

TEST REPORT



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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	Light Bulb Wi-Fi Module
Brand Name	TP-LINK
Model	LBM100
Additional Model & Model Difference	N/A
Date of tests	Jan. 13, 2016 ~ Feb. 25, 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 Chris Chen Assistant Manager / EMC Department
	 Date: Feb. 25, 2016

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Test Report No.: RF160113N033

TABLE OF CONTENTS

RELEASE CONTROL RECORD	4
1 SUMMARY OF TEST RESULTS.....	5
2 MEASUREMENT UNCERTAINTY	5
3 GENERAL INFORMATION	6
3.1 GENERAL DESCRIPTION OF EUT.....	6
3.2 DESCRIPTION OF TEST MODES.....	7
3.2.1 CONFIGURATION OF SYSTEM UNDER TEST	8
3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL.....	8
3.2.3 DUTY CYCLE OF TEST SIGNAL.....	11
3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS.....	12
3.4 DESCRIPTION OF SUPPORT UNITS.....	12
4 TEST TYPES AND RESULTS.....	13
4.1 CONDUCTED EMISSION MEASUREMENT	13
4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT	13
4.1.2 TEST INSTRUMENTS.....	13
4.1.3 TEST PROCEDURES	14
4.1.4 DEVIATION FROM TEST STANDARD	14
4.1.5 TEST SETUP.....	15
4.1.6 EUT OPERATING CONDITIONS	15
4.1.7 TEST RESULTS	16
4.2 RADIATED EMISSION MEASUREMENT	18
4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT	18
4.2.2 TEST INSTRUMENTS.....	19
4.2.3 TEST PROCEDURES	20
4.2.4 DEVIATION FROM TEST STANDARD	20
4.2.5 TEST SETUP.....	21
4.2.6 EUT OPERATING CONDITIONS	21
4.2.7 TEST RESULTS	22
4.3 6DB BANDWIDTH MEASUREMENT.....	36
4.3.1 LIMITS OF 6DB BANDWIDTH MEASUREMENT	36
4.3.2 TEST INSTRUMENTS.....	36
4.3.3 TEST PROCEDURE.....	36
4.3.4 DEVIATION FROM TEST STANDARD	36
4.3.5 TEST SETUP.....	37
4.3.6 EUT OPERATING CONDITIONS	37



4.3.7	TEST RESULTS	38
4.4	CONDUCTED OUTPUT POWER.....	42
4.4.1	LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT	42
4.4.2	TEST SETUP.....	42
4.4.3	TEST INSTRUMENTS.....	42
4.4.4	TEST PROCEDURES	43
4.4.5	DEVIATION FROM TEST STANDARD	43
4.4.6	EUT OPERATING CONDITIONS	43
4.4.7	TEST RESULTS	44
4.5	POWER SPECTRAL DENSITY MEASUREMENT	45
4.5.1	LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT	45
4.5.2	TEST SETUP.....	45
4.5.3	TEST INSTRUMENTS.....	45
4.5.4	TEST PROCEDURE.....	45
4.5.5	DEVIATION FROM TEST STANDARD	45
4.5.6	EUT OPERATING CONDITION	46
4.5.7	TEST RESULTS	46
4.6	OUT OF BAND EMISSION MEASUREMENT	50
4.6.1	LIMITS OF OUT OF BAND EMISSION MEASUREMENT	50
4.6.2	TEST SETUP.....	50
4.6.3	TEST INSTRUMENTS.....	50
4.6.4	TEST PROCEDURE.....	50
4.6.5	DEVIATION FROM TEST STANDARD	51
4.6.6	EUT OPERATING CONDITION	51
4.6.7	TEST RESULTS	52
5	PHOTOGRAPHS OF THE TEST CONFIGURATION.....	58
6	APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB	59



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Test Report No.: RF160113N033

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF160113N033	Original release	Feb. 25, 2016



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	3.67dB
	1GHz ~ 18GHz	4.84dB
	18GHz ~ 40GHz	4.84dB

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	Light Bulb Wi-Fi Module
MODEL NO.	LBM100
FCC ID	TE7LBM100
NOMINAL VOLTAGE	DC 5V From USB
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	21.66dBm (Maximum Average Power)
ANTENNA TYPE	Monopole Antenna; 2.37gain
I/O PORTS	Refer to user's manual
CABLE SUPPLIED	USB Cable: Shielded, Detachable, 1.20m

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 (20MHz)	1TX/1RX
802.11n (40MHz)	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.: 160113N033) 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 USB 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

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

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 + USB

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	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, 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, 6, 11	CCK	DBPSK	1.0	X
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0	X
802.11n HT20	1 to 11	1, 6, 11	OFDM	BPSK	6.5	X
802.11n HT40	3 to 9	3, 6, 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	CCK	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	CCK	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, 51%RH	DC 5V From USB	Eric Fang
RE≥1G	25deg. C, 51%RH	DC 5V From USB	Eric Fang
PLC	20deg. C, 56%RH	DC 5V From USB	Harry Li
APCM	20deg. C, 55%RH	DC 5V From USB	Harry Li



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Test Report No.: RF160113N033

3.2.3 Duty cycle of Test Signal

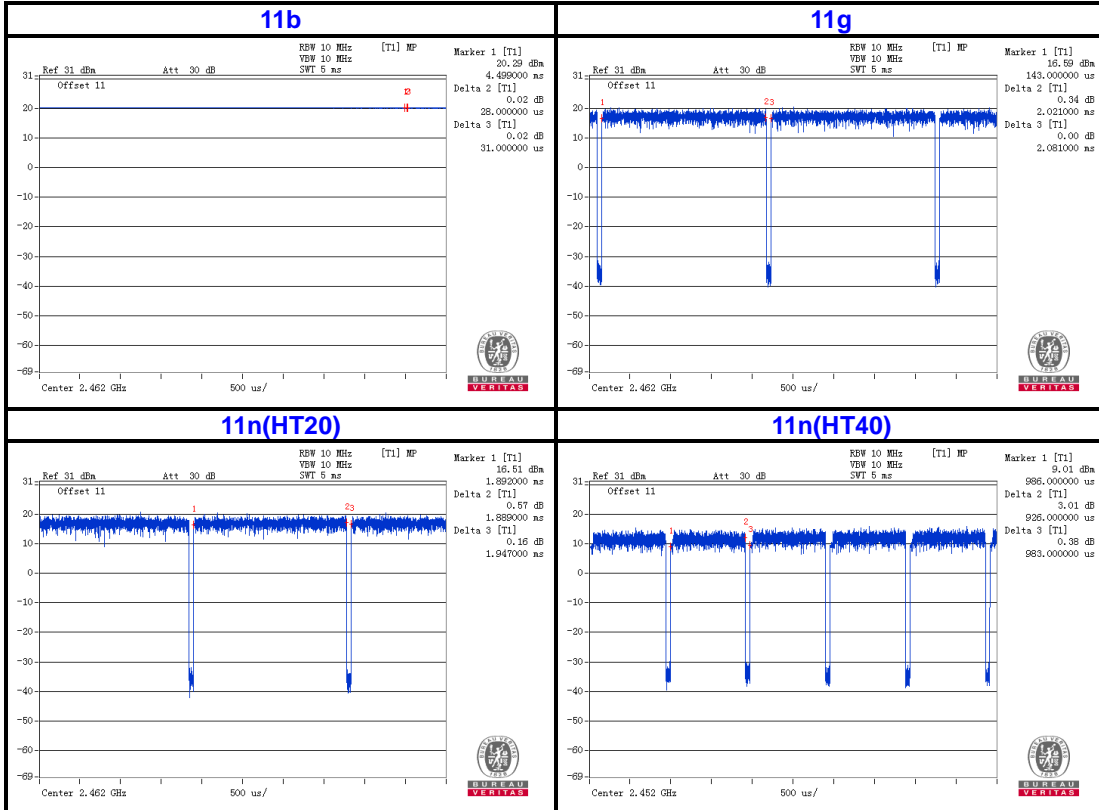
802.11b: Duty cycle of test signal is >98% · duty factor is not required.

802.11g, 802.11n (HT20), 802.11n (HT40): Duty cycle of test signal is <98%, duty factor shall be considered.

802.11g: Duty cycle = 2.021/2.081 = 0.971, Duty factor = $10 \cdot \log(1/0.971) = 0.127$

802.11n (HT20): Duty cycle = 1.889/1.947 = 0.970, Duty factor = $10 \cdot \log(1/0.970) = 0.131$

802.11n (HT40): Duty cycle = 0.926/0.983 = 0.942, Duty factor = $10 \cdot \log(1/0.942) = 0.259$



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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 v03r04**
- 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(VoC). The test report has been issued separately.

3.4 DESCRIPTION OF SUPPORT UNITS

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

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Notebook	DELL	A5049	N/A	N/A
2	Printer	HP	hp LaserJet 1300	CNSJF75989	N/A
3	Mouse	DELL	S5045	N/A	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	Network cable: unshielded, detachable, 4.5m
2	USB Line: shielded, Detachable 1.2m



4 TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

- NOTE:**
1. The lower limit shall apply at the transition frequencies.
 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.
 3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESCI	100962	Mar. 05,15	Mar. 04,16
Artificial Mains Network	Rohde&Schwarz	ENV216	101173	Apr. 25,15	Apr. 24,16
Artificial Mains Network	Rohde&Schwarz	ESH3-Z5	100317	Apr. 25,15	Apr. 24,16
Voltage probe	SCHWARZBEC K	TK 9421	TK 9421-176	Jan. 08,16	Jan. 07,17
Test software	ADT	ADT_Cond_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.

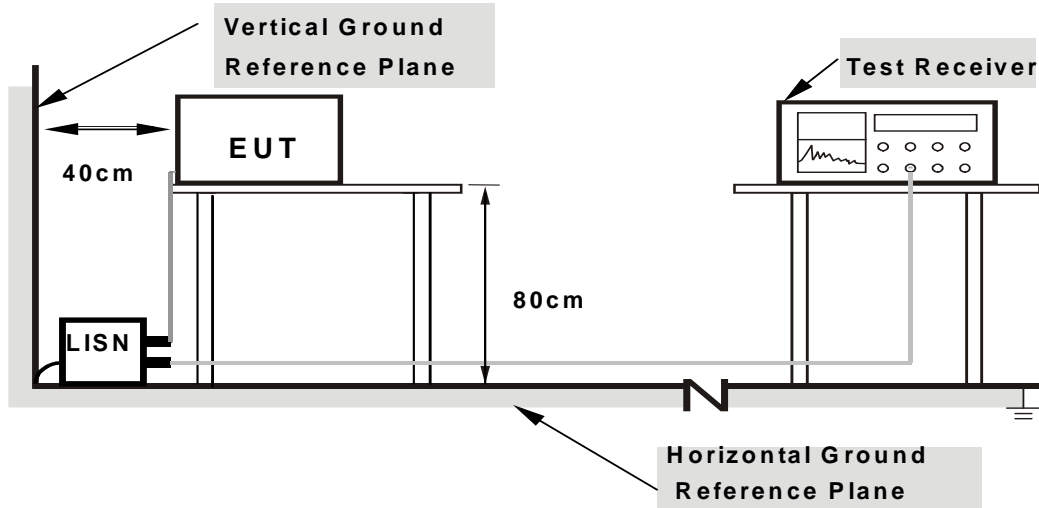
NOTE: All modes of operation were investigated and the worst-case emissions are reported.

