Shenzhen GUOREN Certification Technology Service Co., Ltd.

101#, Building K & Building T, The Second Industrial Zone, Jiazitang Community, Fenghuang Street, Guangming District, Shenzhen, China

FCC PART 15 SUBPART C TEST REPORT

FCC PART 15.247

Report Reference No.....:	**GRCTR240402026-02**
FCC ID..... :	**2AQU4-PZPA065**
Compiled by (position+printed name+signature)..:	Testing Engineer Jimmy Wang
Supervised by (position+printed name+signature)..:	Project Engineer Kelley Zhang
Approved by (position+printed name+signature)..:	Manager Sam Wang
Date of issue.....:	May. 16, 2024
Testing Laboratory Name.....:	**Shenzhen GUOREN Certification Technology Service Co., Ltd.**
Address..... :	101#, Building K & Building T, The Second Industrial Zone, Jiazitang Community, Fenghuang Street, Guangming District, Shenzhen, China
Applicant's name.....:	**Puzhen Life Co.,Ltd.**
Address..... :	Unit S7, 2/F., W LUXE, 5 On Yiu Street, Shatin, NT, Hong Kong
Test specification.....:	
Standard.....:	**FCC Part 15.247**

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Test item description.....:	**WAKE UP LIGHT DIFFUSER**
Trade Mark.....:	YOUNG LIVING ESSENTIAL OILS
Manufacturer.....:	Puzhen Life Co.,Ltd.
Model/Type reference..... :	PZ-PA065
Listed Models ..... :	/
Firmware Version.....:	V1.0
Hardware Version.....:	V1.0
Modulation Type..... :	DSSS/ OFDM
Operation Frequency..... :	From 2412 - 2462MHz
Rating.....:	DC 5V from external circuit
Result.....:	**PASS**

TEST REPORT

Equipment under Test	:	WAKE UP LIGHT DIFFUSER
Model /Type	:	PZ-PA065
Listed Models	:	/
Applicant	:	**Puzhen Life Co.,Ltd.**
Address	:	Unit S7, 2/F., W LUXE, 5 On Yiu Street, Shatin, NT, Hong Kong
Manufacturer	:	**Puzhen Life Co.,Ltd.**
Address	:	Unit S7, 2/F., W LUXE, 5 On Yiu Street, Shatin, NT, Hong Kong

Test Result:	**PASS**

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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1 TEST STANDARDS

The tests were performed according to following standards:

FCC Rules Part 15.247: Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.
ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices
KDB558074 D01 v05r02: Guidance for Compliance Measurements on Digital Transmission Systems (DTS) ,Frequency Hopping Spread Spectrum System(HFSS), and Hybrid System Devices Operating Under §15.247 of The FCC rules.

2 SUMMARY

2.1 General Remarks

Date of receipt of test sample	:	Apr. 17, 2024
Testing commenced on	:	Apr. 17, 2024
Testing concluded on	:	May. 16, 2024

2.2 Product Description

Product Name:	WAKE UP LIGHT DIFFUSER
Model/Type reference:	PZ-PA065
Listed Models:	/
Power supply:	DC 5V from external circuit
Adapter information (Auxiliary test supplied by test Lab):	Model:JYR9-05 Input:AC100-240V 50/60Hz, 0.3A Output:DC 5V,2A
testing sample ID:	GRCTR240402026-1# (Engineer sample), GRCTR240402026-2# (Normal sample)
WIFI:	
Supported type:	802.11b/802.11g/802.11n(H20)
Modulation:	802.11b: DSSS 802.11g/802.11n(H20): OFDM
Operation frequency:	802.11b/802.11g/802.11n(H20): 2412MHz~2462MHz
Channel number:	802.11b/802.11g/802.11n(H20): 11
Channel separation:	5MHz
Antenna type:	PCB antenna
Antenna gain*(Supplied by the customer):	2.54 dBi
Remark:1. *When the information provided by the customer was used to calculate test results, if the information provided by the customer is not accurate, shenzhen GUOREN Certification Technology Service Co., Ltd. does not assume any responsibility. 2. The product has two kinds of motors, the two kinds of motors are only different manufacturers, the input specifications are the same, the two kinds of motors have been tested for Conducted Emission and Radiated Emission below 1GHz.	

2.3 Equipment Under Test

Power supply system utilised

Power supply voltage	:	○	230V / 50 Hz	○	120V / 60Hz
		○	12 V DC	○	24 V DC
		●	Other (specified in blank below)		

DC 5V from external circuit

2.4 Short description of the Equipment under Test (EUT)

This is a WAKE UP LIGHT DIFFUSER.
For more details, refer to the user's manual of the EUT.

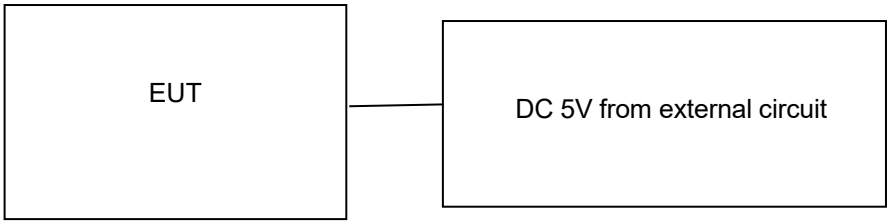
2.5 EUT operation mode

The Applicant provides communication tools software(SecureCRT) to control the EUT for staying in continuous transmitting (Duty Cycle more than 98%) for testing meet KDB558074 test requirement.

IEEE 802.11b/g/n H20: Thirteen channels are provided to the EUT.

Channel	Frequency(MHz)	Channel	Frequency(MHz)
1	2412	8	2447
2	2417	9	2452
3	2422	10	2457
4	2427	11	2462
5	2432		
6	2437		
7	2442		

2.6 Block Diagram of Test Setup



2.7 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules.

2.8 Modifications

No modifications were implemented to meet testing criteria.

3 TEST ENVIRONMENT

3.1 Address of the test laboratory

Shenzhen GUOREN Certification Technology Service Co., Ltd.
101#, Building K & Building T, The Second Industrial Zone, Jiazitang Community, Fenghuang Street, Guangming District, Shenzhen, China

3.2 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

FCC-Registration No.: 920798 Designation Number: CN1304

Shenzhen GUOREN Certification Technology Service Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

A2LA-Lab Cert. No.: 6202.01

Shenzhen GUOREN Certification Technology Service Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

ISED#: 27264 CAB identifier: CN0115
Shenzhen GUOREN Certification Technology Service Co., Ltd. has been listed by Innovation, Science and Economic Development Canada to perform electromagnetic emission measurement.

CNAS-Lab Code: L15631
Shenzhen GUOREN Certification Technology Service Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories for the Competence of Testing and Calibration Laboratories.

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.10 and CISPR 16-1-4:2010.

3.3 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Normal Temperature:	15-35 ℃
Relative Humidity	30-60 %
Air Pressure	950-1050mbar

3.4 Test Description

FCC PART 15.247		
FCC Part 15.207	AC Power Conducted Emission	PASS
FCC Part 15.247(a)(2)	6dB Bandwidth	PASS
FCC Part 15.247(d)	Spurious RF Conducted Emission	PASS
FCC Part 15.247(b)	Maximum Conducted Output Power	PASS
FCC Part 15.247(e)	Power Spectral Density	PASS
FCC Part 15.109/ 15.205/ 15.209	Radiated Emissions	PASS
FCC Part 15.247(d)	Band Edge	PASS
FCC Part 15.203/15.247 (b)	Antenna Requirement	PASS

Data Rate Used:
Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Data Rate	Channel
Maximum Peak Conducted Output Power Power Spectral Density 6dB Bandwidth Spurious RF conducted emission Radiated Emission 9KHz~1GHz& Radiated Emission 1GHz~10th Harmonic	11b/DSSS	1 Mbps	1/6/11
	11g/OFDM	6 Mbps	1/6/11
	11n(20MHz)/OFDM	6.5Mbps	1/6/11
Band Edge	11b/DSSS	1 Mbps	1/11
	11g/OFDM	6 Mbps	1/11
	11n(20MHz)/OFDM	6.5Mbps	1/11

3.5 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01" Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 2 " and is documented in the Shenzhen GUOREN Certification Technology Service Co., Ltd.quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen GUOREN Certification Technology Service Co., Ltd.:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.06 dB	(1)
Radiated Emission	1~18GHz	5.14 dB	(1)
Radiated Emission	18-40GHz	5.38 dB	(1)
Conducted Disturbance	0.15~30MHz	2.14 dB	(1)
Max output power	30MHz~18GHz	0.54 dB	(1)
Power spectral density	/	0.56 dB	(1)
Spectrum bandwidth	/	1.2%	(1)

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

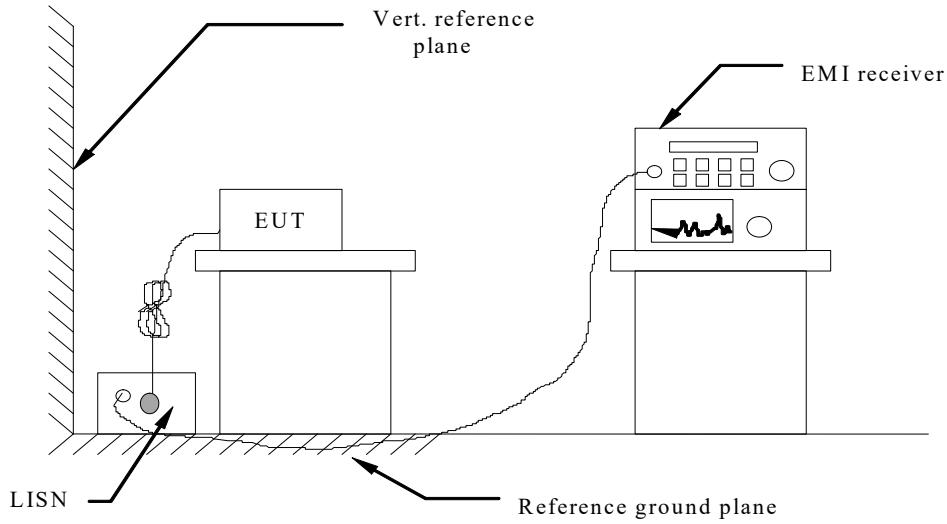
3.6 Equipments Used during the Test

Test Equipment	Manufacturer	Model No.	Equipment No.	Calibration Date	Calibration Due Date
LISN	R&S	ENV216	GRCTEE009	2023/09/27	2024/09/26
LISN	R&S	ENV216	GRCTEE010	2023/09/27	2024/09/26
EMI Test Receiver	R&S	ESPI	GRCTEE017	2023/09/28	2024/09/27
EMI Test Receiver	R&S	ESCI	GRCTEE008	2023/09/27	2024/09/26
Spectrum Analyzer	Agilent	N9020A	GRCTEE002	2023/09/27	2024/09/26
Spectrum Analyzer	R&S	FSP	GRCTEE003	2023/09/28	2024/09/27
Vector Signal generator	Agilent	N5181A	GRCTEE007	2023/09/27	2024/09/26
Analog Signal Generator	R&S	SML03	GRCTEE006	2023/09/27	2024/09/26
Climate Chamber	QIYA	LCD-9530	GRCTES016	2023/09/27	2024/09/26
Ultra-Broadband Antenna	Schwarzbeck	VULB9163	GRCTEE018	2023/09/28	2026/09/27
Horn Antenna	Schwarzbeck	BBHA 9120D	GRCTEE019	2023/09/28	2026/09/27
Loop Antenna	Zhinan	ZN30900C	GRCTEE020	2023/10/15	2026/10/14
Horn Antenna	Beijing Hangwei Dayang	OBH100400	GRCTEE049	2023/09/28	2026/09/27
Amplifier	Schwarzbeck	BBV 9745	GRCTEE021	2023/09/27	2024/09/26
Amplifier	Taiwan chengyi	EMC051845B	GRCTEE022	2023/09/28	2024/09/27
Temperature/Humidity Meter	Huaguan	HG-308	GRCTES037	2023/09/27	2024/09/26
Directional coupler	NARDA	4226-10	GRCTEE004	2023/09/27	2024/09/26
High-Pass Filter	XingBo	XBLBQ-GTA18	GRCTEE053	2023/09/27	2024/09/26
High-Pass Filter	XingBo	XBLBQ-GTA27	GRCTEE054	2023/09/27	2024/09/26
Automated filter bank	Tonscend	JS0806-F	GRCTEE055	2023/09/27	2024/09/26
Power Sensor	Agilent	U2021XA	GRCTEE070	2023/09/27	2024/09/26
EMI Test Software	ROHDE & SCHWARZ	ESK1-V1.71	GRCTEE060	N/A	N/A
EMI Test Software	Fera	EZ-EMC	GRCTEE061	N/A	N/A

4 TEST CONDITIONS AND RESULTS

4.1 AC Power Conducted Emission

TEST CONFIGURATION



TEST PROCEDURE

1 The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10-2013.
2 Support equipment, if needed, was placed as per ANSI C63.10-2013
3 All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10-2013
4 The EUT received power from adapter, the adapter received AC120V/60Hz and AC 240V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5 All support equipments received AC power from a second LISN, if any.
6 The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT.The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7 Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
8 During the above scans, the emissions were maximized by cable manipulation.

