

TEST REPORT

Verified Code:

Report No.:	E202012112553-3		Application No.:	E202012112553
Client:	SHENZHEN EASYLINKIN TECHNOLOGY CO.,LTD			
Address:	705, Floor 7, Zhongdian Difu Building, Zhenhua Road, Fuqiang Community, Huaqiang North Street, Futian District, Shenzhen, Guangdong Province, China			
Sample Description:	LoRaWAN Gateway			
Model:	G200-HU915			
Test Specification:	CFR 47 FCC Part 15 Subpart C 10-1-2019 Edition ANSI C63.10:2013			
Receipt Date:	2020-12-11			
Test Date:	2020-12-11 to 2021-3-19			
Issue Date:	2021-04-08			
Test Result:	Pass			
Prepared By: Test Engineer	Reviewed By: Technical Manager	Approved By: Manager		
Other Aspects:				
Note: Note				
Abbreviations: <i>ok / P = passed; fail / F = failed; n.a. / N = not applicable;</i>				
The test result in this test report refers exclusively to the presented test sample. This report shall not be reproduced except in full, without the written approval of GRT.				

DIRECTIONS OF TEST

- 1. This station carries out test task according to the national regulation of verifications which can be traced to National Primary Standards and BIPM.**
- 2. The test report merely corresponds to the test sample. It is not permitted to copy extracts of these test result without the written permission of the test laboratory.**
- 3. If there is any objection concerning the test, the client should inform the laboratory within 15 days from the date of receiving the test report.**

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1. TEST RESULT SUMMARY

CFR 47 FCC Part 15 Subpart C ANSI C63.10:2013		
Standard	Test Item	Result
15.207	Conducted emission AC power port	Pass
§15.205(a), §15.209(a), §15.249(a), §15.249(c)	Field strength of emissions and Restricted bands	Pass
§15.215(c)	20dB bandwidth	Pass
§15.249(d)	Out of band emissions	Pass
§15.249(d)	Duty Cycle	Pass, Note ¹
§15.203	Antenna Requirement	Pass, Note ²

Note ¹: Duty cycle= $T_{on}/T_{(on+off)}$ =30/1030=2.91

Note ²: The max gain of antenna is 2.15dBi which accordance 15.203.is considered sufficient to comply with the provisions of this section.

2. GENERAL DESCRIPTION OF EUT

2.1 APPLICANT

Name: SHENZHEN EASYLINKIN TECHNOLOGY CO.,LTD
Address: 705, Floor 7, Zhongdian Difu Building, Zhenhua Road, Fuqiang
Community, Huaqiang North Street, Futian District, Shenzhen,
Guangdong Province, China

2.2 MANUFACTURER

Name: SHENZHEN EASYLINKIN TECHNOLOGY CO.,LTD
Address: 705, Floor 7, Zhongdian Difu Building, Zhenhua Road, Fuqiang
Community, Huaqiang North Street, Futian District, Shenzhen,
Guangdong Province, China

2.3 FACTORY

Name: SHENZHEN EASYLINKIN TECHNOLOGY CO.,LTD
Address: 705, Floor 7, Zhongdian Difu Building, Zhenhua Road, Fuqiang
Community, Huaqiang North Street, Futian District, Shenzhen,
Guangdong Province, China

2.4 BASIC DESCRIPTION OF EQUIPMENT UNDER TEST

Equipment:	LoRaWAN Gateway
Model No.:	G200-HU915
Adding Model	/
Trade Name:	Easylinkin
FCC ID:	2AYYO-G200US
Power Supply:	DC12V power supplied by adapter
Adapter Specification:	Model: PS120W1000U Input: 100-240V~50/60Hz 0.5A Max Output: 12.0V --- 1.0A 12.0W
Frequency Range:	904~926MHz
Transmit Power:	Peak: 109.35dBuV/m (Max.) Average: 77.83dBuV/m (Max.)
Type of Modulation:	GFSK
Antenna Specification:	External antenna with 2.15dBi gain (Max.)
Temperature Range:	0°C ~ +60°C
Hardware Version:	PCB-GW200M-01D
Software Version:	g200_v2.0.0.2001201313

Sample No: E202012112553-0001

Note: The EUT have two different color appearances.

2.5 TEST OPERATION MODE

Mode No.	Description of the modes
1	Lora fixed frequency

2.6 LOCAL SUPPORTIVE

Name of Equipment	Manufacturer	Model	Serial Number	Note
Notebook	LENOVO	TianYi 310-14ISK	MP18DLC6	/
Adapter (Notebook)	LENOVO	ADLX65NCC3A	N/A	/
Cable				
AC cable	/	/	/	Unshielded, 1.00m
DC cable	/	/	/	Shielded, 1.80m

2.7 TEST SOFTWARE:

Software version	Test level
SecureCRRT	Default

3. LABORATORY AND ACCREDITATIONS

3.1 LABORATORY

The tests & measurements refer to this report were performed by Shenzhen EMC Laboratory of Guangzhou GRG Metrology & Test Co., Ltd.

Add : Address: No.1301 Guanguang Road Xinlan Community, Guanlan Street, Longhua District Shenzhen, 518110, People's Republic of China

P.C. : 518000

Tel : 0755-61180008

Fax : 0755-61180008

3.2 ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to GB/T 27025(ISO/IEC 17025:2017)

USA A2LA(Certificate #:2861.01)

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

Canada Industry Canada
USA FCC

Copies of granted accreditation certificates are available for downloading from our web site, <http://www.grgtest.com>

3.3 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement		Frequency	Uncertainty	
Radiated Emission	Horizontal	30MHz~1000MHz	4.3dB	
		1GHz~18GHz	5.6dB	
	Vertical	30MHz~1000MHz	4.3dB	
		1GHz~18GHz	5.6dB	
Conduction Emission		9 kHz ~ 150 kHz	2.8 dB	
		150 kHz ~ 10 MHz	2.8 dB	
		10 MHz ~ 30 MHz	2.2 dB	

This uncertainty represents an expanded uncertainty factor of k=2.

4. LIST OF USED TEST EQUIPMENT AT GRGT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Conducted Emissions				
EMI TEST RECEIVER	R&S	ESCI	100783	2021-10-08
LISN(EUT)	R&S	ENV216	101543	2021-03-24
EZ-EMC	EZ	CCS-3A1-CE	/	/
Radiated Spurious Emission& Restricted bands of operation				
TEST RECEIVER	R&S	ESU26	EMC26-G260	2021-09-22
Spectrum Analyzer	R&S	FSV30	1321.3008K30-104381-rH	2021-03-14
Bilog Antenna	Schwarzbeck	VULB 9163	01279	2021-03-14
Horn Antenna	Schwarzbeck	BBHA 9120D(1201)	02143	2021-12-27
Amplifier	EMEC	EM330	/	2021-04-01
Amplifier	Tonscend	TAP9E6343	AP20E806065	2021-06-28
Amplifier	Tonscend	TAP01018048	AP20E8060075	2021-06-28
Test S/W	Tonscend	JS32-RE/2.5.2.4		
20 dB Bandwidth				
Spectrum Analyzer	Keysight	N9020B	MY59050813	2022-01-28

5. CONDUCTED EMISSIONS

5.1. LIMITS

Frequency range	Limits (dB μ V)	
	Quasi-peak	Average
150kHz ~ 0.5MHz	66~56	56~46
0.5 MHz ~ 5 MHz	56	46
5 MHz ~ 30 MHz	60	50

NOTE: (1) The lower limit shall apply at the transition frequencies.

(2) The limit decreases in line with the logarithm of the frequency in the range of 150 kHz to 0.5MHz.

5.2. TEST PROCEDURES

Procedure of Preliminary Test

Test procedures follow ANSI C63.10:2013.

For measurement of the disturbance voltage the equipment under test (EUT) is connected to the power supply mains and any other extended network via one or more artificial network(s). An EUT, whether intended to be grounded or not, and which is to be used on a table is configured as follows:

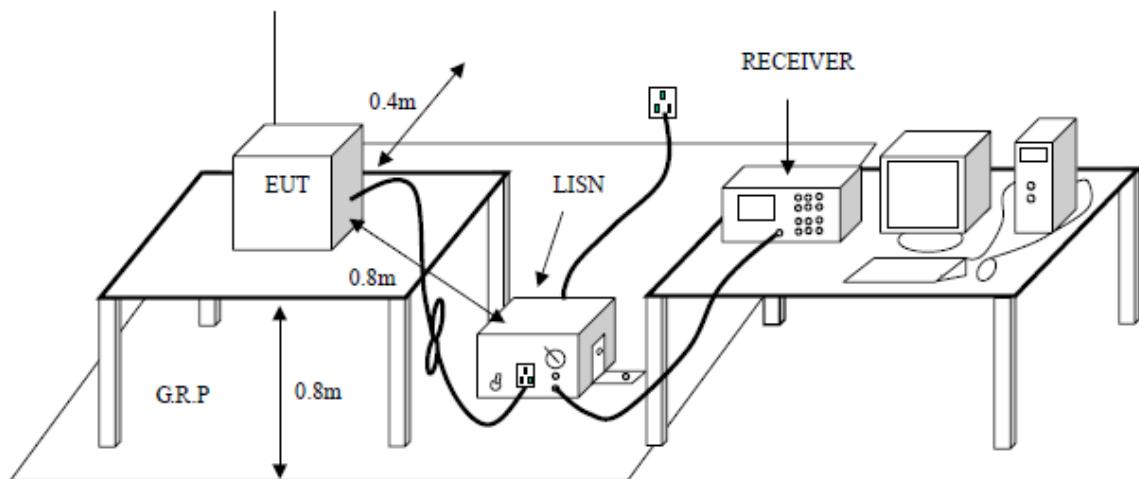
- Either the bottom or the rear of the EUT shall be at a controlled distance of 40 cm from a reference ground plane. This ground plane is normally the wall or floor of a shielded room. It may also be a grounded metal plane of at least 2 m by 2 m. This is physically accomplished as follows:
 - 1) place the EUT on a table of non-conducting material which is at least 80 cm high. Place the EUT so that it is 40 cm from the wall of the shielded room, or place the EUT on a table of non-conducting material which is 40 cm high so that the bottom of the EUT is 40 cm above the ground plane;
 - All other conductive surfaces of the EUT shall be at least 80 cm from the reference ground plane;
 - The EUT are placed on the floor that one side of the housings is 40 cm from the vertical reference ground plane and other metallic parts;
 - Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth forming a bundle 30 cm to 40 cm long, hanging approximately in the middle between the ground plane and the table.
 - I/O cables that are connected to a peripheral shall be bundled in the centre. The end of the cable may be terminated if required using correct terminating impedance. The total length shall not exceed 1 m.

