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# TEST REPORT FOR

## RF TESTING

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Report No.: SRTC2021-9004(B)-21091706(F)

Product Name: Virtual wall barrier system

Product Model: P00107101/P00107401

Applicant: SoftBank Robotics Corp.

Manufacturer: SoftBank Robotics Corp.

Specification: FCC Part 15 Subpart C

FCC ID: 2ATI9-P00107

The State Radio\_monitoring\_center Testing Center (SRTC)

15th Building, No.30 Shixing Street, Shijingshan District, Beijing, P.R.China

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## **1. GENERAL INFORMATION**

### **1.1 Notes of the test report**

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### **1.2 Information about the testing laboratory**

Company:	The State Radio Monitoring Center Testing Center (SRTC)
Address:	15th Building, No.30 Shixing Street, Shijingshan District, P.R.China
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Country or Region:	P.R.China
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Designation Number:	CN1267
Registration number:	239125

### **1.3 Applicant's details**

Company:	SoftBank Robotics Corp.
Address:	7-1, Kaigan 1-chome, Minato-ku, Tokyo 105-7537, Japan
City:	Tokyo
Country or Region:	Japan
Contacted person:	Winston Wu
Tel:	03-6848-0308
Email:	SBRGRP-Regulation-PM@g.softbank.co.jp

### **1.4 Manufacturer's details**

Company:	SoftBank Robotics Corp.
Address:	7-1, Kaigan 1-chome, Minato-ku, Tokyo 105-7537, Japan
City:	Tokyo
Country or Region:	Japan
Contacted person:	Winston Wu
Tel:	03-6848-0308
Email:	SBRGRP-Regulation-PM@g.softbank.co.jp

## 1.5 Test Environment

Date of Receipt of test sample at SRTC:	2021-12-21	
Testing Start Date:	2021-12-23	
Testing End Date:	2022-02-14	

Environmental Data:	Temperature (°C)	Humidity (%)
Ambient:	25	40
Maximum Extreme:	40	---
Minimum Extreme:	0	---

Normal Supply Voltage (V d.c.):	5.2
Maximum Extreme Supply Voltage (V d.c.):	5.4
Minimum Extreme Supply Voltage (V d.c.):	5.0

## **2 DESCRIPTION OF THE DEVICE UNDER TEST**

### **2.1 Final Equipment Build Status**

Frequency Range:	902MHz~928MHz
Number of Channel:	50
Modulation Type:	ASK
Channel Spacing:	500kHz
Power Supply:	Power bank
Software Revision:	1.1.0
Hardware Revision:	2.0.0
SN	D6TB020022
Antenna type:	Refer to Note1
Antenna connector:	Refer to Note1

Note1: The antenna provide to the EUT, please refer to the following table:

Brand	Model	Antenna gain	Frequency range	Antenna type	Connector Type
N/A	N/A	2 dBic	902MHz~928MHz	Quadrifilar Helix Antenna	N/A

Manufacturers ensure that their designs will not be modified by the user or third parties arbitrary antenna parameters and performance. The EUT complies with the requirement of §15.203.

Note2: The equipments have two model names: P00107101 and P00107401.

The material, internal circuit version, antenna, and RFID module are entirely the same.

## 2.2 Description of Test Modes

50 channels are provided to this EUT:

CHANNEL	FREQ. (MHz)	CHANNEL	FREQ. (MHz)	CHANNEL	FREQ. (MHz)
1	902.750	18	911.250	35	919.750
2	903.250	19	911.750	36	920.250
3	903.750	20	912.250	37	920.750
4	904.250	21	912.750	38	921.250
5	904.750	22	913.250	39	921.750
6	905.250	23	913.750	40	922.250
7	905.750	24	914.250	41	922.750
8	906.250	25	914.750	42	923.250
9	906.750	26	915.250	43	923.750
10	907.250	27	915.750	44	924.250
11	907.750	28	916.250	45	924.750
12	908.250	29	916.750	46	925.250
13	908.750	30	917.250	47	925.750
14	909.250	31	917.750	48	926.250
15	909.750	32	918.250	49	926.750
16	910.250	33	918.750	50	927.250
17	910.750	34	919.250	---	---

## 2.3 EUT Operating conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

## 2.4 Support Equipment

The following support equipment was used to exercise the DUT during testing:  
N/A

### **3 REFERENCE SPECIFICATION**

Specification	Version	Title
15.35	2021	Measurement detector functions and bandwidths.
15.209	2021	Radiated emission limits; general requirements.
15.247	2021	Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850MHz.
15.203	2021	Antenna requirement
ANSI C63.10	2013	Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
KDB 558074D01 V05r02	April 2, 2019	GUIDANCE FOR PERFORMING COMPLIANCE MEASUREMENTS ON DIGITAL TRANSMISSION SYSTEMS (DTS) OPERATING UNDER SECTION 15.247

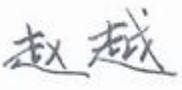
### **4 KEY TO NOTES AND RESULT CODES**

Code	Meaning
PASS	Test result shows that the requirements of the relevant specification have been met.
FAIL	Test result shows that the requirements of the relevant specification have not been met.
N/T	Test case is not tested.

## 5 RESULT SUMMARY

No.	Test case	Reference	Verdict
1	Transmitter Output Power	15.247(b)	Pass
2	20 dB Bandwidth	15.247(a)	Pass
3	Carrier Frequency Separation	15.247(a)	Pass
4	Number of Hopping Frequencies	15.247(a)	Pass
5	Dwell Time	15.247(a)	Pass
6	Conducted Spurious Emissions	15.247(d)	Pass
7	Band-edge	15.247(d)	Pass
8	Spurious Radiated Emissions	15.205/15.209	Pass
9	AC Power line Conducted Emission	15.207	N/A
10	Antenna requirement	15.203	Pass(refer to section 2.1)

NOTE: "N/A" indicates test is not applicable in this test report.

This Test Report Is Issued by: Mr. Peng Zhen 	Checked by: Mr. Li Bin 
Tested by: Mr. Zhao Yue 	Issued date: 20220215

## **6 TEST RESULT**

### **6.1 Transmitter Output Power**

#### **6.1.1 Test limit**

§ 15.247(b)(2), For frequency hopping systems operating in the 902-928 MHz band: 1 watt for systems employing at least 50 hopping channels; and, 0.25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels, as permitted under paragraph (a)(1)(i) of this section.

#### **6.1.2 Test Procedure**

This is an RF-conducted test to evaluate maximum peak output power. Use a direct connection between the antenna port of the EUT and the spectrum analyzer, through suitable attenuation. The hopping shall be disabled for this test:

a) Use the following spectrum analyzer settings:

1) Span: Approximately five times the 20 dB bandwidth, centered on a hopping channel.

2) RBW > 20 dB bandwidth of the emission being measured.

3) VBW  $\geq$  RBW.

4) Sweep: Auto.

5) Detector function: Peak.

6) Trace: Max hold.

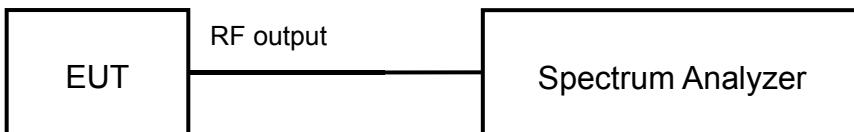
b) Allow trace to stabilize.

c) Use the marker-to-peak function to set the marker to the peak of the emission.

d) The indicated level is the peak output power, after any corrections for external attenuators and cables.

#### **6.1.3 Test Setup**

The EUT and measurement equipment were set up as shown in the diagram below.



#### **6.1.4 Test result**

The test results are shown in Appendix A.