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.



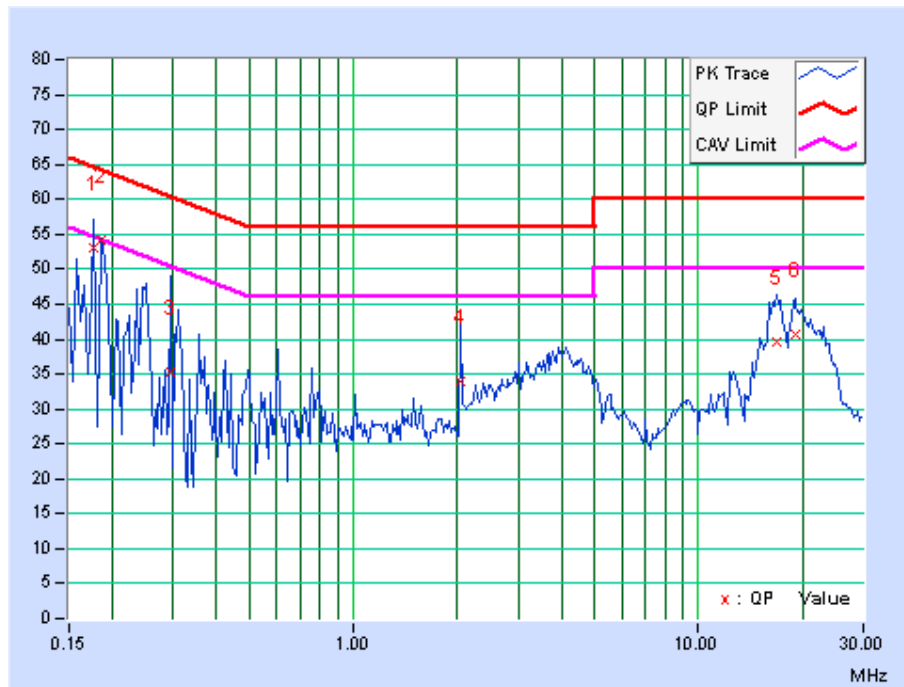
4.1.7 TEST RESULTS

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	0.17734	9.73	43.43	26.89	53.16	36.62	64.61	54.61	-11.45	-17.99
2	0.18516	9.72	44.44	31.33	54.16	41.05	64.25	54.25	-10.09	-13.20
3	0.29453	9.73	25.61	6.89	35.34	16.62	60.40	50.40	-25.06	-33.78
4	2.03906	9.75	24.17	8.37	33.92	18.12	56.00	46.00	-22.08	-27.88
5	16.81641	9.91	29.66	18.88	39.57	28.79	60.00	50.00	-20.43	-21.21
6	19.06641	9.99	30.64	20.01	40.63	30.00	60.00	50.00	-19.37	-20.00

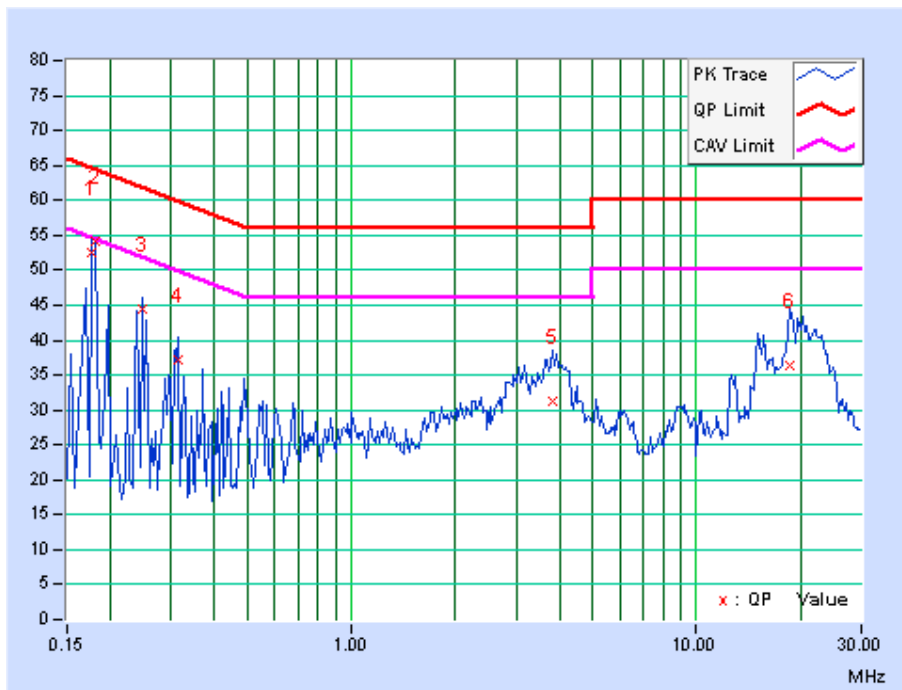
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = 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	0.17734	9.48	43.08	25.97	52.56	35.45	64.61	54.61	-12.05	-19.16
2	0.18125	9.48	44.62	30.47	54.10	39.95	64.43	54.43	-10.33	-14.48
3	0.24766	9.48	34.99	19.04	44.47	28.52	61.84	51.84	-17.37	-23.32
4	0.31406	9.47	27.79	12.19	37.26	21.66	59.86	49.86	-22.60	-28.20
5	3.82422	9.51	21.66	16.19	31.17	25.70	56.00	46.00	-24.83	-20.30
6	18.51563	9.67	26.59	18.35	36.26	28.02	60.00	50.00	-23.74	-21.98

- 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. 27,15	Apr. 26,16
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV40	101094	Apr. 23,15	Apr. 22,16
Bilog Antenna	Teseq	CBL 6111D	30643	Jul. 16, 15	Jul. 15, 16
Horn Antenna	ETS-Lindgren	3117	00062558	May 30,14	May 29,16
Amplifier (9kHz-1GHz)	SONOMA	310D	186955	Mar. 04,15	Mar. 03,16
Pre-Amplifier (0.5~18GHz)	SCHWARZBECK	BBV 9718	9718-266	Mar 26,14	Mar 25,16
GPS Generator+ Antenna	TOJOIN	GNSS-5000A	E1-010119	Aug. 08, 14	Aug. 07,16
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	NSEMC003	Apr. 19,14	Apr. 18,16
Test Software	ADT	ADT_Radiated_V7.6.15.9.2	N/A	N/A	N/A
Horn Antenna (15GHz-40GHz)	SCHWARZBECK	BBHA 9170	BBHA9170147	Jan. 21,14	Jan. 20,17
Pre-Amplifier (18GHz-40GHz)	EMCI	EMC 184045	980102	Nov. 20,15	Nov. 19,16

NOTE:

1. The test was performed in 966 Chamber.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
3. The horn antenna is used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Site Registration No. is 494399.



4.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 1.5 meters 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:

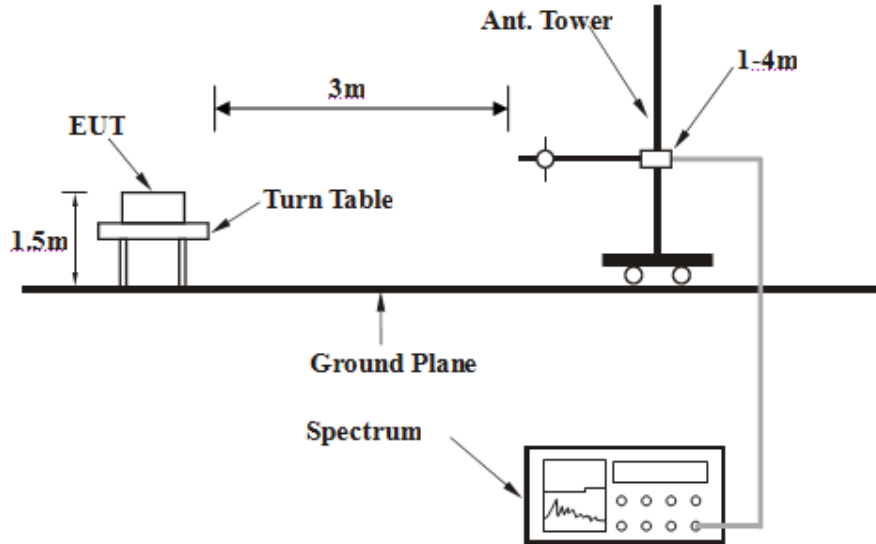
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution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



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

4.2.6 EUT OPERATING CONDITIONS

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



4.2.7 TEST RESULTS

BELOW 1GHz WORST-CASE DATA:

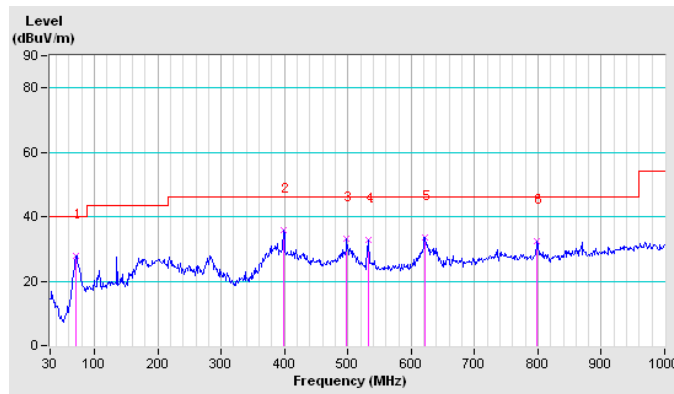
802.11b

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL 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	70.77	27.66	40.00	-12.34	150	204	51.99	-24.33
2	398.32	35.68	46.00	-10.32	150	300	45.95	-10.27
3	498.13	32.99	46.00	-13.01	150	157	40.68	-7.69
4	533.28	32.82	46.00	-13.18	150	213	39.48	-6.66
5	621.84	33.70	46.00	-12.30	150	231	38.56	-4.86
6	798.97	32.37	46.00	-13.63	150	73	34.17	-1.80

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.



