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Test Report No.: RF161205N022



Test Lab
Cert 2951.01

TEST REPORT

Applicant	TP-Link Technologies Co., Ltd.
Address	Building 24 (floors 1,3,4,5) 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 (floors 1,3,4,5) and 28 (floors1-4) Central Science and Technology Park, Shennan Rd, Nanshan, Shenzhen, China
Product	300Mbps Wi-Fi Range Extender
Brand Name	TP-Link
Model	TL-WA850RE
Additional Model & Model Difference	N/A
Date of tests	Dec. 05, 2016 ~ Dec. 16, 2016

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: Jan. 16, 2017

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Test Report No.: RF161205N022

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF161205N022	Original release	Jan. 16, 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	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	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	300Mbps Wi-Fi Range Extender
MODEL NO.	TL-WA850RE
FCC ID	TE7WA850REV4
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)
AVERAGE POWER	23.51dBm (Measured Average Power)
ANTENNA TYPE	PCB Antenna; 2dBi gain
I/O PORTS	Refer to user's manual
CABLE SUPPLIED	N/A

NOTE:

1. The EUT incorporates a MIMO function. Physically, the EUT provides two transmitters and two receivers.

MODULATION MODE	FUNCTION
802.11b	2TX/2RX
802.11g	2TX/2RX
802.11n (HT20)	2TX/2RX
802.11n (HT40)	2TX/2RX

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.: 161205N022) 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	
-	√	√	√	√	Powered by AC 120V 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
-	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
802.11g	1 to 11	1	OFDM	BPSK	6.0	X



RADIATED EMISSION TEST (ABOVE 1GHz):

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, SISO and MIMO mode, 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)	TX&RX FUNCTION WORST CASE	AXIS
802.11b	1 to 11	1,2, 6, 10,11	DSSS	DBPSK	1.0	MIMO mode 2TX/2RX	X
802.11g	1 to 11	1,2, 6, 10,11	OFDM	BPSK	6.0		X
802.11n HT20	1 to 11	1,2, 6, 10,11	OFDM	BPSK	6.5		X
802.11n HT40	3 to 9	3,4, 6, 8,9	OFDM	BPSK	13.5		X

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, 55%RH	AC 120V 60Hz	Cheng Zhong
RE≥1G	25deg. C, 55%RH	AC 120V 60Hz	Cheng Zhong
PLC	20deg. C, 56%RH	AC 120V 60Hz	Yang
APCM	20deg. C, 55%RH	AC 120V 60Hz	Robert Cheng

3.3 DUTY CYCLE OF TEST SIGNAL

Chain 0:

Duty cycle of test signal is 100 %

Chain 1:

Duty cycle of test signal is 100 %



3.4 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

- FCC Part 15, Subpart C, Section 15.247**
- KDB 558074 D01 DTS Meas Guidance v03r05**
- KDB 662911 D01 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(DoC). The test report has been issued separately.

3.5 DESCRIPTION OF SUPPORT UNITS

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

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Notebook	HP	4431s	CNU238944Z	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	AC Line Unshielded, Detachable 1.5m, DC Line Unshielded, Detachable 1.5m RJ45 Line Unshielded, Detachable 1m, 10m



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	101588	Jan. 22,16	Jan. 21,17
Artificial Mains Network	Rohde&Schwarz	ENV216	101173	Mar. 04,16	Mar. 03,17
Artificial Mains Network	Rohde&Schwarz	ESH3-Z5	100317	Apr. 05,16	Apr. 04,17
Voltage probe	SCHWARZBECK	TK 9421	TK 9421-176	Jan. 08,16	Jan. 07,17
Test software	ADT	ADT_Cond_V7.3.7	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.

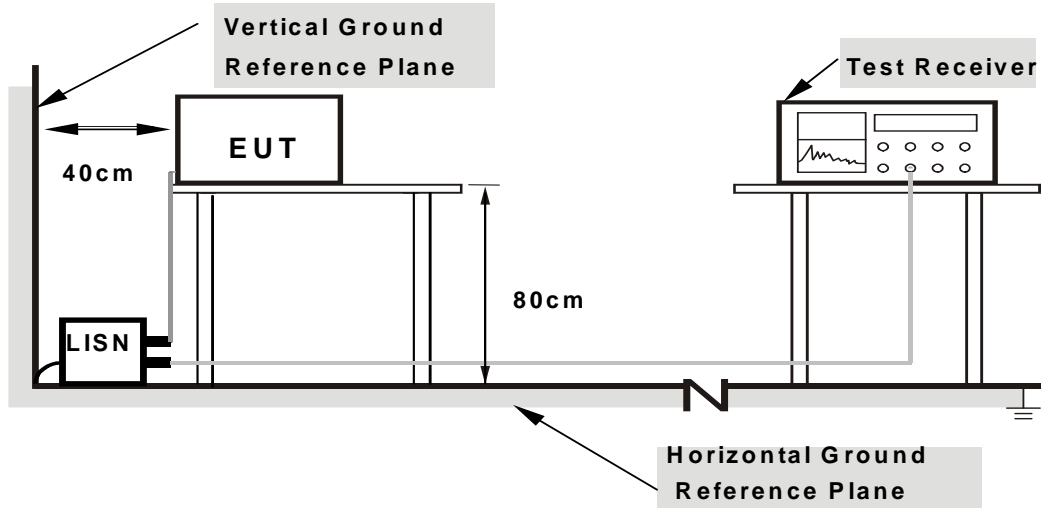
NOTE: All modes of operation were investigated and the worst-case emissions are reported.

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.



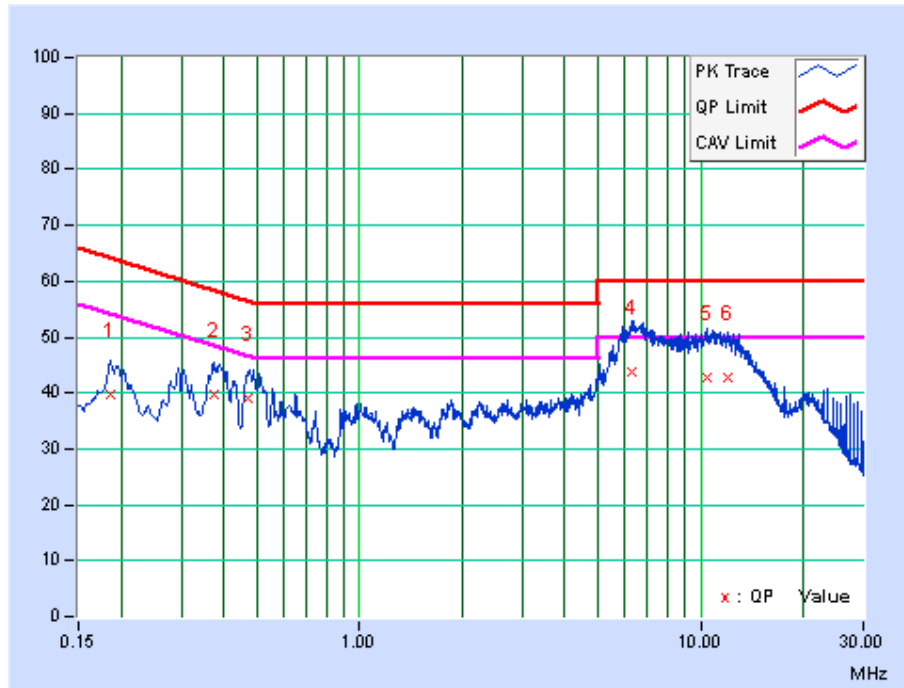
4.1.7 TEST RESULTS

CONDUCTED WORST-CASE DATA: WIFI link mode

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	0.1860	10.12	29.59	18.15	39.71	28.27	64.21	54.21	-24.50	-25.94
2	0.3726	10.21	29.64	20.96	39.85	31.17	58.44	48.44	-18.59	-17.27
3	0.4725	10.27	28.89	19.67	39.16	29.94	56.47	46.47	-17.31	-16.53
4	6.3082	10.43	33.30	23.60	43.73	34.03	60.00	50.00	-16.27	-15.97
5	10.4842	10.50	32.28	22.60	42.78	33.10	60.00	50.00	-17.22	-16.90
6	12.0313	10.52	32.18	21.77	42.70	32.29	60.00	50.00	-17.30	-17.71

- 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.

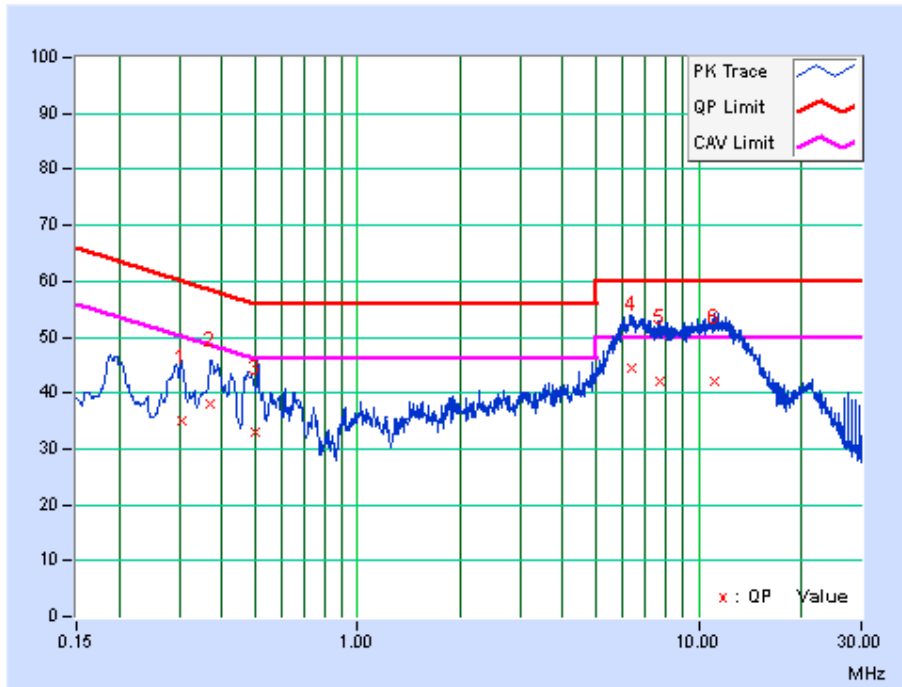




PHASE	Neutral	6dB BANDWIDTH	9kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.3049	9.89	25.29	14.69	35.18	24.58	60.11	50.11	-24.93	-25.53
2	0.3707	9.90	28.24	16.92	38.14	26.82	58.49	48.49	-20.35	-21.67
3	0.5000	9.92	23.03	12.95	32.95	22.87	56.00	46.00	-23.05	-23.13
4	6.3713	10.27	34.28	22.75	44.55	33.02	60.00	50.00	-15.45	-16.98
5	7.6965	10.33	31.60	20.21	41.93	30.54	60.00	50.00	-18.07	-19.46
6	11.1345	10.41	31.83	20.45	42.24	30.86	60.00	50.00	-17.76	-19.14

- 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	ESR7	101494	Apr. 05,16	Apr. 04,17
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV7	102331	Nov. 04,16	Nov. 03,17
Bilog Antenna	Teseq	CBL 6111D	30643	Jul. 14, 16	Jul. 13, 17
Horn Antenna (1GHz -18GHz)	ETS -Lindgren	3117	00062558	May 18,16	May 17,17
GPS Generator+ Antenna	TOJOIN	GNSS-5000A	E1-010119	Aug. 08, 16	Aug. 07, 17
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	NSEMC003	Mar. 12,16	Mar. 11,18
Test Software	ADT	ADT_Radiated_V7.6.15.9.2	N/A	N/A	N/A
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170242	Mar. 12,16	Mar. 11,17
Amplifier (9kHz-1GHz)	SONOMA	310D	186955	Mar. 04,16	Mar. 03, 17
Pre-Amplifier(1-18G)	HP	8449B	3008A00409	Apr. 25,16	Apr. 24,17
Pre-Amplifier (18GHz-40GHz)	EMCI	EMC 184045	980102	Nov. 04,16	Nov. 03,17
Test Software	ADT	ADT_Radiated_V7.6.15.9.2	N/A	N/A	N/A
BLUETOOTH TESTER	Rohde&Schwarz	CBT32	100811	Aug. 08,16	Aug. 07,17

NOTE:

1. The test was performed in 966 Chamber.
2. The calibration interval of the above test instruments are 12, 24 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 1 GHz if tested.
4. The FCC Site Registration No. is 502831.



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 $\geq 1/T$ (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.

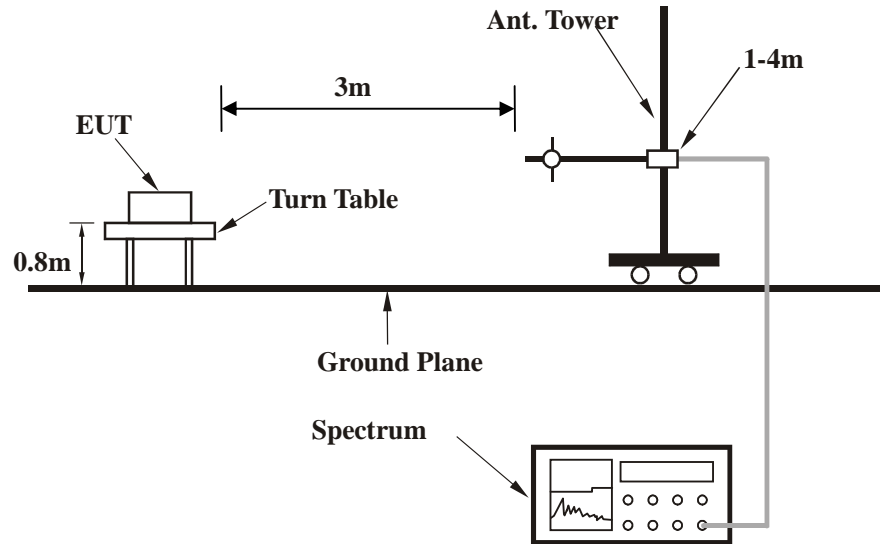
4.2.4 DEVIATION FROM TEST STANDARD

No deviation.



