



RADIO TEST REPORT

Report No: STS2111181W04

Issued for

Litum bilgi teknolojileri san. Ve dis tic. A.S

Sevket Ozcelik sok. No29 Alsancak izmir Turkey

Product Name:	Endurance Gateway
Brand Name:	Litum
Model Name:	200
Series Model:	N/A
FCC ID:	2AW7W-200
IC:	26820-200
Test Standard:	Title 47 of the CFR, Part 15. Subpart F RSS 220 Issue 1, amendment 1 July 2018

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**TEST RESULT CERTIFICATION**

Applicant's Name: Litum bilgi teknolojileri san. Ve dis tic. A.S
Address: Sevket Ozcelik sok. No29 Alsancak izmir Turkey
Manufacture's Name: Litum bilgi teknolojileri san. Ve dis tic. A.S
Address: Sevket Ozcelik sok. No29 Alsancak izmir Turkey

Product Description

Product Name: Endurance Gateway
Brand Name: Litum
Model Name: 200
Series Model: N/A

Test Standards.....: Title 47 of the CFR, Part 15. Subpart F
RSS 220 Issue 1, amendment 1 July 2018
RSS-Gen Issue 5, Amendment 1, March 2019

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: 30 Nov. 2021
Date of performance of tests ...: 30 Nov. 2021 ~ 22 Mar. 2022
Date of Issue: 22 Mar. 2022
Test Result.....: **Pass**

Testing Engineer :

(Chris Chen)

Technical Manager :

(Sean she)

Authorized Signatory :

(Bovey Yang)





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Revision History

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	22 Mar. 2022	STS2111181W04	ALL	Initial Issue





1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part 15. Subpart F RSS 220 Issue 1, amendment 1 July 2018			
Standard Section	Test Item	Judgment	Remark
15.207 RSS-Gen (8.8)	AC Power Conducted Emission	Pass	
15.203 RSS-Gen (6.8)	Antenna Requirement	Pass	
15.209 15.517(c) RSS-220 (3.4) RSS-220 (5.2.1(d))	Radiated Spurious Emission	Pass	
15.209 15.517(d) RSS-220 (5.2.1(e))	Radiated Spurious Emission in GPS Band	Pass	
15.517(e) RSS-220 (5.2.1(g))	Peak Emissions within a 50MHz Bandwidth	Pass	
15.517(b) RSS-220 (2)	UWB Bandwidth	Pass	
RSS-Gen 6.7	99% 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. : 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	$\pm 0.87\text{dB}$
2	Unwanted Emissions, conducted	$\pm 2.895\text{dB}$
3	All emissions, radiated 9K-30MHz	$\pm 3.80\text{dB}$
4	All emissions, radiated 30M-1GHz	$\pm 4.09\text{dB}$
5	All emissions, radiated 1G-6GHz	$\pm 4.92\text{dB}$
6	All emissions, radiated >6G	$\pm 5.49\text{dB}$
7	Conducted Emission (9KHz-30MHz)	$\pm 2.73\text{dB}$



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

Product Name/PMN	Endurance Gateway
Trade Name	Litum
Model Name/HVIN	200
Series Model/HVIN	N/A
Model Difference	N/A
Product Description	Endurance Gateway is a FCC Part 15.517 indoor UWB systems.
	Operation Frequency: 6489.6MHz
	Modulation Type: BPSK
	Antenna Designation: Please refer to the Note 3.
	Antenna Gain(Peak): PCB antenna
	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	110-240V AC or 12-24V DC or PoE
Battery	Rated Voltage: DC 3.7 V Charge Limit Voltage: DC 4.25 V Capacity: 2200 mAh
Hardware version number	LT020104
Software version number/FVIN	LT_02_01_RTLS_1002020B_DEV
Serial Numbers	2000710210002
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.

- | Test channel | Frequency(GHz) | Test channel | Frequency(GHz) |
|--------------|----------------|--------------|----------------|
| 1 | 6489.6 | - | - |

- Table for Filed Antenna

Ant	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	Litum	200	PCB	N/A	3.3	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 Radiated spurious emissions

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

Pretest Mode	Description	Modulation
Mode 1	TX	BPSK

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.

(3) Test model of 2000000003 and 2000000004 all has been tested, only shown the worst case of the test model 2000000003.

For AC Conducted Emission

Test Case	
AC Conducted Emission	Mode 2 : Keeping TX

2.3 TEST SOFTWARE AND POWER LEVEL

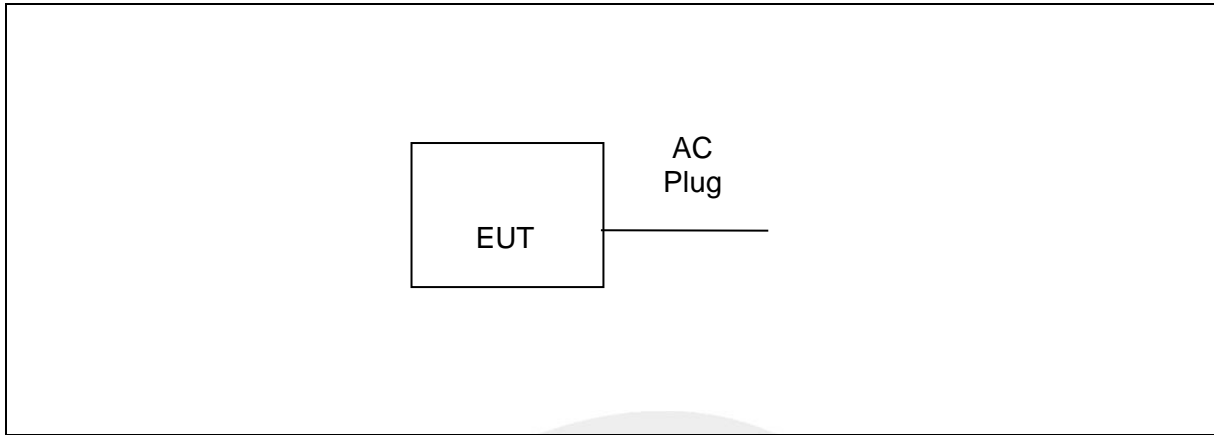
During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level.

RF Function	Type	Mode Or Modulation type	Ant Gain(dBi)	Power Class	Software For Testing
UWB	6849.6MHz	BPSK	3.3	Default	"The Transmitter EUT has signal transmission when it is powered on The Receiver EUT enter the receiving state when it is powered on"

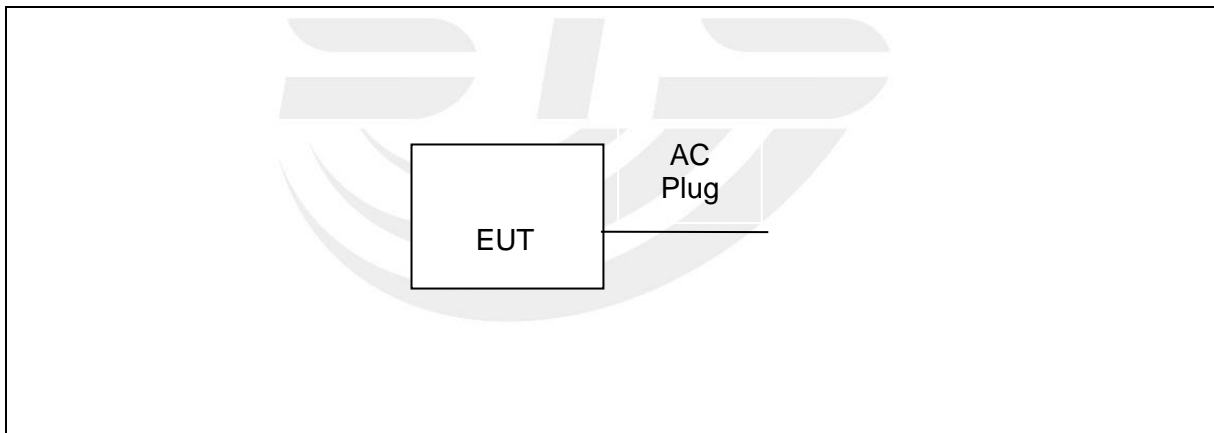
2.4 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

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.	Serial No.	Note
N/A	N/A	N/A	N/A	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.



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
Pre-Amplifier (0.1M-3GHz)	EM	EM330	060665	2021.10.08	2022.10.07
Pre-Amplifier (1G-18GHz)	SKET	LNPA-01018G-45	SK201808090 1	2021.09.30	2022.09.29
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)			

RF Connected Test

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Signal Analyzer	Agilent	N9020A	MY51110105	2022.03.01	2023.02.28
Temperature & Humidity	HH660	Mieo	N/A	2021.10.09	2022.10.08
Test SW	FARAD	LZ-RF /LzRf-3A3			



3. 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 15.207&RSS-Gen (8.8) 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.

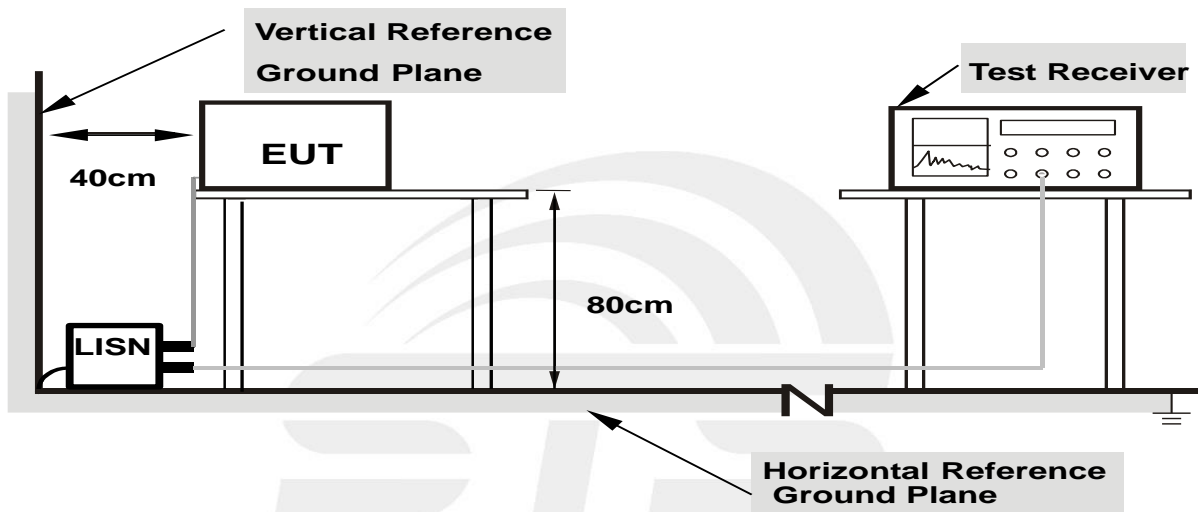
The following table is the setting of the receiver

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 RESULT

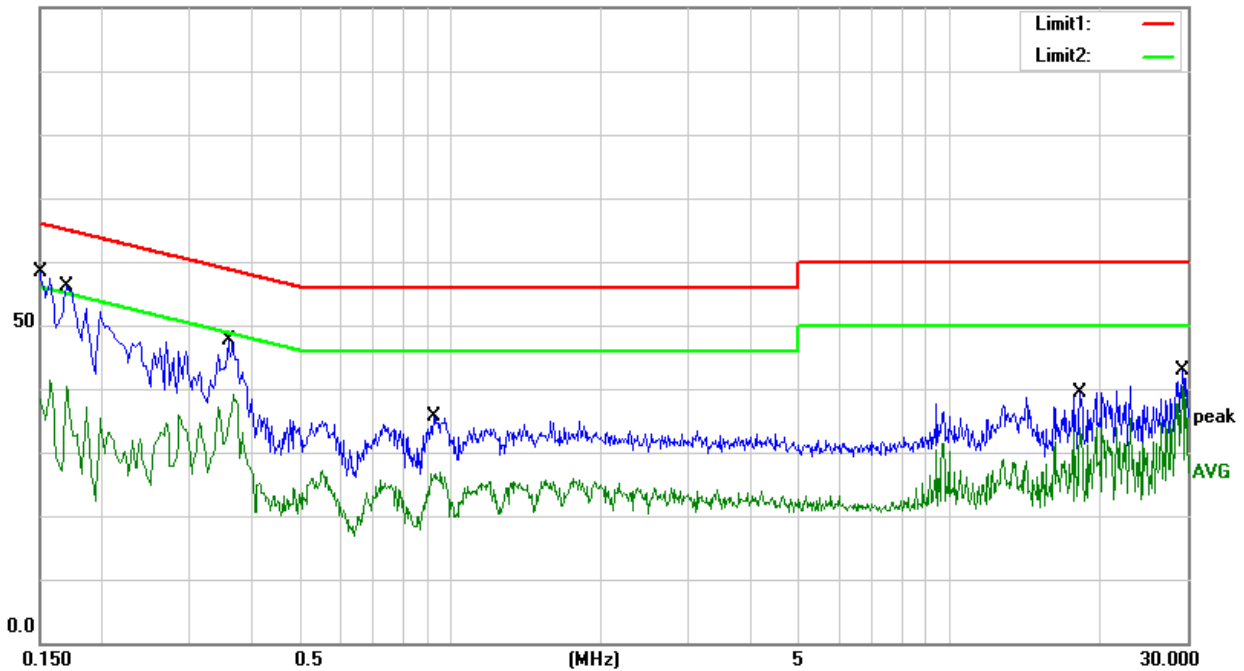
Temperature:	24.4(C)	Relative Humidity:	39%RH
Test Voltage:	AC 120V/60Hz	Phase:	L
Test Mode:	Mode 2		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1500	38.03	20.33	58.36	66.00	-7.64	QP
2	0.1500	21.11	20.33	41.44	56.00	-14.56	AVG
3	0.1700	35.78	20.33	56.11	64.96	-8.85	QP
4	0.1700	17.69	20.33	38.02	54.96	-16.94	AVG
5	0.3580	26.93	20.63	47.56	58.77	-11.21	QP
6	0.3580	18.48	20.63	39.11	48.77	-9.66	AVG
7	0.9260	15.19	20.31	35.50	56.00	-20.50	QP
8	0.9260	6.64	20.31	26.95	46.00	-19.05	AVG
9	18.2420	16.89	22.49	39.38	60.00	-20.62	QP
10	18.2420	11.30	22.49	33.79	50.00	-16.21	AVG
11	29.2460	19.95	22.89	42.84	60.00	-17.16	QP
12	29.2460	17.59	22.89	40.48	50.00	-9.52	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)

100.0 dBuV





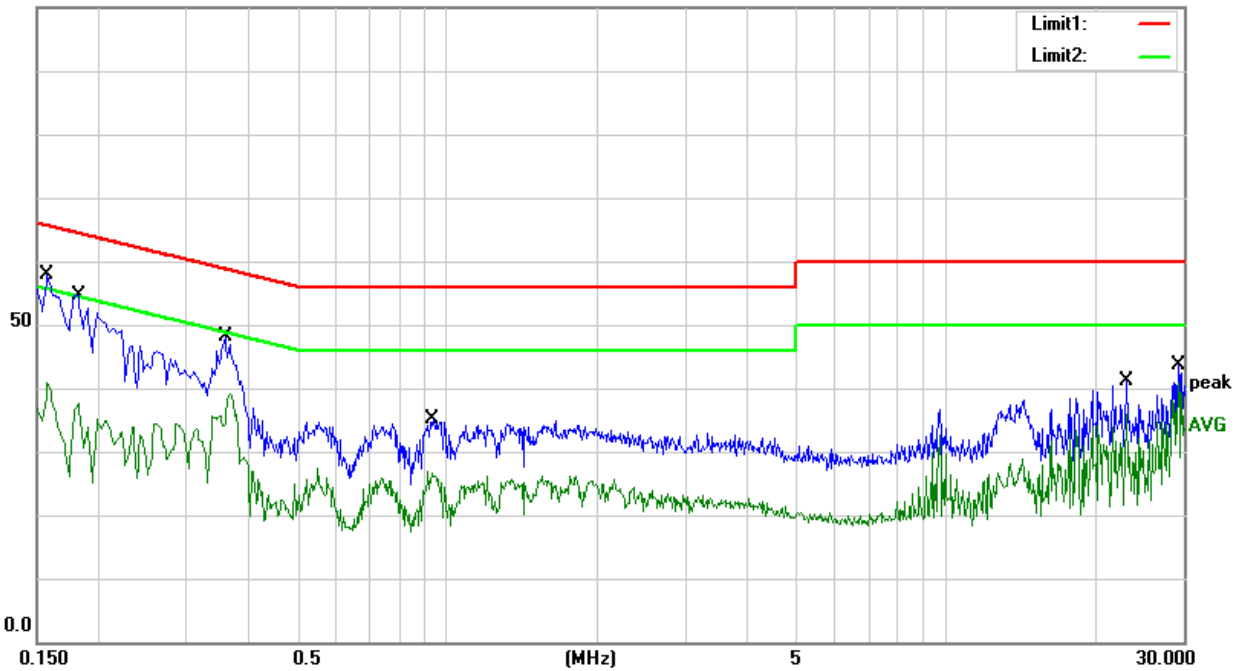
Temperature:	24.4(C)	Relative Humidity:	39%RH
Test Voltage:	AC 120V/60Hz	Phase:	N
Test Mode:	Mode 2		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1580	37.60	20.33	57.93	65.57	-7.64	QP
2	0.1580	20.58	20.33	40.91	55.57	-14.66	AVG
3	0.1820	34.39	20.31	54.70	64.39	-9.69	QP
4	0.1820	17.25	20.31	37.56	54.39	-16.83	AVG
5	0.3580	27.53	20.63	48.16	58.77	-10.61	QP
6	0.3580	18.60	20.63	39.23	48.77	-9.54	AVG
7	0.9420	14.93	20.31	35.24	56.00	-20.76	QP
8	0.9420	6.44	20.31	26.75	46.00	-19.25	AVG
9	23.1300	18.30	22.71	41.01	60.00	-18.99	QP
10	23.1300	13.19	22.71	35.90	50.00	-14.10	AVG
11	29.2420	20.75	22.89	43.64	60.00	-16.36	QP
12	29.2420	17.97	22.89	40.86	50.00	-9.14	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)

100.0 dBuV





3.2 RADIATED EMISSION MEASUREMENT (FOR 15.517(c)&RSS 220 5.2.1(d))

3.2.1 RADIATED EMISSION LIMITS

The radiated emissions at or below 960MHz from a device operating under the provisions of this section shall not exceed the emission levels in Section 15.209&RSS 220(3.4).

Frequencies (MHz)	Field Strength (micovolts/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

Note: 1. The lower limit shall apply at the transition frequencies.

2. Emission level (dBuV/m) = 20 log Emission level (uV/m).

For FCC:

The radiated emissions above 960MHz from a device operating under the provisions of this section shall not exceed the following average limits when measured using a resolution bandwidth of 1MHz:

Frequency of Emission (MHz)	EIRP (dBm)	Field Strength (dBuV/m@3m)	Field Strength (dBuV/m@1m)
960~1610	-75.3	19.9	29.44
1610~1990	-53.3	41.9	51.44
1990~3100	-51.3	43.9	53.44
3100~10600	-41.3	53.9	63.44
Above 10600	-51.3	43.9	53.44

Notes: 1. Transfer rules follow 15.521(g),15.31(f)(1).

2. 15.521(c) Emissions from digital circuitry used to enable the operation of the UWB transmitter shall comply with the limits in Section 15.209 of this chapter, rather than the limits specified in this subpart.

