



BUREAU
VERITAS

Test Report No.: RF181011N013-2



FCC TEST REPORT (Part 15, Subpart C)

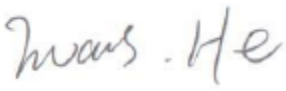
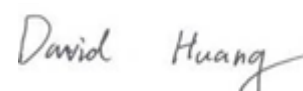
Applicant:	Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd
Address:	Building B, Boton Science Park, Chaguang Road, Xili Town, Nanshan District, Shenzhen

Manufacturer or Supplier:	Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd
Address:	Building B, Boton Science Park, Chaguang Road, Xili Town, Nanshan District, Shenzhen
Product:	Feature phone
Brand Name:	coolpad
Model Name:	Coolpad 3312A
FCC ID:	R38YL3312A
Date of tests:	Oct. 12, 2018 ~ Nov. 30, 2018

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

- FCC Part 15, Subpart C, Section 15.247
- ANSI C63.10-2013

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

Issued by Evans He Engineer / Mobile Department	Approved by David Huang Manager / Mobile Department
	
Date: Nov. 30, 2018	Date: Nov. 30, 2018

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**BUREAU
VERITAS**

Test Report No.: RF181011N013-2

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF181011N013-2	Original release	Nov. 30, 2018

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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. Minimum passing margin is -18.61dB at 0.4035MHz.
15.205 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -7.31dB at 12732MHz.
15.247(d)	Out of band Emission 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

NOTE: Test Lab Information:

Lab: Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch

Test Lab Address: Zone A, Floor 1, Building 2 Wan Ye Long Technology Park
South Side of Zhoushi Road, Bao'an District Shenzhen, Guangdong, 518108, People's Republic of China

1.1 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	3.11dB
Radiated emissions	9KHz ~ 30MHz	3.11dB
	30MHz ~ 1GMHz	5.12dB
	1GHz ~ 18GHz	5.34dB
	18GHz ~ 40GHz	5.02dB

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



2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Feature phone
BRAND NAME	coolpad
MODEL NAME	Coolpad 3312A
NOMINAL VOLTAGE	5.0Vdc (adapter or host equipment) 3.7Vdc (Li-ion, ion battery)
MODULATION TECHNOLOGY	DSSS, OFDM, DTS
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 16QAM, QPSK, BPSK for OFDM BT-LE(GFSK) for DTS
TRANSMISSION RATE	802.11b: 11/ 5.5/ 2.0 / 1.0 Mbps 802.11g: 54/ 48/ 36 / 24 / 18 / 9/ 6 Mbps 802.11n: up to 135 Mbps BT_LE: 1 Mbps
OPERATING FREQUENCY	2412-2462MHz for 11b/g/n(HT20) 2402-2480MHz for BT-LE(GFSK)
MAX. OUTPUT POWER	WLAN: 289.068mW (Maximum) BT-LE: 1.186mW (Maximum)
ANTENNA TYPE	FPC Antenna with 2.9dBi gain
HW VERSION	P1
SW VERSION	3312A.SPRINT.181214.0D
I/O PORTS	Refer to user's manual
CABLE SUPPLIED	USB cable: non-shielded, detachable, 1.0m Earphone cable: non-shielded, detachable, 1.2m

NOTE:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. For the test results, the EUT had been tested with all conditions, but only the worst case was shown in test report.
3. Please refer to the EUT photo document (Reference No.: 181011N013) for detailed product photo.



MODULATION MODE	TX/RX FUNCTION
802.11b	1TX /1RX
802.11g	1TX /1RX
802.11n (20MHz)	1TX /1RX
802.11n (40MHz)	1TX /1RX
BT_LE	1TX /1RX

4. The EUT was powered by the following adapter:

ADAPTER	
BRAND:	N/A
MODEL:	RD0501000-USBA-18MG
INPUT:	AC 100-240V~50/60Hz, 0.25A MAX
OUTPUT:	DC 5V,1000mA

5. The EUT matched the following USB cable:

USB CABLE	
BRAND:	N/A
MODEL:	N/A
SIGNAL LINE:	1.0 METER

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



2.2 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		

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



2.2.1 CONFIGURATION OF SYSTEM UNDER TEST

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

2.2.2 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 Y 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 adapter 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

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

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 and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11n HT20	1 to 11	1, 6, 11	OFDM	BPSK	6.5
BT-LE	0 to 39	39	DTS	GFSK	1



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 and antenna ports (if EUT with antenna diversity architecture).

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

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

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.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11n HT20	1 to 11	1, 6, 11	OFDM	BPSK	6.5

BANDEDGE MEASUREMENT:

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

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 11	CCK	DBPSK	1.0
802.11g	1 to 11	1, 11	OFDM	BPSK	6.0
802.11n HT20	1 to 11	1, 11	OFDM	BPSK	6.5
BT-LE	0 to 39	0, 39	DTS	GFSK	1



ANTENNA PORT CONDUCTED MEASUREMENT:

- This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 11	CCK	DBPSK	1.0
802.11g	1 to 11	1, 11	OFDM	BPSK	6.0
802.11n HT20	1 to 11	1, 11	OFDM	BPSK	6.5
BT-LE	0 to 39	0, 39	DTS	GFSK	1

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	TEST VOLTAGE	TESTED BY
RE<1G	25deg. C, 58%RH	DC 5V from adaptor	Evans He
RE≥1G	25deg. C, 58%RH	DC 5V from adaptor	Evans He
PLC	23deg. C, 57%RH	DC 5V from adaptor	Aaron Liang
APCM	24deg. C, 60%RH	DC 3.7V from battery	Aaron Liang



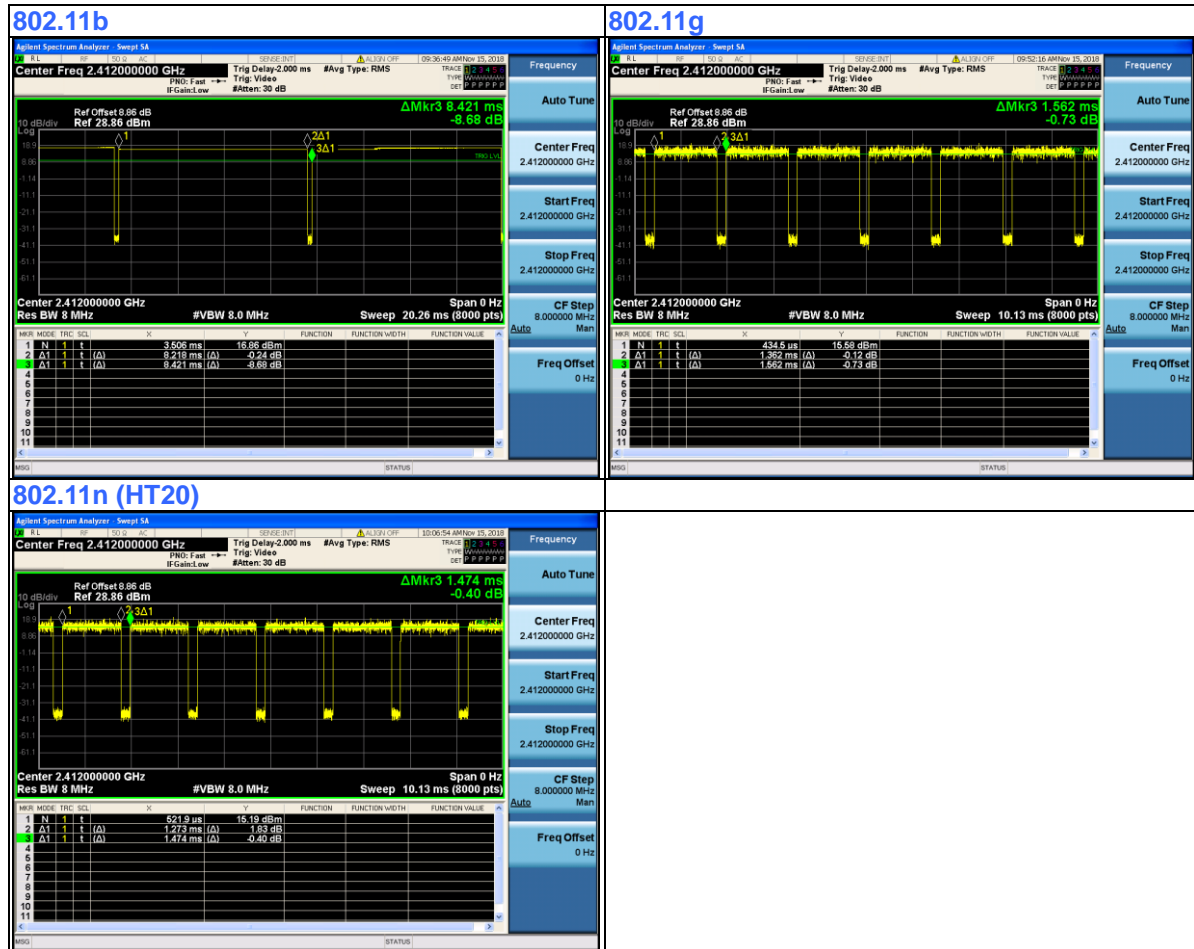
2.3 Duty Cycle of Test Signal

WIFI 2.4GHZ

802.11b: Duty cycle = 8.218/8.421 = 0.98 = 98%, Duty factor = 10 * log(1/0.98) = 0.088

802.11g: Duty cycle = 1.362/1.562 = 0.87 < 98%, Duty factor = 10 * log(1/0.87) = 0.605

802.11n (HT20): Duty cycle = 1.273/1.474 = 0.86 < 98%, Duty factor = 10 * log(1/0.86) = 0.655





2.4 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 v04

ANSI C63.10-2013

Note:

1. All test items have been performed and recorded as per the above standards.
2. The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (Certification). The test report has been issued separately.

2.5 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	Laptop	Lenovo	E40	LR-1EHRX	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	DC Line: Unshielded, Detachable 2.0m
2	AC Line: Unshielded, Detachable 1.2m



3 TEST TYPES AND RESULTS

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 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.

3.1.2 TEST INSTRUMENTS

Instrument	Model	Serial #	Cal Date	Cal Due
EMI test receiver	ESCS30	8471241027	Jan. 05, 18	Jan. 04, 19
Line Impedance Stabilization Network	LI-125A	191106	Dec. 08, 17	Dec. 07, 18
Line Impedance Stabilization Network	LI-125A	191106	Dec. 07, 18	Dec. 06, 19
Line Impedance Stabilization Network	LI-125A	191107	Dec. 08, 17	Dec. 07, 18
Line Impedance Stabilization Network	LI-125A	191107	Dec. 07, 18	Dec. 06, 19
Test Software	EZ-EMC	ver.lcp-03A1	N/A	N/A

- NOTE:**
1. The test was performed in CE shielded 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.



3.1.3 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) was not recorded.

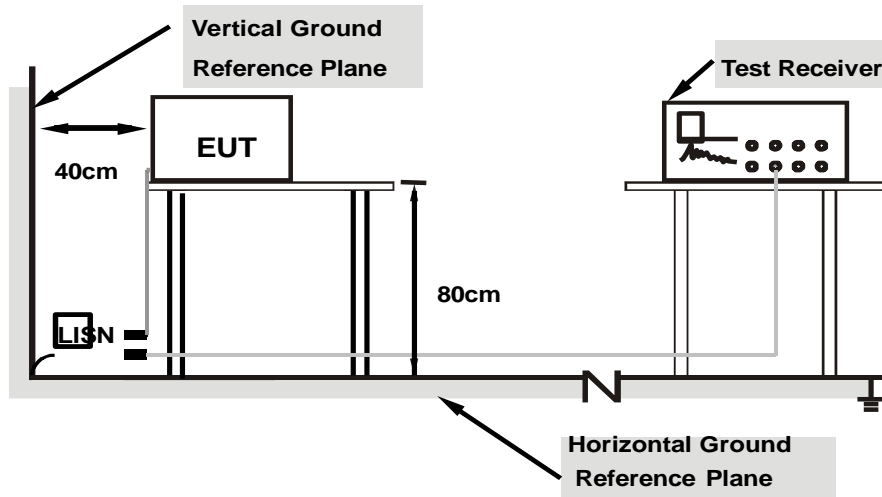
NOTE: All modes of operation were investigated and the worst-case emissions are reported.

3.1.4 DEVIATION FROM TEST STANDARD

No deviation.



3.1.5 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).

3.1.6 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.



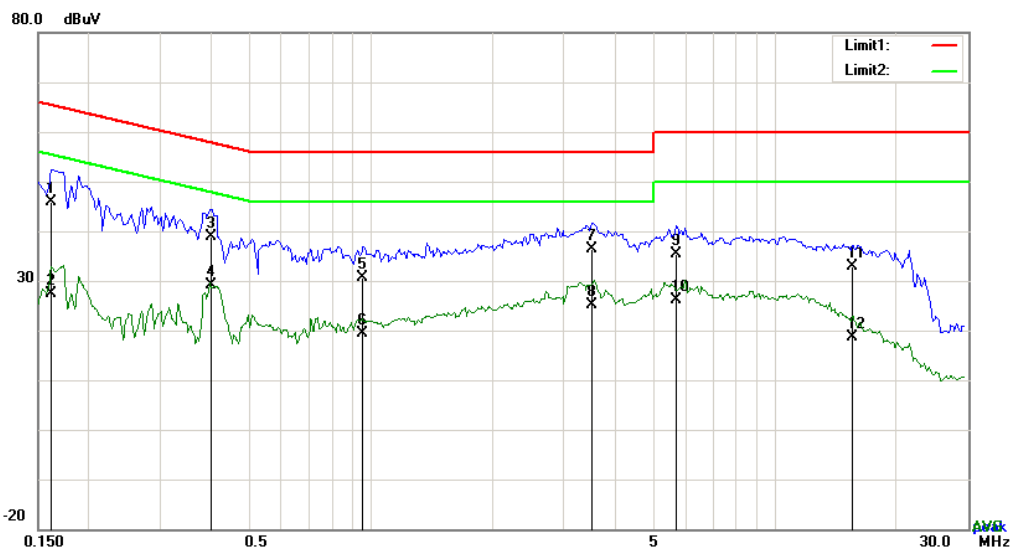
3.1.7 TEST RESULTS

CONDUCTED WORST-CASE DATA:

Frequency Range	150KHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	120Vac, 60Hz	Environmental Conditions	26deg. C, 57RH
Tested By	Evans He	TEST DATE	2018/10/27

No.	P/L	Frequency (MHz)	Reading (dBuV)	Detector	Corrected (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)
1	L1	0.1617	35.85	QP	10.03	45.88	65.38	-19.50
2	L1	0.1617	17.27	AVG	10.03	27.30	55.38	-28.08
3	L1	0.4035	28.97	QP	10.03	39.00	57.78	-18.78
4	L1	0.4035	19.14	AVG	10.03	29.17	47.78	-18.61
5	L1	0.9573	20.72	QP	10.03	30.75	56.00	-25.25
6	L1	0.9573	9.43	AVG	10.03	19.46	46.00	-26.54
7	L1	3.5148	26.37	QP	10.06	36.43	56.00	-19.57
8	L1	3.5148	14.97	AVG	10.06	25.03	46.00	-20.97
9	L1	5.7105	25.31	QP	10.09	35.40	60.00	-24.60
10	L1	5.7105	16.07	AVG	10.09	26.16	50.00	-23.84
11	L1	15.5502	22.59	QP	10.23	32.82	60.00	-27.18
12	L1	15.5502	8.43	AVG	10.23	18.66	50.00	-31.34

- 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.

