

Using MATLAB to Develop 5G RF Front-End Components and Algorithms

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Qualcomm develops RF front-end components and envelope tracking technology for 5G mobile devices that support over 30 different RF bands. The number of possible waveform combinations in 5G is 10x greater than in LTE, making device validation much more complex and time-consuming.

The Qualcomm RF Systems team used MATLAB® to build a complete model of the Tx and Rx paths with fixed-point digital blocks and hardware-accurate power amplifier models. They used simulations to predict key system performance measures, optimize design parameters, and automate testing over a range of waveform combinations. The team automatically generated C waveform libraries from the MATLAB 5G models, enabling delivery of waveform generation to customers.

Advantages of using MATLAB:

- Fully model and verify the RF transceiver, analog, and RF components
- Release sensitive IP both internally and externally in a secure manner
- Enable a small team to create a scalable and maintainable RF test system
- Eliminate the cost of developing separate test suites for different test platforms



We use MATLAB models to **optimize and verify** the 5G RF front end through **all phases of development.**

