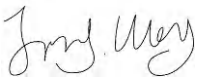
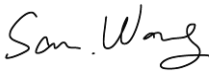
Shenzhen GUOREN Certification Technology Service Co., Ltd.

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.....:	**GRCTR240402026-01**	
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**

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 ..... :	GFSK
Frequency.....	From 2402MHz to 2480MHz
Ratings.....:	DC 5V from external circuit
Result.....:	**PASS**

T E S T R E P O R T

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.

Contents

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 Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247

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)
Bluetooth	
Supported type:	Bluetooth low Energy
Modulation:	GFSK
Operation frequency:	2402MHz to 2480MHz
Channel number:	40
Channel separation:	2 MHz
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.

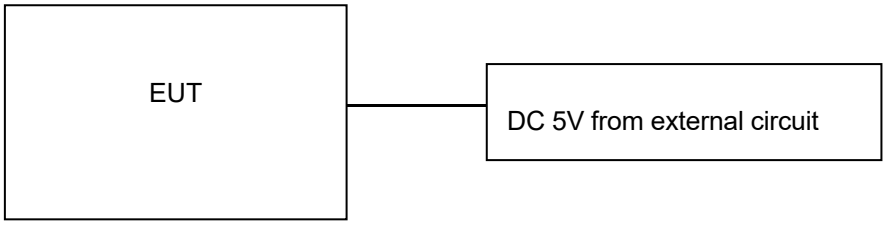
2.5 EUT operation mode

The Applicant provides communication tools software(SecureCRT) to control the EUT for staying in continuous transmitting (Duty Cycle more than 98%) and receiving mode for testing .There are 40 channels provided to the EUT and Channel 00/19/39 were selected to test.

Operation Frequency:

Channel	Frequency (MHz)
00	**2402**
01	2404
02	2406
⋮	⋮
19	**2440**
⋮	⋮
37	2476
38	2478
39	**2480**

2.6 Block Diagram of Test Setup



2.7 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for the device 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 Summary of measurement results

Test Specification clause	Test case	Test Mode	Test Channel	Recorded In Report		Test result
§15.247(e)	Power spectral density	BLE 1Mpbs	☒ Lowest ☒ Middle ☒ Highest	BLE 1Mpbs	☒ Lowest ☒ Middle ☒ Highest	complies
§15.247(a)(2)	Spectrum bandwidth – 6 dB bandwidth	BLE 1Mpbs	☒ Lowest ☒ Middle ☒ Highest	BLE 1Mpbs	☒ Lowest ☒ Middle ☒ Highest	complies
§15.247(b)(3)	Maximum output Peak power	BLE 1Mpbs	☒ Lowest ☒ Middle ☒ Highest	BLE 1Mpbs	☒ Lowest ☒ Middle ☒ Highest	complies
§15.247(d)	Band edge compliance conducted	BLE 1Mpbs	☒ Lowest ☒ Highest	BLE 1Mpbs	☒ Lowest ☒ Highest	complies
§15.205	Band edge compliance radiated	BLE 1Mpbs	☒ Lowest ☒ Highest	BLE 1Mpbs	☒ Lowest ☒ Highest	complies
§15.247(d)	TX spurious emissions conducted	BLE 1Mpbs	☒ Lowest ☒ Middle ☒ Highest	BLE 1Mpbs	☒ Lowest ☒ Middle ☒ Highest	complies
§15.247(d)	TX spurious emissions radiated	BLE 1Mpbs	☒ Lowest ☒ Middle ☒ Highest	BLE 1Mpbs	☒ Lowest ☒ Middle ☒ Highest	complies
§15.209(a)	TX spurious Emissions radiated Below 1GHz	BLE 1Mpbs	-/-	BLE 1Mpbs	-/-	complies
§15.107(a) §15.207	Conducted Emissions < 30 MHz	BLE 1Mpbs	-/-	BLE 1Mpbs	-/-	complies

Remark:
1. The measurement uncertainty is not included in the test result.
2. We tested all test mode and recorded worst case in report.
3. N/A means “not applicable”.

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.

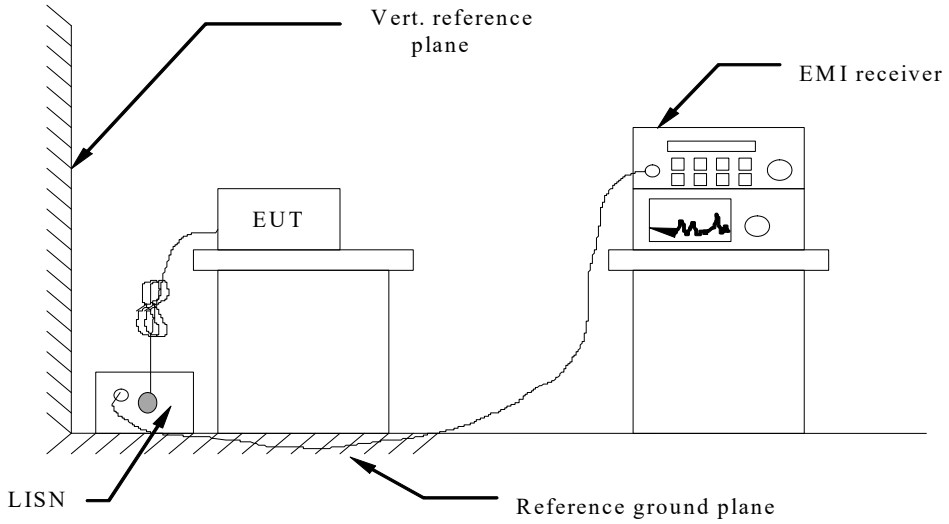
3.6 Equipments Used during the Test

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) 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

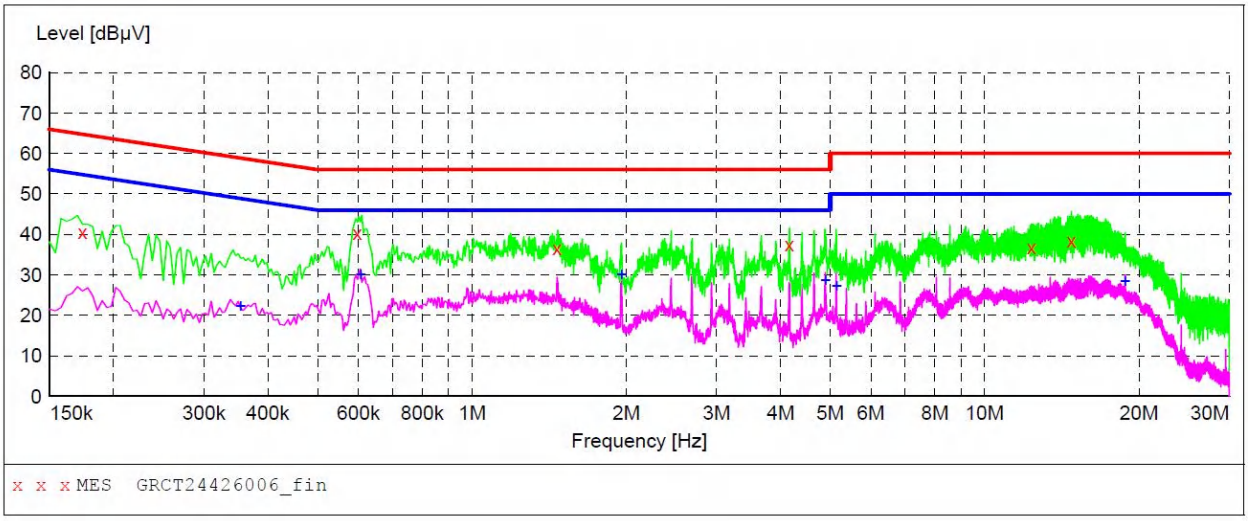
Remark:

1. GFSK 1Mpbs were tested at Low, Middle, and High channel; only the worst result of Middle channel 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: "GRCT24426006_fin"

4/26/2024 10:42AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.174000	40.60	9.5	65	24.2	QP	L1	GND
0.598000	40.30	9.6	56	15.7	QP	L1	GND
1.466000	36.50	10.0	56	19.5	QP	L1	GND
4.162000	37.60	9.9	56	18.4	QP	L1	GND
12.338000	36.70	10.0	60	23.3	QP	L1	GND
14.762000	38.40	10.0	60	21.6	QP	L1	GND

MEASUREMENT RESULT: "GRCT24426006_fin2"

