SOT-23 Formed SMD Package

BC859
BC860

SILICON PLANAR EPITAXIAL TRANSISTORS

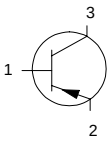
P–N–P transistors

Marking

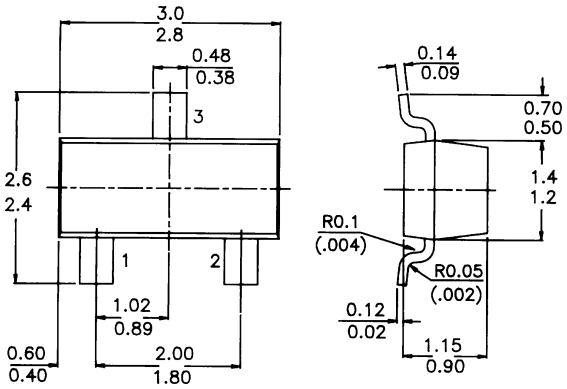
BC859 = 4D
BC859A = 4A
BC859B = 4B
BC859C = 4C
BC860 = 4H
BC860A = 4E
BC860B = 4F
BC860C = 4G

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)	$-V_{CE0}$	*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*

RATINGS *(at T_A = 25°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 °C***	P_{tot}	*max.*	*250*		mW
Storage temperature	T_{stg}		*–55 to +150*		*° C*
Junction temperature	T_j	*max.*	*150*		*° 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 °C unless otherwise specified

Collector cut–off current				
I_E = 0; $-V_{CB}$ = 30V; T_j = 25°C	$-I_{CBO}$	*typ.*	*1*	*nA*
		<	*15*	*nA*
T_j = 150 °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*
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*

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 kΩ					
			BC859	***BC860***	
$-I_C$ = 200 µA; $-V_{CE}$ = 5 V	F	typ.	1,2	1	dB
f = 30 Hz to 15 kHz		<	4	3	dB
f = 1 kHz; B = 200 Hz	F	typ.	1	1	dB
		<	4	4	dB
Equivalent noise voltage at R_S = 2 kΩ					
$-I_C$ = 200 µA; $-V_{CE}$ = 5 V					
f = 10Hz to 50Hz; T_{amb} = 25°C	V_n	<	–	0,11	mV
D.C. current gain					
$-I_C$ = 2mA; $-V_{CE}$ = 5V; 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		

CDIL is a registered Trademark of
Continental Device India Limited
C-120 Naraina Industrial Area, New Delhi 110 028, India.
Telephone + 91-11-2579 6150, 5141 1112 Fax + 91-11-2579 5290, 5141 1119
email@cdil.com www.cdilsemi.com