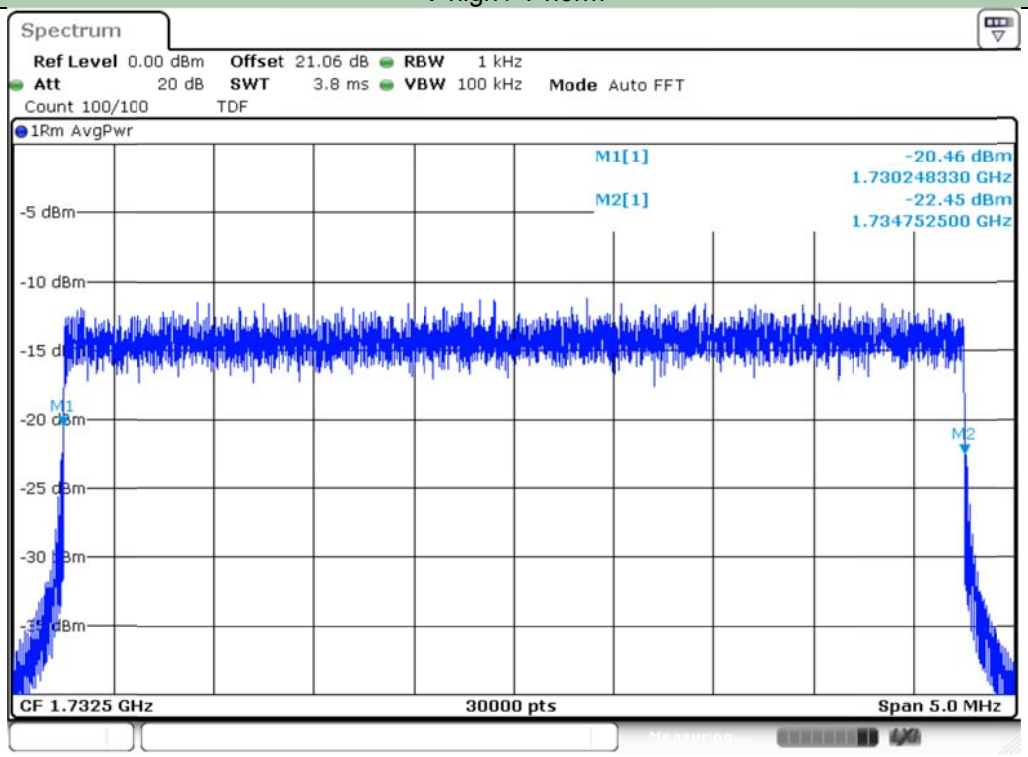
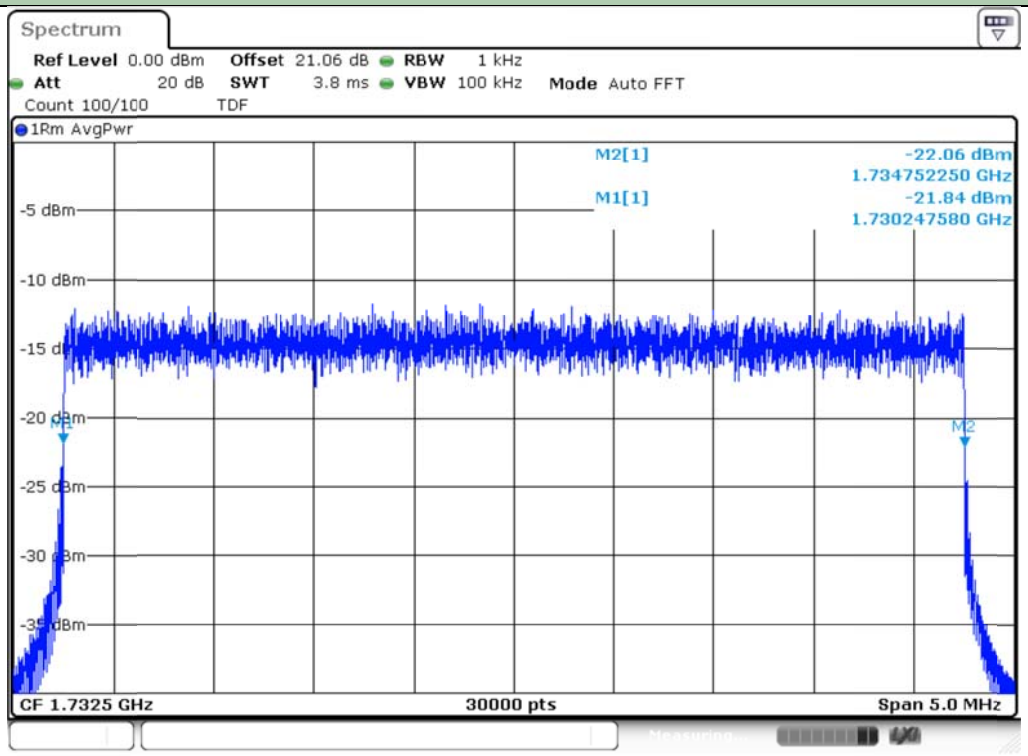
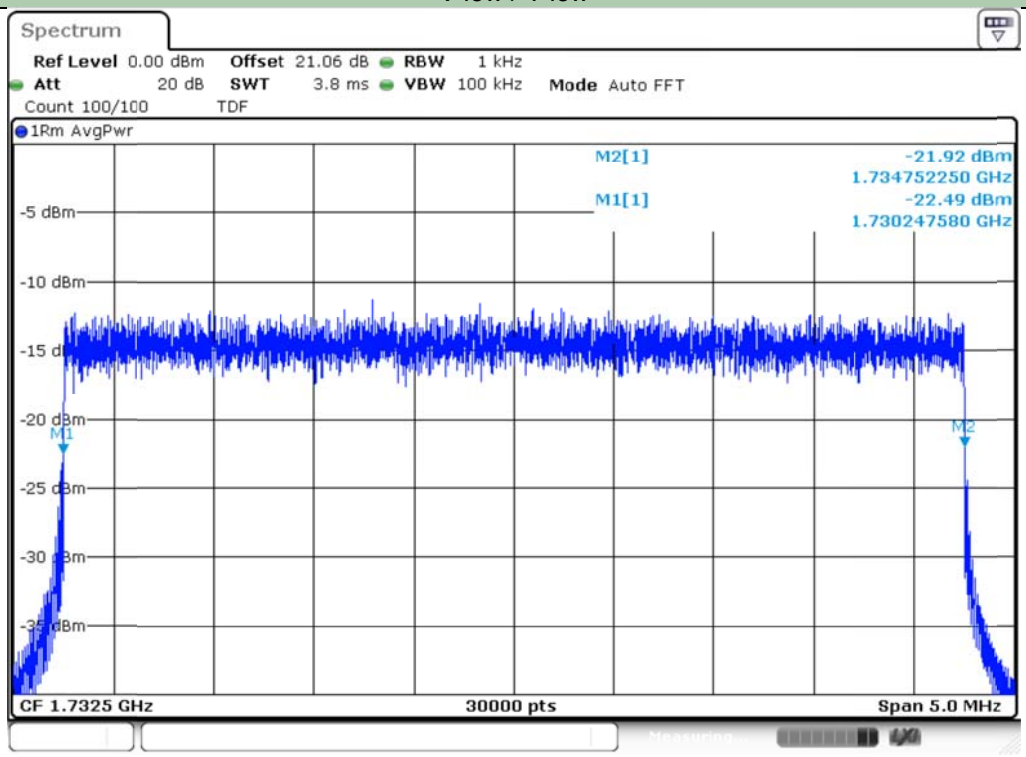
V high / T norm



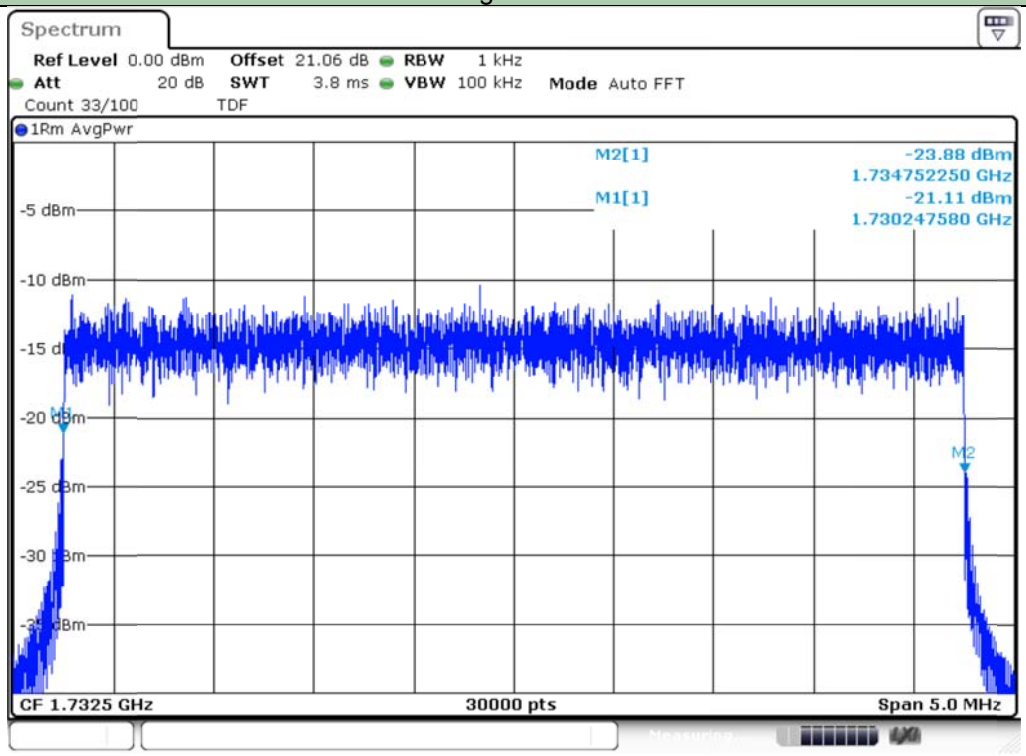
V norm / T low



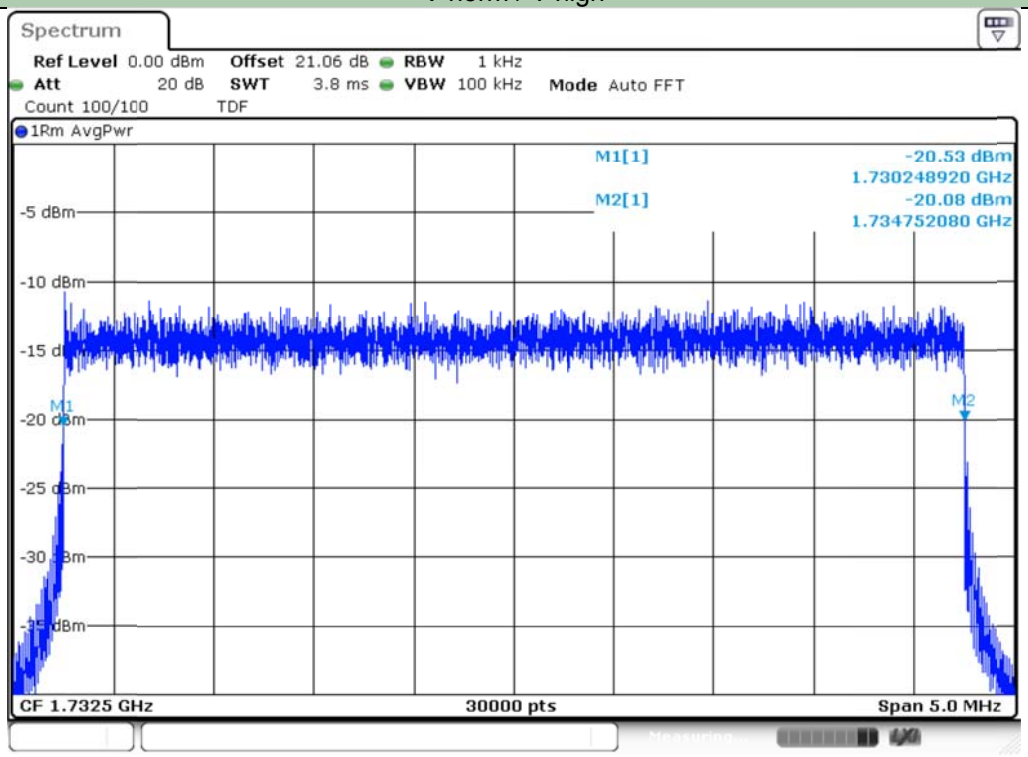
V low / T low



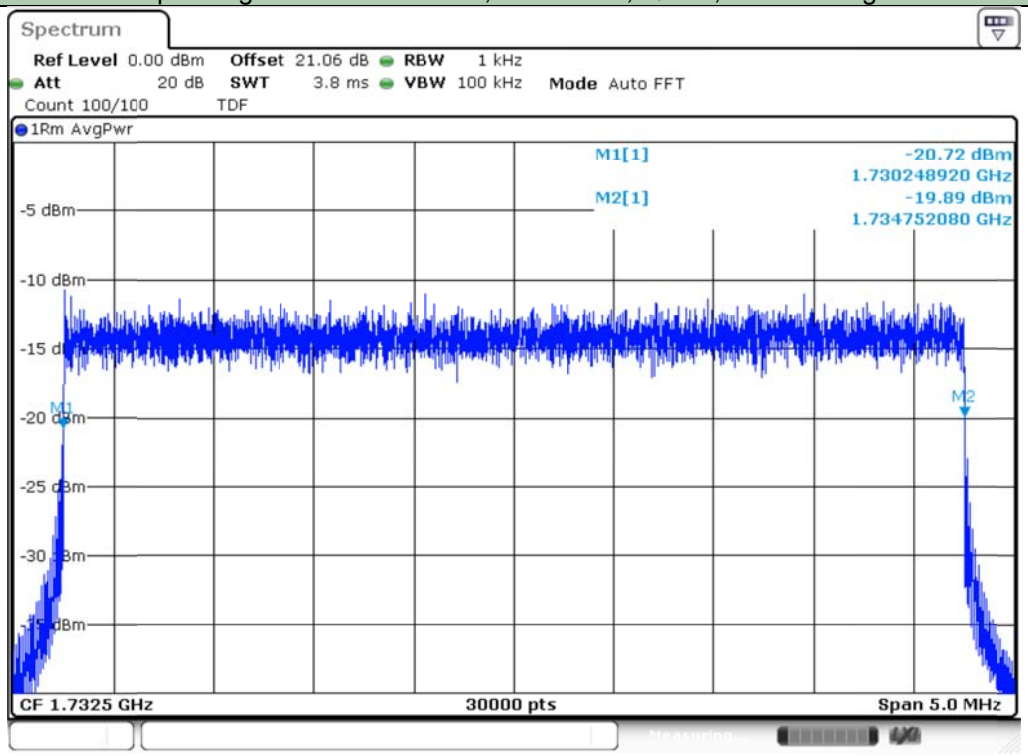
V high / T low



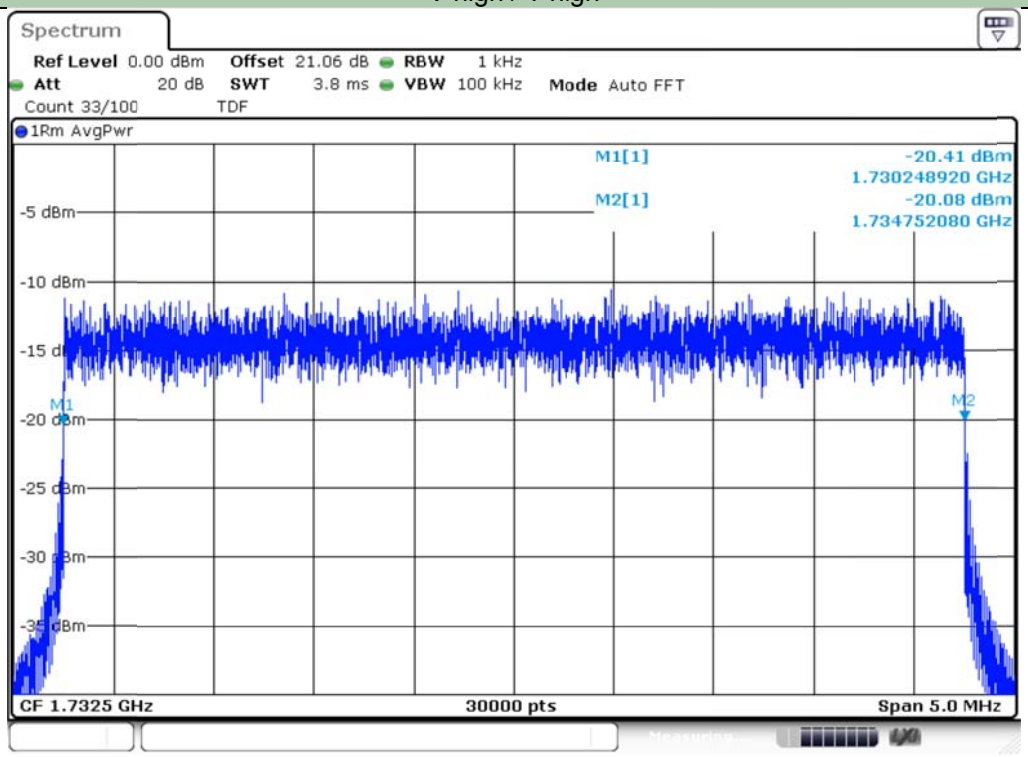
V norm / T high



Operating Mode: LTE Band 4, 5 MHz BW, QPSK, V low / T high



V high / T high


Spectrum
Ref Level 0.00 dBm Offset 21.06 dB RBW 1 kHz
Att 20 dB SWT 3.8 ms VBW 100 kHz Mode Auto FFT
Count 33/100 TDF
1Rm AvgPwr
M1[1] -20.41 dBm
1.730248920 GHz
M2[1] -20.08 dBm
1.734752080 GHz
-5 dBm
-10 dBm
-15 dBm
-20 dBm
-25 dBm
-30 dBm
-35 dBm
M1
M2
CF 1.7325 GHz
30000 pts
Span 5.0 MHz

5.5 Conducted Band Edge and Unwanted Emission

5.5.1 Limit

Acc. to Part 27.53(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:

(2) On any frequency outside the 776-778 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.

