LTE eTDD38 QPSK

Temp. °C	Duration min	Voltage	Limit Hz	Freq. error Average (Hz)	Freq. error Max. (Hz)	Verdict
-30	0	normal	6487.5	4	12	passed
-30	5			2	10	passed
-30	10			-3	16	passed
-20	0	normal	6487.5	-2	12	passed
-20	5			-2	13	passed
-20	10			-3	14	passed
-10	0	normal	6487.5	3	12	passed
-10	5			2	16	passed
-10	10			-2	15	passed
0	0	normal	6487.5	4	10	passed
0	5			-2	15	passed
0	10			3	17	passed
10	0	normal	6487.5	-3	13	passed
10	5			-3	12	passed
10	10			-4	16	passed
20	0	low	6487.5	2	14	passed
20	5			-3	14	passed
20	10			-2	13	passed
20	0	normal	6487.5	-3	12	passed
20	5			-3	14	passed
20	10			-2	16	passed
20	0	high	6487.5	-2	15	passed
20	5			-2	10	passed
20	10			-2	13	passed
30	0	normal	6487.5	4	10	passed
30	5			3	10	passed
30	10			-2	11	passed
40	0	normal	6487.5	-1	12	passed
40	5			-3	15	passed
40	10			-4	13	passed
50	0	normal	6487.5	-2	16	passed
50	5			-3	13	passed
50	10			3	13	passed

LTE eTDD41 QPSK

Temp. °C	Duration min	Voltage	Limit Hz	Freq. error Average (Hz)	Freq. error Max. (Hz)	Verdict
-30	0	normal	6482.5	-2	5	passed
-30	5			-4	-6	passed
-30	10			-3	-7	passed
-20	0	normal	6482.5	-2	-6	passed
-20	5			-2	-7	passed
-20	10			-2	-7	passed
-10	0	normal	6482.5	-1	-6	passed
-10	5			-2	-4	passed
-10	10			1	5	passed
0	0	normal	6482.5	0	6	passed
0	5			1	8	passed
0	10			-1	5	passed
10	0	normal	6482.5	-2	-5	passed
10	5			-2	-5	passed
10	10			1	-4	passed
20	0	low	6482.5	-3	-6	passed
20	5			-2	-6	passed
20	10			1	7	passed
20	0	normal	6482.5	-1	5	passed
20	5			-1	6	passed
20	10			-1	-5	passed
20	0	high	6482.5	0	-4	passed
20	5			-1	-5	passed
20	10			-1	-5	passed
30	0	normal	6482.5	1	6	passed
30	5			-1	-6	passed
30	10			-1	-5	passed
40	0	normal	6482.5	-2	-7	passed
40	5			-2	-6	passed
40	10			-1	-7	passed
50	0	normal	6482.5	2	6	passed
50	5			1	-5	passed
50	10			-1	-5	passed

LTE eFDD66 QPSK

Temp. °C	Duration min	Voltage	Limit Hz	Freq. error Average (Hz)	Freq. error Max. (Hz)	Verdict
-30	0	normal	4362.5	3	9	passed
-30	5			-5	10	passed
-30	10			-3	6	passed
-20	0	normal	4362.5	5	11	passed
-20	5			4	12	passed
-20	10			5	7	passed
-10	0	normal	4362.5	-4	10	passed
-10	5			-4	8	passed
-10	10			-6	9	passed
0	0	normal	4362.5	3	9	passed
0	5			-4	8	passed
0	10			-4	10	passed
10	0	normal	4362.5	3	12	passed
10	5			3	11	passed
10	10			4	11	passed
20	0	low	4362.5	-3	9	passed
20	5			-3	10	passed
20	10			-2	8	passed
20	0	normal	4362.5	-4	8	passed
20	5			4	8	passed
20	10			6	9	passed
20	0	high	4362.5	5	11	passed
20	5			4	10	passed
20	10			4	11	passed
30	0	normal	4362.5	-3	13	passed
30	5			-3	9	passed
30	10			-2	9	passed
40	0	normal	4362.5	-4	7	passed
40	5			-5	8	passed
40	10			-3	8	passed
50	0	normal	4362.5	-3	7	passed
50	5			-4	6	passed
50	10			-5	7	passed

LTE eFDD71 QPSK

Temp. °C	Duration min	Voltage	Limit Hz	Freq. error Average (Hz)	Freq. error Max. (Hz)	Verdict
-30	0	normal	1955	-0.84	-2.2	passed
-30	5			-0.43	-1.95	passed
-30	10			-0.06	2.3	passed
-20	0	normal	1955	0.23	2.5	passed
-20	5			-0.41	-2.25	passed
-20	10			-0.23	-2.95	passed
-10	0	normal	1955	0.07	1.7	passed
-10	5			-0.33	-3.38	passed
-10	10			-0.63	-2.33	passed
0	0	normal	1955	-0.37	3.43	passed
0	5			-0.01	3.76	passed
0	10			-0.86	-2.83	passed
10	0	normal	1955	-0.63	-2.22	passed
10	5			-0.9	-3.48	passed
10	10			0.13	1.79	passed
20	0	low	1955	-0.47	-3.2	passed
20	5			-2.58	-2.77	passed
20	10			-0.89	-3.32	passed
20	0	normal	1955	-0.7	-3.53	passed
20	5			-0.2	-4.01	passed
20	10			-1.26	-2.9	passed
20	0	high	1955	-0.76	-3.55	passed
20	5			-0.4	-2.42	passed
20	10			-0.14	-2.15	passed
30	0	normal	1955	-0.72	-2.3	passed
30	5			-0.77	-2.22	passed
30	10			-0.31	-2.95	passed
40	0	normal	1955	-0.66	-2.33	passed
40	5			-1.22	-2.78	passed
40	10			0.46	-2.47	passed
50	0	normal	1955	0.03	-1.44	passed
50	5			-0.13	2.98	passed
50	10			0.53	3.05	passed

5.16.4 TEST EQUIPMENT USED

- Radio Lab

5.17 SPURIOUS EMISSIONS AT ANTENNA TERMINALS

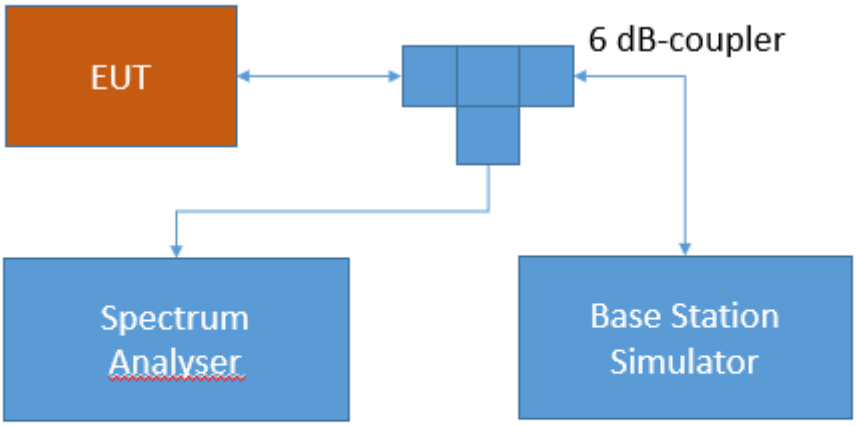
Standard **FCC PART 27 Subpart C**

The test was performed according to:
ANSI C63.26: 2015

5.17.1 TEST DESCRIPTION

This test case is intended to demonstrate compliance to the applicable conducted spurious emission test case per § 2.1051 and RSS-GEN 6.13. The limit comes from the applicable rule part and ISED RSS-Standard for the operating band of the cellular device.

The EUT was connected to the test setup according to the following diagram:



Test Setup FCC Part 22/24/27/90 Cellular;
Spurious Emissions at antenna terminal

The attenuation of the measuring and stimulus path are known for each measured frequency and are considered.

The Spectrum Analyzer settings can be directly found in the measurement diagrams.

5.17.2 TEST REQUIREMENTS / LIMITS

FCC Part 2.1051; Measurement required: Spurious emissions at antenna terminal:

The radio frequency voltage or powers generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of each harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in §2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified.

FCC Part 27; Miscellaneous Wireless Communication Services

Subpart C – Technical standards

§27.53 – Emission limits

Band 13

(c) For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;

(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;

(3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations;

(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations;

(5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;

(f) For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to −70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and −80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

(6) Compliance with the provisions of paragraphs (c)(3) and (c)(4) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

RSS-130; 4.7.1 General unwanted emissions limits

The unwanted emissions in any 100 kHz bandwidth on any frequency outside the low frequency edge and the high frequency edge of each frequency block range(s), shall be attenuated below the transmitter power, P (dBW), by at least 43 + 10 $\log_{10}$ p (watts), dB. However, in the 100 kHz band immediately outside of the equipment's frequency block range, a resolution bandwidth of 30 kHz may be employed.

RSS-130; 4.7.2 Additional unwanted emissions limits

In addition to the limit outlined in section 4.7.1 above, equipment operating in the frequency bands 746-756 MHz and 777-787 MHz shall also comply with the following restrictions:

a. the power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power, P (dBW), by at least:

   i. 76 + 10 $\log_{10}$ p (watts), dB, for base and fixed equipment and

   ii. 65 + 10 $\log_{10}$ p (watts), dB, for mobile and portable equipment

b. the e.i.r.p. in the band 1559-1610 MHz shall not exceed −70 dBW/MHz for wideband signal and −80 dBW for discrete emission with bandwidth less than 700 Hz.

Band 12:

(g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

RSS-130; 4.7.1 General unwanted emissions limits

The unwanted emissions in any 100 kHz bandwidth on any frequency outside the low frequency edge and the high frequency edge of each frequency block range(s), shall be attenuated below the transmitter power, P (dBW), by at least 43 + 10 $\log_{10}$ p (watts), dB. However, in the 100 kHz band immediately outside of the equipment's frequency block range, a resolution bandwidth of 30 kHz may be employed.

RSS-130; 4.7.2 Additional unwanted emissions limits

In addition to the limit outlined in section 4.7.1 above, equipment operating in the frequency bands 746-756 MHz and 777-787 MHz shall also comply with the following restrictions:

a. the power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power, P (dBW), by at least:

   i. 76 + 10 $\log_{10}$ p (watts), dB, for base and fixed equipment and

   ii. 65 + 10 $\log_{10}$ p (watts), dB, for mobile and portable equipment

b. the e.i.r.p. in the band 1559-1610 MHz shall not exceed −70 dBW/MHz for wideband signal and −80 dBW for discrete emission with bandwidth less than 700 Hz.

Band 4/10/66:

(h) *AWS emission limits*— (1) *General protection levels.* Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 $\log_{10}$ (P) dB.

RSS-139; 6.6 Transmitter Unwanted Emissions

Equipment shall comply with the limits in (i) and (ii) below.

i. In the first 1.0 MHz bands immediately outside and adjacent to the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power per any 1% of the emission bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least 43 + 10 $\log_{10}$ p (watts) dB.

ii. After the first 1.0 MHz outside the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power in any 1 MHz bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least 43 + 10 $\log_{10}$ p (watts) dB.

Band 7:

(m) For BRS and EBS stations, the power of any emissions outside the licensee's frequency bands of operation shall be attenuated below the transmitter power (P) measured in watts in accordance with the standards below. If a licensee has multiple contiguous channels, out-of-band emissions shall be measured from the upper and lower edges of the contiguous channels.

(4) For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

RSS-199; 4.5 Transmitter unwanted emissions

In the 1 MHz band immediately outside and adjacent to the channel edge, the unwanted emission power shall be measured with a resolution bandwidth of at least 1% of the occupied bandwidth for base station and fixed subscriber equipment, and 2% for mobile subscriber equipment. Beyond the 1 MHz band, a resolution bandwidth of 1 MHz shall be used. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full required measurement bandwidth of 1 MHz, or 1% or 2% of the occupied bandwidth, as applicable.

Equipment shall comply with the following unwanted emission limits:

b. for mobile subscriber equipment, the power of any unwanted emissions measured as above shall be attenuated (in dB) below the transmitter power, P (dBW), by at least:

$40 + 10 \log_{10} p$ from the channel edges to 5 MHz away

$43 + 10 \log_{10} p$ between 5 MHz and X MHz from the channel edges, and

$55 + 10 \log_{10} p$ at X MHz and beyond from the channel edges

In addition, the attenuation shall not be less than $43 + 10 \log_{10} p$ on all frequencies between 2490.5 MHz and 2496 MHz, and $55 + 10 \log_{10} p$ at or below 2490.5 MHz.

In (b), p is the transmitter power measured in watts and X is 6 MHz or the equipment occupied bandwidth, whichever is greater.

Band 17:

(g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

RSS-130; 4.7.1 General unwanted emissions limits

The unwanted emissions in any 100 kHz bandwidth on any frequency outside the low frequency edge and the high frequency edge of each frequency block range(s), shall be attenuated below the transmitter power, P (dBW), by at least 43 + 10 $\log_{10}$ p (watts), dB. However, in the 100 kHz band immediately outside of the equipment's frequency block range, a resolution bandwidth of 30 kHz may be employed.

RSS-130; 4.7.2 Additional unwanted emissions limits

In addition to the limit outlined in section 4.7.1 above, equipment operating in the frequency bands 746-756 MHz and 777-787 MHz shall also comply with the following restrictions:

a. the power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power, P (dBW), by at least:

   i. 76 + 10 $\log_{10}$ p (watts), dB, for base and fixed equipment and

   ii. 65 + 10 $\log_{10}$ p (watts), dB, for mobile and portable equipment

b. the e.i.r.p. in the band 1559-1610 MHz shall not exceed −70 dBW/MHz for wideband signal and −80 dBW for discrete emission with bandwidth less than 700 Hz.

5.17.3 TEST PROTOCOL

Ambient temperature: 24 °C
Relative humidity: 38 %

Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
eFDD4	low	rms	maxhold	5	1709.98	-37.88	-23	14.88
eFDD4	mid	peak	maxhold	-	-	-	-13	>20
eFDD4	high	rms	maxhold	5	1755	-31.96	-23	8.96

Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
eFDD7	low	peak	maxhold	50	2499.09	-24.84	-10	14.84
eFDD7	low	peak	maxhold	1000	2624.05	-30.24	-25	5.24
eFDD7	mid	peak	maxhold	-	-	-	-13	>20
eFDD7	high	peak	maxhold	50	2570	-22.86	-10	12.86
eFDD7	high	peak	maxhold	1000	2578.09	-30.07	-10	20.07
eFDD7	high	peak	maxhold	1000	5135.27	-34.09	-25	9.09

Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
eFDD12	low	rms	maxhold	-	-	-	-13	>20
eFDD12	mid	rms	maxhold	-	-	-	-13	>20
eFDD12	high	rms	maxhold	-	-	-	-13	>20

Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
eFDD13	low	rms	maxhold	-	-	-	-13	>20
eFDD13	mid	rms	maxhold	-	-	-	-13	>20
eFDD13	high	rms	maxhold	100	787.10	-23.84	-13	10.84

Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
eFDD17	low	rms	maxhold	50	703.99	-24.4	-13	11.4
eFDD17	mid	rms	maxhold	-	-	-	-13	>20
eFDD17	high	rms	maxhold	50	716.00	-21.8	-13	8.8

Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
eTDD38	low	rms	maxhold	50	2570	-26.33	-10	16.33
eTDD38	low	peak	maxhold	1000	2600	-31.71	-25	6.71
eTDD38	low	peak	maxhold	1000	5140.68	-33.03	-25	8.03
eTDD38	mid	rms	maxhold	1000	5190.78	-32.51	-25	7.51
eTDD38	high	rms	maxhold	50	2620.00	-27.63	-10	17.63
eTDD38	high	peak	maxhold	1000	6974.55	-36.63	-25	11.63

Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
eTDD41	low	rms	maxhold	100	2501	-18.51	-10	8.51
eTDD41	mid	peak	maxhold	1000	5186.37	-32.21	-25	7.21
eTDD41	high	rms	maxhold	50	2690.00	-25.04	-10	15.04
eTDD41	high	peak	maxhold	1000	6983.77	-35.83	-25	10.83

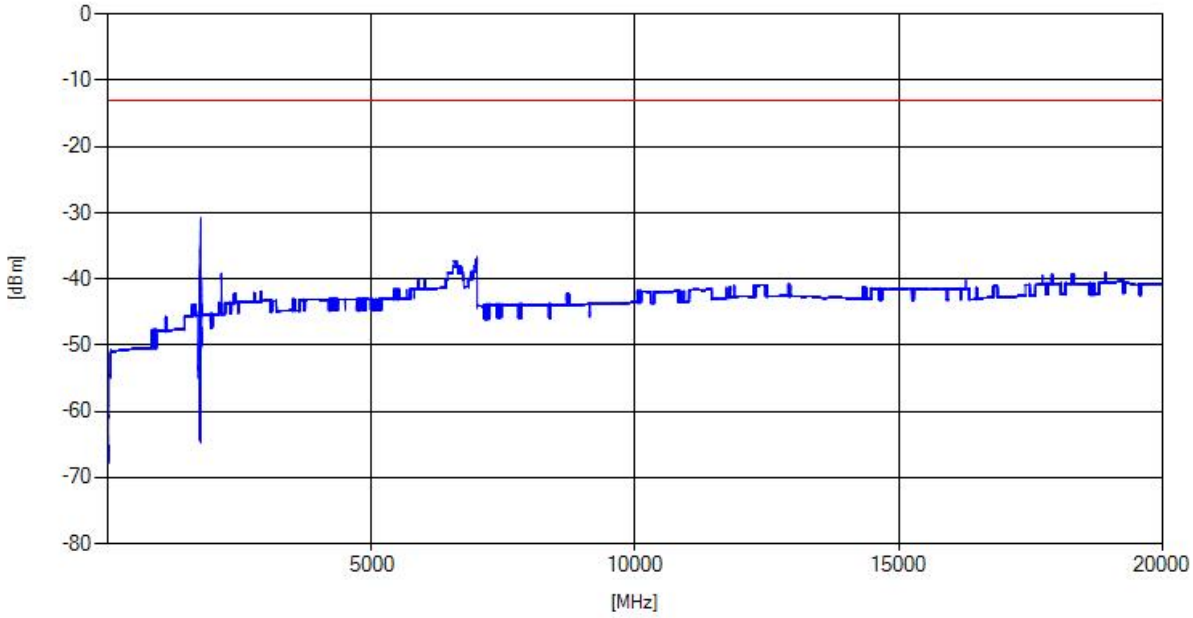
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
eFDD66	low	rms	maxhold	5	1709.99	-32.62	-23	9.62
eFDD66	mid	rms	maxhold	-	-	-	-13	>20
eFDD66	high	rms	maxhold	5	1780.00	-33.44	-23	10.44

Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
eFDD71	low	rms	maxhold	30	662.99	-24.44	-13	11.44
eFDD71	mid	rms	maxhold	-	-	-	-13	>20
eFDD71	high	rms	maxhold	30	698.00	-25.48	-13	12.48

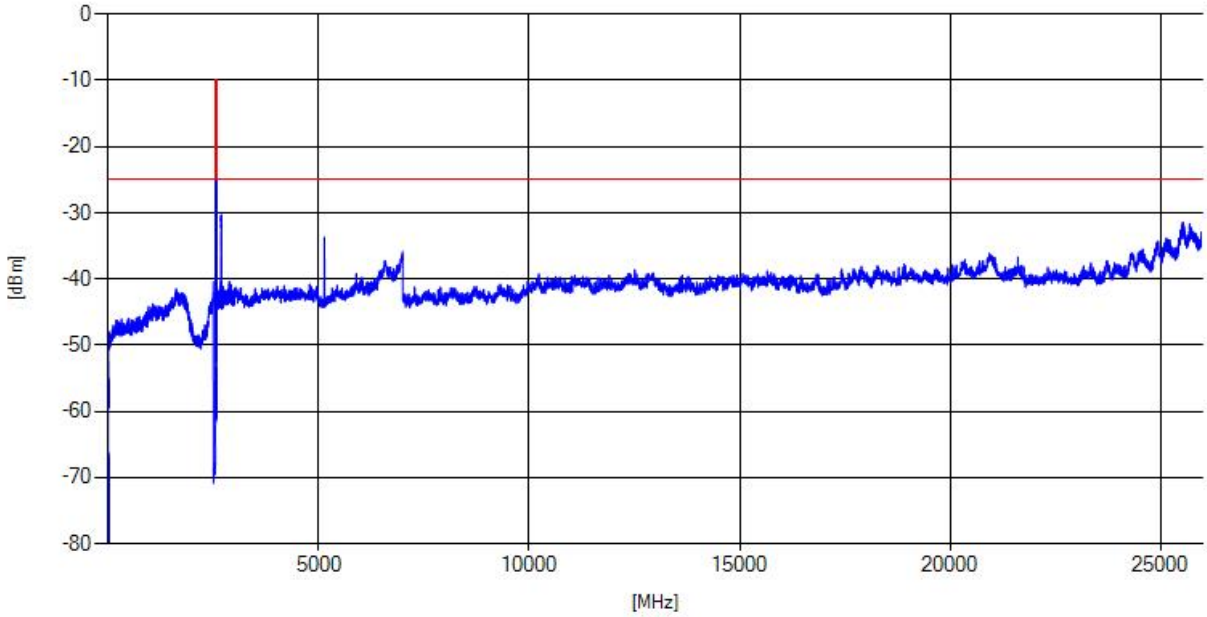
Remark: Please see next sub-clause for the measurement plot.

5.17.4 MEASUREMENT PLOT (SHOWING THE HIGHEST VALUE, "WORST CASE")

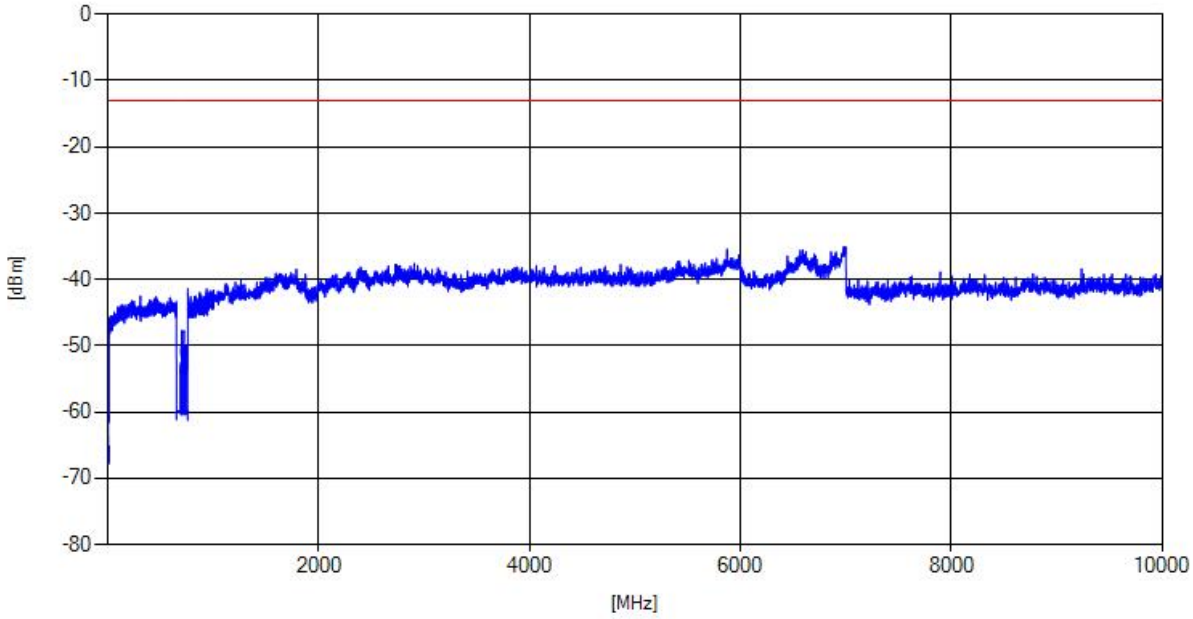
LTE eFDD4, QPSK, 5 MHz, RB = 1, Channel = high



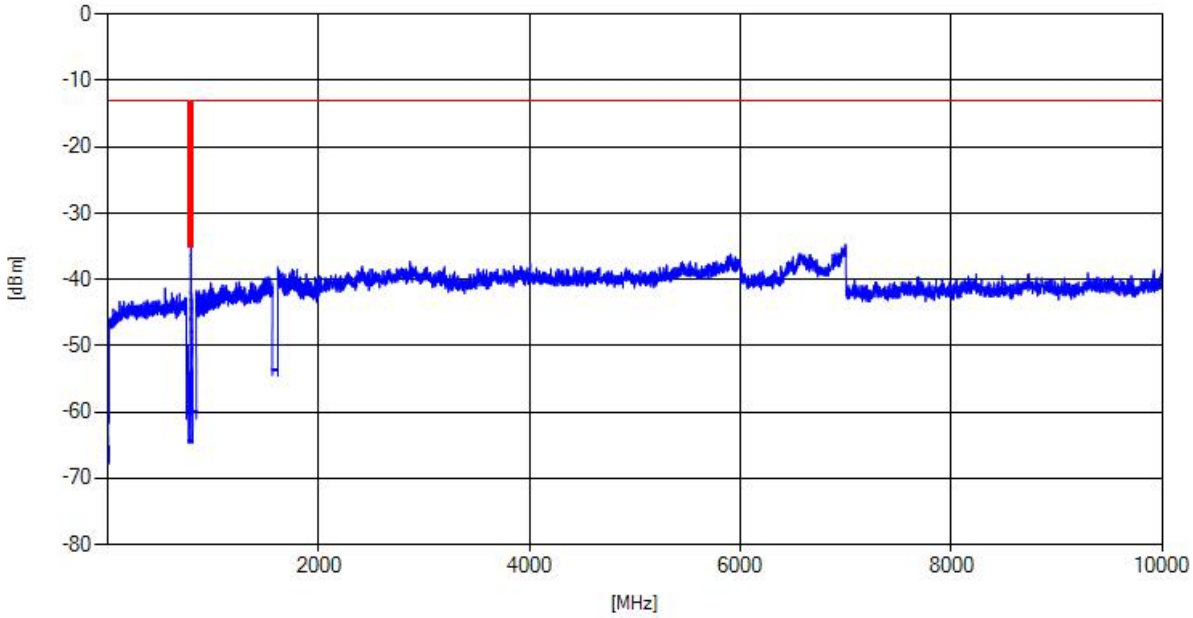
LTE eFDD7, QPSK, 5 MHz, RB = 1, Channel = high



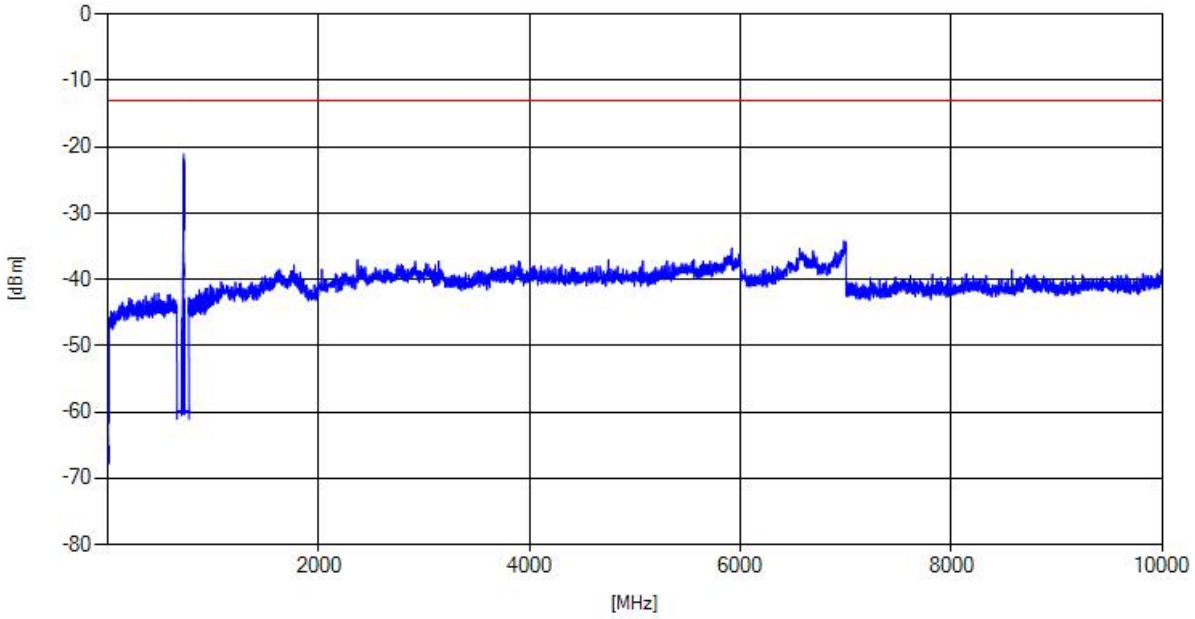
LTE eFDD12, QPSK, 5 MHz, RB = 1, Channel = mid



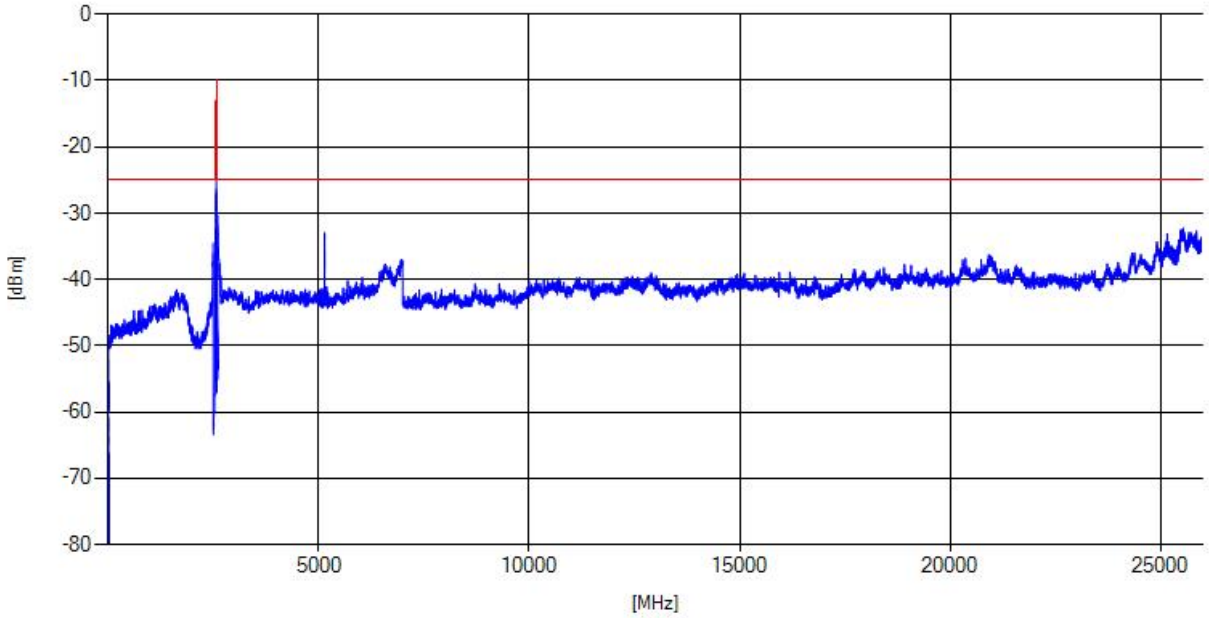
LTE eFDD13, QPSK, 5 MHz, RB = 1, Channel = mid



