

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

Electrostatic sensitive device.
Observe precautions for handling.

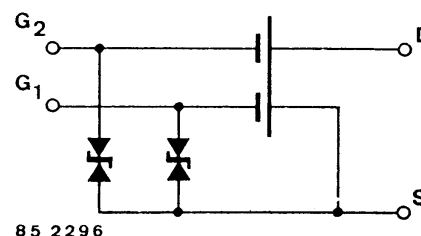
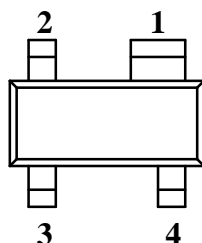


Applications

Input and mixer stages in UHF tuner.

Features

- Integrated gate protection diodes
- Low noise figure
- Low feedback capacitance
- High cross modulation performance
- Low input capacitance
- High AGC-range



94 9279

BF996S Marking: MH

Plastic case (SOT 143)

1 = Source; 2 = Drain; 3 = Gate 2; 4 = Gate 1

Absolute Maximum Ratings

Parameters	Symbol	Value	Unit
Drain source voltage	V_{DS}	20	V
Drain current	I_D	30	mA
Gate 1/gate 2-source peak current	$\pm I_{G1/G2SM}$	10	mA
Total power dissipation $T_{amb} \leq 60^\circ\text{C}$	P_{tot}	200	mW
Channel temperature	T_{Ch}	150	$^\circ\text{C}$
Storage temperature range	T_{stg}	-65 to +150	$^\circ\text{C}$

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

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

Parameters / Test Conditions	Type	Symbol	Min.	Typ.	Max.	Unit
Drain-source breakdown voltage $I_D = 10 \mu\text{A}, -V_{G1S} = -V_{G2S} = 4 \text{ V}$		$V_{(BR)DS}$	20			V
Gate 1-source breakdown voltage $\pm I_{G1S} = 10 \text{ mA}, V_{G2S} = V_{DS} = 0$		$\pm V_{(BR)G1SS}$	8		14	V
Gate 2-source breakdown voltage $\pm I_{G2S} = 10 \text{ mA}, V_{G1S} = V_{DS} = 0$		$\pm V_{(BR)G2SS}$	8		14	V
Gate 1-source leakage current $\pm V_{G1S} = 5 \text{ V}, V_{G2S} = V_{DS} = 0$		$\pm I_{G1SS}$			50	nA
Gate 2-source leakage current $\pm V_{G2S} = 5 \text{ V}, V_{G1S} = V_{DS} = 0$		$\pm I_{G2SS}$			50	nA
Drain current $V_{DS} = 15 \text{ V}, V_{G1S} = 0, V_{G2S} = 4 \text{ V}$	BF 996 S BF 996 SA BF 996 SB	I_{DSS} I_{DSS} I_{DSS}	4 4 9.5		18 10.5 18	mA mA mA
Gate 1-source cut-off voltage $V_{DS} = 15 \text{ V}, V_{G2S} = 4 \text{ V}, I_D = 20 \mu\text{A}$		$-V_{G1S(OFF)}$			2.5	V
Gate 2-source cut-off voltage $V_{DS} = 15 \text{ V}, V_{G1S} = 0, I_D = 20 \mu\text{A}$		$-V_{G2S(OFF)}$			2.0	V

Electrical AC Characteristics

$V_{DS} = 15 \text{ V}, I_D = 10 \text{ mA}, V_{G2S} = 4 \text{ V}, f = 1 \text{ MHz}, T_{amb} = 25^{\circ}\text{C}$

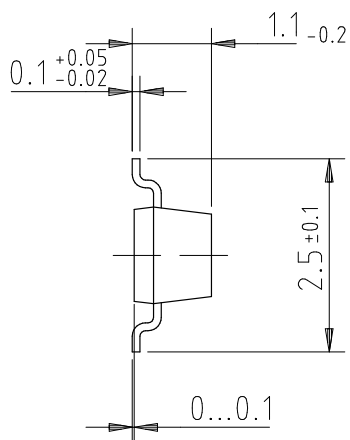
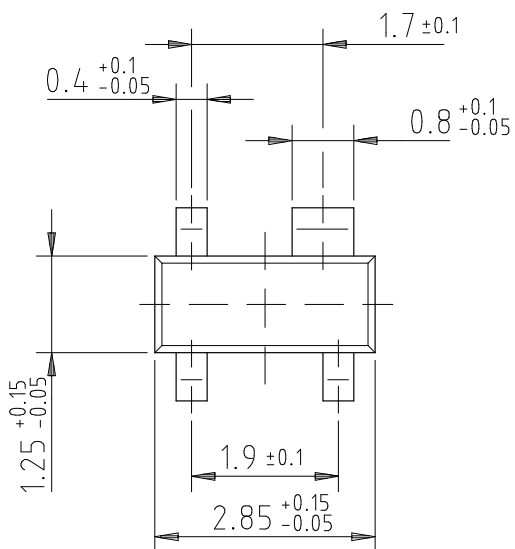
Parameters / Test Conditions	Type	Symbol	Min.	Typ.	Max.	Unit
Forward transadmittance		$ y_{21s} $	15	18.5		mS
Gate 1 input capacitance		C_{issg1}		2.2	2.6	pF
Gate 2 input capacitance $V_{G1S} = 0, V_{G2S} = 4 \text{ V}$		C_{issg2}		1.1		pF
Feedback capacitance		C_{rss}		25	35	fF
Output capacitance		C_{oss}		10.8	1.2	pF
Power gain $V_{DS} = 15 \text{ V}, I_D = 10 \text{ mA}, V_{G2S} = 4 \text{ V},$ $g_s = 2 \text{ mS}, g_L = 0.5 \text{ mS}, f = 200 \text{ MHz}$ $g_s = 3.3 \text{ mS}, g_L = 1 \text{ mS}, f = 800 \text{ MHz}$		G_{ps} G_{ps}		25 18		dB dB
AGC range $V_{DS} = 15 \text{ V}, V_{G2S} = 4 \text{ to } -2 \text{ V},$ $f = 800 \text{ MHz}$		ΔG_{ps}	40			dB
Noise figure $V_{DS} = 15 \text{ V}, I_D = 10 \text{ mA}, V_{G2S} = 4 \text{ V},$ $g_s = 2 \text{ mS}, f = 200 \text{ MHz}$ $g_s = 3.3 \text{ mS}, f = 800 \text{ MHz}$		F F		1.0 1.8		dB dB