Acc. to Part 27.53(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.

Acc. to Part 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 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 log10(P) dB.

5.5.2 Method of Measurement

Reference to KDB 971168 D01 Power Meas License Digital Systems v02r02 section 6.

Acc. to Part 27.53(c)(5) Compliance 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;

Acc. to Part 27.53(h)(3) Measurement procedure. (i) Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

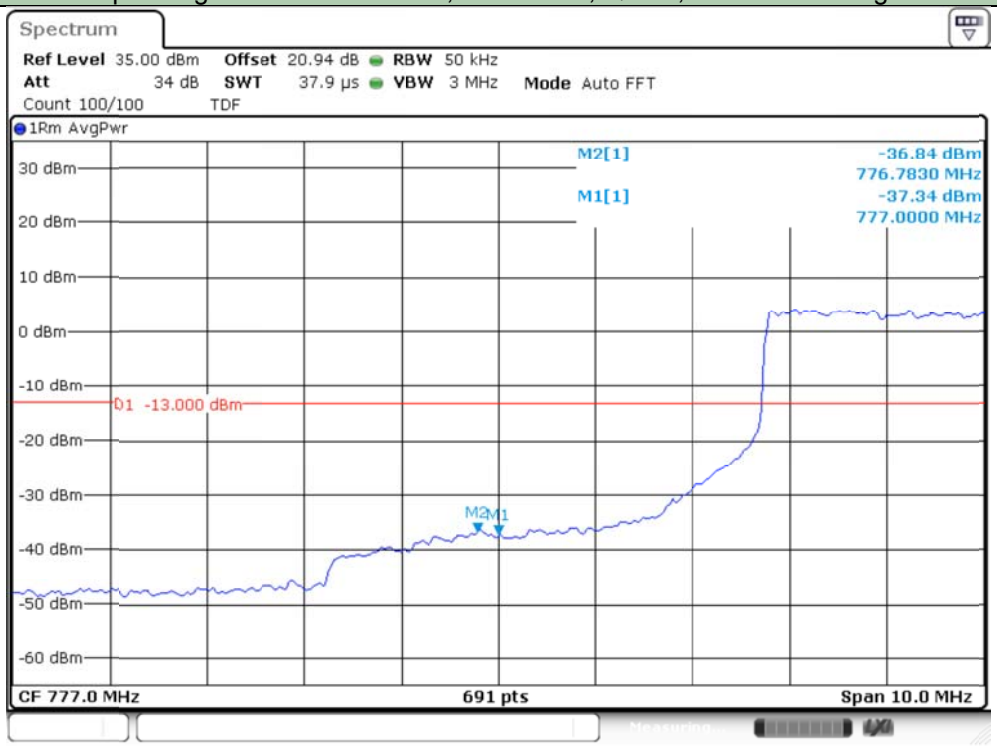
5.5.3 Test Data

Date of Test	2017-03-02	Temperature	(21.2 ~ 22.1) °C
		Relative humidity	(26.8 ~ 28.6) % R.H.
Test Result	***PASS***	Tested By	In-yong Song

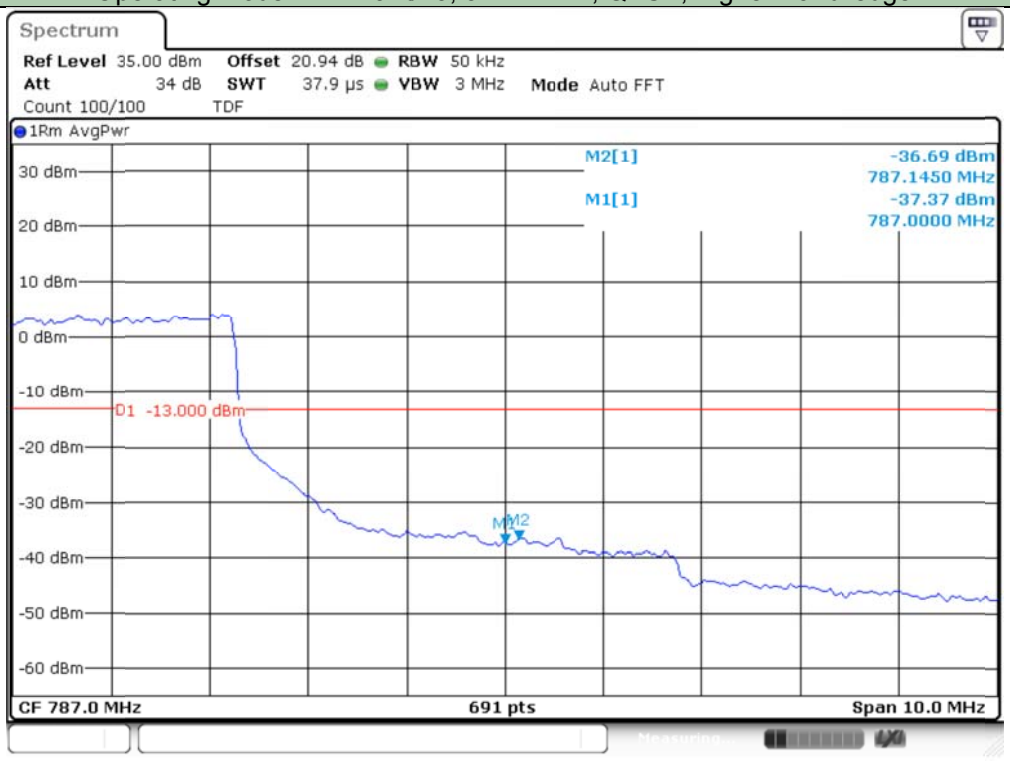
ENG Co., Ltd. 135-60 Gyeongchung-daero, Gonjiam-eup, Gwangju-si, Gyeonggi-do, Korea 464-942 Report Form_01 (Rev.0)
TEL: +82-31-727-8300 FAX: +82-31-746-0800 http://www.the-eng.co.kr

5.5.3.1 Test Plots for LTE Band 13

Operating Mode: LTE Band13, 5 MHz BW, QPSK, Lower Band-edge

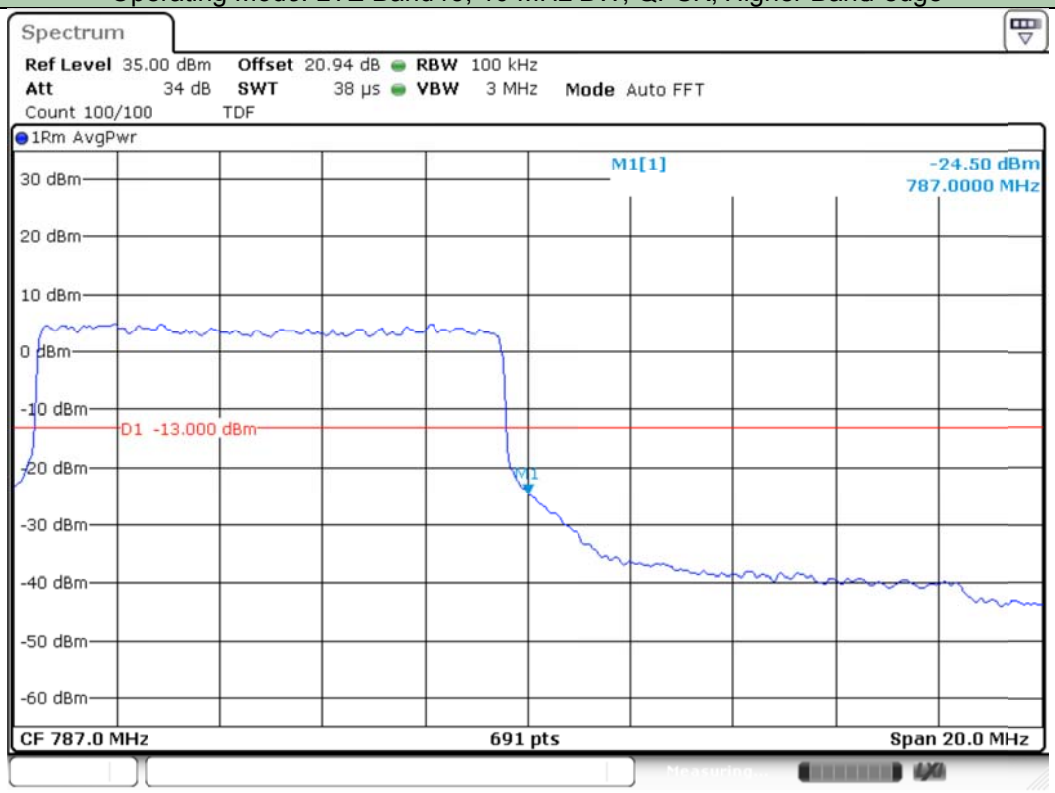


Operating Mode: LTE Band13, 5 MHz BW, QPSK, Higher Band-edge



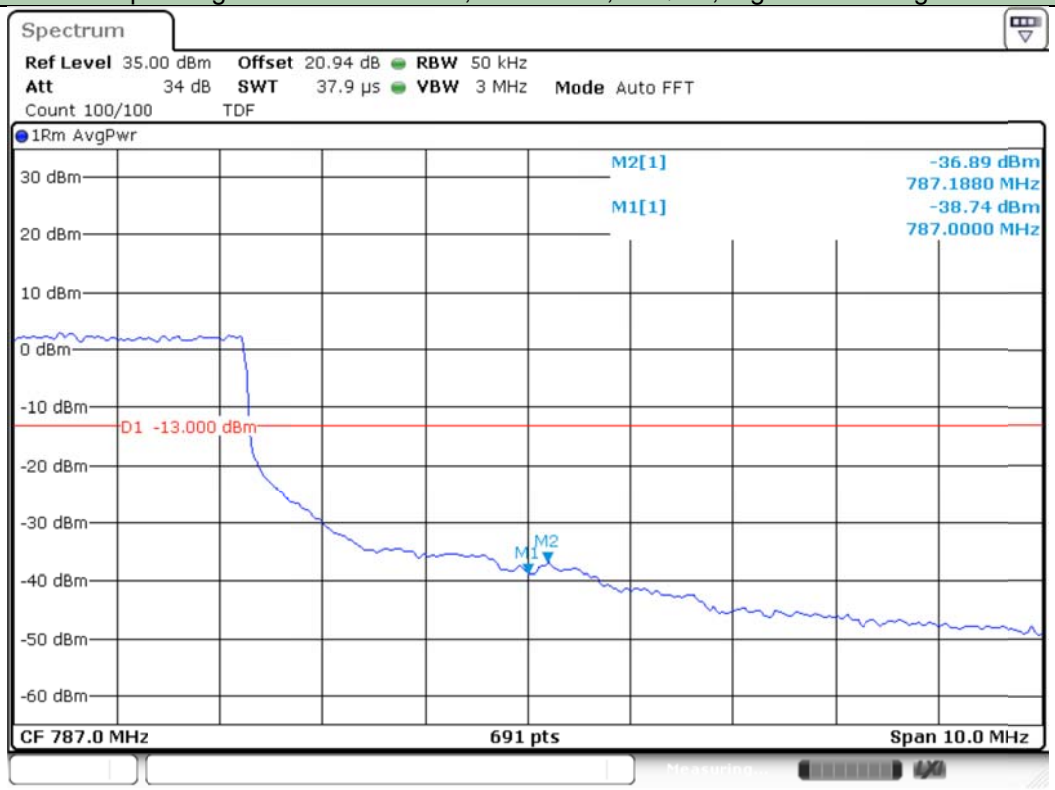
Operating Mode: LTE Band13, 10 MHz BW, QPSK, Lower Band-edge

