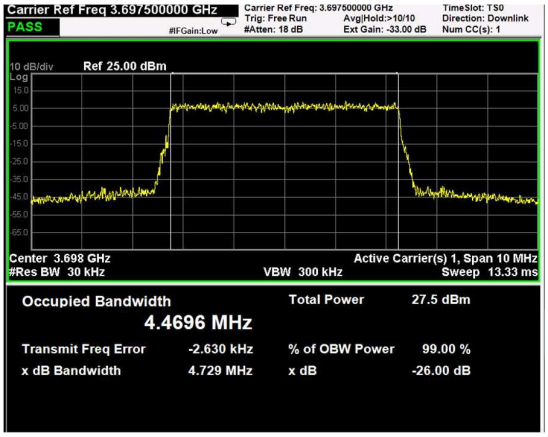
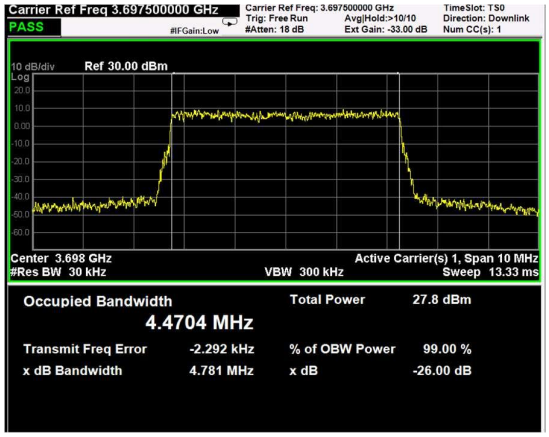
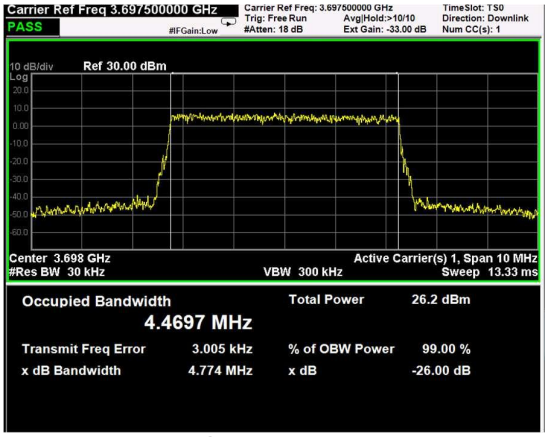


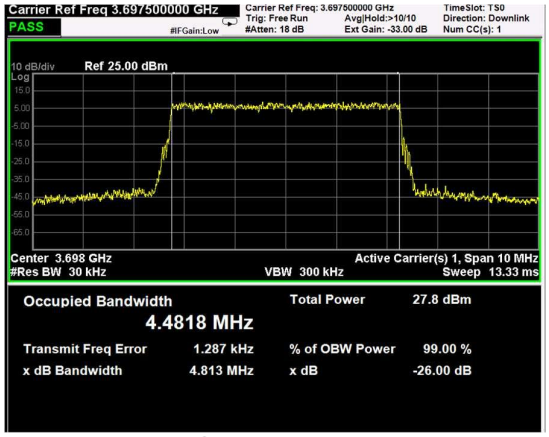
Channel: TOP, Modulation: QPSK, BW=5MHz



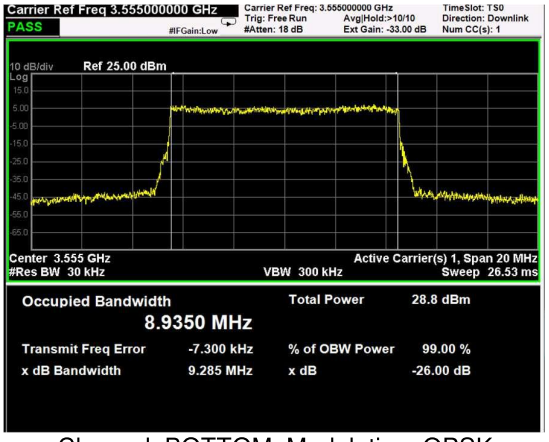
Channel: TOP, Modulation: 16QAM, BW=5MHz



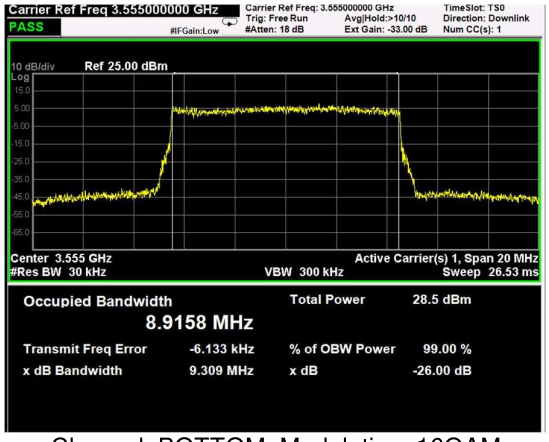
Channel: TOP, Modulation: 64QAM, BW=5MHz



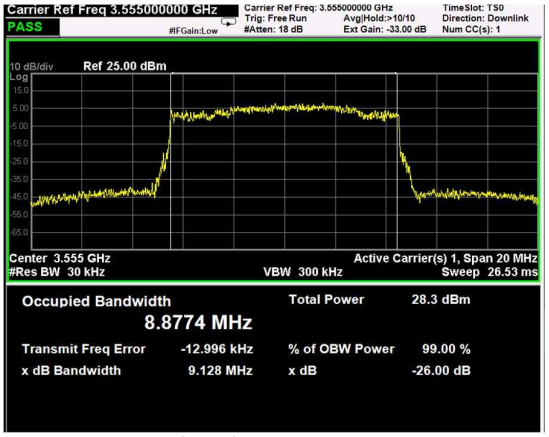
Channel: TOP, Modulation: 256QAM, BW=5MHz



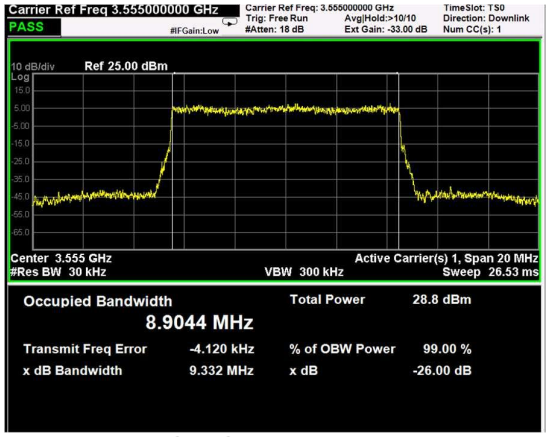
Channel: BOTTOM, Modulation: QPSK, BW=10MHz



