

## ANNEX B \_EMI TEST RESULT

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## 1. GENERAL INFORMATION

### 1.1 Details of Support Equipment

All equipment descriptions used in the tested system (including inserted cards) are:

Device Type	Model Name	Manufacturer	Tech. Information
EUT	SM-A202K	SAMSUNG	-
TA	EP-TA200	SOLUM	Input: AC 100~240 V, 50~60 Hz, 0.5 A Output: DC 9.0 V, 1.67 A or DC 5.0 V, 2.0 A
Data Cable	EP-DR140AWE	KSD	-
Earphone	EHS64AVFWE	CRESYN	-
Micro SD Card	-	SAMSUNG	-

### 1.2. Test Facility

Test site is located at 74, SEOICHEON-RO, 578BEON-GIL, MAJANG-MYEON, ICHEON-SI, GYEONGGI-DO, SOUTH KOREA. Those measurement facilities are constructed in conformance with the requirements of ANSI C63.4-2014. The Normalized site attenuations (30 MHz to 1 GHz) and Site validation (1 GHz to 18 GHz) were performed in accordance with the standard in ANSI C63.4-2014

Measurement Facilities	Registration Number
Radiated Field strength measurement facility 3 m Semi Anechoic chamber	90661
Radiated Field strength measurement facility 10 m Semi Anechoic chamber	

### 1.3 Calibration of Measuring Instrument

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturers recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

Especially, all antenna for measurement is calibrated in accordance with the requirements of C63.5 (Version : 2006).

## 1.4 Measurement Uncertainty

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4-2014.

All measurement uncertainty values are shown with a coverage factor of  $k = 2$  to indicate a 95 % level of confidence. The measurement data shown herein meets or exceeds the  $U_{\text{CISPR}}$  measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty (dB)
Conducted Emission (0.15 MHz to 30 MHz)	1.82 dB
Radiated Emissions (30 MHz to 1 GHz)	5.20 dB
Radiated Emissions (1 GHz to 18 GHz)	5.24 dB
Radiated Emissions (18 GHz to 40 GHz)	5.40 dB

## 2. LIST OF TEST EQUIPMENT

<u>Type</u>	<u>Manufacturer</u>	<u>Model Name</u>	<u>Serial Number</u>	<u>Calibration Cycle</u>	<u>CAL Date</u>
<u>Conducted Emission</u>					
<input checked="" type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESCI	100584	1 year	06.25.2018
<input checked="" type="checkbox"/> LISN	Rohde & Schwarz	ENV216	102245	1 year	12.12.2018
<input checked="" type="checkbox"/> Radio communication analyzer	ANRITSU	MT8820C	6201138643	1 year	08.21.2018
<input checked="" type="checkbox"/> Antenna (for Communication)	Schwarzbeck	USLP9142	VSLP 9142-200	-	-
<input checked="" type="checkbox"/> Software	Rohde & Schwarz	EMC32 VER8.54.0	-	-	-
<u>Radiated Emission</u>					
-For measurement below 1 GHz					
<input checked="" type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESCI	100033	1 year	06.27.2018
<input checked="" type="checkbox"/> Trilog Antenna	Schwarzbeck	VULB 9168	255	2 year	03.26.2019
<input checked="" type="checkbox"/> Antenna master	INNCO Systems	MA4640-XP-ET	-	N/A	-
<input checked="" type="checkbox"/> Antenna master controller	INNCO Systems	CO 3000	CO3000/870/ 35990515/L	N/A	-
<input checked="" type="checkbox"/> Turn Table	INNCO Systems	1060	-	N/A	-
<input checked="" type="checkbox"/> Turn Table controller	INNCO Systems	CO2000	CO2000/095/ 7590304/L	N/A	-
<input checked="" type="checkbox"/> Radio communication analyzer	ANRITSU	MT8820C	6201138643	1 year	08.21.2018
<input checked="" type="checkbox"/> Antenna (for Communication)	Schwarzbeck	USLP9142	VSLP 9142-200	-	-
<input checked="" type="checkbox"/> Software	Rohde & Schwarz	EMC32 VER8.40.0	-	-	-
-For measurement above 1 GHz					
<input checked="" type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESI40	831564103	1 year	10.31.2018
<input checked="" type="checkbox"/> Antenna master	INNCO Systems	MA4640-XP-ET	-	N/A	-
<input checked="" type="checkbox"/> Antenna master controller	INNCO Systems	CO3000	CO3000/870/ 35990515/L	N/A	-
<input checked="" type="checkbox"/> Turn Table	INNCO Systems	1060	-	N/A	-
<input checked="" type="checkbox"/> Turn Table controller	INNCO Systems	CO2000	CO2000/095/ 7590304/L	N/A	-
<input checked="" type="checkbox"/> Horn Antenna	Schwarzbeck	BBHA 9120D	01836	2 year	07.20.2018
<input checked="" type="checkbox"/> Low Noise Amplifier	TESTEK	TK-PA18H	170034-L	1 year	03.04.2019
<input type="checkbox"/> Power Amplifier	TESTEK	TK-PA1840H	170030-L	1 year	12.17.2018
<input type="checkbox"/> Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170#786	2 year	12.05.2017
<input checked="" type="checkbox"/> Radio communication analyzer	ANRITSU	MT8820C	6201138643	1 year	08.21.2018
<input checked="" type="checkbox"/> Antenna (for Communication)	Schwarzbeck	USLP9142	VSLP 9142-200	-	-
<input type="checkbox"/> Highpass Filter	Wainwright Instruments	WHKX1.0/15G-12SS	42	1 year	08.02.2018
<input checked="" type="checkbox"/> Software	Rohde & Schwarz	EMC32 VER8.40.0	-	-	-

### 3. DESCRIPTION OF MEASUREMENTS

#### 3.1 Measurement of Conducted Emission

The test procedure was in accordance with ANSI C63.4-2014, Clause 7.3

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN).  
 If the EUT is connected to the PC through USB, the AC power-line adapter of the PC is directly connected to a line impedance stabilization network (LISN).  
 Other support units were connected to the power mains through another LISN. The two LISNs provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both conducted lines are measured in Quasi-Peak and Average mode, including the worst-case data points for each tested configuration.
- c. The frequency range from 150 kHz to 30 MHz was searched.

