

TEST REPORT



Applicant	Hangzhou Hikvision Digital Technology Co., Ltd.
Address	No.555 Qianmo Road, Binjiang District, Hangzhou 310052, China

Manufacturer or Supplier	Hangzhou Hikvision Digital Technology Co., Ltd.
Address	No.555 Qianmo Road, Binjiang District, Hangzhou 310052, China
Product	Network Camera
Brand Name	HIKVISION
Model	DS-2CD2F12FWD-IWS
Additional Model & Model Difference	DS-2CD2F12FWD-IW, DS-2CD2F22FWD-IW, etc., See items 3.1
Date of tests	Mar. 25, 2017 ~ Apr. 19, 2017

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

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

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

Tested by Breeze Jiang Project Engineer / EMC Department	Approved by Glyn He Supervisor / EMC Department
	

Date: May 20, 2017

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**BUREAU
VERITAS**

Test Report No.: RF160908N043

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF160908N043	Original release	May 20, 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	Network Camera
MODEL NO.	DS-2CD2F12FWD-IWS
ADDITIONAL NO.	DS-2CD2F12FWD-IW, DS-2CD2F22FWD-IW, DS-2CD2F22FWD-IWS, DS-2CD2F42FWD-IW, DS-2CD2F42FWD-IWS, DS-2CD2F52F-IW, DS-2CD2F52F-IWS, DS-2CD2F12F-IZW , DS-2CD2F12F-IZWS
FCC ID	2ADTD-I0D2F00
NOMINAL VOLTAGE	DC 12V from Adapter
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)
PEAK POWER	19.61dBm(Maximum)
ANTENNA TYPE	Integral Antenna, with 2.4dBi gain
I/O PORTS	Refer to user's manual
CABLE SUPPLIED	N/A

NOTE:

1. The EUT provides completed transmitters and receivers:

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

2. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
3. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.
4. Please refer to the EUT photo document (Reference No.: 160908N043) for detailed product photo.
5. Additional models (see above table) are identical with the test model DS-2CD2F12FWD-IWS except the color of the appearance, silk screen and model name for trading purpose.

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 Adapter 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.

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

**RADIATED EMISSION TEST (ABOVE 1GHz):**

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

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	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, 9	OFDM	BPSK	13.5

BANDEDGE MEASUREMENT:

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

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

EUT CONFIGURE MODE	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.

EUT CONFIGURE MODE	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	23deg. C, 53%RH	DC 12V from Adapter	Xue Wang
RE≥1G	23deg. C, 53%RH	DC 12V from Adapter	Xue Wang
PLC	20deg. C, 56%RH	DC 12V from Adapter	Sen He
APCM	20deg. C, 55%RH	DC 12V from Adapter	Yang

3.3 DUTY CYCLE OF TEST SIGNAL

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
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 a dependent 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	Speaker(4ohm)	5W	/	/	N/A

NO.	DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	Speaker Line: Unshielded, Detachable 1.5m.

The EUT power by the adapter follow as below:

ADAPTER	
BRAND:	DVE
MODEL:	DSA-12PFG-12FCH 120100
INPUT:	AC 100-240V, 50/60Hz 0.5A
OUTPUT:	DC 12V, 1A
DC LINE:	Unshielded, Non-detachable, 1.5m

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	ESR7	101494	Apr. 05,17	Apr. 04,18
Artificial Mains Network	Rohde&Schwarz	ENV216	101173	Mar. 06,17	Mar. 05,18
Artificial Mains Network	Rohde&Schwarz	ESH3-Z5	100317	Apr. 05,17	Apr. 04,18
Voltage probe	SCHWARZBECK	TK 9421	TK 9421-176	Jan. 04,17	Jan. 03,18
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

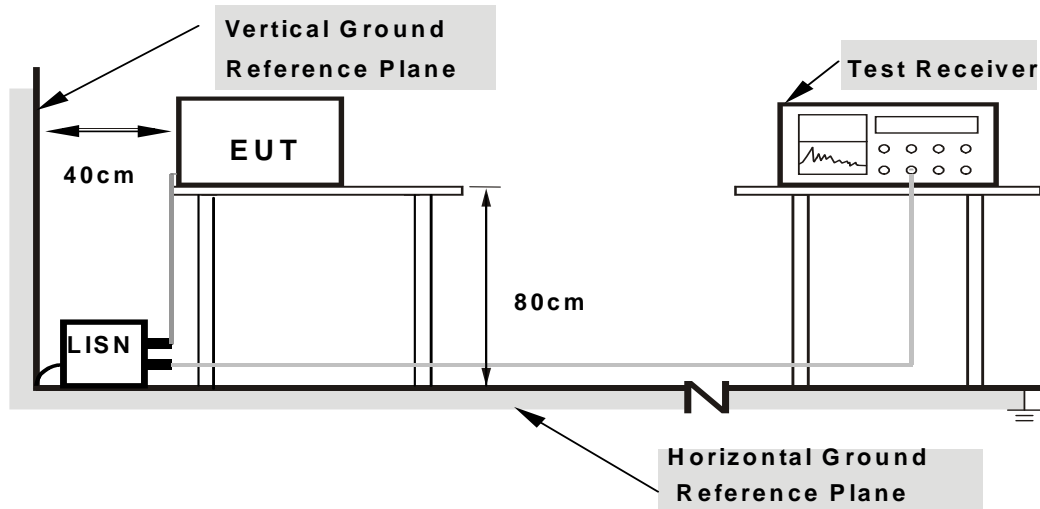
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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



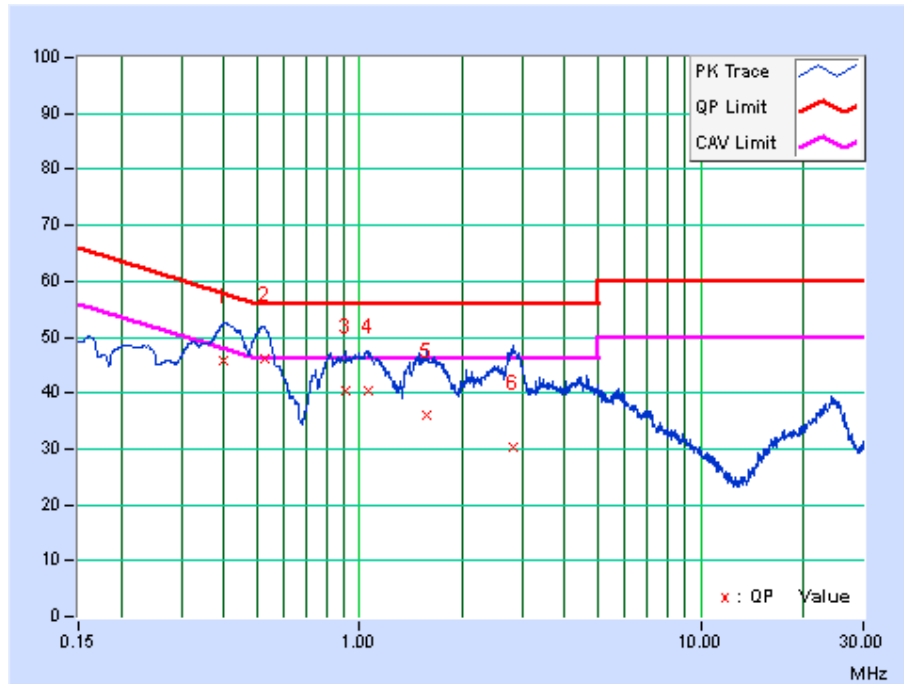
4.1.7 TEST RESULTS

CONDUCTED WORST-CASE DATA: WIFI

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	0.40017	10.23	35.52	21.48	45.75	31.71	57.85	47.85	-12.10	-16.14
2	0.52523	10.28	35.88	19.78	46.16	30.06	56.00	46.00	-9.84	-15.94
3	0.90825	10.35	30.13	15.64	40.48	25.99	56.00	46.00	-15.52	-20.01
4	1.06125	10.37	30.10	15.33	40.47	25.70	56.00	46.00	-15.53	-20.30
5	1.56975	10.38	25.81	11.44	36.19	21.82	56.00	46.00	-19.81	-24.18
6	2.80862	10.39	20.08	7.55	30.47	17.94	56.00	46.00	-25.53	-28.06

- 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.