Common Source S-Parameters

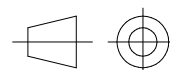
$V_{DS} = 15\text{ V}$, $V_{G2S} = 4\text{ V}$, $I_D = 5\text{ mA}$, $Z_0 = 50\ \Omega$

V_{DS}/V	I_D/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
15	5	100	0.99	-8.5	1.45	164.9	0.001	82.2	0.99	-3.4
		200	0.98	-17.7	1.52	150.9	0.003	75.6	0.98	-7.1
		300	0.95	-24.6	1.33	134.7	0.004	67.7	0.97	-9.7
		400	0.92	-32.1	1.26	121.3	0.004	62.8	0.95	-12.3
		500	0.89	-39.2	1.18	108.4	0.005	57.8	0.93	-15.1
		600	0.86	-45.8	1.11	96.5	0.005	57.3	0.92	-17.4
		700	0.83	-52.3	1.05	85.0	0.004	58.9	0.90	-19.7
		800	0.80	-58.7	0.99	74.1	0.004	63.3	0.88	-22.0
		900	0.78	-64.7	0.93	63.6	0.004	73.1	0.86	-24.3
		1000	0.75	-70.7	0.88	53.1	0.004	83.5	0.85	-26.2
		1100	0.72	-76.6	0.84	43.7	0.004	102.1	0.83	-28.4
		1200	0.70	-82.5	0.80	33.6	0.004	120.4	0.82	-30.5
	1300	0.68	-88.6	0.76	24.1	0.006	131.7	0.80	-32.7	
	10	100	0.99	-9.0	1.82	165.3	0.002	81.9	0.99	-3.5
		200	0.98	-18.7	1.90	151.8	0.003	75.0	0.98	-7.2
		300	0.95	-26.0	1.67	136.3	0.004	67.2	0.96	-9.8
		400	0.92	-33.7	1.58	123.3	0.005	61.8	0.95	-12.6
		500	0.88	-41.2	1.48	110.9	0.005	56.3	0.93	-15.3
		600	0.85	-48.3	1.39	99.5	0.005	55.8	0.91	-17.8
		700	0.82	-55.1	1.32	88.7	0.005	56.7	0.90	-20.0
		800	0.79	-61.6	1.24	78.1	0.004	60.7	0.88	-22.4
		900	0.76	-67.9	1.17	67.9	0.004	69.9	0.86	-24.6
		1000	0.73	-74.2	1.11	57.9	0.004	80.0	0.84	-26.6
		1100	0.71	-80.2	1.06	48.7	0.004	98.9	0.83	-28.8
		1200	0.68	-86.4	1.01	38.9	0.004	118.2	0.81	-31.0
	1300	0.66	-92.3	0.97	29.6	0.006	130.5	0.80	-33.3	
	15	100	0.99	-9.4	2.01	165.4	0.002	81.4	0.98	-3.6
		200	0.98	-19.4	2.10	152.0	0.003	74.6	0.97	-7.3
		300	0.94	-27.1	1.84	136.7	0.004	66.4	0.96	-10.0
		400	0.91	-35.0	1.74	123.8	0.005	60.8	0.94	-12.9
		500	0.87	-42.9	1.63	111.5	0.005	55.1	0.92	-15.7
		600	0.84	-50.3	1.53	100.3	0.005	54.4	0.91	-18.0
		700	0.81	-57.2	1.45	89.6	0.005	54.9	0.89	-20.4
		800	0.78	-63.9	1.37	79.4	0.005	58.5	0.87	-22.7
		900	0.75	-70.4	1.29	69.2	0.004	67.3	0.86	-25.0
		1000	0.72	-76.8	1.22	59.4	0.004	76.7	0.84	-27.1
1100		0.69	-82.9	1.17	50.2	0.004	95.2	0.83	-29.4	
1200		0.67	-89.0	1.12	40.8	0.004	115.3	0.81	-31.6	
1300	0.65	-95.1	1.07	31.5	0.006	128.7	0.79	-33.9		

Dimensions in mm



96 12240



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 and may do so 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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