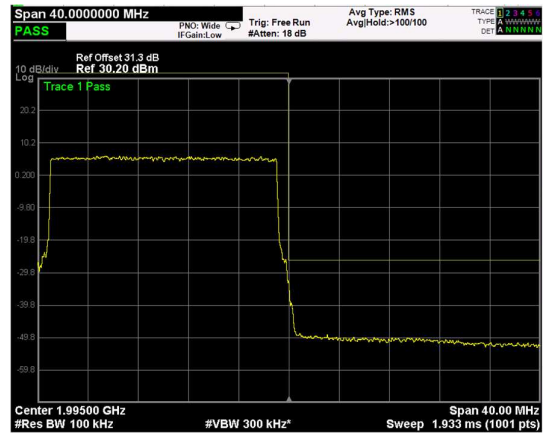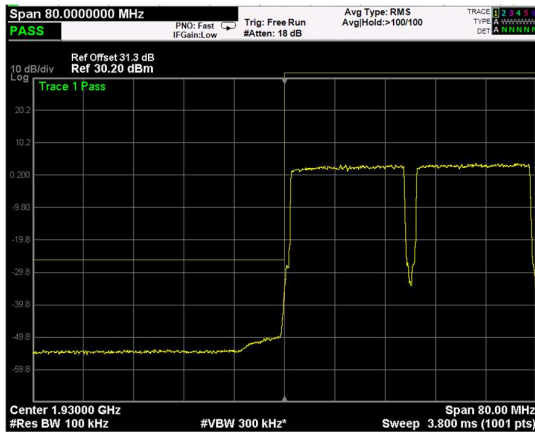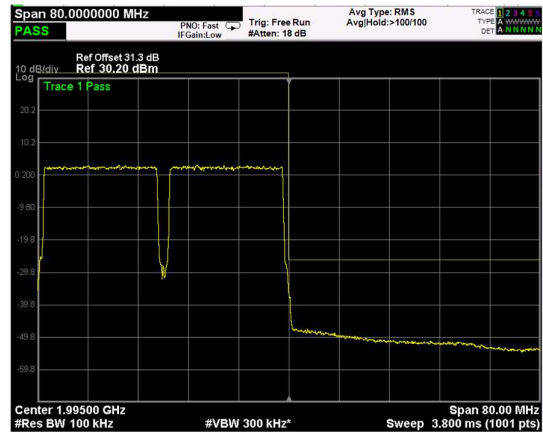Low Band Edge, 1 Carrier,
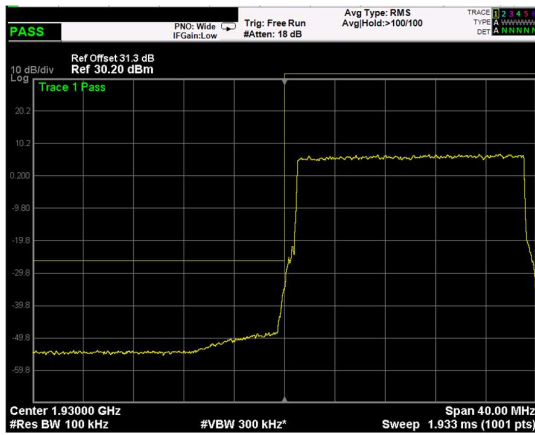Modulation: QPSK, BW=20MHz

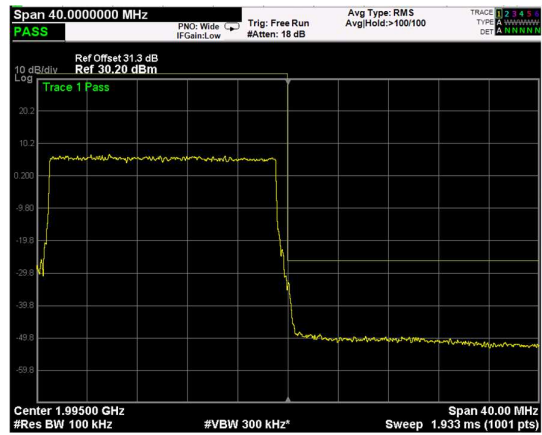High Band Edge, 1 Carrier,
Modulation: QPSK, BW=20MHz

Low Band Edge, 2 Carrier,
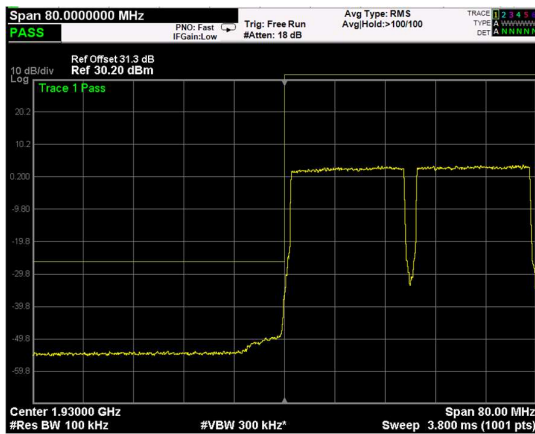Modulation: QPSK, BW=20MHz

High Band Edge, 2 Carrier,
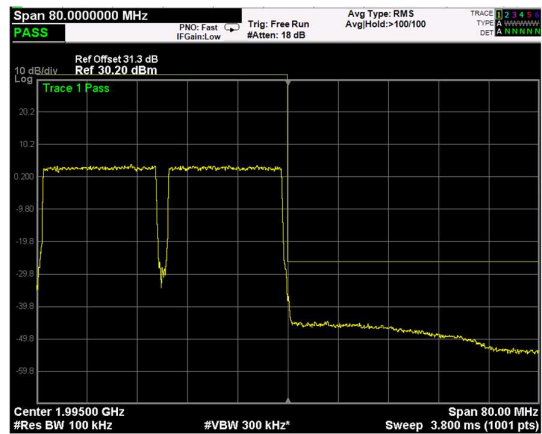Modulation: QPSK, BW=20MHz

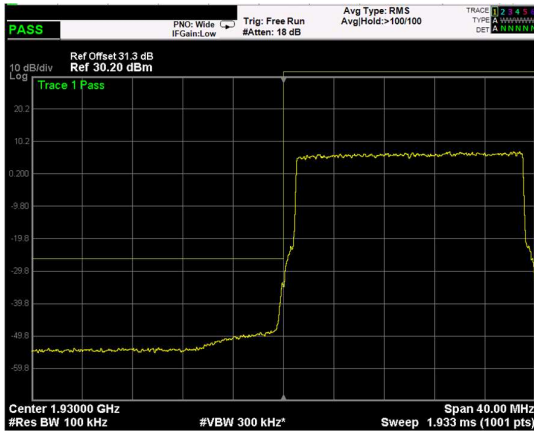Low Band Edge, 1 Carrier,
Modulation: 16QAM, BW=20MHz

High Band Edge, 1 Carrier,
Modulation: 16QAM, BW=20MHz

Low Band Edge, 2 Carrier,
Modulation: 16QAM, BW=20MHz

High Band Edge, 2 Carrier,
Modulation: 16QAM, BW=20MHz

Low Band Edge, 1 Carrier,
Modulation: 64QAM, BW=20MHz

High Band Edge, 1 Carrier,
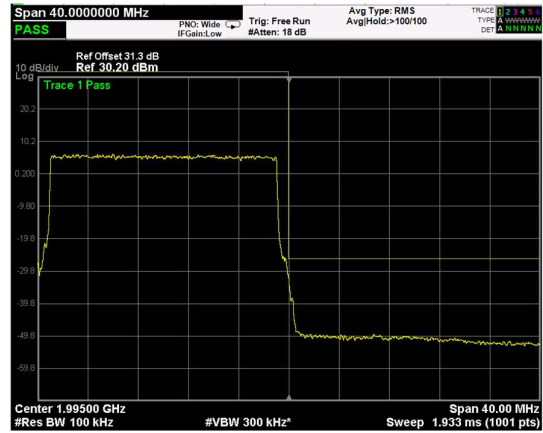Modulation: 64QAM, BW=20MHz

Low Band Edge, 2 Carrier,
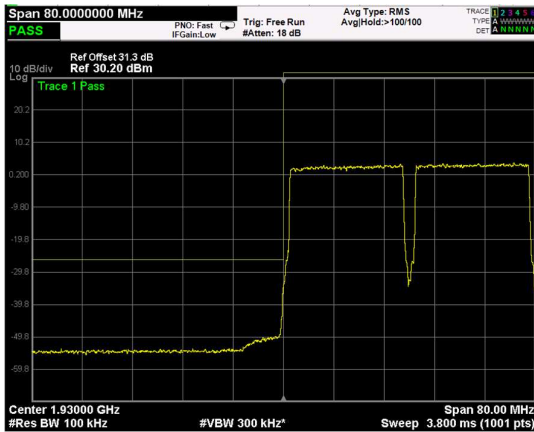Modulation: 64QAM, BW=20MHz

High Band Edge, 2 Carrier,
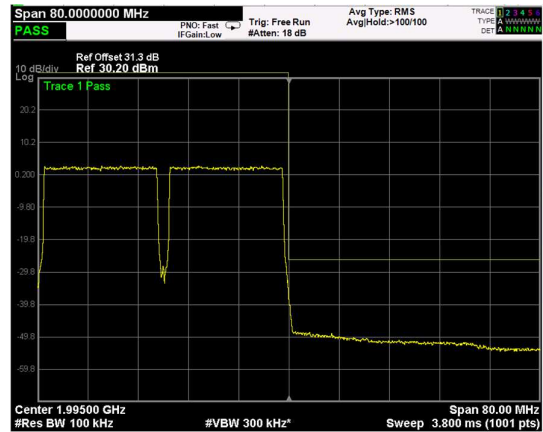Modulation: 64QAM, BW=20MHz

Low Band Edge, 1 Carrier,
Modulation: 256QAM, BW=20MHz
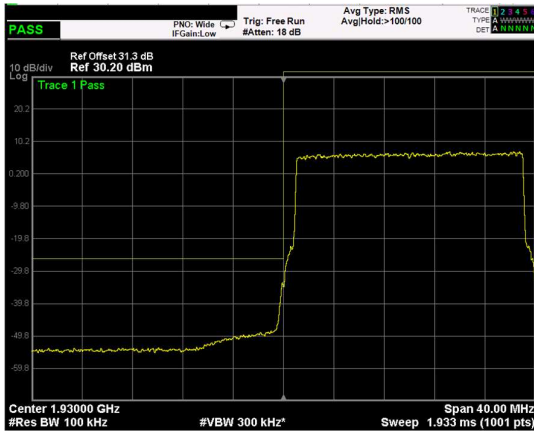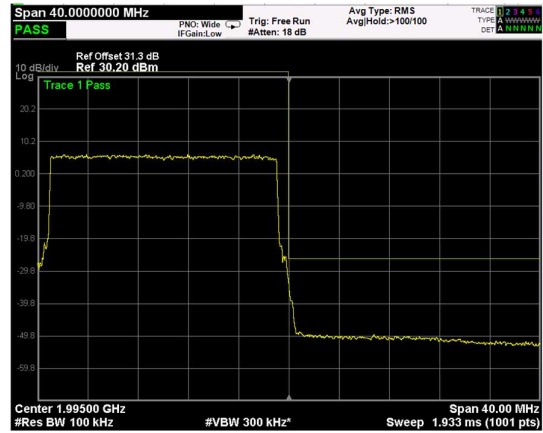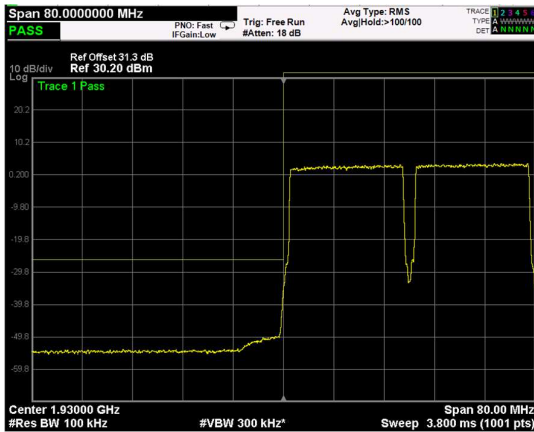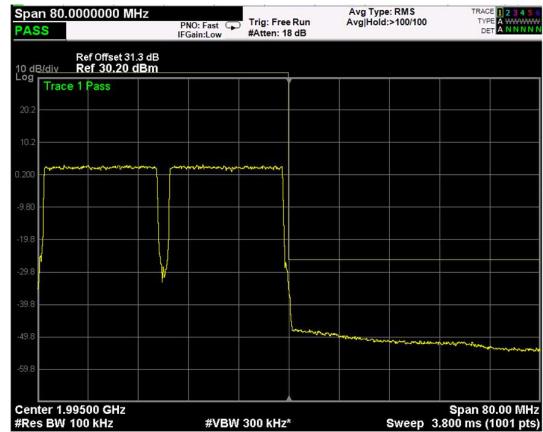

High Band Edge, 1 Carrier,
Modulation: 256QAM, BW=20MHz

Low Band Edge, 2 Carrier,
Modulation: 256QAM, BW=20MHz

High Band Edge, 2 Carrier,
Modulation: 256QAM, BW=20MHz

Clause 24.238(a)(b) Radiated Spurious emissions

(a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 Log (P) dB.

(b) Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 MHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

Test date: 05/06/2019 to 05/10/2019

Test results: Pass

Special notes

Clause 24.238(a)(b) Radiated spurious emissions, continued

Test data

The D.U.T. was positioned according to the radiated emissions set-up

The D.U.T. antenna connector was terminated by a 50 Ω shielded dummy load.
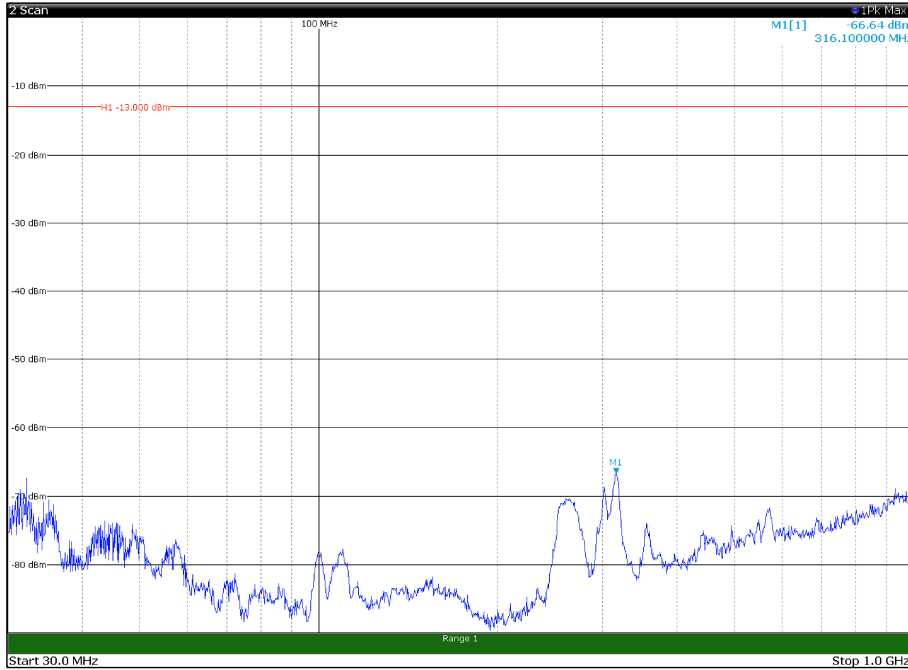
The spectrum was searched from 30 MHz to 1 GHz (RBW 100 kHz) & 1 GHz (RBW 1 MHz) to the tenth harmonic of the carrier.

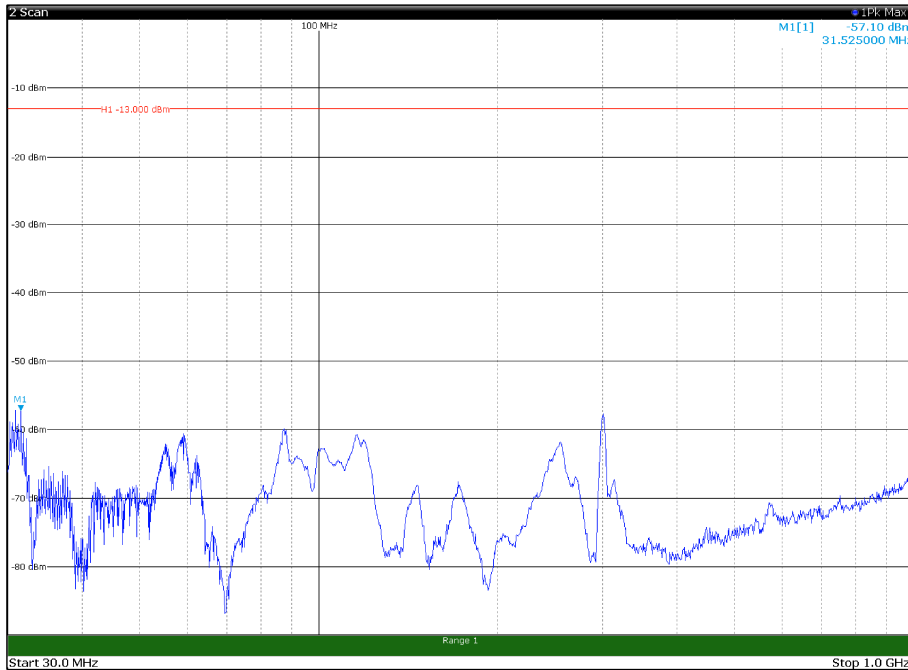There were no emissions detected above the noise floor which was at least 20 dB below the specification limit.

Spurious emissions measurement results:

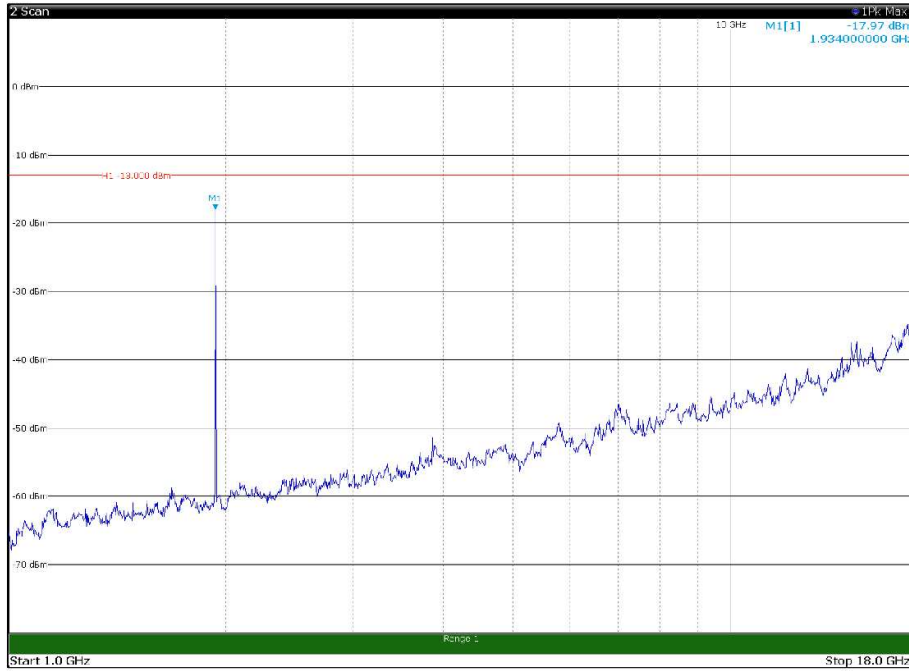| Frequency (MHz)	Polarization. V/H	Field strength (dBm)	Limit (dBm)	Margin (dB)
Low channel				
First Channel	V/H	Negligible	-13	
Mid channel				
1962.5	V/H	Negligible	-13	
High channel				
Last Channel	V/H	Negligible	-13	

Note: Field strength includes correction factor of antenna, cable loss, amplifier, and attenuators where applicable.
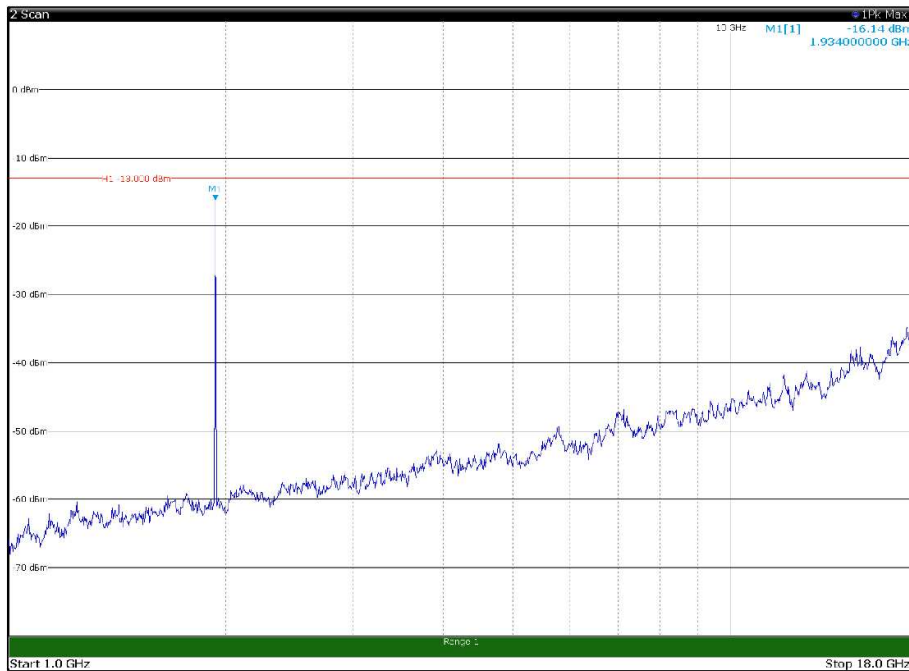
Channel: BOTTOM, Modulation: QPSK,
BW=5MHz, Range: 30MHz - 1GHz, Polarization: Horizontal

Channel: BOTTOM, Modulation: QPSK,
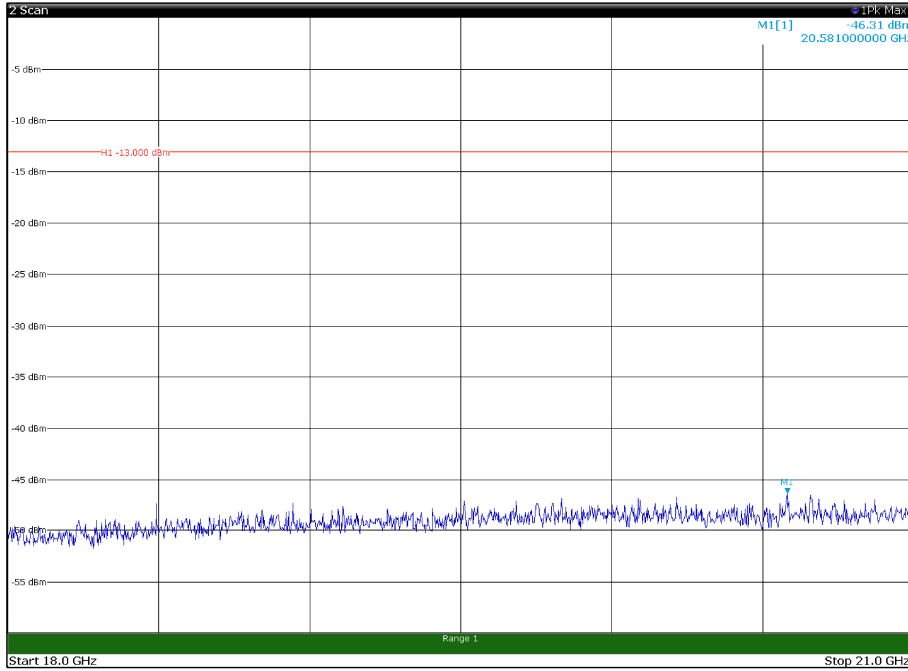BW=5MHz, Range: 30MHz - 1GHz, Polarization: Vertical

Channel: BOTTOM, Modulation: QPSK,
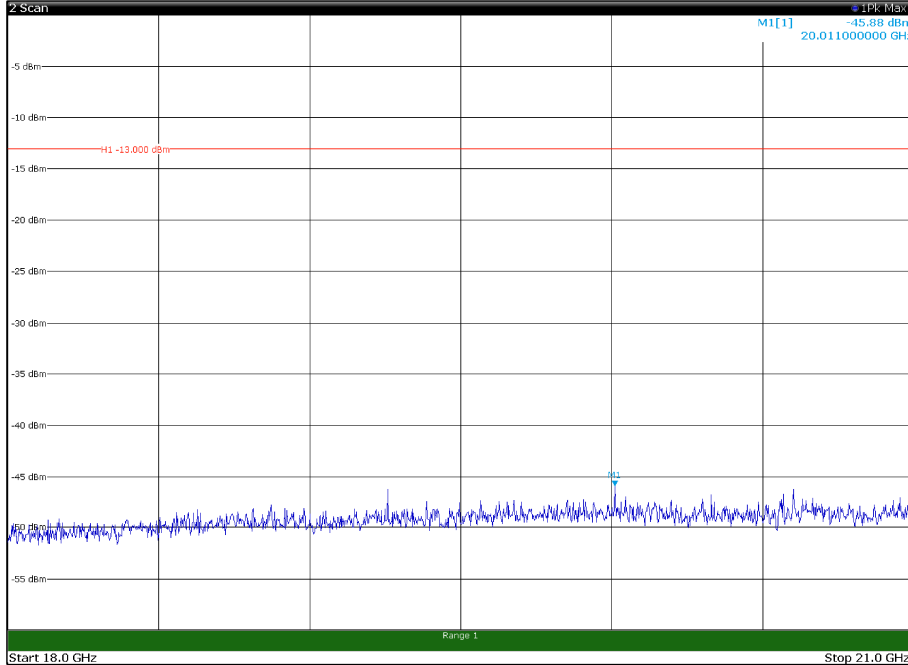BW=5MHz, Range: 1GHz -18GHz, Polarization: Horizontal

Channel: BOTTOM, Modulation: QPSK,
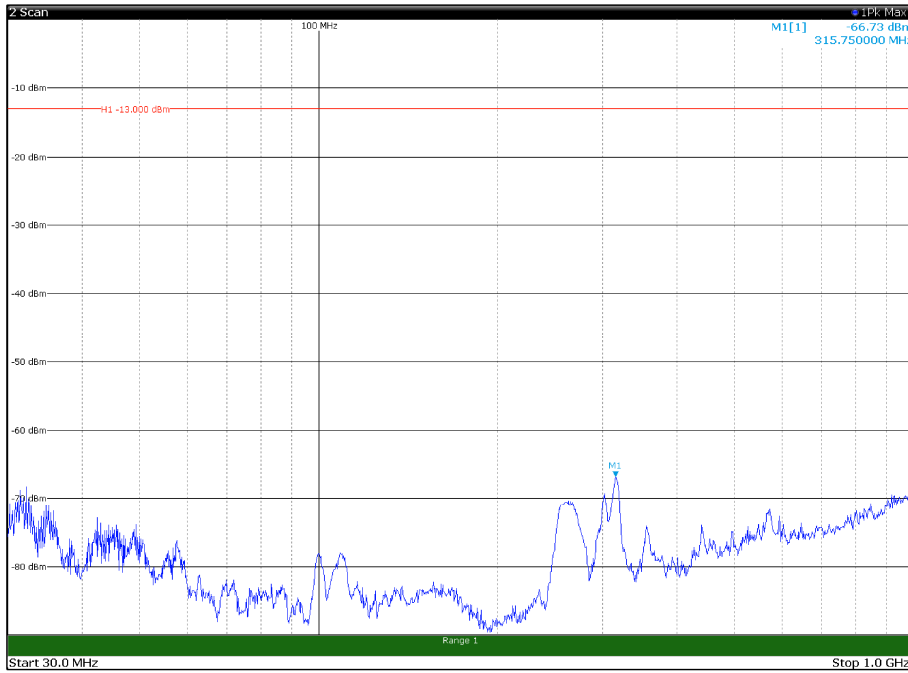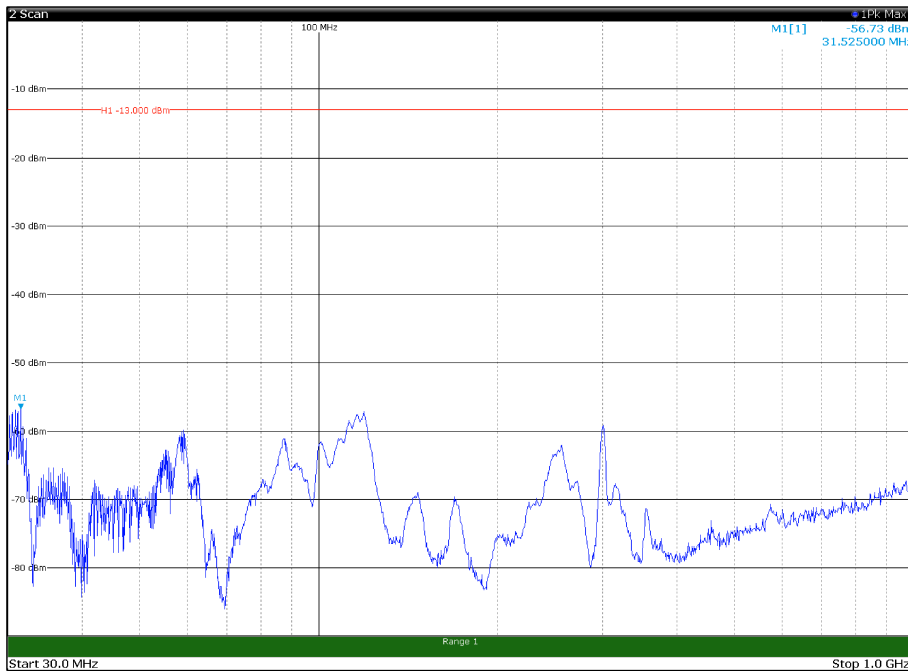BW=5MHz, Range: 1GHz -18GHz, Polarization: Vertical

