TEST REPORT

Applicant	BenQ Corporation
Address	16 Jihu Road, Neihu, Taipei 114, Taiwan

Manufacturer or Supplier	BenQ Corporation
Address	16 Jihu Road, Neihu, Taipei 114, Taiwan
Product	InstaShare Button
Brand Name	BenQ
Model	TWY31
Additional Model & Model Difference	N/A
Date of tests	Sep. 18, 2021 ~ Nov. 01, 2021

The tests have been carried out according to the requirements of the following standard:

☒ **FCC Part 15, Subpart C, Section 15.247**

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

Tested by Andy Zhu Supervisor / EMC Department	Approved by Glyn He Assistant Manager / EMC Department
	 Date: Dec. 15, 2021

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF2109WDG0104-1	Original release	Dec. 15, 2021

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**	**REMARK**
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit.
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit.
15.247(d)	Band Edge Measurement	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted Output power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	No antenna connector is used

2 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	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz~30MHz	3.05dB
Radiated emissions	9KHz ~ 30MHz	2.16dB
	30MHz ~ 1GMHz	3.63dB
	1GHz ~ 18GHz	4.96dB
	18GHz ~ 40GHz	4.37dB

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

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	InstaShare Button
MODEL NO.	TWY31
ADDITIONAL NO.	N/A
FCC ID	JVPTWY31
NOMINAL VOLTAGE	DC 5V from USB host unit
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
OPERATING FREQUENCY	2412-2462MHz for 11b/g/n(HT20)
PEAK OUTPUT POWER	134.965mW(Maximum)
ANTENNA TYPE	FPC Antenna, with 3dBi gain
I/O PORTS	Refer to user's manual
CABLE SUPPLIED	USB Cable: Shielded, detachable,10cm

NOTES:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.
3. Please refer to the EUT photo document (Reference No.: 2109WDG0104) for detailed product photo.
4. The working status of the two antennas is as follows.

MODULATION MODE	Function
802.11b	2 Chains (SISO)
802.11g	2 Chains (SISO)
802.11n (HT20)	2 Chains (MIMO)

** 802.11b/g provided a SISO function, the radiated emission above 1GHz and conducted emission test items are carried out on the maximum power "chain 1" antenna.*

5. ANTENNA LIST

Ant. No.	Vendor	Antenna Type	Operation Frequency Range
			2.4GHz
Chain 0	SHENZHEN SHUODIAN ELECTRONIC AND TECHNOLOGY CO.,LTD	FPC	3dBi
Chain 1		FPC	3dBi
Directional Gain for PSD			6.01dBi
Directional Gain for power			3dBi

All antennas have the same gain, Directional gain = GANT + Array Gain, where Array Gain is as follows.

For power spectral density (PSD) measurements on all devices, Array Gain = 10 log(NANT/NSS=1) dB.

For power measurements on IEEE 802.11 devices, Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 4

3.2 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		

3.2.1 CONFIGURATION OF SYSTEM UNDER TEST

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

3.2.2 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, power supply voltage range and antenna ports. The worst case was found when positioned on X 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	
A	√	√	√	√	Powered by Notebook with WIFI function

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

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.

EUT CONFIGURE MODE	TESTED CONDITION
A	WIFI (2.4G) Link

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, XYZ axis and antenna ports (if EUT with antenna diversity architecture).

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11b	1 to 11	11	DSSS	DBPSK	1.0

For the test results, only the worst case was shown in test report.

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, XYZ axis and antenna ports (if EUT with antenna diversity architecture).

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
A	802.11n HT20	1 to 11	1, 6, 11	OFDM	BPSK	6.5

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.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
A	802.11n HT20	1 to 11	1, 6, 11	OFDM	BPSK	6.5

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	TEST VOLTAGE	TESTED BY
RE<1G	25deg. C, 53%RH	DC 5V From Notebook	Jelly
RE≥1G	25deg. C, 53%RH	DC 5V From Notebook	Jelly
PLC	20deg. C, 56%RH	DC 5V From Notebook	Alex
APCM	25deg. C, 60%RH	DC 5V From Notebook	Vincent

3.3 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
KDB 558074 D01 15.247 Meas Guidance v05r02
KDB 662911 D01 Multiple Transmitter Output v02r01
ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.

NOTE: It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B(sDoC). The test report has been issued separately.

3.4 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	Notebook	DELL	Latitude 5280	77K2GH2	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	AC Line: Unshielded, Detachable 0.8m, DC Line: Unshielded, Detachable 1.8m

4 TEST TYPES AND RESULTS

4.1. CONDUCTED EMISSION MEASUREMENT

4.1.1 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.

4.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESR7	101494	Mar. 07,22
Artificial Mains Network	Rohde&Schwarz	ENV216	101173	Mar. 07,22
Artificial Mains Network	Rohde&Schwarz	ESH3-Z5	100317	Mar. 07,22
Voltage probe	SCHWARZBECK	TK 9421	TK 9421-176	Sep. 17,22
Test software	ADT	ADT_Cond_V7.3.7	N/A	N/A

NOTES:

1. The test was performed in shielded room 553.
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.

4.1.3 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.

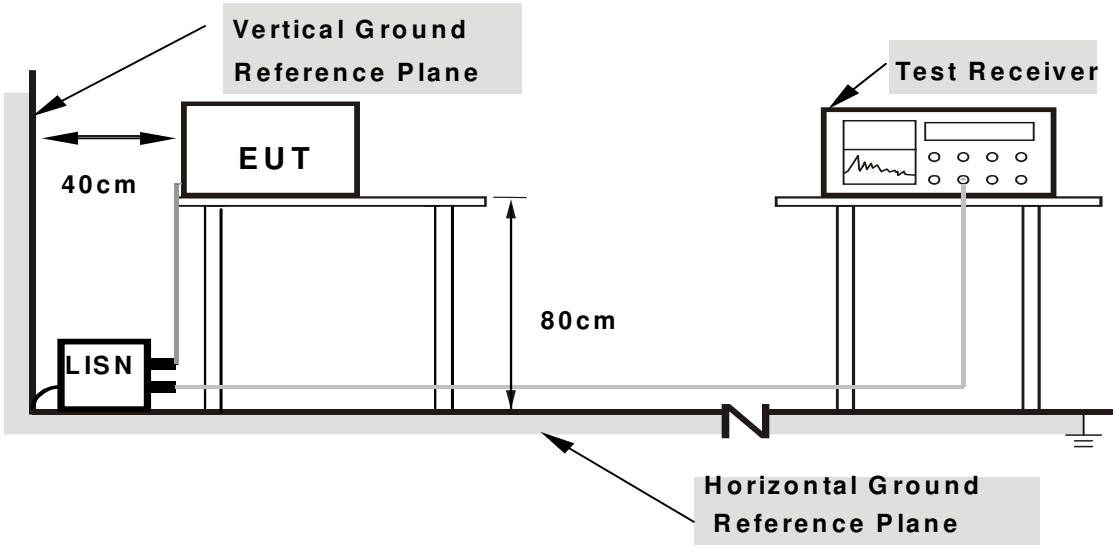
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

4.1.4 DEVIATION FROM TEST STANDARD

No deviation.

4.1.5 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).

4.1.6 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.

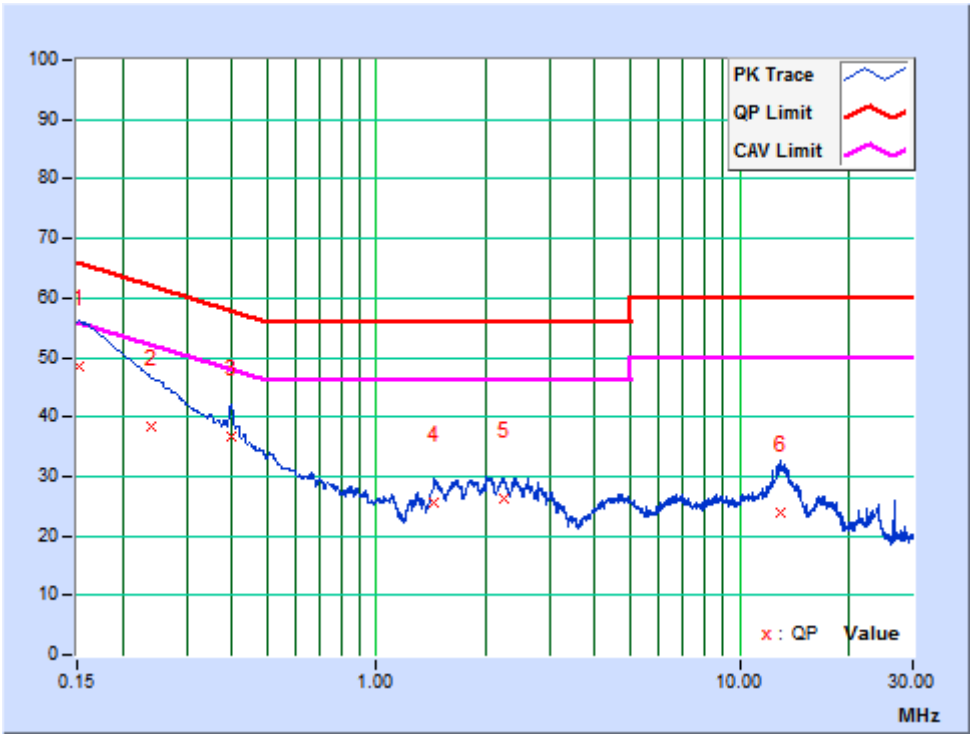
4.1.7 TEST RESULTS

CONDUCTED WORST-CASE DATA:

PHASE	Line	6dB BANDWIDTH	9kHz

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15225	9.90	38.58	13.53	48.48	23.43	65.88	55.88	-17.40	-32.45
2	0.24000	9.94	28.56	10.08	38.50	20.02	62.10	52.10	-23.60	-32.08
3	0.39750	9.95	26.88	25.49	36.83	35.44	57.91	47.91	-21.08	-12.47
4	1.44825	10.01	15.74	12.79	25.75	22.80	56.00	46.00	-30.25	-23.20
5	2.23350	10.03	16.36	12.95	26.39	22.98	56.00	46.00	-29.61	-23.02
6	12.97500	10.16	13.76	7.65	23.92	17.81	60.00	50.00	-36.08	-32.19

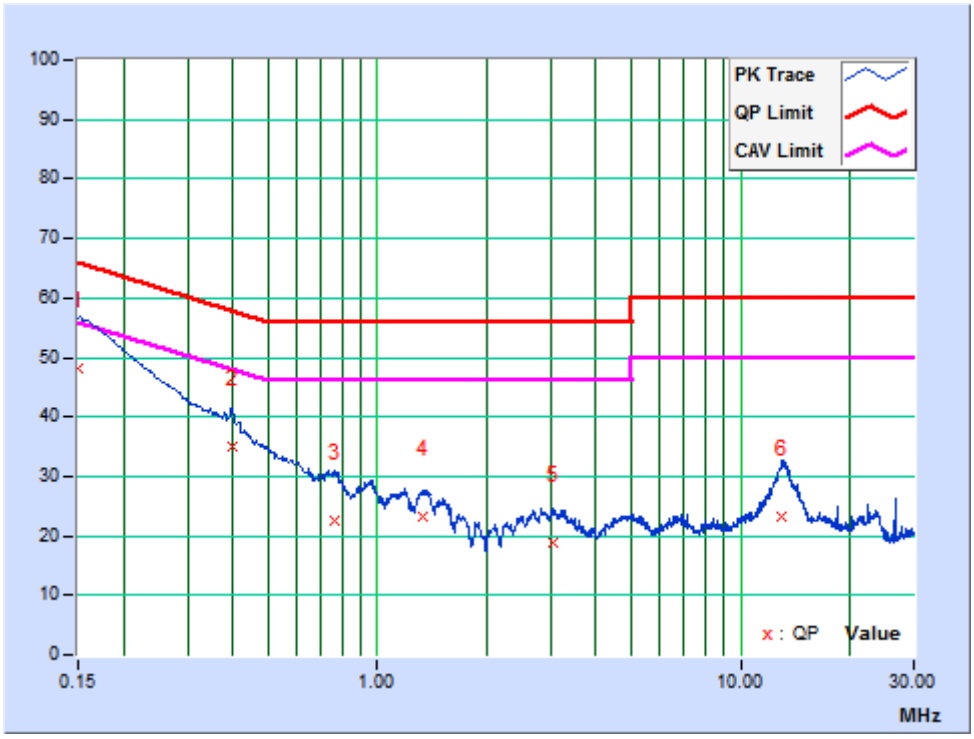
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



PHASE	Neutral	6dB BANDWIDTH	9kHz

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.90	38.22	15.39	48.12	25.29	66.00	56.00	-17.88	-30.71
2	0.39750	9.95	25.08	23.08	35.03	33.03	57.91	47.91	-22.88	-14.88
3	0.75812	9.99	12.67	9.85	22.66	19.84	56.00	46.00	-33.34	-26.16
4	1.34250	10.03	13.17	10.10	23.20	20.13	56.00	46.00	-32.80	-25.87
5	3.05700	10.06	8.65	5.24	18.71	15.30	56.00	46.00	-37.29	-30.70
6	12.97500	10.20	13.18	6.53	23.38	16.73	60.00	50.00	-36.62	-33.27

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.



4.2. RADIATED EMISSION MEASUREMENT

4.2.1 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

NOTES:

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.

4.2.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESU40	100449	Mar. 07,22
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV7	102331	May 09, 22
Active Loop Antenna (9KHz -30MHz)	SCHWARZBECK	FMZB 1519B	1519B-045	May 20,22
Amplifier (9KHz -1GHz)	Burgeon	BPA-530	100210	Mar. 13,22
Bilog Antenna (20MHz -2GHz)	Teseq	CBL 6111D	30643	May 21,22
Horn Antenna (1GHz -18GHz)	ETS -Lindgren	3117	00062558	May 21,22
Horn Antenna (18GHz -40GHz)	SCHWARZBECK	BBHA 9170	BBHA9170147	May 14,22
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	NSEMC003	May 22,22
Test Software	ADT	ADT_Radiated_V 7.6.15.9.2	N/A	N/A
Broadband Preamplifier (1GHz~18GHz)	SCHWARZBECK	BBV9718	305	May 12,22
Pre-Amplifier (18GHz-40GHz)	EMCI	EMC 184045	980102	Mar. 13,22
Test Software	ADT	ADT_Radiated_V 7.6.15.9.2	N/A	N/A

NOTES:

1. The test was performed in 966 Chamber.
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. The horn antenna is used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Site Registration No. is 749762.

