

LTE Band 4 Downlink 5MHz Bandwidth Low Channel Band Edge



12:00:44 03.10.2020

The limit should be adjusted with a correction of -3 dB $[10\log(2)]$
accounting for MIMO transmission on both internal antennas

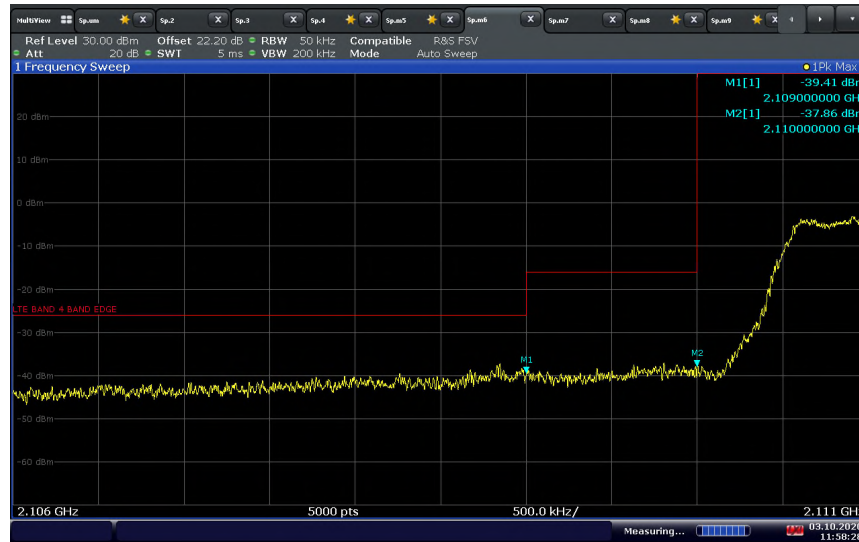
LTE Band 4 Downlink 5MHz Bandwidth High Channel Band Edge



12:03:04 03.10.2020

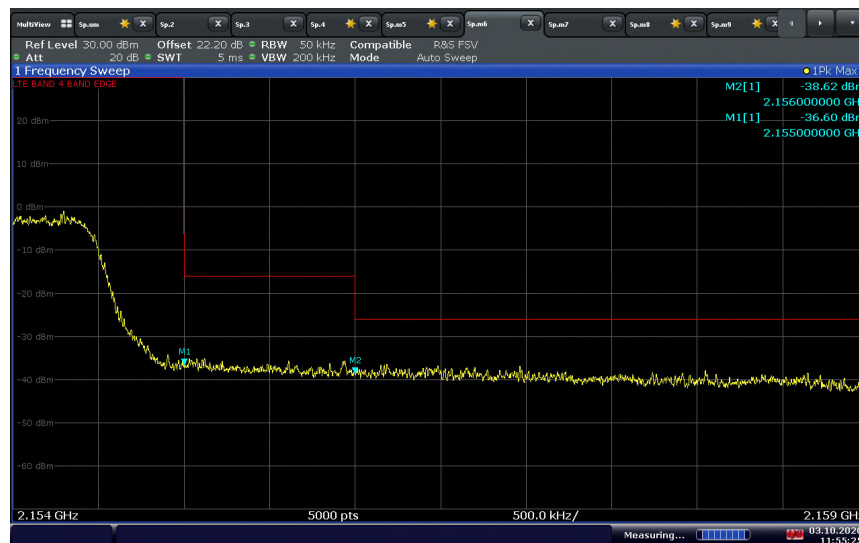
The limit should be adjusted with a correction of -3 dB $[10\log(2)]$
accounting for MIMO transmission on both internal antennas

LTE Band 4 Downlink 10MHz Bandwidth Low Channel Band Edge



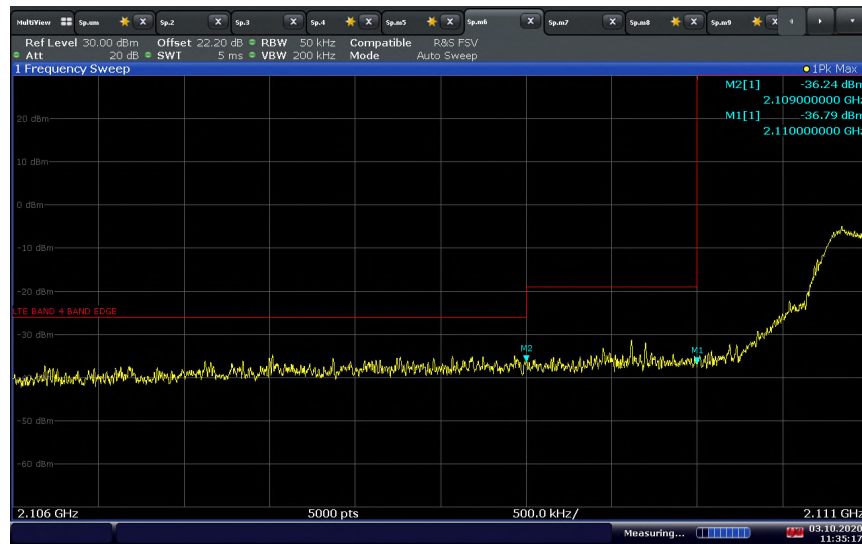
The limit should be adjusted with a correction of -3 dB $[10\log(2)]$ accounting for MIMO transmission on both internal antennas

LTE Band 4 Downlink 10MHz Bandwidth High Channel Band Edge



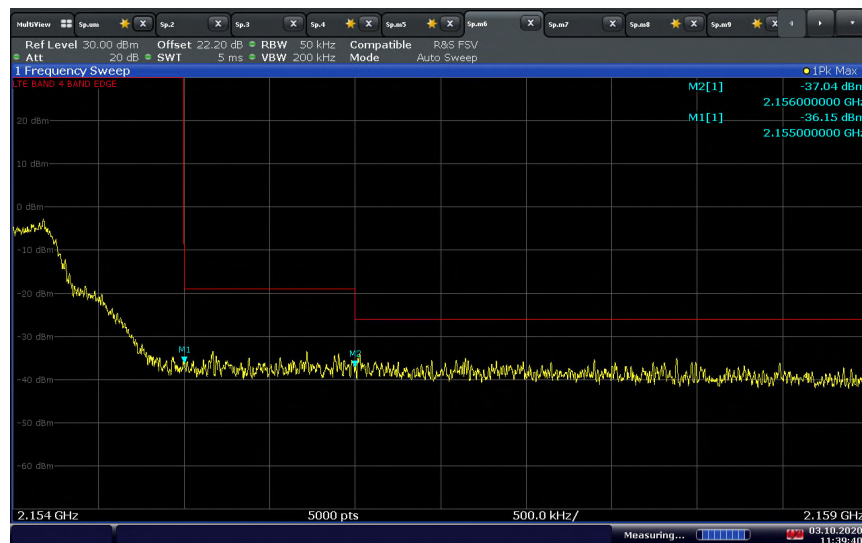
The limit should be adjusted with a correction of -3 dB $[10\log(2)]$ accounting for MIMO transmission on both internal antennas

LTE Band 4 Downlink 15MHz Bandwidth Low Channel Band Edge



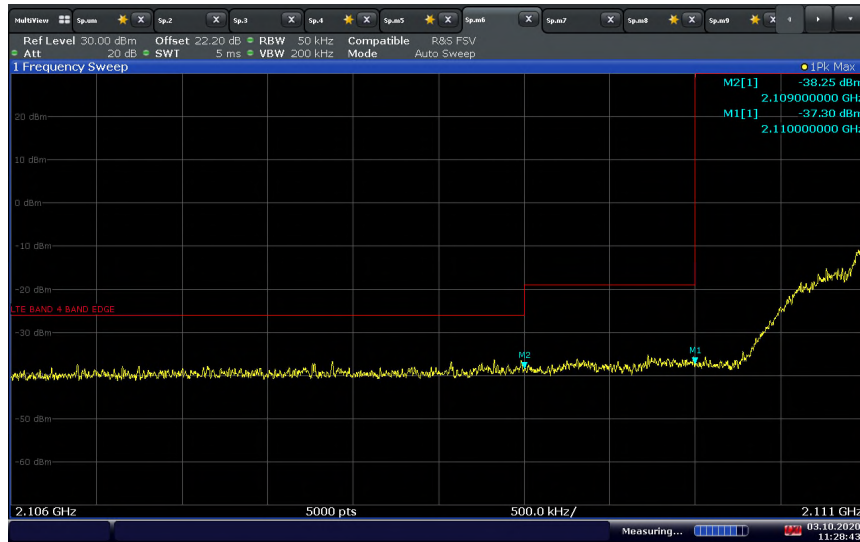
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LTE Band 4 Downlink 15MHz Bandwidth High Channel Band Edge



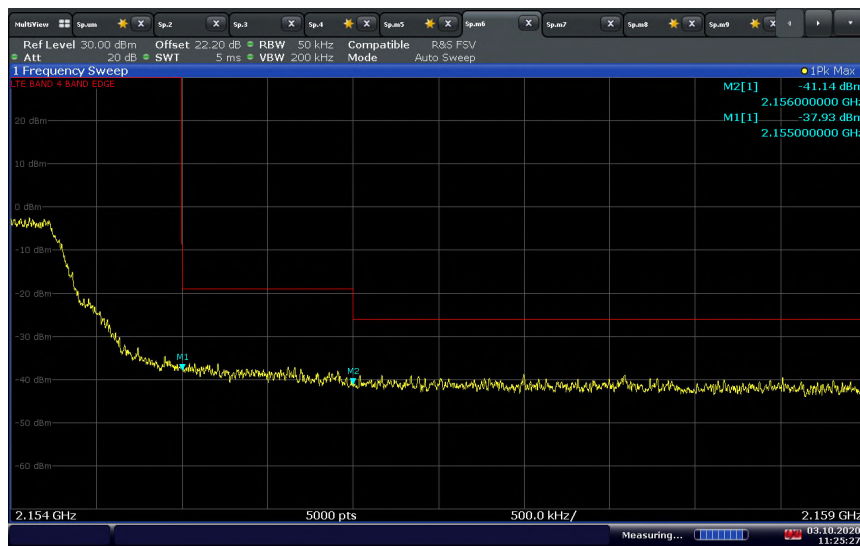
The limit should be adjusted with a correction of -3 dB $[10\log(2)]$ accounting for MIMO transmission on both internal antennas

LTE Band 4 Downlink 20MHz Bandwidth Low Channel Band Edge



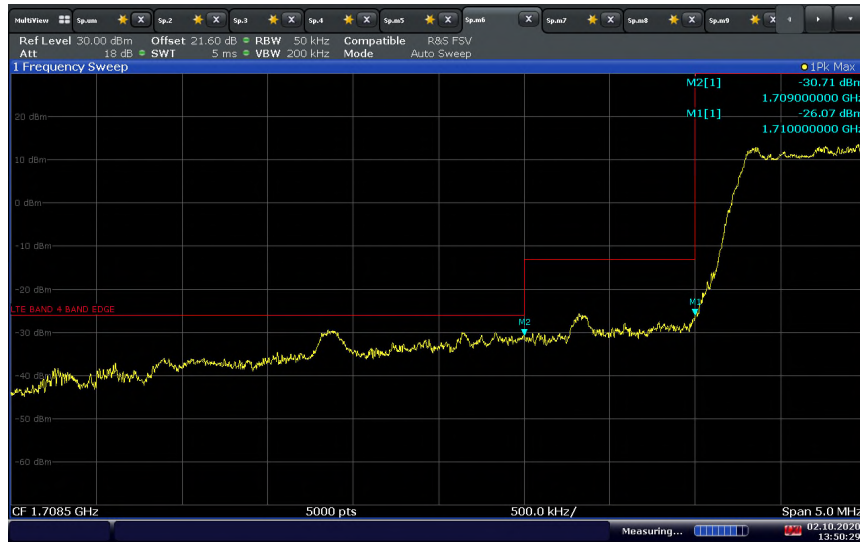
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LTE Band 4 Downlink 20MHz Bandwidth High Channel Band Edge



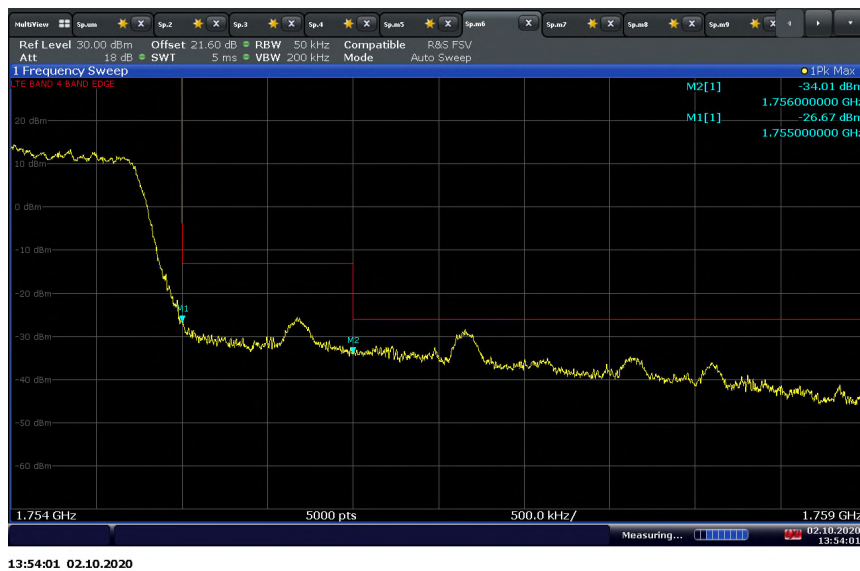
The limit should be adjusted with a correction of -3 dB $[10\log(2)]$ accounting for MIMO transmission on both internal antennas

LTE Band 4 Uplink 5MHz Bandwidth Low Channel Band Edge



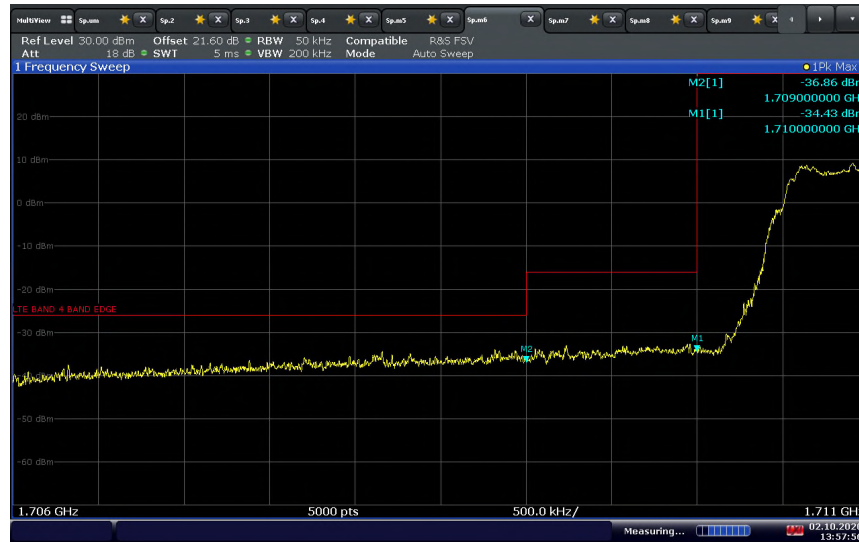
The limit should be adjusted with a correction of -3 dB $[10\log(2)]$ accounting for MIMO transmission on both internal antennas

LTE Band 4 Uplink 5MHz Bandwidth High Channel Band Edge



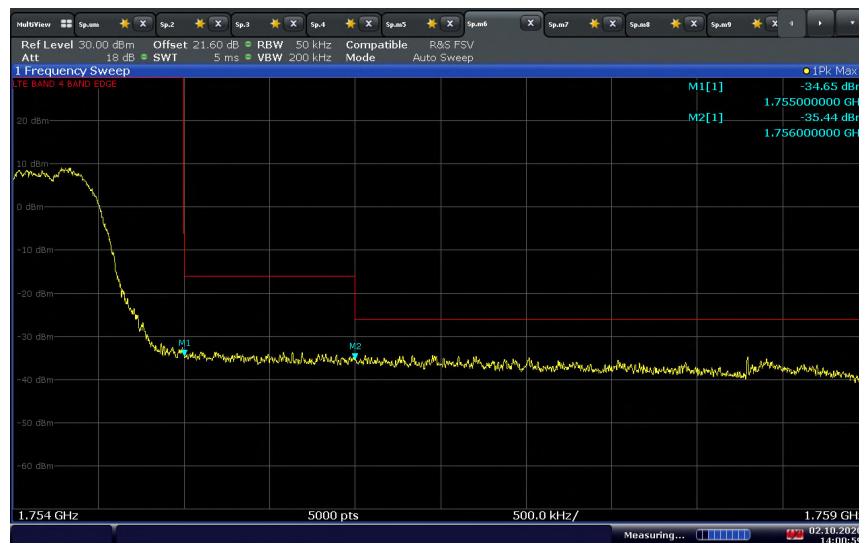
The limit should be adjusted with a correction of -3 dB $[10\log(2)]$ accounting for MIMO transmission on both internal antennas

LTE Band 4 Uplink 10MHz Bandwidth Low Channel Band Edge



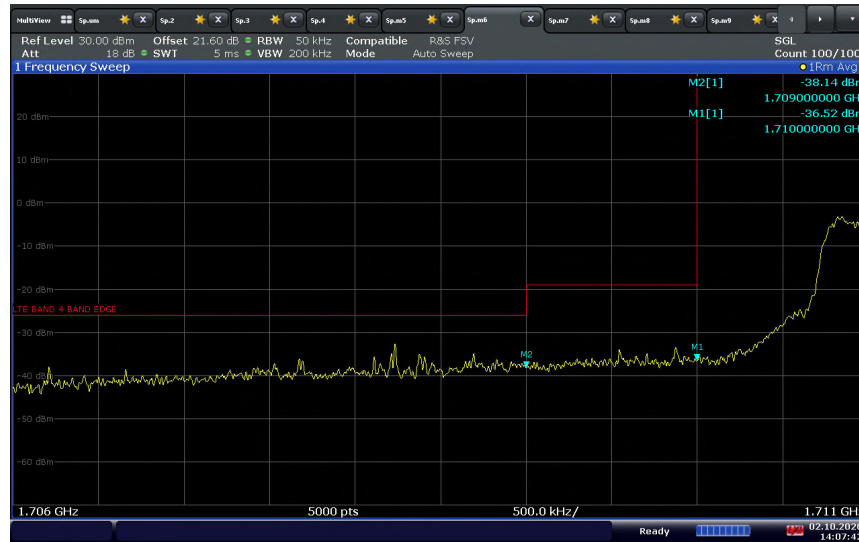
The limit should be adjusted with a correction of -3 dB $[10\log(2)]$ accounting for MIMO transmission on both internal antennas

LTE Band 4 Uplink 10MHz Bandwidth High Channel Band Edge



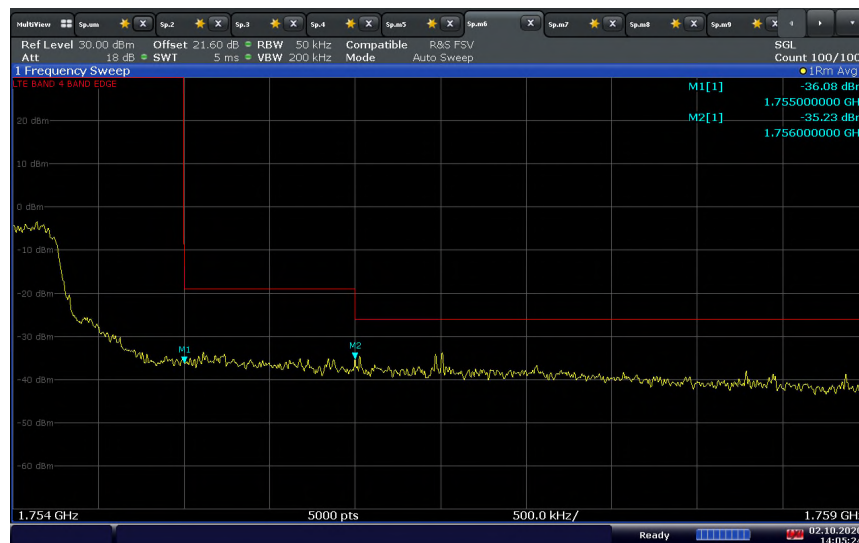
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LTE Band 4 Uplink 15MHz Bandwidth Low Channel Band Edge



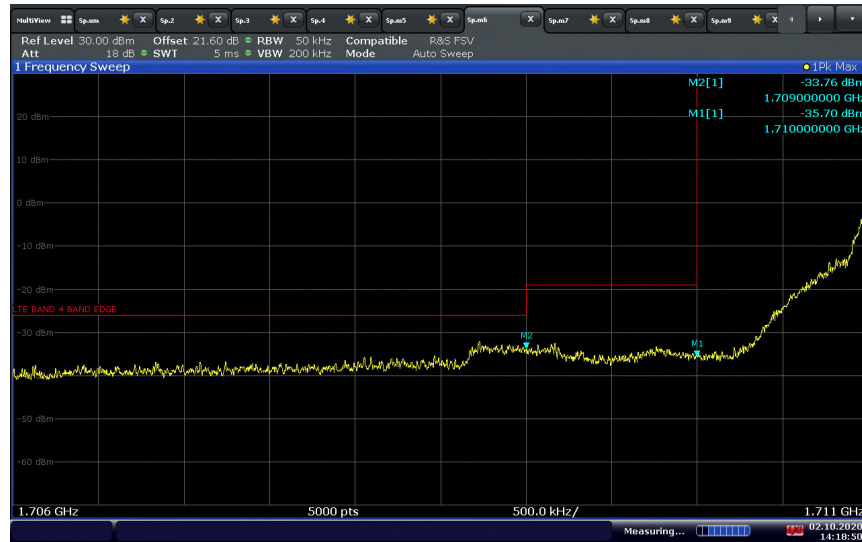
The limit should be adjusted with a correction of -3 dB $[10\log(2)]$ accounting for MIMO transmission on both internal antennas

LTE Band 4 Uplink 15MHz Bandwidth High Channel Band Edge



The limit should be adjusted with a correction of -3 dB $[10\log(2)]$ accounting for MIMO transmission on both internal antennas

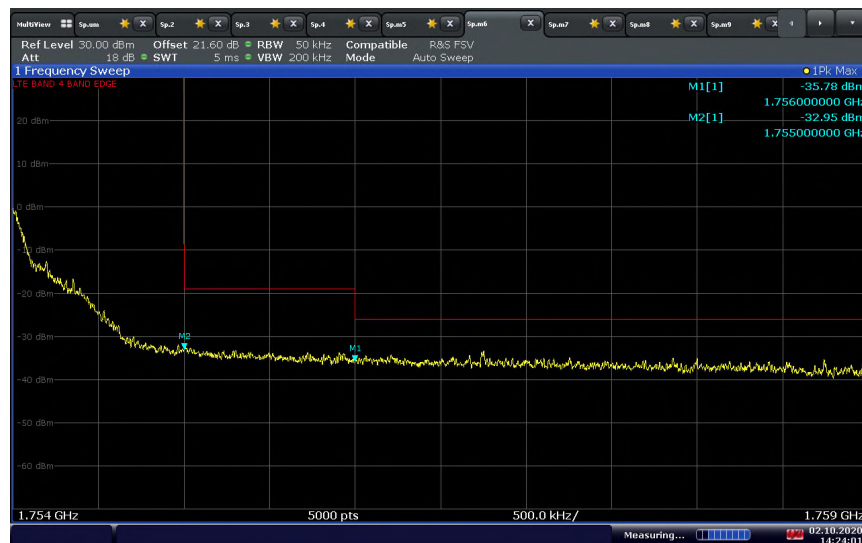
LTE Band 4 Uplink 20MHz Bandwidth Low Channel Band Edge



14:18:51 02.10.2020

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LTE Band 4 Uplink 20MHz Bandwidth High Channel Band Edge



14:24:01 02.10.2020

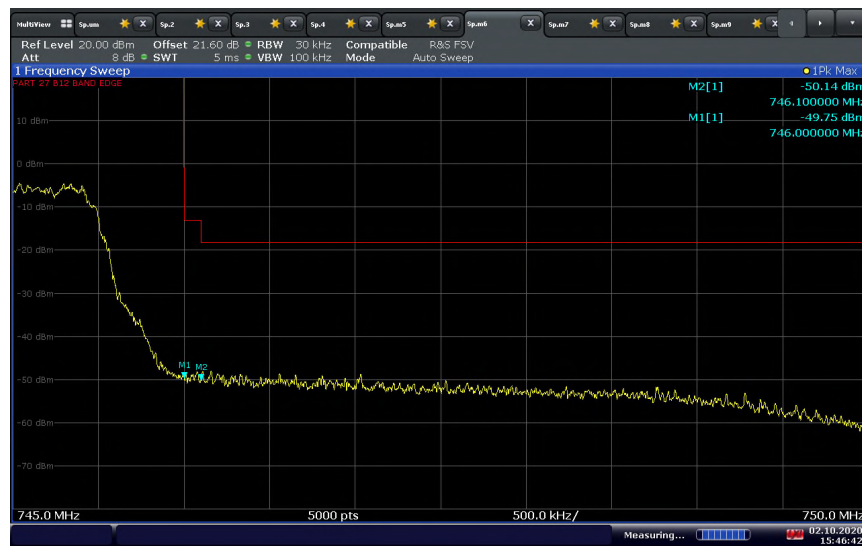
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LTE Band 12 Downlink 5MHz Bandwidth Low Channel Band Edge