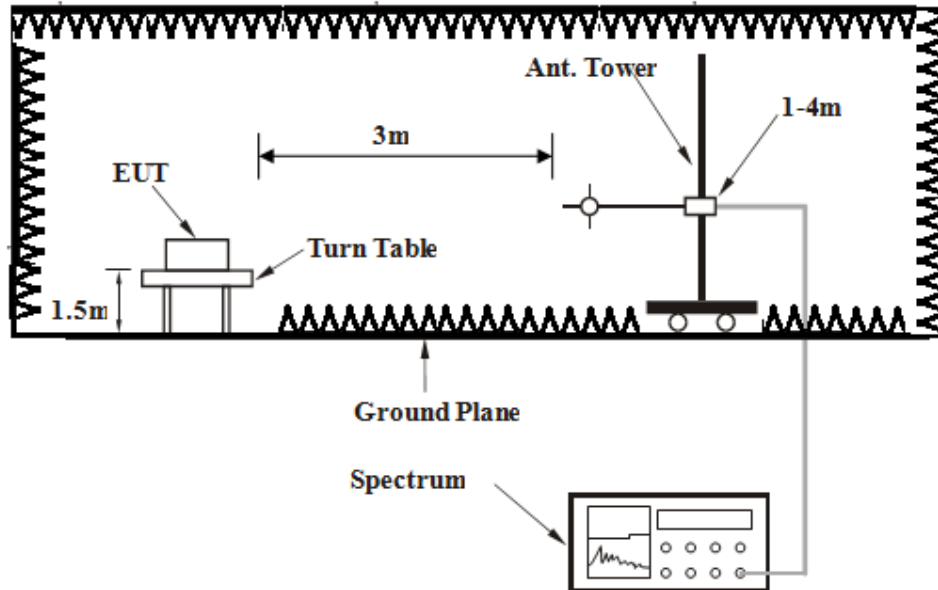
4.2.5 TEST SETUP

Below 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 under full load condition and placed them on a testing table.
- b. Set the transmitter part of EUT under transmission condition continuously at specific channel frequency.
- c. The necessary accessories enable the EUT in full functions.



4.2.7 TEST RESULTS

BELOW 1GHz WORST-CASE DATA:

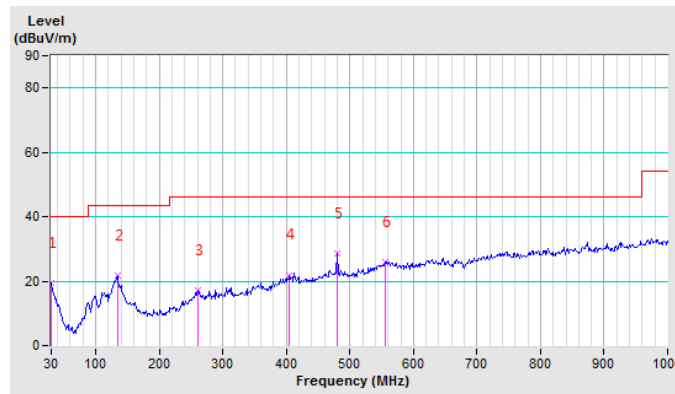
802.11g

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 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	30.00	19.28 QP	40.00	-20.72	1.00 H	0	30.55	-11.27
2	134.03	21.67 QP	43.50	-21.83	1.00 H	0	38.81	-17.14
3	260.55	17.29 QP	46.00	-28.71	1.00 H	0	29.86	-12.57
4	405.35	21.90 QP	46.00	-24.10	1.00 H	0	30.30	-8.40
5	479.86	28.52 QP	46.00	-17.48	1.00 H	0	35.20	-6.68
6	555.77	26.07 QP	46.00	-19.93	1.00 H	0	29.75	-3.68

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.



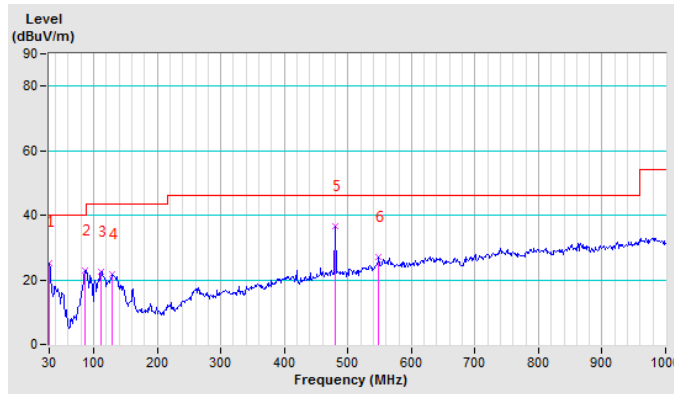


CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

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	30.00	25.33 QP	40.00	-14.67	1.00 V	0	36.60	-11.27
2	86.23	22.70 QP	40.00	-17.30	1.00 V	0	43.01	-20.31
3	111.54	22.36 QP	43.50	-21.14	1.00 V	0	39.99	-17.63
4	129.81	21.68 QP	43.50	-21.82	1.00 V	0	38.65	-16.97
5	479.86	36.61 QP	46.00	-9.39	1.00 V	0	43.29	-6.68
6	548.74	26.96 QP	46.00	-19.04	1.00 V	0	31.11	-4.15

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.





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	61.5 PK	74.0	-12.5	2.87 H	247	58.32	3.14
2	2390.00	53.8 AV	54.0	-0.2	2.87 H	247	50.68	3.14
3	*2412.00	114.5 PK			2.70 H	77	111.36	3.17
4	*2412.00	111.6 AV			2.70 H	77	108.40	3.17
5	4824.00	48.1 PK	74.0	-25.9	1.56 H	333	41.59	6.47
6	4824.00	45.5 AV	54.0	-8.5	1.56 H	333	38.99	6.47
7	#7236.00	48.0 PK	84.5	-36.5	1.42 H	236	35.83	12.13
8	#7236.00	33.7 AV	81.6	-47.9	1.42 H	236	21.56	12.13

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	57.6 PK	74.0	-16.4	2.94 V	203	54.42	3.14
2	2390.00	48.2 AV	54.0	-5.8	2.94 V	203	45.10	3.14
3	*2412.00	103.9 PK			1.00 V	215	100.76	3.17
4	*2412.00	99.0 AV			1.00 V	215	95.87	3.17
5	4824.00	44.7 PK	74.0	-29.3	1.41 V	180	38.19	6.47
6	4824.00	39.1 AV	54.0	-14.9	1.41 V	180	32.67	6.47
7	#7236.00	46.0 PK	73.9	-27.9	1.25 V	203	33.85	12.13
8	#7236.00	33.8 AV	69.0	-35.2	1.25 V	203	21.71	12.13

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	55.5 PK	74.0	-18.5	2.37 H	112	17.49	37.99
2	*2437.00	115.6 PK			2.37 H	112	77.54	38.09
3	*2437.00	112.5 AV			2.37 H	112	74.37	38.09
4	2483.50	56.0 PK	74.0	-18.0	2.37 H	112	17.81	38.19
5	4874.00	49.0 PK	74.0	-25.0	1.75 H	333	7.46	41.55
6	4874.00	47.0 AV	54.0	-7.0	1.75 H	333	5.48	41.55
7	7311.00	45.9 PK	74.0	-28.1	1.52 H	243	0.30	45.60
8	7311.00	35.5 AV	54.0	-18.5	1.52 H	243	-10.11	45.60
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	55.2 PK	74.0	-18.8	1.95 V	210	17.22	37.99
2	*2437.00	104.2 PK			1.95 V	210	66.07	38.09
3	*2437.00	101.2 AV			1.95 V	210	63.06	38.09
4	2483.50	55.5 PK	74.0	-18.5	1.95 V	210	17.34	38.19
5	4874.00	44.6 PK	74.0	-29.4	2.31 V	351	3.07	41.55
6	4874.00	40.7 AV	54.0	-13.3	2.31 V	351	-0.86	41.55
7	7311.00	46.6 PK	74.0	-27.4	1.49 V	234	0.98	45.60
8	7311.00	34.8 AV	54.0	-19.2	1.49 V	234	-10.76	45.60

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	113.2 PK			2.72 H	95	109.91	3.26
2	*2462.00	110.2 AV			2.72 H	95	106.96	3.26
3	2483.50	60.9 PK	74.0	-13.1	3.09 H	89	57.56	3.29
4	2483.50	53.4 AV	54.0	-0.6	3.09 H	89	50.12	3.29
5	4924.00	45.2 PK	74.0	-28.8	1.00 H	151	38.68	6.49
6	4924.00	41.7 AV	54.0	-12.3	1.00 H	151	35.21	6.49
7	7386.00	45.5 PK	74.0	-28.5	1.16 H	278	33.17	12.30
8	7386.00	34.3 AV	54.0	-19.7	1.16 H	278	21.96	12.30

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	101.4 PK			1.00 V	206	98.13	3.26
2	*2462.00	97.8 AV			1.00 V	206	94.54	3.26
3	2483.50	57.4 PK	74.0	-16.6	1.00 V	0	54.06	3.29
4	2483.50	44.7 AV	54.0	-9.3	1.00 V	0	41.43	3.29
5	4924.00	44.8 PK	74.0	-29.2	1.69 V	20	38.26	6.49
6	4924.00	39.0 AV	54.0	-15.0	1.69 V	20	32.54	6.49
7	7386.00	46.1 PK	74.0	-27.9	1.16 V	97	33.78	12.30
8	7386.00	33.6 AV	54.0	-20.4	1.16 V	97	21.26	12.30

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 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	69.4 PK	74.0	-4.6	2.74 H	116	31.44	37.99
2	2390.00	53.5 AV	54.0	-0.5	2.74 H	116	15.46	37.99
3	*2412.00	113.4 PK			2.66 H	227	75.40	38.03
4	*2412.00	103.9 AV			2.66 H	227	65.85	38.03
5	4824.00	45.3 PK	74.0	-28.7	1.95 H	270	3.76	41.54
6	4824.00	32.6 AV	54.0	-21.4	1.95 H	270	-8.94	41.54
7	#7236.00	45.7 PK	83.4	-37.7	1.33 H	185	0.10	45.56
8	#7236.00	33.3 AV	73.9	-40.6	1.33 H	185	-12.22	45.56

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	55.0 PK	74.0	-19.0	1.25 V	203	51.85	3.14
2	2390.00	45.3 AV	54.0	-8.7	1.25 V	203	42.17	3.14
3	*2412.00	102.6 PK			3.33 V	339	99.43	3.17
4	*2412.00	93.6 AV			3.33 V	339	90.45	3.17
5	4824.00	48.1 PK	74.0	-25.9	1.53 V	227	41.61	6.47
6	4824.00	34.8 AV	54.0	-19.2	1.53 V	227	28.29	6.47
7	#7236.00	46.3 PK	72.6	-26.3	1.25 V	223	34.12	12.13
8	#7236.00	34.7 AV	63.6	-28.9	1.25 V	223	22.53	12.13

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	54.5 PK	74.0	-19.5	1.91 H	117	51.37	3.14
2	*2437.00	115.5 PK			1.91 H	117	112.33	3.21
3	*2437.00	106.9 AV			1.91 H	117	103.68	3.21
4	2483.50	55.2 PK	74.0	-18.8	1.91 H	117	51.95	3.29
5	4874.00	45.6 PK	74.0	-28.4	2.43 H	303	39.13	6.48
6	4874.00	32.7 AV	54.0	-21.3	2.43 H	303	26.19	6.48
7	7311.00	45.5 PK	74.0	-28.5	1.53 H	201	33.32	12.21
8	7311.00	33.4 AV	54.0	-20.6	1.53 H	201	21.22	12.21

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	51.3 PK	74.0	-22.7	3.32 V	195	13.29	37.99
2	*2437.00	111.7 PK			3.32 V	195	73.64	38.09
3	*2437.00	103.0 AV			3.32 V	195	64.92	38.09
4	2483.50	53.5 PK	74.0	-20.5	3.32 V	195	15.26	38.19
5	4874.00	41.2 PK	74.0	-32.8	1.45 V	357	-0.36	41.55
6	4874.00	28.8 AV	54.0	-25.2	1.45 V	357	-12.77	41.55
7	7311.00	45.1 PK	74.0	-28.9	1.49 V	204	-0.52	45.60
8	7311.00	34.0 AV	54.0	-20.0	1.49 V	204	-11.65	45.60

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	113.2 PK			2.55 H	221	75.02	38.15
2	*2462.00	104.1 AV			2.55 H	221	65.90	38.15
3	2483.50	69.7 PK	74.0	-4.3	1.00 H	226	31.49	38.19
4	2483.50	53.5 AV	54.0	-0.5	1.00 H	226	15.32	38.19
5	4924.00	46.3 PK	74.0	-27.7	2.04 H	302	4.75	41.57
6	4924.00	33.2 AV	54.0	-20.8	2.04 H	302	-8.38	41.57
7	7386.00	46.6 PK	74.0	-27.4	1.77 H	148	0.94	45.65
8	7386.00	33.2 AV	54.0	-20.8	1.77 H	148	-12.47	45.65

