

Prüfbericht-Nr.: Test Report No.:	15082611 001	Auftrags-Nr.: Order No.:	154095480	Seite 1 von 31 Page 1 of 31
Kunden-Referenz-Nr.: Client Reference No.:	626805	Auftragsdatum: Order date:	17.04.2015	
Auftraggeber: Client:	Murata Manufacturing Co., Ltd. 10-1, Higashikotari 1-chome, Nagaokakyo-shi, Kyoto 617-8555, Japan			
Prüfgegenstand: Test item:	BCG Sensor Node			
Bezeichnung / Typ-Nr.: Identification / Type No.:	SCA11H FCC ID: VPYAAF			
Auftrags-Inhalt: Order content:	Partial test			
Prüfgrundlage: Test specification:	FCC CFR47 Part 15, Subpart C Section 15.247 ANSI C63.4: 2014 KDB 558074 D01 DTS Meas Guidance v03r03			
Wareneingangsdatum: Date of receipt:	11.05.2015			
Prüfmuster-Nr.: Test sample No.:	A000213021-001			
Prüfzeitraum: Testing period:	26.05.2015 - 02.06.2015			
Ort der Prüfung: Place of testing:	MRT Technology (Suzhou) Co., Ltd			
Prüflaboratorium: Testing laboratory:	TÜV Rheinland (Shanghai) Co., Ltd.			
Prüfergebnis*: Test result*:	Pass			
geprüft von / tested by:		kontrolliert von / reviewed by:		
12.06.2015 Adrian Shi / PE Datum Name / Stellung Date Name / Position		12.06.2015 Shi Li / Reviewer Datum Name / Stellung Date Name / Position		
Sonstiges / Other:				
Zustand des Prüfgegenstandes bei Anlieferung: Condition of the test item at delivery:		Prüfmuster vollständig und unbeschädigt Test item complete and undamaged		
* Legende: 1 = sehr gut 2 = gut 3 = befriedigend 4 = ausreichend 5 = mangelhaft P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet Legend: 1 = very good 2 = good 3 = satisfactory 4 = sufficient 5 = poor P(ass) = passed a.m. test specification(s) F(ail) = failed a.m. test specification(s) N/A = not applicable N/T = not tested				
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.				

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TEST SUMMARY

5.1.1 ANTENNA REQUIREMENT

RESULT: Pass

5.1.2 SPURIOUS EMISSION

RESULT: Pass

5.1.3 CONDUCTED EMISSIONS

RESULT: Pass

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APPENDIX I- RF EXPOSURE STATEMENT**APPENDIX II- PHOTOGRAPHS OF THE TEST SET-UP**

1. General Remarks

1.1 Complementary Materials

Null

2. Test Sites

2.1 Test Facilities

MRT Technology (Suzhou) Co., Ltd.

D8 Building, Youxin Industrial Park, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China

The used test equipment is in accordance with CISPR 16 for measurement of radio interference.

The Federal Communications Commission has reviewed the technical characteristics of the radiated and conducted emission facility, and has found these test facilities to be in compliance with the requirements of section 2.948 of the FCC rules. The description of the test facility is listed under FCC registration number 809388.

The Industry Canada has reviewed the technical characteristics of the radiated and conducted emission facility, and has found these test facilities to be in compliance. The description of the test facility is listed under chambers filing number 11384A.

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment
Conducted Emissions

Instrument	Manufacturer	Type No.	Serial No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR7	101209	1 year	2015/11/07
Two-Line V-Network	R&S	ENV216	101683	1 year	2015/11/07
Two-Line V-Network	R&S	ENV216	101684	1 year	2015/11/07
Temperature/ Meter Humidity	Anymetre	TH101B	SR2-01	1 year	2015/11/14

Radiated Emission

Spectrum Analyzer	Agilent	N9010A	MY5144016A	1 year	2015/10/09
Preamplifier	MRT	AP01G18	1310002	1 year	2015/10/06
Loop Antenna	Schwarzbeck	FMZB1519	1519-041	1 year	2015/11/08
TRILOG Antenna	Schwarzbeck	VULB9162	9162-047	1 year	2015/11/08
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1167	1 year	2015/11/08
Broadband Horn Antenna	Schwarzbeck	BBHA9170	9170-549	1 year	2016/01/05
Temperature/Humidity Meter	Anymetre	TH101B	AC1-01	1 year	2015/11/15

Conducted Test Equipment

Spectrum Analyzer	Agilent	N9020A	MRTSUE06106	1 year	2016/04/23
USB Wideband Power Sensor	Boonton	55006	MRTSUE06109	1 year	2015/10/15
Temperature/Humidity Meter	Anymetre	TH101B	TR3-01	1 year	2015/11/14

2.3 Traceability

All measurement equipment calibrations are traceable to NIST or where calibration is performed outside the United States, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

2.5 Measurement Uncertainty

Table 2: Measurement Uncertainty

Measurement Type	Frequency	Uncertainty
Antenna Port Conducted Emission	< 1GHz	±0.39dB
	> 1GHz	±0.68dB
Radiated Emission	30MHz - 1GHz	±5.34dB
	> 1GHz	±5.40dB

3. General Product Information

3.1 Product Function and Intended Use

The EUT (Equipment Under Test) is BCG Sensor Node with Wi-Fi function.

For details refer to the User Manual and Circuit Diagram.

3.2 Ratings and System Details

Kind of Equipment	BCG Sensor Node
Type Designation	SCA11H
Wireless Standard	802.11b/g/n(HT20)
Operating Frequency band	2412 – 2462MHz
Channel Separation	5MHz
Modulation	DSSS, OFDM
Antenna Type	PCB antenna
Antenna Gain	3.3dBi
Extreme Temperature Range	+10~+55°C
Operation Voltage	DC 9V

Table 3: Carrier Frequency of Wi-Fi

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
2400 – 2483.5 MHz	1	2412 MHz	8	2447 MHz
	2	2417 MHz	9	2452 MHz
	3	2422 MHz	10	2457 MHz
	4	2427 MHz	11	2462 MHz
	5	2432 MHz		
	6	2437 MHz		
	7	2442 MHz		

3.3 Independent Operation Modes

The basic operation modes are:

- A. On
 - 1. Wi-Fi mode
 - a. Transmitting
 - i. Low Channel
 - ii. Middle Channel
 - iii. High Channel
 - b. Receiving
- B. Standby
- C. Off

3.4 Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram.

3.5 Submitted Documents

- | | |
|--------------------|----------------------|
| - Bill of Material | - Circuit Diagram |
| - PCB Layout | - Instruction Manual |
| - Photo Document | - Rating Label |

4. Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

The equipment under test (EUT) was configured to measure its maximum power level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Test operation refers to test setup in chapter 5. All testing were performed according to the procedures in ANSI C63.4: 2014.

Software used for testing: wl.exe

This software was running on the laptop computer connected to the EUT. It was used to enable the test operation modes listed in section 3.3 as appropriate for conducted test.

Mode	Data Rate (Mbps)	Worst Case
802.11b	1, 2, 5, 11	11 Mbps
802.11g	6, 9, 12, 18, 24, 36, 48, 54	54 Mbps
802.11n(HT20)	6.5, 13.0, 19.5, 26.0, 39.0, 52.0, 58.5, 65.0 (MCS0 ~ MCS7)	65 Mbps

All modes of operation and data rates were investigated, but only worst case data rate was executed for all test requirements.

4.3 Special Accessories and Auxiliary Equipment

The EUT was tested together with the following accessories:

Description	Manufacturer	Part No.	S/N
Laptop	DELL	PP11L	QDS-BRCM1017

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4.4 Countermeasures to achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Constructional Data Form or the Technical Construction File. No additional measures were employed to achieve compliance.

5. Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

RESULT:**Pass**

Test standard : FCC Part 15.247(b)(4) and Part 15.203
Limit The use of antennas with directional gains that do not exceed 6dBi

According to the manufacturer declared, the EUT has a PCB antenna, the directional gain of antenna is 3.3dBi and the antenna connector is designed with permanent attachment and no consideration of replacement. Therefore the EUT is considered sufficient to comply with the provision.

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5.1.2 Spurious Emission

RESULT:**Pass**

Date of testing : 2015-05-28
Test standard : FCC part 15.247(d)
Basic standard : ANSI C63.4: 2014
Clause 11 of KDB 558074 v03r03
Limits : FCC part 15.209(a)
Kind of test site : 3m Semi-Anechoic Chamber

Test setup

Test Channel : Low/ Middle/ High
Operation mode : A.1
Ambient temperature : 25°C
Relative humidity : 52%
Atmospheric pressure : 101kPa

Table 4: Test result of Spurious Emission of transmitting of Wi-Fi (802.11b)

Channel	Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
Low	192.475	37.077	25.179	-6.423	43.500	11.898	PK	H
	192.512	34.200	22.300	-9.300	43.500	11.900	QP	
	229.335	38.341	25.343	-7.659	46.000	12.998	PK	
	230.002	35.522	22.500	-10.478	46.000	13.023	QP	
	4825.000	41.486	38.786	-32.514	74.000	2.700	PK	
	7239.000	45.311	37.487	-28.689	74.000	7.824	PK	
	41.640	33.082	18.927	-6.918	40.000	14.155	PK	V
	41.845	28.394	14.200	-11.606	40.000	14.194	QP	
	457.770	37.863	20.398	-8.137	46.000	17.465	PK	
	457.856	34.666	17.200	-11.334	46.000	17.466	QP	
	4825.000	40.836	38.136	-33.164	74.000	2.700	PK	
	10528.50	49.482	37.030	-24.518	74.000	12.453	PK	
Middle	192.475	36.823	24.925	-6.677	43.500	11.898	PK	H
	192.482	34.499	22.600	-9.001	43.500	11.899	QP	
	409.270	38.318	21.528	-7.682	46.000	16.790	PK	
	410.012	36.101	19.300	-9.899	46.000	16.801	QP	
	4876.000	39.724	37.049	-34.276	74.000	2.675	PK	
	10894.00	48.696	35.747	-25.304	74.000	12.949	PK	
	41.155	33.371	19.308	-6.629	40.000	14.063	PK	V
	41.231	30.278	16.200	-9.722	40.000	14.077	QP	
	192.475	35.832	23.934	-7.668	43.500	11.898	PK	
	192.475	32.998	21.100	-10.502	43.500	11.898	QP	
	4876.000	39.589	36.914	-34.411	74.000	2.675	PK	
	7783.000	45.706	37.441	-28.294	74.000	8.265	PK	
High	192.475	37.075	25.177	-6.425	43.500	11.898	PK	H
	192.486	35.299	23.400	-8.201	43.500	11.899	QP	
	409.270	40.146	23.356	-5.854	46.000	16.790	PK	
	410.110	38.102	21.300	-7.898	46.000	16.802	QP	
	4927.000	39.825	37.055	-34.175	74.000	2.770	PK	
	11642.00	49.155	36.788	-24.845	74.000	12.367	PK	
	40.670	33.085	19.114	-6.915	40.000	13.971	PK	V
	40.745	29.186	15.200	-10.814	40.000	13.985	QP	
	192.475	35.088	23.190	-8.412	43.500	11.898	PK	
	192.483	32.999	21.100	-10.501	43.500	11.899	QP	
	4927.000	40.282	37.512	-33.718	74.000	2.770	PK	
	9806.000	48.088	36.567	-25.912	74.000	11.521	PK	

Notes:

- For 9 kHz ~ 30 MHz, the amplitude of spurious emissions that are attenuated by more than 20dB below the permissible. The value has no need to be reported.
- Due to the peak measure values also meet the average limit (54dBm), the average measurement is not tested based on technical judgment.

