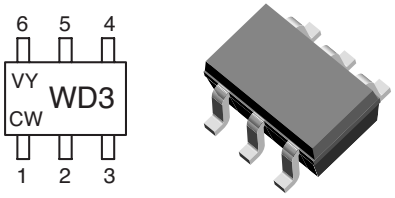
# Dual - MOSMIC®- two AGC Amplifiers for TV-Tuner Prestage with 5 V Supply Voltage

## Comments

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

## Features

- Two AGC amplifiers in a single package
- Integrated gate protection diodes
- Low noise figure
- High gain, high forward transadmittance (30 mS typ.)
- Biasing network on chip
- Improved cross modulation at gain reduction
- High AGC-range with less steep slope
- SMD package
- Lead (Pb)-free component
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

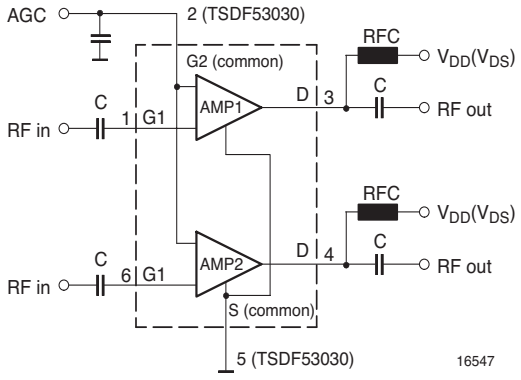



Electrostatic sensitive device.
Observe precautions for handling

## Applications

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

## Typical Application




## Mechanical Data

**Case:** SOT-363 Plastic case

**Weight:** approx. 6.0 mg

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

**Pinning:**

1 = Gate 1 (amplifier 1), 2 = Gate 2,

3 = Drain (amplifier 1), 4 = Drain (amplifier 2),

5 = Source, 6 = Gate 1 (amplifier 2),

## Parts Table

| Part | Marking | Package |
|---|---|---|
| TSDF53030 | WD3 | SOT-363 |

## Absolute Maximum Ratings

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

| 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 | $T_{amb} \leq 60$ °C | $P_{tot}$ | 200 | 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 |
|---|---|---|---|---|---|---|
| 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, $V_{G2S} = V_{DS} = 0$ | + $I_{G1SS}$ | | | 50 | µA |
| | - $V_{G1S}$ = 5 V, $V_{G2S} = V_{DS} = 0$ | - $I_{G1SS}$ | | | 100 | µA |
| Gate 2 - source leakage current | $\pm V_{G2S}$ = 5 V, $V_{G1S} = V_{DS} = 0$ | $\pm I_{G2SS}$ | | | 20 | nA |
| Drain current | $V_{DS}$ = 5 V, $V_{G1S}$ = 0, $V_{G2S}$ = 4 V | $I_{DSS}$ | 50 | | 500 | µA |
| Self-biased operating current | $V_{DS}$ = 5 V, $V_{G1S}$ = nc, $V_{G2S}$ = 4 V | $I_{DSP}$ | 9 | 13 | 18 | mA |
| Gate 2 - source cut-off voltage | $V_{DS}$ = 5 V, $V_{G1S}$ = nc, $I_D$ = 20 µA | $V_{G2S(OFF)}$ | 0 | 1.0 | 0 | V |

## Electrical AC Characteristics

$T_{amb}$ = 25 °C, unless otherwise specified
$V_{DS}$ = 5 V, $V_{G2S}$ = 4 V, $I_D = I_{DSP}$ , f = 1 MHz

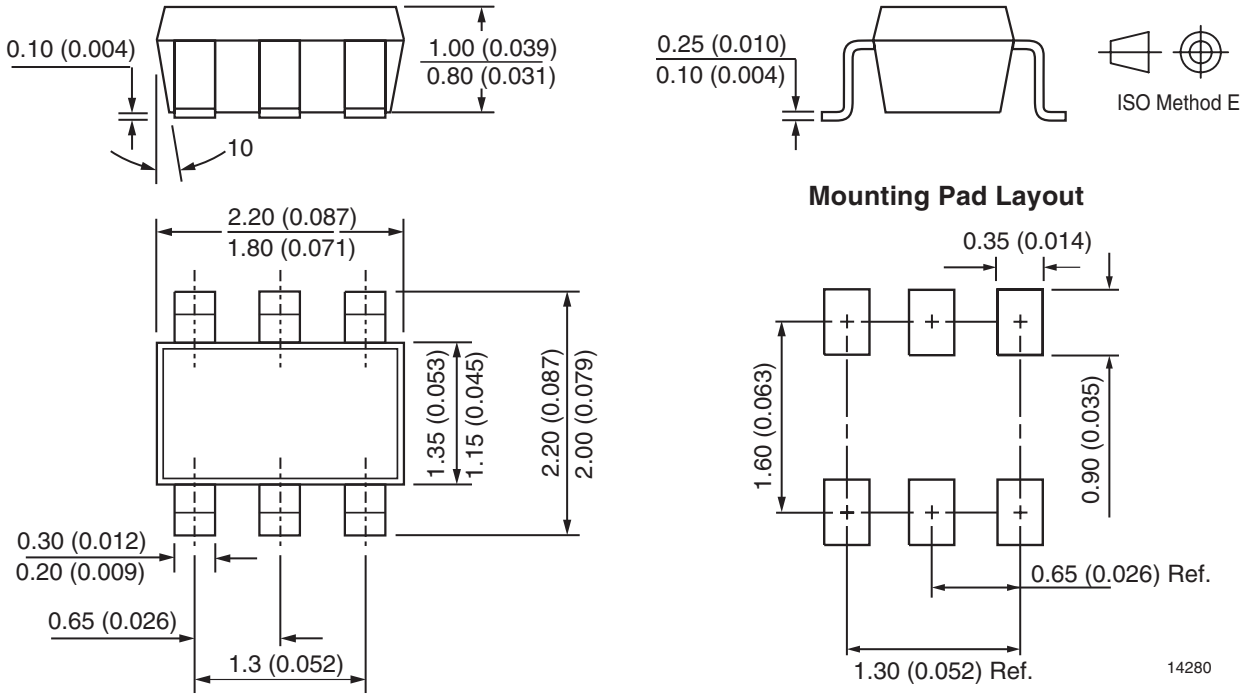
| Parameter | Test condition | Symbol | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|---|
| Forward transadmittance | | $\lvert y_{21s} \rvert$ | 28 | 31 | 35 | mS |
| Gate 1 input capacitance | | $C_{issg1}$ | | 2.4 | 3.0 | pF |
| Feedback capacitance | | $C_{rss}$ | | 25 | | fF |
| Output capacitance | | $C_{oss}$ | | 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 | 20 | | dB |
| AGC range | $V_{DS}$ = 5 V, $V_{G2S}$ = 1 to 4 V, f = 800 MHz | $\Delta G_{ps}$ | | 45 | | dB |

| Parameter | Test condition | Symbol | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|---|
| 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 | | | dBµV |

## Caution for Gate 1 switch-off mode:

No external DC-voltage on Gate 1 in active mode!
Switch-off at Gate 1 with $V_{G1S}$ < 0.7 V is feasible.
Using open collector switching transistor
(inside of PLL), insert 10 kΩ collector resistor.

## Package Dimensions in mm (Inches)



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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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