

TEST REPORT

Applicant	TP-Link Technologies Co., Ltd.
Address	Building 24(floors1,3,4,5) and 28(floors1-4) Central Science and Technology Park, Shennan Rd, Nanshan, Shenzhen, China

Manufacturer or Supplier	TP-Link Technologies Co., Ltd.
Address	Building 24(floors1,3,4,5) and 28(floors1-4) Central Science and Technology Park, Shennan Rd, Nanshan, Shenzhen, China
Product	Wi-Fi Smart Dimmer
Brand Name	tp-link
Model	HS220
Additional Model & Model Difference	N/A
Date of tests	Oct. 10, 2017 ~ Nov. 10, 2017

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 Harry Li Project Engineer/ EMC Department	Approved by Glyn He Supervisor / EMC Department
	 Date: Nov. 23, 2017

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF171010N017	Original release	Nov. 23, 2017

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	Unique 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	2.70dB
Radiated emissions	9KHz ~ 30MHz	2.90dB
	30MHz ~ 1GMHz	3.83dB
	1GHz ~ 18GHz	4.93dB
	18GHz ~ 40GHz	4.80dB

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	Wi-Fi Smart Dimmer
MODEL NO.	HS220
FCC ID	TE7HS220
NOMINAL VOLTAGE	AC 120V, 60Hz
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) 2422-2452MHz for 11n(HT40)
OUTPUT POWER	20.57dBm (Maximum Average Power)
ANTENNA TYPE	PIFA Antenna; 2.98dBi gain
I/O PORTS	Refer to user's manual
CABLE SUPPLIED	N/A

NOTE:

1. The EUT incorporates a SISO function. Physically, the EUT provides one transmitter and one receiver.

MODULATION MODE	FUNCTION
802.11b	1TX/1RX
802.11g	1TX/1RX
802.11n (HT20)	1TX/1RX
802.11n (HT40)	1TX/1RX

2. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
3. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.
4. Please refer to the EUT photo document (Reference No.: 171010N017) for detailed product photo.

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		

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		

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 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 AC 120V with WIFI function

Where **RE<1G**: Radiated Emission below 1GHz
PLC: Power Line Conducted Emission

RE≥1G: Radiated Emission above 1GHz
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.

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

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.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 2,6, ,10,11	DSSS	DBPSK	1.0
802.11g	1 to 11	1, 2,6, ,10,11	OFDM	BPSK	6.0
802.11n HT20	1 to 11	1, 2,6, ,10,11	OFDM	BPSK	6.5
802.11n HT40	3 to 9	3,4, 6, 8,9	OFDM	BPSK	13.5

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 TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 11	DSSS	DBPSK	1.0
802.11g	1 to 11	1, 11	OFDM	BPSK	6.0
802.11n HT20	1 to 11	1, 11	OFDM	BPSK	6.5
802.11n HT40	3 to 9	3, 9	OFDM	BPSK	13.5

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.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
802.11n HT20	1 to 11	1, 6, 11	OFDM	BPSK	6.5
802.11n HT40	3 to 9	3, 6, 9	OFDM	BPSK	13.5

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	TEST VOLTAGE	TESTED BY
RE<1G	25deg. C, 53%RH	AC 120V 60Hz	Eric Fang
RE≥1G	25deg. C, 53%RH	AC 120V 60Hz	Eric Fang
PLC	20deg. C, 56%RH	AC 120V 60Hz	Yang
APCM	20deg. C, 55%RH	AC 120V 60Hz	Robert Cheng

3.2.3 DUTY CYCLE OF TEST SIGNAL

Duty cycle is 100%

**POWER SETTING VALUE:**

Test mode	Test Frequency (MHz)	Power setting	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
11b	2412	21.5	CCK	DBPSK	1.0
	2437	21	CCK	DBPSK	1.0
	2462	21	CCK	DBPSK	1.0
11g	2412	16.5	OFDM	BPSK	6.0
	2417	20	OFDM	BPSK	6.0
	2437	23	OFDM	BPSK	6.0
	2457	19.5	OFDM	BPSK	6.0
	2462	18	OFDM	BPSK	6.0
11n HT20	2412	17	OFDM	BPSK	MCS0
	2417	20.5	OFDM	BPSK	MCS0
	2437	23	OFDM	BPSK	MCS0
	2457	19.5	OFDM	BPSK	MCS0
	2462	18	OFDM	BPSK	MCS0
11n HT40	2422	14.5	OFDM	BPSK	MCS0
	2427	18	OFDM	BPSK	MCS0
	2437	18.5	OFDM	BPSK	MCS0
	2447	18	OFDM	BPSK	MCS0
	2452	15.5	OFDM	BPSK	MCS0

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

558074 D01 DTS Meas Guidance v04

ANSI C63.10-2013

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

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	N/A	N/A	N/A	N/A	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	N/A

4 TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB μ V)	
	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.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESR7	101494	Apr. 05,17	Apr. 04,18
Artificial Mains Network	Rohde&Schwarz	ENV216	101173	Mar. 06,17	Mar. 05,18
Artificial Mains Network	Rohde&Schwarz	ESH3-Z5	100317	Apr. 05,17	Apr. 04,18
Voltage probe	SCHWARZBEC K	TK 9421	TK 9421-176	Jan. 04,17	Jan. 03,18
Test software	ADT	ADT_Conc_V 7.3.7	N/A	N/A	N/A

- NOTE:**
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

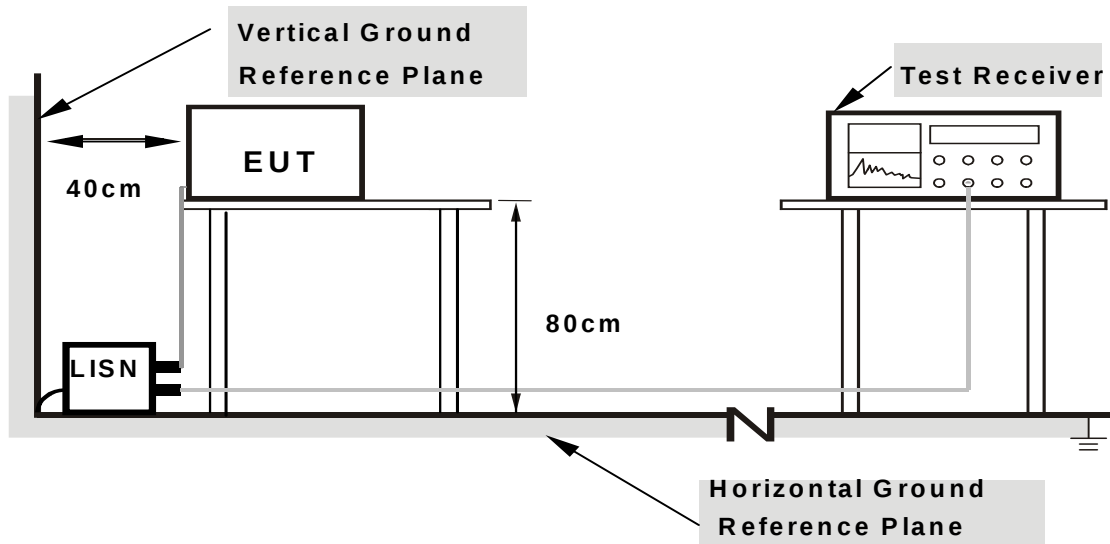
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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

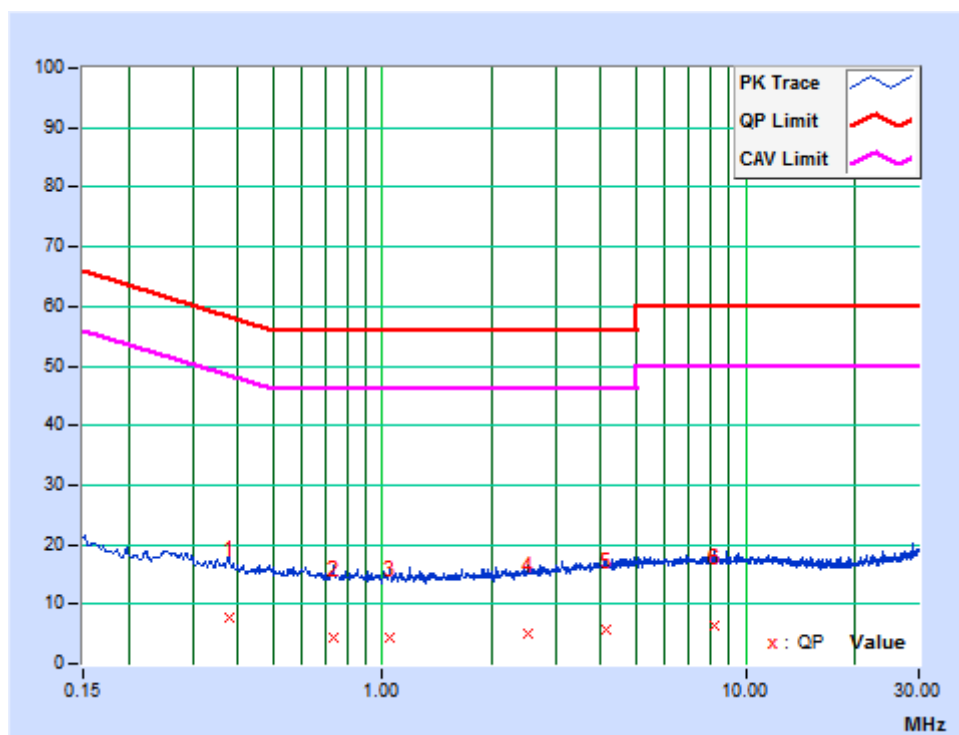
4.1.7 TEST RESULTS

CONDUCTED WORST-CASE DATA: WIFI LINK

PHASE	Line	6dB BANDWIDTH	9kHz
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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	0.37725	9.88	-2.21	-4.93	7.67	4.95	58.34	48.34	-50.67	-43.39
2	0.73061	9.83	-5.54	-7.19	4.29	2.64	56.00	46.00	-51.71	-43.36
3	1.05179	9.83	-5.54	-7.22	4.29	2.61	56.00	46.00	-51.71	-43.39
4	2.51475	9.87	-4.82	-6.84	5.05	3.03	56.00	46.00	-50.95	-42.97
5	4.14150	9.91	-4.28	-5.78	5.63	4.13	56.00	46.00	-50.37	-41.87
6	8.24325	9.92	-3.65	-5.29	6.27	4.63	60.00	50.00	-53.73	-45.37

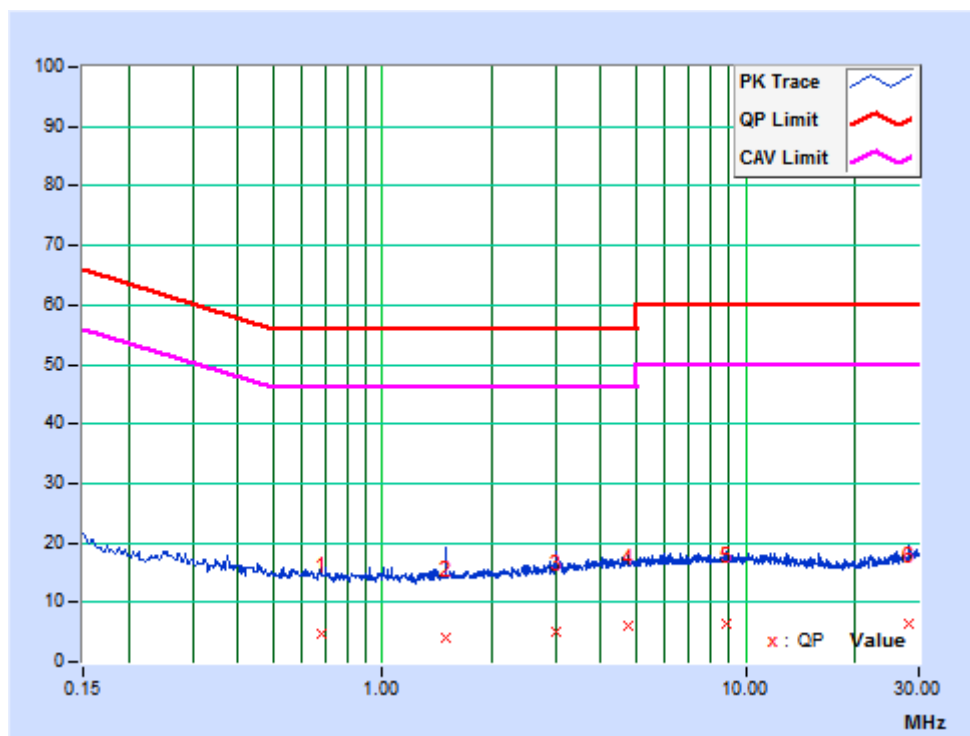
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



PHASE	Neutral	6dB BANDWIDTH	9kHz
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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	0.67676	9.80	-5.18	-7.04	4.62	2.76	56.00	46.00	-51.38	-43.24
2	1.49550	9.88	-6.00	-7.37	3.88	2.51	56.00	46.00	-52.12	-43.49
3	2.99175	9.92	-4.77	-6.37	5.15	3.55	56.00	46.00	-50.85	-42.45
4	4.73736	9.91	-3.91	-5.50	6.00	4.41	56.00	46.00	-50.00	-41.59
5	8.88000	9.93	-3.50	-5.19	6.43	4.74	60.00	50.00	-53.57	-45.26
6	28.29075	9.76	-3.20	-4.81	6.56	4.95	60.00	50.00	-53.44	-45.05

- 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

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.