3. $E(\text{dBuV/m})@3\text{m} = P(\text{dBm EIRP}) + 95.2;$

$E(\text{dBuV/m})@1\text{m} = E(\text{dBuV/m})@3\text{m} + 20 \cdot \log(3/1)$



For IC:

The radiated emissions above 960MHz from a device operating under the provisions of this section shall not exceed the following average limits when measured using a resolution bandwidth of 1MHz:

Frequency of Emission (MHz)	EIRP (dBm)	Field Strength (dBuV/m@3m)	Field Strength (dBuV/m@1m)
960~1610	-75.3	19.9	29.44
1610~4750	-70.0	25.2	34.74
4750~10600	-41.3	53.9	63.44
Above 10600	-51.3	43.9	53.44

Notes: 1. Transfer rules follow section 2 of the RSS 220 Annex.

2. The Emissions from digital circuitry used to enable the operation of the UWB transmitter shall comply with the limits in Section RSS 220(3.4) of this chapter, rather than the limits specified in this subpart.

3. $E(\text{dBuV/m})@3\text{m} = P(\text{dBm EIRP}) + 95.2;$
 $E(\text{dBuV/m})@1\text{m} = E(\text{dBuV/m})@3\text{m} + 20 \cdot \log(3/1)$

Spectrum Parameter	Setting
Detector	RMS
Attenuation	Auto
Start Frequency	960 MHz
Stop Frequency	10th of the highest fundamental frequency or to 40 GHz, whichever is lower
RB	1MHz
VB	3MHz
Sweep Point	1001
SweepTime	1s

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~960MHz / RB 120kHz for QP



3.2.2 TEST PROCEDURE

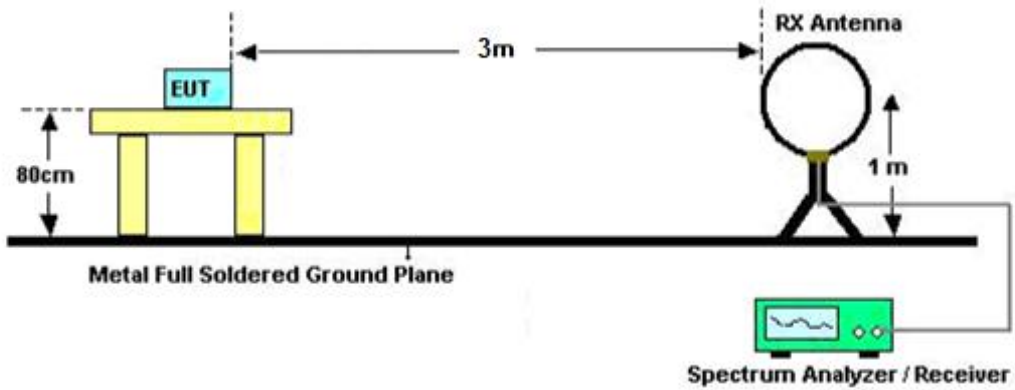
- a. The measuring distance of 1m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8meter (above 1GHz is 1.5 m) above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The height of the test antenna shall vary between 1m to 4m. Both horizontal and vertical polarization of the antenna are set to make the measurement.
- c. 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.
- d. All readings are peak unless otherwise stated QP in column of Note. Peak denoted that the Peak reading complies with the QP limits and then QP Mode measurement didn't perform (Below 960MHz)
- e. All readings are RMS mode value, 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. (Above 960MHz)
- f. 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

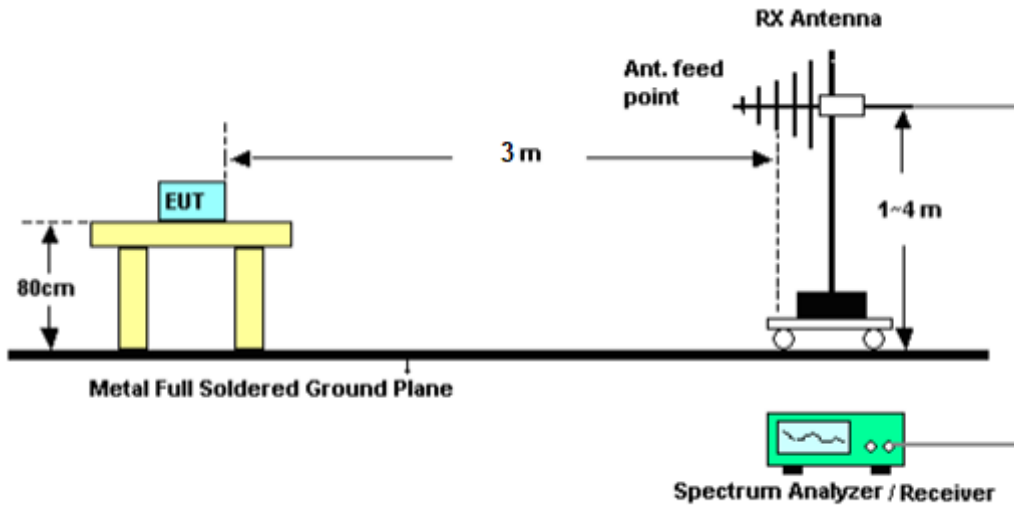
No deviation

3.2.4 TEST SETUP

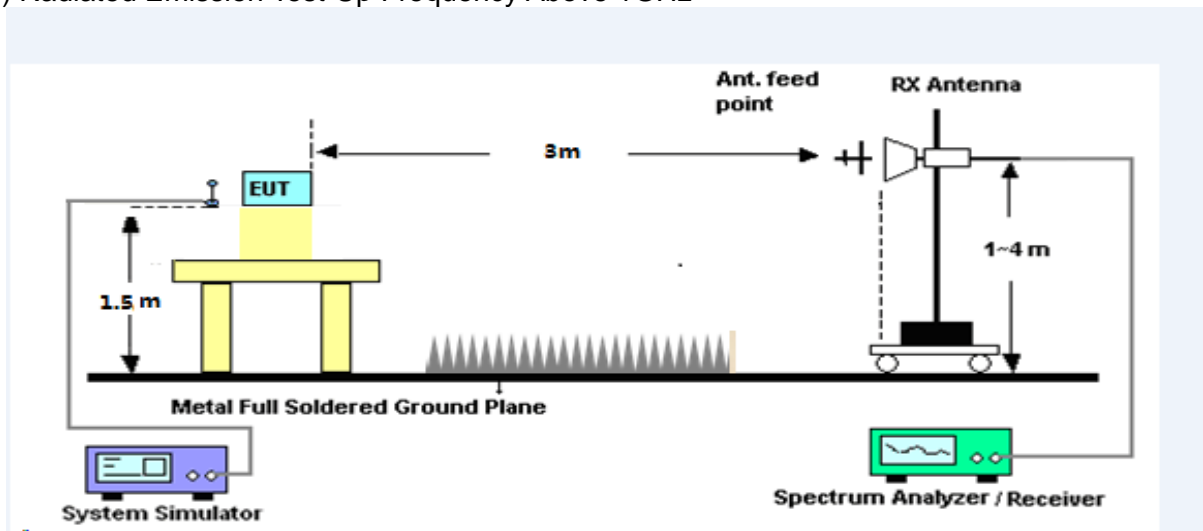
(A) Radiated Emission Test-Up Frequency Below 30MHz



(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

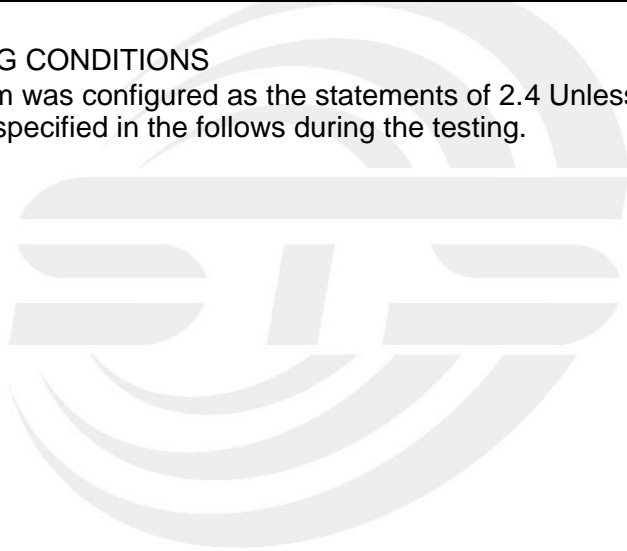
AV L = AV Limit

For example

Frequency	PR	AR	AF	PL	AL	PK L	AV L	Margin
(MHz)	(dB μ V/m)	(dB μ V/m)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB μ V/m)	(dB μ 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.





3.2.7 TEST RESULTS

Below 30MHz

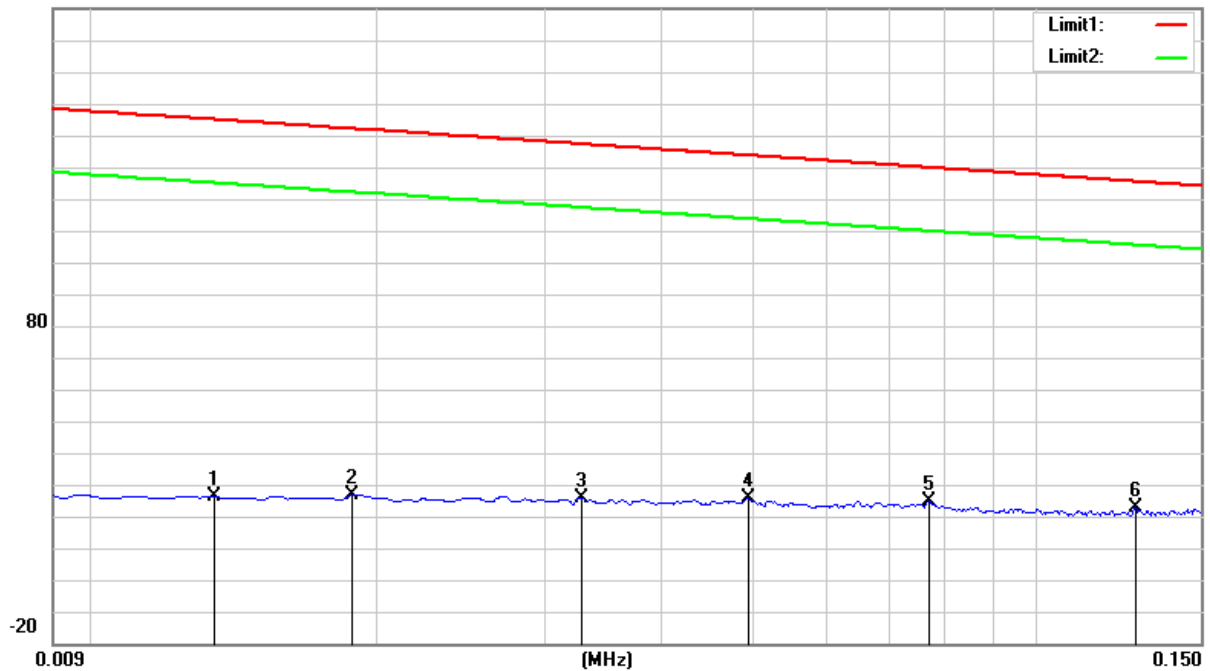
Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	AC 120V/50Hz	Test Mode:	CH 1(9KHz - 150KHz)
Test distance:	3m		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.0132	6.78	19.61	26.39	125.19	-98.80	AVG
2	0.0188	6.83	20.01	26.84	122.12	-95.28	AVG
3	0.0328	5.95	19.84	25.79	117.29	-91.50	AVG
4	0.0493	6.04	19.51	25.55	113.75	-88.20	AVG
5	0.0770	6.09	18.70	24.79	109.87	-85.08	AVG
6	0.1280	5.17	17.54	22.71	105.46	-82.75	AVG

Remark:

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

180.0 dBuV/m



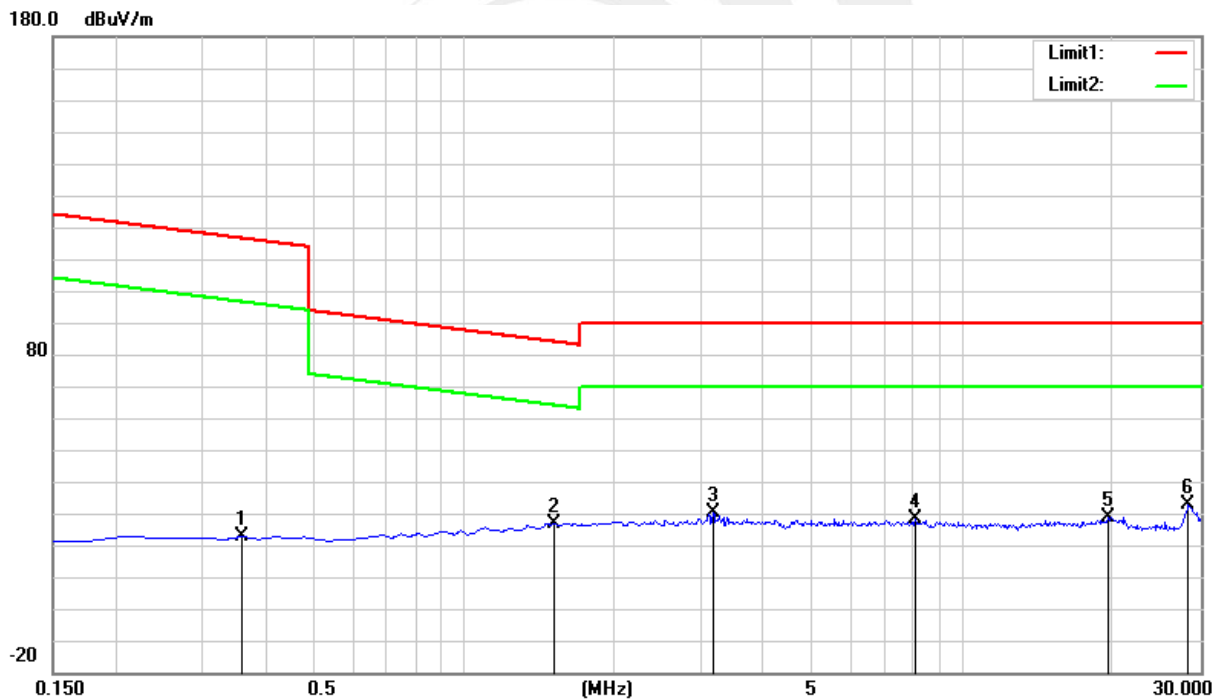


Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	AC 120V/50Hz	Test Mode:	CH 1 (150KHz – 30MHz)
Test distance:	3m		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.3590	2.62	20.14	22.76	96.50	-73.74	AVG
2	1.5231	6.37	20.30	26.67	63.95	-37.28	QP
3	3.1648	10.28	20.15	30.43	69.54	-39.11	QP
4	8.0602	7.95	20.32	28.27	69.54	-41.27	QP
5	19.5823	6.34	22.40	28.74	69.54	-40.80	QP
6	28.4478	12.26	20.32	32.58	69.54	-36.96	QP

Remark:

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



Note: The position of the measurement polarization (Horizontal / Face-on / Face-off) all has been tested, only shown the worst mode of Horizontal position.



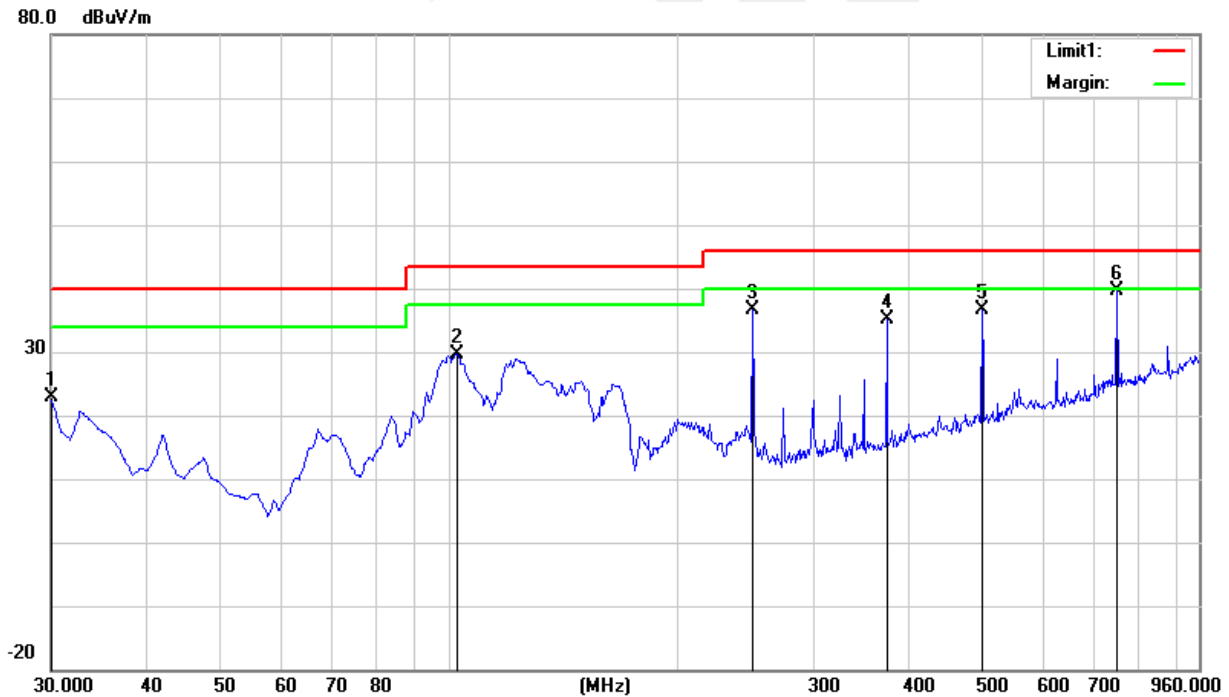
30MHz – 960MHz Radiation Spurious

Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	AC 120V/50Hz	Phase:	Horizontal
Test Mode:	CH 1	Test distance:	3m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	30.0000	35.82	-12.85	22.97	40.00	-17.03	peak
2	102.5400	49.54	-19.86	29.68	43.50	-13.82	peak
3	249.4800	52.76	-16.21	36.55	46.00	-9.45	peak
4	375.0300	47.62	-12.38	35.24	46.00	-10.76	peak
5	499.6500	44.74	-8.01	36.73	46.00	-9.27	peak
6	749.8200	41.89	-2.16	39.73	46.00	-6.27	peak

Remark:

