

## Description

The F5728 is a highly integrated RF upconverter/downconverter used in 5G beamforming applications targeting the 26GHz and 28GHz bands. The device uses classic Tx and Rx heterodyne architectures to convert 3GHz to 9GHz IF signals to the 5G NR (new radio) millimeter wave (mmWave) bands spanning the 24GHz to 30GHz spectrum. Low-side local oscillator (LO) injection is used for both bands, with the F5728's Tx and Rx mixer cores supporting internal LO frequencies ranging between 15GHz and 27GHz. LO feed requirements are eased by the device's two sequential on-chip LO frequency doublers which yield net multiplicative factors of either 2x or 4x.

All RF, IF, and LO ports use single-ended 50Ω impedances for ease of integration into the signal path. Each device uses a single 2.5V analog supply with 280mA and 250mA of  $I_{CC}$  in the Tx and Rx modes, respectively. The digital core and SPI utilize a separate 1.8V supply.

The F5728 is packaged in 4.0 × 4.0 mm, 49-BGA package and is rated for operation over the -40°C to 105°C temperature range.

## Typical Applications

- 5G phased arrays
- Massive MIMO

## Features

### General

- RF range: 24GHz to 30GHz
- IF range: 3GHz to 9GHz
- Two integrated LO frequency doublers
- Operating temperature ( $T_A$ ) range: -40°C to +105°C
- 4.0 × 4.0 mm, 49-BGA package

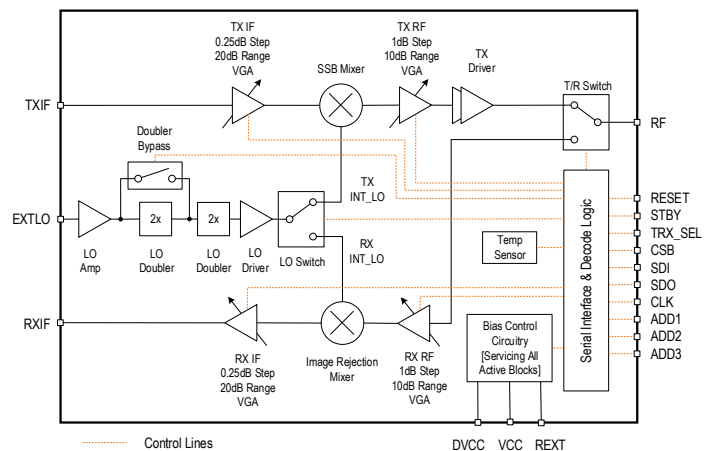
### Transmit Mode

- 25dB conversion gain
- +16dBm OP1dB
- 30dB of *Glitch-Free™* gain adjustment
  - 20dB IF adjustment in 0.25dB steps
  - 10dB RF adjustment in 1dB steps
- $I_{CC} = 280mA$  with a 2.5V analog supply voltage (quiescent)

### Receive Mode

- 22dB conversion gain
- 7dB noise figure
- 30dB of *Glitch-Free™* gain adjustment
  - 20dB IF adjustment in 0.25dB steps
  - 10dB RF adjustment in 1dB steps
- $I_{CC} = 250mA$  with a 2.5V analog supply voltage

## Block Diagram



## Ordering Information

Orderable Part Number	Package	MSL Rating	Shipping Packaging	Temperature
F5728ANGI	4.0 × 4.0 mm, 49-BGA	1	Tray	-40°C to +105°C
F5728ANGI8	4.0 × 4.0 mm, 49-BGA	1	Reel	-40°C to +105°C
F5728EVS	Evaluation Board			

## Revision History

Revision Date	Description of Change
May 12, 2020	Initial release.

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