AC Power Conducted Emission Limit

For intentional device, according to § 15.207(a) and RSS-Gen Issue 5 AC Power Conducted Emission Limits is as following：

Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50
* Decreases with the logarithm of the frequency.		

TEST RESULTS

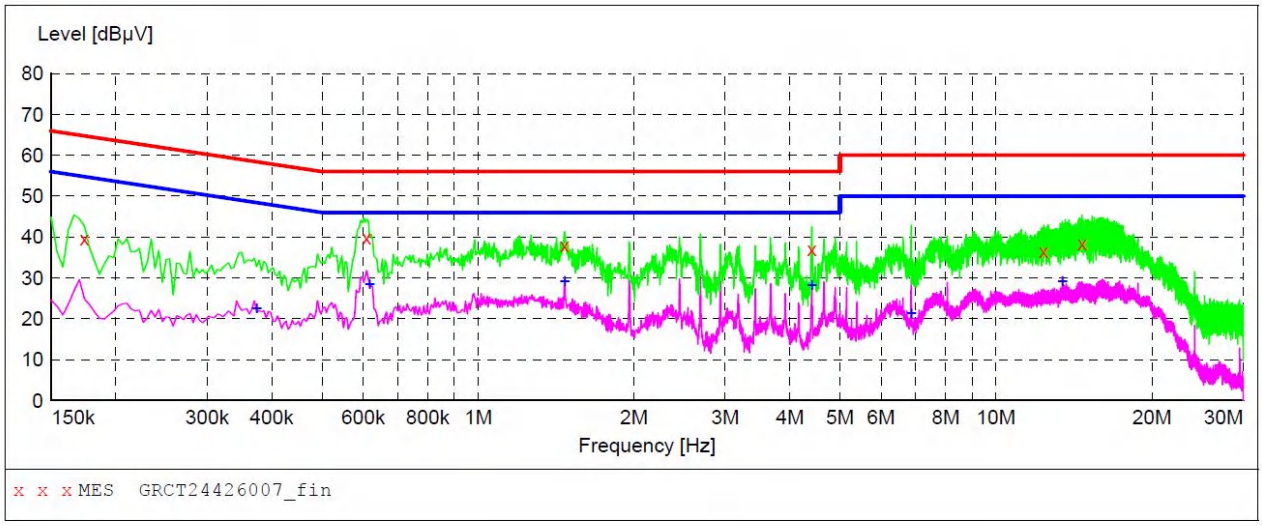
Remark:

1. All modes of 802.11b/g/n were tested at Low, Middle, and High channel; only the worst result of 802.11b CH11 was reported as below:

2. Both 120 VAC, 50/60 Hz and 240 VAC, 50/60 Hz power supply have been tested, only the worst result of 120 VAC, 60 Hz was reported as below:

Motor:WP27F-5

Power supply:	DC 5V from Adapter AC 120V/60Hz	Polarization	L



MEASUREMENT RESULT: "GRCT24426007_fin"

4/26/2024 10:45AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.174000	39.60	9.5	65	25.2	QP	L1	GND
0.610000	39.80	9.6	56	16.2	QP	L1	GND
1.470000	37.90	10.0	56	18.1	QP	L1	GND
4.414000	37.00	9.9	56	19.0	QP	L1	GND
12.358000	36.50	10.0	60	23.5	QP	L1	GND
14.682000	38.50	10.0	60	21.5	QP	L1	GND

MEASUREMENT RESULT: "GRCT24426007_fin2"

4/26/2024 10:45AM

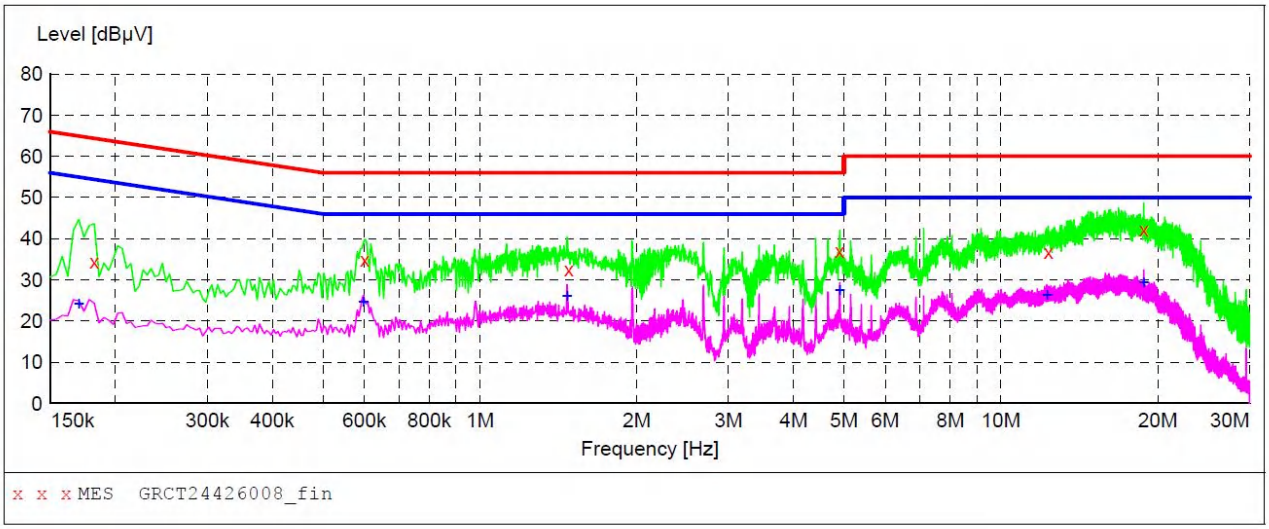
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.374000	22.70	9.6	48	25.7	AV	L1	GND
0.618000	28.50	9.6	46	17.5	AV	L1	GND
1.470000	29.30	10.0	46	16.7	AV	L1	GND
4.414000	28.20	9.9	46	17.8	AV	L1	GND
6.866000	21.40	10.0	50	28.6	AV	L1	GND
13.434000	29.30	10.0	50	20.7	AV	L1	GND

Note:1).Level (dBµV)= Reading (dBµV)+ Transducer (dB)

2). Transducer (dB)=insertion loss of LISN (dB) + Cable loss (dB)

3). Margin(dB) = Limit (dBµV) - Level (dBµV)

Power supply:	DC 5V from Adapter AC 120V/60Hz	Polarization	N



MEASUREMENT RESULT: "GRCT24426008_fin"

4/26/2024 10:48AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.182000	34.40	9.5	64	30.0	QP	N	GND
0.602000	34.90	9.6	56	21.1	QP	N	GND
1.482000	32.60	10.0	56	23.4	QP	N	GND
4.906000	37.00	9.9	56	19.0	QP	N	GND
12.338000	36.80	10.0	60	23.2	QP	N	GND
18.814000	42.20	10.1	60	17.8	QP	N	GND

MEASUREMENT RESULT: "GRCT24426008_fin2"

4/26/2024 10:48AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.170000	24.30	9.5	55	30.7	AV	N	GND
0.598000	24.70	9.6	46	21.3	AV	N	GND
1.470000	26.10	10.0	46	19.9	AV	N	GND
4.906000	27.70	9.9	46	18.3	AV	N	GND
12.266000	26.50	10.0	50	23.5	AV	N	GND
18.806000	29.50	10.1	50	20.5	AV	N	GND

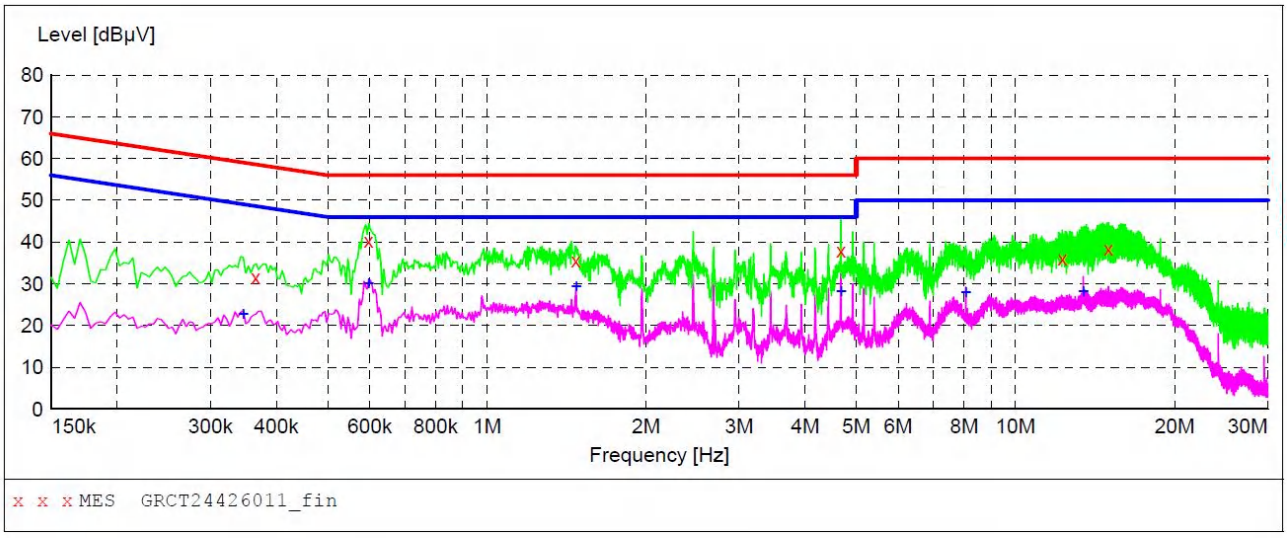
Note:1).Level (dBµV)= Reading (dBµV)+ Transducer (dB)

2). Transducer (dB)=insertion loss of LISN (dB) + Cable loss (dB)

3). Margin(dB) = Limit (dBµV) - Level (dBµV)

Motor:CAP27A02-310-5V

Power supply:	DC 5V from Adapter AC 120V/60Hz	Polarization	L



MEASUREMENT RESULT: "GRCT24426011_fin"