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



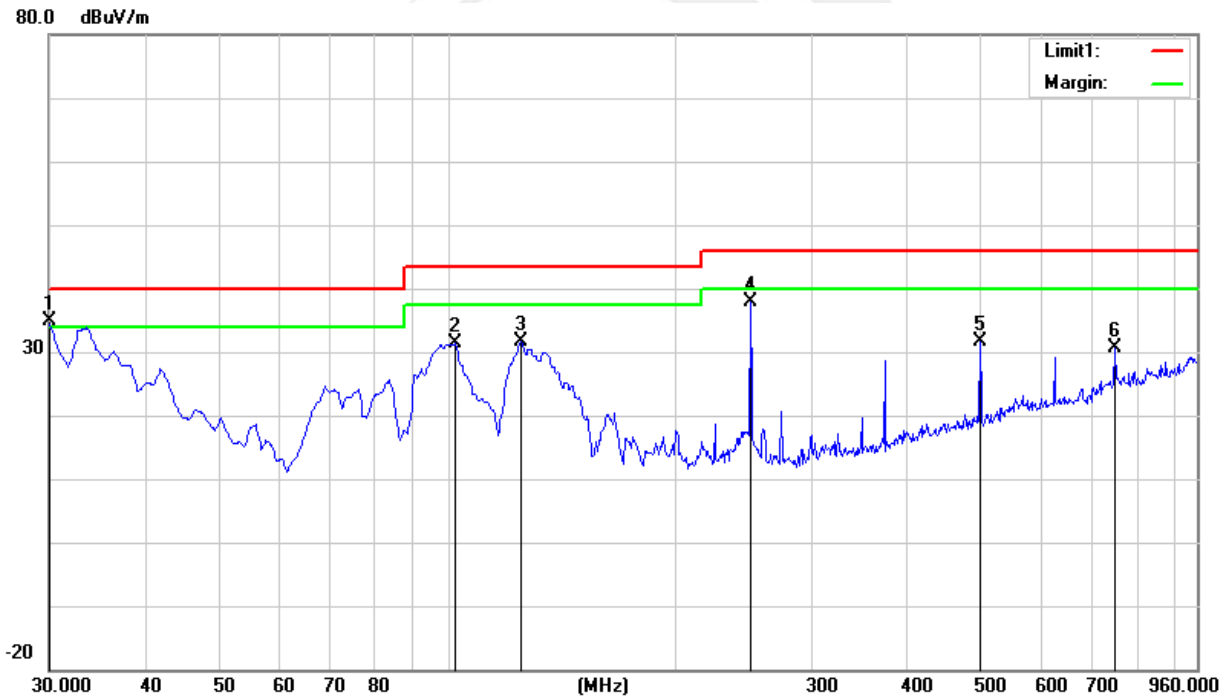


Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	AC 120V/50Hz	Phase:	Vertical
Test Mode:	CH 1	Test distance:	3m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	30.0000	47.75	-12.85	34.90	40.00	-5.10	peak
2	102.5400	51.13	-19.86	31.27	43.50	-12.23	peak
3	124.8600	49.86	-18.22	31.64	43.50	-11.86	peak
4	249.4800	54.09	-16.21	37.88	46.00	-8.12	peak
5	499.6500	39.65	-8.01	31.64	46.00	-14.36	peak
6	749.8200	32.85	-2.16	30.69	46.00	-15.31	peak

Remark:

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





Above 960MHz Radiation Spurious

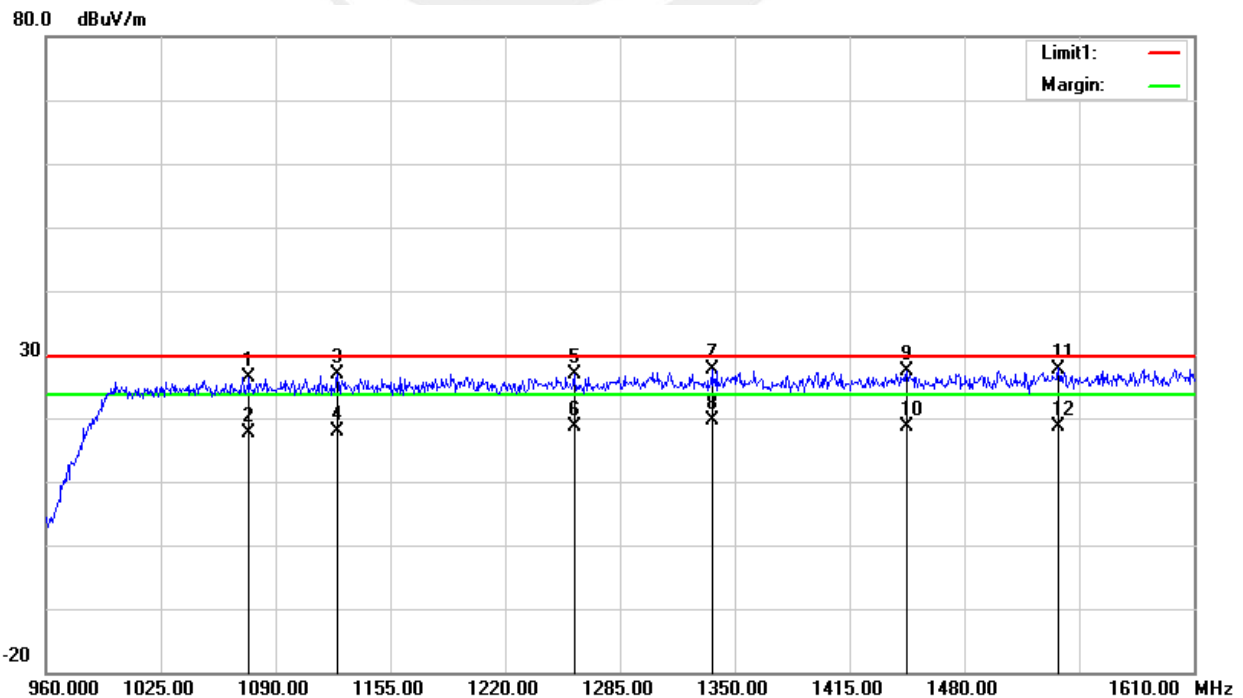
FCC:

Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	AC 120V/60Hz	Phase:	Horizontal
Test Mode:	CH 1(960MHz -1610MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1075.050	27.54	-1.22	26.32	29.44	-3.12	peak
2	1075.050	18.84	-1.22	17.62	29.44	-11.82	RMS
3	1125.100	27.89	-0.99	26.90	29.44	-2.54	peak
4	1125.100	18.77	-0.99	17.78	29.44	-11.66	RMS
5	1259.000	27.22	-0.45	26.77	29.44	-2.67	peak
6	1259.000	19.04	-0.45	18.59	29.44	-10.85	RMS
7	1337.000	27.53	0.01	27.54	29.44	-1.90	peak
8	1337.000	19.60	0.01	19.61	29.44	-9.83	RMS
9	1447.500	26.42	0.86	27.28	29.44	-2.16	peak
10	1447.500	17.88	0.86	18.74	29.44	-10.70	RMS
11	1533.300	25.47	2.28	27.75	29.44	-1.69	peak
12	1533.300	16.35	2.28	18.63	29.44	-10.81	RMS

Remark:

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





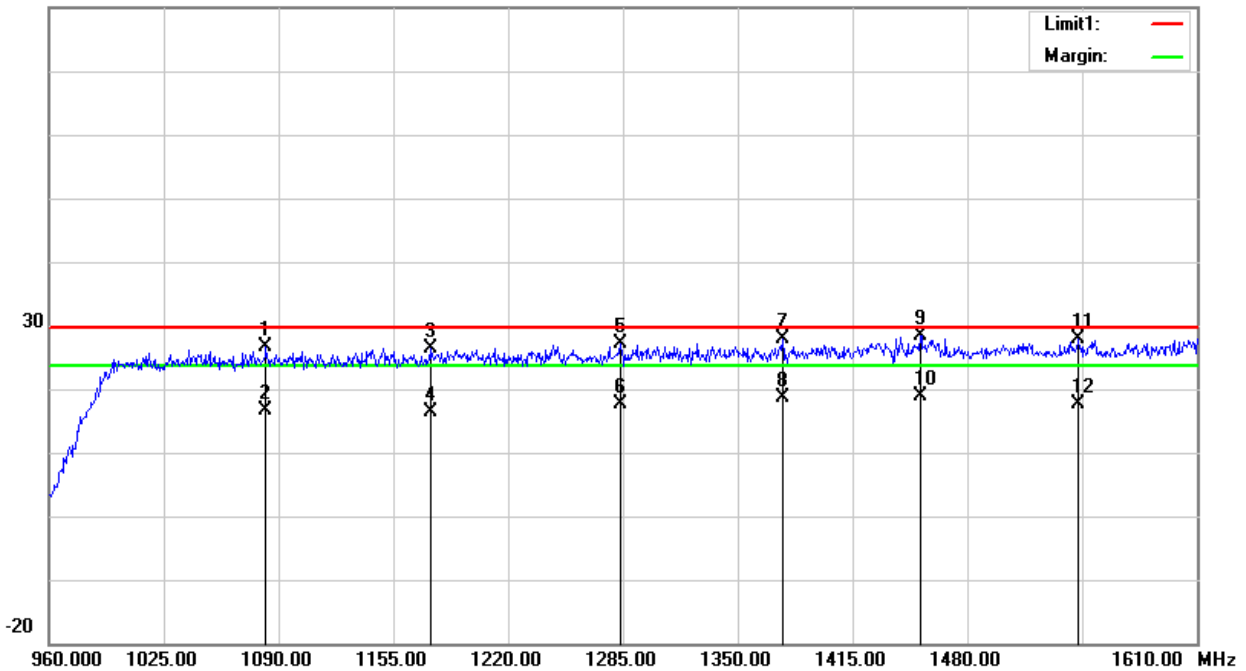
Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	AC 120V/60Hz	Phase:	Vertical
Test Mode:	CH 1(960MHz -1610MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1082.850	27.77	-1.18	26.59	29.44	-2.85	peak
2	1082.850	17.71	-1.18	16.53	29.44	-12.91	RMS
3	1175.800	27.04	-0.66	26.38	29.44	-3.06	peak
4	1175.800	17.13	-0.66	16.47	29.44	-12.97	RMS
5	1283.700	27.33	-0.25	27.08	29.44	-2.36	peak
6	1283.700	17.77	-0.25	17.52	29.44	-11.92	RMS
7	1375.350	27.72	0.17	27.89	29.44	-1.55	peak
8	1375.350	18.52	0.17	18.69	29.44	-10.75	RMS
9	1453.350	27.44	0.93	28.37	29.44	-1.07	peak
10	1453.350	17.94	0.93	18.87	29.44	-10.57	RMS
11	1543.050	25.44	2.51	27.95	29.44	-1.49	peak
12	1543.050	15.15	2.51	17.66	29.44	-11.78	RMS

Remark:

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

80.0 dBuV/m





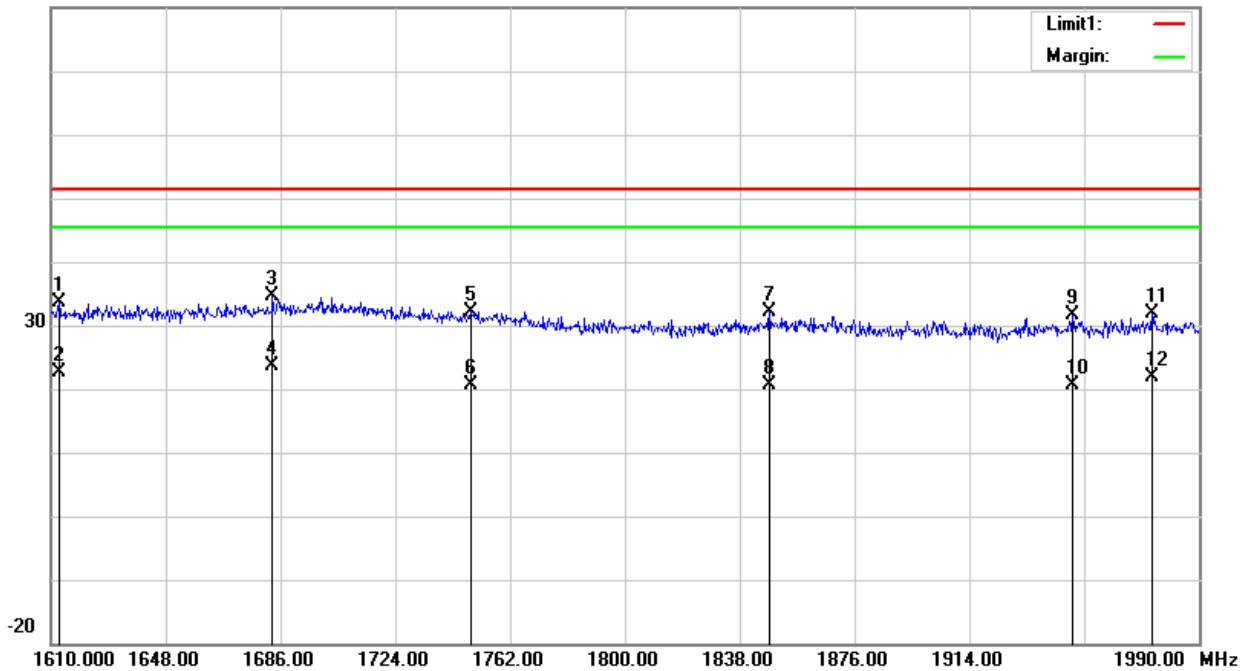
Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	AC 120V/60Hz	Phase:	Horizontal
Test Mode:	CH 1(1610MHz – 1990MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1612.660	29.39	4.24	33.63	51.44	-17.81	peak
2	1612.660	18.38	4.24	22.62	51.44	-28.82	RMS
3	1683.340	29.83	4.89	34.72	51.44	-16.72	peak
4	1683.340	18.72	4.89	23.61	51.44	-27.83	RMS
5	1749.080	28.55	3.69	32.24	51.44	-19.20	peak
6	1749.080	16.90	3.69	20.59	51.44	-30.85	RMS
7	1847.880	29.74	2.33	32.07	51.44	-19.37	peak
8	1847.880	18.24	2.33	20.57	51.44	-30.87	RMS
9	1948.200	30.12	1.53	31.65	51.44	-19.79	peak
10	1948.200	19.17	1.53	20.70	51.44	-30.74	RMS
11	1974.420	30.17	1.76	31.93	51.44	-19.51	peak
12	1974.420	20.10	1.76	21.86	51.44	-29.58	RMS

Remark:

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

80.0 dBuV/m



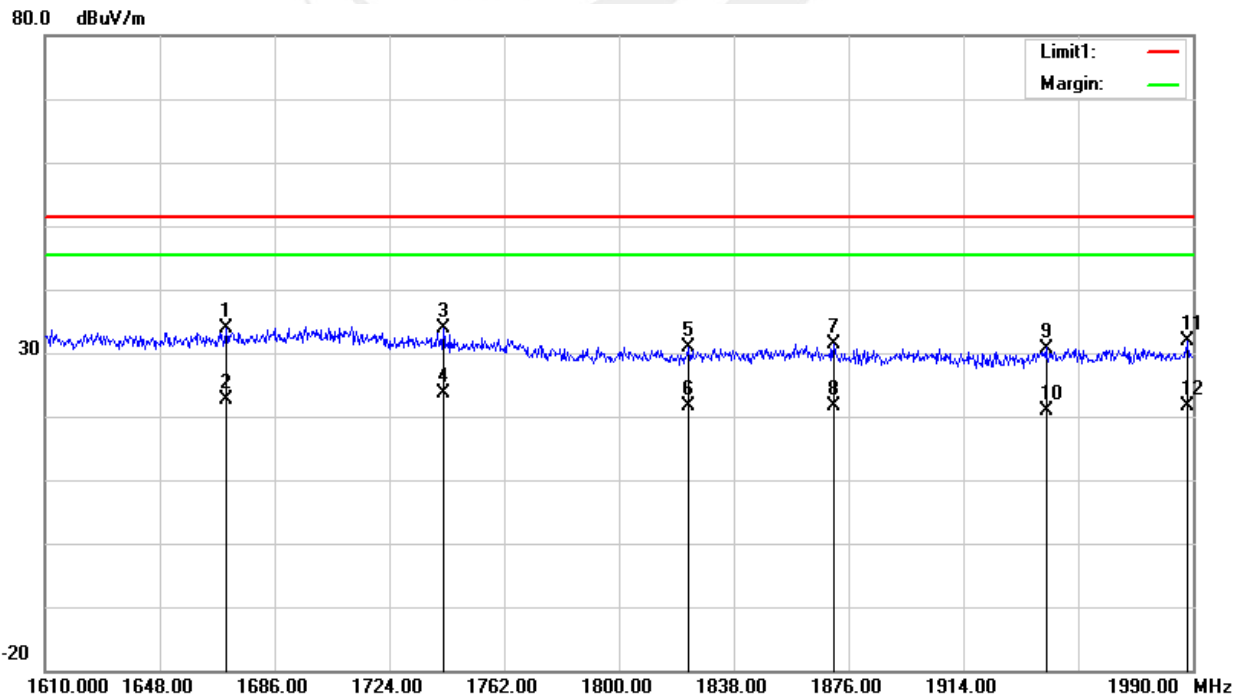


Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	AC 120V/60Hz	Phase:	Vertical
Test Mode:	CH 1(1610MHz – 1990MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1670.040	29.17	4.63	33.80	51.44	-17.64	peak
2	1670.040	17.88	4.63	22.51	51.44	-28.93	RMS
3	1741.860	29.86	3.92	33.78	51.44	-17.66	peak
4	1741.860	19.60	3.92	23.52	51.44	-27.92	RMS
5	1823.180	28.83	2.04	30.87	51.44	-20.57	peak
6	1823.180	19.69	2.04	21.73	51.44	-29.71	RMS
7	1871.060	29.49	1.98	31.47	51.44	-19.97	peak
8	1871.060	19.62	1.98	21.60	51.44	-29.84	RMS
9	1941.360	29.23	1.52	30.75	51.44	-20.69	peak
10	1941.360	19.37	1.52	20.89	51.44	-30.55	RMS
11	1988.100	29.86	1.90	31.76	51.44	-19.68	peak
12	1988.100	19.64	1.90	21.54	51.44	-29.90	RMS

Remark:

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





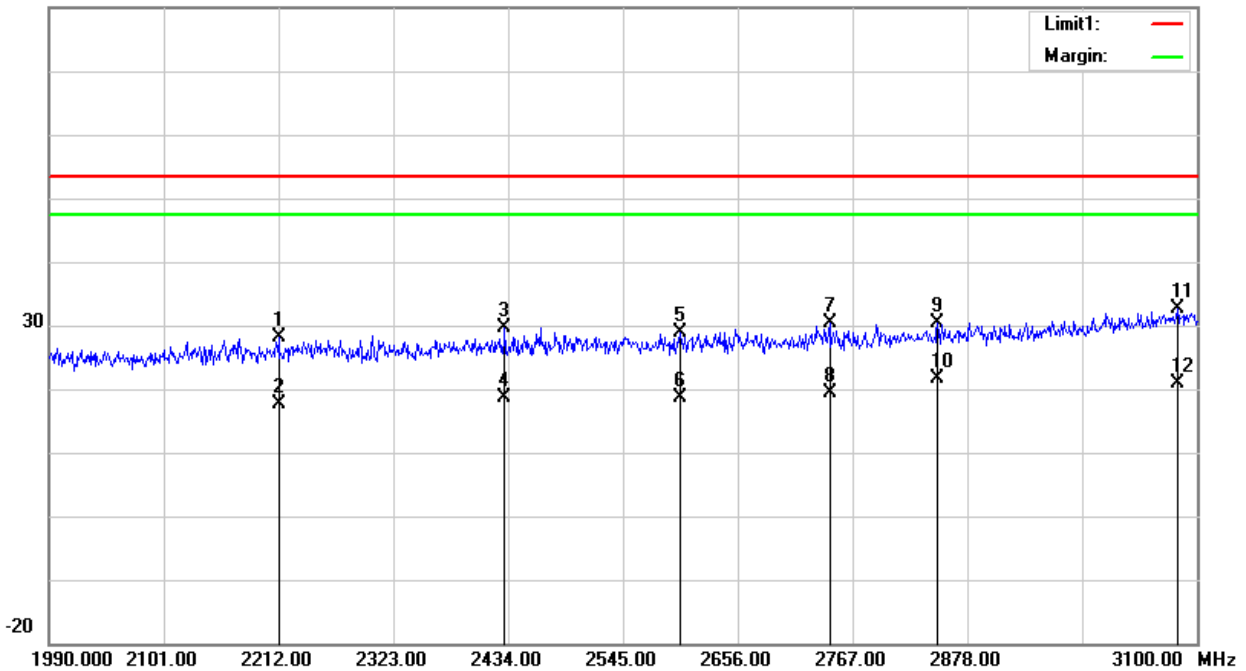
Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	AC 120V/60Hz	Phase:	Horizontal
Test Mode:	CH 1(1990MHz – 3100MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2212.000	24.97	3.13	28.10	53.44	-25.34	peak
2	2212.000	14.60	3.13	17.73	53.44	-35.71	RMS
3	2430.670	25.22	4.50	29.72	53.44	-23.72	peak
4	2430.670	14.09	4.50	18.59	53.44	-34.85	RMS
5	2600.500	23.79	5.03	28.82	53.44	-24.62	peak
6	2600.500	13.69	5.03	18.72	53.44	-34.72	RMS
7	2744.800	24.41	6.02	30.43	53.44	-23.01	peak
8	2744.800	13.45	6.02	19.47	53.44	-33.97	RMS
9	2849.140	23.74	6.56	30.30	53.44	-23.14	peak
10	2849.140	14.99	6.56	21.55	53.44	-31.89	RMS
11	3081.130	4.30	28.25	32.55	53.44	-20.89	peak
12	3081.130	-7.31	28.25	20.94	53.44	-32.50	RMS

