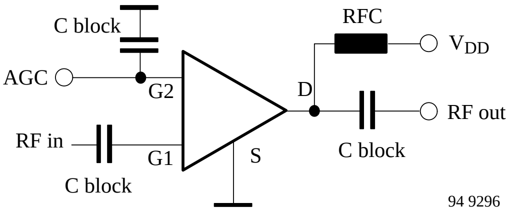
MOSMIC® for TV–Tuner Prestage with 9 V Supply Voltage

MOSMIC - **MOS M**onolithic **I**ntegrated **C**ircuit

Electrostatic sensitive device.
Observe precautions for handling.

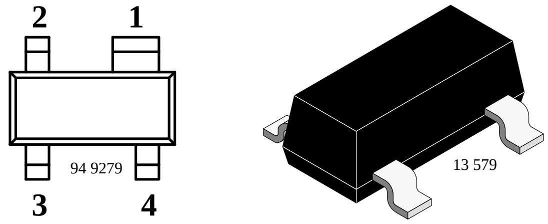
Applications

Low noise gain controlled input stages in UHF-and VHF- tuner with 9 V supply voltage.

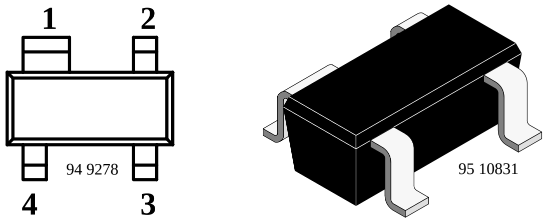


Features

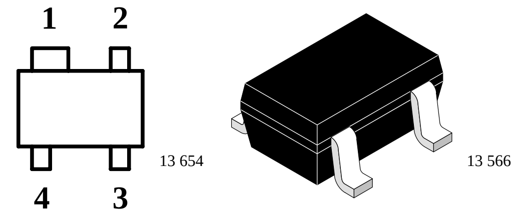
- Easy Gate 1 switch-off with PNP switching transistors inside PLL
- High AGC-range with less steep slope
- Integrated gate protection diodes
- Low noise figure
- High gain
- Improved cross modulation at gain reduction
- SMD package



S974T Marking: 974
Plastic case (SOT 143)
1 = Source, 2 = Drain, 3 = Gate 2, 4 = Gate 1



S974TR Marking: 97R
Plastic case (SOT 143R)
1 = Source, 2 = Drain, 3 = Gate 2, 4 = Gate 1



S974TRW Marking: W97
Plastic case (SOT 343R)
1 = Source, 2 = Drain, 3 = Gate 2, 4 = Gate 1

Absolute Maximum Ratings

T_{amb} = 25°C, unless otherwise specified

Parameter	Test Conditions	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		$\pm V_{G1/G2SM}$	6	V
Total power dissipation	$T_{amb} \leq 60$ °C	P_{tot}	200	mW
Channel temperature		T_{Ch}	150	°C
Storage temperature range		T_{stg}	–55 to +150	°C

Maximum Thermal Resistance

T_{amb} = 25°C, unless otherwise specified

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

Electrical DC Characteristics

T_{amb} = 25°C, unless otherwise specified

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
Drain - source breakdown voltage	$\pm I_{G1S}$ = 10 μA, $V_{G2S} = V_{G1S} = 0$	$\pm V_{(BR)DSS}$	15			V
Gate 1 - source breakdown voltage	$\pm I_{G1S}$ = 10 mA, $V_{G2S} = V_{DS} = 0$	$\pm V_{(BR)G1SS}$	7		10	V
Gate 2 - source breakdown voltage	$\pm I_{G2S}$ = 10 mA, $V_{G1S} = V_{DS} = 0$	$\pm V_{(BR)G2SS}$	7		10	V
Gate 1 - source leakage current	$+V_{G1S}$ = 5 V, $V_{G2S} = V_{DS} = 0$	$+I_{G1SS}$			20	nA
Gate 2 - source leakage current	$\pm V_{G2S}$ = 5 V, $V_{G1S} = V_{DS} = 0$	$\pm I_{G2SS}$			20	nA
Drain - source operating current	$V_{DS} = V_{RG1}$ = 9 V, V_{G2S} = 4 V, R_{G1} = 390 kΩ	I_{DSO}	8	12	16	mA
Gate 1 - source cut-off voltage	$V_{DS} = V_{RG1}$ = 9 V, V_{G2S} = 4 V, I_D = 100 μA	$V_{G1S(OFF)}$	0.4		1.2	V
Gate 2 - source cut-off voltage	$V_{DS} = V_{RG1}$ = 9 V, R_{G1} = 390 kΩ, I_D = 100 μA	$V_{G2S(OFF)}$		1.0		V

