

Radio Test Report

Report No: STS2307032W02

Issued for

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

Sevket Ozcelik sok. No29 Alsancak izmir 35000 Turkey

Product Name: Orbit

Brand Name: Litum

Model Name: 7600000002

Series Model(s): 760

FCC ID: 2AW7W-760

Test Standards: Title 47 of the CFR, Part 15. Subpart F

Any reproduction of this document must be done in full. No single part of this document may be reproduced without permission from STS, all test data presented in this report is only applicable to presented test sample.



TEST REPORT

Applicant's Name: Litum bilgi teknolojileri san. Ve dis tic. A.S
 Address: Sevket Ozcelik sok. No29 Alsancak izmir 35000 Turkey
Manufacture's Name: Litum bilgi teknolojileri san. Ve dis tic. A.S
 Address: Sevket Ozcelik sok. No29 Alsancak izmir 35000 Turkey

Product Description

Product Name: Orbit
 Brand Name: Litum
 Model Name: 7600000002
 Series Model(s): 760

Test Standards.....: Title 47 of the CFR, Part 15. Subpart F
 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.
 This report shall not be reproduced except in full, without the written approval of STS, this document only be altered or revised by STS, personal only, and shall be noted in the revision of the document.

Date of Test:
 Date of receipt of test item: 07 July 2023
 Date of performance of tests ..: 07 July 2023 ~ 04 Aug. 2023
 Date of Issue: 04 Aug. 2023
 Test Result.....: **Pass**

Testing Engineer :

Aaron Bu

(Aaron Bu)

Technical Manager :

Sean She

(Sean she)

Authorized Signatory :

Chris Chen

(Chris Chen)



Table of Contents	Page
1. SUMMARY OF TEST RESULTS	5
1.1 TEST FACTORY	6
1.2 MEASUREMENT UNCERTAINTY	6
2. GENERAL INFORMATION	7
2.1 GENERAL DESCRIPTION OF THE EUT	7
2.2 DESCRIPTION OF THE TEST MODES	8
2.3 TEST SOFTWARE AND POWER LEVEL	8
2.4 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED	9
2.5 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS	10
2.6 EQUIPMENTS LIST FOR ALL TEST ITEMS	11
3. EMISSION TEST	12
3.1 CONDUCTED EMISSION MEASUREMENT	12
3.2 RADIATED EMISSION MEASUREMENT (FOR 15.517(C))	16
3.3 RADIATED EMISSION MEASUREMENT (FOR 15.517(D))	37
4. UWB BANDWIDTH AND 99% BANDWIDTH	43
4.1 LIMITS OF UWB BANDWIDTH MEASUREMENT	43
4.2 INSTRUMENT SETUP VALUE AND MEASUREMENT DISTANCE	43
4.3 TEST PROCEDURE	43
4.4 TEST SETUP	43
4.5 EUT OPERATION CONDITIONS	43
4.6 TEST RESULTS	44
5 PEAK EMISSION WITHIN A 50MHZ BANDWIDTH (FOR 15.517(E))	45
5.1 LIMITS OF PEAK EMISSION	45
5.2 INSTRUMENT SETUP VALUE AND MEASUREMENT DISTANCE	45
5.3 TEST PROCEDURE	45
5.4 DEVIATION FROM TEST STANDARD	45
5.5 TEST SETUP	45
5.6 FIELD STRENGTH CALCULATION	45
5.7 EUT OPERATING CONDITIONS	45
5.8 TEST RESULTS	46
6. ANTENNA REQUIREMENT	48
6.1 STANDARD REQUIREMENT	48
6.2 EUT ANTENNA	48



Revision History

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	04 Aug. 2023	STS2307032W02	ALL	Initial Issue



1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part 15. Subpart F			
Standard Section	Test Item	Judgment	Remark
15.207	AC Power Conducted Emission	Pass	
15.203	Antenna Requirement	Pass	
15.209 15.517(c)	Radiated Spurious Emission	Pass	
15.209 15.517(d)	Radiated Spurious Emission in GPS Band	Pass	
15.517(e)	Peak Emissions within a 50MHz Bandwidth	Pass	
15.517(b)	UWB 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. : 101, Building B, Zhuoke Science Park, No.190 Chongqing Road, ZhanChengShequ, Fuhai 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	$\pm 1.197\text{dB}$
2	Unwanted Emissions, conducted	$\pm 2.896\text{dB}$
3	All emissions, radiated 9K-30MHz	$\pm 3.84\text{dB}$
4	All emissions, radiated 30M-1GHz	$\pm 3.94\text{dB}$
5	All emissions, radiated 1G-6GHz	$\pm 4.59\text{dB}$
6	All emissions, radiated >6G	$\pm 5.22\text{dB}$
7	Conducted Emission (9KHz-150KHz)	$\pm 2.14\text{dB}$
8	Conducted Emission (150KHz-30MHz)	$\pm 2.54\text{dB}$

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

Product Name	Orbit
Brand	Litum
Model Number	7600000002
Series Model(s)	760
Model Difference	Just different model names, everything else is the same.
Product Description	The EUT is a Orbit.
	Operation Frequency: 6489.6MHz
	Modulation Type: BPM with BPSK
	Antenna Designation: Please refer to the Note 3.
	Antenna Gain(Peak): Ceramic 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	Input: DC 5.0V by USB port
Hardware version number	AFA01-01-03
Software version number	LT_04_02_USBGW_28070502
Connecting I/O Port(s)	Please refer to the Note 1.

Note:

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

2.

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

3. Table for Filed Antenna

Ant	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	Litum	76000000002	Ceramic	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	BPM with BPSK

Note:

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

For AC Conducted Emission

Test Case	
AC Conducted Emission	Mode 2 : Keeping TX

2.3 TEST SOFTWARE AND POWER LEVEL

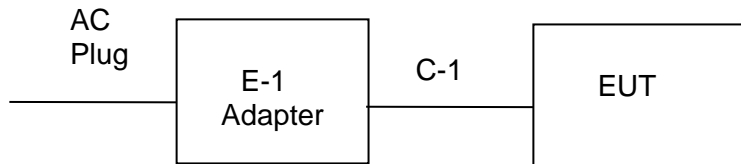
During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level.

RF Function	Type	Mode Or Modulation type	Ant Gain(dBi)	Power Class	Software For Testing
UWB	6489.6MHz	BPM with BPSK	3.3	14	Tera Term

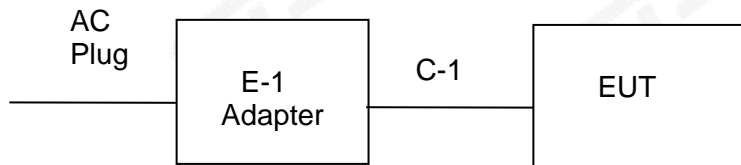
2.4 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

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

Radiated Spurious Emission Test



Conducted Emission Test



2.5 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS

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

Necessary accessories

Item	Equipment	Mfr/Brand	Model/Type No.	Length	Note
C-1	USB Cable	N/A	N/A	180cm	N/A

Support units

Item	Equipment	Mfr/Brand	Model/Type No.	Length	Note
E-1	Adapter	HUAWEI	HW-050450C00	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

RF Radiation Test Equipment					
Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
Temperature & Humidity	SW-108	SuWei	N/A	2023.03.03	2024.03.02
Pre-Amplifier (0.1M-3GHz)	EM	EM330	060665	2023.02.28	2024.02.27
Pre-Amplifier (1G-18GHz)	SKET	LNPA-01018G-45	SK2018080901	2022.09.29	2023.09.28
18GHz-40GHz Filter	XINGBO	XBLBQ-GTA44	22062003-1	2023.03.06	2024.03.05
Pre-mpifier (18G-40G)	SKET	LNPA_1840-50	SK2018101801	2023.03.06	2024.03.05
Positioning Controller	MF	MF-7802	MF-780208587	N/A	N/A
Signal Analyzer	R&S	FSV 40-N	101823	2022.09.29	2023.09.28
Switch Control Box	N/A	N/A	N/A	N/A	N/A
Filter Box	BALUN Technology	SU319E	BL-SZ1530051	N/A	N/A
Active loop Antenna	ZHINAN	ZN30900C	16035	2023.02.28	2024.02.27
Bilog Antenna	TESEQ	CBL6111D	34678	2022.09.30	2024.09.29
Horn Antenna	SCHWARZBECK	BBHA 9120D	02014	2021.10.11	2023.10.10
Horn Antenna	A-INFOMW	LB-180400-KF	J211020657	2021.09.28	2023.09.27
Antenna Mast	MF	MFA-440H	N/A	N/A	N/A
Turn Table	MF	SC100_1	60531	N/A	N/A
AC Power Source	APC	KDF-11010G	F214050035	N/A	N/A
DC Power Supply	Zhaoxin	RXN 605D	20R605D11010081	N/A	N/A
Test SW	EZ-EMC	Ver.STSLAB-03A1 RE			
Conduction Test equipment					
Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Test Receiver	R&S	ESCI	101427	2022.09.29	2023.09.28
LISN	R&S	ENV216	101242	2022.09.28	2023.09.27
LISN	EMCO	3810/2NM	23625	2022.09.28	2023.09.27
Temperature & Humidity	HH660	Mieo	N/A	2022.09.30	2023.09.29
Test SW	EZ-EMC	Ver.STSLAB-03A1 CE			
RF Connected Test					
Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Signal Analyzer	Agilent	N9020A	MY51510623	2023.03.01	2024.02.28
Switch control box	MW	MW100-RFCB	N/A	N/A	N/A
Temperature & Humidity	HH660	Mieo	N/A	2022.09.30	2023.09.29
Test SW	MW	MTS 8310_2.0.0.0			

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 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.

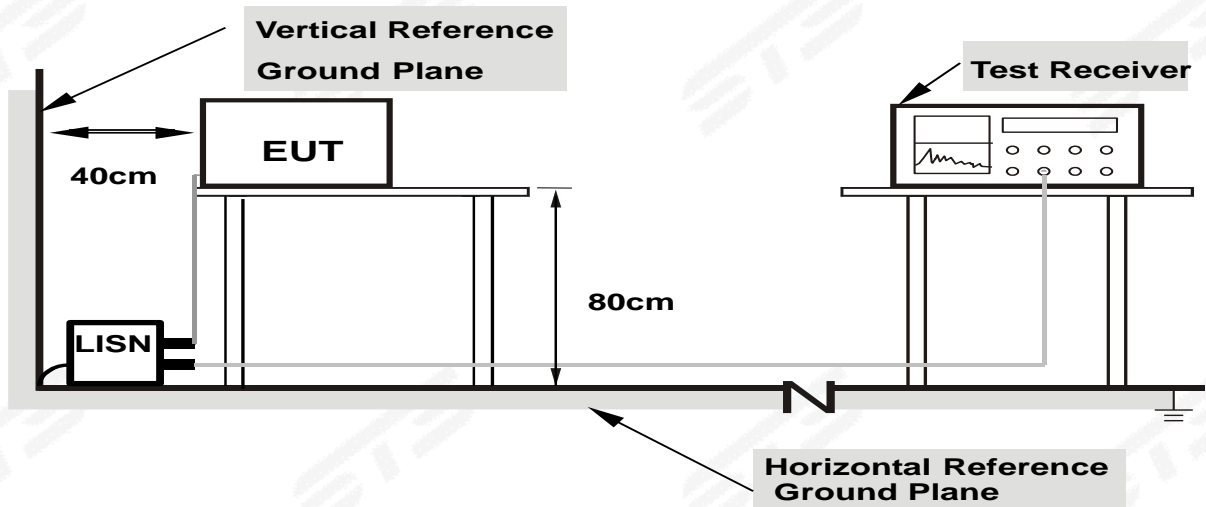
The following table is the setting of the receiver

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.

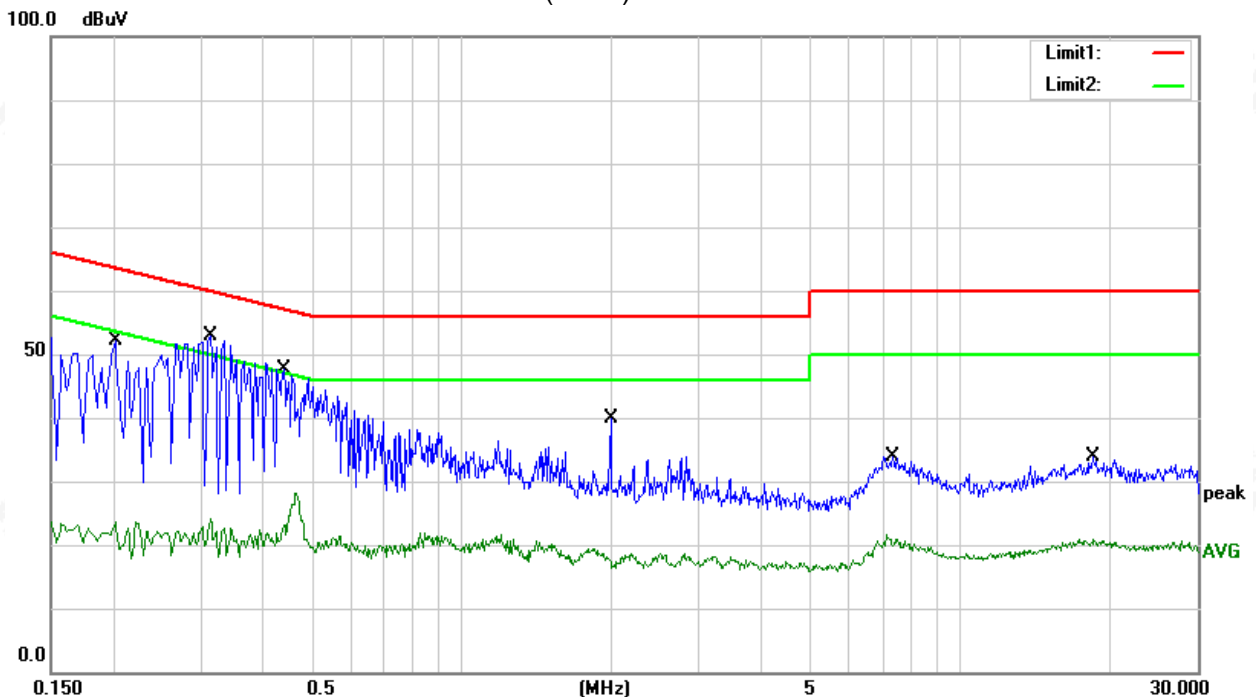
3.1.5 TEST RESULT

Temperature:	26.8(C)	Relative Humidity:	60%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	0.2020	31.76	20.32	52.08	63.53	-11.45	QP
2	0.2020	3.32	20.32	23.64	53.53	-29.89	AVG
3	0.3140	32.06	20.72	52.78	59.86	-7.08	QP
4	0.3140	3.43	20.72	24.15	49.86	-25.71	AVG
5	0.4420	26.98	20.54	47.52	57.02	-9.50	QP
6	0.4420	7.67	20.54	28.21	47.02	-18.81	AVG
7	1.9980	19.61	20.30	39.91	56.00	-16.09	QP
8	1.9980	-0.98	20.30	19.32	46.00	-26.68	AVG
9	7.3420	13.19	20.66	33.85	60.00	-26.15	QP
10	7.3420	0.88	20.66	21.54	50.00	-28.46	AVG
11	18.4380	11.38	22.53	33.91	60.00	-26.09	QP
12	18.4380	-1.69	22.53	20.84	50.00	-29.16	AVG

