BF 998 / BF 998 R

N-Channel Dual Gate MOS-Fieldeffect Tetrode, Depletion Mode

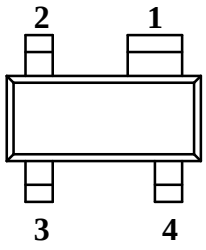
Electrostatic sensitive device.
Observe precautions for handling.

Applications

Input- and mixer stages in UHF- and VHF-tuner

Features

- Integrated gate protection diodes
- Low noise figure
- Low feedback capacitance
- High cross modulation performance
- Low input capacitance
- High AGC-range
- High gain
- Available with reverse pin configuration (BF 998 R) on request



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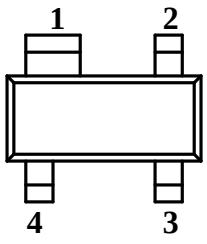

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BF998 Marking: MO
Plastic case (SOT 143)
1 = Source; 2 = Drain; 3 = Gate 2; 4 = Gate 1

BF998R Marking: MO
Plastic case (SOT 143R)
1 = Source; 2 = Drain; 3 = Gate 2; 4 = Gate 1

Absolute Maximum Ratings

Parameters	Symbol	Value	Unit
Drain source voltage	V_{DS}	12	V
Drain current	I_D	30	mA
Gate 1/gate 2-source peak current	$\pm I_{G1/G2SM}$	10	mA
Gate 1/gate 2-source voltage	$\pm V_{G1S/G2S}$	7	V
Total power dissipation $T_{amb} \leq 60$ °C	P_{tot}	200	mW
Channel temperature	T_{Ch}	150	°C
Storage temperature range	T_{stg}	–65 ... +150	°C

Maximum Thermal Resistance

Parameters	Symbol	Value	Unit
Channel ambient on glass fibre printed board 25 x 20 x 1.5 mm^3 plated with 35 µm Cu	R_{thChA}	450	K/W

Electrical DC Characteristics

T_{amb} = 25 °C

Parameters	Test Conditions / Pin	Symbol	Min	Typ	Max	Unit
Drain-source breakdown voltage	I_D = 10 µA, $-V_{G1S} = -V_{G2S}$ = 4 V	$V_{(BR)DS}$	12			V
Gate 1-source breakdown voltage	$\pm I_{G1S}$ = 10 mA, $V_{G2S} = V_{DS}$ = 0	$\pm V_{(BR)G1SS}$	8		14	V
Gate 2-source breakdown voltage	$\pm I_{G2S}$ = 10 mA, $V_{G1S} = V_{DS}$ = 0	$\pm V_{(BR)G2SS}$	8		14	V
Gate 1-source cut-off current	$\pm V_{G1S}$ = 5 V, $V_{G2S} = V_{DS}$ = 0	I_{G1SS}			50	nA
Gate 2-source cut-off current	$\pm V_{G2S}$ = 5 V, $V_{G1S} = V_{DS}$ = 0	I_{G2SS}			50	nA
Drain current	V_{DS} = 8 V, V_{G1S} = 0, V_{G2S} = 4 V					
	BF 998	I_{DSS}	4		18	mA
	BF 998 A	I_{DSS}	4		10.5	mA
	BF 998 B	I_{DSS}	9.5		18	mA
Gate 1-source cut-off voltage	V_{DS} = 8 V, V_{G2S} = 4 V, I_D = 20 µA	$-V_{G1S(OFF)}$		1.0	2.0	V
Gate 2-source cut-off voltage	V_{DS} = 8 V, V_{G1S} = 0 V, I_D = 20 µA	$-V_{G2S(OFF)}$		0.6	1.0	V

