RADIO TEST REPORT

Report No: STS2008184W02

Issued for

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

Sevket Ozcelik sok. No29 Alsancak izmir Turkey

Product Name:	Litum Anchor Endurance Litum Anchor Litum Gateway Endurance Litum Gateway Litum Collision Warning Forklift
Brand Name:	Litum
Model Name:	Anchor/Gateway Series
Series Model:	100,110,200,210,420
FCC ID:	2AW7W-100
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 .....:	Litum Anchor Endurance Litum Anchor Litum Gateway Endurance Litum Gateway Litum Collision Warning Forklift
Brand Name .....:	Litum
Model Name.....:	Anchor/Gateway Series
Series Model .....:	100,110,200,210,420
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.....:	06 Aug. 2020
Date of performance of tests ..:	06 Aug. 2020 ~ 10 Oct. 2020
Date of Issue.....:	10 Oct. 2020
Test Result .....:	**Pass**

Testing Engineer : (Chris Chen)

Technical Manager : (Sean she)

Authorized Signatory : (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 10
2.3 TEST SOFTWARE AND POWER LEVEL 10
2.4 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED 11
2.5 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS 12
2.6 EQUIPMENTS LIST FOR ALL TEST ITEMS 13
3. EMISSION TEST 14
3.1 CONDUCTED EMISSION MEASUREMENT 14
3.2 RADIATED EMISSION MEASUREMENT (FOR 15.517(C) 18
3.3 RADIATED EMISSION MEASUREMENT (FOR 15.517(D)) 39
4. UWB BANDWIDTH 45
4.1 LIMITS OF UWB BANDWIDTH MEASUREMENT 45
4.2 INSTRUMENT SETUP VALUE AND MEASUREMENT DISTANCE 45
4.3 TEST PROCEDURE 45
4.4 TEST SETUP 45
4.5 EUT OPERATION CONDITIONS 45
4.6 TEST RESULTS 46
5 PEAK EMISSION WITHIN A 50MHZ BANDWIDTH (FOR 15.517(E) 47
5.1 LIMITS OF PEAK EMISSION 47
5.2 INSTRUMENT SETUP VALUE AND MEASUREMENT DISTANCE 47
5.3 TEST PROCEDURE 47
5.4 DEVIATION FROM TEST STANDARD 47
5.5 TEST SETUP 47
5.6 FIELD STRENGTH CALCULATION 47
5.7 EUT OPERATING CONDITIONS 47
5.8 TEST RESULTS 48
6 TRANSMITTING CHARACTERISTICS 50
6.1 REQUIREMENT 50
6.2 TEST RESULTS 50
7. ANTENNA REQUIREMENT 51
7.1 STANDARD REQUIREMENT 51

Table of Contents **Page**

7.2 EUT ANTENNA 51

APPENDIX- PHOTOS OF TEST SETUP **52**

Revision History

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	10 Oct. 2020	STS2008184W02	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	
15.517(a)(5)	Transmitting characteristics	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** ± **U**, where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2**, providing a level of confidence of approximately **95** %.

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

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

Product Name	Litum Anchor Endurance Litum Anchor Litum Gateway Endurance Litum Gateway Litum Collision Warning Forklift
Trade Name	Litum
Model Name	Anchor/Gateway Series
Series Model	100,110,200,210,420
Model Difference	Only different in shapes, battery and SW.
Product Description	Operation Frequency: 6.4896GHz Modulation Type: BPSK Antenna Designation: Please refer to the Note 3. Antenna Gain(Peak): 3.3dBi 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.
Power Rating	Input: AC 100~240V, 50/60Hz or +12/+24V DC
Battery	Rated Voltage: 3.7V, Charge Limit: 4.35V Capacity: 3000mAh
Hardware version number	LT0201_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.
2.

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	Anchor/Gateway Series	Planar Monopole	N/A	3.3	Antenna

4.

Model Name	Product Name	Battery	shape	SW
Anchor/Gateway Series				
100	Litum Anchor Endurance	have battery.	Same shapes, same material	The software is different and will not affect the Basic/RF functions
200	Litum Gateway Endurance	have battery.		
210	Litum Gateway	have battery.		
420	Litum Collision Warning Forklift	no battery.		
110	Litum Anchor	no battery.	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) We have be tested for all avaiable U.S. voltage and frequencies(For 120V,50/60Hz and 240V, 50/60Hz) for which the device is capable of operation, and the worst case of 120V,50/60Hz is shown in the report.

For AC Conducted Emission

Test Case	
AC Conducted Emission	Mode 2: Keeping TX

2.3 TEST SOFTWARE AND POWER LEVEL

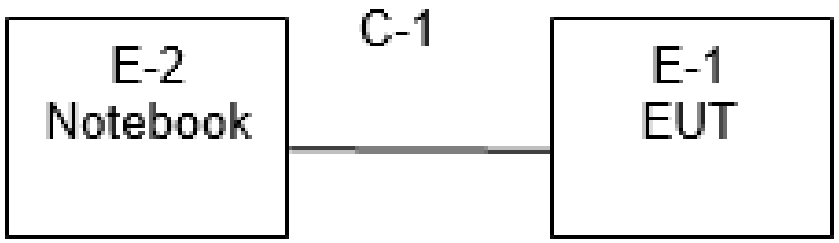
During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level.

RF Function	Type	Mode Or Modulation type	Ant Gain(dBi)	Power Class	Software For Testing
Other SRD	UWB	6489.6MHz	3.3	Default	Tera Term

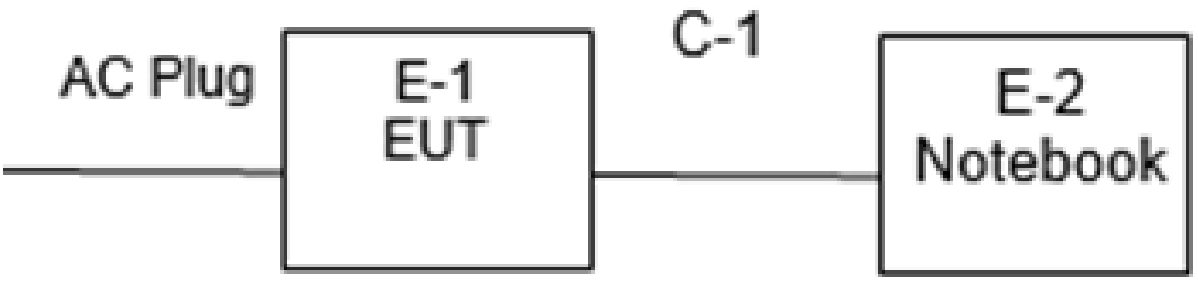
2.4 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

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
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 2020.09.30	2020.10.08 2021.09.29
Signal Analyzer	Agilent	N9020A	MY51110105	2020.03.04	2021.03.04
Active loop Antenna	ZHINAN	ZN30900C	16035	2018.03.11	2021.03.10
Bilog Antenna	TESEQ	CBL6111D	34678	2017.11.02	2020.11.01
Horn Antenna	SCHWARZBECK	BBHA 9120D(1201)	9120D-1343	2018.10.19	2021.10.18
SHF-EHF Horn Antenna (18G-40GHz)	A-INFO	LB-180400-KF	J211020657	2018.03.11	2021.03.10
Pre-Amplifier (0.1M-3GHz)	EM	EM330	060665	2019.10.09 2020.09.30	2020.10.08 2021.09.29
Pre-Amplifier (1G-18GHz)	SKET	LNPA-01018G-45	SK2018080901	2019.10.09 2020.09.30	2020.10.08 2021.09.29
Pre-mplifier(18G-40G)	SKET	LNPA_1840-50	SK2018101801	2019.10.22	2020.10.21
Spectrum Analyzer	R&S	FSV40-N	101823	2019.10.11 2020.09.30	2020.10.10 2021.09.29
Temperature & Humidity	HH660	Mieo	N/A	2019.10.09 2020.09.30	2020.10.08 2021.09.29
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 2020.09.30	2020.10.08 2021.09.29
LISN	R&S	ENV216	101242	2019.10.09 2020.09.30	2020.10.08 2021.09.29
LISN	EMCO	3810/2NM	23625	2019.10.09 2020.09.30	2020.10.08 2021.09.29
Temperature & Humidity	HH660	Mieo	N/A	2019.10.12 2020.09.30	2020.10.11 2021.09.29
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	MY49100060	2019.10.09 2020.09.30	2020.10.08 2021.09.29
Temperature & Humidity	HH660	Mieo	N/A	2019.10.12 2020.09.30	2020.10.11 2021.09.29
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.

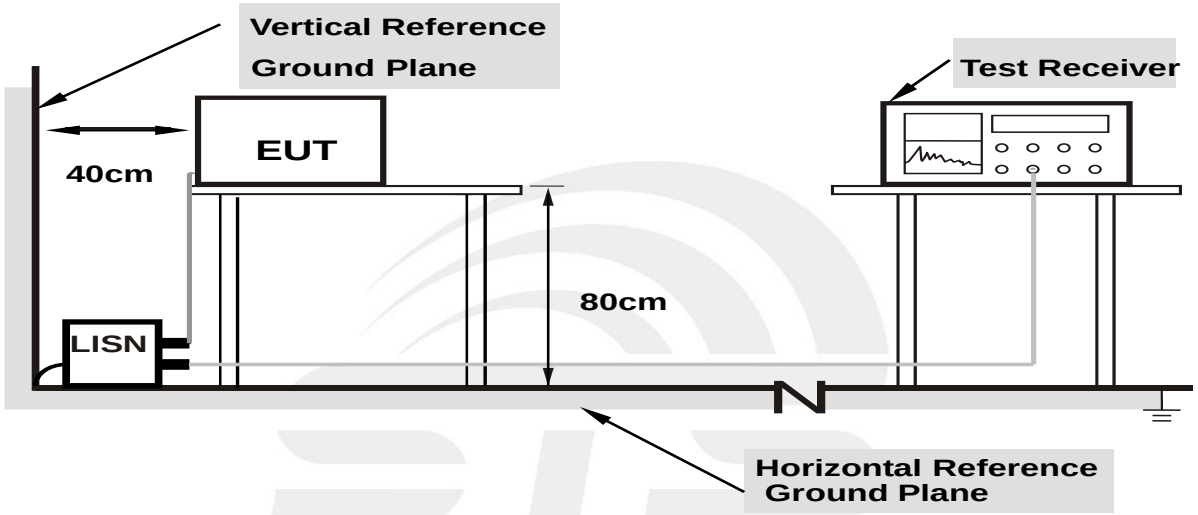
The following table is the setting of the receiver

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 is 0.8 m from the horizontal ground plane and 0.4 m from the vertical ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments are powered from additional LISN(s). The LISN provides 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 is at least 80 cm from the 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

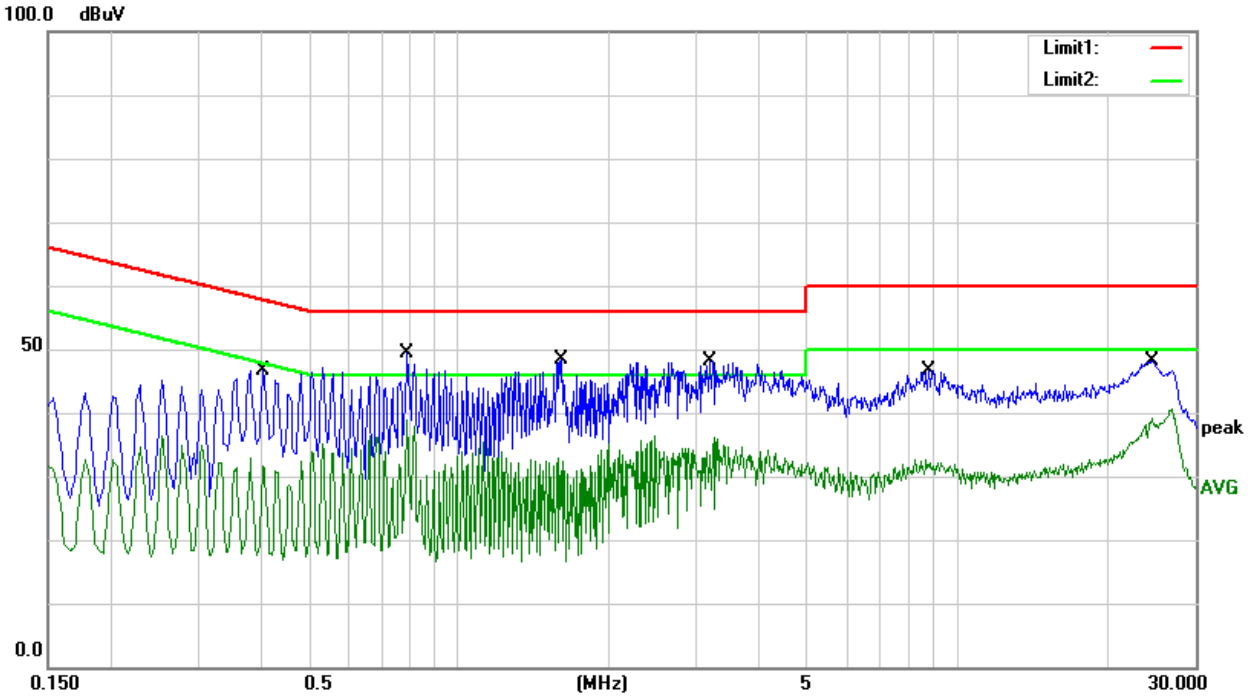
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

3.1.5 TEST RESULT

Temperature:	27.2(C)	Relative Humidity:	69%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	0.4060	26.12	20.49	46.61	57.73	-11.12	QP
2	0.4060	11.01	20.49	31.50	47.73	-16.23	AVG
3	0.7900	29.27	20.23	49.50	56.00	-6.50	QP
4	0.7900	18.74	20.23	38.97	46.00	-7.03	AVG
5	1.6020	28.33	20.10	48.43	56.00	-7.57	QP
6	1.6020	12.26	20.10	32.36	46.00	-13.64	AVG
7	3.1780	28.18	19.97	48.15	56.00	-7.85	QP
8	3.1780	16.15	19.97	36.12	46.00	-9.88	AVG
9	8.7460	26.61	20.04	46.65	60.00	-13.35	QP
10	8.7460	12.61	20.04	32.65	50.00	-17.35	AVG
11	24.5620	27.52	20.57	48.09	60.00	-11.91	QP
12	24.5620	18.54	20.57	39.11	50.00	-10.89	AVG