The test mode(s) described in Item 2.4 were scanned during the preliminary test. After the preliminary scan, we found the test mode described in Item 2.4 producing the highest emission level. The EUT configuration and cable configuration of the above highest emission levels were recorded for reference of the final test.

Procedure of Final Test

EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test. A scan was taken on both power lines, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. The test data of the worst-case condition(s) was recorded.

5.3. TEST SETUP



5.4. DATA SAMPLE

Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
X.XXXX	32.69	25.65	11.52	44.21	37.17	65.78	55.79	-21.57	-18.62	Pass

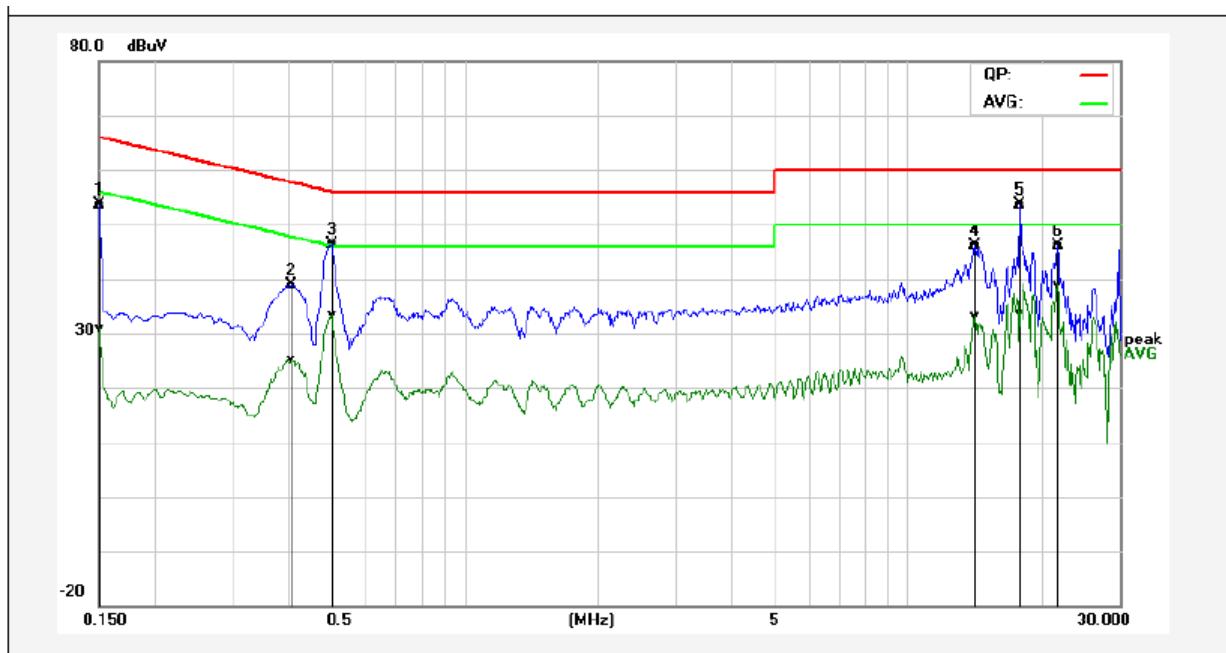
Factor	= Insertion loss of LISN + Cable Loss
Result	= Quasi-peak Reading/ Average Reading + Factor
Limit	= Limit stated in standard
Margin	= Result (dBuV) – Limit (dBuV)

5.5. TEST RESULTS

EUT Name	LoRaWAN Gateway	Model	G200-HU915
Environmental Conditions	24.8°C/45%RH/101kPa	Test Mode	Mode 1
Power supply	AC120V/60Hz	Tested By	Chen Xiaocong
Test Date	2021-01-16	Sample No.	E202012112553-0005

Line:

L1

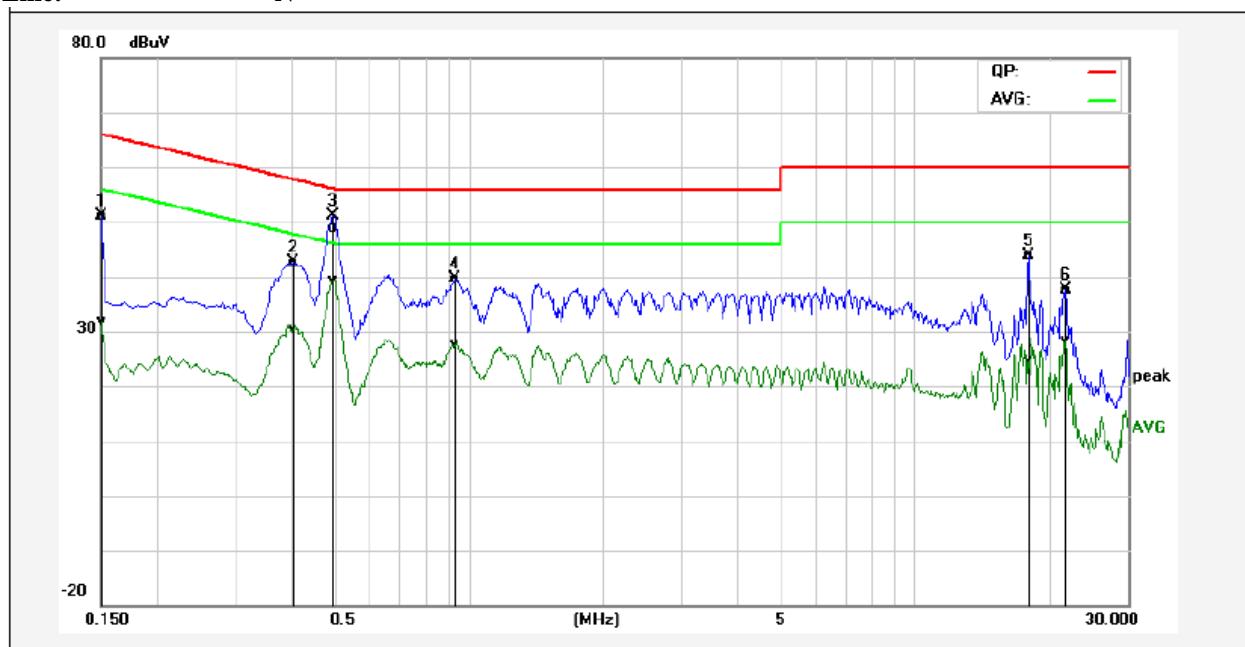


No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1	0.1500	43.96	21.20	9.61	53.57	30.81	65.99	56.00	-12.42	-25.19	Pass
2	0.4100	29.22	15.49	9.62	38.84	25.11	57.65	47.65	-18.81	-22.54	Pass
3	0.5020	36.67	23.78	9.62	46.29	33.40	56.00	46.00	-9.71	-12.60	Pass
4	14.1620	36.41	23.27	9.78	46.19	33.05	60.00	50.00	-13.81	-16.95	Pass
5*	17.9220	43.78	23.85	9.83	53.61	33.68	60.00	50.00	-6.39	-16.32	Pass
6	21.7220	36.21	28.94	9.89	46.10	38.83	60.00	50.00	-13.90	-11.17	Pass

EUT Name	LoRaWAN Gateway	Model	G200-HU915
Environmental Conditions	24.8°C/45%RH/101kPa	Test Mode	Mode 1
Power supply	AC120V/60Hz	Tested By	Chen Xiaocong
Test Date	2021-01-16	Sample No.	E202012112553-0005

Line:

N



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1	0.1500	41.43	22.15	9.61	51.04	31.76	65.99	56.00	-14.95	-24.24	Pass
2	0.4060	33.06	20.71	9.62	42.68	30.33	57.73	47.73	-15.05	-17.40	Pass
3*	0.4980	39.33	29.66	9.62	48.95	39.28	56.03	46.03	-7.08	-6.75	Pass
4	0.9340	30.09	18.10	9.62	39.71	27.72	56.00	46.00	-16.29	-18.28	Pass
5	17.9619	34.07	14.71	9.83	43.90	24.54	60.00	50.00	-16.10	-25.46	Pass
6	21.7220	27.73	18.42	9.89	37.62	28.31	60.00	50.00	-22.38	-21.69	Pass

6. RADIATED SPURIOUS EMISSIONS

6.1. LIMITS

The field strength of fundamental and harmonic emissions, measured at 3 m, shall not exceed 50 mV/m and 0.5 mV/m respectively.

Fundamental Frequency	Field Strength of Fundamental Field Strength (mV/m)	Field Strength of Harmonics (μ V/m)
902-928 MHz	50	500
2400 - 2483.5 MHz	50	500
5725 - 5875 MHz	50	500

Except where otherwise indicated in the applicable FCC, radiated emissions shall comply with the field strength limits shown in table 5 and table 6. Additionally, the level of any transmitter unwanted emission shall not exceed the level of the transmitter's fundamental emission.

