BC 140
BC 141

SILICON PLANAR NPN

GENERAL PURPOSE TRANSISTORS

The BC 140 and BC 141 are silicon planar epitaxial NPN transistors in TO-39 metal case. They are particularly designed for audio amplifiers and switching applications up to 1 A.

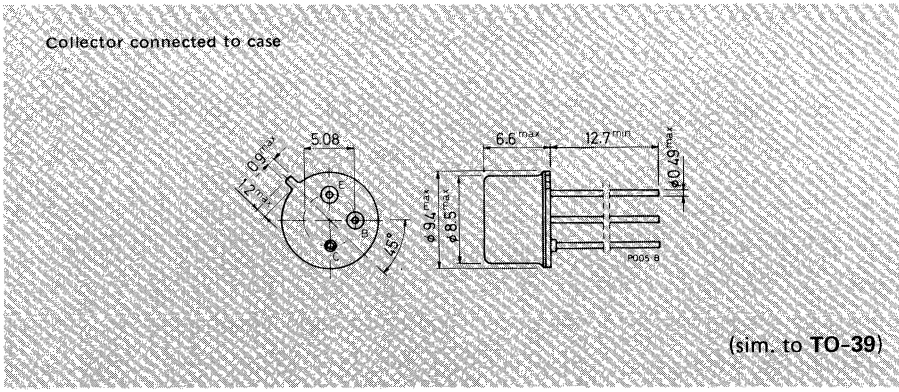
The complementary PNP types are the BC 160 and BC 161.

ABSOLUTE MAXIMUM RATINGS

		BC 140	BC 141
V_{CBO}	Collector-base voltage ($I_E = 0$)	60 V	80 V
V_{CEO}	Collector-emitter voltage ($I_B = 0$)	40 V	60 V
V_{EBO}	Emitter-base voltage ($I_C = 0$)	7 V	
I_C	Collector current	1 A	
I_B	Base current	0.1 A	
P_{tot}	Total power dissipation at $T_{amb} \leq 25$ °C	0.8 W	
	at $T_{case} \leq 25$ °C	4 W	
T_{stg}	Storage temperature	-55 to 200 °C	
T_j	Junction temperature	200 °C	

MECHANICAL DATA

Dimensions in mm



THERMAL DATA

$R_{th\ j\text{-}case}$	Thermal resistence junction-case	max	44	°C/W
$R_{th\ j\text{-}amb}$	Thermal resistance junction-ambient	max	220	°C/W

ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C unless otherwise specified)

Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CBO} Collector cutoff current (I_E = 0)	V_{CB} = 50 V			200	nA
	V_{CB} = 50 V T_{amb} = 150°C			200	μA
$V_{(BR)\ CBO}$ Collector-base breakdown voltage (I_E = 0)	I_C = 100 μA for **BC 140**	60			V
	I_C = 100 μA for **BC 141**	80			V
$V_{(BR)CEO}$* Collector-emitter breakdown voltage (I_B = 0)	I_C = 10 mA for **BC 140**	40			V
	I_C = 10 mA for **BC 141**	60			V
$V_{(BR)\ EBO}$ Emitter-base breakdown voltage (I_C = 0)	I_E = 100 μA	7			V
$V_{CE\ (sat)}$* Collector-emitter saturation voltage	I_C = 100 mA I_B = 10 mA		0.1		V
	I_C = 500 mA I_B = 50 mA		0.35		V
	I_C = 1 A I_B = 0.1 A		0.6	1	V
V_{BE}* Base-emitter voltage	I_C = 1 A V_{CE} = 1 V		1.25	1.6	V

ELECTRICAL CHARACTERISTICS (continued)

Parameter		Test conditions	Min.	Typ.	Max.	Unit
h_{FE}*	DC current gain	I_C = 100 μA V_{CE} = 1 V				
		for **BC 140-141**		75		—
		for **BC 140-141** Gr. 6		28		—
		for **BC 140-141** Gr. 10		40		—
		I_C = 100 mA V_{CE} = 1 V				
		for **BC 140-141**	40	140	250	—
		for **BC 140-141** Gr. 6	40	63	100	—
		for **BC 140-141** Gr. 10	63	100	160	—
		I_C = 1 A V_{CE} = 1 V				
		for **BC 140-141**		26		—
		for **BC 140-141** Gr. 6		15		—
		for **BC 140-141** Gr. 10		20		—
h_{FE_1}/h_{FE_2}	Matched pair ratio	I_C = 100 mA V_{CE} = 1 V			1.25	—
f_T	Transition frequency	I_C = 50 mA V_{CE} = 10 V	50			MHz
C_{CBO}	Collector-base capacitance	I_E = 0 V_{CB} = 20 V f = 1 MHz		12		pF
t_{on}	Turn-on time	I_C = 100 mA I_{B1} = 5 mA			250	ns
t_{off}	Turn-off time	I_C = 100 mA I_{B1} = I_{B2} = 5 mA			850	ns

* Pulsed: pulse duration = 300 μs, duty cycle = 1%