Table 5: Test result of Spurious Emission of transmitting of Wi-Fi (802.11g)

Channel	Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
Low	192.475	36.726	24.828	-6.774	43.500	11.898	PK	H
	192.874	33.522	21.600	-9.978	43.500	11.922	QP	
	227.880	38.701	25.768	-7.299	46.000	12.933	PK	
	228.012	31.139	18.200	-14.861	46.000	12.938	QP	
	4825.000	39.877	37.177	-34.123	74.000	2.700	PK	
	9440.500	47.235	36.729	-26.765	74.000	10.506	PK	
	36.790	32.727	19.485	-7.273	40.000	13.242	PK	V
	36.812	27.446	14.200	-12.554	40.000	13.245	QP	
	192.475	34.823	22.925	-8.677	43.500	11.898	PK	
	192.481	31.699	19.800	-11.801	43.500	11.899	QP	
	8548.000	45.473	36.881	-28.527	74.000	8.592	PK	
	10571.00	48.631	36.193	-25.369	74.000	12.438	PK	
Middle	192.475	36.564	24.666	-6.936	43.500	11.898	PK	H
	192.746	33.214	21.300	-10.286	43.500	11.914	QP	
	409.270	38.761	21.971	-7.239	46.000	16.790	PK	
	410.362	36.206	19.400	-9.794	46.000	16.807	QP	
	4876.000	41.071	38.396	-32.929	74.000	2.675	PK	
	11489.00	49.422	36.668	-24.578	74.000	12.754	PK	
	36.305	32.289	19.136	-7.711	40.000	13.153	PK	V
	36.487	27.987	14.800	-12.013	40.000	13.187	QP	
	192.475	33.750	21.852	-9.750	43.500	11.898	PK	
	192.483	30.499	18.600	-13.001	43.500	11.899	QP	
	7978.500	46.878	38.190	-27.122	74.000	8.688	PK	
	11650.50	49.022	36.711	-24.978	74.000	12.311	PK	
High	192.475	36.493	24.595	-7.007	43.500	11.898	PK	H
	192.523	34.301	22.400	-9.199	43.500	11.901	QP	
	409.270	38.372	21.582	-7.628	46.000	16.790	PK	
	410.021	36.001	19.200	-9.999	46.000	16.801	QP	
	7987.000	45.754	37.011	-28.246	74.000	8.743	PK	
	10936.50	48.860	35.833	-25.140	74.000	13.027	PK	
	41.640	32.687	18.532	-7.313	40.000	14.155	PK	V
	41.874	27.700	13.500	-12.300	40.000	14.199	QP	
	457.285	38.411	20.954	-7.589	46.000	17.457	PK	
	457.568	35.661	18.200	-10.339	46.000	17.462	QP	
	9194.000	46.167	36.063	-27.833	74.000	10.104	PK	
	10860.00	48.565	35.759	-25.435	74.000	12.806	PK	

Notes:

- For 9 kHz ~ 30 MHz, the amplitude of spurious emissions that are attenuated by more than 20dB below the permissible. The value has no need to be reported.
- Due to the peak measure values also meet the average limit (54dBm), the average measurement is not tested based on technical judgment.

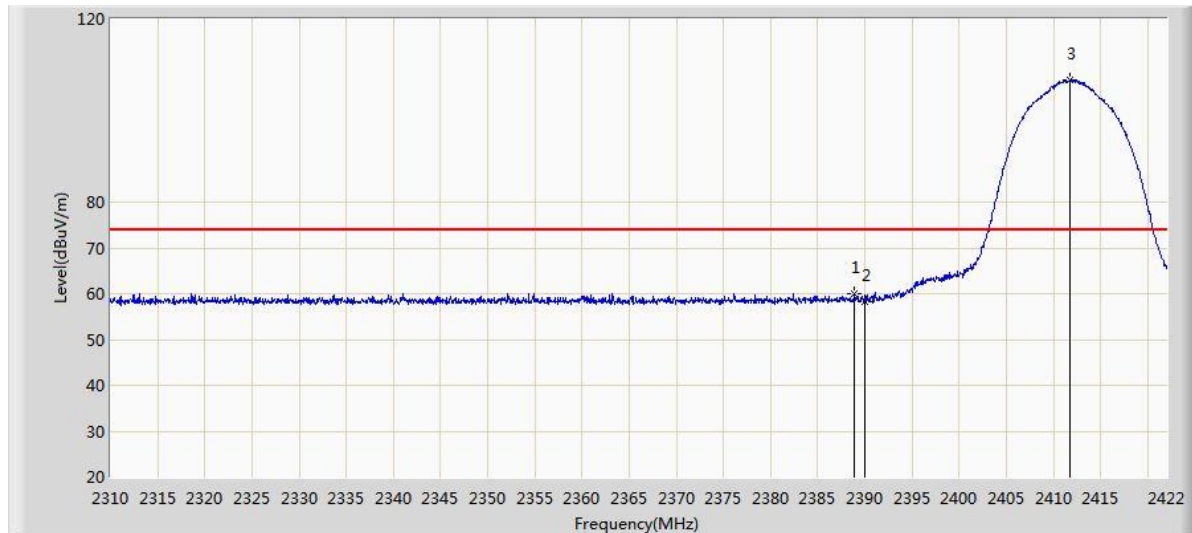
Table 6: Test result of Spurious Emission of transmitting of Wi-Fi (802.11n)

Channel	Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
Low	192.475	37.310	25.412	-6.190	43.500	11.898	PK	H
	192.482	34.299	22.400	-9.201	43.500	11.899	QP	
	409.270	39.380	22.590	-6.620	46.000	16.790	PK	
	409.486	37.393	20.600	-8.607	46.000	16.793	QP	
	4816.500	40.322	37.625	-33.678	74.000	2.697	PK	
	10401.00	48.729	36.419	-25.271	74.000	12.310	PK	
	41.155	32.555	18.492	-7.445	40.000	14.063	PK	V
	41.210	28.274	14.200	-11.726	40.000	14.073	QP	
	457.285	37.387	19.930	-8.613	46.000	17.457	PK	
	457.487	34.660	17.200	-11.340	46.000	17.460	QP	
	4740.000	39.682	37.178	-34.318	74.000	2.504	PK	
	7664.000	45.813	37.846	-28.187	74.000	7.967	PK	
Middle	192.475	36.680	24.782	-6.820	43.500	11.898	PK	H
	192.546	34.302	22.400	-9.198	43.500	11.902	QP	
	227.880	38.331	25.398	-7.669	46.000	12.933	PK	
	227.985	34.437	21.500	-11.563	46.000	12.937	QP	
	7876.500	45.757	37.391	-28.243	74.000	8.366	PK	
	11531.50	48.353	35.612	-25.647	74.000	12.740	PK	
	41.155	32.086	18.023	-7.914	40.000	14.063	PK	V
	41.210	28.274	14.200	-11.726	40.000	14.073	QP	
	192.475	35.380	23.482	-8.120	43.500	11.898	PK	
	192.482	34.299	22.400	-9.201	43.500	11.899	QP	
	7995.500	45.210	36.470	-28.790	74.000	8.740	PK	
	10851.50	48.400	35.624	-25.600	74.000	12.775	PK	
High	192.475	36.895	24.997	-6.605	43.500	11.898	PK	H
	192.483	34.099	22.200	-9.401	43.500	11.899	QP	
	229.335	38.395	25.397	-7.605	46.000	12.998	PK	
	230.021	34.423	21.400	-11.577	46.000	13.023	QP	
	4927.000	38.380	35.610	-35.620	74.000	2.770	PK	
	10537.00	48.443	35.987	-25.557	74.000	12.456	PK	
	192.475	34.761	22.863	-8.739	43.500	11.898	PK	V
	192.482	31.999	20.100	-11.501	43.500	11.899	QP	
	409.270	35.396	18.606	-10.604	46.000	16.790	PK	
	409.321	30.991	14.200	-15.009	46.000	16.791	QP	
	192.475	34.761	22.863	-8.739	43.500	11.898	PK	
	4927.000	39.535	36.765	-34.465	74.000	2.770	PK	
	11268.00	49.458	37.041	-24.542	74.000	12.417	PK	

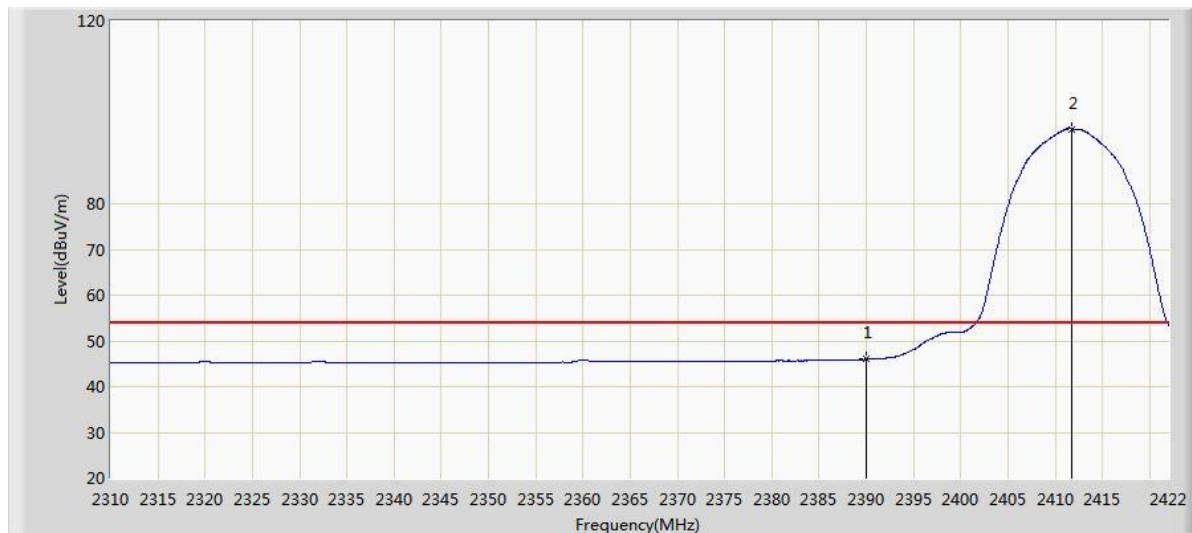
Notes:

1. For 9 kHz ~ 30 MHz, the amplitude of spurious emissions that are attenuated by more than 20dB below the permissible. The value has no need to be reported.
2. Due to the peak measure values also meet the average limit (54dBm), the average measurement is not tested based on technical judgment.