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	104.1 PK			3.08 V	115	65.90	38.15
2	*2462.00	94.8 AV			3.08 V	115	56.63	38.15
3	2483.50	56.9 PK	74.0	-17.1	1.49 V	179	18.70	38.19
4	2483.50	46.5 AV	54.0	-7.5	1.49 V	179	8.30	38.19
5	4924.00	42.5 PK	74.0	-31.5	2.62 V	321	0.96	41.57
6	4924.00	29.6 AV	54.0	-24.4	2.62 V	321	-11.93	41.57
7	7386.00	46.9 PK	74.0	-27.1	1.87 V	243	1.20	45.65
8	7386.00	33.6 AV	54.0	-20.4	1.87 V	243	-12.08	45.65

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 (20MHz)

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	70.8 PK	74.0	-3.2	2.42 H	112	32.77	37.99
2	2390.00	53.5 AV	54.0	-0.5	2.42 H	112	15.46	37.99
3	*2412.00	111.2 PK			2.71 H	227	73.20	38.03
4	*2412.00	101.3 AV			2.71 H	227	63.29	38.03
5	4824.00	34.7 PK	74.0	-39.3	1.49 H	263	-6.89	41.54
6	4824.00	28.6 AV	54.0	-25.4	1.49 H	263	-12.91	41.54
7	#7236.00	46.0 PK	81.2	-35.2	1.14 H	201	0.42	45.56
8	#7236.00	33.0 AV	71.3	-38.3	1.14 H	201	-12.58	45.56

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	54.2 PK	74.0	-19.8	1.85 V	326	16.24	37.99
2	2390.00	43.5 AV	54.0	-10.5	1.85 V	326	5.48	37.99
3	*2412.00	101.1 PK			2.15 V	275	63.05	38.03
4	*2412.00	90.9 AV			2.15 V	275	52.91	38.03
5	4824.00	44.9 PK	74.0	-29.1	1.25 V	248	3.35	41.54
6	4824.00	32.0 AV	54.0	-22.0	1.25 V	248	-9.59	41.54
7	#7236.00	46.4 PK	71.1	-24.7	2.43 V	201	0.79	45.56
8	#7236.00	33.9 AV	60.9	-27.0	2.43 V	201	-11.71	45.56

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	55.1 PK	74.0	-18.9	3.55 H	230	17.10	37.99
2	*2437.00	114.3 PK			3.55 H	230	76.19	38.09
3	*2437.00	104.8 AV			3.55 H	230	66.73	38.09
4	2483.50	59.5 PK	74.0	-14.5	3.55 H	230	21.31	38.19
5	4874.00	46.9 PK	74.0	-27.1	2.45 H	194	5.30	41.55
6	4874.00	33.6 AV	54.0	-20.4	2.45 H	194	-7.93	41.55
7	7311.00	46.9 PK	74.0	-27.1	1.85 H	246	1.27	45.60
8	7311.00	32.1 AV	54.0	-21.9	1.85 H	246	-13.54	45.60

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	52.2 PK	74.0	-21.8	2.94 V	224	14.25	37.99
2	*2437.00	109.3 PK			2.94 V	224	71.24	38.09
3	*2437.00	100.3 AV			2.94 V	224	62.25	38.09
4	2483.50	55.3 PK	74.0	-18.7	2.94 V	224	17.13	38.19
5	4874.00	45.9 PK	74.0	-28.1	1.49 V	225	4.30	41.55
6	4874.00	31.1 AV	54.0	-22.9	1.49 V	225	-10.49	41.55
7	7311.00	45.9 PK	74.0	-28.1	1.87 V	302	0.27	45.60
8	7311.00	33.5 AV	54.0	-20.5	1.87 V	302	-12.06	45.60

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	111.2 PK			2.61 H	227	73.00	38.15
2	*2462.00	101.4 AV			2.61 H	227	63.23	38.15
3	2483.50	68.4 PK	74.0	-5.6	1.00 H	222	30.24	38.19
4	2483.50	53.6 AV	54.0	-0.4	1.00 H	222	15.43	38.19
5	4924.00	46.3 PK	74.0	-27.7	1.00 H	203	4.72	41.57
6	4924.00	31.5 AV	54.0	-22.5	1.00 H	203	-10.08	41.57
7	7386.00	46.3 PK	74.0	-27.7	1.84 H	225	0.62	45.65
8	7386.00	33.6 AV	54.0	-20.4	1.84 H	225	-12.06	45.65

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	104.0 PK			3.08 V	123	65.88	38.15
2	*2462.00	94.2 AV			3.08 V	123	56.04	38.15
3	2483.50	63.3 PK	74.0	-10.7	1.54 V	302	25.13	38.19
4	2483.50	46.3 AV	54.0	-7.7	1.54 V	302	8.06	38.19
5	4924.00	46.9 PK	74.0	-27.1	1.59 V	326	5.29	41.57
6	4924.00	30.1 AV	54.0	23.9	1.59 V	326	-11.48	41.57
7	7386.00	46.5 PK	74.0	-27.5	1.49 V	218	0.85	45.65
8	7386.00	34.4 AV	54.0	-19.6	1.49 V	218	-11.30	45.65

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 (40MHz)

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	69.3 PK	74.0	-4.7	1.00 H	112	31.28	37.99
2	2390.00	53.4 AV	54.0	-0.6	1.00 H	112	15.41	37.99
3	*2422.00	105.2 PK			2.69 H	123	67.11	38.06
4	*2422.00	95.7 AV			2.69 H	123	57.64	38.06
5	4844.00	40.3 PK	74.0	-33.7	1.55 H	216	-1.28	41.54
6	4844.00	30.3 AV	54.0	-23.7	1.55 H	216	-11.28	41.54
7	7266.00	45.6 PK	74.0	-28.4	1.94 H	107	0.05	45.57
8	7266.00	34.0 AV	54.0	-20.0	1.94 H	107	-11.62	45.57

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	1.05 V	56	20.39	37.99
2	2390.00	46.6 AV	54.0	-7.4	1.05 V	56	8.62	37.99
3	*2422.00	92.6 PK			1.00 V	0	54.52	38.06
4	*2422.00	84.4 AV			1.00 V	0	46.31	38.06
5	4844.00	43.6 PK	74.0	-30.4	1.21 V	326	2.04	41.54
6	4844.00	31.5 AV	54.0	-22.5	1.21 V	326	-10.05	41.54
7	7266.00	43.2 PK	74.0	-30.8	1.25 V	203	-2.41	45.57
8	7266.00	33.3 AV	54.0	-20.7	1.25 V	203	-12.31	45.57

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	66.1 PK	74.0	-7.9	2.69 H	124	28.12	37.99
2	*2437.00	110.7 PK			2.69 H	124	72.60	38.09
3	*2437.00	101.1 AV			2.69 H	124	63.01	38.09
4	2483.50	66.6 PK	74.0	-7.4	2.69 H	124	28.42	38.19
5	4874.00	42.5 PK	74.0	-31.5	1.02 H	203	0.97	41.55
6	4874.00	30.1 AV	54.0	-23.9	1.02 H	203	-11.43	41.55
7	7311.00	44.3 PK	74.0	-29.7	1.98 H	244	-1.35	45.60
8	7311.00	30.2 AV	54.0	-23.8	1.98 H	244	-15.45	45.60

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	62.1 PK	74.0	-11.9	3.55 V	222	24.14	37.99
2	*2437.00	106.3 PK			3.55 V	222	68.25	38.09
3	*2437.00	96.7 AV			3.55 V	222	58.58	38.09
4	2483.50	66.5 PK	74.0	-7.5	3.55 V	222	28.30	38.19
5	4874.00	42.1 PK	74.0	-31.9	1.48 V	203	0.52	41.55
6	4874.00	31.3 AV	54.0	-22.7	1.48 V	203	-10.28	41.55
7	7311.00	45.8 PK	74.0	-28.2	1.54 V	187	0.21	45.60
8	7311.00	36.7 AV	54.0	-17.3	1.54 V	187	-8.95	45.60

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	*2452.00	103.9 PK			1.00 H	116	65.78	38.12
2	*2452.00	95.2 AV			1.00 H	116	57.07	38.12
3	2483.50	67.1 PK	74.0	-6.9	1.00 H	228	28.90	38.19
4	2483.50	53.4 AV	54.0	-0.6	1.00 H	228	15.20	38.19
5	4904.00	41.0 PK	74.0	-33.0	1.25 H	201	-0.53	41.56
6	4904.00	28.3 AV	54.0	-25.7	1.25 H	201	-13.24	41.56
7	7356.00	43.2 PK	74.0	-30.8	1.42 H	203	-2.48	45.63
8	7356.00	28.6 AV	54.0	-25.4	1.42 H	203	-16.99	45.63

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	95.9 PK			3.15 V	107	57.79	38.12
2	*2452.00	86.1 AV			3.15 V	107	47.97	38.12
3	2483.50	55.8 PK	74.0	-18.2	1.44 V	317	17.65	38.19
4	2483.50	44.7 AV	54.0	-9.3	1.44 V	317	6.54	38.19
5	4904.00	42.5 PK	74.0	-31.5	1.59 V	306	0.96	41.56
6	4904.00	33.0 AV	54.0	-21.0	1.59 V	306	-8.54	41.56
7	7356.00	41.0 PK	74.0	-33.0	1.54 V	227	-4.60	45.63
8	7356.00	33.0 AV	54.0	-21.0	1.54 V	227	-12.63	45.63

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.



For client request: Additional for Restricted frequency emission of radiation.

ABOVE 1GHz DATA

802.11b

CHANNEL	TX Channel 2	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	53.59 PK	74.00	-20.41	1.00 H	40	15.60	37.99
2	2390.00	41.37 AV	54.00	-12.63	1.00 H	40	3.38	37.99
3	#2417.00	104.62 PK			1.00 H	40	66.52	38.10
4	#2417.00	100.71 AV			1.00 H	40	62.61	38.10
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	59.32 PK	74.00	-14.68	1.62 V	241	21.33	37.99
2	2390.00	48.85 AV	54.00	-5.15	1.62 V	241	10.86	37.99
3	#2417.00	113.92 PK			1.62 V	241	75.82	38.10
4	#2417.00	108.25 AV			1.62 V	241	70.15	38.10

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 other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. "#": The radiated frequency is out of the restricted band.



CHANNEL	TX Channel 10	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	*2457.00	105.53 PK			1.02 H	213	67.41	38.12
2	*2457.00	101.95 AV			1.02 H	213	63.83	38.12
3	2483.50	55.68 PK	74.00	-18.32	1.02 H	213	17.49	38.19
4	2483.50	43.63 AV	54.00	-10.37	1.02 H	213	5.44	38.19

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	*2457.00	115.94 PK			1.14 V	36	77.82	38.12
2	*2457.00	110.24 AV			1.14 V	36	72.12	38.12
3	2483.50	58.68 PK	74.00	-15.32	1.14 V	36	20.49	38.19
4	2483.50	46.87 AV	54.00	-7.13	1.14 V	36	8.68	38.19

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 2	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	54.84 PK	74.00	-19.16	1.70 H	0	16.85	37.99
2	2390.00	46.91 AV	54.00	-7.09	1.70 H	0	8.92	37.99
3	*2417.00	103.74 PK			1.70 H	0	65.68	38.06
4	*2417.00	98.35 AV			1.70 H	0	60.29	38.06

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	62.77 PK	74.00	-11.23	2.00 V	340	24.78	37.99
2	2390.00	53.33 AV	54.00	-0.67	2.00 V	340	15.34	37.99
3	*2417.00	116.89 PK			2.00 V	340	78.83	38.06
4	*2417.00	110.27 AV			2.00 V	340	72.21	38.06

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 10	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	*2457.00	106.68 PK			1.12 H	105	68.56	38.12
2	*2457.00	98.76 AV			1.12 H	105	60.64	38.12
3	2483.50	58.00 PK	74.00	-16.00	1.12 H	105	19.81	38.19
4	2483.50	50.10 AV	54.00	-3.90	1.12 H	105	11.91	38.19

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	*2457.00	113.89 PK			1.00 V	295	75.77	38.12
2	*2457.00	108.20 AV			1.00 V	295	70.08	38.12
3	2483.50	63.69 PK	74.00	-10.31	1.00 V	295	25.50	38.19
4	2483.50	53.46 AV	54.00	-0.54	1.00 V	295	15.27	38.19

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 2	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	55.16 PK	74.00	-18.84	3.07 H	82	17.17	37.99
2	2390.00	47.90 AV	54.00	-6.10	3.07 H	82	9.91	37.99
3	*2417.00	103.67 PK			3.07 H	82	65.61	38.06
4	*2417.00	94.78 AV			3.07 H	82	56.72	38.06

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	62.26 PK	74.00	-11.74	2.20 V	274	24.27	37.99
2	2390.00	53.45 AV	54.00	-0.55	2.20 V	274	15.46	37.99
3	*2417.00	113.04 PK			2.20 V	274	74.98	38.06
4	*2417.00	107.06 AV			2.20 V	274	69.00	38.06

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 10	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	*2457.00	106.33 PK			2.11 H	96	68.21	38.12
2	*2457.00	97.69 AV			2.11 H	96	59.57	38.12
3	2483.50	56.68 PK	74.00	-17.32	2.11 H	96	18.49	38.19
4	2483.50	48.51 AV	54.00	-5.49	2.11 H	96	10.32	38.19

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	*2457.00	114.41 PK			1.70 V	351	75.29	38.12
2	*2457.00	104.17 AV			1.70 V	351	66.05	38.12
3	2483.50	64.58 PK	74.00	-9.42	1.70 V	351	26.39	38.19
4	2483.50	53.34 AV	54.00	-0.66	1.70 V	351	15.15	38.19

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 4	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	59.63 PK	74.00	-14.37	1.52 H	231	21.64	37.99
2	2390.00	47.37 AV	54.00	-6.63	1.52 H	231	9.38	37.99
3	*2427.00	104.33 PK			1.52 H	231	66.25	38.08
4	*2427.00	94.93 AV			1.52 H	231	56.85	38.08

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	67.21 PK	74.00	-6.79	1.42 V	322	29.22	37.99
2	2390.00	53.26 AV	54.00	-0.74	1.42 V	322	15.27	37.99
3	*2427.00	110.78 PK			1.42 V	322	72.70	38.08
4	*2427.00	102.04 AV			1.42 V	322	63.96	38.08

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 8	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	#2447.00	99.13 PK			1.34 V	157	61.03	38.10
2	#2447.00	90.63 AV			1.34 V	157	52.53	38.10
3	2483.50	56.15 PK	74.00	-17.85	1.34 V	157	17.96	38.19
4	2483.50	48.88 AV	54.00	-5.12	1.34 V	157	10.69	38.19

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	#2447.00	108.22 PK			1.26 V	150	70.12	38.10
2	#2447.00	99.71 AV			1.26 V	150	61.61	38.10
3	2483.50	66.32 PK	74.00	-7.68	1.26 V	150	28.13	38.19
4	2483.50	53.89 AV	54.00	-0.11	1.26 V	150	15.70	38.19

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. " # ": The radiated frequency is out of the restricted band.