Operating Mode: LTE Band13, 10 MHz BW, QPSK, Higher Band-edge

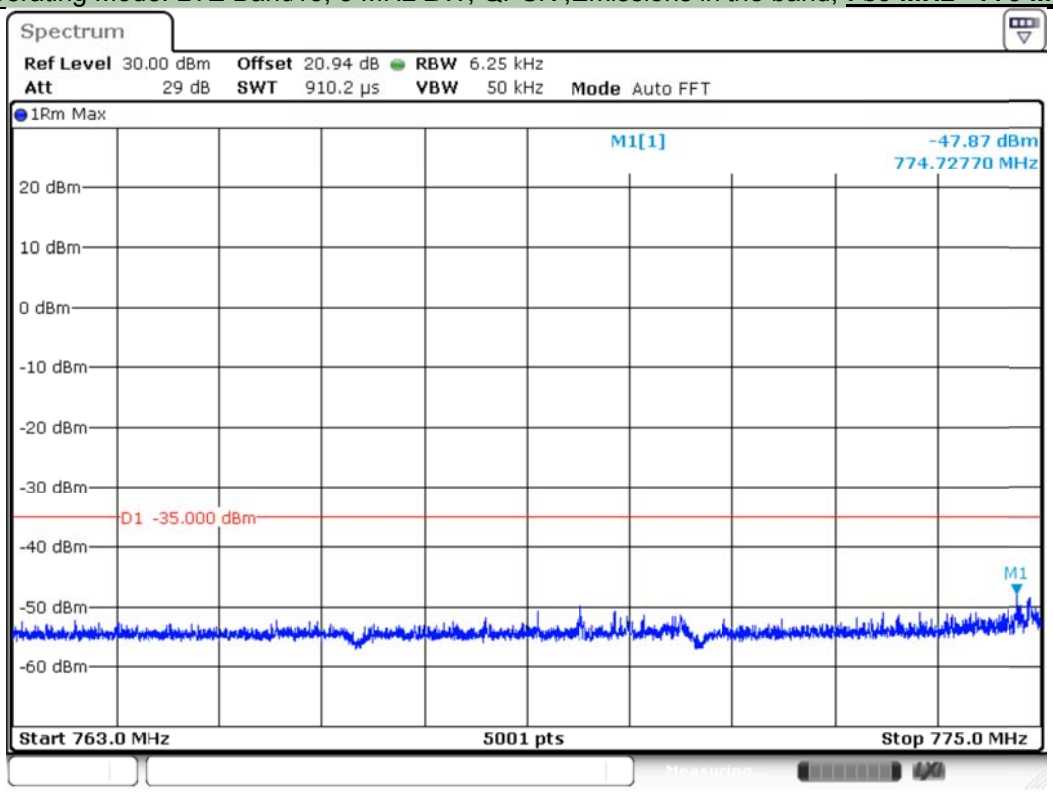


Operating Mode: LTE Band13, 5 MHz BW, 16QAM, Lower Band-edge

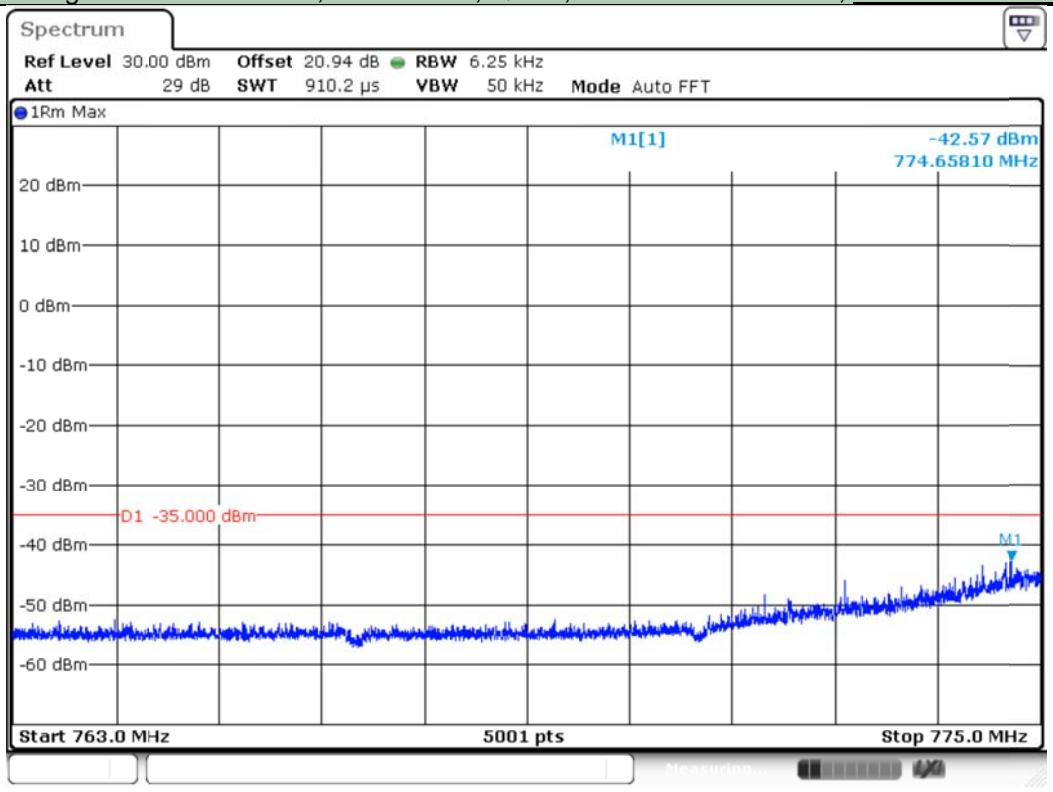
Operating Mode: LTE Band13, 5 MHz BW, 16QAM, Higher Band-edge



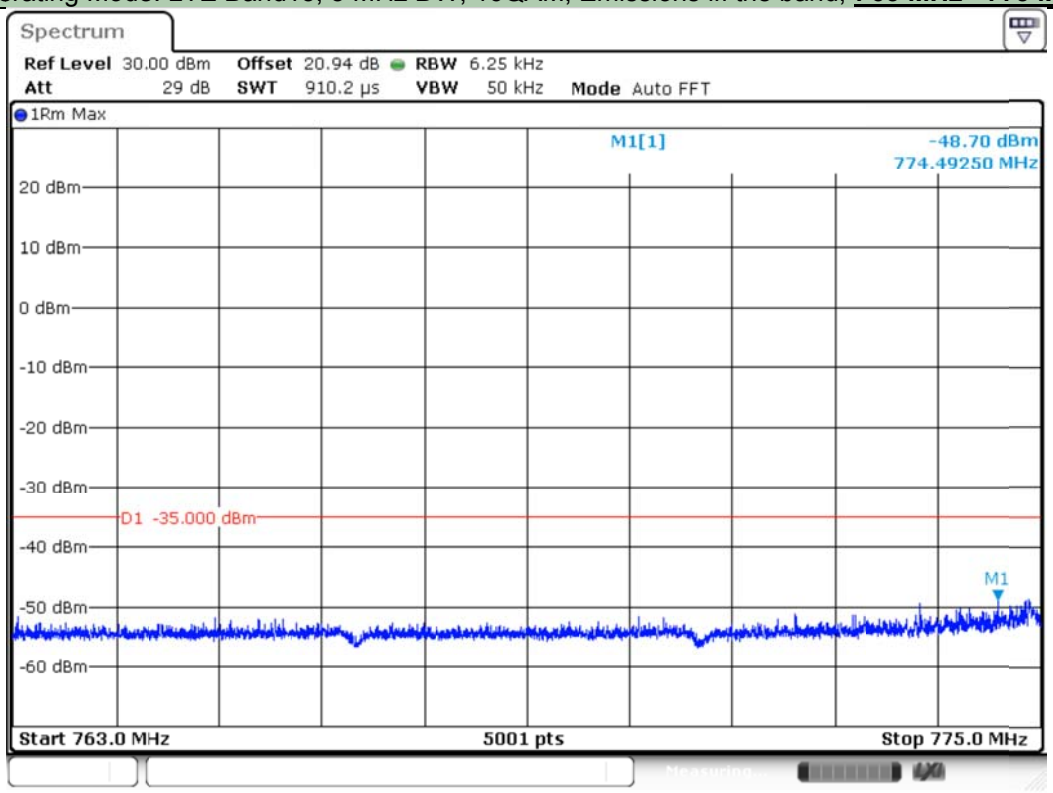
Operating Mode: LTE Band13, 5 MHz BW, QPSK ,Emissions in the band, **763 MHz - 775 MHz**



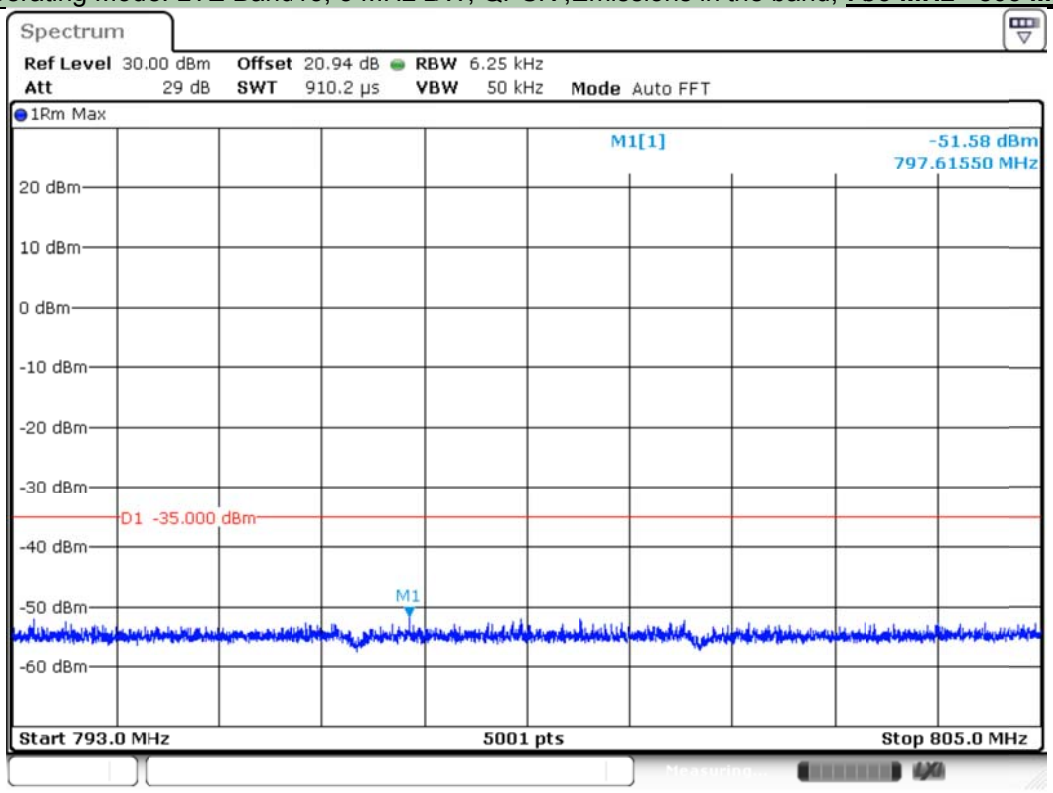
Operating Mode: LTE Band13, 10 MHz BW, QPSK, Emissions in the band, **763 MHz - 775 MHz**



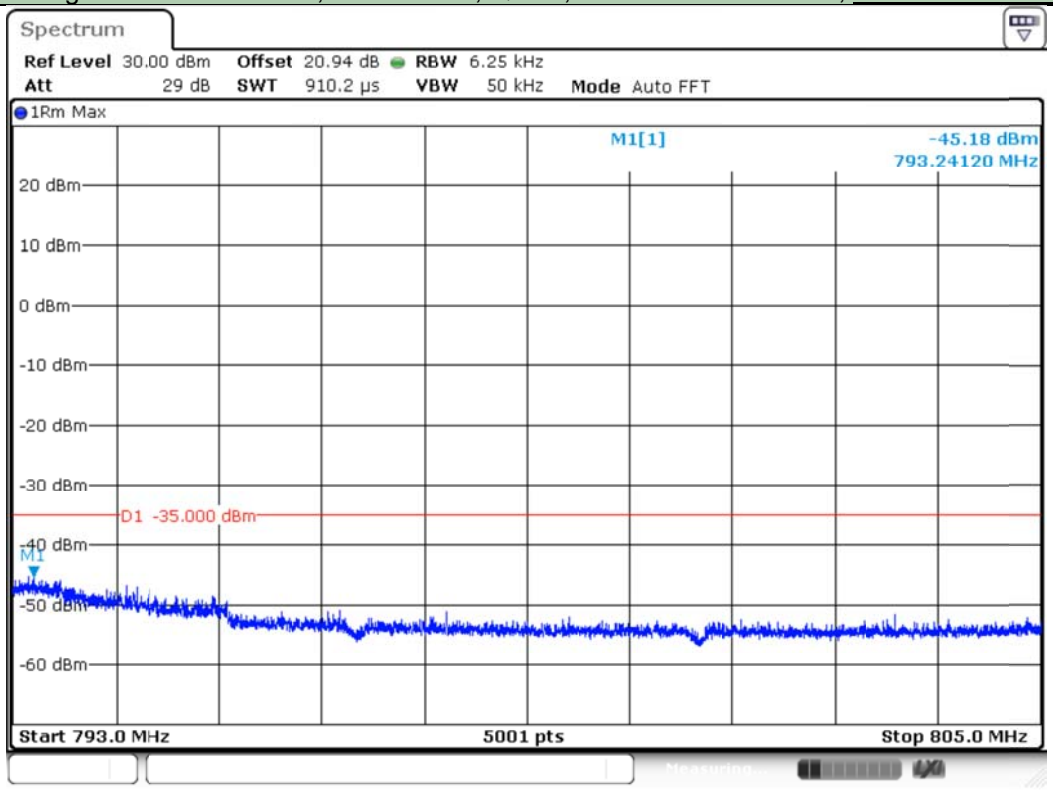
Operating Mode: LTE Band13, 5 MHz BW, 16QAM, Emissions in the band, **763 MHz - 775 MHz**



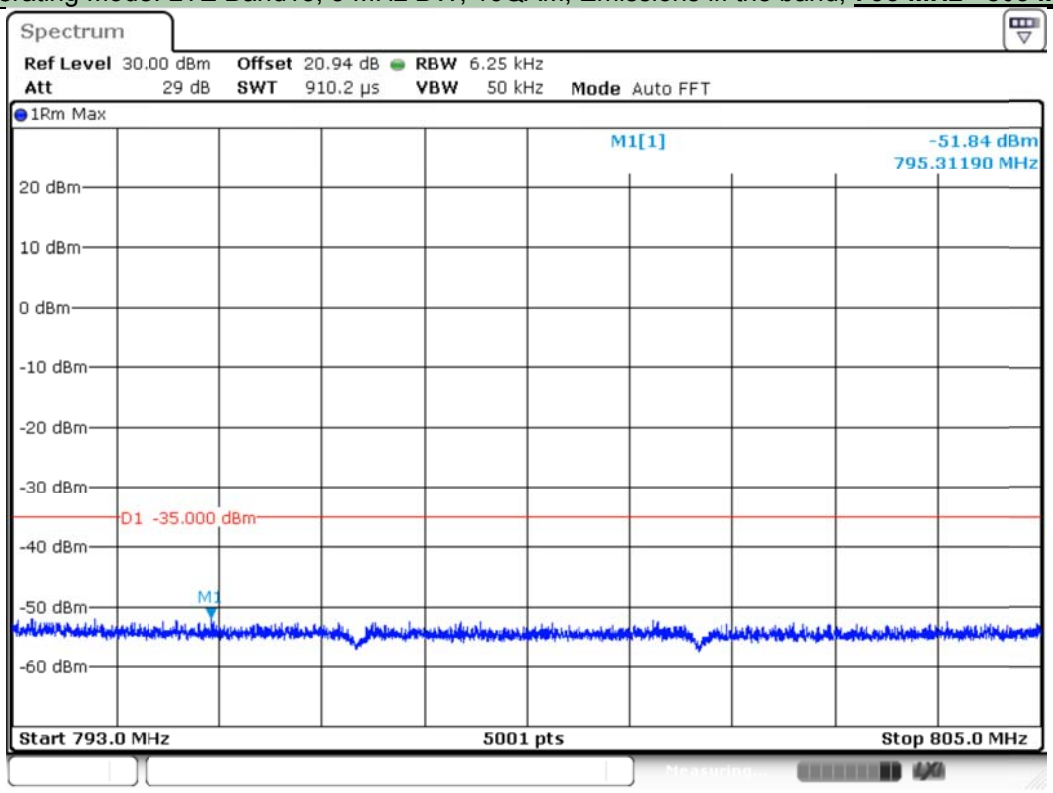
Operating Mode: LTE Band13, 5 MHz BW, QPSK ,Emissions in the band, **793 MHz - 805 MHz**



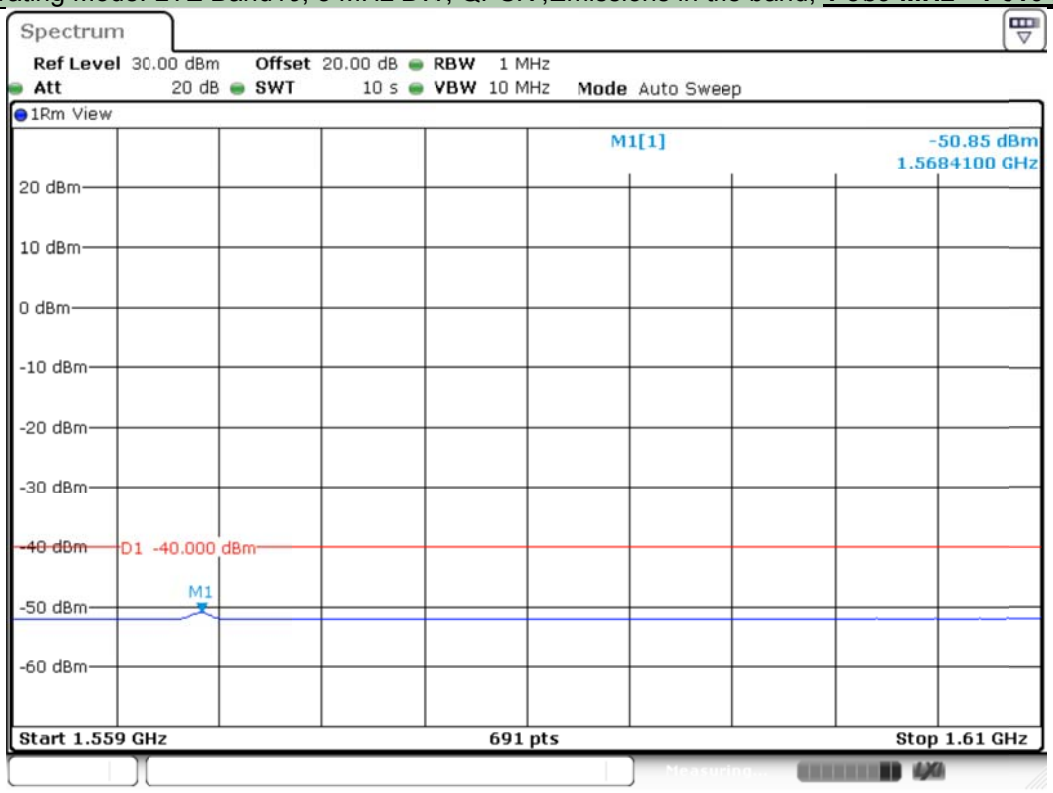
Operating Mode: LTE Band13, 10 MHz BW, QPSK, Emissions in the band, **793 MHz - 805 MHz**