4.2.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESU40	100449	Mar. 12,17	Mar. 11,18
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV7	102331	Nov. 04,17	Nov. 03,18
Bilog Antenna (30MHz~1GHz)	Teseq	CBL 6111D	30643	Jul. 14, 17	Jul. 13, 18
Loop antenna (9KHz ~30MHz)	Daze	ZN30900A	0708	Mar. 12,17	Mar. 11,18
Horn Antenna (1GHz -18GHz)	ETS -Lindgren	3117	00062558	May 18,17	May 17,18
GPS Generator+ Antenna	TOJOIN	GNSS-5000A	E1-010119	Aug. 08, 17	Aug. 07,18
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	NSEMC003	Mar. 12,17	Mar. 11,18
Test Software	ADT	ADT_Radiated_V7.6.15.9.2	N/A	N/A	N/A
Horn Antenna (18GHz-40GHz)	SCHWARZBECK	BBHA 9170	BBHA9170242	Mar. 15,17	Mar. 14,18
Amplifier (9kHz-1GHz)	SONOMA	310D	186955	Mar. 04,17	Mar. 03, 18
Broadband Preamplifier (1GHz~18GHz)	SCHWARZBECK	BBV9718	305	Mar. 09,17	Mar. 08,18
Pre-Amplifier (18GHz-40GHz)	EMCI	EMC 184045	980102	Nov. 04,17	Nov. 03,18
Test Software	ADT	ADT_Radiated_V7.6.15.9.2	N/A	N/A	N/A
BLUETOOTH TESTER	Rohde&Schwarz	CBT32	100811	Aug. 08,17	Aug. 07,18

NOTE:

1. The test was performed in 966 Chamber.
2. The calibration interval of the above test instruments are 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. 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:

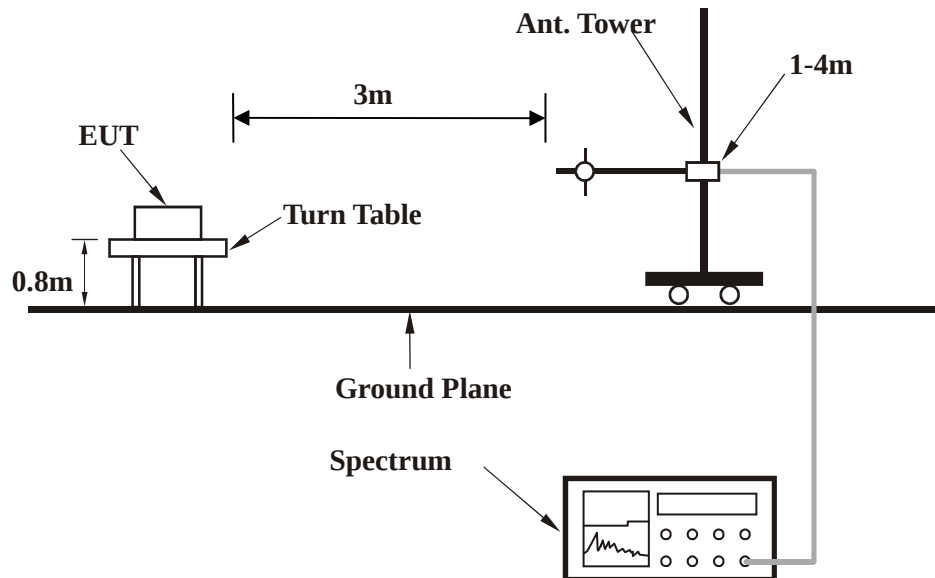
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz 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.

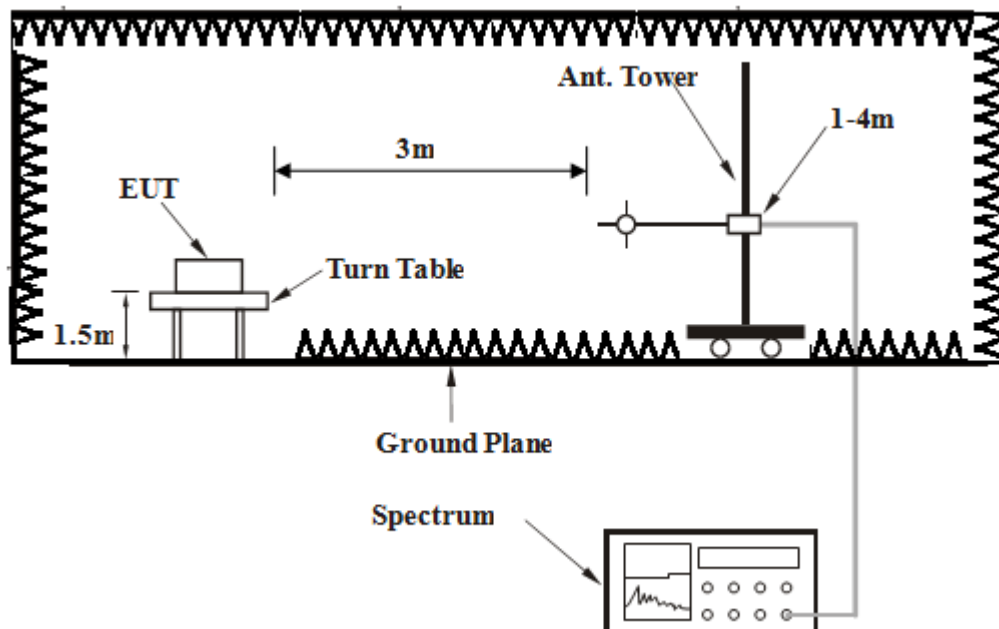
4.2.5 TEST SETUP

Below 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. Set the EUT placed 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:

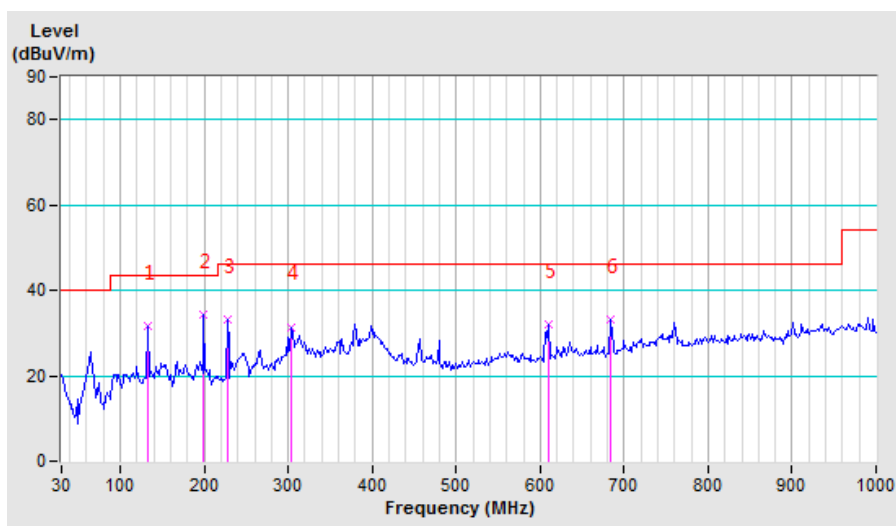
802.11b

CHANNEL	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	132.60	31.74 QP	43.50	-11.76	1.00 H	221	49.01	-17.27
2	199.44	34.28 QP	43.50	-9.22	2.00 H	142	53.41	-19.13
3	227.42	33.24 QP	46.00	-12.76	2.00 H	259	51.28	-18.04
4	303.59	31.42 QP	46.00	-14.58	1.00 H	294	44.37	-12.95
5	609.82	31.92 QP	46.00	-14.08	1.00 H	331	35.93	-4.01
6	682.88	33.28 QP	46.00	-12.72	1.00 H	175	36.54	-3.26

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.

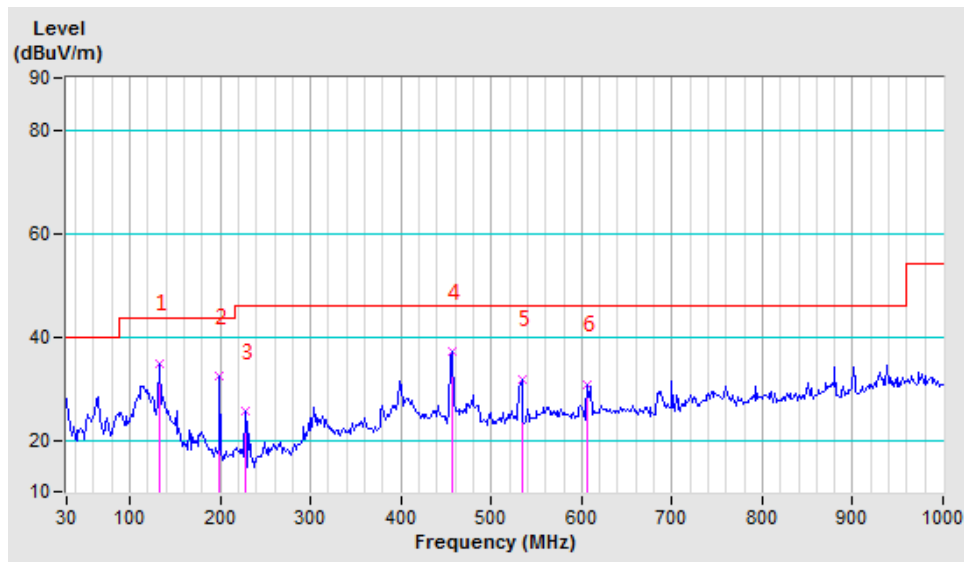


CHANNEL	Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9KHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	132.60	34.90 QP	43.50	-8.60	1.00 V	173	52.17	-17.27
2	199.44	32.26 QP	43.50	-11.24	1.00 V	204	51.39	-19.13
3	227.42	25.50 QP	46.00	-20.50	1.00 V	183	43.54	-18.04
4	457.48	36.96 QP	46.00	-9.04	3.00 V	272	44.36	-7.40
5	533.65	31.68 QP	46.00	-14.32	2.00 V	330	37.21	-5.53
6	606.71	30.66 QP	46.00	-15.34	2.00 V	58	34.76	-4.10