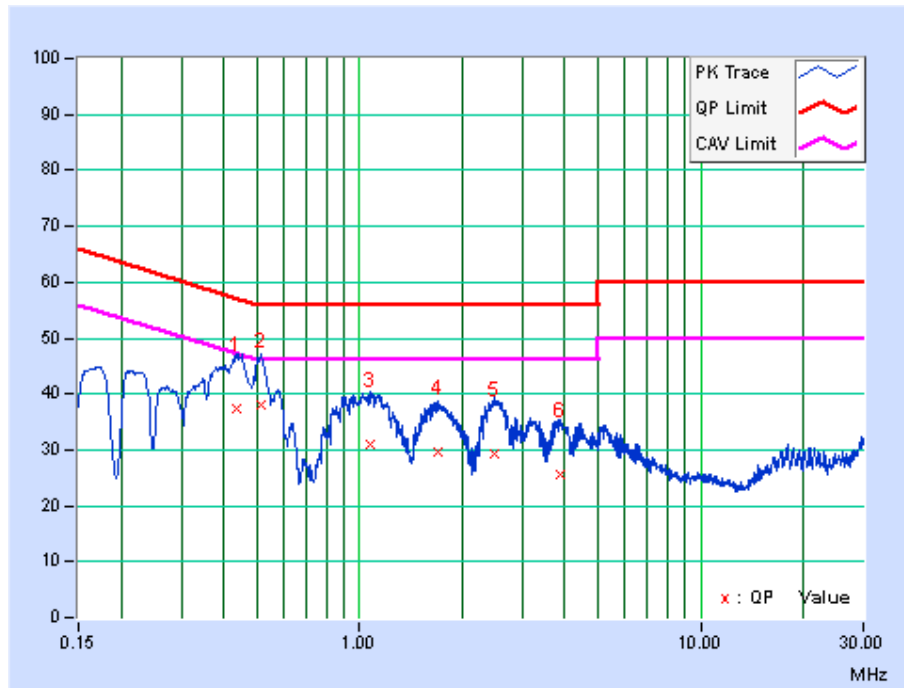




PHASE	Neutral	6dB BANDWIDTH	9kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.43350	9.92	27.51	10.00	37.43	19.92	57.19	47.19	-19.76	-27.27
2	0.51225	9.92	28.29	16.26	38.21	26.18	56.00	46.00	-17.79	-19.82
3	1.07993	9.98	21.04	8.10	31.02	18.08	56.00	46.00	-24.98	-27.92
4	1.70475	10.01	19.53	7.07	29.54	17.08	56.00	46.00	-26.46	-28.92
5	2.50125	10.05	19.36	8.46	29.41	18.51	56.00	46.00	-26.59	-27.49
6	3.86582	10.13	15.33	5.82	25.46	15.95	56.00	46.00	-30.54	-30.05

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



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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

FREQUENCIES (MHz)	FIELD STRENGTH (microvolts/meter)	MEASUREMENT DISTANCE (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

NOTE:

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



4.2.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESU40	100449	Mar. 12,17	Mar. 11,18
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV7	102331	Nov. 04,16	Nov. 03,17
Bilog Antenna (30MHz~1GHz)	Teseq	CBL 6111D	30643	Jul. 14, 16	Jul. 13, 17
Loop antenna (9KHz ~30MHz)	Daze	ZN30900A	0708	Mar. 12,17	Mar. 11,18
Amplifier (9kHz-1GHz)	SONOMA	310D	186955	Mar. 04,17	Mar. 03, 18
Horn Antenna (1GHz -18GHz)	ETS -Lindgren	3117	00062558	May 18,17	May 17,18
GPS Generator+ Antenna	TOJOIN	GNSS-5000A	E1-010119	Aug. 08, 16	Aug. 07, 17
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	NSEMC003	Mar. 12,17	Mar. 11,18
Test Software	ADT	ADT_Radiated_V7.6.15.9.2	N/A	N/A	N/A
Horn Antenna (18GHz-40GHz)	SCHWARZBECK	BBHA 9170	BBHA9170242	Mar. 15,17	Mar. 14,18
Broadband Preamplifier (1GHz~18GHz)	SCHWARZBECK	BBV9718	305	Mar. 09,17	Mar. 08,18
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

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, GREGT/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 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.

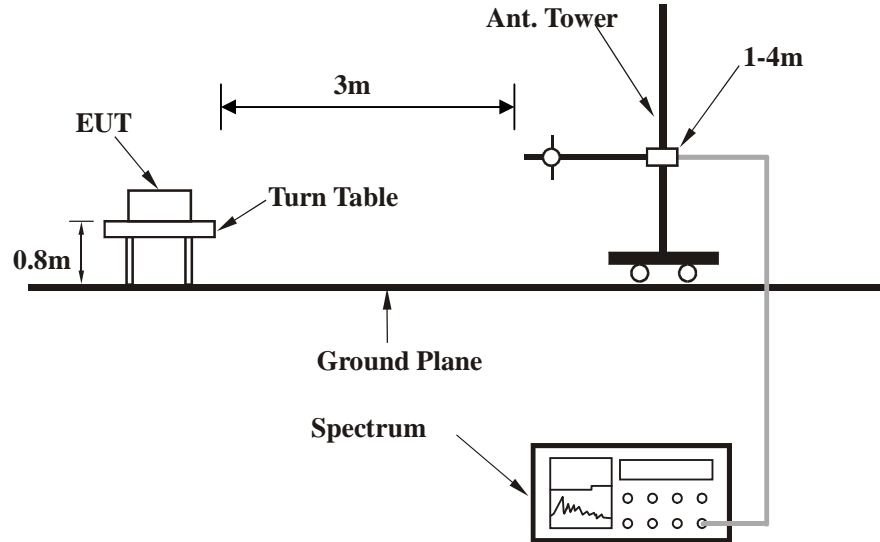
4.2.4 DEVIATION FROM TEST STANDARD

No deviation.



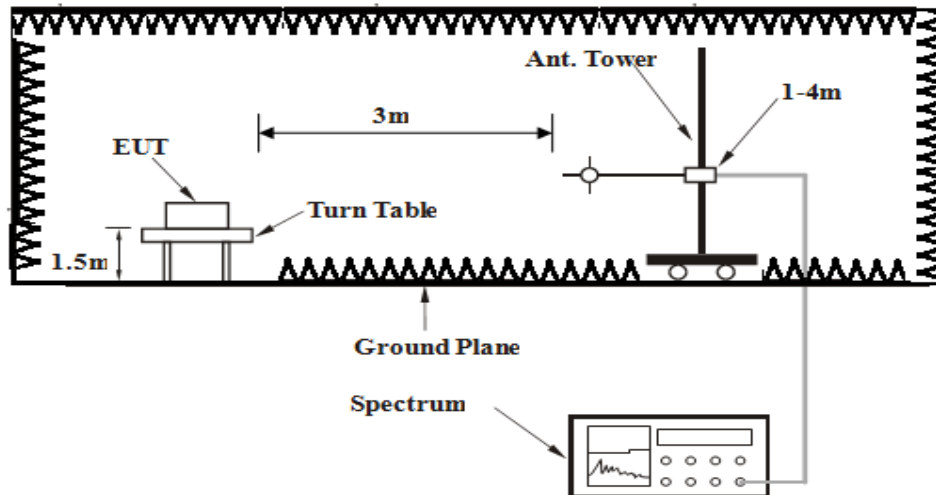
4.2.5 TEST SETUP

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

- Placed the EUT 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:

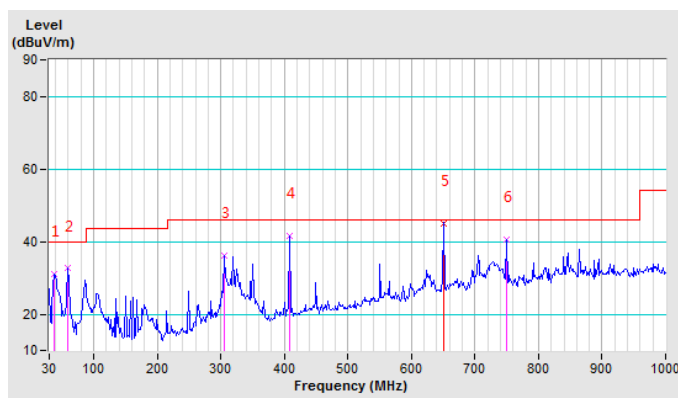
802.11b

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	37.77	31.08 QP	40.00	-8.92	1.00 H	45	46.27	-15.19
2	59.54	32.57 QP	40.00	-7.43	1.00 H	119	57.25	-24.68
3	305.14	36.23 QP	46.00	-9.77	1.00 H	58	48.81	-12.58
4	407.74	41.53 QP	46.00	-4.47	1.00 H	217	49.86	-8.33
5	650.00	44.90 QP	46.00	-1.10	1.00 H	252	47.85	-2.95
6	749.73	40.58 QP	46.00	-5.42	1.00 H	309	40.66	-0.08

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.