Remark on improving intermodulation behavior:

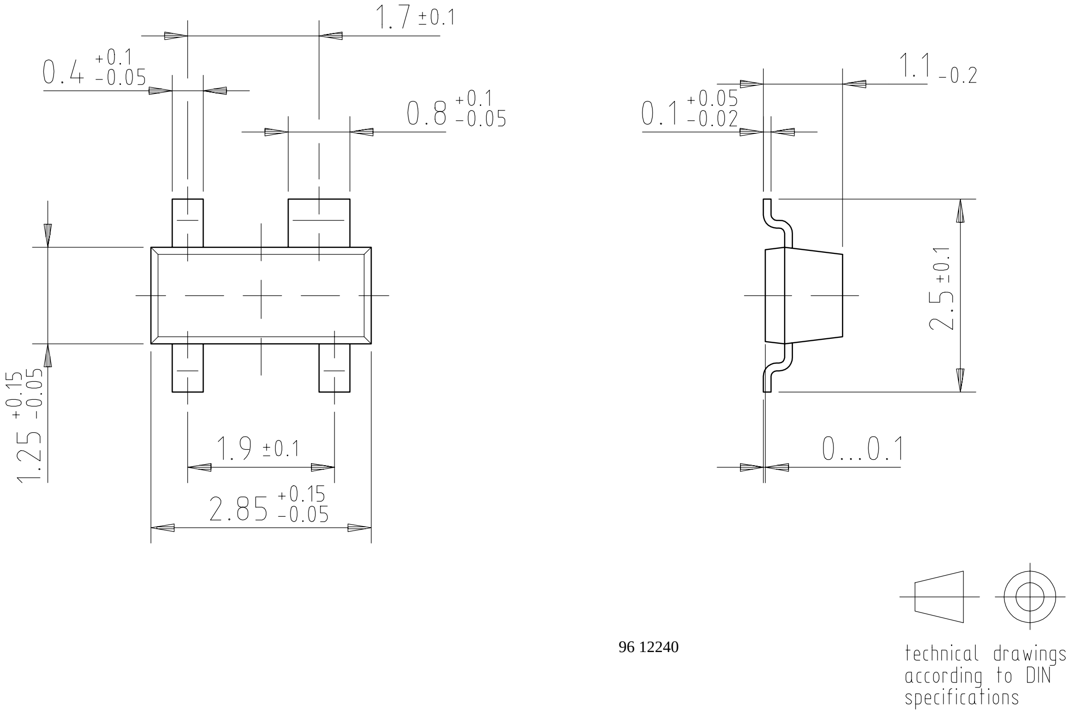
By setting R_{G1} = 300 kΩ instead of 390 kΩ, typical value of I_{DSO} will raise up to about 15 mA and improved intermodulation behavior will be performed.

Electrical AC Characteristics

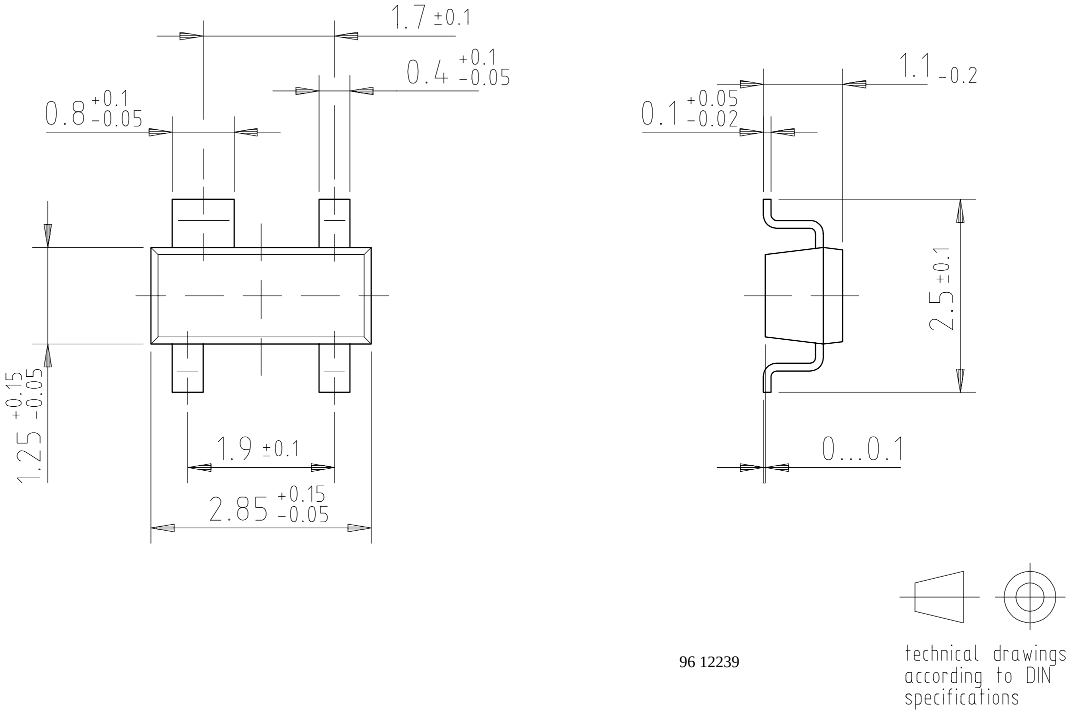
V_{DS} = 9 V, V_{G2S} = 4 V, I_D = 12 mA, f = 1 MHz , T_{amb} = 25°C, unless otherwise specified