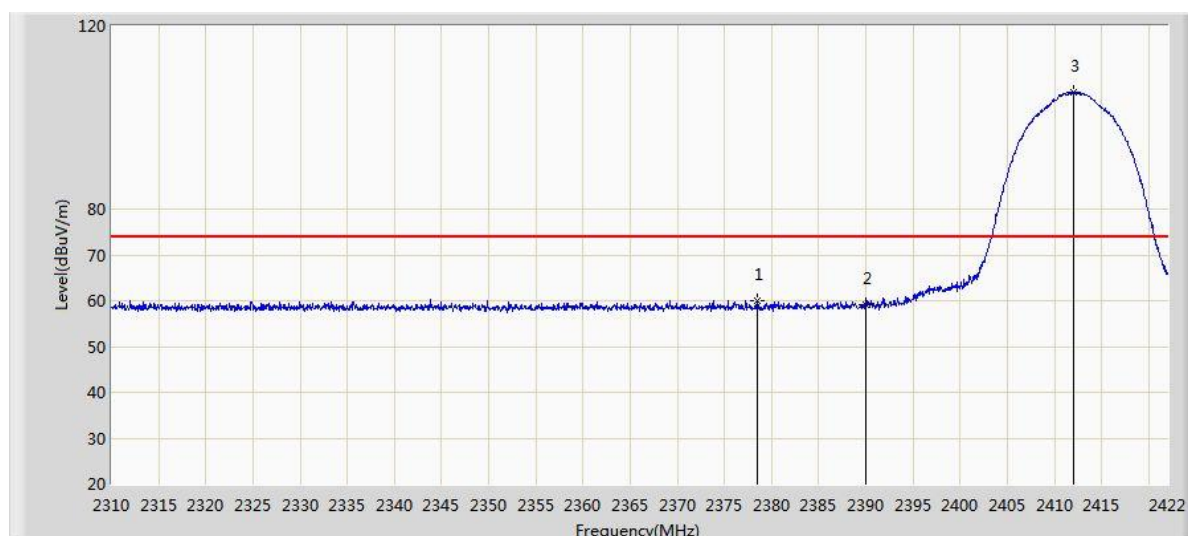
Test Plot of Frequency Band Edge of 802.11b mode Low Channel



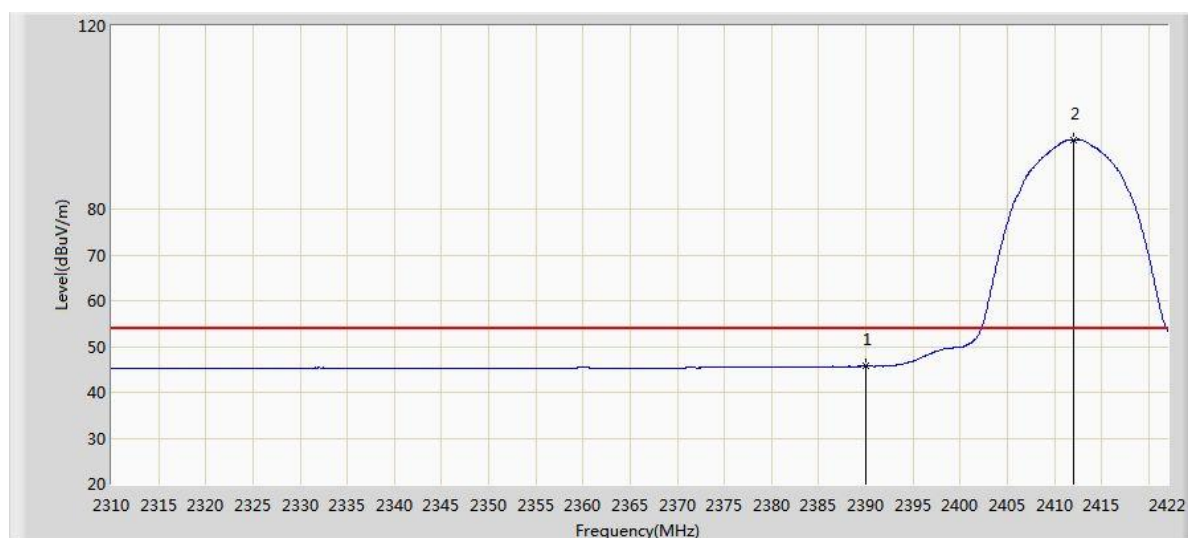
Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
2388.904	60.136	28.931	-13.864	74.000	31.205	PK	H
2390.000	58.373	27.170	-15.627	74.000	31.203	PK	
2411.808	106.771	75.601	N/A	N/A	31.170	PK	



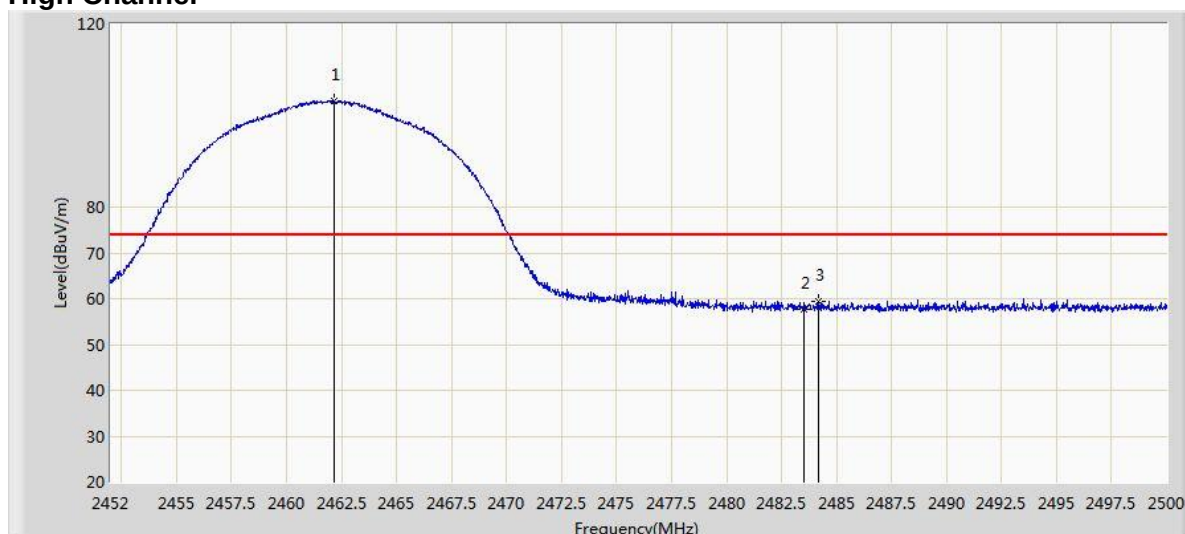
Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
2390.000	45.966	14.763	-8.034	54.000	31.203	AV	H
2411.808	96.302	65.132	N/A	N/A	31.170	AV	



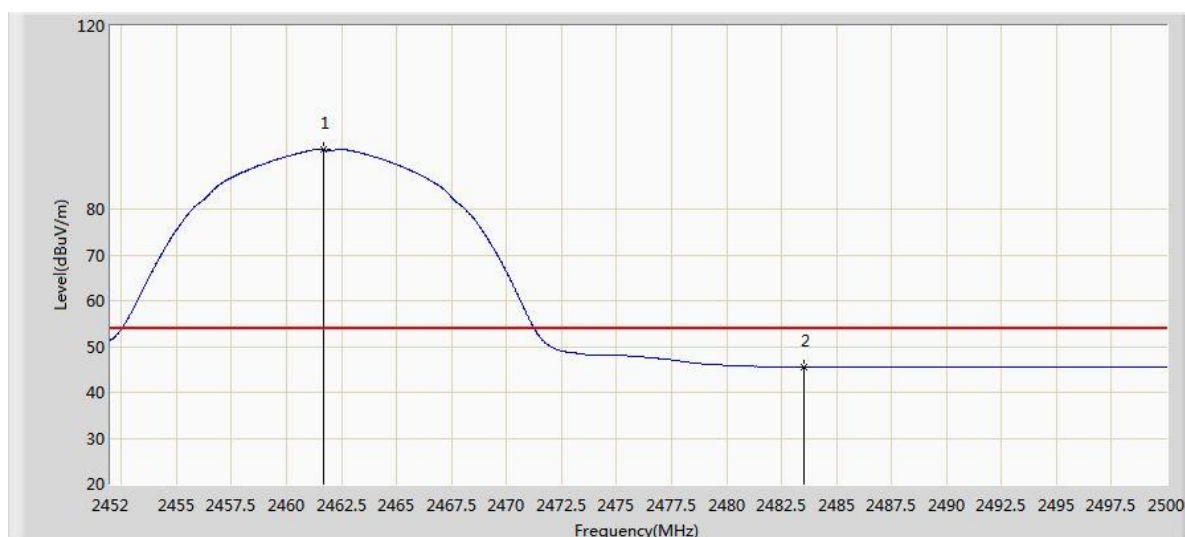
Freq. (MHz)	Measure Level (dB µ V/m)	Reading (dB µ V)	Margin (dB)	Limit (dB µ V/m)	Correct Factor (dB)	Detector	Polar
2378.544	60.144	28.920	-13.856	74.000	31.224	PK	V
2390.000	59.057	27.854	-14.943	74.000	31.203	PK	
2412.032	105.593	74.423	N/A	N/A	31.170	PK	



