NPN 1 GHz wideband transistor

T-31-17

BFW92

DESCRIPTION

NPN transistor in a plastic SOT37 envelope.

It has a low noise over a wide current range, a very high power gain and good intermodulation properties. It is primarily intended for wideband aerial amplifiers (40 to 860 MHz), channel and band aerial amplifiers for band I, II, III and IV/V (40 to 860 MHz), television distribution amplifiers and low noise wideband vertical amplifiers in high speed oscilloscopes.

PINNING

PIN	DESCRIPTION
	Code: BFW92/02
1	base
2	emitter
3	collector

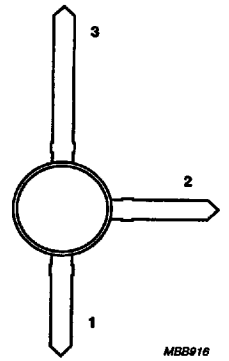

Fig.1 SOT37.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter	–	25	V
V_{CEO}	collector-emitter voltage	open base	–	15	V
I_{CM}	peak collector current	f > 1 MHz	–	50	mA
P_{tot}	total power dissipation	up to T_s = 155 °C (note 1)	–	300	mW
f_T	transition frequency	I_C = 25 mA; V_{CE} = 5 V; f = 500 MHz; T_j = 25 °C	1.6	–	GHz
C_{re}	feedback capacitance	I_C = 2 mA; V_{CE} = 5 V; f = 1 MHz; T_{amb} = 25 °C	0.6	–	pF
F	noise figure	I_C = 2 mA; V_{CE} = 5 V; R_S = 50 Ω; f = 500 MHz; T_{amb} = 25 °C	4	–	dB
G_p	power gain	I_C = 10 mA; V_{CE} = 10 V; f = 800 MHz; T_{amb} = 25 °C	11	–	dB
P_O	output power	I_C = 10 mA; V_{CE} = 10 V; f = 800 MHz; T_{amb} = 25 °C; d_{im} = –30 dB; VSWR at output < 2	8	–	mW

Note

1. T_s is the temperature at the soldering point of the collector lead.

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LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter	–	25	V
V_{CEO}	collector-emitter voltage	open base	–	15	V
V_{EBO}	emitter-base voltage	open collector	–	2.5	V
I_C	DC collector current		–	25	mA
I_{CM}	peak collector current	f > 1 MHz	–	50	mA
P_{tot}	total power dissipation	up to T_s = 155 °C (note 1)	–	300	mW
T_{stg}	storage temperature		–65	150	°C
T_j	junction temperature		–	175	°C

THERMAL RESISTANCE

SYMBOL	PARAMETER	CONDITIONS	THERMAL RESISTANCE
$R_{th\ j\text{-}s}$	thermal resistance from junction to soldering point	up to T_s = 155 °C (note 1)	65 K/W

Note

1. T_s is the temperature at the soldering point of the collector lead.

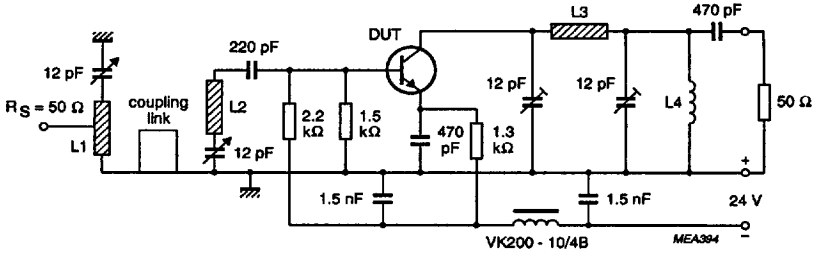
CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CBO}	collector cut-off current	I_E = 0; V_{CB} = 10 V	–	–	50	nA
h_{FE}	DC current gain	I_C = 2 mA; V_{CE} = 1 V	25	90	–	
		I_C = 25 mA; V_{CE} = 1 V	25	90	–	
f_T	transition frequency	I_C = 2 mA; V_{CE} = 5 V; f = 500 MHz	–	1	–	GHz
		I_C = 25 mA; V_{CE} = 5 V; f = 500 MHz	–	1.6	–	GHz
C_c	collector capacitance	$I_E = i_e$ = 0; V_{CB} = 10 V; f = 1 MHz	–	0.7	–	pF
C_e	emitter capacitance	$I_C = i_c$ = 0; V_{EB} = 0.5 V; f = 1 MHz	–	1.5	–	pF
C_{re}	feedback capacitance	I_C = 2 mA; V_{CE} = 5 V; f = 1 MHz; T_{amb} = 25 °C	–	0.6	–	pF
F	noise figure	I_C = 2 mA; V_{CE} = 5 V; R_S = 50 Ω; f = 500 MHz; T_{amb} = 25 °C	–	4	–	dB
G_p	power gain	I_C = 10 mA; V_{CE} = 10 V; f = 800 MHz; T_{amb} = 25 °C	–	11	–	dB
P_O	output power	note 1	–	8	–	mW

Note

1. I_C = 10 mA; V_{CE} = 10 V; f = 800 MHz; T_{amb} = 25 °C; d_{im} = –30 dB; VSWR at output < 2
   f_p = 798 MHz; f_q = 802 MHz;
   measured at $f_{(2p-q)}$ = 806 MHz.



L1 = 24 mm x 6 mm x 0.5 mm silver plated copper strip. Tap of the input at 5 mm from earth.

L2 = 15 mm x 6 mm x 0.5 mm silver plated copper strip.

L3 = 20 mm x 8 mm x 0.5 mm silver plated copper strip.

L4 = 4 turns enamelled 0.5 mm copper wire; winding pitch 1.5 mm; internal diameter 4 mm. Coupling link: 42 mm silver plated 1 mm copper wire.

Fig.2 Intermodulation distortion test circuit.

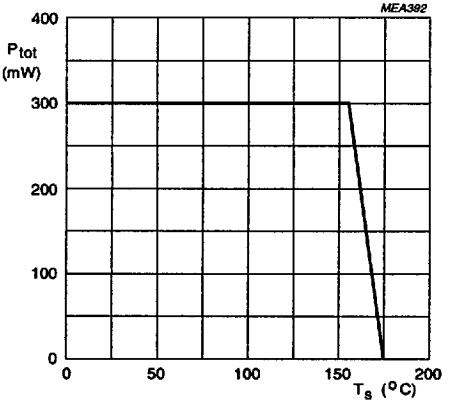
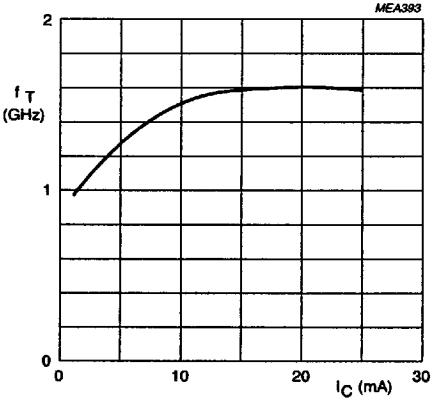


Fig.3 Power derating curve.



V_{CE} = 5 V; f = 500 MHz; T_j = 25 °C.

Fig.4 Transition frequency as a function of collector current.