



MOSMIC[®] for TV-Tuner Prestage with 5 V Supply Voltage

Comments

MOSMIC - MOS Monolithic Integrated Circuit

Features

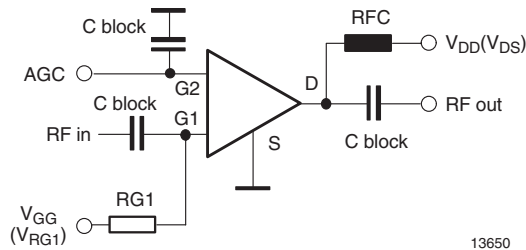
- Easy Gate 1 switch-off with PNP switching transistors inside PLL
- High AGC-range
- Integrated gate protection diodes
- Low noise figure
- High gain
- Improved cross modulation at gain reduction
- SMD package
- Lead (Pb)-free component
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC



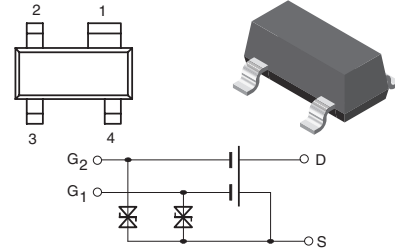
Applications

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

Typical Application



13650



Electrostatic sensitive device. Observe precautions for handling.

13628

Mechanical Data

Typ: S505T

Case: SOT143 Plastic case

Weight: approx. 8.0 mg

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

Typ: S505TR

Case: SOT143R Plastic case

Weight: approx. 8.0 mg

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

Typ: S505TRW

Case: SOT343R Plastic case

Weight: approx. 6.0 mg

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

Parts Table

Part	Marking	Package
S505T	505	SOT143
S505TR	55R	SOT143R
S505TRW	W05	SOT343R

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) mm³ plated with 35 μm 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	$V_{DS} = V_{RG1} = 5\text{ V}$, $V_{G2S} = 4\text{ V}$, $R_{G1} = 220\text{ k}\Omega$	I_{DSO}	10	13	18	mA
Gate 1 - source cut-off voltage	$V_{DS} = 5\text{ V}$, $V_{G2S} = 4\text{ V}$, $I_D = 20\text{ }\mu\text{A}$	$V_{G1S(OFF)}$	0.4		1.2	V
Gate 2 - source cut-off voltage	$V_{DS} = V_{RG1} = 5\text{ V}$, $R_{G1} = 220\text{ k}\Omega$, $I_D = 20\text{ }\mu\text{A}$	$V_{G2S(OFF)}$		1.0		V

Remark on improving intermodulation behavior:

By setting R_{G1} smaller than 220 k Ω , e.g. 180 k Ω typical value of I_{DSO} will raise and improved intermodulation behavior will be performed.