Table 5

Frequency (MHz)	Magnetic field strength (HField) (μ A/m)	Measurement Distance (m)
0.009-0.490	6.37/F (F in kHz)	300
0.490-1.705	63.7/F (F in kHz)	30
1.705-30.0	0.08	30

Table 6

Frequency (MHz)	Field Strength (μ V/m)	Measurement Distance (m)
30-88	100*	3
88-216	150*	3
216-960	200*	3
Above 960	500	3

Restricted band

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	1435 - 1626.5	9.0 - 9.2
0.495 - 0.505	16.69475 - 16.69525	1645.5 - 1646.5	9.3 - 9.5
2.1735 - 2.1905	16.80425 - 16.80475	1660 - 1710	10.6 - 12.7
3.020 - 3.026	25.5 - 25.67	1718.8 - 1722.2	13.25 - 13.4
4.125 - 4.128	37.5 - 38.25	2200 - 2300	14.47 - 14.5
4.17725 - 4.17775	73 - 74.6	2310 - 2390	15.35 - 16.2
4.20725 - 4.20775	74.8 - 75.2	2483.5 - 2500	17.7 - 21.4
5.677 - 5.683	108 - 138	2655 - 2900	22.01 - 23.12
6.215 - 6.218	149.9 - 150.05	3260 - 3267	23.6 - 24.0
6.26775 - 6.26825	156.52475 - 156.52525	3332 - 3339	31.2 - 31.8
6.31175 - 6.31225	156.7 - 156.9	3345.8 - 3358	36.43 - 36.5
8.291 - 8.294	162.0125 - 167.17	3500 - 4400	Above 38.6
8.362 - 8.366	167.72 - 173.2	4500 - 5150	
8.37625 - 8.38675	240 - 285	5350 - 5460	
8.41425 - 8.41475	322 - 335.4	7250 - 7750	
12.29 - 12.293	399.9 - 410	8025 - 8500	
12.51975 - 12.52025	608 - 614	--	
12.57675 - 12.57725	960 - 1427		
13.36 - 13.41			

6.2. TEST PROCEDURES**1) Sequence of testing 9 kHz to 30 MHz****Setup:**

- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a rotatable table with 0.8 m height is used.
- If the EUT is a floor standing device, it is placed on the ground.
- Auxiliary equipment and cables were positioned to simulate normal operation conditions.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- The measurement distance is 3 meter.
- The EUT was set into operation.

Pre measurement:

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna height is 0.8 meter.
- At each turntable position the analyzer sweeps with peak detection to find the maximum of all emissions

Final measurement:

- Identified emissions during the pre measurement the software maximizes by rotating the turntable position (0° to 360°) and by rotating the elevation axes (0° to 360°).
- The final measurement will be done in the position (turntable and elevation) causing the highest emissions with QPK detector.
- The final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the pre measurement and the limit will be stored.

2) Sequence of testing 30 MHz to 1 GHz

Setup:

- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.
- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- Auxiliary equipment and cables were positioned to simulate normal operation conditions
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- The measurement distance is 3 meter.
- The EUT was set into operation.

Pre measurement:

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna is polarized vertical and horizontal.
- The antenna height changes from 1 to 3 meter.
- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.

Final measurement:

- The final measurement will be performed with minimum the six highest peaks.
- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position ($\pm 45^\circ$) and antenna movement between 1 and 4 meter.
- The final measurement will be done with QP detector with an EMI receiver.
- The final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final

measurements and the limit will be stored.

3) Sequence of testing 1 GHz to 18 GHz

Setup:

- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.
- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- Auxiliary equipment and cables were positioned to simulate normal operation conditions
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- The measurement distance is 3 meter.
- The EUT was set into operation.

Pre measurement:

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna is polarized vertical and horizontal.
- The antenna height scan range is 1 meter to 2.5 meter.
- At each turntable position and antenna polarization the analyzer sweeps with peak detection to find the maximum of all emissions.

Final measurement:

- The final measurement will be performed with minimum the six highest peaks.
- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position ($\pm 45^\circ$) and antenna movement between 1 and 4 meter. This procedure is repeated for both antenna polarizations.
- The final measurement will be done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and Average detector.
- The final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the pre measurement with marked maximum final measurements and the limit will be stored.

4) Sequence of testing above 18 GHz

Setup:

- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.
- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- Auxiliary equipment and cables were positioned to simulate normal operation conditions

- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- The measurement distance is 1 meter.
- The EUT was set into operation.

Pre measurement:

- The antenna is moved spherical over the EUT in different polarisations of the antenna.

Final measurement:

- The final measurement will be performed at the position and antenna orientation for all detected emissions that were found during the premeasurements with Peak and Average detector.
- The final levels, frequency, measuring time, bandwidth, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

NOTE: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average (Duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor (10 $\log(1/\text{duty cycle})$).

6.3. TEST SETUP

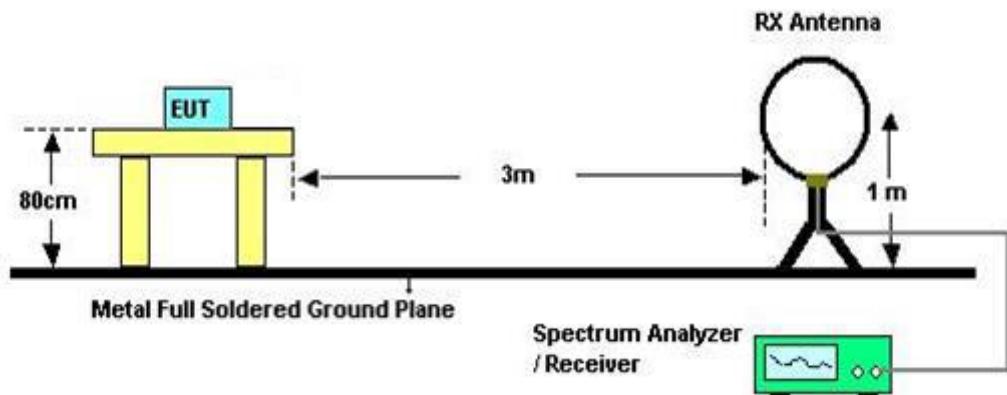
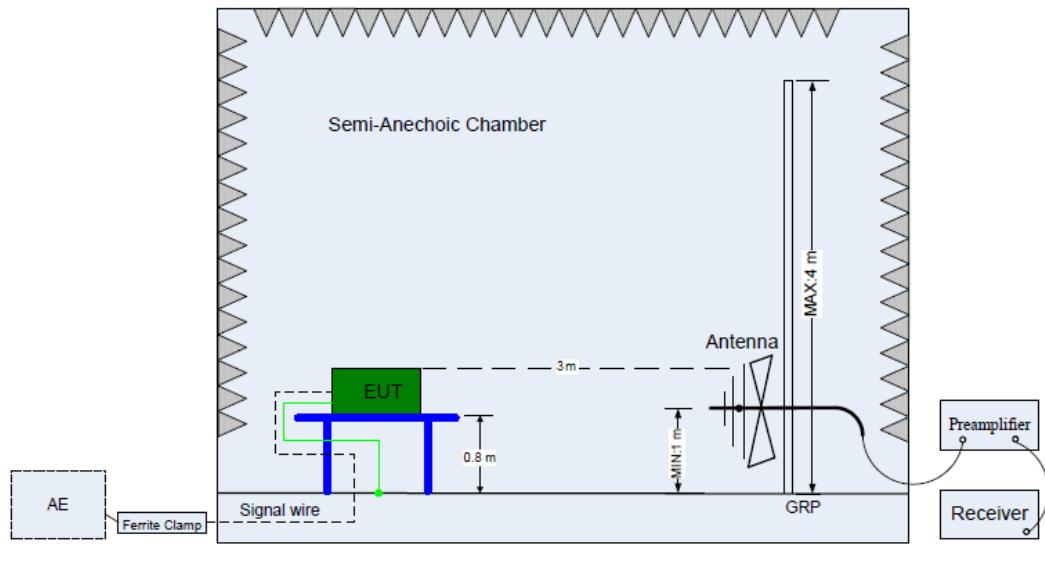
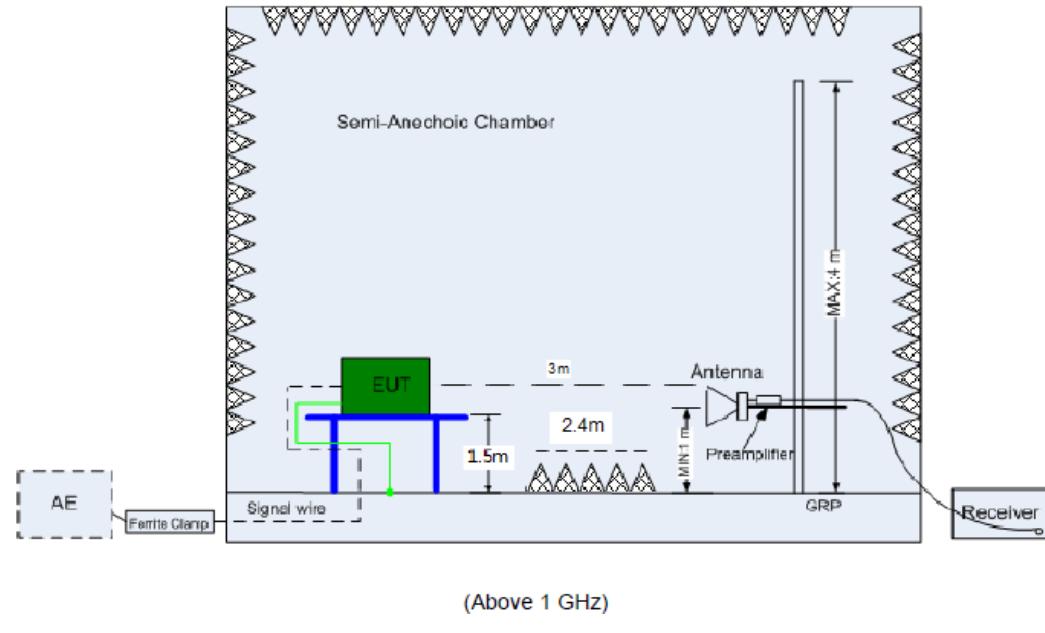


