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T-31-15

**Extremely Low Noise NPN Silicon
Broadband Transistors**

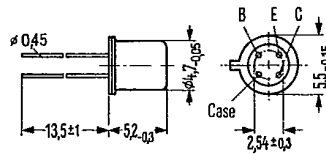
**BFT 66
BFT 67**

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BFT 66 and BFT 67 are epitaxial NPN silicon planar RF transistors in TO 72 case (18 A 4 DIN 41876), intended for input stage applications in extremely low-noise broadband amplifiers up to 1 GHz.

The terminals are electrically insulated from the case.

Type	Ordering code
BFT 66	Q62702-F456
BFT 67	Q62702-F457



Approx. weight 0.4 g Dimensions in mm

Maximum ratings

Collector-emitter voltage
Collector-base voltage
Emitter-base voltage
Collector current
Base current
Junction temperature
Storage temperature range
Total power dissipation ($T_{amb} \leq 60^\circ\text{C}$)

	BFT 66 BFT 67	
V_{CEO}	15	V
V_{CBO}	20	V
V_{EBO}	2.5	V
I_C	30	mA
I_B	4	mA
T_j	200	$^\circ\text{C}$
T_{stg}	-65 to +175	$^\circ\text{C}$
P_{tot}	200	mW

Thermal resistance

Junction to ambient air
Junction to case

R_{thJA}	≤ 700	K/W
R_{thJC}	≤ 400	K/W

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Static characteristics ($T_{amb} = 25^{\circ}\text{C}$)

		BFT 66	BFT 67	
Collector-emitter breakdown voltage ($I_{CEO} = 500 \mu\text{A}$)	$V_{(BR)CEO}$	> 15	> 15	V
Collector-emitter breakdown voltage ($I_{CBO} = 100 \mu\text{A}$)	$V_{(BR)CES}$	> 20	> 20	V
Emitter-base breakdown voltage ($I_{EBO} = 100 \mu\text{A}$)	$V_{(BR)EBO}$	> 2.5	> 2.5	V
Collector cutoff current ($V_{CBO} = 10 \text{ V}$)	I_{CBO}	< 50	< 50	nA
DC current gain ($I_C = 10 \text{ mA}$; $V_{CE} = 6 \text{ V}$)	h_{FE}	≥ 30	≥ 30	—

Dynamic characteristics ($T_{amb} = 25^{\circ}\text{C}$)

Small signal current gain ($I_C = 10 \text{ mA}$; $V_{CE} = 6 \text{ V}$; $f = 1 \text{ kHz}$)	h_{fe}	70 (> 30)	70 (> 30)	—
Transition frequency ($I_C = 20 \text{ mA}$; $V_{CE} = 6 \text{ V}$; $f = 200 \text{ MHz}$)	f_T	3.8(> 3.6)	3.8(> 3.6)	GHz
Reverse transfer capacitance ($I_C = 1 \text{ mA}$; $V_{CE} = 6 \text{ V}$; $f = 1 \text{ MHz}$)	C_{12e}	0.65	0.65	pF
Noise figure ($I_C = 3 \text{ mA}$; $V_{CE} = 6 \text{ V}$; $f = 10 \text{ MHz}$; $R_g = 75 \Omega$)	NF	≤ 1	≤ 1.5	dB
($I_C = 3 \text{ mA}$; $V_{CE} = 6 \text{ V}$; $f = 800 \text{ MHz}$; $R_g = 60 \Omega$)	NF	2.1	2.5	dB
Output voltage ¹⁾ ($I_C = 20 \text{ mA}$; $V_{CE} = 6 \text{ V}$; $R_g = R_L = 75 \Omega$; $d_{IM} = 60 \text{ dB}$)	V_O	240	240	mV

S parameter

Operating point: $V_{CE} = 5 \text{ V}$, $I_C = 3 \text{ mA}$, $Z_o = 50 \Omega$

f (GHz)	S_{11}	φ	S_{21}	φ	S_{12}	φ	S_{22}	φ	G_{max} (dB)
0,1	0,62	- 38	18,0	134	0,03	68	0,90	-15	27,32
0,2	0,62	- 49	16,4	133	0,06	77	0,80	-11	22,94
0,4	0,35	- 87	12,3	102	0,09	70	0,68	-14	15,56
0,6	0,24	-138	9,1	86	0,11	68	0,61	-18	11,38
0,8	0,18	-162	7,2	70	0,13	65	0,60	-27	9,28
1,0	0,05	141	5,5	52	0,18	57	0,65	-35	7,30