4/26/2024 11:00AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.366000	31.60	9.6	59	27.0	QP	L1	GND
0.598000	40.30	9.6	56	15.7	QP	L1	GND
1.474000	35.50	10.0	56	20.5	QP	L1	GND
4.682000	38.00	9.9	56	18.0	QP	L1	GND
12.286000	36.10	10.0	60	23.9	QP	L1	GND
15.010000	38.50	10.1	60	21.5	QP	L1	GND

MEASUREMENT RESULT: "GRCT24426011_fin2"

4/26/2024 11:00AM

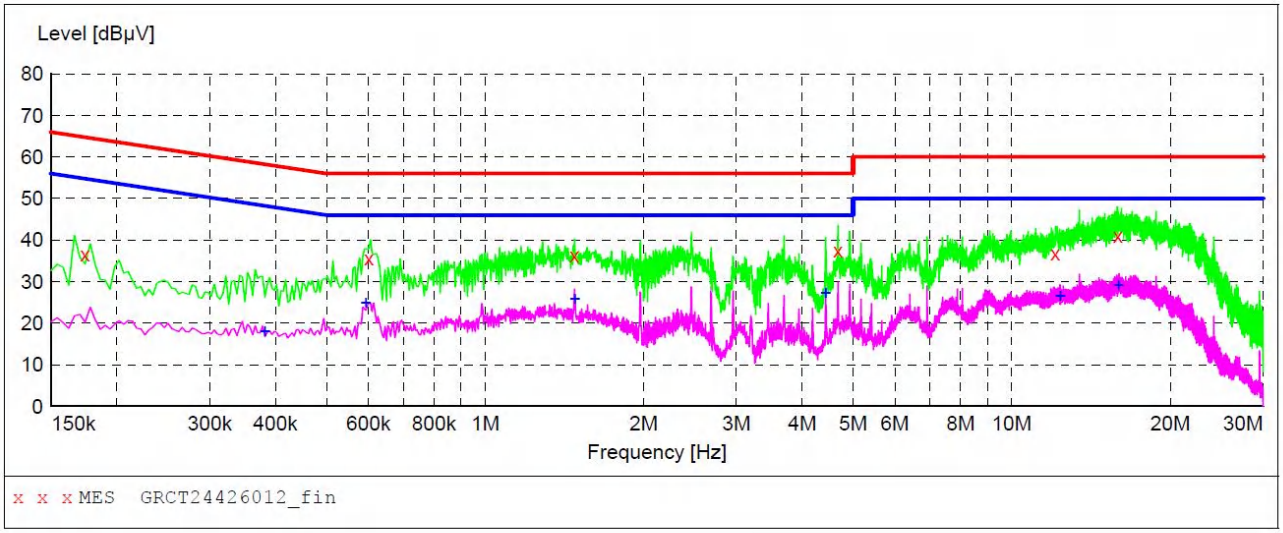
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.346000	22.90	9.5	49	26.2	AV	L1	GND
0.598000	30.10	9.6	46	15.9	AV	L1	GND
1.478000	29.50	10.0	46	16.5	AV	L1	GND
4.682000	28.20	9.9	46	17.8	AV	L1	GND
8.062000	28.00	10.1	50	22.0	AV	L1	GND
13.430000	28.20	10.0	50	21.8	AV	L1	GND

Note:1).Level (dBµV)= Reading (dBµV)+ Transducer (dB)

2). Transducer (dB)=insertion loss of LISN (dB) + Cable loss (dB)

3). Margin(dB) = Limit (dBµV) - Level (dBµV)

Power supply:	DC 5V from Adapter AC 120V/60Hz	Polarization	N



MEASUREMENT RESULT: "GRCT24426012_fin"

4/26/2024 11:03AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.174000	36.50	9.5	65	28.3	QP	N	GND
0.602000	35.60	9.6	56	20.4	QP	N	GND
1.478000	36.30	10.0	56	19.7	QP	N	GND
4.682000	37.40	9.9	56	18.6	QP	N	GND
12.102000	36.90	10.0	60	23.1	QP	N	GND
15.906000	41.00	10.1	60	19.0	QP	N	GND

MEASUREMENT RESULT: "GRCT24426012_fin2"

4/26/2024 11:03AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.382000	18.10	9.7	48	30.1	AV	N	GND
0.594000	24.90	9.6	46	21.1	AV	N	GND
1.482000	25.90	10.0	46	20.1	AV	N	GND
4.438000	27.20	9.9	46	18.8	AV	N	GND
12.354000	26.70	10.0	50	23.3	AV	N	GND
15.950000	29.20	10.1	50	20.8	AV	N	GND

Note:1).Level (dBµV)= Reading (dBµV)+ Transducer (dB)

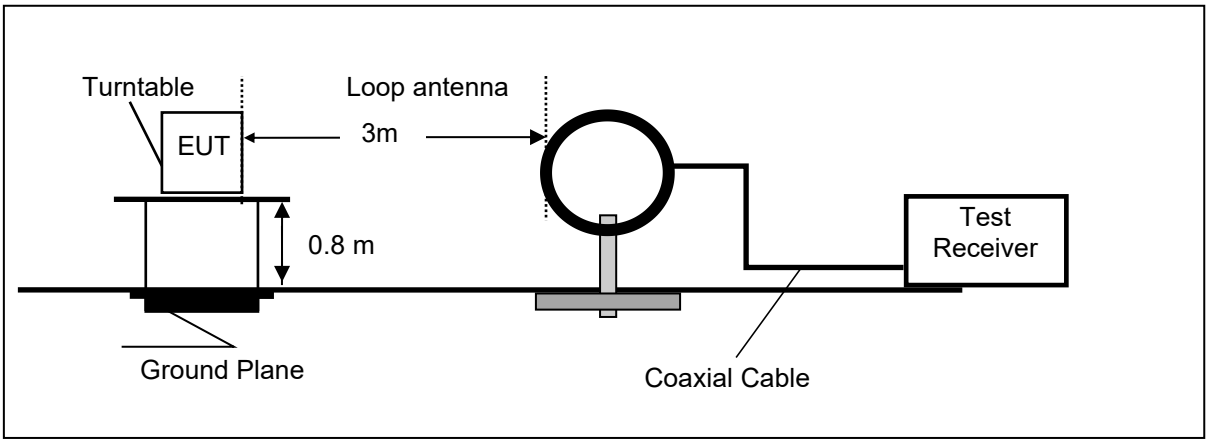
2). Transducer (dB)=insertion loss of LISN (dB) + Cable loss (dB)

3). Margin(dB) = Limit (dBµV) - Level (dBµV)

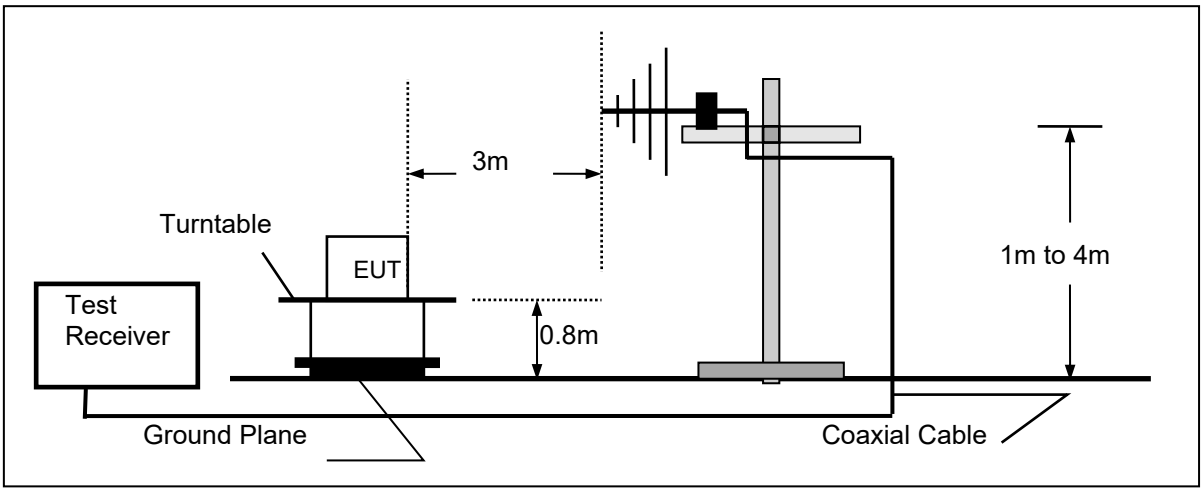
4.2 Radiated Emission

TEST CONFIGURATION

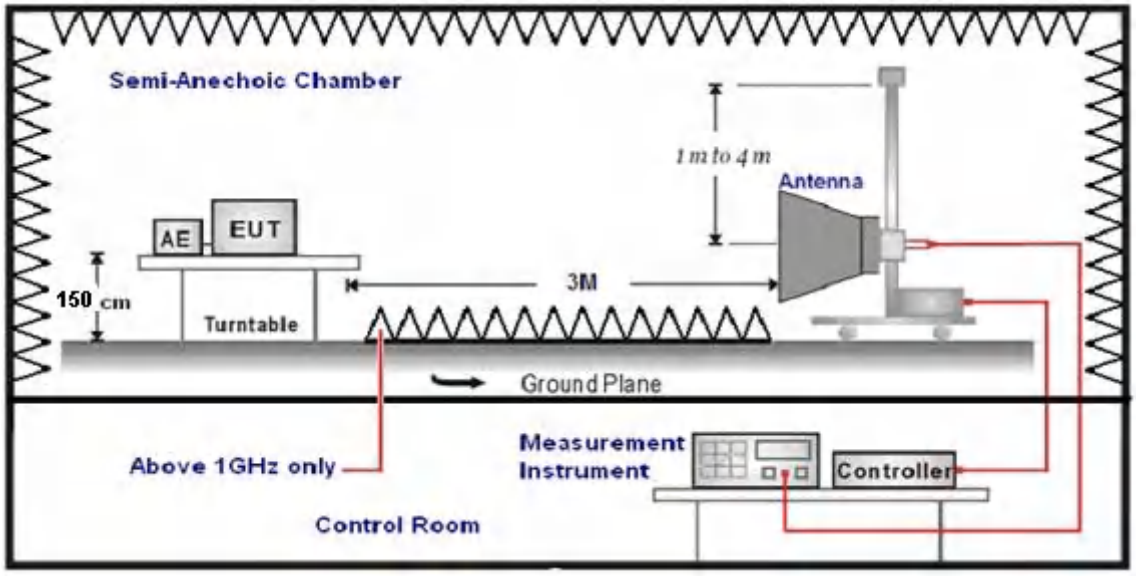
Frequency range 9 KHz – 30MHz



Frequency range 30MHz – 1000MHz



Frequency range above 1GHz-25GHz



TEST PROCEDURE

1. The EUT was placed on a turn table which is 0.8m above ground plane when testing frequency range 9 KHz –1GHz, the EUT was placed on a turn table which is 1.5m above ground plane when testing frequency range 1GHz – 25GHz.
2. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0° to 360° to acquire the highest emissions from EUT.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measurements have been completed.
5. Radiated emission test frequency band from 9KHz to 25GHz.
6. The distance between test antenna and EUT as following table states:

Test Frequency range	Test Antenna Type	Test Distance
9KHz-30MHz	Active Loop Antenna	3
30MHz-1GHz	Ultra-Broadband Antenna	3
1GHz-18GHz	Double Ridged Horn Antenna	3
18GHz-25GHz	Horn Anternna	1

7. Setting test receiver/spectrum as following table states:

Test Frequency range	Test Receiver/Spectrum Setting	Detector
9KHz-150KHz	RBW=200Hz/VBW=3KHz,Sweep time=Auto	QP
150KHz-30MHz	RBW=9KHz/VBW=100KHz,Sweep time=Auto	QP
30MHz-1GHz	RBW=120KHz/VBW=1000KHz,Sweep time=Auto	QP
1GHz-40GHz	Peak Value: RBW=1MHz/VBW=3MHz, Sweep time=Auto Average Value: RBW=1MHz/VBW=10Hz, Sweep time=Auto	Peak

Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

Transd=AF +CL-AG

RADIATION LIMIT

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emission from intentional radiators at a distance of 3 meters shall not exceed the following table. According to § 15.247(d), in any 100kHz bandwidth outside the frequency band in which the EUT is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the100kHz bandwidth within the band that contains the highest level of desired power.

