S T S L A B

FCC TEST REPORT

Report No:STS1906093W01

Issued for

Lakeshore Learning Materials

2695 E. Dominguez St. Carson CA ,90895, USA

Product Name:	Wireless Classroom Headphones Set, Extra Wireless Headphones
Brand Name:	Lakeshore®
Model Name:	DD518
Series Model:	N/A
FCC ID:	2AGG4DD518A
Test Standard:	FCC Part 15.249

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TEST RESULT CERTIFICATION

Applicant's Name .....: Lakeshore Learning Materials

Address .....: 2695 E. Dominguez St. Carson CA ,90895, USA

Manufacture's Name .....: Lakeshore Learning Materials

Address .....: 2695 E. Dominguez St. Carson CA ,90895, USA

Product Description

Product Name .....: Wireless Classroom Headphones Set,
Extra Wireless Headphones

Brand Name .....: Lakeshore®

Model Name .....: DD518

Series Model .....: N/A

Test Standards.....: FCC Part15.249

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 requirements. And it is applicable only to the tested sample identified in the report.
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Date of Test .....:

Date of performance of tests ..: 25 June 2019 ~28 June 2019

Date of Issue .....: 28 June 2019

Test Result.....: **Pass**

Testing Engineer : (Chris Chen)

Technical Manager : (Sunday Hu)

Authorized Signatory : (Vita Li)

TESTING CONSULTING SOLUTION CERTIFICATION STS APPROVAL

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Revision History

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	28 June 2019	STS1906093W01	ALL	Initial Issue

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1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part 15.249 , Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	Pass	
15.203	Antenna Requirement	Pass	
15.249	Radiated Spurious Emission	Pass	
15.205	Radiated Band Edge Emission	Pass	
15.249	20dB Bandwidth	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. : 1/F., Building B, Zhuoke Science Park, No.190, Chongqing Road, Fuyong Street, Bao'an District, Shenzhen, Guangdong, China
FCC test Firm Registration Number: 625569
A2LA Certificate No.: 4338.01

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y** ± **U**, where expended 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	±0.71dB
2	Unwanted Emissions, conducted	±0.63dB
3	All emissions, radiated 30-200MHz	±3.43dB
4	All emissions, radiated 200MHz-1GHz	±3.57dB
5	All emissions, radiated>1G	±4.13dB
6	Conducted Emission (9KHz-150KHz)	±3.18dB
7	Conducted Emission (150KHz-30MHz)	±2.70dB

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

Product Name	Wireless Classroom Headphones Set, Extra Wireless Headphones
Trade Name	Lakeshore®
Model Name	DD518
Series Model	N/A
Model Difference	N/A
Product Description	The EUT is a WIRELESS CLASSRM HEADPHONE SET EXTRA WIRELESS HEADPHONES Operation Frequency: 915.5, 916, 916.5MHz Modulation Type: FM Antenna Designation: Monopole Antenna Antenna Gain(Peak): 0 dBi Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.
Channel List	Please refer to the Note 2.
Adapter	Input: AC120V, 60 Hz, 9W Output: DC 4.5V, 200mA
Hardware version number	N/A
Software version number	N/A

Note:

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

2.

Channel	Frequency (MHz)
01	915.5
02	916
03	916.5

3. Table for Filed Antenna

Ant	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	Lakeshore®	DD518	Monopole	NA	0	Antenna

2.2 DESCRIPTION OF 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..

Radiated spurious emissions

Pretest Mode	Description	Data/Modulation
Mode 1	TX CH01	FM
Mode 2	TX CH02	FM
Mode 3	TX CH03	FM

Conducted Emissions

Pretest Mode	Description	Data/Modulation
Mode 1	TX CH01	FM
Mode 2	TX CH02	FM
Mode 3	TX CH03	FM

Note:

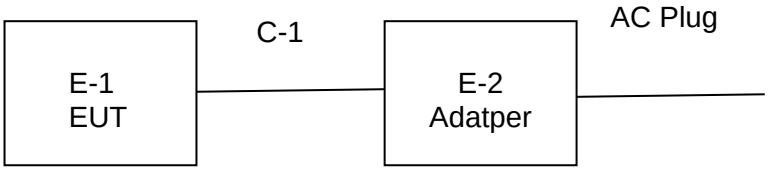
(1) All above mode have been measurement, only worst data was reported.

(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

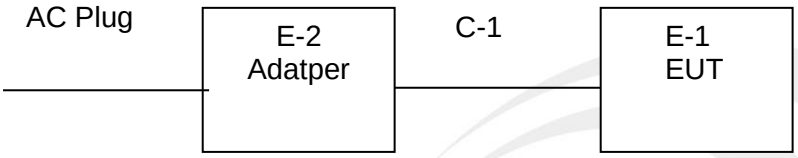
2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

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



2.4 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.	Serial No.	Note
E-2	Adapter	N/A	GPU350450200WDOO	N/A	N/A
C-1	DC Cable	N/A	100cm	N/A	N/A

Support units

Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	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.

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2.5 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	2018.10.13	2019.10.12
Signal Analyzer	Agilent	N9020A	MY51110105	2019.03.02	2020.03.01
Active loop Antenna	ZHINAN	ZN30900C	16035	2018.03.11	2021.03.10
Bilog Antenna	TESEQ	CBL6111D	34678	2017.11.02	2020.11.1
Horn Antenna	SCHWARZBECK	BBHA 9120D(1201)	9120D-1343	2018.10.19	2021.10.18
SHF-EHF Horn Antenna (18G-40GHz)	A-INFO	LB-180400-KF	J211020657	2018.03.11	2021.03.10
Pre-Amplifier(0.1M-3GHz)	EM	EM330	060665	2018.10.13	2019.10.12
Pre-Amplifier (1G-18GHz)	SKET	LNPA-01018G-45	SK2018080901	2018.10.13	2019.10.12
Temperature & Humidity	HH660	Mieo	N/A	2018.10.11	2019.10.10
turn table	EM	SC100_1	60531	N/A	N/A
Antenna mast	EM	SC100	N/A	N/A	N/A
Test SW	BULUN	BL410-E/18.905			

Conduction Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Test Receiver	R&S	ESCI	101427	2018.10.13	2019.10.12
LISN	R&S	ENV216	101242	2018.10.11	2019.10.10
LISN	EMCO	3810/2NM	23625	2018.10.11	2019.10.10
Temperature & Humidity	HH660	Mieo	N/A	2018.10.11	2019.10.10
Test SW	FARAD	EZ-EMC(Ver.STSLAB-03A1 CE)			

RF Connected Test

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
USB RF power sensor	DARE	RPR3006W	15I00041SNO03	2018.10.13	2019.10.12
Signal Analyzer	Agilent	N9020A	MY49100060	2018.10.13	2019.10.12
Temperature & Humidity	HH660	Mieo	N/A	2018.10.11	2019.10.10
Test SW	FARAD	LZ-RF /LzRf-3A3			

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION LIMITS

Operating frequency band. In case the emission fall within the restricted band specified on Part 15.249 limit in the table below has to be followed.

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.

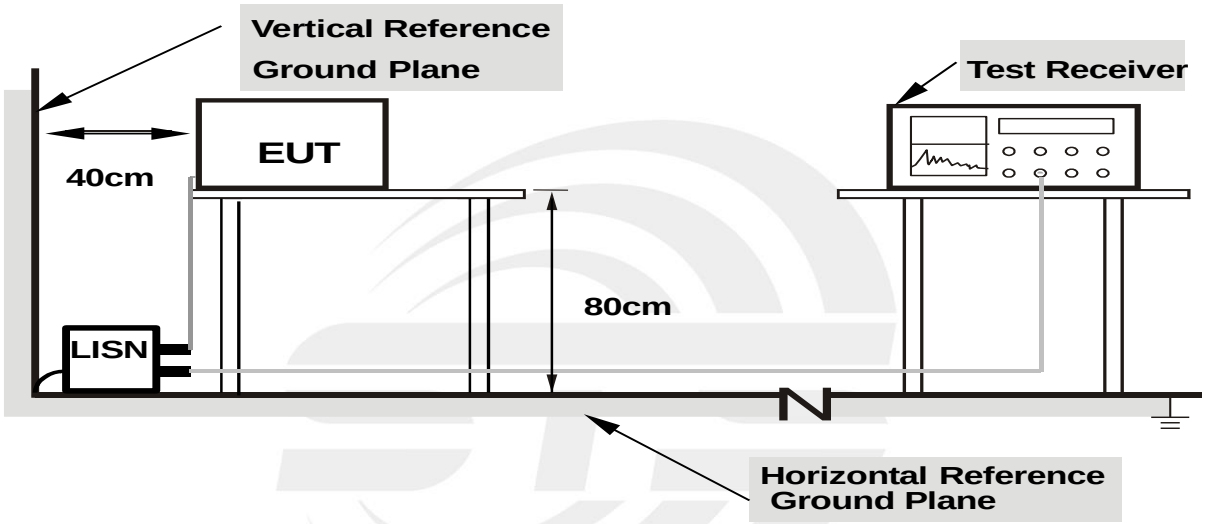
The following table is the setting of the receiver

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

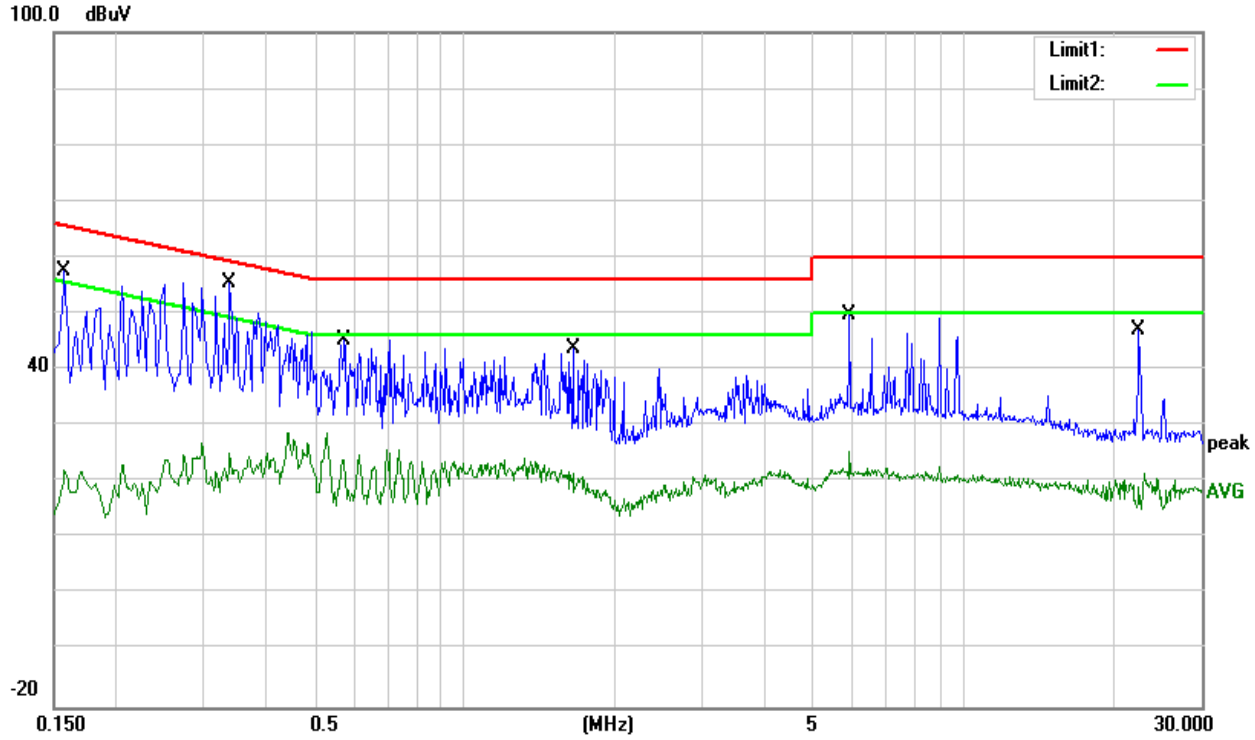
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