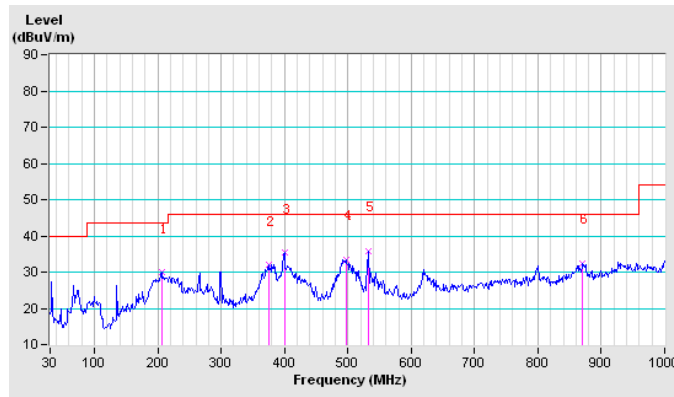


CHANNEL	Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	205.72	29.85	43.50	-13.65	150	231	49.62	-19.77
2	374.42	31.94	46.00	-14.06	150	27	43.75	-11.81
3	399.72	35.33	46.00	-10.67	150	55	45.42	-10.09
4	496.72	33.49	46.00	-12.51	150	332	41.22	-7.73
5	533.28	35.86	46.00	-10.14	150	146	42.52	-6.66
6	870.67	32.54	46.00	-13.46	150	208	33.00	-0.46

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	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz	FUNCTION	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	*2412.00	109.0 PK			1.51 H	254	71.59	37.45
2	*2412.00	106.6 AV			1.51 H	254	69.12	37.45
3	2390.00	65.1 PK	74.0	-8.9	1.61 H	241	27.69	37.38
4	2390.00	53.2 AV	54.0	-0.8	1.61 H	241	15.86	37.38
5	4824.00	52.8 PK	74.0	-21.2	1.41 H	354	44.32	8.46
6	4824.00	45.8 AV	54.0	-8.2	1.41 H	354	37.35	8.46
7	#7236.00	56.4 PK	79.0	-22.6	1.54 H	116	44.76	11.68
8	#7236.00	51.4 AV	76.6	-25.2	1.54 H	116	39.67	11.68

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	*2412.00	104.8 PK			1.79 V	168	67.30	37.45
2	*2412.00	102.9 AV			1.79 V	168	65.40	37.45
3	2390.00	64.3 PK	74.0	-9.7	1.76 V	167	26.88	37.38
4	2390.00	52.4 AV	54.0	-1.6	1.76 V	167	15.05	37.38
5	4824.00	51.4 PK	74.0	-22.6	1.64 V	199	42.97	8.46
6	4824.00	41.6 AV	54.0	-12.4	1.64 V	199	33.15	8.46
7	#7236.00	57.0 PK	74.8	-17.8	1.88 V	338	45.28	11.68
8	#7236.00	47.5 AV	72.9	-25.4	1.88 V	338	35.77	11.68

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.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.



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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	110.4 PK			1.56 H	146	72.87	37.53
2	*2437.00	107.3 AV			1.56 H	146	69.73	37.53
3	2390.00	65.4 PK	74.0	-8.6	1.56 H	213	27.98	37.38
4	2390.00	52.5 AV	54.0	-1.5	1.56 H	213	15.09	37.38
5	2483.50	66.3 PK	74.0	-7.7	1.64 H	84	28.67	37.67
6	2483.50	53.1 AV	54.0	-0.9	1.64 H	84	15.45	37.67
7	4874.00	50.8 PK	74.0	-23.2	1.20 H	0	42.33	8.50
8	4874.00	46.1 AV	54.0	-7.9	1.20 H	0	37.57	8.50
9	7311.00	54.4 PK	74.0	-19.6	1.26 H	92	42.76	11.62
10	7311.00	47.5 AV	54.0	-6.5	1.26 H	92	35.86	11.62

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	108.1 PK			1.12 V	190	70.55	37.53
2	*2437.00	105.3 AV			1.12 V	190	67.78	37.53
3	2390.00	65.6 PK	74.0	-8.4	1.34 V	316	28.26	37.38
4	2390.00	52.5 AV	54.0	-1.5	1.34 V	316	15.11	37.38
5	2483.50	66.6 PK	74.0	-7.4	1.62 V	213	28.90	37.67
6	2483.50	53.2 AV	54.0	-0.8	1.62 V	213	15.52	37.67
7	4874.00	48.7 PK	74.0	-25.3	1.22 V	214	40.23	8.50
8	4874.00	41.2 AV	54.0	-12.8	1.22 V	214	32.71	8.50
9	7311.00	54.4 PK	74.0	-19.6	1.37 V	211	42.78	11.62
10	7311.00	46.7 AV	54.0	-7.3	1.37 V	211	35.09	11.62

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	107.9 PK			1.16 H	219	70.32	37.60
2	*2462.00	105.2 AV			1.16 H	219	67.63	37.60
3	2483.50	67.2 PK	74.0	-6.8	1.75 H	168	29.57	37.67
4	2483.50	53.8 AV	54.0	-0.2	1.75 H	168	16.13	37.67
5	4924.00	50.0 PK	74.0	-24.0	1.63 H	10	41.47	8.55
6	4924.00	45.1 AV	54.0	-8.9	1.63 H	10	36.58	8.55
7	7386.00	54.1 PK	74.0	-19.9	1.69 H	313	42.53	11.57
8	7386.00	47.2 AV	54.0	-6.8	1.69 H	313	35.67	11.57
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	*2462.00	106.1 PK			1.37 V	265	68.49	37.60
2	*2462.00	103.8 AV			1.37 V	265	66.18	37.60
3	2483.50	67.0 PK	74.0	-7.0	1.74 V	224	29.31	37.67
4	2483.50	53.8 AV	54.0	-0.2	1.74 V	224	16.15	37.67
5	4924.00	47.9 PK	74.0	-26.1	1.36 V	203	39.32	8.55
6	4924.00	40.1 AV	54.0	-13.9	1.36 V	203	31.51	8.55
7	7386.00	53.0 PK	74.0	-21.0	1.16 V	293	41.41	11.57
8	7386.00	44.6 AV	54.0	-9.4	1.16 V	293	33.05	11.57

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.



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	*2412.00	108.6 PK			1.35 H	303	71.10	37.45
2	*2412.00	98.3 AV			1.35 H	303	60.83	37.45
3	2390.00	65.8 PK	74.0	-8.2	1.65 H	246	28.46	37.38
4	2390.00	53.4 AV	54.0	-0.6	1.65 H	246	16.02	37.38
5	4824.00	47.9 PK	74.0	-26.1	1.67 H	244	39.48	8.46
6	4824.00	35.1 AV	54.0	-18.9	1.67 H	244	26.67	8.46
7	#7236.00	51.4 PK	78.6	-27.2	1.88 H	140	39.72	11.68
8	#7236.00	39.0 AV	68.3	-29.3	1.88 H	140	27.29	11.68

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	*2412.00	102.1 PK			1.24 V	146	64.61	37.45
2	*2412.00	92.0 AV			1.24 V	146	54.58	37.45
3	2390.00	65.1 PK	74.0	-8.9	1.65 V	213	27.69	37.38
4	2390.00	52.4 AV	54.0	-1.6	1.65 V	213	14.98	37.38
5	4824.00	46.7 PK	74.0	-27.3	1.53 V	302	38.21	8.46
6	4824.00	33.7 AV	54.0	-20.3	1.53 V	302	25.19	8.46
7	#7236.00	51.0 PK	72.1	-21.1	1.89 V	213	39.31	11.68
8	#7236.00	37.7 AV	62.0	-24.3	1.89 V	213	25.99	11.68

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.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.



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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	113.3 PK			1.69 H	213	75.78	37.53
2	*2437.00	103.0 AV			1.69 H	213	65.43	37.53
3	2390.00	64.9 PK	74.0	-9.1	1.53 H	213	27.56	37.38
4	2390.00	51.3 AV	54.0	-2.7	1.53 H	213	13.91	37.38
5	2483.50	67.4 PK	74.0	-6.6	1.89 H	246	29.74	37.67
6	2483.50	53.2 AV	54.0	-0.8	1.89 H	246	15.55	37.67
7	4874.00	50.2 PK	74.0	-23.8	1.60 H	85	41.70	8.50
8	4874.00	36.6 AV	54.0	-17.4	1.60 H	85	28.05	8.50
9	7311.00	54.2 PK	74.0	-19.8	1.58 H	334	42.56	11.62
10	7311.00	41.9 AV	54.0	-12.1	1.58 H	334	30.30	11.62
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	108.2 PK			1.96 V	256	70.65	37.53
2	*2437.00	98.0 AV			1.96 V	256	60.48	37.53
3	2390.00	64.7 PK	74.0	-9.3	1.66 V	138	27.36	37.38
4	2390.00	51.3 AV	54.0	-2.7	1.66 V	138	13.87	37.38
5	2483.50	65.4 PK	74.0	-8.6	1.76 V	234	27.70	37.67
6	2483.50	52.4 AV	54.0	-1.6	1.76 V	234	14.73	37.67
7	4874.00	46.7 PK	74.0	-27.3	1.84 V	289	38.20	8.50
8	4874.00	34.6 AV	54.0	-19.4	1.84 V	289	26.10	8.50
9	7311.00	53.3 PK	74.0	-20.7	1.82 V	164	41.64	11.62
10	7311.00	40.8 AV	54.0	-13.2	1.82 V	164	29.13	11.62

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	105.0 PK			1.95 H	195	67.42	37.60
2	*2462.00	94.9 AV			1.95 H	195	57.29	37.60
3	2483.50	65.4 PK	74.0	-8.6	1.59 H	196	27.77	37.67
4	2483.50	53.8 AV	54.0	-0.2	1.59 H	196	16.10	37.67
5	4924.00	47.2 PK	74.0	-26.8	1.68 H	341	38.69	8.55
6	4924.00	34.0 AV	54.0	-20.0	1.68 H	341	25.48	8.55
7	7386.00	50.3 PK	74.0	-23.7	2.04 H	162	38.77	11.57
8	7386.00	36.9 AV	54.0	-17.1	2.04 H	162	25.34	11.57
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	*2462.00	101.4 PK			1.58 V	216	63.77	37.60
2	*2462.00	92.5 AV			1.58 V	216	54.91	37.60
3	2483.50	65.0 PK	74.0	-9.0	1.54 V	214	27.32	37.67
4	2483.50	53.2 AV	54.0	-0.8	1.54 V	214	15.54	37.67
5	4924.00	46.9 PK	74.0	-27.1	1.77 V	239	38.30	8.55
6	4924.00	33.8 AV	54.0	-20.2	1.77 V	239	25.21	8.55
7	7386.00	50.4 PK	74.0	-23.6	1.59 V	267	38.85	11.57
8	7386.00	36.8 AV	54.0	-17.2	1.59 V	267	25.27	11.57

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.