Remark:

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

80.0 dBuV/m





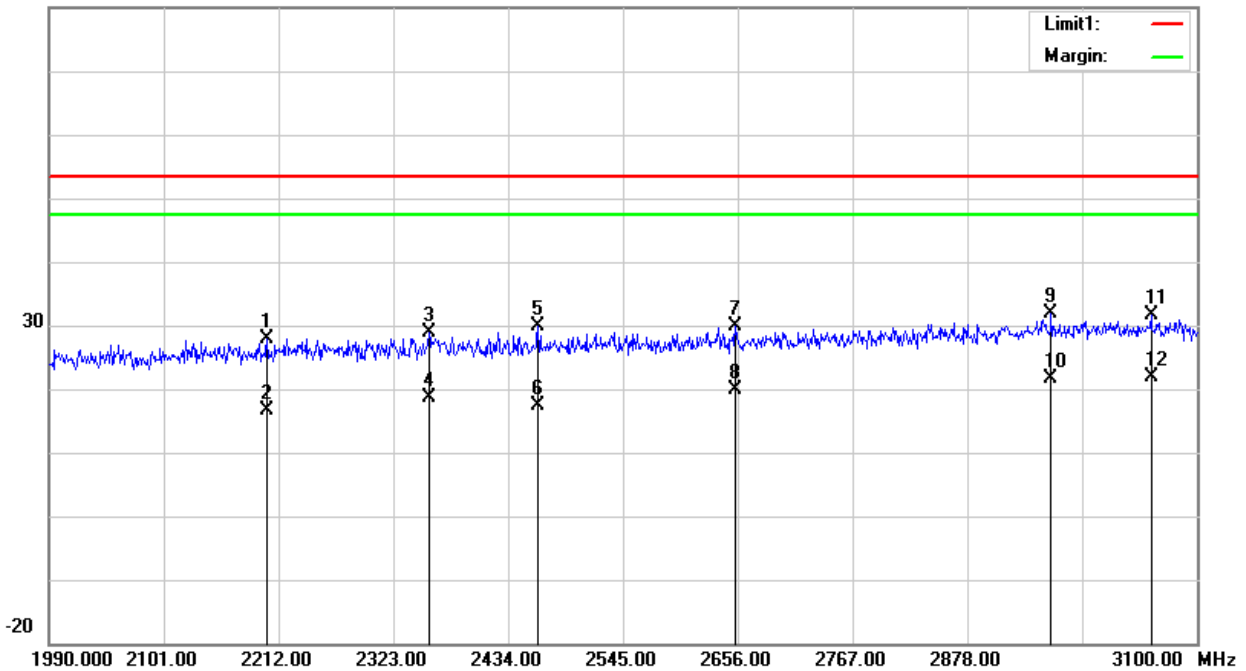
Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	AC 120V/60Hz	Phase:	Vertical
Test Mode:	CH 1(1990MHz – 3100MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2200.900	25.06	2.94	28.00	53.44	-25.44	peak
2	2200.900	13.73	2.94	16.67	53.44	-36.77	RMS
3	2357.410	24.97	3.86	28.83	53.44	-24.61	peak
4	2357.410	14.82	3.86	18.68	53.44	-34.76	RMS
5	2462.860	25.26	4.55	29.81	53.44	-23.63	peak
6	2462.860	12.77	4.55	17.32	53.44	-36.12	RMS
7	2653.780	24.29	5.55	29.84	53.44	-23.60	peak
8	2653.780	14.28	5.55	19.83	53.44	-33.61	RMS
9	2959.030	25.01	6.99	32.00	53.44	-21.44	peak
10	2959.030	14.57	6.99	21.56	53.44	-31.88	RMS
11	3055.600	3.29	28.23	31.52	53.44	-21.92	peak
12	3055.600	-6.43	28.23	21.80	53.44	-31.64	RMS

Remark:

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

80.0 dBuV/m





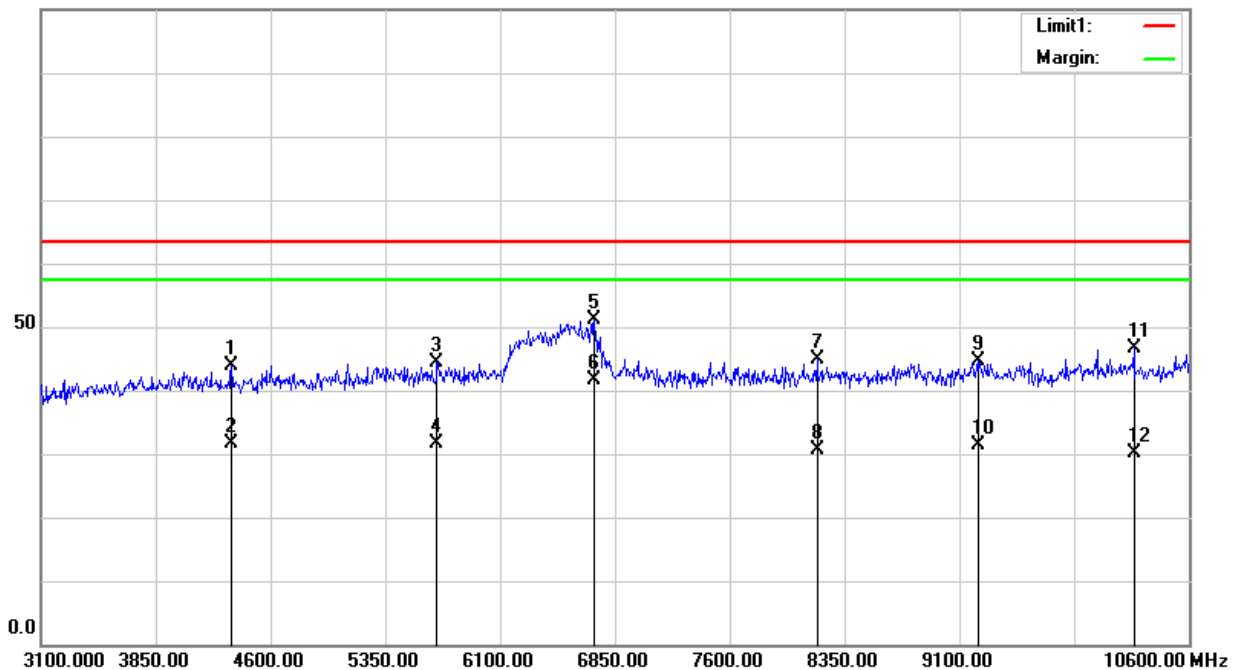
Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	AC 120V/60Hz	Phase:	Horizontal
Test Mode:	CH 1 (3100MHz – 10600MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4345.000	13.46	30.32	43.78	63.44	-19.66	peak
2	4345.000	1.35	30.32	31.67	63.44	-31.77	RMS
3	5687.500	12.13	32.30	44.43	63.44	-19.01	peak
4	5687.500	-0.77	32.30	31.53	63.44	-31.91	RMS
5	6715.000	16.38	34.73	51.11	63.44	-12.33	peak
6	6715.000	6.81	34.73	41.54	63.44	-21.90	RMS
7	8170.000	7.90	37.07	44.97	63.44	-18.47	peak
8	8170.000	-6.49	37.07	30.58	63.44	-32.86	RMS
9	9220.000	7.00	37.55	44.55	63.44	-18.89	peak
10	9220.000	-6.15	37.55	31.40	63.44	-32.04	RMS
11	10240.000	8.29	38.44	46.73	63.44	-16.71	peak
12	10240.000	-8.25	38.44	30.19	63.44	-33.25	RMS

Remark:

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

100.0 dBuV/m





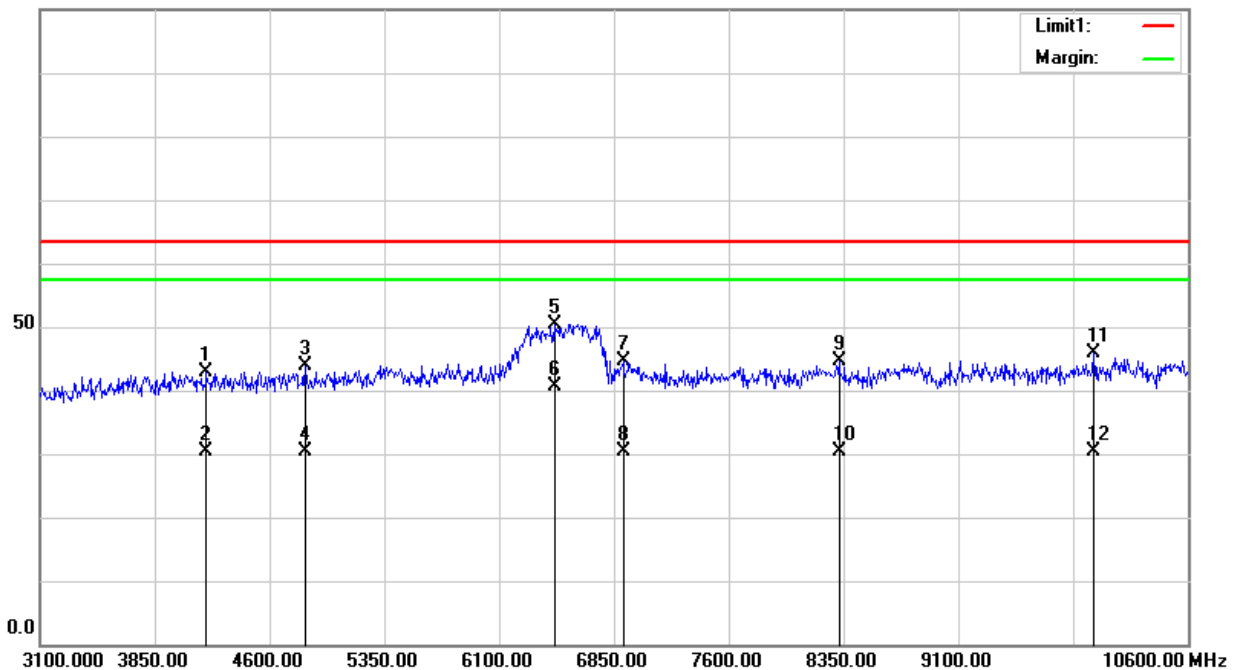
Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	AC 120V/60Hz	Phase:	Vertical
Test Mode:	CH 1 (3100MHz – 10600MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4187.500	12.88	30.04	42.92	63.44	-20.52	peak
2	4187.500	0.43	30.04	30.47	63.44	-32.97	RMS
3	4832.500	12.71	31.27	43.98	63.44	-19.46	peak
4	4832.500	-1.01	31.27	30.26	63.44	-33.18	RMS
5	6460.000	16.34	34.04	50.38	63.44	-13.06	peak
6	6460.000	6.49	34.04	40.53	63.44	-22.91	RMS
7	6910.000	9.45	35.26	44.71	63.44	-18.73	peak
8	6910.000	-4.77	35.26	30.49	63.44	-32.95	RMS
9	8320.000	7.46	37.13	44.59	63.44	-18.85	peak
10	8320.000	-6.85	37.13	30.28	63.44	-33.16	RMS
11	9985.000	7.90	38.09	45.99	63.44	-17.45	peak
12	9985.000	-7.79	38.09	30.30	63.44	-33.14	RMS

Remark:

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

100.0 dBuV/m





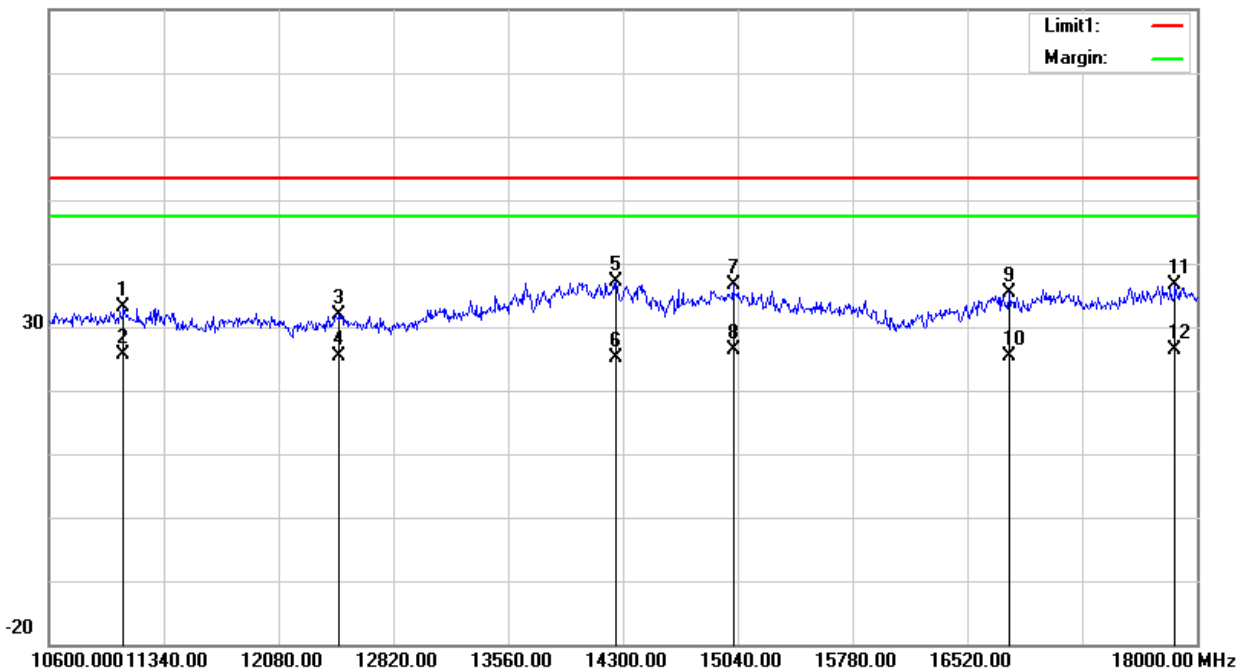
Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	AC 120V/60Hz	Phase:	Horizontal
Test Mode:	CH 1 (10600MHz – 18000MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	11081.000	26.77	6.31	33.08	53.44	-20.36	peak
2	11081.000	19.31	6.31	25.62	53.44	-27.82	RMS
3	12472.200	26.05	5.83	31.88	53.44	-21.56	peak
4	12472.200	19.65	5.83	25.48	53.44	-27.96	RMS
5	14255.600	25.27	11.86	37.13	53.44	-16.31	peak
6	14255.600	13.30	11.86	25.16	53.44	-28.28	RMS
7	15010.400	26.55	10.06	36.61	53.44	-16.83	peak
8	15010.400	16.31	10.06	26.37	53.44	-27.07	RMS
9	16793.800	25.75	9.60	35.35	53.44	-18.09	peak
10	16793.800	15.72	9.60	25.32	53.44	-28.12	RMS
11	17859.400	24.93	11.66	36.59	53.44	-16.85	peak
12	17859.400	14.65	11.66	26.31	53.44	-27.13	RMS

Remark:

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

80.0 dBuV/m





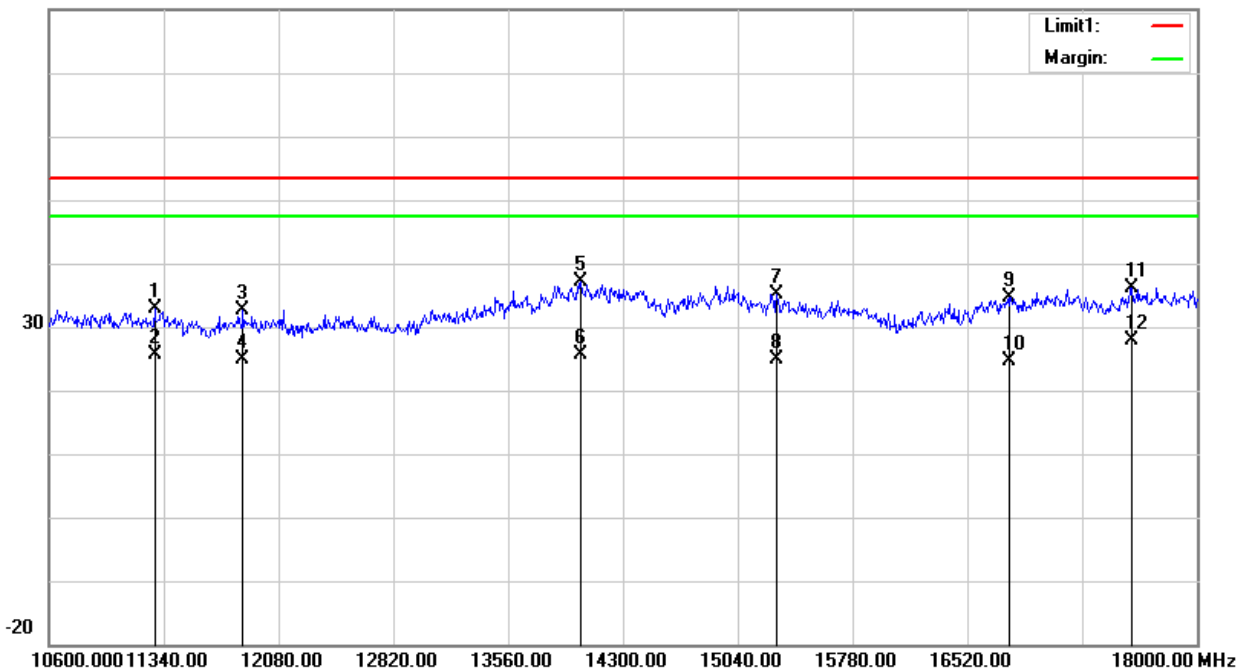
Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	AC 120V/60Hz	Phase:	Vertical
Test Mode:	CH 1 (10600MHz – 18000MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	11280.800	26.53	6.36	32.89	53.44	-20.55	peak
2	11280.800	19.26	6.36	25.62	53.44	-27.82	RMS
3	11850.600	26.66	5.98	32.64	53.44	-20.80	peak
4	11850.600	18.85	5.98	24.83	53.44	-28.61	RMS
5	14026.200	24.96	12.28	37.24	53.44	-16.20	peak
6	14026.200	13.39	12.28	25.67	53.44	-27.77	RMS
7	15291.600	25.23	9.87	35.10	53.44	-18.34	peak
8	15291.600	14.94	9.87	24.81	53.44	-28.63	RMS
9	16793.800	24.97	9.60	34.57	53.44	-18.87	peak
10	16793.800	15.14	9.60	24.74	53.44	-28.70	RMS
11	17578.200	25.19	10.86	36.05	53.44	-17.39	peak
12	17578.200	17.00	10.86	27.86	53.44	-25.58	RMS

Remark:

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

80.0 dBuV/m



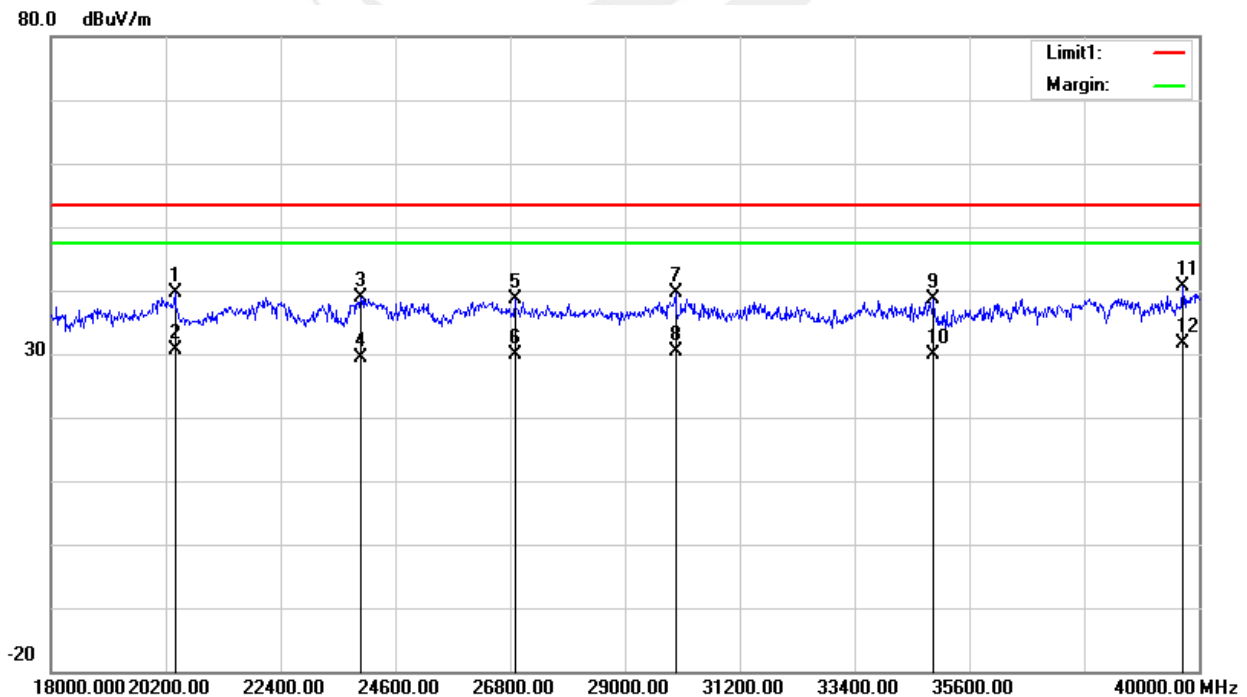


Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	AC 120V/60Hz	Phase:	Horizontal
Test Mode:	CH 1 (18000MHz – 40000MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	20376.000	28.28	11.45	39.73	53.44	-13.71	peak
2	20376.000	19.17	11.45	30.62	53.44	-22.82	RMS
3	23940.000	22.94	16.05	38.99	53.44	-14.45	peak
4	23940.000	13.42	16.05	29.47	53.44	-23.97	RMS
5	26888.000	-1.97	40.50	38.53	53.44	-14.91	peak
6	26888.000	-10.65	40.50	29.85	53.44	-23.59	RMS
7	29968.000	0.94	38.64	39.58	53.44	-13.86	peak
8	29968.000	-8.21	38.64	30.43	53.44	-23.01	RMS
9	34918.000	-0.78	39.40	38.62	53.44	-14.82	peak
10	34918.000	-9.57	39.40	29.83	53.44	-23.61	RMS
11	39692.000	-1.65	42.38	40.73	53.44	-12.71	peak
12	39692.000	-10.67	42.38	31.71	53.44	-21.73	RMS

Remark:

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





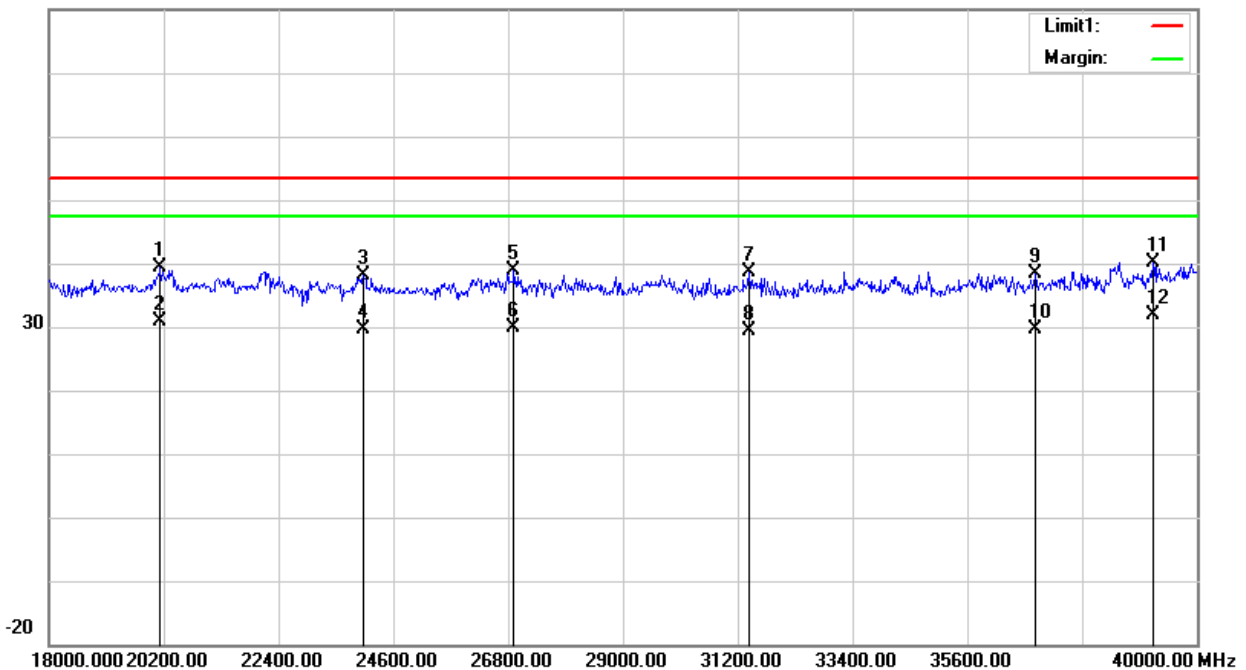
Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	AC 120V/60Hz	Phase:	Vertical
Test Mode:	CH 1 (18000MHz – 40000MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	20134.000	25.62	13.68	39.30	53.44	-14.14	peak
2	20134.000	17.08	13.68	30.76	53.44	-22.68	RMS
3	24028.000	21.87	16.14	38.01	53.44	-15.43	peak
4	24028.000	13.51	16.14	29.65	53.44	-23.79	RMS
5	26910.000	-1.52	40.50	38.98	53.44	-14.46	peak
6	26910.000	-10.66	40.50	29.84	53.44	-23.60	RMS
7	31420.000	-1.06	39.72	38.66	53.44	-14.78	peak
8	31420.000	-10.3	39.72	29.42	53.44	-24.02	RMS
9	36898.000	-0.35	38.63	38.28	53.44	-15.16	peak
10	36898.000	-8.88	38.63	29.75	53.44	-23.69	RMS
11	39164.000	-0.23	40.34	40.11	53.44	-13.33	peak
12	39164.000	-8.41	40.34	31.93	53.44	-21.51	RMS

Remark:

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

80.0 dBuV/m





IC:

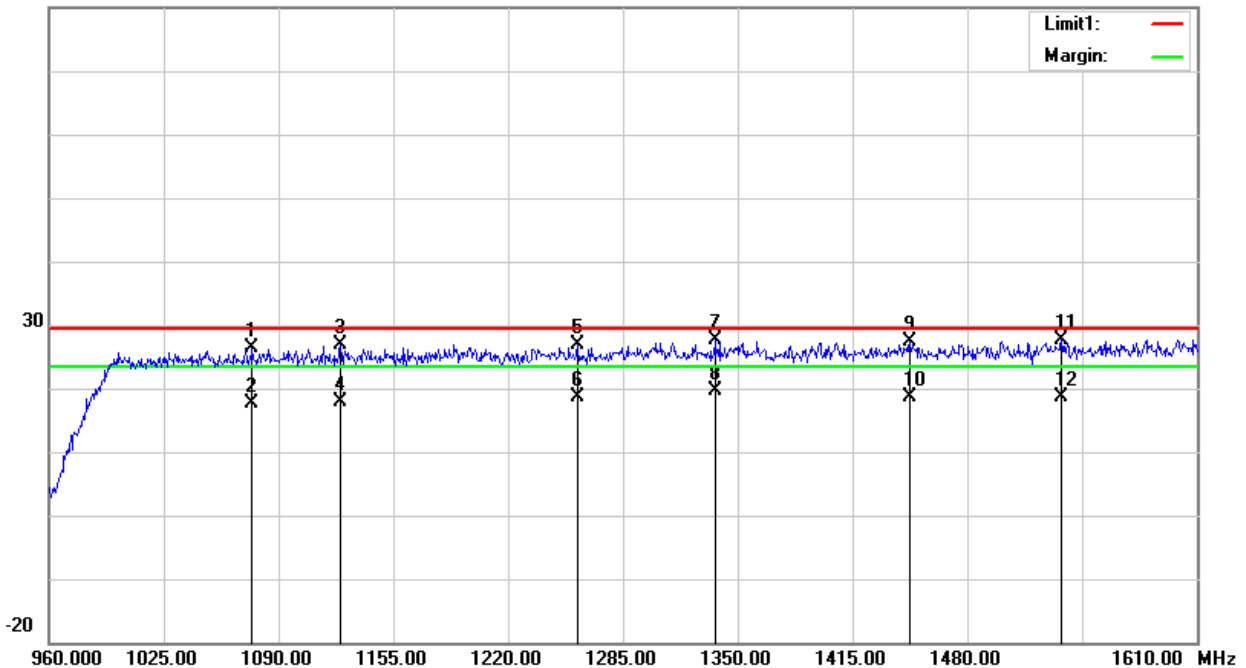
Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	AC 120V/60Hz	Phase:	Horizontal
Test Mode:	CH 1(960MHz -1610MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1075.050	27.54	-1.22	26.32	29.44	-3.12	peak
2	1075.050	18.84	-1.22	17.62	29.44	-11.82	RMS
3	1125.100	27.89	-0.99	26.90	29.44	-2.54	peak
4	1125.100	18.77	-0.99	17.78	29.44	-11.66	RMS
5	1259.000	27.22	-0.45	26.77	29.44	-2.67	peak
6	1259.000	19.04	-0.45	18.59	29.44	-10.85	RMS
7	1337.000	27.53	0.01	27.54	29.44	-1.90	peak
8	1337.000	19.60	0.01	19.61	29.44	-9.83	RMS
9	1447.500	26.42	0.86	27.28	29.44	-2.16	peak
10	1447.500	17.88	0.86	18.74	29.44	-10.70	RMS
11	1533.300	25.47	2.28	27.75	29.44	-1.69	peak
12	1533.300	16.35	2.28	18.63	29.44	-10.81	RMS

Remark:

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

80.0 dBuV/m





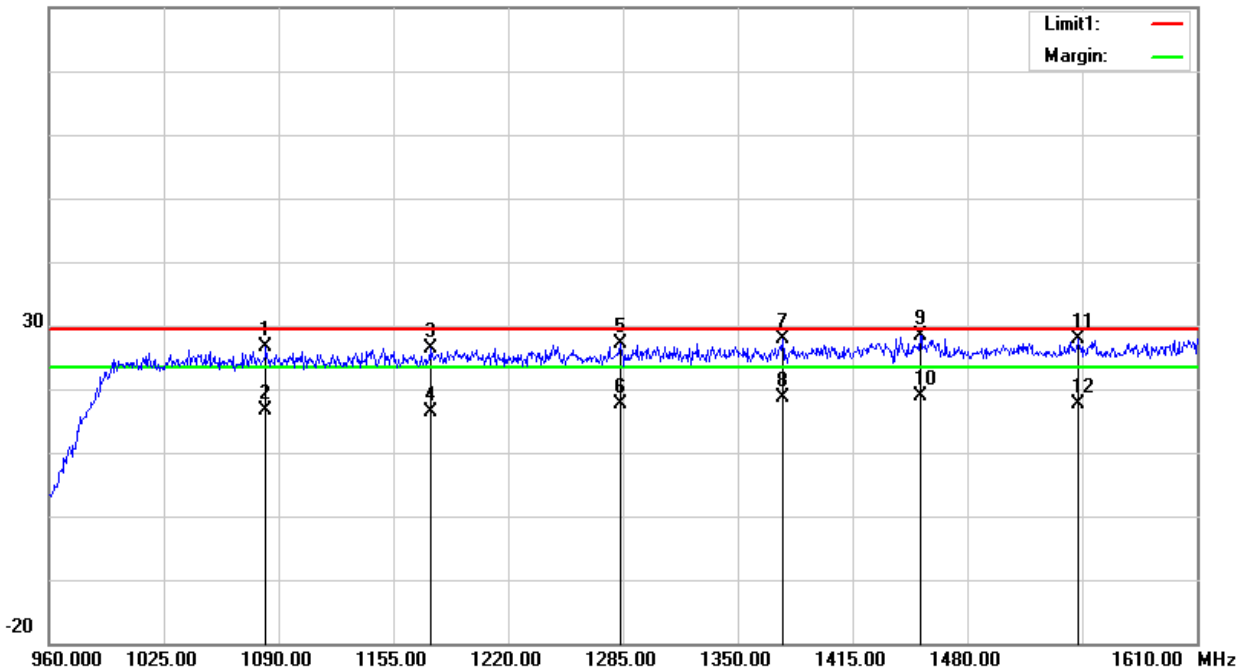
Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	AC 120V/60Hz	Phase:	Vertical
Test Mode:	CH 1(960MHz -1610MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1082.850	27.77	-1.18	26.59	29.44	-2.85	peak
2	1082.850	17.71	-1.18	16.53	29.44	-12.91	RMS
3	1175.800	27.04	-0.66	26.38	29.44	-3.06	peak
4	1175.800	17.13	-0.66	16.47	29.44	-12.97	RMS
5	1283.700	27.33	-0.25	27.08	29.44	-2.36	peak
6	1283.700	17.77	-0.25	17.52	29.44	-11.92	RMS
7	1375.350	27.72	0.17	27.89	29.44	-1.55	peak
8	1375.350	18.52	0.17	18.69	29.44	-10.75	RMS
9	1453.350	27.44	0.93	28.37	29.44	-1.07	peak
10	1453.350	17.94	0.93	18.87	29.44	-10.57	RMS
11	1543.050	25.44	2.51	27.95	29.44	-1.49	peak
12	1543.050	15.15	2.51	17.66	29.44	-11.78	RMS

Remark:

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

80.0 dBuV/m





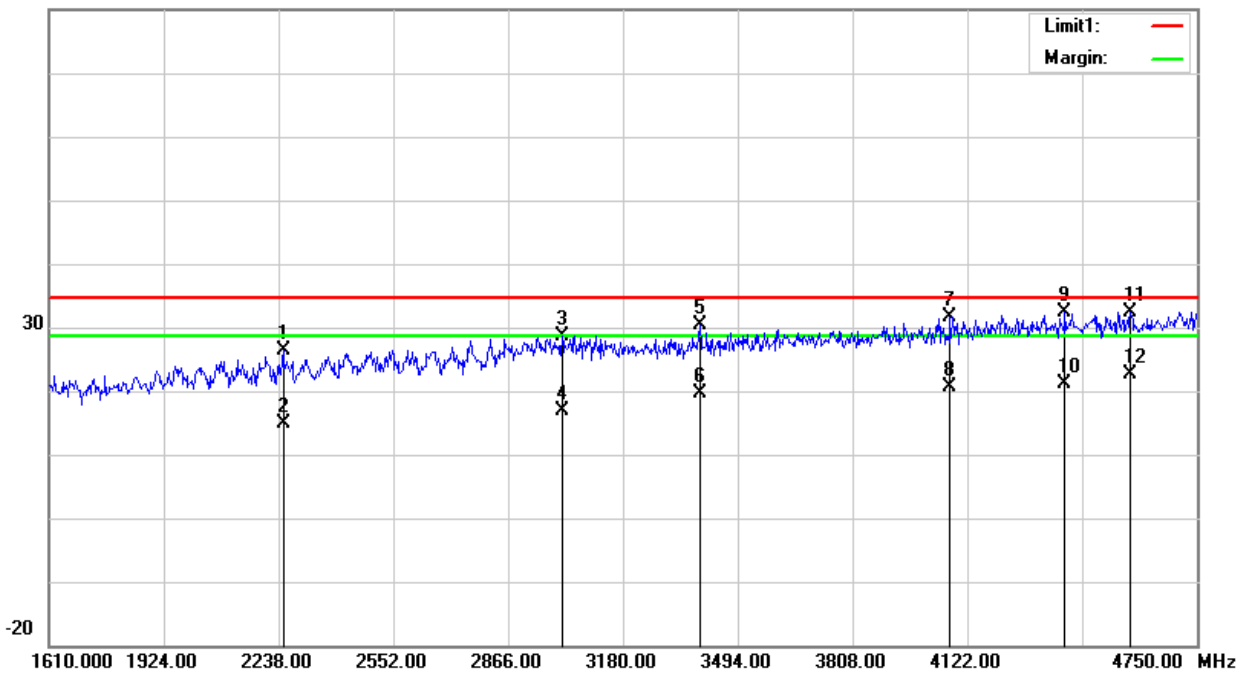
Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	AC 120V/60Hz	Phase:	Horizontal
Test Mode:	CH 1(1610MHz – 4750MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2250.560	41.69	-15.28	26.41	34.74	-8.33	peak
2	2250.560	30.14	-15.28	14.86	34.74	-19.88	RMS
3	3013.580	41.29	-12.62	28.67	34.74	-6.07	peak
4	3013.580	29.47	-12.62	16.85	34.74	-17.89	RMS
5	3390.380	41.90	-11.64	30.26	34.74	-4.48	peak
6	3390.380	31.36	-11.64	19.72	34.74	-15.02	RMS
7	4074.900	40.92	-9.23	31.69	34.74	-3.05	peak
8	4074.900	29.82	-9.23	20.59	34.74	-14.15	RMS
9	4388.900	40.39	-8.08	32.31	34.74	-2.43	peak
10	4388.900	29.25	-8.08	21.17	34.74	-13.57	RMS
11	4567.880	40.38	-7.89	32.49	34.74	-2.25	peak
12	4567.880	30.40	-7.89	22.51	34.74	-12.23	RMS

Remark:

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

80.0 dBuV/m





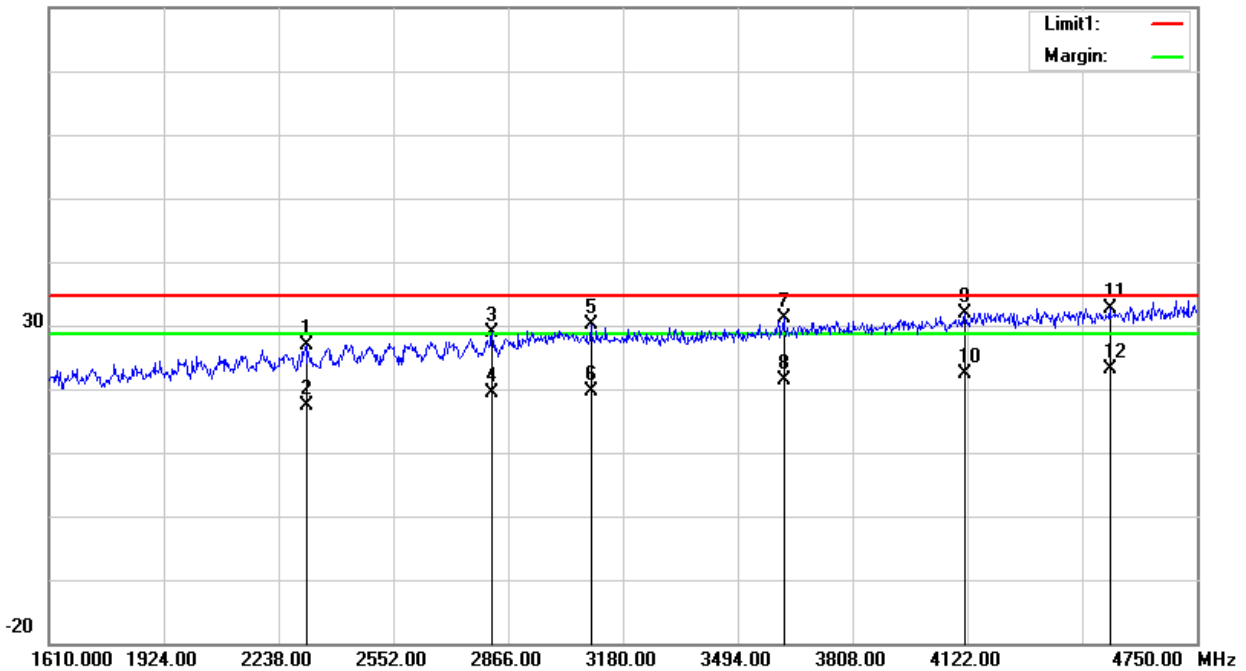
Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	AC 120V/60Hz	Phase:	Vertical
Test Mode:	CH 1(1610MHz – 4750MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2313.360	41.79	-15.01	26.78	34.74	-7.96	peak
2	2313.360	32.40	-15.01	17.39	34.74	-17.35	RMS
3	2822.040	41.59	-12.80	28.79	34.74	-5.95	peak
4	2822.040	32.07	-12.80	19.27	34.74	-15.47	RMS
5	3092.080	42.46	-12.43	30.03	34.74	-4.71	peak
6	3092.080	32.01	-12.43	19.58	34.74	-15.16	RMS
7	3619.600	42.03	-10.79	31.24	34.74	-3.50	peak
8	3619.600	32.22	-10.79	21.43	34.74	-13.31	RMS
9	4115.720	40.74	-8.98	31.76	34.74	-2.98	peak
10	4115.720	31.34	-8.98	22.36	34.74	-12.38	RMS
11	4511.360	40.55	-7.94	32.61	34.74	-2.13	peak
12	4511.360	31.08	-7.94	23.14	34.74	-11.60	RMS

Remark:

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

80.0 dBuV/m





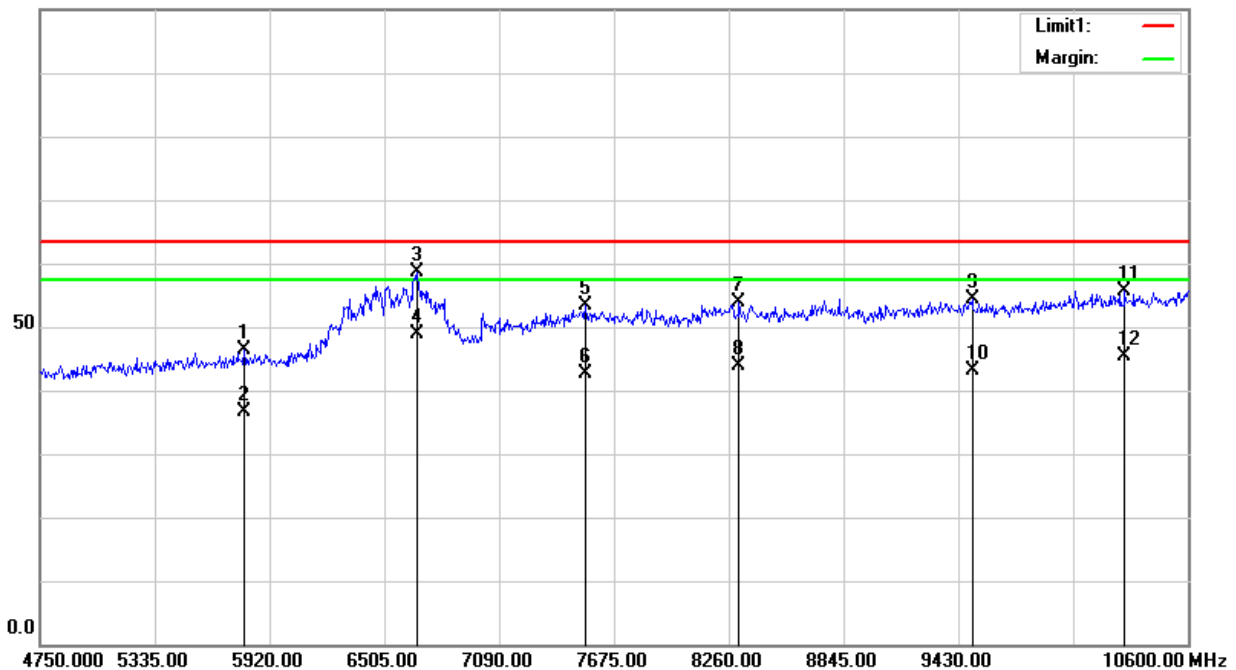
Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	AC 120V/60Hz	Phase:	Horizontal
Test Mode:	CH 1 (4750MHz – 10600MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5791.300	50.68	-4.35	46.33	63.44	-17.11	peak
2	5791.300	41.10	-4.35	36.75	63.44	-26.69	RMS
3	6668.800	59.97	-1.25	58.72	63.44	-4.72	peak
4	6668.800	50.16	-1.25	48.91	63.44	-14.53	RMS
5	7528.750	51.65	1.66	53.31	63.44	-10.13	peak
6	7528.750	40.95	1.66	42.61	63.44	-20.83	RMS
7	8312.650	51.44	2.52	53.96	63.44	-9.48	peak
8	8312.650	41.37	2.52	43.89	63.44	-19.55	RMS
9	9500.200	51.15	3.14	54.29	63.44	-9.15	peak
10	9500.200	40.07	3.14	43.21	63.44	-20.23	RMS
11	10278.250	51.43	4.26	55.69	63.44	-7.75	peak
12	10278.250	41.22	4.26	45.48	63.44	-17.96	RMS

Remark:

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

100.0 dBuV/m



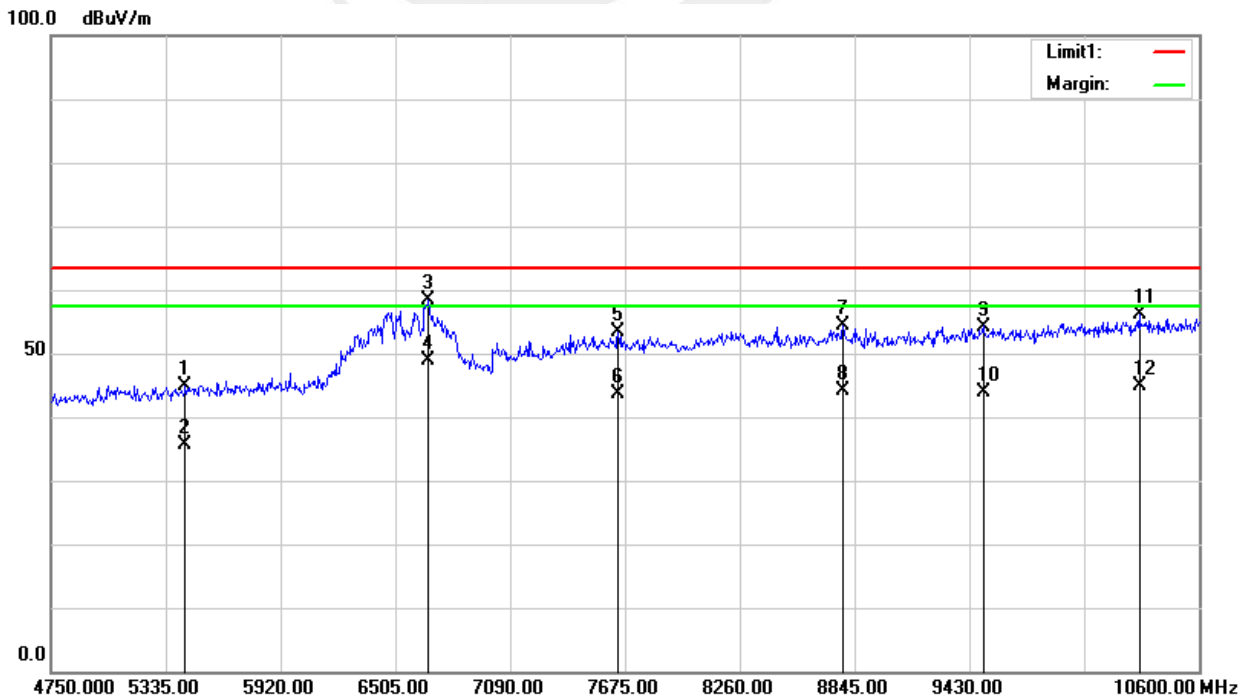


Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	AC 120V/60Hz	Phase:	Vertical
Test Mode:	CH 1 (4750MHz – 10600MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5434.450	50.12	-5.17	44.95	63.44	-18.49	peak
2	5434.450	40.84	-5.17	35.67	63.44	-27.77	RMS
3	6674.650	59.47	-1.21	58.26	63.44	-5.18	peak
4	6674.650	49.99	-1.21	48.78	63.44	-14.66	RMS
5	7639.900	51.49	1.78	53.27	63.44	-10.17	peak
6	7639.900	41.84	1.78	43.62	63.44	-19.82	RMS
7	8786.500	51.84	2.57	54.41	63.44	-9.03	peak
8	8786.500	41.55	2.57	44.12	63.44	-19.32	RMS
9	9500.200	51.11	3.14	54.25	63.44	-9.19	peak
10	9500.200	40.68	3.14	43.82	63.44	-19.62	RMS
11	10295.800	51.89	4.31	56.20	63.44	-7.24	peak
12	10295.800	40.62	4.31	44.93	63.44	-18.51	RMS

Remark:

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





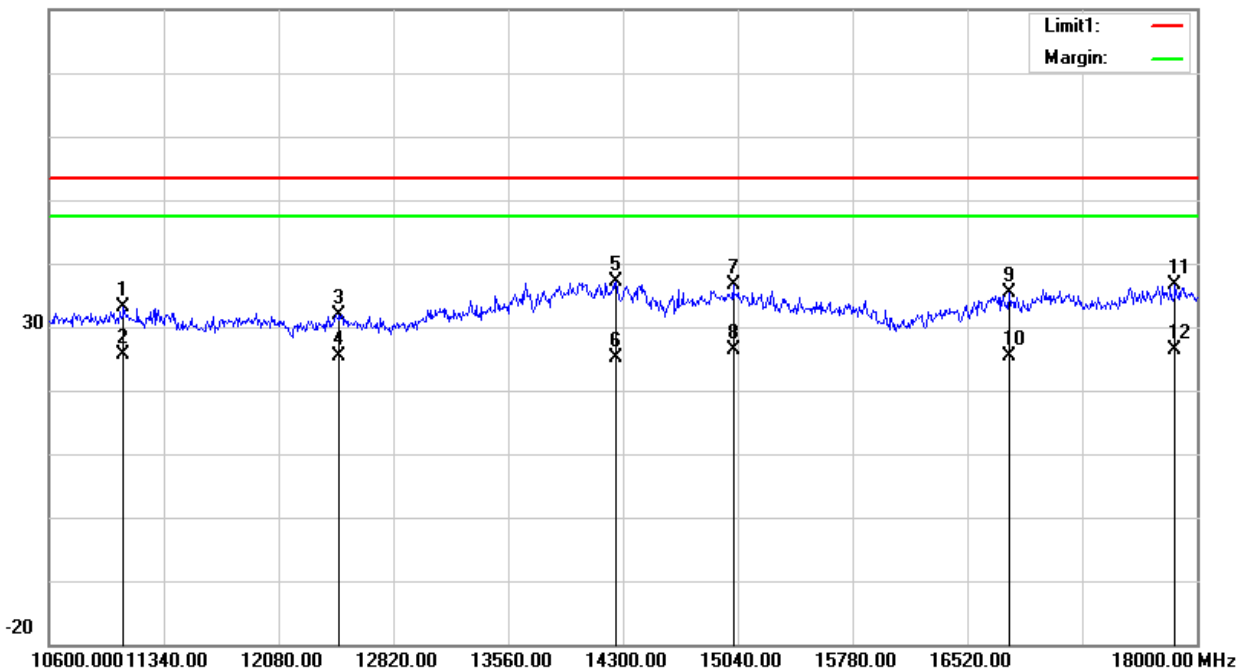
Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	AC 120V/60Hz	Phase:	Horizontal
Test Mode:	CH 1 (10600MHz – 18000MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	11081.000	26.77	6.31	33.08	53.44	-20.36	peak
2	11081.000	19.31	6.31	25.62	53.44	-27.82	RMS
3	12472.200	26.05	5.83	31.88	53.44	-21.56	peak
4	12472.200	19.65	5.83	25.48	53.44	-27.96	RMS
5	14255.600	25.27	11.86	37.13	53.44	-16.31	peak
6	14255.600	13.30	11.86	25.16	53.44	-28.28	RMS
7	15010.400	26.55	10.06	36.61	53.44	-16.83	peak
8	15010.400	16.31	10.06	26.37	53.44	-27.07	RMS
9	16793.800	25.75	9.60	35.35	53.44	-18.09	peak
10	16793.800	15.72	9.60	25.32	53.44	-28.12	RMS
11	17859.400	24.93	11.66	36.59	53.44	-16.85	peak
12	17859.400	14.65	11.66	26.31	53.44	-27.13	RMS

Remark:

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

80.0 dBuV/m



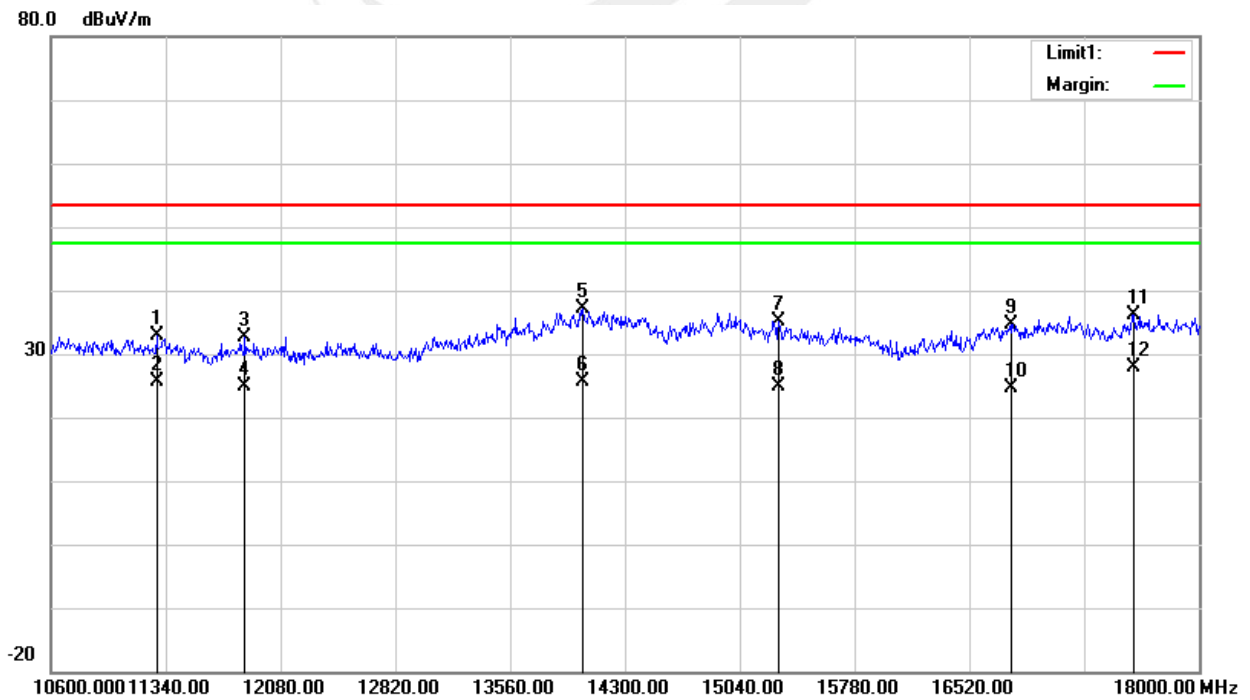


Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	AC 120V/60Hz	Phase:	Vertical
Test Mode:	CH 1 (10600MHz – 18000MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	11280.800	26.53	6.36	32.89	53.44	-20.55	peak
2	11280.800	19.26	6.36	25.62	53.44	-27.82	RMS
3	11850.600	26.66	5.98	32.64	53.44	-20.80	peak
4	11850.600	18.85	5.98	24.83	53.44	-28.61	RMS
5	14026.200	24.96	12.28	37.24	53.44	-16.20	peak
6	14026.200	13.39	12.28	25.67	53.44	-27.77	RMS
7	15291.600	25.23	9.87	35.10	53.44	-18.34	peak
8	15291.600	14.94	9.87	24.81	53.44	-28.63	RMS
9	16793.800	24.97	9.60	34.57	53.44	-18.87	peak
10	16793.800	15.14	9.60	24.74	53.44	-28.70	RMS
11	17578.200	25.19	10.86	36.05	53.44	-17.39	peak
12	17578.200	17.00	10.86	27.86	53.44	-25.58	RMS

Remark:

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



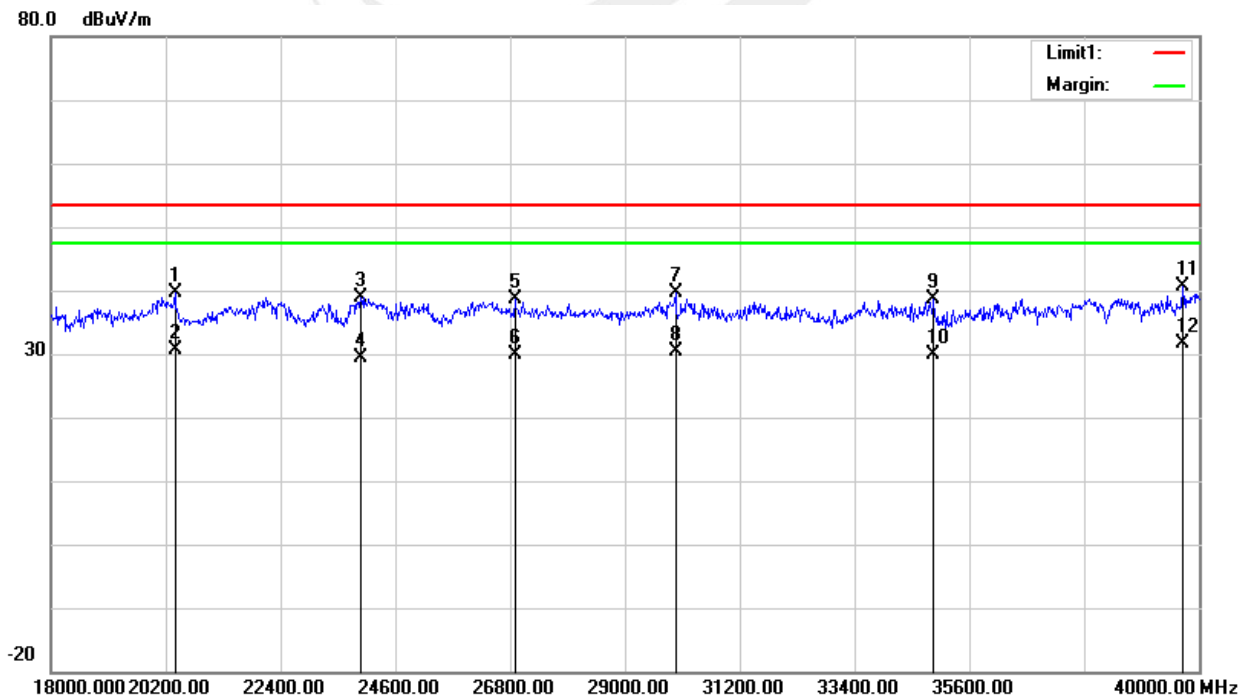


Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	AC 120V/60Hz	Phase:	Horizontal
Test Mode:	CH 1 (10600MHz – 40000MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	20376.000	28.28	11.45	39.73	53.44	-13.71	peak
2	20376.000	19.17	11.45	30.62	53.44	-22.82	RMS
3	23940.000	22.94	16.05	38.99	53.44	-14.45	peak
4	23940.000	13.42	16.05	29.47	53.44	-23.97	RMS
5	26888.000	-1.97	40.50	38.53	53.44	-14.91	peak
6	26888.000	-10.65	40.50	29.85	53.44	-23.59	RMS
7	29968.000	0.94	38.64	39.58	53.44	-13.86	peak
8	29968.000	-8.21	38.64	30.43	53.44	-23.01	RMS
9	34918.000	-0.78	39.40	38.62	53.44	-14.82	peak
10	34918.000	-9.57	39.40	29.83	53.44	-23.61	RMS
11	39692.000	-1.65	42.38	40.73	53.44	-12.71	peak
12	39692.000	-10.67	42.38	31.71	53.44	-21.73	RMS

Remark:

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





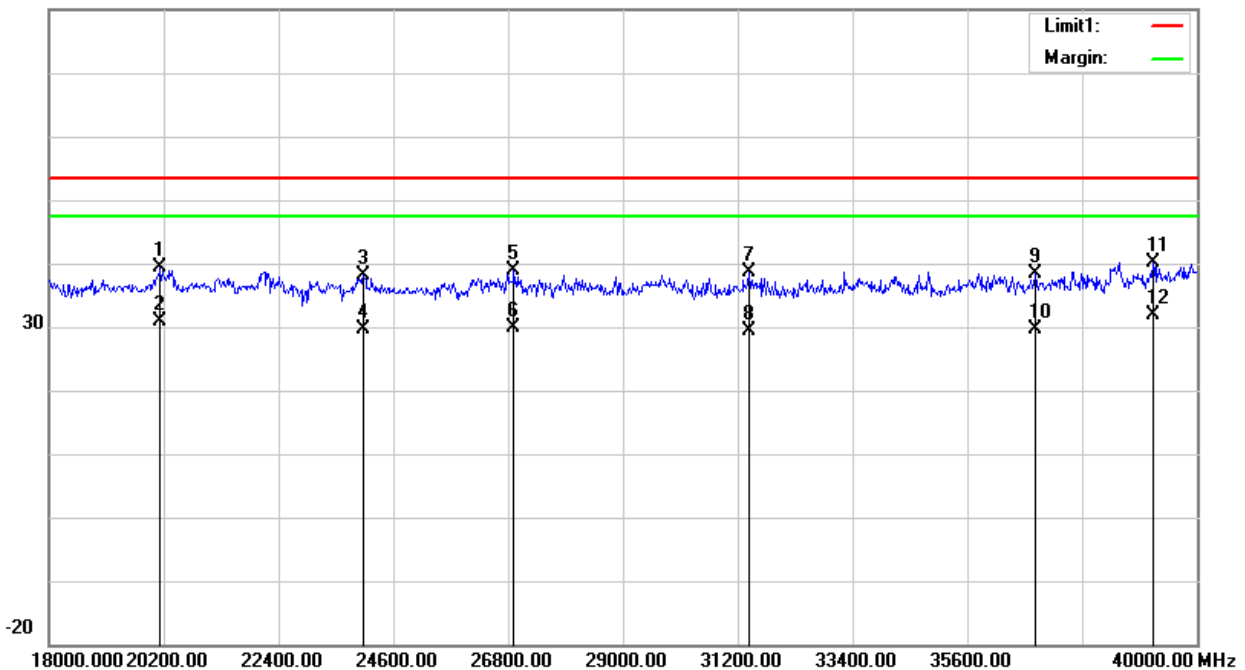
Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	AC 120V/60Hz	Phase:	Vertical
Test Mode:	CH 1 (10600MHz – 40000MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	20134.000	25.62	13.68	39.30	53.44	-14.14	peak
2	20134.000	17.08	13.68	30.76	53.44	-22.68	RMS
3	24028.000	21.87	16.14	38.01	53.44	-15.43	peak
4	24028.000	13.51	16.14	29.65	53.44	-23.79	RMS
5	26910.000	-1.52	40.50	38.98	53.44	-14.46	peak
6	26910.000	-10.66	40.50	29.84	53.44	-23.60	RMS
7	31420.000	-1.06	39.72	38.66	53.44	-14.78	peak
8	31420.000	-10.3	39.72	29.42	53.44	-24.02	RMS
9	36898.000	-0.35	38.63	38.28	53.44	-15.16	peak
10	36898.000	-8.88	38.63	29.75	53.44	-23.69	RMS
11	39164.000	-0.23	40.34	40.11	53.44	-13.33	peak
12	39164.000	-8.41	40.34	31.93	53.44	-21.51	RMS

Remark:

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

80.0 dBuV/m





3.3 RADIATED EMISSION MEASUREMENT (FOR 15.517(d)&RSS 220 5.2.1(e))

3.3.1 RADIATED EMISSION LIMITS

Frequency of Emission (MHz)	EIRP (dBm)	Field Strength (dBuV/m@3m)	Field Strength (dBuV/m@1m)
1164~1240	-85.3	10	19.54
1559~1610	-85.3	10	19.54

Notes: 1. Transfer rules follow 15.521(g),15.31(f)(1).

2. 15.521(g) converted to a peak field strength level at 3 meters using $E(\text{dBuV/m}) = P(\text{dBmEIRP}) + 95.2$.

3. $\text{dBuV/m@1m} = \text{dBuV/m@3m} + 20 \cdot \log(3/1)$

UWB transmitters operating under the provisions of this section shall not exceed the following average limits when measured using a resolution bandwidth of no less than 1 kHz:

Frequency Range	RBW	VBW	Detector	Measurement Distance
1164~1240	1kHz	3kHz	RMS	1 Meter
1559~1610	1kHz	3kHz	RMS	1 Meter

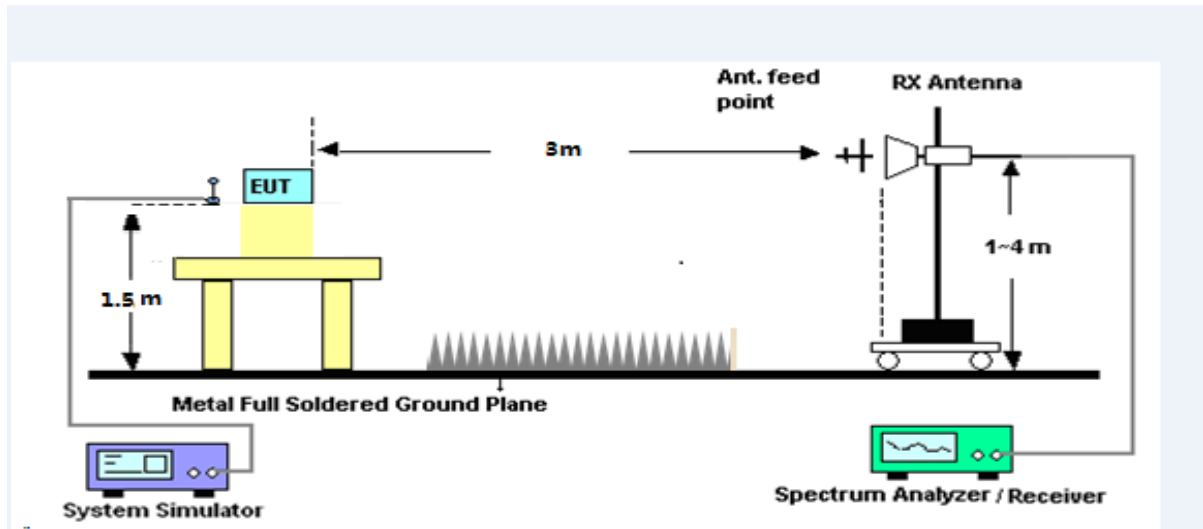
3.3.2 TEST PROCEDURE

- The measuring distance of 1m shall be used for measurements. The EUT was placed on the top of 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.
- 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.
- All readings are RMS mode value, 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.
(Above 960MHz)
- 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.

3.3.3 DEVIATION FROM TEST STANDARD

No deviation

3.3.4 TEST SETUP

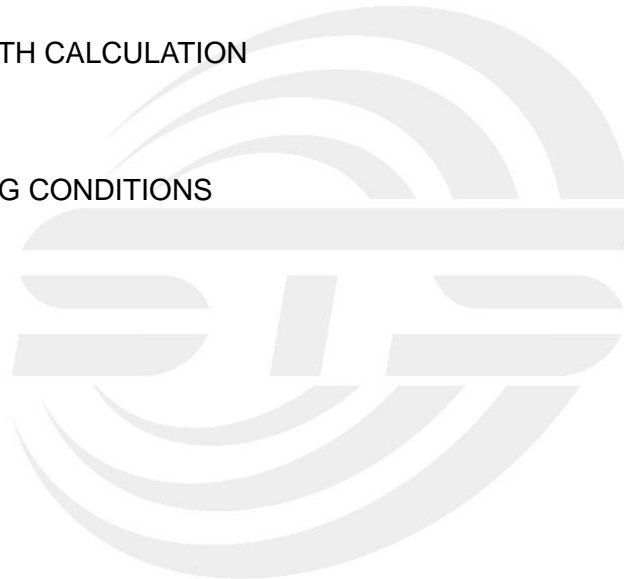


3.3.5 FIELD STRENGTH CALCULATION

Same as 3.2.5

3.3.6 EUT OPERATING CONDITIONS

Same as 3.2.6





3.3.7 TEST RESULTS

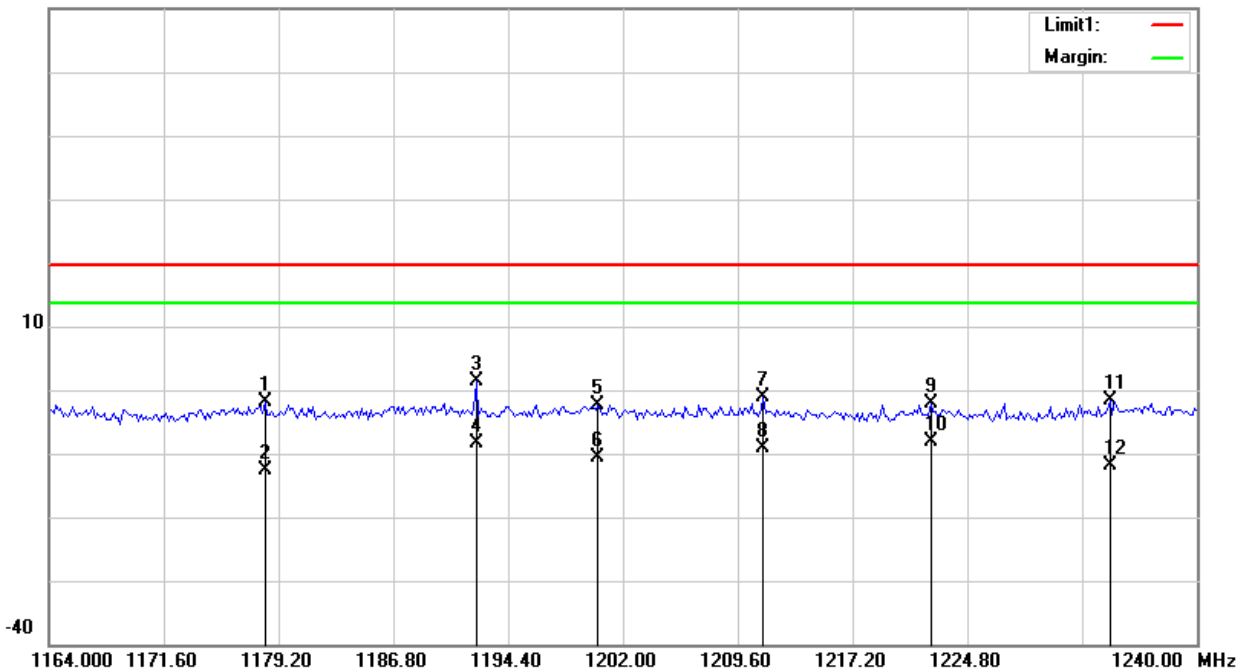
Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	AC 120V/60Hz	Phase:	Horizontal
Test Mode:	CH 1(1164Hz – 1240MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1178.288	-1.29	-0.64	-1.93	19.54	-21.47	peak
2	1178.288	-11.98	-0.64	-12.62	19.54	-32.16	RMS
3	1192.272	1.95	-0.49	1.46	19.54	-18.08	peak
4	1192.272	-7.85	-0.49	-8.34	19.54	-27.88	RMS
5	1200.328	-1.85	-0.42	-2.27	19.54	-21.81	peak
6	1200.328	-10.09	-0.42	-10.51	19.54	-30.05	RMS
7	1211.272	-0.70	-0.44	-1.14	19.54	-20.68	peak
8	1211.272	-8.73	-0.44	-9.17	19.54	-28.71	RMS
9	1222.368	-1.72	-0.46	-2.18	19.54	-21.72	peak
10	1222.368	-7.74	-0.46	-8.20	19.54	-27.74	RMS
11	1234.224	-1.25	-0.48	-1.73	19.54	-21.27	peak
12	1234.224	-11.37	-0.48	-11.85	19.54	-31.39	RMS

Remark:

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

60.0 dBuV/m





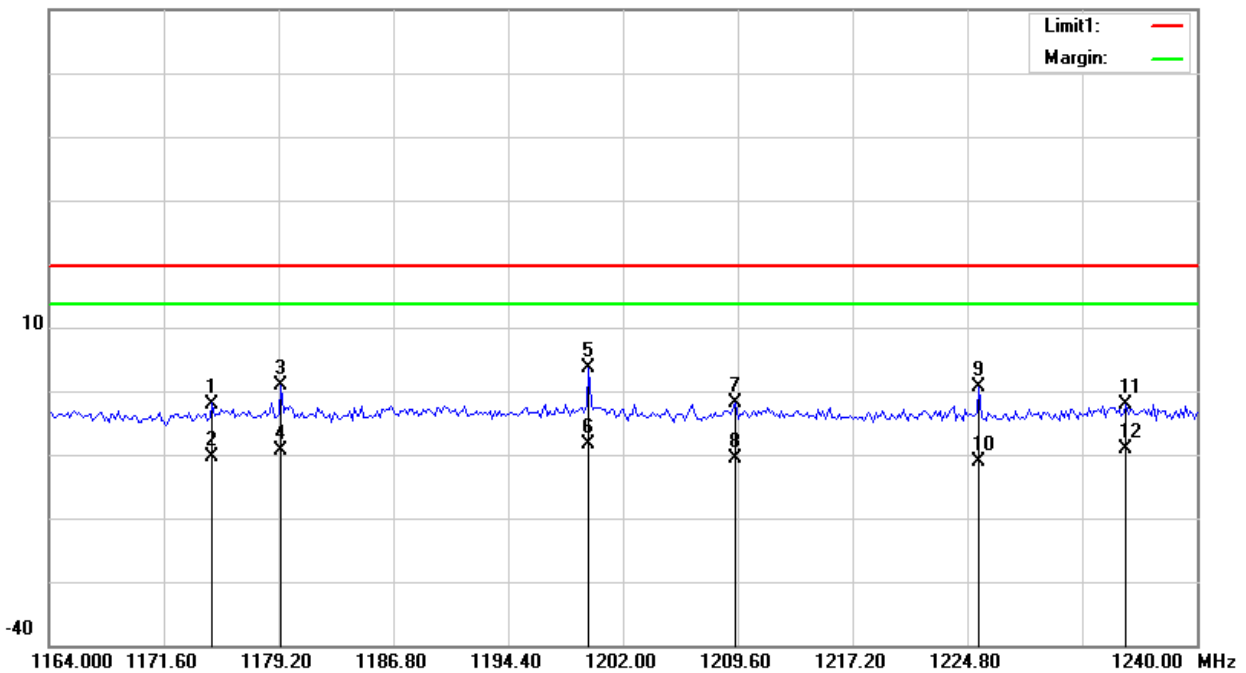
Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	AC 120V/60Hz	Phase:	Vertical
Test Mode:	CH 1(1164Hz – 1240MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1174.792	-1.33	-0.67	-2.00	19.54	-21.54	peak
2	1174.792	-9.68	-0.67	-10.35	19.54	-29.89	RMS
3	1179.352	1.43	-0.63	0.80	19.54	-18.74	peak
4	1179.352	-8.86	-0.63	-9.49	19.54	-29.03	RMS
5	1199.720	4.13	-0.42	3.71	19.54	-15.83	peak
6	1199.720	-7.90	-0.42	-8.32	19.54	-27.86	RMS
7	1209.448	-1.33	-0.43	-1.76	19.54	-21.30	peak
8	1209.448	-10.15	-0.43	-10.58	19.54	-30.12	RMS
9	1225.560	1.00	-0.47	0.53	19.54	-19.01	peak
10	1225.560	-10.77	-0.47	-11.24	19.54	-30.78	RMS
11	1235.288	-1.61	-0.49	-2.10	19.54	-21.64	peak
12	1235.288	-8.54	-0.49	-9.03	19.54	-28.57	RMS

Remark:

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

60.0 dBuV/m





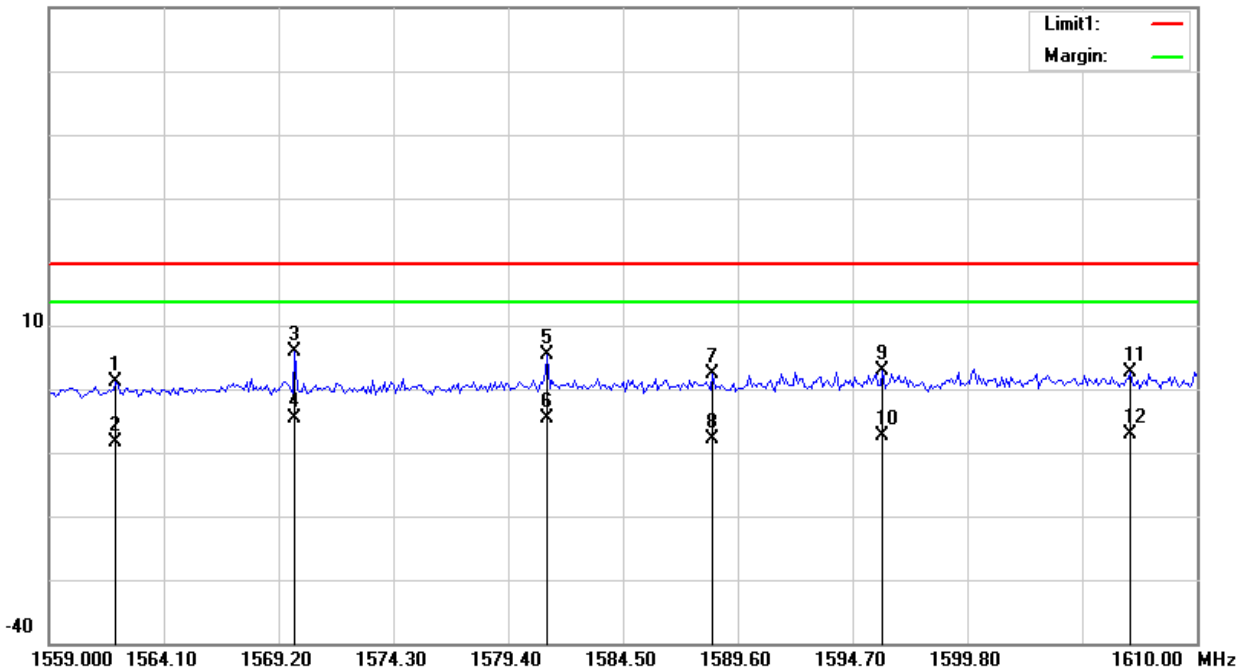
Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	AC 120V/60Hz	Phase:	Horizontal
Test Mode:	CH 1(1559Hz – 1610MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1561.958	-1.97	3.05	1.08	19.54	-18.46	peak
2	1561.958	-11.39	3.05	-8.34	19.54	-27.88	RMS
3	1569.914	2.60	3.30	5.90	19.54	-13.64	peak
4	1569.914	-7.93	3.30	-4.63	19.54	-24.17	RMS
5	1581.134	1.84	3.65	5.49	19.54	-14.05	peak
6	1581.134	-8.21	3.65	-4.56	19.54	-24.10	RMS
7	1588.478	-1.55	3.88	2.33	19.54	-17.21	peak
8	1588.478	-11.69	3.88	-7.81	19.54	-27.35	RMS
9	1596.026	-1.31	4.11	2.80	19.54	-16.74	peak
10	1596.026	-11.47	4.11	-7.36	19.54	-26.90	RMS
11	1607.042	-1.61	4.24	2.63	19.54	-16.91	peak
12	1607.042	-11.43	4.24	-7.19	19.54	-26.73	RMS

Remark:

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

60.0 dBuV/m





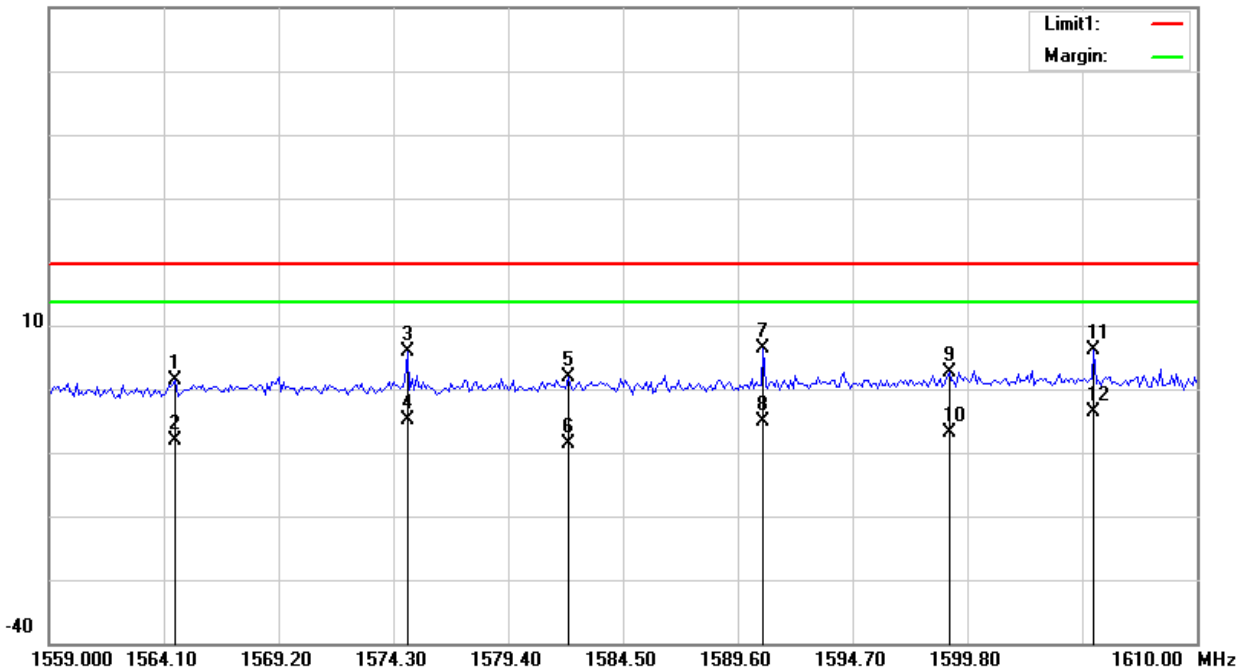
Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	AC 120V/60Hz	Phase:	Vertical
Test Mode:	CH 1(1559Hz – 1610MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1564.610	-1.70	3.13	1.43	19.54	-18.11	peak
2	1564.610	-11.31	3.13	-8.18	19.54	-27.72	RMS
3	1574.912	2.37	3.46	5.83	19.54	-13.71	peak
4	1574.912	-8.42	3.46	-4.96	19.54	-24.50	RMS
5	1582.052	-1.72	3.68	1.96	19.54	-17.58	peak
6	1582.052	-12.31	3.68	-8.63	19.54	-28.17	RMS
7	1590.722	2.36	3.95	6.31	19.54	-13.23	peak
8	1590.722	-9.07	3.95	-5.12	19.54	-24.66	RMS
9	1598.984	-1.63	4.21	2.58	19.54	-16.96	peak
10	1598.984	-11.01	4.21	-6.80	19.54	-26.34	RMS
11	1605.410	1.95	4.24	6.19	19.54	-13.35	peak
12	1605.410	-7.95	4.24	-3.71	19.54	-23.25	RMS

Remark:

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

60.0 dBuV/m



4. UWB BANDWIDTH AND 99% BANDWIDTH

4.1 LIMITS OF UWB BANDWIDTH MEASUREMENT

The UWB bandwidth of a UWB system operating under the provisions of this section must be contained between 3100 MHz and 10,600 MHz.

At any point in time, has a fractional bandwidth equal to or greater than 0.20 or has a UWB bandwidth equal to or greater than 500 MHz, regardless of the fractional bandwidth.

The 99% bandwidth for reporting purposes only.

4.2 INSTRUMENT SETUP VALUE AND MEASUREMENT DISTANCE

Frequency Range	RBW	VBW	Detector	Measurement Distance
3100~10600	1MHz	1MHz	PEAK	1 Meter

4.3 TEST PROCEDURE

- a. The measuring distance of 1m 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.
- b. 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.
- c. All readings are RMS mode value , 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 .
- d. For the actual test configuration, please refer to the related Item –EUT Test Photos.
- e. The Spectrum Analyzer system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. The UWB Bandwidth is measured at the 10 dB point (FL, FH).

Note: Both horizontal and vertical antenna polarities were tested. The worst case emissions were reported.

99% Bandwidth connect the UUT to the spectrum analyser and use the following settings:

Center Frequency	The centre frequency of the channel under test
Detector	Peak
RBW	1% to 5% of the occupied bandwidth
VBW	approximately 3×RBW
Trace	Max hold
Sweep	Auto

Allow the trace to stabilize and measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB and 99% relative to the maximum level measured in the fundamental emission.

4.4 TEST SETUP

Same as 3.3.4

4.5 EUT OPERATION CONDITIONS

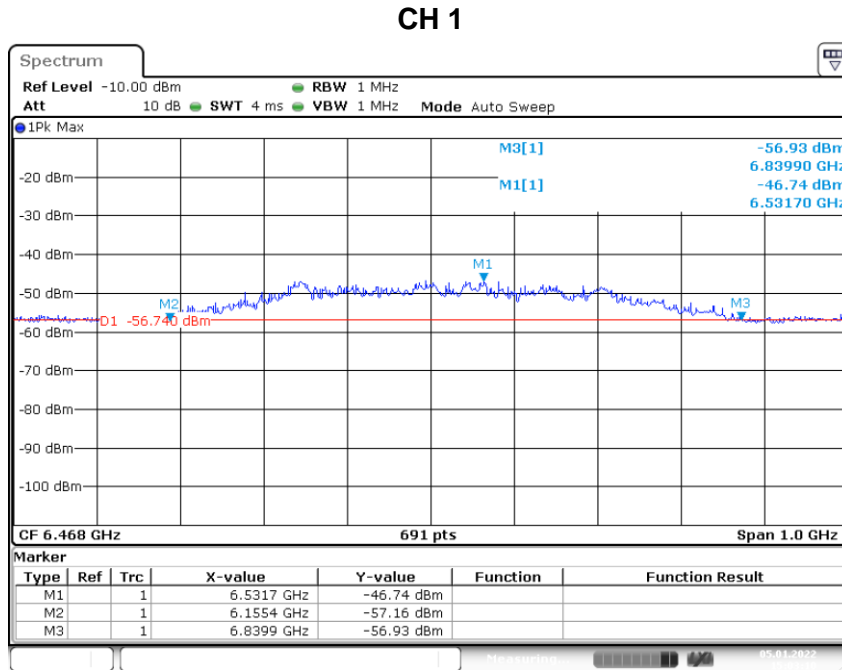
Same as 3.2.6



4.6 TEST RESULTS

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

Test Channel	f _M (MHz)	f _L (MHz)	f _H (MHz)	-10dB Bandwidth (MHz)	f _c (MHz)	Fractional Bandwidth (MHz)	Limit	Result
CH1	6531.7	6155.4	6839.9	684.5	6497.7	0.11	-10dB Bandwidth ≥ 500MHz or Fractional Bandwidth ≥ 0.2	Pass



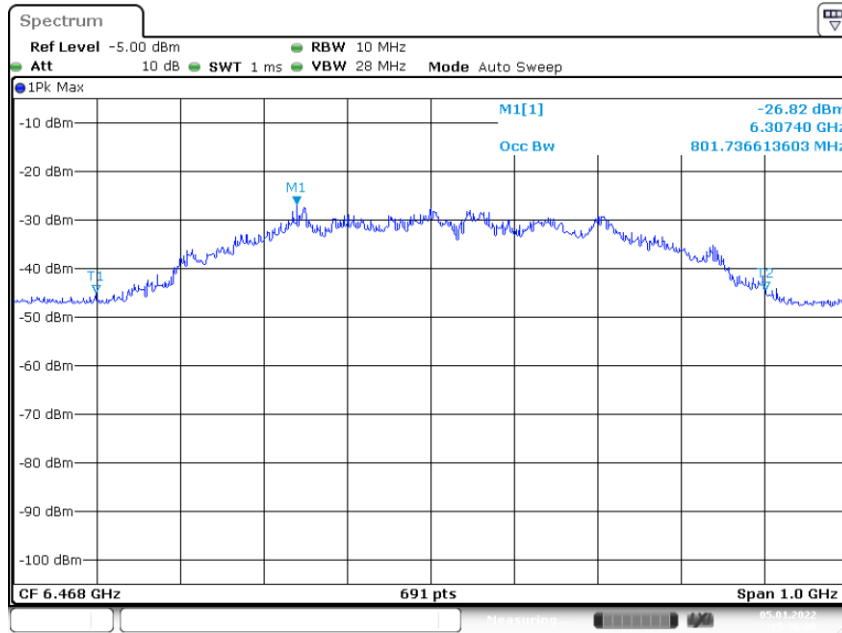
Date: 5.JAN.2022 15:03:09



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

Frequency (MHz)	99% Bandwidth (MHz)	Result
6468	801.74	PASS

CH 1



Date: 5.JAN.2022 15:36:00



5 PEAK EMISSION WITHIN A 50MHZ BANDWIDTH (FOR 15.517(e) & RSS-220

5.2.1(g))

5.1 LIMITS OF PEAK EMISSION

The Maximum Peak Output Power Measurement is 0dBm(RBW=50MHz).

If a resolution bandwidth other than 50 MHz is Employed, the peak EIRP limit shall be $20 \log(RBW/50)$ dBm where RBW is the resolution bandwidth in megahertz that is employed. The resolution bandwidth used to make the peak measurement was 1MHz, resulting in a limit of -34dBm.

This may be converted to a peak field strength level at 3 meters using

$$E(\text{dBuV/m}) = P(\text{dBm EIRP}) + 95.2 = -34 + 95.2 = 61.2 \text{ dBuV/m}$$

$$\text{Note: } EIRP_{1\text{MHz}} = EIRP_{50\text{MHz}} + 20\log(1\text{MHz} / 50 \text{ MHz}) = 0 \text{ dBm} + -34 \text{ dB} = -34 \text{ dBm}$$

5.2 INSTRUMENT SETUP VALUE AND MEASUREMENT DISTANCE

Frequency Range	RBW	VBW	Detector	Measurement Distance
3100~10600	1MHz	3MHz	PEAK	3 Meter

5.3 TEST PROCEDURE

Same as 3.3.2

5.4 DEVIATION FROM TEST STANDARD

No deviation

5.5 TEST SETUP

Same as 3.3.4

5.6 FIELD STRENGTH CALCULATION

Same as 3.2.5

5.7 EUT OPERATING CONDITIONS

Same as 3.2.5



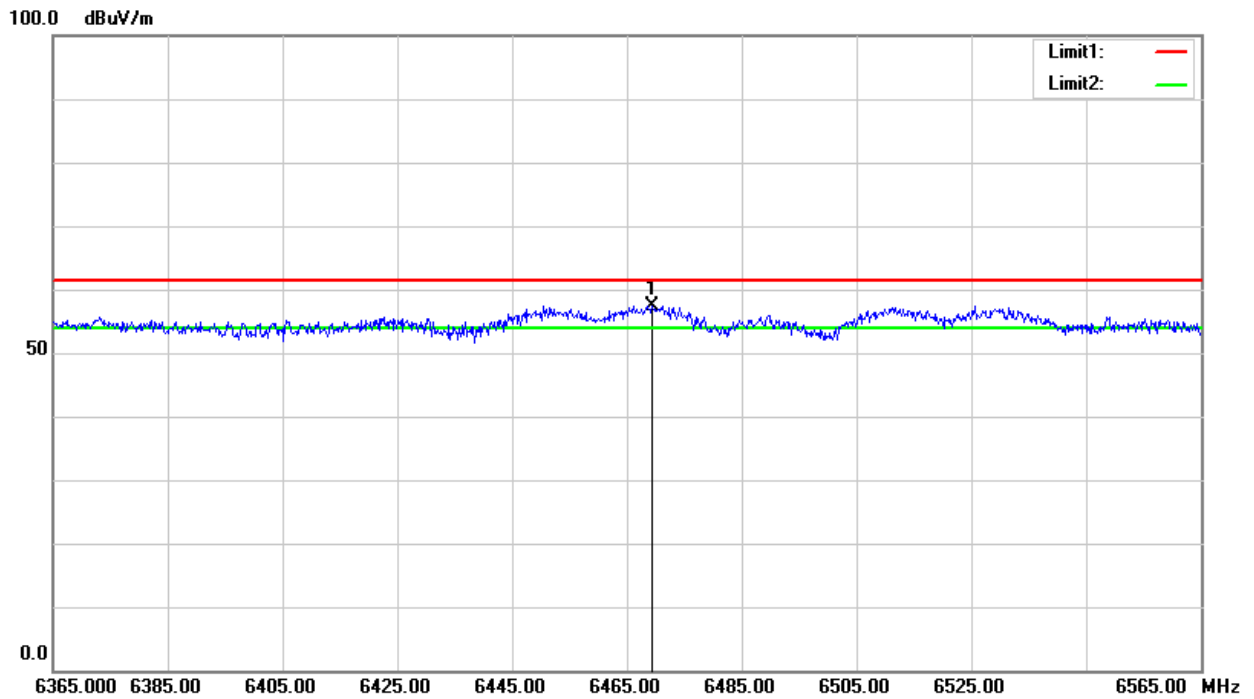
5.8 TEST RESULTS

Temperature:	23.5(C)	Relative Humidity:	62%RH
Test Voltage:	AC 120V/60Hz	Phase:	Horizontal
Test Mode:	CH 1	Test distance:	3m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	6469.400	59.46	-2.03	57.43	61.20	-3.77	peak

Remark:

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





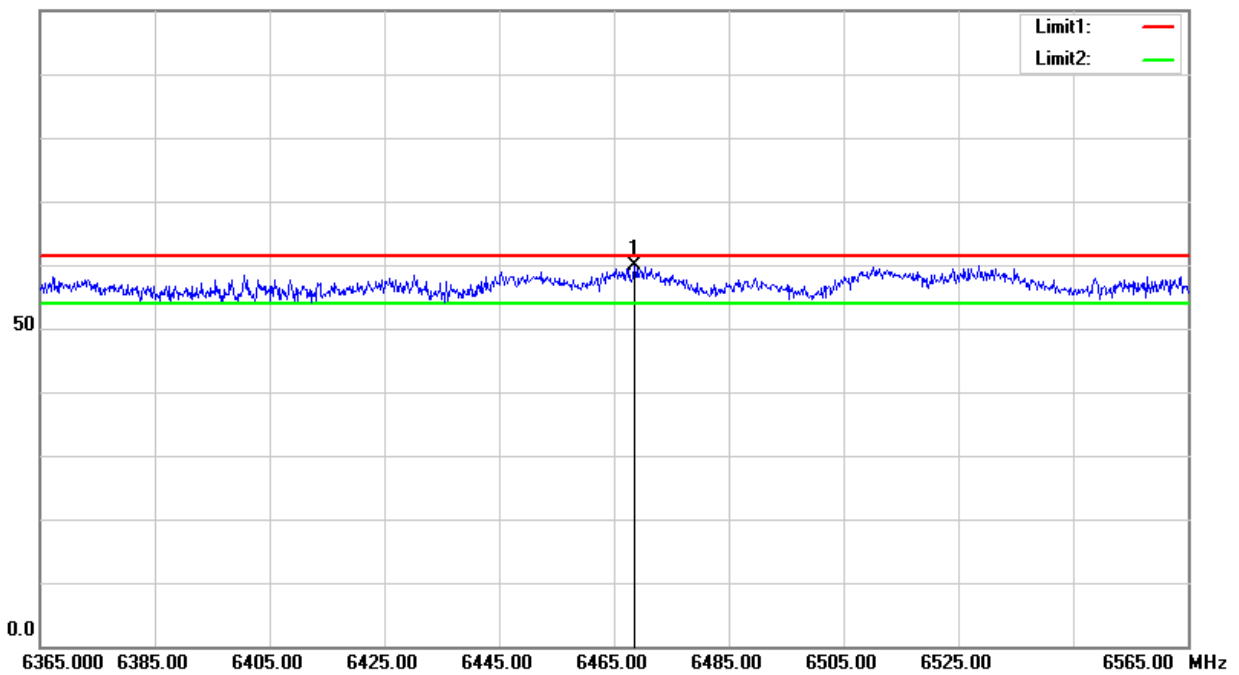
Temperature:	23.5(C)	Relative Humidity:	62%RH
Test Voltage:	AC 120V/60Hz	Phase:	Vertical
Test Mode:	CH 1	Test distance:	3m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	6468.600	61.82	-2.03	59.79	61.20	-1.41	peak

Remark:

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

100.0 dBuV/m





6. ANTENNA REQUIREMENT

6.1 STANDARD REQUIREMENT

According to the FCC Part 15 Paragraph 15.203&RSS-Gen(6.8), 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.

6.2 EUT ANTENNA

The EUT antenna is PCB 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*****

