

## SILICON PLANAR EPITAXIAL TRANSISTORS

P-N-P transistors in plastic TO-92 variant envelopes, primarily intended for use in driver and output stages of audio amplifiers.

The BC327, BC327A, BC328 are complementary to the BC337, BC337A and BC338 respectively.

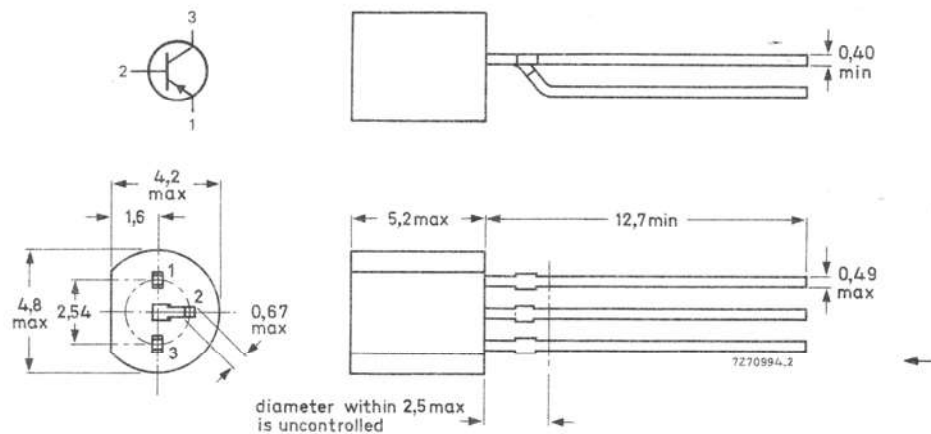
### QUICK REFERENCE DATA

		BC327	BC327A	BC328	
Collector-emitter voltage ( $V_{BE} = 0$ )	$-V_{CES}$ max.	50	60	30	V
Collector-emitter voltage (open base)	$-V_{CEO}$ max.	45	60	25	V
Collector current (peak value)	$-I_{CM}$ max.	1000			mA
Total power dissipation up to $T_{amb} = 25\text{ }^{\circ}\text{C}$	$P_{tot}$ max.	800			mW
Junction temperature	$T_j$ max.	150			$^{\circ}\text{C}$
Transition frequency at $f = 35\text{ MHz}$ $-I_C = 10\text{ mA}; -V_{CE} = 5\text{ V}$	$f_T$ typ.	100			MHz

### MECHANICAL DATA

Dimensions in mm

Fig. 1 TO-92 variant.



BC327  
BC327A  
BC328

**RATINGS**

Limiting values in accordance with the Absolute Maximum System (IEC 134)

		BC327	BC327A	BC328	
Collector-emitter voltage ( $V_{BE} = 0$ )	$-V_{CES}$ max.	50	60	30	V
Collector-emitter voltage (open base) $-I_C = 10$ mA	$-V_{CEO}$ max.	45	60	25	V
Emitter-base voltage (open collector)	$-V_{EBO}$ max.	5	5	5	V
Collector current (d.c.)	$-I_C$ max.	500			mA
Collector current (peak value)	$-I_{CM}$ max.	1000			mA
Emitter current (peak value)	$I_{EM}$ max.	1000			mA
Base current (d.c.)	$-I_B$ max.	100			mA
Base current (peak value)	$-I_{BM}$ max.	200			mA
Total power dissipation at $T_{amb} = 25$ °C up to $T_{amb} = 25$ °C	$P_{tot}$ max.	625			mW
	$P_{tot}$ max.	800			mW*
Storage temperature	$T_{stg}$	-65 to +150			°C
Junction temperature	$T_j$ max.	150			°C

**THERMAL RESISTANCE**

From junction to ambient in free air	$R_{th\ j-a}$ =	0,2	K/mW
From junction to ambient	$R_{th\ j-a}$ =	0,156	K/mW*

\* Transistor mounted on printed circuit board, max. lead length 4 mm, mounting pad for collector lead min. 10 mm x 10 mm.