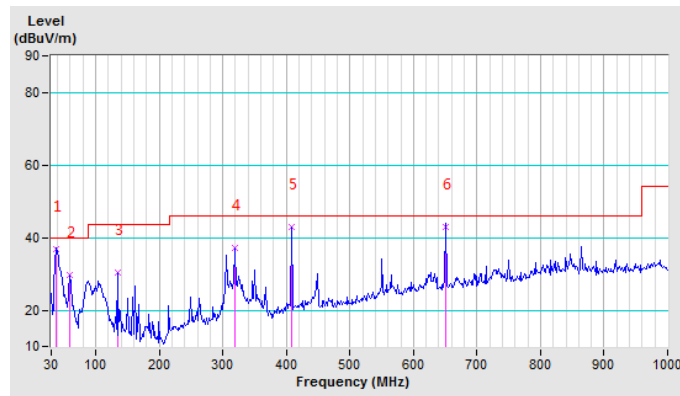


CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9KHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	37.77	36.79 QP	40.00	-3.21	1.00 V	38	51.98	-15.19
2	59.54	29.83 QP	40.00	-10.17	1.00 V	130	54.51	-24.68
3	134.15	30.35 QP	43.50	-13.15	1.00 V	74	47.50	-17.15
4	319.13	37.27 QP	46.00	-8.73	1.00 V	229	50.13	-12.86
5	407.74	42.92 QP	46.00	-3.08	1.00 V	245	51.25	-8.33
6	650.24	43.00 QP	46.00	-3.00	1.00 V	319	45.95	-2.95

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	46.46 PK	74.00	-27.54	1.00 H	247	43.41	3.05
2	2390.00	34.25 AV	54.00	-19.75	1.00 H	247	31.20	3.05
3	*2412.00	94.18 PK			1.00 H	247	91.09	3.09
4	*2412.00	89.72 AV			1.00 H	247	86.63	3.09
5	4824.00	51.81 PK	74.00	-22.19	1.00 H	87	46.68	5.13
6	4824.00	47.35 AV	54.00	-6.65	1.00 H	87	42.22	5.13
7	#7236.00	56.33 PK	74.00	-17.67	2.00 H	159	44.31	12.02
8	#7236.00	42.54 AV	54.00	-11.46	2.00 H	159	30.52	12.02
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	50.80 PK	74.00	-23.20	1.00 V	322	47.75	3.05
2	2390.00	36.73 AV	54.00	-17.27	1.00 V	322	33.68	3.05
3	*2412.00	101.96 PK			1.00 V	322	98.87	3.09
4	*2412.00	97.08 AV			1.00 V	322	93.99	3.09
5	4824.00	54.49 PK	74.00	-19.51	1.00 V	150	49.36	5.13
6	4824.00	51.21 AV	54.00	-2.79	1.00 V	150	46.08	5.13
7	#7236.00	55.17 PK	74.00	-18.83	1.00 V	177	43.15	12.02
8	#7236.00	42.59 AV	54.00	-11.41	1.00 V	177	30.57	12.02

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	95.47 PK			1.00 H	254	92.31	3.16
2	*2437.00	90.52 AV			1.00 H	254	87.36	3.16
3	4874.00	51.49 PK	74.00	-22.51	1.00 H	89	46.27	5.22
4	4874.00	45.31 AV	54.00	-8.69	1.00 H	89	40.09	5.22
5	7311.00	57.10 PK	74.00	-16.90	1.00 H	188	44.79	12.31
6	7311.00	43.46 AV	54.00	-10.54	1.00 H	188	31.15	12.31
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	93.60 PK			1.00 V	285	90.44	3.16
2	*2437.00	89.48 AV			1.00 V	285	86.32	3.16
3	4874.00	54.35 PK	74.00	-19.65	2.00 V	282	49.13	5.22
4	4874.00	51.18 AV	54.00	-2.82	2.00 V	282	45.96	5.22
5	7311.00	58.21 PK	74.00	-15.79	1.00 V	200	45.90	12.31
6	7311.00	45.39 AV	54.00	-8.61	1.00 V	200	33.08	12.31

REMARKS:

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



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	90.74 PK			2.00 H	301	87.52	3.22
2	*2462.00	86.47 AV			2.00 H	301	83.25	3.22
3	2483.50	46.46 PK	74.00	-27.54	2.00 H	301	43.19	3.27
4	2483.50	34.24 AV	54.00	-19.76	2.00 H	301	30.97	3.27
5	4924.00	51.13 PK	74.00	-22.87	1.00 H	97	45.81	5.32
6	4924.00	44.98 AV	54.00	-9.02	1.00 H	97	39.66	5.32
7	7386.00	56.99 PK	74.00	-17.01	1.00 H	252	44.38	12.61
8	7386.00	44.66 AV	54.00	-9.34	1.00 H	252	32.05	12.61
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	94.17 PK			1.00 V	277	90.95	3.22
2	*2462.00	90.24 AV			1.00 V	277	87.02	3.22
3	2483.50	46.55 PK	74.00	-27.45	1.00 V	277	43.28	3.27
4	2483.50	34.31 AV	54.00	-19.69	1.00 V	277	31.04	3.27
5	4924.00	54.40 PK	74.00	-19.60	2.00 V	200	49.08	5.32
6	4924.00	50.71 AV	54.00	-3.29	2.00 V	200	45.39	5.32
7	7386.00	59.55 PK	74.00	-14.45	1.00 V	158	46.94	12.61
8	7386.00	45.74 AV	54.00	-8.26	1.00 V	158	33.13	12.61

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	46.16 PK	74.00	-27.84	2.00 H	247	43.11	3.05
2	2390.00	33.78 AV	54.00	-20.22	2.00 H	247	30.73	3.05
3	*2412.00	90.36 PK			2.00 H	247	87.27	3.09
4	*2412.00	80.29 AV			2.00 H	247	77.20	3.09
5	4824.00	48.11 PK	74.00	-25.89	1.00 H	26	42.98	5.13
6	4824.00	39.48 AV	54.00	-14.52	1.00 H	26	34.35	5.13
7	#7236.00	54.81 PK	74.00	-19.19	1.00 H	253	42.79	12.02
8	#7236.00	43.47 AV	54.00	-10.53	1.00 H	253	31.45	12.02
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	45.20 PK	74.00	-28.80	1.00 V	327	42.15	3.05
2	2390.00	33.75 AV	54.00	-20.25	1.00 V	327	30.70	3.05
3	*2412.00	88.63 PK			1.00 V	327	85.54	3.09
4	*2412.00	79.67 AV			1.00 V	327	76.58	3.09
5	4824.00	53.52 PK	74.00	-20.48	1.00 V	237	48.39	5.13
6	4824.00	43.27 AV	54.00	-10.73	1.00 V	237	38.14	5.13
7	#7236.00	57.52 PK	74.00	-16.48	1.00 V	335	45.50	12.02
8	#7236.00	43.67 AV	54.00	-10.33	1.00 V	335	31.65	12.02

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	85.64 PK			1.00 H	302	82.48	3.16
2	*2437.00	75.41 AV			1.00 H	302	72.25	3.16
3	4874.00	52.37 PK	74.00	-21.63	1.00 H	89	47.15	5.22
4	4874.00	42.21 AV	54.00	-11.79	1.00 H	89	36.99	5.22
5	7311.00	57.33 PK	74.00	-16.67	1.00 H	154	45.02	12.31
6	7311.00	43.41 AV	54.00	-10.59	1.00 H	154	31.10	12.31
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	89.51 PK			2.00 V	285	86.35	3.16
2	*2437.00	79.29 AV			2.00 V	285	76.13	3.16
3	4874.00	52.86 PK	74.00	-21.14	1.00 V	255	47.64	5.22
4	4874.00	41.80 AV	54.00	-12.20	1.00 V	255	36.58	5.22
5	7311.00	56.80 PK	74.00	-17.20	2.00 V	177	44.49	12.31
6	7311.00	42.53 AV	54.00	-11.47	2.00 V	177	30.22	12.31

REMARKS:

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



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	89.28 PK			2.00 H	247	86.06	3.22
2	*2462.00	79.16 AV			2.00 H	247	75.94	3.22
3	2483.50	45.24 PK	74.00	-28.76	2.00 H	247	41.97	3.27
4	2483.50	33.59 AV	54.00	-20.41	2.00 H	247	30.32	3.27
5	4924.00	48.79 PK	74.00	-25.21	1.00 H	168	43.47	5.32
6	4924.00	38.81 AV	54.00	-15.19	1.00 H	168	33.49	5.32
7	7386.00	56.61 PK	74.00	-17.39	1.00 H	225	44.00	12.61
8	7386.00	43.70 AV	54.00	-10.30	1.00 H	225	31.09	12.61
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	88.42 PK			1.00 V	317	85.20	3.22
2	*2462.00	78.35 AV			1.00 V	317	75.13	3.22
3	2483.50	45.88 PK	74.00	-28.12	1.00 V	317	42.61	3.27
4	2483.50	33.83 AV	54.00	-20.17	1.00 V	317	30.56	3.27
5	4924.00	50.17 PK	74.00	-23.83	2.00 V	188	44.85	5.32
6	4924.00	38.27 AV	54.00	-15.73	2.00 V	188	32.95	5.32
7	7386.00	56.84 PK	74.00	-17.16	1.00 V	158	44.23	12.61
8	7386.00	42.86 AV	54.00	-11.14	1.00 V	158	30.25	12.61

