



**RADIO TEST REPORT**

Report No.: STS2111022W01

Issued for

Buddi Limited

Talbot House, 17 Church Street, Rickmansworth, United Kingdom, WD3 1DE

<b>Product Name:</b>	RF Beacon V3
<b>Brand Name:</b>	Buddi Ltd
<b>Model Name:</b>	T5-STR-PTB-915
<b>Series Model:</b>	Colorado
<b>FCC ID:</b>	ZDLRF2
<b>IC:</b>	20371-RF2
<b>Test Standard:</b>	FCC Part 15.249
	RSS-210 Issue 10, Amendment, April 2020

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TEST RESULT CERTIFICATION

**Applicant's Name** .....: Buddi Limited  
 Address .....: Talbot House, 17 Church Street, Rickmansworth, United Kingdom, WD3 1DE  
**Manufacture's Name** .....: Buddi Limited  
 Address .....: Talbot House, 17 Church Street, Rickmansworth, United Kingdom, WD3 1DE  
**Product Description**  
 Product Name .....: RF Beacon V3  
 Brand Name .....: Buddi Ltd  
 Model Name .....: T5-STR-PTB-915  
 Series Model .....: Colorado  
**Test Standards**.....: FCC Part15.249  
 RSS-210 Issue 10, Amendment, April 2020  
 Test Procedure .....: ANSI C63.10-2013

This device described above has been tested by STS, the test results show that the equipment under test (EUT) is in compliance with the FCC/IC requirements. And it is applicable only to the tested sample identified in the report.

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Date of Test .....:  
 Date of receipt of test item .....: 03 Nov. 2021  
 Date of performance of tests ...: 03 Nov. 2021 ~ 23 Nov. 2021  
 Date of Issue .....: 23 Nov. 2021  
 Test Result.....: **Pass**

Testing Engineer :

*Chris Chen*

(Chris Chen)

Technical Manager :

*Sean She*

(Sean she)

Authorized Signatory :

*Vita Li*

(Vita Li)





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**Revision History**

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	23 Nov. 2021	STS2111022W01	ALL	Initial Issue





## 1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

<b>FCC Part 15.249 , Subpart C RSS 210 Issue 10</b>			
Standard Section	Test Item	Judgment	Remark
15.207 RSS-Gen Issue 5	Conducted Emission	Pass	
15.203 RSS-Gen Issue 5	Antenna Requirement	Pass	
15.209/15.249 RSS 210 Issue 10 (B.10)	Radiated Spurious Emission	Pass	
15.209 RSS 210 Issue 10 (B.10)	Radiated Band Edge Emission	Pass	
15.215 RSS-Gen Issue 5	Occupied Bandwidth	Pass	
RSS-Gen Issue 5	Frequency Stability	PASS	--

### NOTE:

- (1) 'N/A' denotes test is not applicable in this Test Report.
- (2) All tests are according to ANSI C63.10-2013.



## 1.1 TEST FACTORY

SHENZHEN STS TEST SERVICES CO., LTD

Add. : A 1/F, Building B, Zhuoke Science Park, No.190 Chongqing Road, HepingShequ, Fuyong Sub-District, Bao'an District, Shenzhen, Guang Dong, China

FCC test Firm Registration Number: 625569

IC test Firm Registration Number: 12108A

A2LA Certificate No.: 4338.01

## 1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement  $y \pm U$ , where expanded uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately **95 %**.

No.	Item	Uncertainty
1	RF output power, conducted	$\pm 0.68\text{dB}$
2	Unwanted Emissions, conducted	$\pm 2.988\text{dB}$
3	All emissions, radiated 9K-30MHz	$\pm 2.84\text{dB}$
4	All emissions, radiated 30M-1GHz	$\pm 4.39\text{dB}$
5	All emissions, radiated 1G-6GHz	$\pm 5.10\text{dB}$
6	All emissions, radiated >6G	$\pm 5.48\text{dB}$
7	Conducted Emission (9KHz-150KHz)	$\pm 2.79\text{dB}$
8	Conducted Emission (150KHz-30MHz)	$\pm 2.80\text{dB}$



## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF THE EUT

Product Name/PMN	RF Beacon V3
Trade Name	Buddi Ltd
Model Name	T5-STR-PTB-915
Series Model	Colorado
Model Difference	The difference only in the model name.
HVIN	T5-STR-PTB-915, Colorado
Product Description	The EUT is a RF Beacon V3
	Operation Frequency: 914.5~921MHz
	Modulation Type: ASK
	Antenna Designation: Please refer to the Note 3.
	Antenna Gain(Peak): -1.5dBi
	Based on the application, features, or specification exhibited in User Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User Manual.
Channel List	Please refer to the Note 2.
Rating	Input: AC 100-240V 50/60Hz 0.3A Output: DC 3.3V 25mA
Hardware version number	v5.1
Software version number/FVIN	2.14
Serial Numbers	RFU00002
Connecting I/O Port(s)	Please refer to the Note 1.

Note:

- For a more detailed features description, please refer to the manufacturer's specifications or the User Manual.
- 

Channel List					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	914.5	02	917.5	03	921

- Table for Filed Antenna

Ant	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	Buddi Ltd	T5-STR-PTB-915	Ceramic	N/A	-1.5dBi	Antenna

Note: The antenna information refer the manufacturer provide report, applicable only to the tested sample identified in the report.



## 2.2 DESCRIPTION OF THE TEST MODES

For conducted test items and radiated spurious emissions

Each of these EUT operation mode(s) or test configuration mode(s) mentioned below was evaluated respectively.

Pretest Mode	Description	Data/Modulation
Mode 1	TX Low channel	ASK
Mode 2	TX Mid channel	ASK
Mode 3	TX High channel	ASK

Note:

(1) All above mode have been measurement, only worst data was reported.

(2) We have be tested for all avaiable U.S. voltage and frequencies(For 120V,50/60Hz and 240V, 50/60Hz) for which the device is capable of operation, and the worst case of 120V,50/60Hz is shown in the report.

For AC Conducted Emission

Test Case	
AC Conducted Emission	Mode 4 : Keeping TX

## 2.3 TEST SOFTWARE AND POWER LEVEL

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level.

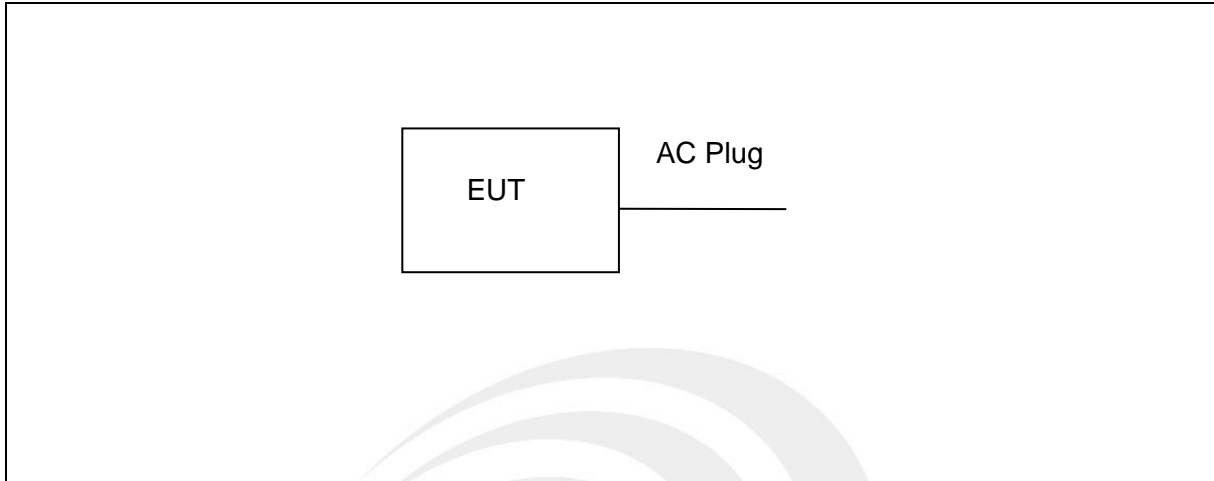
RF Function	Type	Mode Or Modulation type	ANT Gain(dBi)	Power Class	Software For Testing
Other SRD	902-928MHz	ASK	-1.5	Default	The EUT has signal transmission when it is powered on



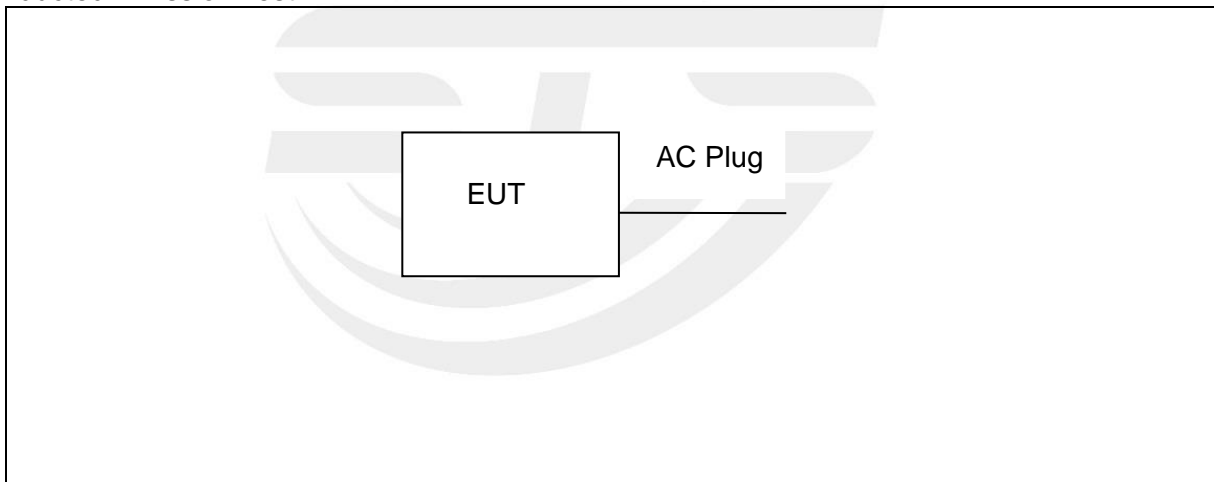
## 2.4 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters.