4.2.3 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 1.5 meters (above 1GHz) and 0.8 meters (below 1GHz) above the ground at a 3 meters semi-anechoic chamber. 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. For below 1GHz was used bilog antenna, and above 1GHz was used horn 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. For below 30MHz, a loop antenna with its vertical plane is place 3m from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. And the centre of the loop shall be 1m above the ground.

g. 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.

NOTES:

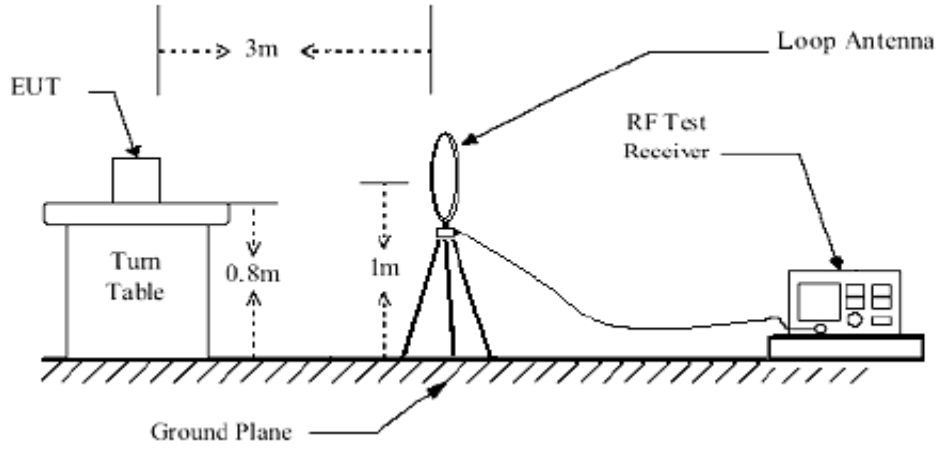
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution 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.
5. The testing of the EUT was performed on all 3 orthogonal axes, the worst-case test configuration was reported on the file test setup photo.

4.2.4 DEVIATION FROM TEST STANDARD

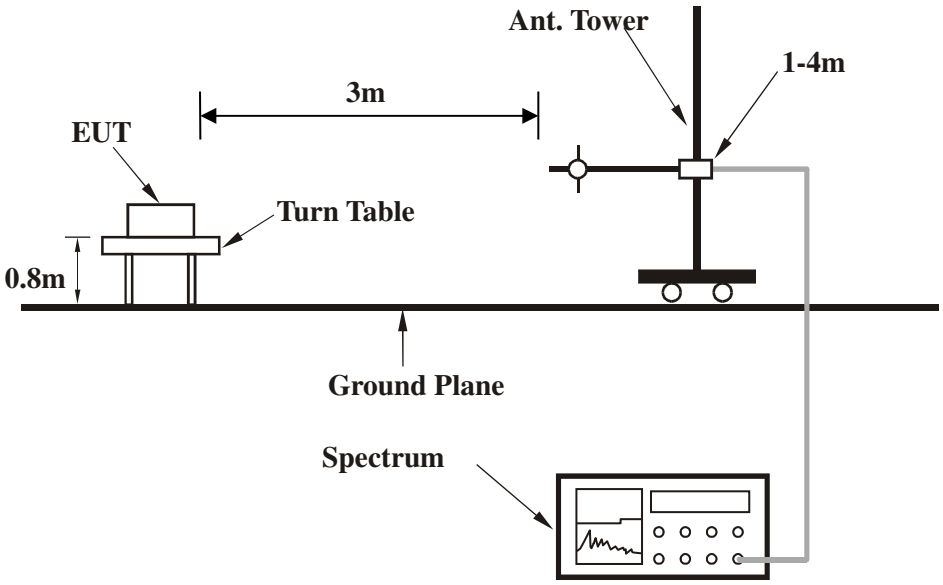
No deviation.

4.2.5 TEST SETUP

Below 30MHz test setup

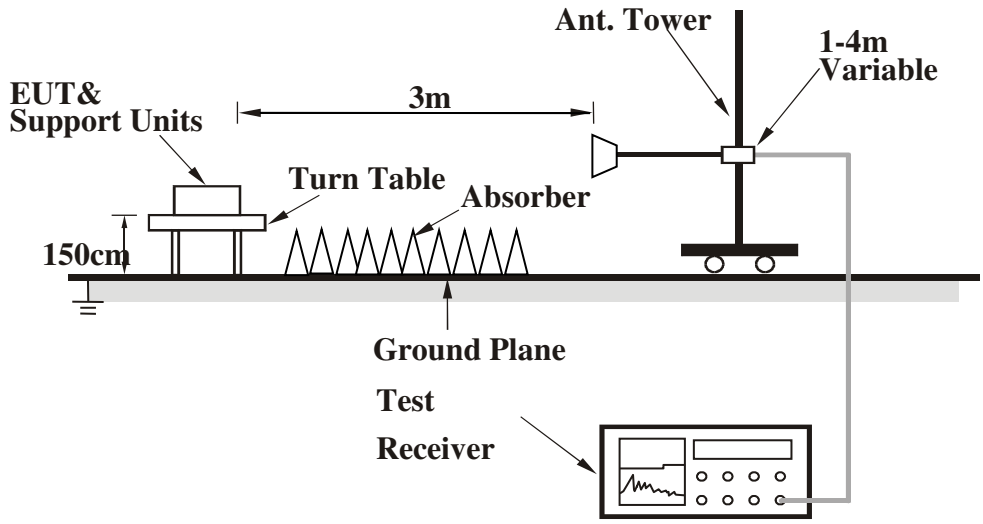


Below 1GHz test setup



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

Above 1GHz test setup



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

4.2.6 EUT OPERATING CONDITIONS

a. Placed the EUT 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.

4.2.7 TEST RESULTS

BELOW 1GHz WORST-CASE DATA:

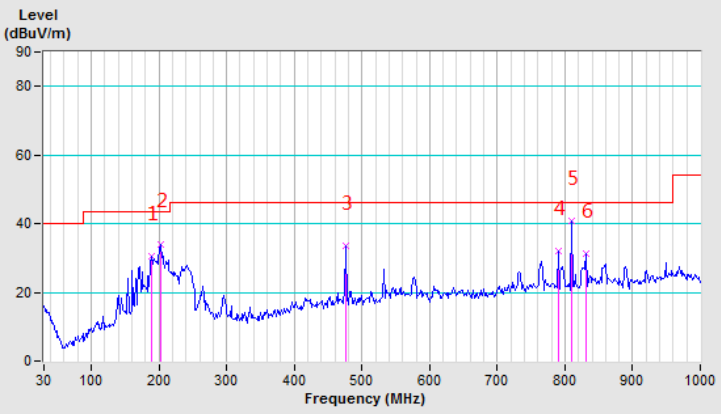
802.11b

CHANNEL	TX Channel 1	**DETECTOR FUNCTION**	Quasi-Peak (QP)
FREQUENCY RANGE	9KHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	188.56	30.50 QP	43.50	-13.00	2.00 H	195	50.69	-20.19
2	202.55	34.09 QP	43.50	-9.41	1.80 H	148	54.68	-20.59
3	476.14	33.61 QP	46.00	-12.39	2.10 H	133	44.97	-11.36
4	790.14	31.88 QP	46.00	-14.12	1.90 H	170	37.95	-6.07
5	**810.35**	**40.76 QP**	**46.00**	**-5.24**	**2.00 H**	**181**	**46.78**	**-6.02**
6	832.12	31.23 QP	46.00	-14.77	2.10 H	116	36.06	-4.83

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were less than 20dB margin against the limit.
4. Margin value = Emission level – Limit value.

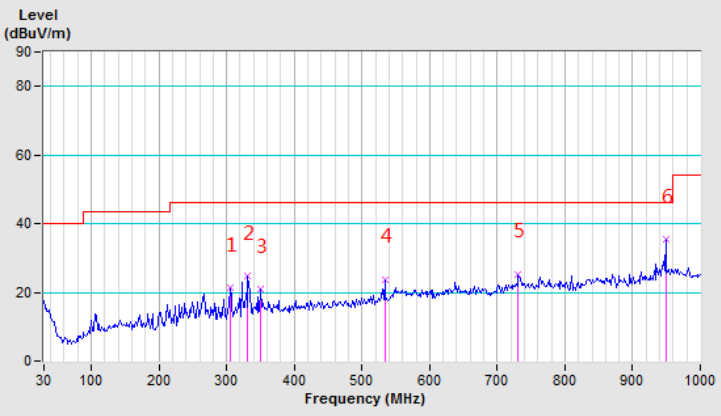


CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9KHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	305.14	21.29 QP	46.00	-24.71	2.50 V	125	37.27	-15.98
2	331.57	24.75 QP	46.00	-21.25	2.00 V	230	40.13	-15.38
3	350.22	20.81 QP	46.00	-25.19	2.00 V	201	35.79	-14.98
4	533.65	23.82 QP	46.00	-22.18	2.00 V	85	33.92	-10.10
5	731.07	25.33 QP	46.00	-20.67	2.00 V	144	31.06	-5.73
6	948.70	35.39 QP	46.00	-10.61	3.50 V	167	38.23	-2.84

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were less than 20dB margin against the limit.
4. Margin value = Emission level – Limit value.



ABOVE 1GHz DATA

802.11b

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	54.75 PK	74.00	-19.25	2.00 H	305	52.78	1.97
2	2390.00	46.47 AV	54.00	-7.53	2.00 H	305	44.50	1.97
3	*2412.00	104.42 PK			1.80 H	305	102.44	1.98
4	*2412.00	100.12 AV			1.80 H	305	98.14	1.98
5	4824.00	56.35 PK	74.00	-17.65	1.52 H	0	51.39	4.96
6	4824.00	45.97 AV	54.00	-8.03	1.52 H	0	41.01	4.96
7	#7236.00	54.36 PK	74.00	-19.64	1.52 H	0	44.67	9.69
8	#7236.00	40.69 AV	54.00	-13.31	1.52 H	0	31.00	9.69
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	50.41 PK	74.00	-23.59	1.50 V	281	48.44	1.97
2	2390.00	41.24 AV	54.00	-12.76	1.50 V	281	39.27	1.97
3	*2412.00	101.09 PK			1.50 V	281	99.11	1.98
4	*2412.00	96.39 AV			1.50 V	281	94.41	1.98
5	4824.00	56.34 PK	74.00	-17.66	1.60 V	0	51.38	4.96
6	4824.00	45.97 AV	54.00	-8.03	1.60 V	0	41.01	4.96
7	#7236.00	50.36 PK	74.00	-23.64	1.60 V	0	40.67	9.69
8	#7236.00	39.44 AV	54.00	-14.56	1.60 V	0	29.75	9.69

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were less than 20dB margin against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	102.35 PK			2.10 H	305	100.36	1.99
2	*2437.00	98.59 AV			2.10 H	305	96.60	1.99
3	4874.00	55.06 PK	74.00	-18.94	1.80 H	0	49.90	5.16
4	4874.00	44.39 AV	54.00	-9.61	1.80 H	0	39.23	5.16
5	7311.00	52.63 PK	74.00	-21.37	1.80 H	0	42.63	10.00
6	7311.00	42.69 AV	54.00	-11.31	1.80 H	0	32.69	10.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	100.71 PK			1.55 V	256	98.72	1.99
2	*2437.00	96.52 AV			1.55 V	256	94.53	1.99
3	4874.00	53.49 PK	74.00	-20.51	1.60 V	0	48.33	5.16
4	4874.00	42.39 AV	54.00	-11.61	1.60 V	0	37.23	5.16
5	7311.00	51.71 PK	74.00	-22.29	1.60 V	0	41.71	10.00
6	7311.00	40.85 AV	54.00	-13.15	1.60 V	0	30.85	10.00

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were less than 20dB margin against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	103.71 PK			2.15 H	149	101.70	2.01
2	*2462.00	99.81 AV			2.15 H	149	97.80	2.01
3	2483.50	56.84 PK	74.00	-17.16	2.15 H	149	54.81	2.03
4	**2483.50**	**49.52 AV**	**54.00**	**-4.48**	2.15 H	**149**	**47.49**	**2.03**
5	4924.00	55.34 PK	74.00	-18.66	2.00 H	0	49.99	5.35
6	4924.00	43.08 AV	54.00	-10.92	2.00 H	0	37.73	5.35
7	7386.00	51.34 PK	74.00	-22.66	2.00 H	0	41.04	10.30
8	7386.00	42.57 AV	54.00	-11.43	2.00 H	0	32.27	10.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	101.11 PK			1.50 V	226	99.10	2.01
2	*2462.00	96.90 AV			1.50 V	226	94.89	2.01
3	2483.50	52.15 PK	74.00	-21.85	1.50 V	226	50.12	2.03
4	2483.50	44.52 AV	54.00	-9.48	1.50 V	226	42.49	2.03
5	4924.00	49.36 PK	74.00	-24.64	1.70 V	0	44.01	5.35
6	4924.00	37.51 AV	54.00	-16.49	1.70 V	0	32.16	5.35
7	7386.00	50.61 PK	74.00	-23.39	1.70 V	0	40.31	10.30
8	7386.00	39.64 AV	54.00	-14.36	1.70 V	0	29.34	10.30

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were less than 20dB margin against the limit.
4. Margin value = Emission level – Limit value.
5. "* ": Fundamental frequency.

