RADIO TESTR EPORT

Report No.:STS1904154W01

Issued for

Nortek Security&Control LLC

5919 Sea Otter Place, Suite 100, Carlsbad, CA 92010, USA

Product Name:	EL-SC-100
Brand Name:	ELAN
Model Name:	EL-SC-100
Series Model:	N/A
FCC ID:	EF400186
Test Standard:	CFR47 FCC Part 15: Subpart C Section 15.247 CFR47 FCC Part 15: Subpart C Section 15.207 CFR47 FCC Part 15: Subpart C Section 15.209 CFR47 FCC Part 15: Subpart B Section 15.107 CFR47 FCC Part 15: Subpart B Section 15.109

Shenzhen STS Test Services Co., Ltd.
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TEST RESULT CERTIFICATION

Applicant's name	:	**Nortek Security&Control LLC**
Address	:	5919 Sea Otter Place, Suite 100, Carlsbad, CA 92010, USA
Manufacture's Name	:	**Linear Electonics(Shenzhen) Limited**
Address	:	Hourui Second Industrila Zone, Hourui village,Hangcheng,Baoan, Shenzhen,P.R.C

Product description

Product Name	:	EL-SC-100
Brand Name	:	ELAN
Model Name	:	EL-SC-100
SeriesModel	:	N/A
Test Standards	:	CFR47 FCC Part 15: Subpart C Section 15.247 CFR47 FCC Part 15: Subpart C Section 15.207 CFR47 FCC Part 15: Subpart C Section 15.209 CFR47 FCC Part 15: Subpart B Section 15.107 CFR47 FCC Part 15: Subpart B Section 15.109
Test procedure	:	ANSI C63.10: 2013, ANSI C63.4: 2014

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 (s) of performance of tests	:	09 Nov. 2018 -20 May 2019
Date of Issue	:	20 May 2019
Test Result	:	**Pass**

Testing Engineer : Chris Chen
(Chris Chen)

Technical Manager : Sunday Hu
(Sunday Hu)

Authorized Signatory : Vita Li
(Vita Li)

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Revision History

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	20 May 2019	STS1904154W01	ALL	Initial Issue

1 SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

KDB 558074 D01 15.247 Meas Guidance v05r02

FCC Part 15,Subpart C			
StandardSection	**Test Item**	**Judgment**	**Remark**
FCC Part 15.207(a)	Conducted Emission	PASS	
FCC Part 15.247(a)(2)	6dB Bandwidth	PASS	
FCC Part 15.247(b)(3)	Output Power	PASS	
FCC Part 15.247(d)	Radiated Spurious Emission	PASS	
FCC Part 15.247(d)	Conducted Spurious & Band EdgeEmission	PASS	
FCC Part 15.247(e)	Power Spectral Density	PASS	
FCC Part 15.205	Restricted Band Edge Emission	PASS	
FCC Part 15.247(d)&15.209(a)	Band Edge Emission	PASS	
FCC Part 15.247(b)(4) &15.203	Antenna Requirement	PASS	

FCC Part 15,Subpart B			
StandardSection	**Test Item**	**Judgment**	**Remark**
FCC Part 15.107(a)	Conducted Emission	PASS	Class B limit
FCC Part 15.109(a))	Radiated Emission	PASS	Class B limit

NOTE:

1) 'N/A' denotes test is not applicable in this test report
2) All tests were performed according to the procedures in ANSI C63.10: 2013 and ANSI C63.4: 2014.

1.1 TEST FACTORY

FCC:
Shenzhen STS Test Services Co., Ltd.
Add.: 1/F., Building B, Zhuoke Science Park, No.190,Chongqing Road, Fuyong Street, Bao'an District, Shenzhen, Guangdong,China
FCC Registration No.: CN1203
A2LA Certificate No.: 4338.01

1.2 MEASUREMENT UNCERTAINTY

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

No.	Item	Uncertainty
1	RF output power, conducted	±0.71dB
2	Unwanted Emissions, conducted	±0.63dB
3	All emissions, radiated 30-200MHz	±3.43dB
4	All emissions, radiated 200MHz-1GHz	±3.57dB
5	All emissions, radiated>1G	±4.13dB
6	Conducted Emission (9KHz-150KHz)	±3.18dB
7	Conducted Emission (150KHz-30MHz)	±2.70dB

2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

Product Name	EL-SC-100
Trade Name	ELAN
Model Name	EL-SC-100
Series Model	N/A
Model Difference	N/A
Product Description	The EUT is a EL-SC-100 which supports Wi-Fi 802.11 b/g/n wireless technology. Operation Frequency: 2412 - 2462 MHz for 802.11b/g/n(HT20) Modulation Type: DSSS(DBPSK/DQPSK/CCK) OFDM(BPSK/QPSK/16QAM/64QAM) Bit Rate of Transmitter: 1/2/5.5/11 Mbps for 802.11b 6/9/12/18/24/36/48/54 Mbps for 802.11g MCS0 ~ MCS7 for 802.11n Number Of Channel: 11 channels for 802.11b/g/n(HT20) Antenna Designation: Please see Note 4 AntennaGain(dBi): 3.5dBi Duty Cycle: >98%
Channel List	Please refer to the Note 2.
Power Rating	DC 12V@1000mA via AC/DC adapter POE Interface
Adapter	Model: SEI1201000P Input: AC 100-240V~50/60Hz,0.5A Output: 12V@1000mA
Hardware version	N/A
Software version	N/A
Radio Hardware version	N/A
Radio Software version	N/A
Test Software	N/A
RF Power Setting TEST Software (power class)	N/A
Connecting I/O Port(s)	Please refer to the User's Manual

Note:

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

2

RF Channel and Frequency of Wi-Fi 802.11 b/g/n	
802.11b/g/n (HT20)	
RF Channel	**Freq.(MHz)**
01	**2412**
02	2417
03	2422
04	2427
05	2432
06	**2437**
07	2442
08	2447
09	2452
10	2457
11	**2462**

3 Note:

1) In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, themiddle frequency, and the highest frequency of channel were selected to perform the test;
2) Test frequencies are lowest channel: 2412 MHz, middle channel: 2437 MHz and highest channel: 2462 MHz for 802.11b/g/n(HT20)

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Ant	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	ELAN	EL-SC-100	Integral FPC Antenna	N/A	3.5	WLAN Antenna

2.2 DESCRIPTION OF TEST MODES

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

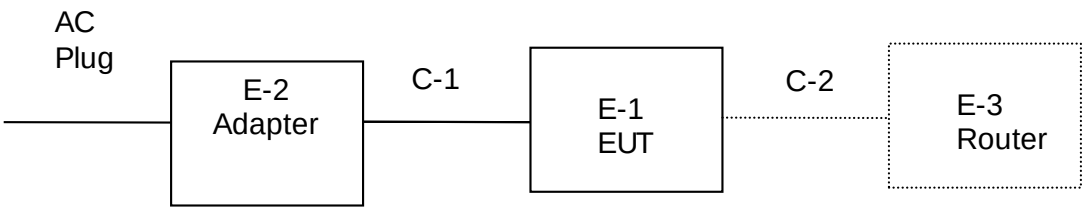
Worst Mode	Description	Data Rate
Mode 1	TX IEEE 802.11b CH1	1 Mbps
Mode 2	TX IEEE 802.11b CH6	1 Mbps
Mode 3	TX IEEE 802.11b CH11	1 Mbps
Mode 4	TX IEEE 802.11g CH1	6 Mbps
Mode 5	TX IEEE 802.11g CH6	6 Mbps
Mode 6	TX IEEE 802.11g CH11	6 Mbps
Mode 7	TX IEEE 802.11n HT20 CH1	MCS 0
Mode 8	TX IEEE 802.11n HT20 CH6	MCS 0
Mode 9	TX IEEE 802.11n HT20 CH11	MCS 0
Mode10	Wi-Fi transmitting mode	/
Mode 11	Data transfer of RJ45 port (Adapter)	/
Mode 12	Data transfer of RJ45 port（POE Interface)	/

Note:

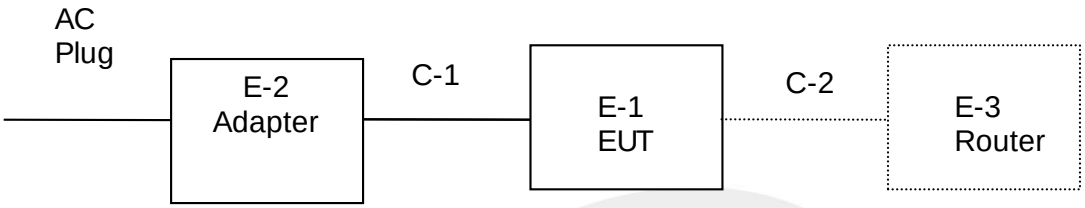
1) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported
2) We have be tested for all avaiable U.S. voltage and frequencies(For 120V,50/60Hz and 240V, 50/60Hz) for which the device is capable of operation, and the worst case of 120V/60Hz is shown in the report.
3) Controlled using a bespoke application on the laptop PC supplied by the customer. The application was used to enable a continuous transmission mode and to select the test channels, data rates and modulation schemes as required.

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiation Test Set



Conduction Test Set



2.4 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS

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

Necessary accessories

Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note
E-2	Adapter	Helms-MAN	SE11201000P	N/A	N/A
\	EU plug	Helms-MAN	N/A	N/A	N/A
\	UK plug	Helms-MAN	N/A	N/A	N/A
Item	**Shielded Type**	**Ferrite Core**	**Length**	**Note**	
C-1	Adapter DC cable	NO	160cm	N/A	

Support units

Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note
\	Router	TP-LINK	TL-WR710N	N/A	N/A
\	PoE Injector	TP-LINK	TL-POE150S	N/A	N/A
\	Adapter	TP-LINK	T480050-2A1	N/A	N/A
\	Monitor	ThinkVision	X1 (2nd Gen)	N/A	N/A
\	Contact Sensor	ELAN	N/A	N/A	N/A
\	Infrared emitter	ELAN	N/A	N/A	N/A
\	Headset	OPPO	HiFi	N/A	N/A
\	Ethernet cable	YES	60cm	N/A	
\	Ethernet cable	YES	60cm	N/A	
\	Ethernet cable	NO	100cm	N/A	
\	HDMI cable	YES	100cm	N/A	
\	RS-232 cable	NO	100cm	N/A	

Note:

1) The support equipment was authorized by Declaration of Confirmation.
2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.

2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
Test Receiver	R&S	ESCI	101427	2018.10.13	2019.10.12
Signal Analyzer	Agilent	N9020A	MY51110105	2019.03.02	2020.03.01
Active loop Antenna	ZHINAN	ZN30900C	16035	2018.03.11	2021.03.10
Bilog Antenna	TESEQ	CBL6111D	34678	2017.11.02	2020.11.1
Horn Antenna	SCHWARZBECK	BBHA 9120D(1201)	9120D-1343	2018.10.19	2021.10.18
SHF-EHF Horn Antenna (18G-40GHz)	A-INFO	LB-180400-KF	J211020657	2018.03.11	2021.03.10
Pre-Amplifier (0.1M-3GHz)	EM	EM330	060665	2018.10.13	2019.10.12
Pre-Amplifier (1G-18GHz)	SKET	LNPA-01018G-45	SK2018080901	2018.10.13	2019.10.12
Temperature & Humidity	HH660	Mieo	N/A	2018.10.11	2019.10.10
turn table	EM	SC100_1	60531	N/A	N/A
Antenna mast	EM	SC100	N/A	N/A	N/A
Test SW	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	2018.10.13	2019.10.12
LISN	R&S	ENV216	101242	2018.10.11	2019.10.10
LISN	EMCO	3810/2NM	23625	2018.10.11	2019.10.10
Temperature & Humidity	HH660	Mieo	N/A	2018.10.11	2019.10.10
Test SW	FARAD	EZ-EMC(Ver.STSLAB-03A1 CE)			

RF Connected Test

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

Note:
The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

3 EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION LIMITS

operating frequency band. In case the emission fall within the restricted band specified on Part 15. 207(a), 107(a) limit in the table below has to be followed.
This item was performed according to the procedures in ANSI C63.10: 2013 and ANSI C63.4: 2014.

FREQUENCY (MHz)	Conducted Emissionlimit (dBuV)	
	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

Note:

1) The tighter limit applies at the band edges.
2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

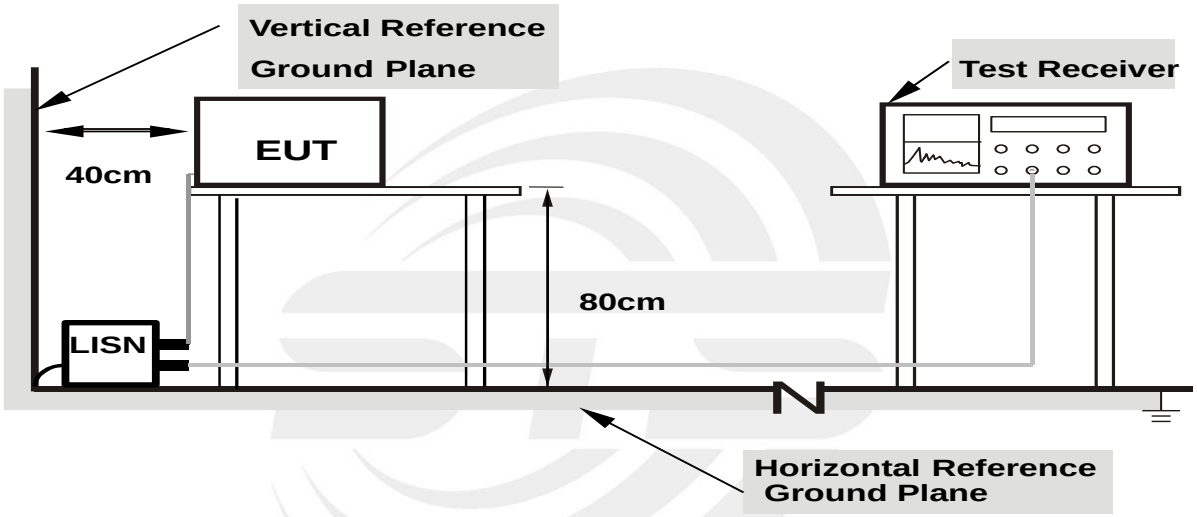
The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.1.2 TEST PROCEDURE

a. The EUT was 0.8 meters from the horizontal ground plane and 0.4 meters from the vertical ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 TEST SETUP



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.1.4 EUT OPERATING CONDITIONS

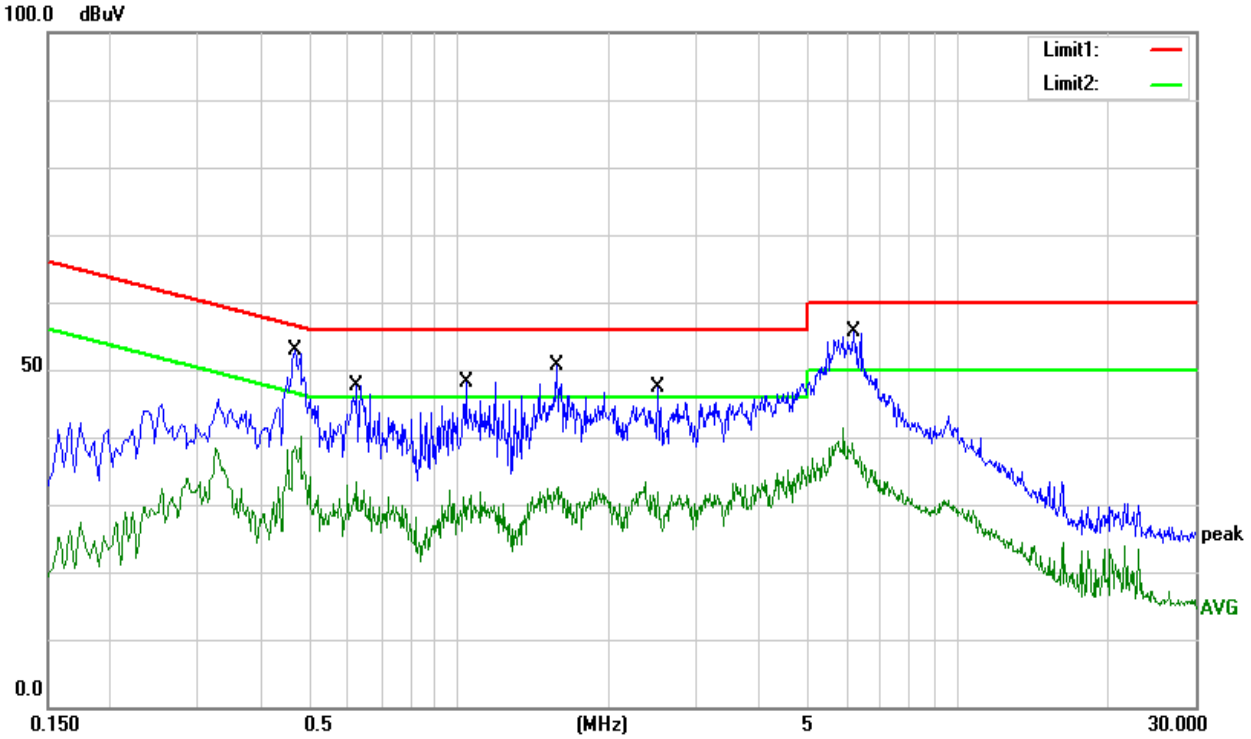
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

3.1.5 TEST RESULT

Temperature:	23.8℃	Relative Humidity:	62%
Test Voltage:	AC 120V/60Hz	Phase:	L
Test Mode:	Mode 10		

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
0.4700	32.30	20.48	52.78	56.51	-3.73	QP
0.4700	19.57	20.48	40.05	46.51	-6.46	AVG
0.6260	27.35	20.34	47.69	56.00	-8.31	QP
0.6260	13.16	20.34	33.50	46.00	-12.50	AVG
1.0340	27.97	20.16	48.13	56.00	-7.87	QP
1.0340	11.83	20.16	31.99	46.00	-14.01	AVG
1.5700	30.55	20.10	50.65	56.00	-5.35	QP
1.5700	12.55	20.10	32.65	46.00	-13.35	AVG
2.5060	27.26	20.02	47.28	56.00	-8.72	QP
2.5060	11.44	20.02	31.46	46.00	-14.54	AVG
6.1980	35.82	19.89	55.71	60.00	-4.29	QP
6.1980	17.58	19.89	37.47	50.00	-12.53	AVG

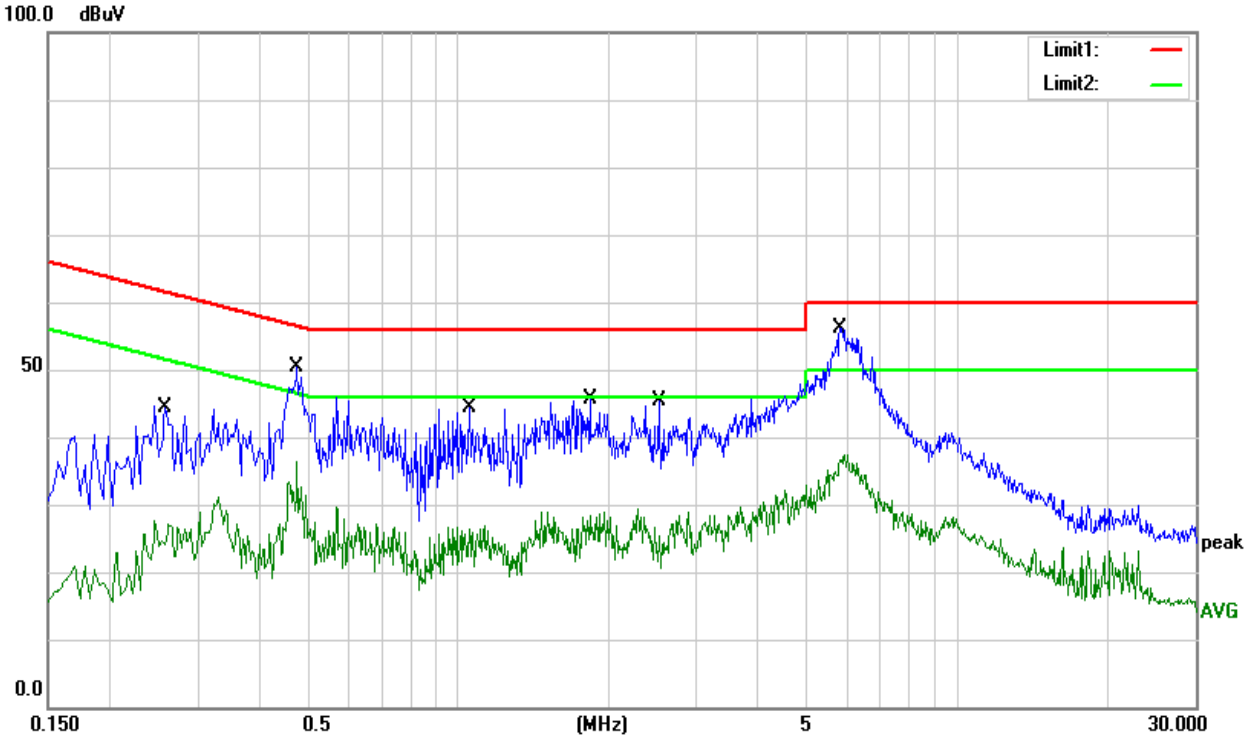
Remark:
1. All readings are Quasi-Peak and Average values.
2. Margin = Result (Result =Reading + Factor)–Limit



Temperature:	23.8℃	Relative Humidity:	62%
Test Voltage:	AC 120V/60Hz	Phase:	N
Test Mode:	Mode 10		

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
0.2580	23.82	20.52	44.34	61.50	-17.16	QP
0.2580	10.63	20.52	31.15	51.50	-20.35	AVG
0.4740	29.82	20.48	50.30	56.44	-6.14	QP
0.4740	12.06	20.48	32.54	46.44	-13.90	AVG
1.0500	24.14	20.16	44.30	56.00	-11.70	QP
1.0500	6.66	20.16	26.82	46.00	-19.18	AVG
1.8340	25.49	20.07	45.56	56.00	-10.44	QP
1.8340	9.19	20.07	29.26	46.00	-16.74	AVG
2.5180	25.47	20.02	45.49	56.00	-10.51	QP
2.5180	8.75	20.02	28.77	46.00	-17.23	AVG
5.8180	36.24	19.90	56.14	60.00	-3.86	QP
5.8180	17.51	19.90	37.41	50.00	-12.59	AVG

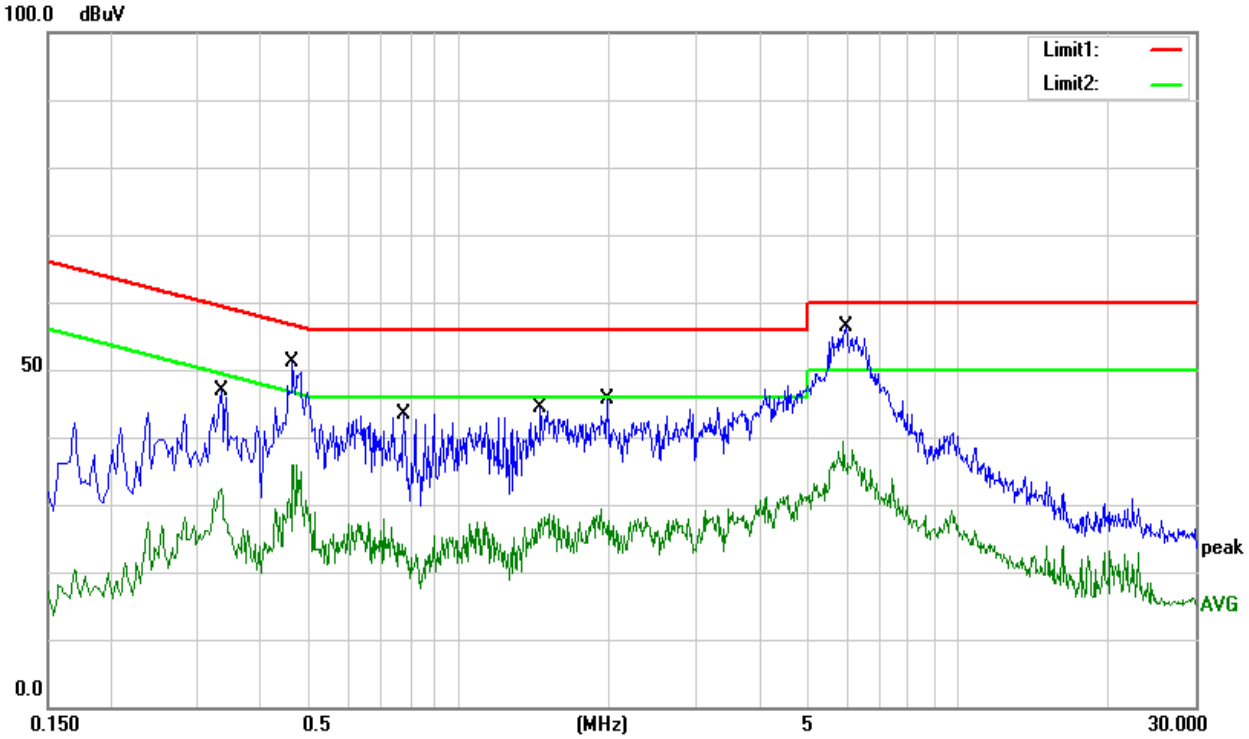
Remark:
1. All readings are Quasi-Peak and Average values.
2. Margin = Result (Result =Reading + Factor)–Limit



Temperature:	23.8℃	Relative Humidity:	62%
Test Voltage:	AC 120V/60Hz	Phase:	N
Test Mode:	Mode 11 (Part 15B)		

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
0.3340	26.09	20.68	46.77	59.35	-12.58	QP
0.3340	11.73	20.68	32.41	49.35	-16.94	AVG
0.4660	30.60	20.46	51.06	56.58	-5.52	QP
0.4660	15.54	20.46	36.00	46.58	-10.58	AVG
0.7780	23.14	20.24	43.38	56.00	-12.62	QP
0.7780	7.25	20.24	27.49	46.00	-18.51	AVG
1.4620	24.21	20.15	44.36	56.00	-11.64	QP
1.4620	9.24	20.15	29.39	46.00	-16.61	AVG
1.9860	25.43	20.15	45.58	56.00	-10.42	QP
1.9860	8.10	20.15	28.25	46.00	-17.75	AVG
5.9780	36.34	19.93	56.27	60.00	-3.73	QP
5.9780	19.35	19.93	39.28	50.00	-10.72	AVG

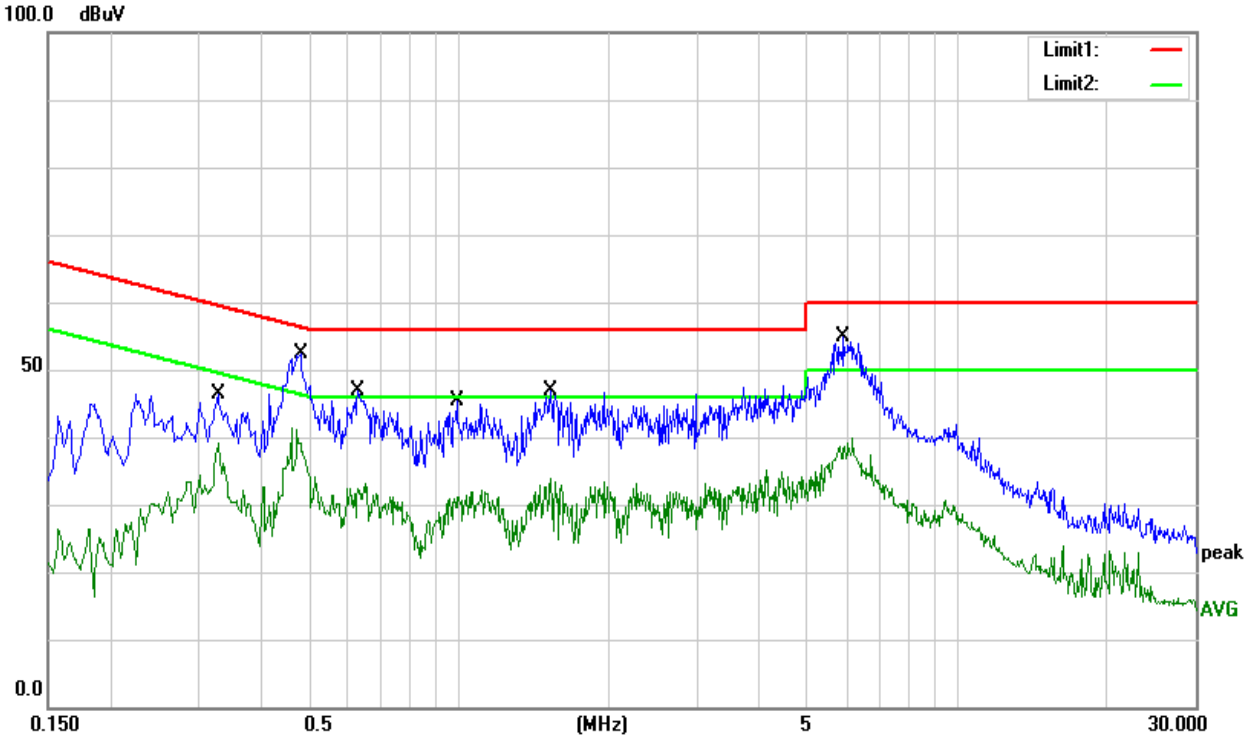
Remark:
1. All readings are Quasi-Peak and Average values.
2. Margin = Result (Result =Reading + Factor)–Limit



Temperature:	23.8℃	Relative Humidity:	62%
Test Voltage:	AC 120V/60Hz	Phase:	L
Test Mode:	Mode 11 (Part 15B)		

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
0.3300	25.70	20.66	46.36	59.45	-13.09	QP
0.3300	18.45	20.66	39.11	49.45	-10.34	AVG
0.4820	31.85	20.48	52.33	56.30	-3.97	QP
0.4820	20.69	20.48	41.17	46.30	-5.13	AVG
0.6300	26.53	20.34	46.87	56.00	-9.13	QP
0.6300	12.73	20.34	33.07	46.00	-12.93	AVG
0.9900	25.19	20.16	45.35	56.00	-10.65	QP
0.9900	11.98	20.16	32.14	46.00	-13.86	AVG
1.5340	26.74	20.11	46.85	56.00	-9.15	QP
1.5340	13.66	20.11	33.77	46.00	-12.23	AVG
5.9020	34.87	19.90	54.77	60.00	-5.23	QP
5.9020	20.00	19.90	39.90	50.00	-10.10	AVG

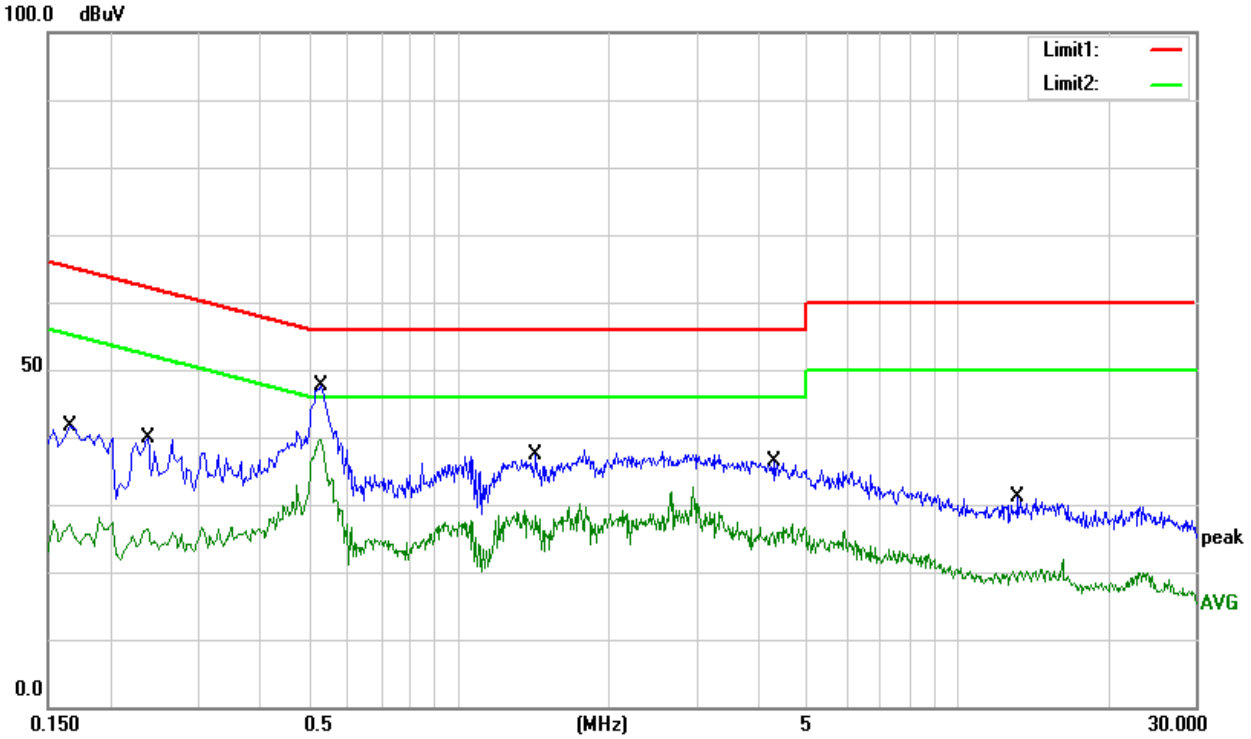
Remark:
1. All readings are Quasi-Peak and Average values.
2. Margin = Result (Result =Reading + Factor)–Limit



