

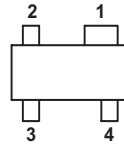
## MOSMIC<sup>®</sup> for TV-Tuner Prestage with 5 V Supply Voltage

### Comments

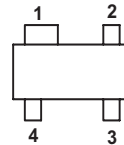
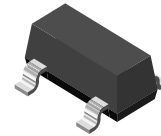
**MOSMIC** - MOS Monolithic Integrated Circuit

### Features

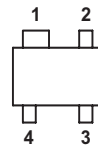
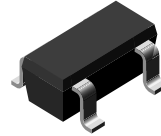
- Easy Gate 1 switch-off with PNP switching transistors inside PLL
- High AGC-range
- Integrated gate protection diodes
- Low noise figure
- High gain
- Improved cross modulation at gain reduction
- SMD package
- Lead (Pb)-free component
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC



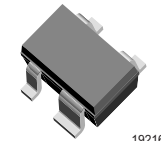
SOT-143



SOT-143R



SOT-343R



19216

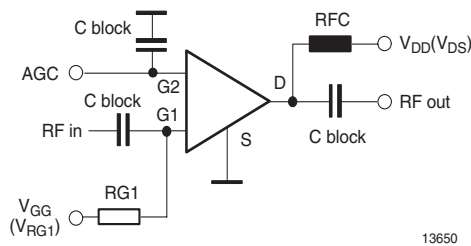


Electrostatic sensitive device.  
Observe precautions for handling.

### Applications

Low noise gain controlled input stages in UHF-and VHF- tuner with 5 V supply voltage.

### Typical Application



13650

### Mechanical Data

**Typ:** S503T

**Case:** SOT-143 Plastic case

**Weight:** approx. 8.0 mg

**Pinning:** 1 = Source, 2 = Drain,  
3 = Gate 2, 4 = Gate 1

**Typ:** S503TR

**Case:** SOT-143R Plastic case

**Weight:** approx. 8.0 mg

**Pinning:** 1 = Source, 2 = Drain,  
3 = Gate 2, 4 = Gate 1

**Typ:** S503TRW

**Case:** SOT-343R Plastic case

**Weight:** approx. 8.0 mg

**Pinning:** 1 = Source, 2 = Drain,  
3 = Gate 2, 4 = Gate 1

### Parts Table

Part	Marking	Package
S503T	503	SOT-143
S503TR	53R	SOT-143R
S503TRW	W03	SOT-343R

### Absolute Maximum Ratings

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

Parameter	Test condition	Symbol	Value	Unit
Drain - source voltage		$V_{DS}$	8	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	$T_{amb} \leq 60\text{ }^{\circ}\text{C}$	$P_{tot}$	200	mW
Channel temperature		$T_{Ch}$	150	$^{\circ}\text{C}$
Storage temperature range		$T_{stg}$	- 55 to + 150	$^{\circ}\text{C}$

### Maximum Thermal Resistance

Parameter	Test condition	Symbol	Value	Unit
Channel ambient	1)	$R_{thChA}$	450	K/W

1) on glass fibre printed board (25 x 20 x 1.5) mm<sup>3</sup> plated with 35  $\mu\text{m}$  Cu

### Electrical DC Characteristics

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

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Drain - source breakdown voltage	$I_D = 10\text{ }\mu\text{A}$ , $V_{G1S} = V_{G2S} = 0$	$V_{(BR)DSS}$	15			V
Gate 1 - source breakdown voltage	$\pm I_{G1S} = 10\text{ mA}$ , $V_{G2S} = V_{DS} = 0$	$\pm V_{(BR)G1SS}$	7		10	V
Gate 2 - source breakdown voltage	$\pm I_{G2S} = 10\text{ mA}$ , $V_{G1S} = V_{DS} = 0$	$\pm V_{(BR)G2SS}$	7		10	V
Gate 1 - source leakage current	$+ V_{G1S} = 5\text{ V}$ , $V_{G2S} = V_{DS} = 0$	$+ I_{G1SS}$			20	nA
Gate 2 - source leakage current	$\pm V_{G2S} = 5\text{ V}$ , $V_{G1S} = V_{DS} = 0$	$\pm I_{G2SS}$			20	nA
Drain - source operating current	$V_{DS} = V_{RG1} = 5\text{ V}$ , $V_{G2S} = 4\text{ V}$ , $R_{G1} = 470\text{ k}\Omega$	$I_{DSO}$	8	13	18	mA
Gate 1 - source cut-off voltage	$V_{DS} = 5\text{ V}$ , $V_{G2S} = 4$ , $I_D = 20\text{ }\mu\text{A}$	$V_{G1S(OFF)}$	0.3		1.0	V
Gate 2 - source cut-off voltage	$V_{DS} = V_{RG1} = 5\text{ V}$ , $R_{G1} = 470\text{ k}\Omega$ , $I_D = 20\text{ }\mu\text{A}$	$V_{G2S(OFF)}$		1.0		V

#### Remark on improving intermodulation behavior:

By setting  $R_{G1}$  smaller than 470 k $\Omega$ , e.g. 390 k $\Omega$  typical value of  $I_{DSO}$  will raise and improved intermodulation behavior will be performed.