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
Forward transadmittance		$\lvert y_{21s} \rvert$	28		35	mS
Gate 1 input capacitance		C_{issg1}		2.3	2.7	pF
Feedback capacitance		C_{rss}		25		fF
Output capacitance		C_{oss}		1.1		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}	17	21		dB
AGC range	V_{DS} = 9 V, V_{G2S} = 1 to 4 V, f = 800 MHz	ΔG_{ps}	45			dB
Noise figure	G_S = 2 mS, G_L = 0.5 mS, f = 200 MHz	F		1		dB
	G_S = 3,3 mS, G_L = 1 mS, f = 800 MHz	F		1.3		dB

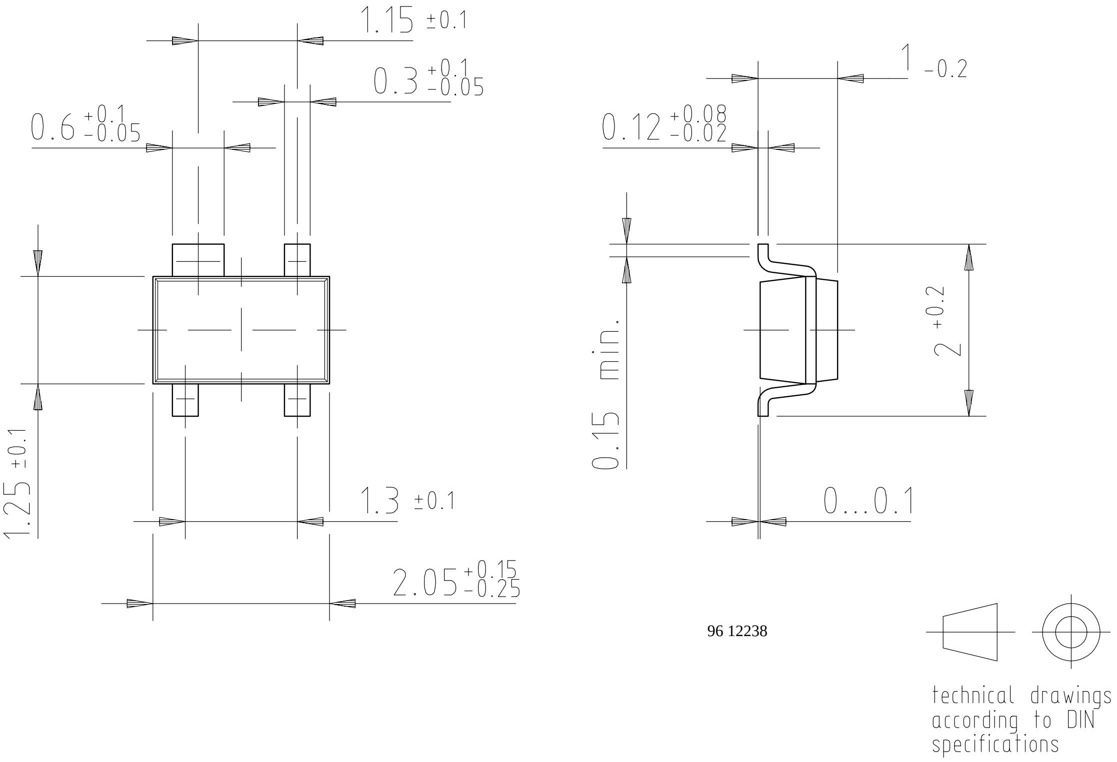
Dimensions of S974T in mm



Dimensions of S974TR in mm



Dimensions of S974TRW in mm



Ozone Depleting Substances Policy Statement

It is the policy of **Vishay Semiconductor 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.

Vishay Semiconductor GmbH 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.

Vishay Semiconductor GmbH 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 Vishay-Telefunken products for any unintended or unauthorized application, the buyer shall indemnify Vishay-Telefunken 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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