3.1.5 TEST RESULTS

Temperature:	25.3 ℃	Relative Humidity:	62%
Test Voltage:	AC 120V/60Hz	Phase:	L
Test Mode:	Mode 1		

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
0.1580	37.38	20.21	57.59	65.57	-7.98	QP
0.1580	4.75	20.21	24.96	55.57	-30.61	AVG
0.3380	34.81	20.67	55.48	59.25	-3.77	QP
0.3380	8.08	20.67	28.75	49.25	-20.50	AVG
0.5740	24.92	20.38	45.30	56.00	-10.70	QP
0.5740	5.30	20.38	25.68	46.00	-20.32	AVG
1.6460	23.61	20.16	43.77	56.00	-12.23	QP
1.6460	0.81	20.16	20.97	46.00	-25.03	AVG
5.9220	29.82	19.94	49.76	60.00	-10.24	QP
5.9220	5.58	19.94	25.52	50.00	-24.48	AVG
22.5060	27.37	19.73	47.10	60.00	-12.90	QP
22.5060	1.88	19.73	21.61	50.00	-28.39	AVG

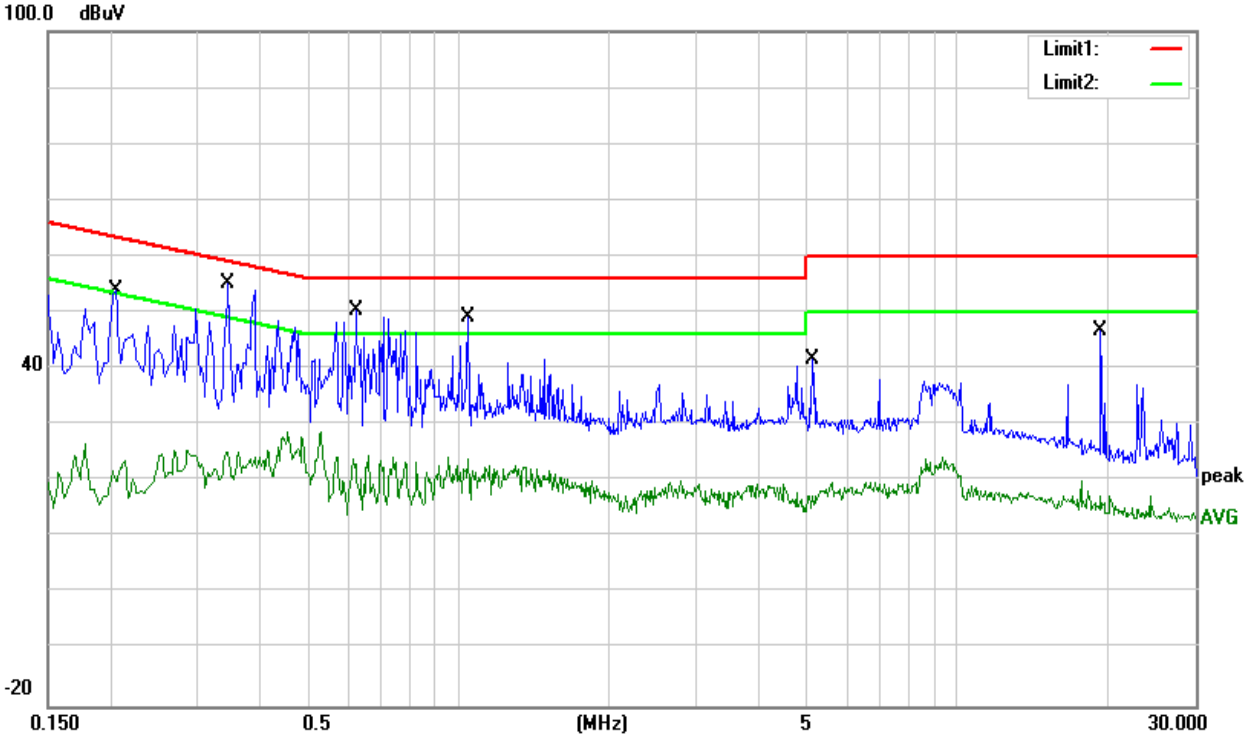
Remark:
1. All readings are Quasi-Peak and Average values.
2. Margin = Result (Result =Reading + Factor)–Limit



Temperature:	25.3 ℃	Relative Humidity:	62%
Test Voltage:	AC 120V/60Hz	Phase:	N
Test Mode:	Mode 1		

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
0.2060	33.62	20.35	53.97	63.37	-9.40	QP
0.2060	5.07	20.35	25.42	53.37	-27.95	AVG
0.3460	34.58	20.65	55.23	59.06	-3.83	QP
0.3460	8.10	20.65	28.75	49.06	-20.31	AVG
0.6220	29.88	20.34	50.22	56.00	-5.78	QP
0.6220	4.12	20.34	24.46	46.00	-21.54	AVG
1.0460	28.96	20.16	49.12	56.00	-6.88	QP
1.0460	3.82	20.16	23.98	46.00	-22.02	AVG
5.1140	21.60	20.01	41.61	60.00	-18.39	QP
5.1140	-0.12	20.01	19.89	50.00	-30.11	AVG
19.3900	26.82	19.94	46.76	60.00	-13.24	QP
19.3900	-2.47	19.94	17.47	50.00	-32.53	AVG

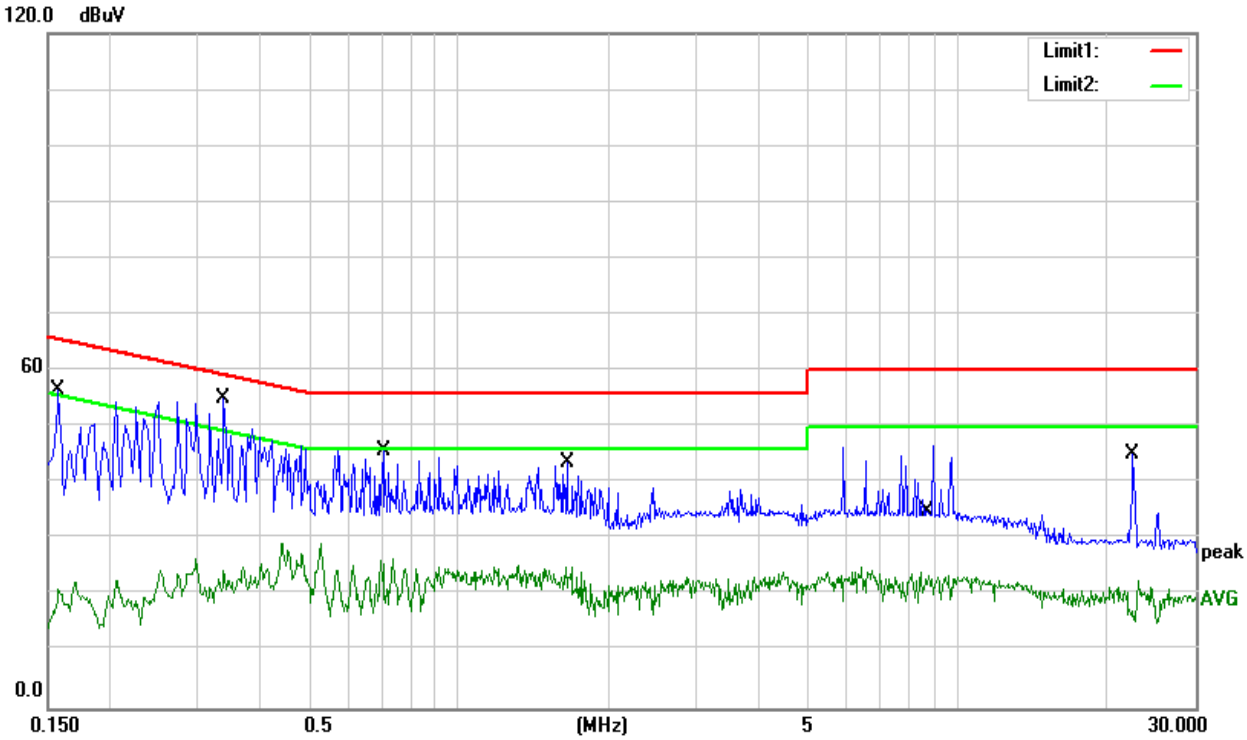
Remark:
1. All readings are Quasi-Peak and Average values.
2. Margin = Result (Result =Reading + Factor)–Limit



Temperature:	25.3 ℃	Relative Humidity:	62%
Test Voltage:	AC 120V/60Hz	Phase:	L
Test Mode:	Mode 2		

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
0.1580	36.38	20.21	56.59	65.57	-8.98	QP
0.1580	4.21	20.21	24.42	55.57	-31.15	AVG
0.3380	34.31	20.67	54.98	59.25	-4.27	QP
0.3380	8.58	20.67	29.25	49.25	-20.00	AVG
0.7060	25.33	20.28	45.61	56.00	-10.39	QP
0.7060	6.40	20.28	26.68	46.00	-19.32	AVG
1.6420	23.62	20.15	43.77	56.00	-12.23	QP
1.6420	4.98	20.15	25.13	46.00	-20.87	AVG
8.7660	26.69	19.88	46.57	60.00	-13.43	QP
8.7660	3.55	19.88	23.43	50.00	-26.57	AVG
22.5060	25.37	19.73	45.10	60.00	-14.90	QP
22.5060	2.88	19.73	22.61	50.00	-27.39	AVG