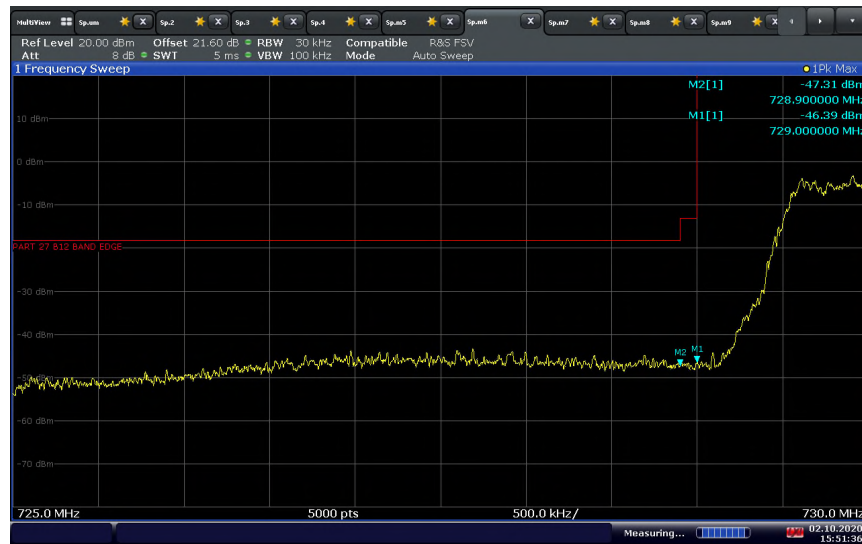
The limit should be adjusted with a correction of -3 dB $[10\log(2)]$ accounting for MIMO transmission on both internal antennas

LTE Band 12 Downlink 5MHz Bandwidth High Channel Band Edge



The limit should be adjusted with a correction of -3 dB $[10\log(2)]$ accounting for MIMO transmission on both internal antennas

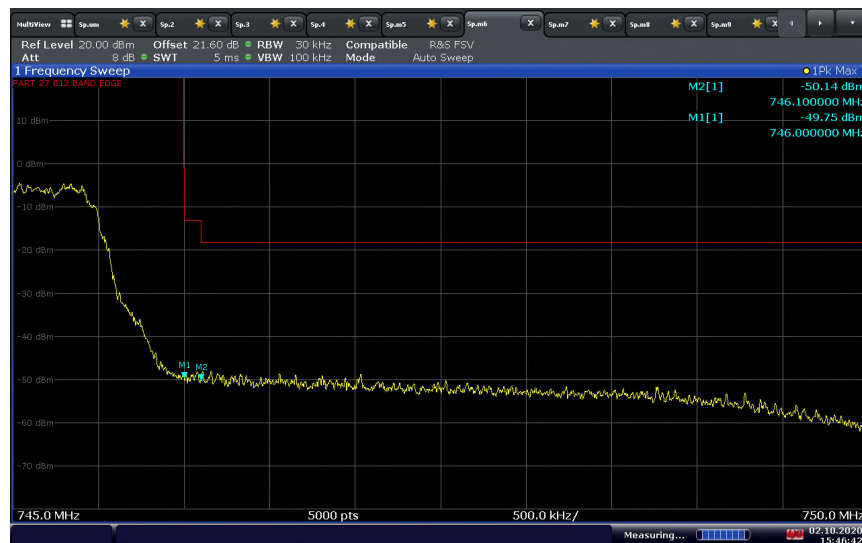
LTE Band 12 Downlink 10MHz Bandwidth Low Channel Band Edge



15:51:37 02.10.2020

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accounting for MIMO transmission on both internal antennas

LTE Band 12 Downlink 10MHz Bandwidth High Channel Band Edge



15:46:42 02.10.2020

The limit should be adjusted with a correction of -3 dB $[10\log(2)]$
accounting for MIMO transmission on both internal antennas

LTE Band 12 Uplink 5MHz Bandwidth Low Channel Band Edge



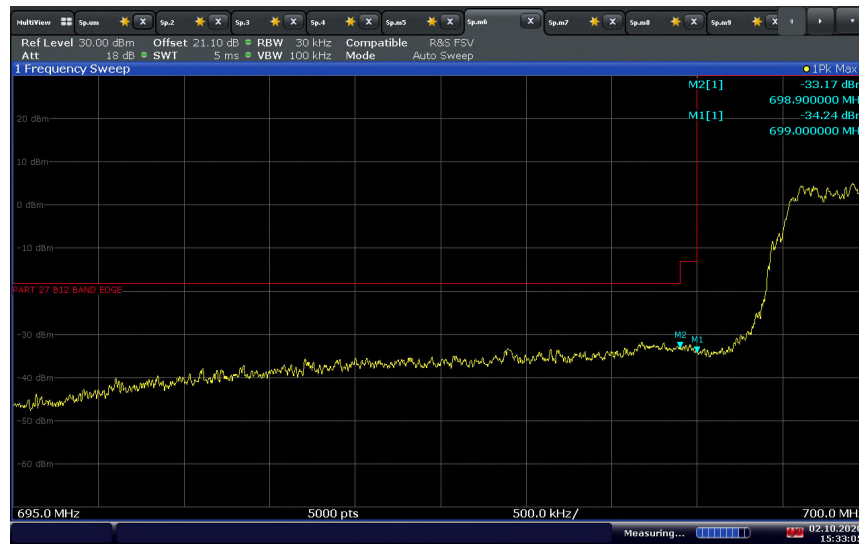
The limit should be adjusted with a correction of -3 dB $[10\log(2)]$ accounting for MIMO transmission on both external antennas

LTE Band 12 Uplink 5MHz Bandwidth High Channel Band Edge



The limit should be adjusted with a correction of -3 dB $[10\log(2)]$ accounting for MIMO transmission on both external antennas

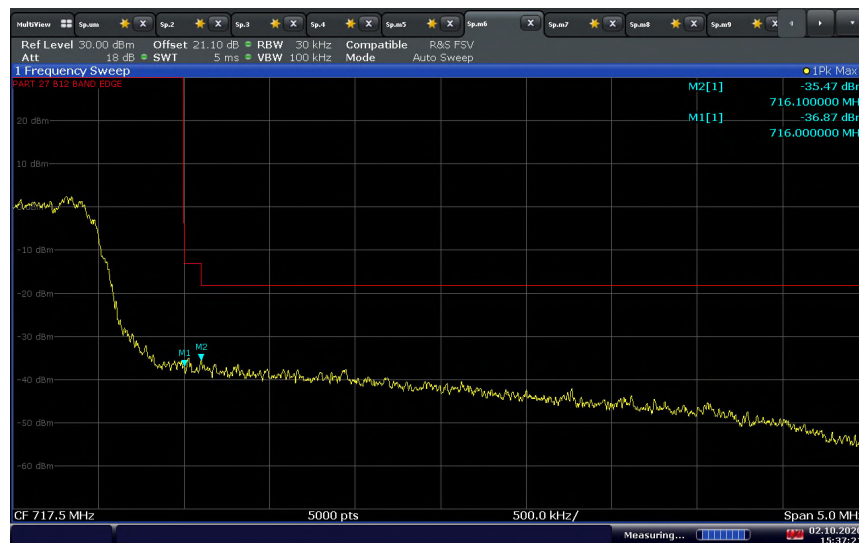
LTE Band 12 Uplink 10MHz Bandwidth Low Channel Band Edge



15:33:05 02.10.2020

The limit should be adjusted with a correction of -3 dB $[10\log(2)]$
accounting for MIMO transmission on both external antennas

LTE Band 12 Uplink 10MHz Bandwidth High Channel Band Edge



15:37:22 02.10.2020

The limit should be adjusted with a correction of -3 dB $[10\log(2)]$
accounting for MIMO transmission on both external antennas



2.7 CONDUCTED SPURIOUS EMISSIONS

2.7.1 Specification Reference

FCC 47 CFR Part 2, Clause 2.1051
FCC 47 CFR Part 24, Clause 24.238(a)(b)
FCC 47 CFR Part 27, Clause 27.53(h)(1)(3)
FCC 47 CFR Part 27, Clause 27.53(g)
RSS-133, Clause 6.5
RSS-130, Clause 4.7

2.7.2 Standard Applicable

FCC 47 CFR Part 27, Clause 24.238:

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

FCC 47 CFR Part 27, Clause 27.53:

(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 MHz 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.

(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-133, Clause 6.5:

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

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

ii. After the first 1.0 MHz, the emission power in any 1 MHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least $43 + 10 \log_{10}p(\text{watts})$. If the measurement is performed using 1% of the emission bandwidth, power integration over 1.0 MHz is required.

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 $43 + 10 \log_{10} p(\text{watts})$, 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.



2.7.3 Equipment Under Test and Modification State

Serial No: NU: 976036000256 and CU: 977036000055 / Test Configuration A and B

2.7.4 Date of Test/Initial of test personnel who performed the test

September 30 to October 02, 2020 / XYZ

2.7.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

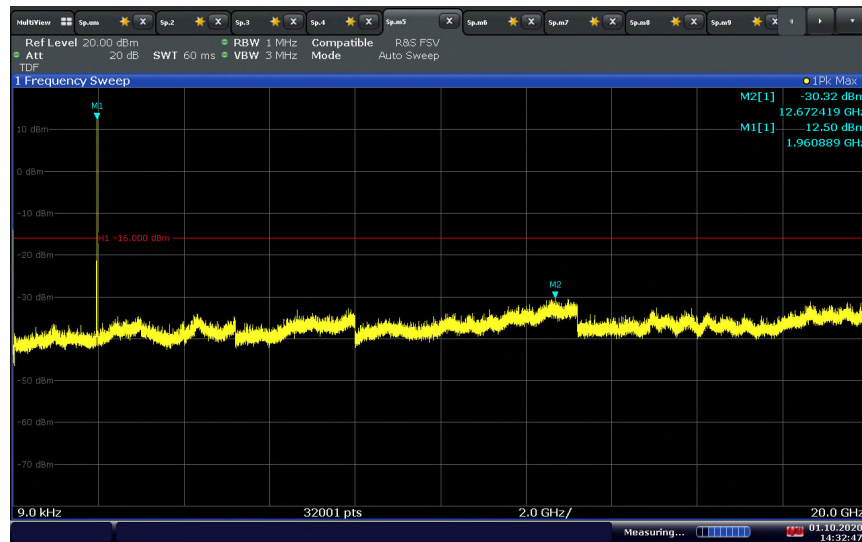
2.7.6 Environmental Conditions/ Test Location

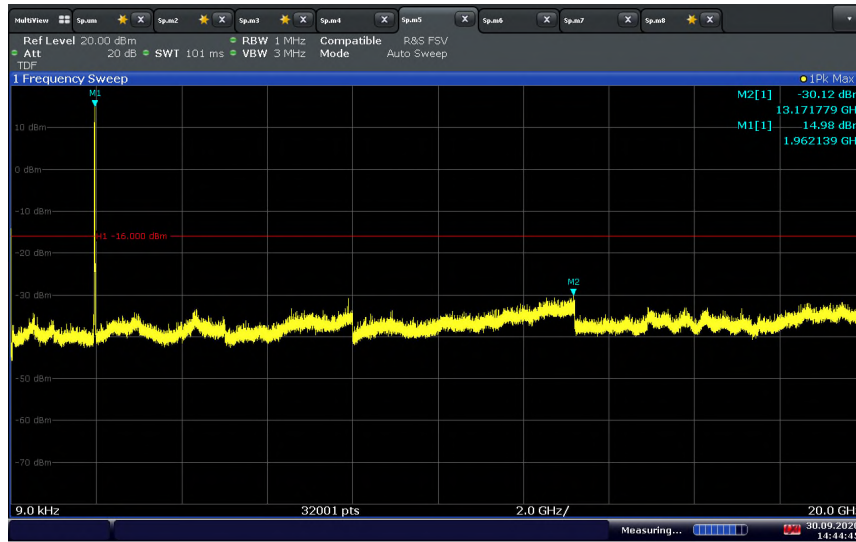
Test performed at TÜV SÜD America Inc. Rancho Bernardo facility

Ambient Temperature	23.0 °C
Relative Humidity	39.1 %
ATM Pressure	98.8 kPa

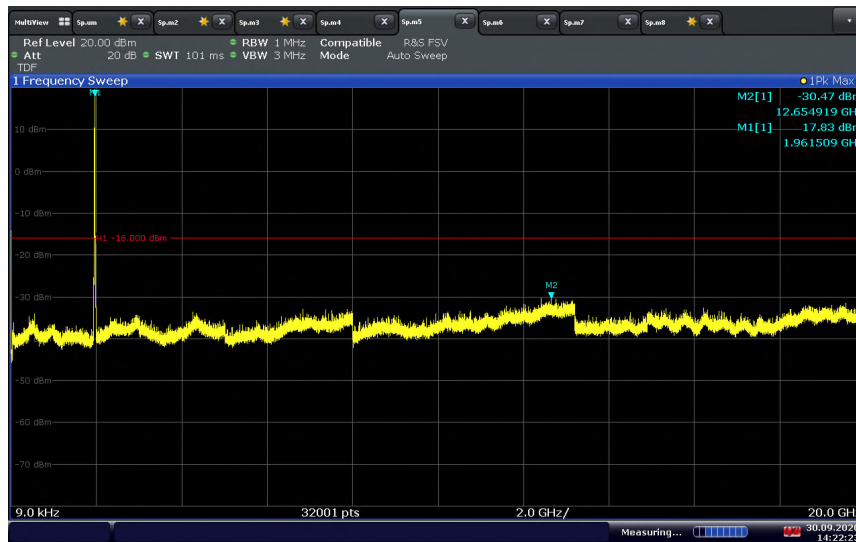
2.7.7 Additional Observations

- This is a conducted test.
- Test guidance is per Section 6.1 of KDB971168 (D01 Power Meas License Digital Systems v03r01).
- The transducer factor (TDF) used is from the external attenuators and cables used.
- EUT Downlink transmits on two internal antennas and uplink transmits on two external antennas simultaneously in the same frequency range, i.e. TX MIMO mode. However, there is no much difference between two antenna ports and the measurement was performed on one antenna port as representative configuration. The limit was adjusted with a correction of -3 dB [10Log(2)] by using Measure and Add 10Log(N) dB technique according to FCC KDB 662911 D01 Multiple Transmitter Output accounting for simultaneous transmission from two internal or external antenna ports.
- Detector is peak and trace is set to max hold as the worst case setting.
- The spectrum was searched from 9 kHz to up to the 10th harmonic
- All low, middle and high channels for all supporting bandwidths were verified and only middle channel presented in this test report as representative configuration.

2.7.8 Test Results**LTE Band 2 Downlink 5MHz Bandwidth Middle Channel Conducted Spurious Emissions****LTE Band 2 Downlink 10MHz Bandwidth Middle Channel Conducted Spurious Emissions**

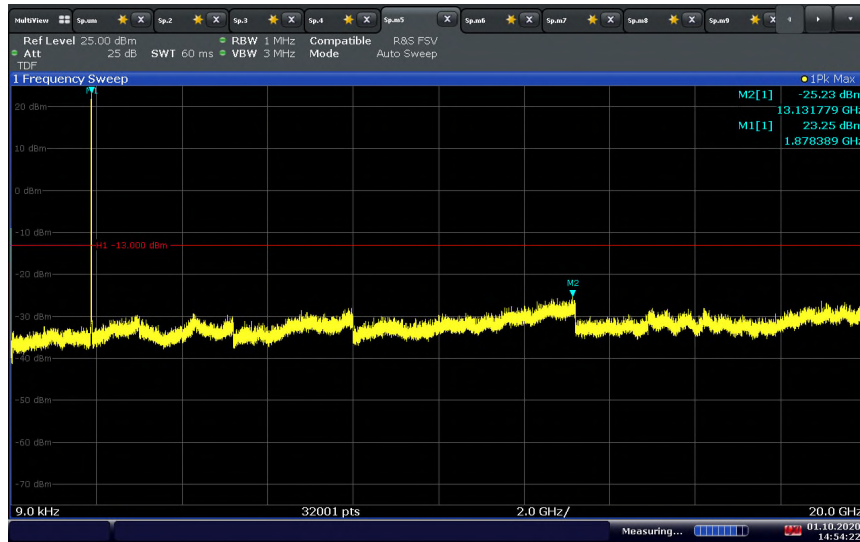
LTE Band 2 Downlink 15MHz Bandwidth Middle Channel Conducted Spurious Emissions

14:44:45 30.09.2020

LTE Band 2 Downlink 20MHz Bandwidth Middle Channel Conducted Spurious Emissions

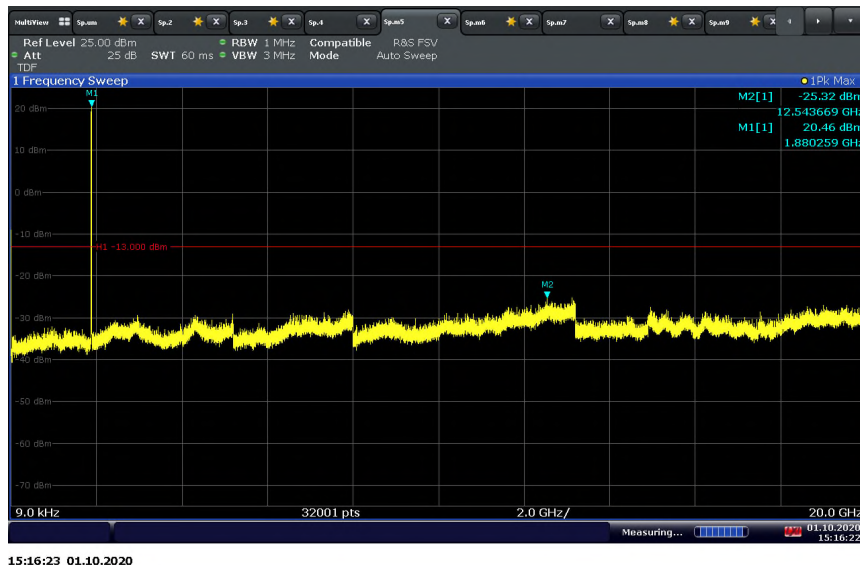
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LTE Band 2 Uplink 5MHz Bandwidth Middle Channel Conducted Spurious Emissions



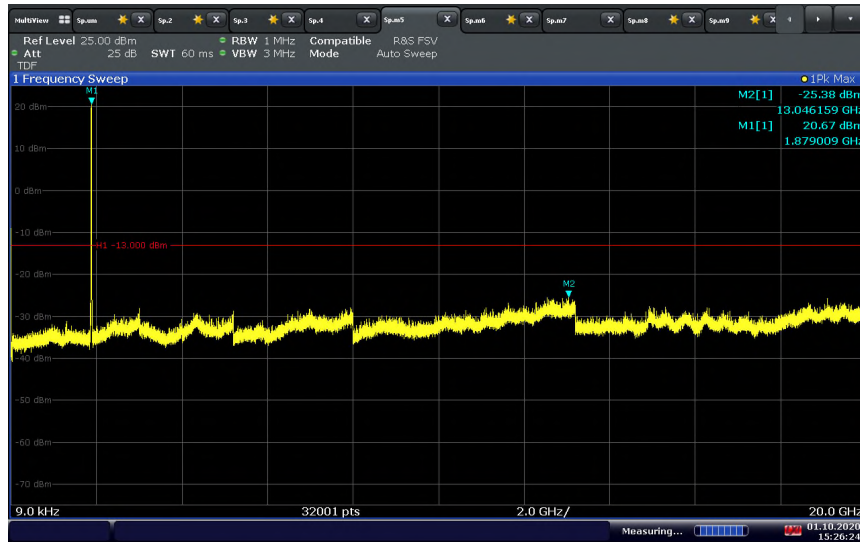
The limit should be adjusted with a correction of -3 dB $[10\log(2)]$
accounting for MIMO transmission on both external antennas
Limit = -13 - 3 = -16 dBm

LTE Band 2 Uplink 10MHz Bandwidth Middle Channel Conducted Spurious Emissions



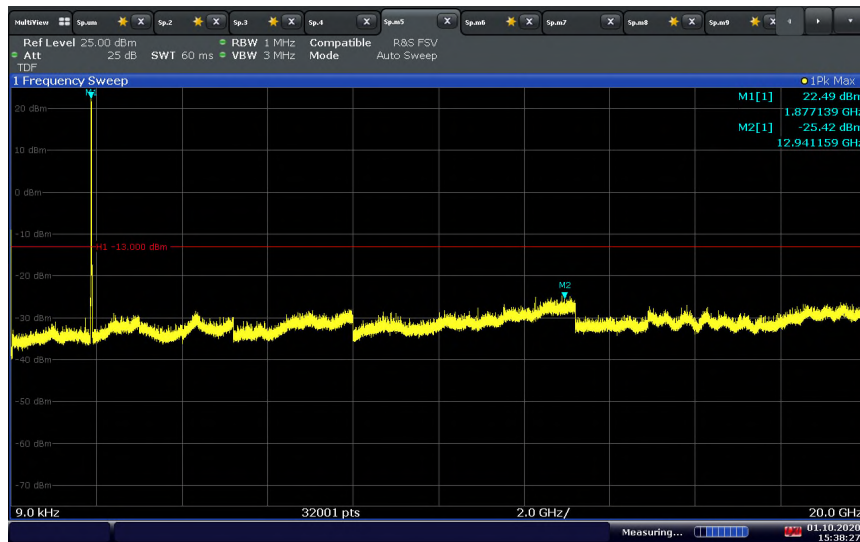
The limit should be adjusted with a correction of -3 dB $[10\log(2)]$
accounting for MIMO transmission on both external antennas
Limit = -13 - 3 = -16 dBm

LTE Band 2 Uplink 15MHz Bandwidth Middle Channel Conducted Spurious Emissions

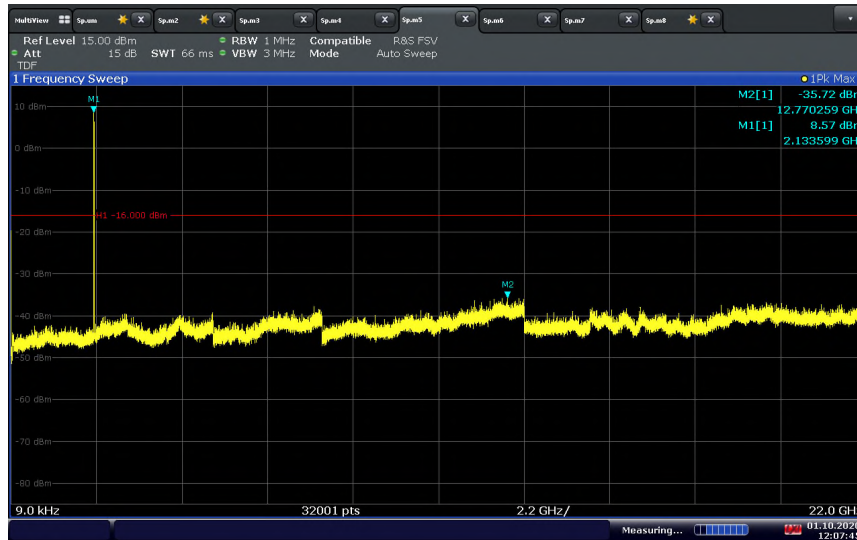


The limit should be adjusted with a correction of -3 dB $[10\log(2)]$
accounting for MIMO transmission on both external antennas
Limit = -13 - 3 = -16 dBm

