Test Lab
Cert 2951.01

TEST REPORT

Applicant	HONG HAI Precision IND.CO.,LTD.
Address	5F-1,5,Hsin-An Road Hsinchu Science-Based Industrial Park, HsinChu, Taiwan.

Manufacturer or Supplier	HONG HAI Precision IND.CO.,LTD.
Address	5F-1,5,Hsin-An Road Hsinchu Science-Based Industrial Park, HsinChu, Taiwan.
Product	pHin Wireless Bridge
Brand Name	pHin
Model	CY-WB1500-A1
Additional Model & Model Difference	N/A
Date of tests	Mar. 24, 2016 ~ May 03, 2016

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

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

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

Tested by Breeze Jiang Project Engineer / EMC Department	Approved by Chris Chen Manager / EMC Department
	 Date: May 03, 2016

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF160324N064-2	Original release	May 03, 2016

1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)			
STANDARD SECTION	**TEST TYPE AND LIMIT**	**RESULT**	**REMARK**
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit.
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit.
15.247(d)	Band Edge Measurement	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted Output power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	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	3.67dB
	1GHz ~ 18GHz	4.84dB
	18GHz ~ 40GHz	4.84dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k = 2.

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	pHin Wireless Bridge
MODEL NO.	CY-WB1500-A1
FCC ID	MCL-CYWB1500
NOMINAL VOLTAGE	AC 120V 60Hz
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM BT-LE(GFSK) for DTS
MODULATION TECHNOLOGY	DSSS, OFDM, DTS
OPERATING FREQUENCY	2412-2462MHz for 11b/g/n(HT20) 2422-2452MHz for 11n(HT40) 2402-2480MHz for BT-LE(GFSK)
PEAK POWER	WLAN: 27.57dBm (Maximum) BT-LE: 3.62dBm (Maximum)
ANTENNA TYPE	FPC Antenna, 1.37dBi Gain For BT-LE(GFSK) FPC Antenna, 2.45dBi Gain For WIFI Chain(Max.)
I/O PORTS	Refer to user's manual
CABLE SUPPLIED	N/A

NOTE:

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

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

2. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

3. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

4. Please refer to the EUT photo document (Reference No.: 160324N064) for detailed product photo.

3.2 DESCRIPTION OF TEST MODES

11 channels are provided for 802.11b, 802.11g and 802.11n(HT20):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2412 MHz	7	2442 MHz
2	2417 MHz	8	2447 MHz
3	2422 MHz	9	2452 MHz
4	2427 MHz	10	2457 MHz
5	2432 MHz	11	2462 MHz
6	2437 MHz		

7 channels are provided for 802.11n (HT40):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
3	2422MHz	7	2442MHz
4	2427MHz	8	2447MHz
5	2432MHz	9	2452MHz
6	2437MHz		

40 channels are provided for BT-LE(GFSK):

CHANNEL	FREQ. (MHZ)	CHANNEL	FREQ. (MHZ)	CHANNEL	FREQ. (MHZ)	CHANNEL	FREQ. (MHZ)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

3.2.1 CONFIGURATION OF SYSTEM UNDER TEST

Please see section 5 photographs of the test configuration for reference.

3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports.
The worst case was found when positioned on X axis for radiated emission. Following test modes were selected for the final test, and the final worst case is marked in boldface and recorded in the report:

EUT CONFIGURE MODE	APPLICABLE TO				MODE
	RE<1G	RE≥1G	PLC	APCM	
A	√	√	√	√	**Powered by AC 120V with (WIFI+BT) 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
-	BT Link+ 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)	AXIS
A	802.11b	1 to 11	1	OFDM	DBPSK	6.0	X
A	BT-LE	0 to 39	39	DTS	GFSK	1.0	X

RADIATED EMISSION TEST (ABOVE 1GHz):

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

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	AXIS
A	802.11b	1 to 11	1, 6, 11	CCK	DBPSK	1.0	X
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0	X
A	802.11n HT20	1 to 11	1, 6, 11	OFDM	BPSK	6.5	X
A	802.11n HT40	3 to 9	3, 6, 9	OFDM	BPSK	13.5	X
A	BT-LE	0 to 39	0,19, 39	DTS	GFSK	1.0	X

BANDEDGE MEASUREMENT:

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

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11b	1 to 11	1, 11	CCK	DBPSK	1.0
A	802.11g	1 to 11	1, 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
A	BT-LE	0 to 39	0,19, 39	DTS	GFSK	1.0

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	CCK	DBPSK	1.0
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
A	802.11n HT20	1 to 11	1, 11	OFDM	BPSK	6.5
A	802.11n HT40	3 to 9	3, 9	OFDM	BPSK	13.5
A	BT-LE	0 to 39	0,19, 39	DTS	GFSK	1.0

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	TEST VOLTAGE	TESTED BY
RE<1G	22deg. C, 56%RH	AC 120V 60Hz	Kery He
RE≥1G	22deg. C, 56%RH	AC 120V 60Hz	Kery He
PLC	20deg. C, 56%RH	AC 120V 60Hz	Breeze Jiang
APCM	20deg. C, 55%RH	AC 120V 60Hz	Breeze Jiang

3.3 DUTY CYCLE OF TEST SIGNAL

Chain 0:

Duty cycle of test signal is 100 %

Chain 1:

Duty cycle of test signal is 100 %

3.4 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

FCC Part 15, Subpart C, Section 15.247
KDB 558074 D01 DTS Meas Guidance v03r05
KDB 662911 D01 v02r01
ANSI C63.10-2013

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

NOTE: It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B(DoC). The test report has been issued separately.

3.5 DESCRIPTION OF SUPPORT UNITS

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

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	N/A	N/A	N/A	N/A	N/A

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

4 TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (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	ESCS30	100340	May 11,15	May 10,16
Artificial Mains Network	Rohde&Schwarz	ENV216	101173	Mar. 04,16	Mar. 03,17
Artificial Mains Network	Rohde&Schwarz	ESH3-Z5	100317	Apr. 05,16	Apr. 04,17
Voltage probe	SCHWARZBECK	TK 9421	TK 9421-176	Jan. 08,16	Jan. 07,17
Test software	ADT	ADT_Cond_V7.3.7	N/A	N/A	N/A

NOTE:

1. The test was performed in shielded room 553.
2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

4.1.3 TEST PROCEDURES

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

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

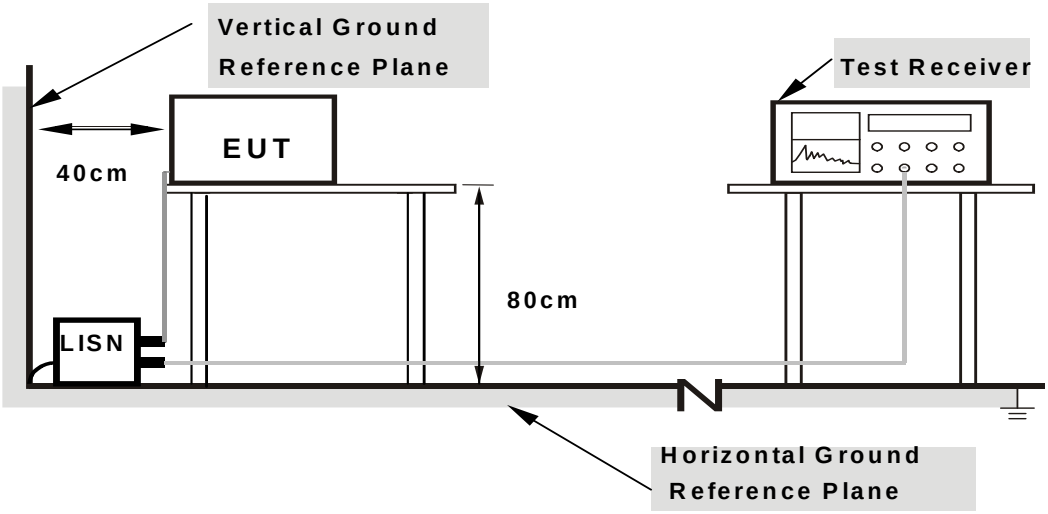
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) were not recorded.

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

4.1.4 DEVIATION FROM TEST STANDARD

No deviation.

4.1.5 TEST SETUP



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

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

4.1.6 EUT OPERATING CONDITIONS

a. Turned on the power and connected of all equipment.
b. EUT was operated according to the type used was description in manufacturer's specifications or the User's Manual.

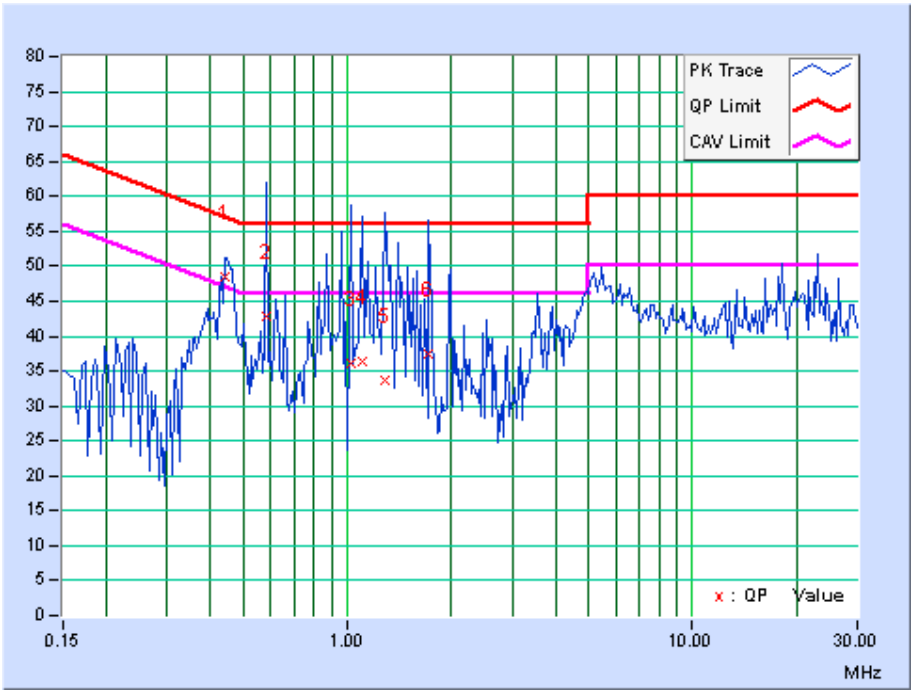
4.1.7 TEST RESULTS

CONDUCTED WORST-CASE DATA: BT+WIFI

PHASE	Line	6dB BANDWIDTH	9kHz

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	**0.44297**	**9.90**	**38.68**	**30.21**	**48.58**	**40.11**	**57.01**	**47.01**	**-8.43**	**-6.90**
2	0.58359	9.92	32.85	18.61	42.77	28.53	56.00	46.00	-13.23	-17.47
3	1.01953	9.97	26.23	15.63	36.20	25.60	56.00	46.00	-19.80	-20.40
4	1.10547	9.97	26.43	17.06	36.40	27.03	56.00	46.00	-19.60	-18.97
5	1.28906	9.97	23.77	15.10	33.74	25.07	56.00	46.00	-22.26	-20.93
6	1.71875	9.98	27.40	25.14	37.38	35.12	56.00	46.00	-18.62	-10.88

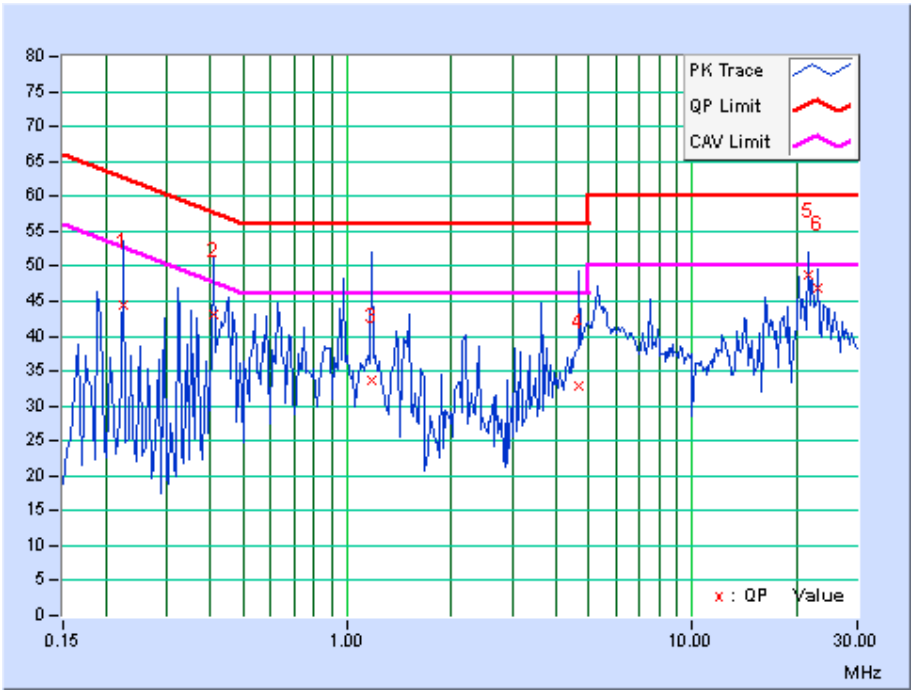
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



PHASE	Neutral	6dB BANDWIDTH	9kHz

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	0.22422	9.51	34.81	18.26	44.32	27.77	62.66	52.66	-18.34	-24.89
2	0.40781	9.54	33.46	18.58	43.00	28.12	57.69	47.69	-14.69	-19.57
3	1.17578	9.64	23.95	11.33	33.59	20.97	56.00	46.00	-22.41	-25.03
4	4.69922	9.74	23.11	10.51	32.85	20.25	56.00	46.00	-23.15	-25.75
5	21.66406	10.16	38.64	28.65	48.80	38.81	60.00	50.00	-11.20	-11.19
6	23.06641	10.24	36.61	27.08	46.85	37.32	60.00	50.00	-13.15	-12.68

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



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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

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

NOTE:

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

4.2.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESR7	101494	Apr. 05,16	Apr. 04,17
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV40	101003	Apr. 05,16	Apr. 04,17
Bilog Antenna	Teseq	CBL 6111D	30643	Jul. 16, 15	Jul. 15, 16
Horn Antenna (1GHz -18GHz)	ETS -Lindgren	3117	00062558	May 30, 14	May 29, 16
GPS Generator+ Antenna	TOJOIN	GNSS-5000A	E1-010119	Aug. 08, 14	Aug. 07, 16
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	NSEMC003	Mar. 12,16	Mar. 11,17
Test Software	ADT	ADT_Radiated_V7.6.15.9.2	N/A	N/A	N/A
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170242	Mar. 12,16	Mar. 11,17
Amplifier (9kHz-1GHz)	SONOMA	310D	186955	Mar. 04,16	Mar. 03, 17
Pre-Amplifier(1-18G)	HP	8449B	3008A00409	Mar. 04,16	Mar. 03, 17
Pre-Amplifier (18GHz-40GHz)	EMCI	EMC 184045	980102	Nov. 20,15	Nov. 19,16
Test Software	ADT	ADT_Radiated_V7.6.15.9.2	N/A	N/A	N/A
BLUETOOTH TESTER	Rohde&Schwarz	CBT32	100811	Sep. 01,15	Aug. 31,16

NOTE:

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

4.2.3 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, For battery operated equipment, the equipment tests shall be perform using fresh batteries. The turntable was rotated to maximize the emission level.