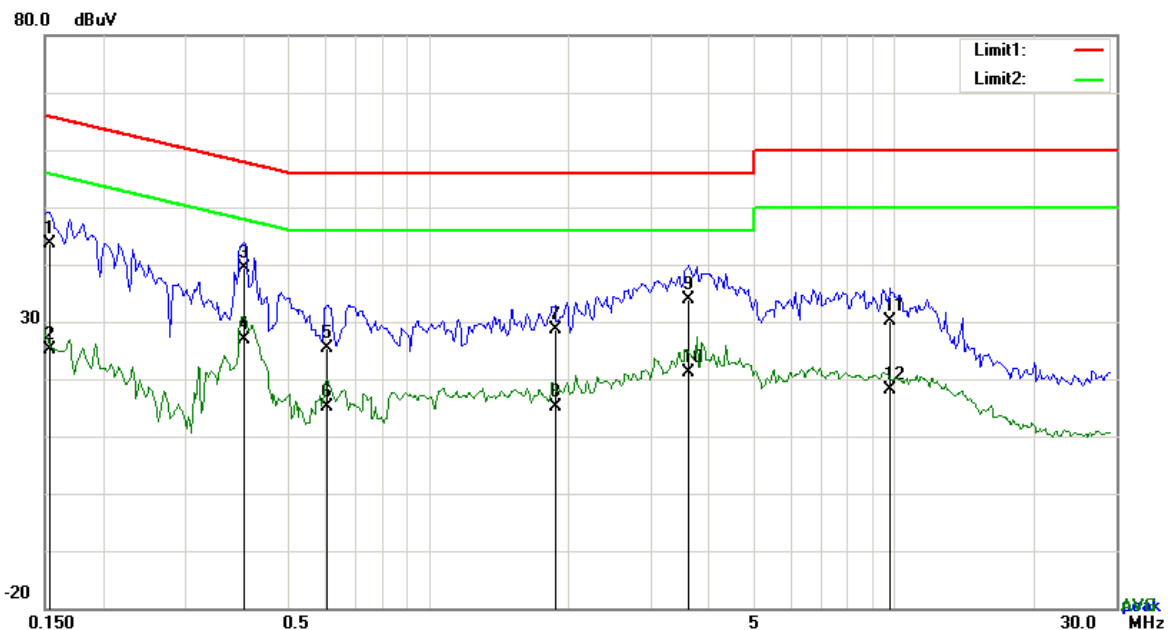




Frequency Range	150KHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	120Vac, 60Hz	Environmental Conditions	26deg. C, 57RH
Tested By	Evans He	TEST DATE	2018/10/27

No.	P/L	Frequency (MHz)	Reading (dBuV)	Detector	Corrected (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)
1	N	0.1539	33.63	QP	10.02	43.65	65.79	-22.14
2	N	0.1539	15.06	AVG	10.02	25.08	55.79	-30.71
3	N	0.4035	29.27	QP	10.02	39.29	57.78	-18.49
4	N	0.4035	16.91	AVG	10.02	26.93	47.78	-20.85
5	N	0.6063	15.40	QP	10.02	25.42	56.00	-30.58
6	N	0.6063	5.13	AVG	10.02	15.15	46.00	-30.85
7	N	1.8777	18.51	QP	10.04	28.55	56.00	-27.45
8	N	1.8777	5.14	AVG	10.04	15.18	46.00	-30.82
9	N	3.6240	23.71	QP	10.06	33.77	56.00	-22.23
10	N	3.6240	11.00	AVG	10.06	21.06	46.00	-24.94
11	N	9.7626	19.87	QP	10.14	30.01	60.00	-29.99
12	N	9.7626	7.87	AVG	10.14	18.01	50.00	-31.99

- 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.





3.2 RADIATED EMISSION MEASUREMENT

3.2.1 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.



3.2.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESL6	1300.5001K06-1 00262-eQ	Jan. 05, 18	Jan. 04, 19
Bilog Antenna	Sunol Sciences	JB6	A110712	Feb. 08, 18	Feb. 07, 19
Signal Amplifier	HP	8447E	443008	Jan. 25,18	Jan. 24,19
3m Semi-anechoic Chamber	SAEMC	9m*6m*6m	N/A	Oct. 18,18	Oct. 17,19
MXA signal analyzer	Agilent	N9020A	MY49100060	Jan. 05, 18	Jan. 04, 19
Horn Antenna	COM-POWER	HAH-118	71259	Jan. 26,18	Jan. 25,19
Horn Antenna	COM-POWER	HAH-118	71283	Feb. 02, 18	Feb. 01, 19
AMPLIFIER	EM Electornic Corporation	EM01G26G	60613	Jan. 25,18	Jan. 24,19
AMPLIFIER	Emc Instruments Corporation	Emc012645	980077	Jan. 05, 18	Jan. 04, 19
Test Software	EZ-EMC	ICP-03A1	N/A	N/A	N/A

- NOTE:**
1. The calibration interval of the above test instruments is 12 months or 24 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
 2. The test was performed in 3m Chamber.
 3. The FCC Site Registration No. is 535293.



3.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters (for below 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. 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 (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average (Duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor ($10 \log(1/\text{duty cycle})$).
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (Duty cycle \geq 98%) for Average detection (AV) at frequency above 1GHz.
5. All modes of operation were investigated and the worst-case emissions are reported.

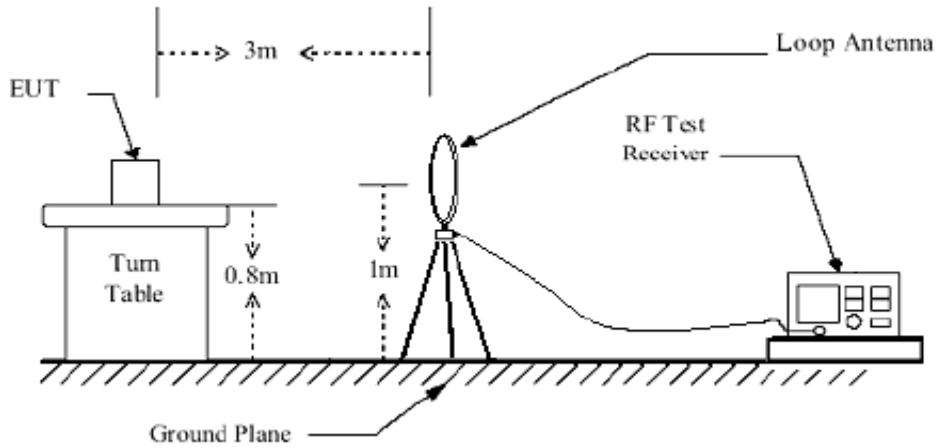
3.2.4 DEVIATION FROM TEST STANDARD

No deviation

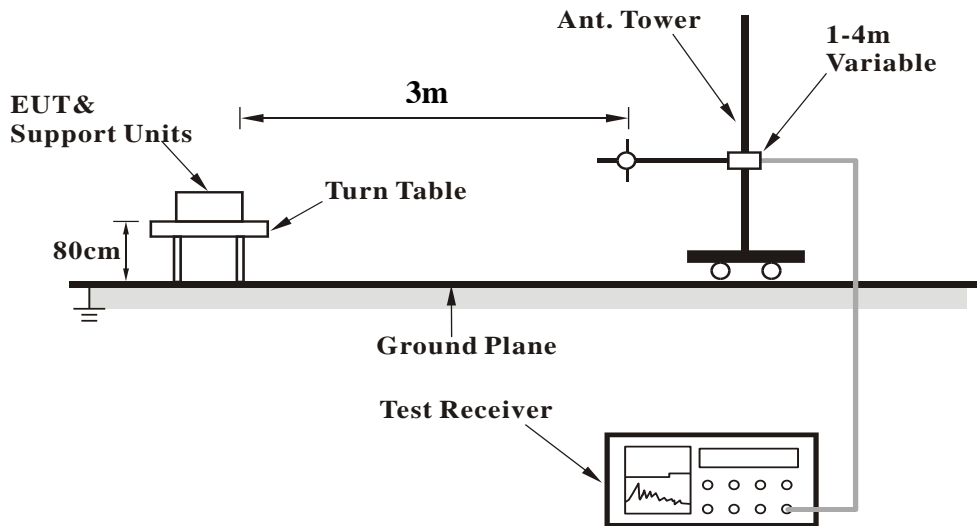


3.2.5 TEST SETUP

< Frequency Range below 30MHz >

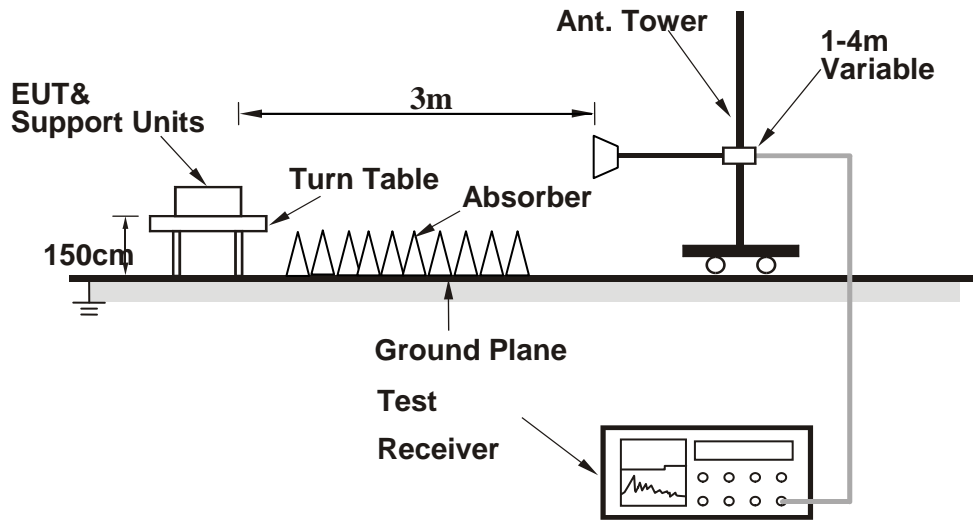


< Frequency Range 30MHz~1GHz >





<Frequency Range above 1GHz>



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

3.2.6 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.



3.2.7 TEST RESULTS

BELOW 1GHz WORST-CASE DATA:

9 KHz – 30 KHz data: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required in the report.

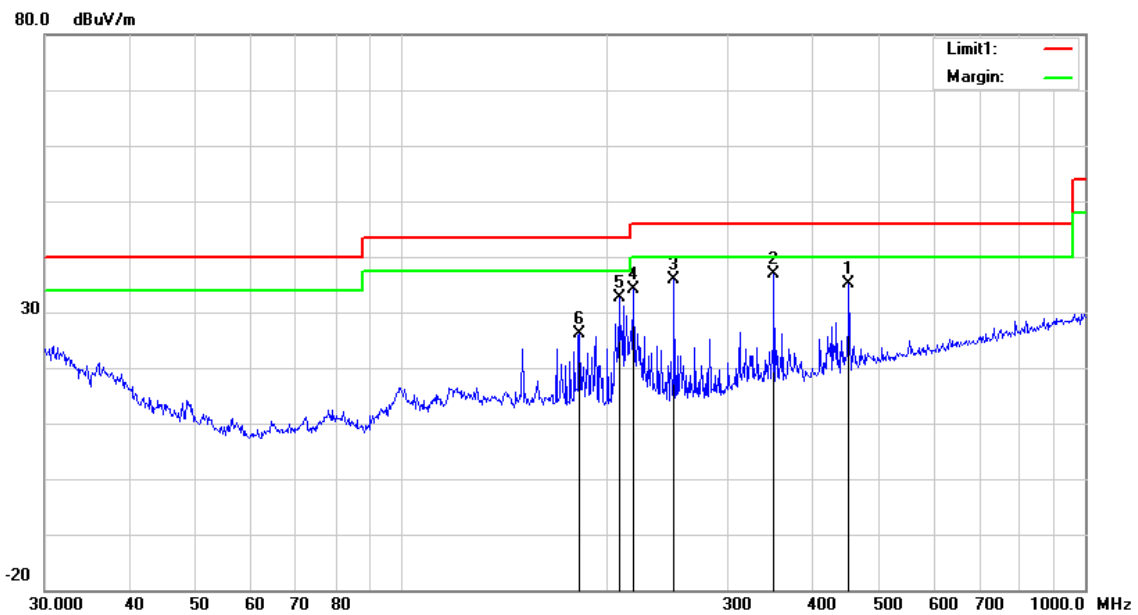
30 MHz – 1GHz data:
802.11g

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
No.	Frequency (MHz)	Reading (dBuV/m)	Ant_F (dB/m)	PA_G (dB)	Cab_L (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)
1	451.1350	38.20	16.72	21.91	2.14	35.15	46.00	-10.85	200	234
2	350.4768	42.23	14.66	22.15	2.04	36.78	46.00	-9.22	100	172
3	250.3012	45.11	11.41	22.29	1.70	35.93	46.00	-10.07	200	38
4	218.3085	43.05	11.84	22.35	1.60	34.14	46.00	-11.86	100	280
5	207.8501	41.53	11.99	22.37	1.57	32.72	43.50	-10.78	100	65
6	181.9202	35.79	11.11	22.26	1.39	26.03	43.50	-17.47	100	302

REMARKS:

- Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
Margin value = Emission level – Limit value.



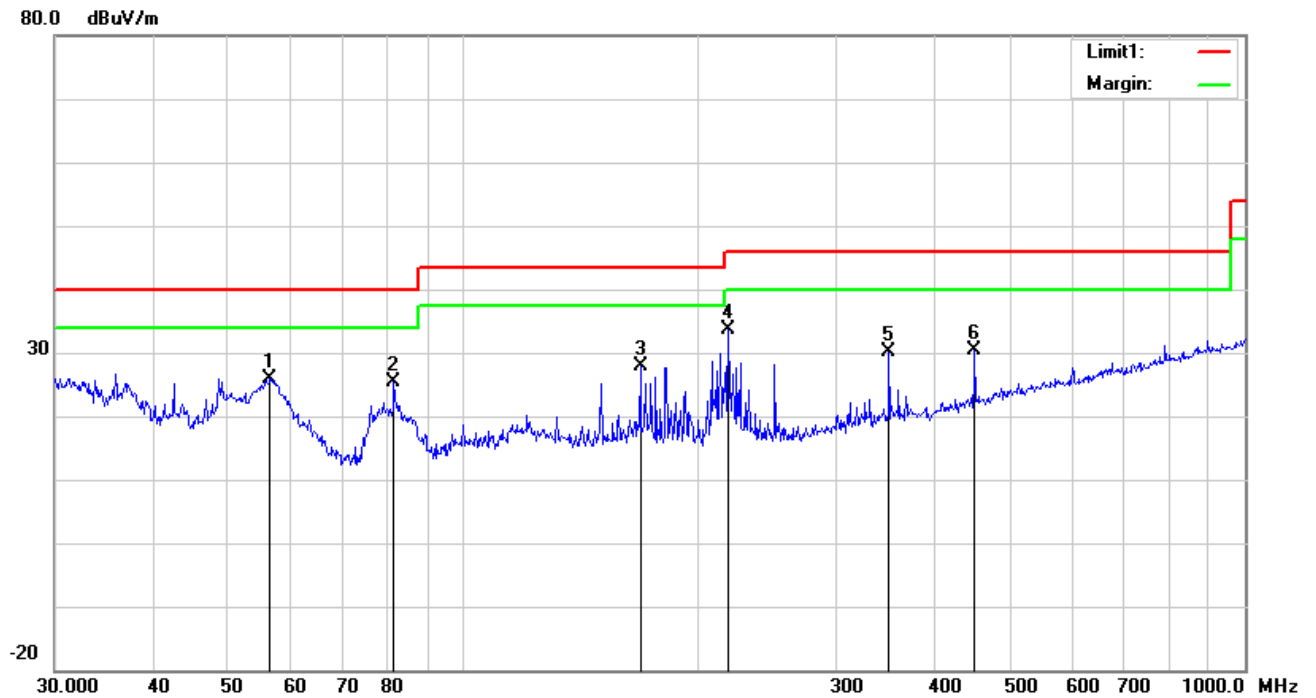


CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
No.	Frequency (MHz)	Reading (dBuV/m)	Ant_F (dB/m)	PA_G (dB)	Cab_L (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)
1	56.5929	39.87	7.67	22.40	0.77	25.91	40.00	-14.09	100	27
2	81.4970	39.07	7.66	22.41	1.06	25.38	40.00	-14.62	100	20
3	168.4138	36.91	11.93	22.26	1.36	27.94	43.50	-15.56	200	28
4	218.3085	42.60	11.84	22.35	1.60	33.69	46.00	-12.31	100	287
5	350.4768	35.47	14.66	22.15	2.04	30.02	46.00	-15.98	100	82
6	451.1350	33.48	16.72	21.91	2.14	30.43	46.00	-15.57	100	145

REMARKS:

- 1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
Margin value = Emission level – Limit value.





ABOVE 1GHz WORST-CASE DATA:

Note: For higher frequency, the emission is too low to be detected.

802.11g

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

Frequency (MHz)	S.A. Reading (dBµV)	Detector (PK/AV)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
4824	48.45	AV	V	33.21	7.28	48.41	40.53	54	-13.47
4824	48.77	AV	H	33.21	7.28	48.41	40.85	54	-13.15
4824	61.19	PK	V	33.21	7.28	48.41	53.27	74	-20.73
4824	62.11	PK	H	33.21	7.28	48.41	54.19	74	-19.81
11682	30.31	AV	V	40.4	12.04	46.46	36.29	54	-17.71
11682	28.7	AV	H	40.4	12.04	46.46	34.68	54	-19.32
11682	48.37	PK	V	40.4	12.04	46.46	54.35	74	-19.65
11682	49.54	PK	H	40.4	12.04	46.46	55.52	74	-18.48
2390	55.64	AV	V	30	4.94	47.09	43.49	54	-10.51
2390	55.76	AV	H	30	4.94	47.09	43.61	54	-10.39
2390	67.74	PK	V	30	4.94	47.09	55.59	74	-18.41
2390	74.03	PK	H	30	4.94	47.09	61.88	74	-12.12

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
Margin value = Emission level – Limit value.
2. 2412MHz: Fundamental frequency.



