BFR92A

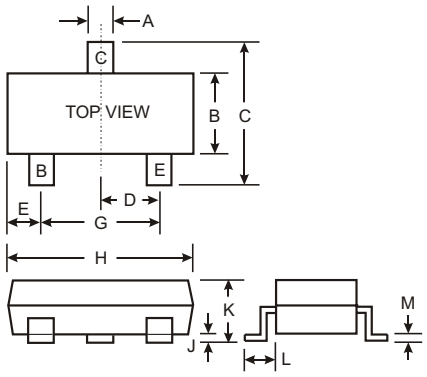
NPN WIDEBAND TRANSISTOR

Features

- RF Wideband Amplifier/Oscillator
- 5GHz Transition Frequency
- Low Intermodulation Distortion
- High Power Gain
- Low Noise

Mechanical Data

- Case: SOT-23, Molded Plastic
- Leads/Terminals: Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Marking: +P2
- Weight: 0.008 grams (approx.)



SOT-23		
Dim	**Min**	**Max**
A	0.37	0.51
B	1.19	1.40
C	2.10	2.50
D	0.89	1.05
E	0.45	0.61
G	1.78	2.05
H	2.65	3.05
J	0.013	0.15
K	0.89	1.10
L	0.45	0.61
M	0.076	0.178
All Dimensions in mm		

Maximum Ratings @ $T_A = 25°C$ unless otherwise specified

Characteristic	Symbol	BRF92A	Unit
Collector-Base Voltage	V_{CBO}	20	V
Collector-Emitter Voltage	V_{CEO}	15	V
Emitter-Base Voltage	V_{EBO}	2.0	V
Collector Current - Continuous (Note 1)	I_C	30	mA
Power Dissipation (Note 1) @ $T_A = 60°C$	P_d	200	mW
Thermal Resistance, Junction to Ambient (Note 1)	$R_{\theta JA}$	450	K/W
Operating and Storage Temperature Range	T_j, T_{STG}	-65 to +150	°C

Notes: 1. Device mounted on ceramic substrate 0.7mm x 2.5 cm^2 area.

Electrical DC Characteristics @ T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
DC Current Gain	h_{FE}	65	—	150	—	V_{CE} = 10V, I_C = 14mA
Collector - Emitter Cutoff Current	I_{CES}	—	—	100	μA	V_{BE} = 0V, V_{CE} = 20V
Collector - Base Cutoff Current	I_{CBO}	—	—	50	nA	I_E = 0V, V_{CB} = 10V
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	20	—	—	V	I_C = 10μA, I_E = 0
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	15	—	—	V	I_C = 1.0mA, I_B = 0
Emitter- Base Breakdown Voltage	$V_{(BR)EBO}$	2.0	—	—	V	I_E = 10μA, I_C = 0

Electrical AC Characteristics @ T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Transition Frequency	f_T	5.0	—	—	GHz	V_{CE} = 10V, I_C = 14mA, f = 500MHz
Collector - Base Capacitance	C_{cbo}	—	0.3	—	pF	V_{CB} = 10V, f = 1.0MHz
Collector - Emitter Capacitance	C_{ceo}	—	0.15	—	pF	V_{CE} = 10V, f =1.0MHz
Emitter - Base Capacitance	C_{ebo}	—	0.65		pF	V_{EB} = 0.5V, f =1.0MHz
Noise Figure	NF	—	1.8	—	dB	V_{CE} = 10V, I_C = 2.0mA, Z_S = 50Ω, f = 800MHz
Power Gain	G_{pe}	—	16	—	dB	V_{CE} = 10V, I_C = 14mA, Z_S = 50Ω, Z_L = Z_{lopt}, f = 800MHz
Linear Fall Time	$V_1 = V_2$	—	120	—	mV	V_{CE} = 10V, I_C = 14mA, d_{IM} = 60dB, Z_S = Z_L = 50Ω, f_1 = 806MHz, f_2 = 810MHz
Third Order Intercept Point	IP_3	—	24	—	dBm	V_{CE} = 10V, I_C = 14mA, f = 800MHz

Notes: 1. Device mounted on ceramic substrate 0.7mm x 2.5 cm^2 area.

