FCC TEST REPORT

(Part 15, Subpart C)

Applicant:	Corporativo Lanix S.A. de C.V.
Address:	Carretera Internacional Hermosillo-Nogales KM 8.5, 83160, Hermosillo, Sonora, México

Manufacturer or Supplier:	Corporativo Lanix S.A. de C.V.
Address:	Carretera Internacional Hermosillo-Nogales KM 8.5, 83160, Hermosillo, Sonora, México
Product:	LTE MODEM
Brand Name:	Lanix
Model Name:	B02
FCC ID:	ZC4B02
Date of tests:	Sep. 03, 2019 ~ Oct. 11, 2019
The tests have been carried out according to the requirements of the following standard:	
☒ **FCC Part 15, Subpart C, Section 15.247** ☒ **ANSI C63.10-2013**	
CONCLUSION: The submitted sample was found to COMPLY with the test requirement	

Prepared by Alex Chen Engineer / Mobile Department	Approved by Luke Lu Manager / Mobile Department
Alex Date: Oct. 16, 2019	Luke Lu Date: Oct. 16, 2019

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF190902W001-1	Original release	Oct. 16, 2019

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1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)		
STANDARD SECTION	**TEST TYPE AND LIMIT**	**RESULT**
15.207	AC Power Conducted Emission	Compliance
15.205 15.209	Radiated Emissions	Compliance
15.247(d)	Out of band Emission Measurement	Compliance
15.247(a)(2)	6dB bandwidth	Compliance
15.247(b)	Conducted Output power	Compliance
15.247(e)	Power Spectral Density	Compliance
15.203	Antenna Requirement	Compliance

1.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

MEASUREMENT	UNCERTAINTY
AC Power Conducted emissions	±2.70dB
Radiated emissions (30MHz~1GMHz)	±4.98dB
Radiated emissions (1GMHz ~6GMHz)	±4.70dB
Radiated emissions (6GMHz ~18GMHz)	±4.60dB
Radiated emissions (18GMHz	±4.12dB
Conducted emissions	±4.01dB
Occupied Channel Bandwidth	±43.58KHz
Conducted Output power	±2.06dB
Power Spectral Density	±0.85 dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k = 2.

2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT	LTE MODEM
BRAND NAME	Lanix
MODEL NAME	B02
NOMINAL VOLTAGE	12(10.8-13.2)V (adapter or host equipment)
MODULATION	DSSS, OFDM
TRANSMISSION RATE	802.11b: 11/ 5.5/ 2.0 / 1.0 Mbps 802.11g: 54/ 48/ 36 / 24 / 18 / 9/ 6 Mbps 802.11n: up to 135 Mbps
OPERATING FREQUENCY	2412-2462MHz for 11b/g/n(HT20) 2422-2452MHz for 11n(HT40)
MAX. OUTPUT POWER	277.098mW (Maximum)
ANTENNA TYPE	PCB Antenna with 2 dBi gain
HW VERSION	PS05I_1_21
SW VERSION	PS05INT2_N21_AP_V003
CABLE SUPPLIED	N/A
ACCESSORY DEVICES	Refer to note as below

NOTE:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. The EUT incorporates a MIMO function. Physically, the EUT provides one transmitter and one receiver.

MODULATION MODE	TX/RX FUNCTION
802.11b	2TX /2RX
802.11g	2TX /2RX
802.11n (20MHz)	2TX /2RX
802.11n (40MHz)	2TX /2RX

3. The EUT was powered by the following adapter:

ADAPTER	
BRAND:	LANIX
MODEL:	RD1201000-C55-91MG
INPUT:	AC 100-240V, 0.6mA
OUTPUT:	DC 12(10.8-13.2)V, 1000mA

4. The EUT matched the following reticle:

RETICLE	
BRAND:	Huachen
MODEL:	HC-WX02
SIGNAL LINE:	1.0 METER

5. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

2.2 DESCRIPTION OF TEST MODES

11 channels are provided for 802.11b, 802.11g and 802.11n (HT20):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2412 MHz	7	2442 MHz
2	2417 MHz	8	2447 MHz
3	2422 MHz	9	2452 MHz
4	2427 MHz	10	2457 MHz
5	2432 MHz	11	2462 MHz
6	2437 MHz		

7 channels are provided for 802.11n (HT40):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
3	2422MHz	7	2442MHz
4	2427MHz	8	2447MHz
5	2432MHz	9	2452MHz
6	2437MHz		

2.2.1 CONFIGURATION OF SYSTEM UNDER TEST

Please see section 5 photographs of the test configuration for reference.

2.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports.
The worst case was found when positioned on Y axis for radiated emission. Following test modes were selected for the final test, and the final worst case is marked in boldface and recorded in the report:

EUT CONFIGURE MODE	APPLICABLE TO				MODE
	RE<1G	RE≥1G	PLC	APCM	
-	√	√	√	√	-

Where **RE<1G:** Radiated Emission below 1GHz **RE≥1G:** Radiated Emission above 1GHz
PLC: Power Line Conducted Emission **APCM:** Antenna Port Conducted Measurement

NOTE: No need to concern of Conducted Emission due to the EUT is powered by battery.

RADIATED EMISSION TEST (BELOW 1GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)
802.11n HT20	1 to 11	11	OFDM	MCS0

RADIATED EMISSION TEST (ABOVE 1GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	CCK	1.0
802.11g	1 to 11	1, 6, 11	OFDM	6.0
802.11n HT20	1 to 11	1, 6, 11	OFDM	MCS0
802.11n HT40	3 to 9	3, 6, 9	OFDM	MCS0

POWER LINE CONDUCTED EMISSION TEST:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)
802.11n HT20	1 to 11	11	OFDM	MCS0

BANDEDGE MEASUREMENT:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)
802.11b	1 to 11	1, 11	CCK	1.0
802.11g	1 to 11	1, 11	OFDM	6.0
802.11n HT20	1 to 11	1, 11	OFDM	MCS0
802.11n HT40	3 to 9	3, 9	OFDM	MCS0

ANTENNA PORT CONDUCTED MEASUREMENT:

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	CCK	1.0
802.11g	1 to 11	1, 6, 11	OFDM	6.0
802.11n HT20	1 to 11	1, 6, 11	OFDM	MCS0
802.11n HT40	3 to 9	3,6, 9	OFDM	MCS0

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	TEST VOLTAGE	TESTED BY
RE<1G	22deg. C, 54%RH	DC 12V	Star Le
RE≥1G	22deg. C, 54%RH	DC 12V	Star Le
PLC	24deg. C, 55%RH	DC 12V	Jacky Liu
APCM	25deg. C, 60%RH	DC 12V	Big Wang

2.3 Duty Cycle of Test Signal

WIFI 2.4GHz

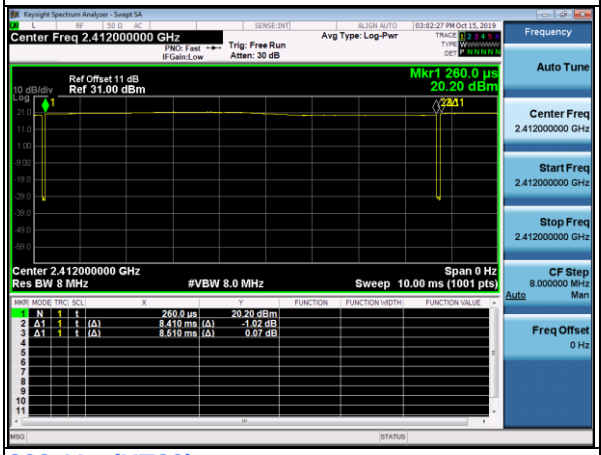
802.11b: Duty cycle = 8.410/8.510 = 0.988 > 98%, Duty factor is not considered.

802.11g: Duty cycle = 1.397/1.440 = 0.970< 98%, Duty factor = 10 * log(1/ 0.970) = 0.132

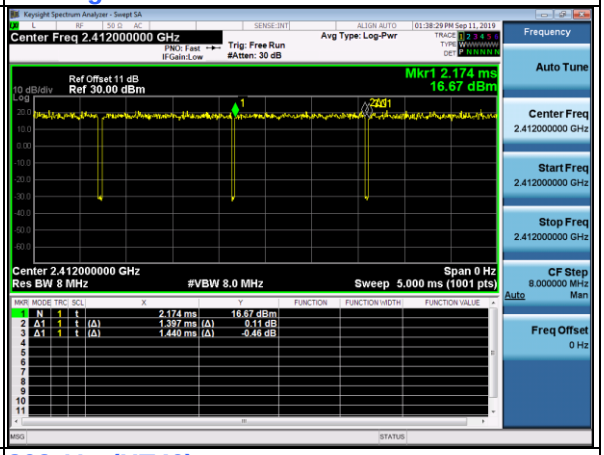
802.11n (HT20): Duty cycle = 1.312/1.435 = 0.914< 98%, Duty factor = 10 * log(1/ 0.914) = 0.389

802.11n (HT40): Duty cycle = 87.15/222.0= 0.393< 98%, Duty factor = 10 * log(1/ 0.393) = 4.061

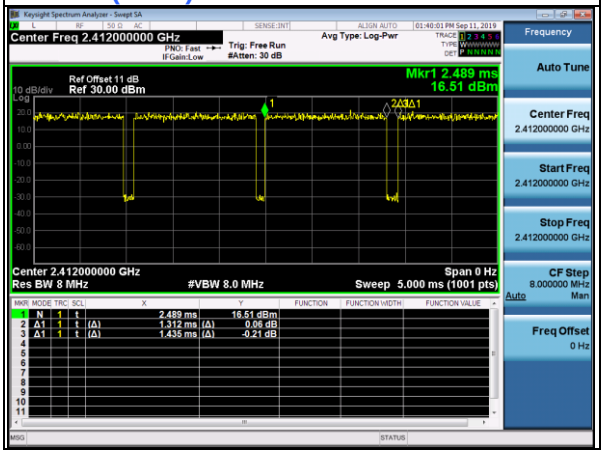
802.11b



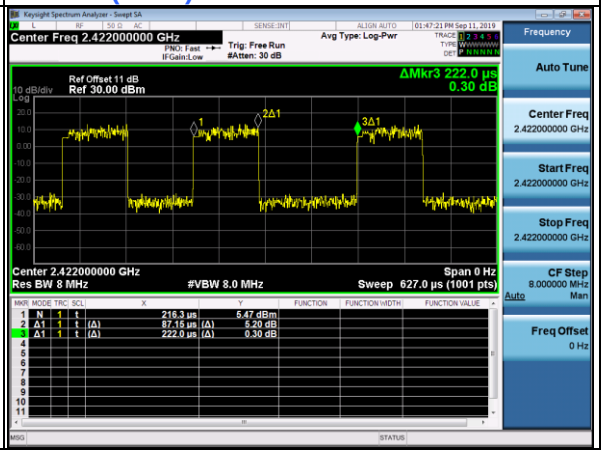
802.11g



802.11n (HT20)



802.11n (HT40)



2.4 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C, Section 15.247

558074 D01 DTS Meas Guidance v05r02

ANSI C63.10-2013

Note：

1. All test items have been performed and recorded as per the above standards.
2. The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (Certification). The test report has been issued separately.

