



RADIO TEST REPORT

Report No: STS2008185W01

Issued for

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

Sevket Ozcelik sok. No29 Alsancak izmir Turkey

Product Name:	Tag
Brand Name:	Litum
Model Name:	Tag Series
Series Model:	631,632,633
FCC ID:	2AW7W-631
Test Standard:	Title 47 of the CFR, Part 15. Subpart F

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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: Tag
Brand Name: Litum
Model Name: Tag Series
Series Model: 631,632,633
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.

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Date of Test:
Date of receipt of test item: 11 Sept. 2020
Date of performance of tests...: 11 Sept. 2020 ~ 17 Sept. 2020; 15 Oct. 2020 ~ 16 Oct. 2020
Date of Issue: 16 Oct. 2020
Test Result.....: Pass

Testing Engineer : [Signature]
(Chris Chen)

Technical Manager : [Signature]
(Sean she)

Authorized Signatory : [Signature]
(Vita Li)





Table of Contents	Page
1. SUMMARY OF TEST RESULTS	6
1.1 TEST FACTORY	7
1.2 MEASUREMENT UNCERTAINTY	7
2. GENERAL INFORMATION	8
2.1 GENERAL DESCRIPTION OF THE EUT	8
2.2 DESCRIPTION OF THE TEST MODES	9
2.3 TEST SOFTWARE AND POWER LEVEL	9
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 15.519(C))	14
3.3 RADIATED EMISSION MEASUREMENT (FOR 15.519(D))	35
4. UWB BANDWIDTH	41
4.1 LIMITS OF UWB BANDWIDTH MEASUREMENT	41
4.2 INSTRUMENT SETUP VALUE AND MEASUREMENT DISTANCE	41
4.3 TEST PROCEDURE	41
4.4 TEST SETUP	41
4.5 EUT OPERATION CONDITIONS	41
4.6 TEST RESULTS	42
5 PEAK EMISSION WITHIN A 50MHZ BANDWIDTH (FOR 15.519(E))	43
5.1 LIMITS OF PEAK EMISSION	43
5.2 INSTRUMENT SETUP VALUE AND MEASUREMENT DISTANCE	43
5.3 TEST PROCEDURE	43
5.4 DEVIATION FROM TEST STANDARD	43
5.5 TEST SETUP	43
5.6 FIELD STRENGTH CALCULATION	43
5.7 EUT OPERATING CONDITIONS	43
5.8 TEST RESULTS	44
6 CESSATION TIME	46
6.1 CESSATION TIME	46
6.2 TEST PROCEDURE	46
6.3 TEST RESULTS	46
7. ANTENNA REQUIREMENT	48



Table of Contents	Page
7.1 STANDARD REQUIREMENT	48
7.2 EUT ANTENNA	48
APPENDIX- PHOTOS OF TEST SETUP	49





Revision History

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	16 Oct. 2020	STS2008185W01	ALL	Initial Issue





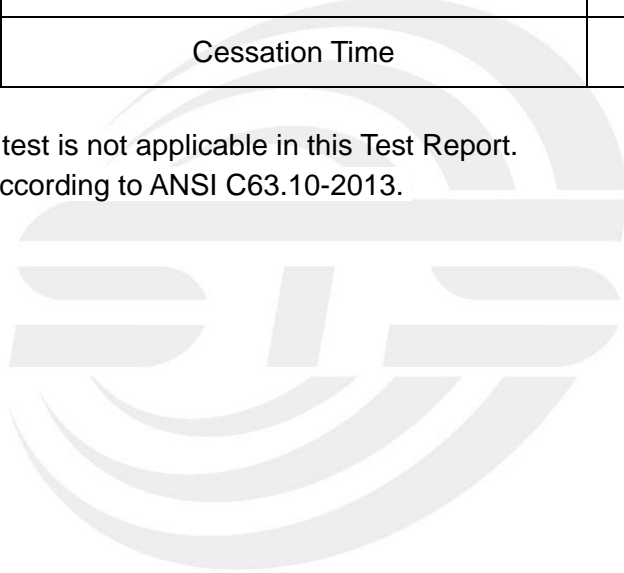
1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part 15. Subpart F			
Standard Section	Test Item	Judgment	Remark
15.207	AC Power Conducted Emission	N/A	
15.203	Antenna Requirement	Pass	
15.209 15.519(c)	Radiated Spurious Emission	Pass	
15.209 15.519(d)	Radiated Spurious Emission in GPS Band	Pass	
15.519(e)	Peak Emissions within a 50MHz Bandwidth	Pass	
15.519(b)	UWB Bandwidth	Pass	
15.519(a)(1)	Cessation Time	Pass	

NOTE:

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





1.1 TEST FACTORY

SHENZHEN STS TEST SERVICES CO., LTD

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

FCC test Firm Registration Number: 625569

IC test Firm Registration Number: 12108A

A2LA Certificate No.: 4338.01

1.2 MEASUREMENT UNCERTAINTY

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

No.	Item	Uncertainty
1	RF output power, conducted	$\pm 0.68\text{dB}$
2	Unwanted Emissions, conducted	$\pm 2.988\text{dB}$
3	All emissions, radiated 30-1GHz	$\pm 6.7\text{dB}$
4	All emissions, radiated 1G-6GHz	$\pm 5.5\text{dB}$
5	All emissions, radiated >6G	$\pm 5.8\text{dB}$
6	Conducted Emission (9KHz-150KHz)	$\pm 4.43\text{dB}$
7	Conducted Emission (150KHz-30MHz)	$\pm 5\text{dB}$



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

Product Name	Tag
Trade Name	Litum
Model Name	Tag Series
Series Model	631,632,633
Model Difference	Only difference shell and battery capacity(see note4)
Product Description	The EUT is a Tag
	Operation Frequency: 6.4896GHz
	Modulation Type: BPSK
	Antenna Designation: Please refer to the Note 3.
	Antenna Gain(Peak): Chip 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.
Battery	1. Model: 502030 (BELT) Rated Voltage: 3.7V Charge Limit: 4.2V Capacity: 250mAh
	2. Model: 383450 (BADGE) Rated Voltage: 3.7V Charge Limit: 4.2V Capacity: 700mAh
Hardware version number	LT0101_0101
Software version number	1001
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.

Test channel	Frequency(GHz)	Test channel	Frequency(GHz)
1	6.4896	--	--

3. Table for Filed Antenna

Ant	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	Litum	631	Chip Antenna	N/A	2.6	Antenna

Model Name	Product Name	Battery	shape	SW
Tag Series				
633	Tag	Battery is the same Capacity:250mAh	Same shapes, same material	Software is the same.
632	Tag			
631	Tag	Capacity:700mAh	different shapes, same material	

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) The test model 631, 633 all has been tested, only shown the worst case of model 631.

2.3 TEST SOFTWARE AND POWER LEVEL

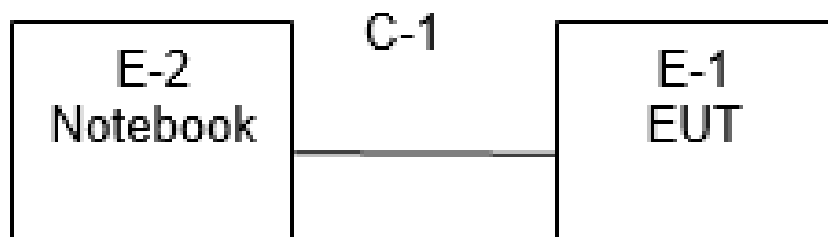
During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level.

RF Function	Type	Mode Or Modulation type	Ant Gain(dBi)	Power Class	Software For Testing
Other SRD	UWB	6489.6MHz	2.6	Default	No software is required, the EUT has signal transmission when it is powered on

2.4 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

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

Radiated Spurious Emission Test





2.5 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS

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

Necessary accessories

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

Support units

Item	Equipment	Mfr/Brand	Model/Type No.	Length	Note
E-2	Notebook	Lenovo	ThinkPad E470	N/A	N/A
C-1	USB Cable	N/A	N/A	110cm	N/A

Note:

- (1) 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	2019.10.09 2020.10.12	2020.10.08 2022.10.11
Signal Analyzer	R&S	FSV 40-N	101823	2019.10.09 2020.10.10	2020.10.08 2021.10.09
Active loop Antenna	ZHINAN	ZN30900C	16035	2019.07.11	2021.07.10
Bilog Antenna	TESEQ	CBL6111D	34678	2017.11.02	2020.11.01
Horn Antenna	SCHWARZBECK	BBHA 9120D	02014	2018.10.19	2021.10.18
SHF-EHF Horn Antenna (18G-40GHz)	A-INFO	LB-180400-KF	J211020657	2018.03.11	2021.03.10
Pre-Amplifier (0.1M-3GHz)	EM	EM330	060665	2019.10.09 2020.10.12	2020.10.08 2021.10.11
Pre-Amplifier (1G-18GHz)	SKET	LNPA-01018G-45	SK201808090 1	2019.10.09 2020.10.12	2020.10.08 2021.10.11
Pre-Amplifier (18G-40GHz)	SKET	LNPA-1840-50	SK201810180 1	2019.10.22 2020.10.10	2020.10.21 2021.10.09
Temperature & Humidity	HH660	Mieo	N/A	2019.10.09 2020.10.13	2020.10.08 2021.10.12
Turn table	EM	SC100_1	60531	N/A	N/A
Antenna mast	EM	SC100	N/A	N/A	N/A
Test SW	FARAD	EZ-EMC(Ver.STSLAB-03A1 RE)			

Conduction Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Test Receiver	R&S	ESCI	101427	2019.10.09 2020.10.12	2020.10.08 2022.10.11
LISN	R&S	ENV216	101242	2019.10.09 2020.10.12	2020.10.08 2022.10.11
LISN	EMCO	3810/2NM	23625	2019.10.09 2020.10.12	2020.10.08 2022.10.11
Temperature & Humidity	HH660	Mieo	N/A	2019.10.12 2020.10.13	2020.10.11 2021.10.12
Test SW	FARAD	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	MY51110105	2020.03.05	2021.03.04
Temperature & Humidity	HH660	Mieo	N/A	2019.10.12 2020.10.13	2020.10.11 2021.10.12
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 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.

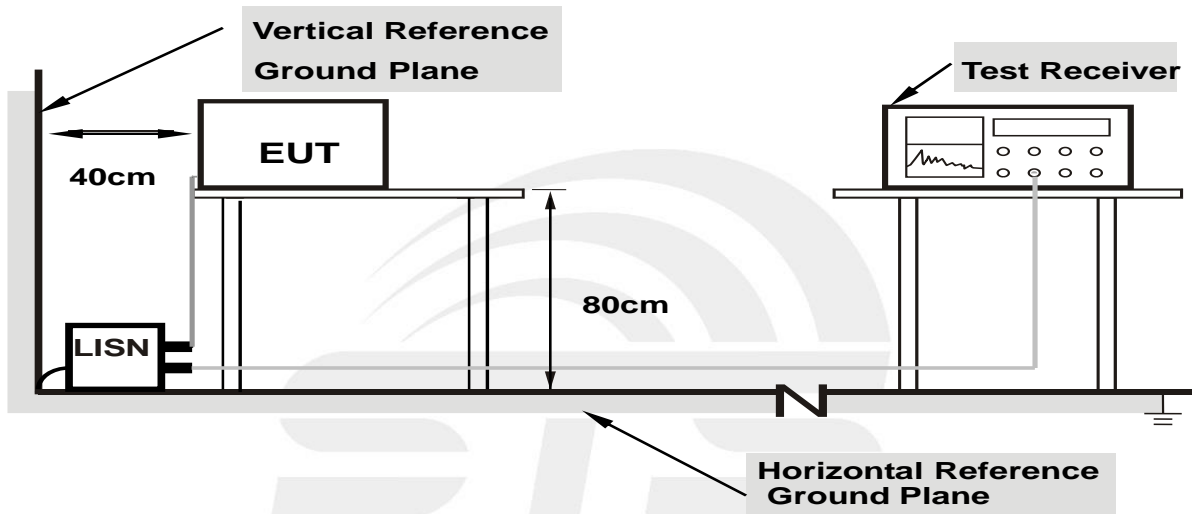
The following table is the setting of the receiver

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 cm 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:	23.5(C)	Relative Humidity:	47%RH
Test Voltage:	N/A	Phase:	L/N
Test Mode:	N/A		

Note: The EUT is powered by the battery and wireless charging function, is not applicable.