### Radiated Spurious Emission Test



### Conducted Emission Test





## 2.5 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

### Necessary accessories

Item	Equipment	Mfr/Brand	Model/Type No.	Length	Note
N/A	N/A	N/A	N/A	N/A	N/A

### Support units

Item	Equipment	Mfr/Brand	Model/Type No.	Length	Note
N/A	N/A	N/A	N/A	N/A	N/A

#### Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.



## 2.6 EQUIPMENTS LIST FOR ALL TEST ITEMS

## Radiation Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Test Receiver	R&S	ESCI	101427	2021.09.30	2022.09.29
Signal Analyzer	R&S	FSV 40-N	101823	2021.09.30	2022.09.29
Active loop Antenna	ZHINAN	ZN30900C	16035	2021.04.11	2023.04.10
Bilog Antenna	TESEQ	CBL6111D	34678	2020.10.12	2022.10.11
Horn Antenna	SCHWARZBECK	BBHA 9120D	02014	2021.10.11	2023.10.10
SHF-EHF Horn Antenna (18G-40GHz)	A-INFO	LB-180400-KF	J211020657	2020.10.12	2022.10.11
Pre-Amplifier(0.1M-3 GHz)	EM	EM330	060665	2021.10.08	2022.10.07
Pre-Amplifier (1G-18GHz)	SKET	LNPA-01018G-45	SK2018080901	2021.09.30	2022.09.29
Pre-Amplifier (18G-40GHz)	SKET	LNPA-1840-50	SK2018101801	2021.09.28	2022.09.27
Temperature & Humidity	HH660	Mieo	N/A	2021.10.09	2022.10.08
turn table	EM	SC100_1	60531	N/A	N/A
Antenna mast	EM	SC100	N/A	N/A	N/A
Test SW	FARAD	EZ-EMC(Ver.STSLAB-03A1 RE)			

## Conduction Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Test Receiver	R&S	ESCI	101427	2021.09.30	2022.09.29
LISN	R&S	ENV216	101242	2021.09.30	2022.09.29
LISN	EMCO	3810/2NM	23625	2021.09.30	2022.09.29
Temperature & Humidity	HH660	Mieo	N/A	2021.10.09	2022.10.08
Test SW	FARAD	EZ-EMC(Ver.STSLAB-03A1 CE)			



## RF Connected Test

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Power Sensor	Keysight	U2021XA	MY55520005	2021.09.30	2022.09.29
			MY55520006	2021.09.30	2022.09.29
			MY56120038	2021.09.30	2022.09.29
			MY56280002	2021.09.30	2022.09.29
Signal Analyzer	Agilent	N9020A	MY51110105	2021.03.04	2022.03.03
Temperature & Humidity	HH660	Mieo	N/A	2021.10.09	2022.10.08
Test SW	FARAD	EZ-EMC(Ver.STSLAB-03A1 RE)			





### 3. EMC EMISSION TEST

#### 3.1 CONDUCTED EMISSION MEASUREMENT

##### 3.1.1 POWER LINE CONDUCTED EMISSION LIMITS

The radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table.

FREQUENCY (MHz)	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of “ \* ” marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

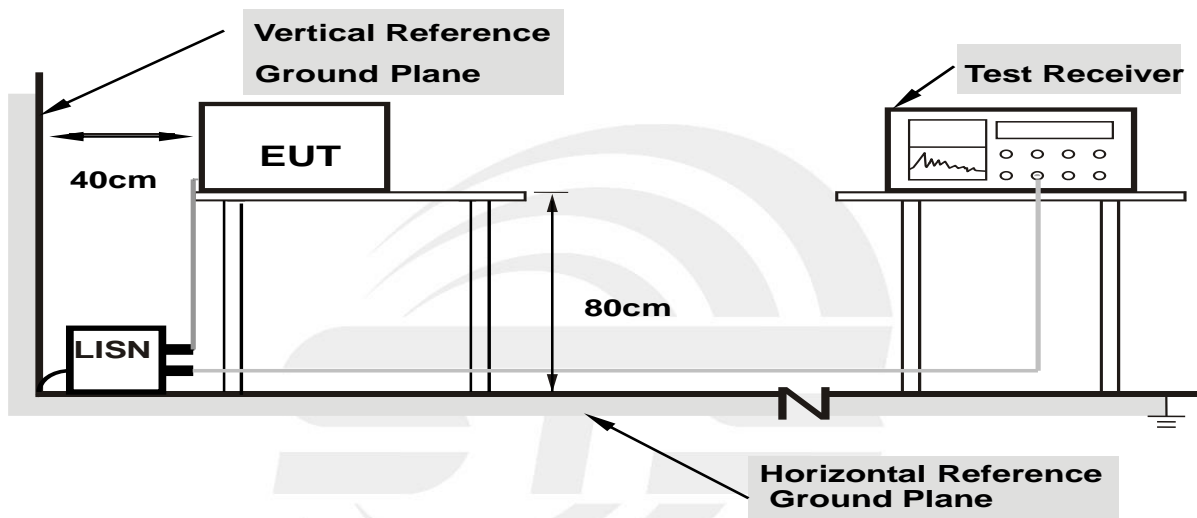
The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

### 3.1.2 TEST PROCEDURE

- a. The EUT was 0.8 meters from the horizontal ground plane and 0.4 meters from the vertical ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

### 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 from other units and other metal planes**

### 3.1.4 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.



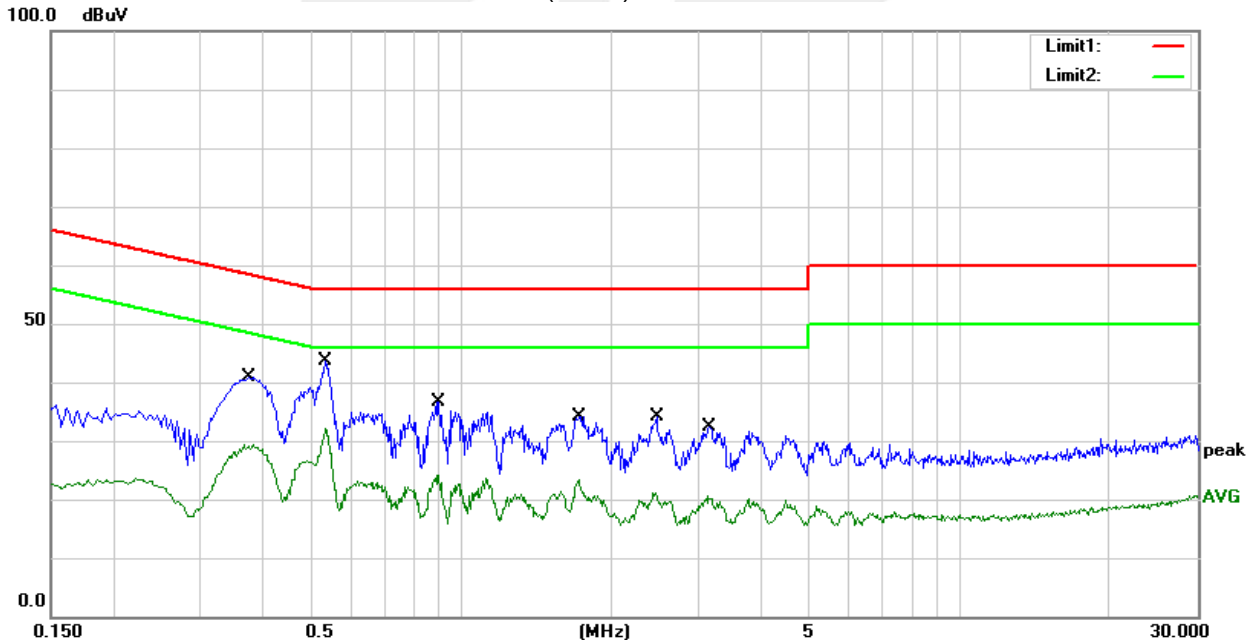
3.1.5 TEST RESULT

Temperature:	25.7(C)	Relative Humidity:	52%RH
Test Voltage:	AC 120V/60Hz	Phase:	L
Test Mode:	Mode 4		