Figure 1.9KHz to 30MHz radiated emissions test configuration



(Below 1 GHz)

Figure 2. 30MHz to 1GHz radiated emissions test configuration



(Above 1 GHz)

Figure 3. Above 1GHz radiated emissions test configuration

6.4. TEST RESULT

The field strength of fundamental

TX / 904MHz

Freq. [MHz]	Reading [dB μ V/m]	Level [dB μ V/m]	Factor [dB]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Remark
903.9717	122.57	108.30	-14.27	114.00	5.70	100	226	Horizontal	Peak
903.9717	91.05	76.78	-14.27	94.00	17.22	100	226	Horizontal	AV

Freq. [MHz]	Reading [dB μ V/m]	Level [dB μ V/m]	Factor [dB]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Remark
903.9830	122.65	108.99	-13.66	114.00	5.01	100	294	Vertical	Peak
903.9830	91.13	77.47	-13.66	94.00	16.53	100	294	Vertical	AV

TX / 915MHz

Freq. [MHz]	Reading [dB μ V/m]	Level [dB μ V/m]	Factor [dB]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Remark
914.9719	122.47	108.33	-14.14	114.00	5.67	100	228	Horizontal	Peak
914.9719	90.95	76.81	-14.14	94.00	17.19	100	228	Horizontal	AV

Freq. [MHz]	Reading [dB μ V/m]	Level [dB μ V/m]	Factor [dB]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Remark
914.9569	122.66	109.15	-13.51	114.00	4.85	100	256	Vertical	Peak
914.9569	91.14	77.63	-13.51	94.00	16.37	100	256	Vertical	AV

TX / 926MHz

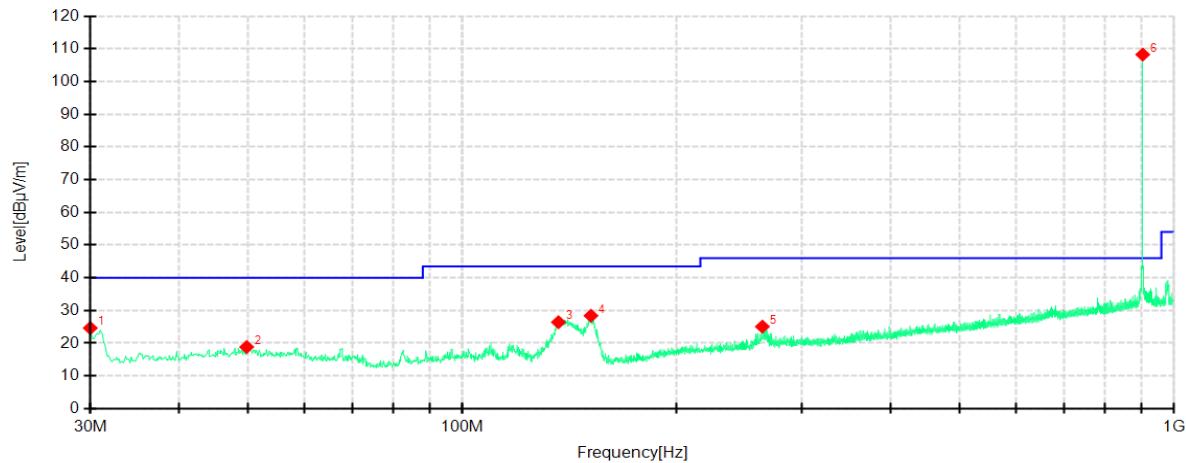
Freq. [MHz]	Reading [dB μ V/m]	Level [dB μ V/m]	Factor [dB]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Remark
925.9945	122.39	108.42	-13.97	114.00	5.58	100	229	Horizontal	Peak
925.9945	90.87	76.90	-13.97	94.00	17.10	100	229	Horizontal	AV

Freq. [MHz]	Reading [dB μ V/m]	Level [dB μ V/m]	Factor [dB]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Remark
925.9682	122.67	109.35	-13.32	114.00	4.65	100	248	Vertical	Peak
925.9682	91.15	77.83	-13.32	94.00	16.17	100	248	Vertical	AV

Radiated Spurious Emission
Test Frequency 30MHz – 1GHz

Lowest channel (904MHz)

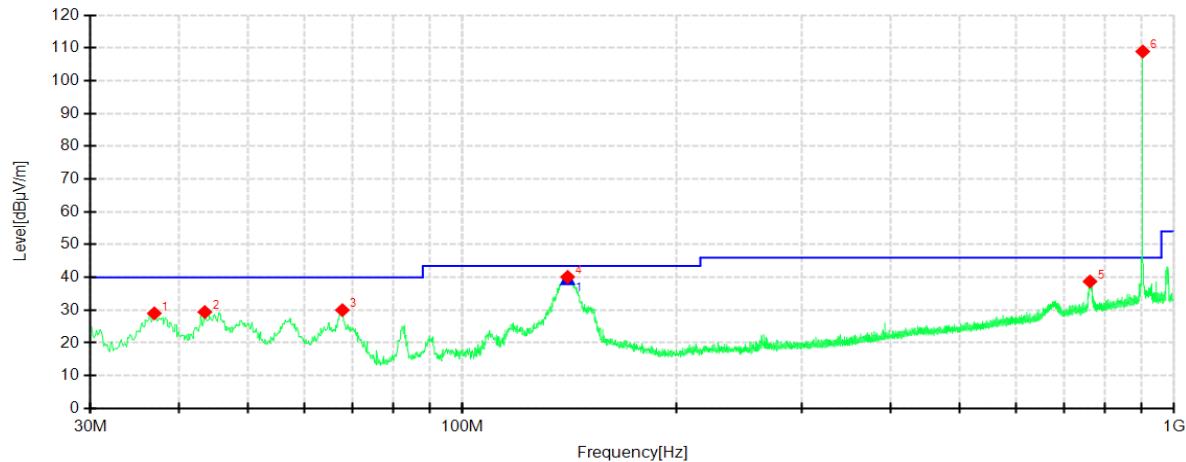
Date: 2021-03-12

**Suspected Data List**

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Trace	Height [cm]	Angle [°]	Polarity
1	30.0000	55.37	24.64	-30.73	40.00	15.36	PK	100	339	Horizontal
2	49.7662	46.33	18.84	-27.49	40.00	21.16	PK	200	52	Horizontal
3	136.4708	58.16	26.42	-31.74	43.50	17.08	PK	200	351	Horizontal
4	151.6290	59.92	28.41	-31.51	43.50	15.09	PK	200	177	Horizontal
5	264.0418	51.39	25.08	-26.31	46.00	20.92	PK	100	178	Horizontal
6	903.9580	122.51	108.24	-14.27	46.00	-62.24	PK	100	229	Horizontal

Lowest channel (904MHz)

Date: 2021-03-12

**Suspected Data List**

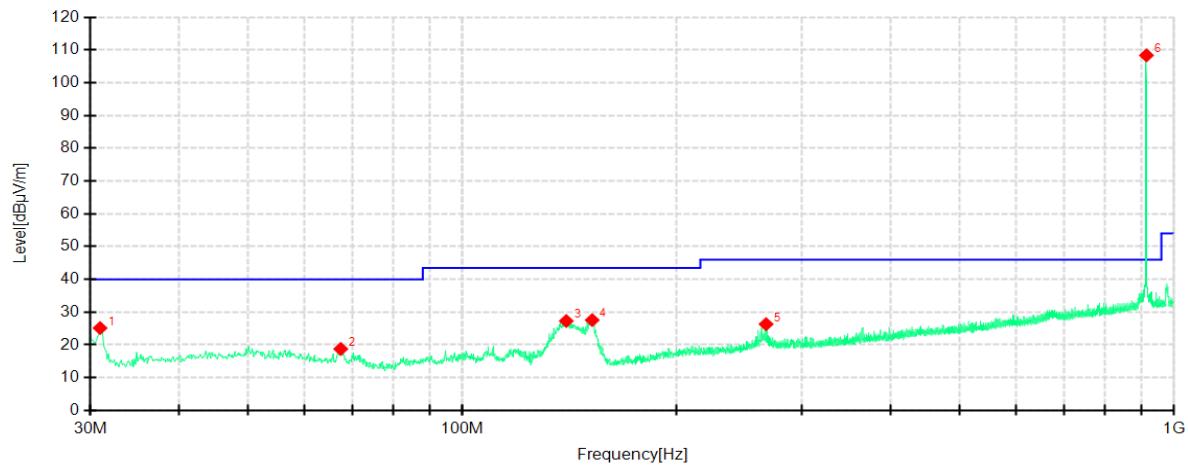
NO.	Freq. [MHz]	Reading [dB μ V/m]	Level [dB μ V/m]	Factor [dB]	Limit [dB μ V/m]	Margin [dB]	Trace	Height [cm]	Angle [°]	Polarity
1	36.9121	57.79	29.00	-28.79	40.00	11.00	PK	100	126	Vertical
2	43.4604	58.10	29.41	-28.69	40.00	10.59	PK	100	126	Vertical
3	67.8347	60.53	29.99	-30.54	40.00	10.01	PK	200	154	Vertical
4	140.5938	66.45	40.13	-26.32	43.50	3.37	PK	100	104	Vertical
5	762.1990	54.50	38.73	-15.77	46.00	7.27	PK	100	45	Vertical
6	903.9580	122.57	108.90	-13.67	46.00	-62.90	PK	100	287	Vertical

Final Data List

NO.	Freq. [MHz]	Factor [dB]	QP Reading [dB μ V/m]	QP Value [dB μ V/m]	QP Limit [dB μ V/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	140.593	-26.32	66.019	39.70	43.50	3.80	100	104	Vertical