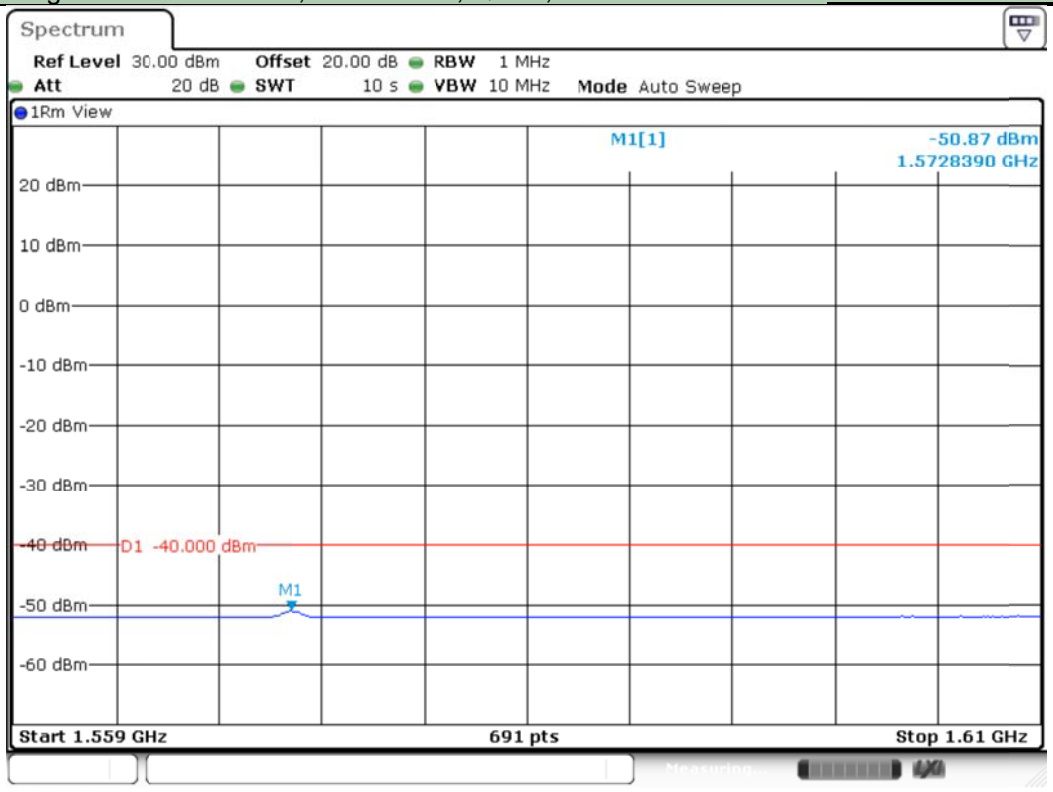
Operating Mode: LTE Band13, 5 MHz BW, 16QAM, Emissions in the band, **793 MHz - 805 MHz**



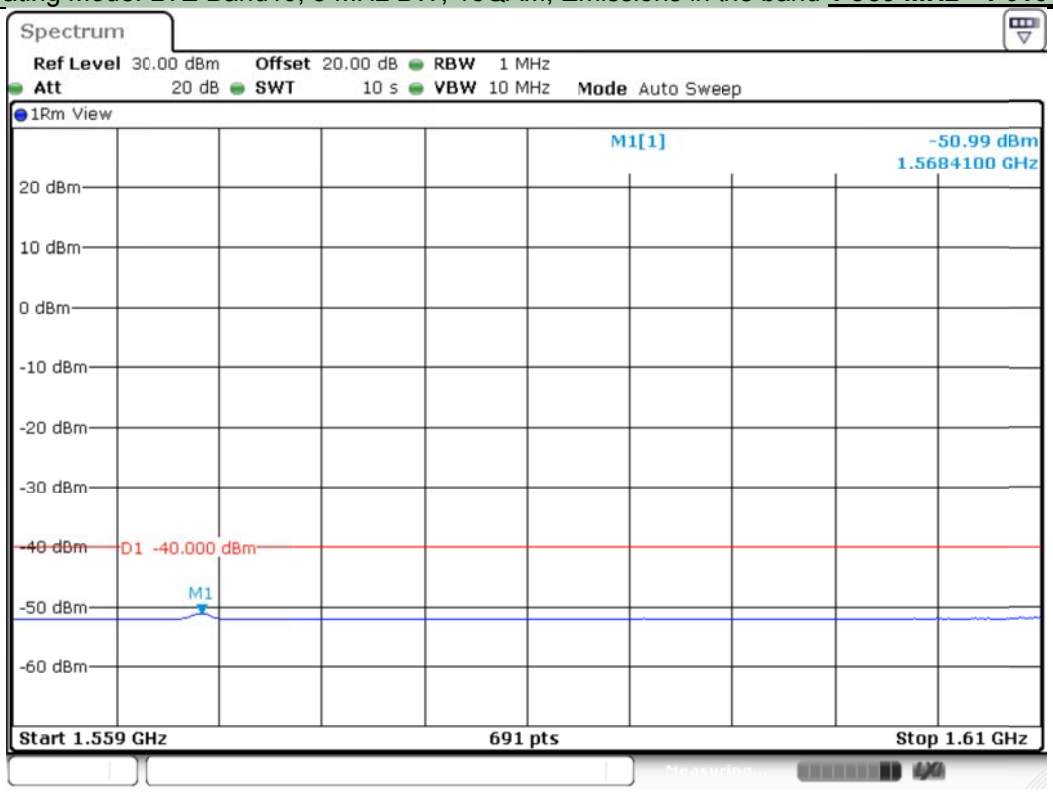
Operating Mode: LTE Band13, 5 MHz BW, QPSK ,Emissions in the band, **1 559 MHz - 1 610 MHz**



Operating Mode: LTE Band13, 10 MHz BW, QPSK, Emissions in the band **1 559 MHz - 1 610 MHz**

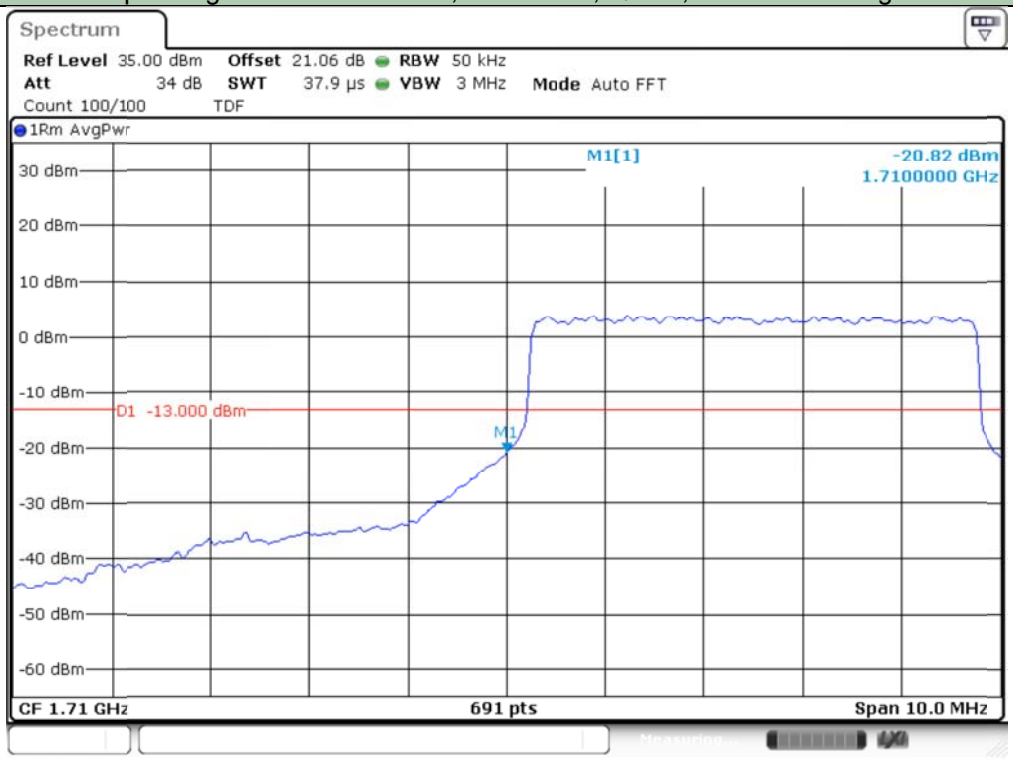


Operating Mode: LTE Band13, 5 MHz BW, 16QAM, Emissions in the band **1 559 MHz - 1 610 MHz**

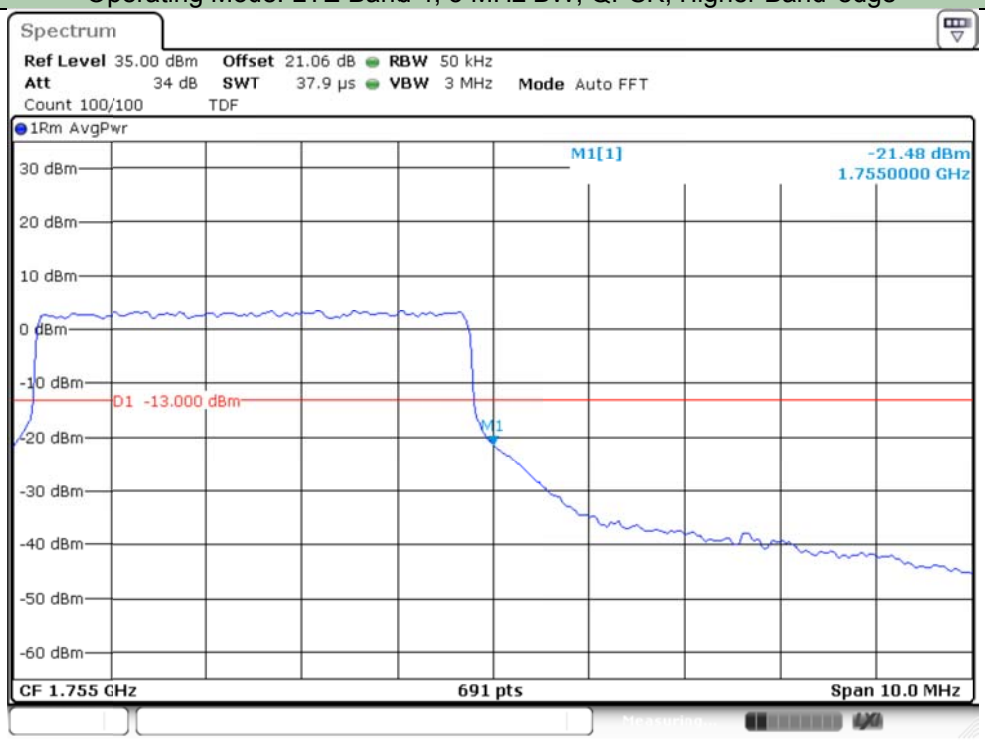


5.5.3.2 Test Plots for LTE Band 4

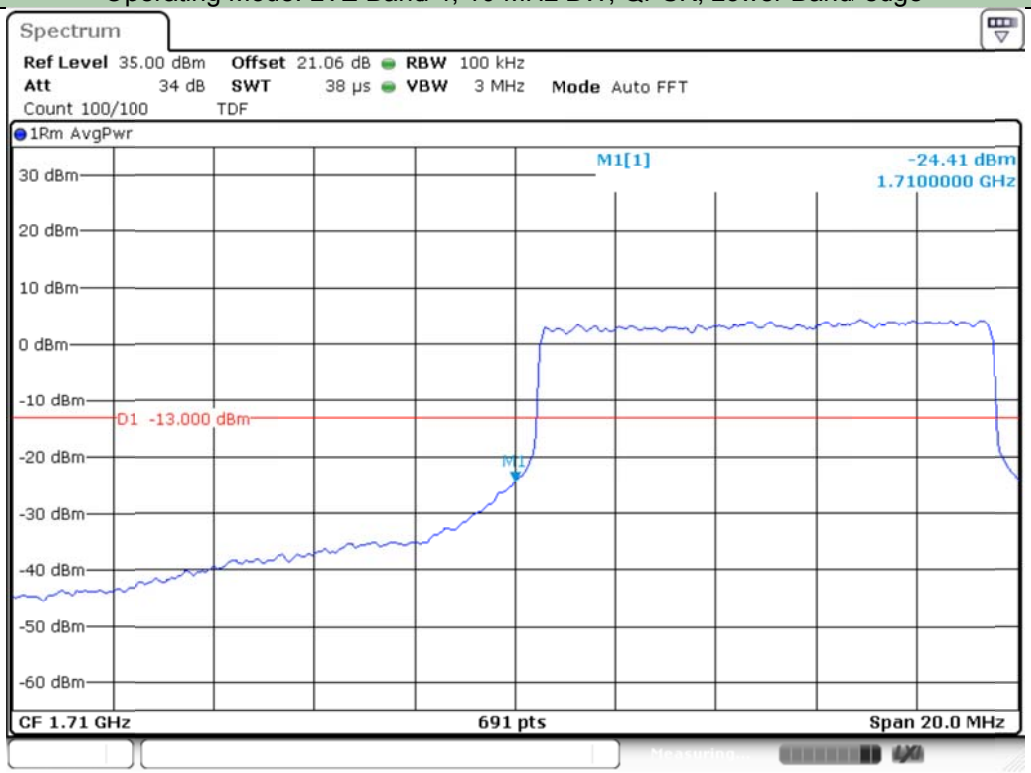
Operating Mode: LTE Band 4, 5 MHz BW, QPSK, Lower Band-edge



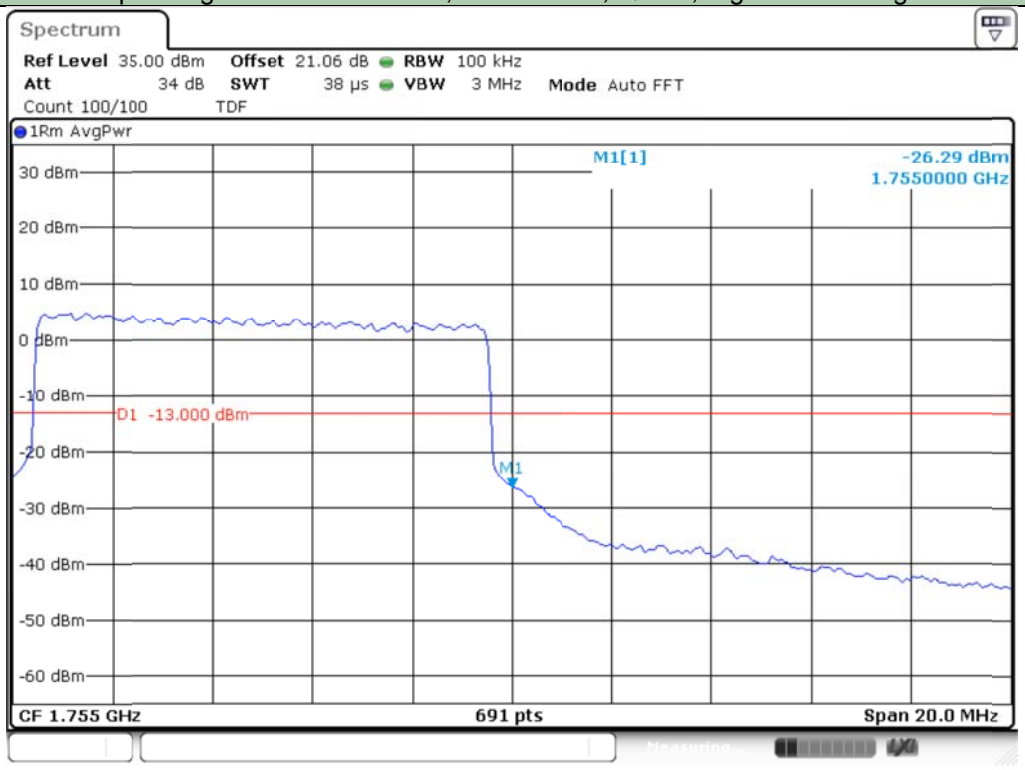
Operating Mode: LTE Band 4, 5 MHz BW, QPSK, Higher Band-edge