4/26/2024 10:42AM

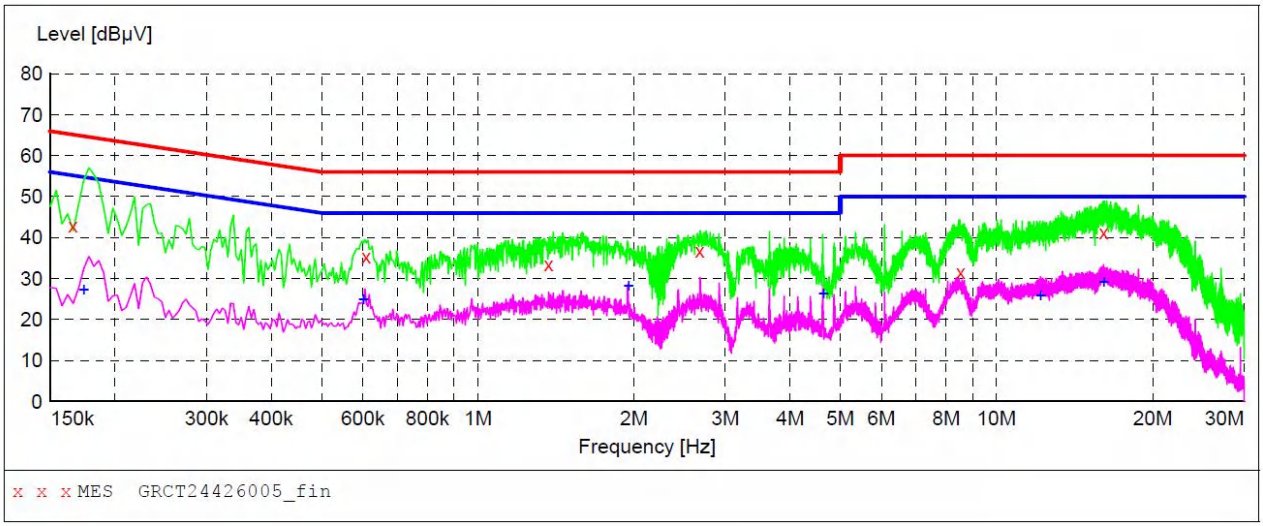
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.354000	22.30	9.5	49	26.6	AV	L1	GND
0.606000	30.10	9.6	46	15.9	AV	L1	GND
1.958000	30.20	10.0	46	15.8	AV	L1	GND
4.894000	28.80	9.9	46	17.2	AV	L1	GND
5.142000	27.30	10.0	50	22.7	AV	L1	GND
18.798000	28.40	10.1	50	21.6	AV	L1	GND

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: "GRCT24426005_fin"

4/26/2024 10:39AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.166000	43.00	9.5	65	22.2	QP	N	GND
0.610000	35.30	9.6	56	20.7	QP	N	GND
1.370000	33.50	10.0	56	22.5	QP	N	GND
2.682000	36.70	10.0	56	19.3	QP	N	GND
8.530000	31.60	10.0	60	28.4	QP	N	GND
16.110000	41.20	10.1	60	18.8	QP	N	GND

MEASUREMENT RESULT: "GRCT24426005_fin2"

4/26/2024 10:39AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.174000	27.30	9.5	55	27.5	AV	N	GND
0.602000	24.90	9.6	46	21.1	AV	N	GND
1.954000	28.20	10.0	46	17.8	AV	N	GND
4.638000	26.50	9.9	46	19.5	AV	N	GND
12.162000	25.90	10.0	50	24.1	AV	N	GND
16.102000	29.20	10.1	50	20.8	AV	N	GND

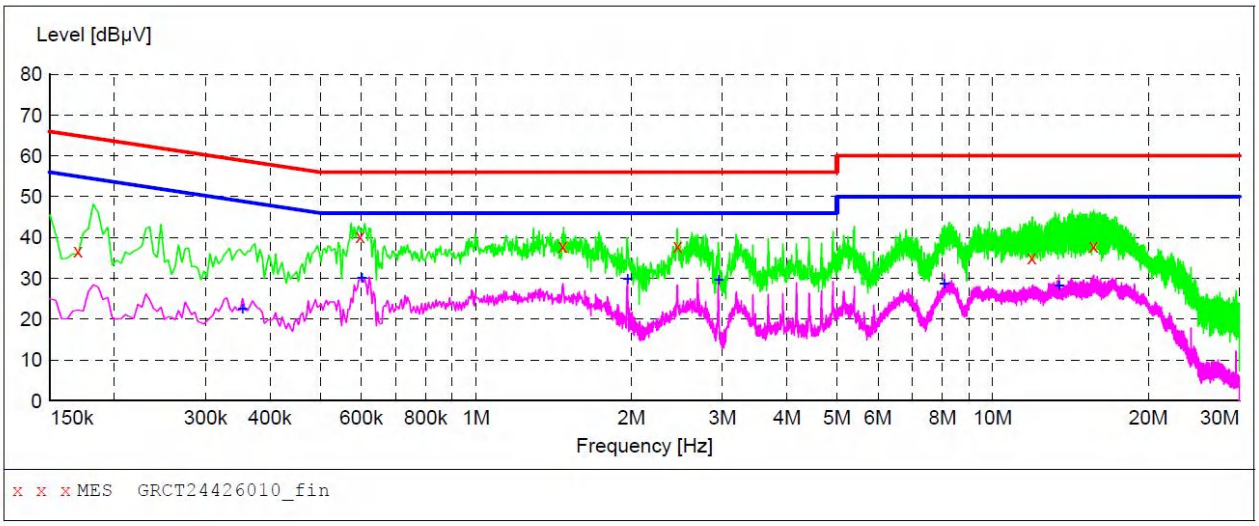
Note:1).Level (dBµV)= Reading (dBµV)+ Transducer (dB)

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

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

Motor:CAP27A02-310-5V

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



MEASUREMENT RESULT: "GRCT24426010_fin"

4/26/2024 10:56AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.170000	36.70	9.5	65	28.3	QP	L1	GND
0.598000	40.40	9.6	56	15.6	QP	L1	GND
1.474000	38.00	10.0	56	18.0	QP	L1	GND
2.458000	37.90	10.0	56	18.1	QP	L1	GND
11.918000	35.10	10.0	60	24.9	QP	L1	GND
15.690000	38.00	10.1	60	22.0	QP	L1	GND

MEASUREMENT RESULT: "GRCT24426010_fin2"

4/26/2024 10:56AM

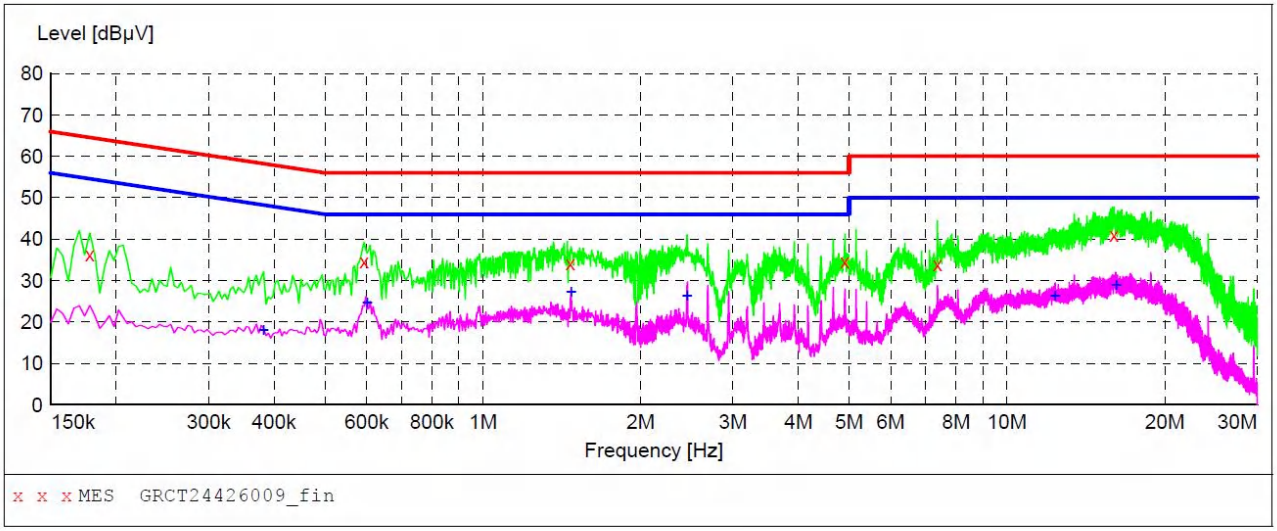
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.354000	22.60	9.5	49	26.3	AV	L1	GND
0.602000	30.10	9.6	46	15.9	AV	L1	GND
1.966000	30.00	10.0	46	16.0	AV	L1	GND
2.950000	29.80	10.0	46	16.2	AV	L1	GND
8.062000	28.70	10.1	50	21.3	AV	L1	GND
13.434000	28.20	10.0	50	21.8	AV	L1	GND