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	46.01 PK	74.00	-27.99	2.00 H	246	42.96	3.05
2	2390.00	33.69 AV	54.00	-20.31	2.00 H	246	30.64	3.05
3	*2412.00	89.45 PK			2.00 H	246	86.36	3.09
4	*2412.00	78.83 AV			2.00 H	246	75.74	3.09
5	4824.00	52.37 PK	74.00	-21.63	1.00 H	151	47.24	5.13
6	4824.00	42.27 AV	54.00	-11.73	1.00 H	151	37.14	5.13
7	#7236.00	57.77 PK	74.00	-16.23	1.00 H	158	45.75	12.02
8	#7236.00	39.63 AV	54.00	-14.37	1.00 H	158	27.61	12.02
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	45.39 PK	74.00	-28.61	2.00 V	326	42.34	3.05
2	2390.00	33.65 AV	54.00	-20.35	2.00 V	326	30.60	3.05
3	*2412.00	88.25 PK			2.00 V	326	85.16	3.09
4	*2412.00	78.69 AV			2.00 V	326	75.60	3.09
5	4824.00	49.49 PK	74.00	-24.51	1.00 V	143	44.36	5.13
6	4824.00	40.53 AV	54.00	-13.47	1.00 V	143	35.40	5.13
7	#7236.00	58.44 PK	74.00	-15.56	1.00 V	178	46.42	12.02
8	#7236.00	43.72 AV	54.00	-10.28	1.00 V	178	31.70	12.02

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.



**BUREAU
VERITAS**

Test Report No.: RF160908N043

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	84.61 PK			1.00 H	307	81.45	3.16
2	*2437.00	74.44 AV			1.00 H	307	71.28	3.16
3	4874.00	48.86 PK	74.00	-25.14	1.00 H	56	43.64	5.22
4	4874.00	39.40 AV	54.00	-14.60	1.00 H	56	34.18	5.22
5	7311.00	58.80 PK	74.00	-15.20	2.00 H	189	46.49	12.31
6	7311.00	43.15 AV	54.00	-10.85	2.00 H	189	30.84	12.31
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	88.37 PK			2.00 V	286	85.21	3.16
2	*2437.00	78.71 AV			2.00 V	286	75.55	3.16
3	4874.00	51.86 PK	74.00	-22.14	1.00 V	148	46.64	5.22
4	4874.00	40.14 AV	54.00	-13.86	1.00 V	148	34.92	5.22
5	7311.00	57.63 PK	74.00	-16.37	2.00 V	127	45.32	12.31
6	7311.00	44.65 AV	54.00	-9.35	2.00 V	127	32.34	12.31

REMARKS:

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



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	89.42 PK			2.00 H	249	86.20	3.22
2	*2462.00	78.99 AV			2.00 H	249	75.77	3.22
3	2483.50	45.93 PK	74.00	-28.07	2.00 H	249	42.66	3.27
4	2483.50	33.73 AV	54.00	-20.27	2.00 H	249	30.46	3.27
5	4924.00	47.36 PK	74.00	-26.64	2.00 H	115	42.04	5.32
6	4924.00	34.25 AV	54.00	-19.75	2.00 H	115	28.93	5.32
7	7386.00	55.32 PK	74.00	-18.68	1.00 H	314	42.71	12.61
8	7386.00	41.98 AV	54.00	-12.02	1.00 H	314	29.37	12.61
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	88.81 PK			1.00 V	279	85.59	3.22
2	*2462.00	78.56 AV			1.00 V	279	75.34	3.22
3	2483.50	45.96 PK	74.00	-28.04	1.00 V	279	42.69	3.27
4	2483.50	33.70 AV	54.00	-20.30	1.00 V	279	30.43	3.27
5	4924.00	49.86 PK	74.00	-24.14	2.00 V	172	44.54	5.32
6	4924.00	36.32 AV	54.00	-17.68	2.00 V	172	31.00	5.32
7	7386.00	57.39 PK	74.00	-16.61	1.00 V	91	44.78	12.61
8	7386.00	43.18 AV	54.00	-10.82	1.00 V	91	30.57	12.61

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	45.02 PK	74.00	-28.98	2.00 H	248	41.97	3.05
2	2390.00	33.77 AV	54.00	-20.23	2.00 H	248	30.72	3.05
3	*2422.00	85.09 PK			2.00 H	248	81.97	3.12
4	*2422.00	74.73 AV			2.00 H	248	71.61	3.12
5	4844.00	48.83 PK	74.00	-25.17	1.00 H	153	43.67	5.16
6	4844.00	37.45 AV	54.00	-16.55	1.00 H	153	32.29	5.16
7	7266.00	56.42 PK	74.00	-17.58	1.00 H	138	44.29	12.13
8	7266.00	43.47 AV	54.00	-10.53	1.00 H	138	31.34	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	46.55 PK	74.00	-27.45	1.00 V	320	43.50	3.05
2	2390.00	33.70 AV	54.00	-20.30	1.00 V	320	30.65	3.05
3	*2422.00	85.45 PK			1.00 V	320	82.33	3.12
4	*2422.00	75.65 AV			1.00 V	320	72.53	3.12
5	4844.00	47.38 PK	74.00	-26.62	1.00 V	158	42.22	5.16
6	4844.00	39.36 AV	54.00	-14.64	1.00 V	158	34.20	5.16
7	7266.00	54.37 PK	74.00	-19.63	2.00 V	332	42.24	12.13
8	7266.00	41.55 AV	54.00	-12.45	2.00 V	332	29.42	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.



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	84.38 PK			1.00 H	176	81.22	3.16
2	*2437.00	74.89 AV			1.00 H	176	71.73	3.16
3	4874.00	48.33 PK	74.00	-25.67	1.00 H	132	43.11	5.22
4	4874.00	37.71 AV	54.00	-16.29	1.00 H	132	32.49	5.22
5	7311.00	53.25 PK	74.00	-20.75	2.00 H	146	40.94	12.31
6	7311.00	38.99 AV	54.00	-15.01	2.00 H	146	26.68	12.31
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	85.72 PK			2.00 V	285	82.56	3.16
2	*2437.00	75.05 AV			2.00 V	285	71.89	3.16
3	4874.00	48.19 PK	74.00	-25.81	1.00 V	159	42.97	5.22
4	4874.00	37.92 AV	54.00	-16.08	1.00 V	159	32.70	5.22
5	7311.00	58.27 PK	74.00	-15.73	1.00 V	150	45.96	12.31
6	7311.00	43.58 AV	54.00	-10.42	1.00 V	150	31.27	12.31

REMARKS:

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



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	87.00 PK			1.00 H	254	83.81	3.19
2	*2452.00	76.48 AV			1.00 H	254	73.29	3.19
3	2483.50	46.02 PK	74.00	-27.98	1.00 H	254	42.75	3.27
4	2483.50	33.65 AV	54.00	-20.35	1.00 H	254	30.38	3.27
5	4904.00	54.21 PK	74.00	-19.79	1.00 H	158	48.93	5.28
6	4904.00	39.33 AV	54.00	-14.67	1.00 H	158	34.05	5.28
7	7356.00	58.14 PK	74.00	-15.86	1.00 H	249	45.65	12.49
8	7356.00	43.64 AV	54.00	-10.36	1.00 H	249	31.15	12.49
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	85.27 PK			1.00 V	320	82.08	3.19
2	*2452.00	74.99 AV			1.00 V	320	71.80	3.19
3	2483.50	45.67 PK	74.00	-28.33	1.00 V	320	42.40	3.27
4	2483.50	33.81 AV	54.00	-20.19	1.00 V	320	30.54	3.27
5	4904.00	55.21 PK	74.00	-18.79	1.00 V	188	49.93	5.28
6	4904.00	37.99 AV	54.00	-16.01	1.00 V	188	32.71	5.28
7	7356.00	58.22 PK	74.00	-15.78	2.00 V	142	45.73	12.49
8	7356.00	44.51 AV	54.00	-9.49	2.00 V	142	32.02	12.49

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	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
Spectrum Analyzer	Keysight	N9020A	MY55400499	Apr. 05,17	Apr. 04,18
MXG-B RF Vector Signal Generator	Keysight	N5182B	MY56200288	Dec.05, 16	Dec. 04, 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

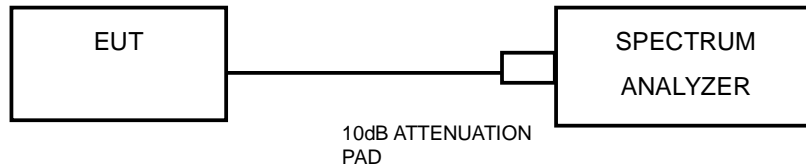
1. Set resolution bandwidth (RBW) = 100KHz
2. Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
3. Trace mode = max hold.
4. Sweep = auto couple.
5. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower)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

4.3.4 DEVIATION FROM TEST STANDARD

No deviation.