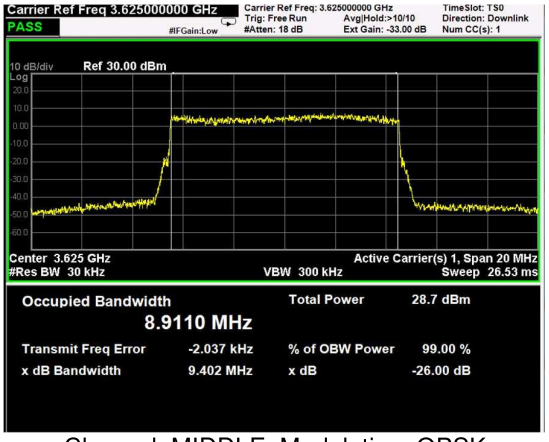
Channel: BOTTOM, Modulation: 16QAM, BW=10MHz



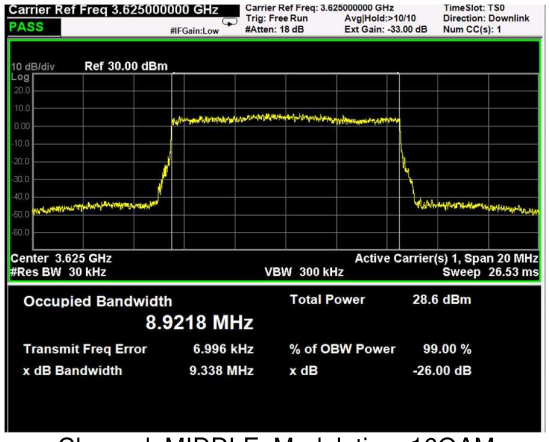
Channel: BOTTOM, Modulation: 64QAM, BW=10MHz



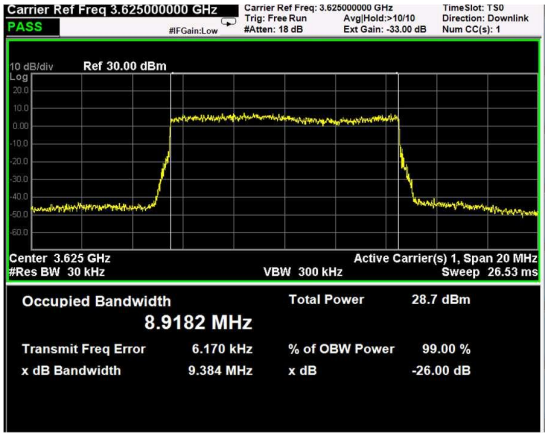
Channel: BOTTOM, Modulation: 256QAM, BW=10MHz



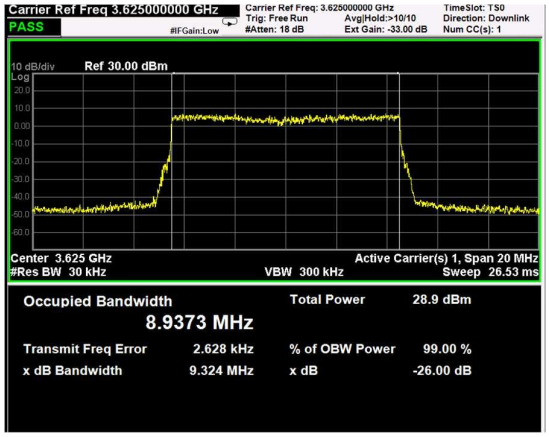
Channel: MIDDLE, Modulation: QPSK, BW=10MHz



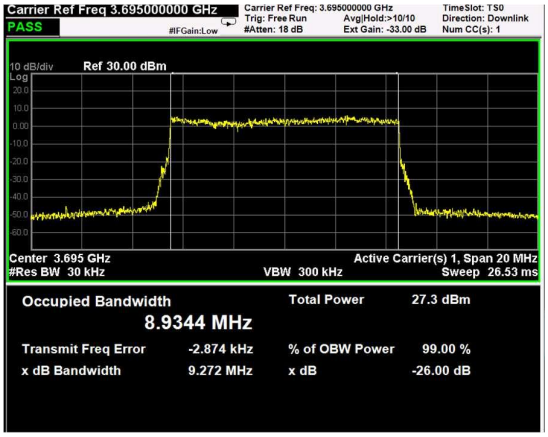
Channel: MIDDLE, Modulation: 16QAM, BW=10MHz



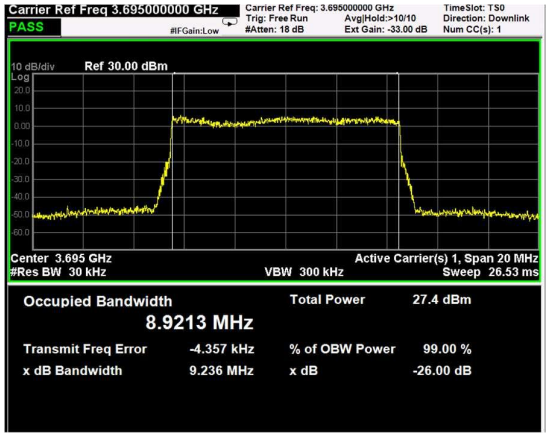
Channel: MIDDLE, Modulation: 64QAM, BW=10MHz



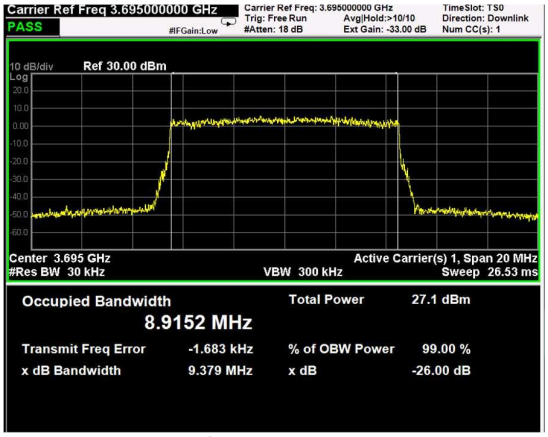
Channel: MIDDLE, Modulation: 256QAM, BW=10MHz



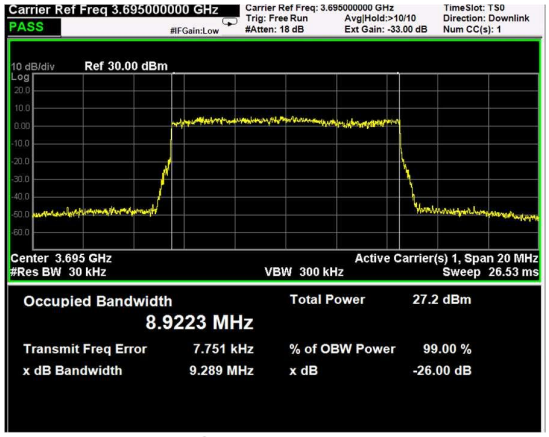
Channel: TOP, Modulation: QPSK, BW=10MHz