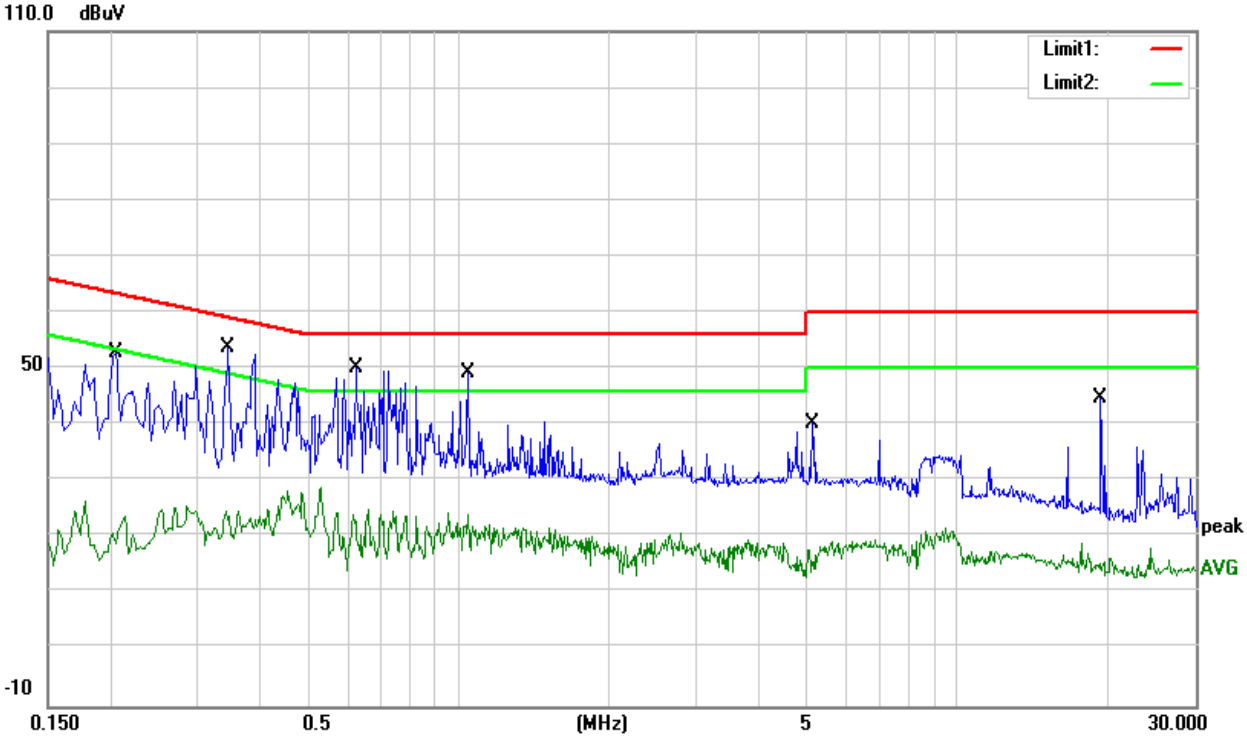
Remark:
1. All readings are Quasi-Peak and Average values.
2. Margin = Result (Result =Reading + Factor)–Limit



Temperature:	25.3 ℃	Relative Humidity:	62%
Test Voltage:	AC 120V/60Hz	Phase:	N
Test Mode:	Mode 2		

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
0.2060	32.62	20.35	52.97	63.37	-10.40	QP
0.2060	5.07	20.35	25.42	53.37	-27.95	AVG
0.3460	33.08	20.65	53.73	59.06	-5.33	QP
0.3460	8.06	20.65	28.71	49.06	-20.35	AVG
0.6220	29.88	20.34	50.22	56.00	-5.78	QP
0.6220	4.62	20.34	24.96	46.00	-21.04	AVG
1.0460	28.96	20.16	49.12	56.00	-6.88	QP
1.0460	1.60	20.16	21.76	46.00	-24.24	AVG
5.1140	20.10	20.01	40.11	60.00	-19.89	QP
5.1140	-0.41	20.01	19.60	50.00	-30.40	AVG
19.3900	24.82	19.94	44.76	60.00	-15.24	QP
19.3900	-1.97	19.94	17.97	50.00	-32.03	AVG

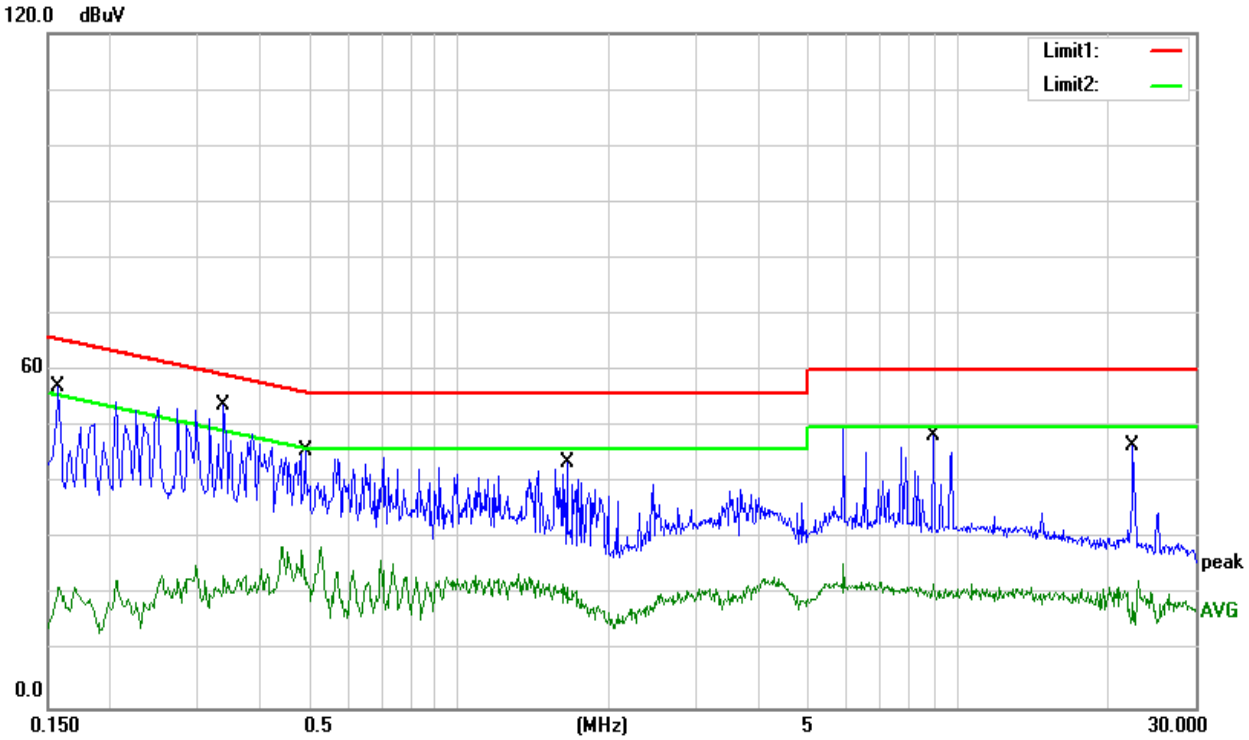
Remark:
1. All readings are Quasi-Peak and Average values.
2. Margin = Result (Result =Reading + Factor)–Limit



Temperature:	25.3 ℃	Relative Humidity:	62%
Test Voltage:	AC 120V/60Hz	Phase:	L
Test Mode:	Mode 3		

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
0.1580	36.88	20.21	57.09	65.57	-8.48	QP
0.1580	3.28	20.21	23.49	55.57	-32.08	AVG
0.3380	33.31	20.67	53.98	59.25	-5.27	QP
0.3380	8.08	20.67	28.75	49.25	-20.50	AVG
0.4940	25.24	20.43	45.67	56.10	-10.43	QP
0.4940	8.19	20.43	28.62	46.10	-17.48	AVG
1.6460	23.61	20.16	43.77	56.00	-12.23	QP
1.6460	0.81	20.16	20.97	46.00	-25.03	AVG
8.9540	28.69	19.88	48.57	60.00	-11.43	QP
8.9540	2.10	19.88	21.98	50.00	-28.02	AVG
22.5060	26.87	19.73	46.60	60.00	-13.40	QP
22.5060	2.88	19.73	22.61	50.00	-27.39	AVG

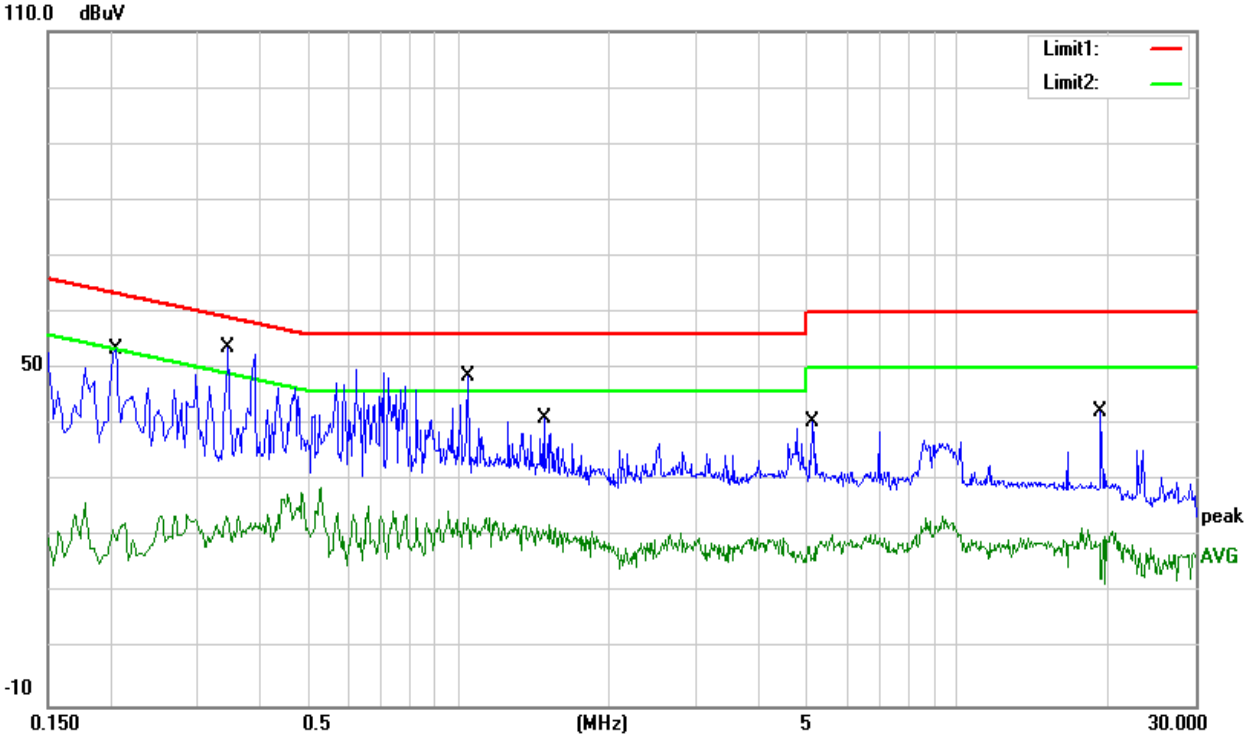
Remark:
1. All readings are Quasi-Peak and Average values.
2. Margin = Result (Result =Reading + Factor)–Limit