Middle channel (915MHz)

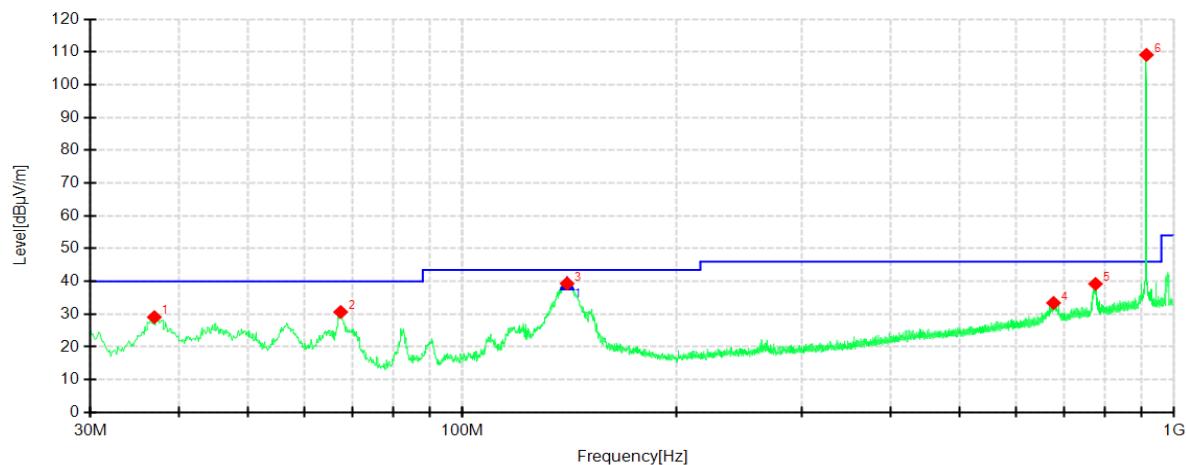
Date: 2021-03-12



Suspected Data List										
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Trace	Height [cm]	Angle [°]	Polarity
1	30.9701	55.67	25.14	-30.53	40.00	14.86	PK	200	251	Horizontal
2	67.4709	49.55	18.76	-30.79	40.00	21.24	PK	200	119	Horizontal
3	139.9875	59.16	27.30	-31.86	43.50	16.20	PK	200	357	Horizontal
4	152.2353	59.05	27.57	-31.48	43.50	15.93	PK	200	359	Horizontal
5	267.1946	52.51	26.32	-26.19	46.00	19.68	PK	100	1	Horizontal
6	914.9931	122.48	108.34	-14.14	46.00	-62.34	PK	100	220	Horizontal

Middle channel (915MHz)

Date: 2021-03-12

**Suspected Data List**

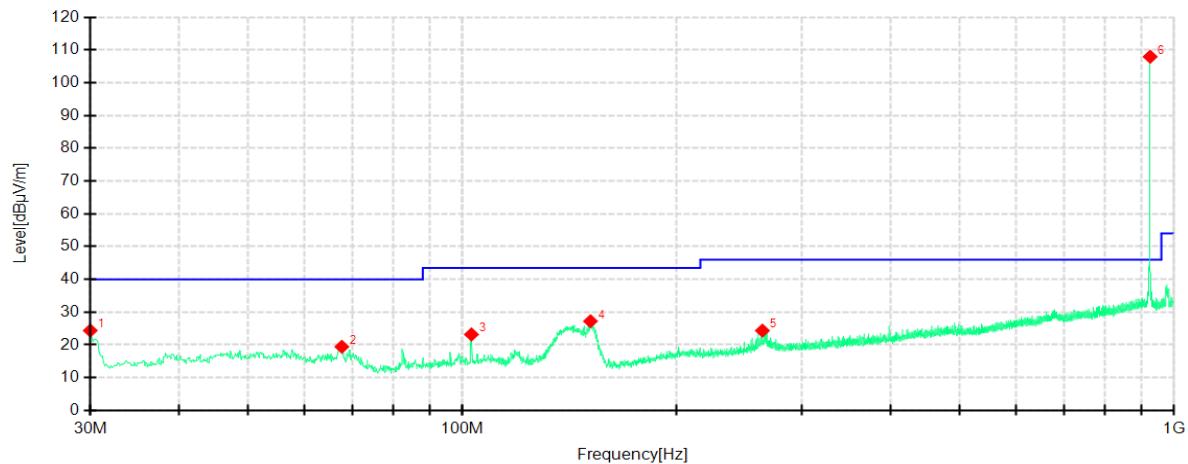
NO.	Freq. [MHz]	Reading [dB μ V/m]	Level [dB μ V/m]	Factor [dB]	Limit [dB μ V/m]	Margin [dB]	Trace	Height [cm]	Angle [°]	Polarity
1	36.9121	57.86	29.07	-28.79	40.00	10.93	PK	100	95	Vertical
2	67.4709	61.15	30.65	-30.50	40.00	9.35	PK	200	44	Vertical
3	140.3513	65.68	39.34	-26.34	43.50	4.16	PK	100	88	Vertical
4	677.4347	50.70	33.42	-17.28	46.00	12.58	PK	100	140	Vertical
5	775.9020	54.74	39.21	-15.53	46.00	6.79	PK	100	51	Vertical
6	914.9931	122.61	109.10	-13.51	46.00	-63.10	PK	100	249	Vertical

Final Data List

NO.	Freq. [MHz]	Factor [dB]	QP Reading [dB μ V/m]	QP Value [dB μ V/m]	QP Limit [dB μ V/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	140.3513	-26.34	65.68	39.34	43.50	4.16	100	92	Vertical

Highest channel (926MHz)

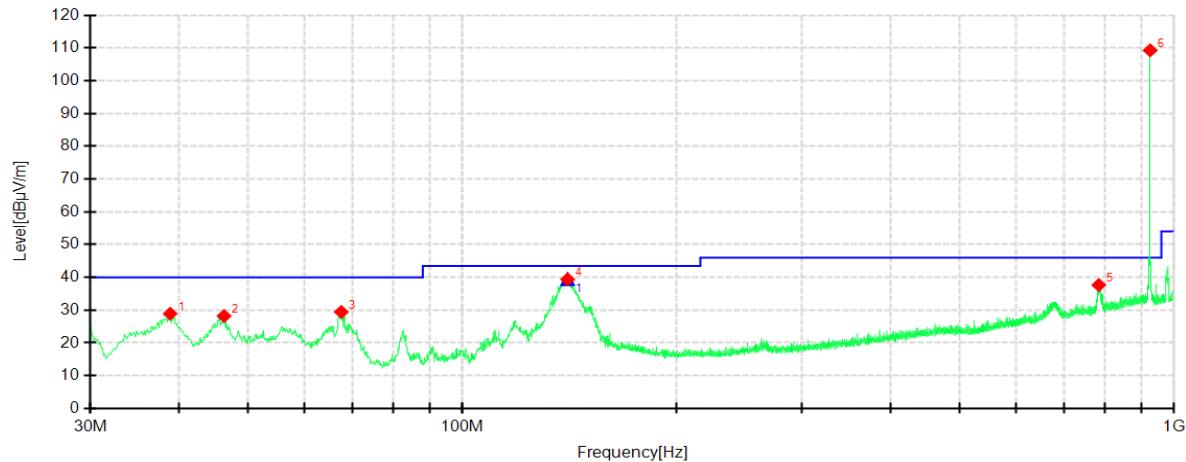
Date: 2021-03-12

**Suspected Data List**

NO.	Freq. [MHz]	Reading[dB μ V/m]	Level [dB μ V/m]	Factor [dB]	Limit [dB μ V/m]	Margin [dB]	Trace	Height [cm]	Angle [°]	Polarity
1	30.0000	56.00	24.39	-31.61	40.00	15.61	PK	200	274	Horizontal
2	67.7135	51.07	19.43	-31.64	40.00	20.57	PK	200	199	Horizontal
3	103.0016	53.20	23.19	-30.01	43.50	20.31	PK	100	110	Horizontal
4	151.3864	59.42	27.23	-32.19	43.50	16.27	PK	200	192	Horizontal
5	264.0418	51.31	24.36	-26.95	46.00	21.64	PK	100	337	Horizontal
6	926.0283	121.81	107.91	-13.90	46.00	-61.91	PK	100	228	Horizontal

Highest channel (926MHz)

Date: 2021-03-12



Suspected Data List										
NO.	Freq. [MHz]	Reading [dB μ V/m]	Level [dB μ V/m]	Factor [dB]	Limit [dB μ V/m]	Margin [dB]	Trace	Height [cm]	Angle [°]	Polarity
1	38.8524	58.58	28.90	-29.68	40.00	11.10	PK	100	124	Vertical
2	46.2495	58.08	28.20	-29.88	40.00	11.80	PK	200	133	Vertical
3	67.5922	60.76	29.45	-31.31	40.00	10.55	PK	200	250	Vertical
4	140.5938	66.56	39.40	-27.16	43.50	4.10	PK	100	95	Vertical
5	784.2693	53.54	37.66	-15.88	46.00	8.34	PK	100	44	Vertical
6	926.0283	122.50	109.25	-13.25	46.00	-63.25	PK	100	248	Vertical

Final Data List										
NO.	Freq. [MHz]	Factor [dB]	QP Reading [dB μ V/m]	QP Value [dB μ V/m]	QP Limit [dB μ V/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity	
1	140.5938	-27.16	66.56	39.40	43.50	4.10	100	99	Vertical	

Remark:

- 1 No emission found between lowest internal used/generated frequency to 30MHz.
- 2 Radiated emissions measured in frequency range from 30MHz to 1GHz were made with an instrument using Quasi-peak detector mode.
- 3 The IF bandwidth of Receiver between 30MHz to 1GHz was 120kHz.
- 4 Below 1GHz: factor = Antenna Factor + Cable Loss.

