BC 347
BC 348
BC 349

NPN SILICON ANNULAR TRANSISTORS

. . . designed for general-purpose use in audio, radio, and television applications.

- High Breakdown Voltage—
  BV_{CEO} = 20, 30, 45 Vdc (Min) @ I_C = 1.0 mAdc
- Low Collector-Emitter Saturation Voltage—
  $V_{CE(sat)}$ = 0.25 Vdc (Max) @ I_C = 10 mAdc
- Low Qutput Capacitance—
  C_{ob} = 4.0 pF (Max) @ V_{CB} = 10 Vdc
- Complementary to PNP BC 350, BC 351, BC 352
- One-Piece, Injection-Molded Unibloc† Package

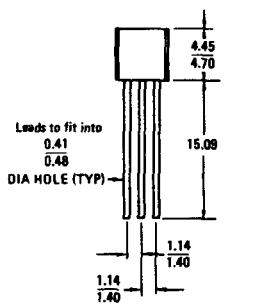
NPN SILICON AMPLIFIER TRANSISTORS

MAXIMUM RATINGS

Rating	Symbol	Type	Value	Unit
Collector-Emitter Voltage	V_{CEO}	BC 347 BC 348 BC 349	45 30 20	Vdc
Emitter-Base Voltage	V_{EB}		5.0	Vdc
Collector Current - Continuous	I_C		100	mAdc
Total Device Dissipation @T_A = 25°C Derate above 25°C	P_D		300 2.73	mW mW/°C
Operating and Storage Junction Temperature range	T_J, T_{stg}		—55 to +135	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol		Max	Unit
Thermal Resistance, Junction to Ambient	θ_{JA}		0.367	°C/mW



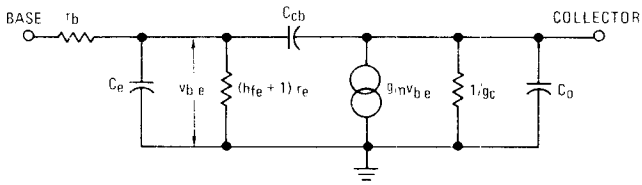
CASE 29(1)
(TO-92)

All dimensions in Millimeters

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic	Symbol	Type	Min.	Max.	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage (I_C = 1.0 mAdc, I_B = 0)	BV_{CEO}	BC347 BC348 BC349	45 30 20	—	Vdc
Collector-Base Breakdown Voltage (I_C = 100 μAdc, I_E = 0)	BV_{CBO}	BC347 BC348 BC349	50 40 30	—	Vdc
Emitter-Base Breakdown Voltage (I_E = 100 μAdc, I_C = 0)	BV_{EBO}		5	—	Vdc
Collector Cutoff Current (V_{CB} = 20 Vdc, I_E = 0)	I_{CBO}		—	100	nAdc
ON CHARACTERISTICS					
DC Current Gain (I_C = 2.0 mAdc, V_{CE} = 5 Vdc)	h_{FE}		40	450	
Collector-Emitter Saturation Voltage (I_C = 10 mAdc, I_B = 1.0 mAdc)	$V_{CE(sat)}$		—	0.25	Vdc
DYNAMIC CHARACTERISTICS					
Current-Gain–Bandwidth Product (I_C = 5.0 mAdc, V_{CE} = 10 Vdc, f = 100MHz)	f_T		125		MHz
Output Capacitance (V_{CB} = 10 Vdc, I_E = 0, f = 100 kHz)	C_{ob}			4.0	pF

FIGURE 1 – SIMPLIFIED AC EQUIVALENT CIRCUIT (Common Emitter)



Note:

Data is presented in terms of the equivalent circuit shown in Figure 1. Values for its components may be found or calculated as follows:

r_b' – See Figure 8
$r_e = 26\ mV/I_E$
$C_e = \dfrac{1}{2\pi f_t r_e}$
$C_{cb} = C_{ob} - 0.2$ pF (See Figure 6)
$g_m = 1/r_e$
$g_c = (h_{fe}+1)\,h_{ob}$ (See Figures 2 & 7)
$C_o = 0.2$ pF

Low frequency h parameters may be found from:

$h_{ie} = r_b' + (h_{fe}+1)\,r_e$
h_{fe} = See Figure 2
h_{re} = Negligible
$h_{oe} = (h_{fe}+1)\,h_{ob}$