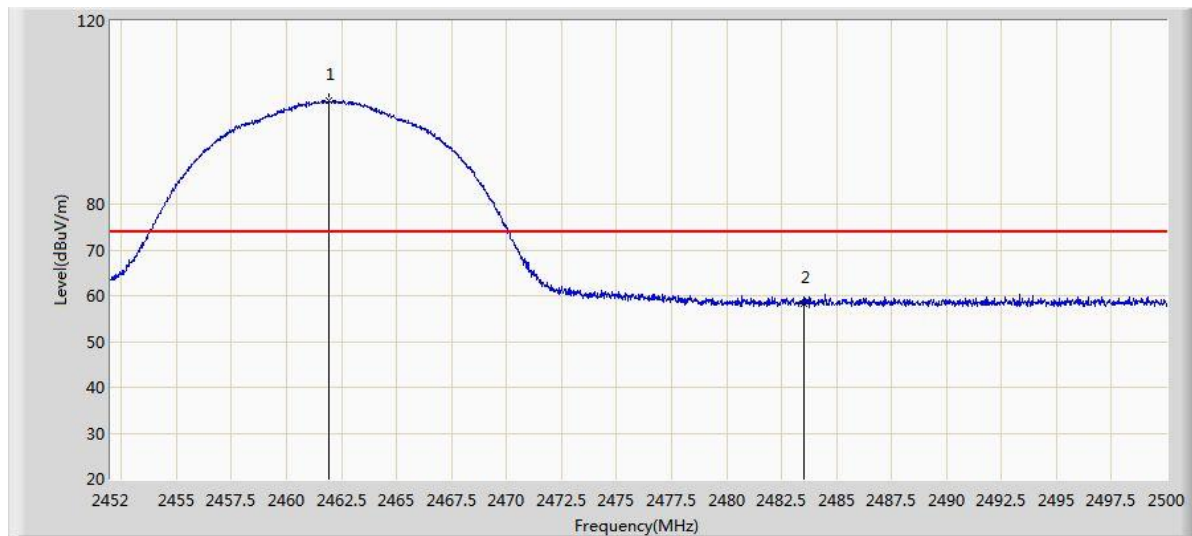
Freq. (MHz)	Measure Level (dB µ V/m)	Reading (dB µ V)	Margin (dB)	Limit (dB µ V/m)	Correct Factor (dB)	Detector	Polar
2390.000	45.708	14.505	-8.292	54.000	31.203	AV	V
2412.088	95.012	63.843	N/A	N/A	31.170	AV	

High Channel


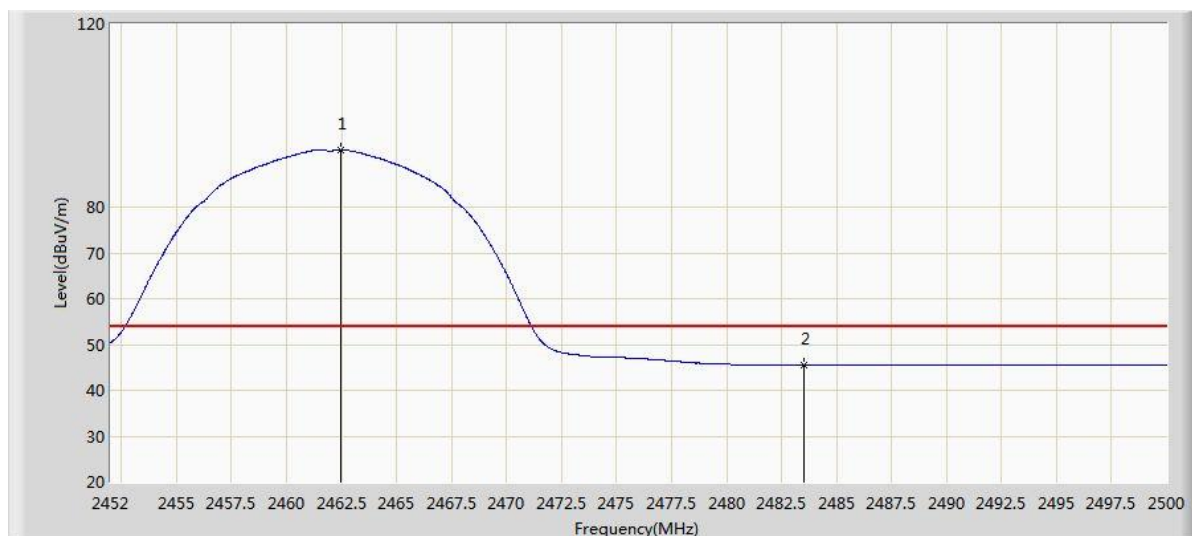
Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
2462.152	103.076	71.940	N/A	N/A	31.136	PK	H
2483.500	57.823	26.630	-16.177	74.000	31.194	PK	
2484.160	59.499	28.304	-14.501	74.000	31.195	PK	



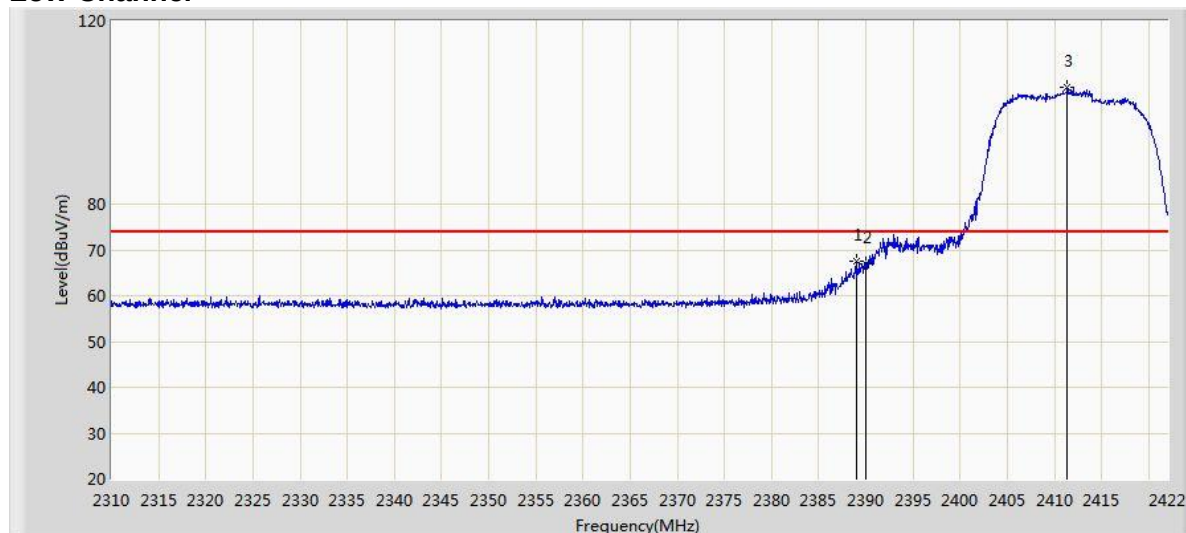
Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
2461.672	93.040	61.905	N/A	N/A	31.135	AV	H
2483.500	45.568	14.375	-8.432	54.000	31.194	AV	



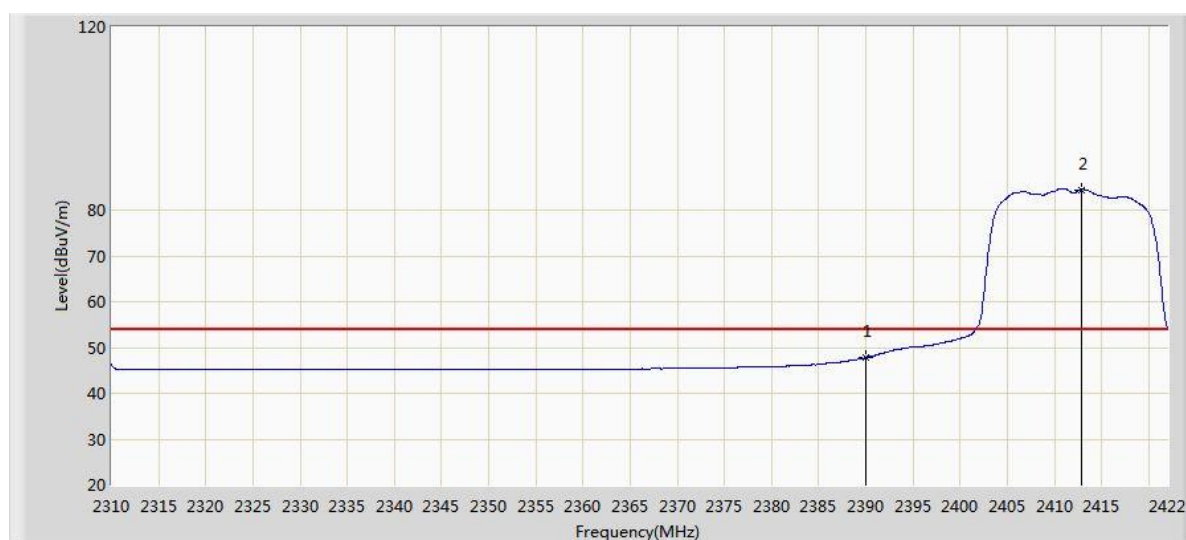
Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
2461.912	102.741	71.606	N/A	N/A	31.135	PK	V
2483.500	58.129	26.936	-15.871	74.000	31.194	PK	



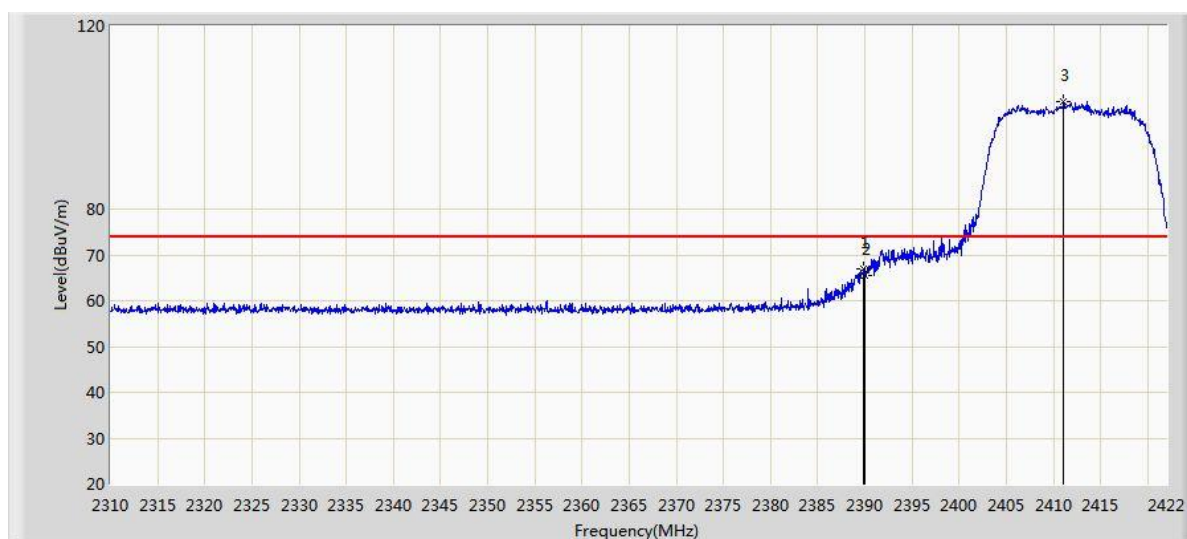
Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
2462.488	92.518	61.382	N/A	N/A	31.136	AV	V
2483.500	45.489	14.296	-8.511	54.000	31.194	AV	