2.5 DESCRIPTION OF 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.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	DC source	LONG WEI	PS-6403D	010934269	N/A
2	PC	HP	A6608CN	3CR83825X3	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	DC Line: Unshielded, Detachable 1.0m
2	AC Line: Unshielded, Detachable 1.5m

2.6 ANTENNA REQUIREMENT

Per FCC Part 15.203. An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Conclusion:

The EUT use one PCB Antenna that was permanently attached and the detail information list as below:

ANT Gain	Type	TX/RX	Frequency range
2	PCB Antenna	TX & RX	2400~2483.5GHz

3 TEST TYPES AND RESULTS

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56	56 to 46
0.5 ~ 5	56	46
5 ~ 30	60	50

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

2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

3.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESR3	101900	Feb. 26,19	Feb. 25,20
EMC32 test software	Rohde&Schwarz	EMC32	NA	NA	NA
LISN network	Rohde&Schwarz	ENV216	101922	Feb. 26,19	Feb. 25,20

NOTE:

1. The test was performed in CE shielded room.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

3.1.3 TEST PROCEDURES

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

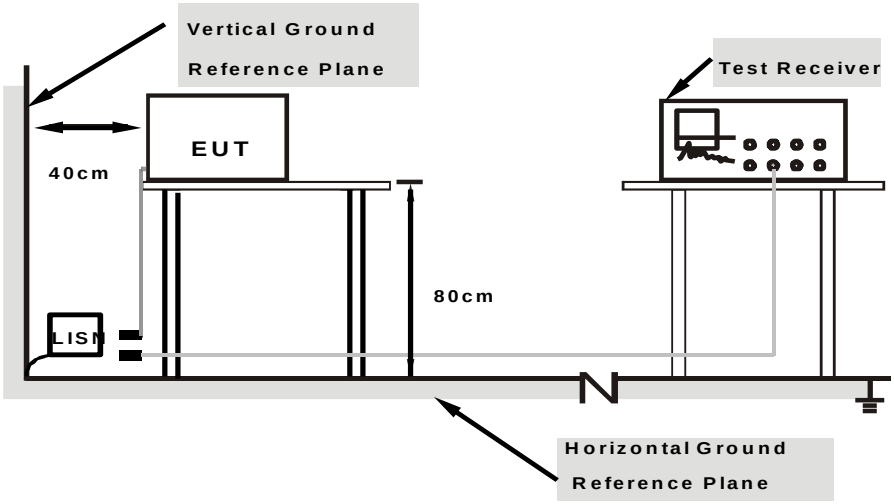
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE: All modes of operation were investigated and the worst-case emissions are reported.

3.1.4 DEVIATION FROM TEST STANDARD

No deviation.

3.1.5 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

For the actual test configuration, please refer to the attached file (Test Setup Photo).

3.1.6 EUT OPERATING CONDITIONS

a. Turned on the power and connected of all equipment.
b. EUT was operated according to the type used was description in manufacturer’s specifications or the User's Manual.

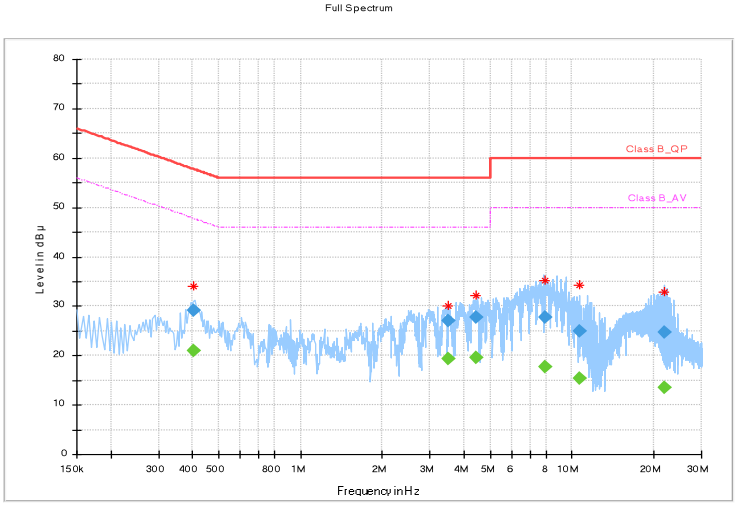
3.1.7 TEST RESULTS

CONDUCTED WORST-CASE DATA:

Frequency Range	150KHz ~ 30MHz	**Detector Function & Resolution Bandwidth**	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	120Vac, 60Hz	**Environmental Conditions**	25deg. C, 52RH
Test Voltage	DC 12V	**Tested By**	Jimmy Liu

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.404000	---	20.91	47.77	-26.86	L	ON	10.0
0.404000	29.05	---	57.77	-28.72	L	ON	10.0
3.504000	---	19.30	46.00	-26.70	L	ON	10.2
3.504000	27.14	---	56.00	-28.86	L	ON	10.2
4.440000	---	19.56	46.00	-26.44	L	ON	10.2
4.440000	27.70	---	56.00	-28.30	L	ON	10.2
7.936000	---	17.61	50.00	-32.39	L	ON	10.4
7.936000	27.82	---	60.00	-32.18	L	ON	10.4
10.624000	---	15.36	50.00	-34.64	L	ON	10.5
10.624000	24.90	---	60.00	-35.10	L	ON	10.5
21.796000	---	13.63	50.00	-36.37	L	ON	10.6
21.796000	24.79	---	60.00	-35.21	L	ON	10.6

REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



Frequency Range	150KHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25deg. C, 52RH
Test Voltage	DC 12V	Tested By	Jimmy Liu

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.396000	---	20.79	47.94	-27.15	N	ON	9.9
0.396000	28.52	---	57.94	-29.41	N	ON	9.9
0.476000	---	13.80	46.41	-32.61	N	ON	9.9
0.476000	22.44	---	56.41	-33.97	N	ON	9.9
3.492000	---	19.38	46.00	-26.62	N	ON	10.1
3.492000	27.14	---	56.00	-28.86	N	ON	10.1
4.416000	---	19.71	46.00	-26.29	N	ON	10.1
4.416000	27.82	---	56.00	-28.18	N	ON	10.1
8.796000	---	17.46	50.00	-32.54	N	ON	10.3
8.796000	27.57	---	60.00	-32.43	N	ON	10.3
21.268000	---	13.64	50.00	-36.36	N	ON	10.5
21.268000	22.56	---	60.00	-37.44	N	ON	10.5

REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.

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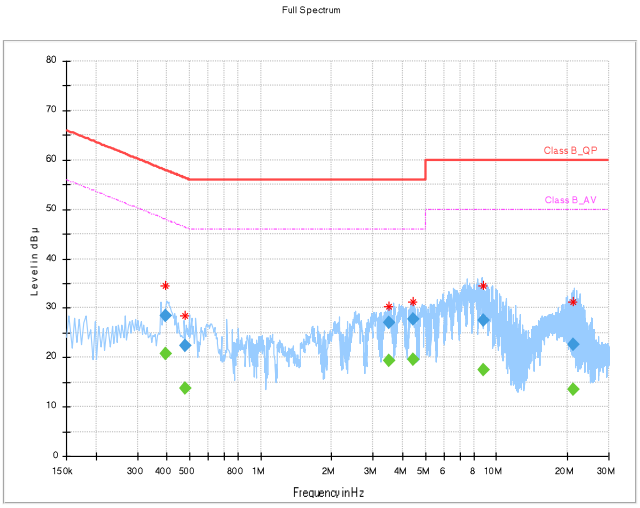


3.2 RADIATED EMISSION MEASUREMENT

3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

FREQUENCIES (MHz)	FIELD STRENGTH (microvolts/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

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

3.2.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	Euroshieldpn-CT0001143-1216	Feb. 26,19	Feb. 25,20
Bilog Antenna	ETS-LINDGREN	3143B	00161965	Feb. 26,19	Feb. 25,20
Horn Antenna	ETS-LINDGREN	3117	00168728	Feb. 26,19	Feb. 25,20
Horn Antenna (18GHz-40GHz)	N/A	QWH-SL-18-40-K-SG/QMS-00361	15433	Nov. 21, 18	Nov. 20, 19
Test Software	E3	V 9.160323	N/A	N/A	N/A
Test Software	ADT	ADT_Radiated_V7.6.15.9.2	N/A	N/A	N/A
10dB Attenuator	JFW/USA	50HF-010-SMA	1505	Jun. 24,19	Jun. 23,20
MXE EMI Receiver	KEYSIGHT	N9038A-544	MY54450026	Feb. 26,19	Feb. 25,20
Signal Pre-Amplifier	EMSI	EMC 9135	980249	Jun. 24,19	Jun. 23,20
Signal Pre-Amplifier	EMSI	EMC 012645B	980257	Jun. 24,19	Jun. 23,20
Signal Pre-Amplifier	EMSI	EMC 184045B	980259	Jun. 24,19	Jun. 23,20

NOTE: 1. The calibration interval of the above test instruments is 12 months or 24 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

2. The test was performed in 3m Chamber.

3. The FCC Site Registration No. is 525120; The Designation No. is CN1171.

3.2.3 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters (for below 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. 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.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, For battery operated equipment, the equipment tests shall be perform using fresh batteries. The turntable was rotated to maximize the emission level.

Note:

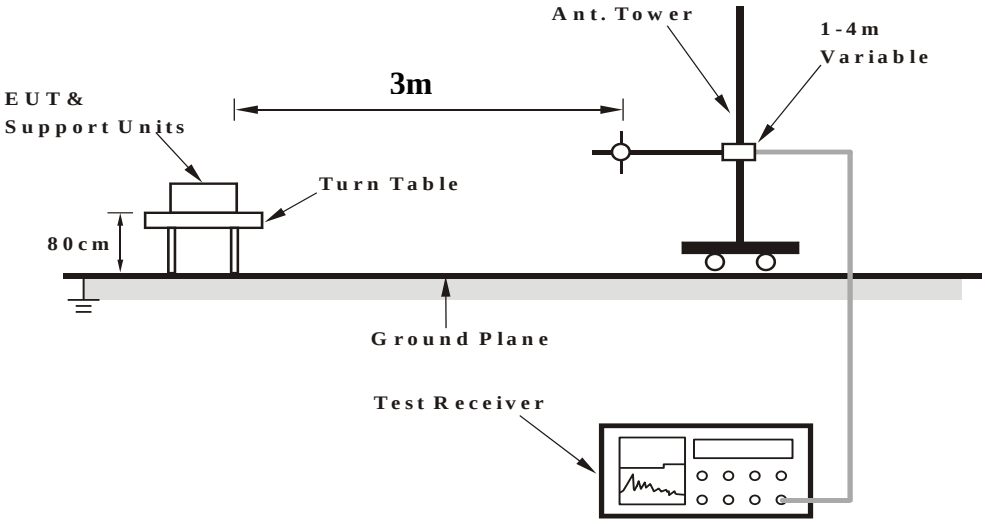
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 10Hz (Duty cycle > 98%) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

3.2.4 DEVIATION FROM TEST STANDARD

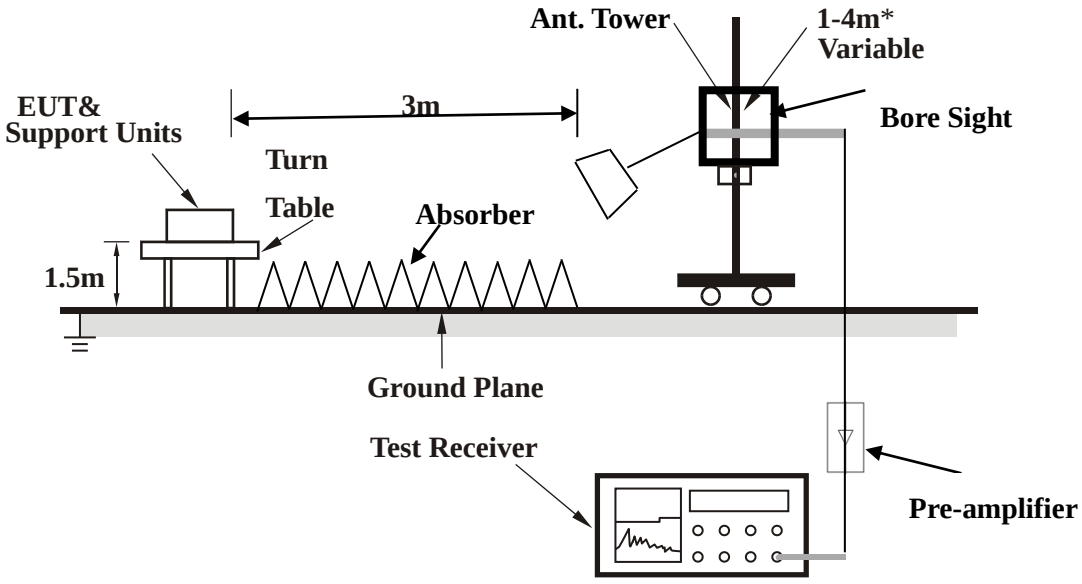
No deviation

3.2.5 TEST SETUP

< Frequency Range 30MHz~1GHz >



<Frequency Range above 1GHz>



Note: Above 1G is a directional antenna

Depends on the EUT height and the antenna 3dB beamwidth both, refer to section 7.3 of CISPR 16-2-3.