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

Frequency (MHz)	S.A. Reading (dBµV)	Detector (PK/AV)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
4874	50.32	AV	V	33.18	7.52	48.54	42.48	54	-11.52
4874	50.1	AV	H	33.18	7.52	48.54	42.26	54	-11.74
4874	62.68	PK	V	33.18	7.52	48.54	54.84	74	-19.16
4874	61.69	PK	H	33.18	7.52	48.54	53.85	74	-20.15
10687	39.41	AV	V	40.15	12.37	47.15	44.78	54	-9.22
10687	38.22	AV	H	40.15	12.37	47.15	43.59	54	-10.41
10687	60.28	PK	V	40.15	12.37	47.15	65.65	74	-8.35
10687	50.65	PK	H	40.15	12.37	47.15	56.02	74	-17.98

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
Margin value = Emission level – Limit value.
2. 2437MHz: Fundamental frequency.



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

Frequency (MHz)	S.A. Reading (dBµV)	Detector (PK/AV)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
4924	51.42	AV	V	33.74	7.78	48.34	44.6	54	-9.4
4924	47.62	AV	H	33.74	7.78	48.34	40.8	54	-13.2
4924	65.28	PK	V	33.74	7.78	48.34	58.46	74	-15.54
4924	62.16	PK	H	33.74	7.78	48.34	55.34	74	-18.66
17950	21.66	AV	V	43.45	19.01	45.1	39.02	54	-14.98
17950	22.99	AV	H	43.45	19.01	45.1	40.35	54	-13.65
17950	37.81	PK	V	43.45	19.01	45.1	55.17	74	-18.83
17950	45.05	PK	H	43.45	19.01	45.1	62.41	74	-11.59
2483.5	52.64	AV	V	29.98	5.83	47.51	40.94	54	-13.06
2483.5	57.57	AV	H	29.98	5.83	47.51	45.87	54	-8.13
2483.5	72.65	PK	V	29.98	5.83	47.51	60.95	74	-13.05
2483.5	72.54	PK	H	29.98	5.83	47.51	60.84	74	-13.16

REMARKS:

- Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
Margin value = Emission level – Limit value.
- 2462MHz: Fundamental frequency.



BELOW 1GHz WORST-CASE DATA:

9 KHz – 30 KHz data: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required in the report.

30 MHz – 1GHz data:

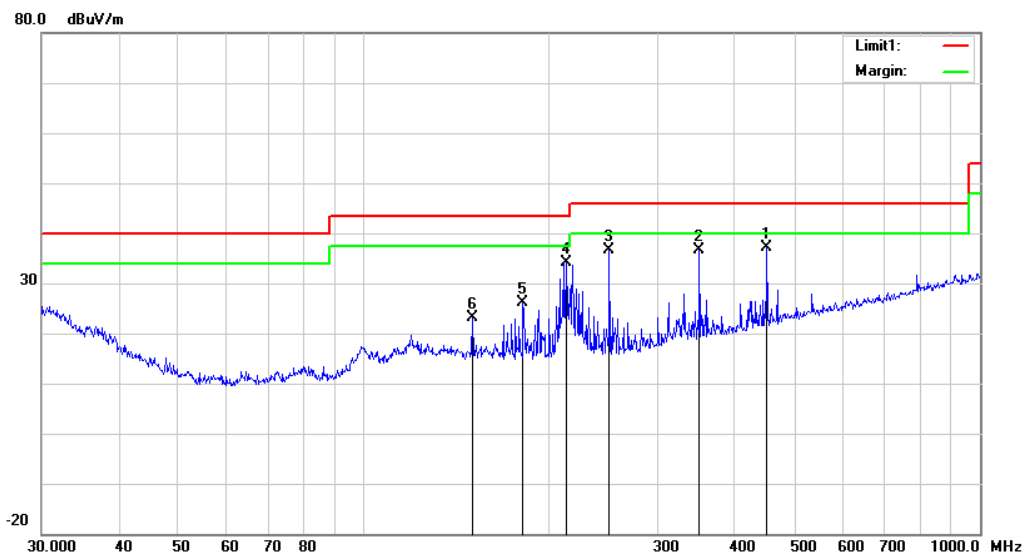
BT-LE (GFSK)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
No.	Frequency (MHz)	Reading (dBuV/m)	Ant_F (dB/m)	PA_G (dB)	Cab_L (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)
1	451.1350	40.06	16.72	21.91	2.14	37.01	46.00	-8.99	100	21
2	350.4768	41.99	14.66	22.15	2.04	36.54	46.00	-9.46	100	357
3	250.3012	45.71	11.41	22.29	1.70	36.53	46.00	-9.47	100	128
4	213.0151	43.11	11.92	22.36	1.58	34.25	43.50	-9.25	100	76
5	181.2834	35.87	11.07	22.26	1.38	26.06	43.50	-17.44	100	308
6	150.0108	31.55	12.60	22.34	1.34	23.15	43.50	-20.35	100	210

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value



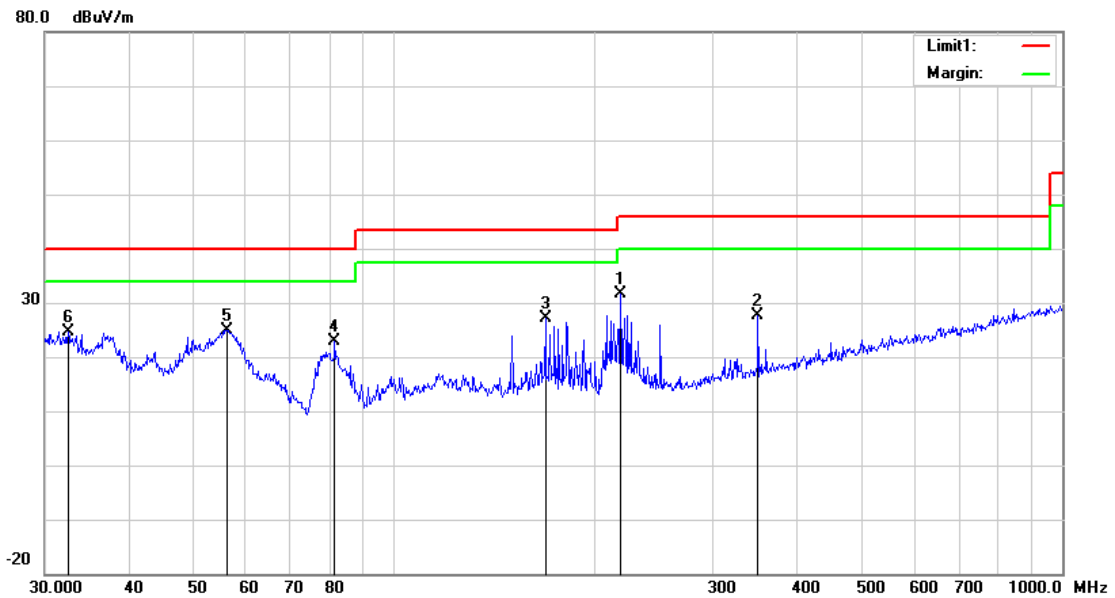


CHANNEL	TX Channel 39	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
No.	Frequency (MHz)	Reading (dBuV/m)	Ant_F (dB/m)	PA_G (dB)	Cab_L (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)
1	218.3085	40.64	11.84	22.35	1.60	31.73	46.00	-14.27	100	156
2	350.4768	33.19	14.66	22.15	2.04	27.74	46.00	-18.26	100	203
3	168.4138	36.08	11.93	22.26	1.36	27.11	43.50	-16.39	100	54
4	81.4970	36.54	7.66	22.41	1.06	22.85	40.00	-17.15	100	57
5	56.1974	38.87	7.72	22.40	0.77	24.96	40.00	-15.04	100	266
6	32.5198	26.80	19.46	22.26	0.69	24.69	40.00	-15.31	100	35

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value





ABOVE 1GHZ TEST DATA:

Note: For higher frequency, the emission is too low to be detected.

BT-LE (GFSK)

CHANNEL	TX Channel 0	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

Frequency (MHz)	S.A. Reading (dBµV)	Detector (PK/AV)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
4804	50	AV	V	33.39	7.22	48.46	42.15	54	-11.85
4804	49.6	AV	H	33.39	7.22	48.46	41.75	54	-12.25
4804	63.94	PK	V	33.39	7.22	48.46	56.09	74	-17.91
4804	62.37	PK	H	33.39	7.22	48.46	54.52	74	-19.48
8860	42.43	AV	V	37.37	8.83	47.82	40.81	54	-13.19
8860	37.77	AV	H	37.37	8.83	47.82	36.15	54	-17.85
8860	55.09	PK	V	37.37	8.83	47.82	53.47	74	-20.53
8860	59.43	PK	H	37.37	8.83	47.82	57.81	74	-16.19
2390	51.51	AV	V	30	4.94	47.09	39.36	54	-14.64
2390	50.32	AV	H	30	4.94	47.09	38.17	54	-15.83
2390	68.18	PK	V	30	4.94	47.09	56.03	74	-17.97
2390	70.1	PK	H	30	4.94	47.09	57.95	74	-16.05

REMARKS:

- Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
Margin value = Emission level – Limit value.
- 2402MHz: Fundamental frequency.
- X-Axis, Y-Axis and Z-Axis were investigated. The results above show only the worst case.
- The radiated spurious test above 18GHz is subcontracted to Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch Laboratories and found 30dB below the limit at least.



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

Frequency (MHz)	S.A. Reading (dBμV)	Detector (PK/AV)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
4880	50.7	AV	V	33.62	7.53	48.36	43.49	54	-10.51
4880	52.53	AV	H	33.62	7.53	48.36	45.32	54	-8.68
4880	62.24	PK	V	33.62	7.53	48.36	55.03	74	-18.97
4880	59.45	PK	H	33.62	7.53	48.36	52.24	74	-21.76
12732	40.62	AV	V	39.09	13.37	46.39	46.69	54	-7.31
12732	36.12	AV	H	39.09	13.37	46.39	42.19	54	-11.81
12732	57.96	PK	V	39.09	13.37	46.39	64.03	74	-9.97
12732	54.36	PK	H	39.09	13.37	46.39	60.43	74	-13.57

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
Margin value = Emission level – Limit value.
2. 2440MHz: Fundamental frequency.
3. X-Axis, Y-Axis and Z-Axis were investigated. The results above show only the worst case.
4. The radiated spurious test above 18GHz is subcontracted to Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch Laboratories and found 30dB below the limit at least.



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

Frequency (MHz)	S.A. Reading (dBµV)	Detector (PK/AV)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
4960	51.15	AV	V	33.89	7.86	48.31	44.59	54	-9.41
4960	47.68	AV	H	33.89	7.86	48.31	41.12	54	-12.88
4960	55.25	PK	V	33.89	7.86	48.31	48.69	74	-25.31
4960	62.12	PK	H	33.89	7.86	48.31	55.56	74	-18.44
17803	21.46	AV	V	42.34	19.63	44.9	38.53	54	-15.47
17803	19.02	AV	H	42.34	19.63	44.9	36.09	54	-17.91
17803	37.12	PK	V	42.34	19.63	44.9	54.19	74	-19.81
17803	39.39	PK	H	42.34	19.63	44.9	56.46	74	-17.54
2483.5	54.08	AV	V	29.98	5.83	47.51	42.38	54	-11.62
2483.5	56.27	AV	H	29.98	5.83	47.51	44.57	54	-9.43
2483.5	72.83	PK	V	29.98	5.83	47.51	61.13	74	-12.87
2483.5	71.72	PK	H	29.98	5.83	47.51	60.02	74	-13.98

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
Margin value = Emission level – Limit value.
2. 2480MHz: Fundamental frequency.
3. X-Axis, Y-Axis and Z-Axis were investigated. The results above show only the worst case.
4. The radiated spurious test above 18GHz is subcontracted to Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch Laboratories and found 30dB below the limit at least.



3.3 6 dB BANDWIDTH MEASUREMENT

3.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

3.3.2 TEST INSTRUMENTS

Instrument	Model	Serial #	Cal Date	Cal Due
DC Power Supply	E3640A	MY40004013	Jan. 05, 18	Jan. 04, 19
MXA Signal Analyzer	N9020A	MY49100060	Jan. 05, 18	Jan. 04, 19
MXG Vector Signal Generator	N5182A	MY50140530	Jan. 05, 18	Jan. 04, 19
Series Signal Generator	E4421B	US40051152	May 12, 18	May 11, 19
RF control unit	JS0806-0806-2	188060112	Apr. 25, 18	Apr. 24, 19
Wireless Connectivity Tester	CMW270	1201.0002K75-101601-PE	Apr. 25, 18	Apr. 24, 19
Test Software	EZ-EMC	ver.lcp-03A1	N/A	N/A

NOTE:

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

3.3.3 TEST PROCEDURE

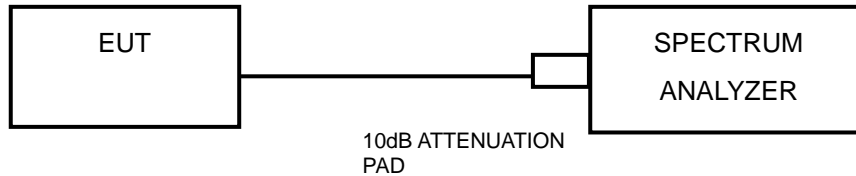
1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) ≥ 3 RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points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



3.3.4 DEVIATION FROM TEST STANDARD

No deviation.

3.3.5 TEST SETUP



3.3.6 EUT OPERATING CONDITIONS

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



3.3.7 TEST RESULTS

802.11b

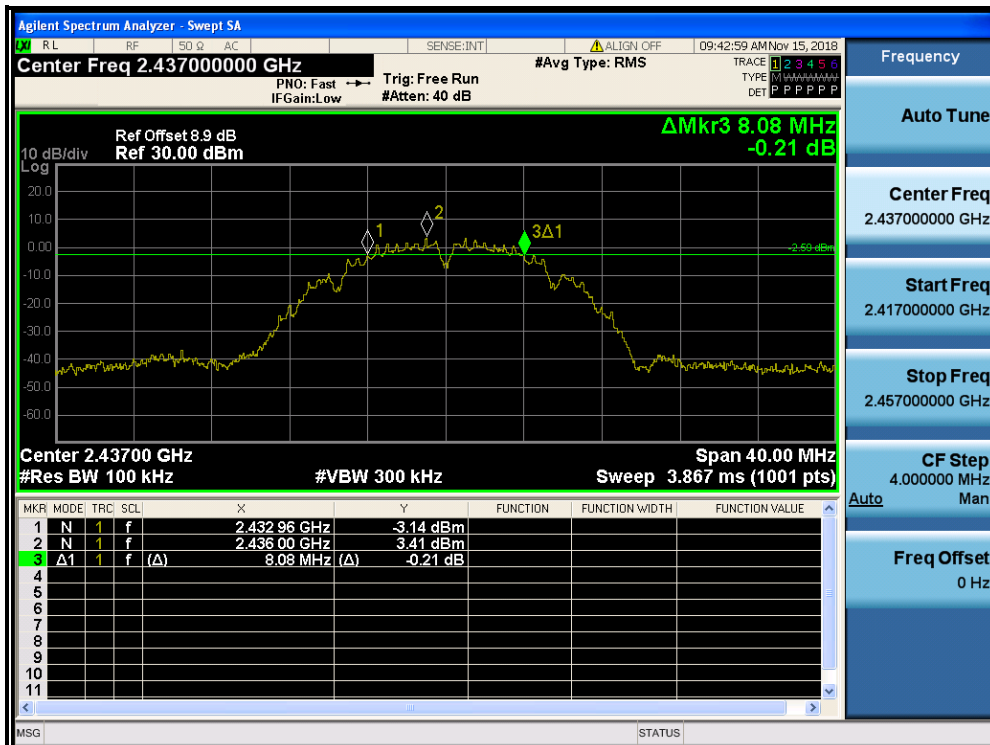
CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	7.68	0.5	PASS
6	2437	8.08	0.5	PASS
11	2462	8.64	0.5	PASS