Channel: BOTTOM, Modulation: QPSK,
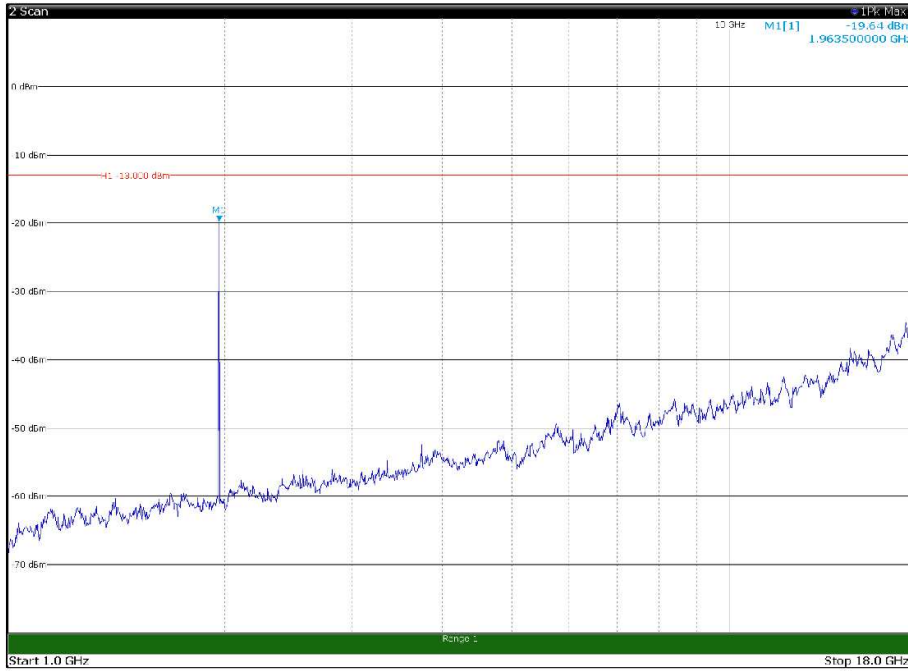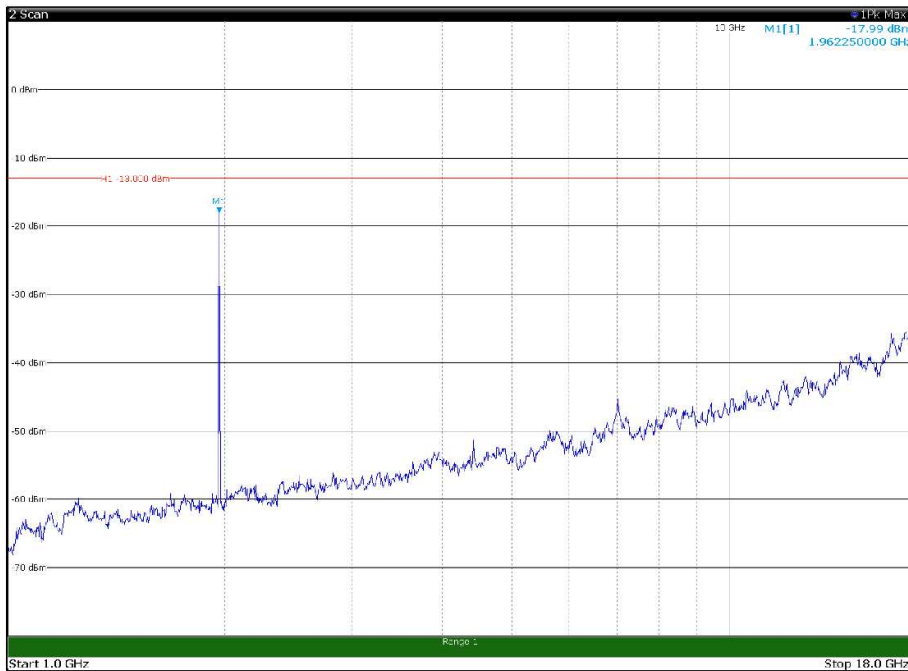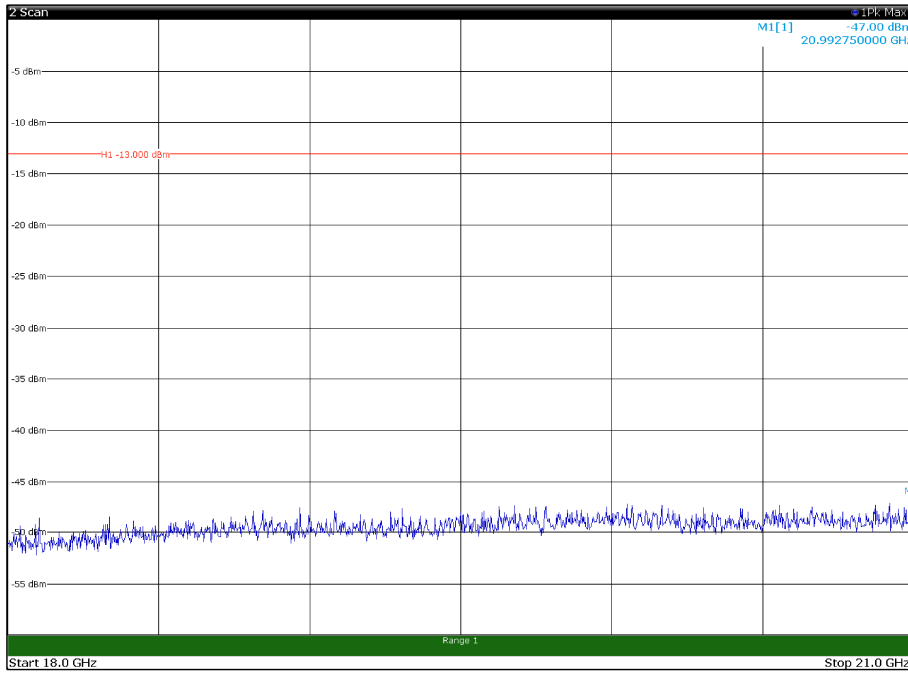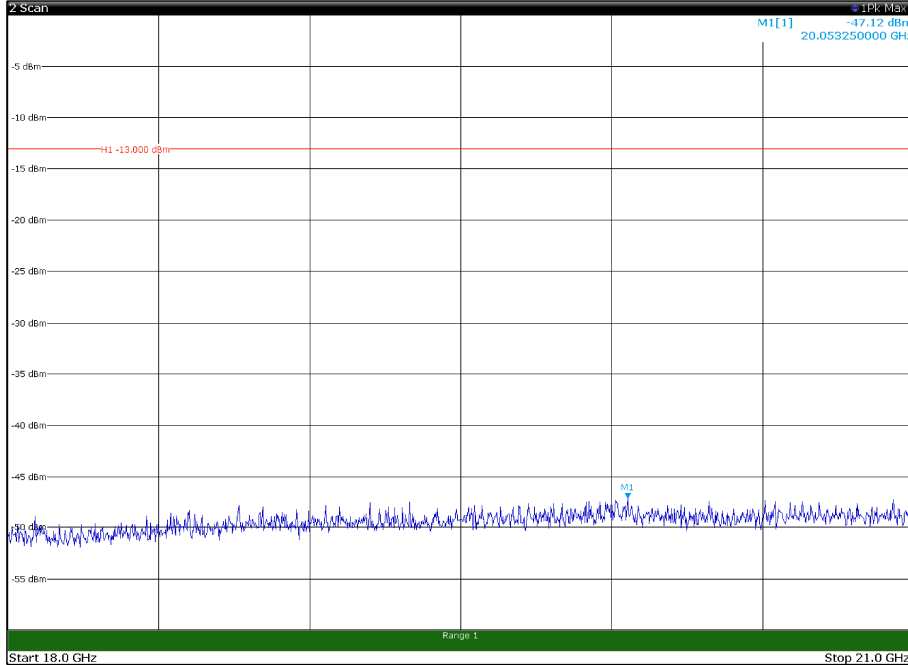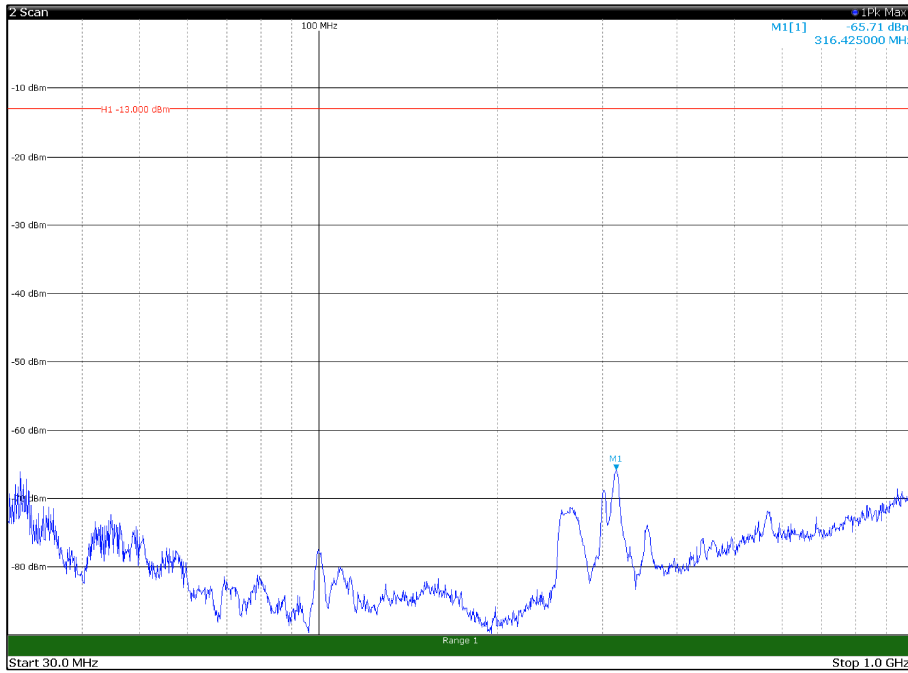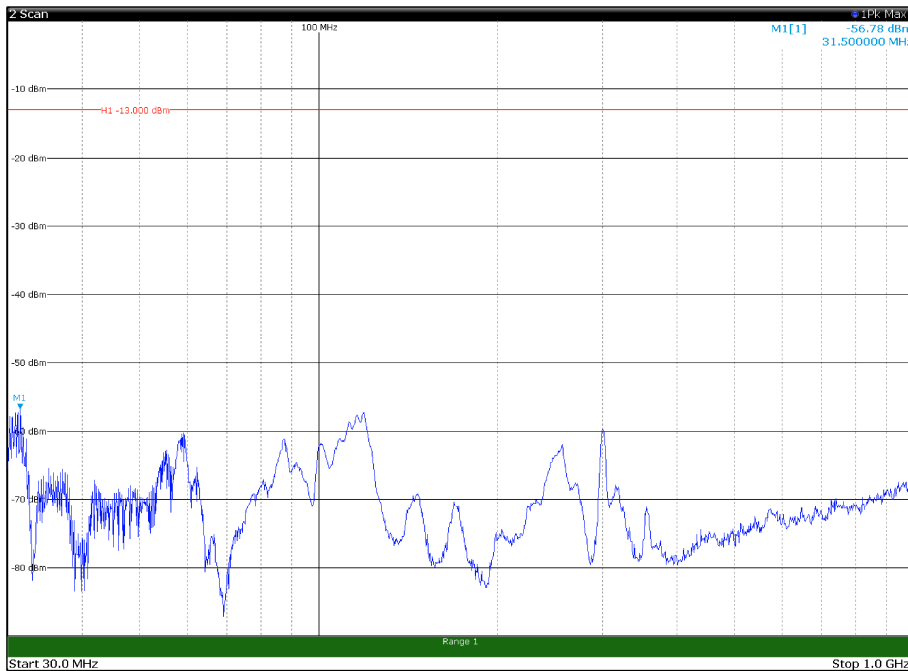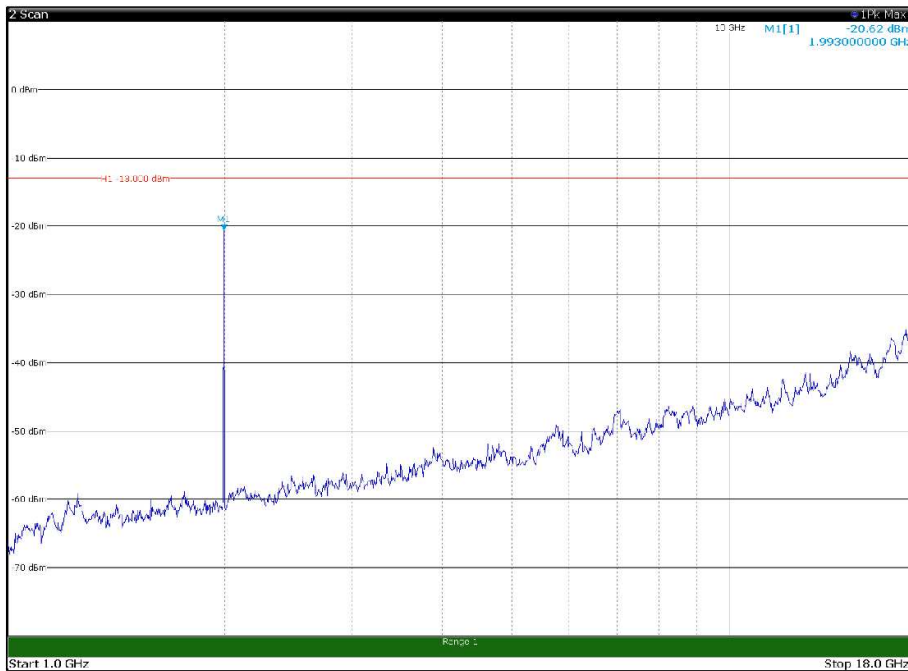BW=5MHz, Range: 18GHz - 21GHz, Polarization: Horizontal

Channel: BOTTOM, Modulation: QPSK,
BW=5MHz, Range: 18GHz - 21GHz, Polarization: Vertical

Channel: MIDDLE, Modulation: QPSK,
BW=5MHz, Range: 30MHz - 1GHz, Polarization: Horizontal
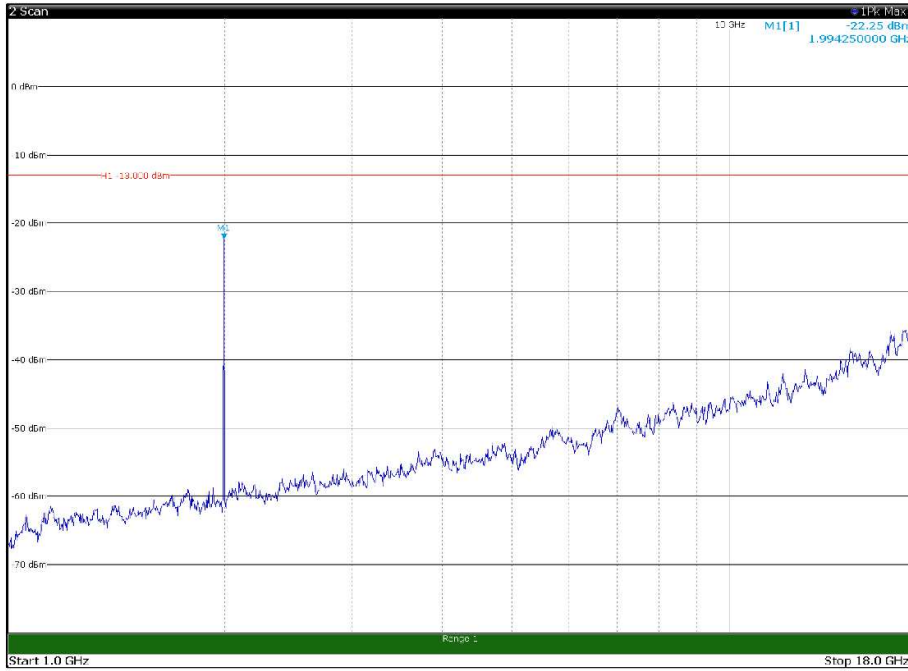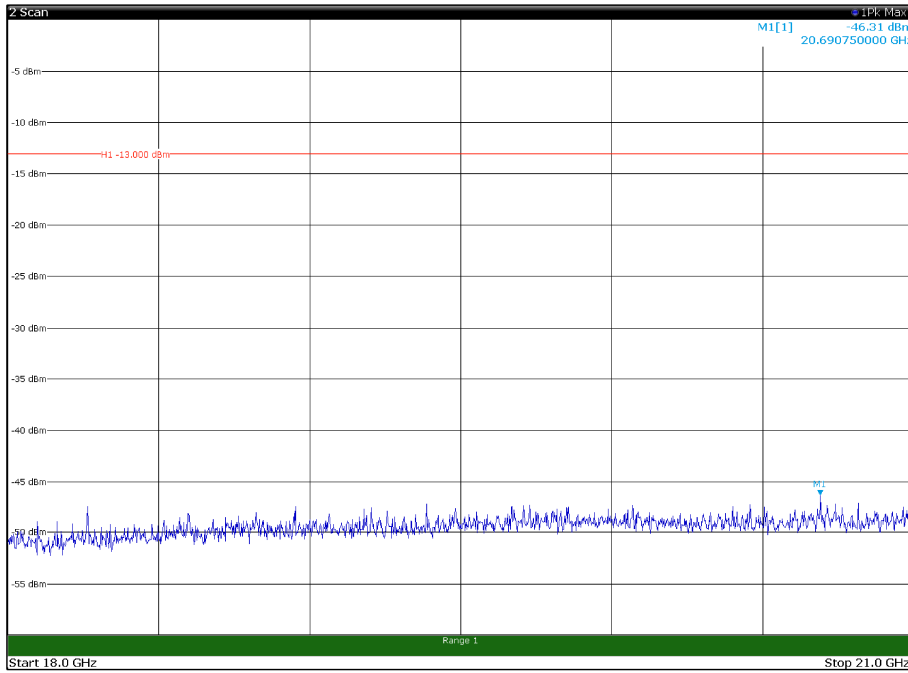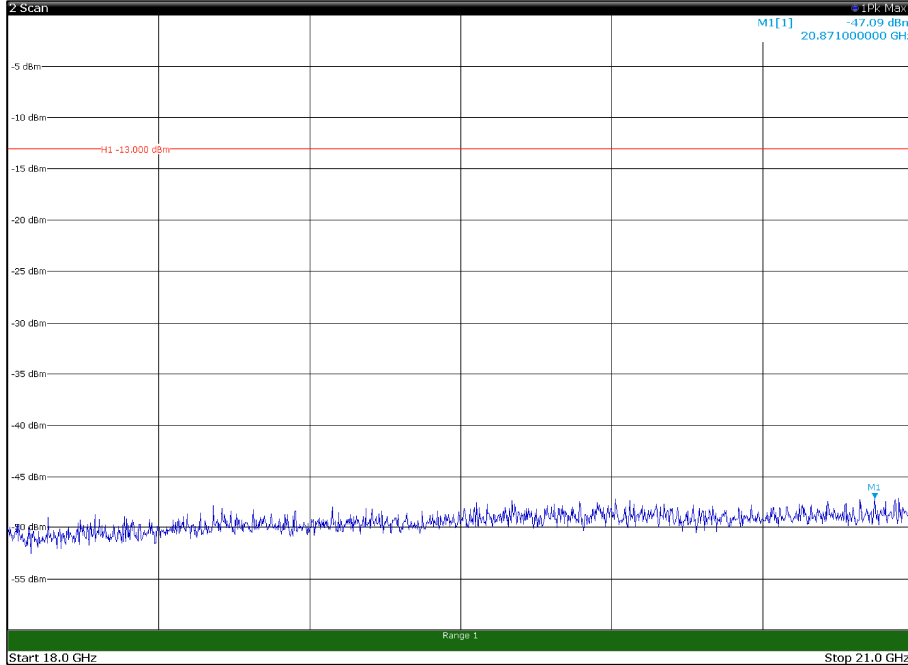

Channel: MIDDLE, Modulation: QPSK,
BW=5MHz, Range: 30MHz - 1GHz, Polarization: Vertical

Channel: MIDDLE, Modulation: QPSK,
BW=5MHz, Range: 1GHz -18GHz, Polarization: Horizontal

Channel: MIDDLE, Modulation: QPSK,
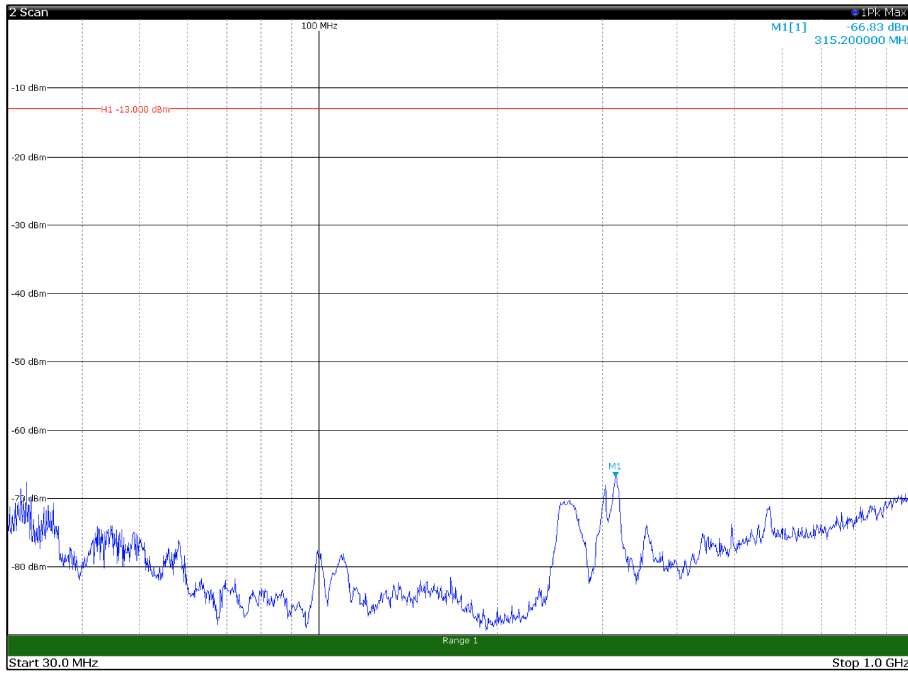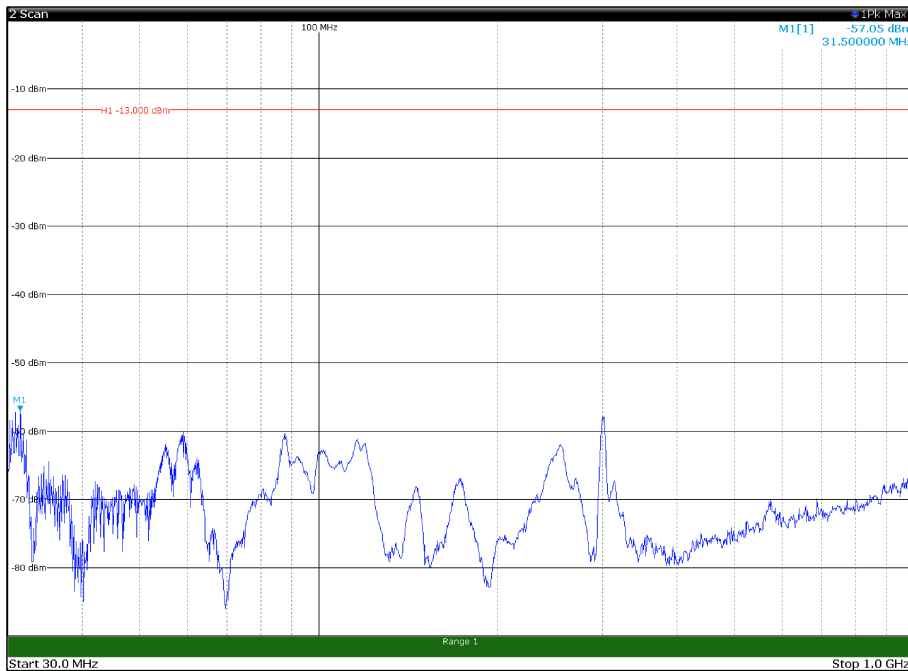BW=5MHz, Range: 1GHz -18GHz, Polarization: Vertical

Channel: MIDDLE, Modulation: QPSK,
BW=5MHz, Range: 18GHz - 21GHz, Polarization: Horizontal

Channel: MIDDLE, Modulation: QPSK,
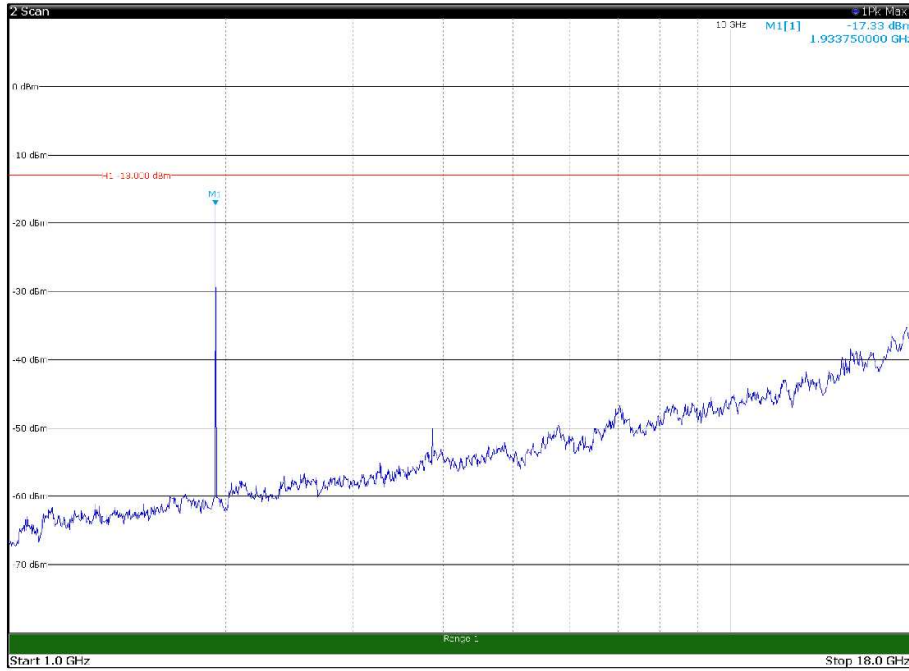BW=5MHz, Range: 18GHz - 21GHz, Polarization: Vertical

Channel: TOP, Modulation: QPSK,
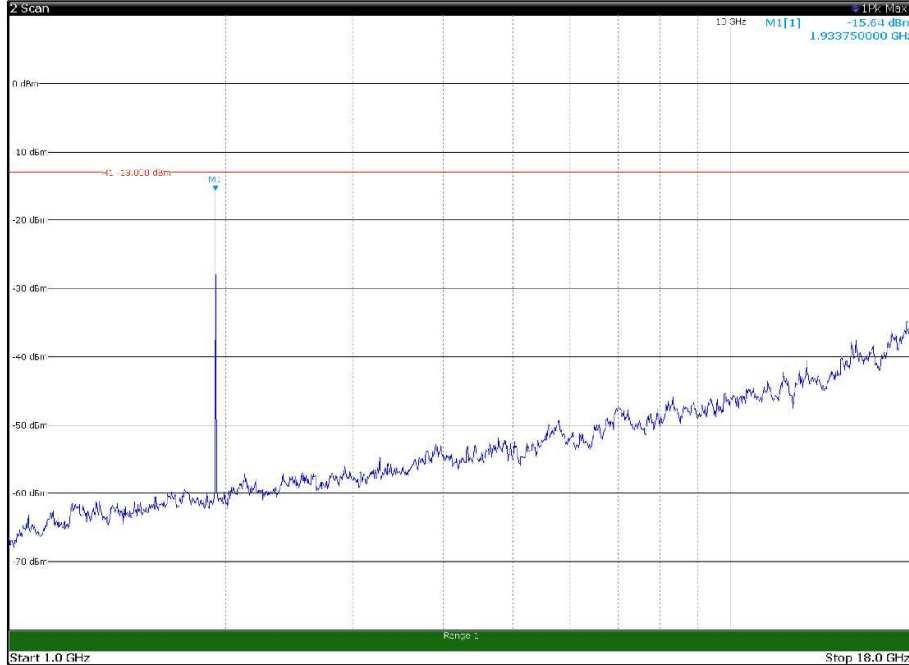BW=5MHz, Range: 30MHz - 1GHz, Polarization: Horizontal

Channel: TOP, Modulation: QPSK,
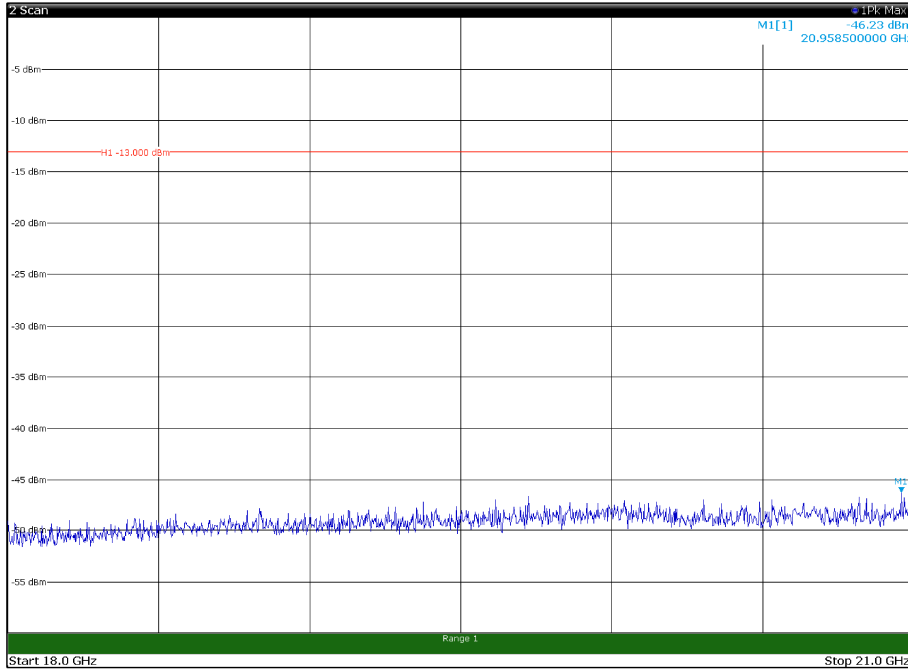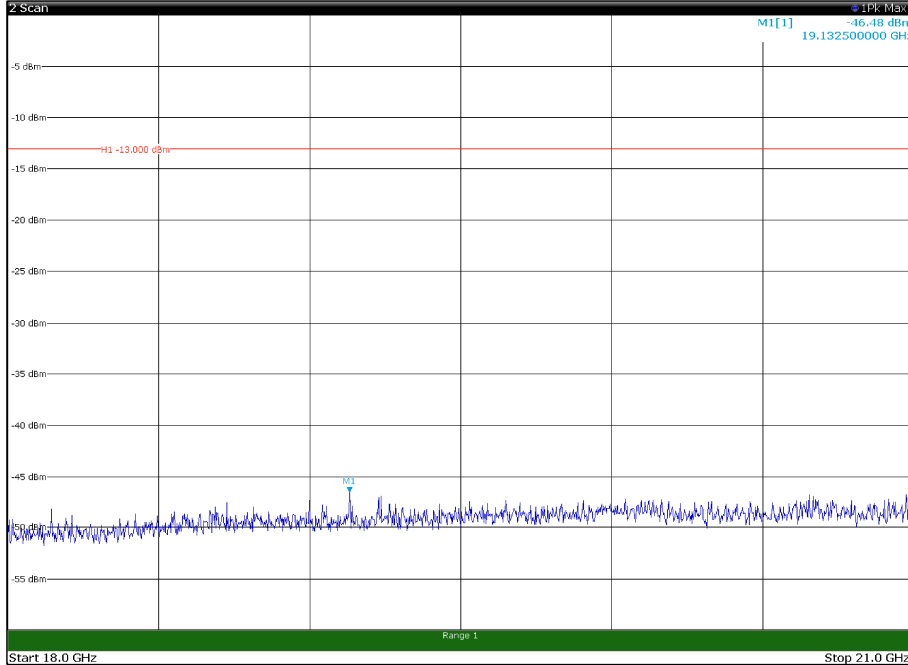BW=5MHz, Range: 30MHz - 1GHz, Polarization: Vertical

Channel: TOP, Modulation: QPSK,
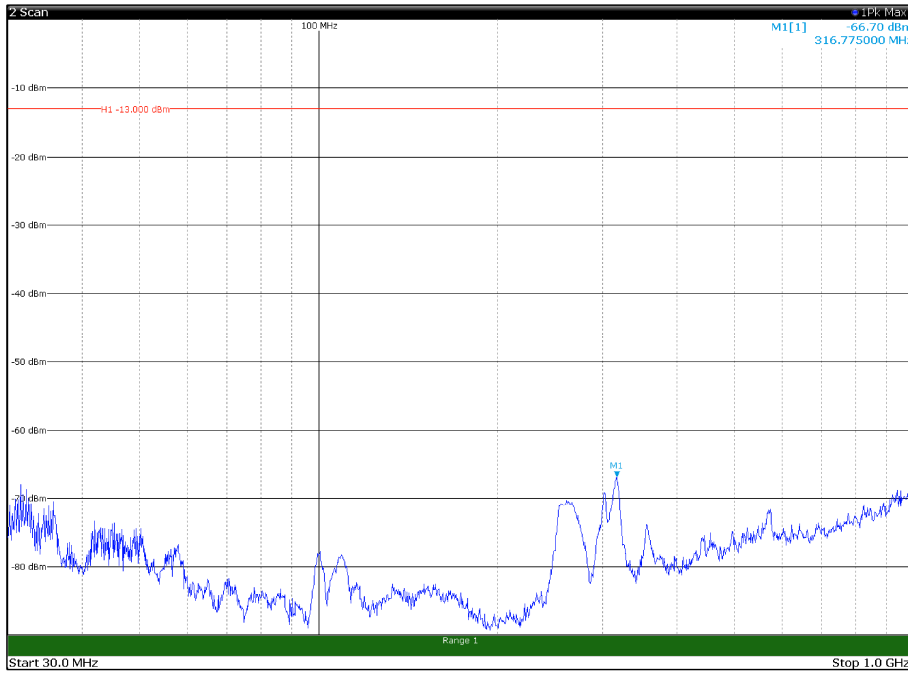BW=5MHz, Range: 1GHz -18GHz, Polarization: Horizontal

Channel: TOP, Modulation: QPSK,
BW=5MHz, Range: 1GHz -18GHz, Polarization: Vertical

Channel: TOP, Modulation: QPSK,
BW=5MHz, Range: 18GHz - 21GHz, Polarization: Horizontal