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	*2412.00	108.0 PK			1.56 H	221	70.54	37.45
2	*2412.00	98.3 AV			1.56 H	221	60.84	37.45
3	2390.00	66.4 PK	74.0	-7.6	1.16 H	341	29.00	37.38
4	2390.00	53.1 AV	54.0	-0.9	1.16 H	341	15.72	37.38
5	4824.00	47.7 PK	74.0	-26.3	1.62 H	331	39.28	8.46
6	4824.00	35.0 AV	54.0	-19.0	1.62 H	331	26.49	8.46
7	#7236.00	53.9 PK	78.0	-24.1	1.80 H	159	42.24	11.68
8	#7236.00	40.9 AV	68.3	-27.4	1.80 H	159	29.20	11.68

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	*2412.00	102.9 PK			1.68 V	188	65.40	37.45
2	*2412.00	94.7 AV			1.68 V	188	57.20	37.45
3	2390.00	66.2 PK	74.0	-7.8	1.93 V	182	28.86	37.38
4	2390.00	52.8 AV	54.0	-1.2	1.93 V	182	15.39	37.38
5	4824.00	47.0 PK	74.0	-27.0	1.56 V	326	38.53	8.46
6	4824.00	33.6 AV	54.0	-20.4	1.56 V	326	25.15	8.46
7	#7236.00	51.2 PK	72.9	-21.7	1.77 V	249	39.48	11.68
8	#7236.00	38.1 AV	64.7	-26.6	1.77 V	249	26.43	11.68

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.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.



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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	109.2 PK			1.67 H	261	71.68	37.53
2	*2437.00	99.1 AV			1.67 H	261	61.59	37.53
3	2390.00	67.6 PK	74.0	-6.4	1.93 H	0	30.24	37.38
4	2390.00	51.3 AV	54.0	-2.7	1.93 H	0	13.89	37.38
5	2483.50	67.5 PK	74.0	-6.5	1.69 H	320	29.79	37.67
6	2483.50	53.2 AV	54.0	-0.8	1.69 H	320	15.48	37.67
7	4874.00	48.4 PK	74.0	-25.6	1.75 H	146	39.93	8.50
8	4874.00	36.7 AV	54.0	-17.3	1.75 H	146	28.15	8.50
9	7311.00	57.2 PK	74.0	-16.8	1.62 H	137	45.54	11.62
10	7311.00	45.0 AV	54.0	-9.0	1.62 H	137	33.35	11.62
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	106.8 PK			1.62 V	295	69.24	37.53
2	*2437.00	96.6 AV			1.62 V	295	59.03	37.53
3	2390.00	64.6 PK	74.0	-9.4	2.01 V	231	27.25	37.38
4	2390.00	51.4 AV	54.0	-2.6	2.01 V	231	13.97	37.38
5	2483.50	65.9 PK	74.0	-8.1	1.71 V	193	28.21	37.67
6	2483.50	52.2 AV	54.0	-1.8	1.71 V	193	14.52	37.67
7	4874.00	46.4 PK	74.0	-27.6	1.87 V	208	37.90	8.50
8	4874.00	33.8 AV	54.0	-20.2	1.87 V	208	25.32	8.50
9	7311.00	54.2 PK	74.0	-19.8	2.09 V	116	42.60	11.62
10	7311.00	42.0 AV	54.0	-12.0	2.09 V	116	30.38	11.62

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	99.6 PK			1.12 H	231	61.95	37.60
2	*2462.00	90.7 AV			1.12 H	231	53.07	37.60
3	2483.50	64.2 PK	74.0	-9.8	1.15 H	225	26.52	37.67
4	2483.50	53.1 AV	54.0	-0.9	1.15 H	225	15.43	37.67
5	4924.00	47.3 PK	74.0	-26.7	1.53 H	211	38.75	8.55
6	4924.00	33.8 AV	54.0	-20.2	1.53 H	211	25.22	8.55
7	7386.00	51.0 PK	74.0	-23.0	1.94 H	139	39.43	11.57
8	7386.00	37.5 AV	54.0	-16.5	1.94 H	139	25.93	11.57
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	*2462.00	100.8 PK			1.27 V	220	63.15	37.60
2	*2462.00	90.1 AV			1.27 V	220	52.53	37.60
3	2483.50	64.7 PK	74.0	-9.3	1.17 V	210	26.98	37.67
4	2483.50	53.0 AV	54.0	-1.0	1.17 V	210	15.28	37.67
5	4924.00	47.1 PK	74.0	-26.9	1.56 V	56	38.55	8.55
6	4924.00	33.7 AV	54.0	-20.3	1.56 V	56	25.13	8.55
7	7386.00	50.5 PK	74.0	-23.5	1.49 V	216	38.90	11.57
8	7386.00	36.9 AV	54.0	-17.1	1.49 V	216	25.35	11.57

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.



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	*2422.00	101.2 PK			1.54 H	103	63.74	37.48
2	*2422.00	90.9 AV			1.54 H	103	53.40	37.48
3	2390.00	66.9 PK	74.0	-7.1	1.75 H	215	29.48	37.38
4	2390.00	53.2 AV	54.0	-0.8	1.75 H	215	15.82	37.38
5	4844.00	47.1 PK	74.0	-26.9	1.76 H	261	38.64	8.47
6	4844.00	33.9 AV	54.0	-20.1	1.76 H	261	25.38	8.47
7	7266.00	50.6 PK	74.0	-23.4	1.85 H	246	38.92	11.67
8	7266.00	38.3 AV	54.0	-15.7	1.85 H	246	26.60	11.67

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	*2422.00	99.4 PK			1.72 V	319	61.87	37.48
2	*2422.00	89.6 AV			1.72 V	319	52.09	37.48
3	2390.00	64.3 PK	74.0	-9.7	1.56 V	124	26.96	37.38
4	2390.00	53.2 AV	54.0	-0.8	1.56 V	124	15.83	37.38
5	4844.00	46.6 PK	74.0	-27.4	1.51 V	261	38.08	8.47
6	4844.00	33.4 AV	54.0	-20.6	1.51 V	261	24.92	8.47
7	7266.00	50.0 PK	74.0	-24.0	1.96 V	237	38.28	11.67
8	7266.00	37.1 AV	54.0	-16.9	1.96 V	237	25.43	11.67

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	*2437.00	103.6 PK			1.10 H	153	66.09	37.53
2	*2437.00	93.1 AV			1.10 H	153	55.56	37.53
3	2390.00	64.0 PK	74.0	-10.0	1.34 H	230	26.59	37.38
4	2390.00	52.7 AV	54.0	-1.3	1.34 H	230	15.27	37.38
5	2483.50	65.2 PK	74.0	-8.8	1.26 H	325	27.50	37.67
6	2483.50	53.5 AV	54.0	-0.5	1.26 H	325	15.83	37.67
7	4874.00	46.5 PK	74.0	-27.5	1.83 H	219	37.96	8.50
8	4874.00	33.6 AV	54.0	-20.4	1.83 H	219	25.14	8.50
9	7311.00	50.3 PK	74.0	-23.7	1.26 H	219	38.70	11.62
10	7311.00	37.5 AV	54.0	-16.5	1.26 H	219	25.86	11.62

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	103.0 PK			1.51 V	196	65.47	37.53
2	*2437.00	92.6 AV			1.51 V	196	55.10	37.53
3	2390.00	63.5 PK	74.0	-10.5	1.23 V	247	26.15	37.38
4	2390.00	52.2 AV	54.0	-1.8	1.23 V	247	14.83	37.38
5	2483.50	64.0 PK	74.0	-10.0	1.75 V	221	26.38	37.67
6	2483.50	53.0 AV	54.0	-1.0	1.75 V	221	15.36	37.67
7	4874.00	46.5 PK	74.0	-27.5	1.98 V	243	37.95	8.50
8	4874.00	33.4 AV	54.0	-20.6	1.98 V	243	24.94	8.50
9	7311.00	50.0 PK	74.0	-24.0	2.14 V	164	38.33	11.62
10	7311.00	37.0 AV	54.0	-17.0	2.14 V	164	25.37	11.62

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	99.4 PK			1.72 H	192	61.79	37.57
2	*2452.00	89.2 AV			1.72 H	192	51.61	37.57
3	2483.50	64.9 PK	74.0	-9.1	1.52 H	216	27.27	37.67
4	2483.50	53.3 AV	54.0	-0.7	1.52 H	216	15.64	37.67
5	4904.00	46.7 PK	74.0	-27.3	1.58 H	216	38.17	8.53
6	4904.00	33.7 AV	54.0	-20.3	1.58 H	216	25.18	8.53
7	7356.00	50.2 PK	74.0	-23.8	2.16 H	318	38.61	11.59
8	7356.00	37.0 AV	54.0	-17.0	2.16 H	318	25.39	11.59
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	95.5 PK			1.85 V	207	57.91	37.57
2	*2452.00	85.4 AV			1.85 V	207	47.78	37.57
3	2483.50	66.2 PK	74.0	-7.8	1.86 V	281	28.49	37.67
4	2483.50	53.3 AV	54.0	-0.7	1.86 V	281	15.59	37.67
5	4904.00	46.4 PK	74.0	-27.6	1.68 V	217	37.82	8.53
6	4904.00	33.6 AV	54.0	-20.4	1.68 V	217	25.06	8.53
7	7356.00	49.8 PK	74.0	-24.2	1.53 V	297	38.19	11.59
8	7356.00	36.8 AV	54.0	-17.2	1.53 V	297	25.17	11.59

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.



