



Certificate # 2861.01



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CNAS L0446

GRGTEST

Page 1 of 48

Test Report

Verified code: 720968

Report No.: E20220126665001-2-G1

Customer: Lumi United Technology Co., Ltd

Address: B1, Chongwen Park, Nanshan iPark, Liuxian Avenue, Taoyuan Residential District, Nanshan District, Shenzhen, China

Sample Name: Hub M1S Gen 2

Sample Model: HM1S-G02

Receive Sample Date: Feb.09,2022

Test Date: Feb.15,2022 ~ Feb.21,2022

Reference Document: CFR 47, FCC Part 15 Subpart C
RADIO FREQUENCY DEVICES:Subpart C—Intentional Radiators
ANSI C63.10-2013
KDB 558074 D01 15.247 Meas Guidance v05r02

Test Result: Pass

Prepared by: Yang Zhaoyun Reviewed by: Jiang Tao Approved by: Xiao Liang

GUANGZHOU GRG METROLOGY & TEST CO., LTD

Issued Date: 2022-03-24

GUANGZHOU GRG METROLOGY & TEST CO., LTD.

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5. Without the agreement of the laboratory, the client is not authorized to use the test results for unapproved propaganda.

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REPORT ISSUED HISTORY

Report Version	Report No.	Description	Compile Date
1.0	E20220126665001-2	Original Issue	2022/03/09
2.0	E20220126665001-2-G1	Update	2022/03/23

Version 2.0:

1. On the basis of the original report, added the description of radiated spurious emissions test from 18GHz to 26.5GHz.
2. This report instead the report E20220126665001-2, and from the date of issuance of this report, the report which being replaced become invalid.

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1. TEST RESULT SUMMARY

Standard	Item	Limit / Severity	Result
CFR 47, FCC Part 15 Subpart C (§15.247)	Antenna Requirement	§15.203	PASS
	Conducted Emissions	§15.207 (a)	PASS
	Radiated Spurious Emission	§15.247(d) § 15.205 § 15.209	PASS
	6 dB Bandwidth	§15.247 (a)(2)	PASS
	Maximum Peak Output Power	§15.247(b)(3)	PASS
	Power Spectral Density	§15.247(e)	PASS
	Conducted band edges and Spurious Emission	§15.247(d)	PASS
	Restricted bands of operation	§15.205 § 15.209 §15.247(d)	PASS

The EUT have two antennas. The antenna is Internal antenna.

The max gain of antenna is 1dBi, which accordance 15.203 is considered sufficient to comply with the provisions of this section.

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2. GENERAL DESCRIPTION OF EUT

2.1 APPLICANT

Name: Lumi United Technology Co., Ltd
Address: B1, Chongwen Park, Nanshan iPark, Liuxian Avenue, Taoyuan Residential District, Nanshan District, Shenzhen, China

2.2 MANUFACTURER

Name: Lumi United Technology Co., Ltd
Address: B1, Chongwen Park, Nanshan iPark, Liuxian Avenue, Taoyuan Residential District, Nanshan District, Shenzhen, China

2.3 BASIC DESCRIPTION OF EQUIPMENT UNDER TEST

Product Name: Hub M1S Gen 2
Product Model: HM1S-G02
Adding Model: /
Trade Name: Aqara
FCC ID: 2AKIT-HM1S-G02
Power Supply: AC120V/60Hz
Adapter Specification: /
Frequency Band: 2405MHz-2475MHz
Transmit Power: 8.86 dBm
Modulation Type: OQPSK
Antenna Specification: Internal antenna with 1dBi gain (Max)
Temperature Range: -10°C ~ +40°C
Hardware Version: T0
Software Version: V1.0.1_0001
Sample submitting way: Provided by customer Sampling
Sample No: E20220126665001-0002, E20220126665001-0003
Note: /

2.4 CHANNEL LIST

CH11 - CH25 for Zigbee							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
11	2405	15	2425	19	2445	23	2465
12	2410	16	2430	20	2450	24	2470
13	2415	17	2435	21	2455	25	2475
14	2420	18	2440	22	2460		

2.5 TEST OPERATION MODE

Mode No.	Description of the modes
1	Zigbee TX mode

2.6 LOCAL SUPPORTIVE INSTRUMENTS

Name of Equipment	Manufacturer	Model	Serial Number	Note
Notebook	LENOVO	TianYi 310-14ISK	MP18DLC6	/
Cable				
Serial port to USB cable	/	/	/	UnShielded, 1.5m

2.7 CONFIGURATION OF SYSTEM UNDER TEST



Test software:

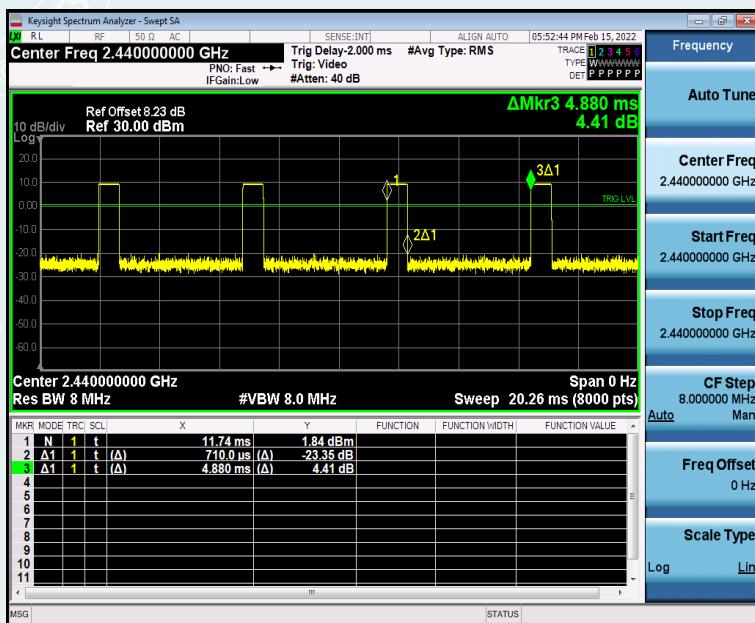
Software version	Power Setting
QCOM_V1.0	90

2.8 DUTY CYCLE

EUT Name	Hub M1S Gen 2	Model	HM1S-G02
Environmental Conditions	22.4 °C/51%RH	Test Voltage	AC120V/60Hz
Tested By	Deng Weihao	Tested Date	2022/02/15

Test Mode	Frequency (MHz)	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	T [s]
Zigbee	2440	0.71	4.88	14.55	0.00071

Zigbee_2440MHz



3. LABORATORY AND ACCREDITATIONS

3.1 LABORATORY

The tests & measurements refer to this report were performed by Shenzhen EMC Laboratory of Guangzhou GRG Metrology & Test Co., Ltd.

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Shenzhen, 518110, People's Republic of China

P.C. : 518000

Tel : 0755-61180008

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3.2 ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

USA A2LA(Certificate#:2861.01)

China CNAS(L0446)

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

Canada ISED (Company Number: 24897, CAB identifier:CN0069)

USA FCC (Registration Number: 759402, Designation Number:CN1198)

Copies of granted accreditation certificates are available for downloading from our web site,
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3.3 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement		Frequency	Uncertainty	
Radiated Emission	Horizontal	9kHz~30MHz	4.46dB	
		30MHz~1000MHz	4.30dB	
		1GHz~18GHz	5.60dB	
		18GHz~26.5GHz	3.65dB	
	Vertical	9kHz~30MHz	4.46dB	
		30MHz~1000MHz	4.30dB	
		1GHz~18GHz	5.60dB	
		18GHz~26.5GHz	3.65dB	
Conduction Emission		9 kHz~150kHz	2.80dB	
		150kHz~10MHz	2.80dB	
		10MHz~30MHz	2.20dB	

Measurement	Uncertainty
RF frequency	6.0×10^{-6}
RF power conducted	0.78 dB
Occupied channel bandwidth	0.4 dB
Unwanted emission, conducted	0.68 dB
Humidity	6 %
Temperature	2 °C

This uncertainty represents an expanded uncertainty factor of k=2.

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4. LIST OF USED TEST EQUIPMENT AT GRGT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Conducted Emissions				
EZ-EMC	EZ	CCS-3A1-CE	/	/
EMI Receiver	R&S	ESCI	100783	2022-09-13
LISN(EUT)	R&S	ENV216	101543	2022-03-21
Radiated Spurious Emission&Restricted bands of operation				
Test S/W	EZ	CCS-2ANT		
Loop Antenna	TESEQ	HLA6121	52599	2022-04-21
Test Receiver	R&S	ESCI	100088	2022-10-31
Preamplifier	EMEC	EM330	/	2022-03-21
Bi-log Antenna	TESEQ	CBL6143A	32399	2022-11-25
Spectrum Analyzer	Agilent	N9010A	MY52221469	2022-04-16
Horn Antenna	Schwarzbeck	BBHA9120D(120 1)	02143	2022-10-22
Board-Band Horn Antenna	Schwarzbeck	BBHA 9170	BBHA 9170-497	2022-10-16
Amplifier	Tonscend	TAP01018048	AP20E8060075	2022-06-07
Amplifier	Tonscend	TAP184050	AP20E806071	2022-05-17
Test S/W	Tonscend	JS32-RE/2.5.1.5		
6 dB Bandwidth				
Spectrum Analyzer	R&S	FSV30	104381	2022-12-10
Output Power				
Pulse power sensor	Agilent	MA2411B	1126150	2022-03-21
Power meter	Anritsu	ML2495A	1204003	2022-03-21
Conducted band edges and Spurious Emission				
Spectrum Analyzer	R&S	FSV30	104381	2022-12-10
Power Spectral Density				
Spectrum Analyzer	R&S	FSV30	104381	2022-12-10

Note: The calibration interval of the above test instruments is 12 months.

5. CONDUCTED EMISSION MEASUREMENT

5.1 LIMITS

Frequency range	Limits (dB μ V)	
	Quasi-peak	Average
150kHz ~ 0.5MHz	66~56	56~46
0.5 MHz ~ 5 MHz	56	46
5 MHz ~ 30 MHz	60	50

NOTE: (1) The lower limit shall apply at the transition frequencies.

(2) The limit decreases in line with the logarithm of the frequency in the range of 150 kHz to 0.5MHz.

5.2 TEST PROCEDURES

Procedure of Preliminary Test

Test procedures follow ANSI C63.10:2013.

For measurement of the disturbance voltage the equipment under test (EUT) is connected to the power supply mains and any other extended network via one or more artificial network(s). An EUT, whether intended to be grounded or not, and which is to be used on a table is configured as follows:

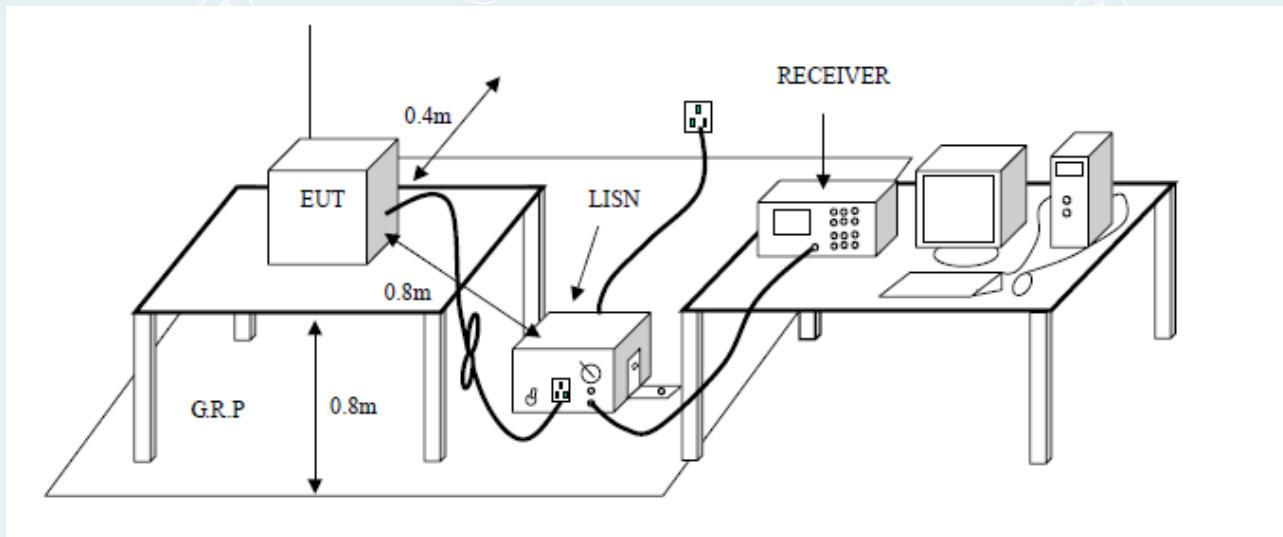
- Either the bottom or the rear of the EUT shall be at a controlled distance of 40 cm from a reference ground plane. This ground plane is normally the wall or floor of a shielded room. It may also be a grounded metal plane of at least 2 m by 2 m. This is physically accomplished as follows:
 - 1) place the EUT on a table of non-conducting material which is at least 80 cm high. Place the EUT so that it is 40 cm from the wall of the shielded room, or
 - 2) place the EUT on a table of non-conducting material which is 40 cm high so that the bottom of the EUT is 40 cm above the ground plane;
- All other conductive surfaces of the EUT shall be at least 80 cm from the reference ground plane;
- The EUT are placed on the floor that one side of the housings is 40 cm from the vertical reference ground plane and other metallic parts;
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth forming a bundle 30 cm to 40 cm long, hanging approximately in the middle between the ground plane and the table.
- I/O cables that are connected to a peripheral shall be bundled in the centre. The end of the cable may be terminated if required using correct terminating impedance. The total length shall not exceed 1 m.
- Use serial board or connecting line to make EUT and notebook to communicate, according to the actual need to make EUT send constant frequency signal continuously.