802.11g

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	55.18 PK	74.00	-18.82	1.80 H	17	53.21	1.97
2	2390.00	46.72 AV	54.00	-7.28	1.80 H	17	44.75	1.97
3	*2412.00	103.84 PK			1.80 H	17	101.86	1.98
4	*2412.00	100.15 AV			1.80 H	17	98.17	1.98
5	4824.00	56.77 PK	74.00	-17.23	1.60 H	0	51.81	4.96
6	4824.00	46.36 AV	54.00	-7.64	1.60 H	0	41.40	4.96
7	#7236.00	55.28 PK	74.00	-18.72	1.60 H	0	45.59	9.69
8	#7236.00	41.42 AV	54.00	-12.58	1.60 H	0	31.73	9.69
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	50.66 PK	74.00	-23.34	1.50 V	309	48.69	1.97
2	2390.00	42.75 AV	54.00	-11.25	1.50 V	309	40.78	1.97
3	*2412.00	100.93 PK			1.50 V	309	98.95	1.98
4	*2412.00	95.79 AV			1.50 V	309	93.81	1.98
5	4824.00	53.08 PK	74.00	-20.92	1.45 V	0	48.12	4.96
6	4824.00	42.19 AV	54.00	-11.81	1.45 V	0	37.23	4.96
7	#7236.00	51.79 PK	74.00	-22.21	1.45 V	0	42.10	9.69
8	#7236.00	40.54 AV	54.00	-13.46	1.45 V	0	30.85	9.69

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were less than 20dB margin against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	102.58 PK			2.00 H	273	100.59	1.99
2	*2437.00	98.55 AV			2.00 H	273	96.56	1.99
3	4874.00	55.39 PK	74.00	-18.61	1.80 H	0	50.23	5.16
4	4874.00	43.09 AV	54.00	-10.91	1.80 H	0	37.93	5.16
5	7311.00	51.58 PK	74.00	-22.42	1.80 H	0	41.58	10.00
6	7311.00	43.05 AV	54.00	-10.95	1.80 H	0	33.05	10.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	99.85 PK			1.62 V	18	97.86	1.99
2	*2437.00	94.76 AV			1.62 V	18	92.77	1.99
3	4874.00	49.53 PK	74.00	-24.47	1.48 V	0	44.37	5.16
4	4874.00	37.15 AV	54.00	-16.85	1.48 V	0	31.99	5.16
5	7311.00	50.47 PK	74.00	-23.53	1.48 V	0	40.47	10.00
6	7311.00	39.82 AV	54.00	-14.18	1.48 V	0	29.82	10.00

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were less than 20dB margin against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	103.18 PK			2.23 H	155	101.17	2.01
2	*2462.00	99.84 AV			2.23 H	155	97.83	2.01
3	2483.50	57.86 PK	74.00	-16.14	2.23 H	155	55.83	2.03
4	2483.50	49.38 AV	54.00	-4.62	2.23 H	155	47.35	2.03
5	4924.00	56.04 PK	74.00	-17.96	2.12 H	0	50.69	5.35
6	4924.00	44.52 AV	54.00	-9.48	2.12 H	0	39.17	5.35
7	7386.00	52.19 PK	74.00	-21.81	2.12 H	0	41.89	10.30
8	7386.00	43.27 AV	54.00	-10.73	2.12 H	0	32.97	10.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	100.54 PK			1.60 V	206	98.53	2.01
2	*2462.00	95.89 AV			1.60 V	206	93.88	2.01
3	2483.50	53.19 PK	74.00	-20.81	1.60 V	206	51.16	2.03
4	2483.50	45.07 AV	54.00	-8.93	1.60 V	206	43.04	2.03
5	4924.00	50.47 PK	74.00	-23.53	1.54 V	0	45.12	5.35
6	4924.00	38.96 AV	54.00	-15.04	1.54 V	0	33.61	5.35
7	7386.00	51.29 PK	74.00	-22.71	1.54 V	0	40.99	10.30
8	7386.00	40.54 AV	54.00	-13.46	1.54 V	0	30.24	10.30

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were less than 20dB margin against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.

802.11n HT20

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	55.72 PK	74.00	-18.28	2.09 H	58	53.75	1.97
2	2390.00	47.51 AV	54.00	-6.49	2.09 H	58	45.54	1.97
3	*2412.00	103.82 PK			2.09 H	58	101.84	1.98
4	*2412.00	99.86 AV			2.09 H	58	97.88	1.98
5	4824.00	56.38 PK	74.00	-17.62	1.60 H	0	51.42	4.96
6	4824.00	46.02 AV	54.00	-7.98	1.60 H	0	41.06	4.96
7	#7236.00	55.19 PK	74.00	-18.81	1.60 H	0	45.50	9.69
8	#7236.00	40.52 AV	54.00	-13.48	1.60 H	0	30.83	9.69
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	50.63 PK	74.00	-23.37	1.56 V	163	48.66	1.97
2	2390.00	42.55 AV	54.00	-11.45	1.56 V	163	40.58	1.97
3	*2412.00	100.96 PK			1.56 V	163	98.98	1.98
4	*2412.00	95.71 AV			1.56 V	163	93.73	1.98
5	4824.00	53.19 PK	74.00	-20.81	1.49 V	0	48.23	4.96
6	4824.00	42.05 AV	54.00	-11.95	1.49 V	0	37.09	4.96
7	#7236.00	51.55 PK	74.00	-22.45	1.49 V	0	41.86	9.69
8	#7236.00	40.52 AV	54.00	-13.48	1.49 V	0	30.83	9.69

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were less than 20dB margin against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	102.58 PK			2.01 H	18	100.59	1.99
2	*2437.00	97.86 AV			2.01 H	18	95.87	1.99
3	4874.00	55.32 PK	74.00	-18.68	1.54 H	0	50.16	5.16
4	4874.00	44.35 AV	54.00	-9.65	1.54 H	0	39.19	5.16
5	7311.00	51.29 PK	74.00	-22.71	1.54 H	0	41.29	10.00
6	7311.00	41.58 AV	54.00	-12.42	1.54 H	0	31.58	10.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	99.52 PK			1.66 V	283	97.53	1.99
2	*2437.00	95.44 AV			1.66 V	283	93.45	1.99
3	4874.00	48.71 PK	74.00	-25.29	1.73 V	0	43.55	5.16
4	4874.00	36.52 AV	54.00	-17.48	1.73 V	0	31.36	5.16
5	7311.00	48.75 PK	74.00	-25.25	1.73 V	0	38.75	10.00
6	7311.00	40.29 AV	54.00	-13.71	1.73 V	0	30.29	10.00

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were less than 20dB margin against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	103.52 PK			2.08 H	17	101.51	2.01
2	*2462.00	99.88 AV			2.08 H	17	97.87	2.01
3	2483.50	57.05 PK	74.00	-16.95	2.08 H	17	55.02	2.03
4	2483.50	48.75 AV	54.00	-5.25	2.08 H	17	46.72	2.03
5	4924.00	55.63 PK	74.00	-18.37	2.12 H	0	50.28	5.35
6	4924.00	44.52 AV	54.00	-9.48	2.12 H	0	39.17	5.35
7	7386.00	52.09 PK	74.00	-21.91	2.12 H	0	41.79	10.30
8	7386.00	43.58 AV	54.00	-10.42	2.12 H	0	33.28	10.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	100.74 PK			1.60 V	279	98.73	2.01
2	*2462.00	95.03 AV			1.60 V	279	93.02	2.01
3	2483.50	53.49 PK	74.00	-20.51	1.60 V	279	51.46	2.03
4	2483.50	45.71 AV	54.00	-8.29	1.60 V	279	43.68	2.03
5	4924.00	50.75 PK	74.00	-23.25	1.65 V	0	45.40	5.35
6	4924.00	38.92 AV	54.00	-15.08	1.65 V	0	33.57	5.35
7	7386.00	51.74 PK	74.00	-22.26	1.65 V	0	41.44	10.30
8	7386.00	40.59 AV	54.00	-13.41	1.65 V	0	30.29	10.30

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were less than 20dB margin against the limit.
4. Margin value = Emission level – Limit value.
5. "* ": Fundamental frequency.

4.3 6dB BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
Power Sensor	Keysight	U2021XA	MY55060016	May 09, 22
Power Sensor	Keysight	U2021XA	MY55060018	May 09, 22
Power Meter	Anritsu	ML2495A	1139001	Feb. 24,22
Power Sensor	Anritsu	MA2411B	1531155	Feb. 24,22
Digital Multimeter	FLUKE	15B	A1220010DG	N/A
Humid & Temp Programmable Tester	Haida	HD-225T	110807201	Nov. 03,21
Oscilloscope	Agilent	DSO9254A	MY51260160	Aug. 11,22
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV40	101094	Feb. 24,22
Signal Generator	Agilent	N5183A	MY50140980	Mar 23.22
MXG-B RF Vector Signal Generator	Keysight	N5182B	MY56200288	Sep. 14,22
Attenuator	MINI	BW-S10W2+	S130129FGE2	N/A
DC Source	Keysight	E3642A	MY56146098	N/A

NOTES: 1. The test was performed in RF Oven 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.

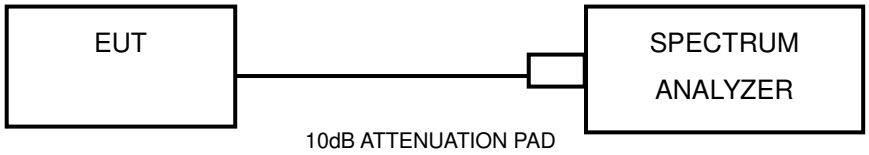
4.3.3 TEST PROCEDURE

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

4.3.4 DEVIATION FROM TEST STANDARD

No deviation.

4.3.5 TEST SETUP



4.3.6 EUT OPERATING CONDITIONS

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

4.3.7 TEST RESULTS

802.11b

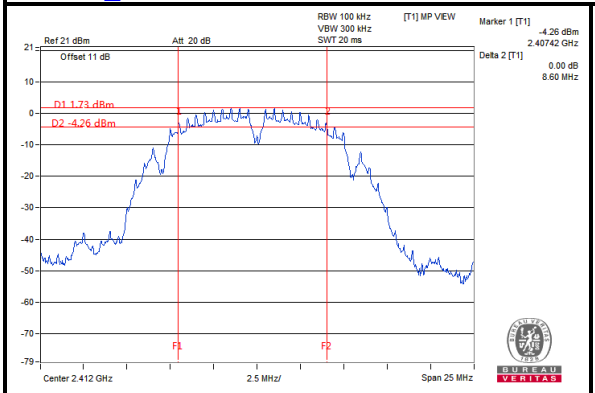
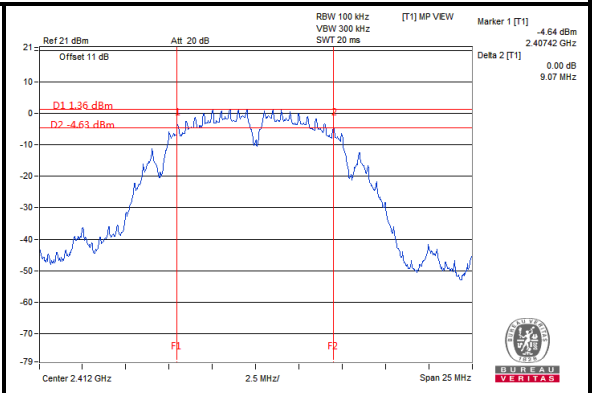
CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	8.60	9.07	0.5	PASS
6	2437	8.62	9.55	0.5	PASS
11	2462	9.10	9.08	0.5	PASS

802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	16.42	16.38	0.5	PASS
6	2437	15.79	15.81	0.5	PASS
11	2462	16.40	16.40	0.5	PASS

802.11n HT20

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	17.65	17.63	0.5	PASS
6	2437	17.19	17.38	0.5	PASS
11	2462	17.65	17.65	0.5	PASS

SPECTRUM PLOT	
CHAIN 0	CHAIN 1
802.11b_CH1	
	
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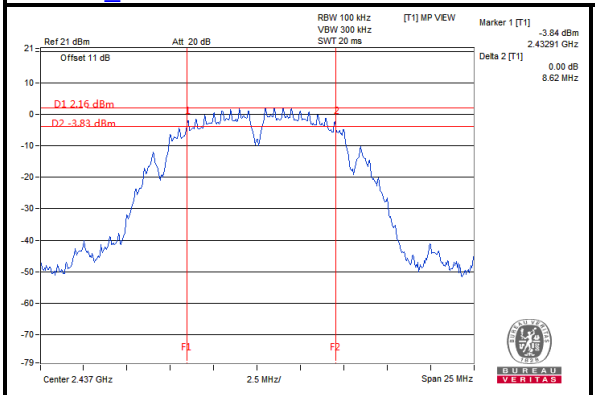
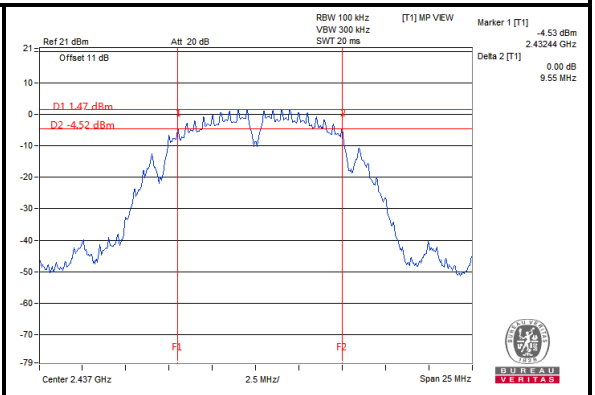
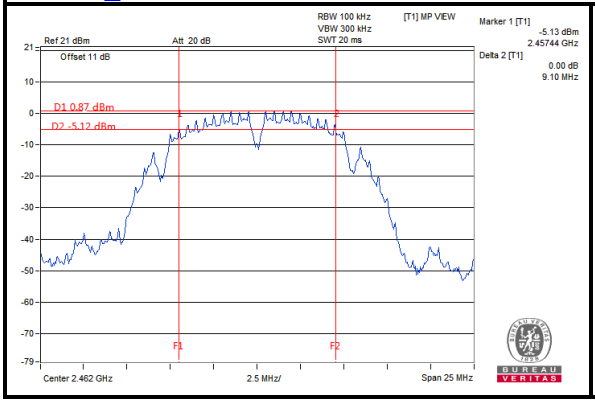
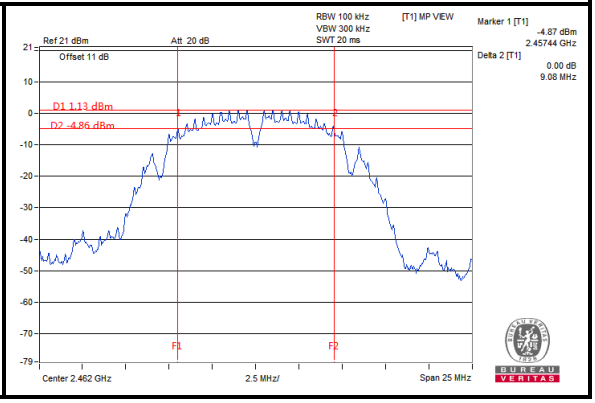
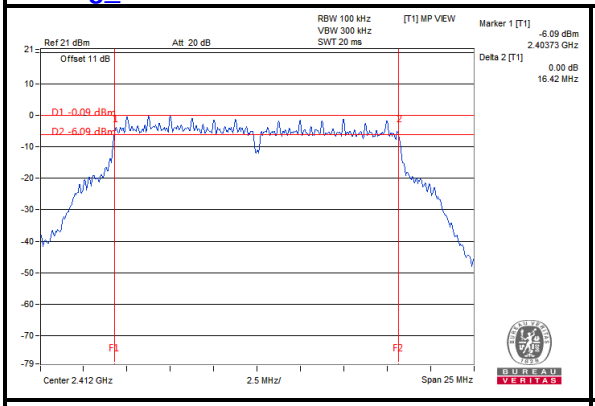
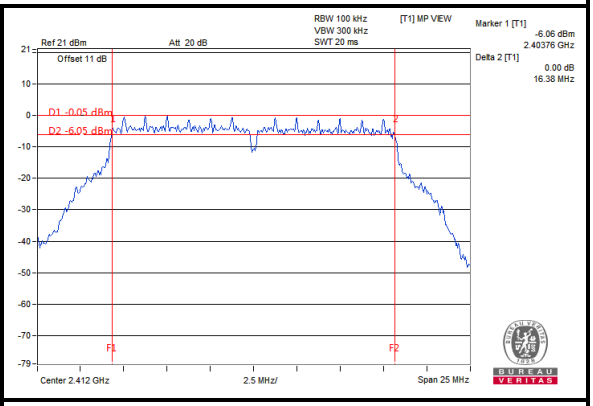
	
