

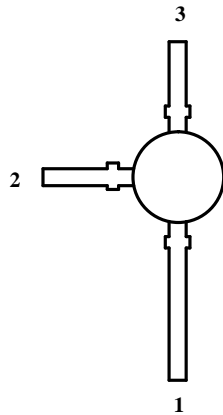
## Silicon NPN Planar RF Transistor

### Applications

RF-amplifier up to GHz range specially for wide band antenna amplifier.

### Features

- High power gain
- Low noise figure
- High transition frequency



BFR91A Marking

Plastic case (~TO 50)

1= Collector; 2= Base; 3= Emitter

### Absolute Maximum Ratings

Parameters	Symbol	Value	Unit
Collector-base voltage	$V_{CBO}$	20	V
Collector-emitter voltage	$V_{CEO}$	12	V
Emitter-base voltage	$V_{EBO}$	2	V
Collector current	$I_C$	50	mA
Total power dissipation $T_{amb} \leq 65^\circ\text{C}$	$P_{tot}$	300	mW
Junction temperature	$T_j$	150	$^\circ\text{C}$
Storage temperature range	$T_{stg}$	-65 to +150	$^\circ\text{C}$

### Maximum Thermal Resistance

Parameters	Symbol	Value	Unit
Junction ambient	$R_{thJA}$	300	K/W

### Electrical DC Characteristics

$T_j = 25^\circ\text{C}$ , unless otherwise specified

Parameters / Test Conditions	Symbol	Min.	Typ.	Max.	Unit
Collector cut-off current $V_{CB} = 10\text{ V}$	$I_{CBO}$			50	nA
Collector-base breakdown voltage $I_C = 10\ \mu\text{A}$	$V_{(BR)CBO}$	20			V
Collector-emitter breakdown voltage $I_C = 2\text{ mA}$	$V_{(BR)CEO}$	12			V
Emitter-base breakdown voltage $I_E = 10\ \mu\text{A}$	$V_{(BR)EBO}$	2			V
DC forward current transfer ratio $V_{CE} = 5\text{ V}, I_C = 30\text{ mA}$	$h_{FE}$	40	90		
Collector-emitter saturation voltage $I_C = 50\text{ mA}, I_B = 5\text{ mA}$	$V_{CEsat}$		100	400	mV

### Electrical AC Characteristics

$T_{amb} = 25^\circ\text{C}$

Parameters / Test Conditions	Symbol	Min.	Typ.	Max.	Unit
Transition frequency $V_{CE} = 5\text{ V}, I_C = 30\text{ mA}, f = 500\text{ MHz}$	$f_T$		6		GHz
Collector-emitter capacitance $V_{CE} = 5\text{ V}, f = 1\text{ MHz}$	$C_{CE}$		0.3		pF
Collector-base capacitance $V_{CB} = 10\text{ V}, f = 1\text{ MHz}$	$C_{CB}$		0.4		pF
Emitter-base capacitance $V_{EB} = 0.5\text{ V}, f = 1\text{ MHz}$	$C_{EB}$		1.5		pF
Noise figure $V_{CE} = 8\text{ V}, Z_G = 50\ \Omega, f = 800\text{ MHz},$ $I_C = 5\text{ mA}$ $I_C = 30\text{ mA}$	$F_e$ $F_e$		1.6 2.3		dB dB
Power gain $V_{CE} = 8\text{ V}, I_C = 30\text{ mA}, f = 800\text{ MHz},$ $Z_G = 50\ \Omega, Z_L = R_{Lopt}$	$G_{pe}$		14		dB
Linear output voltage – two tone intermodulation test $I_C = 30\text{ mA}, V_{CE} = 8\text{ V}, d_{IM} = 60\text{ dB},$ $f_1 = 806\text{ MHz}, f_2 = 810\text{ MHz}$	$V_1 = V_2$		280		mV
Third order intercept point $I_C = 30\text{ mA}, V_{CE} = 8\text{ V}, f = 800\text{ MHz}$	$IP_3$		32		dBm