μA

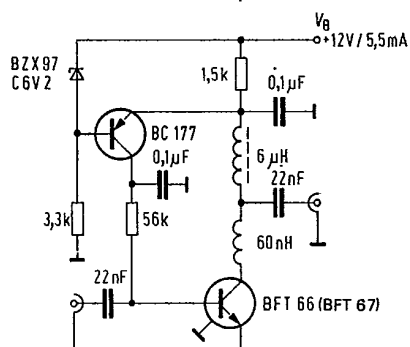
1) Three tone modulation f approx. 800 MHz

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Circuit examples

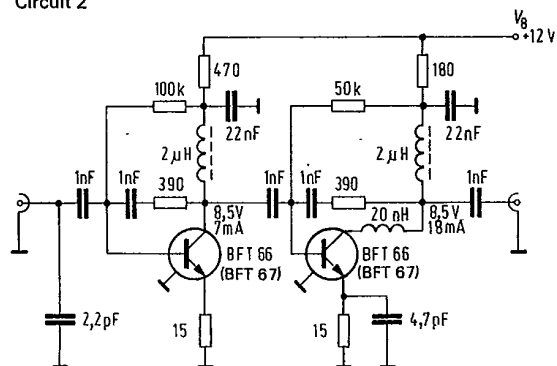
Low-noise preamplifier for the frequency band 1 to 300 MHz

Circuit 1

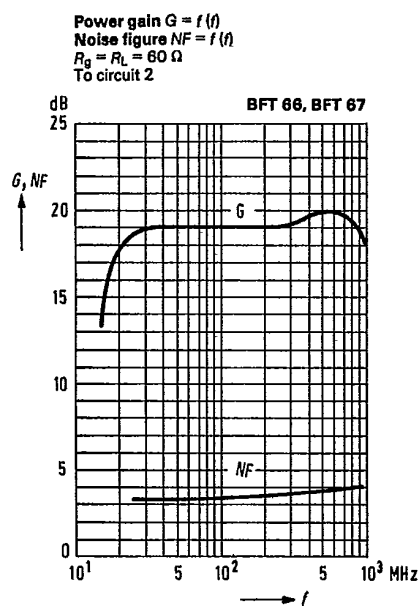
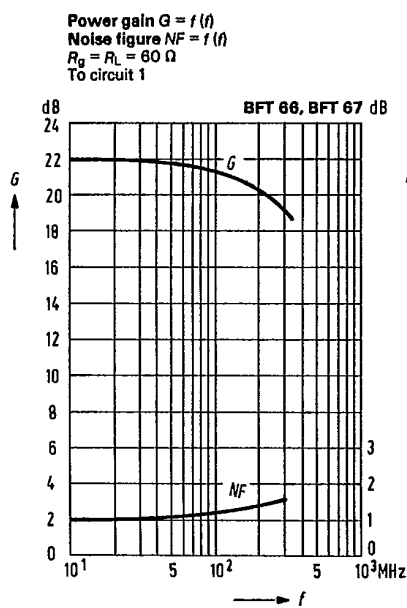
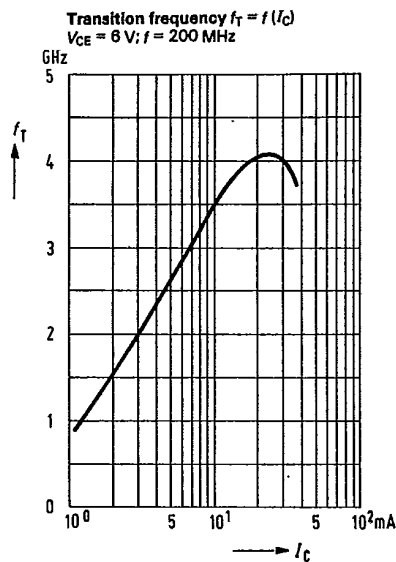
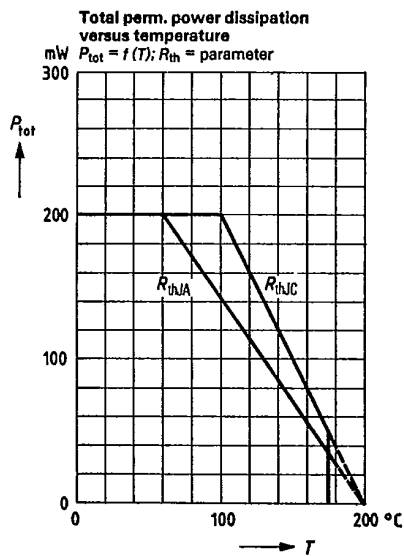


Two-stage broadband amplifier for the frequency band 25 to 1000 MHz

Circuit 2



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