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 04,16	May 03,17
Power Sensor	Keysight	U2021XA	MY55060018	May 04,16	May 03,17
Digital Multimeter	FLUKE	15B	A1220010DG	Oct. 13, 16	Oct.12, 17
Humid & Temp Programmable Tester	Haida	HD-2257	110807201	Sep.05,16	Sep. 04,17
Oscilloscope	Agilent	DSO9254A	MY51260160	Nov. 04,16	Nov. 03,17
Signal Analyzer	Rohde & Schwarz	FSV7	102331	Nov. 04,16	Nov. 03,17
Signal Generator	Agilent	N5183A	MY50140980	Nov. 04,16	Nov. 03,17
Agile Signal Generator	Agilent	8645A	Agilent	Aug.08, 16	Aug.07, 17
ESG Vector Signal Generator	Agilent	E4438C	MY49072505	Apr. 22, 16	Apr. 21, 17
BLUETOOTH TESTER	Rohde&Schwarz	CBT32	100811	Aug.08, 16	Aug.07, 17

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

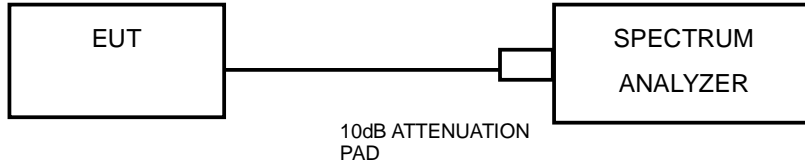
1. Set resolution bandwidth (RBW) = 100KHz
2. Set the video bandwidth (VBW) ≥ 3 x RBW, Detector = Peak.
3. Trace mode = max hold.
4. Sweep = auto couple.
5. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that 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	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	9.08	10.04	0.5	PASS
6	2437	9.59	10.07	0.5	PASS
11	2462	9.11	9.58	0.5	PASS

802.11g

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	16.11	16.32	0.5	PASS
6	2437	16.35	16.37	0.5	PASS
11	2462	16.33	16.36	0.5	PASS



802.11n 20MHz

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	17.58	17.61	0.5	PASS
6	2437	17.63	17.60	0.5	PASS
11	2462	17.58	16.92	0.5	PASS

802.11n 40MHz

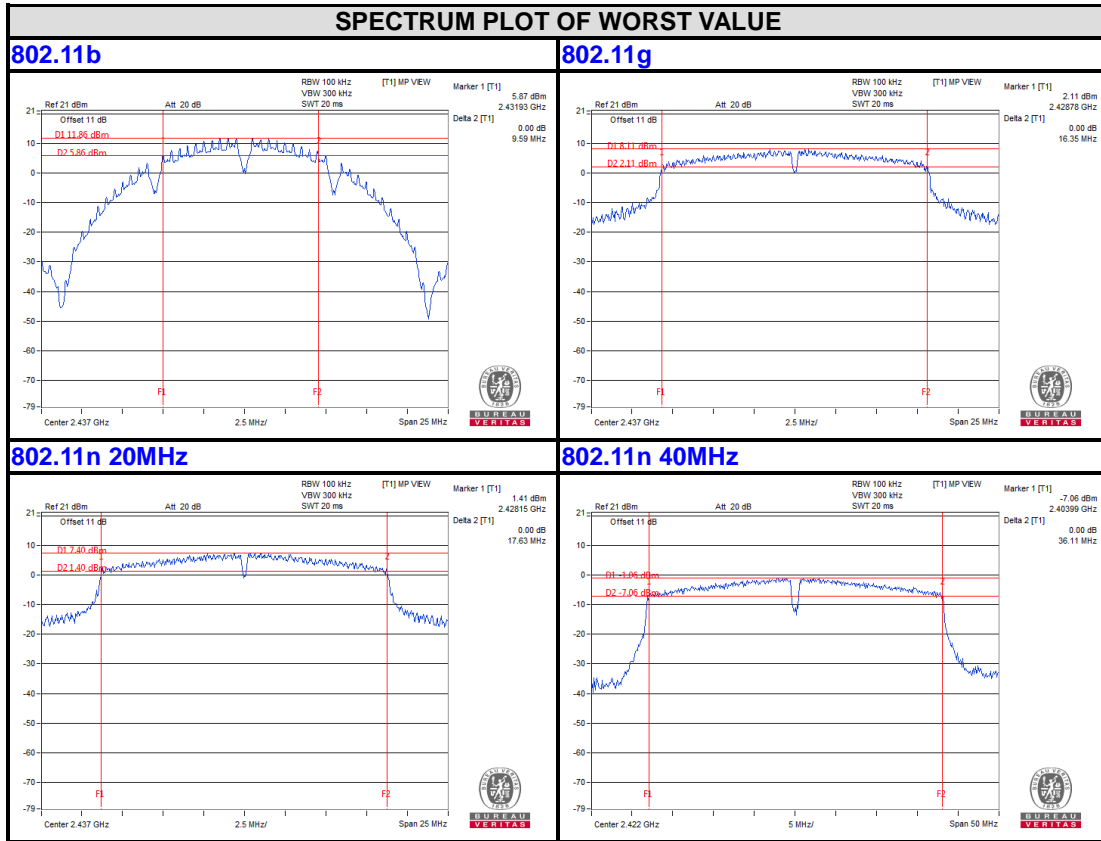
CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
3	2422	36.11	34.75	0.5	PASS
6	2437	35.68	35.59	0.5	PASS
9	2452	35.95	35.70	0.5	PASS



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CHAIN 0



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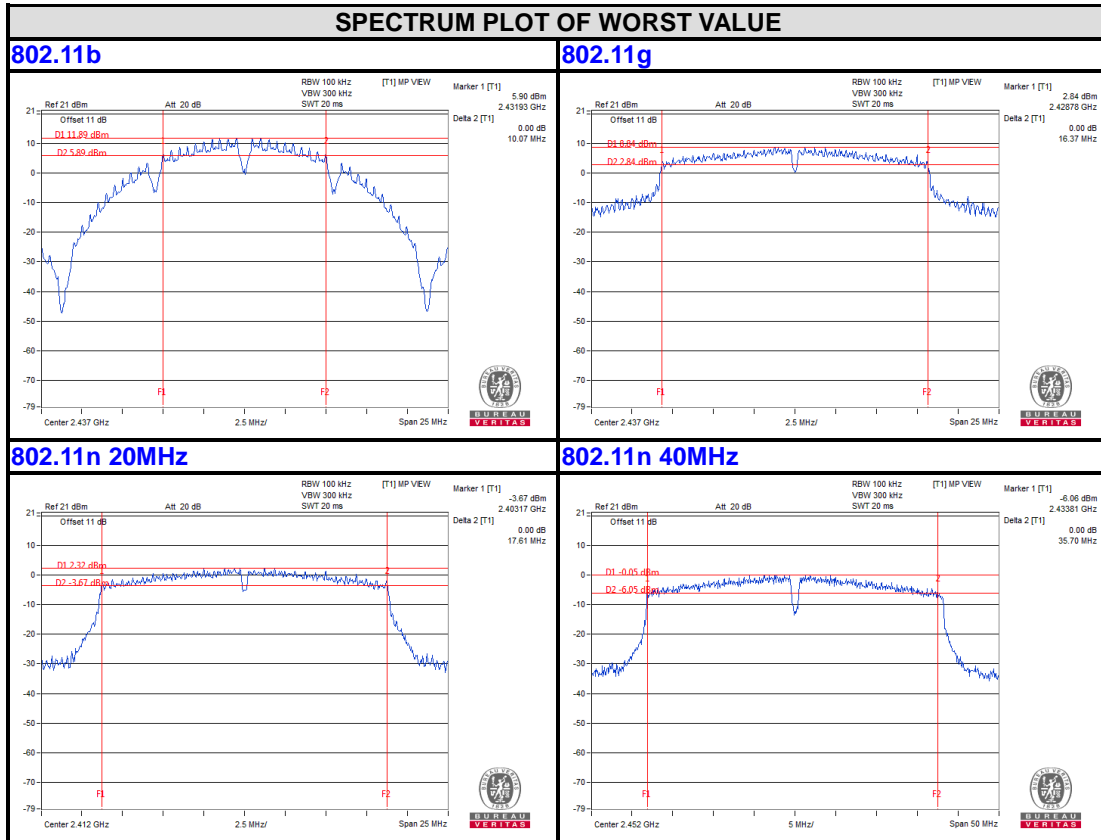
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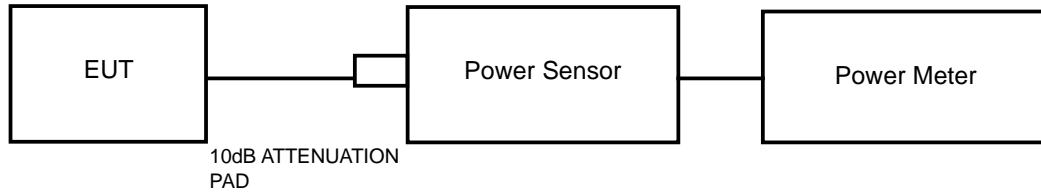


4.4 CONDUCTED OUTPUT POWER

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 04,16	May 03,17
Power Sensor	Keysight	U2021XA	MY55060018	May 04,16	May 03,17
Digital Multimeter	FLUKE	15B	A1220010DG	Oct. 13, 16	Oct.12, 17
Humid & Temp Programmable Tester	Haida	HD-2257	110807201	Sep.05,16	Sep. 04,17
Oscilloscope	Agilent	DSO9254A	MY51260160	Nov. 04,16	Nov. 03,17
Signal Analyzer	Rohde & Schwarz	FSV7	102331	Nov. 04,16	Nov. 03,17
Signal Generator	Agilent	N5183A	MY50140980	Nov. 04,16	Nov. 03,17
Agile Signal Generator	Agilent	8645A	Agilent	Aug.08, 16	Aug.07, 17
ESG Vector Signal Generator	Agilent	E4438C	MY49072505	Apr. 22, 16	Apr. 21, 17
BLUETOOTH TESTER	Rohde&Schwarz	CBT32	100811	Aug.08, 16	Aug.07, 17

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. An Average power meter was used to read the response of the Average power sensor. Record the Average 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

802.11b

CHAN.	FREQ (MHz)	AVG. POWER (dBm)		AVG. POWER (mW)		TOTAL POWER (mW)	TOTAL POWER (dBm)	AVG. POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 0	CHAIN 1				
1	2412	18.24	18.27	66.681	67.143	133.824	21.27	30	PASS
6	2437	20.57	20.43	114.025	110.408	224.433	23.51	30	PASS
11	2462	17.51	17.34	56.364	54.200	110.564	20.44	30	PASS

802.11g

CHAN.	FREQ (MHz)	AVG. POWER (dBm)		AVG. POWER (mW)		TOTAL POWER (mW)	TOTAL POWER (dBm)	AVG. POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 0	CHAIN 1				
1	2412	15.58	15.43	36.141	34.914	71.055	18.52	30	PASS
6	2437	20.59	20.37	114.551	108.893	223.444	23.49	30	PASS
11	2462	16.09	15.94	40.644	39.264	79.908	19.03	30	PASS



802.11n 20MHz

CHAN.	FREQ (MHz)	AVG. POWER (dBm)		AVG. POWER (mW)		TOTAL POWER (mW)	TOTAL POWER (dBm)	AVG. POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 0	CHAIN 1				
1	2412	15.35	15.26	34.277	33.574	67.851	18.32	30	PASS
6	2437	20.38	20.29	109.144	106.905	216.049	23.35	30	PASS
11	2462	14.96	15.04	31.333	31.915	63.248	18.01	30	PASS

802.11n 40MHz

CHAN.	FREQ (MHz)	AVG. POWER (dBm)		AVG. POWER (mW)		TOTAL POWER (mW)	TOTAL POWER (dBm)	AVG. POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 0	CHAIN 1				
3	2422	12.86	12.61	19.32	18.239	37.559	15.75	30	PASS
6	2437	17.21	17.04	52.602	50.582	103.184	20.14	30	PASS
9	2452	12.47	12.43	17.66	17.498	35.158	15.46	30	PASS

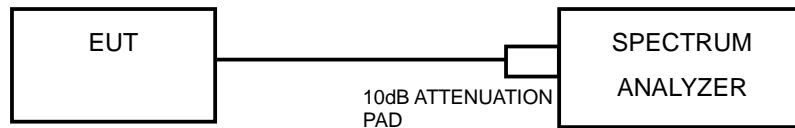


4.5 POWER SPECTRAL DENSITY MEASUREMENT

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 OBW.
- c) Set RBW to: 10 kHz.
- d) Set VBW $\geq 3 \times$ RBW.
- e) Detector = peak
- f) Ensure that the number of measurement points in the sweep $\geq 2 \times$ 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

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=2) dB	TOTAL PSD (dBm)	Limit (dBm)	PASS /FAIL
0	1	2412	-3.19	3.01	-0.18	8.00	PASS
	6	2437	-0.60	3.01	2.41	8.00	PASS
	11	2462	-3.30	3.01	-0.29	8.00	PASS
1	1	2412	-3.44	3.01	-0.43	8.00	PASS
	6	2437	-0.51	3.01	2.50	8.00	PASS
	11	2462	-3.60	3.01	-0.59	8.00	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.
- Directional gain = 2dBi+10log(2)=5.01,so the limit about power density no need to reduce .