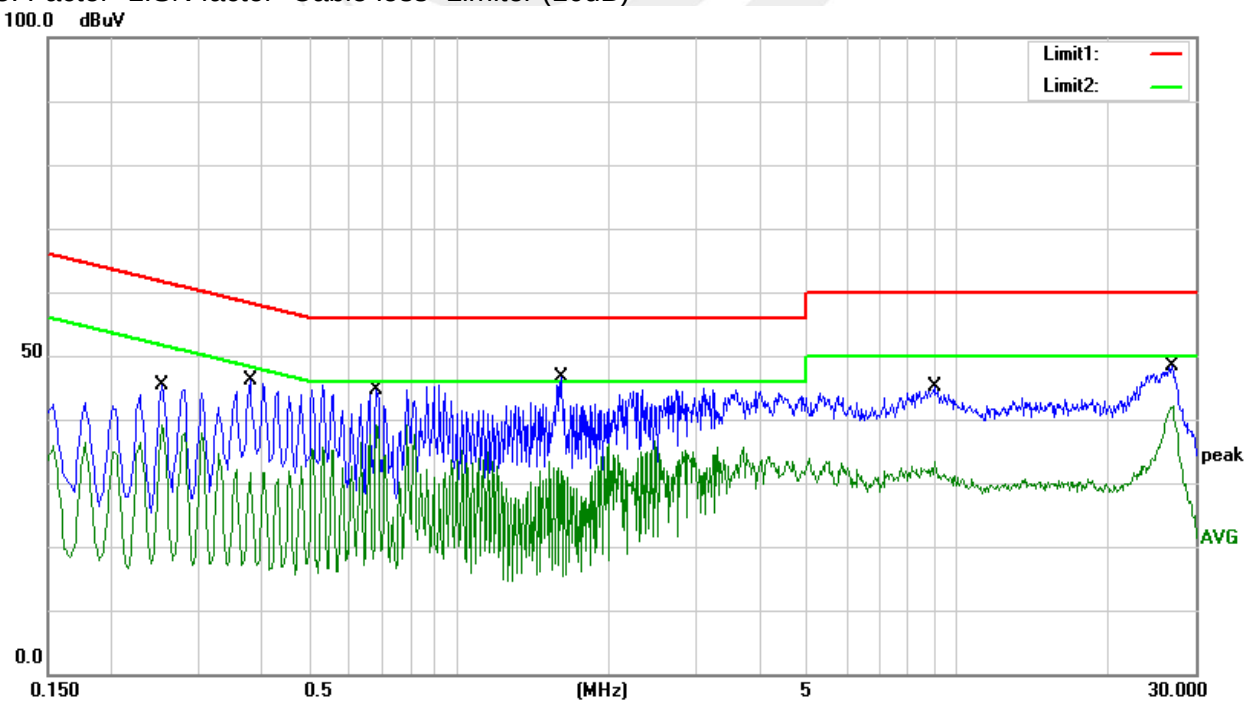
Remark:
1. All readings are Quasi-Peak and Average values
2. Margin = Result (Result =Reading + Factor)–Limit
3. Factor=LISN factor+Cable loss+Limiter (10dB)



Temperature:	27.2(C)	Relative Humidity:	69%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	0.2540	25.01	20.49	45.50	61.63	-16.13	QP
2	0.2540	18.54	20.49	39.03	51.63	-12.60	AVG
3	0.3820	25.47	20.54	46.01	58.24	-12.23	QP
4	0.3820	11.03	20.54	31.57	48.24	-16.67	AVG
5	0.6860	24.48	20.27	44.75	56.00	-11.25	QP
6	0.6860	18.90	20.27	39.17	46.00	-6.83	AVG
7	1.6020	26.56	20.10	46.66	56.00	-9.34	QP
8	1.6020	11.90	20.10	32.00	46.00	-14.00	AVG
9	8.9780	25.06	20.06	45.12	60.00	-14.88	QP
10	8.9780	12.61	20.06	32.67	50.00	-17.33	AVG
11	26.8780	27.66	20.63	48.29	60.00	-11.71	QP
12	26.8780	21.44	20.63	42.07	50.00	-7.93	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 (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3

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	20	29.54
1610~1990	-53.3	42	51.54
1990~3100	-51.3	44	53.54
3100~10600	-41.3	54	63.54
Above 10600	-51.3	44	53.54

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(dBuV/m)@3m = P(dBm EIRP) + 95.3;
E(dBuV/m)@1m= E(dBuV/m)@3m+20*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 arotating 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)

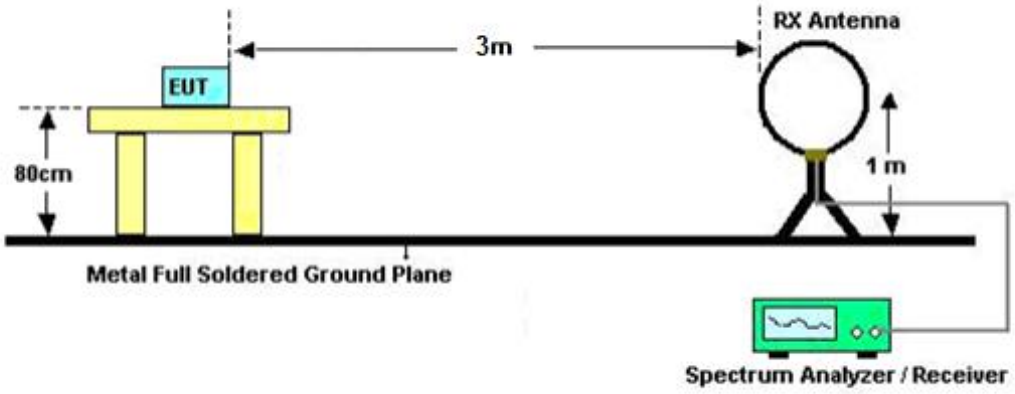
f. For the actual test configuration, please refer to the related Item –EUT Test Photos. Note: Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

3.2.3 DEVIATION FROM TEST STANDARD

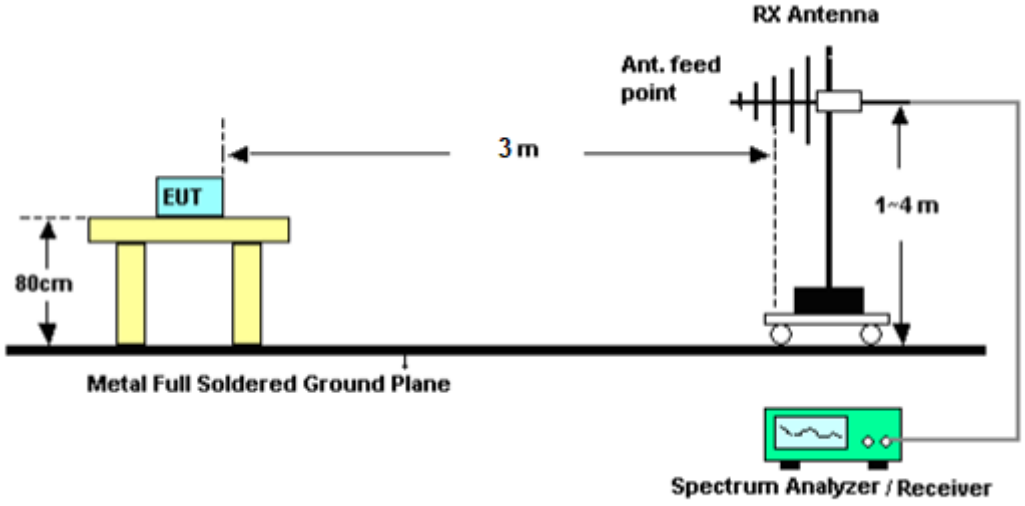
No deviation

3.2.4 TEST SETUP

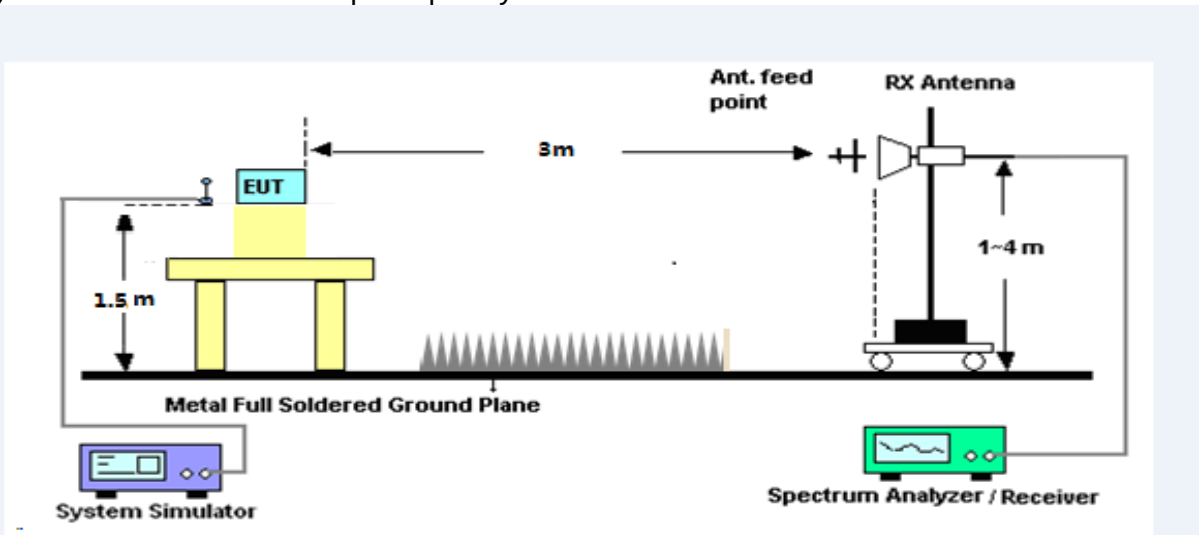
(A) Radiated Emission Test-Up Frequency Below 30MHz



(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)	(dBμV/m)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV/m)	(dBμV/m)	(dBμV/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

Note: We pretested the battery powered and AC powered mode, find the worst case in AC powered mode and shown in this report.

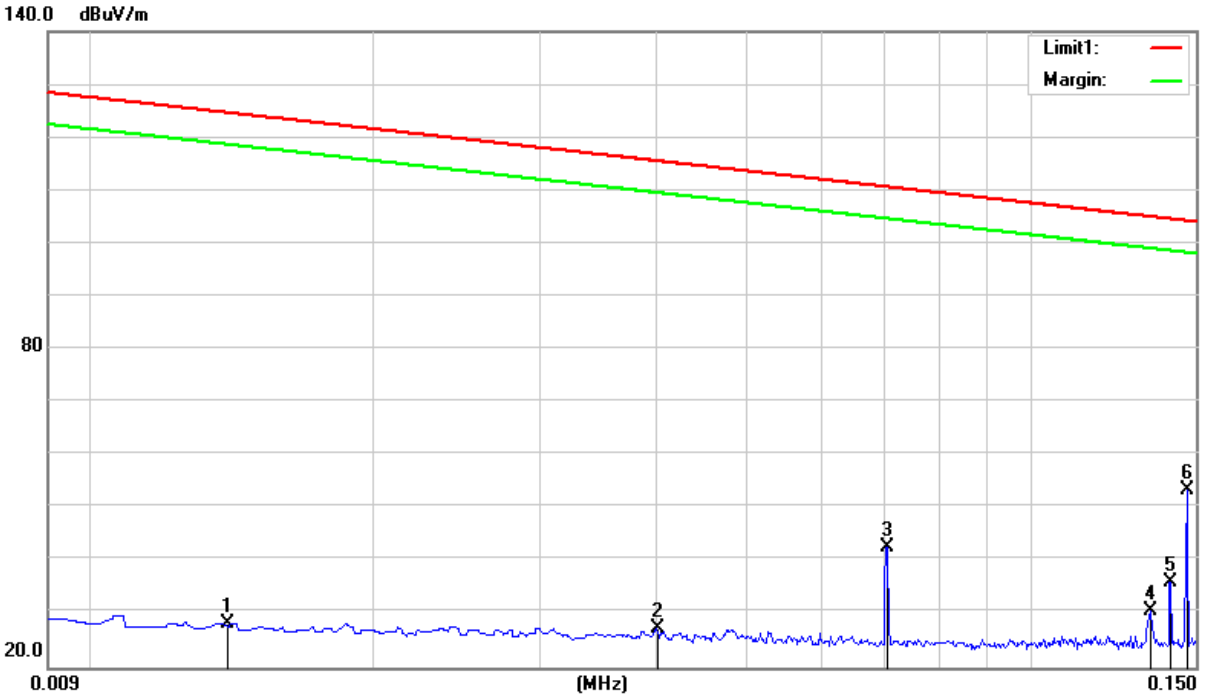
Below 30MHz

Temperature:	23.3(C)	Relative Humidity:	62%RH
Test Voltage:	AC 120V/60Hz	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	0.0140	8.62	19.74	28.36	124.68	-96.32	AVG
2	0.0401	7.51	19.78	27.29	115.54	-88.25	AVG
3	0.0704	23.67	19.01	42.68	110.65	-67.97	AVG
4	0.1341	13.03	17.61	30.64	105.05	-74.41	AVG
5	0.1410	18.45	17.60	36.05	104.62	-68.57	AVG
6	0.1470	35.75	17.59	53.34	104.26	-50.92	AVG

Remark:

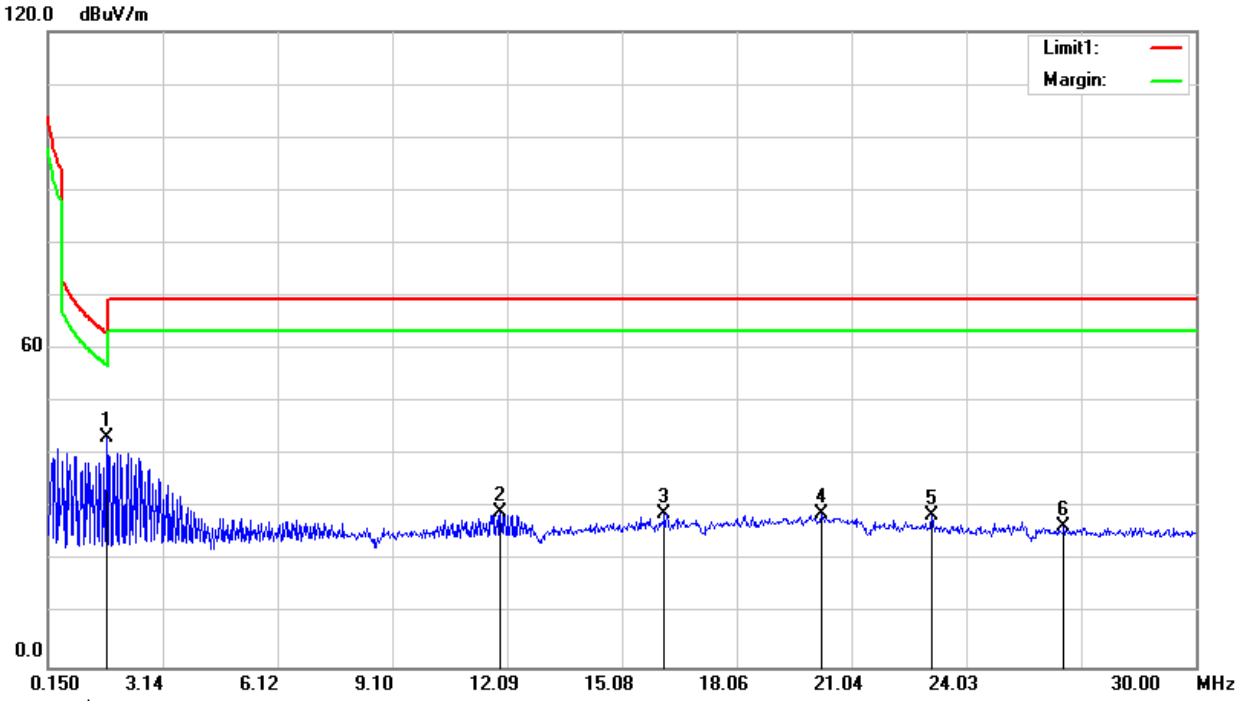
1. Margin = Result (Result =Reading + Factor)–Limit
2. Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain



Temperature:	23.3(C)	Relative Humidity:	62%RH
Test Voltage:	AC 120V/60Hz	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	22.82	20.41	43.23	63.14	-19.91	QP
2	11.9108	7.79	21.31	29.10	69.54	-40.44	QP
3	16.1794	6.61	22.46	29.07	69.54	-40.47	QP
4	20.2690	5.73	23.36	29.09	69.54	-40.45	QP
5	23.1345	6.26	22.34	28.60	69.54	-40.94	QP
6	26.5673	4.94	21.59	26.53	69.54	-43.01	QP

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



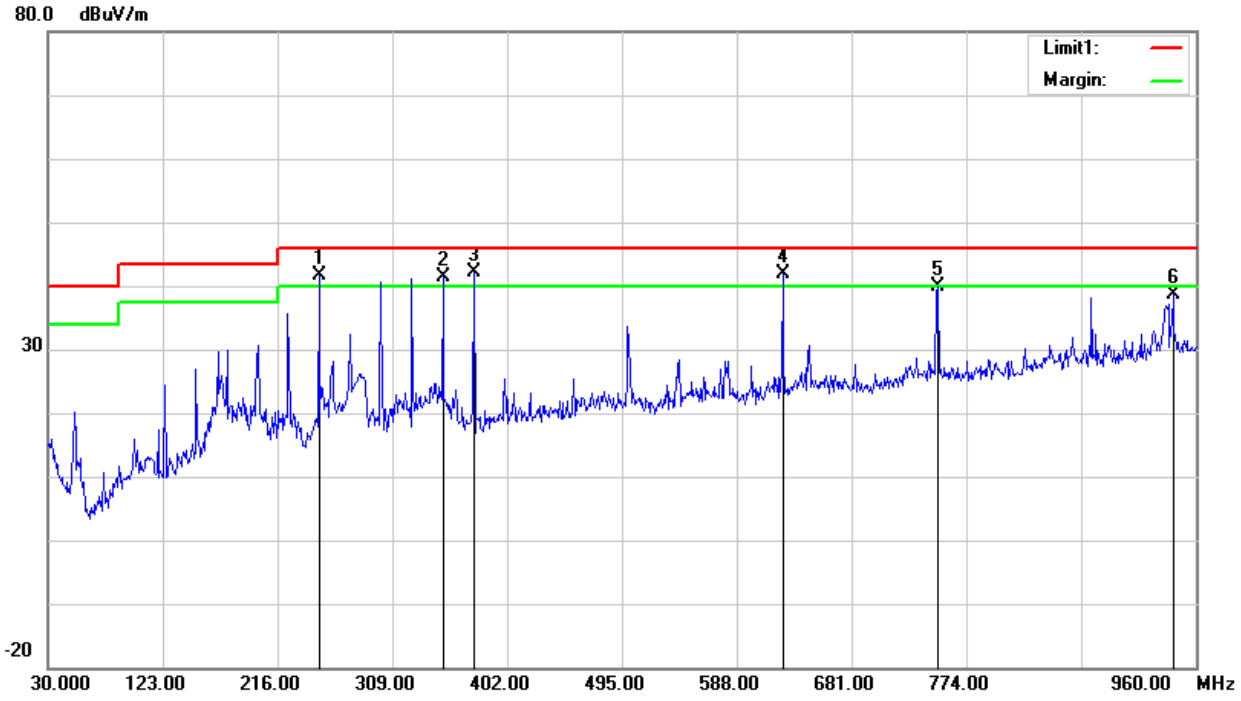
Note: The position of the measurement polarization (Horizontal / Face-on / Face-off) all has been tested, only shown the worst mode of Horizontal position.

30MHz – 960MHz Radiation Spurious

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

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	249.4800	57.76	-16.21	41.55	46.00	-4.45	QP
2	349.9200	54.39	-13.06	41.33	46.00	-4.67	QP
3	375.0300	54.53	-12.38	42.15	46.00	-3.85	QP
4	625.2000	47.26	-5.26	42.00	46.00	-4.00	QP
5	750.7500	42.08	-2.16	39.92	46.00	-6.08	QP
6	941.4000	37.13	1.41	38.54	46.00	-7.46	QP

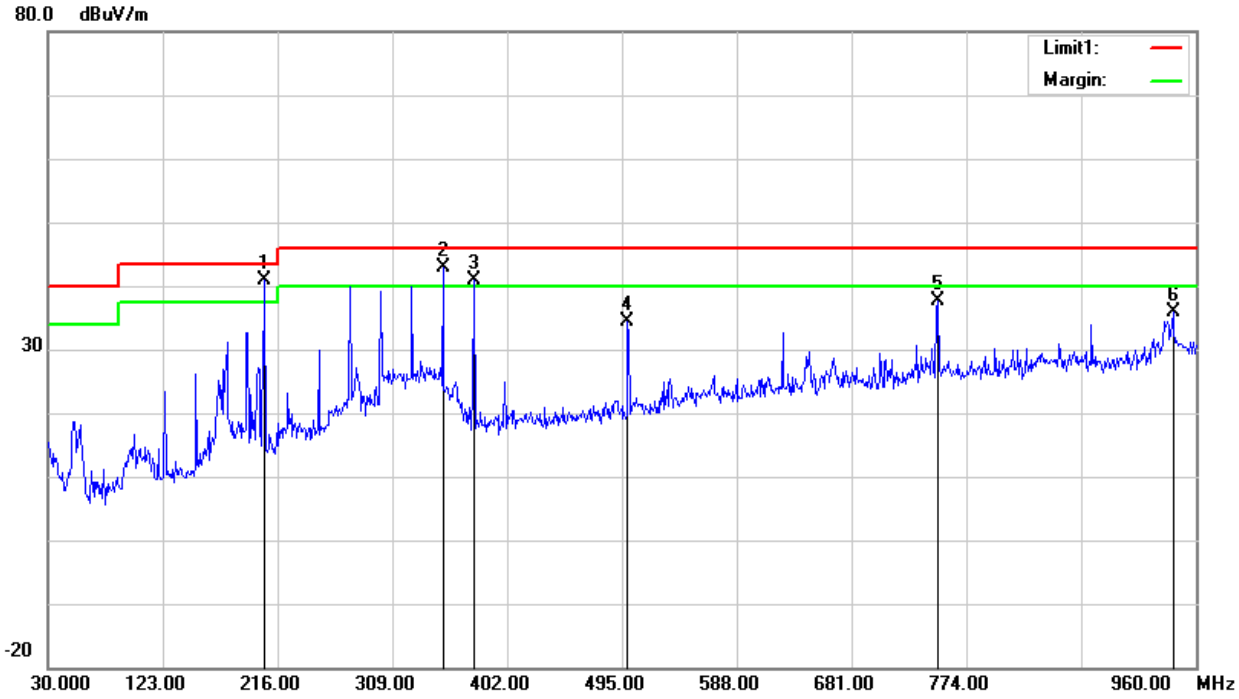
Remark:
1. Margin = Result (Result =Reading + Factor)–Limit
2. Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain



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

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	205.7700	61.65	-20.71	40.94	43.50	-2.56	QP
2	349.9200	55.83	-13.06	42.77	46.00	-3.23	QP
3	375.0300	53.34	-12.38	40.96	46.00	-5.04	QP
4	499.6500	42.37	-8.01	34.36	46.00	-11.64	QP
5	750.7500	39.84	-2.16	37.68	46.00	-8.32	QP
6	941.4000	34.40	1.41	35.81	46.00	-10.19	QP

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

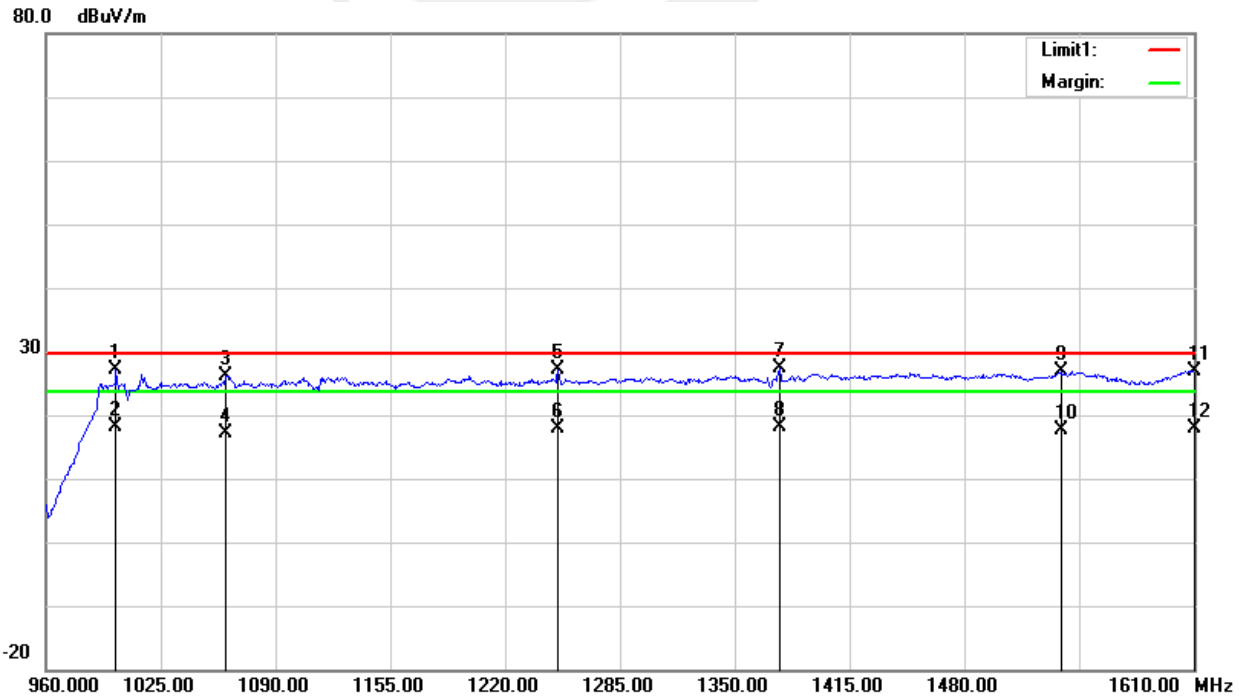


Above 960MHz Radiation Spurious

Temperature:	23.5(C)	Relative Humidity:	62%RH
Test Voltage:	AC 120V/60Hz	Phase:	Horizontal
Test Mode:	CH 1(960MHz -1610MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	999.6500	53.08	-26.00	27.08	29.54	-2.46	peak
2	999.6500	44.05	-26.00	18.05	29.54	-11.49	RMS
3	1061.400	27.48	-1.30	26.18	29.54	-3.36	peak
4	1061.400	18.39	-1.30	17.09	29.54	-12.45	RMS
5	1249.900	27.55	-0.51	27.04	29.54	-2.50	peak
6	1249.900	18.49	-0.51	17.98	29.54	-11.56	RMS
7	1375.350	27.30	0.17	27.47	29.54	-2.07	peak
8	1375.350	18.06	0.17	18.23	29.54	-11.31	RMS
9	1534.600	24.55	2.31	26.86	29.54	-2.68	peak
10	1534.600	15.28	2.31	17.59	29.54	-11.95	RMS
11	1610.000	22.76	4.23	26.99	29.54	-2.55	peak
12	1610.000	13.60	4.23	17.83	29.54	-11.71	RMS