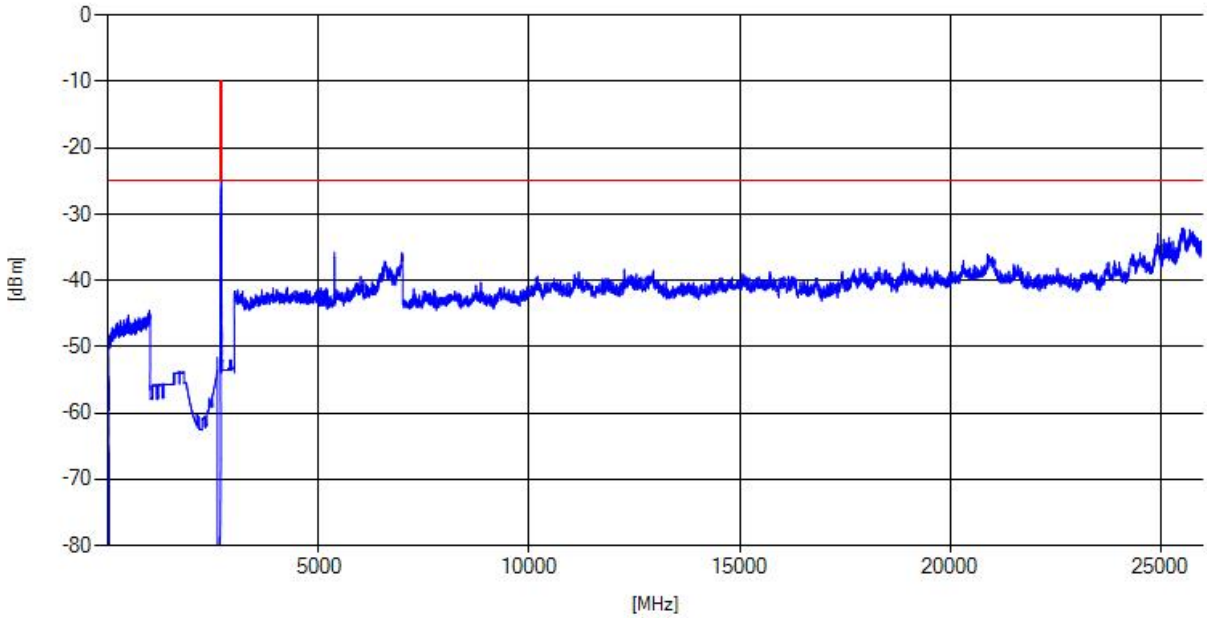
LTE eFDD17, QPSK, 5 MHz, RB = 1, Channel = mid



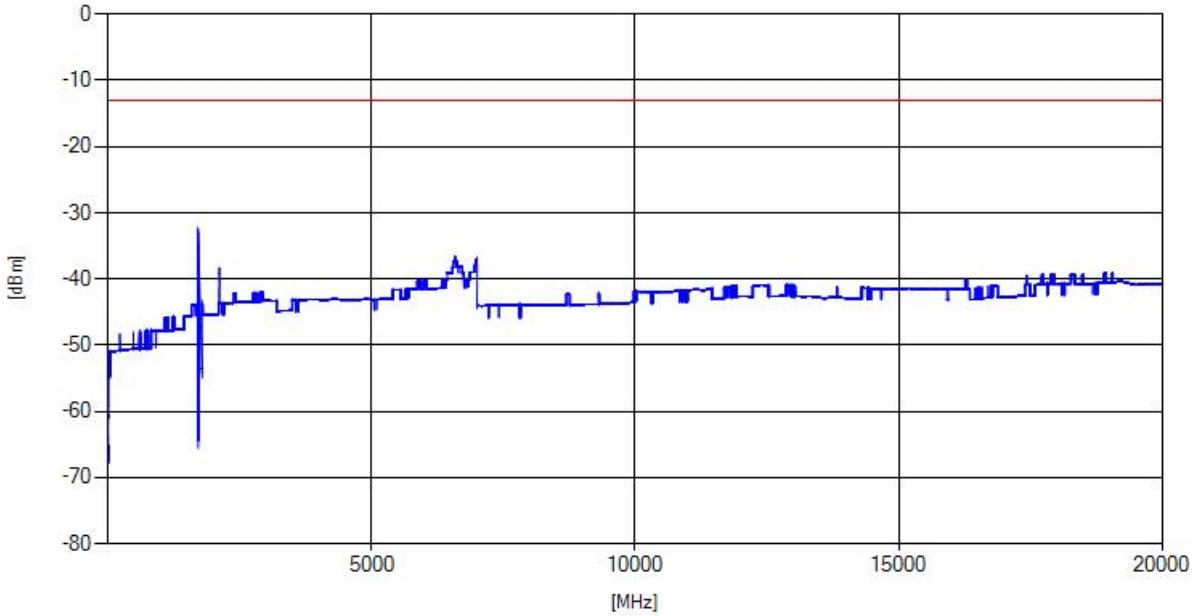
LTE eTDD38, QPSK, 5 MHz, RB = 1, Channel = low



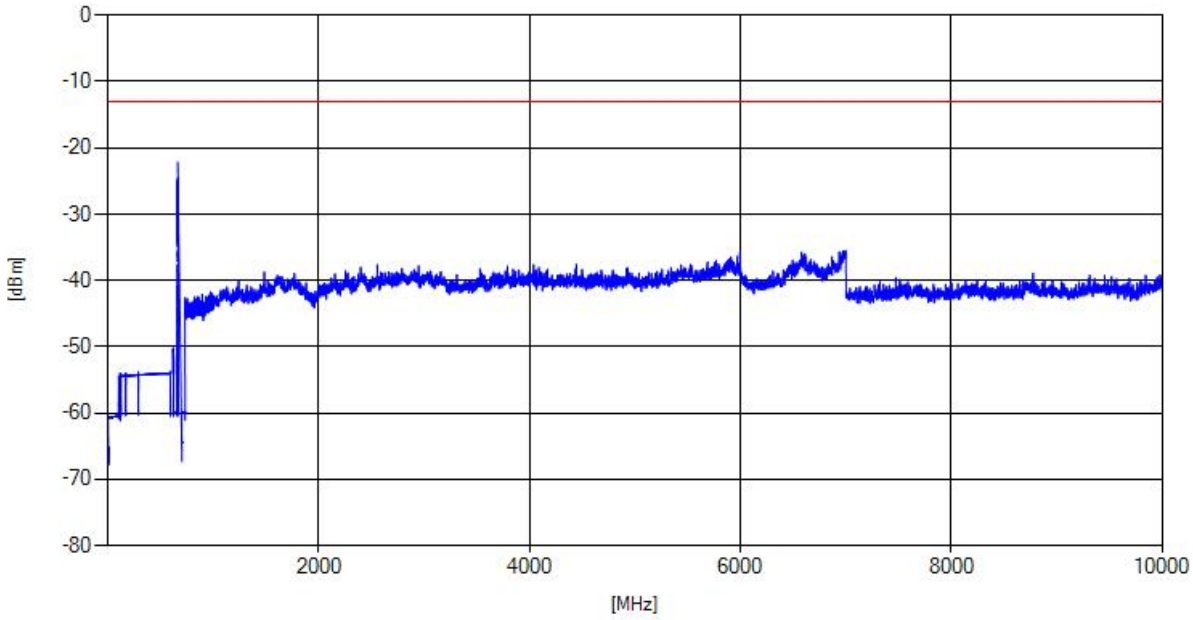
LTE eTDD41, QPSK, 5 MHz, RB = 1, Channel = high



LTE eFDD66, QPSK, 5 MHz, RB = 1, Channel = low



LTE eFDD71, QPSK, 5 MHz, RB = 1, Channel = low



5.17.5 TEST EQUIPMENT USED

- Radio Lab

5.18 FIELD STRENGTH OF SPURIOUS RADIATION

Standard **FCC PART 27 Subpart C**

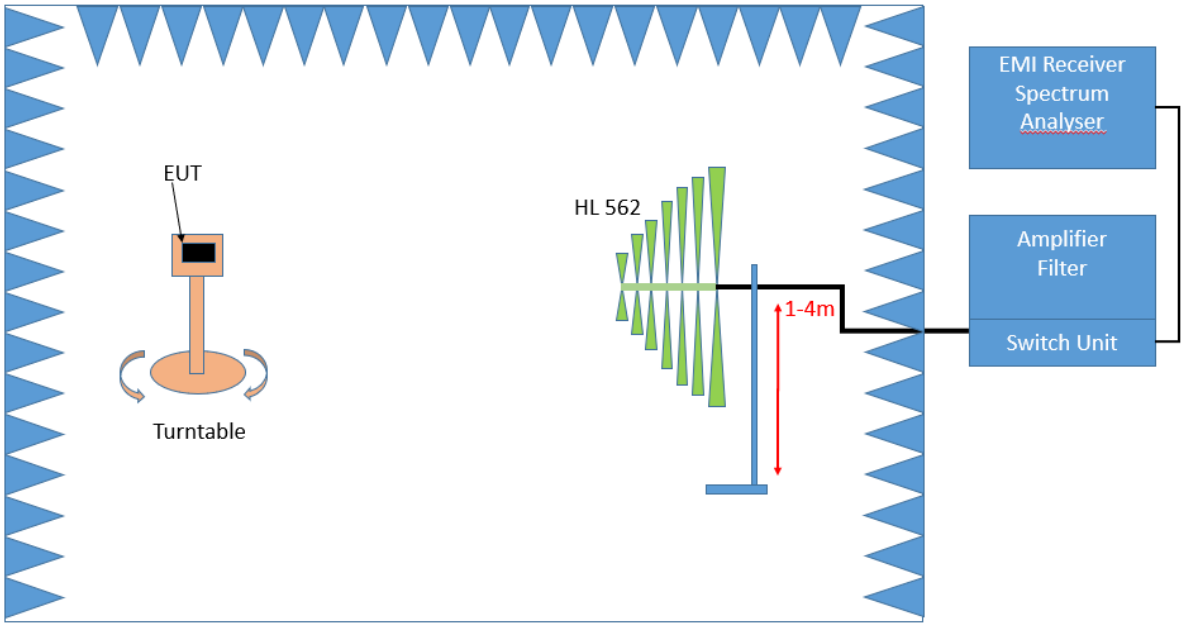
The test was performed according to:
ANSI C63.26: 2015

5.18.1 TEST DESCRIPTION

This test case is intended to demonstrate compliance to the applicable radiated spurious emission measurements per § 2.1053 and RSS-GEN 6.13. The limit and requirements come from the applicable rule part and ISED RSS-Standard for the operating band of the cellular device.

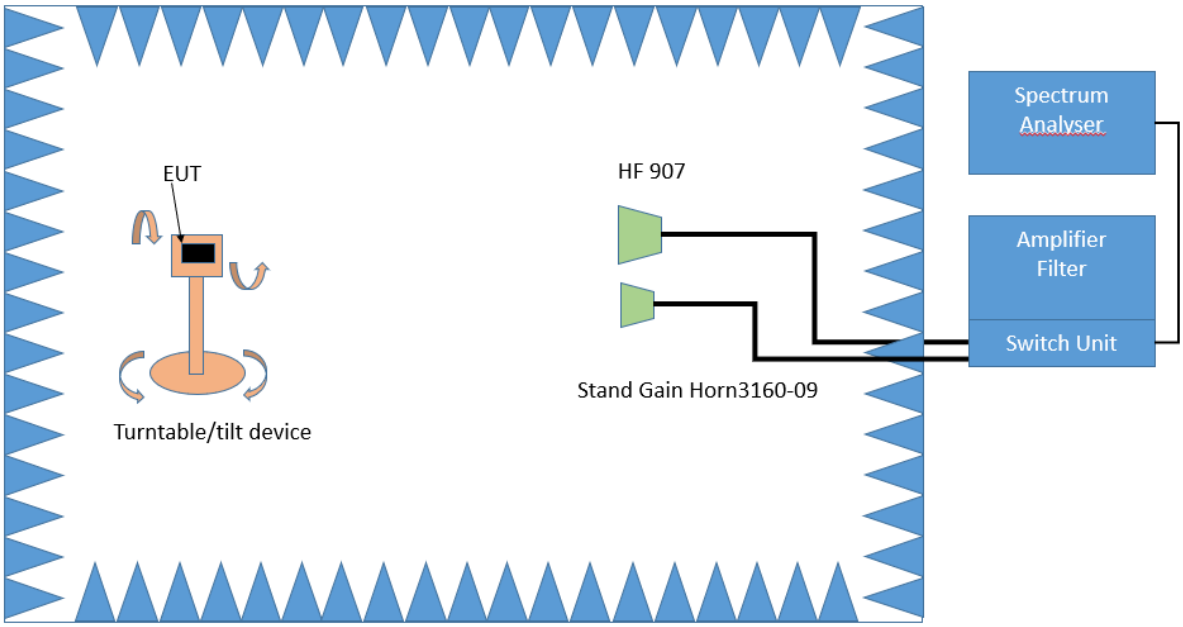
The EUT was connected to the test setup according to the following diagram:

Frequency Range: 30 MHz – 1 GHz:



Test Setup; Spurious Emission Radiated (SAC), 30 MHz- 1GHz

Frequency Range: 1 GHz – 26.5 GHz



Test Setup; Spurious Emission Radiated (FAC), 1 GHz-26.5 GHz

The test set-up was made in accordance to the general provisions of ANSI C63.26 in a typical installation configuration. The Equipment Under Test (EUT) was set up on a non-conductive table 1.0 x 2.0 m² in the semi-anechoic chamber. The influence of the EUT support table that is used between 30–1000 MHz was evaluated.
The measurement procedure is implemented into the EMI test software EMC32 from R&S. Exploratory tests are performed at 3 orthogonal axes to determine the worst-case orientation of a body-worn or handheld EUT. The final test on all kind of EUTs is also performed at 3 axes. A pre-check is performed while the EUT is powered from a DC power source.

1. Measurement above 30 MHz and up to 1 GHz

Step 1: Preliminary scan
This is a preliminary test to identify the highest amplitudes relative to the limit.
Settings for step 1:
- Antenna distance: 3 m
- Detector: Peak
- RBW: 100 kHz
- VBW: 300 kHz
- Sweep time: coupled
- Turntable angle range: –180° to 90°
- Turntable step size: 90°
- Height variation range: 1 – 4 m
- Height variation step size: 1.5 m
- Polarisation: Horizontal + Vertical

Intention of this step is, to determine the radiated EMI-profile of the EUT. Afterwards the relevant emissions for the final measurement are identified.

Step 2: Adjustment measurement
In this step the accuracy of the turntable azimuth and antenna height will be improved. This is necessary to find out the maximum value of every frequency.
For each frequency, which was determined the turntable azimuth and antenna height will be adjusted. The turntable azimuth will slowly vary by 360°. During this action, the value of emission is continuously measured. The turntable azimuth at the highest emission will be recorded and adjusted. In this position, the antenna height will also slowly vary from 1 – 4 m.

During this action, the value of emission is also continuously measured. The antenna height of the highest emission will also be recorded and adjusted.
- Detector: Peak
- Measured frequencies: in step 1 determined frequencies
- RBW: 100 kHz
- VBW: 300 kHz
- Sweep time: coupled
- Turntable angle range: 360°
- Height variation range: 1 – 4 m
- Antenna Polarisation: max. value determined in step 1

Step 3: Final measurement with RMS detector
With the settings determined in step 3, the final measurement will be performed:
EMI receiver settings for step 4:
- Detector: RMS
- Measured frequencies: in step 1 determined frequencies
- RBW: 100 kHz
- VBW: 300 kHz
- Sweep time: 1 s

After the measurement a plot will be generated which contains a diagram with the results of the preliminary scan and a chart with the frequencies and values of the results of the final measurement.

3. Measurement above 1 GHz
The following modifications apply to the measurement procedure for the frequency range above 1 GHz:
Step 1:
The Equipment Under Test (EUT) was set up on a non-conductive support (tilt device) at 1.5 m height in the fully-anechoic chamber.
All steps were performed with one height (1.5 m) of the receiving antenna only.
The EUT is turned during the preliminary measurement across the elevation axis, with a step size of 45 °.
The turn table step size (azimuth angle) for the preliminary measurement is 45 °.
- Antenna distance: 3 m
- Detector: Peak
- RBW: 1 MHz
- VBW: 3 MHz
- Sweep time: coupled
- Turntable angle range: –180° to 135°
- Turntable step size: 45°
- Polarisation: Horizontal + Vertical

Step 2:
Due to the fact, that in this frequency range the test is performed in a fully anechoic room, the height scan of the receiving antenna instep 2 is omitted. Instead of this, a maximum search with a step size ± 45° for the elevation axis is performed.
The turn table azimuth will slowly vary by ± 22.5°.
The elevation angle will slowly vary by ± 45°
EMI receiver settings (for all steps):
- Detector: Peak,
- RBW: 1 MHz
- VBW: 3 MHz
- Sweep time: coupled

Step 3:

Spectrum analyser settings for step 3:
- Detector: RMS
- Measured frequencies: in step 1 determined frequencies
- RBW: 1 MHz
- VBW: 3 MHz
- Sweep Time: 1 s

5.18.2 TEST REQUIREMENTS / LIMITS

FCC Part 2.1053; Measurement required: Field strength of spurious radiation:

Measurements shall be made to detect spurious emissions that may be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal conditions of installation and operation. Curves or equivalent data shall be supplied showing the magnitude of each harmonic and other spurious emission. For this test, single sideband, independent sideband, and controlled carrier transmitters shall be modulated under the conditions specified in paragraph (c) of §2.1049, as appropriate.

FCC Part 27; Miscellaneous Wireless Communication Services

Subpart C – Technical standards

§27.53 – Emission limits

Band 13

(c) For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;

(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;

(3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations;

(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations;

(5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;

(f) For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to −70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and −80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

(6) Compliance with the provisions of paragraphs (c)(3) and (c)(4) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

RSS-130; 4.7.1 General unwanted emissions limits

The unwanted emissions in any 100 kHz bandwidth on any frequency outside the low frequency edge and the high frequency edge of each frequency block range(s), shall be attenuated below the transmitter power, P (dBW), by at least 43 + 10 $\log_{10}$ p (watts), dB. However, in the 100 kHz band immediately outside of the equipment's frequency block range, a resolution bandwidth of 30 kHz may be employed.

RSS-130; 4.7.2 Additional unwanted emissions limits

In addition to the limit outlined in section 4.7.1 above, equipment operating in the frequency bands 746-756 MHz and 777-787 MHz shall also comply with the following restrictions:

a. the power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power, P (dBW), by at least:

   i. 76 + 10 $\log_{10}$ p (watts), dB, for base and fixed equipment and

   ii. 65 + 10 $\log_{10}$ p (watts), dB, for mobile and portable equipment

b. the e.i.r.p. in the band 1559-1610 MHz shall not exceed −70 dBW/MHz for wideband signal and −80 dBW for discrete emission with bandwidth less than 700 Hz.

Band 12:

(g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

RSS-130; 4.7.1 General unwanted emissions limits

The unwanted emissions in any 100 kHz bandwidth on any frequency outside the low frequency edge and the high frequency edge of each frequency block range(s), shall be attenuated below the transmitter power, P (dBW), by at least 43 + 10 $\log_{10}$ p (watts), dB. However, in the 100 kHz band immediately outside of the equipment's frequency block range, a resolution bandwidth of 30 kHz may be employed.

RSS-130; 4.7.2 Additional unwanted emissions limits

In addition to the limit outlined in section 4.7.1 above, equipment operating in the frequency bands 746-756 MHz and 777-787 MHz shall also comply with the following restrictions:

a. the power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power, P (dBW), by at least:

   i. 76 + 10 $\log_{10}$ p (watts), dB, for base and fixed equipment and

   ii. 65 + 10 $\log_{10}$ p (watts), dB, for mobile and portable equipment

b. the e.i.r.p. in the band 1559-1610 MHz shall not exceed −70 dBW/MHz for wideband signal and −80 dBW for discrete emission with bandwidth less than 700 Hz.

Band 4/10/66:

(h) *AWS emission limits*—(1) *General protection levels.* Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 $\log_{10}$ (P) dB.

RSS-139; 6.6 Transmitter Unwanted Emissions

Equipment shall comply with the limits in (i) and (ii) below.

i. In the first 1.0 MHz bands immediately outside and adjacent to the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power per any 1% of the emission bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least 43 + 10 $\log_{10}$ p (watts) dB.
ii. After the first 1.0 MHz outside the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power in any 1 MHz bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least 43 + 10 $\log_{10}$ p (watts) dB.

Band 7:

(m) For BRS and EBS stations, the power of any emissions outside the licensee's frequency bands of operation shall be attenuated below the transmitter power (P) measured in watts in accordance with the standards below. If a licensee has multiple contiguous channels, out-of-band emissions shall be measured from the upper and lower edges of the contiguous channels.

(4) For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

RSS-199; 4.5 Transmitter unwanted emissions

In the 1 MHz band immediately outside and adjacent to the channel edge, the unwanted emission power shall be measured with a resolution bandwidth of at least 1% of the occupied bandwidth for base station and fixed subscriber equipment, and 2% for mobile subscriber equipment. Beyond the 1 MHz band, a resolution bandwidth of 1 MHz shall be used. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full required measurement bandwidth of 1 MHz, or 1% or 2% of the occupied bandwidth, as applicable.

Equipment shall comply with the following unwanted emission limits:

b. for mobile subscriber equipment, the power of any unwanted emissions measured as above shall be attenuated (in dB) below the transmitter power, P (dBW), by at least:

40 + 10 $\log_{10}$ p from the channel edges to 5 MHz away

43 + 10 $\log_{10}$ p between 5 MHz and X MHz from the channel edges, and

55 + 10 $\log_{10}$ p at X MHz and beyond from the channel edges

In addition, the attenuation shall not be less than 43 + 10 $\log_{10}$ p on all frequencies between 2490.5 MHz and 2496 MHz, and 55 + 10 $\log_{10}$ p at or below 2490.5 MHz.

In (b), p is the transmitter power measured in watts and X is 6 MHz or the equipment occupied bandwidth, whichever is greater.

Band 17:

(g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

RSS-130; 4.7.1 General unwanted emissions limits

The unwanted emissions in any 100 kHz bandwidth on any frequency outside the low frequency edge and the high frequency edge of each frequency block range(s), shall be below the transmitter power, P (dBW), by at least 43 + 10 $\log_{10}$ p (watts), dB. However, in the 100 kHz band immediately outside of the equipment's frequency block range, a resolution bandwidth of 30 kHz may be employed.

RSS-130; 4.7.2 Additional unwanted emissions limits

In attenuated addition to the limit outlined in section 4.7.1 above, equipment operating in the frequency bands 746-756 MHz and 777-787 MHz shall also comply with the following restrictions:

a. the power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power, P (dBW), by at least:

   i. 76 + 10 $\log_{10}$ p (watts), dB, for base and fixed equipment and

   ii. 65 + 10 $\log_{10}$ p (watts), dB, for mobile and portable equipment

b. the e.i.r.p. in the band 1559-1610 MHz shall not exceed −70 dBW/MHz for wideband signal and −80 dBW for discrete emission with bandwidth less than 700 Hz.

5.18.3 TEST PROTOCOL

Ambient temperature: 24 °C
Relative humidity: 38 %

Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
eFDD4	low	rms	maxhold	50	1710.0	-23.2	-13	10.2
eFDD4	mid	peak	maxhold				-13	>20
eFDD4	high	rms	maxhold	50	1755.1	-25.4	-13	12.4

Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
eFDD7	low	peak	maxhold	1000	2498.5	-27.7	-10	17.7
eFDD7	low	peak	maxhold	1000	5004.0	-39.8	-25	14.8
eFDD7	low	peak	maxhold	1000	7506.0	-38.5	-25	13.5
eFDD7	low	peak	maxhold	1000	20016.0	-30.8	-25	5.8
eFDD7	low	peak	maxhold	1000	22518.0	-34.1	-25	9.1
eFDD7	mid	rms	maxhold	1000	2538.5	-45.6	-10	35.6
eFDD7	mid	peak	maxhold	1000	5069.0	-37.7	-25	12.7
eFDD7	mid	peak	maxhold	1000	7603.2	-39.8	-25	14.8
eFDD7	mid	peak	maxhold	1000	20277.0	-35.1	-25	10.1
eFDD7	mid	peak	maxhold	1000	22811.0	-30.1	-25	5.1
eFDD7	mid	rms	maxhold	1000	22811.0	-37.5	-25	12.5
eFDD7	high	rms	maxhold	1000	2556.7	-48.2	-10	38.2
eFDD7	high	rms	maxhold	1000	2571.0	-36.6	-10	26.6
eFDD7	high	rms	maxhold	1000	2998.3	-45.6	-25	20.6
eFDD7	high	rms	maxhold	1000	17976.2	-42.6	-25	17.6
eFDD7	high	rms	maxhold	1000	20543.0	-37.5	-25	12.5
eFDD7	high	rms	maxhold	1000	23112.0	-37.1	-25	12.1

Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
eFDD12	low	rms	maxhold	-	-	-	-13	>20
eFDD12	mid	rms	maxhold	-	-	-	-13	>20
eFDD12	high	rms	maxhold	-	-	-	-13	>20

Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
eFDD13	low	rms	maxhold	1000	1559.1	-50.3	-40	10.3
eFDD13	low	rms	maxhold	1000	2338.9	-43.4	-13	30.4
eFDD13	mid	rms	maxhold	1000	1563.8	-56.3	-40	16.3
eFDD13	mid	rms	maxhold	1000	2346.4	-45.0	-13	32.0
eFDD13	high	rms	maxhold	1000	1573.1	-53.4	-40	13.4

Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
eFDD17	low	rms	maxhold	-	-	-	-13	>20
eFDD17	mid	rms	maxhold	-	-	-	-13	>20
eFDD17	high	rms	maxhold	30	716.0	-32.7	-13	19.7

Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
eTDD38	low	rms	maxhold	1000	2564.3	-48.9	-13	35.9
eTDD38	low	rms	maxhold	50	2569.0	-45.6	-13	32.6
eTDD38	low	peak	maxhold	50	2570.0	-25.7	-13	12.7
eTDD38	mid	rms	maxhold	-	-	-	-25	>20
eTDD38	high	rms	maxhold	50	2620.0	-26.7	-10	16.7

Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
eTDD41	low	rms	maxhold	50	2496.0	-18.3	-13	5.3
eTDD41	mid	peak	maxhold	-	-	-	-13	>20
eTDD41	high	peak	maxhold	50	2690.0	-18.1	-13	5.1

Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
eFDD66	low	rms	maxhold	1000	1708.3	-28.4	-13	15.4
eFDD66	low	rms	maxhold	1000	8563.5	-36.3	-13	23.3
eFDD66	mid	rms	maxhold	-	-	-	-13	>20
eFDD66	high	rms	maxhold	1000	1781.0	-28.6	-13	15.6

Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
eFDD71	low	rms	maxhold	30	662.99	-32.83	-13	19.83
eFDD71	low	rms	maxhold	1000	1326.67	-26.9	-13	13.9
eFDD71	mid	rms	maxhold	-	-	-	-13	>20
eFDD71	high	rms	maxhold	30	698.00	-36.38	-13	23.38

Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
CA_7C	low	rms	maxhold	1000	2487.0	-26.5	-25	1.5
CA_7C	low	rms	maxhold	1000	2492.5	-20.6	-13	7.6
CA_7C	low	rms	maxhold	1000	2499.0	-17.9	-10	7.9
CA_7C	low	rms	maxhold	300	2536.0	-23.3	-10	13.3
CA_7C	low	rms	maxhold	300	2545.7	-26.0	-25	1.0
CA_7C	low	rms	maxhold	300	2559.7	-28.2	-25	3.2
CA_7C	low	rms	maxhold	300	2567.6	-41.3	-25	16.3
CA_7C	low	rms	maxhold	1000	2572.2	-36.1	-25	11.1
CA_7C	mid	rms	maxhold	300	2507.3	-27.5	-25	2.5
CA_7C	mid	rms	maxhold	300	2514.4	-25.4	-10	15.4
CA_7C	mid	rms	maxhold	300	2517.9	-23.2	-10	13.2
CA_7C	mid	rms	maxhold	300	2553.0	-24.5	-10	14.5
CA_7C	mid	rms	maxhold	300	2554.3	-24.6	-10	14.6
CA_7C	mid	rms	maxhold	300	2559.7	-23.1	-13	10.1
CA_7C	mid	rms	maxhold	300	2562.8	-28.7	-25	3.7
CA_7C	high	rms	maxhold	300	2522.1	-28.6	-25	3.6
CA_7C	high	rms	maxhold	300	2531.3	-24.0	-10	14.0
CA_7C	high	rms	maxhold	300	2535.4	-23.2	-10	13.2
CA_7C	high	rms	maxhold	300	2570.4	-25.2	-10	15.2
CA_7C	high	rms	maxhold	1000	2571.8	-22.8	-10	12.8
CA_7C	high	rms	maxhold	1000	2576.5	-25.8	-13	12.8
CA_7C	high	rms	maxhold	1000	2580.0	-29.9	-25	4.9

Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
CA_38C	low	rms	maxhold	1000	2540.8	-35.2	-25	10.2
CA_38C	low	rms	maxhold	1000	2554.4	-40.9	-25	15.9
CA_38C	low	rms	maxhold	1000	2560.6	-27.6	-13	14.6
CA_38C	low	rms	maxhold	300	2619.2	-46.1	-13	33.1
CA_38C	low	rms	maxhold	1000	2639.4	-41.8	-25	16.8
CA_38C	mid	rms	maxhold	1000	2542.2	-46.8	-25	21.8
CA_38C	mid	rms	maxhold	1000	2545.9	-36.4	-25	11.4
CA_38C	mid	rms	maxhold	1000	2552.7	-43.7	-25	18.7
CA_38C	mid	rms	maxhold	1000	2560.0	-40.9	-25	15.9
CA_38C	mid	rms	maxhold	1000	2565.8	-26.1	-13	13.1
CA_38C	mid	rms	maxhold	1000	2624.6	-28.9	-13	15.9
CA_38C	mid	rms	maxhold	1000	2635.4	-45.2	-25	20.2
CA_38C	mid	rms	maxhold	1000	2644.6	-43.3	-25	18.3
CA_38C	mid	rms	maxhold	1000	2551.3	-38.4	-25	13.4
CA_38C	mid	rms	maxhold	1000	2558.1	-42.2	-25	17.2
CA_38C	mid	rms	maxhold	1000	2561.3	-41.7	-25	16.7
CA_38C	mid	rms	maxhold	300	2569.2	-46.6	-25	21.6
CA_38C	mid	rms	maxhold	300	2570.3	-33.6	-13	20.6
CA_38C	mid	rms	maxhold	1000	2629.9	-27.8	-13	14.8
CA_38C	mid	rms	maxhold	1000	2635.6	-45.0	-25	20.0
CA_38C	mid	rms	maxhold	1000	2649.2	-44.6	-25	19.6

Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
CA_41C	low	rms	maxhold	1000	2485.033	-36.1	-25	11.1
CA_41C	low	rms	maxhold	1000	2521.214	-44.0	-10	34.0
CA_41C	low	rms	maxhold	1000	2521.751	-44.2	-10	34.2
CA_41C	low	rms	maxhold	1000	2523.912	-44.1	-10	34.1
CA_41C	low	rms	maxhold	1000	2526.302	-44.3	-13	31.3
CA_41C	low	rms	maxhold	1000	2533.95	-45.2	-25	20.2
CA_41C	low	rms	maxhold	1000	2538.73	-44.2	-25	19.2
CA_41C	low	rms	maxhold	1000	2542.554	-45.4	-25	20.4
CA_41C	mid	rms	maxhold	1000	2541.846	-50.4	-25	25.4
CA_41C	mid	rms	maxhold	1000	2557.649	-42.9	-25	17.9
CA_41C	mid	rms	maxhold	1000	2565.551	-40.4	-25	15.4
CA_41C	mid	rms	maxhold	1000	2573.452	-32.1	-13	19.1
CA_41C	mid	rms	maxhold	1000	2580.3	-34.4	-10	24.4
CA_41C	mid	rms	maxhold	1000	2608.085	-31.4	-10	21.4
CA_41C	mid	rms	maxhold	1000	2615.939	-32.0	-13	19.0
CA_41C	mid	rms	maxhold	1000	2620.259	-35.3	-25	10.3

CA_41C	high	rms	maxhold	1000	2618.741	-47.1	-25	22.1
CA_41C	high	rms	maxhold	1000	2623.18	-46.3	-25	21.3
CA_41C	high	rms	maxhold	1000	2631.504	-43.4	-25	18.4
CA_41C	high	rms	maxhold	1000	2639.828	-38.9	-25	13.9
CA_41C	high	rms	maxhold	1000	2650.927	-29.4	-25	4.4
CA_41C	high	rms	maxhold	1000	2655.366	-26.4	-25	1.4
CA_41C	high	rms	maxhold	1000	2664.8	-23.3	-10	13.3
CA_41C	high	rms	maxhold	1000	2701.971	-30.4	-25	5.4
CA_41C	high	rms	maxhold	1000	2705.053	-32.4	-25	7.4
CA_41C	high	rms	maxhold	1000	2709.984	-37.8	-25	12.8

Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
CA_66B	low	rms	maxhold	1000	1708.9	-22.9	-13	9.9
CA_66B	low	rms	maxhold	1000	1709.0	-23	-13	10
CA_66B	mid	peak	maxhold	1000	1703.4	-16.83	-13	3.83
CA_66B	mid	peak	maxhold	1000	1782.8	-20.04	-13	7.04
CA_66B	high	rms	maxhold	1000	1788.9	-21.1	-13	8.1

Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
CA_66C	low	rms	maxhold	1000	1708.8	-29.7	-13	16.7
CA_66C	low	rms	maxhold	1000	1709.0	-28.7	-13	15.7
CA_66C	mid	rms	maxhold	-	-	-	-13	>20
CA_66C	high	rms	maxhold	1000	1781.0	-30.6	-13	17.6
CA_66C	high	rms	maxhold	1000	1784.6	-32.4	-13	19.4

Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
CA_4_5	mid	rms	maxhold	-	-	-	-13	>20

Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
CA_4_12	mid	rms	maxhold	-	-	-	-13	>20

Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
CA_4_13	mid	rms	maxhold	-	-	-	-13	>20

Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
CA_5_7	mid	rms	maxhold	-	-	-	-13	>20

Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
CA_5_66	mid	rms	maxhold	-	-	-	-13	>20

Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
CA_4_17	mid	rms	maxhold	-	-	-	-13	>20

Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
CA_7_26	mid	rms	maxhold	-	-	-	-13	>20

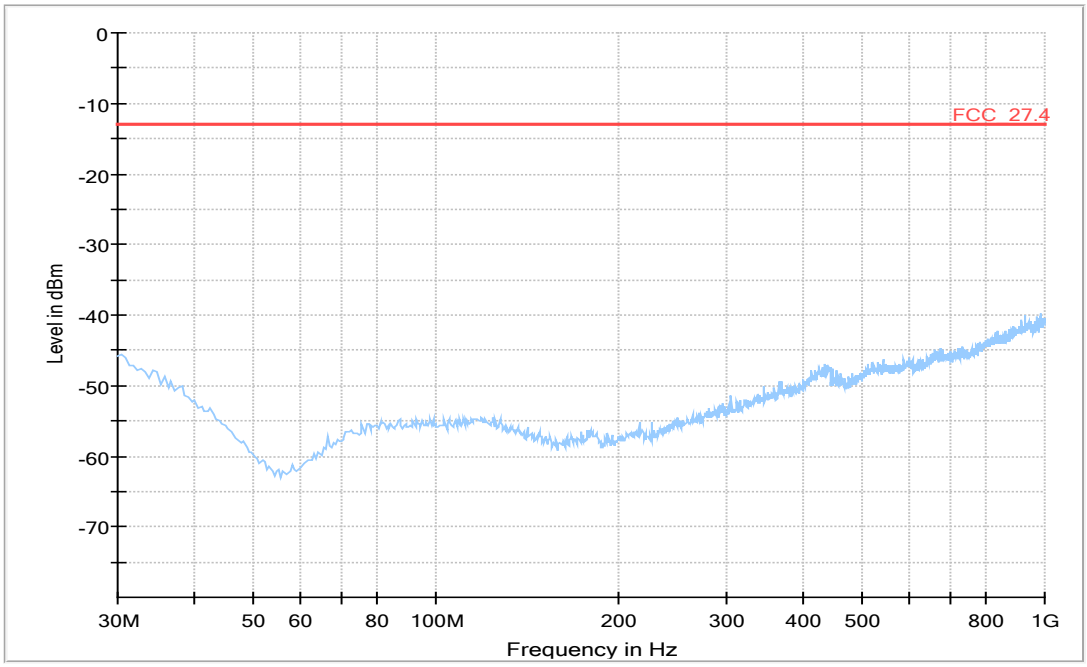
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
CA_12_66	mid	rms	maxhold	-	-	-	-13	>20

Remark: Please see next sub-clause for the measurement plot.

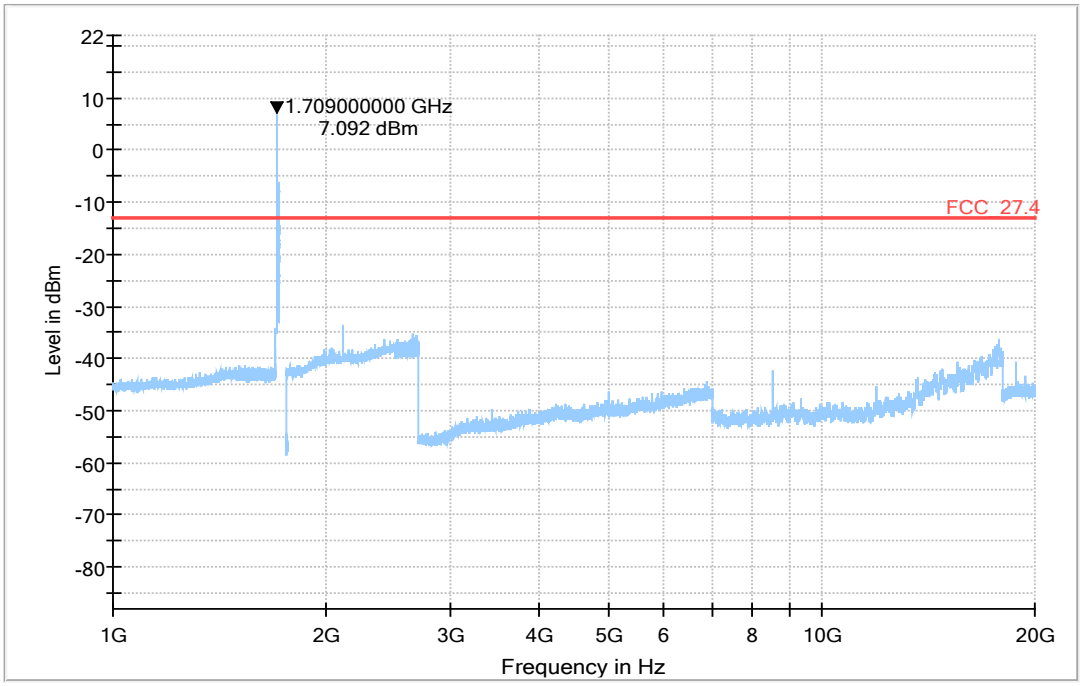
5.18.4 MEASUREMENT PLOT (SHOWING THE HIGHEST VALUE, "WORST CASE")

LTE eFDD4, QPSK, 5 MHz, RB = 1, Channel = low

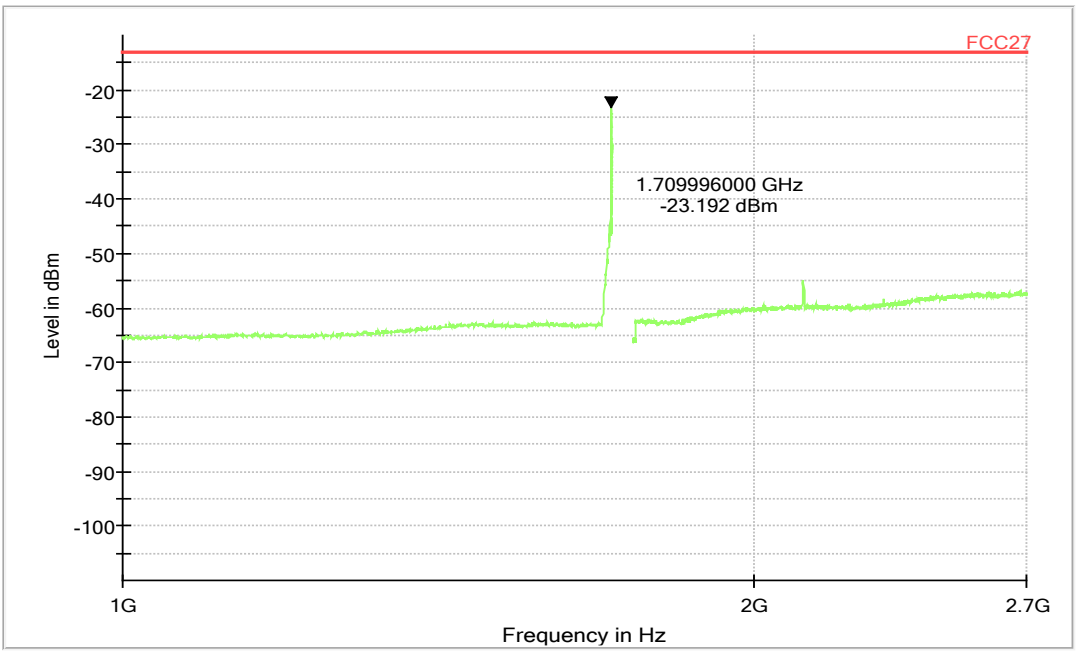
30 MHz – 1 GHz



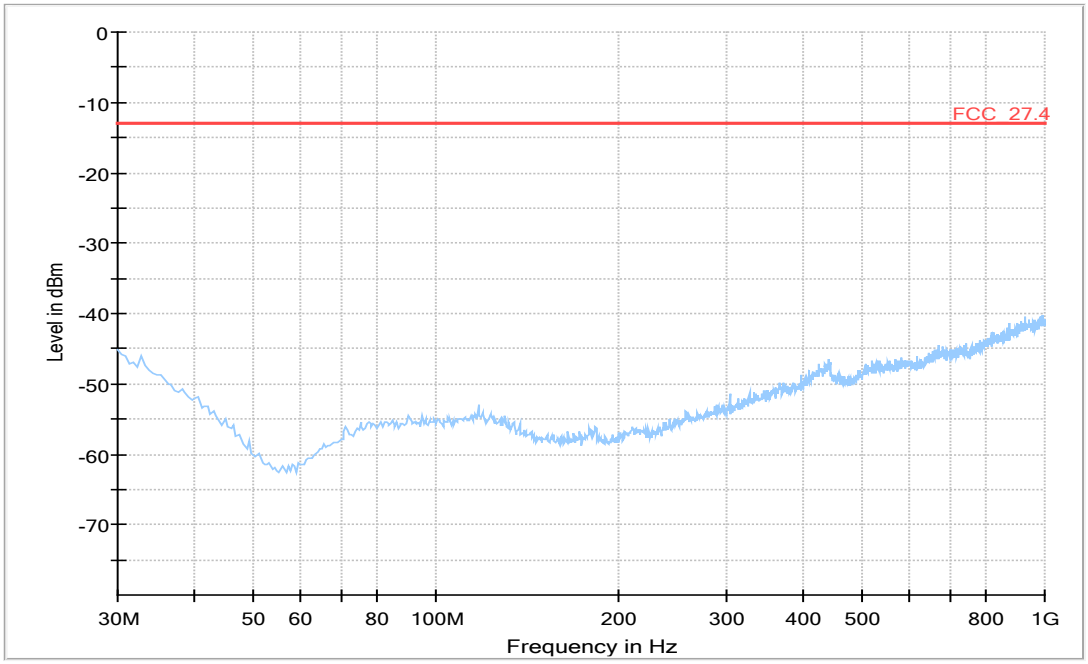
1 GHz – 20 GHz



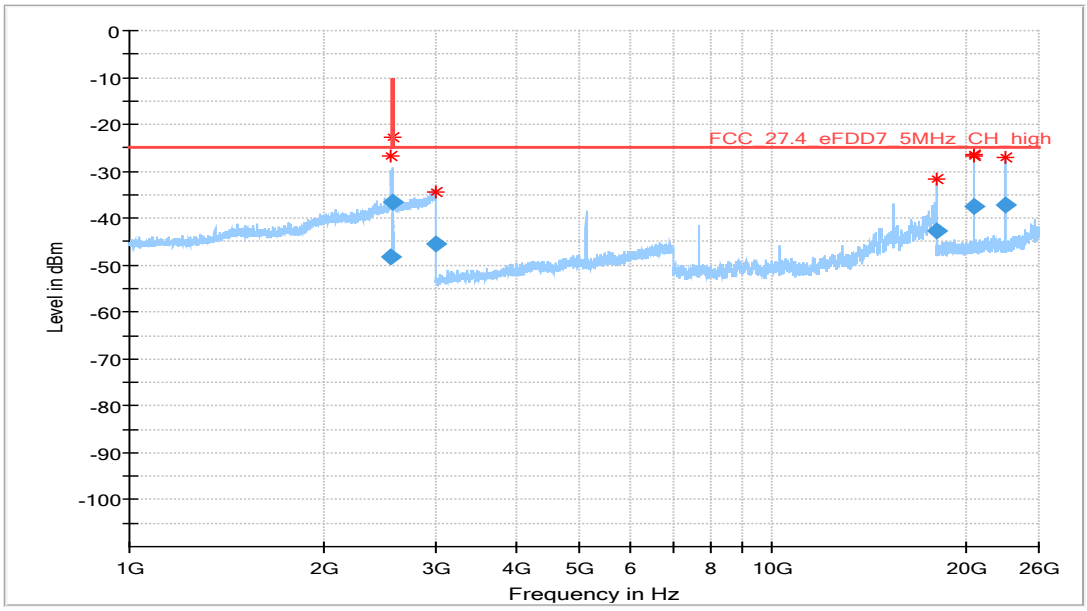
re-measurement at carrier



LTE eFDD7, QPSK, 5 MHz, RB = 1, Channel = high
30 MHz – 1 GHz

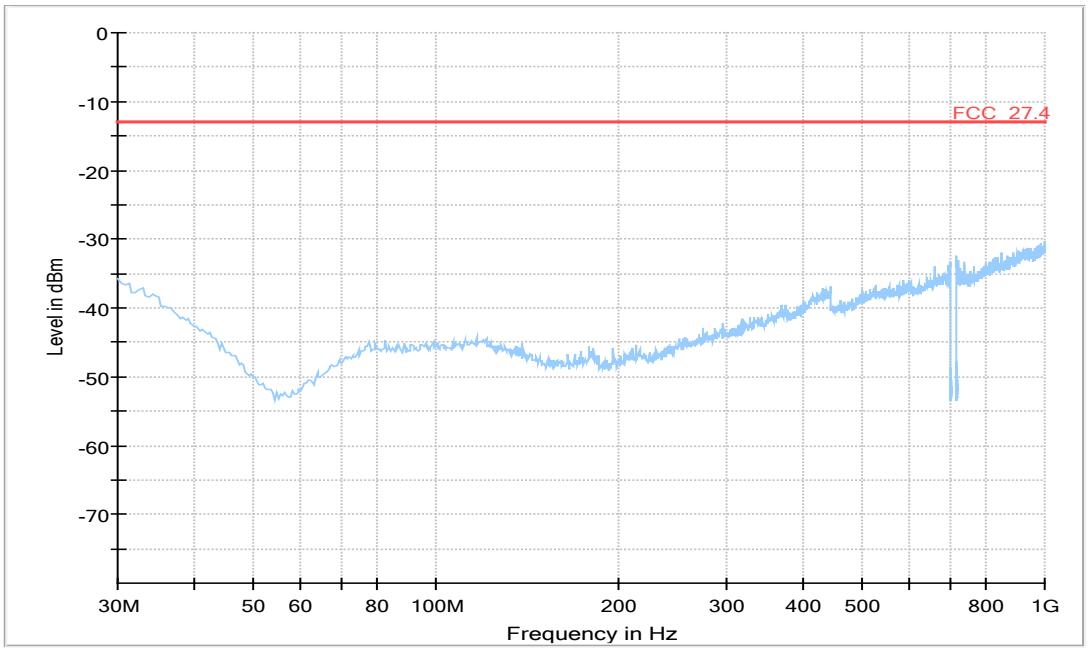


1 GHz – 26 GHz

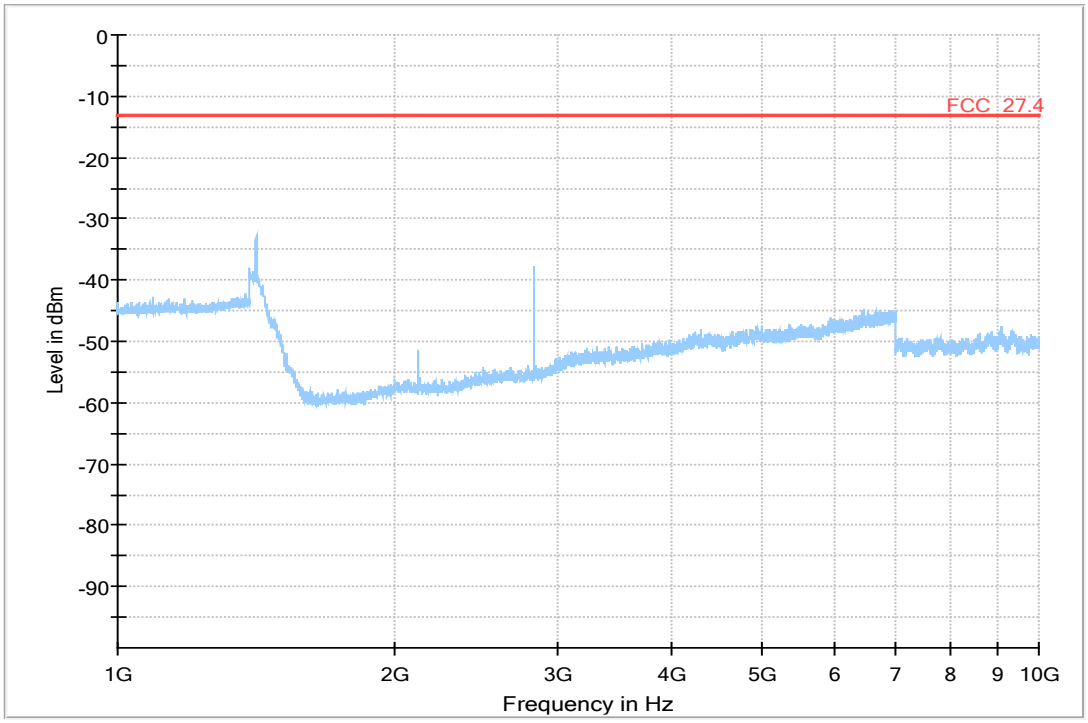


Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
2556.701	-48.2	-25.00	23.25	1000.0	100.000	150.0	H	-196.0	75.0	-61.9
2571.000	-36.6	-10.00	26.61	1000.0	1000.000	150.0	H	-198.0	82.0	-61.8
2998.284	-45.6	-25.00	20.55	1000.0	1000.000	150.0	V	-179.0	100.0	-60.1
17976.167	-42.6	-25.00	17.57	1000.0	1000.000	150.0	H	137.0	68.0	-97.1
20543.000	-37.5	-25.00	12.54	1000.0	1000.000	150.0	H	122.0	91.0	-79.4
23112.000	-37.1	-25.00	12.12	1000.0	1000.000	150.0	H	139.0	68.0	-77.8

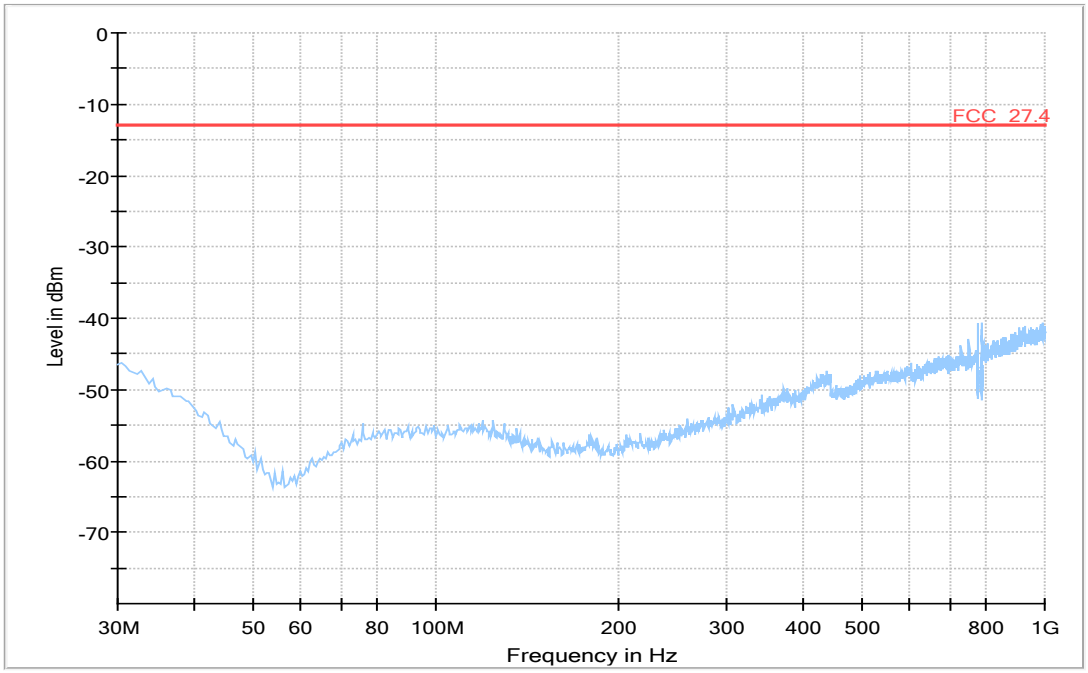
LTE eFDD12, QPSK, 5 MHz, RB = 1, Channel = mid
30 MHz – 1 GHz



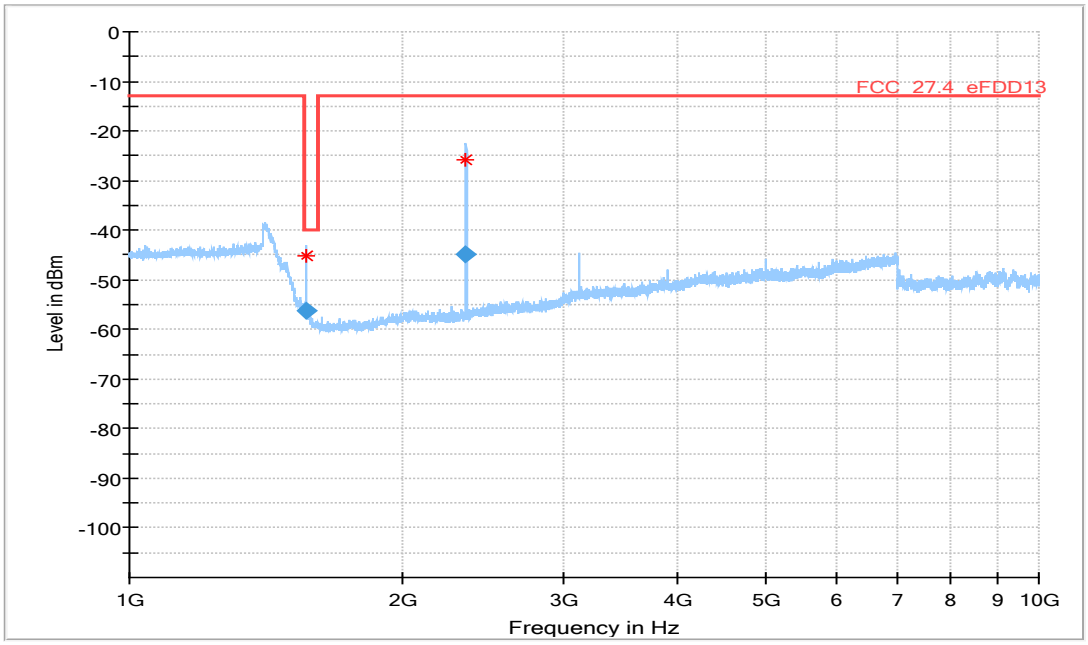
1 GHz – 10 GHz



LTE eFDD13, QPSK, 5 MHz, RB = 1, Channel = mid
30 MHz – 1 GHz

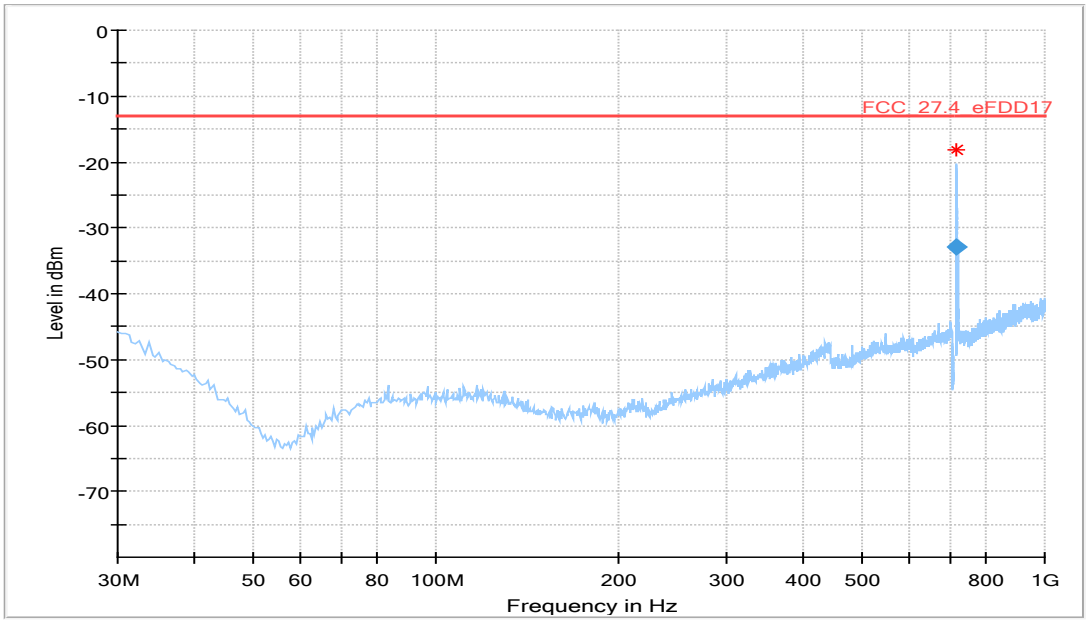


1 GHz – 10 GHz



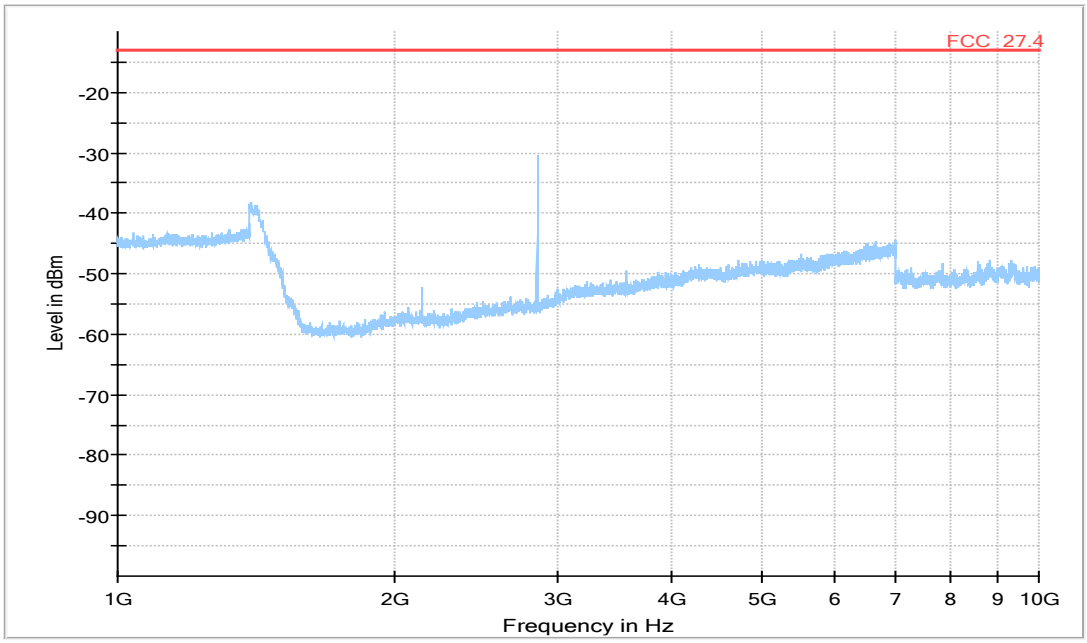
Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
1563.800	-56.3	-40.00	16.26	1000.0	1000.000	150.0	H	1.0	93.0	-100.6
2346.400	-45.0	-13.00	32.01	1000.0	1000.000	150.0	H	-56.0	85.0	-102.2