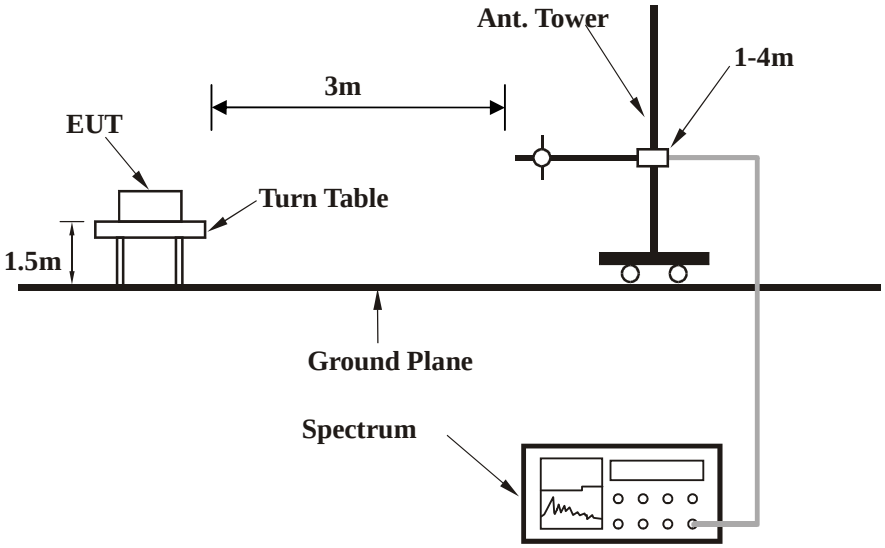
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. Bluetooth duty factor correction is not correct as it is based on 79 channels, worst case would be with AFH enabled and device using the minimum of 20 channels.Channel hop rate = 800 hops/second (AFH Mode), Adjusted channel hop rate for DH5 mode = 133.33 hops/second, Time per channel hop = 1 / 133.33 hops/second = 7.5 ms, Time to cycle through all channels = 7.5 x 20 channels = 150 ms, Number of times transmitter hits on one channel = 100 ms / 150 ms = 1 time(s), Worst case dwell time = 7.5 ms, Duty cycle connection factor = 20log10(7.5ms / 100ms) = -22.5 dB. Average value = peak reading + 20log(duty cycle).
4. For WiFi, the resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 10Hz(Duty cycle > 98%) for Average detection (AV) at frequency above 1GHz.
5. The testing of the EUT was performed on all 3 orthogonal axes; the worst-case test configuration was reported on the file test setup photo.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

4.2.5 TEST SETUP



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

4.2.6 EUT OPERATING CONDITIONS

a. Set the EUT under full load condition and placed them on a testing table.

b. Set the transmitter part of EUT under transmission condition continuously at specific channel frequency.

c. The necessary accessories enable the EUT in full functions.

4.2.7 TEST RESULTS

BELOW 1GHz WORST-CASE DATA:

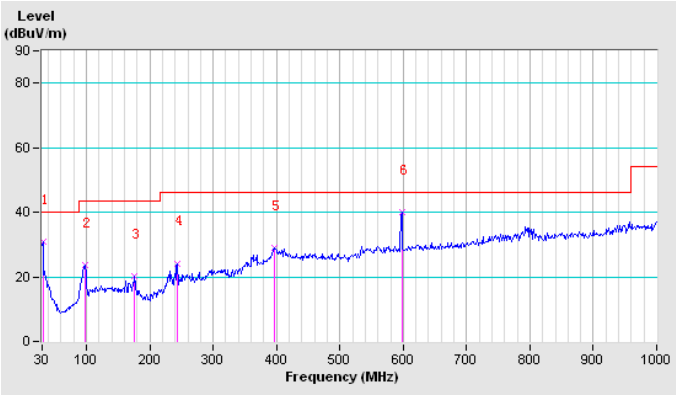
802.11b

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (cm)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	31.41	30.70	40.00	-9.30	200	0	43.60	-12.90
2	97.48	23.50	43.50	-20.00	200	0	43.40	-19.90
3	176.20	20.20	43.50	-23.30	200	0	39.50	-19.30
4	243.68	24.20	46.00	-21.80	200	0	40.90	-16.70
5	396.91	29.00	46.00	-17.00	200	0	39.50	-10.50
6	597.94	39.90	46.00	-6.10	200	0	45.60	-5.70

REMARKS:

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

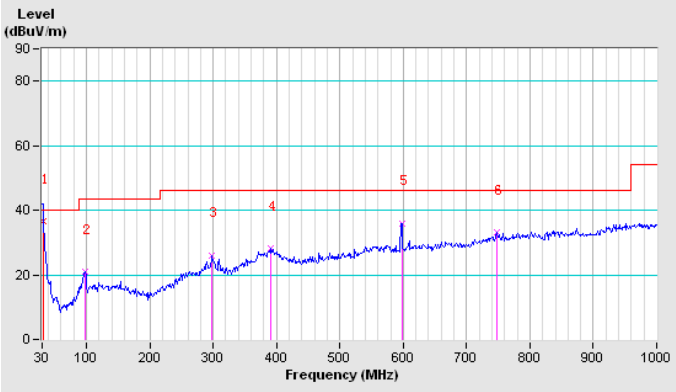


CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	**31.40**	**36.50**	**40.00**	**-3.50**	**100**	**93**	**49.40**	**-12.90**
2	97.48	21.00	43.50	-22.50	100	0	40.90	-19.90
3	298.51	26.10	46.00	-19.90	100	0	40.30	-14.20
4	391.29	28.10	46.00	-17.90	100	0	39.30	-11.20
5	597.94	36.00	46.00	-10.00	100	0	41.70	-5.70
6	746.96	33.10	46.00	-12.90	100	0	34.80	-1.70

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

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	47.9 PK	74.0	-26.1	1.11 H	262	45.40	2.50
2	2390.00	37.7 AV	54.0	-16.3	1.11 H	262	35.20	2.50
3	*2412.00	97.5 PK			1.11 H	262	95.00	2.50
4	*2412.00	93.5 AV			1.11 H	262	91.00	2.50
5	4824.00	53.7 PK	74.0	-20.3	1.00 H	39	46.00	7.70
6	4824.00	50.1 AV	54.0	-3.9	1.00 H	39	42.40	7.70
7	#7236.00	56.3 PK	77.5	-21.2	1.48 H	204	42.80	13.50
8	#7236.00	43.2 AV	73.5	-30.3	1.48 H	204	29.70	13.50
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	44.4 PK	74.0	-29.6	1.34 V	90	41.90	2.50
2	2390.00	30.5 AV	54.0	-23.5	1.34 V	90	28.00	2.50
3	*2412.00	96.7 PK			1.34 V	90	94.20	2.50
4	*2412.00	94.1 AV			1.34 V	90	91.60	2.50
5	4824.00	56.3 PK	74.0	-17.7	1.65 V	293	48.60	7.70
6	4824.00	49.7 AV	54.0	-4.3	1.65 V	293	42.00	7.70
7	#7236.00	56.5 PK	76.7	-20.2	1.20 V	81	43.00	13.50
8	#7236.00	43.6 AV	74.1	-30.5	1.20 V	81	30.10	13.50

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

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	105.6 PK			1.25 H	198	103.00	2.60
2	*2437.00	102.1 AV			1.25 H	198	99.50	2.60
3	4874.00	53.1 PK	74.0	-20.9	1.56 H	111	45.30	7.80
4	**4874.00**	**50.9 AV**	**54.0**	**-3.1**	**1.56 H**	**111**	**43.10**	**7.80**
5	7311.00	48.7 PK	74.0	-25.3	1.58 H	184	35.10	13.60
6	7311.00	36.9 AV	54.0	-17.1	1.58 H	184	23.30	13.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	103.9 PK			1.02 V	99	101.30	2.60
2	*2437.00	98.9 AV			1.02 V	99	96.30	2.60
3	4874.00	52.1 PK	74.0	-21.9	1.97 V	156	44.30	7.80
4	4874.00	48.8 AV	54.0	-5.2	1.97 V	156	41.00	7.80
5	7311.00	48.4 PK	74.0	-25.6	1.08 V	171	34.80	13.60
6	7311.00	35.1 AV	54.0	-18.9	1.08 V	171	21.50	13.60

REMARKS:

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

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	99.6 PK			1.22 H	256	96.90	2.70
2	*2462.00	96.9 AV			1.22 H	256	94.20	2.70
3	2483.50	45.1 PK	74.0	-28.9	1.22 H	256	42.30	2.80
4	2483.50	34.1 AV	54.0	-19.9	1.22 H	256	31.30	2.80
5	4924.00	50.4 PK	74.0	-23.6	1.01 H	181	42.50	7.90
6	4924.00	48.9 AV	54.0	-5.1	1.01 H	181	41.00	7.90
7	7386.00	48.1 PK	74.0	-25.9	1.77 H	86	34.40	13.70
8	7386.00	35.1 AV	54.0	-18.9	1.77 H	86	21.40	13.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	101.4 PK			1.82 V	77	98.70	2.70
2	*2462.00	97.8 AV			1.82 V	77	95.10	2.70
3	2483.50	46.4 PK	74.0	-27.6	1.82 V	77	43.60	2.80
4	2483.50	35.7 AV	54.0	-18.3	1.82 V	77	32.90	2.80
5	4924.00	50.8 PK	74.0	-23.2	2.54 V	255	42.90	7.90
6	4924.00	49.9 AV	54.0	-4.1	2.54 V	255	42.00	7.90
7	7386.00	48.7 PK	74.0	-25.3	1.17 V	44	35.00	13.70
8	7386.00	35.5 AV	54.0	-18.5	1.17 V	44	21.80	13.70

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

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	50.0 PK	74.0	-24.0	1.00 H	349	47.50	2.50
2	2390.00	35.6 AV	54.0	-18.4	1.00 H	349	33.10	2.50
3	*2412.00	97.9 PK			1.00 H	349	95.40	2.50
4	*2412.00	88.5 AV			1.00 H	349	86.00	2.50
5	4824.00	50.9 PK	74.0	-23.1	1.14 H	30	43.20	7.70
6	4824.00	48.9 AV	54.0	-5.1	1.14 H	30	41.20	7.70
7	#7236.00	47.1 PK	77.9	-30.8	1.53 H	55	33.60	13.50
8	#7236.00	36.1 AV	68.5	-32.4	1.53 H	55	22.60	13.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	51.5 PK	74.0	-22.5	1.48 V	71	49.00	2.50
2	2390.00	37.6 AV	54.0	-16.4	1.48 V	71	35.10	2.50
3	*2412.00	105.4 PK			1.48 V	71	102.90	2.50
4	*2412.00	94.6 AV			1.48 V	71	92.10	2.50
5	4824.00	51.6 PK	74.0	-22.4	1.84 V	126	43.90	7.70
6	4824.00	49.6 AV	54.0	-4.4	1.84 V	126	41.90	7.70
7	#7236.00	46.8 PK	85.4	-38.6	1.00 V	92	33.30	13.50
8	#7236.00	34.8 AV	74.6	-39.8	1.00 V	92	21.30	13.50

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

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	101.1 PK			1.00 H	231	98.50	2.60
2	*2437.00	90.3 AV			1.00 H	231	87.70	2.60
3	4874.00	51.4 PK	74.0	-22.6	1.28 H	74	43.60	7.80
4	4874.00	48.9 AV	54.0	-5.1	1.28 H	74	41.10	7.80
5	7311.00	49.6 PK	74.0	-24.4	1.51 H	11	36.00	13.60
6	7311.00	35.8 AV	54.0	-18.2	1.51 H	11	22.20	13.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	106.7 PK			1.53 V	99	104.10	2.60
2	*2437.00	97.1 AV			1.53 V	99	94.50	2.60
3	4874.00	51.5 PK	74.0	-22.5	1.71 V	56	43.70	7.80
4	4874.00	49.7 AV	54.0	-4.3	1.71 V	56	41.90	7.80
5	7311.00	49.7 PK	74.0	-24.3	1.16 V	87	36.10	13.60
6	7311.00	36.1 AV	54.0	-17.9	1.16 V	87	22.50	13.60

REMARKS:

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

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

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	101.4 PK			1.99 H	233	98.70	2.70
2	*2462.00	91.8 AV			1.99 H	233	89.10	2.70
3	2483.50	60.2 PK	74.0	-13.8	1.99 H	233	57.40	2.80
4	2483.50	41.3 AV	54.0	-12.7	1.99 H	233	38.50	2.80
5	4924.00	51.4 PK	74.0	-22.6	1.17 H	33	43.50	7.90
6	4924.00	50.1 AV	54.0	-3.9	1.17 H	33	42.20	7.90
7	7386.00	49.4 PK	74.0	-24.6	1.04 H	18	35.70	13.70
8	7386.00	35.5 AV	54.0	-18.5	1.04 H	18	21.80	13.70
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	103.3 PK			1.86 V	79	100.60	2.70
2	*2462.00	93.8 AV			1.86 V	79	91.10	2.70
3	2483.50	62.2 PK	74.0	-11.8	1.86 V	79	59.40	2.80
4	2483.50	47.8 AV	54.0	-6.2	1.86 V	79	45.00	2.80
5	4924.00	51.3 PK	74.0	-22.7	1.24 V	284	43.40	7.90
6	4924.00	49.7 AV	54.0	-4.3	1.24 V	284	41.80	7.90
7	7386.00	50.5 PK	74.0	-23.5	1.82 V	57	36.80	13.70
8	7386.00	36.5 AV	54.0	-17.5	1.82 V	57	22.80	13.70

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	61.6 PK	74.0	-12.4	1.01 H	213	59.10	2.50
2	2390.00	44.4 AV	54.0	-9.6	1.01 H	213	41.90	2.50
3	*2412.00	101.0 PK			1.01 H	213	98.50	2.50
4	*2412.00	92.2 AV			1.01 H	213	89.70	2.50
5	4824.00	54.6 PK	74.0	-19.4	1.02 H	41	46.90	7.70
6	4824.00	49.7 AV	54.0	-4.3	1.02 H	41	42.00	7.70
7	#7236.00	49.4 PK	81.0	-31.6	1.53 H	204	35.90	13.50
8	#7236.00	36.5 AV	72.2	-35.7	1.53 H	204	23.00	13.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	55.6 PK	74.0	-18.4	1.00 V	337	53.10	2.50
2	2390.00	41.6 AV	54.0	-12.4	1.00 V	337	39.10	2.50
3	*2412.00	103.8 PK			1.00 V	337	101.30	2.50
4	*2412.00	94.6 AV			1.00 V	337	92.10	2.50
5	4824.00	49.8 PK	74.0	-24.2	1.45 V	100	42.10	7.70
6	4824.00	44.2 AV	54.0	-9.8	1.45 V	100	36.50	7.70
7	#7236.00	47.1 PK	83.8	-36.7	1.48 V	20	33.60	13.50
8	#7236.00	33.5 AV	74.6	-41.1	1.48 V	20	20.00	13.50