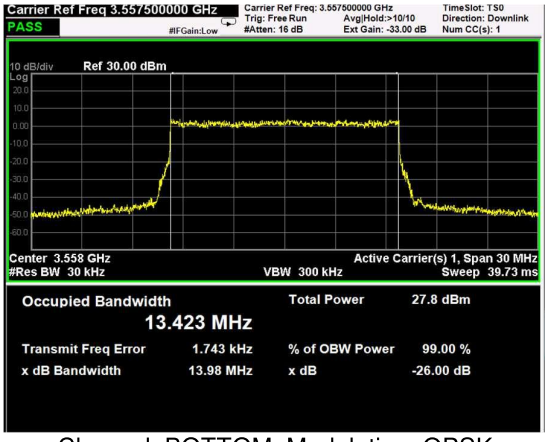
Channel: TOP, Modulation: 16QAM, BW=10MHz



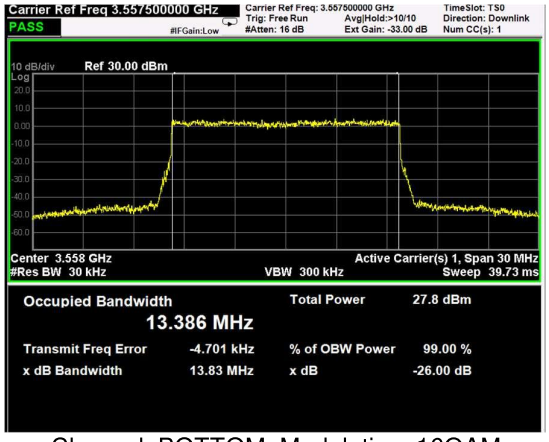
Channel: TOP, Modulation: 64QAM, BW=10MHz



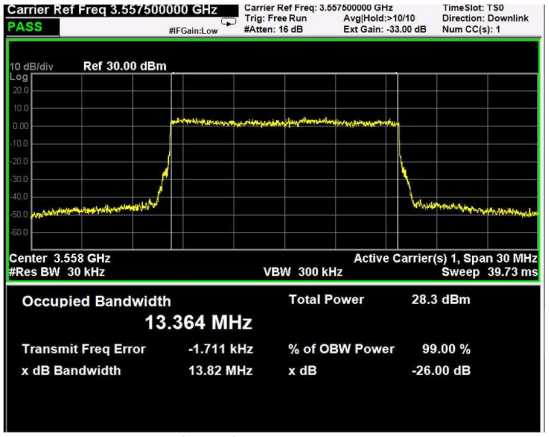
Channel: TOP, Modulation: 256QAM, BW=10MHz



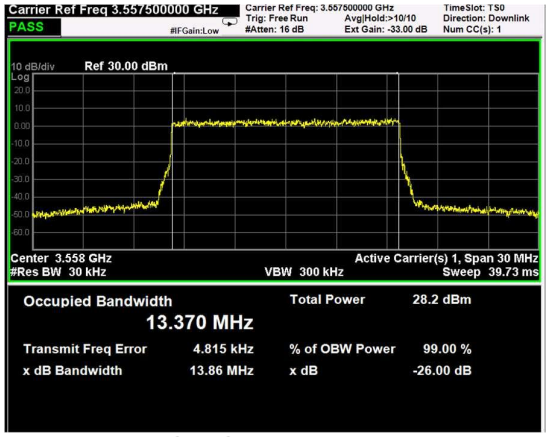
Channel: BOTTOM, Modulation: QPSK, BW=15MHz



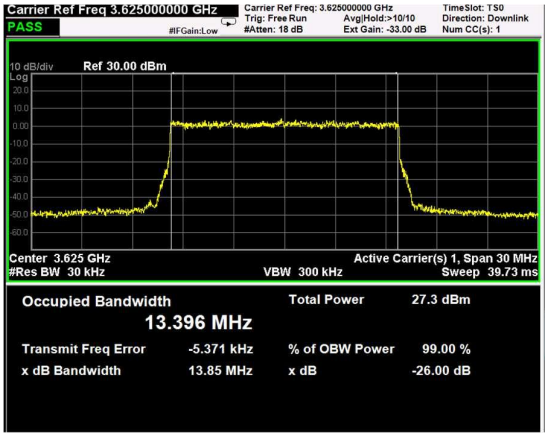
Channel: BOTTOM, Modulation: 16QAM, BW=15MHz



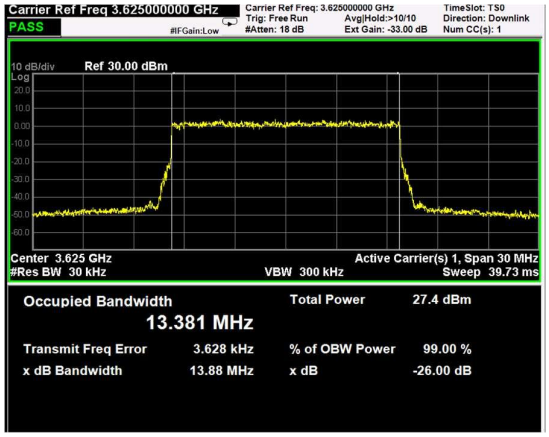
Channel: BOTTOM, Modulation: 64QAM, BW=15MHz



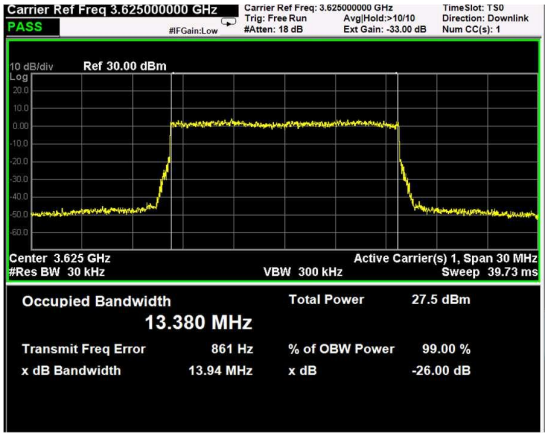
Channel: BOTTOM, Modulation: 256QAM, BW=15MHz



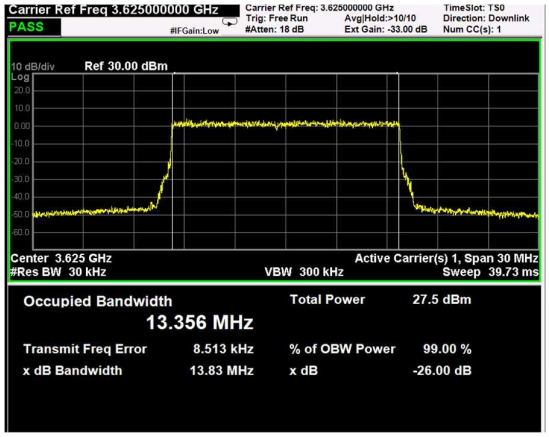
Channel: MIDDLE, Modulation: QPSK, BW=15MHz