LTE eFDD17, QPSK, 5 MHz, RB = 1, Channel = high
30 MHz – 1 GHz

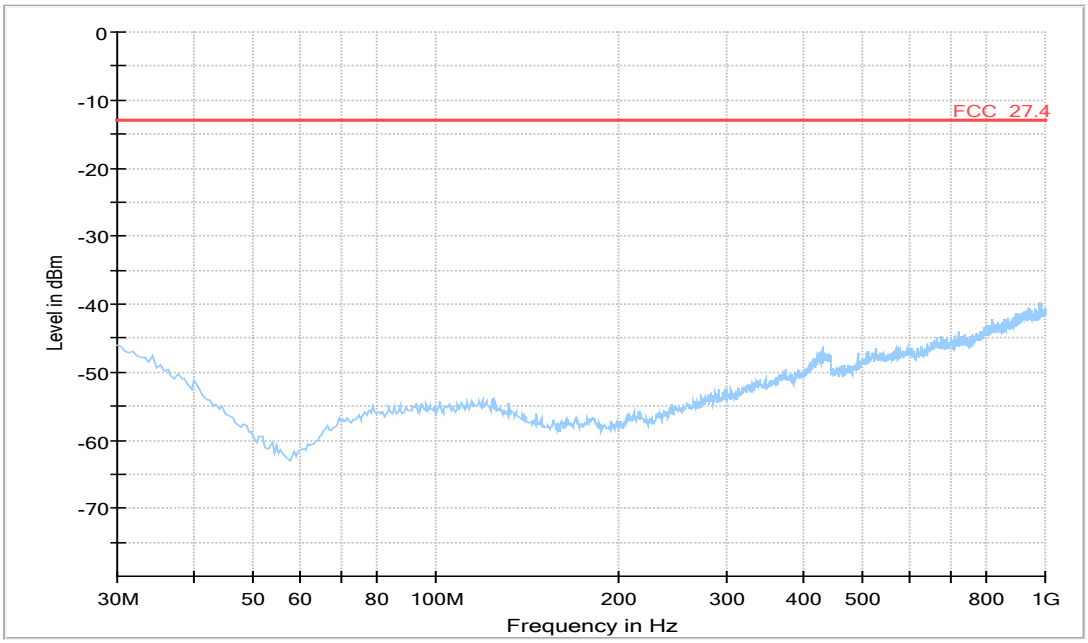


Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
716.011250	-32.74	-13.00	19.74	1000.0	30.000	120.0	H	-92.0	-75.4

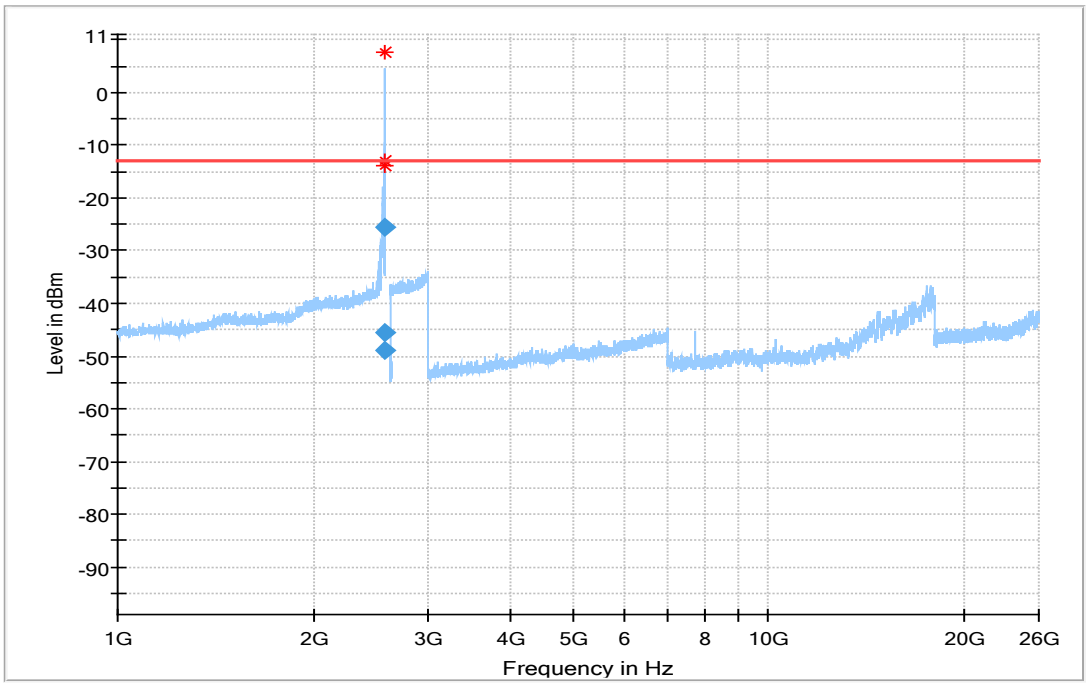
1 GHz – 10 GHz



LTE eTDD38, QPSK, 5 MHz, RB = 1, Channel = low
30 MHz – 1 GHz

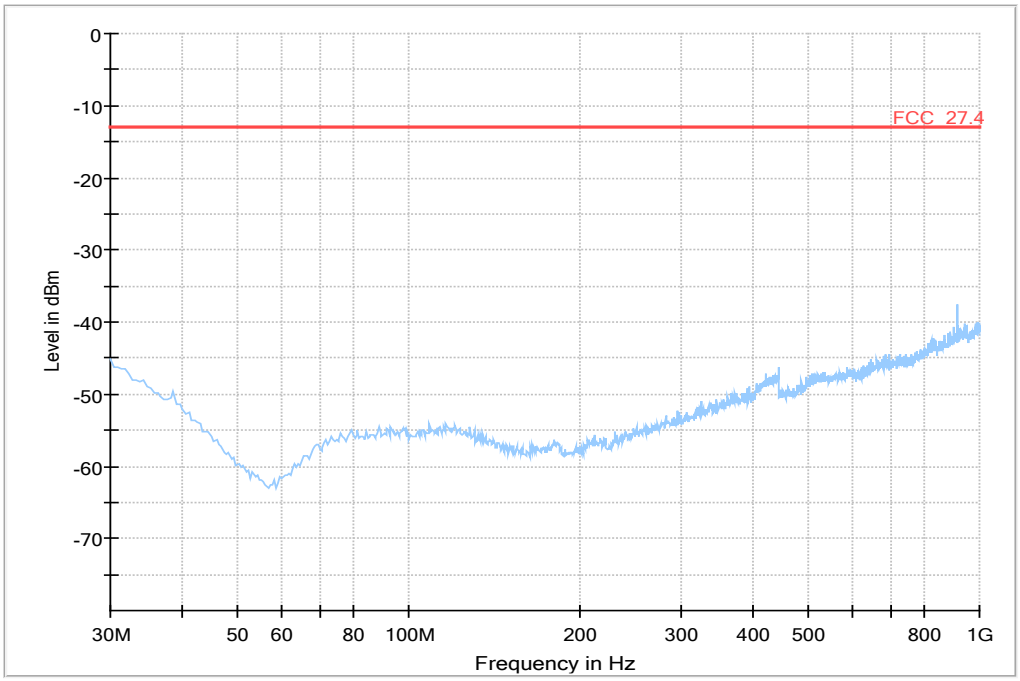


1 GHz – 26 GHz

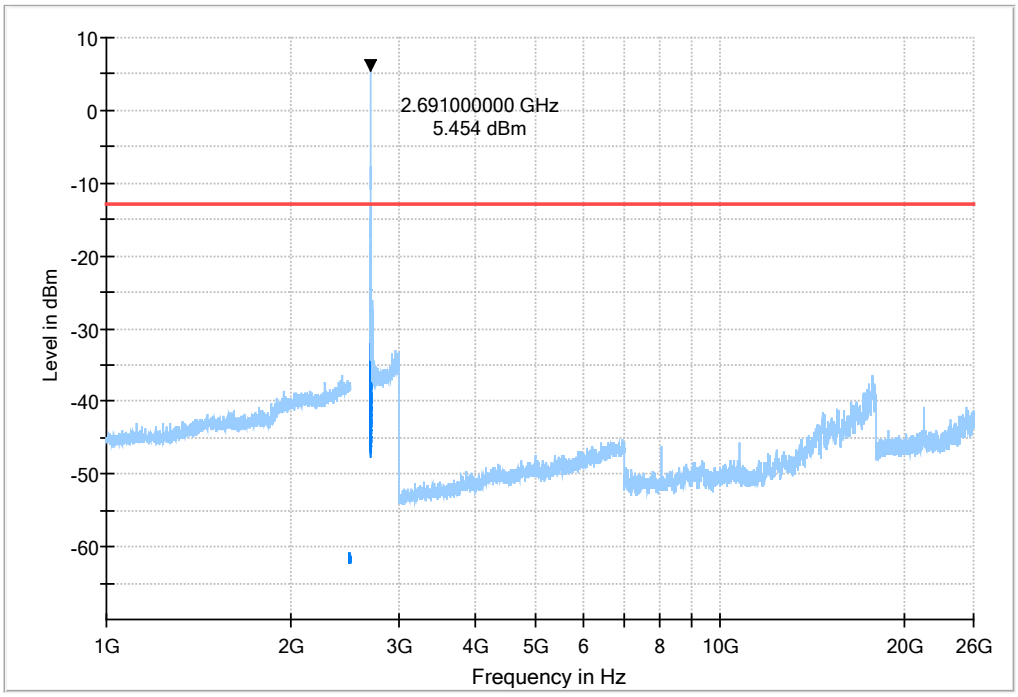


Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
2564.293	-48.9	-13.00	35.94	1000.0	1000.000	150.0	V	-136.0	68.0	-61.9
2569.000	-45.6	-13.00	32.61	1000.0	50.000	150.0	V	-93.0	15.0	-61.9
2569.998	-25.7	-13.00	12.67	1000.0	50.000	150.0	V	-91.0	19.0	-61.8

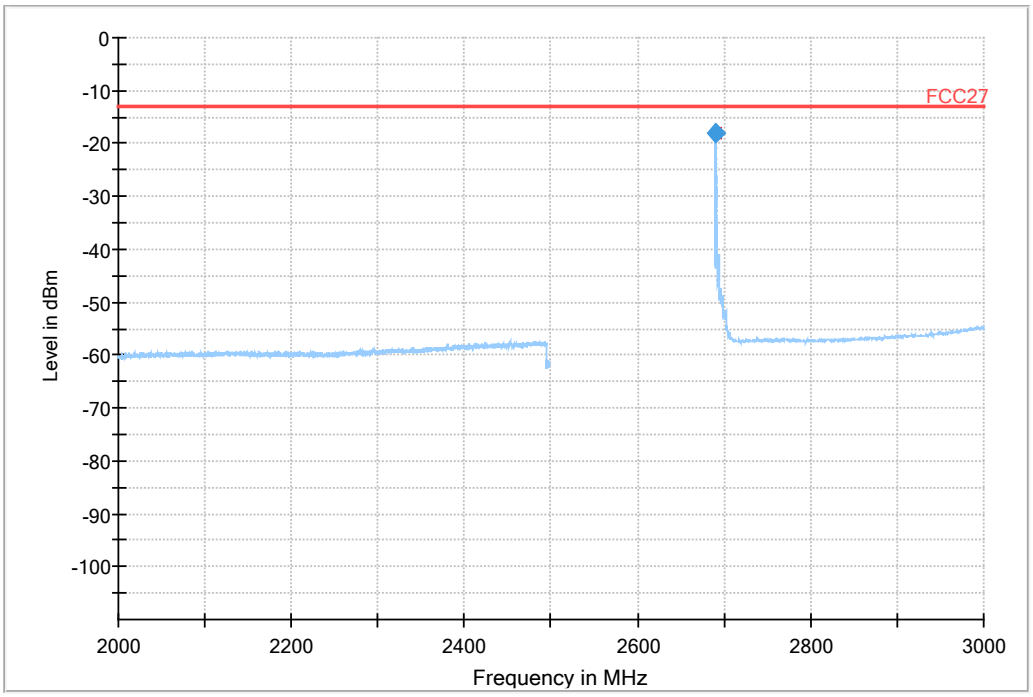
LTE eTDD41, QPSK, 5 MHz, RB = 1, Channel = high
30 MHz – 1 GHz



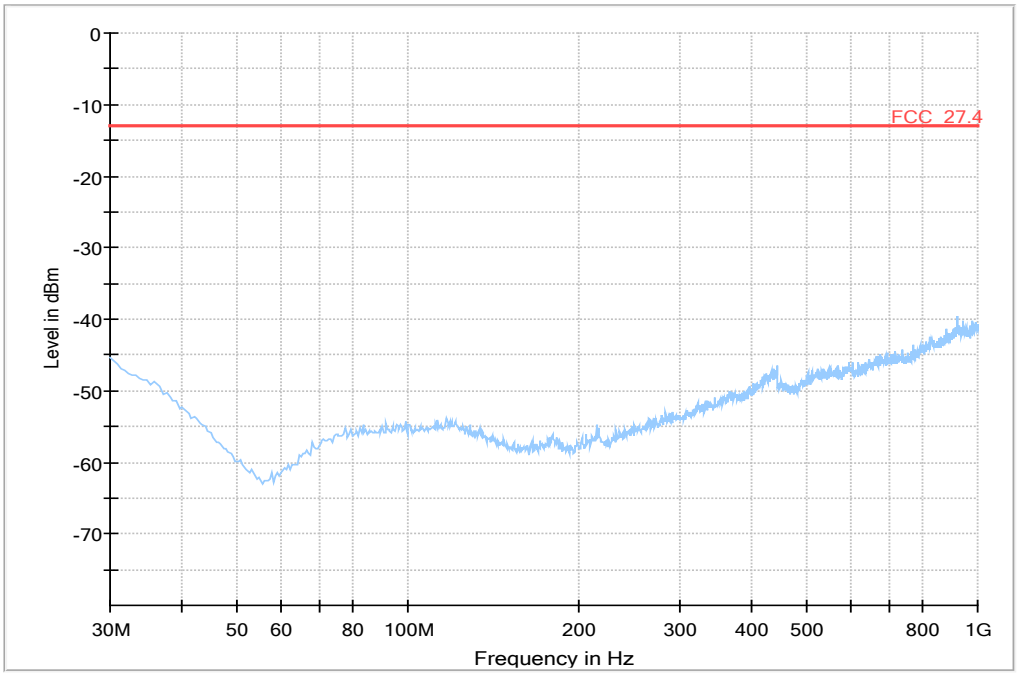
1 GHz – 26 GHz



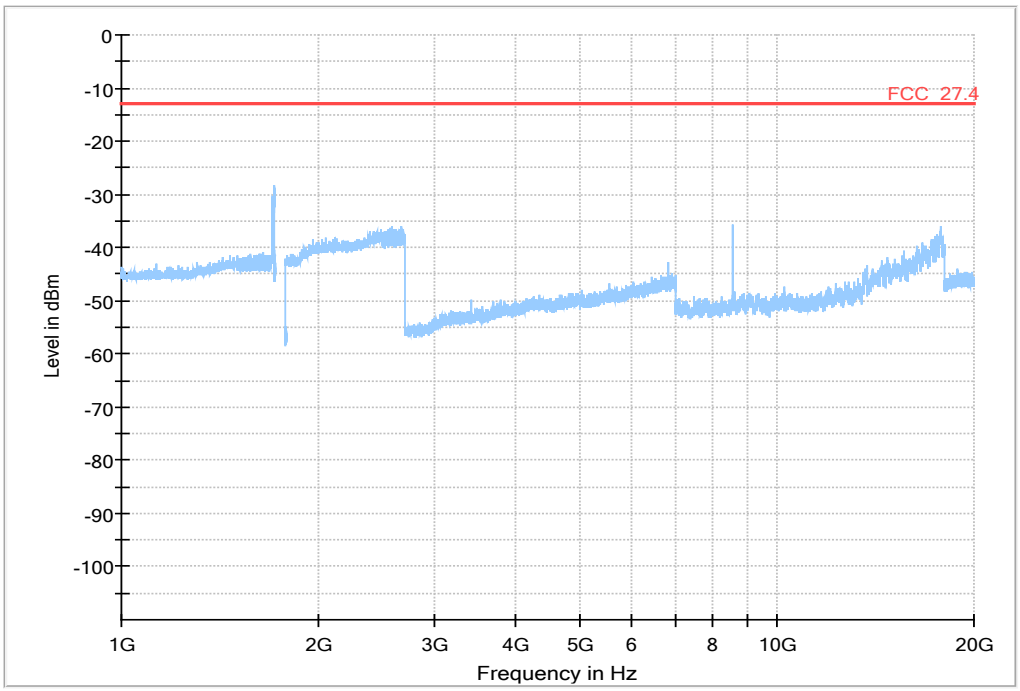
re-measurement at carrier



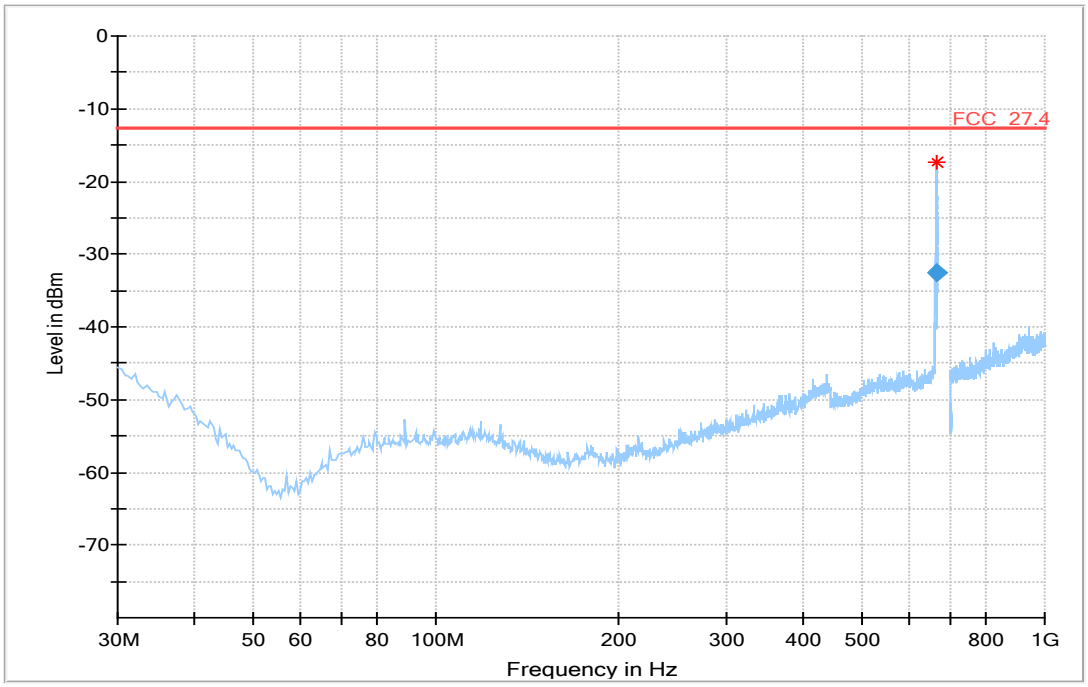
LTE eFDD66, QPSK, 5 MHz, RB = 1, Channel = high
30 MHz – 1 GHz



1 GHz – 20 GHz

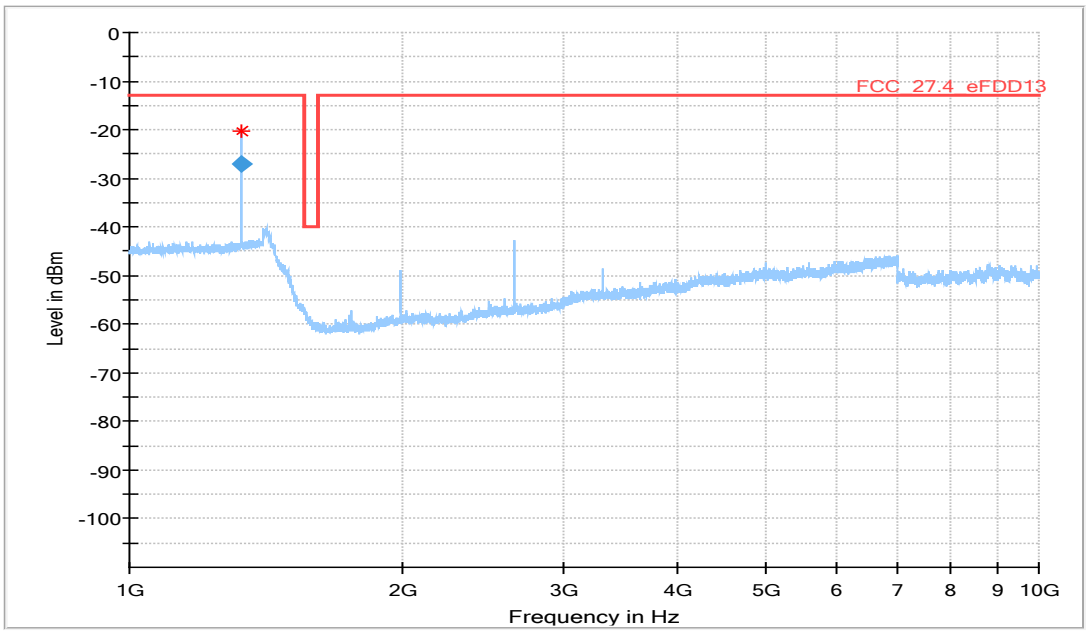


LTE eFDD71, QPSK, 5 MHz, RB = 1, Channel = low
30 MHz – 1 GHz



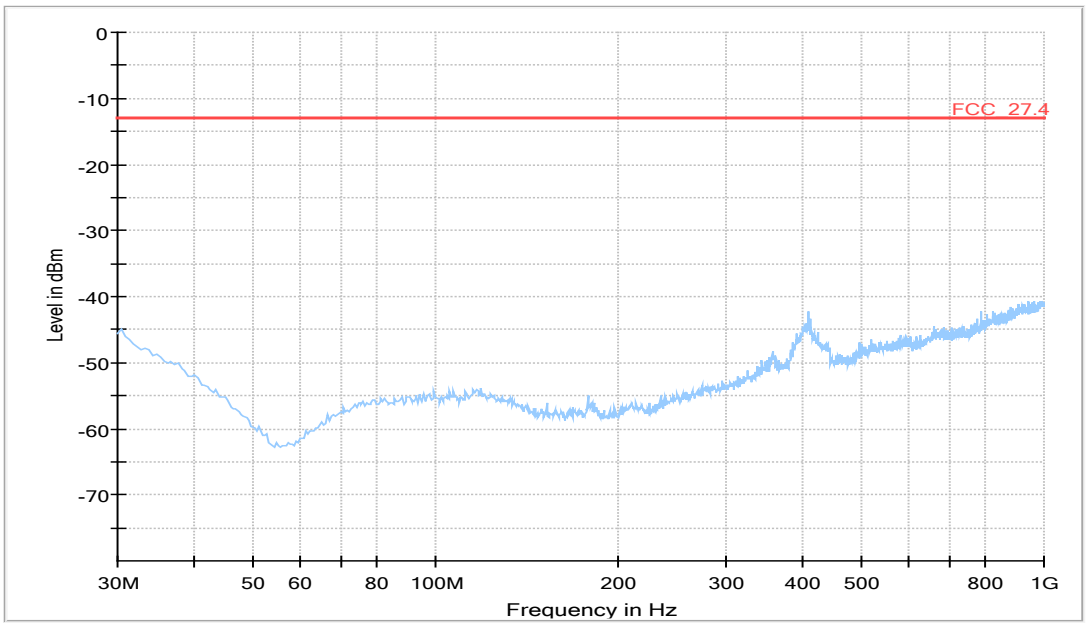
Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
662.999783	-32.83	-13.00	19.83	1000.0	30.000	100.0	V	-168.0	-76.1

1 GHz – 10 GHz

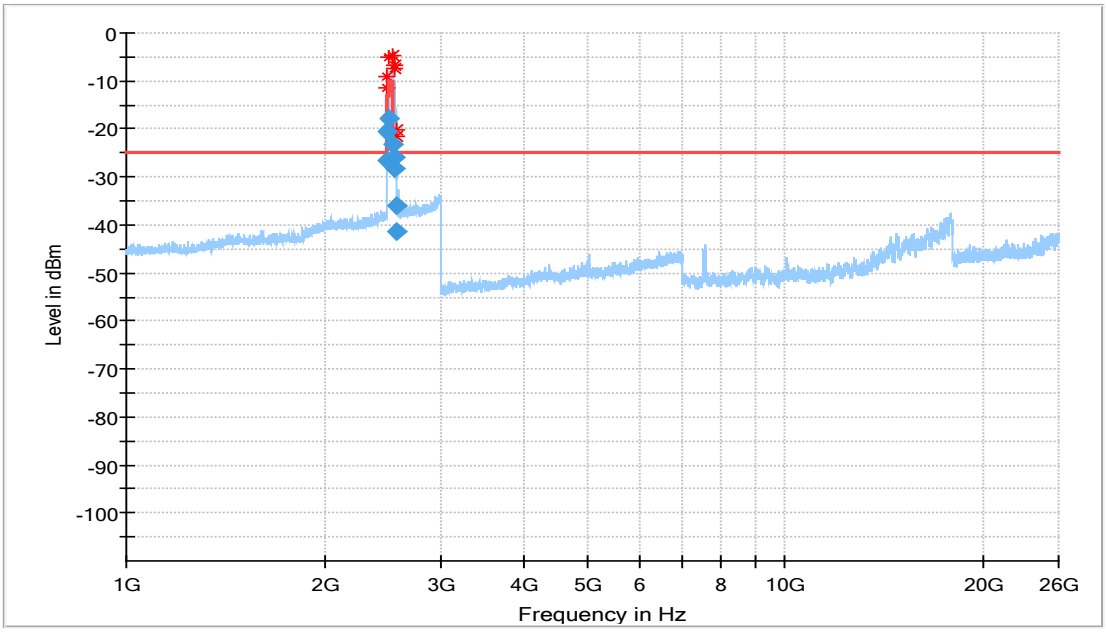


Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
1326.667	-26.9	-13.00	13.93	1000.0	1000.000	150.0	H	94.0	96.0	-68.6

CA_7C, QPSK, 20 MHz & 15 MHz, RB = 100 & 75, Channel = low
30 MHz – 1 GHz

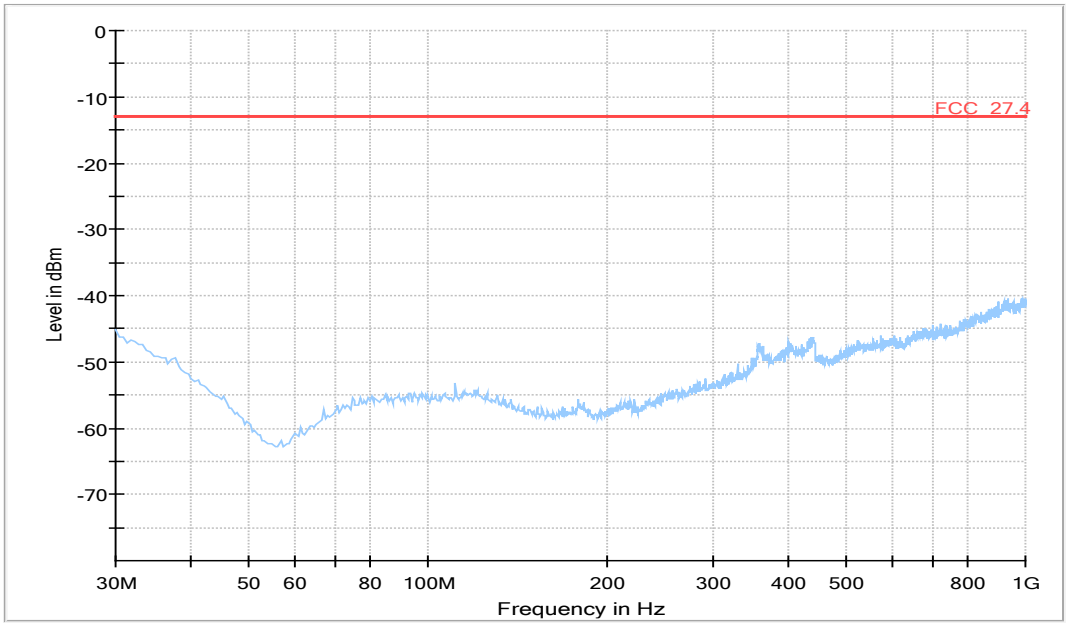


1 GHz – 26 GHz

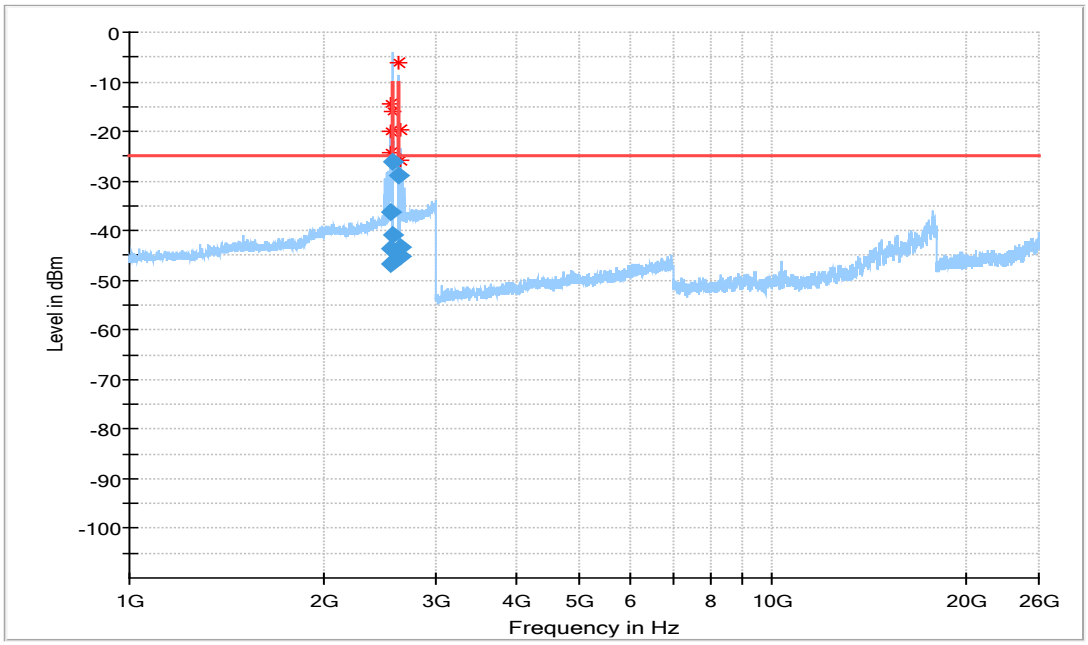


Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
2487.008	-26.5	-25.00	1.50	1000.0	1000.000	150.0	H	13.0	-14.0	-62.2
2492.504	-20.6	-13.00	7.61	1000.0	1000.000	150.0	H	8.0	-13.0	-62.2
2499.000	-17.9	-10.00	7.94	1000.0	1000.000	150.0	H	8.0	-13.0	-62.2
2536.000	-23.3	-10.00	13.32	1000.0	300.000	150.0	H	7.0	-17.0	-62.0
2545.744	-26.0	-25.00	0.96	1000.0	300.000	150.0	H	-24.0	79.0	-61.9
2559.664	-28.2	-25.00	3.21	1000.0	300.000	150.0	H	-24.0	81.0	-61.9
2567.552	-41.3	-25.00	16.27	1000.0	300.000	150.0	H	0.0	-15.0	-61.9
2572.192	-36.1	-25.00	11.10	1000.0	1000.000	150.0	H	2.0	-15.0	-61.8