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

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	106.1 PK			1.22 H	263	103.50	2.60
2	*2437.00	95.9 AV			1.22 H	263	93.30	2.60
3	4874.00	54.3 PK	74.0	-19.7	1.57 H	24	46.50	7.80
4	4874.00	49.9 AV	54.0	-4.1	1.57 H	24	42.10	7.80
5	7311.00	48.5 PK	74.0	-25.5	1.75 H	112	34.90	13.60
6	7311.00	36.1 AV	54.0	-17.9	1.75 H	112	22.50	13.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	103.7 PK			1.00 V	56	101.10	2.60
2	*2437.00	94.1 AV			1.00 V	56	91.50	2.60
3	4874.00	50.4 PK	74.0	-23.6	1.04 V	18	42.60	7.80
4	4874.00	45.4 AV	54.0	-8.6	1.04 V	18	37.60	7.80
5	7311.00	48.0 PK	74.0	-26.0	1.61 V	224	34.40	13.60
6	7311.00	35.6 AV	54.0	-18.4	1.61 V	224	22.00	13.60

REMARKS:

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

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

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	100.6 PK			2.22 H	335	97.90	2.70
2	*2462.00	89.4 AV			2.22 H	335	86.70	2.70
3	2483.50	55.3 PK	74.0	-18.7	2.22 H	335	52.50	2.80
4	2483.50	46.8 AV	54.0	-7.2	2.22 H	335	44.00	2.80
5	4924.00	48.9 PK	74.0	-25.1	1.18 H	201	41.00	7.90
6	4924.00	45.5 AV	54.0	-8.5	1.18 H	201	37.60	7.90
7	7386.00	48.1 PK	74.0	-25.9	1.77 H	48	34.40	13.70
8	7386.00	35.4 AV	54.0	-18.6	1.77 H	48	21.70	13.70
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	102.7 PK			1.48 V	355	100.00	2.70
2	*2462.00	90.3 AV			1.48 V	355	87.60	2.70
3	2483.50	59.9 PK	74.0	-14.1	1.48 V	355	57.10	2.80
4	2483.50	45.6 AV	54.0	-8.4	1.48 V	355	42.80	2.80
5	4924.00	54.6 PK	74.0	-19.4	1.44 V	58	46.70	7.90
6	4924.00	49.6 AV	54.0	-4.4	1.44 V	58	41.70	7.90
7	7386.00	49.2 PK	74.0	-24.8	1.58 V	23	35.50	13.70
8	7386.00	36.7 AV	54.0	-17.3	1.58 V	23	23.00	13.70

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

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	50.8 PK	74.0	-23.2	2.23 H	339	48.30	2.50
2	2390.00	46.0 AV	54.0	-8.0	2.23 H	339	43.50	2.50
3	*2422.00	99.2 PK			2.23 H	339	96.60	2.60
4	*2422.00	88.5 AV			2.23 H	339	85.90	2.60
5	4844.00	45.6 PK	74.0	-28.4	1.84 H	123	37.80	7.80
6	4844.00	42.6 AV	54.0	-11.4	1.84 H	123	34.80	7.80
7	7266.00	47.5 PK	74.0	-26.5	1.58 H	22	34.00	13.50
8	7266.00	35.4 AV	54.0	-18.6	1.58 H	22	21.90	13.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	60.8 PK	74.0	-13.2	2.43 V	176	58.30	2.50
2	2390.00	50.1 AV	54.0	-3.9	2.43 V	176	47.60	2.50
3	*2422.00	99.1 PK			2.43 V	176	96.50	2.60
4	*2422.00	88.6 AV			2.43 V	176	86.00	2.60
5	4844.00	50.4 PK	74.0	-23.6	1.82 V	50	42.60	7.80
6	4844.00	43.8 AV	54.0	-10.2	1.82 V	50	36.00	7.80
7	7266.00	47.6 PK	74.0	-26.4	1.07 V	18	34.10	13.50
8	7266.00	36.1 AV	54.0	-17.9	1.07 V	18	22.60	13.50

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

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	98.6 PK			1.01 H	338	96.00	2.60
2	*2437.00	89.2 AV			1.01 H	338	86.60	2.60
3	4874.00	52.3 PK	74.0	-21.7	1.18 H	206	44.50	7.80
4	4874.00	46.6 AV	54.0	-7.4	1.18 H	206	38.80	7.80
5	7311.00	48.6 PK	74.0	-25.4	1.58 H	17	35.00	13.60
6	7311.00	35.4 AV	54.0	-18.6	1.58 H	17	21.80	13.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	98.4 PK			2.23 V	316	95.80	2.60
2	*2437.00	88.2 AV			2.23 V	316	85.60	2.60
3	4874.00	56.1 PK	74.0	-17.9	1.58 V	47	48.30	7.80
4	4874.00	49.6 AV	54.0	-4.4	1.58 V	47	41.80	7.80
5	7311.00	49.5 PK	74.0	-24.5	1.00 V	21	35.90	13.60
6	7311.00	36.1 AV	54.0	-17.9	1.00 V	21	22.50	13.60

REMARKS:

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

CHANNEL	TX Channel 9	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

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	100.4 PK			2.05 H	2	97.70	2.70
2	*2452.00	89.1 AV			2.05 H	2	86.40	2.70
3	2483.50	66.8 PK	74.0	-7.2	2.05 H	2	64.00	2.80
4	2483.50	50.8 AV	54.0	-3.2	2.05 H	2	48.00	2.80
5	4904.00	47.6 PK	74.0	-26.4	1.84 H	11	39.70	7.90
6	4904.00	42.5 AV	54.0	-11.5	1.84 H	11	34.60	7.90
7	7356.00	49.8 PK	74.0	-24.2	1.62 H	284	36.10	13.70
8	7356.00	35.8 AV	54.0	-18.2	1.62 H	284	22.10	13.70
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	97.5 PK			1.00 V	314	94.80	2.70
2	*2452.00	86.7 AV			1.00 V	314	84.00	2.70
3	2483.50	62.8 PK	74.0	-11.2	1.00 V	314	60.00	2.80
4	2483.50	50.3 AV	54.0	-3.7	1.00 V	314	47.50	2.80
5	4904.00	56.2 PK	74.0	-17.8	1.07 V	128	48.30	7.90
6	4904.00	48.6 AV	54.0	-5.4	1.07 V	128	40.70	7.90
7	7356.00	48.6 PK	74.0	-25.4	1.18 V	15	34.90	13.70
8	7356.00	34.9 AV	54.0	-19.1	1.18 V	15	21.20	13.70

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.

BELOW 1GHz WORST-CASE DATA:

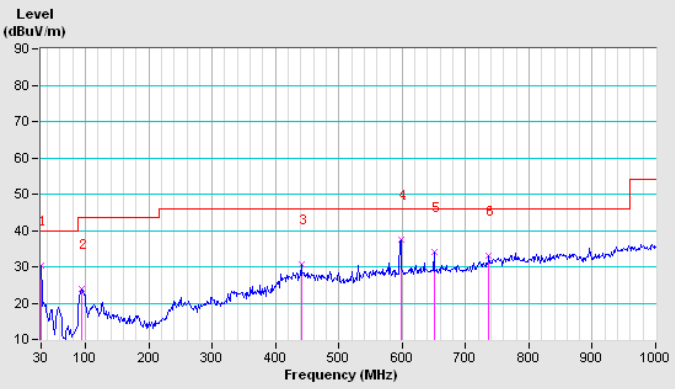
BT-LE (GFSK)

CHANNEL	TX Channel 39	**DETECTOR FUNCTION**	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (cm)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	30.00	30.30	40.00	-9.70	200	0	42.60	-12.30
2	94.67	24.00	43.50	-19.50	200	0	44.20	-20.20
3	440.49	30.60	46.00	-15.40	200	0	40.20	-9.60
4	597.94	37.40	46.00	-8.60	200	0	43.10	-5.70
5	649.96	34.10	46.00	-11.90	200	0	38.70	-4.60
6	737.12	33.10	46.00	-12.90	200	0	35.10	-2.00

REMARKS:

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

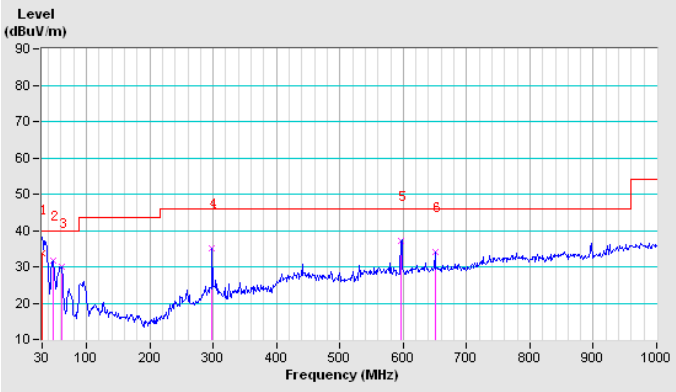


CHANNEL	TX Channel 39	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	**30.01**	**33.60**	**40.00**	**-6.40**	**100**	**274**	**45.90**	**-12.30**
2	46.87	31.80	40.00	-8.20	100	0	52.40	-20.60
3	60.93	29.80	40.00	-10.20	100	0	54.80	-25.00
4	298.51	35.20	46.00	-10.80	100	0	49.40	-14.20
5	596.54	37.10	46.00	-8.90	100	0	42.70	-5.60
6	649.96	34.10	46.00	-11.90	100	0	38.70	-4.60

REMARKS:

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



ABOVE 1GHz TEST DATA:

BT-LE (GFSK)

CHANNEL	TX Channel 0	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	43.0 PK	74.0	-31.0	1.01 H	210	40.50	2.50
2	2390.00	20.5 AV	54.0	-33.5	1.01 H	210	18.00	2.50
3	*2402.00	85.5 PK			1.01 H	210	83.00	2.50
4	*2402.00	63.0 AV			1.01 H	210	60.50	2.50
5	4804.00	47.4 PK	74.0	-26.6	1.94 H	172	39.70	7.70
6	4804.00	24.9 AV	54.0	-29.1	1.94 H	172	17.20	7.70
7	**#7206.00**	**47.8 PK**	**65.5**	**-17.7**	**1.56 H**	**87**	**34.40**	**13.40**
8	**#7206.00**	**25.3 AV**	**43.0**	**-17.7**	**1.56 H**	**87**	**11.90**	**13.40**
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	48.8 PK	74.0	-25.2	1.00 V	330	46.30	2.50
2	2390.00	26.3 AV	54.0	-27.7	1.00 V	330	23.80	2.50
3	*2402.00	86.2 PK			1.00 V	330	83.70	2.50
4	*2402.00	63.7 AV			1.00 V	330	61.20	2.50
5	4804.00	45.4 PK	74.0	-28.6	1.15 V	71	37.70	7.70
6	4804.00	22.9 AV	54.0	-31.1	1.15 V	71	15.20	7.70
7	#7206.00	47.5 PK	66.2	-18.7	1.36 V	185	34.10	13.40
8	#7206.00	25.0 AV	43.7	-18.7	1.36 V	185	11.60	13.40

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 19	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

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	*2440.00	83.3 PK			1.00 H	208	80.70	2.60
2	*2440.00	60.8 AV			1.00 H	208	58.20	2.60
3	4880.00	45.8 PK	74.0	-28.2	1.25 H	39	38.00	7.80
4	4880.00	23.3 AV	54.0	-30.7	1.25 H	39	15.50	7.80
5	7320.00	48.3 PK	74.0	-25.7	1.69 H	50	34.70	13.60
6	7320.00	25.8 AV	54.0	-28.2	1.69 H	50	12.20	13.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2440.00	85.3 PK			1.10 V	326	82.70	2.60
2	*2440.00	62.8 AV			1.10 V	326	60.20	2.60
3	4880.00	45.9 PK	74.0	-28.1	1.19 V	201	38.10	7.80
4	4880.00	23.4 AV	54.0	-30.6	1.19 V	201	15.60	7.80
5	7320.00	47.9 PK	74.0	-26.1	1.55 V	28	34.30	13.60
6	7320.00	25.4 AV	54.0	-28.6	1.55 V	28	11.80	13.60

REMARKS:

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

CHANNEL	TX Channel 39	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

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	*2480.00	83.0 PK			1.23 H	251	80.20	2.80
2	*2480.00	60.5 AV			1.23 H	251	57.70	2.80
3	2483.50	45.5 PK	74.0	-28.5	1.23 H	251	42.70	2.80
4	2483.50	23.0 AV	54.0	-31.0	1.23 H	251	20.20	2.80
5	4960.00	44.1 PK	74.0	-29.9	2.04 H	246	36.10	8.00
6	4960.00	21.6 AV	54.0	-32.4	2.04 H	246	13.60	8.00
7	7440.00	47.8 PK	74.0	-26.2	1.18 H	76	33.90	13.90
8	7440.00	25.3 AV	54.0	-28.7	1.18 H	76	11.40	13.90
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	*2480.00	83.8 PK			1.95 V	62	81.00	2.80
2	*2480.00	61.3 AV			1.95 V	62	58.50	2.80
3	2483.50	48.9 PK	74.0	-25.1	1.95 V	62	46.10	2.80
4	2483.50	26.4 AV	54.0	-27.6	1.95 V	62	23.60	2.80
5	4960.00	44.0 PK	74.0	-30.0	1.08 V	271	36.00	8.00
6	4960.00	21.5 AV	54.0	-32.5	1.08 V	271	13.50	8.00
7	7440.00	48.2 PK	74.0	-25.8	1.68 V	22	34.30	13.90
8	7440.00	25.7 AV	54.0	-28.3	1.68 V	22	11.80	13.90

REMARKS:

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

4.3 6dB BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Power Sensor	Keysight	U2021XA	MY55060016	Feb. 18,16	Feb. 17,17
Power Sensor	Keysight	U2021XA	MY55060018	Feb. 18,16	Feb. 17,17
Digital Multimeter	FLUKE	15B	A1220010DG	Oct. 12, 15	Oct.11, 16
Humid & Temp Programmable Tester	Haida	HD-2257	110807201	Sep.07,15	Sep. 06,16
Oscilloscope	Agilent	DSO9254A	MY51260160	Nov. 28,15	Nov. 27,16
Signal Analyzer	Rohde & Schwarz	FSV7	102331	Nov. 09,15	Nov. 08,16
Signal Generator	Agilent	N5183A	MY50140980	Nov. 09,15	Nov. 08,16
ESG Vector Signal Generator	Agilent	E4438C	MY49072505	Apr. 22, 16	Apr. 21, 17
BLUETOOTH TESTER	Rohde&Schwarz	CBT32	100811	Sep. 01,15	Aug. 31,16

NOTE:

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

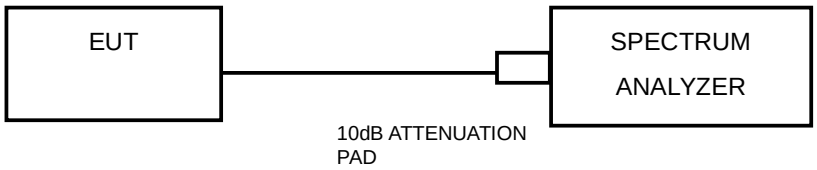
4.3.3 TEST PROCEDURE

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

4.3.4 DEVIATION FROM TEST STANDARD

No deviation.