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: "GRCT24426009_fin"

4/26/2024 10:51AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.178000	36.30	9.5	65	28.3	QP	N	GND
0.594000	34.70	9.6	56	21.3	QP	N	GND
1.470000	34.10	10.0	56	21.9	QP	N	GND
4.906000	34.70	9.9	56	21.3	QP	N	GND
7.374000	33.90	10.0	60	26.1	QP	N	GND
16.002000	41.10	10.1	60	18.9	QP	N	GND

MEASUREMENT RESULT: "GRCT24426009_fin2"

4/26/2024 10:51AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.382000	18.00	9.7	48	30.2	AV	N	GND
0.602000	24.80	9.6	46	21.2	AV	N	GND
1.474000	27.40	10.0	46	18.6	AV	N	GND
2.454000	26.30	10.0	46	19.7	AV	N	GND
12.334000	26.40	10.0	50	23.6	AV	N	GND
16.146000	28.90	10.1	50	21.1	AV	N	GND

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

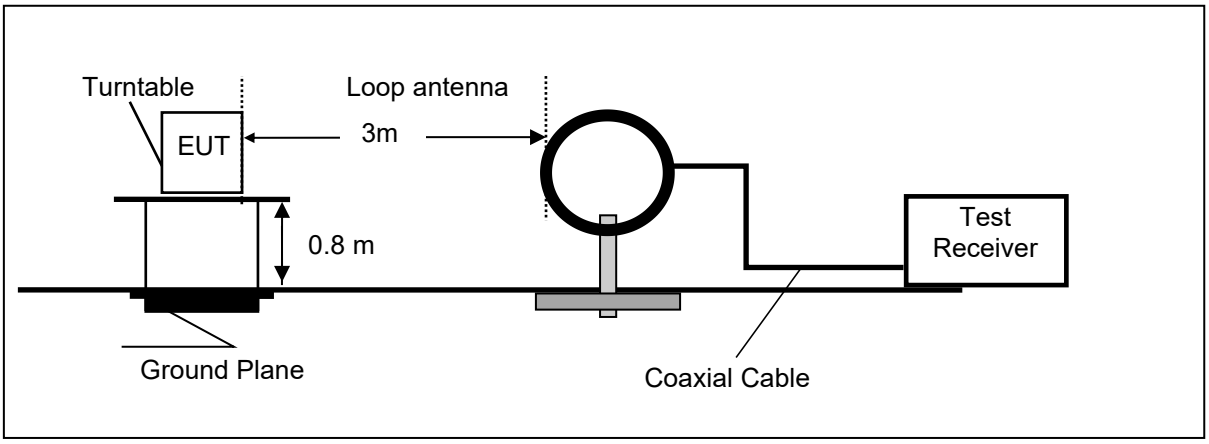
2). Transducer (dB)=insertion loss of LISN (dB) + Cable loss (dB)

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

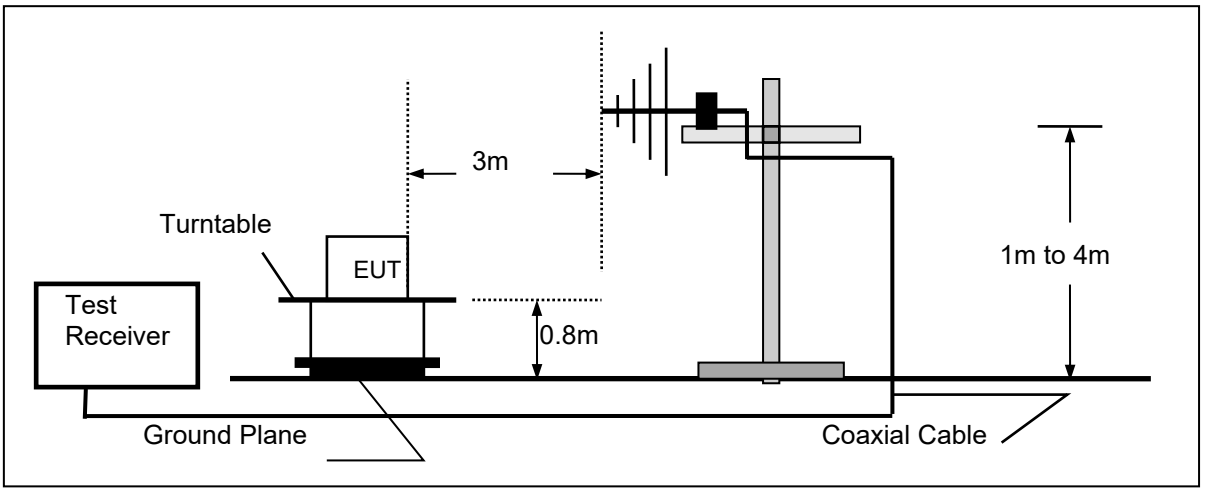
4.2 Radiated Emissions and Band Edge

TEST CONFIGURATION

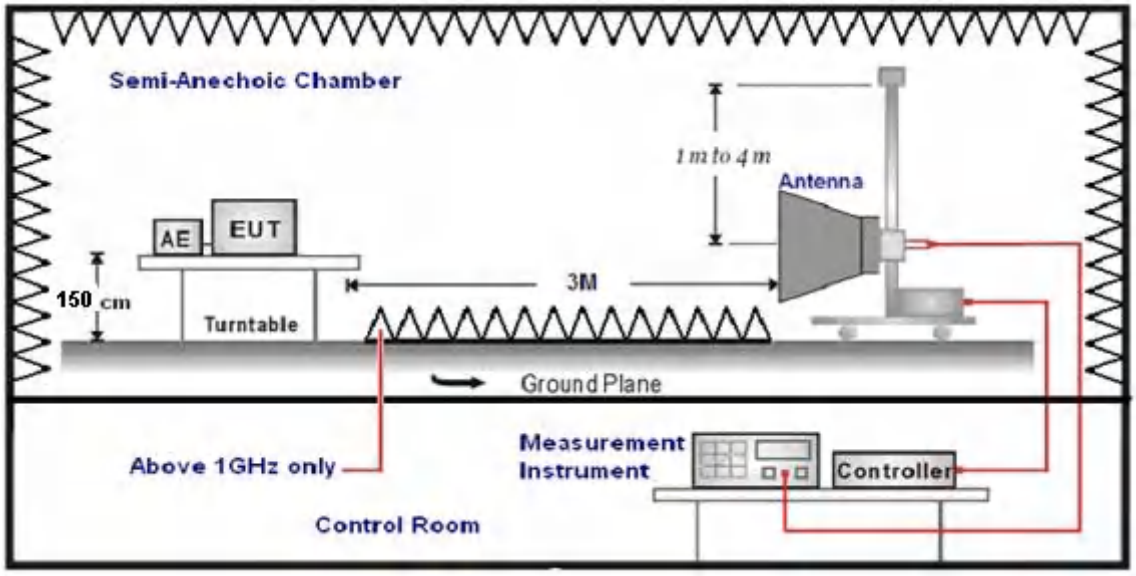
Frequency range 9 KHz – 30MHz



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 thE200kHz 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