For the actual test configuration, please refer to the attached file (Test Setup Photo).

3.2.6 EUT OPERATING CONDITIONS

a. Set the EUT under full load condition and placed them on a testing table.

b. Set the transmitter part of EUT under transmission condition continuously at specific channel frequency.

c. The necessary accessories enable the EUT in full functions.

3.2.7 TEST RESULTS

BELOW 1GHz WORST-CASE DATA:

30 MHz – 1GHz data:

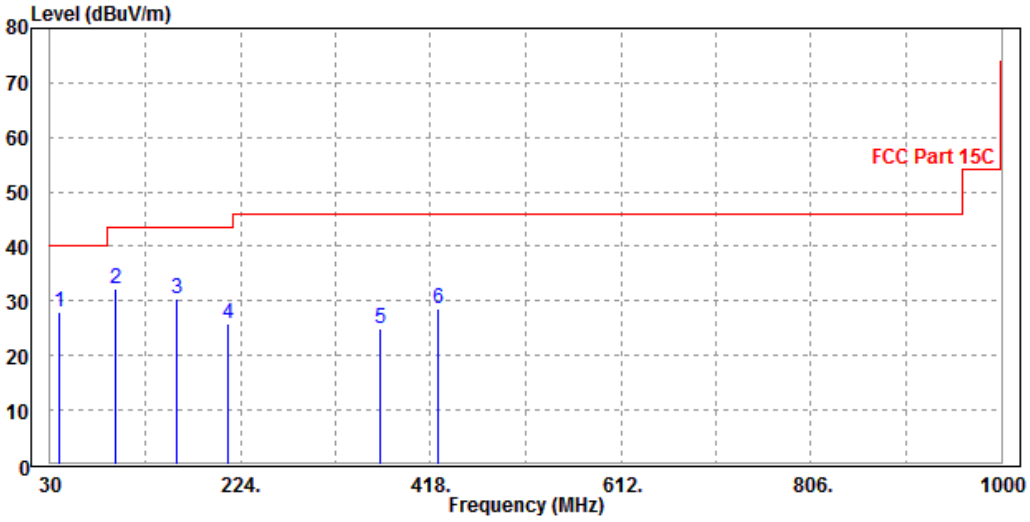
802.11n (20MHz)

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
39.65	27.97	51.02	40	-12.03	13.56	0.91	37.52	100	360	Peak
96.32	32.1	58.73	43.5	-11.4	9.26	1.3	37.19	100	360	Peak
158.63	30.5	55.2	43.5	-13	10.39	1.65	36.74	100	360	Peak
211.32	25.82	49.24	43.5	-17.68	11.3	1.85	36.57	100	360	Peak
366.14	25.09	43.26	46	-20.91	16.15	2.48	36.8	100	360	Peak
425.12	28.68	45.31	46	-17.32	17.53	2.71	36.87	100	360	Peak

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Emission level – Limit value.

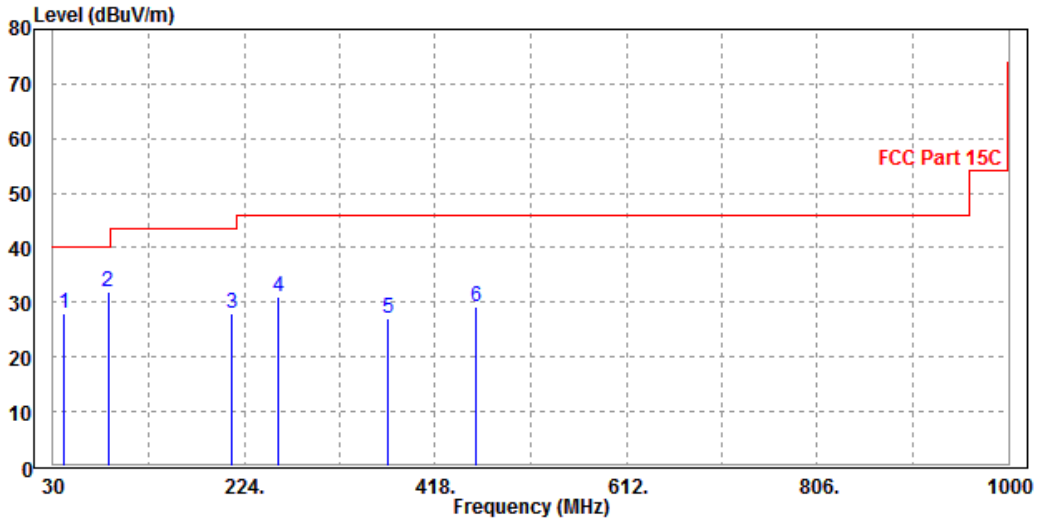


CHANNEL	TX Channel 11	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
41.25	28.09	52.46	40	-11.91	12.18	0.94	37.49	100	0	Peak
85.67	31.85	59.42	40	-8.15	8.47	1.25	37.29	100	0	Peak
211.36	27.9	51.27	43.5	-15.6	11.35	1.85	36.57	100	0	Peak
258.41	31.13	52.36	46	-14.87	13.37	2.07	36.67	100	0	Peak
369.85	27.18	45.12	46	-18.82	16.37	2.5	36.81	100	0	Peak
458.96	29.19	45.15	46	-16.81	18.13	2.84	36.93	100	0	Peak

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Emission level – Limit value.



ABOVE 1GHz WORST-CASE DATA:

Note: For higher frequency, the emission is too low to be detected.

802.11b

CHANNEL	TX Channel 1	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	**EMISSION LEVEL (dBuV/m)**	**READ LEVEL (dBuV)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA FACTOR (dB /m)**	**CABLE LOSS (dB)**	**PREAMP FACTOR (dB)**	**ANTENNA HEIGHT (cm)**	**TABLE ANGLE (Degree)**	**REMARK**
2390	55.98	64.37	74	-18.02	33.1	4.88	46.37	100	125	Peak
2390	44.95	53.34	54	-9.05	33.1	4.88	46.37	100	125	Average
2412	107.46	115.79			33.14	4.9	46.37	100	125	Peak
2412	104.09	112.42			33.14	4.9	46.37	100	125	Average
2483.5	52.9	61.02	74	-21.1	33.27	4.98	46.37	100	125	Peak
2483.5	40	48.12	54	-14	33.27	4.98	46.37	100	125	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	**EMISSION LEVEL (dBuV/m)**	**READ LEVEL (dBuV)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA FACTOR (dB /m)**	**CABLE LOSS (dB)**	**PREAMP FACTOR (dB)**	**ANTENNA HEIGHT (cm)**	**TABLE ANGLE (Degree)**	**REMARK**
2390	56.28	65.56	74	-17.72	32.21	4.88	46.37	100	0	Peak
2390	45.02	54.3	54	-8.98	32.21	4.88	46.37	100	0	Average
2412	107.16	116.36			32.27	4.9	46.37	100	0	Peak
2412	104.04	113.24			32.27	4.9	46.37	100	0	Average
2483.5	51.72	60.65	74	-22.28	32.46	4.98	46.37	100	0	Peak
2483.5	39.06	47.99	54	-14.94	32.46	4.98	46.37	100	0	Average

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Emission level – Limit value.
2. 2412MHz: Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	53.28	61.67	74	-20.72	33.1	4.88	46.37	100	136	Peak
2390	39.57	47.96	54	-14.43	33.1	4.88	46.37	100	136	Average
2437	107.53	115.78			33.19	4.93	46.37	100	136	Peak
2437	103.07	111.32			33.19	4.93	46.37	100	136	Average
2483.5	53.13	61.25	74	-20.87	33.27	4.98	46.37	100	136	Peak
2483.5	39.99	48.11	54	-14.01	33.27	4.98	46.37	100	136	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	52.31	61.59	74	-21.69	32.21	4.88	46.37	100	5	Peak
2390	38.98	48.26	54	-15.02	32.21	4.88	46.37	100	5	Average
2437	107.44	116.54			32.34	4.93	46.37	100	5	Peak
2437	104.35	113.45			32.34	4.93	46.37	100	5	Average
2483.5	52.7	61.63	74	-21.3	32.46	4.98	46.37	100	5	Peak
2483.5	39.03	47.96	54	-14.97	32.46	4.98	46.37	100	5	Average

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Emission level – Limit value.
   2. 2437MHz: Fundamental frequency.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	52.5	60.89	74	-21.5	33.1	4.88	46.37	100	126	Peak
2390	39.91	48.3	54	-14.09	33.1	4.88	46.37	100	126	Average
2462	113.78	121.96			33.23	4.96	46.37	100	126	Peak
2462	103.07	111.25			33.23	4.96	46.37	100	126	Average
2483.5	58.17	66.29	74	-15.83	33.27	4.98	46.37	100	126	Peak
2483.5	47.59	55.71	54	-6.41	33.27	4.98	46.37	100	126	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	52.15	61.43	74	-21.85	32.21	4.88	46.37	100	12	Peak
2390	38.64	47.92	54	-15.36	32.21	4.88	46.37	100	12	Average
2462	111.22	120.23			32.4	4.96	46.37	100	12	Peak
2462	101.37	110.38			32.4	4.96	46.37	100	12	Average
2483.5	57.92	66.85	74	-16.08	32.46	4.98	46.37	100	12	Peak
2483.5	46.52	55.45	54	-7.48	32.46	4.98	46.37	100	12	Average

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Emission level – Limit value.
2. 2462MHz: Fundamental frequency.

802.11g

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	66.22	74.61	74	-7.78	33.1	4.88	46.37	100	125	Peak
2390	50.97	59.36	54	-3.03	33.1	4.88	46.37	100	125	Average
2412	105.44	113.77			33.14	4.9	46.37	100	125	Peak
2412	95.13	103.46			33.14	4.9	46.37	100	125	Average
2483.5	53.55	61.67	74	-20.45	33.27	4.98	46.37	100	125	Peak
2483.5	40.44	48.56	54	-13.56	33.27	4.98	46.37	100	125	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	63.29	72.57	74	-10.71	32.21	4.88	46.37	100	315	Peak
2390	49.52	58.8	54	-4.48	32.21	4.88	46.37	100	315	Average
2412	103.46	112.66			32.27	4.9	46.37	100	315	Peak
2412	93.29	102.49			32.27	4.9	46.37	100	315	Average
2483.5	52.15	61.08	74	-21.85	32.46	4.98	46.37	100	315	Peak
2483.5	38.96	47.89	54	-15.04	32.46	4.98	46.37	100	315	Average

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Emission level – Limit value.
2. 2412MHz: Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	57.4	65.79	74	-16.6	33.1	4.88	46.37	100	123	Peak
2390	45.26	53.65	54	-8.74	33.1	4.88	46.37	100	123	Average
2437	110.17	118.42			33.19	4.93	46.37	100	123	Peak
2437	100.2	108.45			33.19	4.93	46.37	100	123	Average
2483.5	56.46	64.58	74	-17.54	33.27	4.98	46.37	100	123	Peak
2483.5	44.34	52.46	54	-9.66	33.27	4.98	46.37	100	123	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	55.04	64.32	74	-18.96	32.21	4.88	46.37	100	325	Peak
2390	43.19	52.47	54	-10.81	32.21	4.88	46.37	100	325	Average
2437	108.15	117.25			32.34	4.93	46.37	100	325	Peak
2437	98.02	107.12			32.34	4.93	46.37	100	325	Average
2483.5	55.6	64.53	74	-18.4	32.46	4.98	46.37	100	325	Peak
2483.5	44.18	53.11	54	-9.82	32.46	4.98	46.37	100	325	Average

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Emission level – Limit value.
2. 2437MHz: Fundamental frequency.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	53.42	61.81	74	-20.58	33.1	4.88	46.37	100	125	Peak
2390	40.11	48.5	54	-13.89	33.1	4.88	46.37	100	125	Average
2462	105.3	113.48			33.23	4.96	46.37	100	125	Peak
2462	95.03	103.21			33.23	4.96	46.37	100	125	Average
2483.5	67.24	75.36	74	-6.76	33.27	4.98	46.37	100	125	Peak
2483.5	50.99	59.11	54	-3.01	33.27	4.98	46.37	100	125	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	51.96	61.24	74	-22.04	32.21	4.88	46.37	100	336	Peak
2390	38.84	48.12	54	-15.16	32.21	4.88	46.37	100	336	Average
2462	103.64	112.65			32.4	4.96	46.37	100	336	Peak
2462	93.15	102.16			32.4	4.96	46.37	100	336	Average
2483.5	65.22	74.15	74	-8.78	32.46	4.98	46.37	100	336	Peak
2483.5	49.74	58.67	54	-4.26	32.46	4.98	46.37	100	336	Average

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Emission level – Limit value.
2. 2462MHz: Fundamental frequency.