Remark:

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



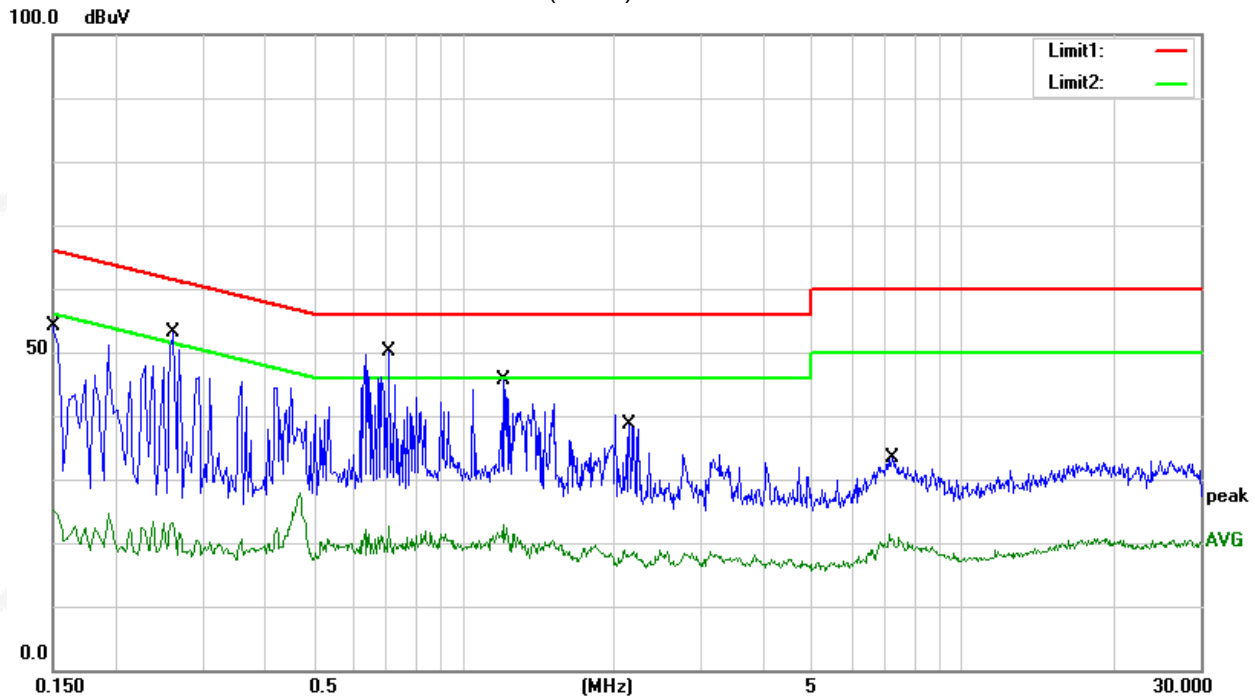


Temperature:	26.8(C)	Relative Humidity:	60%RH
Test Voltage:	AC 120V/60Hz	Phase:	N
Test Mode:	Mode 2		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1500	33.84	20.33	54.17	66.00	-11.83	QP
2	0.1500	4.88	20.33	25.21	56.00	-30.79	AVG
3	0.2620	32.65	20.58	53.23	61.37	-8.14	QP
4	0.2620	2.68	20.58	23.26	51.37	-28.11	AVG
5	0.7100	29.68	20.35	50.03	56.00	-5.97	QP
6	0.7100	7.44	20.35	27.79	46.00	-18.21	AVG
7	1.2020	25.24	20.30	45.54	56.00	-10.46	QP
8	1.2020	2.57	20.30	22.87	46.00	-23.13	AVG
9	2.1460	18.27	20.30	38.57	56.00	-17.43	QP
10	2.1460	-1.36	20.30	18.94	46.00	-27.06	AVG
11	7.2260	12.69	20.62	33.31	60.00	-26.69	QP
12	7.2260	0.70	20.62	21.32	50.00	-28.68	AVG

Remark:

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





3.2 RADIATED EMISSION MEASUREMENT (FOR 15.517(c))

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.

Frequencies (MHz)	Field Strength (microrvolts/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).

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



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

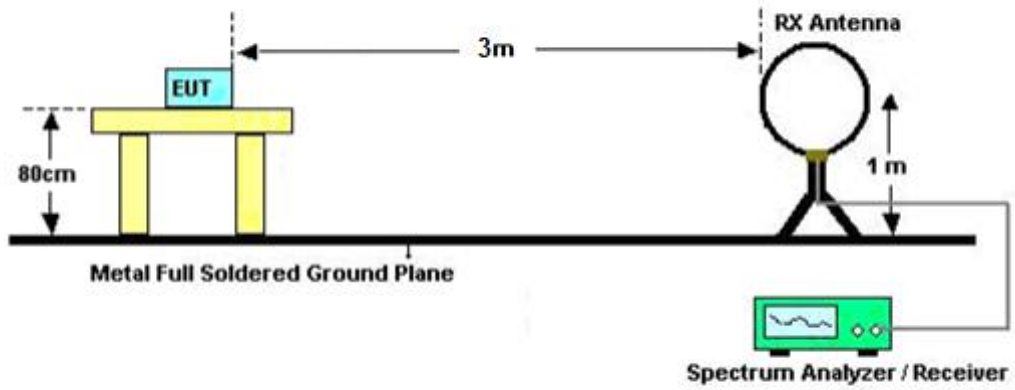
- a. The measuring distance of 1m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter (above 1GHz is 1.5 m) above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The height 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 compliance 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

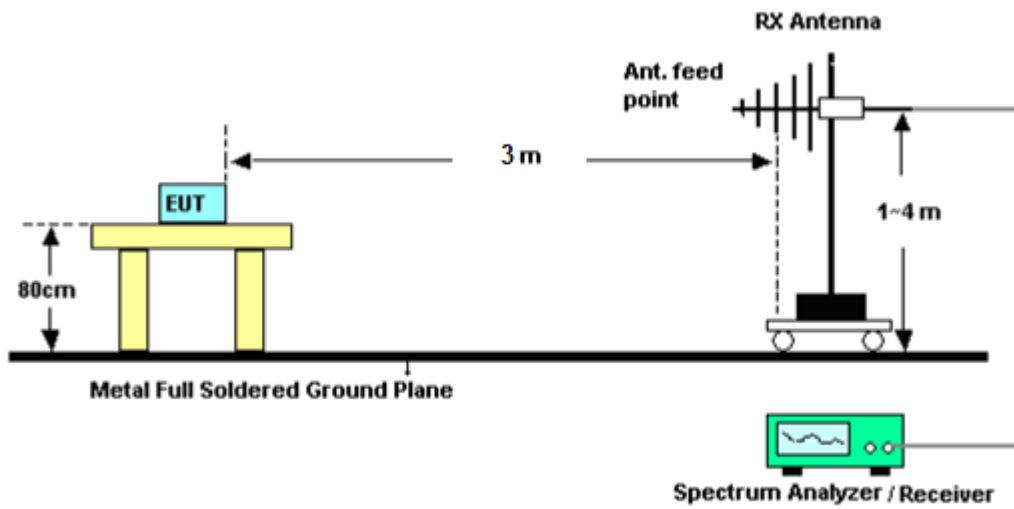
No deviation

3.2.4 TEST SETUP

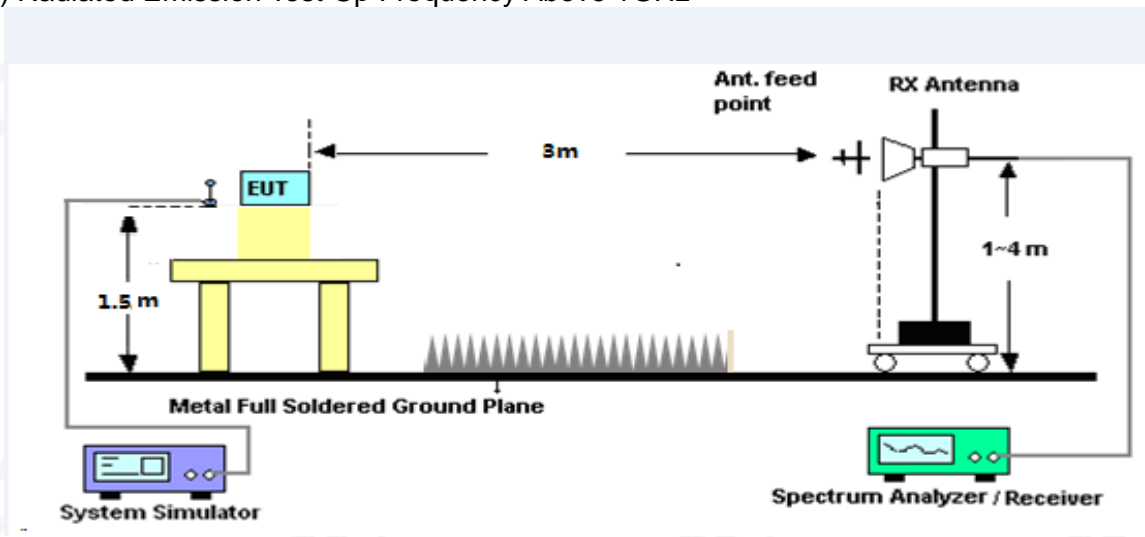
(A) Radiated Emission Test-Up Frequency Below 30MHz



(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

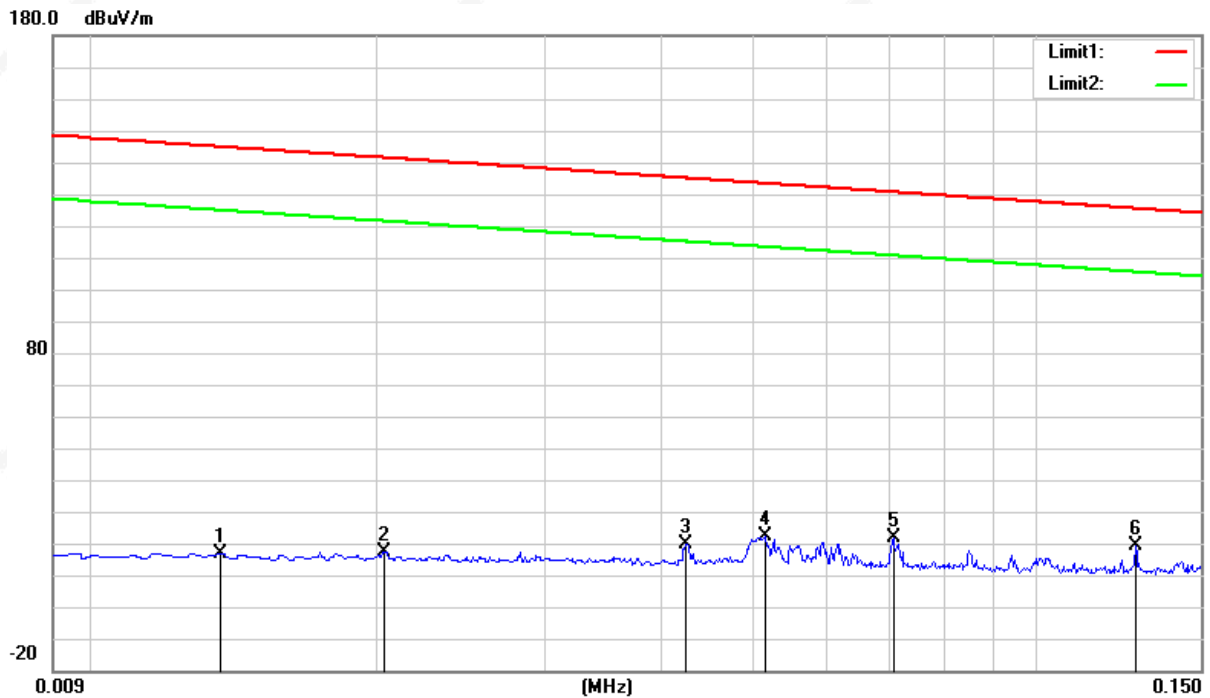
Below 30MHz

Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	DC 5V	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	0.0135	-2.72	19.63	16.91	125.00	-108.09	AVG
2	0.0202	-2.83	20.10	17.27	121.50	-104.23	AVG
3	0.0424	0.25	19.65	19.90	115.06	-95.16	AVG
4	0.0516	2.58	19.46	22.04	113.35	-91.31	AVG
5	0.0706	3.07	18.92	21.99	110.63	-88.64	AVG
6	0.1280	1.84	17.54	19.38	105.46	-86.08	AVG