Common Emitter S - Parameters @ T_A = 25°C, Z_O = 50Ω unless otherwise specified

V_{CE}/V	I_C/mA	f/MHz	S_{11}		S_{21}		S_{12}		S_{22}	
			LINEAR MAG	ANGULAR MAG	LINEAR MAG	ANGULAR MAG	LINEAR MAG	ANGULAR MAG	LINEAR MAG	ANGULAR MAG
			—	DEGREE	—	DEGREE	—	DEGREE	—	DEGREE
5.0	2.0	100	0.902	-17.5	6.38	164.6	0.025	79.9	0.978	-7.6
		300	0.761	-50.2	5.51	137.8	0.064	63.1	0.859	-19.3
		500	0.577	-76.8	4.48	117.8	0.086	53.7	0.736	-24.2
		800	0.399	-105.3	3.28	98.9	0.104	49.7	0.642	-25.3
		1000	0.339	-121.9	2.79	90.0	0.114	50.3	0.618	-26.0
		1200	0.303	-138.1	2.45	82.1	0.124	51.1	0.603	-28.0
		1500	0.284	-163-3	2.07	71.4	0.140	53.1	0.577	-31.2
		1800	0.272	172.9	1.79	62.5	0.157	55.5	0.560	-33.9
		2000	0.278	159.4	1.65	57.3	0.171	56.6	0.558	-36.0
	5.0	100	0.783	-27.2	12.84	155.8	0.023	76.3	0.934	-12.7
		300	0.534	-69.6	9.12	122.8	0.052	61.9	0.711	-25.1
		500	0.351	-97.6	6.41	104.8	0.068	59.5	0.580	-25.6
		800	0.220	-128.3	4.28	89.8	0.091	61.1	0.518	-22.1
		1000	0.188	-145.2	3.53	82.9	0.107	62.5	0.515	-22.2
		1200	0.175	-162.0	3.04	76.5	0.124	62.8	0.510	-24.1
		1500	0.189	175.1	2.51	67.8	0.149	63.0	0.494	-27.3
		1800	0.200	153.5	2.16	60.2	0.175	62.4	0.483	-30.0
		2000	0.214	140.6	1.98	55.8	0.194	61.6	0.481	-32.6
	10	100	0.641	-38.1	19.40	146.3	0.020	73.2	0.869	-17.6
		300	0.362	-85.8	11.09	112.0	0.043	65.2	0.597	-26.0
		500	0.229	-116.7	7.27	97.3	0.062	66.3	0.496	-22.9
		800	0.148	-151.6	4.69	84.9	0.089	68.1	0.465	-18.1
		1000	0.136	-168.5	3.83	79.0	0.108	68.1	0.473	-18.4
		1200	0.133	176.8	3.27	73.4	0.127	67.8	0.473	-20.6
		1500	0.160	158.3	2.70	65.7	0.156	66.5	0.461	-24.6
		1800	0.183	139.4	2.30	58.9	0.184	64.8	0.452	-27.4
		2000	0.198	130.4	2.12	54.8	0.203	63.5	0.450	-30.1
	14	100	0.566	-44.3	22.20	141.5	0.019	72.7	0.832	-19.4
		300	0.301	-94.2	11.58	108.1	0.041	67.5	0.560	-25.1
		500	0.195	-127.0	7.43	94.6	0.060	69.0	0.475	-20.9
		800	0.137	-164.6	4.78	83.2	0.089	70.1	0.456	-16.5
		1000	0.129	-179.9	3.88	77.6	0.109	69.9	0.466	-17.1
		1200	0.132	167.7	3.30	72.3	0.128	69.1	0.469	-19.4
		1500	0.162	153.1	2.72	64.9	0.157	67.5	0.456	-23.4
		1800	0.183	136.6	2.32	58.1	0.185	65.6	0.448	-26.3
		2000	0.204	127.4	2.13	54.1	0.205	64.1	0.446	-29.2
	20	100	0.484	-52.5	24.55	136.0	0.018	72.0	0.788	-20.7
		300	0.251	-106.2	11.67	104.3	0.039	69.5	0.531	-22.8
		500	0.181	-141.8	7.37	92.1	0.058	71.5	0.466	-18.3
		800	0.144	-177.4	4.70	81.3	0.088	72.0	0.456	-14.4
		1000	0.138	169.3	3.82	76.0	0.108	71.4	0.469	-15.3
		1200	0.145	159.1	3.26	70.9	0.127	70.6	0.472	-18.1
		1500	0.179	148.3	2.67	63.7	0.157	68.4	0.461	-22.4
		1800	0.202	133.7	2.28	57.0	0.185	66.4	0.453	-25.4
		2000	0.220	125.9	2.10	52.8	0.205	64.8	0.452	-28.4

Common Emitter S - Parameters @ $T_A = 25°C$, $Z_O = 50\Omega$ unless otherwise specified