#### [ Conducted Emission Limits ]

Frequency (MHz)	Resolution Bandwidth (kHz)	Quasi-Peak (dB(μV))	Average (dB(μV))
0.15 to 0.5	9	66 to 56*	56 to 46*
0.5 to 5	9	56	46
5 to 30	9	60	50

*\*Decreases with the logarithm of the frequency.*

### 3.2 Measurement of Radiated Emission

The test procedure was in accordance with ANSI C63.4-2014, Clause 8.3

- a. The EUT was placed on the top of a turn table 0.8 meters above the ground at a semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 m away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from 1 m to 4 m above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 m to 4 m and the turn table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Quasi-Peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to Peak and Average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz.
- g. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response.(1 GHz to 40 GHz)

#### [ Radiated Emission Limits ]

Frequency (MHz)	Antenna Distance (m)	Field Strength ( $\mu\text{V}/\text{m}$ )	Quasi-Peak ( $\text{dB}(\mu\text{V})/\text{m}$ )
30 to 88	3	100	40.0
88 to 216	3	150	43.5
216 to 960	3	200	46.0
Above 960	3	500	54.0
Frequency (MHz)	Antenna Distance (m)	Peak ( $\text{dB}(\mu\text{V})/\text{m}$ )	Average ( $\text{dB}(\mu\text{V})/\text{m}$ )
Above 1 000	3	74	54

### 3.2.1 Frequency Range of Radiated Measurements

An unintentional radiator, including a digital device, the spectrum shall be investigated from the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a Radiated Emission limit is specified, up to the frequency shown in the following table

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30
1.705 to 108	1 000
108 to 500	2 000
500 to 1 000	5 000
Above 1 000	5 <sup>th</sup> harmonic of the highest frequency or 40 GHz, whichever is lower

## 4. PRELIMINARY TEST

During preliminary tests, the following operating mode was investigated.

WCDMA 850 Idle (Low/Middle/High CH)  
LTE B5 Idle (Low/Middle/High CH)  
LTE B17 Idle (Low/Middle/High CH)

NOTE.

1. The worst band is tested.

### 4.1 Conducted Emission

It was tested the following operating mode, after connecting all peripheral devices.

#### Operating Modes:

LTE B5 Middle CH Idle  
LTE B17 Middle CH Idle

### 4.2 Radiated Emission

It was tested the following operating mode, after connecting all peripheral devices.

#### Operating Modes:

LTE B5 Low CH Idle  
LTE B5 Middle CH Idle  
LTE B5 High CH Idle  
LTE B17 Low CH Idle  
LTE B17 Middle CH Idle  
LTE B17 High CH Idle

NOTE.

1. Three orientations have been investigated and the worst case orientation is reported.
2. The worst case of operating mode is reported.



## 5. CONDUCTED AND RADIATED EMISSION TEST SUMMARY

### 5.1 Conducted Emission

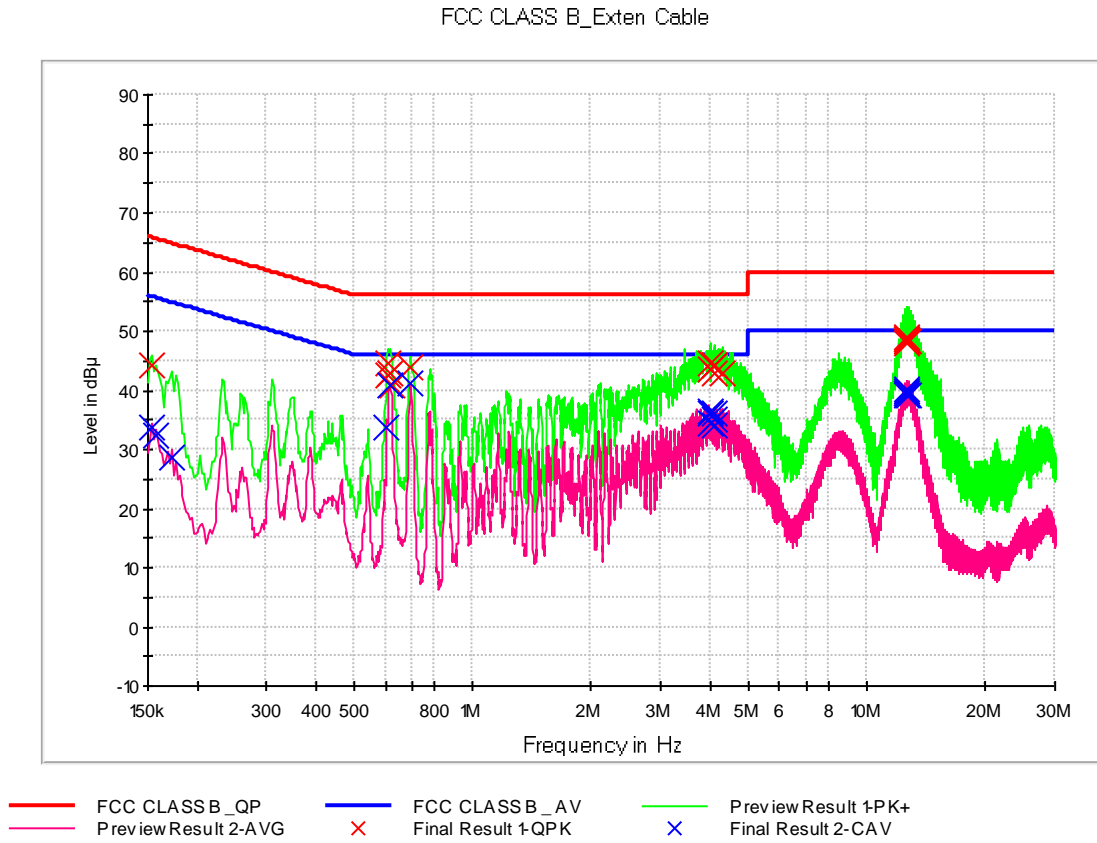
The test results of conducted emission at mains ports provide the following information:

