

# LTE\_UL\_FDD\_RX\_TestBench

## Where To Find This Example

Select **Help > Open Examples...** from the menus and type either the example name listed above or one of the keywords below.

Or in Version 14 or higher you can open the project directly from this page using this button. Make sure to select the **Enable Guided Help** before clicking this button.

Open Install Example

## Design Notes

### LTE FDD Uplink User Equipment TX Test Bench

This example demonstrates:

LTE FDD Uplink TX, compliant with 3GPP specifications.

Specification document: TS 36.104, TS 36.211, TS 36.212

Configurable options include:

NFramesSweep: number of 10ms frames used in each sweep

TxOutLvlStart\_dBm, TxOutLvlSpan\_dBm, TxOutLvlStep\_dBm: Define swept power of transmitted signal

Carrier Frequency (MHz)

PayloadSize (bits): Block size defined in TS 36.104, Annex A.

MinNumBlkErrsCollect: minimum number of block errors collected for each signal level. This parameter determines when to move to the next the signal level. Block errors are calculated based on the decoded CRC.

MaxNumBlockRun: maximum number of blocks generated for each signal level. If after MaxNumBlockRun blocks the number of collected errors is smaller than MinNumBlkErrsCollect, the simulation for that signal level is terminated.

FrameType: frame type and cycling prefix:

- 0: Frame structure type 1: FDD

- 1: Frame structure type 2: TDD

N\_RB\_UL: number of resource blocks used for transmission; determines the channel bandwidth as defined in the specifications (See Global Definitions for relationship between N\_RB\_UL and channel BW).

RB\_Idxs: indexes of the resource blocks assigned to the uplink transmission

ModType: modulation type (QPSK, 16QAM, 64QAM)

The test bench can be used to monitor:

The TX signal spectrum at various points

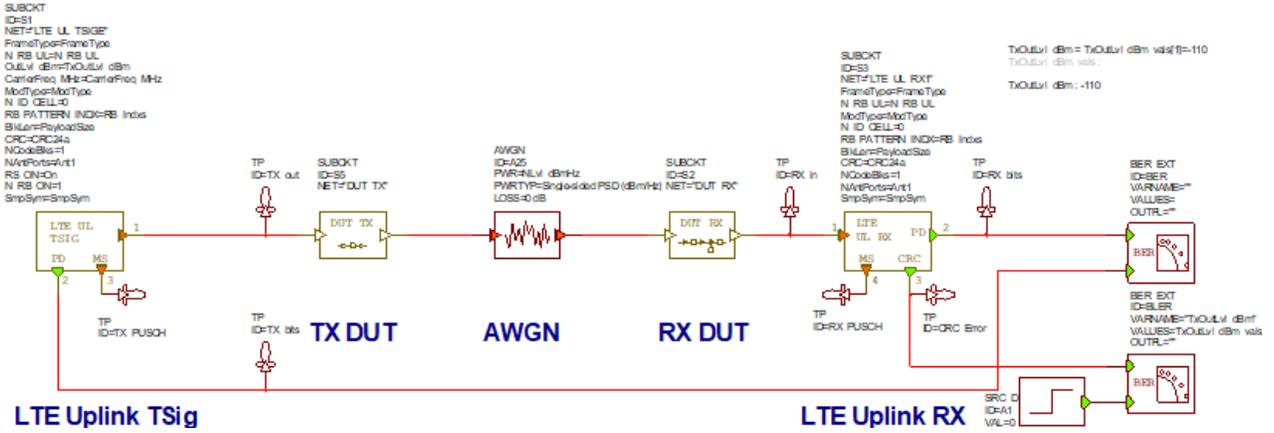
IQ constellation of the transmitted and demodulated signals

Bit error rate (BER) and block error rate (BLER)

