

# FCC Test Report

**FCC ID** : MXF-WMDS-203  
**Equipment** : LPWAN Module  
**Model No.** : GL6509  
**Brand Name** : Gemtek  
**Applicant** : Gemtek Technology Co., Ltd.  
**Address** : No.15-1 Zhoughua Rd, Hsinchu Industrial  
Park, Hukou, Hsinchu, Taiwan, R.O.C  
**Standard** : 47 CFR FCC Part 15.247  
**Received Date** : Apr. 15, 2016  
**Tested Date** : Apr. 15 ~ May 19, 2016

We, International Certification Corp., would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It may be duplicated completely for legal use with the approval of the applicant. It shall not be reproduced except in full without the written approval of our laboratory.

Approved & Reviewed by:

  
Gary Chang / Manager



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## Release Record

Report No.	Version	Description	Issued Date
FR641901	Rev. 01	Initial issue	Jun. 03, 2016

## Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 17.755MHz 30.26 (Margin -19.74dB) - AV	Pass
15.247(d) 15.209	Radiated Emissions	[dBuV/m at 3m]: 9023.00MHz 48.31 (Margin -5.69dB) - AV	Pass
15.247(d)	Band Edge	Meet the requirement of limit	Pass
15.247(b)(2)(3)	Conducted Output Power	Power [dBm]: 18.98	Pass
15.247(a)(1)(i)	Number of Hopping Channels	Meet the requirement of limit	Pass
15.247(a)(1)	Hopping Channel Separation	Meet the requirement of limit	Pass
15.247(f)	Dwell Time	Meet the requirement of limit	Pass
15.247(f)	Power spectral density	Meet the requirement of limit	Pass
15.203	Antenna Requirement	Meet the requirement of limit	Pass

# 1 General Description

## 1.1 Information

### 1.1.1 Specification of the Equipment under Test (EUT)

RF General Information					
Frequency Range (MHz)	Ch. Freq. (MHz)	Channel Number	Channel Bandwidth (kHz)	Spread Factor	Channel Spacing (kHz)
902 ~ 928	902.3 ~ 924.375	1-96 [80]	125	7 ~ 10	200 / 250
Note 1: RF output power specifies that Maximum Conducted (Average) Output Power. Note 2: The device uses CSS modulation.					

### 1.1.2 Antenna Details

Ant. No.	Brand	Model	Type	Connector	Gain (dBi)
1	GSC-Tech	OMA-G01	Fiberglass Omni Antenna	N-style Jack	8

### 1.1.3 Power Supply Type of Equipment under Test (EUT)

<b>Power Supply Type</b>	3.3Vdc from host
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### 1.1.4 Accessories

N/A

### 1.1.5 Channel List

Channel spacing 200 kHz								Channel spacing 250 kHz	
Group 1		Group 3		Group 5		Group 7		Group 9	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	902.3	17	905.5	33	908.7	49	911.9	81	920.625
2	902.5	18	905.7	34	908.9	50	912.1	82	920.875
3	902.7	19	905.9	35	909.1	51	912.3	83	921.125
4	902.9	20	906.1	36	909.3	52	912.5	84	921.375
5	903.1	21	906.3	37	909.5	53	912.7	85	921.625
6	903.3	22	906.5	38	909.7	54	912.9	86	921.875
7	903.5	23	906.7	39	909.9	55	913.1	87	922.125
8	903.7	24	906.9	40	910.1	56	913.3	88	922.375
Group 2		Group 4		Group 6		Group 8		Group 10	
9	903.9	25	907.1	41	910.3	57	913.5	89	922.625
10	904.1	26	907.3	42	910.5	58	913.7	90	922.875
11	904.3	27	907.5	43	910.7	59	913.9	91	923.125
12	904.5	28	907.7	44	910.9	60	914.1	92	923.375
13	904.7	29	907.9	45	911.1	61	914.3	93	923.625
14	904.9	30	908.1	46	911.3	62	914.5	94	923.875
15	905.1	31	908.3	47	911.5	63	914.7	95	924.125
16	905.3	32	908.5	48	911.7	64	914.9	96	924.375

**Note:**

The device supports 3 operation modes as below:

Mode	Operation Channels	Operation Group
1	8 Channels	1 / 2 / 3 / 4 / 5 / 6 / 7 / 8 / 9 / 10
2	16 Channels	1 + 2 , 3 + 4 , 5 + 6 , 7 + 8 , 9 + 10
3	64 Channels	1 + 2 + 3 + 4 + 5 + 6 + 7 + 8

### 1.1.6 Test Tool and Duty Cycle

Test Tool	Putty, Ver. 0.60.0.0
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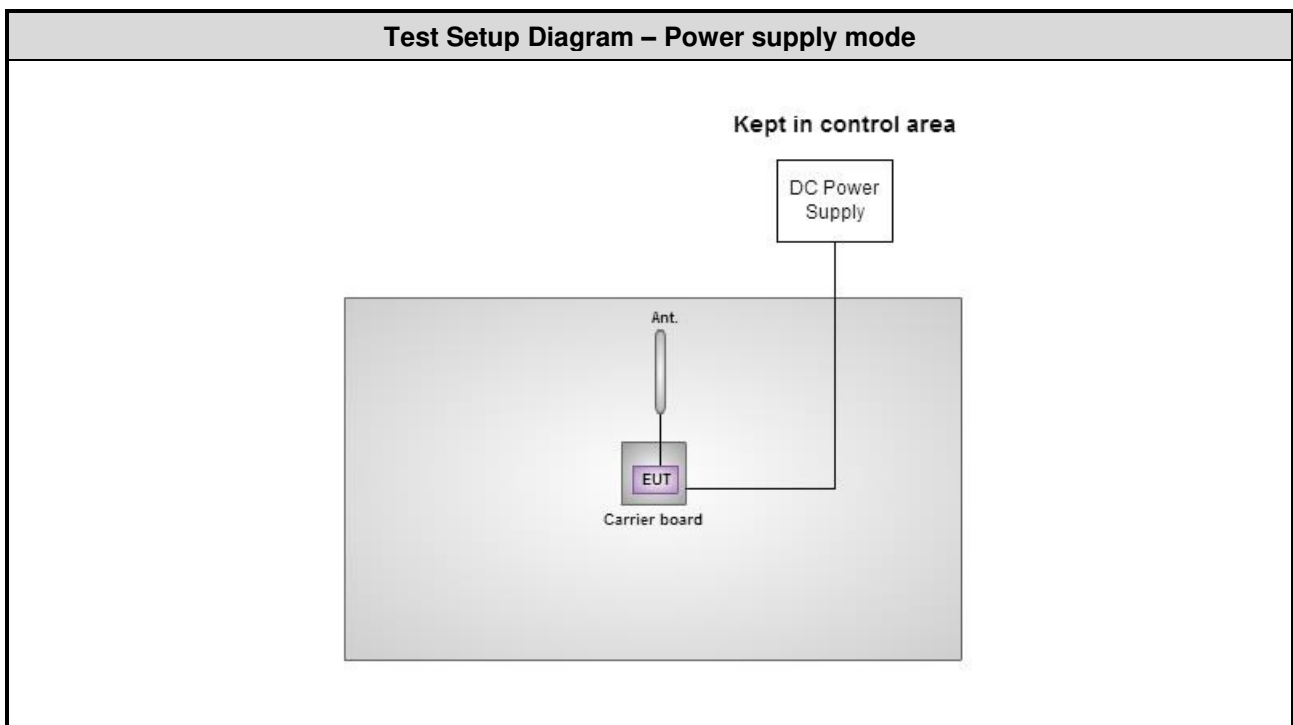
### 1.1.7 Power Setting

Modulation Mode	Test Frequency (MHz)		
	902.3	910.1	924.375
CSS	20	20	20

## 1.2 Local Support Equipment List

Support Equipment List					
No.	Equipment	Brand	Model	S/N	Signal cable / Length (m)
1	DC Power Supply	GWINSTEK	GPC-60300	EM884797	---
2	Notebook	DELL	Latitude E6430	F2JB4X1	---
3	Carrier board	---	---	---	---

## 1.3 Test Setup Chart



Note: The notebook is disconnected from EUT and removed from test table when EUT is set to transmit continuously.