Test Plot of Frequency Band Edge of 802.11g mode
Low Channel


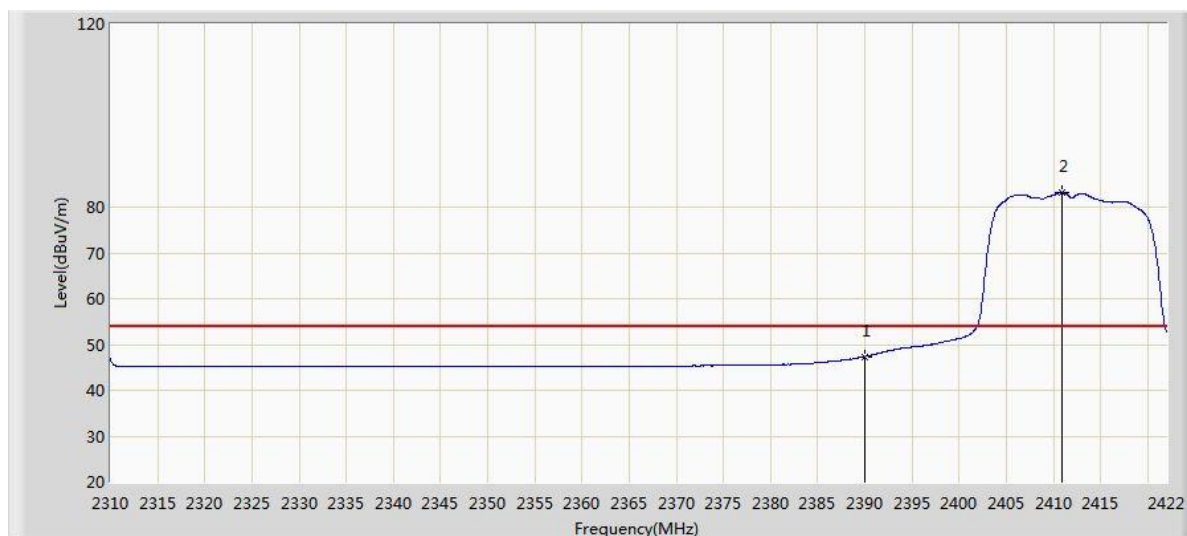
Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
2389.016	67.573	36.368	-6.427	74.000	31.204	PK	H
2390.000	66.882	35.679	-7.118	74.000	31.203	PK	
2411.360	105.421	74.250	N/A	N/A	31.170	PK	



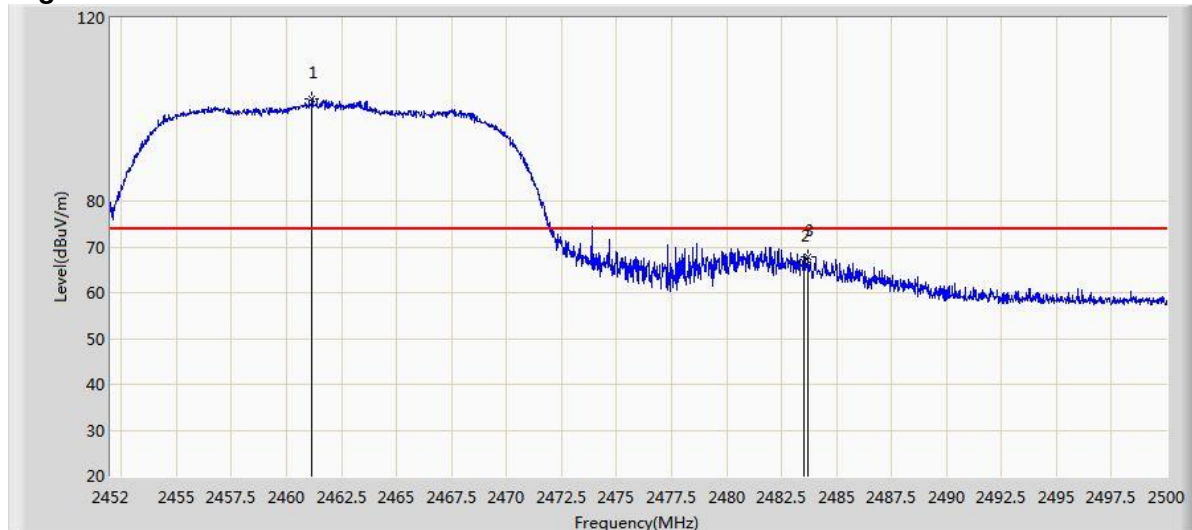
Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
2390.000	47.792	16.589	-6.208	54.000	31.203	AV	H
2412.872	84.484	53.316	N/A	N/A	31.168	AV	



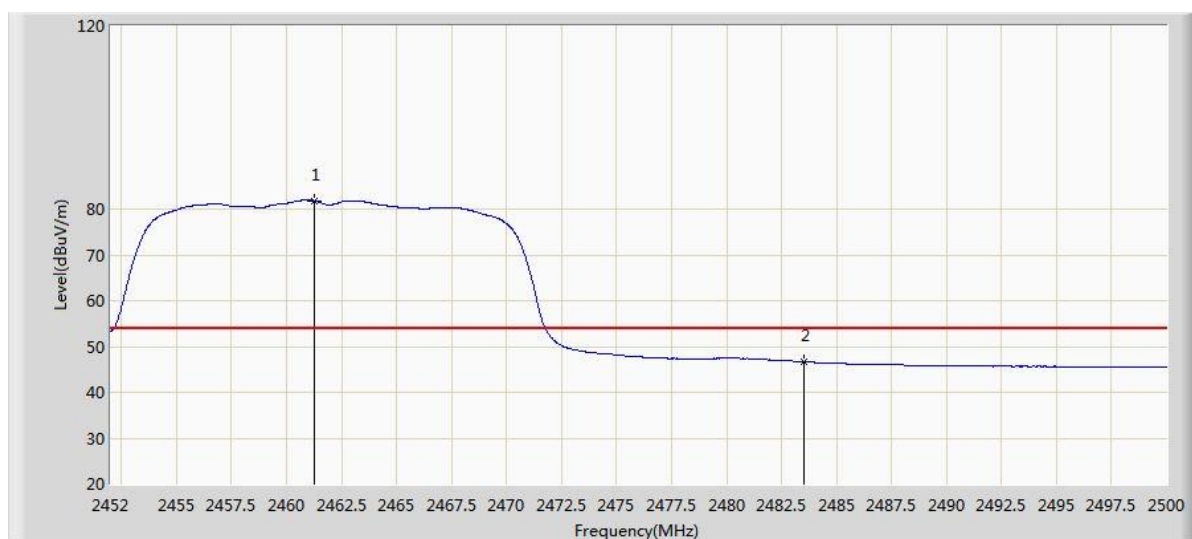
Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
2389.912	66.956	35.753	-7.044	74.000	31.203	PK	V
2390.000	65.631	34.428	-8.369	74.000	31.203	PK	
2411.080	103.511	72.340	N/A	N/A	31.171	PK	



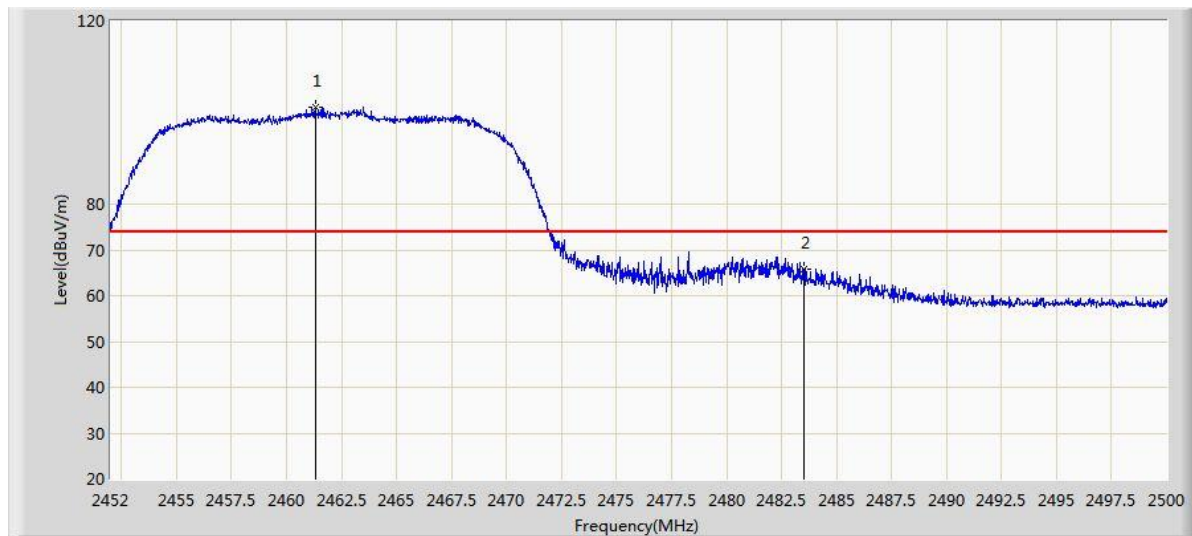
Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
2390.000	47.357	16.154	-6.643	54.000	31.203	AV	V
2410.912	83.115	51.944	N/A	N/A	31.171	AV	