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	59.78 PK	74.00	-14.22	1.50 H	28	21.78	38.00
2	2390.00	48.87 AV	54.00	-5.13	1.50 H	28	10.87	38.00
3	*2412.00	105.58 PK			1.50 H	28	67.52	38.06
4	*2412.00	102.48 AV			1.50 H	28	64.42	38.06
5	4824.00	56.39 PK	74.00	-17.61	1.52 H	108	50.43	5.96
6	4824.00	51.23 AV	54.00	-2.77	1.52 H	108	45.27	5.96
7	#7236.00	55.26 PK	74.00	-18.74	1.62 H	260	42.95	12.31
8	#7236.00	42.06 AV	54.00	-11.94	1.62 H	260	29.75	12.31
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	53.58 PK	74.00	-20.42	1.00 V	150	15.58	38.00
2	2390.00	42.14 AV	54.00	-11.86	1.00 V	150	4.14	38.00
3	*2412.00	98.25 PK			1.00 V	150	60.19	38.06
4	*2412.00	96.94 AV			1.00 V	150	58.88	38.06
5	4824.00	55.91 PK	74.00	-18.09	1.50 V	240	49.95	5.96
6	4824.00	53.54 AV	54.00	-0.46	1.50 V	240	47.58	5.96
7	#7236.00	55.36 PK	74.00	-18.64	1.32 V	230	43.05	12.31
8	#7236.00	46.21 AV	54.00	-7.79	1.32 V	230	33.90	12.31

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 other emission levels were very low 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	2390.00	60.36 PK	74.00	-13.64	1.65 H	154	22.36	38.00
2	2390.00	53.23 AV	54.00	-0.77	1.65 H	154	15.23	38.00
3	*2437.00	105.73 PK			1.64 H	284	67.59	38.14
4	*2437.00	103.50 AV			1.64 H	284	65.36	38.14
5	2483.50	57.96 PK	74.00	-16.04	1.68 H	240	19.68	38.28
6	2483.50	51.97 AV	54.00	-2.03	1.68 H	240	13.69	38.28
7	4874.00	56.32 PK	74.00	-17.68	1.67 H	239	50.27	6.05
8	4874.00	51.23 AV	54.00	-2.77	1.67 H	239	45.18	6.05
9	7440.00	56.32 PK	74.00	-17.68	1.50 H	263	43.12	13.20
10	7440.00	42.36 AV	54.00	-11.64	1.50 H	263	29.16	13.20
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	58.4 PK	74.0	-15.6	1.64 V	254	20.39	38.00
2	2390.00	53.0 AV	54.0	-1.00	1.64 V	254	14.98	38.00
3	*2437.00	100.2 PK			1.64 V	240	62.10	38.14
4	*2437.00	95.7 AV			1.64 V	240	57.57	38.14
5	2483.50	58.2 PK	74.0	-15.90	1.98 V	210	19.87	38.28
6	2483.50	51.0 AV	54.0	-3.00	1.98 V	210	12.69	38.28
7	4874.00	55.36 PK	74.00	-18.64	1.62 V	246	49.31	6.05
8	4874.00	50.66 AV	54.00	-3.34	1.62 V	246	44.61	6.05
9	7440.00	56.36 PK	74.00	-17.64	1.62 V	263	43.16	13.20
10	7440.00	42.43 AV	54.00	-11.57	1.62 V	263	29.23	13.20

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 other emission levels were very low 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	106.9 PK			1.65 H	182	68.64	38.22
2	*2462.00	103.7 AV			1.65 H	182	65.48	38.22
3	2483.50	60.7 PK	74.0	-13.3	1.68 H	148	22.39	38.28
4	2483.50	53.6 AV	54.0	-0.40	1.68 H	148	15.36	38.28
5	4924.00	50.31 PK	74.00	-23.69	1.68 H	103	44.18	6.13
6	4924.00	42.36 AV	54.00	-11.64	1.68 H	103	36.23	6.13
7	7386.00	55.97 PK	74.00	-18.03	2.54 H	130	43.01	12.96
8	7386.00	43.29 AV	54.00	-10.71	2.54 H	130	30.33	12.96
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	98.0 PK			1.98 V	157	59.80	38.22
2	*2462.00	95.1 AV			1.98 V	157	56.86	38.22
3	2483.50	64.6 PK	74.0	-9.40	1.68 V	194	26.36	38.28
4	2483.50	52.5 AV	54.0	-1.50	1.68 V	194	14.26	38.28
1	4924.00	50.37 PK	74.00	-23.63	1.68 V	259	44.24	6.13
2	4924.00	40.23 AV	54.00	-13.77	1.68 V	259	34.10	6.13
3	7386.00	56.38 PK	74.00	-17.62	1.86 V	302	43.42	12.96
4	7386.00	42.69 AV	54.00	-11.31	1.86 V	302	29.73	12.96

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 other emission levels were very low 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	69.7 PK	74.0	-4.40	1.65 H	148	31.65	38.00
2	2390.00	53.4 AV	54.0	-0.60	1.65 H	148	15.36	38.00
3	*2412.00	103.5 PK			2.31 H	148	65.43	38.06
4	*2412.00	94.4 AV			2.31 H	148	56.32	38.06
5	4824.00	50.21 PK	74.00	-23.79	1.87 H	234	44.25	5.96
6	4824.00	38.56 AV	54.00	-15.44	1.87 H	234	32.60	5.96
7	#7236.00	55.91 PK	74.00	-18.09	1.98 H	263	43.60	12.31
8	#7236.00	42.67 AV	54.00	-11.33	1.98 H	263	30.36	12.31
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	57.7 PK	74.0	-16.30	1.85 V	120	19.69	38.00
2	2390.00	45.7 AV	54.0	-8.40	1.85 V	120	7.65	38.00
3	*2412.00	97.0 PK			1.98 V	120	58.89	38.06
4	*2412.00	87.4 AV			1.98 V	120	49.32	38.06
5	4824.00	49.68 PK	74.00	-24.32	1.98 V	187	43.72	5.96
6	4824.00	36.59 AV	54.00	-17.41	1.98 V	187	30.63	5.96
7	#7236.00	55.68 PK	74.00	-18.32	1.24 V	302	43.37	12.31
8	#7236.00	42.57 AV	54.00	-11.43	1.24 V	302	30.26	12.31

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 other emission levels were very low 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	2390.00	67.9 PK	74.0	-6.10	1.65 H	230	29.89	38.00
2	2390.00	53.0 AV	54.0	-1.00	1.65 H	230	15.03	38.00
3	*2437.00	109.9 PK			1.65 H	218	71.73	38.14
4	*2437.00	99.8 AV			1.65 H	218	61.67	38.14
5	2483.50	67.2 PK	74.0	-6.80	1.52 H	254	28.91	38.28
6	2483.50	52.3 AV	54.0	-1.70	1.52 H	254	13.98	38.28
7	4874.00	50.12 PK	74.00	-23.88	1.68 H	197	44.07	6.05
8	4874.00	38.95 AV	54.00	-15.05	1.68 H	197	32.90	6.05
9	7311.00	54.30 PK	74.00	-19.70	1.67 H	231	41.66	12.64
10	7311.00	42.57 AV	54.00	-11.43	1.67 H	231	29.93	12.64
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	59.4 PK	74.0	-14.60	1.52 V	179	21.36	38.00
2	2390.00	48.4 AV	54.0	-5.60	1.52 V	179	10.39	38.00
3	*2437.00	101.0 PK			1.58 V	260	62.82	38.14
4	*2437.00	91.5 AV			1.58 V	260	53.39	38.14
5	2483.50	59.8 PK	74.0	-14.20	1.68 V	294	21.56	38.28
6	2483.50	49.1 AV	54.0	-4.90	1.68 V	294	10.82	38.28
7	4874.00	50.21 PK	74.00	-23.79	1.98 V	254	44.16	6.05
8	4874.00	38.24 AV	54.00	-15.76	1.98 V	254	32.19	6.05
9	7311.00	55.46 PK	74.00	-18.54	1.87 V	97	42.82	12.64
10	7311.00	42.87 AV	54.00	-11.13	1.87 V	97	30.23	12.64

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 other emission levels were very low 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	103.6 PK			1.57 H	30	65.34	38.22
2	*2462.00	93.8 AV			1.57 H	30	55.62	38.22
3	2483.50	70.5 PK	74.0	-3.50	3.21 H	56	32.26	38.28
4	2483.50	53.9 AV	54.0	-0.10	3.21 H	56	15.63	38.28
5	4924.00	51.07 PK	74.00	-22.93	1.02 H	301	44.94	6.13
6	4924.00	38.95 AV	54.00	-15.05	1.02 H	301	32.82	6.13
7	7386.00	55.87 PK	74.00	-18.13	1.65 H	102	42.91	12.96
8	7386.00	43.01 AV	54.00	-10.99	1.65 H	102	30.05	12.96
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	97.2 PK			1.65 V	128	58.95	38.22
2	*2462.00	87.9 AV			1.65 V	128	49.72	38.22
3	2483.50	66.8 PK	74.0	-7.20	1.84 V	120	28.56	38.28
4	2483.50	49.7 AV	54.0	-4.30	1.84 V	120	11.38	38.28
5	4924.00	50.12 PK	74.00	-23.88	1.54 V	201	43.99	6.13
6	4924.00	36.98 AV	54.00	-17.02	1.54 V	201	30.85	6.13
7	7386.00	56.17 PK	74.00	-17.83	1.57 V	241	43.21	12.96
8	7386.00	42.38 AV	54.00	-11.62	1.57 V	241	29.42	12.96

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 other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.

802.11n (HT20)

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	66.6 PK	74.0	-7.40	1.52 H	179	28.62	38.00
2	2390.00	53.3 AV	54.0	-0.70	1.52 H	179	15.30	38.00
3	*2412.00	100.8 PK			1.68 H	250	62.74	38.06
4	*2412.00	92.6 AV			1.68 H	250	54.51	38.06
5	4824.00	50.12 PK	74.00	-23.88	1.27 H	316	44.16	5.96
6	4824.00	36.17 AV	54.00	-17.83	1.27 H	316	30.21	5.96
7	#7236.00	55.28 PK	74.00	-18.72	1.67 H	219	42.97	12.31
8	#7236.00	43.07 AV	54.00	-10.93	1.67 H	219	30.76	12.31
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	59.7 PK	74.0	-14.3	1.52 V	189	21.69	38.00
2	2390.00	49.4 AV	54.0	-4.60	1.52 V	189	11.36	38.00
3	*2412.00	95.6 PK			1.85 V	113	57.49	38.06
4	*2412.00	85.8 AV			1.85 V	113	47.76	38.06
5	4824.00	49.62 PK	74.00	-24.38	1.68 V	207	43.66	5.96
6	4824.00	35.68 AV	54.00	-18.32	1.68 V	207	29.72	5.96
7	#7236.00	55.89 PK	74.00	-18.11	1.84 V	123	43.58	12.31
8	#7236.00	43.04 AV	54.00	-10.96	1.84 V	123	30.73	12.31

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 other emission levels were very low 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	2390.00	69.7 PK	74.0	-4.40	1.56 H	127	31.65	38.00
2	2390.00	53.1 AV	54.0	-0.90	1.56 H	127	15.12	38.00
3	*2437.00	109.3 PK			1.52 H	59	71.19	38.14
4	*2437.00	99.6 AV			1.52 H	59	61.43	38.14
5	2483.50	71.0 PK	74.0	-3.00	1.98 H	46	32.68	38.28
6	2483.50	53.6 AV	54.0	-0.40	1.98 H	46	15.35	38.28
7	4874.00	51.26 PK	74.00	-22.74	1.00 H	214	45.21	6.05
8	4874.00	39.21 AV	54.00	-14.79	1.00 H	214	33.16	6.05
9	7311.00	56.04 PK	74.00	-17.96	1.87 H	154	43.40	12.64
10	7311.00	42.31 AV	54.00	-11.69	1.87 H	154	29.67	12.64
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	65.7 PK	74.0	-8.30	1.62 V	310	27.68	38.00
2	2390.00	51.7 AV	54.0	-2.30	1.62 V	310	13.74	38.00
3	*2437.00	102.0 PK			1.52 V	190	63.89	38.14
4	*2437.00	101.4 AV			1.52 V	190	63.22	38.14
5	2483.50	63.5 PK	74.0	-10.50	1.52 V	86	25.26	38.28
6	2483.50	50.6 AV	54.0	-3.40	1.52 V	86	12.32	38.28
7	4874.00	49.62 PK	74.00	-24.38	1.68 V	187	43.57	6.05
8	4874.00	39.12 AV	54.00	-14.88	1.68 V	187	33.07	6.05
9	7311.00	56.38 PK	74.00	-17.62	1.67 V	214	43.74	12.64
10	7311.00	42.85 AV	54.00	-11.15	1.67 V	214	30.21	12.64

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 other emission levels were very low 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	103.2 PK			1.85 H	294	64.97	38.22
2	*2462.00	93.5 AV			1.85 H	294	55.26	38.22
3	2483.50	68.7 PK	74.0	-5.30	1.96 H	210	30.39	38.28
4	2483.50	53.6 AV	54.0	-0.40	1.96 H	210	15.36	38.28
5	4924.00	50.23 PK	74.00	-23.77	1.64 H	245	44.10	6.13
6	4924.00	38.75 AV	54.00	-15.25	1.64 H	245	32.62	6.13
7	7386.00	55.67 PK	74.00	-18.33	1.24 H	217	42.71	12.96
8	7386.00	42.19 AV	54.00	-11.81	1.24 H	217	29.23	12.96
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	98.3 PK			1.20 V	184	60.12	38.22
2	*2462.00	88.7 AV			1.20 V	184	50.45	38.22
3	2483.50	64.7 PK	74.0	-9.30	1.98 V	263	26.39	38.28
4	2483.50	49.6 AV	54.0	-4.40	1.98 V	263	11.36	38.28
5	4924.00	50.61 PK	74.00	-23.39	1.65 V	217	44.48	6.13
6	4924.00	38.14 AV	54.00	-15.86	1.65 V	217	32.01	6.13
7	7386.00	55.27 PK	74.00	-18.73	1.68 V	219	42.31	12.96
8	7386.00	42.18 AV	54.00	-11.82	1.68 V	219	29.22	12.96

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 other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.