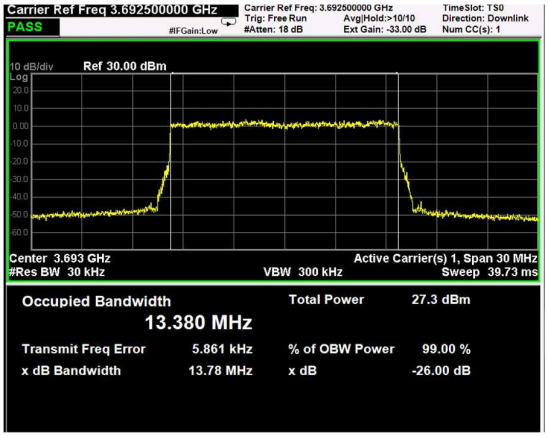
Channel: MIDDLE, Modulation: 16QAM, BW=15MHz



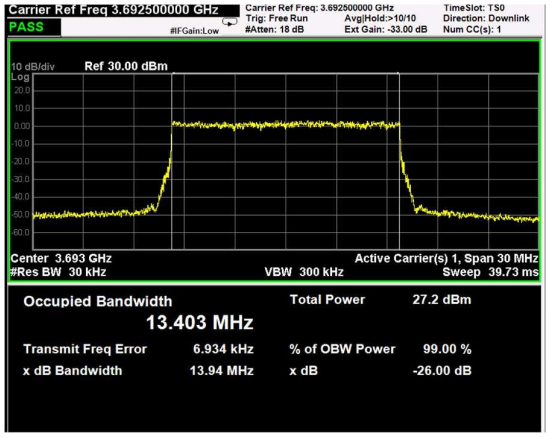
Channel: MIDDLE, Modulation: 64QAM, BW=15MHz



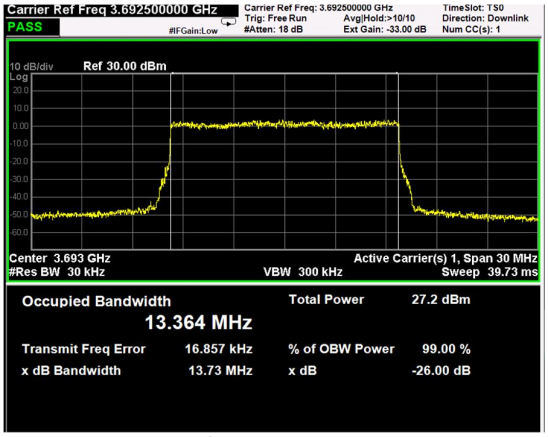
Channel: MIDDLE, Modulation: 256QAM, BW=15MHz



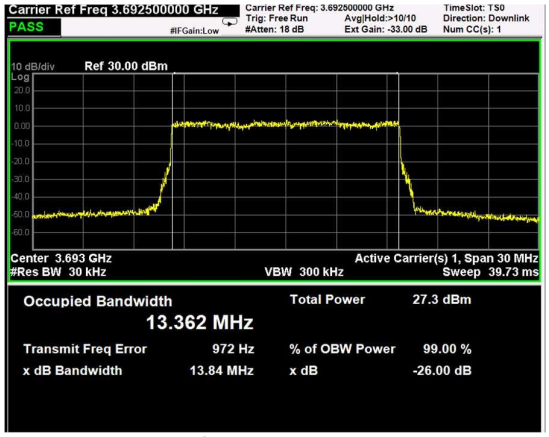
Channel: TOP, Modulation: QPSK, BW=15MHz



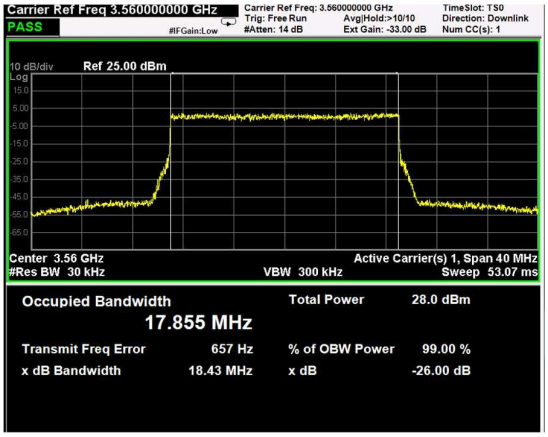
Channel: TOP, Modulation: 16QAM, BW=15MHz



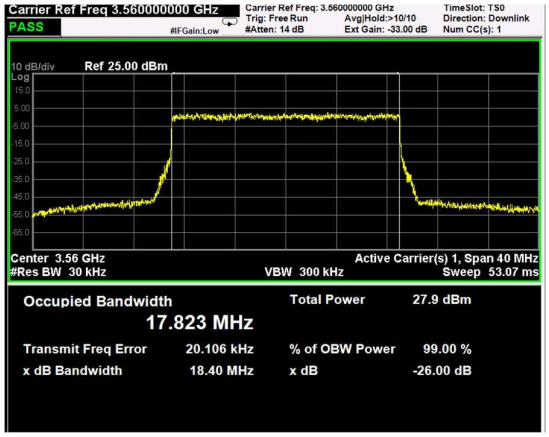
Channel: TOP, Modulation: 64QAM, BW=15MHz



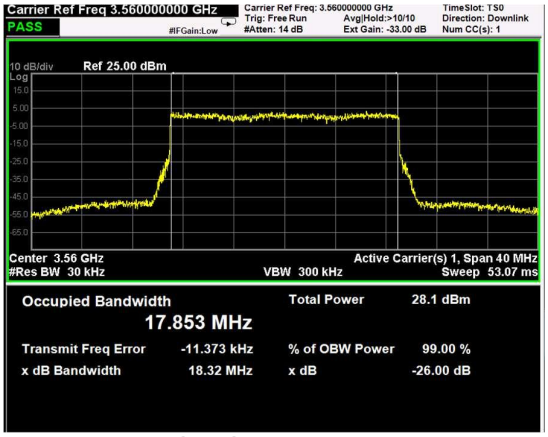
Channel: TOP, Modulation: 256QAM, BW=15MHz



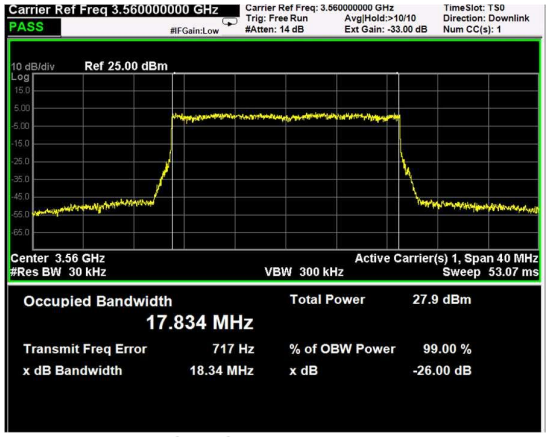
Channel: BOTTOM, Modulation: QPSK, BW=20MHz