Electrical AC Characteristics

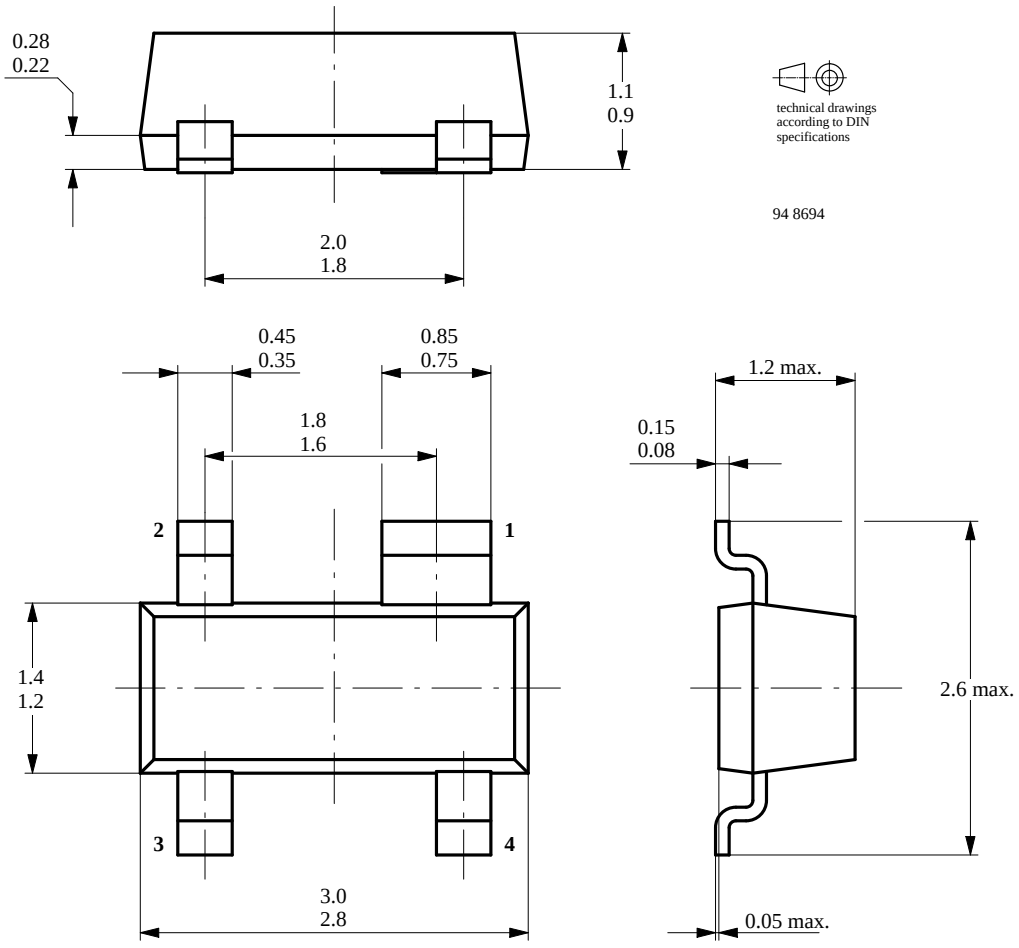
V_{DS} = 8 V, I_D = 10 mA, V_{G2S} = 4 V, f = 1 MHz, T_{amb} = 25 °C

Parameters	Test Conditions / Pin	Symbol	Min	Typ	Max	Unit
Forward transadmittance		$\lvert y_{21s} \rvert$	21	24		mS
Gate 1 input capacitance		C_{issg1}		2.1	2.5	pF
Gate 2 input capacitance	V_{G1S} = 0, V_{G2S} = 4 V	C_{issg2}		1.1		pF
Feedback capacitance		C_{rss}		25		fF
Output capacitance		C_{oss}		1.05		pF
Power gain	G_S = 2 mS, G_L = 0.5 mS, f = 200 MHz	G_{ps}		28		dB
	G_S = 3.3 mS, G_L = 1 mS, f = 800 MHz	G_{ps}	16.5	20		dB
AGC range	V_{G2S} = 4 V ... –2 V, f = 800 MHz	ΔG_{ps}	40			dB
Noise figure	G_S = 2 mS, G_L = 0.5 mS, f = 200 MHz	F		1.1		dB
	G_S = 3.3 mS, G_L = 1 mS, f = 800 MHz	F		1.6		dB