802.11n (HT40)

CHANNEL	TX Channel 3	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	66.8 PK	74.0	-7.20	1.85 H	294	28.79	38.00
2	2390.00	53.4 AV	54.0	-0.60	1.85 H	294	15.36	38.00
3	*2422.00	100.0 PK			1.85 H	197	61.91	38.09
4	*2422.00	90.4 AV			1.85 H	197	52.30	38.09
5	4844.00	49.68 PK	74.00	-24.32	1.67 H	241	43.69	5.99
6	4844.00	37.67 AV	54.00	-16.33	1.67 H	241	31.68	5.99
7	7266.00	55.27 PK	74.00	-18.73	1.27 H	301	42.83	12.44
8	7266.00	42.39 AV	54.00	-11.61	1.27 H	301	29.95	12.44
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	62.4 PK	74.0	-11.6	1.98 V	254	24.36	38.00
2	2390.00	48.3 AV	54.0	-5.7	1.98 V	254	10.26	38.00
3	*2422.00	93.1 PK			1.65 V	198	55.02	38.09
4	*2422.00	83.1 AV			1.65 V	198	44.98	38.09
5	4844.00	47.92 PK	74.00	-26.08	1.04 V	291	41.93	5.99
6	4844.00	38.17 AV	54.00	-15.83	1.04 V	291	32.18	5.99
7	7266.00	55.68 PK	74.00	-18.32	1.67 V	251	43.24	12.44
8	7266.00	42.17 AV	54.00	-11.83	1.67 V	251	29.73	12.44

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 other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.

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	2390.00	60.3 PK	74.0	-13.70	1.69 H	263	22.30	38.00
2	2390.00	49.3 AV	54.0	-4.70	1.69 H	263	11.30	38.00
3	*2437.00	101.2 PK			1.32 H	210	63.02	38.14
4	*2437.00	91.3 AV			1.32 H	210	53.16	38.14
5	2483.50	68.0 PK	74.0	-6.00	2.05 H	164	29.68	38.28
6	2483.50	53.6 AV	54.0	-0.40	2.05 H	164	15.32	38.28
7	4874.00	51.07 PK	74.00	-22.93	1.25 H	179	45.02	6.05
8	4874.00	40.32 AV	54.00	-13.68	1.25 H	179	34.27	6.05
9	7311.00	56.34 PK	74.00	-17.66	1.85 H	124	43.70	12.64
10	7311.00	43.01 AV	54.00	-10.99	1.85 H	124	30.37	12.64
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	60.4 PK	74.0	-13.60	1.69 V	248	22.36	38.00
2	2390.00	50.3 AV	54.0	-3.70	1.69 V	248	12.32	38.00
3	*2437.00	93.5 PK			1.62 V	234	55.37	38.14
4	*2437.00	83.0 AV			1.62 V	234	44.86	38.14
5	2483.50	64.6 PK	74.0	-9.40	1.68 V	195	26.32	38.28
6	2483.50	50.6 AV	54.0	-3.40	1.68 V	195	12.36	38.28
7	4874.00	50.12 PK	74.00	-23.88	1.24 V	261	44.07	6.05
8	4874.00	38.57 AV	54.00	-15.43	1.24 V	261	32.52	6.05
9	7311.00	55.86 PK	74.00	-18.14	1.50 V	234	43.22	12.64
10	7311.00	42.17 AV	54.00	-11.83	1.50 V	234	29.53	12.64

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 other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 9	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	60.4 PK	74.0	-13.60	1.69 V	248	22.36	38.00
2	2390.00	50.3 AV	54.0	-3.70	1.69 V	248	12.32	38.00
3	*2437.00	93.5 PK			1.62 V	234	55.37	38.14
4	*2437.00	83.0 AV			1.62 V	234	44.86	38.14
5	4904.00	49.36 PK	74.00	-24.64	2.54 H	198	43.26	6.10
6	4904.00	36.23 AV	54.00	-17.77	2.54 H	198	30.13	6.10
7	7356.00	55.39 PK	74.00	-18.61	1.98 H	236	42.56	12.83
8	7356.00	42.37 AV	54.00	-11.63	1.98 H	236	29.54	12.83
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	*2452.00	82.8 PK			1.85 V	83	44.61	38.19
2	*2452.00	73.3 AV			1.85 V	83	35.12	38.19
3	2483.50	60.6 PK	74.0	-13.40	1.65 V	128	22.36	38.28
4	2483.50	50.6 AV	54.0	-3.40	1.65 V	128	12.36	38.28
5	4904.00	51.23 PK	74.00	-22.77	1.98 V	47	45.13	6.10
6	4904.00	32.56 AV	54.00	-21.44	1.98 V	47	26.46	6.10
7	7356.00	55.98 PK	74.00	-18.02	1.98 V	245	43.15	12.83
8	7356.00	42.39 AV	54.00	-11.61	1.98 V	245	29.56	12.83

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 other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.

Additional test for other channel of radiated emission

ABOVE 1GHz DATA

802.11g

CHANNEL	TX Channel 2	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	2417MHz		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	69.26 PK	74.00	-4.74	2.68 H	329	31.26	38.00
2	2390.00	53.32 AV	54.00	-0.68	2.68 H	329	15.32	38.00
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	2390.00	63.38 PK	74.00	-10.62	1.68 V	254	25.38	38.00
2	2390.00	45.68 AV	54.00	-8.32	1.68 V	254	7.68	38.00

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 other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.

CHANNEL	TX Channel 10	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	2457MHz		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	2483.50	71.49 PK	74.00	-2.51	1.65 H	184	33.21	38.28
2	2483.50	53.52 AV	54.00	-0.48	1.65 H	184	15.24	38.28
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	2483.50	61.93 PK	74.00	-12.07	1.65 V	65	23.65	38.28
2	2483.50	47.51 AV	54.00	-6.49	1.65 V	65	9.23	38.28

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 other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.

802.11n (HT20)

CHANNEL	TX Channel 2	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	2417MHz		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	69.26 PK	74.00	-4.74	1.56 H	325	31.26	38.00
2	2390.00	53.23 AV	54.00	-0.77	1.56 H	325	15.23	38.00
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	2390.00	62.62 PK	74.00	-11.38	1.65 V	254	24.62	38.00
2	2390.00	46.69 AV	54.00	-7.31	1.65 V	254	8.69	38.00

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 other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



BUREAU
VERITAS

Test Report No.: RF171010N017

CHANNEL	TX Channel 10	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	2457MHz		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	2483.50	67.96 PK	74.00	-6.04	1.65 H	284	29.68	38.28
2	2483.50	52.54 AV	54.00	-1.46	1.65 H	284	14.26	38.28
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	2483.50	64.01 PK	74.00	-9.99	1.54 V	258	25.73	38.28
2	2483.50	46.26 AV	54.00	-7.74	1.54 V	258	7.98	38.28

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 other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.

802.11n (HT40)

CHANNEL	TX Channel 4	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	2427MHz		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	69.59 PK	74.00	-4.41	1.56 H	275	31.59	38.00
2	2390.00	53.91 AV	54.00	-0.09	1.56 H	275	15.91	38.00
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	2390.00	62.17 PK	74.00	-11.83	1.65 V	284	24.17	38.00
2	2390.00	48.69 AV	54.00	-5.31	1.65 V	284	10.69	38.00

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 other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



CHANNEL	TX Channel 8	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	2447MHz		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	2483.50	66.97 PK	74.00	-7.03	1.65 H	254	28.69	38.28
	2483.50	53.32 AV	54.00	-0.68	1.65 H	254	15.04	38.28
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	2483.50	61.64 PK	74.00	-12.36	1.65 V	323	23.36	38.28
2	2483.50	47.96 AV	54.00	-6.04	1.65 V	323	9.68	38.28

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 other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.

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.	Last Cal.	Next Cal.
Power Sensor	Keysight	U2021XA	MY55060016	May 19,17	May 18,18
Power Sensor	Keysight	U2021XA	MY55060018	May 19,17	May 18,18
Digital Multimeter	FLUKE	15B	A1220010DG	Oct. 13, 17	Oct.12, 18
Humid & Temp Programmable Tester	Haida	HD-2257	110807201	Sep.05,17	Sep. 04,18
Oscilloscope	Agilent	DSO9254A	MY51260160	Nov. 04,17	Nov. 03,18
Signal Analyzer	Rohde & Schwarz	FSV7	102331	Nov. 04,17	Nov. 03,18
Signal Generator	Agilent	N5183A	MY50140980	Nov. 04,17	Nov. 03,18
Agile Signal Generator	Agilent	8645A	Agilent	Aug.08, 17	Aug.07, 18
Spectrum Analyzer	Keysight	N9020A	MY55400499	Apr. 10,17	Apr. 09,18
MXG-B RF Vector Signal Generator	Keysight	N5182B	MY56200288	Dec.05, 16	Dec. 04, 17
BLUETOOTH TESTER	Rohde&Schwarz	CBT32	100811	Aug.08, 17	Aug.07, 18
Attenuator	MINI	BW-S10W2+	S130129FGE2	N/A	N/A

NOTE:

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

Refer to "KDB 558074 D01 DTS Meas Guidance v04 " 8.1 Option 2

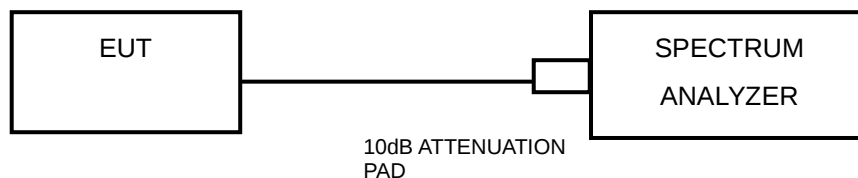
Refer to "ANSI C63.10-2013 " 11.8.2 Option 2

1. Set resolution bandwidth (RBW) = 100KHz
2. Set the video bandwidth (VBW) $\geq 3 \times$ 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



