



Test Report No.: RF200518N028-2



TEST REPORT



Applicant	Particle Industries, Inc
Address	126 Post St,4th floor, San Francisco, CA 94108 USA

Manufacturer or Supplier	Particle Industries, Inc
Address	126 Post St,4th floor, San Francisco, CA 94108 USA
Product	Tracker SoM LTE M1
Brand Name	Particle
Model	T402M
Additional Model & Model Difference	T404M, see items 3.1 note
Date of tests	May 18, 2020 ~ Jul. 18, 2020

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 Senior Project Engineer / EMC Department	Approved by Glyn He Assistant Manager / EMC Department
	 Date: Aug. 14, 2020

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Test Report No.: RF200518N028-2

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF200518N028-2	Original release	Aug. 14, 2020

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	N/A	Powered by Battery
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	Antenna connector is i-pex not a standard connector.

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
Radiated emissions	9KHz ~ 30MHz	2.16dB
	30MHz ~ 1GMHz	3.60dB
	1GHz ~ 18GHz	4.82dB
	18GHz ~ 40GHz	5.00dB

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	Tracker SoM LTE M1
BRAND	Particle
MODEL NO.	T402M
ADDITIONAL NO.	T404M
FCC ID	2AEMI-T40X
NOMINAL VOLTAGE	Li+ PIN: DC +3.3V-4.3V or VBUS PIN: DC +4.35V-5.5V or VIN PIN: DC +3.9V-17V
MODULATION TECHNOLOGY	DSSS, OFDM
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
OPERATING FREQUENCY	2412-2462MHz for 11b/g/n(HT20) 2422-2452MHz for 11n(HT40)
PEAK OUTPUT POWER	248.886 mW(Maximum)
ANTENNA TYPE	FPCB Antenna, with 2dBi gain
I/O PORTS	Refer to user's manual
CABLE SUPPLIED	N/A

NOTES:

1. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.
2. Please refer to the EUT photo document (Reference No.: 200518N028) for detailed product photo.
3. Additional model T404M is identical with the test model T402M except the model number for marketing purpose.
4. The EUT is wireless module, it no any accessories, the EUT power by "Som test board: V03" (support units) in the test.
5. 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

FPCB antenna (optional for marketing purpose) may be connect to EUT with ANT connector.

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	√	√	-	√	DC3.8V from som test board: V03

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

RADIATED EMISSION TEST (BELOW 1GHz):

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

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

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

RADIATED EMISSION TEST (ABOVE 1GHz):

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

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

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

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER(POE)	TESTED BY
RE<1G	23deg. C, 53%RH	DC3.8V from som test board: V03	Vincent
RE≥1G	23deg. C, 53%RH	DC3.8V from som test board: V03	Vincent
PLC	N/A	N/A	N/A
APCM	20deg. C, 55%RH	DC3.8V from som test board: V03	Daniel

Remarks: The Som test board: V03 is support units, it power by 3.8V fully battery.



3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

- FCC Part 15, Subpart C, Section 15.247**
- KDB 558074 D01 15.247 Meas Guidance v05r02**
- ANSI C63.10-2013**

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

3.4 DESCRIPTION OF SUPPORT UNITS

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

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	SOM test Board	Particle	V03	38069A-Y411-200421	N/A
2	FPCB Antenna	Particle	Gain: 2dBi	N/A	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1,2	N/A

4 TEST TYPES AND RESULTS

4.1. RADIATED EMISSION MEASUREMENT

4.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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

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

NOTES:

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

4.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESU40	100449	Mar. 18,20	Mar. 17,21
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV7	102331	May 14, 20	May 13, 21
Active Loop Antenna (9KHz -30MHz)	SCHWARZBECK	FMZB 1519B	1519B-045	May 28,20	May 27,21
Amplifier (9KHz -1GHz)	Burgeon	BPA-530	100210	Mar. 15,20	Mar. 14,21
Bilog Antenna (20MHz -2GHz)	Teseq	CBL 6111D	30643	May 30,20	May 29,21
Horn Antenna (1GHz -18GHz)	ETS -Lindgren	3117	00062558	May 30,20	May 29,21
Horn Antenna (18GHz -40GHz)	SCHWARZBECK	BBHA 9170	BBHA9170147	May 10, 20	May 09, 21
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	NSEMC003	May 23,20	May 22,21
Test Software	ADT	ADT_Radiated_V7.6.15.9.2	N/A	N/A	N/A
Broadband Preamplifier (1GHz~18GHz)	SCHWARZBECK	BBV9718	305	May 09,20	May 08,21
Pre-Amplifier (18GHz-40GHz)	EMCI	EMC 184045	980102	Mar. 04,20	Mar. 03,21
Test Software	ADT	ADT_Radiated_V7.6.15.9.2	N/A	N/A	N/A
BLUETOOTH TESTER	Rohde&Schwarz	CBT32	100811	May 20,20	May 19,21

NOTES:

1. The test was performed in 966 Chamber.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
3. The horn antenna is used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Site Registration No. is 749762.

4.1.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 1.5 meters (above 1GHz) and 0.8 meters (below 1GHz) above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. For below 1GHz was used bilog antenna, and above 1GHz was used horn antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. For below 30MHz, a loop antenna with its vertical plane is place 3m from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. And the centre of the loop shall be 1m above the ground.
- g. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, For battery operated equipment, the equipment tests shall be perform using fresh batteries. The turntable was rotated to maximize the emission level.

NOTES:

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

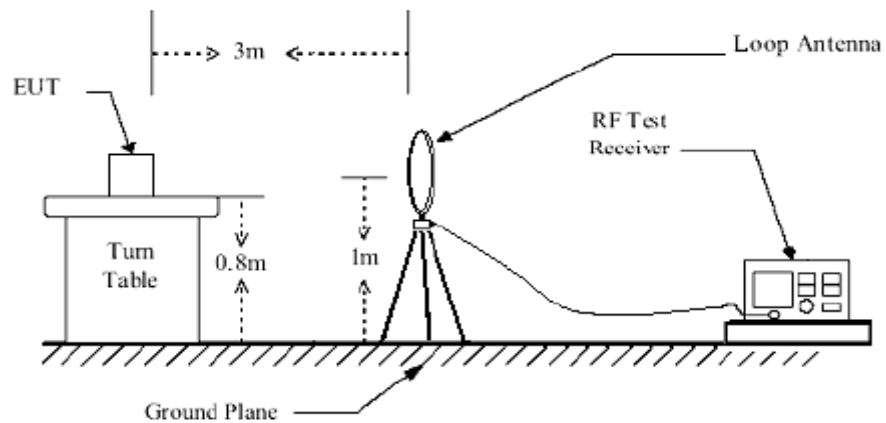


4.1.4 DEVIATION FROM TEST STANDARD

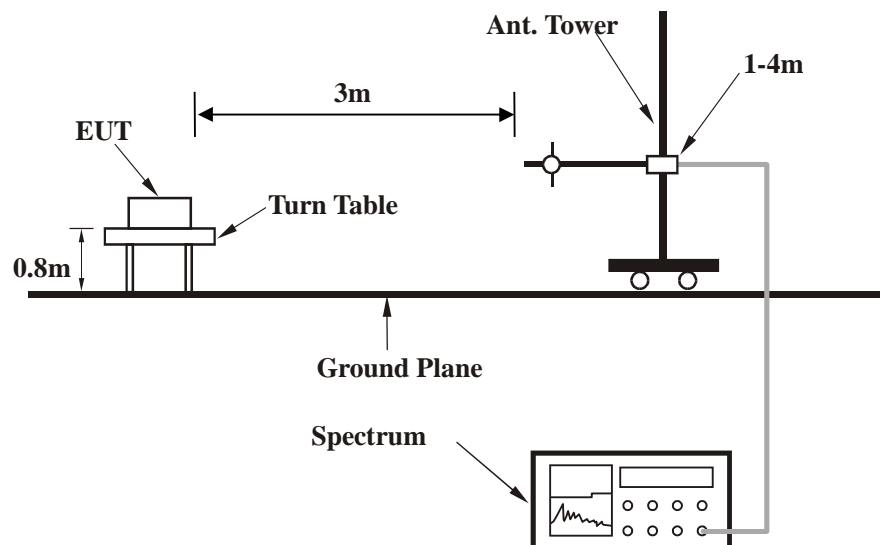
No deviation.

4.1.5 TEST SETUP

Below 30MHz test setup

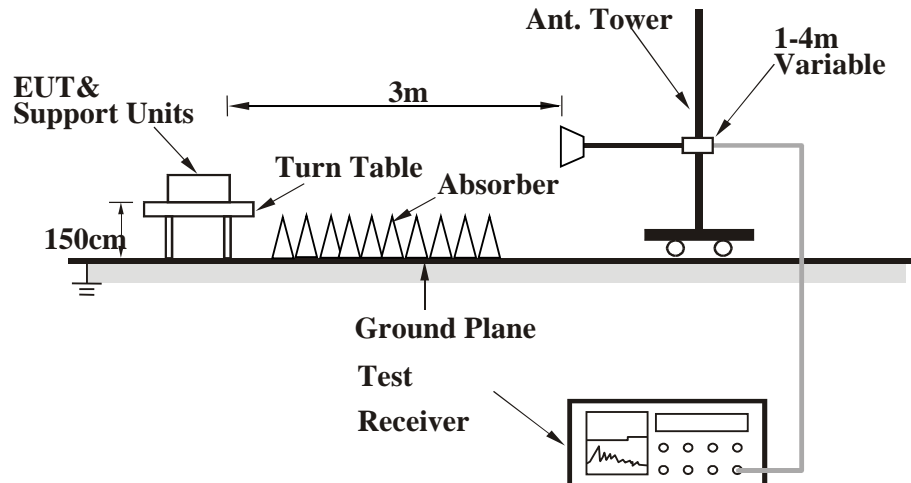


Below 1GHz test setup



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

Above 1GHz test setup



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

4.1.6 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.