High Channel


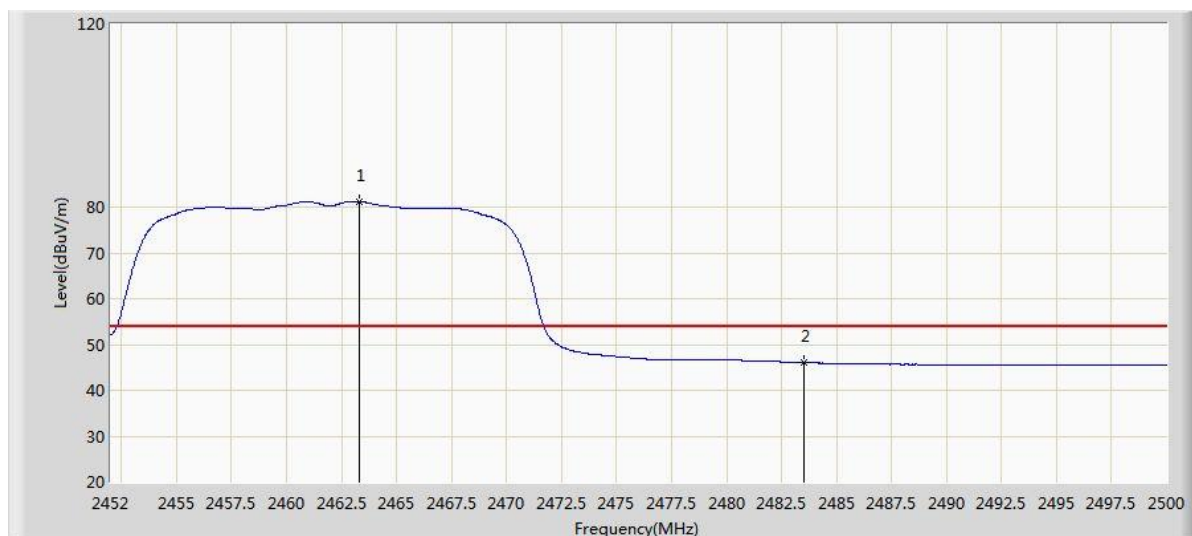
Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
2461.144	102.286	71.152	N/A	N/A	31.134	PK	H
2483.500	66.568	35.375	-7.432	74.000	31.194	PK	
2483.728	67.859	36.665	-6.141	74.000	31.194	PK	



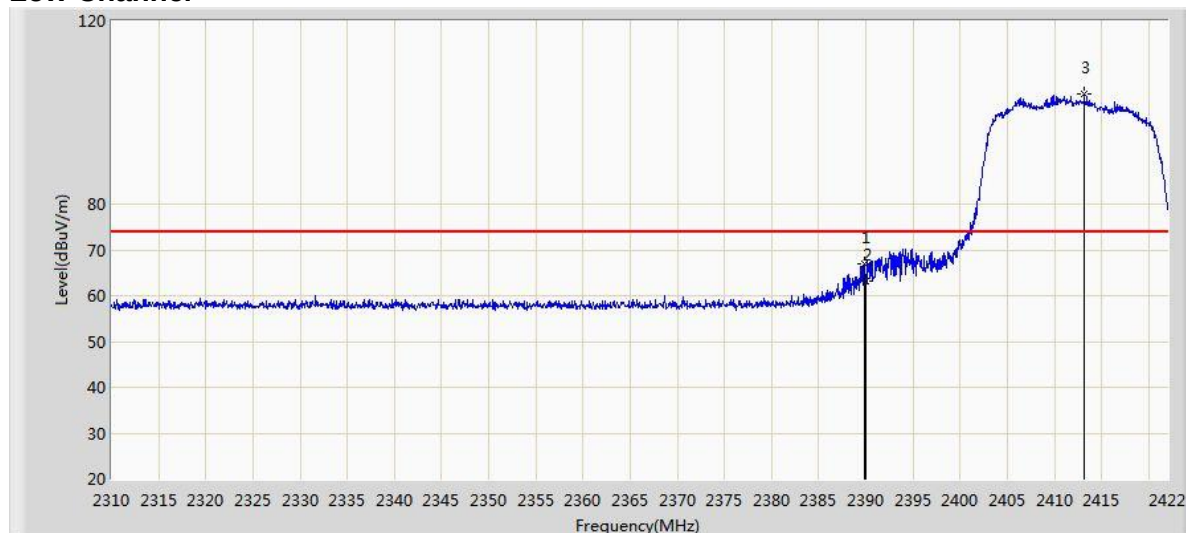
Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
2461.240	81.807	50.673	N/A	N/A	31.134	AV	H
2483.500	46.655	15.462	-7.345	54.000	31.194	AV	



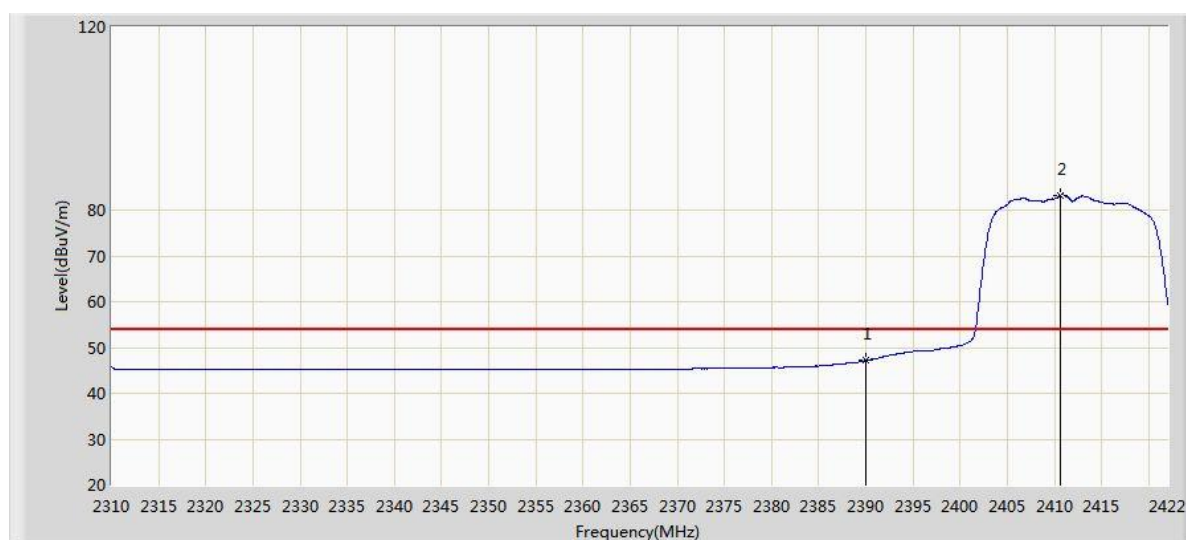
Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
2461.312	101.213	70.079	N/A	N/A	31.134	PK	V
2483.500	65.693	34.500	-8.307	74.000	31.194	PK	



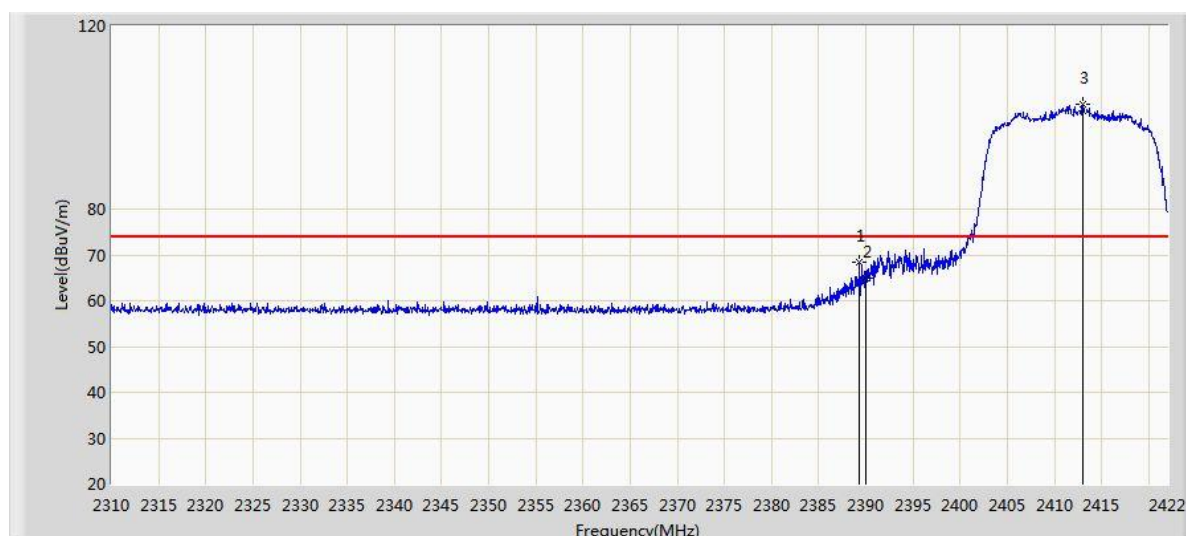
Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
2463.304	81.165	50.027	N/A	N/A	31.138	AV	V
2483.500	46.110	14.917	-7.890	54.000	31.194	AV	

Test Plot of Frequency Band Edge of 802.11n mode
Low Channel


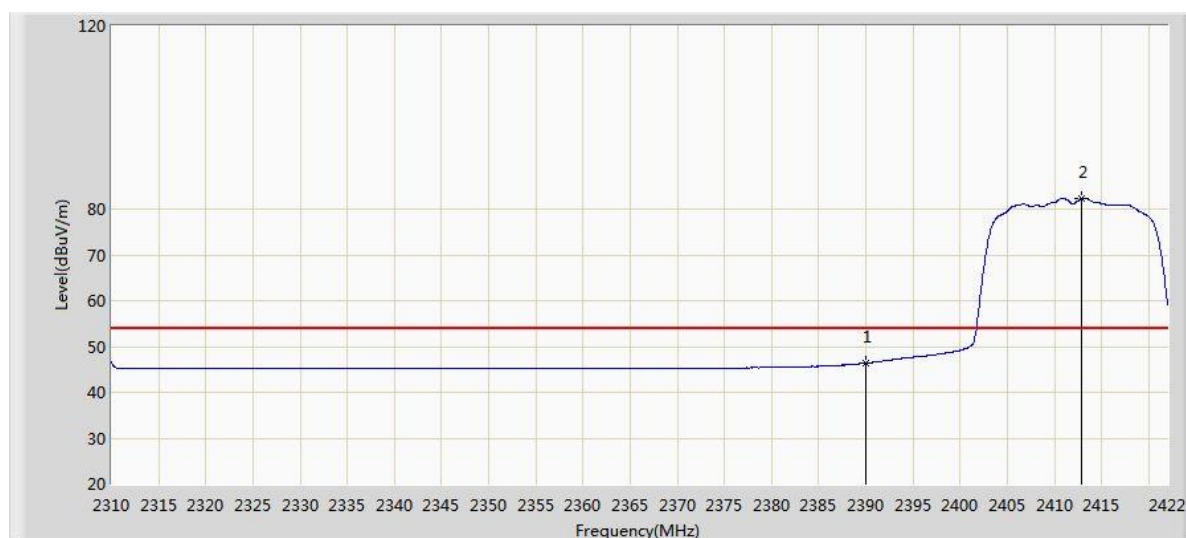
Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
2389.912	66.980	35.777	-7.020	74.000	31.203	PK	H
2390.000	63.149	31.946	-10.851	74.000	31.203	PK	
2413.152	104.051	72.883	N/A	N/A	31.167	PK	