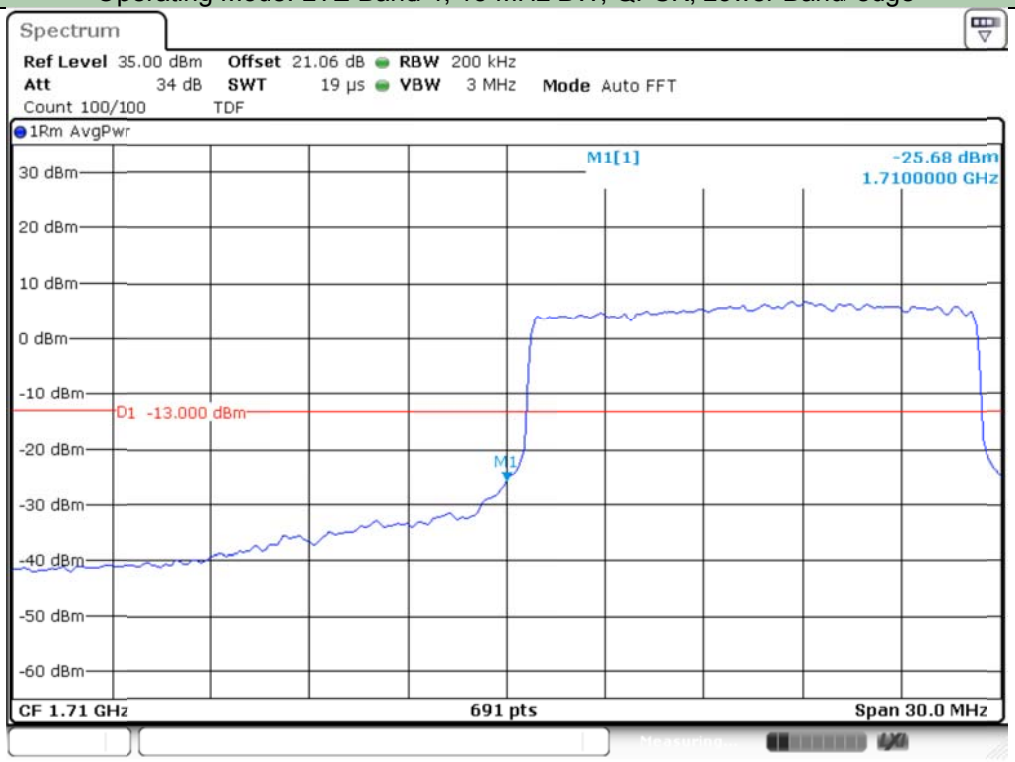
Operating Mode: LTE Band 4, 10 MHz BW, QPSK, Lower Band-edge



Operating Mode: LTE Band 4, 10 MHz BW, QPSK, Higher Band-edge

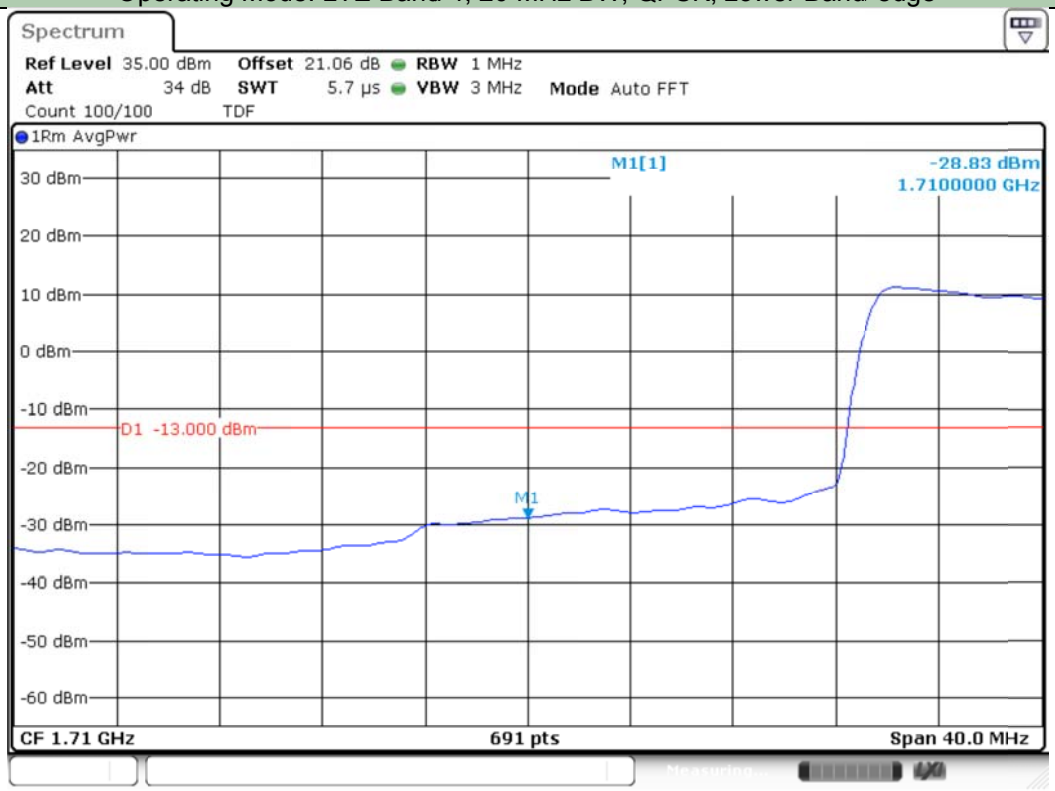


Operating Mode: LTE Band 4, 15 MHz BW, QPSK, Lower Band-edge

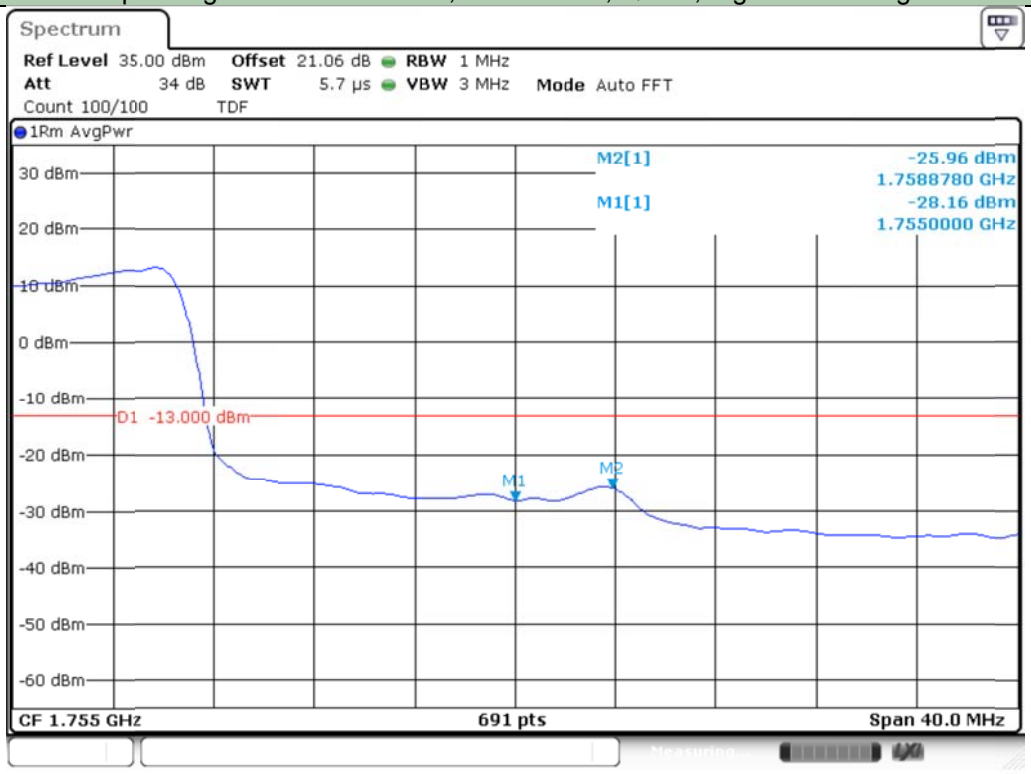


Operating Mode: LTE Band 4, 15 MHz BW, QPSK, Higher Band-edge

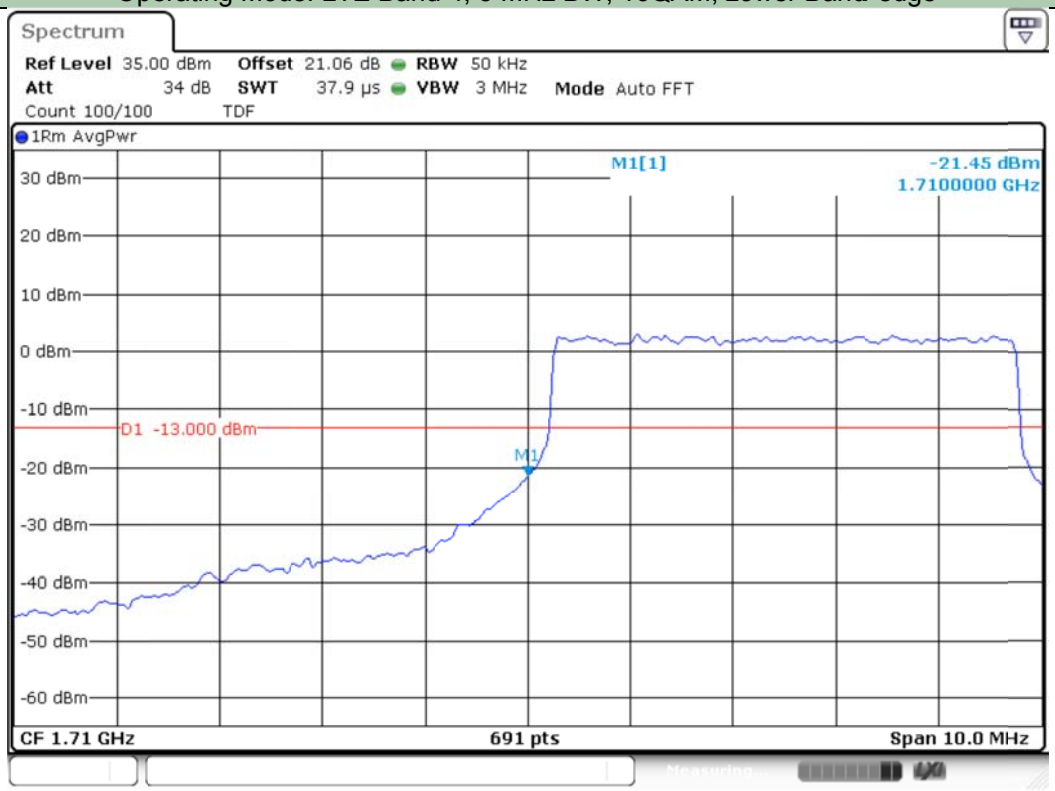
Operating Mode: LTE Band 4, 20 MHz BW, QPSK, Lower Band-edge



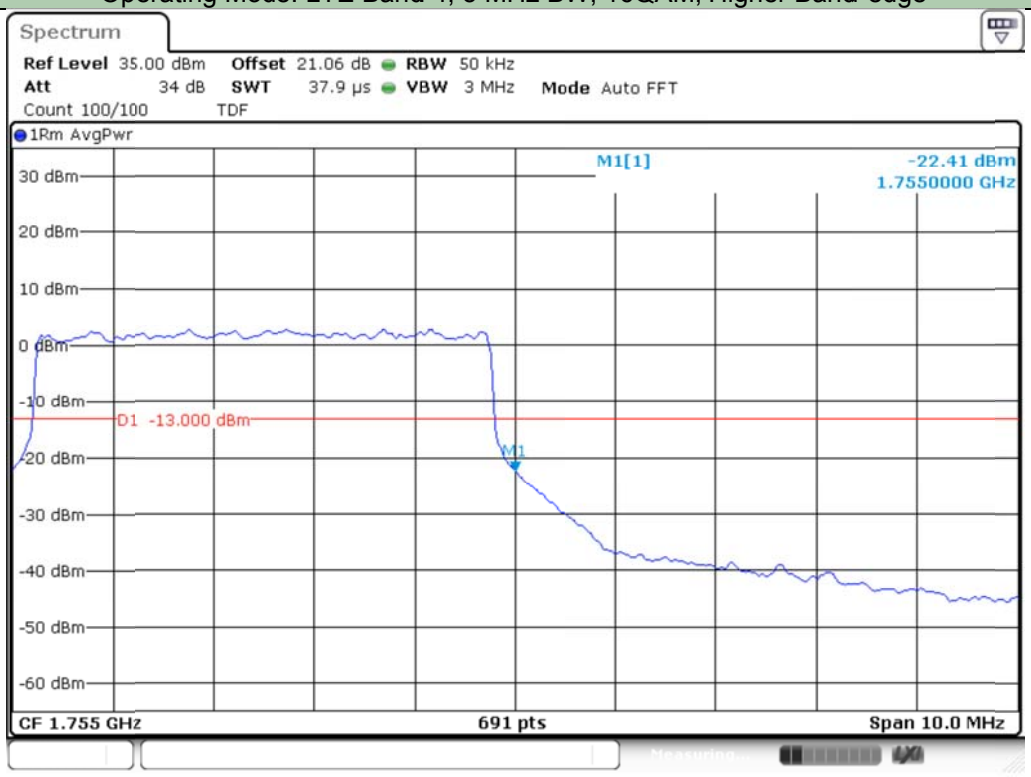
Operating Mode: LTE Band 4, 20 MHz BW, QPSK, Higher Band-edge



Operating Mode: LTE Band 4, 5 MHz BW, 16QAM, Lower Band-edge



Operating Mode: LTE Band 4, 5 MHz BW, 16QAM, Higher Band-edge



5.6 Radiated Spurious Emissions

5.6.1 Limit

Acc. to Part 27.53(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:

(2) On any frequency outside the 776-778 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

Acc. to Part 27.53(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.

Acc. to Part 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 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 log10(P) dB.

5.6.2 Method of Measurement

Reference to KDB 971168 D01 Power Meas License Digital Systems v02r02

The radiated emissions measurements were on 3 m, semi-anechoic chamber. The EUT and other support equipment were placed on a non-conductive table 80 cm above the ground plane. The interconnecting cables from outside test site were inserted into ferrite clamps at the point where the cables reach the turntable.

The frequency spectrum from 30 MHz to tenth harmonic of the highest fundamental frequency or to 40 GHz was scanned and emission levels maximized at each frequency recorded. The system was rotated 360°, and the antenna was varied in height between 1.0 m and 4.0 m in order to determine the maximum emission levels. This procedure was performed for both horizontal and vertical polarization of the receiving antenna.

The maximum radiated emission was recorded and used as reference for the effective radiated power measurement. The EUT was then replaced by a tuned dipole antenna or Horn antenna and was oriented for vertical polarization and then the length of dipole antenna was adjusted to correspond to the frequency of the transmitter. The substitution antenna was connected to a signal generator with a coaxial cable. The receiving antenna height was raised and lowered again through the specified range of height until maximum signal level is detected by the measuring receiver. The signal to the substitution antenna was adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the EUT radiated power measured, corrected for the change of input attenuation setting of the measuring receiver. The signal generator level was recorded and corrected by the power loss in the cable between the signal generator and substitution antenna and further corrected for the gain of the dipole antenna or horn antenna used relative to an ideal tuned dipole antenna. The measurement was repeated with the test antenna and the substitution antenna oriented for horizontal polarization. The measure of the effective radiated power is the larger of the two levels recorded.

For measurement below 1 GHz, the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

The spectrum from 30 MHz to tenth harmonic of the highest fundamental frequency or to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

5.6.3 Test Site Requirement for KDB 937606

Acc. to KDB 937606, Semi Anechoic Chamber (SAC) shall be verified test results below 30 MHz with Open Area Test Site (OATS), so we compared test results between the measurements from our SAC and an OATS and found test results almost same, so we declare test result for below 30 MHz from our SAC is valid and met the requirement acc. to KDB 937606.