3.2 RADIATED EMISSION MEASUREMENT (FOR 15.519(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	29.54
1610~1990	-63.3	31.9	41.54
1990~3100	-61.3	33.9	43.54
3100~10600	-41.3	53.9	63.54
Above 10600	-61.3	33.9	43.54

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	960 MHz -1610MHz: 1001 1610MHz – 1990MHz: 1001 1990MHz – 3100MHz: 1110 3100MHz – 10600MHz: 7500 10600MHz – 18000MHz: 7400 18000MHz – 40000MHz: 22000
SweepTime	1s

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~90kHz / RB 200Hz for AVG
	90kHz~110kHz / RB 200Hz for QP
	110kHz~490kHz / RB 200Hz for AVG
	490kHz~30MHz / RB 9kHz for QP
	30MHz~960MHz / RB 120kHz for QP



3.2.2 TEST PROCEDURE

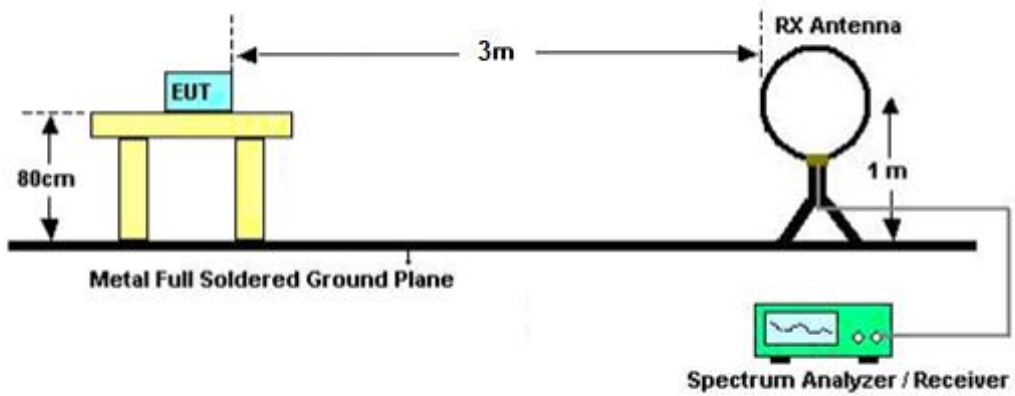
- a. The measuring distance of 1m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8meter (above 1GHz is 1.5 m) above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The height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

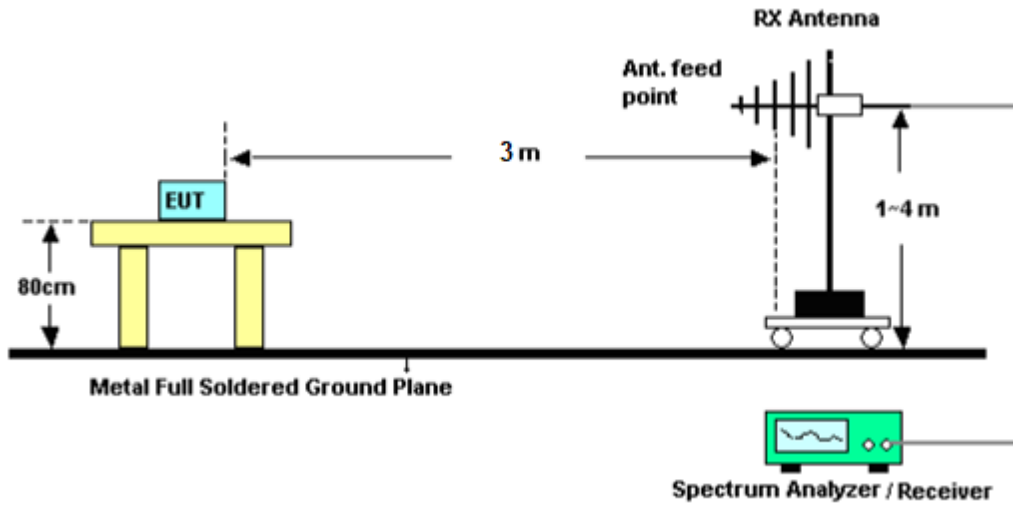
No deviation

3.2.4 TEST SETUP

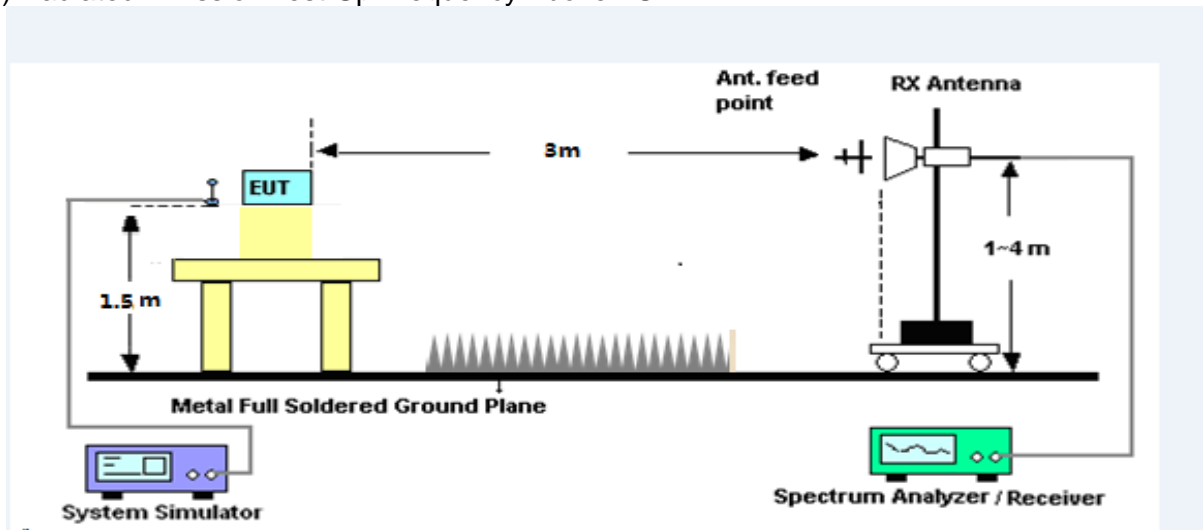
(A) Radiated Emission Test-Up Frequency Below 30MHz



(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

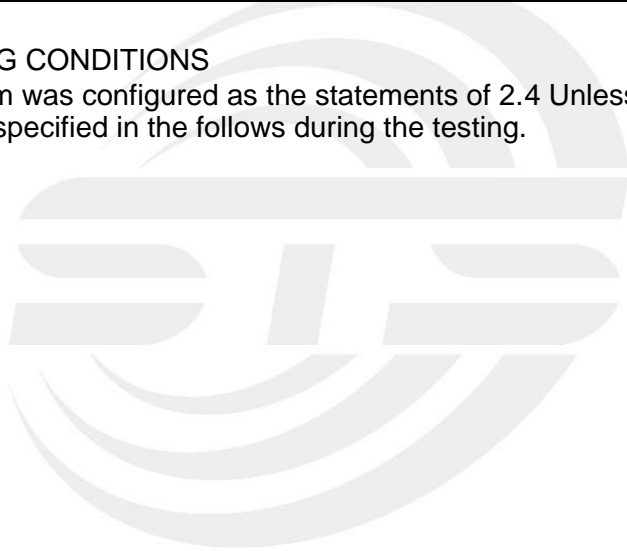
AV L = AV Limit

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

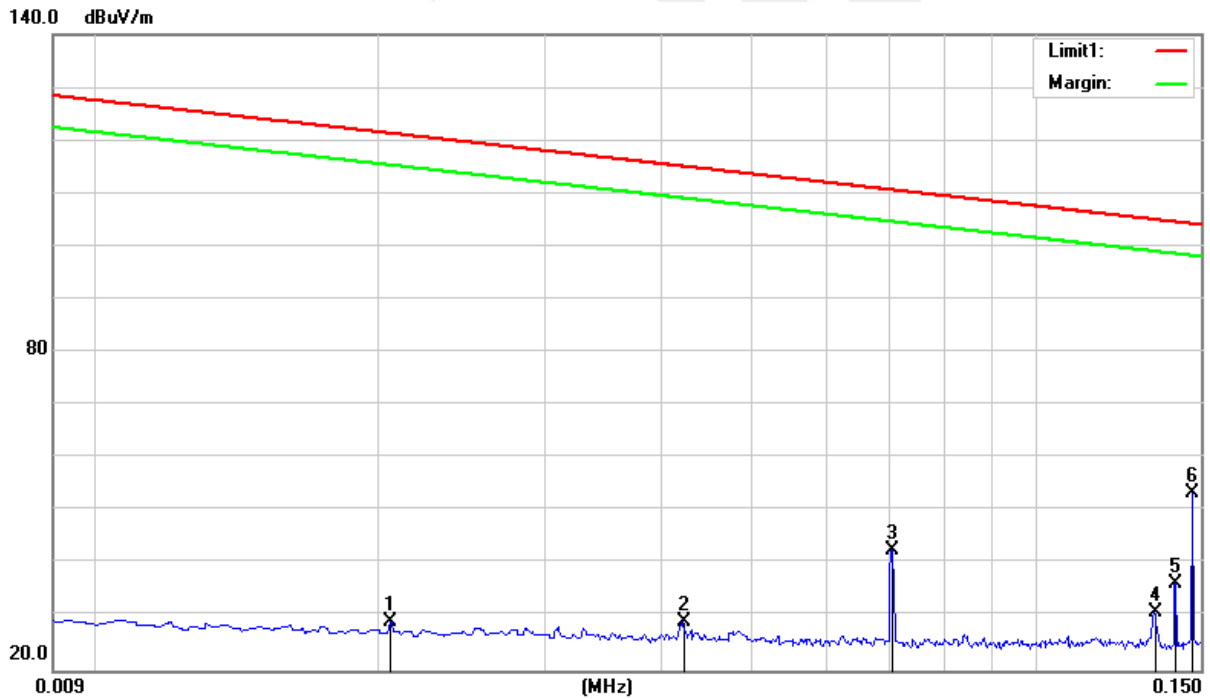
Below 30MHz

Temperature:	23.3(C)	Relative Humidity:	61%RH
Test Voltage:	DC 3.7V	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	0.0206	8.97	20.17	29.14	121.33	-92.19	AVG
2	0.0423	9.38	19.73	29.11	115.08	-85.97	AVG
3	0.0704	23.69	19.01	42.70	110.65	-67.95	AVG
4	0.1340	13.35	17.61	30.96	105.06	-74.10	AVG
5	0.1411	18.89	17.60	36.49	104.61	-68.12	AVG
6	0.1472	35.74	17.59	53.33	104.24	-50.91	AVG

Remark:

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



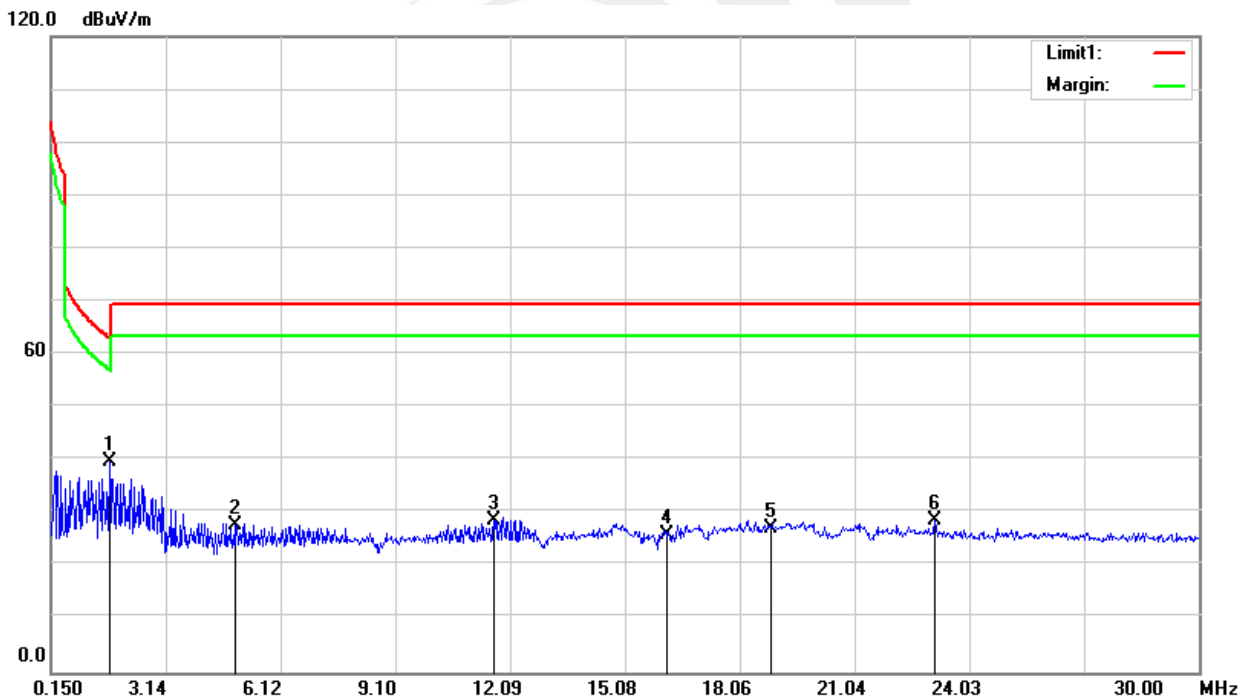


Temperature:	23.3(C)	Relative Humidity:	61%RH
Test Voltage:	DC 3.7V	Test Mode:	CH 1 (150KHz – 30MHz)
Test distance:	3m		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1.6724	19.32	20.41	39.73	63.14	-23.41	QP
2	4.9260	7.03	20.65	27.68	69.54	-41.86	QP
3	11.6721	7.46	21.24	28.70	69.54	-40.84	QP
4	16.1794	3.61	22.46	26.07	69.54	-43.47	QP
5	18.8660	3.97	23.15	27.12	69.54	-42.42	QP
6	23.1341	6.26	22.34	28.60	69.54	-40.94	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.