Channel: TOP, Modulation: QPSK,
BW=5MHz, Range: 18GHz - 21GHz, Polarization: Vertical
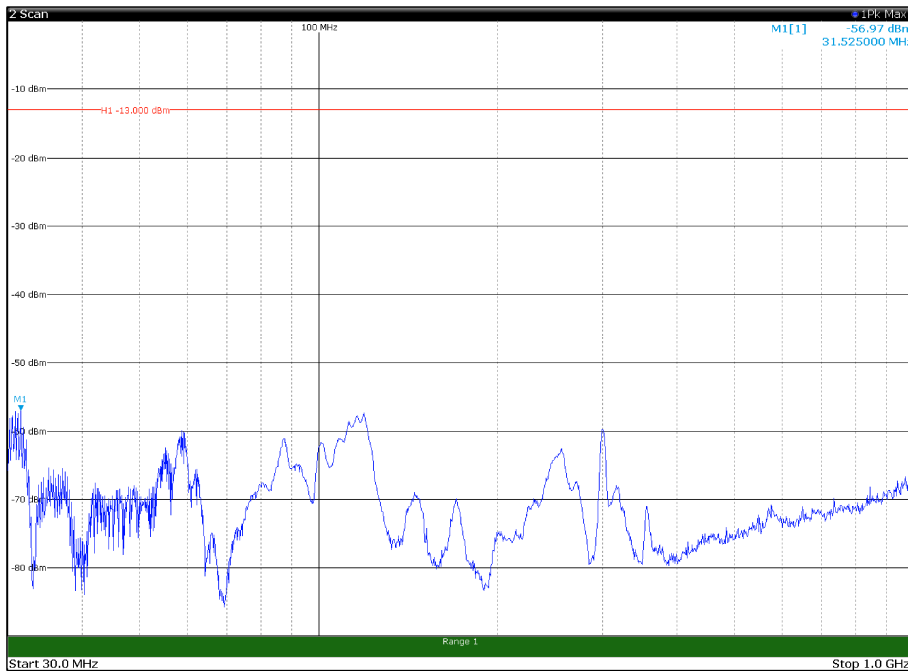
Channel: BOTTOM, Modulation: 16QAM,
BW=5MHz, Range: 30MHz - 1GHz, Polarization: Horizontal

Channel: BOTTOM, Modulation: 16QAM,
BW=5MHz, Range: 30MHz - 1GHz, Polarization: Vertical

Channel: BOTTOM, Modulation: 16QAM,
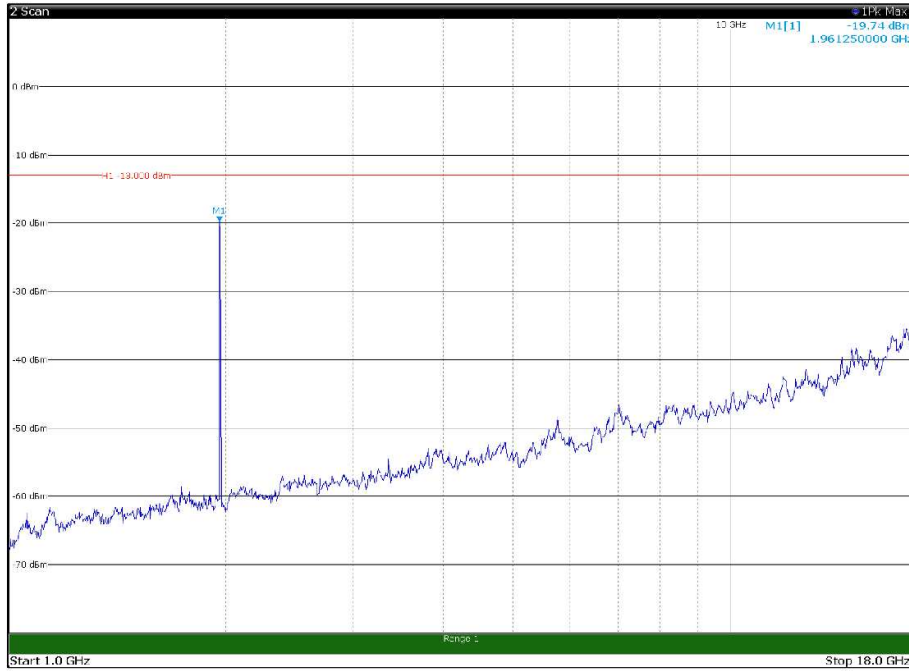BW=5MHz, Range: 1GHz -18GHz, Polarization: Horizontal

Channel: BOTTOM, Modulation: 16QAM,
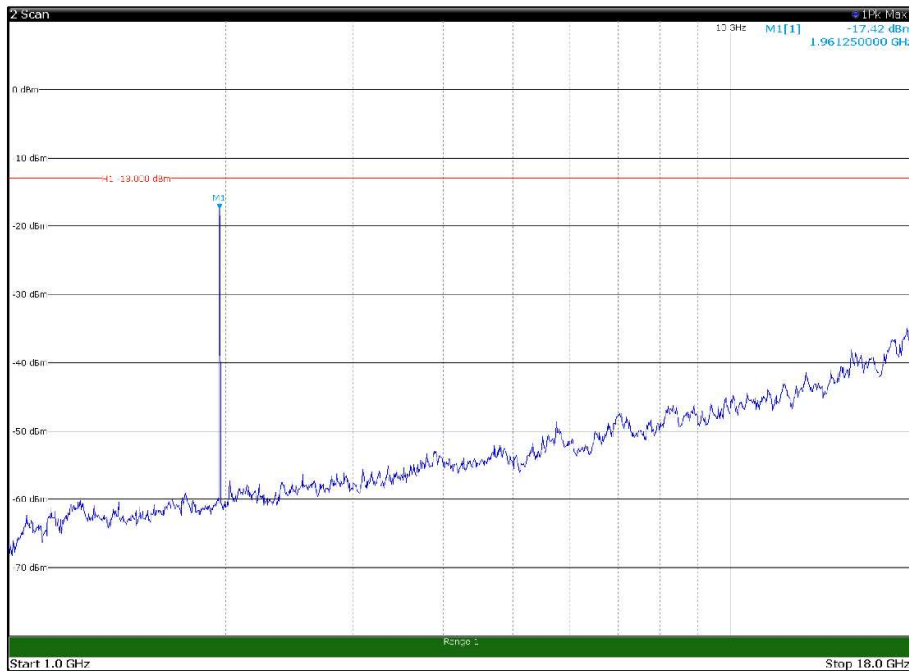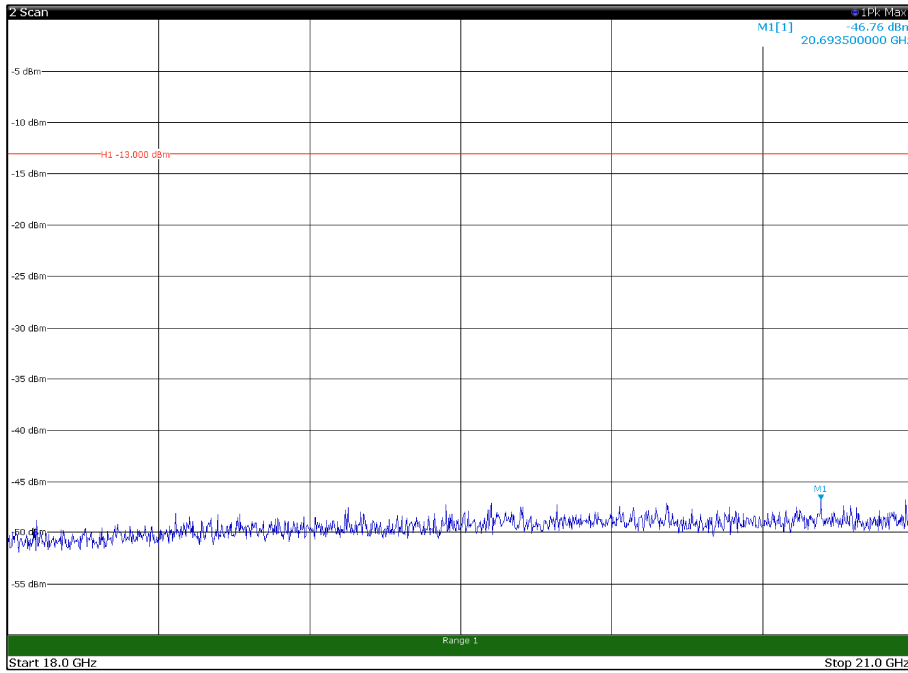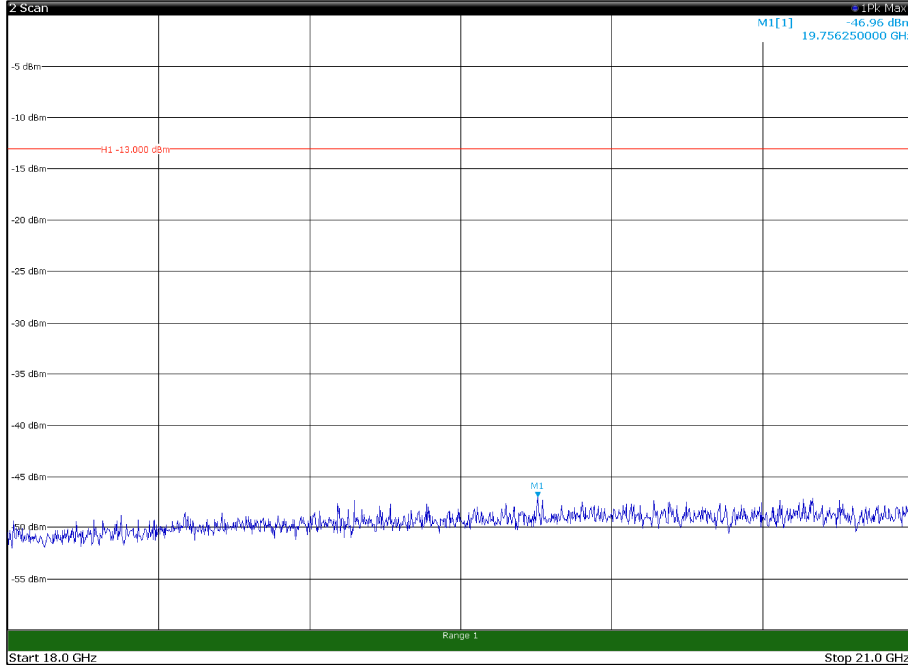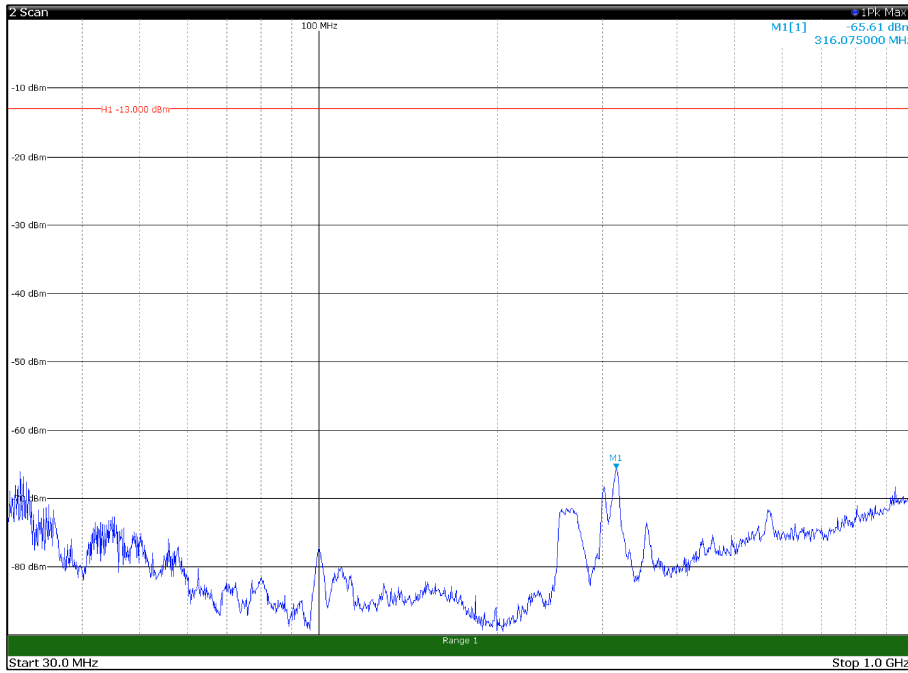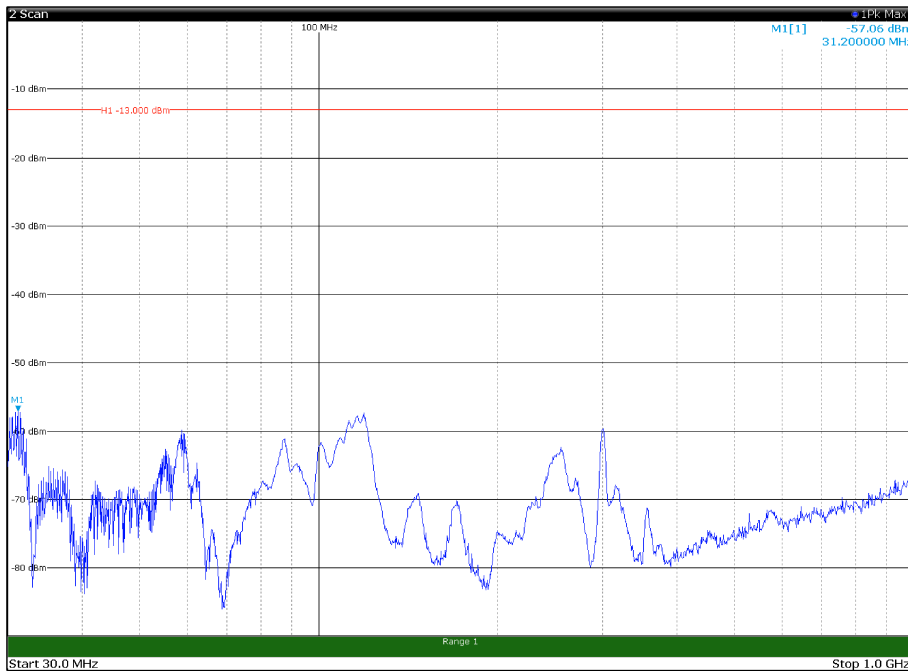BW=5MHz, Range: 1GHz -18GHz, Polarization: Vertical

Channel: BOTTOM, Modulation: 16QAM,
BW=5MHz, Range: 18GHz - 21GHz, Polarization: Horizontal

Channel: BOTTOM, Modulation: 16QAM,
BW=5MHz, Range: 18GHz - 21GHz, Polarization: Vertical

Channel: MIDDLE, Modulation: 16QAM,
BW=5MHz, Range: 30MHz - 1GHz, Polarization: Horizontal
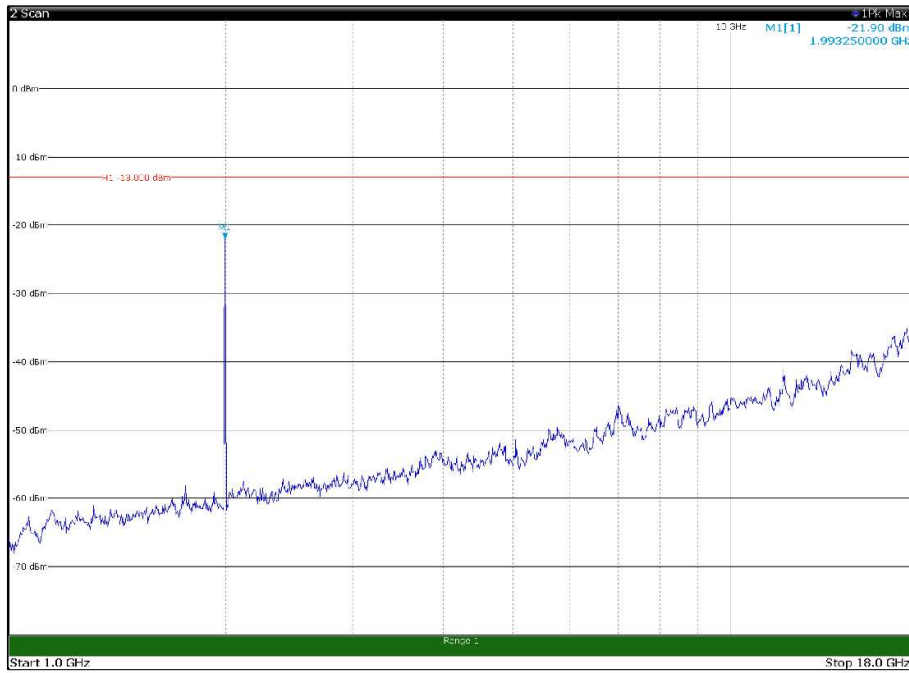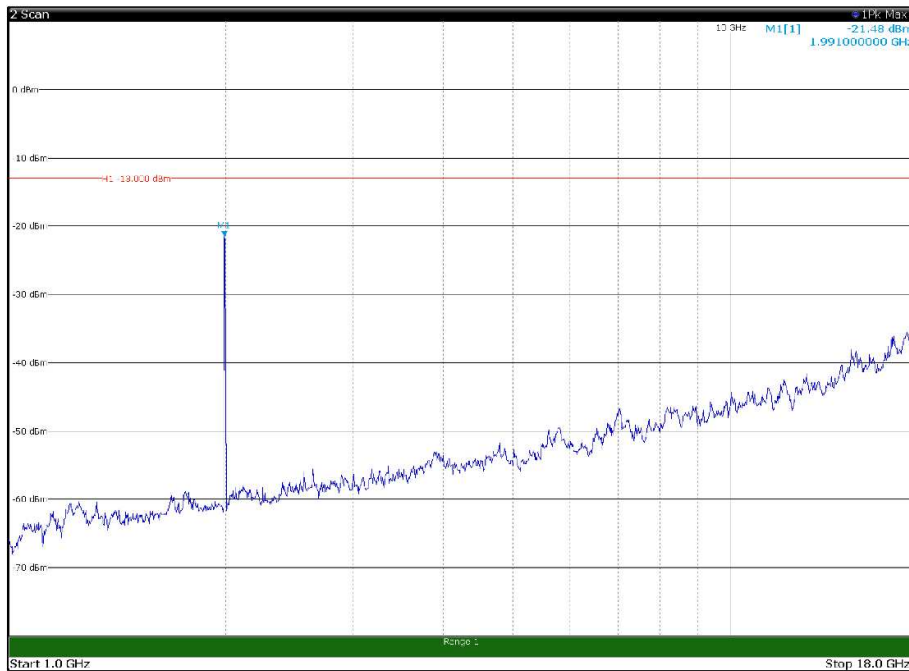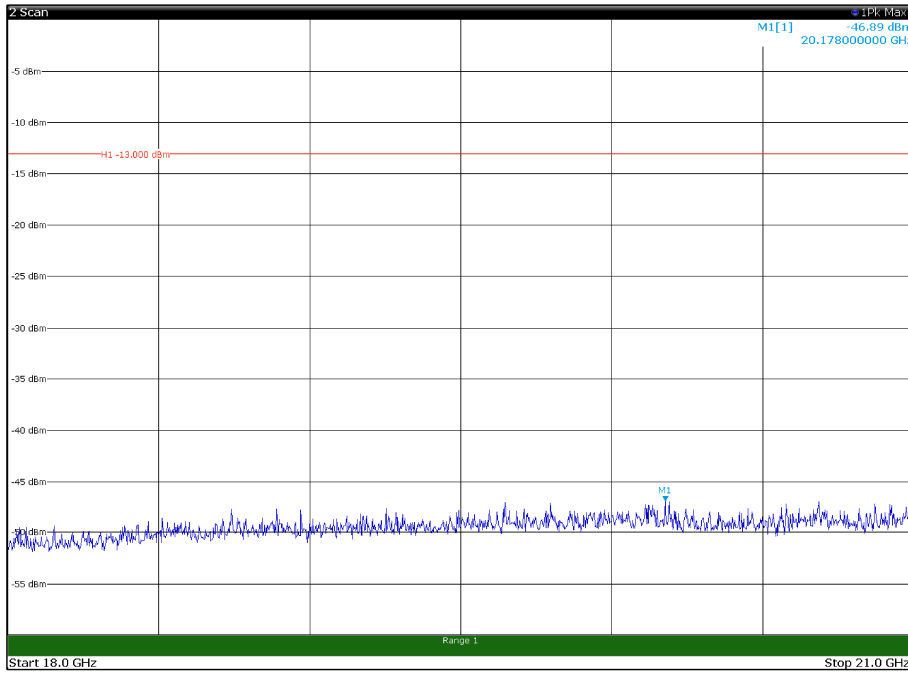

Channel: MIDDLE, Modulation: 16QAM,
BW=5MHz, Range: 30MHz - 1GHz, Polarization: Vertical

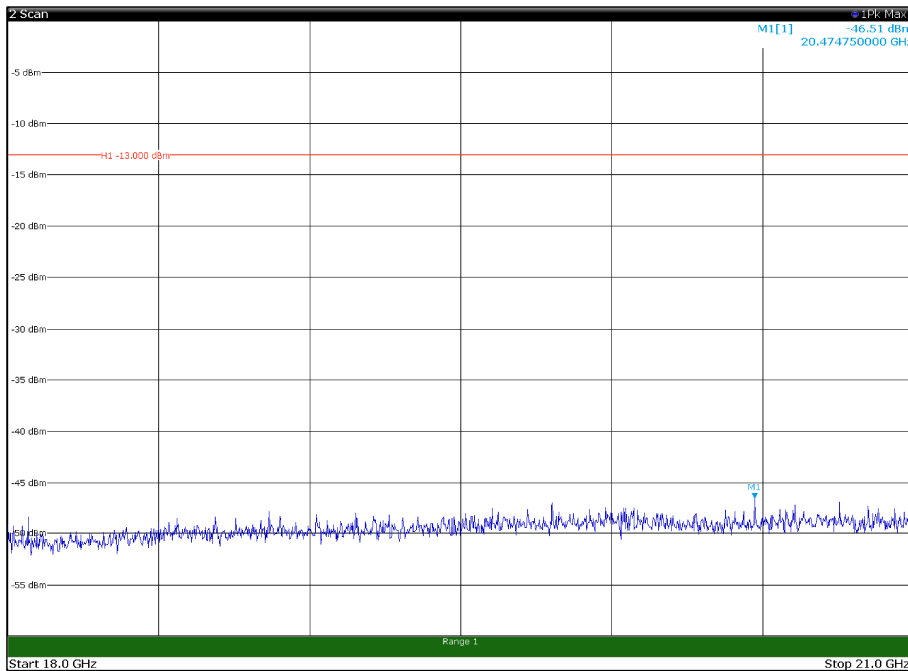Channel: MIDDLE, Modulation: 16QAM,
BW=5MHz, Range: 1GHz -18GHz, Polarization: Horizontal

Channel: MIDDLE, Modulation: 16QAM,
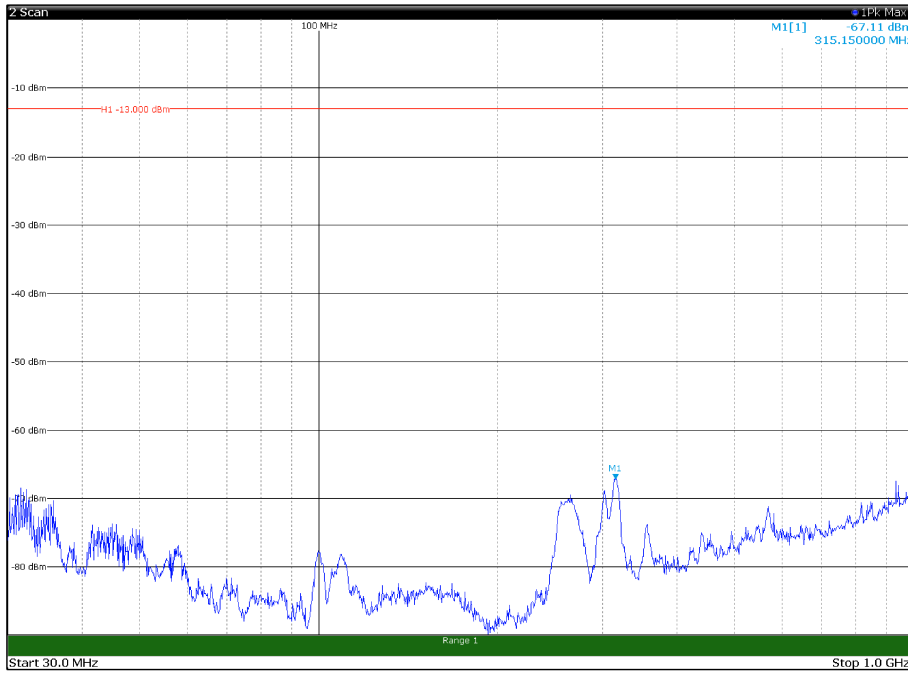BW=5MHz, Range: 1GHz -18GHz, Polarization: Vertical

Channel: MIDDLE, Modulation: 16QAM,
BW=5MHz, Range: 18GHz - 21GHz, Polarization: Horizontal

Channel: MIDDLE, Modulation: 16QAM,
BW=5MHz, Range: 18GHz - 21GHz, Polarization: Vertical

Channel: TOP, Modulation: 16QAM,
BW=5MHz, Range: 30MHz - 1GHz, Polarization: Horizontal
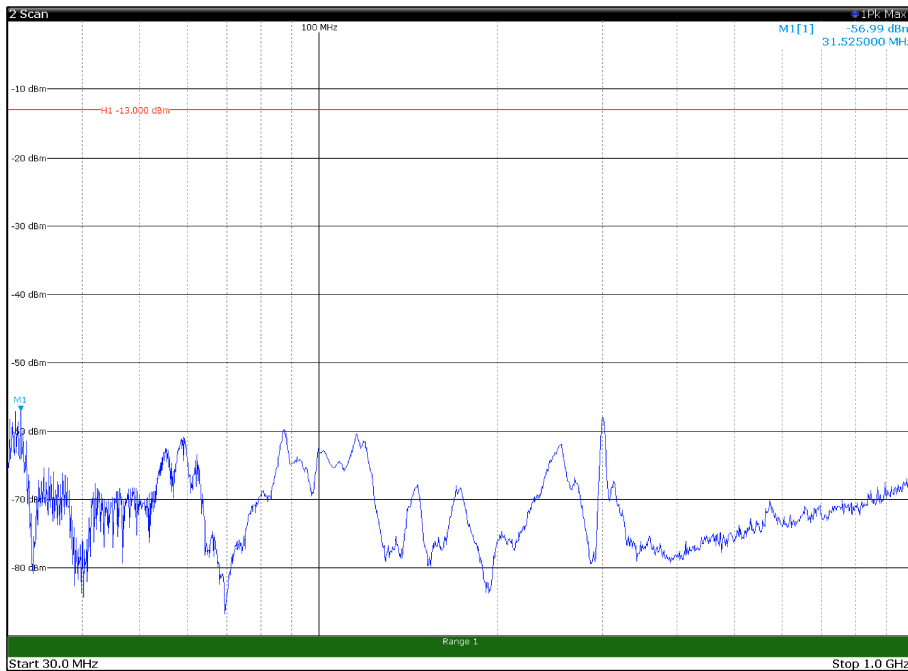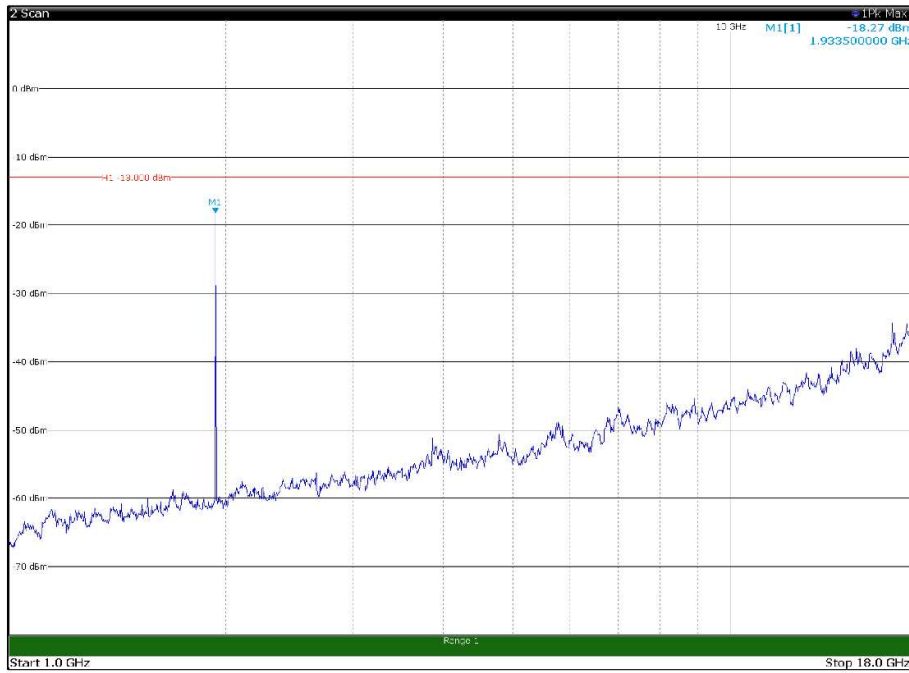

Channel: TOP, Modulation: 16QAM,
BW=5MHz, Range: 30MHz - 1GHz, Polarization: Vertical

Channel: TOP, Modulation: 16QAM,
BW=5MHz, Range: 1GHz -18GHz, Polarization: Horizontal

Channel: TOP, Modulation: 16QAM,
BW=5MHz, Range: 1GHz -18GHz, Polarization: Vertical

Channel: TOP, Modulation: 16QAM,
BW=5MHz, Range: 18GHz - 21GHz, Polarization: Horizontal