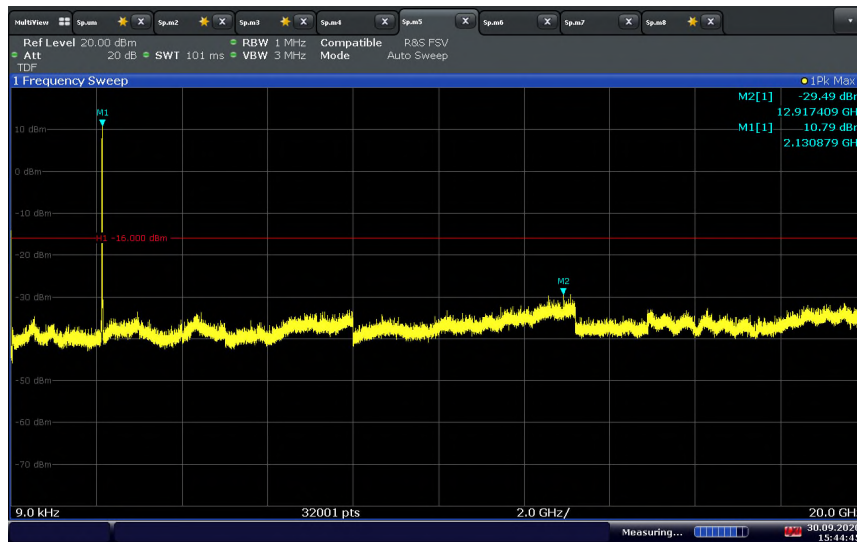
LTE Band 2 Uplink 20MHz Bandwidth Middle Channel Conducted Spurious Emissions



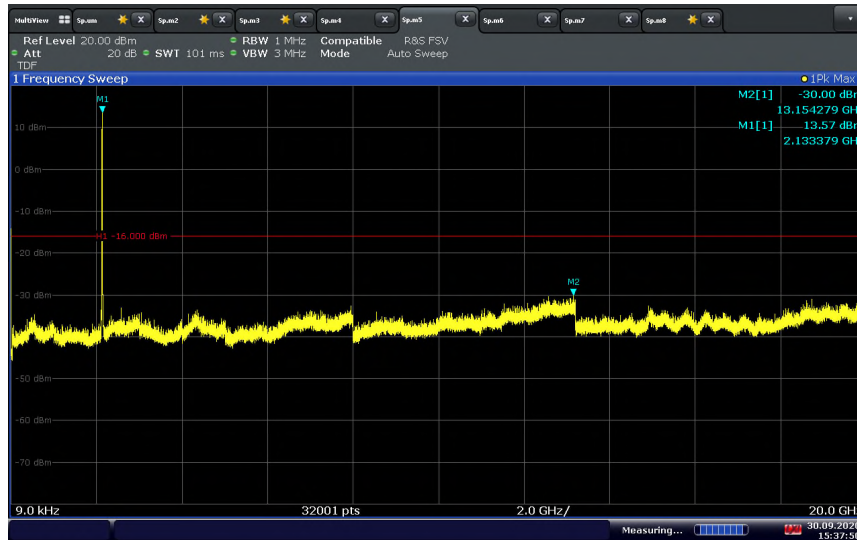
The limit should be adjusted with a correction of -3 dB $[10\log(2)]$
accounting for MIMO transmission on both external antennas
Limit = -13 - 3 = -16 dBm

LTE Band 4 Downlink 5MHz Bandwidth Middle Channel Conducted Spurious Emissions

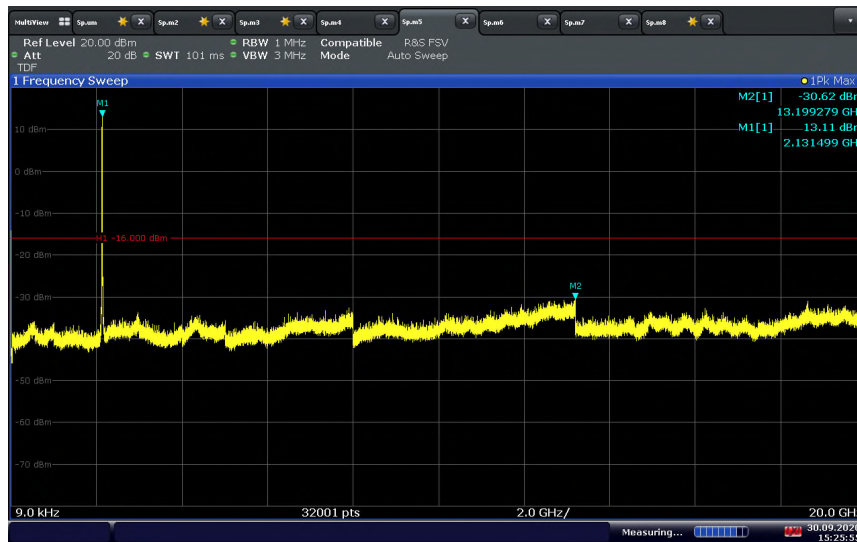
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LTE Band 4 Downlink 10MHz Bandwidth Middle Channel Conducted Spurious Emissions

15:44:45 30.09.2020

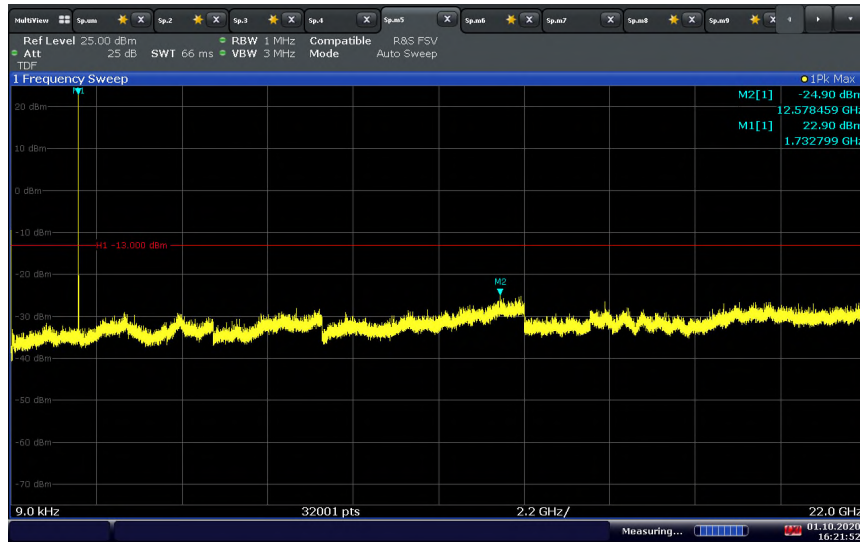
LTE Band 4 Downlink 15MHz Bandwidth Middle Channel Conducted Spurious Emissions

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LTE Band 4 Downlink 20MHz Bandwidth Middle Channel Conducted Spurious Emissions

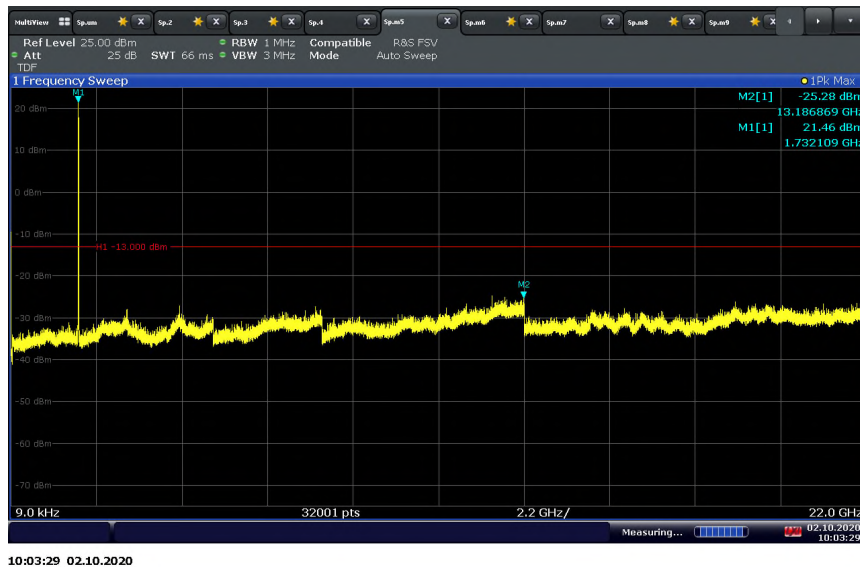
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LTE Band 4 Uplink 5MHz Bandwidth Middle Channel Conducted Spurious Emissions



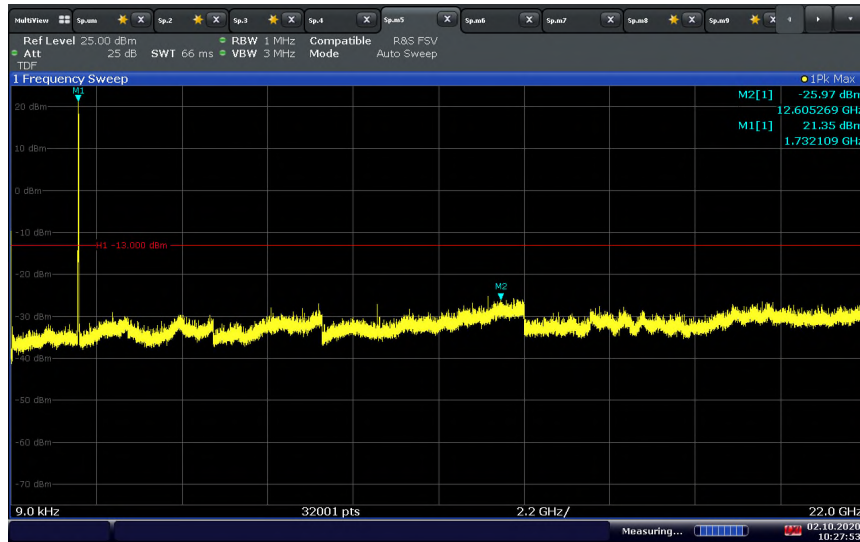
The limit should be adjusted with a correction of -3 dB $[10\log(2)]$
accounting for MIMO transmission on both external antennas
Limit = -13 - 3 = -16 dBm

LTE Band 4 Uplink 10MHz Bandwidth Middle Channel Conducted Spurious Emissions



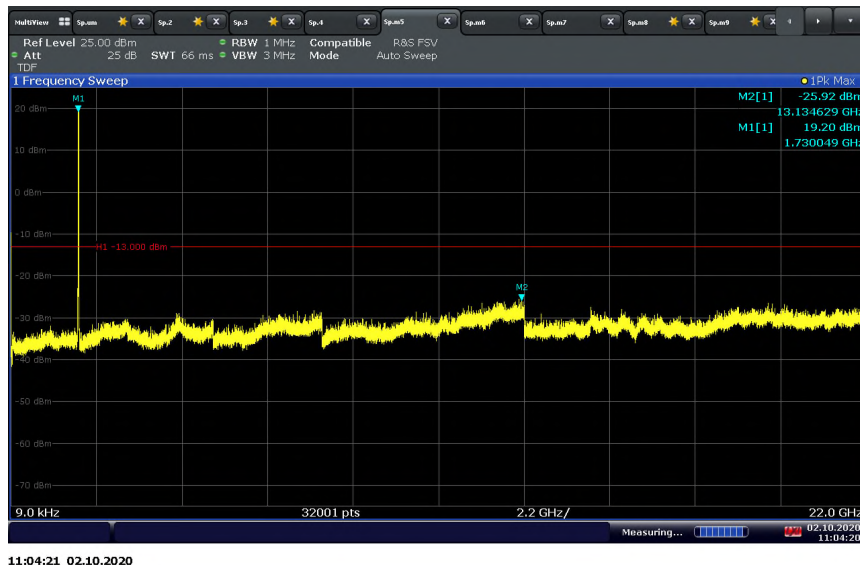
The limit should be adjusted with a correction of -3 dB $[10\log(2)]$
accounting for MIMO transmission on both external antennas
Limit = -13 - 3 = -16 dBm

LTE Band 4 Uplink 15MHz Bandwidth Middle Channel Conducted Spurious Emissions

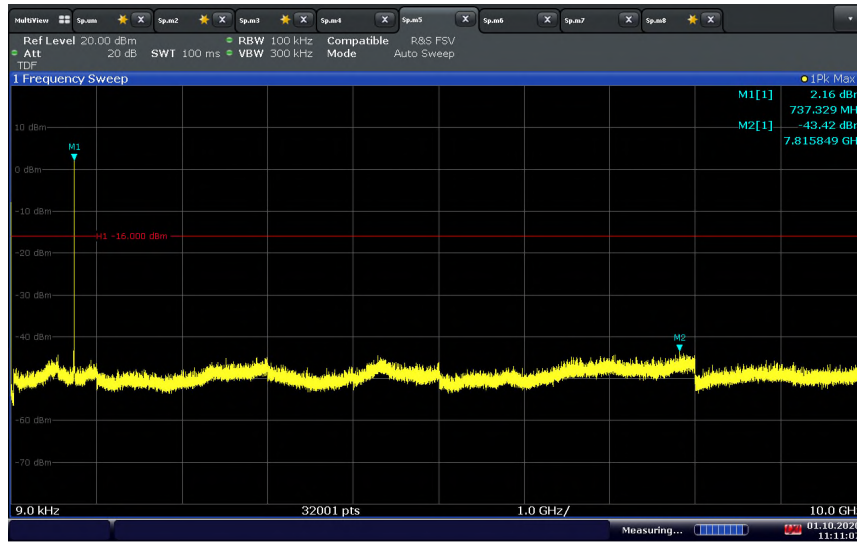


The limit should be adjusted with a correction of -3 dB $[10\log(2)]$
accounting for MIMO transmission on both external antennas
Limit = $-13 - 3 = -16$ dBm

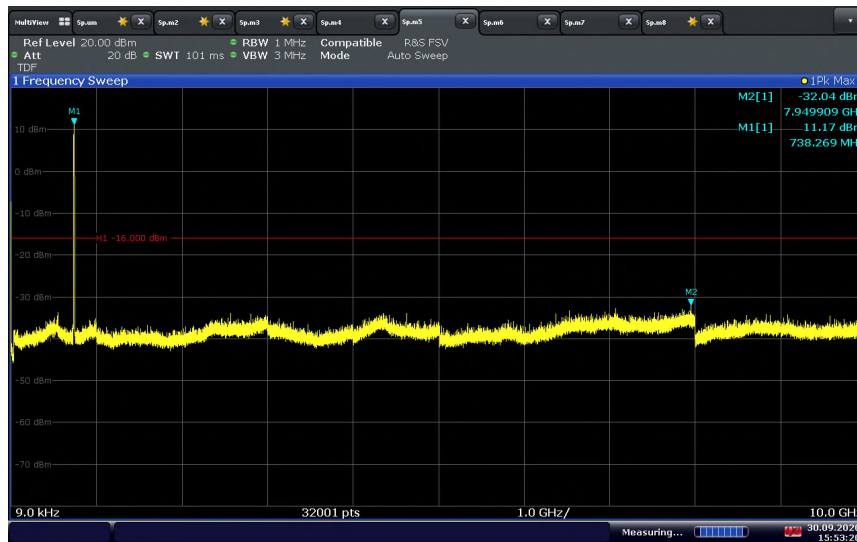
LTE Band 4 Uplink 20MHz Bandwidth Middle Channel Conducted Spurious Emissions



The limit should be adjusted with a correction of -3 dB $[10\log(2)]$
accounting for MIMO transmission on both external antennas
Limit = $-13 - 3 = -16$ dBm

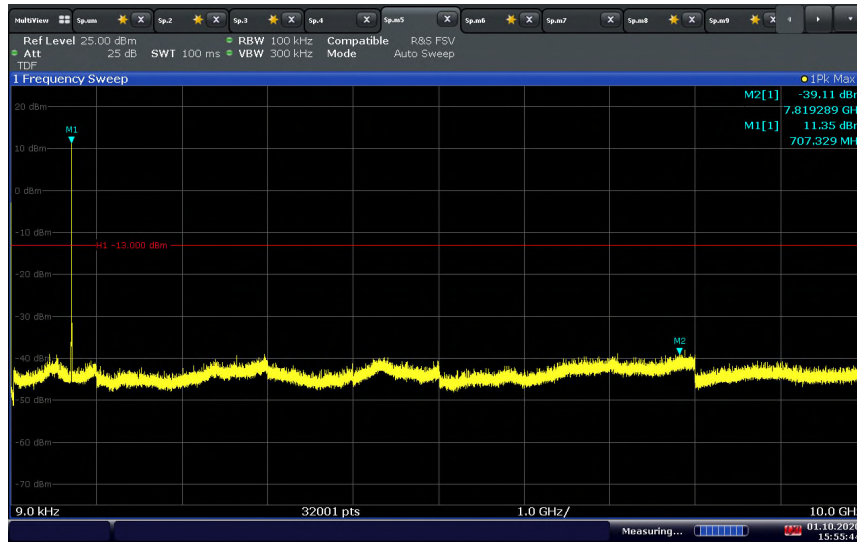
LTE Band 12 Downlink 5MHz Bandwidth Middle Channel Conducted Spurious Emissions

11:11:08 01.10.2020

LTE Band 12 Downlink 10MHz Bandwidth Middle Channel Conducted Spurious Emissions

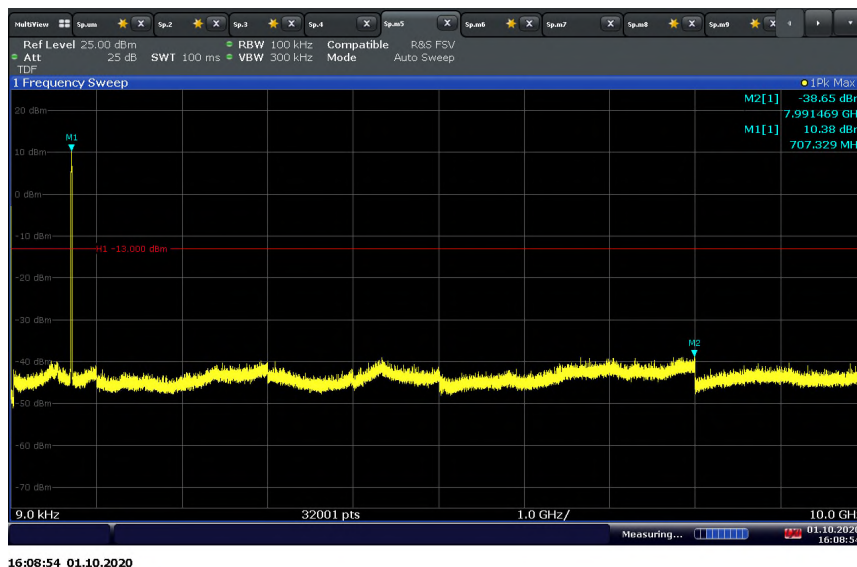
15:53:20 30.09.2020

LTE Band 12 Uplink 5MHz Bandwidth Middle Channel Conducted Spurious Emissions



The limit should be adjusted with a correction of -3 dB $[10\log(2)]$
accounting for MIMO transmission on both external antennas
Limit = -13 - 3 = -16 dBm

LTE Band 12 Uplink 10MHz Bandwidth Middle Channel Conducted Spurious Emissions



The limit should be adjusted with a correction of -3 dB $[10\log(2)]$
accounting for MIMO transmission on both external antennas
Limit = -13 - 3 = -16 dBm



2.8 FIELD STRENGTH OF SPURIOUS RADIATION

2.8.1 Specification Reference

FCC 47 CFR Part 2, Clause 2.1053
FCC 47 CFR Part 24, Clause 238(a)
FCC 47 CFR Part 27, Clause 27.53 (h)(1)(3)
FCC 47 CFR Part 27, Clause 27.53 (g)
RSS-133, Clause 6.5
RSS-130, Clause 4.7

2.8.2 Standard Applicable

FCC 47 CFR Part 27, Clause 24.238:

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

FCC 47 CFR Part 27, Clause 27.53:

(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 MHz 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.

(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-133, Clause 6.5:

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

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

ii. After the first 1.0 MHz, the emission power in any 1 MHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least $43 + 10 \log_{10}(P)$ (watts). If the measurement is performed using 1% of the emission bandwidth, power integration over 1.0 MHz is required.

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.



2.8.3 Equipment Under Test and Modification State

Serial No: NU: 976036000256 and CU: 977036000055 / Test Configuration C and D

2.8.4 Date of Test/Initial of test personnel who performed the test

October 08, 09, 10 and 15, 2020 / XYZ

2.8.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.8.6 Environmental Conditions/ Test Location

Test performed at TÜV SÜD America Inc. Rancho Bernardo facility

Ambient Temperature	23.4 - 24.2°C
Relative Humidity	34.2 - 54.2%
ATM Pressure	98.7 - 99.0kPa

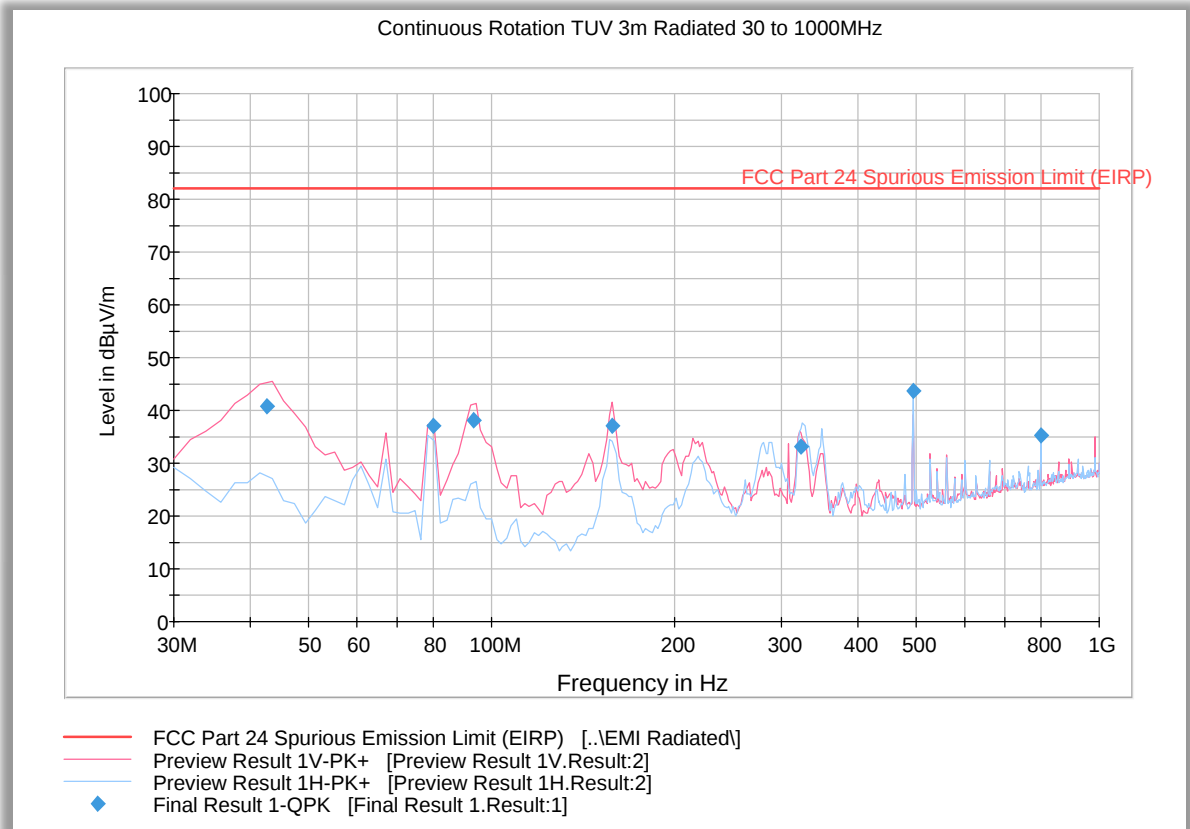
2.8.7 Additional Observations

- This is a radiated test using the Direct Radiated Field Strength method of C63.26 2015.
- This is cabinet spurious emissions testing. Main antenna port was terminated during the test. Fundamental frequency measurement will be ignored for this test.
- Only the worst case configuration presented in this test report.
- Measurement was done using EMC32 automated software. Reported level is the actual level with all the correction factors factored in. Correction Factor column is for informational purposes only.

2.8.8 Test Results

Compliant. See attached plots.

