

## N-P-N H.F. WIDEBAND TRANSISTOR

N-P-N transistor in TO-72 metal envelope with insulated electrodes and a shield lead connected to the case. The 2N918 is primarily intended for low power amplifiers and oscillators in the v.h.f. and u.h.f. ranges for industrial service.

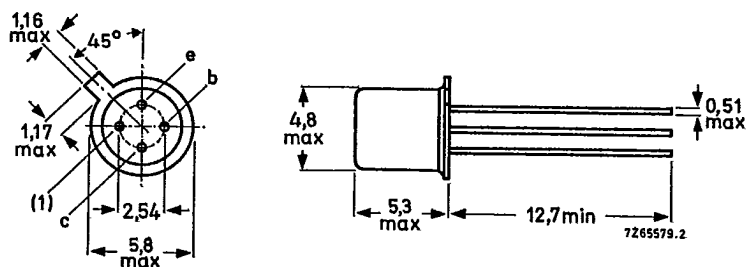
## QUICK REFERENCE DATA

Collector-base voltage (open emitter)	$V_{CBO}$	max.	30 V
Collector-emitter voltage (open base)	$V_{CEO}$	max.	15 V
Collector current (d.c.)	$I_C$	max.	50 mA
Total power dissipation up to $T_{amb} = 25^\circ\text{C}$	$P_{tot}$	max.	200 mW
Junction temperature	$T_j$	max.	200 $^\circ\text{C}$
Transition frequency $I_C = 6\text{ mA}; V_{CE} = 10\text{ V}$	$f_T$	min.	900 MHz
Maximum unilateralized power gain $I_C = 6\text{ mA}; V_{CE} = 12\text{ V}; f = 200\text{ MHz}$	$G_{UM}$	typ.	36 dB
Noise figure at $f = 60\text{ MHz}$ $I_C = 1\text{ mA}; V_{CE} = 6\text{ V}; Z_S = 400\ \Omega$	$F$	max.	6,0 dB

## MECHANICAL DATA

Dimensions in mm

Fig. 1 TO-72.



(1) = shield lead (connected to case).

Accessories: 56246 (distance disc).

#### RATINGS

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

Collector-base voltage (open emitter)	$V_{CBO}$	max.	30 V
Collector-emitter voltage (open base)	$V_{CEO}$	max.	15 V
Emitter-base voltage (open collector)	$V_{EBO}$	max.	3 V
Collector current (d.c.)	$I_C$	max.	50 mA
Total power dissipation up to $T_{amb} = 25\text{ }^{\circ}\text{C}$	$P_{tot}$	max.	200 mW
Storage temperature	$T_{stg}$		-65 to + 200 $^{\circ}\text{C}$
Junction temperature	$T_j$	max.	200 $^{\circ}\text{C}$

#### THERMAL RESISTANCE

From junction to ambient in free air	$R_{th\ j-a}$	=	880 K/W
From junction to case	$R_{th\ j-c}$	=	580 K/W

# CHARACTERISTICS

$T_j = 25\text{ }^{\circ}\text{C}$  unless otherwise specified. All measurements taken with ungrounded shield lead.

Collector cut-off current

$I_E = 0; V_{CB} = 15\text{ V}$

$I_E = 0; V_{CB} = 15\text{ V}; T_j = 150\text{ }^{\circ}\text{C}$

$I_{CBO}$  max. 10 nA

$I_{CBO}$  max. 1  $\mu\text{A}$

Saturation voltages

$I_C = 10\text{ mA}; I_B = 1\text{ mA}$

$V_{CEsat}$  max. 0,4 V

$V_{BEsat}$  max. 1 V

D.C. current gain

$I_C = 3\text{ mA}; V_{CE} = 1\text{ V}$

$h_{FE}$  min. 20

Collector capacitance at  $f = 140\text{ kHz}$

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

$I_E = I_e = 0; V_{CB} = 0$

$C_c$  max. 1,7 pF

$C_c$  max. 3,0 pF

Emitter capacitance at  $f = 140\text{ kHz}$

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

$C_e$  max. 2,0 pF

Transition frequency

$I_C = 6\text{ mA}; V_{CE} = 10\text{ V}^*$

$f_T$  min. 900 MHz

Noise figure at  $f = 60\text{ MHz}$

$I_C = 1\text{ mA}; V_{CE} = 6\text{ V}; Z_S = 400\text{ }\Omega; T_{amb} = 25\text{ }^{\circ}\text{C}$

F max. 6,0 dB

Oscillator power output at  $f = 500\text{ MHz}$

$-I_E = 8\text{ mA}; V_{CB} = 15\text{ V}; T_{amb} = 25\text{ }^{\circ}\text{C}$

$P_O$  min. 30 mW

Maximum unilateralised power gain

$$G_{UM} = \frac{|y_{fe}|^2}{4g_{ie}g_{os}}$$

$I_C = 6\text{ mA}; V_{CE} = 12\text{ V}; f = 200\text{ MHz}; T_{amb} = 25\text{ }^{\circ}\text{C}$

$G_{UM}$  typ. 36 dB

\* JEDEC registration:  $I_C = 4\text{ mA}; V_{CE} = 10\text{ V}, f_T > 600\text{ MHz}$ .

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**CHARACTERISTICS (continued)**

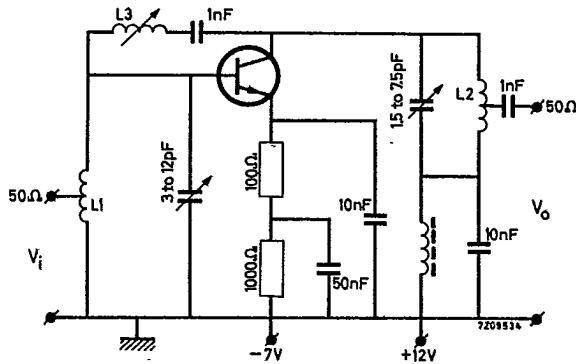
Available power gain at  $f = 200 \text{ MHz}$

$I_C = 6 \text{ mA}$ ;  $V_{CE} = 12 \text{ V}$ ;  $T_{amb} = 25^\circ \text{C}$

$G_p$  min. 15 dB

Basic circuit for measuring the available neutralised power gain (Fig. 2)

Grounded shield lead



$L1 = 3,5$  turns tinned Cu wire, 1,3 mm  
d = 8 mm; length = 11 mm

Tap at  $\approx 2$  turns from earth side

$L2 = 8$  turns tinned Cu wire, 1,3 mm  
d = 3 mm; length = 22 mm

Tap at 1 turn from earth side

$L3 = 0,4$  to  $0,65 \mu\text{H}$