V_{CE}/V	I_C/mA	f/MHz	S_{11}		S_{21}		S_{12}		S_{22}	
			LINEAR MAG	ANGULAR MAG	LINEAR MAG	ANGULAR MAG	LINEAR MAG	ANGULAR MAG	LINEAR MAG	ANGULAR MAG
			—	DEGREE	—	DEGREE	—	DEGREE	—	DEGREE
10	2.0	100	0.915	-16.2	6.32	165.5	0.020	80.5	0.981	-6.2
		300	0.780	-46.7	5.56	139.6	0.054	65.1	0.883	-16.1
		500	0.597	-71.2	4.57	119.9	0.073	55.8	0.778	-20.4
		800	0.405	-97.6	3.37	101.0	0.089	52.2	0.692	-21.6
		1000	0.339	-113.1	2.87	92.3	0.098	53.0	0.677	-22.4
		1200	0.294	-129.6	2.53	84.2	0.107	54.3	0.663	-24.0
		1500	0.261	-155.8	2.13	73.7	0.121	56.8	0.643	-27.0
		1800	0.240	179.2	1.84	64.8	0.136	59.2	0.630	-29.6
		2000	0.243	163.2	1.70	59.8	0.149	61.1	0.630	-31.4
	5.0	100	0.816	-24.3	12.50	157.7	0.019	77.2	0.947	-10.3
		300	0.569	-62.7	9.15	125.3	0.044	63.6	0.761	-20.5
		500	0.372	-87.9	6.55	106.9	0.059	60.6	0.647	-21.1
		800	0.220	-114.2	4.41	91.6	0.079	62.3	0.592	-18.8
		1000	0.175	-129.6	3.63	84.6	0.093	63.9	0.590	-19.1
		1200	0.153	-145.8	3.13	78.3	0.107	64.8	0.589	-20.8
		1500	0.153	-175.7	2.59	69.7	0.129	65.5	0.576	-24.1
		1800	0.157	158.0	2.22	62.1	0.152	65.5	0.567	-26.6
		2000	0.170	143.4	2.04	57.9	0.168	65.3	0.567	-28.7
	10	100	0.696	-33.7	18.83	148.4	0.017	74.6	0.896	-13.8
		300	0.397	-75.7	11.20	114.4	0.038	66.4	0.666	-20.8
		500	0.237	-101.2	7.41	99.0	0.054	67.0	0.577	-18.6
		800	0.132	-130.2	4.81	86.4	0.078	68.9	0.553	-15.5
		1000	0.103	-149.3	3.92	80.4	0.094	69.4	0.560	-16.0
		1200	0.097	-165.8	3.35	75.0	0.111	69.5	0.561	-18.2
		1500	0.116	167.2	2.76	67.5	0.136	69.0	0.551	-21.9
		1800	0.133	141.3	2.36	60.4	0.160	67.9	0.545	-24.4
		2000	0.148	129.4	2.16	56.4	0.178	66.8	0.549	-27.1
	14	100	0.639	-38.8	21.41	143.8	0.016	73.2	0.866	-15.2
		300	0.339	-82.4	11.61	110.2	0.036	67.5	0.636	-19.8
		500	0.199	-110.0	7.52	96.3	0.053	69.4	0.562	-16.9
		800	0.113	-144.1	4.83	84.4	0.077	70.7	0.549	-14.2
		1000	0.093	160.9	3.93	78.9	0.094	71.1	0.556	-14.9
		1200	0.090	179.0	3.36	73.7	0.110	70.5	0.560	-17.3
		1500	0.118	158.6	2.76	66.4	0.136	69.8	0.550	-21.0
		1800	0.137	137.7	2.35	59.5	0.161	68.4	0.546	-24.0
		2000	0.155	125.7	2.16	55.6	0.178	67.4	0.548	-26.5
	20	100	0.576	-45.8	23.38	138.5	0.015	72.0	0.836	-15.8
		300	0.286	-91.7	11.55	106.1	0.034	69.0	0.620	-17.7
		500	0.177	-123.1	7.34	93.4	0.051	71.3	0.565	-14.7
		800	0.113	-161.1	4.69	82.2	0.075	72.4	0.557	-12.6
		1000	0.101	-177.3	3.81	77.1	0.092	72.4	0.568	-13.8
		1200	0.107	168.1	3.24	72.0	0.109	71.9	0.571	-16.4
		1500	0.136	152.5	2.67	64.8	0.159	70.9	0.564	-20.4
		1800	0.160	133.1	2.27	58.1	0.176	69.5	0.559	-23.5
		2000	0.181	124.2	2.09	54.0		68.4	0.560	-25.9