Temperature:	23.8℃	Relative Humidity:	62%
Test Voltage:	POE Interface	Phase:	N
Test Mode:	Mode 12 (Part 15B)		

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
0.1660	21.34	20.23	41.57	65.16	-23.59	QP
0.1660	7.82	20.23	28.05	55.16	-27.11	AVG
0.2380	19.46	20.49	39.95	62.17	-22.22	QP
0.2380	5.79	20.49	26.28	52.17	-25.89	AVG
0.5300	27.27	20.40	47.67	56.00	-8.33	QP
0.5300	19.34	20.40	39.74	46.00	-6.26	AVG
1.4260	17.27	20.16	37.43	56.00	-18.57	QP
1.4260	8.40	20.16	28.56	46.00	-17.44	AVG
4.2700	16.21	20.05	36.26	56.00	-19.74	QP
4.2700	7.14	20.05	27.19	46.00	-18.81	AVG
13.2580	11.25	19.83	31.08	60.00	-28.92	QP
13.2580	2.05	19.83	21.88	50.00	-28.12	AVG

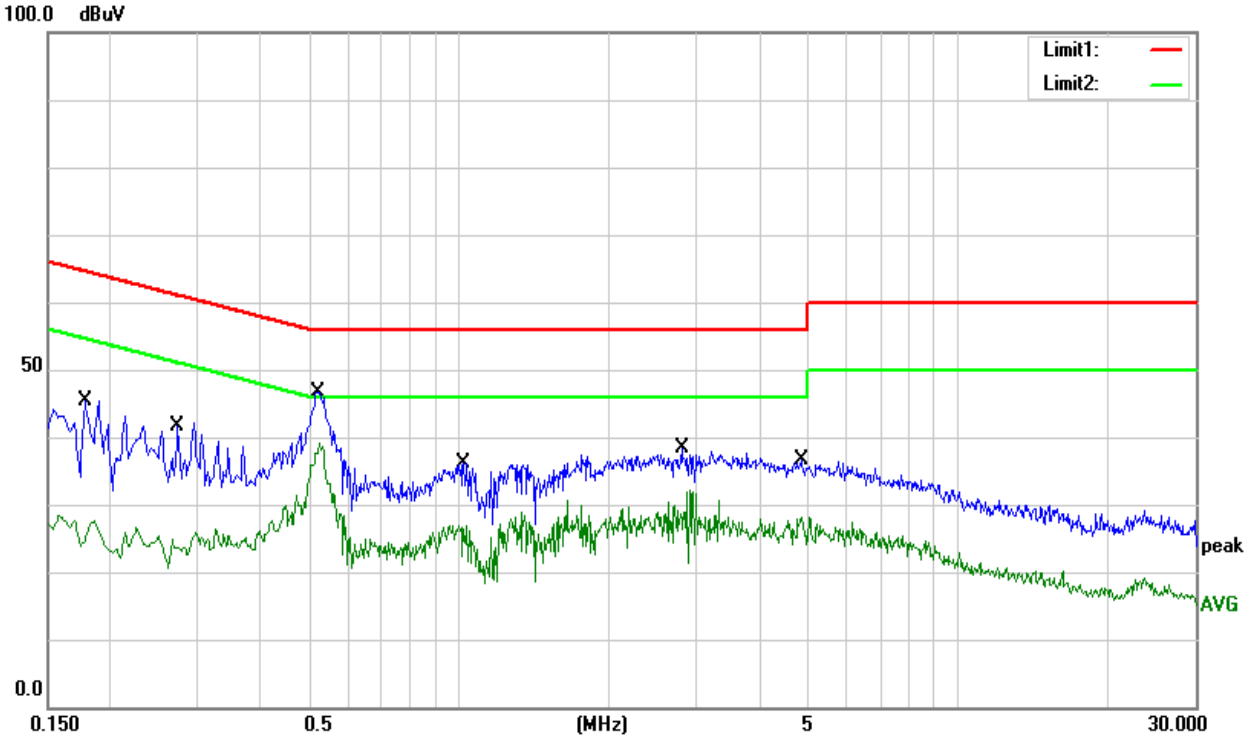
Remark:
1. All readings are Quasi-Peak and Average values.
2. Margin = Result (Result =Reading + Factor)–Limit



Temperature:	23.8℃	Relative Humidity:	62%
Test Voltage:	POE Interface	Phase:	L
Test Mode:	Mode 12 (Part 15B)		

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
0.1780	25.18	20.23	45.41	64.58	-19.17	QP
0.1780	7.35	20.23	27.58	54.58	-27.00	AVG
0.2740	20.96	20.59	41.55	61.00	-19.45	QP
0.2740	5.71	20.59	26.30	51.00	-24.70	AVG
0.5220	26.25	20.46	46.71	56.00	-9.29	QP
0.5220	18.62	20.46	39.08	46.00	-6.92	AVG
1.0260	16.08	20.16	36.24	56.00	-19.76	QP
1.0260	10.59	20.16	30.75	46.00	-15.25	AVG
2.8060	18.30	20.00	38.30	56.00	-17.70	QP
2.8060	10.69	20.00	30.69	46.00	-15.31	AVG
4.8660	16.59	19.95	36.54	56.00	-19.46	QP
4.8660	8.27	19.95	28.22	46.00	-17.78	AVG

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



3.2 RADIATED EMISSION MEASUREMENT

3.2.1 RADIATED EMISSION LIMITS

Frequencies (MHz)	Class A (at 10m) dBuV/m	Class B (at 3m) dBuV/m
30~88	39.0	40.0
88~216	43.5	43.5
216~960	46.5	46.0
Above 960	49.5	54.0

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Class A (dBuV/m) (at 3M)		Class B (dBuV/m) (at 3M)	
	PEAK	AVERAGE	PEAK	AVERAGE
Above 1000	80	60	74	54

Note:
1) The tighter limit applies at the band edges.
2) Emission level (dBuV/m)=20log Emission level (uV/m).

3.2.2 TEST PROCEDURE

a) The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.

b) The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.

c) The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 0.8 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d) The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.

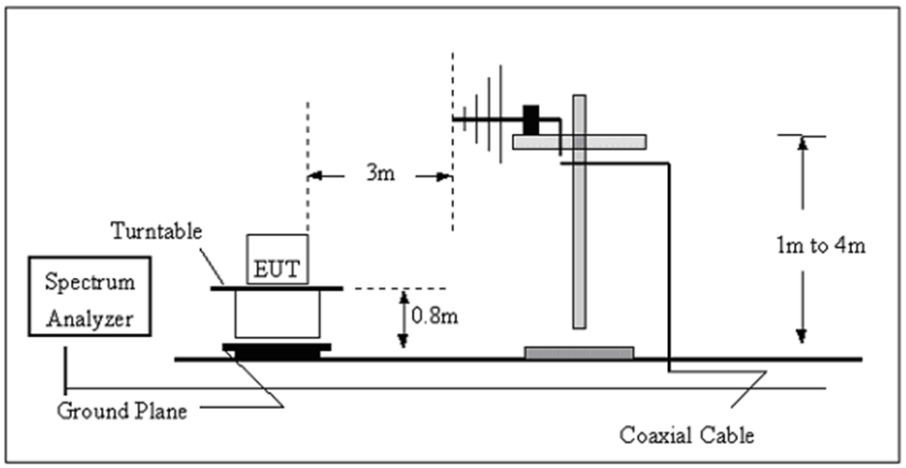
e) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.

f) For the actual test configuration, please refer to the related Item –EUT Test Photos.

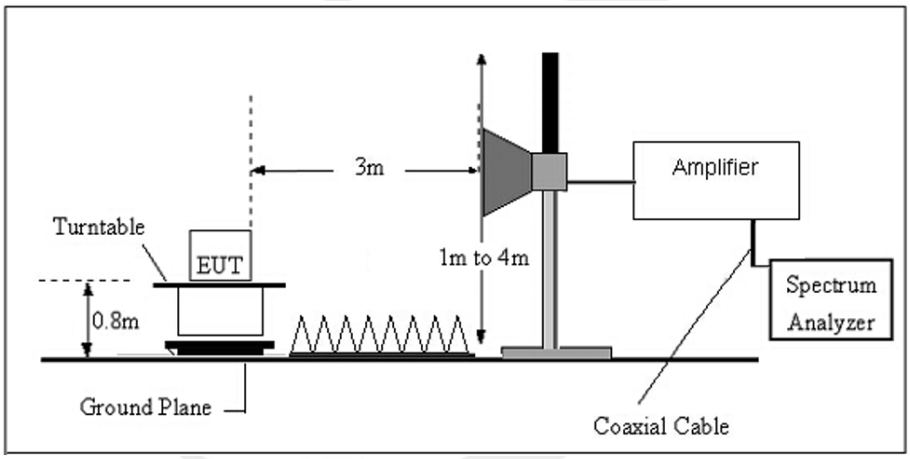
Note: Both horizontal and vertical antenna polarities were testedand performed pretest to three orthogonal axis. The worst case emissions were reported

3.2.3 TEST SETUP

a) Radiated Emission Test-Up Frequency 30MHz~1GHz



b) Radiated Emission Test-Up Frequency Above 1GHz



3.2.4 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.

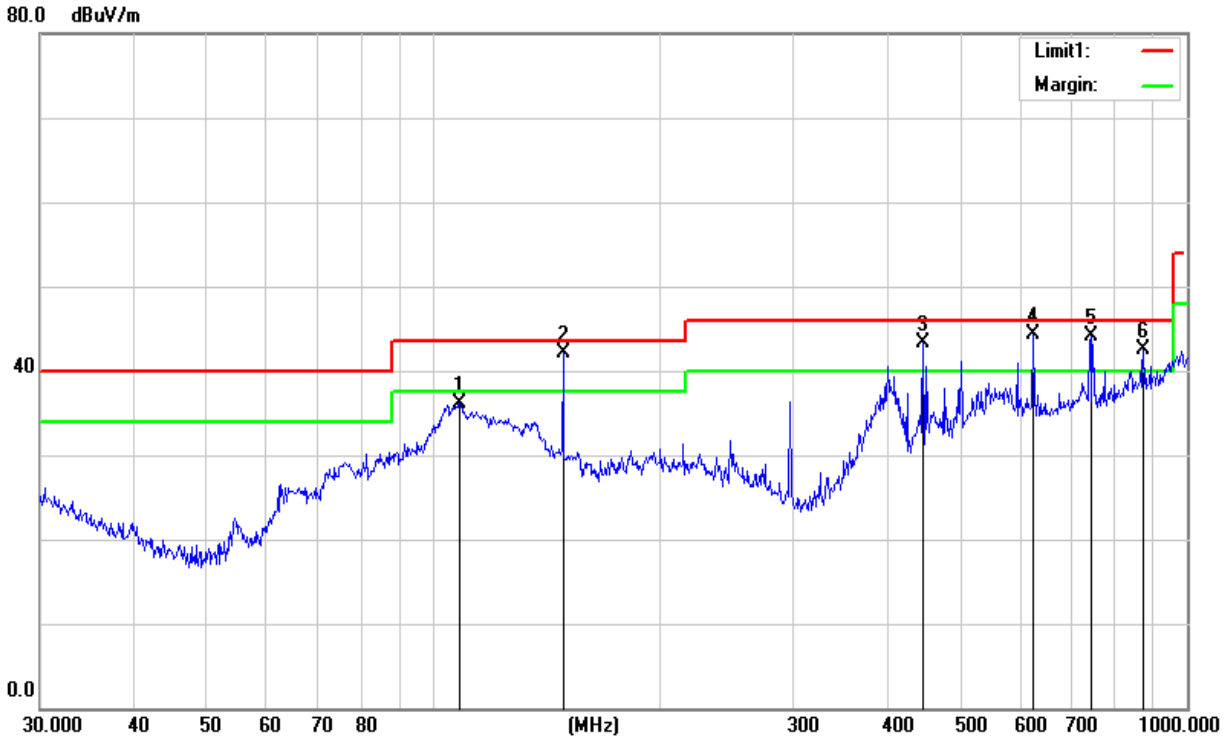
3.2.5 TEST RESULTS

Between 30-1000MHz:

Temperature:	23.3℃	Relative Humidity:	64%
Pressure:	1010hPa	Phase:	Horizontal
Test Voltage:	AC 120V/60Hz	Test Mode:	Mode 11 (Part 15B)

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	108.2667	23.15	12.95	36.10	43.50	-7.40	QP
2	148.4410	28.33	13.71	42.04	43.50	-1.46	QP
3	446.4141	21.33	21.97	43.30	46.00	-2.70	QP
4	625.0780	18.10	26.20	44.30	46.00	-1.70	QP
5	744.8661	14.82	29.20	44.02	46.00	-1.98	QP
6	875.2470	11.94	30.54	42.48	46.00	-3.52	QP

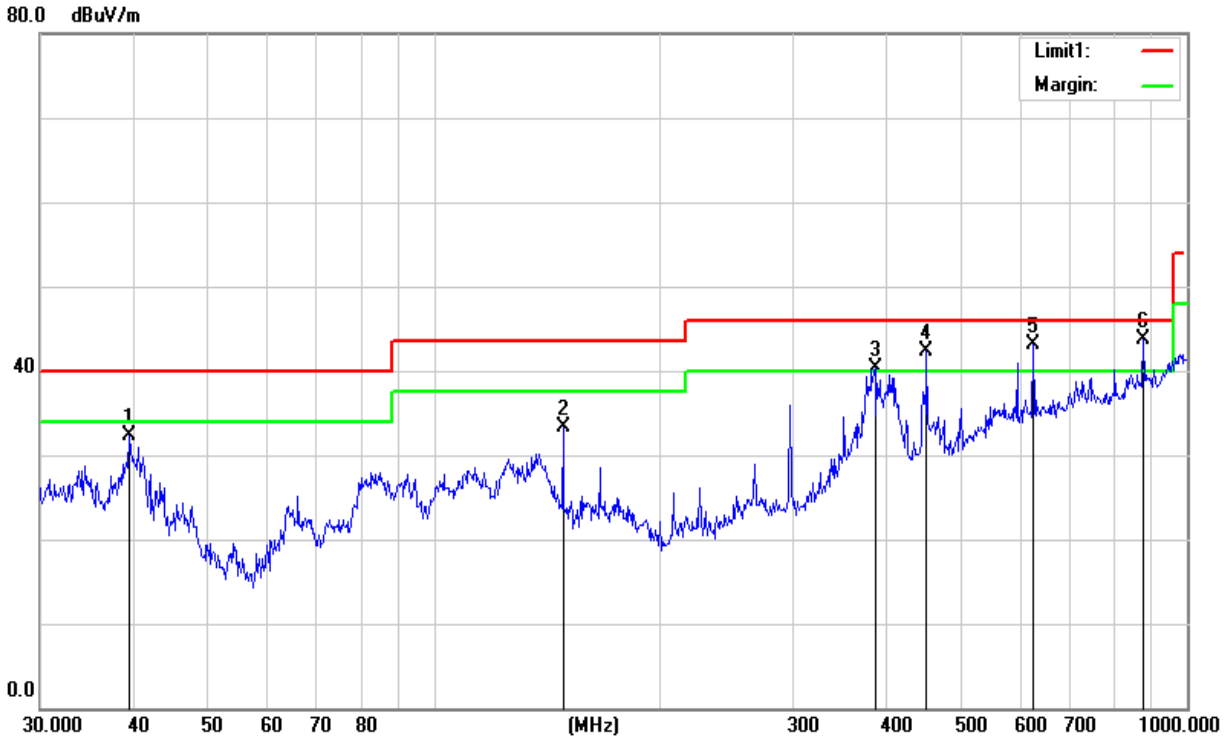
Remark:
1. All readings are Quasi-Peak .
2. Margin = Result (Result =Reading + Factor)–Limit



Temperature:	23.3℃	Relative Humidity:	64%
Pressure:	1010hPa	Phase:	Vertical
Test Voltage:	AC 120V/60Hz	Test Mode:	Mode 11 (Part 15B)

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	39.4371	17.71	14.66	32.37	40.00	-7.63	QP
2	148.4410	19.50	13.71	33.21	43.50	-10.29	QP
3	385.2805	20.21	20.01	40.22	46.00	-5.78	QP
4	451.1350	20.23	22.15	42.38	46.00	-3.62	QP
5	625.0780	16.84	26.20	43.04	46.00	-2.96	QP
6	875.2470	13.20	30.54	43.74	46.00	-2.26	QP

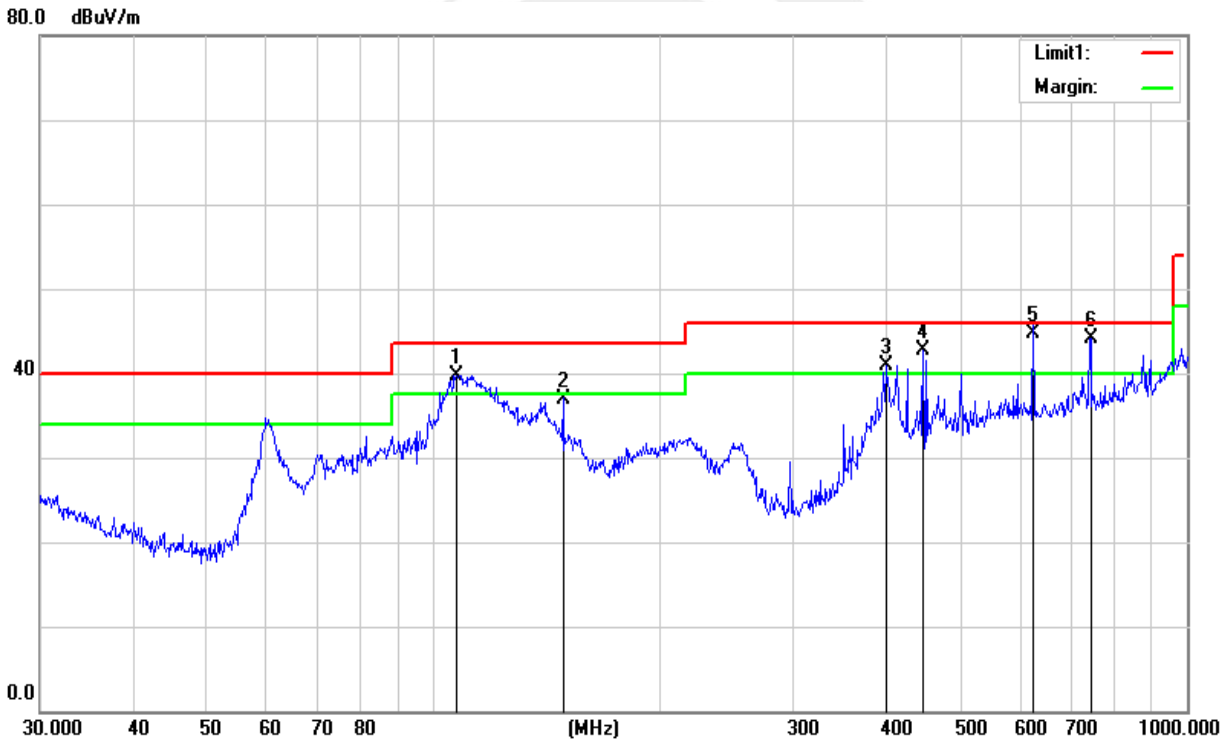
Remark:
1. All readings are Quasi-Peak .
2. Margin = Result (Result =Reading + Factor)–Limit



Temperature:	23.3℃	Relative Humidity:	64%
Pressure:	1010hPa	Phase:	Horizontal
Test Voltage:	POE Interface	Test Mode:	Mode 12 (Part 15B)

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	107.1337	26.95	12.83	39.78	43.50	-3.72	QP
2	148.4410	23.29	13.71	37.00	43.50	-6.50	QP
3	399.0302	20.12	20.81	40.93	46.00	-5.07	QP
4	446.4141	20.65	21.97	42.62	46.00	-3.38	QP
5	625.0180	18.42	26.20	44.62	46.00	-1.38	QP
6	744.8661	14.90	29.20	44.10	46.00	-1.90	QP

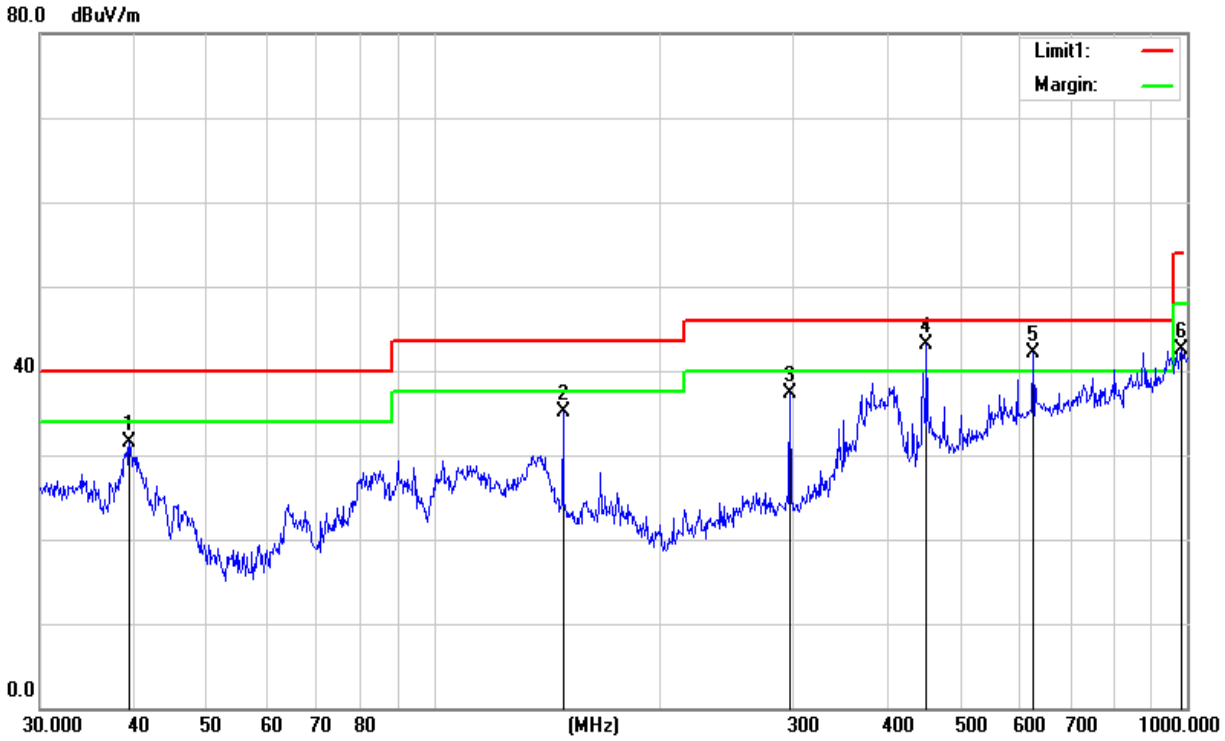
Remark:
1. All readings are Quasi-Peak .
2. Margin = Result (Result =Reading + Factor)–Limit



Temperature:	23.3℃	Relative Humidity:	64%
Pressure:	1010hPa	Phase:	Vertical
Test Voltage:	POE Interface	Test Mode:	Mode 12 (Part 15B)

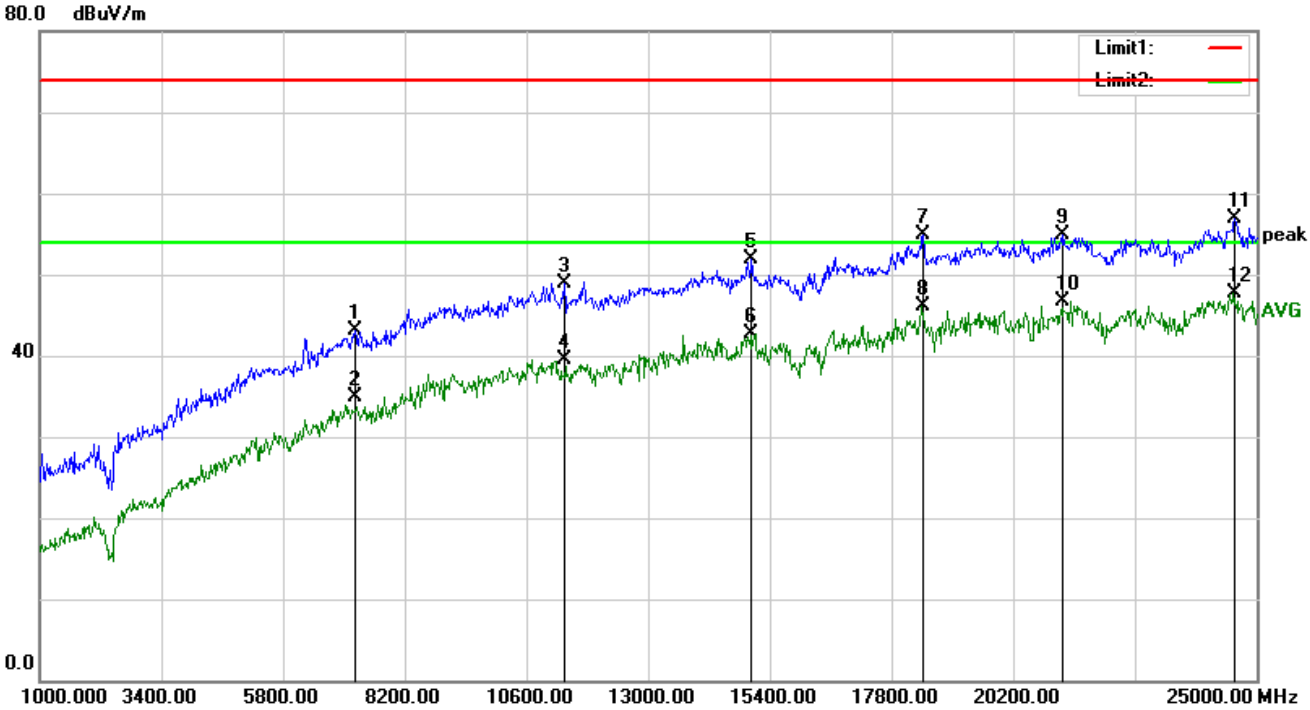
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	39.4371	16.75	14.66	31.41	40.00	-8.59	QP
2	148.4410	21.35	13.71	35.06	43.50	-8.44	QP
3	297.2241	20.25	17.02	37.27	46.00	-8.73	QP
4	451.1350	21.01	22.15	43.16	46.00	-2.84	QP
5	625.0780	15.83	26.20	42.03	46.00	-3.97	QP
6	982.6200	8.91	33.61	42.52	54.00	-11.48	QP

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



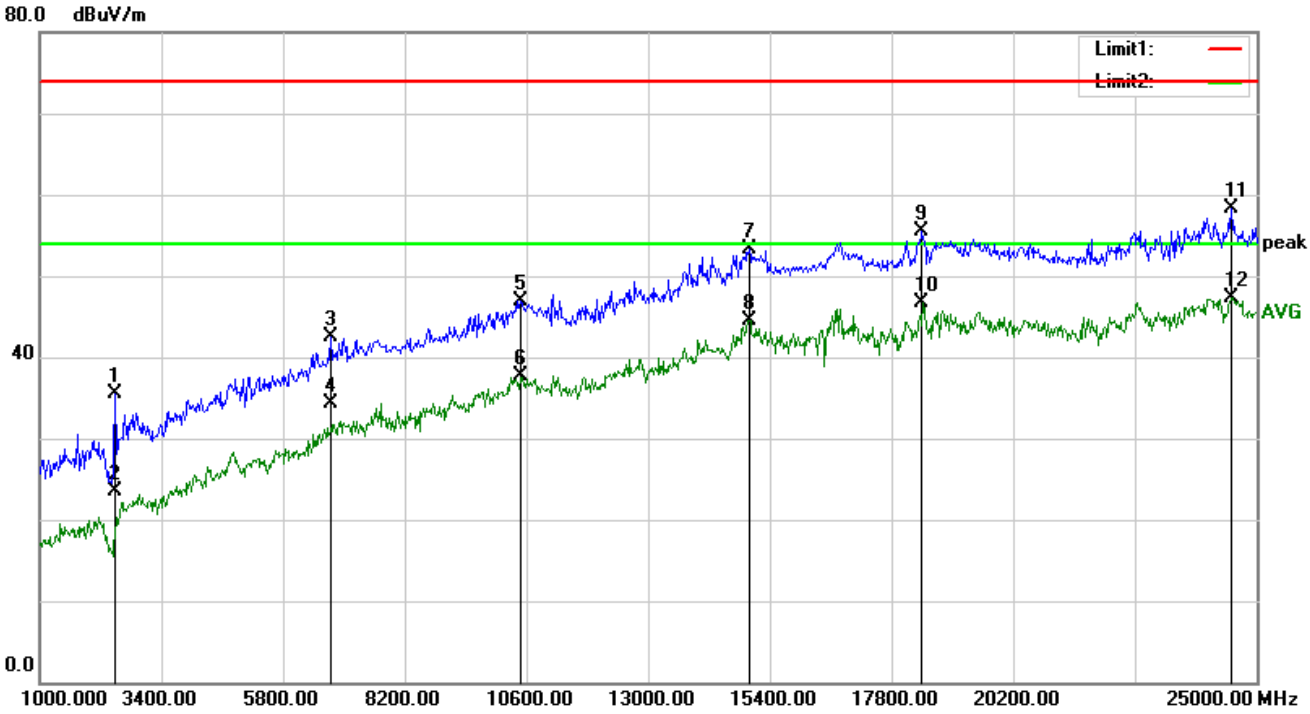
Above 1GHz:

Temperature:	22.4℃	Relative Humidity:	68%
Pressure:	1010hPa	Phase:	Horizontal
Test Voltage:	AC 120V/60Hz	Test Mode:	Mode 11 (Part 15B)