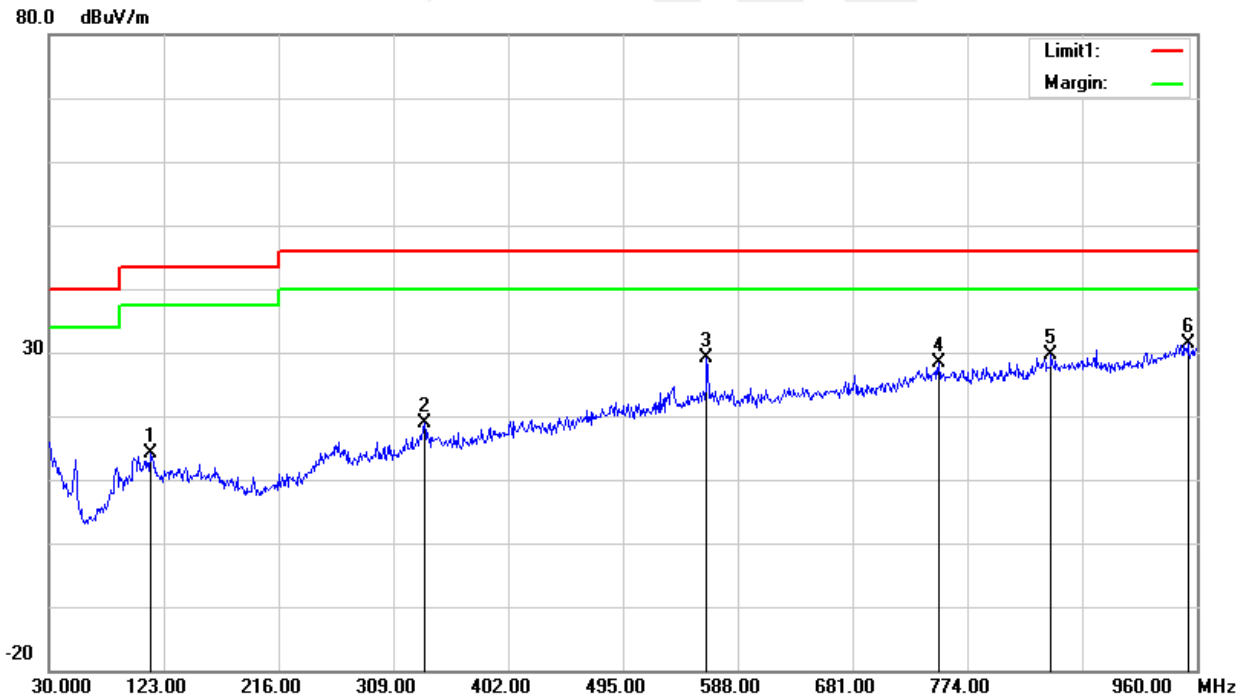
30MHz – 960MHz Radiation Spurious

Temperature:	23.3(C)	Relative Humidity:	60%RH
Test Voltage:	DC 3.7V	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	112.7700	32.80	-18.79	14.01	43.50	-29.49	QP
2	334.1100	32.42	-13.58	18.84	46.00	-27.16	QP
3	562.8900	34.76	-5.52	29.24	46.00	-16.76	QP
4	750.7500	30.43	-2.16	28.27	46.00	-17.73	QP
5	841.8900	29.96	-0.42	29.54	46.00	-16.46	QP
6	952.5600	29.71	1.63	31.34	46.00	-14.66	QP

Remark:

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



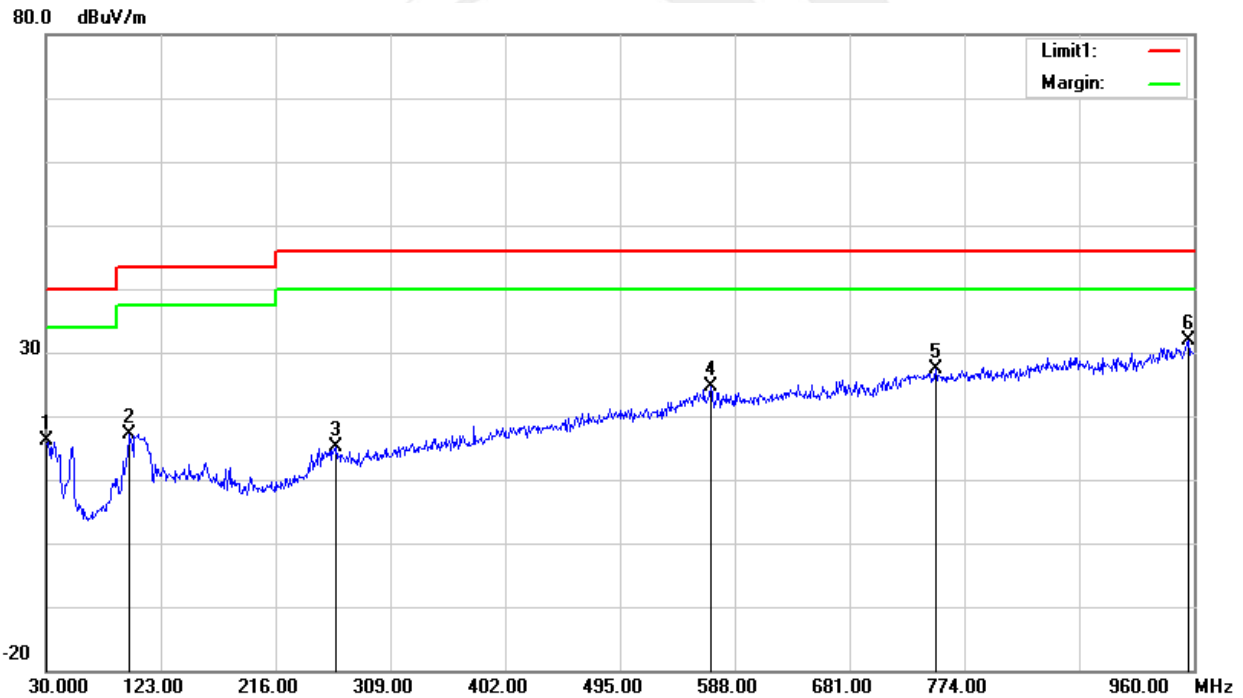


Temperature:	23.3(C)	Relative Humidity:	60%RH
Test Voltage:	DC 3.7V	Phase:	Vertical
Test Mode:	CH 1	Test distance:	3m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	30.0000	29.07	-12.85	16.22	40.00	-23.78	QP
2	97.8900	37.51	-20.46	17.05	43.50	-26.45	QP
3	265.2900	30.00	-14.79	15.21	46.00	-30.79	QP
4	568.4700	30.29	-5.58	24.71	46.00	-21.29	QP
5	750.7500	29.66	-2.16	27.50	46.00	-18.50	QP
6	955.3500	30.30	1.68	31.98	46.00	-14.02	QP

Remark:

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





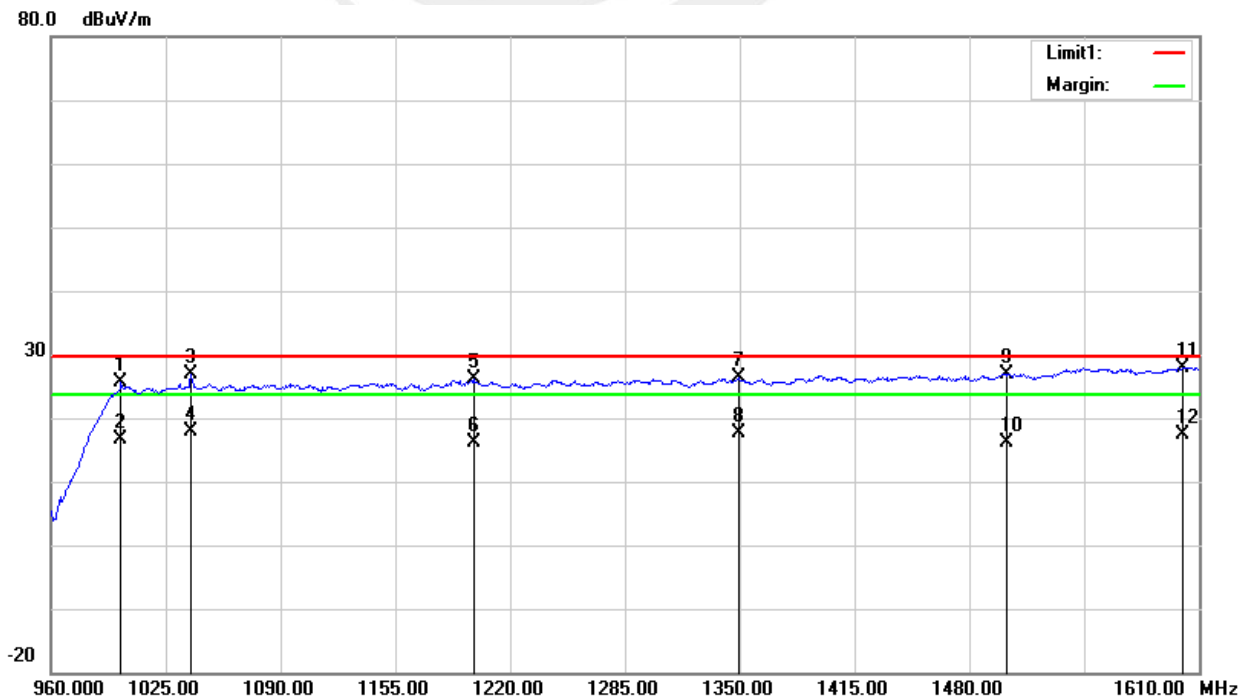
Above 960MHz Radiation Spurious

Temperature:	23.3(C)	Relative Humidity:	62%RH
Test Voltage:	DC 3.7V	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	999.6500	51.56	-26.00	25.56	29.54	-3.98	peak
2	999.6500	42.68	-26.00	16.68	29.54	-12.86	RMS
3	1039.300	28.24	-1.42	26.82	29.54	-2.72	peak
4	1039.300	19.40	-1.42	17.98	29.54	-11.56	RMS
5	1199.200	26.52	-0.43	26.09	29.54	-3.45	peak
6	1199.200	16.44	-0.43	16.01	29.54	-13.53	RMS
7	1349.350	26.28	0.06	26.34	29.54	-3.20	peak
8	1349.350	17.50	0.06	17.56	29.54	-11.98	RMS
9	1500.800	25.42	1.50	26.92	29.54	-2.62	peak
10	1500.800	14.53	1.50	16.03	29.54	-13.51	RMS
11	1600.900	23.67	4.24	27.91	29.54	-1.63	peak
12	1600.900	13.02	4.24	17.26	29.54	-12.28	RMS

Remark:

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





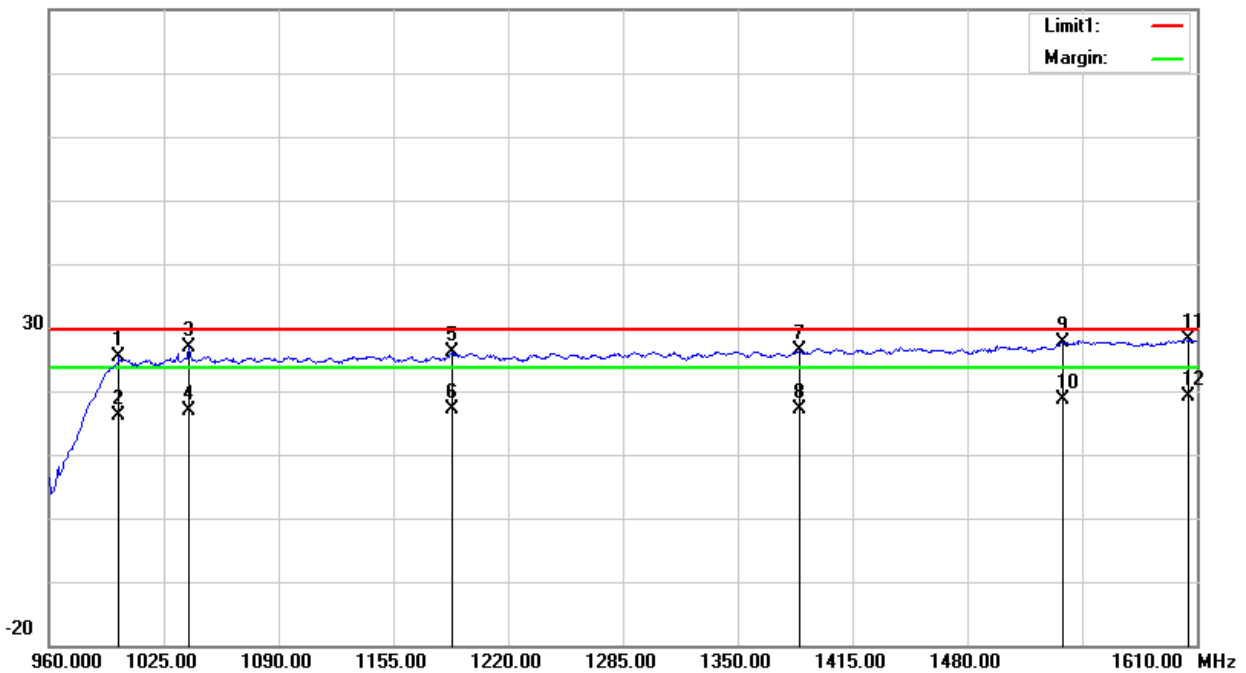
Temperature:	23.3(C)	Relative Humidity:	62%RH
Test Voltage:	DC 3.7V	Phase:	Vertical
Test Mode:	CH 1(960MHz -1610MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	999.6500	51.26	-26.00	25.26	29.54	-4.28	peak
2	999.6500	42.15	-26.00	16.15	29.54	-13.39	RMS
3	1039.300	28.29	-1.42	26.87	29.54	-2.67	peak
4	1039.300	18.42	-1.42	17.00	29.54	-12.54	RMS
5	1188.150	26.58	-0.54	26.04	29.54	-3.50	peak
6	1188.150	17.77	-0.54	17.23	29.54	-12.31	RMS
7	1385.100	26.10	0.20	26.30	29.54	-3.24	peak
8	1385.100	16.92	0.20	17.12	29.54	-12.42	RMS
9	1533.950	25.37	2.29	27.66	29.54	-1.88	peak
10	1533.950	16.27	2.29	18.56	29.54	-10.98	RMS
11	1605.450	24.00	4.24	28.24	29.54	-1.30	peak
12	1605.450	14.88	4.24	19.12	29.54	-10.42	RMS

Remark:

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

80.0 dBuV/m





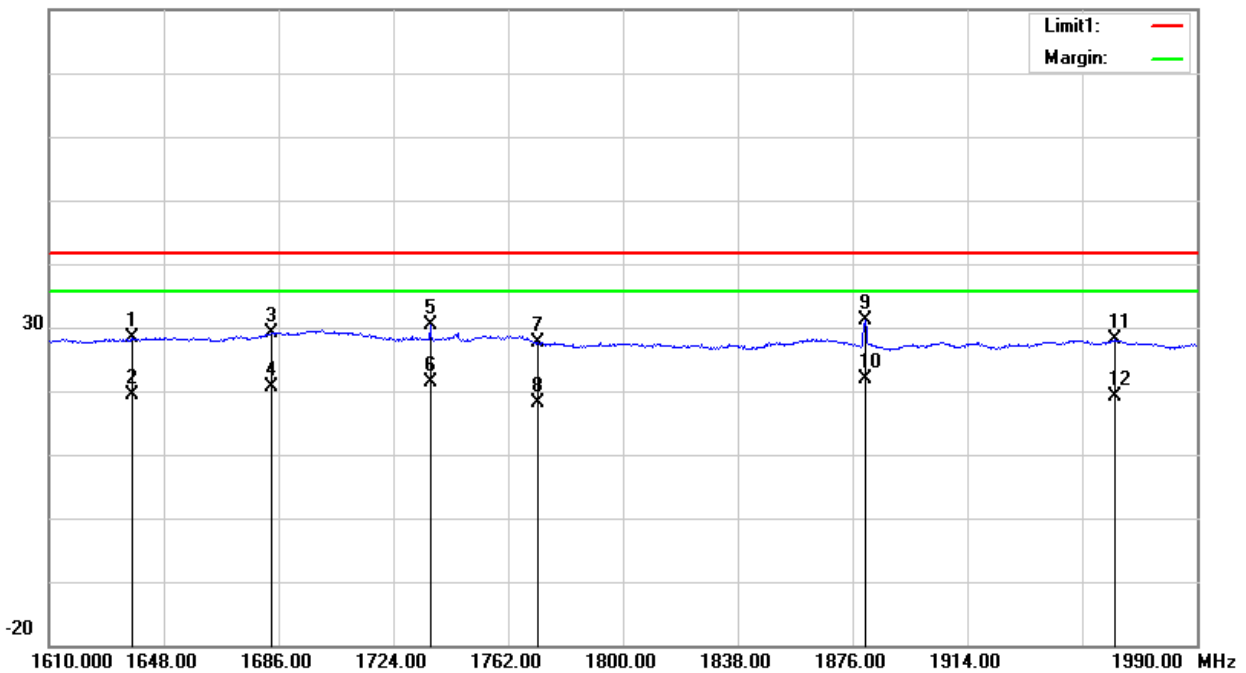
Temperature:	23.3(C)	Relative Humidity:	62%RH
Test Voltage:	DC 3.7V	Phase:	Horizontal
Test Mode:	CH 1(1610MHz – 1990MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1637.360	24.07	4.24	28.31	41.54	-13.23	peak
2	1637.360	15.12	4.24	19.36	41.54	-22.18	RMS
3	1683.720	24.30	4.90	29.20	41.54	-12.34	peak
4	1683.720	15.66	4.90	20.56	41.54	-20.98	RMS
5	1736.160	26.27	4.10	30.37	41.54	-11.17	peak
6	1736.160	17.35	4.10	21.45	41.54	-20.09	RMS
7	1771.880	24.82	2.84	27.66	41.54	-13.88	peak
8	1771.880	15.39	2.84	18.23	41.54	-23.31	RMS
9	1880.180	29.32	1.81	31.13	41.54	-10.41	peak
10	1880.180	20.17	1.81	21.98	41.54	-19.56	RMS
11	1963.020	26.38	1.65	28.03	41.54	-13.51	peak
12	1963.020	17.47	1.65	19.12	41.54	-22.42	RMS

Remark:

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

80.0 dBuV/m





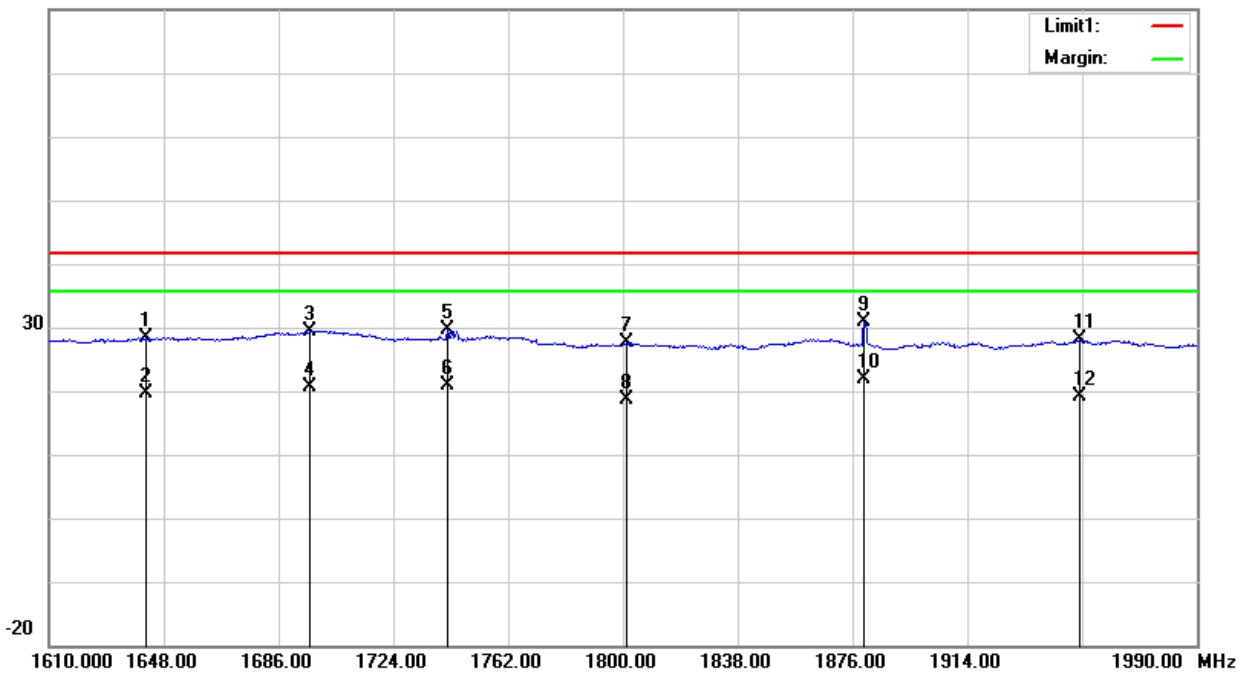
Temperature:	23.3(C)	Relative Humidity:	62%RH
Test Voltage:	DC 3.7V	Phase:	Vertical
Test Mode:	CH 1(1610MHz – 1990MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1641.920	24.11	4.23	28.34	41.54	-13.20	peak
2	1641.920	15.33	4.23	19.56	41.54	-21.98	RMS
3	1696.260	24.28	5.15	29.43	41.54	-12.11	peak
4	1696.260	15.43	5.15	20.58	41.54	-20.96	RMS
5	1741.860	25.72	3.92	29.64	41.54	-11.90	peak
6	1741.860	16.87	3.92	20.79	41.54	-20.75	RMS
7	1801.140	25.79	1.79	27.58	41.54	-13.96	peak
8	1801.140	16.85	1.79	18.64	41.54	-22.90	RMS
9	1879.800	29.00	1.82	30.82	41.54	-10.72	peak
10	1879.800	20.03	1.82	21.85	41.54	-19.69	RMS
11	1951.240	26.54	1.54	28.08	41.54	-13.46	peak
12	1951.240	17.49	1.54	19.03	41.54	-22.51	RMS

Remark:

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

80.0 dBuV/m





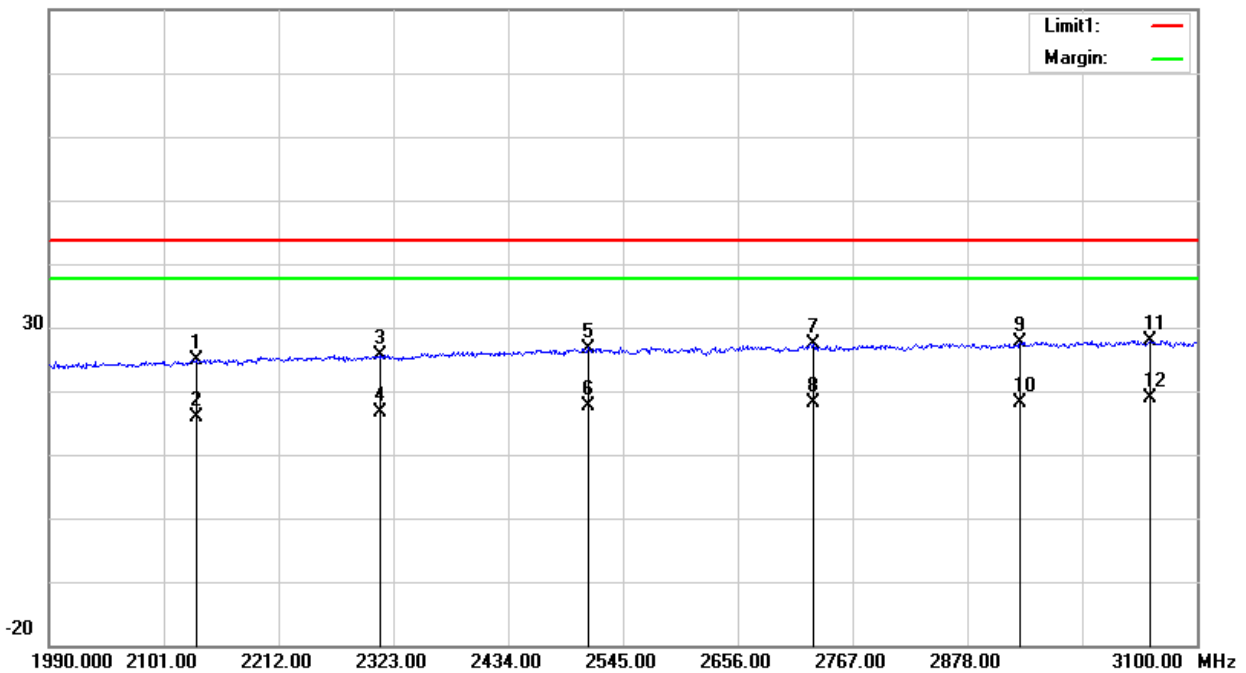
Temperature:	23.3(C)	Relative Humidity:	62%RH
Test Voltage:	DC 3.7V	Phase:	Horizontal
Test Mode:	CH 1(1990MHz – 3100MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2132.080	40.81	-15.83	24.98	43.54	-18.56	peak
2	2132.080	31.72	-15.83	15.89	43.54	-27.65	RMS
3	2309.680	40.76	-15.04	25.72	43.54	-17.82	peak
4	2309.680	31.66	-15.04	16.62	43.54	-26.92	RMS
5	2511.700	40.56	-13.81	26.75	43.54	-16.79	peak
6	2511.700	31.40	-13.81	17.59	43.54	-25.95	RMS
7	2729.260	40.28	-13.01	27.27	43.54	-16.27	peak
8	2729.260	31.22	-13.01	18.21	43.54	-25.33	RMS
9	2929.060	40.24	-12.64	27.60	43.54	-15.94	peak
10	2929.060	30.87	-12.64	18.23	43.54	-25.31	RMS
11	3054.490	40.47	-12.53	27.94	43.54	-15.60	peak
12	3054.490	31.31	-12.53	18.78	43.54	-24.76	RMS

Remark:

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

80.0 dBuV/m





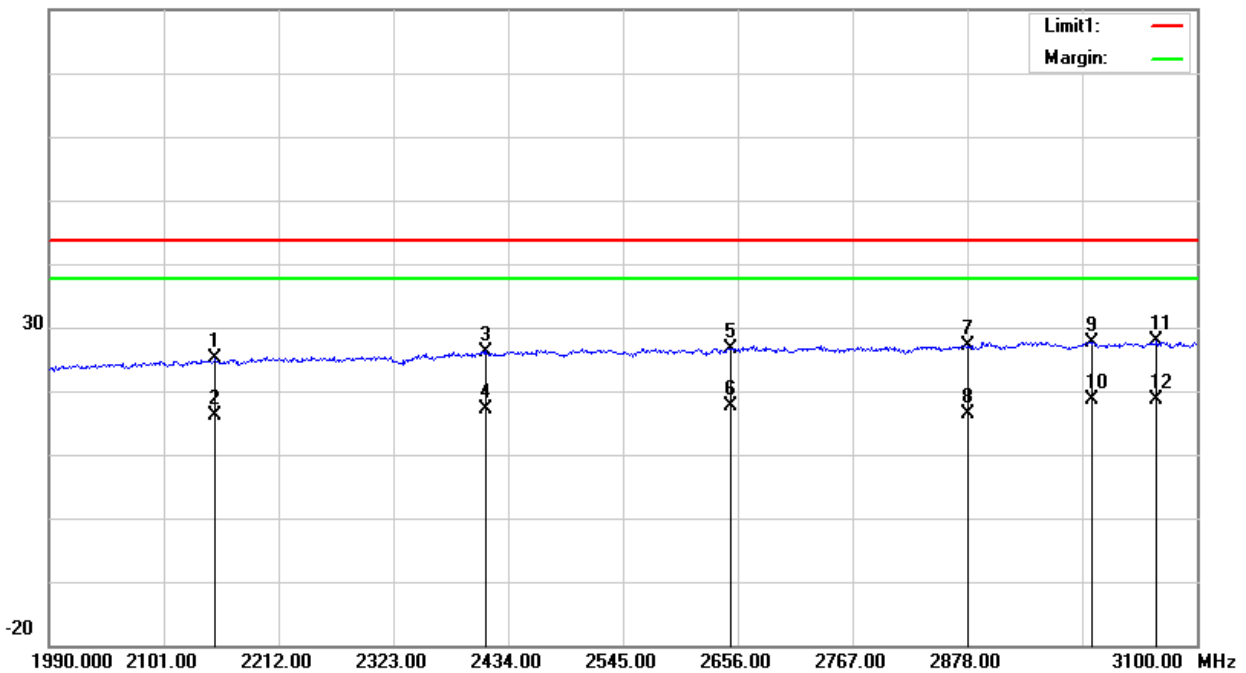
Temperature:	23.3(C)	Relative Humidity:	62%RH
Test Voltage:	DC 3.7V	Phase:	Vertical
Test Mode:	CH 1(1990MHz – 3100MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2150.950	40.78	-15.73	25.05	43.54	-18.49	peak
2	2150.950	31.74	-15.73	16.01	43.54	-27.53	RMS
3	2411.800	40.62	-14.37	26.25	43.54	-17.29	peak
4	2411.800	31.60	-14.37	17.23	43.54	-26.31	RMS
5	2649.340	40.04	-13.32	26.72	43.54	-16.82	peak
6	2649.340	30.91	-13.32	17.59	43.54	-25.95	RMS
7	2878.000	39.81	-12.68	27.13	43.54	-16.41	peak
8	2878.000	28.94	-12.68	16.26	43.54	-27.28	RMS
9	2998.990	40.38	-12.66	27.72	43.54	-15.82	peak
10	2998.990	31.22	-12.66	18.56	43.54	-24.98	RMS
11	3061.150	40.27	-12.50	27.77	43.54	-15.77	peak
12	3061.150	31.17	-12.50	18.67	43.54	-24.87	RMS

