RF Front-End T/R Chip

AAS1601

Product Specification

V1.0

1. 产品 Product Features

Operating Frequency: ： 14~18 GHz
Transmit Channel:

- Output Power: 31.8 dBm @ Pin = 8 dBm
- Power-Added Efficiency (PAE): 41.0% @ Pin = 8 dBm
- Drain Dynamic Current: 720 mA @ Pin = 8 dBm
- Power Gain: 23.7 dB @ Pin = 8 dBm
- Input Return Loss: 18 dB
- Small-Signal Gain: 30.0 dB
- Bias Conditions: VD1 = VD2 = VD3 = 5 V, SW1 = -5 V, SW2 = 0 V, VG = -0.5 V, IDQ = 538 mA

Receive Channel:

- Small-Signal Gain: 27.0 dB
- Noise Figure (NF): 2.4 dB
- Output P1dB: 3.5 dBm
- Power Withstanding Capability: 38 dBm (CW, 25 ℃)
- Bias Conditions: VDR = 3.3 V, SW1 = 0 V, SW2 = -5 V, IDQ = 12 mA

Chip Dimensions:

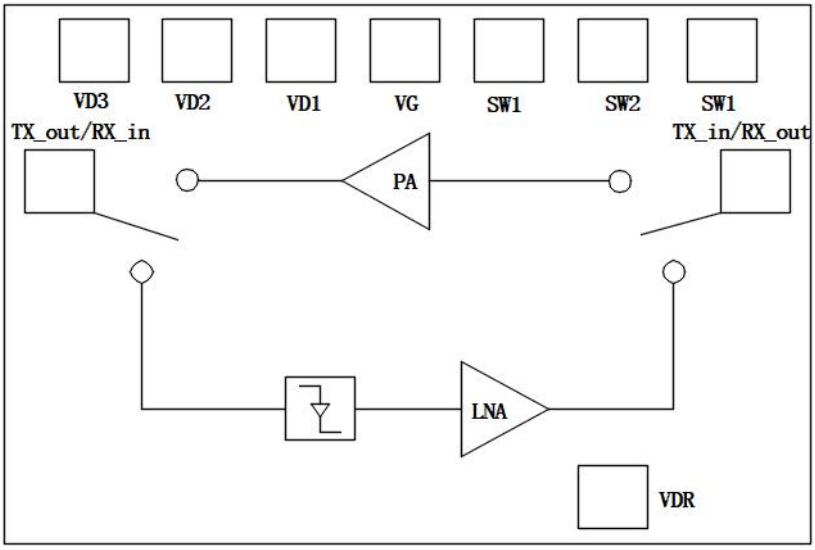
- PA: 2.5 mm × 1.95 mm × 0.05 mm
- LNA: 0.8 mm × 0.65 mm × 0.1 mm
- Limiter: 1.0 mm × 0.65 mm × 0.1 mm

2. Functional Description

This chip is a GaAs RF front-end T/R chip operating at 14 - 18 GHz. Tested under continuous wave (CW) conditions, the transmit channel achieves a power gain of 23.7 dB and a saturated output power of 31.8 dBm at a supply voltage of +5 V, with a typical power-added efficiency of 41.0%. The receive channel provides a gain of 27.0 dB at a supply voltage of +3.3 V, with an output P1dB of 3.5 dBm and a typical noise figure of 2.4 dB.

The chip features a 50 Ω port impedance and is grounded via backside metallization.

3. Block Diagram



4. Typical Applications

Suitable for applications including communications, radar, electronic warfare, and other related fields。

5. Electrical Performance Parameters

5.1 RF Characteristics – Transmit Channel

Unless otherwise specified, measurements are performed under the following test conditions:VD1 = VD2 = VD3 = 5 V (typical), IDQ = 538 mA, VG = -0.5 V (typical), SW1 = -5 V, SW2 = 0 V, large-signal Pin = 8 dBm, TA = +25 ℃, 50 Ω system, tested under continuous wave.