RF Front-End T/R Chip

AAS1605

Product Specification

V1.0

1. Product Features

Operating Frequency: 14 ~ 18 GHz

Transmit Channel:

- Output Power: 28 dBm @ Pin = 13 dBm
- Power-Added Efficiency (PAE): 44% @ Pin = 13 dBm
- Drain Dynamic Current: 350 mA @ Pin = 13 dBm
- Power Gain: 15.5 dB @ Pin = 13 dBm
- Input Return Loss: 15 dB
- Small-Signal Gain: 21 dB
- Bias Conditions: VD1 = VD2 = 5 V, SW1 = 0 V, SW2 = -5 V, VG = -0.6 V, IDQ = 155 mA

Receive Channel:

- Small-Signal Gain: 25 dB
- Noise Figure: 2.3 dB
- Output P1dB: 4 dBm
- Power Withstanding Capability: 38 dBm (CW, 25℃)
- Bias Conditions: VDD = 3.3 V, SW1 = -5 V, SW2 = 0 V, IDQ = 12 mA

Chip Dimensions:

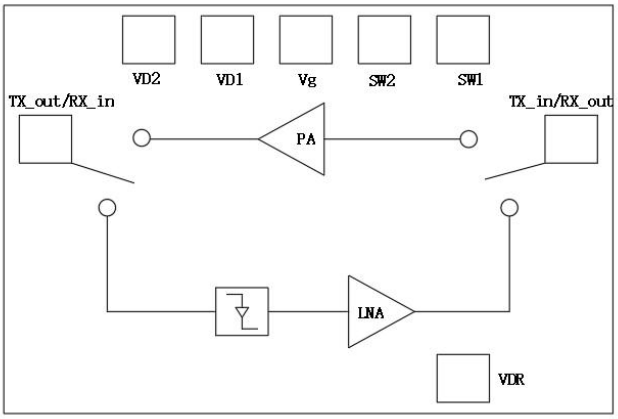
- PA: 2.2 mm × 1.9 mm × 0.05 mm
- LNA: 0.8 mm × 0.65 mm × 0.1 mm
- Limiter: 1.0 mm × 0.65 mm × 0.1 mm

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, operating at +5 V, provides a power gain of 15.5 dB and a saturated output power of 28 dBm, with a typical power-added efficiency of 44%. The receive channel, operating at +3.3 V, provides a gain of 25 dB, an output P1dB of 4 dBm, and a typical noise figure of 2.3 dB.

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

3. Block Diagram



4. Typical Applications

Suitable for applications including communications, radar, and related fields.

5. Electrical Performance Parameters

5.1 RF Characteristics – Transmit Channel

Test Conditions (unless otherwise specified):VD1 = VD2 = 5 V (typical), IDQ = 155 mA, VG = -0.6 V (typical), SW1 = 0 V, SW2 = -5 V, large-signal Pin = 13 dBm, TA = +25℃, 50 Ω system, measured under continuous wave (CW).