The test mode(s) described in Item 2.5 were scanned during the preliminary test. After the preliminary scan, we found the test mode described in Item 2.5 producing the highest emission level. The EUT configuration and cable configuration of the above highest emission levels were recorded for reference of the final test.

Procedure of Final Test

EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test. A scan was taken on both power lines, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. The test data of the worst-case condition(s) was recorded.

5.3 TEST SETUP



5.4 DATA SAMPLE

Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
X.XXXX	32.69	25.65	11.52	44.21	37.17	65.78	55.79	-21.57	-18.62	Pass

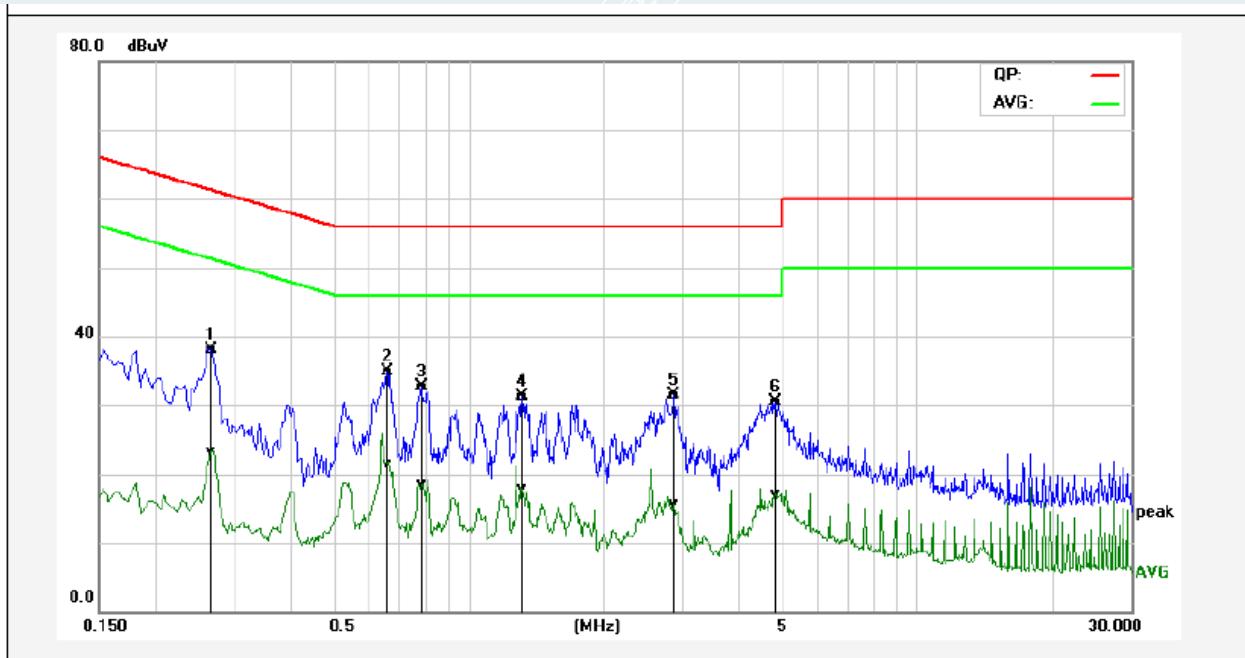
Factor = Insertion loss of LISN + Cable Loss
 Result = Quasi-peak Reading/ Average Reading + Factor
 Limit = Limit stated in standard
 Margin = Result (dBuV) – Limit (dBuV)

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5.5 TEST RESULTS

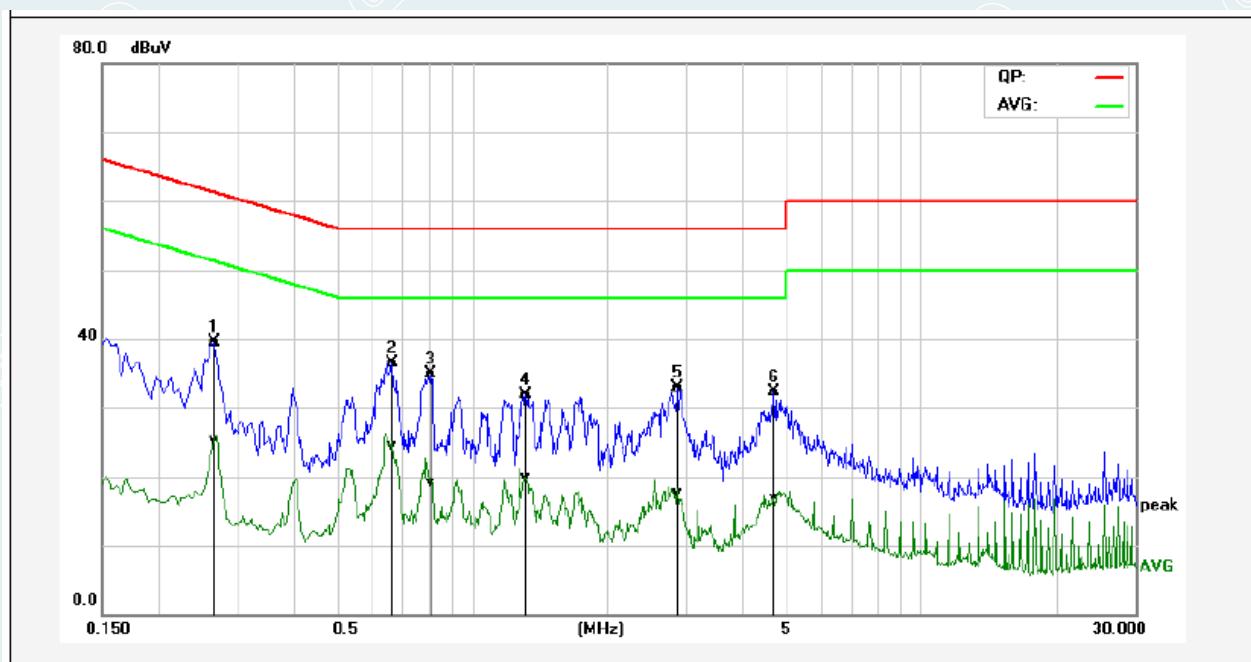
All models were pretested and only the worst modes and channels were recorded in this report. (Zigbee 2405MHz)

EUT Name	Hub M1S Gen 2	Model	HM1S-G02
Environmental Conditions	23.5°C/47% RH	Test Mode	Zigbee 2405MHz
Tested By	Zeng Xianglong	Line	L1
Tested Date	2022/02/16	Test Voltage	AC120V/60Hz



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1	0.2660	28.53	13.67	9.60	38.13	23.27	61.24	51.24	-23.11	-27.97	Pass
2*	0.6580	25.16	11.83	9.67	34.83	21.50	56.00	46.00	-21.17	-24.50	Pass
3	0.7860	23.10	8.93	9.65	32.75	18.58	56.00	46.00	-23.25	-27.42	Pass
4	1.3180	21.62	8.21	9.62	31.24	17.83	56.00	46.00	-24.76	-28.17	Pass
5	2.8699	21.82	6.11	9.60	31.42	15.71	56.00	46.00	-24.58	-30.29	Pass
6	4.8380	20.93	7.42	9.66	30.59	17.08	56.00	46.00	-25.41	-28.92	Pass

EUT Name	Hub M1S Gen 2	Model	HM1S-G02
Environmental Conditions	23.5 °C/47%RH	Test Mode	Zigbee 2405MHz
Tested By	Zeng Xianglong	Line	N
Tested Date	2022/02/16	Test Voltage	AC120V/60Hz



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1	0.2660	29.88	15.72	9.60	39.48	25.32	61.24	51.24	-21.76	-25.92	Pass
2*	0.6660	26.89	14.76	9.67	36.56	24.43	56.00	46.00	-19.44	-21.57	Pass
3	0.8100	25.19	9.52	9.65	34.84	19.17	56.00	46.00	-21.16	-26.83	Pass
4	1.3180	22.29	10.31	9.62	31.91	19.93	56.00	46.00	-24.09	-26.07	Pass
5	2.8780	23.26	8.19	9.60	32.86	17.79	56.00	46.00	-23.14	-28.21	Pass
6	4.7060	22.69	7.20	9.65	32.34	16.85	56.00	46.00	-23.66	-29.15	Pass

6. RADIATED SPURIOUS EMISSIONS

6.1 LIMITS

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

Frequency (MHz)	Quasi-peak(μ V/m)	Measurement distance(m)	Quasi-peak(dB μ V/m)@distance 3m
0.009-0.490	2400/F(kHz)	300	53.8~88.5
0.490-1.705	24000/F(kHz)	30	43~53.8
1.705-30.0	30	30	49.5
30 ~ 88	100	3	40
88~216	150	3	43.5
216 ~ 960	200	3	46
Above 960	500	3	54

NOTE:

- (1) The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.
- (2) The lower limit shall apply at the transition frequencies.
- (3) Above 18GHz test distance is 1m, so the Peak Limit=74+20*log(3/1)=83.54 (dB μ V/m).
The Avg Limit=54+20*log(3/1)=63.54 (dB μ V/m).

6.2 TEST PROCEDURES

1) Sequence of testing 9kHz to 30MHz

Setup:

- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a rotatable table with 0.8 m height is used.
- If the EUT is a floor standing device, it is placed on the ground.
- Use serial board or connecting line to make EUT and notebook to communicate, according to the actual need to make EUT send constant frequency signal continuously.
- The EUT is placed on a desktop position in the center of the turntable.
- The measurement distance is 3 meter.
- The EUT was set into operation.

Pre measurement:

- The turntable rotates from 0 ° to 360 °.
- The antenna height is 1.0 meter.
- At each turntable position the analyzer sweeps with peak detection to find the maximum of all emissions

Final measurement:

- Identified emissions during the pre measurement the software maximizes by rotating the turntable position (0 ° to 360 °) and by rotating the elevation axes (0 ° to 360 °).
- The final measurement will be done in the position (turntable and elevation) causing the highest emissions with QP detector.
- The final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the pre measurement and the limit will be stored.

2) Sequence of testing 30MHz to 1GHz**Setup:**

- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.
- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- Use serial board or connecting line to make EUT and notebook to communicate, according to the actual need to make EUT send constant frequency signal continuously.
- The EUT is placed on a desktop position in the center of the turntable.
- The measurement distance is 3 meter.
- The EUT was set into operation.

Pre measurement:

- The turntable rotates from 0 ° to 360 °.
- The antenna is polarized vertical and horizontal.
- The antenna height changes from 1 to 4 meter.
- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.

Final measurement:

- The final measurement will be performed with minimum the six highest peaks.
- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable rotates from 0 ° to 360 ° and antenna movement between 1 and 4 meter.
- The final measurement will be done with QP detector with an EMI receiver.
- The final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

3) Sequence of testing 1GHz to 18GHz

Setup:

- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.
- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- Use serial board or connecting line to make EUT and notebook to communicate, according to the actual need to make EUT send constant frequency signal continuously.
- The EUT is placed on a desktop position in the center of the turntable.
- The measurement distance is 3 meter.
- The EUT was set into operation.

Pre measurement:

- The turntable rotates from 0 ° to 360 °.
- The antenna is polarized vertical and horizontal.
- The antenna height scan range is 1 meter to 4 meter.
- At each turntable position and antenna polarization the analyzer sweeps with peak detection to find the maximum of all emissions.