The pre-test have done for the EUT in three axes and found the worst emission at position shown in test setup photos.

Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
0.009-0.49	3	20log(2400/F(KHz))+40log(300/3)	2400/F(KHz)
0.49-1.705	3	20log(24000/F(KHz))+ 40log(30/3)	24000/F(KHz)
1.705-30	3	20log(30)+ 40log(30/3)	30
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

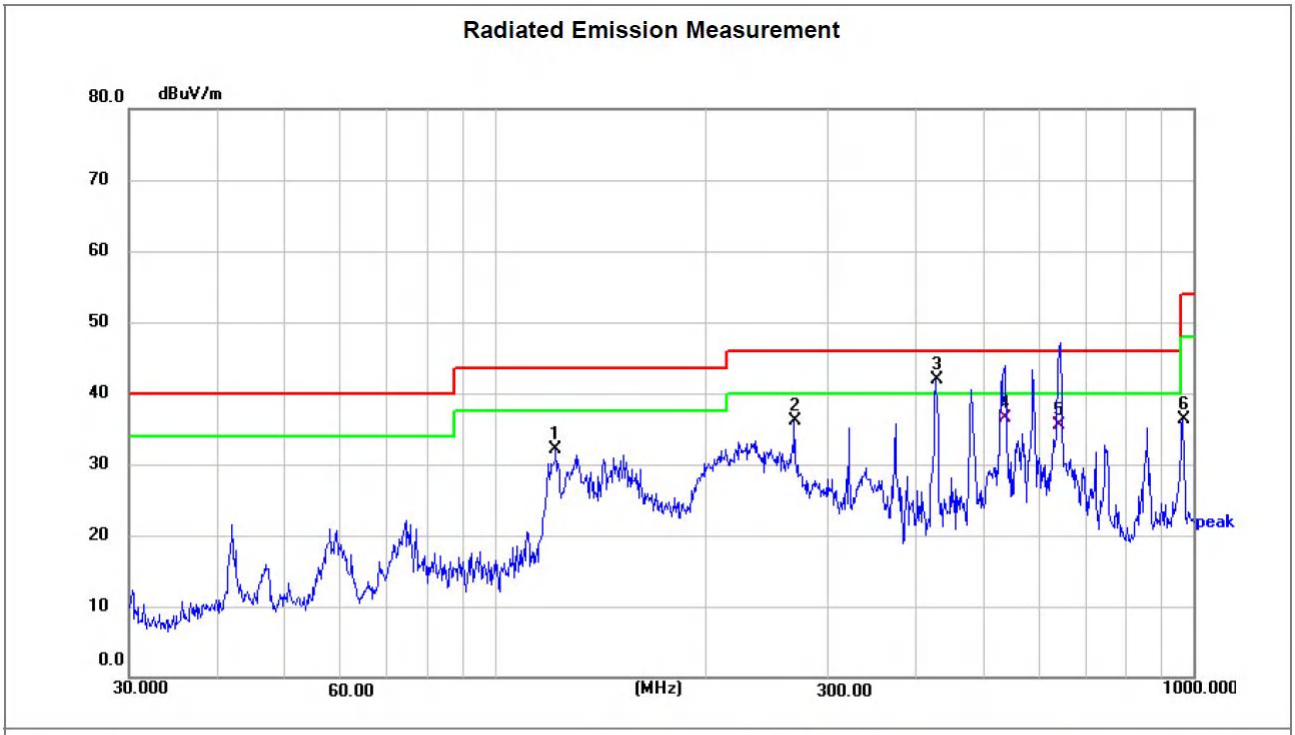
TEST RESULTS

Remark:
1. This test was performed with EUT in X, Y, Z position and the worse case was found when EUT in X position.
2. All three channels (lowest/middle/highest) of each mode were measured below 1GHz and recorded worst case at 802.11b low channel.
3. Radiated emission test from 9 KHz to 10th harmonic of fundamental was verified, and no emission found except system noise floor in 9 KHz to 30MHz and not recorded in this report.

For 30MHz-1GHz

Motor:WP27F-5

Horizontal



Site LAB
Limit: FCC Part15 RE-Class B_30-1000MHz
EUT: WAKE UP LIGHT DIFFUSER
M/N: PZ-PA065
Mode: B CH 01
Note: Motor:WP27F-5

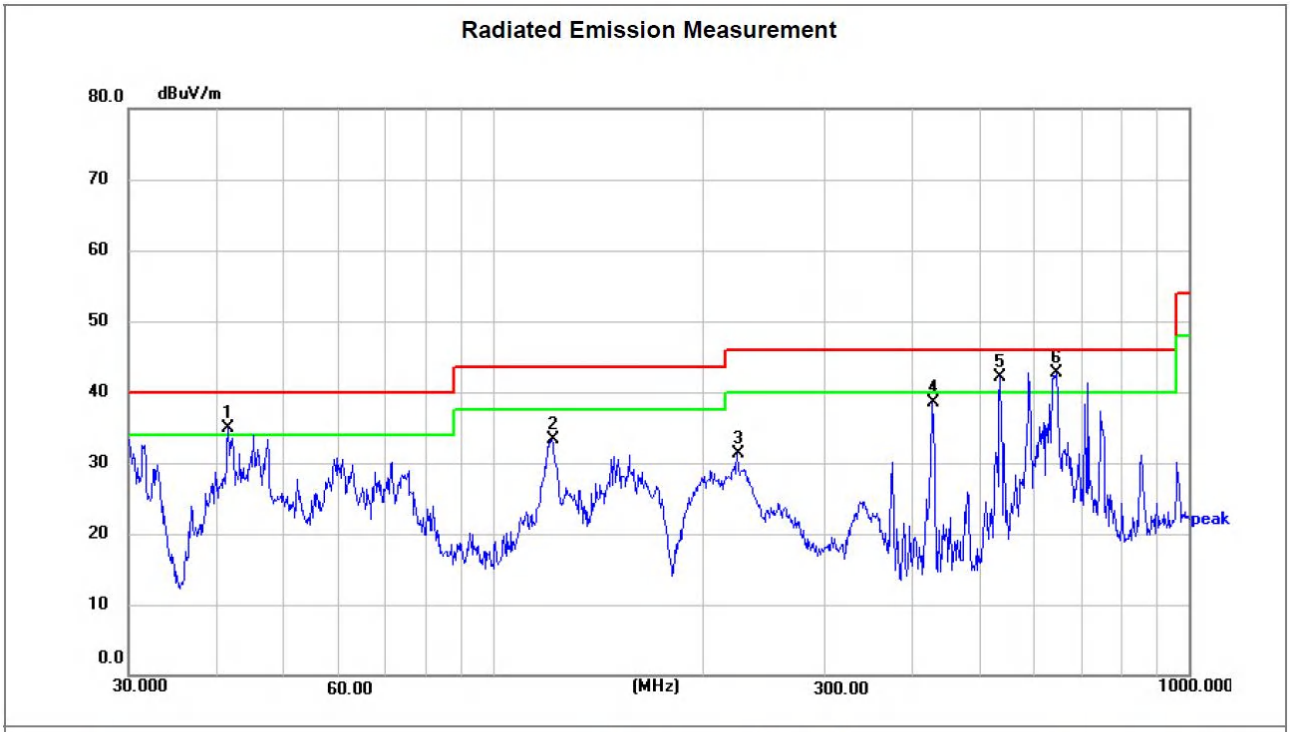
Polarization: ***Horizontal***
Power: AC120V/60Hz
Distance: 3m

Temperature: 24.5(C)
Humidity: 52 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	122.4040	52.97	-20.95	32.02	43.50	-11.48	peak	199	9	P	
2	268.4853	53.90	-17.81	36.09	46.00	-9.91	peak	199	9	P	
3 *	428.0193	57.36	-15.41	41.95	46.00	-4.05	peak	199	328	P	
4	535.9503	50.60	-14.18	36.42	46.00	-9.58	QP	164	54	P	
5	642.7033	46.40	-10.82	35.58	46.00	-10.42	QP	198	27	P	
6	965.5421	43.13	-6.79	36.34	54.00	-17.66	peak	199	9	P	

Note:1).Level (dBµV/m)= Reading (dBµV)+ Factor (dB/m)
2). Factor(dB/m)=Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB)
3). Margin(dB) = Level (dBµV/m) - Limit (dBµV/m)

Vertical



Site LAB
Limit: FCC Part15 RE-Class B_30-1000MHz
EUT: WAKE UP LIGHT DIFFUSER
M/N: PZ-PA065
Mode: B CH 01
Note: Motor:WP27F-5

Polarization: ***Vertical***
Power: AC120V/60Hz
Distance: 3m

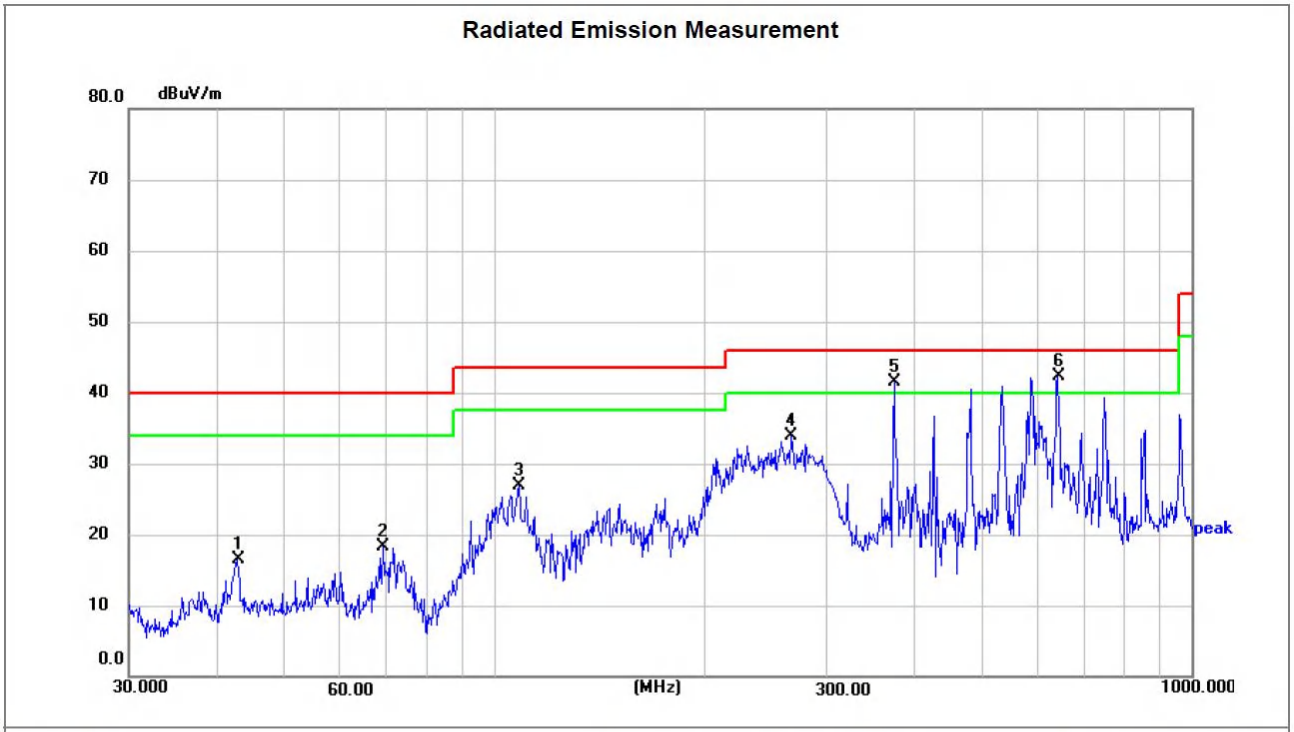
Temperature: 24.5(C)
Humidity: 52 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1 !	41.7129	52.61	-17.77	34.84	40.00	-5.16	peak	100	184	P	
2	121.5486	53.95	-20.59	33.36	43.50	-10.14	peak	100	46	P	
3	224.5193	50.02	-18.67	31.35	46.00	-14.65	peak	200	153	P	
4	428.0193	53.99	-15.41	38.58	46.00	-7.42	peak	200	73	P	
5 !	535.7073	56.37	-14.18	42.19	46.00	-3.81	peak	100	341	P	
6 *	645.1194	53.54	-10.81	42.73	46.00	-3.27	peak	100	345	P	