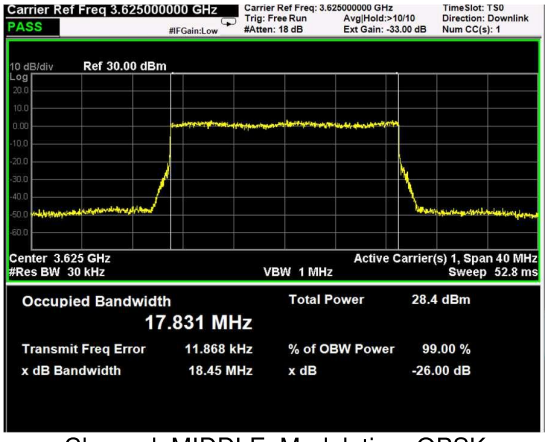
Channel: BOTTOM, Modulation: 16QAM, BW=20MHz



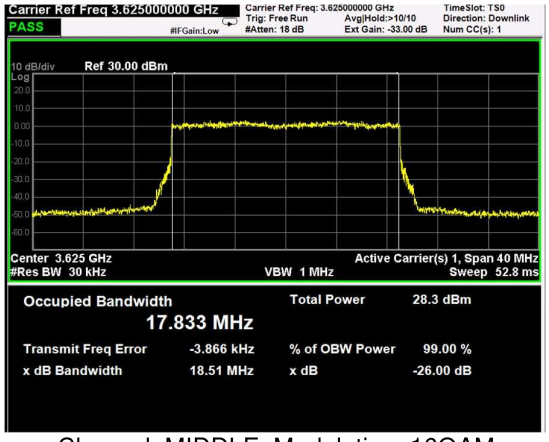
Channel: BOTTOM, Modulation: 64QAM, BW=20MHz



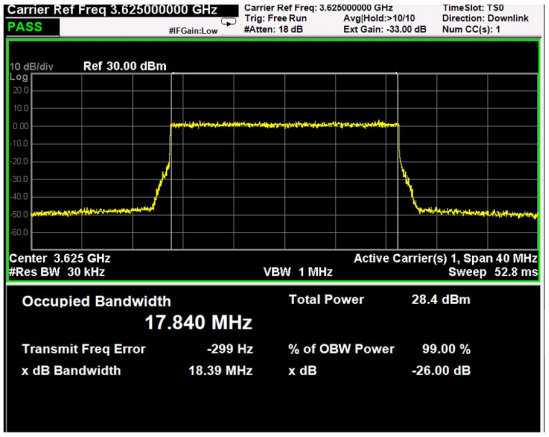
Channel: BOTTOM, Modulation: 256QAM, BW=20MHz



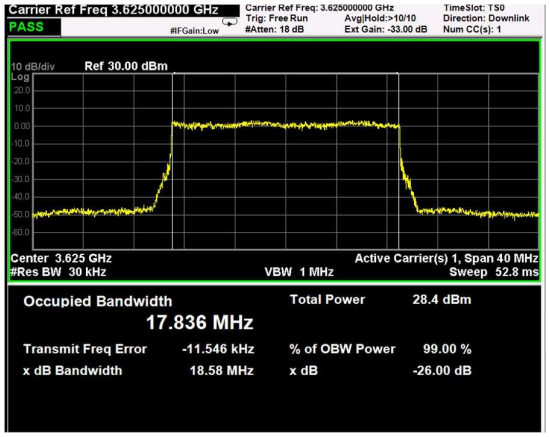
Channel: MIDDLE, Modulation: QPSK, BW=20MHz



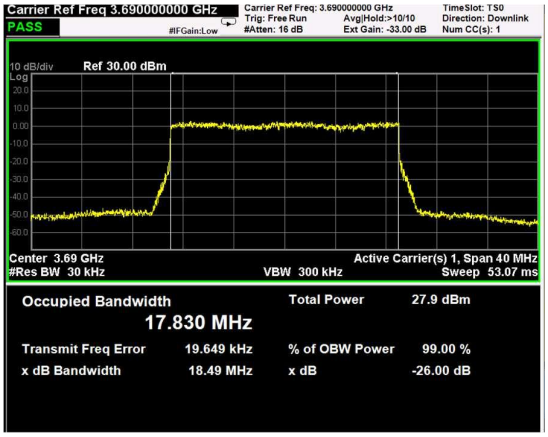
Channel: MIDDLE, Modulation: 16QAM, BW=20MHz



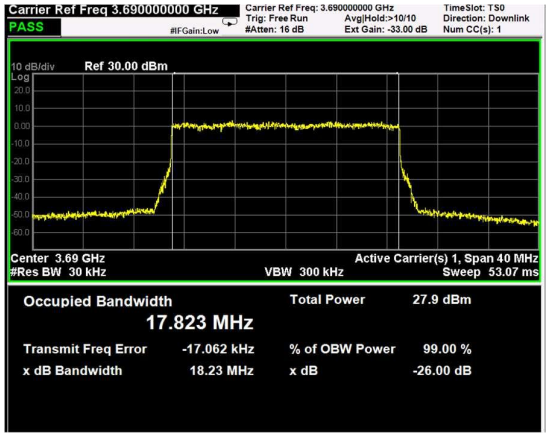
Channel: MIDDLE, Modulation: 64QAM, BW=20MHz



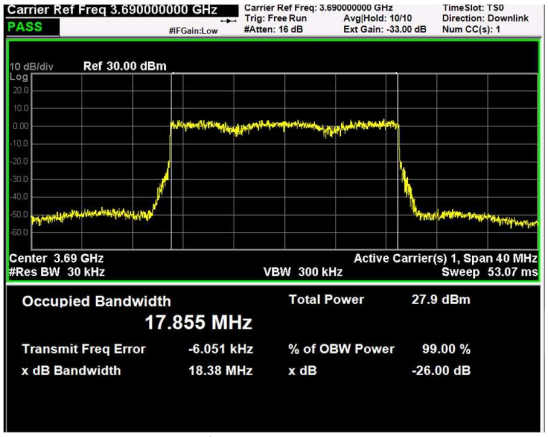
Channel: MIDDLE, Modulation: 256QAM, BW=20MHz



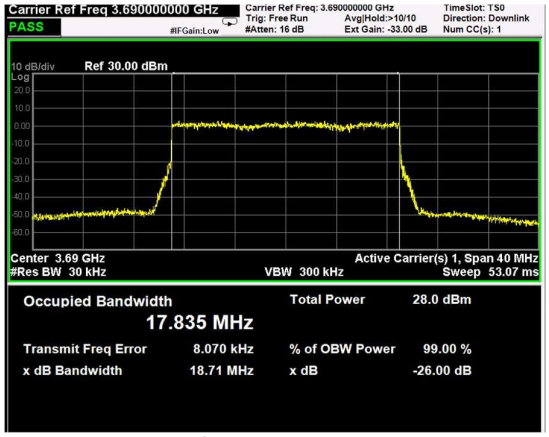
Channel: TOP, Modulation: QPSK, BW=20MHz



Channel: TOP, Modulation: 16QAM, BW=20MHz



Channel: TOP, Modulation: 64QAM, BW=20MHz



Channel: TOP, Modulation: 256QAM, BW=20MHz

Clause 96.41(b)(g) Peak output power at RF antenna connector

(b) *Power limits.* Unless otherwise specified in this section, the maximum effective isotropic radiated power (EIRP) and maximum Power Spectral Density (PSD) of any CBSD and End User Device must comply with the limits shown in the table in this paragraph (b):

Device	Maximum EIRP (dBm/10 megahertz)	Maximum PSD (dBm/MHz)
End User Device	23	n/a
Category A CBSD	30	20
Category B CBSD[1]	47	37

(g) *Power measurement.* The peak-to-average power ratio (PAPR) of any CBSD transmitter output power must not exceed 13 dB. PAPR measurements should be made using either an instrument with complementary cumulative distribution function (CCDF) capabilities or another Commission approved procedure. The measurement must be performed using a signal corresponding to the highest PAPR expected during periods of continuous transmission.