## 6.2 20dB Bandwidth

### 6.2.1 Test limit

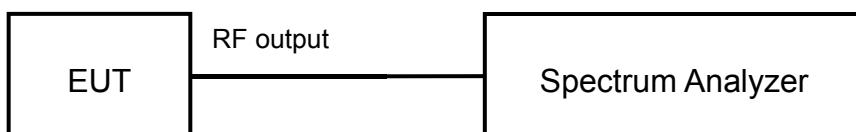
For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

### 6.2.2 Test Procedure Used

1. The 20 dB bandwidth were measured with a spectrum analyzer connected to RF antenna Connector (conducted measurement) while EUT was operating in transmit mode. The analyzer center frequency was set to the EUT carrier frequency, using the analyzer.
2. The bandwidth of the fundamental frequency was measured with the spectrum analyzer using below setting:  
RBW shall be in the range of 1% to 5% of the 20 dB bandwidth ,  
 $VBW \geq 3 \times RBW$ ,  
Span = between two times and five times the 20 dB bandwidth.

### 6.2.3 Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



### 6.2.4 Test result

The test results are shown in Appendix A.

## 6.3 Carrier Frequency Separation

### 6.3.1 Test limit

Limit :  $\geq 25$  kHz or  $\geq 20$  dB BW whichever is greater.

### 6.3.2 Test Procedure

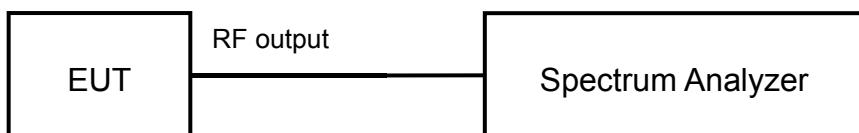
The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings:

- a) Span: Wide enough to capture the peaks of two adjacent channels.
- b) RBW: Start with the RBW set to approximately 30% of the channel spacing; adjust as necessary to best identify the center of each individual channel.
- c) Video (or average) bandwidth (VBW)  $\geq$  RBW.
- d) Sweep: Auto.
- e) Detector function: Peak.
- f) Trace: Max hold.
- g) Allow the trace to stabilize.

Use the marker-delta function to determine the separation between the peaks of the adjacent channels.

### 6.3.3 Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



### 6.3.4 Test result

The test results are shown in Appendix A.

## 6.4 Number of Hopping Frequencies

### 6.4.1 Test limit

Limit:  $\geq 50$  hops

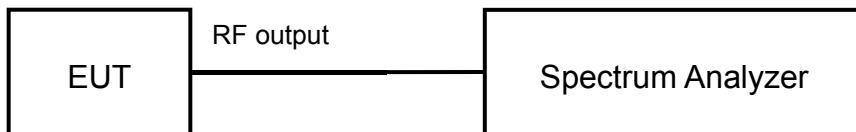
### 6.4.2 Test Procedure

The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings:

- a) Span: The frequency band of operation. Depending on the number of channels the device supports, it may be necessary to divide the frequency range of operation across multiple spans, to allow the individual channels to be clearly seen.
- b) RBW: To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.
- c) VBW  $\geq$  RBW.
- d) Sweep: Auto.
- e) Detector function: Peak.
- f) Trace: Max hold.
- g) Allow the trace to stabilize.

### 6.4.3 Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



### 6.4.4 Test result

The test results are shown in Appendix A.

## 6.5 Dwell Time

### 6.5.1 Test limit

For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

### 6.5.2 Test Settings

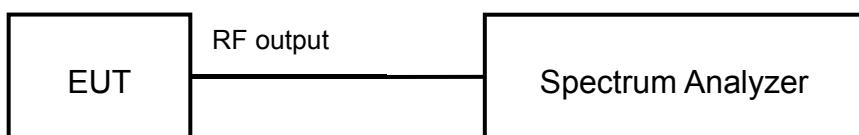
The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings:

- a) Span: Zero span, centered on a hopping channel.
- b) RBW shall be  $\leq$  channel spacing and where possible RBW should be set  $\gg 1 / T$ , where T is the expected dwell time per channel.
- c) Sweep: As necessary to capture the entire dwell time per hopping channel; where possible use a video trigger and trigger delay so that the transmitted signal starts a little to the right of the start of the plot. The trigger level might need slight adjustment to prevent triggering when the system hops on an adjacent channel.
- d) Detector function: Peak.
- e) Trace: Max hold.

Use the marker-delta function to determine the transmit time per hop.

### 6.5.3 Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



### 6.5.4 Test result

The test results are shown in Appendix A.

## 6.6 Conducted Spurious Emissions

### 6.6.1 Test limit

FCC Part15.247 (d)

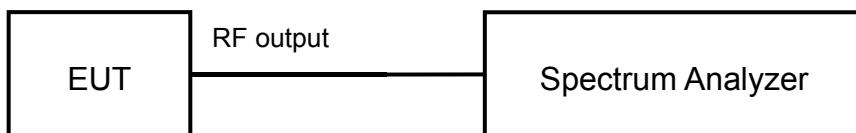
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

### 6.6.2 Test Procedure

Connect the primary antenna port through an attenuator to the spectrum analyzer input; in the results, account for all losses between the EUT output and the spectrum analyzer. The instrument shall span 30 MHz to 10 times the operating frequency in GHz, with a resolution bandwidth of 100 kHz, video bandwidth of 300 kHz, and a coupled sweep time with a peak detector.

### 6.6.3 Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



### 6.6.4 Test result

The test results are shown in Appendix A .

The spectrum plots are attached on the following images. D1 line indicates the 20dB offset below the highest level. It shows compliance with the requirement.

## 6.7 Band-edge measurement

### 6.7.1 Test limit

FCC Part15.247 (d)

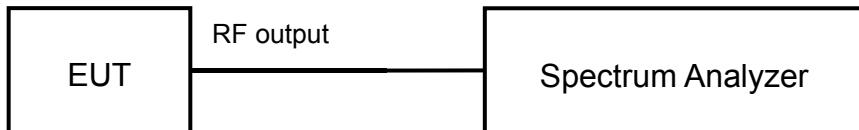
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

### 6.7.2 Test Procedure

1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW = 100 kHz
4. VBW = 300 kHz
5. Detector = Peak
6. Number of sweep points  $\geq 2 \times \text{Span}/\text{RBW}$
7. Trace mode = max hold
8. Sweep time = auto couple
9. The trace was allowed to stabilize

### 6.7.3 Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



### 6.7.4 Test result

The test results are shown in Appendix A.

The spectrum plots are attached on the following images. D1 line indicates the 20dB offset below the highest level. It shows compliance with the requirement

## 6.8 Spurious Radiated Emissions

### 6.8.1 Test Description

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at maximum power and at the appropriate frequencies. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

### 6.8.2 Test limit

Part15.205, 15.209, 15.247(d)

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in below Table per Section 15.209. The spectrum shall be investigated from the lowest radio frequency signal generated in the device.

Frequency [MHz]	Field strength [ μV/m ]	Measured Distance [meters]
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

### Radiated Limits

Part15.35(b):

There is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit

**Used conversion factor: Limit (dB $\mu$ V/m) = 20 log (Limit ( $\mu$ V/m)/1 $\mu$ V/m)**

Frequency [MHz]	Detector	Unit (dB $\mu$ V/m)
30~88	Quasi-peak	40.0
88~216	Quasi-peak	43.5
216~960	Quasi-peak	46.0
960~1000	Quasi-peak	54.0
1000~5th harmonic of the highest frequency or 40GHz, whichever is lower	Average	54.0
	Peak	74.0

### Conversion Radiated limits

### 6.8.3 Test Procedure Used

KDB 558074 D01 v05r02 – Section 12.2.7

#### For Radiated emission below 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. Both X and Y axes of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and the rotatable 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 recorded the reading with Maximum Hold Mode.

#### NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer complied the following setting:

Frequency	RBW
9-150kHz	200-300Hz
0.15-30MHz	9-10kHz

2. Signals below 30MHz are not recorded in the report because they are lower than the limits by more than 20dB.

#### For Radiated emission above 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground in chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters 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 meter to 4 meters and the rotatable 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 recorded the reading with Maximum Hold Mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detector and recorded the reading with Maximum Hold Mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

### For the radiated emission test above 1GHz:

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. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

#### NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Average detection (AV) at frequency above 1GHz. If duty cycle of test signal is < 98%, the duty factor need added to measured value.
4. All modes of operation were investigated and the worst-case emissions are reported.