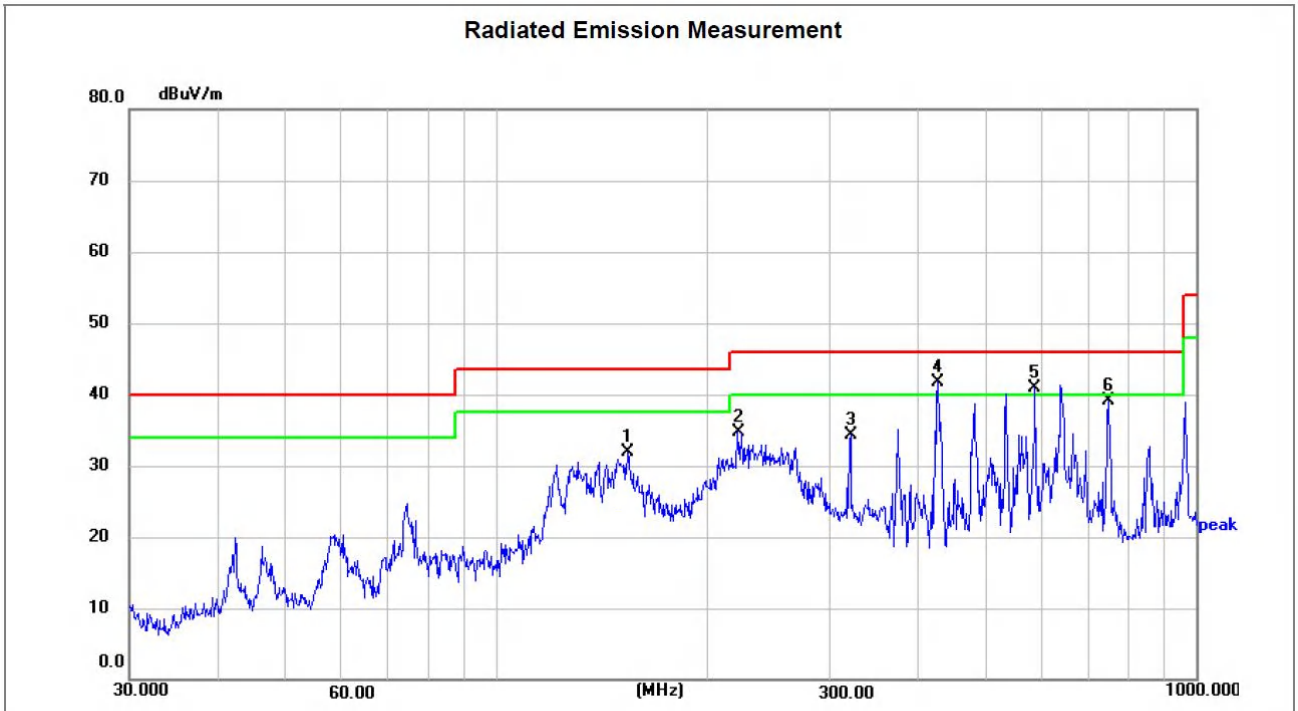
Remark:

1. This test was performed with EUT in X, Y, Z position and the worse case was found when EUT in X position.
2. BLE 1Mpbs were tested at Low, Middle, and High channel and recorded worst mode at BLE 1Mpbs Middle channel below 1GHz.
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: GFSK CH 19
Note: Motor:WP27F-5

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

Temperature: 24.5(C)
Humidity: 52 %

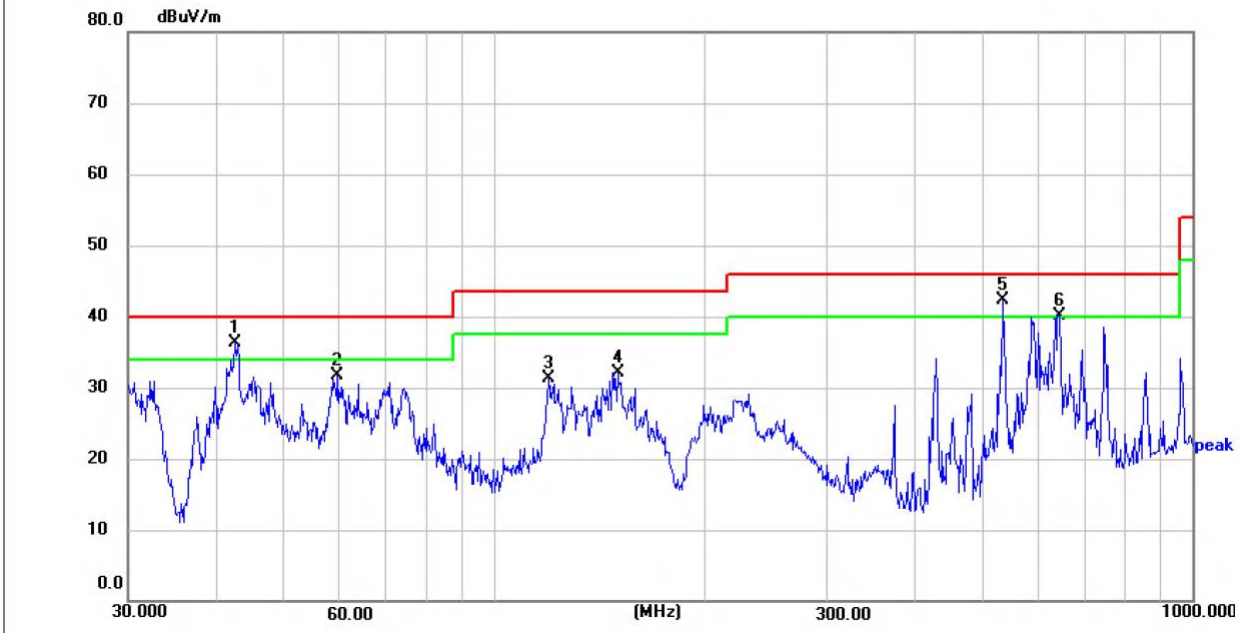
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	154.2785	53.78	-21.89	31.89	43.50	-11.61	peak	200	22	P	
2	221.3920	53.34	-18.70	34.64	46.00	-11.36	peak	200	351	P	
3	321.0605	51.16	-16.79	34.37	46.00	-11.63	peak	100	228	P	
4 *	428.0192	57.04	-15.41	41.63	46.00	-4.37	peak	100	359	P	
5 !	588.9048	52.67	-11.77	40.90	46.00	-5.10	peak	100	247	P	
6	750.1082	49.08	-10.07	39.01	46.00	-6.99	peak	100	344	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: GFSK CH 19
Note: Motor:WP27F-5

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

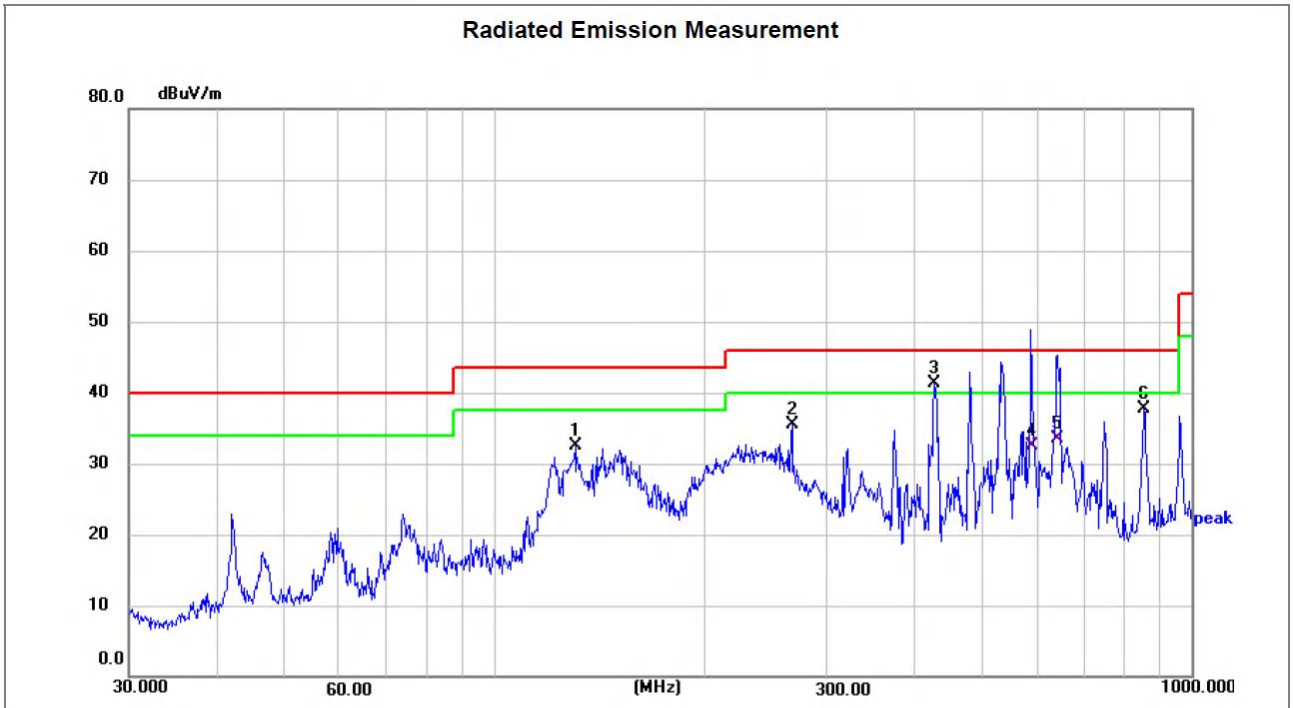
Temperature: 24.5(C)
Humidity: 52 %

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 !	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	100	119	P	
5 *	535.7073	56.48	-14.18	42.30	46.00	-3.70	peak	100	164	P	
6 !	645.1194	51.00	-10.81	40.19	46.00	-5.81	peak	100	245	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: GFSK CH 19
Note: Motor:CAP27A02-310-5V