Note:1).Level (dBμV/m)= Reading (dBμV)+ Factor (dB/m)
2). Factor(dB/m)=Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB)
3). Margin(dB) = Level (dBμV/m) - Limit (dBμV/m)

Motor:CAP27A02-310-5V

Horizontal



Site LAB
Limit: FCC Part15 RE-Class B_30-1000MHz
EUT: WAKE UP LIGHT DIFFUSER
M/N: PZ-PA065
Mode: B CH 01
Note: Motor:CAP27A02-310-5V

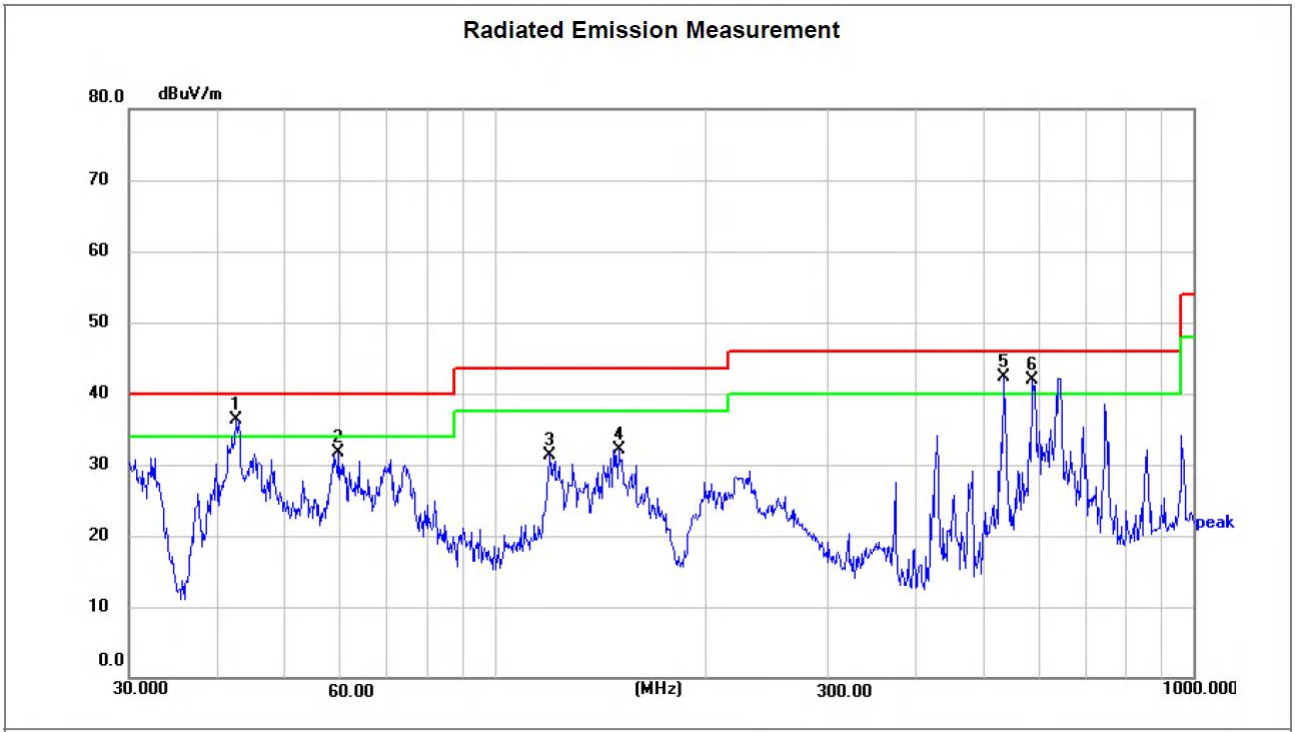
Polarization: ***Horizontal***
Power: AC120V/60Hz
Distance: 3m

Temperature: 24.5(C)
Humidity: 52 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	42.8998	34.24	-17.70	16.54	40.00	-23.46	peak	200	33	P	
2	69.3568	38.75	-20.41	18.34	40.00	-21.66	peak	100	5	P	
3	108.6470	46.30	-19.37	26.93	43.50	-16.57	peak	200	77	P	
4	266.6089	51.71	-17.86	33.85	46.00	-12.15	peak	200	350	P	
5 !	374.6225	57.54	-16.13	41.41	46.00	-4.59	peak	100	195	P	
6 *	642.8613	53.16	-10.82	42.34	46.00	-3.66	peak	100	325	P	

Note:1).Level (dBμV/m)= Reading (dBμV)+ Factor (dB/m)
2). Factor(dB/m)=Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB)
3). Margin(dB) = Level (dBμV/m) - Limit (dBμV/m)

Vertical



Site LAB
Limit: FCC Part15 RE-Class B_30-1000MHz
EUT: WAKE UP LIGHT DIFFUSER
M/N: PZ-PA065
Mode: B CH 01
Note: Motor:CAP27A02-310-5V

Polarization: ***Vertical***
Power: AC120V/60Hz
Distance: 3m

Temperature: 24.5(C)
Humidity: 52 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1 !	42.6000	53.98	-17.71	36.27	40.00	-3.73	peak	100	92	P	
2	59.8588	50.57	-18.89	31.68	40.00	-8.32	peak	100	110	P	
3	119.8555	51.17	-19.93	31.24	43.50	-12.26	peak	100	37	P	
4	150.5377	53.79	-21.66	32.13	43.50	-11.37	peak	200	119	P	
5 *	535.7073	56.48	-14.18	42.30	46.00	-3.70	peak	200	164	P	
6 !	588.9048	53.67	-11.77	41.90	46.00	-4.10	peak	100	124	P	

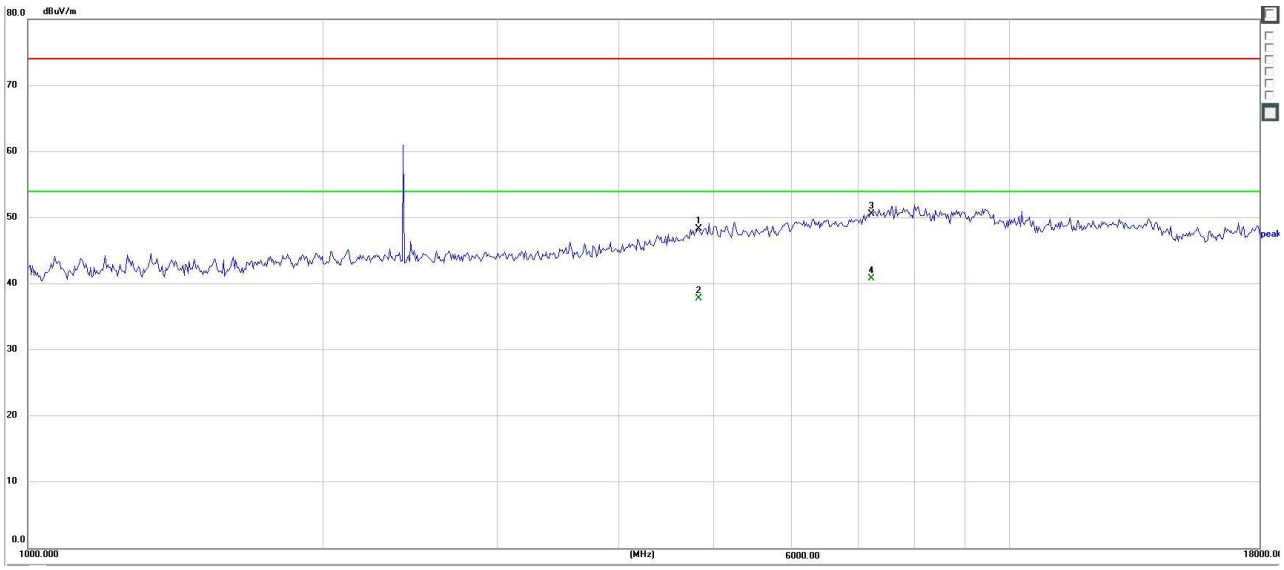
Note:1).Level (dBμV/m)= Reading (dBμV)+ Factor (dB/m)
2). Factor(dB/m)=Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB)
3). Margin(dB) = Level (dBμV/m) - Limit (dBμV/m)

For above 1GHz

Note: 802.11b/802.11g/802.11n (H20) Mode all have been tested, only worse case 802.11b mode is reported.

802.11b 2412MHz

Horizontal

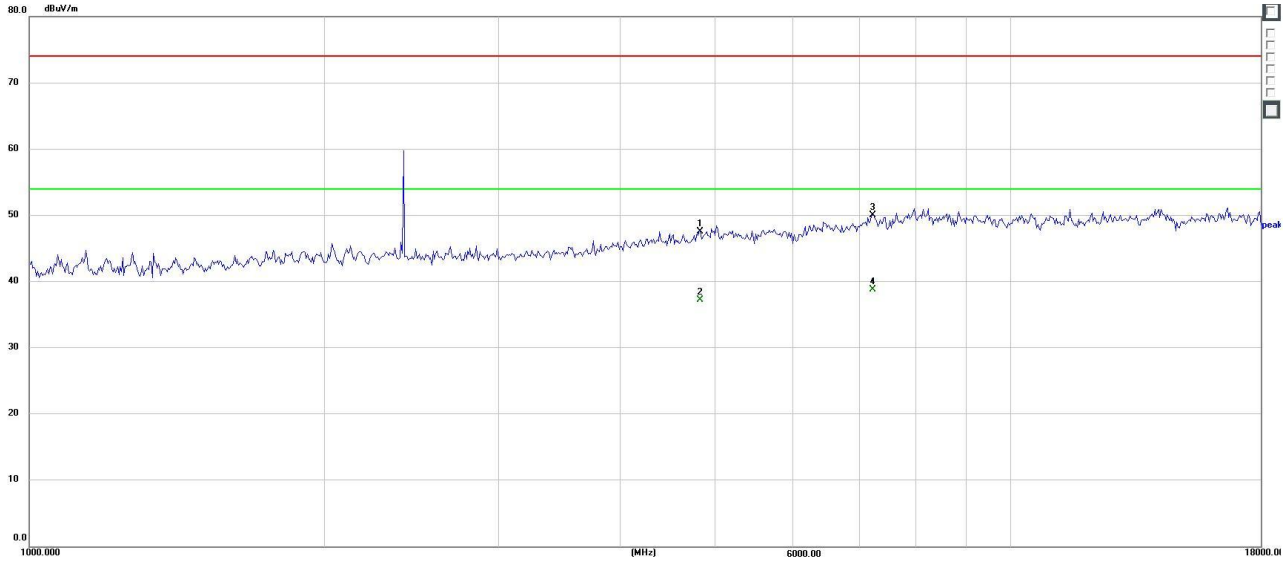


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	4824.000	69.58	-21.23	48.35	74.00	-25.65	peak	200	226	P	
2	4824.000	59.02	-21.23	37.79	54.00	-16.21	AVG	200	226	P	
3	7236.000	65.11	-14.49	50.62	74.00	-23.38	peak	100	108	P	
4	7236.000	55.34	-14.49	40.85	54.00	-13.15	AVG	100	108	P	

Note: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
3).Margin value = Limit value- Emission level.