802.11b_CH11	
	

SPECTRUM PLOT	
CHAIN 0	CHAIN 1
802.11g_CH1	
	
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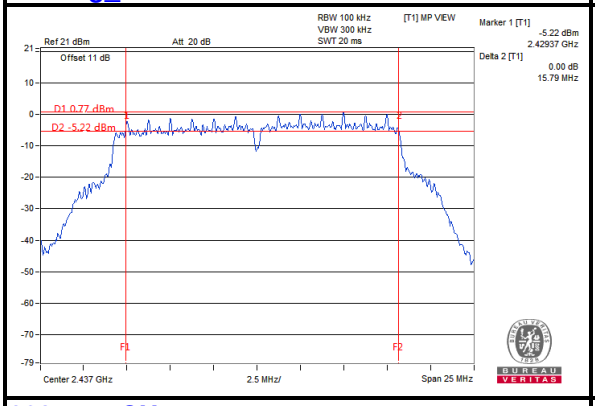	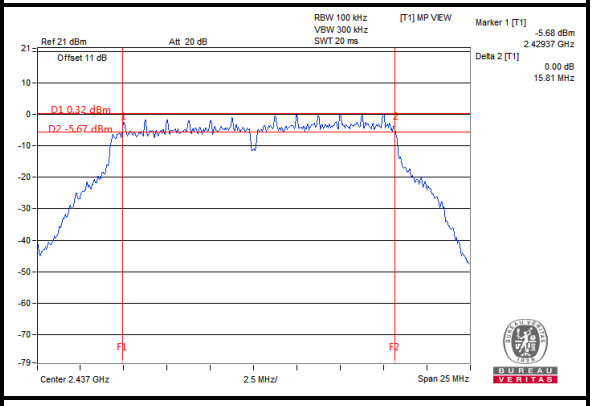
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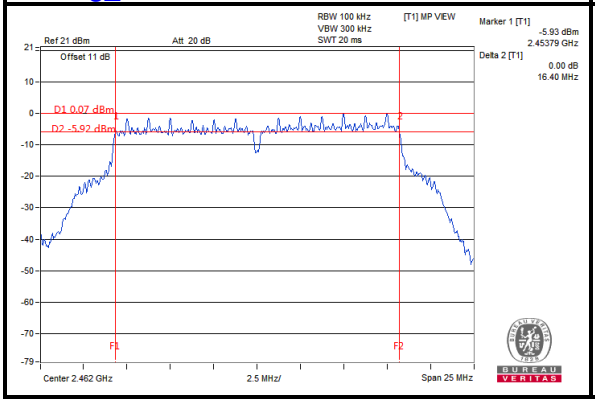
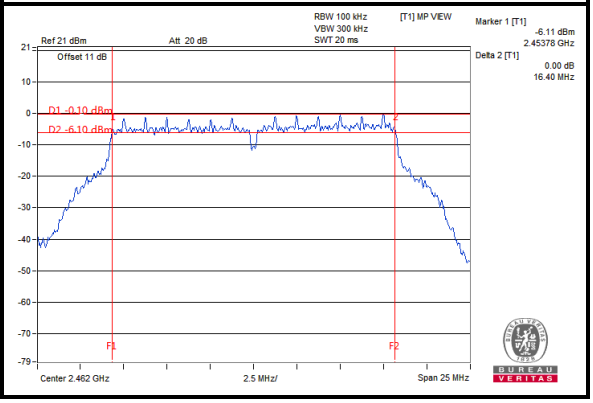
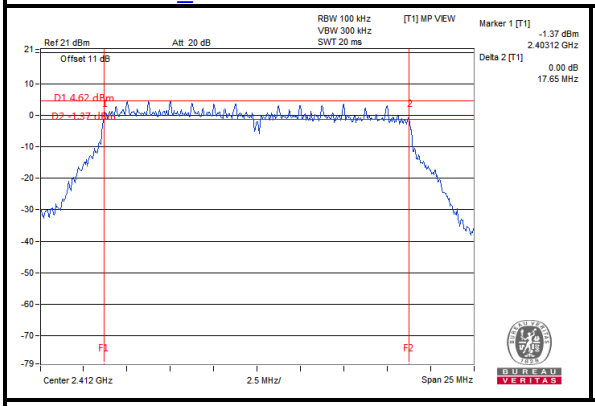
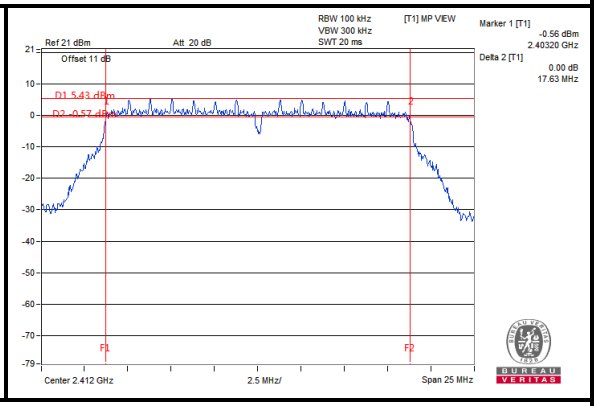
	

SPECTRUM PLOT	
CHAIN 0	CHAIN 1
802.11n HT20_CH1	
	
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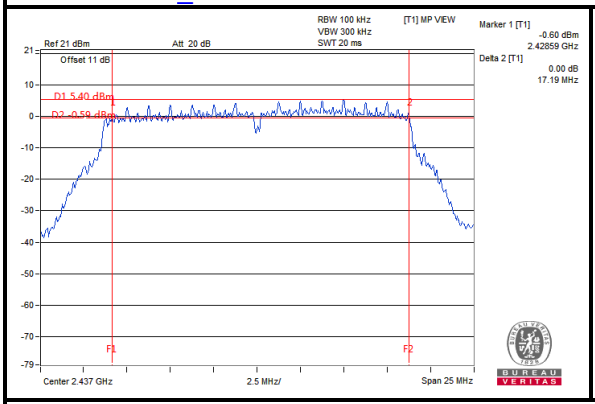
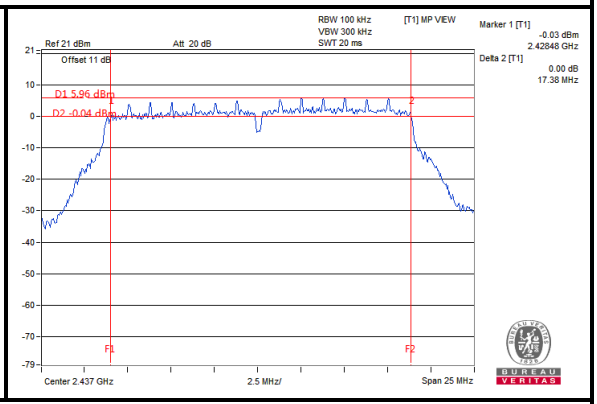
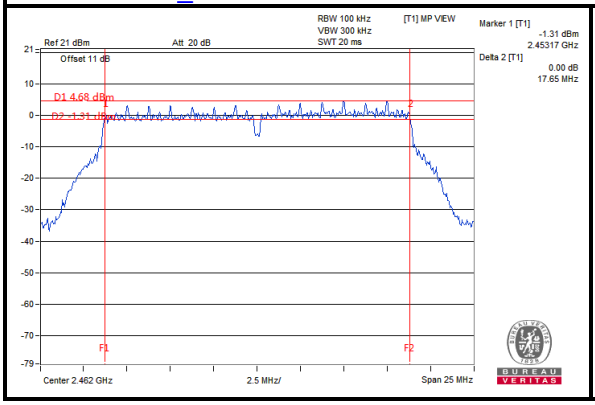
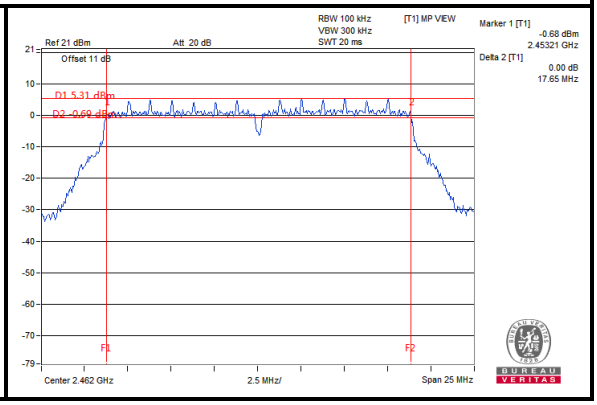
	
802.11n HT20_CH11	
	

4.4 CONDUCTED OUTPUT POWER

4.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

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

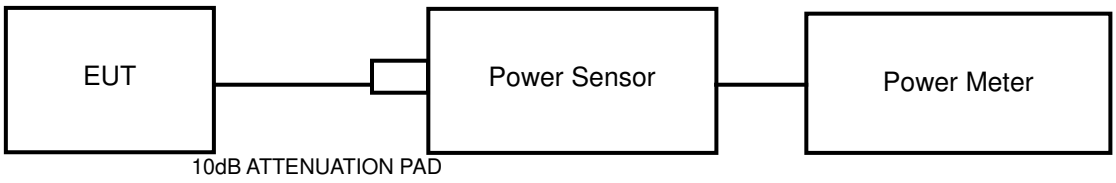
Per KDB 662911 D01 Multiple Transmitter Output Method of conducted output power measurement on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};

Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

4.4.2 TEST SETUP



4.4.3 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
Power Sensor	Keysight	U2021XA	MY55060016	May 09, 22
Power Sensor	Keysight	U2021XA	MY55060018	May 09, 22
Power Meter	Anritsu	ML2495A	1139001	Feb. 24,22
Power Sensor	Anritsu	MA2411B	1531155	Feb. 24,22
Digital Multimeter	FLUKE	15B	A1220010DG	N/A
Humid & Temp Programmable Tester	Haida	HD-225T	110807201	Nov. 03,21
Oscilloscope	Agilent	DSO9254A	MY51260160	Aug. 11,22
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV40	101094	Feb. 24,22
Signal Generator	Agilent	N5183A	MY50140980	Mar 23.22
MXG-B RF Vector Signal Generator	Keysight	N5182B	MY56200288	Sep. 14,22
Attenuator	MINI	BW-S10W2+	S130129FGE2	N/A
DC Source	Keysight	E3642A	MY56146098	N/A

NOTES:

1. The test was performed in RF Oven 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.

4.4.4 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 and set the detector to PEAK. Record the power level.

An average power sensor was used on the output port of the EUT. A power meter was used to read the response of the average power senso and set the detector to AVERAGE. Record the power level.

4.4.5 DEVIATION FROM TEST STANDARD

No deviation.

4.4.6 EUT OPERATING CONDITIONS

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

4.4.7 TEST RESULTS

MAXIMUM PEAK OUTPUT POWER

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	CONDUCTED POWER (dBm)		CONDUCTED POWER (mW)		PEAK POWER LIMIT (W)	PASS/ FAIL
		CHAIN 0	CHAIN 1	CHAIN 0	CHAIN 1		
1	2412	12.29	13.38	16.943	21.777	1	PASS
6	2437	12.87	13.15	19.364	20.654	1	PASS
11	2462	12.30	13.33	16.982	21.528	1	PASS

802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	CONDUCTED POWER (dBm)		CONDUCTED POWER (mW)		PEAK POWER LIMIT (W)	PASS/ FAIL
		CHAIN 0	CHAIN 1	CHAIN 0	CHAIN 1		
1	2412	17.57	16.90	57.148	48.978	1	PASS
6	2437	17.39	17.11	54.828	51.404	1	PASS
11	2462	17.07	16.78	50.933	47.643	1	PASS

802.11n HT20

CHANNEL	CHANNEL FREQUENCY (MHz)	CONDUCTED POWER (dBm)		CONDUCTED POWER (mW)		TOTAL MAX. POWER OUTPUT		PEAK POWER LIMIT (W)	PASS/ FAIL
		CHAIN 0	CHAIN 1	CHAIN 0	CHAIN 1	mW	dBm		
1	2412	18.04	18.53	63.68	71.285	134.965	21.30	1	PASS
6	2437	17.86	18.37	61.094	68.707	129.801	21.13	1	PASS
11	2462	17.93	18.24	62.087	66.681	128.768	21.10	1	PASS

NOTE: Directional gain = 3dBi < 6dBi , so the limit is no need to be reduced.

AVERAGE OUTPUT POWER (FOR REFERENCE)

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

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)		AVERAGE POWER (mW)	
		CHAIN 0	CHAIN 1	CHAIN 0	CHAIN 1
1	2412	9.27	10.42	8.453	11.015
6	2437	9.81	10.27	9.572	10.641
11	2462	9.29	10.24	8.492	10.568

802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)		AVERAGE POWER (mW)	
		CHAIN 0	CHAIN 1	CHAIN 0	CHAIN 1
1	2412	9.81	9.33	9.572	8.57
6	2437	9.86	9.57	9.683	9.057
11	2462	9.59	9.38	9.099	8.67

802.11n HT20

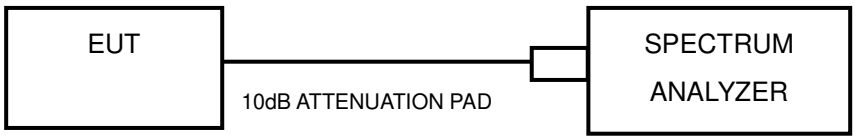
CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)		AVERAGE POWER (mW)		TOTAL POWER (dBm)	TOTAL POWER (mW)
		CHAIN 0	CHAIN 1	CHAIN 0	CHAIN 1		
1	2412	9.87	10.22	9.705	10.52	13.06	20.225
6	2437	9.74	10.15	9.419	10.351	12.96	19.77
11	2462	9.88	10.09	9.727	10.209	13.00	19.936

4.5 POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

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

4.5.2 TEST SETUP



4.5.3 TEST INSTRUMENTS

Refer to section 4.3.2 to get information of above instrument.