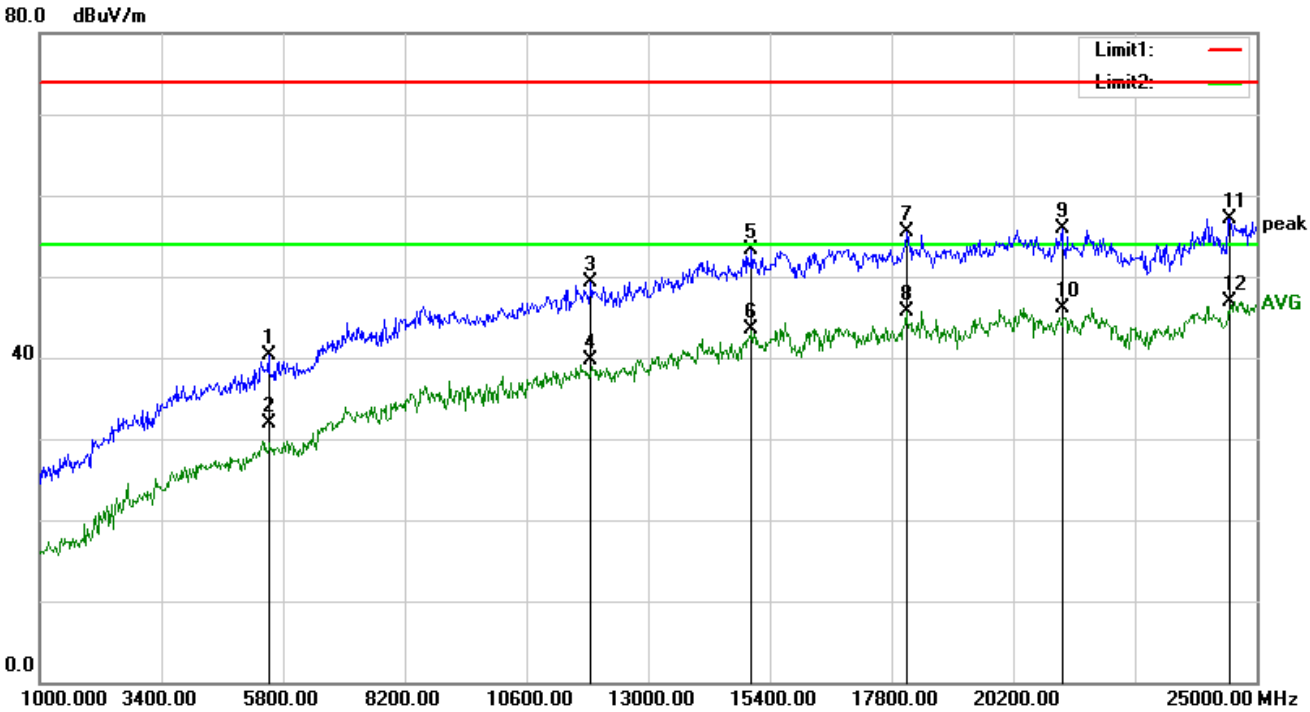
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7216.000	33.26	9.83	43.09	74.00	-30.91	peak
2	7216.000	25.06	9.83	34.89	54.00	-19.11	AVG
3	11344.000	9.77	39.19	48.96	74.00	-25.04	peak
4	11344.000	0.26	39.19	39.45	54.00	-14.55	AVG
5	15040.000	11.79	40.08	51.87	74.00	-22.13	peak
6	15040.000	2.54	40.08	42.62	54.00	-11.38	AVG
7	18424.000	54.92	0.00	54.92	74.00	-19.08	peak
8	18424.000	46.19	0.00	46.19	54.00	-7.81	AVG
9	21184.000	54.81	0.00	54.81	74.00	-19.19	peak
10	21184.000	46.76	0.00	46.76	54.00	-7.24	AVG
11	24568.000	56.87	0.00	56.87	74.00	-17.13	peak
12	24568.000	47.76	0.00	47.76	54.00	-6.24	AVG

Temperature:	22.4℃	Relative Humidity:	68%
Pressure:	1010hPa	Phase:	Vertical
Test Voltage:	AC 120V/60Hz	Test Mode:	Mode 11 (Part 15B)



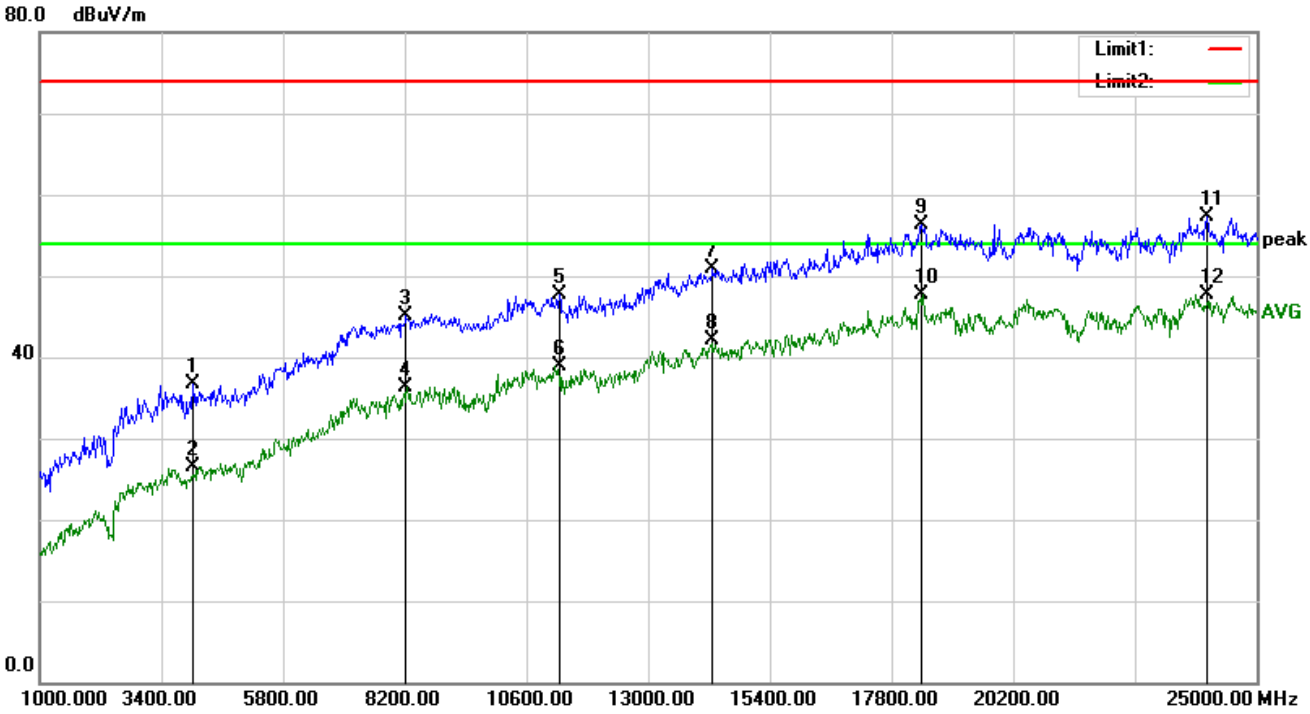
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2488.000	38.97	-3.50	35.47	74.00	-38.53	peak
2	2488.000	26.94	-3.50	23.44	54.00	-30.56	AVG
3	6736.000	34.12	8.30	42.42	74.00	-31.58	peak
4	6736.000	25.95	8.30	34.25	54.00	-19.75	AVG
5	10480.000	32.34	14.62	46.96	74.00	-27.04	peak
6	10480.000	23.08	14.62	37.70	54.00	-16.30	AVG
7	14992.000	13.12	40.21	53.33	74.00	-20.67	peak
8	14992.000	4.34	40.21	44.55	54.00	-9.45	AVG
9	18400.000	55.41	0.00	55.41	74.00	-18.59	peak
10	18400.000	46.80	0.00	46.80	54.00	-7.20	AVG
11	24496.000	58.35	0.00	58.35	74.00	-15.65	peak
12	24496.000	47.35	0.00	47.35	54.00	-6.65	AVG

Temperature:	22.4℃	Relative Humidity:	68%
Pressure:	1010hPa	Phase:	Horizontal
Test Voltage:	POE Interface	Test Mode:	Mode 12 (Part 15B)



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5512.000	35.36	4.94	40.30	74.00	-33.70	peak
2	5512.000	27.01	4.94	31.95	54.00	-22.05	AVG
3	11872.000	10.61	38.72	49.33	74.00	-24.67	peak
4	11872.000	1.04	38.72	39.76	54.00	-14.24	AVG
5	15040.000	13.30	40.08	53.38	74.00	-20.62	peak
6	15040.000	3.51	40.08	43.59	54.00	-10.41	AVG
7	18088.000	15.03	40.50	55.53	74.00	-18.47	peak
8	18088.000	5.19	40.50	45.69	54.00	-8.31	AVG
9	21160.000	15.40	40.50	55.90	74.00	-18.10	peak
10	21160.000	5.69	40.50	46.19	54.00	-7.81	AVG
11	24472.000	16.63	40.50	57.13	74.00	-16.87	peak
12	24472.000	6.44	40.50	46.94	54.00	-7.06	AVG

Temperature:	22.4℃	Relative Humidity:	68%
Pressure:	1010hPa	Phase:	Vertical
Test Voltage:	POE Interface	Test Mode:	Mode 12 (Part 15B)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4024.000	35.33	1.39	36.72	74.00	-37.28	peak
2	4024.000	25.18	1.39	26.57	54.00	-27.43	AVG
3	8224.000	33.94	11.12	45.06	74.00	-28.94	peak
4	8224.000	25.21	11.12	36.33	54.00	-17.67	AVG
5	11248.000	8.47	39.28	47.75	74.00	-26.25	peak
6	11248.000	-0.30	39.28	38.98	54.00	-15.02	AVG
7	14272.000	9.83	41.15	50.98	74.00	-23.02	peak
8	14272.000	0.86	41.15	42.01	54.00	-11.99	AVG
9	18376.000	15.76	40.50	56.26	74.00	-17.74	peak
10	18376.000	7.14	40.50	47.64	54.00	-6.36	AVG
11	24016.000	16.88	40.50	57.38	74.00	-16.62	peak
12	24016.000	7.11	40.50	47.61	54.00	-6.39	AVG

3.3 RADIATED SPURIOUS EMISSION MEASUREMENT

3.3.1 RADIATED EMISSION LIMITS

in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the Restricted band specified on Part15.205(a)&209(a) limit in the table and according to ANSI C63.10-2013 below has to be followed.

LIMITS OF RADIATED EMISSION MEASUREMENT (0.009MHz - 1000MHz)

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
Above 960	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (1000MHz-25GHz)

FREQUENCY (MHz)	(dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

(1) The limit for radiated test was performed according to FCC PART 15C.

(2) The tighter limit applies at the band edges.

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

For Radiated Emission

Spectrum Parameter	Setting
Attenuation	Auto
Detector	Peak/AV
Start Frequency	1000MHz(Peak/AV)
Stop Frequency	10th carrier hamonic(Peak/AV)
RB / VB (emission in restricted	1 MHz /3MHz

For Band edge

Spectrum Parameter	Setting
Detector	Peak/AV
Start/Stop Frequency	Lower Band Edge: 2300 to 2422 MHz Upper Band Edge: 2452to 2500 MHz
RB / VB (emission in restricted band)	1 MHz /3MHz

Receiver Parameter	Setting
Start ~ Stop Frequency	9kHz~90kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	90kHz~110kHz / RB 200Hz for QP
Start ~ Stop Frequency	110kHz~490kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	490kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.3.2 TEST PROCEDURE

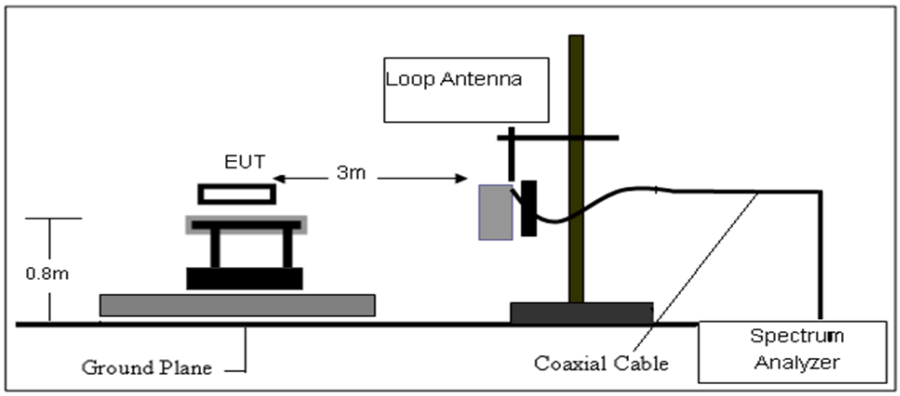
a) The measuring distance of at 3 m shall be used for measurements at frequency 0.009MHz up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b) The EUT was placed on the top of a rotating table 0.8 meters(above 1GHz is 1.5 m) above the ground at a 3 meter anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
c) The height of the equipment shall be 0.8 m(above 1GHz is 1.5 m); the height of the test antenna shall vary between 1 m to 4 m. Horizontal and vertical polarizations of the antenna are set to make the measurement
d) The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
e) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f) For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

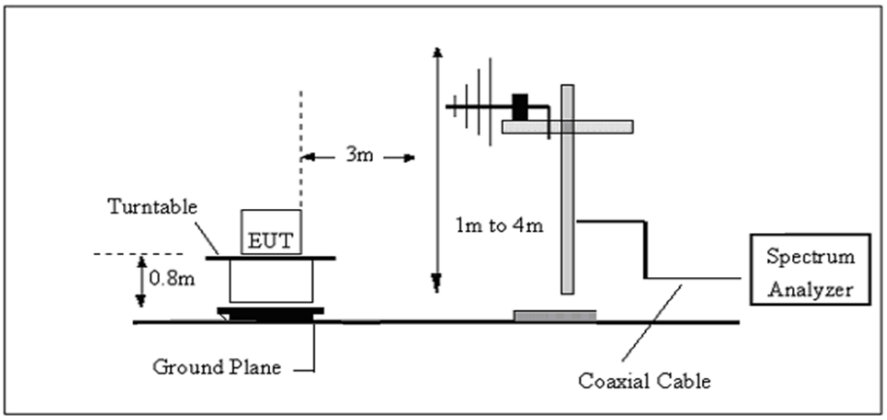
Both horizontal and vertical antenna polarities were testedand performed test to three orthogonal axis. The worst case emissions were reported

3.3.3 TEST SETUP

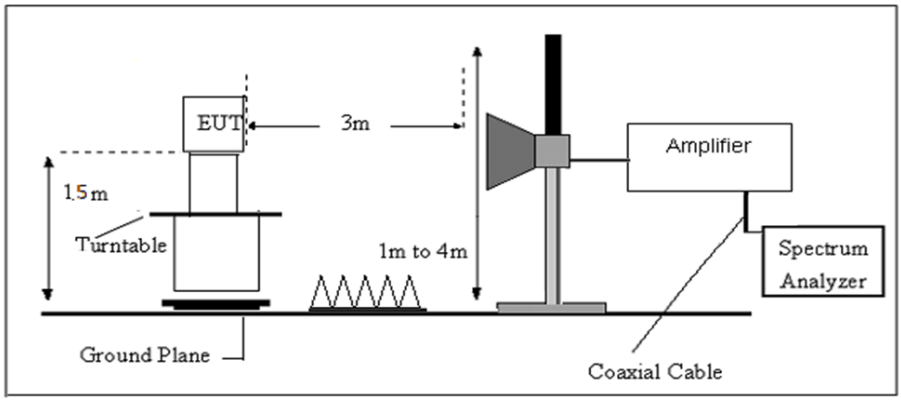
a) Radiated Emission Test-Up Frequency Below 30MHz



b) Radiated Emission Test-Up Frequency 30MHz~1GHz



c) Radiated Emission Test-Up Frequency Above 1GHz



3.3.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

3.3.5 FIELD STRENGTH CALCULATION

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting theAmplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:
FS = RA + AF + CL - AG
Where
FS = Field Strength
CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude
AG = Amplifier Gain
AF = Antenna Factor
For example

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

Factor=AF+CL-AG

3.3.6 TEST RESULT

9KHz-30MHz

Temperature：	23.3℃	Relative Humidtity：	64%
Test Voltage：	DC 12V	Polarization ：	--
Test Mode ：	TX Mode		

Freq.	Reading	Limit	Margin	State	Test Result
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F	
--	--	--	--	--	PASS
--	--	--	--	--	PASS

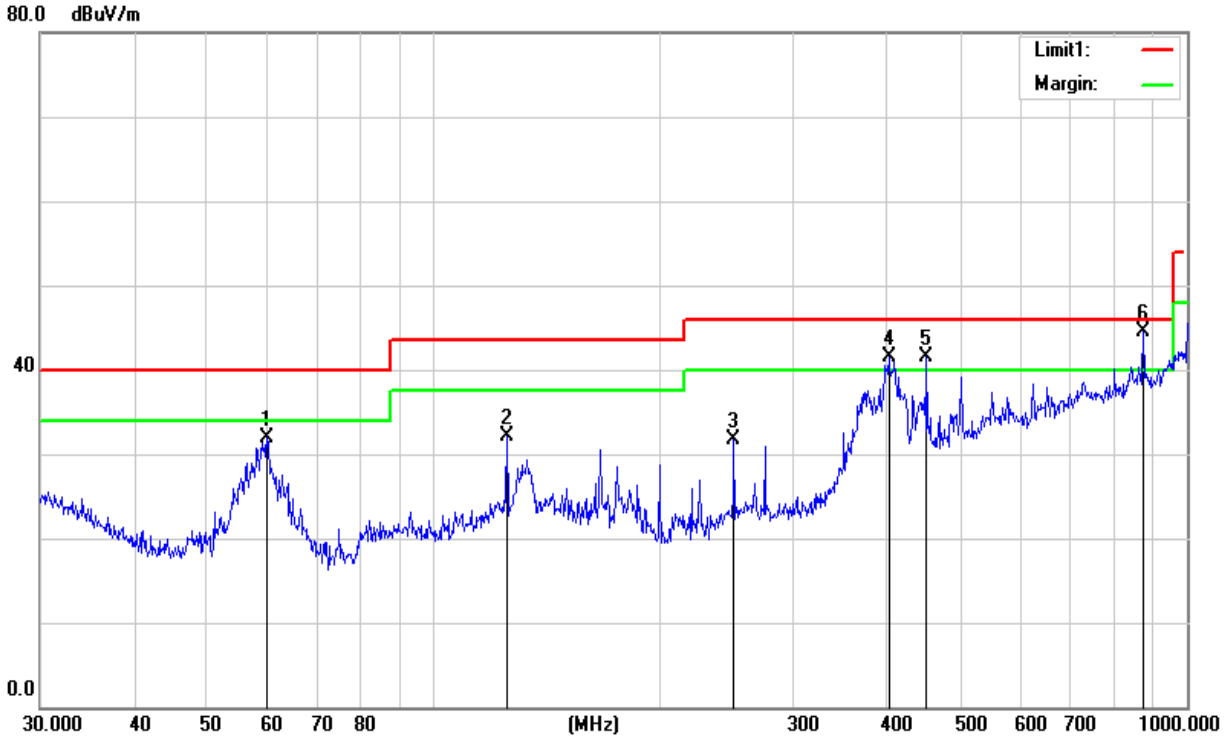
Note:
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
Distance extrapolation factor =40 log (specific distance/test distance)(dB);
Limit line = specific limits(dBuv) + distance extrapolation factor.

(30MHz - 1000MHz)

Temperature：	23.3℃	Relative Humidtity：	64%
Test Voltage：	AC 120/60Hz	Polarization ：	Horizontal
Test Mode ：	Mode 1/2/3/4/5/6/7/8/9 (Mode 4 worst mode)		

Frequency	Reading	Correct	Result	Limit	Margin	Remark
(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
60.0691	25.46	6.46	31.92	40.00	-8.08	QP
125.0066	18.10	14.02	32.12	43.50	-11.38	QP
250.3012	15.69	15.94	31.63	46.00	-14.37	QP
401.8385	20.53	20.95	41.48	46.00	-4.52	QP
451.1350	19.28	22.15	41.43	46.00	-4.57	QP
875.2470	13.87	30.54	44.41	46.00	-1.59	QP

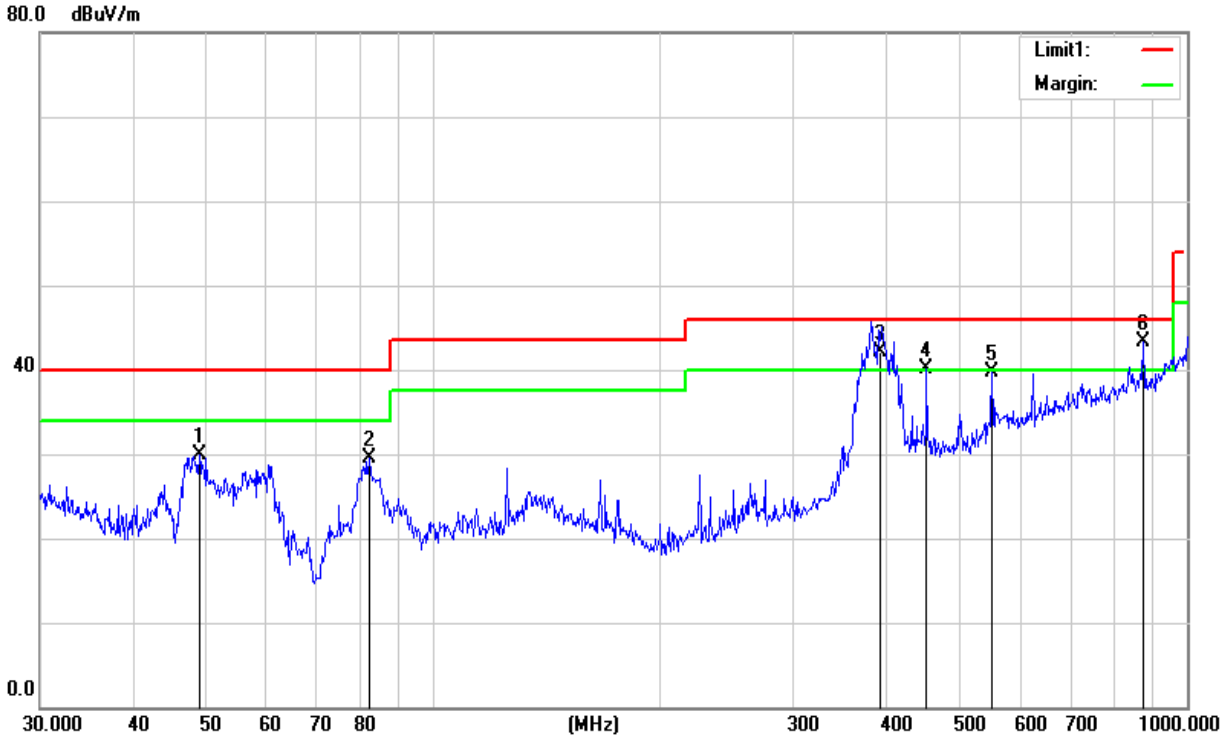
Remark:
1. Margin = Result (Result =Reading + Factor)–Limit



Temperature：	23.3℃	Relative Humidtity：	64%
Test Voltage：	AC 120/60Hz	Polarization ：	Vertical
Test Mode ：	Mode 1/2/3/4/5/6/7/8/9 (Mode 4 worst mode)		

Frequency	Reading	Correct	Result	Limit	Margin	Remark
(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
48.8430	20.18	9.71	29.89	40.00	-10.11	QP
82.0704	20.02	9.53	29.55	40.00	-10.45	QP
391.2344	21.72	20.42	42.14	46.00	-3.86	QP
451.1350	18.00	22.15	40.15	46.00	-5.85	QP
550.9480	13.88	25.82	39.70	46.00	-6.30	QP
875.2470	12.86	30.54	43.40	46.00	-2.60	QP

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

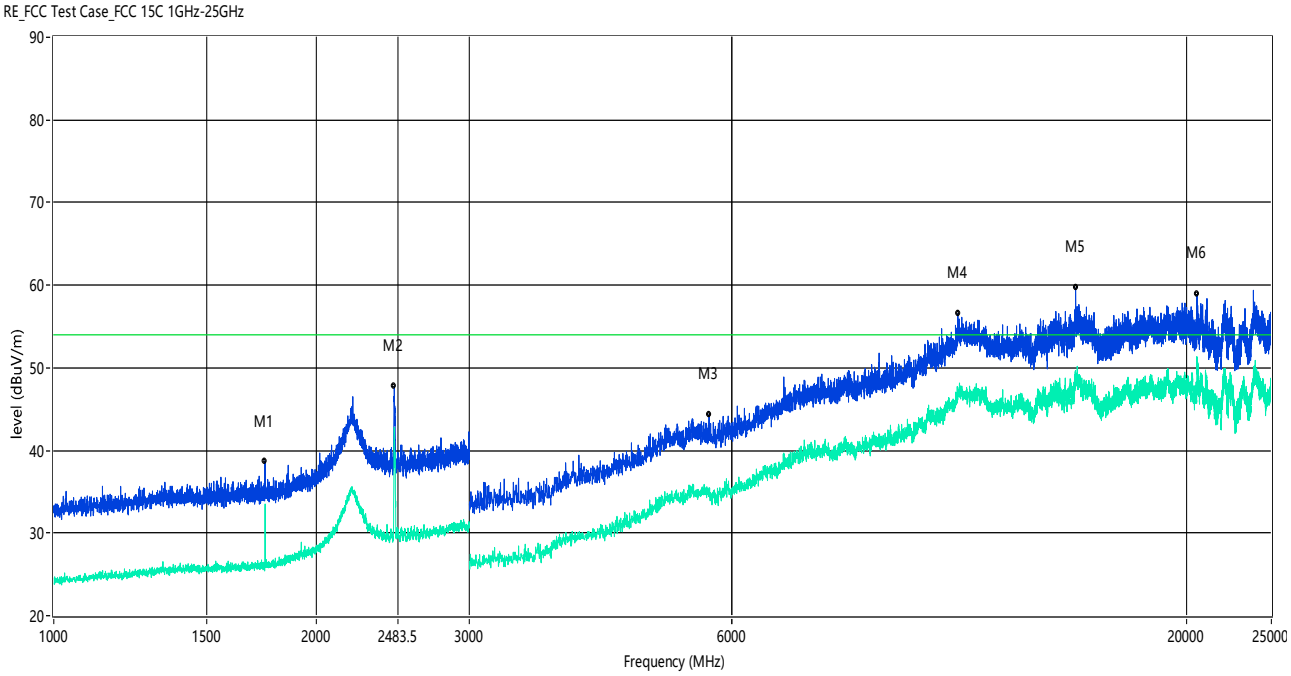


Restricted band and Spurious emission Requirements

(Above1GHz)

802.11b Low Channel

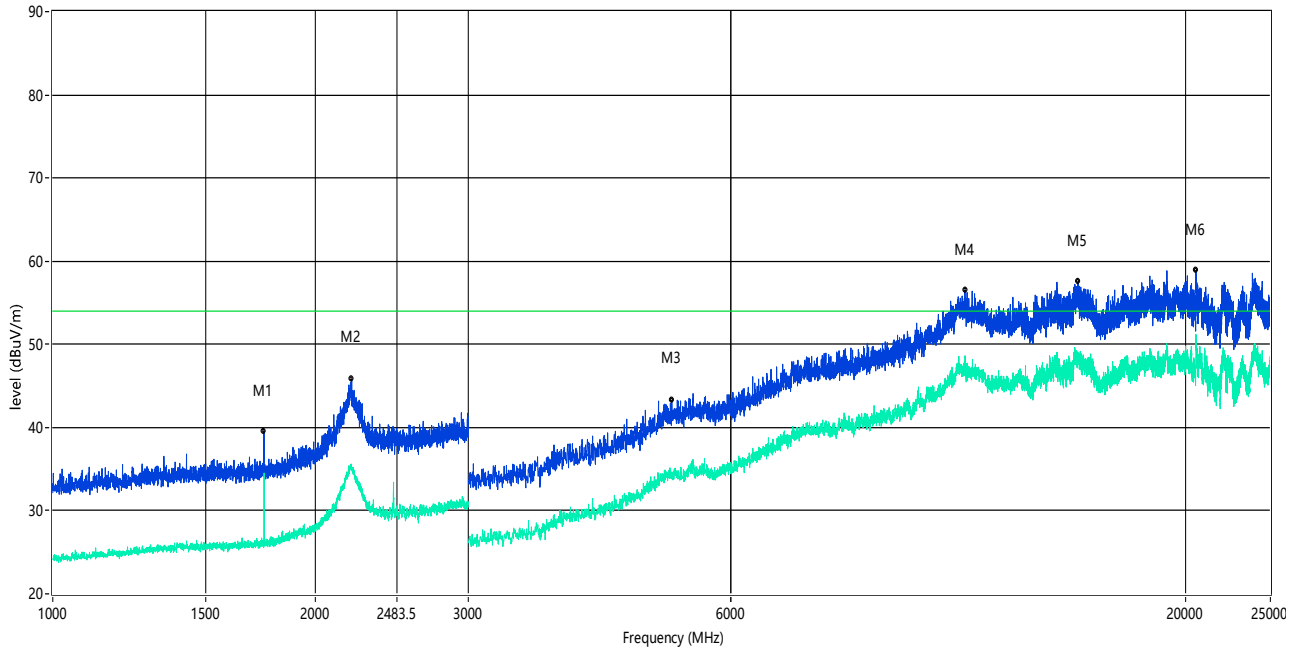
Temperature:	24℃	Relative Humidity:	63%
Pressure:	1010hPa	Phase:	Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	ANT	Verdict
1**	1748.000	32.96	-16.76	54.0	-21.04	AV	H	Pass
1	1748.000	38.75	-16.76	74.0	-35.25	Peak	H	Pass
2**	2460.000	42.79	-12.53	54.0	-11.21	AV	H	Pass
2	2460.000	47.77	-12.53	74.0	-26.23	Peak	H	Pass
3**	5655.000	35.47	-1.31	54.0	-18.53	AV	H	Pass
3	5655.000	44.37	-1.31	74.0	-29.63	Peak	H	Pass
4**	10915.000	46.70	10.62	54.0	-7.30	AV	H	Pass
4	10915.000	56.56	10.62	74.0	-17.44	Peak	H	Pass
5**	14901.250	48.97	12.63	54.0	-5.03	AV	H	Pass
5	14901.250	59.67	12.63	74.0	-14.33	Peak	H	Pass
6**	20541.000	51.26	14.09	54.0	-2.74	AV	H	Pass
6	20541.000	58.86	14.09	74.0	-15.14	Peak	H	Pass

Temperature:	24℃	Relative Humidity:	63%
Pressure:	1010hPa	Phase:	Vertical

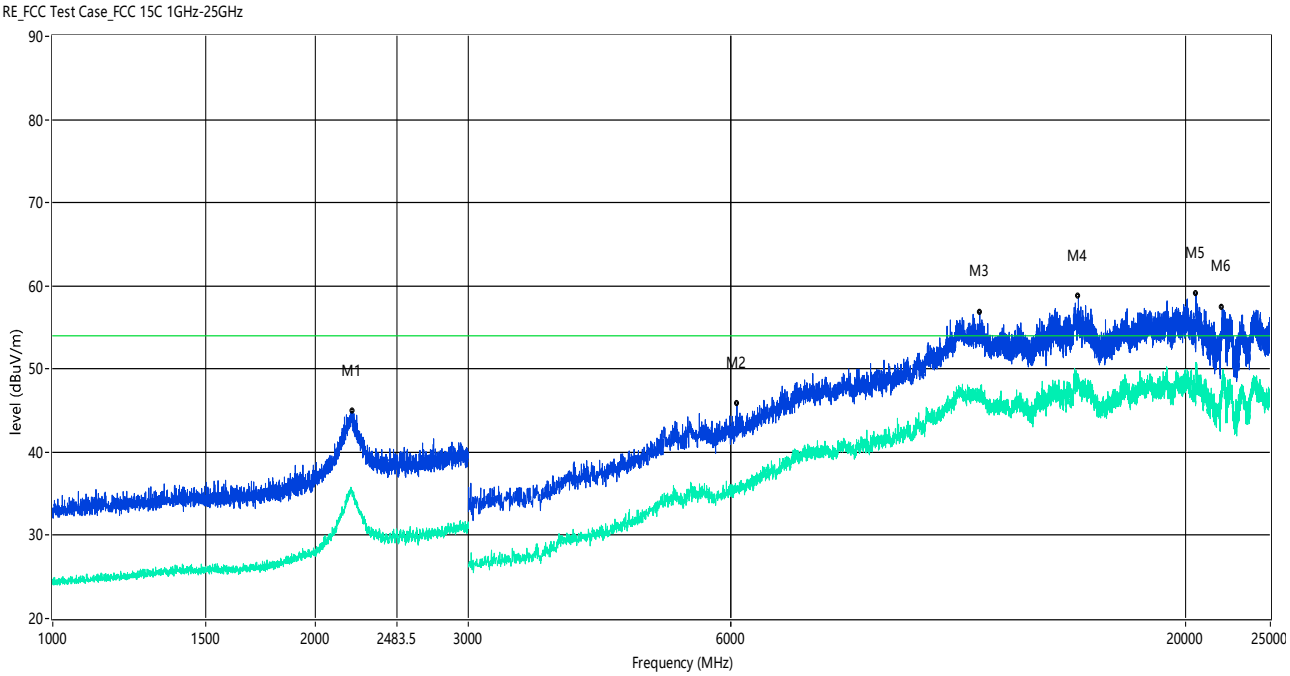
RE_FCC Test Case_FCC 15C 1GHz-25GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	ANT	Verdict
1**	1747.500	29.99	-16.77	54.0	-24.01	AV	V	Pass
1	1747.500	39.59	-16.77	74.0	-34.41	Peak	V	Pass
2**	2204.000	35.06	-7.40	54.0	-18.94	AV	V	Pass
2	2204.000	45.82	-7.40	74.0	-28.18	Peak	V	Pass
3**	5135.000	33.92	-1.84	54.0	-20.08	AV	V	Pass
3	5135.000	43.32	-1.84	74.0	-30.68	Peak	V	Pass
4**	11150.000	46.23	10.51	54.0	-7.77	AV	V	Pass
4	11150.000	56.52	10.51	74.0	-17.48	Peak	V	Pass
5**	15032.500	48.42	11.82	54.0	-5.58	AV	V	Pass
5	15032.500	57.52	11.82	74.0	-16.48	Peak	V	Pass
6**	20537.500	50.10	14.08	54.0	-3.90	AV	V	Pass
6	20537.500	58.93	14.08	74.0	-15.07	Peak	V	Pass

