ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C REQUIREMENT

OF

2.4G Wireless USB Transceiver

Model No.: GD7820, LD-900, LD-901, LD-902, LD-903, LD-905, LD-906, LD-907, LD-908, LD-909, LD-910, LD-911, LD-912, LD-913, LD-914, LD-915, LD-916, LD-918, LD-920, LD-925, LD-930, LD-933, LD-934, LD-935, LD-936, LD-938, LD-940, LD-944, LD-950, LD-955, LD-956, LD-958, LD-960, LD-961, LD-963, LD-965, LD-966, LD-968, LD-969, LD-970, LD-971, LD-972, LD-977, LD-978, LD-979, LD-982, LD-984, LD-985, LD-986, LD-988, LD-990, LD-995, LD-996, LD-998, M300

Trade Mark: N/A

FCC ID: 2ACKHGD7820R

Report No.: EA1908196F 01001

Issue Date: August 26, 2019

Prepared for

Shenzhen Lord Way Technology Co., Ltd
Building 5, Jinhengli Industrial Park, Jiangbian Village, Chuangye 3rd Road, Songgang Town, Baoan District, Shenzhen

Prepared by

Dong Guan Anci Electronic Technology Co., Ltd.
1-2 Floor, Building A, No.11, Headquarters 2 Road, Songshan, Lake Hi-tech Industrial Development Zone, Dongguan City, evelopment Zone, Dongguan City, Guangdong Pr., China.

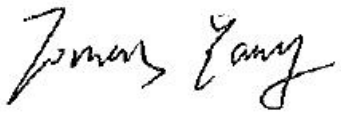
VERIFICATION OF COMPLIANCE

Applicant:	Shenzhen Lord Way Technology Co., Ltd Building 5, Jinhengli Industrial Park, Jiangbian Village, Chuangye 3rd Road, Songgang Town, Baoan District, Shenzhen
Manufacturer:	Shenzhen Lord Way Technology Co., Ltd Building 5, Jinhengli Industrial Park, Jiangbian Village, Chuangye 3rd Road, Songgang Town, Baoan District, Shenzhen
Product Description:	2.4G Wireless USB Transceiver
Trade Mark:	N/A
Model Number:	GD7820, LD-900, LD-901, LD-902, LD-903, LD-905, LD-906, LD-907, LD-908, LD-909, LD-910, LD-911, LD-912, LD-913, LD-914, LD-915, LD-916, LD-918, LD-920, LD-925, LD-930, LD-933, LD-934, LD-935, LD-936, LD-938, LD-940, LD-944, LD-950, LD-955, LD-956, LD-958, LD-960, LD-961, LD-963, LD-965, LD-966, LD-968, LD-969, LD-970, LD-971, LD-972, LD-977, LD-978, LD-979, LD-982, LD-984, LD-985, LD-986, LD-988, LD-990, LD-995, LD-996, LD-998, M300 (Note:All models are identical except for the model and Brand. So we choose GD7820 to do all the tests.)

We hereby certify that:

The above equipment was tested by Dong Guan Anci Electronic Technology Co., Ltd.The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10-2013 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.249(2018).

Date of Test : August 21, 2019 to August 26, 2019



Prepared by : _____

Tomas Yang/Supervisor

Reviewer & Approved : _____

Alan He/Manager

Modified Information

Version	Summary	Revision Date	Report No.
Ver.1.0	Original Report	/	EA1908196F 01001

Table of Contents

1. General Information

1.1 Product Description

Characteristics	Description
Product Name	2.4G Wireless USB Transceiver
Model number	GD7820
Input rating	DC 5V from USB interface
Test Power Supply	DC 5V from USB interface
Modulation	FSK
Operating Frequency Range	2408-2474MHz
Number of Channels	34
Antenna Type	Internal PCB antenna
Antenna Gain	0 dBi

1.2 Test Facility

Site Description

EMC Lab.	:	Accredited by CNAS, 2017.06.26 The certificate is valid until 2022.10.28 The Laboratory has been assessed and proved to be in compliance with CNAS-CL01:2006 (identical to ISO/IEC 17025:2005) The Certificate Registration Number is L0468. Accredited by A2LA, 2018.03.15 The Certificate Number is 4422.01.
Name of Firm	:	Dong Guan Anci Electronic Technology Co., Ltd.
Site Location	:	1-2 Floor, Building A, No.11, Headquarters 2 Road, Songshan, Lake Hi-tech Industrial Development Zone, Dongguan City, evelopment Zone, Dongguan City, Guangdong Pr., China.

2. Test Configuration

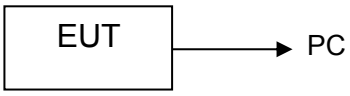


Table 2-1 Equipment Used in Tested System

Item	Equipment	Trade Mark	Model No.	FCC ID	Note
1.	2.4G Wireless USB Transceiver	N/A	GD7820	2ACKHGD7820R	***EUT***
2	Notebook	DELL	LATITUDE E5440	N/A	***Support Equipment***

Note:

(1) Unless otherwise denoted as EUT in 『Remark』 column , device(s) used in tested system is a support equipment.

3. Summary of Test Results

FCC Rules	Description Of Test	Result
§15.207	AC Power Conducted Emission	Complies
§2.1049/15.215c	20dB Bandwidth	Complies
§15.249/15.205	Band Edge	Complies
§15.249(a)	Field Strength of Fundamental Emissions	Complies
§15.249(a)(d)	Radiated Spurious Emissions	Complies
§15.203	Antenna Requirements	Complies

4. Description of test modes

The EUT has been tested under its typical operating condition for EUT tested alone.
Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting. Only the worst case data were reported.

The EUT has been associated with peripherals pursuant to ANSI C63.10-2013 and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: radiation (9 KHz to the 10th harmonics of the highest fundamental frequency or to 40 GHz, whichever is lower).

The test mode is programmed on the EUT. The measurements are performed at Channel 1 (2408MHz), Channel 17 (2440MHz) and Channel 34 (2474MHz) are chosen for the final testing.

Channel List:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	**2408**	2	2410	3	2412
4	2414	5	2416	6	2418
7	2420	8	2422	9	2424
10	2426	11	2428	12	2430
13	2432	14	2434	15	2436
16	2438	**17**	**2440**	18	2442
19	2444	20	2446	21	2448
22	2450	23	2452	24	2454
25	2456	26	2458	27	2460
28	2462	29	2464	30	2466
31	2468	32	2470	33	2472
34	**2474**				

5. TEST SYSTEM UNCERTAINTY

The following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Parameter	Uncertainty
Radio Frequency	±1x10^-5
Maximum Peak Output Power Test	±1.0dB
Conducted Emissions Test	±2.0dB
Radiated Emission Test	±2.0dB
Power Density	±2.0dB
Occupied Bandwidth Test	±1.0dB
Band Edge Test	±3dB
All emission, radiated	±3dB
Antenna Port Emission	±3dB
Temperature	±0.5℃
Humidity	±3%

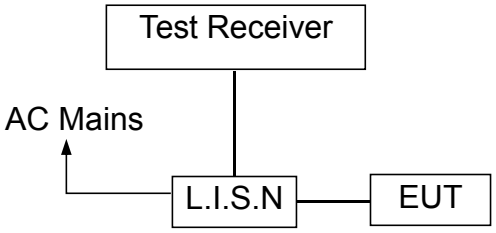
Remark: The coverage Factor (k=2), and measurement Uncertainty for a level of Confidence of 95%.

6. Conducted Emissions Test

6.1 Measurement Procedure:

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured was complete.

6.2 Test SET-UP (Block Diagram of Configuration)



6.3 Measurement Equipment Used:

Conducted Emission Test Site				
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**Calibrated until**
L.I.S.N	SCHWARZBECK	NSLK 8127	8127-669	2020-05-19
10 db attenuator	JFW	50FP-010-H4	4360846-427-1	2020-05-19
RF Cable	N/A	N/A	2#	2020-05-19
EMI Test Receiver	ROHDE&SCHWARZ	ESCI	101358	2020-05-19
Shielded Room	chengyu	8m*4m*3m	N/A	2020-05-19
Test Software	Farad	EZ-EMC Ver:ANCI-8A1	N/A	N/A

6.4 Conducted Emission Limit

(7) Conducted Emission

Frequency(MHz)	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50

Note:

1. The lower limit shall apply at the transition frequencies
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

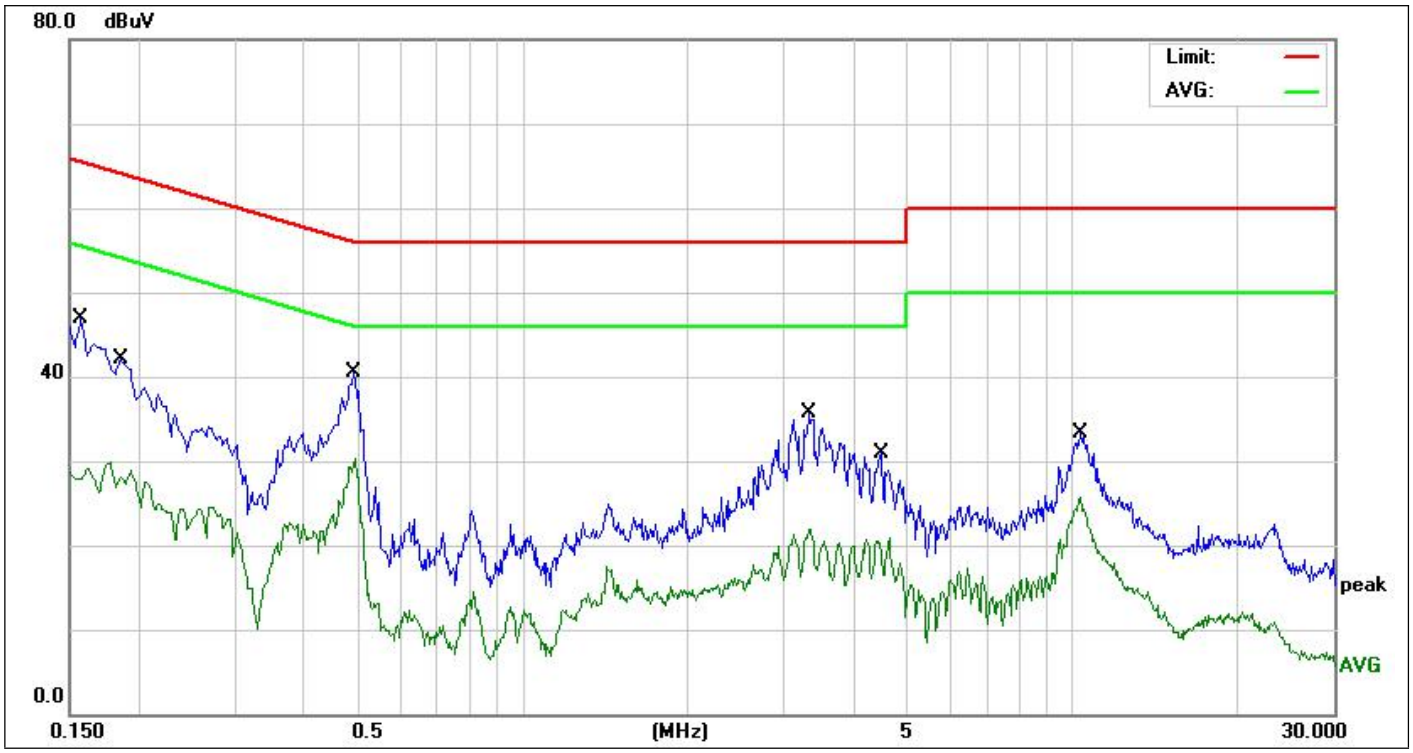
6.5 Measurement Result:

Operation Mode:	TX	Test Date :	August 22, 2019
Frequency Range:	0.15MHz~30MHz	Temperature :	24℃
Test Result:	PASS	Humidity :	58 %
Test By:	Best		

Pass.