4.3.5 TEST SETUP



4.3.6 EUT OPERATING CONDITIONS

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



4.3.7 TEST RESULTS

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	10.08	0.5	PASS
6	2437	10.02	0.5	PASS
11	2462	10.05	0.5	PASS

802.11g

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

802.11n 20MHz

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	16.41	0.5	PASS
6	2437	16.42	0.5	PASS
11	2462	16.42	0.5	PASS

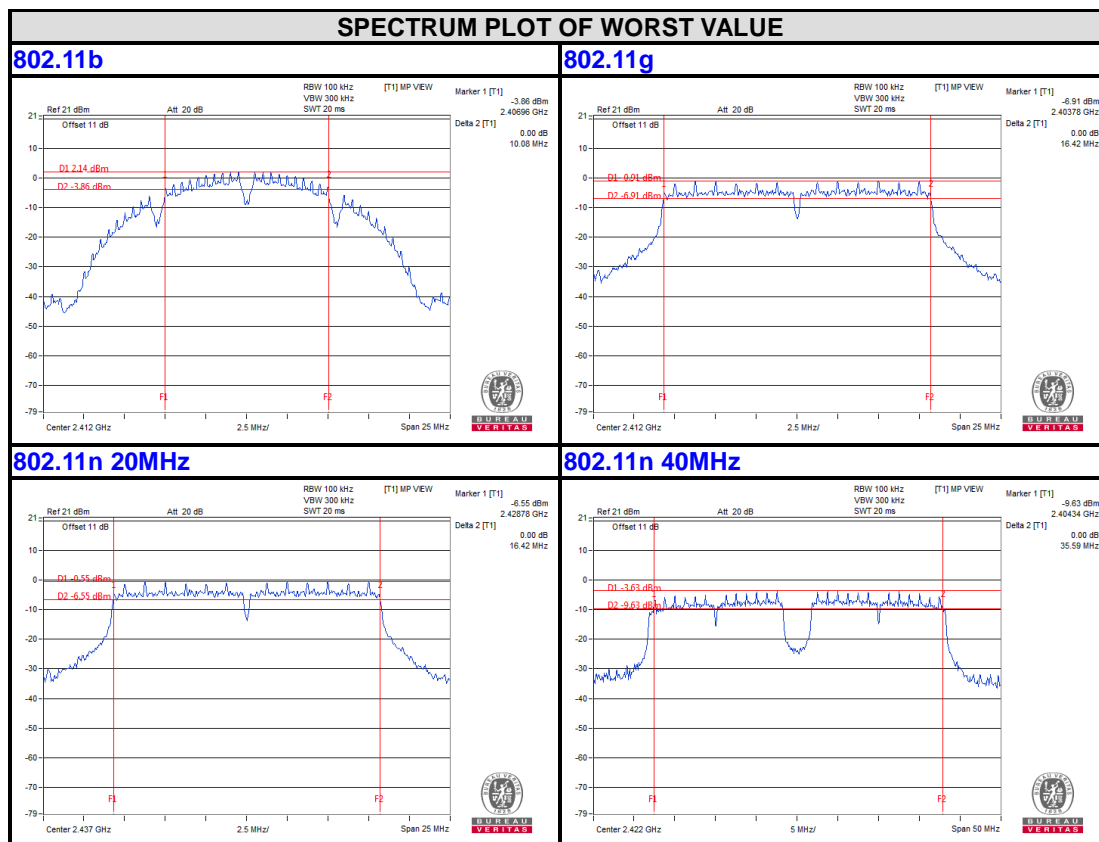
802.11n 40MHz

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
3	2422	35.59	0.5	PASS
6	2437	35.56	0.5	PASS
9	2452	35.54	0.5	PASS



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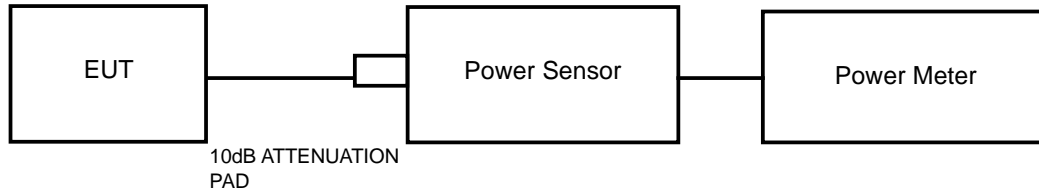


4.4 CONDUCTED OUTPUT POWER

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
Spectrum Analyzer	Keysight	N9020A	MY55400499	Apr. 05,17	Apr. 04,18
MXG-B RF Vector Signal Generator	Keysight	N5182B	MY56200288	Dec.05, 16	Dec. 04, 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

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

4.4.5 DEVIATION FROM TEST STANDARD

No deviation.

4.4.6 EUT OPERATING CONDITIONS

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



4.4.7 TEST RESULTS

MAXIMUM PEAK OUTPUT POWER

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)	PEAK POWER (mW)	PEAK POWER LIMIT (W)	PASS/FAIL
1	2412	14.73	29.717	1	PASS
6	2437	14.91	30.974	1	PASS
11	2462	15.27	33.651	1	PASS

802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)	PEAK POWER (mW)	PEAK POWER LIMIT (W)	PASS/FAIL
1	2412	18.41	69.343	1	PASS
6	2437	18.72	74.473	1	PASS
11	2462	19.61	91.411	1	PASS

802.11n 20MHz

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)	PEAK POWER (mW)	PEAK POWER LIMIT (W)	PASS/FAIL
1	2412	18.27	67.143	1	PASS
6	2437	18.56	71.779	1	PASS
11	2462	19.28	84.723	1	PASS

802.11n 40MHz

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)	PEAK POWER (mW)	PEAK POWER LIMIT (W)	PASS/FAIL
3	2422	18.02	63.387	1	PASS
6	2437	18.16	65.464	1	PASS
9	2452	18.44	69.823	1	PASS



4.4.7.2 AVERAGE OUTPUT POWER (FOR REFERENCE)

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

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	AVG. POWER (mW)	PEAK POWER LIMIT (W)	PASS / FAIL
1	2412	11.18	13.122	1	PASS
6	2437	11.39	13.772	1	PASS
11	2462	11.88	15.417	1	PASS

802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	AVG. POWER (mW)	PEAK POWER LIMIT (W)	PASS / FAIL
1	2412	10.95	12.445	1	PASS
6	2437	11.34	13.614	1	PASS
11	2462	12.06	16.069	1	PASS

802.11n 20MHz

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	AVG. POWER (mW)	PEAK POWER LIMIT (W)	PASS / FAIL
1	2412	10.74	11.858	1	PASS
6	2437	10.91	12.331	1	PASS
11	2462	11.29	13.459	1	PASS

802.11n 40MHz

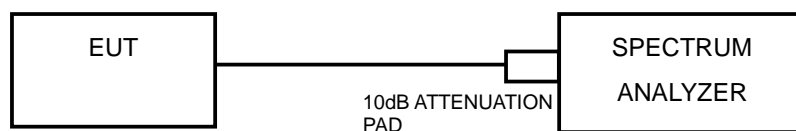
CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	AVG. POWER (mW)	PEAK POWER LIMIT (W)	PASS / FAIL
3	2422	10.24	10.568	1	PASS
6	2437	10.43	11.041	1	PASS
9	2452	10.93	12.388	1	PASS

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

- Set instrument center frequency to DTS channel center frequency.
- Set span to at least 1.5 times the OBW.
- Set RBW to: 3KHz
- Set VBW $\geq 3 \times$ RBW.
- Detector = peak
- Ensure that the number of measurement points in the sweep $\geq 2 \times$ span/RBW.
- Sweep time = auto couple.
- Use the peak marker function to determine the maximum amplitude level.

4.5.5 DEVIATION FROM TEST STANDARD

No deviation.



4.5.6 EUT OPERATING CONDITION

Same as item 4.3.6.