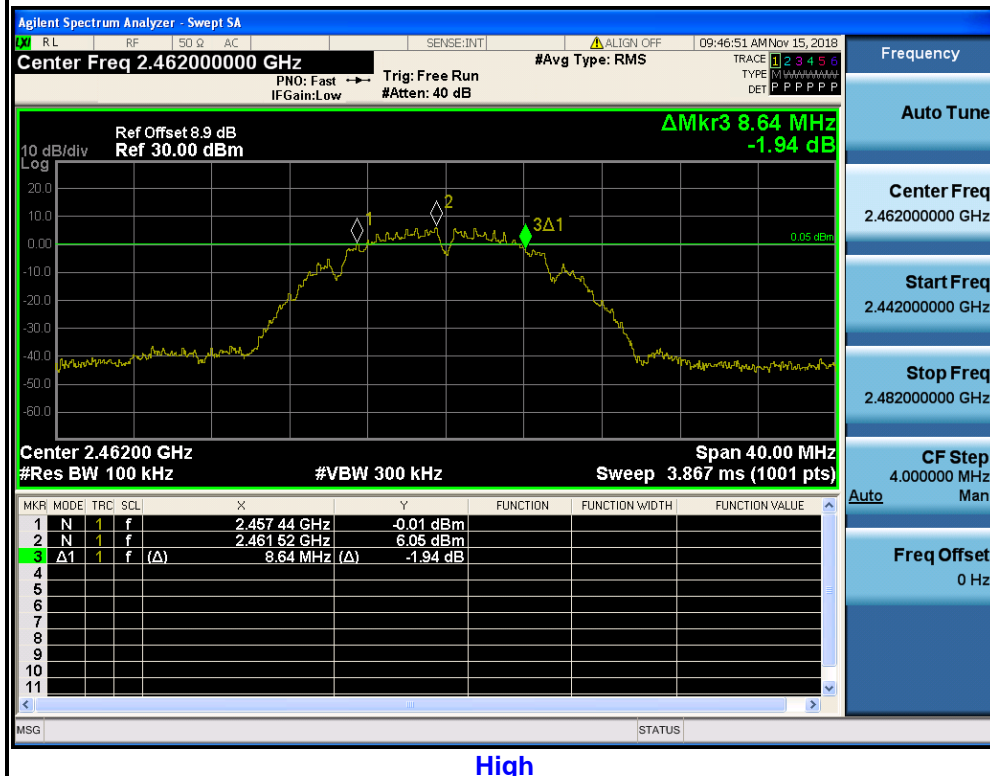


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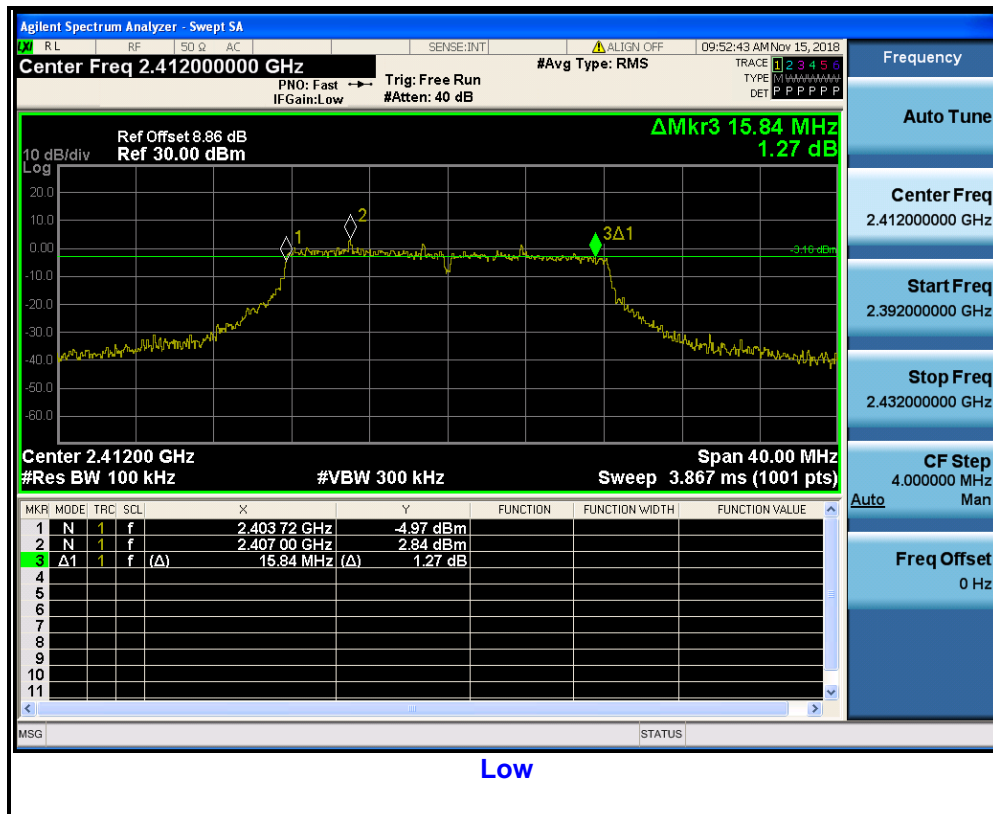
No. 34, Chenwulu Section, Guantai Rd.,
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802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	15.84	0.5	PASS
6	2437	16.48	0.5	PASS
11	2462	16.36	0.5	PASS

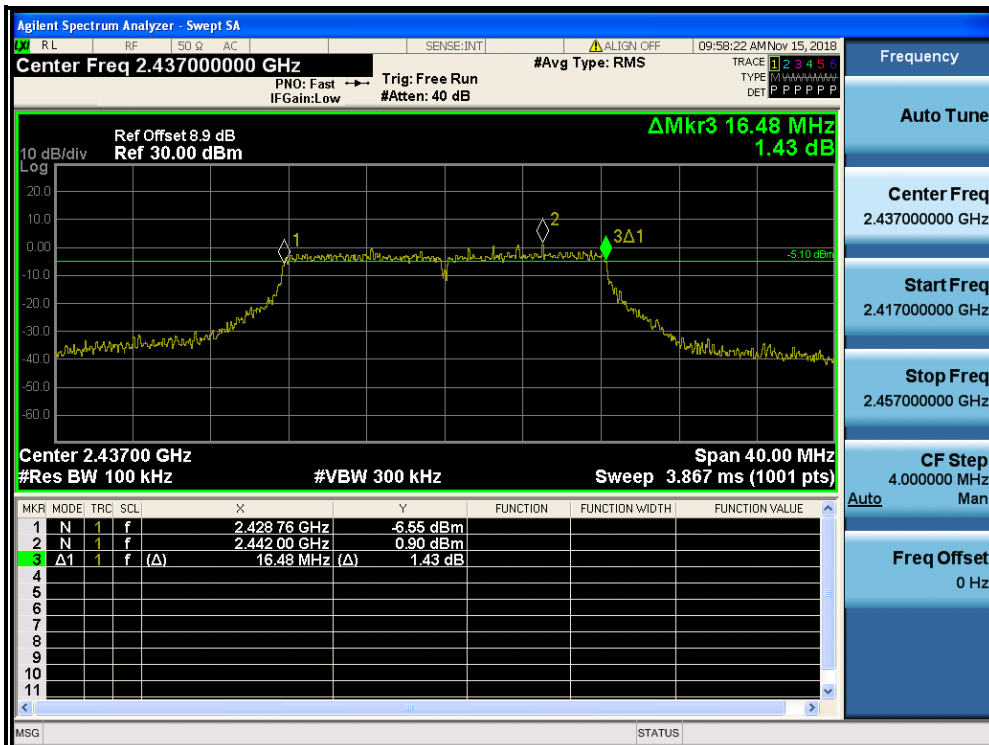


Low

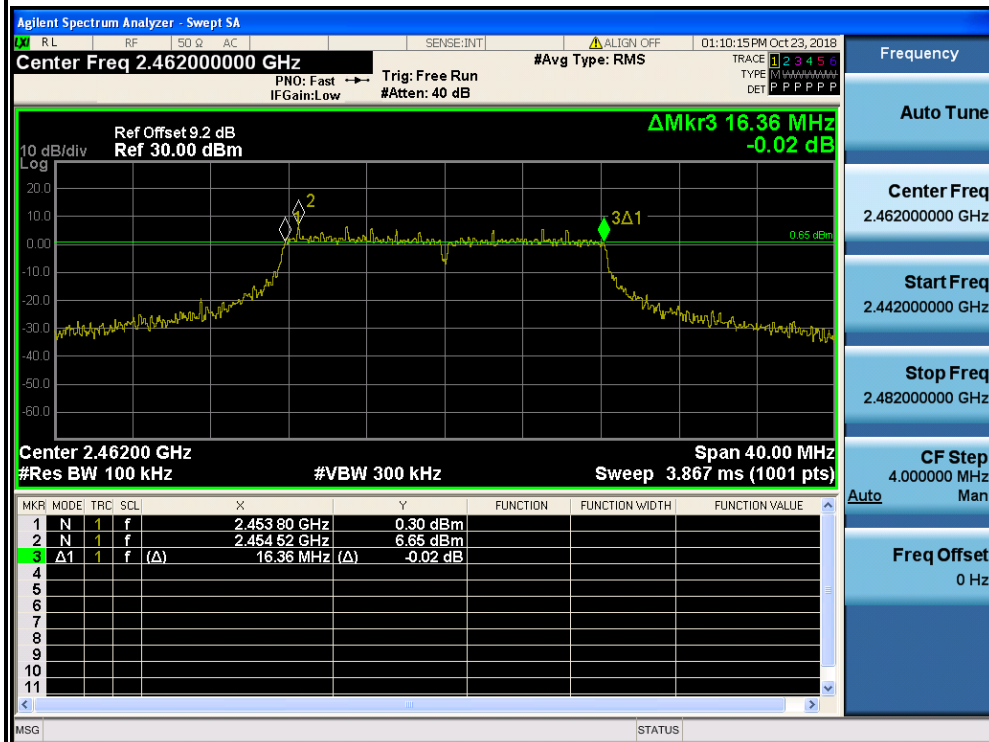


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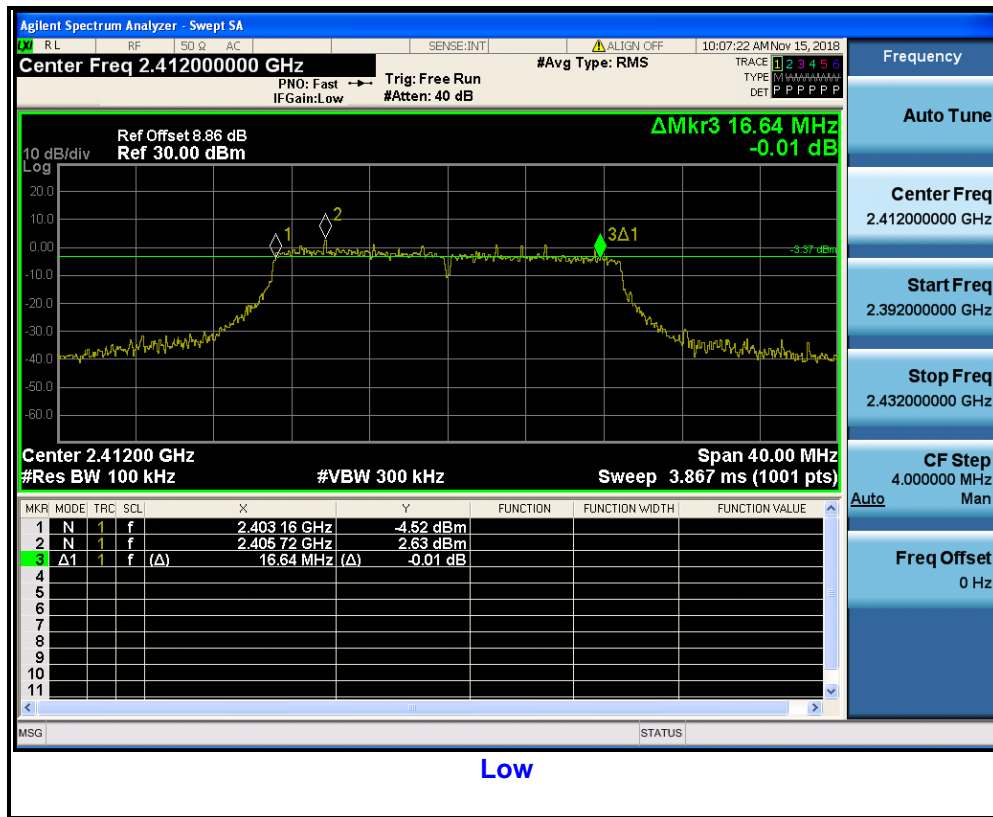


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802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	16.64	0.5	PASS
6	2437	17.72	0.5	PASS
11	2462	17.28	0.5	PASS



Low

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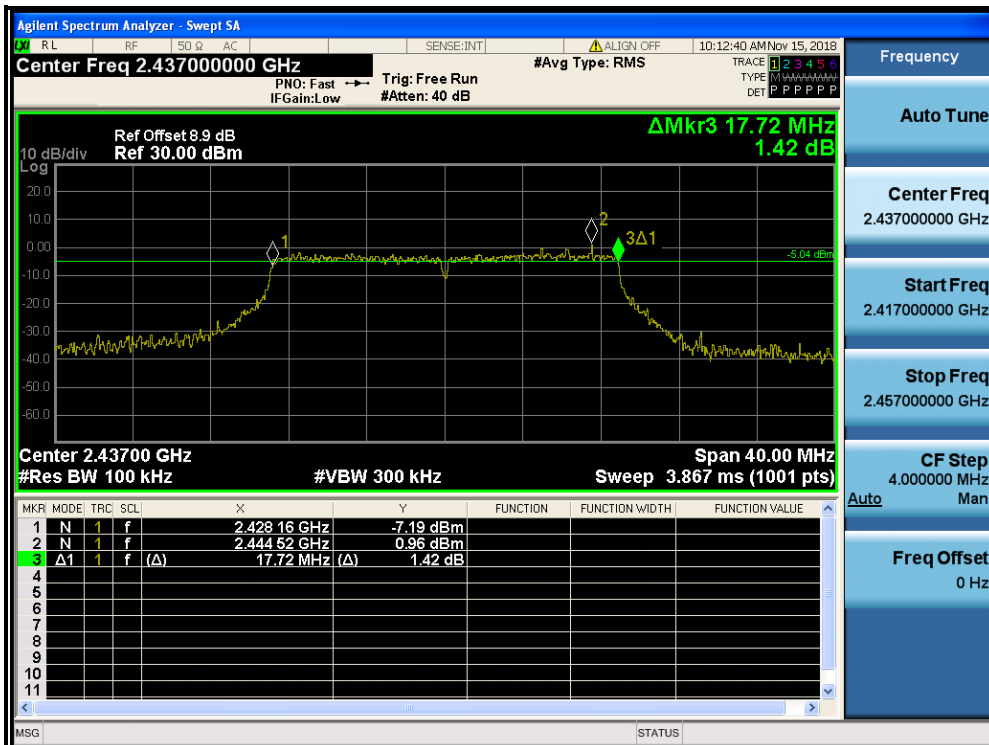
No. 34, Chenwulu Section, Guantai Rd.,
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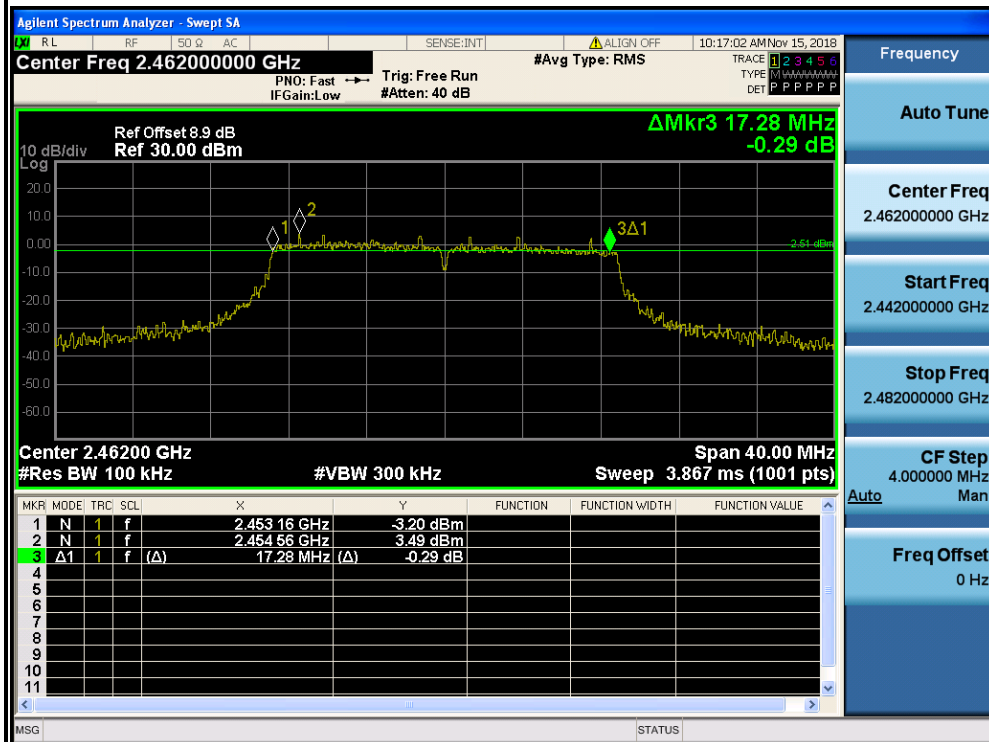