802.11n (20MHz)

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	65.25	73.64	74	-8.75	33.1	4.88	46.37	100	125	Peak
2390	50.83	59.22	54	-3.17	33.1	4.88	46.37	100	125	Average
2412	104.53	112.86			33.14	4.9	46.37	100	125	Peak
2412	94.09	102.42			33.14	4.9	46.37	100	125	Average
2483.5	53.23	61.35	74	-20.77	33.27	4.98	46.37	100	125	Peak
2483.5	39.9	48.02	54	-14.1	33.27	4.98	46.37	100	125	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	62.94	72.22	74	-11.06	32.21	4.88	46.37	100	315	Peak
2390	49.09	58.37	54	-4.91	32.21	4.88	46.37	100	315	Average
2412	103.04	112.24			32.27	4.9	46.37	100	315	Peak
2412	92.96	102.16			32.27	4.9	46.37	100	315	Average
2483.5	52.34	61.27	74	-21.66	32.46	4.98	46.37	100	315	Peak
2483.5	39.02	47.95	54	-14.98	32.46	4.98	46.37	100	315	Average

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Emission level – Limit value.
2. 2412MHz: Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	54.87	63.26	74	-19.13	33.1	4.88	46.37	100	154	Peak
2390	43.4	51.79	54	-10.6	33.1	4.88	46.37	100	154	Average
2437	109.28	117.53			33.19	4.93	46.37	100	154	Peak
2437	99	107.25			33.19	4.93	46.37	100	154	Average
2483.5	56.47	64.59	74	-17.53	33.27	4.98	46.37	100	154	Peak
2483.5	44.19	52.31	54	-9.81	33.27	4.98	46.37	100	154	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	53.07	62.35	74	-20.93	32.21	4.88	46.37	100	115	Peak
2390	40.85	50.13	54	-13.15	32.21	4.88	46.37	100	115	Average
2437	107.48	116.58			32.34	4.93	46.37	100	115	Peak
2437	97.13	106.23			32.34	4.93	46.37	100	115	Average
2483.5	55.22	64.15	74	-18.78	32.46	4.98	46.37	100	115	Peak
2483.5	43.39	52.32	54	-10.61	32.46	4.98	46.37	100	115	Average

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Emission level – Limit value.
   2. 2437MHz: Fundamental frequency.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	52.98	61.37	74	-21.02	33.1	4.88	46.37	100	121	Peak
2390	39.74	48.13	54	-14.26	33.1	4.88	46.37	100	121	Average
2462	104.41	112.59			33.23	4.96	46.37	100	121	Peak
2462	94.38	102.56			33.23	4.96	46.37	100	121	Average
2483.5	67.06	75.18	74	-6.94	33.27	4.98	46.37	100	121	Peak
2483.5	**51.09**	**59.21**	**54**	**-2.91**	**33.27**	**4.98**	**46.37**	**100**	**121**	**Average**
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	52.45	61.73	74	-21.55	32.21	4.88	46.37	100	326	Peak
2390	38.78	48.06	54	-15.22	32.21	4.88	46.37	100	326	Average
2462	102.55	111.56			32.4	4.96	46.37	100	326	Peak
2462	101.2	110.21			32.4	4.96	46.37	100	326	Average
2483.5	64.32	73.25	74	-9.68	32.46	4.98	46.37	100	326	Peak
2483.5	49.78	58.71	54	-4.22	32.46	4.98	46.37	100	326	Average

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Emission level – Limit value.
2. 2462MHz: Fundamental frequency.

802.11n (40MHz)

CHANNEL	TX Channel 3	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	64.83	73.22	74	-9.17	33.1	4.88	46.37	100	120	Peak
2390	50.84	59.23	54	-3.16	33.1	4.88	46.37	100	120	Average
2422	104.09	112.38			33.16	4.92	46.37	100	120	Peak
2422	95.13	103.42			33.16	4.92	46.37	100	120	Average
2483.5	53.24	61.36	74	-20.76	33.27	4.98	46.37	100	120	Peak
2483.5	39.9	48.02	54	-14.1	33.27	4.98	46.37	100	120	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	62.85	72.13	74	-11.15	32.21	4.88	46.37	100	125	Peak
2390	49.59	58.87	54	-4.41	32.21	4.88	46.37	100	125	Average
2422	102.09	111.24			32.3	4.92	46.37	100	125	Peak
2422	93.29	102.44			32.3	4.92	46.37	100	125	Average
2483.5	52.7	61.63	74	-21.3	32.46	4.98	46.37	100	125	Peak
2483.5	39.35	48.28	54	-14.65	32.46	4.98	46.37	100	125	Average

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Emission level – Limit value.
2. 2422MHz: Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	54.75	63.14	74	-19.25	33.1	4.88	46.37	100	154	Peak
2390	42.27	50.66	54	-11.73	33.1	4.88	46.37	100	154	Average
2437	107	115.25			33.19	4.93	46.37	100	154	Peak
2437	97.39	105.64			33.19	4.93	46.37	100	154	Average
2483.5	57.44	65.56	74	-16.56	33.27	4.98	46.37	100	154	Peak
2483.5	44.63	52.75	54	-9.37	33.27	4.98	46.37	100	154	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	53.88	63.16	74	-20.12	32.21	4.88	46.37	100	112	Peak
2390	40.96	50.24	54	-13.04	32.21	4.88	46.37	100	112	Average
2437	105.75	114.85			32.34	4.93	46.37	100	112	Peak
2437	96.13	105.23			32.34	4.93	46.37	100	112	Average
2483.5	56.19	65.12	74	-17.81	32.46	4.98	46.37	100	112	Peak
2483.5	44.34	53.27	54	-9.66	32.46	4.98	46.37	100	112	Average

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Emission level – Limit value.
   2. 2437MHz: Fundamental frequency.

CHANNEL	TX Channel 9	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	52.87	61.26	74	-21.13	33.1	4.88	46.37	100	145	Peak
2390	39.73	48.12	54	-14.27	33.1	4.88	46.37	100	145	Average
2452	105.37	113.58			33.21	4.95	46.37	100	145	Peak
2452	95	103.21			33.21	4.95	46.37	100	145	Average
2483.5	66.11	74.23	74	-7.89	33.27	4.98	46.37	100	145	Peak
2483.5	50.89	59.01	54	-3.11	33.27	4.98	46.37	100	145	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	52.6	61.88	74	-21.4	32.21	4.88	46.37	100	145	Peak
2390	39.24	48.52	54	-14.76	32.21	4.88	46.37	100	145	Average
2452	103.31	112.35			32.38	4.95	46.37	100	145	Peak
2452	94.16	103.2			32.38	4.95	46.37	100	145	Average
2483.5	63.2	72.13	74	-10.8	32.46	4.98	46.37	100	145	Peak
2483.5	49.12	58.05	54	-4.88	32.46	4.98	46.37	100	145	Average

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Emission level – Limit value.
2. 2452MHz: Fundamental frequency.

3.3 6 dB BANDWIDTH MEASUREMENT

3.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

3.3.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Power Meter	ANRITSU	ML2495A	1506002	Feb. 26,19	Feb. 25,20
EXA Signal Analyzer	KEYSIGHT	N9010A-526	MY54510322	Feb. 26,19	Feb. 25,20
EXA Signal Analyzer	KEYSIGHT	N9010A-544	MY54510355	Feb. 26,19	Feb. 25,20
Power Sensor	ANRITSU	MA2411B	1339352	Feb. 26,19	Feb. 25,20

NOTE:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
2. The test was performed in RF Oven room.

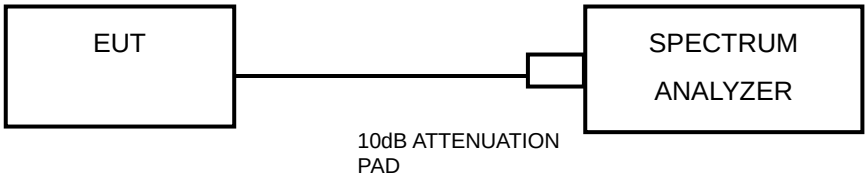
3.3.3 TEST PROCEDURE

1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) ≥ 3 RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

3.3.4 DEVIATION FROM TEST STANDARD

No deviation.

3.3.5 TEST SETUP



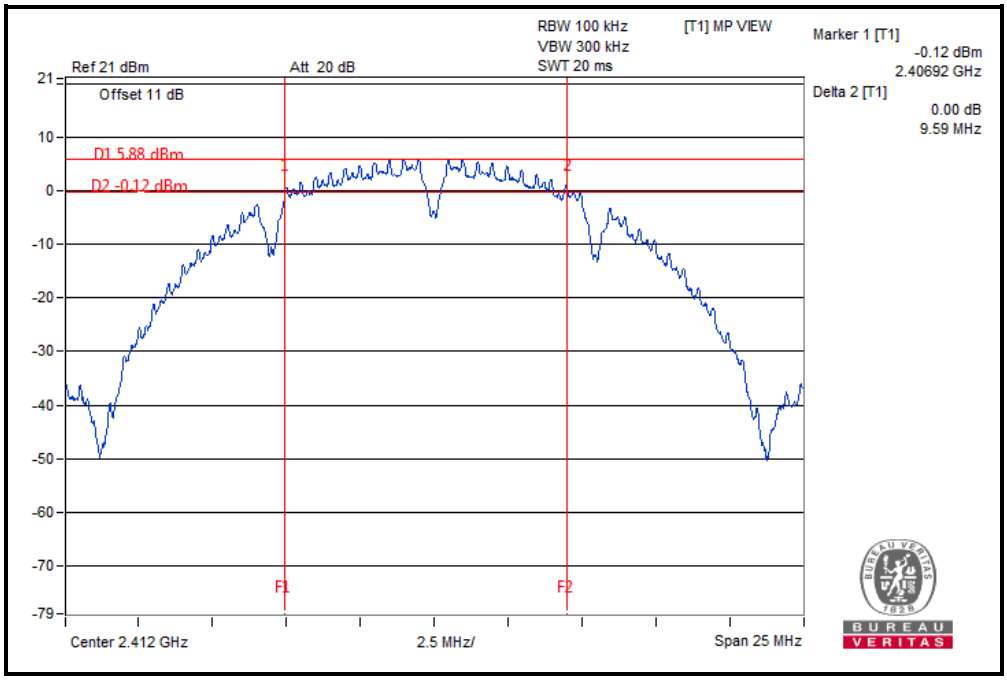
3.3.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

