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.

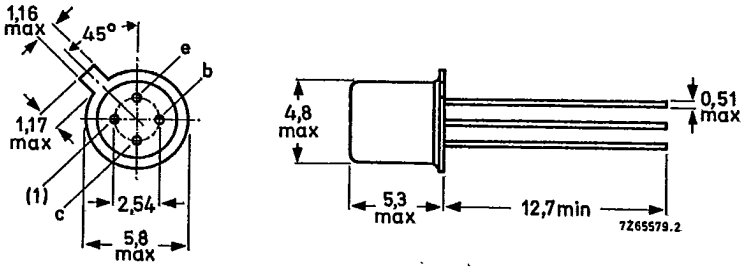
QUICK REFERENCE DATA

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 °C	P_{tot}	max.	200 mW
Junction temperature	T_j	max.	200 °C
Transition frequency I_C = 6 mA; V_{CE} = 10 V	f_T	min.	900 MHz
Maximum unilateralized power gain I_C = 6 mA; V_{CE} = 12 V; f = 200 MHz	G_{UM}	typ.	36 dB
Noise figure at f = 60 MHz I_C = 1 mA; V_{CE} = 6 V; Z_S = 400 Ω	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 °C	P_{tot}	max.	200 mW
Storage temperature	T_{stg}	−65 to +	200 °C
Junction temperature	T_j	max.	200 °C

THERMAL RESISTANCE

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

CHARACTERISTICS

T_j = 25 °C unless otherwise specified. All measurements taken with ungrounded shield lead.

Collector cut-off current			
$I_E = 0$; $V_{CB} = 15$ V	I_{CBO}	max.	10 nA
$I_E = 0$; $V_{CB} = 15$ V; $T_j = 150$ °C	I_{CBO}	max.	1 μA
Saturation voltages			
$I_C = 10$ mA; $I_B = 1$ mA	V_{CEsat}	max.	0,4 V
	V_{BEsat}	max.	1 V
D.C. current gain			
$I_C = 3$ mA; $V_{CE} = 1$ V	h_{FE}	min.	20
Collector capacitance at f = 140 kHz			
$I_E = I_e = 0$; $V_{CB} = 10$ V	C_c	max.	1,7 pF
$I_E = I_e = 0$; $V_{CB} = 0$	C_c	max.	3,0 pF
Emitter capacitance at f = 140 kHz			
$I_C = I_c = 0$; $V_{EB} = 0,5$ V	C_e	max.	2,0 pF
Transition frequency			
$I_C = 6$ mA; $V_{CE} = 10$ V*	f_T	min.	900 MHz
Noise figure at f = 60 MHz			
$I_C = 1$ mA; $V_{CE} = 6$ V; $Z_S = 400\ \Omega$; $T_{amb} = 25$ °C	F	max.	6,0 dB
Oscillator power output at f = 500 MHz			
$-I_E = 8$ mA; $V_{CB} = 15$ V; $T_{amb} = 25$ °C	P_o	min.	30 mW
Maximum unilateralised power gain			
$G_{UM} = \frac{\lvert y_{fe}\rvert^2}{4 g_{ie} g_{oe}}$			
$I_C = 6$ mA; $V_{CE} = 12$ V; f = 200 MHz; $T_{amb} = 25$ °C	G_{UM}	typ.	36 dB

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

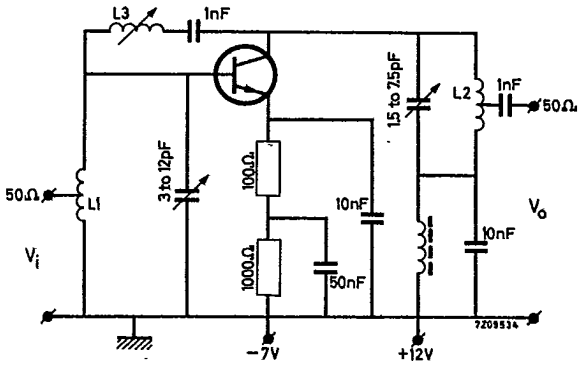
CHARACTERISTICS (continued)

Available power gain at f = 200 MHz

I_C = 6 mA; V_{CE} = 12 V; T_{amb} = 25 °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 ≈ 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 μH