No.	Frequency (MHz)	Reading (dBUV)	Correct Factor(dB)	Result (dBUV)	Limit (dBUV)	Margin (dB)	Remark
1	0.3740	20.26	20.63	40.89	58.41	-17.52	QP
2	0.3740	8.64	20.63	29.27	48.41	-19.14	AVG
3	0.5340	23.18	20.47	43.65	56.00	-12.35	QP
4	0.5340	11.75	20.47	32.22	46.00	-13.78	AVG
5	0.9020	16.41	20.32	36.73	56.00	-19.27	QP
6	0.9020	3.77	20.32	24.09	46.00	-21.91	AVG
7	1.7300	13.89	20.36	34.25	56.00	-21.75	QP
8	1.7300	2.94	20.36	23.30	46.00	-22.70	AVG
9	2.4700	13.81	20.41	34.22	56.00	-21.78	QP
10	2.4700	0.82	20.41	21.23	46.00	-24.77	AVG
11	3.1500	11.95	20.45	32.40	56.00	-23.60	QP
12	3.1500	0.24	20.45	20.69	46.00	-25.31	AVG

Remark:

1. All readings are Quasi-Peak and Average values
2. Margin = Result (Result = Reading + Factor) – Limit
3. Factor=LISN factor+Cable loss+Limiter (10dB)



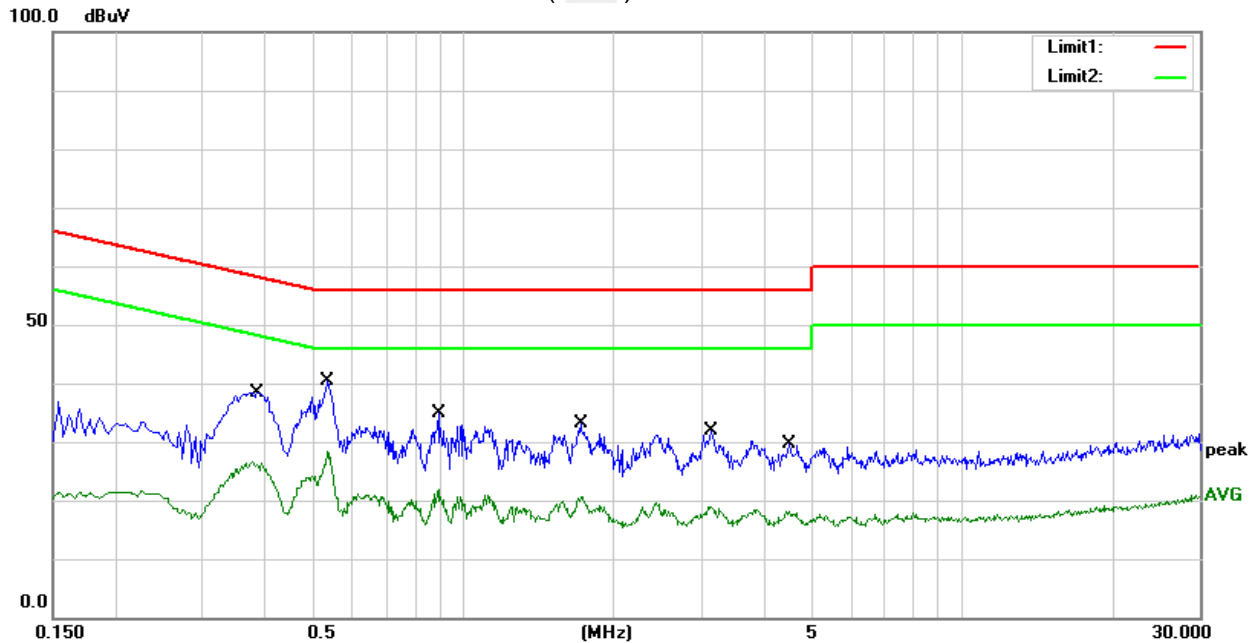


Temperature:	25.7(C)	Relative Humidity:	52%RH
Test Voltage:	AC 120V/60Hz	Phase:	N
Test Mode:	Mode 4		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.3860	17.87	20.60	38.47	58.15	-19.68	QP
2	0.3860	5.92	20.60	26.52	48.15	-21.63	AVG
3	0.5340	19.87	20.47	40.34	56.00	-15.66	QP
4	0.5340	7.91	20.47	28.38	46.00	-17.62	AVG
5	0.8940	14.58	20.32	34.90	56.00	-21.10	QP
6	0.8940	1.57	20.32	21.89	46.00	-24.11	AVG
7	1.7180	12.77	20.36	33.13	56.00	-22.87	QP
8	1.7180	0.33	20.36	20.69	46.00	-25.31	AVG
9	3.1540	11.34	20.45	31.79	56.00	-24.21	QP
10	3.1540	-0.92	20.45	19.53	46.00	-26.47	AVG
11	4.5020	8.97	20.53	29.50	56.00	-26.50	QP
12	4.5020	-2.61	20.53	17.92	46.00	-28.08	AVG

Remark:

1. All readings are Quasi-Peak and Average values
2. Margin = Result (Result =Reading + Factor )–Limit
3. Factor=LISN factor+Cable loss+Limiter (10dB)







### 3.2 RADIATED EMISSION MEASUREMENT

#### 3.2.1 RADIATED EMISSION LIMITS

In any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on Part 15.249 and the Part 15.209(a), RSS-Gen Issue 5, and RSS 210 Issue 10 (B.10) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement 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
960~1000	500	3
Above 1000	Other:74.0 dB( $\mu$ V)/m (Peak) 54.0 dB( $\mu$ V)/m (Average)	3

Frequency of Emission (MHz)	Field Strength of fundamental (millivolts /meter)	Field Strength of Harmonics (microvolts/meter)
900~928	50	500
2400~2483.5	50	500
5725~5875	50	500
24000~242500	250	2500

Notes:

- (1) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.



## LIMITS OF RESTRICTED FREQUENCY BANDS

FCC:

FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (GHz)
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6
13.36-13.41			

IC:

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

16.80425 - 16.80475	3500 - 4400	
25.5 - 25.67	4500 - 5150	
37.5 - 38.25	5350 - 5460	
73 - 74.6	7250 - 7750	
74.8 - 75.2	8025 - 8500	
108 - 138		

Spectrum Parameter	Setting
Detector	Peak/AV
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB (emission in restricted band)	>20BW
VB (emission in restricted band)	=3xRB

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~90kHz / RB 200Hz for PK & AV
	90kHz~110kHz / RB 200Hz for QP
	110kHz~490kHz / RB 200Hz for PK & AV
	490kHz~30MHz / RB 9kHz for QP
	30MHz~1000MHz / RB 120kHz for QP

3.2.2 TEST PROCEDURE

- a. The measuring distance of 3m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation(Below 1GHz)
- b. The measuring distance of 3m shall be used for measurements. The EUT was placed on the top of a rotating table 1.5 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation(Above 1GHz)
- c. The height of the test antenna shall vary between 1m to 4m.Both horizontal and vertical polarization Of the antenna are set to make the measurement.
- d. The initial step in collecting radiated emission data is a receive peak detector mode. Pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- e. All readings are peak unless otherwise stated QP in column of Note. Peak denoted that the Peak reading compliance with the QP limits and then QP Mode measurement didn't perform (Below 1GHz)



f. All readings are Peak mode value unless otherwise stated AVG in column of Note. If the Peak mode measured value compliance with the Peak limits and lower than AVG Limits, the EUT shall be deemed to meet Peak & AVG limits and then only Peak mode was measured, but AVG mode didn't perform.(Above 1GHz)

9. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note: Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