802.11b 2412MHz

Vertical

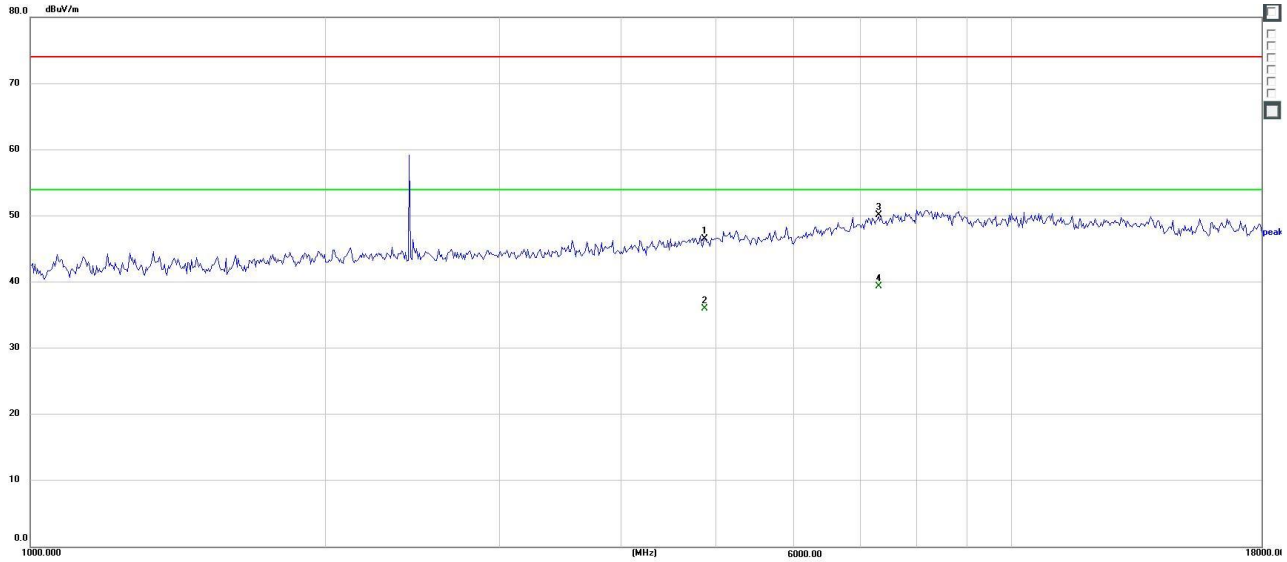


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	4824.000	68.75	-21.23	47.52	74.00	-26.48	peak	100	87	P	
2	4824.000	58.51	-21.23	37.28	54.00	-16.72	AVG	100	87	P	
3	7236.000	64.49	-14.49	50.00	74.00	-24.00	peak	100	151	P	
4	7236.000	53.35	-14.49	38.86	54.00	-15.14	AVG	100	151	P	

Note: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
3).Margin value = Limit value- Emission level.

802.11b 2437MHz

Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	4874.000	66.85	-20.27	46.58	74.00	-27.42	peak	200	306	P	
2	4874.000	56.24	-20.27	35.97	54.00	-18.03	AVG	200	306	P	
3	7311.000	63.78	-13.63	50.15	74.00	-23.85	peak	100	242	P	
4	7311.000	53.05	-13.63	39.42	54.00	-14.58	AVG	100	242	P	

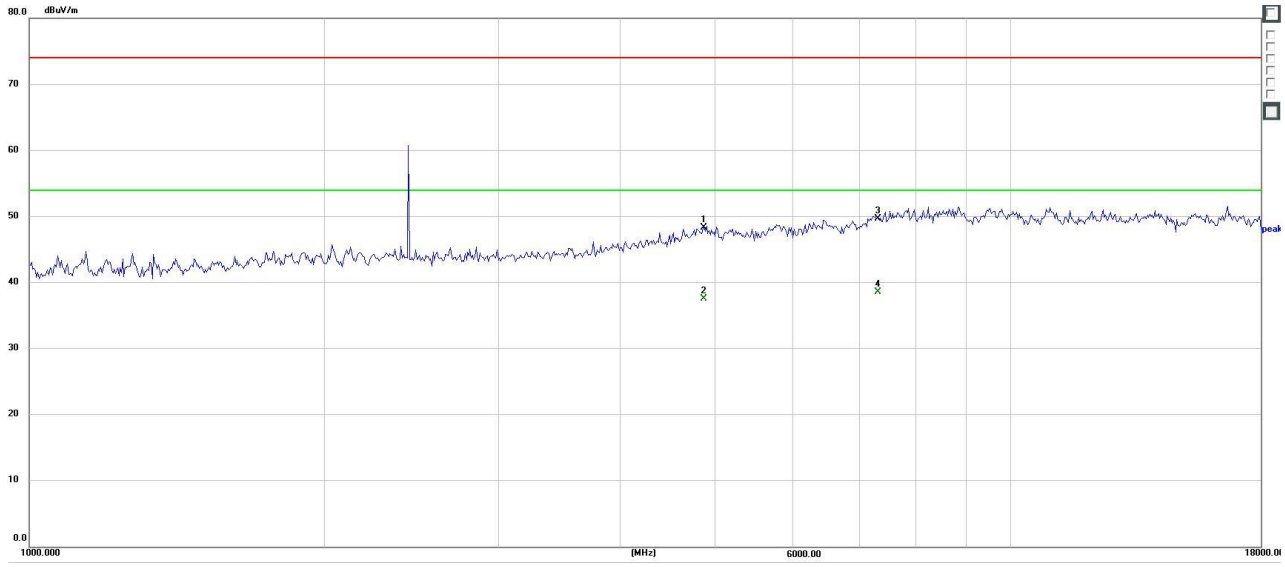
Note:1).Emission level (dBuV/m) =Raw Value (dBuV)+Correction Factor (dB/m)

2).Correction Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier

3).Margin value = Limit value- Emission level.

802.11b 2437MHz

Vertical



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	4874.000	68.63	-20.27	48.36	74.00	-25.64	peak	100	75	P	
2	4874.000	57.85	-20.27	37.58	54.00	-16.42	AVG	100	75	P	
3	7311.000	63.35	-13.63	49.72	74.00	-24.28	peak	200	136	P	
4	7311.000	52.18	-13.63	38.55	54.00	-15.45	AVG	200	136	P	

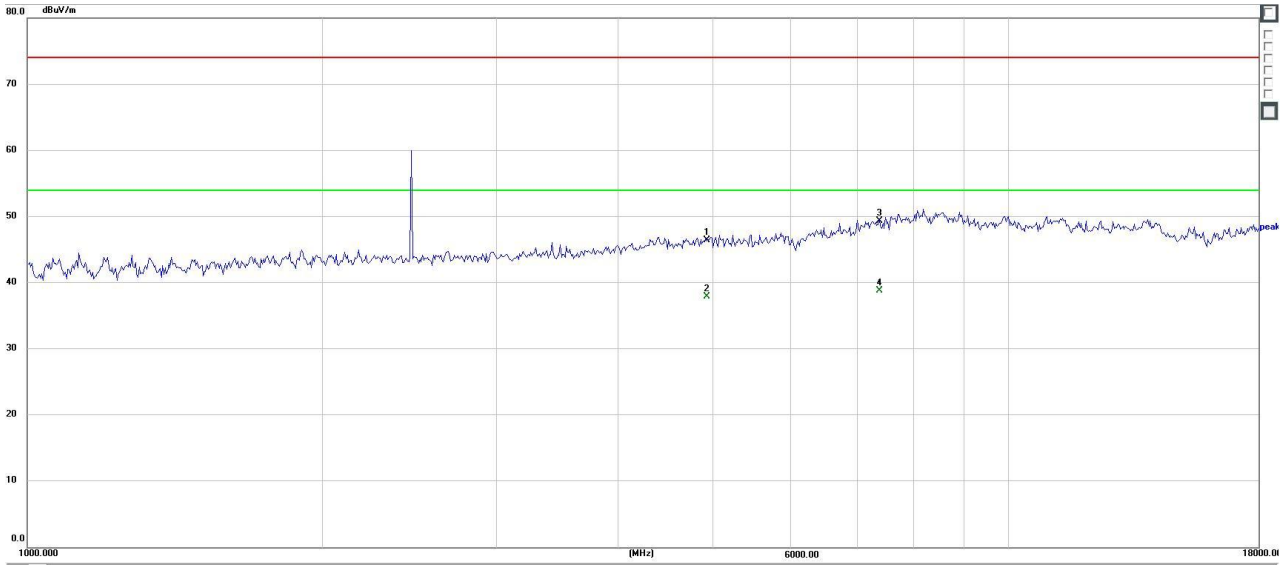
Note:1).Emission level (dBuV/m) =Raw Value (dBuV)+Correction Factor (dB/m)

2).Correction Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier

3).Margin value = Limit value- Emission level.

802.11b 2462MHz

Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	4924.000	65.89	-19.45	46.44	74.00	-27.56	peak	100	206	P	
2	4924.000	57.37	-19.45	37.92	54.00	-16.08	AVG	100	206	P	
3	7386.000	62.50	-13.14	49.36	74.00	-24.64	peak	200	113	P	
4	7386.000	51.92	-13.14	38.78	54.00	-15.22	AVG	200	113	P	

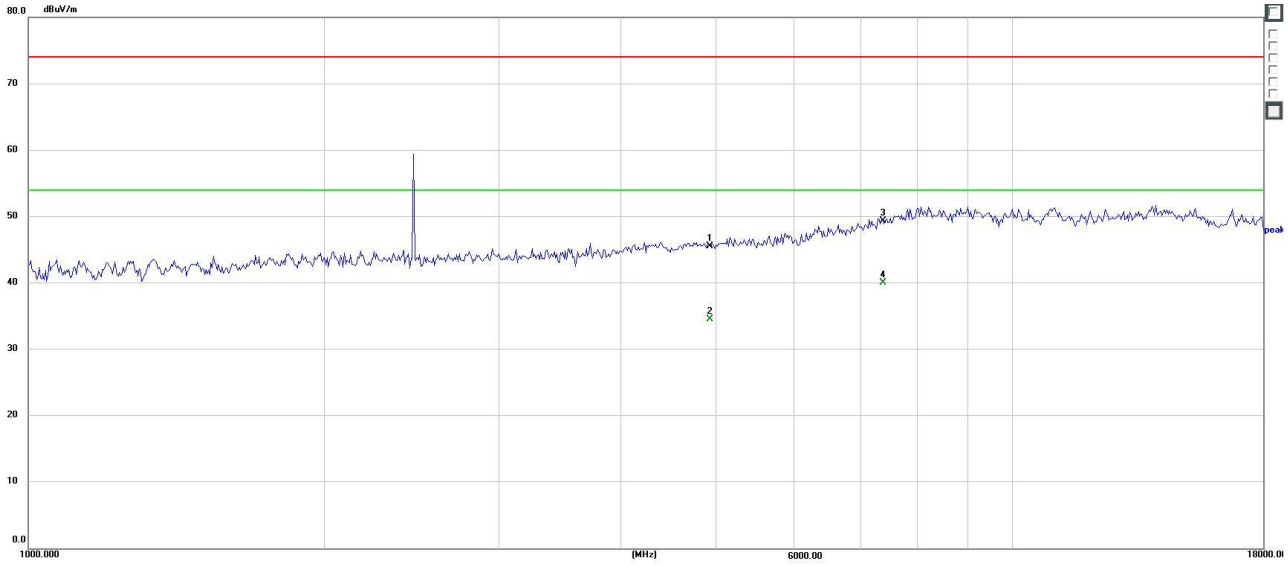
Note:1).Emission level (dBuV/m) =Raw Value (dBuV)+Correction Factor (dB/m)

2).Correction Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier

3).Margin value = Limit value- Emission level.