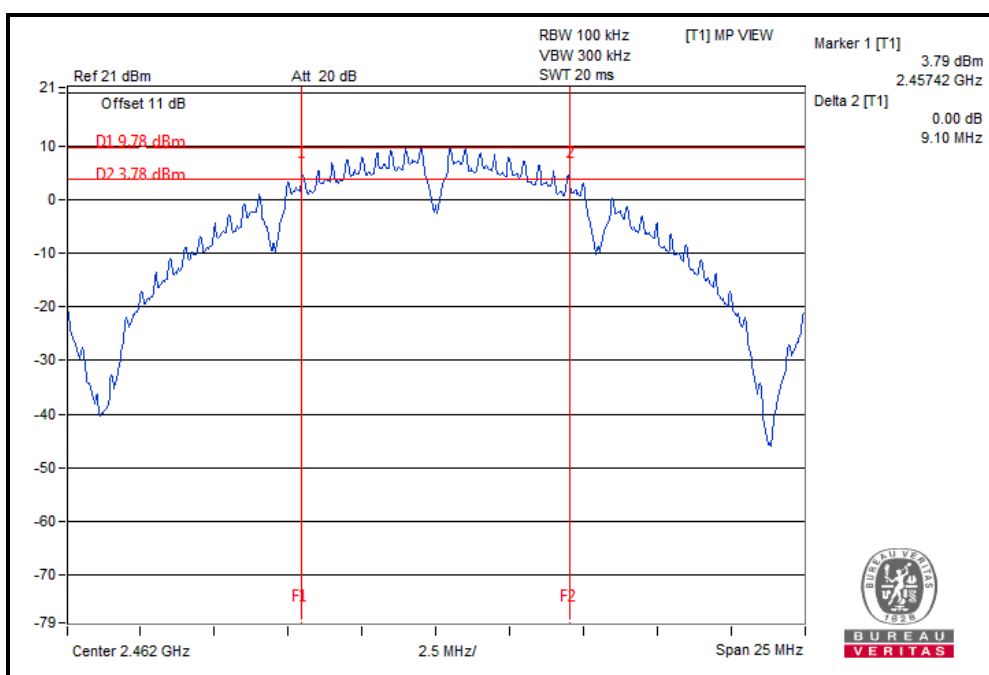
4.3.6 EUT OPERATING CONDITIONS

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

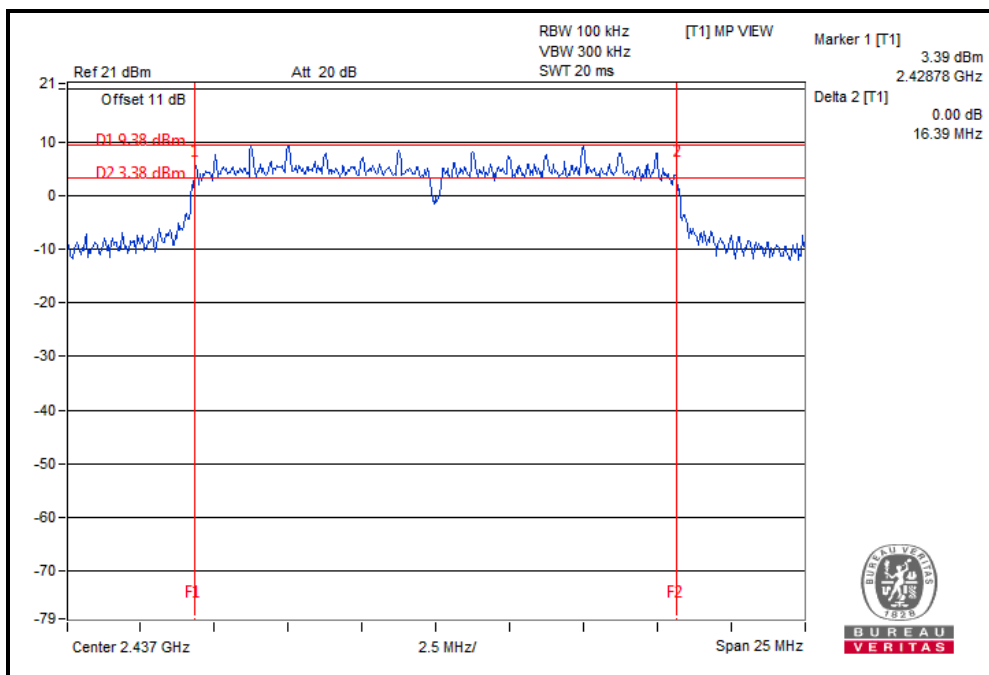
802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	9.10	0.5	PASS
6	2437	9.10	0.5	PASS
11	2462	9.10	0.5	PASS



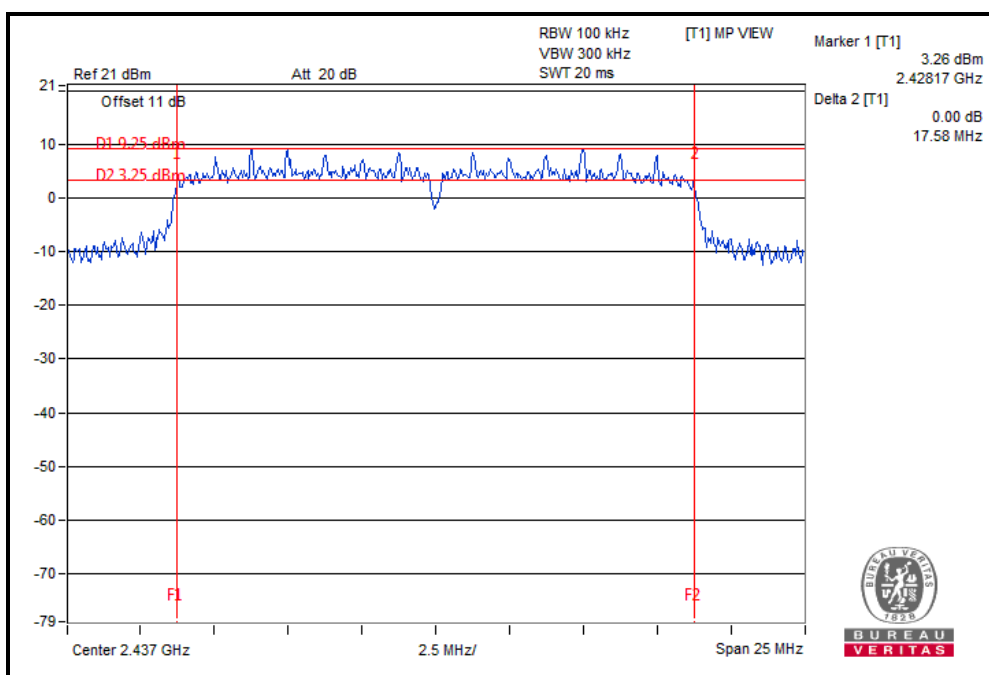
802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	16.37	0.5	PASS
6	2437	16.39	0.5	PASS
11	2462	16.34	0.5	PASS



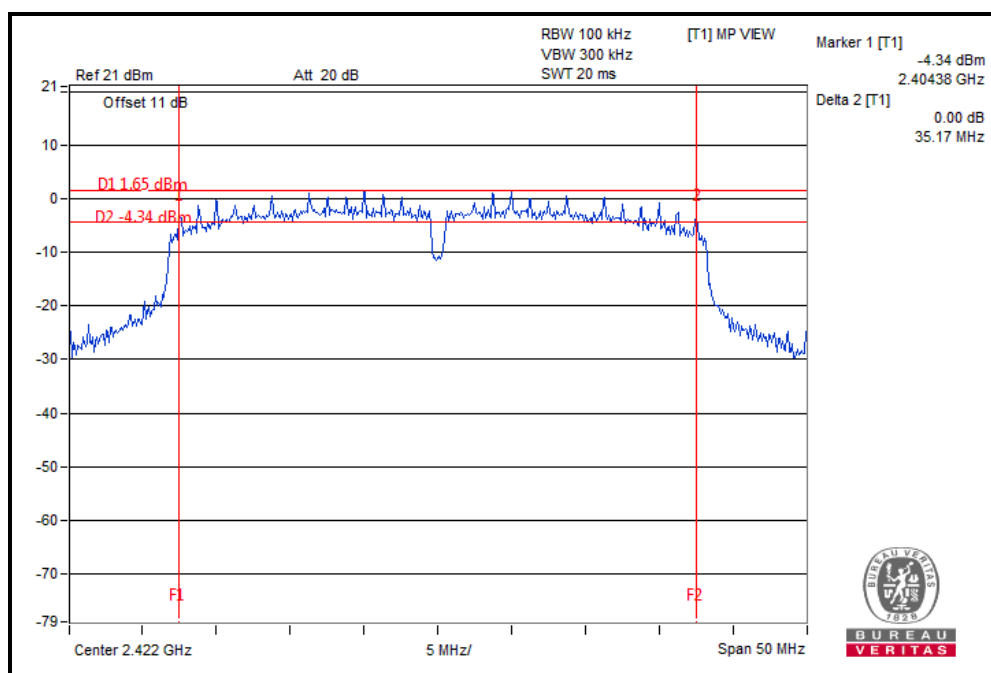
802.11n (HT20)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	17.32	0.5	PASS
6	2437	17.58	0.5	PASS
11	2462	17.30	0.5	PASS



802.11n (HT40)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
3	2422	35.17	0.5	PASS
6	2437	35.09	0.5	PASS
9	2452	35.07	0.5	PASS

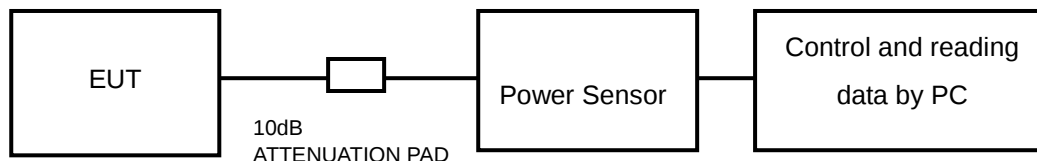


4.4 CONDUCTED OUTPUT POWER

4.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

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

4.4.2 TEST SETUP



4.4.3 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Power Sensor	Keysight	U2021XA	MY55060016	May 19,17	May 18,18
Power Sensor	Keysight	U2021XA	MY55060018	May 19,17	May 18,18
Test Software	Keysight	Power Analyzer 3.9	Power Analyzer 3.9	N/A	N/A
Digital Multimeter	FLUKE	15B	A1220010DG	Oct. 13, 17	Oct.12, 18
Humid & Temp Programmable Tester	Haida	HD-2257	110807201	Sep.05,17	Sep. 04,18
Oscilloscope	Agilent	DSO9254A	MY51260160	Nov. 04,17	Nov. 03,18
Signal Analyzer	Rohde & Schwarz	FSV40	102331	Nov. 04,17	Nov. 03,18
Signal Generator	Agilent	N5183A	MY50140980	Nov. 04,17	Nov. 03,18
Agile Signal Generator	Agilent	8645A	Agilent	Aug.08, 17	Aug.07, 18
Spectrum Analyzer	Keysight	N9020A	MY55400499	Apr. 10,17	Apr. 09,18
MXG-B RF Vector Signal Generator	Keysight	N5182B	MY56200288	Dec.05, 16	Dec. 04, 17
BLUETOOTH TESTER	Rohde&Schwarz	CBT32	100811	Aug.08, 17	Aug.07, 18
Attenuator	MINI	BW-S10W2+	S130129FGE2	N/A	N/A

NOTE:

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

An average power sensor was used on the output port of the EUT. The test software was installed in PC used to read the response of the average power sensor. Record the average power level. The Maximum Conducted Output Power was tested based on KDB 558074 D01 DTS Meas Guidance v04 "Chapter 9.2.3.1 and "ANSI C63.10-2013" Chapter 11.9.2.3.1

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

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	AVERAGE POWER (mW)
1	2412	19.06	80.538
6	2437	19.24	83.946
11	2462	19.17	82.604

802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	AVERAGE POWER (mW)
1	2412	16.16	41.305
2	2417	18.47	70.307
6	2437	20.38	109.144
10	2457	18.14	65.163
11	2462	17.43	55.335

802.11n (HT20)

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	AVERAGE POWER (mW)
1	2412	16.63	46.026
2	2417	18.74	74.817
6	2437	20.57	114.025
10	2457	18.17	65.615
11	2462	17.42	55.208

802.11n (HT40)