4.1.7 TEST RESULTS

BELOW 1GHz WORST-CASE DATA:

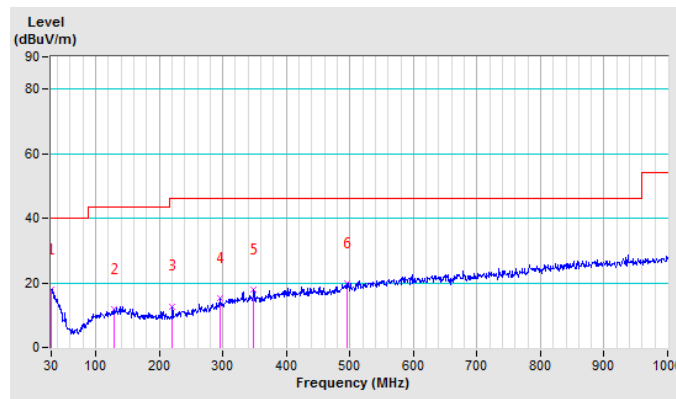
802.11b

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	30.00	17.95 QP	40.00	-22.05	1.00 H	152	29.49	-11.54
2	127.97	11.71 QP	43.50	-31.79	1.00 H	303	28.89	-17.18
3	220.12	12.74 QP	46.00	-33.26	1.00 H	179	31.11	-18.37
4	295.78	15.11 QP	46.00	-30.89	1.00 H	204	29.26	-14.15
5	348.16	18.01 QP	46.00	-27.99	1.00 H	82	30.25	-12.24
6	494.63	19.66 QP	46.00	-26.34	1.00 H	77	28.78	-9.12

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were greater than 20dB margin.
4. 9KHz~30MHz have been test and test data more than 20dB margin.
5. Margin value = Emission level – Limit value.

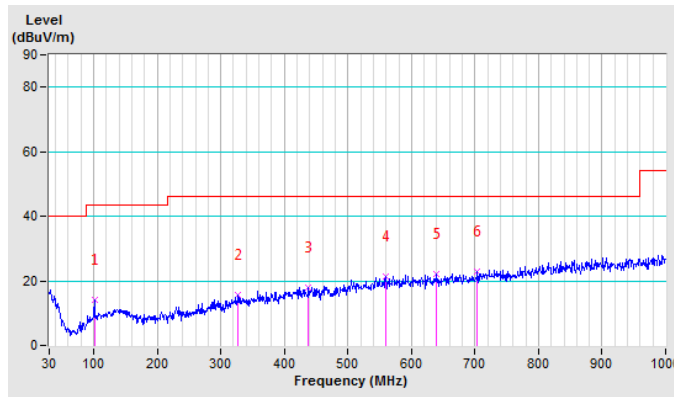


CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9KHz ~ 1GHz		

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	100.81	14.03 QP	43.50	-29.47	1.00 V	61	32.78	-18.75
2	326.82	15.78 QP	46.00	-30.22	1.00 V	46	28.54	-12.76
3	437.40	18.04 QP	46.00	-27.96	1.00 V	34	28.43	-10.39
4	559.62	21.46 QP	46.00	-24.54	1.00 V	23	28.93	-7.47
5	639.16	22.14 QP	46.00	-23.86	1.00 V	12	28.15	-6.01
6	703.18	22.84 QP	46.00	-23.16	1.00 V	2	27.88	-5.04

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were greater than 20dB margin.
4. 9KHz~30MHz have been test and test data more than 20dB margin.
5. 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	51.57 PK	74.00	-22.43	1.00 H	78	47.49	4.08
2	2390.00	37.03 AV	54.00	-16.97	1.00 H	78	32.95	4.08
3	*2412.00	107.36 PK			1.00 H	78	103.18	4.18
4	*2412.00	97.79 AV			1.00 H	78	93.61	4.18
5	4824.00	51.53 PK	74.00	-22.47	1.00 H	271	43.51	8.02
6	4824.00	34.71 AV	54.00	-19.29	1.00 H	271	26.69	8.02
7	#7236.00	56.07 PK	74.00	-17.93	1.00 H	271	42.65	13.42
8	#7236.00	41.68 AV	54.00	-12.32	1.00 H	271	28.26	13.42
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	48.88 PK	74.00	-25.12	1.00 V	187	44.80	4.08
2	2390.00	34.44 AV	54.00	-19.56	1.00 V	187	30.36	4.08
3	*2412.00	98.85 PK			1.00 V	187	94.67	4.18
4	*2412.00	89.60 AV			1.00 V	187	85.42	4.18
5	4824.00	49.14 PK	74.00	-24.86	1.00 V	125	41.12	8.02
6	4824.00	35.99 AV	54.00	-18.01	1.00 V	125	27.97	8.02
7	#7236.00	56.19 PK	74.00	-17.81	1.00 V	125	42.77	13.42
8	#7236.00	42.19 AV	54.00	-11.81	1.00 V	125	28.77	13.42

REMARKS:

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



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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	108.12 PK			1.00 H	126	103.83	4.29
2	*2437.00	98.41 AV			1.00 H	126	94.12	4.29
3	4874.00	50.17 PK	74.00	-23.83	1.00 H	176	41.97	8.20
4	4874.00	36.13 AV	54.00	-17.87	1.00 H	176	27.93	8.20
5	7311.00	56.19 PK	74.00	-17.81	1.00 H	150	42.55	13.64
6	7311.00	41.54 AV	54.00	-12.46	1.00 H	150	27.90	13.64

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	99.64 PK			1.00 V	185	95.35	4.29
2	*2437.00	90.12 AV			1.00 V	185	85.83	4.29
3	4874.00	49.80 PK	74.00	-24.20	1.00 V	176	41.60	8.20
4	4874.00	36.02 AV	54.00	-17.98	1.00 V	176	27.82	8.20
5	7311.00	55.91 PK	74.00	-18.09	1.00 V	150	42.27	13.64
6	7311.00	41.54 AV	54.00	-12.46	1.00 V	150	27.90	13.64

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were greater than 20dB margin.
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	109.97 PK			1.00 H	125	105.57	4.40
2	*2462.00	99.85 AV			1.00 H	125	95.45	4.40
3	2483.50	52.01 PK	74.00	-21.99	1.00 H	125	47.50	4.51
4	2483.50	40.83 AV	54.00	-13.17	1.00 H	125	36.32	4.51
5	4924.00	51.40 PK	74.00	-22.60	1.00 H	222	43.02	8.38
6	4924.00	36.84 AV	54.00	-17.16	1.00 H	222	28.46	8.38
7	7386.00	56.17 PK	74.00	-17.83	1.00 H	222	42.32	13.85
8	7386.00	41.94 AV	54.00	-12.06	1.00 H	222	28.09	13.85
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	100.27 PK			1.00 V	264	95.87	4.40
2	*2462.00	90.07 AV			1.00 V	264	85.67	4.40
3	2483.50	46.87 PK	74.00	-27.13	1.00 V	264	42.36	4.51
4	2483.50	34.40 AV	54.00	-19.60	1.00 V	264	29.89	4.51
5	4924.00	50.93 PK	74.00	-23.07	1.00 V	337	42.55	8.38
6	4924.00	36.94 AV	54.00	-17.06	1.00 V	337	28.56	8.38
7	7386.00	56.09 PK	74.00	-17.91	1.00 V	222	42.24	13.85
8	7386.00	41.93 AV	54.00	-12.07	1.00 V	222	28.08	13.85

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were greater than 20dB margin.
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	50.48 PK	74.00	-23.52	1.00 H	180	46.40	4.08
2	2390.00	38.12 AV	54.00	-15.88	1.00 H	180	34.04	4.08
3	*2412.00	105.97 PK			1.00 H	180	101.79	4.18
4	*2412.00	95.61 AV			1.00 H	180	91.43	4.18
5	4824.00	51.56 PK	74.00	-22.44	1.00 H	269	43.54	8.02
6	4824.00	34.75 AV	54.00	-19.25	1.00 H	269	26.73	8.02
7	#7236.00	56.17 PK	74.00	-17.83	1.00 H	269	42.75	13.42
8	#7236.00	41.76 AV	54.00	-12.24	1.00 H	269	28.34	13.42
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	52.29 PK	74.00	-21.71	1.00 V	162	48.21	4.08
2	2390.00	38.69 AV	54.00	-15.31	1.00 V	162	34.61	4.08
3	*2412.00	95.88 PK			1.00 V	162	91.70	4.18
4	*2412.00	86.89 AV			1.00 V	162	82.71	4.18
5	4824.00	49.67 PK	74.00	-24.33	1.00 V	126	41.65	8.02
6	4824.00	35.88 AV	54.00	-18.12	1.00 V	126	27.86	8.02
7	#7236.00	56.11 PK	74.00	-17.89	1.00 V	126	42.69	13.42
8	#7236.00	42.39 AV	54.00	-11.61	1.00 V	126	28.97	13.42