802.11b 2462MHz

Vertical



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	4924.000	65.03	-19.45	45.58	74.00	-28.42	peak	100	177	P	
2	4924.000	54.07	-19.45	34.62	54.00	-19.38	AVG	100	177	P	
3	7386.000	62.49	-13.14	49.35	74.00	-24.65	peak	100	65	P	
4	7386.000	53.25	-13.14	40.11	54.00	-13.89	AVG	100	65	P	

Note: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

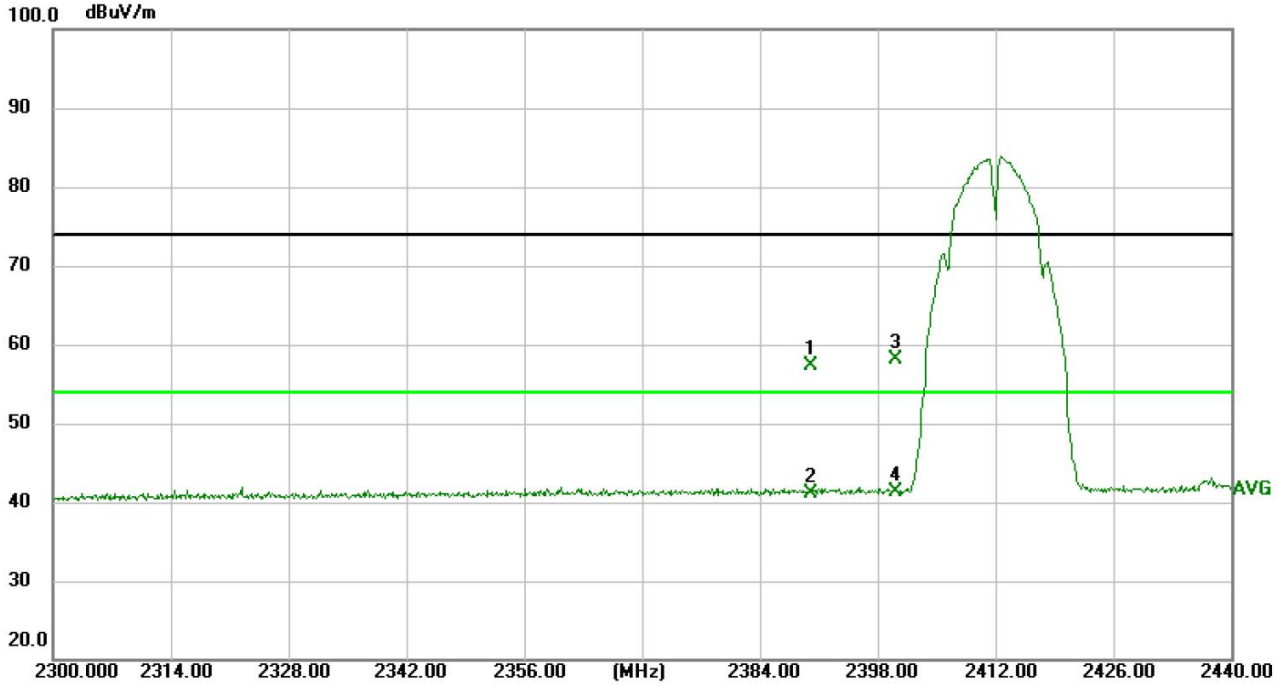
3).Margin value = Limit value- Emission level.

Results of Band Edges Test (Radiated)

Note: 802.11b/802.11g/802.11n (H20) Mode all have been tested, only worse case 802.11b mode is reported.

802.11b 2412MHz

Horizontal

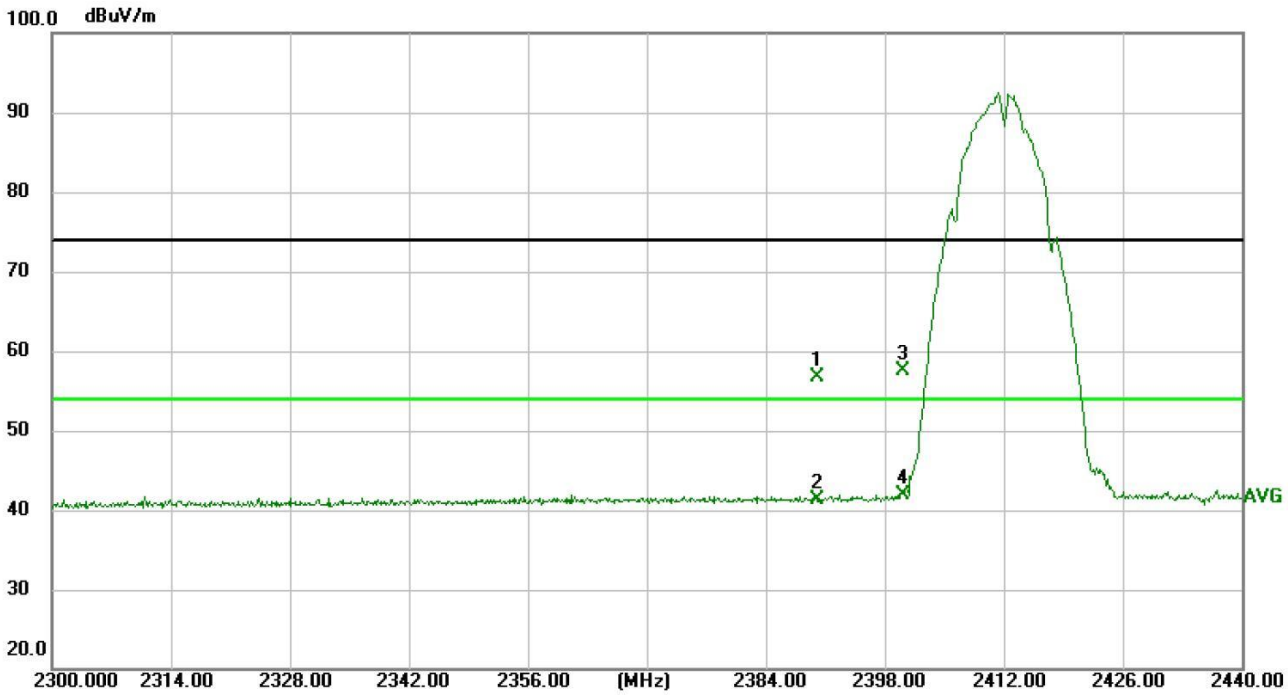


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	2390.000	27.30	30.04	57.34	74.00	-16.66	peak	100	145	P	
2	2390.000	11.04	30.04	41.08	54.00	-12.92	AVG	100	145	P	
3	2400.000	28.08	30.06	58.14	74.00	-15.86	peak	200	223	P	
4	2400.000	11.26	30.06	41.32	54.00	-12.68	AVG	200	223	P	

Note: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).Margin value = Limit value- Emission level.

802.11b 2412MHz

Vertical

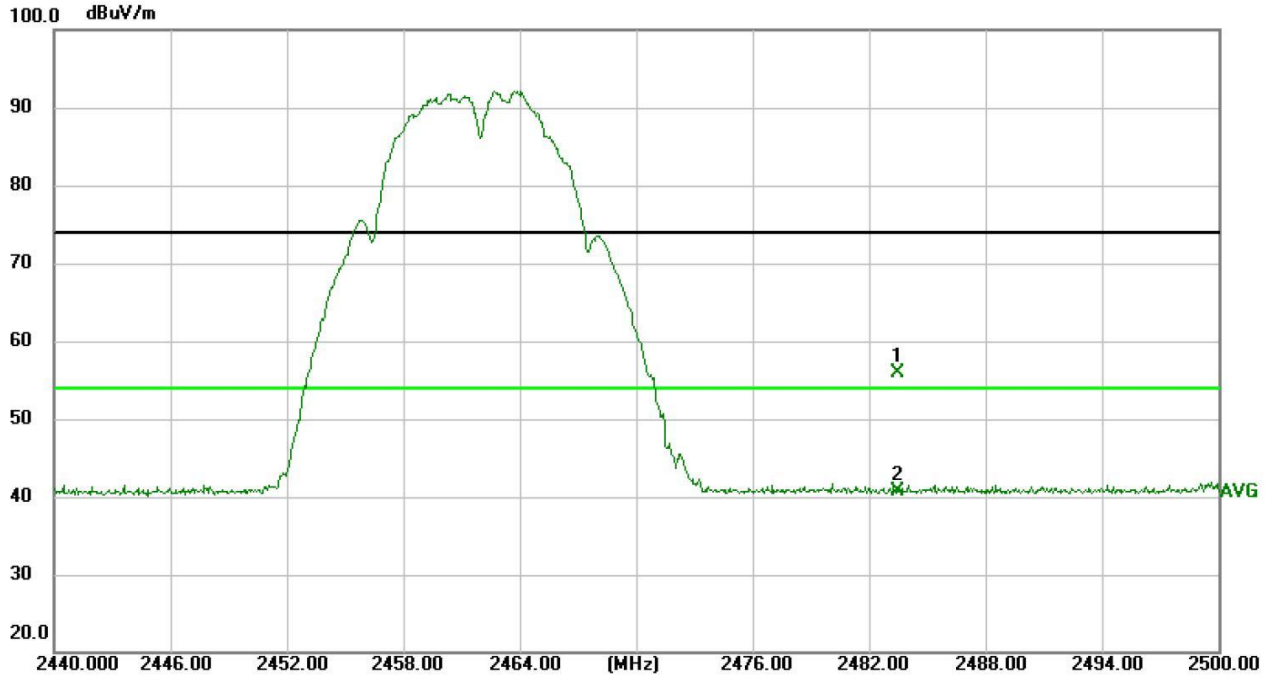


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	2390.000	26.69	30.04	56.73	74.00	-17.27	peak	200	105	P	
2	2390.000	11.27	30.04	41.31	54.00	-12.69	AVG	200	105	P	
3	2400.000	27.36	30.06	57.42	74.00	-16.58	peak	200	272	P	
4	2400.000	11.81	30.06	41.87	54.00	-12.13	AVG	200	272	P	

Note: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).Margin value = Limit value- Emission level.