4.3.5 TEST SETUP



4.3.6 EUT OPERATING CONDITIONS

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

4.3.7 TEST RESULTS

802.11b

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	8.60	9.58	0.5	PASS
6	2437	9.09	9.62	0.5	PASS
11	2462	9.59	9.61	0.5	PASS

802.11g

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	13.85	15.11	0.5	PASS
6	2437	15.12	15.11	0.5	PASS
11	2462	15.11	15.11	0.5	PASS

802.11n 20MHz

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	13.86	15.15	0.5	PASS
6	2437	15.10	15.12	0.5	PASS
11	2462	15.13	15.12	0.5	PASS

802.11n 40MHz

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
3	2422	31.46	33.92	0.5	PASS
6	2437	33.20	32.64	0.5	PASS
9	2452	34.18	35.16	0.5	PASS

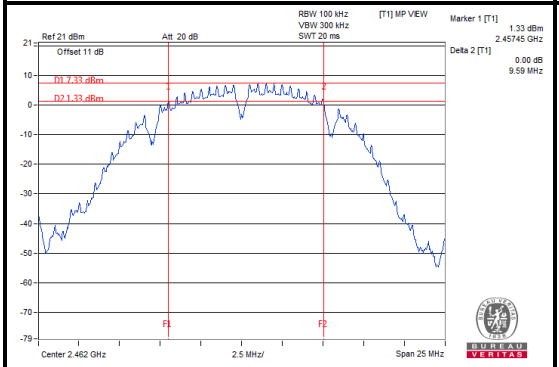
BT-LE (GFSK)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
0	2402	0.708	0.5	PASS
19	2440	0.715	0.5	PASS
39	2480	0.715	0.5	PASS

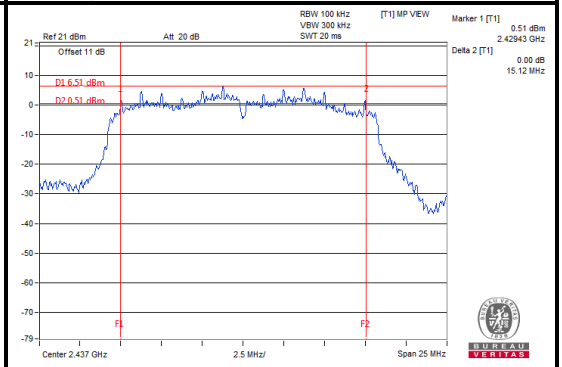
CHAIN 0

SPECTRUM PLOT OF WORST VALUE

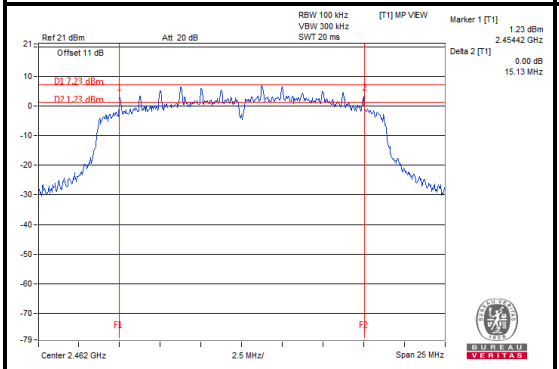
802.11b



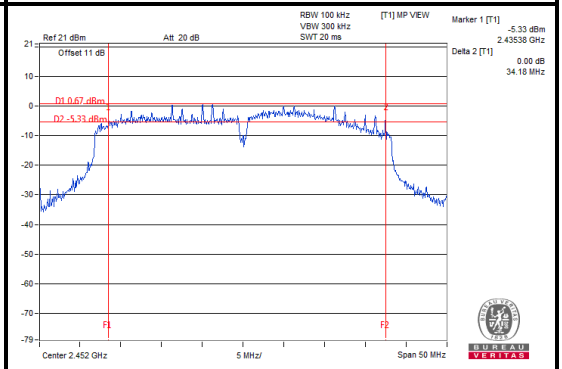
802.11g



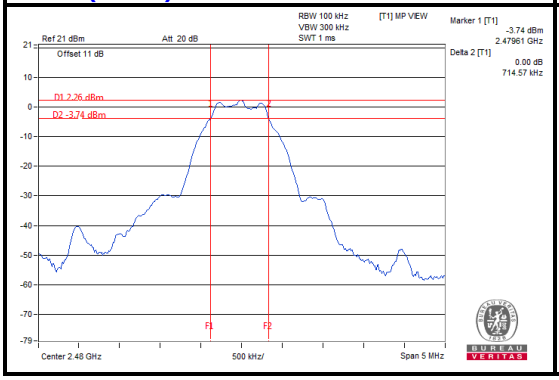
802.11n 20MHz



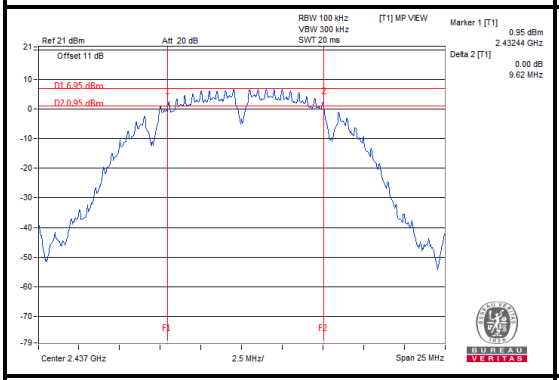
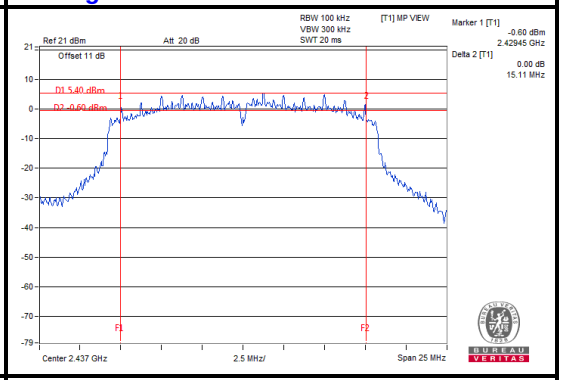
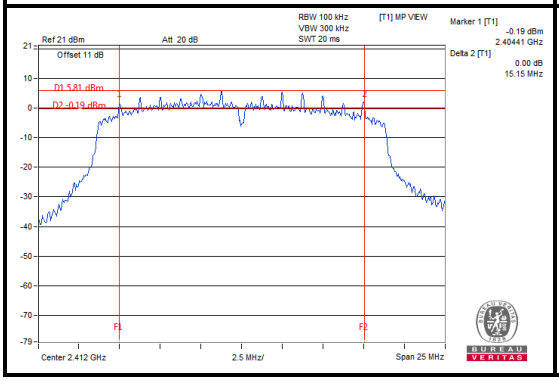
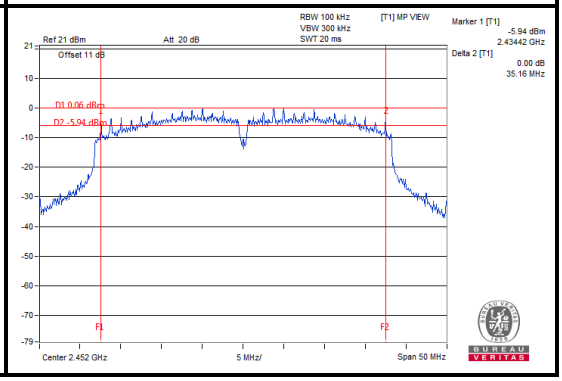
802.11n 40MHz



BT-LE (GFSK)



CHAIN 1

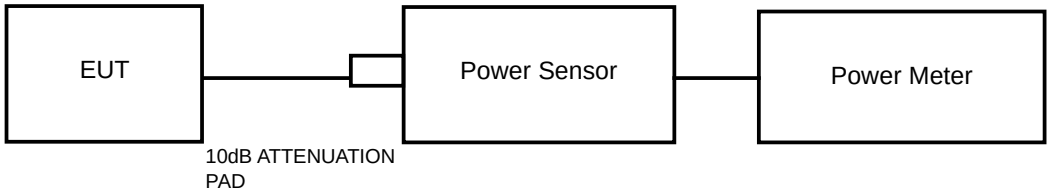
SPECTRUM PLOT OF WORST VALUE	
802.11b	802.11g
	
802.11n 20MHz	802.11n 40MHz
	

4.4 CONDUCTED OUTPUT POWER

4.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

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

4.4.2 TEST SETUP



4.4.3 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Power Sensor	Keysight	U2021XA	MY55060016	Feb. 18,16	Feb. 17,17
Power Sensor	Keysight	U2021XA	MY55060018	Feb. 18,16	Feb. 17,17
Digital Multimeter	FLUKE	15B	A1220010DG	Oct. 12, 15	Oct.11, 16
Humid & Temp Programmable Tester	Haida	HD-2257	110807201	Sep.07,15	Sep. 06,16
Oscilloscope	Agilent	DSO9254A	MY51260160	Nov. 28,15	Nov. 27,16
Signal Analyzer	Rohde & Schwarz	FSV7	102331	Nov. 09,15	Nov. 08,16
Signal Generator	Agilent	N5183A	MY50140980	Nov. 09,15	Nov. 08,16
ESG Vector Signal Generator	Agilent	E4438C	MY49072505	Nov. 09,15	Nov. 08,16
BLUETOOTH TESTER	Rohde&Schwarz	CBT32	100811	Sep. 01,15	Aug. 31,16

NOTE:

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

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

4.4.7.1 MAXIMUM PEAK OUTPUT POWER

802.11b

CHAN.	FREQ. (MHz)	PEAK POWER(dBm)		PEAK POWER(mW)		TOTAL POWER (mW)	TOTAL POWER (dBm)	PEAK POWER LIMIT (W)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 0	CHAIN 1				
1	2412	17.91	16.87	61.802	48.641	110.443	20.43	1	PASS
6	2437	19.92	19.86	98.175	96.828	195.003	22.90	1	PASS
11	2462	19.25	18.25	84.14	66.834	150.974	21.79	1	PASS

802.11g

CHAN.	FREQ. (MHz)	PEAK POWER(dBm)		PEAK POWER(mW)		TOTAL POWER (mW)	TOTAL POWER (dBm)	PEAK POWER LIMIT (W)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 0	CHAIN 1				
1	2412	22.91	22.97	195.434	198.153	393.587	25.95	1	PASS
6	2437	22.61	23.25	182.39	211.349	393.739	25.95	1	PASS
11	2462	24.56	24.56	285.759	285.759	**571.518**	**27.57**	1	PASS

802.11n 20MHz

CHAN.	FREQ. (MHz)	PEAK POWER(dBm)		PEAK POWER(mW)		TOTAL POWER (mW)	TOTAL POWER (dBm)	PEAK POWER LIMIT (W)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 0	CHAIN 1				
1	2412	15.44	14.98	34.995	31.477	66.472	18.23	1	PASS
6	2437	15.96	15.92	39.446	39.084	78.530	18.95	1	PASS
11	2462	15.81	15.30	38.107	33.884	71.991	18.57	1	PASS

802.11n 40MHz

CHAN.	FREQ. (MHz)	PEAK POWER(dBm)		PEAK POWER(mW)		TOTAL POWER (mW)	TOTAL POWER (dBm)	PEAK POWER LIMIT (W)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 0	CHAIN 1				
3	2422	21.85	21.51	153.109	141.579	294.688	24.69	1	PASS
6	2437	23.47	23.62	222.331	230.144	452.475	26.56	1	PASS
9	2452	21.25	21.09	133.352	128.529	261.881	24.18	1	PASS

BT-LE (GFSK)

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)	PEAK POWER (mW)	PEAK POWER LIMIT (W)	PASS/FAIL
0	2402	1.33	1.358	1	PASS
19	2440	3.42	2.198	1	PASS
39	2480	**3.62**	**2.301**	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

CHAN.	FREQ. (MHz)	AVG. POWER (dBm)		AVG. POWER (mW)		TOTAL POWER (mW)	TOTAL POWER (dBm)	PEAK POWER LIMIT (W)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 0	CHAIN 1				
1	2412	14.54	13.95	28.445	24.831	53.276	17.27	30	PASS
6	2437	16.80	16.76	47.863	47.424	95.287	19.79	30	PASS
11	2462	16.26	15.31	42.267	33.963	76.230	18.82	30	PASS

802.11g

CHAN.	FREQ. (MHz)	AVG. POWER (dBm)		AVG. POWER (mW)		TOTAL POWER (mW)	TOTAL POWER (dBm)	PEAK POWER LIMIT (W)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 0	CHAIN 1				
1	2412	15.45	15.12	35.075	32.509	67.584	18.30	30	PASS
6	2437	15.41	14.81	34.754	30.269	65.023	18.13	30	PASS
11	2462	17.13	16.76	51.642	47.424	**99.066**	**19.96**	30	PASS

802.11n 20MHz

CHAN.	FREQ. (MHz)	AVG. POWER (dBm)		AVG. POWER (mW)		TOTAL POWER (mW)	TOTAL POWER (dBm)	PEAK POWER LIMIT (W)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 0	CHAIN 1				
1	2412	15.44	14.98	34.995	31.477	66.472	18.23	30	PASS
6	2437	15.96	15.92	39.446	39.084	78.530	18.95	30	PASS
11	2462	15.81	15.30	38.107	33.884	71.991	18.57	30	PASS

802.11n 40MHz

CHAN.	FREQ. (MHz)	AVG. POWER (dBm)		AVG. POWER (mW)		TOTAL POWER (mW)	TOTAL POWER (dBm)	PEAK POWER LIMIT (W)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 0	CHAIN 1				
3	2422	14.15	13.91	26.002	24.604	50.606	17.04	30	PASS
6	2437	16.28	15.85	42.462	38.459	80.921	19.08	30	PASS
9	2452	13.57	13.41	22.751	21.928	44.679	16.50	30	PASS

BT-LE (GFSK)

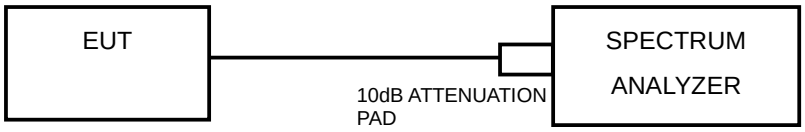
CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	AVG. POWER (mW)
0	2402	-1.89	0.6471
19	2440	0.19	1.045
39	2480	**0.44**	**1.107**

4.5 POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

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

4.5.2 TEST SETUP



4.5.3 TEST INSTRUMENTS

Refer to section 4.3.2 to get information of above instrument.

4.5.4 TEST PROCEDURE

a) Set instrument center frequency to DTS channel center frequency.
b) Set span to at least 1.5 times the OBW.
c) Set RBW to: 10 KHz(WiFi) & 3KHz(BT)
d) Set VBW ≥3 x RBW.
e) Detector = peak
f) Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW.
g) Sweep time = auto couple.
h) Use the peak marker function to determine the maximum amplitude level.

4.5.5 DEVIATION FROM TEST STANDARD

No deviation.

4.5.6 EUT OPERATING CONDITION

Same as item 4.3.6.

4.5.7 TEST RESULTS

802.11b

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=2) dB	TOTAL PSD (dBm)	Limit (dBm)	PASS /FAIL
0	1	2412	-12.13	3.01	-9.12	8.00	PASS
	6	2437	-12.11	3.01	-9.10	8.00	PASS
	11	2462	-11.82	3.01	-8.81	8.00	PASS
1	1	2412	-14.05	3.01	-11.04	8.00	PASS
	6	2437	-12.40	3.01	-9.39	8.00	PASS
	11	2462	-13.98	3.01	-10.97	8.00	PASS

Note:
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 2.45dBi+10log(2)=5.46,so the power density limit no need to reduce.