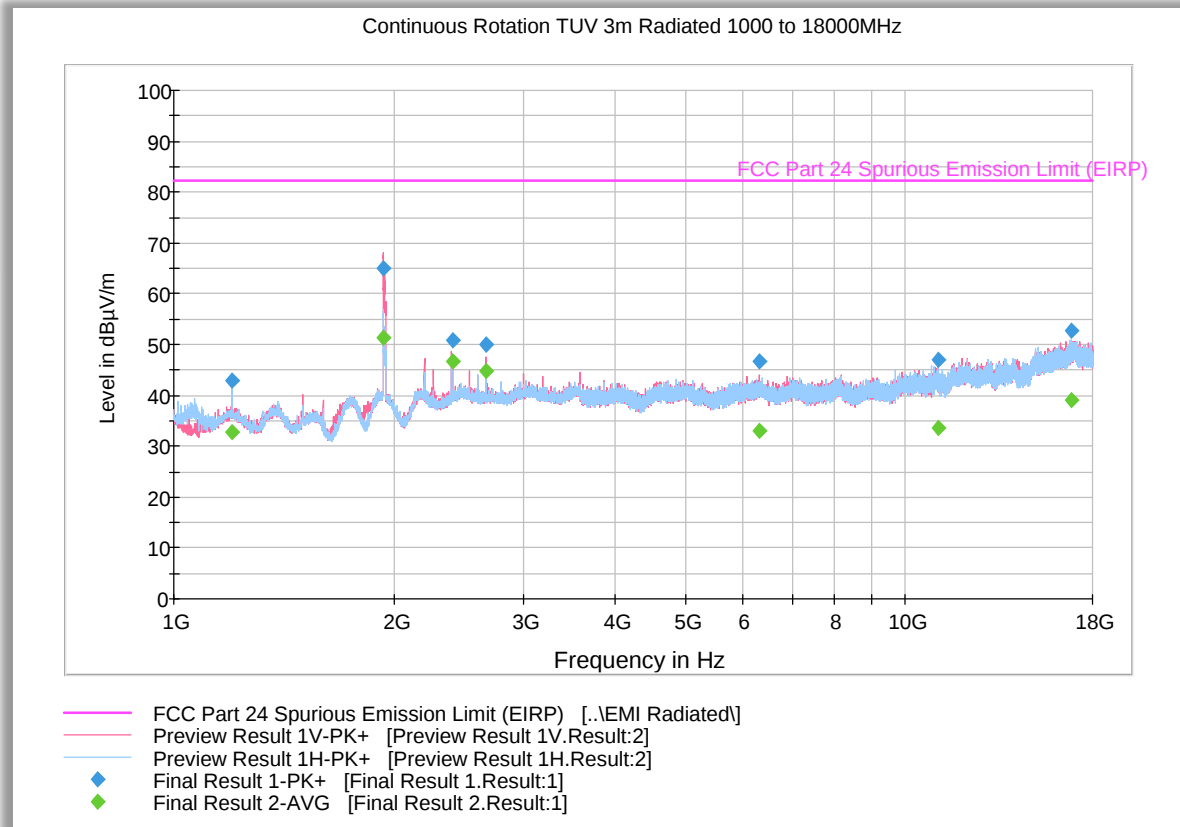
2.8.9 Test Results Below 1GHz (LTE Band 2 Downlink Worst Case Configuration) - 20MHz Bandwidth Middle Channel



Quasi Peak Data

Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
42.663327	40.7	1000.0	120.000	100.0	V	15.0	-14.5	41.6	82.2
79.997194	37.0	1000.0	120.000	109.0	V	170.0	-17.6	45.2	82.2
93.468297	38.1	1000.0	120.000	100.0	V	114.0	-14.6	44.1	82.2
158.056593	37.1	1000.0	120.000	100.0	V	46.0	-13.2	45.1	82.2
323.470942	33.1	1000.0	120.000	100.0	H	341.0	-7.3	49.2	82.2
494.989178	43.6	1000.0	120.000	133.0	H	333.0	-2.6	38.6	82.2
800.003447	35.3	1000.0	120.000	100.0	V	0.0	3.0	46.9	82.2

2.8.10 Test Results Above 1GHz (LTE Band 2 Downlink Worst Case Configuration) - 20MHz Bandwidth Low Channel



Peak Data

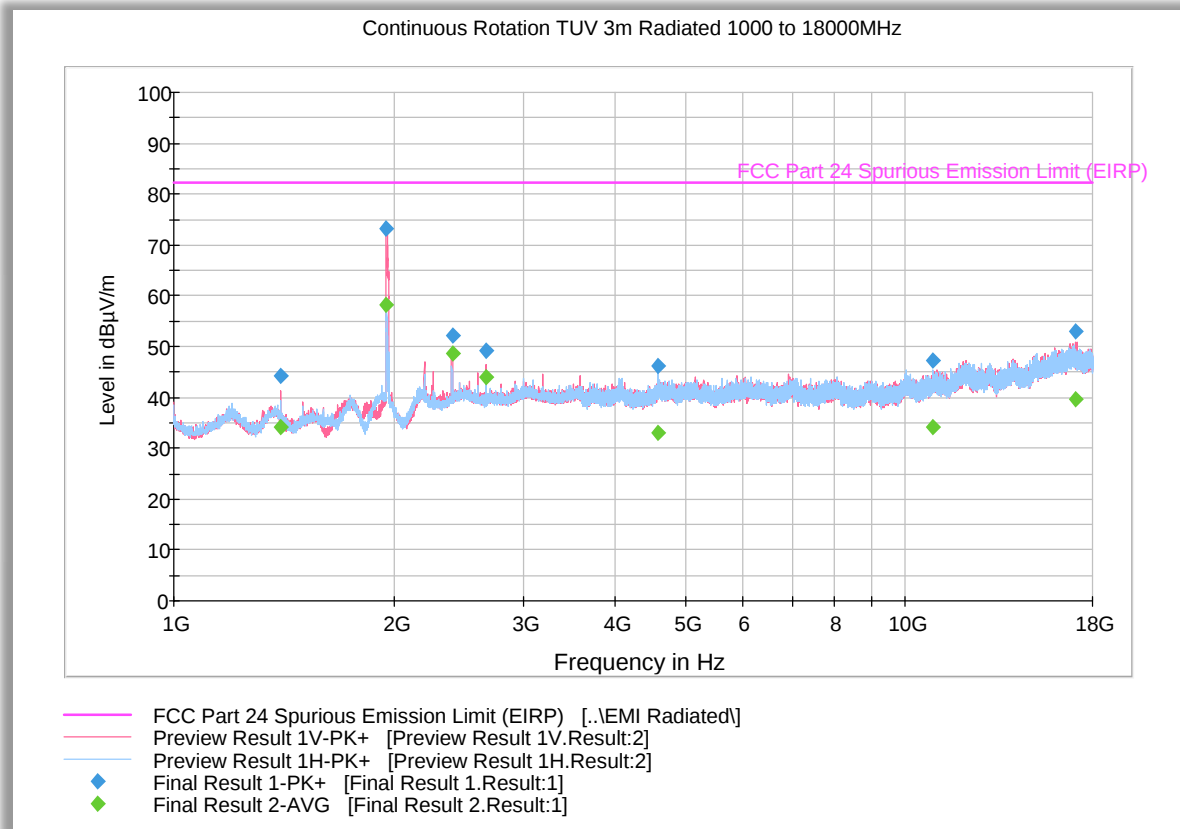
Frequency (MHz)	MaxPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1199.866667	42.9	1000.0	1000.000	290.2	H	280.0	-6.3	39.3	82.2
1932.933333	65.0	1000.0	1000.000	103.7	V	11.0	-2.6	Fundamental Carrier	82.2
2399.866667	50.8	1000.0	1000.000	103.7	V	142.0	-0.3	31.4	82.2
2666.766667	50.0	1000.0	1000.000	108.7	V	-7.0	0.4	32.2	82.2
6307.800000	46.6	1000.0	1000.000	343.1	V	-7.0	6.7	35.6	82.2
11062.666666	47.0	1000.0	1000.000	178.6	H	114.0	11.3	35.3	82.2
16835.166666	52.8	1000.0	1000.000	352.7	V	168.0	18.4	29.4	82.2

Average Data

Frequency (MHz)	Average (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1199.866667	32.8	1000.0	1000.000	290.2	H	280.0	-6.3	49.4	82.2
1932.933333	51.3	1000.0	1000.000	103.7	V	11.0	-2.6	Fundamental Carrier	82.2
2399.866667	46.6	1000.0	1000.000	103.7	V	142.0	-0.3	35.6	82.2
2666.766667	44.8	1000.0	1000.000	108.7	V	-7.0	0.4	37.5	82.2
6307.800000	32.9	1000.0	1000.000	343.1	V	-7.0	6.7	49.3	82.2
11062.666666	33.7	1000.0	1000.000	178.6	H	114.0	11.3	48.6	82.2
16835.166666	39.1	1000.0	1000.000	352.7	V	168.0	18.4	43.2	82.2

Note: A 1.8 – 2.0 GHz Notch filter is used during the test.

2.8.11 Test Results Above 1GHz (LTE Band 2 Downlink Worst Case Configuration) - 20MHz Bandwidth Middle Channel



Peak Data

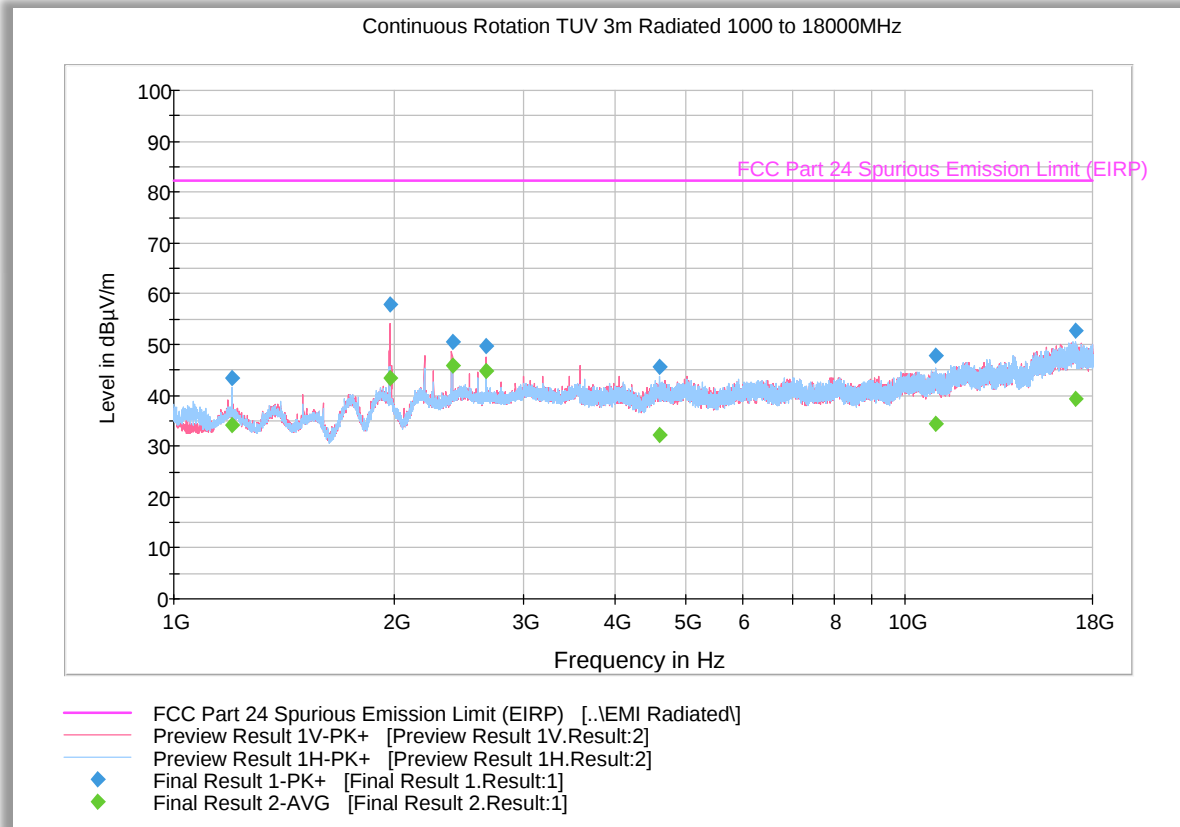
Frequency (MHz)	MaxPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1400.266667	44.3	1000.0	1000.000	151.6	V	187.0	-5.7	37.9	82.2
1954.500000	73.2	1000.0	1000.000	235.4	V	97.0	-2.5	Fundamental Carrier	82.2
2399.866667	52.2	1000.0	1000.000	239.4	V	152.0	-0.3	30.0	82.2
2666.766667	49.1	1000.0	1000.000	103.7	V	199.0	0.4	33.2	82.2
4588.666667	46.1	1000.0	1000.000	190.5	H	38.0	4.8	36.2	82.2
10880.966666	47.3	1000.0	1000.000	147.7	H	192.0	11.2	34.9	82.2
17066.533333	53.0	1000.0	1000.000	275.3	V	76.0	18.5	29.2	82.2

Average Data

Frequency (MHz)	Average (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1400.266667	34.1	1000.0	1000.000	151.6	V	187.0	-5.7	48.1	82.2
1954.500000	58.2	1000.0	1000.000	235.4	V	97.0	-2.5	Fundamental Carrier	82.2
2399.866667	48.7	1000.0	1000.000	239.4	V	152.0	-0.3	33.5	82.2
2666.766667	44.0	1000.0	1000.000	103.7	V	199.0	0.4	38.2	82.2
4588.666667	33.0	1000.0	1000.000	190.5	H	38.0	4.8	49.2	82.2
10880.966666	34.3	1000.0	1000.000	147.7	H	192.0	11.2	48.0	82.2
17066.533333	39.7	1000.0	1000.000	275.3	V	76.0	18.5	42.5	82.2

Note: A 1.8 – 2.0 GHz Notch filter is used during the test.

2.8.12 Test Results Above 1GHz (LTE Band 2 Downlink Worst Case Configuration) - 20MHz Bandwidth High Channel



Peak Data

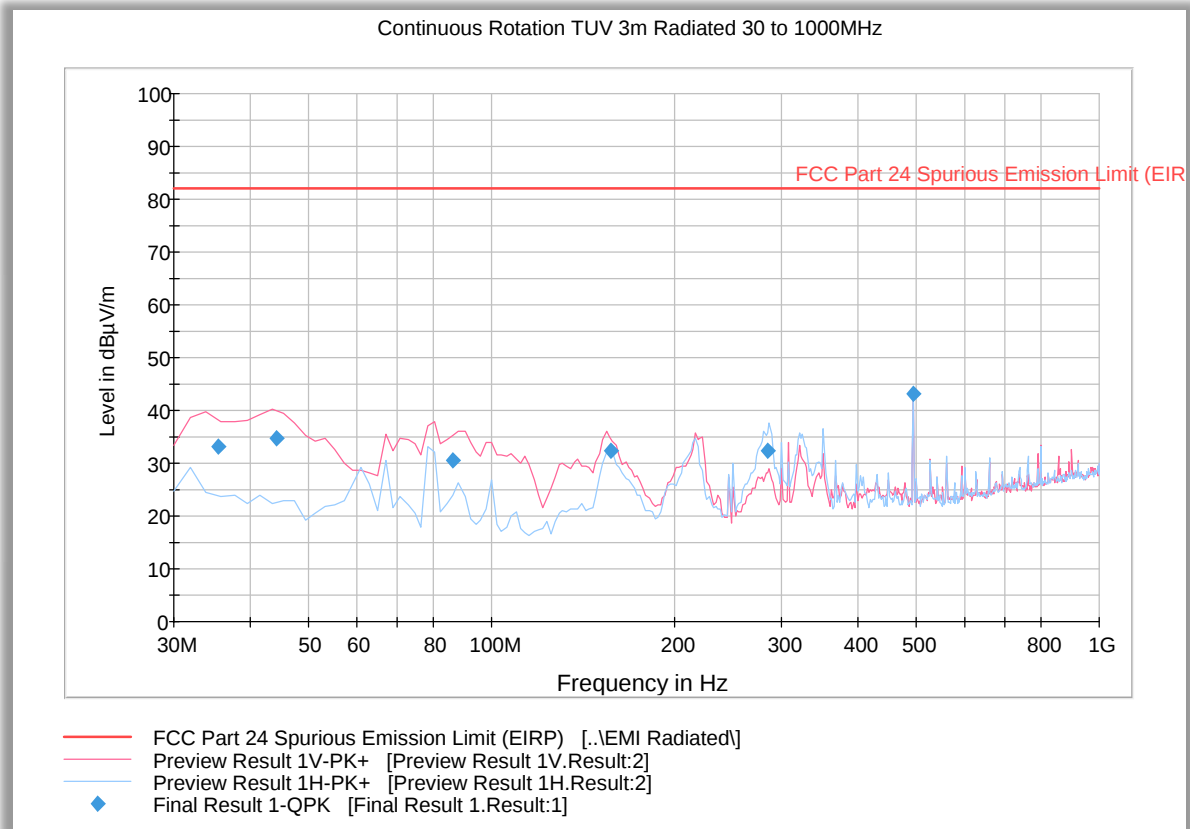
Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1199.833333	43.5	1000.0	1000.000	295.2	H	144.0	-6.3	38.7	82.2
1973.000000	57.8	1000.0	1000.000	99.7	V	92.0	-2.2	Fundamental Carrier	
2400.033333	50.7	1000.0	1000.000	113.7	V	199.0	-0.3	31.6	82.2
2666.766667	49.8	1000.0	1000.000	103.7	V	-1.0	0.4	32.5	82.2
4614.200000	45.6	1000.0	1000.000	322.2	H	216.0	4.8	36.6	82.2
10997.266666	47.7	1000.0	1000.000	240.4	H	138.0	11.3	34.5	82.2
17085.033333	52.7	1000.0	1000.000	230.4	H	96.0	18.4	29.5	82.2

Average Data

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1199.833333	34.2	1000.0	1000.000	295.2	H	144.0	-6.3	48.1	82.2
1973.000000	43.4	1000.0	1000.000	99.7	V	92.0	-2.2	Fundamental Carrier	
2400.033333	46.0	1000.0	1000.000	113.7	V	199.0	-0.3	36.2	82.2
2666.766667	44.9	1000.0	1000.000	103.7	V	-1.0	0.4	37.3	82.2
4614.200000	32.3	1000.0	1000.000	322.2	H	216.0	4.8	49.9	82.2
10997.266666	34.5	1000.0	1000.000	240.4	H	138.0	11.3	47.8	82.2
17085.033333	39.3	1000.0	1000.000	230.4	H	96.0	18.4	43.0	82.2

Note: A 1.8 – 2.0 GHz Notch filter is used during the test.

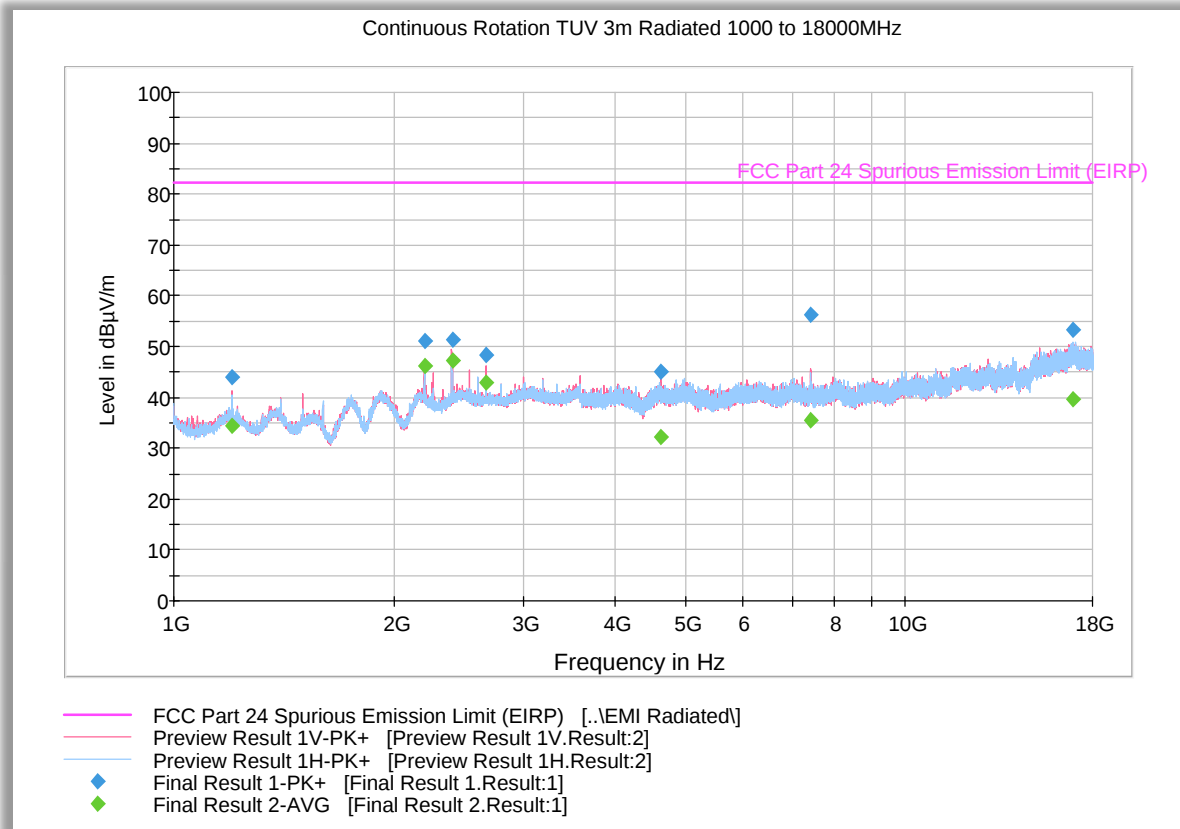
2.8.13 Test Results Below 1GHz (LTE Band 2 Uplink Worst Case Configuration) - 20MHz Bandwidth Low Channel



Quasi Peak Data

Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
35.487776	33.1	1000.0	120.000	100.0	V	265.0	-12.4	49.2	82.2
44.367214	34.7	1000.0	120.000	100.0	V	109.0	-14.8	47.5	82.2
86.236633	30.4	1000.0	120.000	100.0	V	15.0	-16.8	51.8	82.2
156.848818	32.3	1000.0	120.000	100.0	V	50.0	-13.4	49.9	82.2
283.993186	32.2	1000.0	120.000	231.0	H	9.0	-9.1	50.0	82.2
494.989178	43.1	1000.0	120.000	100.0	H	309.0	-2.6	39.1	82.2

2.8.14 Test Results Above 1GHz (LTE Band 2 Uplink Worst Case Configuration) - 20MHz Bandwidth Low Channel



Peak Data

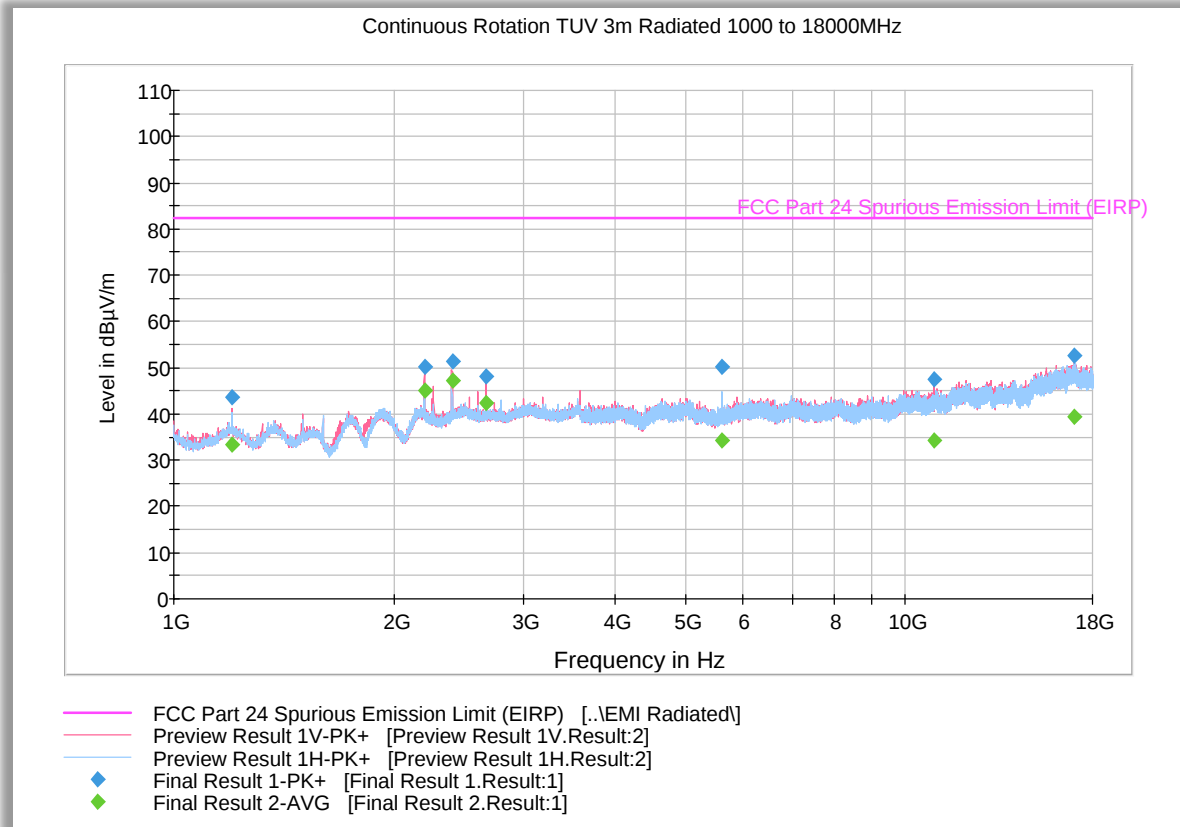
Frequency (MHz)	MaxPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1200.266667	43.9	1000.0	1000.000	103.7	V	60.0	-6.2	38.3	82.2
2199.833333	51.2	1000.0	1000.000	217.4	V	27.0	-1.1	31.1	82.2
2399.866667	51.4	1000.0	1000.000	120.7	V	132.0	-0.3	30.9	82.2
2666.766667	48.4	1000.0	1000.000	103.7	V	172.0	0.4	33.9	82.2
4630.066667	45.2	1000.0	1000.000	280.2	V	23.0	4.8	37.0	82.2
7410.533333	56.2	1000.0	1000.000	244.4	V	-7.0	7.7	26.0	82.2
16943.16666	53.2	1000.0	1000.000	181.6	H	186.0	18.3	29.0	82.2

Average Data

Frequency (MHz)	Average (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1200.266667	34.4	1000.0	1000.000	103.7	V	60.0	-6.2	47.8	82.2
2199.833333	46.1	1000.0	1000.000	217.4	V	27.0	-1.1	36.1	82.2
2399.866667	47.3	1000.0	1000.000	120.7	V	132.0	-0.3	34.9	82.2
2666.766667	42.8	1000.0	1000.000	103.7	V	172.0	0.4	39.4	82.2
4630.066667	32.3	1000.0	1000.000	280.2	V	23.0	4.8	49.9	82.2
7410.533333	35.5	1000.0	1000.000	244.4	V	-7.0	7.7	46.7	82.2
16943.16666	39.5	1000.0	1000.000	181.6	H	186.0	18.3	42.7	82.2

Note: A 1.8 – 2.0 GHz Notch filter is used during the test.