Channel: TOP, Modulation: 16QAM,
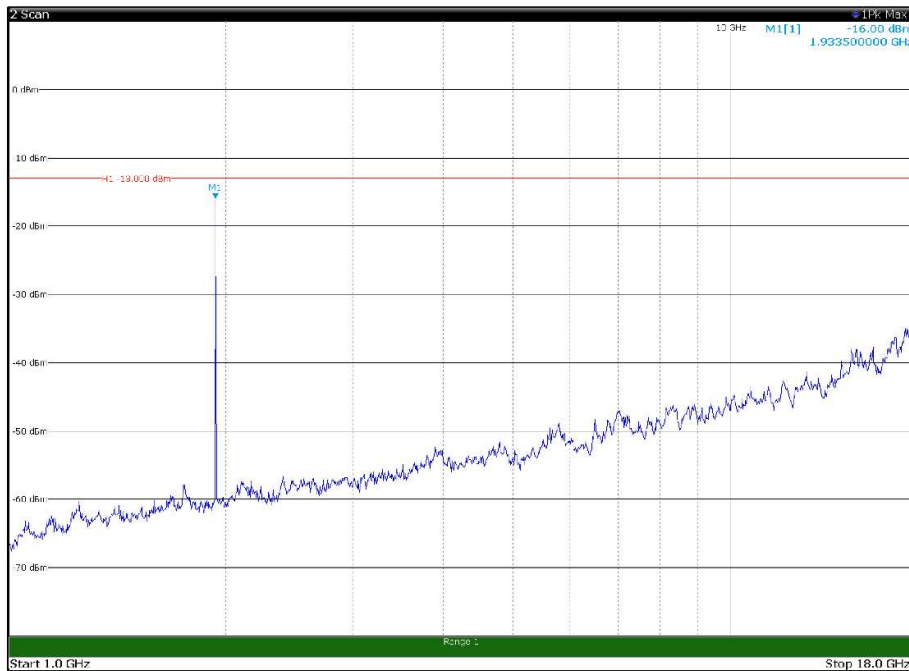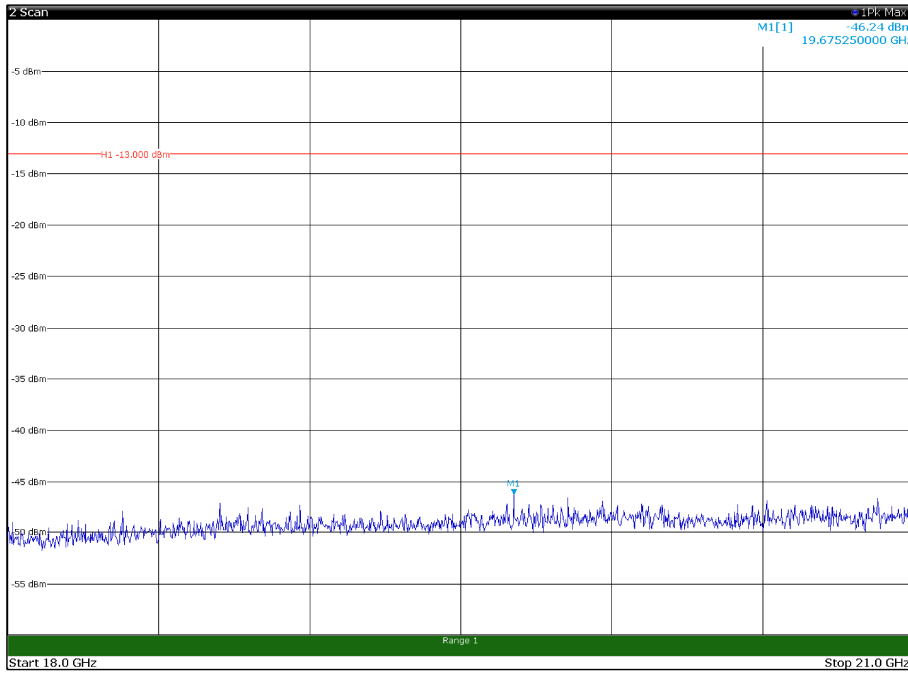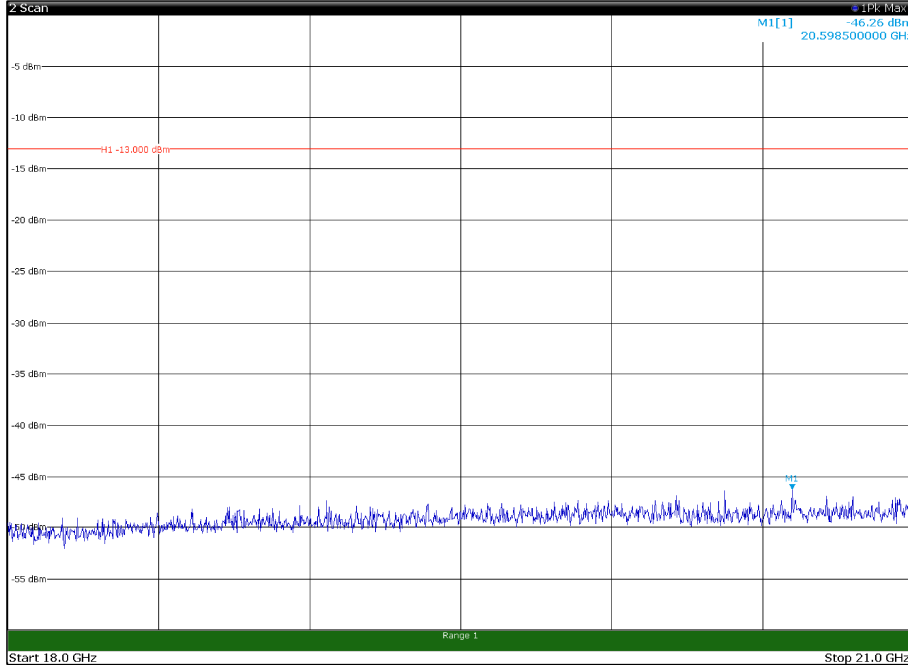BW=5MHz, Range: 18GHz - 21GHz, Polarization: Vertical

Channel: BOTTOM, Modulation: 64QAM,
BW=5MHz, Range: 30MHz - 1GHz, Polarization: Horizontal

Channel: BOTTOM, Modulation: 64QAM,
BW=5MHz, Range: 30MHz - 1GHz, Polarization: Vertical

Channel: BOTTOM, Modulation: 64QAM,
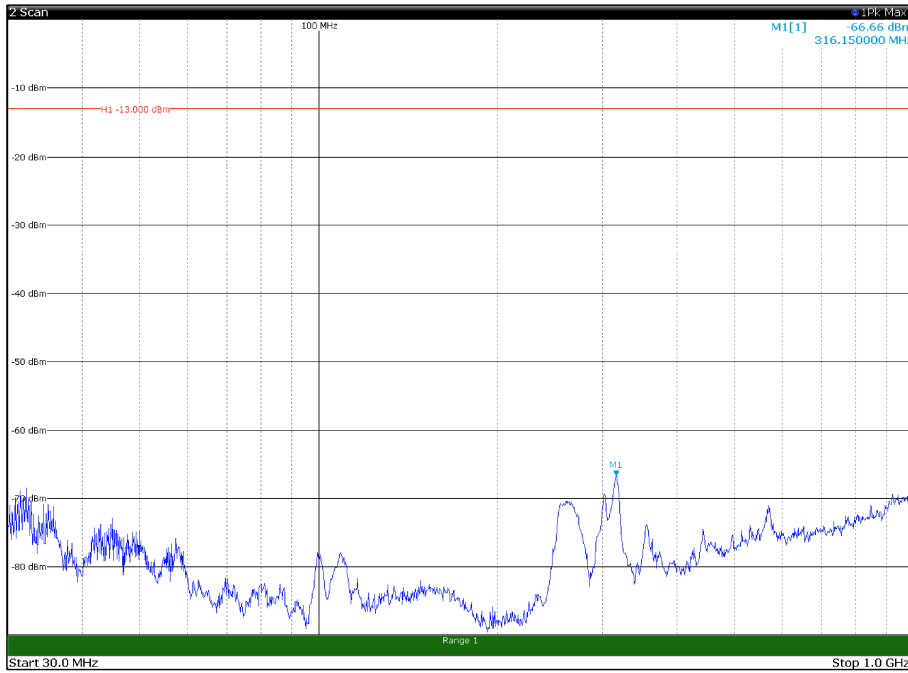BW=5MHz, Range: 1GHz -18GHz, Polarization: Horizontal

Channel: BOTTOM, Modulation: 64QAM,
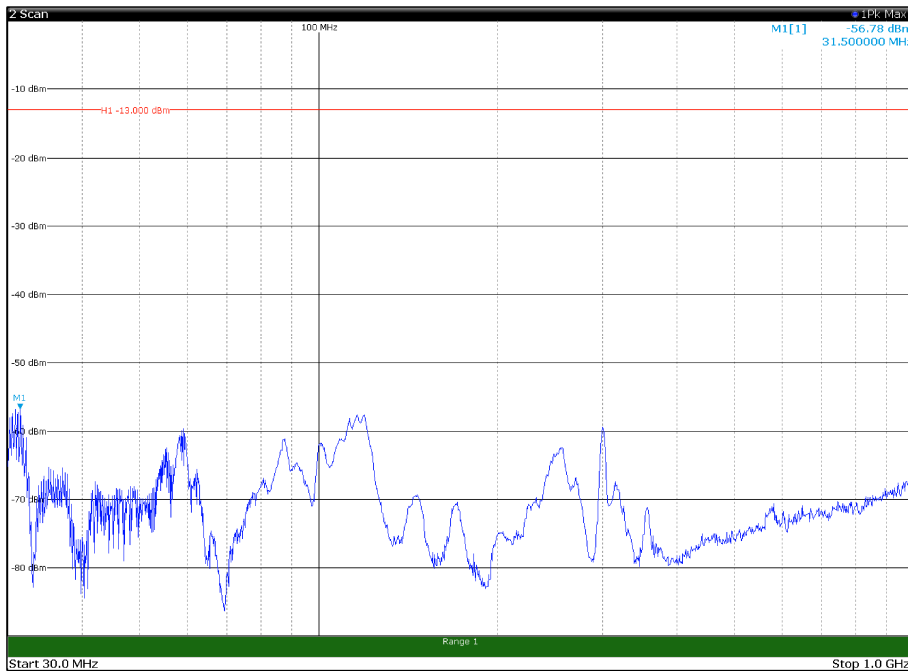BW=5MHz, Range: 1GHz -18GHz, Polarization: Vertical

Channel: BOTTOM, Modulation: 64QAM,
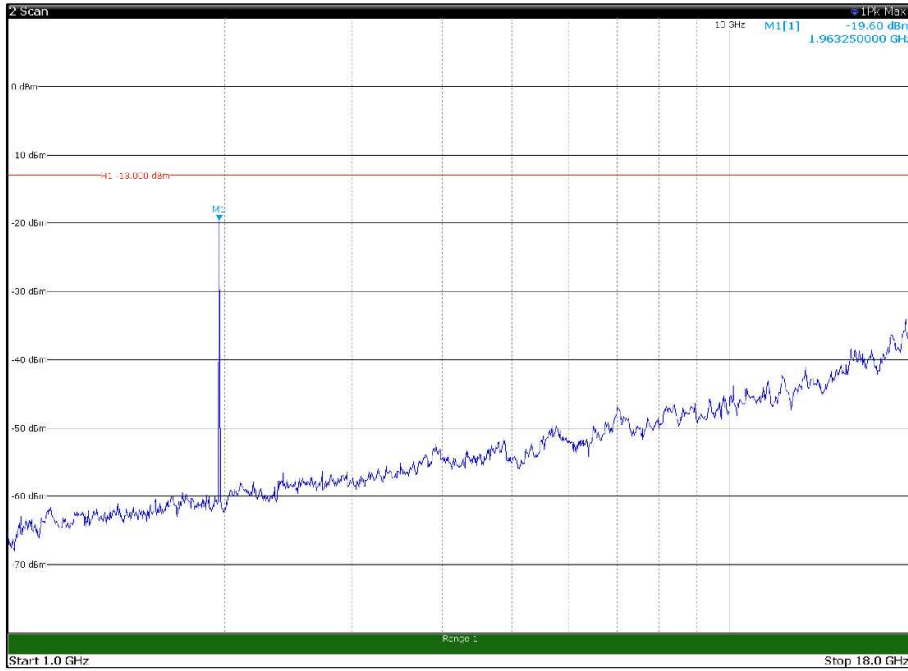BW=5MHz, Range: 18GHz - 21GHz, Polarization: Horizontal

Channel: BOTTOM, Modulation: 64QAM,
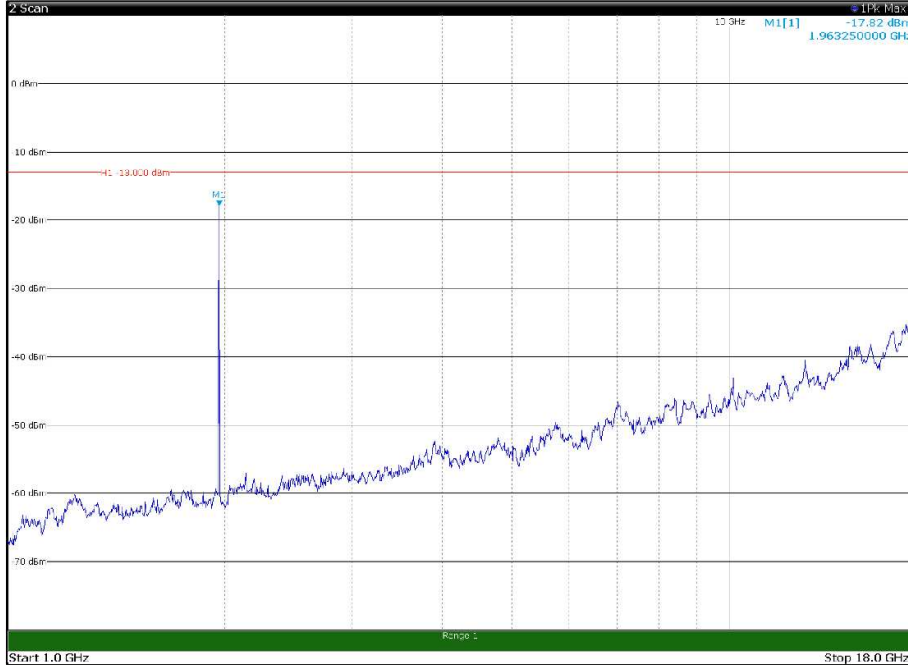BW=5MHz, Range: 18GHz - 21GHz, Polarization: Vertical

Channel: MIDDLE, Modulation: 64QAM,
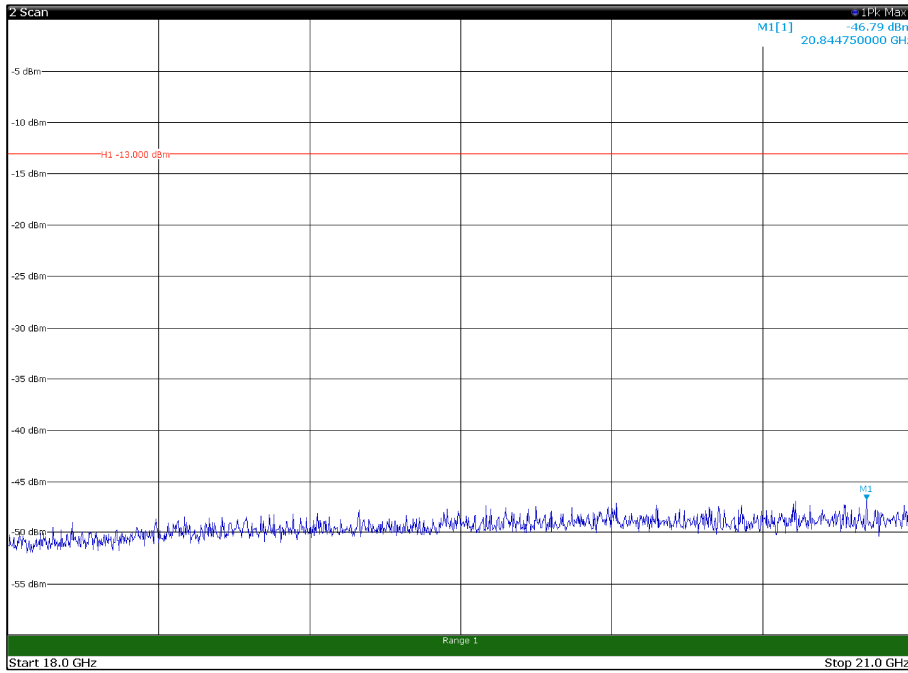BW=5MHz, Range: 30MHz - 1GHz, Polarization: Horizontal

Channel: MIDDLE, Modulation: 64QAM,
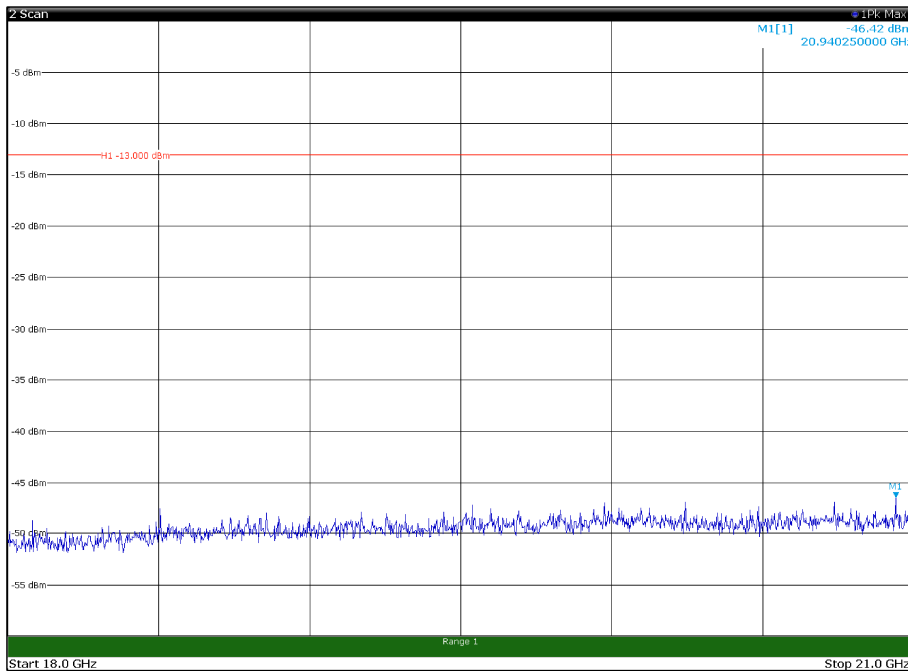BW=5MHz, Range: 30MHz - 1GHz, Polarization: Vertical

Channel: MIDDLE, Modulation: 64QAM,
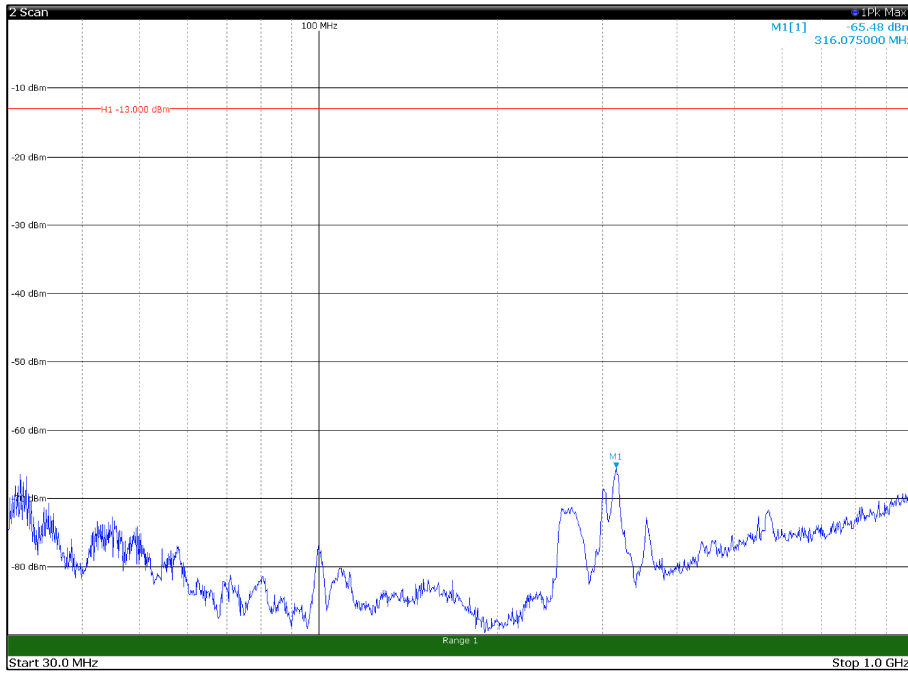BW=5MHz, Range: 1GHz -18GHz, Polarization: Horizontal

Channel: MIDDLE, Modulation: 64QAM,
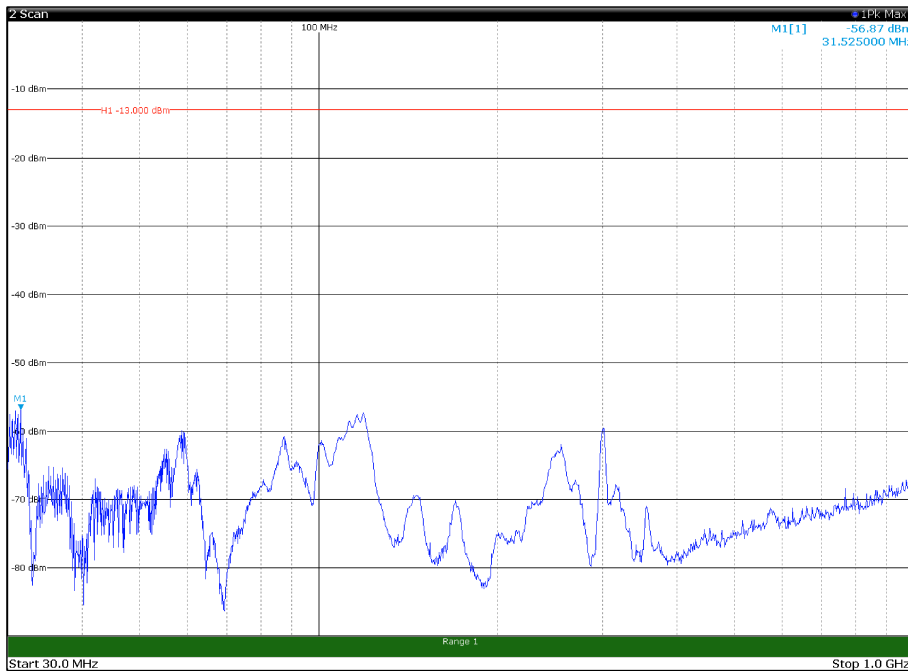BW=5MHz, Range: 1GHz -18GHz, Polarization: Vertical

Channel: MIDDLE, Modulation: 64QAM,
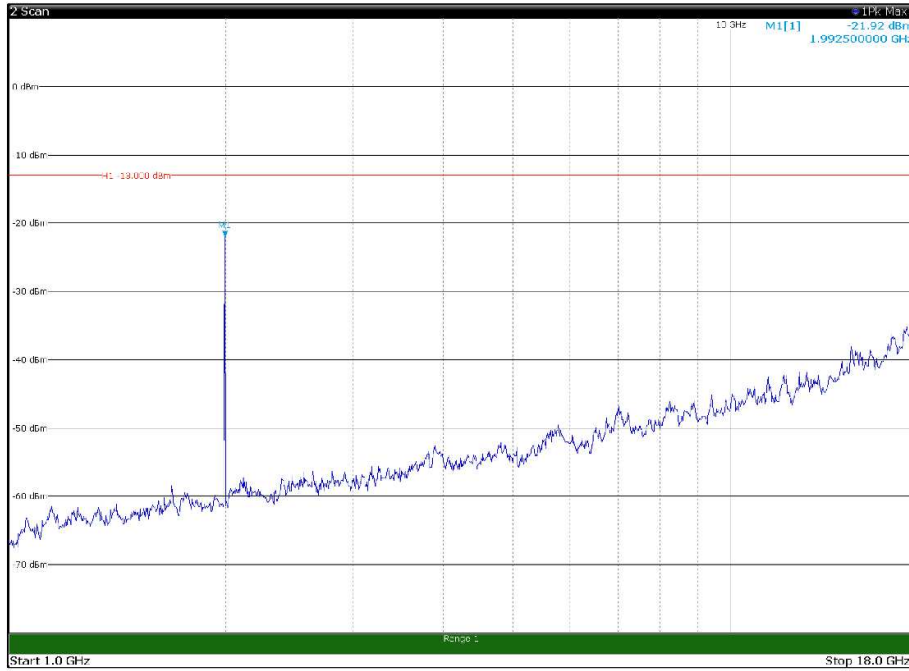BW=5MHz, Range: 18GHz - 21GHz, Polarization: Horizontal

Channel: MIDDLE, Modulation: 64QAM,
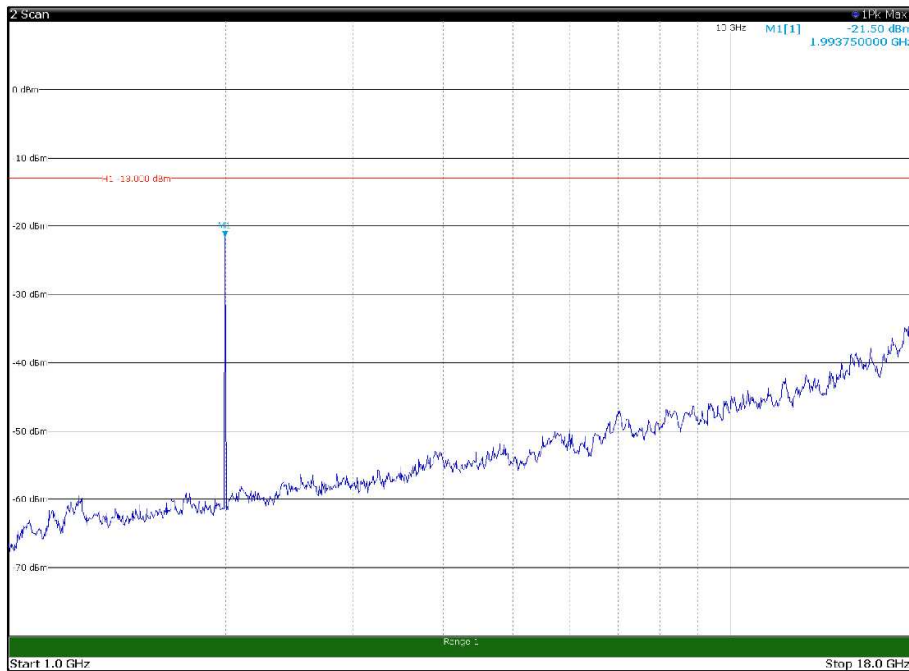BW=5MHz, Range: 18GHz - 21GHz, Polarization: Vertical

Channel: TOP, Modulation: 64QAM,
BW=5MHz, Range: 30MHz - 1GHz, Polarization: Horizontal

Channel: TOP, Modulation: 64QAM,
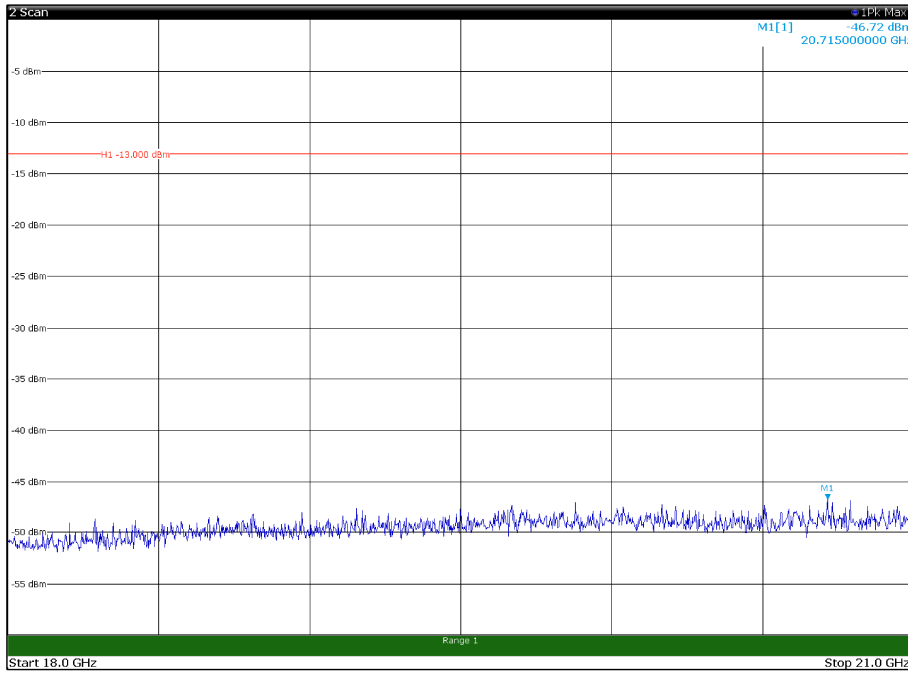BW=5MHz, Range: 30MHz - 1GHz, Polarization: Vertical

Channel: TOP, Modulation: 64QAM,
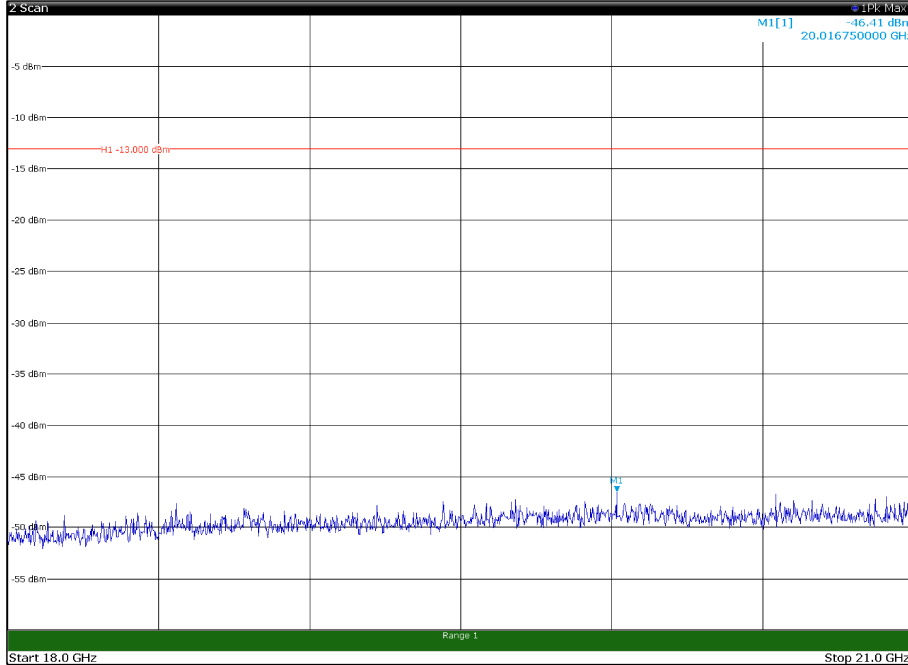BW=5MHz, Range: 1GHz -18GHz, Polarization: Horizontal

Channel: TOP, Modulation: 64QAM,
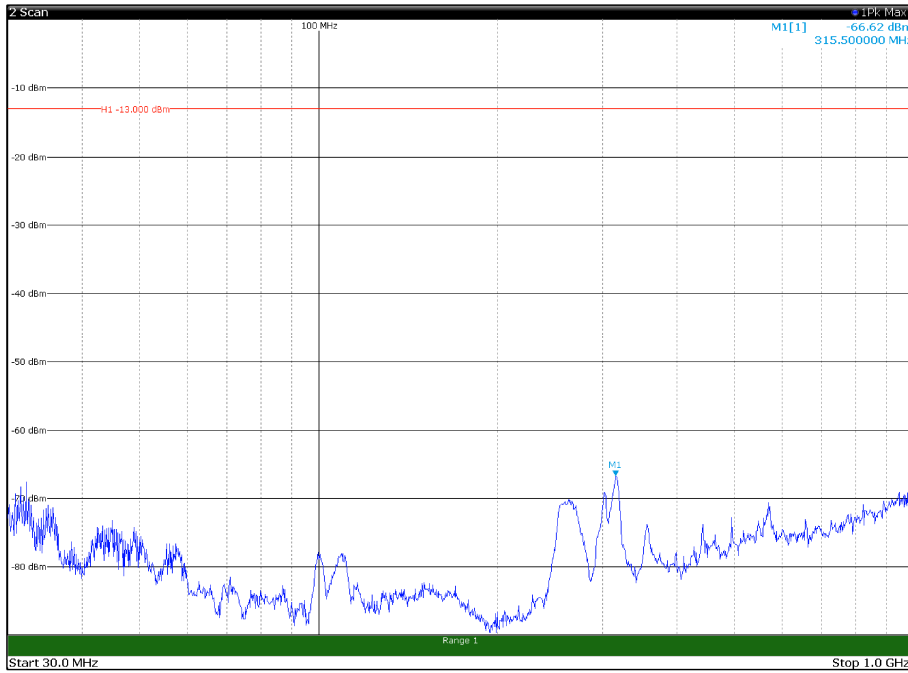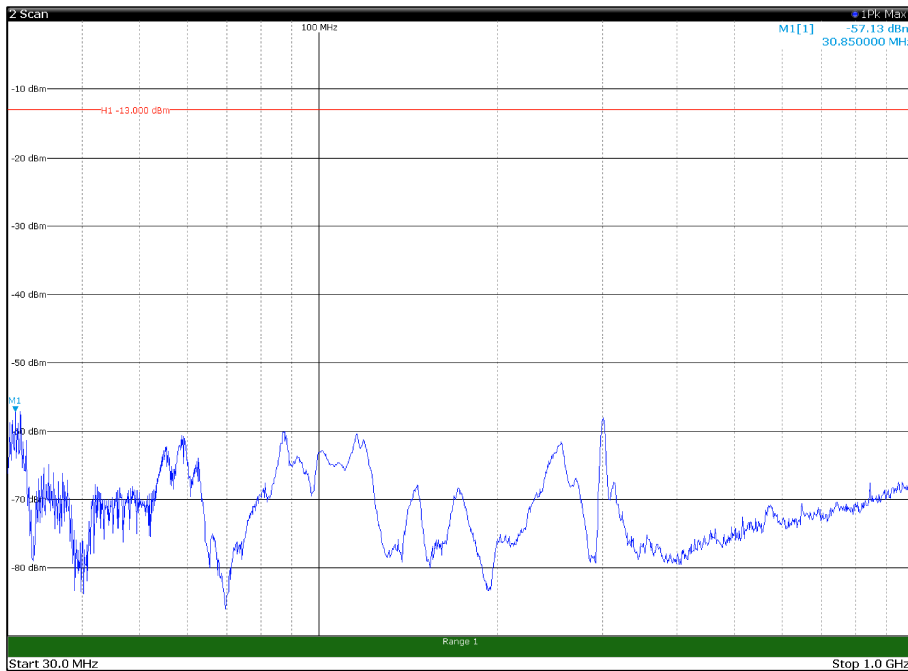BW=5MHz, Range: 1GHz -18GHz, Polarization: Vertical