Applicable Standards	FCC PART 15 Subpart B Class B ANSI C63.4-2014
Detector	Quasi-Peak, CISPR-Average
Bandwidth	9 kHz (6 dB)
Operating Mode	LTE B5 Middle CH Idle LTE B17 Middle CH Idle
Kind of Test Site	Shielded Room
Temperature	23.9 °C
Relative Humidity	43.6 %
Test Date	April 24, 2019

**- Calculation Formula:**

1. Conductor L1 = Hot, Conductor N = Neutral
2. Corr. = LISN Factor + Cable Loss
3. QuasiPeak or CAverage= Receiver Reading + Corr.
4. Margin = Limit – QuasiPeak or CAverage

Figure 1: Conducted Emission, LTE B5 Middle CH Idle, Line (L1)



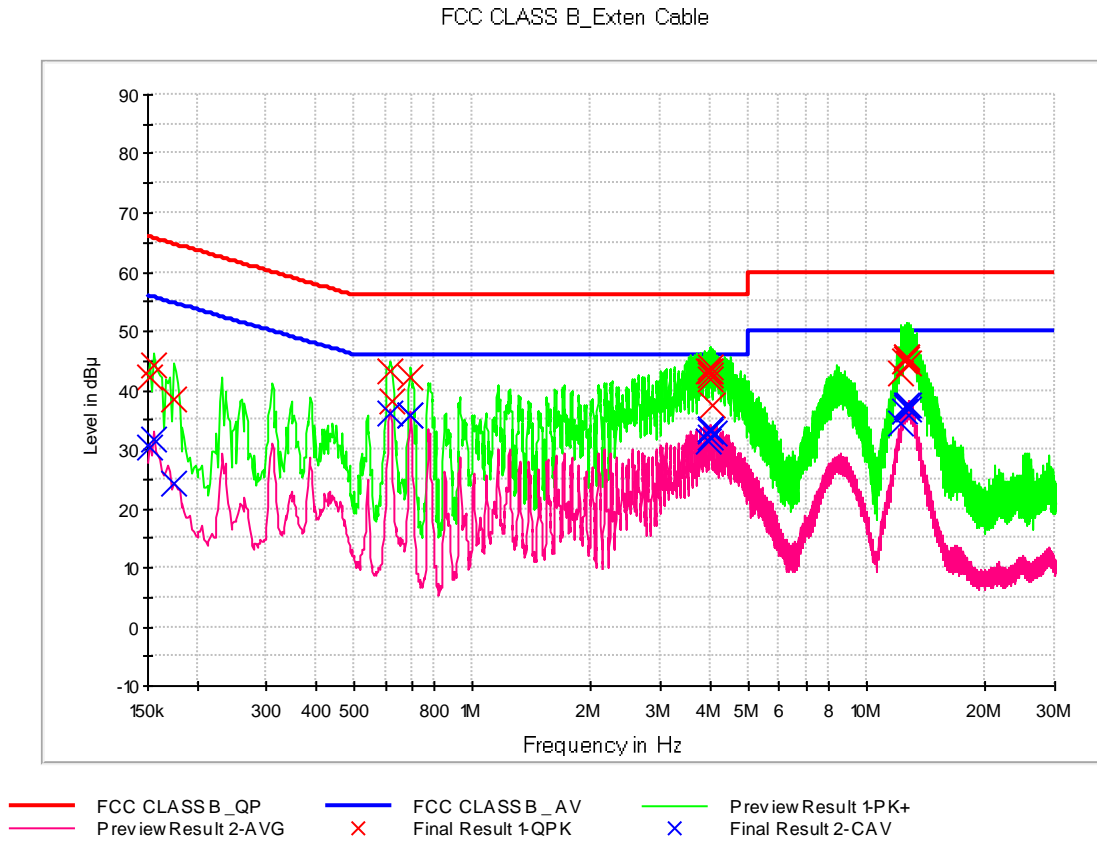
**QuasiPeak Final Result, Line (L1)**

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.154000	44.1	9.000	Off	L1	9.7	21.6
0.608000	42.7	9.000	Off	L1	9.8	13.3
0.612000	44.5	9.000	Off	L1	9.8	11.5
0.618000	42.9	9.000	Off	L1	9.8	13.1
0.624000	40.9	9.000	Off	L1	9.8	15.1
0.696000	43.7	9.000	Off	L1	9.8	12.3
4.024000	44.5	9.000	Off	L1	10.0	11.5
4.032000	43.7	9.000	Off	L1	10.0	12.3
4.092000	42.8	9.000	Off	L1	10.0	13.2
4.104000	44.4	9.000	Off	L1	10.0	11.6
4.110000	44.1	9.000	Off	L1	10.0	11.9
4.304000	42.9	9.000	Off	L1	10.0	13.1
12.552000	48.0	9.000	Off	L1	10.3	12.0
12.600000	48.4	9.000	Off	L1	10.3	11.6
12.604000	48.6	9.000	Off	L1	10.3	11.4
12.662000	48.8	9.000	Off	L1	10.3	11.2
12.684000	48.6	9.000	Off	L1	10.3	11.4
12.732000	48.2	9.000	Off	L1	10.3	11.8