Final measurement:

- The final measurement will be performed with minimum the six highest peaks.
- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable rotates from 0 ° to 360 ° and antenna movement between 1 and 4 meter. This procedure is repeated for both antenna polarizations.
- The final measurement will be done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and Average detector.
- The final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the pre measurement with marked maximum final measurements and the limit will be stored.

4) Sequence of testing above 18GHz

Setup:

- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.
- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- Use serial board or connecting line to make EUT and notebook to communicate, according to the actual need to make EUT send constant frequency signal continuously.
- The EUT is placed on a desktop position in the center of the turntable.
- The measurement distance is 1 meter.
- The EUT was set into operation.

Pre measurement:

- The antenna is moved spherical over the EUT in different polarisations of the antenna.

Final measurement:

- The final measurement will be performed at the position and antenna orientation for all detected emissions that were found during the premeasurements with Peak and Average detector.
- The final levels, frequency, measuring time, bandwidth, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

NOTE:

- (a).The frequency from 9kHz to 150kHz, Set RBW=300Hz(for Peak&AVG), RBW=300Hz(for Peak&AVG).
the frequency from 150kHz to 30MHz, Set RBW=9kHz, RBW=9kHz, (for QP Detector).
- (b).The frequency from 30MHz to 1GHz, Set RBW=120kHz, RBW=300kHz, (for QP Detector).
- (c).The frequency above 1GHz, for Peak detector: Set RBW=1MHz, RBW=3MHz.
- (d).The frequency above 1GHz, for Avg detector: Set RBW=1MHz, if the EUT is configured to transmit with duty cycle $\geq 98\%$, set $VBW \leq RBW/100$ (i.e.,10kHz) but not less than 10 Hz, if the EUT duty cycle is $< 98\%$, set $VBW \geq 1/T$. Where T is defined in section 2.8.

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6.3 TEST SETUP

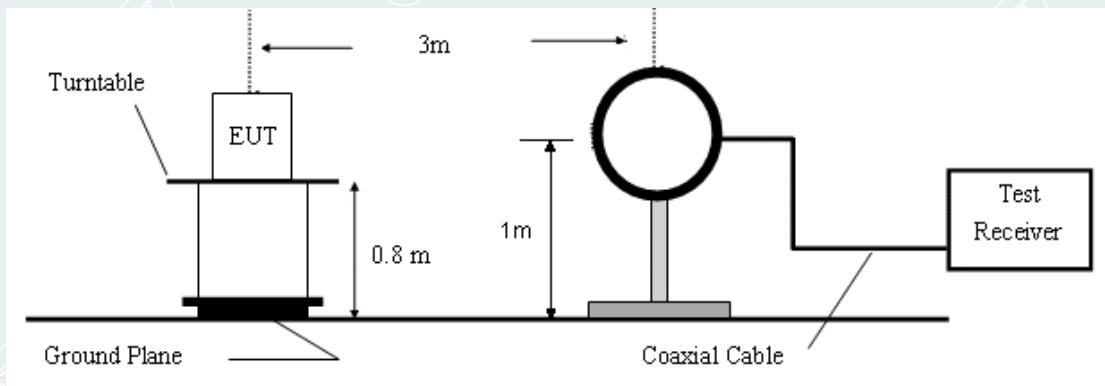


Figure 1. 9kHz to 30MHz radiated emissions test configuration

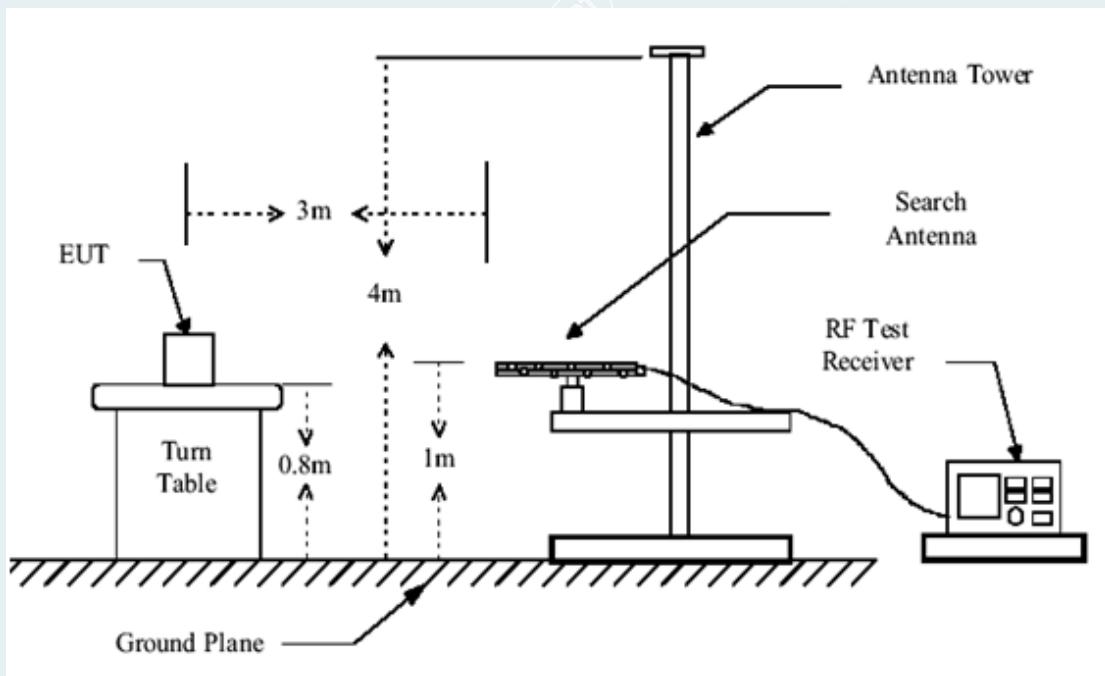


Figure 2. 30MHz to 1GHz radiated emissions test configuration

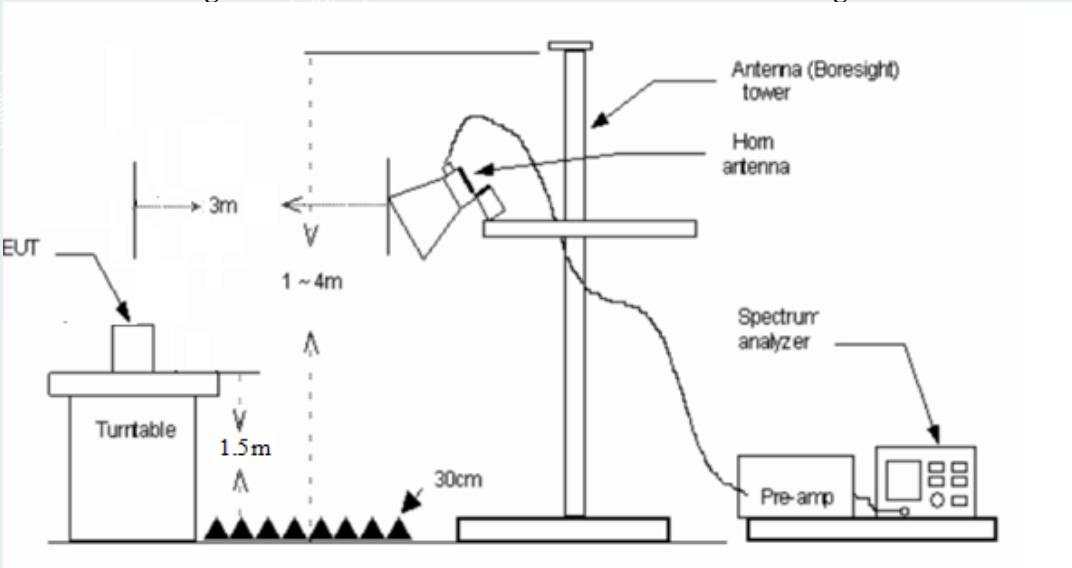


Figure 3. 1GHz to 18GHz radiated emissions test configuration

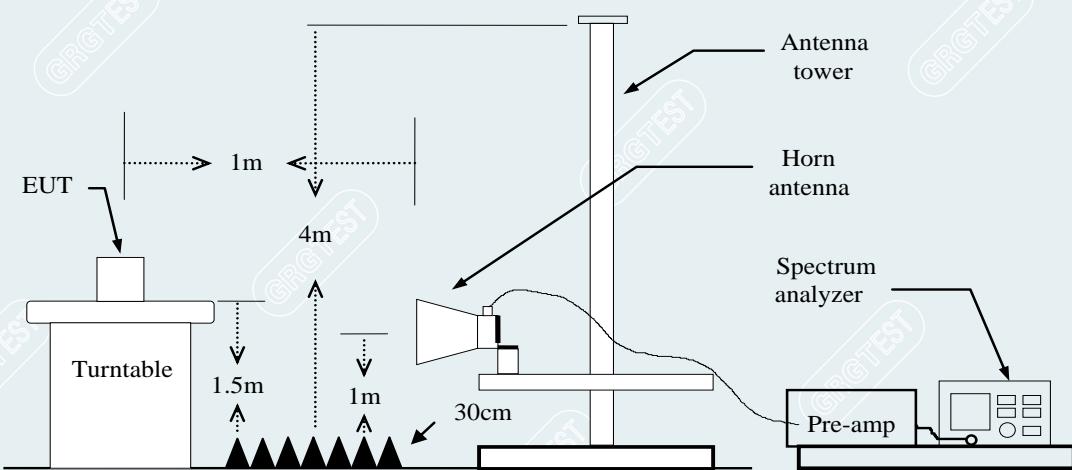


Figure 4. 18GHz to 26.5GHz radiated emissions test configuration

6.4 DATA SAMPLE

30MHz to 1GHz

No.	Frequency	Reading	Factor	Level	Limit	Margin	Remark	Pole
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)		
xxx	xxx	37.06	-15.48	21.58	40.00	-18.42	QP	Vertical

1GHz-18GHz

No.	Frequency	Reading	Factor	Level	Limit	Margin	Remark	Pole
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)		
xxx	xxx	65.45	-11.12	54.33	74.00	-19.67	peak	Vertical
xxx	xxx	63.00	-11.12	51.88	54.00	-2.12	AVG	Vertical

Above 18GHz

No.	Frequency	Reading	Factor	Level	Limit	Margin	Remark	Pole
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)		
xxx	xxx	68.86	57.66	-11.20	83.54	25.88	peak	Vertical
xxx	xxx	68.89	-11.20	57.69	63.54	5.85	AVG	Vertical

Frequency (MHz) = Emission frequency in MHz

Ant.Pol. (H/V) = Antenna polarization

Reading (dBuV) = Uncorrected Analyzer / Receiver reading

Correction Factor (dB/m) = Antenna factor + Cable loss – Amplifier gain

Result (dBuV/m) = Reading (dBuV) + Correction Factor (dB/m)

Limit (dBuV/m) = Limit stated in standard

Margin (dB) = Remark Result (dBuV/m) – Limit (dBuV/m)