## 1.4 The Equipment List

<b>Test Item</b>	Conducted Emission				
<b>Test Site</b>	Conduction room 1 / (CO01-WS)				
<b>Instrument</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Calibration Date</b>	<b>Calibration Until</b>
EMC Receiver	R&S	ESCS 30	100169	Oct. 21, 2015	Oct. 20, 2016
LISN	SCHWARZBECK	Schwarzbeck 8127	8127-667	Nov. 13, 2015	Nov. 12, 2016
RF Cable-CON	EMC	EMCCFD300-BM-BM-6000	50821	Dec. 21, 2015	Dec. 20, 2016
Measurement Software	AUDIX	e3	6.120210k	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

<b>Test Item</b>	Radiated Emission				
<b>Test Site</b>	966 chamber 3 / (03CH03-WS)				
<b>Instrument</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Calibration Date</b>	<b>Calibration Until</b>
Spectrum Analyzer	Agilent	N9010A	MY53400091	Sep. 14, 2015	Sep. 13, 2016
Receiver	Agilent	N9038A	MY53290044	Oct. 14, 2015	Oct. 13, 2016
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-563	Dec. 29, 2015	Dec. 28, 2016
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1206	Feb. 24, 2016	Feb. 23, 2017
Preamplifier	EMC	EMC02325	980187	Sep. 21, 2015	Sep. 20, 2016
Preamplifier	Agilent	83017A	MY53270014	Sep. 07, 2015	Sep. 06, 2016
RF cable-3M	HUBER+SUHNER	SUCOFLEX104	MY22620/4	Feb. 05, 2016	Feb. 04, 2017
RF cable-8M	HUBER+SUHNER	SUCOFLEX104	MY22600/4	Feb. 05, 2016	Feb. 04, 2017
RF cable-1M	HUBER+SUHNER	SUCOFLEX104	MY22624/4	Feb. 05, 2016	Feb. 04, 2017
LF cable-0.8M	EMC	EMC8D-NM-NM-800	EMC8D-NM-NM-800-001	Feb. 05, 2016	Feb. 04, 2017
LF cable-3M	EMC	EMC8D-NM-NM-3000	131103	Feb. 05, 2016	Feb. 04, 2017
LF cable-13M	EMC	EMC8D-NM-NM-13000	131104	Feb. 05, 2016	Feb. 04, 2017
Measurement Software	AUDIX	e3	6.120210g	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

<b>Test Item</b>	RF Conducted				
<b>Test Site</b>	(TH01-WS)				
<b>Instrument</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Calibration Date</b>	<b>Calibration Until</b>
Spectrum Analyzer	R&S	FSV40	101063	Feb. 17, 2016	Feb. 16, 2017
Power Meter	Anritsu	ML2495A	1241002	Sep. 21, 2015	Sep. 20, 2016
Power Sensor	Anritsu	MA2411B	1207366	Sep. 21, 2015	Sep. 20, 2016
Measurement Software	Sporton	Sporton_1	1.3.30	NA	NA
Note: Calibration Interval of instruments listed above is one year.					



## 1.5 Test Standards

According to the specification of EUT, the EUT must comply with following standards and KDB documents.

47 CFR FCC Part 15.247

ANSI C63.10-2013

## 1.6 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor ( $k=2$ ))

Measurement Uncertainty	
Parameters	Uncertainty
Bandwidth	$\pm 34.134$ Hz
Conducted power	$\pm 0.808$ dB
Power density	$\pm 0.463$ dB
Conducted emission	$\pm 2.670$ dB
AC conducted emission	$\pm 2.90$ dB
Radiated emission $\leq 1$ GHz	$\pm 3.66$ dB
Radiated emission $> 1$ GHz	$\pm 5.37$ dB

## 2 Test Configuration

### 2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By
AC Conduction	CO01-WS	20°C / 60%	Howard Huang
Radiated Emissions	03CH03-WS	21°C / 69%	Warren Lee
RF Conducted	TH01-WS	23°C / 65%	Felix Sung

- FCC site registration No.: 207696
- IC site registration No.: 10807C-1

### 2.2 The Worst Test Modes and Channel Details

Test item	Test Frequency (MHz)	Modulation / SF	Test Configuration
Conducted Emissions	902.3 / 910.1 / 924.375	CSS / 9	---
Radiated Emissions ≤ 1GHz	902.3 / 910.1 / 924.375	CSS / 9	---
Radiated Emissions > 1GHz Conducted Output Power	902.3 / 910.1 / 924.375	CSS / 9	---
Number of Hopping Channels	902.3 ~ 924.375	CSS / 9	---
Hopping Channel Separation	902.3 / 910.1 / 914.9 920.625 / 924.375	CSS / 9	---
Dwell Time	902.9 / 904.5 / 906.1 / 907.7 / 909.3 910.9 / 912.5 / 914.1 / 921.375 / 923.375 903.7 / 906.9 / 910.1 / 913.3 / 922.375 / 908.7	CSS: 7 ~ 10	---
Power spectral density	902.3 / 910.1 / 924.375	CSS / 9	---

**NOTE:**

1. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane. The **Y-plane** results were found as the worst case and were shown in this report.

## 3 Transmitter Test Results

### 3.1 Conducted Emissions

#### 3.1.1 Limit of Conducted Emissions

Conducted Emissions Limit		
Frequency Emission (MHz)	Quasi-Peak	Average
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50

Note 1: \* Decreases with the logarithm of the frequency.

#### 3.1.2 Test Procedures

1. The device is placed on a test table, raised 80 cm above the reference ground plane. The vertical conducting plane is located 40 cm to the rear of the device.
2. The device is connected to line impedance stabilization network (LISN) and other accessories are connected to other LISN. Measured levels of AC power line conducted emission are across the 50  $\Omega$  LISN port.
3. AC conducted emission measurements is made over frequency range from 150 kHz to 30 MHz.
4. This measurement was performed with AC 120V/60Hz