**CAverage Final Result, Line (L1)**

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.154000	33.6	9.000	Off	L1	9.7	22.2
0.158000	32.2	9.000	Off	L1	9.7	23.3
0.172000	28.6	9.000	Off	L1	9.7	26.3
0.606000	33.8	9.000	Off	L1	9.8	12.2
0.616000	41.0	9.000	Off	L1	9.8	5.0
0.696000	41.2	9.000	Off	L1	9.8	4.8
4.016000	36.5	9.000	Off	L1	10.0	9.5
4.024000	36.0	9.000	Off	L1	10.0	10.0
4.034000	34.3	9.000	Off	L1	10.0	11.7
4.092000	36.2	9.000	Off	L1	10.0	9.8
4.106000	35.0	9.000	Off	L1	10.0	11.0
4.110000	34.2	9.000	Off	L1	10.0	11.8
12.552000	39.3	9.000	Off	L1	10.3	10.7
12.578000	39.3	9.000	Off	L1	10.3	10.7
12.654000	39.4	9.000	Off	L1	10.3	10.6
12.662000	39.8	9.000	Off	L1	10.3	10.2
12.684000	40.2	9.000	Off	L1	10.3	9.8
12.732000	39.2	9.000	Off	L1	10.3	10.8

Figure 2: Conducted Emission, LTE B5 Middle CH Idle, Line (N)



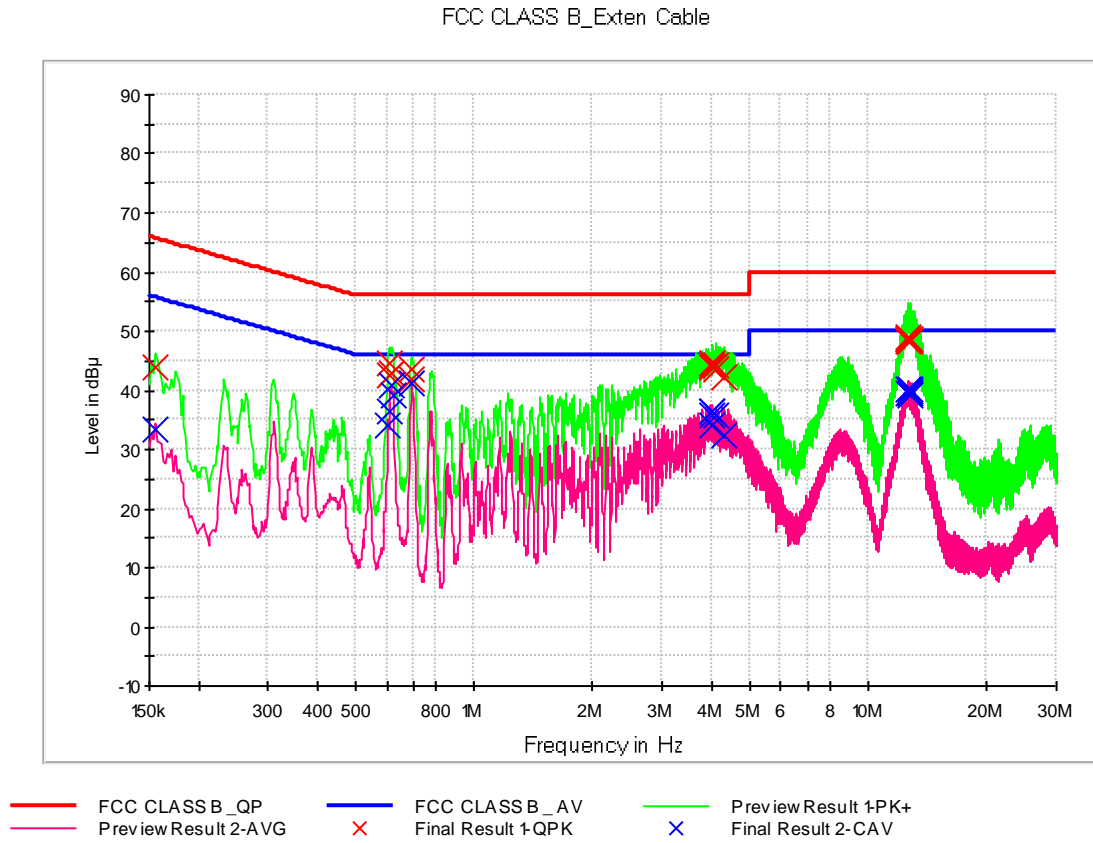
**QuasiPeak Final Result, Line (N)**

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.152000	42.3	9.000	Off	N	9.8	23.6
0.156000	44.1	9.000	Off	N	9.8	21.6
0.174000	38.4	9.000	Off	N	9.8	26.4
0.620000	43.3	9.000	Off	N	9.9	12.7
0.626000	38.3	9.000	Off	N	9.9	17.7
0.698000	42.1	9.000	Off	N	9.9	13.9
3.952000	43.3	9.000	Off	N	10.2	12.7
4.014000	42.6	9.000	Off	N	10.2	13.4
4.024000	44.0	9.000	Off	N	10.2	12.0
4.032000	43.3	9.000	Off	N	10.2	12.7
4.036000	41.8	9.000	Off	N	10.2	14.2
4.046000	37.3	9.000	Off	N	10.2	18.7
12.252000	42.8	9.000	Off	N	10.5	17.2
12.460000	45.0	9.000	Off	N	10.6	15.0
12.558000	45.1	9.000	Off	N	10.6	14.9
12.622000	45.5	9.000	Off	N	10.6	14.5
12.684000	45.5	9.000	Off	N	10.6	14.5
12.826000	44.5	9.000	Off	N	10.6	15.5

**CAverage Final Result, Line (N)**

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.152000	30.4	9.000	Off	N	9.8	25.5
0.156000	31.8	9.000	Off	N	9.8	23.9
0.174000	24.1	9.000	Off	N	9.8	30.6
0.620000	36.2	9.000	Off	N	9.9	9.8
0.694000	35.7	9.000	Off	N	9.9	10.3
0.698000	35.8	9.000	Off	N	9.9	10.2
3.952000	31.3	9.000	Off	N	10.2	14.7
4.014000	33.3	9.000	Off	N	10.2	12.7
4.020000	33.3	9.000	Off	N	10.2	12.7
4.024000	32.9	9.000	Off	N	10.2	13.1
4.028000	31.9	9.000	Off	N	10.2	14.1
4.096000	32.9	9.000	Off	N	10.2	13.1
12.252000	34.3	9.000	Off	N	10.5	15.7
12.460000	36.5	9.000	Off	N	10.6	13.5
12.622000	37.3	9.000	Off	N	10.6	12.7
12.684000	37.3	9.000	Off	N	10.6	12.7
12.706000	37.4	9.000	Off	N	10.6	12.6
12.754000	36.7	9.000	Off	N	10.6	13.3