2.8.15 Test Results Above 1GHz (LTE Band 2 Uplink Worst Case Configuration) - 20MHz Bandwidth Middle Channel



Peak Data

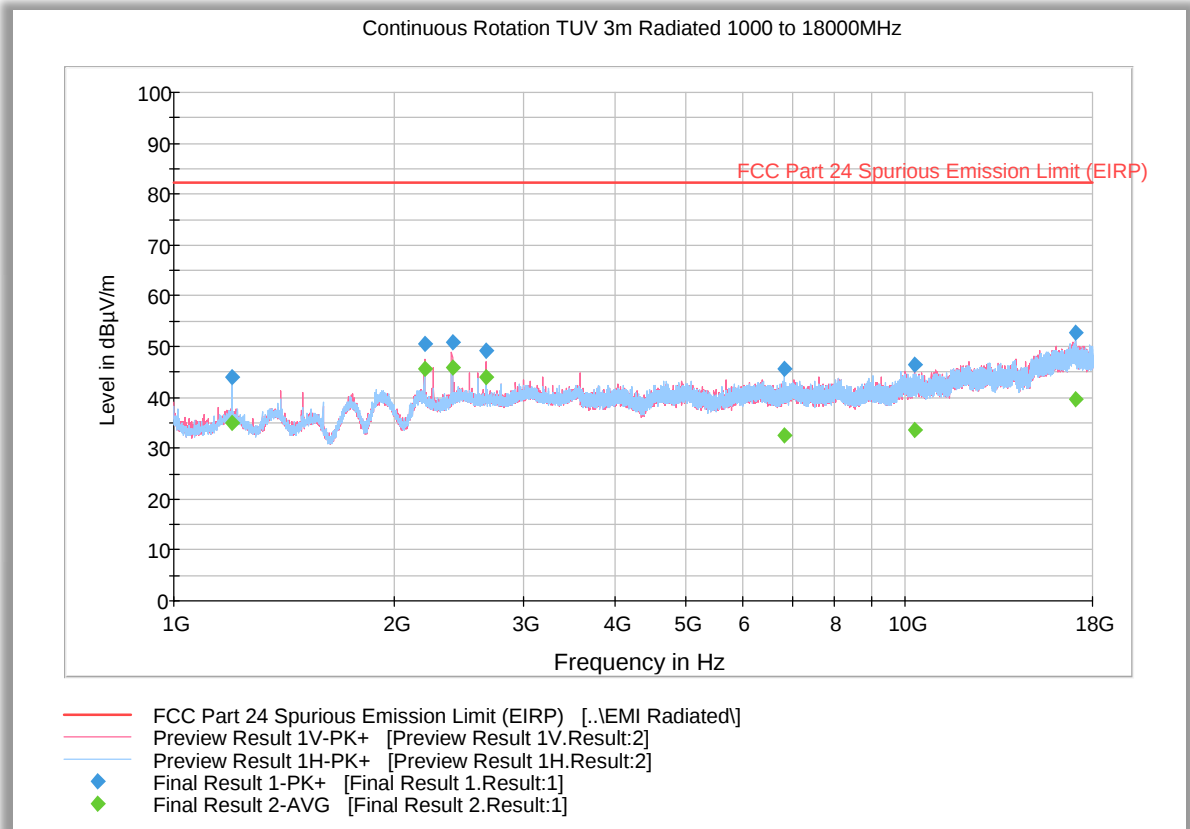
Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1199.866667	43.6	1000.0	1000.000	300.2	V	68.0	-6.3	38.7	82.2
2199.833333	50.1	1000.0	1000.000	116.7	V	203.0	-1.1	32.2	82.2
2399.866667	51.4	1000.0	1000.000	99.7	V	131.0	-0.3	30.8	82.2
2666.766667	48.1	1000.0	1000.000	120.7	V	-1.0	0.4	34.2	82.2
5621.766667	50.1	1000.0	1000.000	102.7	H	315.0	6.0	32.1	82.2
10944.066666	47.6	1000.0	1000.000	285.3	V	231.0	11.2	34.6	82.2
17026.10000	52.7	1000.0	1000.000	151.2	V	75.0	18.4	29.5	82.2

Average Data

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1199.866667	33.3	1000.0	1000.000	300.2	V	68.0	-6.3	48.9	82.2
2199.833333	45.0	1000.0	1000.000	116.7	V	203.0	-1.1	37.3	82.2
2399.866667	47.2	1000.0	1000.000	99.7	V	131.0	-0.3	35.0	82.2
2666.766667	42.5	1000.0	1000.000	120.7	V	-1.0	0.4	39.8	82.2
5621.766667	34.4	1000.0	1000.000	102.7	H	315.0	6.0	47.8	82.2
10944.066666	34.1	1000.0	1000.000	285.3	V	231.0	11.2	48.1	82.2
17026.10000	39.5	1000.0	1000.000	151.2	V	75.0	18.4	42.7	82.2

Note: A 1.8 – 2.0 GHz Notch filter is used during the test.

2.8.16 Test Results Above 1GHz (LTE Band 2 Uplink Worst Case Configuration) - 20MHz Bandwidth High Channel



Peak Data

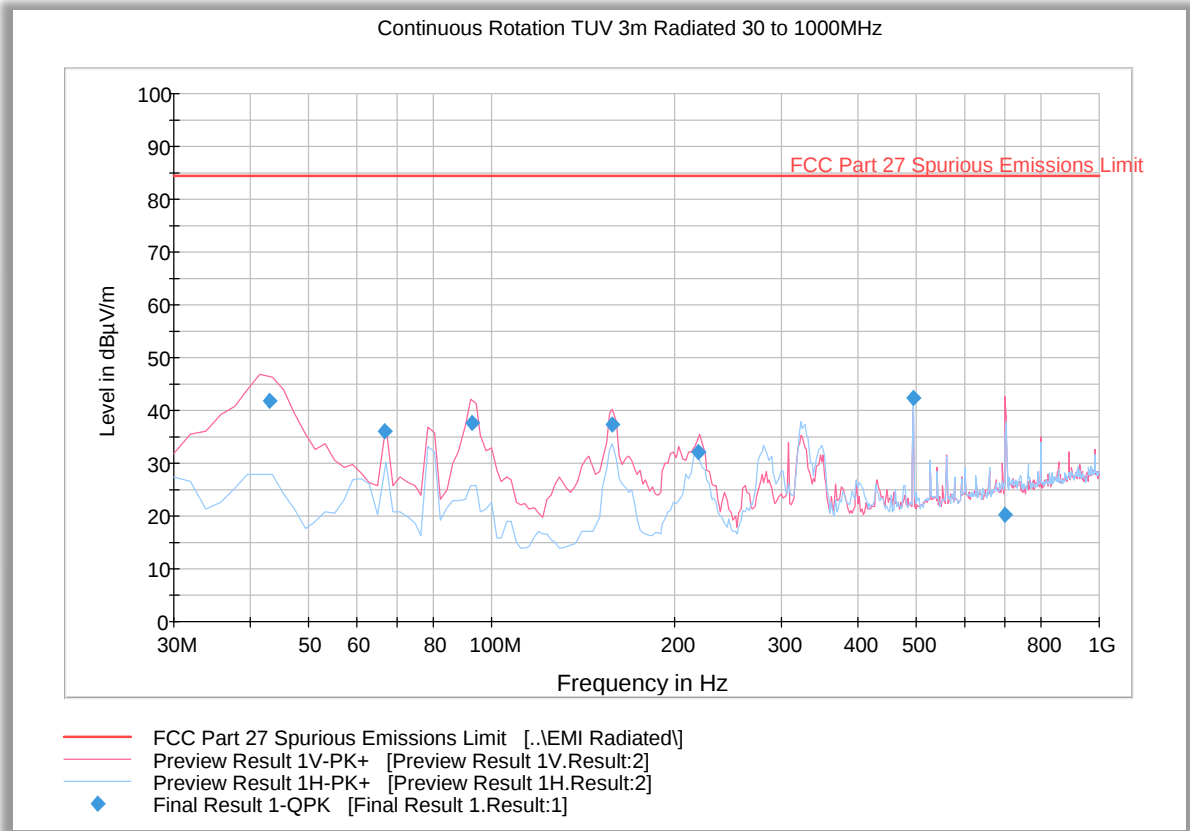
Frequency (MHz)	MaxPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1199.866667	43.9	1000.0	1000.000	300.2	H	98.0	-6.3	38.3	82.2
2199.833333	50.6	1000.0	1000.000	225.4	V	27.0	-1.1	31.6	82.2
2399.866667	50.7	1000.0	1000.000	99.7	V	129.0	-0.3	31.5	82.2
2666.766667	49.3	1000.0	1000.000	105.7	V	177.0	0.4	32.9	82.2
6831.800000	45.7	1000.0	1000.000	327.2	H	184.0	7.2	36.5	82.2
10296.366666	46.4	1000.0	1000.000	270.3	V	309.0	10.2	35.8	82.2
17063.866666	52.7	1000.0	1000.000	332.1	H	214.0	18.4	29.5	82.2

Average Data

Frequency (MHz)	Average (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1199.866667	34.8	1000.0	1000.000	300.2	H	98.0	-6.3	47.4	82.2
2199.833333	45.7	1000.0	1000.000	225.4	V	27.0	-1.1	36.5	82.2
2399.866667	45.9	1000.0	1000.000	99.7	V	129.0	-0.3	36.3	82.2
2666.766667	44.0	1000.0	1000.000	105.7	V	177.0	0.4	38.2	82.2
6831.800000	32.6	1000.0	1000.000	327.2	H	184.0	7.2	49.6	82.2
10296.366666	33.7	1000.0	1000.000	270.3	V	309.0	10.2	48.5	82.2
17063.866666	39.5	1000.0	1000.000	332.1	H	214.0	18.4	42.7	82.2

Note: A 1.8 – 2.0 GHz Notch filter is used during the test.

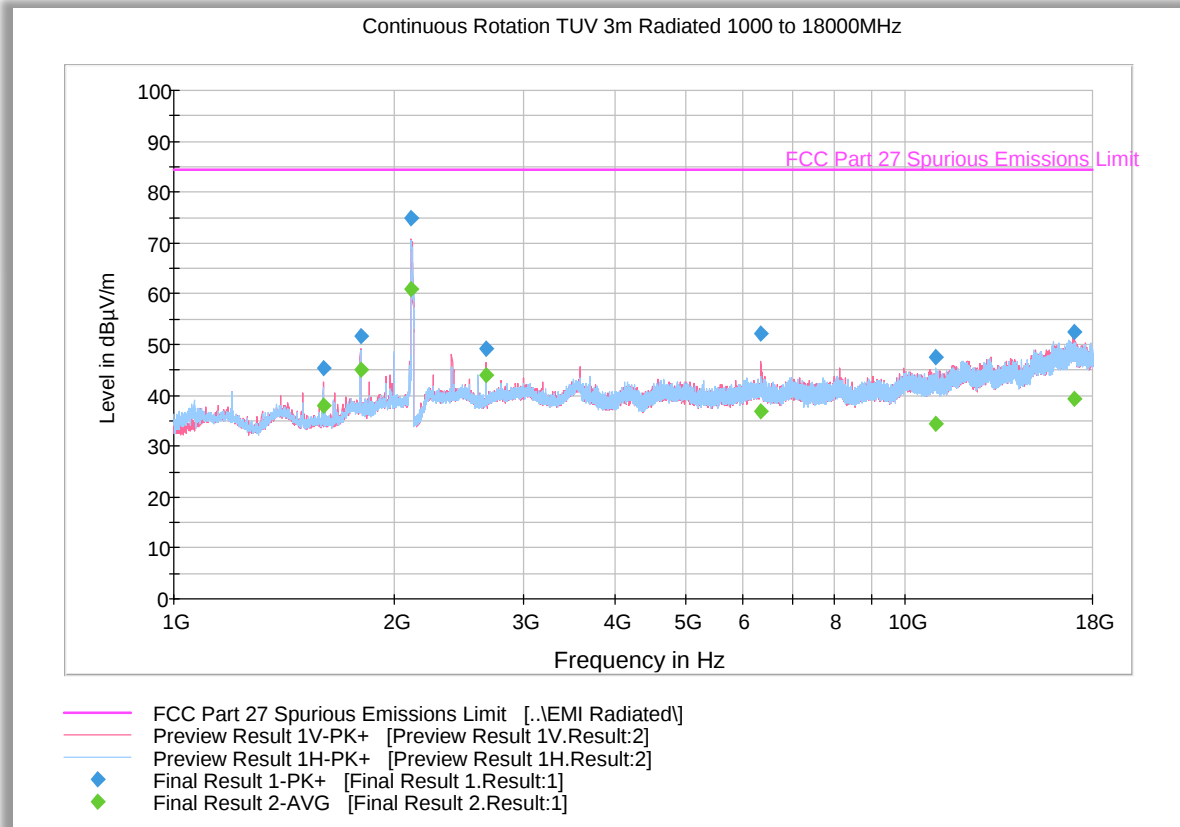
2.8.17 Test Results Below 1GHz (LTE Band 4 Downlink Worst Case Configuration) - 20MHz Bandwidth Low Channel



Quasi Peak Data

Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
43.143327	41.9	1000.0	120.000	100.0	V	223.0	-14.6	42.5	84.4
66.533868	36.1	1000.0	120.000	150.0	V	169.0	-18.1	48.3	84.4
93.044409	37.6	1000.0	120.000	100.0	V	138.0	-14.7	46.8	84.4
158.136593	37.4	1000.0	120.000	100.0	V	25.0	-13.2	47.0	84.4
219.381002	32.0	1000.0	120.000	100.0	V	337.0	-11.1	52.4	84.4
494.989178	42.3	1000.0	120.000	133.0	H	332.0	-2.6	42.1	84.4
700.241283	20.4	1000.0	120.000	350.0	V	63.0	1.6	64.0	84.4

2.8.18 Test Results Above 1GHz (LTE Band 4 Downlink Worst Case Configuration) - 20MHz Bandwidth Low Channel



Peak Data

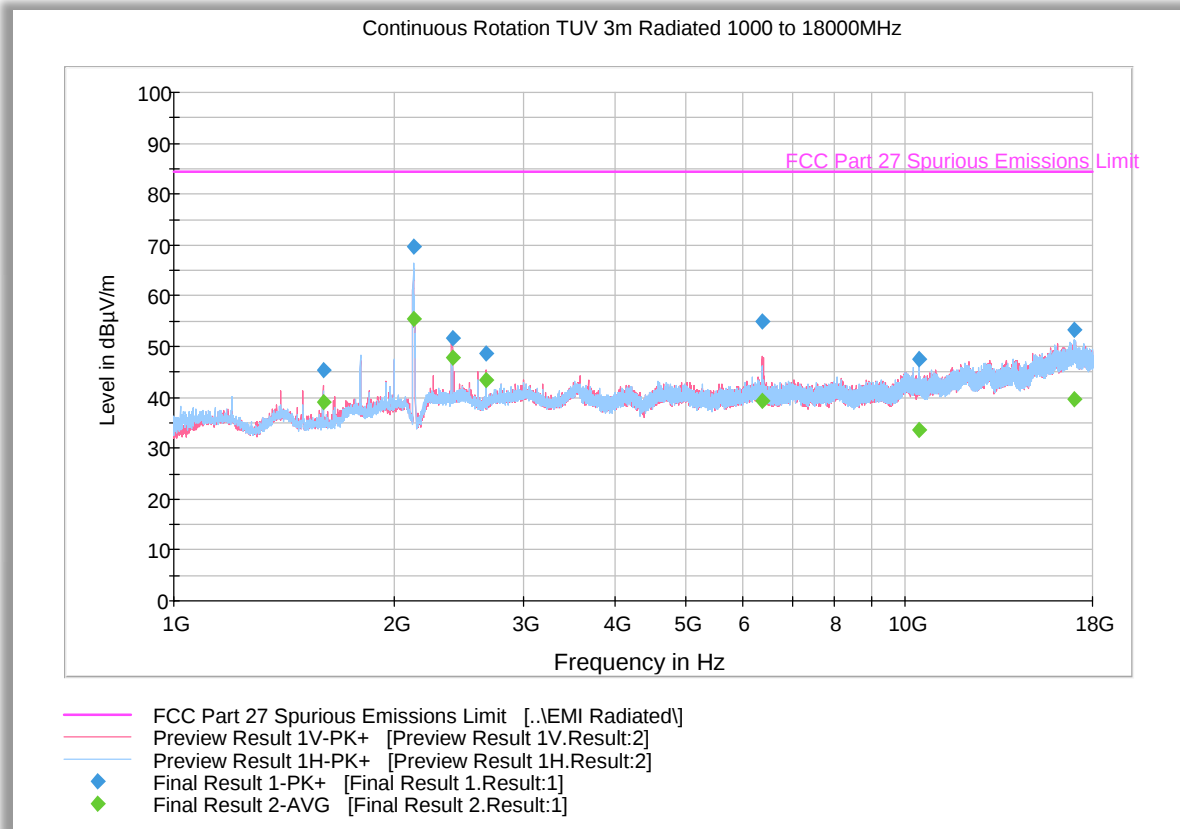
Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1599.900000	45.3	1000.0	1000.000	151.2	V	165.0	-6.0	39.1	84.4
1799.966667	51.6	1000.0	1000.000	181.6	V	27.0	-3.6	32.8	84.4
2112.900000	74.7	1000.0	1000.000	161.6	V	-1.0	-1.6	Fundamental Carrier	
2666.766667	49.2	1000.0	1000.000	102.7	V	-7.0	0.4	35.2	84.4
6339.900000	52.1	1000.0	1000.000	102.7	V	186.0	6.7	32.3	84.4
10990.166666	47.6	1000.0	1000.000	252.3	H	296.0	11.3	36.8	84.4
17043.466666	52.6	1000.0	1000.000	120.7	V	279.0	18.4	31.8	84.4

Average Data

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1599.900000	38.0	1000.0	1000.000	151.2	V	165.0	-6.0	46.4	84.4
1799.966667	45.0	1000.0	1000.000	181.6	V	27.0	-3.6	39.4	84.4
2112.900000	61.0	1000.0	1000.000	161.6	V	-1.0	-1.6	Fundamental Carrier	
2666.766667	44.0	1000.0	1000.000	102.7	V	-7.0	0.4	40.4	84.4
6339.900000	36.8	1000.0	1000.000	102.7	V	186.0	6.7	47.6	84.4
10990.166666	34.4	1000.0	1000.000	252.3	H	296.0	11.3	50.0	84.4
17043.466666	39.3	1000.0	1000.000	120.7	V	279.0	18.4	45.1	84.4

Note: A 2.11 – 2.17 GHz Notch filter is used during the test.

2.8.19 Test Results Above 1GHz (LTE Band 4 Downlink Worst Case Configuration) - 20MHz Bandwidth Middle Channel



Peak Data

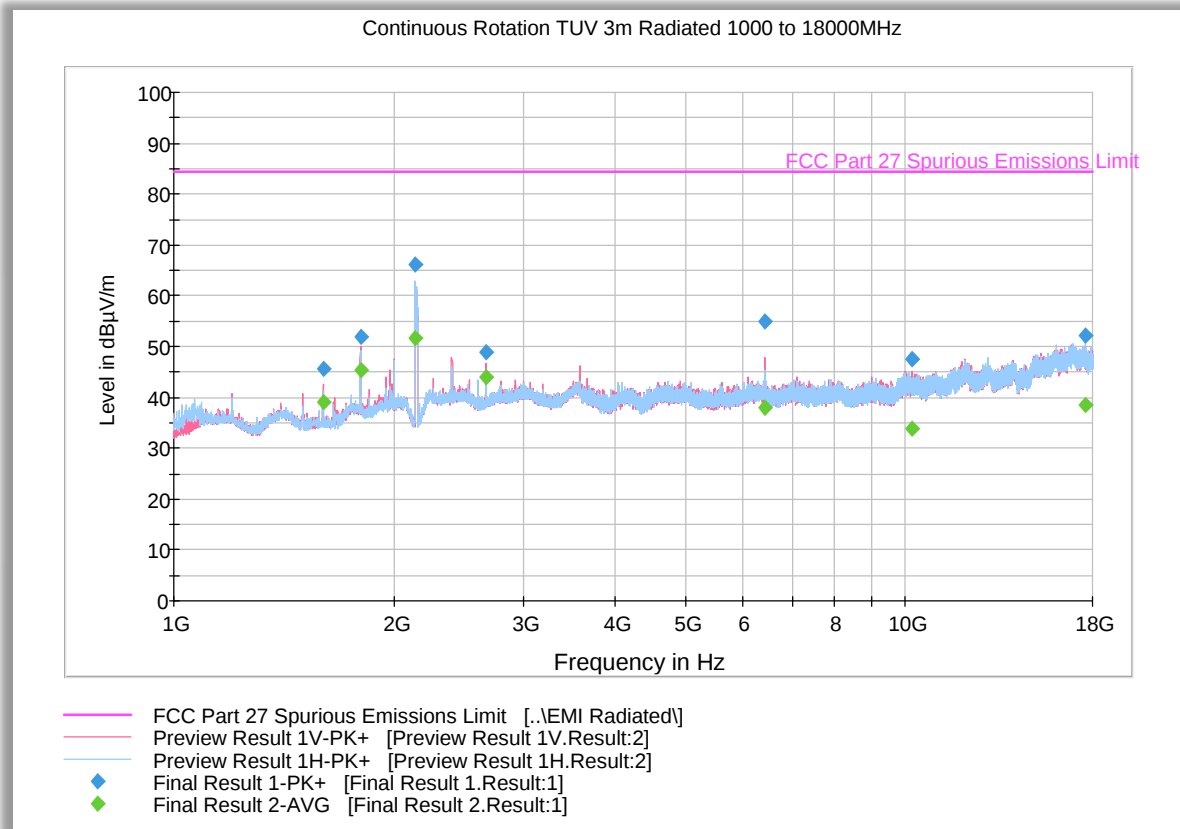
Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1600.133333	45.4	1000.0	1000.000	332.1	V	154.0	-6.0	39.0	84.4
2126.966667	69.7	1000.0	1000.000	103.7	H	207.0	-1.5	Fundamental Carrier	
2400.066667	51.8	1000.0	1000.000	152.2	V	141.0	-0.3	32.6	84.4
2666.766667	48.7	1000.0	1000.000	99.7	V	351.0	0.4	35.7	84.4
6378.633333	55.0	1000.0	1000.000	166.6	V	193.0	6.8	29.4	84.4
10427.866666	47.4	1000.0	1000.000	251.5	H	125.0	10.5	37.0	84.4
16995.30000	53.2	1000.0	1000.000	152.2	H	260.0	18.4	31.2	84.4

Average Data

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1600.133333	38.9	1000.0	1000.000	332.1	V	154.0	-6.0	45.5	84.4
2126.966667	55.6	1000.0	1000.000	103.7	H	207.0	-1.5	Fundamental Carrier	
2400.066667	47.9	1000.0	1000.000	152.2	V	141.0	-0.3	36.5	84.4
2666.766667	43.5	1000.0	1000.000	99.7	V	351.0	0.4	40.9	84.4
6378.633333	39.5	1000.0	1000.000	166.6	V	193.0	6.8	44.9	84.4
10427.866666	33.7	1000.0	1000.000	251.5	H	125.0	10.5	50.7	84.4
16995.30000	39.6	1000.0	1000.000	152.2	H	260.0	18.4	44.8	84.4

Note: A 2.11 – 2.17 GHz Notch filter is used during the test.