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BT-LE (GFSK)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
0	2402	0.664	0.5	PASS
19	2440	0.656	0.5	PASS
39	2480	0.720	0.5	PASS



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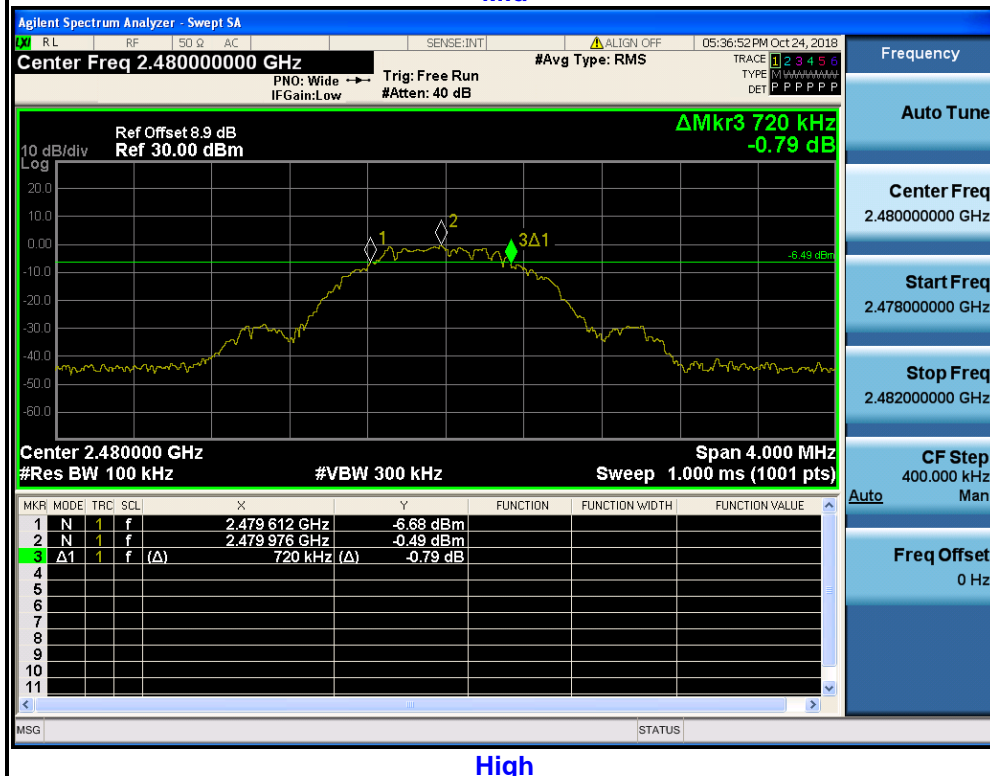


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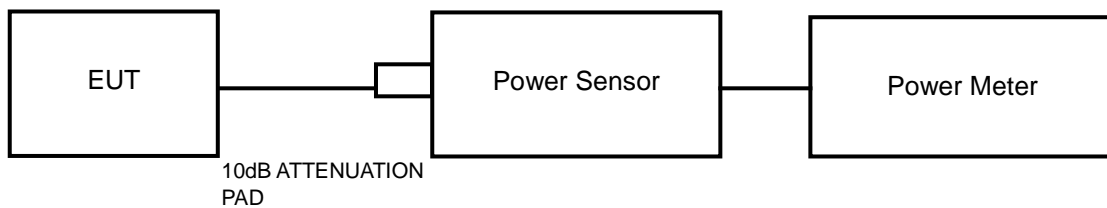


3.4 CONDUCTED OUTPUT POWER

3.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

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

3.4.2 TEST SETUP



3.4.3 TEST INSTRUMENTS

Refer to section 3.3.2 to get information of above instrument.

3.4.4 TEST PROCEDURES

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

3.4.5 DEVIATION FROM TEST STANDARD

No deviation.

3.4.6 EUT OPERATING CONDITIONS

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



3.4.7 TEST RESULTS

3.4.7.1 MAXIMUM PEAK OUTPUT POWER

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)	PEAK POWER (mW)	PEAK POWER LIMIT(W)	PASS/FAIL
1	2412	19.80	95.499	1	PASS
6	2437	19.31	85.310	1	PASS
11	2462	21.21	132.130	1	PASS

802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)	PEAK POWER (mW)	PEAK POWER LIMIT(W)	PASS/FAIL
1	2412	24.20	263.027	1	PASS
6	2437	24.37	273.527	1	PASS
11	2462	24.61	289.068	1	PASS

802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)	PEAK POWER (mW)	PEAK POWER LIMIT(W)	PASS/FAIL
1	2412	20.07	101.625	1	PASS
6	2437	19.31	85.310	1	PASS
11	2462	21.60	144.544	1	PASS

BT-LE (GFSK)

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)	PEAK POWER (mW)	PEAK POWER LIMIT(W)	PASS/FAIL
0	2402	0.74	1.186	1	PASS
19	2440	0.70	1.175	1	PASS
39	2480	0.44	1.107	1	PASS



3.4.7.2 AVERAGE OUTPUT POWER (FOR REFERENCE)

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

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	AVG. POWER (mW)
1	2412	16.81	47.973
6	2437	16.05	40.272
11	2462	18.14	65.163

802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	AVG. POWER (mW)
1	2412	16.18	41.495
6	2437	16.05	40.272
11	2462	16.24	42.073

802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	AVG. POWER (mW)
1	2412	11.60	14.454
6	2437	11.07	12.794
11	2462	12.54	17.947



BT-LE (GFSK)

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	AVG. POWER (mW)
0	2402	-5.54	0.279
19	2440	-6.81	0.208
39	2480	0.00	1.000

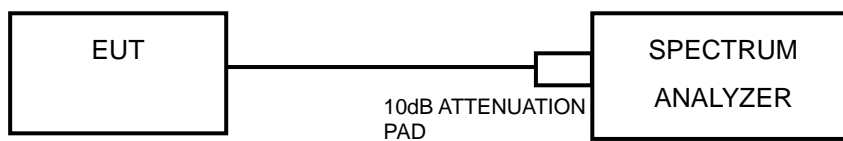


3.5 POWER SPECTRAL DENSITY MEASUREMENT

3.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

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

3.5.2 TEST SETUP



3.5.3 TEST INSTRUMENTS

Refer to section 3.3.2 to get information of above instrument.

3.5.4 TEST PROCEDURE

1. Set the span to 1.5 times the DTS bandwidth
2. Set the RBW = 3 kHz, VBW $\geq 3 \times$ RBW, Detector = peak.
3. Sweep time = auto couple, Trace mode = max hold, allow trace to fully stabilize.
4. Use the peak marker function to determine the maximum amplitude level.

3.5.5 DEVIATION FROM TEST STANDARD

No deviation.

3.5.6 EUT OPERATING CONDITION

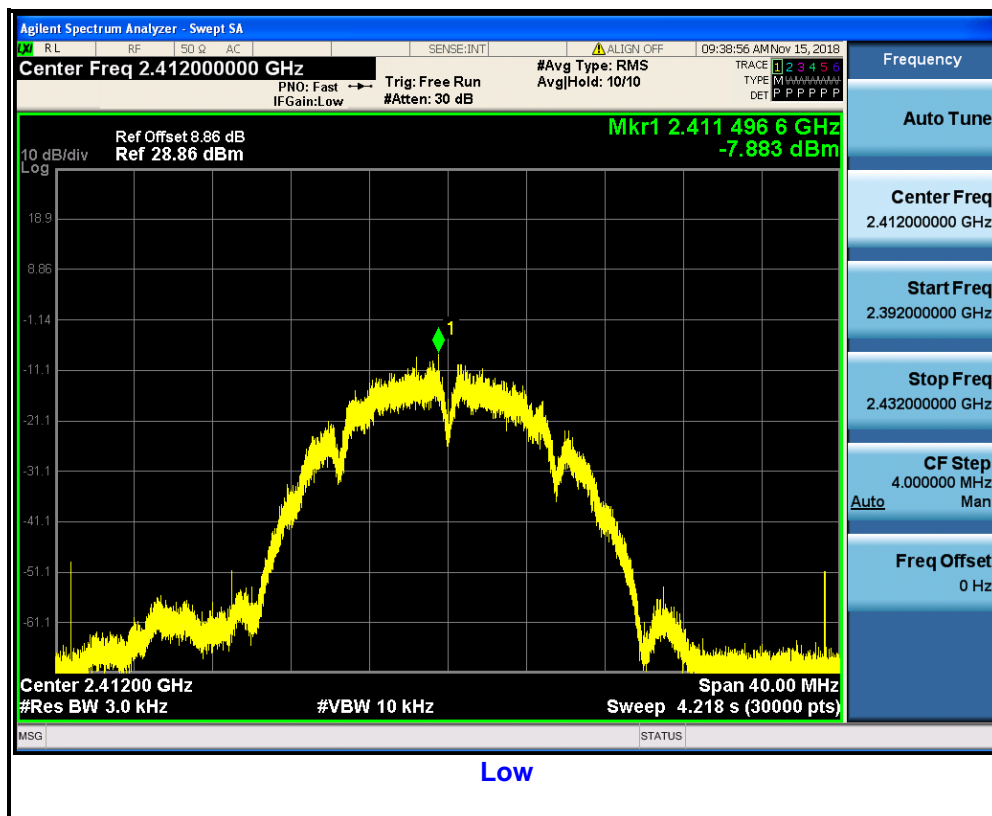
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.



3.5.7 TEST RESULTS

802.11b

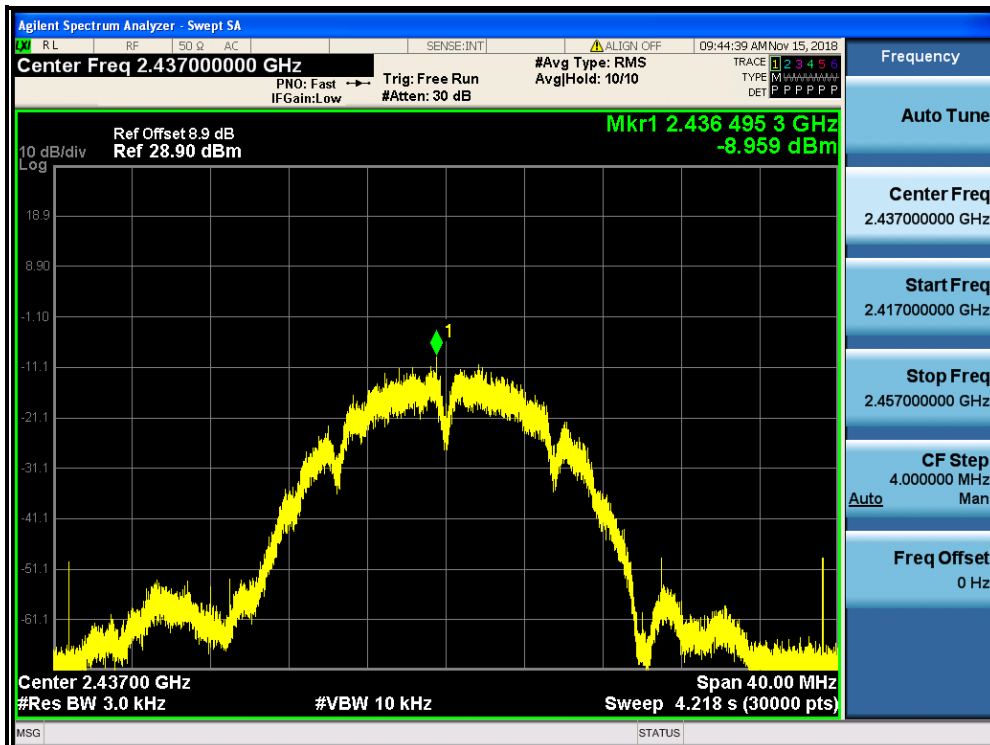
Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-7.883	8	PASS
6	2437	-8.959	8	PASS
11	2462	-6.113	8	PASS



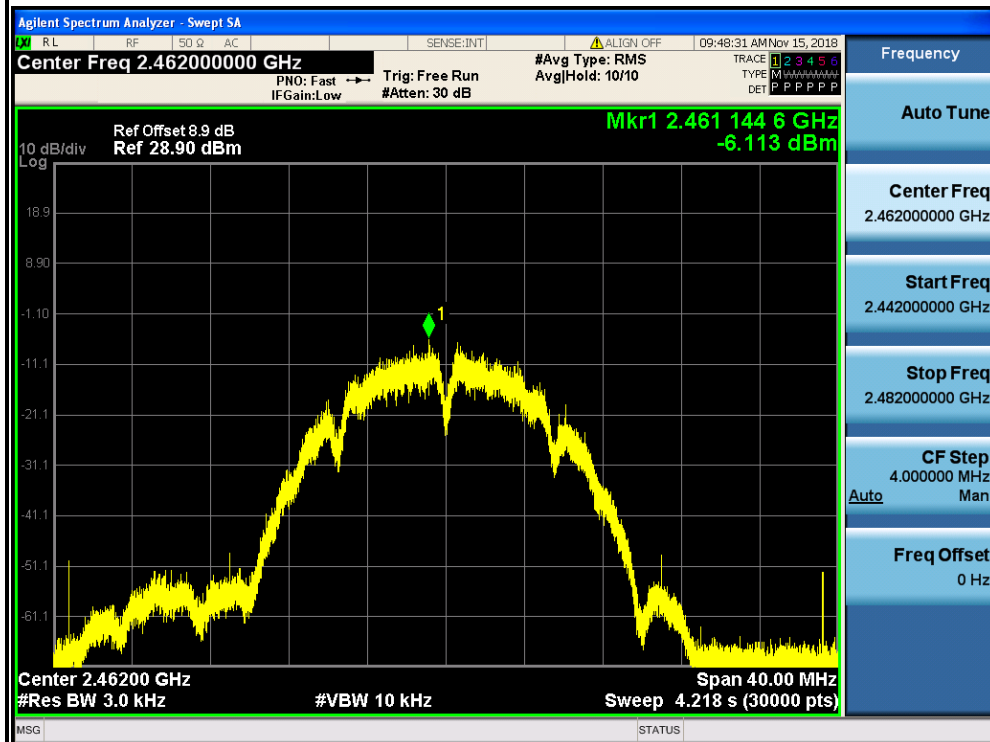


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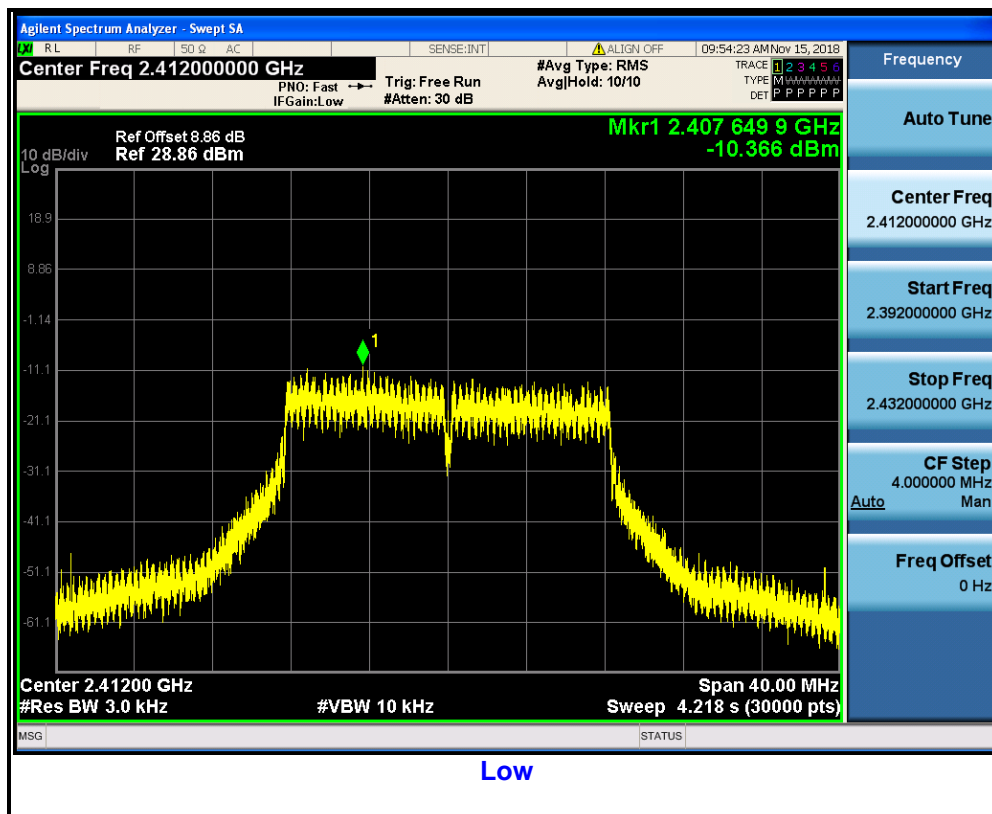