**Figure 3: Conducted Emission, LTE B17 Middle CH Idle, Line (L1)**





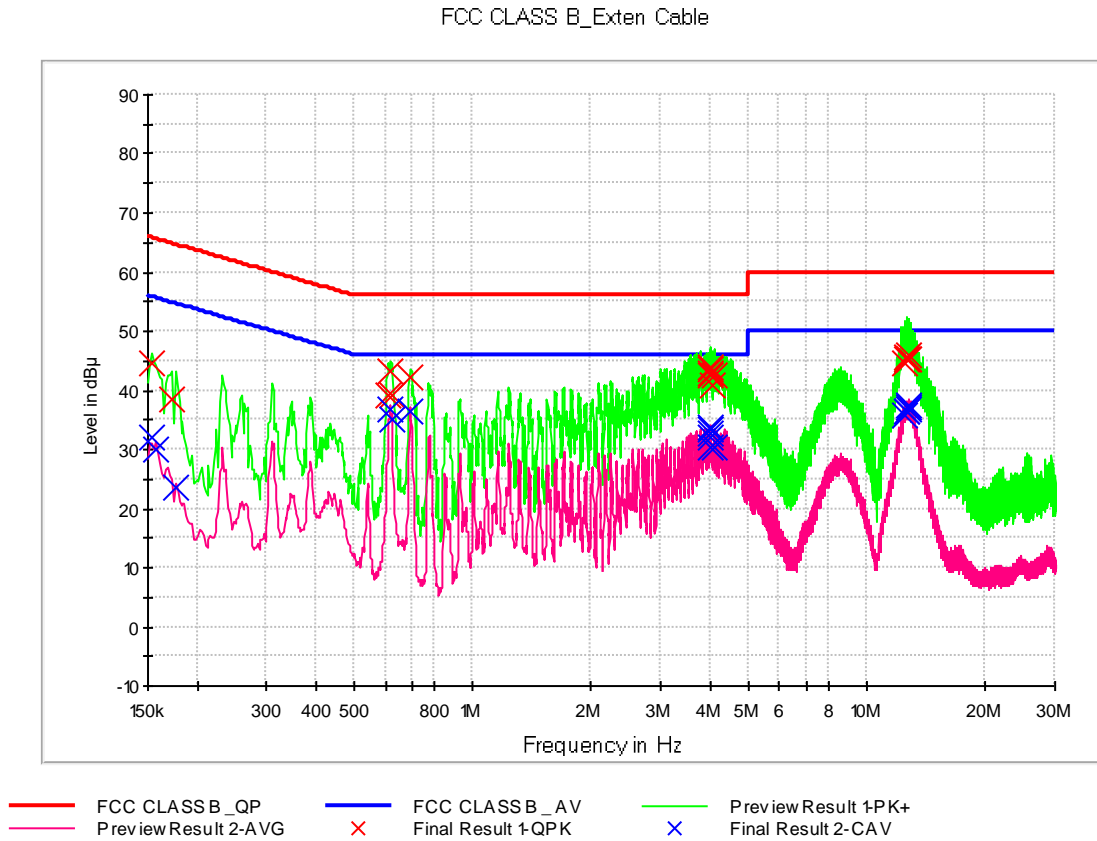
**QuasiPeak Final Result, Line (L1)**

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.156000	43.8	9.000	Off	L1	9.7	21.9
0.608000	42.7	9.000	Off	L1	9.8	13.3
0.614000	44.7	9.000	Off	L1	9.8	11.3
0.620000	43.0	9.000	Off	L1	9.8	13.0
0.692000	42.0	9.000	Off	L1	9.8	14.0
0.696000	43.7	9.000	Off	L1	9.8	12.3
4.018000	43.9	9.000	Off	L1	10.0	12.1
4.026000	44.5	9.000	Off	L1	10.0	11.5
4.030000	44.2	9.000	Off	L1	10.0	11.8
4.106000	44.2	9.000	Off	L1	10.0	11.8
4.110000	43.7	9.000	Off	L1	10.0	12.3
4.298000	42.3	9.000	Off	L1	10.0	13.7
12.602000	48.5	9.000	Off	L1	10.3	11.5
12.612000	48.3	9.000	Off	L1	10.3	11.7
12.662000	48.9	9.000	Off	L1	10.3	11.1
12.682000	48.8	9.000	Off	L1	10.3	11.2
12.776000	48.3	9.000	Off	L1	10.3	11.7
12.832000	48.6	9.000	Off	L1	10.3	11.4

**CAverage Final Result, Line (L1)**

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.156000	33.5	9.000	Off	L1	9.7	22.2
0.606000	34.0	9.000	Off	L1	9.8	12.0
0.610000	36.6	9.000	Off	L1	9.8	9.4
0.616000	40.9	9.000	Off	L1	9.8	5.1
0.622000	39.1	9.000	Off	L1	9.8	6.9
0.696000	41.2	9.000	Off	L1	9.8	4.8
4.012000	36.5	9.000	Off	L1	10.0	9.5
4.018000	36.3	9.000	Off	L1	10.0	9.7
4.026000	35.7	9.000	Off	L1	10.0	10.3
4.036000	34.0	9.000	Off	L1	10.0	12.0
4.104000	35.7	9.000	Off	L1	10.0	10.3
4.298000	32.5	9.000	Off	L1	10.0	13.5
12.662000	39.5	9.000	Off	L1	10.3	10.5
12.692000	40.2	9.000	Off	L1	10.3	9.8
12.754000	39.9	9.000	Off	L1	10.3	10.1
12.776000	40.1	9.000	Off	L1	10.3	9.9
12.802000	39.2	9.000	Off	L1	10.3	10.8
12.832000	39.4	9.000	Off	L1	10.3	10.6