Channel: TOP, Modulation: 64QAM,
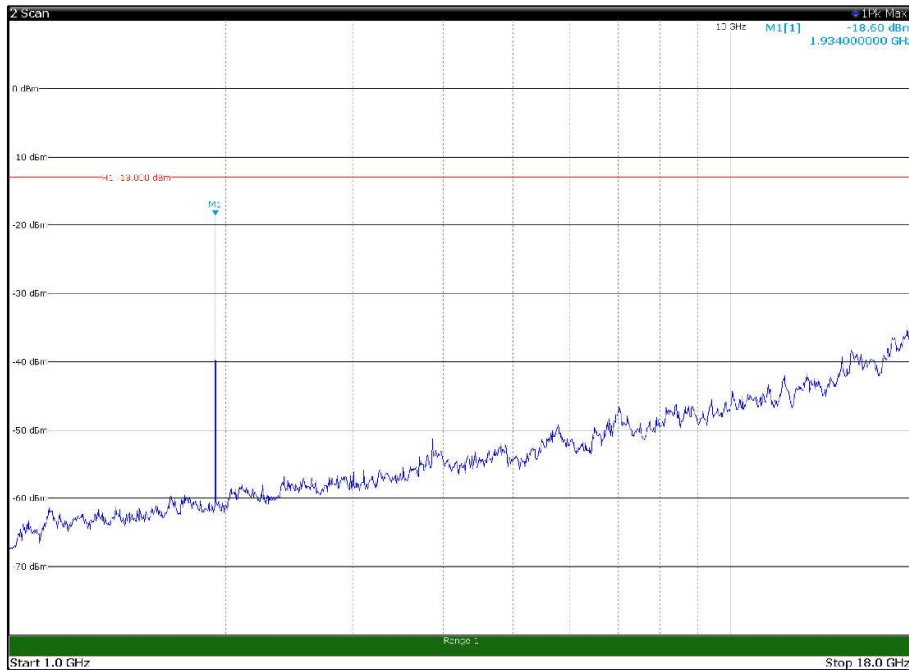BW=5MHz, Range: 18GHz - 21GHz, Polarization: Horizontal

Channel: TOP, Modulation: 64QAM,
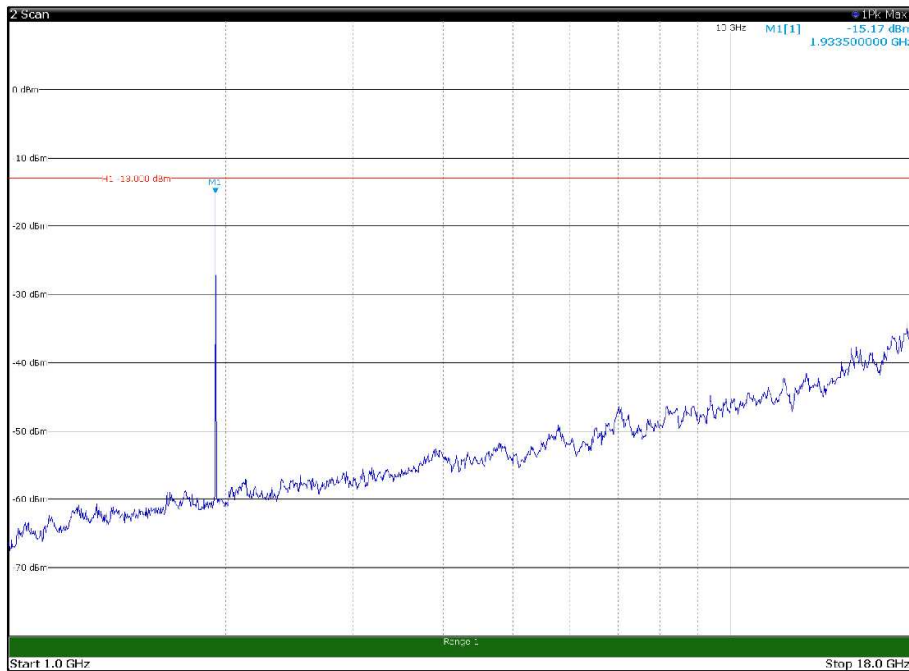BW=5MHz, Range: 18GHz - 21GHz, Polarization: Vertical

Channel: BOTTOM, Modulation: 256QAM,
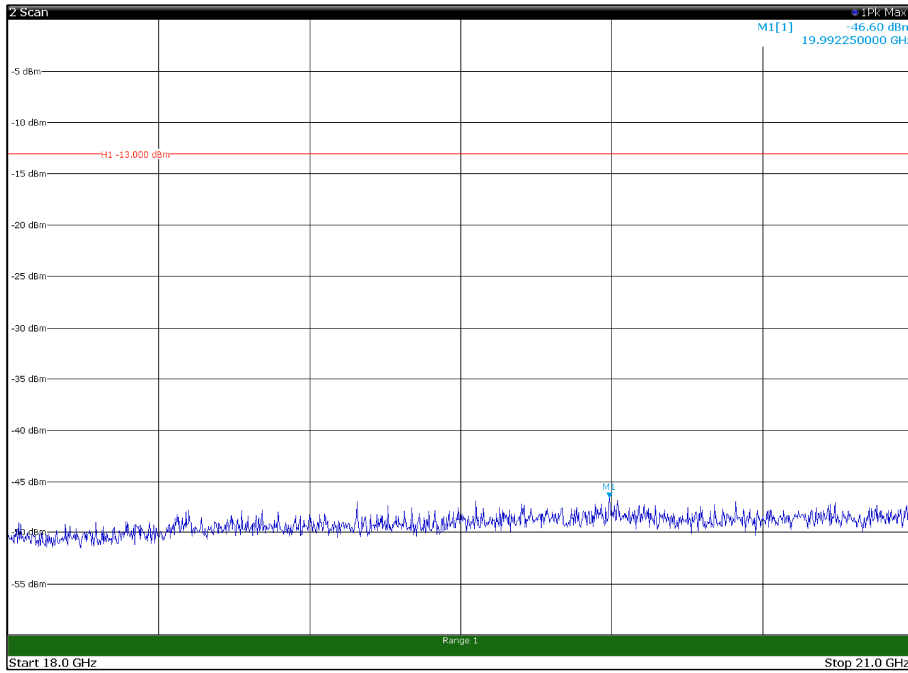BW=5MHz, Range: 30MHz - 1GHz, Polarization: Horizontal

Channel: BOTTOM, Modulation: 256QAM,
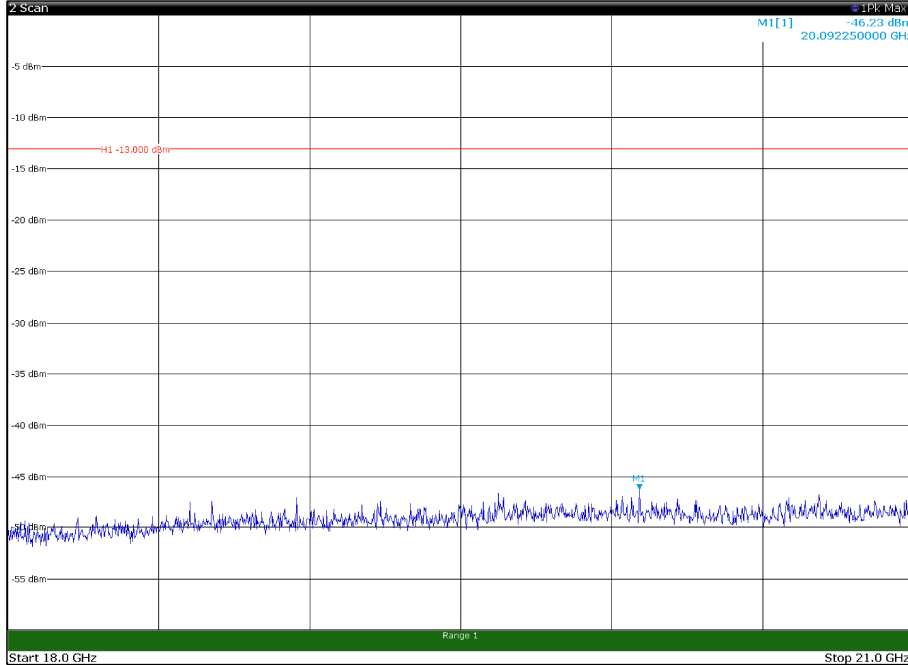BW=5MHz, Range: 30MHz - 1GHz, Polarization: Vertical

Channel: BOTTOM, Modulation: 256QAM,
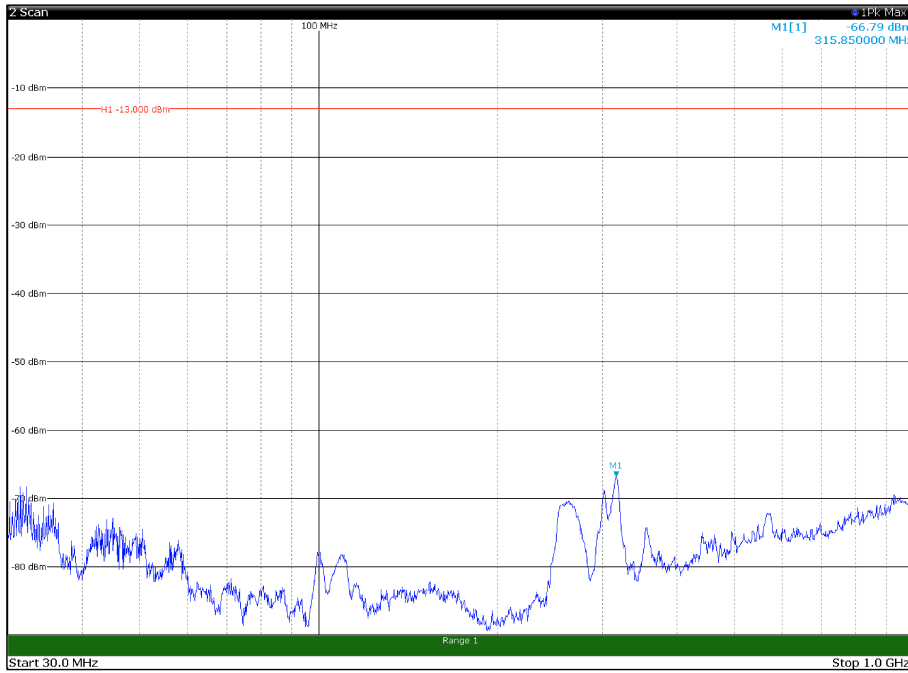BW=5MHz, Range: 1GHz -18GHz, Polarization: Horizontal

Channel: BOTTOM, Modulation: 256QAM,
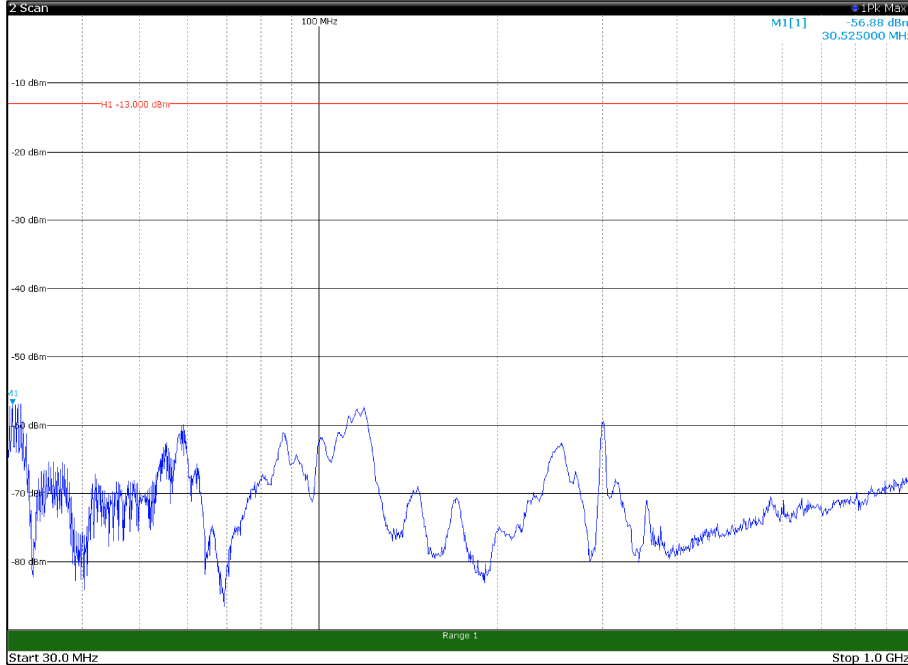BW=5MHz, Range: 1GHz -18GHz, Polarization: Vertical

Channel: BOTTOM, Modulation: 256QAM,
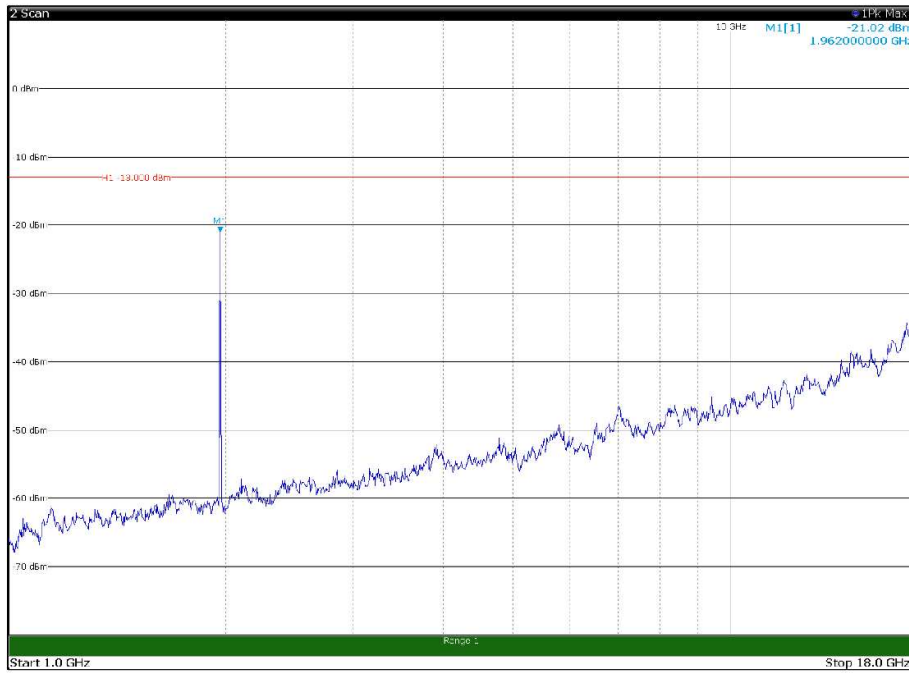BW=5MHz, Range: 18GHz - 21GHz, Polarization: Horizontal

Channel: BOTTOM, Modulation: 256QAM,
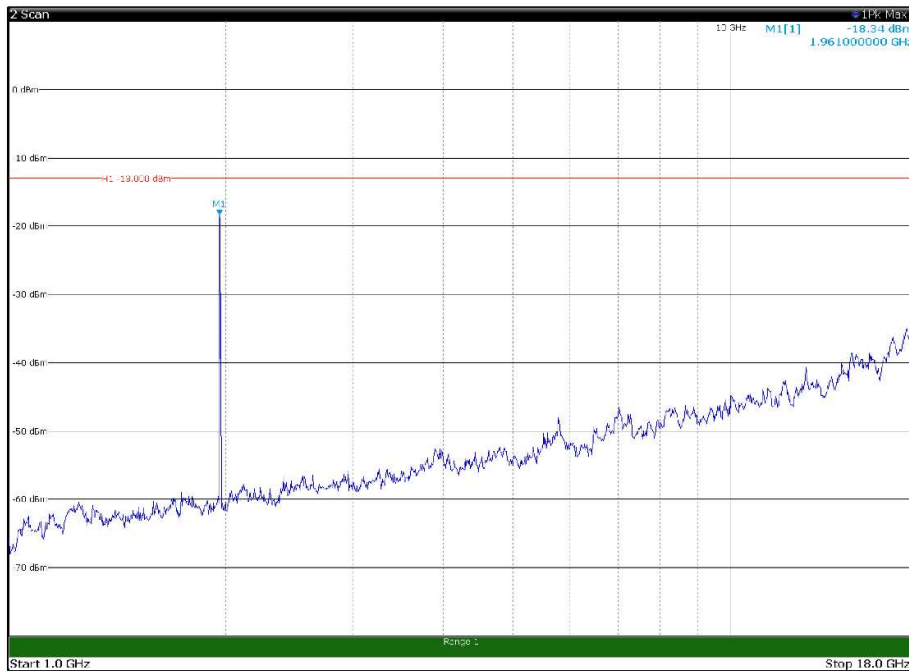BW=5MHz, Range: 18GHz - 21GHz, Polarization: Vertical

Channel: MIDDLE, Modulation: 256QAM,
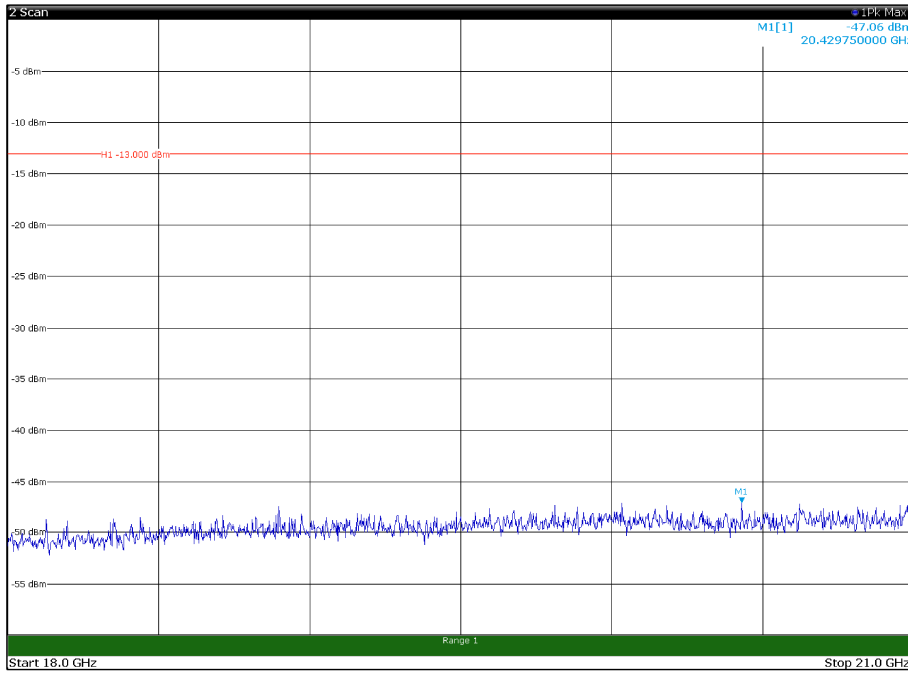BW=5MHz, Range: 30MHz - 1GHz, Polarization: Horizontal

Channel: MIDDLE, Modulation: 256QAM,
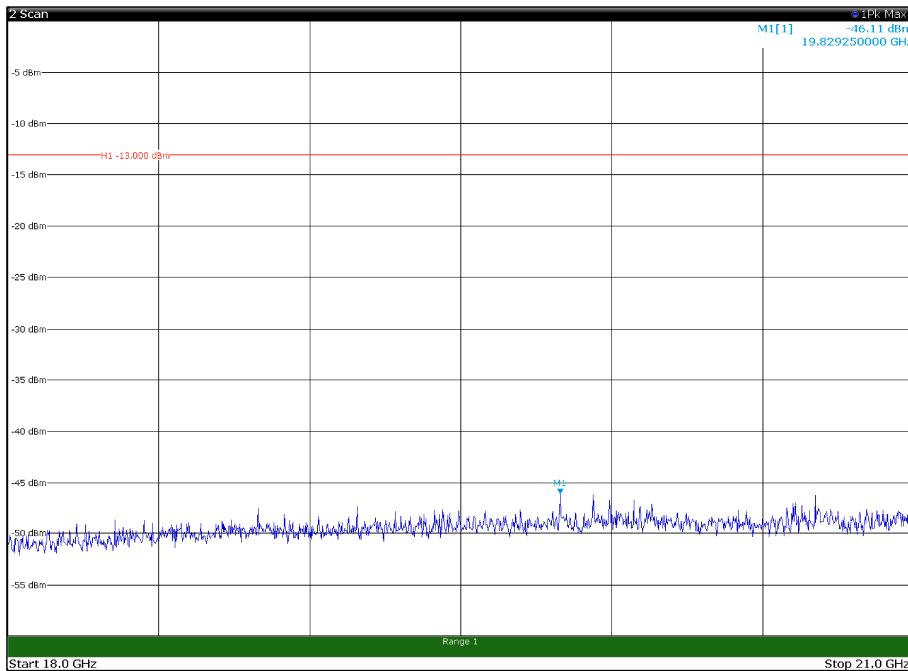BW=5MHz, Range: 30MHz - 1GHz, Polarization: Vertical

Channel: MIDDLE, Modulation: 256QAM,
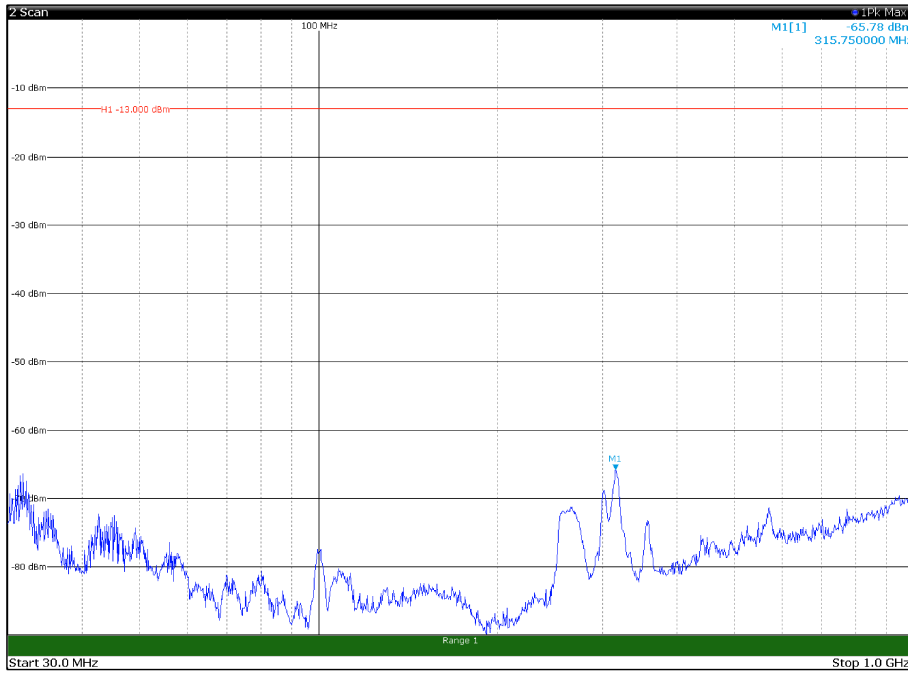BW=5MHz, Range: 1GHz -18GHz, Polarization: Horizontal

Channel: MIDDLE, Modulation: 256QAM,
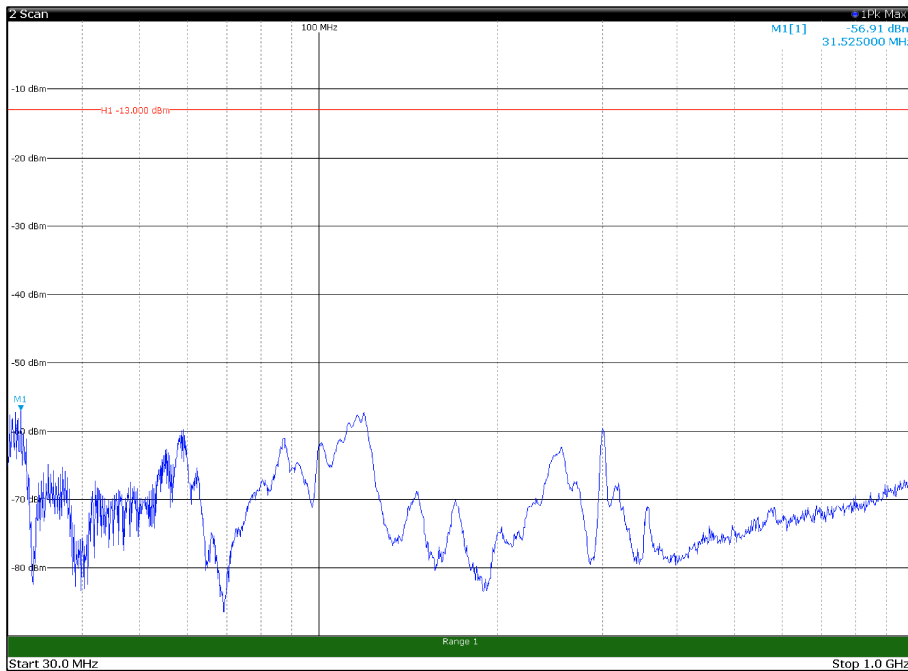BW=5MHz, Range: 1GHz -18GHz, Polarization: Vertical

Channel: MIDDLE, Modulation: 256QAM,
BW=5MHz, Range: 18GHz - 21GHz, Polarization: Horizontal

Channel: MIDDLE, Modulation: 256QAM,
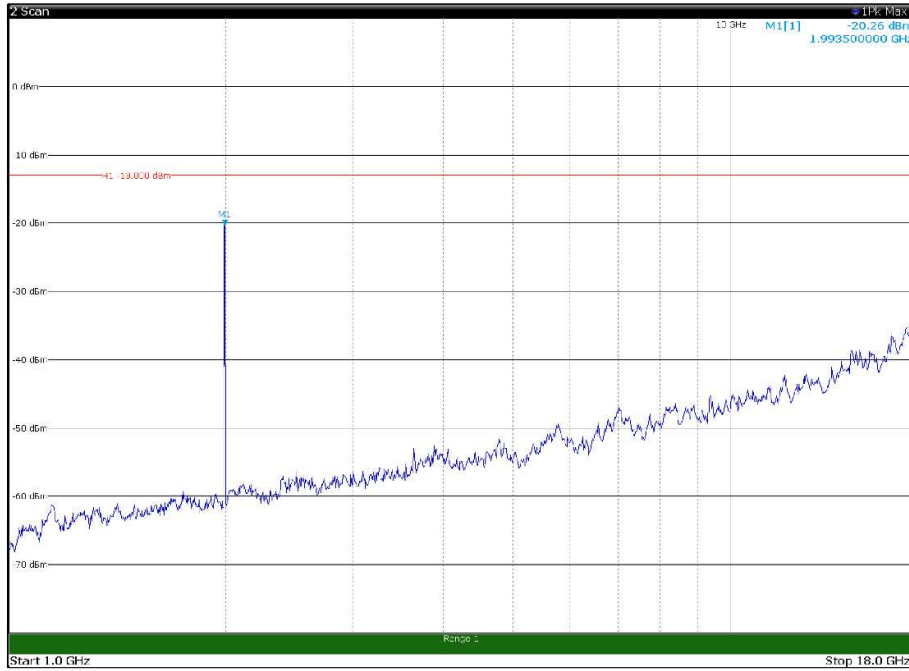BW=5MHz, Range: 18GHz - 21GHz, Polarization: Vertical

Channel: TOP, Modulation: 256QAM,
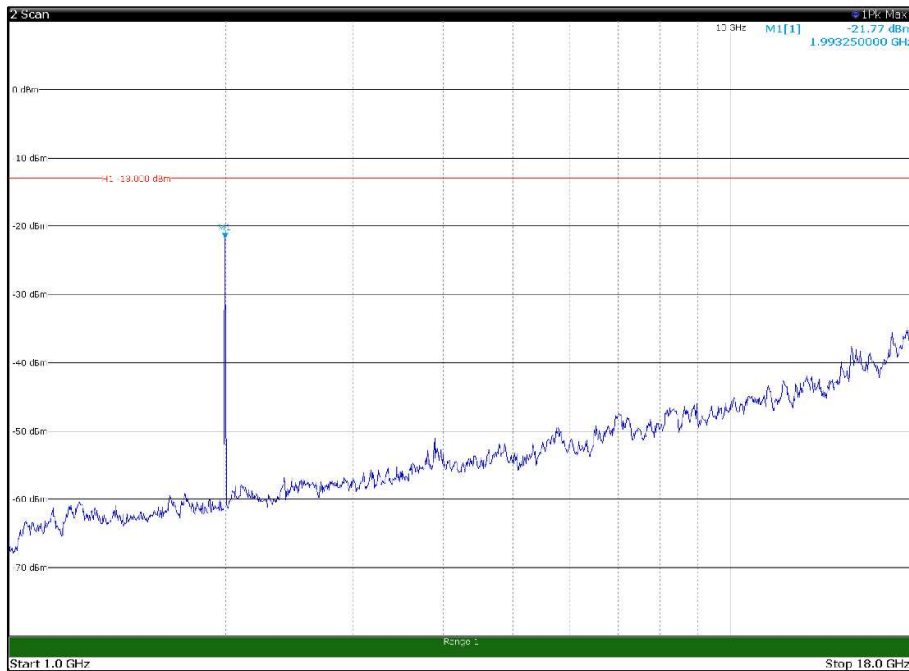BW=5MHz, Range: 30MHz - 1GHz, Polarization: Horizontal

Channel: TOP, Modulation: 256QAM,
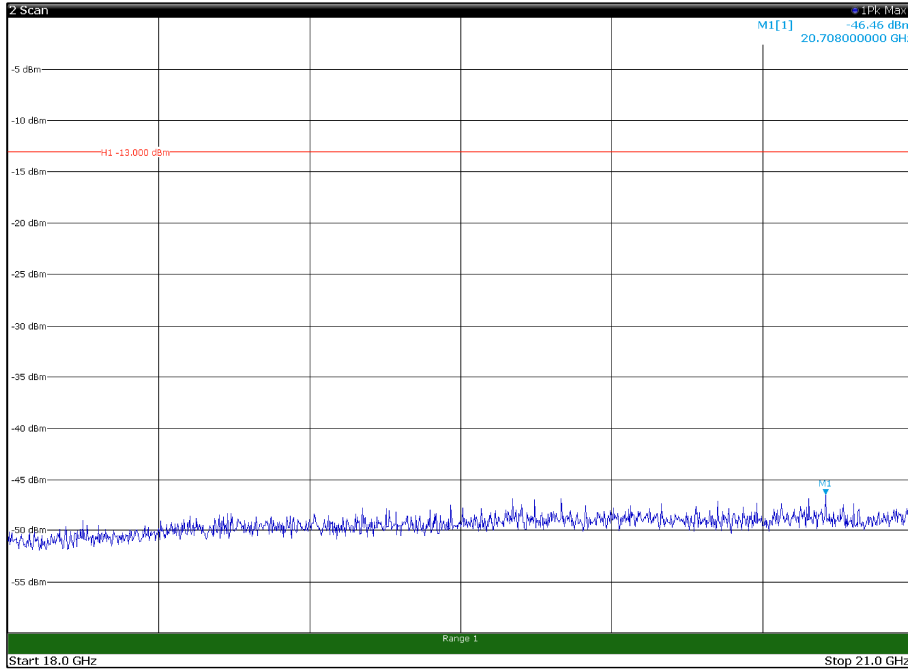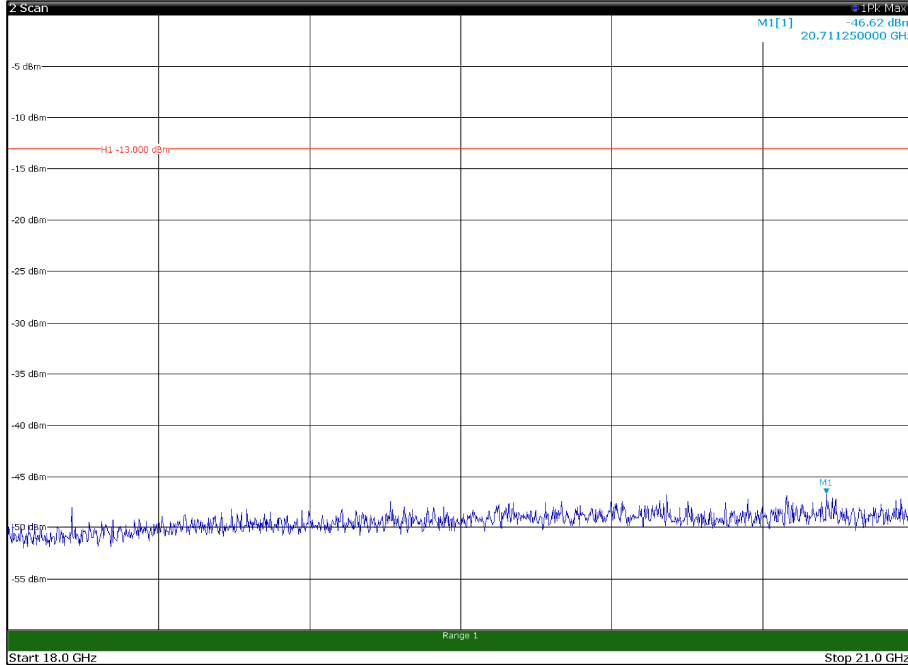BW=5MHz, Range: 30MHz - 1GHz, Polarization: Vertical