4.5.4 TEST PROCEDURE

a) Set instrument center frequency to DTS channel center frequency.
b) Set span to at least 1.5 times the DTS Bandwidth.
c) Set RBW to: 3KHz
d) Set VBW ≥3 x RBW.
e) Detector = peak
f) Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW.
g) Sweep time = auto couple.
h) Use the peak marker function to determine the maximum amplitude level.

4.5.5 DEVIATION FROM TEST STANDARD

No deviation.

4.5.6 EUT OPERATING CONDITION

Same as item 4.3.6.

4.5.7 TEST RESULTS

802.11b

Channel	FREQ. (MHz)	PSD (dBm/3kHz)		Limit (dBm/3kHz)	PASS /FAIL
		Chain 0	Chain 1		
1	2412	-12.29	-11.22	8.00	PASS
6	2437	-11.83	-10.39	8.00	PASS
11	2462	-12.89	-11.68	8.00	PASS

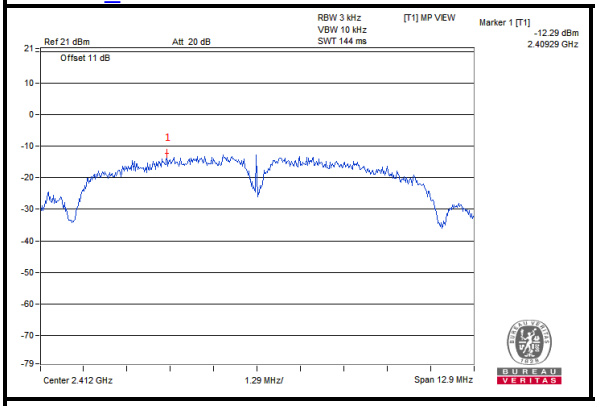
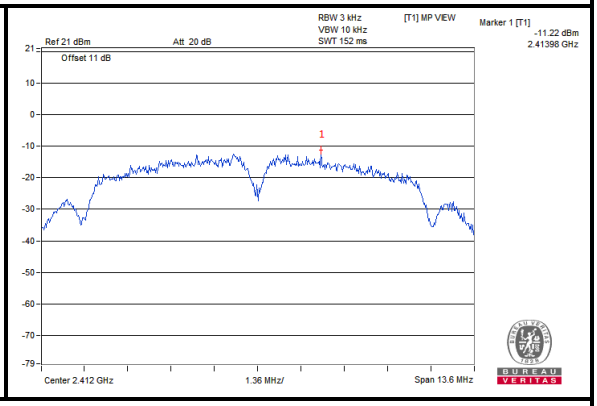
802.11g

Channel	FREQ. (MHz)	PSD (dBm/3kHz)		Limit (dBm/3kHz)	PASS /FAIL
		Chain 0	Chain 1		
1	2412	-14.59	-14.89	8.00	PASS
6	2437	-14.03	-14.55	8.00	PASS
11	2462	-15.35	-14.86	8.00	PASS

802.11n HT20

Channel	FREQ. (MHz)	PSD (dBm/3kHz)		TOTAL (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
		Chain 0	Chain 1			
1	2412	-9.69	-9.51	-6.59	7.99	PASS
6	2437	-9.94	-8.71	-6.27	7.99	PASS
11	2462	-10.23	-9.63	-6.91	7.99	PASS

NOTE: Directional gain = 3dBi + 10log(2) = 6.01dBi > 6dBi , so the power density limit shall be reduced to 8-(6.01-6) = 7.99dBm.

SPECTRUM PLOT	
Chain 0	Chain 1
802.11b_CH1	
	
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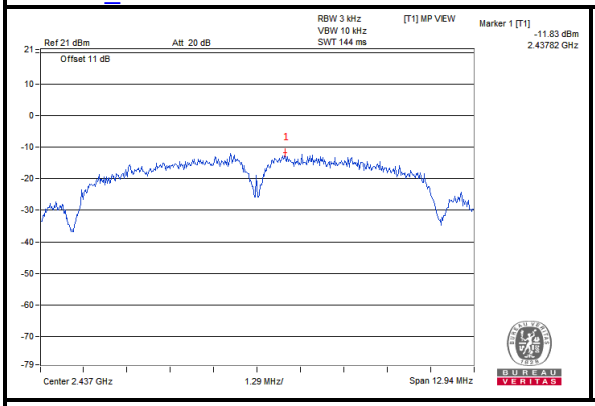	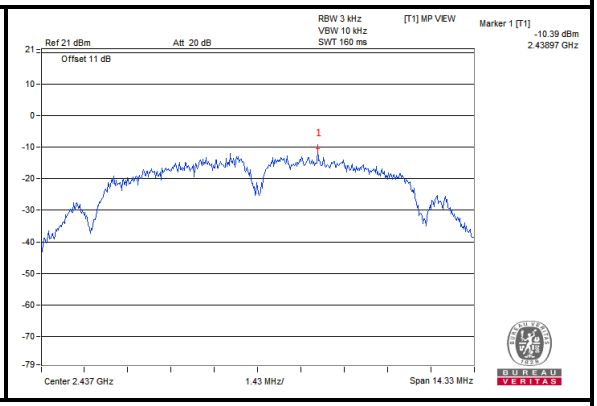
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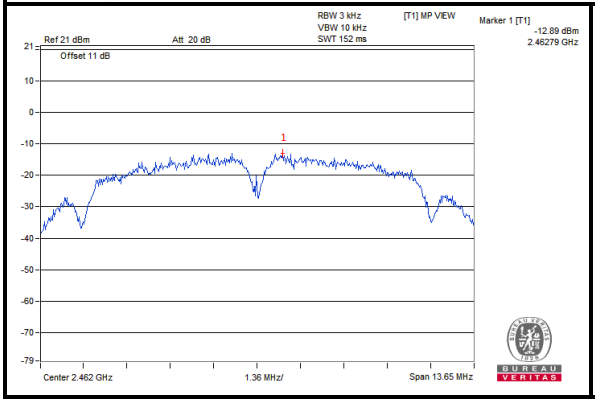	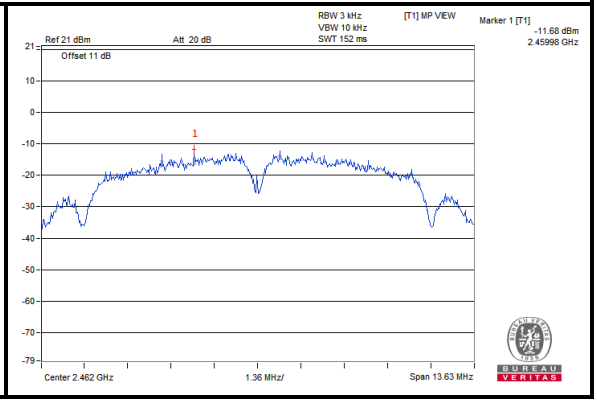

SPECTRUM PLOT	
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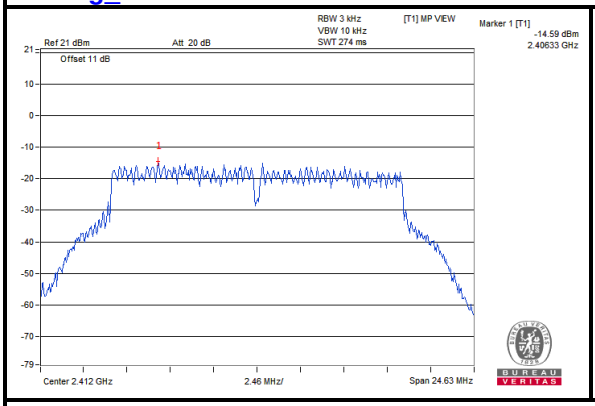	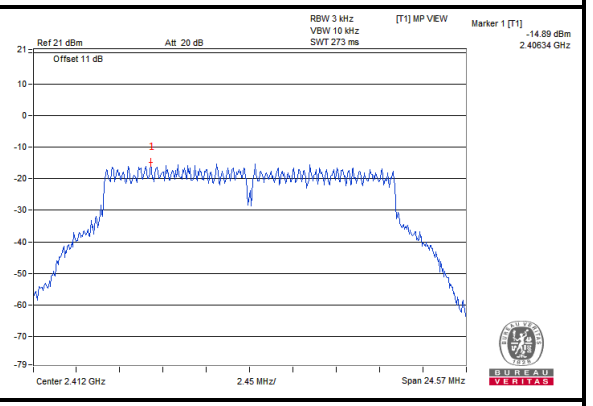
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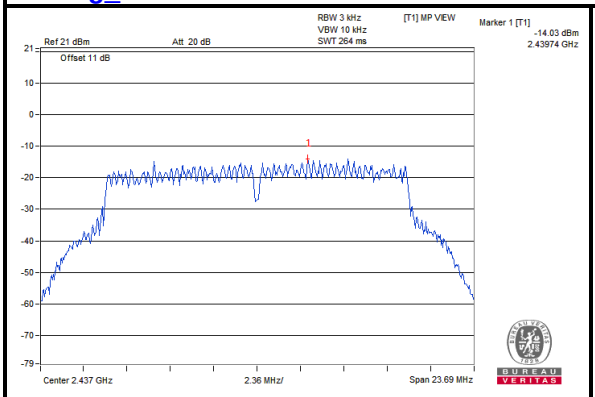	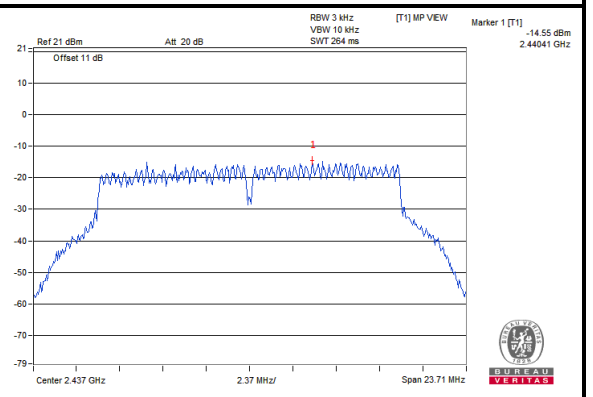
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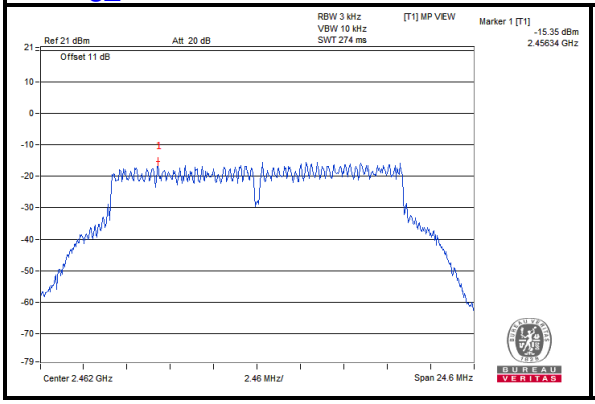
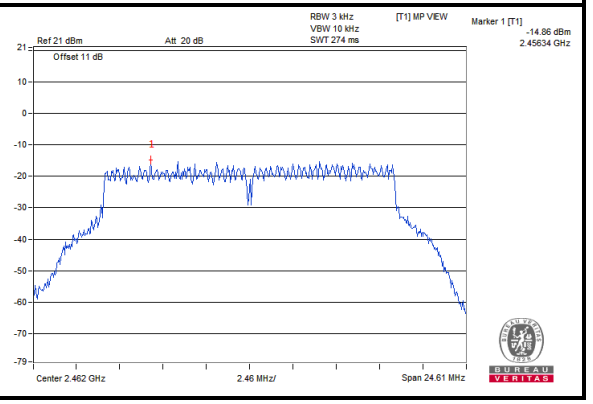
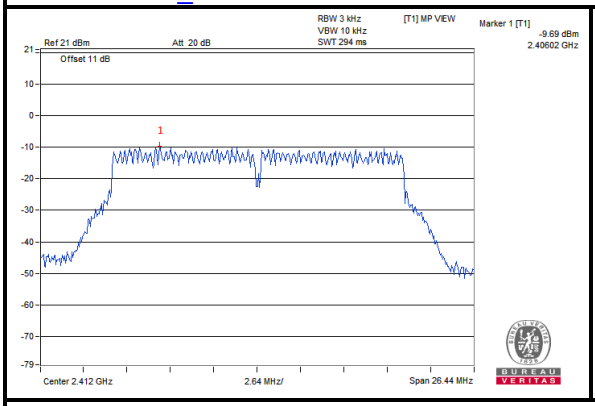
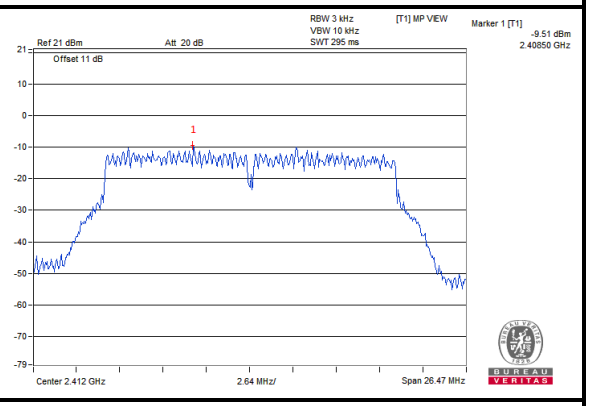
	

