DVB_TX

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 13 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

Digital Video Broadcasting (DVB) Transmitter

This example illustrates a DVB transmitter, based on the ETSI EN 300 744, V 1.5.1 (2004-06) technical specifications.

Configuration parameters are described below.

- TRANSMISSION_MODE determines the inner interleaving (Section 4.3.4) and signal constellation and mapping (Section 4.3.5). Available options are:

- QPSK Non-hierarchical

- 16QAM Non-hierarchical

- 64QAM Non-hierarchical

- 16QAM Hierarchical

- 64QAM Hierarchical

- OPERATION_MODE is defined in Section 4.1 and can be set to:

- 2K

- 4K

- 8K

2K and 8K modes are defined for both DVB-T and DVB-H. 4K mode is used exclusively in DVB-H systems and is defined in Annex F.

- RANDOMIZE can disable randomization of input data, which may be useful for testing purposes. This is achieved by setting the RANDOMIZE parameter to Off.

- CODE_RATE determines the rate of the convolutional inner encoder. Available rates are:
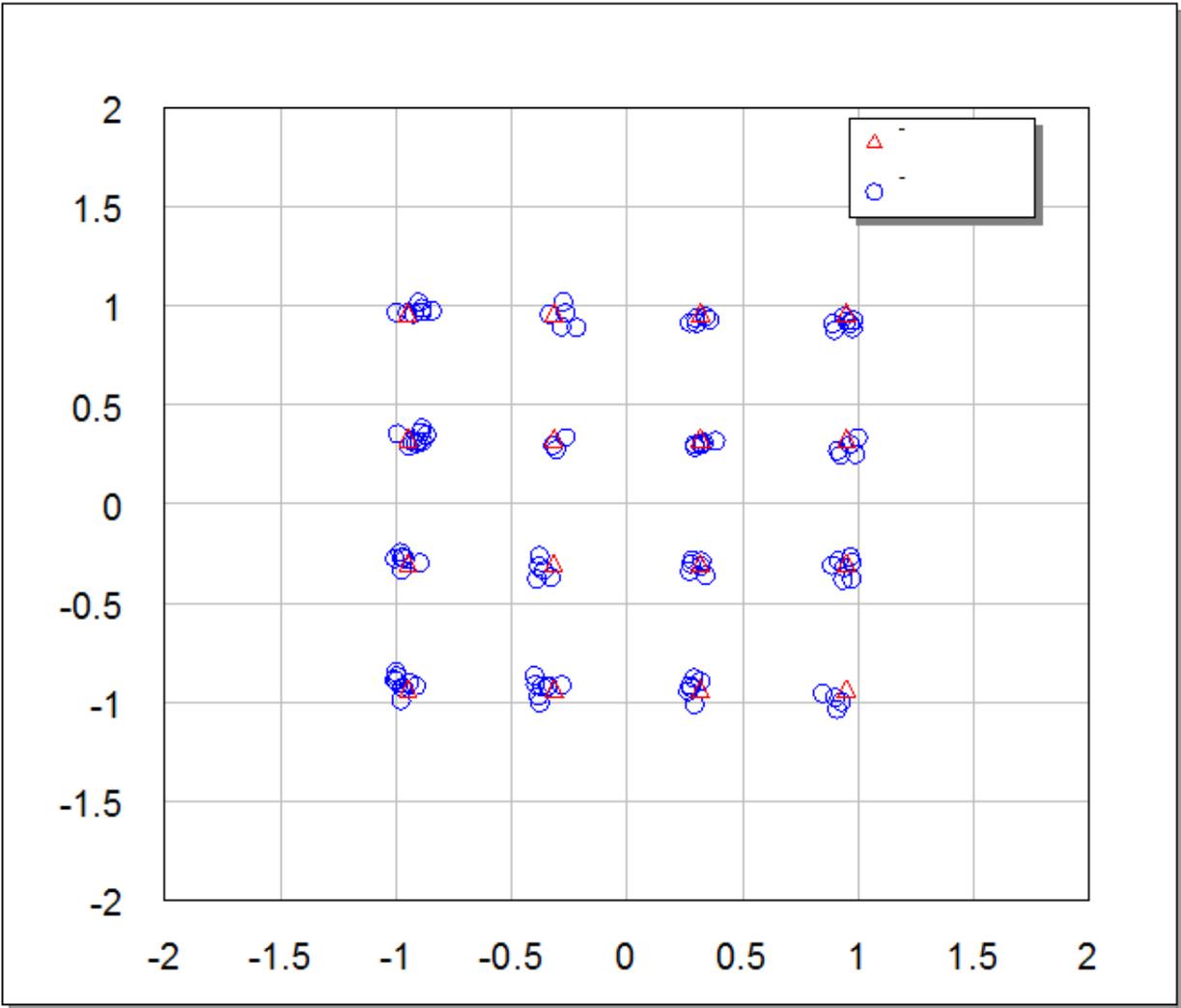
- 1/2