802.11b Middle Channel

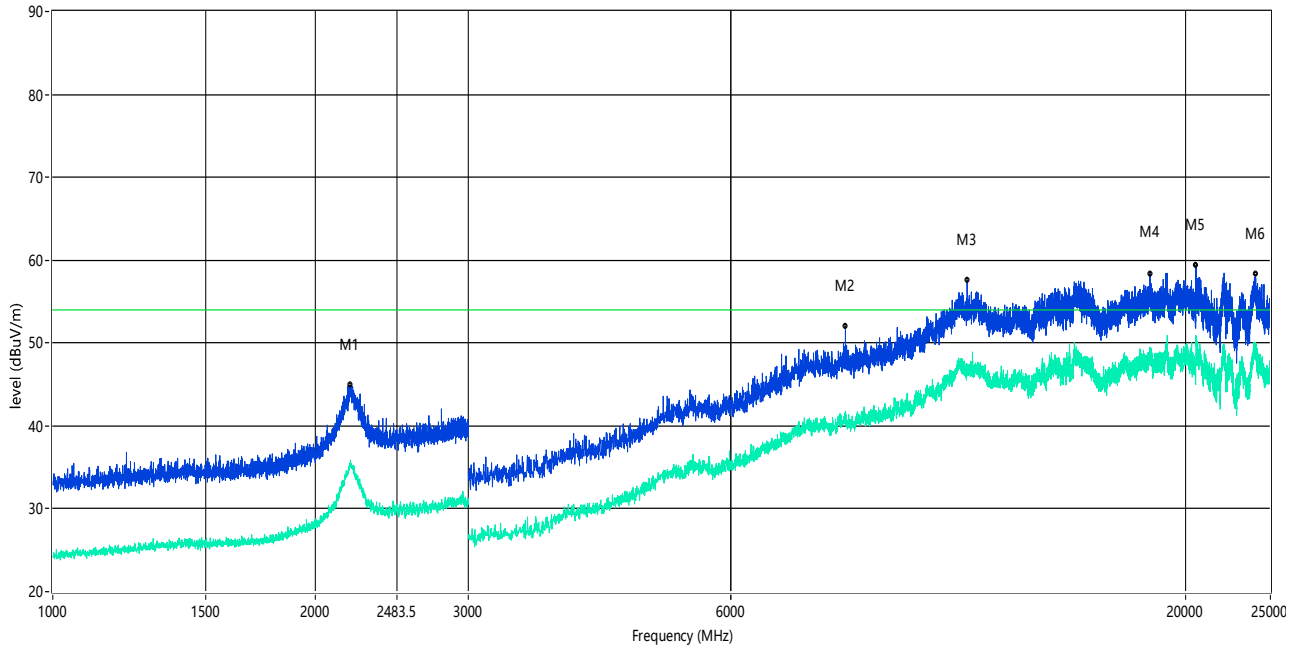
Temperature:	24℃	Relative Humidity:	63%
Pressure:	1010hPa	Phase:	Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	ANT	Verdict
1**	2209.500	34.77	-7.67	54.0	-19.23	AV	H	Pass
1	2209.500	44.88	-7.67	74.0	-29.12	Peak	H	Pass
2**	6102.500	35.41	-0.16	54.0	-18.59	AV	H	Pass
2	6102.500	45.78	-0.16	74.0	-28.22	Peak	H	Pass
3**	11597.500	47.42	11.22	54.0	-6.58	AV	H	Pass
3	11597.500	56.85	11.22	74.0	-17.15	Peak	H	Pass
4**	15051.250	48.37	11.52	54.0	-5.63	AV	H	Pass
4	15051.250	58.72	11.52	74.0	-15.28	Peak	H	Pass
5**	20546.251	49.41	14.09	54.0	-4.59	AV	H	Pass
5	20546.251	59.07	14.09	74.0	-14.93	Peak	H	Pass
6**	22011.001	47.86	9.88	54.0	-6.14	AV	H	Pass
6	22011.001	57.34	9.88	74.0	-16.66	Peak	H	Pass

Temperature:	24℃	Relative Humidity:	63%
Pressure:	1010hPa	Phase:	Vertical

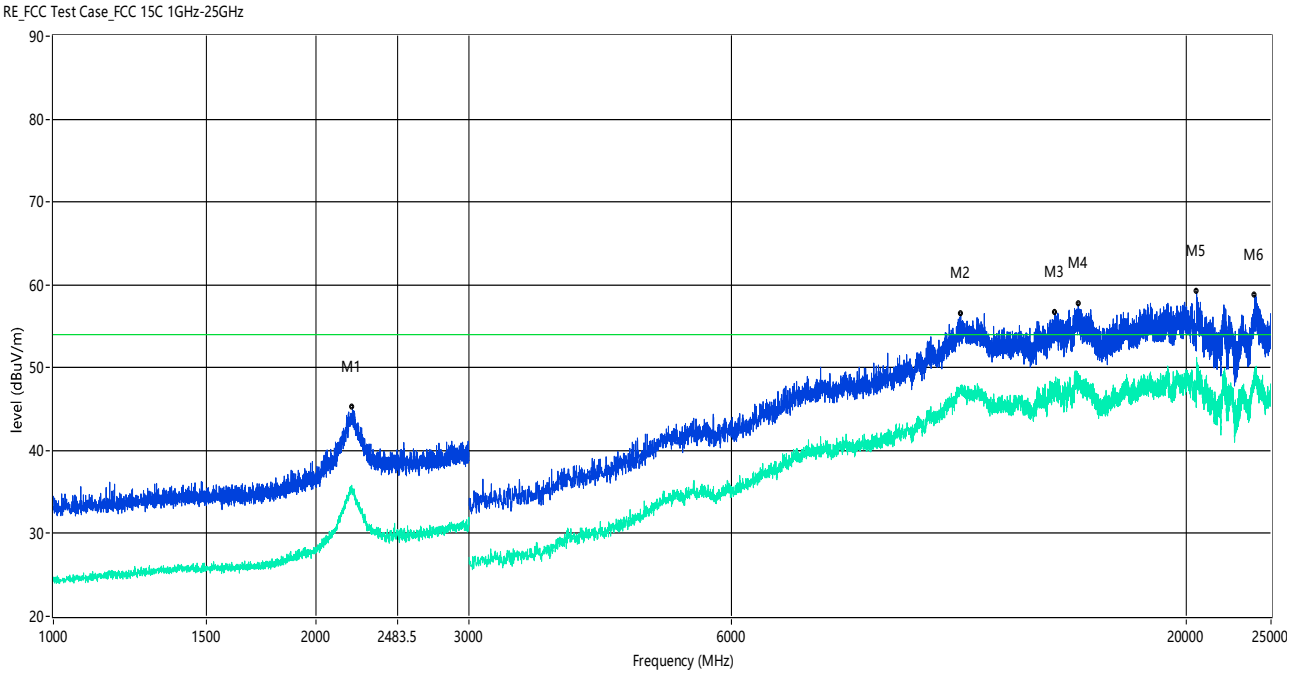
RE_FCC Test Case_FCC 15C 1GHz-25GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	ANT	Verdict
1**	2196.500	35.89	-7.40	54.0	-18.11	AV	V	Pass
1	2196.500	44.90	-7.40	74.0	-29.10	Peak	V	Pass
2**	8130.000	40.66	5.26	54.0	-13.34	AV	V	Pass
2	8130.000	51.96	5.26	74.0	-22.04	Peak	V	Pass
3**	11215.000	46.11	10.45	54.0	-7.89	AV	V	Pass
3	11215.000	57.49	10.45	74.0	-16.51	Peak	V	Pass
4**	18187.250	48.28	12.19	54.0	-5.72	AV	V	Pass
4	18187.250	58.38	12.19	74.0	-15.62	Peak	V	Pass
5**	20530.500	50.34	14.07	54.0	-3.66	AV	V	Pass
5	20530.500	59.31	14.07	74.0	-14.69	Peak	V	Pass
6**	24037.501	50.08	15.09	54.0	-3.92	AV	V	Pass
6	24037.501	58.26	15.09	74.0	-15.74	Peak	V	Pass

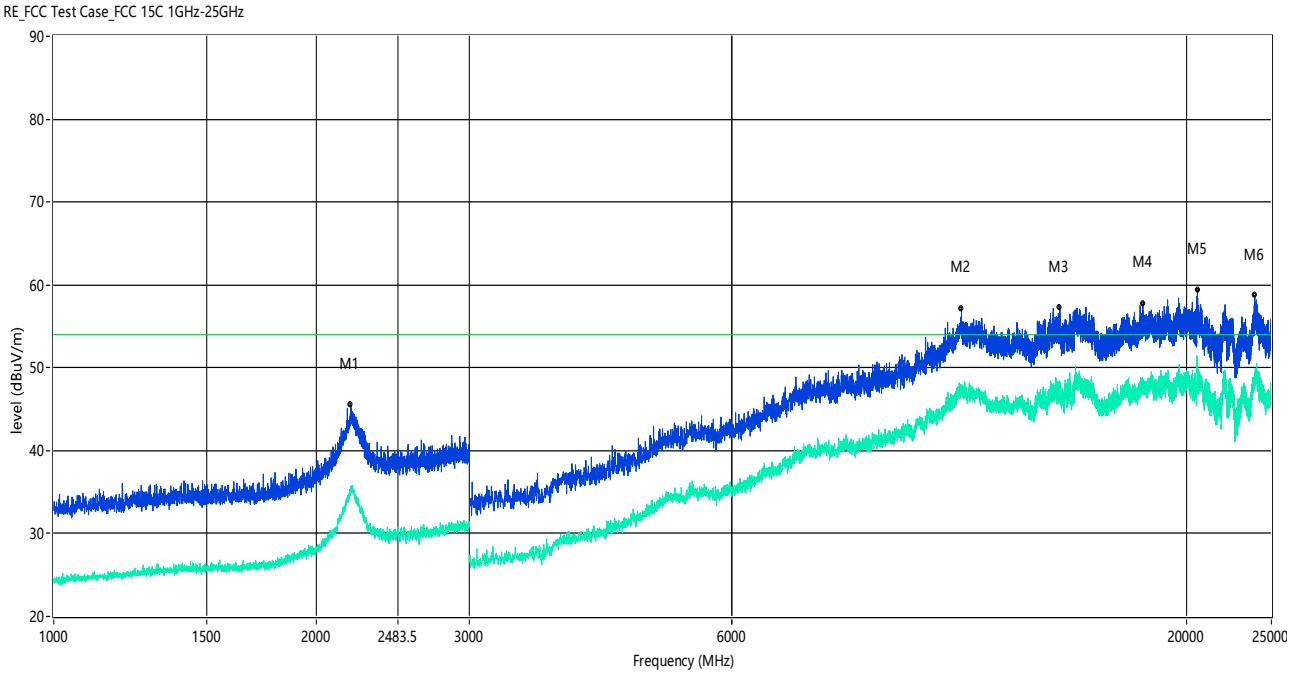
802.11b High Channel

Temperature:	24℃	Relative Humidity:	63%
Pressure:	1010hPa	Phase:	Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	ANT	Verdict
1**	2204.500	35.14	-7.43	54.0	-18.86	AV	H	Pass
1	2204.500	45.25	-7.43	74.0	-28.75	Peak	H	Pass
2**	11007.500	47.65	10.94	54.0	-6.35	AV	H	Pass
2	11007.500	56.48	10.94	74.0	-17.52	Peak	H	Pass
3**	14133.750	48.25	11.40	54.0	-5.75	AV	H	Pass
3	14133.750	56.59	11.40	74.0	-17.41	Peak	H	Pass
4**	15018.750	49.29	12.05	54.0	-4.71	AV	H	Pass
4	15018.750	57.65	12.05	74.0	-16.35	Peak	H	Pass
5**	20537.500	50.11	14.08	54.0	-3.89	AV	H	Pass
5	20537.500	59.14	14.08	74.0	-14.86	Peak	H	Pass
6**	23953.500	49.19	15.08	54.0	-4.81	AV	H	Pass
6	23953.500	58.72	15.08	74.0	-15.28	Peak	H	Pass

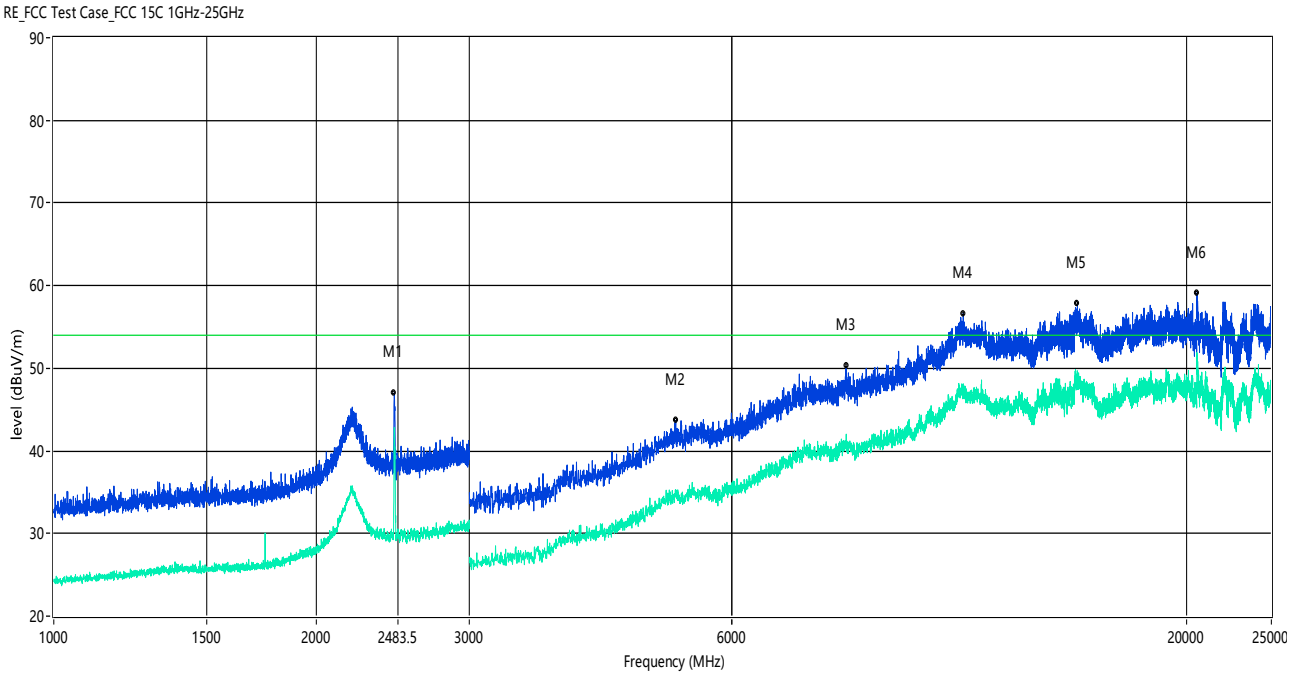
Temperature:	24℃	Relative Humidity:	63%
Pressure:	1010hPa	Phase:	Vertical



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	ANT	Verdict
1**	2193.500	35.30	-7.55	54.0	-18.70	AV	V	Pass
1	2193.500	45.49	-7.55	74.0	-28.51	Peak	V	Pass
2**	11020.000	47.82	10.88	54.0	-6.18	AV	V	Pass
2	11020.000	57.14	10.88	74.0	-16.86	Peak	V	Pass
3**	14295.000	46.71	11.84	54.0	-7.29	AV	V	Pass
3	14295.000	57.24	11.84	74.0	-16.76	Peak	V	Pass
4**	17799.999	47.58	12.01	54.0	-6.42	AV	V	Pass
4	17799.999	57.70	12.01	74.0	-16.30	Peak	V	Pass
5**	20565.500	50.39	14.12	54.0	-3.61	AV	V	Pass
5	20565.500	59.41	14.12	74.0	-14.59	Peak	V	Pass
6**	23929.000	48.11	15.08	54.0	-5.89	AV	V	Pass
6	23929.000	58.68	15.08	74.0	-15.32	Peak	V	Pass

802.11g Low Channel

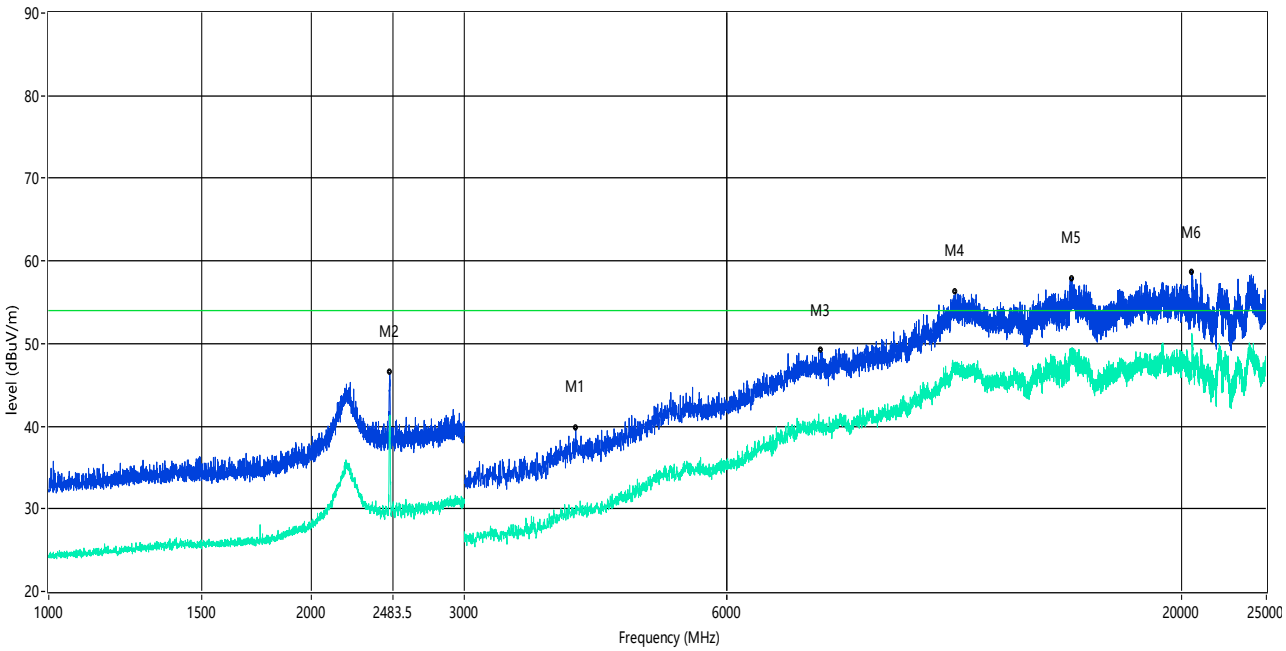
Temperature:	24℃	Relative Humidity:	63%
Pressure:	1010hPa	Phase:	Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	ANT	Verdict
1**	2460.000	42.50	-12.53	54.0	-11.50	AV	H	Pass
1	2460.000	47.03	-12.53	74.0	-26.97	Peak	H	Pass
2**	5177.500	35.29	-1.83	54.0	-18.71	AV	H	Pass
2	5177.500	43.72	-1.83	74.0	-30.28	Peak	H	Pass
3**	8122.500	41.59	5.31	54.0	-12.41	AV	H	Pass
3	8122.500	50.26	5.31	74.0	-23.74	Peak	H	Pass
4**	11070.000	47.70	10.67	54.0	-6.30	AV	H	Pass
4	11070.000	56.64	10.67	74.0	-17.36	Peak	H	Pass
5**	14971.250	49.27	12.43	54.0	-4.73	AV	H	Pass
5	14971.250	57.75	12.43	74.0	-16.25	Peak	H	Pass
6**	20528.751	49.98	13.42	54.0	-4.02	AV	H	Pass
6	20528.751	59.10	13.42	74.0	-14.90	Peak	H	Pass

Temperature:	24℃	Relative Humidity:	63%
Pressure:	1010hPa	Phase:	Vertical

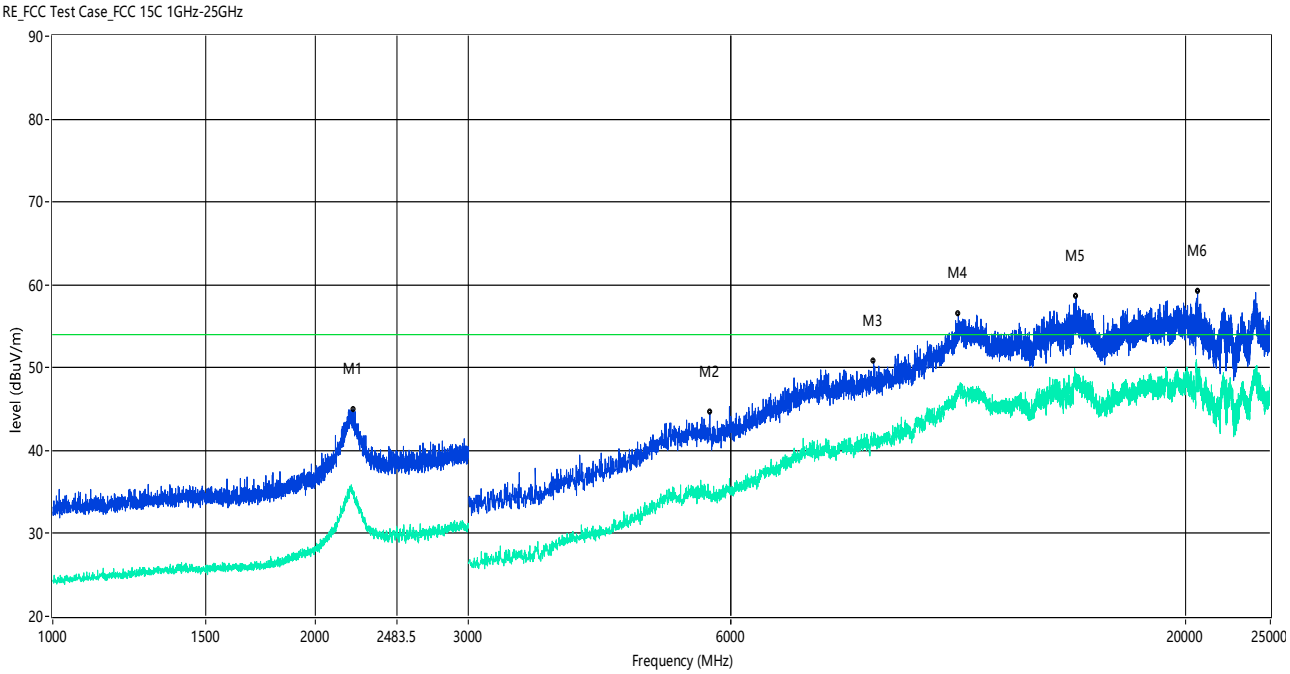
RE_FCC Test Case_FCC 15C 1GHz-25GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	ANT	Verdict
1**	4027.500	29.42	-7.45	54.0	-24.58	AV	V	Pass
1	4027.500	39.71	-7.45	74.0	-34.29	Peak	V	Pass
2**	2463.500	40.98	-12.52	54.0	-13.02	AV	V	Pass
2	2463.500	46.45	-12.52	74.0	-27.55	Peak	V	Pass
3**	7700.000	39.98	5.05	54.0	-14.02	AV	V	Pass
3	7700.000	49.15	5.05	74.0	-24.85	Peak	V	Pass
4**	10995.000	47.76	10.95	54.0	-6.24	AV	V	Pass
4	10995.000	56.19	10.95	74.0	-17.81	Peak	V	Pass
5**	14953.750	48.67	12.48	54.0	-5.33	AV	V	Pass
5	14953.750	57.89	12.48	74.0	-16.11	Peak	V	Pass
6**	20530.500	49.95	14.07	54.0	-4.05	AV	V	Pass
6	20530.500	58.68	14.07	74.0	-15.32	Peak	V	Pass

802.11g Middle Channel

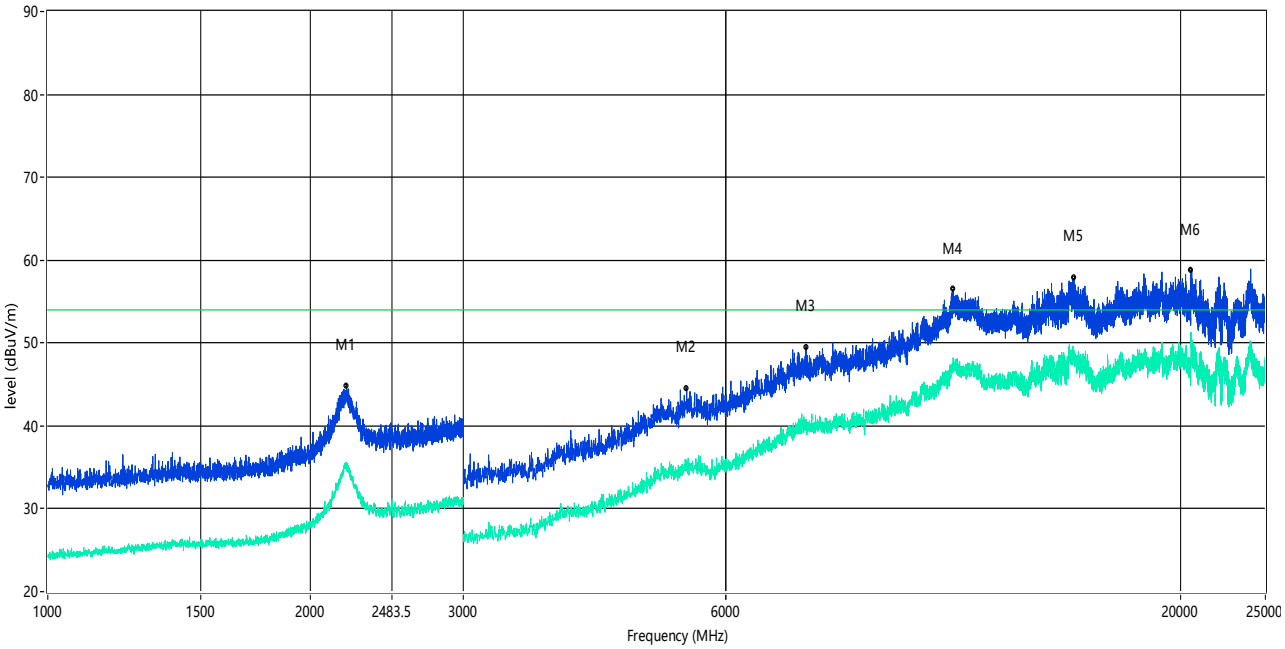
Temperature:	24℃	Relative Humidity:	63%
Pressure:	1010hPa	Phase:	Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	ANT	Verdict
1**	2215.500	34.45	-7.96	54.0	-19.55	AV	H	Pass
1	2215.500	44.94	-7.96	74.0	-29.06	Peak	H	Pass
2**	5680.000	34.55	-1.41	54.0	-19.45	AV	H	Pass
2	5680.000	44.59	-1.41	74.0	-29.41	Peak	H	Pass
3**	8760.001	41.46	5.22	54.0	-12.54	AV	H	Pass
3	8760.001	50.79	5.22	74.0	-23.21	Peak	H	Pass
4**	10957.500	46.62	10.80	54.0	-7.38	AV	H	Pass
4	10957.500	56.49	10.80	74.0	-17.51	Peak	H	Pass
5**	14955.000	48.41	12.48	54.0	-5.59	AV	H	Pass
5	14955.000	58.53	12.48	74.0	-15.47	Peak	H	Pass
6**	20625.000	49.52	14.21	54.0	-4.48	AV	H	Pass
6	20625.000	59.15	14.21	74.0	-14.85	Peak	H	Pass

Temperature:	24℃	Relative Humidity:	63%
Pressure:	1010hPa	Phase:	Vertical

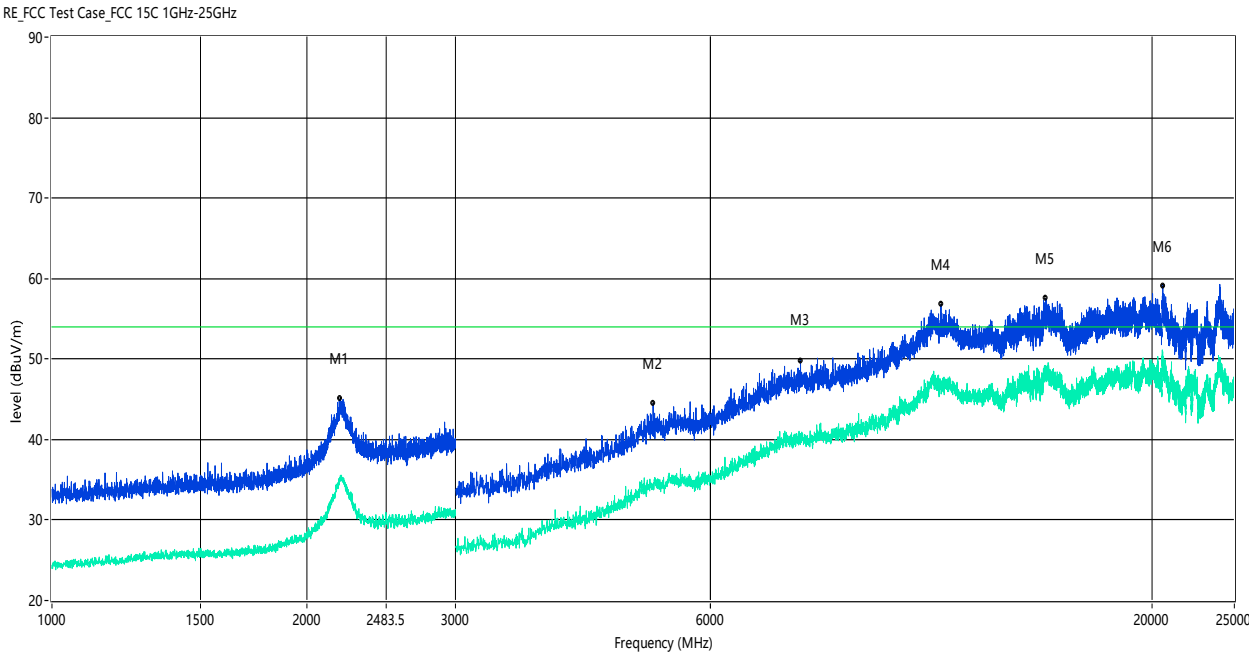
RE_FCC Test Case_FCC 15C 1GHz-25GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	ANT	Verdict
1**	2202.500	35.40	-7.33	54.0	-18.60	AV	V	Pass
1	2202.500	44.85	-7.33	74.0	-29.15	Peak	V	Pass
2**	5415.000	34.93	-1.36	54.0	-19.07	AV	V	Pass
2	5415.000	44.55	-1.36	74.0	-29.45	Peak	V	Pass
3**	7422.500	39.90	4.43	54.0	-14.10	AV	V	Pass
3	7422.500	49.50	4.43	74.0	-24.50	Peak	V	Pass
4**	10947.500	47.27	10.75	54.0	-6.73	AV	V	Pass
4	10947.500	56.46	10.75	74.0	-17.54	Peak	V	Pass
5**	15072.500	48.84	11.17	54.0	-5.16	AV	V	Pass
5	15072.500	57.79	11.17	74.0	-16.21	Peak	V	Pass
6**	20532.251	49.91	14.08	54.0	-4.09	AV	V	Pass
6	20532.251	58.75	14.08	74.0	-15.25	Peak	V	Pass