Remark:

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

80.0 dBuV/m



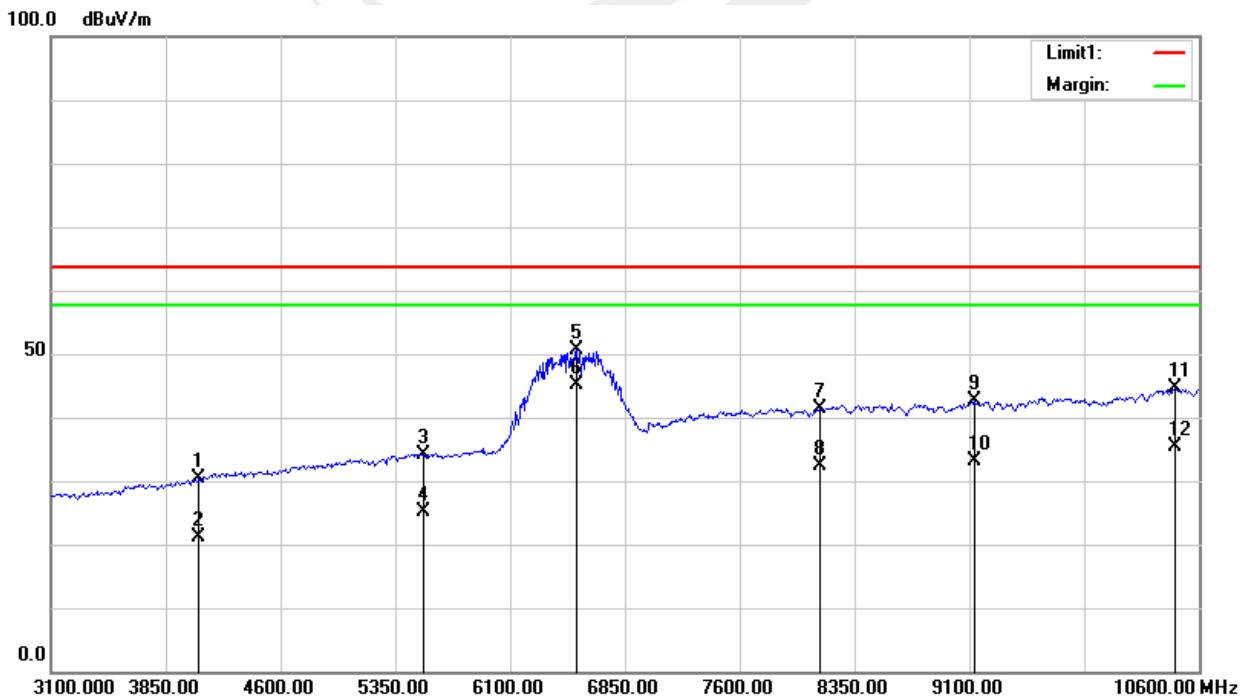


Temperature:	23.3(C)	Relative Humidity:	62%RH
Test Voltage:	DC 3.7V	Phase:	Horizontal
Test Mode:	CH 1 (3100MHz – 10600MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4067.500	39.57	-9.27	30.30	63.54	-33.24	peak
2	4067.500	30.42	-9.27	21.15	63.54	-42.39	RMS
3	5537.500	39.13	-4.90	34.23	63.54	-29.31	peak
4	5537.500	30.05	-4.90	25.15	63.54	-38.39	RMS
5	6535.000	52.52	-1.88	50.64	63.54	-12.90	peak
6	6535.000	47.11	-1.88	45.23	63.54	-18.31	RMS
7	8125.000	39.12	2.31	41.43	63.54	-22.11	peak
8	8125.000	29.95	2.31	32.26	63.54	-31.28	RMS
9	9130.000	39.90	2.64	42.54	63.54	-21.00	peak
10	9130.000	30.55	2.64	33.19	63.54	-30.35	RMS
11	10442.500	39.91	4.79	44.70	63.54	-18.84	peak
12	10442.500	30.50	4.79	35.29	63.54	-28.25	RMS

Remark:

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



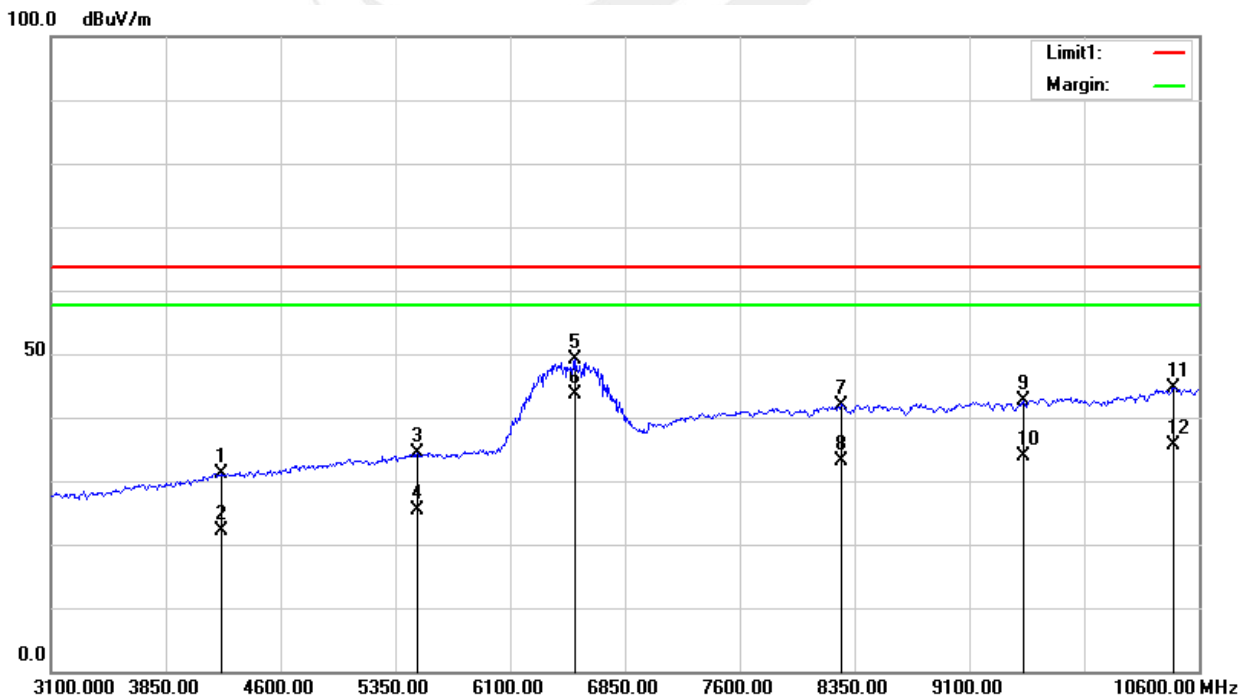


Temperature:	23.3(C)	Relative Humidity:	62%RH
Test Voltage:	DC 3.7V	Phase:	Vertical
Test Mode:	CH 1 (3100MHz – 10600MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4210.000	39.60	-8.45	31.15	63.54	-32.39	peak
2	4210.000	30.50	-8.45	22.05	63.54	-41.49	RMS
3	5492.500	39.42	-5.04	34.38	63.54	-29.16	peak
4	5492.500	30.30	-5.04	25.26	63.54	-38.28	RMS
5	6520.000	51.10	-1.91	49.19	63.54	-14.35	peak
6	6520.000	45.49	-1.91	43.58	63.54	-19.96	RMS
7	8260.000	39.55	2.45	42.00	63.54	-21.54	peak
8	8260.000	30.57	2.45	33.02	63.54	-30.52	RMS
9	9452.500	39.45	3.08	42.53	63.54	-21.01	peak
10	9452.500	30.78	3.08	33.86	63.54	-29.68	RMS
11	10435.000	39.83	4.76	44.59	63.54	-18.95	peak
12	10435.000	30.86	4.76	35.62	63.54	-27.92	RMS

Remark:

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





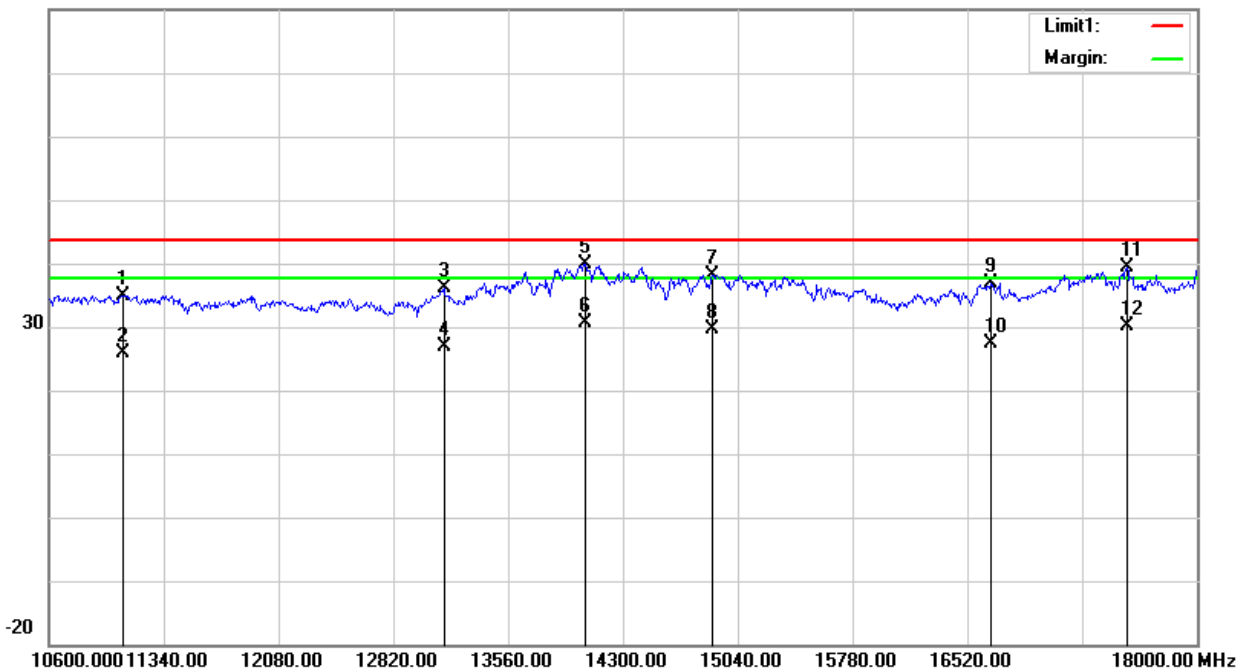
Temperature:	23.3(C)	Relative Humidity:	62%RH
Test Voltage:	DC 3.7V	Phase:	Horizontal
Test Mode:	CH 1 (10600MHz – 18000MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	11073.600	28.67	6.30	34.97	43.54	-8.57	peak
2	11073.600	19.56	6.30	25.86	43.54	-17.68	RMS
3	13145.600	28.56	7.45	36.01	43.54	-7.53	peak
4	13145.600	19.41	7.45	26.86	43.54	-16.68	RMS
5	14055.800	27.71	12.22	39.93	43.54	-3.61	peak
6	14055.800	18.30	12.22	30.52	43.54	-13.02	RMS
7	14877.200	27.80	10.39	38.19	43.54	-5.35	peak
8	14877.200	19.14	10.39	29.53	43.54	-14.01	RMS
9	16675.400	27.45	9.47	36.92	43.54	-6.62	peak
10	16675.400	18.02	9.47	27.49	43.54	-16.05	RMS
11	17548.600	22.05	17.36	39.41	43.54	-4.13	peak
12	17548.600	12.76	17.36	30.12	43.54	-13.42	RMS

Remark:

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

80.0 dBuV/m



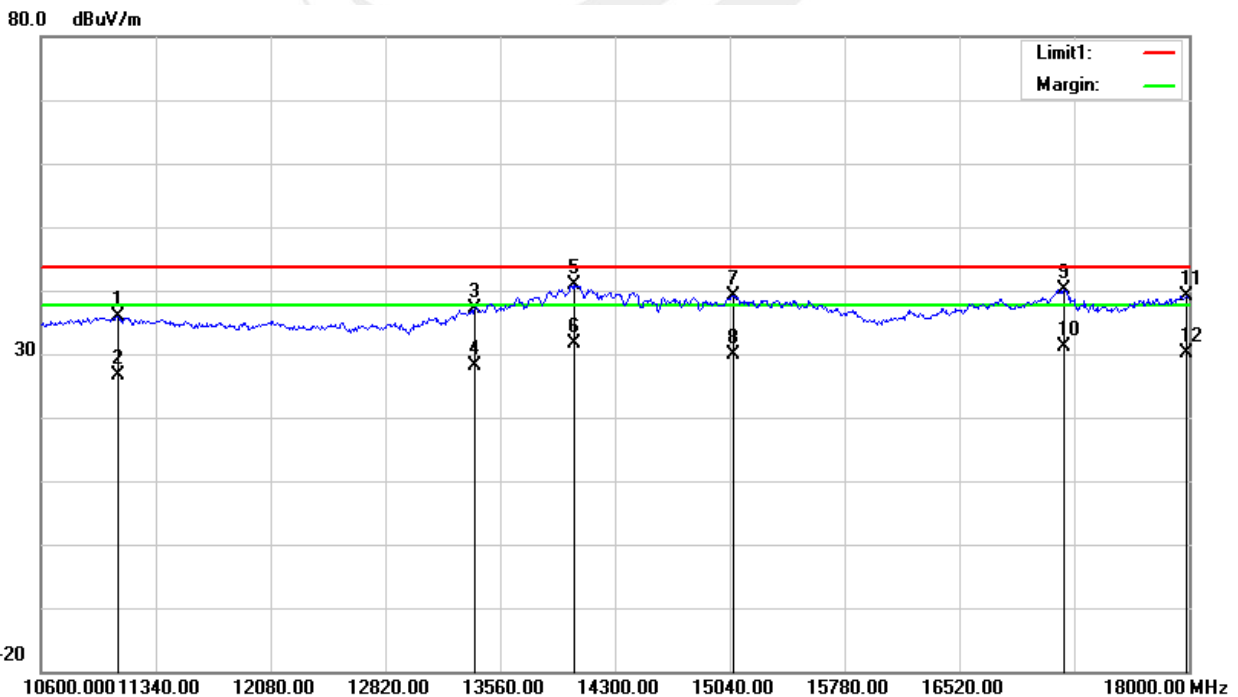


Temperature:	23.3(C)	Relative Humidity:	62%RH
Test Voltage:	DC 3.7V	Phase:	Vertical
Test Mode:	CH 1 (10600MHz – 18000MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	11095.800	29.55	6.31	35.86	43.54	-7.68	peak
2	11095.800	20.25	6.31	26.56	43.54	-16.98	RMS
3	13397.200	28.28	8.97	37.25	43.54	-6.29	peak
4	13397.200	19.05	8.97	28.02	43.54	-15.52	RMS
5	14033.600	28.54	12.26	40.80	43.54	-2.74	peak
6	14033.600	19.29	12.26	31.55	43.54	-11.99	RMS
7	15062.200	29.01	10.02	39.03	43.54	-4.51	peak
8	15062.200	19.96	10.02	29.98	43.54	-13.56	RMS
9	17193.400	30.00	10.14	40.14	43.54	-3.40	peak
10	17193.400	20.88	10.14	31.02	43.54	-12.52	RMS
11	17985.200	27.22	12.02	39.24	43.54	-4.30	peak
12	17985.200	18.01	12.02	30.03	43.54	-13.51	RMS