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

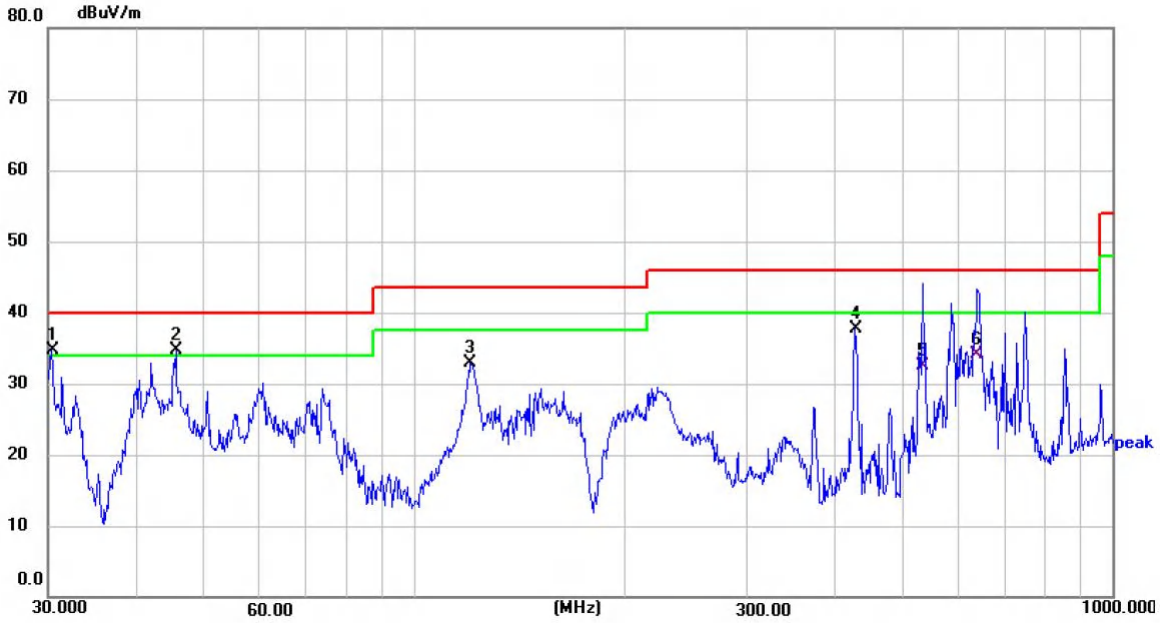
Temperature: 24.5(C)
Humidity: 52 %

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	130.8369	55.14	-22.59	32.55	43.50	-10.95	peak	199	344	P	
2	267.5454	53.32	-17.84	35.48	46.00	-10.52	peak	199	9	P	
3 *	428.0192	56.69	-15.41	41.28	46.00	-4.72	peak	199	9	P	
4	590.3101	44.12	-11.68	32.44	46.00	-13.56	QP	165	44	P	
5	641.8260	44.33	-10.83	33.50	46.00	-12.50	QP	100	344	P	
6	854.0247	46.42	-8.69	37.73	46.00	-8.27	peak	100	200	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

Radiated Emission Measurement



Site LAB
Limit: FCC Part15 RE-Class B_30-1000MHz
EUT: WAKE UP LIGHT DIFFUSER
M/N: PZ-PA065
Mode: GFSK CH 19
Note: Motor:CAP27A02-310-5V

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

Temperature: 24.5(C)
Humidity: 52 %

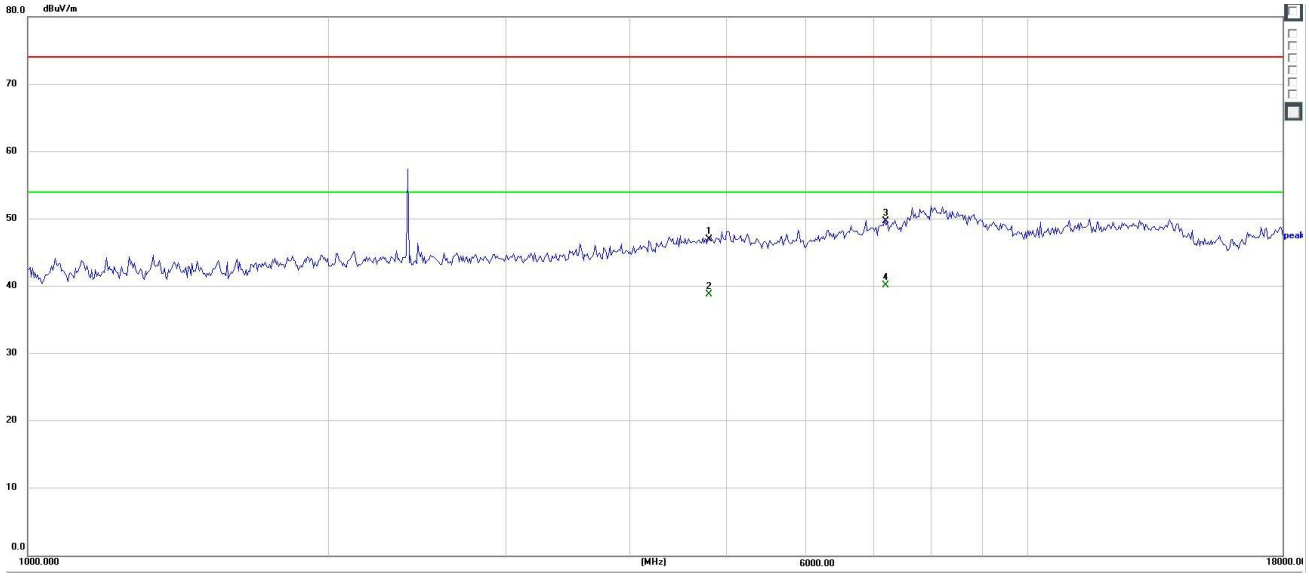
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1 !	30.3173	54.61	-19.88	34.73	40.00	-5.27	peak	100	237	P	
2 *	45.6948	52.29	-17.55	34.74	40.00	-5.26	peak	100	1	P	
3	120.6991	53.11	-20.23	32.88	43.50	-10.62	peak	100	76	P	
4	428.0193	53.21	-15.41	37.80	46.00	-8.20	peak	100	76	P	
5	535.3061	46.60	-14.18	32.42	46.00	-13.58	QP	100	341	P	
6	640.5288	44.98	-10.84	34.14	46.00	-11.86	QP	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)

For above 1GHz

2402MHz

Horizontal

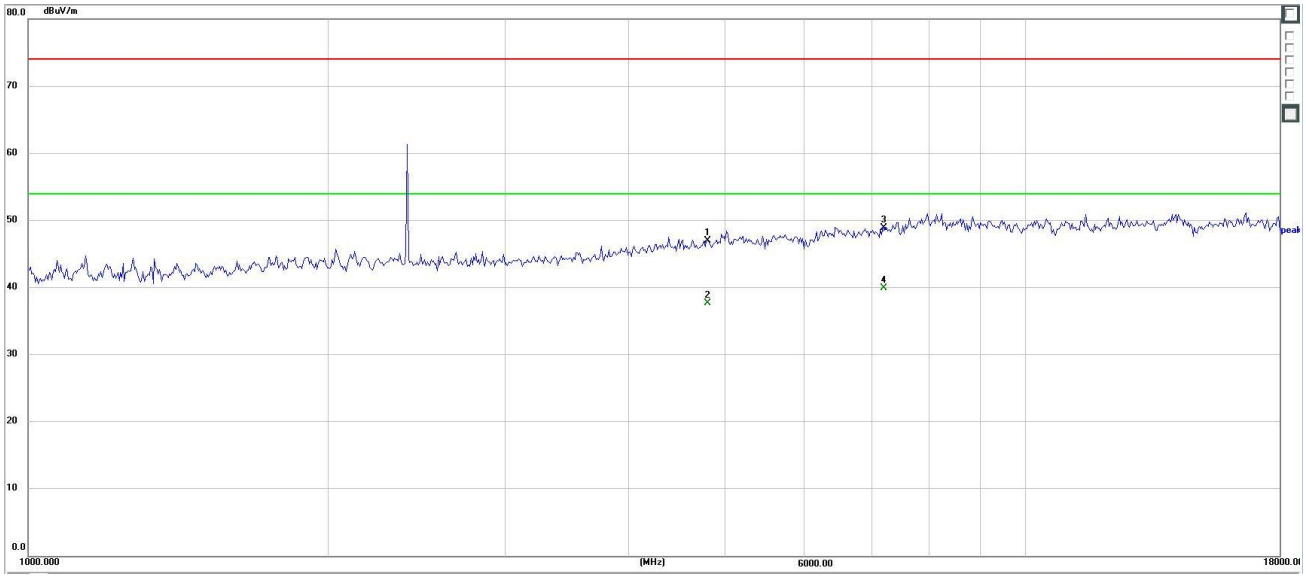


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	4804.000	68.17	-21.16	47.01	74.00	-26.99	peak	200	351	P	
2	4804.000	59.93	-21.16	38.77	54.00	-15.23	AVG	200	351	P	
3	7206.000	64.07	-14.42	49.65	74.00	-24.35	peak	100	183	P	
4	7206.000	54.63	-14.42	40.21	54.00	-13.79	AVG	100	183	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.