2.8.20 Test Results Above 1GHz (LTE Band 4 Downlink Worst Case Configuration) - 20MHz Bandwidth High Channel



Peak Data

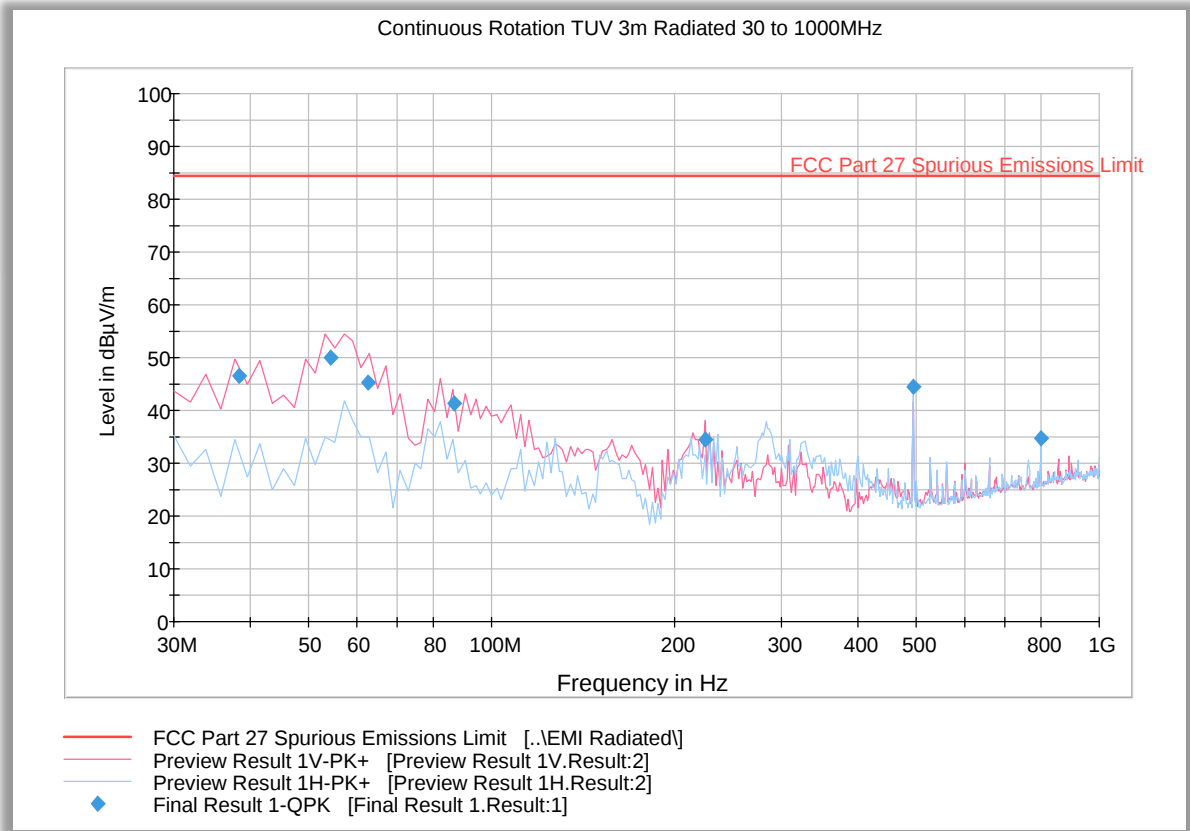
Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1599.733333	45.7	1000.0	1000.000	152.2	V	148.0	-6.0	38.7	84.4
1799.966667	52.0	1000.0	1000.000	195.5	V	30.0	-3.6	32.4	84.4
2139.400000	66.2	1000.0	1000.000	134.7	H	44.0	-1.5	Fundamental Carrier	
2666.766667	48.9	1000.0	1000.000	103.7	V	-7.0	0.4	35.5	84.4
6416.400000	55.0	1000.0	1000.000	199.5	V	351.0	6.8	29.4	84.4
10205.066666	47.5	1000.0	1000.000	332.1	V	132.0	10.1	36.9	84.4
17588.800000	52.2	1000.0	1000.000	225.4	H	39.0	18.1	32.2	84.4

Average Data

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1599.733333	39.2	1000.0	1000.000	152.2	V	148.0	-6.0	45.2	84.4
1799.966667	45.5	1000.0	1000.000	195.5	V	30.0	-3.6	38.9	84.4
2139.400000	51.6	1000.0	1000.000	134.7	H	44.0	-1.5	Fundamental Carrier	
2666.766667	44.0	1000.0	1000.000	103.7	V	-7.0	0.4	40.4	84.4
6416.400000	38.1	1000.0	1000.000	199.5	V	351.0	6.8	46.3	84.4
10205.066666	33.8	1000.0	1000.000	332.1	V	132.0	10.1	50.6	84.4
17588.800000	38.5	1000.0	1000.000	225.4	H	39.0	18.1	45.9	84.4

Note: A 2.11 – 2.17 GHz Notch filter is used during the test.

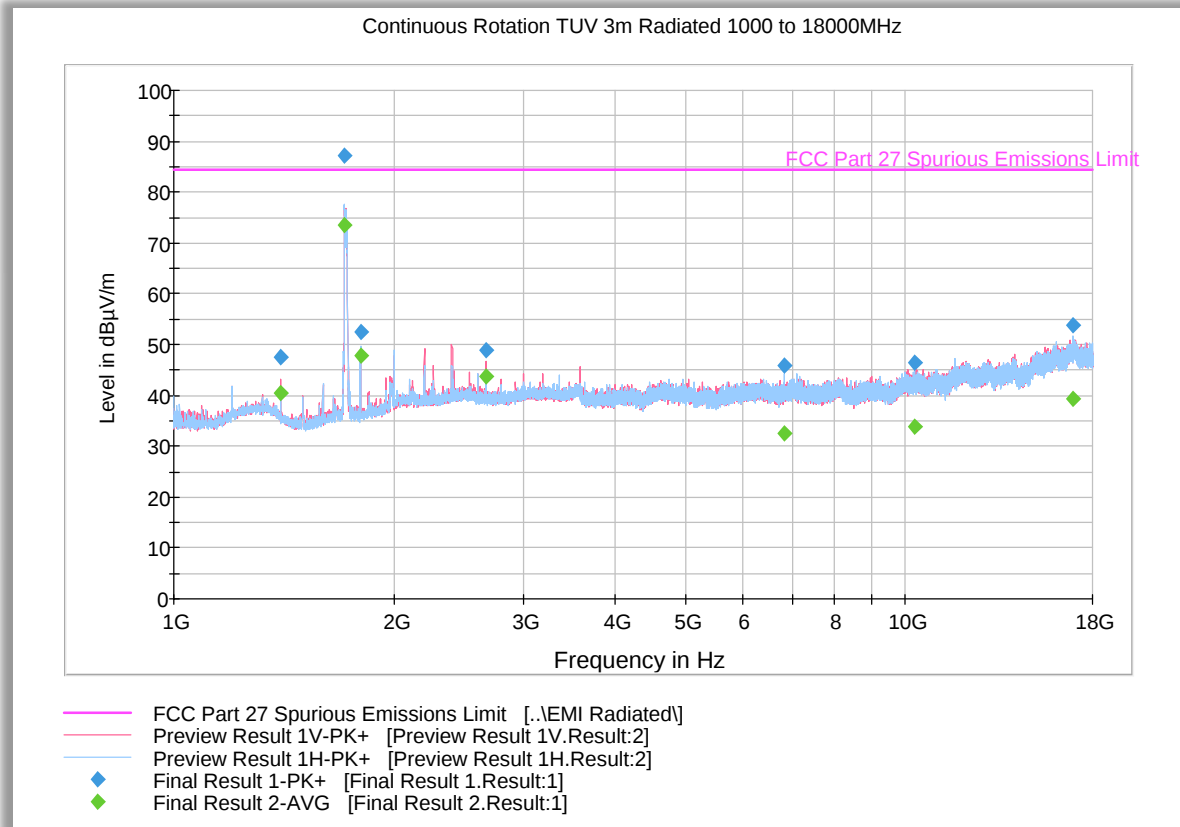
2.8.21 Test Results Below 1GHz (LTE Band 4 Uplink Worst Case Configuration) – 20 MHz Bandwidth High Channel



Quasi Peak Data

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
38.375551	46.7	1000.0	120.000	100.0	V	80.0	-13.8	37.7	84.4
54.406653	49.9	1000.0	120.000	100.0	V	14.0	-16.0	34.5	84.4
62.766092	45.3	1000.0	120.000	150.0	V	36.0	-18.2	39.1	84.4
86.812745	41.4	1000.0	120.000	105.0	V	225.0	-16.7	43.0	84.4
224.388778	34.5	1000.0	120.000	100.0	V	355.0	-10.5	49.9	84.4
494.989178	44.5	1000.0	120.000	133.0	H	329.0	-2.6	39.9	84.4
800.003447	34.7	1000.0	120.000	100.0	H	36.0	3.0	49.7	84.4

2.8.22 Test Results Above 1GHz (LTE Band 4 Uplink Worst Case Configuration) – 20 MHz Bandwidth Low Channel



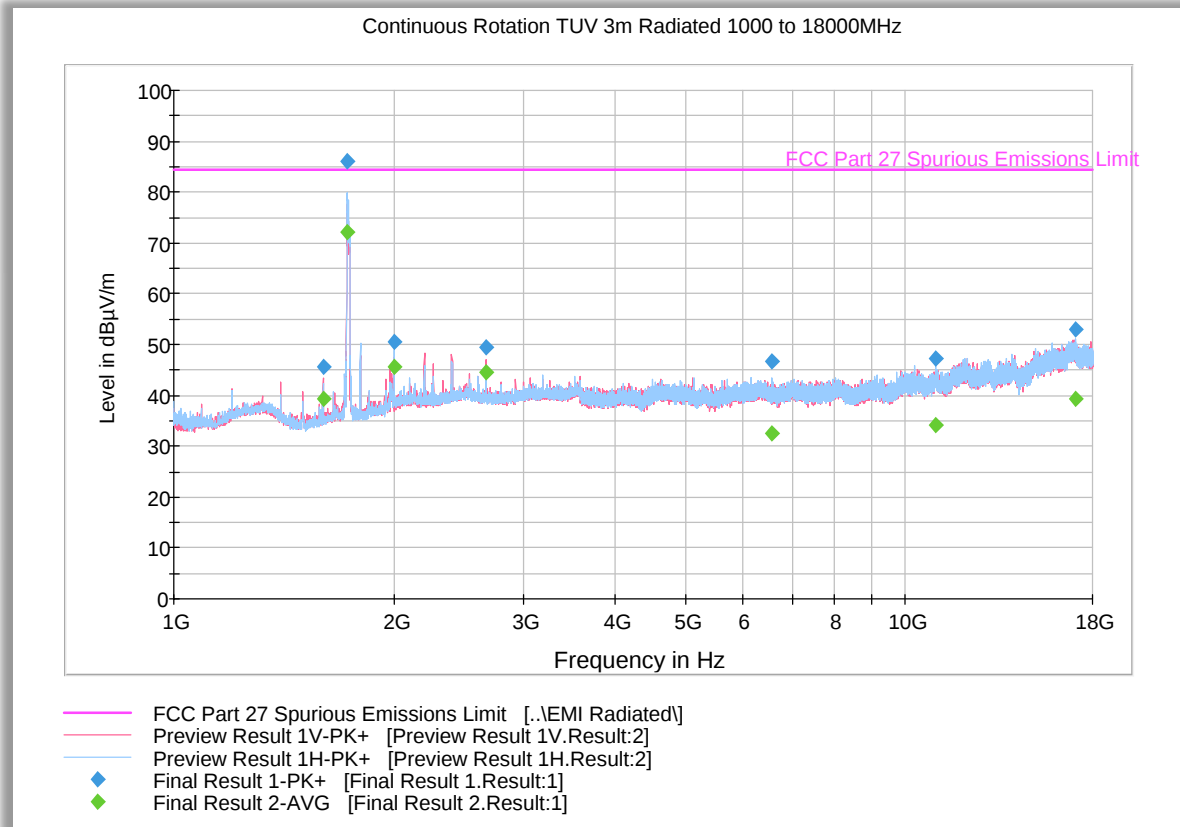
Peak Data

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1399.866667	47.5	1000.0	1000.000	230.4	V	153.0	-5.7	36.9	84.4
1714.000000	87.2	1000.0	1000.000	182.6	H	263.0	-4.7	Fundamental Carrier	
1799.966667	52.5	1000.0	1000.000	200.5	H	170.0	-3.6	31.9	84.4
2666.966667	48.9	1000.0	1000.000	103.7	V	-7.0	0.4	35.5	84.4
6842.166667	46.0	1000.0	1000.000	240.4	H	262.0	7.3	38.4	84.4
10279.533333	46.6	1000.0	1000.000	290.2	H	-13.0	10.2	37.8	84.4
16911.266666	53.7	1000.0	1000.000	300.2	H	78.0	18.2	30.7	84.4

Average Data

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1399.866667	40.5	1000.0	1000.000	230.4	V	153.0	-5.7	43.9	84.4
1714.000000	73.5	1000.0	1000.000	182.6	H	263.0	-4.7	Fundamental Carrier	
1799.966667	47.8	1000.0	1000.000	200.5	H	170.0	-3.6	36.6	84.4
2666.966667	43.7	1000.0	1000.000	103.7	V	-7.0	0.4	40.7	84.4
6842.166667	32.6	1000.0	1000.000	240.4	H	262.0	7.3	51.8	84.4
10279.533333	33.7	1000.0	1000.000	290.2	H	-13.0	10.2	50.7	84.4
16911.266666	39.4	1000.0	1000.000	300.2	H	78.0	18.2	45.0	84.4

2.8.23 Test Results Above 1GHz (LTE Band 4 Uplink Worst Case Configuration) – 20 MHz Bandwidth Middle Channel



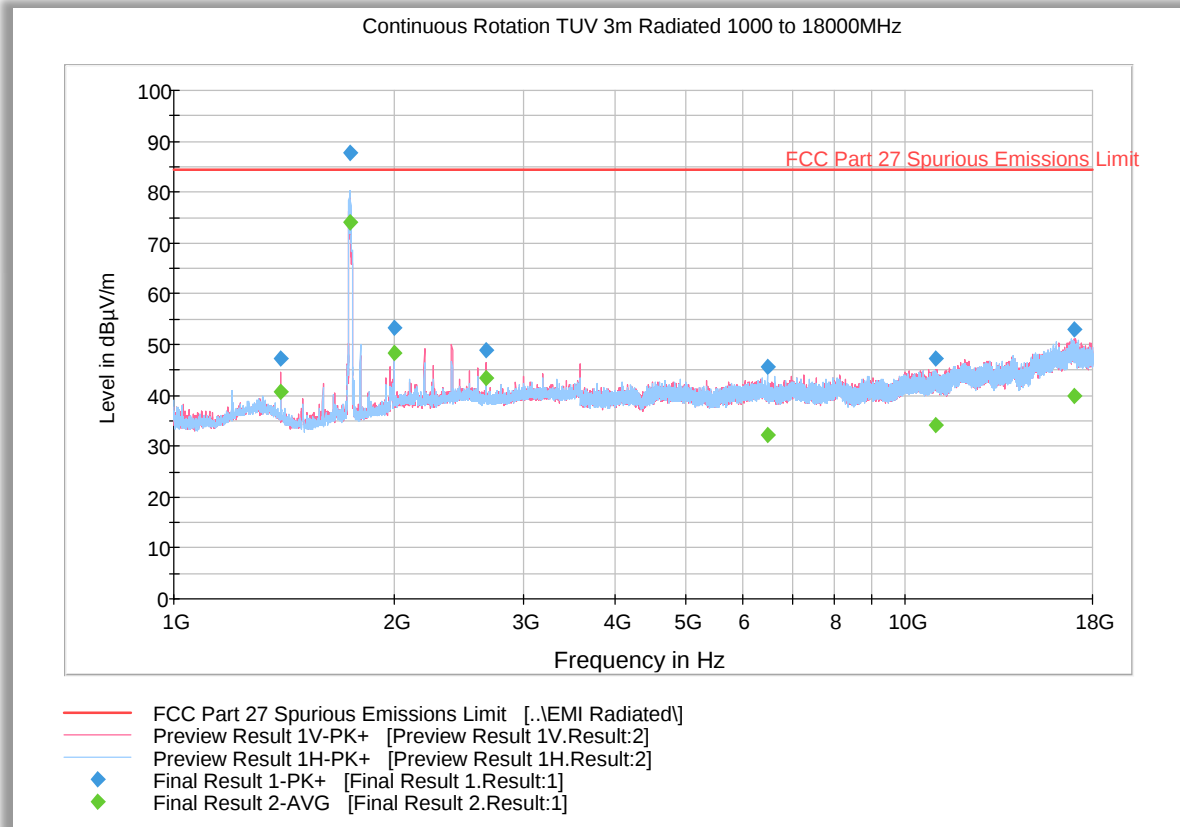
Peak Data

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1600.133333	45.6	1000.0	1000.000	352.7	V	163.0	-6.0	38.8	84.4
1725.533333	86.1	1000.0	1000.000	186.5	H	270.0	-4.5	Fundamental Carrier	
2000.000000	50.6	1000.0	1000.000	252.3	V	182.0	-1.9	33.8	84.4
2666.766667	49.6	1000.0	1000.000	103.7	V	-7.0	0.4	34.8	84.4
6575.866667	46.8	1000.0	1000.000	250.5	H	-13.0	6.9	37.6	84.4
11006.60000	47.3	1000.0	1000.000	352.7	H	28.0	11.3	37.1	84.4
17078.40000	53.1	1000.0	1000.000	270.3	H	18.0	18.5	31.3	84.4

Average Data

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1600.133333	39.3	1000.0	1000.000	352.7	V	163.0	-6.0	45.1	84.4
1725.533333	72.1	1000.0	1000.000	186.5	H	270.0	-4.5	Fundamental Carrier	
2000.000000	45.7	1000.0	1000.000	252.3	V	182.0	-1.9	38.7	84.4
2666.766667	44.5	1000.0	1000.000	103.7	V	-7.0	0.4	39.9	84.4
6575.866667	32.5	1000.0	1000.000	250.5	H	-13.0	6.9	51.9	84.4
11006.60000	34.2	1000.0	1000.000	352.7	H	28.0	11.3	50.2	84.4
17078.40000	39.4	1000.0	1000.000	270.3	H	18.0	18.5	45.0	84.4

2.8.24 Test Results Above 1GHz (LTE Band 4 Uplink Worst Case Configuration) – 20 MHz Bandwidth High Channel



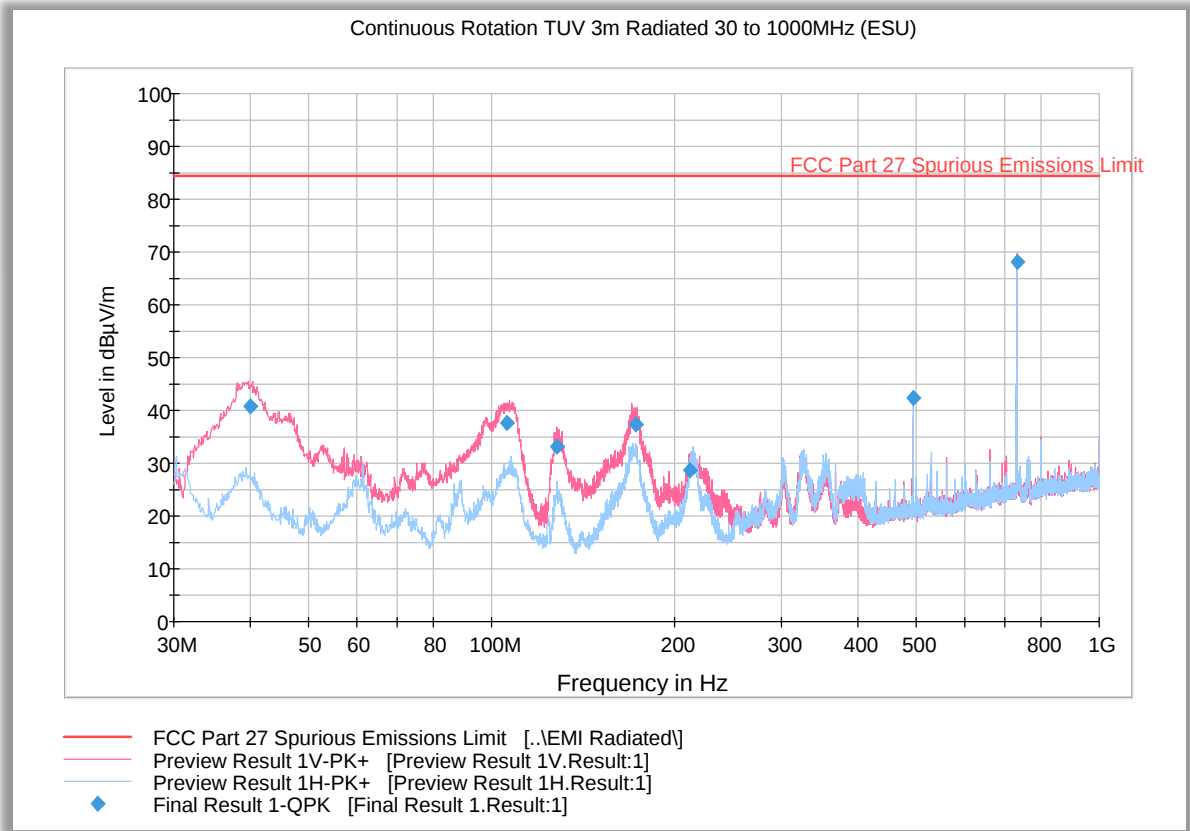
Peak Data

Frequency (MHz)	MaxPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1399.900000	47.3	1000.0	1000.000	217.4	V	153.0	-5.7	37.1	84.4
1739.333333	87.6	1000.0	1000.000	322.2	H	252.0	-4.3	Fundamental Carrier	
2000.200000	53.2	1000.0	1000.000	190.5	V	10.0	-1.9	31.2	84.4
2666.366667	49.0	1000.0	1000.000	103.7	V	-1.0	0.4	35.4	84.4
6465.866667	45.7	1000.0	1000.000	177.6	H	282.0	6.8	38.7	84.4
11013.966666	47.4	1000.0	1000.000	143.7	V	240.0	11.3	37.0	84.4
17011.700000	53.1	1000.0	1000.000	285.3	V	155.0	18.4	31.3	84.4

Average Data

Frequency (MHz)	Average (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1399.900000	40.7	1000.0	1000.000	217.4	V	153.0	-5.7	43.7	84.4
1739.333333	74.0	1000.0	1000.000	322.2	H	252.0	-4.3	Fundamental Carrier	
2000.200000	48.4	1000.0	1000.000	190.5	V	10.0	-1.9	36.1	84.4
2666.366667	43.5	1000.0	1000.000	103.7	V	-1.0	0.4	40.9	84.4
6465.866667	32.3	1000.0	1000.000	177.6	H	282.0	6.8	52.1	84.4
11013.966666	34.1	1000.0	1000.000	143.7	V	240.0	11.3	50.3	84.4
17011.700000	39.8	1000.0	1000.000	285.3	V	155.0	18.4	44.6	84.4