Remark:

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

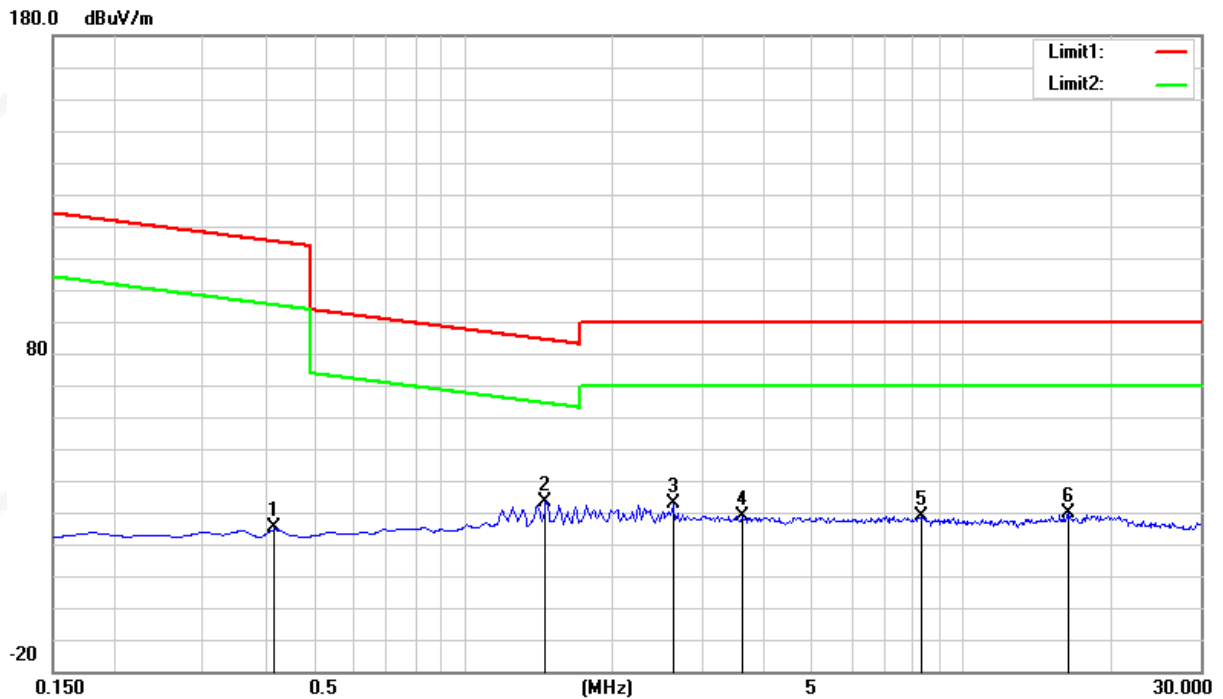


Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	DC 5V	Test Mode:	CH 1 (150KHz – 30MHz)
Test distance:	3m		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.4187	4.85	20.17	25.02	95.17	-70.15	AVG
2	1.4633	13.19	20.29	33.48	64.30	-30.82	QP
3	2.6275	12.44	20.21	32.65	69.54	-36.89	QP
4	3.6126	8.62	20.28	28.90	69.54	-40.64	QP
5	8.2692	8.44	20.30	28.74	69.54	-40.80	QP
6	16.2391	7.97	21.60	29.57	69.54	-39.97	QP

Remark:

1. Margin = Result (Result =Reading + Factor)–Limit
2. 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.

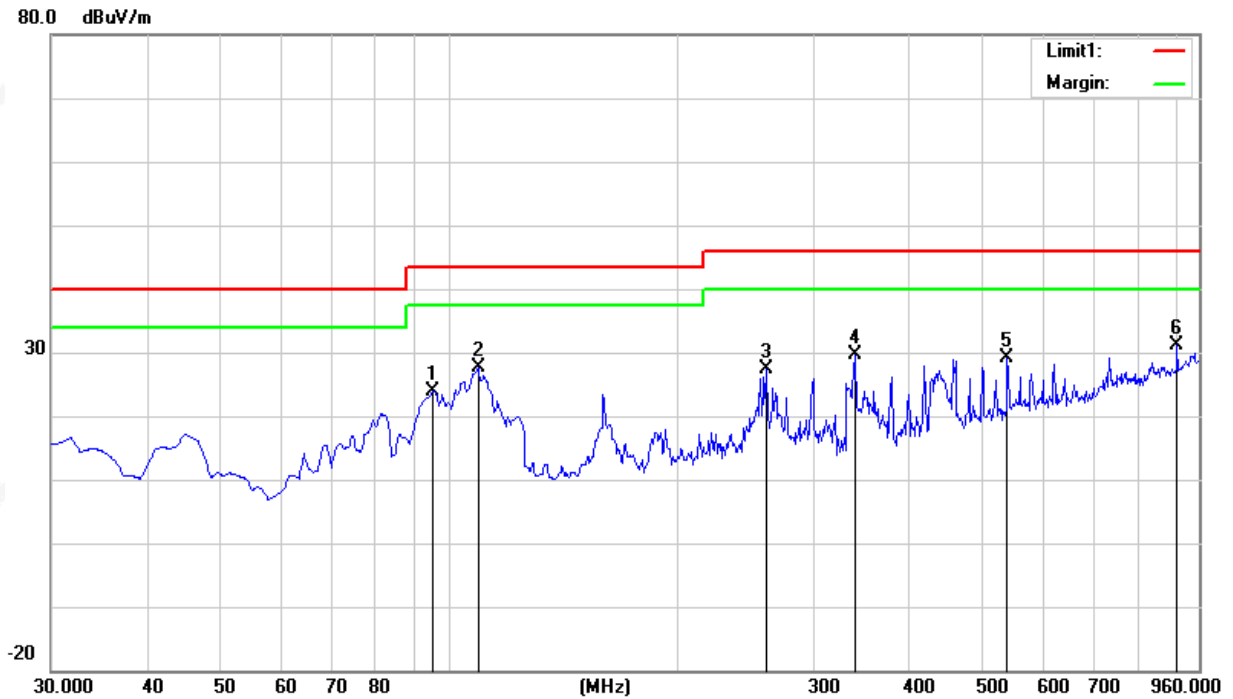
30MHz – 960MHz Radiation Spurious

Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	DC 5V	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	95.1000	44.67	-20.77	23.90	43.50	-19.60	QP
2	109.0500	46.84	-19.17	27.67	43.50	-15.83	QP
3	260.6400	42.13	-14.78	27.35	46.00	-18.65	QP
4	340.6200	43.03	-13.39	29.64	46.00	-16.36	QP
5	539.6400	36.08	-6.88	29.20	46.00	-16.80	QP
6	899.5500	31.62	-0.46	31.16	46.00	-14.84	QP

Remark:

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



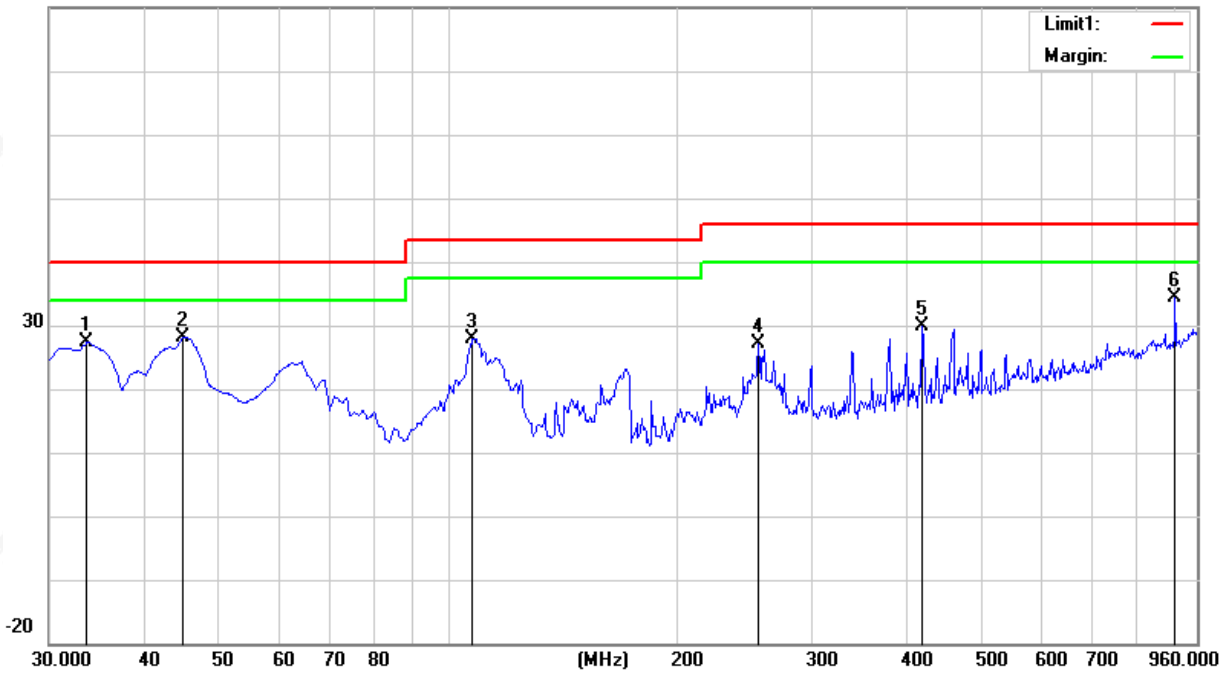
Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	DC 5V	Phase:	Vertical
Test Mode:	CH 1	Test distance:	3m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	33.7200	42.20	-14.72	27.48	40.00	-12.52	QP
2	44.8800	48.66	-20.60	28.06	40.00	-11.94	QP
3	108.1200	47.17	-19.27	27.90	43.50	-15.60	QP
4	255.9900	42.41	-15.25	27.16	46.00	-18.84	QP
5	420.6000	39.91	-10.09	29.82	46.00	-16.18	QP
6	899.5500	34.82	-0.46	34.36	46.00	-11.64	QP

Remark:

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

80.0 dBuV/m



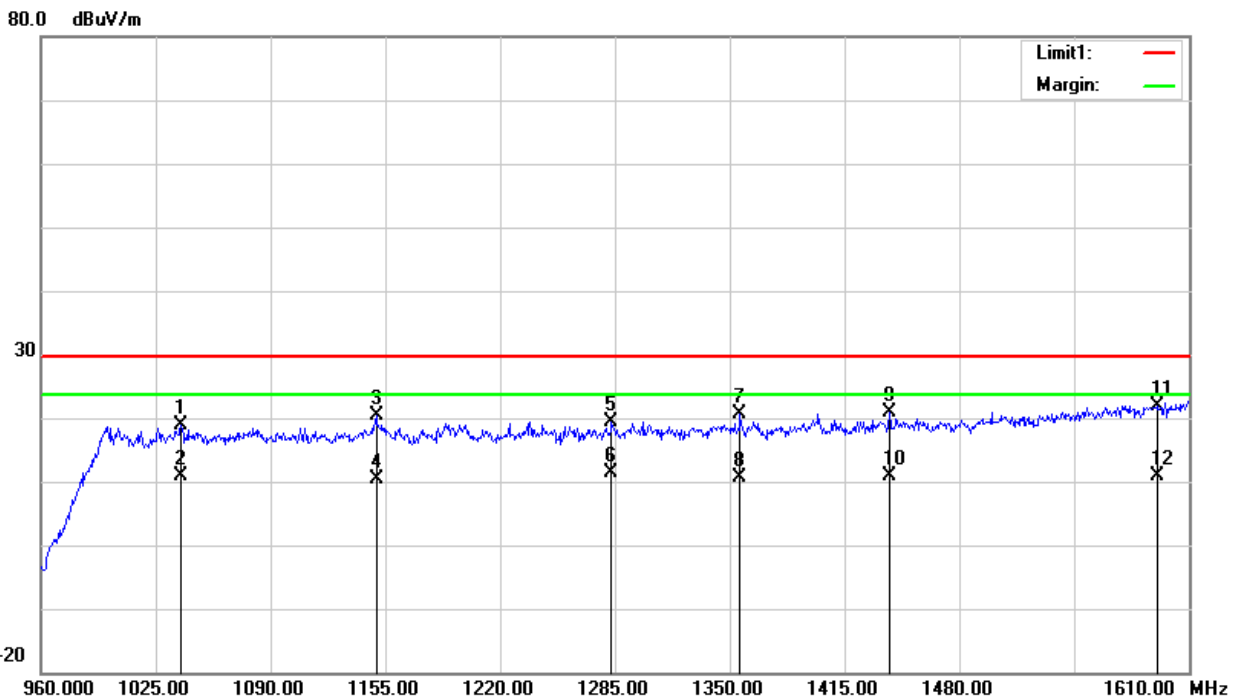
Above 960MHz Radiation Spurious

Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	DC 5V	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	1039.300	20.37	-1.42	18.95	29.54	-10.59	peak
2	1039.300	12.37	-1.42	10.95	29.54	-18.59	RMS
3	1149.800	21.27	-0.92	20.35	29.54	-9.19	peak
4	1149.800	11.27	-0.92	10.35	29.54	-19.19	RMS
5	1283.050	19.60	-0.26	19.34	29.54	-10.20	peak
6	1283.050	11.60	-0.26	11.34	29.54	-18.20	RMS
7	1355.850	20.63	0.08	20.71	29.54	-8.83	peak
8	1355.850	10.63	0.08	10.71	29.54	-18.83	RMS
9	1440.350	20.02	0.77	20.79	29.54	-8.75	peak
10	1440.350	10.02	0.77	10.79	29.54	-18.75	RMS
11	1592.450	17.93	4.01	21.94	29.54	-7.60	peak
12	1592.450	6.93	4.01	10.94	29.54	-18.60	RMS