**CHARACTERISTICS**

$T_j = 25\text{ }^\circ\text{C}$  unless otherwise specified

Collector cut-off current

$I_E = 0; -V_{CB} = 20\text{ V}; T_j = 25\text{ }^\circ\text{C}$

$I_E = 0; -V_{CB} = 20\text{ V}; T_j = 150\text{ }^\circ\text{C}$

$-I_{CBO} < 100\text{ nA}$

$-I_{CBO} < 5\text{ }\mu\text{A}$

Emitter cut-off current

$I_C = 0; -V_{EB} = 5\text{ V}$

$-I_{EBO} < 10\text{ }\mu\text{A}$

Base emitter voltage\*

$-I_C = 500\text{ mA}; -V_{CE} = 1\text{ V}$

$-V_{BE} < 1,2\text{ V}$

Saturation voltage

$-I_C = 500\text{ mA}; -I_B = 50\text{ mA}$

$-V_{CEsat} < 700\text{ mV} \leftarrow$

D.C. current gain

$-I_C = 500\text{ mA}; -V_{CE} = 1\text{ V}$

$h_{FE} > 40$

$-I_C = 100\text{ mA}; -V_{CE} = 1\text{ V};$  BC327; BC328

$h_{FE}$  100 to 600

BC327A

$h_{FE}$  100 to 400

BC327-16 |

$h_{FE}$  100 to 250

BC328-16 |

$h_{FE}$  160 to 400

BC327-25 |

$h_{FE}$  160 to 400

BC328-25 |

$h_{FE}$  250 to 600

BC327-40 |

$h_{FE}$  250 to 600

BC328-40 |

Transition frequency at  $f = 35\text{ MHz}$

$-I_C = 10\text{ mA}; -V_{CE} = 5\text{ V}$

$f_T$  typ. 100 MHz

Collector capacitance at  $f = 1\text{ MHz}$

$I_E = I_e = 0; -V_{CB} = 10\text{ V}$

$C_c$  typ. 8 pF

D.C. current gain ratio of matched pairs

BC327/BC337; BC328/BC338

$|I_C| = 100\text{ mA}; |V_{CE}| = 1\text{ V}$

$h_{FE1}/h_{FE2}$  typ. 1,25  
< 1,40

\*  $-V_{BE}$  decreases by about  $2\text{ mV}/^\circ\text{C}$  with increasing temperature.

BC327  
BC327A  
BC328

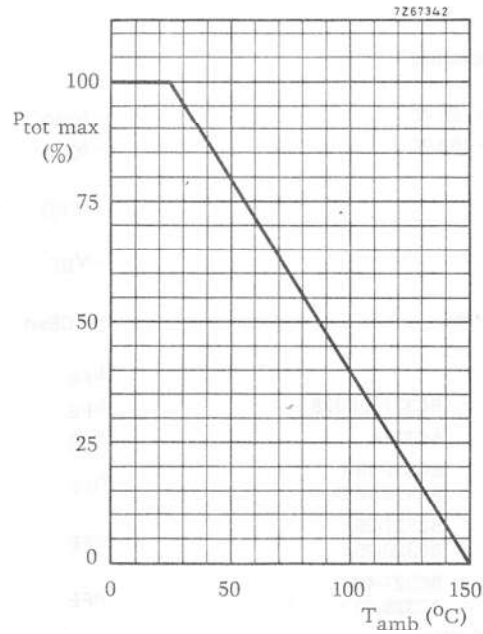


Fig. 2.