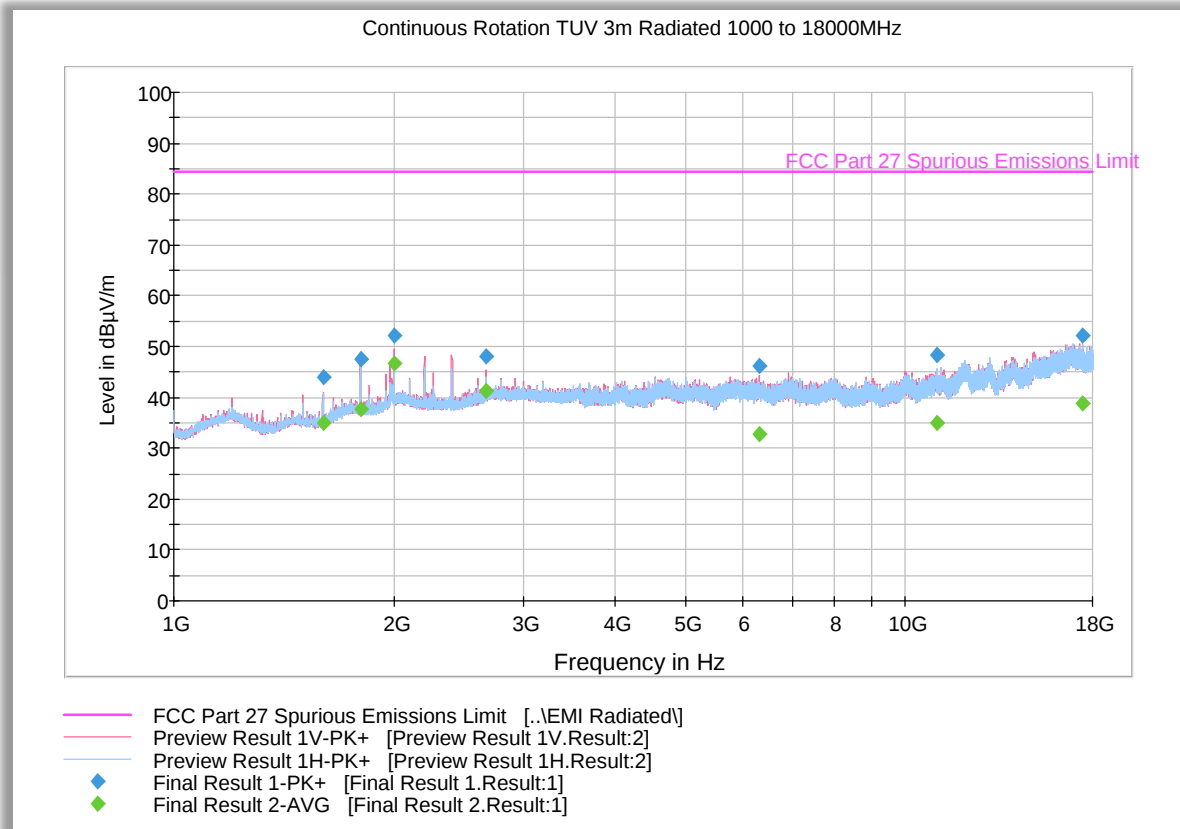
2.8.25 Test Results Below 1GHz (LTE Band 12 Downlink Worst Case Configuration) - 10MHz Bandwidth Low Channel



Quasi Peak Data

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
40.077000	40.8	1000.0	120.000	100.0	V	349.0	-14.3	43.6	84.4
106.092000	37.7	1000.0	120.000	100.0	V	174.0	-14.4	46.7	84.4
128.146000	33.0	1000.0	120.000	100.0	V	124.0	-15.7	51.4	84.4
172.359000	37.3	1000.0	120.000	100.0	V	261.0	-12.5	47.1	84.4
212.589000	28.6	1000.0	120.000	110.0	V	18.0	-11.5	55.8	84.4
494.978000	42.4	1000.0	120.000	141.0	H	13.0	-2.6	42.0	84.4
733.107000	68.1	1000.0	120.000	106.0	V	307.0	1.9	Fundamental Carrier	84.4

2.8.26 Test Results Above 1GHz (LTE Band 12 Downlink Worst Case Configuration) – 10 MHz Bandwidth Low Channel



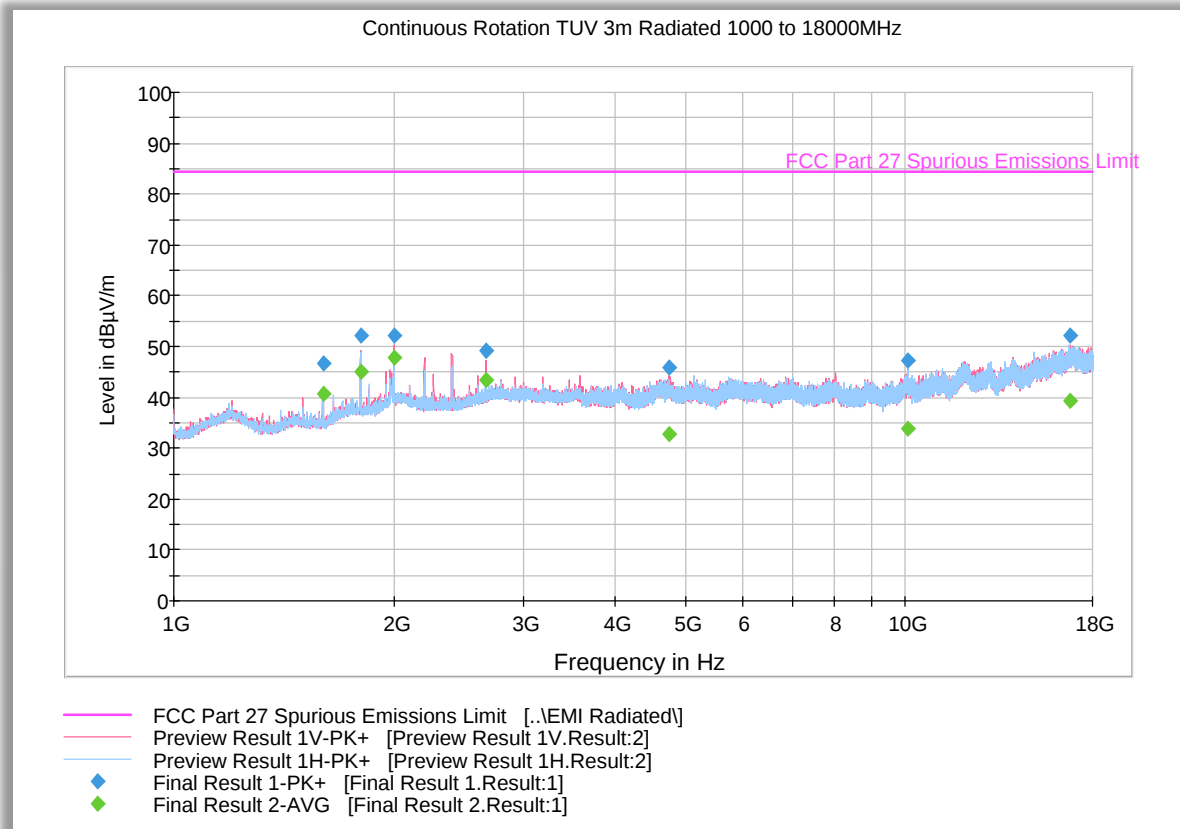
Peak Data

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1599.933333	44.1	1000.0	1000.000	295.3	V	174.0	-6.0	40.3	84.4
1799.933333	47.4	1000.0	1000.000	103.7	V	188.0	-3.6	37.0	84.4
1999.800000	52.1	1000.0	1000.000	152.7	V	31.0	-1.9	32.3	84.4
2666.766667	48.2	1000.0	1000.000	195.5	V	185.0	0.4	36.2	84.4
6324.200000	46.1	1000.0	1000.000	194.5	V	261.0	6.7	38.3	84.4
11029.10000	48.5	1000.0	1000.000	352.7	H	191.0	11.3	35.9	84.4
17426.93333	52.3	1000.0	1000.000	280.3	H	324.0	18.2	32.1	84.4

Average Data

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1599.933333	35.1	1000.0	1000.000	295.3	V	174.0	-6.0	49.3	84.4
1799.933333	37.8	1000.0	1000.000	103.7	V	188.0	-3.6	46.6	84.4
1999.800000	46.6	1000.0	1000.000	152.7	V	31.0	-1.9	37.8	84.4
2666.766667	41.4	1000.0	1000.000	195.5	V	185.0	0.4	43.0	84.4
6324.200000	32.7	1000.0	1000.000	194.5	V	261.0	6.7	51.7	84.4
11029.10000	35.0	1000.0	1000.000	352.7	H	191.0	11.3	49.4	84.4
17426.93333	38.7	1000.0	1000.000	280.3	H	324.0	18.2	45.7	84.4

2.8.27 Test Results Above 1GHz (LTE Band 12 Downlink Worst Case Configuration) – 10 MHz Bandwidth Middle Channel



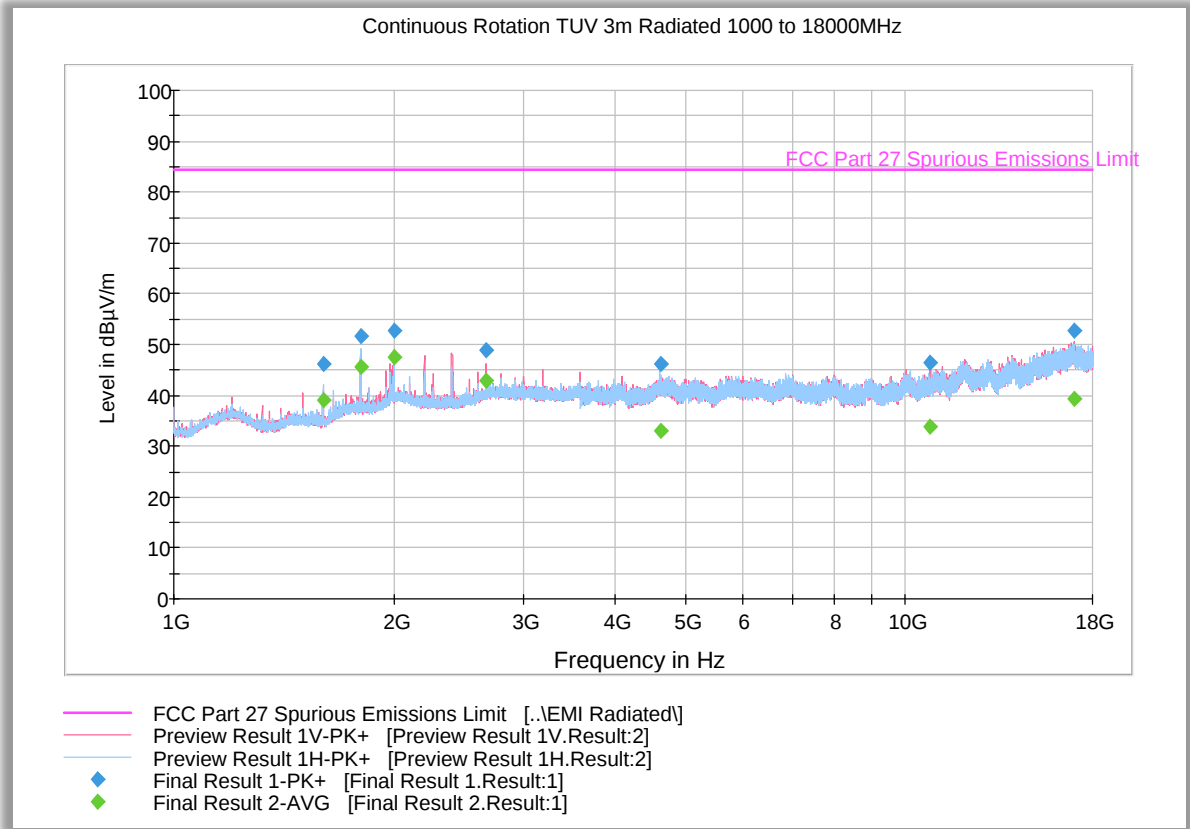
Peak Data

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1600.133333	46.8	1000.0	1000.000	127.7	H	173.0	-6.0	37.6	84.4
1799.966667	52.1	1000.0	1000.000	169.6	V	49.0	-3.6	32.3	84.4
2000.000000	52.3	1000.0	1000.000	103.7	V	170.0	-1.9	32.1	84.4
2666.766667	49.2	1000.0	1000.000	103.7	V	49.0	0.4	35.2	84.4
4748.900000	46.0	1000.0	1000.000	182.6	V	119.0	4.8	38.4	84.4
10051.500000	47.4	1000.0	1000.000	232.4	H	86.0	9.9	37.0	84.4
16786.733333	52.2	1000.0	1000.000	303.2	V	87.0	18.5	32.2	84.4

Average Data

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1600.133333	40.7	1000.0	1000.000	127.7	H	173.0	-6.0	43.7	84.4
1799.966667	45.0	1000.0	1000.000	169.6	V	49.0	-3.6	39.4	84.4
2000.000000	47.8	1000.0	1000.000	103.7	V	170.0	-1.9	36.6	84.4
2666.766667	43.4	1000.0	1000.000	103.7	V	49.0	0.4	41.0	84.4
4748.900000	32.7	1000.0	1000.000	182.6	V	119.0	4.8	51.7	84.4
10051.500000	33.9	1000.0	1000.000	232.4	H	86.0	9.9	50.5	84.4
16786.733333	39.3	1000.0	1000.000	303.2	V	87.0	18.5	45.1	84.4

2.8.28 Test Results Above 1GHz (LTE Band 12 Downlink Worst Case Configuration) - 10MHz Bandwidth High Channel



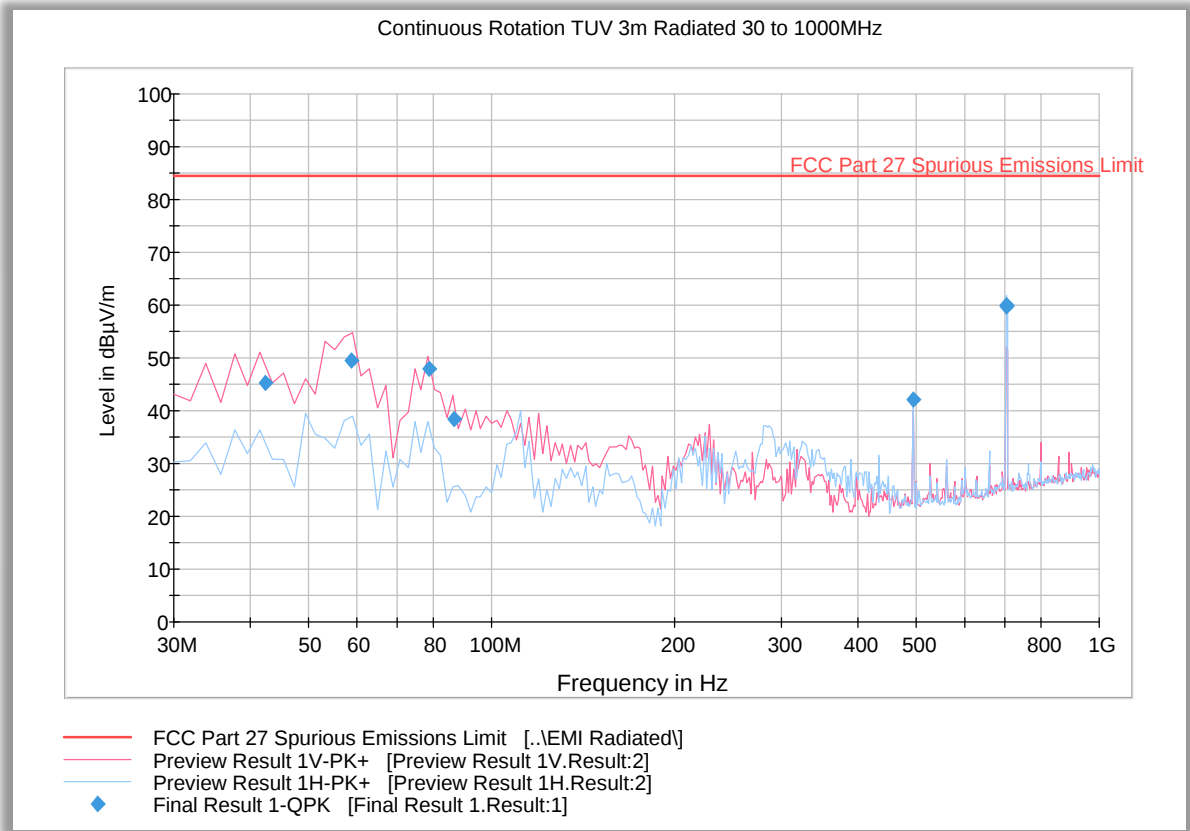
Peak Data

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1599.900000	46.2	1000.0	1000.000	124.7	H	178.0	-6.0	38.2	84.4
1800.166667	51.7	1000.0	1000.000	103.7	H	204.0	-3.6	32.7	84.4
1999.800000	52.8	1000.0	1000.000	151.6	V	33.0	-1.9	31.6	84.4
2666.766667	48.9	1000.0	1000.000	99.7	V	57.0	0.4	35.5	84.4
4619.700000	46.1	1000.0	1000.000	343.1	H	124.0	4.8	38.3	84.4
10795.600000	46.5	1000.0	1000.000	146.7	V	241.0	11.1	37.9	84.4
16975.333333	52.8	1000.0	1000.000	343.1	V	263.0	18.4	31.6	84.4

Average Data

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1599.900000	39.2	1000.0	1000.000	124.7	H	178.0	-6.0	45.2	84.4
1800.166667	45.6	1000.0	1000.000	103.7	H	204.0	-3.6	38.8	84.4
1999.800000	47.6	1000.0	1000.000	151.6	V	33.0	-1.9	36.8	84.4
2666.766667	43.0	1000.0	1000.000	99.7	V	57.0	0.4	41.4	84.4
4619.700000	33.2	1000.0	1000.000	343.1	H	124.0	4.8	51.2	84.4
10795.600000	33.8	1000.0	1000.000	146.7	V	241.0	11.1	50.6	84.4
16975.333333	39.4	1000.0	1000.000	343.1	V	263.0	18.4	45.0	84.4

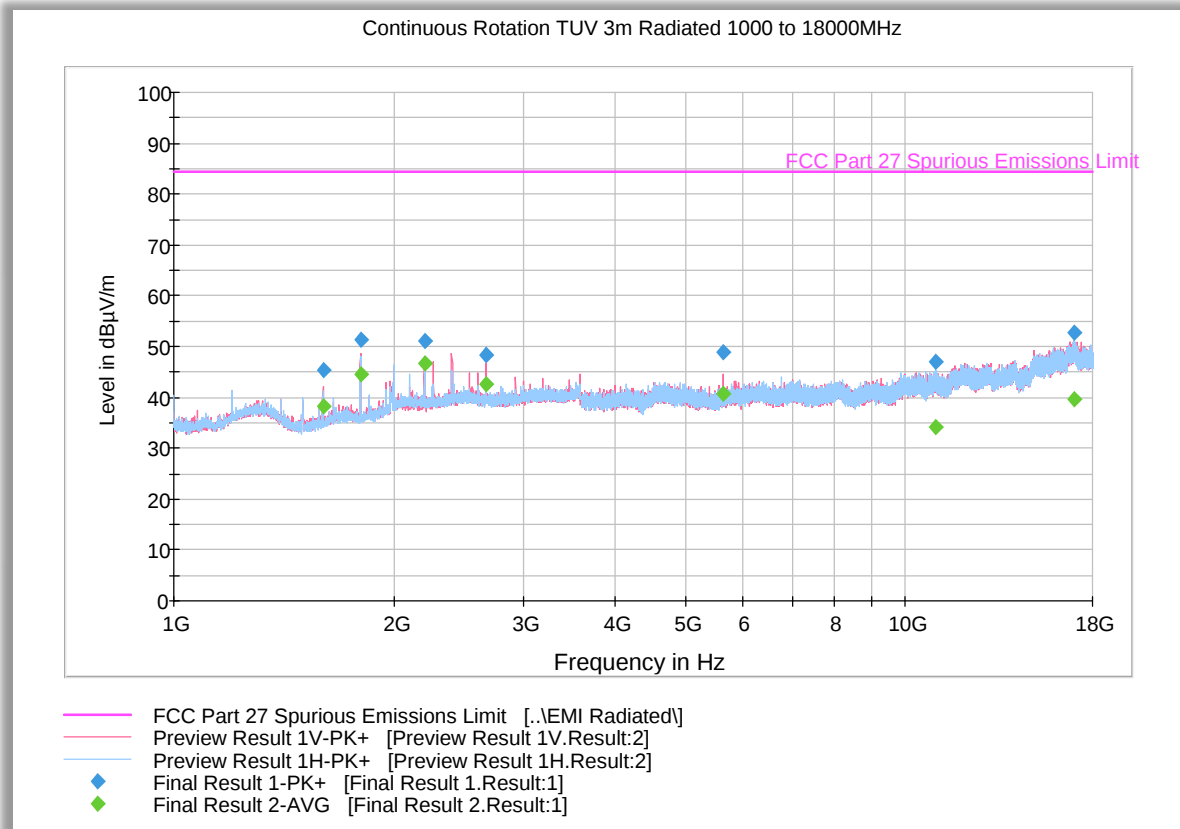
2.8.29 Test Results Below 1GHz (LTE Band 12 Uplink Worst Case Configuration) - 5MHz Bandwidth Low Channel



Quasi Peak Data

Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
42.423327	45.2	1000.0	120.000	100.0	V	105.0	-14.5	39.2	84.4
58.798317	49.4	1000.0	120.000	105.0	V	72.0	-16.9	35.0	84.4
78.797194	47.9	1000.0	120.000	127.0	V	168.0	-17.6	36.5	84.4
86.772745	38.5	1000.0	120.000	128.0	V	86.0	-16.7	45.9	84.4
494.989178	42.1	1000.0	120.000	100.0	V	328.0	-2.6	42.3	84.4
703.609058	59.9	1000.0	120.000	105.0	H	303.0	1.6	24.5	84.4
703.625170	59.8	1000.0	120.000	105.0	H	308.0	1.6	Fundamental Carrier	

2.8.30 Test Results Above 1GHz (LTE Band 12 Uplink Worst Case Configuration) - 5MHz Bandwidth Low Channel



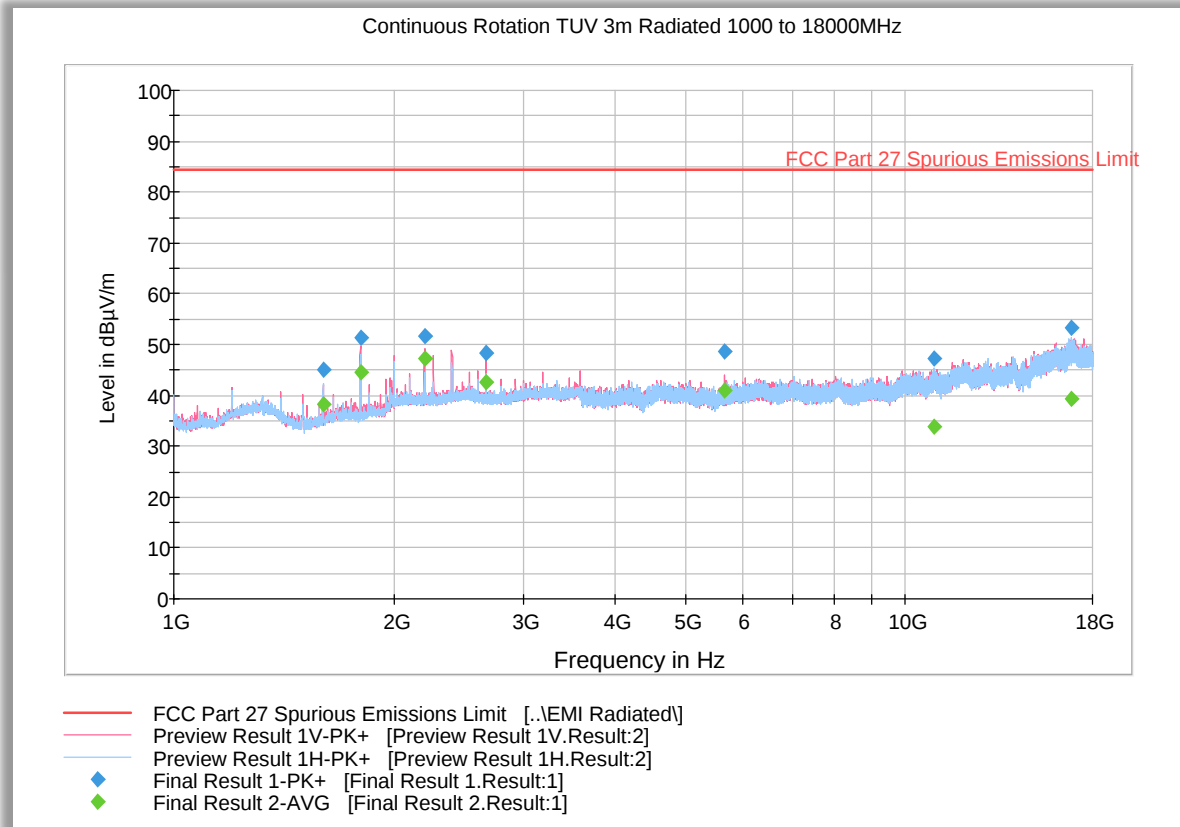
Peak Data

Frequency (MHz)	MaxPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1600.133333	45.2	1000.0	1000.000	352.7	V	159.0	-6.0	39.2	84.4
1800.166667	51.5	1000.0	1000.000	199.5	V	23.0	-3.6	32.9	84.4
2200.033333	51.2	1000.0	1000.000	217.5	V	15.0	-1.1	33.2	84.4
2666.766667	48.4	1000.0	1000.000	103.7	V	346.0	0.4	36.0	84.4
5632.133333	48.8	1000.0	1000.000	178.6	V	154.0	6.0	35.6	84.4
11010.16666	46.9	1000.0	1000.000	151.2	H	52.0	11.3	37.5	84.4
16994.76666	52.8	1000.0	1000.000	191.5	H	52.0	18.4	31.6	84.4