Channel: TOP, Modulation: 256QAM,
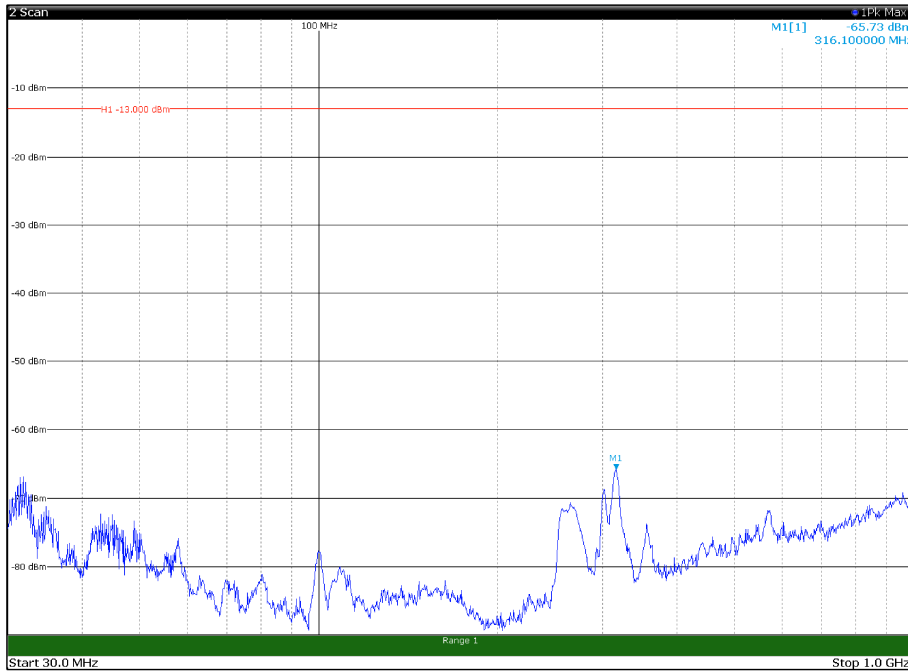BW=5MHz, Range: 1GHz -18GHz, Polarization: Horizontal

Channel: TOP, Modulation: 256QAM,
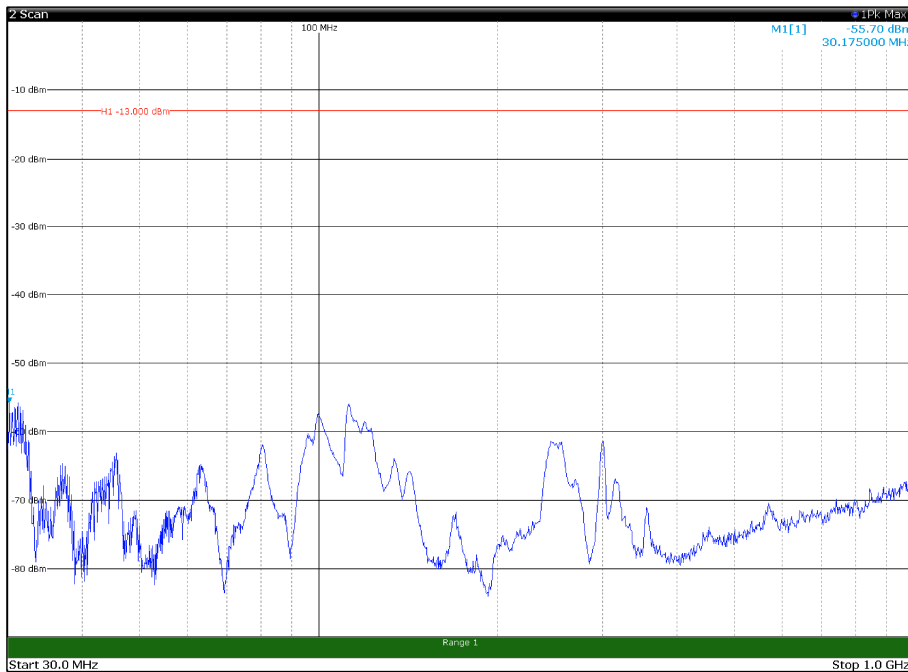BW=5MHz, Range: 1GHz -18GHz, Polarization: Vertical

Channel: TOP, Modulation: 256QAM,
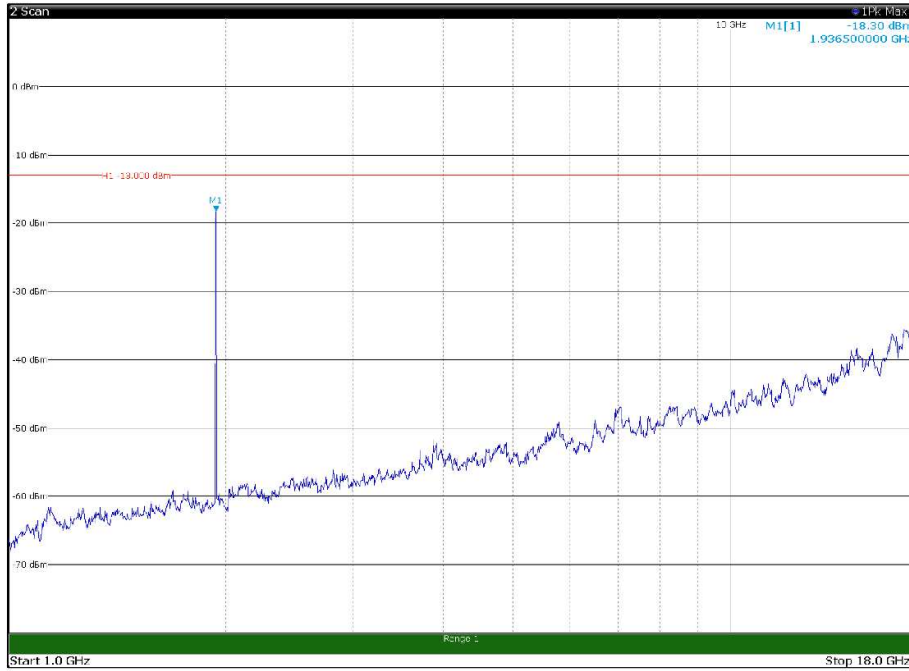BW=5MHz, Range: 18GHz - 21GHz, Polarization: Horizontal

Channel: TOP, Modulation: 256QAM,
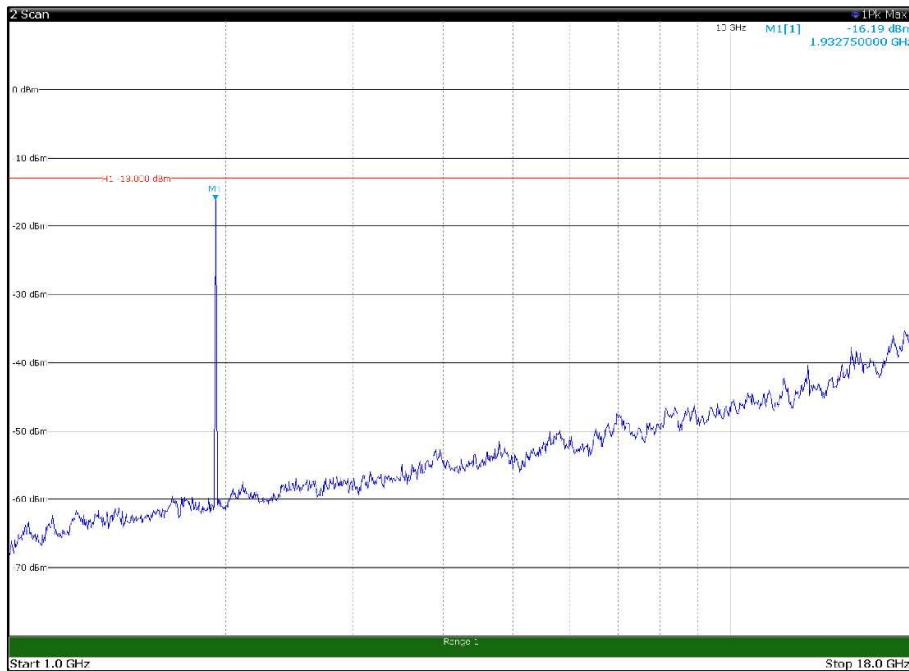BW=5MHz, Range: 18GHz - 21GHz, Polarization: Vertical

Channel: BOTTOM, Modulation: QPSK,
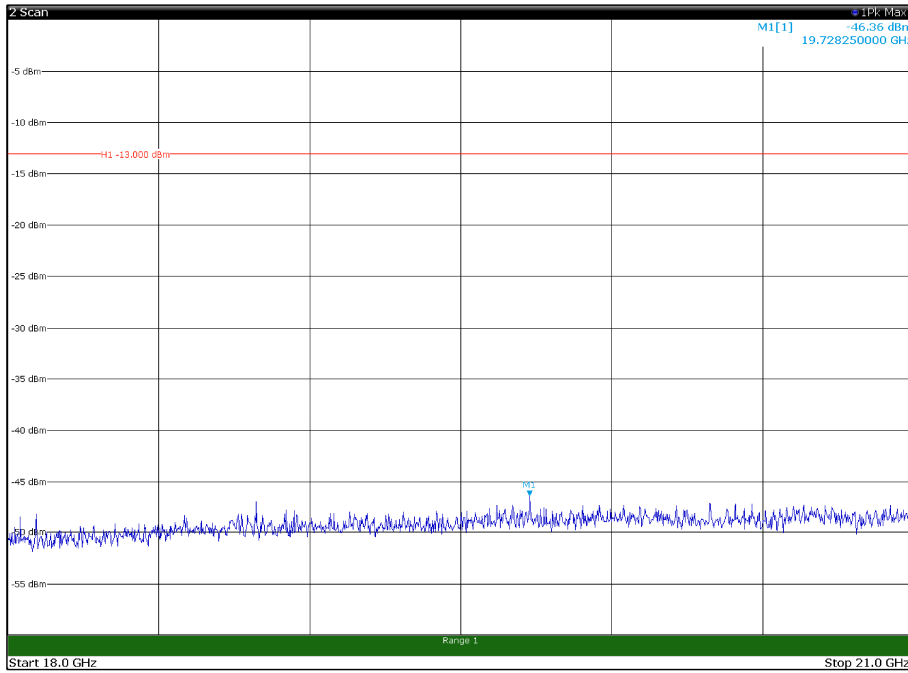BW=10MHz, Range: 30MHz - 1GHz, Polarization: Horizontal

Channel: BOTTOM, Modulation: QPSK,
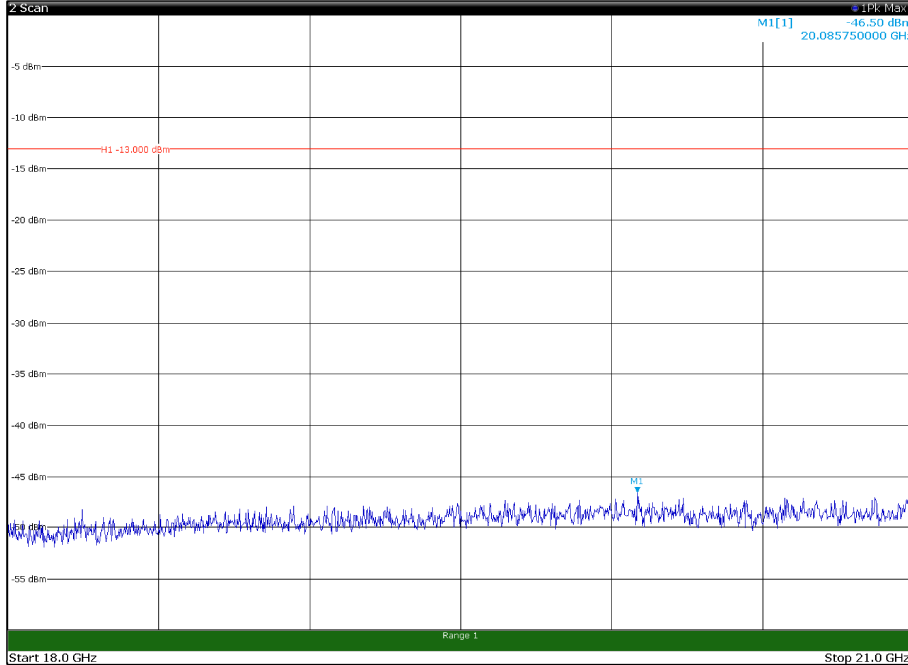BW=10MHz, Range: 30MHz - 1GHz, Polarization: Vertical

Channel: BOTTOM, Modulation: QPSK,
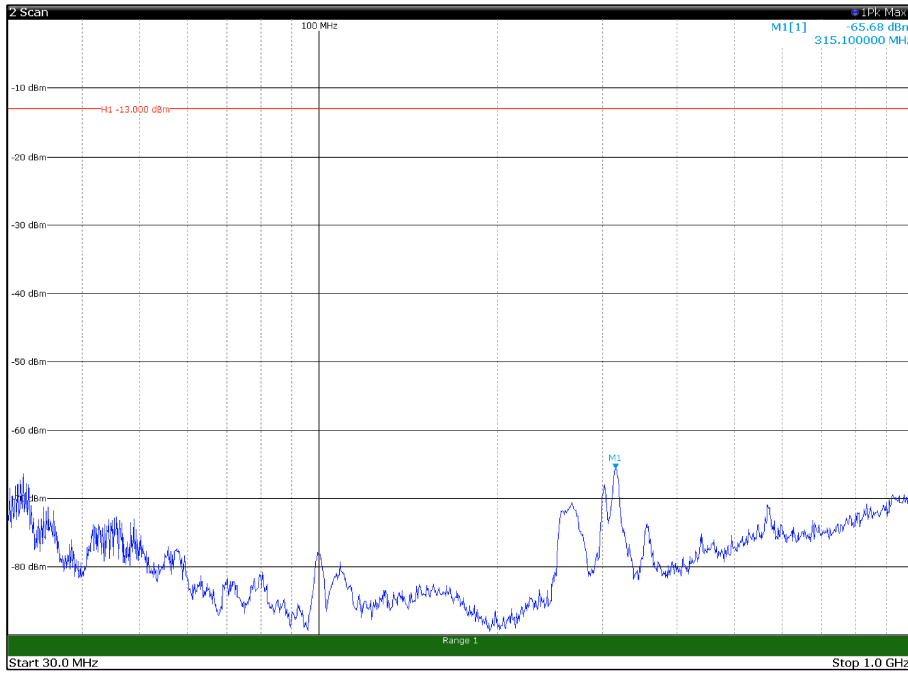BW=10MHz, Range: 1GHz - 18GHz, Polarization: Horizontal

Channel: BOTTOM, Modulation: QPSK,
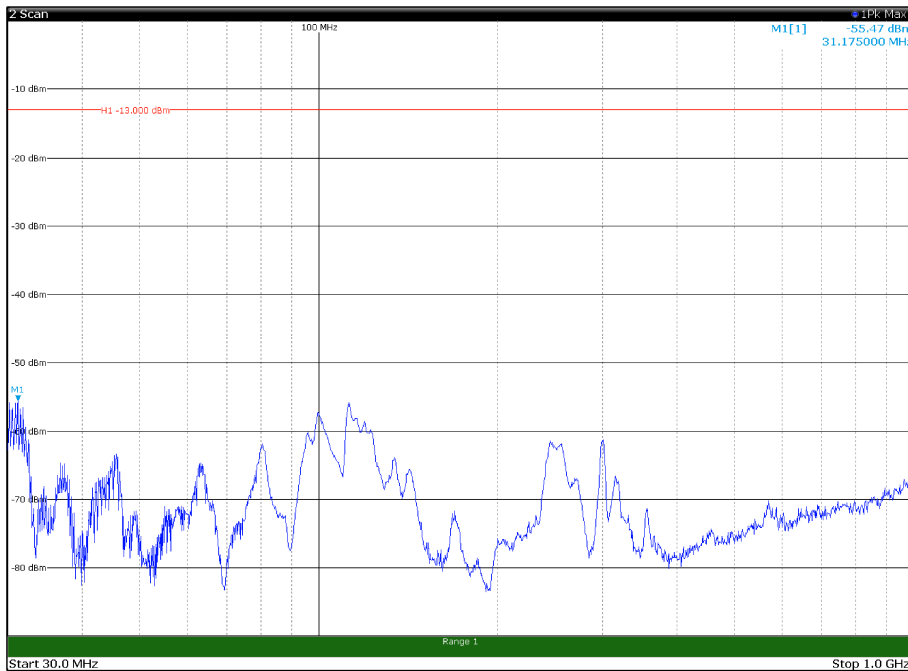BW=10MHz, Range: 1GHz - 18GHz, Polarization: Vertical

Channel: BOTTOM, Modulation: QPSK,
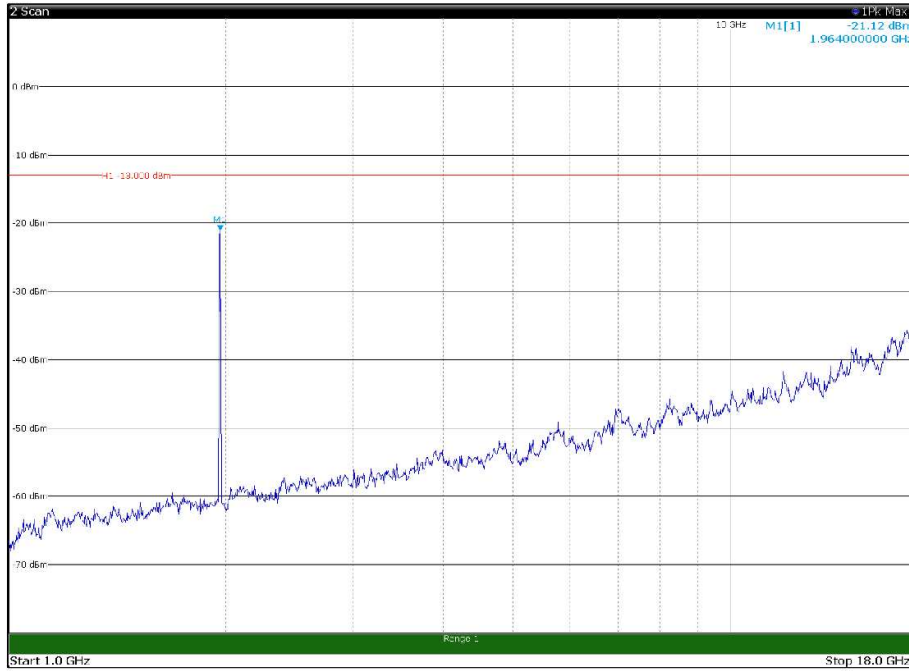BW=10MHz, Range: 18GHz - 21GHz, Polarization: Horizontal

Channel: BOTTOM, Modulation: QPSK,
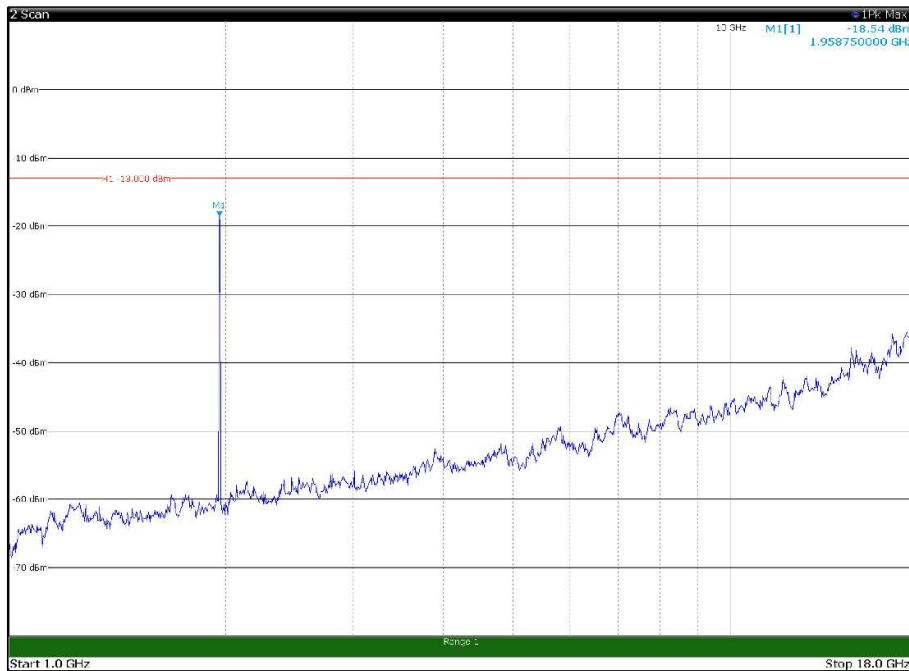BW=10MHz, Range: 18GHz - 21GHz, Polarization: Vertical

Channel: MIDDLE, Modulation: QPSK,
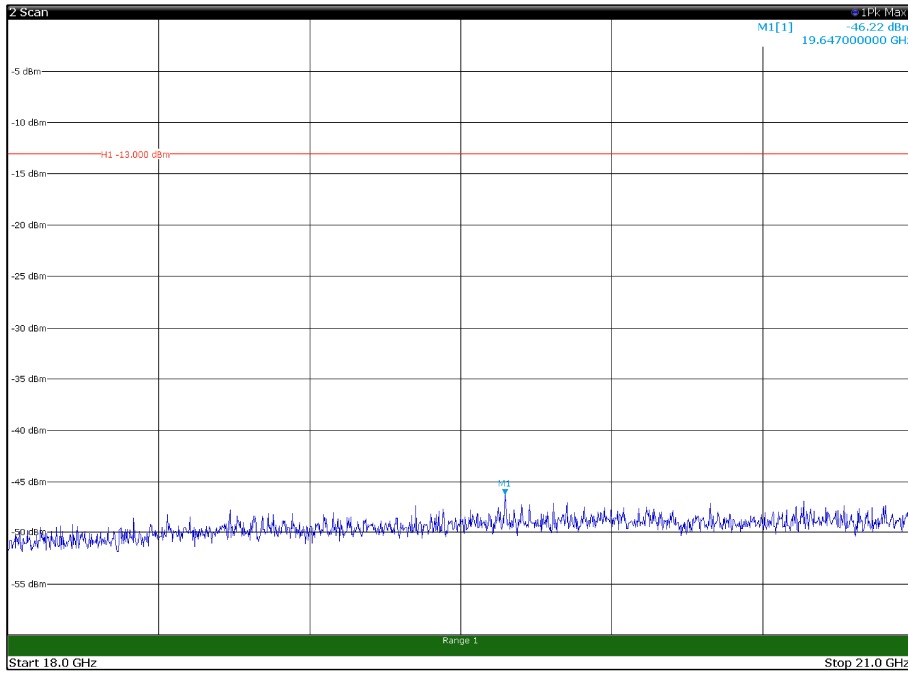BW=10MHz, Range: 30MHz - 1GHz, Polarization: Horizontal

Channel: MIDDLE, Modulation: QPSK,
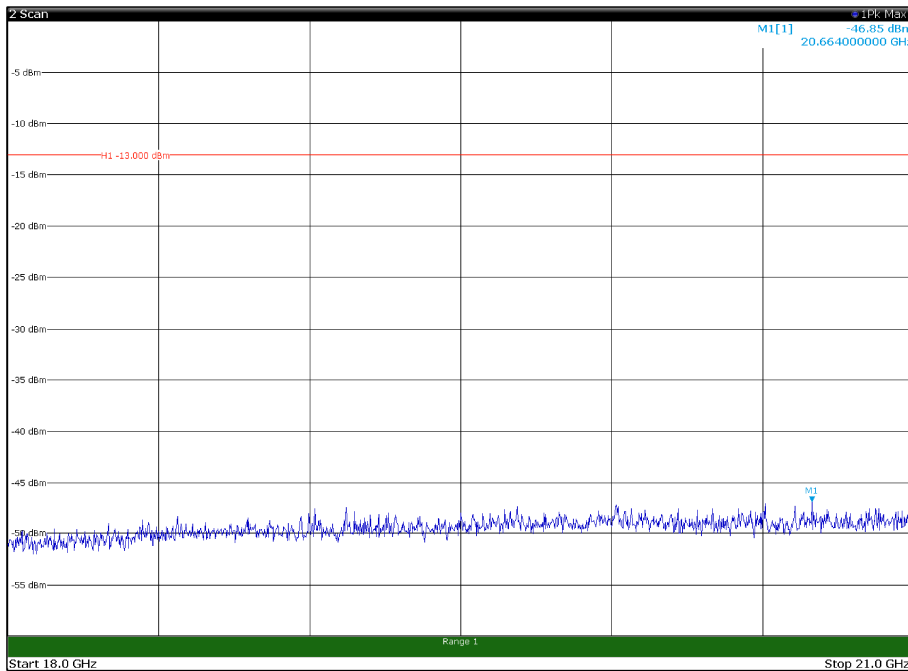BW=10MHz, Range: 30MHz - 1GHz, Polarization: Vertical

Channel: MIDDLE, Modulation: QPSK,
BW=10MHz, Range: 1GHz - 18GHz, Polarization: Horizontal

Channel: MIDDLE, Modulation: QPSK,
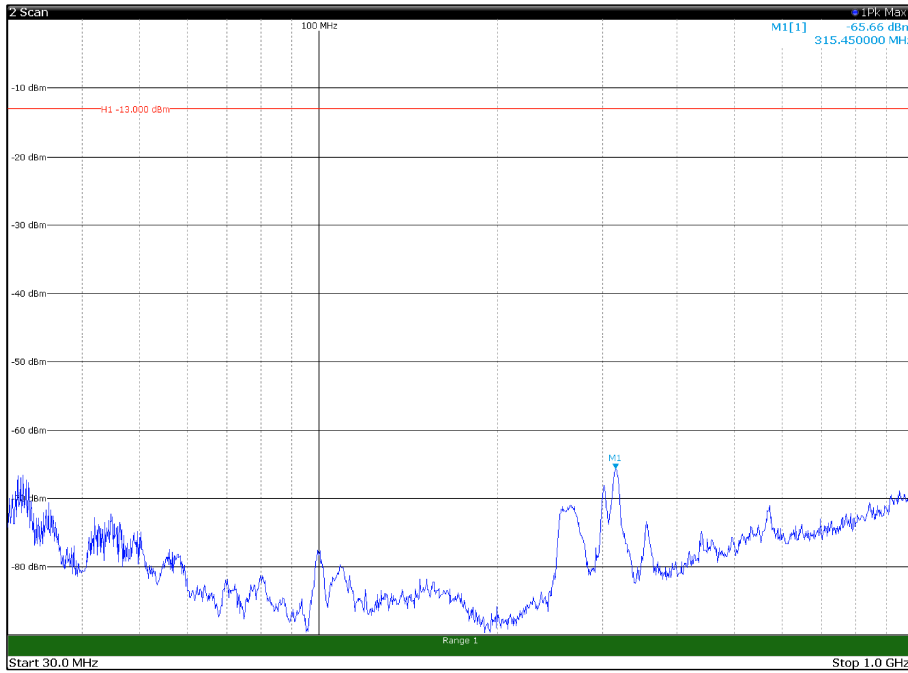BW=10MHz, Range: 1GHz - 18GHz, Polarization: Vertical

Channel: MIDDLE, Modulation: QPSK,
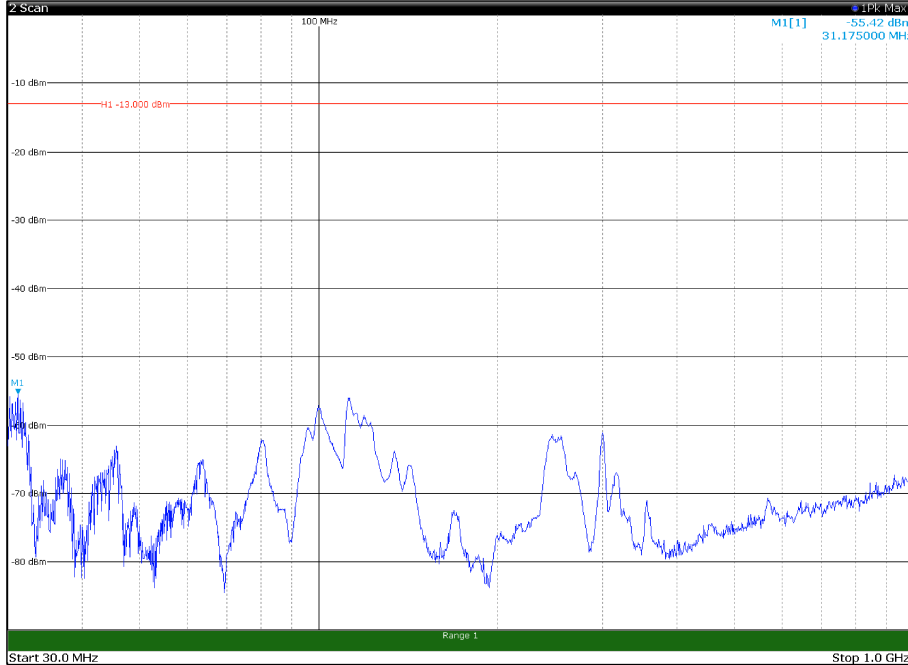BW=10MHz, Range: 18GHz - 21GHz, Polarization: Horizontal

Channel: MIDDLE, Modulation: QPSK,
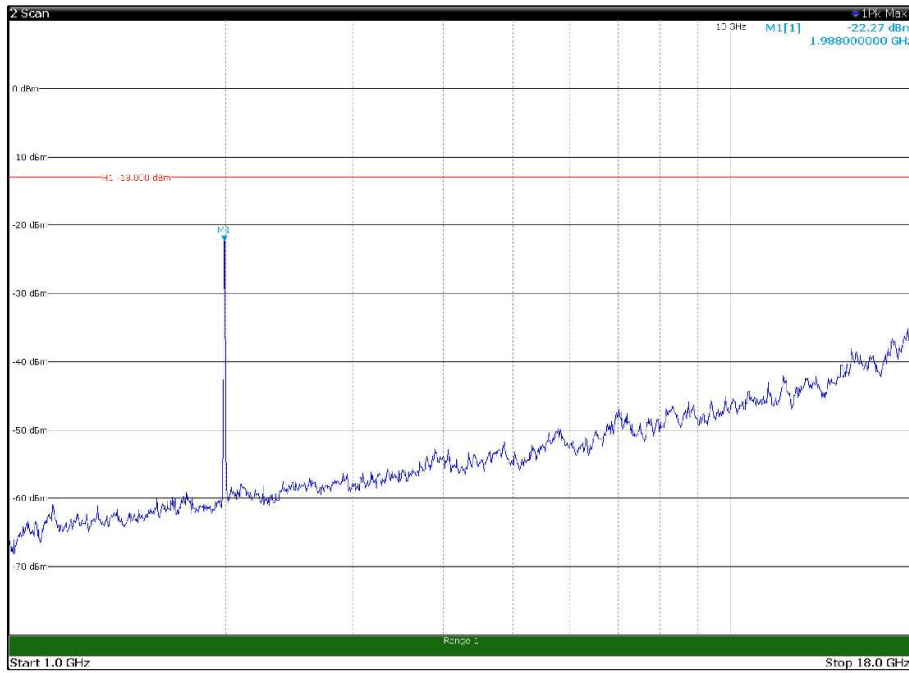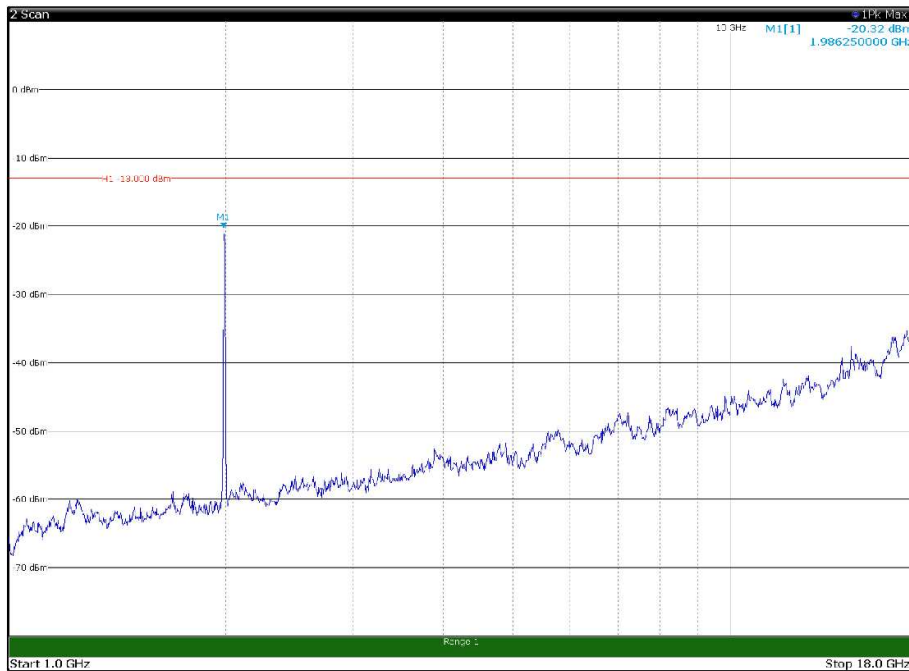BW=10MHz, Range: 18GHz - 21GHz, Polarization: Vertical