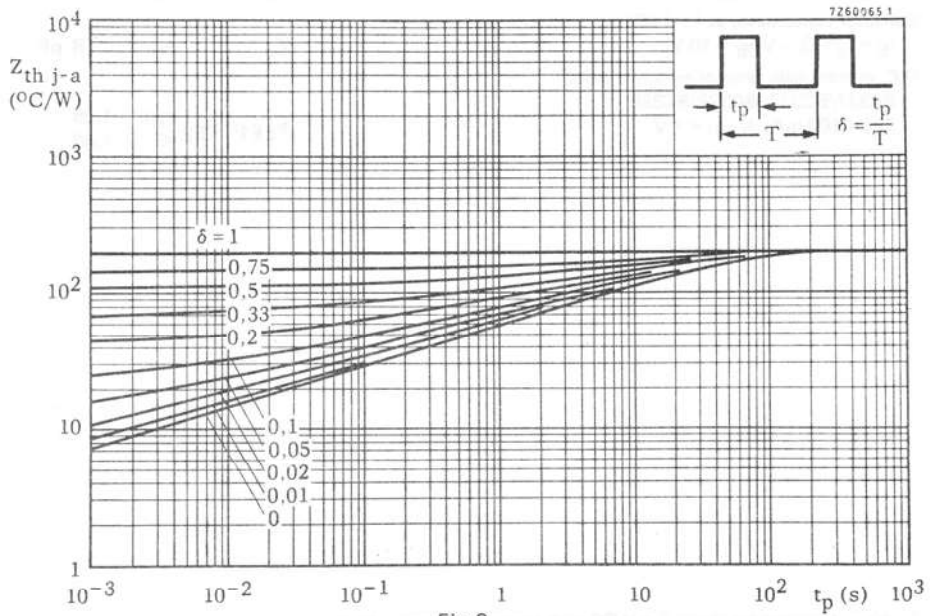


Fig. 3.

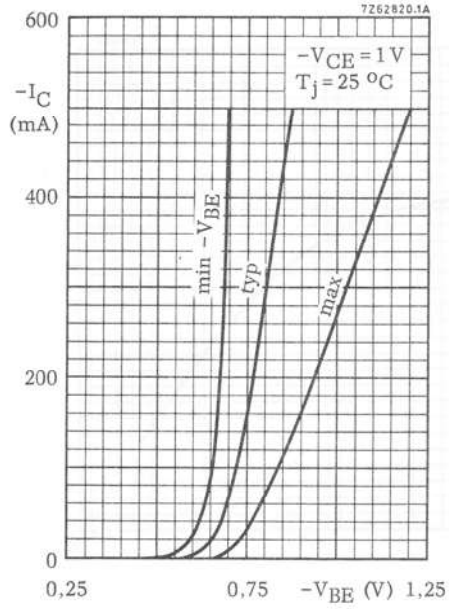


Fig. 4.

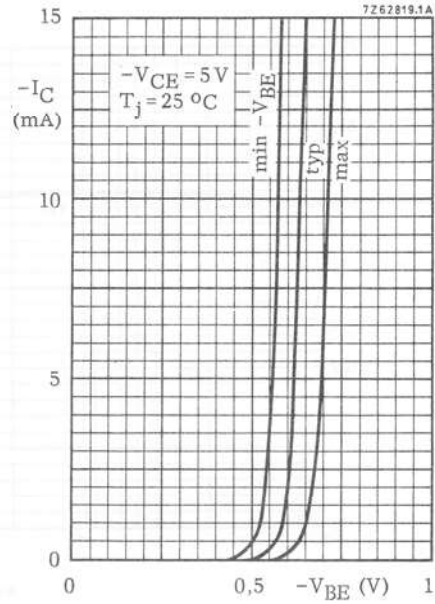


Fig. 5.

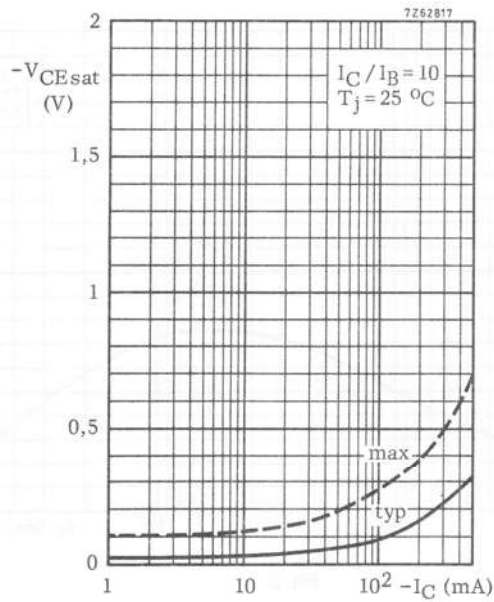


Fig. 6.