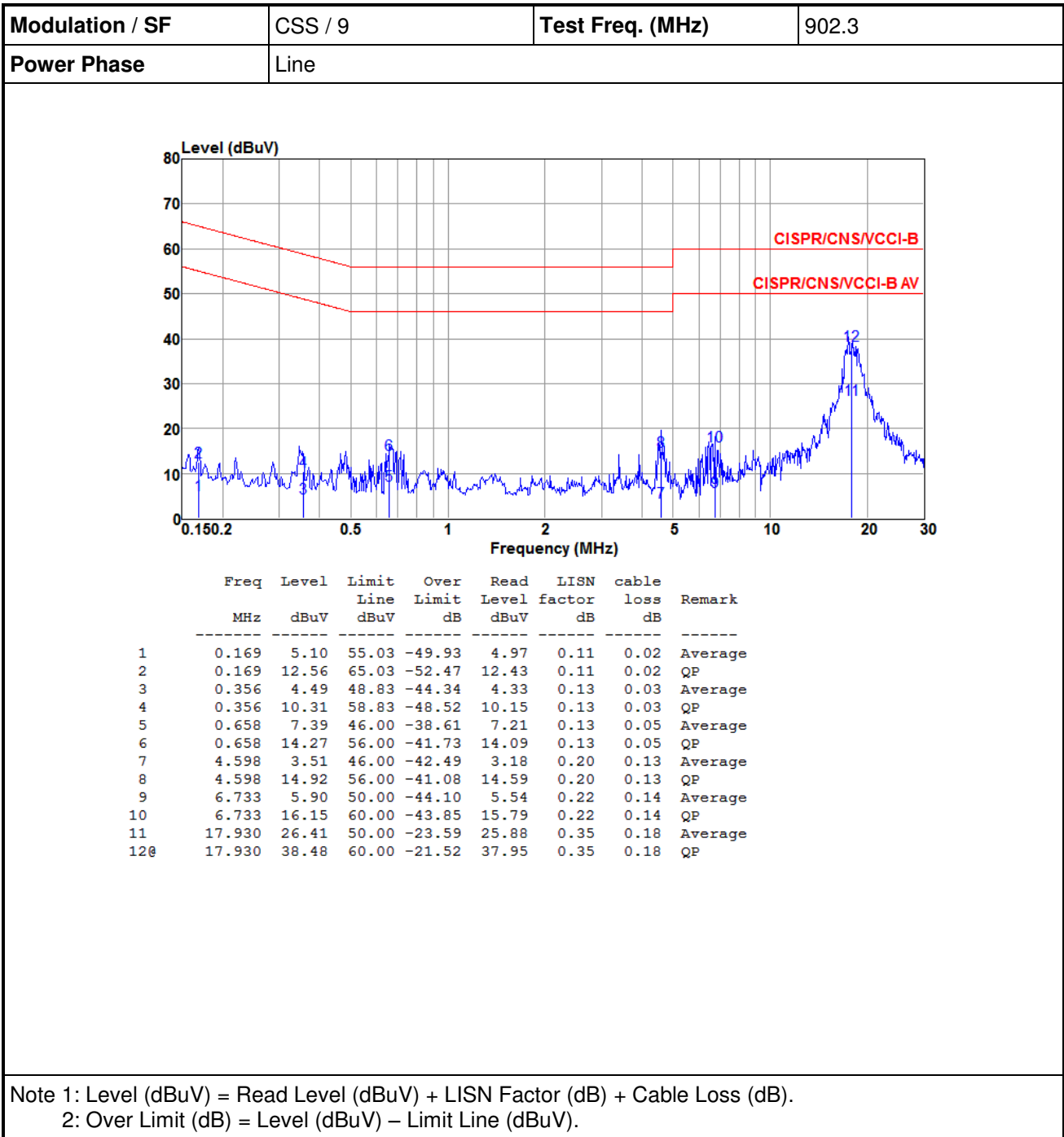
#### 3.1.3 Test Setup



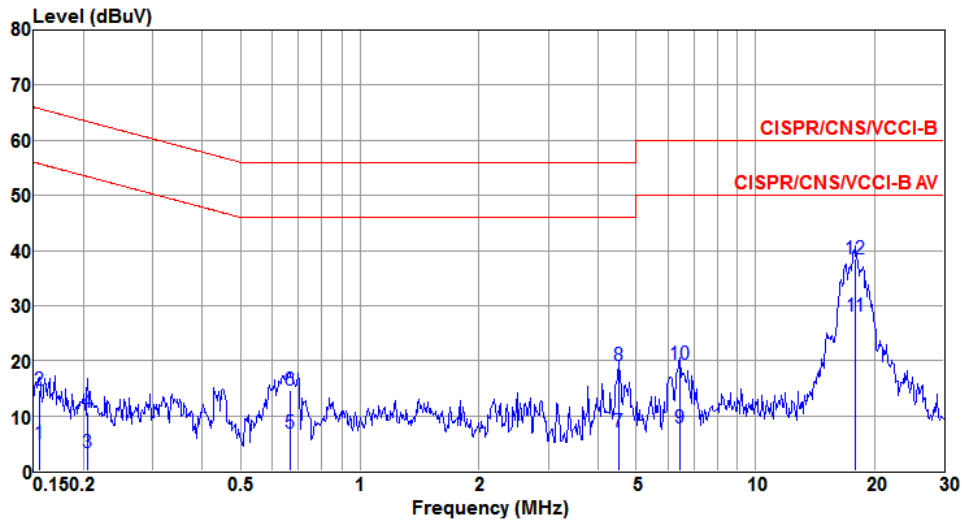
Note: 1. Support units were connected to second LISN.

2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

### 3.1.4 Test Result of Conducted Emissions



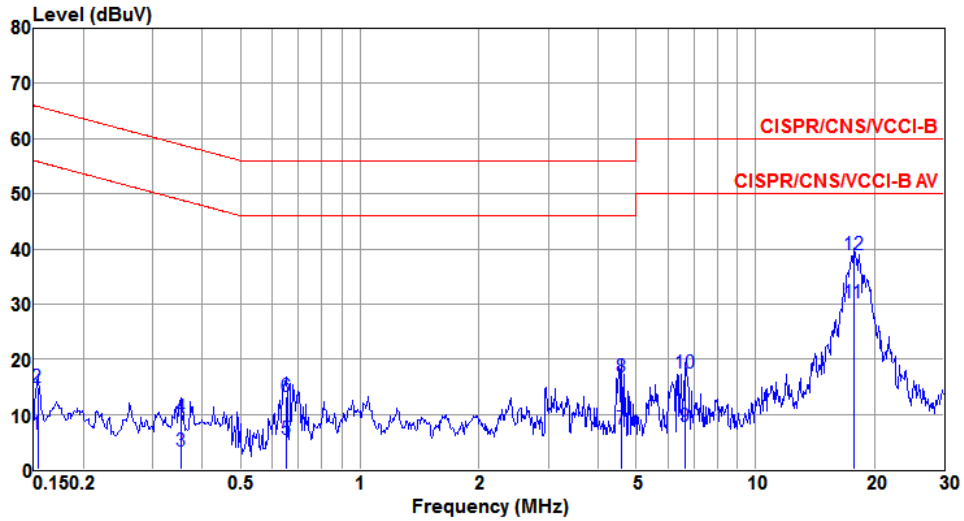
Modulation / SF	CSS / 9	Test Freq. (MHz)	902.3
Power Phase	Neutral		



	Freq MHz	Level dBUV	Limit Line dBUV	Over Limit dB	Read Level dBUV	LISN factor dB	cable loss dB	Remark
1	0.155	4.90	55.74	-50.84	4.75	0.13	0.02	Average
2	0.155	14.61	65.74	-51.13	14.46	0.13	0.02	QP
3	0.205	3.20	53.40	-50.20	3.08	0.10	0.02	Average
4	0.205	10.69	63.40	-52.71	10.57	0.10	0.02	QP
5	0.665	6.80	46.00	-39.20	6.62	0.13	0.05	Average
6	0.665	14.65	56.00	-41.35	14.47	0.13	0.05	QP
7	4.501	7.19	46.00	-38.81	6.89	0.18	0.12	Average
8	4.501	19.12	56.00	-36.88	18.82	0.18	0.12	QP
9	6.454	7.85	50.00	-42.15	7.49	0.22	0.14	Average
10	6.454	19.28	60.00	-40.72	18.92	0.22	0.14	QP
11	17.944	27.99	50.00	-22.01	27.43	0.38	0.18	Average
12	17.944	38.36	60.00	-21.64	37.80	0.38	0.18	QP

Note 1: Level (dBUV) = Read Level (dBUV) + LISN Factor (dB) + Cable Loss (dB).  
 2: Over Limit (dB) = Level (dBUV) – Limit Line (dBUV).

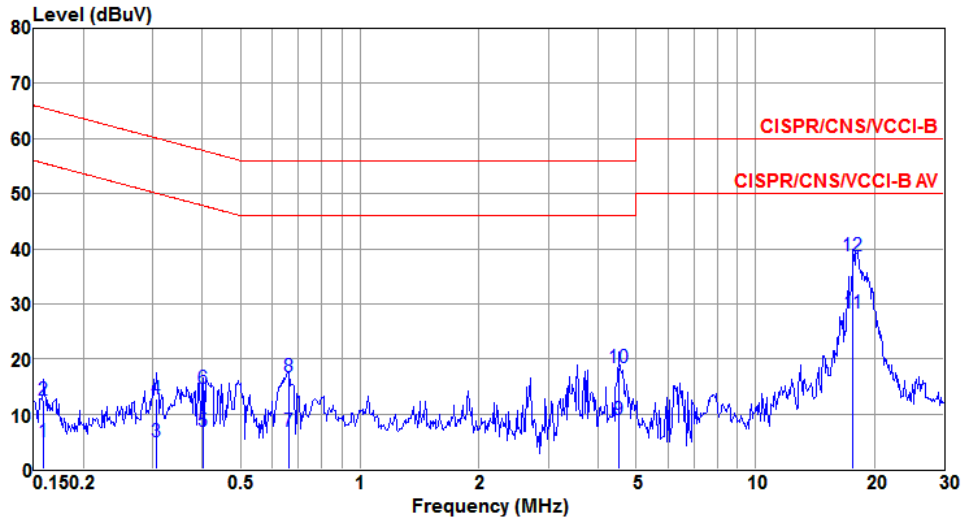
<b>Modulation / SF</b>	CSS / 9	<b>Test Freq. (MHz)</b>	910.1
<b>Power Phase</b>	Line		



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.153	6.44	55.82	-49.38	6.31	0.11	0.02	Average
2	0.153	14.78	65.82	-51.04	14.65	0.11	0.02	QP
3	0.352	3.36	48.91	-45.55	3.20	0.13	0.03	Average
4	0.352	9.37	58.91	-49.54	9.21	0.13	0.03	QP
5	0.651	5.39	46.00	-40.61	5.21	0.13	0.05	Average
6	0.651	13.32	56.00	-42.68	13.14	0.13	0.05	QP
7	4.598	7.36	46.00	-38.64	7.03	0.20	0.13	Average
8	4.598	16.74	56.00	-39.26	16.41	0.20	0.13	QP
9	6.662	7.86	50.00	-42.14	7.50	0.22	0.14	Average
10	6.662	17.52	60.00	-42.48	17.16	0.22	0.14	QP
11	17.755	30.26	50.00	-19.74	29.72	0.35	0.19	Average
12	17.755	38.93	60.00	-21.07	38.39	0.35	0.19	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).  
 2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