### 6.8.4 Test Settings

#### Average Field Strength Measurements per Section 12.2.7 of KDB 558074 (Part 15.35)

Frequency	Detector
<1000MHz	Quasi-peak
>1000MHz	Peak and average

#### Peak Field Strength Measurements per Section 12.2.7 of KDB 558074 (Part 15.35)

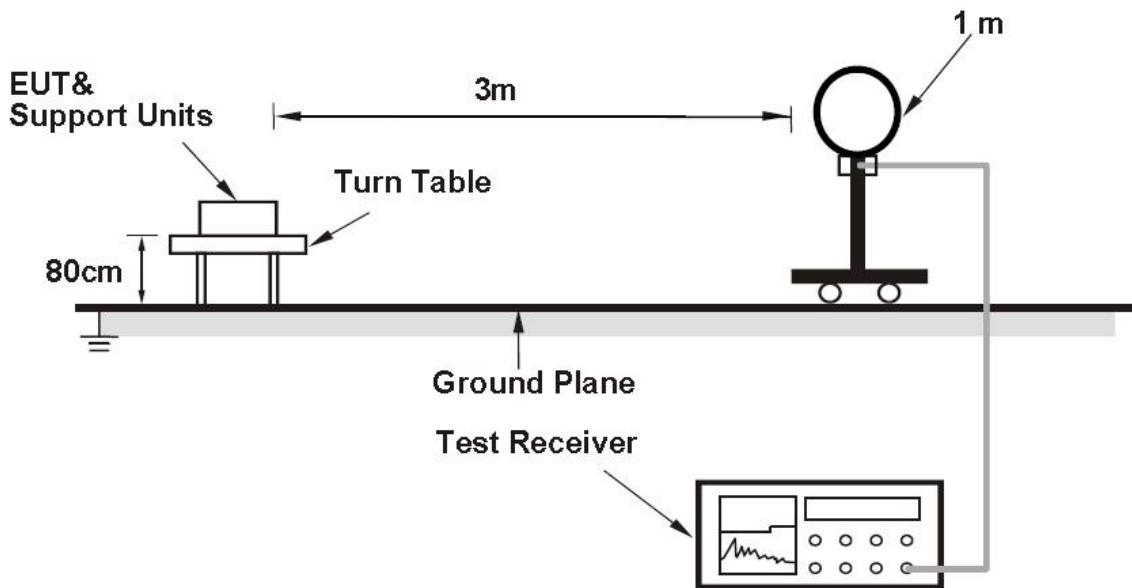
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW is set depending on measurement frequency, as specified in following table

Frequency	RBW
9-150kHz	200-300Hz
0.15-30MHz	9-10kHz
30-1000MHz	100-120kHz
>1000MHz	1MHz

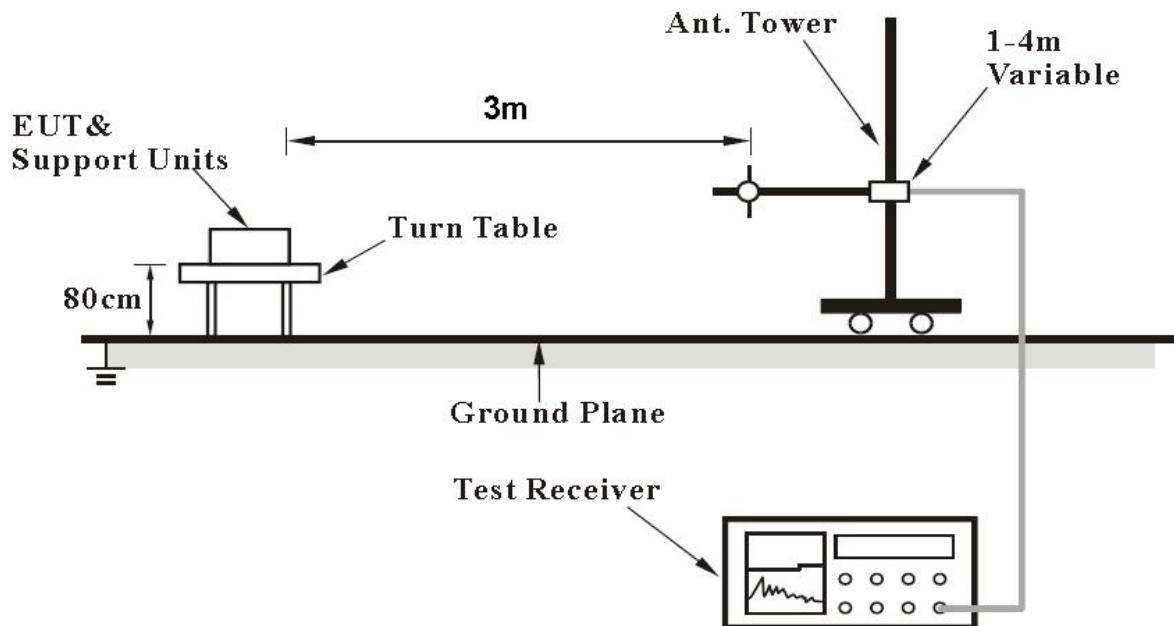
3. VBV = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

### 6.8.5 Test Setup

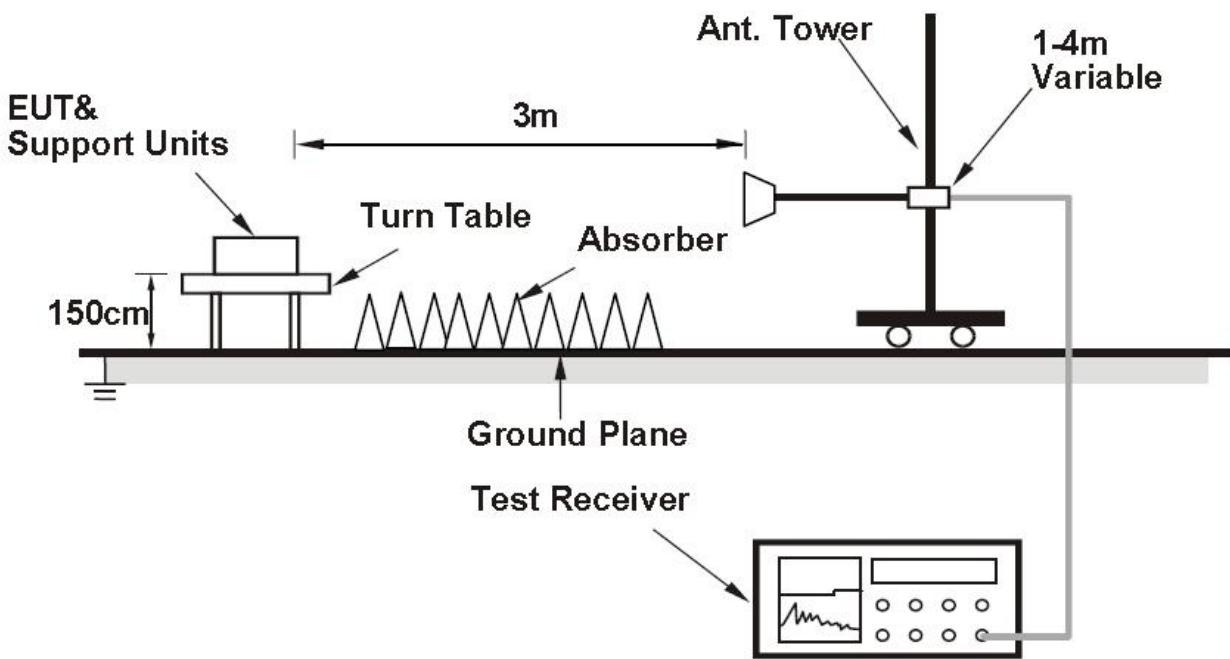
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



#### 6.8.6 Test result

The test results are shown in Appendix B.