REMARKS:

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



Test Report No.: RF200518N028-2

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	106.56 PK			1.00 H	161	102.27	4.29
2	*2437.00	97.55 AV			1.00 H	161	93.26	4.29
3	4874.00	50.59 PK	74.00	-23.41	1.00 H	271	42.39	8.20
4	4874.00	36.21 AV	54.00	-17.79	1.00 H	271	28.01	8.20
5	7311.00	56.17 PK	74.00	-17.83	1.00 H	130	42.53	13.64
6	7311.00	41.44 AV	54.00	-12.56	1.00 H	130	27.80	13.64

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	96.59 PK			1.00 V	162	92.30	4.29
2	*2437.00	87.12 AV			1.00 V	162	82.83	4.29
3	4874.00	50.08 PK	74.00	-23.92	1.00 V	178	41.88	8.20
4	4874.00	36.09 AV	54.00	-17.91	1.00 V	178	27.89	8.20
5	7311.00	55.69 PK	74.00	-18.31	1.00 V	130	42.05	13.64
6	7311.00	41.39 AV	54.00	-12.61	1.00 V	130	27.75	13.64

REMARKS:

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



Test Report No.: RF200518N028-2

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	107.16 PK			1.00 H	130	102.76	4.40
2	*2462.00	96.18 AV			1.00 H	130	91.78	4.40
3	2483.50	63.52 PK	74.00	-10.48	1.00 H	130	59.01	4.51
4	2483.50	48.20 AV	54.00	-5.80	1.00 H	130	43.69	4.51
5	4924.00	51.29 PK	74.00	-22.71	1.00 H	270	42.91	8.38
6	4924.00	36.59 AV	54.00	-17.41	1.00 H	270	28.21	8.38
7	7386.00	56.11 PK	74.00	-17.89	1.00 H	270	42.26	13.85
8	7386.00	41.87 AV	54.00	-12.13	1.00 H	270	28.02	13.85
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	96.60 PK			1.00 V	95	92.20	4.40
2	*2462.00	86.09 AV			1.00 V	95	81.69	4.40
3	2483.50	53.55 PK	74.00	-20.45	1.00 V	95	49.04	4.51
4	2483.50	39.45 AV	54.00	-14.55	1.00 V	95	34.94	4.51
5	4924.00	51.15 PK	74.00	-22.85	1.00 V	193	42.77	8.38
6	4924.00	36.87 AV	54.00	-17.13	1.00 V	193	28.49	8.38
7	7386.00	55.87 PK	74.00	-18.13	1.00 V	193	42.02	13.85
8	7386.00	41.89 AV	54.00	-12.11	1.00 V	193	28.04	13.85

REMARKS:

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

802.11n HT20

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	51.41 PK	74.00	-22.59	1.00 H	138	47.33	4.08
2	2390.00	38.68 AV	54.00	-15.32	1.00 H	138	34.60	4.08
3	*2412.00	105.88 PK			1.00 H	138	101.70	4.18
4	*2412.00	95.74 AV			1.00 H	138	91.56	4.18
5	4824.00	51.66 PK	74.00	-22.34	1.00 H	274	43.64	8.02
6	4824.00	34.85 AV	54.00	-19.15	1.00 H	274	26.83	8.02
7	#7236.00	56.27 PK	74.00	-17.73	1.00 H	274	42.85	13.42
8	#7236.00	41.89 AV	54.00	-12.11	1.00 H	274	28.47	13.42
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	52.08 PK	74.00	-21.92	1.00 V	183	48.00	4.08
2	2390.00	38.78 AV	54.00	-15.22	1.00 V	183	34.70	4.08
3	*2412.00	96.32 PK			1.00 V	183	92.14	4.18
4	*2412.00	87.11 AV			1.00 V	183	82.93	4.18
5	4824.00	50.67 PK	74.00	-23.33	1.00 V	128	42.65	8.02
6	4824.00	36.84 AV	54.00	-17.16	1.00 V	128	28.82	8.02
7	#7236.00	55.96 PK	74.00	-18.04	1.00 V	128	42.54	13.42
8	#7236.00	42.08 AV	54.00	-11.92	1.00 V	128	28.66	13.42

REMARKS:

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



Test Report No.: RF200518N028-2

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	106.88 PK			1.00 H	155	102.59	4.29
2	*2437.00	97.68 AV			1.00 H	155	93.39	4.29
3	4874.00	50.74 PK	74.00	-23.26	1.00 H	178	42.54	8.20
4	4874.00	36.28 AV	54.00	-17.72	1.00 H	178	28.08	8.20
5	7311.00	56.28 PK	74.00	-17.72	1.00 H	156	42.64	13.64
6	7311.00	41.62 AV	54.00	-12.38	1.00 H	156	27.98	13.64
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2473.00	97.15 PK			1.00 V	186	92.69	4.46
2	*2473.00	88.19 AV			1.00 V	186	83.73	4.46
3	4874.00	50.22 PK	74.00	-23.78	1.00 V	177	42.02	8.20
4	4874.00	36.35 AV	54.00	-17.65	1.00 V	177	28.15	8.20
5	7311.00	55.48 PK	74.00	-18.52	1.00 V	150	41.84	13.64
6	7311.00	41.22 AV	54.00	-12.78	1.00 V	150	27.58	13.64

REMARKS:

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



Test Report No.: RF200518N028-2

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	107.20 PK			1.00 H	131	102.80	4.40
2	*2462.00	96.22 AV			1.00 H	131	91.82	4.40
3	2483.50	66.70 PK	74.00	-7.30	1.00 H	131	62.19	4.51
4	2483.50	49.68 AV	54.00	-4.32	1.00 H	131	45.17	4.51
5	4924.00	51.46 PK	74.00	-22.54	1.00 H	270	43.08	8.38
6	4924.00	36.79 AV	54.00	-17.21	1.00 H	270	28.41	8.38
7	7386.00	56.09 PK	74.00	-17.91	1.00 H	270	42.24	13.85
8	7386.00	41.39 AV	54.00	-12.61	1.00 H	270	27.54	13.85
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	96.75 PK			1.00 V	184	92.35	4.40
2	*2462.00	86.27 AV			1.00 V	184	81.87	4.40
3	2483.50	54.12 PK	74.00	-19.88	1.00 V	184	49.61	4.51
4	2483.50	39.11 AV	54.00	-14.89	1.00 V	184	34.60	4.51
5	4924.00	51.64 PK	74.00	-22.36	1.00 V	195	43.26	8.38
6	4924.00	36.66 AV	54.00	-17.34	1.00 V	195	28.28	8.38
7	7386.00	55.28 PK	74.00	-18.72	1.00 V	195	41.43	13.85
8	7386.00	41.05 AV	54.00	-12.95	1.00 V	195	27.20	13.85

REMARKS:

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

802.11n HT40

CHANNEL	TX Channel 3	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.18 PK	74.00	-15.82	1.00 H	138	54.10	4.08
2	2390.00	45.50 AV	54.00	-8.50	1.00 H	138	41.42	4.08
3	*2422.00	105.23 PK			1.00 H	138	101.00	4.23
4	*2422.00	93.44 AV			1.00 H	138	89.21	4.23
5	4844.00	51.41 PK	74.00	-22.59	1.00 H	349	43.32	8.09
6	4844.00	37.56 AV	54.00	-16.44	1.00 H	349	29.47	8.09
7	7266.00	56.14 PK	74.00	-17.86	1.00 H	349	42.63	13.51
8	7266.00	42.18 AV	54.00	-11.82	1.00 H	349	28.67	13.51
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	53.62 PK	74.00	-20.38	1.00 V	186	49.54	4.08
2	2390.00	40.28 AV	54.00	-13.72	1.00 V	186	36.20	4.08
3	*2422.00	97.07 PK			1.00 V	186	92.84	4.23
4	*2422.00	85.76 AV			1.00 V	186	81.53	4.23
5	4844.00	51.08 PK	74.00	-22.92	1.00 V	143	42.99	8.09
6	4844.00	37.41 AV	54.00	-16.59	1.00 V	143	29.32	8.09
7	7266.00	56.12 PK	74.00	-17.88	1.00 V	143	42.61	13.51
8	7266.00	42.17 AV	54.00	-11.83	1.00 V	143	28.66	13.51

REMARKS:

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



Test Report No.: RF200518N028-2

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	106.04 PK			1.00 H	242	101.75	4.29
2	*2437.00	94.86 AV			1.00 H	242	90.57	4.29
3	4874.00	51.56 PK	74.00	-22.44	1.00 H	155	43.36	8.20
4	4874.00	34.55 AV	54.00	-19.45	1.00 H	155	26.35	8.20
5	7311.00	56.37 PK	74.00	-17.63	1.00 H	144	42.73	13.64
6	7311.00	41.14 AV	54.00	-12.86	1.00 H	144	27.50	13.64

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	96.56 PK			1.00 V	193	92.27	4.29
2	*2437.00	84.95 AV			1.00 V	193	80.66	4.29
3	4874.00	51.19 PK	74.00	-22.81	1.00 V	150	42.99	8.20
4	4874.00	37.39 AV	54.00	-16.61	1.00 V	160	29.19	8.20
5	7311.00	56.19 PK	74.00	-17.81	1.00 V	150	42.55	13.64
6	7311.00	42.01 AV	54.00	-11.99	1.00 V	160	28.37	13.64