CRC error for each block

## System Diagram - LTE UL

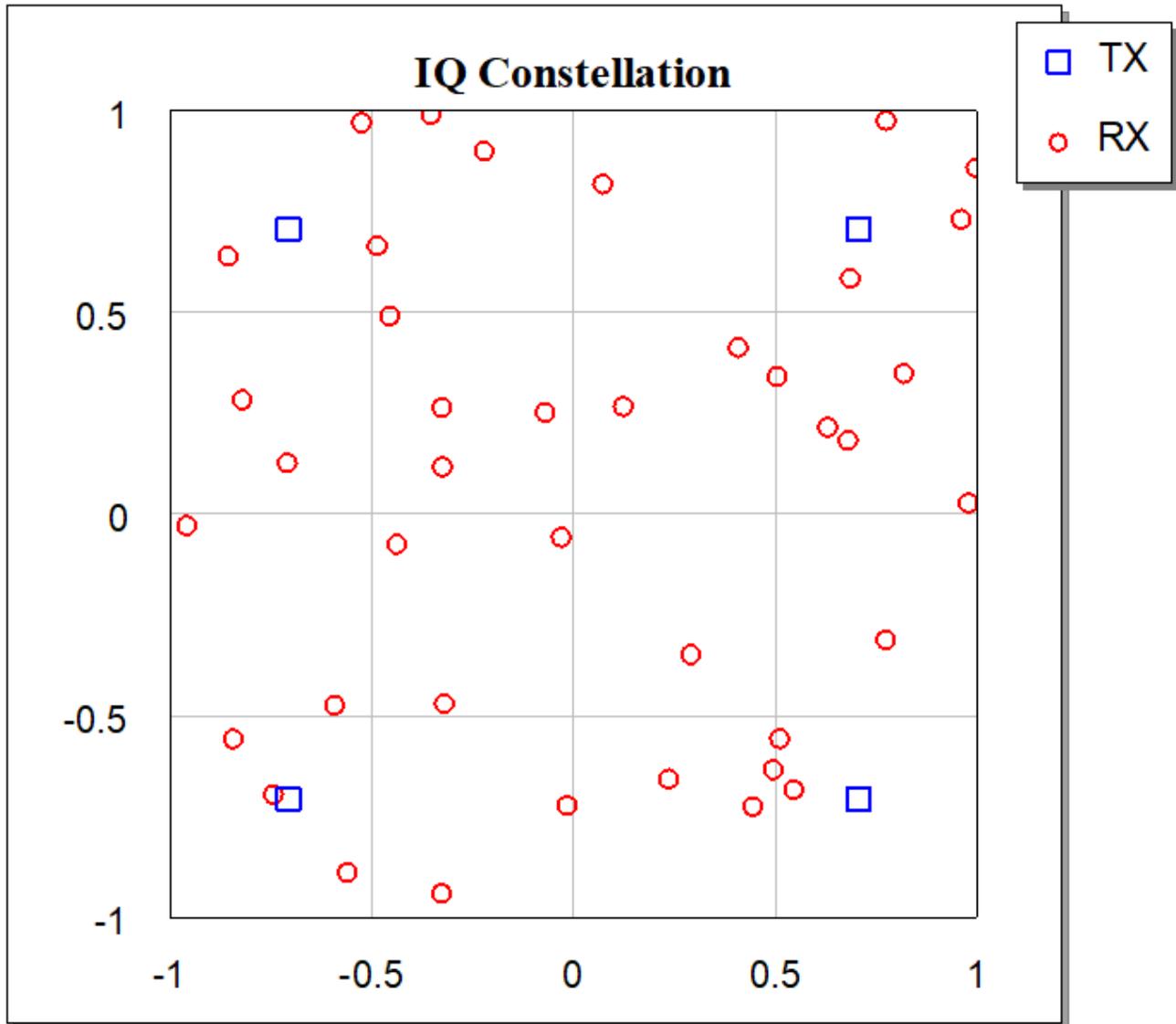
## LTE FDD Uplink RX Sensitivity Test Bench