- 2/3

- 3/4

- 5/6

- 7/8

- MOD_ALPA determines constellation proportions (Section 4.3.5). It is always 1 for Non-hierarchical modes, so in this case it is ignored. The available settings for Hierarchical modes are:
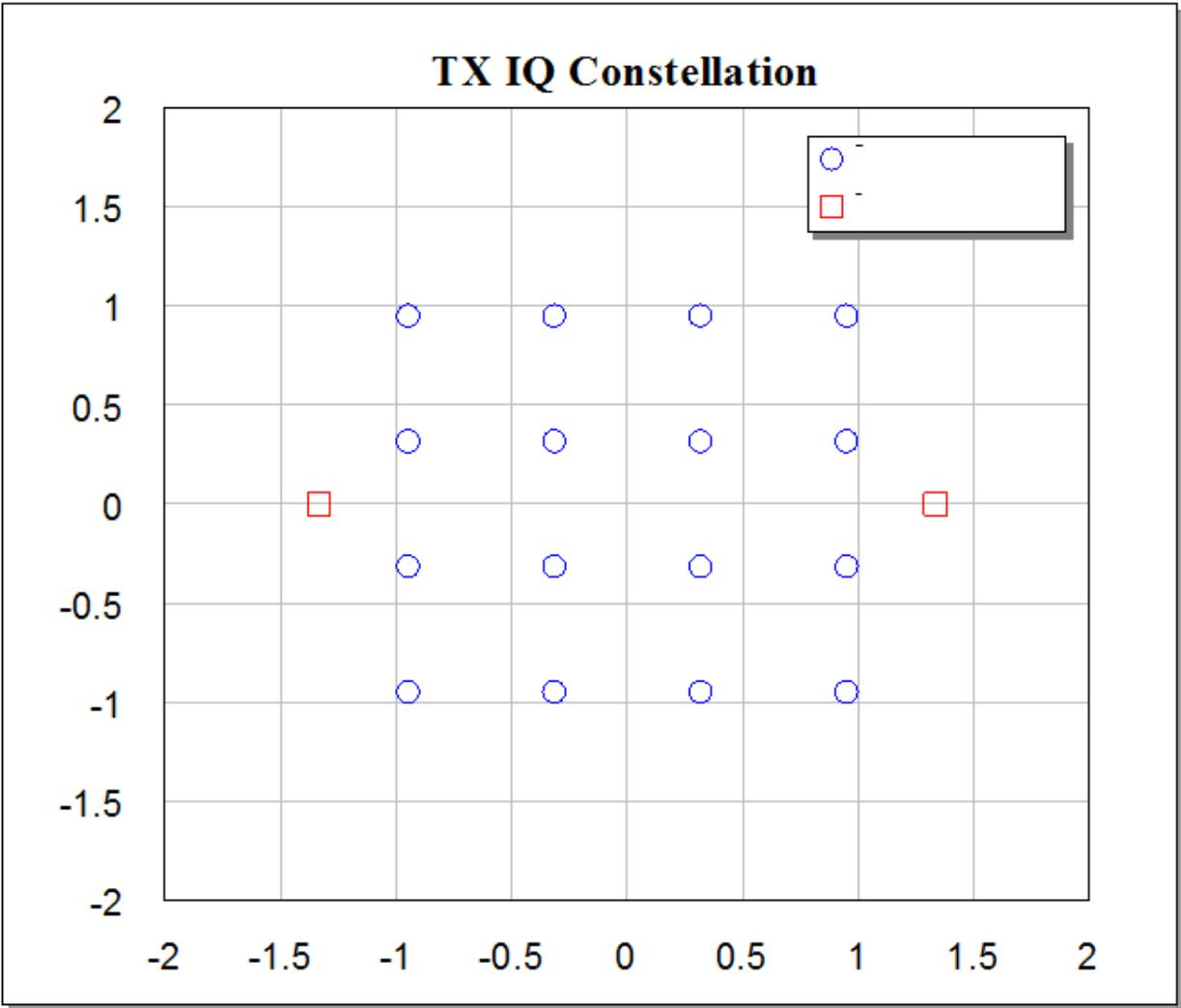
- 1