3.3.7 TEST RESULTS

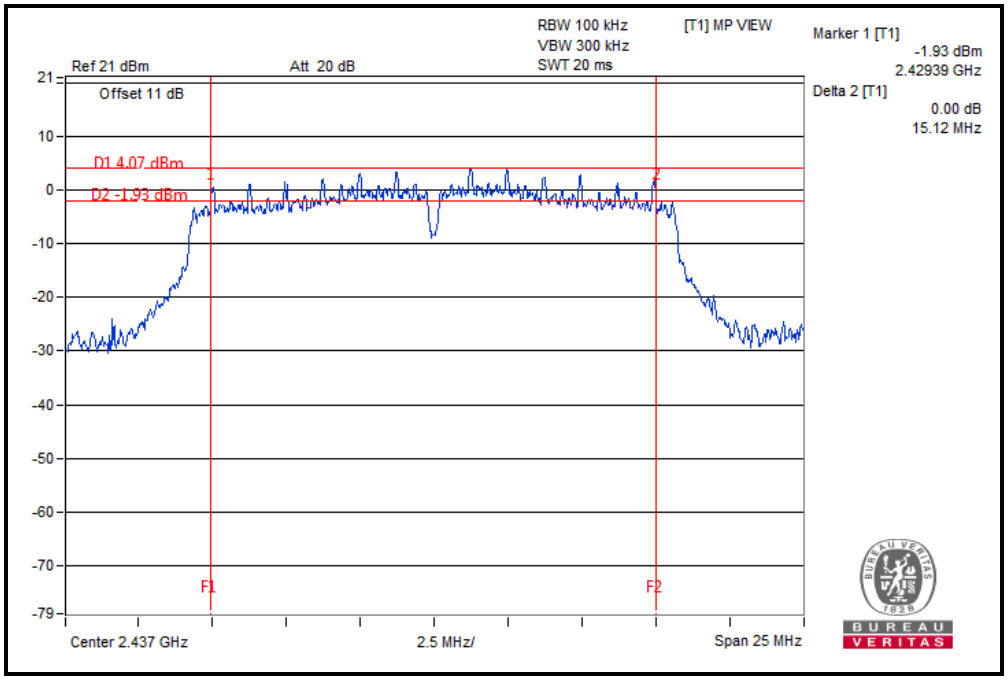
802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		Chain0	Chain1		
1	2412	9.59	9.57	0.5	PASS
6	2437	9.57	9.59	0.5	PASS
11	2462	9.59	8.60	0.5	PASS



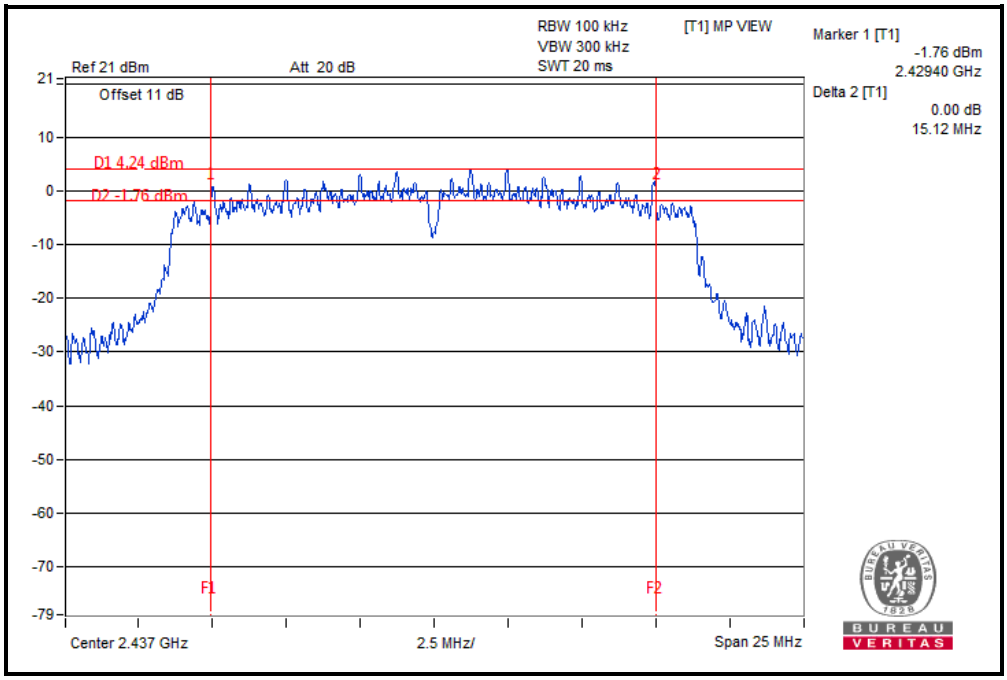
802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		Chain0	Chain1		
1	2412	15.09	15.10	0.5	PASS
6	2437	15.10	15.12	0.5	PASS
11	2462	15.11	15.12	0.5	PASS



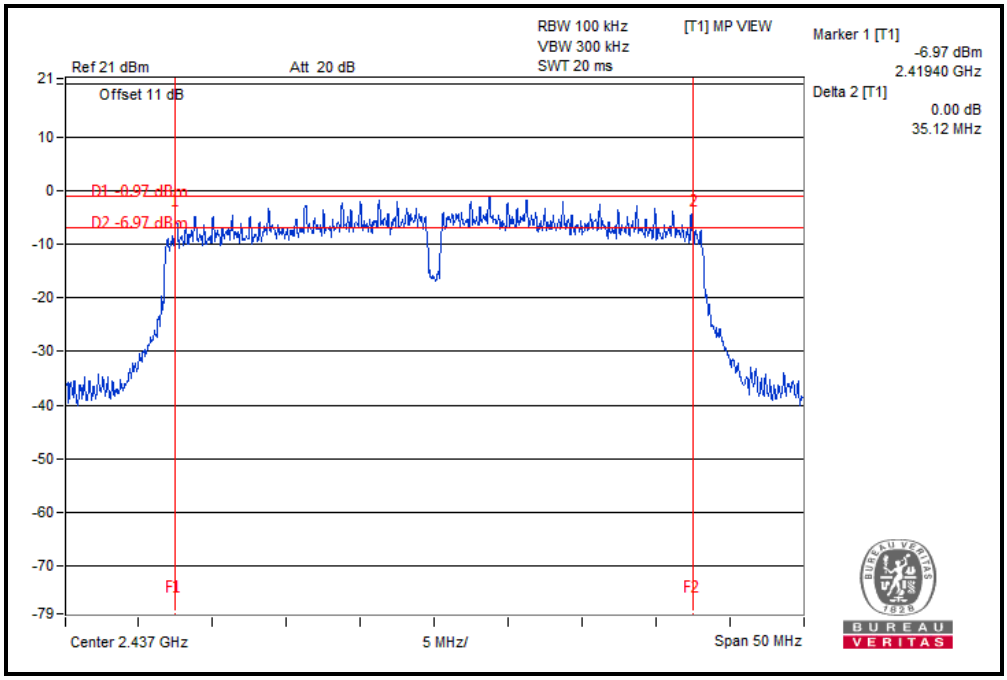
802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		Chain0	Chain1		
1	2412	15.09	15.09	0.5	PASS
6	2437	15.11	15.12	0.5	PASS
11	2462	15.11	15.09	0.5	PASS



802.11n (40MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		Chain0	Chain1		
1	2412	35.11	33.86	0.5	PASS
6	2437	35.07	35.12	0.5	PASS
11	2462	31.29	30.06	0.5	PASS

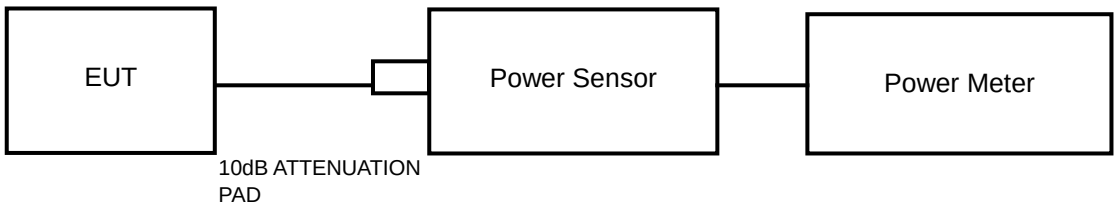


3.4 CONDUCTED OUTPUT POWER

3.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

For systems using digital modulation in the 2400–2483.5 MHz band: 1 Watt (30dBm)

3.4.2 TEST SETUP



3.4.3 TEST INSTRUMENTS

Refer to section 3.3.2 to get information of above instrument.

3.4.4 TEST PROCEDURES

A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor. Record the power level.

3.4.5 DEVIATION FROM TEST STANDARD

No deviation.

3.4.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

3.4.7 TEST RESULTS

3.4.7.1 MAXIMUM PEAK OUTPUT POWER

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)		PEAK POWER (mW)		PEAK POWER (dBm)	PEAK POWER (mW)	PEAK POWER LIMIT(W)	PASS/ FAIL
		Chain 0	Chain 1	Chain 0	Chain 1				
1	2412	17.54	17.00	56.754	50.119	20.29	106.873	1	PASS
6	2437	17.21	16.67	52.602	46.452	19.96	99.054	1	PASS
11	2462	16.79	17.05	47.753	50.699	19.93	98.452	1	PASS

802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)		PEAK POWER (mW)		PEAK POWER (dBm)	PEAK POWER (mW)	PEAK POWER LIMIT(W)	PASS/ FAIL
		Chain 0	Chain 1	Chain0	Chain1				
1	2412	17.59	16.90	57.412	48.978	20.27	106.390	1	PASS
6	2437	21.14	21.42	130.017	138.676	24.29	268.693	1	PASS
11	2462	15.68	14.68	36.983	29.376	18.22	66.359	1	PASS

802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)		PEAK POWER (mW)		PEAK POWER (dBm)	PEAK POWER (mW)	PEAK POWER LIMIT(W)	PASS/ FAIL
		Chain 0	Chain 1	Chain0	Chain1				
1	2412	17.80	17.01	60.256	50.234	20.43	110.490	1	PASS
6	2437	21.32	21.51	135.519	141.579	24.43	277.098	1	PASS
11	2462	15.64	14.75	36.644	29.854	18.23	66.498	1	PASS

802.11n (40MHz)

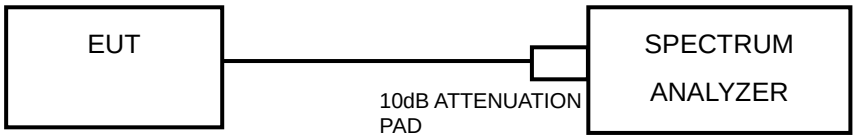
CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)		PEAK POWER (mW)		PEAK POWER (dBm)	PEAK POWER (mW)	PEAK POWER LIMIT(W)	PASS/ FAIL
		Chain 0	Chain 1	Chain0	Chain1				
3	2422	16.72	15.81	46.989	38.107	19.30	85.096	1	PASS
6	2437	20.19	20.42	104.472	110.154	23.32	214.626	1	PASS
9	2452	14.91	12.53	30.974	17.906	16.89	48.880	1	PASS

3.5 POWER SPECTRAL DENSITY MEASUREMENT

3.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm/3KHz.

3.5.2 TEST SETUP



3.5.3 TEST INSTRUMENTS

Refer to section 3.3.2 to get information of above instrument.

3.5.4 TEST PROCEDURE

1. Set the span to 1.5 times the DTS bandwidth
2. Set the RBW = 3 kHz, VBW ≥ 3 x RBW, Detector = peak.
3. Sweep time = auto couple, Trace mode = max hold, allow trace to fully stabilize.
4. Use the peak marker function to determine the maximum amplitude level.

3.5.5 DEVIATION FROM TEST STANDARD

No deviation.