The data of the worst mode (TX 2408MHz) are recorded.

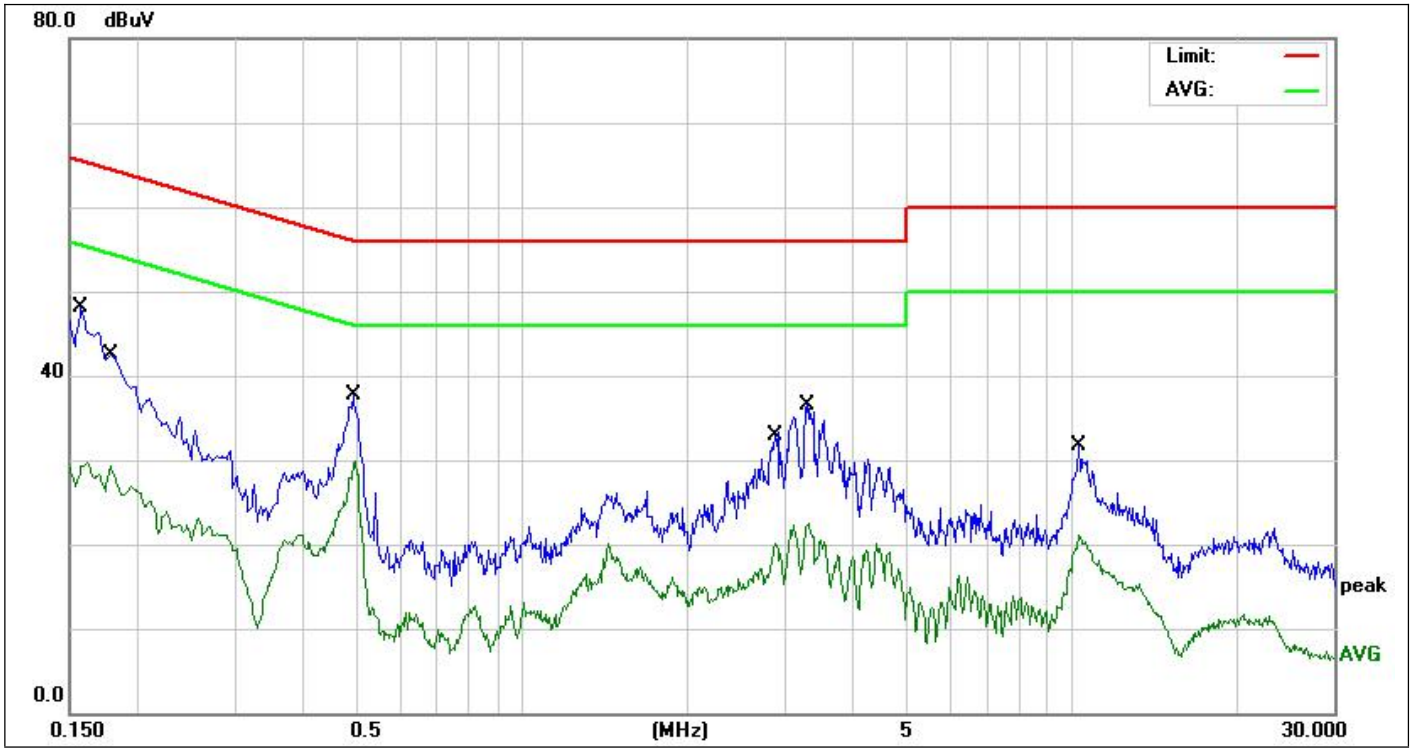
Please refer to the following data.



Site:	**843**	**Phase:L1**	**Temperature(C):26(C)**
Limit:	**FCC Part 15 C Conduction(QP)**		**Humidity(%):60%**
EUT:	**2.4G Wireless USB Transceiver**	**Test Time:**	**2019/8/22**
M/N.:	**GD7820**	**Power Rating:**	**AC 120V/60Hz**
Mode:	**TX2408**	**Test Engineer:**	**Bast**
Note:			

No.	Frequency (MHz)	Reading Level(dBuV)	Factor (dB)	Measure-ment(dBuV)	Limit (dBuV)	Over (dB)	Detector	Comment
1	0.1580	32.60	9.74	42.34	65.56	-23.22	QP	
2	0.1580	18.80	9.74	28.54	55.56	-27.02	AVG	
3	0.1864	27.49	9.78	37.27	64.19	-26.92	QP	
4	0.1864	16.75	9.78	26.53	54.19	-27.66	AVG	
5	0.4940	26.75	9.91	36.66	56.10	-19.44	QP	
6 *	0.4940	18.13	9.91	28.04	46.10	-18.06	AVG	
7	3.3300	20.52	9.91	30.43	56.00	-25.57	QP	
8	3.3300	9.38	9.91	19.29	46.00	-26.71	AVG	
9	4.5060	13.60	9.96	23.56	56.00	-32.44	QP	
10	4.5060	7.12	9.96	17.08	46.00	-28.92	AVG	
11	10.3580	18.67	9.88	28.55	60.00	-31.45	QP	
12	10.3580	14.43	9.88	24.31	50.00	-25.69	AVG	

*:Maximum data x:Over limit !:over margin

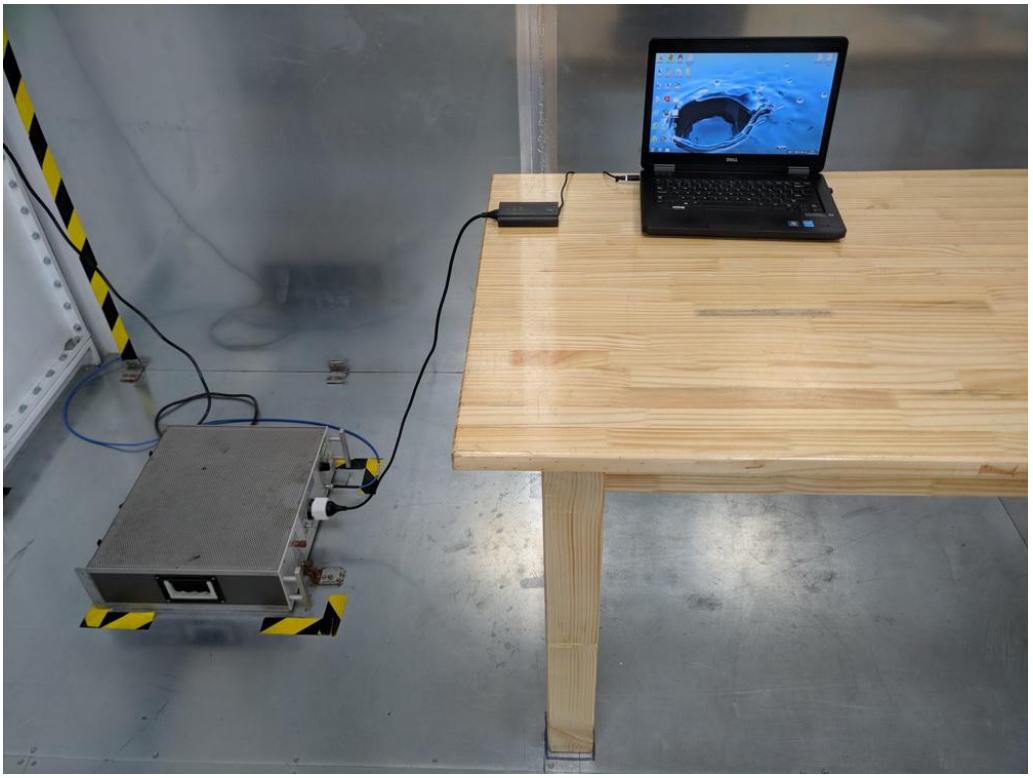


Site:	**843**	**Phase:N**	**Temperature(C):26(C)**
Limit:	**FCC Part 15 C Conduction(QP)**		**Humidity(%):60%**
EUT:	**2.4G Wireless USB Transceiver**	**Test Time:**	**2019/8/22**
M/N.:	**GD7820**	**Power Rating:**	**AC 120V/60Hz**
Mode:	**TX2408**	**Test Engineer:**	**Bast**
Note:			

No.	Frequency (MHz)	Reading Level(dBuV)	Factor (dB)	Measure-ment(dBuV)	Limit (dBuV)	Over (dB)	Detector	Comment
1	0.1580	32.12	9.76	41.88	65.56	-23.68	QP	
2	0.1580	18.63	9.76	28.39	55.56	-27.17	AVG	
3	0.1787	28.06	9.79	37.85	64.54	-26.69	QP	
4	0.1787	16.81	9.79	26.60	54.54	-27.94	AVG	
5	0.4940	23.26	9.93	33.19	56.10	-22.91	QP	
6 *	0.4940	18.66	9.93	28.59	46.10	-17.51	AVG	
7	2.8580	15.65	9.81	25.46	56.00	-30.54	QP	
8	2.8580	7.49	9.81	17.30	46.00	-28.70	AVG	
9	3.3020	21.67	9.84	31.51	56.00	-24.49	QP	
10	3.3020	9.76	9.84	19.60	46.00	-26.40	AVG	
11	10.3380	14.66	9.87	24.53	60.00	-35.47	QP	
12	10.3380	9.89	9.87	19.76	50.00	-30.24	AVG	

*:Maximum data x:Over limit !:over margin

6.6 Conducted Measurement Photo:

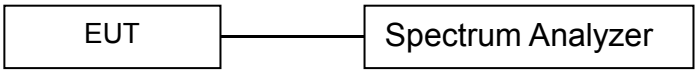


7. 20dB Bandwidth test

6.1 Measurement Procedure

The EUT was operating in hopping mode or could be controlled its channel. Printed out the test result from the spectrum by hard copy function.