CA_38C, QPSK, 20 MHz & 20 MHz, RB = 100 & 100, Channel = mid
30 MHz – 1 GHz

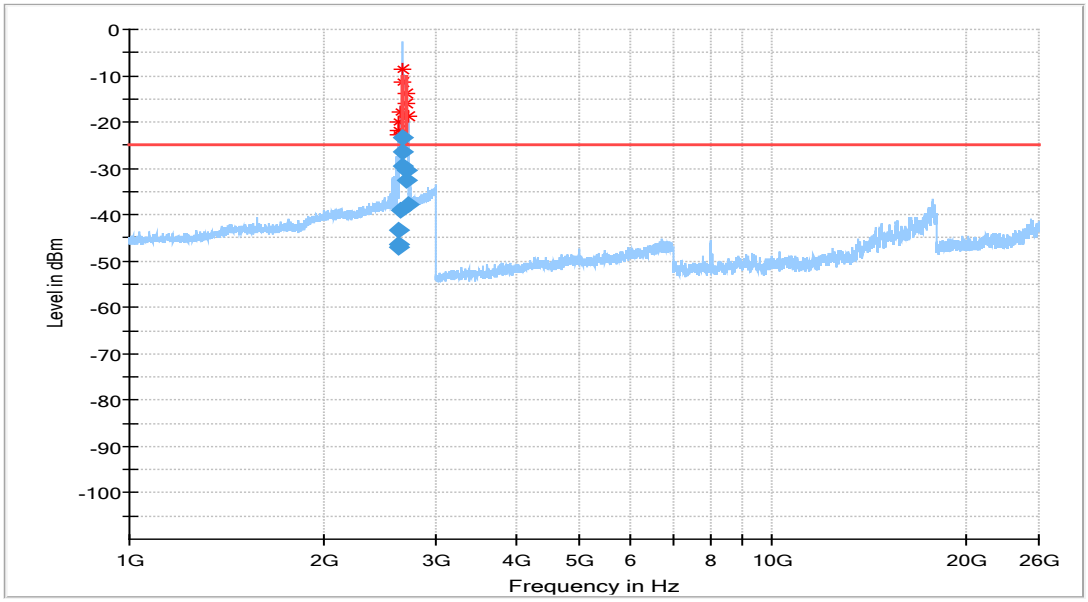


1 GHz – 26 GHz

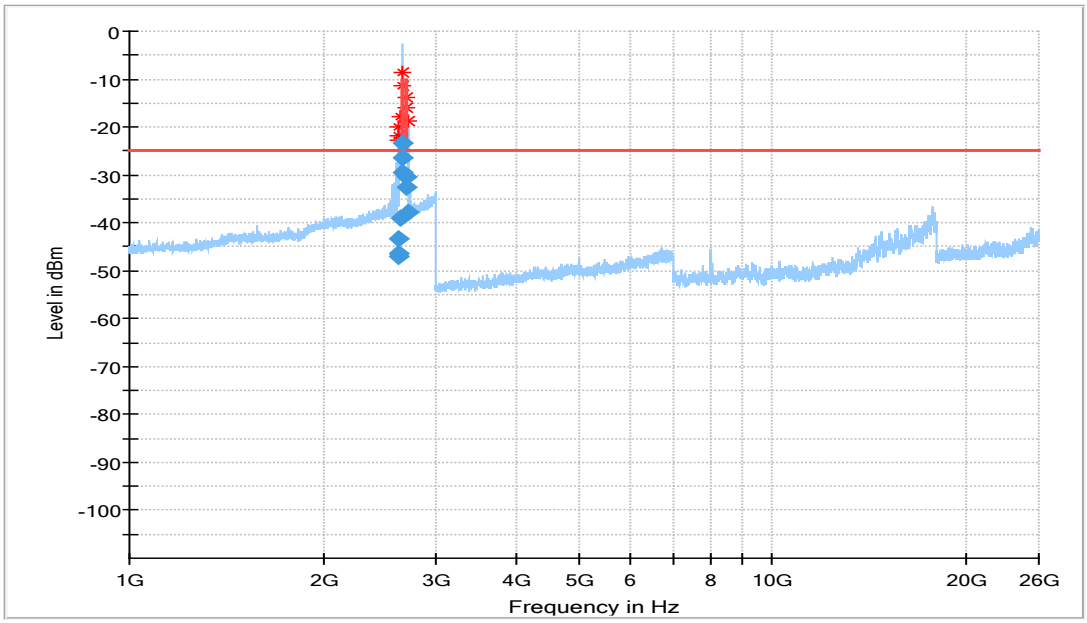


Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
2542.191	-46.8	-25.00	21.85	1000.0	1000.000	150.0	H	-44.0	3.0	-62.0
2545.864	-36.4	-25.00	11.36	1000.0	1000.000	150.0	H	-42.0	6.0	-61.9
2552.686	-43.7	-25.00	18.73	1000.0	1000.000	150.0	V	4.0	110.0	-61.9
2560.032	-40.9	-25.00	15.90	1000.0	1000.000	150.0	H	152.0	20.0	-61.9
2565.804	-26.1	-13.00	13.10	1000.0	1000.000	150.0	H	-47.0	2.0	-61.9
2624.644	-28.9	-13.00	15.94	1000.0	1000.000	150.0	H	158.0	-5.0	-61.7
2635.390	-45.2	-25.00	20.23	1000.0	1000.000	150.0	H	-12.0	88.0	-61.7
2644.601	-43.3	-25.00	18.34	1000.0	1000.000	150.0	V	-101.0	110.0	-61.7

CA_41C, QPSK, 20 MHz & 5 MHz, RB = 100 & 25, Channel = high
30 MHz – 1 GHz

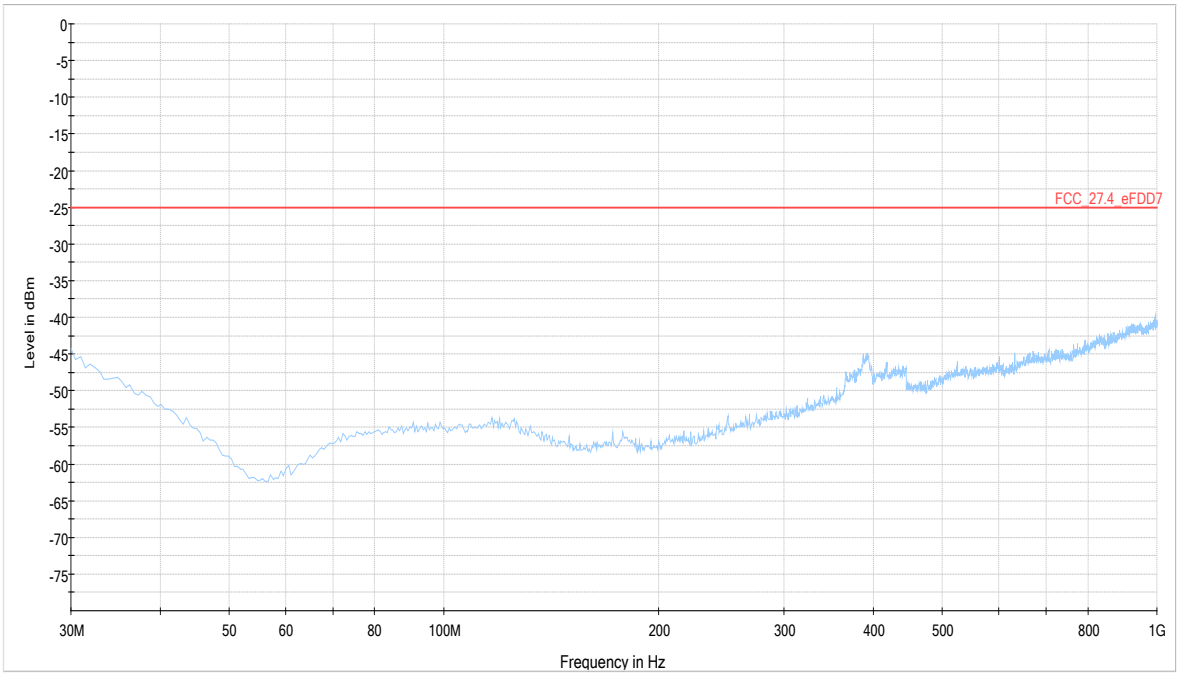


1 GHz – 26 GHz

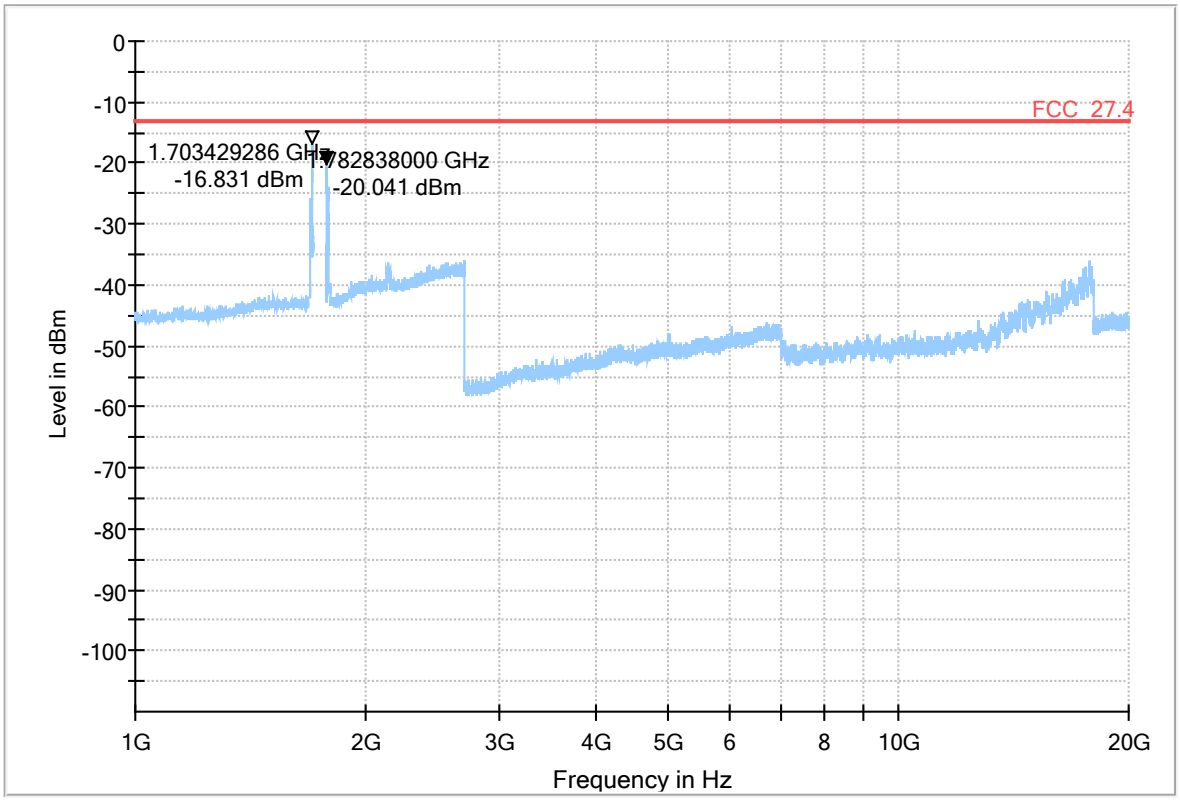


Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
2618.741	-47.1	-25.00	22.09	1000.0	1000.000	150.0	H	-38.0	82.0	-61.7
2623.180	-46.3	-25.00	21.30	1000.0	1000.000	150.0	H	-37.0	91.0	-61.7
2631.504	-43.4	-25.00	18.43	1000.0	1000.000	150.0	H	-36.0	77.0	-61.7
2639.828	-38.9	-25.00	13.90	1000.0	1000.000	150.0	H	-36.0	90.0	-61.7
2650.927	-29.4	-25.00	4.41	1000.0	1000.000	150.0	H	-30.0	85.0	-61.7
2655.366	-26.4	-25.00	1.41	1000.0	1000.000	150.0	H	-30.0	83.0	-61.7
2664.800	-23.3	-10.00	13.25	1000.0	1000.000	150.0	H	-30.0	77.0	-61.6
2701.971	-30.4	-25.00	5.37	1000.0	1000.000	150.0	H	148.0	79.0	-61.6
2705.053	-32.4	-25.00	7.44	1000.0	1000.000	150.0	H	147.0	85.0	-61.5
2709.984	-37.8	-25.00	12.79	1000.0	1000.000	150.0	H	147.0	83.0	-61.5

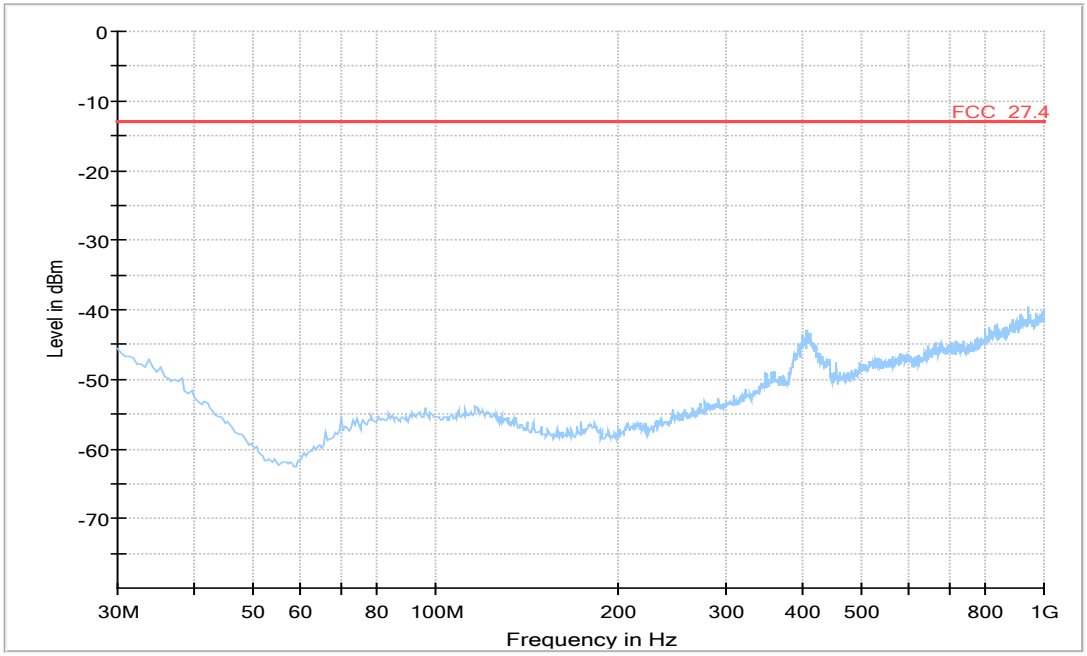
CA_66B, QPSK, 10 MHz & 10 MHz, RB = 50 & 50, Channel = mid
30 MHz – 1 GHz



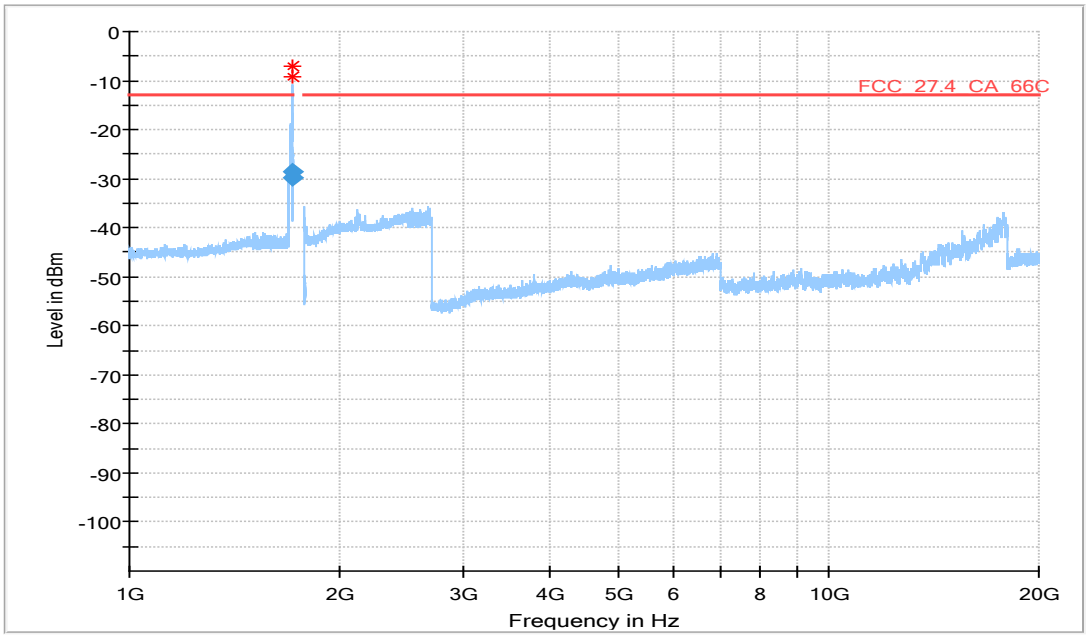
1 GHz – 20 GHz



CA_66C, QPSK, 15 MHz & 15 MHz, RB = 75 & 75, Channel = low
30 MHz – 1 GHz

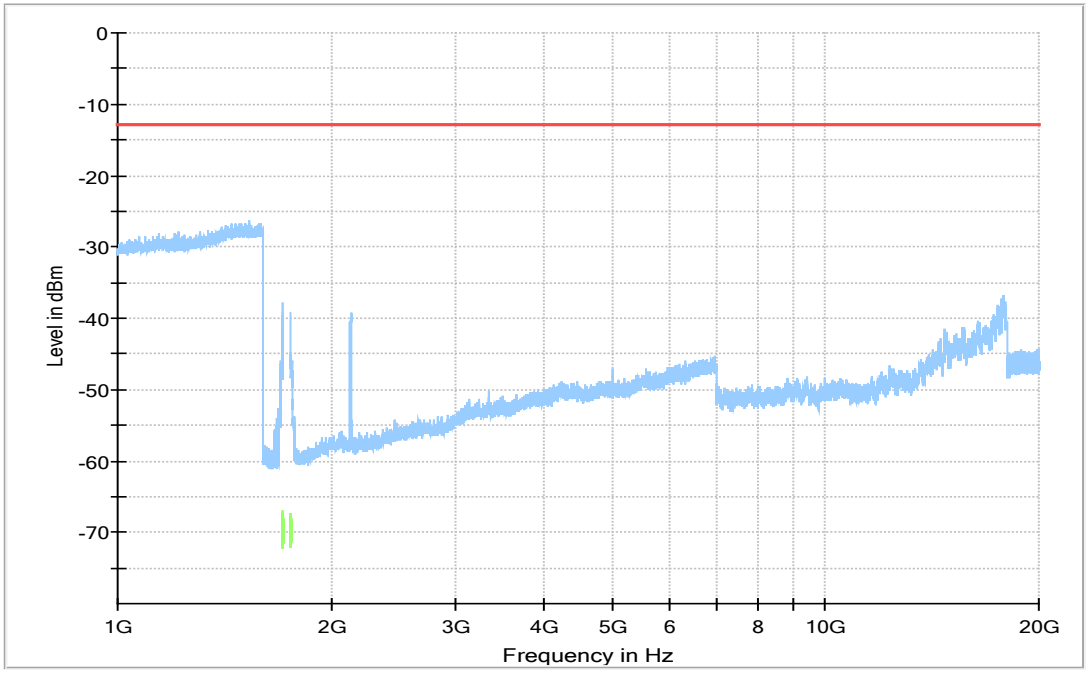


1 GHz – 20 GHz

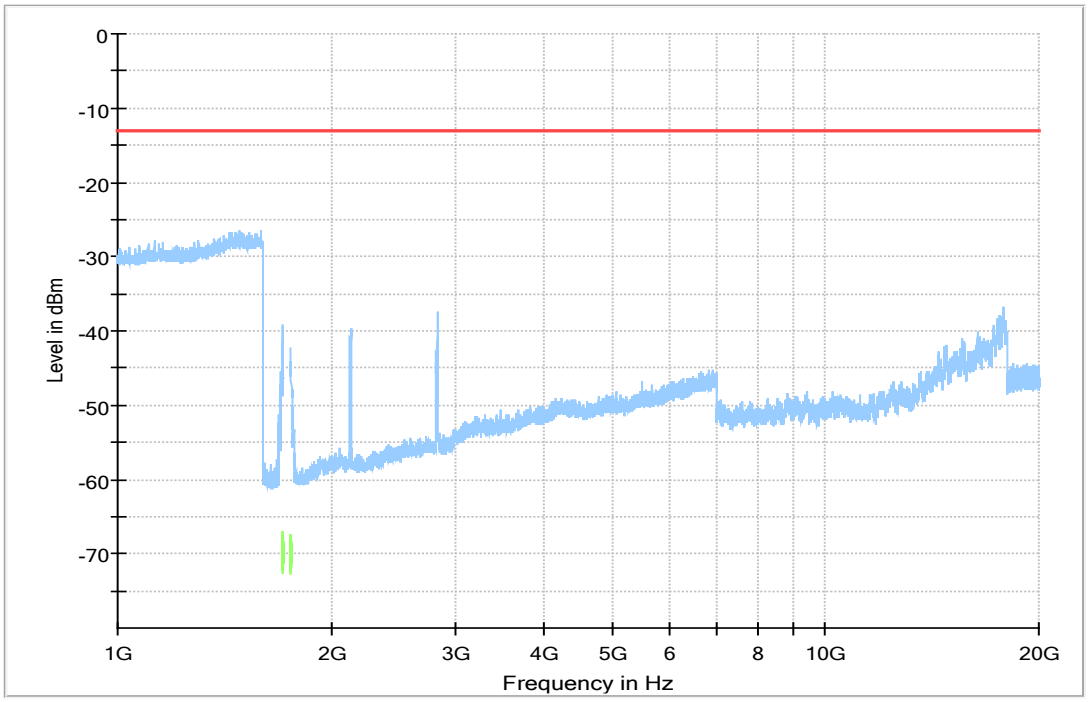


Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
1708.843	-29.7	-13.00	16.75	1000.0	1000.000	150.0	H	28.0	-1.0	-65.9
1709.000	-28.7	-13.00	15.70	1000.0	1000.000	150.0	H	28.0	-2.0	-65.9

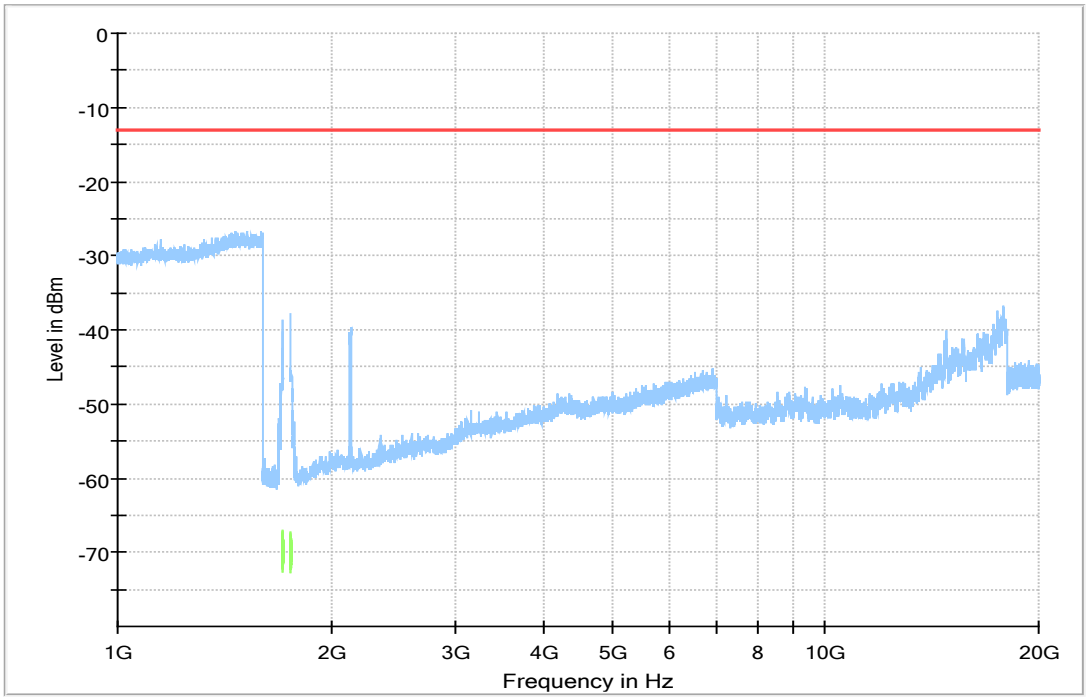
CA_4_5, QPSK, 5 MHz & 5 MHz, RB = 1 & 1, Channel = mid
1 GHz – 20 GHz



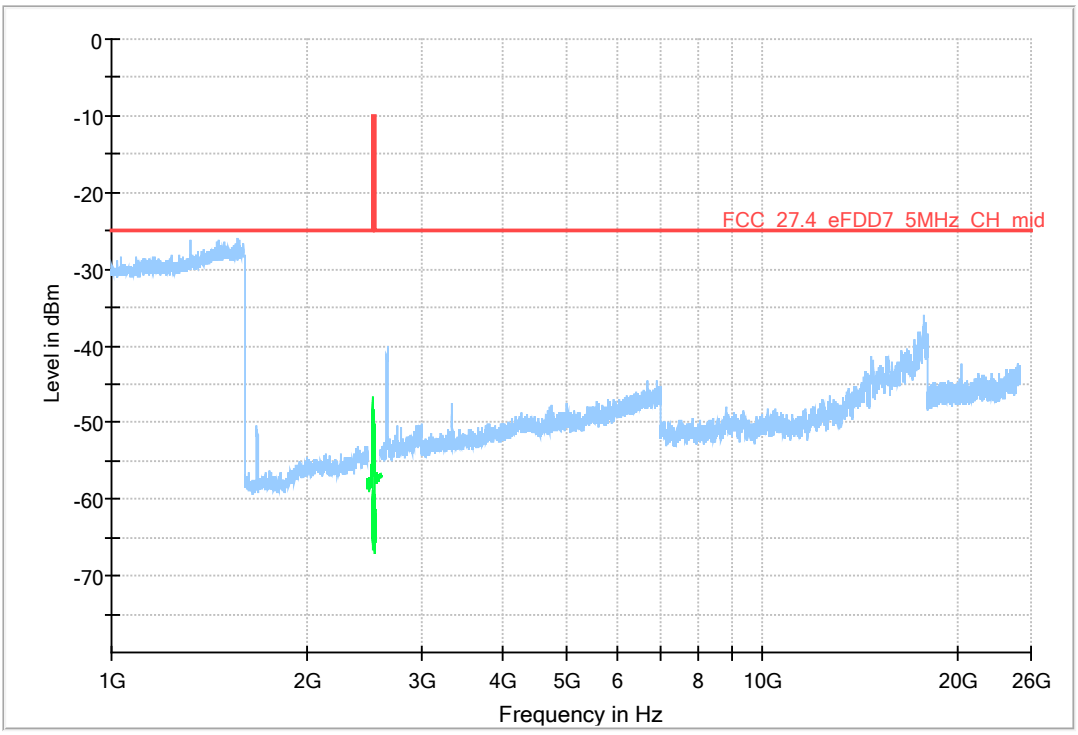
CA_4_12, QPSK, 5 MHz & 5 MHz, RB = 1 & 1, Channel = mid
1 GHz – 20 GHz



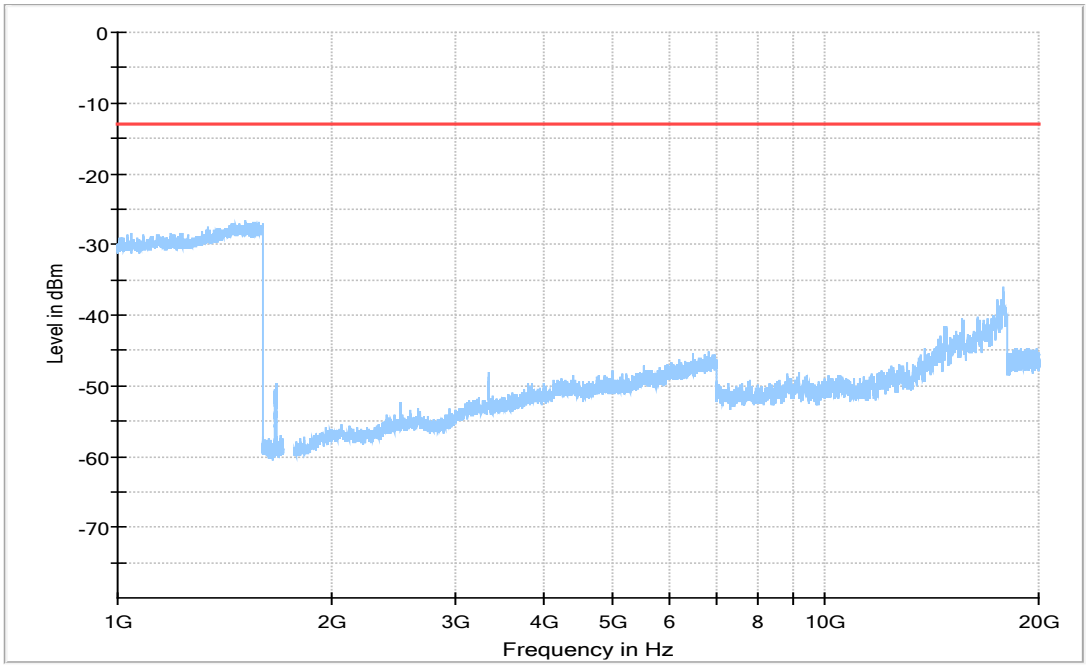
CA_4_13, QPSK, 5 MHz & 5 MHz, RB = 1 & 1, Channel = mid
1 GHz – 20 GHz