Above 1 GHz

Lowest channel (904MHz)

Date: 2021-03-09

Suspected Data List									
NO.	Freq. [MHz]	Reading [dB μ V/m]	Level [dB μ V/m]	Factor [dB]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1179.5500	63.50	38.91	-24.59	74.00	35.09	150	49	Horizontal
2	1965.2500	58.20	37.52	-20.68	74.00	36.48	150	231	Horizontal
3	3059.2000	56.17	38.53	-17.64	74.00	35.47	150	231	Horizontal
4	4201.7500	53.69	40.21	-13.48	74.00	33.79	150	58	Horizontal
5	6704.2000	51.35	45.13	-6.22	74.00	28.87	150	121	Horizontal
6	9788.0500	47.09	49.29	2.20	74.00	24.71	150	12	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dB μ V/m]	Level [dB μ V/m]	Factor [dB]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1178.2000	61.74	37.14	-24.60	74.00	36.86	150	311	Vertical
2	1768.1500	59.72	38.14	-21.58	74.00	35.86	150	257	Vertical
3	2793.2500	59.85	41.01	-18.84	74.00	32.99	150	83	Vertical
4	3830.9500	55.15	40.91	-14.24	74.00	33.09	150	311	Vertical
5	6700.6000	51.29	45.05	-6.24	74.00	28.95	150	248	Vertical
6	7231.6000	54.73	50.36	-4.37	74.00	23.64	150	1	Vertical

PK Final Data List				
NO.	Freq. [MHz]	Factor [dB]	Height [cm]	Polarity
1	7231.6000	-4.37	150	Vertical

AV Final Data List								
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dB μ V/m]	AV Value [dB μ V/m]	AV Limit [dB μ V/m]	AV Margin [dB]	Height [cm]	Polarity
1	7231.6000	-4.37	51.69	47.32	54.00	6.68	150	Vertical

Middle channel (915MHz)

Date: 2021-03-09

Suspected Data List

NO.	Freq. [MHz]	Reading [dB μ V/m]	Level [dB μ V/m]	Factor [dB]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1178.2000	64.47	39.87	-24.60	74.00	34.13	150	38	Horizontal
2	2084.0500	56.33	36.17	-20.16	74.00	37.83	150	1	Horizontal
3	2793.2500	57.28	38.44	-18.84	74.00	35.56	150	309	Horizontal
4	4030.3000	54.27	40.06	-14.21	74.00	33.94	150	170	Horizontal
5	6665.9500	51.35	44.94	-6.41	74.00	29.06	150	1	Horizontal
6	9754.7500	47.22	49.48	2.26	74.00	24.52	150	318	Horizontal

Suspected Data List

NO.	Freq. [MHz]	Reading [dB μ V/m]	Level [dB μ V/m]	Factor [dB]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1174.6000	61.50	36.89	-24.61	74.00	37.11	150	304	Vertical
2	2073.7000	56.06	35.89	-20.17	74.00	38.11	150	11	Vertical
3	2793.2500	60.70	41.86	-18.84	74.00	32.14	150	56	Vertical
4	4230.5500	53.99	40.40	-13.59	74.00	33.60	150	139	Vertical
5	6696.5500	50.96	44.70	-6.26	74.00	29.30	150	248	Vertical
6	7320.2500	55.45	51.24	-4.21	74.00	22.76	150	359	Vertical

PK Final Data List

NO.	Freq. [MHz]	Factor [dB]	Height [cm]	Angle [°]	Polarity
1	7319.9572	-4.21	102	2	Vertical

AV Final Data List

NO.	Freq. [MHz]	Factor [dB]	AV Reading [dB μ V/m]	AV Value [dB μ V/m]	AV Limit [dB μ V/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	7319.9572	-4.21	52.52	48.31	54.00	5.69	102	2	Vertical

Highest channel (926MHz)

Date: 2021-03-09

Suspected Data List									
NO.	Freq. [MHz]	Reading [dB μ V/m]	Level [dB μ V/m]	Factor [dB]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1095.8500	62.25	37.31	-24.94	74.00	36.69	150	360	Horizontal
2	2138.9500	56.28	36.14	-20.14	74.00	37.86	150	354	Horizontal
3	2793.2500	57.28	38.44	-18.84	74.00	35.56	150	302	Horizontal
4	4229.2000	53.88	40.30	-13.58	74.00	33.70	150	1	Horizontal
5	6785.2000	50.72	44.93	-5.79	74.00	29.07	150	147	Horizontal
6	9967.1500	47.49	49.92	2.43	74.00	24.08	150	174	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dB μ V/m]	Level [dB μ V/m]	Factor [dB]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1174.6000	58.73	34.12	-24.61	74.00	39.88	150	310	Vertical
2	2150.2000	56.48	36.34	-20.14	74.00	37.66	150	204	Vertical
3	3059.2000	57.79	40.15	-17.64	74.00	33.85	150	95	Vertical
4	3929.0500	54.58	40.41	-14.17	74.00	33.59	150	140	Vertical
5	6196.6000	51.98	44.82	-7.16	74.00	29.18	150	77	Vertical
6	7407.5500	55.36	51.50	-3.86	74.00	22.50	150	348	Vertical

PK Final Data List					
NO.	Freq. [MHz]	Factor [dB]	Height [cm]	Angle [°]	Polarity
1	7407.5500	-3.86	150	348	Vertical
2	7408.0685	-3.86	108	4	Vertical

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dB μ V/m]	AV Value [dB μ V/m]	AV Limit [dB μ V/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	7407.5500	-3.86	51.39	47.53	54.00	6.47	150	348	Vertical
2	7408.0685	-3.86	51.79	47.93	54.00	6.07	108	4	Vertical

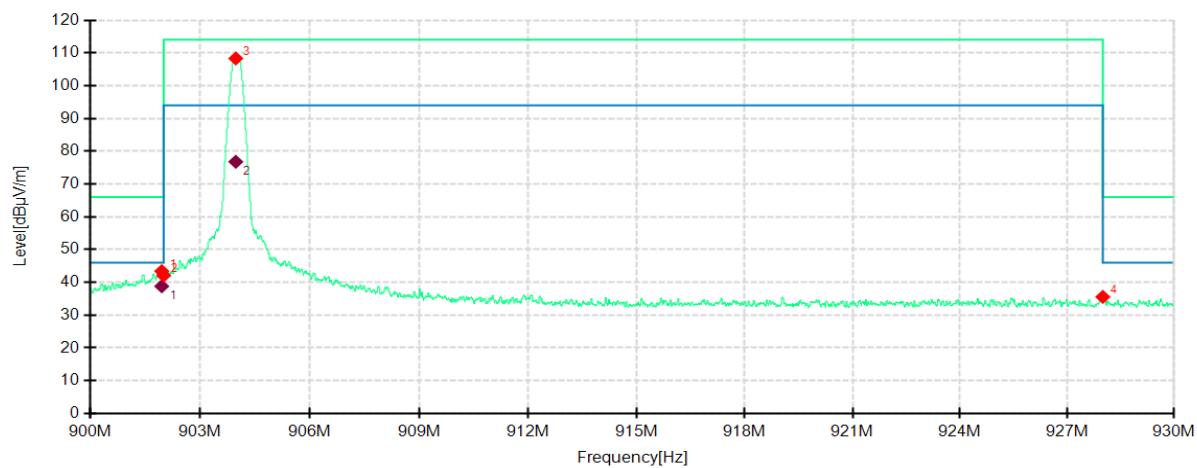
Remark:

- 1 Radiated emissions measured in frequency range from 1GHz – 10GHz were made with an instrument using Peak/AV detector mode.
- 2 According to C63.10, if the peak (or quasi-peak) measured value complies with the average limit, it's unnecessary to perform an average measurement.
- 3 The IF bandwidth of Receiver between above was 1MHz
- 4 Above 1GHz: Corrector factor = Antenna Factor + Cable Loss- Amplifier Gain.

BANDEDGE

Lowest channel (904MHz)

Date: 2021-03-12

**Suspected Data List**

NO.	Freq. [MHz]	Reading [dBµV/m]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	901.9502	57.73	43.41	-14.32	66.00	22.59	100	233	Horizontal
2	902.0000	56.42	42.10	-14.32	114.00	71.90	100	293	Horizontal
3	903.9717	122.57	108.30	-14.27	114.00	5.70	100	226	Horizontal
4	928.0010	49.47	35.56	-13.91	66.00	30.44	100	197	Horizontal

PK Final Data List

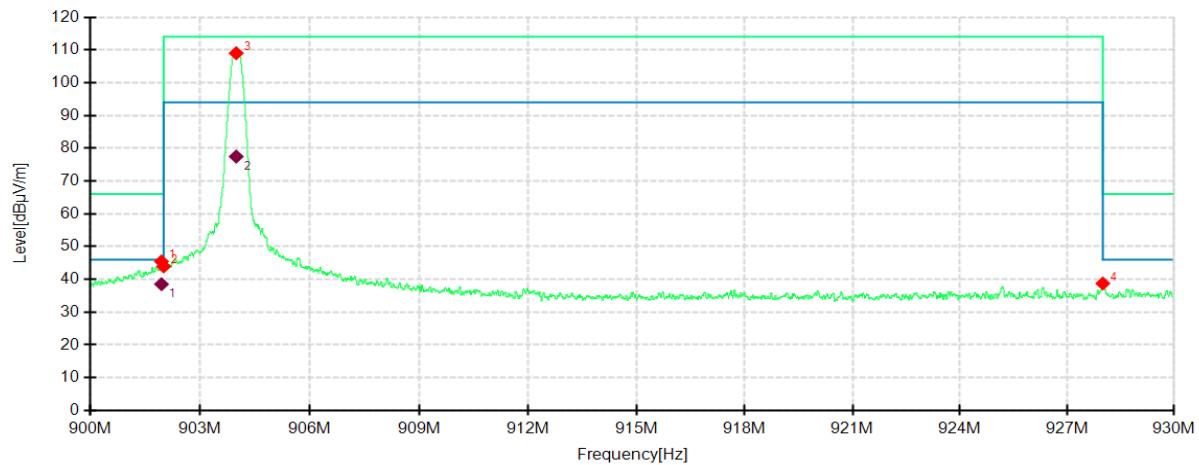
NO.	Freq. [MHz]	Factor [dB]	Height [cm]	Angle [°]	Polarity
1	901.9502	-14.32	100	233	Horizontal
2	903.9717	-14.27	100	226	Horizontal