Peak = Peak Reading

QP = Quasi-peak Reading

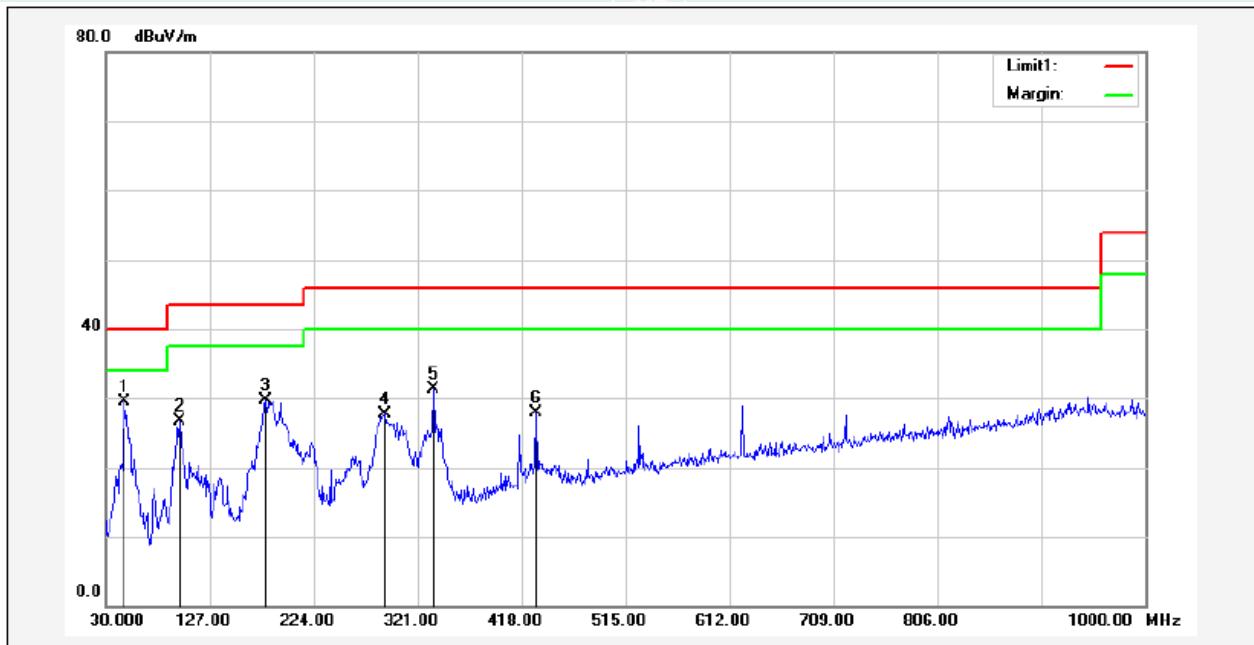
AVG = Average Reading

6.5 TEST RESULTS

Below 1GHz

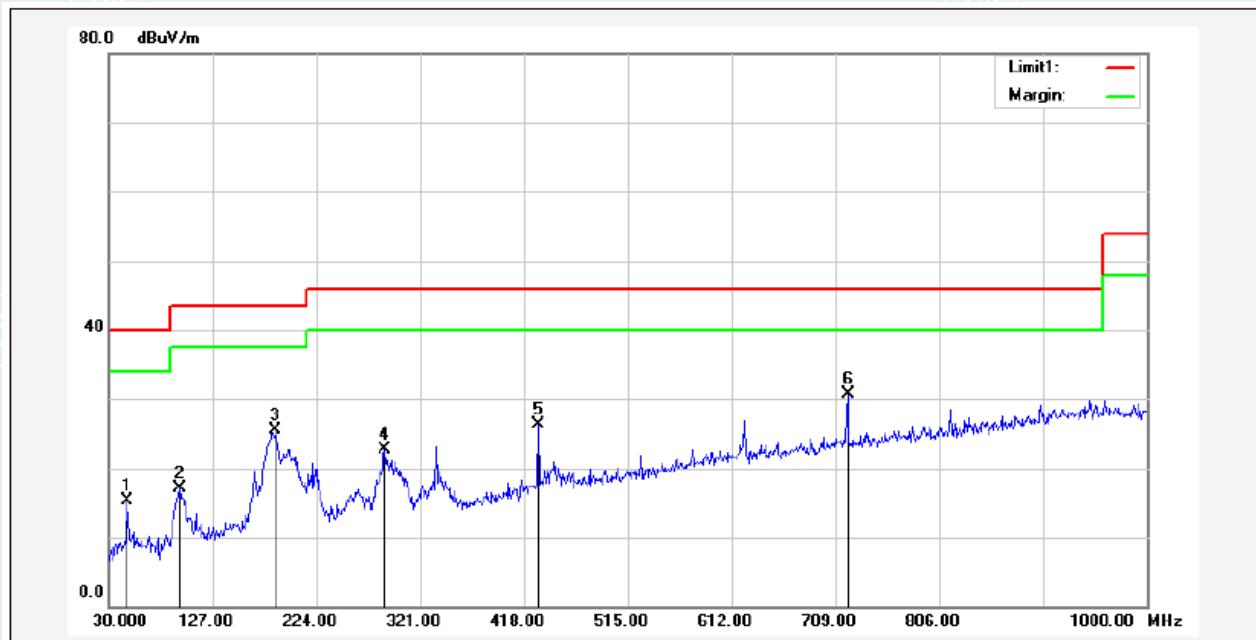
All models were pretested and only the worst modes and channels were recorded in this report. (Zigbee 2405MHz)

EUT Name	Hub M1S Gen 2	Model	HM1S-G02
Environmental Conditions	25.1 °C/55%RH	Test Voltage	AC120V/60Hz
Test Mode	Zigbee 2405MHz	Polarity	Vertical
Tested By	Tang Shenghui	Tested Date	2022/02/21



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over (dB)	Degree (deg.)	Height (cm)	Remark
1*	47.4600	56.12	-26.59	29.53	40.00	-10.47	354	100	QP
2	98.8700	55.61	-28.97	26.64	43.50	-16.86	360	142	QP
3	179.3800	55.35	-25.57	29.78	43.50	-13.72	33	100	QP
4	289.9600	51.25	-23.47	27.78	46.00	-18.22	221	100	QP
5	335.5500	53.52	-22.20	31.32	46.00	-14.68	77	100	QP
6	431.5800	46.70	-18.84	27.86	46.00	-18.14	143	100	QP

EUT Name	Hub M1S Gen 2	Model	HM1S-G02
Environmental Conditions	25.1°C/55%RH	Test Voltage	AC120V/60Hz
Test Mode	Zigbee 2405MHz	Polarity	Horizontal
Tested By	Tang Shenghui	Tested Date	2022/02/21



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over (dB)	Degree (deg.)	Height (cm)	Remark
1	47.4600	41.84	-26.59	15.25	40.00	-24.75	60	200	QP
2	96.9300	46.43	-29.38	17.05	43.50	-26.45	88	200	QP
3	186.1700	51.59	-26.17	25.42	43.50	-18.08	58	200	QP
4	288.0200	46.20	-23.54	22.66	46.00	-23.34	41	300	QP
5	431.5800	45.15	-18.84	26.31	46.00	-19.69	299	200	QP
6*	720.6400	43.06	-12.28	30.78	46.00	-15.22	124	100	QP

Remark:

- 1 No emission found between lowest internal used/generated frequency to 30MHz.
- 2 Radiated emissions measured in frequency range from 9 kHz to 1GHz were made with an instrument using Quasi-peak detector mode.
- 3 Data of measurement within this frequency range shown “---” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 4 The IF bandwidth of Receiver between 30MHz to 1GHz was 120 kHz.

1GHz-18GHz:

Mode: Zigbee

Lowest Frequency (2405MHz)

Environment: 25°C/60%RH

Tested By:Lu Qiang

Date: 2022/02/16

Voltage:AC120V/60Hz

/

Suspected Data List									
NO.	Freq. [MHz]	Reading [dB μ V/m]	Level [dB μ V/m]	Factor [dB]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1088.0110	59.08	34.15	-24.93	74.00	39.85	200	251	Horizontal
2	1580.5726	56.82	33.93	-22.89	74.00	40.07	100	27	Horizontal
3	3202.5253	53.18	37.31	-15.87	74.00	36.69	200	293	Horizontal
4	4811.4764	53.03	43.27	-9.76	74.00	30.73	200	286	Horizontal
5	7215.5269	52.04	48.74	-3.30	74.00	25.26	200	238	Horizontal
6	9643.9555	44.78	46.88	2.10	74.00	27.12	200	286	Horizontal

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dB μ V/m]	AV Value [dB μ V/m]	AV Limit [dB μ V/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	7215.8155	-3.30	37.06	33.76	54.00	20.24	200	279	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dB μ V/m]	Level [dB μ V/m]	Factor [dB]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1083.7605	58.12	33.18	-24.94	74.00	40.82	200	47	Vertical
2	1487.5609	56.52	33.56	-22.96	74.00	40.44	200	33	Vertical
3	1998.8749	57.10	35.54	-21.56	74.00	38.46	100	53	Vertical
4	3624.4531	52.74	38.25	-14.49	74.00	35.75	200	116	Vertical
5	4811.4764	52.73	42.97	-9.76	74.00	31.03	200	314	Vertical
6	7215.5269	49.98	46.68	-3.30	74.00	27.32	100	245	Vertical

Mode: Zigbee
 Middle Frequency (2440MHz)
 Environment: 25°C/60%RH
 Tested By:Lu Qiang

Date: 2022/02/16
 Voltage:AC120V/60Hz
 /

Suspected Data List									
NO.	Freq. [MHz]	Reading [dB μ V/m]	Level [dB μ V/m]	Factor [dB]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1112.0140	60.15	35.34	-24.81	74.00	38.66	200	246	Horizontal
2	1544.3180	56.92	34.07	-22.85	74.00	39.93	100	191	Horizontal
3	2015.6270	56.65	35.13	-21.52	74.00	38.87	100	123	Horizontal
4	3628.2035	53.85	39.33	-14.52	74.00	34.67	200	356	Horizontal
5	4877.1096	55.18	45.32	-9.86	74.00	28.68	200	190	Horizontal
6	7313.0391	56.20	51.93	-4.27	74.00	22.07	200	217	Horizontal

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dB μ V/m]	AV Value [dB μ V/m]	AV Limit [dB μ V/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	7313.4048	-4.28	45.46	41.18	54.00	12.82	200	359	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dB μ V/m]	Level [dB μ V/m]	Factor [dB]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1078.5098	60.82	35.86	-24.96	74.00	38.14	200	48	Vertical
2	1584.0730	57.88	34.98	-22.90	74.00	39.02	200	61	Vertical
3	4194.5243	52.37	39.25	-13.12	74.00	34.75	200	285	Vertical
4	4878.9849	52.40	42.52	-9.88	74.00	31.48	200	237	Vertical
5	6585.4482	48.36	42.66	-5.70	74.00	31.34	100	359	Vertical
6	7313.0391	52.95	48.68	-4.27	74.00	25.32	200	359	Vertical

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dB μ V/m]	AV Value [dB μ V/m]	AV Limit [dB μ V/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	7320.2059	-4.28	45.81	41.53	54.00	12.47	200	203	Vertical

Mode: Zigbee
 Highest Frequency (2475MHz)
 Environment: 25°C/60%RH
 Tested By:Lu Qiang

Date: 2022/02/16
 Voltage:AC120V/60Hz
 /

Suspected Data List									
NO.	Freq. [MHz]	Reading [dB μ V/m]	Level [dB μ V/m]	Factor [dB]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1081.5102	59.08	34.13	-24.95	74.00	39.87	200	129	Horizontal
2	1815.8520	55.98	33.98	-22.00	74.00	40.02	200	352	Horizontal
3	3603.8255	52.87	38.57	-14.30	74.00	35.43	100	157	Horizontal
4	4346.4183	51.69	39.32	-12.37	74.00	34.68	100	232	Horizontal
5	4950.2438	52.93	42.86	-10.07	74.00	31.14	200	292	Horizontal
6	7719.9650	47.89	45.41	-2.48	74.00	28.59	200	21	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dB μ V/m]	Level [dB μ V/m]	Factor [dB]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1085.2607	58.08	33.14	-24.94	74.00	40.86	200	136	Vertical
2	1584.0730	57.20	34.30	-22.90	74.00	39.70	100	149	Vertical
3	3735.0919	52.96	38.29	-14.67	74.00	35.71	200	34	Vertical
4	4952.1190	53.68	43.62	-10.06	74.00	30.38	200	217	Vertical
5	7641.2052	47.89	45.32	-2.57	74.00	28.68	100	143	Vertical
6	10784.0980	45.03	48.76	3.73	74.00	25.24	200	279	Vertical

Remark:

- 1 Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 2 The amplitude of 18GHz to 26.5GHz spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.
- 3 Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
- 4 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 5 Spectrum setting:
 - a. Peak Setting 1GHz – 26.5GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = auto.
 - b. AV Setting 1GHz – 26.5GHz, RBW = 1MHz, VBW = 10Hz (if the EUT duty cycle is <98% , set VBW \geq 1/T), Sweep time = auto.

Test result: The unit does meet the requirements.

7. 6DB BANDWIDTH

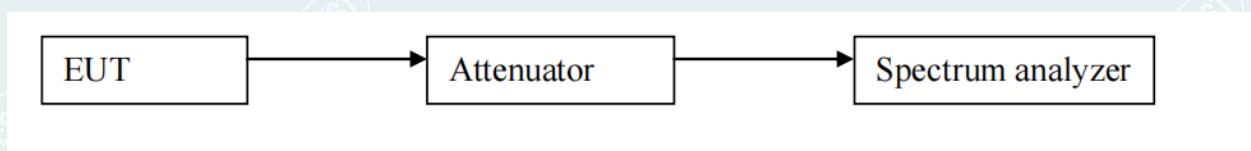
7.1 LIMITS

Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

7.2 TEST PROCEDURES

- 1) Remove the antenna from the EUT, and then connect a low loss RF cable from antenna port to the spectrum analyzer.
- 2) Set resolution bandwidth (RBW) = 100kHz. Set the video bandwidth (VBW) $\geq 3 \times$ RBW. Detector = Peak. Trace mode = max hold. Sweep = auto couple. Allow the trace to stabilize, record 6dB bandwidth value.
- 3) Repeat above procedures until all frequencies measured were complete.