SPECTRUM PLOT	
Chain 0	**Chain 1**
802.11n HT20_CH1	
	
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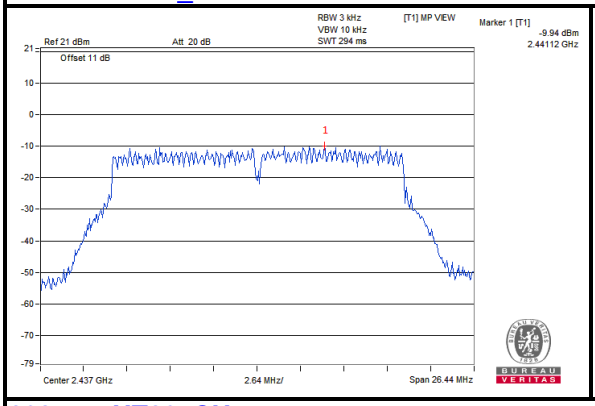	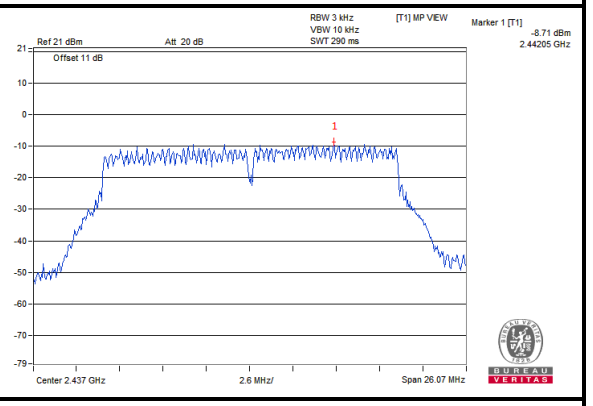
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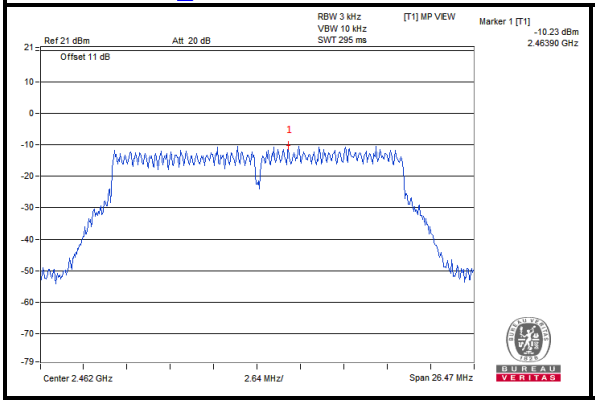
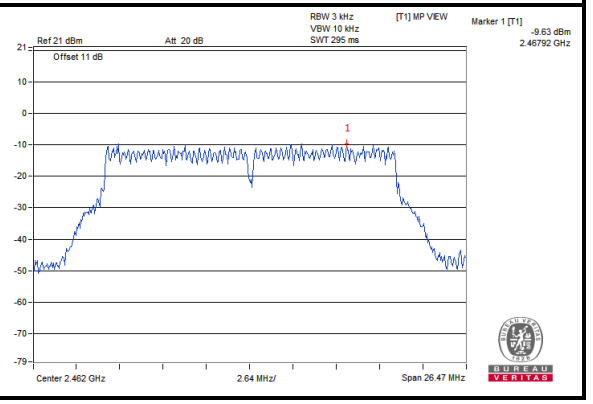
	

4.6 OUT OF BAND EMISSION MEASUREMENT

4.6.1 LIMITS OF OUT OF BAND EMISSION MEASUREMENT

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

4.6.2 TEST SETUP

4.6.3 TEST INSTRUMENTS

Refer to section 4.3.2 to get information of above instrument.

4.6.4 TEST PROCEDURE

Measurement Procedure - Reference Level

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 –Unwanted Emission Level

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.

4.6.5 DEVIATION FROM TEST STANDARD

No deviation.

4.6.6 EUT OPERATING CONDITION

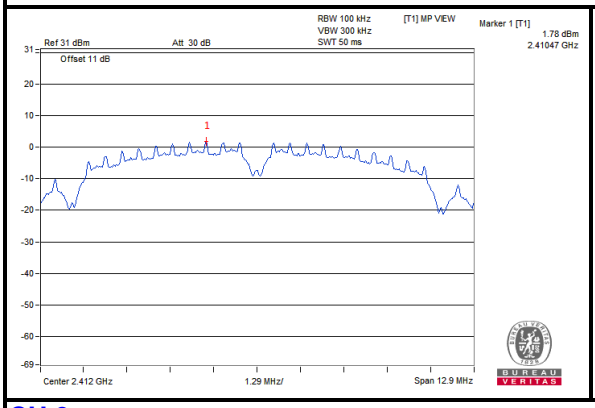
Same as item 4.3.6

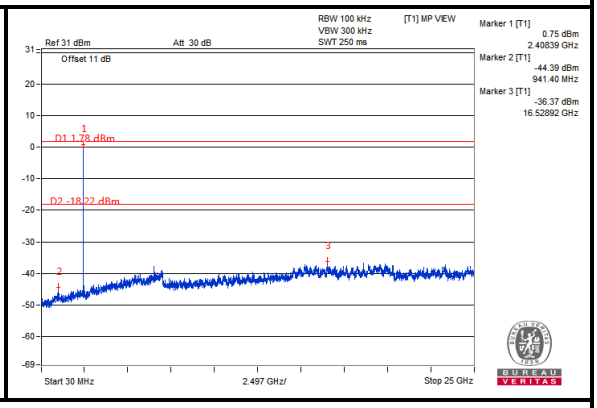
4.6.7 TEST RESULTS

802.11b

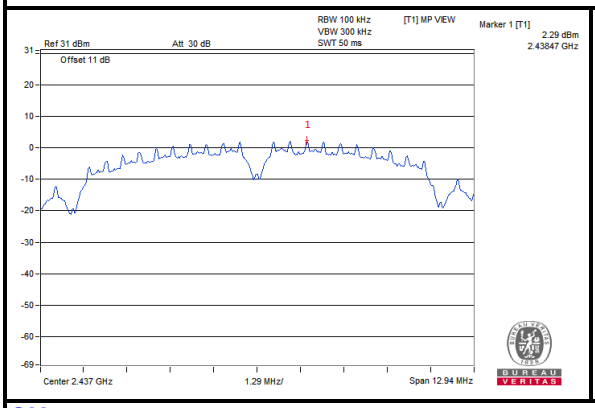
Chain 0

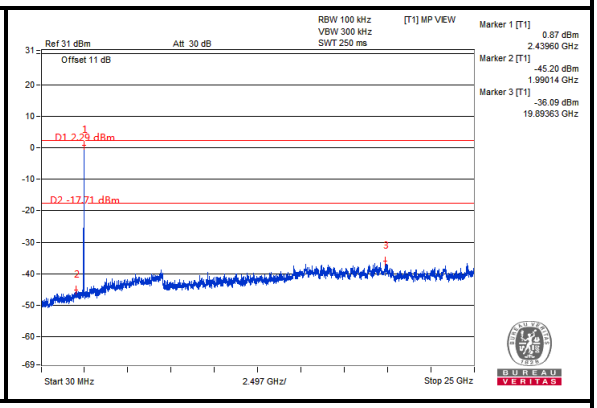
CH 1





CH 6





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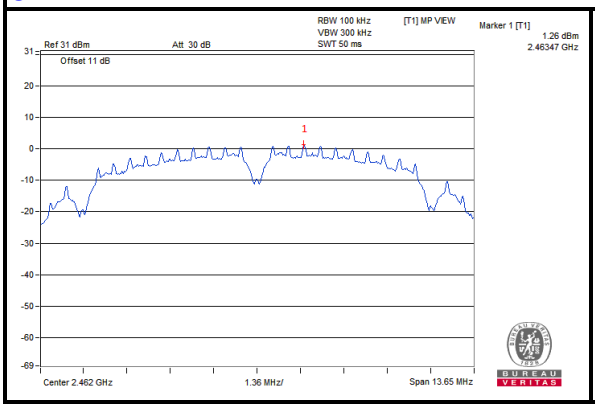
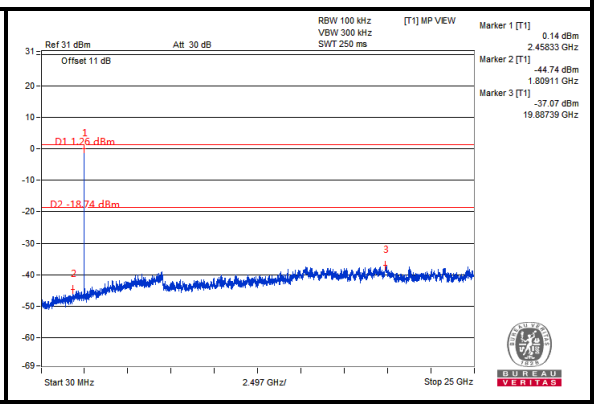
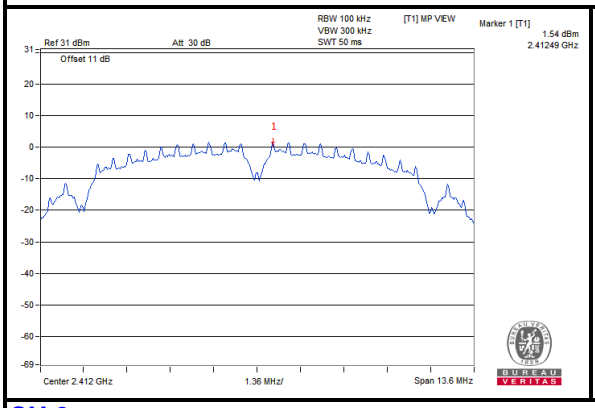
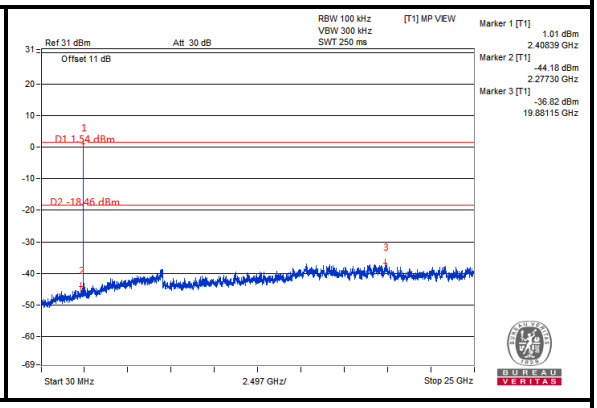




Chain 1

CH 1





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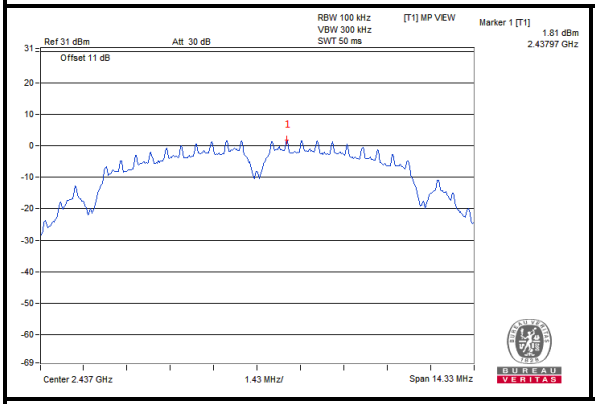

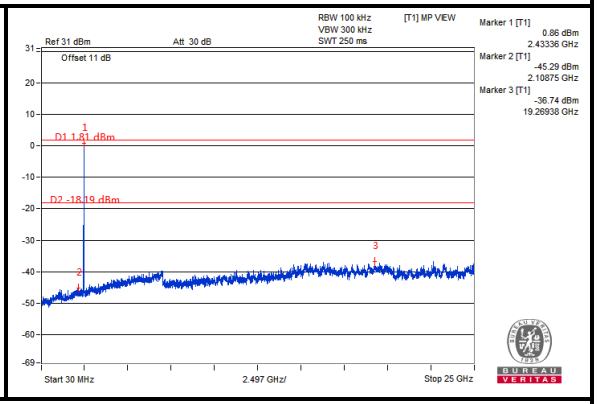

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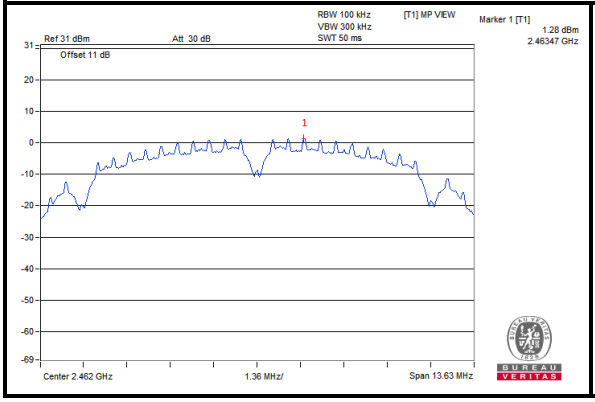
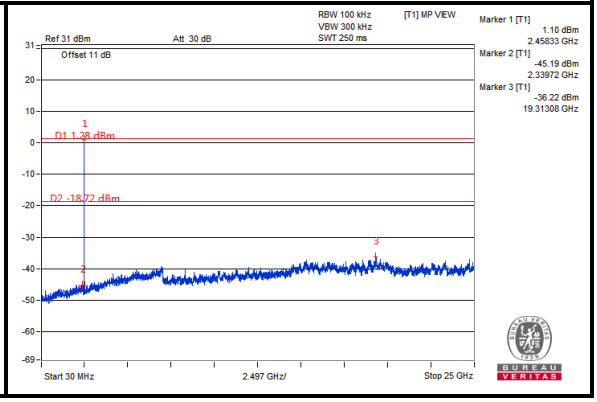
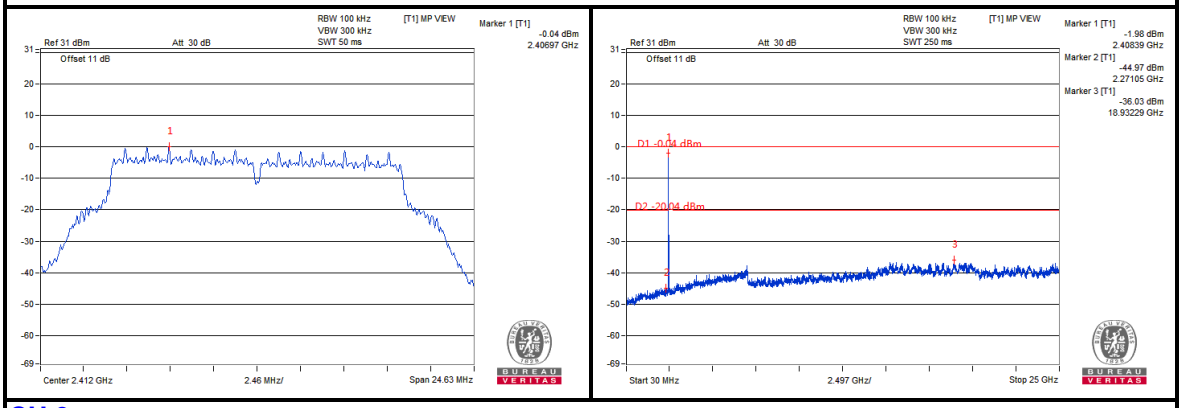