## 6.9 AC Power line Conducted Emission

### 6.9.1 Test limit

FCC Part15.207

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

\* Decreases with the logarithm of the frequency.

The measurement is made according to ANSI C63.10-2013

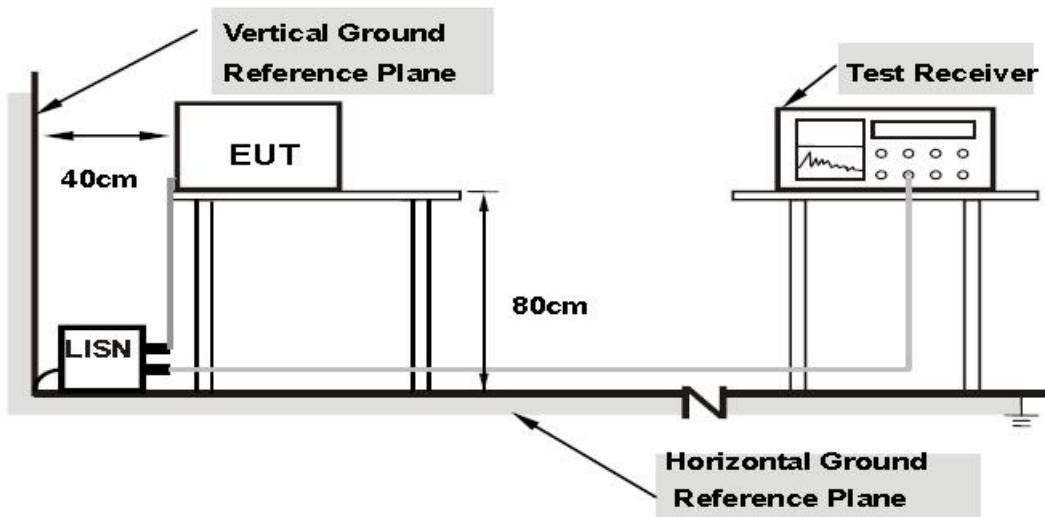
### 6.9.2 Test Procedures

- 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). 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.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- The frequency range from 150 kHz to 30MHz was searched. Emission levels under (Limit - 20dB) were not recorded.

**NOTE:** The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

The EUT shall test under the power AC120V/60Hz.

### 6.9.3 Test Setup



For the actual test configuration, please refer to the attached file (Test Setup Photo).

### 6.9.4 Test result

The test results are shown in Appendix B.

## 7 MEASUREMENT UNCERTAINTIES

Items	Uncertainty	
6dB Bandwidth	3kHz	
Peak power output	0.67dB	
Band edge compliance	1.20dB	
Conducted Out of band emission measurement	30MHz~1GHz	2.83dB
	1GHz~12.75GHz	2.50dB
	12.75GHz~25GHz	2.75dB
Spurious Radiated Emissions	30MHz~200MHz	4.88dB
	200MHz~1GHz	4.87dB
	1GHz~18GHz	4.58dB
	18GHz~40GHz	4.35dB
AC Power line Conducted Emission	3.92dB	

## 8 TEST EQUIPMENTS

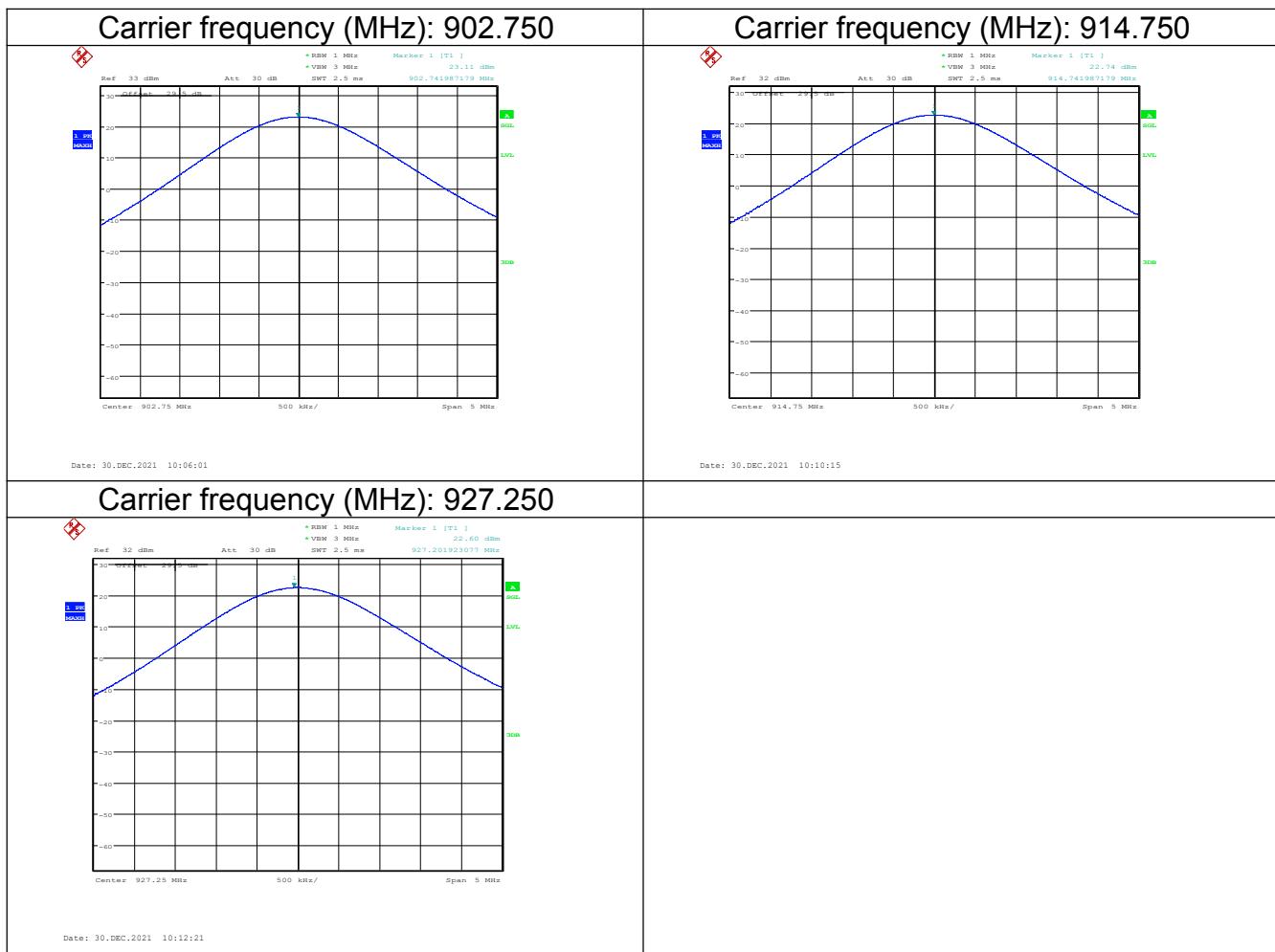
No.	Name/ Model	Manufacturer	S/N	Cal date	Cal Due date
1.	Spectrum Analyzer / FSU	ROHDE & SCHWARZ	200357	2021.06.21	2022.06.20
2.	Power Divider / 11667A	HP	19632	2021.06.21	2022.06.20
3.	Power Meter E4416A	Agilent	MY52370013	2021.04.13	2022.04.12
4.	Power Sensor E9323A	Agilent	MY52150008	2021.04.13	2022.04.12
5.	Signal Generator / SMBV100A	R&S	260910	2021.06.21	2022.06.20
6.	Temperature chamber / SH241	ESPEC	92013758	2021.06.21	2022.06.20
7.	Fully-Anechoic Chamber / 12.65m×8.03m×7.50m	FRANKONIA	----	----	----
8.	Semi-Anechoic Chamber / 23.18m×16.88m×9.60m	FRANKONIA	---	----	----
9.	Turn table Diameter:1m	FRANKONIA	----	----	----
10.	Turn table Diameter:5m	FRANKONIA	----	----	----
11.	Antenna master FAC(MA4.0)	MATURO	----	----	----
12.	Antenna master SAC(MA4.0)	MATURO	----	----	----
13.	Shielding room / 9.080m×5.255m×3.525m	FRANKONIA	----	----	----
14.	Double-Ridged Waveguide Horn Antenna / HF 907	R&S	100512	2021.06.21	2022.06.20
15.	Double-Ridged Waveguide Horn Antenna / HF 907	R&S	100513	2021.06.21	2022.06.20
16.	Ultra log antenna / HL562	R&S	100016	2021.06.21	2022.06.20
17.	Receive antenna / 3160-09	SCHWARZ-BECK	002058-002	2021.06.21	2022.06.20
18.	EMI test receiver / ESI 40	R&S	100015	2021.06.21	2022.06.20
19.	EMI test receiver / ESCS30	R&S	100029	2021.06.21	2022.06.20
20.	Receive antenna / HL562	R&S	100167	2021.06.21	2022.06.20
21.	AMN / ENV216	R&S	3560.6550.12	2021.06.21	2022.06.20
22.	Loop Antenna	R&S	100340	2021.08.20	2022.08.20