Remark:

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



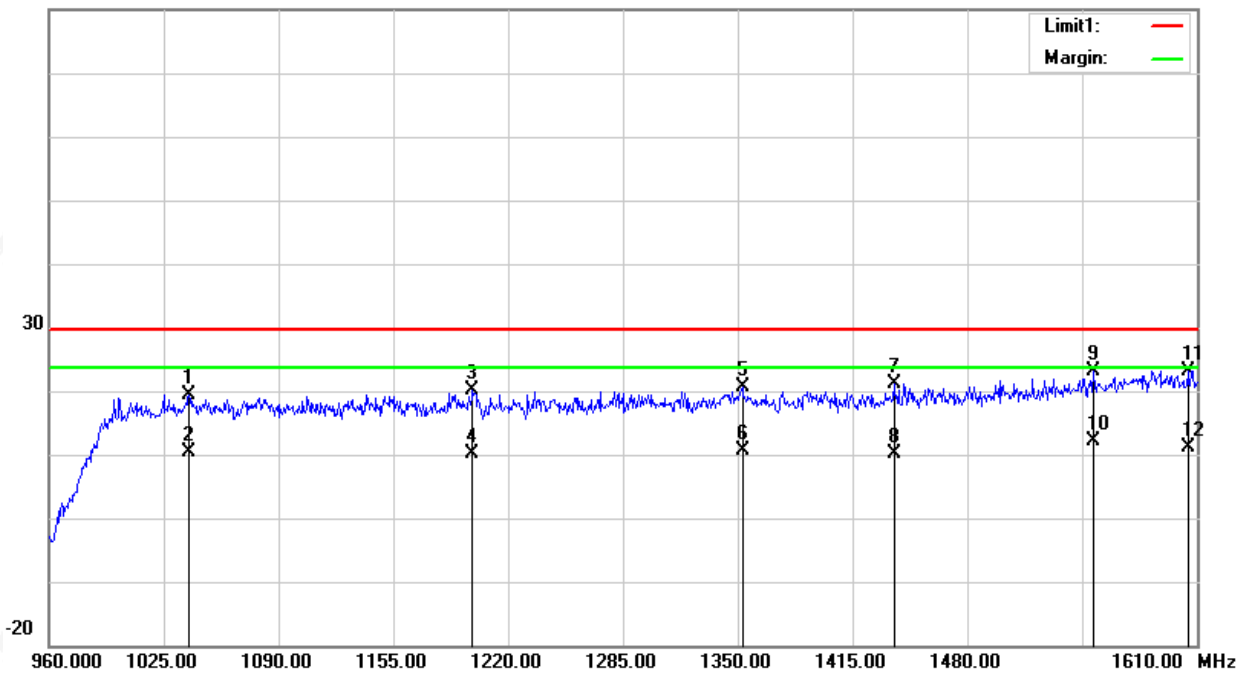
Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	DC 5V	Phase:	Vertical
Test Mode:	CH 1(960MHz -1610MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1039.300	20.88	-1.42	19.46	29.54	-10.08	peak
2	1039.300	11.88	-1.42	10.46	29.54	-19.08	RMS
3	1199.850	20.55	-0.42	20.13	29.54	-9.41	peak
4	1199.850	10.55	-0.42	10.13	29.54	-19.41	RMS
5	1352.600	20.63	0.08	20.71	29.54	-8.83	peak
6	1352.600	10.63	0.08	10.71	29.54	-18.83	RMS
7	1438.400	20.49	0.74	21.23	29.54	-8.31	peak
8	1438.400	9.49	0.74	10.23	29.54	-19.31	RMS
9	1551.500	20.49	2.72	23.21	29.54	-6.33	peak
10	1551.500	9.49	2.72	12.21	29.54	-17.33	RMS
11	1604.800	18.99	4.24	23.23	29.54	-6.31	peak
12	1604.800	6.99	4.24	11.23	29.54	-18.31	RMS

Remark:

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

80.0 dBuV/m



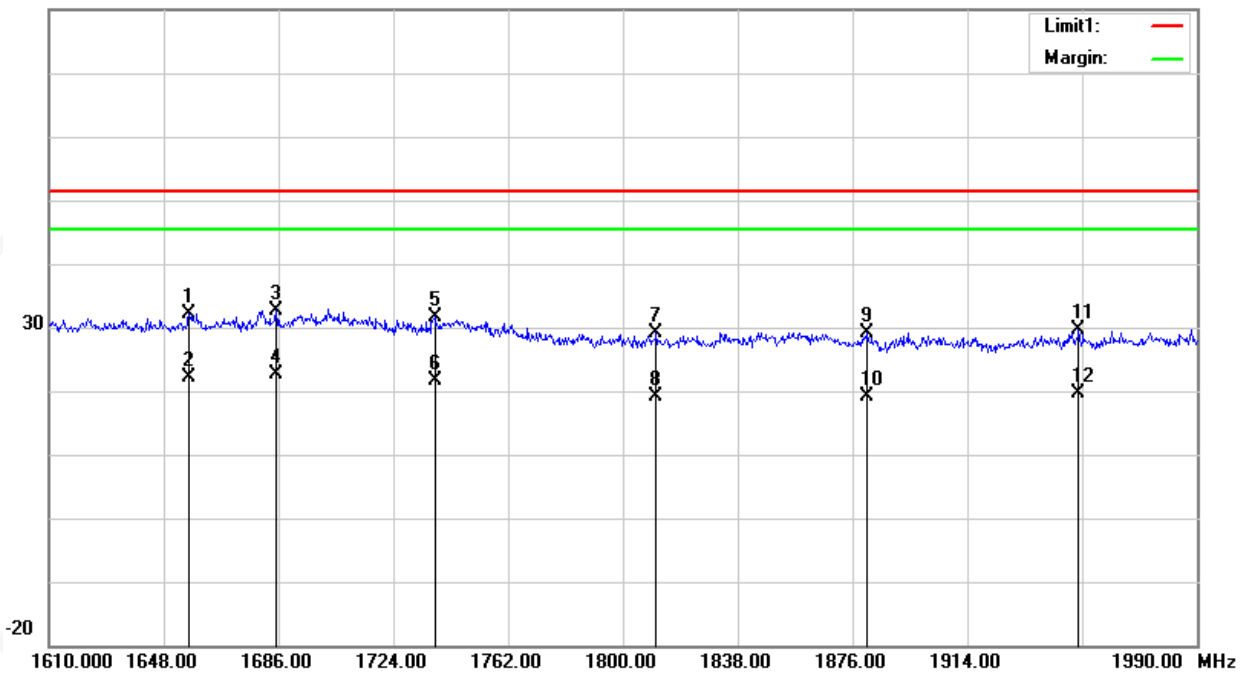
Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	DC 5V	Phase:	Horizontal
Test Mode:	CH 1(1610MHz – 1990MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1656.360	27.67	4.36	32.03	51.44	-19.41	peak
2	1656.360	17.67	4.36	22.03	51.44	-29.41	RMS
3	1685.240	27.74	4.93	32.67	51.44	-18.77	peak
4	1685.240	17.74	4.93	22.67	51.44	-28.77	RMS
5	1737.680	27.62	4.05	31.67	51.44	-19.77	peak
6	1737.680	17.62	4.05	21.67	51.44	-29.77	RMS
7	1811.020	27.24	1.90	29.14	51.44	-22.30	peak
8	1811.020	17.24	1.90	19.14	51.44	-32.30	RMS
9	1880.940	27.32	1.80	29.12	51.44	-22.32	peak
10	1880.940	17.32	1.80	19.12	51.44	-32.32	RMS
11	1950.860	28.00	1.53	29.53	51.44	-21.91	peak
12	1950.860	18.00	1.53	19.53	51.44	-31.91	RMS

Remark:

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

80.0 dBuV/m

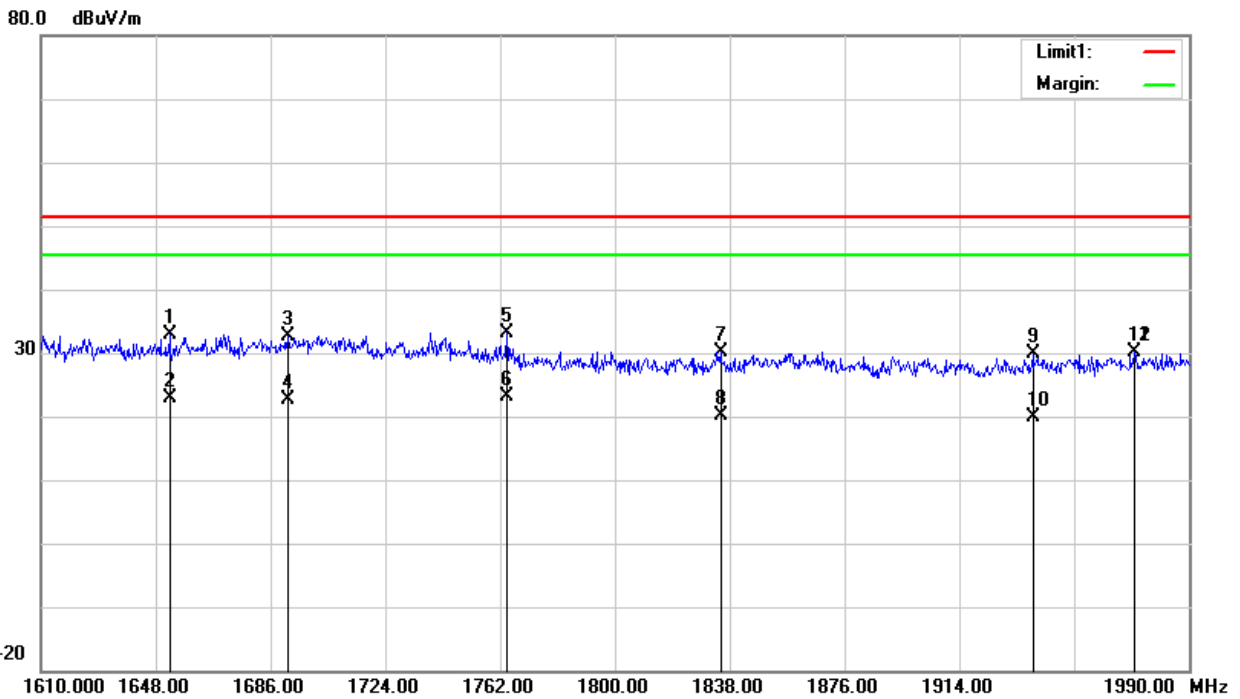


Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	DC 5V	Phase:	Vertical
Test Mode:	CH 1(1610MHz – 1990MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1652.560	28.59	4.29	32.88	51.44	-18.56	peak
2	1652.560	18.59	4.29	22.88	51.44	-28.56	RMS
3	1691.700	27.68	5.06	32.74	51.44	-18.70	peak
4	1691.700	17.68	5.06	22.74	51.44	-28.70	RMS
5	1764.280	30.06	3.12	33.18	51.44	-18.26	peak
6	1764.280	20.06	3.12	23.18	51.44	-28.26	RMS
7	1834.960	28.03	2.18	30.21	51.44	-21.23	peak
8	1834.960	18.03	2.18	20.21	51.44	-31.23	RMS
9	1938.320	28.26	1.51	29.77	51.44	-21.67	peak
10	1938.320	18.26	1.51	19.77	51.44	-31.67	RMS
11	1972.140	28.46	1.74	30.20	51.44	-21.24	peak
12	1972.140	28.46	1.74	30.20	51.44	-21.24	RMS

Remark:

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



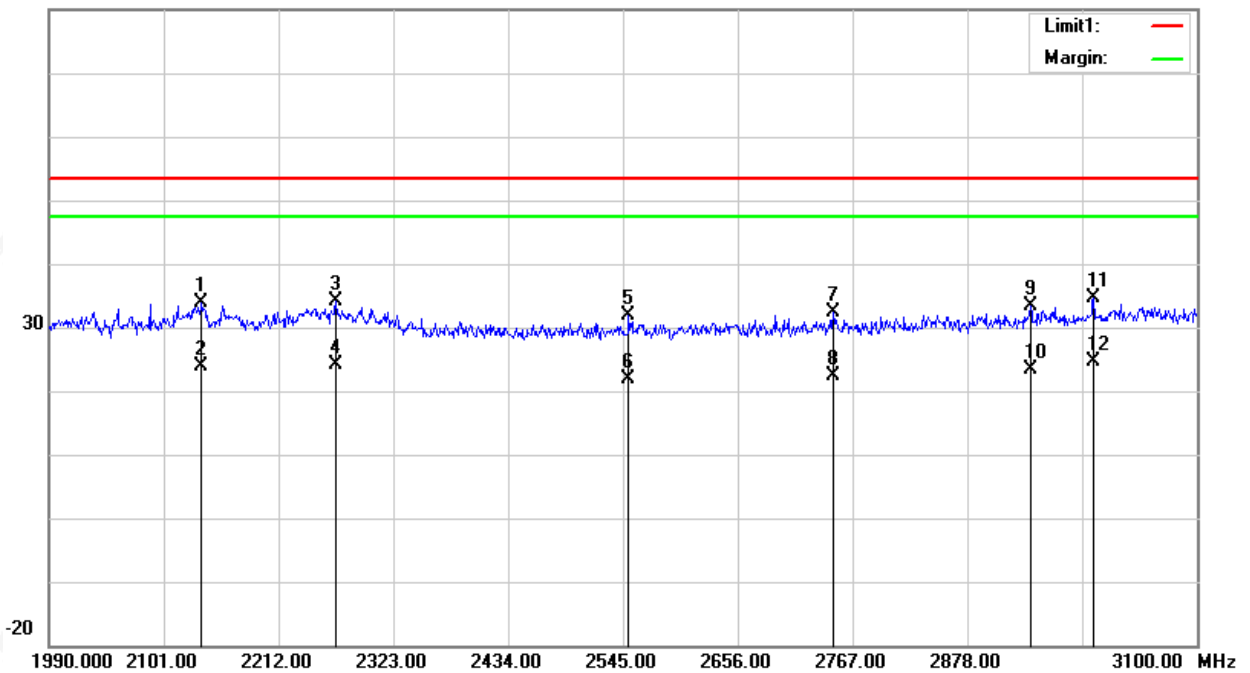
Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	DC 5V	Phase:	Horizontal
Test Mode:	CH 1(1990MHz – 3100MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2137.630	30.76	3.08	33.84	53.44	-19.60	peak
2	2137.630	20.76	3.08	23.84	53.44	-29.60	RMS
3	2267.500	30.38	3.67	34.05	53.44	-19.39	peak
4	2267.500	20.38	3.67	24.05	53.44	-29.39	RMS
5	2550.550	26.86	4.98	31.84	53.44	-21.60	peak
6	2550.550	16.86	4.98	21.84	53.44	-31.60	RMS
7	2748.130	26.37	6.06	32.43	53.44	-21.01	peak
8	2748.130	16.37	6.06	22.43	53.44	-31.01	RMS
9	2939.050	26.42	6.93	33.35	53.44	-20.09	peak
10	2939.050	16.42	6.93	23.35	53.44	-30.09	RMS
11	3000.100	6.49	28.20	34.69	53.44	-18.75	peak
12	3000.100	-3.51	28.20	24.69	53.44	-28.75	RMS