802.11g

Chain 0

CH 1



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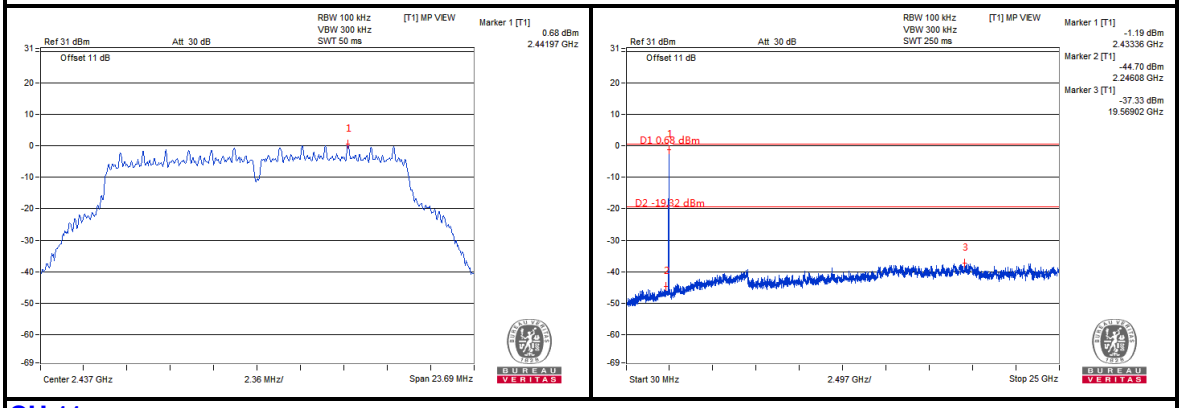

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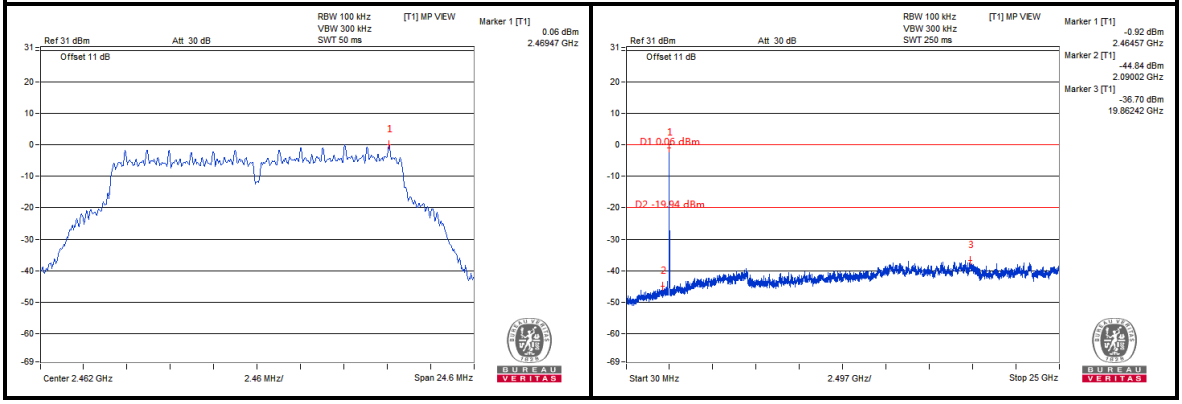
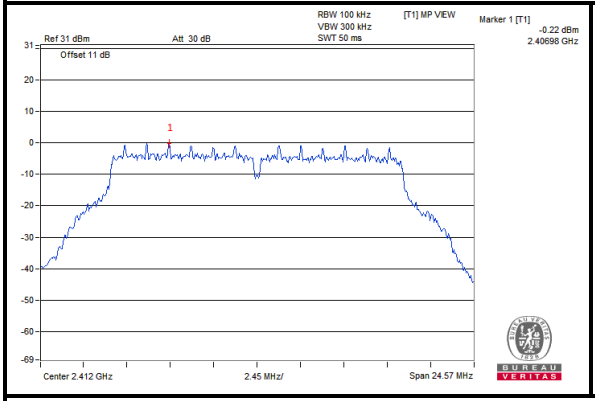
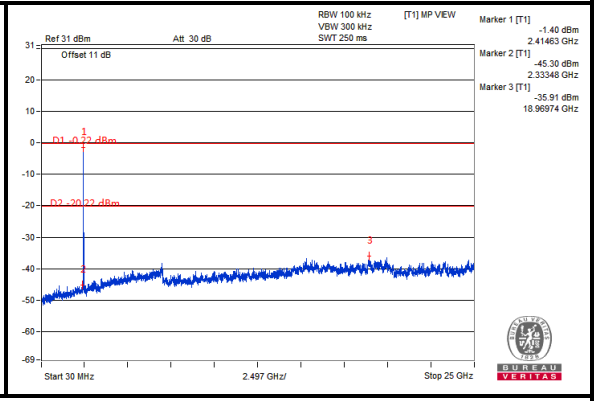


Chain 1

CH 1





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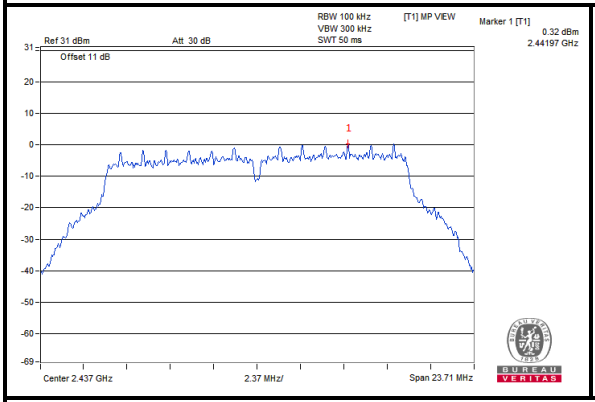

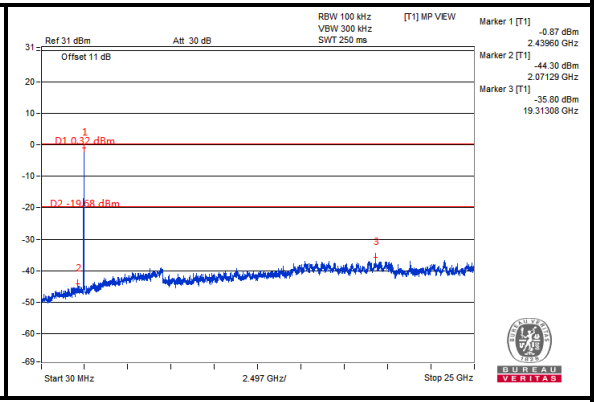

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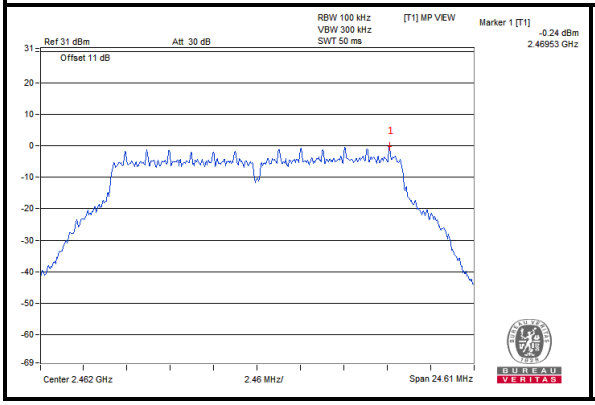
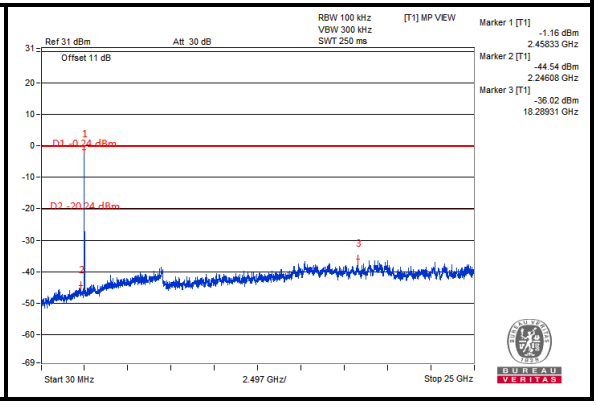
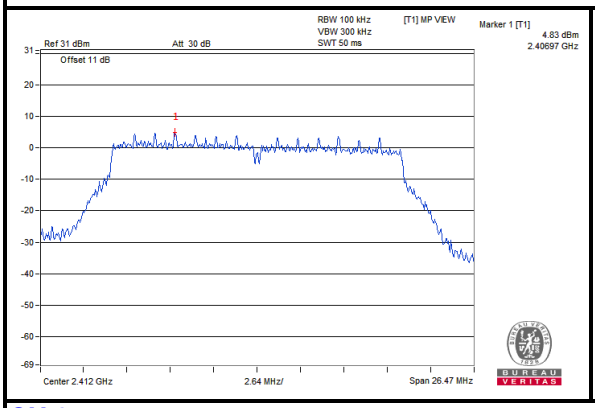
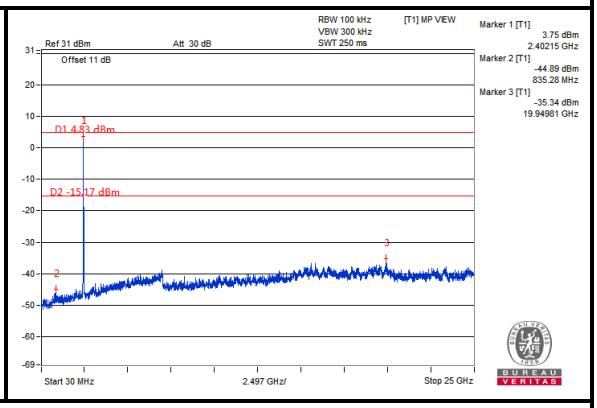




802.11n HT20
Chain 0

CH 1





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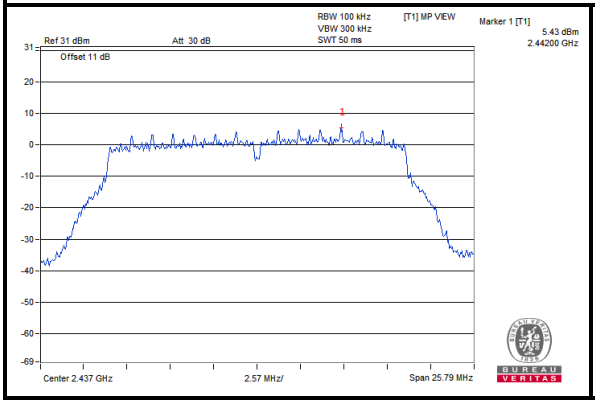

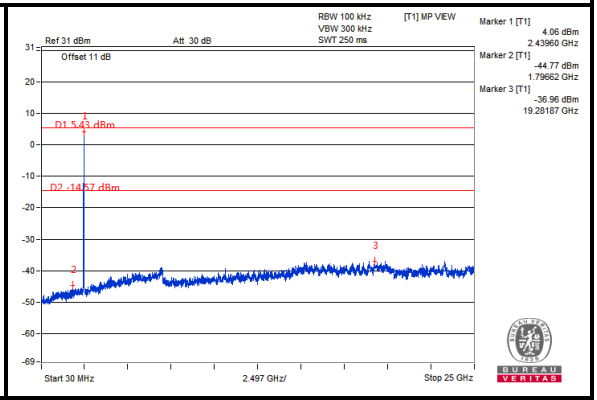

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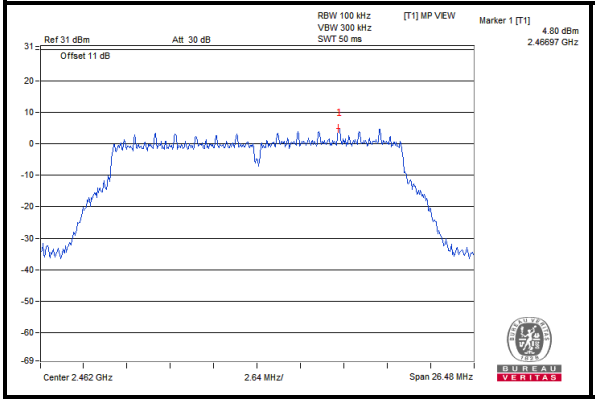
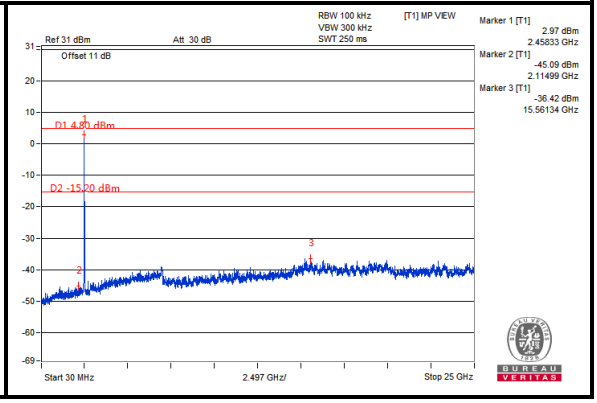
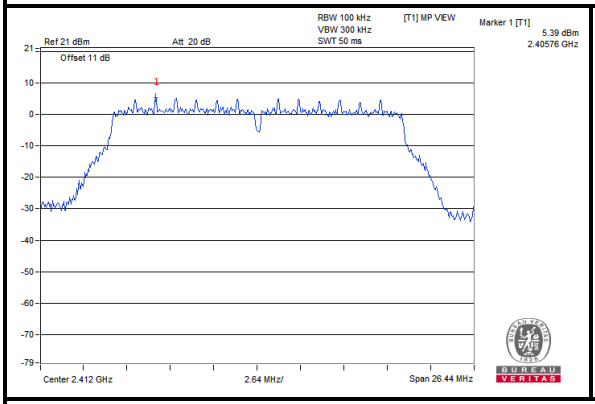
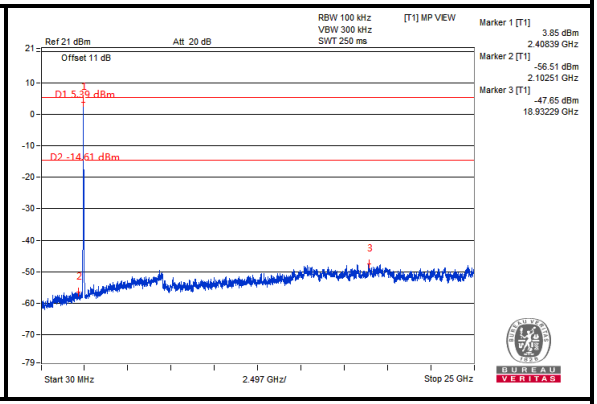