Test date: 10/21/2019 to 12/13/2019

Test results: Pass

Special notes

Clause 96.41(b)(d) Peak output power at RF antenna connector

Test data

RF PORT 1

Test data							
Direction	Modulation	Frequency (MHz)	RF output Power (dBm)	RF output channel Power (W)	PSD (dBm/Hz)	PSD (dBm/MHz)	PAR (dB)
Down-link	LTE 5MHz (QPSK)	3552.5	30.1	1.026	-36.9	23.1	10.7
Down-link	LTE 5MHz (QPSK)	3625.0	30.0	1.007	-37.0	23.0	10.0
Down-link	LTE 5MHz (QPSK)	3697.5	29.5	0.891	-37.5	22.5	10.4
Down-link	LTE 5MHz (16QAM)	3552.5	30.0	0.993	-37.0	23.0	10.5
Down-link	LTE 5MHz (16QAM)	3625.0	29.9	0.982	-37.1	22.9	10.3
Down-link	LTE 5MHz (16QAM)	3697.5	29.5	0.881	-37.5	22.5	10.3
Down-link	LTE 5MHz (64QAM)	3552.5	30.1	1.019	-36.9	23.1	10.3
Down-link	LTE 5MHz (64QAM)	3625.0	29.8	0.953	-37.2	22.8	9.8
Down-link	LTE 5MHz (64QAM)	3697.5	29.4	0.865	-37.6	22.4	10.4
Down-link	LTE 5MHz (256QAM)	3552.5	30.0	1.005	-37.0	23.0	10.2
Down-link	LTE 5MHz (256QAM)	3625.0	30.0	0.998	-37.0	23.0	10.3
Down-link	LTE 5MHz (256QAM)	3697.5	29.4	0.875	-37.6	22.4	10.3

RF PORT 2

Test data							
Direction	Modulation	Frequency (MHz)	RF output Power (dBm)	RF output channel Power (W)	PSD (dBm/Hz)	PSD (dBm/MHz)	PAR (dB)
Down-link	LTE 5MHz (QPSK)	3552.5	29.0	0.802	-38.0	22.1	10.4
Down-link	LTE 5MHz (QPSK)	3625.0	29.2	0.839	-37.8	22.3	10.7
Down-link	LTE 5MHz (QPSK)	3697.5	29.5	0.883	-37.5	22.5	11.1
Down-link	LTE 5MHz (16QAM)	3552.5	29.5	0.887	-37.5	22.5	9.3
Down-link	LTE 5MHz (16QAM)	3625.0	29.2	0.836	-37.8	22.2	10.6
Down-link	LTE 5MHz (16QAM)	3697.5	29.6	0.918	-37.4	22.6	10.3
Down-link	LTE 5MHz (64QAM)	3552.5	29.0	0.796	-38.0	22.0	10.3
Down-link	LTE 5MHz (64QAM)	3625.0	29.5	0.891	-37.5	22.5	10.1
Down-link	LTE 5MHz (64QAM)	3697.5	29.0	0.798	-38.0	22.0	9.1
Down-link	LTE 5MHz (256QAM)	3552.5	29.0	0.798	-38.0	22.0	10.3
Down-link	LTE 5MHz (256QAM)	3625.0	29.6	0.902	-37.4	22.6	10.4
Down-link	LTE 5MHz (256QAM)	3697.5	29.4	0.861	-37.6	22.4	12.0

Special notes

Maximum EIRP ≤ 30dBm/10MHz
Maximum PSD eirp ≤ 20dBm/1MHz

Remark: MIMO application where only cross-polarized antennas are allowed (KDB "662911 D01 Multiple Transmitter Output v02r01", chapter F, paragraph 2), letter c), item (i)).

PSD eirp (in 1 MHz) = PSDmax – N + Gmax = 23 – N + Gmax ≤ 20
Gmax ≤ (20-23+N) = N - 3

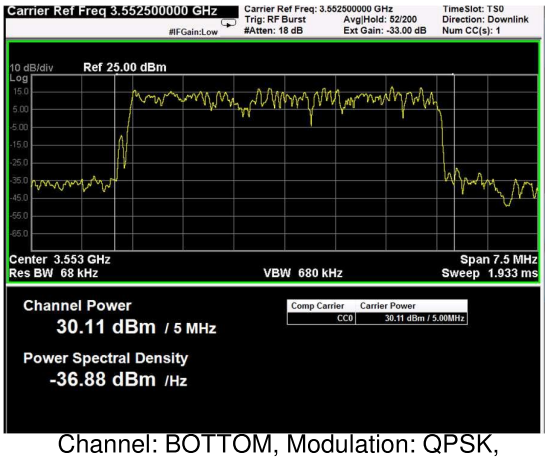
Where:

- PSD_{max} is the maximum PSD value measured on the antenna connector of the equipment and it depends on the LTE bandwidth signal
- N is system path loss (in dB) due to cable insertion, splitter, etc….
- G_{max} is the maximum antenna gain (in dBi)

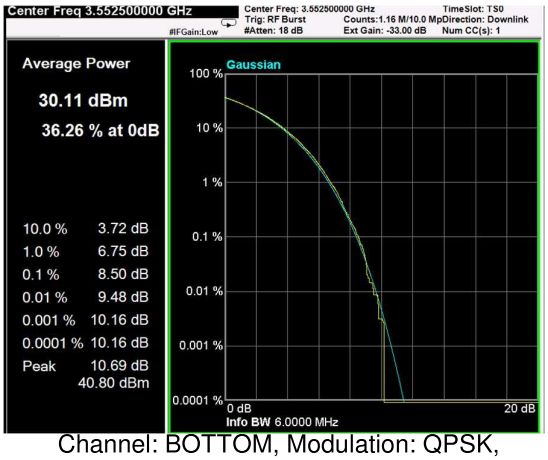
Therefore:

- for N < 3 dB → Maximum antenna gain Gmax = 0 dBi and Output power setting = (27 + N) dBm (in this case the output power shall be reduced by the amount in dB of the insertion loss less than 3 dB)
- for N ≥ 3 dB → Maximum antenna gain Gmax = N–3 and Output power setting = 30 dBm