Remark:

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





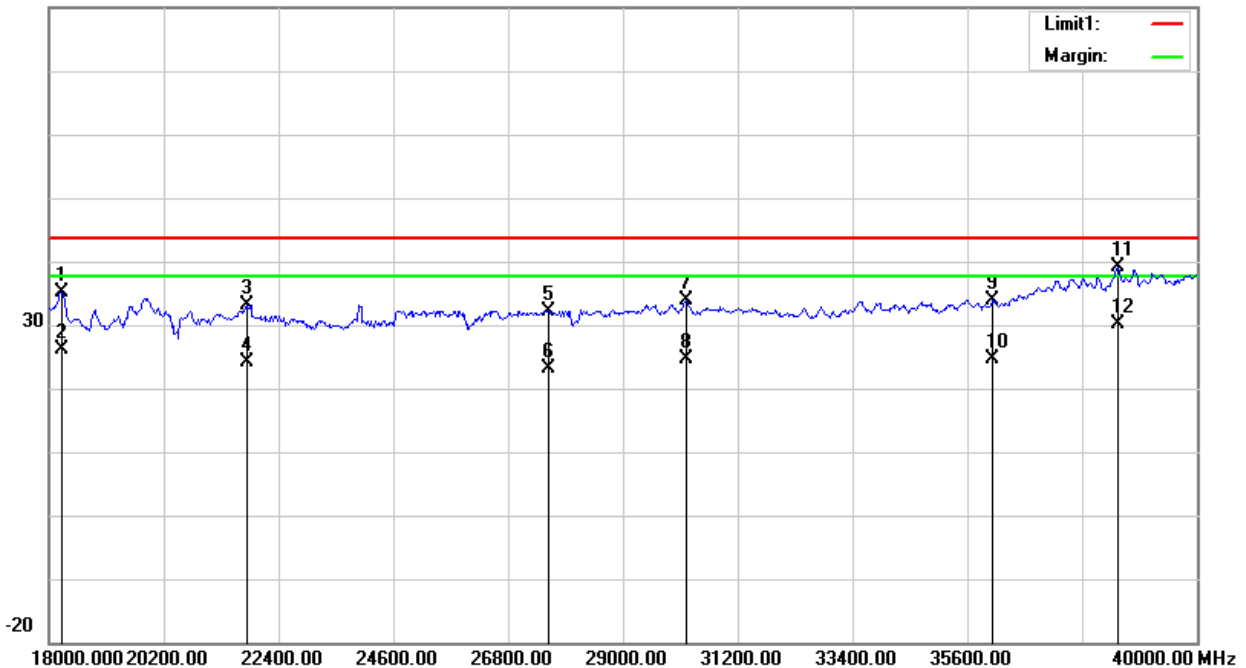
Temperature:	23.3(C)	Relative Humidity:	62%RH
Test Voltage:	DC 3.7V	Phase:	Horizontal
Test Mode:	CH 1 (18000MHz – 40000MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	18242.000	29.09	6.08	35.17	43.54	-8.37	peak
2	18242.000	19.95	6.08	26.03	43.54	-17.51	RMS
3	21784.000	26.63	6.52	33.15	43.54	-10.39	peak
4	21784.000	17.53	6.52	24.05	43.54	-19.49	RMS
5	27570.000	26.11	6.13	32.24	43.54	-11.30	peak
6	27570.000	17.02	6.13	23.15	43.54	-20.39	RMS
7	30210.000	80.63	-46.83	33.80	43.54	-9.74	peak
8	30210.000	71.34	-46.83	24.51	43.54	-19.03	RMS
9	36084.000	81.20	-47.22	33.98	43.54	-9.56	peak
10	36084.000	71.90	-47.22	24.68	43.54	-18.86	RMS
11	38482.000	87.76	-48.54	39.22	43.54	-4.32	peak
12	38482.000	78.63	-48.54	30.09	43.54	-13.45	RMS

Remark:

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

80.0 dBuV/m





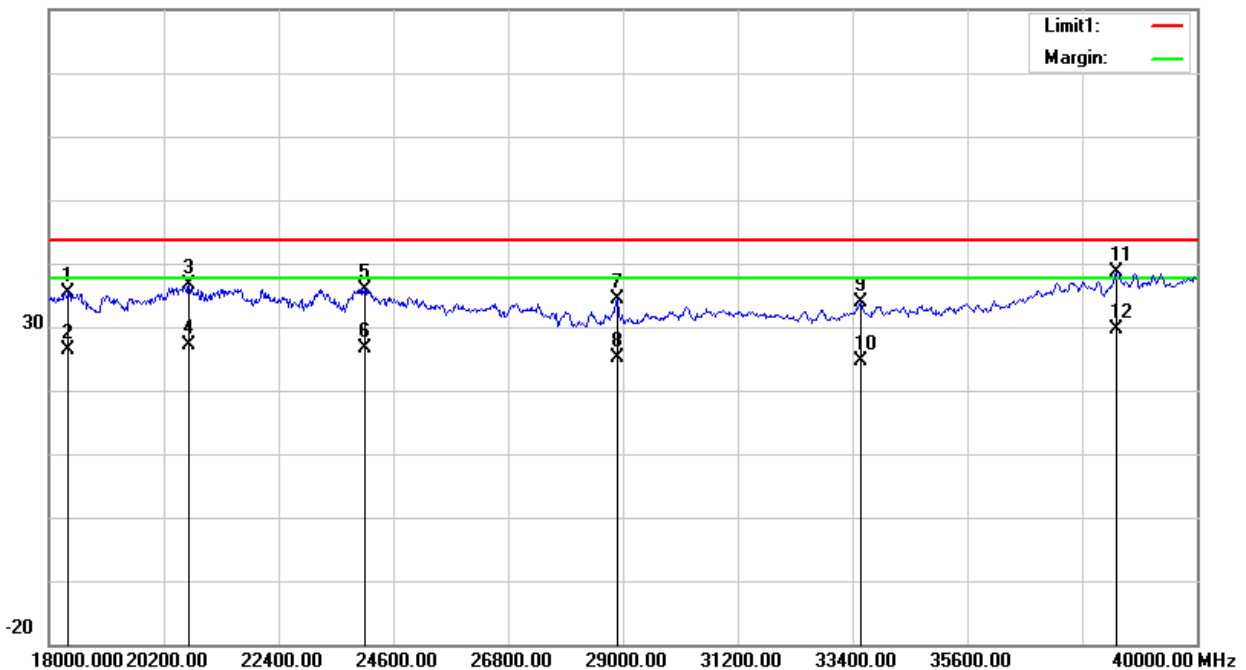
Temperature:	23.3(C)	Relative Humidity:	62%RH
Test Voltage:	DC 3.7V	Phase:	Vertical
Test Mode:	CH 1 (18000MHz – 40000MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	18374.000	29.42	6.06	35.48	43.54	-8.06	peak
2	18374.000	20.29	6.06	26.35	43.54	-17.19	RMS
3	20684.000	30.41	6.14	36.55	43.54	-6.99	peak
4	20684.000	21.11	6.14	27.25	43.54	-16.29	RMS
5	24050.000	28.89	7.09	35.98	43.54	-7.56	peak
6	24050.000	19.60	7.09	26.69	43.54	-16.85	RMS
7	28890.000	80.90	-46.63	34.27	43.54	-9.27	peak
8	28890.000	71.78	-46.63	25.15	43.54	-18.39	RMS
9	33554.000	81.09	-47.26	33.83	43.54	-9.71	peak
10	33554.000	71.82	-47.26	24.56	43.54	-18.98	RMS
11	38460.000	87.22	-48.50	38.72	43.54	-4.82	peak
12	38460.000	78.11	-48.50	29.61	43.54	-13.93	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 15.519(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 $E(\text{dBuV/m}) = P(\text{dBmEIRP}) + 95.3$.

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

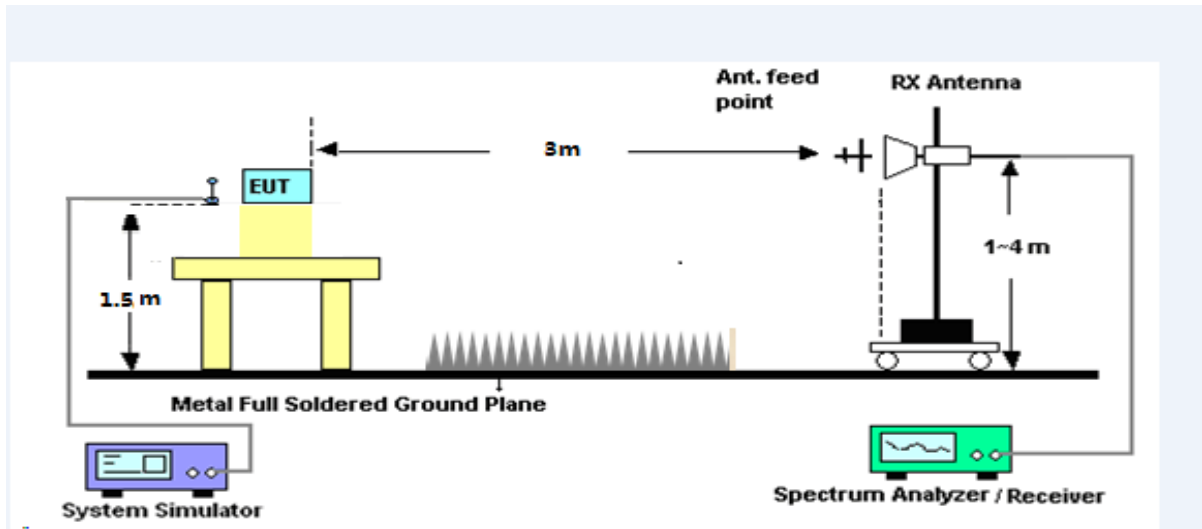
3.3.2 TEST PROCEDURE

- The measuring distance of 1m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- 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 axes. The worst case emissions were reported.