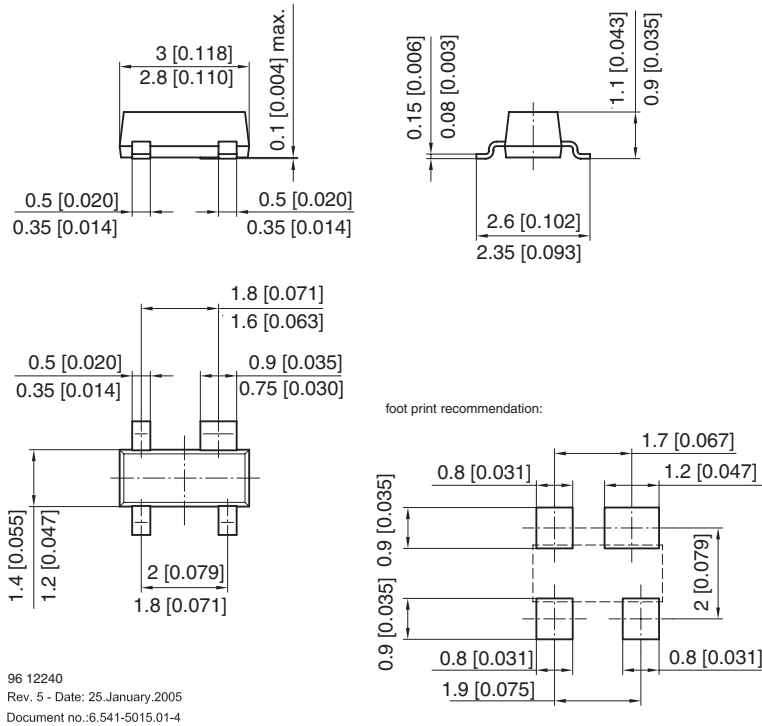
Electrical AC Characteristics

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

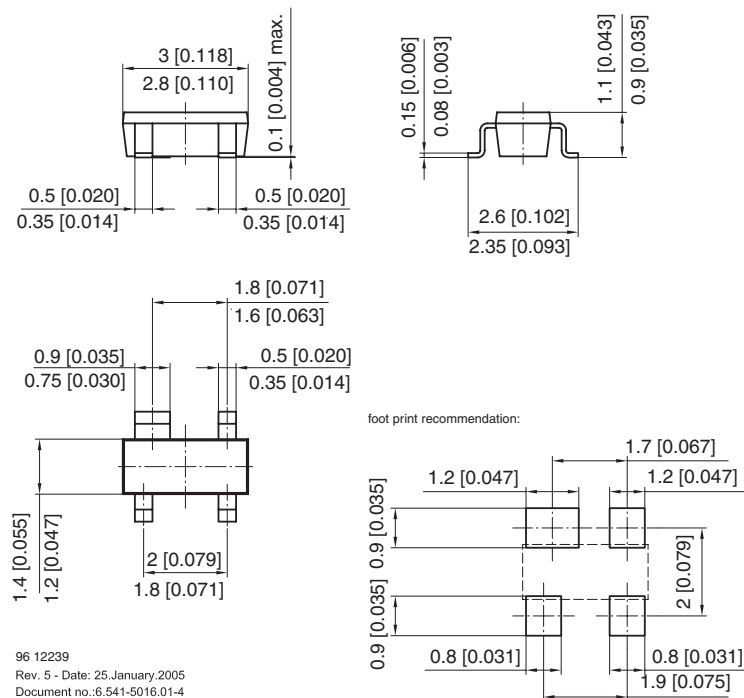
$V_{DS} = 5\text{ V}$, $V_{G2S} = 4\text{ V}$, $I_D = 13\text{ mA}$, $f = 1\text{ MHz}$

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Forward transadmittance		$ y_{21s} $	28	30	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	$G_S = 2\text{ mS}$, $G_L = 0.5\text{ mS}$, $f = 200\text{ MHz}$	G_{ps}		28		dB
	$G_S = 3.3\text{ mS}$, $G_L = 1\text{ mS}$, $f = 800\text{ MHz}$	G_{ps}	17	21		dB
AGC range	$V_{DS} = 5\text{ V}$, $V_{G2S} = 1\text{ to }4\text{ V}$, $f = 800\text{ MHz}$	ΔG_{ps}	45			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 (Inches): SOT143



Package Dimensions in mm (Inches): SOT143R

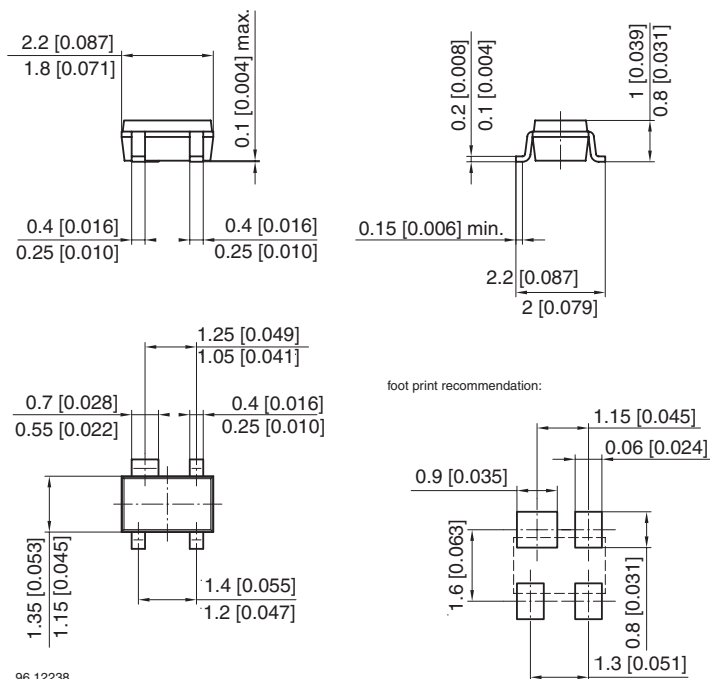


S505T/S505TR/S505TRW

Vishay Semiconductors



Package Dimensions in mm (Inches): SOT343R



96 12238
Rev. 4 - Date: 26 January 2005
Document no.: 6.541-5042.01-4



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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