## APPENDIX A – TEST DATA OF CONDUCTED EMISSION

Offset 29.5dB = Attenuator + Temporary antenna connector loss+ Cable loss

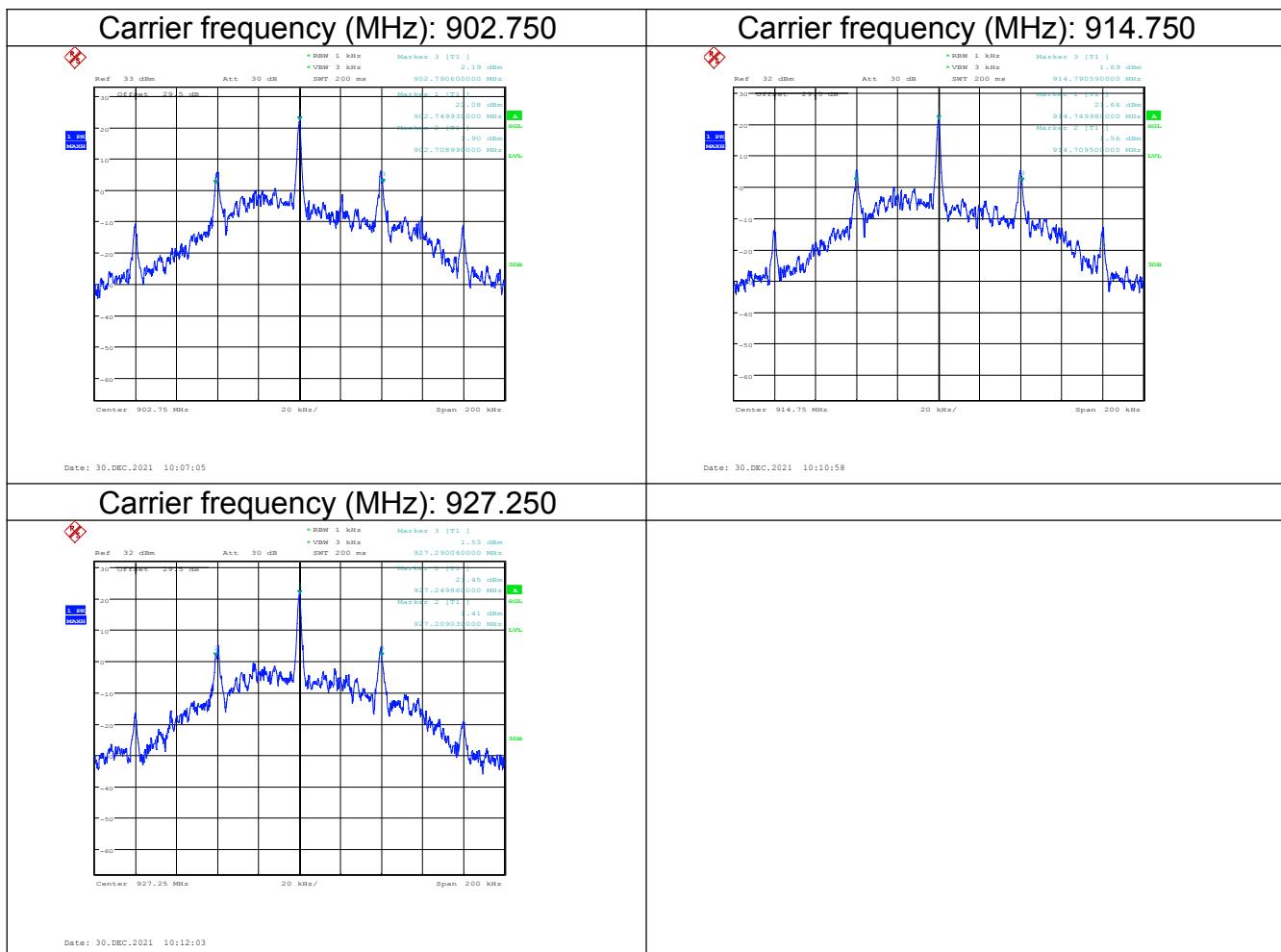
### Transmitter Output Power

Carrier frequency (MHz)	Channel No.	Peak Power Output (dBm)
902.750	Low	23.11
914.750	Middle	22.74
927.250	High	22.60

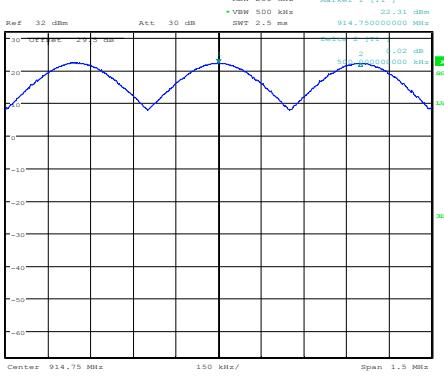
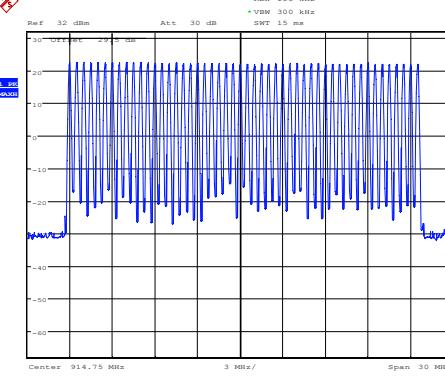
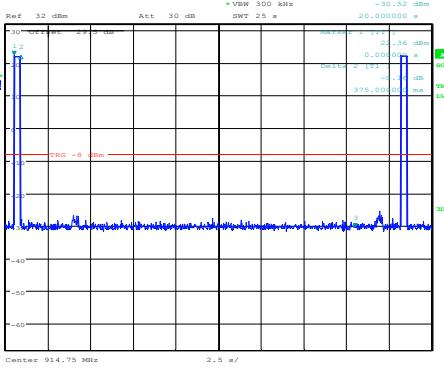