7.2 Test SET-UP (Block Diagram of Configuration)



7.3 Measurement Equipment Used:

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	Calibrated until
Spectrum Analyzer	Rohde & Schwarz	FSV40	102257	2019-11-28
RF Cable	Gigalink Microwave	ZT40-2.92J-2.92J-0.3m	RF Cable	2020-03-06
Antenna Connector	ARTHUR-YANG	2244-N1TG1	N/A	N/A

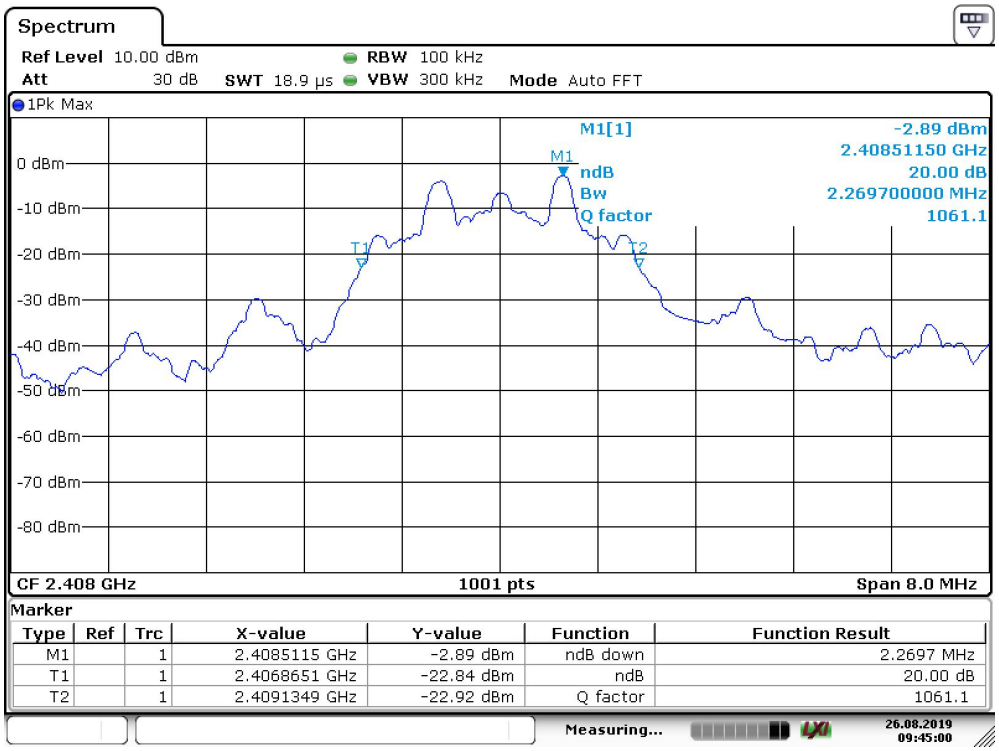
Remark: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.
The cable loss is 0.4dBm, and impedance is 50 Ω for the antenna connector.

7.4 Measurement Results:

Refer to attached data chart.

Spectrum Detector:	PK	Test Date :	August 26, 2019
Test By:	Best	Temperature :	24℃
Test Result:	PASS	Humidity :	53 %
Modulation:	FSK		

Channel frequency (MHz)	20dB Down BW(kHz)
2408	2270
2440	2230
2474	2294



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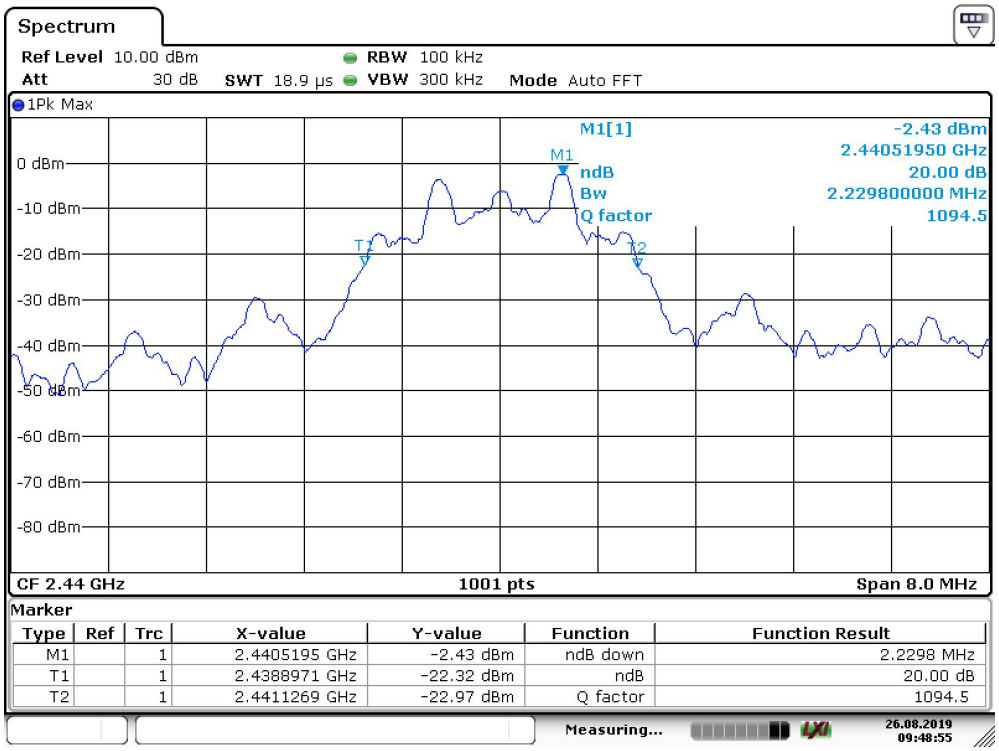

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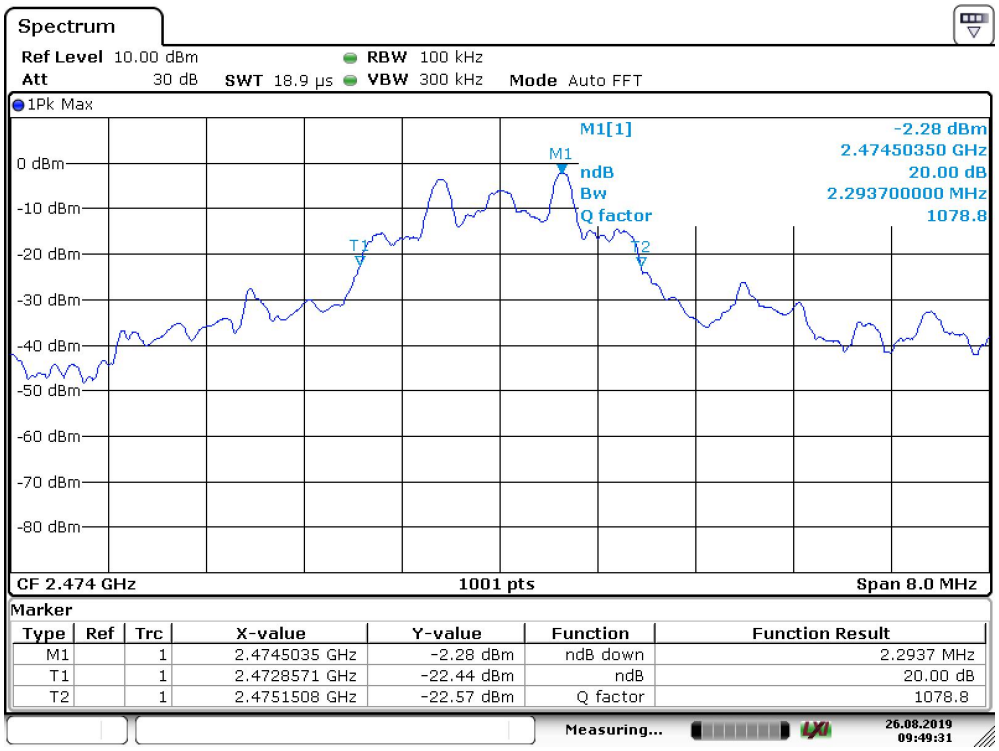

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8. Band EDGE test

8.1 Measurement Procedure

The EUT was placed on a styrofoam table which is 1.5m above ground plane.

The measurement procedure at the ban edges was simplified by performing the measurement in just one plot. Both, the in-band-emission and the unwanted emission were be encompassed by the span. After trace stabilization, the maximum peak was be determined by a peak detector and the value was marked by an appropriate limit line. The second limit line, which is 20dB below the first, marks the limit for the emissions in the unrestricted band. A maximum-peak-detector marks the highest emission in the unrestricted band next to the band edge.

The measurements were performed at the lower end of the 2.4GHz band.

Use the following spectrum analyzer settings:

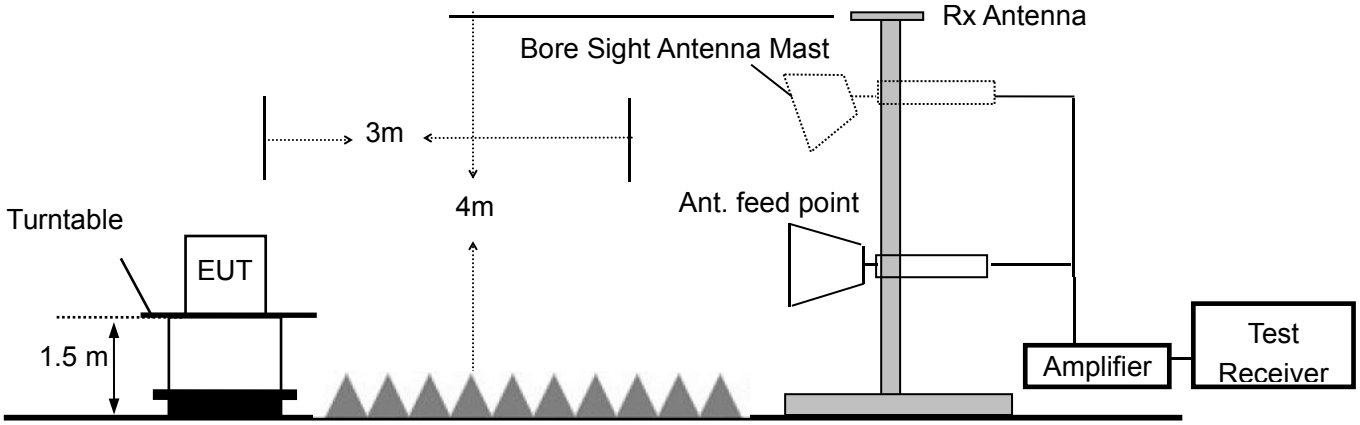
When spectrum scanned above 1GHz setting resolution bandwidth 1MHz, video bandwidth 3MHz:

EMI Test Receiver	Setting
Attenuation	Auto
RB	1MHz
VB	3MHz
Detector	Peak
Trace	Max hold

When spectrum scanned above 1GHz setting resolution bandwidth 1MHz, video bandwidth 10Hz:

EMI Test Receiver	Setting
Attenuation	Auto
RB	1MHz
VB	10Hz
Detector	Peak
Trace	Max hold