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	Feb. 18,16	Feb. 17,17
Power Sensor	Keysight	U2021XA	MY55060018	Feb. 18,16	Feb. 17,17
Digital Multimeter	FLUKE	15B	A1220010DG	Oct. 12, 15	Oct.11, 16
Humid & Temp Programmable Tester	Haida	HD-2257	110807201	Sep.07,15	Sep. 06,16
Oscilloscope	Agilent	DSO9254A	MY51260160	Nov. 28,15	Nov. 27,16
Signal Analyzer	Rohde & Schwarz	FSV7	102331	Nov. 05,15	Nov. 04,16
Signal Generator	Agilent	N5183A	MY50140980	Nov. 05,15	Nov. 04,16
ESG Vector Signal Generator	Agilent	E4438C	MY49072505	Apr. 22, 15	Apr. 21, 16

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

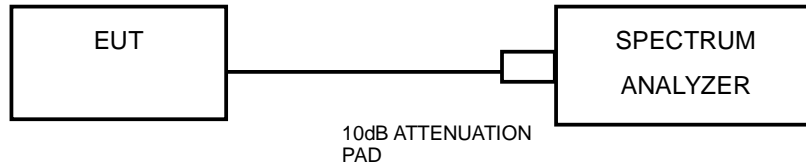
1. Set resolution bandwidth (RBW) = 100KHz
2. Set the video bandwidth (VBW) ≥ 3 x RBW, Detector = Peak.
3. Trace mode = max hold.
4. Sweep = auto couple.
5. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that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

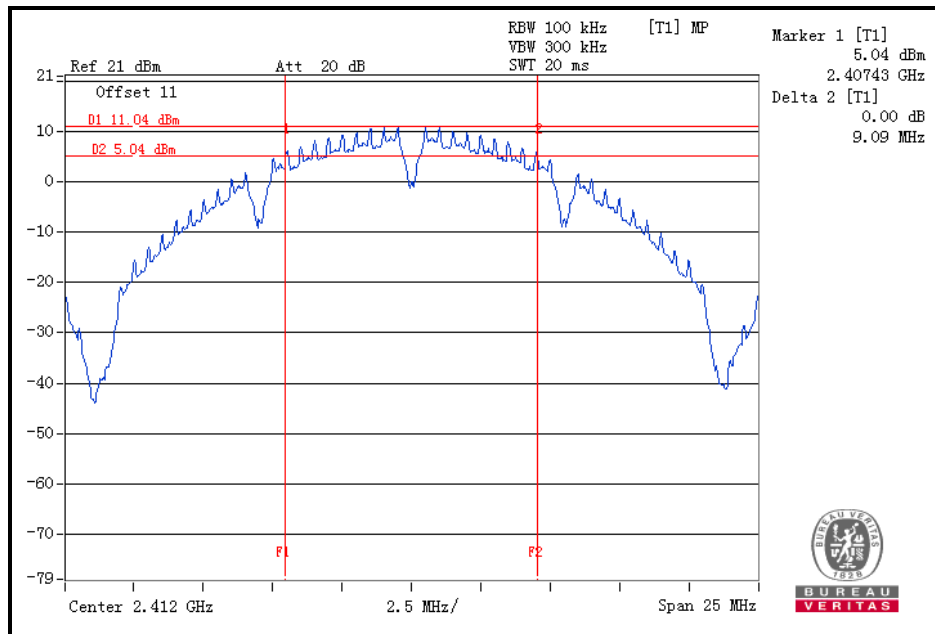
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.



4.3.7 TEST RESULTS

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	9.09	0.5	PASS
6	2437	9.08	0.5	PASS
11	2462	9.05	0.5	PASS



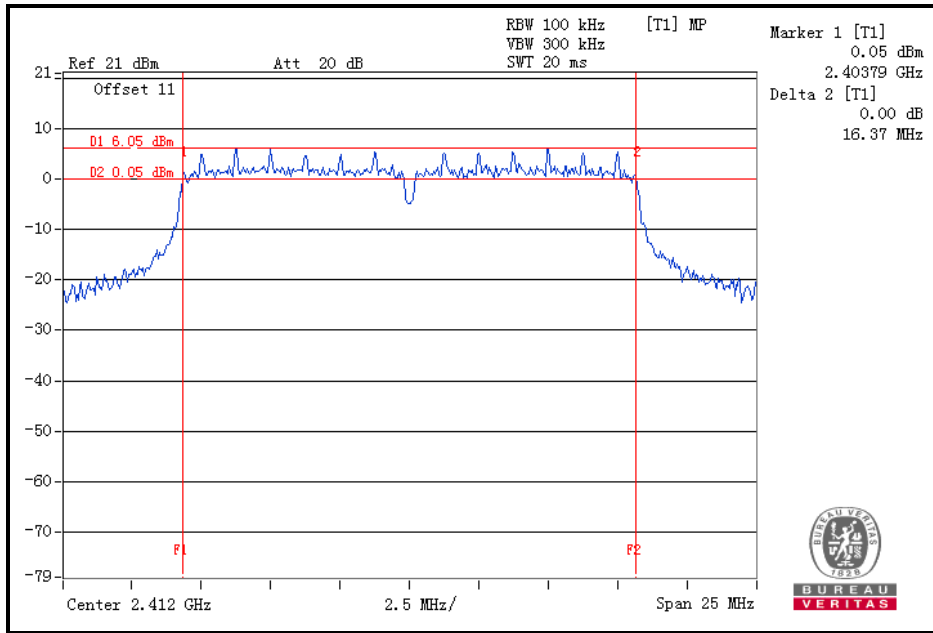


BUREAU VERITAS

Test Report No.: RF160113N033

802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	16.37	0.5	PASS
6	2437	16.36	0.5	PASS
11	2462	16.36	0.5	PASS



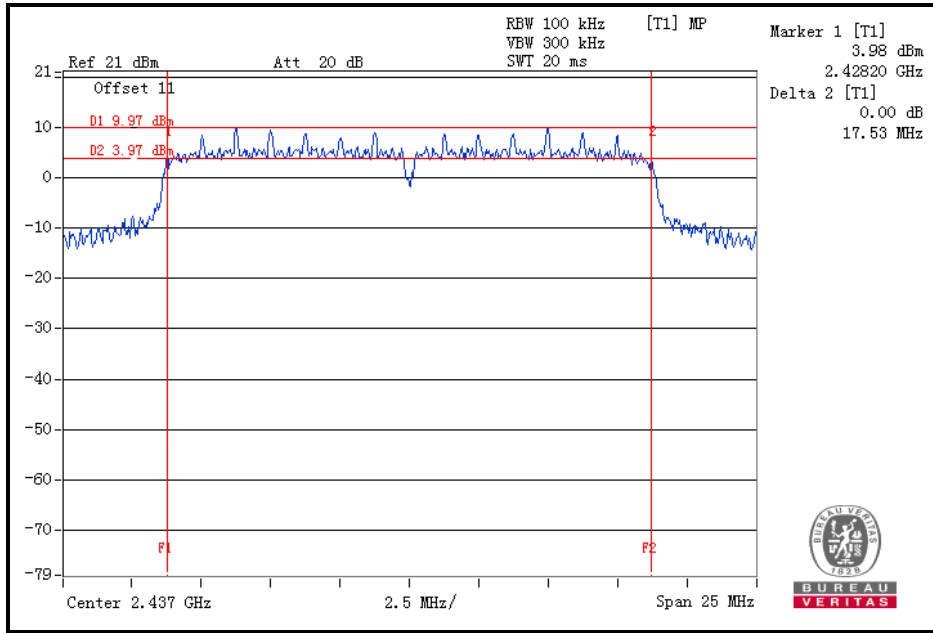


BUREAU VERITAS

Test Report No.: RF160113N033

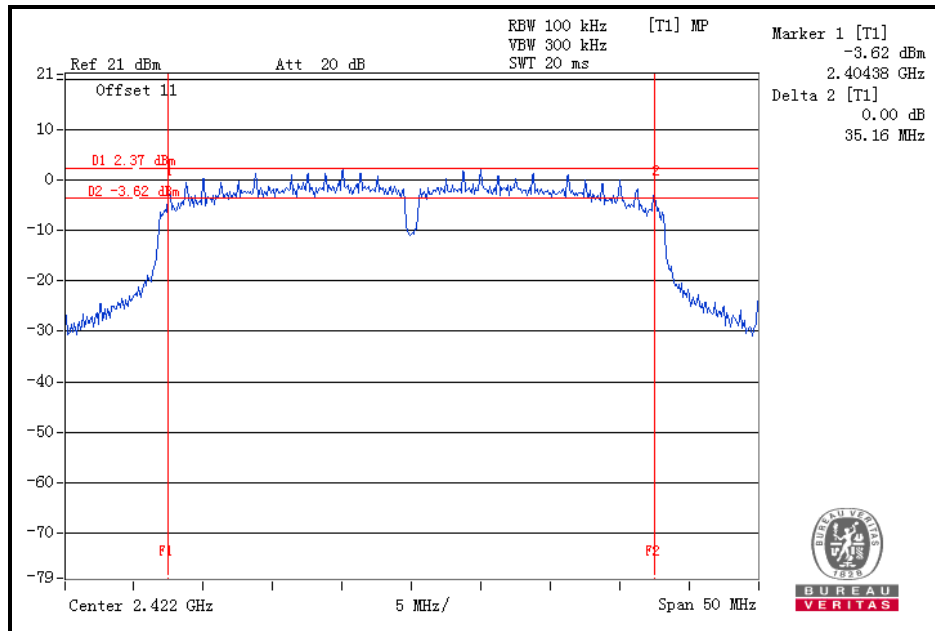
802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	17.09	0.5	PASS
6	2437	17.53	0.5	PASS
11	2462	17.31	0.5	PASS



802.11n (40MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
3	2422	35.16	0.5	PASS
6	2437	35.12	0.5	PASS
9	2452	35.10	0.5	PASS



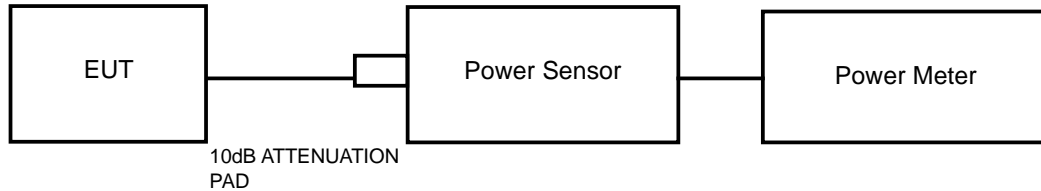


4.4 CONDUCTED OUTPUT POWER

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	Feb. 18,16	Feb. 17,17
Power Sensor	Keysight	U2021XA	MY55060018	Feb. 18,16	Feb. 17,17
Humid & Temp Programmable Tester	Haida	HD-2257	110807201	Sep.07,15	Sep. 06,16
Oscilloscope	Agilent	DSO9254A	MY51260160	Sep.07,15	Sep. 06,16
Signal Analyzer	Rohde & Schwarz	FSV7	102331	Sep.07,15	Sep. 06,16
Signal Generator	Agilent	N5183A	MY50140980	Sep.07,15	Sep. 06,16
ESG Vector Signal Generator	Agilent	E4438C	MY49072505	Apr. 22, 15	Apr. 21, 16
BLUETOOTH TESTER	Rohde&Schwarz	CBT32	100811	Sep. 01,15	Aug. 31,16

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.