## 20 dB Bandwidth

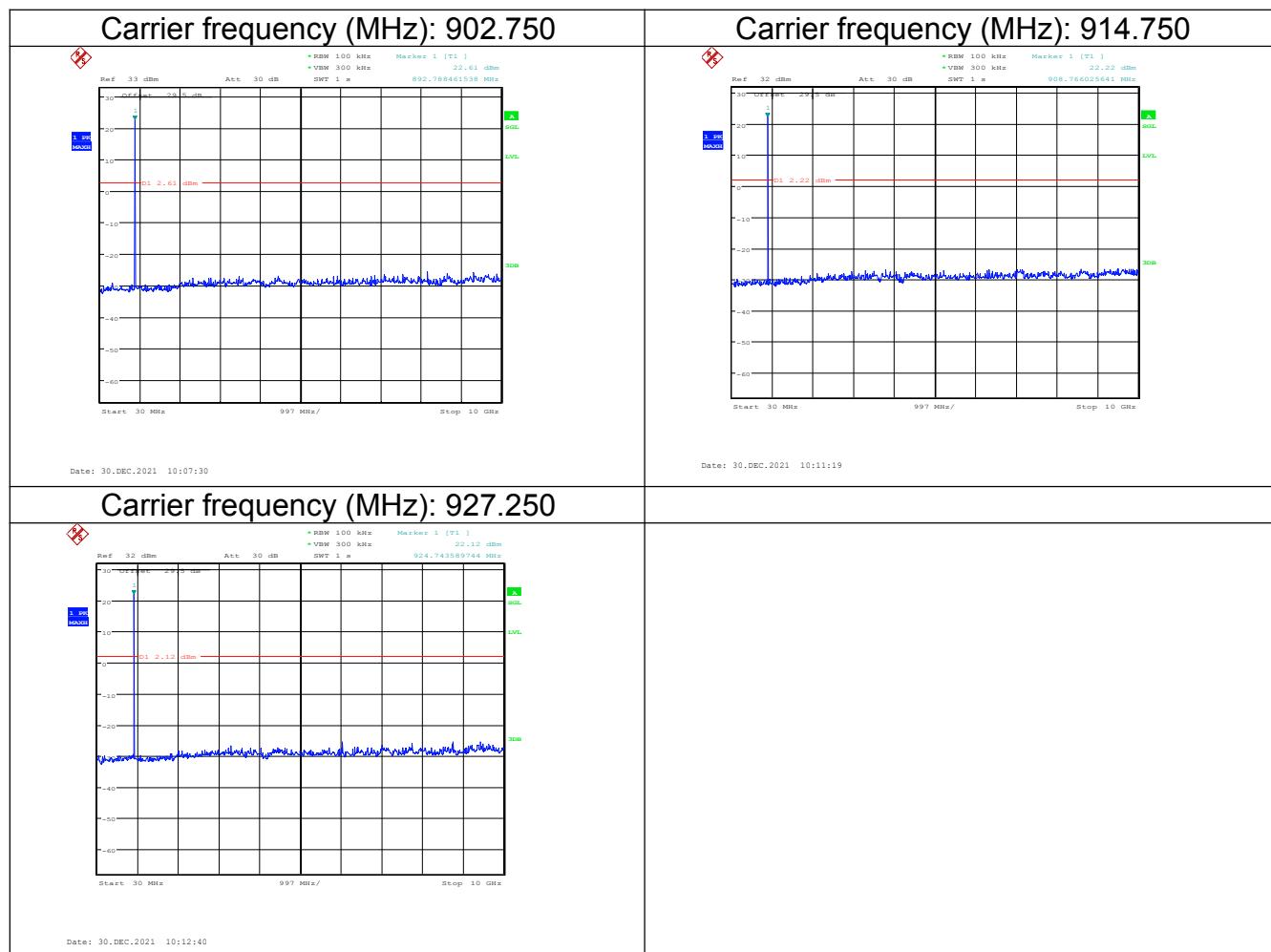
Carrier frequency (MHz)	Channel No.	20 dB bandwidth(kHz)
902.750	Low	81.61
914.750	Middle	81.09
927.250	High	81.03



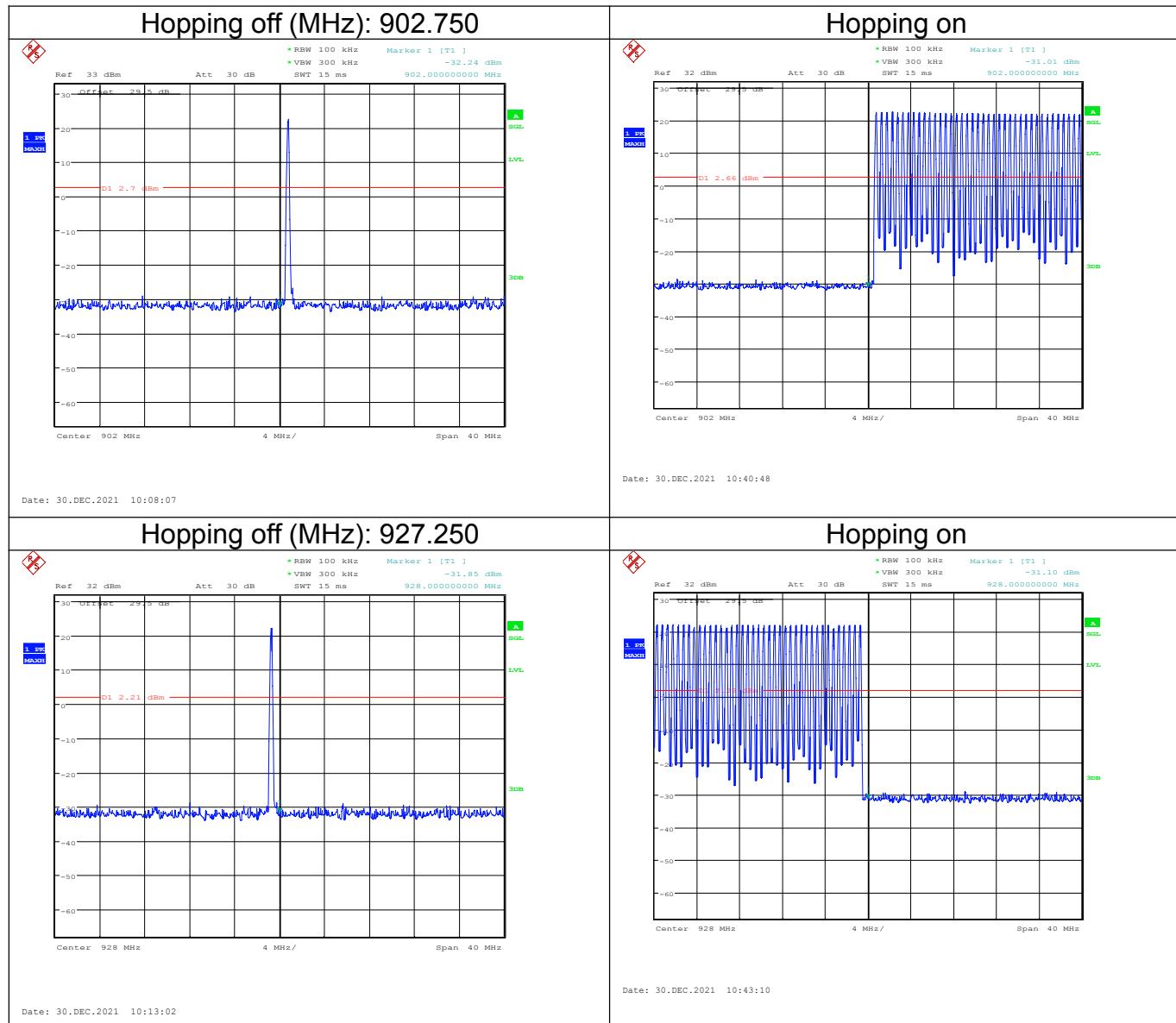
## Carrier Frequency Separation and Dwell Time

Carrier Frequency Separation(kHz)	Number of Hopping Frequencies
500.0	50
	
Dwell Time(ms)	
375	
	

## Conducted Spurious Emissions



## Band edge measurement (RF Conducted measurement)



## APPENDIX B – TEST DATA OF RADIATED EMISSION

### Spurious Radiated Emissions

Sample Calculations:

#### Determining Spurious Emissions Levels

A “reference path loss” is established and the ARpl is the attenuation of “reference path loss”, and including the gain of receive antenna, the gain of the preamplifier, the cable loss. The measurement results are obtained as described below:

Below 1GHz:

QuasiPeak=Reading Value + ARpl

Above 1GHz:

MaxPeak=Reading MaxPeak + ARpl OR Average=Reading Average + ARpl

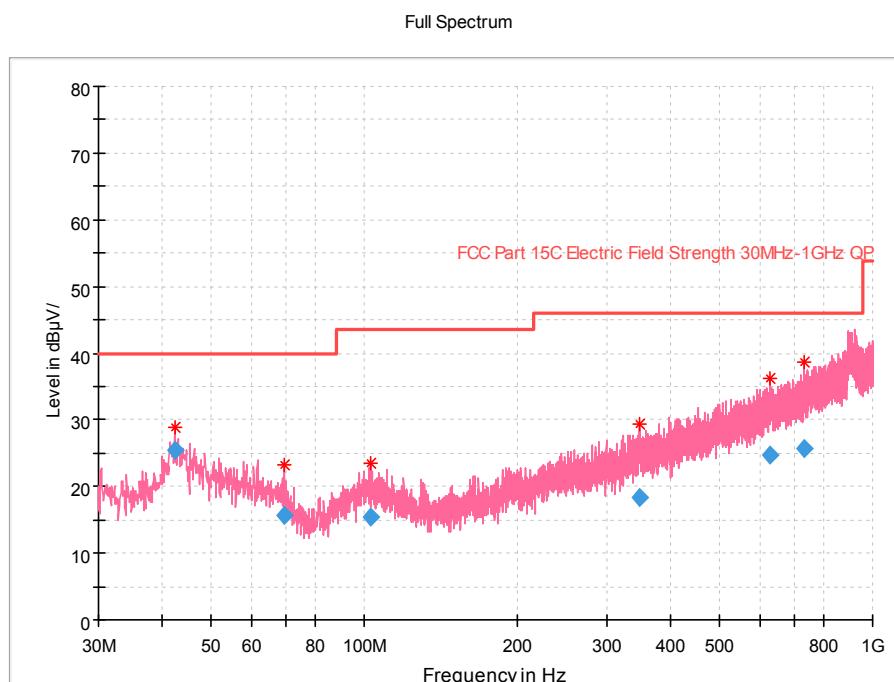
Sample calculation: (25.42 dB $\mu$ V/m) = (35.82 dB $\mu$ V) + (-10.40dB/m), the corresponding frequency is 42.319MHz.

The worst case attitude: The EUT lay down.

### Spurious Radiated Emissions from 30MHz to 1GHz:

Frequency: 902.75MHz

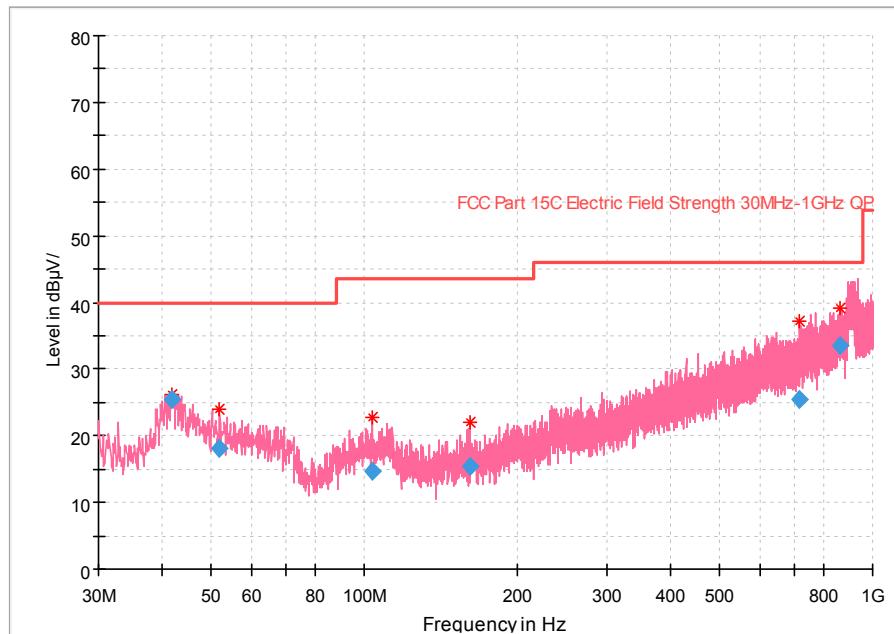
CH Low (No.1)



Frequency (MHz)	Reading (dB $\mu$ V)	QuasiPeak (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	ARpl (dB)	Polarity
42.319	35.82	25.42	40.00	14.58	-10.40	Vertical
69.673	29.24	15.74	40.00	24.26	-13.50	Vertical
102.944	25.97	15.37	43.50	28.13	-10.60	Vertical
347.093	23.32	18.32	46.00	27.68	-5.00	Vertical
630.042	22.60	24.70	46.00	21.30	2.10	Vertical
735.093	22.06	25.76	46.00	20.24	3.70	Vertical

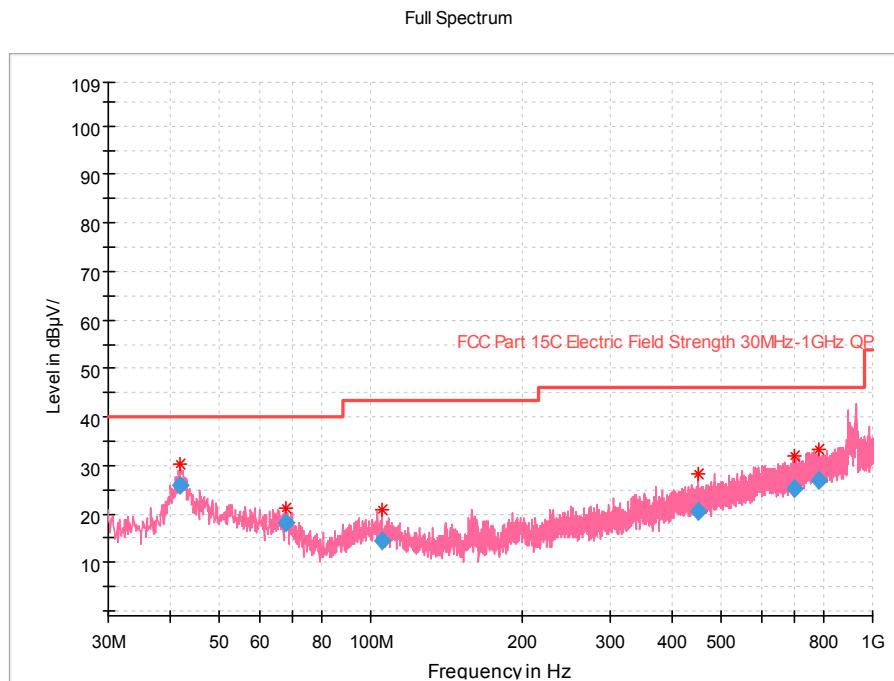
**Frequency: 914.75MHz**  
**CH Middle (No.25)**

Full Spectrum



Frequency (MHz)	Reading (dBuV)	QuasiPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	$A_{Rpl}$ (dB)	Polarity
41.834	35.96	25.46	40.00	14.54	-10.50	Vertical
51.922	27.87	18.07	40.00	21.93	-9.80	Vertical
103.914	25.33	14.63	43.50	28.87	-10.70	Vertical
161.338	28.51	15.31	43.50	28.19	-13.20	Vertical
719.864	22.25	25.45	46.00	20.55	3.20	Vertical
861.588	26.61	33.41	46.00	12.59	6.80	Vertical