2402MHz

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	4804.000	68.20	-21.16	47.04	74.00	-26.96	peak	200	133	P	
2	4804.000	58.82	-21.16	37.66	54.00	-16.34	AVG	200	133	P	
3	7206.000	63.38	-14.42	48.96	74.00	-25.04	peak	100	208	P	
4	7206.000	54.38	-14.42	39.96	54.00	-14.04	AVG	100	208	P	

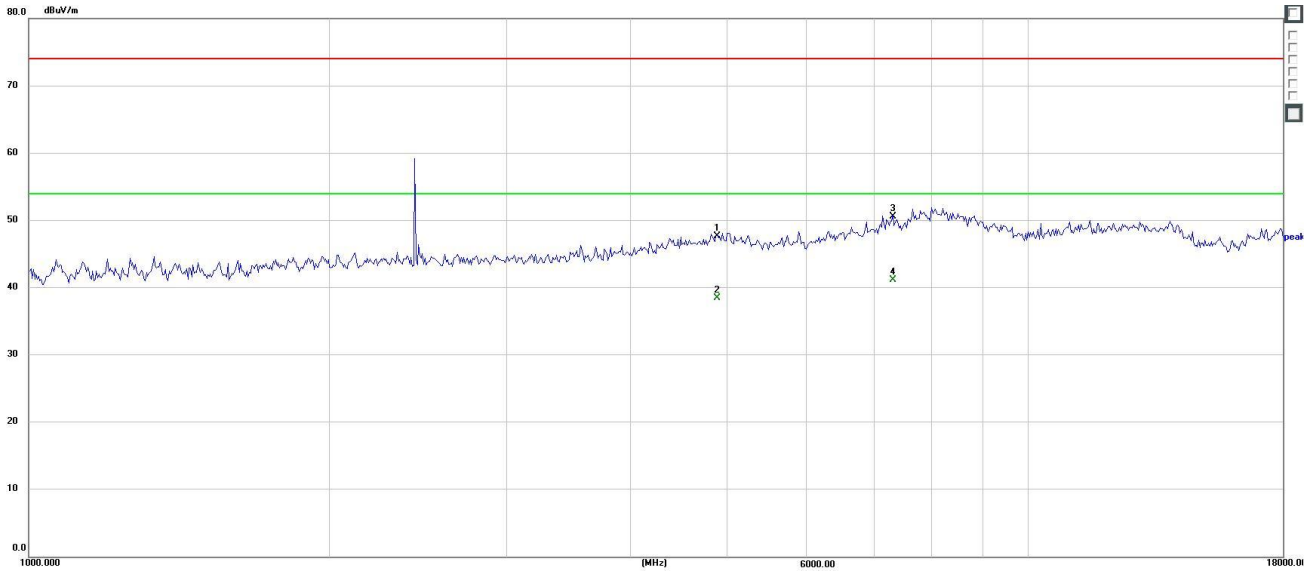
Note:1).Emission level (dBuV/m) =Raw Value (dBuV)+Correction Factor (dB/m)

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

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

2440MHz

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	4880.000	67.99	-20.31	47.68	74.00	-26.32	peak	200	140	P	
2	4880.000	58.83	-20.31	38.52	54.00	-15.48	AVG	200	140	P	
3	7320.000	64.22	-13.66	50.56	74.00	-23.44	peak	100	116	P	
4	7320.000	54.82	-13.66	41.16	54.00	-12.84	AVG	100	116	P	

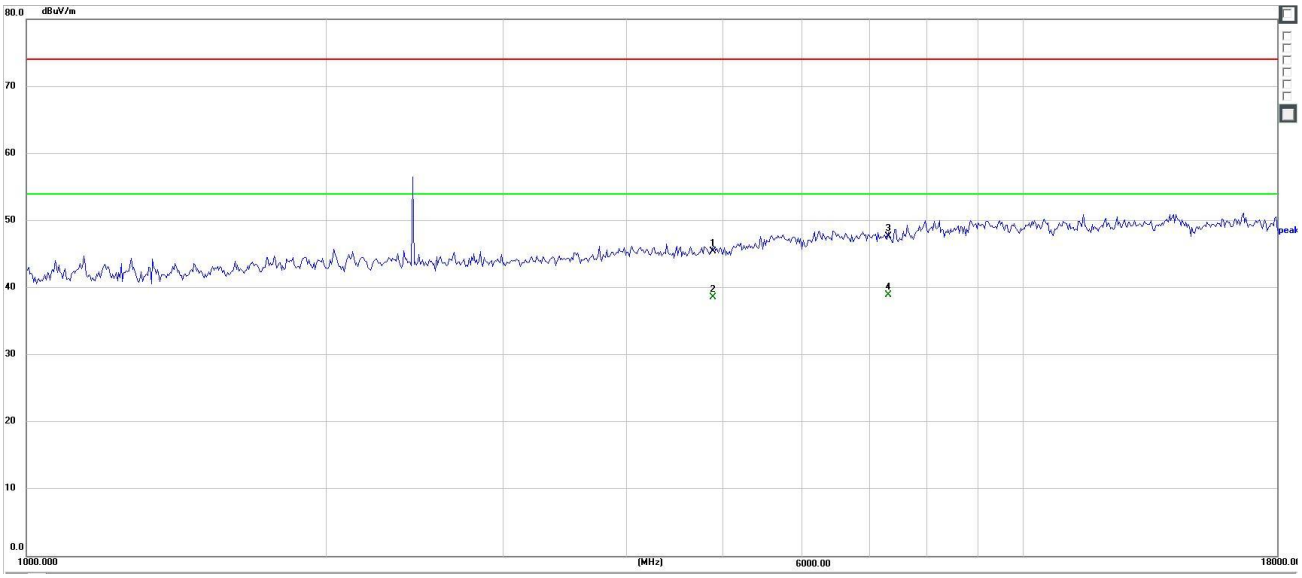
Note:1).Emission level (dBuV/m) =Raw Value (dBuV)+Correction Factor (dB/m)

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

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

2440MHz

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	4880.000	65.74	-20.31	45.43	74.00	-28.57	peak	200	152	P	
2	4880.000	58.95	-20.31	38.64	54.00	-15.36	AVG	200	152	P	
3	7320.000	61.39	-13.66	47.73	74.00	-26.27	peak	100	164	P	
4	7320.000	52.62	-13.66	38.96	54.00	-15.04	AVG	100	164	P	

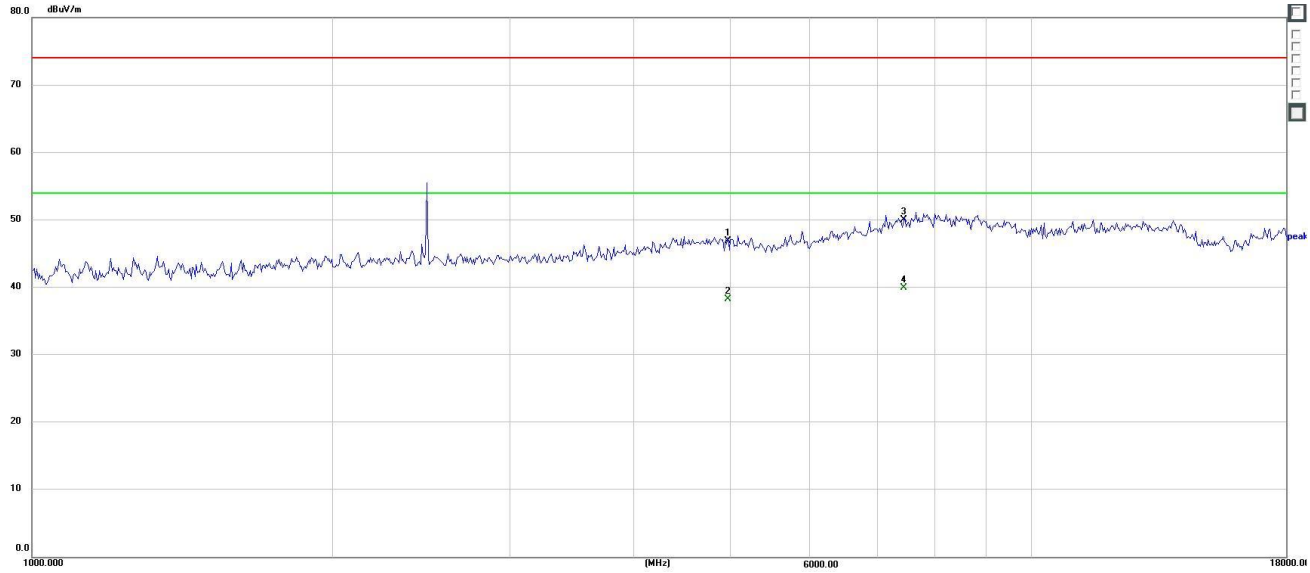
Note:1).Emission level (dBuV/m) =Raw Value (dBuV)+Correction Factor (dB/m)