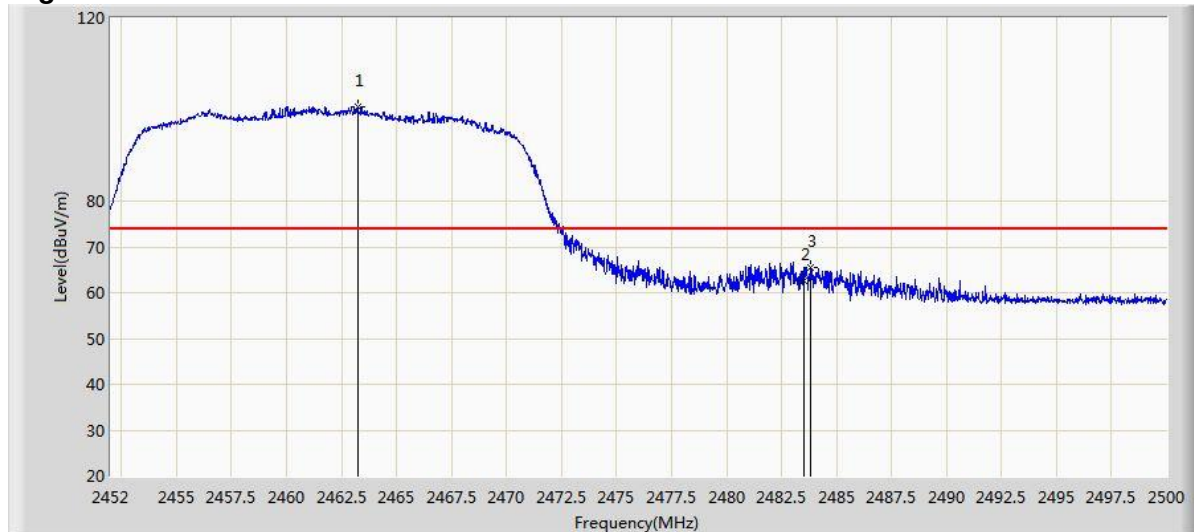
Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
2390.000	47.135	15.932	-6.865	54.000	31.203	AV	H
2410.632	83.273	52.101	N/A	N/A	31.172	AV	



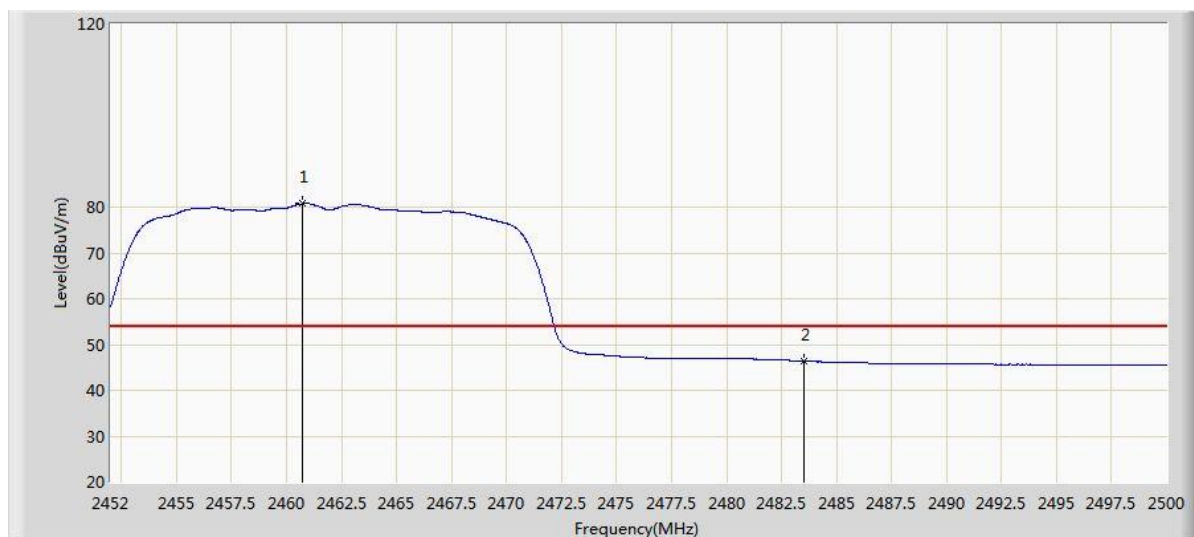
Freq. (MHz)	Measure Level (dB µ V/m)	Reading (dB µ V)	Margin (dB)	Limit (dB µ V/m)	Correct Factor (dB)	Detector	Polar
2389.352	68.483	37.279	-5.517	74.000	31.203	PK	V
2390.000	65.016	33.813	-8.984	74.000	31.203	PK	
2413.040	102.854	71.686	N/A	N/A	31.167	PK	



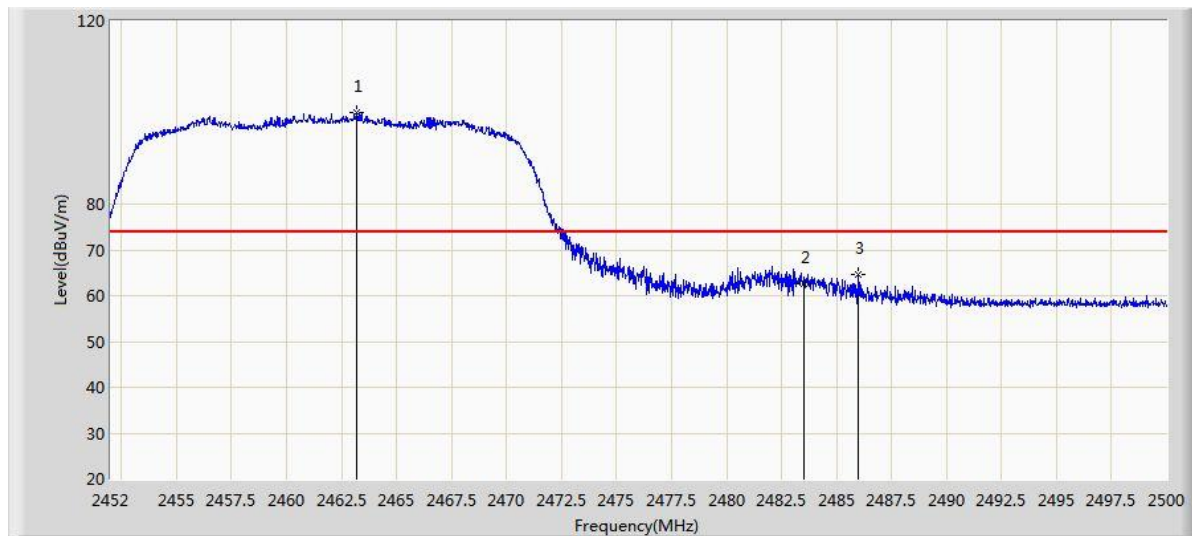
Freq. (MHz)	Measure Level (dB µ V/m)	Reading (dB µ V)	Margin (dB)	Limit (dB µ V/m)	Correct Factor (dB)	Detector	Polar
2390.000	46.338	15.135	-7.662	54.000	31.203	AV	V
2412.928	82.277	51.109	N/A	N/A	31.168	AV	

High Channel


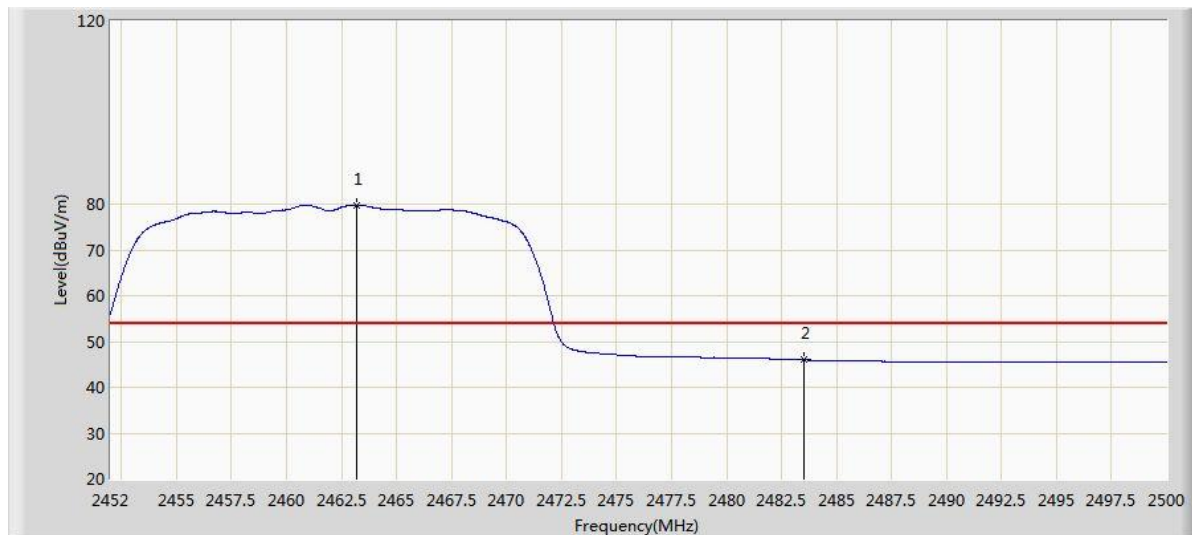
Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
2463.232	100.706	69.568	N/A	N/A	31.137	PK	H
2483.500	62.737	31.544	-11.263	74.000	31.194	PK	
2483.824	65.489	34.295	-8.511	74.000	31.194	PK	



Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
2460.712	80.728	49.595	N/A	N/A	31.133	AV	H
2483.500	46.365	15.172	-7.635	54.000	31.194	AV	



Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
2463.208	100.071	68.933	N/A	N/A	31.137	PK	V
2483.500	62.497	31.304	-11.503	74.000	31.194	PK	
2486.008	64.559	33.359	-9.441	74.000	31.200	PK	



Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
2463.160	79.798	48.660	N/A	N/A	31.137	AV	V
2483.500	45.967	14.774	-8.033	54.000	31.194	AV	

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Test Report No.

