

PE128300

Document Category: Product Brief

Dual-channel Up-Down Converter, 24.25–29.50 GHz



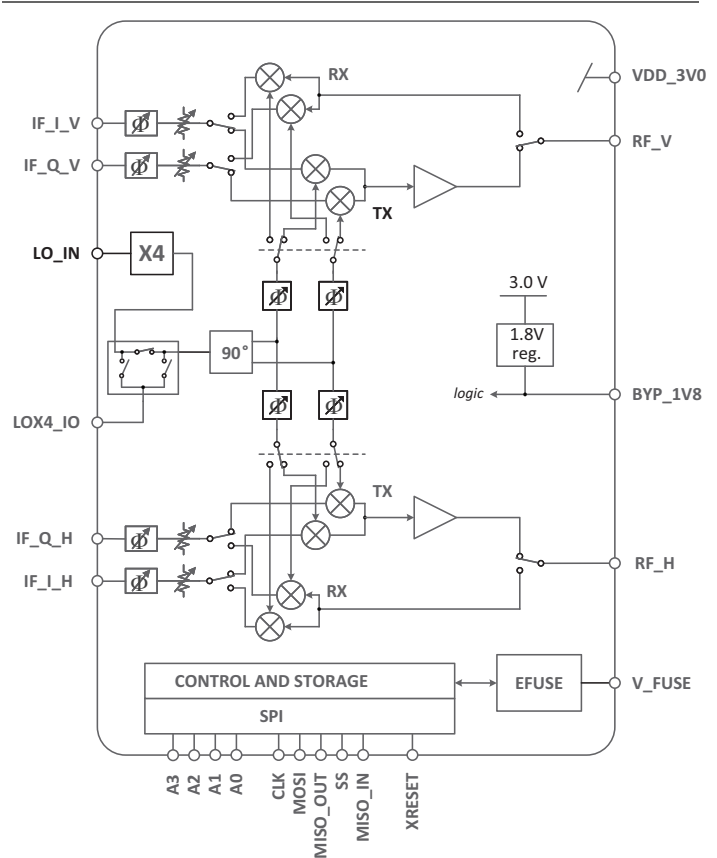
Features

- Supports bands n257, n258 and n261
- Compatible with PE188100 and PE188200 8-channel beamforming front ends
- Fast TDD switching in < 400 ns
- Separate V and H channels use a single X4 LO multiplier
- Image reject up and down converters with I/Q balance adjustment
- IF, LO I/Q phase and IF amplitude adjustment
- TX OP1dB = +14 dBm, RX IIP3 = +7 dBm, RX NF = 6.0 dB
- Up to 16 pre-stored modes selected by an 8-bit mode command via SPI interface
- Package—Flip chip die

Applications

- 5G base stations
- 5G customer premises equipment (CPE)
- Point-to-point radio

Figure 1 ■ PE128300 Functional Diagram



Product Description

The PE128300 is dual-channel TDD up-down converter designed for 5G FR2 n257, n258 and n261 frequency bands.

In transmit mode, the input to a channel is applied to IF_I and IF_Q 50Ω impedance ports. The signal passes through circuits which adjust the relative amplitude and phase of the I/Q signals. T/R switches route the IF signal to the transmit image reject mixer. Next, the up-converted signal is either directly connected to an RF amplifier, or, in the packaged case, is routed through a bandpass filter inside the package and amplified afterward. The RF amplifier outputs route through T/R switches to IC bump contacts.

In receive mode, the input arrives at the RF 50Ω port and is then routed to the RX image reject mixer by a T/R switch. After the down-conversion, the signal passes through the I/Q quadrature correction circuits. The I/Q correction digital control is multiplexed between TX and RX stored coefficients depending upon the active mode.

The chip supports both fundamental and sub-harmonic inputs of the internal local oscillator drive signals to the mixers. As shown in **Figure 1**, there are two dedicated inputs. The LO_IN port includes a 4x multiplier chain in its path to create the internal mixer drive signal frequency in support of low-side conversion. The LOX4_IO permits direct drive of the internal mixers at the required switching frequency.

Up to 16 different mode definitions are pre-stored and selectable via a single-byte SPI command. Mode definitions contain seven elements: LO power on/off, V/H RX power on/off, V/H TX power on/off and V/H T/R switch state. Typical modes used are TX, RX, idle, sleep, and loopback.