



Not for new design, this product will be obsoleted soon

# TSDF02424X/TSDF02424XR

Vishay Semiconductors

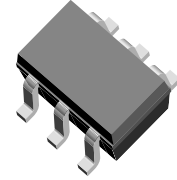
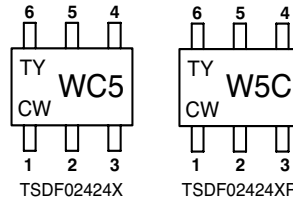
## Dual - MOSMIC<sup>®</sup> - two AGC Amplifiers for TV-Tuner Prestage with 5 V Supply Voltage

### Comments

MOSMIC - MOS Monolithic Integrated Circuit

### Features

- Two AGC amplifiers in a single package
- Easy Gate 1 switch-off with PNP switching transistors inside PLL
- Integrated gate protection diodes
- Low noise figure
- High gain, medium forward transadmittance (24 mS typ.)
- Biasing network on chip
- Improved cross modulation at gain reduction
- High AGC-range with less steep slope
- SMD package, reverse pinning possible
- Lead (Pb)-free component
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC



Electrostatic sensitive device. Observe precautions for handling.

16602

### Mechanical Data

**Typ:** TSDF02424X

**Case:** SOT-363 Plastic case

**Weight:** approx. 6.0 mg

**Pinning:** 1 = Gate 1 (amplifier 1), 2 = Gate 2, 3 = Drain (amplifier 1), 4 = Drain (amplifier 2), 5 = Source, 6 = Gate1 (amplifier 2)

**Typ:** TSDF02424XR

**Case:** SOT-363 Plastic case

**Weight:** approx. 6.0 mg

**Pinning:** 1 = Gate 1 (amplifier 1), 2 = Source, 3 = Drain (amplifier 1), 4 = Drain (amplifier 2), 5 = Gate 2, 6 = Gate1 (amplifier 2)

V - Vishay

Y - Year, is variable for digit from 0 to 9 (e.g. 0 = 2000, 1 = 2001)

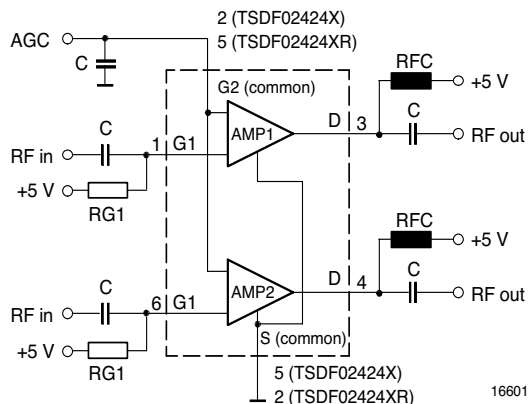
CW - Calendar Week, is variable for number from 01 to 52

Number of Calendar Week is always indicating place of pin 1

### Applications

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

### Typical Application



### Parts Table

Part	Marking	Package
TSDF02424X	WC5	SOT-363
TSDF02424XR	W5C	SOT-363R

All of following data and characteristics are valid for operating either amplifier 1 (pin 1, 3, 2, 5) or amplifier 2 (pin 6, 4, 2, 5)