7.3 TEST SETUP



----- The following blanks -----

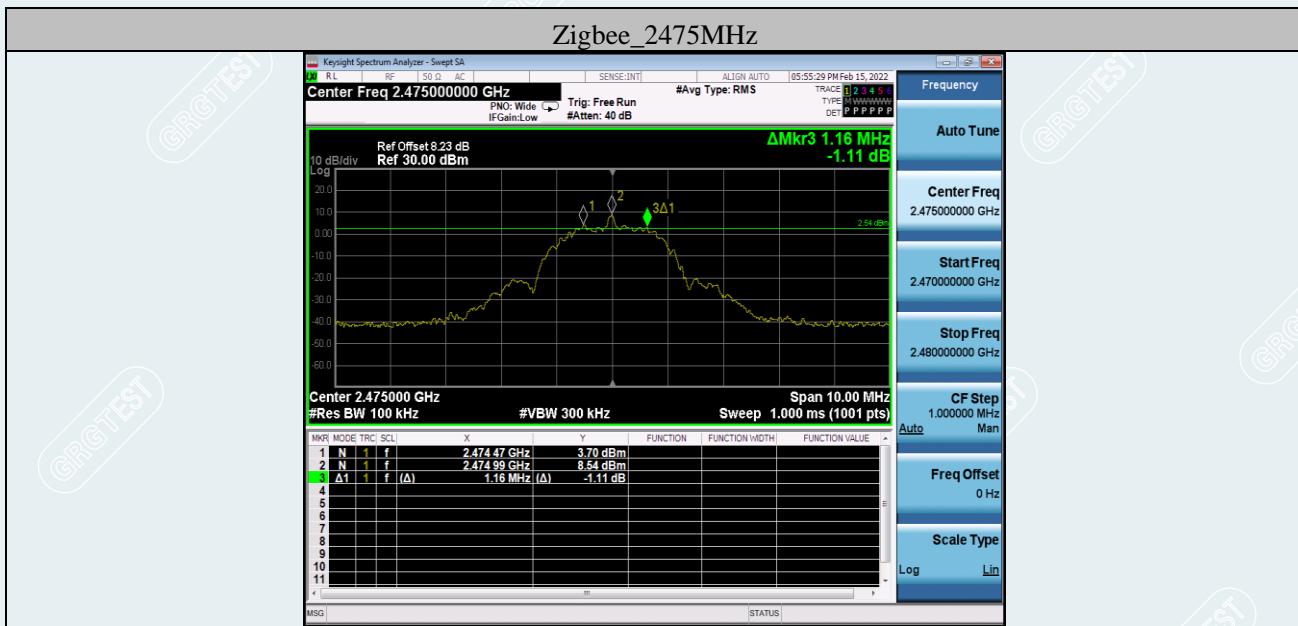
7.4 TEST RESULTS

Environment: 22.4°C/51%RH
Tested By:Deng Weihao

Voltage:AC120V/60Hz
Date: 2022/02/15

Test Mode	Antenna	Frequency[MHz]	DTS BW[MHz]	Limit[MHz]	Verdict
Zigbee	Ant1	2405	1.090	≥0.5	PASS
	Ant1	2440	1.440	≥0.5	PASS
	Ant1	2475	1.160	≥0.5	PASS





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8. MAXIMUM PEAK OUTPUT POWER

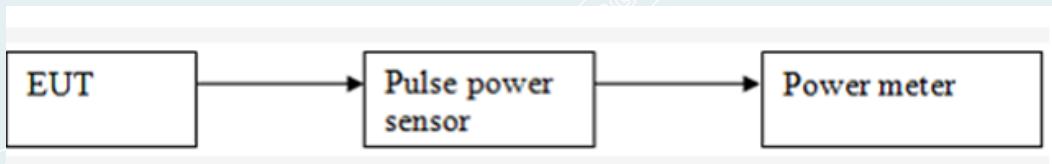
8.1 LIMITS

The maximum Peak output power measurement is 1W

8.2 TEST PROCEDURES

- 1) RF output of EUT was connected to the broadband peak RF power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
- 2) Set to the maximum power setting and enable the EUT transmit continuously.
- 3) Measure the conducted output power and record the results in the test report.

8.3 TEST SETUP



8.4 TEST RESULT

Environment: 25°C/60%RH
Tested By:Deng Weihao

Voltage:AC120V/60Hz
Date: 2022/02/16

Channel No.	Frequency (MHz)	Measured Channel Power (dBm)	Peak / AVG	Limit	Result
11	2405	8.70	Peak	30dBm	Pass
18	2440	8.75			Pass
25	2475	8.86			Pass

9. POWER SPECTRAL DENSITY

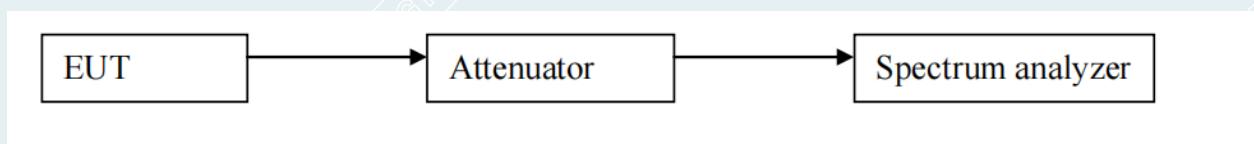
9.1 LIMITS

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

9.2 TEST PROCEDURES

- 1) Remove the antenna from the EUT, and then connect a low loss RF cable from antenna port to the spectrum analyzer.
- 2) Position the EUT was set without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
- 3) The following procedure shall be used if maximum peak conducted output power was used to determine compliance, and it is optional if the maximum conducted (average) output power was used to determine compliance:
 - a) Set analyzer center frequency to DTS channel center frequency.
 - b) Set the span to 1.5 times the DTS bandwidth.
 - c) Set the RBW to $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
 - d) Set the VBW $\geq [3 \times \text{RBW}]$.
 - e) Detector = Peak
 - f) Sweep time = auto couple.
 - g) Trace mode = max hold.
 - h) Allow trace to fully stabilize.
 - i) Use the peak marker function to determine the maximum amplitude level within the RBW.
 - j) If measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat.
- 4) Repeat above procedures until all frequencies measured were complete.

9.3 TEST SETUP



9.4 TEST RESULTS

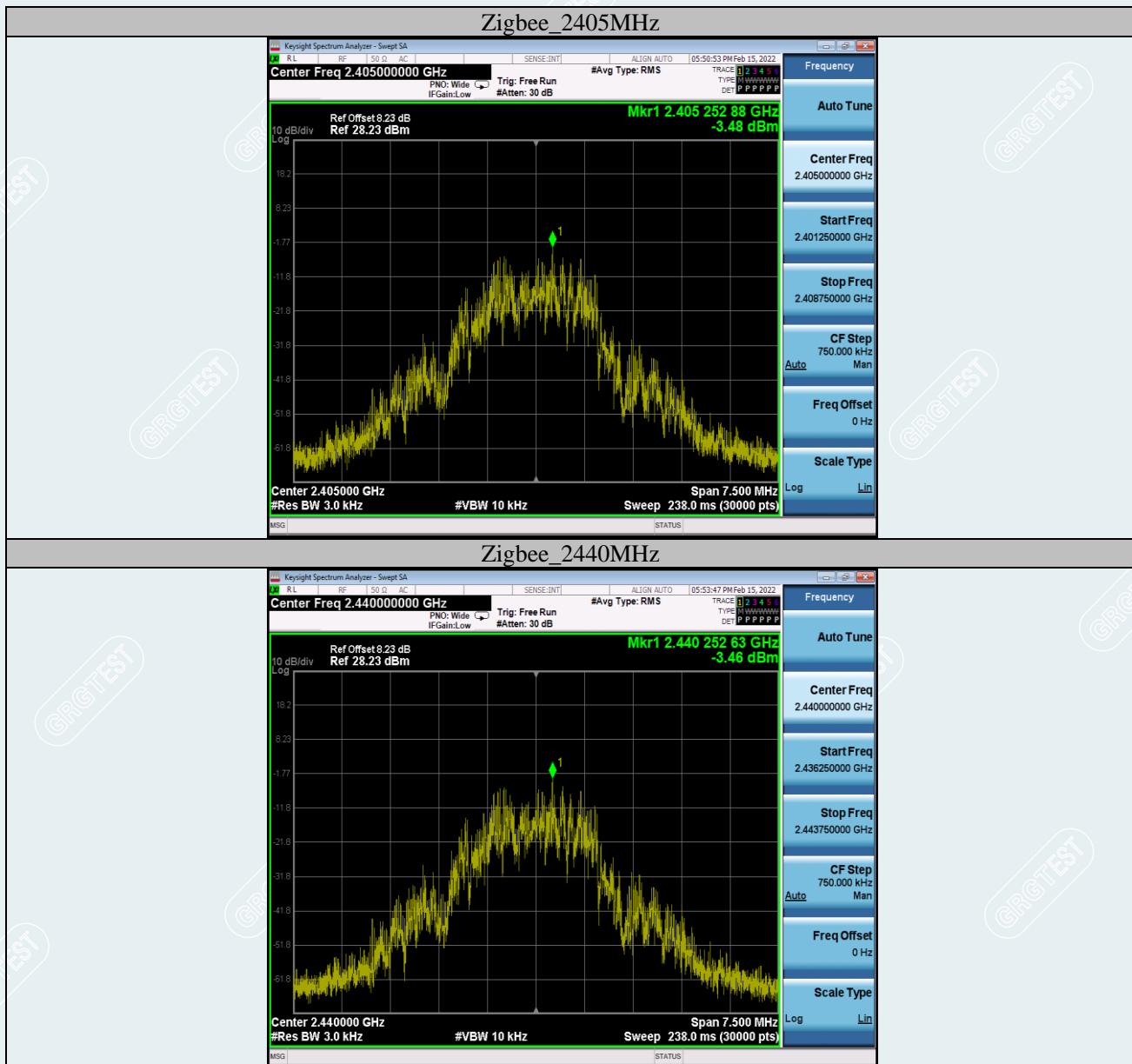
Environment: 25°C/60%RH

Tested By:Deng Weihao

Voltage:AC120V/60Hz

Date: 2022/02/15

Channel No.	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Result
11	2405	-3.48	8.00	Pass
18	2440	-3.46	8.00	Pass
25	2475	-3.28	8.00	Pass





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10. CONDUCTED BAND EDGES AND SPURIOUS EMISSIONS

10.1 LIMITS

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

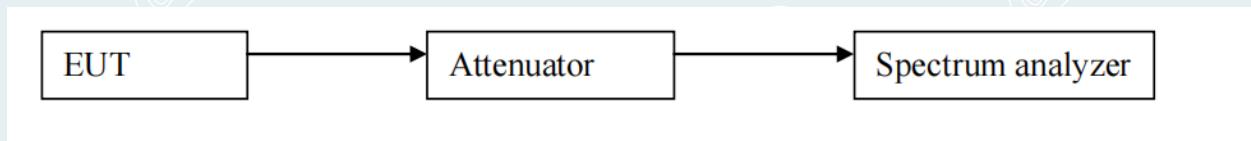
10.2 TEST PROCEDURES

Test procedures follow KDB 558074 D01 DTS Measurement Guidance.

Remove the antenna from the EUT and then connect a low attenuation cable from the antenna port to the spectrum.