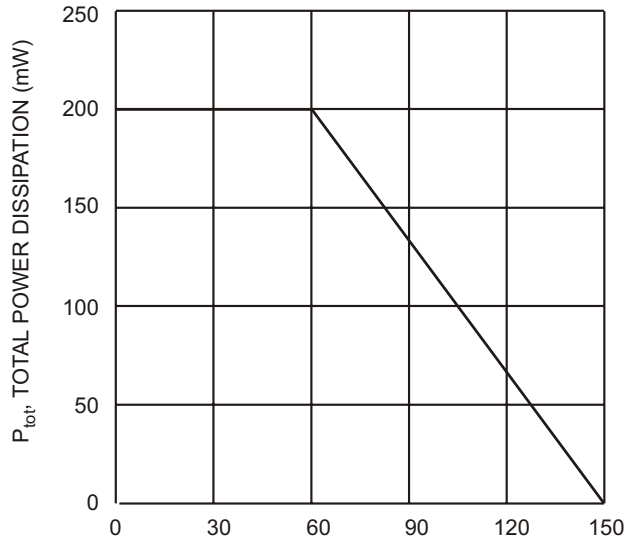


Fig. 1 Total Power Dissipation vs. Ambient Temperature

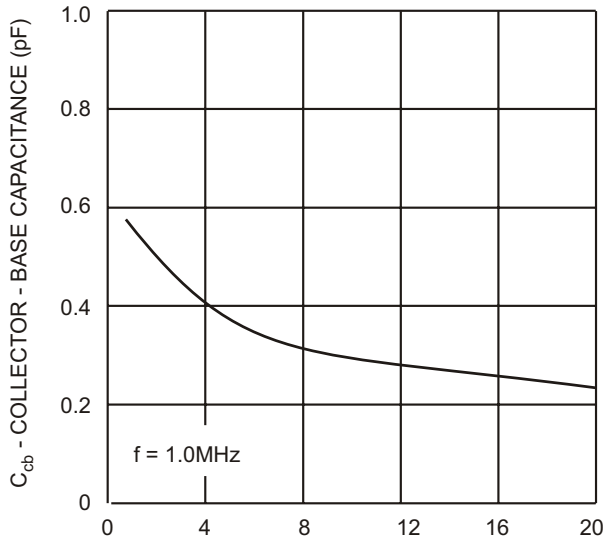


Fig. 2 Collector - Base Capacitance vs. Collector - Base Voltage

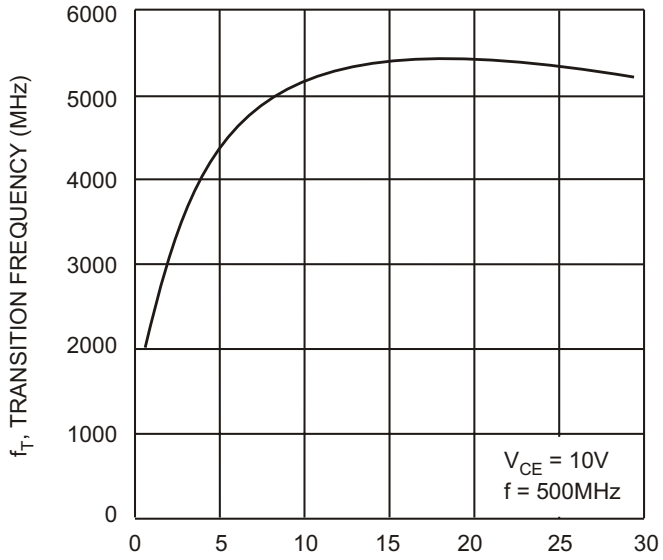


Fig 3. Transition Frequency vs. Collector Current

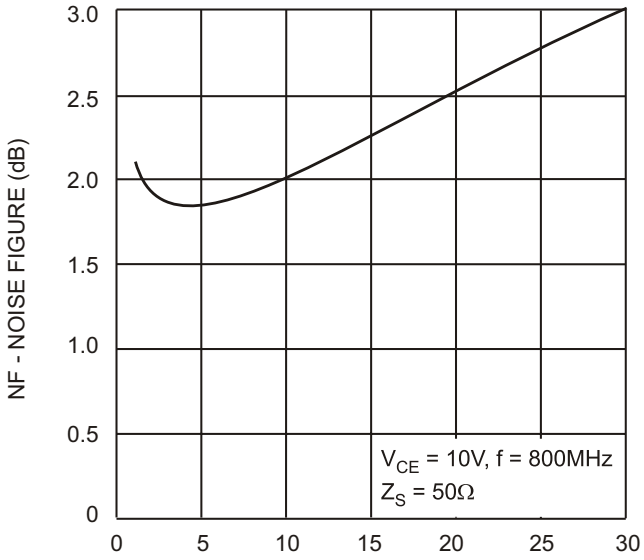


Fig 4. Noise Figure vs. Collector Current