- 2

- 4

- CHANNEL_BW defines the standard channel spacing defined in Section 4.1. Available options are:
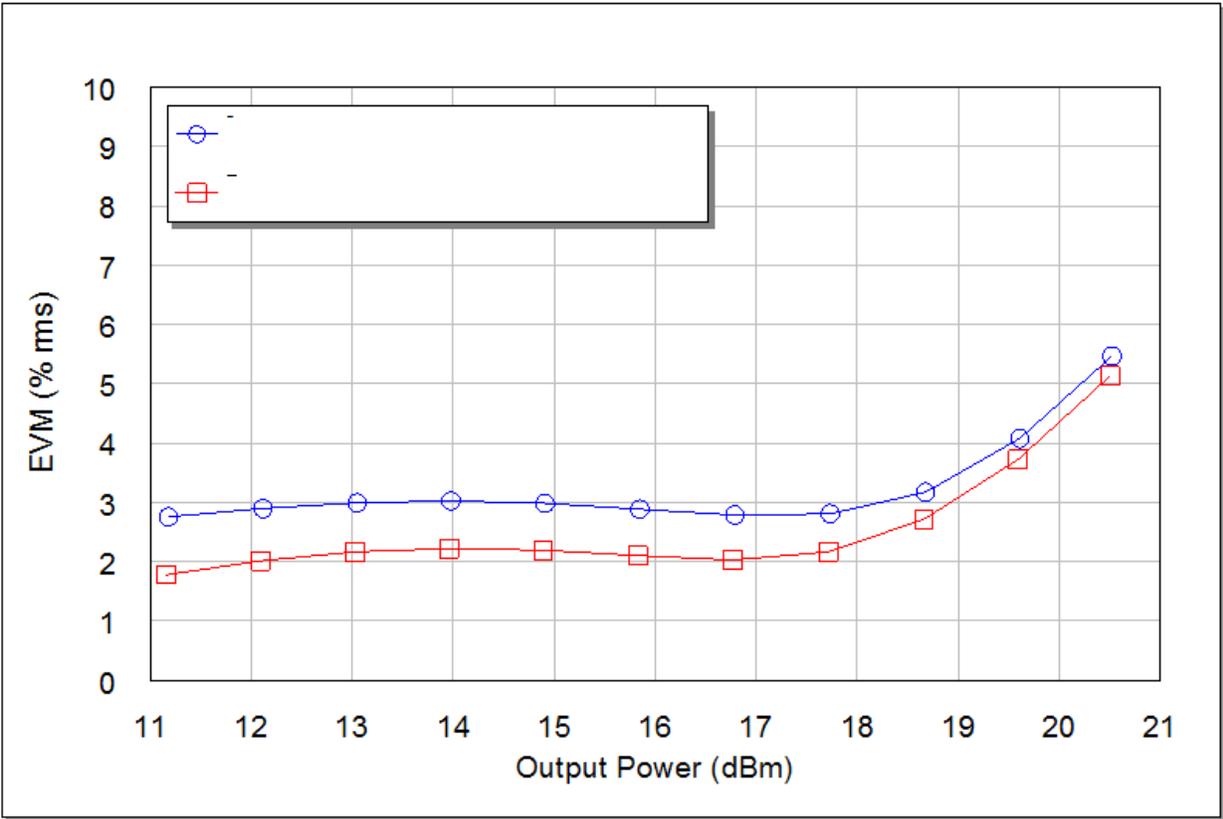
- 8 MHz