3.3.3 DEVIATION FROM TEST STANDARD

No deviation

3.3.4 TEST SETUP

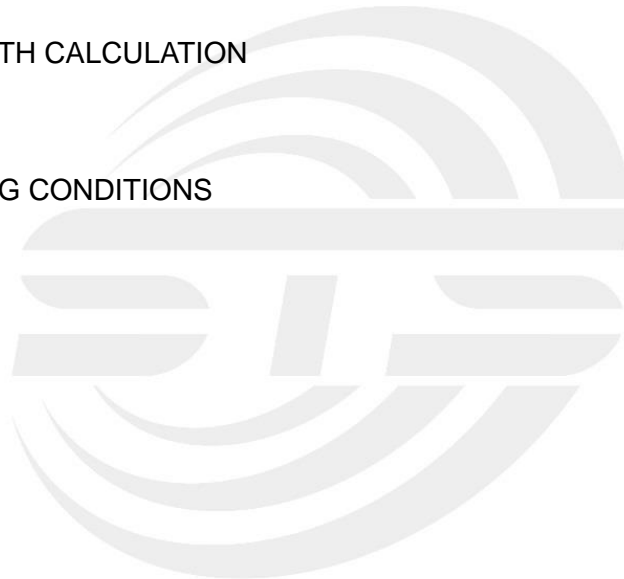


3.3.5 FIELD STRENGTH CALCULATION

Same as 3.2.5

3.3.6 EUT OPERATING CONDITIONS

Same as 3.2.6





3.3.7 TEST RESULTS

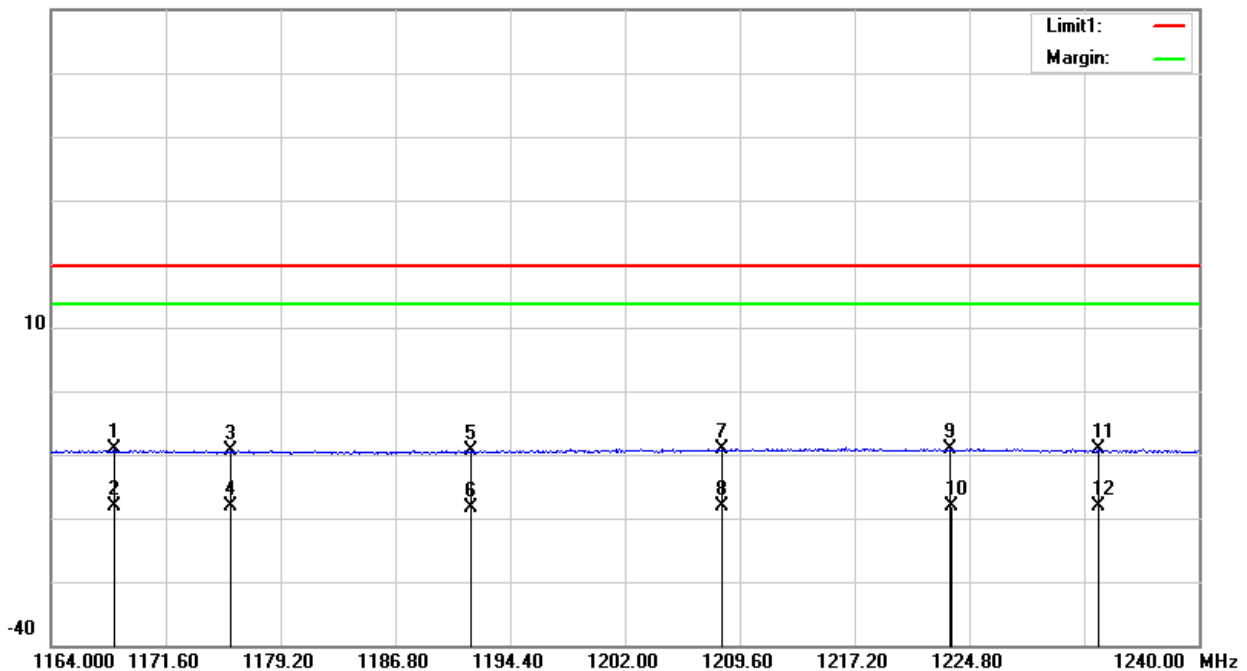
Temperature:	23.3(C)	Relative Humidity:	62%RH
Test Voltage:	DC 3.7V	Phase:	Horizontal
Test Mode:	CH 1(1164Hz – 1240MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1168.180	9.95	-19.08	-9.13	19.54	-28.67	peak
2	1168.180	1.07	-19.08	-18.01	19.54	-37.55	RMS
3	1175.932	9.66	-19.05	-9.39	19.54	-28.93	peak
4	1175.932	0.89	-19.05	-18.16	19.54	-37.70	RMS
5	1191.816	9.59	-19.01	-9.42	19.54	-28.96	peak
6	1191.816	0.63	-19.01	-18.38	19.54	-37.92	RMS
7	1208.384	9.82	-18.96	-9.14	19.54	-28.68	peak
8	1208.384	0.93	-18.96	-18.03	19.54	-37.57	RMS
9	1223.540	9.74	-18.90	-9.16	19.54	-28.70	peak
10	1223.584	0.85	-18.90	-18.05	19.54	-37.59	RMS
11	1233.312	9.65	-18.86	-9.21	19.54	-28.75	peak
12	1233.312	0.77	-18.86	-18.09	19.54	-37.63	RMS

Remark:

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

60.0 dBuV/m





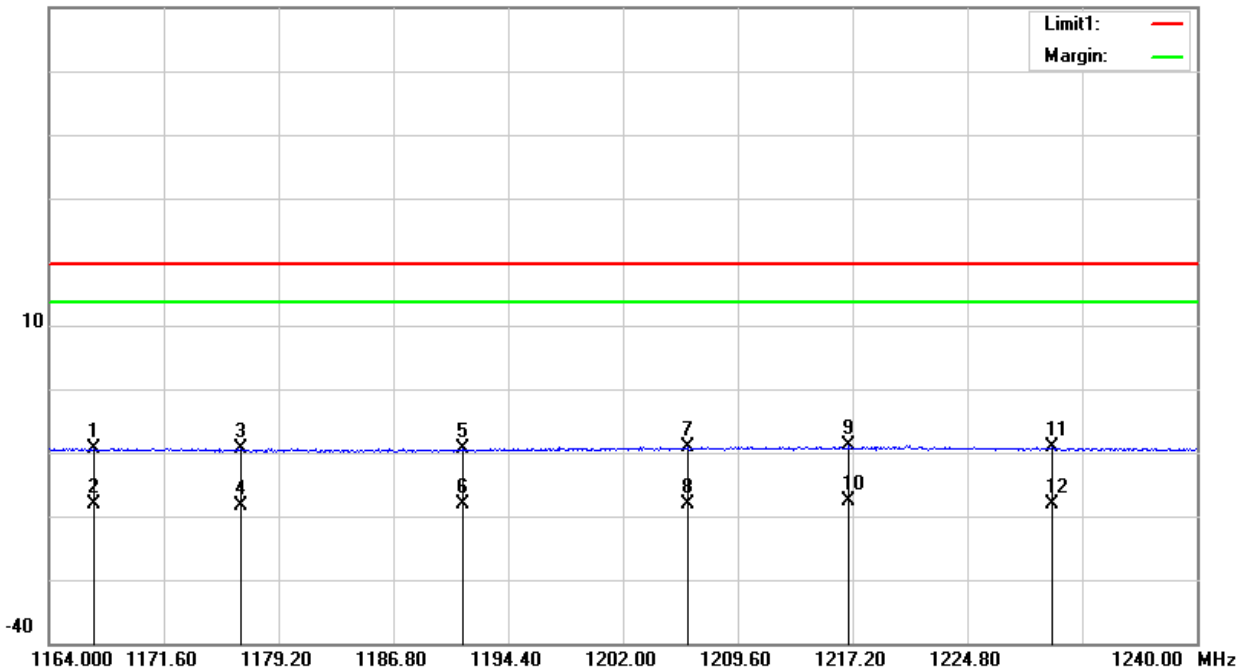
Temperature:	23.3(C)	Relative Humidity:	62%RH
Test Voltage:	DC 3.7V	Phase:	Vertical
Test Mode:	CH 1(1164Hz – 1240MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1166.964	9.83	-19.08	-9.25	19.54	-28.79	peak
2	1166.964	0.99	-19.08	-18.09	19.54	-37.63	RMS
3	1176.692	9.63	-19.05	-9.42	19.54	-28.96	peak
4	1176.692	0.76	-19.05	-18.29	19.54	-37.83	RMS
5	1191.360	9.72	-19.02	-9.30	19.54	-28.84	peak
6	1191.360	0.84	-19.02	-18.18	19.54	-37.72	RMS
7	1206.332	9.87	-18.97	-9.10	19.54	-28.64	peak
8	1206.332	0.94	-18.97	-18.03	19.54	-37.57	RMS
9	1216.972	10.00	-18.92	-8.92	19.54	-28.46	peak
10	1216.972	1.36	-18.92	-17.56	19.54	-37.10	RMS
11	1230.424	9.67	-18.88	-9.21	19.54	-28.75	peak
12	1230.424	0.82	-18.88	-18.06	19.54	-37.60	RMS

Remark:

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

60.0 dBuV/m





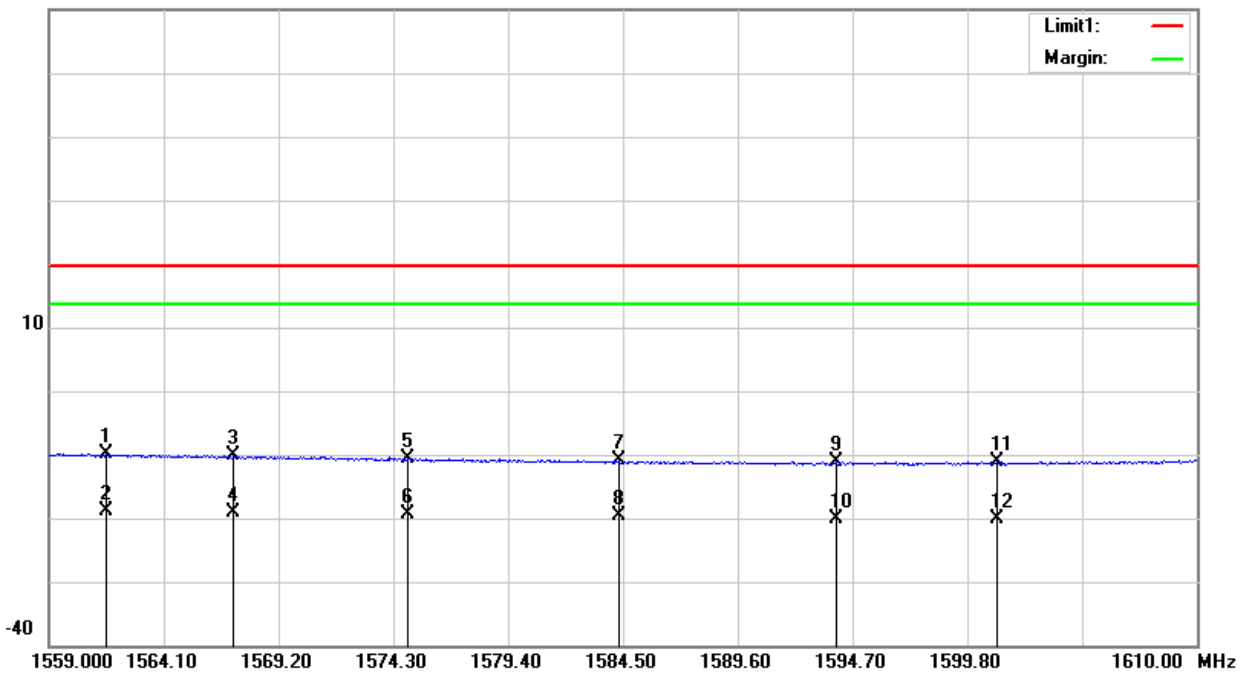
Temperature:	23.3(C)	Relative Humidity:	62%RH
Test Voltage:	DC 3.7V	Phase:	Horizontal
Test Mode:	CH 1(1559Hz – 1610MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1561.550	8.28	-18.23	-9.95	19.54	-29.49	peak
2	1561.550	-0.56	-18.23	-18.79	19.54	-38.33	RMS
3	1567.211	8.01	-18.23	-10.22	19.54	-29.76	peak
4	1567.211	-0.93	-18.23	-19.16	19.54	-38.70	RMS
5	1574.912	7.67	-18.22	-10.55	19.54	-30.09	peak
6	1574.912	-1.12	-18.22	-19.34	19.54	-38.88	RMS
7	1584.296	7.39	-18.21	-10.82	19.54	-30.36	peak
8	1584.296	-1.47	-18.21	-19.68	19.54	-39.22	RMS
9	1593.986	7.09	-18.21	-11.12	19.54	-30.66	peak
10	1593.986	-1.80	-18.21	-20.01	19.54	-39.55	RMS
11	1601.126	7.05	-18.21	-11.16	19.54	-30.70	peak
12	1601.126	-1.84	-18.21	-20.05	19.54	-39.59	RMS

Remark:

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

60.0 dBuV/m





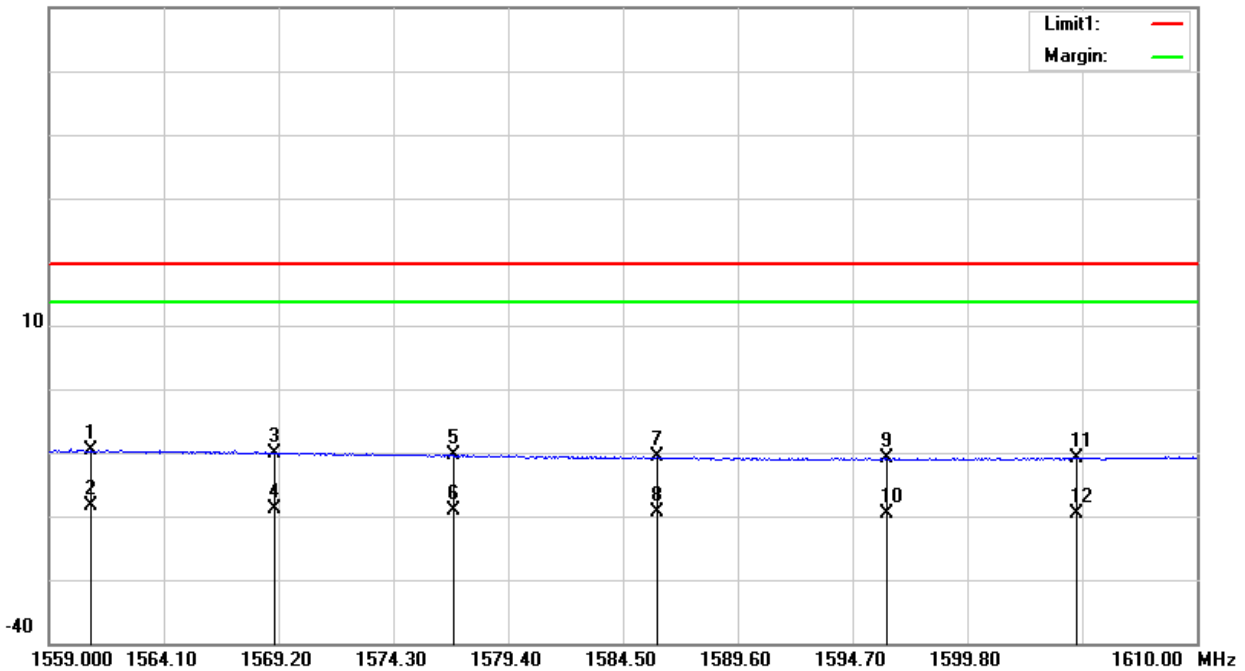
Temperature:	23.3(C)	Relative Humidity:	62%RH
Test Voltage:	DC 3.7V	Phase:	Vertical
Test Mode:	CH 1(1559Hz – 1610MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1560.836	8.53	-18.23	-9.70	19.54	-29.24	peak
2	1560.836	-0.03	-18.23	-18.26	19.54	-37.80	RMS
3	1568.996	8.20	-18.23	-10.03	19.54	-29.57	peak
4	1568.996	-0.66	-18.23	-18.89	19.54	-38.43	RMS
5	1577.003	7.84	-18.22	-10.38	19.54	-29.92	peak
6	1577.003	-0.81	-18.22	-19.03	19.54	-38.57	RMS
7	1586.030	7.51	-18.22	-10.71	19.54	-30.25	peak
8	1586.030	-1.04	-18.22	-19.26	19.54	-38.80	RMS
9	1596.230	7.42	-18.22	-10.80	19.54	-30.34	peak
10	1596.230	-1.37	-18.22	-19.59	19.54	-39.13	RMS
11	1604.645	7.45	-18.20	-10.75	19.54	-30.29	peak
12	1604.645	-1.35	-18.20	-19.55	19.54	-39.09	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

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.