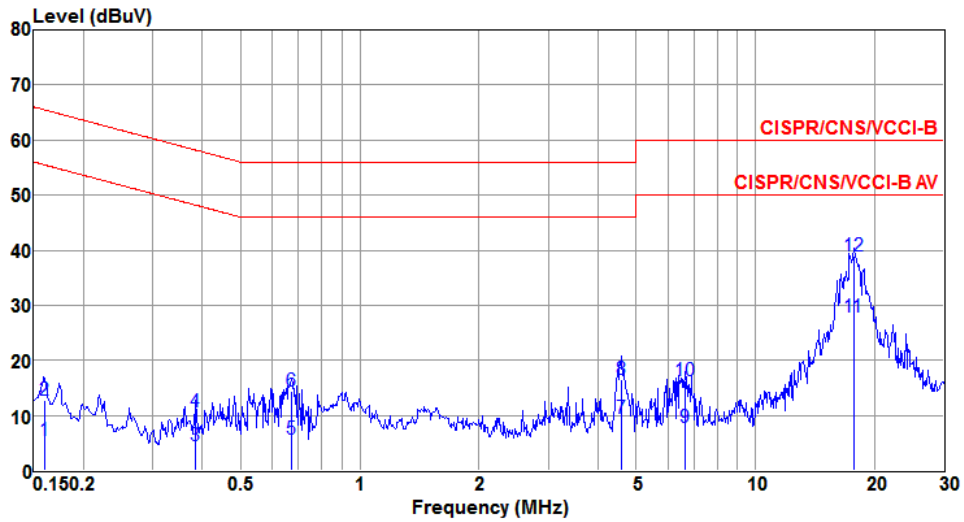
<b>Modulation / SF</b>	CSS / 9	<b>Test Freq. (MHz)</b>	910.1
<b>Power Phase</b>	Neutral		



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.159	4.98	55.52	-50.54	4.84	0.12	0.02	Average
2	0.159	12.50	65.52	-53.02	12.36	0.12	0.02	QP
3	0.307	4.93	50.06	-45.13	4.78	0.12	0.03	Average
4	0.307	12.86	60.06	-47.20	12.71	0.12	0.03	QP
5	0.402	6.86	47.81	-40.95	6.69	0.14	0.03	Average
6	0.402	14.59	57.81	-43.22	14.42	0.14	0.03	QP
7	0.661	6.97	46.00	-39.03	6.79	0.13	0.05	Average
8	0.661	16.85	56.00	-39.15	16.67	0.13	0.05	QP
9	4.501	9.06	46.00	-36.94	8.76	0.18	0.12	Average
10	4.501	18.32	56.00	-37.68	18.02	0.18	0.12	QP
11	17.661	28.25	50.00	-21.75	27.68	0.38	0.19	Average
12	17.661	38.79	60.00	-21.21	38.22	0.38	0.19	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).  
 2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

<b>Modulation / SF</b>	CSS / 9	<b>Test Freq. (MHz)</b>	924.375
<b>Power Phase</b>	Line		

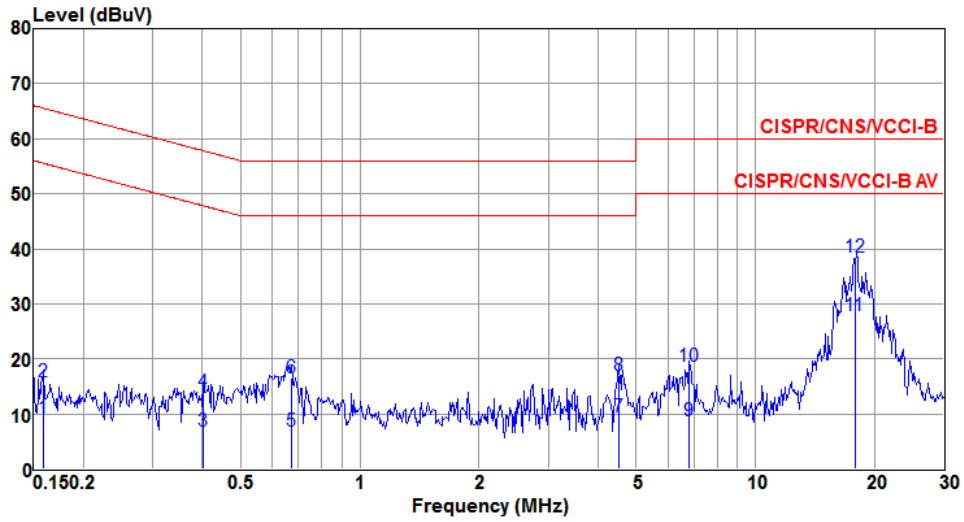


	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.160	5.52	55.47	-49.95	5.39	0.11	0.02	Average
2	0.160	12.70	65.47	-52.77	12.57	0.11	0.02	QP
3	0.385	4.49	48.17	-43.68	4.33	0.13	0.03	Average
4	0.385	10.60	58.17	-47.57	10.44	0.13	0.03	QP
5	0.672	5.59	46.00	-40.41	5.41	0.13	0.05	Average
6	0.672	14.51	56.00	-41.49	14.33	0.13	0.05	QP
7	4.574	9.56	46.00	-36.44	9.23	0.20	0.13	Average
8	4.574	16.57	56.00	-39.43	16.24	0.20	0.13	QP
9	6.662	7.75	50.00	-42.25	7.39	0.22	0.14	Average
10	6.662	16.40	60.00	-43.60	16.04	0.22	0.14	QP
11	17.755	27.94	50.00	-22.06	27.40	0.35	0.19	Average
12	17.755	38.88	60.00	-21.12	38.34	0.35	0.19	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).  
 2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).



<b>Modulation / SF</b>	CSS / 9	<b>Test Freq. (MHz)</b>	924.375
<b>Power Phase</b>	Neutral		



	Freq	Level	Limit	Over	Read	LISN	cable	
	MHz	dBuV	Line	Limit	Level	factor	loss	Remark
			dBuV	dB	dBuV	dB	dB	
1	0.159	9.19	55.52	-46.33	9.05	0.12	0.02	Average
2	0.159	15.93	65.52	-49.59	15.79	0.12	0.02	QP
3	0.402	6.86	47.81	-40.95	6.69	0.14	0.03	Average
4	0.402	13.96	57.81	-43.85	13.79	0.14	0.03	QP
5	0.672	6.97	46.00	-39.03	6.79	0.13	0.05	Average
6	0.672	16.53	56.00	-39.47	16.35	0.13	0.05	QP
7	4.501	9.39	46.00	-36.61	9.09	0.18	0.12	Average
8	4.501	17.06	56.00	-38.94	16.76	0.18	0.12	QP
9	6.805	8.76	50.00	-41.24	8.39	0.23	0.14	Average
10	6.805	18.63	60.00	-41.37	18.26	0.23	0.14	QP
11	17.860	27.77	50.00	-22.23	27.20	0.38	0.19	Average
12	17.860	38.42	60.00	-21.58	37.85	0.38	0.19	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).  
 2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

## 3.2 Unwanted Emissions into Restricted Frequency Bands

### 3.2.1 Limit of Unwanted Emissions into Restricted Frequency Bands

Restricted Band Emissions Limit			
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

**Note 1:**  
Qusai-Peak value is measured for frequency below 1GHz except for 9–90 kHz, 110–490 kHz frequency band. Peak and average value are measured for frequency above 1GHz. The limit on average radio frequency emission is as above table. The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit

**Note 2:**  
Measurements may be performed at a distance other than what is specified provided. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor as below, Frequency at or above 30 MHz: 20 dB/decade Frequency below 30 MHz: 40 dB/decade.

### 3.2.2 Test Procedures

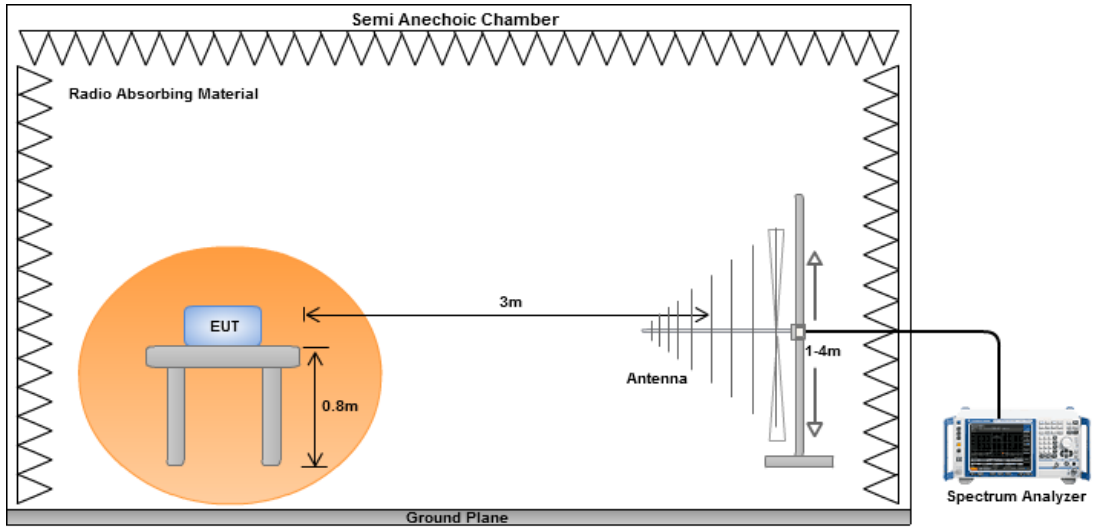
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT is placed at test table. For emissions testing at or below 1 GHz, the table height is 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height is 1.5 m
2. Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m ~ 4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3 m.
3. This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.