802.11g

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=2) dB	TOTAL PSD (dBm)	Limit (dBm)	PASS /FAIL
0	1	2412	-13.29	3.01	-10.28	8.00	PASS
	6	2437	-13.56	3.01	-10.55	8.00	PASS
	11	2462	-11.89	3.01	-8.88	8.00	PASS
1	1	2412	-13.81	3.01	-10.80	8.00	PASS
	6	2437	-14.40	3.01	-11.39	8.00	PASS
	11	2462	-13.42	3.01	-10.41	8.00	PASS

Note:
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 2.45dBi+10log(2)=5.46,so the power density limit no need to reduce.

802.11n 20MHz

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=2) dB	TOTAL PSD (dBm)	Limit (dBm)	PASS /FAIL
0	1	2412	-13.55	3.01	-10.54	8.00	PASS
	6	2437	-13.29	3.01	-10.28	8.00	PASS
	11	2462	-13.70	3.01	-10.69	8.00	PASS
1	1	2412	-15.19	3.01	-12.18	8.00	PASS
	6	2437	-13.65	3.01	-10.64	8.00	PASS
	11	2462	-15.13	3.01	-12.12	8.00	PASS

Note:
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 2.45dBi+10log(2)=5.46,so the power density limit no need to reduce.

802.11n 40MHz

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=2) dB	TOTAL PSD (dBm)	Limit (dBm)	PASS /FAIL
0	3	2422	-17.42	3.01	-14.41	8.00	PASS
	6	2437	-17.21	3.01	-14.20	8.00	PASS
	9	2452	-18.60	3.01	-15.59	8.00	PASS
1	3	2422	-18.43	3.01	-15.42	8.00	PASS
	6	2437	-17.21	3.01	-14.20	8.00	PASS
	9	2452	-19.13	3.01	-16.12	8.00	PASS

Note:
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 2.45dBi+10log(2)=5.46,so the power density limit no need to reduce.

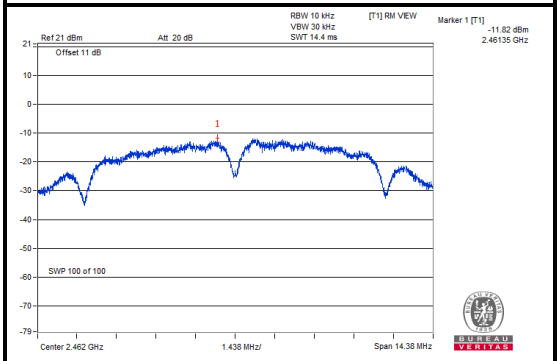
BT-LE (GFSK)

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	2402	-15.47	8.00	PASS
19	2440	-13.30	8.00	PASS
39	2480	-13.19	8.00	PASS

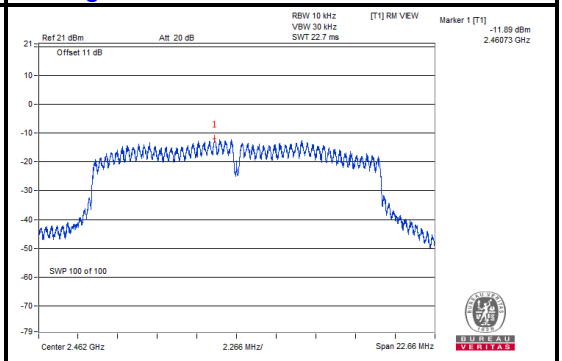
CHAIN 0

SPECTRUM PLOT OF WORST VALUE

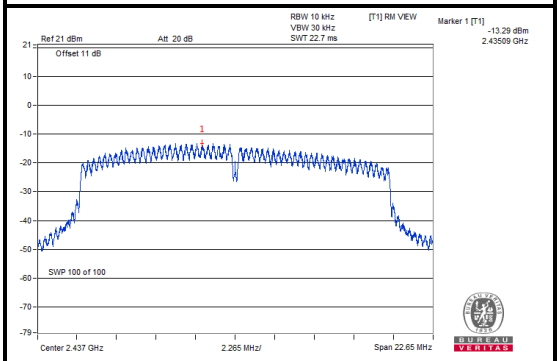
802.11b



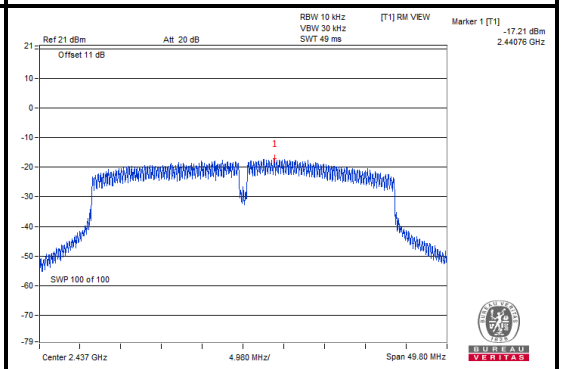
802.11g



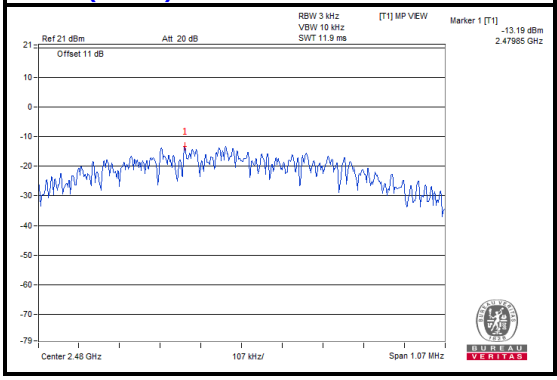
802.11n 20MHz



802.11n 40MHz



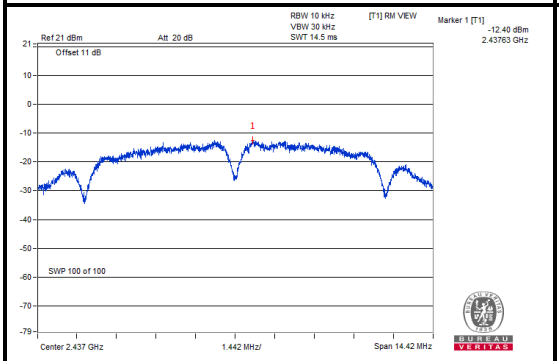
BT-LE (GFSK)



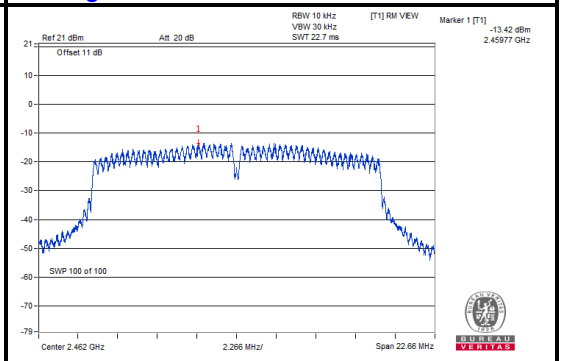
CHAIN 1

SPECTRUM PLOT OF WORST VALUE

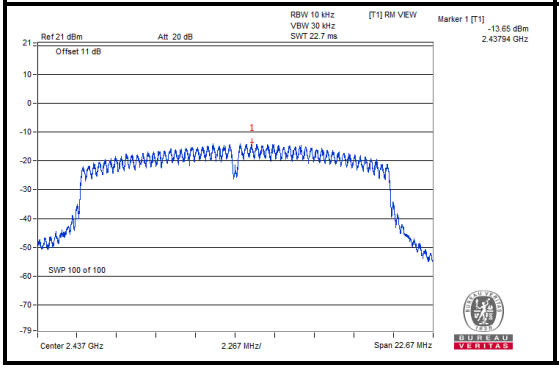
802.11b



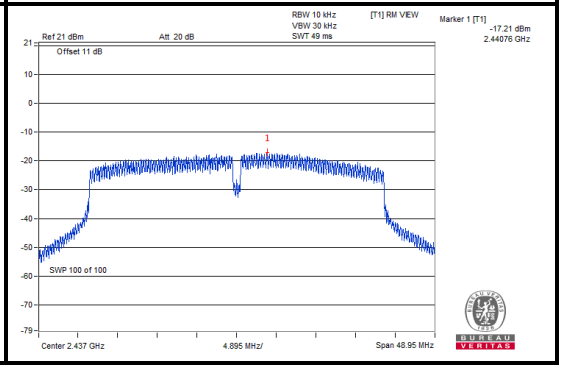
802.11g



802.11n 20MHz



802.11n 40MHz

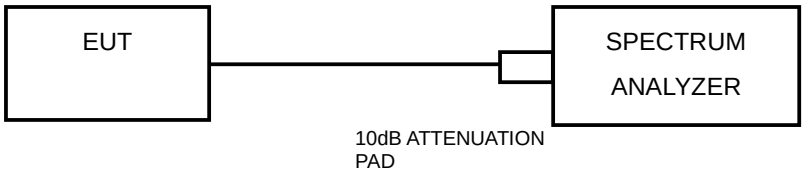


4.6 OUT OF BAND EMISSION MEASUREMENT

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 ≥ 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 ≥ 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