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802.11g

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-10.366	8	PASS
6	2437	-12.868	8	PASS
11	2462	-8.373	8	PASS



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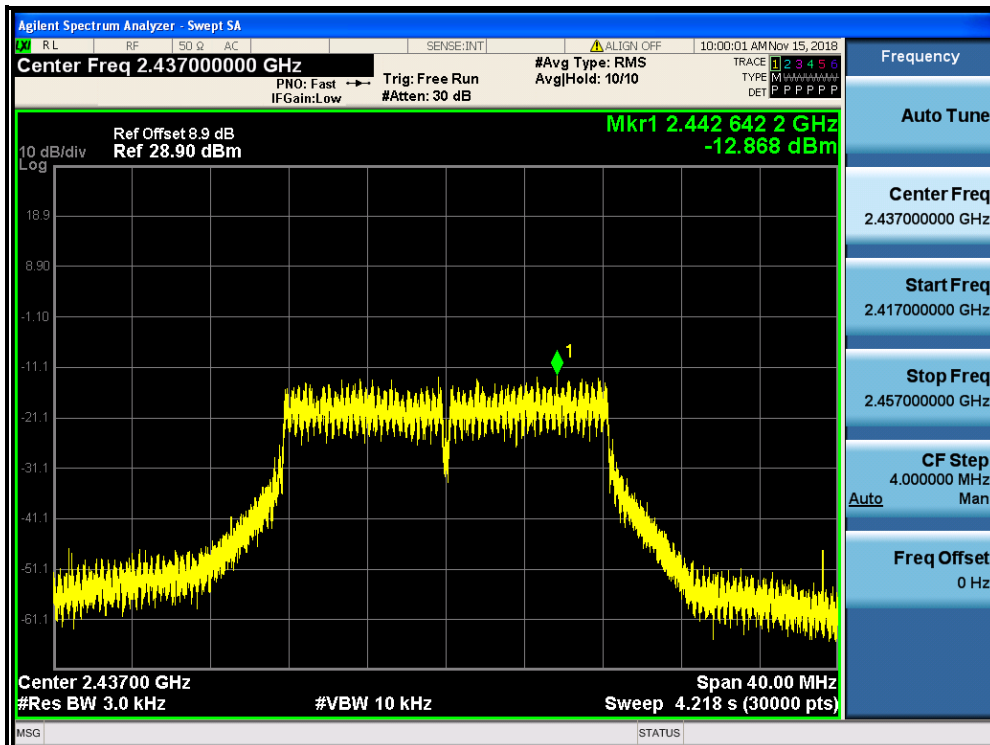
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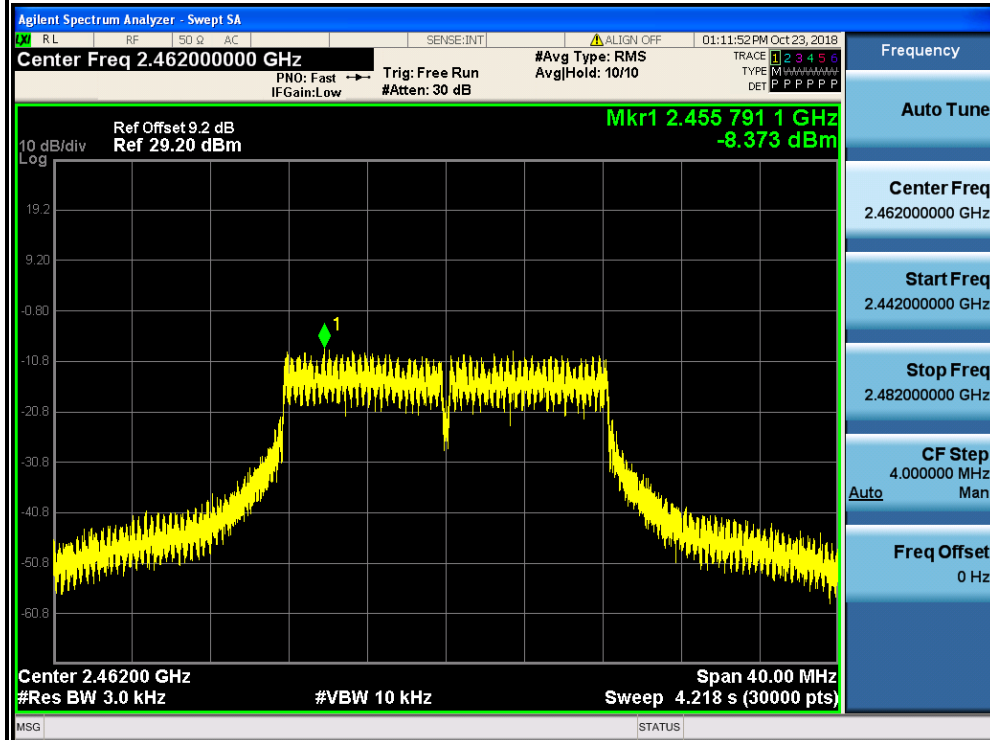


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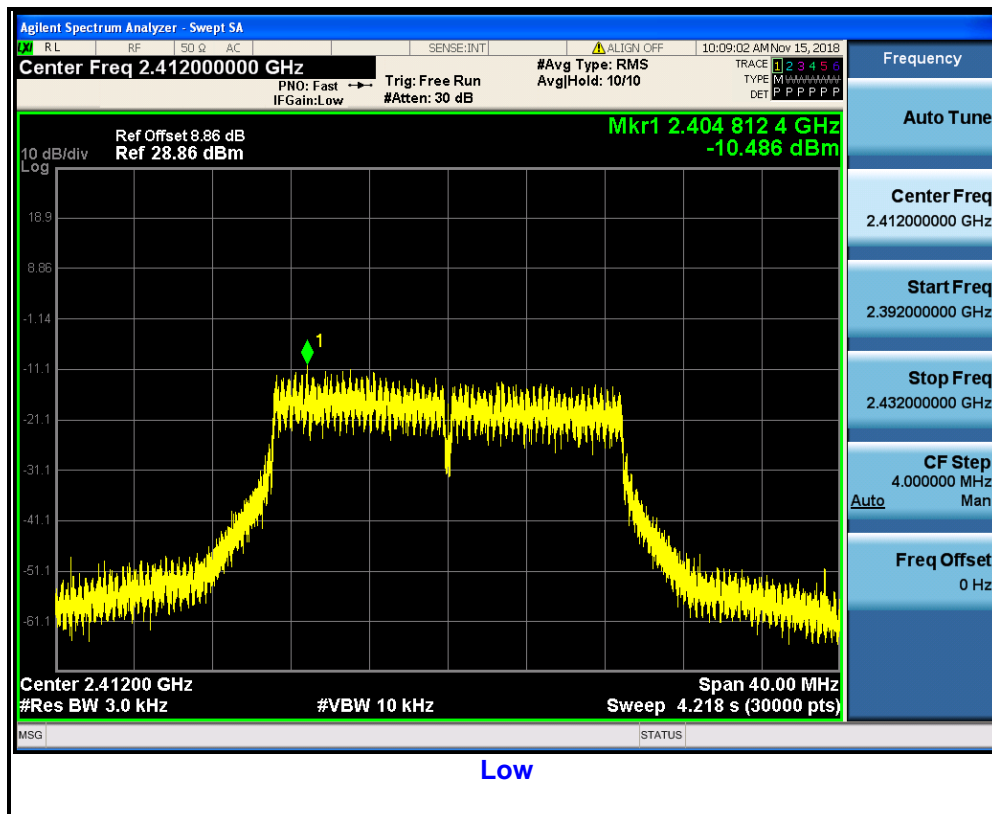


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802.11n (20MHz)

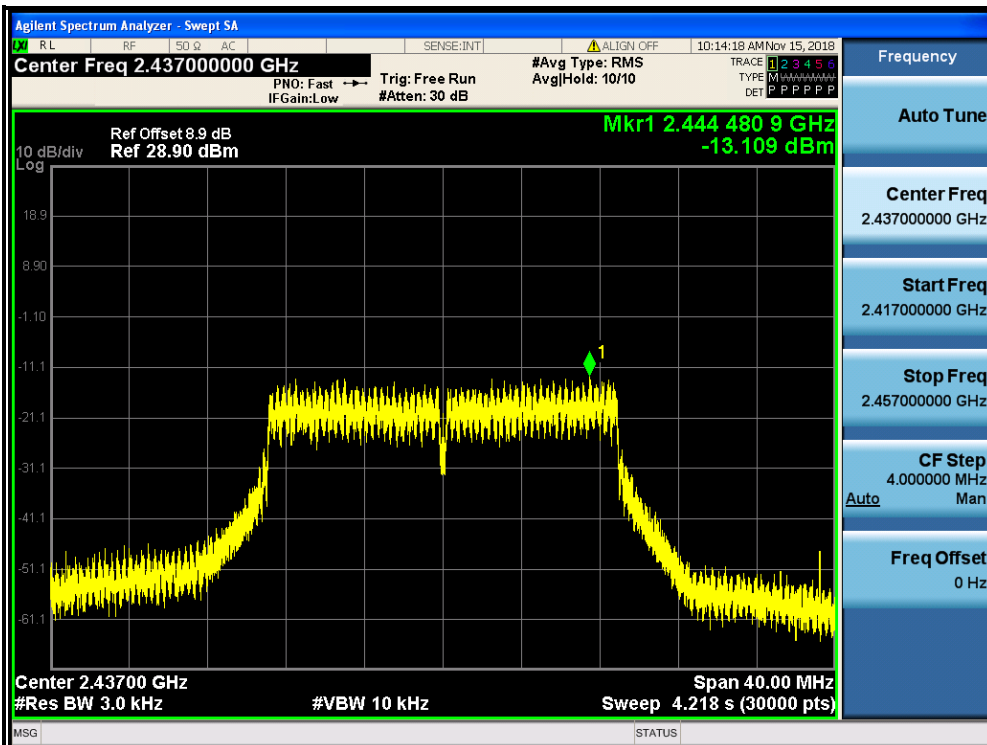
Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-10.486	8	PASS
6	2437	-13.109	8	PASS
11	2462	-9.322	8	PASS



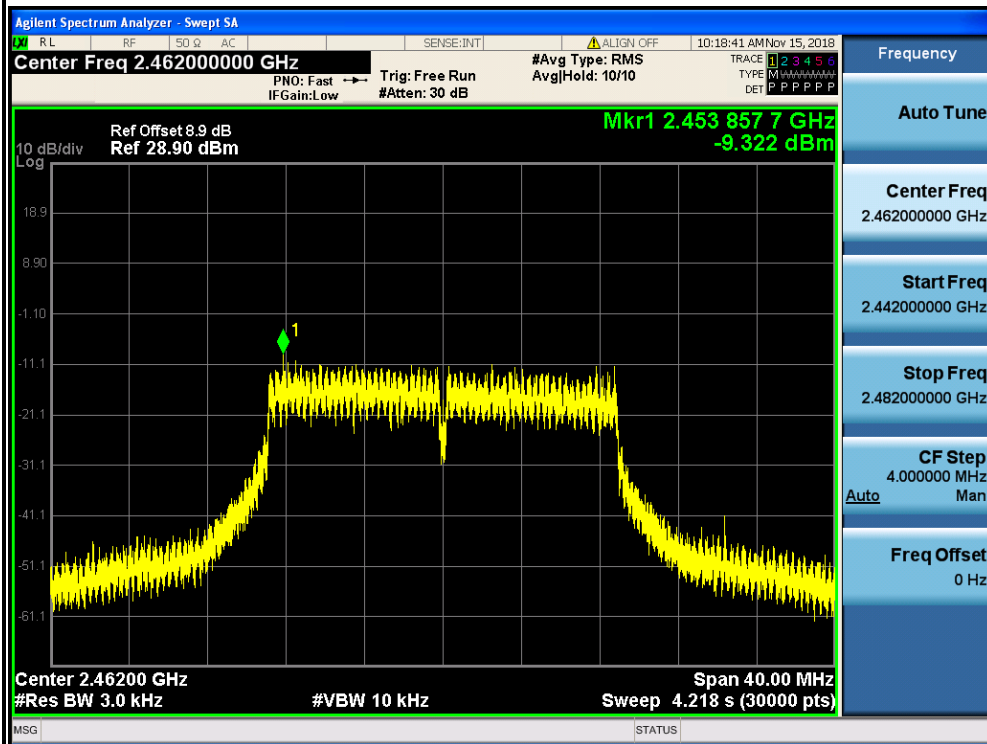


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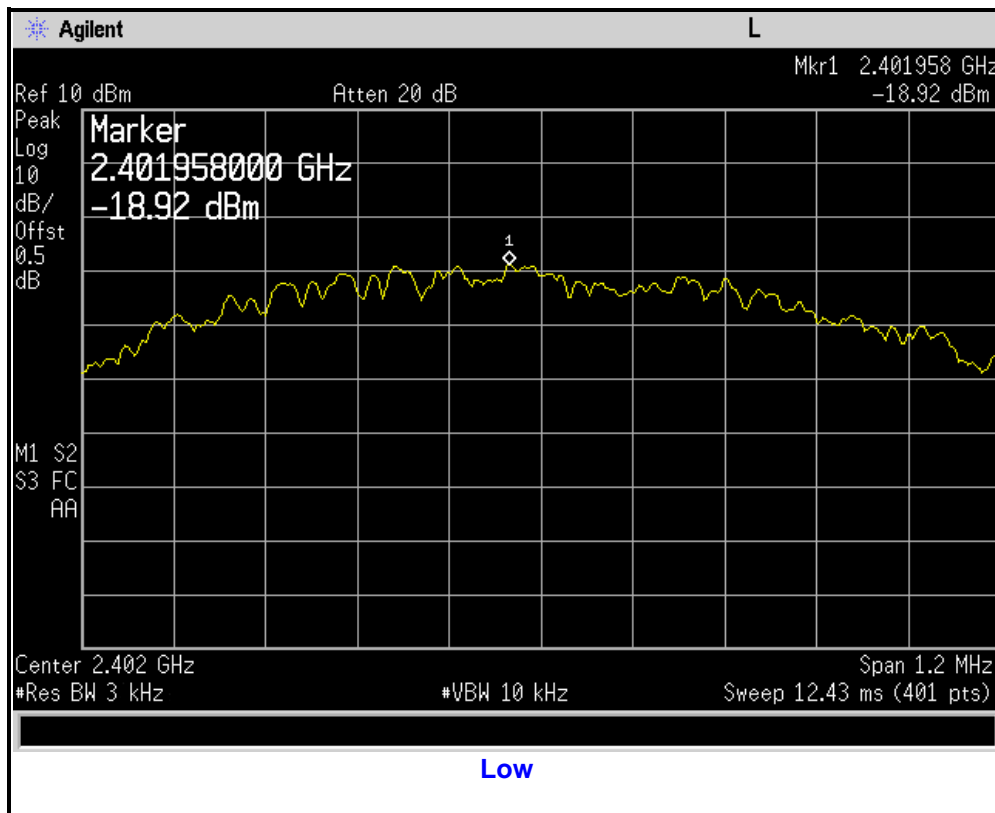
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BT-LE (GFSK)

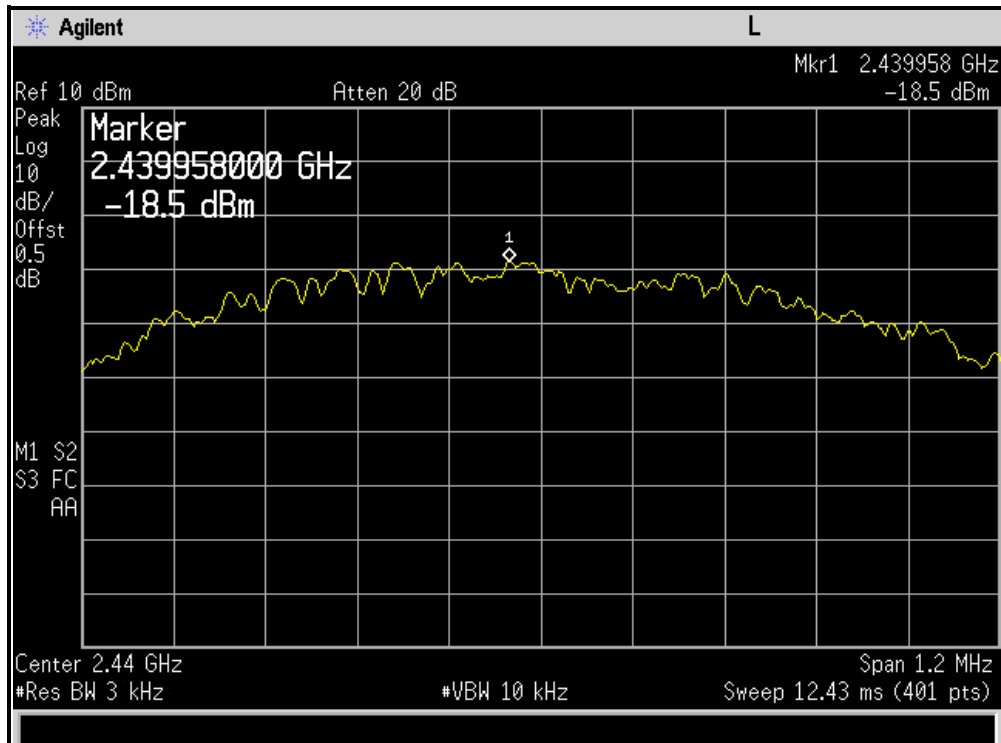
Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	2402	-18.92	8	PASS
19	2440	-18.50	8	PASS
39	2480	-18.30	8	PASS



