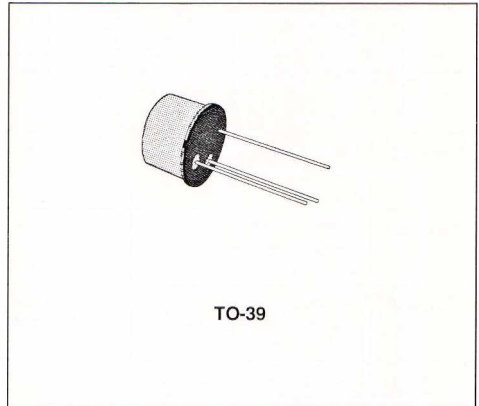


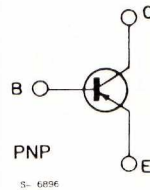
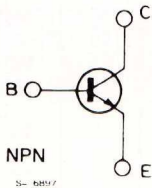
## GENERAL PURPOSE TRANSISTORS

### DESCRIPTION

The BC140 and BC141 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 BC160 and BC161.



### INTERNAL SCHEMATIC DIAGRAM



### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value		Unit
		BC140	BC141	
$V_{CBO}$	Collector-base Voltage ( $I_E = 0$ )	80	100	V
$V_{CEO}$	Collector-emitter Voltage ( $I_B = 0$ )	40	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 $T_{amb} \leq 45^\circ\text{C}$ at $T_{case} \leq 45^\circ\text{C}$	0.65		W
		3.7		W
$T_{stg}$	Storage Temperature	- 55 to 175		$^\circ\text{C}$
$T_j$	Junction Temperature	175		$^\circ\text{C}$

**THERMAL DATA**

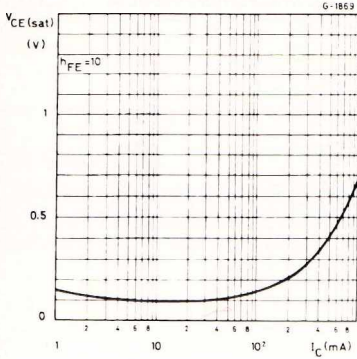
$R_{th\ j-case}$	Thermal Resistance Junction-case	Max	35	°C/W
$R_{th\ j-amb}$	Thermal Resistance Junction-ambient	Max	200	°C/W

**ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ °C}$  unless otherwise specified)

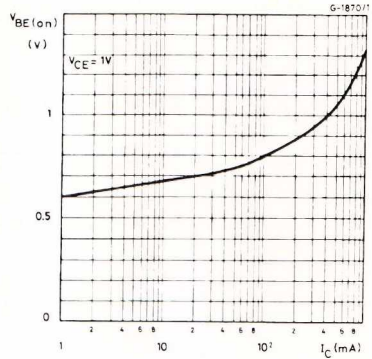
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CES}$	Collector Cutoff Current ( $I_E = 0$ )	$V_{CES} = 60\text{ V}$ $V_{CES} = 60\text{ V}$ $T_{amb} = 150\text{ °C}$			100 100	nA μA
$V_{(BR)CBO}$	Collector-base Breakdown Voltage ( $I_E = 0$ )	$I_C = 100\text{ μA}$ for <b>BC140</b> for <b>BC141</b>	80 100			V V
$V_{(BR)CEO}^*$	Collector-emitter Breakdown Voltage ( $I_B = 0$ )	$I_C = 30\text{ mA}$ for <b>BC140</b> for <b>BC141</b>	40 60			V V
$V_{(BR)EBO}$	Emitter-base Breakdown Voltage ( $I_C = 0$ )	$I_E = 100\text{ μA}$	7			V
$V_{CE(sat)}^*$	Collector-emitter Saturation Voltage	$I_C = 100\text{ mA}$ $I_B = 10\text{ mA}$ $I_C = 500\text{ mA}$ $I_B = 50\text{ mA}$ $I_C = 1\text{ A}$ $I_B = 0.1\text{ A}$		0.1 0.35 0.6	1	V V V
$V_{BE}^*$	Base-emitter Voltage	$I_C = 1\text{ A}$ $V_{CE} = 1\text{ V}$		1.25	1.8	V
$h_{FE}^*$	DC Current Gain	$I_C = 100\text{ μA}$ $V_{CE} = 1\text{ V}$ for <b>BC140-141</b> for <b>BC140-141</b> Gr. 6 for <b>BC140-141</b> Gr. 10 for <b>BC140-141</b> Gr. 16 $I_C = 100\text{ mA}$ $V_{CE} = 1\text{ V}$ for <b>BC140-141</b> for <b>BC140-141</b> Gr. 6 for <b>BC140-141</b> Gr.10 for <b>BC140-141</b> Gr.16 $I_C = 1\text{ A}$ $V_{CE} = 1\text{ V}$ for <b>BC140-141</b> for <b>BC140-141</b> Gr. 6 for <b>BC140-141</b> Gr.10 for <b>BC140-141</b> Gr.16		75 28 40 90 40 40 63 100 100 26 15 20 30	250 100 160 250	
$f_T$	Transition Frequency	$I_C = 50\text{ mA}$ $V_{CE} = 10\text{ V}$	50			MHz
$C_{CBO}$	Collector-base Capacitance	$I_E = 0$ $V_{CB} = 10\text{ V}$ $f = 1\text{ MHz}$		12	25	pF
$t_{on}$	Turn-on Time	$I_C = 100\text{ mA}$ $I_{B1} = 5\text{ mA}$			250	ns
$t_{off}$	Turn-off Time	$I_C = 100\text{ mA}$ $I_{B1} = I_{B2} = 5\text{ mA}$			850	ns

\* Pused : pulse duration = 300 μs, duty cycle = 1 %.

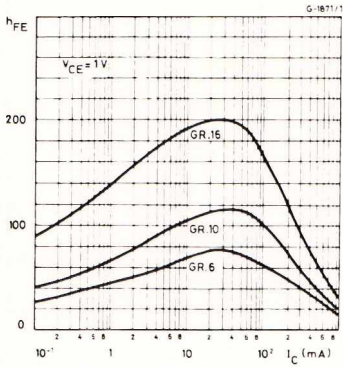
Collector-emitter Saturation Voltage.



Base-emitter Voltage.



DC Current Gain.



Transition Frequency.