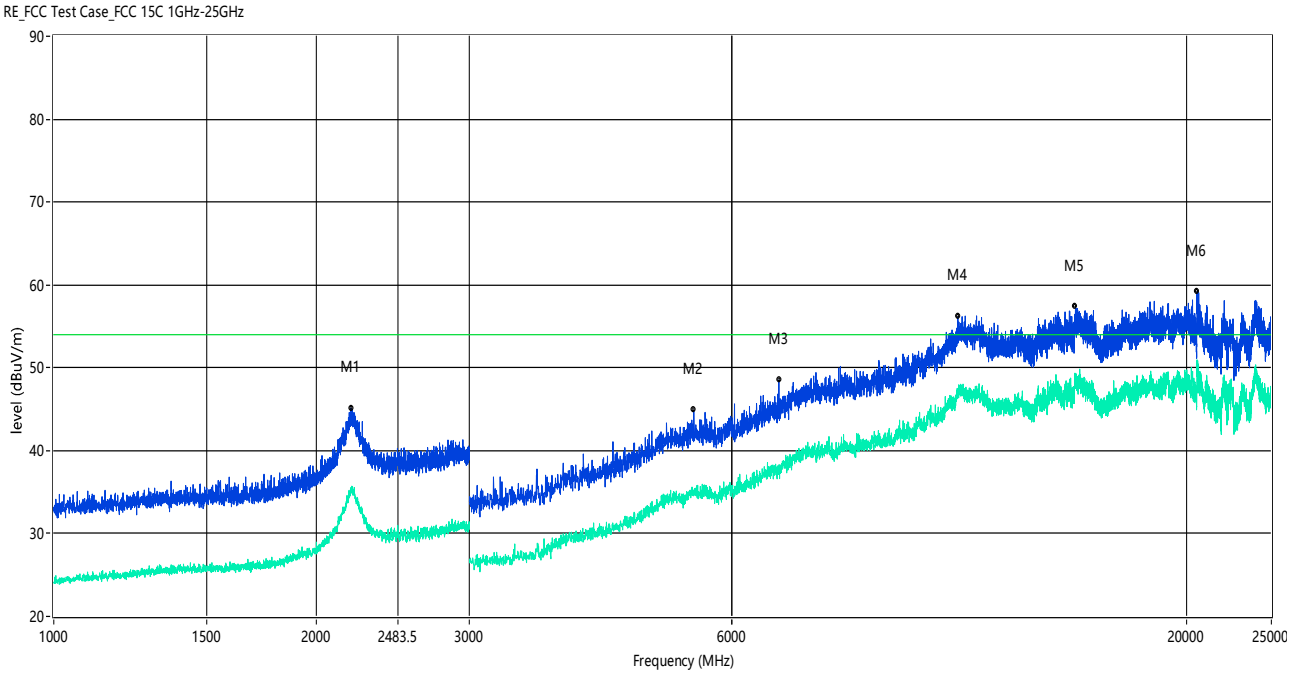
802.11g High Channel

Temperature:	24℃	Relative Humidity:	63%
Pressure:	1010hPa	Phase:	Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	ANT	Verdict
1**	2191.500	35.33	-7.66	54.0	-18.67	AV	H	Pass
1	2191.500	45.04	-7.66	74.0	-28.96	Peak	H	Pass
2**	5137.500	34.50	-1.84	54.0	-19.50	AV	H	Pass
2	5137.500	44.49	-1.84	74.0	-29.51	Peak	H	Pass
3**	7675.000	40.47	4.96	54.0	-13.53	AV	H	Pass
3	7675.000	49.82	4.96	74.0	-24.18	Peak	H	Pass
4**	11247.500	46.56	10.38	54.0	-7.44	AV	H	Pass
4	11247.500	56.75	10.38	74.0	-17.25	Peak	H	Pass
5**	14968.750	48.65	12.44	54.0	-5.35	AV	H	Pass
5	14968.750	57.49	12.44	74.0	-16.51	Peak	H	Pass
6**	20574.251	50.20	14.13	54.0	-3.80	AV	H	Pass
6	20574.251	59.11	14.13	74.0	-14.89	Peak	H	Pass

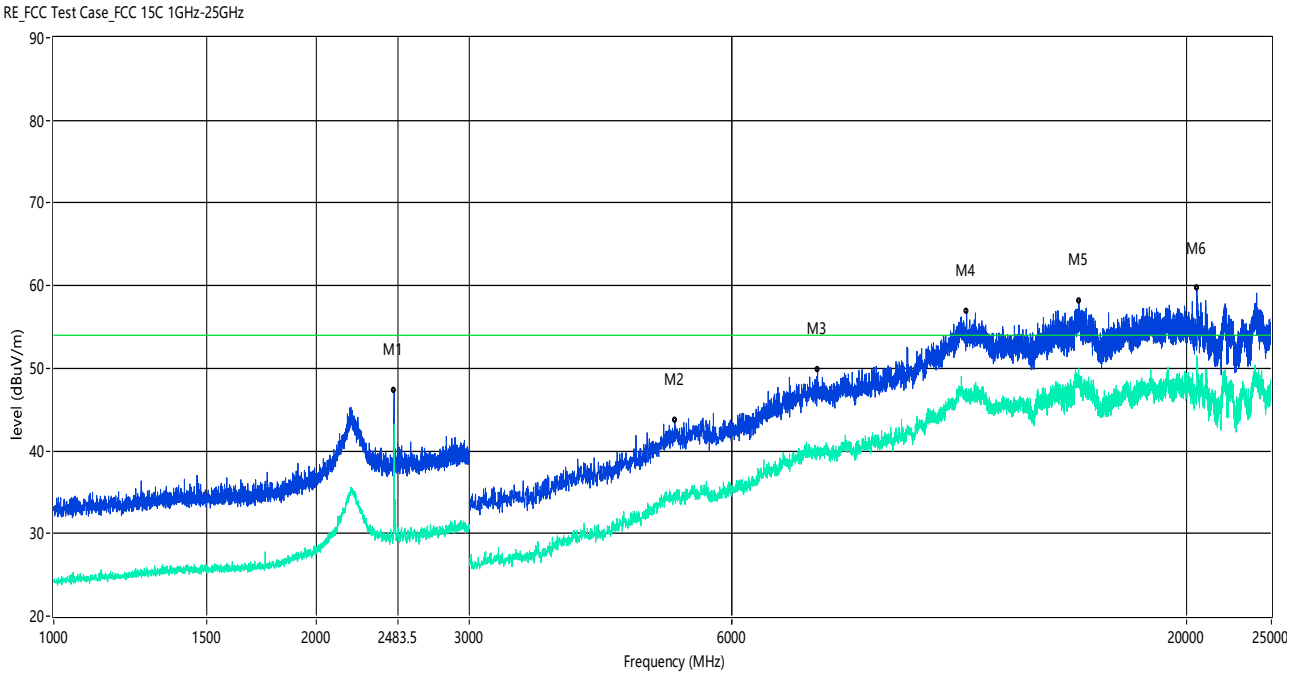
Temperature:	24℃	Relative Humidity:	63%
Pressure:	1010hPa	Phase:	Vertical



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	ANT	Verdict
1**	2194.000	35.47	-7.53	54.0	-18.53	AV	V	Pass
1	2194.000	45.14	-7.53	74.0	-28.86	Peak	V	Pass
2**	5430.000	34.78	-1.40	54.0	-19.22	AV	V	Pass
2	5430.000	44.89	-1.40	74.0	-29.11	Peak	V	Pass
3**	6800.000	37.94	2.06	54.0	-16.06	AV	V	Pass
3	6800.000	48.52	2.06	74.0	-25.48	Peak	V	Pass
4**	10915.000	47.38	10.62	54.0	-6.62	AV	V	Pass
4	10915.000	56.15	10.62	74.0	-17.85	Peak	V	Pass
5**	14893.750	48.17	12.55	54.0	-5.83	AV	V	Pass
5	14893.750	57.34	12.55	74.0	-16.66	Peak	V	Pass
6**	20539.251	50.96	14.09	54.0	-3.04	AV	V	Pass
6	20539.251	59.18	14.09	74.0	-14.82	Peak	V	Pass

802.11n(HT20) Low Channel

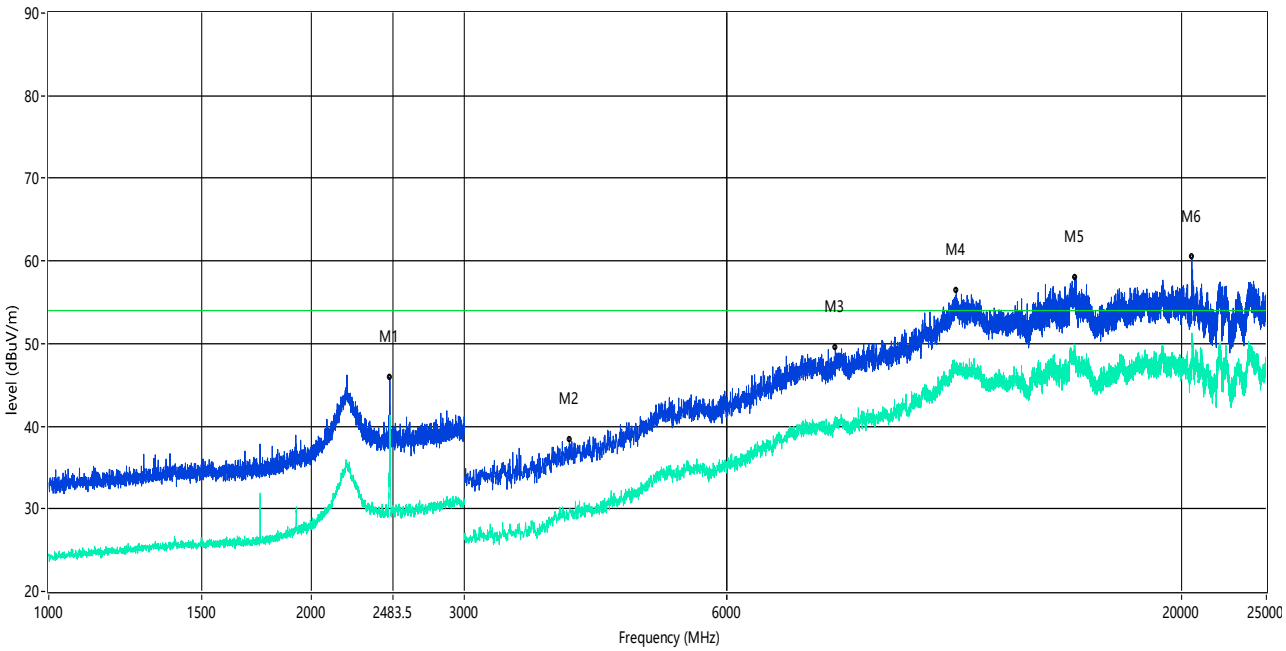
Temperature:	24℃	Relative Humidity:	63%
Pressure:	1010hPa	Phase:	Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	ANT	Verdict
1**	2459.000	42.50	-12.54	54.0	-11.50	AV	H	Pass
1	2459.000	47.35	-12.54	74.0	-26.65	Peak	H	Pass
2**	5165.000	34.92	-1.83	54.0	-19.08	AV	H	Pass
2	5165.000	43.70	-1.83	74.0	-30.30	Peak	H	Pass
3**	7532.500	39.97	4.59	54.0	-14.03	AV	H	Pass
3	7532.500	49.86	4.59	74.0	-24.14	Peak	H	Pass
4**	11172.500	47.08	10.50	54.0	-6.92	AV	H	Pass
4	11172.500	56.85	10.50	74.0	-17.15	Peak	H	Pass
5**	15028.750	48.20	11.88	54.0	-5.80	AV	H	Pass
5	15028.750	58.16	11.88	74.0	-15.84	Peak	H	Pass
6**	20532.251	50.88	14.08	54.0	-3.12	AV	H	Pass
6	20532.251	59.72	14.08	74.0	-14.28	Peak	H	Pass

Temperature:	24℃	Relative Humidity:	63%
Pressure:	1010hPa	Phase:	Vertical

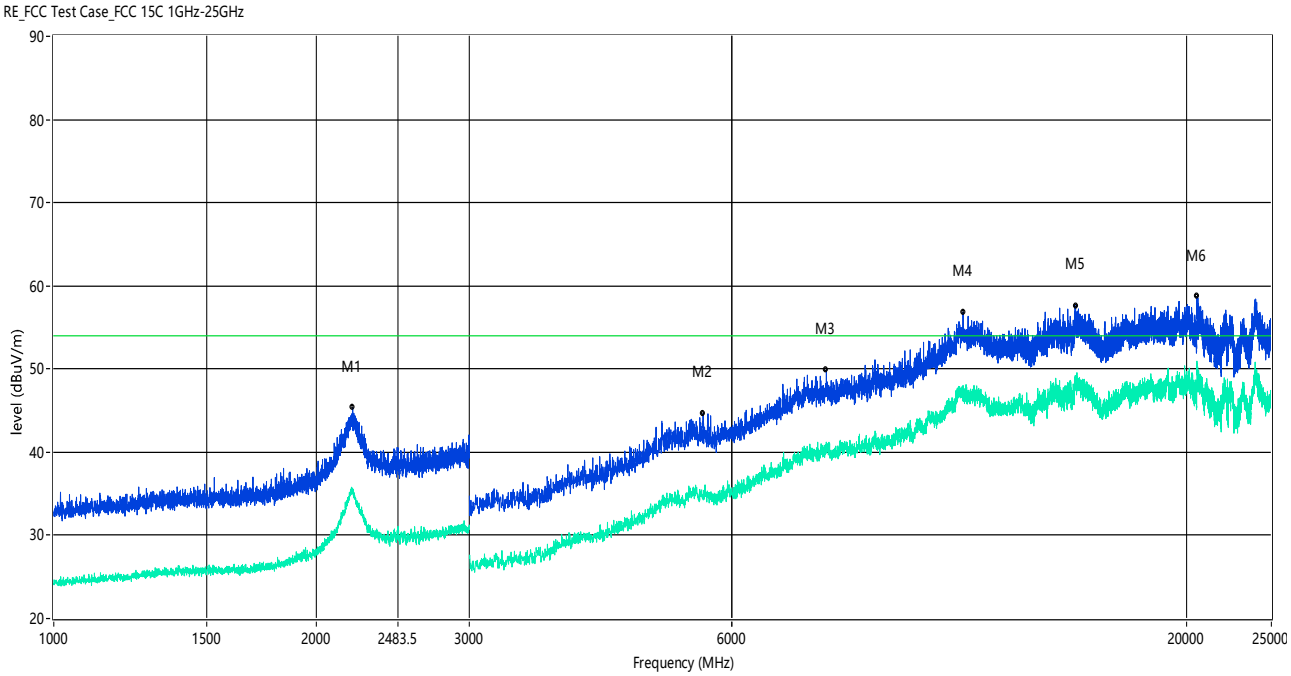
RE_FCC Test Case_FCC 15C 1GHz-25GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	ANT	Verdict
1**	2463.500	39.86	-12.52	54.0	-14.14	AV	V	Pass
1	2463.500	45.91	-12.52	74.0	-28.09	Peak	V	Pass
2**	3960.000	29.62	-7.81	54.0	-24.38	AV	V	Pass
2	3960.000	38.33	-7.81	74.0	-35.67	Peak	V	Pass
3**	8000.000	39.89	4.89	54.0	-14.11	AV	V	Pass
3	8000.000	49.47	4.89	74.0	-24.53	Peak	V	Pass
4**	11015.000	46.29	10.91	54.0	-7.71	AV	V	Pass
4	11015.000	56.43	10.91	74.0	-17.57	Peak	V	Pass
5**	15067.500	48.28	11.25	54.0	-5.72	AV	V	Pass
5	15067.500	58.00	11.25	74.0	-16.00	Peak	V	Pass
6**	20528.751	50.20	13.42	54.0	-3.80	AV	V	Pass
6	20528.751	60.43	13.42	74.0	-13.57	Peak	V	Pass

802.11n(HT20) Middle Channel

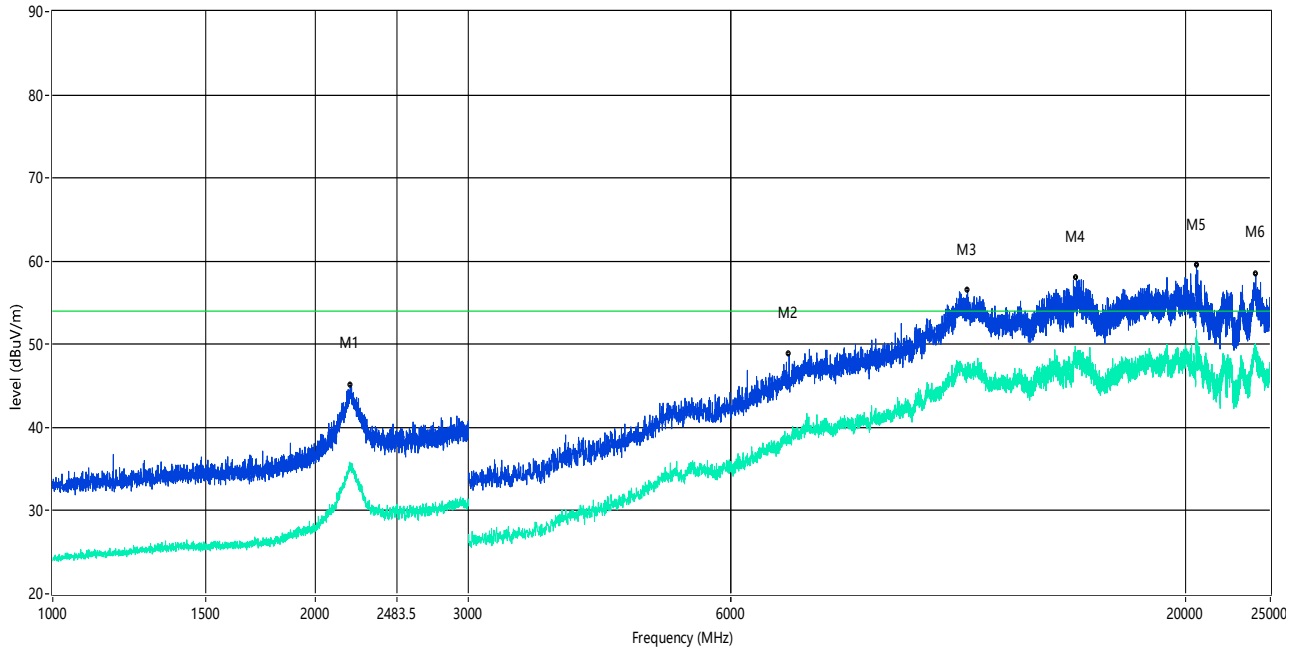
Temperature:	24℃	Relative Humidity:	63%
Pressure:	1010hPa	Phase:	Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	ANT	Verdict
1**	2204.000	35.02	-7.40	54.0	-18.98	AV	H	Pass
1	2204.000	45.37	-7.40	74.0	-28.63	Peak	H	Pass
2**	5565.000	34.53	-1.27	54.0	-19.47	AV	H	Pass
2	5565.000	44.67	-1.27	74.0	-29.33	Peak	H	Pass
3**	7710.000	40.26	4.95	54.0	-13.74	AV	H	Pass
3	7710.000	49.91	4.95	74.0	-24.09	Peak	H	Pass
4**	11065.000	48.03	10.69	54.0	-5.97	AV	H	Pass
4	11065.000	56.86	10.69	74.0	-17.14	Peak	H	Pass
5**	14898.750	48.43	12.61	54.0	-5.57	AV	H	Pass
5	14898.750	57.60	12.61	74.0	-16.40	Peak	H	Pass
6**	20532.251	50.48	14.08	54.0	-3.52	AV	H	Pass
6	20532.251	58.71	14.08	74.0	-15.29	Peak	H	Pass

Temperature:	24℃	Relative Humidity:	63%
Pressure:	1010hPa	Phase:	Vertical

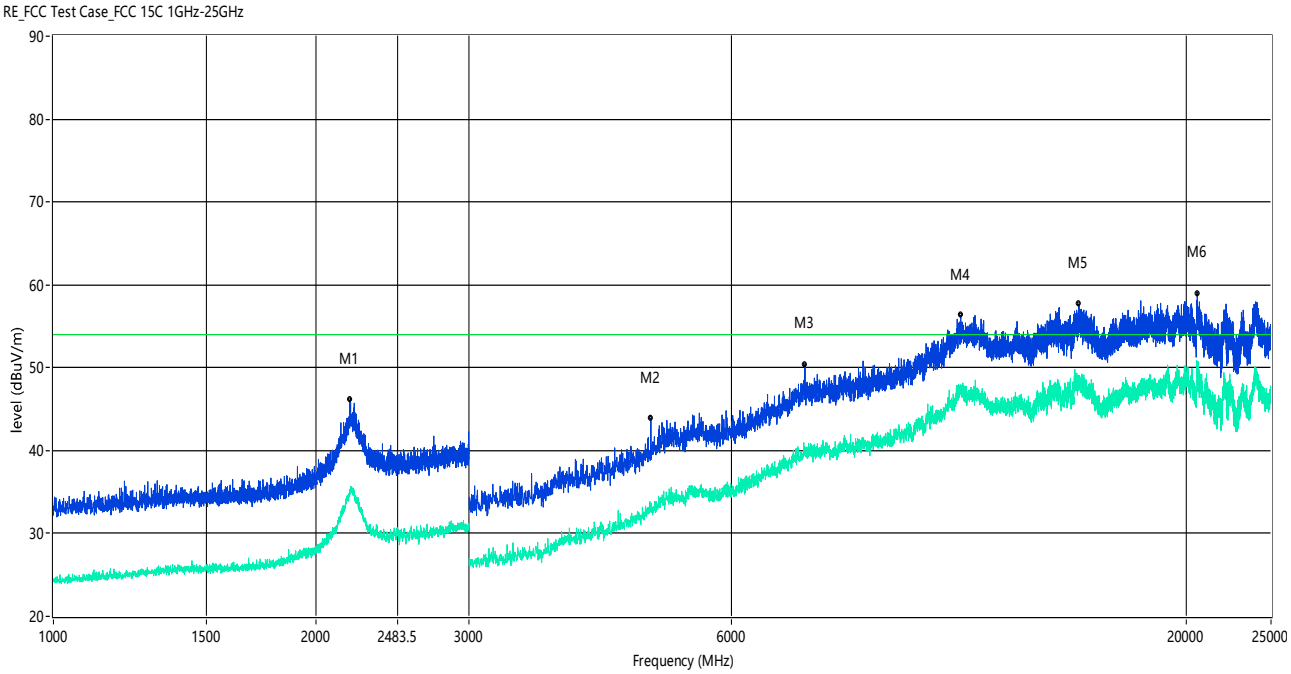
RE_FCC Test Case_FCC 15C 1GHz-25GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	ANT	Verdict
1**	2199.000	35.53	-7.26	54.0	-18.47	AV	V	Pass
1	2199.000	45.14	-7.26	74.0	-28.86	Peak	V	Pass
2**	7005.000	38.65	3.09	54.0	-15.35	AV	V	Pass
2	7005.000	48.79	3.09	74.0	-25.21	Peak	V	Pass
3**	11230.000	46.95	10.42	54.0	-7.05	AV	V	Pass
3	11230.000	56.53	10.42	74.0	-17.47	Peak	V	Pass
4**	14971.250	48.23	12.43	54.0	-5.77	AV	V	Pass
4	14971.250	58.05	12.43	74.0	-15.95	Peak	V	Pass
5**	20565.500	51.72	14.12	54.0	-2.28	AV	V	Pass
5	20565.500	59.53	14.12	74.0	-14.47	Peak	V	Pass
6**	24053.250	49.13	15.09	54.0	-4.87	AV	V	Pass
6	24053.250	58.39	15.09	74.0	-15.61	Peak	V	Pass

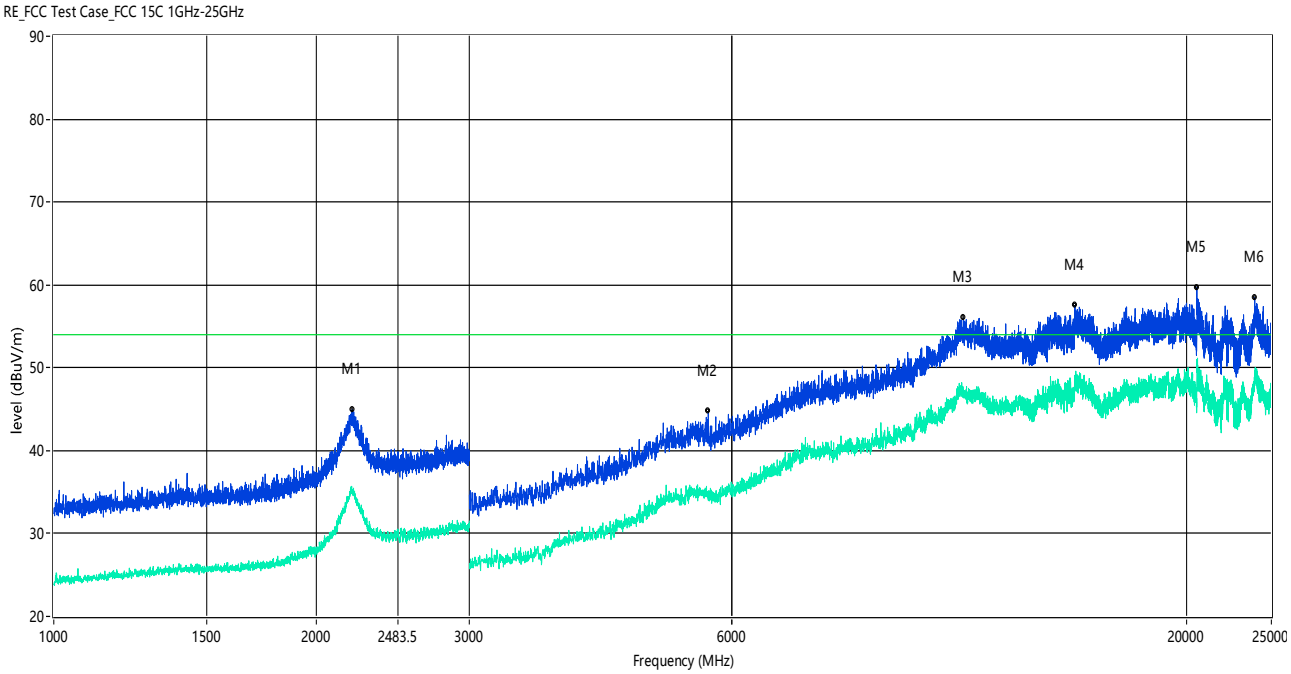
802.11n(HT20) High Channel

Temperature:	24℃	Relative Humidity:	63%
Pressure:	1010hPa	Phase:	Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	ANT	Verdict
1**	2190.500	35.12	-7.71	54.0	-18.88	AV	H	Pass
1	2190.500	46.14	-7.71	74.0	-27.86	Peak	H	Pass
2**	4852.500	32.91	-3.87	54.0	-21.09	AV	H	Pass
2	4852.500	43.91	-3.87	74.0	-30.09	Peak	H	Pass
3**	7292.500	39.91	4.43	54.0	-14.09	AV	H	Pass
3	7292.500	50.41	4.43	74.0	-23.59	Peak	H	Pass
4**	11007.500	47.12	10.94	54.0	-6.88	AV	H	Pass
4	11007.500	56.35	10.94	74.0	-17.65	Peak	H	Pass
5**	15045.000	48.47	11.62	54.0	-5.53	AV	H	Pass
5	15045.000	57.69	11.62	74.0	-16.31	Peak	H	Pass
6**	20579.500	49.17	14.14	54.0	-4.83	AV	H	Pass
6	20579.500	58.95	14.14	74.0	-15.05	Peak	H	Pass

Temperature:	24℃	Relative Humidity:	63%
Pressure:	1010hPa	Phase:	Vertical

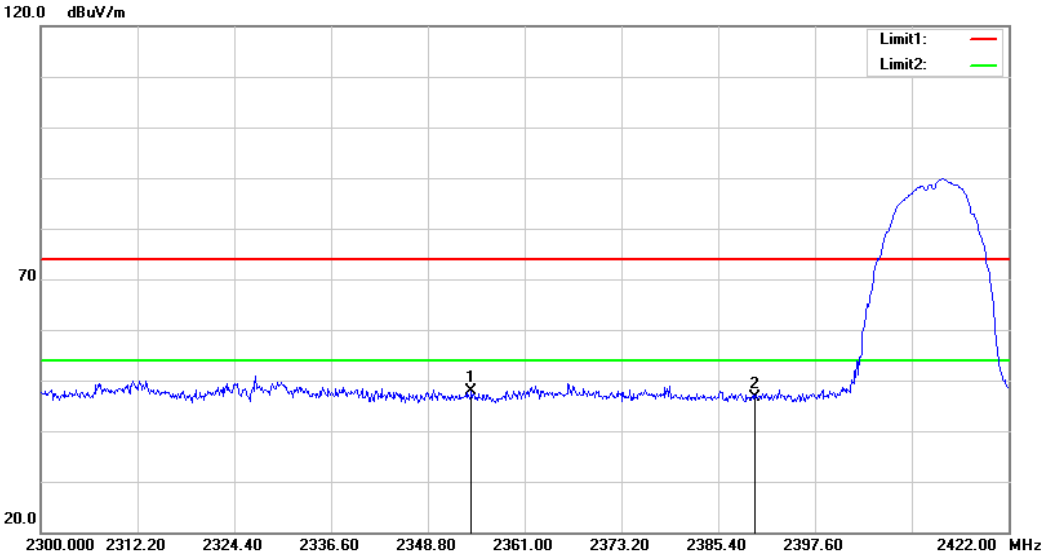


No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	ANT	Verdict
1**	2201.500	35.15	-7.28	54.0	-18.85	AV	V	Pass
1	2201.500	44.95	-7.28	74.0	-29.05	Peak	V	Pass
2**	5642.500	34.02	-1.27	54.0	-19.98	AV	V	Pass
2	5642.500	44.72	-1.27	74.0	-29.28	Peak	V	Pass
3**	11072.500	47.39	10.66	54.0	-6.61	AV	V	Pass
3	11072.500	55.99	10.66	74.0	-18.01	Peak	V	Pass
4**	14870.000	48.35	12.24	54.0	-5.65	AV	V	Pass
4	14870.000	57.52	12.24	74.0	-16.48	Peak	V	Pass
5**	20528.751	49.02	13.42	54.0	-4.98	AV	V	Pass
5	20528.751	59.66	13.42	74.0	-14.34	Peak	V	Pass
6**	23923.751	48.59	15.08	54.0	-5.41	AV	V	Pass
6	23923.751	58.49	15.08	74.0	-15.51	Peak	V	Pass

3.3.7 TEST RESULTS (RESTRICTED BAND)

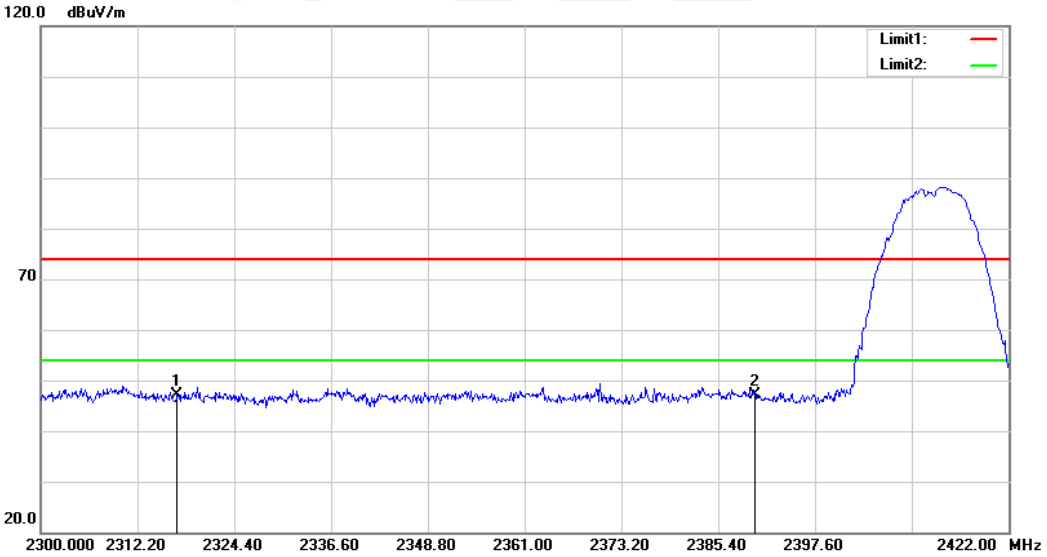
802.11b Low Channel

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2354.290	58.76	-10.99	47.77	74.00	-26.23	peak
2	2390.000	57.26	-10.75	46.51	74.00	-27.49	peak