Note:

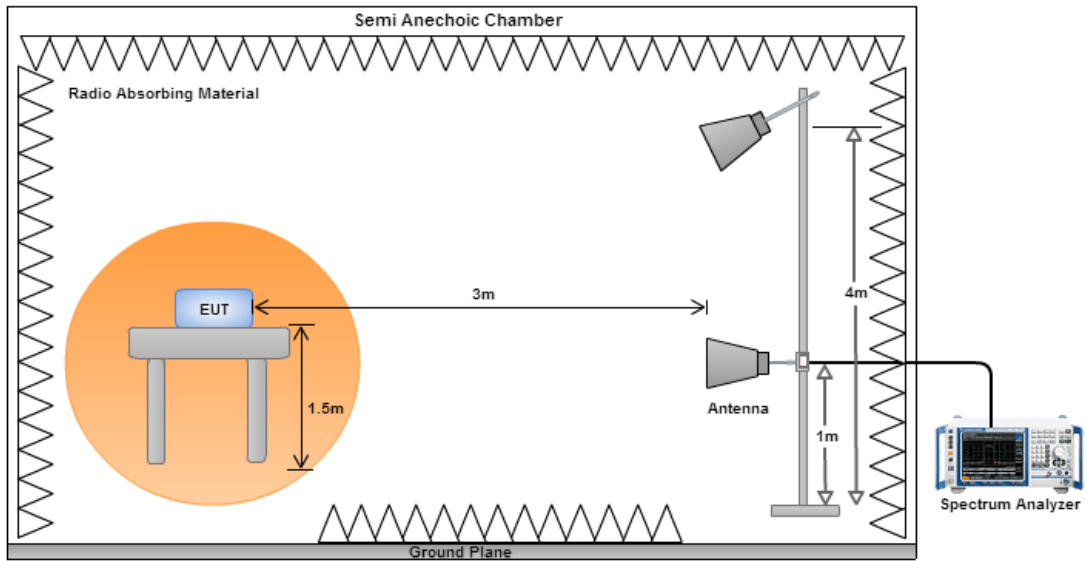
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above 1GHz.

### 3.2.3 Test Setup

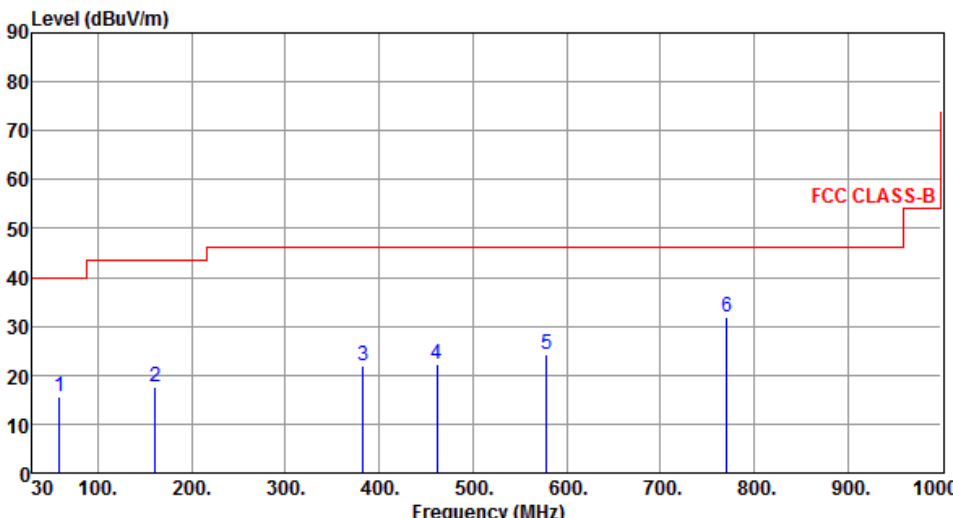
#### Radiated Emissions below 1 GHz



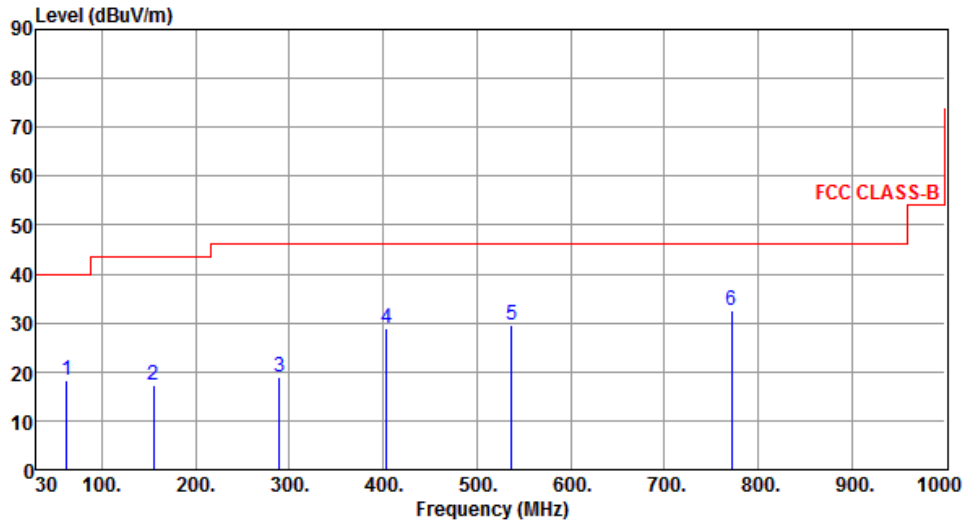
#### Radiated Emissions above 1 GHz



### 3.2.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)

Modulation / SF	CSS / 9	Test Freq. (MHz)	902.3																																																													
Polarization	Horizontal																																																															
																																																																
	<table border="1"> <thead> <tr> <th>Freq. MHz</th> <th>Emission level dBuV/m</th> <th>Limit dBuV/m</th> <th>Margin dB</th> <th>SA reading dBuV</th> <th>Factor dB</th> <th>Remark</th> <th>ANT High cm</th> <th>Turn Table deg</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>59.10</td> <td>40.00</td> <td>-24.24</td> <td>29.68</td> <td>-13.92</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> <tr> <td>2</td> <td>160.95</td> <td>43.50</td> <td>-25.75</td> <td>31.10</td> <td>-13.35</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> <tr> <td>3</td> <td>383.08</td> <td>46.00</td> <td>-24.04</td> <td>32.57</td> <td>-10.61</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> <tr> <td>4</td> <td>461.65</td> <td>46.00</td> <td>-23.64</td> <td>30.96</td> <td>-8.60</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> <tr> <td>5</td> <td>579.02</td> <td>46.00</td> <td>-21.68</td> <td>30.52</td> <td>-6.20</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> <tr> <td>6</td> <td>771.08</td> <td>46.00</td> <td>-14.15</td> <td>34.87</td> <td>-3.02</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> </tbody> </table>	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg	1	59.10	40.00	-24.24	29.68	-13.92	Peak	---	---	2	160.95	43.50	-25.75	31.10	-13.35	Peak	---	---	3	383.08	46.00	-24.04	32.57	-10.61	Peak	---	---	4	461.65	46.00	-23.64	30.96	-8.60	Peak	---	---	5	579.02	46.00	-21.68	30.52	-6.20	Peak	---	---	6	771.08	46.00	-14.15	34.87	-3.02	Peak	---	---
Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg																																																								
1	59.10	40.00	-24.24	29.68	-13.92	Peak	---	---																																																								
2	160.95	43.50	-25.75	31.10	-13.35	Peak	---	---																																																								
3	383.08	46.00	-24.04	32.57	-10.61	Peak	---	---																																																								
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6	771.08	46.00	-14.15	34.87	-3.02	Peak	---	---																																																								
<p>Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)            *Factor includes antenna factor , cable loss and amplifier gain            Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).            Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.</p>																																																																

<b>Modulation / SF</b>	CSS / 9	<b>Test Freq. (MHz)</b>	902.3
<b>Polarization</b>	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	62.01	18.28	40.00	-21.72	32.62	-14.34	Peak	---	---
2	155.13	17.33	43.50	-26.17	30.69	-13.36	Peak	---	---
3	288.99	18.93	46.00	-27.07	32.00	-13.07	Peak	---	---
4	403.45	28.82	46.00	-17.18	38.91	-10.09	Peak	---	---
5	537.31	29.48	46.00	-16.52	36.64	-7.16	Peak	---	---
6	772.05	32.45	46.00	-13.55	35.46	-3.01	Peak	---	---