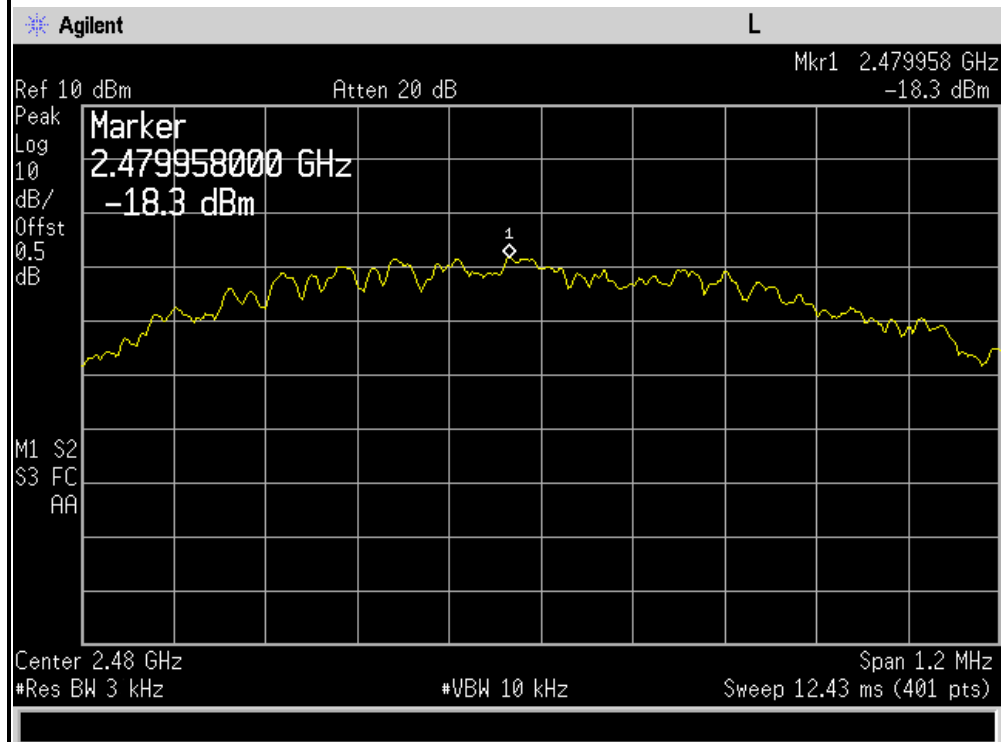


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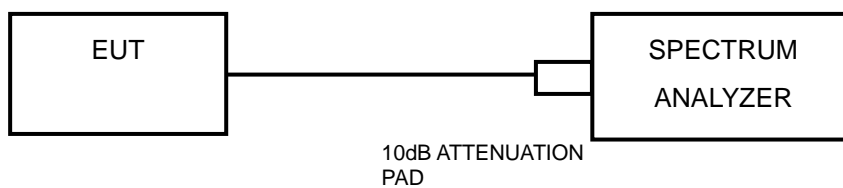


3.6 OUT OF BAND EMISSION MEASUREMENT

3.6.1 LIMITS OF OUT OF BAND EMISSION MEASUREMENT

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

3.6.2 TEST SETUP



3.6.3 TEST INSTRUMENTS

Refer to section 3.3.2 to get information of above instrument.

3.6.4 TEST PROCEDURE

MEASUREMENT PROCEDURE REF

1. Set the RBW = 100 kHz.
2. Set the VBW \geq 300 kHz.
3. Detector = peak.
4. Sweep time = auto couple.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.



MEASUREMENT PROCEDURE OOB

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.

3.6.5 DEVIATION FROM TEST STANDARD

No deviation.

3.6.6 EUT OPERATING CONDITION

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

3.6.7 TEST RESULTS

The spectrum plots are attached on the following images. D1 line indicates the highest level. D2 line indicates the 20dB offset below D1. It shows compliance to the requirement.



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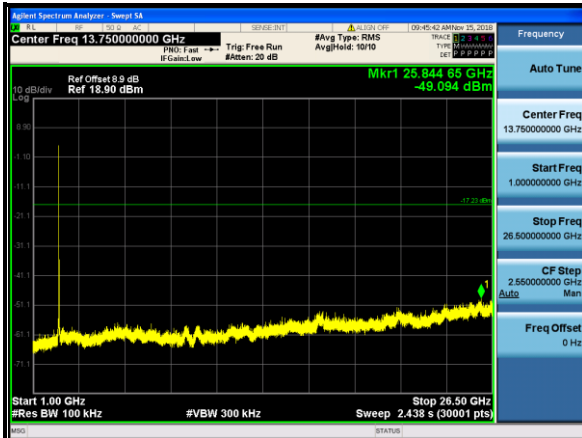
802.11b



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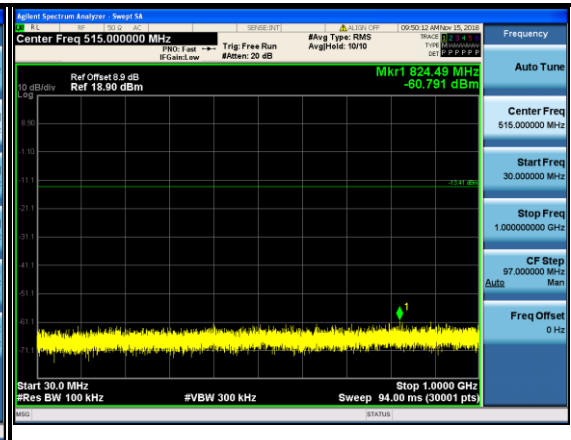
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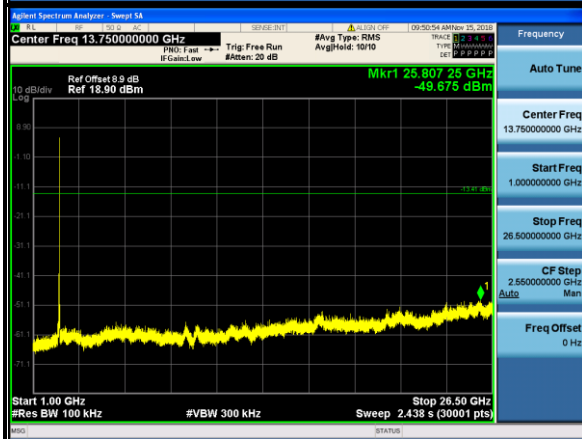


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Auto Tune
Center Freq 13.75000000 GHz
Start Freq 1.000000000 GHz
Stop Freq 26.500000000 GHz
CF Step 2.550000000 GHz
Auto Man
Freq Offset 0 Hz

CH 11



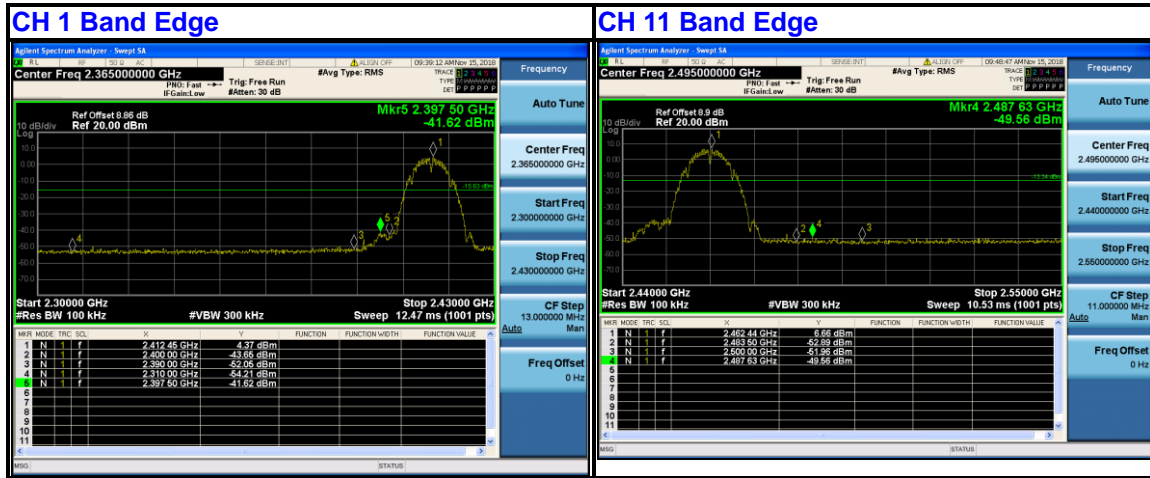
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Center Freq 13.75000000 GHz
Start Freq 1.000000000 GHz
Stop Freq 26.500000000 GHz
CF Step 2.550000000 GHz
Auto Man
Freq Offset 0 Hz



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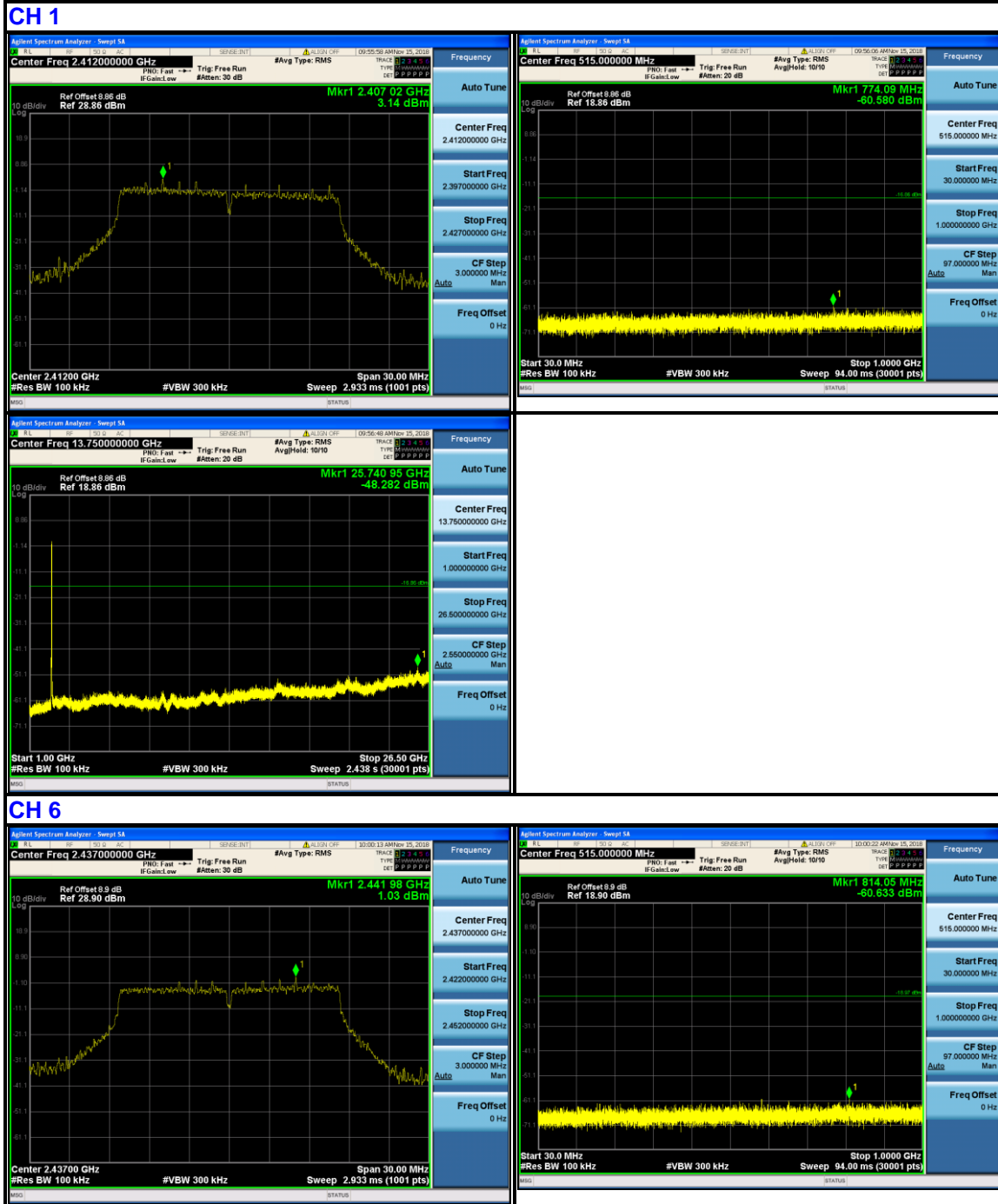
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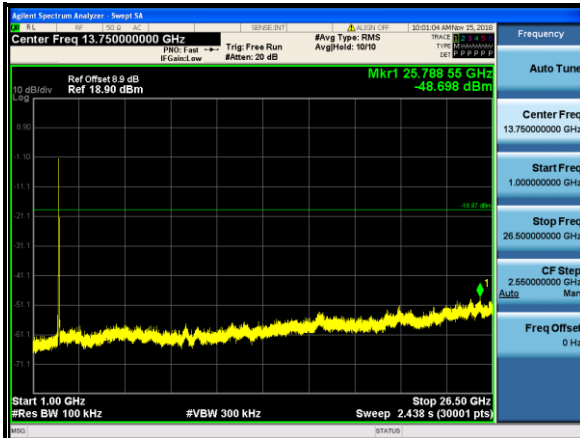


802.11g



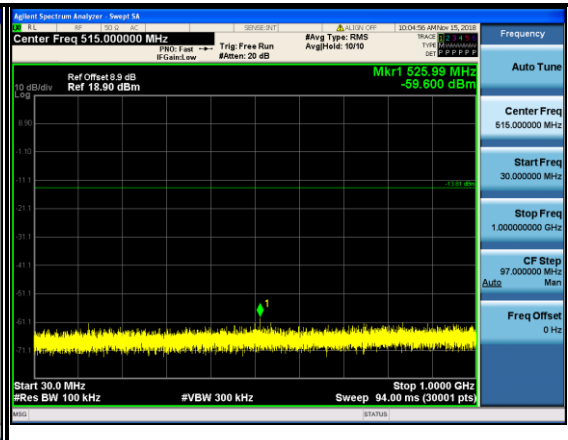


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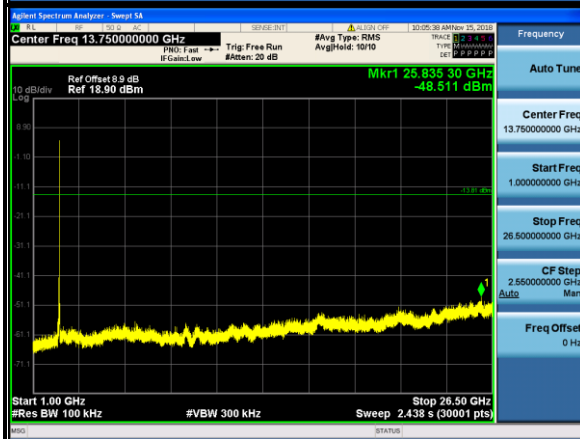


Frequency
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Center Freq 13.75000000 GHz
Start Freq 1.000000000 GHz
Stop Freq 26.500000000 GHz
CF Step 2.550000000 GHz
Auto Man
Freq Offset 0 Hz

CH 11



Frequency
Auto Tune
Center Freq 13.75000000 GHz
Start Freq 1.000000000 GHz
Stop Freq 26.500000000 GHz
CF Step 2.550000000 GHz
Auto Man
Freq Offset 0 Hz