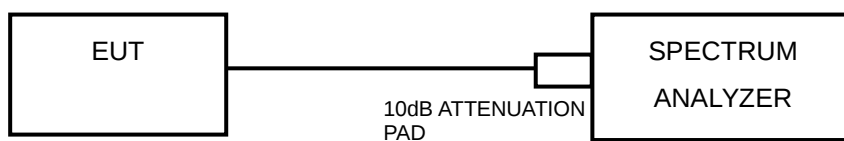
CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	AVERAGE POWER (mW)
3	2422	14.53	28.379
4	2427	17.84	60.814
6	2437	18.31	67.764
8	2447	17.91	61.802
9	2452	15.42	34.834

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 EUT OPERATING CONDITION

Same as item 4.3.6

4.5.5 TEST PROCEDURE

Refer to KDB 558074 D01 DTS Meas Guidance v04 Chapter 10.2

Refer to ANSI C63.10-2013 Chapter 11.10.2

- a) Set analyzer center frequency to DTS channel center frequency.
- b) Set the span to $1.5 \times \text{DTS bandwidth}$.
- c) Set the RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- d) Set the VBW $\geq 3 \times \text{RBW}$.
- e) Detector = peak.
- f) Sweep time = auto couple.
- g) Trace mode = max hold.
- h) Allow trace to fully stabilize.
- i) Use the peak marker function to determine the maximum amplitude level within the RBW.
- j) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

4.5.6 DEVIATION FROM TEST STANDARD

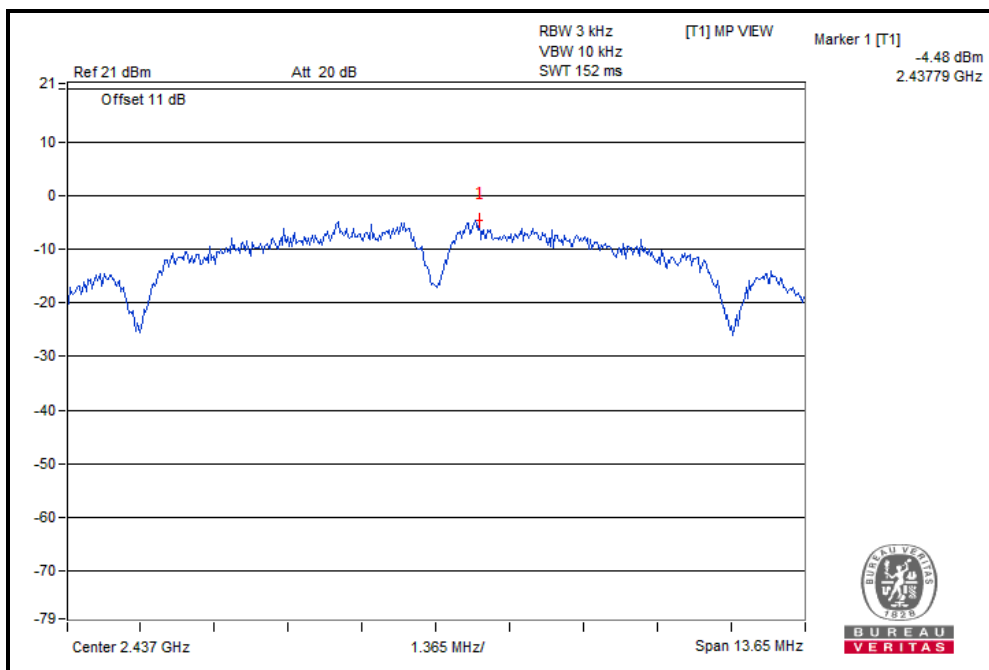
No deviation.

4.5.7 TEST RESULTS

802.11b

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-4.53	8	PASS
6	2437	-4.48	8	PASS
11	2462	-4.89	8	PASS

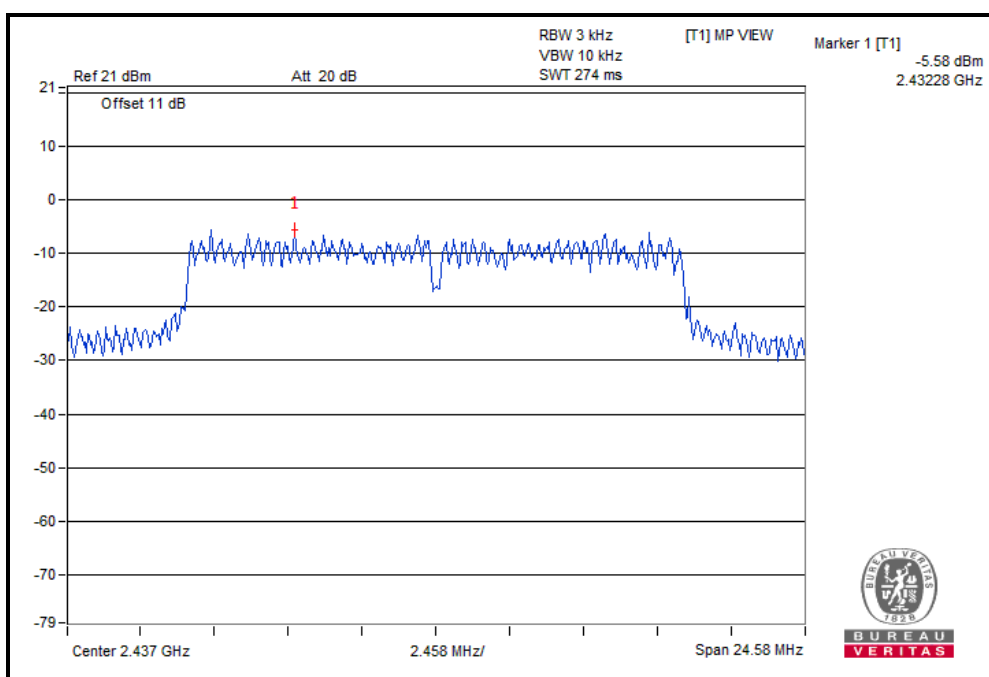
Note: Method 1 of power density measurement of KDB 662911 is using for calculating total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.



802.11g

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-8.45	8	PASS
6	2437	-5.58	8	PASS
11	2462	-7.56	8	PASS

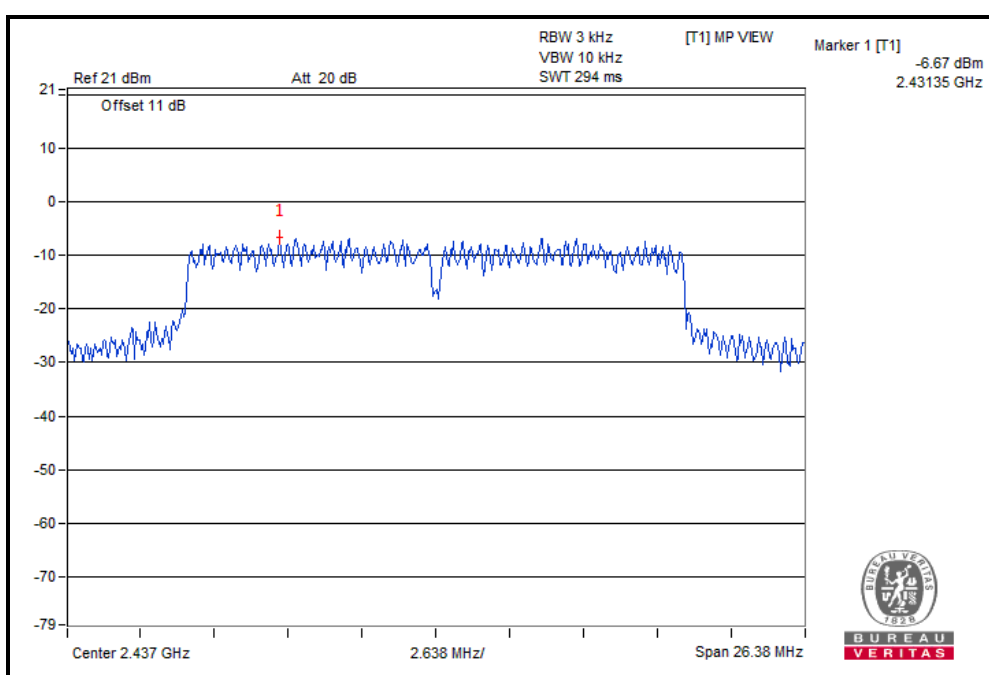
Note: Method 1 of power density measurement of KDB 662911 is using for calculating total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.



802.11n (HT20)

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-9.53	8	PASS
6	2437	-6.67	8	PASS
11	2462	-8.79	8	PASS

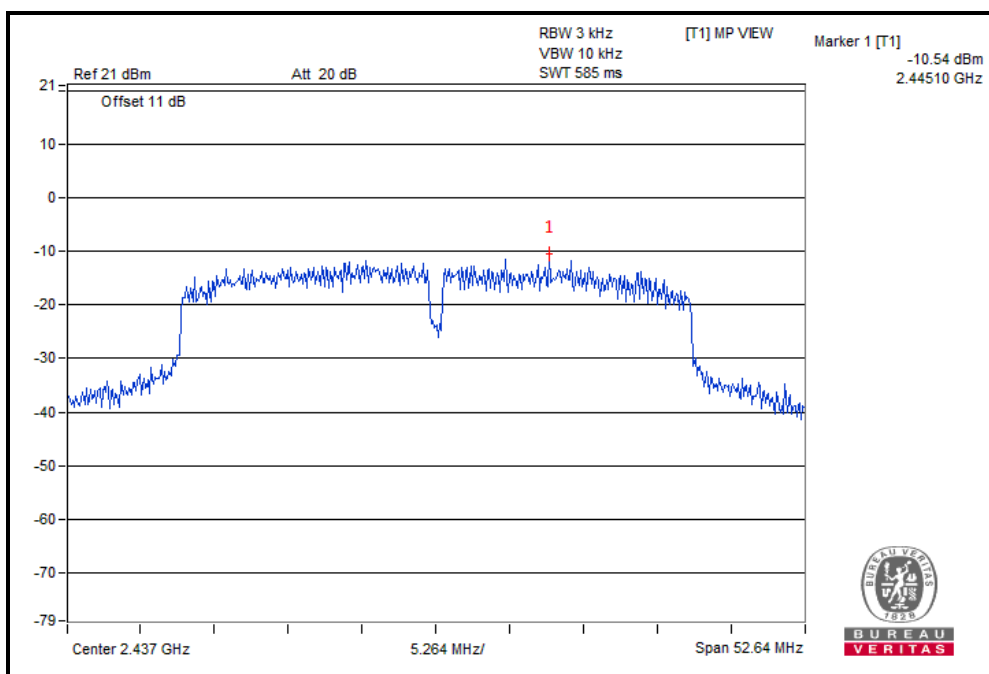
Note: Method 1 of power density measurement of KDB 662911 is using for calculating total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.



802.11n (HT40)

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
3	2422	-13.06	8	PASS
6	2437	-10.54	8	PASS
9	2452	-13.44	8	PASS

Note: Method 1 of power density measurement of KDB 662911 is using for calculating total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.