- 7 MHz

- 6 MHz

- 5 MHz

5 MHz channel spacing is defined for use outside the traditional broadcast bands and parameters for operating with such spacing are given in Annex G.
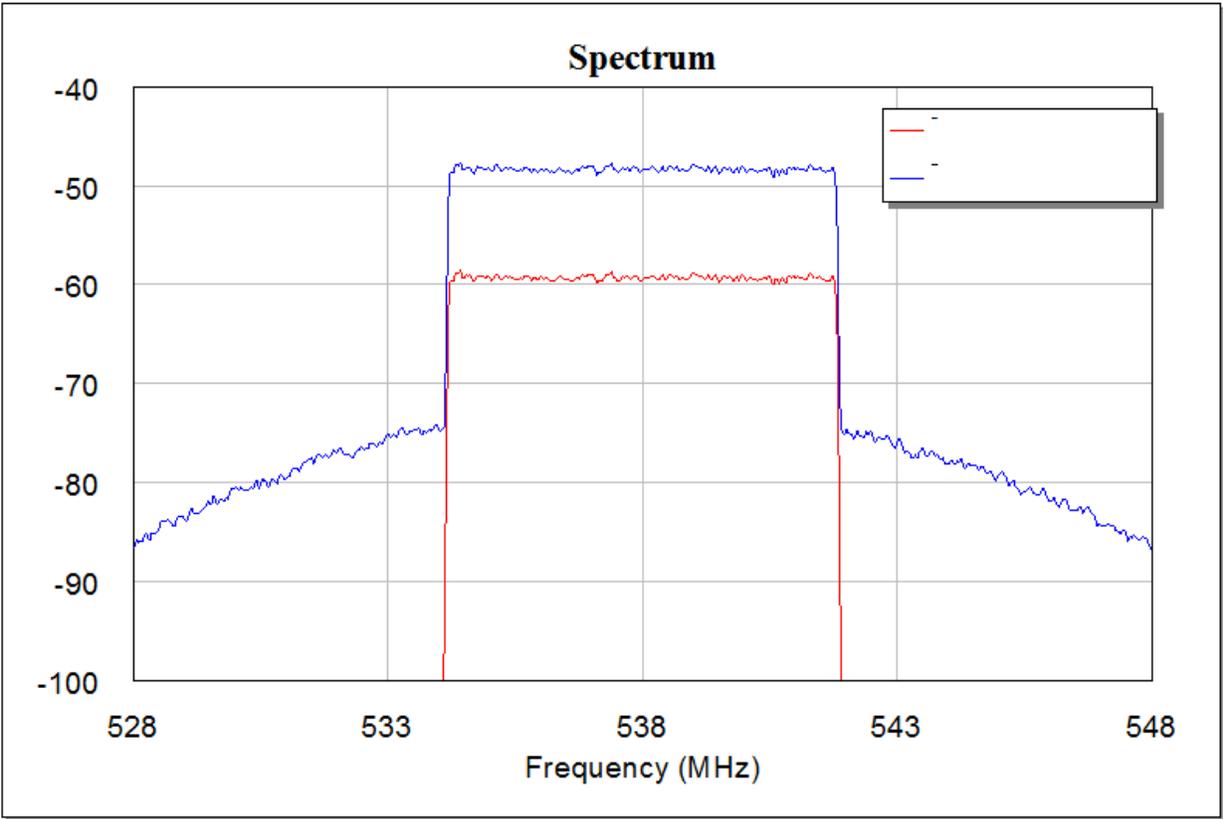
- G determines the guard interval for the OFDM modulation. The available options are:

  - 1/4

  - 1/8

  - 1/16

  - 1/32

- TX_OUT_LEVEL determines the output level of the transmitter and is defined in units defined in Options/Project Options/Global Units, in the Power window.

- TX_CARRIER_FREQ determines the carrier frequency in units defined in Options/Project Options/Global Units, in the Frequency entry.

- SMPSYM determines the number of samples per symbol used at the transmitter.

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This example implements a typical Device-Under-Test (DUT), which includes amplitude and phase imbalance, DC offset, phase noise, and a file-based power amplifier. The test bench monitors the following measurements:

• The CCDF at the input and output of the DUT

• The signal spectrum at the input and output of the DUT

• EVM %rms vs. output power

• AM-to-AM conversion caused by the power amplifier

• Distortion of the signal constellation caused by the power amplifier

Note the amplifier model is based on a text data file. It can be replaced with an MWO circuit or a VSS behavioral amplifier model that accounts for frequency dependency. This test bench is used to illustrate several capabilities of VSS.