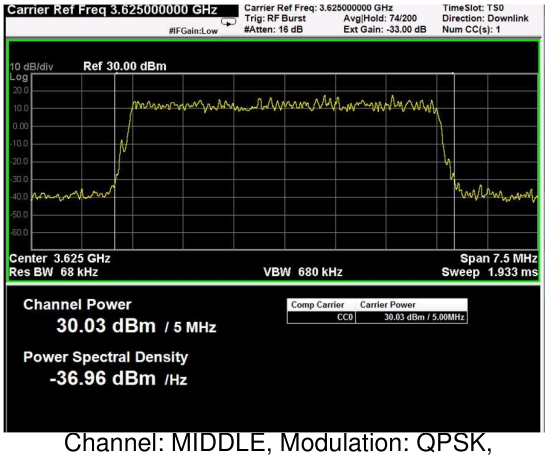
RF PORT 1 PLOT



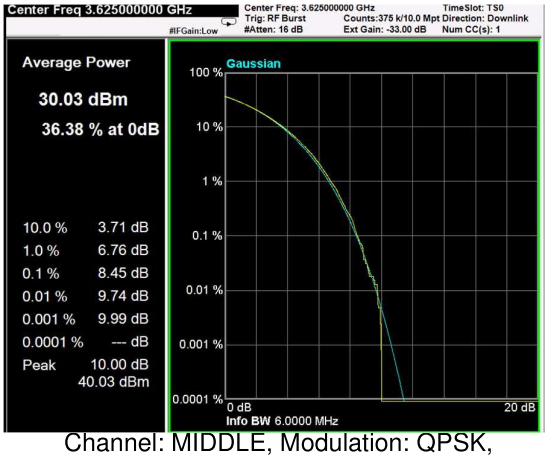
Channel: BOTTOM, Modulation: QPSK, BW=5MHz, Channel Power



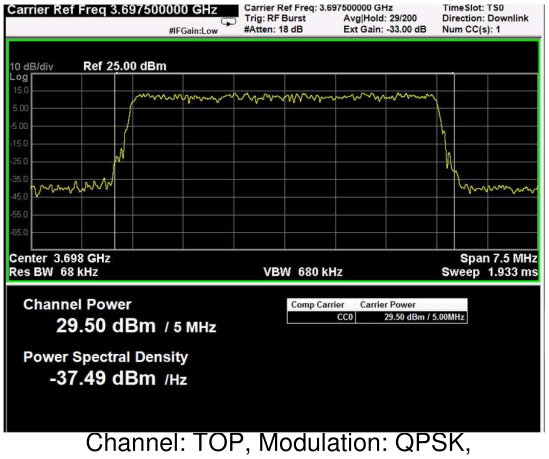
Channel: BOTTOM, Modulation: QPSK, BW=5MHz, CCDF



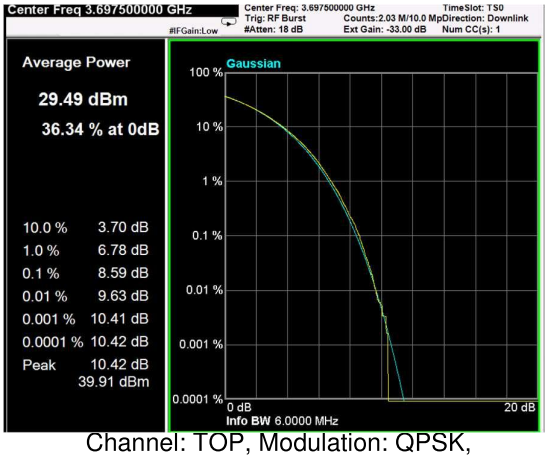
Channel: MIDDLE, Modulation: QPSK, BW=5MHz, Channel Power



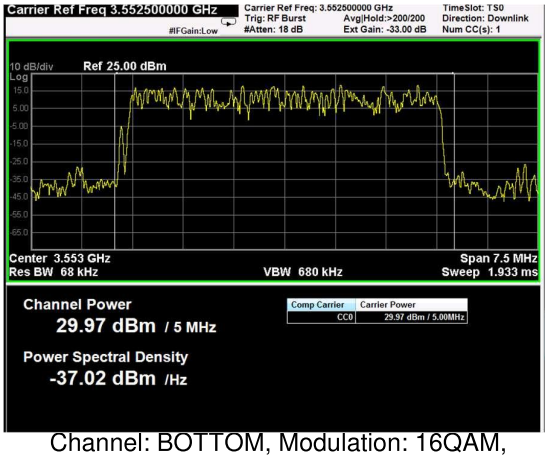
Channel: MIDDLE, Modulation: QPSK, BW=5MHz, CCDF



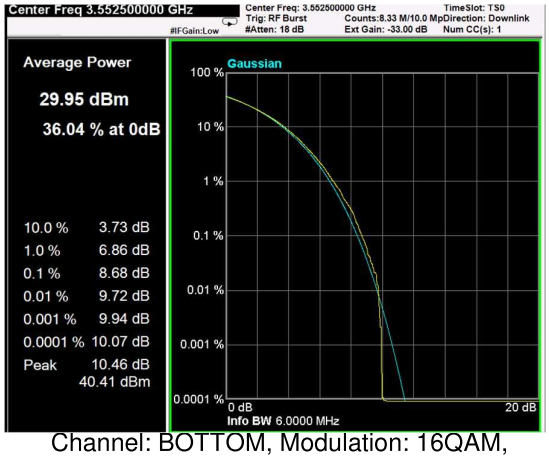
Channel: TOP, Modulation: QPSK, BW=5MHz, Channel Power



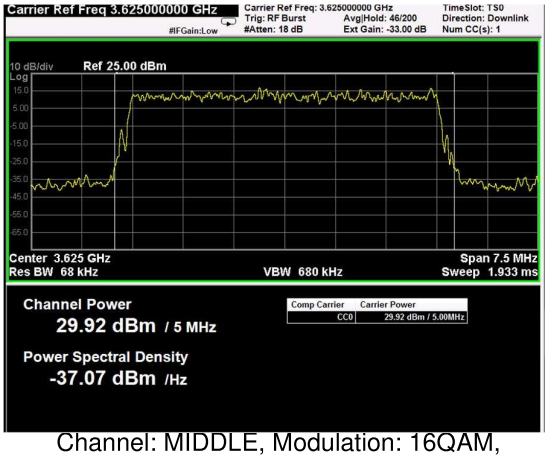
Channel: TOP, Modulation: QPSK, BW=5MHz, CCDF



