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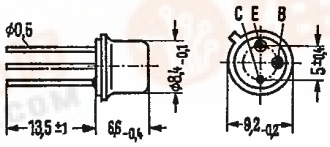
NPN Silicon RF Broadband Transistor

BFW 16 A

BFW 16 A is an epitaxial NPN silicon planar RF transistor in TO 39 metal case (5 C 3 DIN 41873) intended for general applications up to the GHz range, e.g. for driver and output stages of channel and range antenna amplifiers up to band V, as well as for vertical amplifier output stages in broadband oscillographs. The collector is conductively connected to the case.

Type	Ordering code
BFW 16 A	Q62702-F319



Approx. weight 1.6 g Dimensions in mm

Maximum ratings

Collector-base voltage	V_{CBO}	40	V
Collector-emitter voltage ($R_{BE} \leq 50\ \Omega$)	V_{CER}	40	V
Collector-emitter voltage	V_{CEO}	25	V
Emitter-base voltage	V_{EBO}	2	V
Collector current	I_C	150	mA
Collector peak current ($f \geq 1$ MHz)	I_{CM}	300	mA
Junction temperature	T_j	200	°C
Storage temperature range	T_{stg}	−65 to +200	°C
Total power dissipation (T_{case} = 125 °C)	P_{tot}	1.5	W

Thermal resistance

Junction to ambient air	R_{thJA}	≤250	K/W
Junction to case	R_{thJC}	≤50	K/W

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

Collector cutoff current (V_{CBO} = 20 V; T_{amb} = 125°C)	I_{CBO}	≤20	µA
Collector-emitter saturation voltage[1] (I_C = 100 mA)	V_{CEsat}	≤0.75	V
DC current gain (I_C = 50 mA; V_{CE} = 5 V)	h_{FE}	≥25	–
(I_C = 150 mA; V_{CE} = 5 V)	h_{FE}	≥25	–

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

Transition frequency (I_C = 150 mA; V_{CE} = 15 V; f = 200 MHz)	f_T	1.2	GHz
Reverse transfer capacitance (I_C = 10 mA; V_{CE} = 15 V; f = 1 MHz)	C_{12e}	1.7	pF
Collector-base capacitance (V_{CBO} = 15 V; f = 1 MHz)	C_{CBO}	≤4	pF
Power gain (I_C = 70 mA; V_{CE} = 18 V; f = 200 MHz; R_g = 60 Ω)	G_{pe}	16	dB
(I_C = 70 mA; V_{CE} = 18 V; f = 800 MHz; R_g = 60 Ω)	G_{pe}	6.5	dB
Noise figure (I_C = 30 mA; V_{CE} = 15 V; f = 200 MHz; R_g = 75 Ω)	NF	≤6	dB
Output voltage[2] (I_C = 70 mA; V_{CE} = 18 V; R_L = R_g = 75 Ω; d_{IM} = 60 dB)	V_0	600	mV

S parameter

Operating point: I_C = 70 mA, V_{CE} = 18 V; Z_o = 50 Ω

f (GHz)	S_{11}	φ	S_{21}	φ	S_{12}	φ	S_{22}	φ	G_{max} (dB)
0,2	0,547	-178	5,537	78	0,061	70	0,259	- 58	16,7
0,3	0,540	172	3,750	69	0,088	72	0,283	- 65	13,3
0,4	0,551	165	2,803	61	0,115	74	0,309	- 72	11,0
0,5	0,568	159	2,179	55	0,140	74	0,336	- 81	9,0
0,6	0,583	155	1,822	47	0,162	73	0,379	- 91	7,7
0,7	0,585	151	1,547	41	0,192	71	0,441	- 99	6,6
0,8	0,579	146	1,356	35	0,219	71	0,505	-103	5,7
0,9	0,572	141	1,181	30	0,248	69	0,556	-106	4,8
1,0	0,568	136	1,075	26	0,273	68	0,581	-109	4,1

1) Applicable to that characteristic passing through I_C = 110 mA, V_{CE} = 1 V at constant I_B.
2) Measured with three tone modulation f approx. 800 MHz

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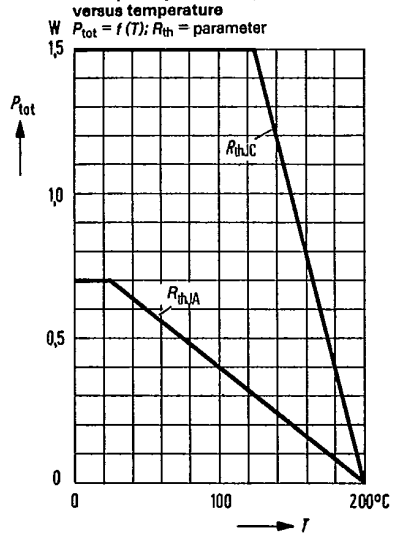
Total perm. power dissipation versus temperature
$P_{tot} = f(T)$; R_{th} = parameter