**BUREAU
VERITAS**

Test Report No.: RF160113N033

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

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	AVERAGE POWER (mW)
1	2412	21.01	126.183
6	2437	21.07	127.938
11	2462	19.56	90.365

802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	AVERAGE POWER (mW)
1	2412	17.87	61.235
6	2437	21.47	140.281
11	2462	17.14	51.761

802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	AVERAGE POWER (mW)
1	2412	17.75	59.566
6	2437	21.66	146.555
11	2462	17.07	50.933

802.11n (40MHz)

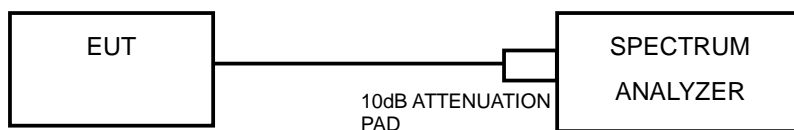
CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	AVERAGE POWER (mW)
3	2422	17.26	53.211
6	2437	18.16	65.464
7	2452	14.08	25.586

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

For duty cycle $\geq 98\%$

- a) Set instrument center frequency to DTS channel center frequency.
- b) Set span to at least 1.5 times the OBW.
- c) Set RBW : 10 kHz.
- d) Set VBW $\geq 3 \times$ RBW.
- e) Detector = peak.
- f) Sweep time = auto couple.
- g) Use the peak marker function to determine the maximum amplitude level.
- h) Add $10\log(1/T)$, where x is the duty cycle measured in step (a), to the measured PSD to computer the average PSD during the actual transmission time.

4.5.5 DEVIATION FROM TEST STANDARD

No deviation.

4.5.6 EUT OPERATING CONDITION

Same as item 4.3.6

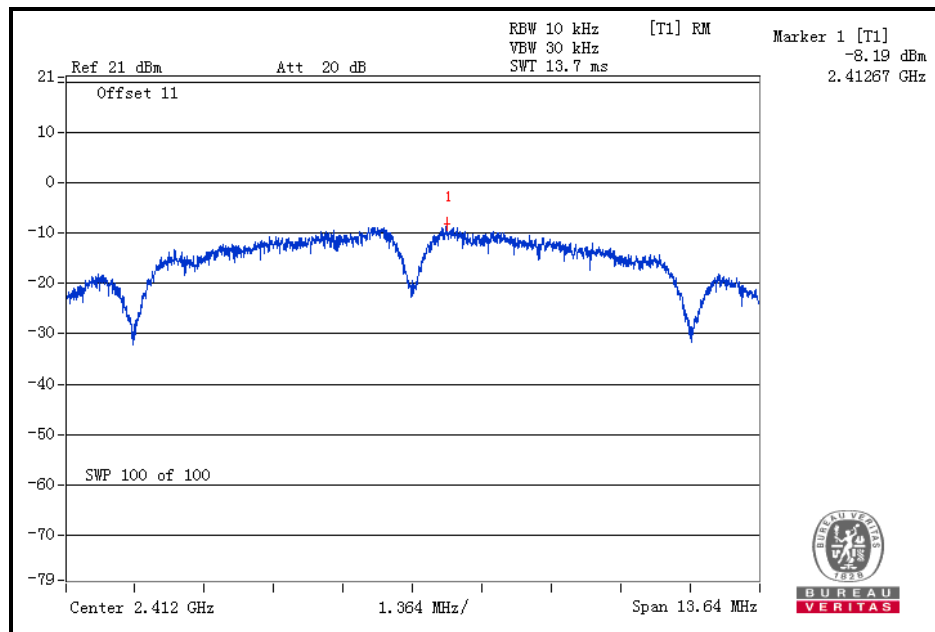
4.5.7 TEST RESULTS

802.11b

Channel	FREQ. (MHz)	PSD (dBm)	Limit (dBm)	PASS /FAIL
1	2412	-8.19	8	PASS
6	2437	-8.28	8	PASS
11	2462	-10.17	8	PASS

Note:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain=2.37dBi<6dBi, so the power density limit no need to reduce

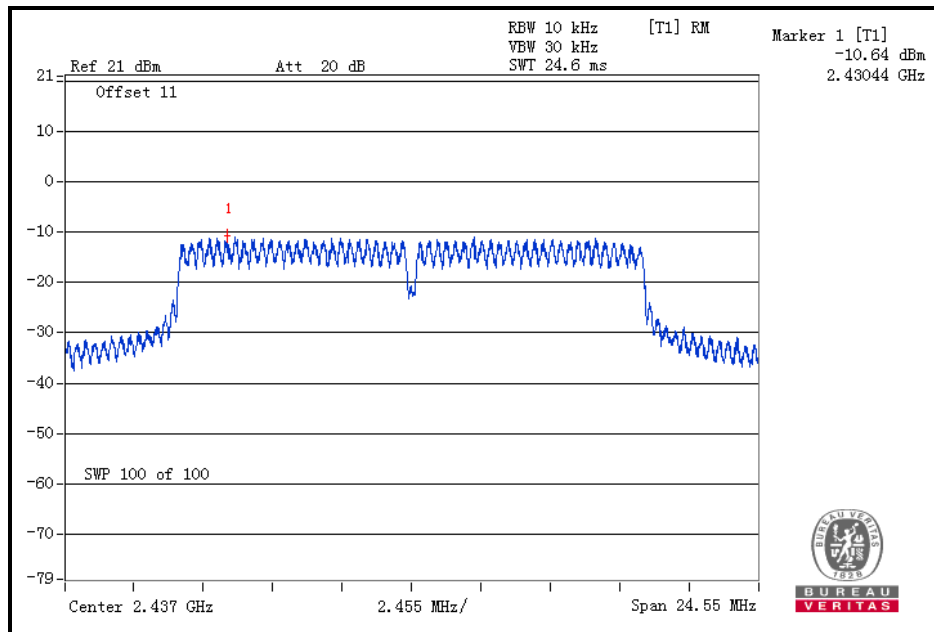


802.11g

Channel	FREQ. (MHz)	PSD (dBm)	Limit (dBm)	PASS /FAIL
1	2412	-14.28	8	PASS
6	2437	-10.64	8	PASS
11	2462	-15.38	8	PASS

Note:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain=2.37dBi < 6dBi, so the power density limit no need to reduce

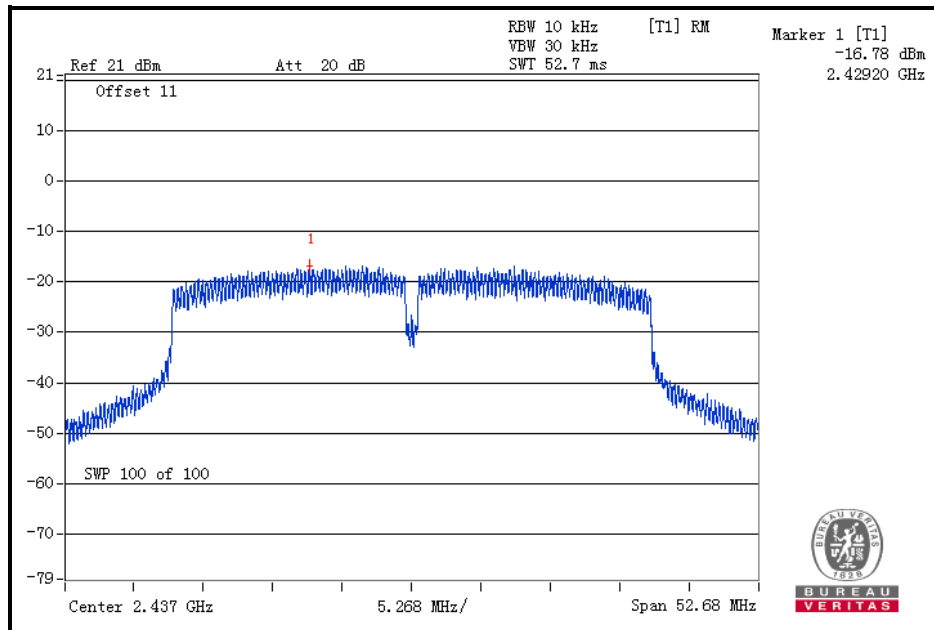


802.11n (40MHz)

Channel	FREQ. (MHz)	PSD (dBm)	Limit (dBm)	PASS /FAIL
3	2422	-17.56	8	PASS
6	2437	-16.78	8	PASS
9	2452	-20.78	8	PASS

Note:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain=2.37dBi < 6dBi, so the power density limit no need to reduce