8.2 Test SET-UP (Block Diagram of Configuration)



8.3 Measurement Equipment Used:

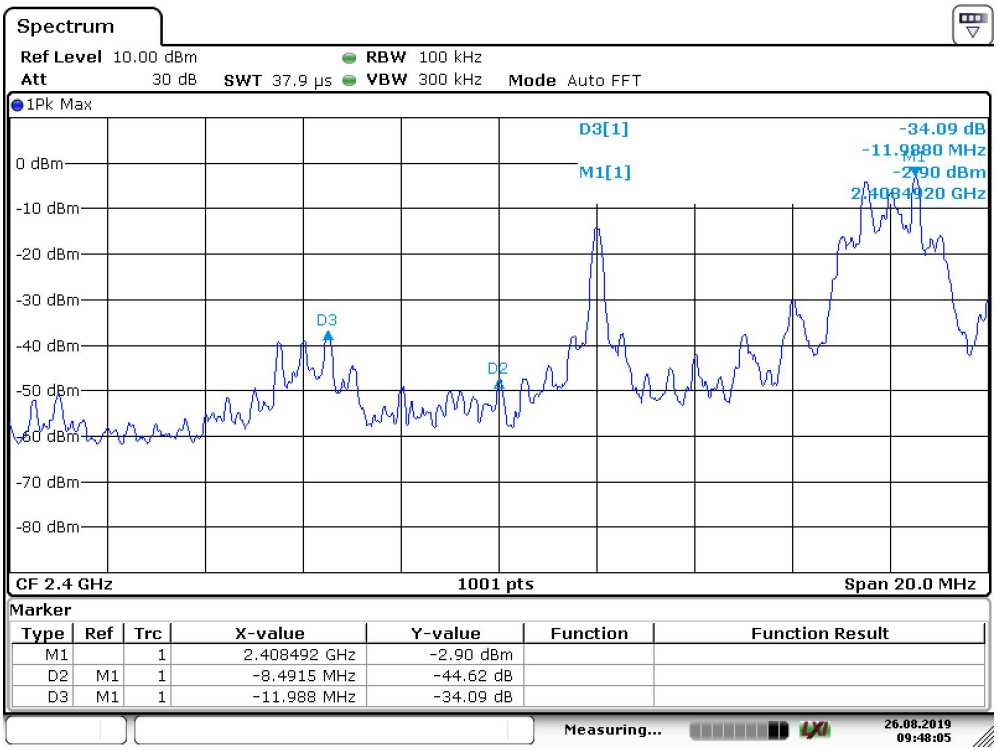
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Spectrum Analyzer	Rohde & Schwarz	FSV40	US40240623	2019-11-28
2	Low noise Amplifiers	A-INFO	LA1018N4009	J1013130524001	2020-05-19
3	Horn antenna	A-INFO	LB-10180-SF	J2031090612123	2020-05-19
4	RF Cable	Gigalink Microwave	ZT40-2.92J-2.92J-2m	N/A	2020-03-07
5	RF Cable	Gigalink Microwave	ZT40-2.92J-2.92J-0.3m	N/A	2020-03-07

8.4 Measurement Results:

Spectrum Detector:	PK	Test Date :	August 26, 2019
Test By:	Best	Temperature :	25 ℃
Test Result:	PASS	Humidity :	50 %

1. Conducted Test

Frequency (MHz)	Modulation	Peak Power Output(dBm)	Result of Band edge(dBc)	Band edge Limit(dBc)
2396.5	GFSK	-2.9	34.09	>20dBc
2487.49	GFSK	-2.31	25.25	>20dBc



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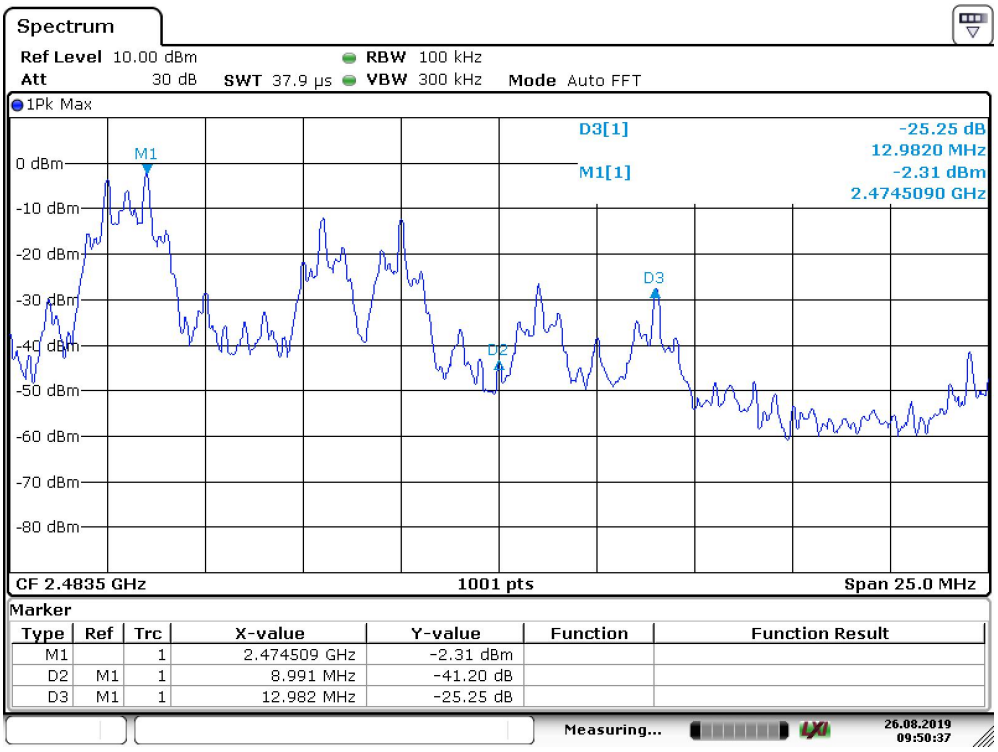

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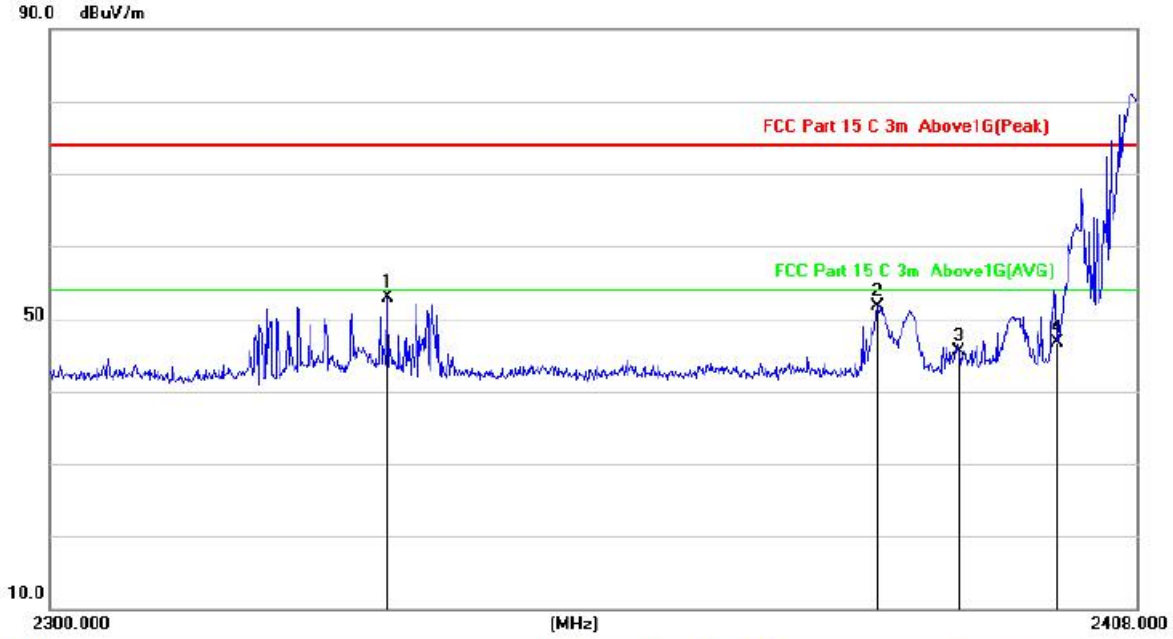
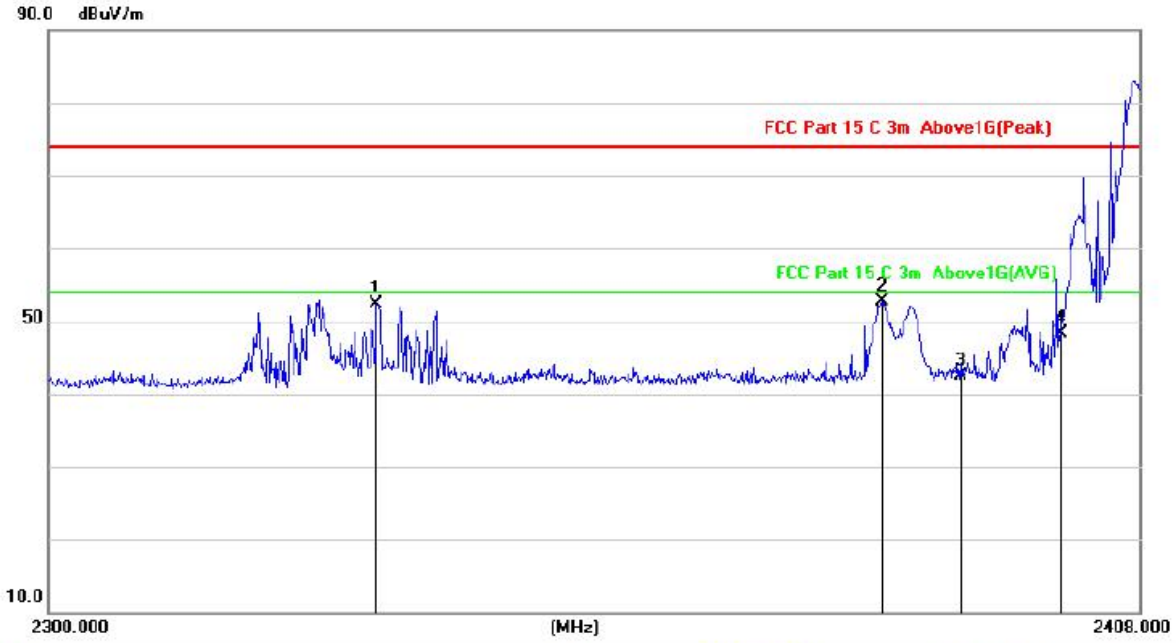
2. Radiated emission Test



Site LAB
Polarization: *Vertical*
Temperature: 26
Limit: FCC Part 15 C 3m Above1G(Peak)
Power: DC 5V
Humidity: 60 %
Mode: TX2408
Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector	cm	degree	Comment
1	*	2333.059	58.84	-5.93	52.91	74.00	-21.09	peak			
2		2381.845	57.29	-5.60	51.69	74.00	-22.31	peak			
3		2390.000	51.03	-5.55	45.48	74.00	-28.52	peak			
4		2400.000	52.26	-5.48	46.78	74.00	-27.22	peak			