Remark:

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

80.0 dBuV/m

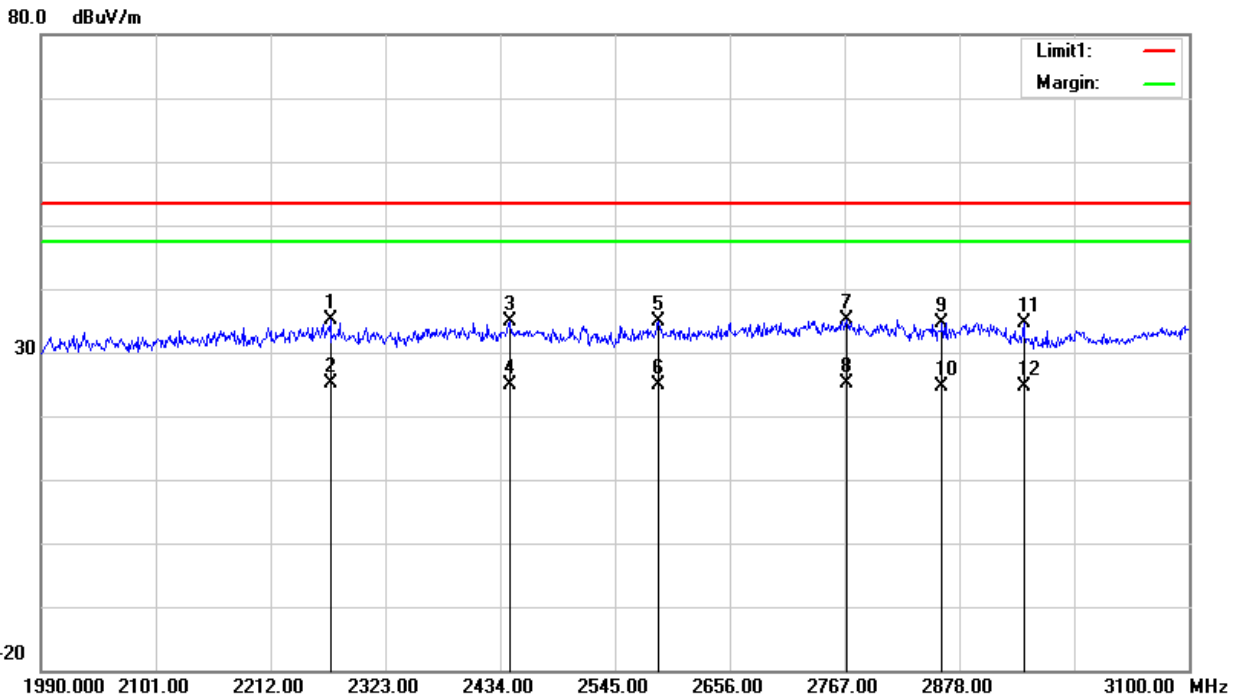


Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	DC 5V	Phase:	Vertical
Test Mode:	CH 1(1990MHz – 3100MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBUV)	Correct Factor(dB/m)	Result (dBUV/m)	Limit (dBUV/m)	Margin (dB)	Remark
1	2269.720	31.37	3.65	35.02	53.44	-18.42	peak
2	2269.720	21.37	3.65	25.02	53.44	-28.42	RMS
3	2442.880	30.31	4.52	34.83	53.44	-18.61	peak
4	2442.880	20.31	4.52	24.83	53.44	-28.61	RMS
5	2587.180	29.88	5.01	34.89	53.44	-18.55	peak
6	2587.180	19.88	5.01	24.89	53.44	-28.55	RMS
7	2769.220	29.06	6.13	35.19	53.44	-18.25	peak
8	2769.220	19.06	6.13	25.19	53.44	-28.25	RMS
9	2861.350	28.10	6.59	34.69	53.44	-18.75	peak
10	2861.350	18.10	6.59	24.69	53.44	-28.75	RMS
11	2940.160	27.63	6.93	34.56	53.44	-18.88	peak
12	2940.160	17.63	6.93	24.56	53.44	-28.88	RMS

Remark:

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



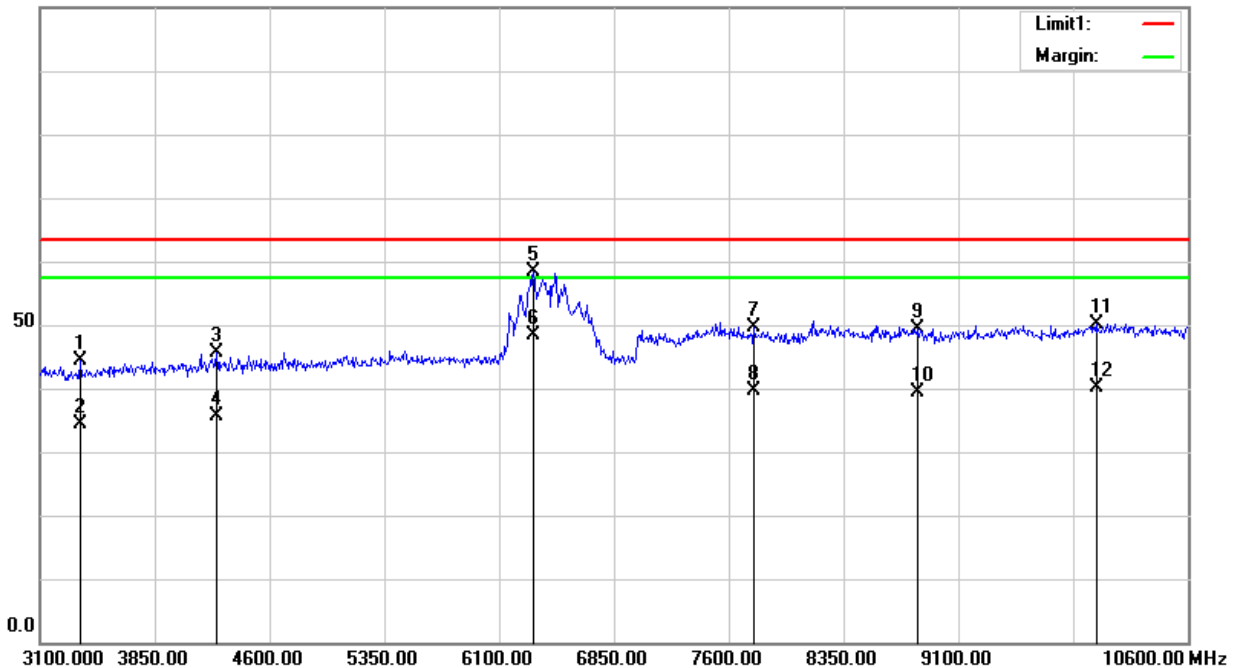
Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	DC 5V	Phase:	Horizontal
Test Mode:	CH 1 (3100MHz – 10600MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3362.500	56.16	-11.76	44.40	63.44	-19.04	peak
2	3362.500	46.16	-11.76	34.40	63.44	-29.04	RMS
3	4255.000	54.07	-8.36	45.71	63.44	-17.73	peak
4	4255.000	44.07	-8.36	35.71	63.44	-27.73	RMS
5	6325.000	60.64	-2.38	58.26	63.44	-5.18	peak
6	6325.000	50.64	-2.38	48.26	63.44	-15.18	RMS
7	7765.000	47.69	1.92	49.61	63.44	-13.83	peak
8	7765.000	37.69	1.92	39.61	63.44	-23.83	RMS
9	8830.000	46.90	2.55	49.45	63.44	-13.99	peak
10	8830.000	36.90	2.55	39.45	63.44	-23.99	RMS
11	10000.000	46.75	3.36	50.11	63.44	-13.33	peak
12	10000.000	36.75	3.36	40.11	63.44	-23.33	RMS

Remark:

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

100.0 dBuV/m



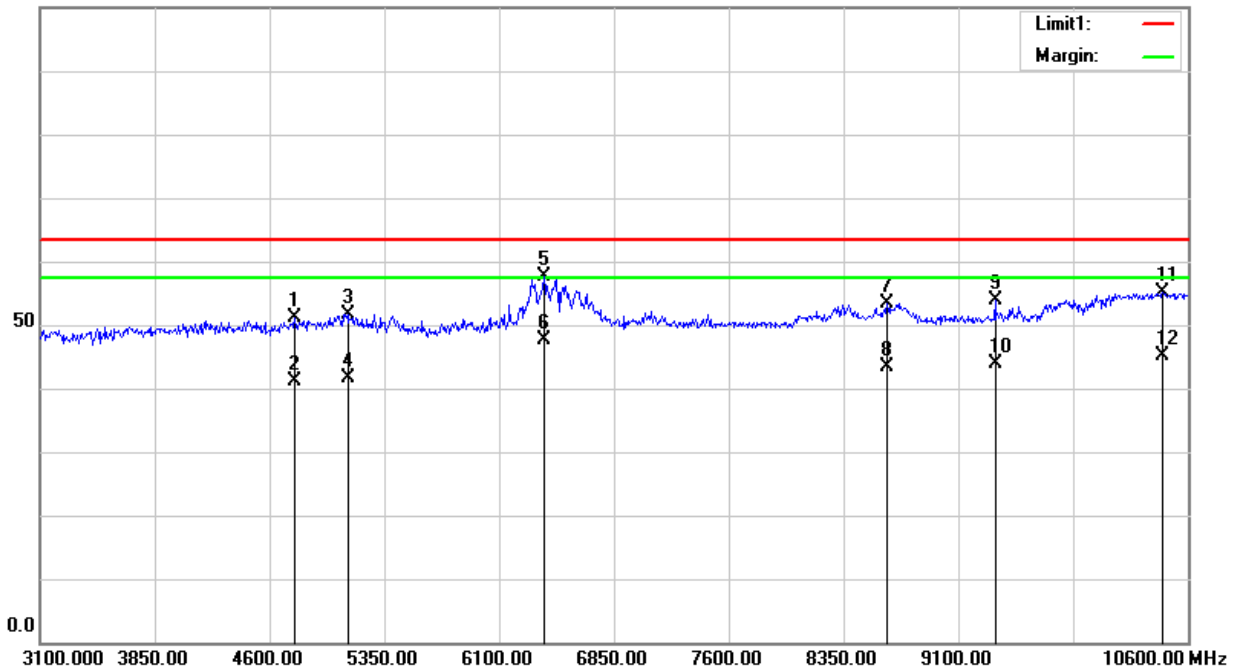
Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	DC 5V	Phase:	Vertical
Test Mode:	CH 1 (3100MHz – 10600MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4765.000	58.52	-7.27	51.25	63.44	-12.19	peak
2	4765.000	48.52	-7.27	41.25	63.44	-22.19	RMS
3	5110.000	57.46	-5.74	51.72	63.44	-11.72	peak
4	5110.000	47.46	-5.74	41.72	63.44	-21.72	RMS
5	6392.500	59.83	-2.24	57.59	63.44	-5.85	peak
6	6392.500	49.83	-2.24	47.59	63.44	-15.85	RMS
7	8635.000	50.84	2.65	53.49	63.44	-9.95	peak
8	8635.000	40.84	2.65	43.49	63.44	-19.95	RMS
9	9340.000	50.97	2.92	53.89	63.44	-9.55	peak
10	9340.000	40.97	2.92	43.89	63.44	-19.55	RMS
11	10435.000	50.41	4.76	55.17	63.44	-8.27	peak
12	10435.000	40.41	4.76	45.17	63.44	-18.27	RMS

Remark:

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

100.0 dBuV/m





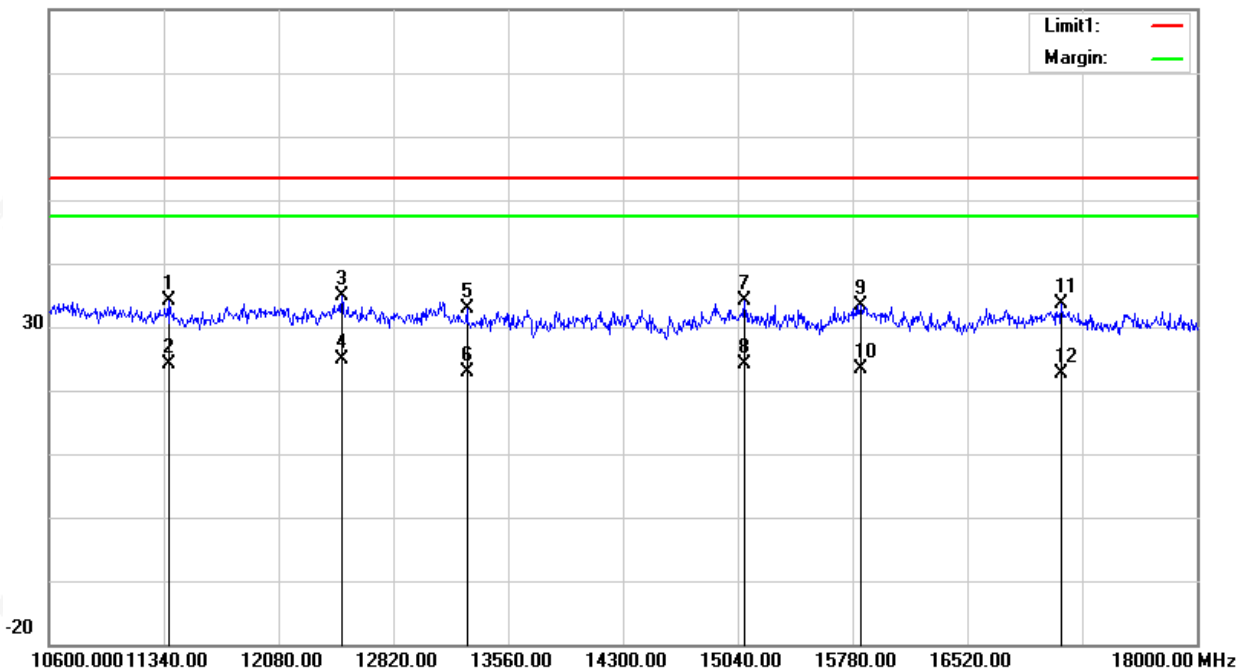
Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	DC 5V	Phase:	Horizontal
Test Mode:	CH 1 (10600MHz – 18000MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	11377.000	-5.01	39.16	34.15	53.44	-19.29	peak
2	11377.000	-15.01	39.16	24.15	53.44	-29.29	RMS
3	12487.000	-3.93	38.75	34.82	53.44	-18.62	peak
4	12487.000	-13.93	38.75	24.82	53.44	-28.62	RMS
5	13293.600	-6.90	39.66	32.76	53.44	-20.68	peak
6	13293.600	-16.90	39.66	22.76	53.44	-30.68	RMS
7	15084.400	-5.88	39.94	34.06	53.44	-19.38	peak
8	15084.400	-15.88	39.94	24.06	53.44	-29.38	RMS
9	15831.800	-4.15	37.62	33.47	53.44	-19.97	peak
10	15831.800	-14.15	37.62	23.47	53.44	-29.97	RMS
11	17126.800	-6.38	39.89	33.51	53.44	-19.93	peak
12	17126.800	-17.38	39.89	22.51	53.44	-30.93	RMS

Remark:

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

80.0 dBuV/m





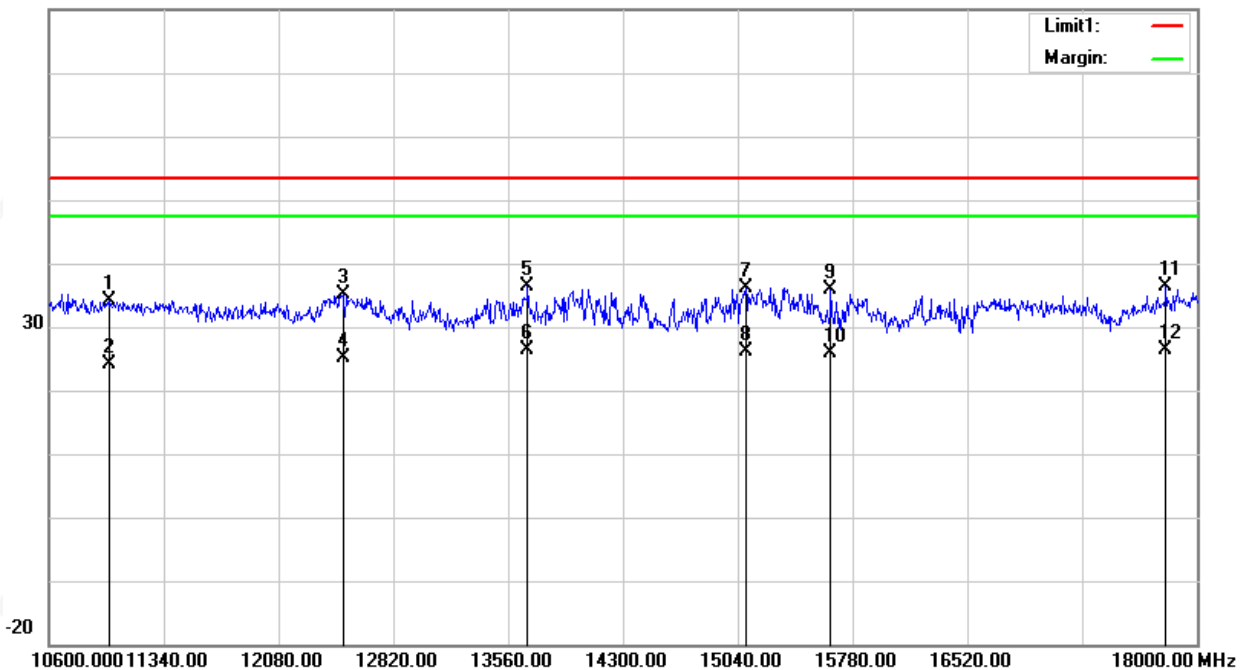
Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	DC 5V	Phase:	Vertical
Test Mode:	CH 1 (10600MHz – 18000MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	10992.200	27.90	6.27	34.17	53.44	-19.27	peak
2	10992.200	17.90	6.27	24.17	53.44	-29.27	RMS
3	12494.400	29.30	5.83	35.13	53.44	-18.31	peak
4	12494.400	19.30	5.83	25.13	53.44	-28.31	RMS
5	13685.800	25.67	10.61	36.28	53.44	-17.16	peak
6	13685.800	15.67	10.61	26.28	53.44	-27.16	RMS
7	15091.800	26.19	10.00	36.19	53.44	-17.25	peak
8	15091.800	16.19	10.00	26.19	53.44	-27.25	RMS
9	15639.400	27.02	8.86	35.88	53.44	-17.56	peak
10	15639.400	17.02	8.86	25.88	53.44	-27.56	RMS
11	17800.200	24.96	11.49	36.45	53.44	-16.99	peak
12	17800.200	14.96	11.49	26.45	53.44	-26.99	RMS

Remark:

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

80.0 dBuV/m



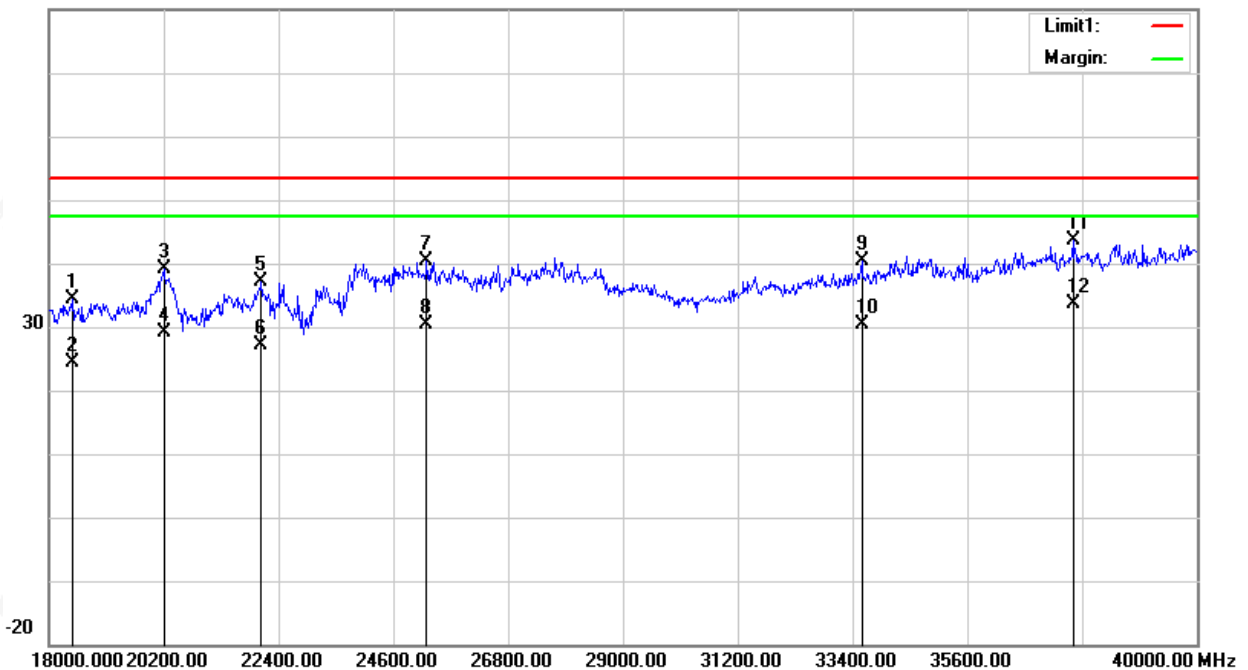
Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	DC 5V	Phase:	Horizontal
Test Mode:	CH 1 (18000MHz – 40000MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	18462.000	28.86	5.56	34.42	53.44	-19.02	peak
2	18462.000	18.86	5.56	24.42	53.44	-29.02	RMS
3	20200.000	26.10	13.08	39.18	53.44	-14.26	peak
4	20200.000	16.10	13.08	29.18	53.44	-24.26	RMS
5	22070.000	26.18	10.83	37.01	53.44	-16.43	peak
6	22070.000	16.18	10.83	27.01	53.44	-26.43	RMS
7	25238.000	23.12	17.18	40.30	53.44	-13.14	peak
8	25238.000	13.12	17.18	30.30	53.44	-23.14	RMS
9	33576.000	24.58	15.73	40.31	53.44	-13.13	peak
10	33576.000	14.58	15.73	30.31	53.44	-23.13	RMS
11	37624.000	26.04	17.48	43.52	53.44	-9.92	peak
12	37624.000	16.04	17.48	33.52	53.44	-19.92	RMS

Remark:

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

80.0 dBuV/m



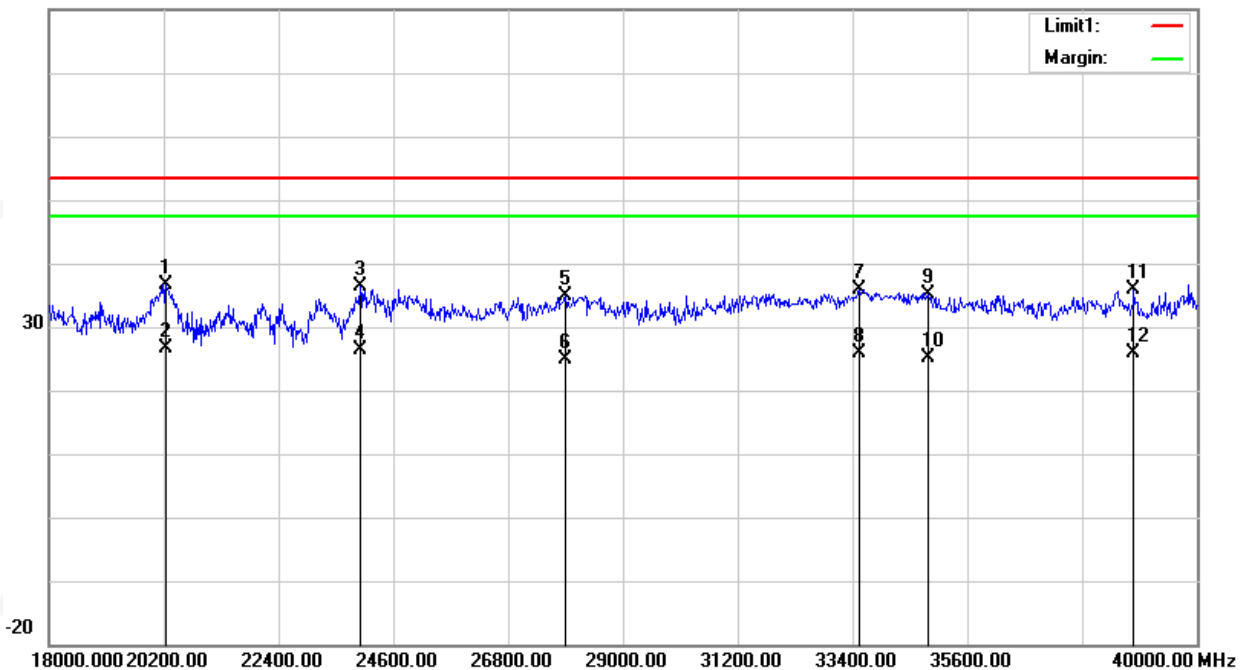
Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	DC 5V	Phase:	Vertical
Test Mode:	CH 1 (18000MHz – 40000MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	20244.000	23.96	12.67	36.63	53.44	-16.81	peak
2	20244.000	13.96	12.67	26.63	53.44	-26.81	RMS
3	23962.000	20.20	16.07	36.27	53.44	-17.17	peak
4	23962.000	10.20	16.07	26.27	53.44	-27.17	RMS
5	27900.000	15.43	19.56	34.99	53.44	-18.45	peak
6	27900.000	5.43	19.56	24.99	53.44	-28.45	RMS
7	33532.000	20.19	15.73	35.92	53.44	-17.52	peak
8	33532.000	10.19	15.73	25.92	53.44	-27.52	RMS
9	34852.000	18.89	16.17	35.06	53.44	-18.38	peak
10	34852.000	8.89	16.17	25.06	53.44	-28.38	RMS
11	38790.000	17.66	18.10	35.76	53.44	-17.68	peak
12	38790.000	7.66	18.10	25.76	53.44	-27.68	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))