802.11g

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=2) dB	TOTAL PSD (dBm)	Limit (dBm)	PASS /FAIL
0	1	2412	-5.54	3.01	-2.53	8.00	PASS
	6	2437	-1.91	3.01	1.10	8.00	PASS
	11	2462	-5.95	3.01	-2.94	8.00	PASS
1	1	2412	-5.02	3.01	-3.01	8.00	PASS
	6	2437	-1.86	3.01	1.15	8.00	PASS
	11	2462	-5.92	3.01	-2.91	8.00	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.
- Directional gain = 2dBi+10log(2)=5.01,so the limit about power density no need to reduce .



802.11n 20MHz

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=2) dB	TOTAL PSD (dBm)	Limit (dBm)	PASS /FAIL
0	1	2412	-8.44	3.01	-5.43	8.00	PASS
	6	2437	-3.23	3.01	-0.22	8.00	PASS
	11	2462	-9.74	3.01	-6.73	8.00	PASS
1	1	2412	-9.13	3.01	-6.12	8.00	PASS
	6	2437	-3.19	3.01	0.18	8.00	PASS
	11	2462	-9.32	3.01	-6.31	8.00	PASS

NOTE:

1. 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.
2. Directional gain = 2dBi+10log(2)=5.01,so the limit about power density no need to reduce.

802.11n 40MHz

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=2) dB	TOTAL PSD (dBm)	Limit (dBm)	PASS /FAIL
0	3	2422	-15.42	3.01	-12.41	8.00	PASS
	6	2437	-13.84	3.01	-10.83	8.00	PASS
	9	2452	-15.91	3.01	-12.90	8.00	PASS
1	3	2422	-15.30	3.01	-12.29	8.00	PASS
	6	2437	-13.44	3.01	-10.43	8.00	PASS
	9	2452	-15.37	3.01	-12.36	8.00	PASS

NOTE:

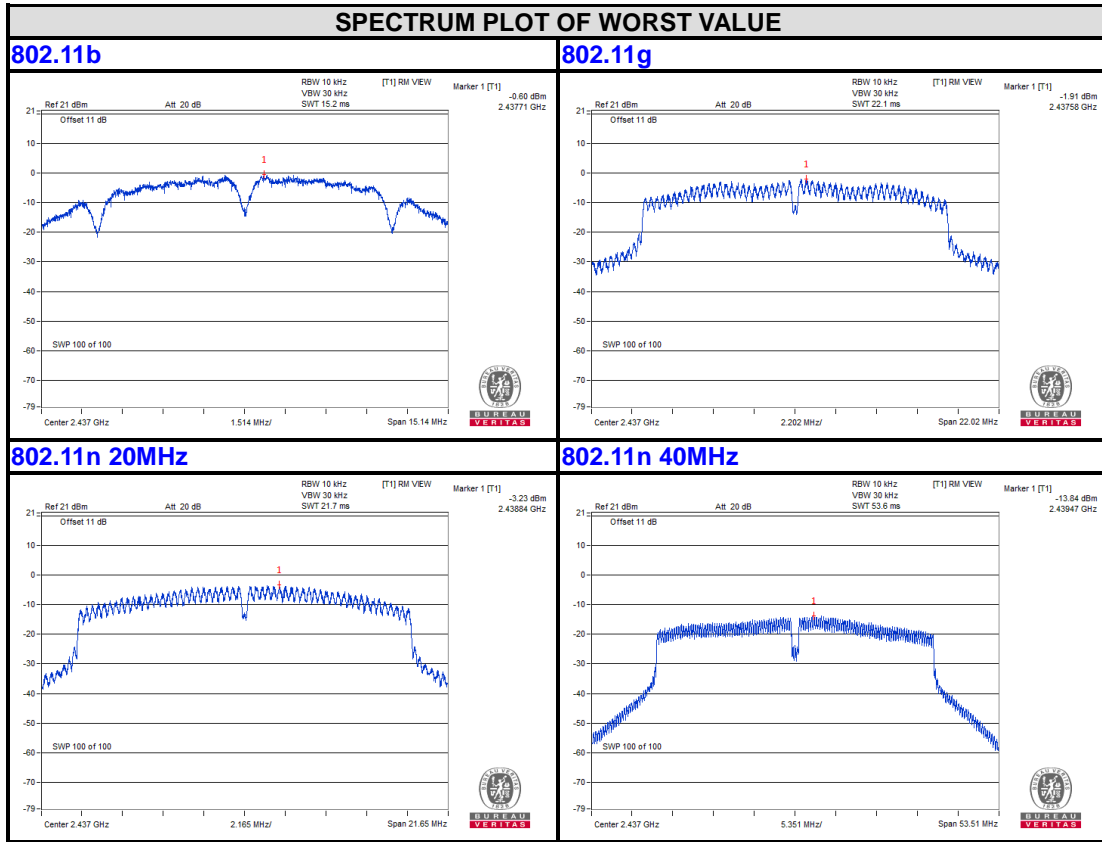
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 2dBi+10log(2)=5.01,so the limit about power density no need to reduce.



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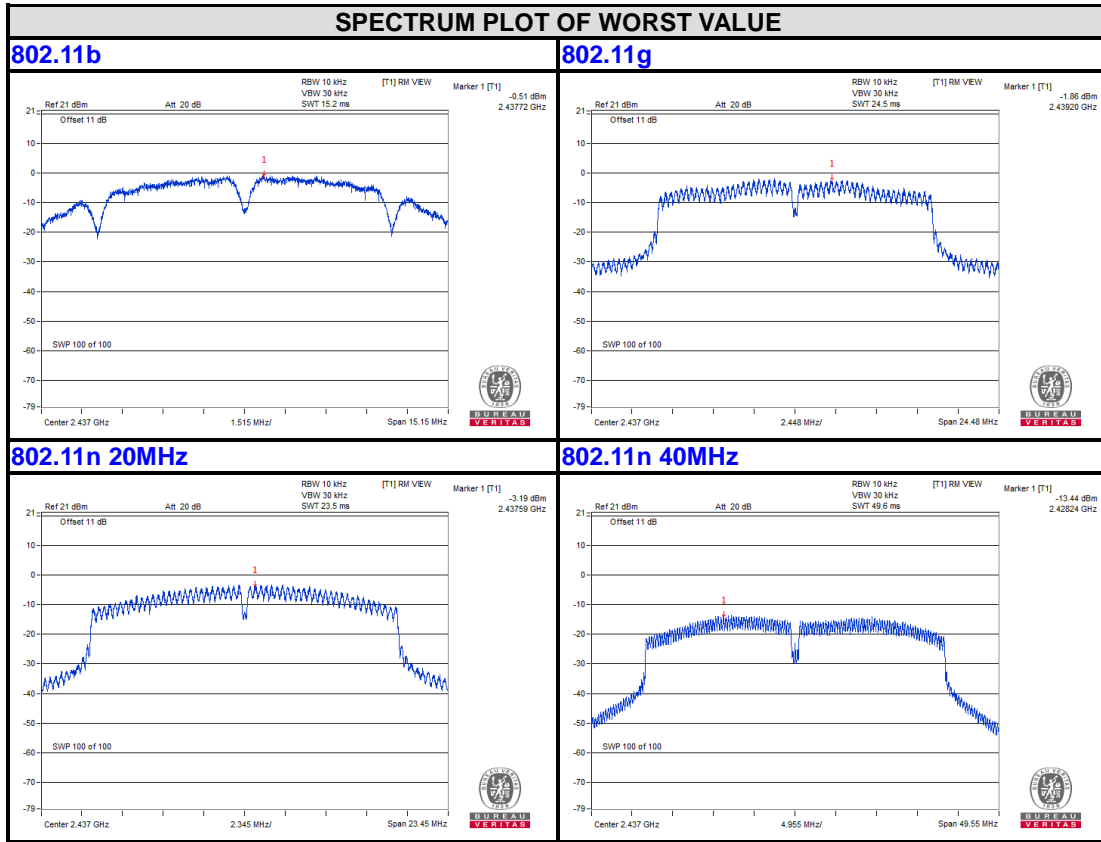




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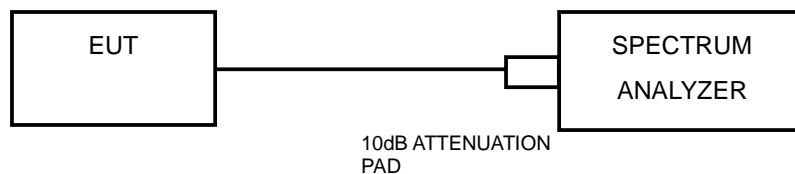


4.6 OUT OF BAND EMISSION MEASUREMENT

4.6.1 LIMITS OF OUT OF BAND EMISSION MEASUREMENT

Below -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

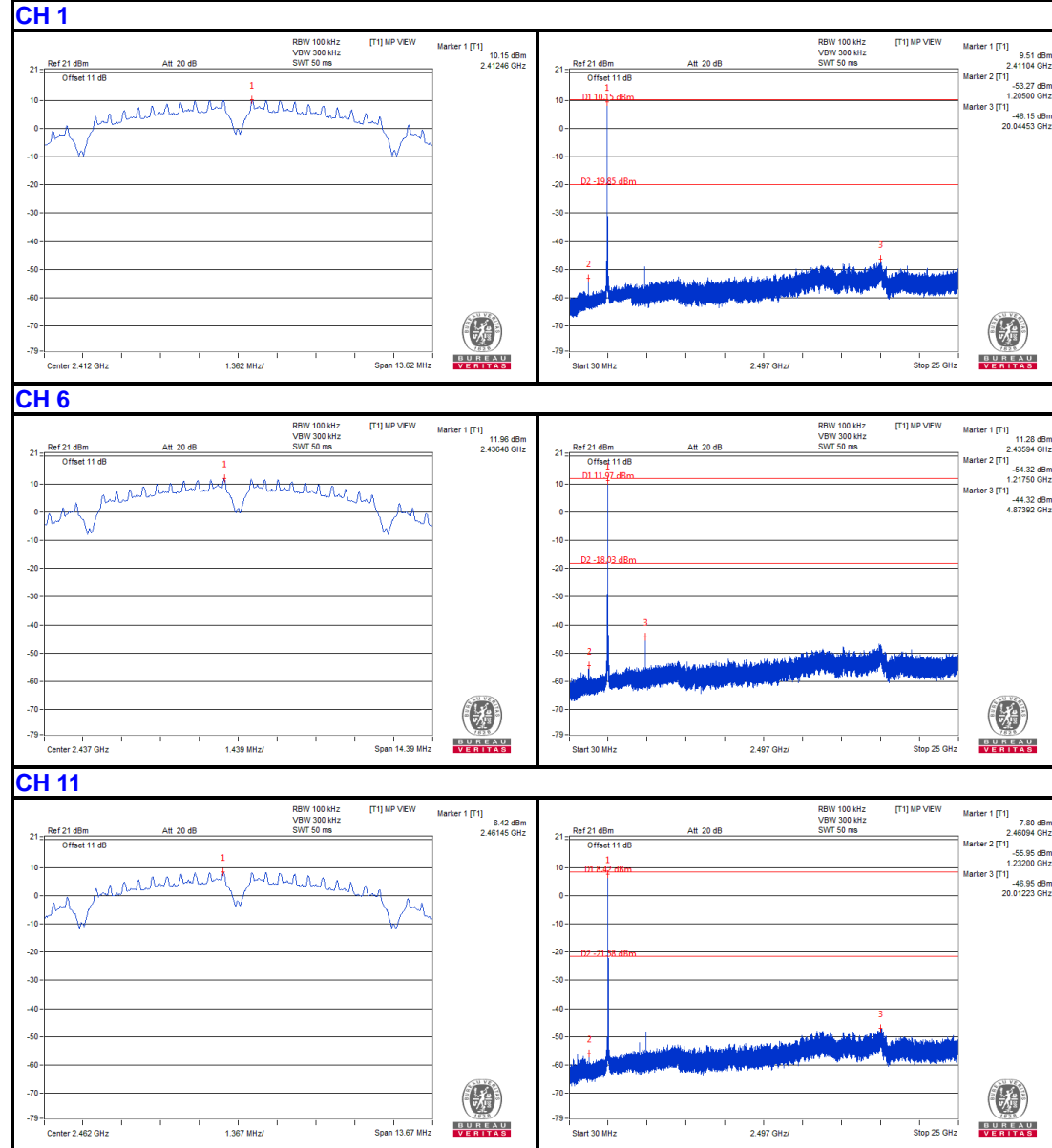
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4.6.7 TEST RESULTS