Channel: TOP, Modulation: QPSK,
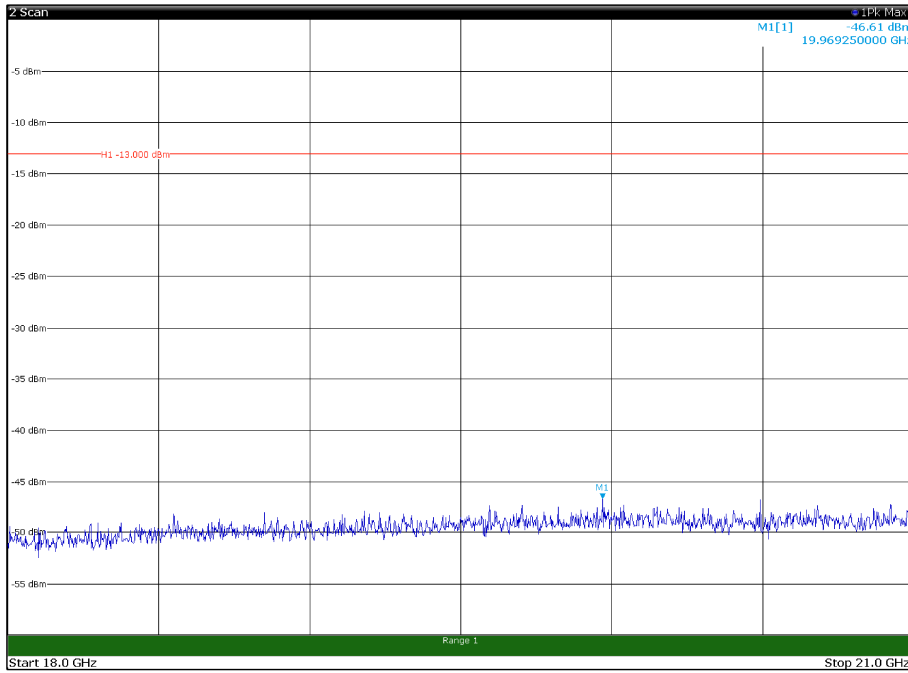BW=10MHz, Range: 30MHz - 1GHz, Polarization: Horizontal

Channel: TOP, Modulation: QPSK,
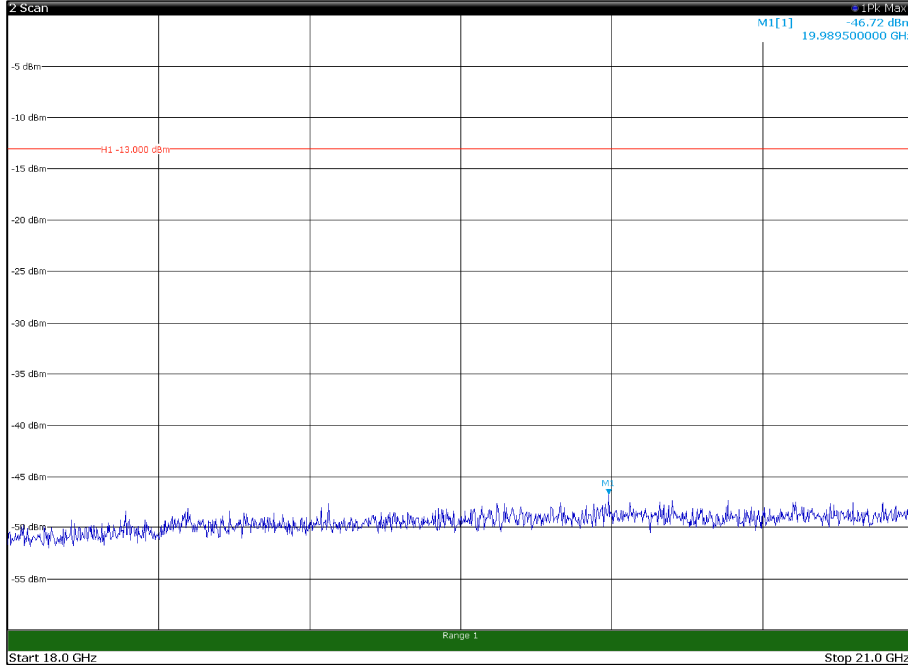BW=10MHz, Range: 30MHz - 1GHz, Polarization: Vertical

Channel: TOP, Modulation: QPSK,
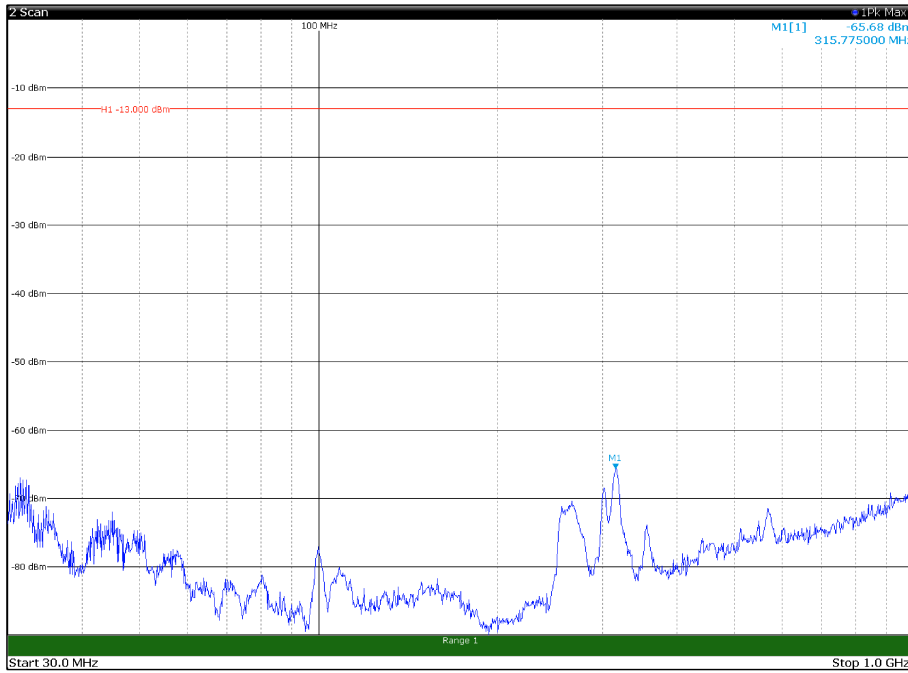BW=10MHz, Range: 1GHz - 18GHz, Polarization: Horizontal

Channel: TOP, Modulation: QPSK,
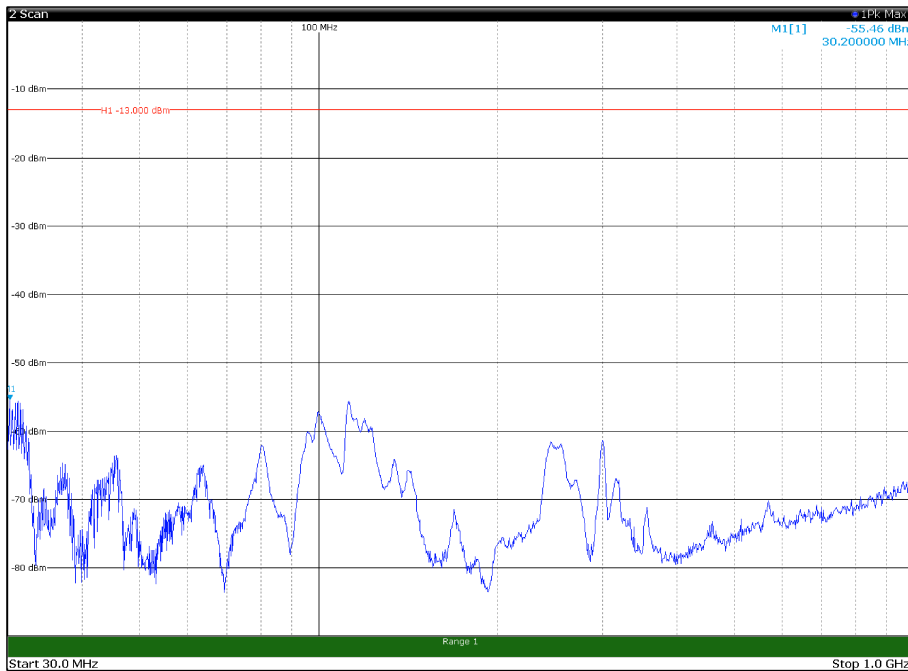BW=10MHz, Range: 1GHz - 18GHz, Polarization: Vertical

Channel: TOP, Modulation: QPSK,
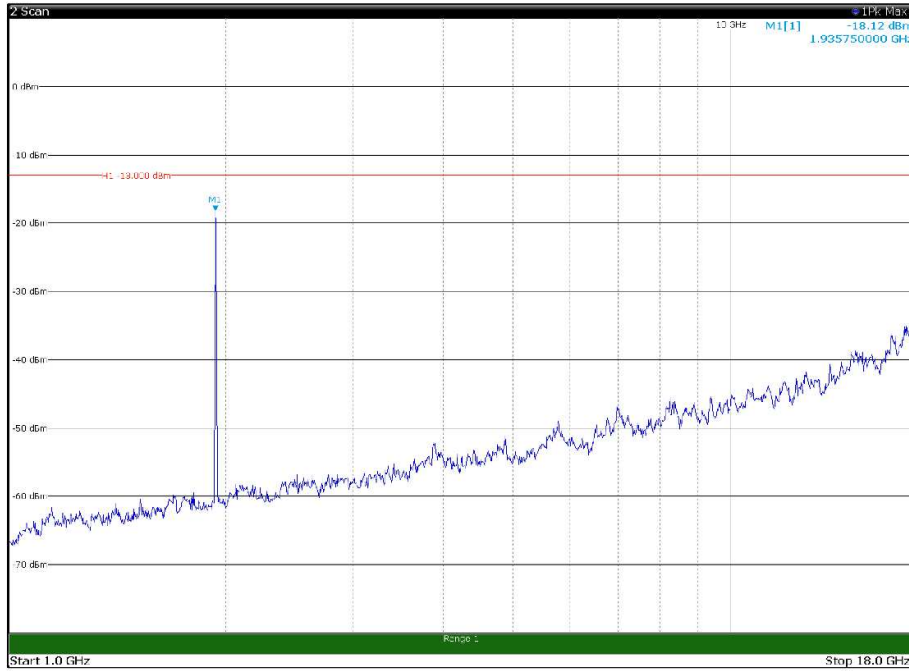BW=10MHz, Range: 18GHz - 21GHz, Polarization: Horizontal

Channel: TOP, Modulation: QPSK,
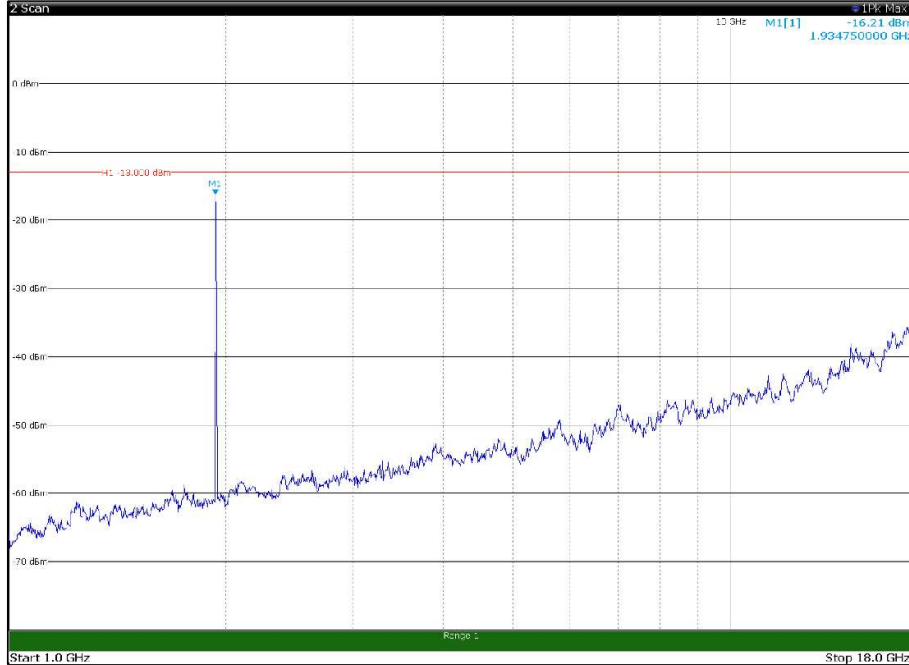BW=10MHz, Range: 18GHz - 21GHz, Polarization: Vertical

Channel: BOTTOM, Modulation: 16QAM,
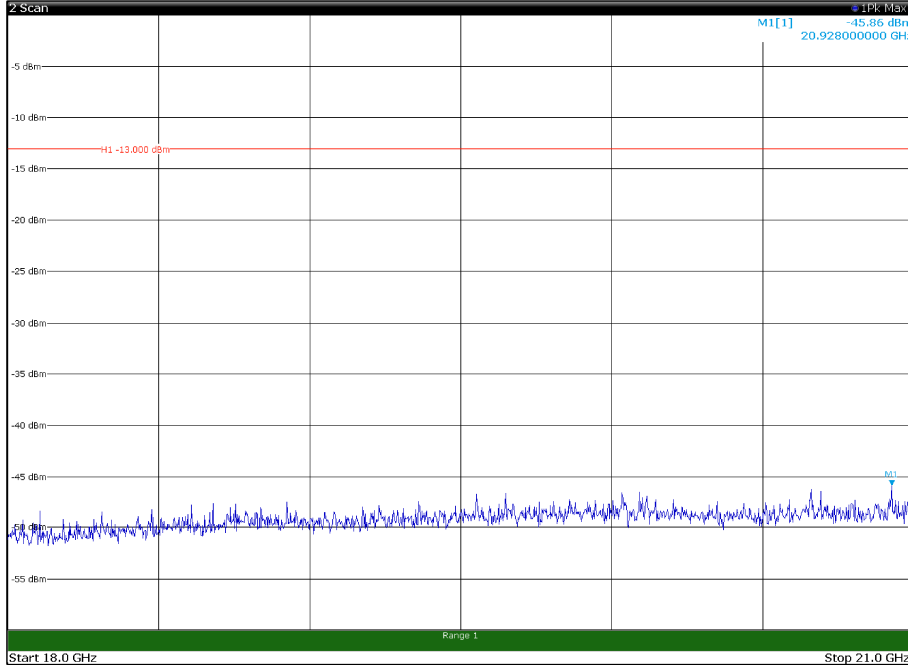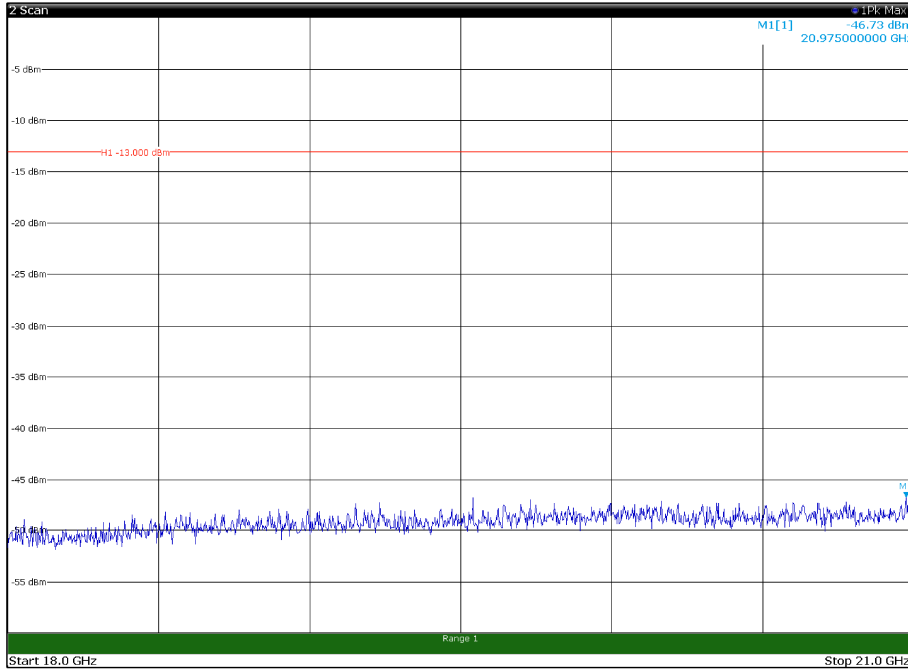BW=10MHz, Range: 30MHz - 1GHz, Polarization: Horizontal

Channel: BOTTOM, Modulation: 16QAM,
BW=10MHz, Range: 30MHz - 1GHz, Polarization: Vertical

Channel: BOTTOM, Modulation: 16QAM,
BW=10MHz, Range: 1GHz - 18GHz, Polarization: Horizontal

Channel: BOTTOM, Modulation: 16QAM,
BW=10MHz, Range: 1GHz - 18GHz, Polarization: Vertical
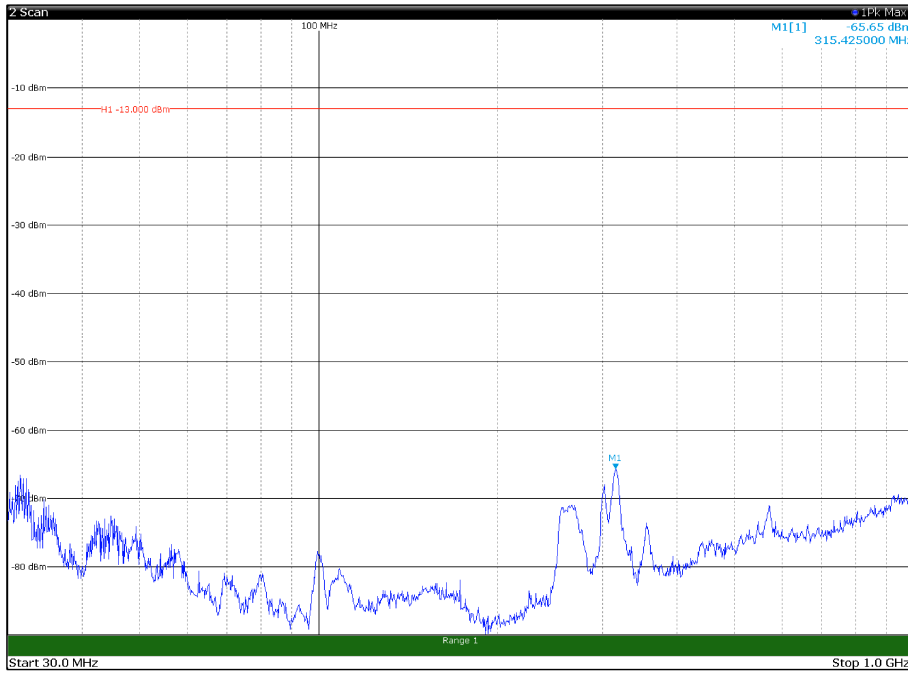
Channel: BOTTOM, Modulation: 16QAM,
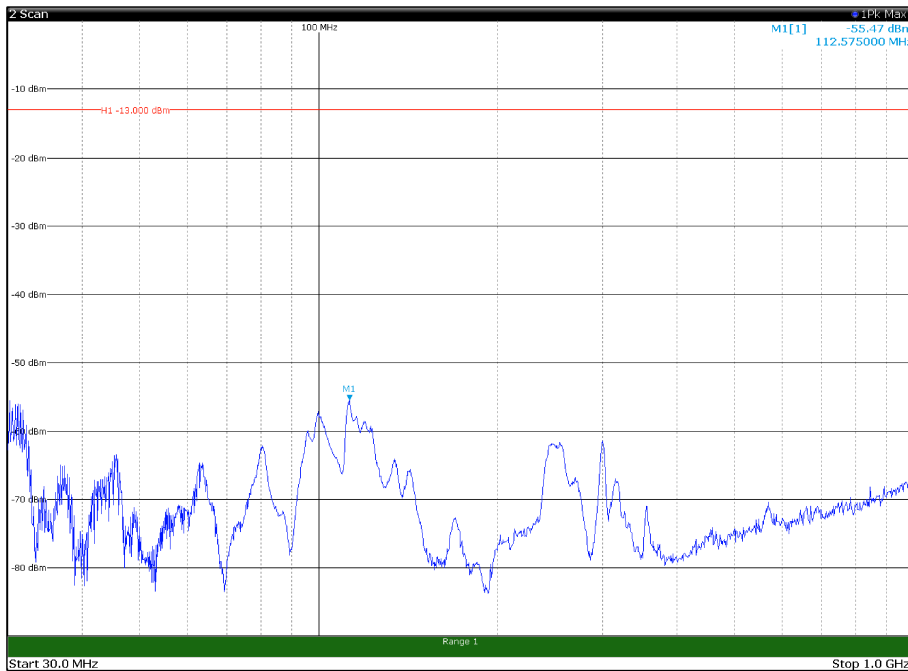BW=10MHz, Range: 18GHz - 21GHz, Polarization: Horizontal

Channel: BOTTOM, Modulation: 16QAM,
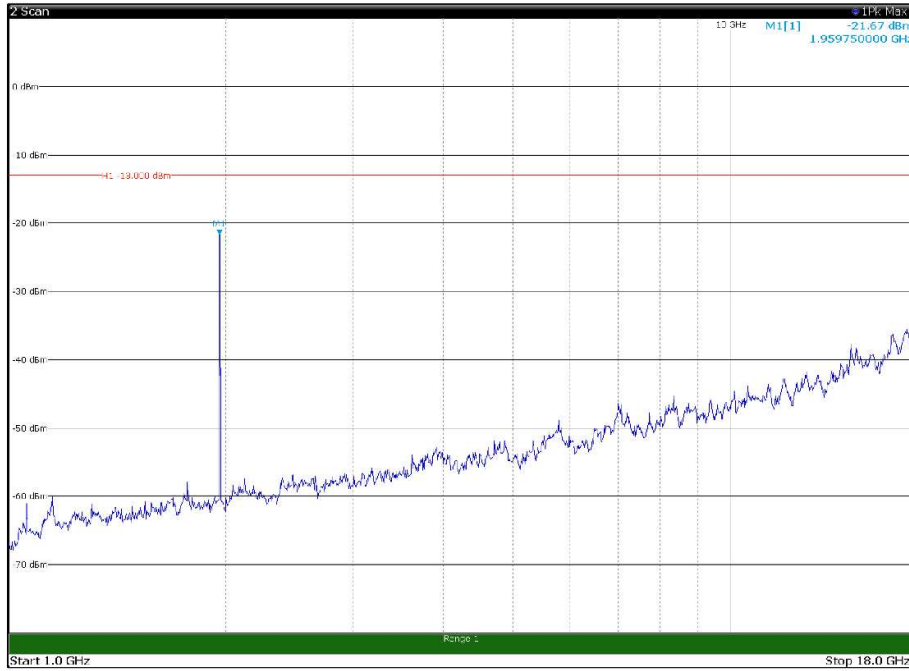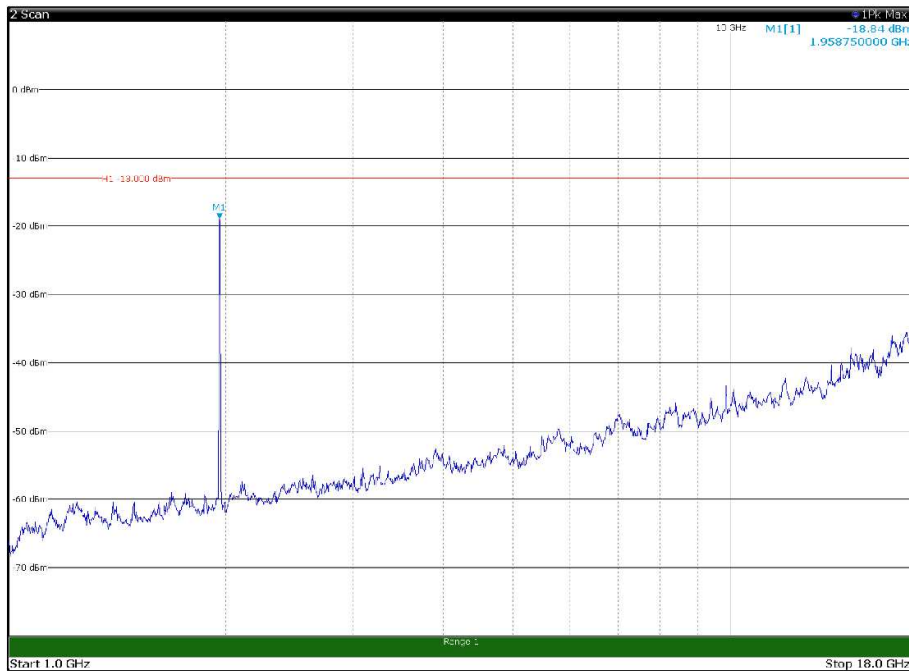BW=10MHz, Range: 18GHz - 21GHz, Polarization: Vertical

Channel: MIDDLE, Modulation: 16QAM,
BW=10MHz, Range: 30MHz - 1GHz, Polarization: Horizontal

Channel: MIDDLE, Modulation: 16QAM,
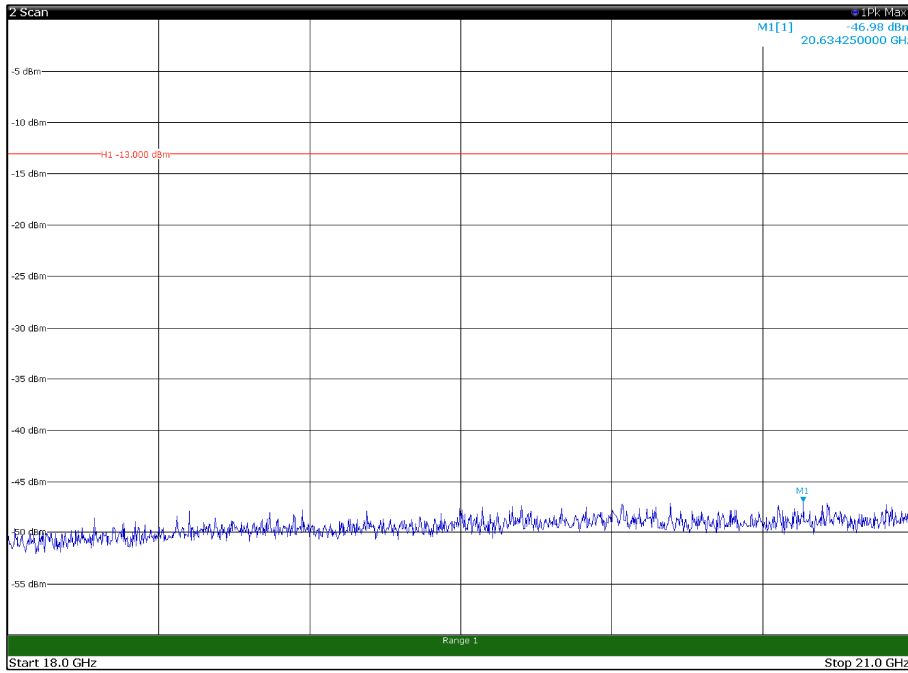BW=10MHz, Range: 30MHz - 1GHz, Polarization: Vertical

Channel: MIDDLE, Modulation: 16QAM,
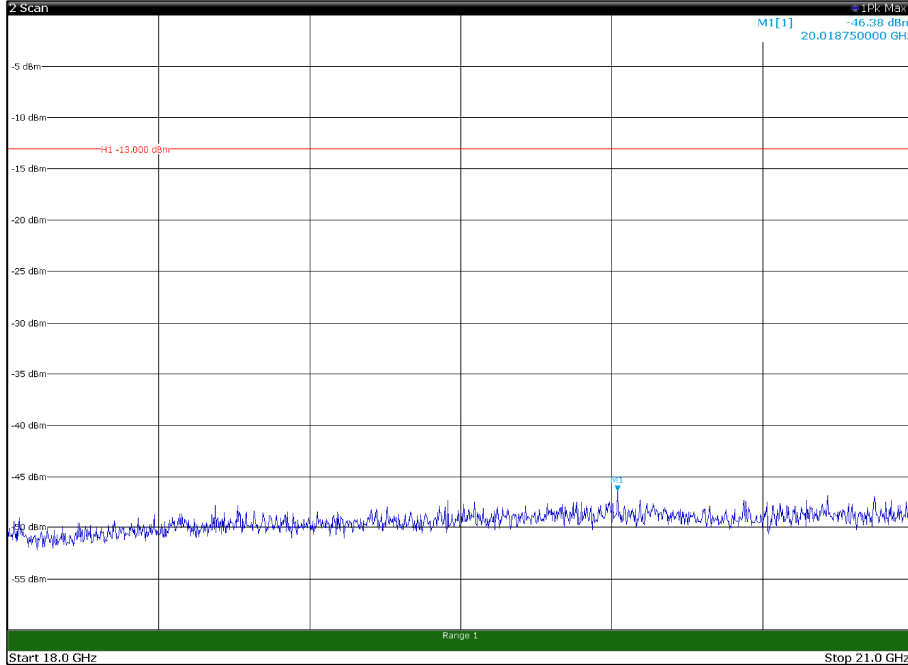BW=10MHz, Range: 1GHz - 18GHz, Polarization: Horizontal