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

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

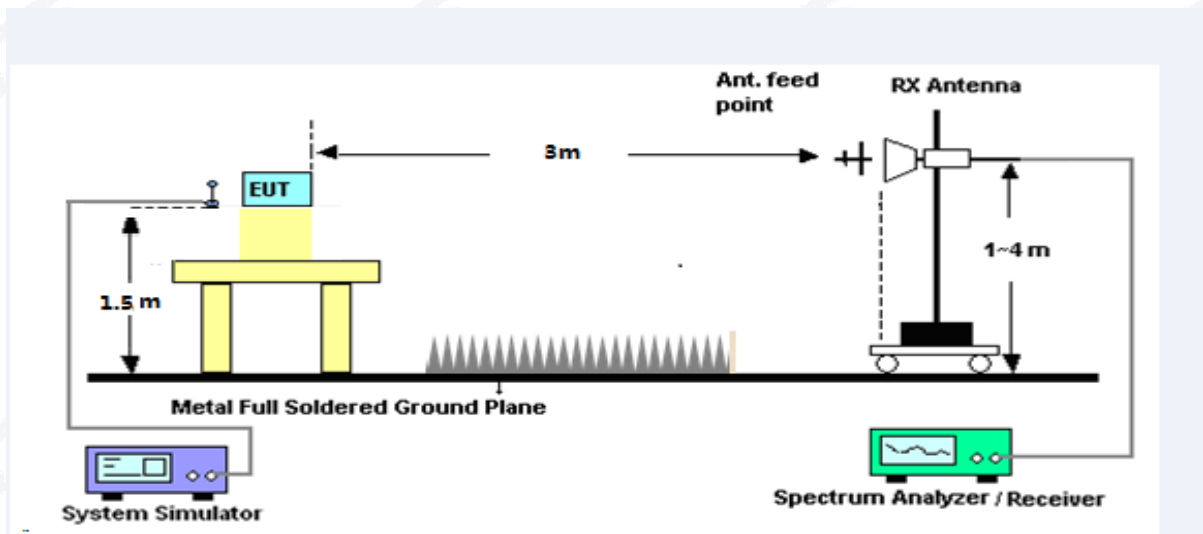
3.3.2 TEST PROCEDURE

- 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 .
(Above 960MHz)
- d. 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

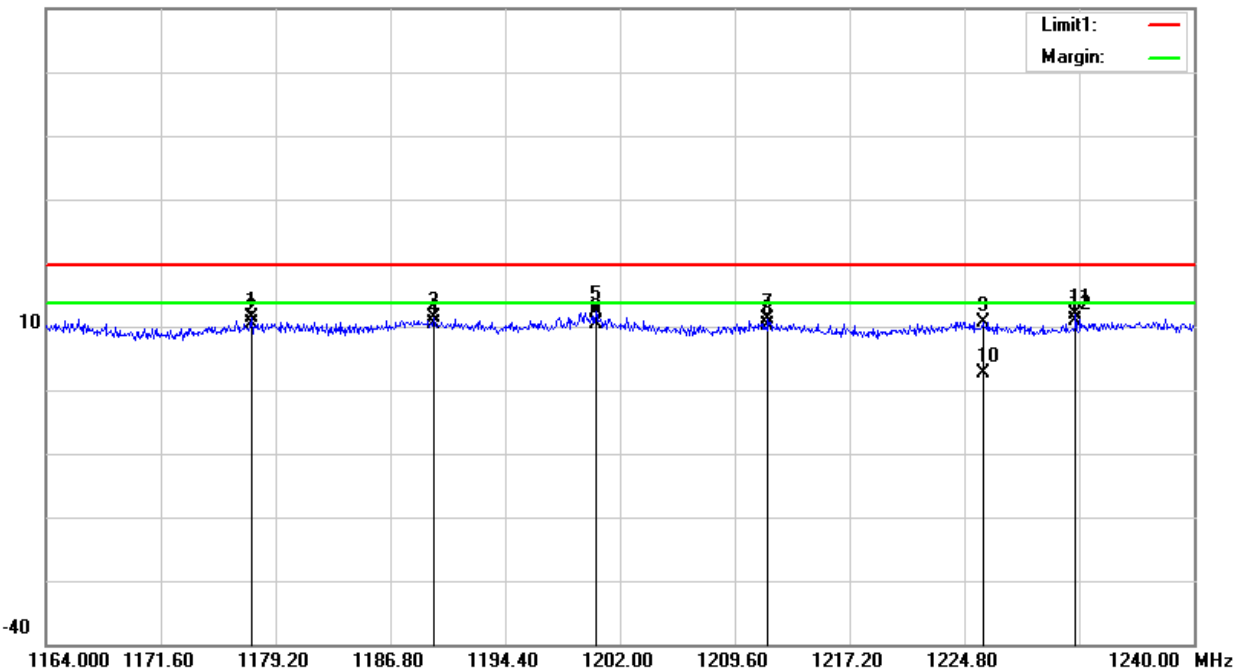
Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	DC 5V	Phase:	Horizontal
Test Mode:	CH 1(1164Hz – 1240MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1177.604	11.93	-0.64	11.29	19.54	-8.25	peak
2	1177.604	10.93	-0.64	10.29	19.54	-9.25	RMS
3	1189.688	11.80	-0.52	11.28	19.54	-8.26	peak
4	1189.688	10.80	-0.52	10.28	19.54	-9.26	RMS
5	1200.404	12.87	-0.42	12.45	19.54	-7.09	peak
6	1200.404	10.87	-0.42	10.45	19.54	-9.09	RMS
7	1211.804	11.46	-0.44	11.02	19.54	-8.52	peak
8	1211.804	10.46	-0.44	10.02	19.54	-9.52	RMS
9	1226.016	11.20	-0.46	10.74	19.54	-8.80	peak
10	1226.016	3.20	-0.46	2.74	19.54	-16.80	RMS
11	1232.172	12.29	-0.48	11.81	19.54	-7.73	peak
12	1232.172	11.29	-0.48	10.81	19.54	-8.73	RMS

Remark:

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

60.0 dBuV/m



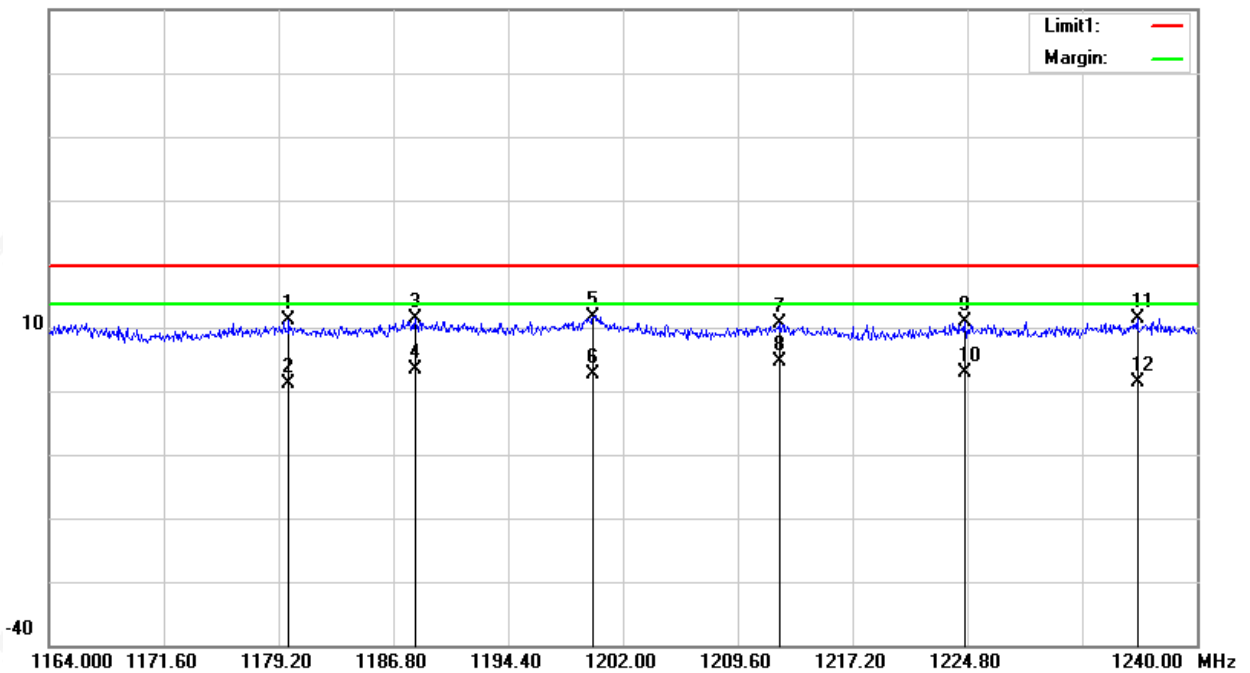
Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	DC 5V	Phase:	Vertical
Test Mode:	CH 1(1164Hz – 1240MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1179.884	11.75	-0.62	11.13	19.54	-8.41	peak
2	1179.884	1.75	-0.62	1.13	19.54	-18.41	RMS
3	1188.244	11.84	-0.54	11.30	19.54	-8.24	peak
4	1188.244	3.84	-0.54	3.30	19.54	-16.24	RMS
5	1200.024	12.14	-0.42	11.72	19.54	-7.82	peak
6	1200.024	3.14	-0.42	2.72	19.54	-16.82	RMS
7	1212.336	11.09	-0.44	10.65	19.54	-8.89	peak
8	1212.336	5.09	-0.44	4.65	19.54	-14.89	RMS
9	1224.648	11.41	-0.47	10.94	19.54	-8.60	peak
10	1224.648	3.41	-0.47	2.94	19.54	-16.60	RMS
11	1236.048	11.87	-0.49	11.38	19.54	-8.16	peak
12	1236.048	1.87	-0.49	1.38	19.54	-18.16	RMS

Remark:

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

60.0 dBuV/m





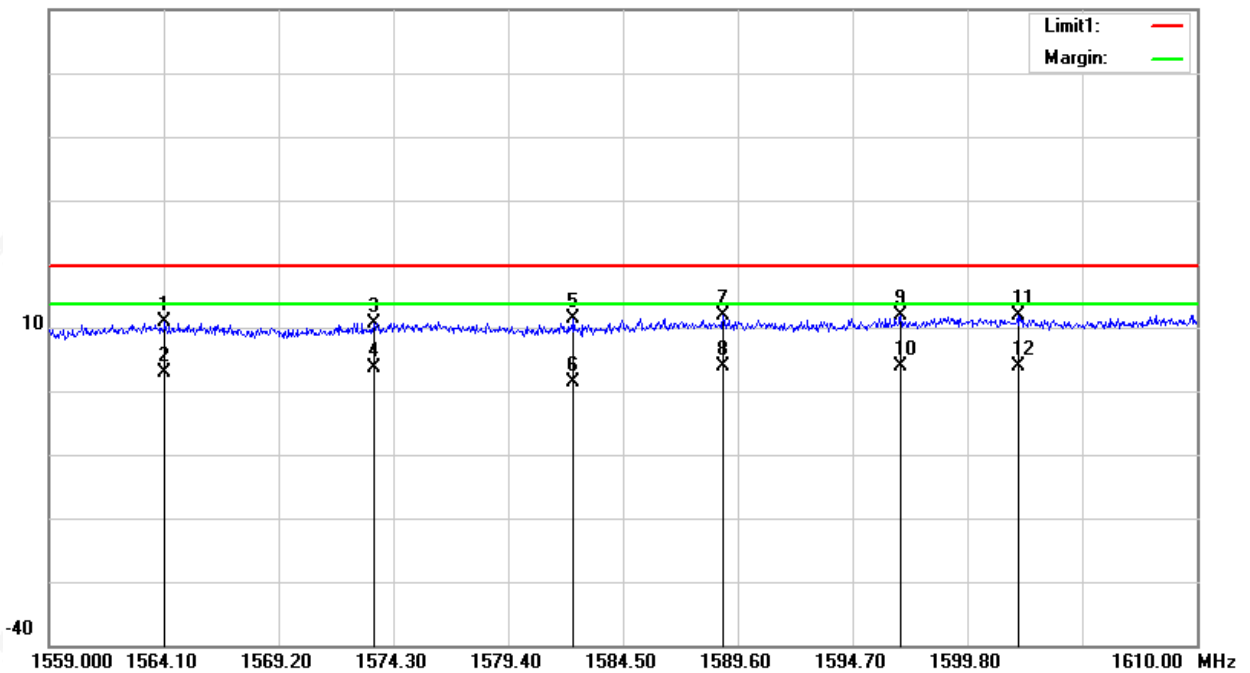
Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	DC 5V	Phase:	Horizontal
Test Mode:	CH 1(1559Hz – 1610MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1564.151	7.77	3.12	10.89	19.54	-8.65	peak
2	1564.151	-0.23	3.12	2.89	19.54	-16.65	RMS
3	1573.433	7.27	3.41	10.68	19.54	-8.86	peak
4	1573.433	0.27	3.41	3.68	19.54	-15.86	RMS
5	1582.307	7.67	3.69	11.36	19.54	-8.18	peak
6	1582.307	-2.33	3.69	1.36	19.54	-18.18	RMS
7	1588.937	8.04	3.89	11.93	19.54	-7.61	peak
8	1588.937	0.04	3.89	3.93	19.54	-15.61	RMS
9	1596.842	7.64	4.14	11.78	19.54	-7.76	peak
10	1596.842	-0.36	4.14	3.78	19.54	-15.76	RMS
11	1602.044	7.55	4.24	11.79	19.54	-7.75	peak
12	1602.044	-0.45	4.24	3.79	19.54	-15.75	RMS

Remark:

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

60.0 dBuV/m





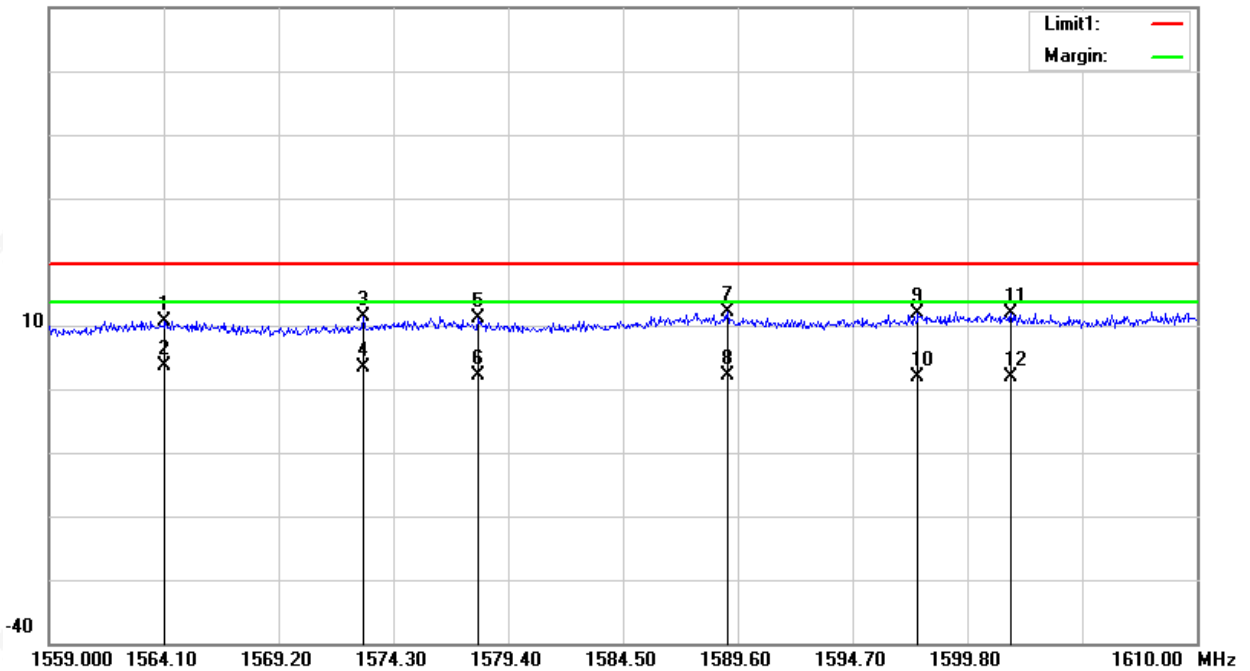
Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	DC 5V	Phase:	Vertical
Test Mode:	CH 1(1559Hz – 1610MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1564.151	7.57	3.12	10.69	19.54	-8.85	peak
2	1564.151	0.57	3.12	3.69	19.54	-15.85	RMS
3	1572.974	7.97	3.39	11.36	19.54	-8.18	peak
4	1572.974	-0.03	3.39	3.36	19.54	-16.18	RMS
5	1578.074	7.59	3.55	11.14	19.54	-8.40	peak
6	1578.074	-1.41	3.55	2.14	19.54	-17.40	RMS
7	1589.141	8.16	3.90	12.06	19.54	-7.48	peak
8	1589.141	-1.84	3.90	2.06	19.54	-17.48	RMS
9	1597.607	7.78	4.16	11.94	19.54	-7.60	peak
10	1597.607	-2.22	4.16	1.94	19.54	-17.60	RMS
11	1601.738	7.58	4.24	11.82	19.54	-7.72	peak
12	1601.738	-2.42	4.24	1.82	19.54	-17.72	RMS

Remark:

- 1. Margin = Result (Result =Reading + Factor)-Limit
- 2. 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

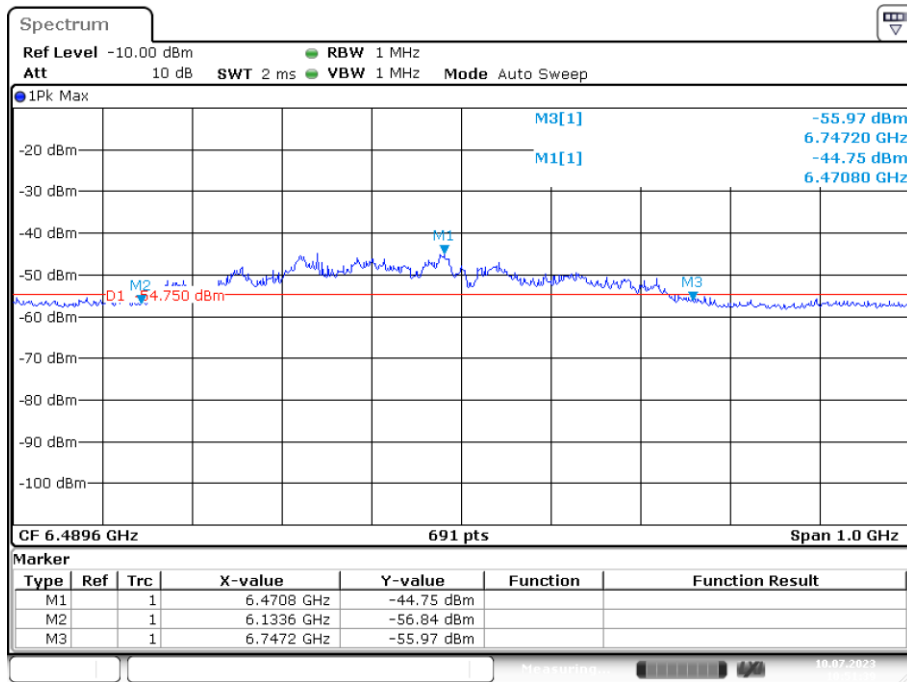


4.6 TEST RESULTS

Temperature:	25 °C	Relative Humidity:	50%
Test Voltage:	DC 5V		

Test Channel	f _M (MHz)	f _L (MHz)	f _H (MHz)	-10dB Bandwidth (MHz)	f _c (MHz)	Fractional Bandwidth (MHz)	Limit	Result
CH1	6470.8	6133.6	6747.2	613.6	6440.4	0.10	-10dB Bandwidth ≥ 500MHz or Fractional Bandwidth ≥ 0.2	Pass

CH 1





5 PEAK EMISSION WITHIN A 50MHZ BANDWIDTH (FOR 15.517(e))

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

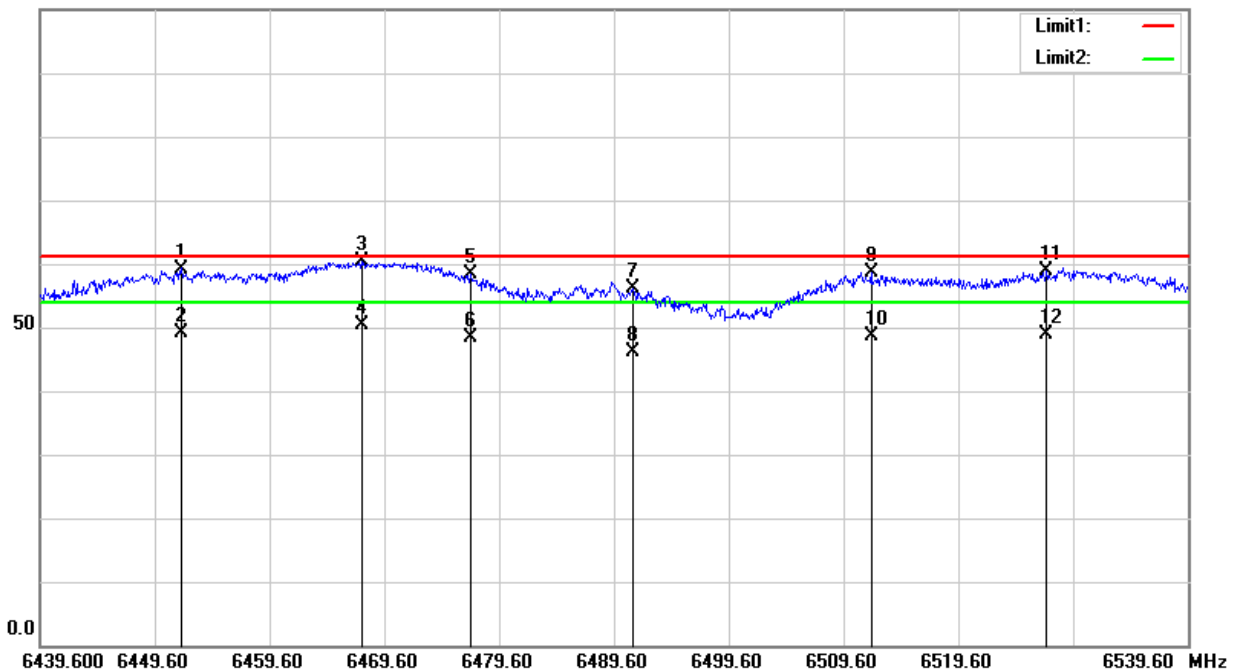
Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	DC 5V	Phase:	Horizontal
Test Mode:	CH 1	Test distance:	3m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	6451.900	61.33	-2.08	59.25	61.20	-1.95	peak
2	6451.900	51.33	-2.08	49.25	61.20	-11.95	RMS
3	6467.600	62.39	-2.04	60.35	61.20	-0.85	peak
4	6467.600	52.39	-2.04	50.35	61.20	-10.85	RMS
5	6477.100	60.38	-2.00	58.38	61.20	-2.82	peak
6	6477.100	50.38	-2.00	48.38	61.20	-12.82	RMS
7	6491.200	58.00	-1.96	56.04	61.20	-5.16	peak
8	6491.200	48.00	-1.96	46.04	61.20	-15.16	RMS
9	6512.000	60.57	-1.92	58.65	61.20	-2.55	peak
10	6512.000	50.57	-1.92	48.65	61.20	-12.55	RMS
11	6527.300	60.74	-1.89	58.85	61.20	-2.35	peak
12	6527.300	50.74	-1.89	48.85	61.20	-12.35	RMS

Remark:

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

100.0 dBuV/m



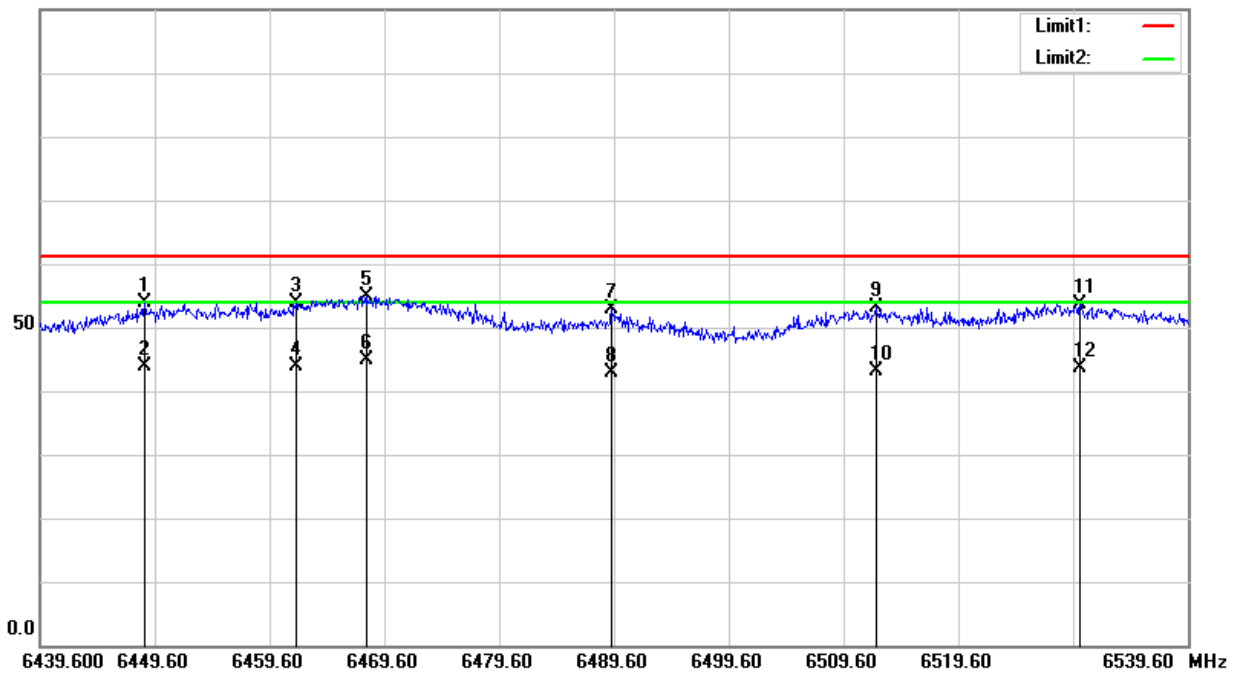
Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	DC 5V	Phase:	Vertical
Test Mode:	CH 1	Test distance:	3m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	6448.700	55.90	-2.09	53.81	61.20	-7.39	peak
2	6448.700	45.90	-2.09	43.81	61.20	-17.39	RMS
3	6461.900	55.92	-2.05	53.87	61.20	-7.33	peak
4	6461.900	45.92	-2.05	43.87	61.20	-17.33	RMS
5	6468.100	57.00	-2.04	54.96	61.20	-6.24	peak
6	6468.100	47.00	-2.04	44.96	61.20	-16.24	RMS
7	6489.400	54.73	-1.97	52.76	61.20	-8.44	peak
8	6489.400	44.73	-1.97	42.76	61.20	-18.44	RMS
9	6512.400	55.04	-1.92	53.12	61.20	-8.08	peak
10	6512.400	45.04	-1.92	43.12	61.20	-18.08	RMS
11	6530.200	55.63	-1.89	53.74	61.20	-7.46	peak
12	6530.200	45.63	-1.89	43.74	61.20	-17.46	RMS

Remark:

- Margin = Result (Result =Reading + Factor)-Limit
- 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, 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 Ceramic 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*****