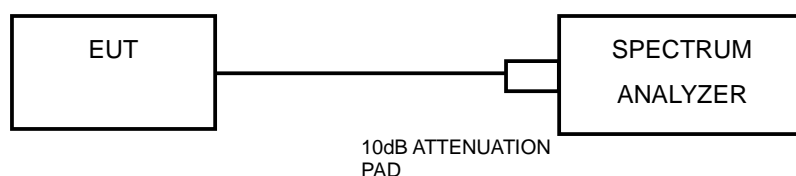


4.6 OUT OF BAND EMISSION MEASUREMENT

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

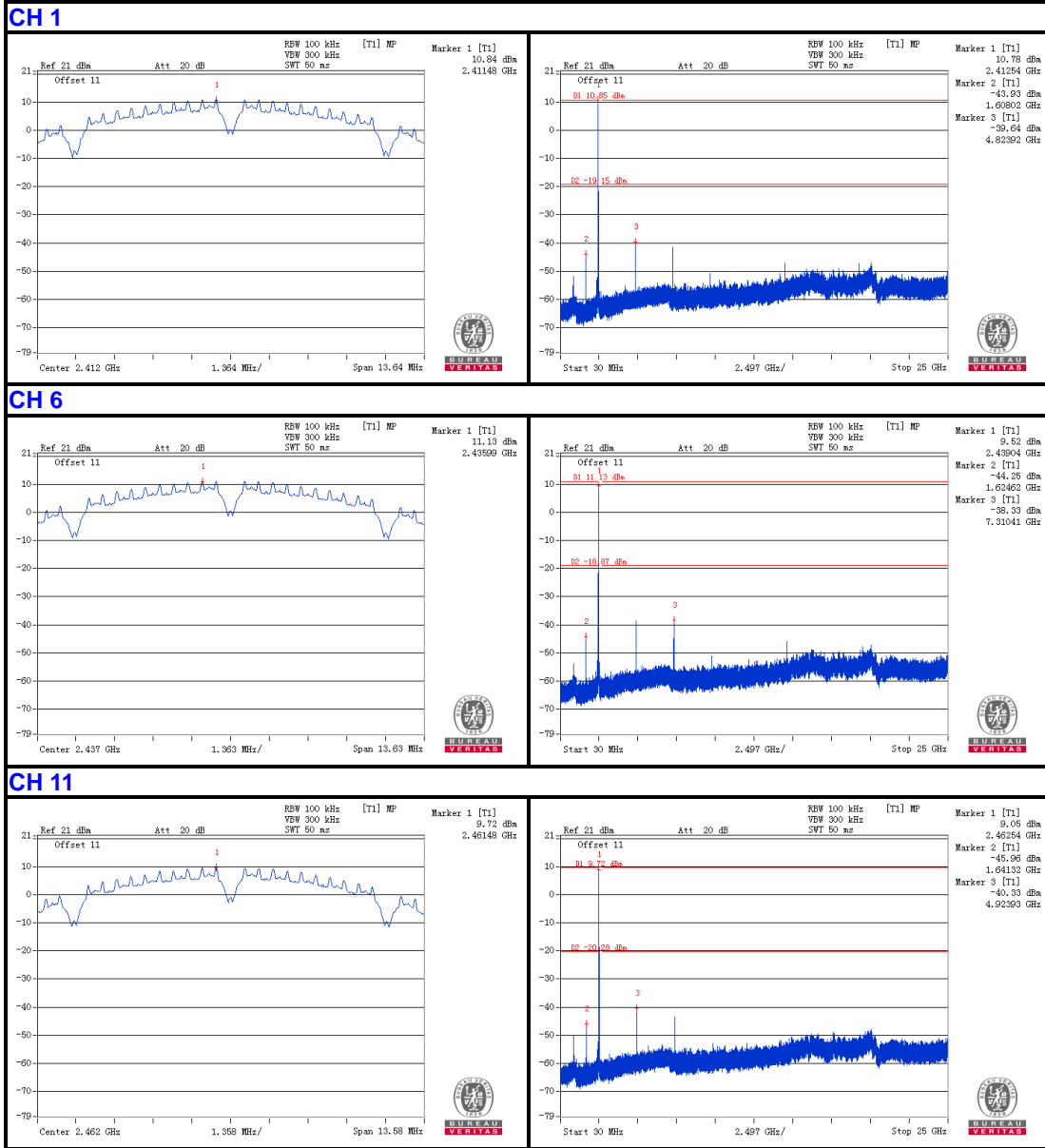


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4.6.7 TEST RESULTS

802.11b



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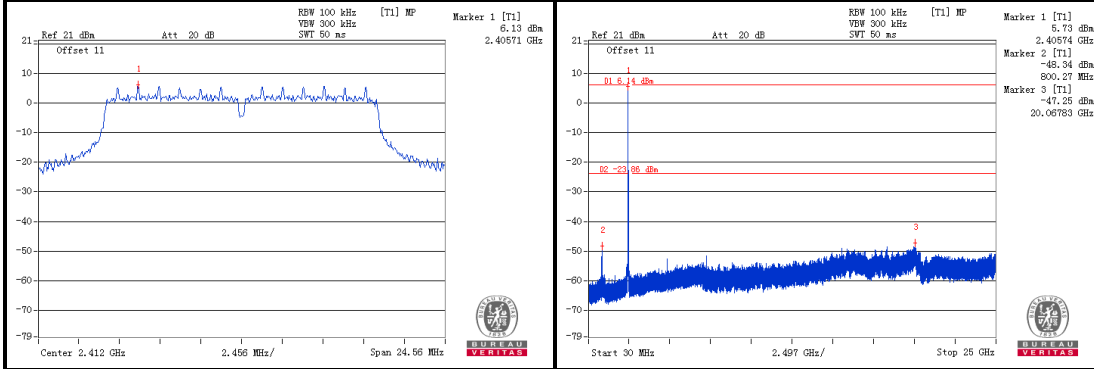


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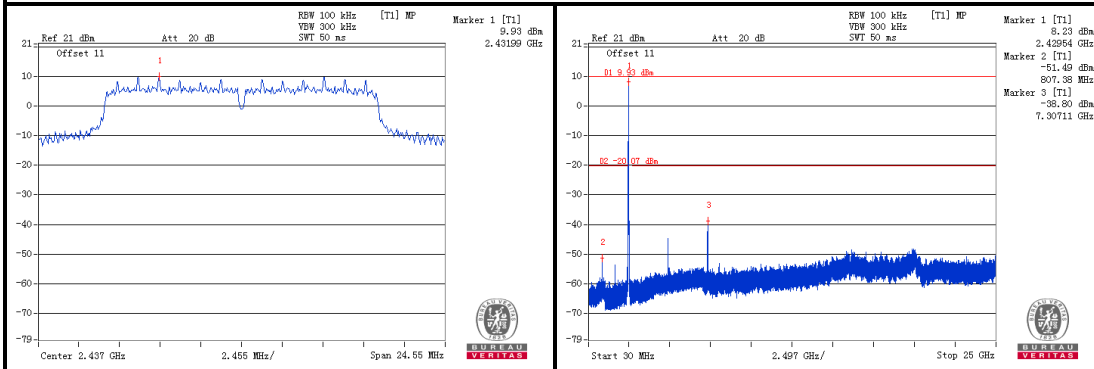
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802.11g

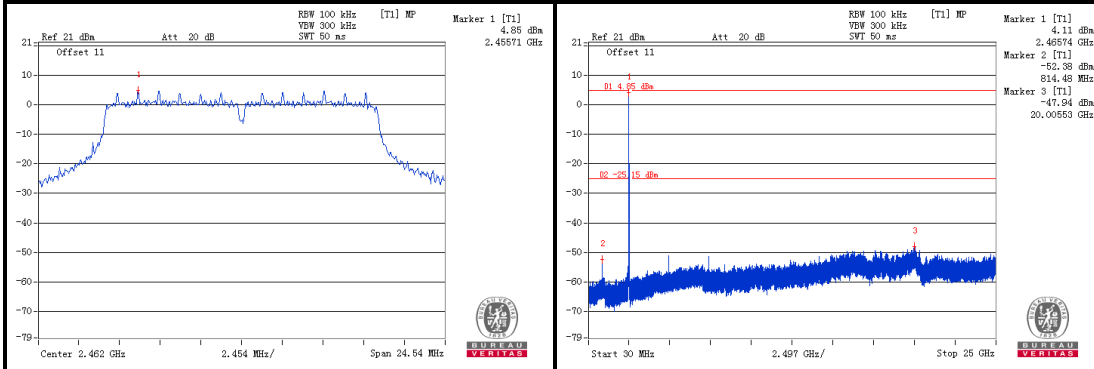
CH 1



CH 6



CH 11



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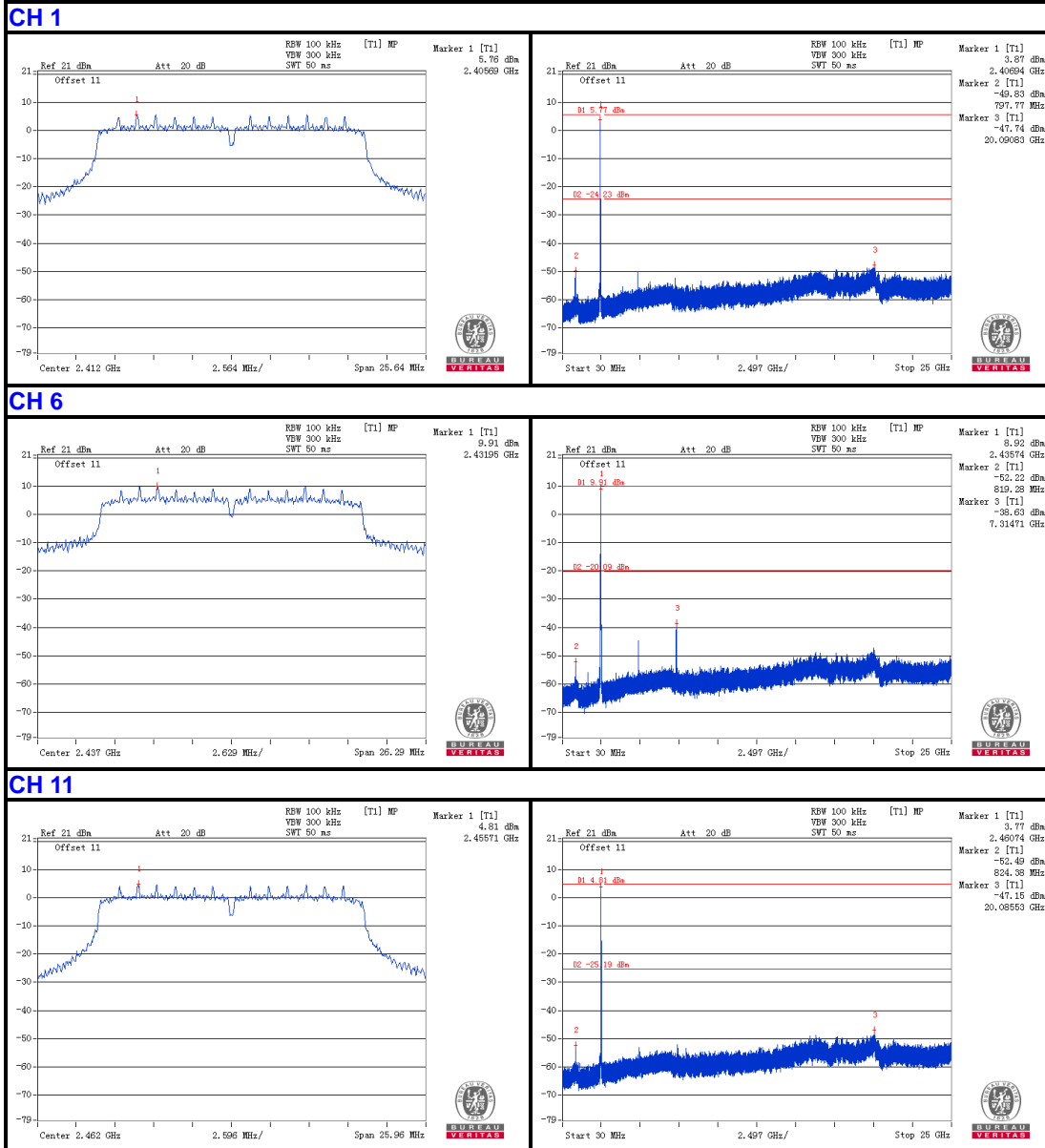
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802.11n (20MHz)



