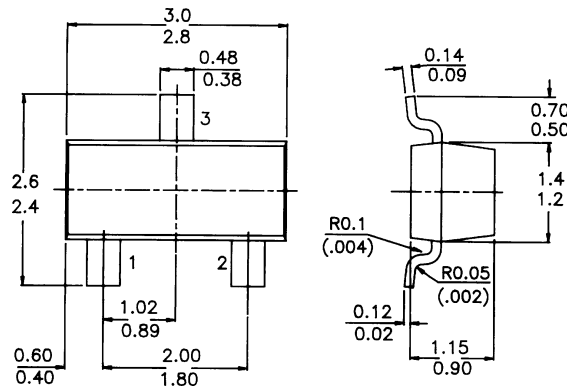
- BC859 = 4D
- BC859A = 4A
- BC859B = 4B
- BC859C = 4C
- BC860 = 4H
- BC860A = 4E
- BC860B = 4F
- BC860C = 4G

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
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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

The product information and the selection guides facilitate selection of the CDIL's Discrete Semiconductor Device(s) best suited for application in your product(s) as per your requirement. It is recommended that you completely review our Data Sheet(s) so as to confirm that the Device(s) meet functionality parameters for your application. The information furnished on the CDIL Web Site/ CD is believed to be accurate and reliable. CDIL however, does not assume responsibility for inaccuracies or incomplete information. Furthermore, CDIL does not assume liability whatsoever, arising out of the application or use of any CDIL product; neither does it convey any license under its patent rights nor rights of others. These products are not designed for use in life saving/support appliances or systems. CDIL customers selling these products (either as individual Discrete Semiconductor Devices or incorporated in their end products), in any life saving/support appliances or systems or applications do so at their own risk and CDIL will not be responsible for any damages resulting from such sale(s).

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