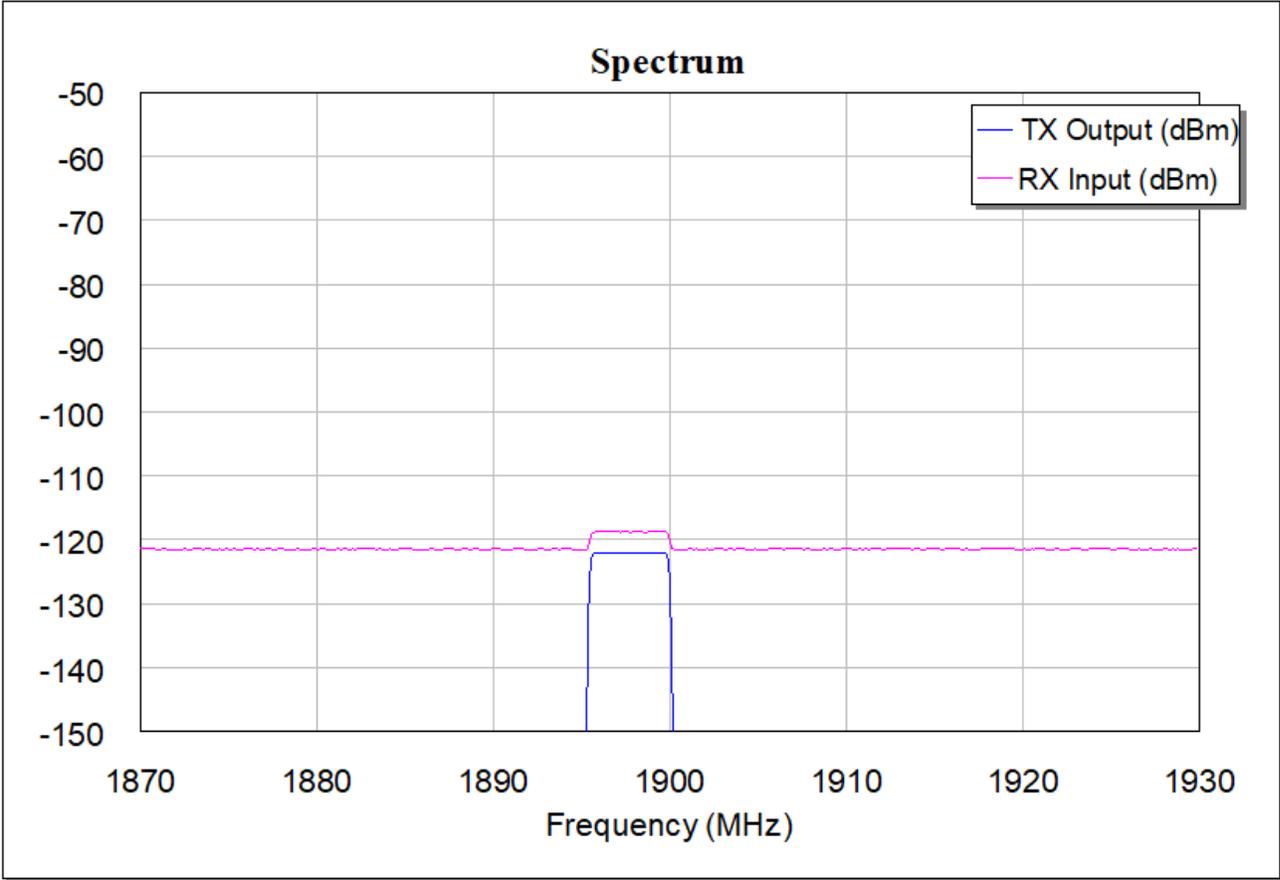
Graph - CRC Error

Re(WVFM(TP.CRC_Error,10,1,0,0,0,2,0)) LTE UL x Values (Unitless)	Re(WVFM(TP.CRC_Error,10,1,0,0,0,2,0)) LTE UL
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0

Graph - IQ Constellation



Graph - Spectrum



Graph - BER