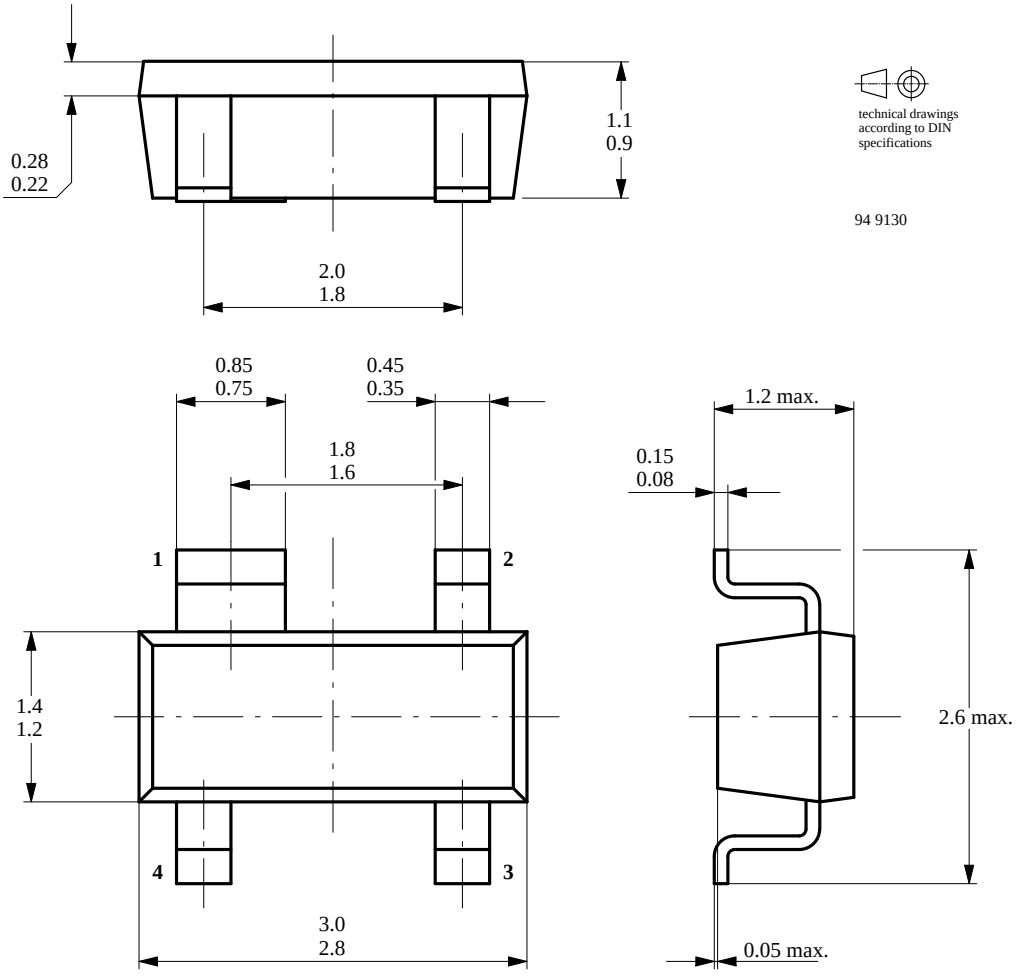
Common Source S-Parameters
V_{G2S} = 4 V, Z_0 = 50 Ω