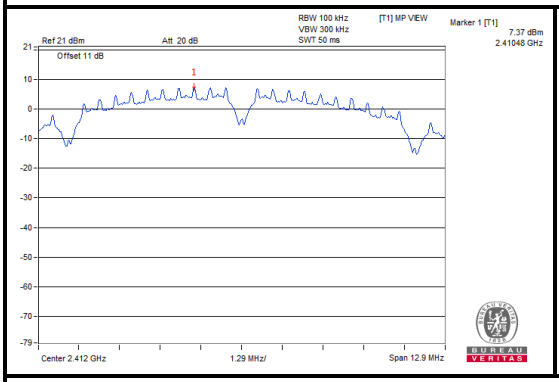
Same as item 4.3.6

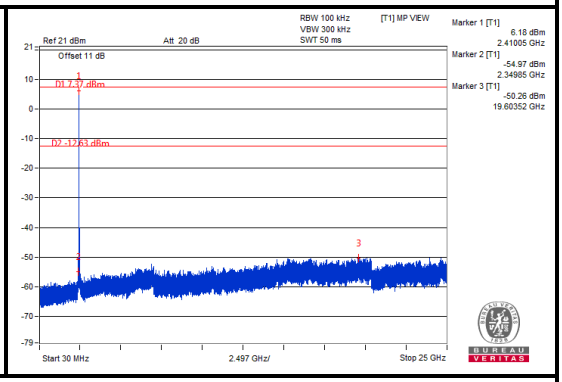
4.6.7 TEST RESULTS

802.11b

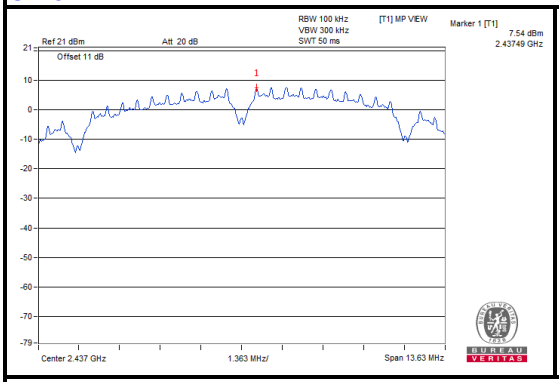
CHAIN 0

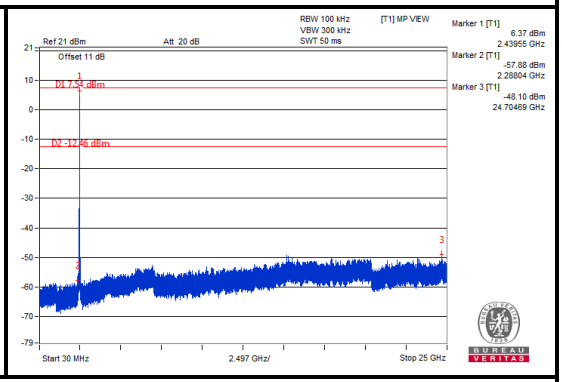
CH 1



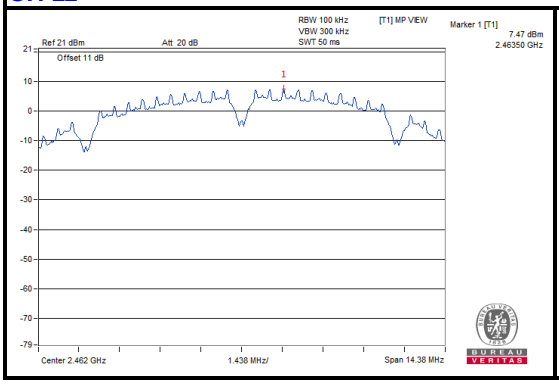


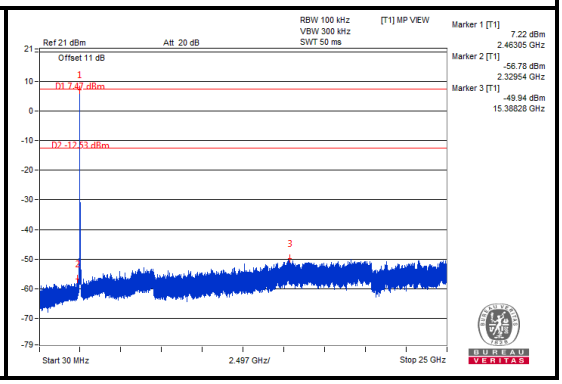
CH 6





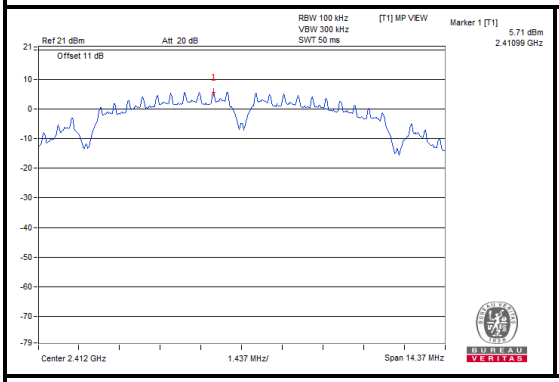
CH 11

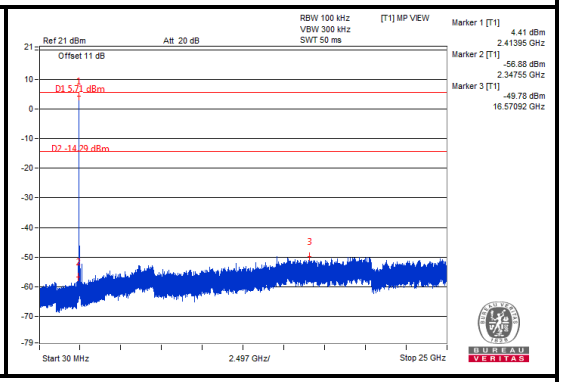




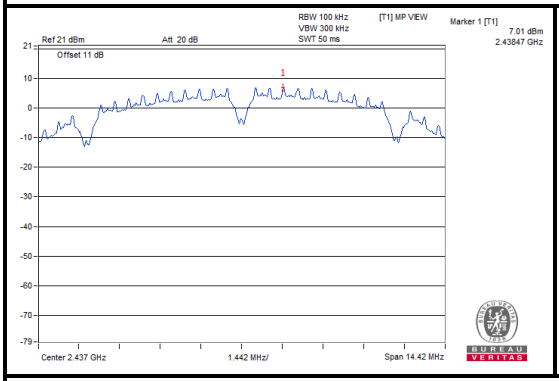
CHAIN 1

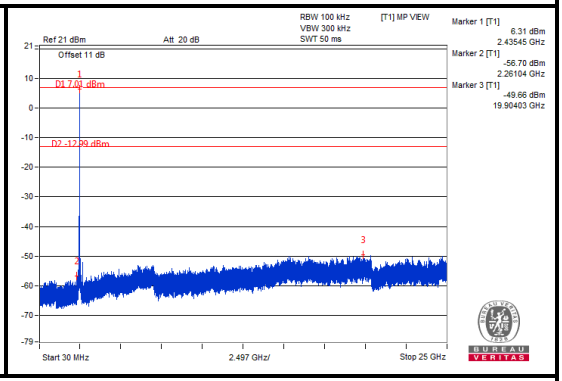
CH 1





CH 6





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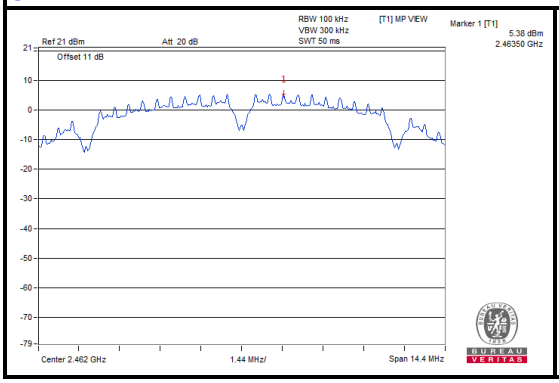
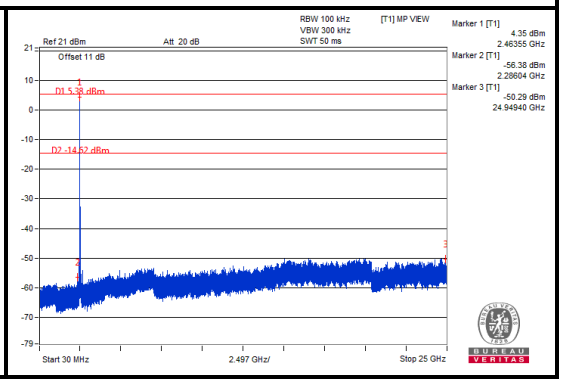
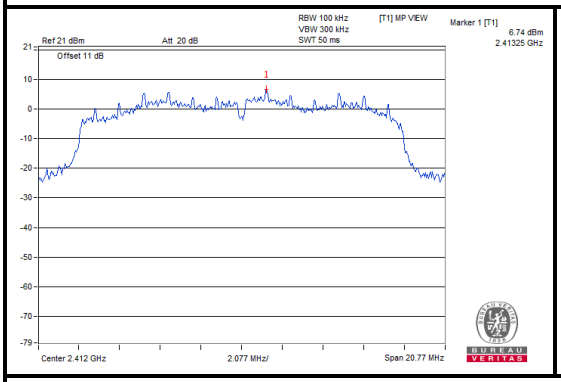


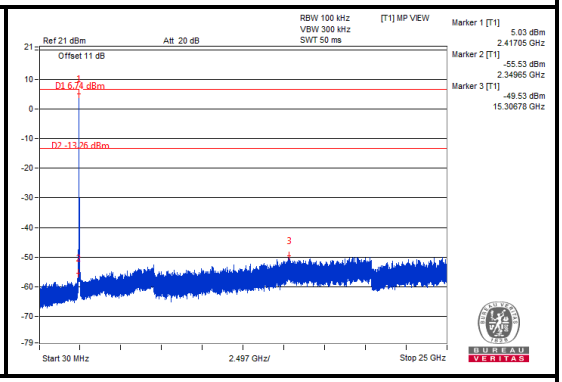


802.11g

CHAIN 0

CH 1





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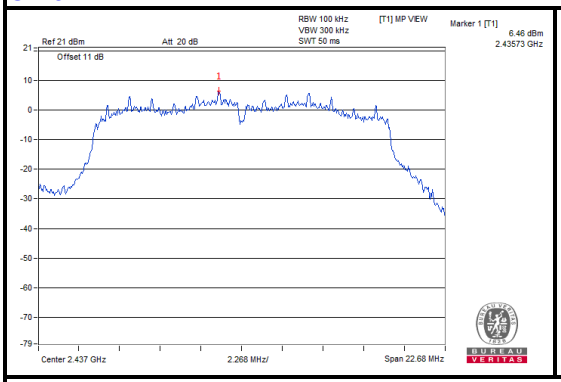

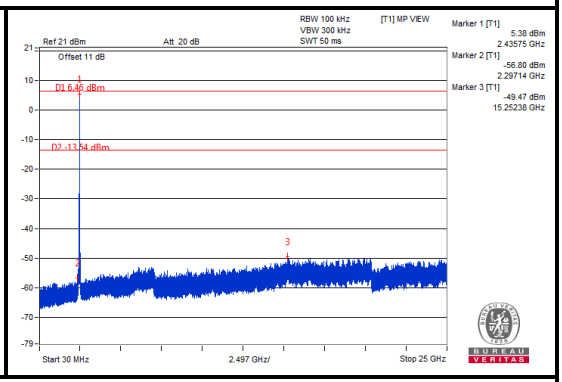

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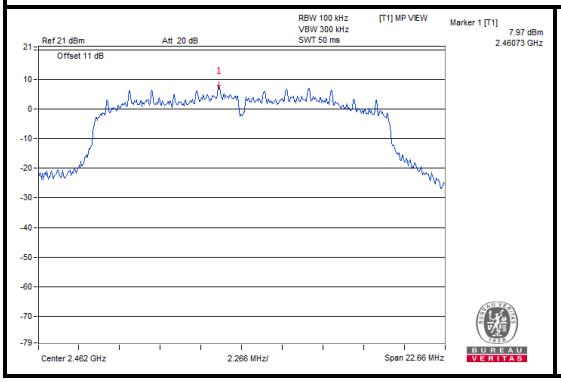
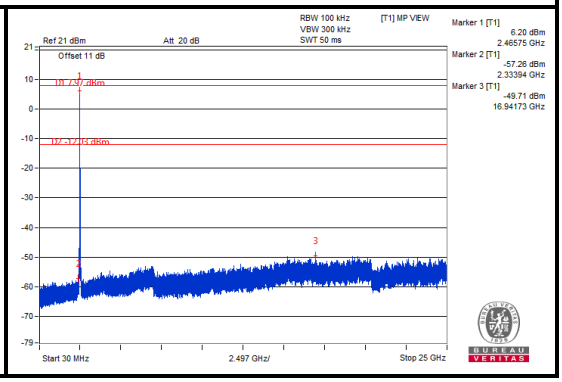
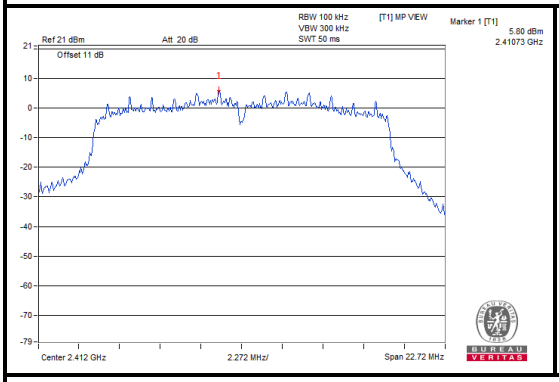
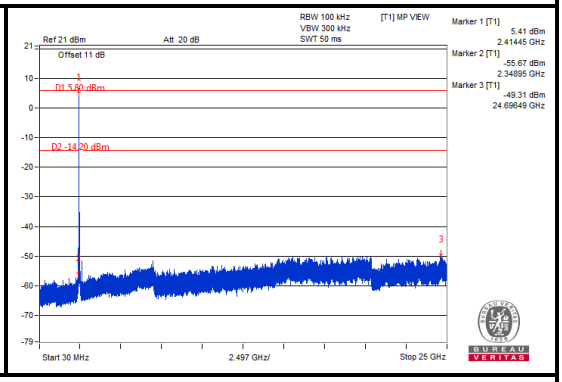




CHAIN 1

CH 1





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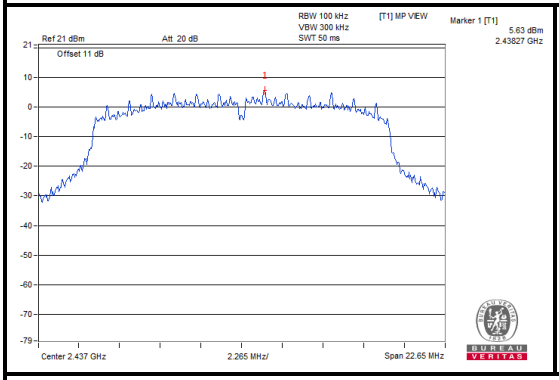

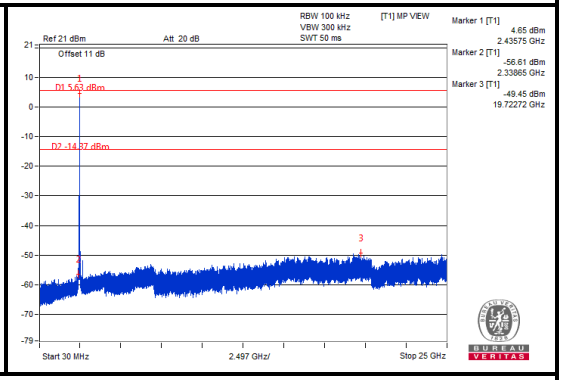

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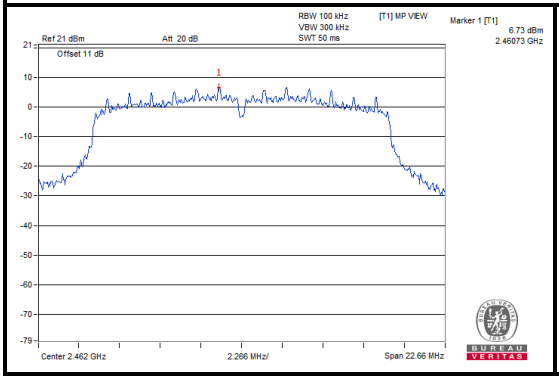

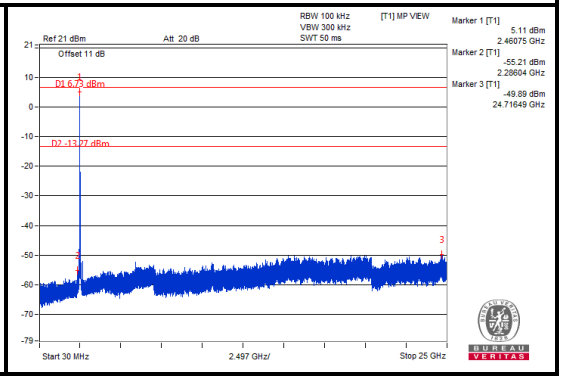

802.11n 20MHz

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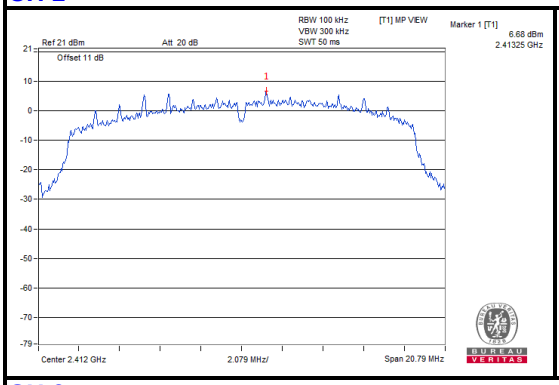
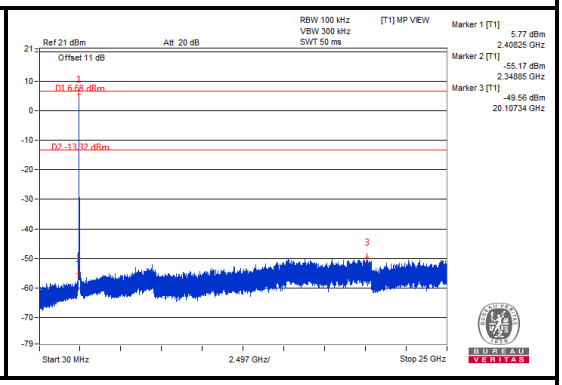
CH 1





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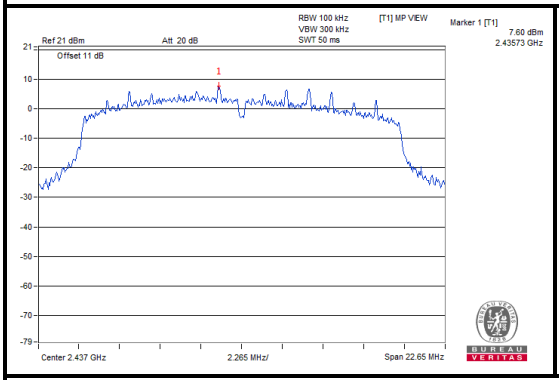

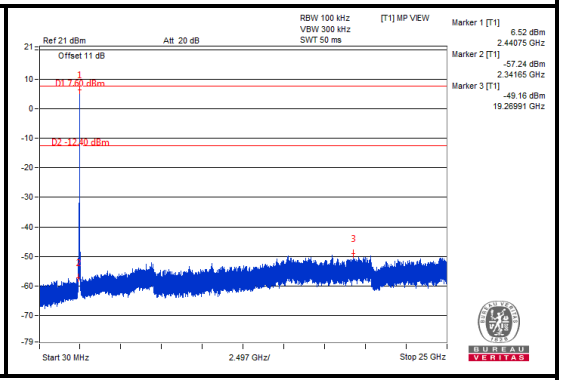

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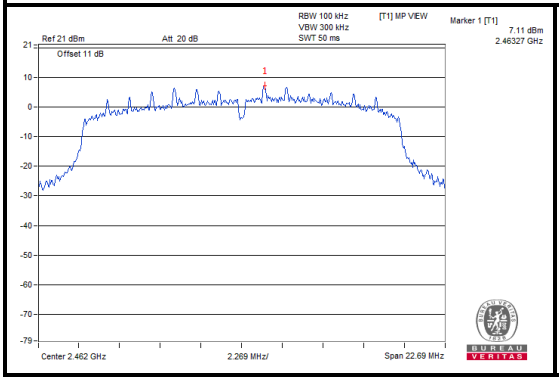
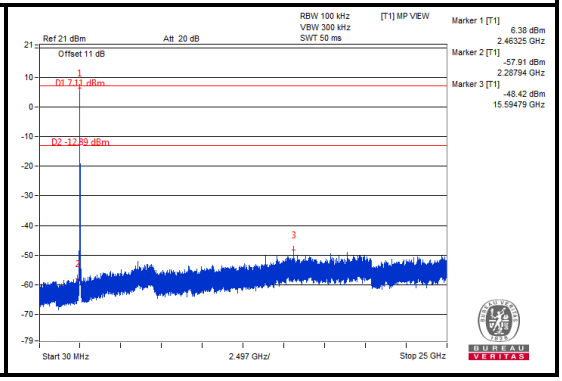
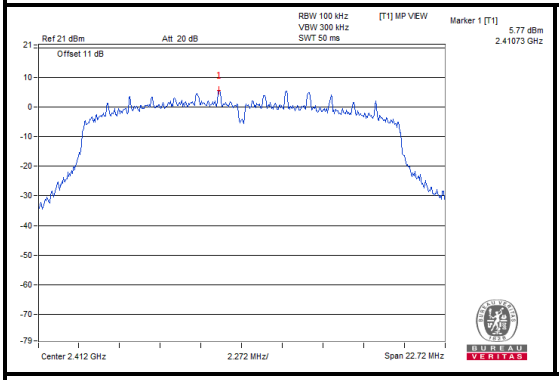
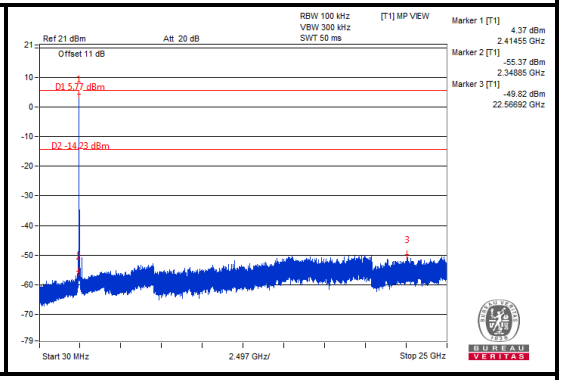