Figure 4: Conducted Emission, LTE B17 Middle CH Idle, Line (N)



**QuasiPeak Final Result, Line (N)**

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.154000	44.5	9.000	Off	N	9.8	21.3
0.172000	38.6	9.000	Off	N	9.8	26.3
0.610000	39.3	9.000	Off	N	9.9	16.7
0.620000	43.2	9.000	Off	N	9.9	12.8
0.626000	39.0	9.000	Off	N	9.9	17.0
0.696000	42.3	9.000	Off	N	9.9	13.7
4.014000	42.7	9.000	Off	N	10.2	13.3
4.020000	43.4	9.000	Off	N	10.2	12.6
4.024000	43.9	9.000	Off	N	10.2	12.1
4.034000	42.9	9.000	Off	N	10.2	13.1
4.038000	41.0	9.000	Off	N	10.2	15.0
4.110000	42.5	9.000	Off	N	10.2	13.5
12.410000	44.6	9.000	Off	N	10.6	15.4
12.630000	45.6	9.000	Off	N	10.6	14.4
12.646000	45.2	9.000	Off	N	10.6	14.8
12.712000	45.1	9.000	Off	N	10.6	14.9
12.780000	45.8	9.000	Off	N	10.6	14.2
12.848000	45.2	9.000	Off	N	10.6	14.8

**CAverage Final Result, Line (N)**

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.154000	32.0	9.000	Off	N	9.8	23.8
0.158000	30.1	9.000	Off	N	9.8	25.5
0.176000	23.6	9.000	Off	N	9.8	31.1
0.618000	36.8	9.000	Off	N	9.9	9.2
0.622000	35.0	9.000	Off	N	9.9	11.0
0.696000	36.6	9.000	Off	N	9.9	9.4
4.014000	33.7	9.000	Off	N	10.2	12.3
4.020000	33.2	9.000	Off	N	10.2	12.8
4.024000	32.6	9.000	Off	N	10.2	13.4
4.028000	32.0	9.000	Off	N	10.2	14.0
4.034000	30.3	9.000	Off	N	10.2	15.7
4.110000	30.5	9.000	Off	N	10.2	15.5
12.410000	35.8	9.000	Off	N	10.6	14.2
12.646000	36.5	9.000	Off	N	10.6	13.5
12.668000	36.5	9.000	Off	N	10.6	13.5
12.712000	36.9	9.000	Off	N	10.6	13.1
12.782000	37.2	9.000	Off	N	10.6	12.8
12.848000	37.5	9.000	Off	N	10.6	12.5

## 5.2 Radiated Emission

The test results of radiated emission provide the following information:

### For Measurement Below 1 GHz

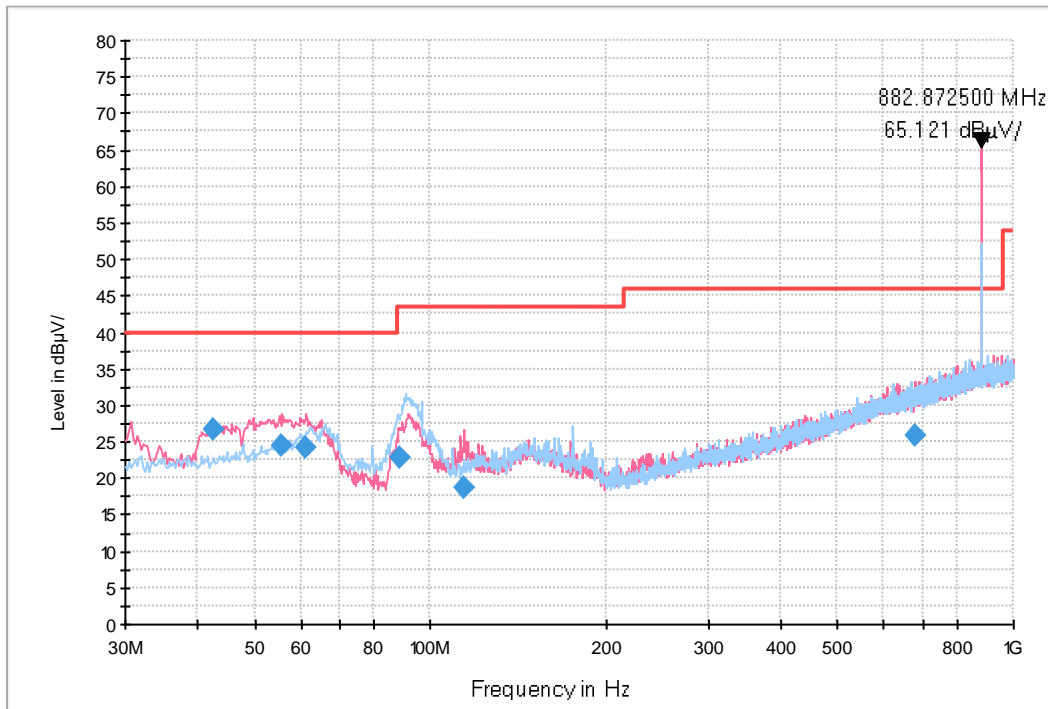
Applicable Standards	FCC PART 15 Subpart B Class B ANSI C63.4-2014
Detector	Quasi-Peak
Bandwidth	120 kHz (6 dB)
Worst Case of Operating Mode	LTE B5 Middle CH Idle LTE B17 Middle CH Idle
Kind of Test Site	3 m semi anechoic chamber
Temperature	24.7 °C
Relative Humidity	44.4 %
Test Date	April 23, 2019

### - Calculation Formula:

1. POL. H = Horizontal, POL. V = Vertical
2. QuasiPeak = Reading (Receiver Reading) + Corr.
3. Corr. (Correction Factor) = Antenna Factor + Cable Loss
4. Margin = Limit - QuasiPeak