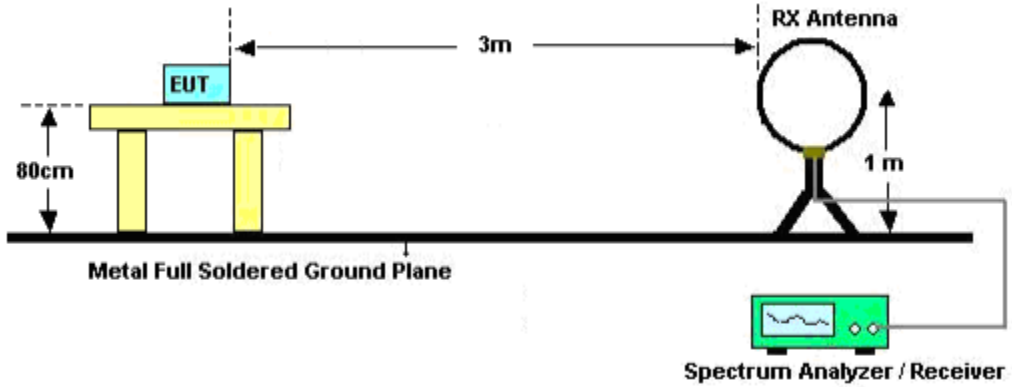
### 3.2.3 DEVIATION FROM TEST STANDARD

No deviation

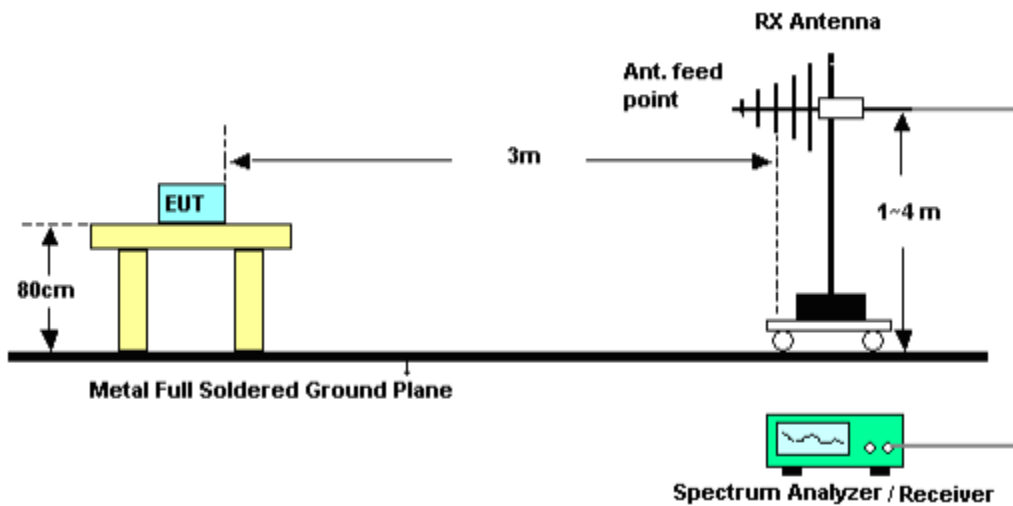


### 3.2.4 TEST SETUP

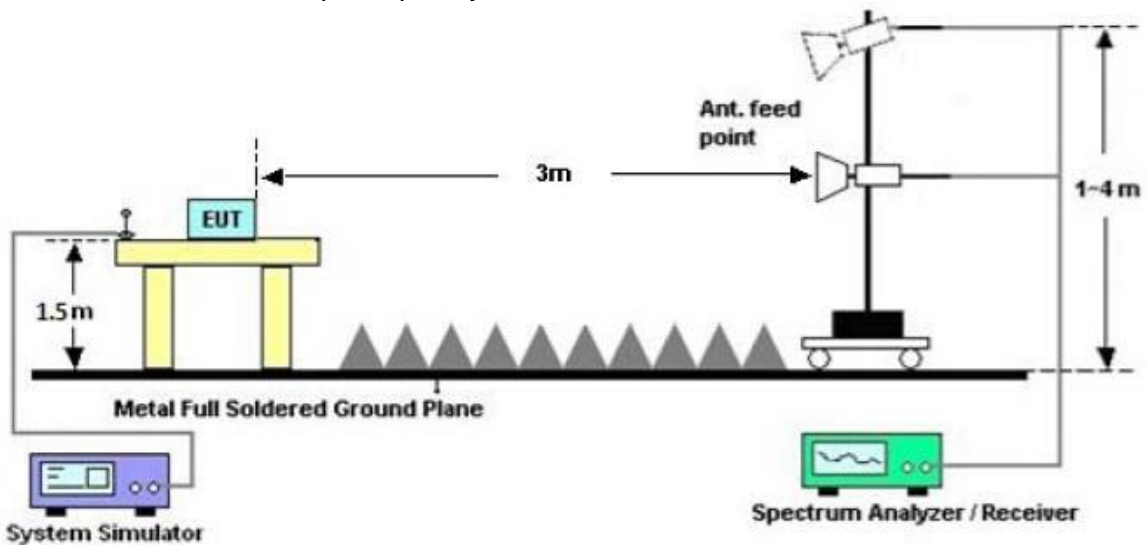
#### (A) Radiated Emission Test-Up Frequency Below 30MHz



#### (B) Radiated Emission Test-Up Frequency 30MHz~1GHz



#### (C) Radiated Emission Test-Up Frequency Above 1GHz





### 3.2.5 FIELD STRENGTH CALCULATION

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

Margin=PL-PK L or AL- AV L; Margin only shown the worst case.

Where

PR = Peak Reading

AR = Average Reading

PL = Peak Level

AL = Average Level

AF = Antenna Factor

PK L = Peak Limit

AV L = AV Limit

For example

Frequency	PR	AR	AF	PL	AL	PK L	AV L	Margin
(MHz)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)
2178	40.23	30.31	9.83	50.06	40.14	74.00	54.00	-13.86





### 3.2.6 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

Below 30 MHz

Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	AC 120V/60Hz	Polarization:	---
Test Mode:	TX Mode		

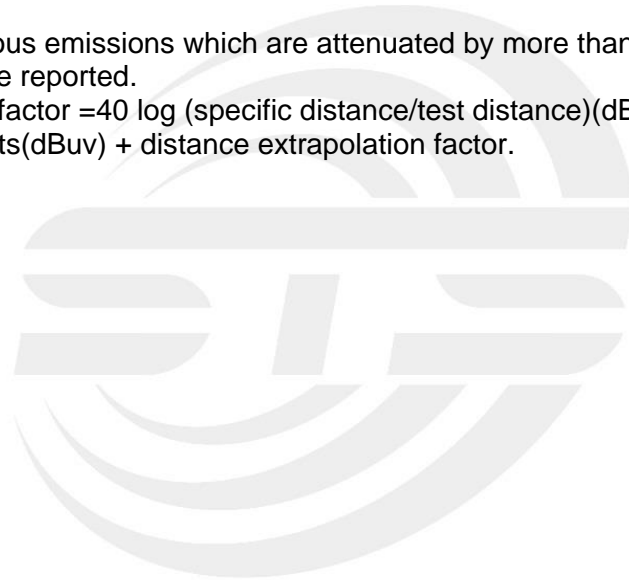
Freq. (MHz)	Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	State P/F
--	--	--	--	PASS
--	--	--	--	PASS

**NOTE:**

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor =  $40 \log(\text{specific distance}/\text{test distance})$ (dB);

Limit line = specific limits(dBuv) + distance extrapolation factor.





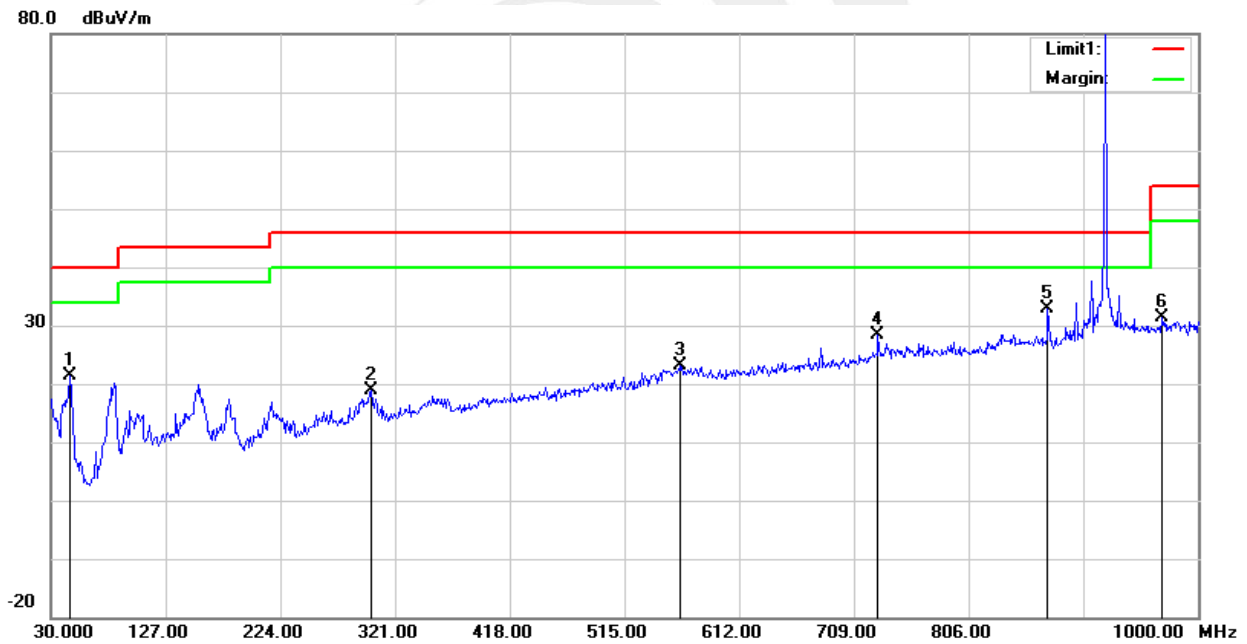
Between 30MHz – 1000 MHz Radiation Spurious

Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	AC 120V/60Hz	Phase:	Horizontal
Test Mode:	Mode 1/2/3 (Mode 3 worst mode)		

No.	Frequency (MHz)	Reading (dBUV)	Correct Factor(dB/m)	Result (dBUV/m)	Limit (dBUV/m)	Margin (dB)	Remark
1	45.5200	42.39	-20.91	21.48	40.00	-18.52	QP
2	300.6300	33.55	-14.79	18.76	46.00	-27.24	QP
3	562.5300	28.63	-5.52	23.11	46.00	-22.89	QP
4	729.3700	30.78	-2.52	28.26	46.00	-17.74	QP
5	872.9300	33.45	-0.57	32.88	46.00	-13.12	QP
6	969.9300	29.30	2.00	31.30	54.00	-22.70	QP

