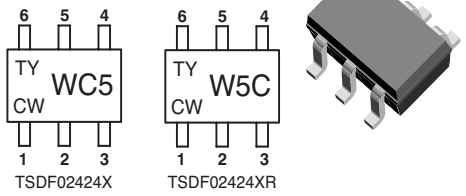
Dual - MOSMIC®- two AGC Amplifiers for TV-Tuner Prestage with 5 V Supply Voltage

Comments

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

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.

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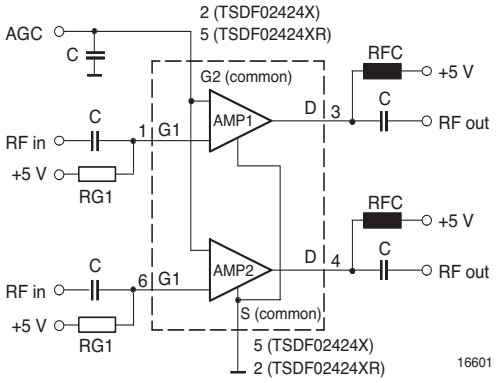
Applications

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

Typical Application



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

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 °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	$T_{amb} \leq 60$ °C	P_{tot}	160	mW
Channel temperature		T_{Ch}	150	°C
Storage temperature range		T_{stg}	- 55 to + 150	°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^3 plated with 35 µm Cu

Electrical DC Characteristics

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

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Drain - source breakdown voltage	I_D = 10 µA, $V_{G1S} = V_{G2S} = 0$	$V_{(BR)DSS}$	12			V
Gate 1 - source breakdown voltage	$+ I_{G1S}$ = 10 mA, $V_{G2S} = V_{DS} = 0$	$+ V_{(BR)G1SS}$	7		10	V
Gate 2 - source breakdown voltage	$\pm I_{G2S}$ = 10 mA, $V_{G2S} = V_{DS} = 0$	$\pm V_{(BR)G2SS}$	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	$V_{DS} = V_{RG1}$ = 5 V, V_{G2S} = 4 V, R_{G1} = 56 kΩ	I_{DSO}	8	13	18	mA
Gate 1 - source cut-off voltage	V_{DS} = 5 V, V_{G2S} = 4, I_D = 20 µA	$V_{G1S(OFF)}$	0.5		1.3	V
Gate 2 - source cut-off voltage	$V_{DS} = V_{RG1}$ = 5 V, R_{G1} = 56 kΩ, I_D = 20 µA	$V_{G2S(OFF)}$	0.8	1.0	1.4	V

Remark on improving intermodulation behavior:

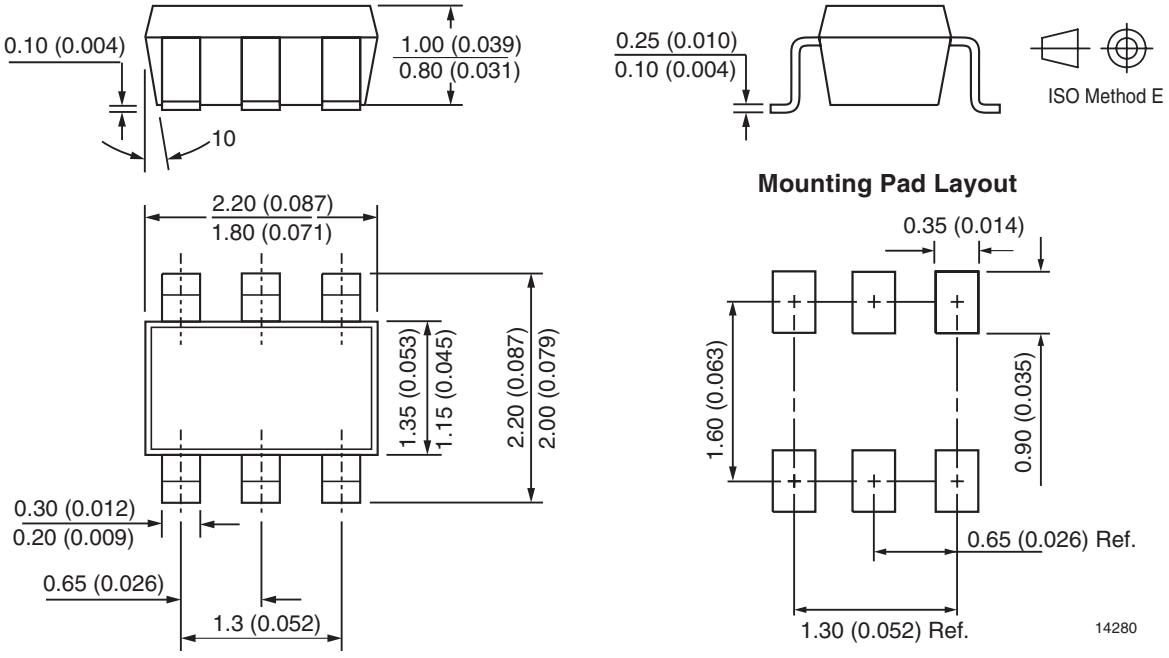
By setting R_{G1} smaller than 56 kΩ, typical value of I_{DSO} will raise and improved intermodulation behavior will be performed.

Electrical AC Characteristics

T_{amb} = 25 °C, unless otherwise specified
$V_{DS} = V_{RG1}$ = 5 V, V_{G2S} = 4 V, R_{G1} = 56 kΩ, $I_D = I_{DSO}$, f = 1 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 mS, G_L = 0.5 mS, f = 200 MHz	G_{ps}		26		dB
	G_S = 3,3 mS, G_L = 1 mS, f = 800 MHz	G_{ps}	16.5	21		dB
AGC range	V_{DS} = 5 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
Cross modulation	Input level for k = 1 % @ 0 dB AGC f_w = 50 MHz, f_{unw} = 60 MHz	X_{mod}	90			dBµV
	Input level for k = 1 % @ 40 dB AGC f_w = 50 MHz, f_{unw} = 60 MHz	X_{mod}	100	105		dBµV

Package Dimensions in mm (Inches)



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.

Vishay Semiconductor GmbH, P.O.B. 3535, D-74025 Heilbronn, Germany

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