### Electrical AC Characteristics

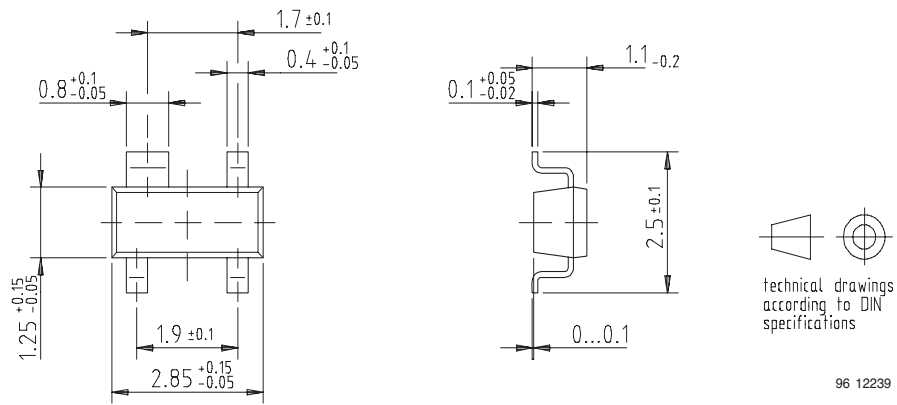
$T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified

$V_{DS} = 5\text{ V}$ ,  $V_{G2S} = 4\text{ V}$ ,  $I_D = 13\text{ mA}$ ,  $f = 1\text{ MHz}$

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Forward transadmittance		$ y_{21s} $	35	40	50	mS
Gate 1 input capacitance		$C_{issg1}$		3.2		pF
Feedback capacitance		$C_{rss}$		30		fF
Output capacitance		$C_{oss}$		1.5		pF
Power gain	$G_S = 2\text{ mS}$ , $G_L = 0.5\text{ mS}$ , $f = 200\text{ MHz}$	$G_{ps}$		28		dB
	$G_S = 3.3\text{ mS}$ , $G_L = 1\text{ mS}$ , $f = 800\text{ MHz}$	$G_{ps}$	18	23		dB

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
AGC range	$V_{DS} = 5\text{ V}$ , $V_{G2S} = 1\text{ to }4\text{ V}$ , $f = 800\text{ MHz}$	$\Delta G_{ps}$	40			dB
Noise figure	$G_S = 2\text{ mS}$ , $G_L = 0.5\text{ mS}$ , $f = 200\text{ MHz}$	F		1		dB
	$G_S = 3.3\text{ mS}$ , $G_L = 1\text{ mS}$ , $f = 800\text{ MHz}$	F		1.3		dB

## Package Dimensions in mm

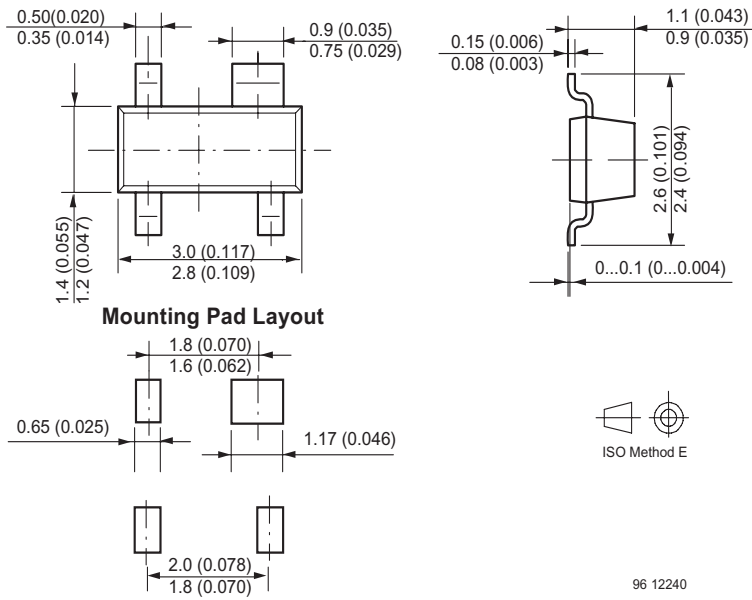


# S503T/S503TR/S503TRW

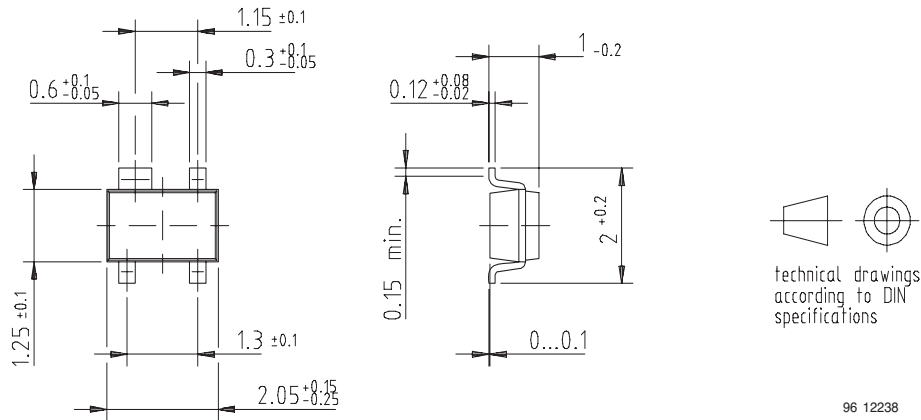


Vishay Semiconductors

## Package Dimensions in mm



## Package Dimensions 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.

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