Remark:

- Margin = Result (Result =Reading + Factor )-Limit
- Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain





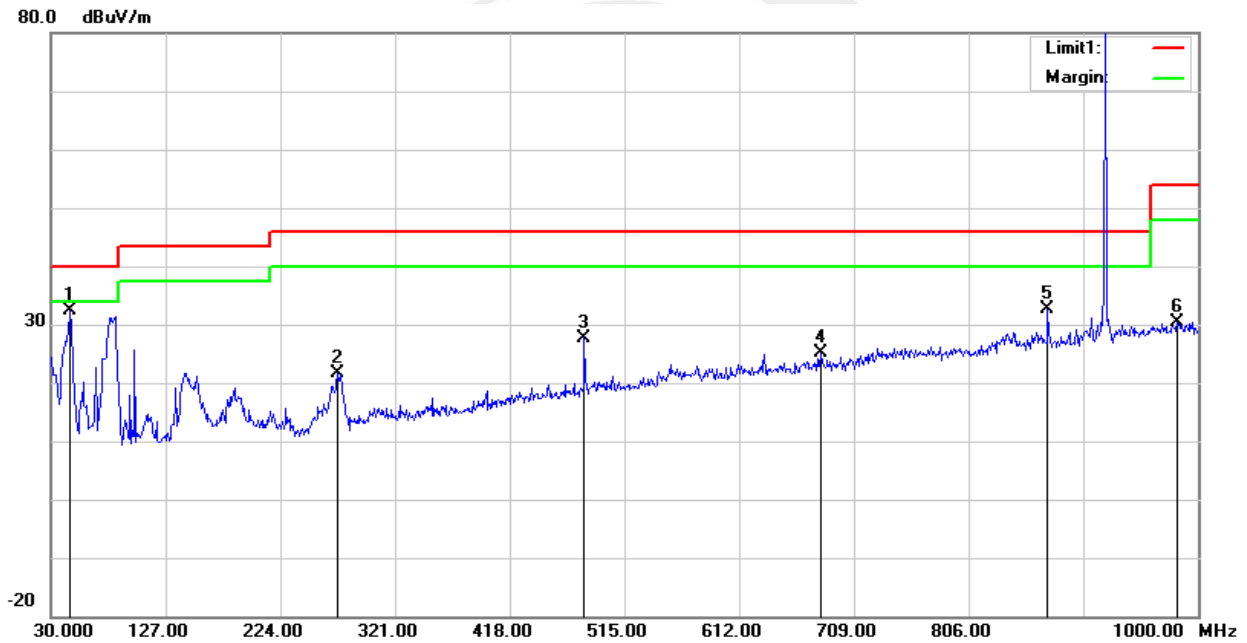


Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	AC 120V/60Hz	Phase:	Vertical
Test Mode:	Mode 1/2/3 (Mode 3 worst mode)		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	46.4900	53.71	-21.41	32.30	40.00	-7.70	QP
2	272.5000	37.04	-15.38	21.66	46.00	-24.34	QP
3	481.0500	36.36	-8.61	27.75	46.00	-18.25	QP
4	680.8700	29.53	-4.28	25.25	46.00	-20.75	QP
5	872.9300	33.30	-0.57	32.73	46.00	-13.27	QP
6	982.5400	27.94	2.52	30.46	54.00	-23.54	QP

Remark:

- 1. Margin = Result (Result =Reading + Factor )-Limit
- 2. Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain





Above 1G Radiation Spurious

**Low channel**

**PK**

Frequency (MHz)	Meter Reading (dBµV/m)	Detector (PK/QP/AV)	Amplifier (dB)	Loss (dB)	Antenna Factor (dB/m)	Orrected Factor (dB)	Corrected Amplitude (dBµV/m)	FCC Part 15.249/15.209/205		RX Antenna
								Limit (dBµV/m)	Margin (dB)	Polar (H/V)
1829.13	67.68	PK	45.10	4.91	25.00	-15.19	52.49	74	-21.51	H
1829.13	66.76	PK	45.10	4.91	25.00	-15.19	51.57	74	-22.43	V
2743.48	58.10	PK	44.10	5.03	25.80	-13.27	44.83	74	-29.17	H
2743.48	56.40	PK	44.10	5.03	25.80	-13.27	43.13	74	-30.87	V
3657.94	40.83	PK	43.80	6.72	33.40	-3.68	37.15	74	-36.85	H
3657.94	40.56	PK	43.80	6.72	33.40	-3.68	36.88	74	-37.12	V

**Mid channel**

**PK**

Frequency (MHz)	Meter Reading (dBµV/m)	Detector (PK/QP/AV)	Amplifier (dB)	Loss (dB)	Antenna Factor (dB/m)	Orrected Factor (dB)	Corrected Amplitude (dBµV/m)	FCC Part 15.249/15.209/205		RX Antenna
								Limit (dBµV/m)	Margin (dB)	Polar (H/V)
1835.03	67.76	PK	45.10	4.91	25.00	-15.19	52.57	74	-21.43	H
1835.03	66.79	PK	45.10	4.91	25.00	-15.19	51.60	74	-22.40	V
2752.44	58.27	PK	44.10	5.03	25.80	-13.27	45.00	74	-29.00	H
2752.44	56.55	PK	44.10	5.03	25.80	-13.27	43.28	74	-30.72	V
3669.93	40.88	PK	43.80	6.72	33.40	-3.68	37.20	74	-36.80	H
3669.93	40.82	PK	43.80	6.72	33.40	-3.68	37.14	74	-36.86	V

**High channel**

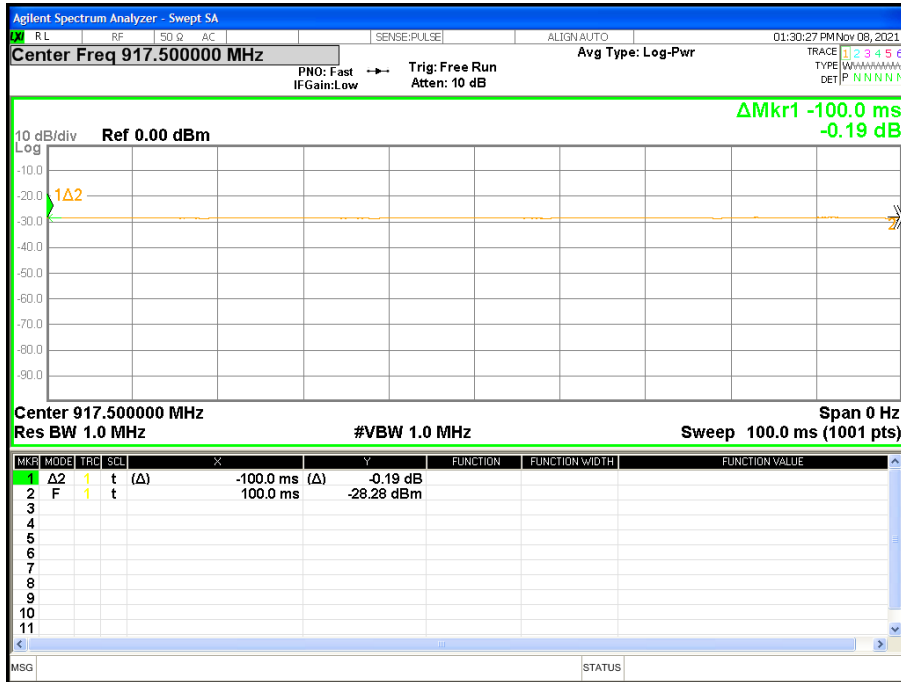
**PK**

Frequency (MHz)	Meter Reading (dBµV/m)	Detector (PK/QP/AV)	Amplifier (dB)	Loss (dB)	Antenna Factor (dB/m)	Orrected Factor (dB)	Corrected Amplitude (dBµV/m)	FCC Part 15.249/15.209/205		RX Antenna
								Limit (dBµV/m)	Margin (dB)	Polar (H/V)
1842.06	67.75	PK	45.10	4.91	25.00	-15.19	52.56	74	-21.44	H
1842.06	67.08	PK	45.10	4.91	25.00	-15.19	51.89	74	-22.11	V
2763.14	58.45	PK	44.10	5.03	25.80	-13.27	45.18	74	-28.82	H
2763.14	56.52	PK	44.10	5.03	25.80	-13.27	43.25	74	-30.75	V
3683.93	40.72	PK	43.80	6.72	33.40	-3.68	37.04	74	-36.96	H
3683.93	40.88	PK	43.80	6.72	33.40	-3.68	37.20	74	-36.80	V

Note: The PK value is lower than the AV limit, the AV data does not need to be tested.