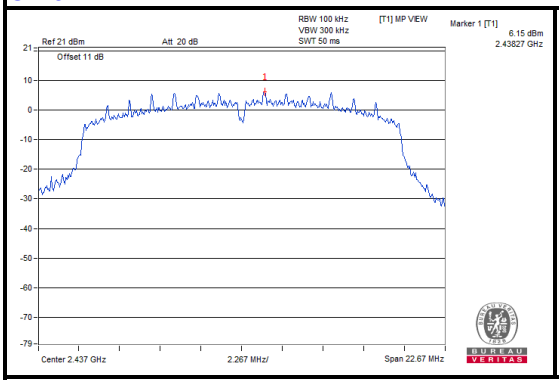
CHAIN 1

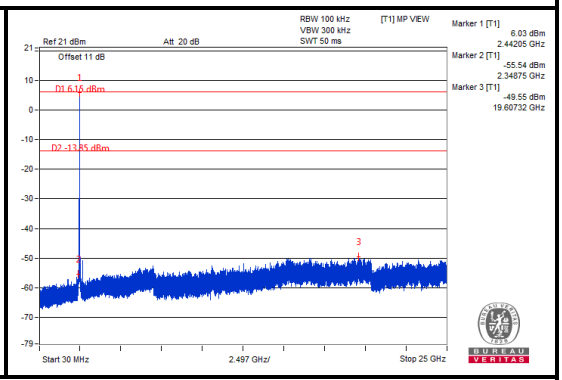
CH 1





CH 6





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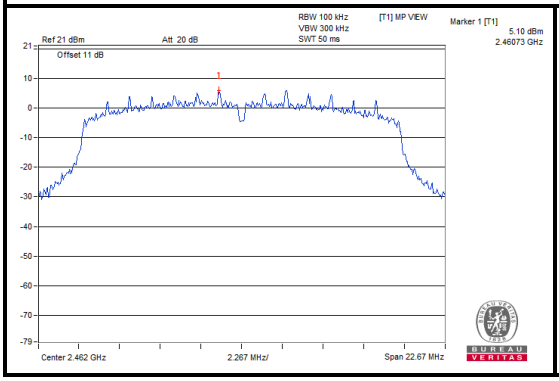

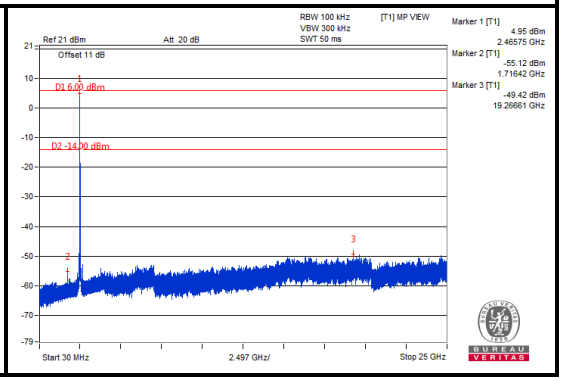

802.11n 40MHz

CHAIN 0

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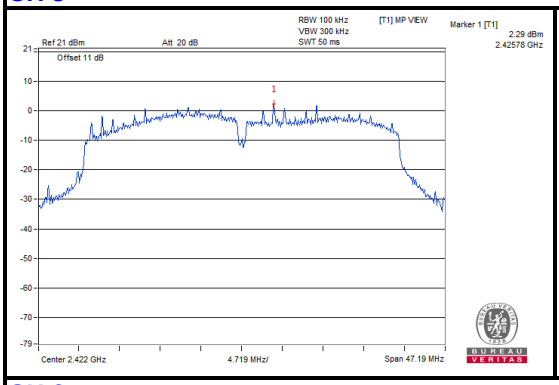
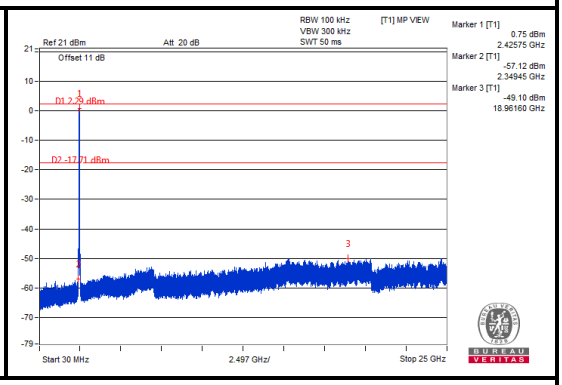
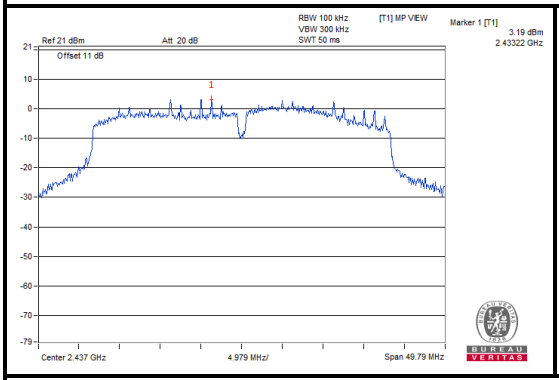
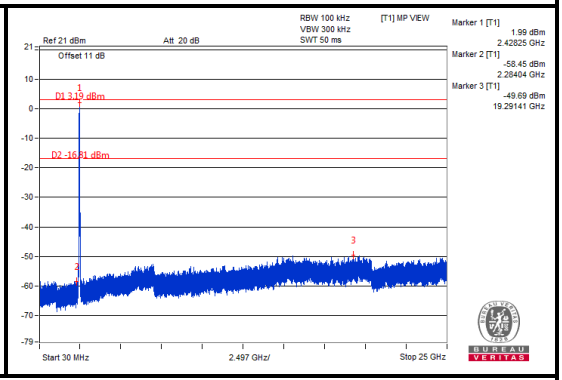




CH 6





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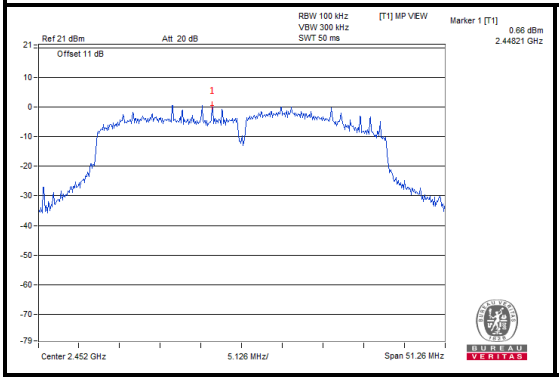
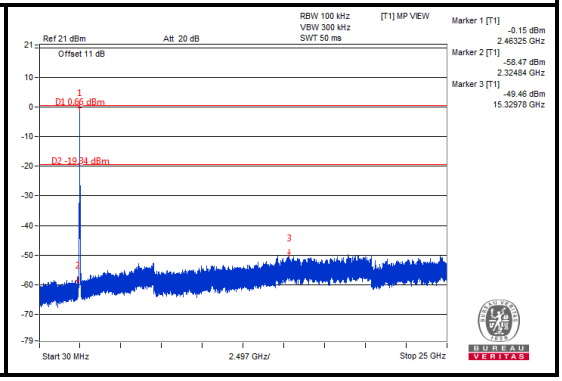
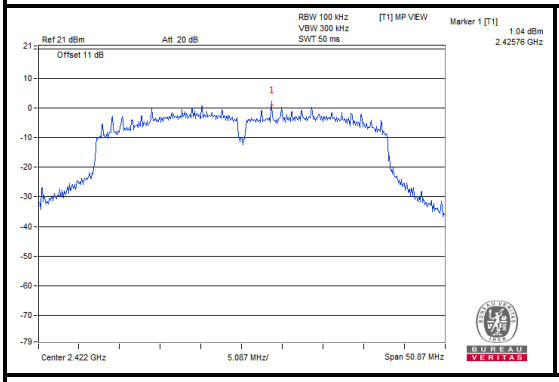
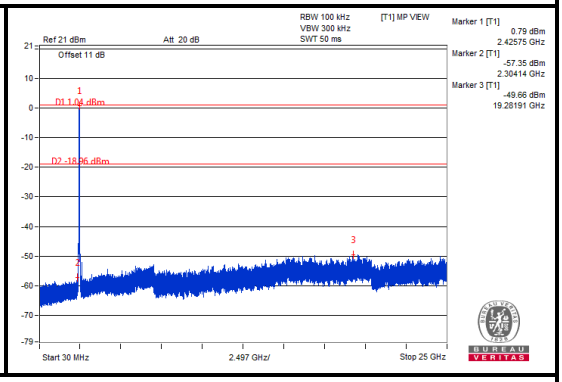




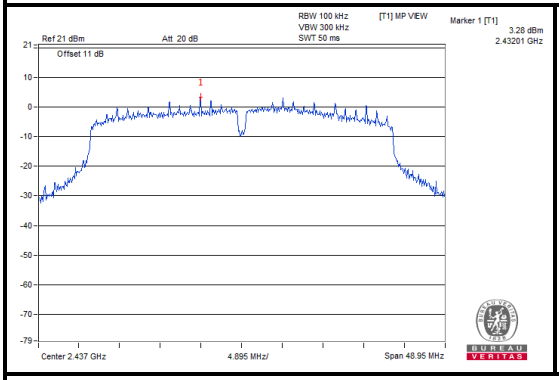
CHAIN 1

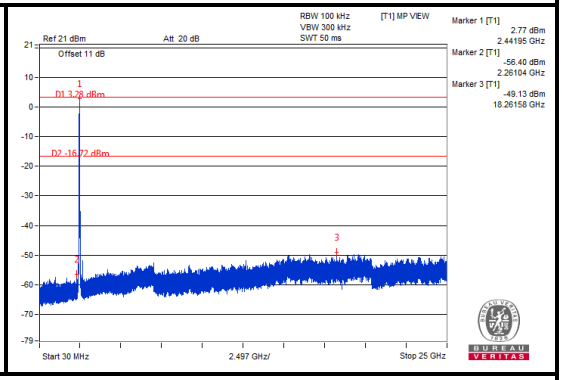
CH 3





CH 6





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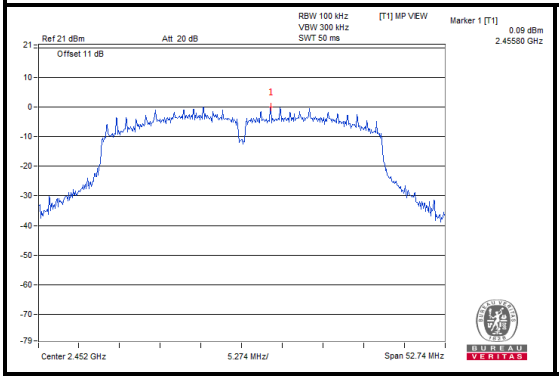
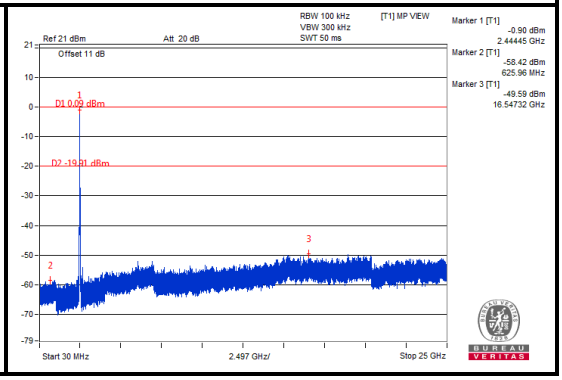
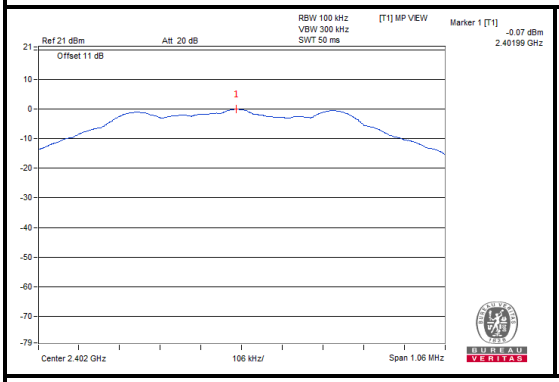


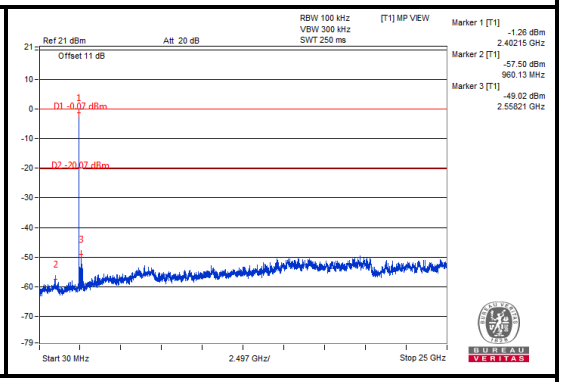


BT-LE (GFSK)