Temperature:	25.3 ℃	Relative Humidity:	62%
Test Voltage:	AC 120V/60Hz	Phase:	N
Test Mode:	Mode 3		

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
0.2060	33.12	20.35	53.47	63.37	-9.90	QP
0.2060	3.57	20.35	23.92	53.37	-29.45	AVG
0.3460	33.08	20.65	53.73	59.06	-5.33	QP
0.3460	8.06	20.65	28.71	49.06	-20.35	AVG
1.0460	28.46	20.16	48.62	56.00	-7.38	QP
1.0460	3.43	20.16	23.59	46.00	-22.41	AVG
1.4860	21.00	20.15	41.15	56.00	-14.85	QP
1.4860	2.11	20.15	22.26	46.00	-23.74	AVG
5.1140	20.60	20.01	40.61	60.00	-19.39	QP
5.1140	3.61	20.01	23.62	50.00	-26.38	AVG
19.3900	22.32	19.94	42.26	60.00	-17.74	QP
19.3900	1.11	19.94	21.05	50.00	-28.95	AVG

Remark:
1. All readings are Quasi-Peak and Average values.
2. Margin = Result (Result =Reading + Factor)–Limit



3.2 RADIATED EMISSION MEASUREMENT

3.2.1 RADIATED EMISSION LIMITS

20dBc 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) limit in the table below has to be followed.

Standard FCC 15.209

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(μV)/m (Peak) 54.0 dB(μV)/m (Average)	3

Standard FCC 15.249

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.

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 arotating 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 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)

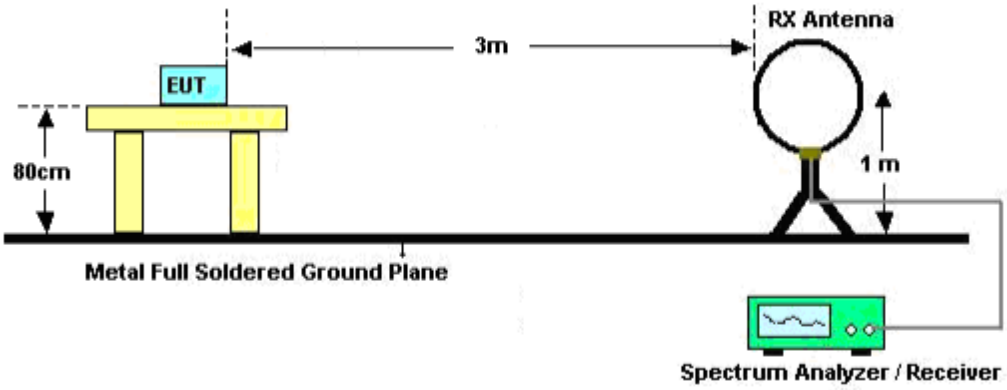
g. For the actual test configuration, please refer to the related Item –EUT Test Photos.
Note: Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

3.2.3 DEVIATION FROM TEST STANDARD

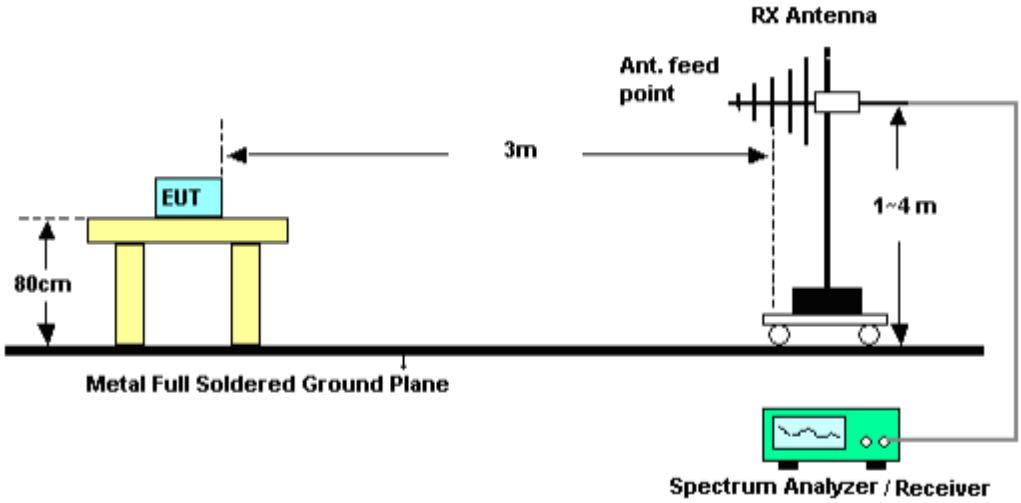
No deviation

3.2.4 TEST SETUP

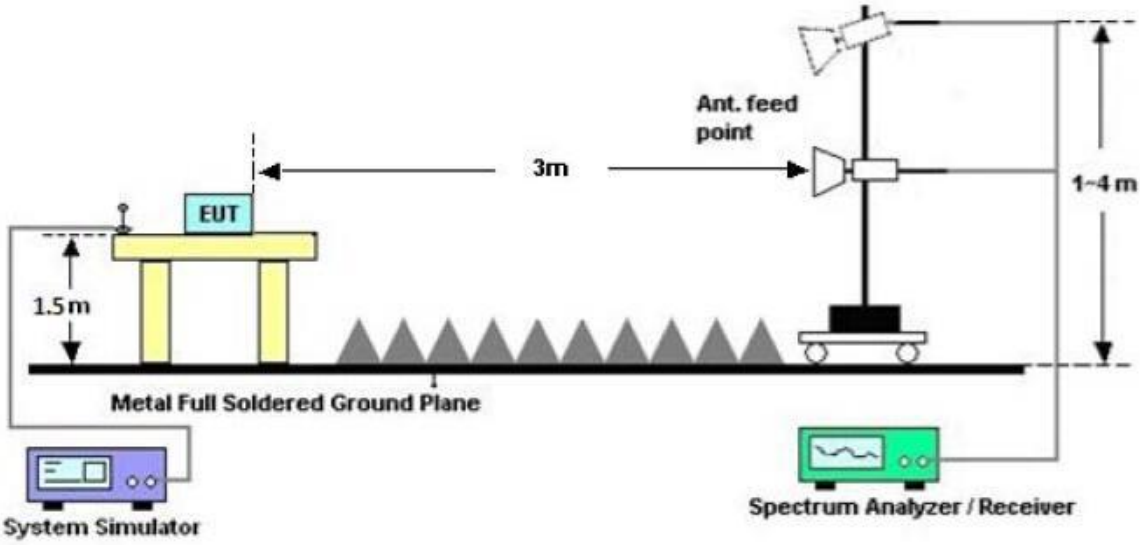
（A）Radiated Emission Test-Up Frequency Below 30MHz



（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:

FS = RA + AF + CL - AG

Where

FS = Field Strength

CL = Cable Attenuation Factor (Cable Loss)

RA = Reading Amplitude

AG = Amplifier Gain

AF = Antenna Factor

For example

Frequency	FS	RA	AF	CL	AG	Factor
(MHz)	(dBμV/m)	(dBμV/m)	(dB)	(dB)	(dB)	(dB)
300	40	58.1	12.2	1.6	31.9	-18.1

Factor=AF+CL-AG

1/F., Building B, Zhuoke Science Park, No.190, Chongqing Road, Fuyong Street, Bao'an District, Shenzhen, Guangdong, China
Tel: + 86-755 3688 6288 Fax:+ 86-755 3688 6277 Http://www.stsapp.com E-mail: sts@stsapp.com

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:	25.1 ℃	Relative Humidity:	62%
Test Voltage:	AC 120V/60Hz	Polarization:	---
Test Mode:	TX Mode		

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	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 (specific distance/test distance)(dB);

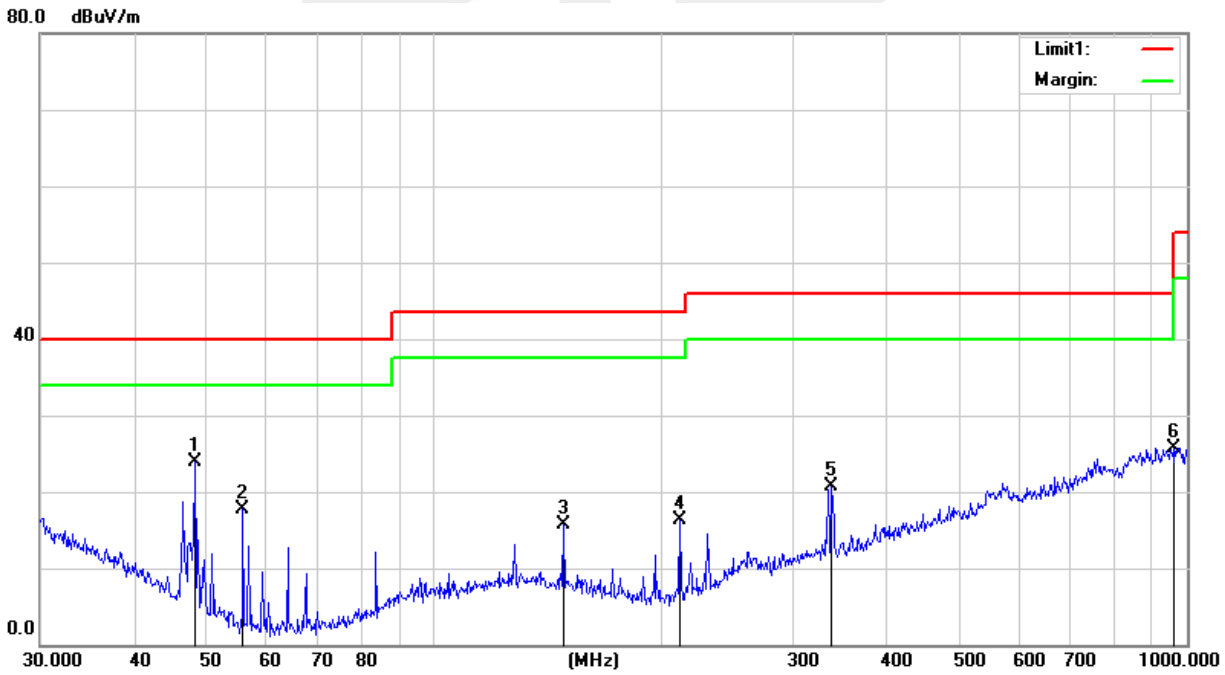
Limit line = specific limits(dBuv) + distance extrapolation factor.