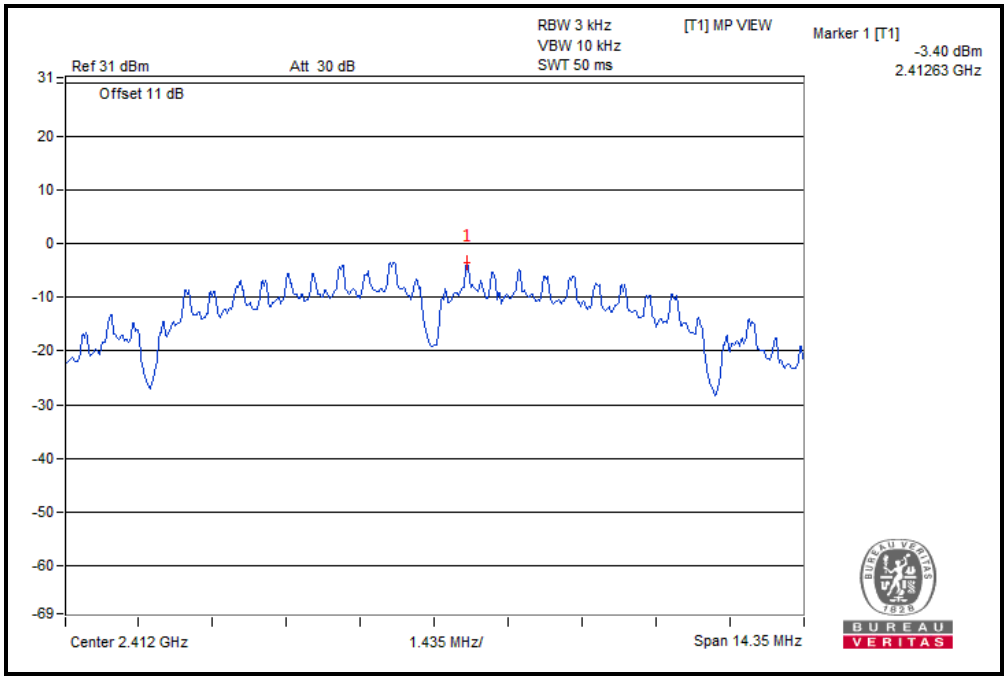
3.5.6 EUT OPERATING CONDITION

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

3.5.7 TEST RESULTS

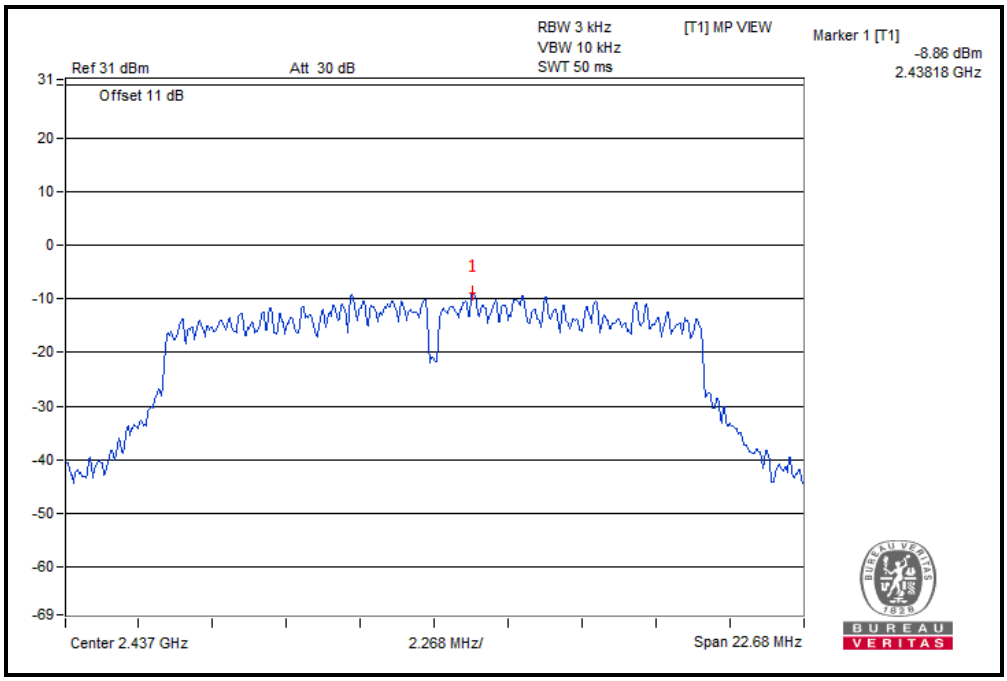
802.11b

Channel	FREQ. (MHz)	PSD (dBm/3kHz)		TOTAL PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
		ANT 0	ANT 1			
1	2412	-4.03	-3.40	-0.69	8	PASS
6	2437	-4.48	-3.69	-1.06	8	PASS
11	2462	-3.44	-3.73	-0.57	8	PASS



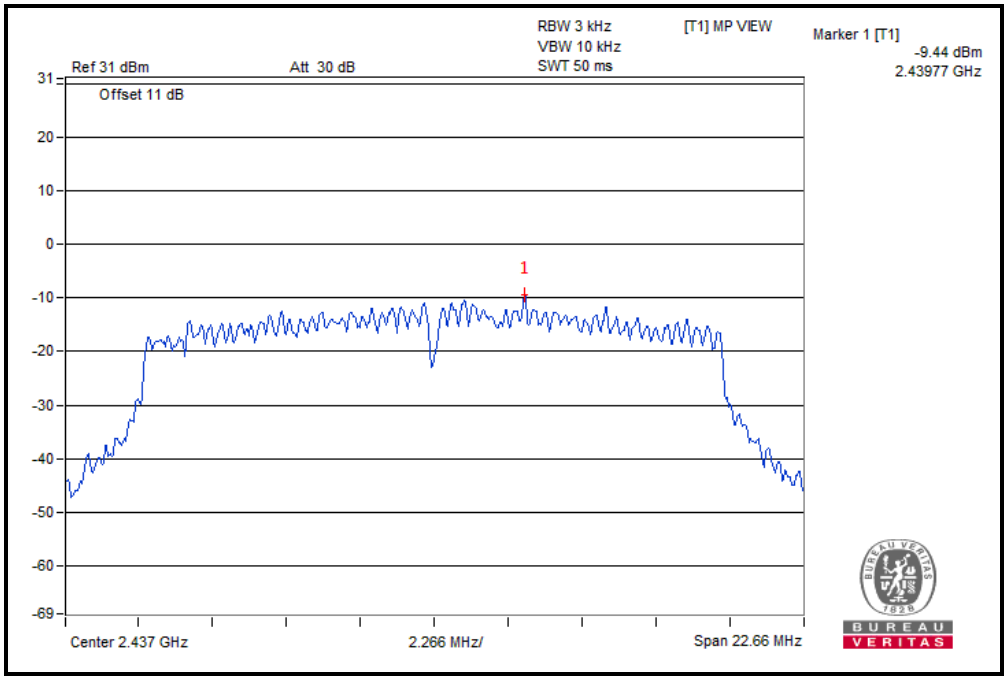
802.11g

Channel	FREQ. (MHz)	PSD (dBm/3kHz)		TOTAL PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
		ANT 0	ANT 1			
1	2412	-18.29	-17.19	-14.69	8	PASS
6	2437	-9.77	-8.86	-6.28	8	PASS
11	2462	-19.52	-20.24	-16.85	8	PASS



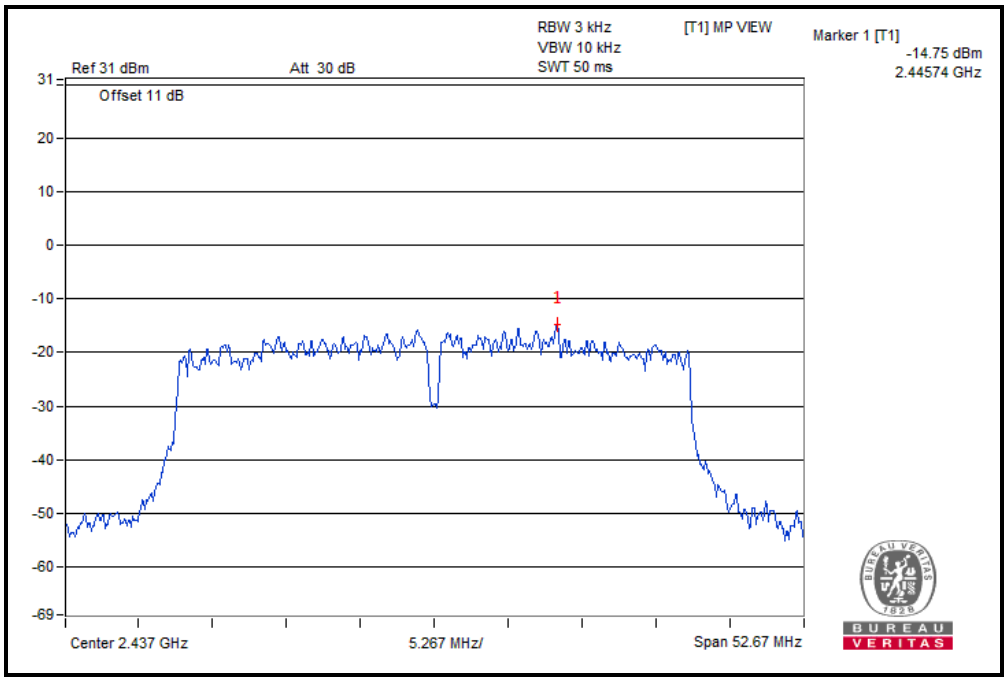
802.11n (20MHz)

Channel	FREQ. (MHz)	PSD (dBm/3kHz)		TOTAL PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
		ANT 0	ANT 1			
1	2412	-18.40	-17.00	-14.63	8	PASS
6	2437	-9.44	-9.66	-6.54	8	PASS
11	2462	-21.00	-18.20	-16.37	8	PASS



802.11n (40MHz)

Channel	FREQ. (MHz)	PSD (dBm/3kHz)		TOTAL PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
		ANT 0	ANT 1			
1	2412	-21.56	-20.99	-18.26	8	PASS
6	2437	-15.06	-14.75	-11.89	8	PASS
11	2462	-23.55	-21.33	-19.29	8	PASS

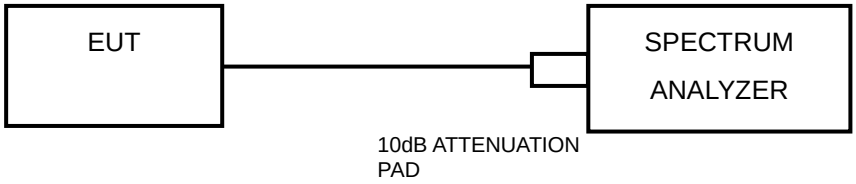


3.6 OUT OF BAND EMISSION MEASUREMENT

3.6.1 LIMITS OF OUT OF BAND EMISSION MEASUREMENT

Below –20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

3.6.2 TEST SETUP



3.6.3 TEST INSTRUMENTS

Refer to section 3.3.2 to get information of above instrument.

3.6.4 TEST PROCEDURE

MEASUREMENT PROCEDURE REF

1. Set the RBW = 100 kHz.
2. Set the VBW ≥ 300 kHz.
3. Detector = peak.
4. Sweep time = auto couple.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

MEASUREMENT PROCEDURE OOBE

1. Set RBW = 100 kHz.
2. Set VBW ≥ 300 kHz.
3. Set span to encompass the spectrum to be examined
4. Detector = peak.
5. Trace Mode = max hold.
6. Sweep = auto couple.

3.6.5 DEVIATION FROM TEST STANDARD

No deviation.

3.6.6 EUT OPERATING CONDITION

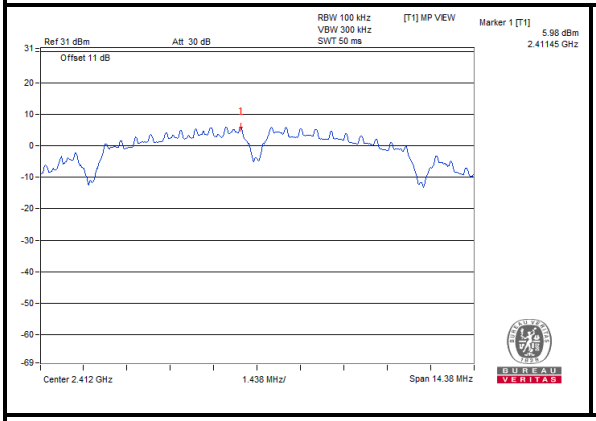
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

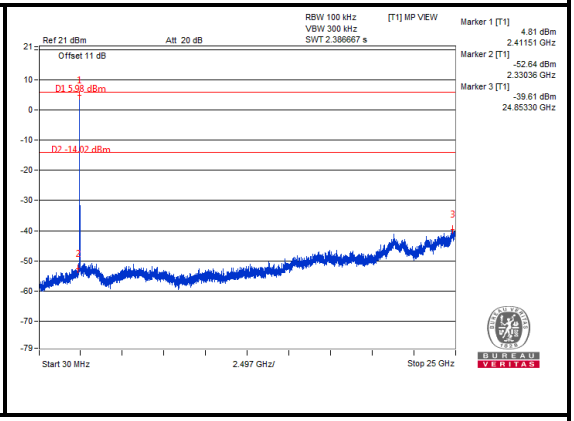
3.6.7 TEST RESULTS

The spectrum plots are attached on the following images. D1 line indicates the highest level. D2 line indicates the 20dB offset below D1. It shows compliance to the requirement.