802.11b 2462MHz

Horizontal

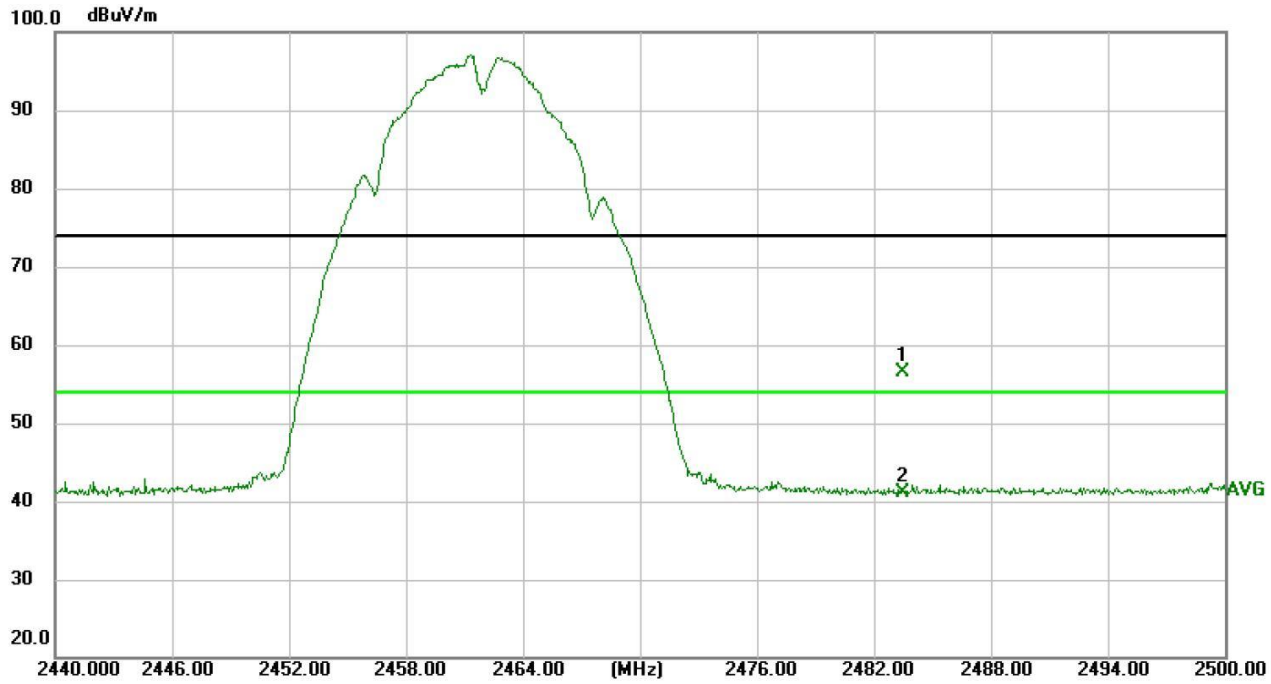


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	2483.500	25.55	30.26	55.81	74.00	-18.19	peak	100	89	P	
2	2483.500	10.42	30.26	40.68	54.00	-13.32	AVG	100	89	P	

Note: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).Margin value = Limit value- Emission level.

802.11b 2462MHz

Vertical



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	2483.500	26.16	30.26	56.42	74.00	-17.58	peak	100	164	P	
2	2483.500	10.82	30.26	41.08	54.00	-12.92	AVG	100	164	P	

Note: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).Margin value = Limit value- Emission level.

4.3 Maximum Conducted Output Power

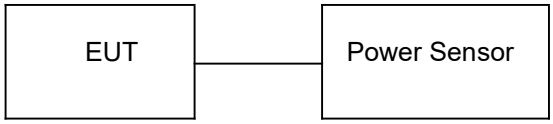
Limit

The Maximum Peak Output Power Measurement is 30dBm.

Test Procedure

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power sensor.

Test Configuration



Test Results

Type	Channel	Output power PK (dBm)	Limit (dBm)	Result
802.11b	01	14.96	30.00	Pass
	06	14.93		
	11	15.30		
802.11g	01	15.32	30.00	Pass
	06	16.08		
	11	16.50		
802.11n(HT20)	01	14.21	30.00	Pass
	06	14.86		
	11	15.38		

Note:
1) Measured output power at difference data rate for each mode and recorded worst case for each mode.
2) Test results including cable loss.
3) Worst case data at 1Mbps at IEEE 802.11b; 6Mbps at IEEE 802.11g; 6.5Mbps at IEEE 802.11n HT20.

4.4 Power Spectral Density

Limit

The resulting peak PSD level shall not be greater than 8 dBm/3KHz.

Test Procedure

1. Use this procedure when the maximum peak conducted output power in the fundamental emission is used to demonstrate compliance.
2. Set the RBW ≥ 3 kHz.
3. Set the VBW ≥ 3× RBW.
4. Set the span to 1.5 times the DTS channel bandwidth.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum power level.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.
11. The resulting peak PSD level shall not be greater than 8 dBm/3KHz.

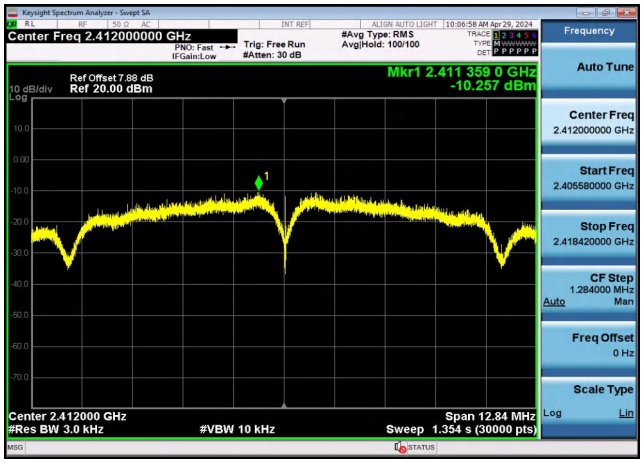
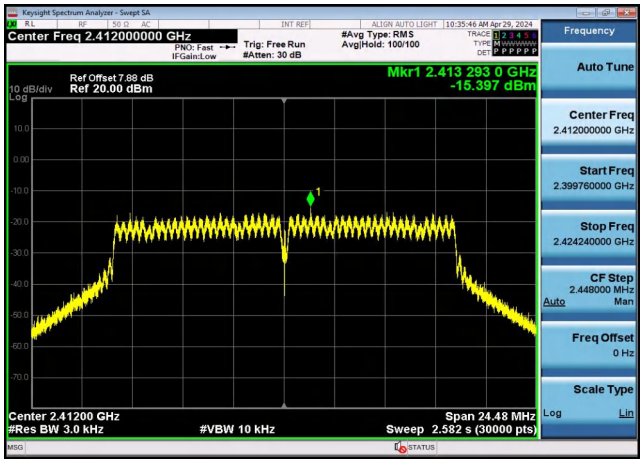
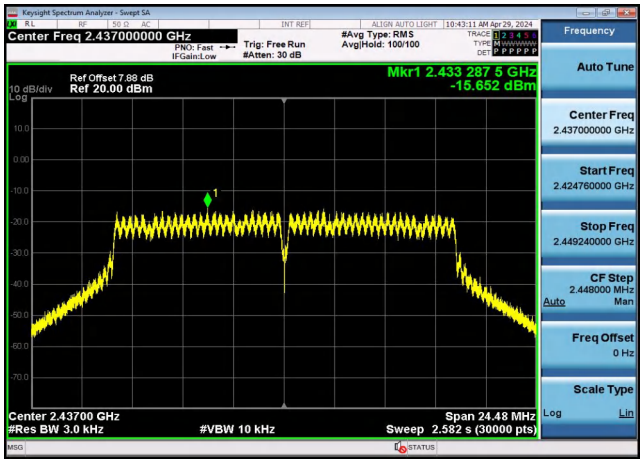
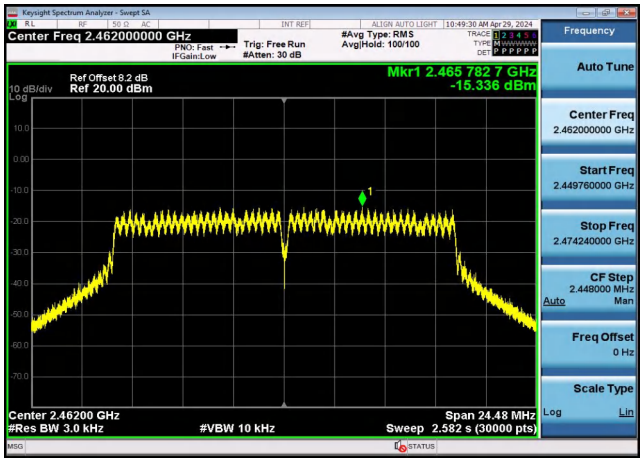
Test Configuration

Test Results

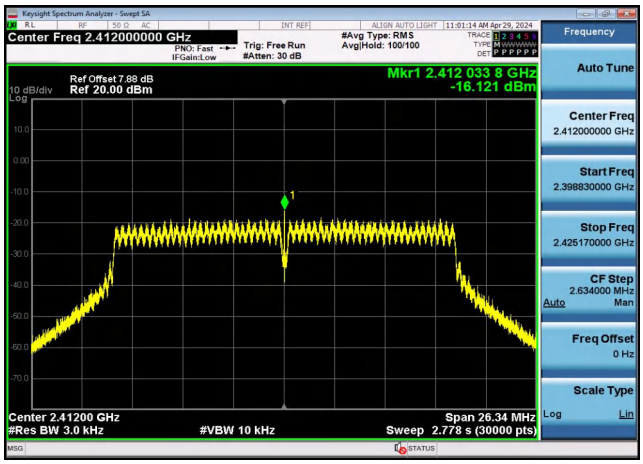
Type	Channel	Power Spectral Density (dBm/3KHz)	Limit (dBm/3KHz)	Result
802.11b	01	-10.26	8.00	Pass
	06	-10.00		
	11	-8.72		
802.11g	01	-15.40	8.00	Pass
	06	-15.65		
	11	-15.34		
802.11n(HT20)	01	-16.12	8.00	Pass
	06	-15.90		
	11	-16.31		

Note:
1) Measured peak power spectrum density at difference data rate for each mode and recorded worst case for each mode.
2) Test results including cable loss;
3) Worst case data at 1Mbps at IEEE 802.11b; 6Mbps at IEEE 802.11g; 6.5Mbps at IEEE 802.11n HT20.

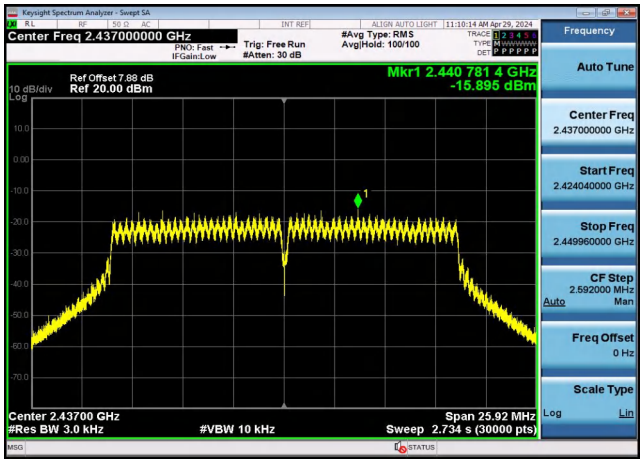
Please refer to following plots;

802.11b	802.11g
	
CH01	CH01
	
CH06	CH06
	
CH11	CH11

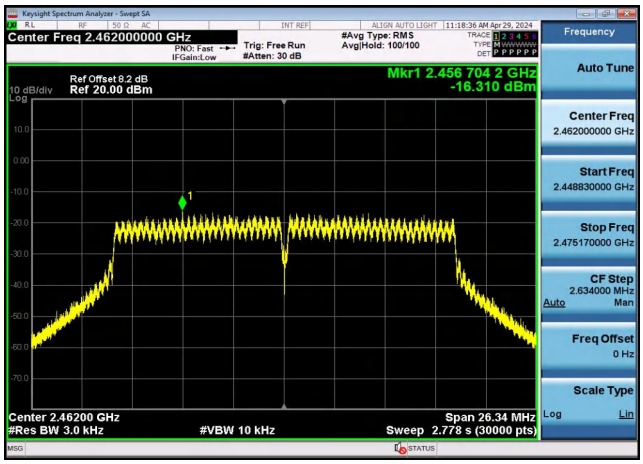
802.11n(HT20)



CH01



CH06



CH11