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were greater than 20dB margin.
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	106.68 PK			1.00 H	165	102.32	4.36
2	*2452.00	94.02 AV			1.00 H	165	89.66	4.36
3	2483.50	66.88 PK	74.00	-7.12	1.00 H	165	62.37	4.51
4	2483.50	52.97 AV	54.00	-1.03	1.00 H	165	48.46	4.51
5	4904.00	51.31 PK	74.00	-22.69	1.00 H	54	43.00	8.31
6	4904.00	37.46 AV	54.00	-16.54	1.00 H	54	29.15	8.31
7	7356.00	56.24 PK	74.00	-17.76	1.00 H	54	42.47	13.77
8	7356.00	42.29 AV	54.00	-11.71	1.00 H	54	28.52	13.77

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	102.35 PK			1.00 V	163	97.99	4.36
2	*2452.00	87.76 AV			1.00 V	163	83.40	4.36
3	2483.50	61.21 PK	74.00	-12.79	1.00 V	163	56.70	4.51
4	2483.50	47.02 AV	54.00	-6.98	1.00 V	163	42.51	4.51
5	4904.00	51.07 PK	74.00	-22.93	1.00 V	255	42.76	8.31
6	4904.00	37.29 AV	54.00	-16.71	1.00 V	255	28.98	8.31
7	7356.00	56.22 PK	74.00	-17.78	1.00 V	255	42.45	13.77
8	7356.00	42.28 AV	54.00	-11.72	1.00 V	255	28.51	13.77

REMARKS:

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

4.2. 6dB BANDWIDTH MEASUREMENT

4.2.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.2.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Power Sensor	Keysight	U2021XA	MY55060016	May 22,20	May 21,21
Power Sensor	Keysight	U2021XA	MY55060018	May 22,20	May 21,21
Power Meter	Anritsu	ML2495A	1139001	Mar. 12,20	Mar. 11,21
Power Sensor	Anritsu	MA2411B	1531155	Mar. 12,20	Mar. 11,21
Digital Multimeter	FLUKE	15B	A1220010DG	Oct. 17, 19	Oct.16, 20
Humid & Temp Programmable Tester	Haida	HD-2257	110807201	Nov.15,19	Nov. 14,20
Oscilloscope	Agilent	DSO9254A	MY51260160	Sep. 18,19	Sep. 17,20
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV40	101094	Mar. 13,20	Mar. 12,21
Signal Generator	Agilent	N5183A	MY50140980	Sep. 19,19	Sep. 18,20
MXG-B RF Vector Signal Generator	Keysight	N5182B	MY56200288	Sep. 12,19	Sep. 11,20
BLUETOOTH TESTER	Rohde&Schwarz	CBT32	100811	May 20,20	May 19,21
Attenuator	MINI	BW-S10W2+	S130129FGE2	N/A	N/A
DC Source	Keysight	E3642A	MY56146098	N/A	N/A

- NOTES:** 1. The test was performed in RF Oven room.
 2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

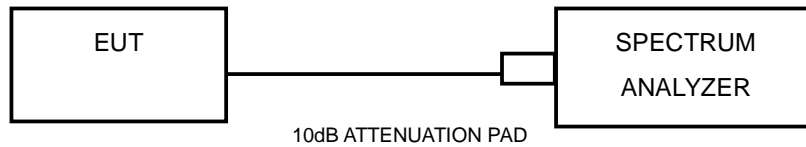
4.2.3 TEST PROCEDURE

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.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

4.2.5 TEST SETUP



4.2.6 EUT OPERATING CONDITIONS

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

4.2.7 TEST RESULTS

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	8.74	0.5	PASS
6	2437	8.75	0.5	PASS
11	2462	8.74	0.5	PASS

802.11g

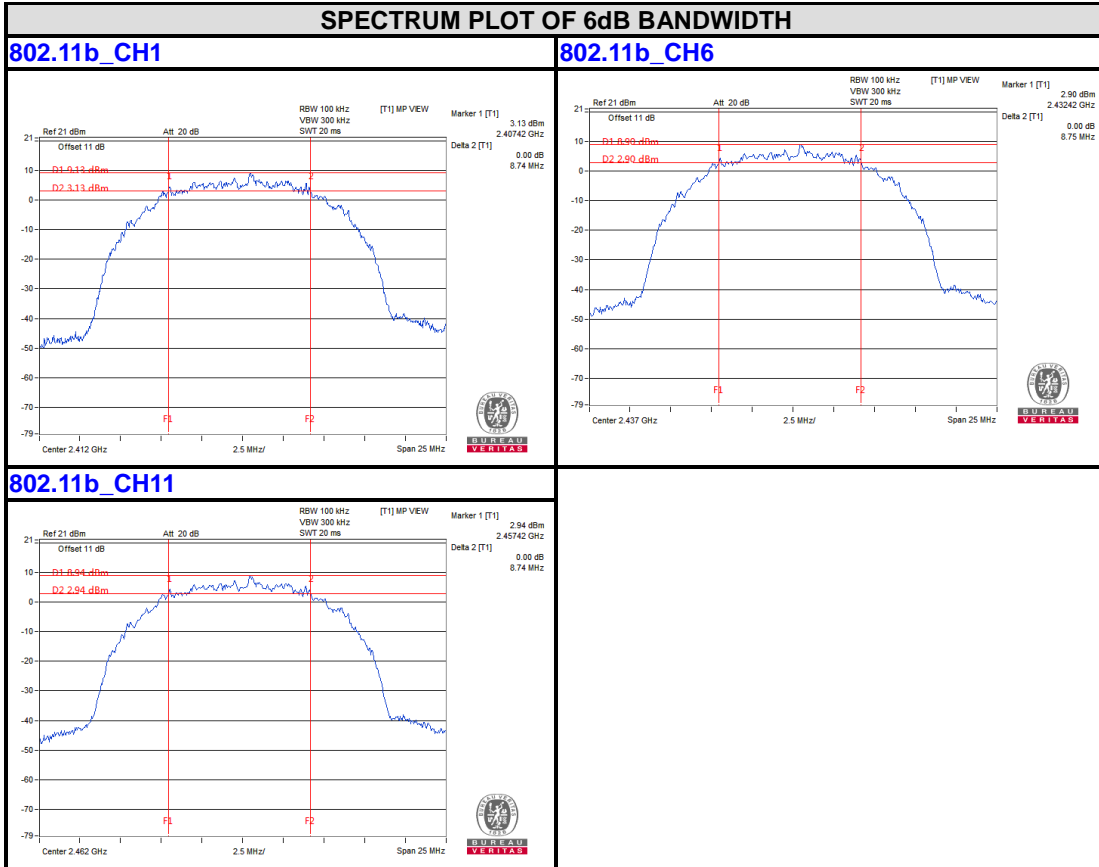
CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	16.47	0.5	PASS
6	2437	16.47	0.5	PASS
11	2462	16.47	0.5	PASS

