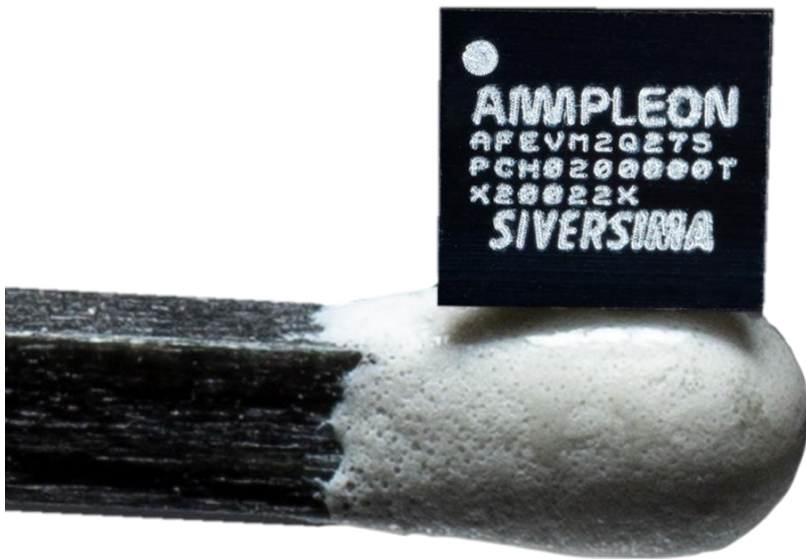




5G NR dual quad beamformer for 24-29.5 GHz



5G coverage in higher frequencies require multiple high-power antennas for distance and throughput. The challenge is to reach many end users with both high data rates and efficiency.

The dual quad core Radio Frequency Integrated Circuit (RFIC) is intended for 5G dual polarized phased antenna array applications. Unmatched scalability enables very large array configurations while limiting the number of digital interfaces. Due to its flexible control interface, scalability and low power dissipation, it is the perfect choice for 5G NR beamforming applications. Moreover, factory calibration provides unmatched simplicity at installation.



FWA



5G MMWAVE



BACKHAUL



V2X

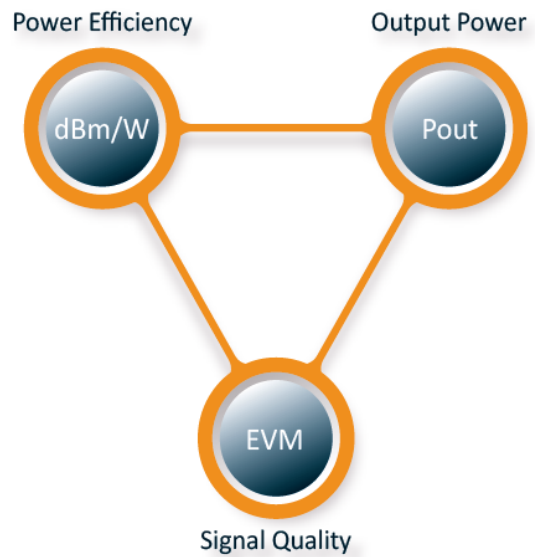
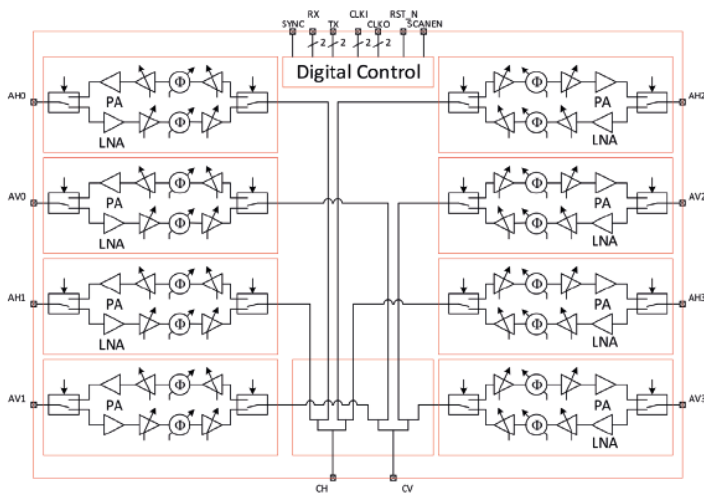
Key features

- 24.25 GHz-27.5 GHz (AFEVM2Q275)
- 26.5 GHz-29.5 GHz (AFEVM2Q295)
- 8 individually controlled Rx and Tx beamforming sections
- Horizontal and vertical polarization beamformers
- 5.625° phase resolution (6 bit) control in Tx and Rx mode
- Beam settling rate < 10 ns)
- 0.5 dB amplitude resolution control in Tx and Rx mode
- Pout1dB > +18dBm per Tx path
- Rx noise figure < 5dB
- 1.8V analog and digital supply

The RFIC includes two common ports, one for each polarization, which are connected to the dual quad antenna connections. Time Division Duplex (TDD) mode is set independently for the horizontal and vertical polarization beamformer. The RFIC is packaged in a Wafer Level Chip Scale Package (WL-CSP) with a ball out optimized for connection of the patch antenna with only few layers.

The gain and phase of the transmit and receive sections (Tx/Rx) are individually controlled over a high speed Low-Voltage Differential Signaling (LVDS) interface allowing on the fly beam adjustment. Fast beam setting updates for dynamic beam control is useful in a multi-user environment. Various telemetry, such as output power and chip temperature, is reported over the high-speed interface. The low noise amplifier in combination with a low loss receive/transmit switch provides low system noise figure. The RFIC is factory calibrated to ensure low spread between devices, temperature compensation and minimized Over-the-Air (OTA) calibration at system level.

The AFE VM 2Q 275/295 is packaged with a pin configuration optimized for connection to an antenna array using few layers and short traces. The package is Restriction of Hazardous Substances (RoHS)-compliant, and the device can operate from -40°C to +85°C. NR waveforms with different configurations may be generated in the modem simulation framework and uploaded to the RFSoc. The waveform/IQ samples are then transmitted through the data-converters to the Radio Frequency Integrated Circuit (RFIC).system integration.



The chip features a transmit section with the combination of superior linearity, high output power and low DC power dissipation.