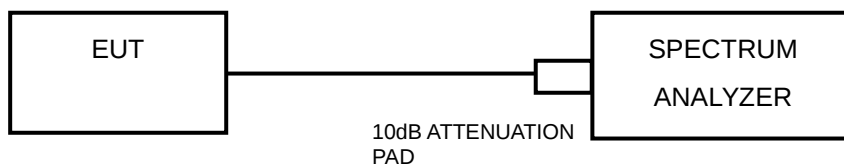


4.6 OUT OF BAND EMISSION MEASUREMENT

4.6.1 LIMITS OF OUT OF BAND EMISSION MEASUREMENT

Below –30dB 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 $\geq$ 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 $\geq$ 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



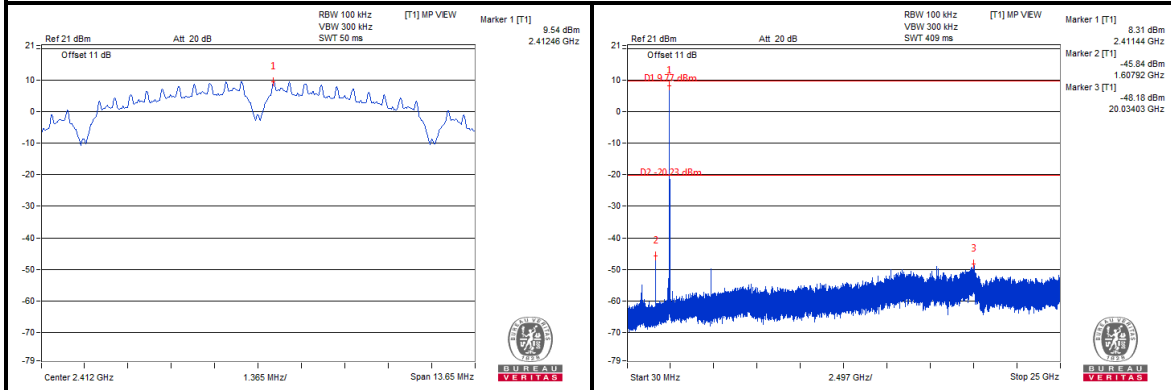
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Test Report No.: RF171010N017

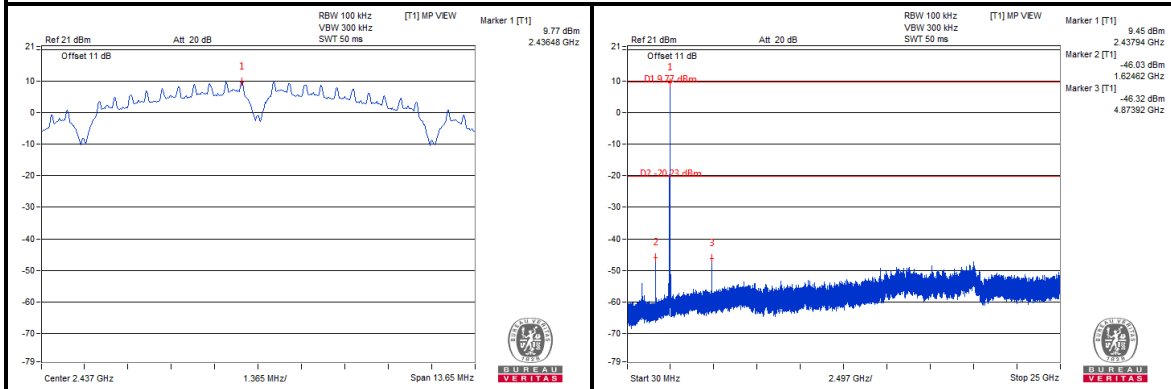
4.6.7 TEST RESULTS

802.11b

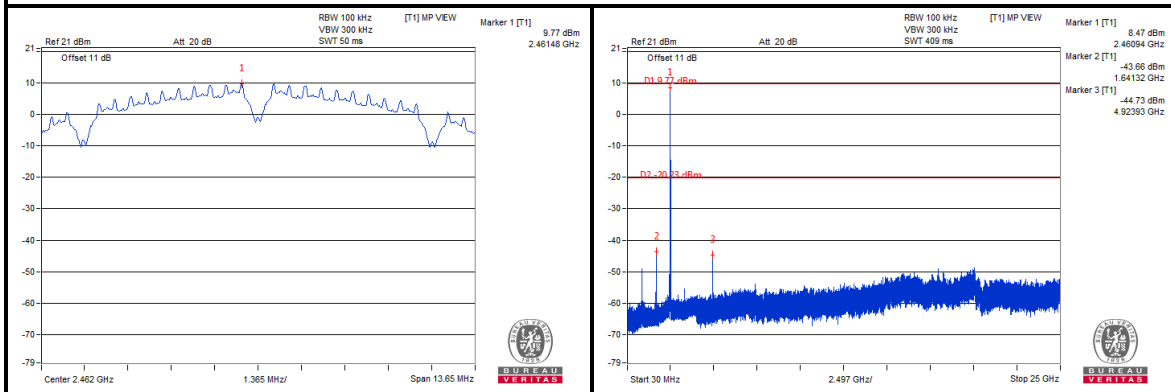
CH 1



CH 6



CH 11



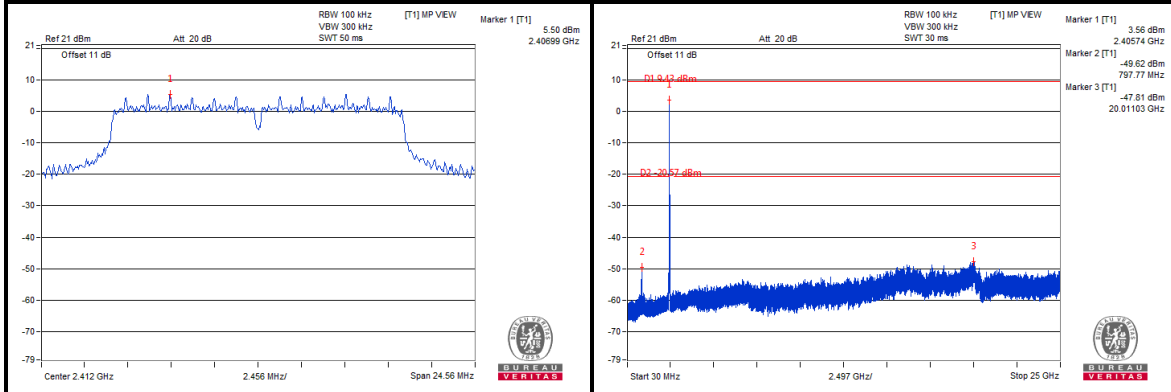


BUREAU
VERITAS

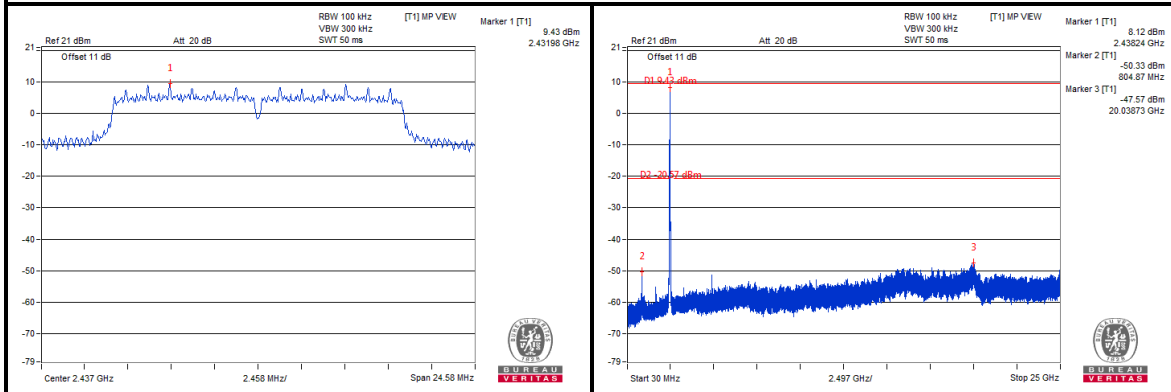
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802.11g

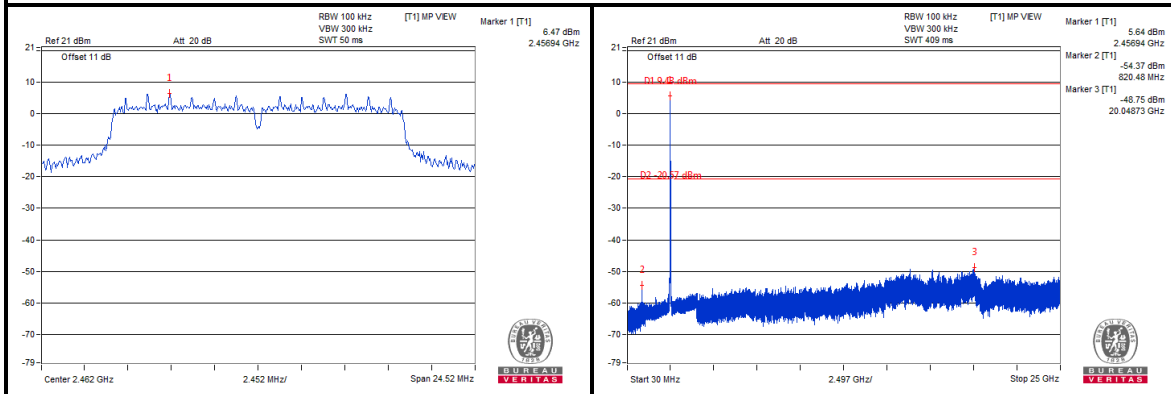
CH 1



CH 6



CH 11



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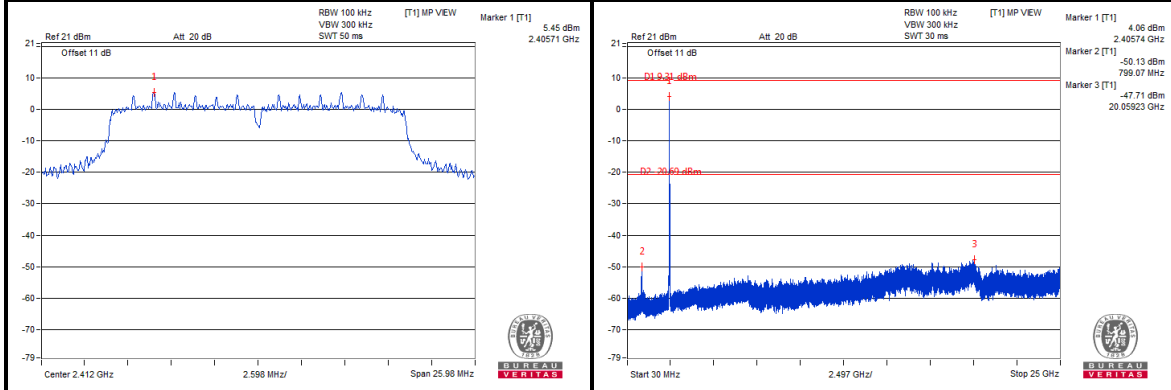


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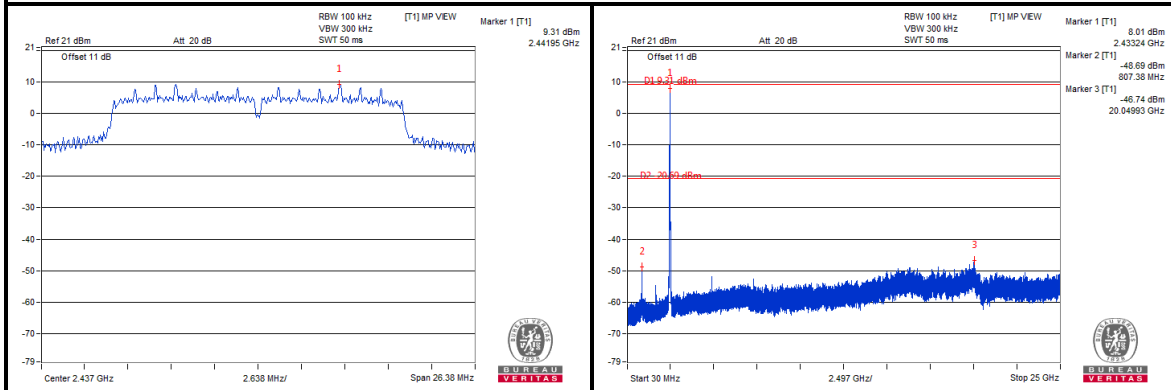
Test Report No.: RF171010N017

802.11n (HT20)