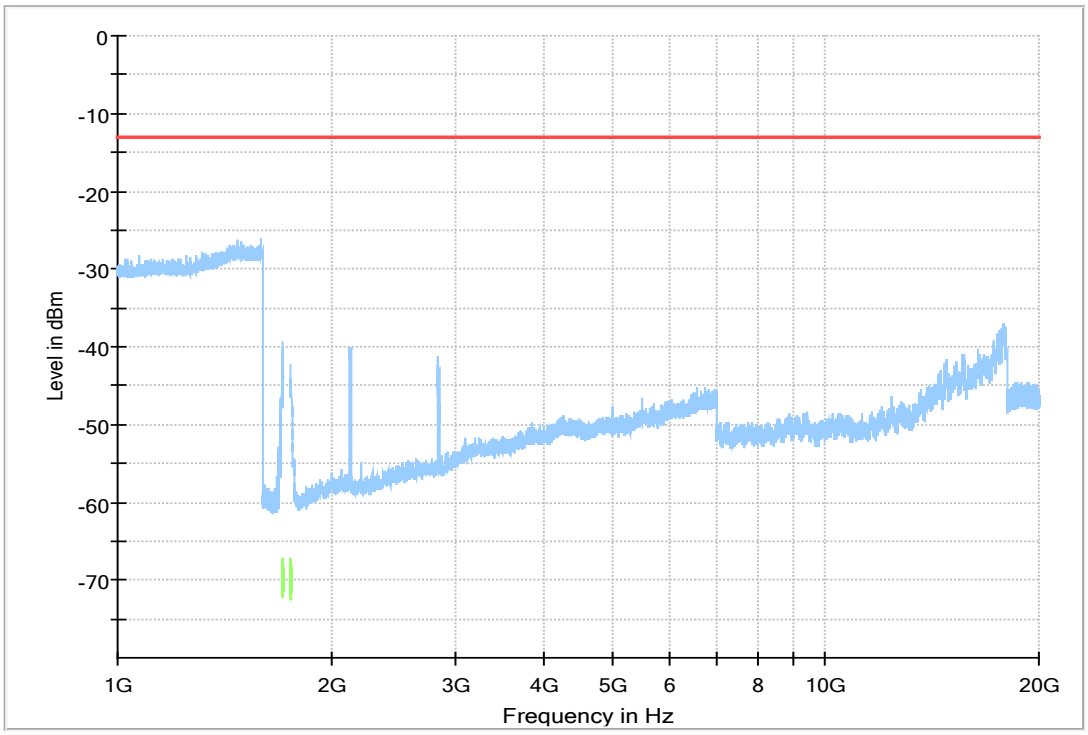
CA_5_7, QPSK, 5 MHz & 5 MHz, RB = 1 & 1, Channel = mid
1 GHz – 26 GHz



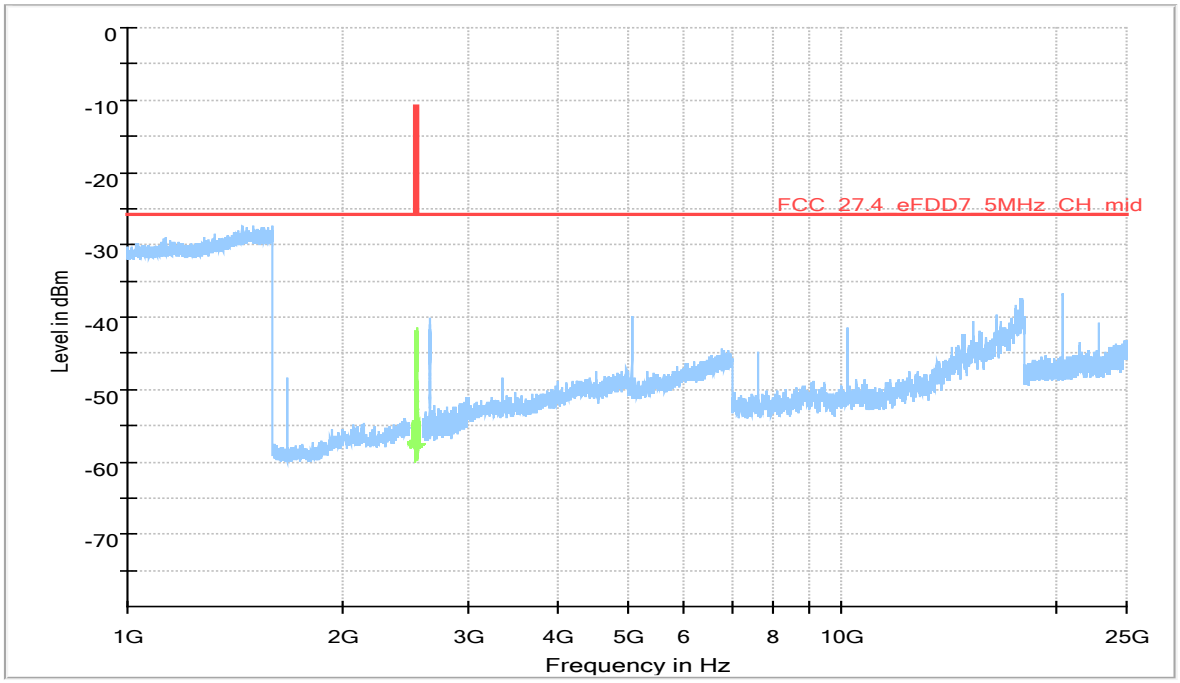
CA_5_66, QPSK, 5 MHz & 5 MHz, RB = 1 & 1, Channel = mid
1 GHz – 20 GHz



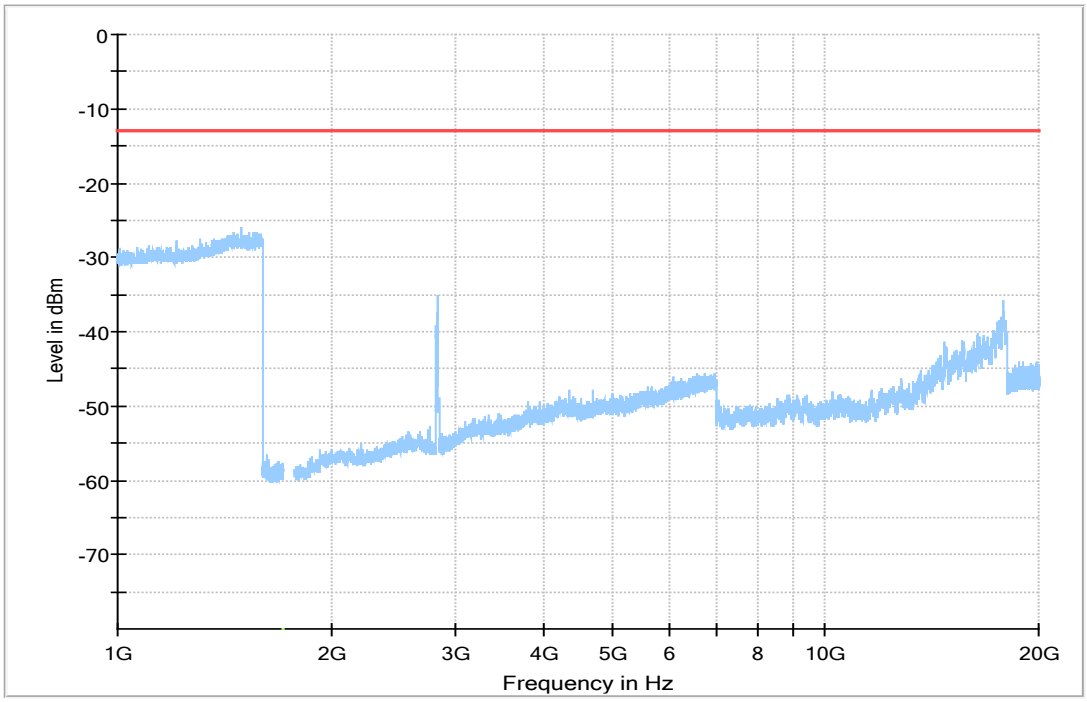
CA_4_17, QPSK, 5 MHz & 5 MHz, RB = 1 & 1, Channel = mid
1 GHz – 20 GHz



CA_7_26, QPSK, 5 MHz & 5 MHz, RB = 1 & 1, Channel = mid
1 GHz – 26 GHz



CA_12_66, QPSK, 5 MHz & 5 MHz, RB = 1 & 1, Channel = mid
1 GHz – 20 GHz



5.18.5TEST EQUIPMENT USED

- Radiated Emissions

5.19 EMISSION AND OCCUPIED BANDWIDTH

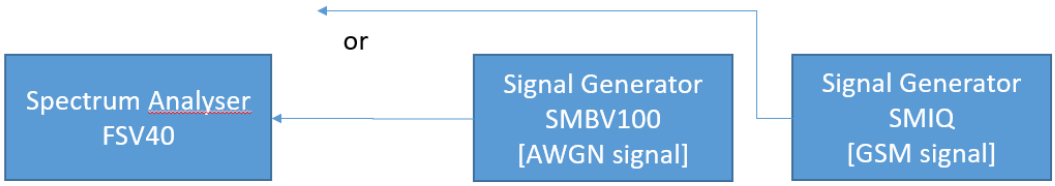
Standard **FCC PART 27 Subpart C**

The test was performed according to:
ANSI C63.26: 2015

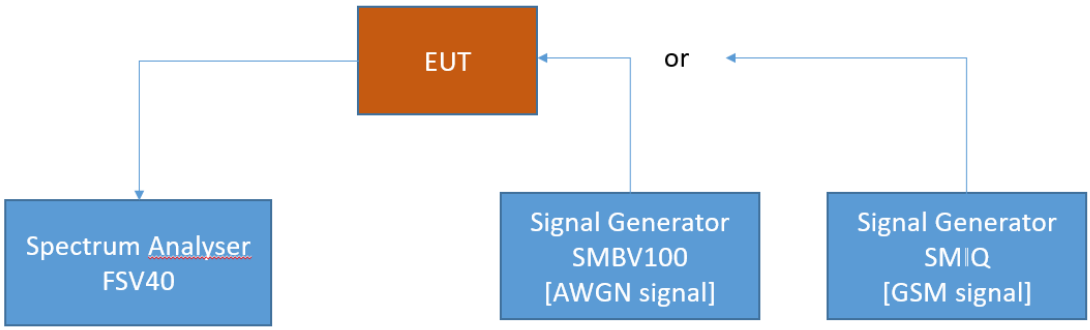
5.19.1 TEST DESCRIPTION

This test case is intended to demonstrate compliance to the applicable conducted spurious emission test case per FCC §2.1049 and RSS-GEN 6.7. The limit and the requirements come from the applicable rule part and ISED RSS-Standard for the operating band of the cellular device.

The EUT was connected to the test setups according to the following diagram:



FCC Part 22/24/27/90; Industrial Signal Booster
Test Setup step 1: Measuring characteristics of test signals



FCC Part 22/24/27/90; Industrial Signal Booster
Test Setup step 2; Occupied Bandwidth/Input-versus-output spectrum

The attenuation of the measuring and stimulus path are known for each measured frequency and are considered.

The Spectrum Analyzer settings can be directly found in the measurement diagrams.

5.19.2 TEST REQUIREMENTS / LIMITS

FCC Part 2.1049; Occupied Bandwidth:

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured under the following conditions as applicable:

(h) Transmitters employing digital modulation techniques—when modulated by an input signal such that its amplitude and symbol rate represent the maximum rated conditions under which the equipment will be operated. The signal shall be applied through any filter networks, pseudo-random generators or other devices required in normal service. Additionally, the occupied bandwidth shall be shown for operation with any devices used for modifying the spectrum when such devices are optional at the discretion of the user.

(i) Transmitters designed for other types of modulation—when modulated by an appropriate signal of sufficient amplitude to be representative of the type of service in which used. A description of the input signal should be supplied.

RSS-GEN; 6.7 Occupied Bandwidth

The emission bandwidth (×dB) is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated × dB below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth in the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least 3× the resolution bandwidth.

When the occupied bandwidth limit is not stated in the applicable RSS or reference measurement method, the transmitted signal bandwidth shall be reported as the 99% emission bandwidth, as calculated or measured.

The transmitter shall be operated at its maximum carrier power measured under normal test conditions.

The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.

The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the occupied bandwidth (OBW) and video bandwidth (VBW) shall be approximately 3×RBW.

Note: Video averaging is not permitted.

A peak, or peak hold, may be used in place of the sampling detector as this may produce a wider bandwidth than the actual bandwidth (worst-case measurement). Use of a peak hold may be necessary to determine the occupied bandwidth if the device is not transmitting continuously.

The trace data points are recovered and are directly summed in linear power level terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points (starting at the highest frequency, at the right side of the span, and going down in frequency). This frequency is then recorded.
The difference between the two recorded frequencies is the 99% occupied bandwidth.

5.19.3 TEST PROTOCOL

Ambient temperature: 24 °C
Relative humidity: 38 %

Radio Technology	Channel	Ressource Blocks	Bandwidth (MHz)	Nominal BW [MHz]	99 % BW [kHz]
eFDD 4 QPSK	low	6	1.4	1.4	1112.22
eFDD 4 QPSK	mid	6	1.4	1.4	1112.22
eFDD 4 QPSK	high	6	1.4	1.4	1106.21
eFDD 4 16QAM	low	6	1.4	1.4	1112.22
eFDD 4 16QAM	mid	6	1.4	1.4	1106.21
eFDD 4 16QAM	high	6	1.4	1.4	1112.22
eFDD 4 64QAM	low	6	1.4	1.4	1106.21
eFDD 4 64QAM	mid	6	1.4	1.4	1112.22
eFDD 4 64QAM	high	6	1.4	1.4	1112.22
eFDD 4 QPSK	low	15	3	3	2777.56
eFDD 4 QPSK	mid	15	3	3	2765.53
eFDD 4 QPSK	high	15	3	3	2777.56
eFDD 4 16QAM	low	15	3	3	2777.56
eFDD 4 16QAM	mid	15	3	3	2789.58
eFDD 4 16QAM	high	15	3	3	2765.53
eFDD 4 64QAM	low	15	3	3	2777.56
eFDD 4 64QAM	mid	15	3	3	2777.56
eFDD 4 64QAM	high	15	3	3	2801.60
eFDD 4 QPSK	low	25	5	5	4569.14
eFDD 4 QPSK	mid	25	5	5	4569.14
eFDD 4 QPSK	high	25	5	5	4569.14
eFDD 4 16QAM	low	25	5	5	4569.14
eFDD 4 16QAM	mid	25	5	5	4569.14
eFDD 4 16QAM	high	25	5	5	4569.14
eFDD 4 64QAM	low	25	5	5	4549.10
eFDD 4 64QAM	mid	25	5	5	4589.18
eFDD 4 64QAM	high	25	5	5	4589.18
eFDD 4 QPSK	low	50	10	10	9098.20
eFDD 4 QPSK	mid	50	10	10	9018.04
eFDD 4 QPSK	high	50	10	10	9058.12
eFDD 4 16QAM	low	50	10	10	9098.20
eFDD 4 16QAM	mid	50	10	10	9058.12
eFDD 4 16QAM	high	50	10	10	9098.20
eFDD 4 64QAM	low	50	10	10	9058.12

eFDD 4 64QAM	mid	50	10	10	9058.12
eFDD 4 64QAM	high	50	10	10	9058.12
eFDD 4 QPSK	low	75	15	15	13527.05
eFDD 4 QPSK	mid	75	15	15	13527.05
eFDD 4 QPSK	high	75	15	15	13647.29
eFDD 4 16QAM	low	75	15	15	13587.17
eFDD 4 16QAM	mid	75	15	15	13527.05
eFDD 4 16QAM	high	75	15	15	13647.29
eFDD 4 64QAM	low	75	15	15	13587.17
eFDD 4 64QAM	mid	75	15	15	13587.17
eFDD 4 64QAM	high	75	15	15	13647.29
eFDD 4 QPSK	low	100	20	20	18116.23
eFDD 4 QPSK	mid	100	20	20	18116.23
eFDD 4 QPSK	high	100	20	20	18276.55
eFDD 4 16QAM	low	100	20	20	18196.39
eFDD 4 16QAM	mid	100	20	20	18116.23
eFDD 4 16QAM	high	100	20	20	18196.39
eFDD 4 64QAM	low	100	20	20	18196.39
eFDD 4 64QAM	mid	100	20	20	18116.23
eFDD 4 64QAM	high	100	20	20	18196.39
eFDD 12 QPSK	low	6	1.4	1.4	1106.21
eFDD 12 QPSK	mid	6	1.4	1.4	1106.21
eFDD 12 QPSK	high	6	1.4	1.4	1100.20
eFDD 12 16QAM	low	6	1.4	1.4	1112.22
eFDD 12 16QAM	mid	6	1.4	1.4	1106.21
eFDD 12 16QAM	high	6	1.4	1.4	1118.24
eFDD 12 64QAM	low	6	1.4	1.4	1106.21
eFDD 12 64QAM	mid	6	1.4	1.4	1112.22
eFDD 12 64QAM	high	6	1.4	1.4	1106.21
eFDD 12 QPSK	low	15	3	3	2789.58
eFDD 12 QPSK	mid	15	3	3	2789.58
eFDD 12 QPSK	high	15	3	3	2789.58
eFDD 12 16QAM	low	15	3	3	2777.56
eFDD 12 16QAM	mid	15	3	3	2789.58
eFDD 12 16QAM	high	15	3	3	2789.58
eFDD 12 64QAM	low	15	3	3	2777.56
eFDD 12 64QAM	mid	15	3	3	2777.56
eFDD 12 64QAM	high	15	3	3	2789.58
eFDD 12 QPSK	low	25	5	5	4569.14
eFDD 12 QPSK	mid	25	5	5	4549.10
eFDD 12 QPSK	high	25	5	5	4589.18
eFDD 12 16QAM	low	25	5	5	4569.14
eFDD 12 16QAM	mid	25	5	5	4569.14
eFDD 12 16QAM	high	25	5	5	4569.14
eFDD 12 64QAM	low	25	5	5	4569.14
eFDD 12 64QAM	mid	25	5	5	4569.14
eFDD 12 64QAM	high	25	5	5	4569.14
eFDD 12 QPSK	low	50	10	10	9098.20
eFDD 12 QPSK	mid	50	10	10	9058.12
eFDD 12 QPSK	high	50	10	10	9098.20
eFDD 12 16QAM	low	50	10	10	9098.20
eFDD 12 16QAM	mid	50	10	10	9058.12

eFDD 12 16QAM	high	50	10	10	9058.12
eFDD 12 64QAM	low	50	10	10	9058.12
eFDD 12 64QAM	mid	50	10	10	9098.20
eFDD 12 64QAM	high	50	10	10	9058.12
eFDD 7 QPSK	low	25	5	5	4569.14
eFDD 7 QPSK	mid	25	5	5	4569.14
eFDD 7 QPSK	high	25	5	5	4569.14
eFDD 7 16QAM	low	25	5	5	4569.14
eFDD 7 16QAM	mid	25	5	5	4549.10
eFDD 7 16QAM	high	25	5	5	4569.14
eFDD 7 64QAM	low	25	5	5	4569.14
eFDD 7 64QAM	mid	25	5	5	4569.14
eFDD 7 64QAM	high	25	5	5	4549.10
eFDD 7 QPSK	low	50	10	10	9098.20
eFDD 7 QPSK	mid	50	10	10	9058.12
eFDD 7 QPSK	high	50	10	10	9138.28
eFDD 7 16QAM	low	50	10	10	9098.20
eFDD 7 16QAM	mid	50	10	10	9058.12
eFDD 7 16QAM	high	50	10	10	9058.12
eFDD 7 64QAM	low	50	10	10	9098.20
eFDD 7 64QAM	mid	50	10	10	9098.20
eFDD 7 64QAM	high	50	10	10	9098.20
eFDD 7 QPSK	low	75	15	15	13587.17
eFDD 7 QPSK	mid	75	15	15	13587.17
eFDD 7 QPSK	high	75	15	15	13587.17
eFDD 7 16QAM	low	75	15	15	13647.29
eFDD 7 16QAM	mid	75	15	15	13647.29
eFDD 7 16QAM	high	75	15	15	13587.17
eFDD 7 64QAM	low	75	15	15	13587.17
eFDD 7 64QAM	mid	75	15	15	13707.41
eFDD 7 64QAM	high	75	15	15	13587.17
eFDD 7 QPSK	low	100	20	20	18196.39
eFDD 7 QPSK	mid	100	20	20	18276.55
eFDD 7 QPSK	high	100	20	20	18196.39
eFDD 7 16QAM	low	100	20	20	18196.39
eFDD 7 16QAM	mid	100	20	20	18276.55
eFDD 7 16QAM	high	100	20	20	18276.55
eFDD 7 64QAM	low	100	20	20	18276.55
eFDD 7 64QAM	mid	100	20	20	18276.55
eFDD 7 64QAM	high	100	20	20	18276.55
eFDD 13 QPSK	low	25	5	5	4569.14
eFDD 13 QPSK	mid	25	5	5	4569.14
eFDD 13 QPSK	high	25	5	5	4529.06
eFDD 13 16QAM	low	25	5	5	4549.10
eFDD 13 16QAM	mid	25	5	5	4569.14
eFDD 13 16QAM	high	25	5	5	4549.10
eFDD 13 64QAM	low	25	5	5	4549.10
eFDD 13 64QAM	mid	25	5	5	4569.14
eFDD 13 64QAM	high	25	5	5	4549.10
eFDD 13 QPSK	mid	50	10	10	9018.04
eFDD 13 16QAM	mid	50	10	10	9058.12
eFDD 13 64QAM	mid	50	10	10	9018.04

eFDD 17 QPSK	low	25	5	5	4569.14
eFDD 17 QPSK	mid	25	5	5	4549.10
eFDD 17 QPSK	high	25	5	5	4589.18
eFDD 17 16QAM	low	25	5	5	4549.10
eFDD 17 16QAM	mid	25	5	5	4549.10
eFDD 17 16QAM	high	25	5	5	4569.14
eFDD 17 64QAM	low	25	5	5	4549.09
eFDD 17 64QAM	mid	25	5	5	4569.13
eFDD 17 64QAM	high	25	5	5	4569.14
eFDD 17 QPSK	low	50	10	10	9058.12
eFDD 17 QPSK	mid	50	10	10	9058.12
eFDD 17 QPSK	high	50	10	10	9018.04
eFDD 17 16QAM	low	50	10	10	9058.12
eFDD 17 16QAM	mid	50	10	10	9098.20
eFDD 17 16QAM	high	50	10	10	9018.04
eFDD 17 64QAM	low	50	10	10	9018.04
eFDD 17 64QAM	mid	50	10	10	9058.12
eFDD 17 64QAM	high	50	10	10	9058.12
eTDD 38 QPSK	low	25	5	5	4569.14
eTDD 38 QPSK	mid	25	5	5	4569.14
eTDD 38 QPSK	high	25	5	5	4529.06
eTDD 38 16QAM	low	25	5	5	4549.09
eTDD 38 16QAM	mid	25	5	5	4589.17
eTDD 38 16QAM	high	25	5	5	4549.09
eTDD 38 64QAM	low	25	5	5	4549.09
eTDD 38 64QAM	mid	25	5	5	4549.09
eTDD 38 64QAM	high	25	5	5	4569.14
eTDD 38 QPSK	low	50	10	10	9058.12
eTDD 38 QPSK	mid	50	10	10	9018.04
eTDD 38 QPSK	high	50	10	10	9058.12
eTDD 38 16QAM	low	50	10	10	9018.04
eTDD 38 16QAM	mid	50	10	10	9018.04
eTDD 38 16QAM	high	50	10	10	9058.12
eTDD 38 64QAM	low	50	10	10	9018.04
eTDD 38 64QAM	mid	50	10	10	9018.04
eTDD 38 64QAM	high	50	10	10	9098.19
eTDD 38 QPSK	low	75	15	15	13587.17
eTDD 38 QPSK	mid	75	15	15	13587.17
eTDD 38 QPSK	high	75	15	15	13587.17
eTDD 38 16QAM	low	75	15	15	13527.05
eTDD 38 16QAM	mid	75	15	15	13527.05
eTDD 38 16QAM	high	75	15	15	13527.05
eTDD 38 64QAM	low	75	15	15	13527.05
eTDD 38 64QAM	mid	75	15	15	13647.29
eTDD 38 64QAM	high	75	15	15	13527.05
eTDD 38 QPSK	low	100	20	20	18196.39
eTDD 38 QPSK	mid	100	20	20	18196.39
eTDD 38 QPSK	high	100	20	20	18196.39
eTDD 38 16QAM	low	100	20	20	18116.23
eTDD 38 16QAM	mid	100	20	20	18116.62
eTDD 38 16QAM	high	100	20	20	18196.39
eTDD 38 64QAM	low	100	20	20	18036.07

eTDD 38 64QAM	mid	100	20	20	18196.39
eTDD 38 64QAM	high	100	20	20	18196.39
eTDD 41 QPSK	low	25	5	5	4539.07
eTDD 41 QPSK	mid	25	5	5	4529.06
eTDD 41 QPSK	high	25	5	5	4569.14
eTDD 41 16QAM	low	25	5	5	4539.08
eTDD 41 16QAM	mid	25	5	5	4589.18
eTDD 41 16QAM	high	25	5	5	4529.06
eTDD 41 64QAM	low	25	5	5	4599.19
eTDD 41 64QAM	mid	25	5	5	4549.09
eTDD 41 64QAM	high	25	5	5	4549.09
eTDD 41 QPSK	low	50	10	10	9018.04
eTDD 41 QPSK	mid	50	10	10	9058.12
eTDD 41 QPSK	high	50	10	10	9098.19
eTDD 41 16QAM	low	50	10	10	9058.12
eTDD 41 16QAM	mid	50	10	10	9018.04
eTDD 41 16QAM	high	50	10	10	9058.12
eTDD 41 64QAM	low	50	10	10	9018.04
eTDD 41 64QAM	mid	50	10	10	9018.04
eTDD 41 64QAM	high	50	10	10	9058.12
eTDD 41 QPSK	low	75	15	15	13528.70
eTDD 41 QPSK	mid	75	15	15	13527.05
eTDD 41 QPSK	high	75	15	15	13587.17
eTDD 41 16QAM	low	75	15	15	13527.05
eTDD 41 16QAM	mid	75	15	15	13527.05
eTDD 41 16QAM	high	75	15	15	13647.29
eTDD 41 64QAM	low	75	15	15	13527.05
eTDD 41 64QAM	mid	75	15	15	13647.29
eTDD 41 64QAM	high	75	15	15	13527.05
eTDD 41 QPSK	low	100	20	20	18196.39
eTDD 41 QPSK	mid	100	20	20	18156.31
eTDD 41 QPSK	high	100	20	20	18276.55
eTDD 41 16QAM	low	100	20	20	18036.07
eTDD 41 16QAM	mid	100	20	20	18096.19
eTDD 41 16QAM	high	100	20	20	18196.39
eTDD 41 64QAM	low	100	20	20	18036.07
eTDD 41 64QAM	mid	100	20	20	18156.31
eTDD 41 64QAM	high	100	20	20	18196.39
eFDD 66 QPSK	low	6	1.4	1.4	1106.21
eFDD 66 QPSK	mid	6	1.4	1.4	1106.21
eFDD 66 QPSK	high	6	1.4	1.4	1100.20
eFDD 66 16QAM	low	6	1.4	1.4	1106.21
eFDD 66 16QAM	mid	6	1.4	1.4	1106.21
eFDD 66 16QAM	high	6	1.4	1.4	1106.21
eFDD 66 64QAM	low	6	1.4	1.4	1106.21
eFDD 66 64QAM	mid	6	1.4	1.4	1106.21
eFDD 66 64QAM	high	6	1.4	1.4	1112.22
eFDD 66 QPSK	low	15	3	3	2777.56
eFDD 66 QPSK	mid	15	3	3	2777.56
eFDD 66 QPSK	high	15	3	3	2777.56
eFDD 66 16QAM	low	15	3	3	2777.56
eFDD 66 16QAM	mid	15	3	3	2765.53

eFDD 66 16QAM	high	15	3	3	2801.60
eFDD 66 64QAM	low	15	3	3	2789.58
eFDD 66 64QAM	mid	15	3	3	2777.56
eFDD 66 64QAM	high	15	3	3	2765.53
eFDD 66 QPSK	low	25	5	5	4549.10
eFDD 66 QPSK	mid	25	5	5	4569.14
eFDD 66 QPSK	high	25	5	5	4549.10
eFDD 66 16QAM	low	25	5	5	4549.10
eFDD 66 16QAM	mid	25	5	5	4569.14
eFDD 66 16QAM	high	25	5	5	4549.10
eFDD 66 64QAM	low	25	5	5	4569.14
eFDD 66 64QAM	mid	25	5	5	4569.14
eFDD 66 64QAM	high	25	5	5	4549.10
eFDD 66 QPSK	low	50	10	10	9058.12
eFDD 66 QPSK	mid	50	10	10	9098.20
eFDD 66 QPSK	high	50	10	10	9058.12
eFDD 66 16QAM	low	50	10	10	9098.20
eFDD 66 16QAM	mid	50	10	10	9058.12
eFDD 66 16QAM	high	50	10	10	9058.12
eFDD 66 64QAM	low	50	10	10	9098.20
eFDD 66 64QAM	mid	50	10	10	9058.12
eFDD 66 64QAM	high	50	10	10	9098.20
eFDD 66 QPSK	low	75	15	15	13587.17
eFDD 66 QPSK	mid	75	15	15	13527.05
eFDD 66 QPSK	high	75	15	15	13587.17
eFDD 66 16QAM	low	75	15	15	13587.17
eFDD 66 16QAM	mid	75	15	15	13527.05
eFDD 66 16QAM	high	75	15	15	29098.20
eFDD 66 64QAM	low	75	15	15	13587.17
eFDD 66 64QAM	mid	75	15	15	13527.05
eFDD 66 64QAM	high	75	15	15	29098.20
eFDD 66 QPSK	low	100	20	20	18116.23
eFDD 66 QPSK	mid	100	20	20	18196.39
eFDD 66 QPSK	high	100	20	20	18116.23
eFDD 66 16QAM	low	100	20	20	18116.23
eFDD 66 16QAM	mid	100	20	20	18276.55
eFDD 66 16QAM	high	100	20	20	18116.23
eFDD 66 64QAM	low	100	20	20	18276.55
eFDD 66 64QAM	mid	100	20	20	18196.39
eFDD 66 64QAM	high	100	20	20	18196.39
eFDD 71 QPSK	low	25	5	5	4569.14
eFDD 71 QPSK	mid	25	5	5	4569.14
eFDD 71 QPSK	high	25	5	5	4529.06
eFDD 71 16QAM	low	25	5	5	4549.10
eFDD 71 16QAM	mid	25	5	5	4569.14
eFDD 71 16QAM	high	25	5	5	4589.18
eFDD 71 64QAM	low	25	5	5	4569.14
eFDD 71 64QAM	mid	25	5	5	4569.14
eFDD 71 64QAM	high	25	5	5	4569.14
eFDD 71 QPSK	low	50	10	10	9058.12
eFDD 71 QPSK	mid	50	10	10	9098.20
eFDD 71 QPSK	high	50	10	10	9058.12

eFDD 71 16QAM	low	50	10	10	9058.12
eFDD 71 16QAM	mid	50	10	10	9098.20
eFDD 71 16QAM	high	50	10	10	9058.12
eFDD 71 64QAM	low	50	10	10	9058.12
eFDD 71 64QAM	mid	50	10	10	9058.12
eFDD 71 64QAM	high	50	10	10	9058.12
eFDD 71 QPSK	low	75	15	15	13527.10
eFDD 71 QPSK	mid	75	15	15	13587.17
eFDD 71 QPSK	high	75	15	15	13587.17
eFDD 71 16QAM	low	75	15	15	13587.17
eFDD 71 16QAM	mid	75	15	15	13527.10
eFDD 71 16QAM	high	75	15	15	13587.17
eFDD 71 64QAM	low	75	15	15	13527.10
eFDD 71 64QAM	mid	75	15	15	13587.17
eFDD 71 64QAM	high	75	15	15	13527.10
eFDD 71 QPSK	low	100	20	20	18116.23
eFDD 71 QPSK	mid	100	20	20	18196.39
eFDD 71 QPSK	high	100	20	20	18196.39
eFDD 71 16QAM	low	100	20	20	18116.23
eFDD 71 16QAM	mid	100	20	20	18196.39
eFDD 71 16QAM	high	100	20	20	18196.39
eFDD 71 64QAM	low	100	20	20	18116.23
eFDD 71 64QAM	mid	100	20	20	18196.39
eFDD 71 64QAM	high	100	20	20	18196.39

Remark: Please see next sub-clause for the measurement plot.