5.6.4 Sample Calculation for Power measurement using Substitution Procedure or radiated measurement

- Substitution Measurement:

EIRP (dBm) = Signal Generator Setting (dBm) - Cable Loss (dB) + Antenna Gain (dBi)

Example:

Frequency (MHz)	Measured SA (dBuV)	Signal Generator Level (dBm)	Antenna Gain (dBi)	Dipole Gain (dBd)	Cable Loss (dB)	EIRP (dBm)
1100	90	15	8.0	0	4.0	19

- Radiated Measurement:

Example:

At 78.50 MHz Limit = 40.0 dBuV/m

Result =Receiver reading value + Antenna Factor + Cable Loss - Pre-amplifier gain = 37.0 dBuV/m

Margin = Limit - Result = 40 – 37.0 = 3.0 so the EUT has 3.0 dB margin at 78.50 MHz

5.6.5 Measurement Uncertainty

Measurement uncertainties were not taken into account and following uncertainty levels have been estimated for tests performed on the apparatus. The measurement uncertainties are given with at least 95 % confidence.

Frequency Range	Uncertainty	Frequency Range	Uncertainty
9 kHz ~ 30 MHz	± 3.2 dB	30 MHz ~ 1 GHz	± 3.8 dB
1 GHz ~ 18 GHz	± 4.9 dB	18 GHz ~ 40 GHz	± 5.1 dB

5.6.6 Test Data for LTE Band 13

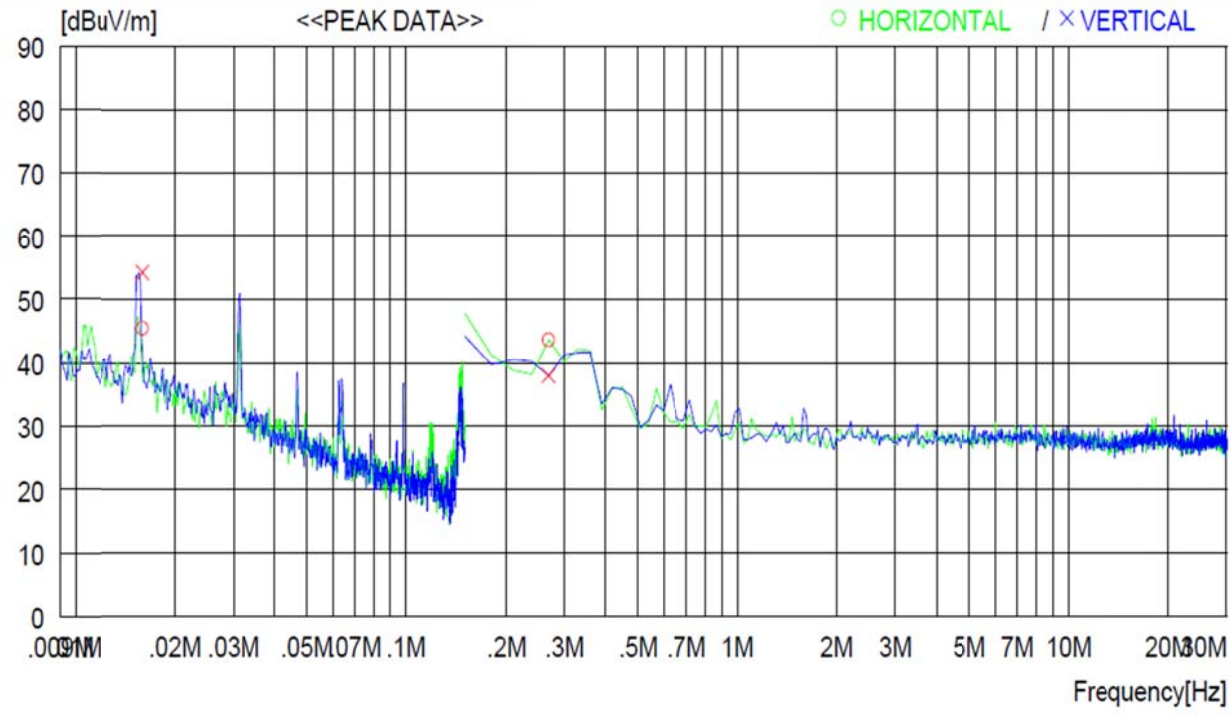
Date of Test	2017-03-12	Temperature	(17.4 ~ 18.5) °C
		Relative humidity	(26.9 ~ 27.5) % R.H.
Measurement Frequency Range		9 kHz ~ 18 GHz	
Test Result	***PASS***	Tested By	In-yong Song

Frequency range	Resolution Bandwidth	Video Bandwidth	Detector Mode	Measurement distance
Below 1 000 MHz	100 kHz or 120 kHz	300 kHz	Peak or Q.P.	3 m
Above 1 000 MHz	1 MHz	1 MHz	Peak or CISPR Average	3 m

LTE Band 13 (777 MHz ~ 787 MHz)		
RB Size: 1	BW (MHz): 5	Modulation: QPSK

5.6.6.1 Test Data below 30 MHz

Graphical Test Data

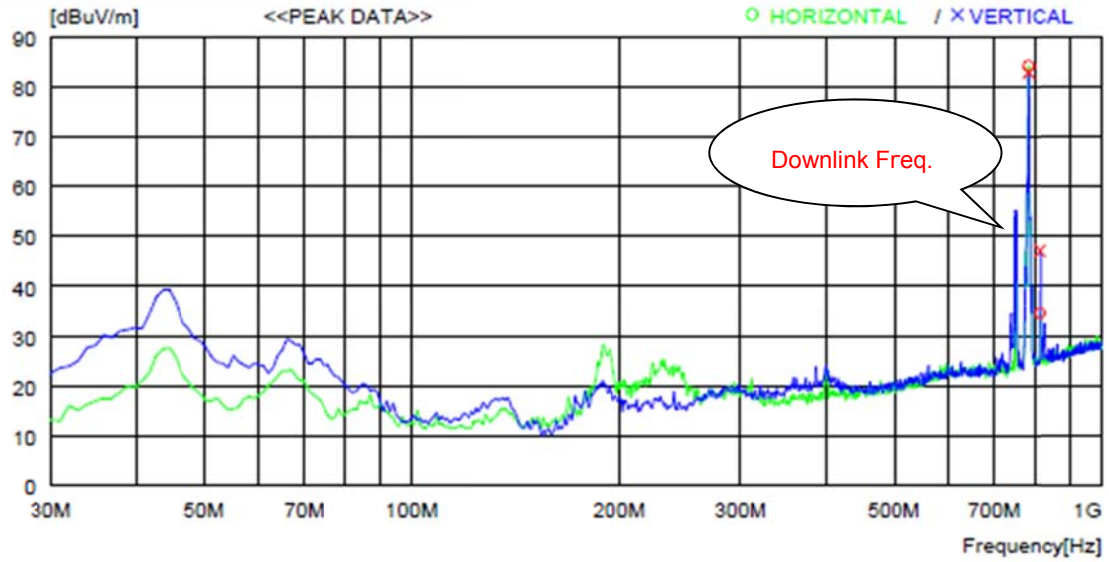


Tabulated Test Data

Frequency (MHz)	Receiver Reading (dBuV)	Detector Mode	Pol.	Ant. Factor (dB/m)	Corr. Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Azimuth (Degree)
* Spurious emissions that 6 dB below the limits didn't be recorded										

5.6.6.2 Test Data above 30 MHz to 1 GHz

Graphical Test Data



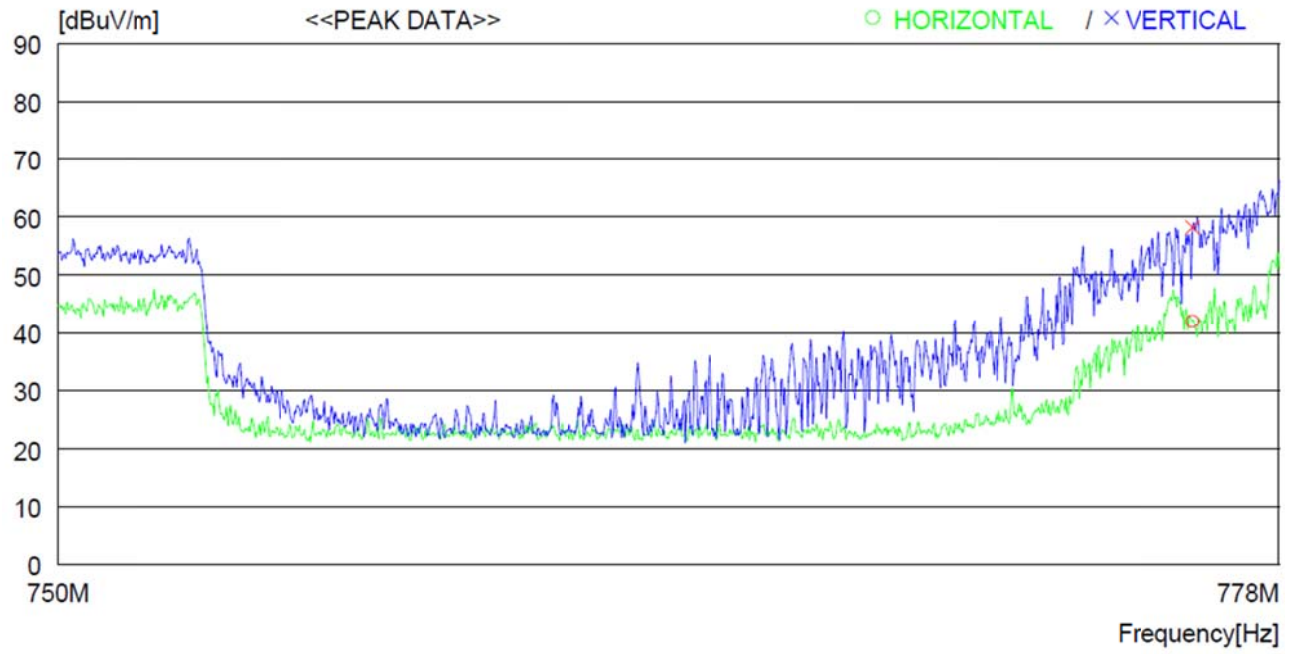
No.	FREQ [MHz]	READING PEAK [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal ------										
1	784.652	85.2	21.1	10.8	33.0	84.1	84.1	84.1	100	0
2	815.691	35.0	21.5	10.9	32.9	34.5	34.5	34.5	200	6
----- Vertical ------										
3	784.652	83.9	21.1	10.8	33.0	82.8	82.8	82.8	200	187
4	815.691	47.6	21.5	10.9	32.9	47.1	47.1	47.1	100	49

Tabulated Test Data

Frequency (MHz)	Receiver Reading (dBuV)	Generator Reading (dBm)	Detector Mode	Pol.	Ant. Gain (dB)	Cable Loss (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Height (cm)
815.691	35.0	- 56.2	Peak	H	1.37	0.55	- 55.38	- 13.0	42.38	100
815.691	47.6	- 49.6		V			- 48.78		35.78	100

5.6.6.3 Test Data for Band edge

Graphical Test Data - Low Channel



Tabulated Test Data

Frequency (MHz)	Receiver Reading (dBuV)	Detector Mode	Pol.	Ant. Factor (dB/m)	Corr. Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Azimuth (Deg)
775.998	43.2	Peak	H	21.0	-23.2	42.0	80.1	38.1	100	6
775.998	59.4	Peak	V	21.0	-23.2	58.2	80.1	21.9	100	359

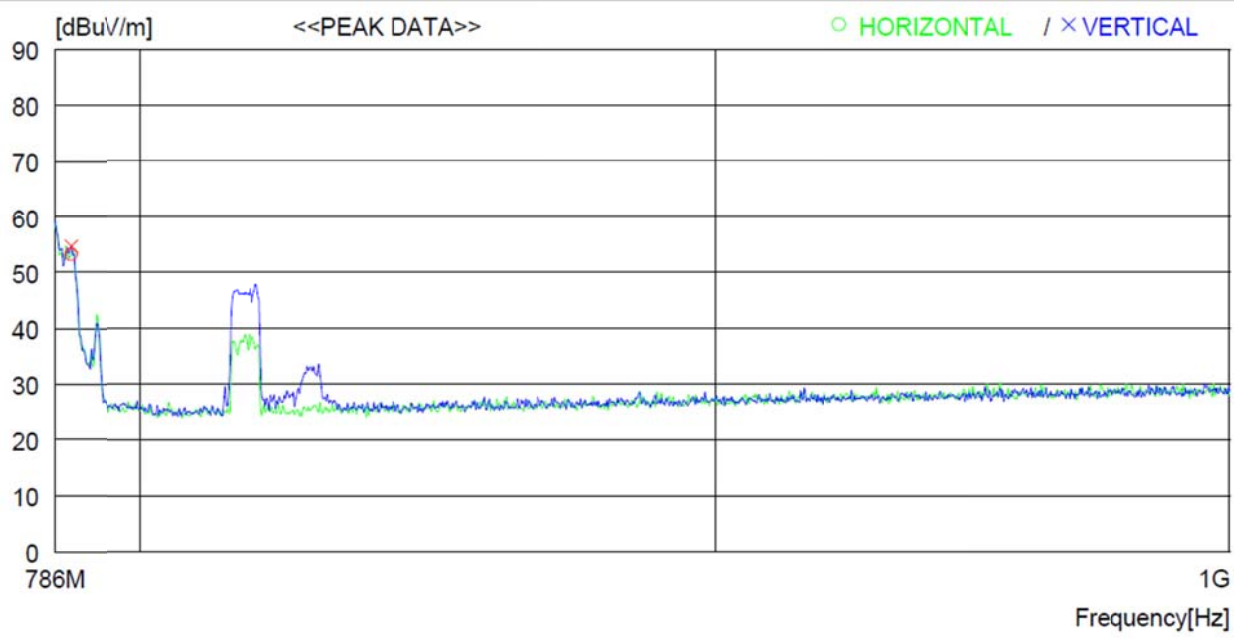
Note. "H" means Horizontal polarity, "V" means Vertical polarity.

Limit (dBuV/m) = -13 dBm (e.i.r.p) – 2.15 - 20log(D) + 104.8 = 80.1 dBuV/m

Where, D is measurement distance

Margin = Limit - Result

Graphical Test Data



Tabulated Test Data

Frequency (MHz)	Receiver Reading (dBuV)	Detector Mode	Pol.	Ant. Factor (dB/m)	Corr. Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Azimuth (Deg)
788.568	54.2	Peak	H	21.2	-22.2	53.2	80.1	26.9	200	328
788.568	55.7	Peak	V	21.2	-22.2	54.7	80.1	25.4	100	301

Note. "H" means Horizontal polarity, "V" means Vertical polarity.

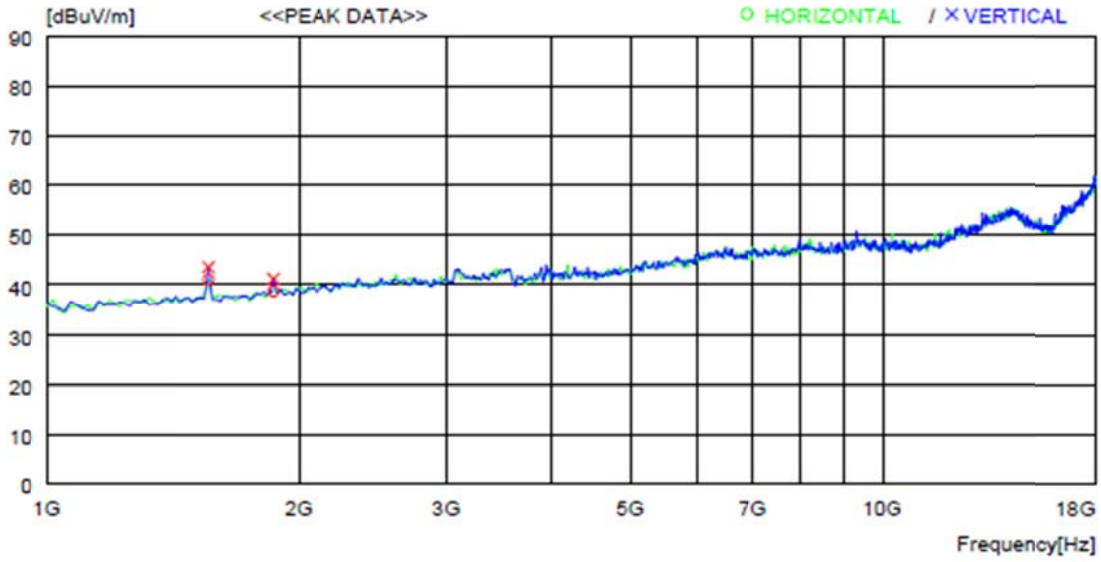
Limit (dBuV/m) = -13 dBm (e.i.r.p) – 2.15 - 20log(D) + 104.8 = 80.1 dBuV/m

Where, D is measurement distance, 3 m.