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

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

2480MHz

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	4960.000	66.45	-19.53	46.92	74.00	-27.08	peak	100	27	P	
2	4960.000	57.79	-19.53	38.26	54.00	-15.74	AVG	100	27	P	
3	7440.000	63.25	-13.20	50.05	74.00	-23.95	peak	200	301	P	
4	7440.000	53.17	-13.20	39.97	54.00	-14.03	AVG	200	301	P	

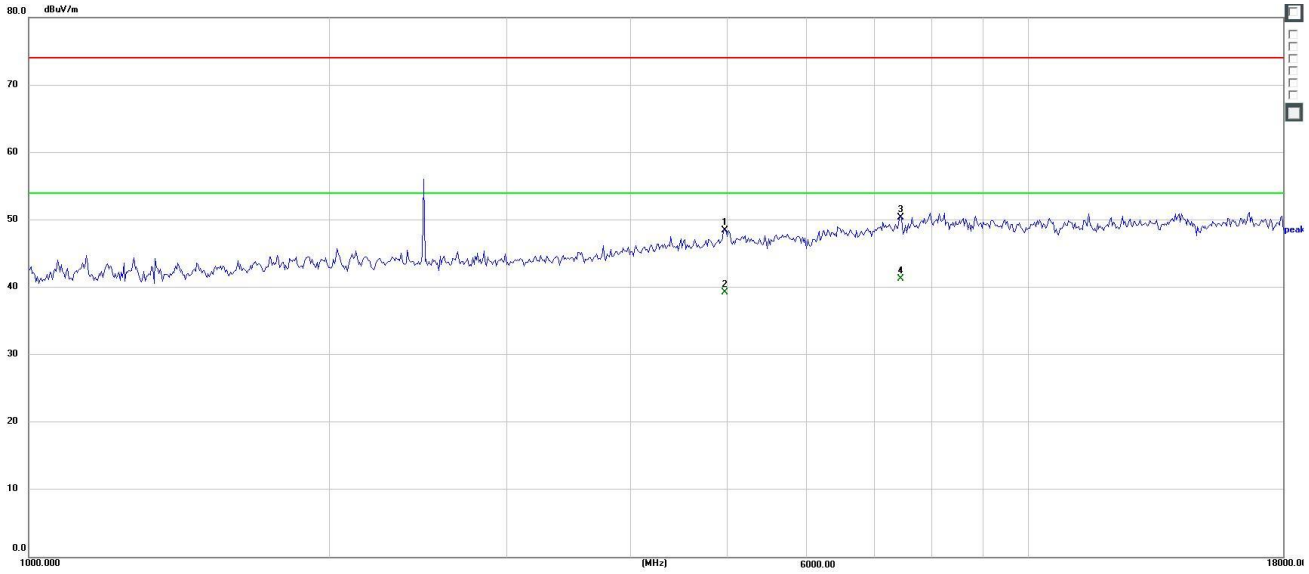
Note:1).Emission level (dBuV/m) =Raw Value (dBuV)+Correction Factor (dB/m)

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

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

2480MHz

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	4960.000	67.99	-19.53	48.46	74.00	-25.54	peak	100	56	P	
2	4960.000	58.81	-19.53	39.28	54.00	-14.72	AVG	100	56	P	
3	7440.000	63.61	-13.20	50.41	74.00	-23.59	peak	200	133	P	
4	7440.000	54.47	-13.20	41.27	54.00	-12.73	AVG	200	133	P	

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

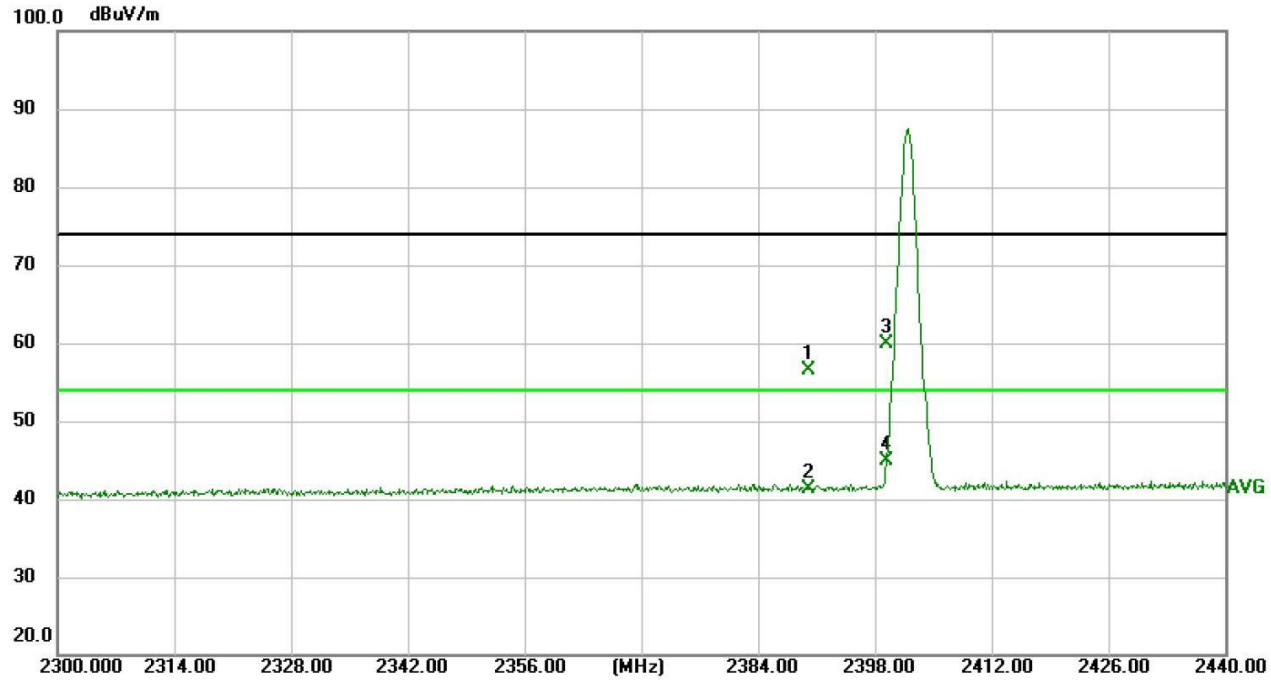
2).Correction Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier

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

Results of Band Edges Test (Radiated)