802.11b

CHAIN 0

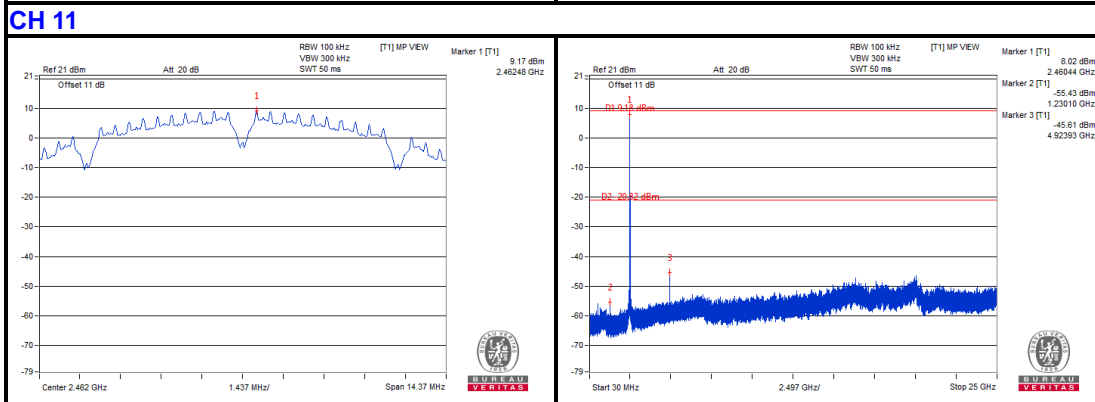
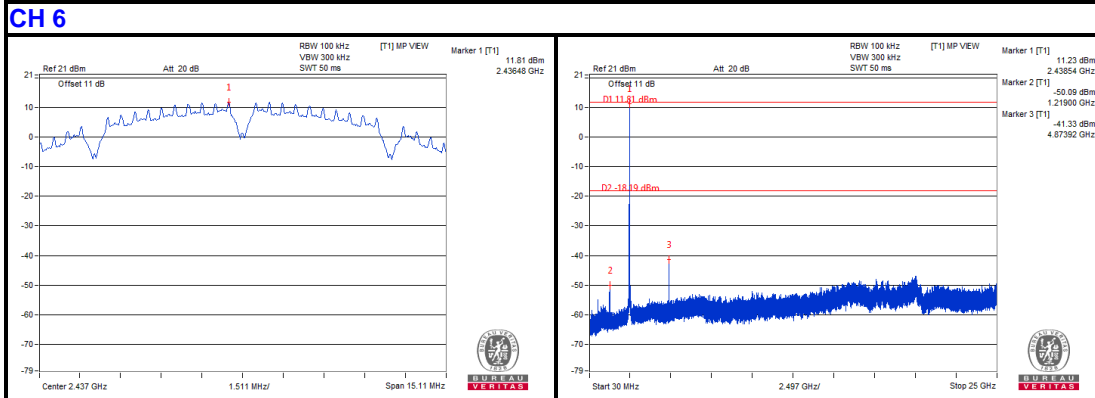
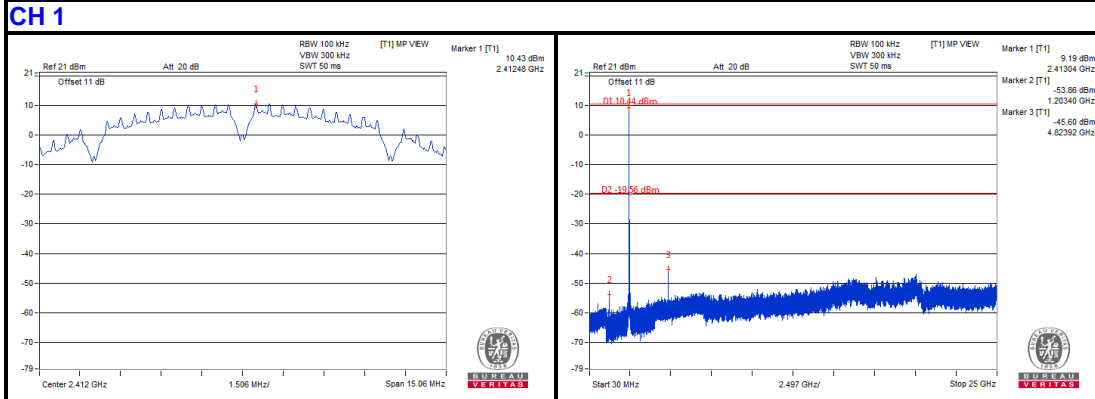




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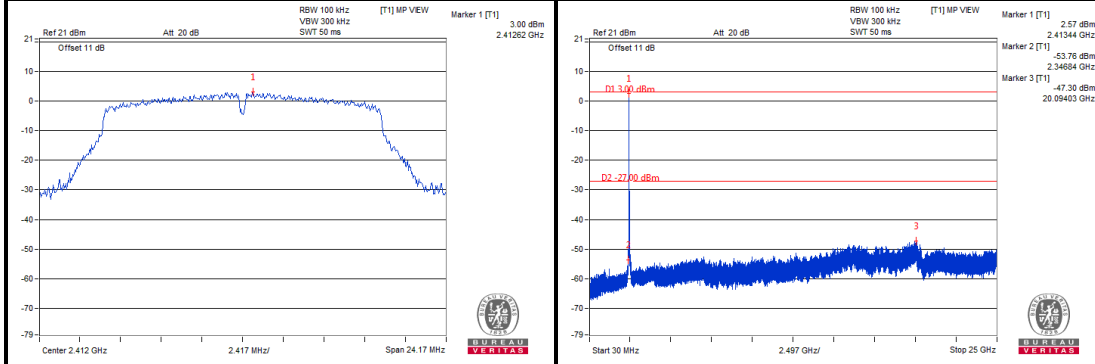
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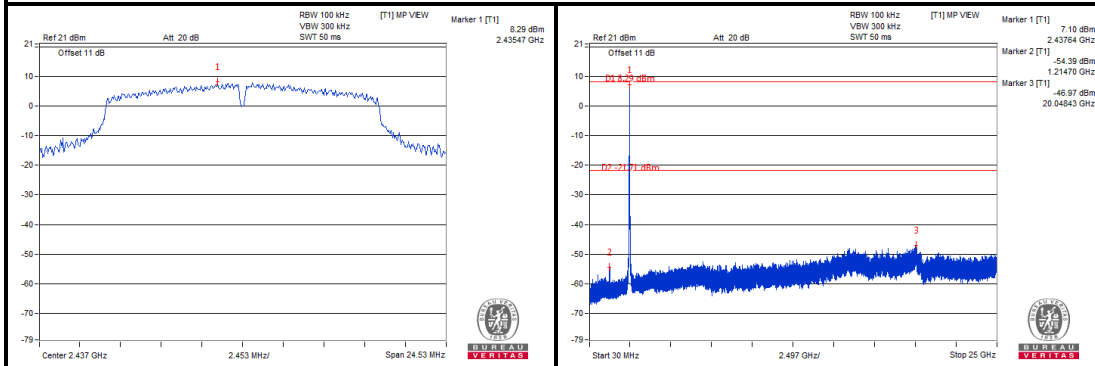
802.11g

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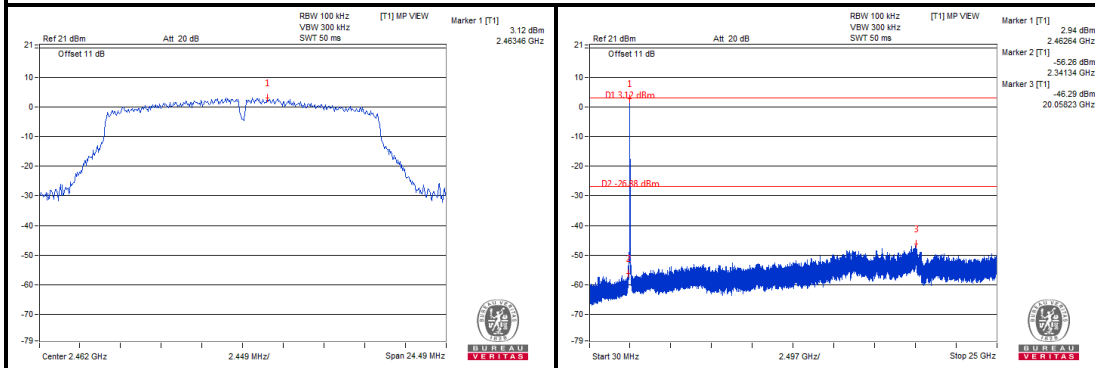
CH 1



CH 6



CH 11



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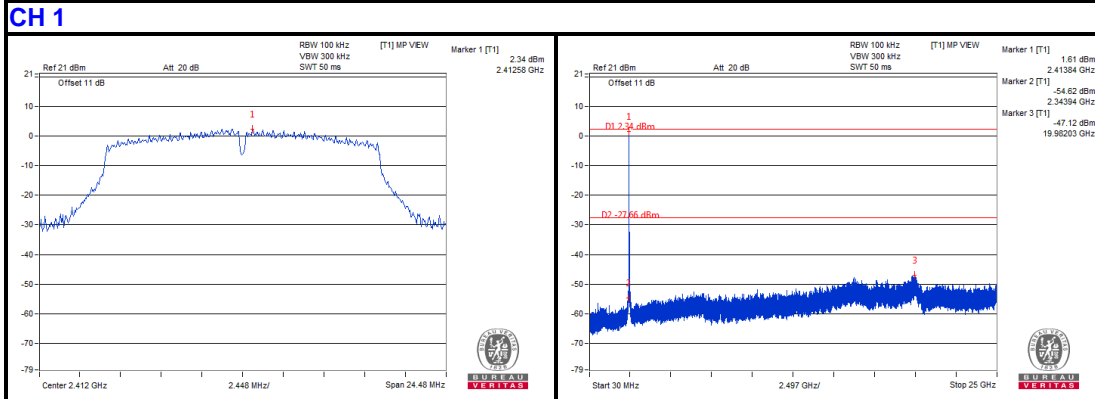
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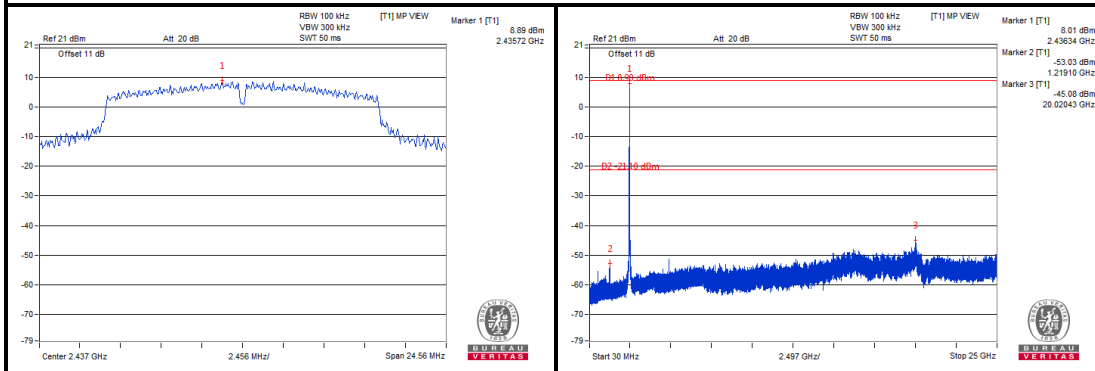
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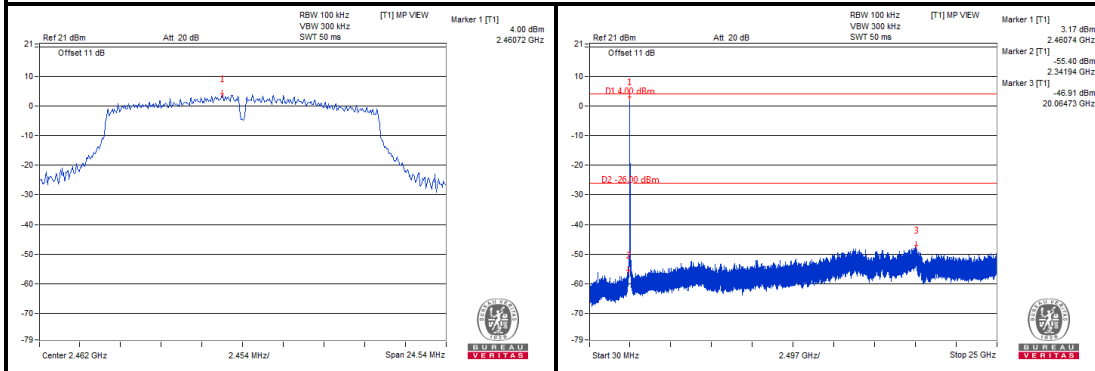
CHAIN 1



CH 6



CH 11



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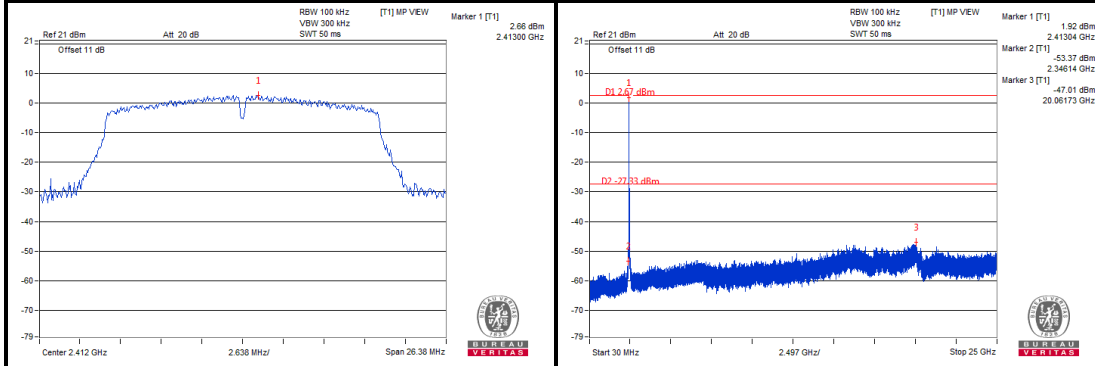
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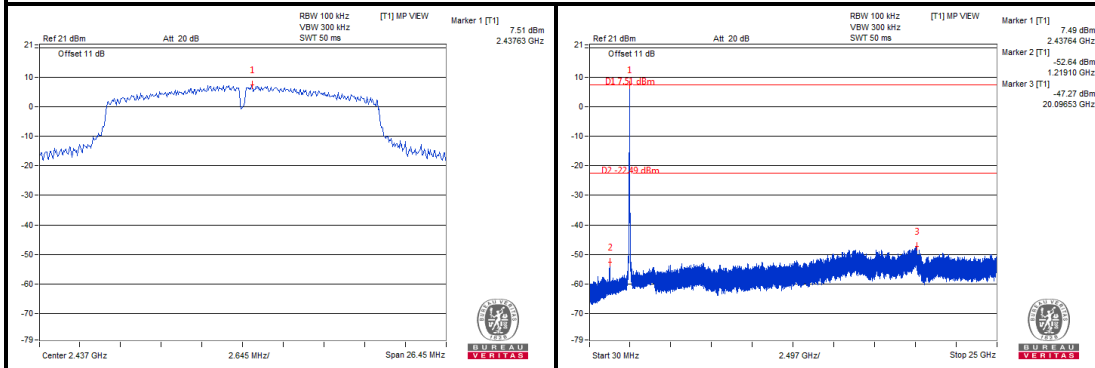
802.11n 20MHz