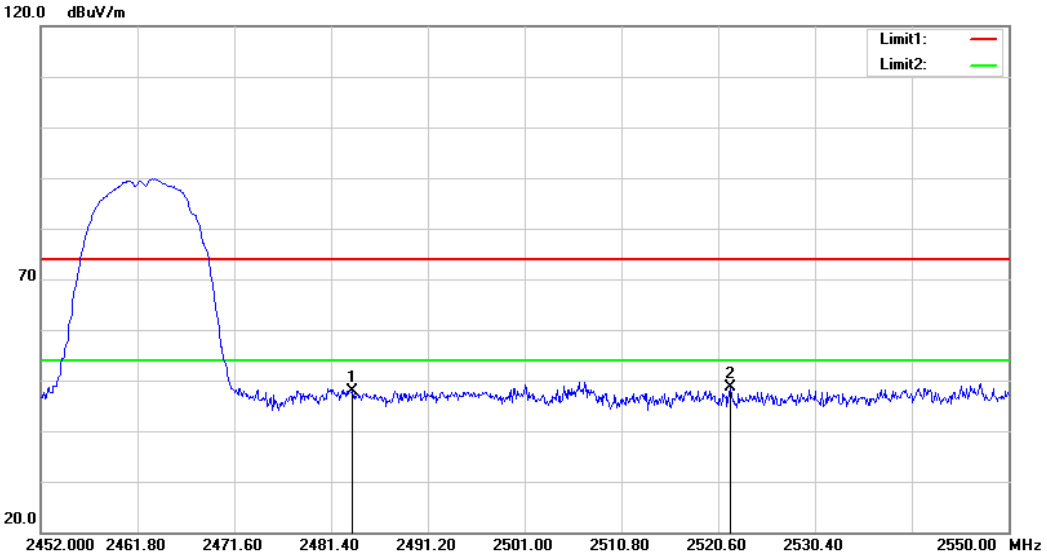
Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2317.202	58.42	-11.22	47.20	74.00	-26.80	peak
2	2390.000	57.76	-10.75	47.01	74.00	-26.99	peak

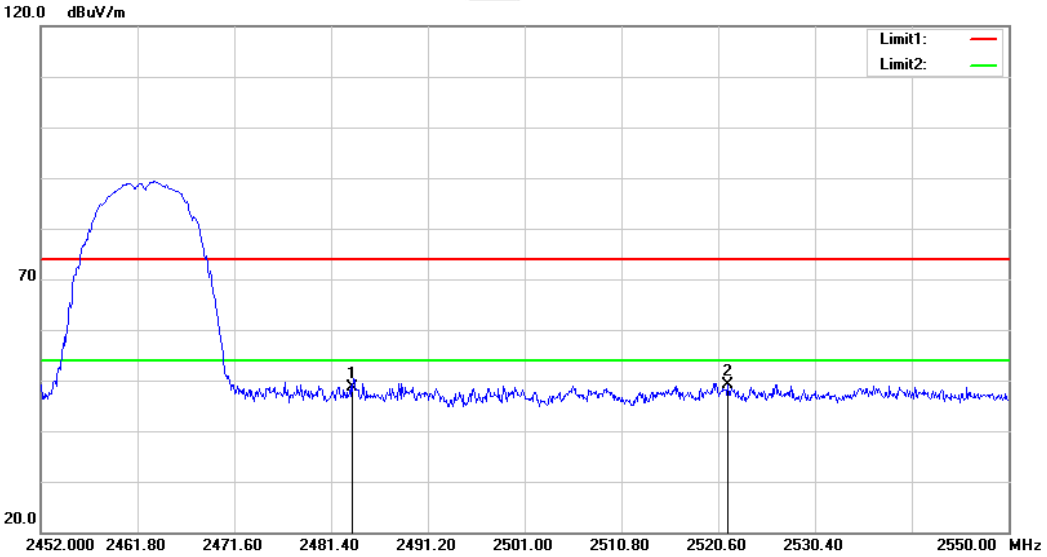
802.11b High channel

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2483.500	58.08	-10.29	47.79	74.00	-26.21	peak
2	2521.874	58.73	-10.15	48.58	74.00	-25.42	peak

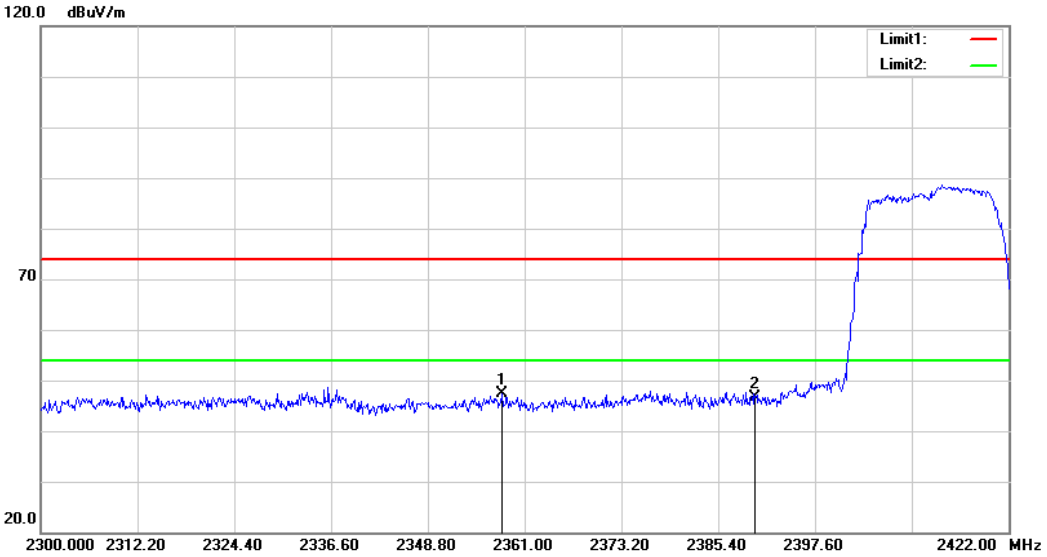
Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2483.500	58.87	-10.29	48.58	74.00	-25.42	peak
2	2521.580	59.39	-10.15	49.24	74.00	-24.76	peak

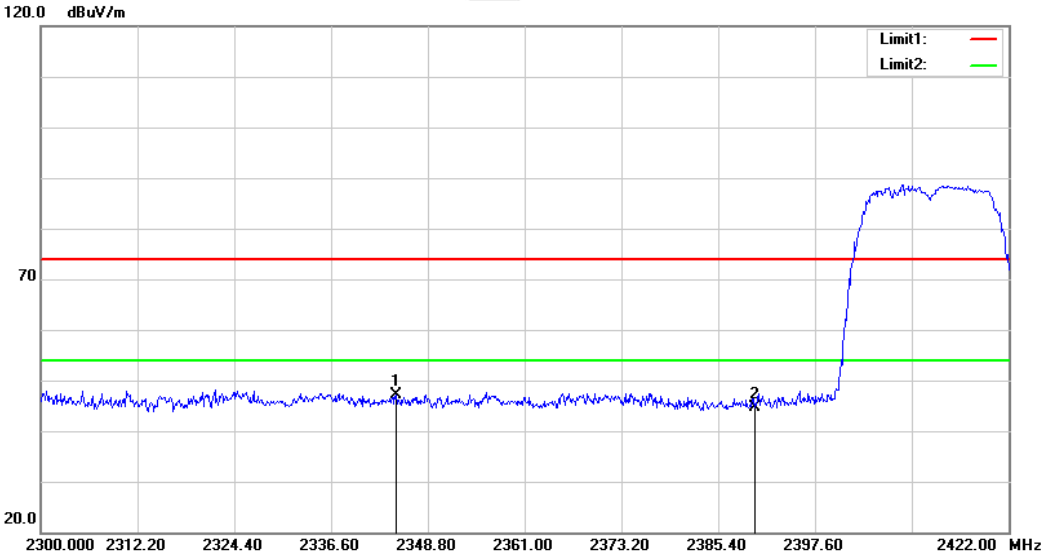
802.11g Low Channel

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2358.194	58.36	-10.96	47.40	74.00	-26.60	peak
2	2390.000	57.47	-10.75	46.72	74.00	-27.28	peak

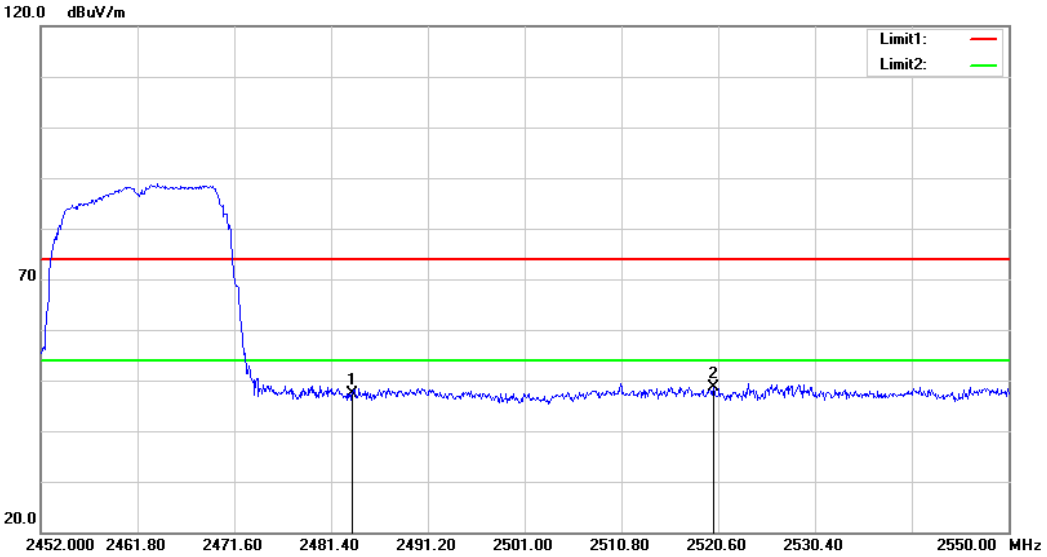
Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2344.774	58.10	-11.05	47.05	74.00	-26.95	peak
2	2390.000	55.45	-10.75	44.70	74.00	-29.30	peak

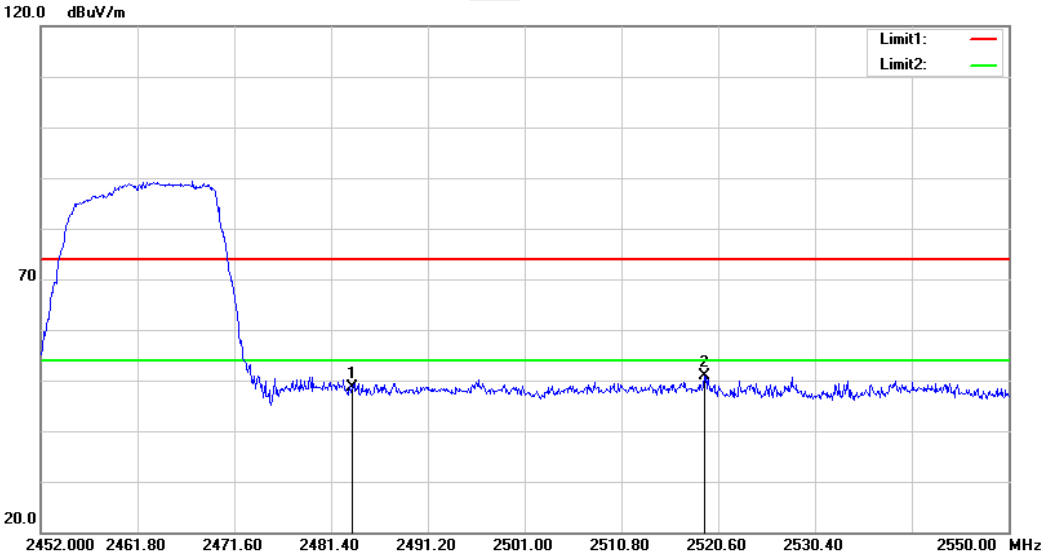
802.11g High Channel

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2483.500	57.78	-10.29	47.49	74.00	-26.51	peak
2	2520.110	58.79	-10.16	48.63	74.00	-25.37	peak

Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2483.500	58.97	-10.29	48.68	74.00	-25.32	peak
2	2519.228	61.09	-10.16	50.93	74.00	-23.07	peak

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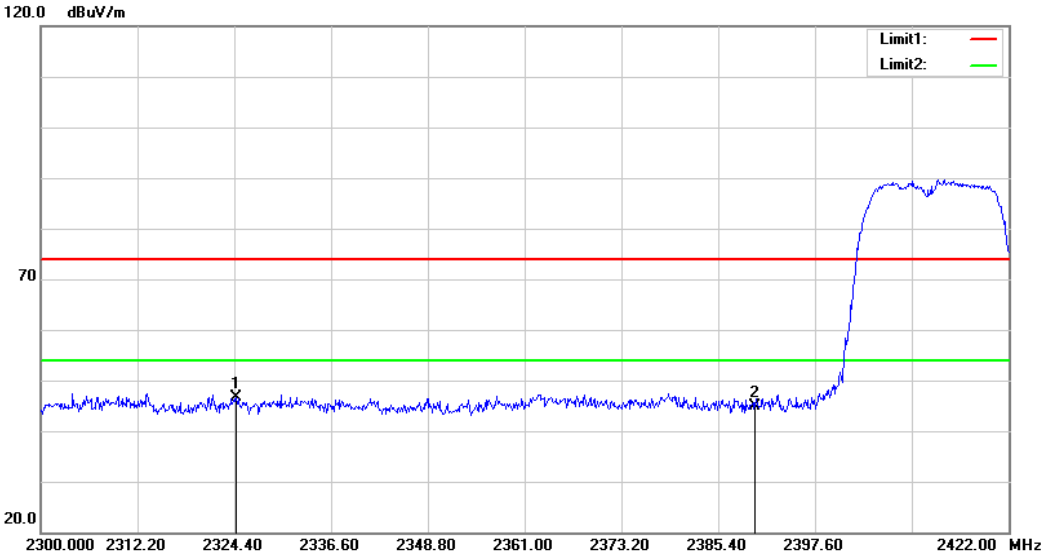
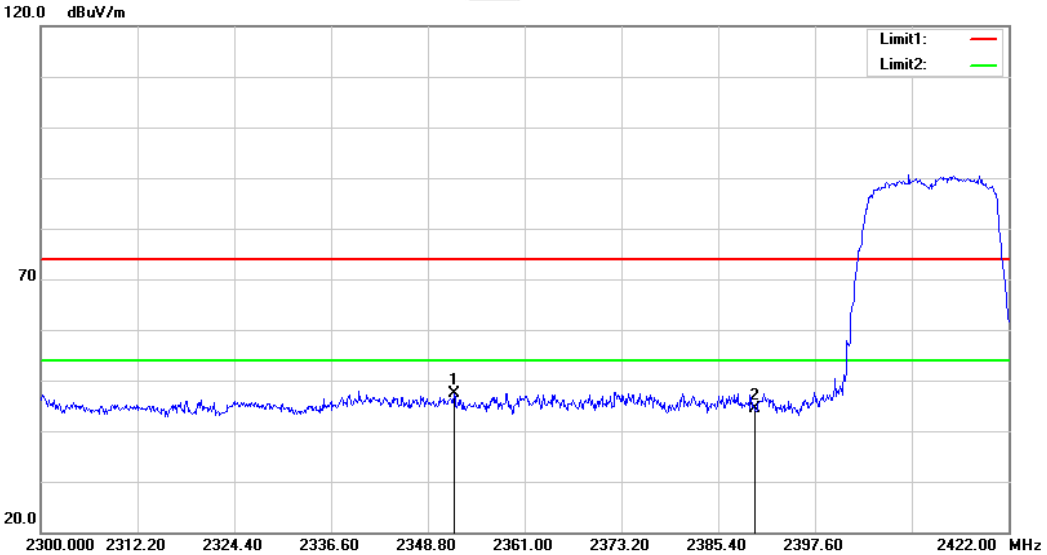
802.11n(HT20) Low Channel

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2324.644	57.89	-11.18	46.71	74.00	-27.29	peak
2	2390.000	55.62	-10.75	44.87	74.00	-29.13	peak

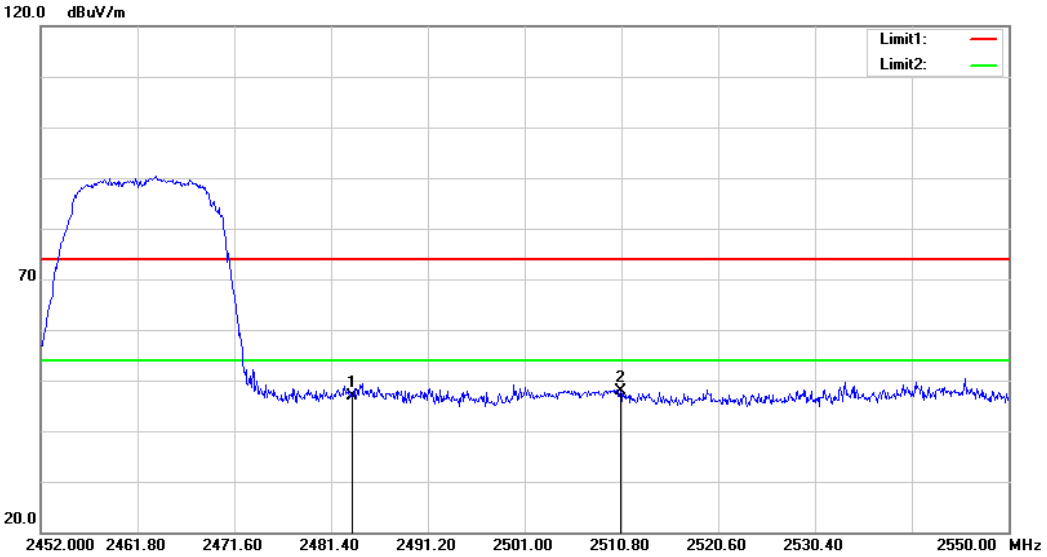
Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2352.094	58.46	-11.00	47.46	74.00	-26.54	peak
2	2390.000	55.19	-10.75	44.44	74.00	-29.56	peak

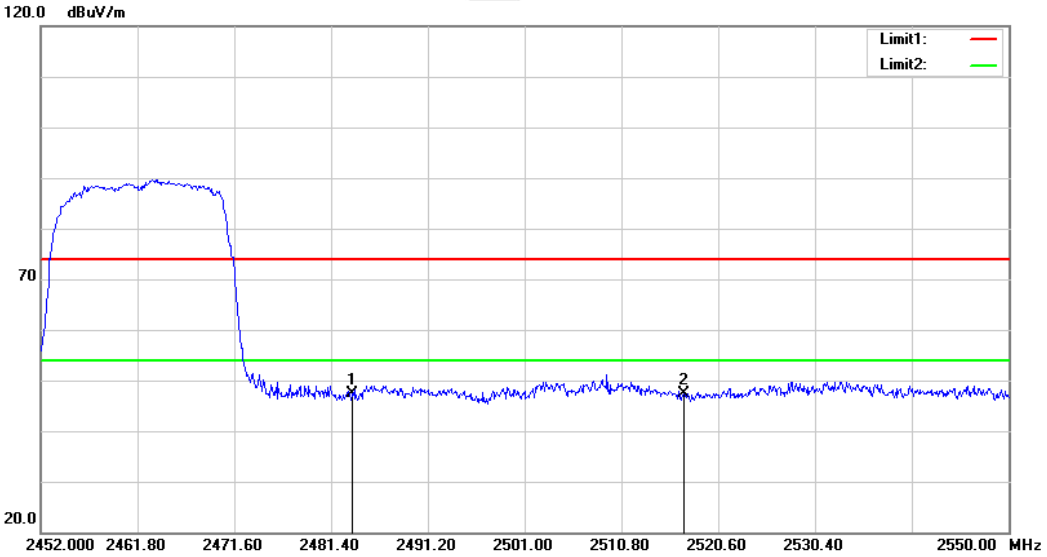
802.11n(HT20) High Channel

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2483.500	57.14	-10.29	46.85	74.00	-27.15	peak
2	2510.702	58.10	-10.18	47.92	74.00	-26.08	peak

Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2483.500	57.57	-10.29	47.28	74.00	-26.72	peak
2	2517.170	57.57	-10.16	47.41	74.00	-26.59	peak

4 CONDUCTED SPURIOUS & BAND EDGE EMISSION

4.1 APPLIED PROCEDURES / LIMIT

According to FCC Part 15.247(d), in any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

4.2 TEST PROCEDURE

Spectrum Parameter	Setting
Detector	Peak
Start/Stop Frequency	30 MHz to 10th carrier harmonic
RB / VB (emission in restricted band)	100 KHz/300 KHz
Trace-Mode:	Max hold

For Band edge

Spectrum Parameter	Setting
Detector	Peak
Start/Stop Frequency	Lower Band Edge: 2300 to 2422 MHz Upper Band Edge: 2452to 2500 MHz
RB / VB (emission in restricted band)	100 KHz/300 KHz
Trace-Mode:	Max hold

4.3 DEVIATION FROM STANDARD

No deviation.

4.4 TEST SETUP

The EUT which is powered by the Battery, is coupled to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading.
Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. In order to make an accurate measurement, set the span greater than RBW.

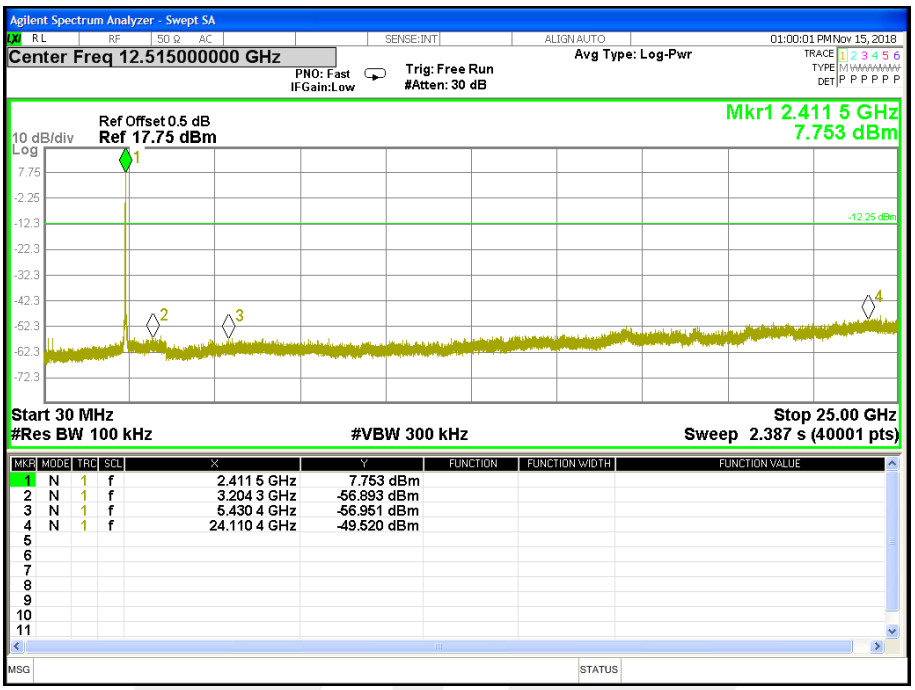
4.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

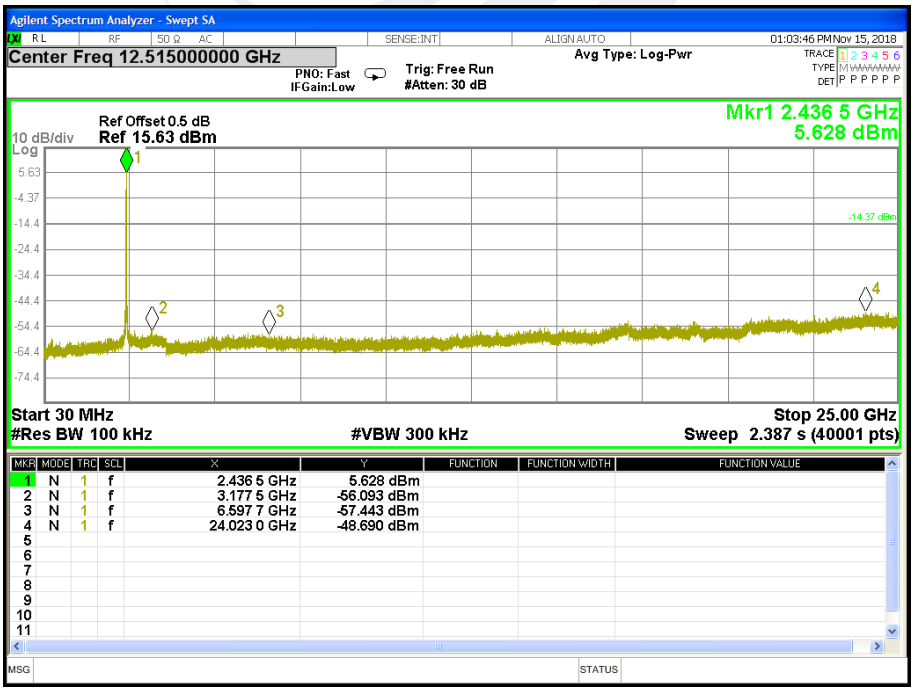
4.6 TEST RESULTS

Temperature：	25℃	Relative Humidity：	60%
Test Voltage：	DC 12V	Test Mode ：	TX b Mode /CH01, CH06, CH11

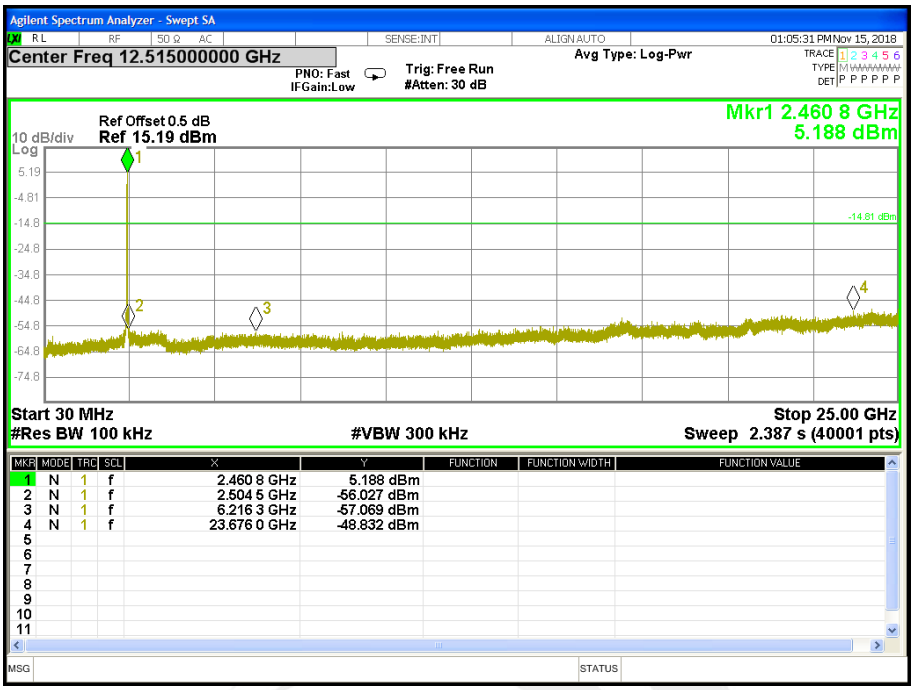
CH 01



CH 06

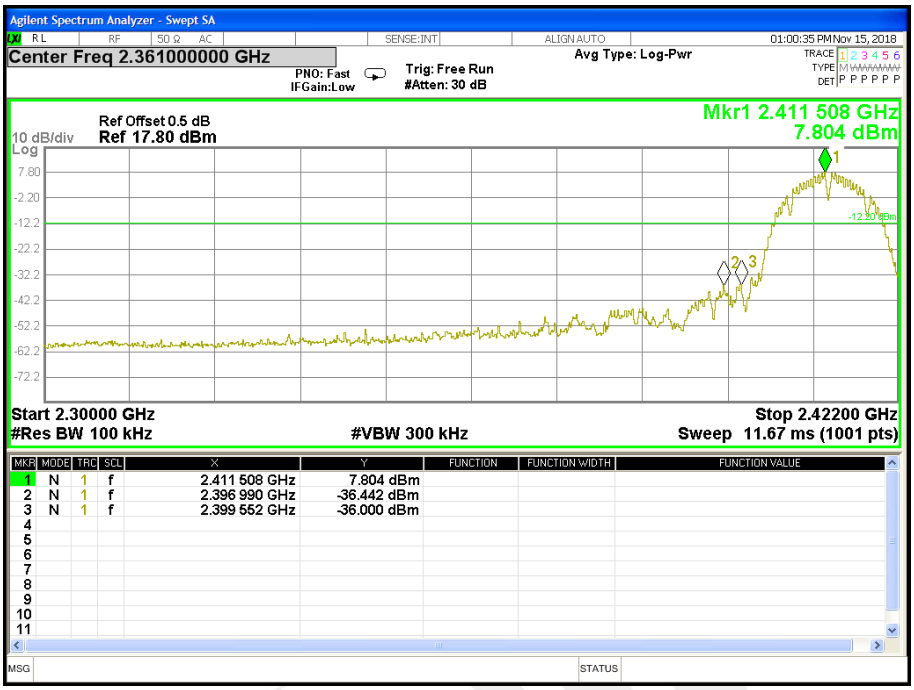


CH 11

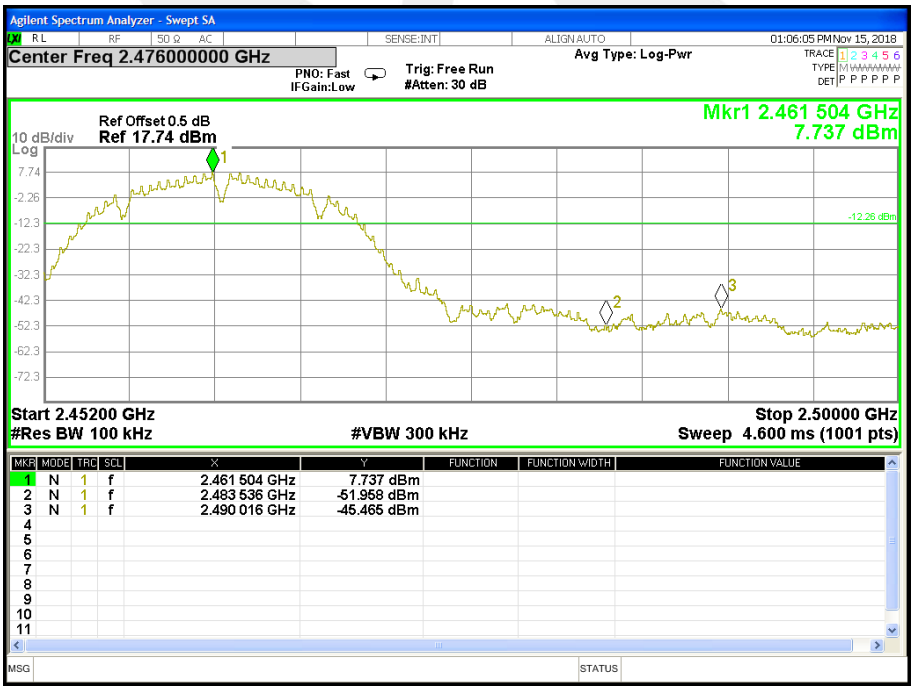

Agilent Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
01:05:31 PM Nov 15, 2018
Center Freq 12.515000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
TRACE 1 2 3 4 5 6
TYPE M
DET P P P P P
Mkr1 2.460 8 GHz
5.188 dBm
Ref Offset 0.5 dB
10 dB/div
Ref 15.19 dBm
Log
5.19
-4.81
-14.8
-24.8
-34.8
-44.8
-54.8
-64.8
-74.8
-14.81 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.00 GHz
Sweep 2.387 s (40001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 2.460 8 GHz 5.188 dBm
2 N 1 f 2.504 5 GHz -56.027 dBm
3 N 1 f 6.216 3 GHz -57.069 dBm
4 N 1 f 23.676 0 GHz -48.832 dBm
5
6
7
8
9
10
11
MSG
STATUS