Margin = Limit - Result

5.6.6.4 Test Data above 1 GHz

Graphical Test Data



No.	FREQ [MHz]	READING PEAK [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal ------										
1	1561.000	46.9	26.1	1.6	33.5	41.1	41.1	41.1	100	149
2	1867.000	43.1	27.2	1.7	33.3	38.7	38.7	38.7	100	171
----- Vertical ------										
3	1561.000	49.4	26.1	1.6	33.5	43.6	43.6	43.6	100	354
4	1867.000	45.6	27.2	1.7	33.3	41.2	41.2	41.2	100	55

Tabulated Test Data

Frequency (MHz)	Receiver Reading (dBuV)	Generator Reading (dBm)	Detector Mode	Pol.	Ant. Gain (dB)	Cable Loss (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Height (cm)
1561.00	46.9	- 61.6	Peak	H	8.46	0.81	- 53.95	- 13.0	40.95	100
1561.00	49.4	- 64.7		V			- 57.05		44.05	100
1867.00	43.1	- 57.7	Peak	H	8.43	0.88	- 50.15	- 13.0	37.15	100
1867.00	45.6	- 59.7		V			- 52.15		39.15	100

Emission was scanned up to 18 GHz; No emissions were detected above the noise floor which was at least 20 dB below the specification limit

Note. "H" means Horizontal polarity, "V" means Vertical polarity.

5.6.7 Test Data – LTE Band 4

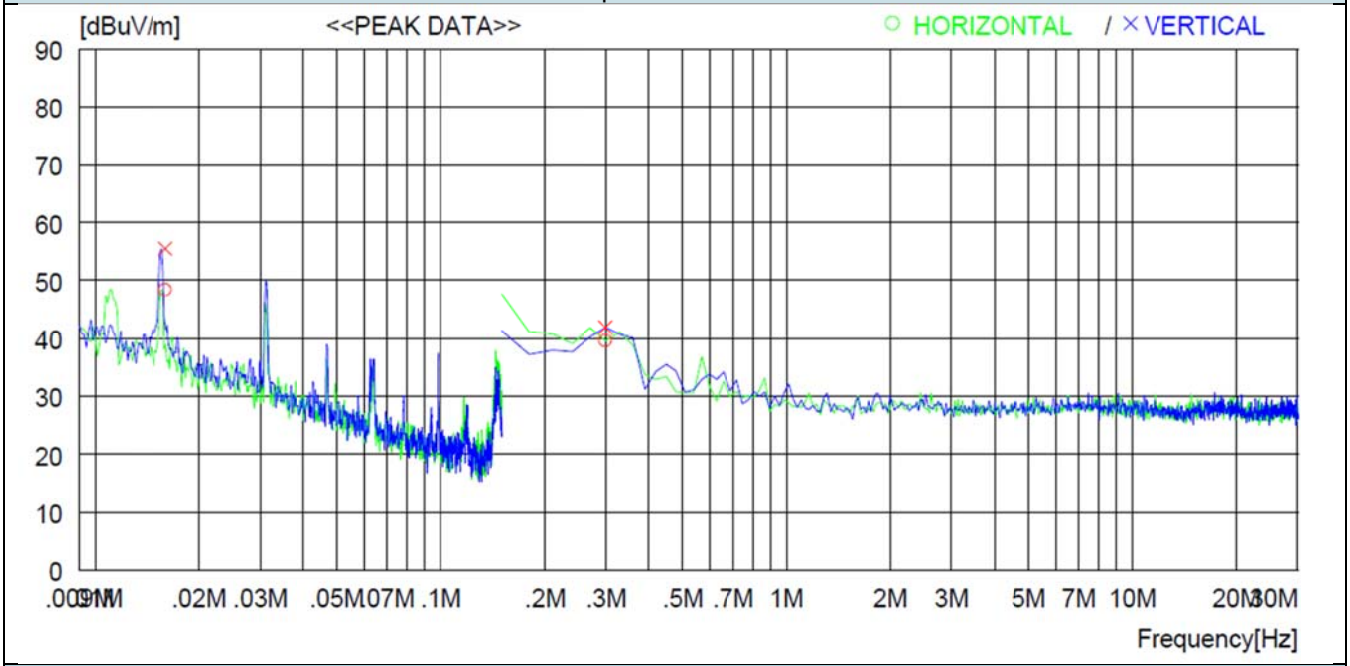
Date of Test	2017-03-12	Temperature	(17.4 ~ 18.5) °C
		Relative humidity	(26.9 ~ 27.5) % R.H.
Measurement Frequency Range		9 kHz ~ 26 GHz	
Test Result	***PASS***	Tested By	In-yong Song

Frequency range	Resolution Bandwidth	Video Bandwidth	Detector Mode	Measurement distance
Below 1 000 MHz	100 kHz or 120 kHz	300 kHz	Peak or Q.P.	3 m
Above 1 000 MHz	1 MHz	1 MHz or 10 Hz	Peak or Average	3 m

LTE Band 4 (1 710 MHz ~ 1 755 MHz)		
RB Size: 1	BW (MHz): 5	Modulation: QPSK

5.6.7.1 Test Data below 30 MHz

Graphical Test Data

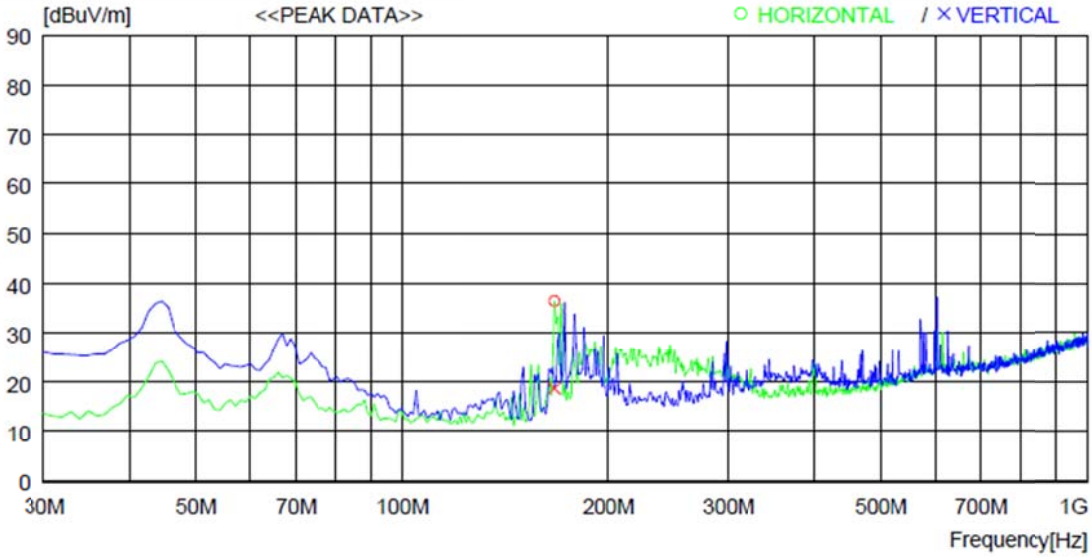


Tabulated Test Data - Low Channel

Frequency (MHz)	Receiver Reading (dBuV)	Detector Mode	Pol.	Ant. Factor (dB/m)	Corr. Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Azimuth (Degree)
* Spurious emissions that 20 dB below the limits didn't be recorded										

5.6.7.2 Test Data above 30 MHz to 1 GHz

Graphical Test Data - Low Channel

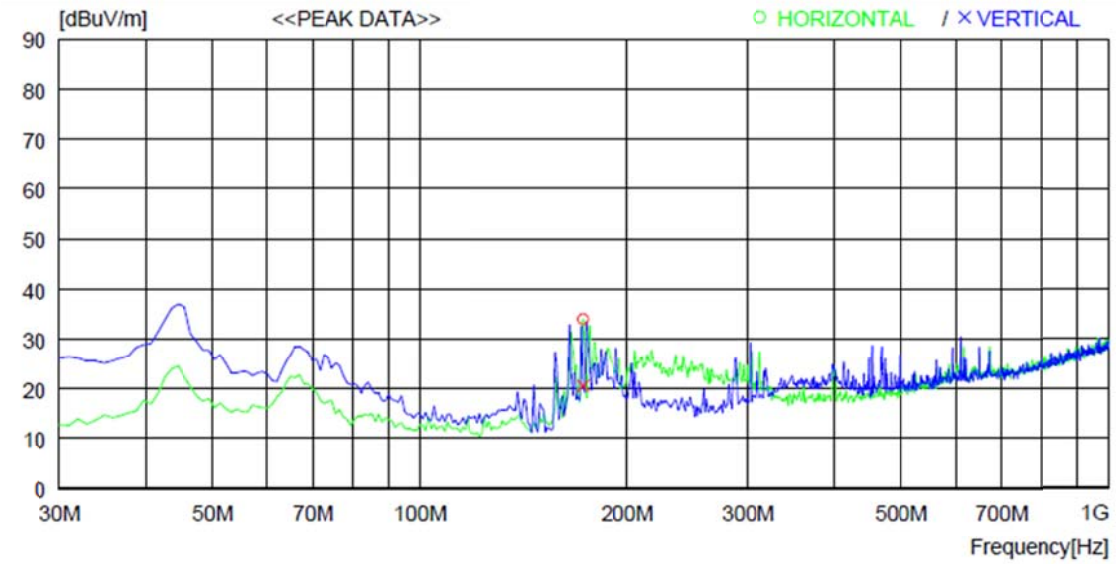


No.	FREQ [MHz]	READING PEAK [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal ------										
1	166.770	52.3	8.9	7.9	32.7	36.4	36.4	36.4	100	189
----- Vertical ------										
2	166.770	34.6	8.9	7.9	32.7	18.7	18.7	18.7	100	0

Tabulated Test Data - Low Channel

Frequency (MHz)	Receiver Reading (dBuV)	Detector Mode	Pol.	Ant. Factor (dB/m)	Corr. Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Azimuth (Degree)
* Spurious emissions that 20 dB below the limits didn't be recorded										

Graphical Test Data - Middle Channel

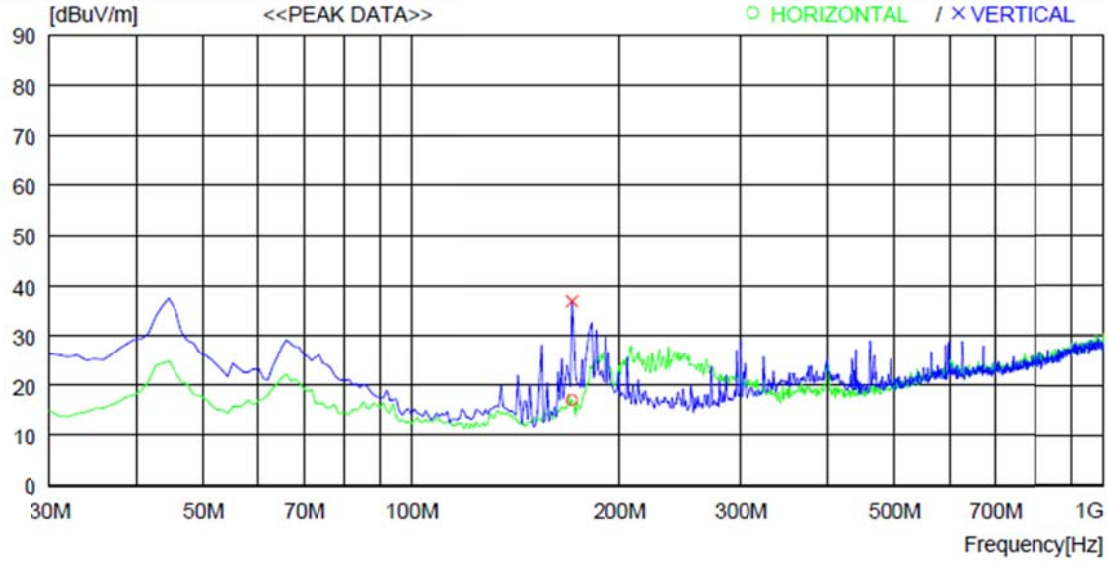


No.	FREQ [MHz]	READING PEAK [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	172.590	49.7	9.1	7.9	32.7	34.0	34.0	34.0	100	0
----- Vertical -----										
2	172.590	36.3	9.1	7.9	32.7	20.6	20.6	20.6	100	359

Tabulated Test Data - Middle Channel

Frequency (MHz)	Receiver Reading (dBuV)	Detector Mode	Pol.	Ant. Factor (dB/m)	Corr. Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Azimuth (Degree)
* Spurious emissions that 20 dB below the limits didn't be recorded										

Graphical Test Data - High Channel



No.	FREQ [MHz]	READING PEAK [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	170.650	32.8	9.0	7.9	32.7	17.0	17.0	17.0	200	211
----- Vertical -----										
2	170.650	52.7	9.0	7.9	32.7	36.9	36.9	36.9	100	170

Tabulated Test Data - High Channel

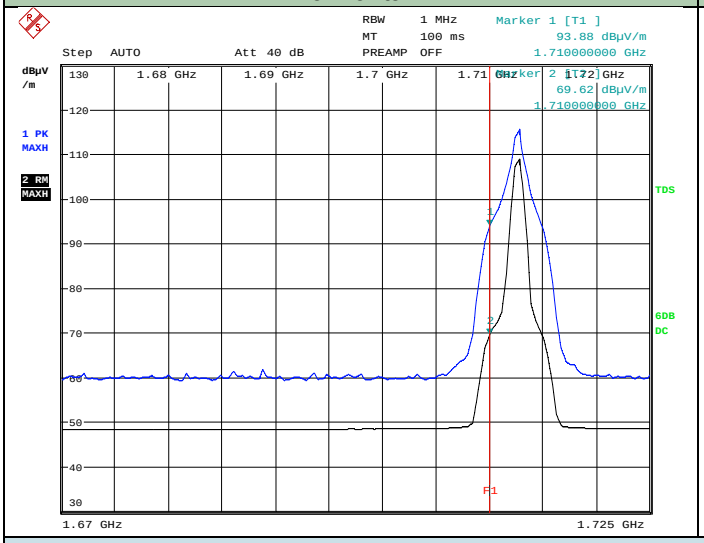
Frequency (MHz)	Receiver Reading (dBuV)	Detector Mode	Pol.	Ant. Factor (dB/m)	Corr. Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Azimuth (Degree)
* Spurious emissions that 20 dB below the limits didn't be recorded										

5.6.7.3 Test Data above 1 GHz

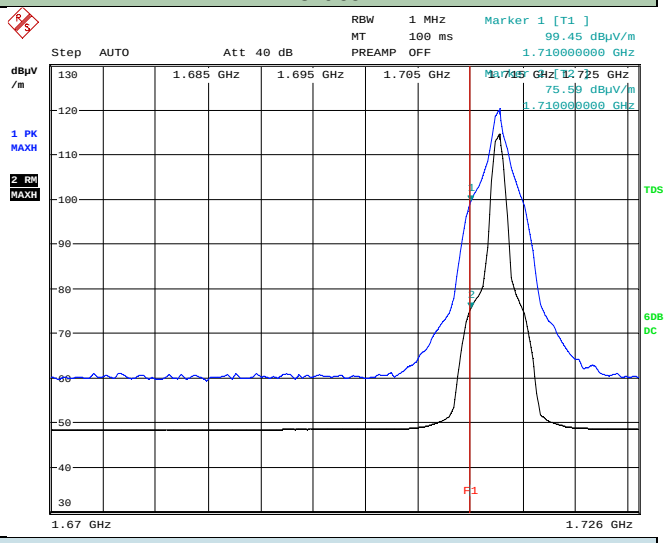
5.6.7.3.1 Test Data for Band edge

Graphical Test Data - Low Channel

Horizontal



Vertical



Tabulated Test Data - Low Channel

Frequency (MHz)	Receiver Reading (dBuV)	Detector Mode	Pol.	Ant. Factor (dB/m)	Corr. Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Azimuth (Deg)
1710.00	98.98	Peak	H	26.6	-31.7	93.88	82.3	-11.58	100	0
1710.00	74.72	Average	H	26.6	-31.7	69.62	82.3	12.68	100	0
1710.00	104.55	Peak	V	26.6	-31.7	99.45	82.3	-17.15	100	359
1710.00	80.69	Average	V	26.6	-31.7	75.59	82.3	6.71	100	359

Note. "H" means Horizontal polarity, "V" means Vertical polarity.