**LTE B5 Middle CH Idle**

FCC PART 15 CLASS B



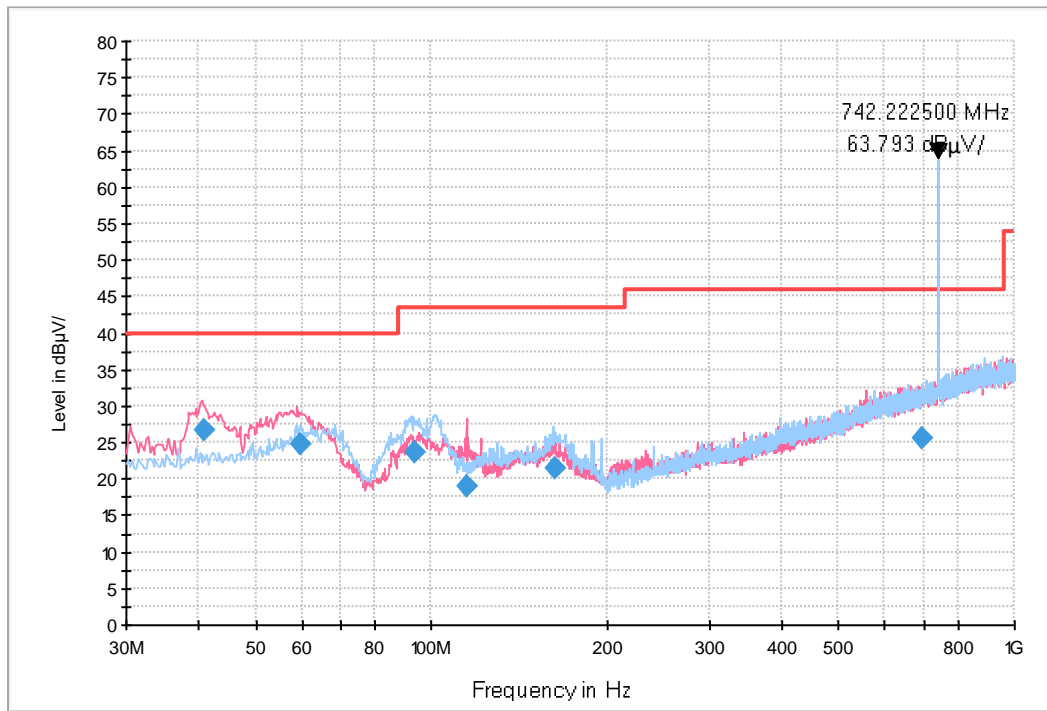
note. LTE B5 Middle ch Rx Frequency : 882.8725 MHz

These are signals for fundamental frequency from the base station

Frequency (MHz)	Quasi Peak (dBµV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
42.610000	26.7	100.0	V	0.0	18.3	13.3	40.0
55.543500	24.4	100.0	V	55.0	19.6	15.6	40.0
61.005000	24.1	100.0	V	43.0	19.2	15.9	40.0
88.499500	22.8	225.0	H	137.0	14.4	20.7	43.5
114.624000	18.6	125.2	V	269.0	16.8	24.9	43.5
678.730500	25.8	125.2	V	312.0	28.3	20.2	46.0

**LTE B17 Middle CH Idle**

FCC PART 15 CLASS B



note. LTE B17 Middle ch Rx Frequency : 742.2225 MHz

These are signals for fundamental frequency from the base station

Frequency (MHz)	Quasi Peak (dBµV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
40.724000	26.6	100.0	V	77.0	19.0	13.4	40.0
59.527000	24.8	100.0	V	61.0	19.4	15.2	40.0
93.863500	23.7	174.7	H	116.0	14.5	19.8	43.5
114.843500	18.9	125.3	V	310.0	16.8	24.6	43.5
163.084500	21.5	100.0	H	17.0	19.6	22.0	43.5
694.723500	25.6	117.8	H	161.0	28.5	20.4	46.0



**For Measurement Above 1 GHz**

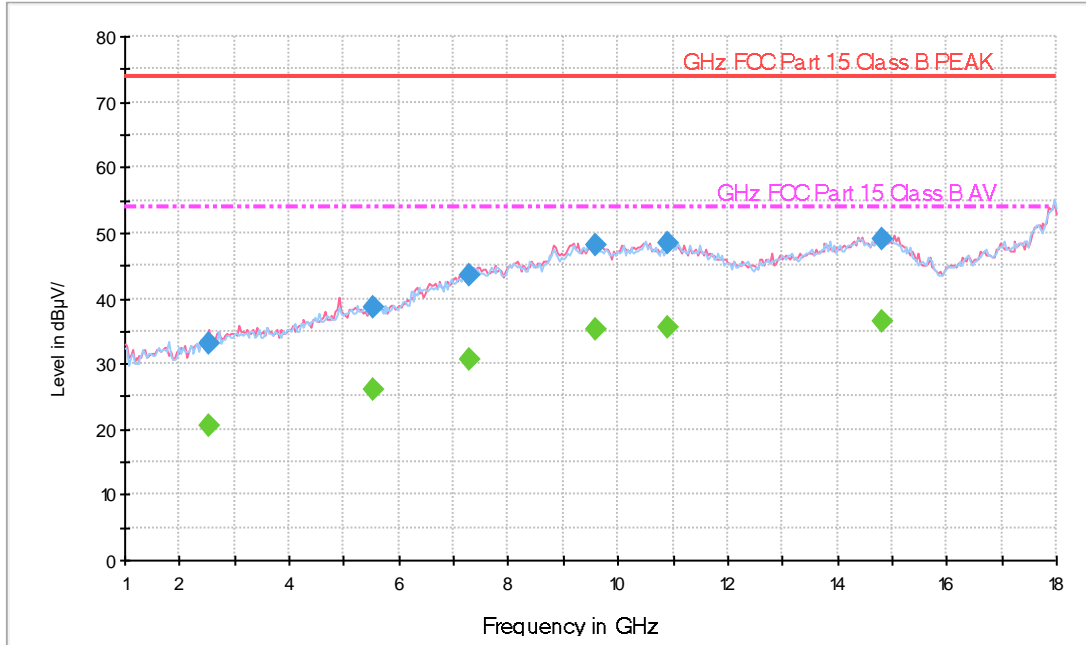
Applicable Standards	FCC PART 15 Subpart B Class B ANSI C63.4-2014
Detector	Peak mode: Peak (RBW: 1 MHz, VBW: 3 MHz) CISPR-Average mode: Peak (RBW: 1 MHz, VBW: 10 Hz)
Worst Case of Operating Mode	LTE B5 Middle CH Idle LTE B17 Middle CH Idle
Kind of Test Site	3 m semi anechoic chamber
Temperature	21.8 °C
Relative Humidity	42.3 %
Test Date	April 24, 2019