Chain 1

CH 1





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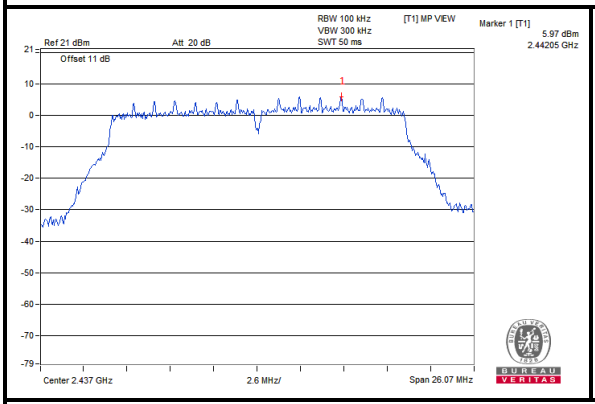

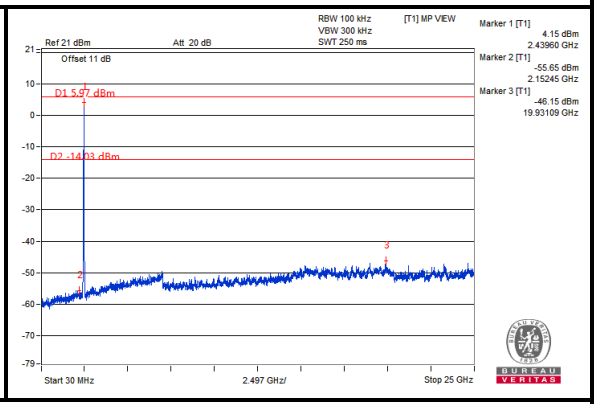

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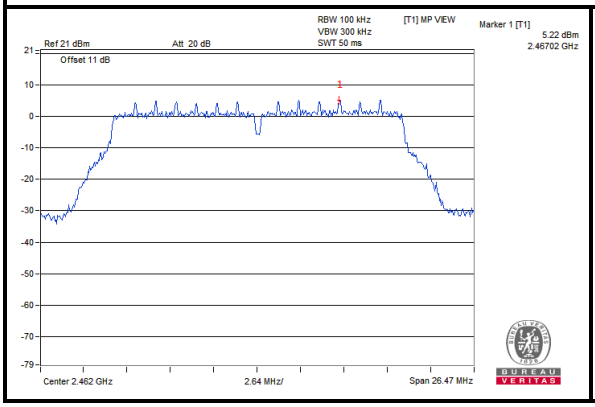
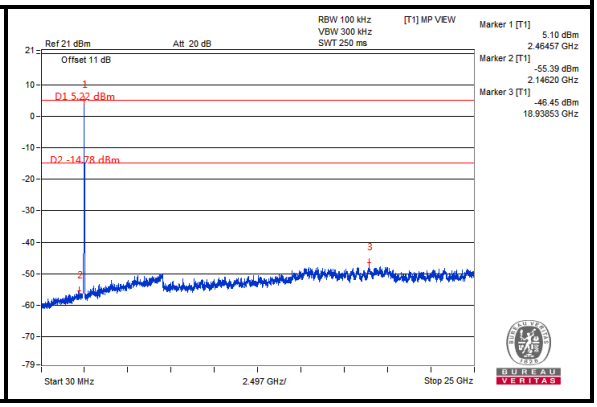
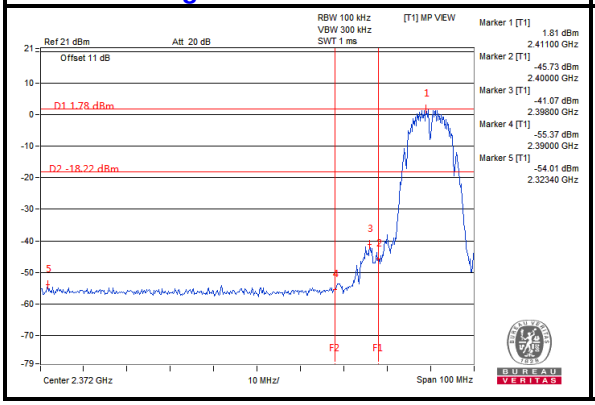
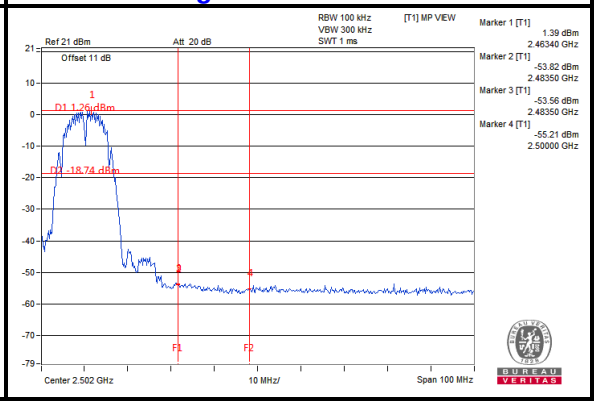


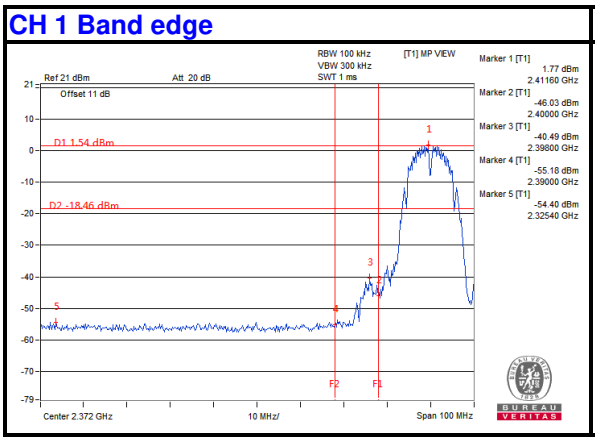
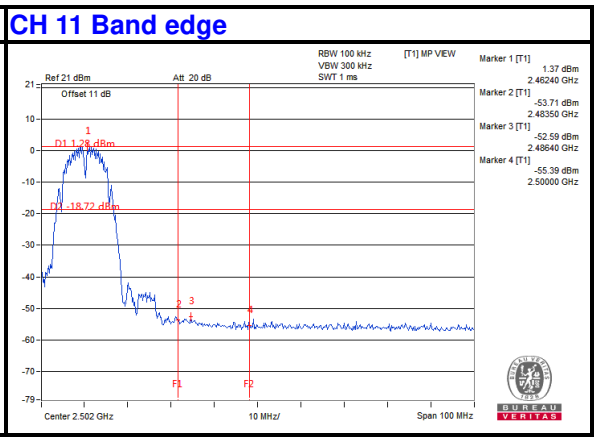


802.11b

Chain 0

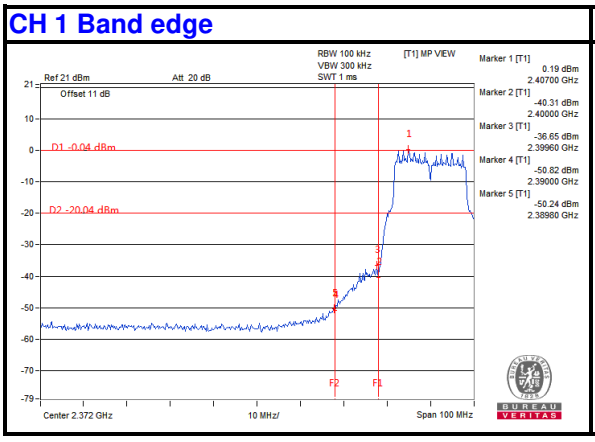
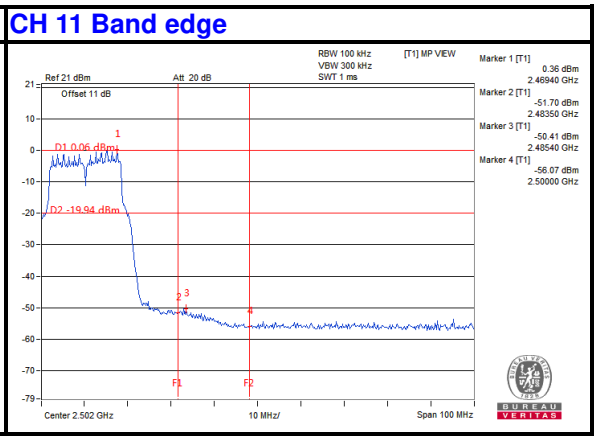
CH 1 Band edge	CH 11 Band edge
	

Chain 1

CH 1 Band edge	CH 11 Band edge
	

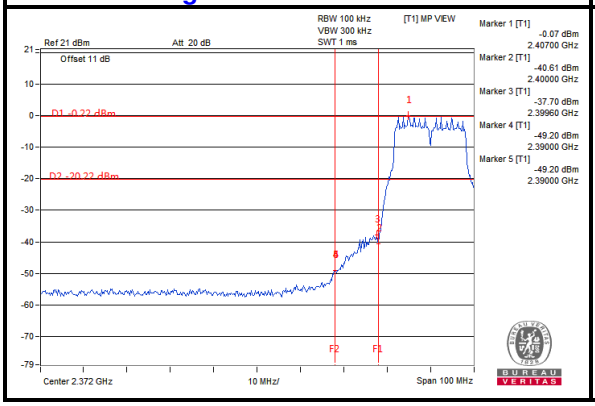
802.11g

Chain 0

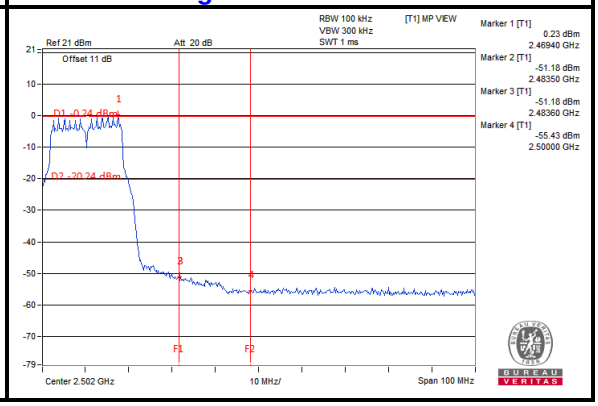
CH 1 Band edge	CH 11 Band edge
	

Chain 1

CH 1 Band edge



CH 11 Band edge



802.11n HT20

Chain 0

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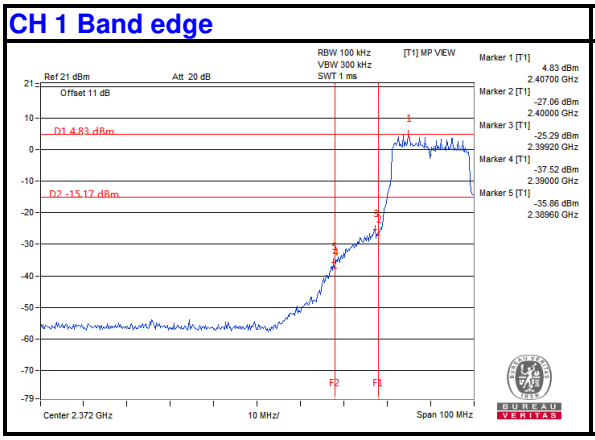
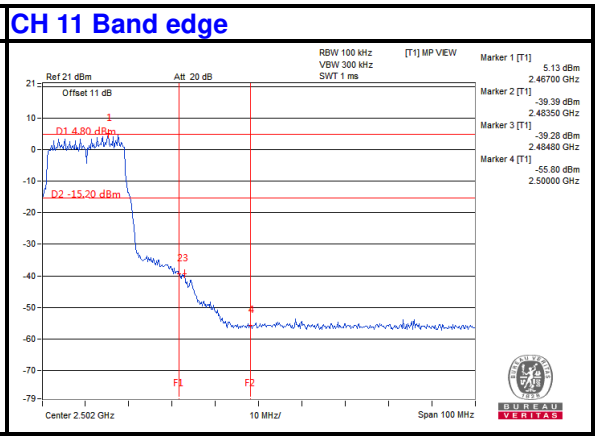
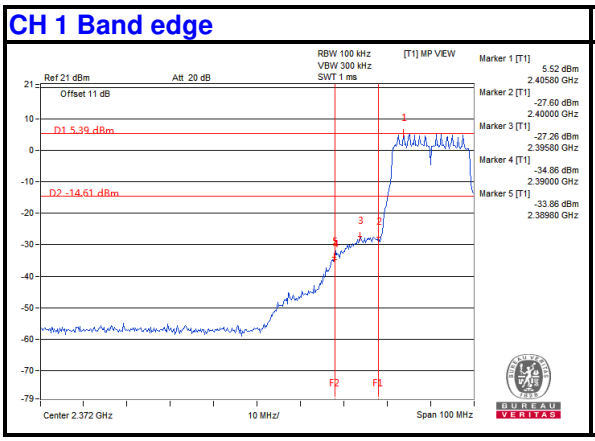


CH 11 Band edge

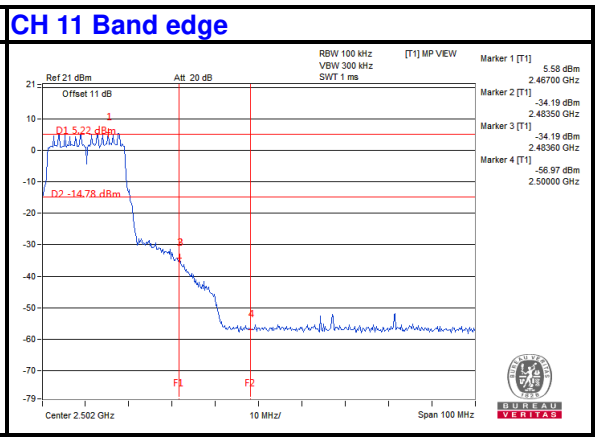


Chain 1

CH 1 Band edge



CH 11 Band edge



5 PHOTOGRAPHS OF THE TEST CONFIGURATION

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

6 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---