Band edge

CH 01

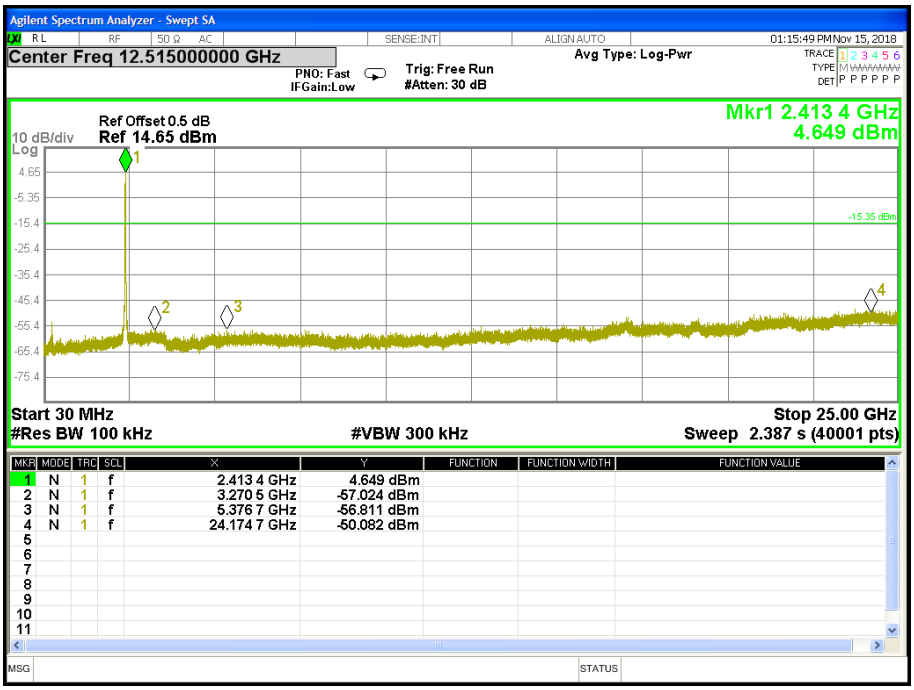


CH 11

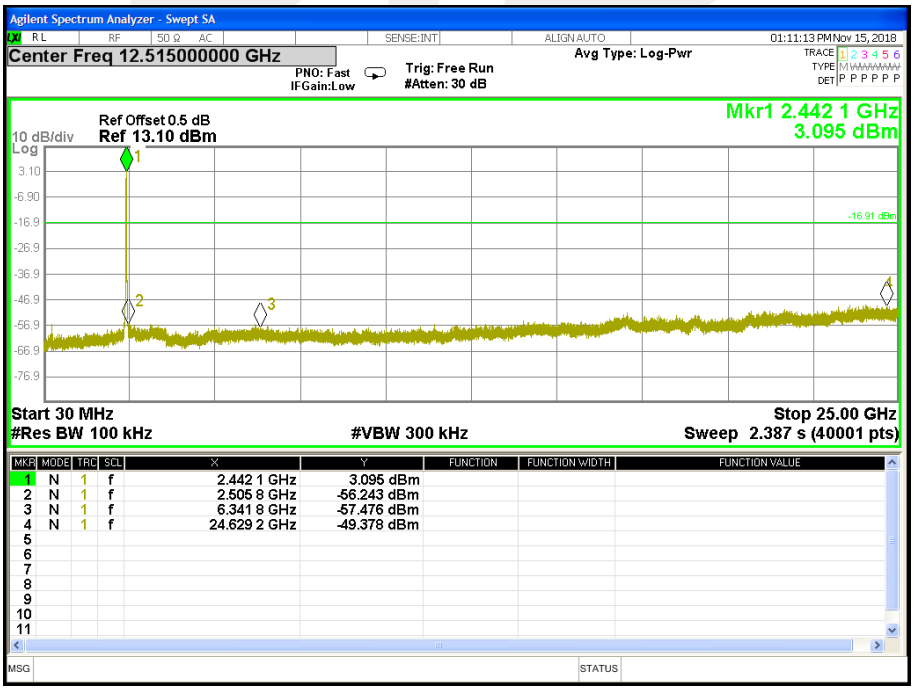


Temperature：	25℃	Relative Humidity：	60%
Test Voltage：	DC 12V	Test Mode ：	TX g Mode /CH01, CH06, CH11

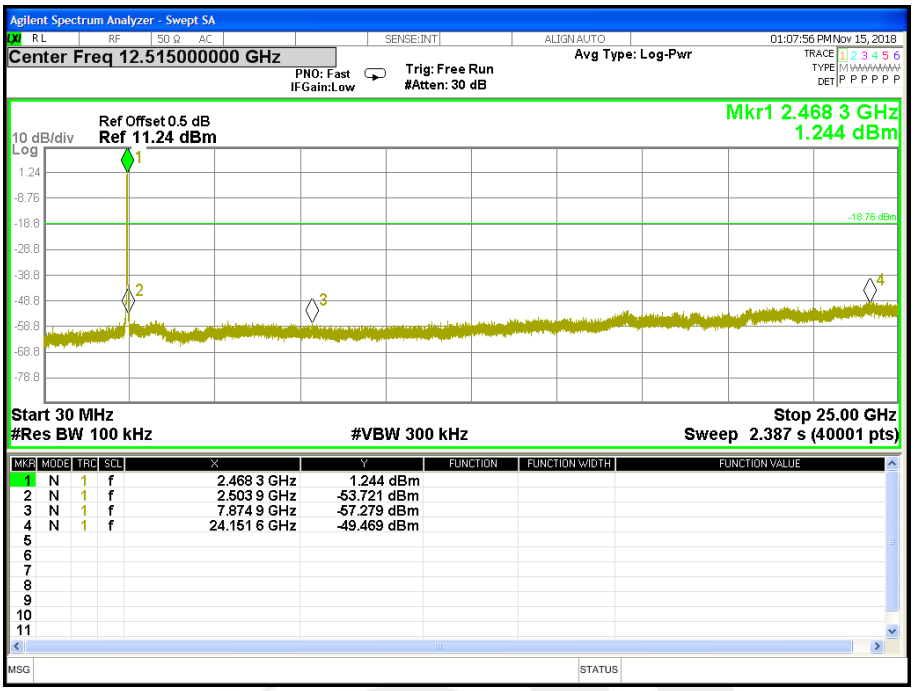
CH 01



CH06

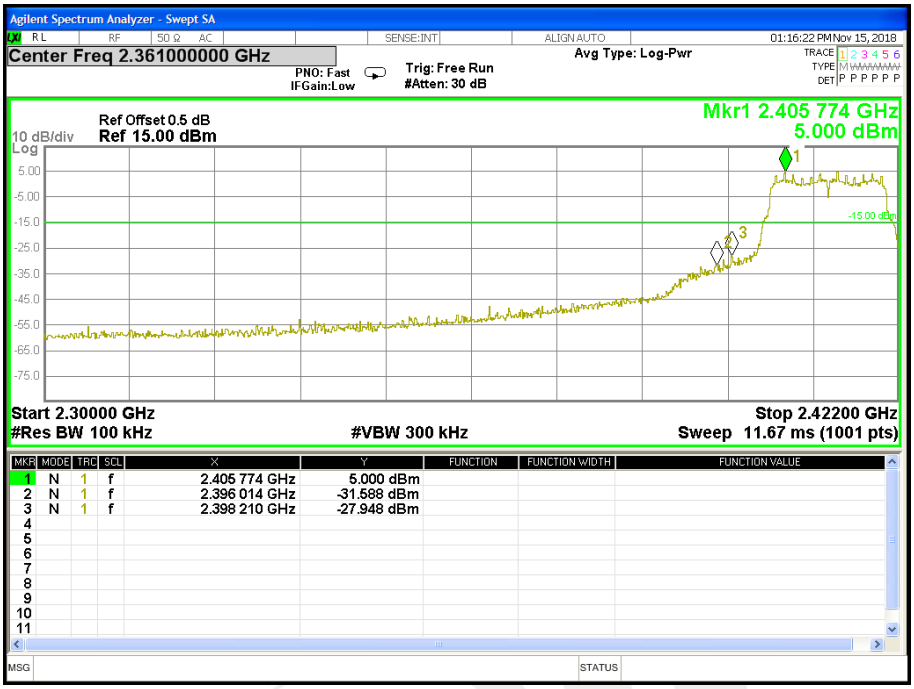


CH 11

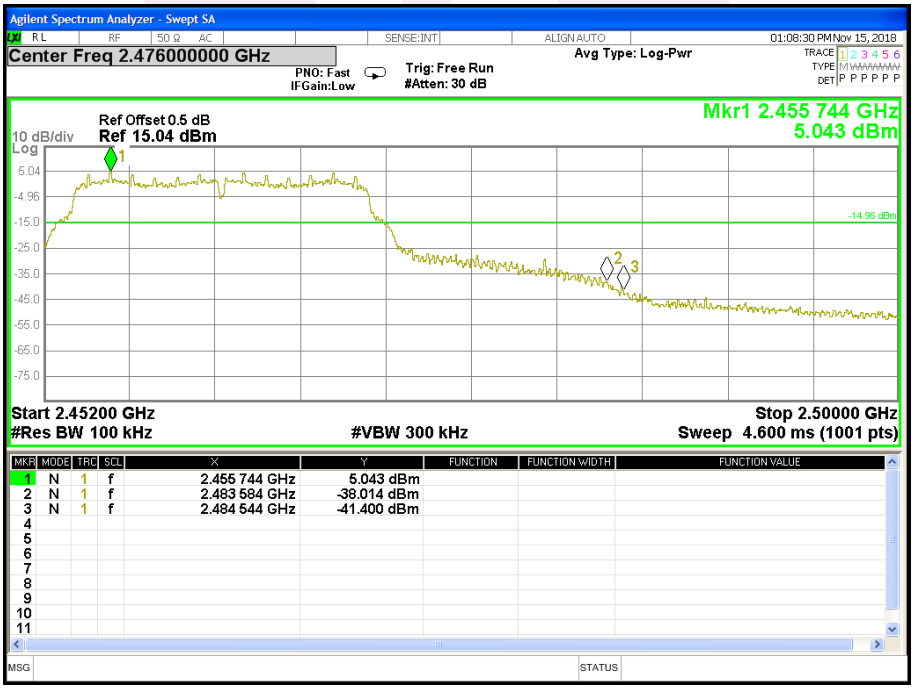

Agilent Spectrum Analyzer - Swept SA
Center Freq 12.515000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
01:07:56 PM Nov 15, 2018
Ref Offset 0.5 dB
10 dB/div
Ref 11.24 dBm
Mkr1 2.468 3 GHz
1.244 dBm
-18.76 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.00 GHz
Sweep 2.387 s (40001 pts)
1 N 1 f 2.468 3 GHz 1.244 dBm
2 N 1 f 2.503 9 GHz -53.721 dBm
3 N 1 f 7.874 9 GHz -57.279 dBm
4 N 1 f 24.151 6 GHz -49.469 dBm

Band edge

CH 01

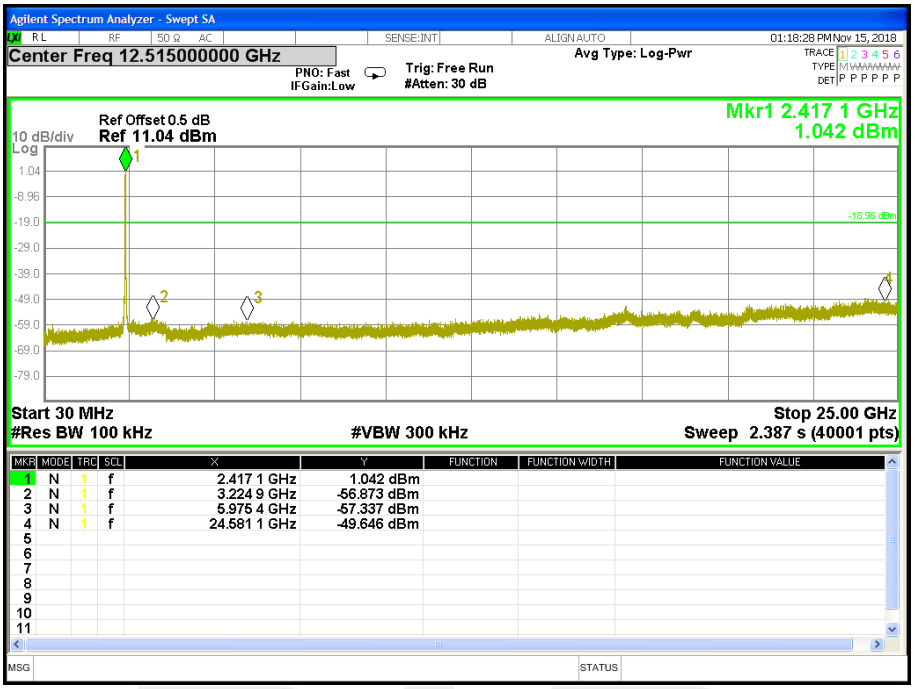


CH11

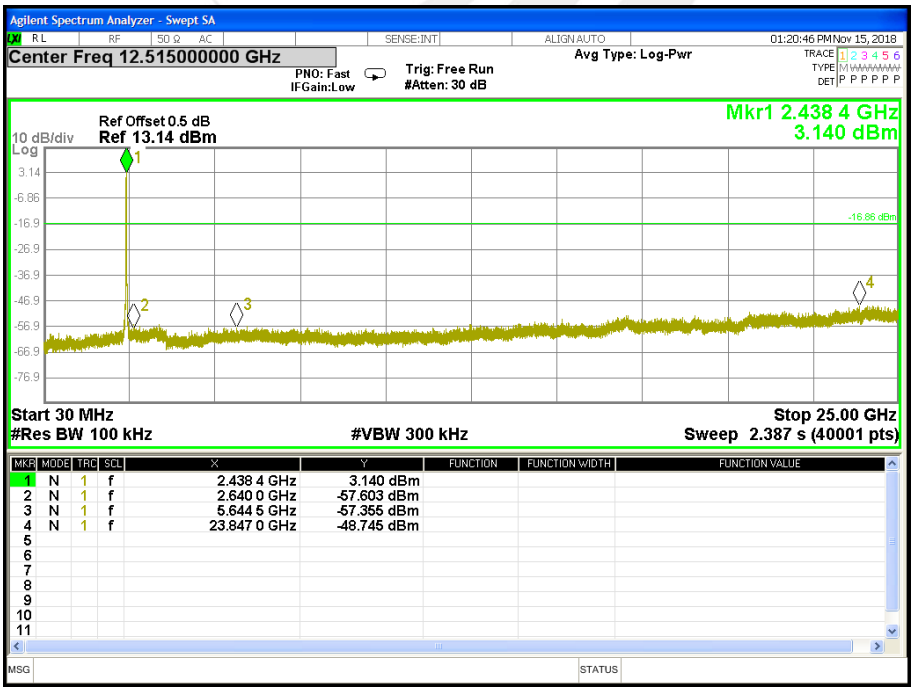


Temperature：	25℃	Relative Humidity：	60%
Test Voltage：	DC 12V	Test Mode ：	TX n Mode(20M) /CH01, CH06, CH11

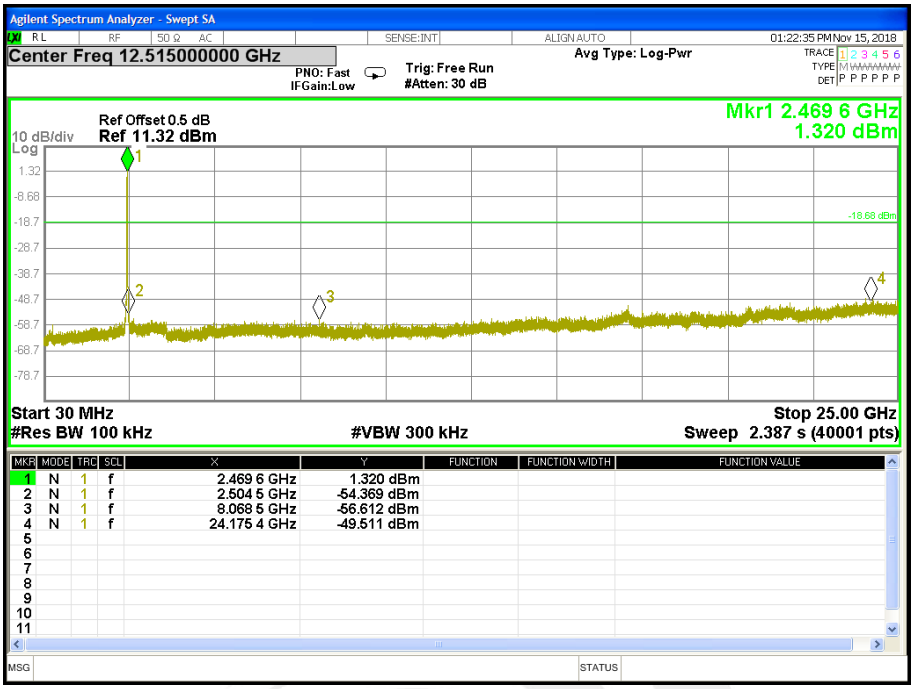
CH 01



CH 06

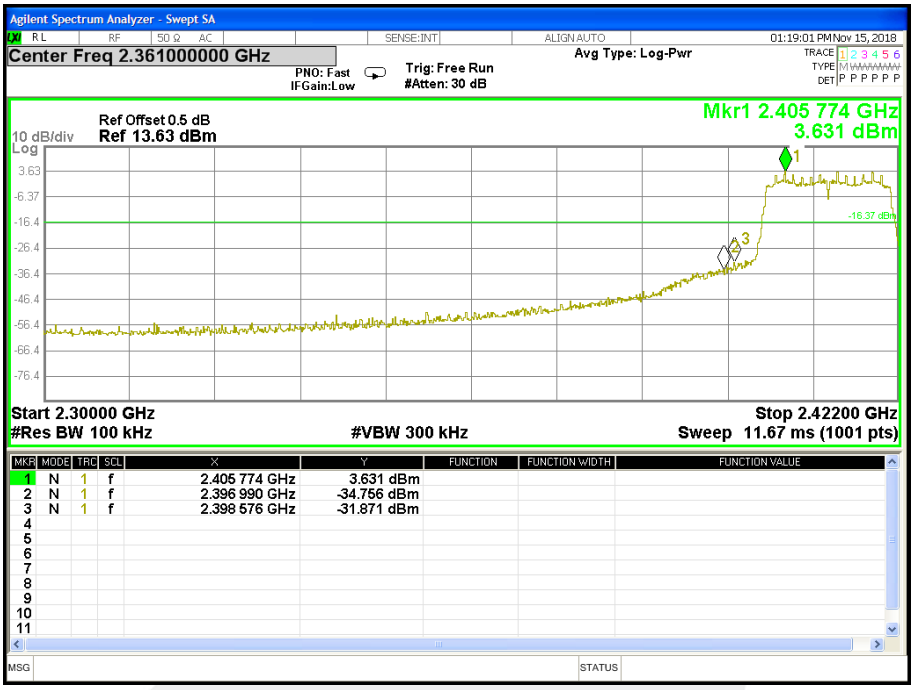


CH 11

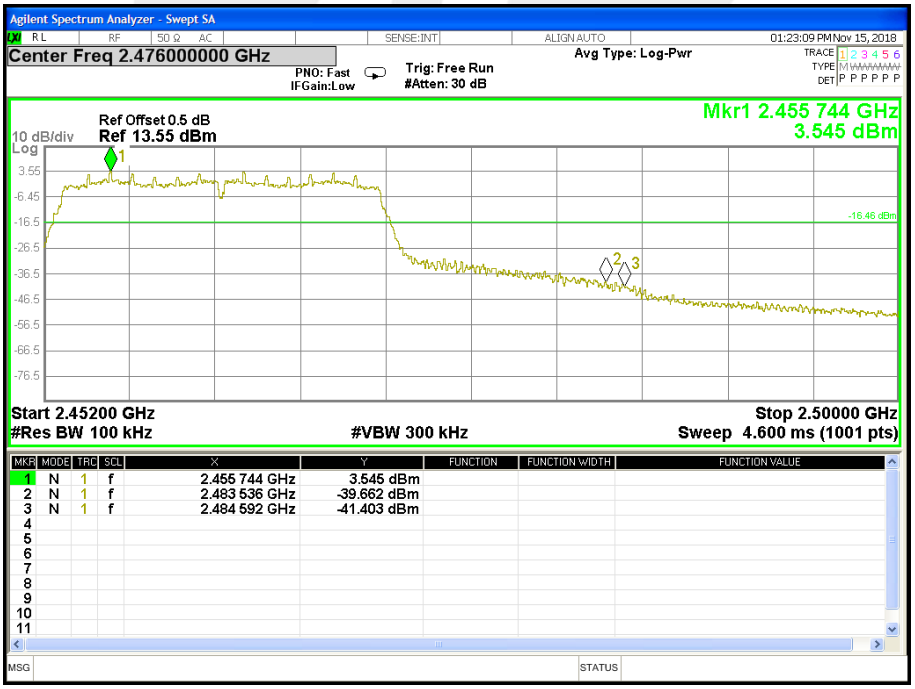

Agilent Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
01:22:35 PM Nov 15, 2018
Center Freq 12.515000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
TRACE 1 2 3 4 5 6
TYPE M
DET P P P P P
Ref Offset 0.5 dB
10 dB/div
Log
Ref 11.32 dBm
Mkr1 2.469 6 GHz
1.320 dBm
1.32
-8.68
-18.7
-28.7
-38.7
-48.7
-58.7
-68.7
-78.7
-18.68 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.00 GHz
Sweep 2.387 s (40001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 2.469 6 GHz 1.320 dBm
2 N 1 f 2.504 5 GHz -54.369 dBm
3 N 1 f 8.068 5 GHz -56.612 dBm
4 N 1 f 24.175 4 GHz -49.511 dBm
5
6
7
8
9
10
11
MSG
STATUS

Band edge

CH 01



CH 11



5 POWER SPECTRAL DENSITY TEST

5.1 APPLIED PROCEDURES / LIMIT

FCC Part15.247,Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(e)	Power Spectral Density	≤8 dBm (RBW ≥3KHz)	2400-2483.5	PASS

5.2 TEST PROCEDURE

1) Set analyzer center frequency to DTS channel center frequency.
2) Set the span to 1.5 times the DTS channel bandwidth.
3) Set the 100 kHz ≥ RBW ≥3 kHz.
4) Set the VBW ≥ 3 x RBW.
5) Detector = peak.
6) Sweep time = auto couple.
7) Trace mode = max hold.
8) Allow trace to fully stabilize.
9) Use the peak marker function to determine the maximum amplitude level.
10) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

5.3 DEVIATION FROM STANDARD

No deviation.

5.4 TEST SETUP

5.5 EUT OPERATION CONDITIONS

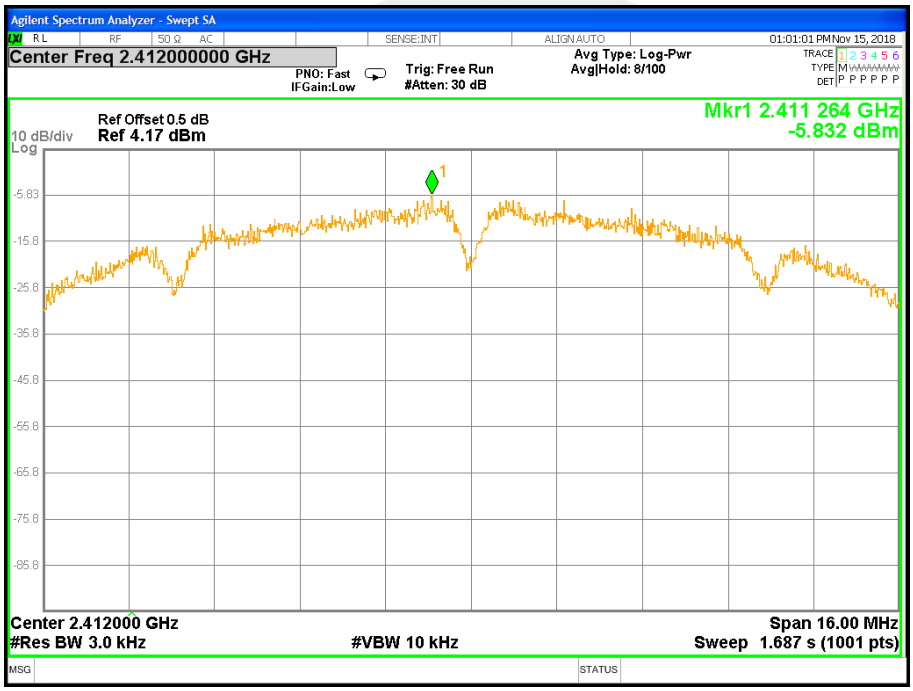
The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

5.6 TEST RESULTS

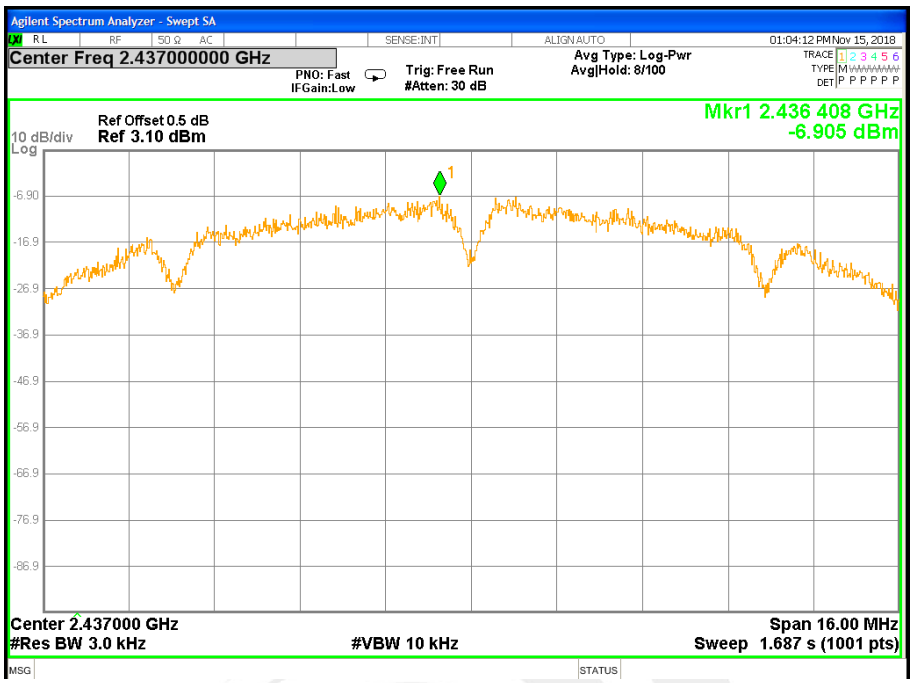
Temperature:	25℃	Relative Humidity:	60%
Test Voltage:	DC 12V	Test Mode:	TX b Mode /CH01, CH06, CH11

Test Mode	Frequency (MHz)	Power Density (dBm/3kHz)	Limit (dBm/3KHz)	Result
b mode (1 Mbps)	2412.00	-5.832	≤ 8.00	PASS
	2437.00	-6.905	≤ 8.00	PASS
	2462.00	-4.113	≤ 8.00	PASS

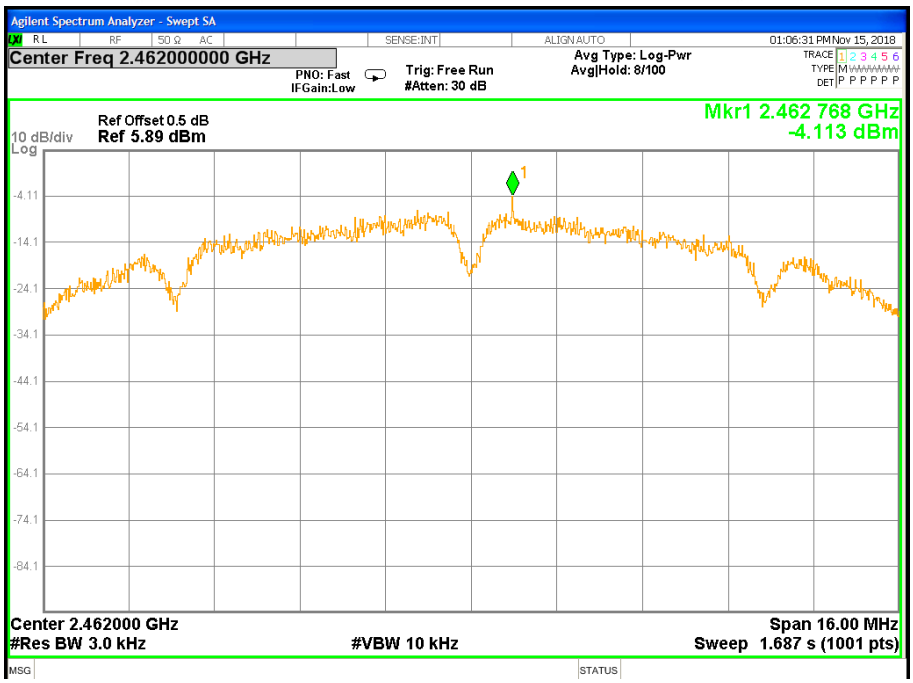
TX CH01



TX CH06



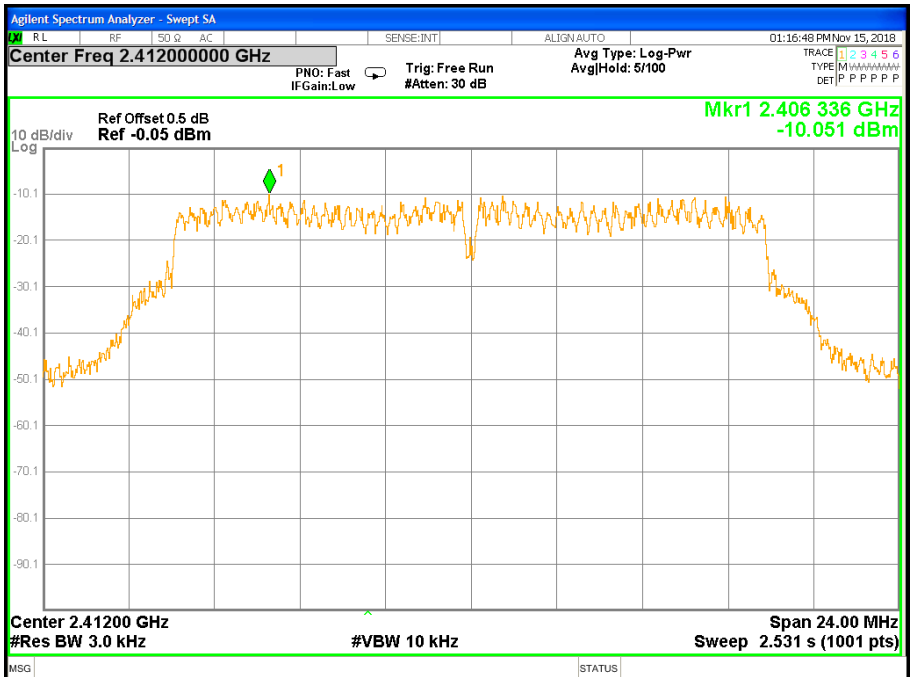
TX CH11



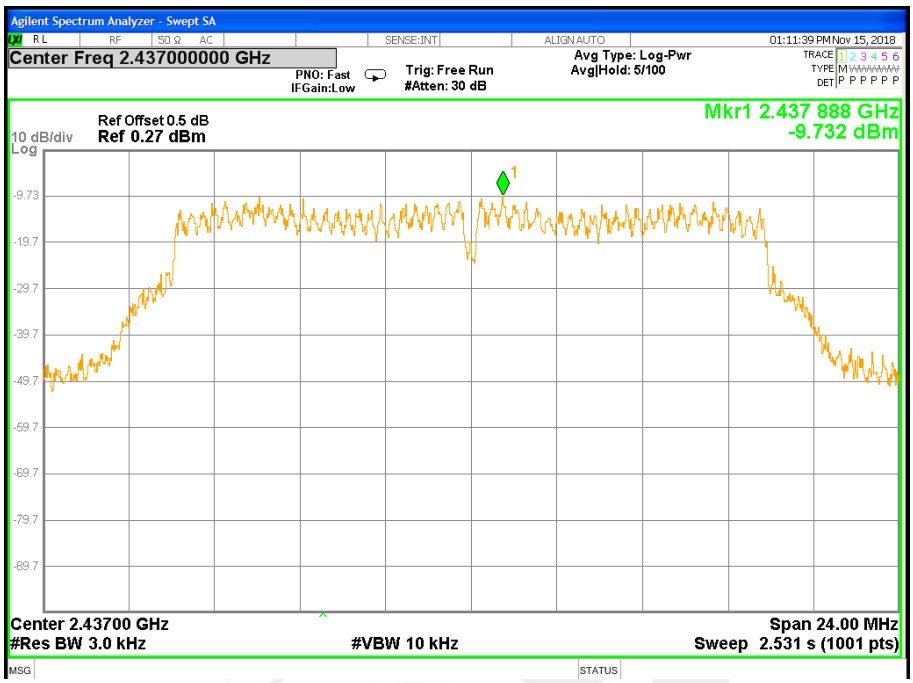
Temperature:	25℃	Relative Humidity:	60%
Test Voltage:	DC 12V	Test Mode:	TX g Mode /CH01, CH06, CH11