BC327  
BC327A  
BC328

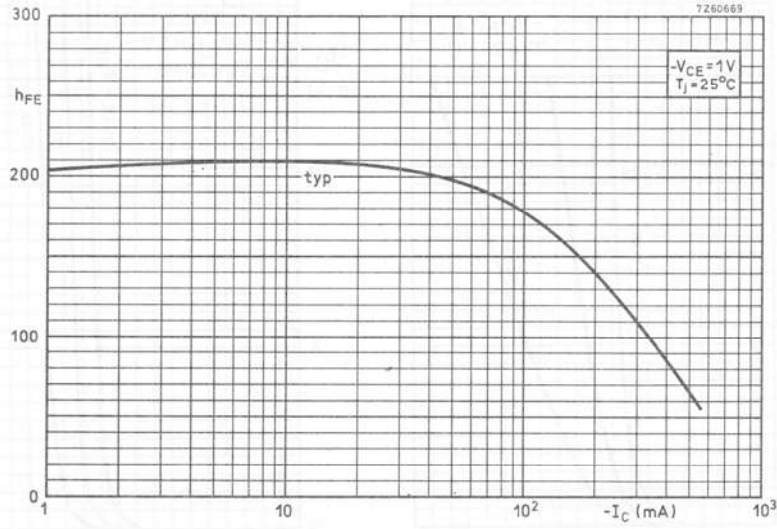


Fig. 7.

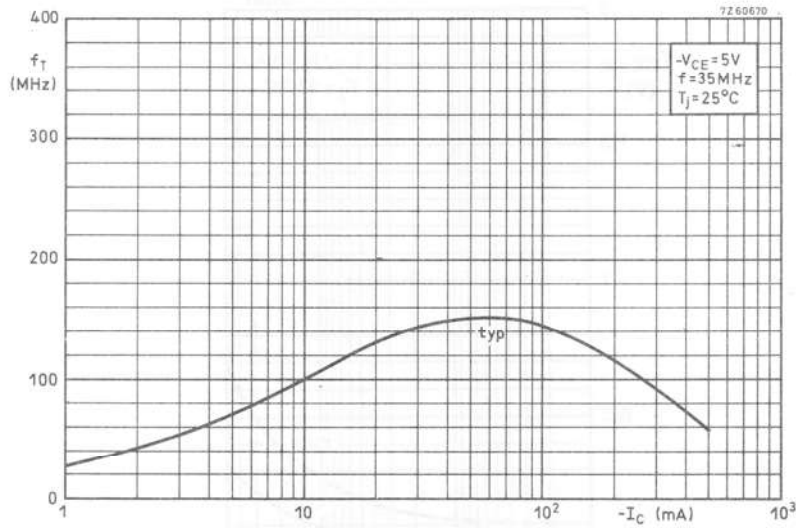


Fig. 8.

## APPLICATION INFORMATION

2,8 W transformerless audio-frequency amplifier with matched pair BC328/BC338 in complementary class-B output stage up to  $T_{amb} = 45\text{ }^{\circ}\text{C}$ .