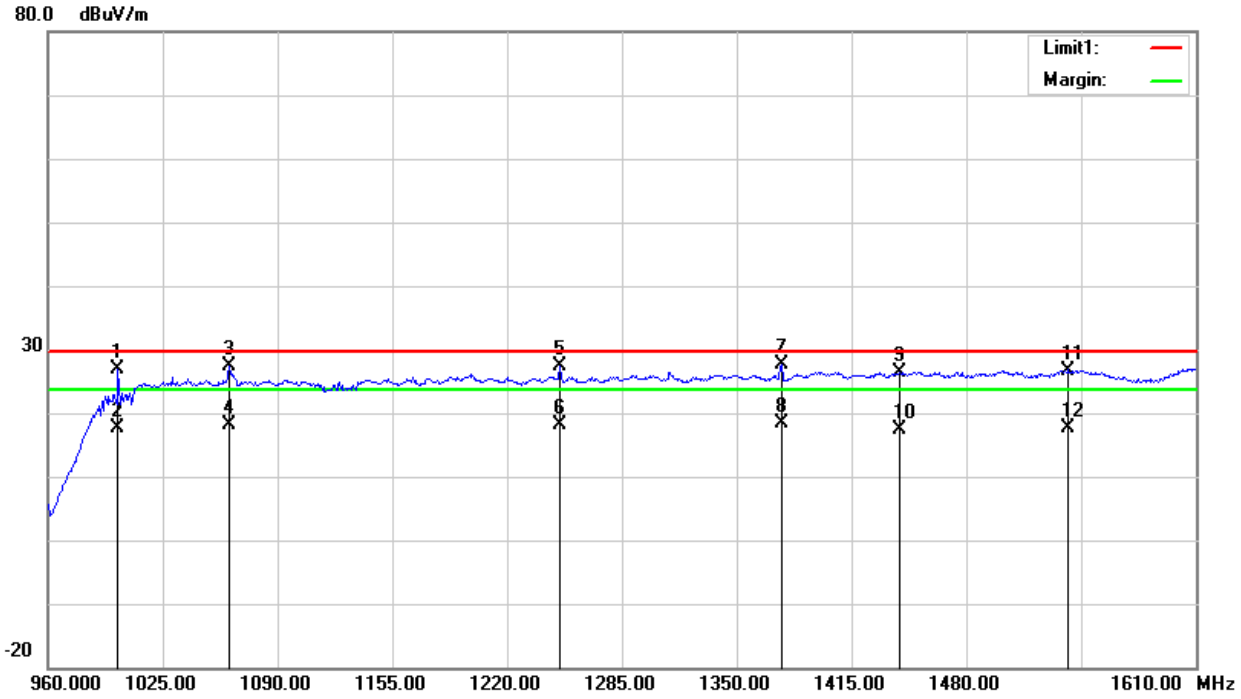
Remark:
1. Margin = Result (Result =Reading + Factor)–Limit
2. Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain



Temperature:	23.5(C)	Relative Humidity:	62%RH
Test Voltage:	AC 120V/60Hz	Phase:	Vertical
Test Mode:	CH 1(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	52.84	-26.00	26.84	29.54	-2.70	peak
2	999.6500	43.56	-26.00	17.56	29.54	-11.98	RMS
3	1062.700	28.75	-1.30	27.45	29.54	-2.09	peak
4	1062.700	19.53	-1.30	18.23	29.54	-11.31	RMS
5	1249.900	27.81	-0.51	27.30	29.54	-2.24	peak
6	1249.900	18.63	-0.51	18.12	29.54	-11.42	RMS
7	1375.350	27.53	0.17	27.70	29.54	-1.84	peak
8	1375.350	18.18	0.17	18.35	29.54	-11.19	RMS
9	1442.300	25.63	0.80	26.43	29.54	-3.11	peak
10	1442.300	16.46	0.80	17.26	29.54	-12.28	RMS
11	1537.850	24.37	2.38	26.75	29.54	-2.79	peak
12	1537.850	15.21	2.38	17.59	29.54	-11.95	RMS

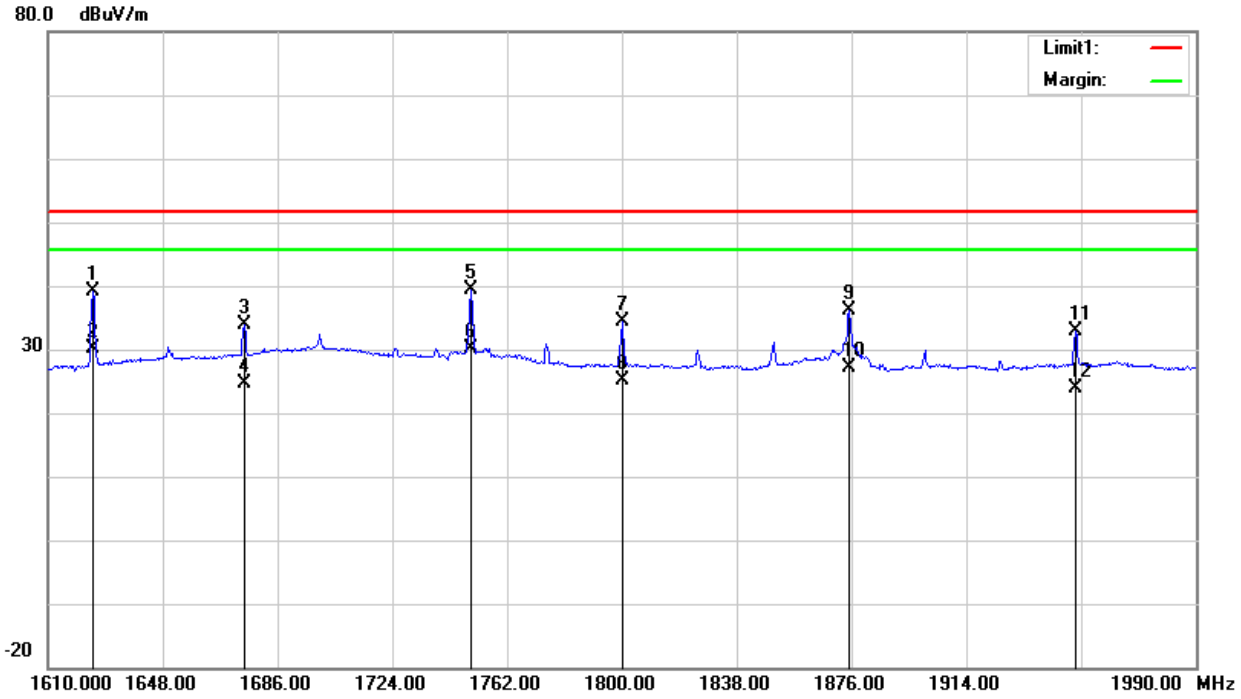
Remark:
1. Margin = Result (Result =Reading + Factor)–Limit
2. Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain



Temperature:	23.5(C)	Relative Humidity:	62%RH
Test Voltage:	AC 120V/60Hz	Phase:	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	1624.820	34.89	4.24	39.13	51.54	-12.41	peak
2	1624.820	25.78	4.24	30.02	51.54	-21.52	RMS
3	1674.980	29.03	4.73	33.76	51.54	-17.78	peak
4	1674.980	19.83	4.73	24.56	51.54	-26.98	RMS
5	1749.840	35.81	3.67	39.48	51.54	-12.06	peak
6	1749.840	26.45	3.67	30.12	51.54	-21.42	RMS
7	1800.000	32.62	1.77	34.39	51.54	-17.15	peak
8	1800.000	23.35	1.77	25.12	51.54	-26.42	RMS
9	1875.240	34.33	1.90	36.23	51.54	-15.31	peak
10	1875.240	25.18	1.90	27.08	51.54	-24.46	RMS
11	1950.100	31.41	1.53	32.94	51.54	-18.60	peak
12	1950.100	22.25	1.53	23.78	51.54	-27.76	RMS

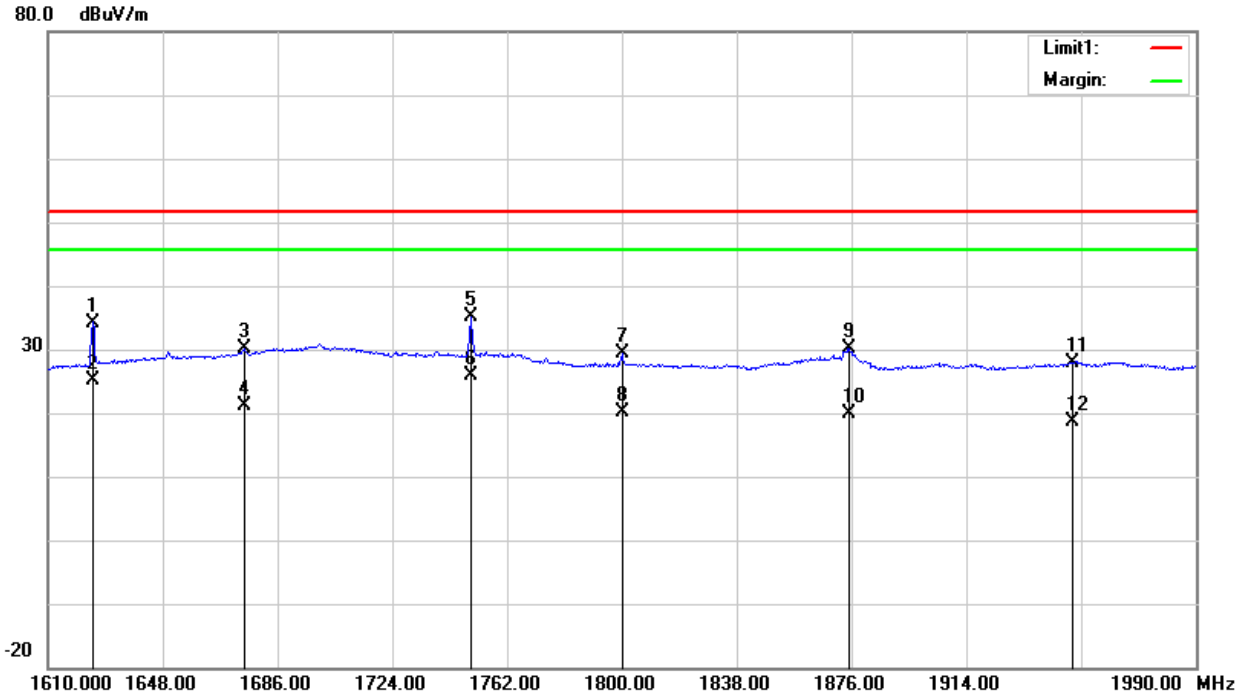
Remark:
1. Margin = Result (Result =Reading + Factor)–Limit
2. Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain



Temperature:	23.5(C)	Relative Humidity:	62%RH
Test Voltage:	AC 120V/60Hz	Phase:	Vertical
Test Mode:	CH 1(1610MHz – 1990MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1624.820	30.01	4.24	34.25	51.54	-17.29	peak
2	1624.820	20.88	4.24	25.12	51.54	-26.42	RMS
3	1674.980	25.41	4.73	30.14	51.54	-21.40	peak
4	1674.980	16.29	4.73	21.02	51.54	-30.52	RMS
5	1749.840	31.39	3.67	35.06	51.54	-16.48	peak
6	1749.840	22.31	3.67	25.98	51.54	-25.56	RMS
7	1800.000	27.61	1.77	29.38	51.54	-22.16	peak
8	1800.000	18.35	1.77	20.12	51.54	-31.42	RMS
9	1875.240	28.15	1.90	30.05	51.54	-21.49	peak
10	1875.240	17.99	1.90	19.89	51.54	-31.65	RMS
11	1949.340	26.39	1.52	27.91	51.54	-23.63	peak
12	1949.340	17.16	1.52	18.68	51.54	-32.86	RMS

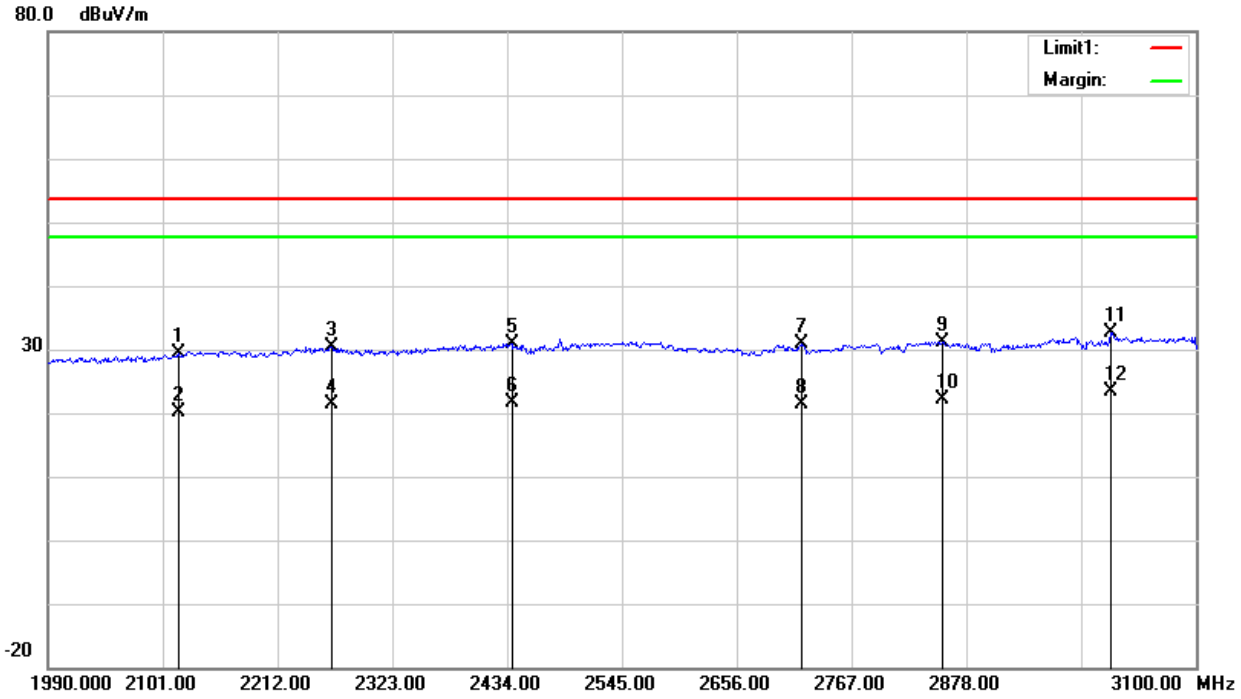
Remark:
1. Margin = Result (Result =Reading + Factor)–Limit
2. Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain



Temperature:	23.3(C)	Relative Humidity:	61%RH
Test Voltage:	AC 120V/60Hz	Phase:	Horizontal
Test Mode:	CH 1(1990MHz – 3100MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2116.540	26.59	2.71	29.30	53.54	-24.24	peak
2	2116.540	17.41	2.71	20.12	53.54	-33.42	RMS
3	2264.170	26.65	3.69	30.34	53.54	-23.20	peak
4	2264.170	17.57	3.69	21.26	53.54	-32.28	RMS
5	2438.440	26.40	4.51	30.91	53.54	-22.63	peak
6	2438.440	17.08	4.51	21.59	53.54	-31.95	RMS
7	2719.270	25.03	5.78	30.81	53.54	-22.73	peak
8	2719.270	15.68	5.78	21.46	53.54	-32.08	RMS
9	2854.690	24.64	6.58	31.22	53.54	-22.32	peak
10	2854.690	15.48	6.58	22.06	53.54	-31.48	RMS
11	3017.860	4.52	28.21	32.73	53.54	-20.81	peak
12	3017.860	-4.87	28.21	23.34	53.54	-30.20	RMS