Radio Technology	Modulation	Channel	Ressource Blocks PCC	Ressource Blocks SCC1	BW PCC [MHz]	BW SCC1 [MHz]	99% BW [MHz]
CA_7C	QPSK	low + low	50	100	10	20	27.956
CA_7C	QPSK	mid + mid	50	100	10	20	27.956
CA_7C	QPSK	high + high	50	100	10	20	27.856
CA_7C	16QAM	low + low	50	100	10	20	27.956
CA_7C	16QAM	mid + mid	50	100	10	20	28.056
CA_7C	16QAM	high + high	50	100	10	20	27.856
CA_7C	64QAM	low + low	50	100	10	20	28.056
CA_7C	64QAM	mid + mid	50	100	10	20	27.856
CA_7C	64QAM	high + high	50	100	10	20	27.856
CA_7C	QPSK	low + low	75	50	15	10	23.547
CA_7C	QPSK	mid + mid	75	50	15	10	23.647
CA_7C	QPSK	high + high	75	50	15	10	23.347
CA_7C	16QAM	low + low	75	50	15	10	23.447
CA_7C	16QAM	mid + mid	75	50	15	10	23.447
CA_7C	16QAM	high + high	75	50	15	10	23.347
CA_7C	64QAM	low + low	75	50	15	10	23.447
CA_7C	64QAM	mid + mid	75	50	15	10	23.647
CA_7C	64QAM	high + high	75	50	15	10	23.447
CA_7C	QPSK	low + low	75	100	15	20	32.866
CA_7C	QPSK	mid + mid	75	100	15	20	32.866
CA_7C	QPSK	high + high	75	100	15	20	32.766
CA_7C	16QAM	low + low	75	100	15	20	32.866
CA_7C	16QAM	mid + mid	75	100	15	20	32.866
CA_7C	16QAM	high + high	75	100	15	20	32.665
CA_7C	64QAM	low + low	75	100	15	20	32.766
CA_7C	64QAM	mid + mid	75	100	15	20	32.966
CA_7C	64QAM	high + high	75	100	15	20	32.665
CA_7C	QPSK	low + low	100	75	20	15	32.866
CA_7C	QPSK	mid + mid	100	75	20	15	32.966
CA_7C	QPSK	high + high	100	75	20	15	32.665
CA_7C	16QAM	low + low	100	75	20	15	32.866
CA_7C	16QAM	mid + mid	100	75	20	15	32.766
CA_7C	16QAM	high + high	100	75	20	15	32.766
CA_7C	64QAM	low + low	100	75	20	15	32.766
CA_7C	64QAM	mid + mid	100	75	20	15	32.866
CA_7C	64QAM	high + high	100	75	20	15	32.866
CA_7C	QPSK	low + low	100	50	20	10	28.056
CA_7C	QPSK	mid + mid	100	50	20	10	28.056
CA_7C	QPSK	high + high	100	50	20	10	27.856
CA_7C	16QAM	low + low	100	50	20	10	28.056
CA_7C	16QAM	mid + mid	100	50	20	10	28.056
CA_7C	16QAM	high + high	100	50	20	10	27.856
CA_7C	64QAM	low + low	100	50	20	10	27.956
CA_7C	64QAM	mid + mid	100	50	20	10	28.156
CA_7C	64QAM	high + high	100	50	20	10	27.856
CA_7C	QPSK	low + low	75	75	15	15	28.557
CA_7C	QPSK	mid + mid	75	75	15	15	28.657
CA_7C	QPSK	high + high	75	75	15	15	28.457
CA_7C	16QAM	low + low	75	75	15	15	28.557

CA_7C	16QAM	mid + mid	75	75	15	15	28.657
CA_7C	16QAM	high + high	75	75	15	15	28.457
CA_7C	64QAM	low + low	75	75	15	15	28.657
CA_7C	64QAM	mid + mid	75	75	15	15	28.758
CA_7C	64QAM	high + high	75	75	15	15	28.457
CA_7C	QPSK	low + low	100	100	20	20	37.635
CA_7C	QPSK	mid + mid	100	100	20	20	37.776
CA_7C	QPSK	high + high	100	100	20	20	37.756
CA_7C	16QAM	low + low	100	100	20	20	37.635
CA_7C	16QAM	mid + mid	100	100	20	20	37.515
CA_7C	16QAM	high + high	100	100	20	20	37.756
CA_7C	64QAM	low + low	100	100	20	20	37.635
CA_7C	64QAM	mid + mid	100	100	20	20	37.756
CA_7C	64QAM	high + high	100	100	20	20	37.635
CA_38C	QPSK	low + low	75	75	15	15	28.357
CA_38C	QPSK	mid + mid	75	75	15	15	28.357
CA_38C	QPSK	high + high	75	75	15	15	28.357
CA_38C	16QAM	low + low	75	75	15	15	28.257
CA_38C	16QAM	mid + mid	75	75	15	15	28.357
CA_38C	16QAM	high + high	75	75	15	15	28.257
CA_38C	64QAM	low + low	75	75	15	15	28.357
CA_38C	64QAM	mid + mid	75	75	15	15	28.357
CA_38C	64QAM	high + high	75	75	15	15	28.257
CA_38C	QPSK	low + low	100	100	20	20	37.675
CA_38C	QPSK	mid + mid	100	100	20	20	37.375
CA_38C	QPSK	high + high	100	100	20	20	37.375
CA_38C	16QAM	low + low	100	100	20	20	37.475
CA_38C	16QAM	mid + mid	100	100	20	20	37.475
CA_38C	16QAM	high + high	100	100	20	20	37.575
CA_38C	64QAM	low + low	100	100	20	20	37.375
CA_38C	64QAM	mid + mid	100	100	20	20	37.375
CA_38C	64QAM	high + high	100	100	20	20	37.375
CA_41C	QPSK	low + low	25	100	5	20	23.046
CA_41C	QPSK	mid + mid	25	100	5	20	22.846
CA_41C	QPSK	high + high	25	100	5	20	22.846
CA_41C	16QAM	low + low	25	100	5	20	22.846
CA_41C	16QAM	mid + mid	25	100	5	20	22.846
CA_41C	16QAM	high + high	25	100	5	20	22.745
CA_41C	64QAM	low + low	25	100	5	20	22.846
CA_41C	64QAM	mid + mid	25	100	5	20	22.846
CA_41C	64QAM	high + high	25	100	5	20	22.745
CA_41C	QPSK	low + low	75	75	15	15	28.257
CA_41C	QPSK	mid + mid	75	75	15	15	28.357
CA_41C	QPSK	high + high	75	75	15	15	28.257
CA_41C	16QAM	low + low	75	75	15	15	28.357
CA_41C	16QAM	mid + mid	75	75	15	15	28.357
CA_41C	16QAM	high + high	75	75	15	15	28.156
CA_41C	64QAM	low + low	75	75	15	15	28.357
CA_41C	64QAM	mid + mid	75	75	15	15	28.357
CA_41C	64QAM	high + high	75	75	15	15	28.257
CA_41C	QPSK	low + low	75	100	15	20	32.565
CA_41C	QPSK	mid + mid	75	100	15	20	32.565

CA_41C	QPSK	high + high	75	100	15	20	32.465
CA_41C	16QAM	low + low	75	100	15	20	32.565
CA_41C	16QAM	mid + mid	75	100	15	20	32.465
CA_41C	16QAM	high + high	75	100	15	20	32.465
CA_41C	64QAM	low + low	75	100	15	20	32.565
CA_41C	64QAM	mid + mid	75	100	15	20	32.565
CA_41C	64QAM	high + high	75	100	15	20	32.565
CA_41C	QPSK	low + low	100	50	20	10	27.756
CA_41C	QPSK	mid + mid	100	50	20	10	27.956
CA_41C	QPSK	high + high	100	50	20	10	27.856
CA_41C	16QAM	low + low	100	50	20	10	27.856
CA_41C	16QAM	mid + mid	100	50	20	10	27.756
CA_41C	16QAM	high + high	100	50	20	10	27.756
CA_41C	64QAM	low + low	100	50	20	10	27.856
CA_41C	64QAM	mid + mid	100	50	20	10	27.756
CA_41C	64QAM	high + high	100	50	20	10	27.756
CA_41C	QPSK	low + low	100	75	20	15	32.665
CA_41C	QPSK	mid + mid	100	75	20	15	32.565
CA_41C	QPSK	high + high	100	75	20	15	32.465
CA_41C	16QAM	low + low	100	75	20	15	32.766
CA_41C	16QAM	mid + mid	100	75	20	15	32.665
CA_41C	16QAM	high + high	100	75	20	15	32.665
CA_41C	64QAM	low + low	100	75	20	15	32.565
CA_41C	64QAM	mid + mid	100	75	20	15	32.465
CA_41C	64QAM	high + high	100	75	20	15	32.465
CA_41C	QPSK	low + low	100	100	20	20	37.475
CA_41C	QPSK	mid + mid	100	100	20	20	37.375
CA_41C	QPSK	high + high	100	100	20	20	37.275
CA_41C	16QAM	low + low	100	100	20	20	37.475
CA_41C	16QAM	mid + mid	100	100	20	20	37.375
CA_41C	16QAM	high + high	100	100	20	20	37.374
CA_41C	64QAM	low + low	100	100	20	20	37.475
CA_41C	64QAM	mid + mid	100	100	20	20	37.275
CA_41C	64QAM	high + high	100	100	20	20	37.275
CA_41C	QPSK	low + low	25	100	5	20	23.046
CA_41C	QPSK	mid + mid	25	100	5	20	22.847
CA_41C	QPSK	high + high	25	100	5	20	22.846
CA_41C	16QAM	low + low	25	100	5	20	22.846
CA_41C	16QAM	mid + mid	25	100	5	20	22.846
CA_41C	16QAM	high + high	25	100	5	20	22.745
CA_41C	64QAM	low + low	25	100	5	20	22.846
CA_41C	64QAM	mid + mid	25	100	5	20	22.846
CA_41C	64QAM	high + high	25	100	5	20	22.745
CA_41C	QPSK	low + low	100	25	20	5	23.046
CA_41C	QPSK	mid + mid	100	25	20	5	23.046
CA_41C	QPSK	high + high	100	25	20	5	22.946
CA_41C	16QAM	low + low	100	25	20	5	22.846
CA_41C	16QAM	mid + mid	100	25	20	5	22.946
CA_41C	16QAM	high + high	100	25	20	5	22.946
CA_41C	64QAM	low + low	100	25	20	5	22.846
CA_41C	64QAM	mid + mid	100	25	20	5	22.946
CA_41C	64QAM	high + high	100	25	20	5	22.946

CA_41C	QPSK	low + low	50	75	10	15	23.246
CA_41C	QPSK	mid + mid	50	75	10	15	23.146
CA_41C	QPSK	high + high	50	75	10	15	23.146
CA_41C	16QAM	low + low	50	75	10	15	23.046
CA_41C	16QAM	mid + mid	50	75	10	15	23.046
CA_41C	16QAM	high + high	50	75	10	15	23.046
CA_41C	64QAM	low + low	50	75	10	15	23.347
CA_41C	64QAM	mid + mid	50	75	10	15	23.246
CA_41C	64QAM	high + high	50	75	10	15	23.146
CA_41C	QPSK	low + low	75	50	15	10	23.246
CA_41C	QPSK	mid + mid	75	50	15	10	23.246
CA_41C	QPSK	high + high	75	50	15	10	23.146
CA_41C	16QAM	low + low	75	50	15	10	23.046
CA_41C	16QAM	mid + mid	75	50	15	10	23.046
CA_41C	16QAM	high + high	75	50	15	10	23.046
CA_41C	64QAM	low + low	75	50	15	10	23.347
CA_41C	64QAM	mid + mid	75	50	15	10	23.246
CA_41C	64QAM	high + high	75	50	15	10	23.146
CA_66B	QPSK	low + low	25	25	5	5	9.569
CA_66B	QPSK	mid + mid	25	25	5	5	9.469
CA_66B	QPSK	high + high	25	25	5	5	9.469
CA_66B	16QAM	low + low	25	25	5	5	9.519
CA_66B	16QAM	mid + mid	25	25	5	5	9.469
CA_66B	16QAM	high + high	25	25	5	5	9.519
CA_66B	64QAM	low + low	25	25	5	5	9.519
CA_66B	64QAM	mid + mid	25	25	5	5	9.469
CA_66B	64QAM	high + high	25	25	5	5	9.469
CA_66B	QPSK	low + low	25	50	5	10	14.028
CA_66B	QPSK	mid + mid	25	50	5	10	13.978
CA_66B	QPSK	high + high	25	50	5	10	14.078
CA_66B	16QAM	low + low	25	50	5	10	14.028
CA_66B	16QAM	mid + mid	25	50	5	10	13.978
CA_66B	16QAM	high + high	25	50	5	10	13.978
CA_66B	64QAM	low + low	25	50	5	10	13.978
CA_66B	64QAM	mid + mid	25	50	5	10	13.978
CA_66B	64QAM	high + high	25	50	5	10	18.186
CA_66B	QPSK	low + low	25	75	5	15	18.337
CA_66B	QPSK	mid + mid	25	75	5	15	18.186
CA_66B	QPSK	high + high	25	75	5	15	18.236
CA_66B	16QAM	low + low	25	75	5	15	18.337
CA_66B	16QAM	mid + mid	25	75	5	15	18.236
CA_66B	16QAM	high + high	25	75	5	15	18.186
CA_66B	64QAM	low + low	25	75	5	15	18.337
CA_66B	64QAM	mid + mid	25	75	5	15	18.236
CA_66B	64QAM	high + high	25	75	5	15	18.236
CA_66B	QPSK	low + low	50	25	10	5	14.078
CA_66B	QPSK	mid + mid	50	25	10	5	14.078
CA_66B	QPSK	high + high	50	25	10	5	14.028
CA_66B	16QAM	low + low	50	25	10	5	14.078
CA_66B	16QAM	mid + mid	50	25	10	5	14.078
CA_66B	16QAM	high + high	50	25	10	5	14.028
CA_66B	64QAM	low + low	50	25	10	5	14.078

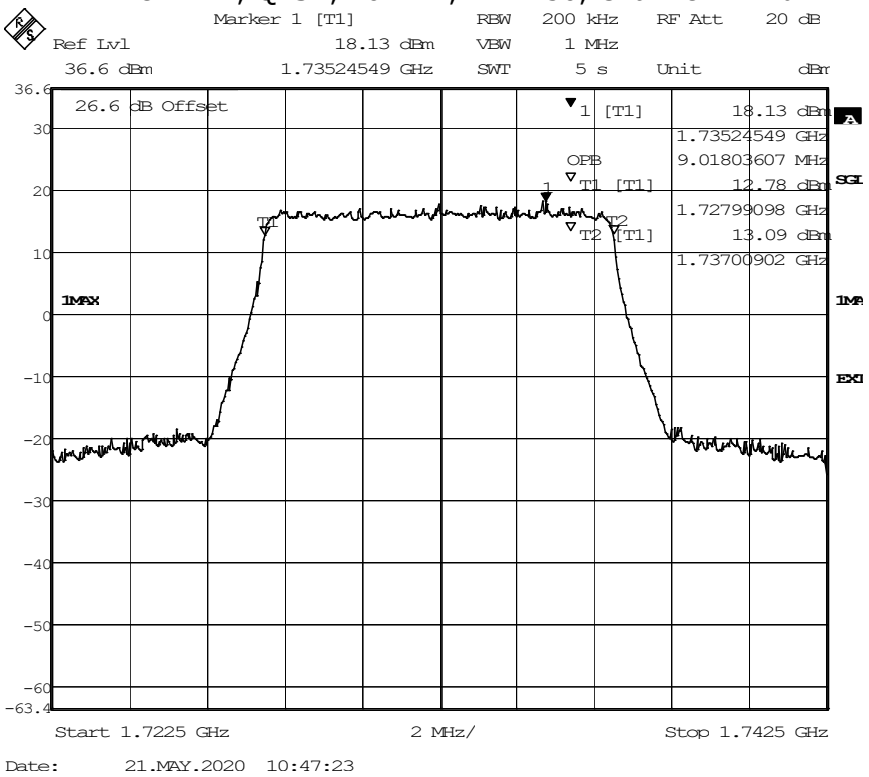
CA_66B	64QAM	mid + mid	50	25	10	5	14.028
CA_66B	64QAM	high + high	50	25	10	5	14.028
CA_66B	QPSK	low + low	50	50	10	10	18.888
CA_66B	QPSK	mid + mid	50	50	10	10	18.838
CA_66B	QPSK	high + high	50	50	10	10	18.838
CA_66B	16QAM	low + low	50	50	10	10	18.938
CA_66B	16QAM	mid + mid	50	50	10	10	18.838
CA_66B	16QAM	high + high	50	50	10	10	18.838
CA_66B	64QAM	low + low	50	50	10	10	18.938
CA_66B	64QAM	mid + mid	50	50	10	10	18.838
CA_66B	64QAM	high + high	50	50	10	10	18.838
CA_66B	QPSK	low + low	75	25	15	5	18.337
CA_66B	QPSK	mid + mid	75	25	15	5	18.334
CA_66B	QPSK	high + high	75	25	15	5	18.337
CA_66B	16QAM	low + low	75	25	15	5	18.337
CA_66B	16QAM	mid + mid	75	25	15	5	18.337
CA_66B	16QAM	high + high	75	25	15	5	18.334
CA_66B	64QAM	low + low	75	25	15	5	18.337
CA_66B	64QAM	mid + mid	75	25	15	5	18.337
CA_66B	64QAM	high + high	75	25	15	5	18.337
CA_66C	QPSK	low + low	25	100	5	20	22.846
CA_66C	QPSK	mid + mid	25	100	5	20	24.849
CA_66C	QPSK	high + high	25	100	5	20	24.949
CA_66C	16QAM	low + low	25	100	5	20	22.946
CA_66C	16QAM	mid + mid	25	100	5	20	24.849
CA_66C	16QAM	high + high	25	100	5	20	24.949
CA_66C	64QAM	low + low	25	100	5	20	22.946
CA_66C	64QAM	mid + mid	25	100	5	20	22.745
CA_66C	64QAM	high + high	25	100	5	20	22.846
CA_66C	QPSK	low + low	50	100	10	20	27.756
CA_66C	QPSK	mid + mid	50	100	10	20	27.555
CA_66C	QPSK	high + high	50	100	10	20	27.655
CA_66C	16QAM	low + low	50	100	10	20	27.756
CA_66C	16QAM	mid + mid	50	100	10	20	27.555
CA_66C	16QAM	high + high	50	100	10	20	27.655
CA_66C	64QAM	low + low	50	100	10	20	27.756
CA_66C	64QAM	mid + mid	50	100	10	20	27.555
CA_66C	64QAM	high + high	50	100	10	20	27.655
CA_66C	QPSK	low + low	50	75	10	15	23.146
CA_66C	QPSK	mid + mid	50	75	10	15	23.146
CA_66C	QPSK	high + high	50	75	10	15	23.046
CA_66C	16QAM	low + low	50	75	10	15	23.146
CA_66C	16QAM	mid + mid	50	75	10	15	23.146
CA_66C	16QAM	high + high	50	75	10	15	23.046
CA_66C	64QAM	low + low	50	75	10	15	23.146
CA_66C	64QAM	mid + mid	50	75	10	15	23.146
CA_66C	64QAM	high + high	50	75	10	15	23.046
CA_66C	QPSK	low + low	75	50	15	10	23.146
CA_66C	QPSK	mid + mid	75	50	15	10	23.046
CA_66C	QPSK	high + high	75	50	15	10	23.046
CA_66C	16QAM	low + low	75	50	15	10	23.146
CA_66C	16QAM	mid + mid	75	50	15	10	23.146

CA_66C	16QAM	high + high	75	50	15	10	23.146
CA_66C	64QAM	low + low	75	50	15	10	23.146
CA_66C	64QAM	mid + mid	75	50	15	10	23.146
CA_66C	64QAM	high + high	75	50	15	10	23.146
CA_66C	QPSK	low + low	75	75	15	15	28.357
CA_66C	QPSK	mid + mid	75	75	15	15	28.257
CA_66C	QPSK	high + high	75	75	15	15	28.257
CA_66C	16QAM	low + low	75	75	15	15	28.357
CA_66C	16QAM	mid + mid	75	75	15	15	28.257
CA_66C	16QAM	high + high	75	75	15	15	28.257
CA_66C	64QAM	low + low	75	75	15	15	28.357
CA_66C	64QAM	mid + mid	75	75	15	15	28.257
CA_66C	64QAM	high + high	75	75	15	15	28.257
CA_66C	QPSK	low + low	75	100	15	20	32.565
CA_66C	QPSK	mid + mid	75	100	15	20	32.565
CA_66C	QPSK	high + high	75	100	15	20	32.565
CA_66C	16QAM	low + low	75	100	15	20	32.565
CA_66C	16QAM	mid + mid	75	100	15	20	32.465
CA_66C	16QAM	high + high	75	100	15	20	32.565
CA_66C	64QAM	low + low	75	100	15	20	32.565
CA_66C	64QAM	mid + mid	75	100	15	20	32.565
CA_66C	64QAM	high + high	75	100	15	20	32.565
CA_66C	QPSK	low + low	100	25	20	5	22.946
CA_66C	QPSK	mid + mid	100	25	20	5	23.046
CA_66C	QPSK	high + high	100	25	20	5	22.946
CA_66C	16QAM	low + low	100	25	20	5	22.946
CA_66C	16QAM	mid + mid	100	25	20	5	23.046
CA_66C	16QAM	high + high	100	25	20	5	22.946
CA_66C	64QAM	low + low	100	25	20	5	22.946
CA_66C	64QAM	mid + mid	100	25	20	5	23.046
CA_66C	64QAM	high + high	100	25	20	5	22.946
CA_66C	QPSK	low + low	100	50	20	10	27.756
CA_66C	QPSK	mid + mid	100	50	20	10	27.756
CA_66C	QPSK	high + high	100	50	20	10	27.756
CA_66C	16QAM	low + low	100	50	20	10	27.756
CA_66C	16QAM	mid + mid	100	50	20	10	27.756
CA_66C	16QAM	high + high	100	50	20	10	27.756
CA_66C	64QAM	low + low	100	50	20	10	27.756
CA_66C	64QAM	mid + mid	100	50	20	10	27.856
CA_66C	64QAM	high + high	100	50	20	10	27.756
CA_66C	QPSK	low + low	100	75	20	15	32.565
CA_66C	QPSK	mid + mid	100	75	20	15	32.565
CA_66C	QPSK	high + high	100	75	20	15	32.565
CA_66C	16QAM	low + low	100	75	20	15	32.665
CA_66C	16QAM	mid + mid	100	75	20	15	32.565
CA_66C	16QAM	high + high	100	75	20	15	32.565
CA_66C	64QAM	low + low	100	75	20	15	32.565
CA_66C	64QAM	mid + mid	100	75	20	15	32.565
CA_66C	64QAM	high + high	100	75	20	15	32.565
CA_66C	QPSK	low + low	100	100	20	20	37.475
CA_66C	QPSK	mid + mid	100	100	20	20	37.475
CA_66C	QPSK	high + high	100	100	20	20	37.475

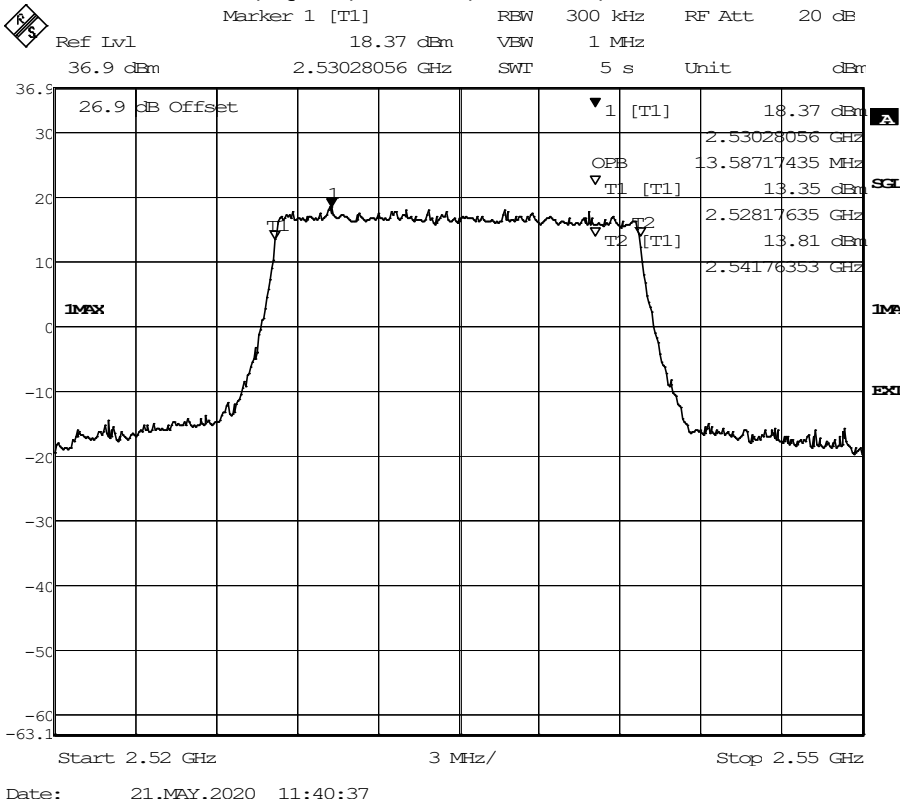
CA_66C	16QAM	low + low	100	100	20	20	37.475
CA_66C	16QAM	mid + mid	100	100	20	20	37.475
CA_66C	16QAM	high + high	100	100	20	20	37.475
CA_66C	64QAM	low + low	100	100	20	20	37.475
CA_66C	64QAM	mid + mid	100	100	20	20	37.475
CA_66C	64QAM	high + high	100	100	20	20	37.475

5.19.4 MEASUREMENT PLOT (SHOWING THE HIGHEST VALUE, "WORST CASE")

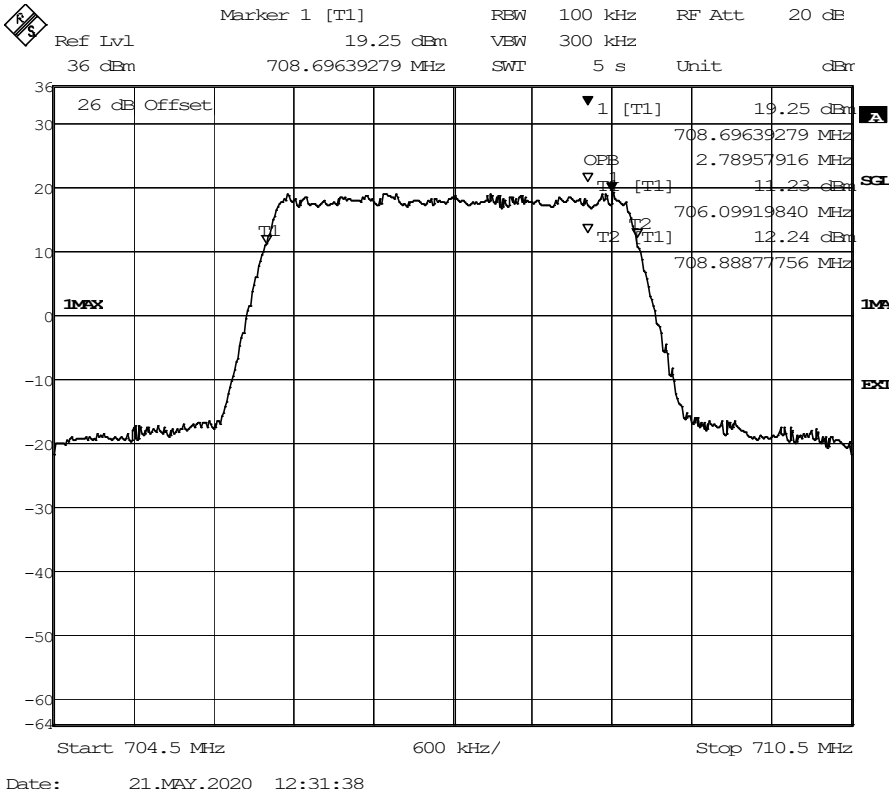
LTE eFDD 4, QPSK, 10 MHz, RB = 50, Channel = mid