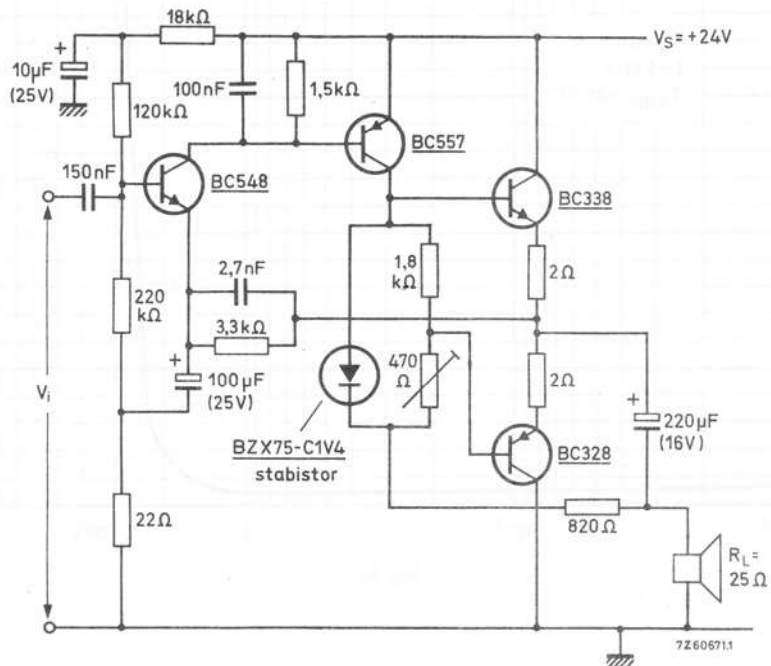


Fig. 9.

Performance at  $V_S = 24\text{ V}$ ;  $R_L = 25\ \Omega$

Collector quiescent current of BC338

$I_{CQ}$  typ. 1 mA

Input voltage for  $P_L = 50\text{ mW}$

$V_i$  typ. 8 mV

Input voltage for  $P_L = 2,8\text{ W}$

$V_i$  typ. 67 mV

Output power at  $f = 1\text{ kHz}$ ;  $d_{tot} = 10\%$

$P_L$  typ. 2,8 W

Frequency response (3 dB)

70 to 16 000 Hz

This amplifier needs no external cooling fin, provided each output transistor is mounted with its leads not longer than 3 mm. The collector lead must, in addition, be soldered to a copper area of at least 10 mm x 10 mm.

APPLICATION INFORMATION (continued)

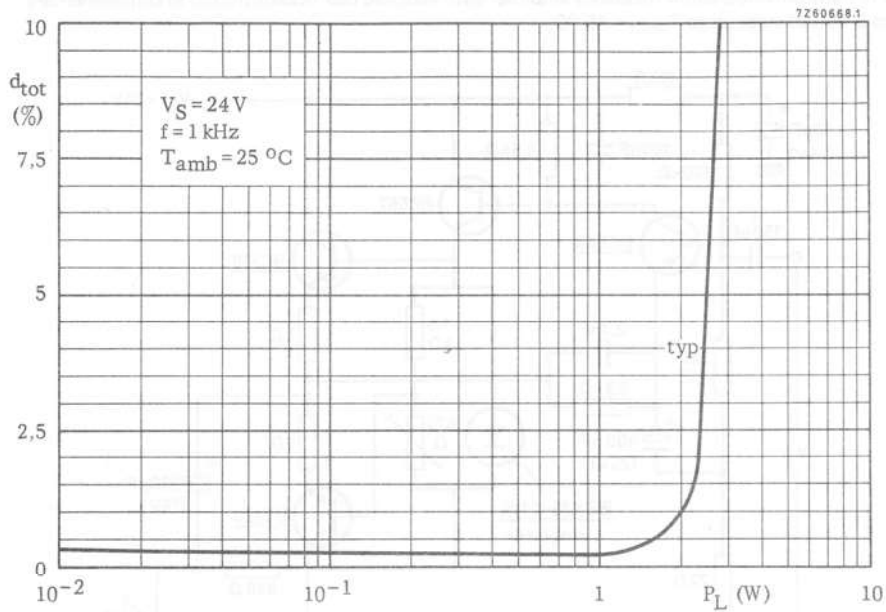


Fig. 10.