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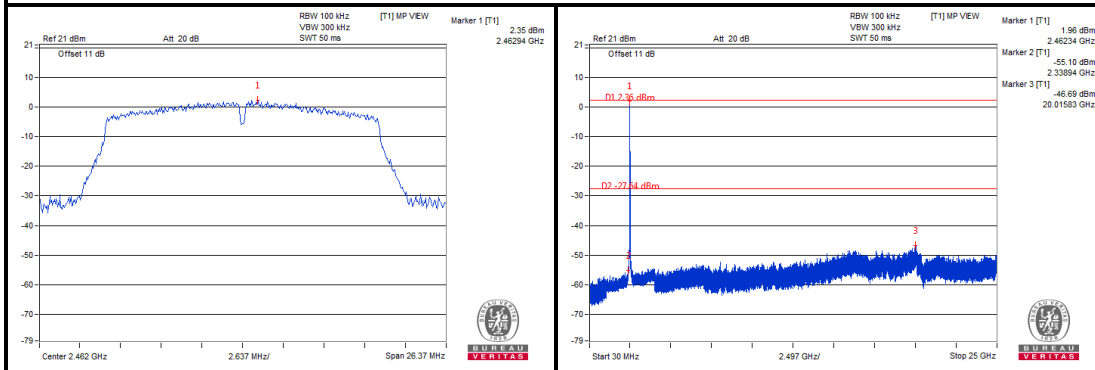
CH 1



CH 6

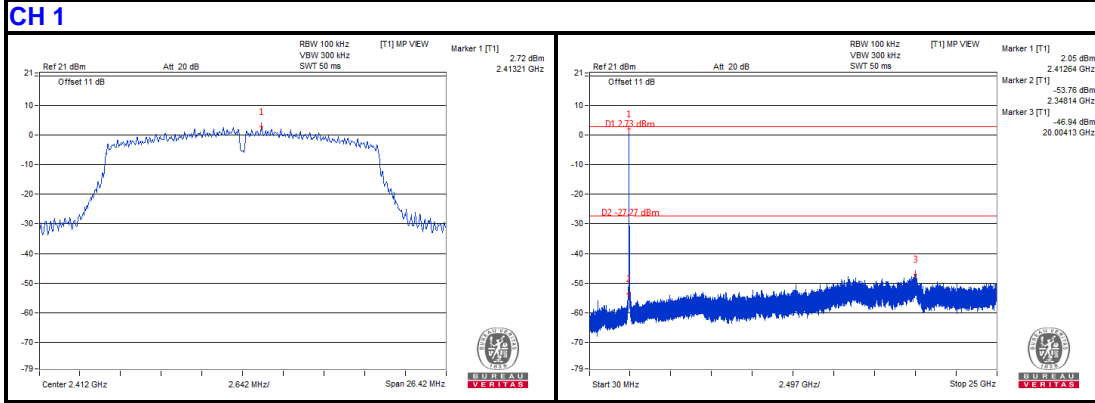


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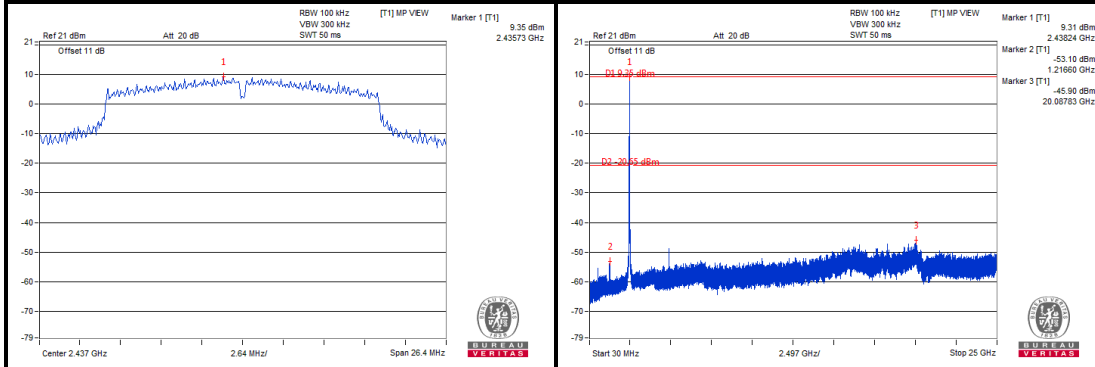




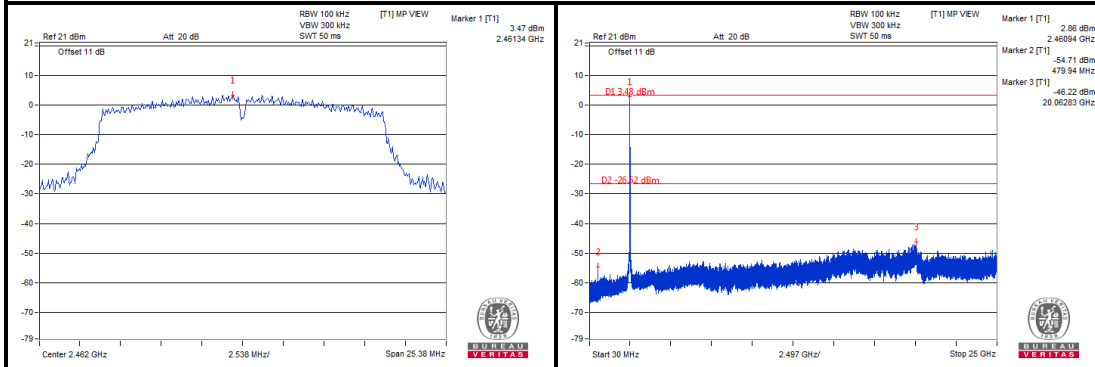
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CH 6



CH 11

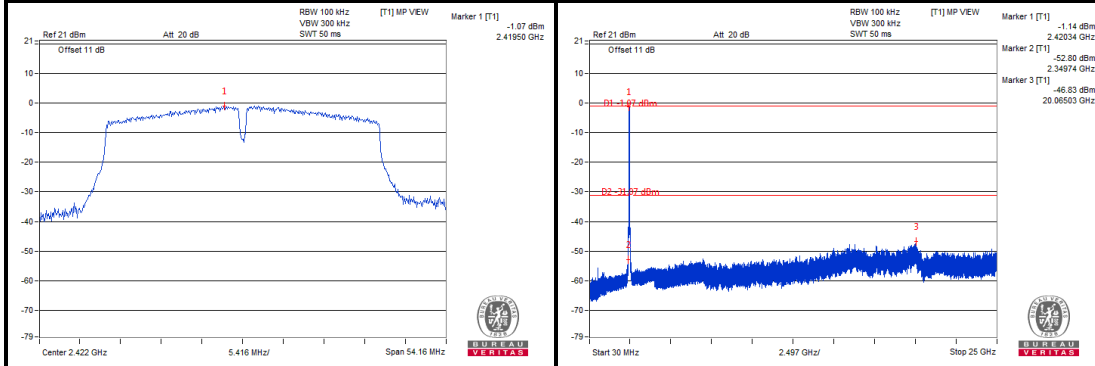




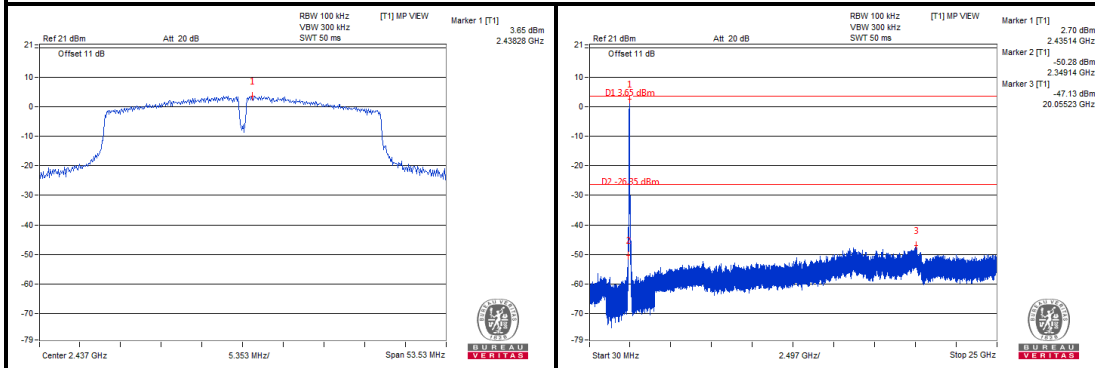
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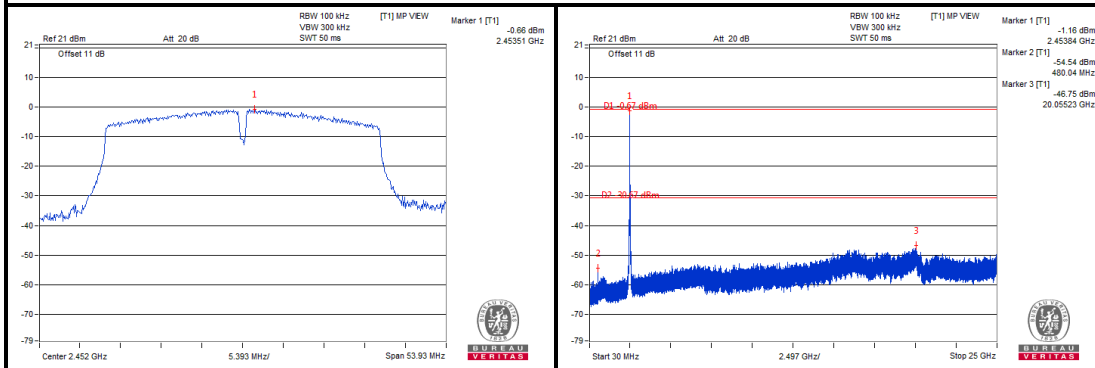
CH 3



CH 6



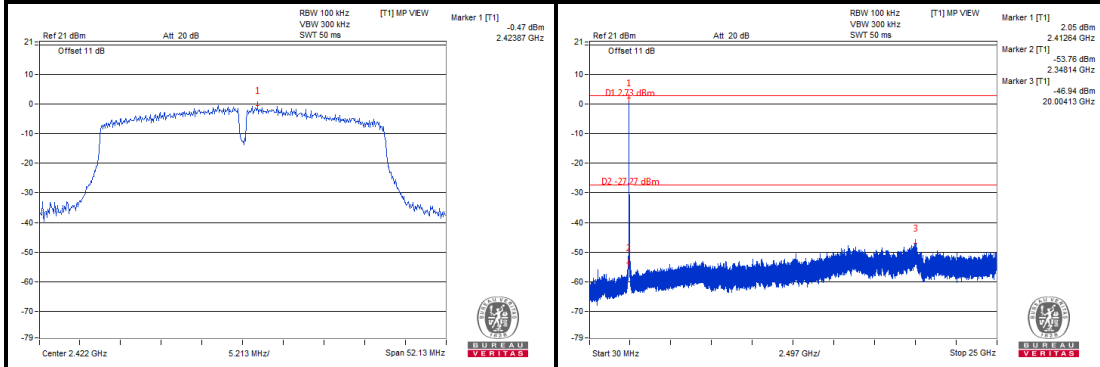
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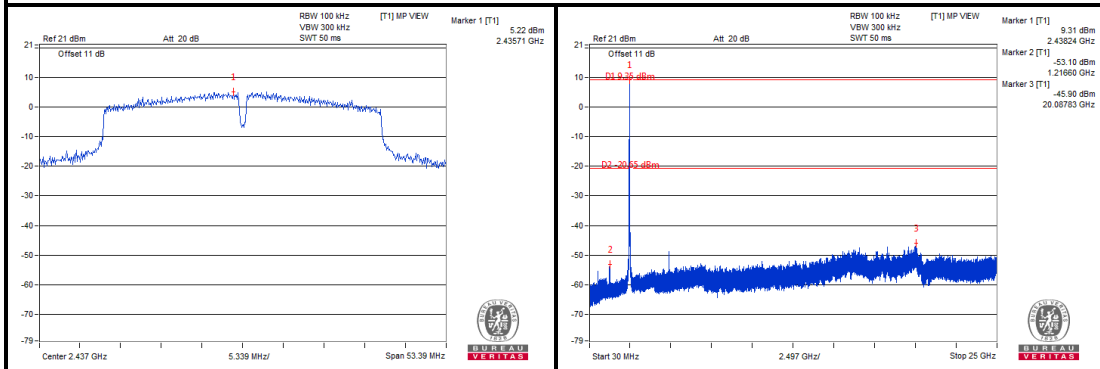