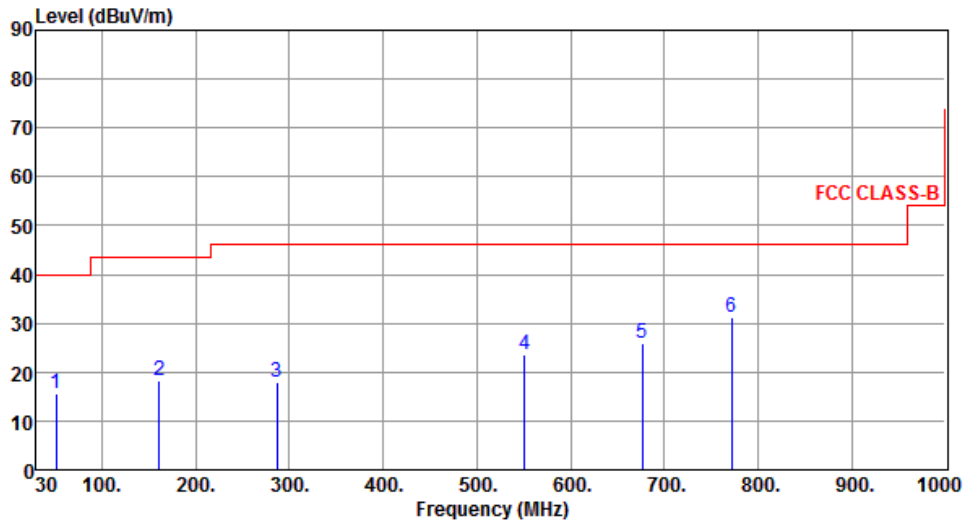
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

\*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

<b>Modulation / SF</b>	CSS / 9	<b>Test Freq. (MHz)</b>	910.1
<b>Polarization</b>	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	51.34	15.63	40.00	-24.37	28.82	-13.19	Peak	---	---
2	160.95	18.18	43.50	-25.32	31.53	-13.35	Peak	---	---
3	287.05	18.02	46.00	-27.98	31.14	-13.12	Peak	---	---
4	550.89	23.49	46.00	-22.51	30.37	-6.88	Peak	---	---
5	676.99	25.79	46.00	-20.21	30.52	-4.73	Peak	---	---
6	772.05	31.06	46.00	-14.94	34.07	-3.01	Peak	---	---

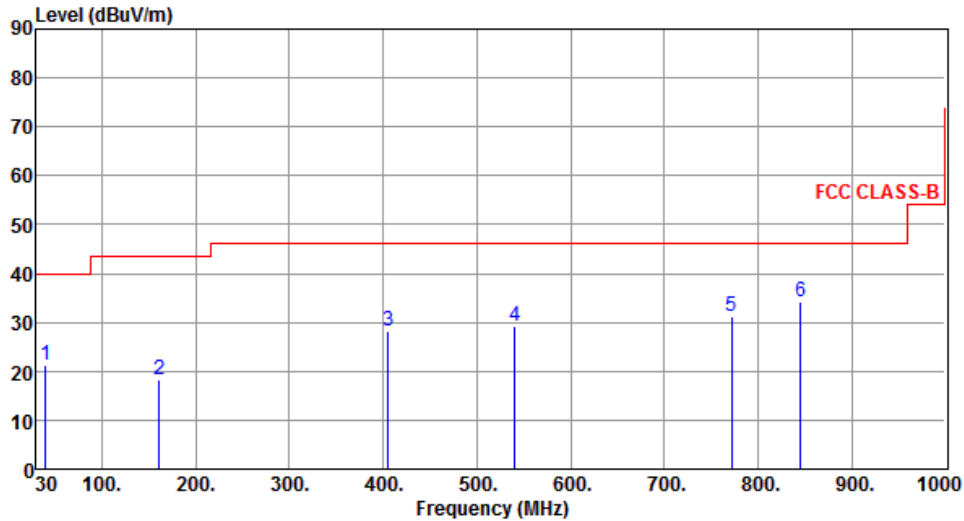
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

\*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

<b>Modulation / SF</b>	CSS / 9	<b>Test Freq. (MHz)</b>	910.1
<b>Polarization</b>	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	39.70	21.14	40.00	-18.86	34.49	-13.35	Peak	---	---
2	160.95	18.18	43.50	-25.32	31.53	-13.35	Peak	---	---
3	405.39	28.11	46.00	-17.89	38.14	-10.03	Peak	---	---
4	540.22	29.26	46.00	-16.74	36.36	-7.10	Peak	---	---
5	772.05	31.06	46.00	-14.94	34.07	-3.01	Peak	---	---
6	845.77	34.10	46.00	-11.90	35.83	-1.73	Peak	---	---

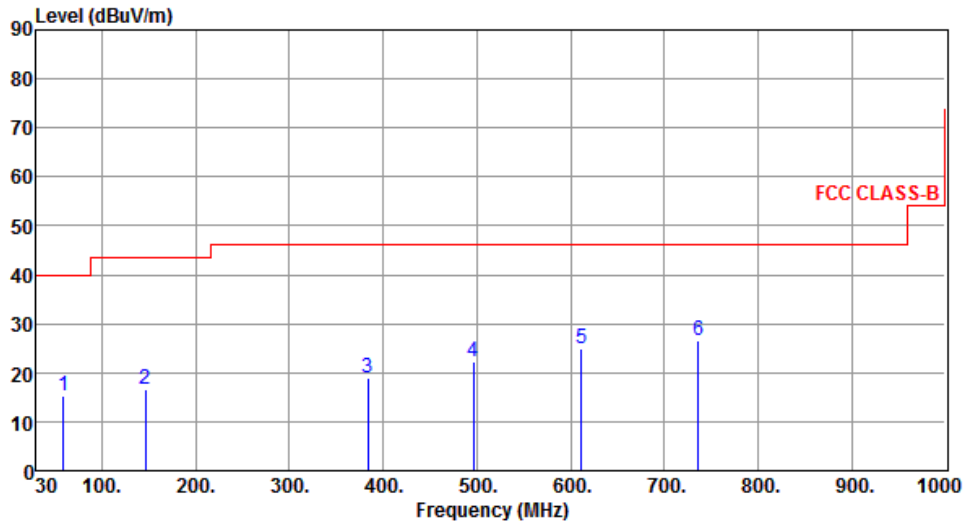
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

\*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

<b>Modulation / SF</b>	CSS / 9	<b>Test Freq. (MHz)</b>	924.375
<b>Polarization</b>	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	59.10	15.20	40.00	-24.80	29.12	-13.92	Peak	---	---
2	146.40	16.61	43.50	-26.89	30.12	-13.51	Peak	---	---
3	384.05	18.85	46.00	-27.15	29.44	-10.59	Peak	---	---
4	496.57	22.32	46.00	-23.68	30.28	-7.96	Peak	---	---
5	612.00	25.02	46.00	-20.98	30.60	-5.58	Peak	---	---
6	736.16	26.48	46.00	-19.52	30.07	-3.59	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

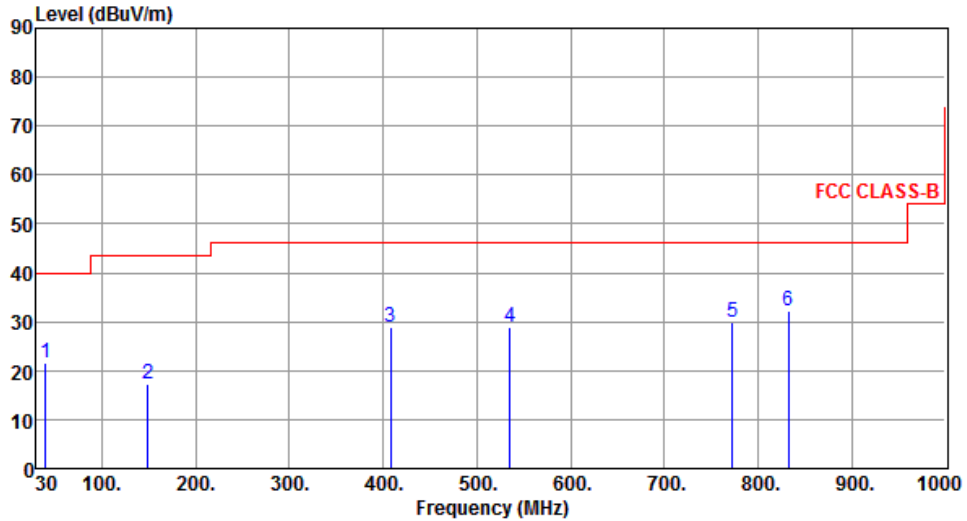
\*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.