Channel: MIDDLE, Modulation: 16QAM,
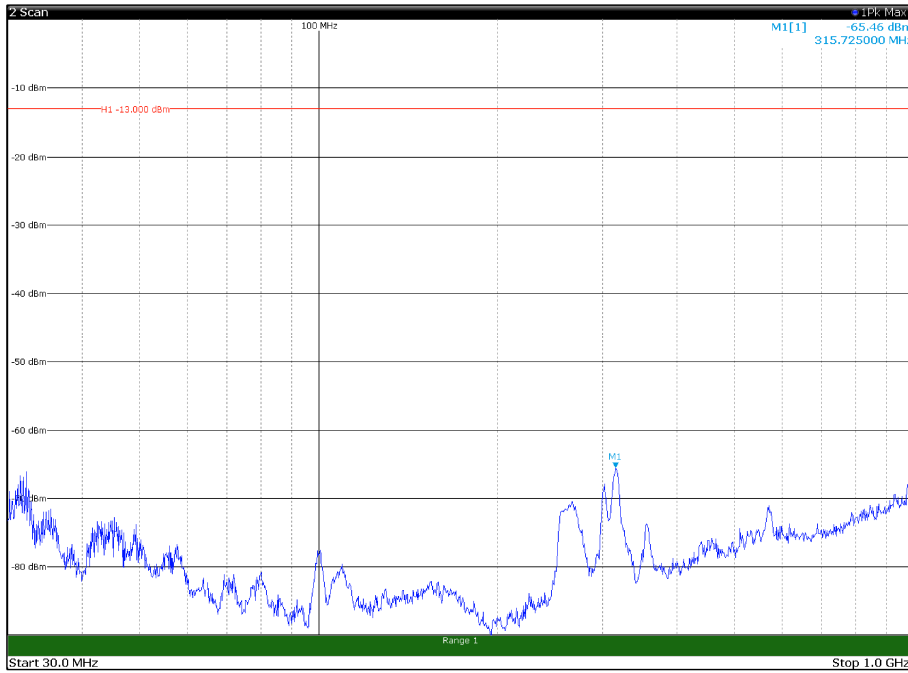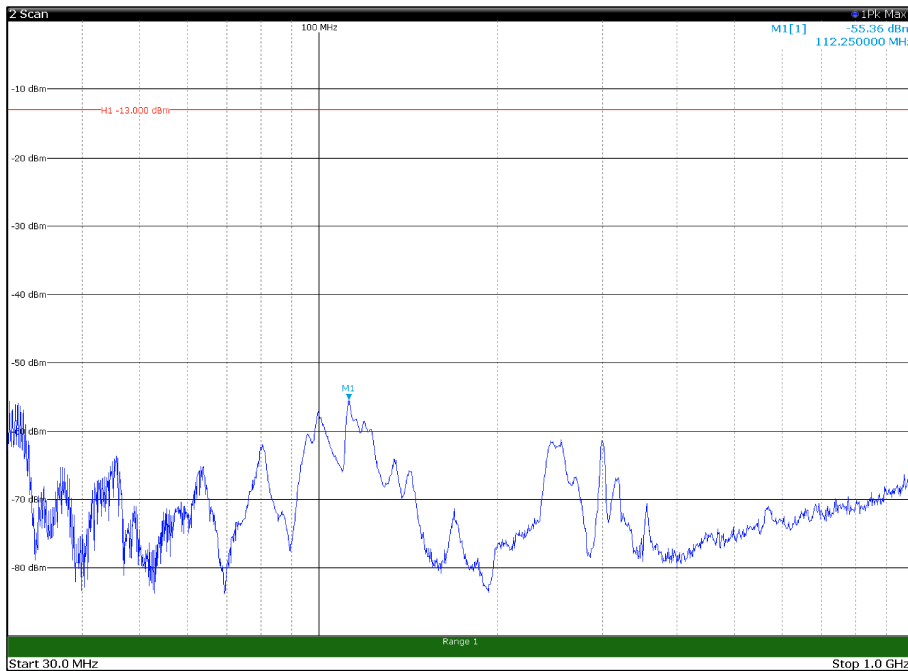BW=10MHz, Range: 1GHz - 18GHz, Polarization: Vertical

Channel: MIDDLE, Modulation: 16QAM,
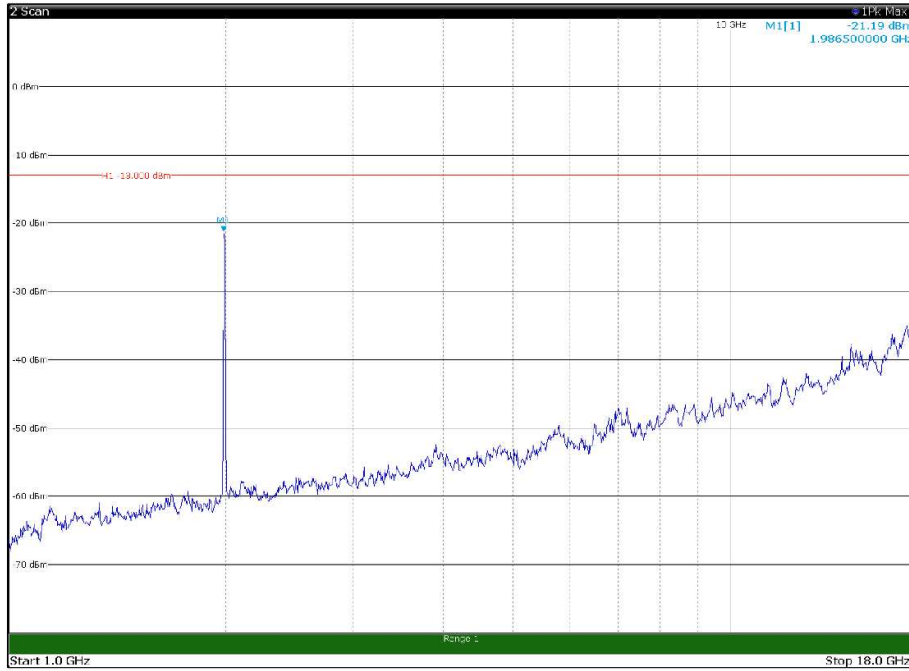BW=10MHz, Range: 18GHz - 21GHz, Polarization: Horizontal

Channel: MIDDLE, Modulation: 16QAM,
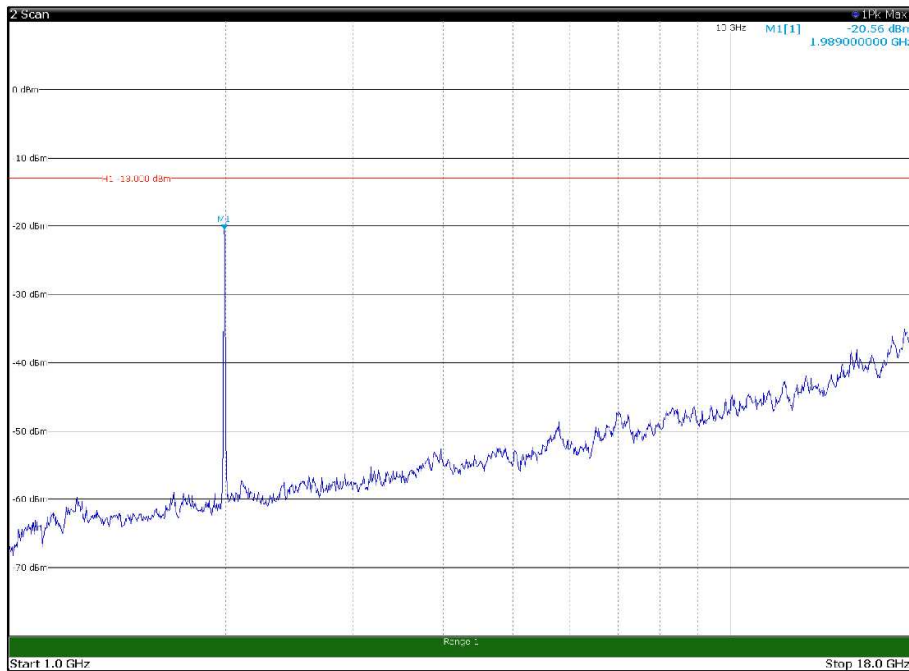BW=10MHz, Range: 18GHz - 21GHz, Polarization: Vertical

Channel: TOP, Modulation: 16QAM,
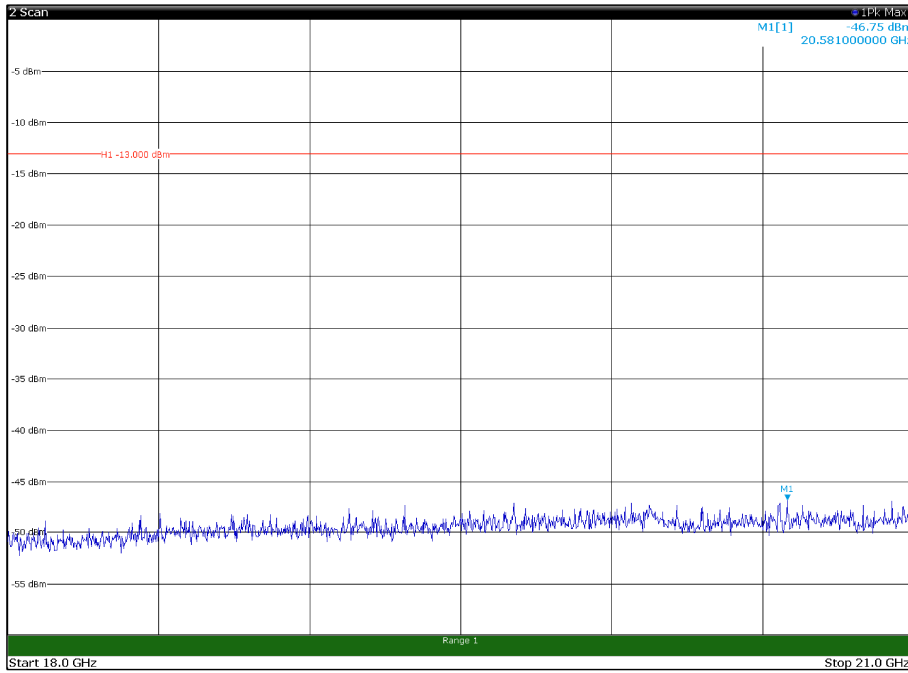BW=10MHz, Range: 30MHz - 1GHz, Polarization: Horizontal

Channel: TOP, Modulation: 16QAM,
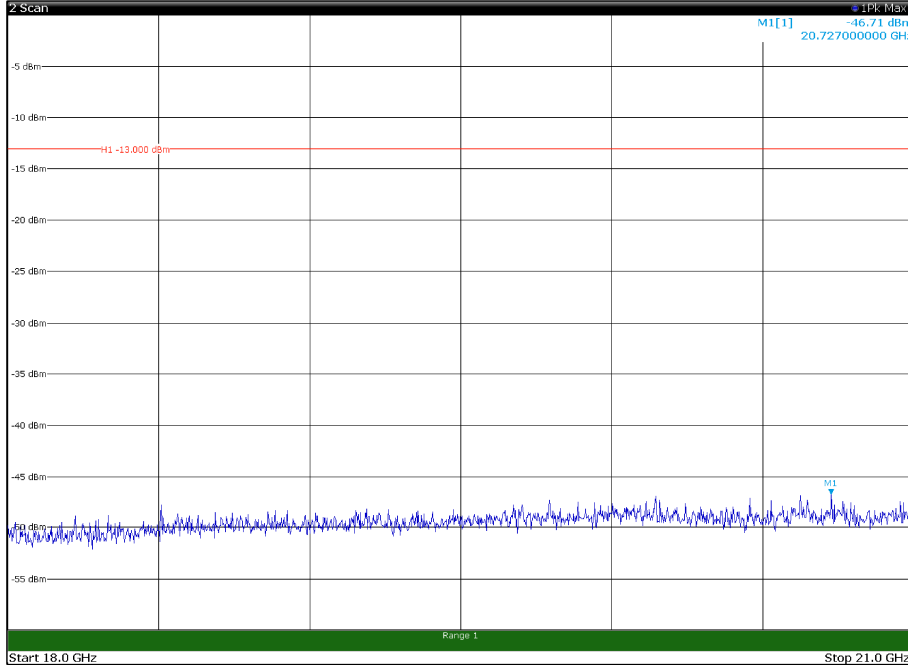BW=10MHz, Range: 30MHz - 1GHz, Polarization: Vertical

Channel: TOP, Modulation: 16QAM,
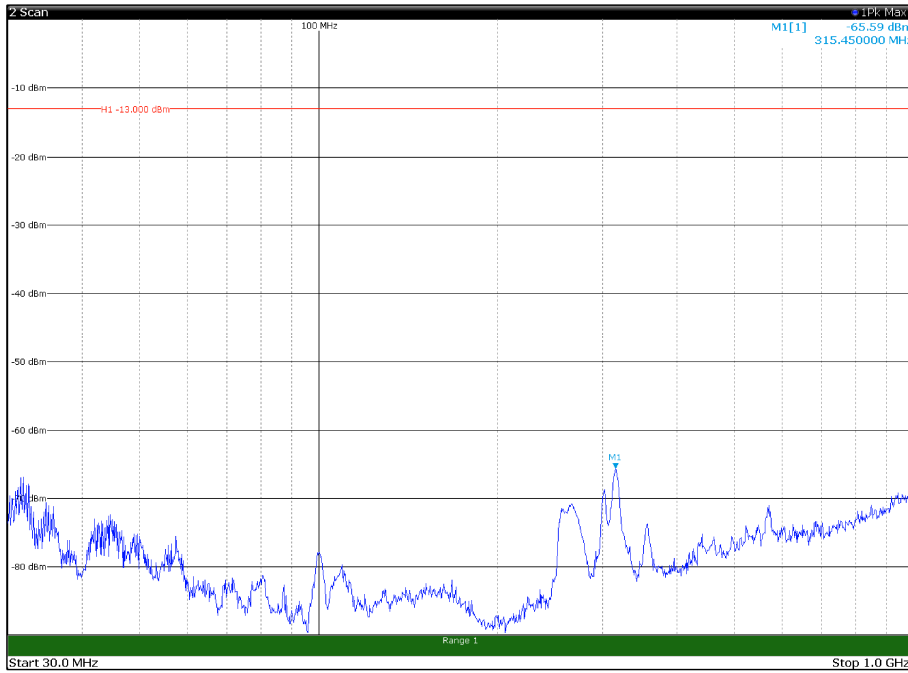BW=10MHz, Range: 1GHz - 18GHz, Polarization: Horizontal

Channel: TOP, Modulation: 16QAM,
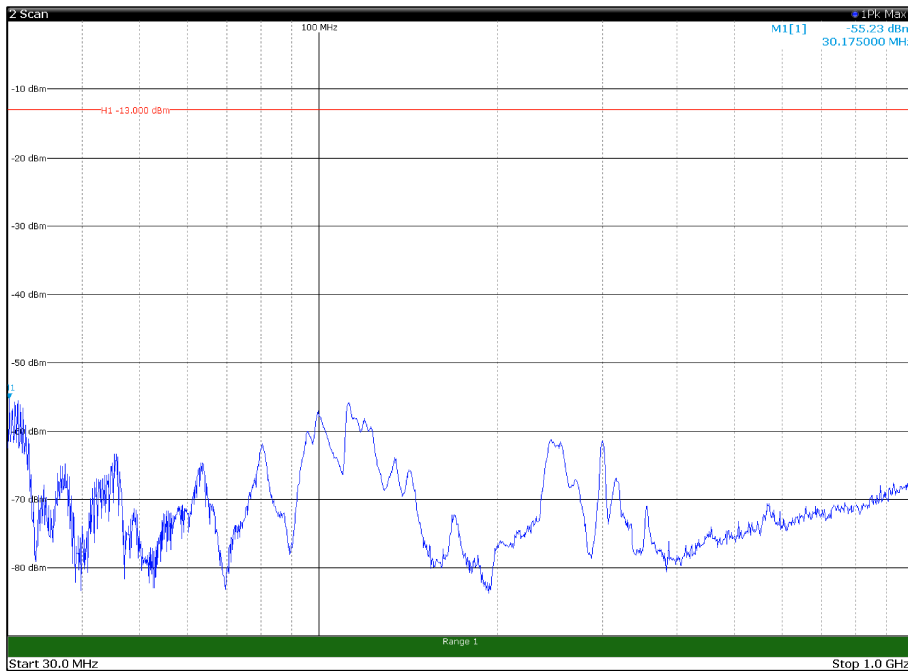BW=10MHz, Range: 1GHz - 18GHz, Polarization: Vertical

Channel: TOP, Modulation: 16QAM,
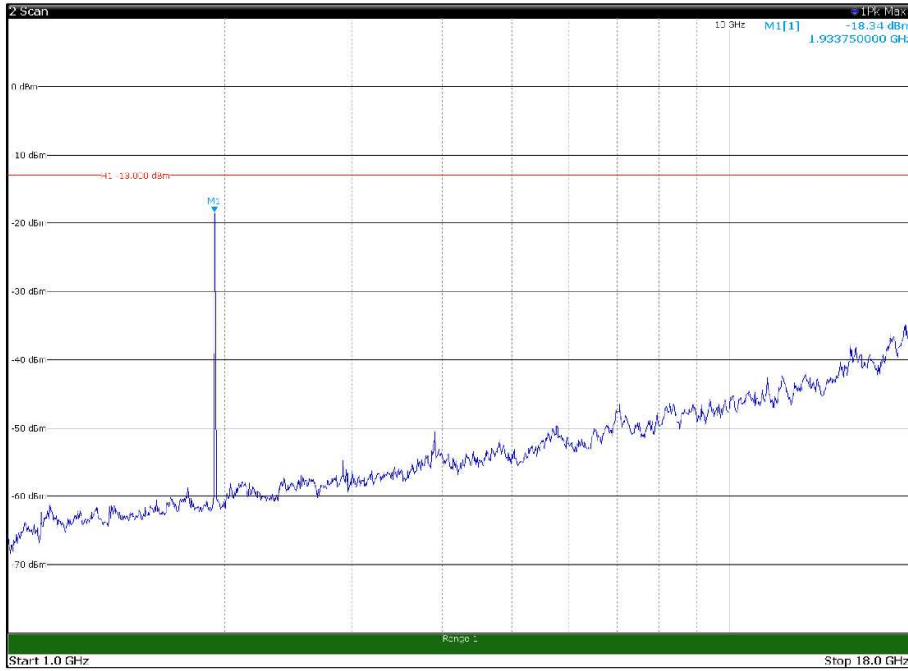BW=10MHz, Range: 18GHz - 21GHz, Polarization: Horizontal

Channel: TOP, Modulation: 16QAM,
BW=10MHz, Range: 18GHz - 21GHz, Polarization: Vertical

Channel: BOTTOM, Modulation: 64QAM,
BW=10MHz, Range: 30MHz - 1GHz, Polarization: Horizontal

Channel: BOTTOM, Modulation: 64QAM,
BW=10MHz, Range: 30MHz - 1GHz, Polarization: Vertical

Channel: BOTTOM, Modulation: 64QAM,
BW=10MHz, Range: 1GHz - 18GHz, Polarization: Horizontal

Channel: BOTTOM, Modulation: 64QAM,
BW=10MHz, Range: 1GHz - 18GHz, Polarization: Vertical

Channel: BOTTOM, Modulation: 64QAM,
BW=10MHz, Range: 18GHz - 21GHz, Polarization: Horizontal

Channel: BOTTOM, Modulation: 64QAM,
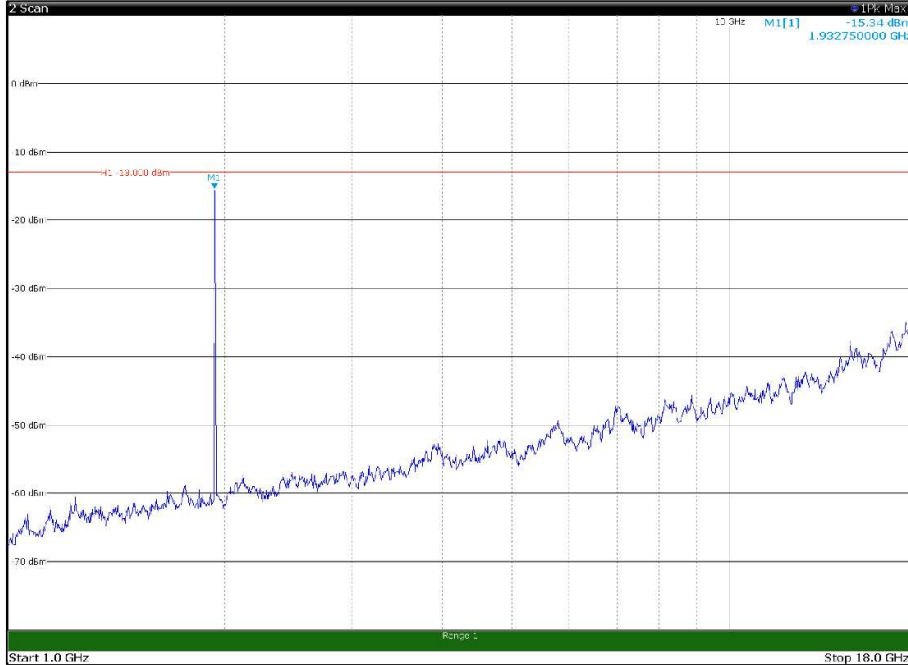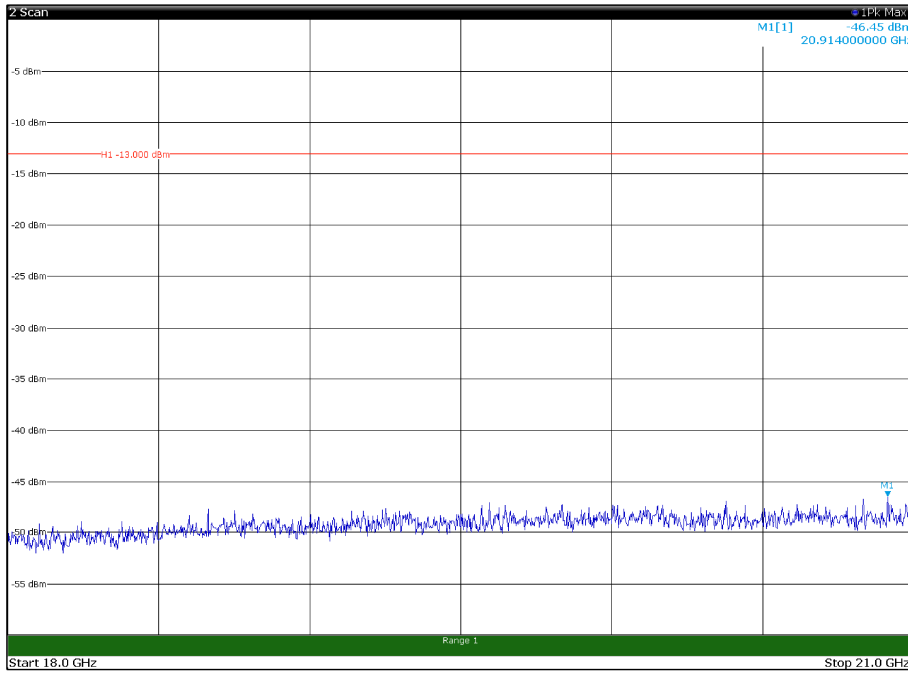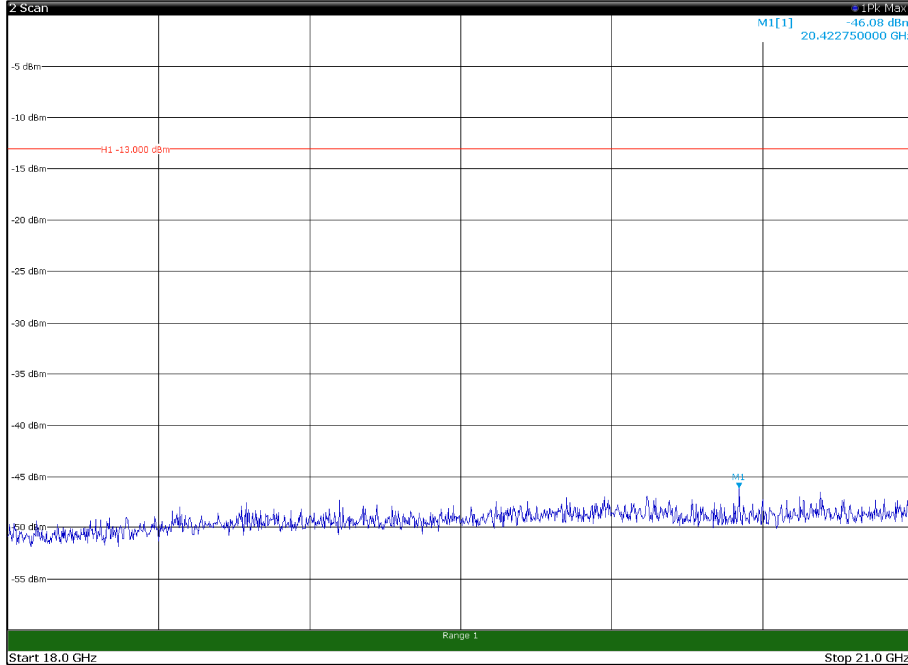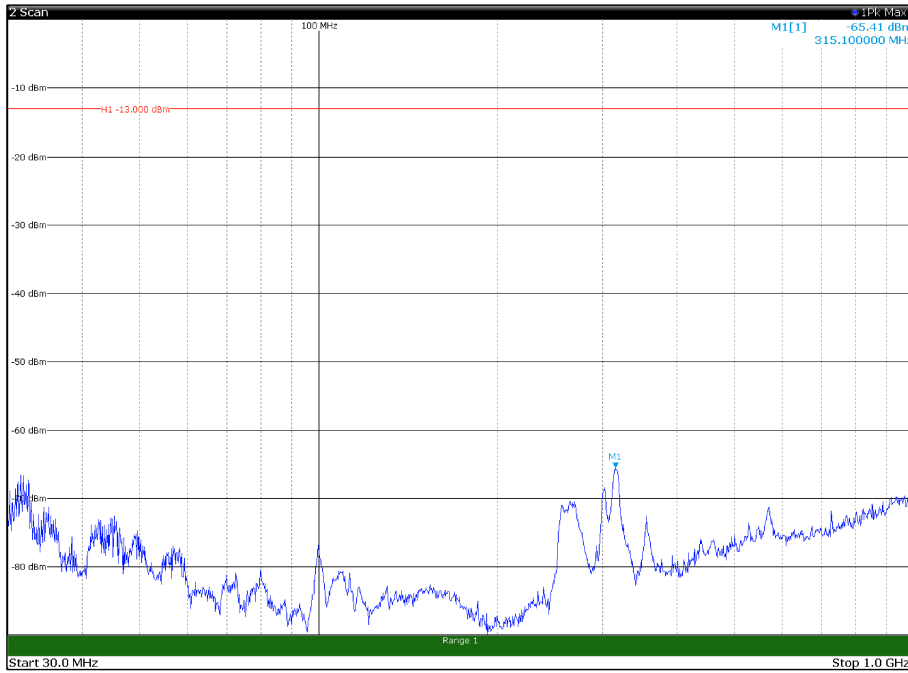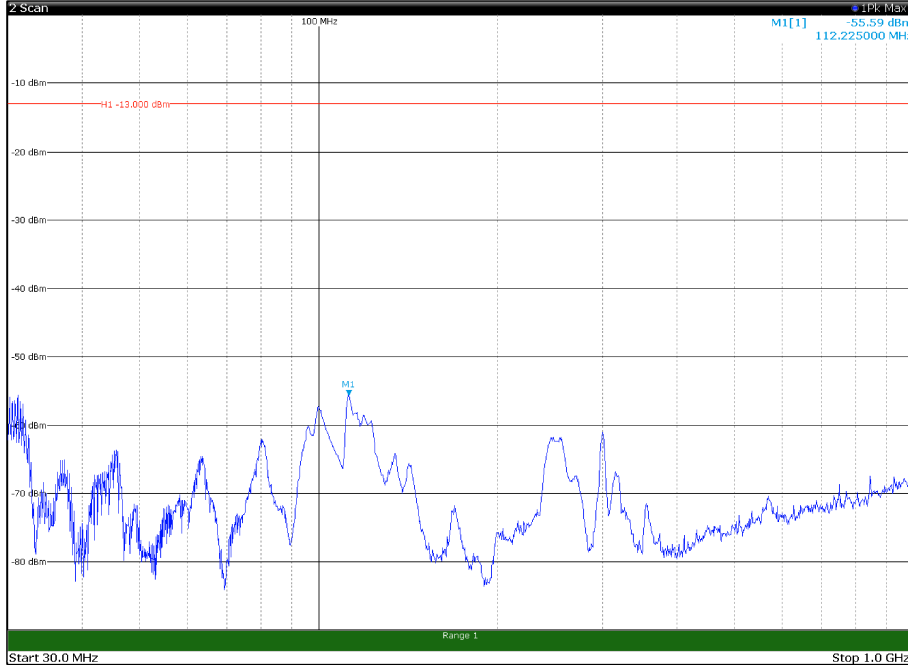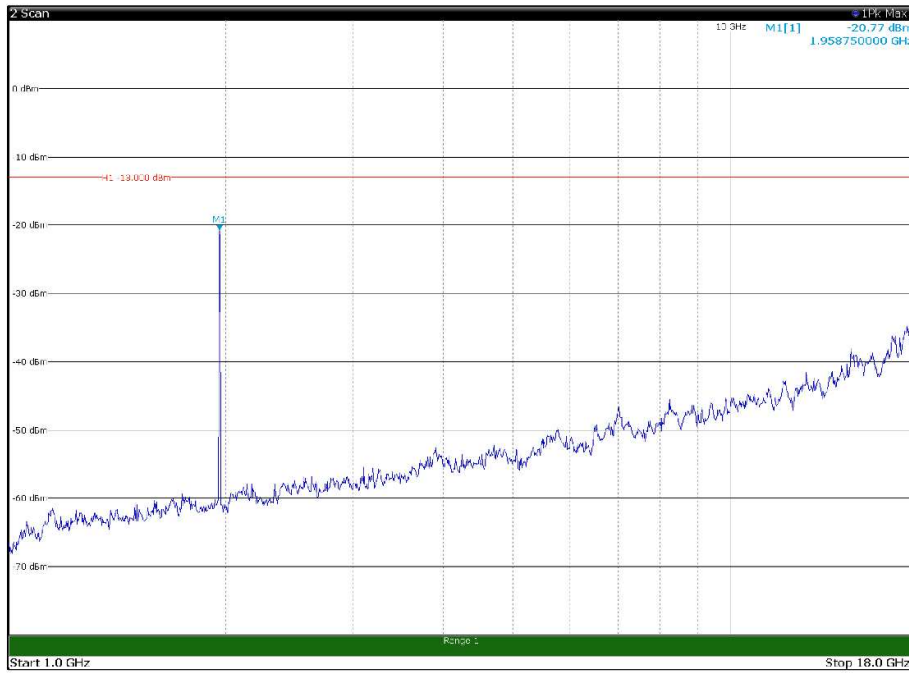BW=10MHz, Range: 18GHz - 21GHz, Polarization: Vertical

Channel: MIDDLE, Modulation: 64QAM,
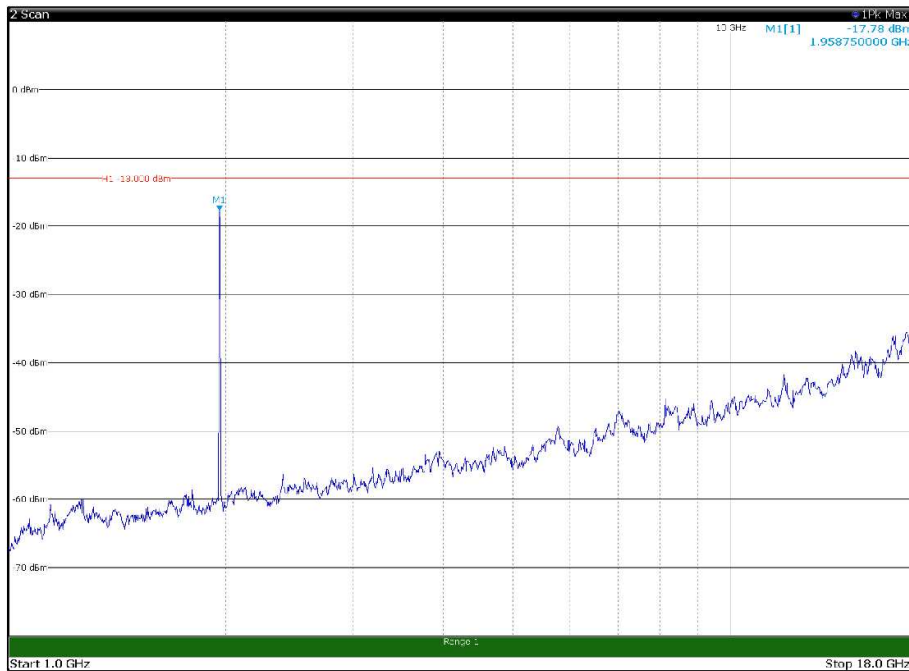BW=10MHz, Range: 30MHz - 1GHz, Polarization: Horizontal

Channel: MIDDLE, Modulation: 64QAM,
BW=10MHz, Range: 30MHz - 1GHz, Polarization: Vertical

Channel: MIDDLE, Modulation: 64QAM,
BW=10MHz, Range: 1GHz - 18GHz, Polarization: Horizontal

Channel: MIDDLE, Modulation: 64QAM,
BW=10MHz, Range: 1GHz - 18GHz, Polarization: Vertical