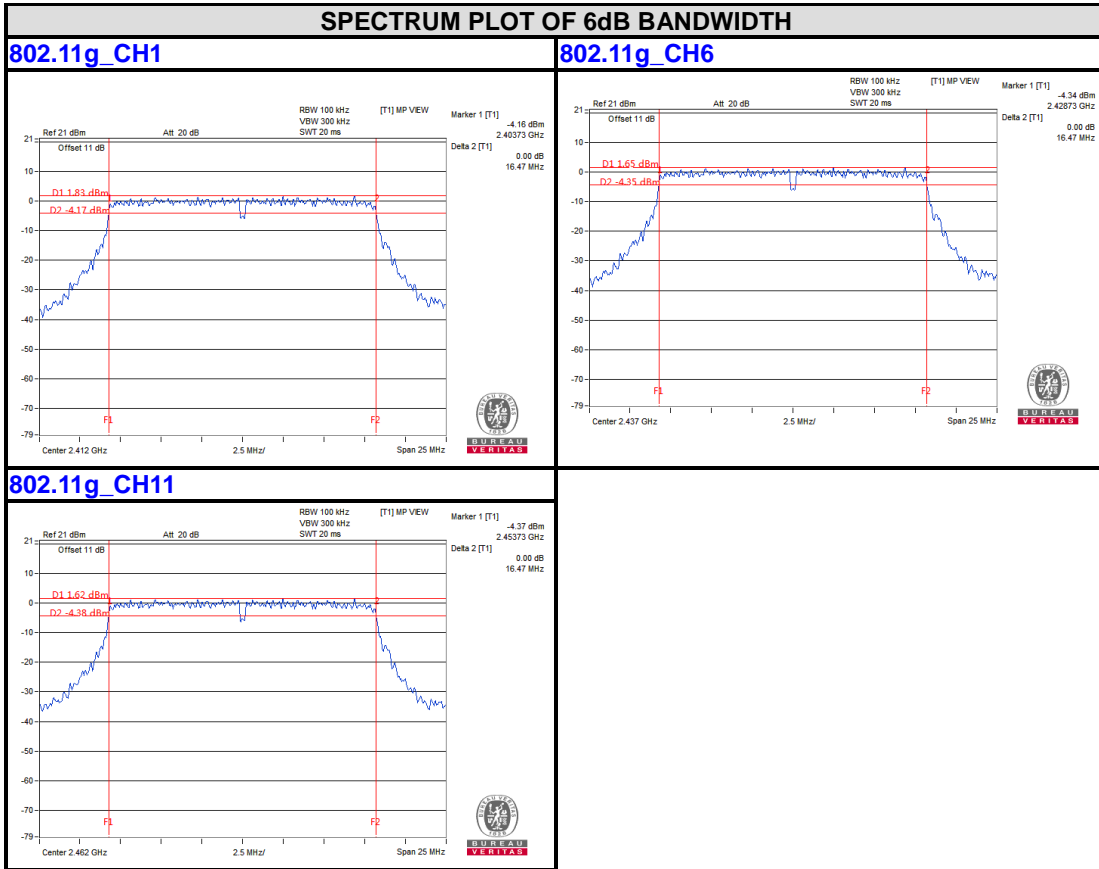
802.11n HT20

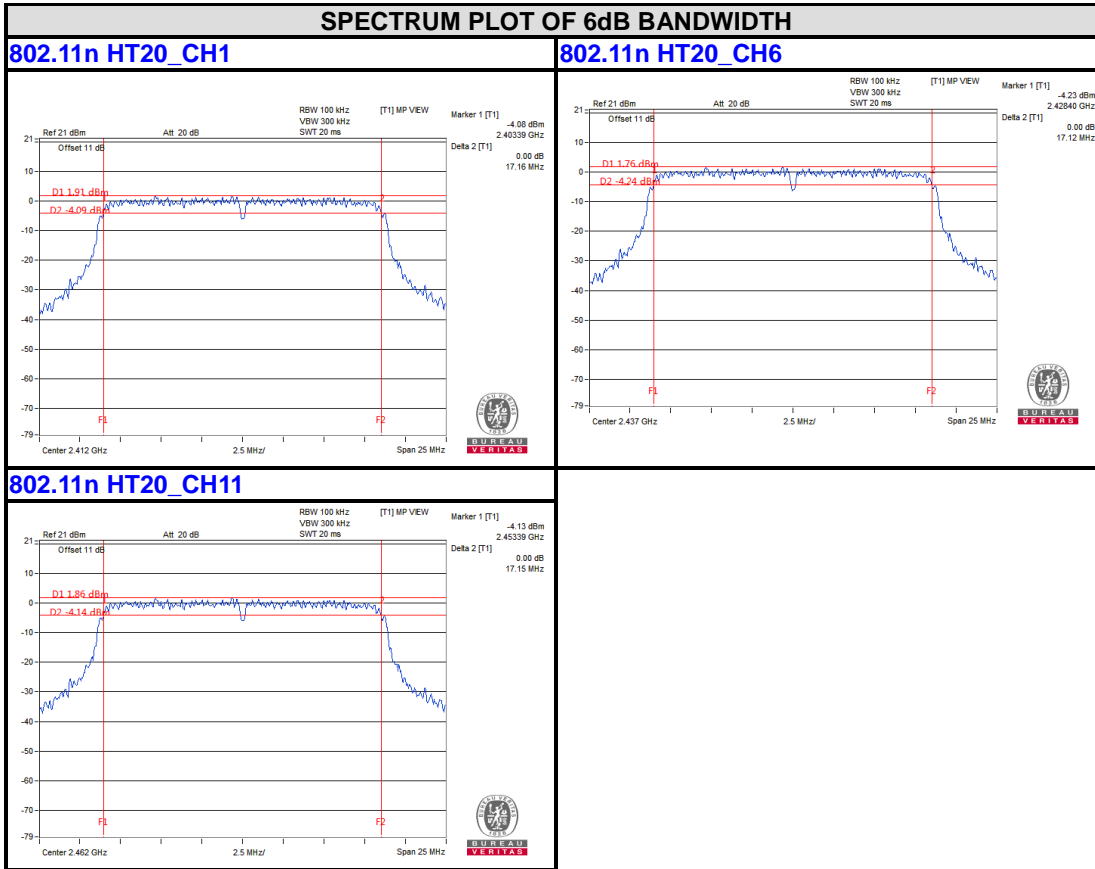
CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	17.16	0.5	PASS
6	2437	17.12	0.5	PASS
11	2462	17.15	0.5	PASS

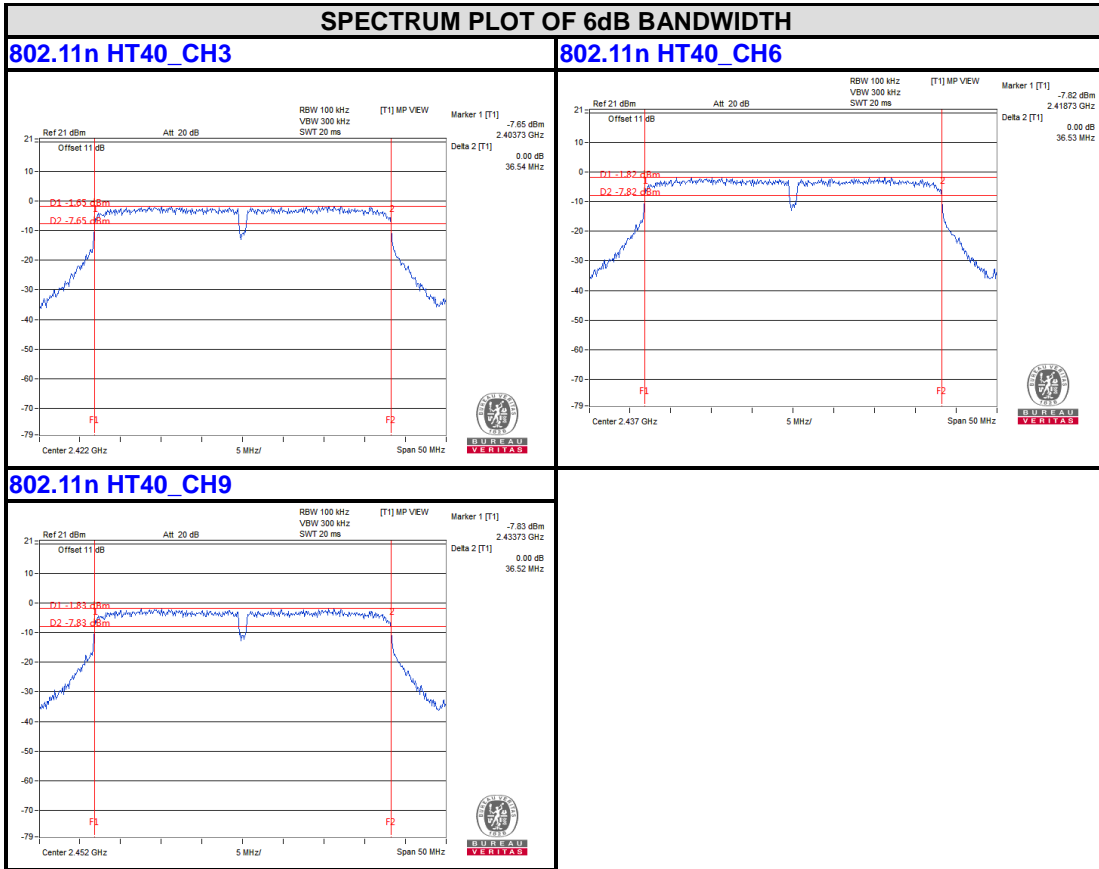
802.11n HT40

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
3	2422	36.54	0.5	PASS
6	2437	36.53	0.5	PASS
9	2452	36.52	0.5	PASS







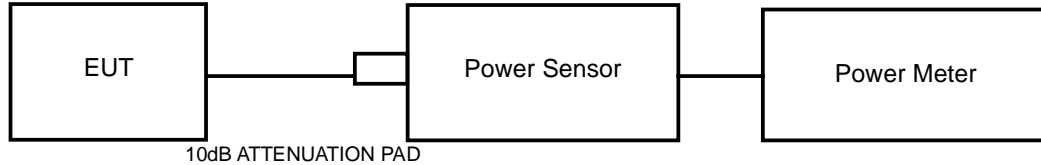


4.3 CONDUCTED OUTPUT POWER

4.3.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

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

4.3.2 TEST SETUP



4.3.3 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Power Sensor	Keysight	U2021XA	MY55060016	May 22,20	May 21,21
Power Sensor	Keysight	U2021XA	MY55060018	May 22,20	May 21,21
Power Meter	Anritsu	ML2495A	1139001	Mar. 12,20	Mar. 11,21
Power Sensor	Anritsu	MA2411B	1531155	Mar. 12,20	Mar. 11,21
Digital Multimeter	FLUKE	15B	A1220010DG	Oct. 17, 19	Oct.16, 20
Humid & Temp Programmable Tester	Haida	HD-2257	110807201	Nov.15,19	Nov. 14,20
Oscilloscope	Agilent	DSO9254A	MY51260160	Sep. 18,19	Sep. 17,20
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV40	101094	Mar. 13,20	Mar. 12,21
Signal Generator	Agilent	N5183A	MY50140980	Sep. 19,19	Sep. 18,20
MXG-B RF Vector Signal Generator	Keysight	N5182B	MY56200288	Sep. 12,19	Sep. 11,20
BLUETOOTH TESTER	Rohde&Schwarz	CBT32	100811	May 20,20	May 19,21
Attenuator	MINI	BW-S10W2+	S130129FGE2	N/A	N/A
DC Source	Keysight	E3642A	MY56146098	N/A	N/A

NOTES:

1. The test was performed in RF Oven room.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.



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4.3.4 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.