<b>Modulation / SF</b>	CSS / 9	<b>Test Freq. (MHz)</b>	924.375
<b>Polarization</b>	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	39.70	21.43	40.00	-18.57	34.78	-13.35	Peak	---	---
2	149.31	17.26	43.50	-26.24	30.70	-13.44	Peak	---	---
3	408.30	28.90	46.00	-17.10	38.85	-9.95	Peak	---	---
4	535.37	28.96	46.00	-17.04	36.15	-7.19	Peak	---	---
5	773.02	29.73	46.00	-16.27	32.73	-3.00	Peak	---	---
6	832.19	32.25	46.00	-13.75	34.23	-1.98	Peak	---	---

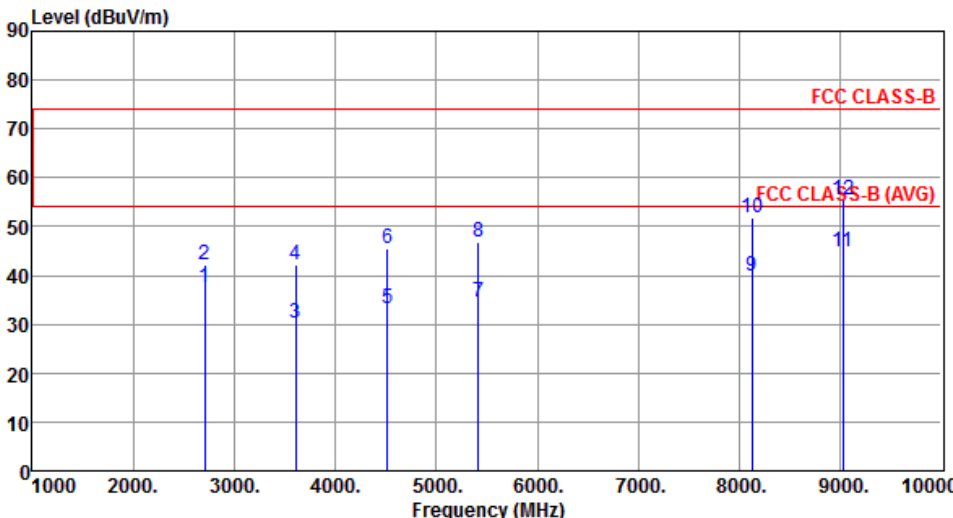
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

\*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

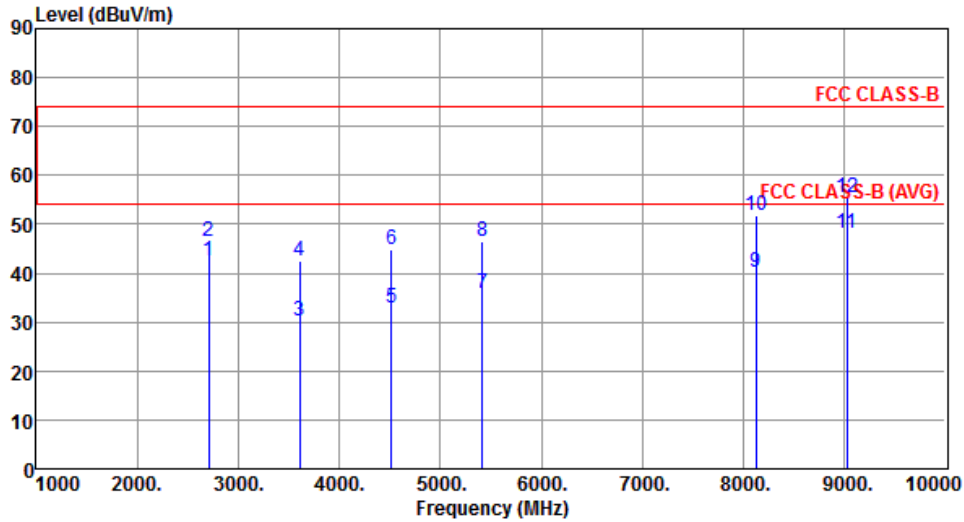
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

### 3.2.5 Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation / SF	CSS / 9	Test Freq. (MHz)	902.3						
Polarization	Horizontal								
									
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2706.90	37.64	54.00	-16.36	37.59	0.05	Average	398	275
2	2706.90	42.31	74.00	-31.69	42.26	0.05	Peak	398	275
3	3609.20	30.29	54.00	-23.71	28.51	1.78	Average	302	257
4	3609.20	42.08	74.00	-31.92	40.30	1.78	Peak	302	257
5	4511.50	33.25	54.00	-20.75	28.66	4.59	Average	235	157
6	4511.50	45.46	74.00	-28.54	40.87	4.59	Peak	235	157
7	5413.80	34.70	54.00	-19.30	28.37	6.33	Average	122	55
8	5413.80	46.69	74.00	-27.31	40.36	6.33	Peak	122	55
9	8120.70	39.75	54.00	-14.25	28.26	11.49	Average	203	19
10	8120.70	51.65	74.00	-22.35	40.16	11.49	Peak	203	19
11	9023.00	44.75	54.00	-9.25	31.70	13.05	Average	135	338
12	9023.00	55.31	74.00	-18.69	42.26	13.05	Peak	135	338

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)  
\*Factor includes antenna factor , cable loss and amplifier gain  
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

<b>Modulation / SF</b>	CSS / 9	<b>Test Freq. (MHz)</b>	902.3
<b>Polarization</b>	Vertical		



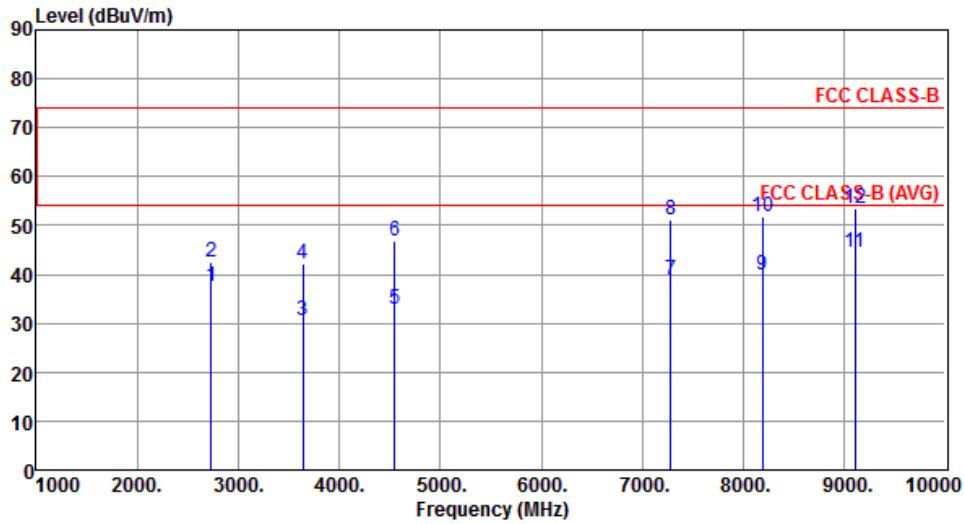
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2706.90	42.35	54.00	-11.65	42.30	0.05	Average	120	316
2	2706.90	46.58	74.00	-27.42	46.53	0.05	Peak	120	316
3	3609.20	30.38	54.00	-23.62	28.60	1.78	Average	135	26
4	3609.20	42.38	74.00	-31.62	40.60	1.78	Peak	135	26
5	4511.50	32.92	54.00	-21.08	28.33	4.59	Average	267	174
6	4511.50	44.85	74.00	-29.15	40.26	4.59	Peak	267	174
7	5413.80	35.89	54.00	-18.11	29.56	6.33	Average	267	157
8	5413.80	46.63	74.00	-27.37	40.30	6.33	Peak	267	157
9	8120.70	40.06	54.00	-13.94	28.57	11.49	Average	305	271
10	8120.70	51.75	74.00	-22.25	40.26	11.49	Peak	305	271
11	9023.00	48.31	54.00	-5.69	35.26	13.05	Average	167	5
12	9023.00	55.58	74.00	-18.42	42.53	13.05	Peak	167	5

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

\*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

<b>Modulation / SF</b>	CSS / 9	<b>Test Freq. (MHz)</b>	910.1
<b>Polarization</b>	Horizontal		