AV Final Data List

NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBµV/m]	AV Value [dBµV/m]	AV Limit [dBµV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	901.9502	-14.32	53.125	38.81	46.00	7.19	100	233	Horizontal
2	903.9717	-14.27	91.05	76.78	94.00	17.22	100	226	Horizontal

Lowest channel (904MHz)

Date: 2021-03-12

**Suspected Data List**

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	901.9427	59.17	45.46	-13.71	66.00	20.54	100	301	Vertical
2	902.0000	57.66	43.95	-13.71	114.00	70.05	100	351	Vertical
3	903.9830	122.65	108.99	-13.66	114.00	5.01	100	294	Vertical
4	928.0010	52.00	38.74	-13.26	66.00	27.26	100	125	Vertical

PK Final Data List

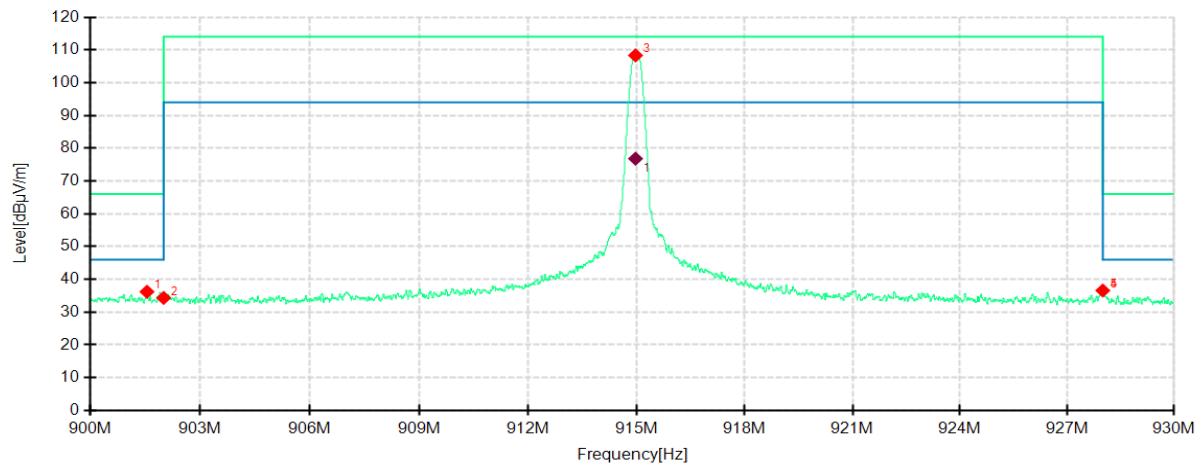
NO.	Freq. [MHz]	Factor [dB]	Height [cm]	Angle [°]	Polarity
1	901.9427	-13.71	100	301	Vertical
2	903.9830	-13.66	100	294	Vertical

AV Final Data List

NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	901.9427	-13.71	52.230	38.52	46.00	7.48	100	301	Vertical
2	903.9830	-13.66	91.13	77.47	94.00	16.53	100	294	Vertical

Middle channel (915MHz)

Date: 2021-03-12

**Suspected Data List**

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	901.5452	50.54	36.21	-14.33	66.00	29.79	100	126	Horizontal
2	902.0000	48.66	34.34	-14.32	114.00	79.66	100	148	Horizontal
3	914.9719	122.47	108.33	-14.14	114.00	5.67	100	228	Horizontal
4	928.0000	50.50	36.59	-13.91	66.00	29.41	100	265	Horizontal
5	928.0085	50.52	36.61	-13.91	66.00	29.39	100	265	Horizontal

PK Final Data List

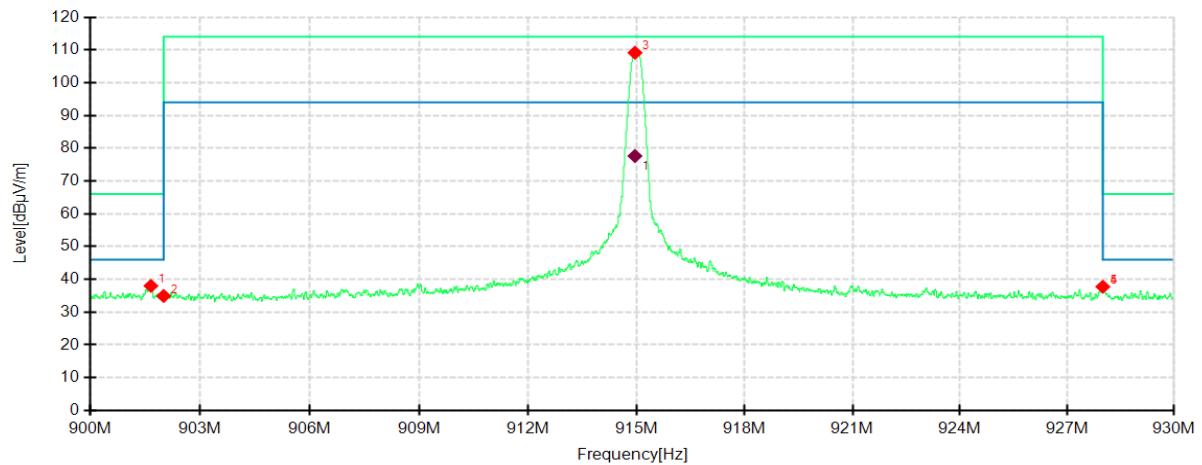
NO.	Freq. [MHz]	Factor [dB]	Height [cm]	Angle [°]	Polarity
1	914.9719	-14.14	100	228	Horizontal

AV Final Data List

NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	914.9719	-14.14	90.95	76.81	94.00	17.19	100	228	Horizontal

Middle channel (915MHz)

Date: 2021-03-12

**Suspected Data List**

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	901.6540	51.72	38.00	-13.72	66.00	28.00	100	132	Vertical
2	902.0000	48.64	34.93	-13.71	114.00	79.07	100	359	Vertical
3	914.9569	122.66	109.15	-13.51	114.00	4.85	100	256	Vertical
4	928.0000	51.01	37.75	-13.26	66.00	28.25	100	191	Vertical
5	928.0123	50.92	37.66	-13.26	66.00	28.34	100	205	Vertical

PK Final Data List

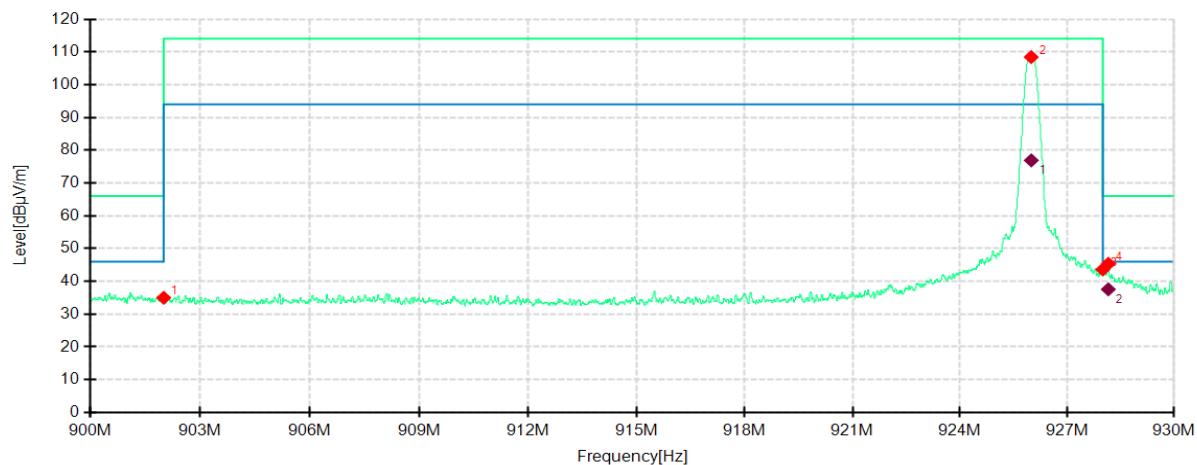
NO.	Freq. [MHz]	Factor [dB]	Height [cm]	Angle [°]	Polarity
1	914.9569	-13.51	100	256	Vertical

AV Final Data List

NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	914.9569	-13.51	91.14	77.63	94.00	16.37	100	256	Vertical

Highest channel (926MHz)

Date: 2021-03-12

**Suspected Data List**

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	902.0028	49.31	34.99	-14.32	114.00	79.01	100	118	Horizontal
2	925.9945	122.39	108.42	-13.97	114.00	5.58	100	229	Horizontal
3	928.0000	57.52	43.61	-13.91	66.00	22.39	100	237	Horizontal
4	928.1548	59.26	45.35	-13.91	66.00	20.65	100	213	Horizontal