Channel: BOTTOM, Modulation: 16QAM, BW=5MHz, Channel Power

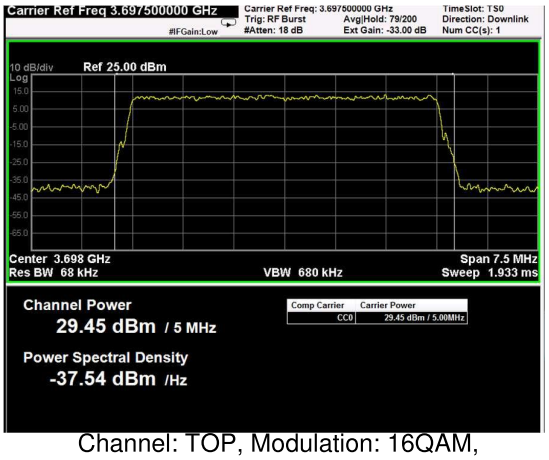


Channel: BOTTOM, Modulation: 16QAM, BW=5MHz, CCDF

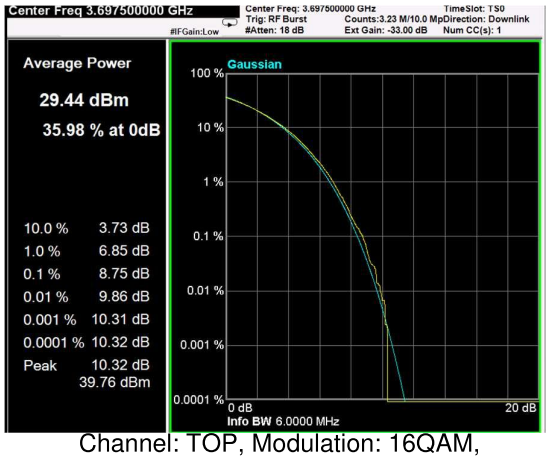


Channel: MIDDLE, Modulation: 16QAM, BW=5MHz, Channel Power

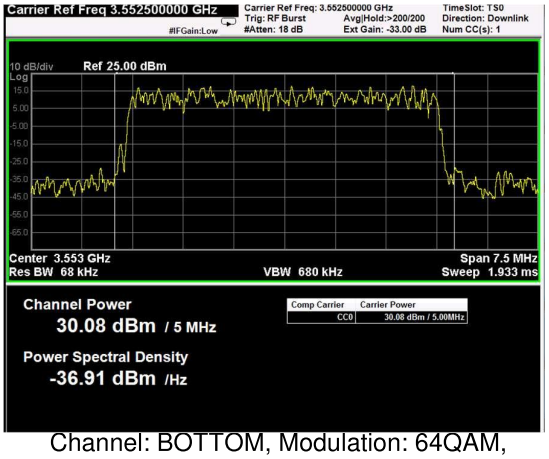
Channel: MIDDLE, Modulation: 16QAM, BW=5MHz, CCDF



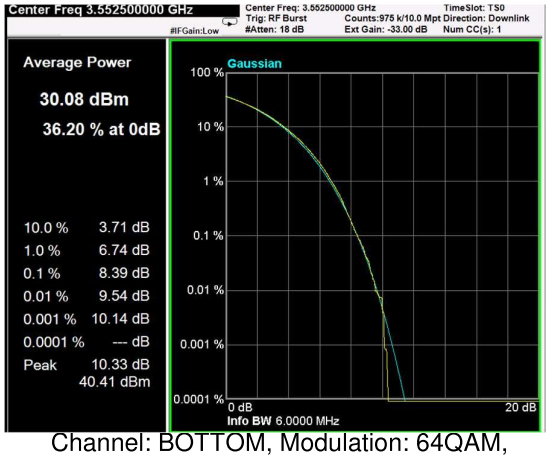
Channel: TOP, Modulation: 16QAM, BW=5MHz, Channel Power



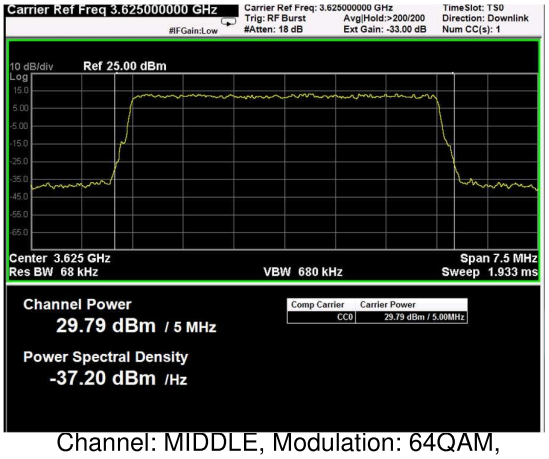
Channel: TOP, Modulation: 16QAM, BW=5MHz, CCDF



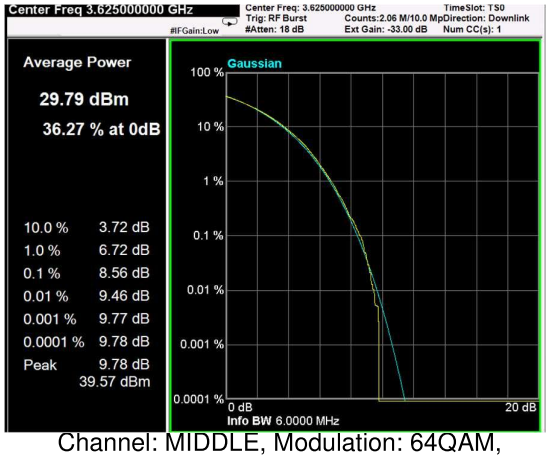
Channel: BOTTOM, Modulation: 64QAM, BW=5MHz, Channel Power



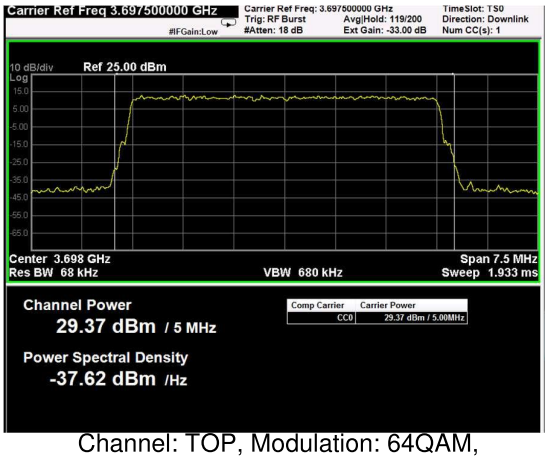
Channel: BOTTOM, Modulation: 64QAM, BW=5MHz, CCDF



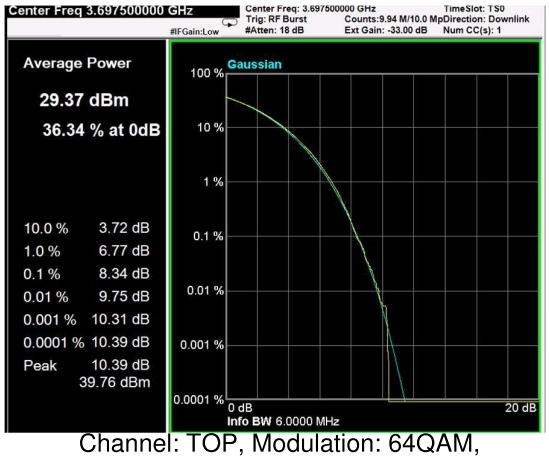
Channel: MIDDLE, Modulation: 64QAM, BW=5MHz, Channel Power



Channel: MIDDLE, Modulation: 64QAM, BW=5MHz, CCDF



Channel: TOP, Modulation: 64QAM, BW=5MHz, Channel Power



Channel: TOP, Modulation: 64QAM, BW=5MHz, CCDF