

NPN Silicon RF Broadband Transistor

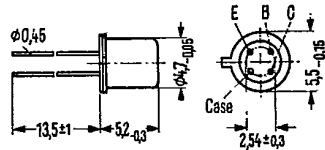
BFW 30

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Not for new design

BFW 30 is an epitaxial NPN silicon planar RF transistor in a TO 72 case (18 A 4 DIN 41876), designed for universal application up to the GHz range, e. g. for vertical amplifiers in broadband oscillographs and for broadband antenna amplifiers. The terminals E, B, C are insulated from the case.

Type	Ordering code
BFW 30	Q62702-F320



Approx. weight 0.4 g Dimensions in mm

Maximum ratings

Collector-base voltage	V_{CBO}	20	V
Collector-emitter voltage	V_{CEO}	10	V
Emitter-base voltage	V_{EBO}	2.5	V
Collector current	I_C	50	mA
Collector-peak current ($f \geq 1$ MHz)	I_{CM}	100	mA
Junction temperature	T_j	200	°C
Storage temperature range	T_{stg}	-65 to +175	°C
Total power dissipation ($T_{amb} \leq 25^\circ\text{C}$)	P_{tot}	250	mW

Thermal resistance

Junction to ambient air	R_{thJA}	≤ 700	K/W
Junction to case	R_{thJC}	≤ 400	K/W

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

Collector cutoff current ($V_{CBO} = 10\text{ V}$)

DC current gain

($I_C = 25\text{ mA}$; $V_{CE} = 5\text{ V}$)

($I_C = 50\text{ mA}$; $V_{CE} = 5\text{ V}$)

I_{CBO}	≤ 50	nA
h_{FE}	≥ 25	-
h_{FE}	≥ 25	-

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

Transition frequency

($I_C = 50\text{ mA}$; $V_{CE} = 5\text{ V}$; $f = 200\text{ MHz}$)

Reverse transfer capacitance

($I_C = 2\text{ mA}$; $V_{CE} = 5\text{ V}$; $f = 1\text{ MHz}$)

Collector-base capacitance ($V_{CBO} = 5\text{ V}$; $f = 1\text{ MHz}$)

Power gain

($I_C = 30\text{ mA}$; $V_{CE} = 5\text{ V}$; $f = 200\text{ MHz}$; $R_g = 60\ \Omega$)

($I_C = 30\text{ mA}$; $V_{CE} = 5\text{ V}$; $f = 800\text{ MHz}$; $R_g = 60\ \Omega$)

Noise figure

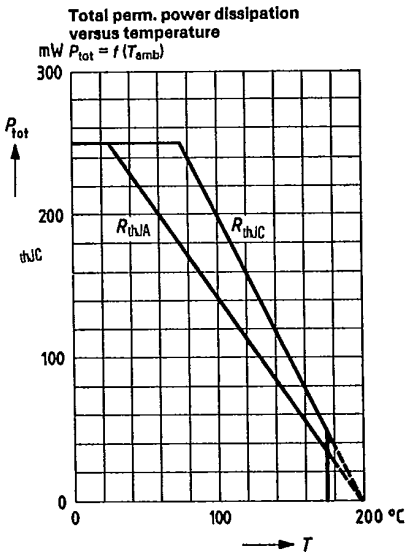
($I_C = 2\text{ mA}$; $V_{CE} = 5\text{ V}$; $f = 500\text{ MHz}$; $R_g = 60\ \Omega$)

Output voltage¹⁾

($I_C = 30\text{ mA}$; $V_{CE} = 5\text{ V}$; $d_{IM} = 60\text{ dB}$;

$R_g = R_L = 75\ \Omega$)

f_T	1.6	GHz
C_{12e}	0.8	pF
C_{CBO}	≤ 1.5	pF
G_{pe}	21 (≥ 19)	dB
G_{pe}	7.5	dB
NF	≤ 5	dB
V_0	350	mV



1) Three tone modulation f approx. 800 MHz

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S parameterOperating point: $V_{CE} = 5 \text{ V}$, $I_C = 30 \text{ mA}$, $Z_o = 50 \Omega$

f (MHz)	S_{11}	φ	S_{21}	φ	S_{12}	φ	S_{22}	φ
0,1	0,171	-89	11,49	107	0,036	74	0,580	-17
0,2	0,133	-126	6,20	94	0,064	80	0,494	-13
0,3	0,133	-148	4,26	89	0,093	82	0,465	-11
0,4	0,154	-160	3,27	84	0,122	84	0,450	-10
0,5	0,177	-165	2,67	80	0,150	85	0,417	-11
0,6	0,197	-168	2,28	77	0,178	86	0,402	-15
0,7	0,214	-171	1,98	73	0,201	87	0,399	-17
0,8	0,230	-172	1,84	69	0,229	88	0,399	-20
0,9	0,224	-170	1,69	68	0,260	89	0,406	-24
1,0	0,221	-172	1,54	66	0,286	89	0,419	-27
1,1	0,204	-173	1,42	63	0,309	90	0,447	-28
1,2	0,183	-172	1,33	59	0,332	89	0,465	-31
1,3	0,138	-168	1,26	57	0,355	88	0,501	-32
1,4	0,100	-168	1,17	53	0,372	87	0,515	-32
1,5	0,061	-162	1,11	49	0,390	83	0,534	-35
1,6	0,039	-127	1,05	45	0,409	80	0,564	-37
1,7	0,068	-80	0,99	40	0,416	77	0,605	-41
1,8	0,142	-83	0,87	31	0,393	71	0,650	-49
1,9	0,299	-97	0,69	17	0,321	61	0,734	-60
2,0	0,559	-124	0,32	4	0,161	62	0,786	-81