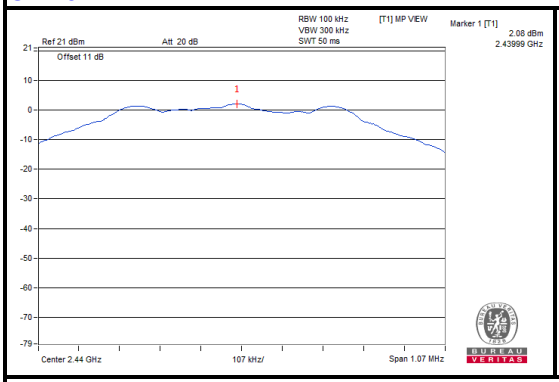
CHAIN 0

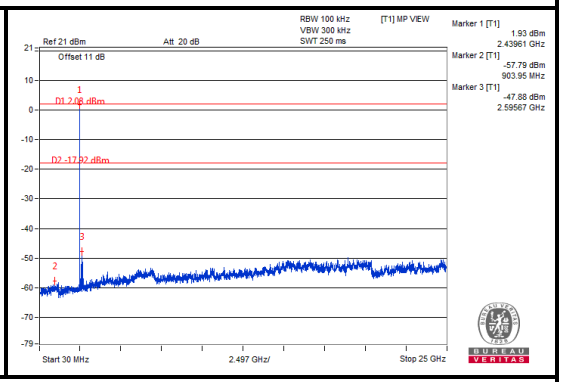
CH 0



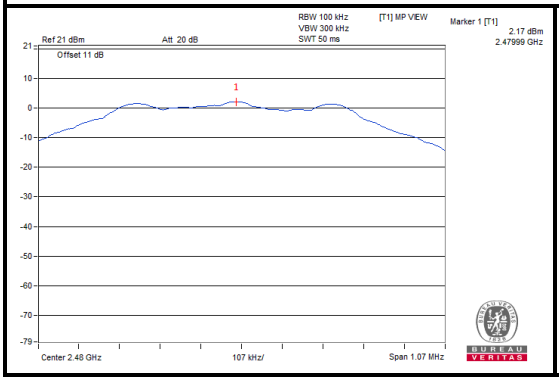


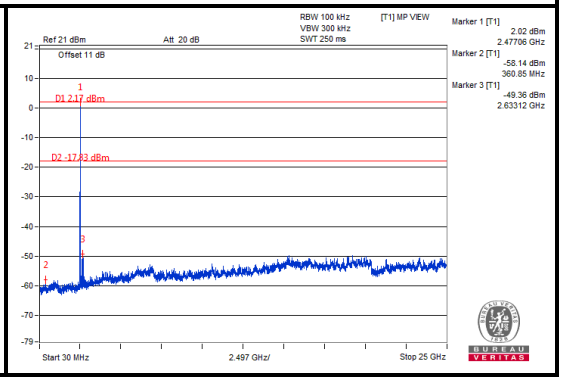
CH 19





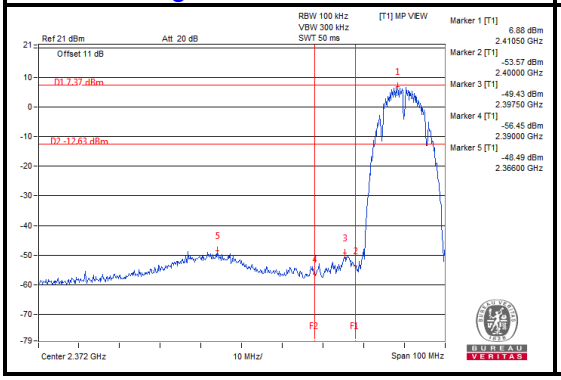
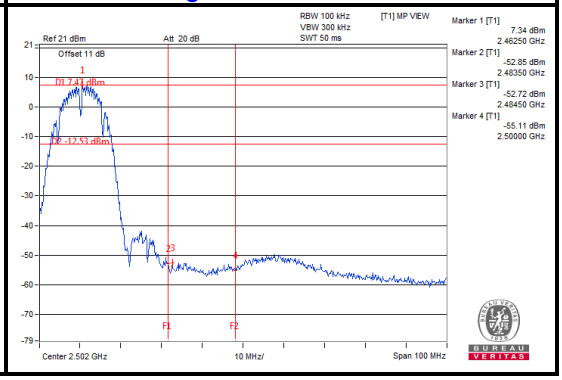
CH 39



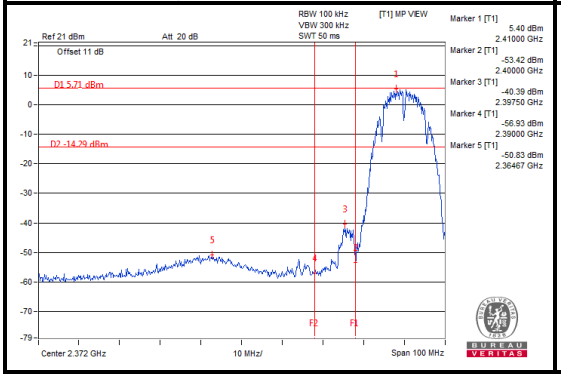
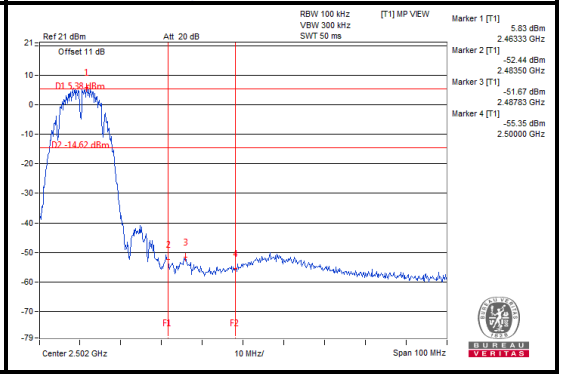


802.11b

CHAIN 0

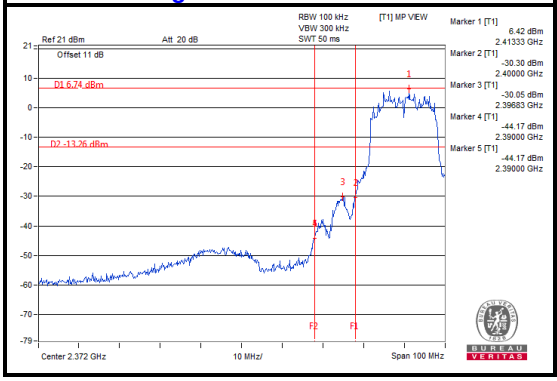
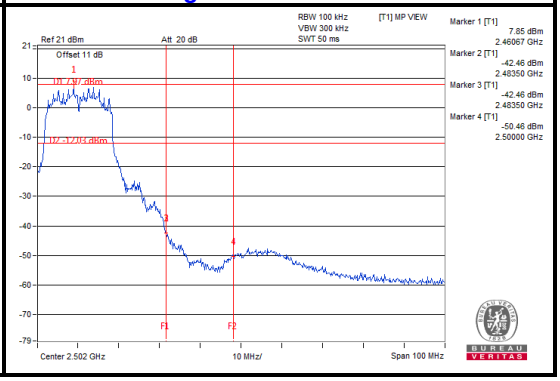
CH 1 Band edge	CH 11 Band edge
	

CHAIN 1

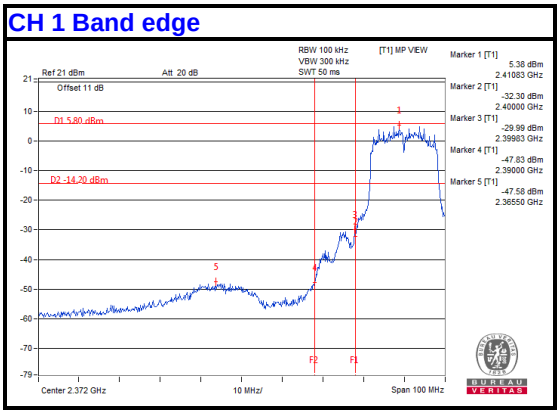
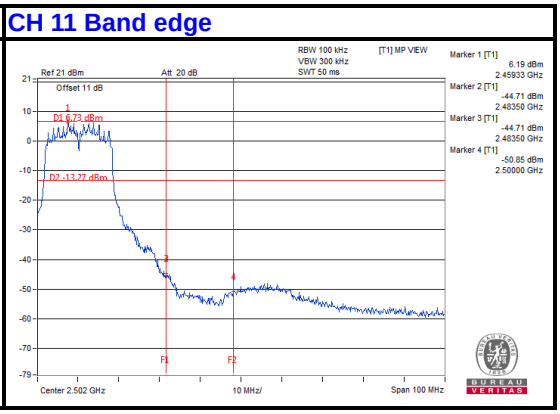
CH 1 Band edge	CH 11 Band edge
	

802.11g

CHAIN 0

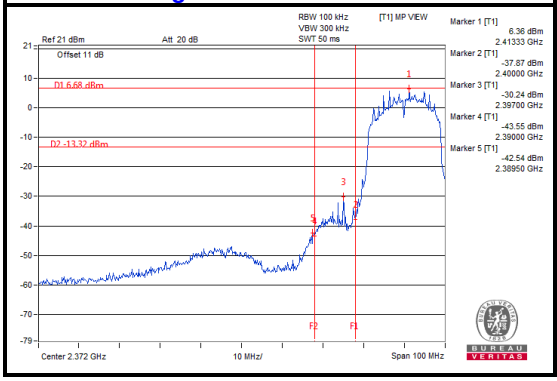
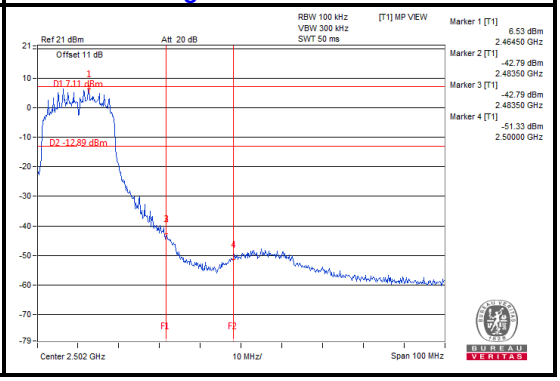
CH 1 Band edge	CH 11 Band edge
	

CHAIN 1

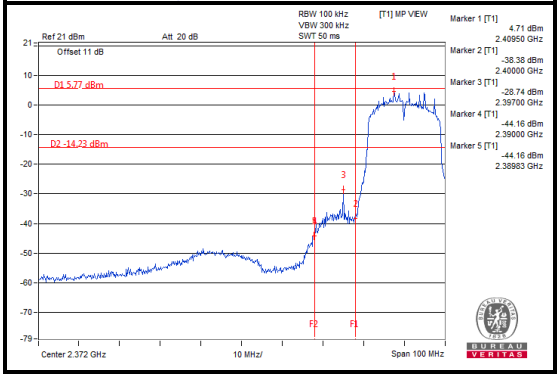
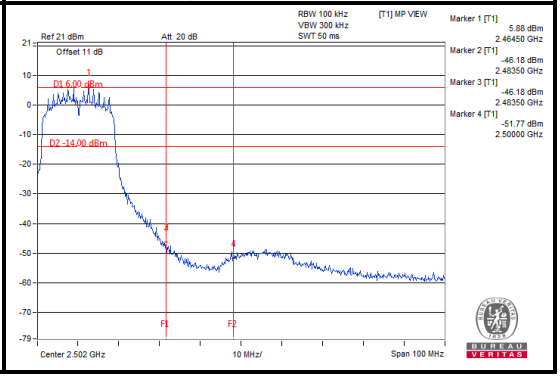
CH 1 Band edge	CH 11 Band edge
	

802.11n 20MHz

CHAIN 0

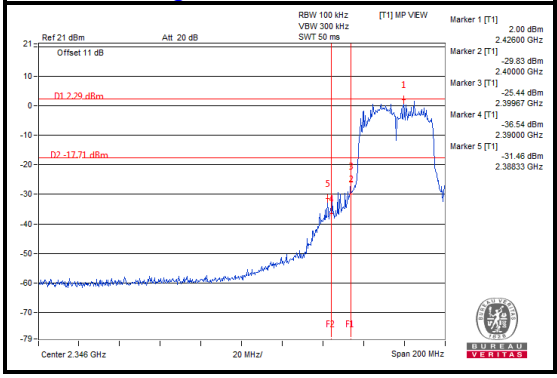
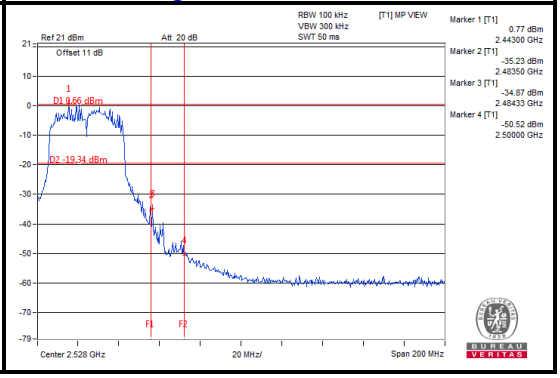
CH 1 Band edge	CH 11 Band edge
	

CHAIN 1

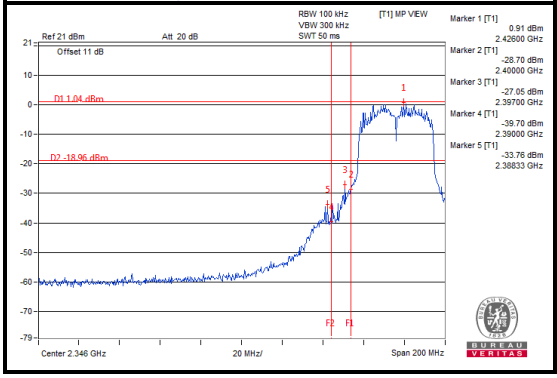
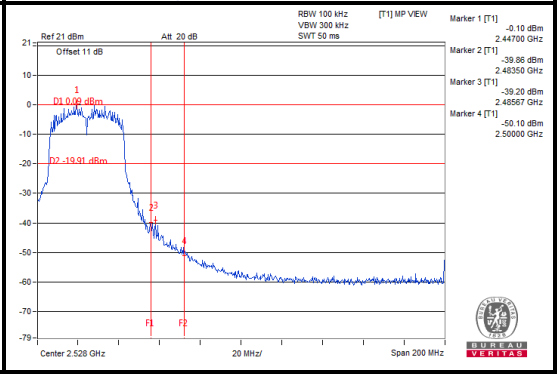
CH 1 Band edge	CH 11 Band edge
	

802.11n 40MHz

CHAIN 0

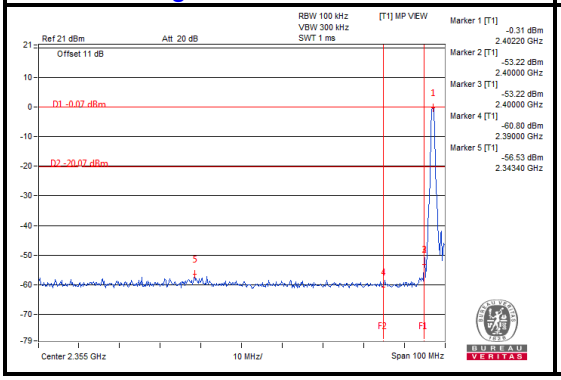
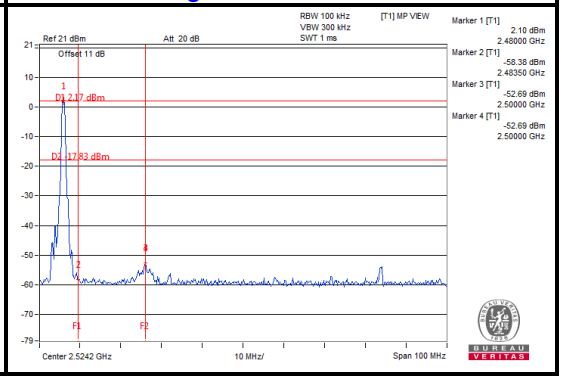
CH 3 Band edge	CH 9 Band edge
	

CHAIN 1

CH 3 Band edge	CH 9 Band edge
	

BT-LE (GFSK)

CHAIN 0

CH 0 Band edge	CH 39 Band edge
	

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---