Duty cycle



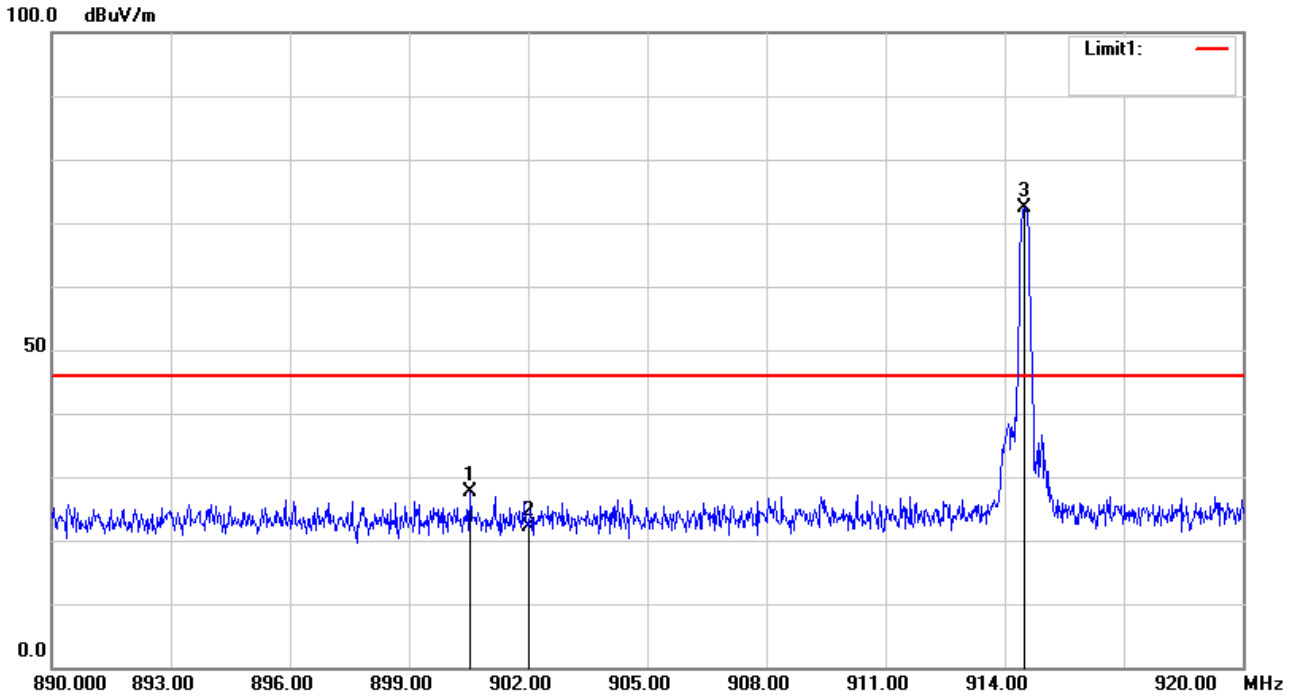
Ton	Tp	Duty cycle(%)	Duty factor(dB)
100.000	100.000	100.00%	0.00

Note: Duty Factor=20\*LOG10(1/(Ton/Tp))



(Radiation Band edge)

**Low channel**  
Horizontal



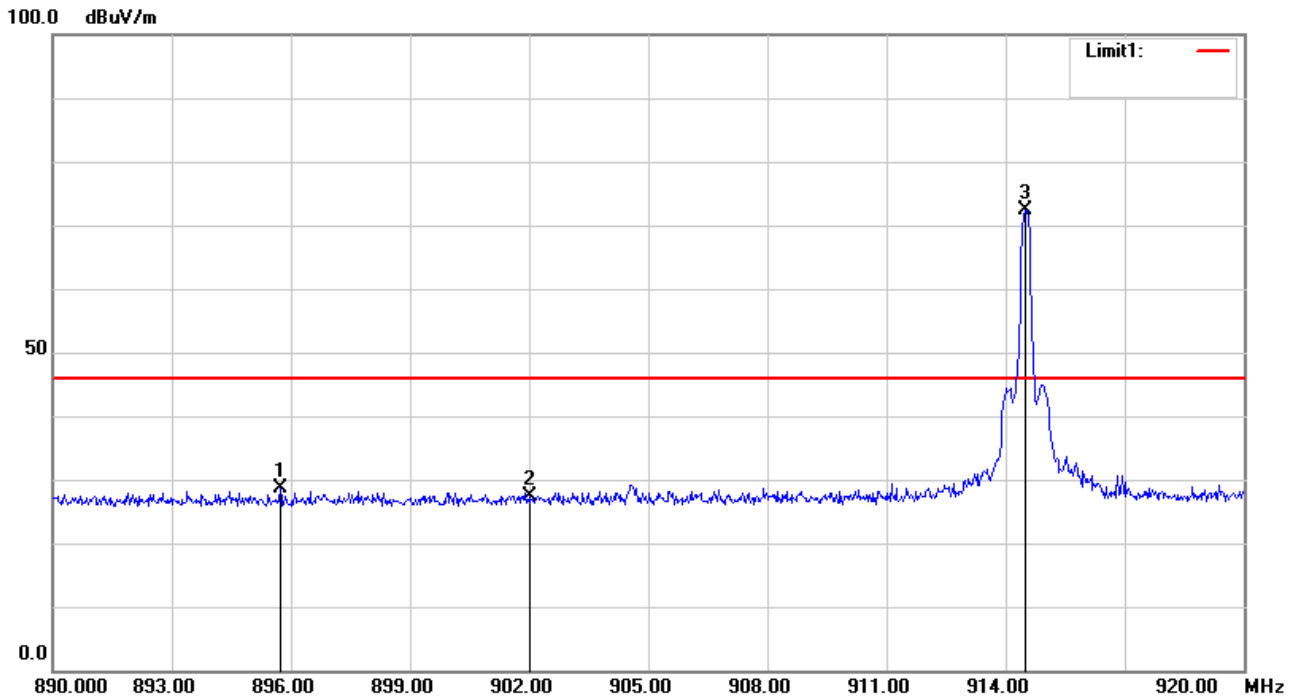
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	900.5300	28.18	-0.44	27.74	46.00	-18.26	peak
2	902.0000	22.65	-0.40	22.25	46.00	-23.75	peak

**Fundamental Frequency**

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Duty cycle Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
3	914.5000	72.60	-0.11	-	72.49	114.00	-41.51	peak



Vertical



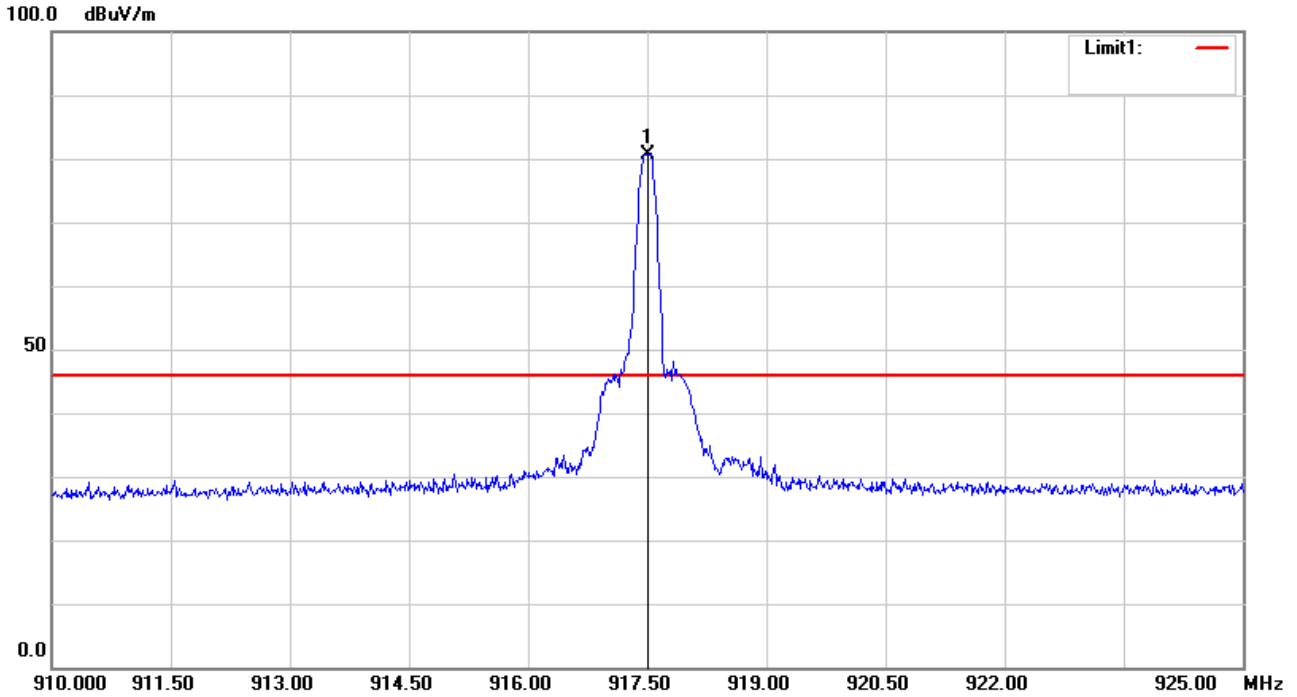
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	895.7300	29.17	-0.55	28.62	46.00	-17.38	peak
2	902.0000	27.69	-0.40	27.29	46.00	-18.71	peak