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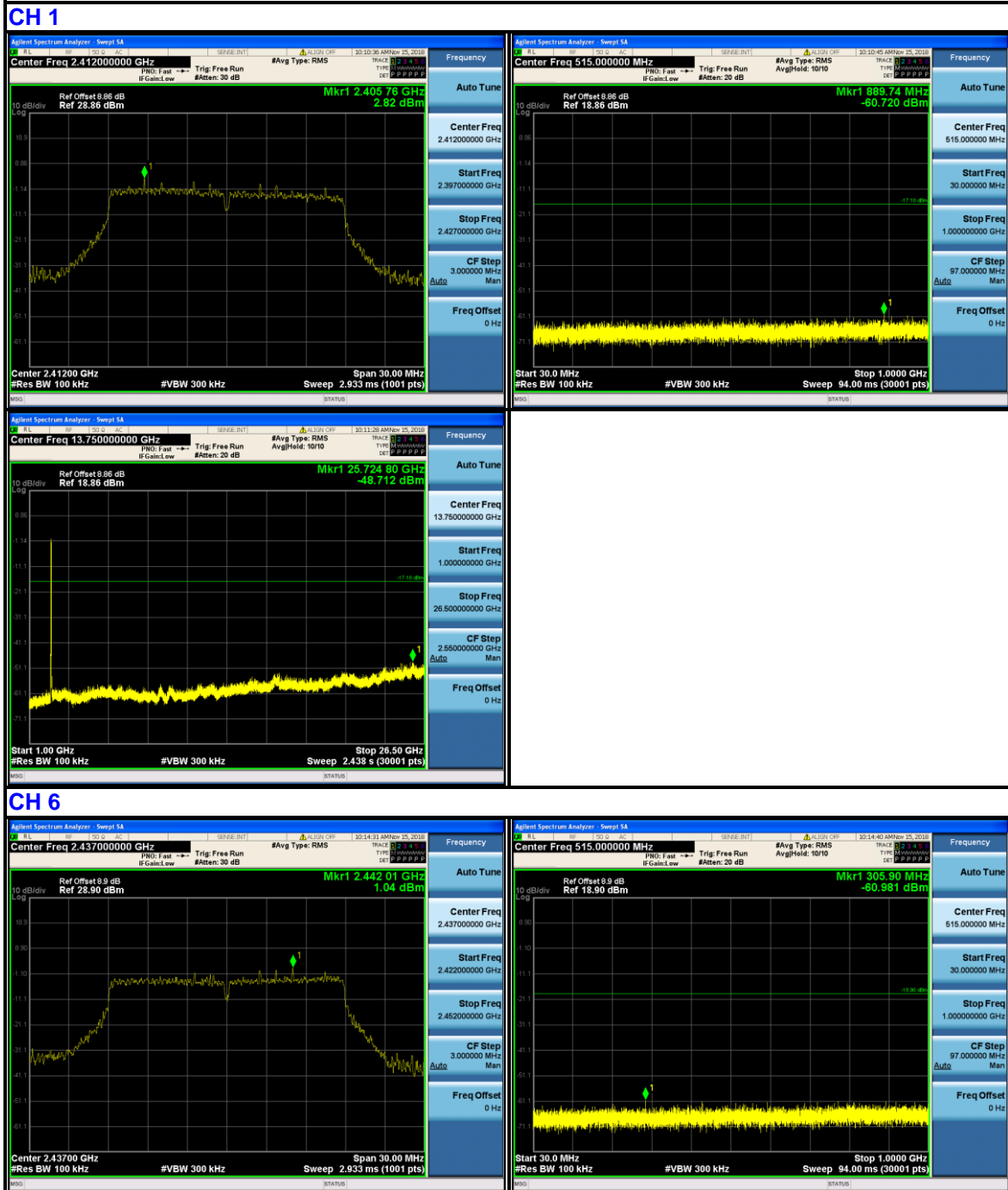
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802.11n (20MHz)



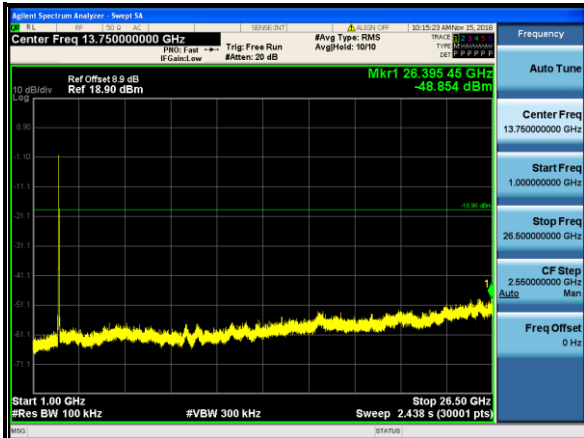
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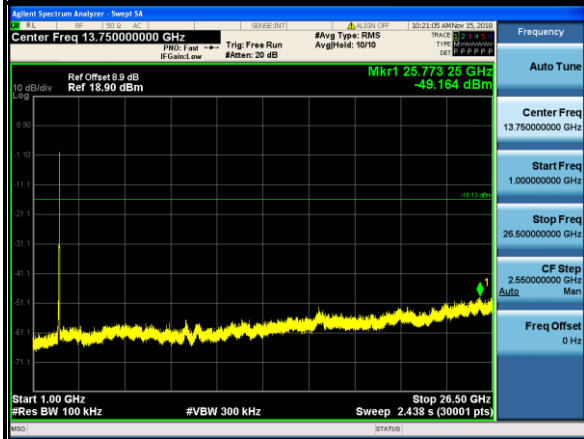
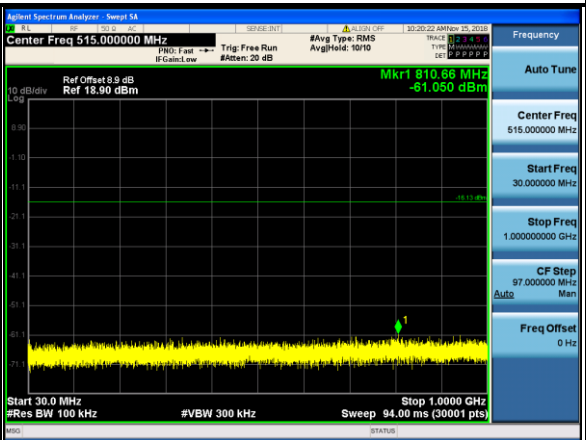
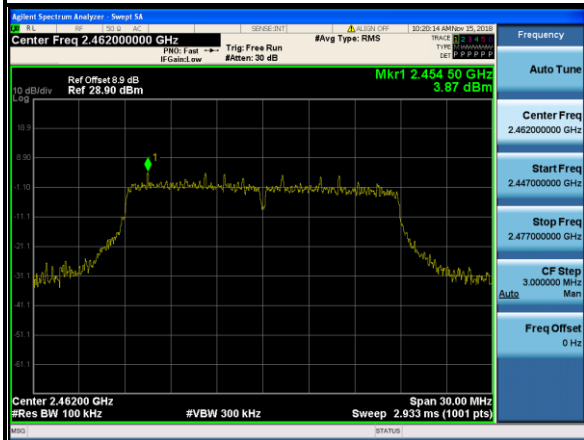


BUREAU VERITAS Test Report No.: RF181011N013-2



Frequency
Auto Tune
Center Freq 13.75000000 GHz
Start Freq 1.000000000 GHz
Stop Freq 26.500000000 GHz
CF Step 2.550000000 GHz Auto Man
Freq Offset 0 Hz

CH 11



Frequency
Auto Tune
Center Freq 13.75000000 GHz
Start Freq 1.000000000 GHz
Stop Freq 26.500000000 GHz
CF Step 2.550000000 GHz Auto Man
Freq Offset 0 Hz

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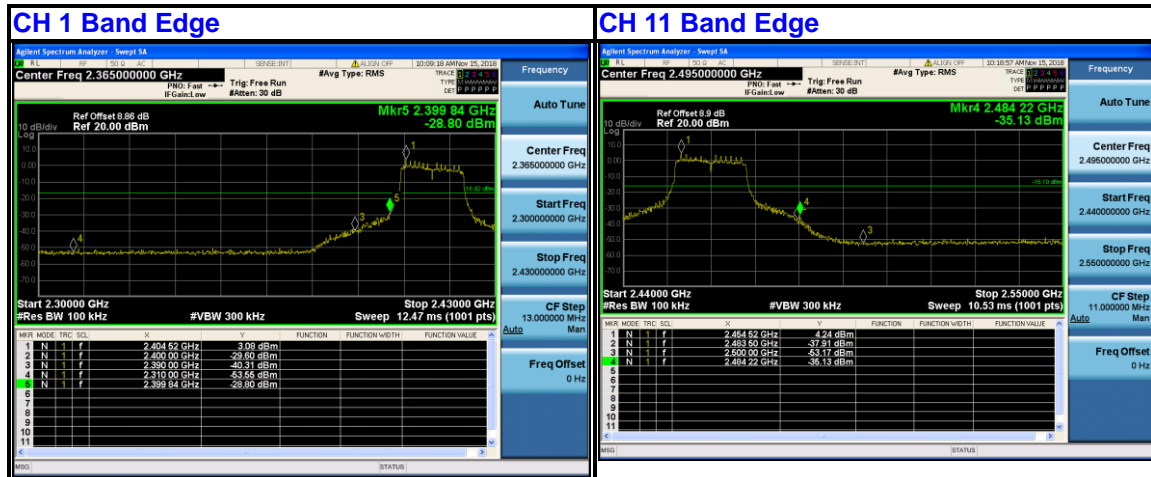
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 Dongguan Branch

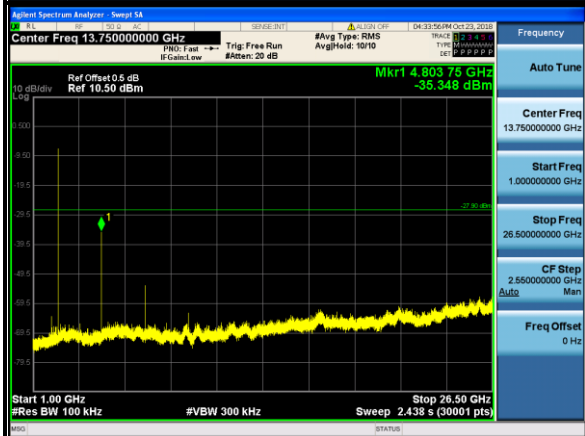
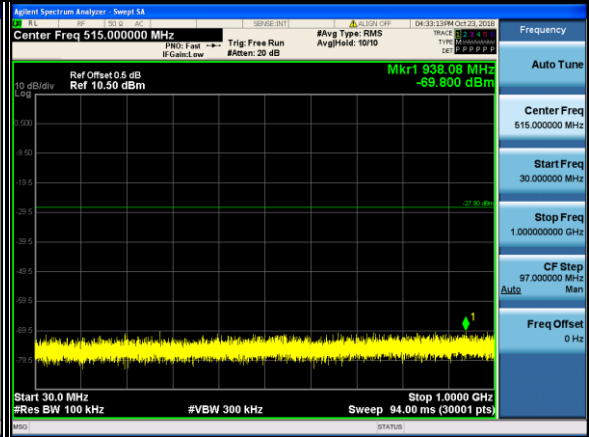
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 Houjie Town, Dongguan City, Guangdong 523942,
 China

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

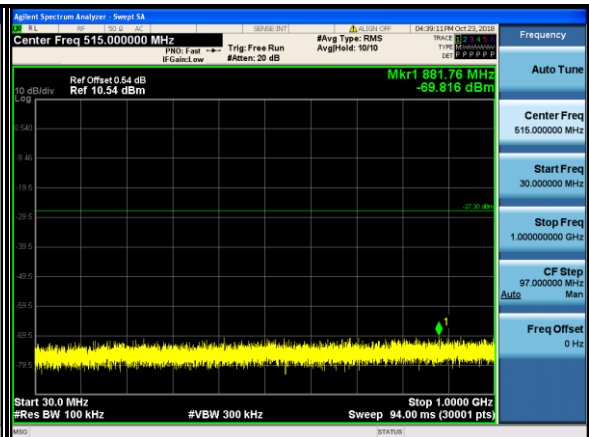


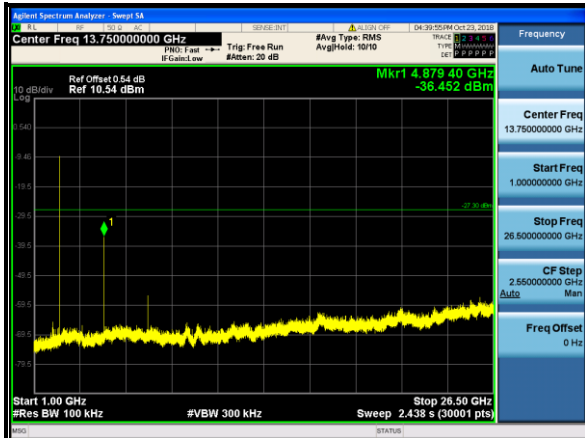
BT-LE (GFSK)

CH 0



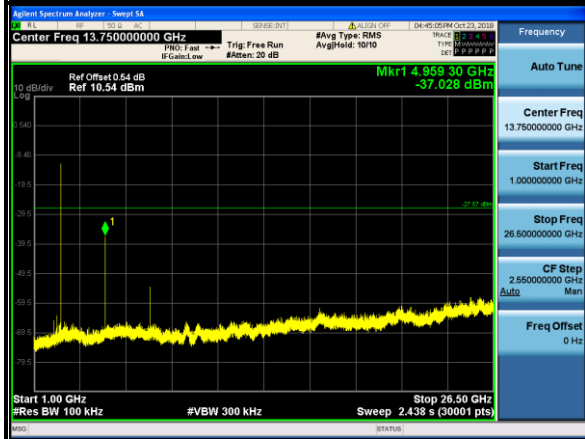
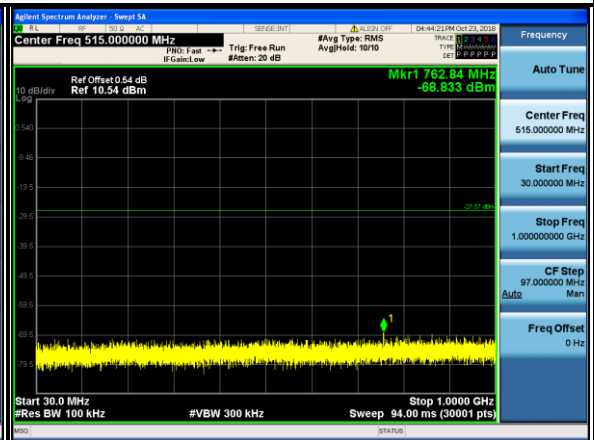
CH 19





Frequency	Auto Tune
Center Freq	13.750000000 GHz
Start Freq	1.000000000 GHz
Stop Freq	26.500000000 GHz
CF Step	2.550000000 GHz Auto Man
Freq Offset	0 Hz

CH 39

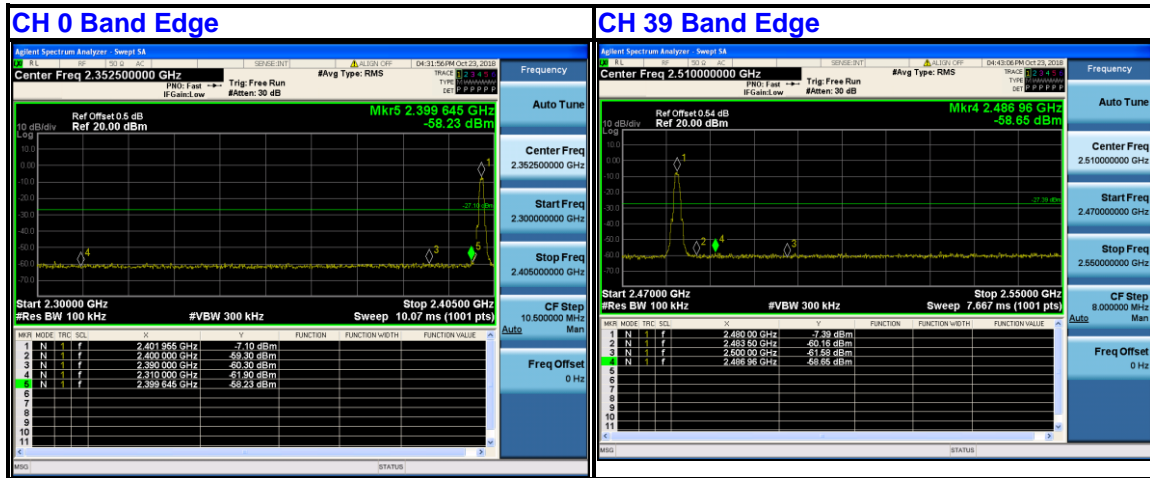


Frequency	Auto Tune
Center Freq	13.750000000 GHz
Start Freq	1.000000000 GHz
Stop Freq	26.500000000 GHz
CF Step	2.550000000 GHz Auto Man
Freq Offset	0 Hz



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Test Report No.: RF181011N013-2

4 PHOTOGRAPHS OF THE TEST CONFIGURATION

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



5 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---