- 1) Remove the antenna from the EUT and then connect a low attenuation cable from the antenna port to the spectrum.
- 2) Set the spectrum analyzer: RBW =100kHz; VBW =300kHz, Frequency range = 30MHz to 26.5GHz; Sweep = auto; Detector Function = Peak; Trace = Max hold.
- 3) Measure and record the results in the test report.
- 4) The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

10.3 TEST SETUP



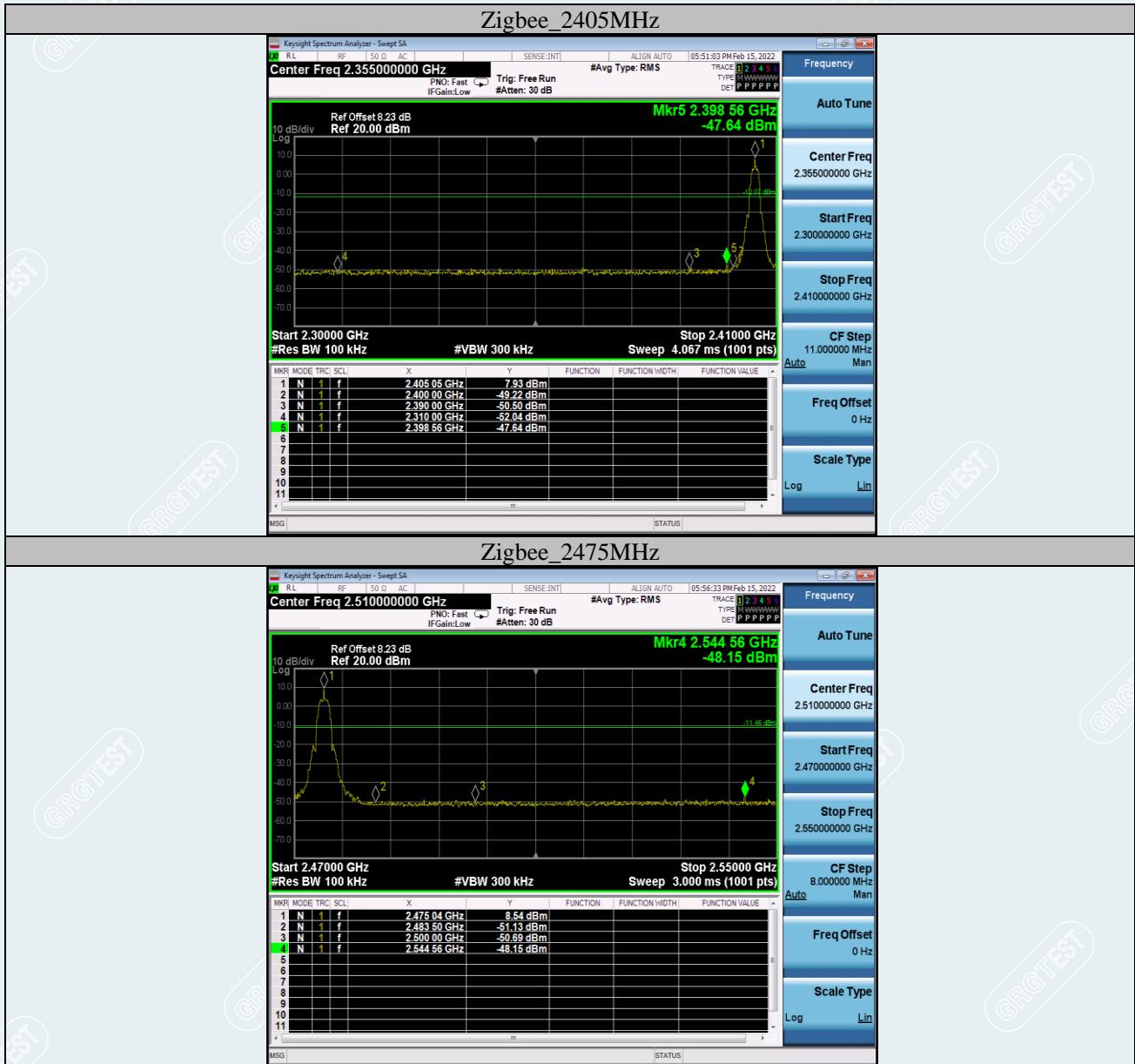
10.4 TEST RESULTS

Environment: 25°C/60%RH
Tested By:Deng Weihao

Voltage:AC120V/60Hz
Date: 2022/02/15

Band edge

Test Mode	Antenna	ChName	Frequency[MHz]	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
Zigbee	Ant1	Low	2405	7.93	-47.64	≤-12.07	PASS
	Ant1	High	2475	8.54	-48.15	≤-11.46	PASS



Conducted Spurious Emission:

Test Result

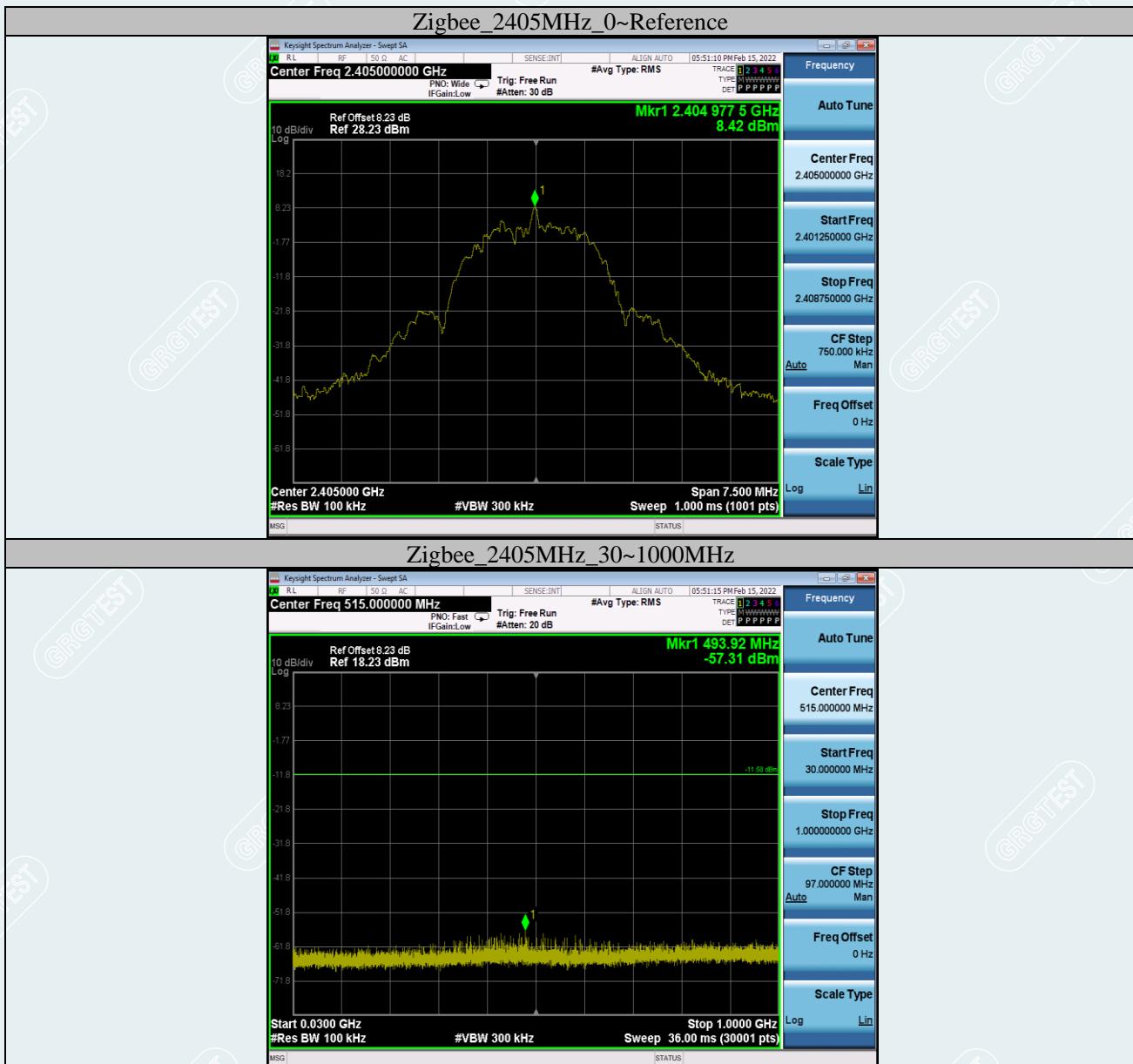
Environment: 25°C/60%RH

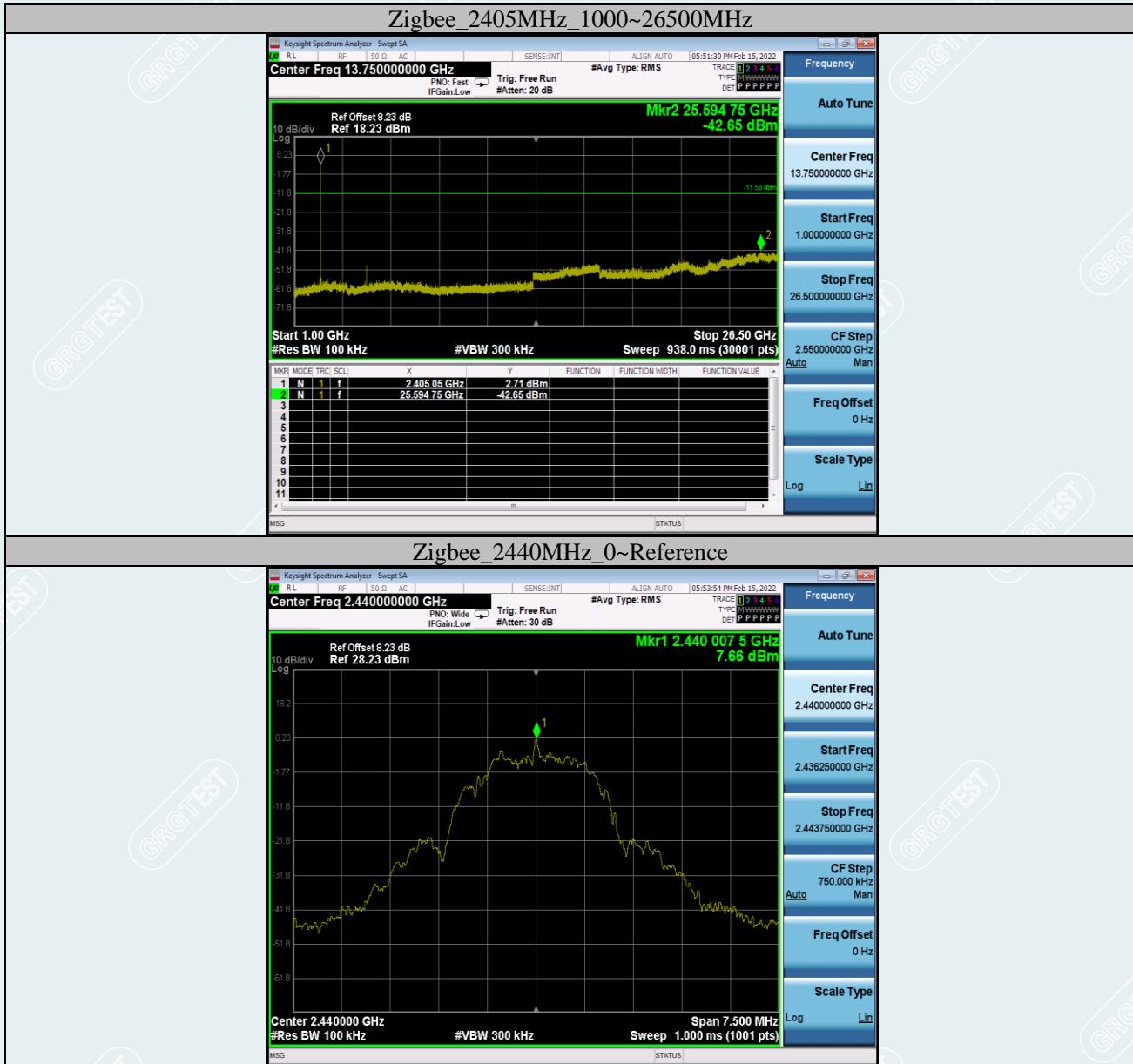
Tested By:Deng Weihao

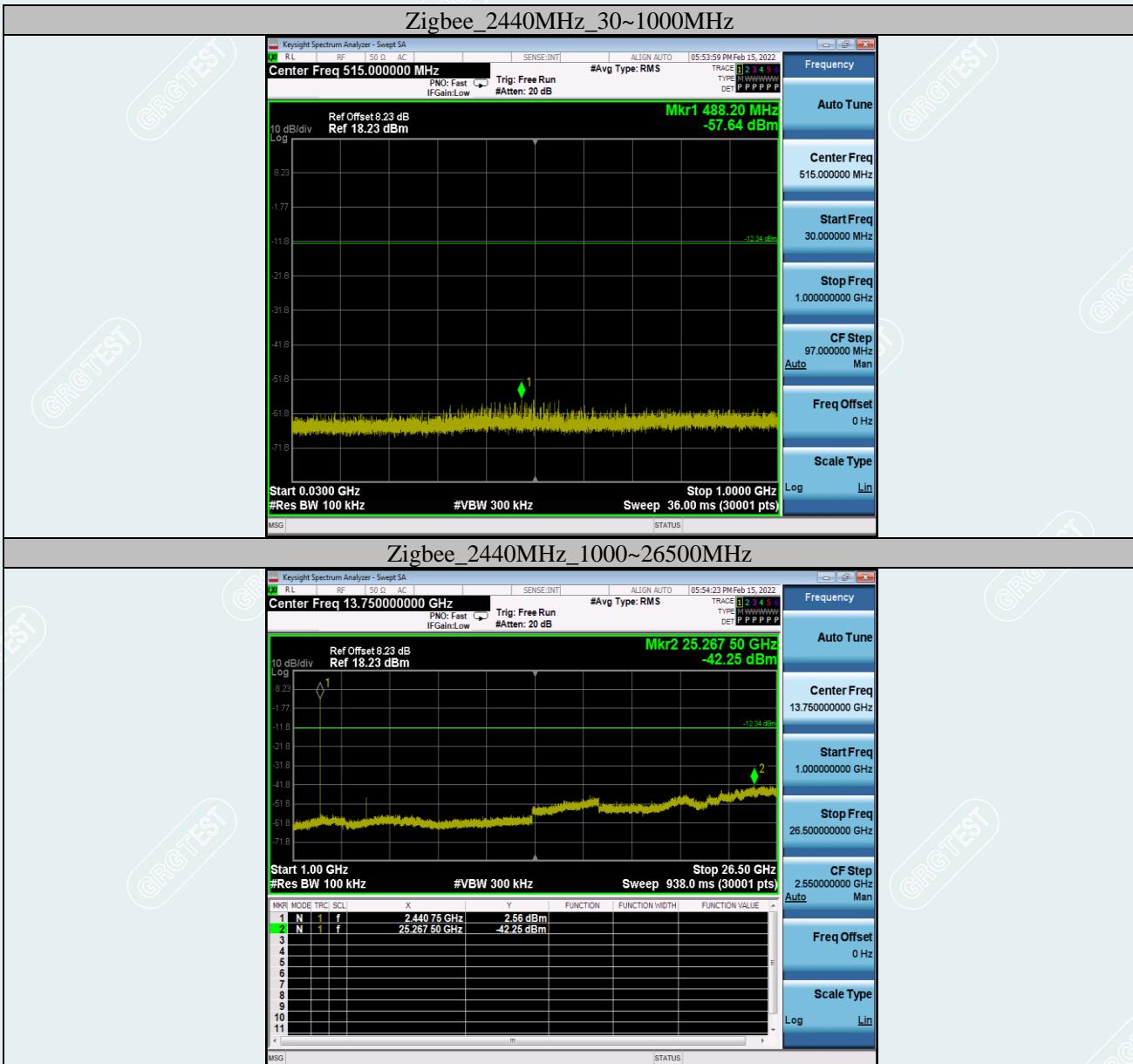
Voltage:AC120V/60Hz

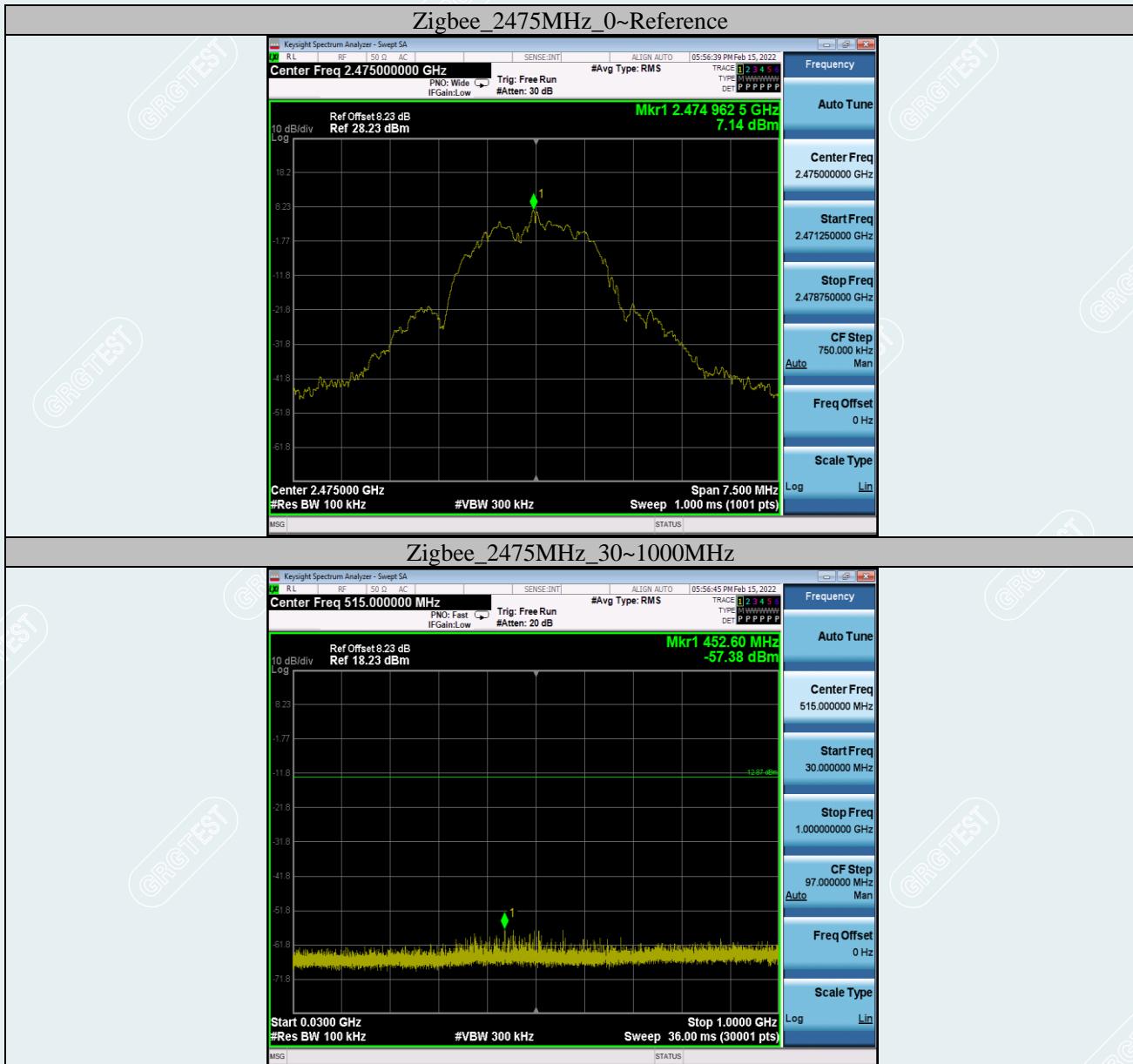
Date: 2022/02/15

Test Mode	Antenna	Frequency[MHz]	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
Zigbee	Ant1	2405	Reference	8.42	8.42	---	PASS
			30~1000	8.42	-57.31	≤-11.58	PASS
			1000~26500	8.42	-42.66	≤-11.58	PASS
	Ant1	2440	Reference	7.66	7.66	---	PASS
			30~1000	7.66	-57.64	≤-12.34	PASS
			1000~26500	7.66	-42.25	≤-12.34	PASS
	Ant1	2475	Reference	7.14	7.14	---	PASS
			30~1000	7.14	-57.38	≤-12.87	PASS
			1000~26500	7.14	-41.17	≤-12.87	PASS











11. RESTRICTED BANDS OF OPERATION

11.1 LIMITS

Section 15.247(d) In addition, Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	
13.36 - 13.41			

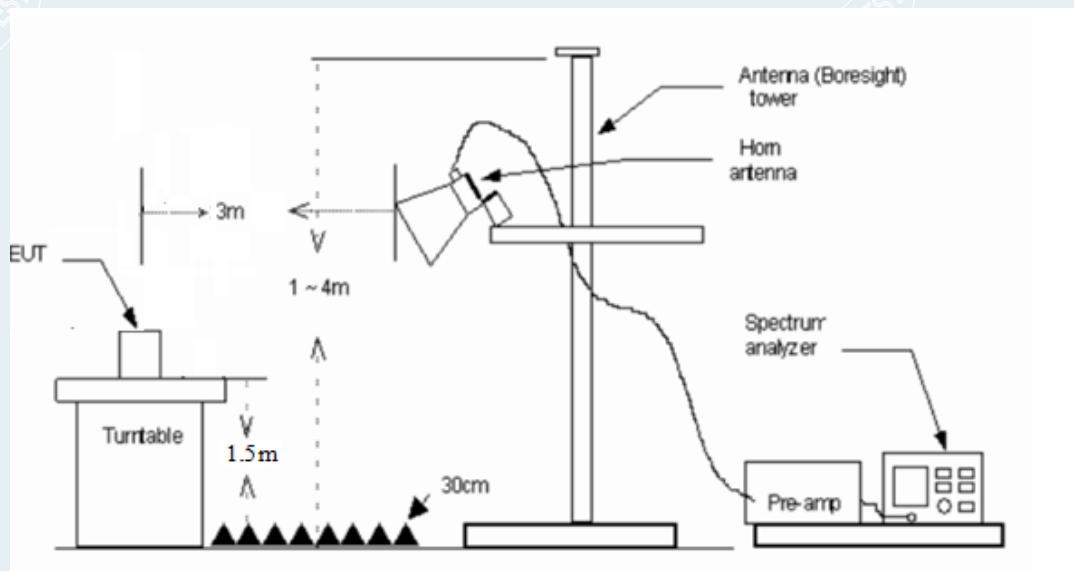
Frequency (MHz)	Quasi-peak(μ V/m)	Measurement distance(m)	Quasi-peak(dB μ V/m)@distance 3m
0.009-0.490	2400/F(kHz)	300	53.8~88.5
0.490-1.705	24000/F(kHz)	30	43~53.8
1.705-30.0	30	30	49.5
30 ~ 88	100	3	40
88~216	150	3	43.5
216 ~ 960	200	3	46
Above 960	500	3	54

11.2 TEST PROCEDURES

Test procedures follow KDB 558074 D01 DTS Measurement Guidance.

- 1) The EUT is placed on a turntable, which is 1.5m above the ground plane.
- 2) The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- 3) EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
- 4) Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
 - a) PEAK: RBW=1MHz / VBW=1MHz / Sweep=AUTO
 - b) AVERAGE: RBW=1MHz / VBW=1/T / Sweep=AUTO
 - c) The frequency above 1GHz, for Peak detector: Set RBW=1MHz, RBW=3MHz.
 - d) The frequency above 1GHz, for Avg detector: Set RBW=1MHz, if the EUT is configured to transmit with duty cycle $\geq 98\%$, set $VBW \leq RBW/100$ (i.e., 10kHz) but not less than 10 Hz, if the EUT duty cycle is $< 98\%$, set $VBW \geq 1/T$. Where T is defined in section 2.8.
- 5) Repeat the procedures until all the PEAK and AVERAGE versus polarization are measured.