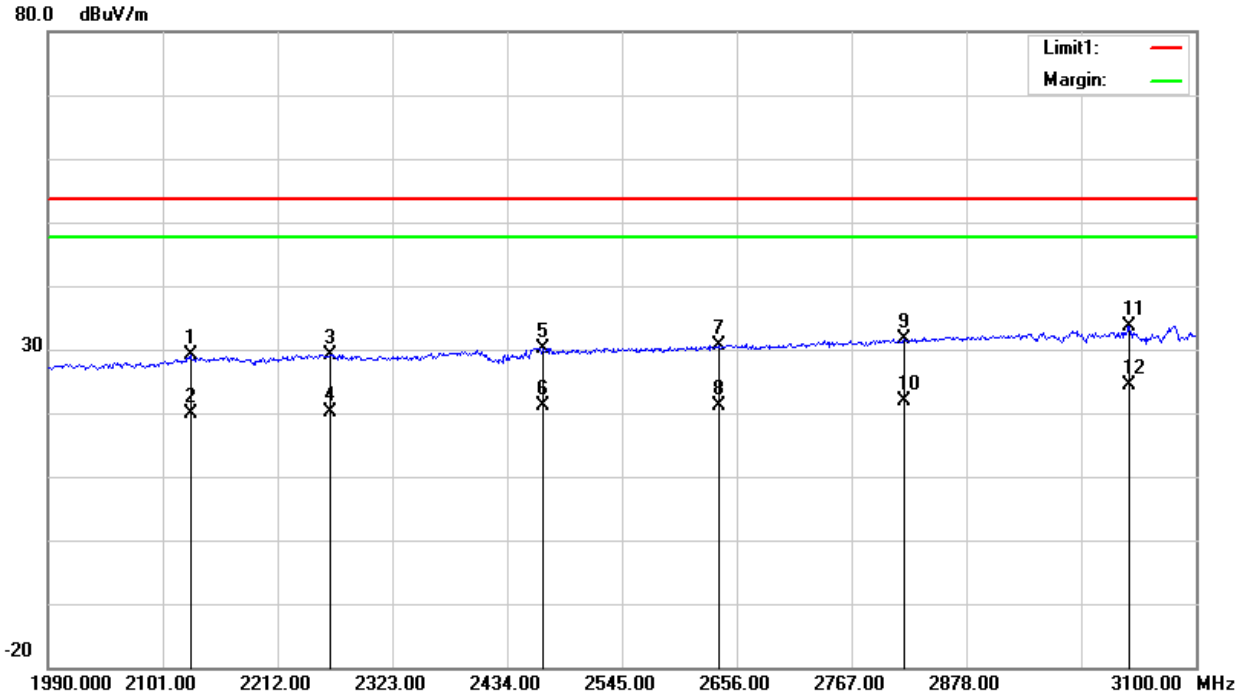
Remark:
1. Margin = Result (Result =Reading + Factor)–Limit
2. Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain



Temperature:	23.3(C)	Relative Humidity:	61%RH
Test Voltage:	AC 120V/60Hz	Phase:	Vertical
Test Mode:	CH 1(1990MHz – 3100MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2127.640	26.15	2.90	29.05	53.54	-24.49	peak
2	2127.640	17.08	2.90	19.98	53.54	-33.56	RMS
3	2263.060	25.55	3.69	29.24	53.54	-24.30	peak
4	2263.060	16.33	3.69	20.02	53.54	-33.52	RMS
5	2468.410	25.67	4.57	30.24	53.54	-23.30	peak
6	2468.410	16.44	4.57	21.01	53.54	-32.53	RMS
7	2638.240	25.28	5.43	30.71	53.54	-22.83	peak
8	2638.240	15.80	5.43	21.23	53.54	-32.31	RMS
9	2818.060	25.21	6.35	31.56	53.54	-21.98	peak
10	2818.060	15.63	6.35	21.98	53.54	-31.56	RMS
11	3035.620	5.37	28.22	33.59	53.54	-19.95	peak
12	3035.620	-3.91	28.22	24.31	53.54	-29.23	RMS

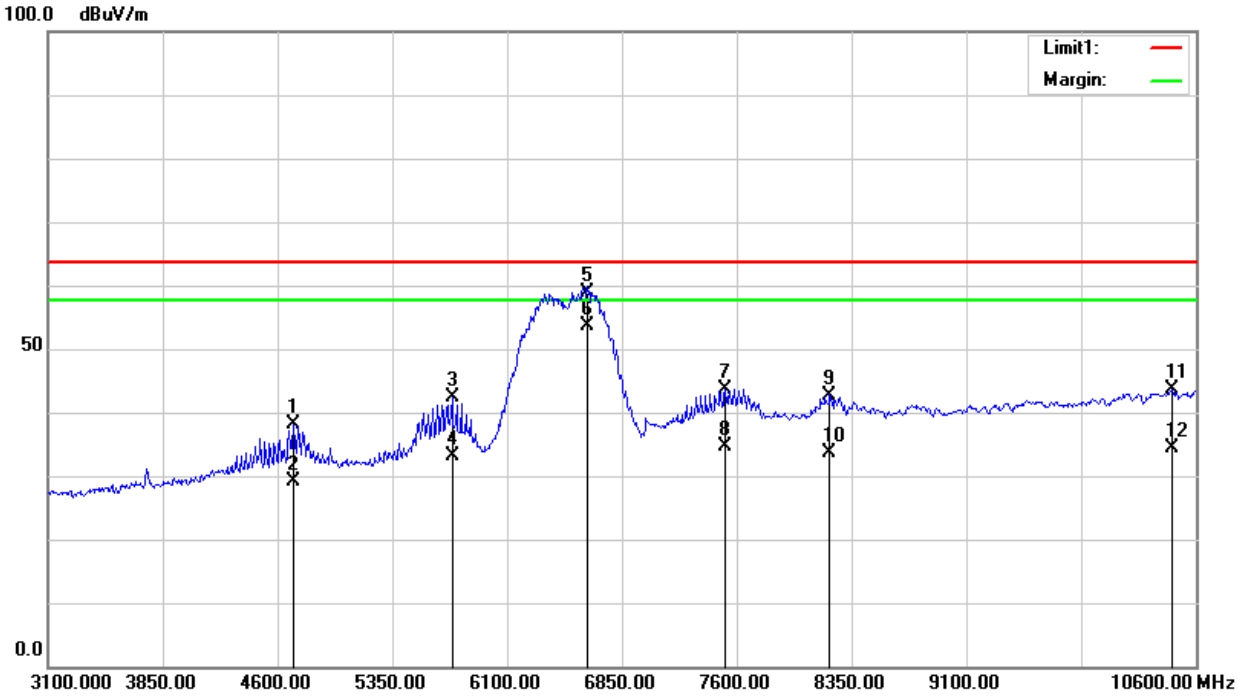
Remark:
1. Margin = Result (Result =Reading + Factor)–Limit
2. Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain



Temperature:	23.5(C)	Relative Humidity:	62%RH
Test Voltage:	AC 120V/60Hz	Phase:	Horizontal
Test Mode:	CH 1 (3100MHz – 10600MHz)	Test distance:	1m

No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4705.000	45.45	-7.35	38.10	63.54	-25.44	peak
2	4705.000	36.37	-7.35	29.02	63.54	-34.52	RMS
3	5740.000	46.83	-4.53	42.30	63.54	-21.24	peak
4	5740.000	37.65	-4.53	33.12	63.54	-30.42	RMS
5	6625.000	60.39	-1.57	58.82	63.54	-4.72	peak
6	6625.000	55.15	-1.57	53.58	63.54	-9.96	RMS
7	7525.000	42.06	1.66	43.72	63.54	-19.82	peak
8	7525.000	33.02	1.66	34.68	63.54	-28.86	RMS
9	8207.500	40.35	2.40	42.75	63.54	-20.79	peak
10	8207.500	31.22	2.40	33.62	63.54	-29.92	RMS
11	10442.500	38.75	4.79	43.54	63.54	-20.00	peak
12	10442.500	29.59	4.79	34.38	63.54	-29.16	RMS

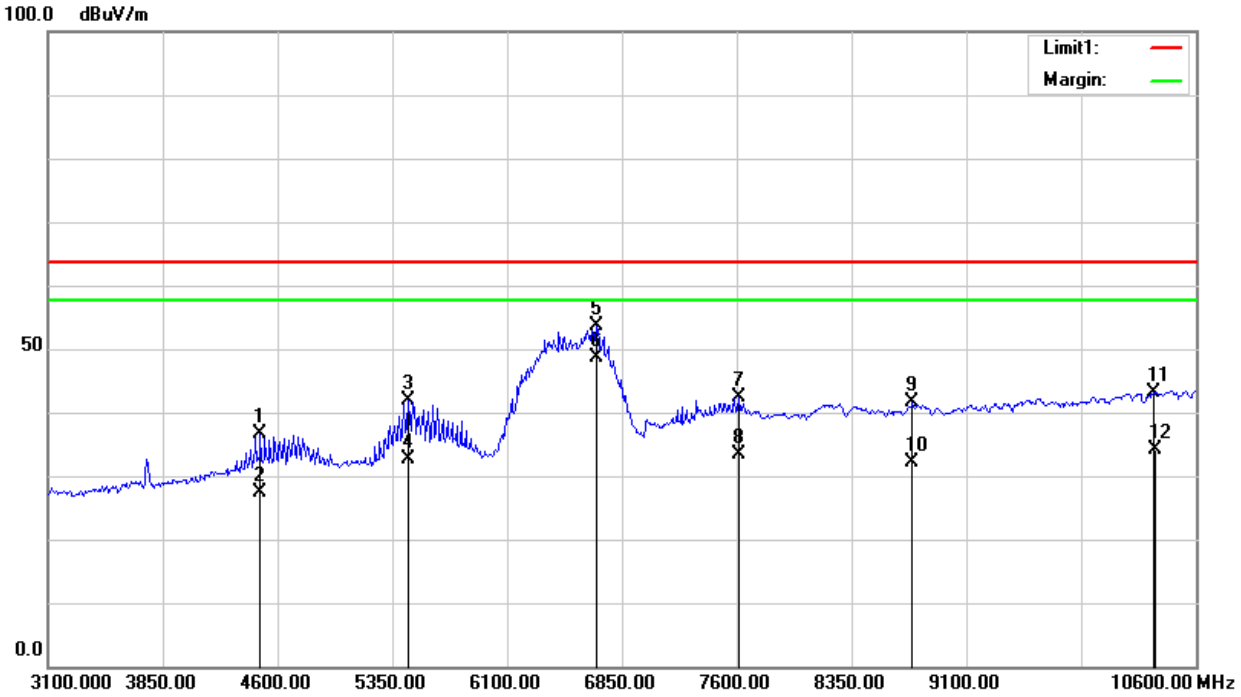
Remark:
1. Margin = Result (Result =Reading + Factor)–Limit
2. Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain



Temperature:	23.5(C)	Relative Humidity:	62%RH
Test Voltage:	AC 120V/60Hz	Phase:	Vertical
Test Mode:	CH 1 (3100MHz – 10600MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4487.500	44.48	-7.96	36.52	63.54	-27.02	peak
2	4487.500	35.41	-7.96	27.45	63.54	-36.09	RMS
3	5455.000	46.92	-5.13	41.79	63.54	-21.75	peak
4	5455.000	37.72	-5.13	32.59	63.54	-30.95	RMS
5	6685.000	54.86	-1.13	53.73	63.54	-9.81	peak
6	6685.000	49.65	-1.13	48.52	63.54	-15.02	RMS
7	7615.000	40.63	1.75	42.38	63.54	-21.16	peak
8	7615.000	31.51	1.75	33.26	63.54	-30.28	RMS
9	8747.500	38.97	2.59	41.56	63.54	-21.98	peak
10	8747.500	29.65	2.59	32.24	63.54	-31.30	RMS
11	10322.500	38.80	4.40	43.20	63.54	-20.34	peak
12	10332.500	29.59	4.44	34.03	63.54	-29.51	RMS

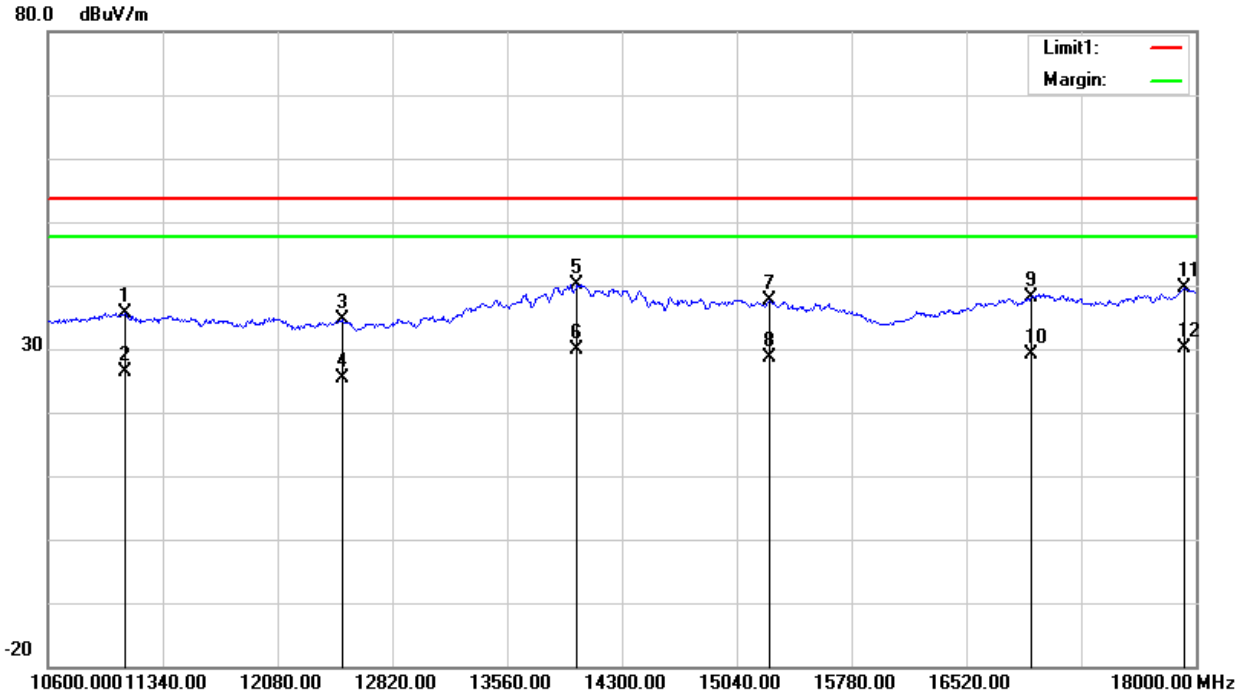
Remark:
1. Margin = Result (Result =Reading + Factor)–Limit
2. Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain



Temperature:	23.3(C)	Relative Humidity:	61%RH
Test Voltage:	AC 120V/60Hz	Phase:	Horizontal
Test Mode:	CH 1 (10600MHz – 18000MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	11095.800	29.31	6.31	35.62	53.54	-17.92	peak
2	11095.800	20.04	6.31	26.35	53.54	-27.19	RMS
3	12501.800	28.86	5.83	34.69	53.54	-18.85	peak
4	12501.800	19.65	5.83	25.48	53.54	-28.06	RMS
5	14011.400	27.75	12.30	40.05	53.54	-13.49	peak
6	14011.400	17.66	12.30	29.96	53.54	-23.58	RMS
7	15247.200	27.75	9.89	37.64	53.54	-15.90	peak
8	15247.200	18.71	9.89	28.60	53.54	-24.94	RMS
9	16941.800	28.37	9.76	38.13	53.54	-15.41	peak
10	16941.800	19.26	9.76	29.02	53.54	-24.52	RMS
11	17926.000	16.58	22.96	39.54	53.54	-14.00	peak
12	17926.000	7.16	22.96	30.12	53.54	-23.42	RMS

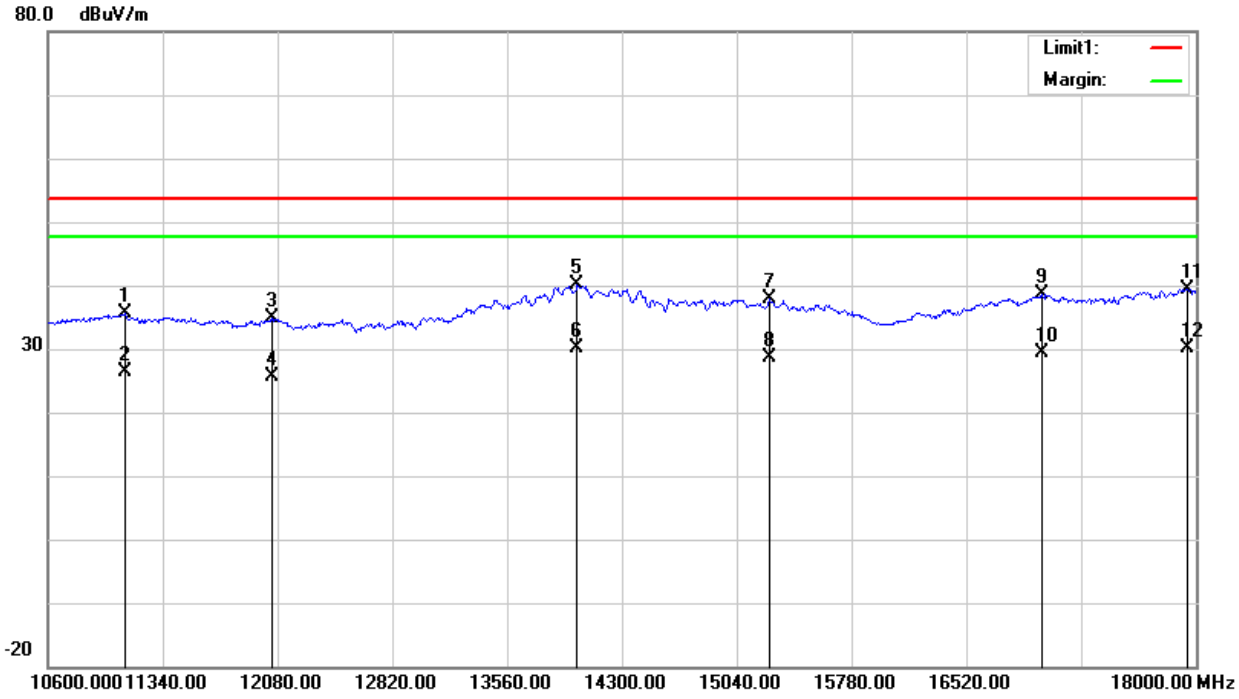
Remark:
1. Margin = Result (Result =Reading + Factor)–Limit
2. Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain



Temperature:	23.3(C)	Relative Humidity:	61%RH
Test Voltage:	AC 120V/60Hz	Phase:	Vertical
Test Mode:	CH 1 (10600MHz – 18000MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	11095.800	29.23	6.31	35.54	53.54	-18.00	peak
2	11095.800	20.17	6.31	26.48	53.54	-27.06	RMS
3	12043.000	28.96	5.80	34.76	53.54	-18.78	peak
4	12043.000	19.82	5.80	25.62	53.54	-27.92	RMS
5	14011.400	27.80	12.30	40.10	53.54	-13.44	peak
6	14011.400	17.73	12.30	30.03	53.54	-23.51	RMS
7	15247.200	27.87	9.89	37.76	53.54	-15.78	peak
8	15247.200	18.70	9.89	28.59	53.54	-24.95	RMS
9	17008.400	28.69	9.84	38.53	53.54	-15.01	peak
10	17008.400	19.59	9.84	29.43	53.54	-24.11	RMS
11	17948.200	27.56	11.91	39.47	53.54	-14.07	peak
12	17948.200	18.32	11.91	30.23	53.54	-23.31	RMS

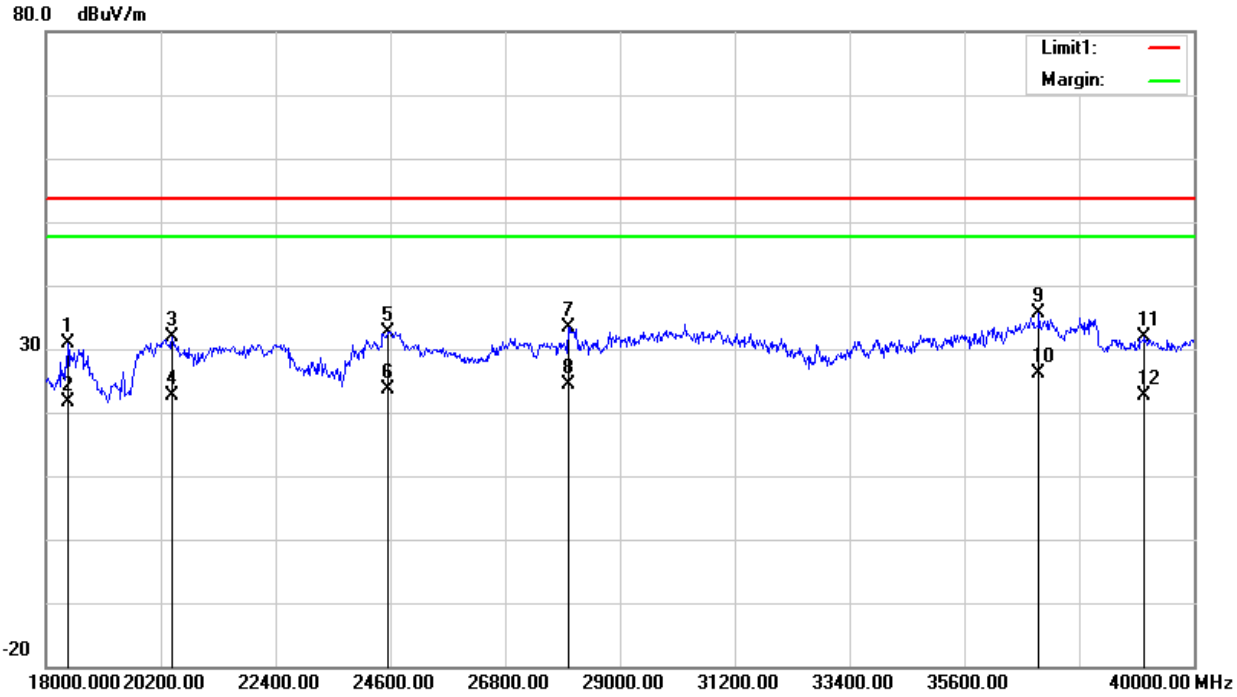
Remark:
1. Margin = Result (Result =Reading + Factor)–Limit
2. Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain



Temperature:	23.2(C)	Relative Humidity:	60%RH
Test Voltage:	AC 120V/60Hz	Phase:	Horizontal
Test Mode:	CH 1 (18000MHz – 40000MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	18418.000	36.79	-5.94	30.85	53.54	-22.69	peak
2	18418.000	27.57	-5.94	21.63	53.54	-31.91	RMS
3	20420.000	37.78	-5.95	31.83	53.54	-21.71	peak
4	20420.000	28.51	-5.95	22.56	53.54	-30.98	RMS
5	24556.000	37.77	-5.04	32.73	53.54	-20.81	peak
6	24556.000	28.66	-5.04	23.62	53.54	-29.92	RMS
7	28010.000	79.94	-46.50	33.44	53.54	-20.10	peak
8	28010.000	70.79	-46.50	24.29	53.54	-29.25	RMS
9	37030.000	82.97	-47.41	35.56	53.54	-17.98	peak
10	37030.000	73.64	-47.41	26.23	53.54	-27.31	RMS
11	39054.000	81.53	-49.66	31.87	53.54	-21.67	peak
12	39054.000	72.25	-49.66	22.59	53.54	-30.95	RMS

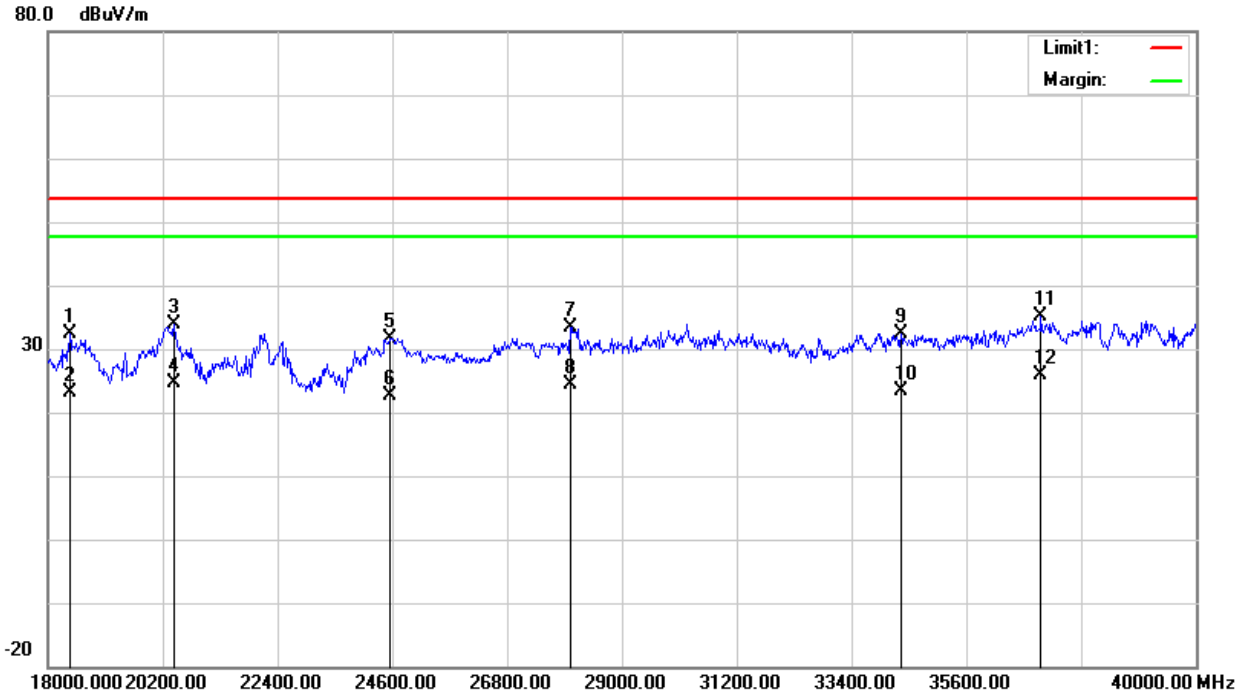
Remark:
1. Margin = Result (Result =Reading + Factor)–Limit
2. Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain



Temperature:	23.2(C)	Relative Humidity:	60%RH
Test Voltage:	AC 120V/60Hz	Phase:	Vertical
Test Mode:	CH 1 (18000MHz – 40000MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	18418.000	38.29	-5.94	32.35	53.54	-21.19	peak
2	18418.000	29.15	-5.94	23.21	53.54	-30.33	RMS
3	20420.000	39.78	-5.95	33.83	53.54	-19.71	peak
4	20420.000	30.57	-5.95	24.62	53.54	-28.92	RMS
5	24556.000	36.77	-5.04	31.73	53.54	-21.81	peak
6	24556.000	27.63	-5.04	22.59	53.54	-30.95	RMS
7	28010.000	79.94	-46.50	33.44	53.54	-20.10	peak
8	28010.000	70.82	-46.50	24.32	53.54	-29.22	RMS
9	34346.000	79.69	-47.28	32.41	53.54	-21.13	peak
10	34346.000	70.57	-47.28	23.29	53.54	-30.25	RMS
11	37030.000	82.47	-47.41	35.06	53.54	-18.48	peak
12	37030.000	73.29	-47.41	25.88	53.54	-27.66	RMS

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



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(dBuV/m) = P(dBmEIRP) + 95.3.
3. dBuV/m@1m= dBuV/m@3m+20*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.