**- Calculation Formula:**

1. POL. H = Horizontal, POL. V = Vertical
2. Peak or CAverage = Reading (Receiver Reading) + Corr.
3. Corr. (Correction Factor) = Antenna Factor+ Cable Loss –Amplifier Gain
4. Margin = Limit - Peak or CAverage

**LTE B5 Middle CH Idle**

Tilting of GHz FCC PART 15 CLASS B

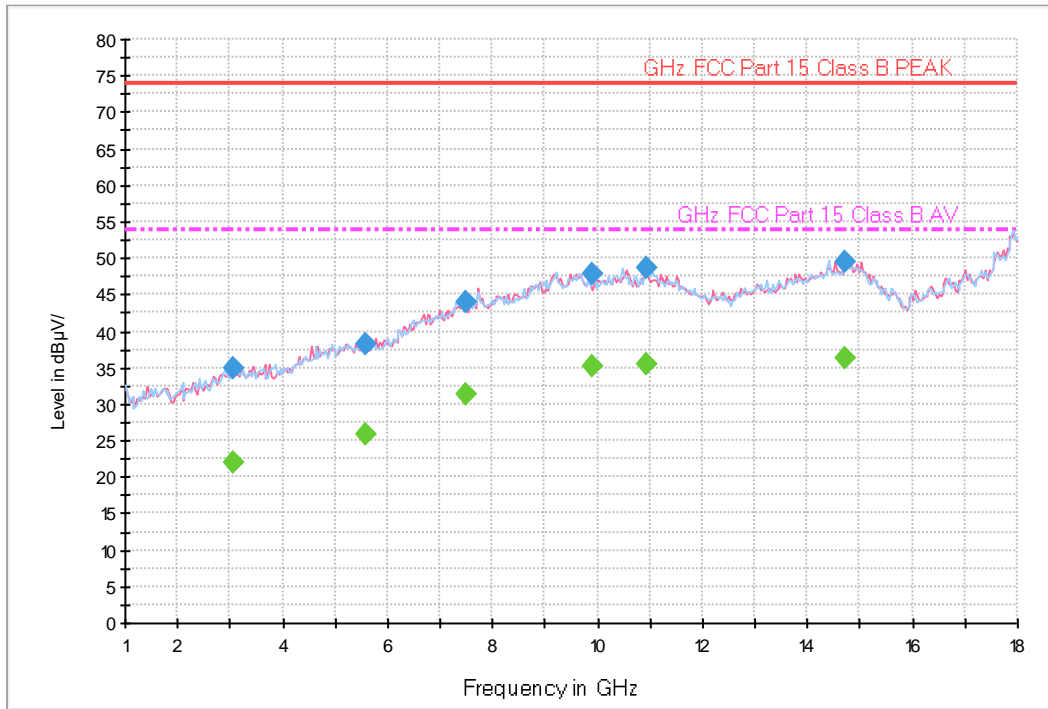


Frequency (MHz)	Peak (dBµV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
2541.633266	33.0	139.6	V	20.0	-23.3	41.0	74.0
5541.332666	38.6	113.4	H	277.0	-15.3	35.4	74.0
7281.813627	43.4	149.5	V	0.0	-10.1	30.6	74.0
9576.703407	48.0	149.6	V	268.0	-5.4	26.0	74.0
10917.685370	48.3	100.0	V	105.0	-2.8	25.7	74.0
14810.270541	49.2	175.6	V	322.0	0.9	24.8	74.0

Frequency (MHz)	CAverage (dBµV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
2541.633266	20.5	139.6	V	20.0	-23.3	33.5	54.0
5541.332666	26.1	113.4	H	277.0	-15.3	27.9	54.0
7281.813627	30.7	149.5	V	0.0	-10.1	23.3	54.0
9576.703407	35.4	149.6	V	268.0	-5.4	18.6	54.0
10917.685370	35.4	100.0	V	105.0	-2.8	18.6	54.0
14810.270541	36.4	175.6	V	322.0	0.9	17.6	54.0

**LTE B17 Middle CH Idle**

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Frequency (MHz)	Peak (dBµV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
3044.338677	35.0	113.4	V	85.0	-21.0	39.0	74.0
5581.112225	38.3	249.9	V	279.0	-15.3	35.7	74.0
7507.565130	44.1	100.0	H	46.0	-9.4	29.9	74.0
9908.166332	47.9	150.0	H	285.0	-5.4	26.1	74.0
10950.250501	48.6	150.0	H	76.0	-2.7	25.4	74.0
14712.274549	49.4	249.9	H	187.0	0.8	24.6	74.0

Frequency (MHz)	CAverage (dBµV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
3044.338677	22.0	113.4	V	85.0	-21.0	32.0	54.0
5581.112225	26.0	249.9	V	279.0	-15.3	28.0	54.0
7507.565130	31.4	100.0	H	46.0	-9.4	22.6	54.0
9908.166332	35.2	150.0	H	285.0	-5.4	18.8	54.0
10950.250501	35.5	150.0	H	76.0	-2.7	18.5	54.0
14712.274549	36.4	249.9	H	187.0	0.8	17.6	54.0