FIGURE 2 – SMALL SIGNAL CURRENT GAIN

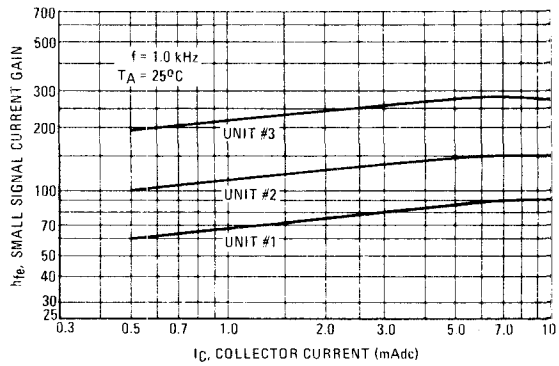


FIGURE 3 – NORMALIZED DC CURRENT GAIN

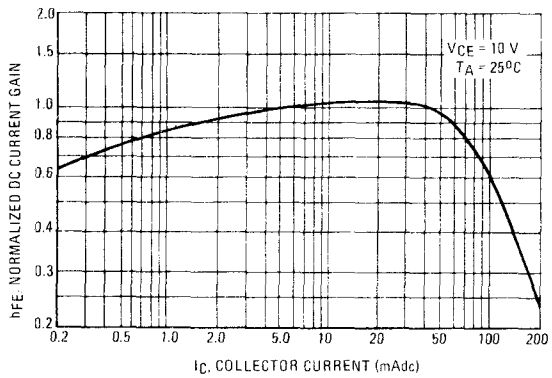


FIGURE 4 – "SATURATION" AND "ON" VOLTAGES

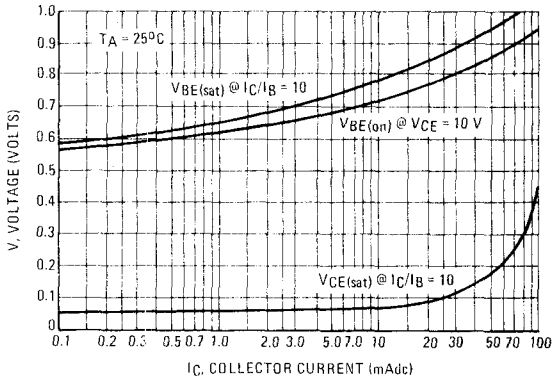


FIGURE 5 – CURRENT-GAIN–BANDWIDTH PRODUCT

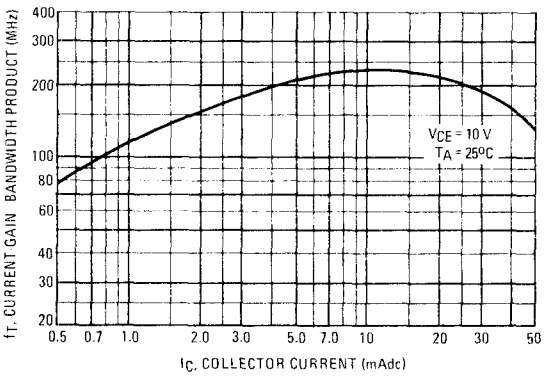


FIGURE 6 – CAPACITANCES

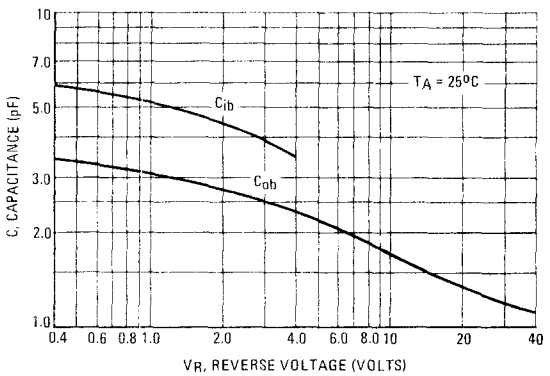


FIGURE 7 – OUTPUT ADMITTANCE

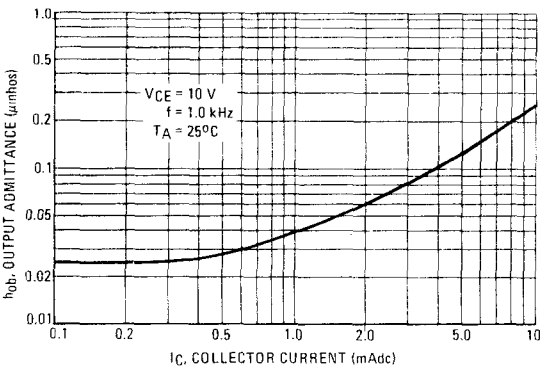
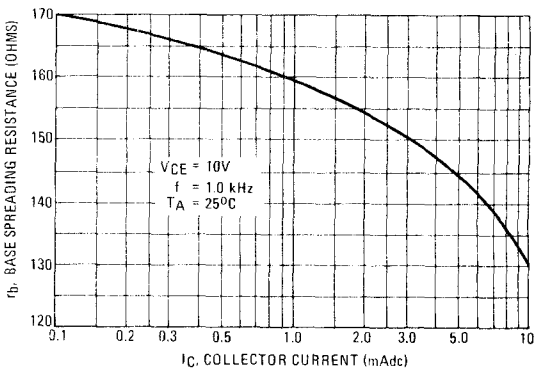


FIGURE 8 – BASE SPREADING RESISTANCE



BC 347, BC 348, BC 349
can be supplied in 4 different h_{FE} ranges as follows

Characteristic	Symbol	Type	Min	Max	Unit
DC Current Gain (I_C = 2 mA, V_{CE} = 5 V)	h_{FE}	BC347 BC348 BC349	40	450	—
		BC347L BC348L BC349L	40	120	—
		BC347A BC348A BC349A	110	220	—
		BC347B BC348B BC349B	200	450	—