4.5.7 TEST RESULTS

802.11b

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-12.35	8.00	PASS
6	2437	-11.74	8.00	PASS
11	2462	-11.40	8.00	PASS

802.11g

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-15.25	8.00	PASS
6	2437	-14.80	8.00	PASS
11	2462	-14.64	8.00	PASS

802.11n 20MHz

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-15.37	8.00	PASS
6	2437	-14.83	8.00	PASS
11	2462	-14.95	8.00	PASS

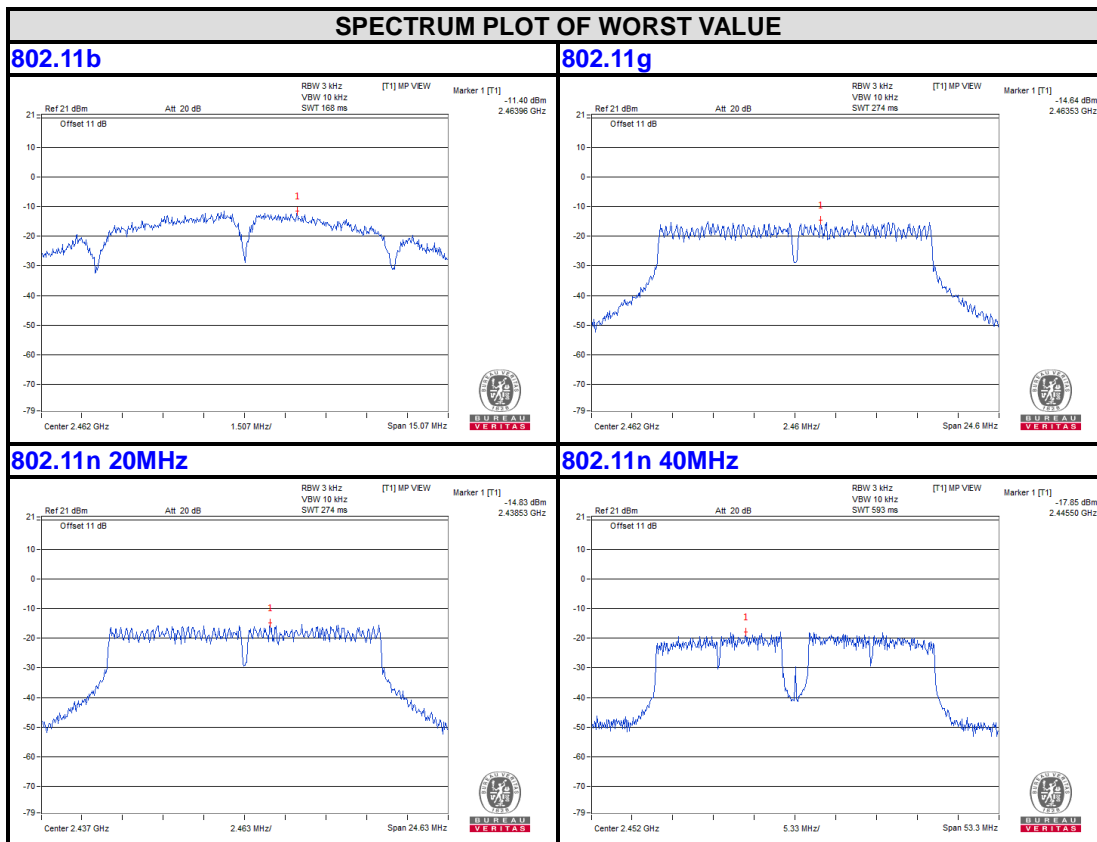
802.11n 40MHz

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
3	2422	-18.70	8.00	PASS
6	2437	-18.17	8.00	PASS
9	2452	-17.85	8.00	PASS



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4.6 OUT OF BAND EMISSION MEASUREMENT

4.6.1 LIMITS OF OUT OF BAND EMISSION MEASUREMENT

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

4.6.2 TEST SETUP



4.6.3 TEST INSTRUMENTS

Refer to section 4.3.2 to get information of above instrument.

4.6.4 TEST PROCEDURE

Measurement Procedure - Reference Level

1. Set the RBW = 100 kHz.
2. Set the VBW \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



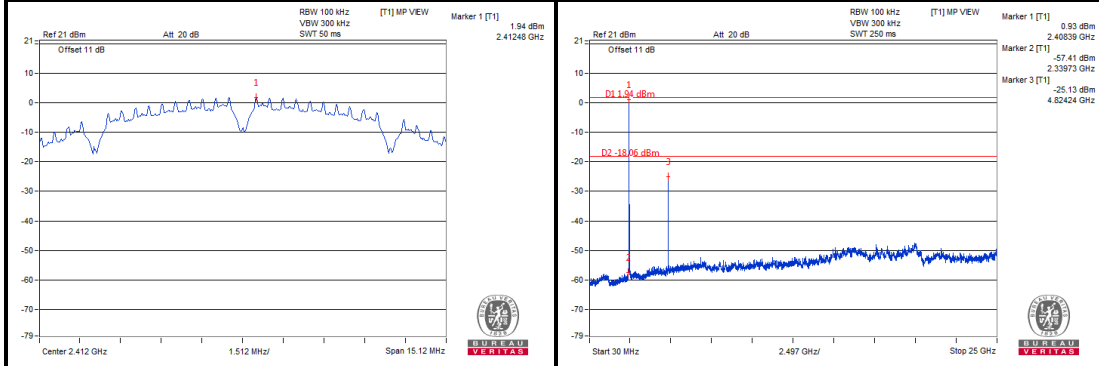
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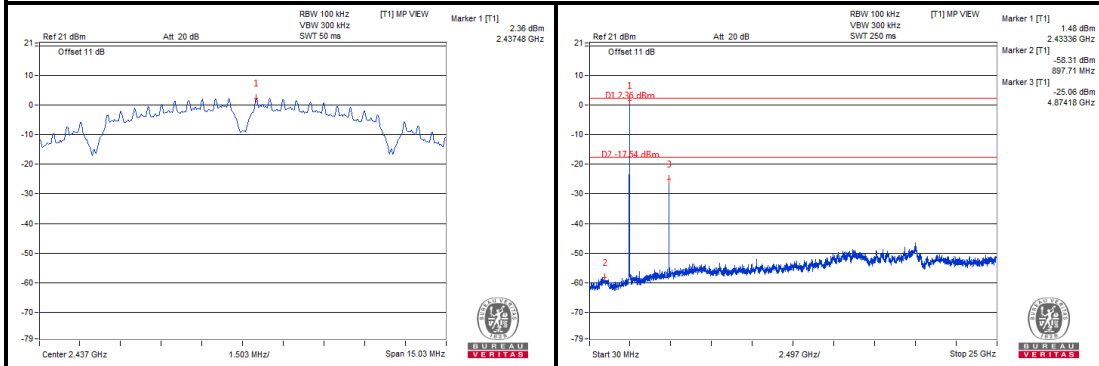
4.6.7 TEST RESULTS