11.3 TEST SETUP



11.4 TEST RESULTS

Zigbee

Lowest Channel

Frequency 2405MHz

Environment: 25°C/60%RH

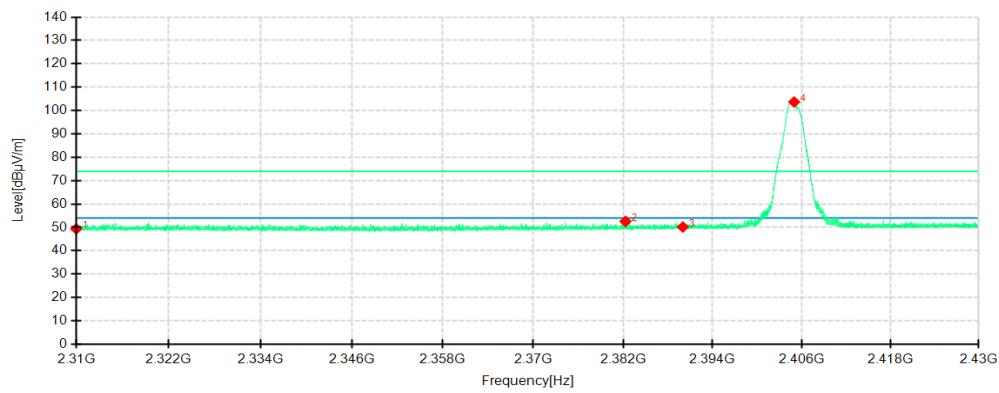
Tested By: Lu Qiang

Detector mode: Peak

Voltage: AC120V/60Hz

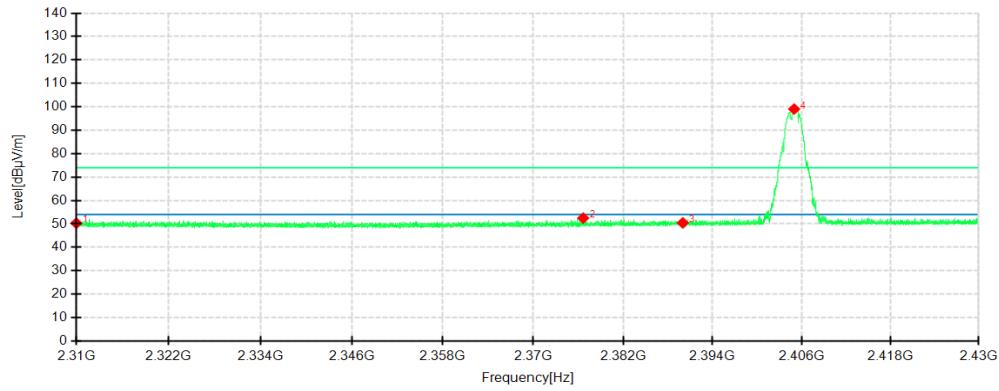
Date: 2022/02/16

Polarity: Horizontal



Detector mode: Peak

Polarity: Vertical

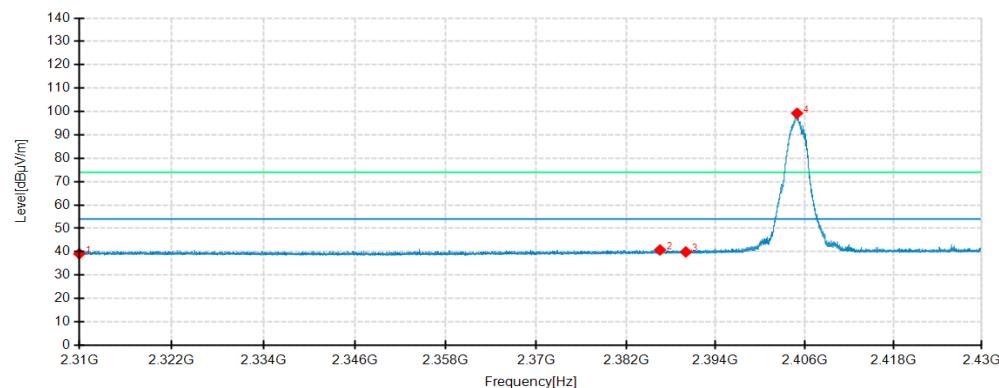


No .	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBuV/m	Margin dB	Height cm	Angl e °	Pole	Comment
1	2310.0000	45.88	49.36	3.48	74.00	24.64	200	176	Horizontal	/
2	2382.3240	48.87	52.55	3.68	74.00	21.45	100	218	Horizontal	/
3	2390.0000	46.34	50.15	3.81	74.00	23.85	100	0	Horizontal	/
4	2404.9800	99.67	103.67	4.00	74.00	-29.67	200	142	Horizontal	No limit
1	2310.0000	46.82	50.30	3.48	74.00	23.70	100	238	Vertical	/
2	2376.6720	48.90	52.48	3.58	74.00	21.52	100	176	Vertical	/
3	2390.0000	46.62	50.43	3.81	74.00	23.57	200	218	Vertical	/
4	2404.9800	95.02	99.02	4.00	74.00	-25.02	200	54	Vertical	No limit

Zigbee
Lowest Channel

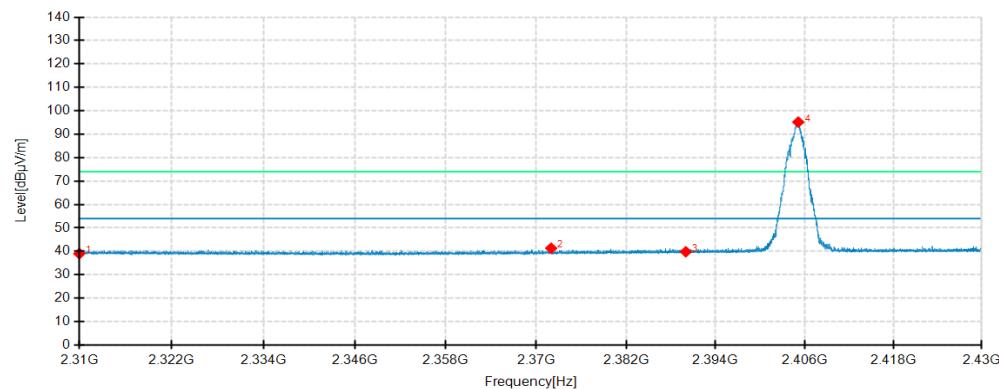
Frequency 2405MHz
Environment: 25°C/60%RH
Tested By: Lu Qiang
Detector mode: Average

Voltage: AC120V/60Hz
Date: 2022/02/16
Polarity: Horizontal



Detector mode: Average

Polarity: Vertical

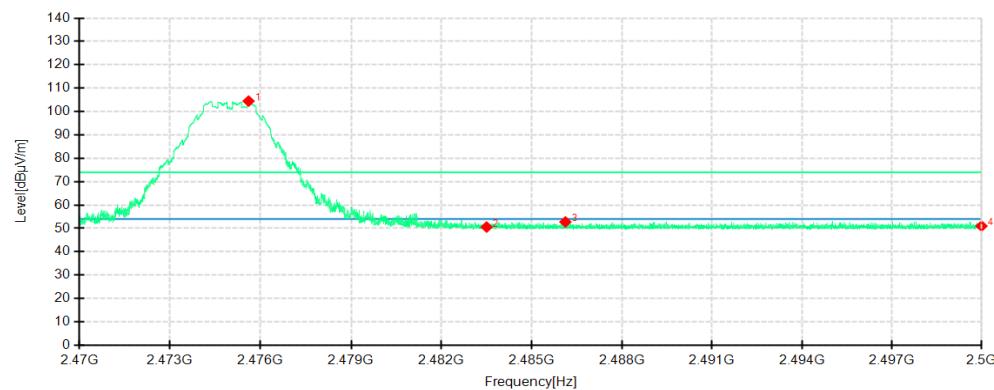


No.	Frequency MHz	Reading dB μ V/m	Level dB μ V/m	Factor dB	Limit dB μ V/m	Margin dB	Height cm	Angle °	Pole	Comment
1	2310.0000	35.66	39.14	3.48	54.00	14.86	100	218	Horizontal	/
2	2386.5360	37.02	40.77	3.75	54.00	13.23	100	33	Horizontal	/
3	2390.0000	36.09	39.90	3.81	54.00	14.10	100	177	Horizontal	
4	2404.9680	95.25	99.25	4.00	54.00	-45.25	200	142	Horizontal	No limit
1	2310.0000	35.52	39.00	3.48	54.00	15.00	100	142	Vertical	/
2	2372.0040	37.82	41.32	3.50	54.00	12.68	200	218	Vertical	/
3	2390.0000	35.99	39.80	3.81	54.00	14.20	200	3	Vertical	/
4	2405.1360	91.16	95.17	4.01	54.00	-41.17	200	53	Vertical	No limit

Zigbee**Highest Channel**

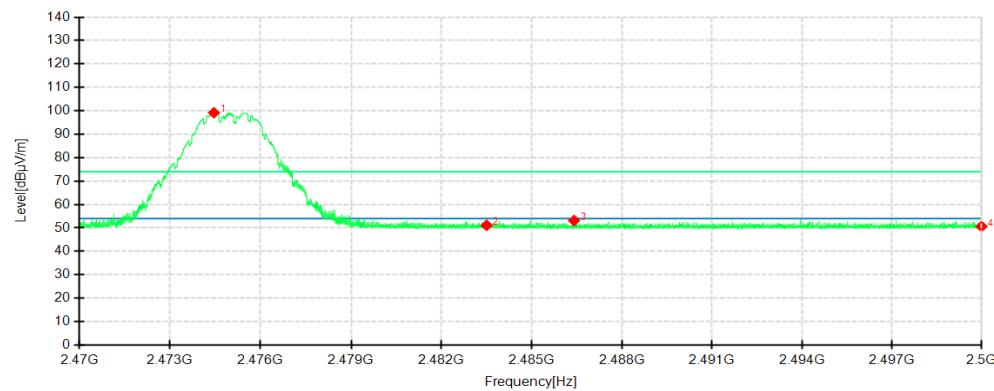
Frequency 2475MHz
 Environment: 25°C/60%RH
 Tested By: Lu Qiang
 Detector mode: Peak

Voltage: AC120V/60Hz
 Date: 2022/02/16
 Polarity: Horizontal



Detector mode: Peak

Polarity: Vertical



No.	Frequency MHz	Reading dB μ V/m	Level dB μ V/m	Factor dB	Limit dBuV/m	Margin dB	Height cm	Angle °	Pole	Comment
1	2475.6010	100.15	104.46	4.31	74.00	-30.46	200	142	Horizontal	No limit
2	2483.5000	46.23	50.56	4.33	74.00	23.44	200	288	Horizontal	/
3	2486.1190	48.42	52.76	4.34	74.00	21.24	100	218	Horizontal	/
4	2500.0000	46.60	50.98	4.38	74.00	23.02	200	177	Horizontal	/
1	2474.4550	94.89	99.19	4.30	74.00	-25.19	200	54	Vertical	No limit
2	2483.5000	46.76	51.09	4.33	74.00	22.91	200	218	Vertical	/
3	2486.4070	48.81	53.15	4.34	74.00	20.85	200	218	Vertical	/
4	2500.0000	46.21	50.59	4.38	74.00	23.41	200	218	Vertical	/

Zigbee**Highest Channel**

Frequency 2475MHz

Environment: 25°C/60%RH

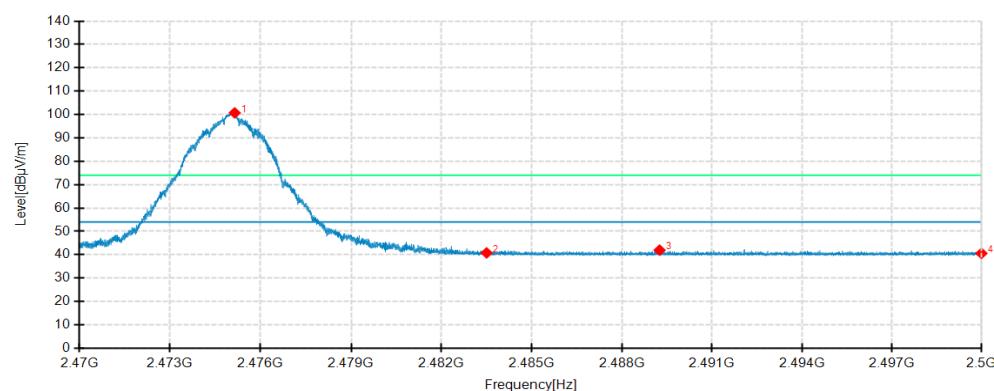
Tested By: Lu Qiang

Detector mode: Average

Voltage: AC120V/60Hz

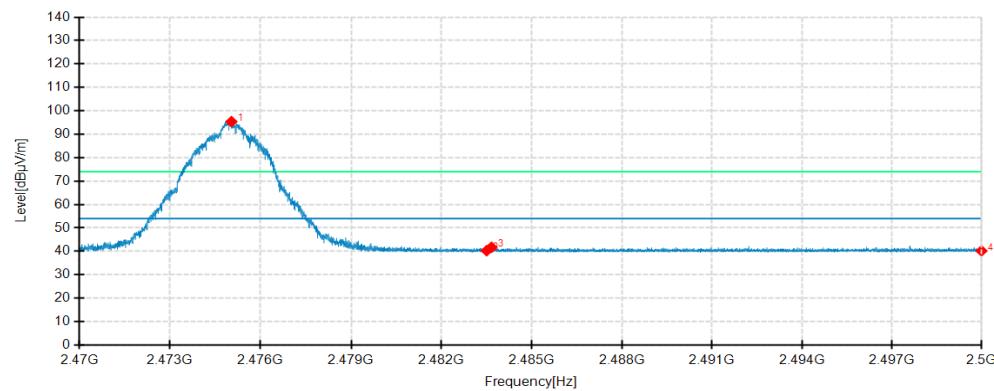
Date: 2022/02/16

Polarity: Horizontal



Detector mode: Average

Polarity: Vertical



No.	Frequency MHz	Reading dB μ V/m	Level dB μ V/m	Factor dB	Limit dBuV/m	Margin dB	Height cm	Angle °	Pole	Comment
1	2475.1420	96.39	100.70	4.31	54.00	-46.70	200	142	Horizontal	No limit
2	2483.5000	36.45	40.78	4.33	54.00	13.22	200	142	Horizontal	/
3	2489.2540	37.63	41.98	4.35	54.00	12.02	100	218	Horizontal	/
4	2500.0000	36.20	40.58	4.38	54.00	13.42	200	357	Horizontal	/
1	2475.0340	91.06	95.37	4.31	54.00	-41.37	200	60	Vertical	No limit
2	2483.5000	35.95	40.28	4.33	54.00	13.72	200	53	Vertical	/
3	2483.6620	37.40	41.73	4.33	54.00	12.27	200	170	Vertical	/
4	2500.0000	35.81	40.19	4.38	54.00	13.81	200	39	Vertical	/

APPENDIX A. PHOTOGRAPH OF THE TEST CONNECTION DIAGRAM

Please refer to the attached document E20220126665001-1-Test setup photo.

APPENDIX B. PHOTOGRAPH OF THE EUT

Please refer to the attached document E20220126665001-1-EUT Photo.

----- End of Report -----