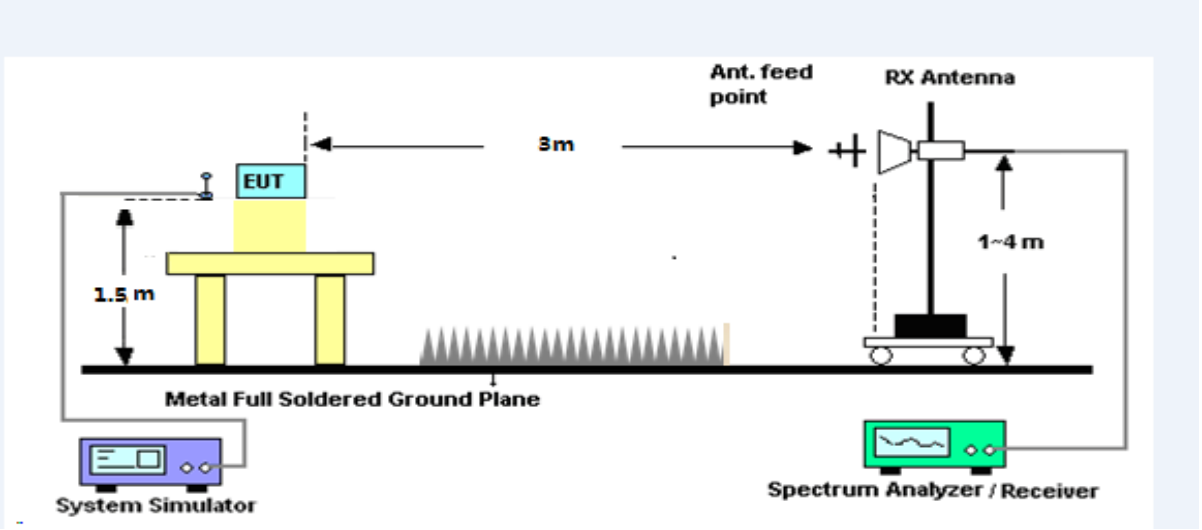
c. All readings are RMS mode value , for each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading . (Above 960MHz)

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

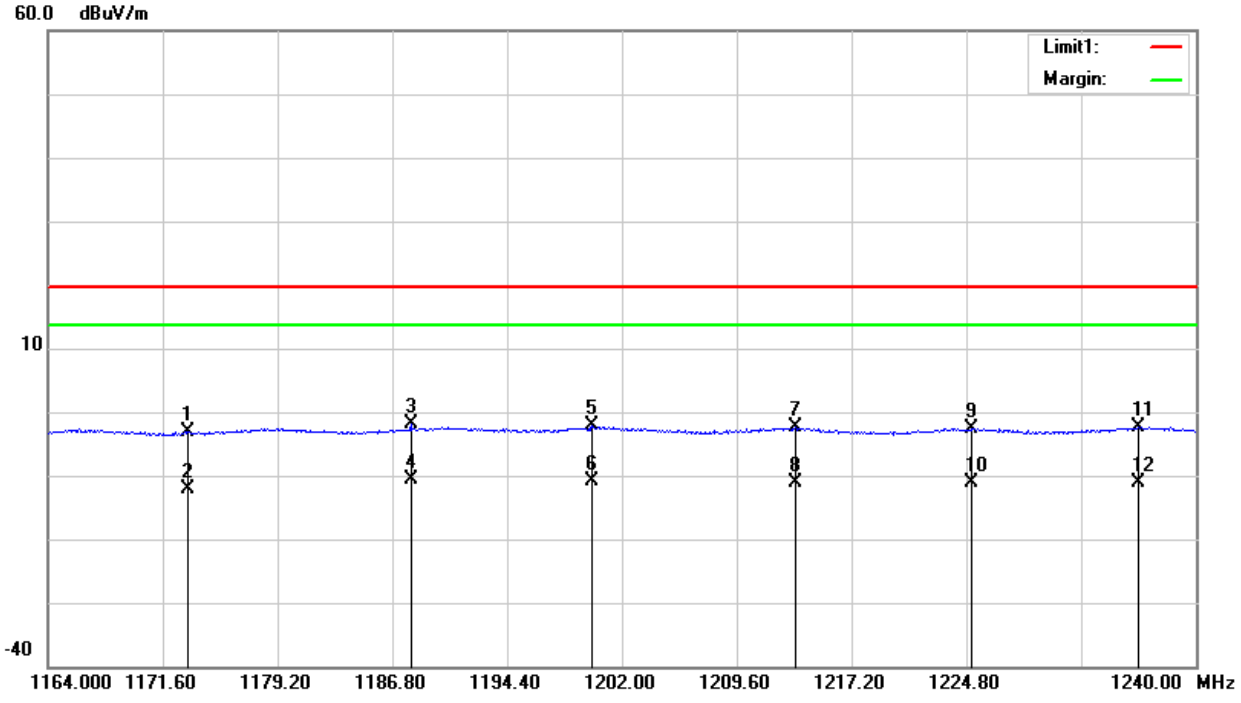
Note: We pretested the battery powered and AC powered mode, find the worst case in AC powered mode and shown in this report.

Temperature:	23.3(C)	Relative Humidity:	61%RH
Test Voltage:	AC 120V/60Hz	Phase:	Horizontal
Test Mode:	CH 1(1164Hz – 1240MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1173.272	-2.42	-0.69	-3.11	19.54	-22.65	peak
2	1173.272	-11.34	-0.69	-12.03	19.54	-31.57	RMS
3	1188.016	-1.39	-0.54	-1.93	19.54	-21.47	peak
4	1188.016	-10.02	-0.54	-10.56	19.54	-30.10	RMS
5	1200.024	-1.71	-0.42	-2.13	19.54	-21.67	peak
6	1200.024	-10.56	-0.42	-10.98	19.54	-30.52	RMS
7	1213.476	-1.95	-0.45	-2.40	19.54	-21.94	peak
8	1213.476	-10.63	-0.45	-11.08	19.54	-30.62	RMS
9	1225.104	-2.11	-0.47	-2.58	19.54	-22.12	peak
10	1225.104	-10.72	-0.47	-11.19	19.54	-30.73	RMS
11	1236.200	-1.80	-0.49	-2.29	19.54	-21.83	peak
12	1236.200	-10.57	-0.49	-11.06	19.54	-30.60	RMS

Remark:

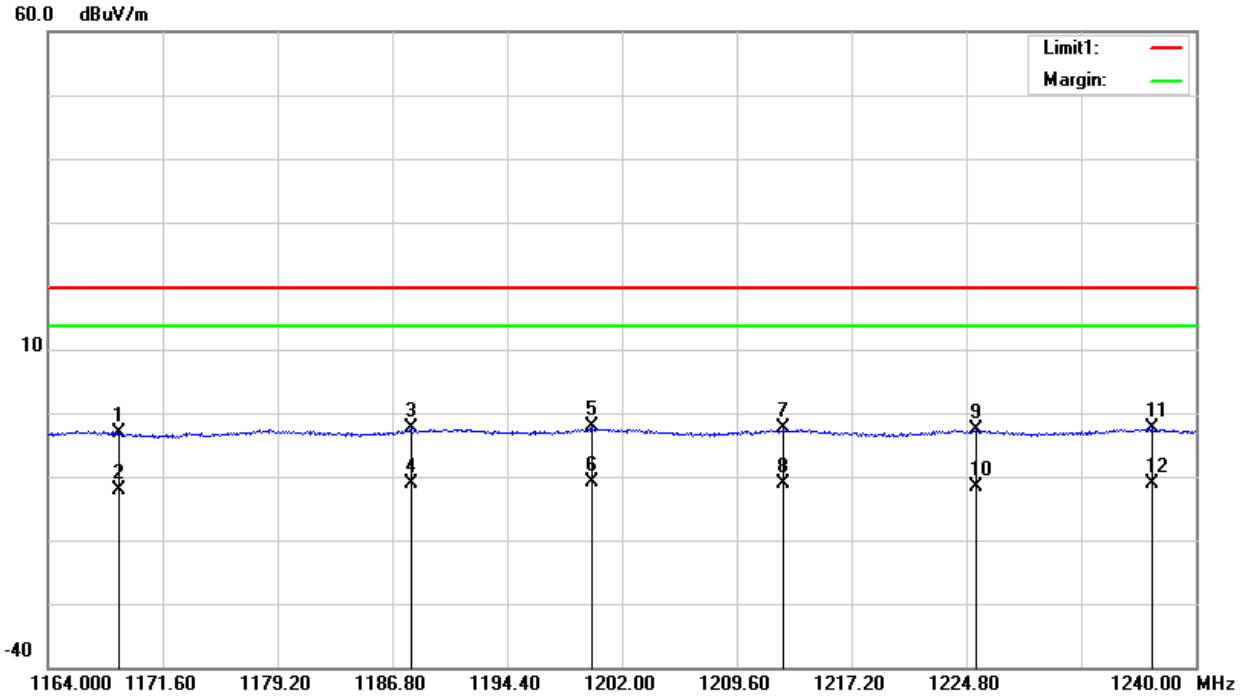
1. Margin = Result (Result =Reading + Factor)–Limit
2. Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain



Temperature:	23.3(C)	Relative Humidity:	61%RH
Test Voltage:	AC 120V/60Hz	Phase:	Vertical
Test Mode:	CH 1(1164Hz – 1240MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1168.712	-2.44	-0.73	-3.17	19.54	-22.71	peak
2	1168.712	-11.29	-0.73	-12.02	19.54	-31.56	RMS
3	1188.016	-1.74	-0.54	-2.28	19.54	-21.82	peak
4	1188.016	-10.49	-0.54	-11.03	19.54	-30.57	RMS
5	1200.024	-1.74	-0.42	-2.16	19.54	-21.70	peak
6	1200.024	-10.56	-0.42	-10.98	19.54	-30.52	RMS
7	1212.716	-2.03	-0.45	-2.48	19.54	-22.02	peak
8	1212.716	-10.78	-0.45	-11.23	19.54	-30.77	RMS
9	1225.408	-2.24	-0.47	-2.71	19.54	-22.25	peak
10	1225.408	-11.09	-0.47	-11.56	19.54	-31.10	RMS
11	1237.112	-1.91	-0.49	-2.40	19.54	-21.94	peak
12	1237.112	-10.70	-0.49	-11.19	19.54	-30.73	RMS

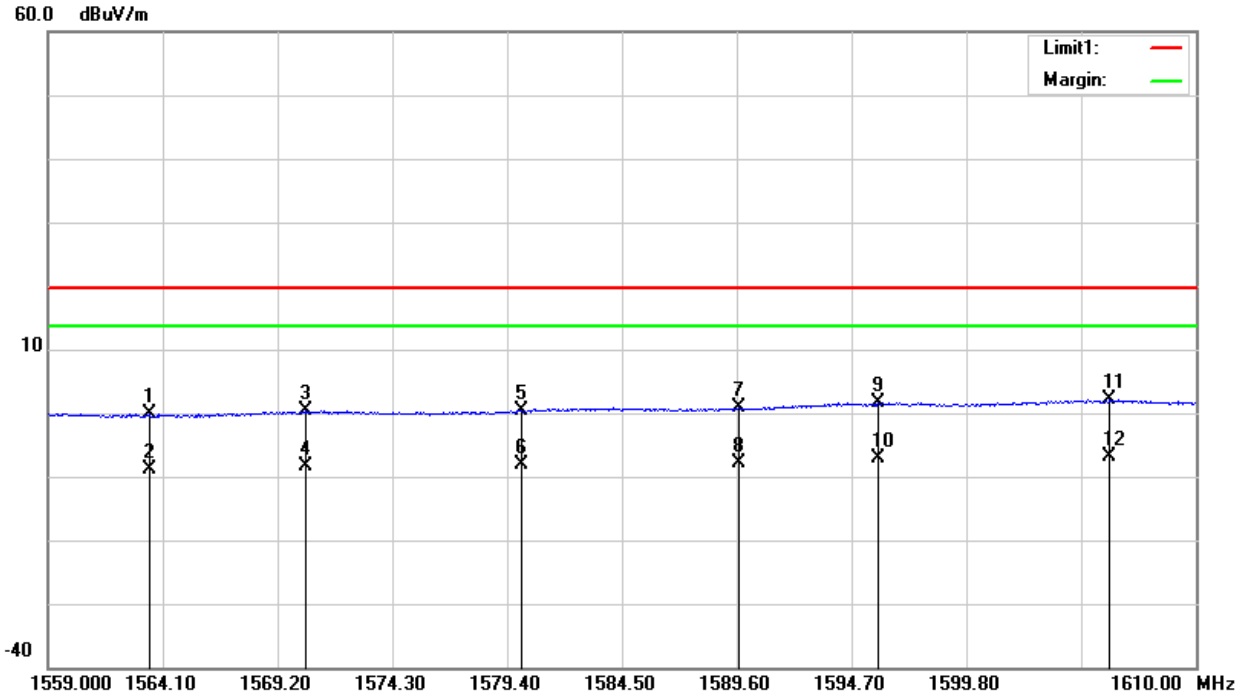
Remark:
1. Margin = Result (Result =Reading + Factor)–Limit
2. Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain



Temperature:	23.3(C)	Relative Humidity:	61%RH
Test Voltage:	AC 120V/60Hz	Phase:	Horizontal
Test Mode:	CH 1(1559Hz – 1610MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1563.539	-3.24	3.10	-0.14	19.54	-19.68	peak
2	1563.539	-12.09	3.10	-8.99	19.54	-28.53	RMS
3	1570.475	-2.92	3.31	0.39	19.54	-19.15	peak
4	1570.475	-11.57	3.31	-8.26	19.54	-27.80	RMS
5	1580.012	-3.18	3.61	0.43	19.54	-19.11	peak
6	1580.012	-11.80	3.61	-8.19	19.54	-27.73	RMS
7	1589.702	-3.10	3.92	0.82	19.54	-18.72	peak
8	1589.702	-11.90	3.92	-7.98	19.54	-27.52	RMS
9	1595.873	-2.45	4.11	1.66	19.54	-17.88	peak
10	1595.873	-11.26	4.11	-7.15	19.54	-26.69	RMS
11	1606.175	-2.19	4.24	2.05	19.54	-17.49	peak
12	1606.175	-11.13	4.24	-6.89	19.54	-26.43	RMS