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.

4.4 TEST SETUP

Same as 3.3.4

4.5 EUT OPERATION CONDITIONS

Same as 3.2.6

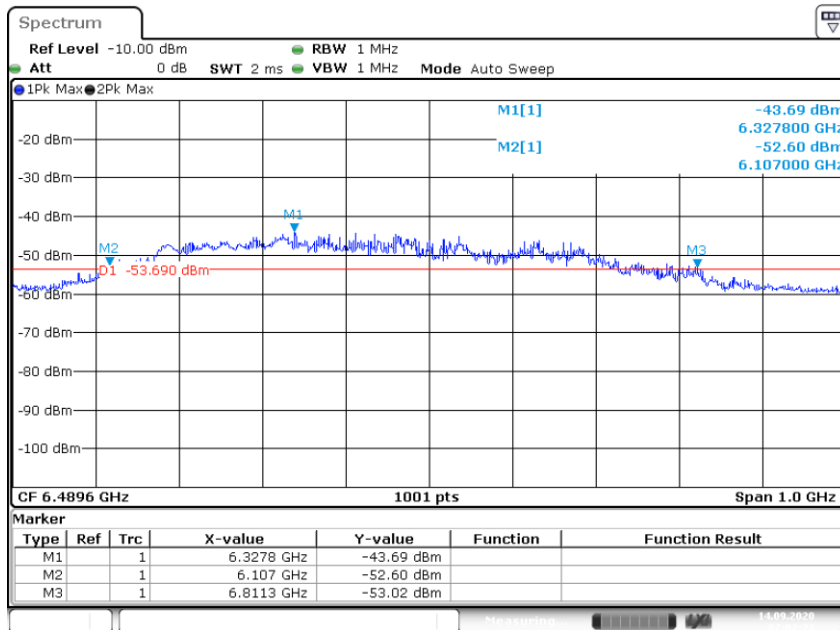


4.6 TEST RESULTS

Temperature:	25 °C	Relative Humidity:	50%
Test Voltage:	DC 3.7V		

Test Channel	f _M (MHz)	f _L (MHz)	f _H (MHz)	-10dB Bandwidth (MHz)	f _c (MHz)	Fractional Bandwidth (MHz)	Limit	Result
CH1	6327.8	6107	6811.3	704.3	6459.2	0.11	-10dB Bandwidth ≥ 500MHz or Fractional Bandwidth ≥ 0.2	Pass

CH 1



Date: 14.SEP.2020 07:02:21



5 PEAK EMISSION WITHIN A 50MHZ BANDWIDTH (FOR 15.519(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

$$E(\text{dBuV/m}) = P(\text{dBm EIRP}) + 95.3 = -34 + 95.3 = 61.3 \text{ dBuV/m}$$

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

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



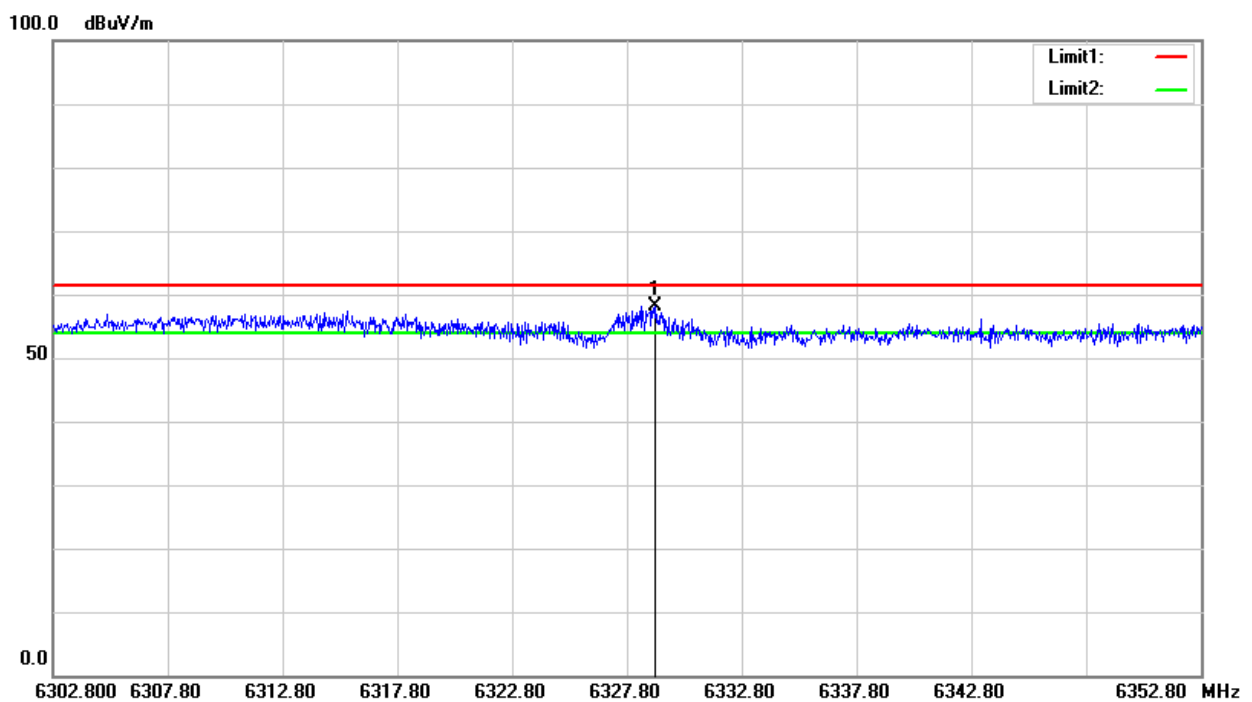
5.8 TEST RESULTS

Temperature:	23.3(C)	Relative Humidity:	62%RH
Test Voltage:	DC 3.7V	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	6329.050	60.46	-2.37	58.09	61.30	-3.21	peak

Remark:

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





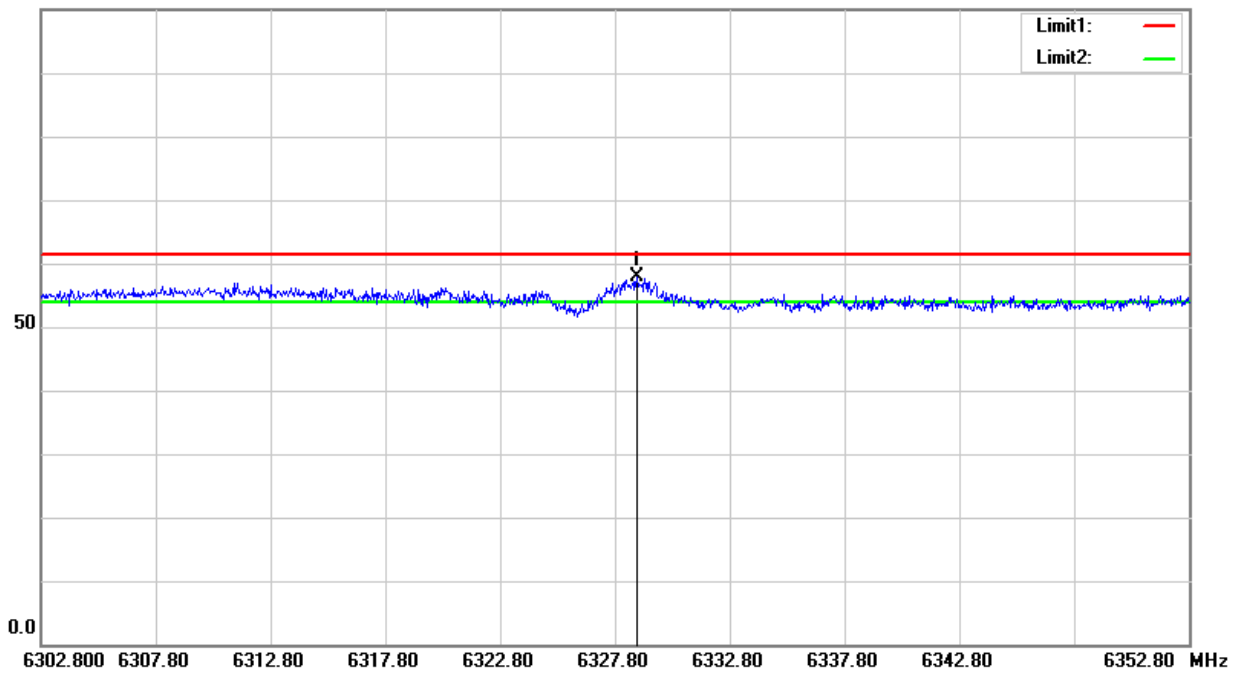
Temperature:	23.5(C)	Relative Humidity:	62%RH
Test Voltage:	DC 3.7V	Phase:	Vertical
Test Mode:	CH 1	Test distance:	3m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	6328.750	60.14	-2.37	57.77	61.30	-3.53	peak

Remark:

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

100.0 dBuV/m



6 CESSATION TIME

6.1 CESSATION TIME

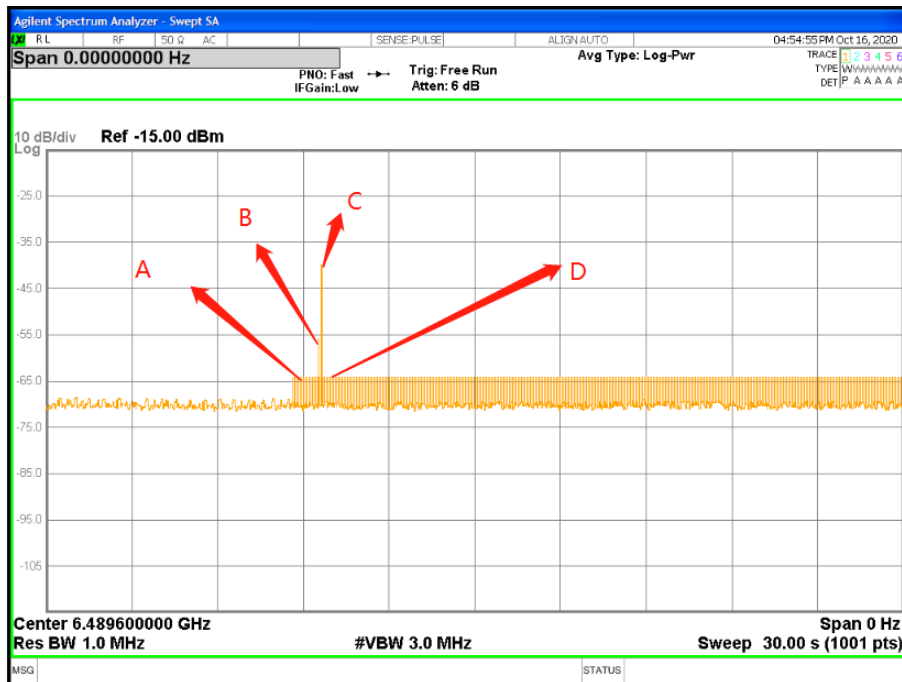
FCC Part 15.519(a)(1): A UWB device operating under the provisions of this section shall transmit only when it is sending information to an associated receiver. The UWB intentional radiator shall cease transmission within 10 seconds unless it receives an acknowledgement from the associated receiver that its transmission is being received. An acknowledgment of reception must continue to be received by the UWB intentional radiator at least every 10 seconds or the UWB device must cease transmitting.

6.2 TEST PROCEDURE

EUT and receiving pairing device keep UWB normal connection.

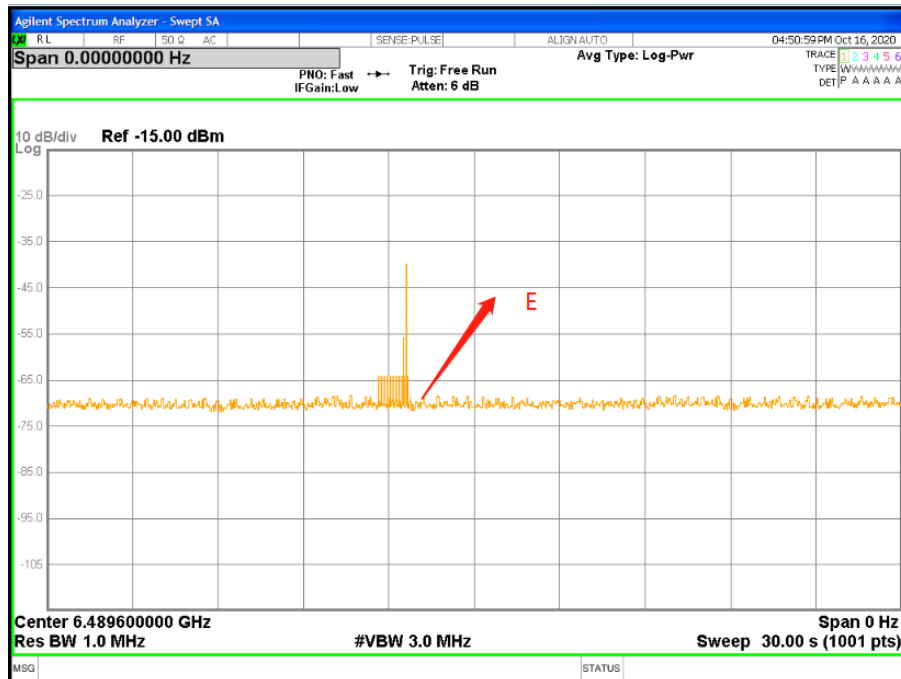
6.3 TEST RESULTS

Transmitter closed





Receiver closed



Remark A: Receiver signal.

Remark B: Signal paired with transmitter.

Remark C: Working signal after successful pairing.

Remark D: Turn off the transmitter, the working signal and the signal paired with the transmitter are stopped, and the receiver signal still exists.

Remark E: After removing the receiver, both the transmitting signal and the working signal are stopped.

Note: It can be seen from the test result graph of the transmitter and receiver turned off that the scan time is 30s, and the transmitter immediately stops working signals after the transmitter is turned off and the receiver is turned off, so the EUT meets the requirements of cessation time.



7. ANTENNA REQUIREMENT

7.1 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.

7.2 EUT ANTENNA

The EUT antenna is Chip 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*****