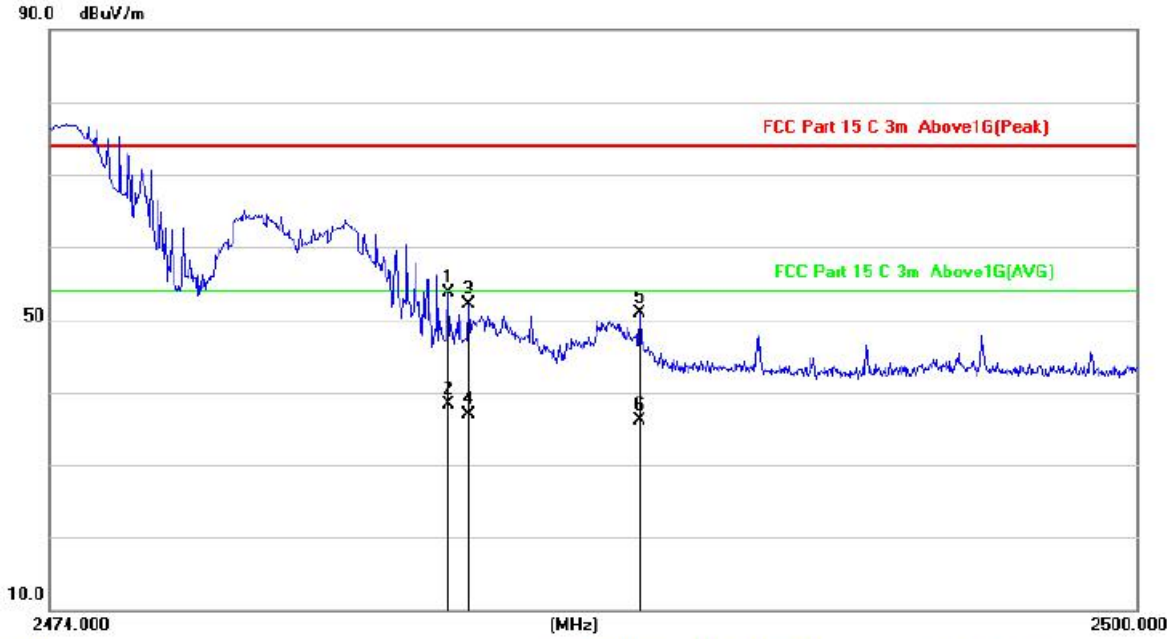
*:Maximum data x:Over limit !:over margin 〈Reference Only



Site LAB
Polarization: *Horizontal*
Temperature: 26
Limit: FCC Part 15 C 3m Above1G(Peak)
Power: DC 5V
Humidity: 60 %
Mode: TX2408
Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector	cm	degree	Comment
1		2331.988	58.31	-5.94	52.37	74.00	-21.63	peak			
2	*	2382.173	58.23	-5.60	52.63	74.00	-21.37	peak			
3		2390.000	48.14	-5.55	42.59	74.00	-31.41	peak			
4		2400.000	53.79	-5.48	48.31	74.00	-25.69	peak			

*:Maximum data x:Over limit !:over margin (Reference Only



Site LAB Polarization: *Horizontal* Temperature: 26

Limit: FCC Part 15 C 3m Above1G(Peak) Power: DC 5V Humidity: 60 %

Mode: TX2474

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector	cm	degree	Comment
1		2483.500	58.55	-4.90	53.65	74.00	-20.35	peak			
2	*	2483.510	43.25	-4.90	38.35	54.00	-15.65	AVG			
3		2484.004	57.07	-4.90	52.17	74.00	-21.83	peak			
4		2484.004	41.85	-4.90	36.95	54.00	-17.05	AVG			
5		2488.084	55.72	-4.87	50.85	74.00	-23.15	peak			
6		2488.084	40.97	-4.87	36.10	54.00	-17.90	AVG			

*:Maximum data x:Over limit !:over margin 〈Reference Only

Site LAB
Limit: FCC Part 15 C 3m Above1G(Peak)
Mode: TX2474
Note:

Polarization: *Vertical*
Power: DC 5V

Temperature: 26
Humidity: 60 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector	cm	degree	Comment
1		2483.500	48.82	-4.90	43.92	74.00	-30.08	peak			
2		2483.500	33.17	-4.90	28.27	54.00	-25.73	AVG			
3		2483.588	58.78	-4.90	53.88	74.00	-20.12	peak			
4		2483.588	43.85	-4.90	38.95	54.00	-15.05	AVG			
5		2484.731	60.45	-4.89	55.56	74.00	-18.44	peak			
6	*	2484.731	45.98	-4.89	41.09	54.00	-12.91	AVG			

*:Maximum data x:Over limit !:over margin 〈Reference Only

9. Radiated Emission Test

9.1 Measurement Procedure

1. Below 1000MHz, The EUT was placed on a turn table which is 0.8m above ground plane. And above 1000MHz, The EUT was placed on a styrofoam table which is 1.5m above ground plane.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (From 1m to 4m) and turntable (from 0 degree to 360 degree) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
4. Set to the maximum power setting and enable the EUT transmit continuously.
5. Final measurement (Above 1GHz): The frequency range will be divided into different sub ranges depending of the frequency range of the used horn antenna. The EMI Receiver set to peak and average mode and a resolution bandwidth of 1MHz. The measurement will be performed in horizontal and vertical polarization of the measuring antenna and while rotating the EUT in its vertical axis in the range of 0 degree to 360 degree in order to have the antenna inside the cone of radiation.
6. Test Procedure of measurement (For Above 1GHz):
   1) Monitor the frequency range at horizontal polarization and move the antenna over all sides of the EUT(if necessary move the EUT to another orthogonal axis).
   2) Change the antenna polarization and repeat 1) with vertical polarization.
   3) Make a hardcopy of the spectrum.
   4) Measure the frequency of the detected emissions with a lower span and resolution bandwidth to increase the accuracy and note the frequency value.
   5) Change the analyser mode to Clear/ Write and found the cone of emission.
   6) Rotate and move the EUT, so that the measuring distance can be enlarged to 3m and the antenna will be still inside the cone of emission.
   7) Measure the level of the detected frequency with the correct resolution bandwidth, with the antenna polarization and azimuth and the peak and average detector, which causes the maximum emission.
   8) Repeat steps 1) to 7) for the next antenna spot if the EUT is larger than the antenna beamwidth.

The following table is the setting of spectrum analyzer:

When spectrum scanned from 30MHz to 1GHz setting resolution bandwidth 120KHz and video bandwidth 300KHz:

EMI Test Receiver	Setting
Attenuation	Auto
RB	120KHz
VB	300KHz
Detector	QP
Trace	Max hold

For harmonics emission .When spectrum scanned above 1GHz setting resolution bandwidth 1MHz, video bandwidth 3MHz:

EMI Test Receiver	Setting
Attenuation	Auto
RB	1MHz
VB	3MHz
Detector	Peak
Trace	Max hold

For fundamental emission .When spectrum scanned above 1GHz setting resolution bandwidth 3MHz, video bandwidth 10MHz:

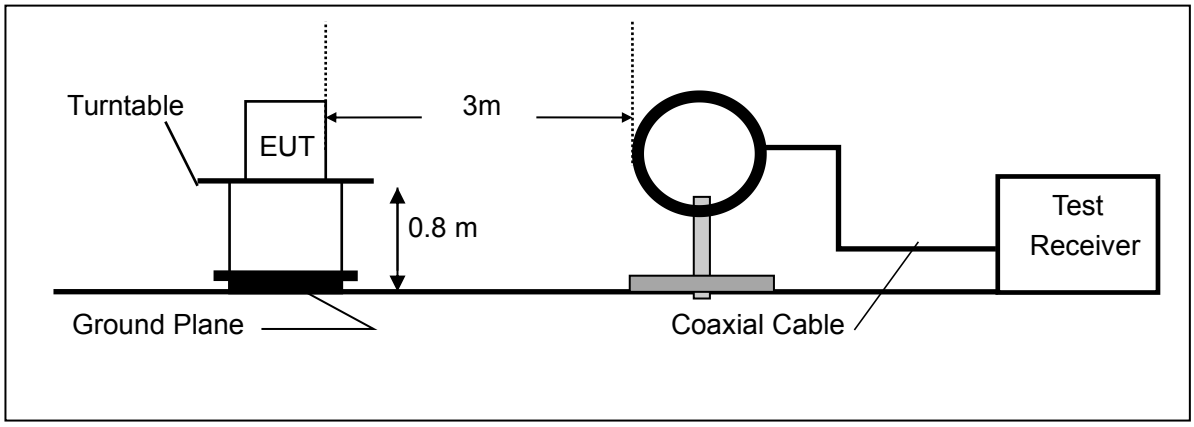
EMI Test Receiver	Setting
Attenuation	Auto
RB	3MHz
VB	10MHz
Detector	Peak
Trace	Max hold

When spectrum scanned above 1GHz setting resolution bandwidth 1MHz, video bandwidth 10Hz:

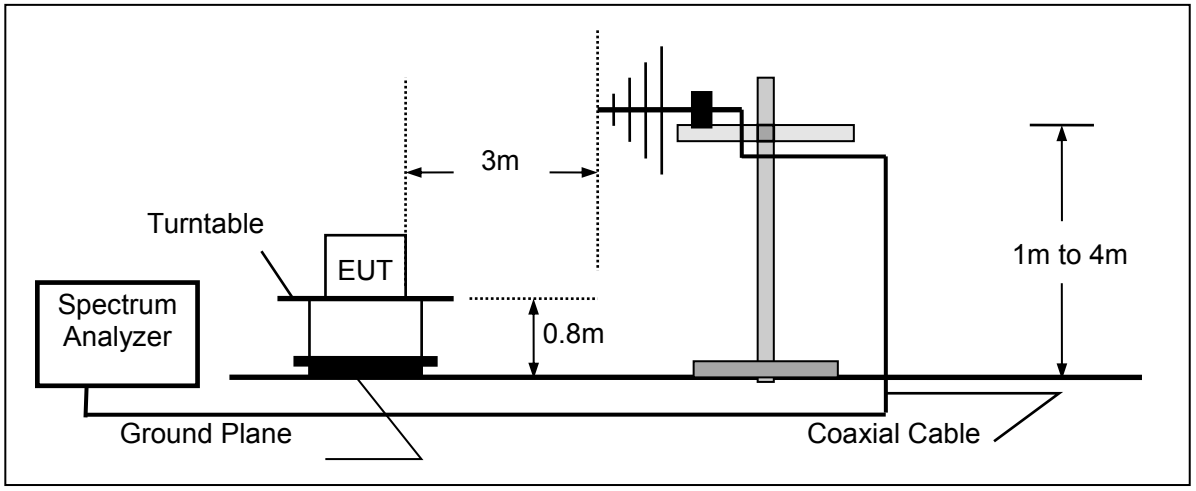
EMI Test Receiver	Setting
Attenuation	Auto
RB	1MHz
VB	10Hz
Detector	Peak
Trace	Max hold