2402MHz

Horizontal

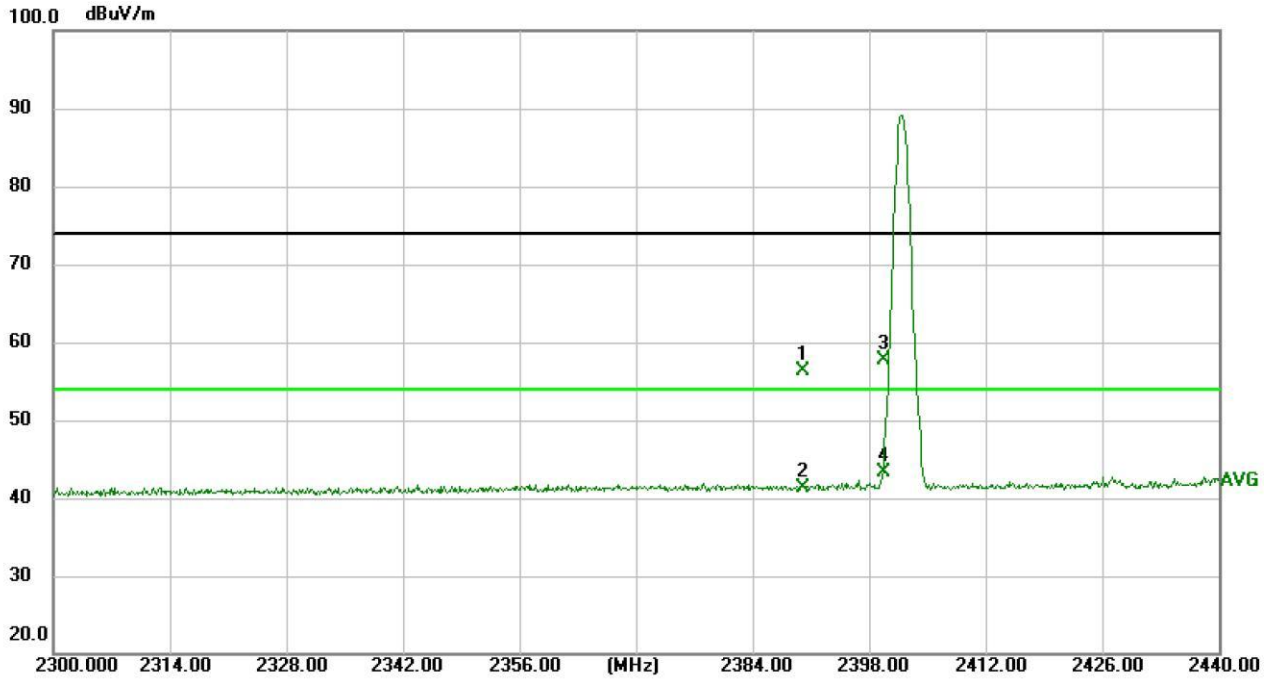


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	2390.000	26.50	30.04	56.54	74.00	-17.46	peak	100	173	P	
2	2390.000	11.24	30.04	41.28	54.00	-12.72	AVG	100	173	P	
3	2400.000	29.86	30.06	59.92	74.00	-14.08	peak	200	207	P	
4	2400.000	14.81	30.06	44.87	54.00	-9.13	AVG	200	207	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.

2402MHz

Vertical

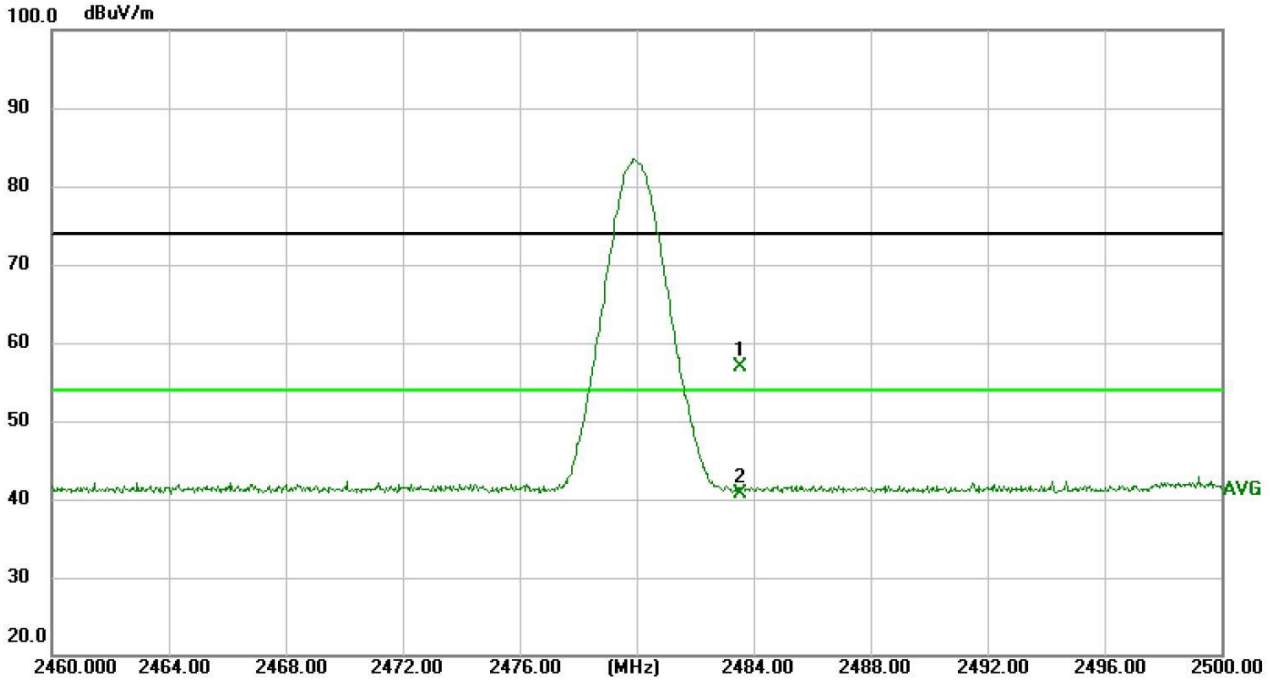


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	2390.000	26.34	30.04	56.38	74.00	-17.62	peak	200	135	P	
2	2390.000	11.23	30.04	41.27	54.00	-12.73	AVG	200	135	P	
3	2400.000	27.68	30.06	57.74	74.00	-16.26	peak	100	224	P	
4	2400.000	13.19	30.06	43.25	54.00	-10.75	AVG	100	224	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.

2480MHz

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	26.58	30.26	56.84	74.00	-17.16	peak	100	162	P	
2	2483.500	10.48	30.26	40.74	54.00	-13.26	AVG	100	162	P	

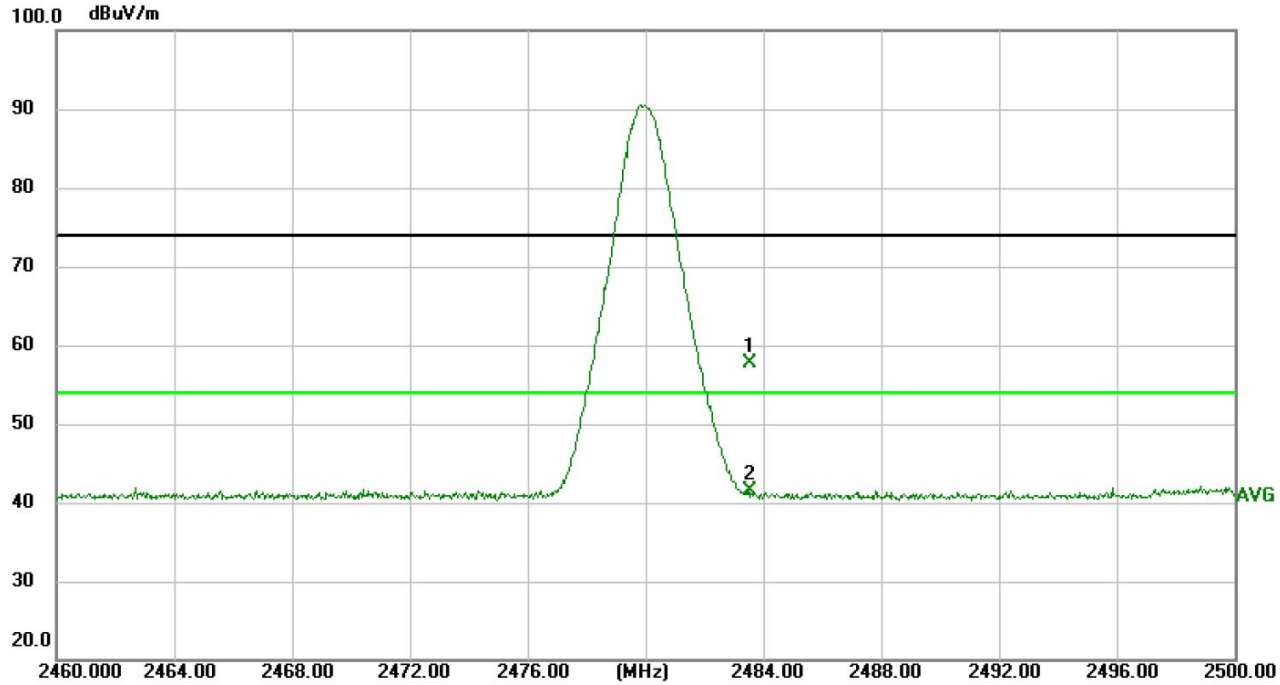
Note:1).Emission level (dBuV/m) =Raw Value (dBuV)+Correction Factor (dB/m)

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

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

2480MHz

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	27.36	30.26	57.62	74.00	-16.38	peak	200	340	P	
2	2483.500	11.30	30.26	41.56	54.00	-12.44	AVG	200	340	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 Peak Output Power

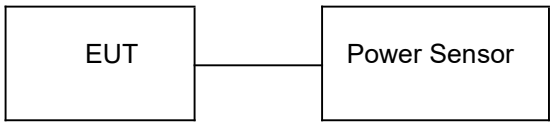
Limit

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 (dBm)	Limit (dBm)	Result
GFSK	00	4.61	30.00	Pass
	19	4.67		
	39	4.41		

Note: 1.The test results including the cable lose.