Between 30MHz – 1000 MHz Radiation Spurious

Temperature:	25.1 ℃	Relative Humidity:	62%
Test Voltage:	AC 120V/60Hz	Phase:	Horizontal
Test Mode:	Mode 1		

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
48.1625	43.48	-19.63	23.85	40.00	-16.15	QP
55.8046	40.76	-22.99	17.77	40.00	-22.23	QP
148.4410	32.61	-16.85	15.76	43.50	-27.74	QP
212.2692	36.15	-19.91	16.24	43.50	-27.26	QP
337.2155	34.49	-13.79	20.70	46.00	-25.30	QP
958.7943	25.45	0.35	25.80	46.00	-20.20	QP

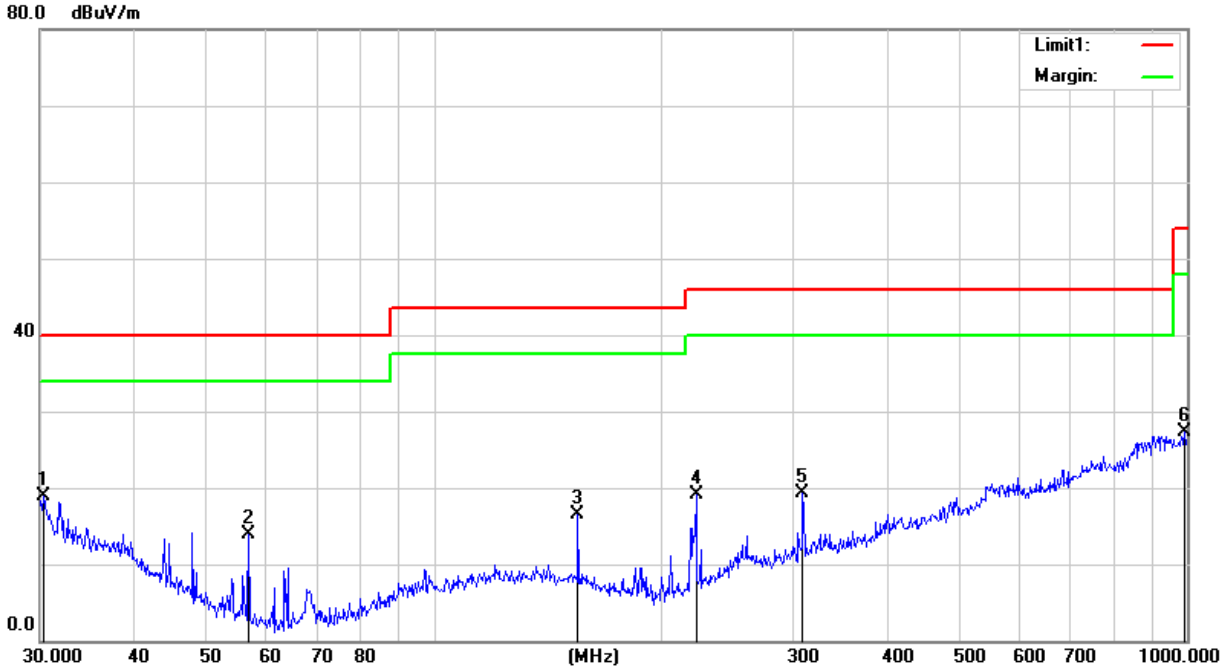
Remark:
1. All readings are Quasi-Peak .
2. Margin = Result (Result =Reading + Factor)–Limit



Temperature:	25.1 ℃	Relative Humidity:	62%
Test Voltage:	AC 120V/60Hz	Phase:	Vertical
Test Mode:	Mode 1		

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
30.3170	30.23	-11.35	18.88	40.00	-21.12	QP
56.7916	37.40	-23.42	13.98	40.00	-26.02	QP
155.3642	34.70	-18.25	16.45	43.50	-27.05	QP
222.9500	38.07	-18.93	19.14	46.00	-26.86	QP
308.9125	33.74	-14.53	19.21	46.00	-26.79	QP
993.0113	27.47	-0.10	27.37	54.00	-26.63	QP

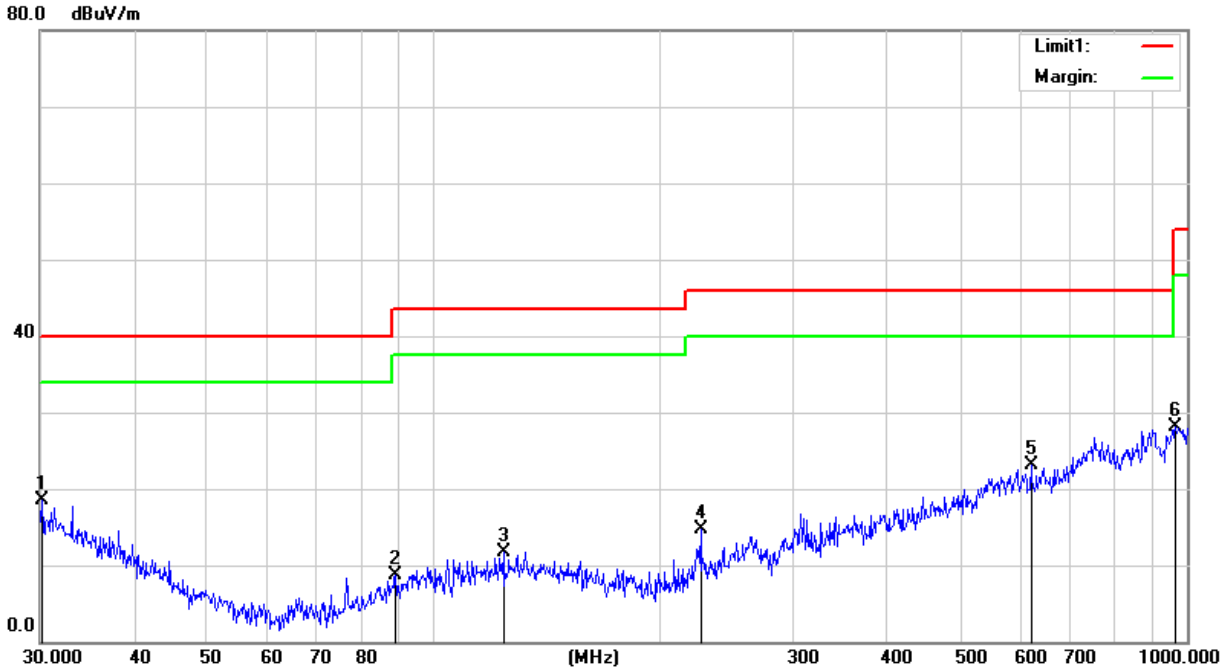
Remark:
1. All readings are Quasi-Peak.
2. Margin = Result (Result =Reading + Factor)–Limit



Temperature:	25.1 ℃	Relative Humidity:	62%
Test Voltage:	AC 120V/60Hz	Phase:	Horizontal
Test Mode:	Mode 2		

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
30.2110	28.87	-10.30	18.57	40.00	-21.43	QP
88.9637	29.03	-20.33	8.70	43.50	-34.80	QP
123.6984	28.33	-16.62	11.71	43.50	-31.79	QP
226.0994	32.55	-17.84	14.71	46.00	-31.29	QP
620.7096	29.67	-6.64	23.03	46.00	-22.97	QP
965.5421	27.74	0.31	28.05	54.00	-25.95	QP

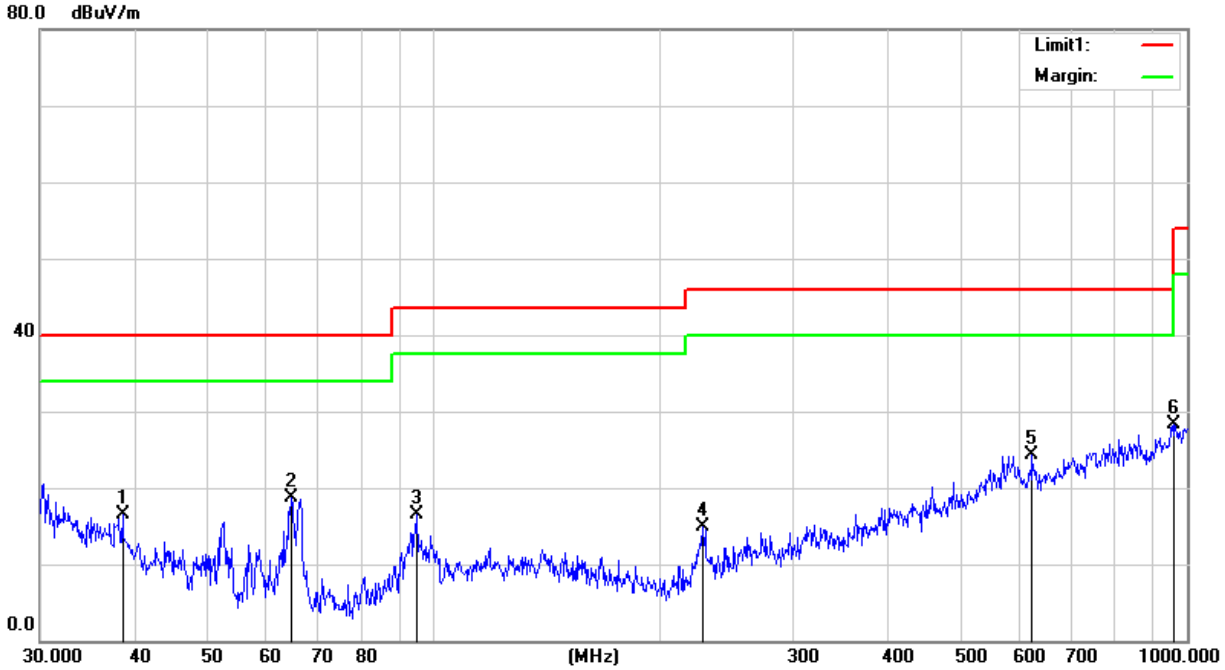
Remark:
1. All readings are Quasi-Peak .
2. Margin = Result (Result =Reading + Factor)–Limit