9.2 Test SET-UP (Block Diagram of Configuration)

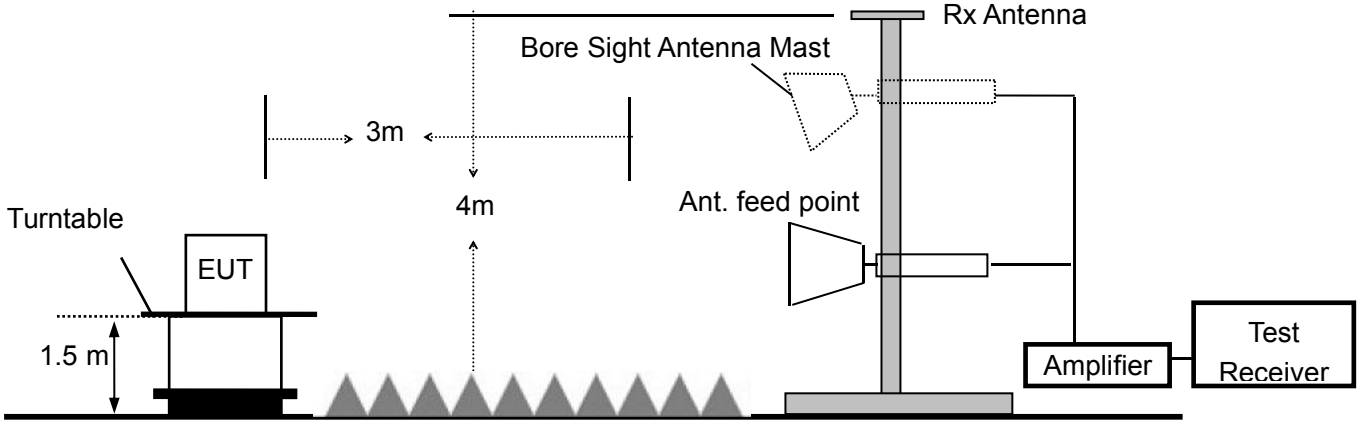
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(C) Radiated Emission Test Set-Up, Frequency above 1000MHz



9.3 Measurement Equipment Used:

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1.	EMI Test Receiver	Rohde & Schwarz	ESPI	100502	2019-11-29
2.	Pre-Amplifier	HP	8447D	2727A06172	2020-05-19
3.	Bilog Antenna	Schwarzbeck	VULB9163	VULB9163-588	2020-05-19
4.	Loop Antenna	Schwarzbeck	FMZB 1516	1516-141	2020-01-04
5.	Spectrum Analyzer	Rohde & Schwarz	FSV40	US40240623	2019-11-28
6.	Low noise Amplifiers	A-INFO	LA1018N4009	J1013130524001	2020-05-19
7.	Horn antenna	A-INFO	LB-10180-SF	J2031090612123	2020-05-19
8.	Broadband RF Power Amplifier	AEROFLEX	AEROFLEX 100KHz-40GHz	J1013130524001	2020-03-12
9.	DRG Horm Antenna	A.H.SYSTEMS	SAS-574	J2031090612123	2020-03-12
10.	RF Cable	Gigalink Microwave	ZT40-2.92J-2.92J-2m	N/A	2020-03-12
11.	RF Cable	Gigalink Microwave	ZT40-2.92J-2.92J-0.3m	N/A	2020-03-12
12.	RF Cable	N/A	N/A	6#	2020-05-19
13.	RF Cable	N/A	N/A	1-1#	2020-05-19
14.	RF Cable	N/A	N/A	1-2#	2020-05-19
15.	RF Cable	N/A	N/A	7#	2020-05-19
16.	3m Semi-anechoic Chamber	chengyu	9m*6m*6m	N/A	2020-05-19
17.	Test Software	Farad	EZ-EMC Ver:ANCI-3A1	N/A	N/A

9.4 Limit:

The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table 15.209(a):

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

Remark: 1. Emission level in dBuV/m=20 log (uV/m)
2. Measurement was performed at an antenna to the closed point of EUT distance of meters.

The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Frequency(MHz)	Filed Strength of Fundamental(at 3m)		Filed Strength of Harmonics(at 3m)	
	PEAK	AVERAGE	PEAK	AVERAGE
902-928	114	94	74.0	54.0
2400-2483.5	114	94	74.0	54.0
5725-5875	114	94	74.0	54.0
24000-24250	128	108	88.0	68.0

9.5 Measurement Result

Below 30MHz:

Operation Mode:	TX	Test Date :	August 22, 2019
Frequency Range:	9KHz~30MHz	Temperature :	28℃
Test Result:	PASS	Humidity :	65 %
Measured Distance:	3m	Test By:	Best

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV/m)	Limit 3m (dBuV/m)	Over (dB)
--	--	--	--	--

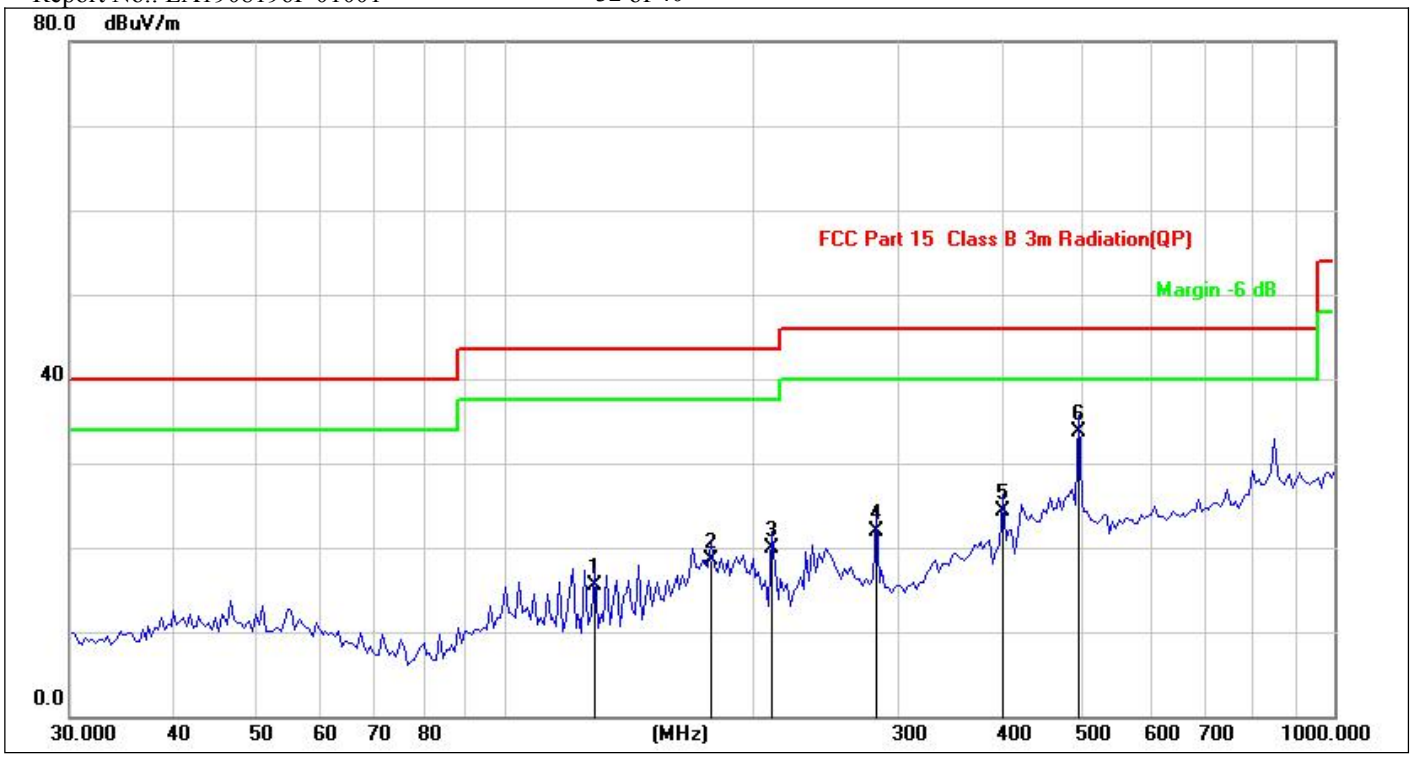
Note: the amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

Below 1000MHz:

Pass.

All the modulation modes were tested the worst data of the mode (TX 2408MHz)are recorded in the following pages and the others modulation methods do not exceed the limits.

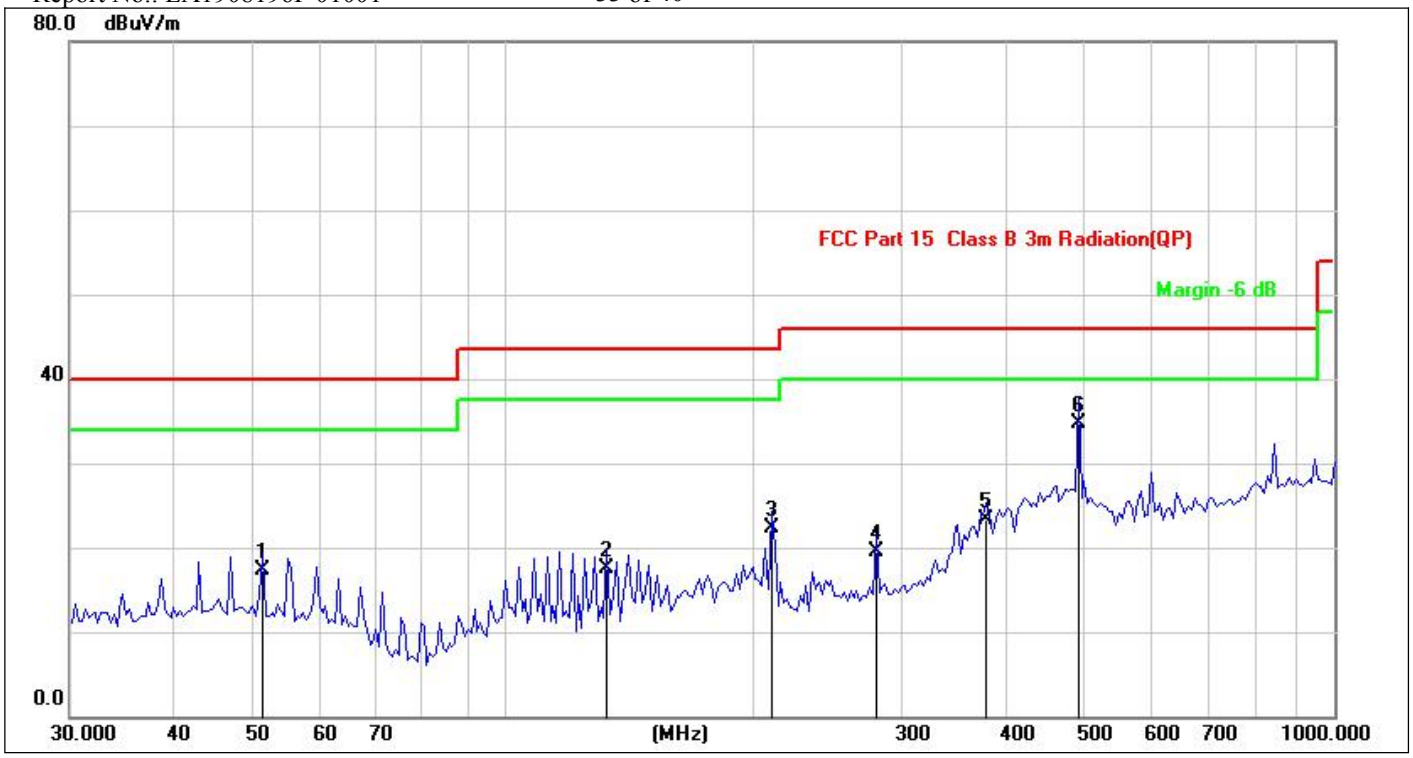
Please refer to the following data.