### 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		$I_D$	25	mA
Gate 1/Gate 2 - source peak current		$\pm I_{G1/G2SM}$	10	mA
Gate 1/Gate 2 - source voltage		$+ V_{G1/\pm G2SM}$	6	V
		$- V_{G1SM}$	1.5	V
Total power dissipation	$T_{amb} \leq 60\text{ }^{\circ}\text{C}$	$P_{tot}$	160	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	$I_D = 10\text{ }\mu\text{A}$ , $V_{G1S} = V_{G2S} = 0$	$V_{(BR)DSS}$	12			V
Gate 1 - source breakdown voltage	$+ I_{G1S} = 10\text{ mA}$ , $V_{G2S} = V_{DS} = 0$	$+ V_{(BR)G1SS}$	7		10	V
Gate 2 - source breakdown voltage	$\pm I_{G2S} = 10\text{ mA}$ , $V_{G2S} = V_{DS} = 0$	$\pm V_{(BR)G2SS}$	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	$V_{DS} = V_{RG1} = 5\text{ V}$ , $V_{G2S} = 4\text{ V}$ , $R_{G1} = 56\text{ k}\Omega$	$I_{DSO}$	8	13	18	mA
Gate 1 - source cut-off voltage	$V_{DS} = 5\text{ V}$ , $V_{G2S} = 4$ , $I_D = 20\text{ }\mu\text{A}$	$V_{G1S(OFF)}$	0.5		1.3	V
Gate 2 - source cut-off voltage	$V_{DS} = V_{RG1} = 5\text{ V}$ , $R_{G1} = 56\text{ k}\Omega$ , $I_D = 20\text{ }\mu\text{A}$	$V_{G2S(OFF)}$	0.8	1.0	1.4	V

#### Remark on improving intermodulation behavior:

By setting  $R_{G1}$  smaller than 56 k $\Omega$ , typical value of  $I_{DSO}$  will raise and improved intermodulation behavior will be performed.

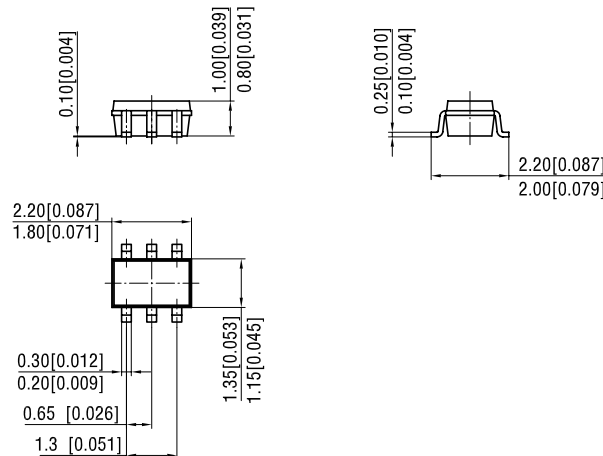
## Electrical AC Characteristics

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

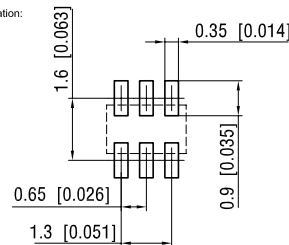
$V_{DS} = V_{RG1} = 5\text{ V}$ ,  $V_{G2S} = 4\text{ V}$ ,  $R_{G1} = 56\text{ k}\Omega$ ,  $I_D = I_{DSO}$ ,  $f = 1\text{ MHz}$

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Forward transadmittance		$ Y_{21s} $	20	24	28	mS
Gate 1 input capacitance		$C_{issg1}$		1.7	2.1	pF
Feedback capacitance		$C_{rss}$		15	30	fF
Output capacitance		$C_{oss}$		0.9		pF
Power gain	$G_S = 2\text{ mS}$ , $G_L = 0.5\text{ mS}$ , $f = 200\text{ MHz}$	$G_{ps}$		26		dB
	$G_S = 3.3\text{ mS}$ , $G_L = 1\text{ mS}$ , $f = 800\text{ MHz}$	$G_{ps}$	16.5	21		dB
AGC range	$V_{DS} = 5\text{ V}$ , $V_{G2S} = 1\text{ to }4\text{ V}$ , $f = 800\text{ MHz}$	$\Delta G_{ps}$		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
Cross modulation	Input level for $k = 1\%$ @ $0\text{ dB}$ AGC $f_w = 50\text{ MHz}$ , $f_{unw} = 60\text{ MHz}$	$X_{mod}$	90			dB $\mu$ V
	Input level for $k = 1\%$ @ $40\text{ dB}$ AGC $f_w = 50\text{ MHz}$ , $f_{unw} = 60\text{ MHz}$	$X_{mod}$	100	105		dB $\mu$ V

## Package Dimensions in mm (Inches)



foot print recommendation:



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14280

### 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  
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