Temperature:	25.1 ℃	Relative Humidity:	62%
Test Voltage:	AC 120V/60Hz	Phase:	Vertical
Test Mode:	Mode 2		

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
38.6160	32.06	-15.61	16.45	40.00	-23.55	QP
64.6594	42.86	-24.23	18.63	40.00	-21.37	QP
95.0930	36.18	-19.68	16.50	43.50	-27.00	QP
227.6904	33.57	-18.63	14.94	46.00	-31.06	QP
622.8900	30.75	-6.44	24.31	46.00	-21.69	QP
962.1621	28.51	-0.12	28.39	54.00	-25.61	QP

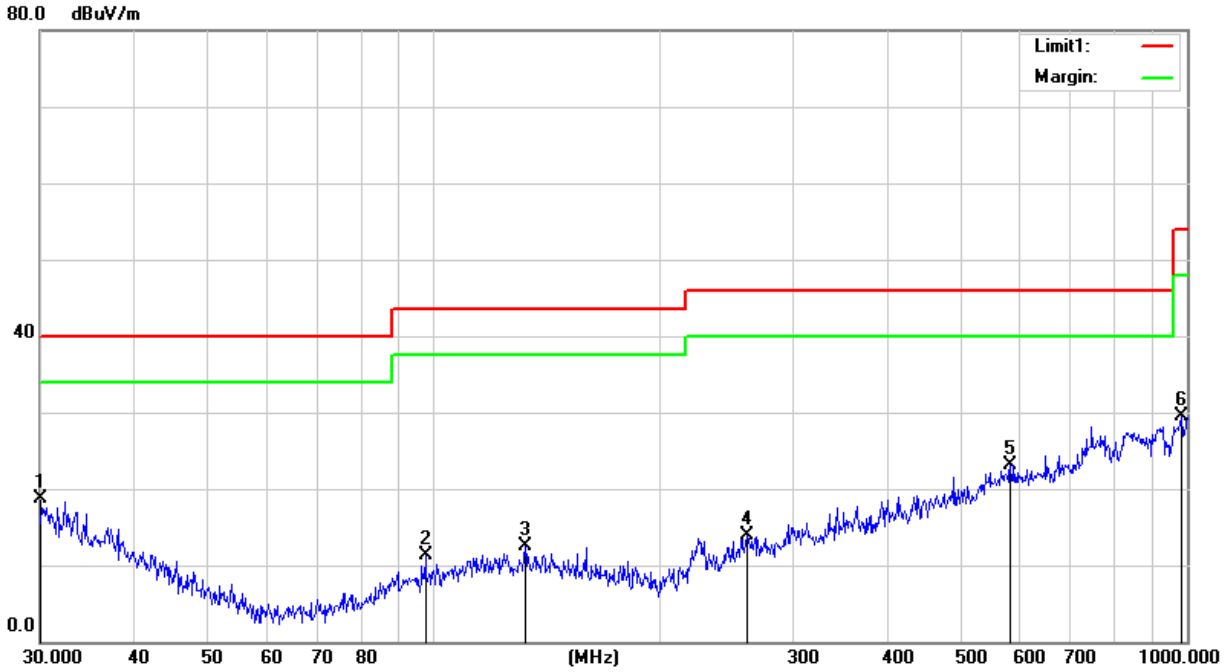
Remark:
1. All readings are Quasi-Peak.
2. Margin = Result (Result =Reading + Factor)–Limit



Temperature:	25.1 ℃	Relative Humidity:	62%
Test Voltage:	AC 120V/60Hz	Phase:	Horizontal
Test Mode:	Mode 3		

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
30.0000	28.99	-10.19	18.80	40.00	-21.20	QP
97.4560	30.13	-18.92	11.21	43.50	-32.29	QP
132.2205	29.24	-16.80	12.44	43.50	-31.06	QP
261.0582	27.43	-13.50	13.93	46.00	-32.07	QP
582.7424	29.92	-6.85	23.07	46.00	-22.93	QP
982.6200	29.31	0.13	29.44	54.00	-24.56	QP

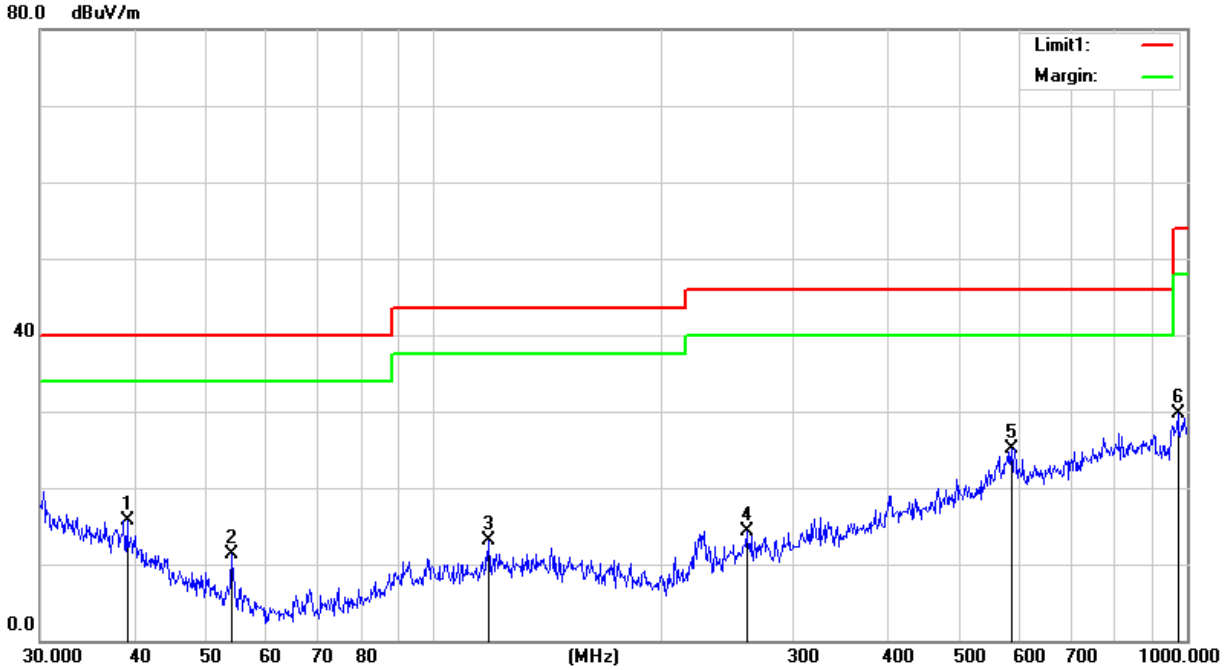
Remark:
1. All readings are Quasi-Peak .
2. Margin = Result (Result =Reading + Factor)–Limit



Temperature:	25.1 ℃	Relative Humidity:	62%
Test Voltage:	AC 120V/60Hz	Phase:	Vertical
Test Mode:	Mode 2		

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
39.1615	31.68	-15.89	15.79	40.00	-24.21	QP
53.8817	33.93	-22.59	11.34	40.00	-28.66	QP
118.1861	30.86	-17.81	13.05	43.50	-30.45	QP
260.1444	29.34	-15.07	14.27	46.00	-31.73	QP
584.7894	31.89	-6.82	25.07	46.00	-20.93	QP
972.3374	29.85	-0.14	29.71	54.00	-24.29	QP

Remark:
1. All readings are Quasi-Peak.
2. Margin = Result (Result =Reading + Factor)–Limit



Above 1G Radiation Spurious

Frequency (MHz)	Reading (dBμV)	Amplifier (dB)	Loss (dB)	Antenna Factor (dB/m)	Corrected Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Comment
Low Channel (915.5 MHz)										
1100.59	67.68	46.30	3.70	24.30	-18.30	49.38	74	-24.62	PK	Vertical
1100.59	57.12	46.30	3.70	24.30	-18.30	38.82	54	-15.18	AV	Vertical
1100.73	67.65	46.30	3.70	24.30	-18.30	49.35	74	-24.65	PK	Horizontal
1100.73	57.06	46.30	3.70	24.30	-18.30	38.76	54	-15.24	AV	Horizontal
1517.71	65.52	44.90	4.19	25.00	-15.71	49.80	74	-24.20	PK	Vertical
1517.71	57.06	44.90	4.19	25.00	-15.71	41.35	54	-12.65	AV	Vertical
1517.83	66.42	44.90	4.19	25.00	-15.71	50.70	74	-23.30	PK	Horizontal
1517.83	57.24	44.90	4.19	25.00	-15.71	41.52	54	-12.48	AV	Horizontal
1832.40	65.51	44.10	5.30	25.00	-13.80	51.71	74	-22.29	PK	Vertical
1832.40	54.87	44.10	5.30	25.00	-13.80	41.07	54	-12.93	AV	Vertical
1831.80	65.66	44.10	5.30	25.00	-13.80	51.86	74	-22.14	PK	Horizontal
1831.80	53.55	44.10	5.30	25.00	-13.80	39.75	54	-14.25	AV	Horizontal
2146.12	63.33	43.80	5.40	25.90	-12.50	50.83	74	-23.17	PK	Vertical
2146.12	53.12	43.80	5.40	25.90	-12.50	40.62	54	-13.38	AV	Vertical
2146.18	62.67	43.80	5.40	25.90	-12.50	50.17	74	-23.83	PK	Horizontal
2146.18	49.97	43.80	5.40	25.90	-12.50	37.47	54	-16.53	AV	Horizontal
2748.02	67.20	44.40	6.20	27.60	-10.60	56.60	74	-17.40	PK	Vertical
2748.02	50.30	44.40	6.20	27.60	-10.60	39.70	54	-14.30	AV	Vertical
2747.53	64.63	44.40	6.20	27.60	-10.60	54.03	74	-19.97	PK	Horizontal
2747.53	51.03	44.40	6.20	27.60	-10.60	40.43	54	-13.57	AV	Horizontal