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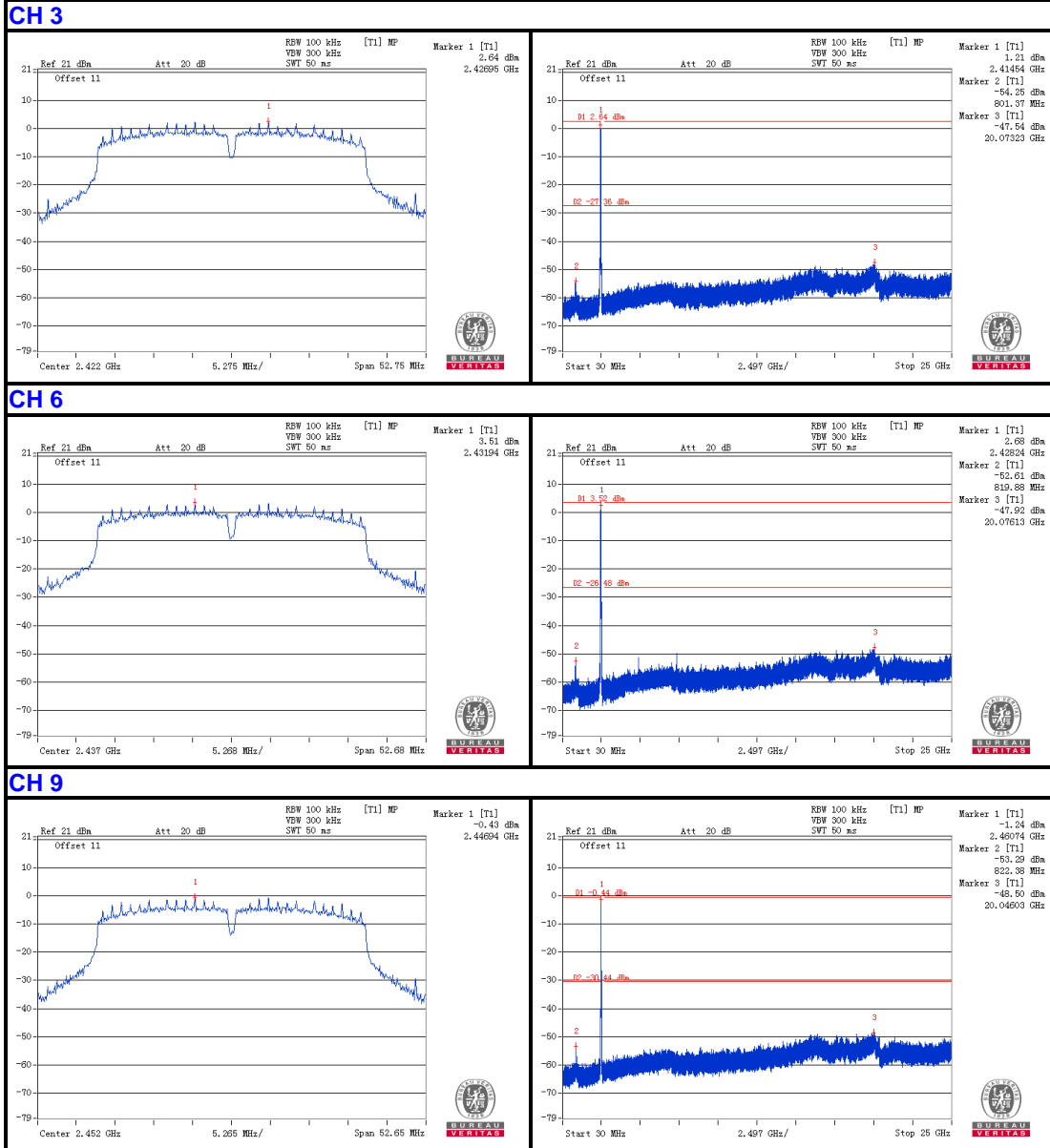
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802.11n (40MHz)



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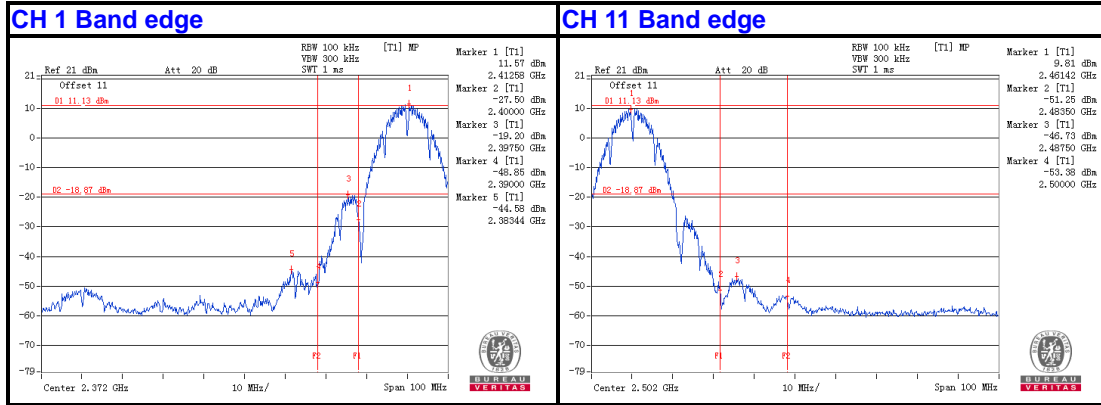
Tel: +86 769 8593 5656
Fax: +86 769 8593 1080
Email: customerservice.dg@cn.bureauveritas.com



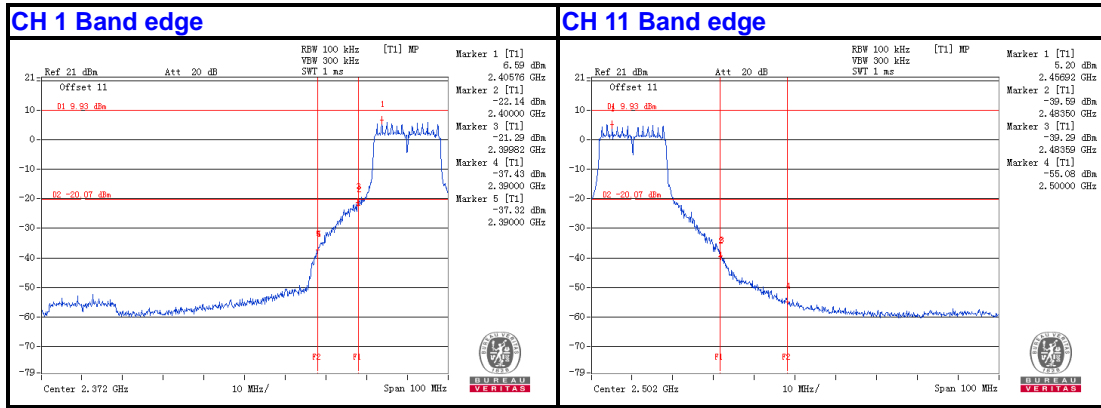
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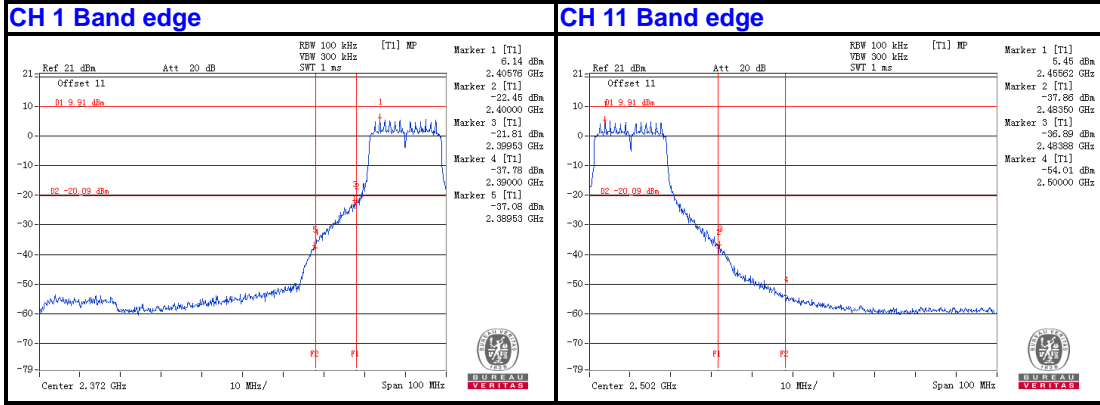
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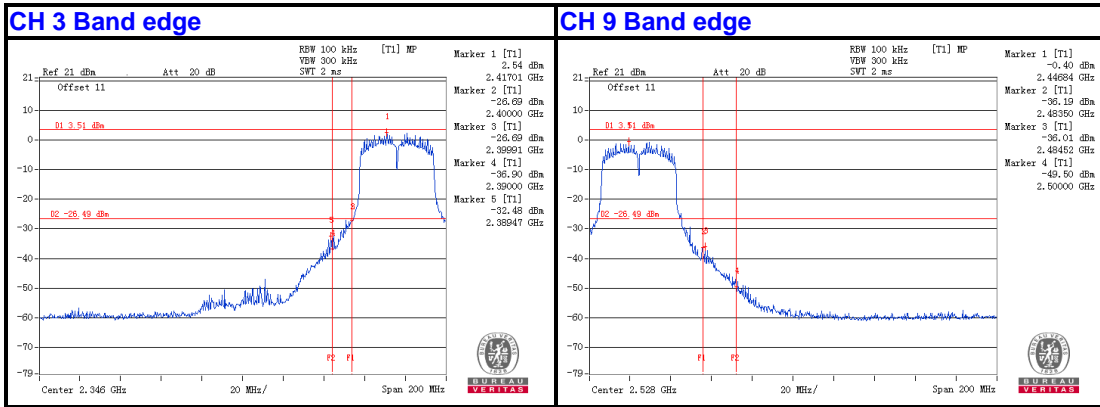
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802.11n (40MHz)





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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---