Test Mode	Frequency (MHz)	Power Density (dBm/3kHz)	Limit (dBm/3KHz)	Result
g mode (6 Mbps)	2412.00	-10.051	≤ 8.00	PASS
	2437.00	-9.732	≤ 8.00	PASS
	2462.00	-9.890	≤ 8.00	PASS

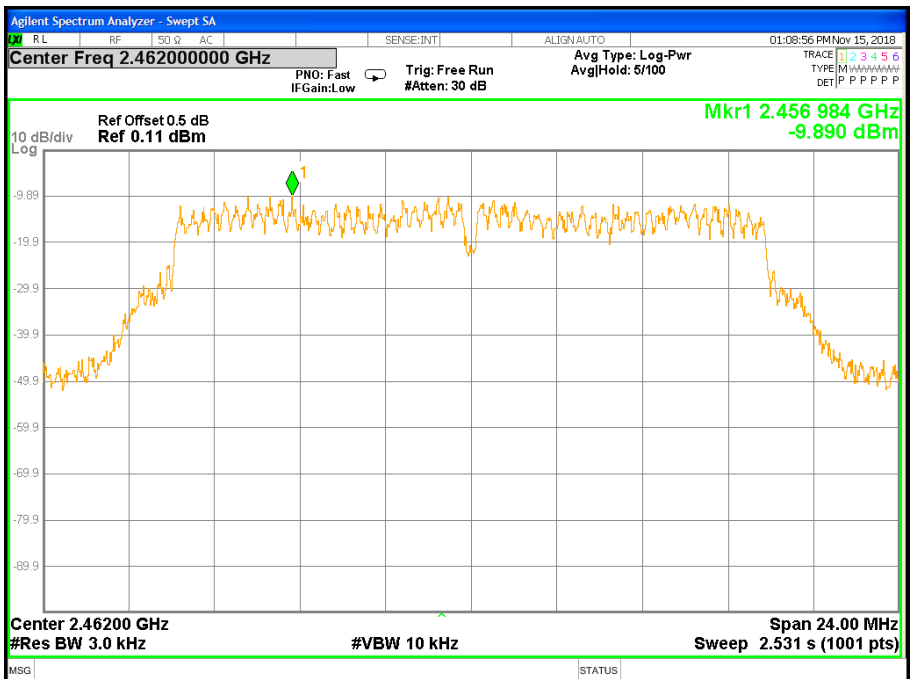
TX CH01



TX CH06



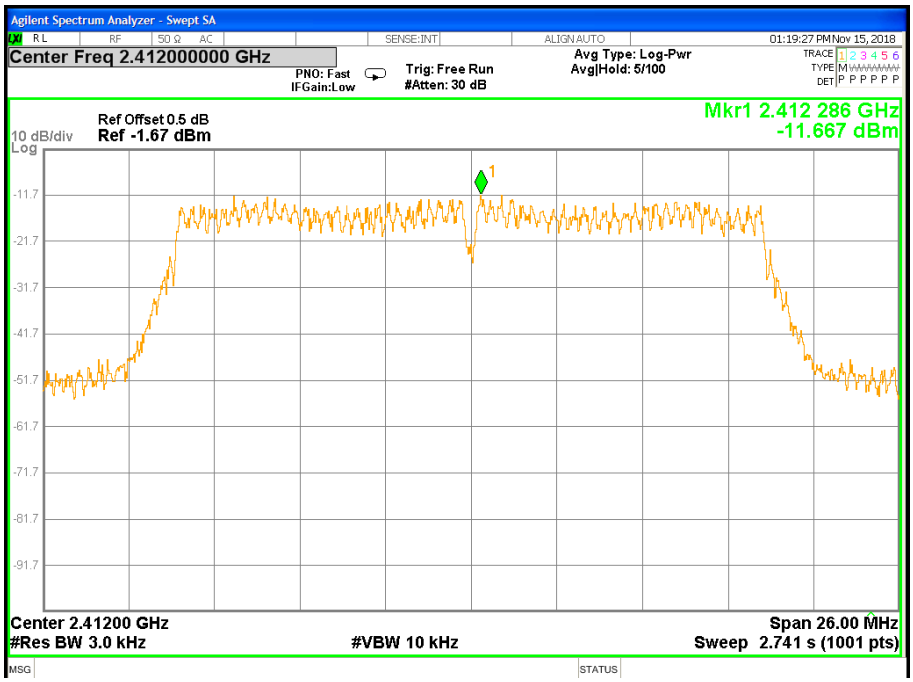
TX CH11



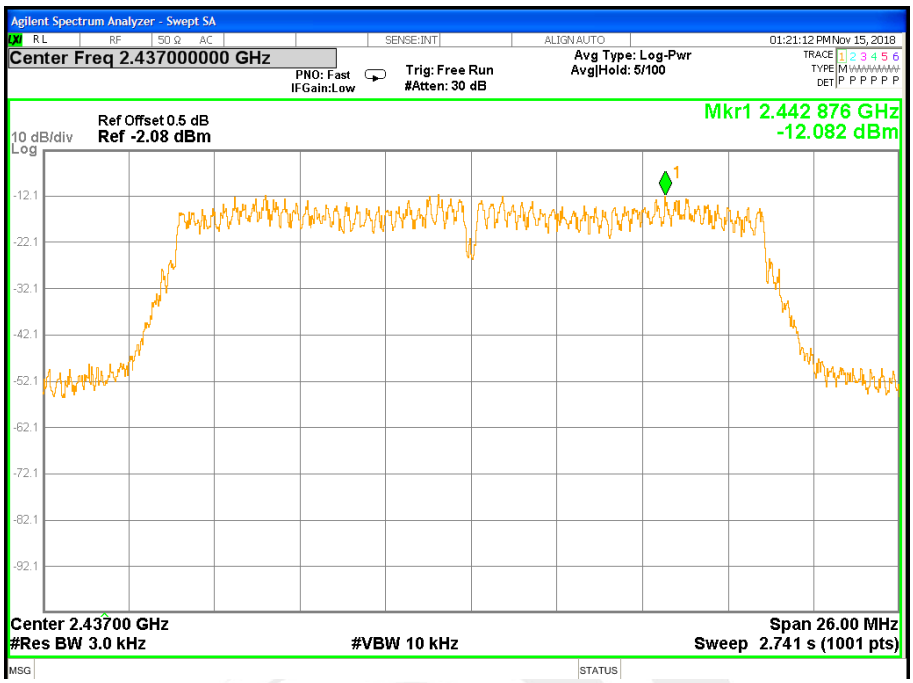
Temperature:	25℃	Relative Humidity:	60%
Test Voltage:	DC 12V	Test Mode:	TX n Mode(20M) /CH01, CH06, CH11

Test Mode	Frequency (MHz)	Power Density (dBm/3kHz)	Limit (dBm/3KHz)	Result
n(HT20) mode (MCS0)	2412.00	-11.667	≤ 8.00	PASS
	2437.00	-12.082	≤ 8.00	PASS
	2462.00	-11.345	≤ 8.00	PASS

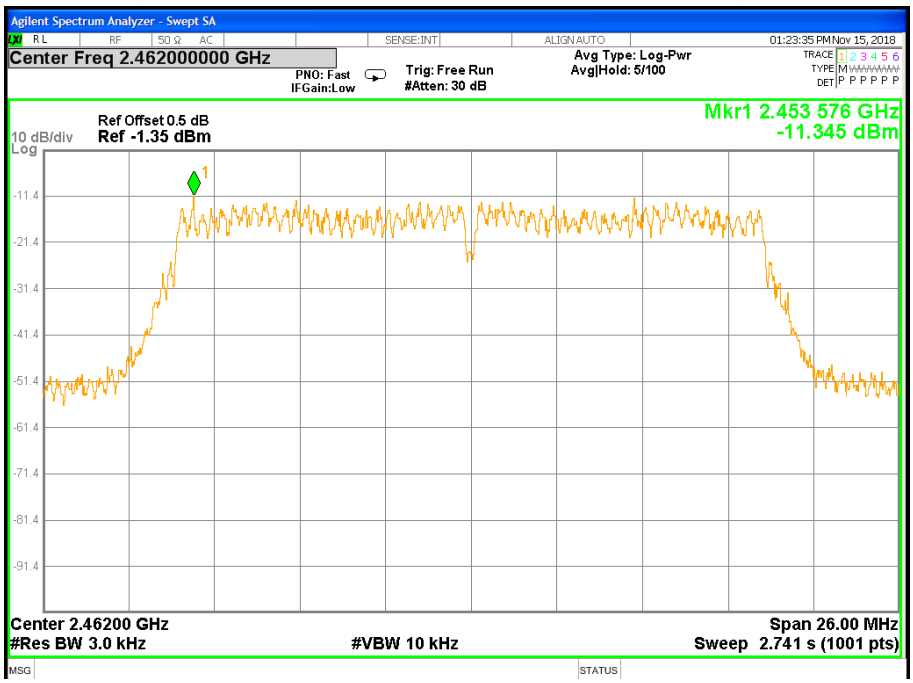
TX CH01



TX CH06



TX CH11



6 BANDWIDTH TEST

6.1 APPLIED PROCEDURES / LIMIT

FCC Part15.247,Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(2)	6dB Bandwidth	≥500KHz	2400-2483.5	PASS

6.2 TEST PROCEDURE

The automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 6 dB, if the functionality described above (i.e., RBW = 100 kHz, VBW≥3RBW, peak detector with maximum hold) is implemented by the instrumentation function. When using this capability, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be≥6 dB.

6.3 DEVIATION FROM STANDARD

No deviation.

6.4 TEST SETUP

6.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

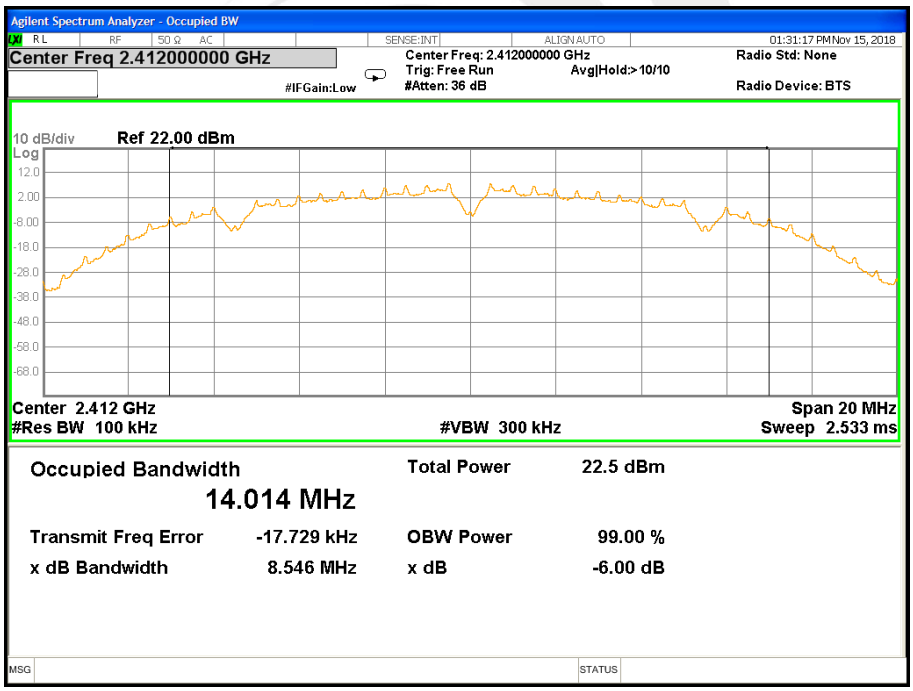
6.6 TEST RESULTS

Temperature:	25℃	Relative Humidity:	60%
Test Voltage:	DC 12V	Test Mode:	TX b Mode /CH01, CH06, CH11

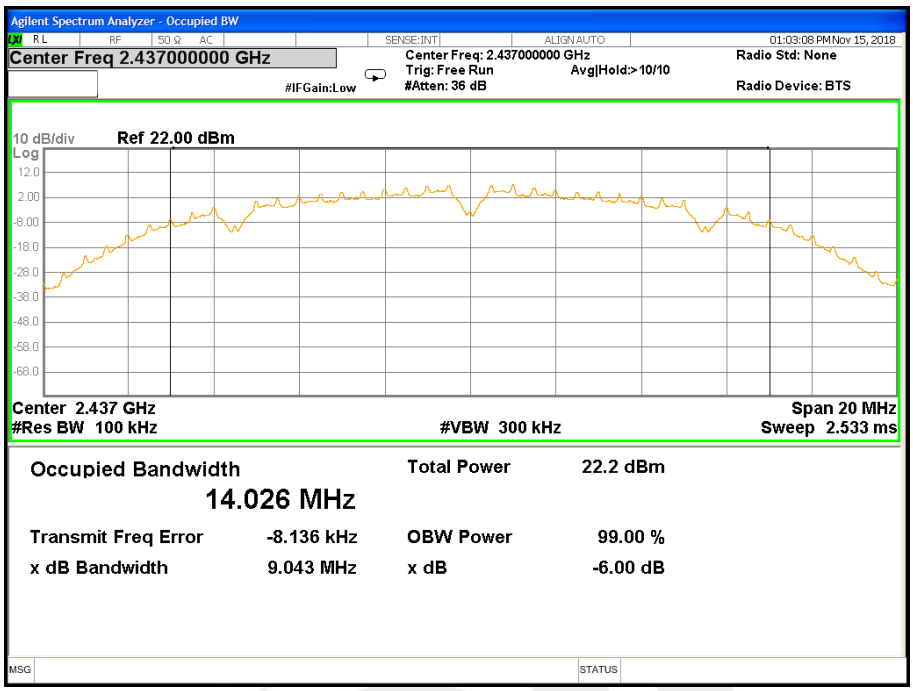
Remark: PEAK DETECTOR IS USED

Test Mode	Frequency (MHz)	6dB Bandwidth (MHz)	Limit of 6dB Bandwidth (MHz)	Result
b mode (1 Mbps)	2412.00	8.546	≥ 0.50	PASS
	2437.00	9.043	≥ 0.50	PASS
	2462.00	8.546	≥ 0.50	PASS

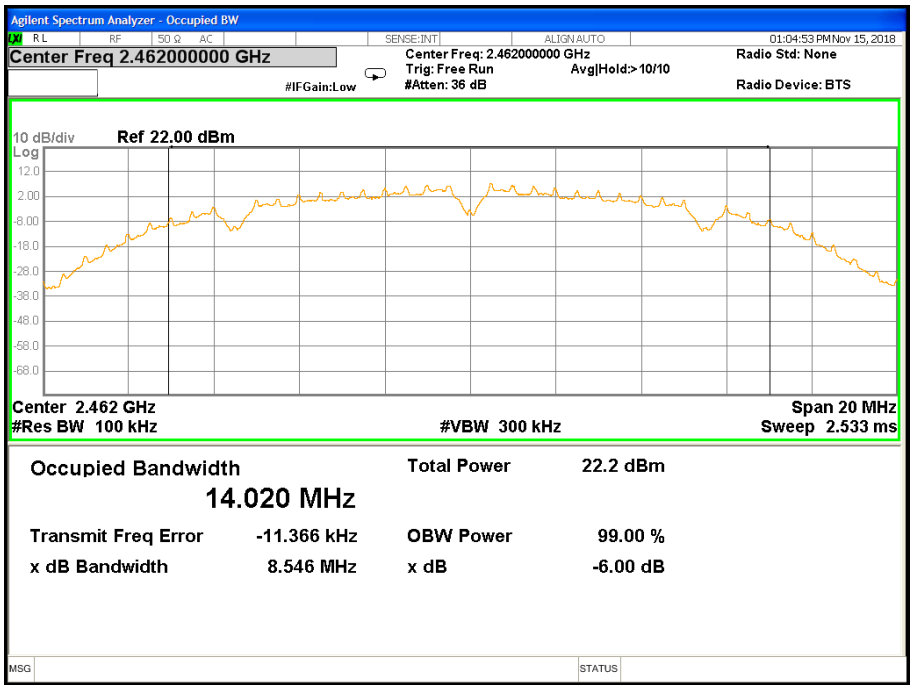
6dB Bandwidth TX CH 01



6dB BandwidthTX CH 06



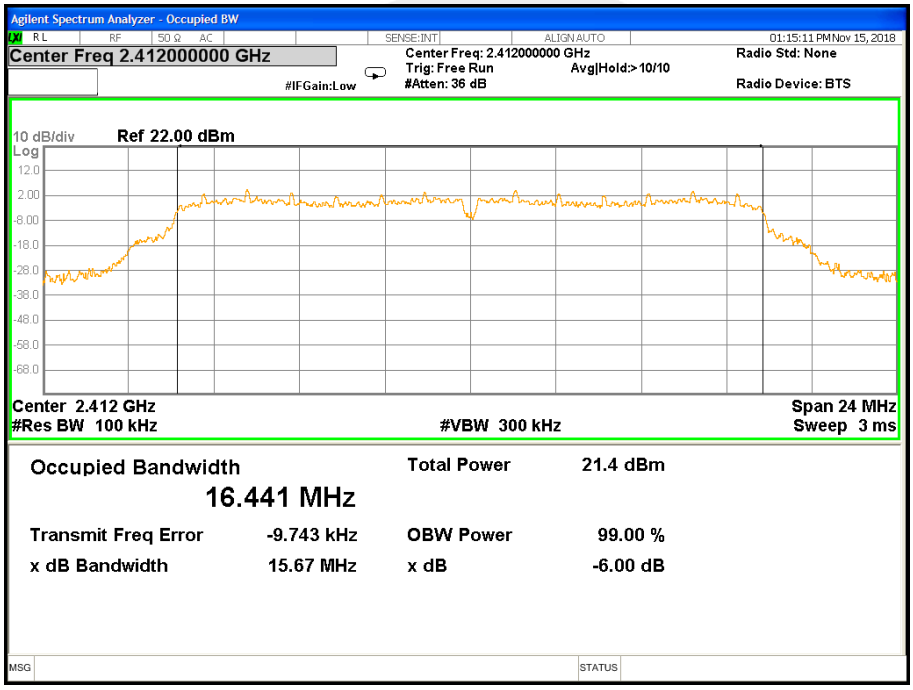
6dB BandwidthTX CH 11



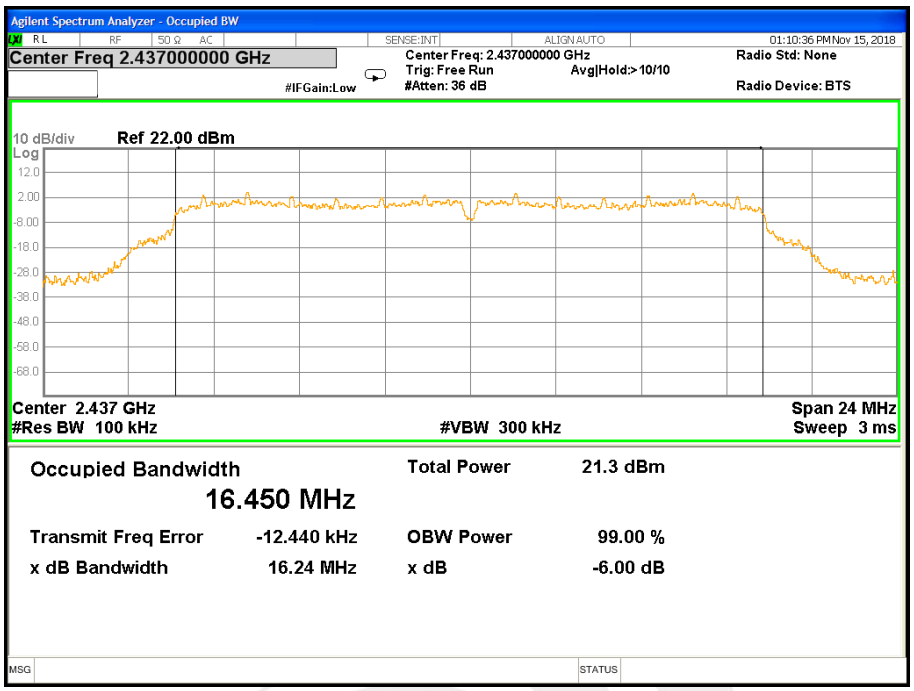
Temperature:	25℃	Relative Humidity:	60%
Test Voltage:	DC 12V	Test Mode:	TX g Mode /CH01, CH06, CH11

Test Mode	Frequency (MHz)	6dB Bandwidth (MHz)	Limit of 6dB Bandwidth (MHz)	Result
g mode (6 Mbps)	2412.00	15.67	≥ 0.50	PASS
	2437.00	16.24	≥ 0.50	PASS
	2462.00	16.05	≥ 0.50	PASS

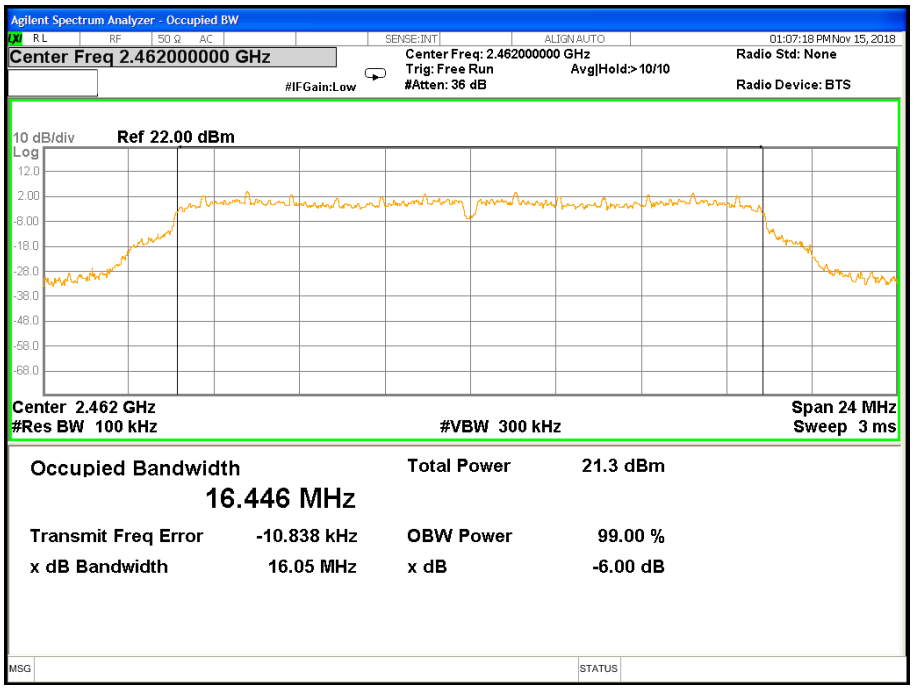
6dB BandwidthTX CH 01



6dB BandwidthTX CH 06



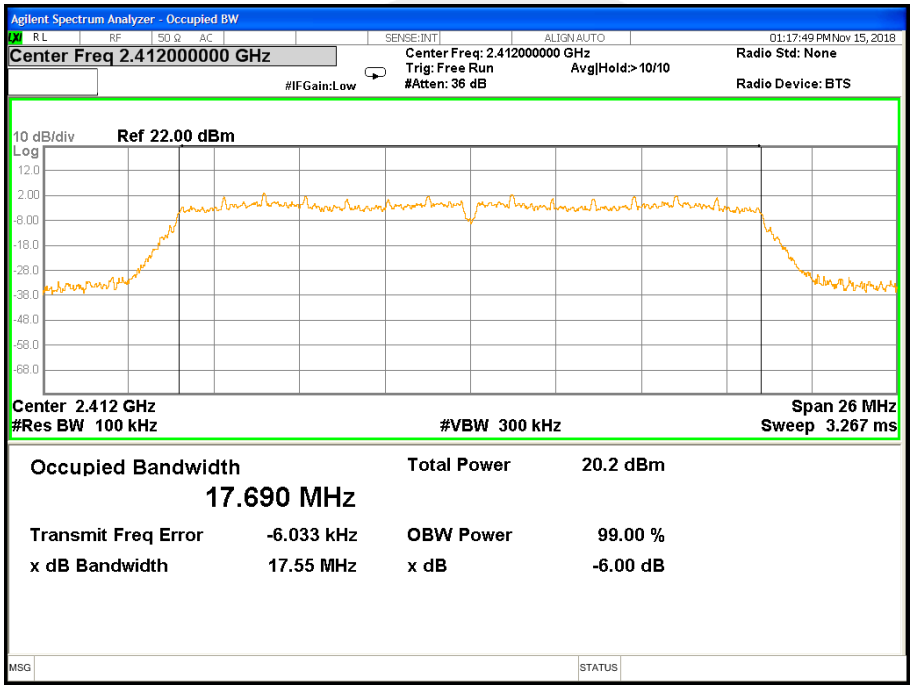
6dB BandwidthTX CH 11



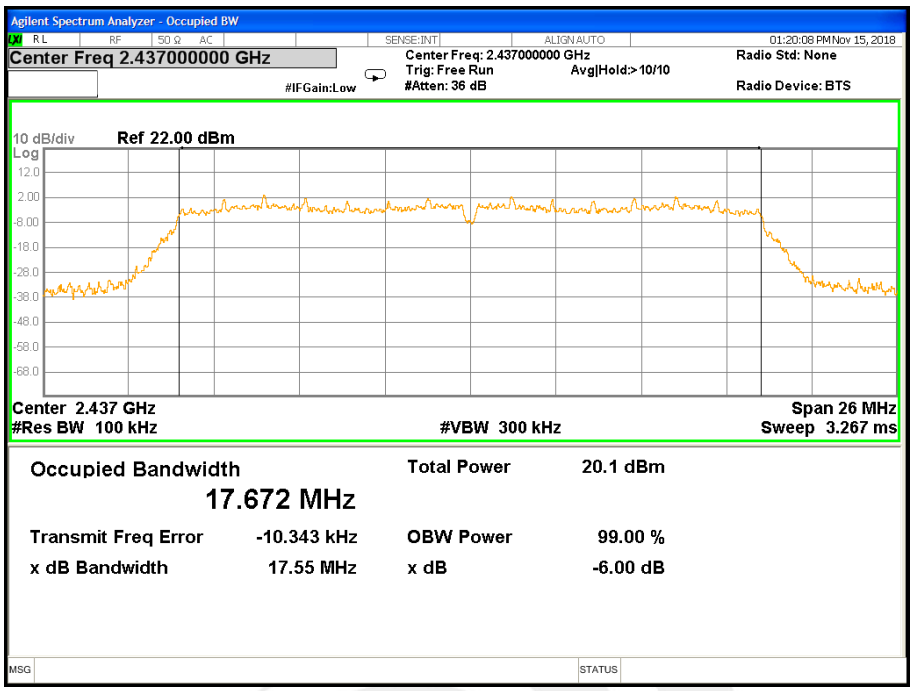
Temperature:	25℃	Relative Humidity:	60%
Test Voltage:	DC 12V	Test Mode:	TX n Mode(20M) /CH01, CH06, CH11

Test Mode	Frequency (MHz)	6dB Bandwidth (MHz)	Limit of 6dB Bandwidth (MHz)	Result
n(HT20) mode (MCS0)	2412.00	17.55	≥ 0.50	PASS
	2437.00	17.55	≥ 0.50	PASS
	2462.00	17.51	≥ 0.50	PASS

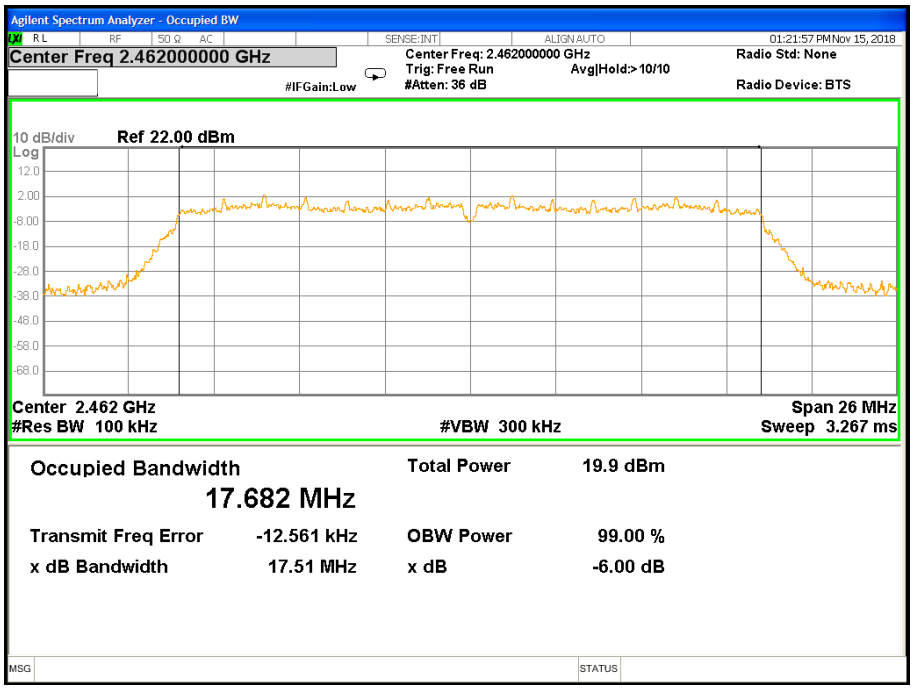
6dB BandwidthTX CH 01



6dB BandwidthTX CH 06



6dB BandwidthTX CH 11



7 PEAK OUTPUT POWER TEST

7.1 APPLIED PROCEDURES / LIMIT

FCC Part15.247,Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(3)	Output Power	1 watt or 30dBm	2400-2483.5	PASS

7.2 TEST PROCEDURE

a. The EUT was directly connected to the Power Sensor&PC

7.3 DEVIATION FROM STANDARD

No deviation.

7.4 TEST SETUP

7.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

7.6 TEST RESULTS

Temperature：	25℃	Relative Humidity：	60%
Test Voltage ：	DC 12V		

TX 802.11 b mode (1 Mbps)						
Test Channel	Frequency (MHz)	Conducted Output Power		Limit (dBm)	e.i.r.p. (dBm)	e.i.r.p. Limit (dBm)
		Peak(dBm)	AVG(dBm)			
CH01	2412.00	19.42	18.31	30.00	22.92	36.02
CH06	2437.00	19.23	18.14	30.00	22.73	36.02
CH11	2462.00	19.07	17.96	30.00	22.57	36.02

TX 802.11 g mode (6 Mbps)						
Test Channel	Frequency (MHz)	Conducted Output Power		Limit (dBm)	e.i.r.p. (dBm)	e.i.r.p. Limit (dBm)
		Peak(dBm)	AVG(dBm)			
CH01	2412.00	22.64	21.52	30.00	26.14	36.02
CH06	2437.00	22.34	21.26	30.00	25.84	36.02
CH11	2462.00	21.19	20.17	30.00	24.69	36.02

TX 802.11 n(HT20) mode (MCS0)						
Test Channel	Frequency (MHz)	Conducted Output Power		Limit (dBm)	e.i.r.p. (dBm)	e.i.r.p. Limit (dBm)
		Peak(dBm)	AVG(dBm)			
CH01	2412.00	21.54	19.41	30.00	25.04	36.02
CH06	2437.00	21.30	19.26	30.00	24.80	36.02
CH11	2462.00	21.04	19.02	30.00	24.54	36.02

8 ANTENNA REQUIREMENT

8.1 STANDARD REQUIREMENT

15.203 requirement: For intentional device, according to 15.203: an intentional radiator shallbe designed to ensure that no antenna other than that furnished by the responsible partyshall be used with the device.

8.2 EUT ANTENNA

The EUT antenna is Integral FPC Antenna. It complies with the standard requirement.