Frequency (MHz)	Reading (dBμV)	Amplifier (dB)	Loss (dB)	Antenna Factor (dB/m)	Corrected Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Comment
Middle Channel (916 MHz)										
1101.18	68.41	46.30	3.70	24.30	-18.30	50.11	74	-23.89	PK	Vertical
1101.18	56.47	46.30	3.70	24.30	-18.30	38.17	54	-15.83	AV	Vertical
1101.45	68.32	46.30	3.70	24.30	-18.30	50.02	74	-23.98	PK	Horizontal
1101.45	57.26	46.30	3.70	24.30	-18.30	38.96	54	-15.04	AV	Horizontal
1518.60	66.09	44.90	4.19	25.00	-15.71	50.37	74	-23.63	PK	Vertical
1518.60	57.41	44.90	4.19	25.00	-15.71	41.70	54	-12.30	AV	Vertical
1518.73	65.09	44.90	4.19	25.00	-15.71	49.38	74	-24.62	PK	Horizontal
1518.73	56.98	44.90	4.19	25.00	-15.71	41.26	54	-12.74	AV	Horizontal
1834.44	65.52	44.10	5.30	25.00	-13.80	51.72	74	-22.28	PK	Vertical
1834.44	54.59	44.10	5.30	25.00	-13.80	40.79	54	-13.21	AV	Vertical
1833.86	65.27	44.10	5.30	25.00	-13.80	51.47	74	-22.53	PK	Horizontal
1833.86	54.64	44.10	5.30	25.00	-13.80	40.84	54	-13.16	AV	Horizontal
2147.22	63.45	43.80	5.40	25.90	-12.50	50.95	74	-23.05	PK	Vertical
2147.22	52.33	43.80	5.40	25.90	-12.50	39.84	54	-14.16	AV	Vertical
2147.37	62.50	43.80	5.40	25.90	-12.50	50.00	74	-24.00	PK	Horizontal
2147.37	50.66	43.80	5.40	25.90	-12.50	38.17	54	-15.83	AV	Horizontal
2751.50	66.48	44.40	6.20	27.60	-10.60	55.88	74	-18.12	PK	Vertical
2751.50	50.77	44.40	6.20	27.60	-10.60	40.17	54	-13.83	AV	Vertical
2750.99	65.66	44.40	6.20	27.60	-10.60	55.06	74	-18.94	PK	Horizontal
2750.99	50.70	44.40	6.20	27.60	-10.60	40.10	54	-13.90	AV	Horizontal

Frequency (MHz)	Reading (dBμV)	Amplifier (dB)	Loss (dB)	Antenna Factor (dB/m)	Corrected Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Comment
High Channel (916.5 MHz)										
1101.71	68.48	46.30	3.70	24.30	-18.30	50.18	74	-23.82	PK	Vertical
1101.71	57.28	46.30	3.70	24.30	-18.30	38.98	54	-15.02	AV	Vertical
1101.87	67.21	46.30	3.70	24.30	-18.30	48.91	74	-25.09	PK	Horizontal
1101.87	57.47	46.30	3.70	24.30	-18.30	39.17	54	-14.83	AV	Horizontal
1519.21	65.58	44.90	4.19	25.00	-15.71	49.86	74	-24.14	PK	Vertical
1519.21	56.26	44.90	4.19	25.00	-15.71	40.55	54	-13.45	AV	Vertical
1519.44	65.71	44.90	4.19	25.00	-15.71	50.00	74	-24.00	PK	Horizontal
1519.44	58.37	44.90	4.19	25.00	-15.71	42.65	54	-11.35	AV	Horizontal
1836.54	64.41	44.10	5.30	25.00	-13.80	50.61	74	-23.39	PK	Vertical
1836.54	54.30	44.10	5.30	25.00	-13.80	40.50	54	-13.50	AV	Vertical
1835.96	64.49	44.10	5.30	25.00	-13.80	50.69	74	-23.31	PK	Horizontal
1835.96	54.63	44.10	5.30	25.00	-13.80	40.83	54	-13.17	AV	Horizontal
2148.52	62.62	43.80	5.40	25.90	-12.50	50.13	74	-23.87	PK	Vertical
2148.52	53.15	43.80	5.40	25.90	-12.50	40.65	54	-13.35	AV	Vertical
2148.51	62.66	43.80	5.40	25.90	-12.50	50.16	74	-23.84	PK	Horizontal
2148.51	50.33	43.80	5.40	25.90	-12.50	37.83	54	-16.17	AV	Horizontal
2754.14	67.15	44.40	6.20	27.60	-10.60	56.55	74	-17.45	PK	Vertical
2754.14	51.03	44.40	6.20	27.60	-10.60	40.43	54	-13.57	AV	Vertical
2753.58	65.28	44.40	6.20	27.60	-10.60	54.68	74	-19.32	PK	Horizontal
2753.58	50.90	44.40	6.20	27.60	-10.60	40.30	54	-13.70	AV	Horizontal

Note:

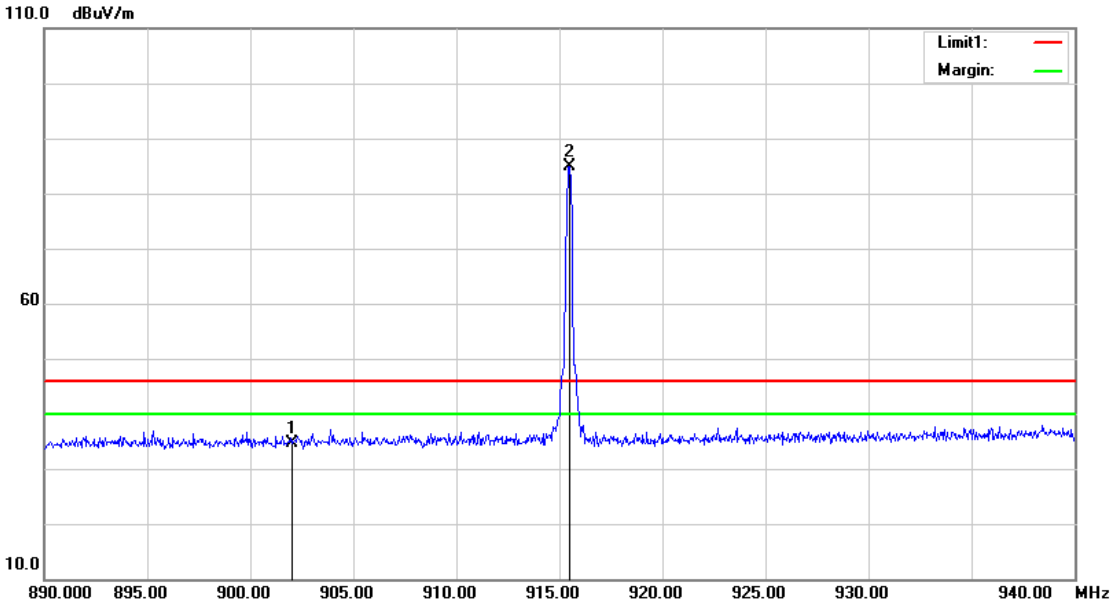
1) Factor = Antenna Factor + Cable Loss – Pre-amplifier.
   Emission Level = Reading + Factor

2) The frequency emission of peak points that did not show above the forms are below the limit, the frequency emission is mainly from the environment noise.

(Radiation Band edge)

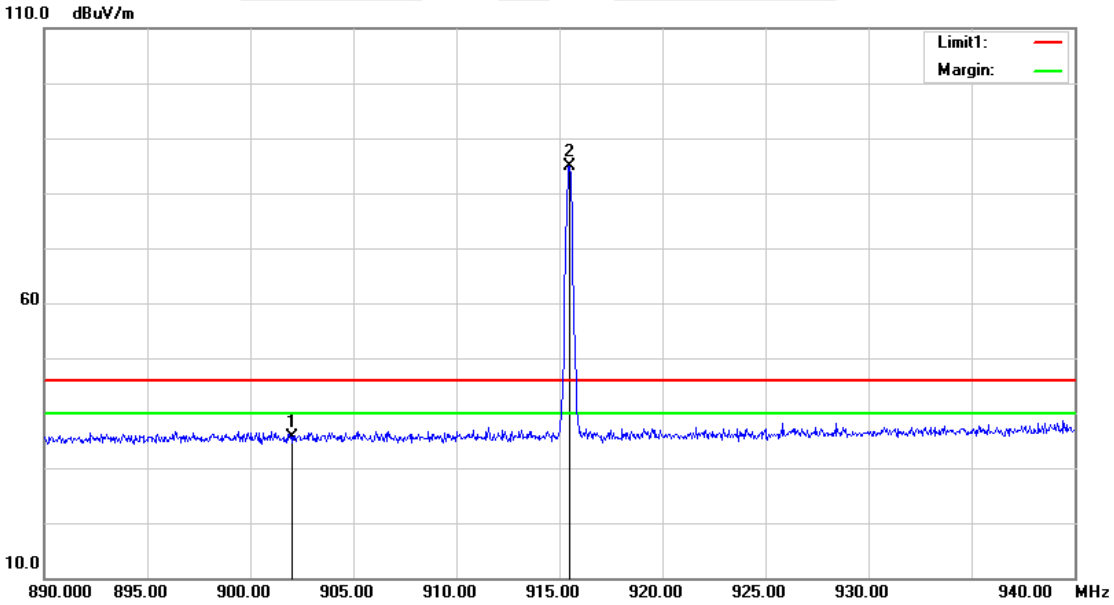
FM-Low

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	902.0000	38.49	-3.76	34.73	46.00	-11.27	QP
2	915.5000	88.39	-3.47	84.92	94.00	-9.08	QP

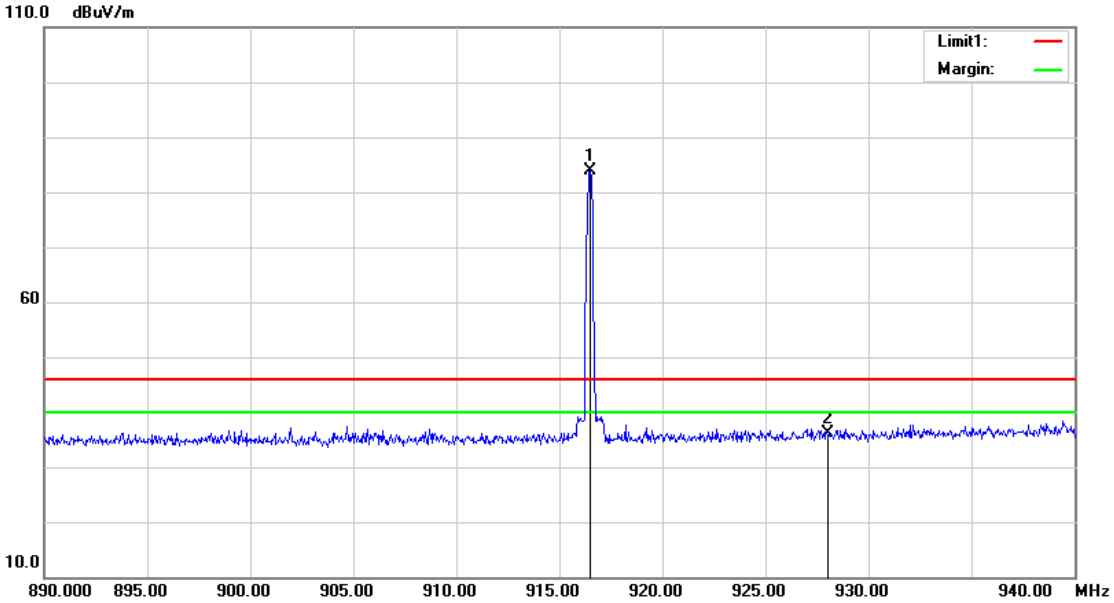
Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	902.0000	39.29	-3.76	35.53	46.00	-10.47	QP
2	915.5000	88.40	-3.47	85.43	94.00	-8.57	QP