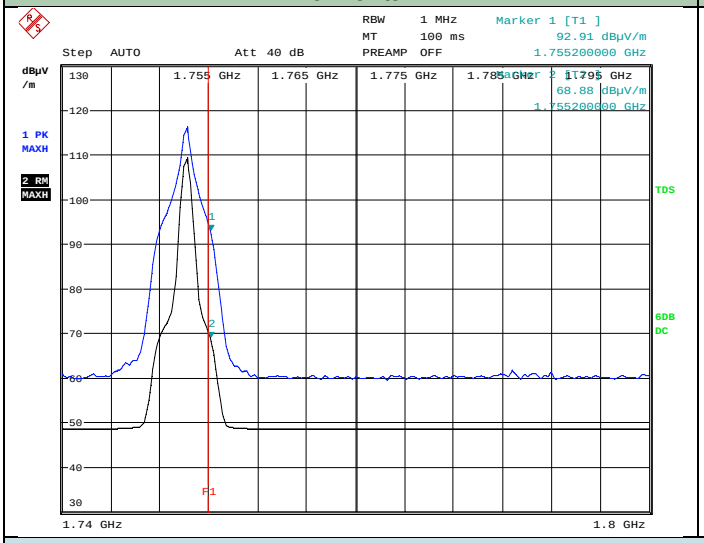
Limit (dBuV/m) = -13 dBm (e.i.r.p) – 20log(D) + 104.8= 82.3 dBuV/m

Where, D is measurement distance.

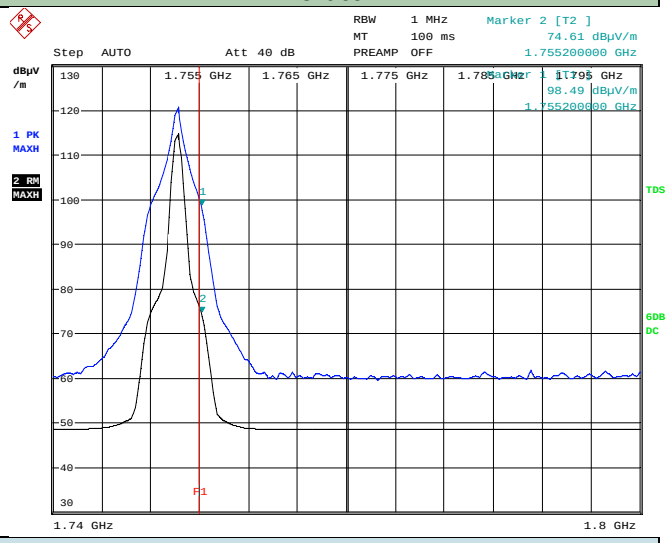
Margin = Limit - Result

Graphical Test Data - High Channel

Horizontal



Vertical



Tabulated Test Data - High Channel

Frequency (MHz)	Receiver Reading (dBuV)	Detector Mode	Pol.	Ant. Factor (dB/m)	Corr. Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Azimuth (Deg)
1755.2	97.81	Peak	H	26.8	-31.7	92.91	82.3	-10.61	100	352
1755.2	73.78	Average	H	26.8	-31.7	68.88	82.3	13.42	100	352
1755.2	103.39	Peak	V	26.8	-31.7	98.49	82.3	-16.19	100	3
1755.2	79.51	Averge	V	26.8	-31.7	74.61	82.3	7.69	100	3

Note. "H" means Horizontal polarity, "V" means Vertical polarity.

Limit (dBuV/m) = -13 dBm (e.i.r.p) – 20log (D) + 104.8= 82.3 dBuV/m

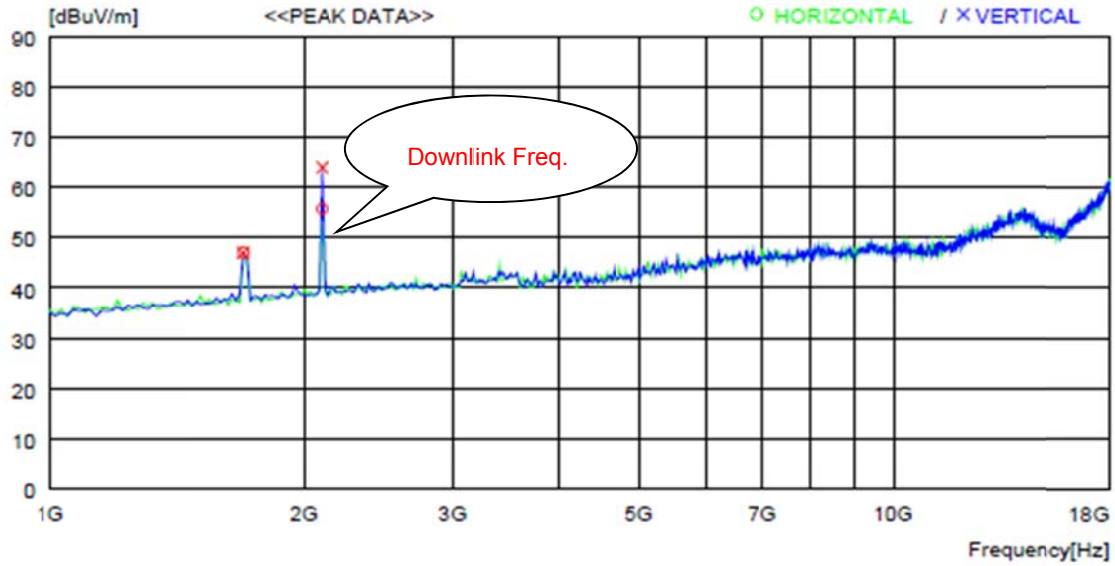
Where, D is measurement distance.

Margin = Limit- Result.

5.6.7.3.2 Test Data for Harmonic & Spurious emission

5.6.7.3.2.1 Low Channel

Graphical Test Data



No.	FREQ [MHz]	READING PEAK [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal ------										
1	1697.000	52.0	26.6	1.6	33.4	46.8	46.8	46.8	100	0
2	2105.000	59.1	28.0	1.8	33.2	55.7	55.7	55.7	100	85
----- Vertical ------										
3	1697.000	52.0	26.6	1.6	33.4	46.8	46.8	46.8	100	359
4	2105.000	67.3	28.0	1.8	33.2	63.9	63.9	63.9	100	55

Tabulated Test Data - Low Channel

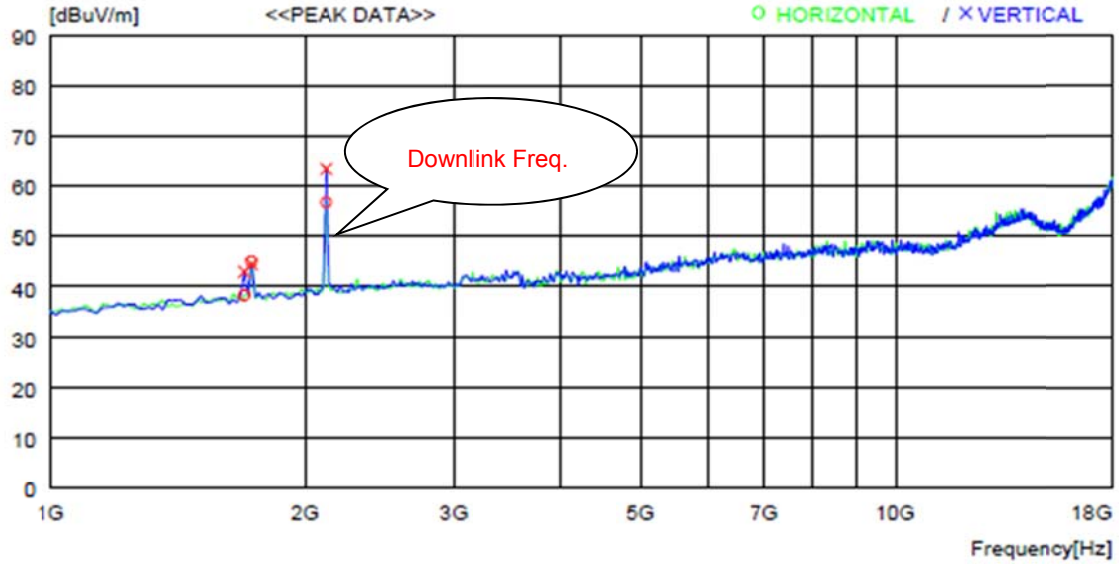
Frequency (MHz)	Receiver Reading (dBuV)	Generator Reading (dBm)	Detector Mode	Pol.	Ant. Gain (dB)	Cable Loss (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Height (cm)
1697.0	52.0	-56.1	Peak	H	8.44	0.84	-48.50	- 13.0	35.5	100
1697.0	52.0	-54.5		V			-46.90		33.9	100

Emission was scanned up to 26 GHz; No emissions were detected above the noise floor which was at least 20 dB below the specification limit

Note. "H" means Horizontal polarity, "V" means Vertical polarity.

5.6.7.3.2.2 Middle Channel

Graphical Test Data



No.	FREQ [MHz]	READING PEAK [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal ------										
1	1697.000	43.5	26.6	1.6	33.4	38.3	38.3	38.3	100	115
2	1731.000	50.0	26.7	1.7	33.4	45.0	45.0	45.0	100	4
3	2122.000	60.2	28.0	1.8	33.2	56.8	56.8	56.8	100	326
----- Vertical ------										
4	1697.000	48.2	26.6	1.6	33.4	43.0	43.0	43.0	100	2
5	1731.000	49.4	26.7	1.7	33.4	44.4	44.4	44.4	100	356
6	2122.000	66.8	28.0	1.8	33.2	63.4	63.4	63.4	100	142

Tabulated Test Data - Low Channel

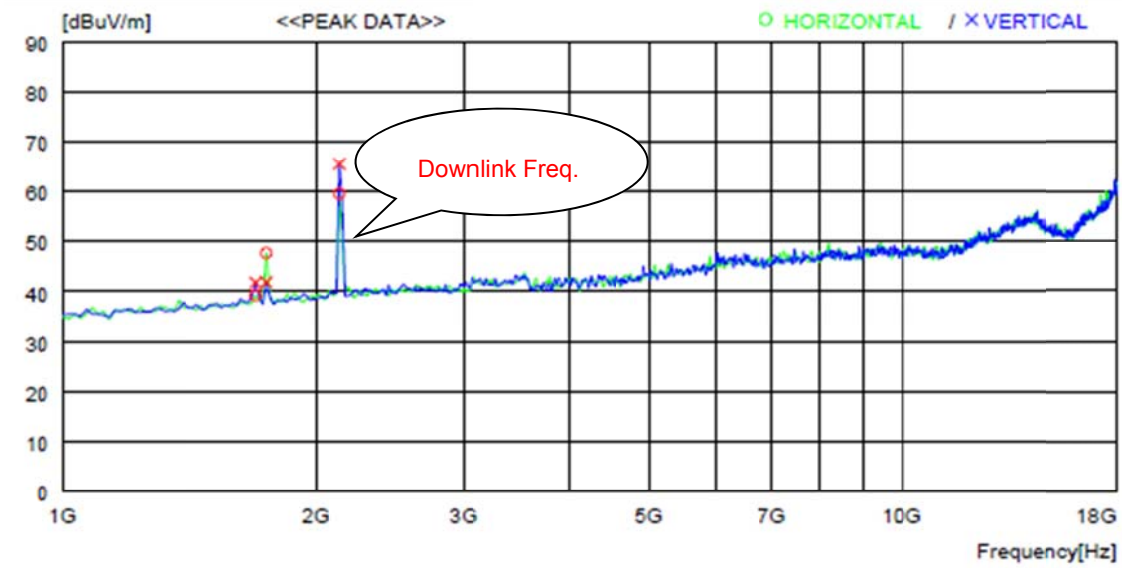
Frequency (MHz)	Receiver Reading (dBuV)	Generator Reading (dBm)	Detector Mode	Pol.	Ant. Gain (dB)	Cable Loss (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Height (cm)
1697.0	43.5	- 65.0	Peak	H	8.44	0.84	- 57.4	- 13.0	44.4	100
1697.0	48.2	- 58.0	Peak	V			- 50.4		37.4	100

Emission was scanned up to 26 GHz; No emissions were detected above the noise floor which was at least 20 dB below the specification limit

Note. "H" means Horizontal polarity, "V" means Vertical polarity.

5.6.7.3.2.3 High Channel

Graphical Test Data



No.	FREQ [MHz]	READING PEAK [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal ------										
1	1697.000	44.5	26.6	1.6	33.4	39.3	39.3	39.3	100	352
2	1748.000	52.6	26.8	1.7	33.4	47.7	47.7	47.7	100	352
3	2139.000	62.8	28.1	1.8	33.2	59.5	59.5	59.5	100	352
----- Vertical ------										
4	1697.000	47.0	26.6	1.6	33.4	41.8	41.8	41.8	100	3
5	1748.000	46.8	26.8	1.7	33.4	41.9	41.9	41.9	100	3
6	2139.000	68.8	28.1	1.8	33.2	65.5	65.5	65.5	100	54

Tabulated Test Data

Frequency (MHz)	Receiver Reading (dBuV)	Generator Reading (dBm)	Detector Mode	Pol.	Ant. Gain (dB)	Cable Loss (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Height (cm)
1697.0	44.5	- 63.6	Peak	H	8.44	0.84	- 56.0	- 13.0	43.0	100
1697.0	47.0	- 59.5	Peak	V			- 51.9	- 13.0	38.9	100

Emission was scanned up to 26 GHz; No emissions were detected above the noise floor which was at least 20 dB below the specification limit

Note. "H" means Horizontal polarity, "V" means Vertical polarity.

Appendix I - Test Instrumentation

Description	Model No.	Serial No.	Manufacturer.	Due for Cal Date
Signal Analyzer	FSV 13	101243	Rohde & Schwarz	2018-01-19
Wideband Radio Communication Tester	CMW500	100441	Rohde & Schwarz	2017-08-31
DC Power Supply	U8001A	MY51080019	AGILENT	2017-07-29
Directional Coupler	AAMCS-UDC-0.5G-18G-SF	000757	AAMCS	2018-01-20
Band Reject Filter	WRCG1710/1785-1690/1805-60/12SS	2	Wainwright	2017-08-09
High pass Filter	WHK1.2/15G-10EF	2	Wainwright	2017-06-07
Attenuator	10dB	N/A	Rohde & Schwarz	2018-01-19
Temperature & Humidity Chamber	PR-3KP	14004209	Espec	2017-07-29
Test Receiver	ESU 26	100303	Rohde & Schwarz	2018-01-19
Loop Antenna	HFH2-Z2	100341	Rohde & Schwarz	2017-06-04
TRILOG Broadband Antenna	VULB9163	9163.770	Schwarzbeck	2019-02-13
Horn Antenna	HF 907	102426	Rohde & Schwarz	2019-01-06
DOPPEL STEG Horn Antenna	HF 906	100332	Rohde & Schwarz	2019-02-13
Attenuator	6dB	272.4110.50	Rohde & Schwarz	2018-01-19
Pre-Amplifier	310N	344015	Sonoma Instrument	2018-01-19
Turn Table	DT3000-3t	1310814	INNCO SYSTEM	N/A
Antenna Master	MA4000-EP	4600814	INNCO SYSTEM	N/A
Camera Controller	HDCon4102	6531445048	PONTIS	N/A
CO3000 Controller	Co3000-4Port	CO3000/806/34130814/L	INNCO SYSTEM	N/A
EMI Test Receiver	ESCI 7	100722	Rohde & Schwarz	2018-01-19
LISN	ENV216	100110	Rohde & Schwarz	2017-07-29
LISN	LS16C	16011403310	AFJ	2017-07-29

The measuring equipment utilized to perform the tests documented in this test report has been calibrated in accordance with manufacturer's recommendations, and is traceable to recognized national standards.