V_{DS}/V	I_D/mA	f/MHz	S_{11}		S_{21}		S_{12}		S_{22}	
			LOG MAG	ANG	LOG MAG	ANG	LOG MAG	ANG	LOG MAG	ANG
			dB	deg	dB	deg	dB	deg	dB	deg
8	5	100	–0.03	–7.2	5.71	168.8	–55.94	83.6	–0.08	–3.6
		200	–0.15	–14.1	5.51	157.3	–50.26	76.8	–0.13	–7.0
		300	–0.34	–20.9	5.20	145.9	–47.29	70.6	–0.21	–10.4
		400	–0.57	–27.4	4.84	135.5	–45.68	65.5	–0.28	–13.5
		500	–0.83	–33.6	4.39	125.3	–44.98	60.1	–0.37	–16.7
		600	–1.10	–39.3	3.98	116.0	–44.62	58.6	–0.47	–19.5
		700	–1.35	–45.0	3.57	107.2	–45.51	56.2	–0.55	–22.5
		800	–1.62	–50.1	3.16	98.9	–45.88	58.4	–0.65	–25.1
		900	–1.84	–55.6	2.80	90.6	–46.46	64.0	–0.72	–28.2
		1000	–2.09	–60.6	2.43	83.0	–47.88	70.0	–0.77	–30.9
		1100	–2.33	–65.4	2.11	75.3	–49.66	89.8	–0.82	–33.7
		1200	–2.52	–70.2	1.79	67.5	–49.70	116.0	–0.89	–36.7
		1300	–2.72	–74.9	1.52	60.4	–47.29	145.4	–0.89	–39.6
	10	100	–0.04	–7.6	7.92	168.9	–55.74	83.2	–0.10	–3.6
		200	–0.15	–14.8	7.72	157.6	–49.95	76.8	–0.16	–7.1
		300	–0.38	–21.9	7.42	146.7	–47.09	70.5	–0.24	–10.5
		400	–0.62	–28.6	7.02	136.4	–45.38	65.4	–0.33	–13.8
		500	–0.91	–35.0	6.60	126.5	–44.69	60.1	–0.43	–17.1
		600	–1.19	–41.0	6.15	117.4	–44.43	58.8	–0.53	–19.8
		700	–1.45	–46.6	5.73	108.9	–45.21	57.0	–0.61	–22.6
		800	–1.74	–52.0	5.32	100.8	–45.48	59.5	–0.72	–25.4
		900	–2.01	–57.5	4.95	92.8	–46.06	65.2	–0.79	–28.4
		1000	–2.27	–62.5	4.58	85.4	–47.18	71.5	–0.85	–31.1
		1100	–2.52	–67.2	4.23	78.1	–48.75	89.0	–0.90	–33.8
		1200	–2.73	–72.0	3.92	70.6	–48.80	111.9	–0.96	–36.9
		1300	–2.94	–76.6	3.62	63.9	–46.98	139.8	–0.97	–39.7
	15	100	–0.04	–7.6	8.75	169.1	–55.44	83.4	–0.13	–3.7
		200	–0.16	–14.9	8.54	157.8	–49.75	76.8	–0.19	–7.2
		300	–0.39	–22.1	8.24	147.0	–46.89	70.5	–0.28	–10.6
		400	–0.64	–28.9	7.83	136.7	–45.18	65.5	–0.35	–13.9
		500	–0.93	–35.3	7.40	126.8	–44.49	60.3	–0.46	–17.2
		600	–1.22	–41.5	6.94	117.9	–44.23	59.4	–0.57	–20.0
		700	–1.50	–47.1	6.52	109.3	–44.91	57.6	–0.66	–22.8
		800	–1.80	–52.6	6.12	101.5	–45.08	60.2	–0.76	–25.7
		900	–2.06	–58.0	5.73	93.6	–45.56	65.8	–0.84	–28.6
		1000	–2.32	–62.9	5.35	86.4	–46.48	71.4	–0.90	–31.3
		1100	–2.59	–67.7	5.00	79.0	–47.85	87.0	–0.95	–34.0
		1200	–2.78	–72.4	4.68	71.7	–48.20	107.0	–1.00	–36.9
		1300	–3.00	–77.0	4.38	65.2	–46.78	133.8	–1.01	–39.9

Dimensions of BF998 in mm



Dimensions of BF998R in mm



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.

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