### Common Source S-Parameters

$U_{CE} = 8 \text{ V}$ ,  $I_C = 2 \text{ mA}$

$V_{CE}/\text{V}$	$I_C/\text{mA}$	f/MHz	$S_{11}$		$S_{21}$		$S_{12}$		$S_{22}$	
			LIN MAG	ANG	LIN MAG	ANG	LIN MAG	ANG	LIN MAG	ANG
				deg		deg		deg		deg
8	2	100	0.92	-22.12	6.38	162.8	0.02	78.4	0.9	-8.1
		300	0.78	-61.3	5.42	134.7	0.05	61.5	0.88	-20.8
		500	0.64	-92.7	4.38	114.3	0.07	52.8	0.79	-28.2
		800	0.51	-128.0	3.19	92.9	0.09	49.3	0.73	-35.9
		1000	0.45	-146.3	2.65	82.3	0.10	50.4	0.71	-40.6
		1200	0.41	-161.4	2.27	73.8	0.11	53.1	0.70	-45.1
		1500	0.37	177.9	1.85	63.0	0.12	57.8	0.71	-52.3
		1800	0.34	159.7	1.58	53.4	0.14	61.8	0.73	-60.0
	2000	0.32	149.7	1.44	48.5	0.16	63.8	0.74	-64.9	
	5	100	0.79	-31.8	13.51	153.5	0.02	75.1	0.92	-13.4
		300	0.54	-78.6	9.24	119.9	0.04	61.9	0.73	-26.4
		500	0.40	-107.8	6.44	101.9	0.06	61.0	0.64	-31.1
		800	0.30	-138.4	4.30	85.7	0.09	63.7	0.59	-36.3
		1000	0.27	-153.8	3.50	77.8	0.10	65.0	0.58	-41.3
		1200	0.25	-167.2	2.98	71.1	0.12	65.7	0.58	-45.8
		1500	0.22	175.1	2.41	62.4	0.14	66.0	0.59	-53.2
1800		0.21	157.8	2.06	54.2	0.18	65.3	0.61	-60.6	
2000	0.20	149.4	1.88	49.7	0.19	64.5	0.62	-65.5		

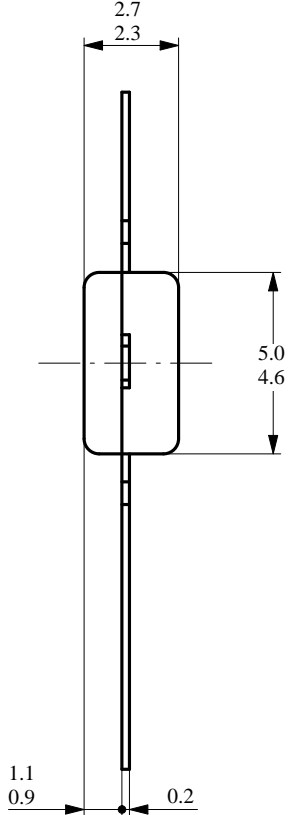
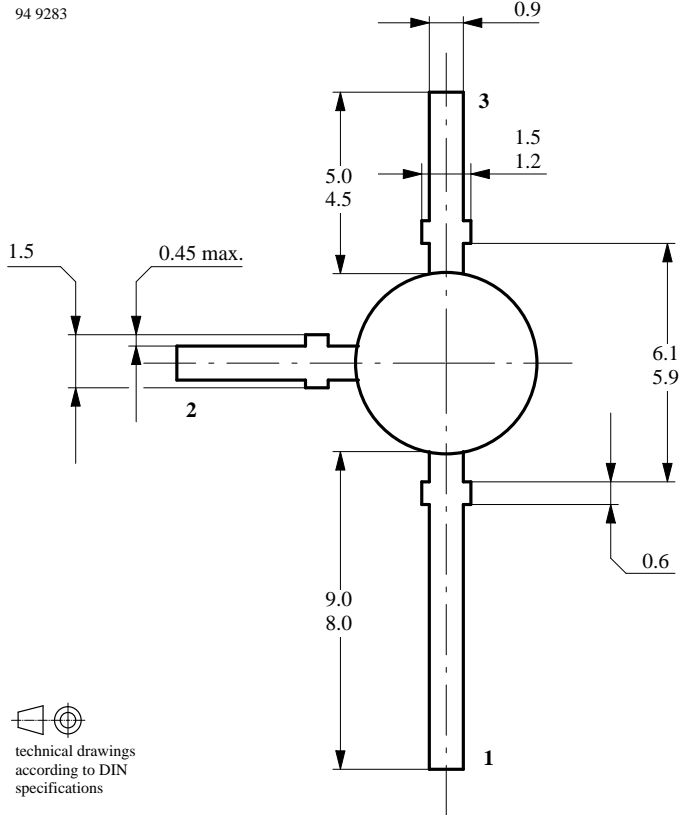
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
# TEMIC

TELEFUNKEN Semiconductors

## Dimensions in mm

94 9283



  
technical drawings  
according to DIN  
specifications

## Ozone Depleting Substances Policy Statement

It is the policy of **TEMIC TELEFUNKEN microelectronic GmbH** to

1. Meet all present and future national and international statutory requirements.
2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

**TEMIC TELEFUNKEN microelectronic GmbH** semiconductor division has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively
2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA
3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

**TEMIC** can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

**We reserve the right to make changes to improve technical design without further notice.**

Parameters can vary in different applications. All operating parameters must be validated for each customer application by the customer. Should the buyer use TEMIC products for any unintended or unauthorized application, the buyer shall indemnify TEMIC against all claims, costs, damages, and expenses, arising out of, directly or indirectly, any claim of personal damage, injury or death associated with such unintended or unauthorized use.

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