This example can be used to test a PA's error vector magnitude (EVM) performance vs. output power. The effect of hardware degradations implemented in the DUT may be observed. EVM measurements are calculated for each power level and plotted in the "EVM vs. Output Power" graph.

Please read the online help for information on any of the blocks that are used in the system diagrams. In addition, please read the online help for EVM measurements.

System Diagram - DVB System

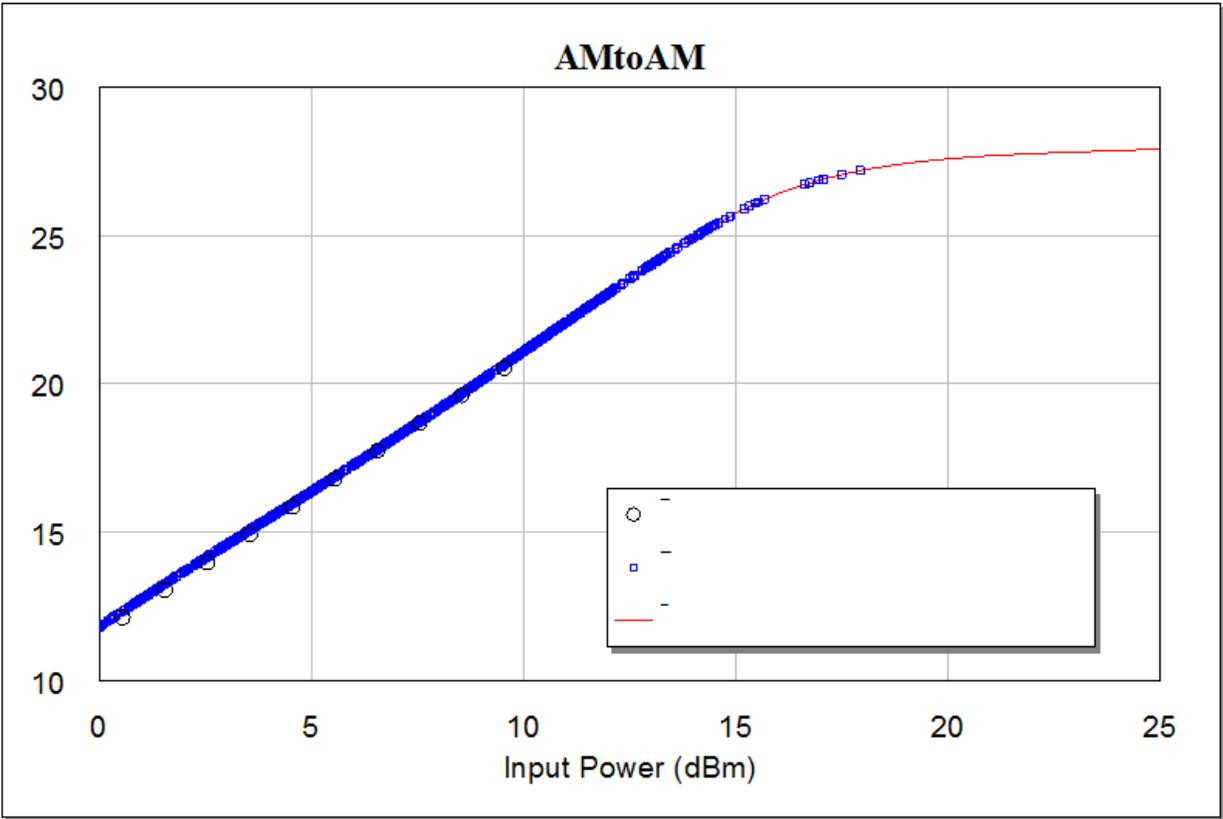## Graph - RX IQ Constellation

Graph - TX IQ Constellation

TX IQ Constellation

Graph - EVM vs Output Power

Graph - Spectrum

Graph - AMtoAM

AMtoAM

Graph - CCDF