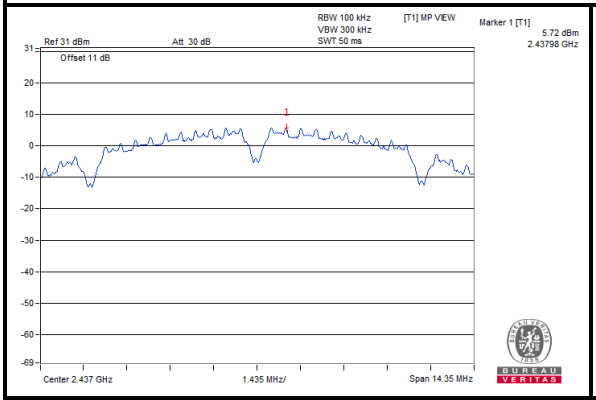
802.11b

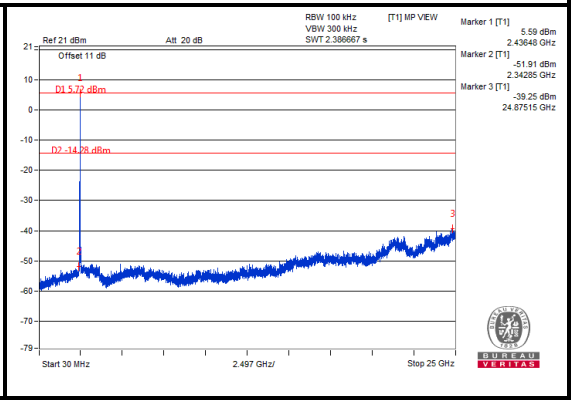
CH 1



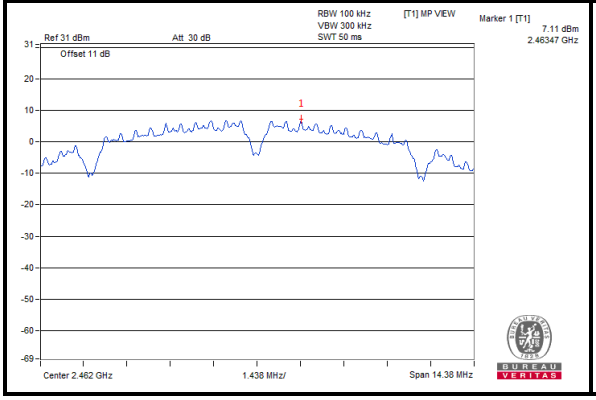


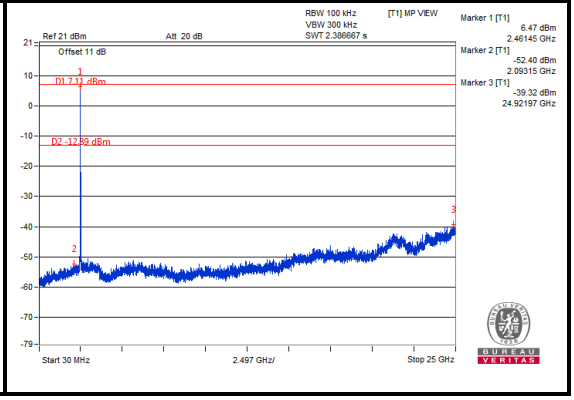
CH 6

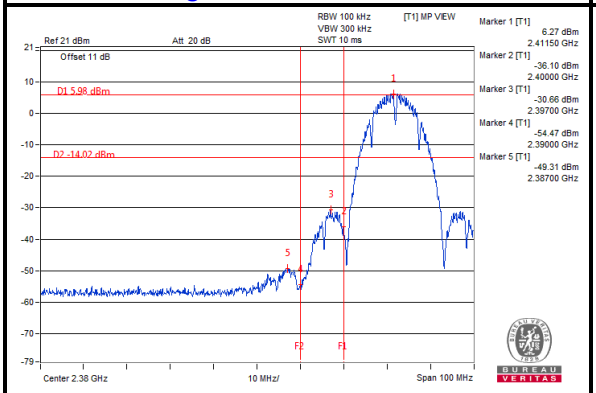
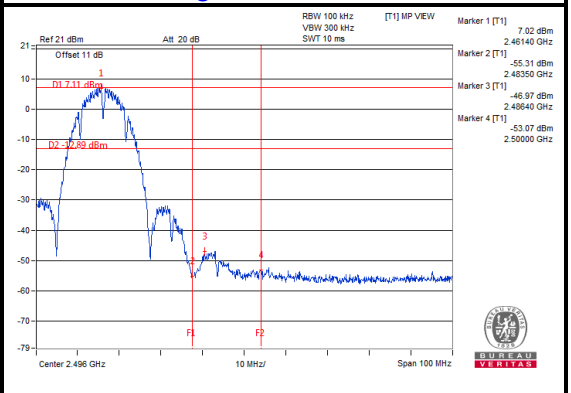




CH 11

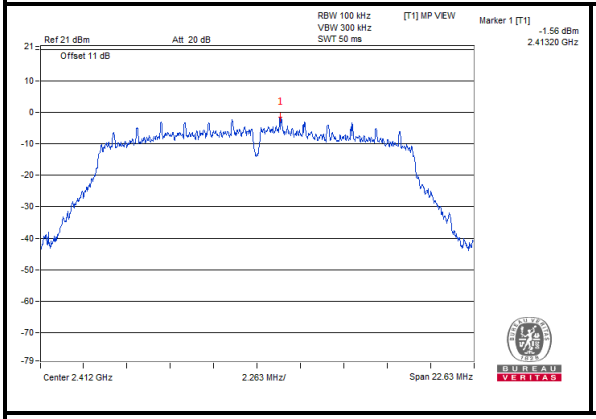


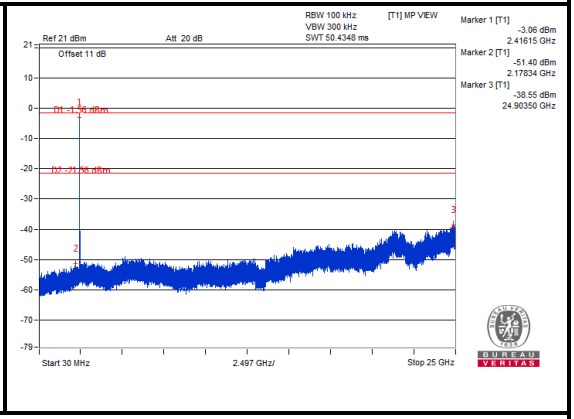


CH 1 Band Edge	CH 11 Band Edge
	

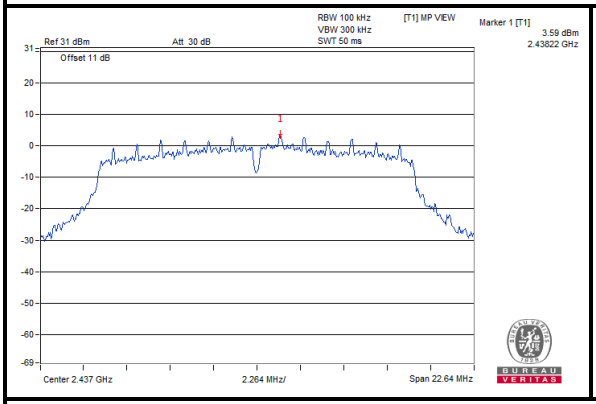
802.11g

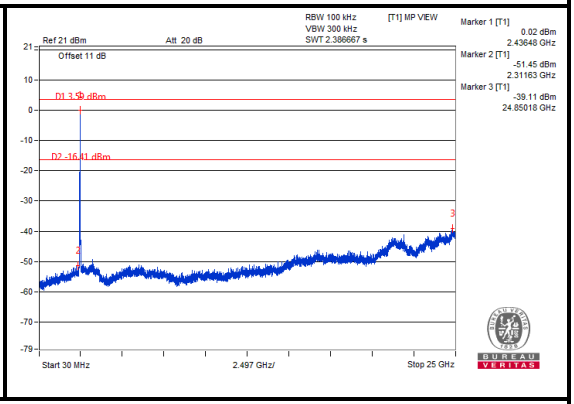
CH 1



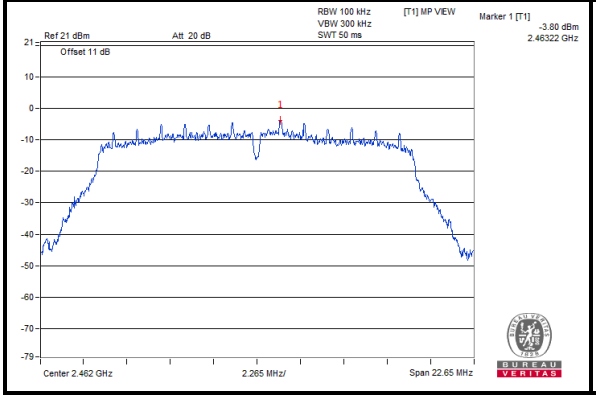


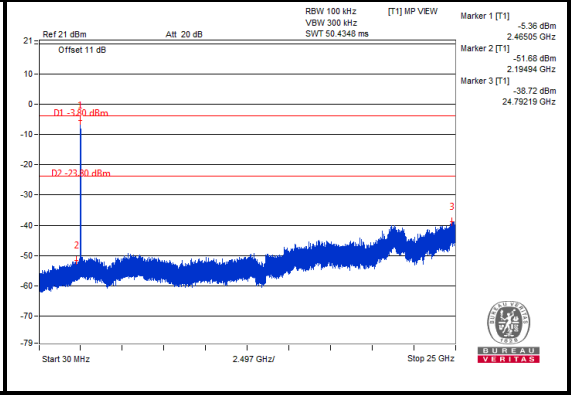
CH 6

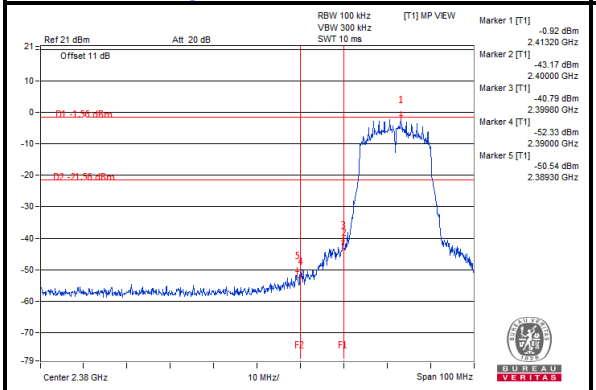
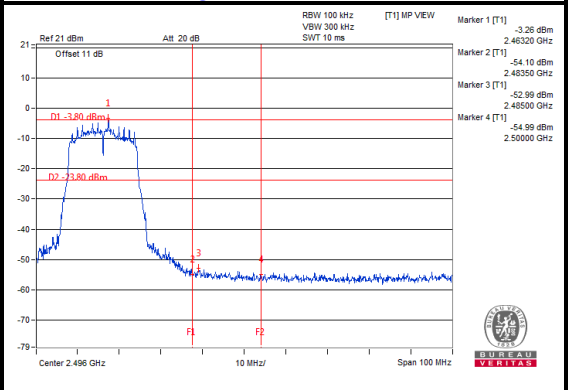