Average Data

Frequency (MHz)	Average (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1600.133333	38.2	1000.0	1000.000	352.7	V	159.0	-6.0	46.2	84.4
1800.166667	44.6	1000.0	1000.000	199.5	V	23.0	-3.6	39.8	84.4
2200.033333	46.7	1000.0	1000.000	217.5	V	15.0	-1.1	37.7	84.4
2666.766667	42.7	1000.0	1000.000	103.7	V	346.0	0.4	41.7	84.4
5632.133333	40.8	1000.0	1000.000	178.6	V	154.0	6.0	43.6	84.4
11010.16666	34.1	1000.0	1000.000	151.2	H	52.0	11.3	50.3	84.4
16994.76666	39.6	1000.0	1000.000	191.5	H	52.0	18.4	44.8	84.4

2.8.31 Test Results Above 1GHz (LTE Band 12 Uplink Worst Case Configuration) - 5MHz Bandwidth Middle Channel



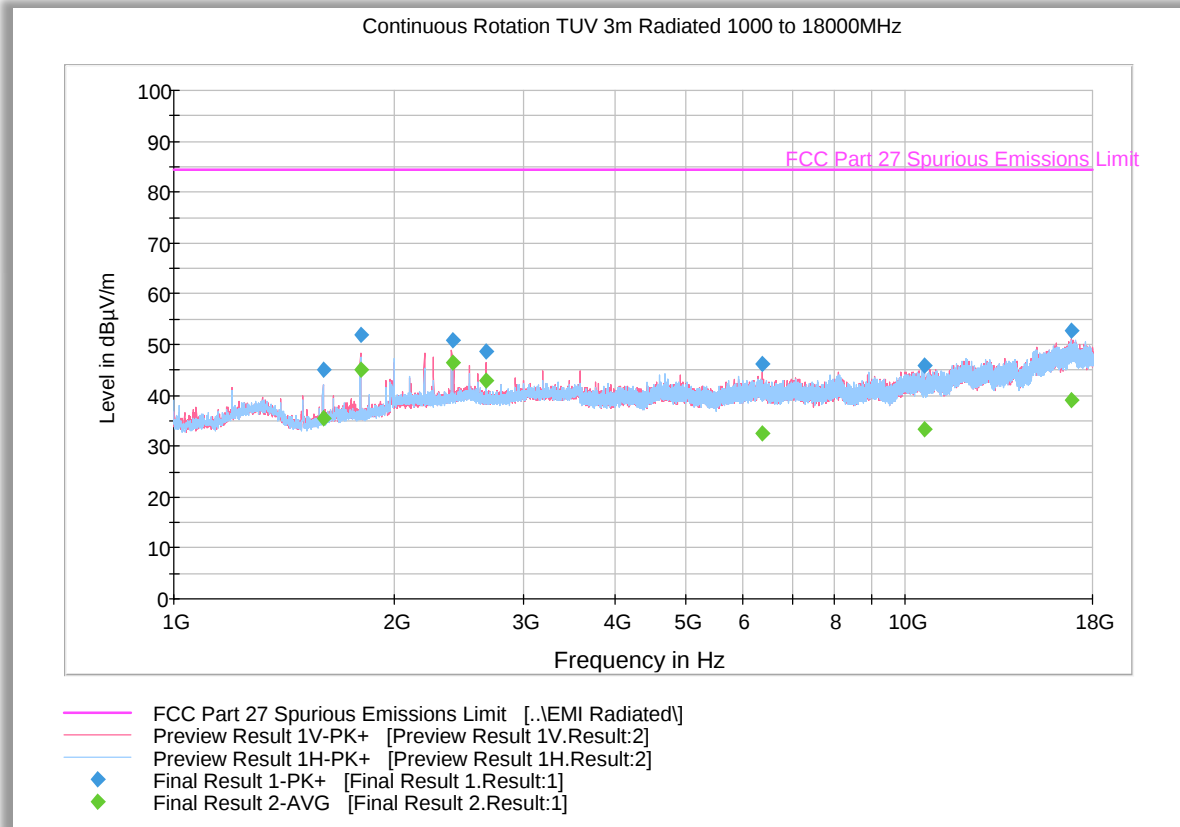
Peak Data

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1600.133333	45.1	1000.0	1000.000	127.7	H	136.0	-6.0	39.3	84.4
1799.966667	51.3	1000.0	1000.000	217.4	V	25.0	-3.6	33.1	84.4
2200.000000	51.6	1000.0	1000.000	250.5	V	161.0	-1.1	32.8	84.4
2666.766667	48.3	1000.0	1000.000	103.7	V	-13.0	0.4	36.1	84.4
5659.900000	48.7	1000.0	1000.000	165.6	V	145.0	6.0	35.7	84.4
10953.16666	47.2	1000.0	1000.000	252.3	H	166.0	11.2	37.2	84.4
16877.06666	53.3	1000.0	1000.000	325.1	H	-13.0	18.3	31.1	84.4

Average Data

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1600.133333	38.1	1000.0	1000.000	127.7	H	136.0	-6.0	46.3	84.4
1799.966667	44.7	1000.0	1000.000	217.4	V	25.0	-3.6	39.7	84.4
2200.000000	47.3	1000.0	1000.000	250.5	V	161.0	-1.1	37.1	84.4
2666.766667	42.7	1000.0	1000.000	103.7	V	-13.0	0.4	41.7	84.4
5659.900000	40.9	1000.0	1000.000	165.6	V	145.0	6.0	43.5	84.4
10953.16666	33.9	1000.0	1000.000	252.3	H	166.0	11.2	50.5	84.4
16877.06666	39.3	1000.0	1000.000	325.1	H	-13.0	18.3	45.1	84.4

2.8.32 Test Results Above 1GHz (LTE Band 12 Uplink Worst Case Configuration) - 10MHz Bandwidth High Channel



Peak Data

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1599.933333	45.1	1000.0	1000.000	191.5	H	112.0	-6.0	39.3	84.4
1799.966667	52.0	1000.0	1000.000	212.4	V	21.0	-3.6	32.4	84.4
2400.266667	51.0	1000.0	1000.000	142.7	V	141.0	-0.3	33.4	84.4
2666.766667	48.7	1000.0	1000.000	108.7	V	-13.0	0.4	35.7	84.4
6359.200000	46.2	1000.0	1000.000	352.7	V	199.0	6.7	38.2	84.4
10610.066666	46.0	1000.0	1000.000	332.1	H	16.0	10.8	38.4	84.4
16872.166666	52.6	1000.0	1000.000	326.2	V	134.0	18.3	31.8	84.4

Average Data

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1599.933333	35.5	1000.0	1000.000	191.5	H	112.0	-6.0	48.9	84.4
1799.966667	45.0	1000.0	1000.000	212.4	V	21.0	-3.6	39.4	84.4
2400.266667	46.5	1000.0	1000.000	142.7	V	141.0	-0.3	37.9	84.4
2666.766667	43.0	1000.0	1000.000	108.7	V	-13.0	0.4	41.4	84.4
6359.200000	32.4	1000.0	1000.000	352.7	V	199.0	6.7	52.0	84.4
10610.066666	33.2	1000.0	1000.000	332.1	H	16.0	10.8	51.2	84.4
16872.166666	39.1	1000.0	1000.000	326.2	V	134.0	18.3	45.3	84.4



2.9 FREQUENCY STABILITY

2.9.1 Specification Reference

FCC 47 CFR Part 2, Clause 2.1055
FCC 47 CFR Part 24, Clause 24.235
FCC 47 CFR Part 27, Clause 27.54
RSS-133, Clause 6.3
RSS-130, Clause 4.5

2.9.2 Standard Applicable

FCC 47 CFR Part 22, Clause 24.235 and Part 27, Clause 27.54:
The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

RSS-133 Clause 6.3 and RSS-130 Clause 4.5:
The frequency stability shall be sufficient to ensure that the occupied bandwidth stays within the operating frequency block when tested to the temperature and supply voltage variations specified in RSS-Gen.

2.9.3 Equipment Under Test and Modification State

2.9.4 Equipment Under Test and Modification State

Serial No: NU: 976036000256 and CU: 977036000055 / Test Configuration A and B

2.9.5 Date of Test/Initial of test personnel who performed the test

October 07 and 08, 2020 / XYZ

2.9.6 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.9.7 Environmental Conditions/ Test Location

Test performed at TÜV SÜD America Inc. Rancho Bernardo facility

Ambient Temperature	23.6 - 24.2°C
Relative Humidity	44.7 - 48.9%
ATM Pressure	98.6 - 98.9kPa



2.9.8 Additional Observations

- This is a conducted test.
- EUT Downlink transmits on two internal antennas and uplink transmits on two external antennas simultaneously in the same frequency range, i.e. TX MIMO mode. However, there is no much difference between two antenna ports and the measurement was performed on one antenna port as representative configuration.
- The EUT was operated at 120.0VAC nominal voltage and was placed in the temperature chamber for the series of evaluations performed.
- Test was performed on 5 MHz Bandwidth Mid channel as the representative configuration. Input Type "Tones" was selected and the EUT was injected a CW signal from a Signal Generator and maximum frequency error was monitored using the spectrum analyzer.
- The Temperature was reduced to -30°C and allowed to sit for 1 hour to allow the equipment and chamber temperature to stabilize. The measurements on both downlink and uplink were then performed. The temperature was then increased by 10°C steps and allowed to settle before taking the next set of measurements. The EUT was tested over the temperature -30°C to +50°C.
- Voltage variation was also performed at 85% and 115% of the nominal voltage.

2.9.9 Test Results Summary

LTE B2 Downlink – 5 MHz BW Middle Channel 1960 MHz				
Voltage (VDC)	Temperature (°C)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
120	-30	0	0	-
	-20	0	0	-
	-10	0	0	-
	0	0	0	-
	+10	0	0	-
	+20	0	0	-
	+30	0	0	-
	+40	0	0	-
	+50	0	0	-
102	+20	0	0	-
138		0	0	-

LTE B2 Uplink – 5 MHz BW Middle Channel 1880 MHz				
Voltage (VDC)	Temperature (°C)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
120	-30	0	0	-
	-20	0	0	-
	-10	0	0	-
	0	0	0	-
	+10	0	0	-
	+20	0	0	-
	+30	0	0	-
	+40	0	0	-
	+50	0	0	-
102	+20	0	0	-
138		0	0	-

The frequency stability of the EUT is sufficient to keep it within the authorised frequency ranges at any temperature interval and voltage variations across the measured range.

LTE B4 Downlink – 5 MHz BW Middle Channel 2132.5 MHz				
Voltage (VDC)	Temperature (°C)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
120	-30	0	0	-
	-20	0	0	-
	-10	0	0	-
	0	0	0	-
	+10	0	0	-
	+20	0	0	-
	+30	0	0	-
	+40	0	0	-
	+50	0	0	-
102	+20	0	0	-
138		0	0	-

LTE B4 Uplink – 5 MHz BW Middle Channel 1732.5 MHz				
Voltage (VDC)	Temperature (°C)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
120	-30	0	0	-
	-20	0	0	-
	-10	0	0	-
	0	0	0	-
	+10	0	0	-
	+20	0	0	-
	+30	0	0	-
	+40	0	0	-
	+50	0	0	-
102	+20	0	0	-
138		0	0	-

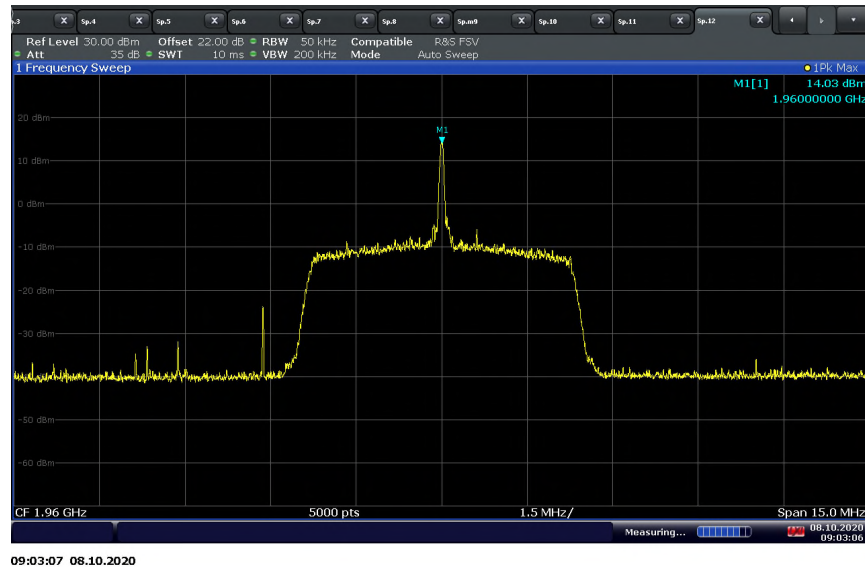
The frequency stability of the EUT is sufficient to keep it within the authorised frequency ranges at any temperature interval and voltage variations across the measured range.

LTE B12 Downlink – 5 MHz BW Middle Channel 737.5 MHz				
Voltage (VDC)	Temperature (°C)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
120	-30	0	0	-
	-20	0	0	-
	-10	0	0	-
	0	0	0	-
	+10	0	0	-
	+20	0	0	-
	+30	0	0	-
	+40	0	0	-
	+50	0	0	-
102	+20	0	0	-
138		0	0	-

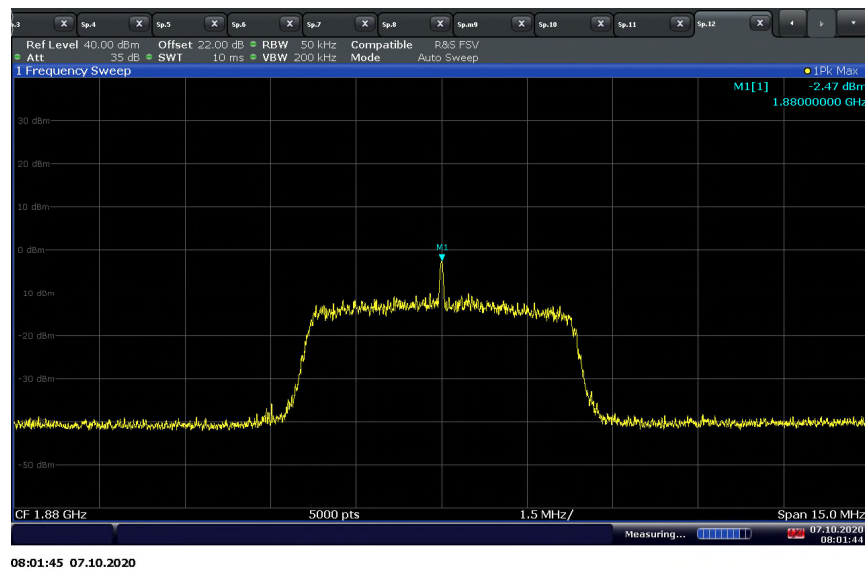
LTE B12 Uplink – 5 MHz BW Middle Channel 707.5 MHz				
Voltage (VDC)	Temperature (°C)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
120	-30	0	0	-
	-20	0	0	-
	-10	0	0	-
	0	0	0	-
	+10	0	0	-
	+20	0	0	-
	+30	0	0	-
	+40	0	0	-
	+50	0	0	-
102	+20	0	0	-
138		0	0	-

The frequency stability of the EUT is sufficient to keep it within the authorised frequency ranges at any temperature interval and voltage variations across the measured range.

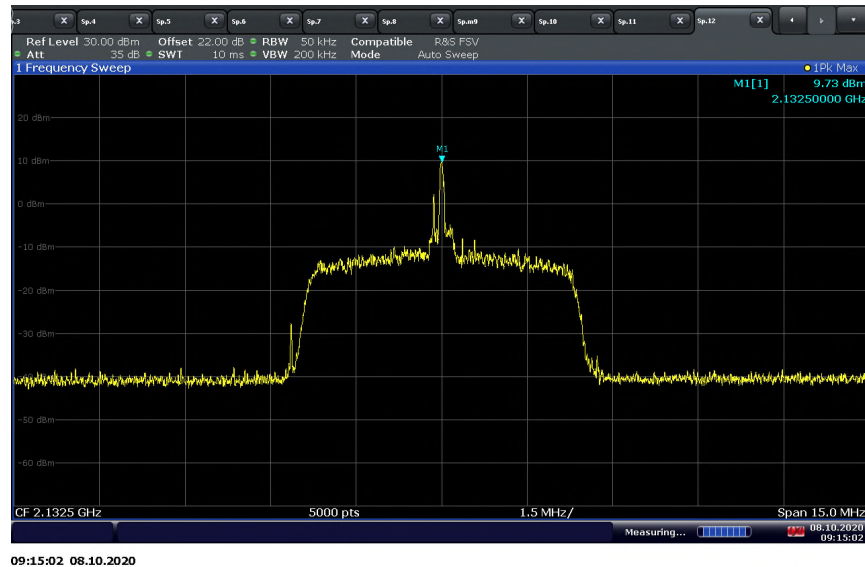
2.9.10 Sample Test Plots



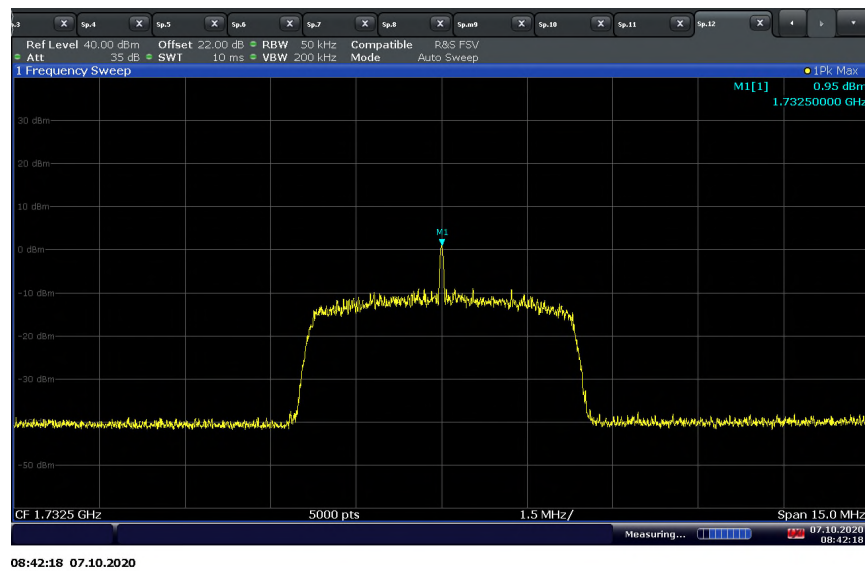
LTE Band 2 Downlink Middle Channel 120VAC @ 20°C



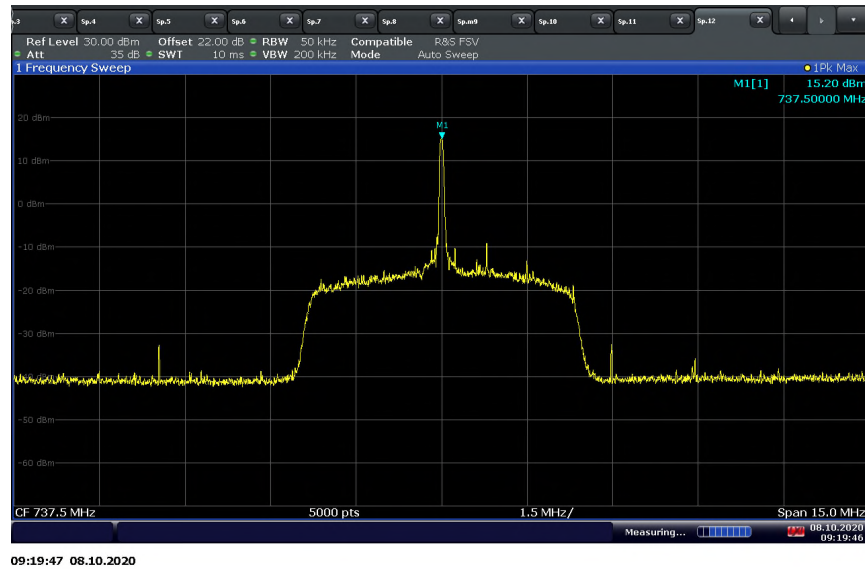
LTE Band 2 Uplink Middle Channel 120VAC @ 20°C



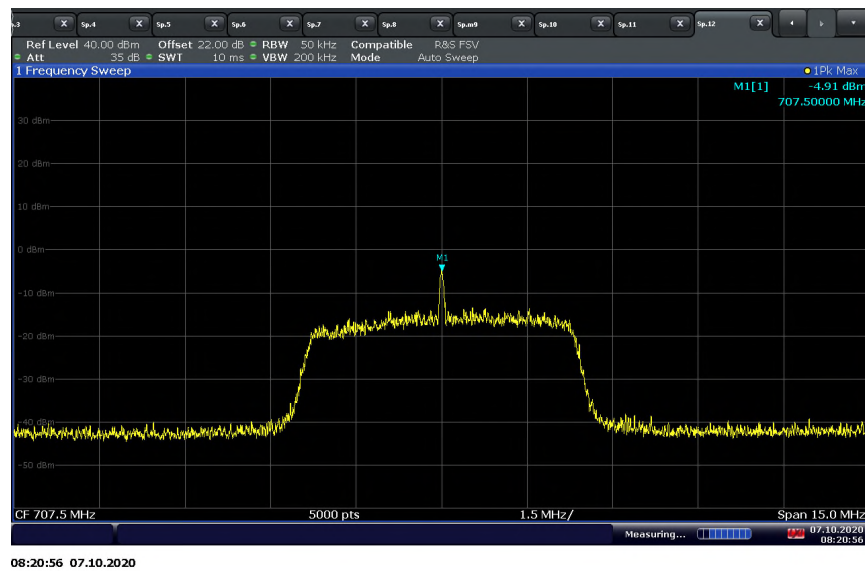
LTE Band 4 Downlink Middle Channel 120VAC @ 20°C



LTE Band 4 Uplink Middle Channel 120VAC @ 20°C



LTE Band 12 Downlink Middle Channel 120VAC @ 20°C



LTE Band 12 Uplink Middle Channel 120VAC @ 20°C



2.10 AGC THRESHOLD LEVEL

2.10.1 Specification Reference

KDB 935210 D05, Clause 3.2

2.10.2 Standard Applicable

The AGC threshold shall be determined by applying the procedure of 3.2 (of the current KDB), but with the signal generator configured to produce representative broadband band-limited AWGN signal.

2.10.3 Equipment Under Test and Modification State

Serial No: NU: 976036000256 and CU: 977036000055 / Test Configuration A and B

2.10.4 Date of Test/Initial of test personnel who performed the test

September 27 and 28, 2020 / XYZ

2.10.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.10.6 Environmental Conditions/ Test Location

Test performed at TÜV SÜD America Inc. Rancho Bernardo facility

Ambient Temperature	21.8 - 22.3 °C
Relative Humidity	49.8 - 51.6 %
ATM Pressure	98.7 kPa

2.10.7 Additional Observations

- This is a conducted test.
- EUT Downlink transmits on two internal antennas and uplink transmits on two external antennas simultaneously in the same frequency range, i.e. TX MIMO mode. However, there is no much difference between two antenna ports and the measurement was performed on one antenna port as representative configuration.
- LTE 5 MHz bandwidth Signal was used as the applicable intended operating signal type.
- When testing output power of the EUT, a power meter was used according to method 3.5.4 of this KDB, and a spectrum analyzer was used according to method 3.5.3 with setting as below when testing input power of the EUT:
 - RBW = 1% to 5% of OBW
 - VBW $\geq 3 \times$ RBW
 - RMS Detector
 - Trace average at least 100 traces
 - Span is 2 x to 3 x the OBW
- The AGC threshold level was recorded when increasing the input level until a 1 dB increase in the input signal power no longer causes a 1 dB increase in the output signal power.
- Both downlink and uplink are tested.

2.10.8 Test Results

AGC Threshold Level						
Mode	Bandwidth (MHz)	Channel	Frequency (MHz)	Average Power		AGC Threshold Level (dBm)
				(dBm)	(W)	
LTE B2 Downlink	5	900	1960.0	10.33	0.01	-85.75
LTE B2 Uplink	5	18900	1880.0	21.60	0.14	-75.90
LTE B4 Downlink	5	2175	2132.5	10.30	0.01	-85.25
LTE B4 Uplink	5	20175	1732.5	23.35	0.22	-76.34
LTE B12 Downlink	5	5095	737.5	10.39	0.01	-83.15
LTE B12 Uplink	5	23095	707.5	20.79	0.12	-79.14