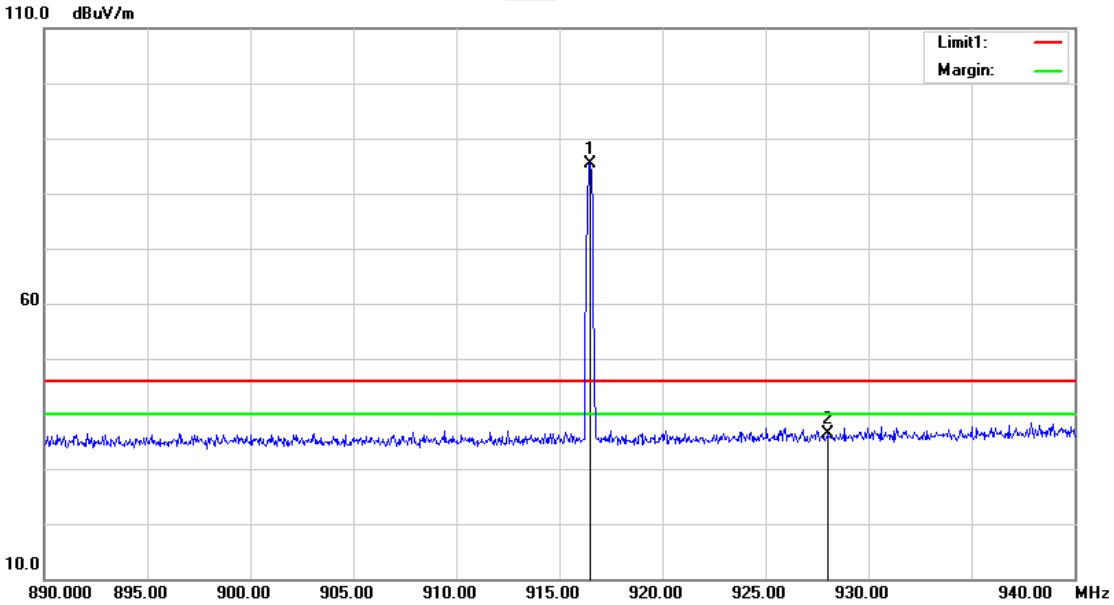
FM-High

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	916.5000	87.31	-3.45	83.86	94.00	-10.14	QP
2	928.0000	39.16	-2.97	36.19	46.00	-9.81	QP

Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	916.5000	88.92	-3.45	85.47	94.00	-8.53	QP
2	928.0000	39.47	-2.97	36.50	46.00	-9.50	QP

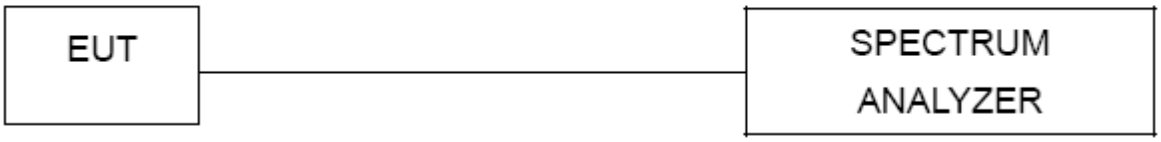
4. BANDWIDTH TEST

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= 30KHz, VBW≧RBW, Sweep time = Auto.

4.2 TEST SETUP



4.3 EUT OPERATION CONDITIONS

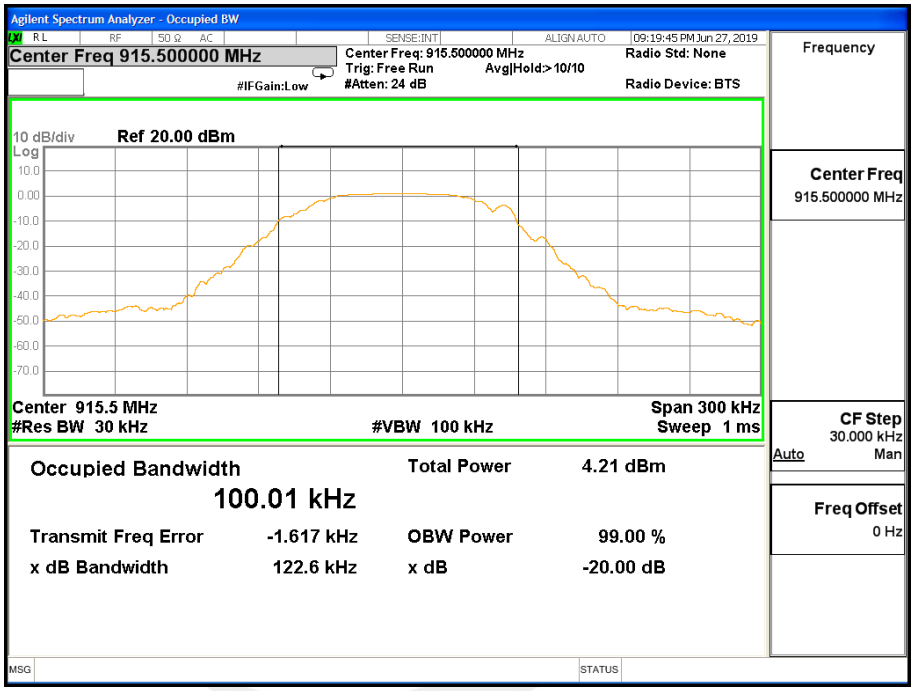
TX mode.

4.4 TEST RESULTS

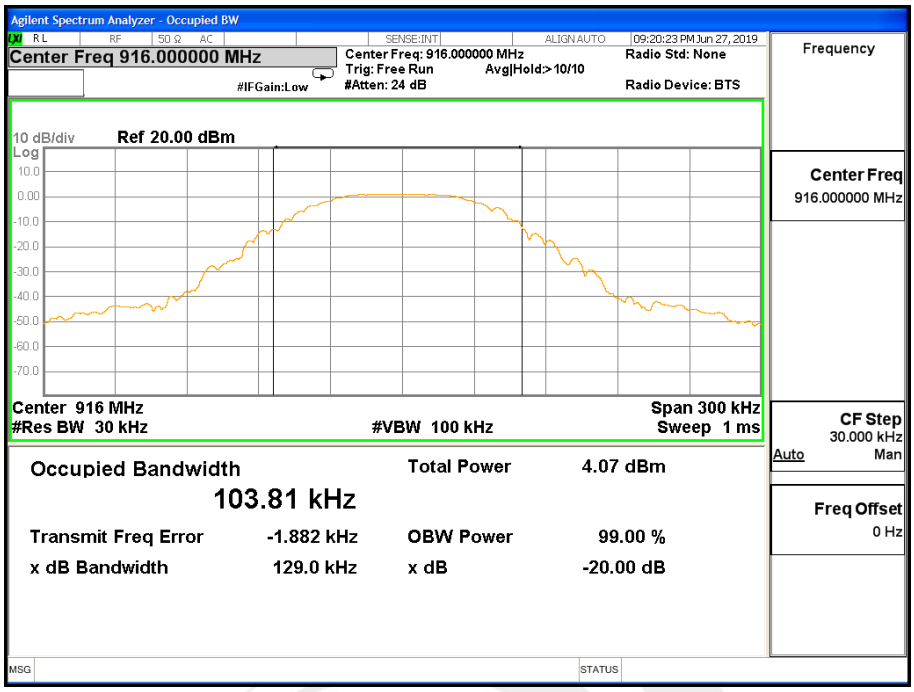
Temperature:	25 ℃	Relative Humidity:	50%
Test Voltage:	AC120V/60Hz		

Test Channel	Frequency (MHz)	20 dBc Bandwidth (KHz)	99% Bandwidth (KHz)
CH01	915.5	122.6	100.01
CH02	916	129.0	103.81
CH03	916.5	122.5	100.73

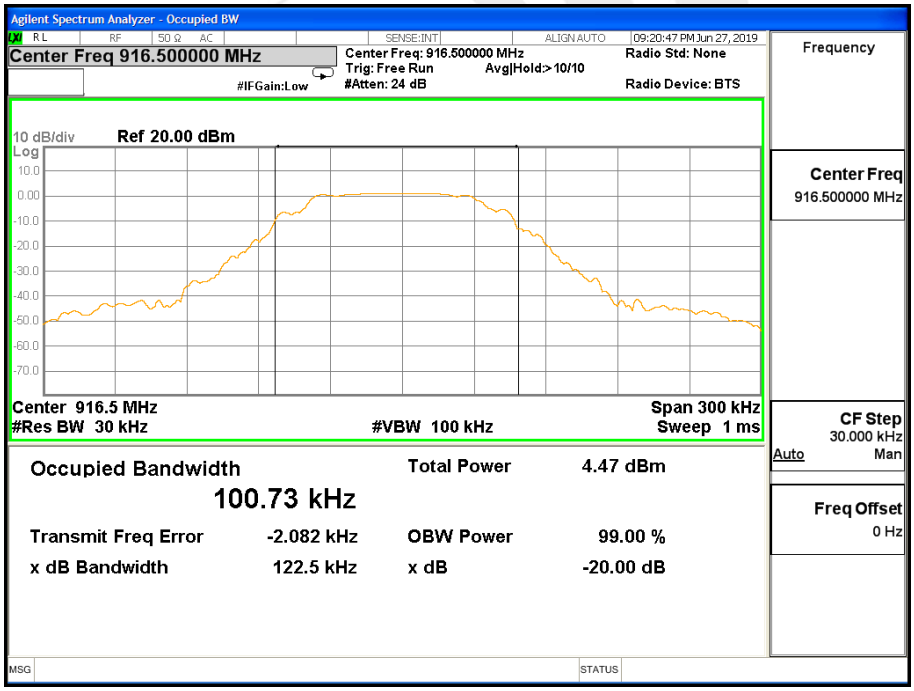
The Lowest Channel:915.5MHz



The Middle Channel:916MHz



The High Channel: 916.5MHz



5. ANTENNA REQUIREMENT

5.1 STANDARD REQUIREMENT

According to the FCC Part 15 Paragraph 15.203, 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 Monopole Antenna.It conforms to the standard requirements.

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※※※※※