Fundamental Frequency

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Duty cycle Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
3	914.5000	72.52	-0.11	-	72.41	114.00	-41.59	peak

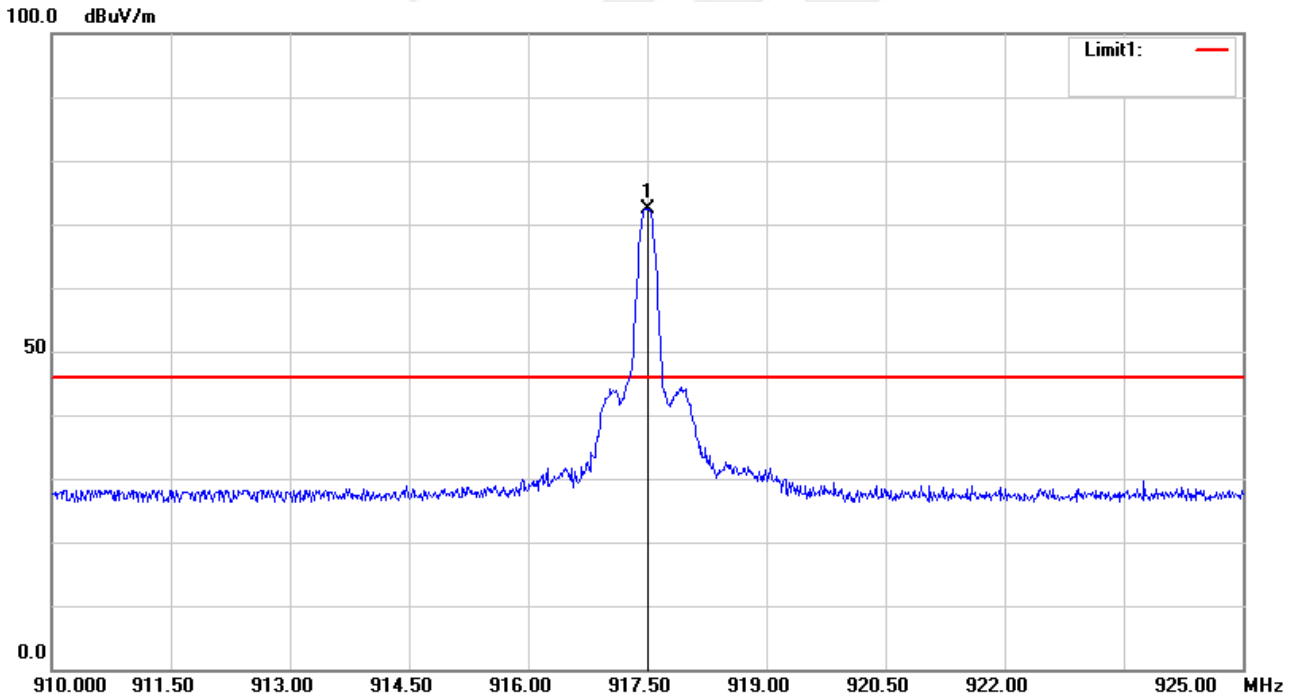


Mid channel  
Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Duty cycle Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	917.5000	80.72	-0.06	-	80.66	114.00	-33.34	peak

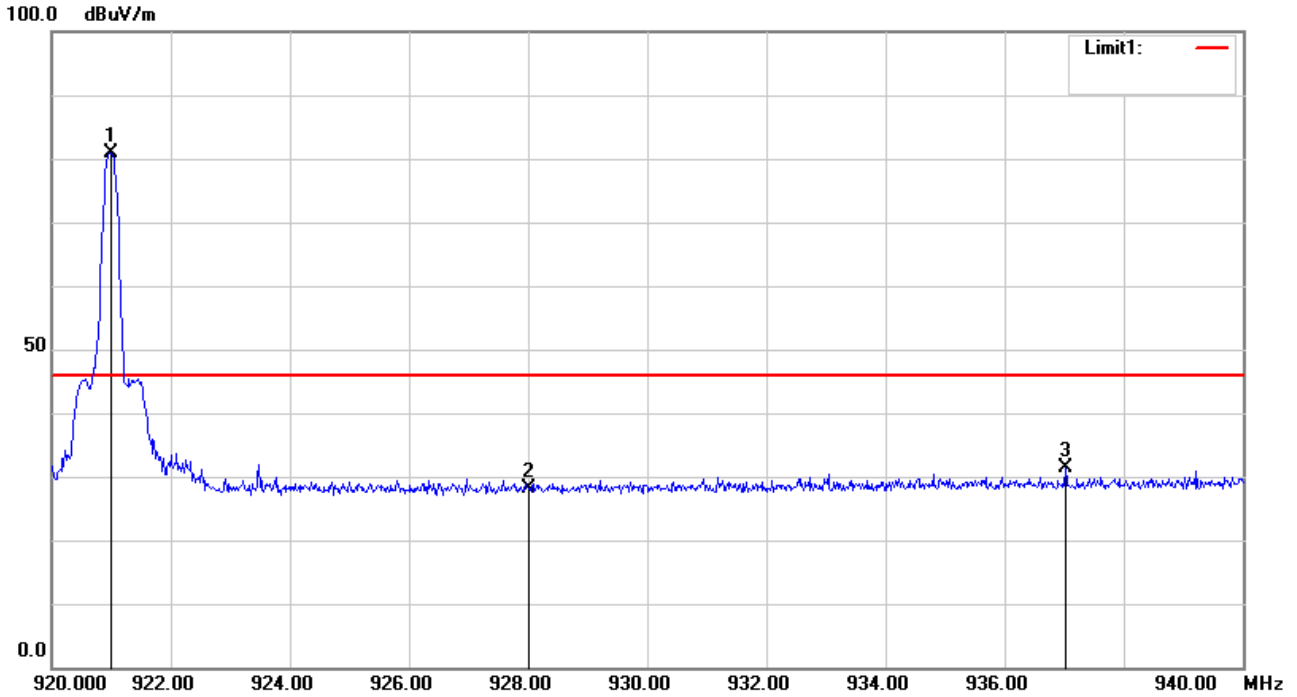
Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Duty cycle Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	917.5000	72.46	-0.06	-	72.40	114.00	-41.60	peak



High channel  
Horizontal



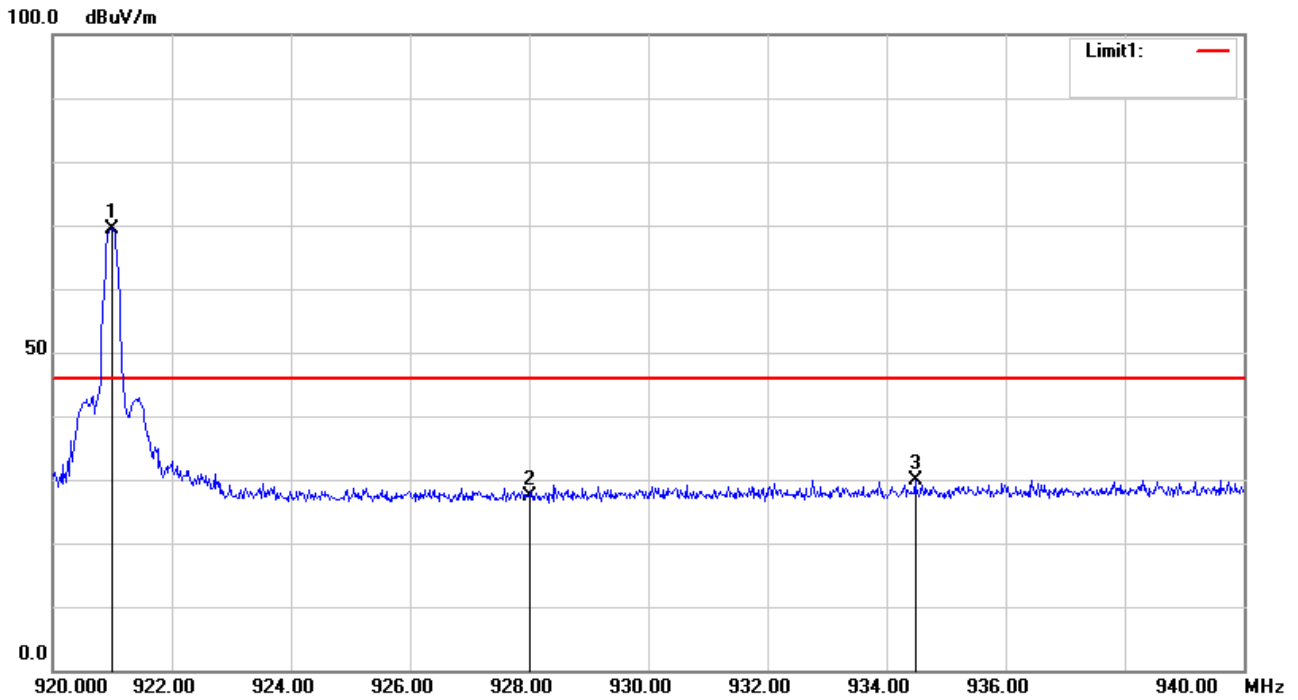
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2	928.0000	27.59	0.43	28.02	46.00	-17.98	peak
3	937.0200	30.13	1.13	31.26	46.00	-14.74	peak

Fundamental Frequency

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Duty cycle Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	921.0000	80.73	0.04	-	80.77	114.00	-33.23	peak



Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2	928.0000	27.05	0.43	27.48	46.00	-18.52	peak
3	934.4800	29.03	0.92	29.95	46.00	-16.05	peak

Fundamental Frequency

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Duty cycle Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	921.0000	69.34	0.04	-	69.38	114.00	-44.62	peak



## 4. BANDWIDTH TEST

### 4.1 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- b. Spectrum Setting: RBW=1% to 5% of the OBW, VBW $\geq$ RBW, Sweep time = Auto.