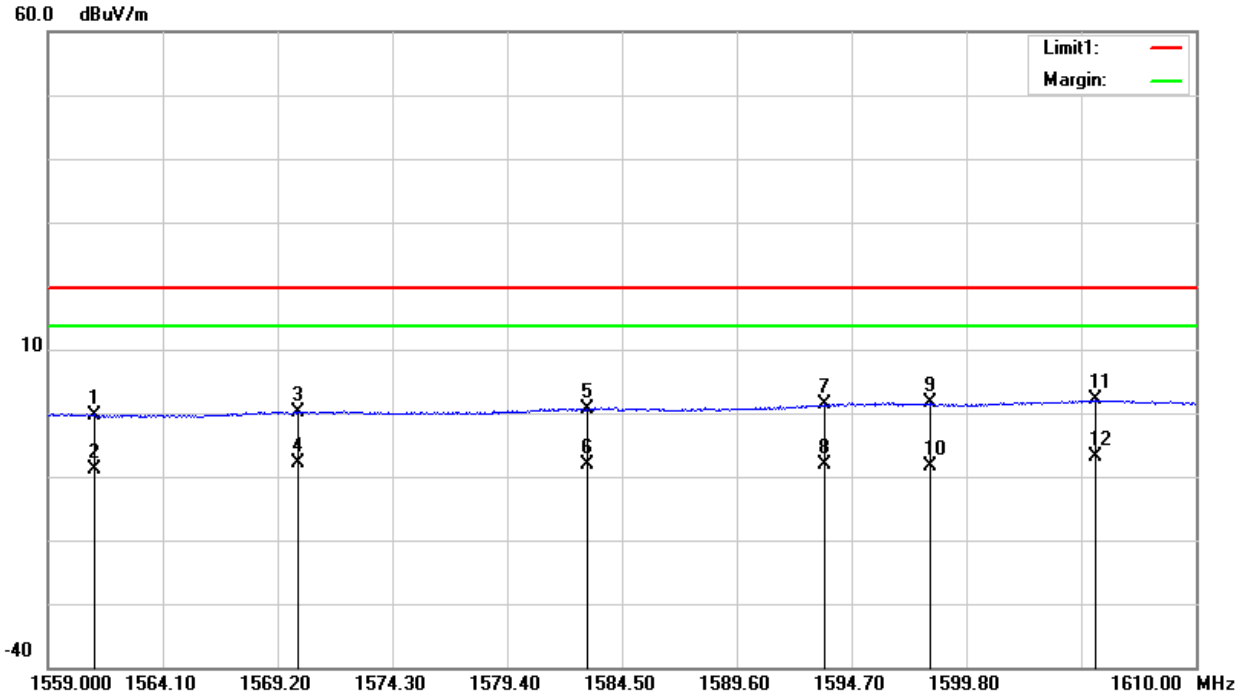
Remark:
1. Margin = Result (Result =Reading + Factor)–Limit
2. Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain



Temperature:	23.3(C)	Relative Humidity:	61%RH
Test Voltage:	AC 120V/60Hz	Phase:	Vertical
Test Mode:	CH 1(1559Hz – 1610MHz)	Test distance:	1m

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1561.091	-3.27	3.02	-0.25	19.54	-19.79	peak
2	1561.091	-11.87	3.02	-8.85	19.54	-28.39	RMS
3	1570.118	-3.10	3.30	0.20	19.54	-19.34	peak
4	1570.118	-11.28	3.30	-7.98	19.54	-27.52	RMS
5	1582.970	-2.97	3.71	0.74	19.54	-18.80	peak
6	1582.970	-11.72	3.71	-8.01	19.54	-27.55	RMS
7	1593.476	-2.76	4.04	1.28	19.54	-18.26	peak
8	1593.476	-12.16	4.04	-8.12	19.54	-27.66	RMS
9	1598.168	-2.56	4.18	1.62	19.54	-17.92	peak
10	1598.168	-12.44	4.18	-8.26	19.54	-27.80	RMS
11	1605.512	-2.23	4.24	2.01	19.54	-17.53	peak
12	1605.512	-11.22	4.24	-6.98	19.54	-26.52	RMS

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



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

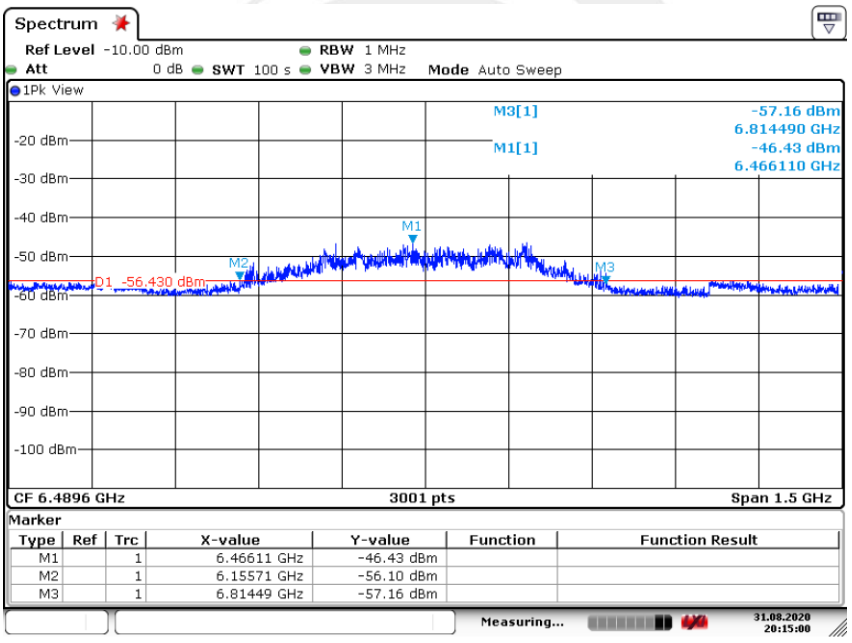
Same as 3.2.6

4.6 TEST RESULTS

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

Test Channel	f_M (MHz)	f_L (MHz)	f_H (MHz)	-10dB Bandwidth (MHz)	f_C (MHz)	Fractional Bandwidth (MHz)	Limit	Result
CH1	6466.11	6155.71	6814.49	658.78	6485.10	0.10	-10dB Bandwidth≥ 500MHz or Fractional Bandwidth≥ 0.2	Pass

CH 1



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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(dBuV/m) = P(dBm EIRP) + 95.3 = -34 + 95.3 = 61.3 dBuV/m
Note: $EIRP_{1MHz}=EIRP_{50MHz}+20\log(1MHz/50\ MHz) = 0\ dBm + -34\ dB = -34\ dBm$

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

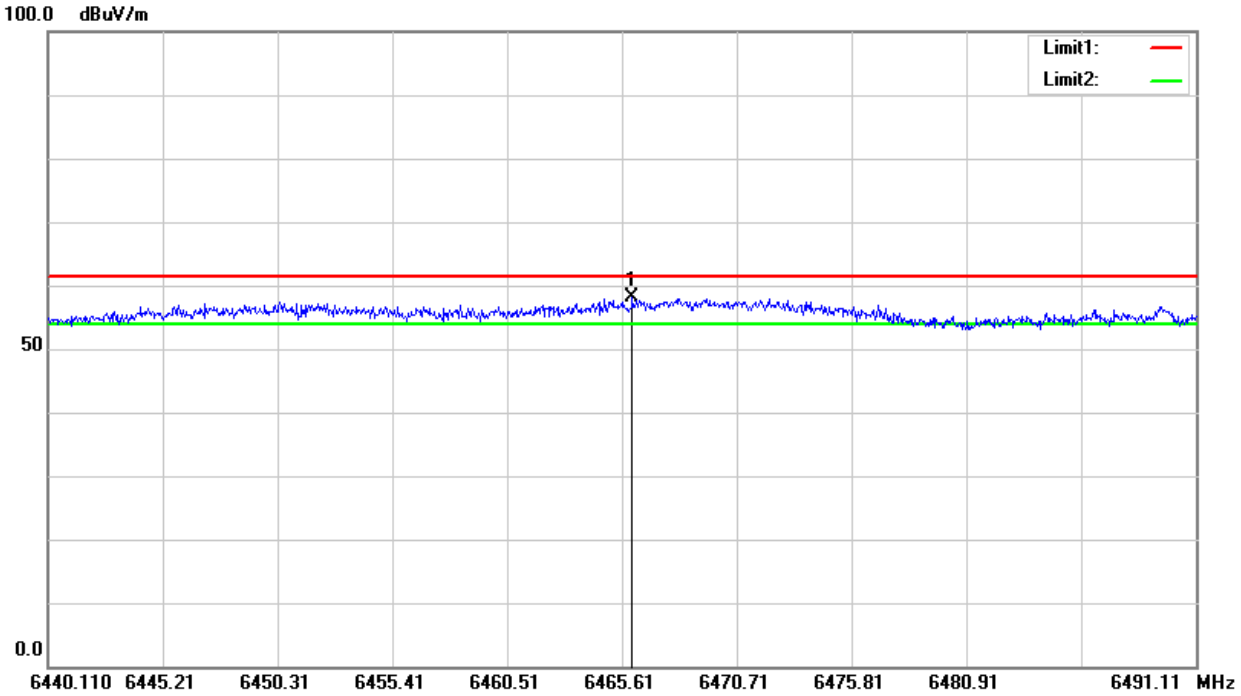
5.8 TEST RESULTS

Note: We pretested the battery powered and AC powered mode, find the worst case in AC powered mode and shown in this report.

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

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	6466.069	60.08	-2.04	58.04	61.30	-3.26	peak

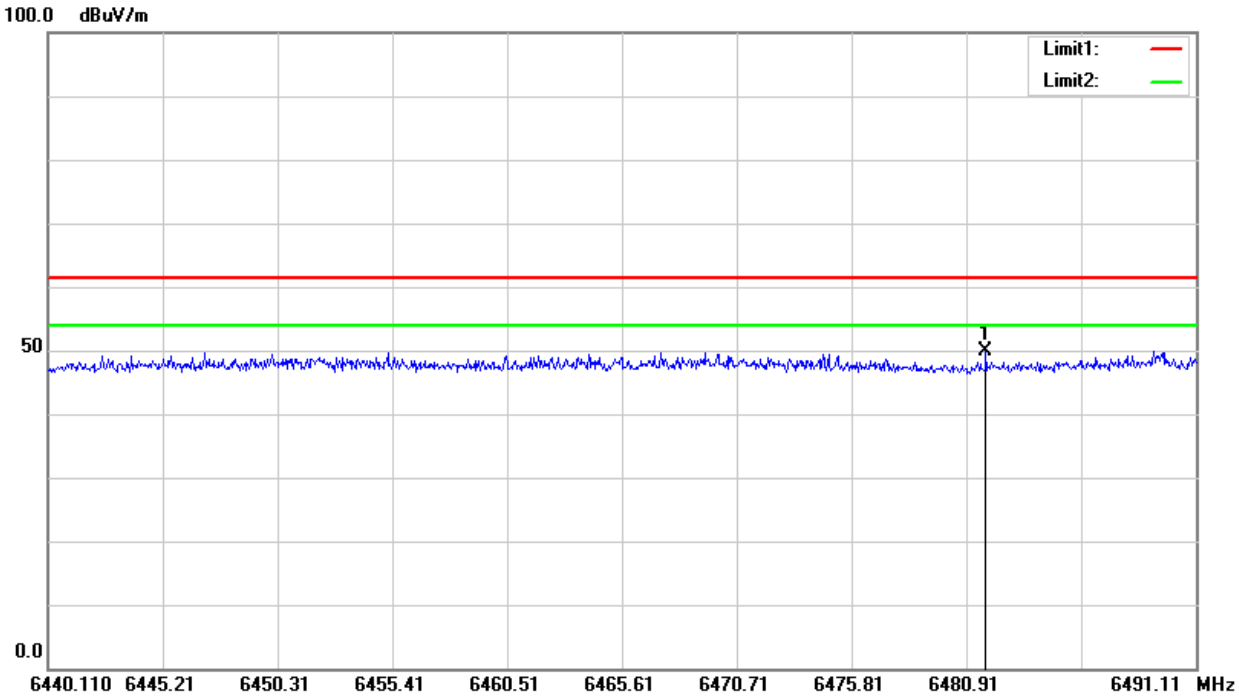
Remark:
1. Margin = Result (Result =Reading + Factor)–Limit
2. Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain



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

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	6481.777	51.77	-1.99	49.78	61.30	-11.52	peak

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

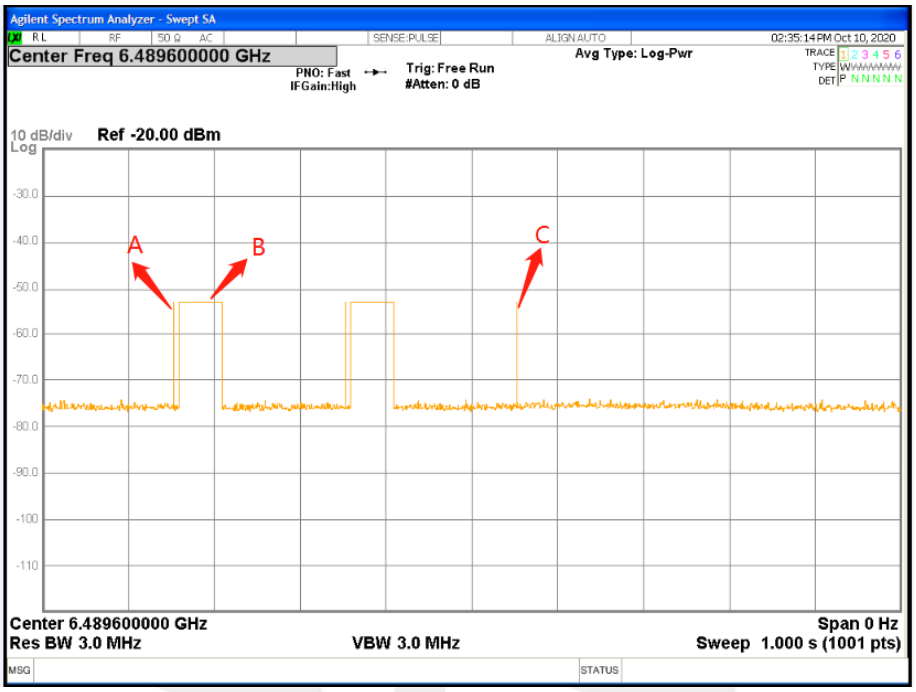


6 TRANSMITTING CHARACTERISTICS

6.1 REQUIREMENT

FCC Part 15.517(a)(5) A communications system shall transmit only when the intentional radiator is sending information to an associated receiver.

6.2 TEST RESULTS



Remark A: When both the transmitting device and the receiving device are turned on, the pairing signal sent by the transmitting device to the receiving device.
Remark B: The transmitting device and the receiving device begin to communicate.
Remark C: The receiving device is turned off, and only when the transmitting device is turned on, the transmitting device sends a pairing signal, but no feedback information from the receiving device is received, so no communication is established.

After the transmitting device sends the pairing signal, the transmitting device stops working and enters the dormant state after not receiving feedback from the receiving device

7. ANTENNA REQUIREMENT

7.1 STANDARD REQUIREMENT

According to the FCC Part 15 Paragraph 15.203&RSS-Gen(6.8), an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

7.2 EUT ANTENNA

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

APPENDIX- PHOTOS OF TEST SETUP

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

※※※※※END OF THE REPORT※※※※※