802.11b

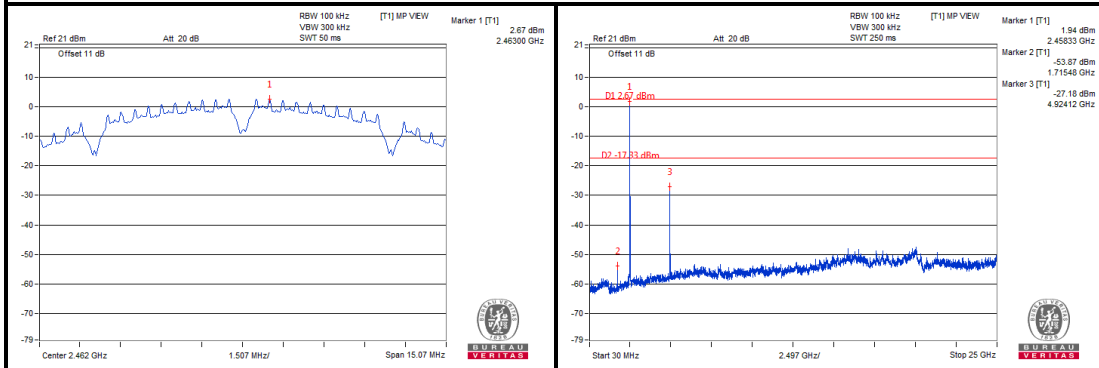
CH 1



CH 6



CH 11



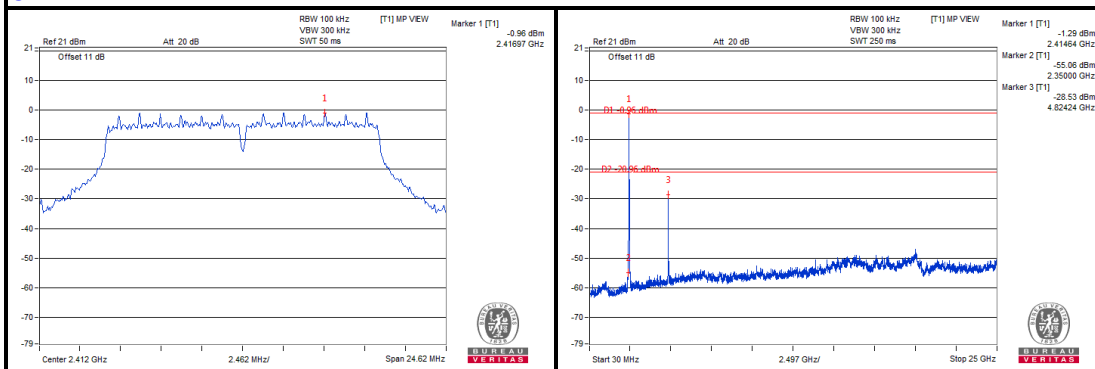


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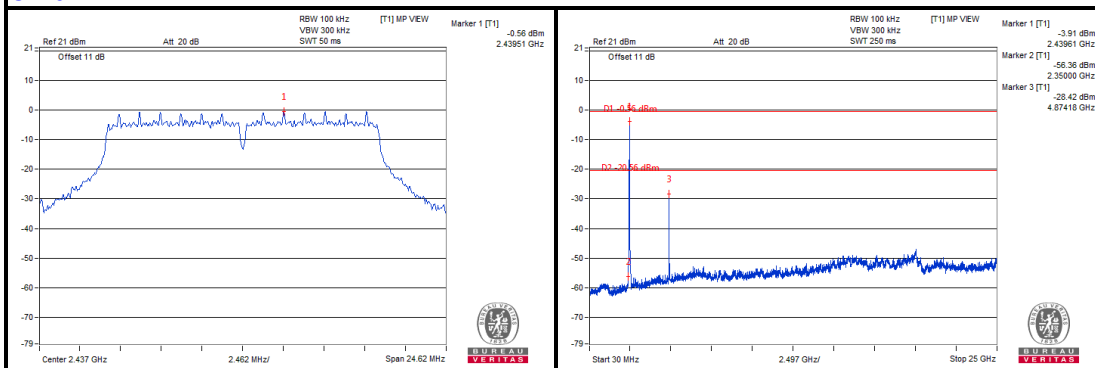
Test Report No.: RF160908N043