4.3.5 DEVIATION FROM TEST STANDARD

No deviation.

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

MAXIMUM PEAK OUTPUT POWER

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)	PEAK POWER (mW)	PEAK POWER LIMIT (W)	PASS/FAIL
1	2412	23.21	209.411	1	PASS
6	2437	23.96	248.886	1	PASS
11	2462	23.93	247.172	1	PASS

802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)	PEAK POWER (mW)	PEAK POWER LIMIT (W)	PASS/FAIL
1	2412	23.41	219.28	1	PASS
6	2437	23.25	211.349	1	PASS
11	2462	23.31	214.289	1	PASS

802.11n HT20

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)	PEAK POWER (mW)	PEAK POWER LIMIT (W)	PASS/FAIL
1	2412	23.52	224.905	1	PASS
6	2437	23.35	216.272	1	PASS
11	2462	23.45	221.309	1	PASS

802.11n HT40

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)	PEAK POWER (mW)	PEAK POWER LIMIT (W)	PASS/FAIL
3	2422	23.95	248.313	1	PASS
6	2437	23.74	236.592	1	PASS
9	2452	23.76	237.684	1	PASS

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)
1	2412	16.32	42.855
6	2437	16.83	48.195
11	2462	16.79	47.753

802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	AVG. POWER (mW)
1	2412	15.71	37.239
6	2437	15.52	35.645
11	2462	15.60	36.308

802.11n HT20

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	AVG. POWER (mW)
1	2412	15.54	35.81
6	2437	15.34	34.198
11	2462	15.43	34.914

802.11n HT40

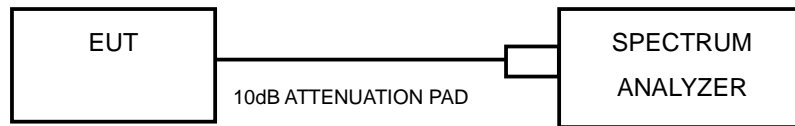
CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	AVG. POWER (mW)
3	2422	15.61	36.392
6	2437	15.41	34.754
9	2452	15.40	34.674

4.4 POWER SPECTRAL DENSITY MEASUREMENT

4.4.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

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

4.4.2 TEST SETUP



4.4.3 TEST INSTRUMENTS

Refer to section 4.3.2 to get information of above instrument.

4.4.4 TEST PROCEDURE

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

4.4.5 DEVIATION FROM TEST STANDARD

No deviation.

4.4.6 EUT OPERATING CONDITION

Same as item 4.3.6.

4.4.7 TEST RESULTS

802.11b

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-7.12	8.00	PASS
6	2437	-7.29	8.00	PASS
11	2462	-7.25	8.00	PASS

802.11g

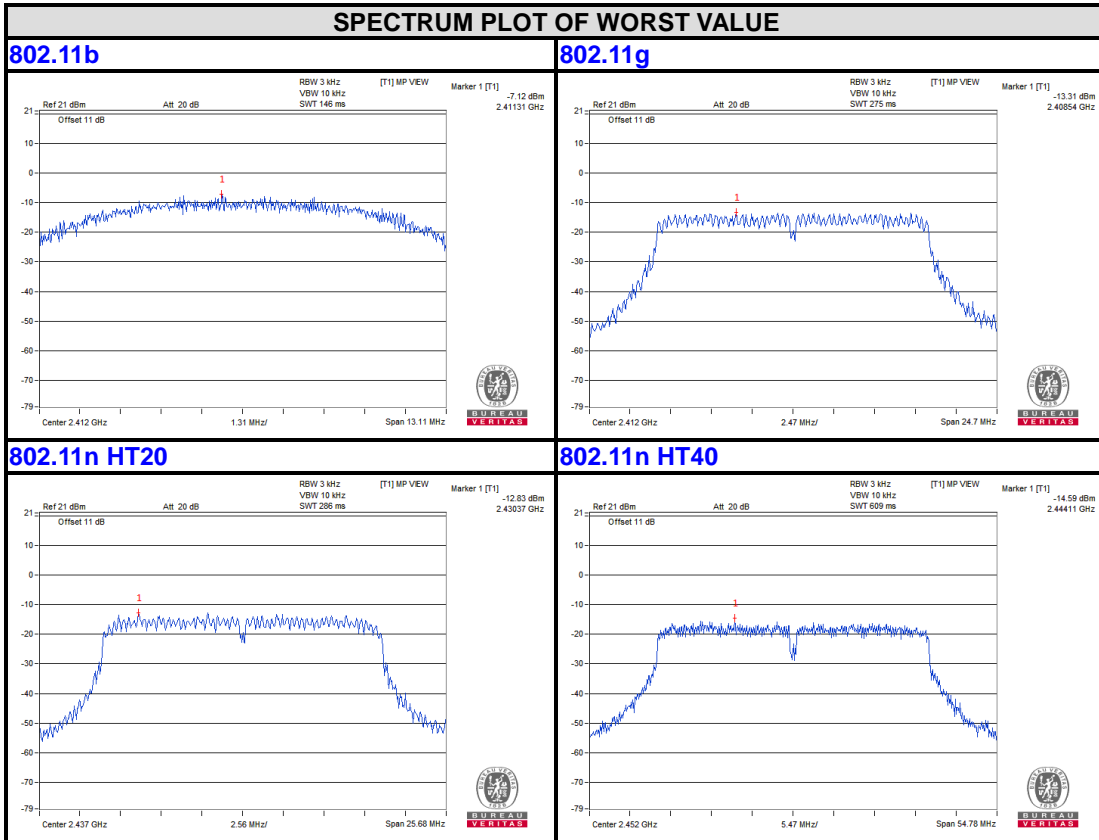
Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-13.31	8.00	PASS
6	2437	-13.51	8.00	PASS
11	2462	-13.33	8.00	PASS

802.11n HT20

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-12.91	8.00	PASS
6	2437	-12.83	8.00	PASS
11	2462	-13.40	8.00	PASS

802.11n HT40

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
3	2422	-15.19	8.00	PASS
6	2437	-14.64	8.00	PASS
9	2452	-14.59	8.00	PASS



4.5 OUT OF BAND EMISSION MEASUREMENT

4.5.1 LIMITS OF OUT OF BAND EMISSION MEASUREMENT

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

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

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.



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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.

4.5.5 DEVIATION FROM TEST STANDARD

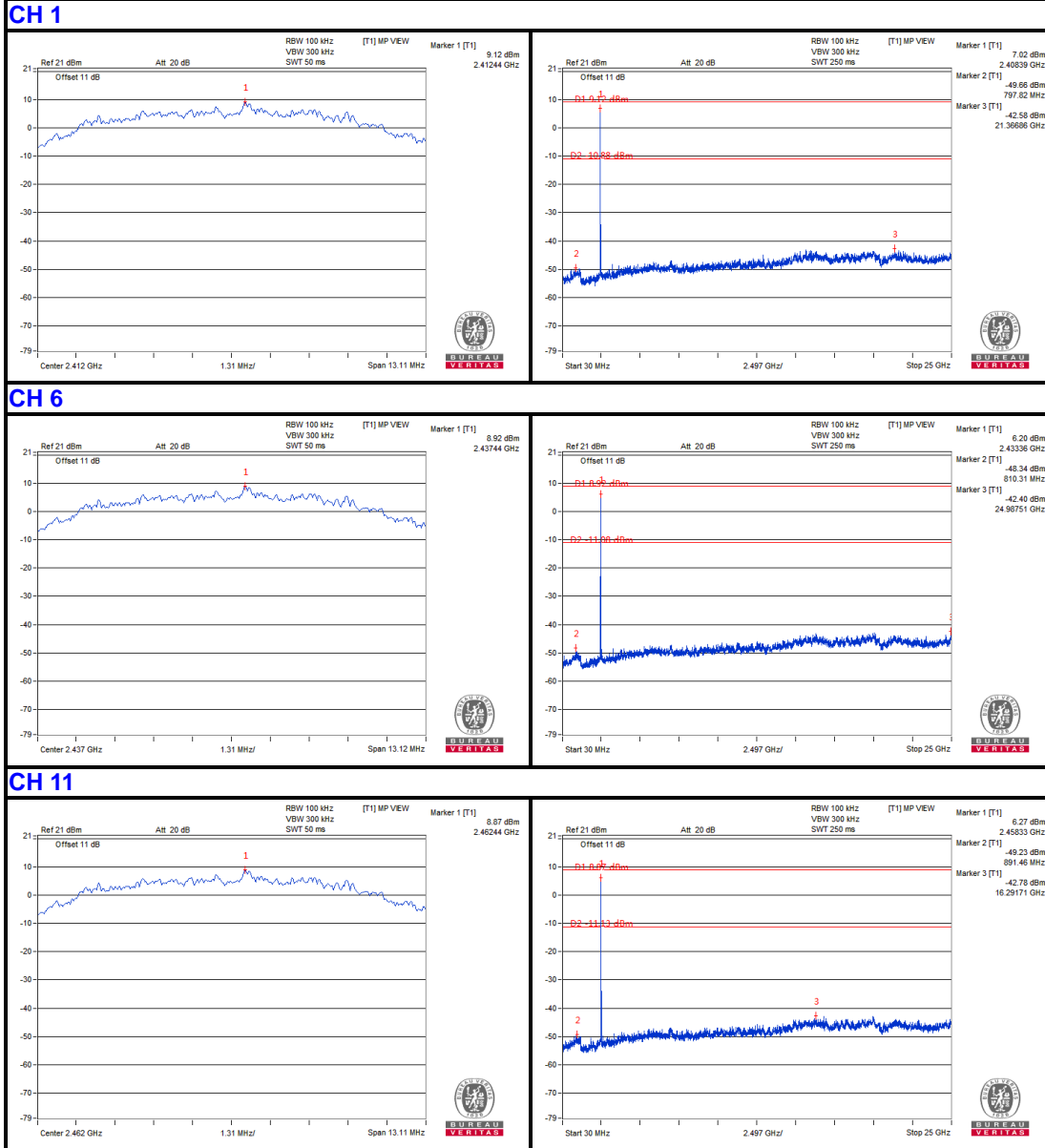
No deviation.