Site:	**LAB**	**Antenna::Horizontal**	**Temperature(C):26(C)**
Limit:	**FCC Part 15 C 3m Radiation**		**Humidity(%):60%**
EUT:	**2.4G Wireless USB Transceiver**	**Test Time:**	**2019/08/22**
M/N.:	**GD7820**	**Power Rating:**	**DC 5V**
Mode:	**TX2408**	**Test Engineer:**	**Bast**
Note:			

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)	Remark
1	125.2260	33.44	-17.59	15.85	43.50	-27.65	QP			
2	168.7093	37.82	-18.38	19.44	43.50	-24.06	QP			
3	243.8043	34.22	-14.73	19.49	46.00	-26.51	QP			
4	280.5152	35.35	-13.60	21.75	46.00	-24.25	QP			
5	398.3312	35.76	-10.24	25.52	46.00	-20.48	QP			
6 *	491.6059	40.16	-6.37	33.79	46.00	-12.21	QP			

*:Maximum data x:Over limit !:over margin



Site:	**LAB**	**Antenna::Vertical**	**Temperature(C):26(C)**
Limit:	**FCC Part 15 C 3m Radiation**		**Humidity(%):60%**
EUT:	**2.4G Wireless USB Transceiver**	**Test Time:**	**2019/08/02 14:56:32**
M/N.:	**GD7820**	**Power Rating:**	**AC 120V/60Hz**
Mode:	**TX2408**	**Test Engineer:**	**Bast**
Note:			

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)	Remark
1	51.2106	33.46	-16.21	17.25	40.00	-22.75	QP			
2	133.1511	35.63	-18.03	17.60	43.50	-25.90	QP			
3	210.0482	38.75	-16.50	22.25	43.50	-21.25	QP			
4	280.5152	33.06	-13.60	19.46	46.00	-26.54	QP			
5	381.2487	33.94	-10.61	23.33	46.00	-22.67	QP			
6 *	491.6059	41.03	-6.37	34.66	46.00	-11.34	QP			

*:Maximum data x:Over limit !:over margin

Above 1000MHz~10th Harmonics:

Operation Mode: GFSK(CH1: 2408MHz) Test Date : August 22, 2019

Freq.	Ant. Pol.	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Margin(dB)	
(MHz)	H/V	PK	AV	PK	AV	PK	AV
2408(F)	V	85.36	71.02	114	94	-28.64	-22.98
4816	V	64.25	43.02	74	54	-9.75	-10.98
7224	V	61.2	42.69	74	54	-12.8	-11.31
9632	V	58.36	39.64	74	54	-15.64	-14.36
12040	V	56.35	37.52	74	54	-17.65	-16.48
14448	V	56.14	37.33	74	54	-17.86	-16.67
16856	V	56.18	37.26	74	54	-17.82	-16.74
2408(F)	H	85.69	71.2	114	94	-28.31	-22.8
4816	H	64.16	45.69	74	54	-9.84	-8.31
7224	H	61.25	42.36	74	54	-12.75	-11.64
9632	H	58.47	39.25	74	54	-15.53	-14.75
12040	H	56.39	37.16	74	54	-17.61	-16.84
14448	H	56.14	37.58	74	54	-17.86	-16.42
16856	H	55.22	36.58	74	54	-18.78	-17.42

Operation Mode: GFSK(CH17: 2440MHz) Test Date : August 22, 2019

Freq.	Ant. Pol.	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Margin(dB)	
(MHz)	H/V	PK	AV	PK	AV	PK	AV
2440(F)	V	85.36	70.25	114	94	-28.64	-23.75
4880	V	64.02	45.69	74	54	-9.98	-8.31
7320	V	61.39	42.35	74	54	-12.61	-11.65
9760	V	59.33	40.11	74	54	-14.67	-13.89
12200	V	57.26	38.02	74	54	-16.74	-15.98
14640	V	56.32	37.69	74	54	-17.68	-16.31
17080	V	56.17	37.58	74	54	-17.83	-16.42
2440(F)	H	85.47	72.03	114	94	-28.53	-21.97
4880	H	63.14	44.05	74	54	-10.86	-9.95
7320	H	60.25	41.25	74	54	-13.75	-12.75
9760	H	58.97	39.44	74	54	-15.03	-14.56
12200	H	57.58	38.25	74	54	-16.42	-15.75
14640	H	56.02	36.96	74	54	-17.98	-17.04
17080	H	56.32	37.58	74	54	-17.68	-16.42

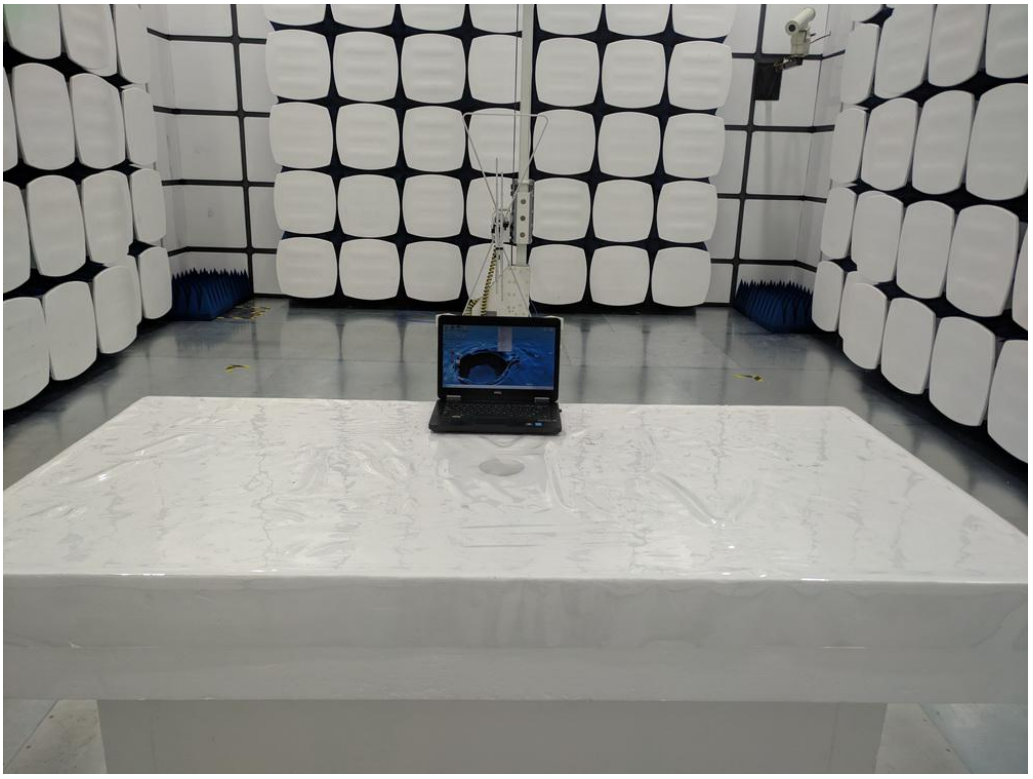
Operation Mode: GFSK(CH34: 2474MHz) Test Date : August 22, 2019

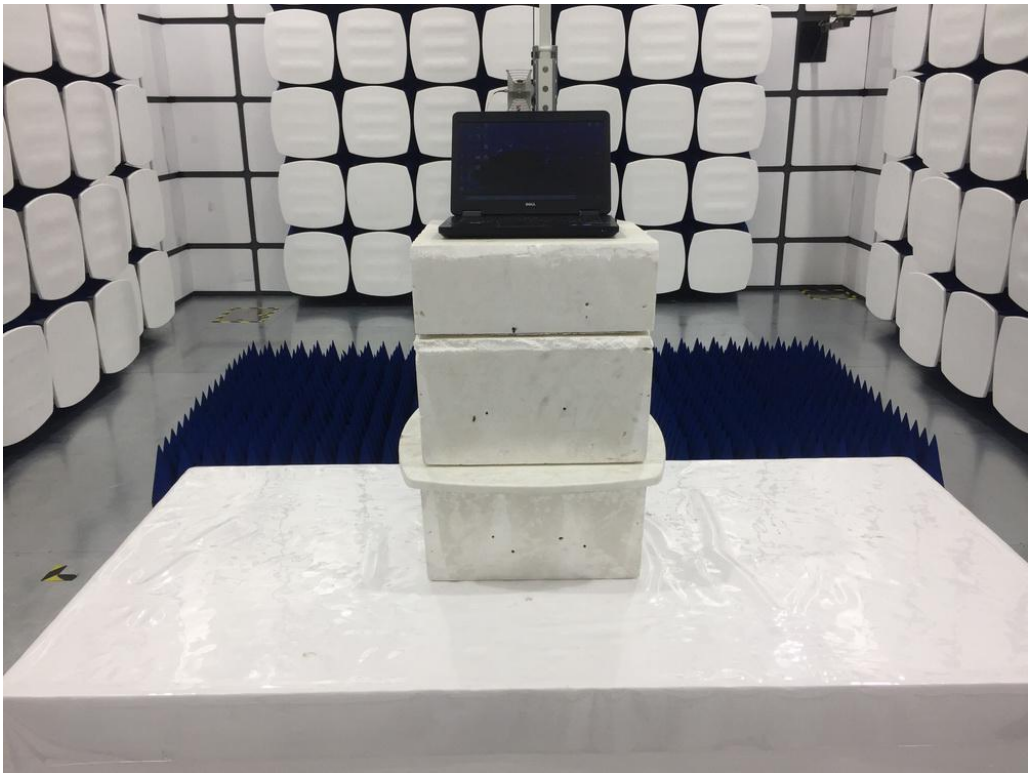
Freq.	Ant. Pol.	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Margin(dB)	
(MHz)	H/V	PK	AV	PK	AV	PK	AV
2474(F)	V	85.02	69.31	114	94	-28.98	-24.69
4948	V	62.58	44.2	74	54	-11.42	-9.8
7422	V	60.45	41.36	74	54	-13.55	-12.64
9896	V	58.63	39.17	74	54	-15.37	-14.83
12370	V	57.25	37.45	74	54	-16.75	-16.55
14844	V	56.58	36.52	74	54	-17.42	-17.48
17318	V	56.47	36.17	74	54	-17.53	-17.83
2474(F)	H	84.96	69.58	114	94	-29.04	-24.42
4948	H	63.02	44.15	74	54	-10.98	-9.85
7422	H	60.38	41.2	74	54	-13.62	-12.8
9896	H	58.16	39.85	74	54	-15.84	-14.15
12370	H	57.56	38.58	74	54	-16.44	-15.42
14844	H	56.17	37.69	74	54	-17.83	-16.31
17318	H	56.33	37.52	74	54	-17.67	-16.48

Other harmonics emissions are lower than 20dB below the allowable limit.