CH 11

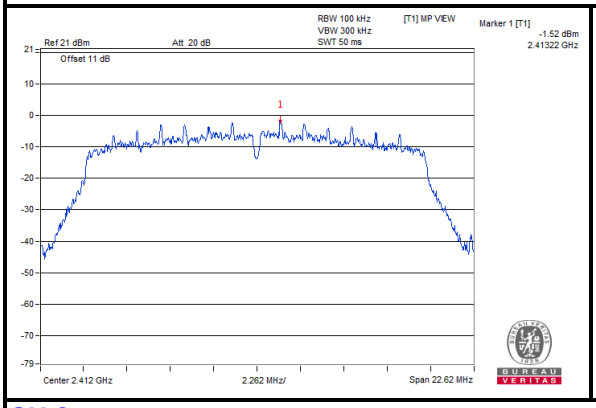


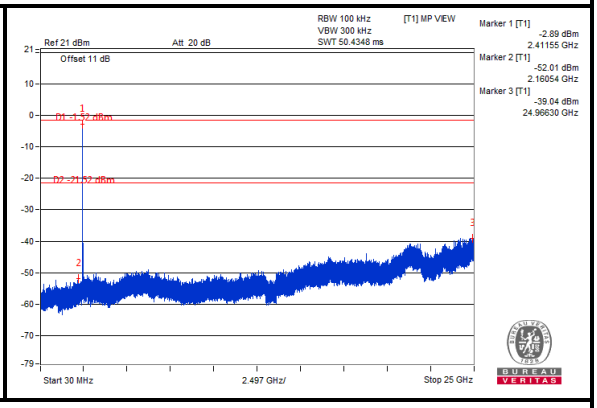


CH 1 Band Edge	CH 11 Band Edge
	

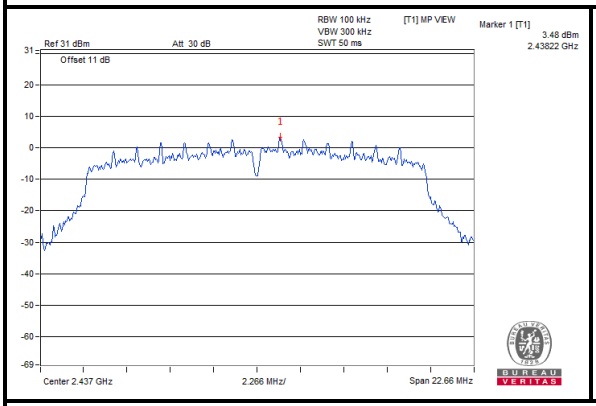
802.11n (20MHz)

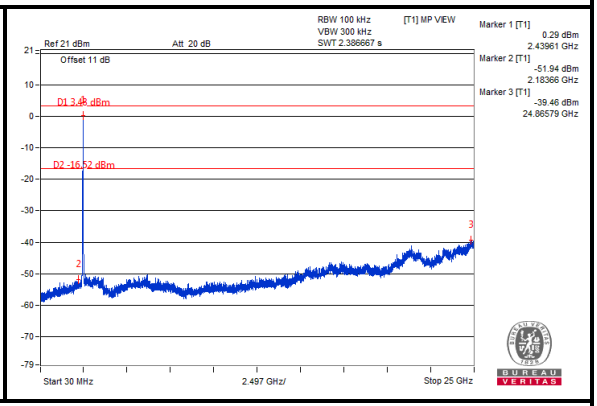
CH 1



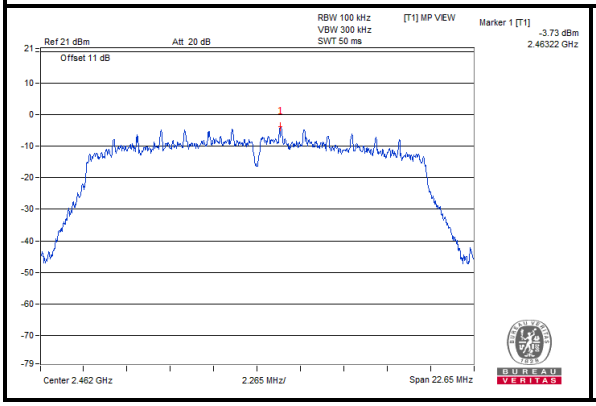


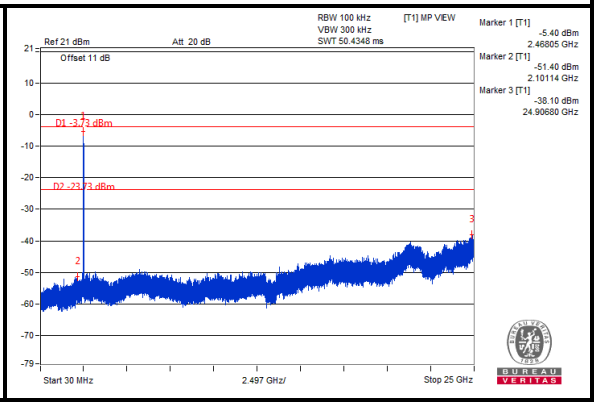
CH 6

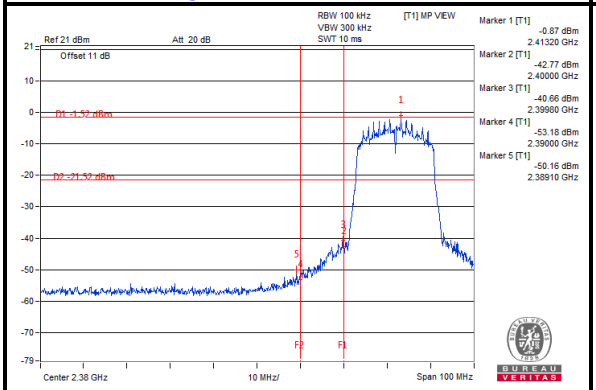
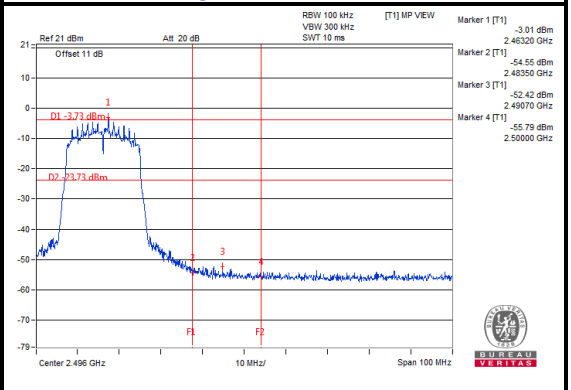




CH 11

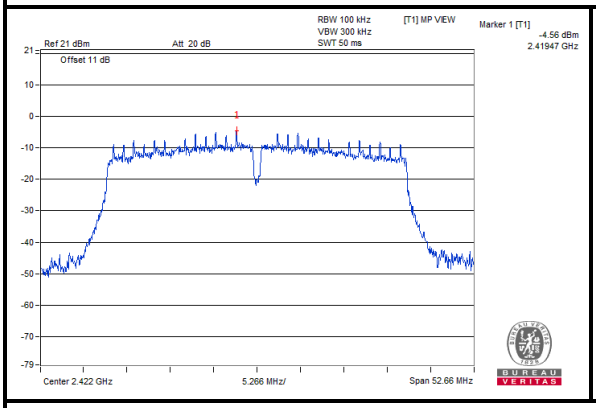


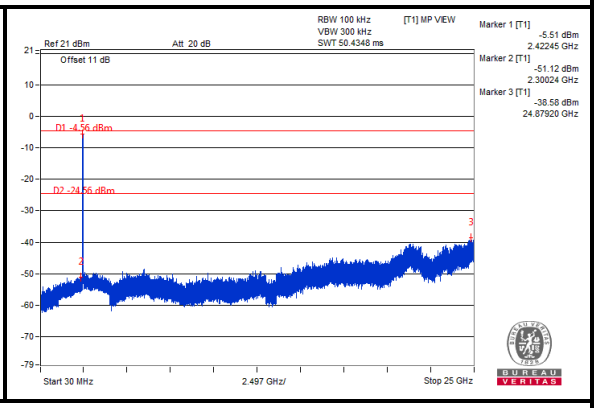


CH 1 Band Edge	CH 11 Band Edge
	

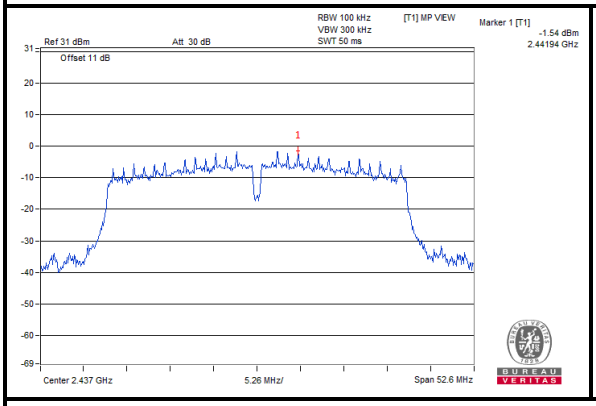
802.11n (40MHz)

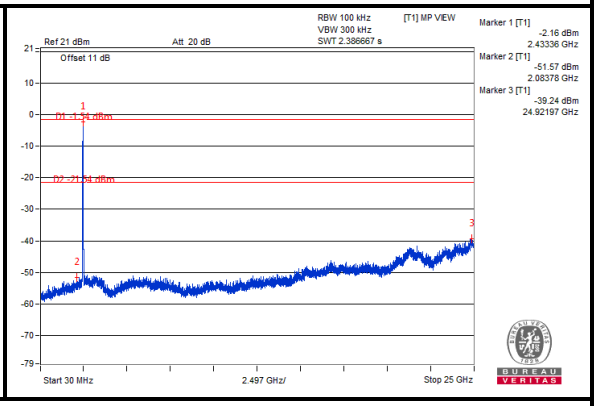
CH 3



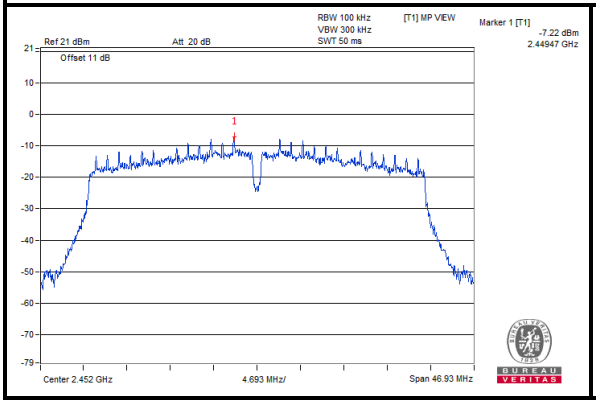


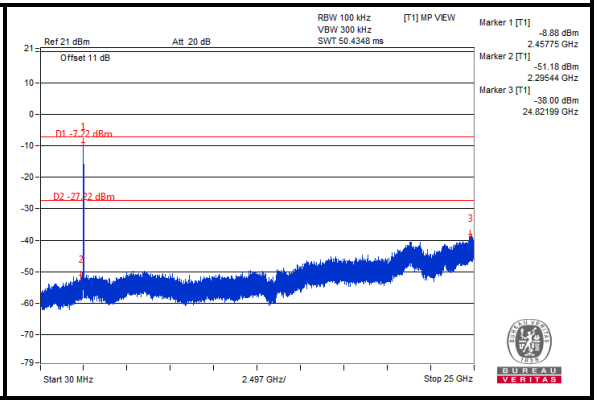
CH 6

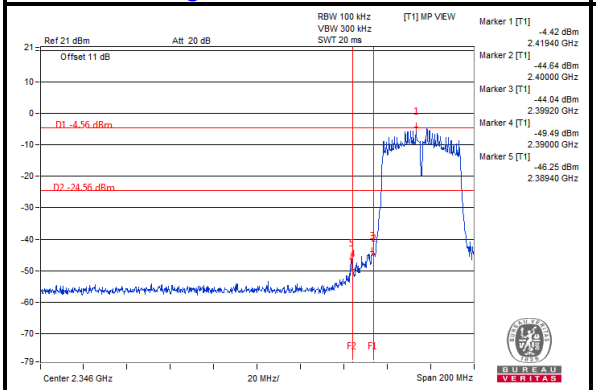
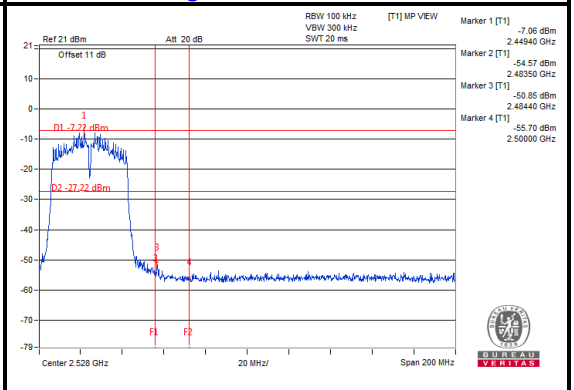




CH 9





CH 3 Band Edge	CH 9 Band Edge
	

4 PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).

5 APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

---END---