4.5.6 EUT OPERATING CONDITION

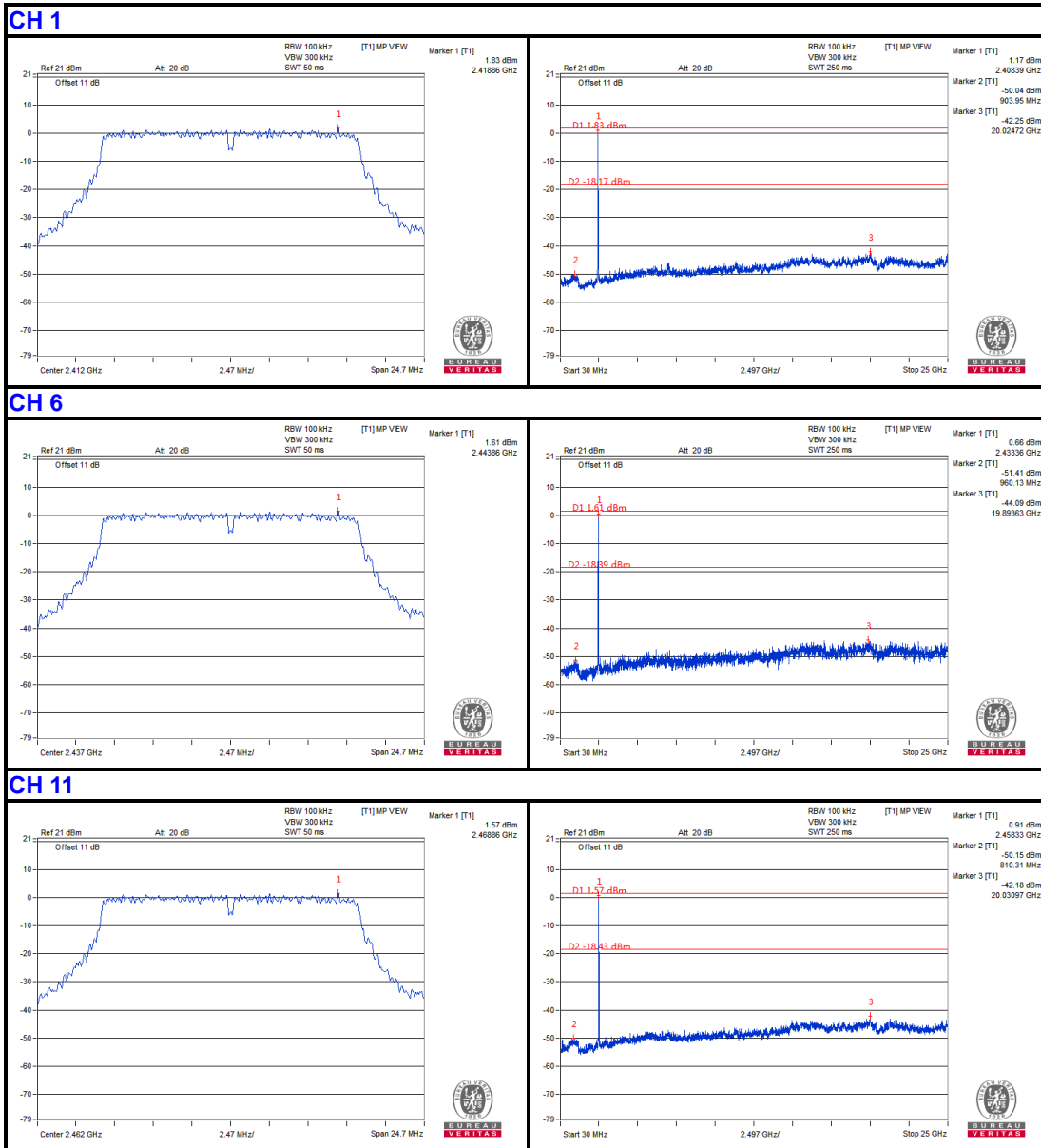
Same as item 4.3.6

4.5.7 TEST RESULTS

802.11b

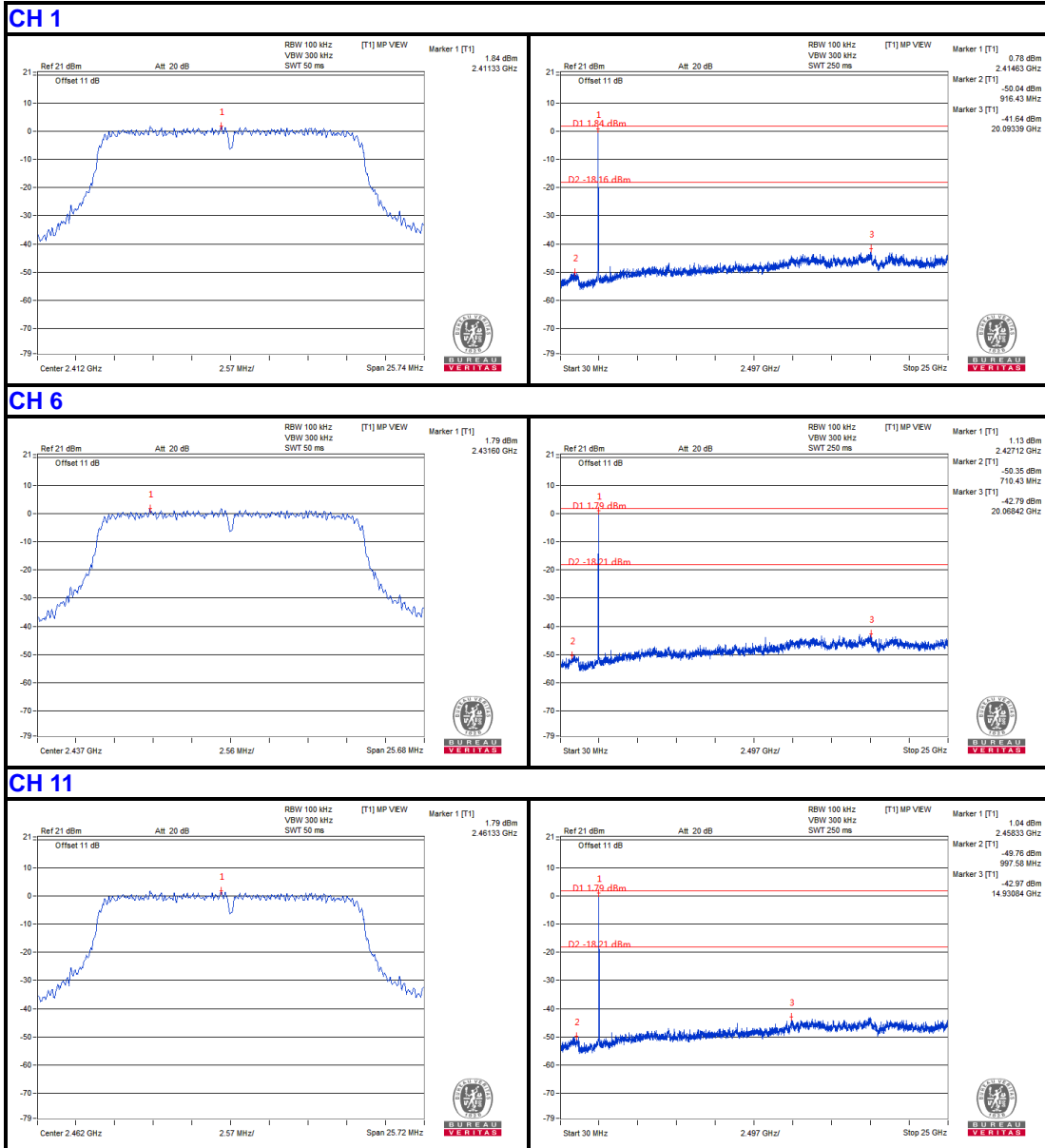


802.11g



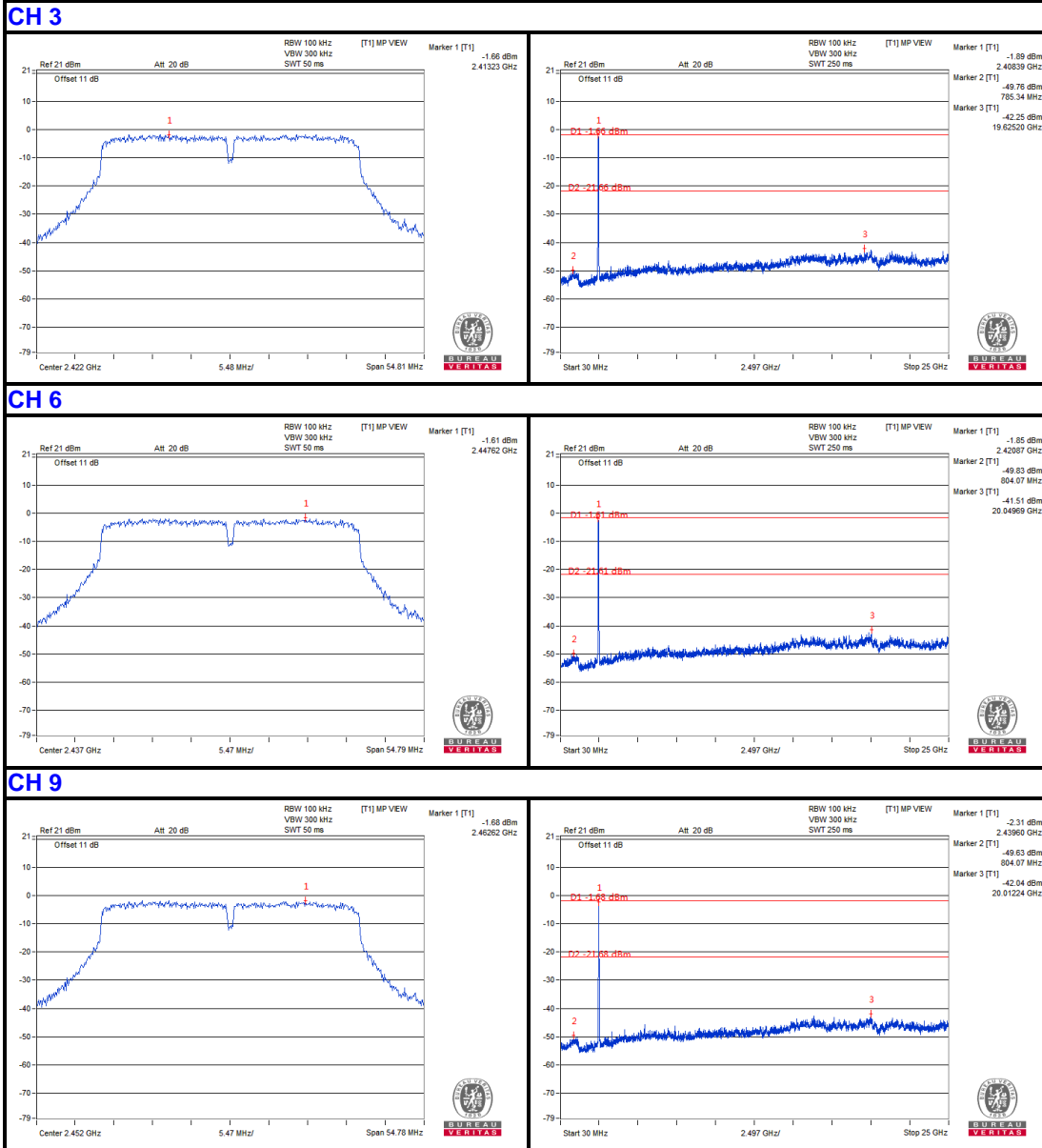


802.11n HT20

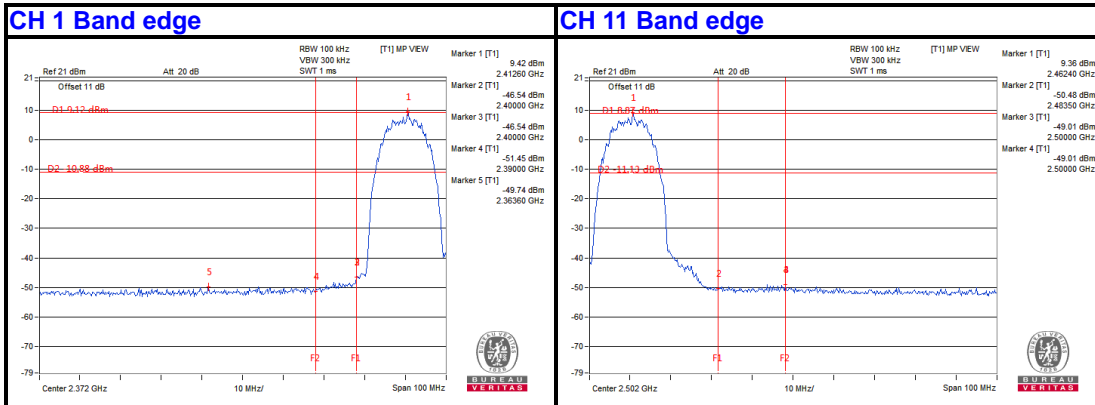