LTE eFDD 7, QPSK, 15 MHz, RB = 75, Channel = mid

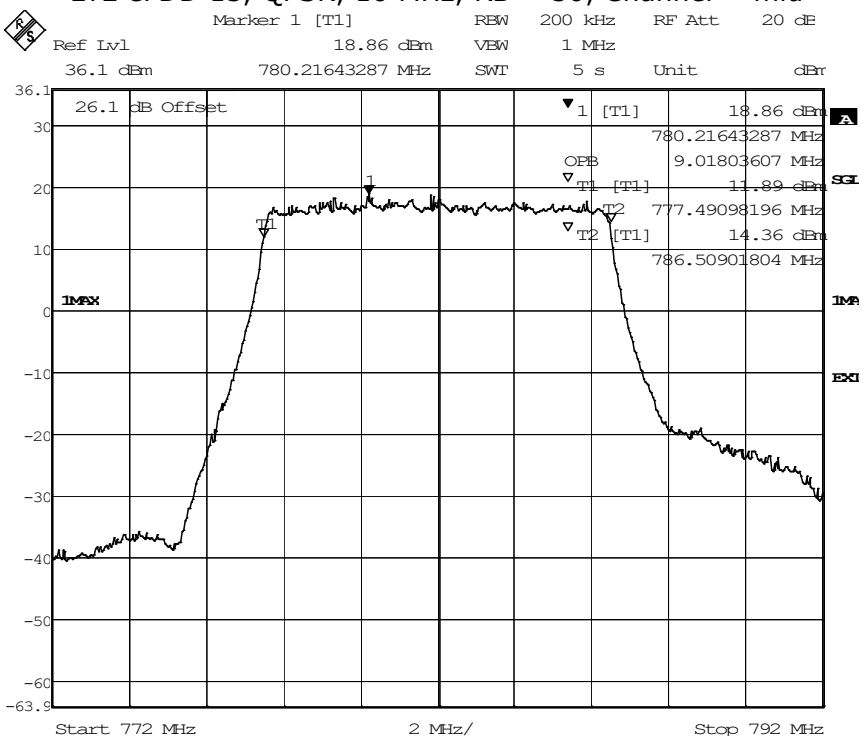


LTE eFDD 12, QPSK, 3 MHz, RB = 12, Channel = mid



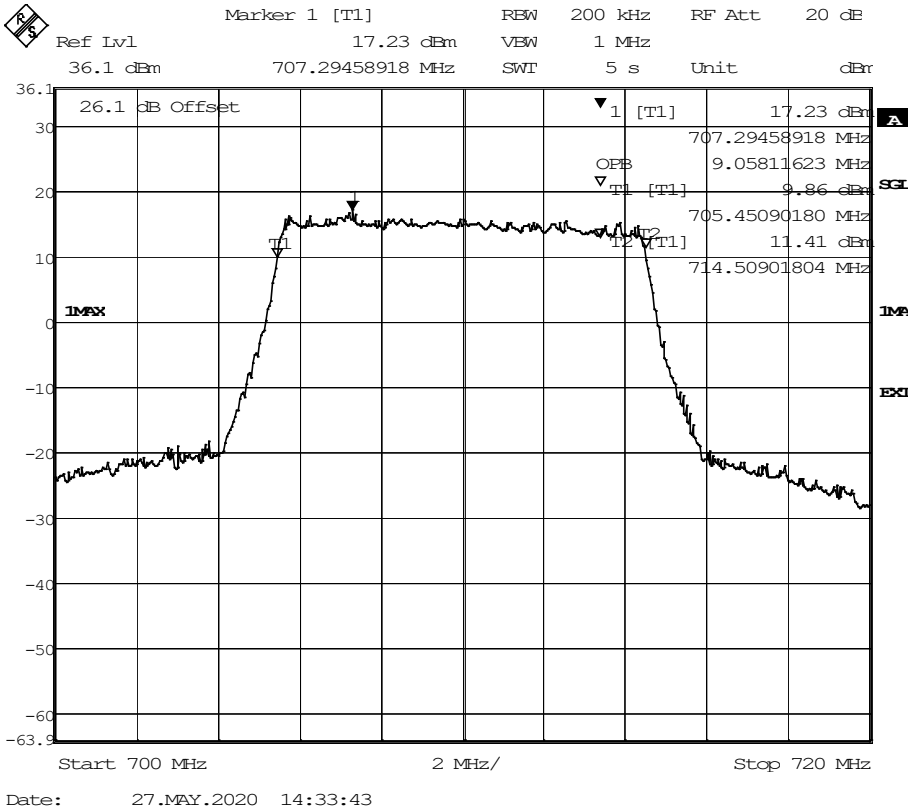
Date: 21.MAY.2020 12:31:38

LTE eFDD 13, QPSK, 10 MHz, RB = 50, Channel = mid



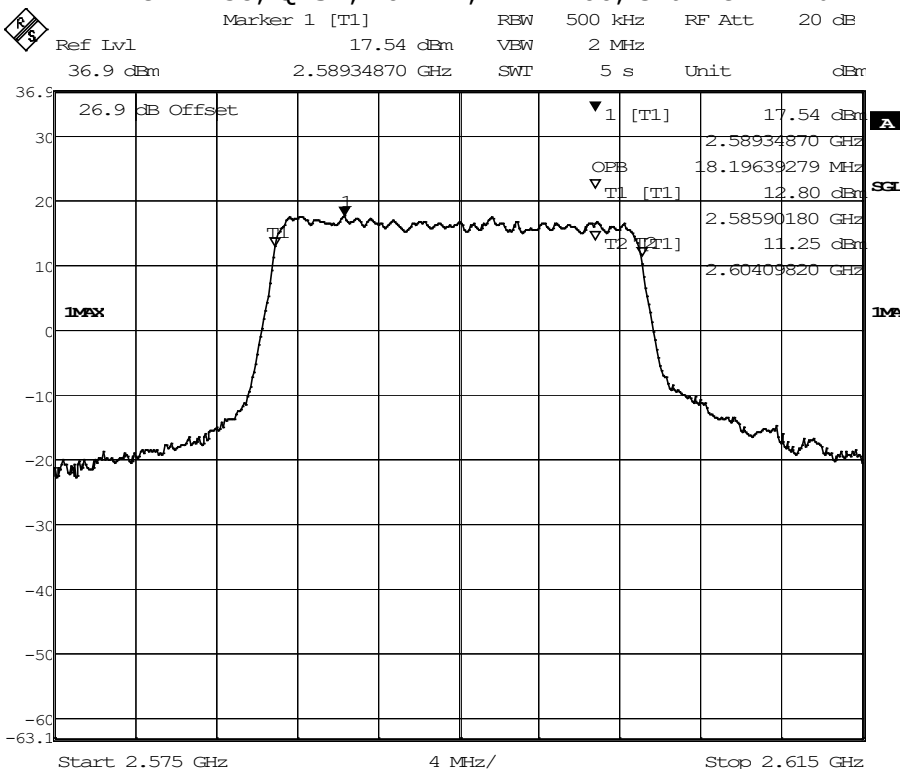
Date: 21.MAY.2020 11:55:02

LTE eFDD 17, QPSK, 10 MHz, RB = 50, Channel = mid



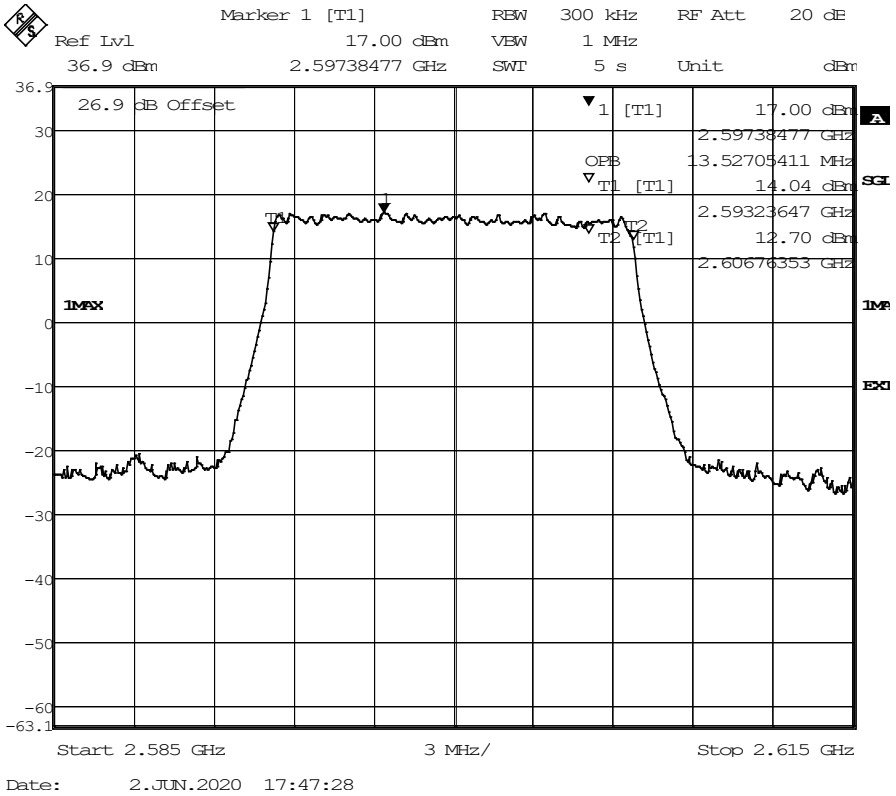
Date: 27.MAY.2020 14:33:43

LTE eTDD 38, QPSK, 20 MHz, RB = 100, Channel = mid

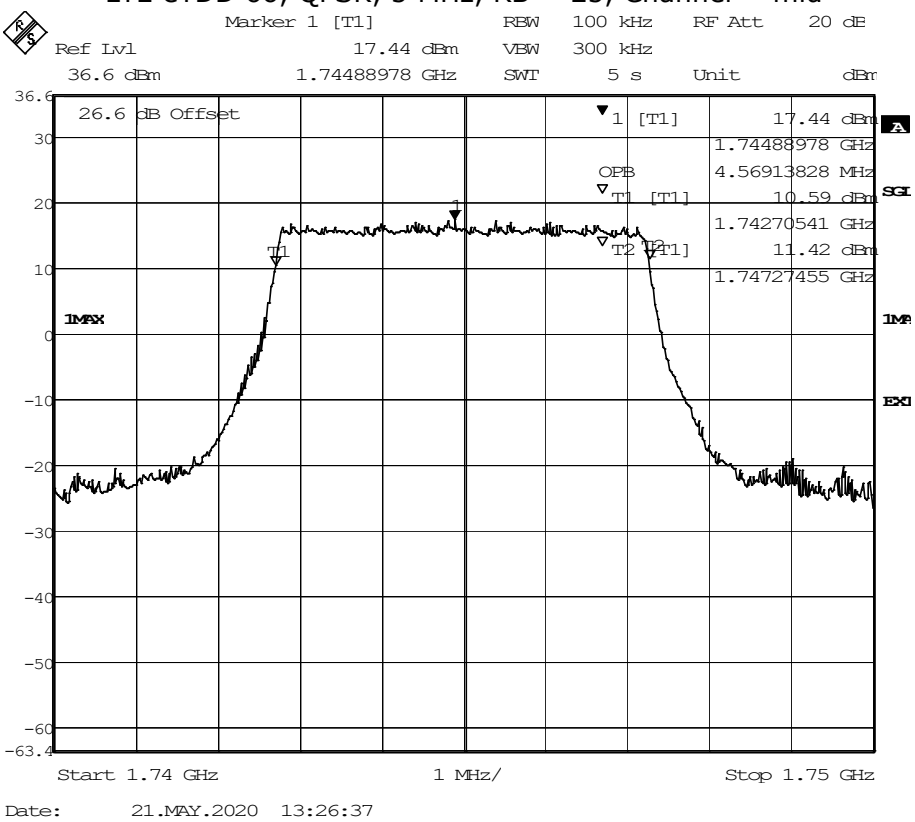


Date: 4.JUN.2020 12:19:07

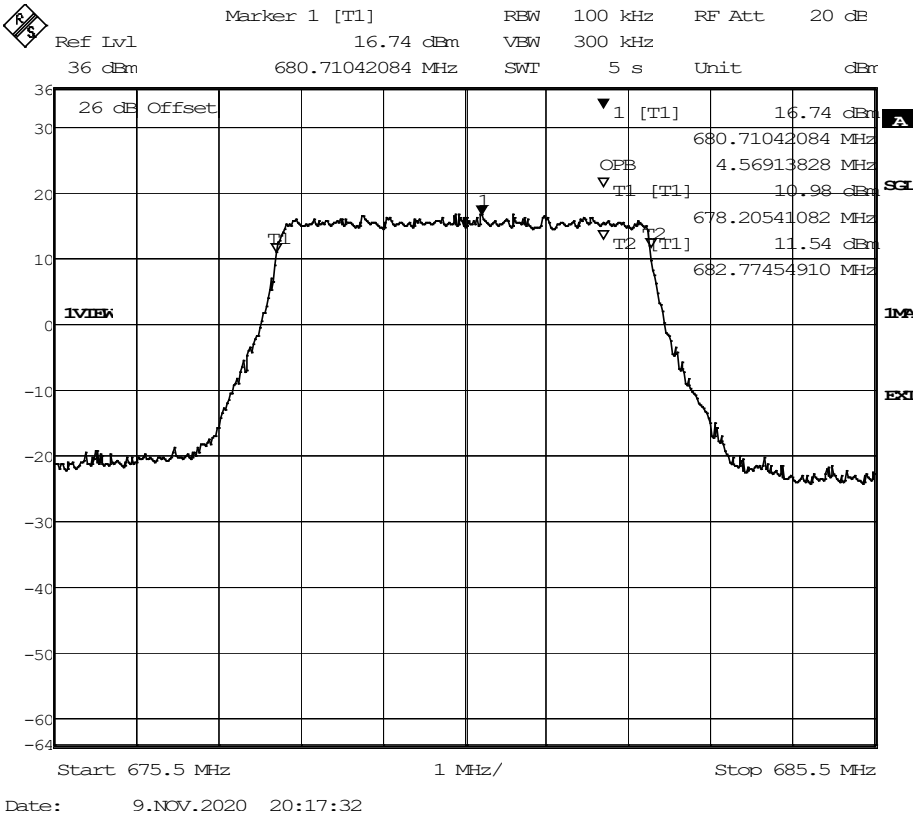
LTE eTDD 41, QPSK, 15 MHz, RB = 75, Channel = mid



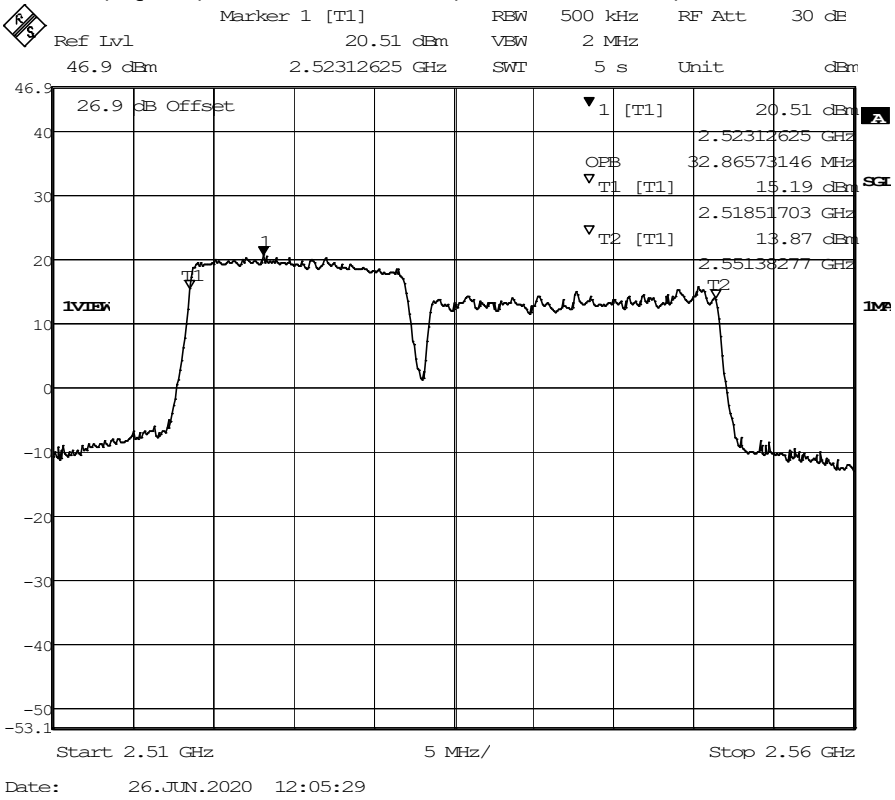
LTE eTDD 66, QPSK, 5 MHz, RB = 25, Channel = mid



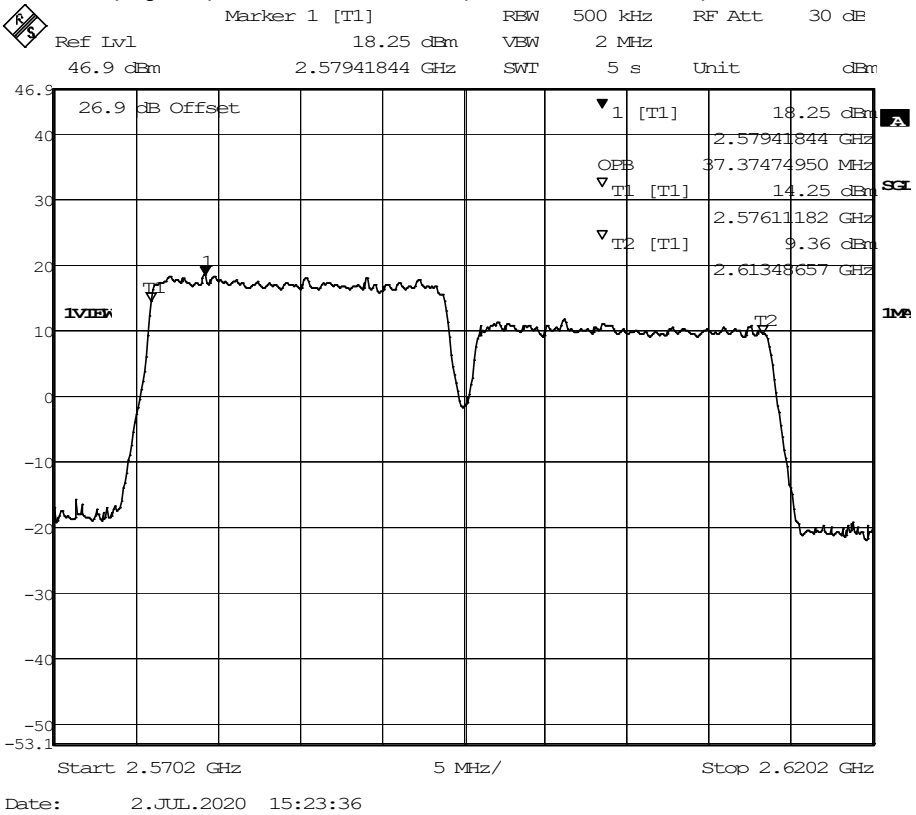
LTE eTDD 71, QPSK, 5 MHz, RB = 25, Channel = mid



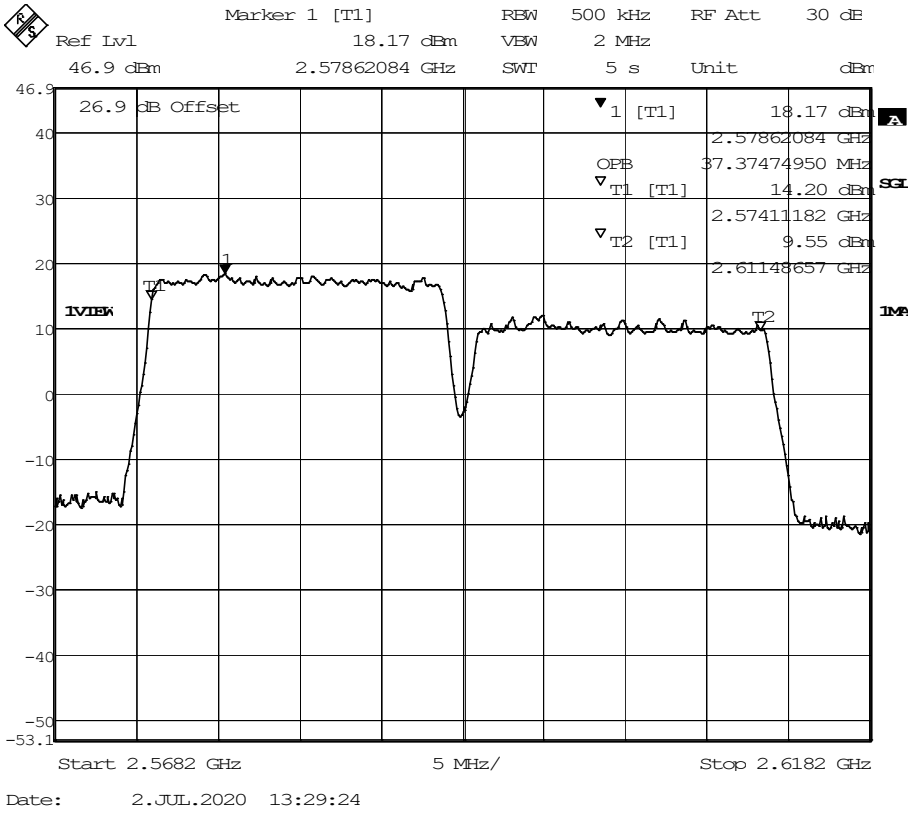
CA_7C, QPSK, 15 MHz & 20 MHz, RB = 75 & 100, Channel = mid



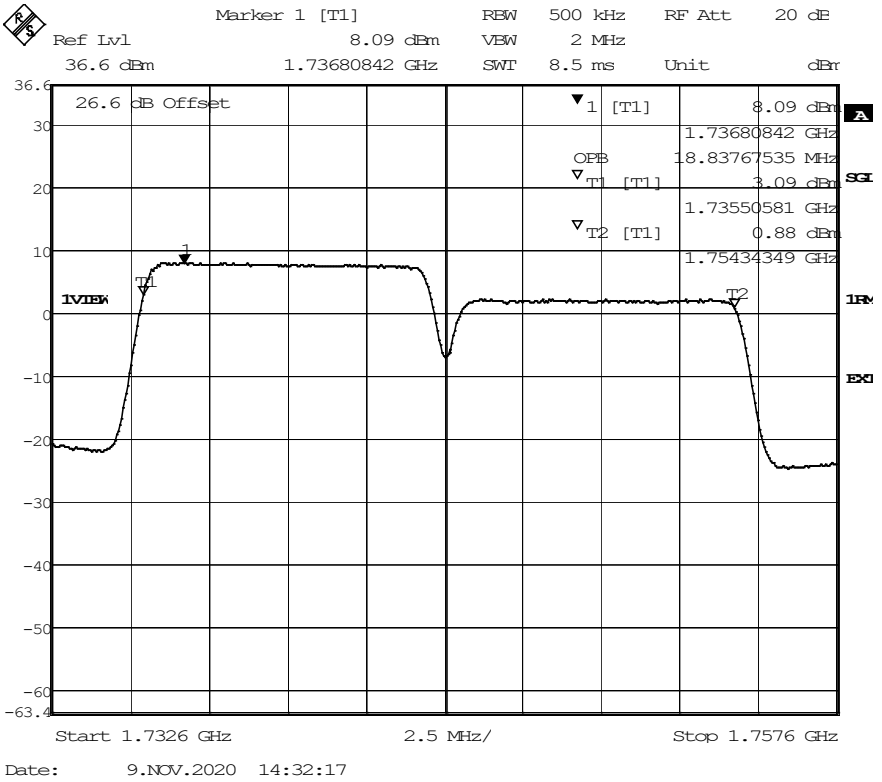
CA_38C, QPSK, 20 MHz & 20 MHz, RB = 100 & 100, Channel = mid



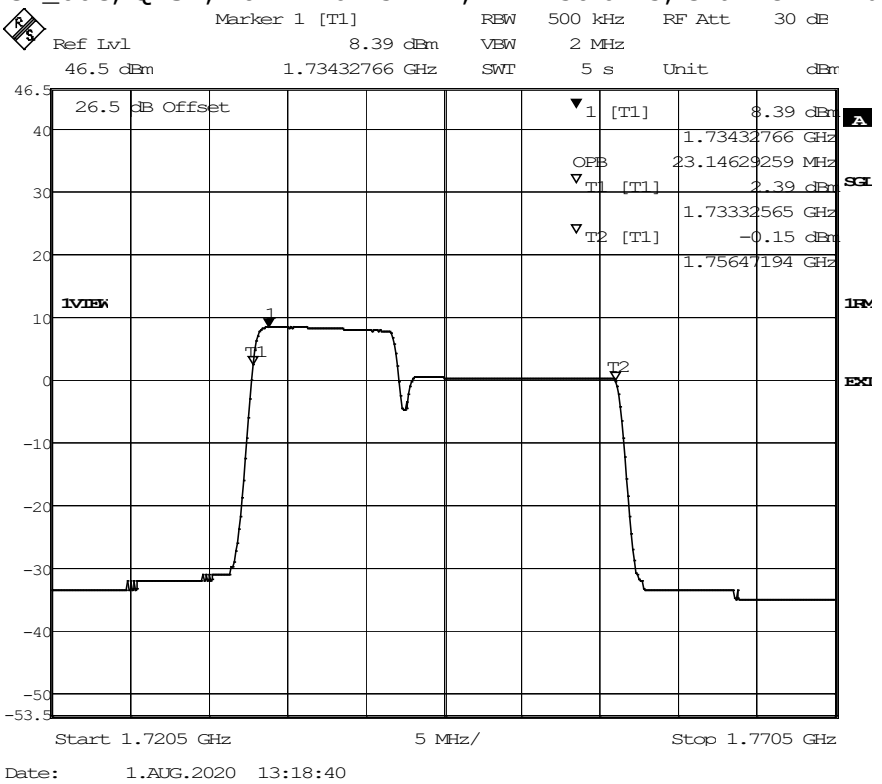
CA_41C, QPSK, 20 MHz & 20 MHz, RB = 100 & 100, Channel = mid



CA_66B, QPSK, 10 MHz & 10 MHz, RB = 50 & 50, Channel = mid



CA_66C, QPSK, 10 MHz & 15 MHz, RB = 50 & 75, Channel = mid



5.19.5 TEST EQUIPMENT USED

- Radio Lab

5.20 BAND EDGE COMPLIANCE

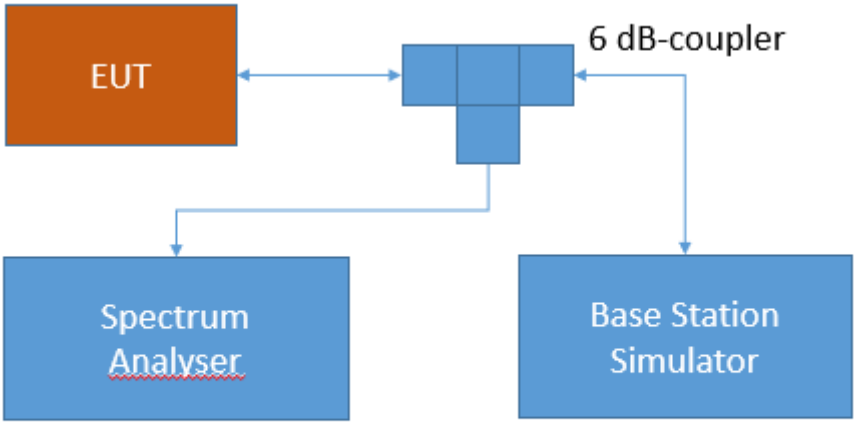
Standard **FCC PART 27 Subpart C**

The test was performed according to:
ANSI C63.26: 2015

5.20.1 TEST DESCRIPTION

This test case is intended to demonstrate compliance to the applicable conducted spurious emission test case per § 2. 1051 and RSS-GEN 6.13. The limit comes from the applicable rule part and ISED RSS-Standard for the operating band of the cellular device.

The EUT was connected to the test setup according to the following diagram:



Test Setup FCC Part 22/24/27/90 Cellular;
Band edge compliance

The attenuation of the measuring and stimulus path are known for each measured frequency and are considered.

The Spectrum Analyzer settings can be directly found in the measurement diagrams.

5.20.2 TEST REQUIREMENTS / LIMITS

FCC Part 2.1051; Measurement required: Spurious emissions at antenna terminal:

The radio frequency voltage or powers generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of each harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in §2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified.

FCC Part 27; Miscellaneous Wireless Communication Services

Subpart C – Technical standards

§27.53 - Emission limits

Band 13

(c) For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;

(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;

(3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations;

(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations;

(5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;

(f) For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to −70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and −80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

(6) Compliance with the provisions of paragraphs (c)(3) and (c)(4) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

RSS-130; 4.7.1 General unwanted emissions limits

The unwanted emissions in any 100 kHz bandwidth on any frequency outside the low frequency edge and the high frequency edge of each frequency block range(s), shall be attenuated below the transmitter power, P (dBW), by at least 43 + 10 $\log_{10}$ p (watts), dB. However, in the 100 kHz band immediately outside of the equipment's frequency block range, a resolution bandwidth of 30 kHz may be employed.

RSS-130; 4.7.2 Additional unwanted emissions limits

In addition to the limit outlined in section 4.7.1 above, equipment operating in the frequency bands 746-756 MHz and 777-787 MHz shall also comply with the following restrictions:

a. the power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power, P (dBW), by at least:

   i. 76 + 10 $\log_{10}$ p (watts), dB, for base and fixed equipment and

   ii. 65 + 10 $\log_{10}$ p (watts), dB, for mobile and portable equipment

b. the e.i.r.p. in the band 1559-1610 MHz shall not exceed −70 dBW/MHz for wideband signal and −80 dBW for discrete emission with bandwidth less than 700 Hz.

Band 12:

(g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

RSS-130; 4.7.1 General unwanted emissions limits

The unwanted emissions in any 100 kHz bandwidth on any frequency outside the low frequency edge and the high frequency edge of each frequency block range(s), shall be attenuated below the transmitter power, P (dBW), by at least 43 + 10 $\log_{10}$ p (watts), dB. However, in the 100 kHz band immediately outside of the equipment's frequency block range, a resolution bandwidth of 30 kHz may be employed.

RSS-130; 4.7.2 Additional unwanted emissions limits

In addition to the limit outlined in section 4.7.1 above, equipment operating in the frequency bands 746-756 MHz and 777-787 MHz shall also comply with the following restrictions:

a. the power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power, P (dBW), by at least:

   i. 76 + 10 $\log_{10}$ p (watts), dB, for base and fixed equipment and

   ii. 65 + 10 $\log_{10}$ p (watts), dB, for mobile and portable equipment

b. the e.i.r.p. in the band 1559-1610 MHz shall not exceed −70 dBW/MHz for wideband signal and −80 dBW for discrete emission with bandwidth less than 700 Hz.

Band 4/10/66:

(h) *AWS emission limits*— (1) *General protection levels.* Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 $\log_{10}$ (P) dB.

RSS-139; 6.6 Transmitter Unwanted Emissions

Equipment shall comply with the limits in (i) and (ii) below.

i. In the first 1.0 MHz bands immediately outside and adjacent to the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power per any 1% of the emission bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least 43 + 10 $\log_{10}$ p (watts) dB.

ii. After the first 1.0 MHz outside the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power in any 1 MHz bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least 43 + 10 $\log_{10}$ p (watts) dB.

Band 7:

(m) For BRS and EBS stations, the power of any emissions outside the licensee's frequency bands of operation shall be attenuated below the transmitter power (P) measured in watts in accordance with the standards below. If a licensee has multiple contiguous channels, out-of-band emissions shall be measured from the upper and lower edges of the contiguous channels.

(4) For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

RSS-199; 4.5 Transmitter unwanted emissions

In the 1 MHz band immediately outside and adjacent to the channel edge, the unwanted emission power shall be measured with a resolution bandwidth of at least 1% of the occupied bandwidth for base station and fixed subscriber equipment, and 2% for mobile subscriber equipment. Beyond the 1 MHz band, a resolution bandwidth of 1 MHz shall be used. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full required measurement bandwidth of 1 MHz, or 1% or 2% of the occupied bandwidth, as applicable.

Equipment shall comply with the following unwanted emission limits:

b. for mobile subscriber equipment, the power of any unwanted emissions measured as above shall be attenuated (in dB) below the transmitter power, P (dBW), by at least:

$40 + 10 \log_{10} p$ from the channel edges to 5 MHz away

$43 + 10 \log_{10} p$ between 5 MHz and X MHz from the channel edges, and

$55 + 10 \log_{10} p$ at X MHz and beyond from the channel edges

In addition, the attenuation shall not be less than $43 + 10 \log_{10} p$ on all frequencies between 2490.5 MHz and 2496 MHz, and $55 + 10 \log_{10} p$ at or below 2490.5 MHz.

In (b), p is the transmitter power measured in watts and X is 6 MHz or the equipment occupied bandwidth, whichever is greater.