802.11g

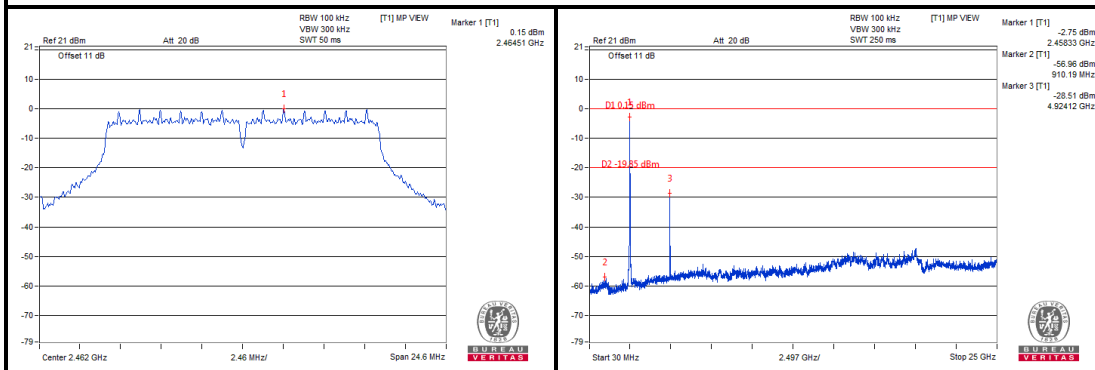
CH 1



CH 6



CH 11

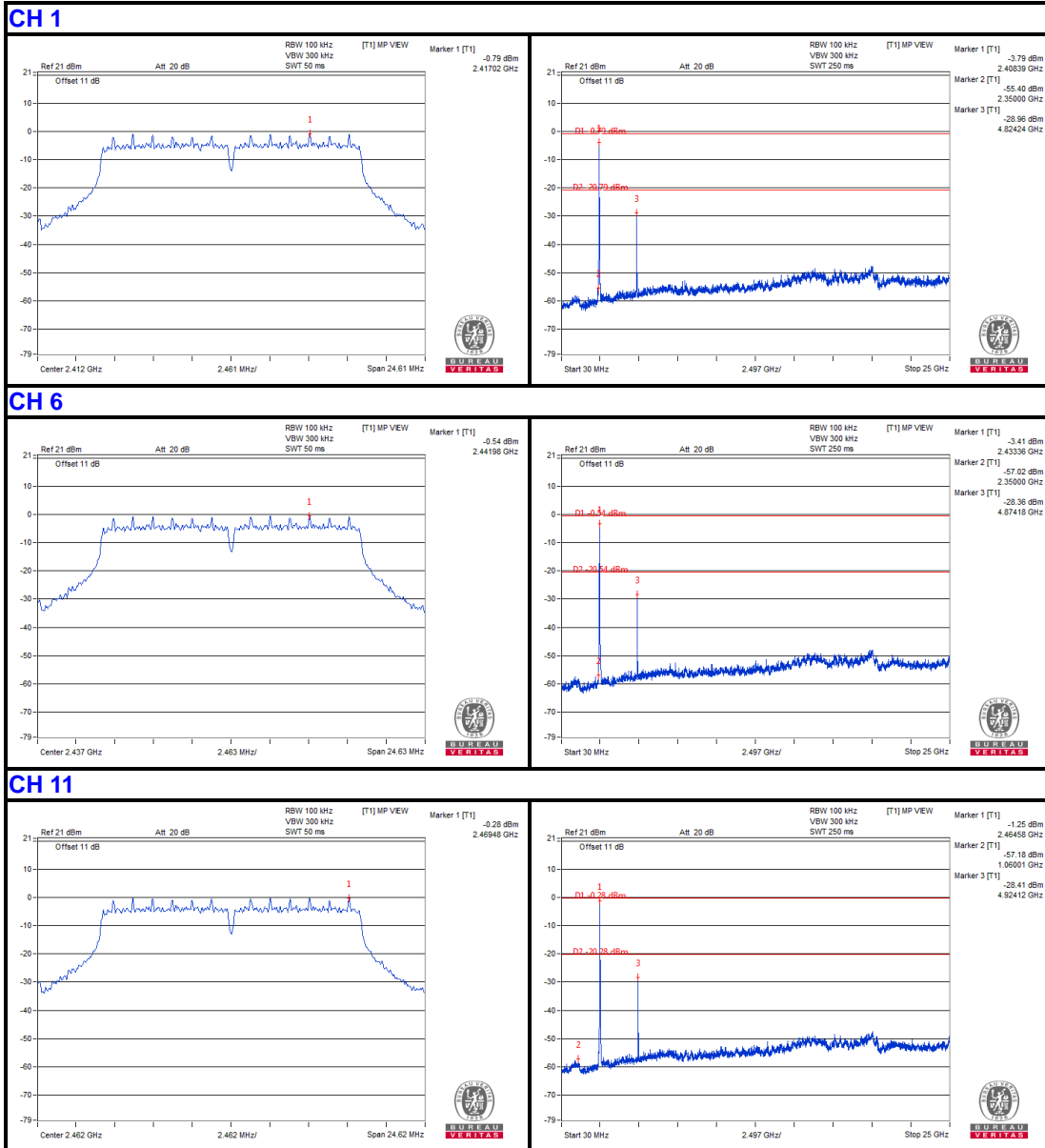




BUREAU
VERITAS

Test Report No.: RF160908N043

802.11n 20MHz



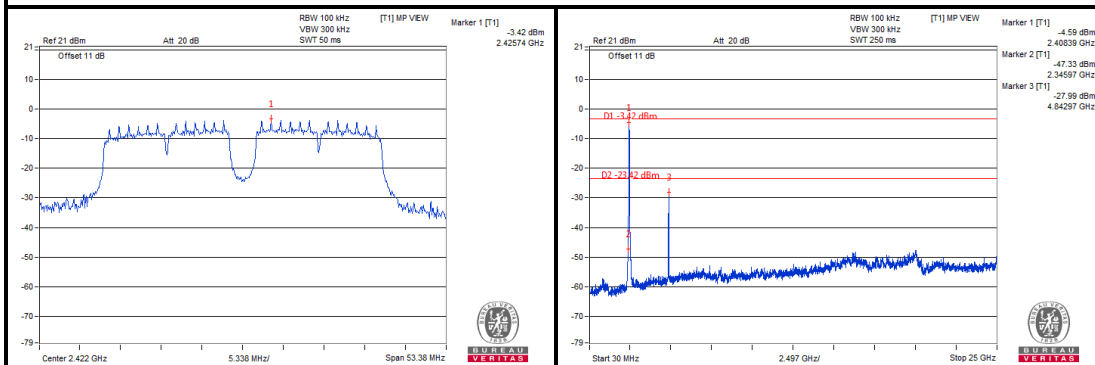


BUREAU
VERITAS

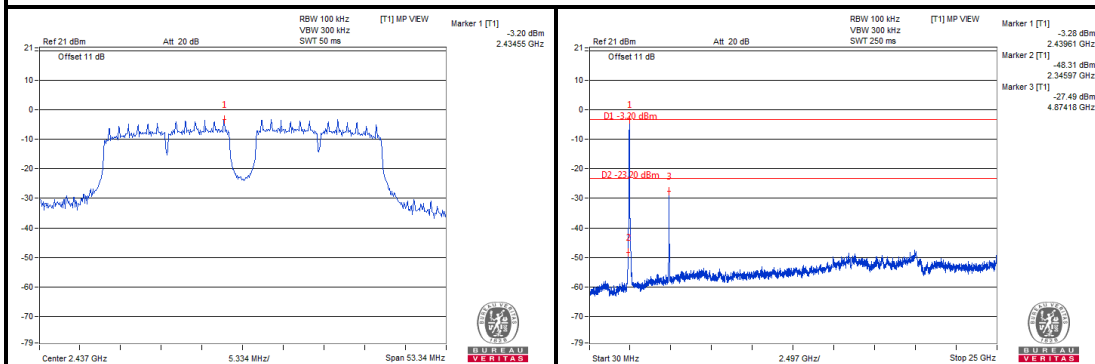
Test Report No.: RF160908N043

802.11n 40MHz

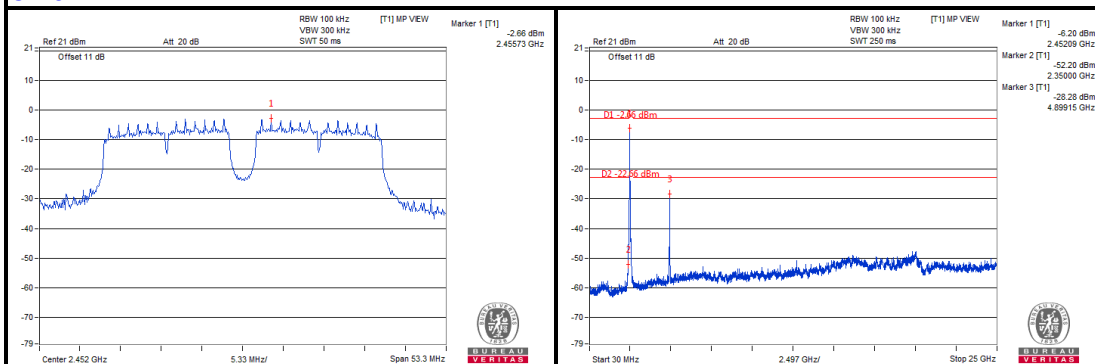
CH 3



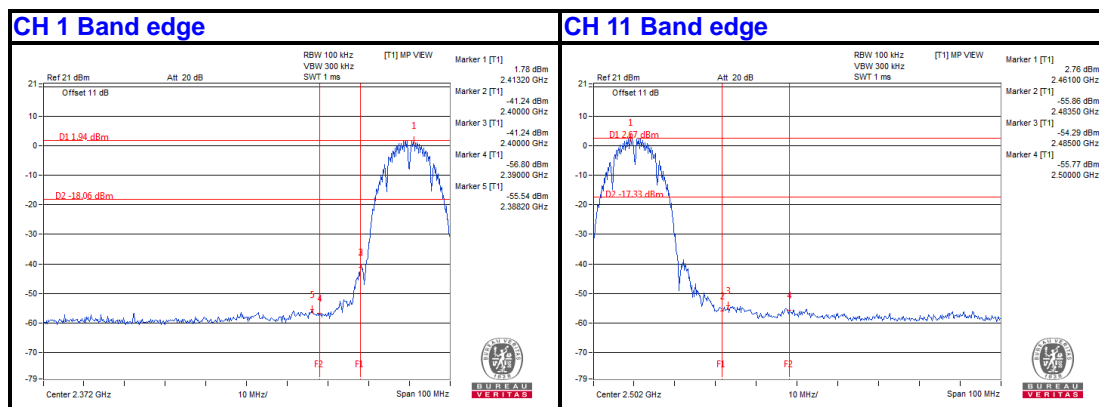
CH 6



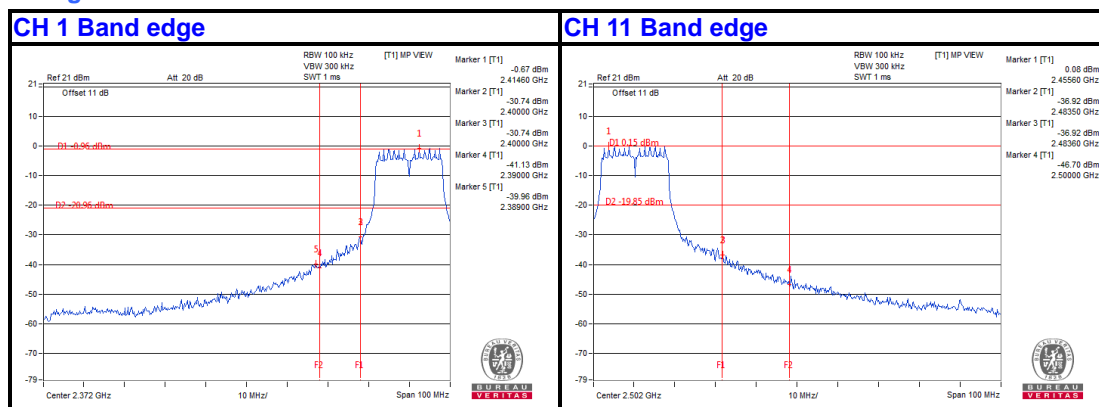
CH 9



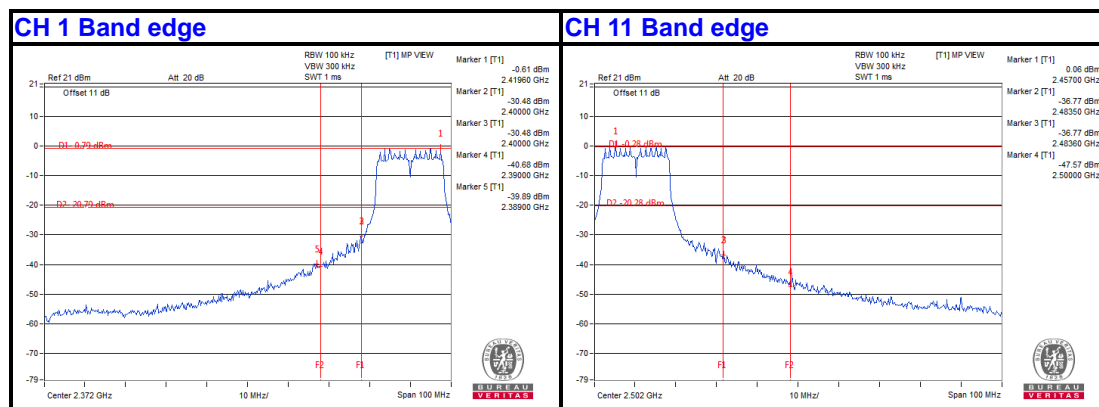
802.11b



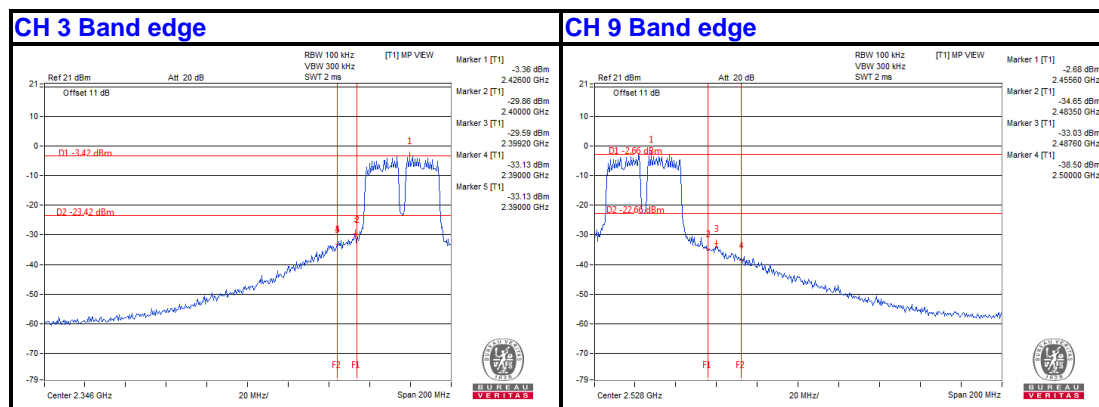
802.11g



802.11n 20MHz



802.11n 40MHz





5 PHOTOGRAPHS OF THE TEST CONFIGURATION

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



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

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

---END---