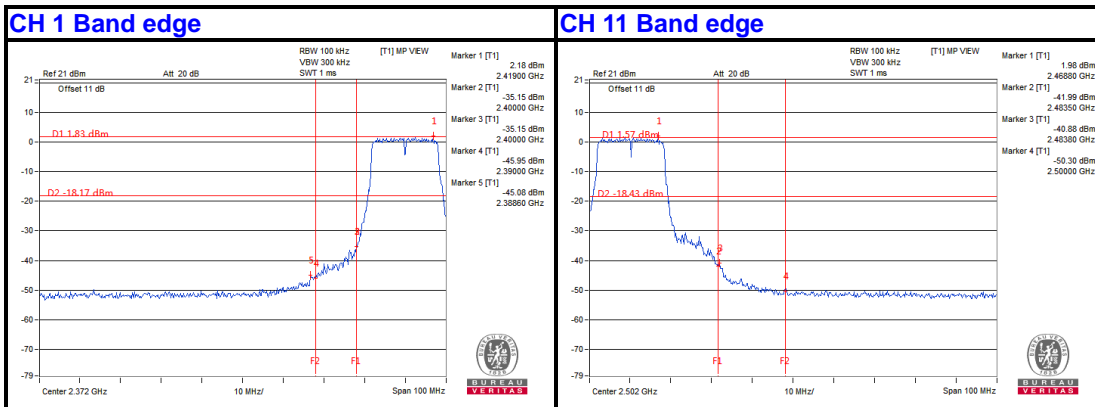
802.11n HT40



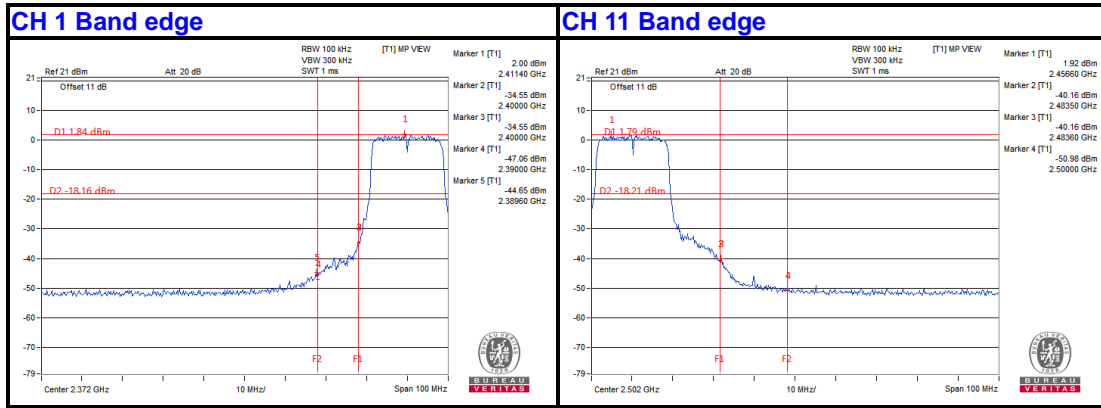
802.11b



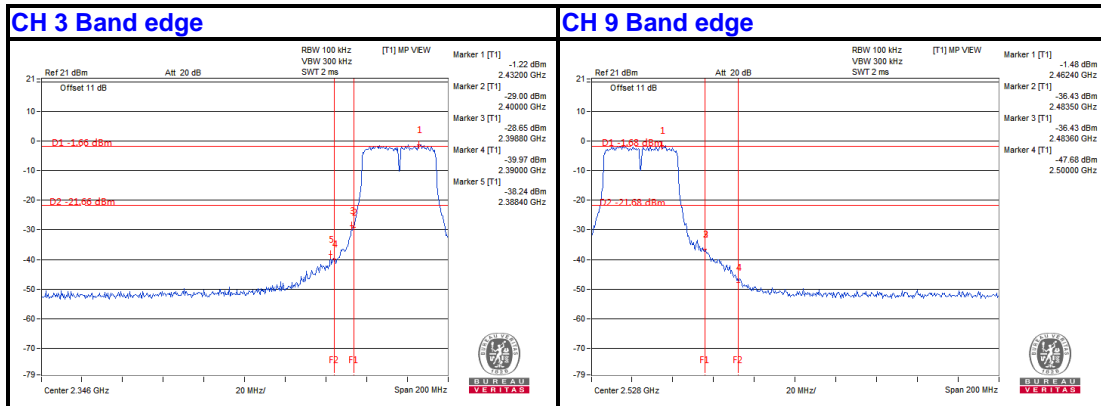
802.11g



802.11n HT20



802.11n HT40





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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---