### 4.2 TEST SETUP



### 4.3 EUT OPERATION CONDITIONS

TX mode.



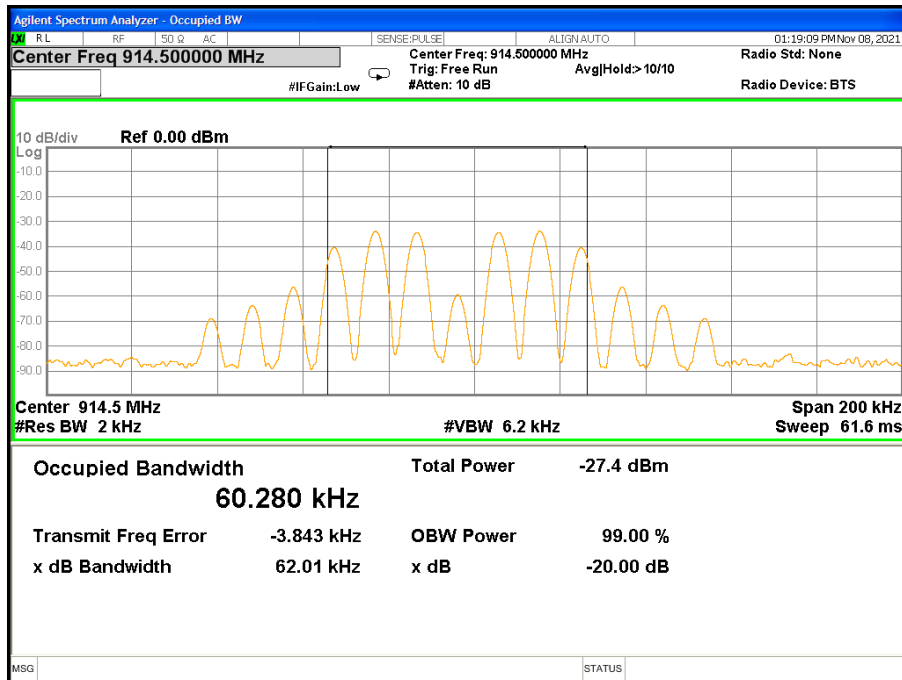


4.4 TEST RESULTS

Temperature:	25 °C	Relative Humidity:	50%
Test Voltage:	AC 120V/60Hz		

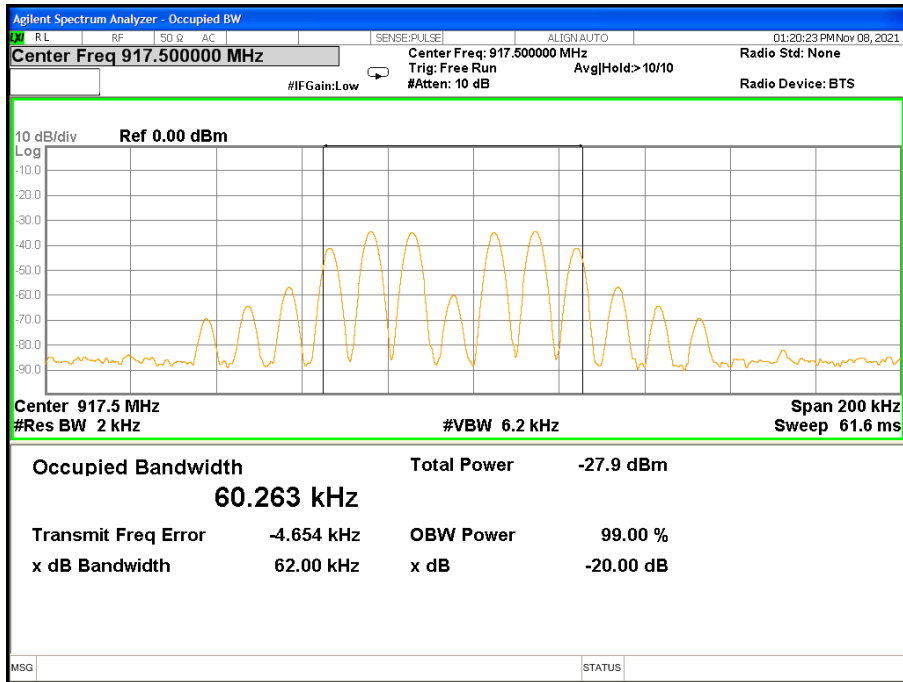
Test Channel	Frequency(MHz)	20 dB Bandwidth(KHz)	99% Bandwidth(KHz)
CH01	914.5	62.01	60.280
CH02	917.5	62.00	60.263
CH03	921	79.33	76.043

Low Channel

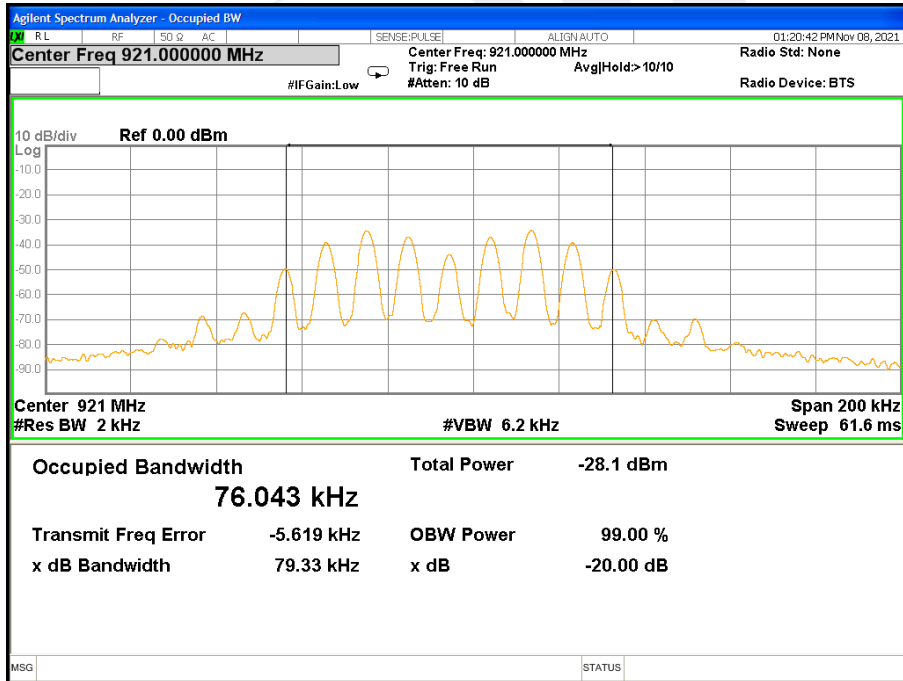




### Mid Channel



### High Channel





## 5. ANTENNA REQUIREMENT

### 5.1 STANDARD REQUIREMENT

According to the FCC Part 15 Paragraph 15.203& RSS-Gen Issue 5, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

### 5.2 EUT ANTENNA

The EUT antenna is Ceramic Antenna.It conforms to the standard requirements.





## 6. FREQUENCY STABILITY

### 6.1 LIMITS

The frequency tolerance of the carrier signal shall be maintained within +/-0.02% of the operating frequency over a temperature variation of -30 degrees to 50 degrees C at normal supply voltage, and for a variation in primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees.

### 6.2 TEST PROCEDURE

1. The EUT was placed inside the environmental test chamber and powered by nominal DC voltage.
2. Turn the EUT on and couple its output to spectrum analyzer.
3. Turn the EUT off and set the chamber to the highest temperature specified.
4. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
5. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
6. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

### 6.3 TEST RESULT

Channel 02 (917.5MHz)

Voltage vs. Frequency Stability

Voltage vs. Frequency Stability Voltage(V)	Measurement Frequency(MHz)
138	917.5021
120	917.5011
102	917.5018
Max.Deviation(MHz)	0.0021
Max.Deviation(ppm)	2.29

Rated working voltage: AC 120V/60Hz

Temperature vs. Frequency Stability

Temperature(°C)	Measurement Frequency(MHz)
-30	917.5025
-20	917.5017
-10	917.5020
0	917.5021
10	917.5020
20	917.5023
30	917.5018
40	917.5019
50	917.5020
Max.Deviation(MHz)	0.0025
Max.Deviation(ppm)	2.72



## APPENDIX- PHOTOS OF TEST SETUP

Note: See test photos in setup photo document for the actual connections between Product and support equipment.

\*\*\*\*\*END OF THE REPORT\*\*\*\*\*