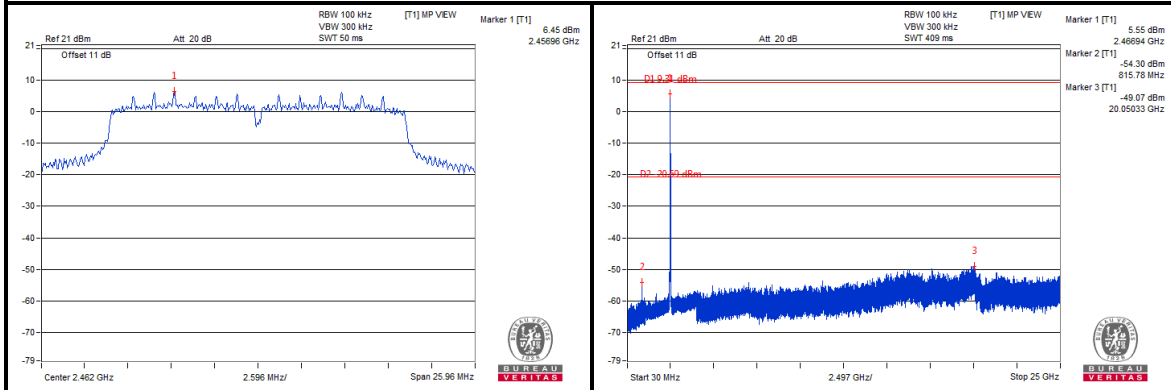
CH 1



CH 6



CH 11



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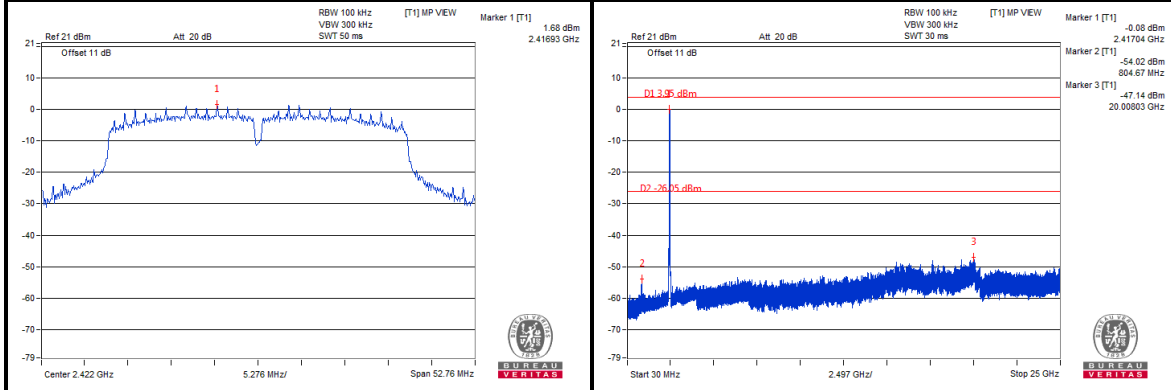


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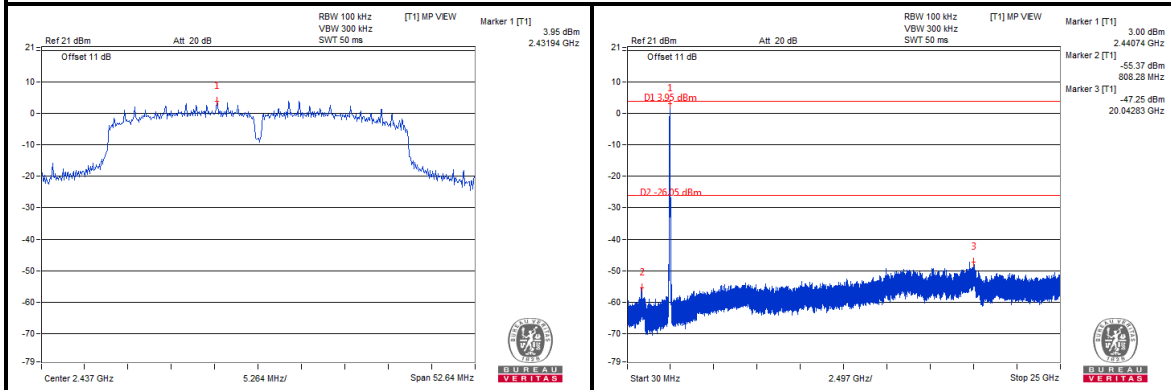
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802.11n (HT40)

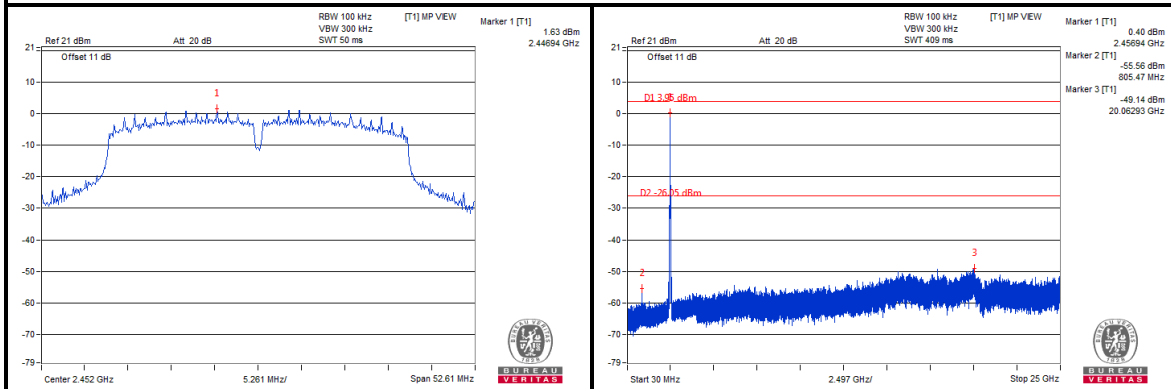
CH 3



CH 6



CH 9



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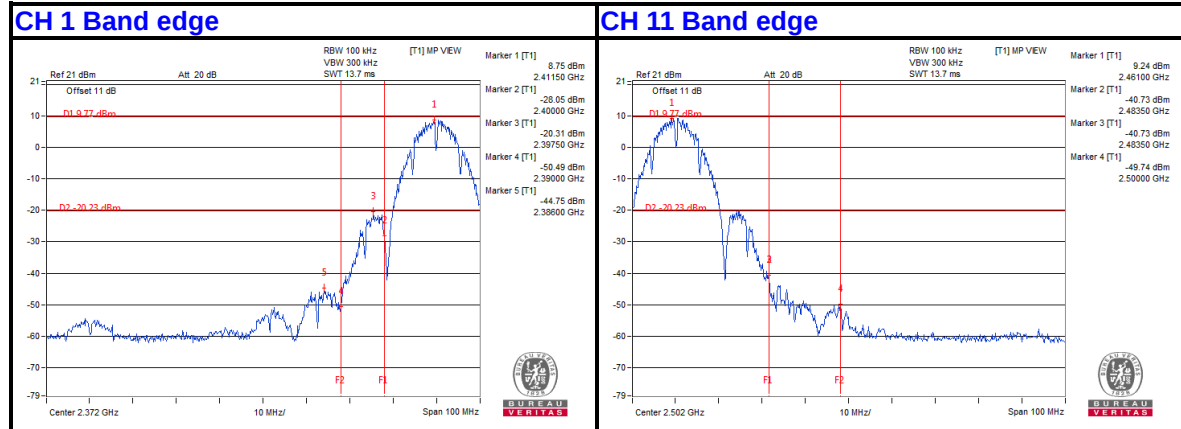
Tel: +86 769 8593 5656
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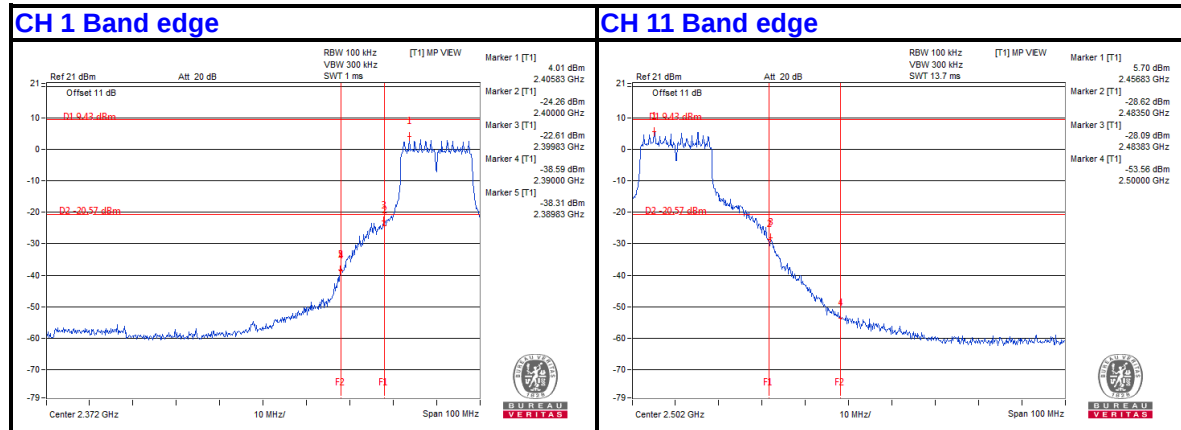
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Test Report No.: RF171010N017

802.11b



802.11g



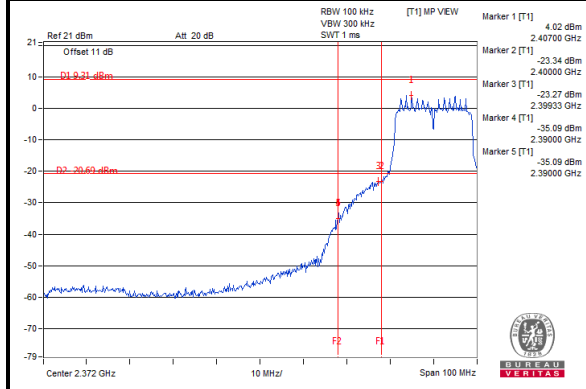


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VERITAS

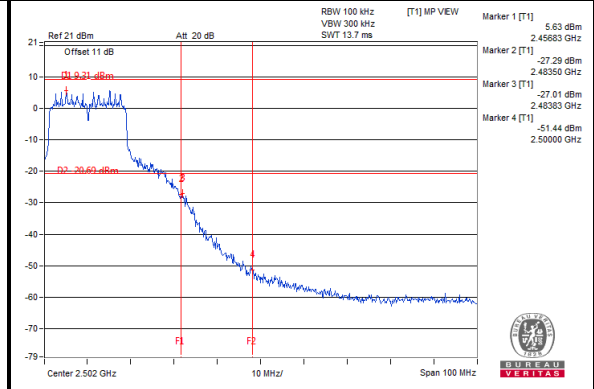
Test Report No.: RF171010N017

802.11n (HT20)

CH 1 Band edge

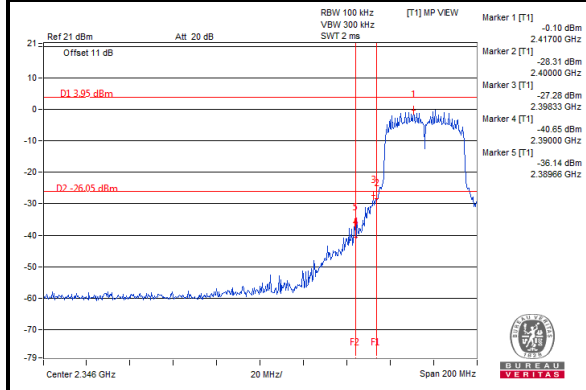


CH 11 Band edge

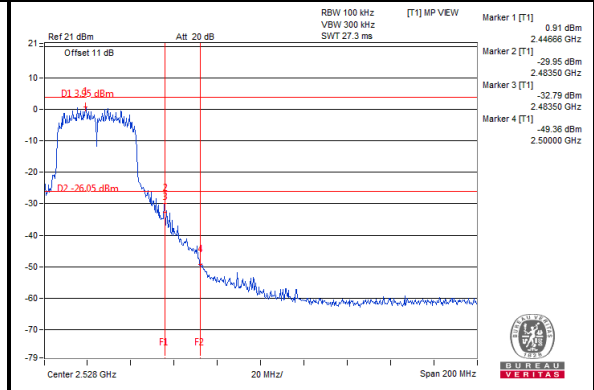


802.11n (HT40)

CH 3 Band edge



CH 9 Band edge





Test Report No.: RF171010N017

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---