

**NPN Silicon RF Broadband Transistor**

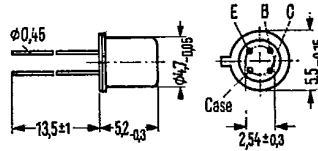
**BFW 30**

**SIEMENS AKTIENGESELLSCHAFT**

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	$R_{thJA}$	$\leq 700$	K/W
Junction to case	$R_{thJC}$	$\leq 400$	K/W

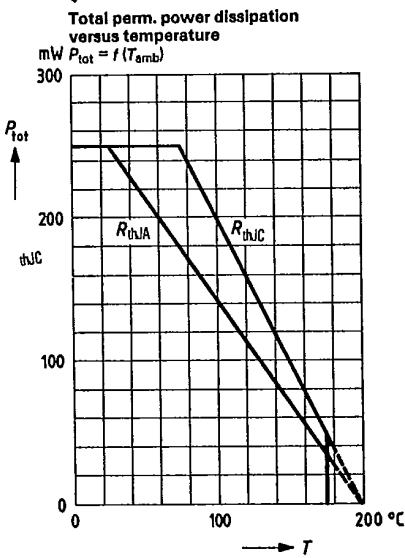
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Static characteristics ( $T_{amb} = 25^{\circ}\text{C}$ )

Collector cutoff current ( $V_{CBO} = 10\text{ V}$ )	$I_{CBO}$	$\leq 50$	nA
DC current gain ( $I_C = 25\text{ mA}$ ; $V_{CE} = 5\text{ V}$ )	$h_{FE}$	$\geq 25$	-
( $I_C = 50\text{ mA}$ ; $V_{CE} = 5\text{ V}$ )	$h_{FE}$	$\geq 25$	-

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

Transition frequency ( $I_C = 50\text{ mA}$ ; $V_{CE} = 5\text{ V}$ ; $f = 200\text{ MHz}$ )	$f_T$	1.6	GHz
Reverse transfer capacitance ( $I_C = 2\text{ mA}$ ; $V_{CE} = 5\text{ V}$ ; $f = 1\text{ MHz}$ )	$C_{12e}$	0.8	pF
Collector-base capacitance ( $V_{CBO} = 5\text{ V}$ ; $f = 1\text{ MHz}$ )	$C_{CBO}$	$\leq 1.5$	pF
Power gain ( $I_C = 30\text{ mA}$ ; $V_{CE} = 5\text{ V}$ ; $f = 200\text{ MHz}$ ; $R_g = 60\ \Omega$ )	$G_{pe}$	21 ( $\geq 19$ )	dB
( $I_C = 30\text{ mA}$ ; $V_{CE} = 5\text{ V}$ ; $f = 800\text{ MHz}$ ; $R_g = 60\ \Omega$ )	$G_{pe}$	7.5	dB
Noise figure ( $I_C = 2\text{ mA}$ ; $V_{CE} = 5\text{ V}$ ; $f = 500\text{ MHz}$ ; $R_g = 60\ \Omega$ )	NF	$\leq 5$	dB
Output voltage <sup>1)</sup> ( $I_C = 30\text{ mA}$ ; $V_{CE} = 5\text{ V}$ ; $d_{IM} = 60\text{ dB}$ ; $R_g = R_L = 75\ \Omega$ )	$V_0$	350	mV



1) Three tone modulation  $f$  approx. 800 MHz

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S parameter

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

f (MHz)	S <sub>11</sub>	φ	S <sub>21</sub>	φ	S <sub>12</sub>	φ	S <sub>22</sub>	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