**Frequency: 927.25MHz**  
**CH High (No.50)**



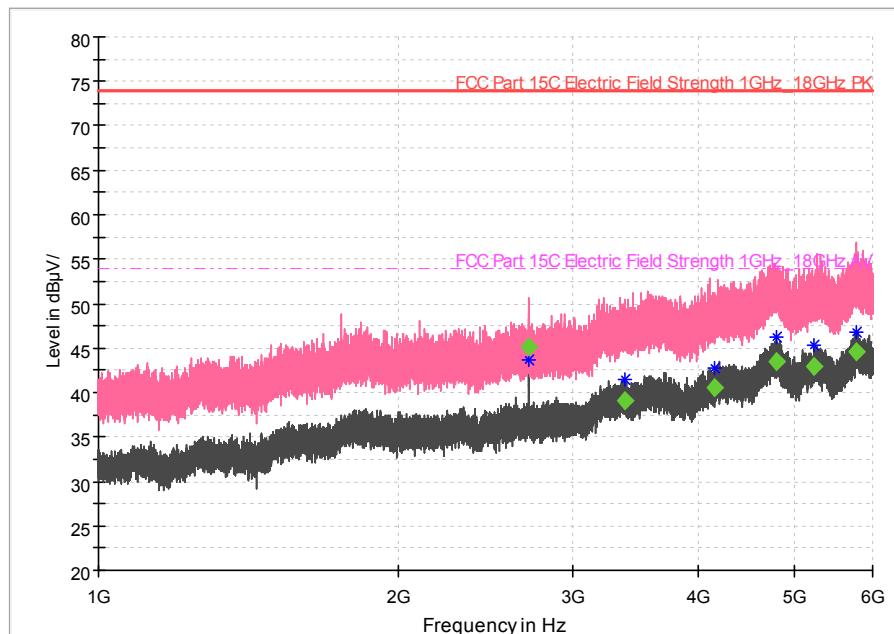
Frequency (MHz)	Reading (dB $\mu$ V)	QuasiPeak (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	$A_{Rpl}$ (dB)	Polarity
41.640	36.35	25.75	40.00	14.25	-10.60	Vertical
67.539	30.69	18.09	40.00	21.91	-12.60	Vertical
105.272	25.24	14.44	43.50	29.06	-10.80	Vertical
448.361	23.32	20.62	46.00	25.38	-2.70	Vertical
699.300	22.46	25.16	46.00	20.84	2.70	Vertical
778.937	22.44	27.04	46.00	18.96	4.60	Vertical

## Spurious Radiated Emissions from 1GHz to 6GHz:

Frequency: 902.75MHz

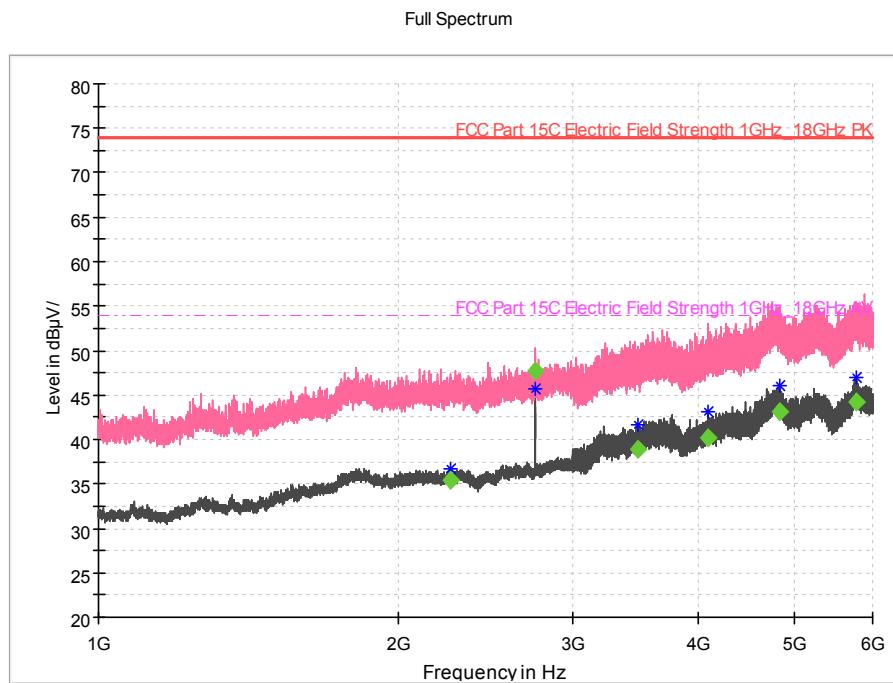
CH Low (No.1)

Full Spectrum



Frequency (MHz)	Reading MaxPeak (dBuV)	Reading Average (dBuV)	MaxPeak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	ARpl (dB)	Polarity
2708.000	---	63.42	---	45.12	54.00	8.88	-18.30	Vertical
3377.000	---	54.85	---	39.05	54.00	14.95	-15.80	Vertical
4168.700	---	54.77	---	40.47	54.00	13.53	-14.30	Vertical
4802.000	---	54.53	---	43.43	54.00	10.57	-11.10	Vertical
5242.300	---	54.65	---	42.95	54.00	11.05	-11.70	Vertical
5773.700	---	54.85	---	44.55	54.00	9.45	-10.30	Vertical

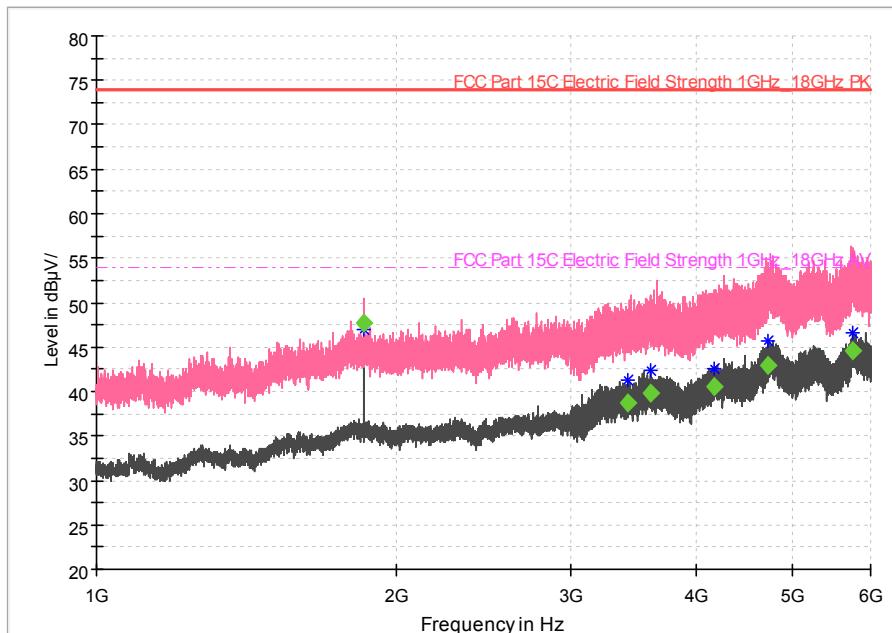
**Frequency: 914.75MHz**  
**CH Middle (No.25)**



Frequency (MHz)	Reading MaxPeak (dBuV)	Reading Average (dBuV)	MaxPeak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	$A_{Rpl}$ (dB)	Polarity
2257.907	---	54.85	---	35.35	54.00	18.65	-19.50	Vertical
2744.186	---	66.28	---	47.68	54.00	6.32	-18.60	Vertical
3487.600	---	54.65	---	38.85	54.00	15.15	-15.80	Vertical
4103.100	---	54.71	---	40.21	54.00	13.79	-14.50	Vertical
4833.600	---	54.41	---	43.11	54.00	10.89	-11.30	Vertical
5778.900	---	54.51	---	44.21	54.00	9.79	-10.30	Vertical

**Frequency: 927.25MHz**  
**CH High (No.50)**

Full Spectrum



Frequency (MHz)	Reading MaxPeak (dBuV)	Reading Average (dBuV)	MaxPeak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	ARpl (dB)	Polarity
1854.600	---	67.14	---	47.64	54.00	6.36	-19.50	Vertical
3424.800	---	54.76	---	38.76	54.00	15.24	-16.00	Vertical
3606.800	---	54.87	---	39.77	54.00	14.23	-15.10	Vertical
4184.800	---	54.69	---	40.59	54.00	13.41	-14.10	Vertical
4730.000	---	54.55	---	42.85	54.00	11.15	-11.70	Vertical
5762.400	---	54.76	---	44.56	54.00	9.44	-10.20	Vertical

---End of Test Report---