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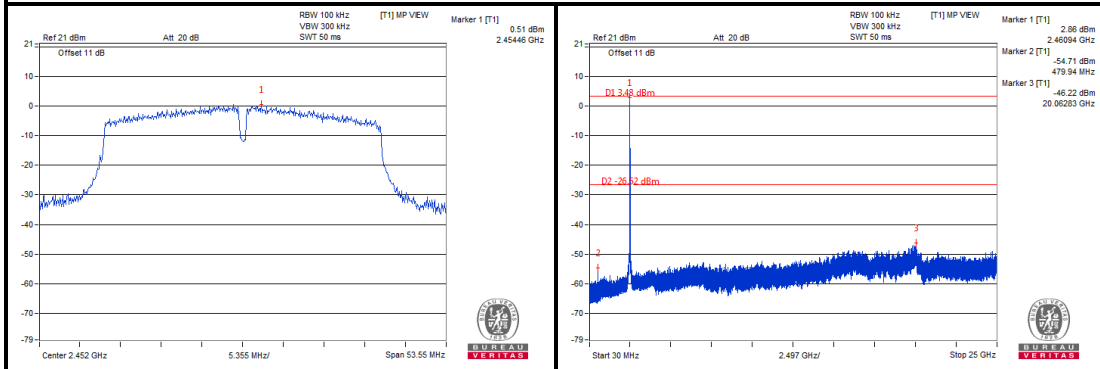
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CH 6



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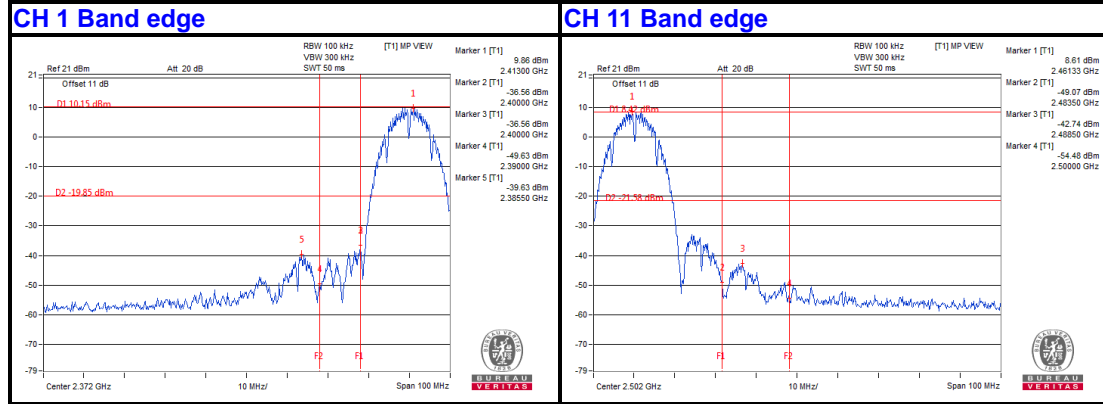


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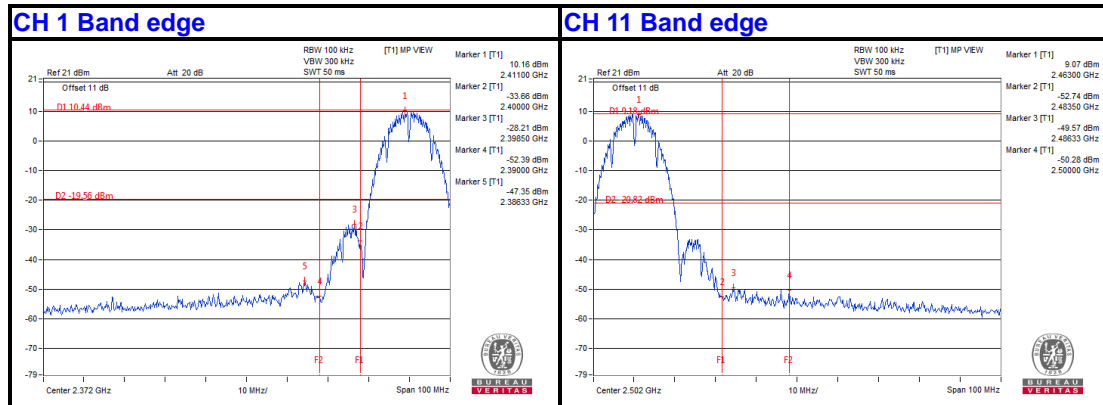
Test Report No.: RF161205N022

802.11b

CHAIN 0



CHAIN 1





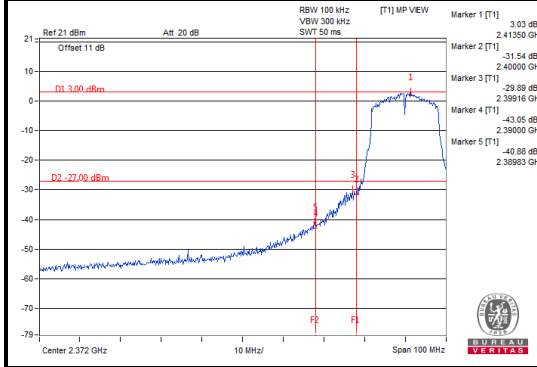
BUREAU VERITAS

Test Report No.: RF161205N022

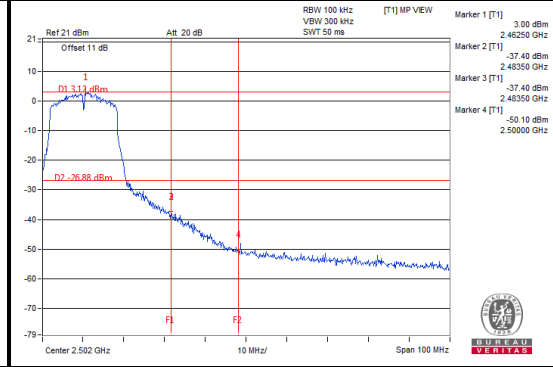
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CH 1 Band edge

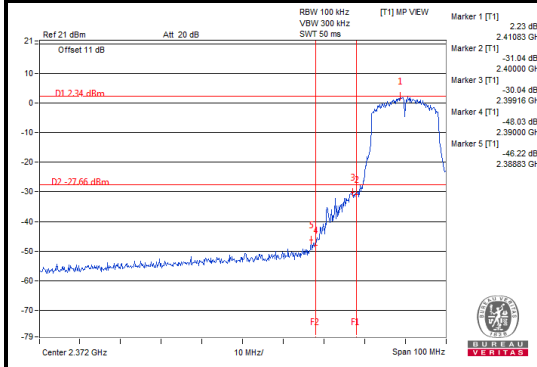


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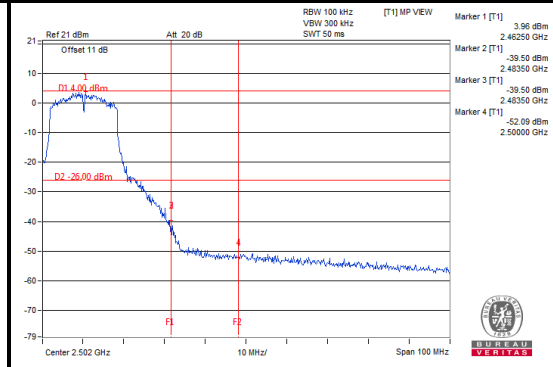


CHAIN 1

CH 1 Band edge



CH 11 Band edge



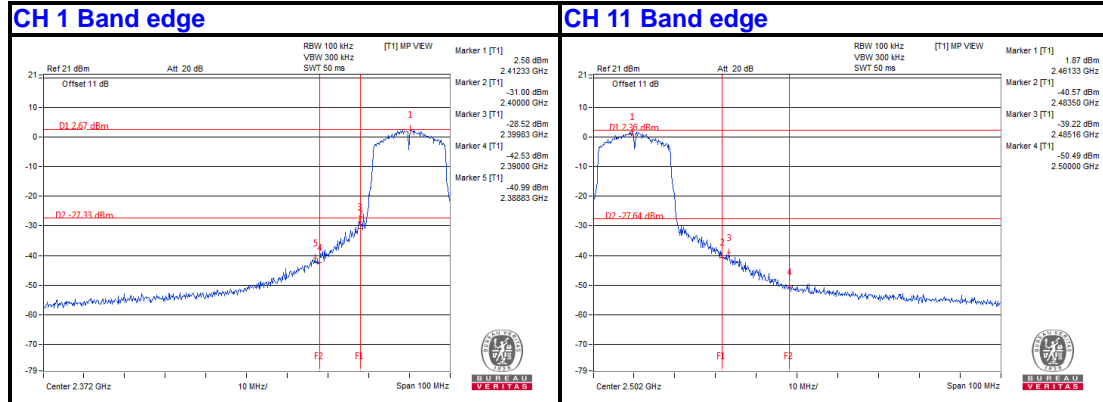


BUREAU VERITAS

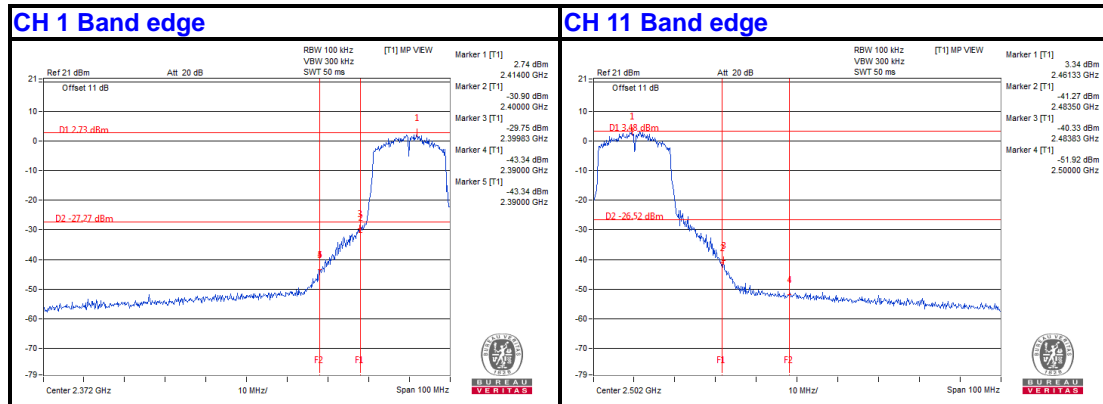
Test Report No.: RF161205N022

802.11n 20MHz

CHAIN 0



CHAIN 1



Bureau Veritas Shenzhen Co., Ltd.
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No. 34, Chenwulu Section, Guantai Rd., Houjie
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Guangdong 523942, China

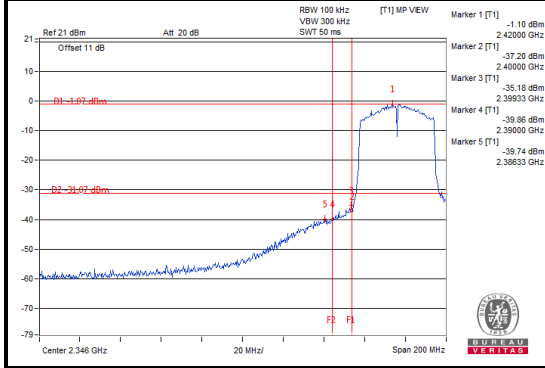
Tel: +86 769 8593 5656
Fax: +86 769 8593 1080
Email: customerservice.dg@cn.bureauveritas.com



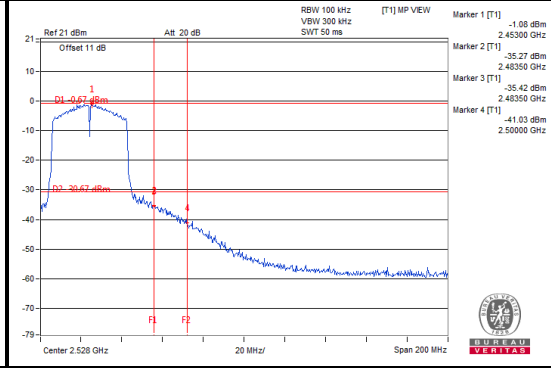
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CH 3 Band edge

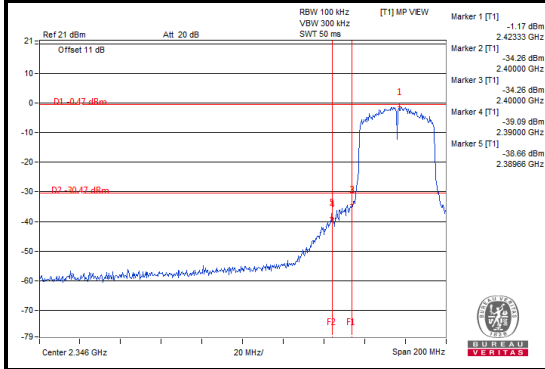


CH 9 Band edge

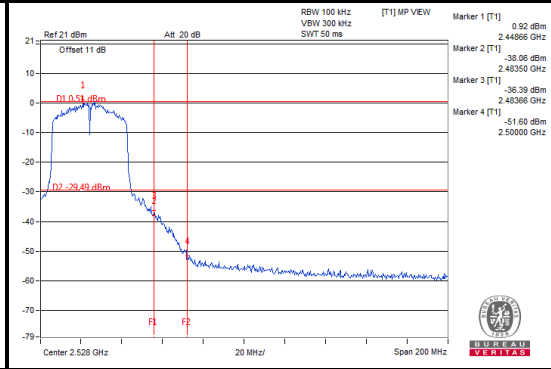


CHAIN 1

CH 3 Band edge



CH 9 Band edge





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5 PHOTOGRAPHS OF THE TEST CONFIGURATION

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



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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---