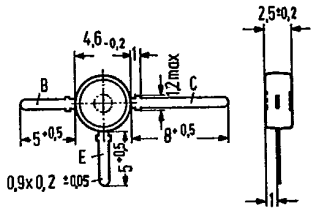
NPN Silicon RF Broadband Transistor

BFW 93

Not for new design

BFW 93 is an epitaxial NPN silicon planar RF transistor in a plastic package of low capacitance, similar to TO 119 (50 B 3 DIN 41867). The transistor is particularly suitable for use as RF amplifiers up to the GHz range.

Type	Ordering code
BFW 93	Q62702-F365



Approx. weight 0.3 g Dimensions in mm

Maximum ratings

Collector-base voltage	V_{CBO}	18	V
Collector-emitter voltage	V_{CEO}	10	V
Emitter-base voltage	V_{BEO}	2.5	V
Collector current	I_C	50	mA
Collector peak current (f > 1 MHz)	I_{CM}	100	mA
Junction temperature	T_j	150	°C
Storage temperature range	T_{stg}	–55 to +125	°C
Total power dissipation (T_{amb} ≤ 70°C)	P_{tot}	200	mW

Thermal resistance

Junction to ambient air (mounted on glass fiber epoxy resin PCB 40 mm x 25 mm x 1 mm)	R_{thJA}	≤400	K/W

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Static characteristics (T_{amb} = 25°C)

Collector cutoff current (V_{CBO} = 10 V)	I_{CBO}	≤50	nA
DC current gain			
(I_C = 25 mA; V_{CE} = 5 V)	h_{FE}	≥25	–
(I_C = 50 mA; V_{CE} = 5 V)	h_{FE}	≥ 25	–

Dynamic characteristics (T_{amb} = 25°C)

Transition frequency			
(I_C = 50 mA; V_{CE} = 5 V; f = 200 MHz)	f_T	1.6	GHz
Reverse transfer capacitance			
(I_C = 2 mA; V_{CE} = 5 V; f = 1 MHz)	C_{12e}	0.6	pF
Collector-base capacitance			
(V_{CBO} = 5 V; f = 1 MHz)	C_{CBO}	1.5	pF
Power gain			
(I_C = 30 mA; V_{CE} = 5 V; f = 200 MHz; R_g = 60 Ω)	G_{pe}	23	dB
(I_C = 30 mA; V_{CE} = 5 V; f = 800 MHz; R_g = 60 Ω)	G_{pe}	11	dB
Noise figure			
(I_C = 2 mA; V_{CE} = 5 V;			
f = 500 MHz); R_g = 60 Ω)	NF	≤5	dB
Output voltage[1]	V_O	350	mV
(I_C = 30 mA; V_{CE} = 5 V; d_{IM} = 60 dB;			
$R_g = R_L$ = 75 Ω)			

S parameter: Operating point: I_C = 30 mA, V_{CE} = 5 V, Z_o = 50 Ω

f (GHz)	S_{11}	φ	S_{21}	φ	S_{12}	φ	S_{22}	φ	G_{max} (dB)
0,1	0,346	–134	17,385	115	0,015	60	0,680	–20	28,1
0,2	0,372	–158	9,549	97	0,024	68	0,596	–17	22,2
0,3	0,384	–168	6,519	88	0,034	69	0,555	–15	18,6
0,4	0,396	–175	5,001	83	0,044	72	0,528	–17	16,1
0,5	0,422	–179	3,978	79	0,053	73	0,540	–22	14,3
0,6	0,431	177	3,322	73	0,062	73	0,556	–23	12,9
0,7	0,445	173	2,888	70	0,072	74	0,527	–26	11,6
0,8	0,447	169	2,534	66	0,081	75	0,547	–31	10,6
0,9	0,466	166	2,222	63	0,088	76	0,537	–33	9,5
1,0	0,468	163	1,981	59	0,098	75	0,542	–37	8,5
1,1	0,484	160	1,818	55	0,107	75	0,532	–40	7,8
1,2	0,491	156	1,681	52	0,117	75	0,534	–44	7,2
1,3	0,515	154	1,560	50	0,128	76	0,533	–48	6,6
1,4	0,521	152	1,443	47	0,138	77	0,531	–53	6,0
1,5	0,541	151	1,333	45	0,147	78	0,544	–54	5,5
1,6	0,534	149	1,260	41	0,157	77	0,538	–57	5,0
1,7	0,560	146	1,192	39	0,170	76	0,526	–64	4,6
1,8	0,559	145	1,120	36	0,181	76	0,546	–67	4,1
1,9	0,580	143	1,058	34	0,192	75	0,518	–71	3,6
2,0	0,583	142	1,013	32	0,206	74	0,537	–75	3,4

1) Three tone modulation f approx. 800 MHz

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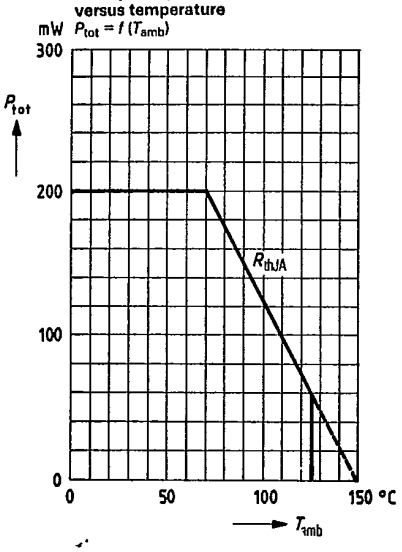
Total perm. power dissipation
versus temperature
$P_{tot} = f(T_{amb})$



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