PK Final Data List

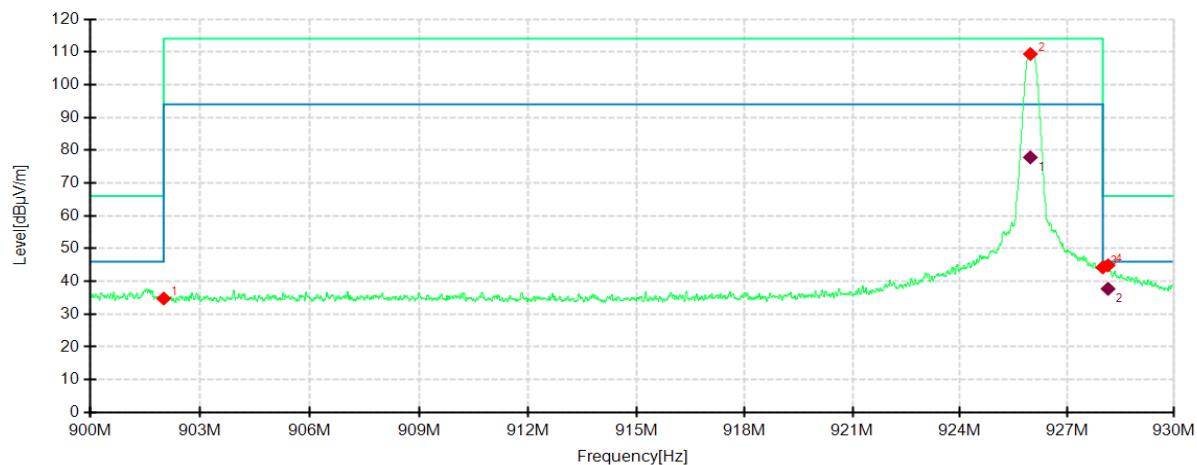
NO.	Freq. [MHz]	Factor [dB]	Height [cm]	Angle [°]	Polarity
1	925.9945	-13.97	100	229	Horizontal
2	928.1548	-13.91	100	213	Horizontal

AV Final Data List

NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	925.9945	-13.97	90.87	76.90	94.00	17.10	100	229	Horizontal
2	928.1548	-13.91	51.465	37.56	46.00	8.44	100	213	Horizontal

Highest channel (926MHz)

Date: 2021-03-12

**Suspected Data List**

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	902.0028	48.47	34.76	-13.71	114.00	79.24	100	35	Vertical
2	925.9682	122.67	109.35	-13.32	114.00	4.65	100	248	Vertical
3	928.0000	57.50	44.24	-13.26	66.00	21.76	100	270	Vertical
4	928.1473	58.14	44.89	-13.25	66.00	21.11	100	21	Vertical

PK Final Data List

NO.	Freq. [MHz]	Factor [dB]	Height [cm]	Angle [°]	Polarity
1	925.9682	-13.32	100	248	Vertical
2	928.1473	-13.25	100	21	Vertical

AV Final Data List

NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	925.9682	-13.32	91.15	77.83	94.00	16.17	100	248	Vertical
2	928.1473	-13.25	50.971	37.72	46.00	8.28	100	21	Vertical

Remark:

- 1 The IF bandwidth of Receiver between 30MHz to 1GHz was 120kHz.
- 2 Below 1GHz: factor = Antenna Factor + Cable Loss.

7. 20DB BANDWIDTH

7.1. LIMITS

The test of the item was performed in accordance with the standards §15.215(c).

7.2. TEST PROCEDURES

- 1) Remove the antenna from the EUT, and then connect a low loss RF cable from antenna port to the spectrum analyzer.
- 2) Set the spectrum analyzer as RBW=1%to 3% OBW, VBW=3RBW, Span>Declare bandwidth, Sweep = auto.
- 3) Record 20dB of the bandwidth value.
- 4) Repeat above procedures until all frequencies measured were complete.

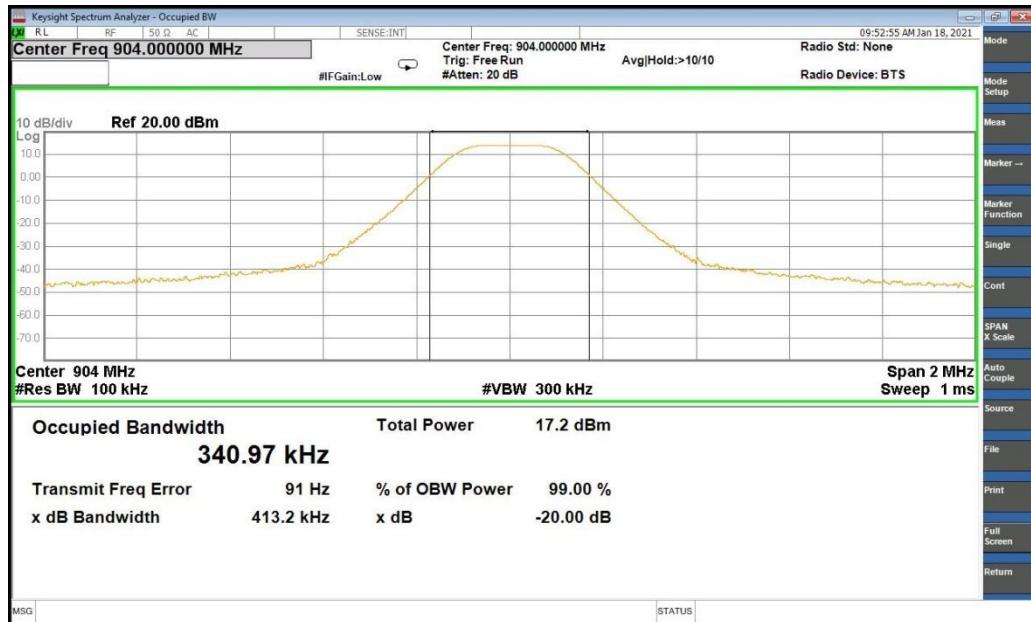
7.3. TEST SETUP



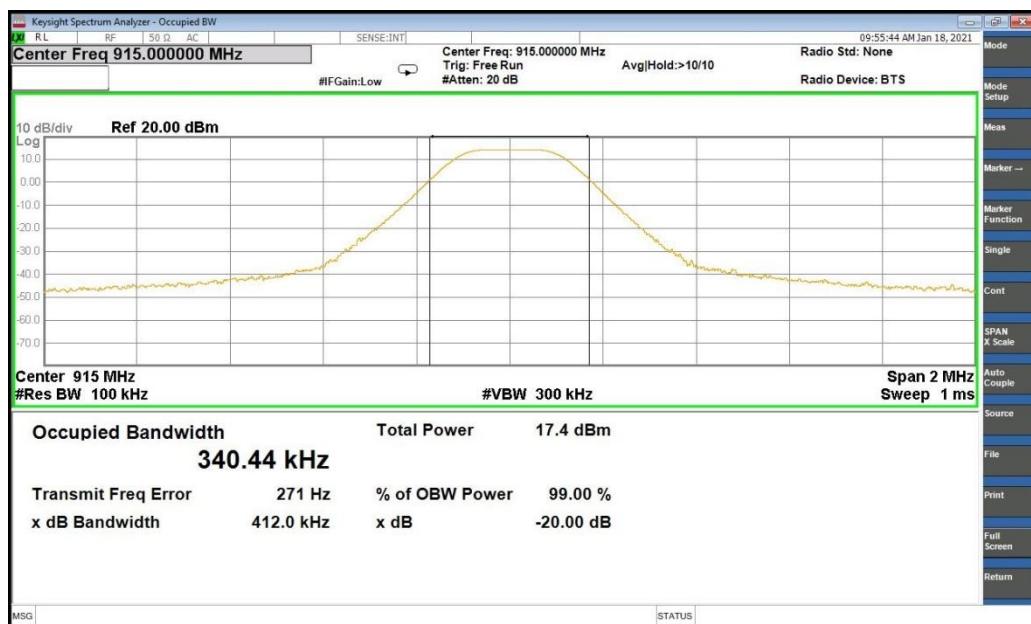
7.4. TEST RESULTS

Channel	Frequency (MHz)	20dB Bandwidth (KHz)	Test Result
Low	904	413.2	PASS
Mid	915	412.0	PASS
High	926	413.1	PASS

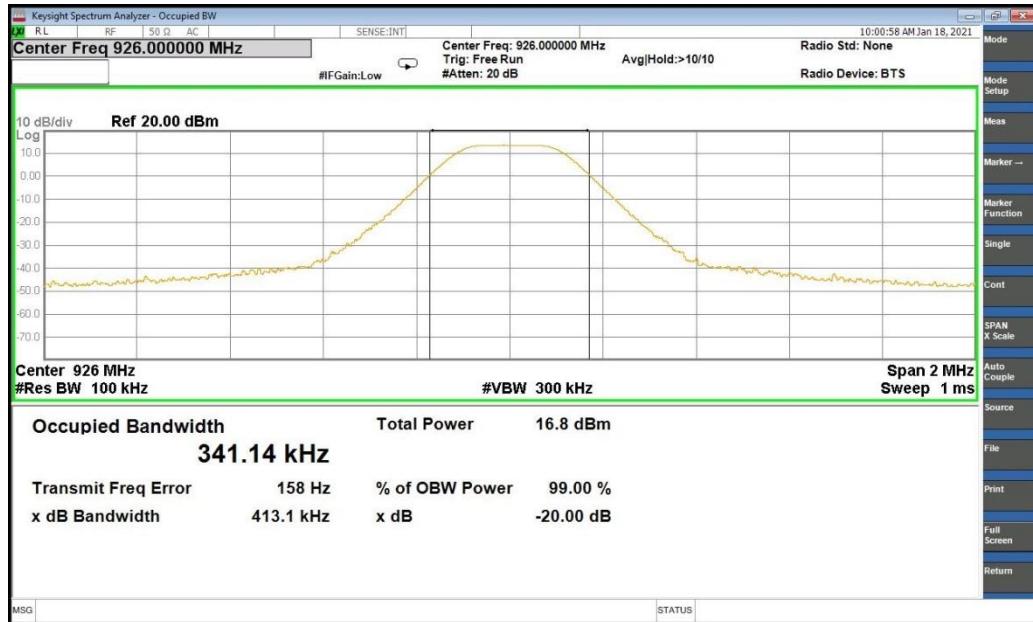
Channel 904MHz



Channel 915MHz



Channel 926MHz



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