Note: (1) All Readings are Peak Value and AV.
(2) Emission Level= Reading Level+ Probe Factor +Cable Loss.
(3) The average measurement was not performed when the peak measured data under the limit of average detection.
(4) Measuring frequencies from 1GHz to 25GHz.

9.5 Radiated Measurement Photos:





9. Antenna requirement

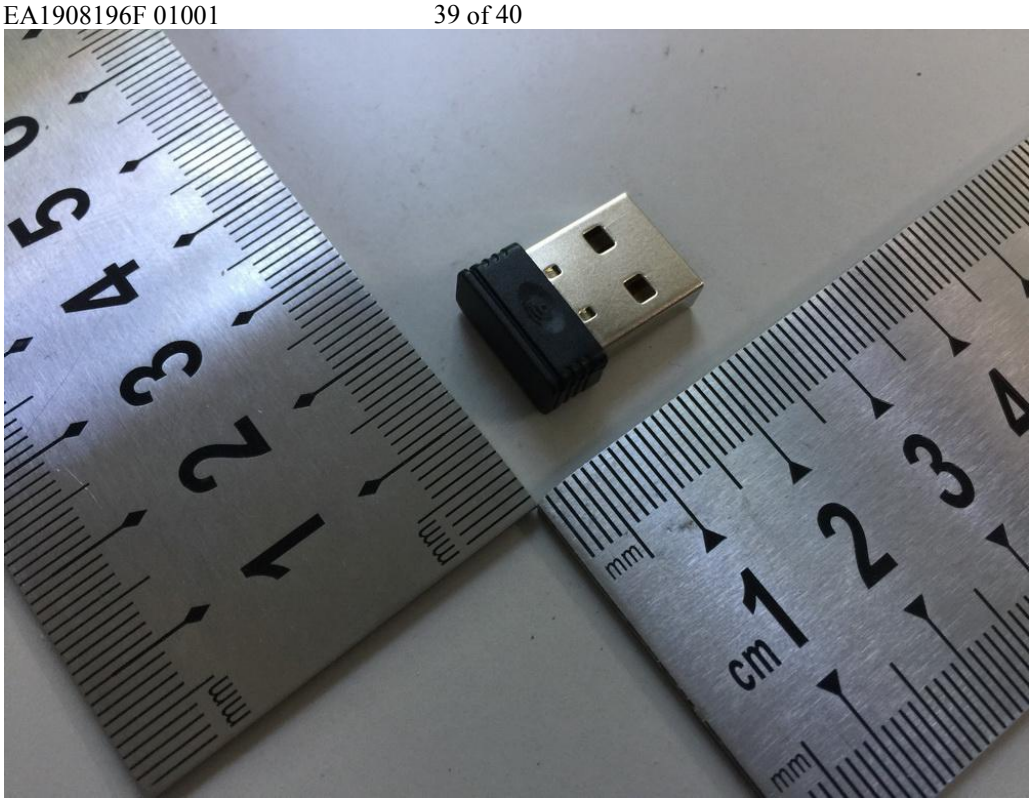
9.1 Limit

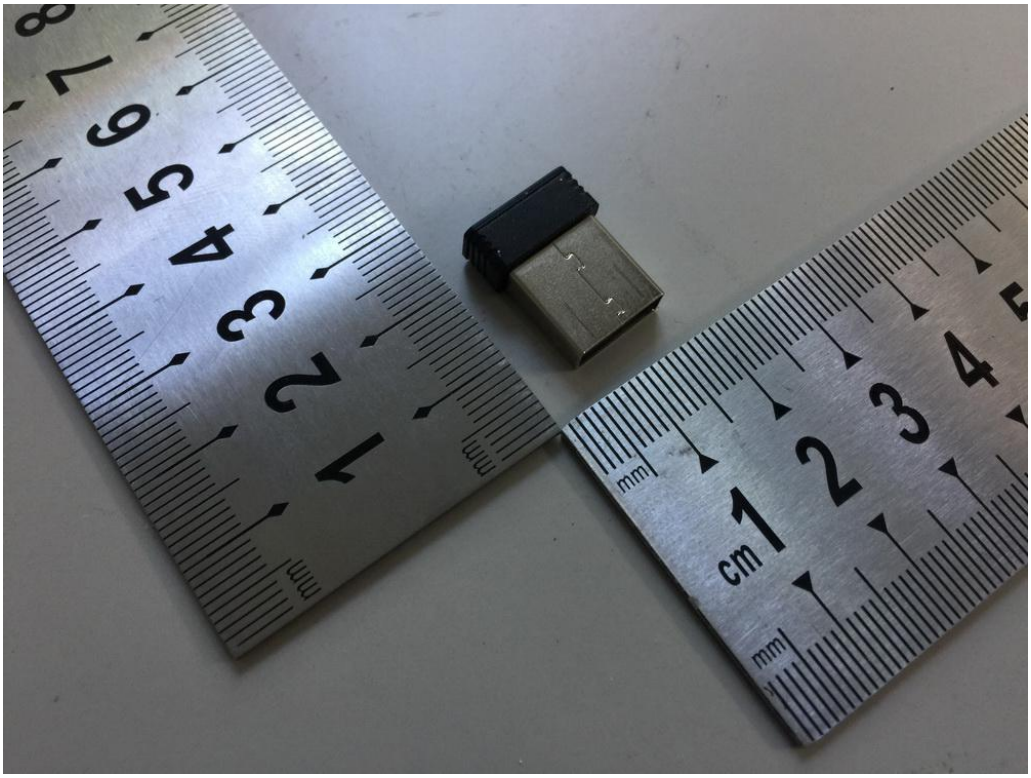
Except for special regulations, the Low-power Radio-Frequency Devices must not be equipped with any jacket for installing an antenna with extension cable. An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacture may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited.

9.2 Result

The EUT's antenna, permanent attached antenna, used a PCB antenna and integrated on PCB, The antenna's gain is 0dBi and meets the requirement.

APPENDIX I
(Photos of EUT)


cm
mm


cm
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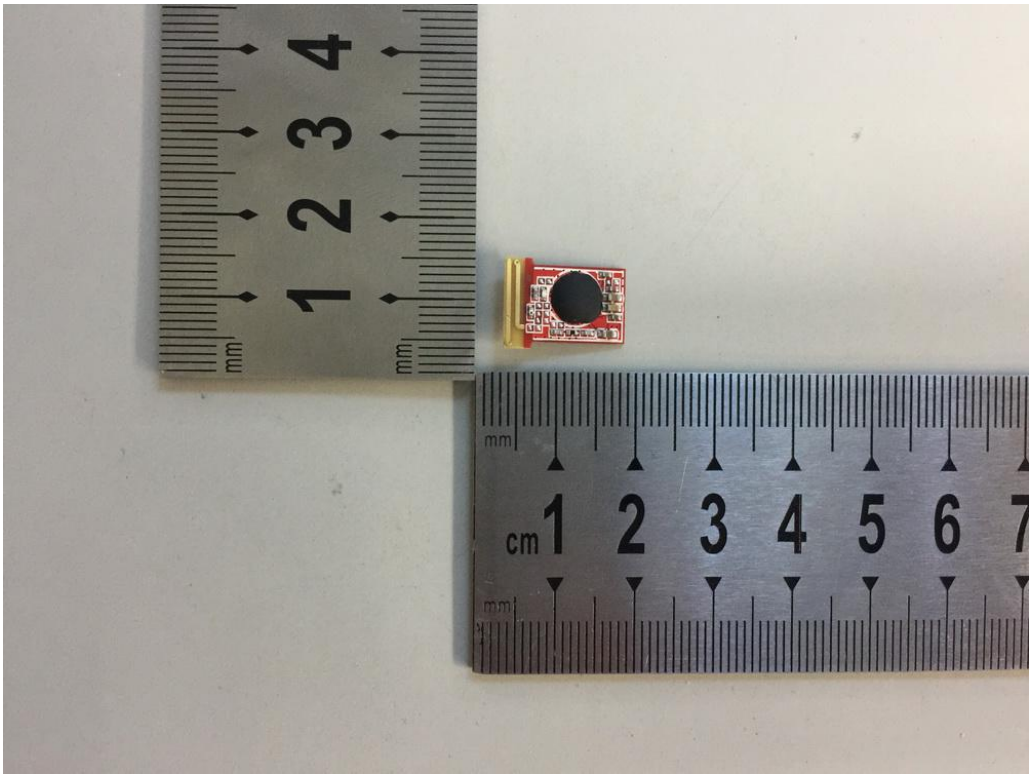

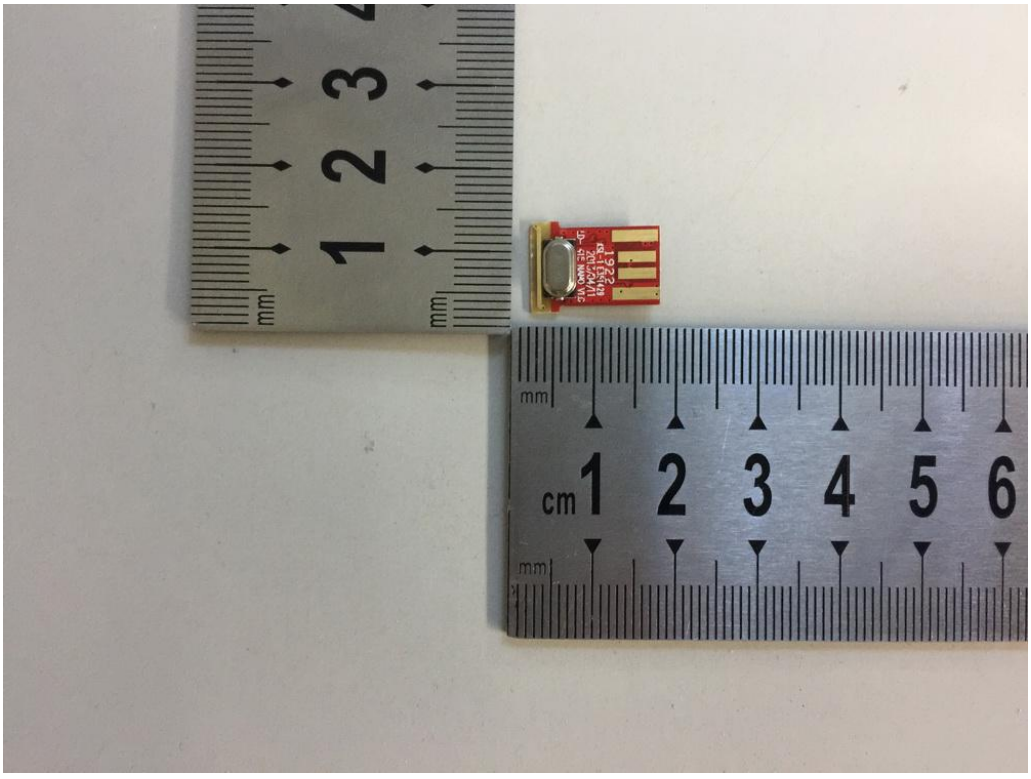

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