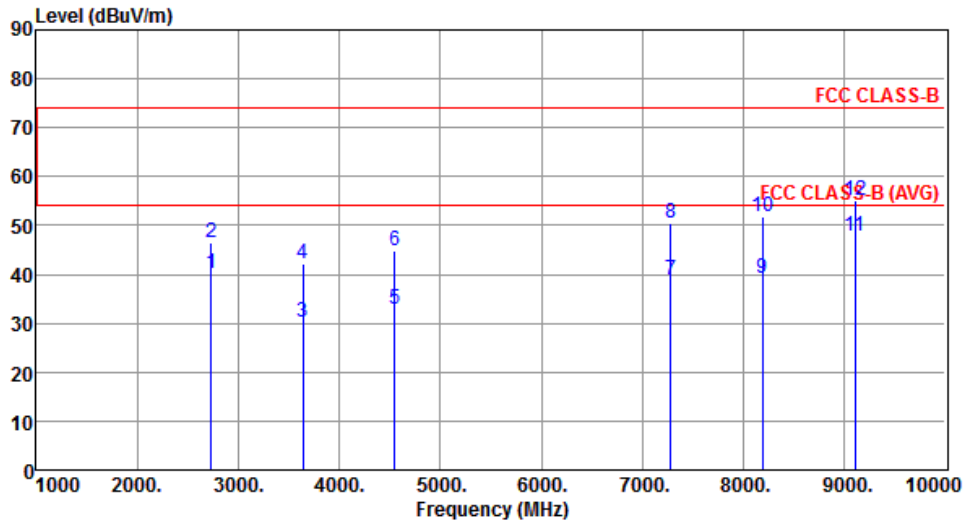
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2730.30	37.68	54.00	-16.32	37.59	0.09	Average	235	227
2	2730.30	42.35	74.00	-31.65	42.26	0.09	Peak	235	227
3	3640.40	30.54	54.00	-23.46	28.63	1.91	Average	271	274
4	3640.40	42.20	74.00	-31.80	40.29	1.91	Peak	271	274
5	4550.50	33.01	54.00	-20.99	28.35	4.66	Average	157	174
6	4550.50	46.93	74.00	-27.07	42.27	4.66	Peak	157	174
7	7280.80	38.86	54.00	-15.14	28.66	10.20	Average	252	257
8	7280.80	51.16	74.00	-22.84	40.96	10.20	Peak	252	257
9	8190.90	39.85	54.00	-14.15	28.26	11.59	Average	305	271
10	8190.90	51.75	74.00	-22.25	40.16	11.59	Peak	305	271
11	9101.00	44.60	54.00	-9.40	31.26	13.34	Average	235	329
12	9101.00	53.63	74.00	-20.37	40.29	13.34	Peak	235	329

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

\*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

<b>Modulation / SF</b>	CSS / 9	<b>Test Freq. (MHz)</b>	910.1
<b>Polarization</b>	Vertical		



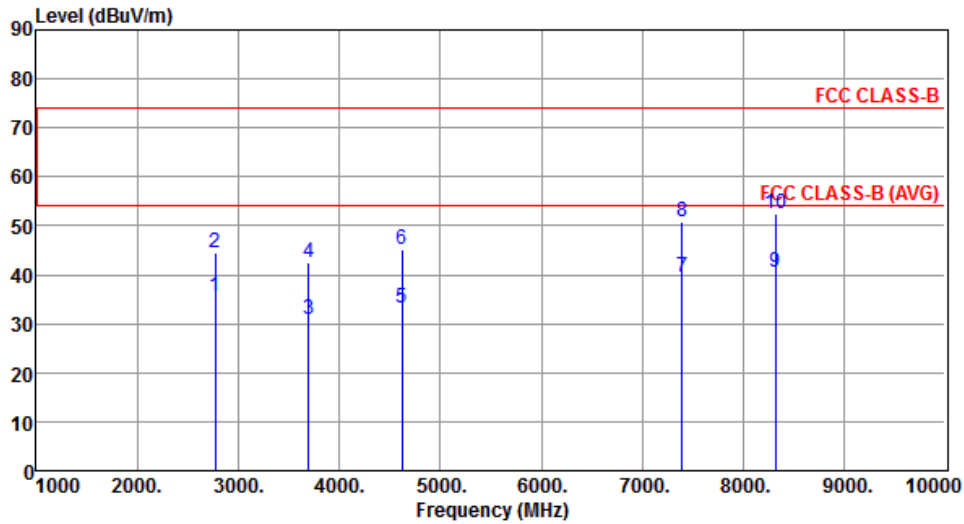
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2730.30	40.22	54.00	-13.78	40.13	0.09	Average	320	90
2	2730.30	46.35	74.00	-27.65	46.26	0.09	Peak	320	90
3	3640.40	30.07	54.00	-23.93	28.16	1.91	Average	307	272
4	3640.40	42.27	74.00	-31.73	40.36	1.91	Peak	307	272
5	4550.50	32.93	54.00	-21.07	28.27	4.66	Average	195	271
6	4550.50	44.99	74.00	-29.01	40.33	4.66	Peak	195	271
7	7280.80	38.76	54.00	-15.24	28.56	10.20	Average	264	171
8	7280.80	50.45	74.00	-23.55	40.25	10.20	Peak	264	171
9	8190.90	39.19	54.00	-14.81	27.60	11.59	Average	265	44
10	8190.90	51.85	74.00	-22.15	40.26	11.59	Peak	265	44
11	9101.00	47.77	54.00	-6.23	34.43	13.34	Average	196	3
12	9101.00	55.19	74.00	-18.81	41.85	13.34	Peak	196	3

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

\*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

<b>Modulation / SF</b>	CSS / 9	<b>Test Freq. (MHz)</b>	924.375
<b>Polarization</b>	Horizontal		



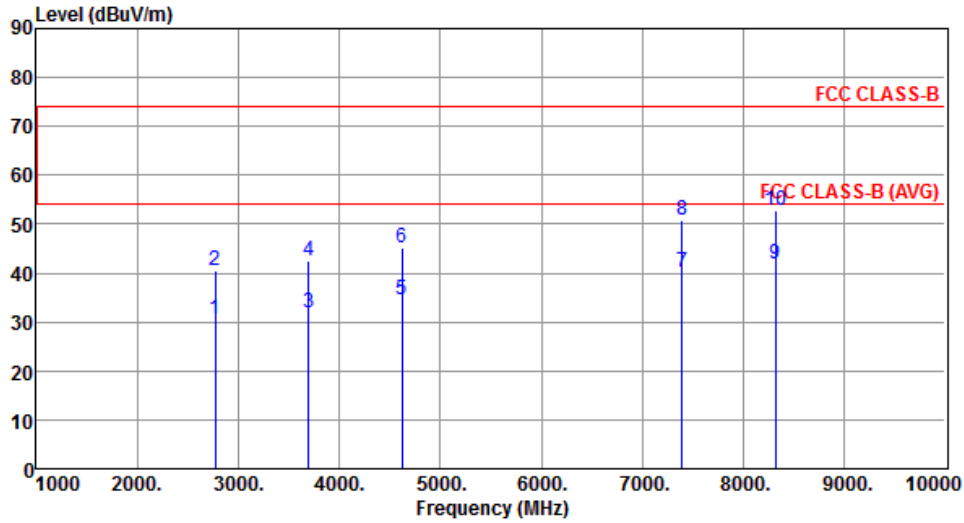
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2773.13	35.42	54.00	-18.58	35.26	0.16	Average	120	225
2	2773.13	44.42	74.00	-29.58	44.26	0.16	Peak	120	225
3	3697.50	30.81	54.00	-23.19	28.69	2.12	Average	265	136
4	3697.50	42.54	74.00	-31.46	40.42	2.12	Peak	265	136
5	4621.88	33.16	54.00	-20.84	28.36	4.80	Average	305	172
6	4621.88	45.20	74.00	-28.80	40.40	4.80	Peak	305	172
7	7395.00	39.39	54.00	-14.61	28.97	10.42	Average	125	171
8	7395.00	50.75	74.00	-23.25	40.33	10.42	Peak	125	171
9	8319.38	40.56	54.00	-13.44	28.98	11.58	Average	207	35
10	8319.38	52.56	74.00	-21.44	40.98	11.58	Peak	207	35

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

\*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

<b>Modulation / SF</b>	CSS / 9	<b>Test Freq. (MHz)</b>	924.375
<b>Polarization</b>	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2773.13	30.41	54.00	-23.59	30.25	0.16	Average	235	158
2	2773.13	40.47	74.00	-33.53	40.31	0.16	Peak	235	158
3	3697.50	32.02	54.00	-21.98	29.90	2.12	Average	235	158
4	3697.50	42.39	74.00	-31.61	40.27	2.12	Peak	235	158
5	4621.88	34.67	54.00	-19.33	29.87	4.80	Average	271	251
6	4621.88	45.03	74.00	-28.97	40.23	4.80	Peak	271	251
7	7395.00	40.04	54.00	-13.96	29.62	10.42	Average	305	123
8	7395.00	50.65	74.00	-23.35	40.23	10.42	Peak	305	123
9	8319.38	41.94	54.00	-12.06	30.36	11.58	Average	302	32
10	8319.38	52.84	74.00	-21.16	41.26	11.58	Peak	302	32

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

\*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).