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5.1.3 Conducted emissions**RESULT:****Pass**

Date of testing : 2015-06-02
Test standard : FCC Part 15.207
Basic standard : ANSI C63.4: 2014
Frequency range : 0.15 – 30MHz
Limits : FCC Part 15.207
Kind of test site : Shield room

Test setup

Input Voltage : AC 120V, 60Hz
Operation Mode : A.1
Earthing : Not Connected
Ambient temperature : 25°C
Relative humidity : 52%
Atmospheric pressure : 101kPa

Table 7: Test result of Conducted Emission
L Phase

Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor	Type	Comment
0.354	40.667	30.619	-18.201	58.868	10.048	QP	PASS
0.354	32.554	22.507	-16.314	48.868	10.048	AV	PASS
0.394	40.915	30.835	-17.064	57.979	10.080	QP	PASS
0.394	25.698	15.617	-22.281	47.979	10.080	AV	PASS
0.594	32.610	22.492	-23.390	56.000	10.118	QP	PASS
0.594	23.076	12.958	-22.924	46.000	10.118	AV	PASS
0.718	32.953	22.899	-23.047	56.000	10.054	QP	PASS
0.718	18.198	8.144	-27.802	46.000	10.054	AV	PASS
0.974	30.026	20.104	-25.974	56.000	9.922	QP	PASS
0.974	19.119	9.197	-26.881	46.000	9.922	AV	PASS
1.162	31.141	21.238	-24.859	56.000	9.903	QP	PASS
1.162	21.862	11.959	-24.138	46.000	9.903	AV	PASS

N Phase

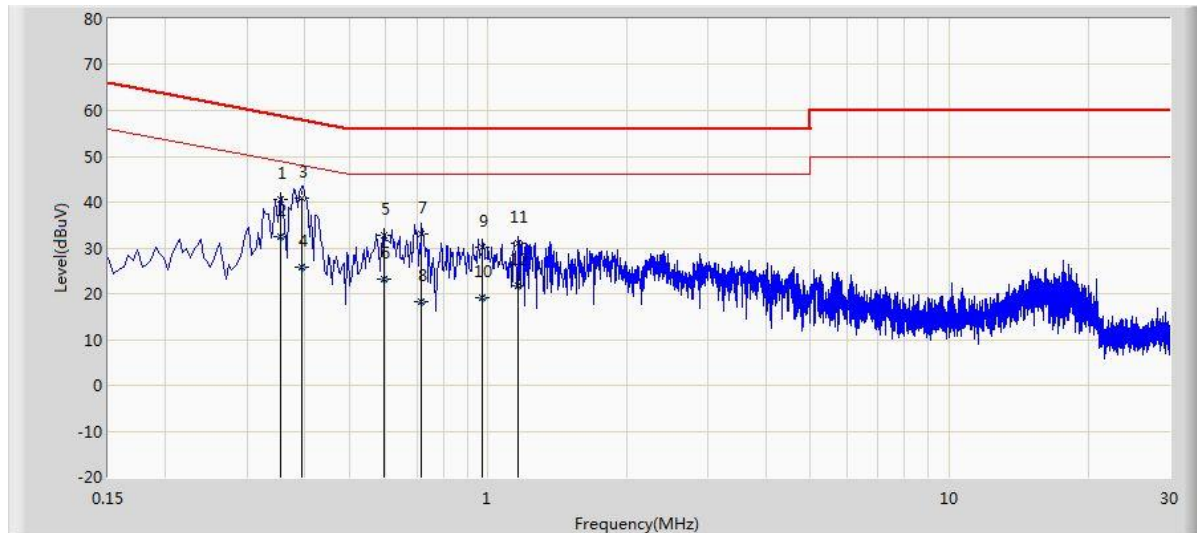
Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor	Type	Comment
0.322	39.423	29.369	-20.232	59.655	10.054	QP	PASS
0.322	23.096	13.042	-26.559	49.655	10.054	AV	PASS
0.354	43.683	33.606	-15.185	58.868	10.078	QP	PASS
0.354	34.536	24.459	-14.332	48.868	10.078	AV	PASS
0.378	44.678	34.582	-13.646	58.323	10.096	QP	PASS
0.378	35.415	25.319	-12.909	48.323	10.096	AV	PASS
0.394	43.342	33.234	-14.637	57.979	10.108	QP	PASS
0.394	26.958	16.850	-21.021	47.979	10.108	AV	PASS
0.718	36.341	26.276	-19.659	56.000	10.065	QP	PASS
0.718	20.201	10.137	-25.799	46.000	10.065	AV	PASS
1.214	32.856	22.954	-23.144	56.000	9.902	QP	PASS
1.214	17.256	7.354	-28.744	46.000	9.902	AV	PASS

Note:

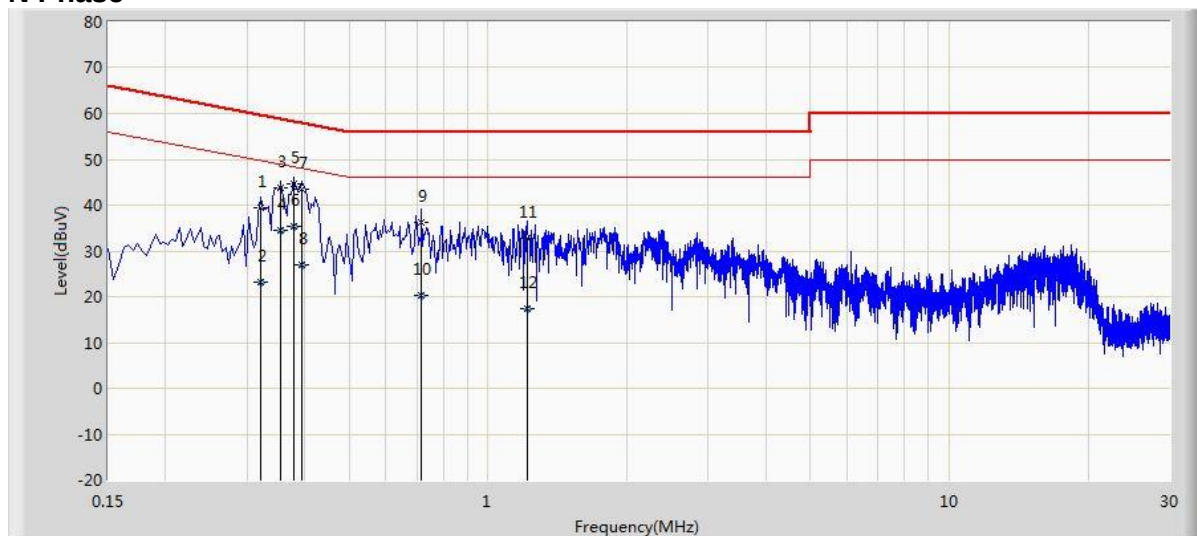
Only show worse case: Transmit at channel 2412MHz by 802.11b

Test Plot of Conducted Emission of 802.11b mode

L Phase



N Phase



6. List of Tables

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Appendix I- RF Exposure statement

FCC Requirement

According to FCC 2.1091, mobile equipment must comply with the following applicable limit for maximum permissible exposure (MPE) specified in FCC 1.1310:

Equipment Use	Frequency Range	Power Density [mW/cm ²]	Average Time [min]
General Population / Uncontrolled Exposure	1.5 – 100GHz	1	30

Measurement Result

The maximum measured transmitter power is the following:

Conducted Output Power P _{out} [dBm]	Conducted Output Power P _{out} [mW]	Maximum Antenna Gain [dBi]	P _{out} EIRP [mW]	Power Density at 20cm [mW/cm ²]
22.69	185.78	3.3	397.19	0.079

Note:

The power density S in mW/cm² is calculated according to the Friis formula:

$$S = (P_{out} \cdot G) / (4\pi \cdot D^2),$$

where

S = power density in mW/cm²

P_{out} = antenna conducted output power in mW

G = antenna gain in linear scale (here: 3.3dBi=10log(G))

D = distance between observation point and radiating structure in cm (here: 20cm)

Conclusion

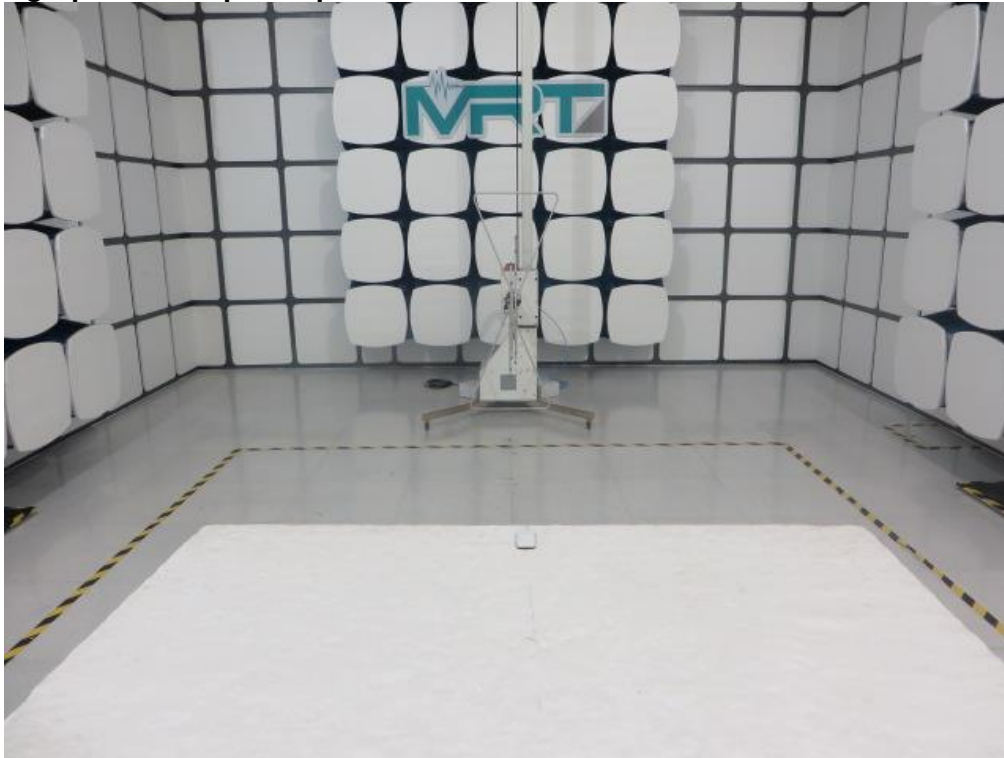
The device complies with the FCC RF exposure requirements since the maximum transmitter power density is below the FCC limit.

Appendix II- Photographs of the Test Set-Up

Photograph 1: Set-up for Conducted Emissions



Photograph 2: Set-up for Spurious Emissions below 1GHz



Photograph 3: Set-up for Spurious Emissions above 1GHz

