FCC PART 15C TEST REPORT FOR CERTIFICATION
On Behalf of

Cherry GmbH

2.4GHz Wireless Receiver

Model No.: R070

FCC ID: GDDR070REV

Prepared for : Cherry GmbH
Cherrystraße, 91275 Auerbach/Opf. GERMANY

Prepared By : Audix Technology (Shenzhen) Co., Ltd.
No. 6, Kefeng Road, Science & Technology Park,
Nanshan District , Shenzhen, Guangdong, China

Tel: (0755) 26639496

Report Number	:	ACS-F18117
Date of Test	:	Apr.20~23,2018
Date of Report	:	May.22,2018

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TEST REPORT CERTIFICATION

Applicant : Cherry GmbH

Product : 2.4GHz Wireless Receiver

FCC ID : GDDR070REV

(A)Model No. : R070
(B) Serial No. : N/A
(C) Power Supply : DC 5V
(D) Test Voltage : DC 5V From Notebook Input AC 120V/60Hz

Tested for comply with:
FCC CFR 47 Part 15 Subpart C

Test procedure used:
ANSI C63.10:2013

The device described above is tested by AUDIX TECHNOLOGY (SHENZHEN) CO., LTD. to confirm comply with all the FCC Part 15 Subpart C requirements.

The test results are contained in this test report and AUDIX TECHNOLOGY (SHENZHEN) CO., LTD. is assumed full responsibility for the accuracy and completeness of these tests. This report contains data that are not covered by the NVLAP accreditation. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

This Report is made under FCC Part 2.1075. No modifications were required during testing to bring this product into compliance.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of AUDIX TECHNOLOGY (SHENZHEN) CO., LTD.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

Date of Test : Apr.20~23,2018 Report of date: May.22,2018

Prepared by : Brave Zhang / Assistant

Reviewed by : Sunny Lu / Deputy Manager

信華科技（深圳）有限公司
Audix Technology (Shenzhen) Co., Ltd.
EMC 部門報告專用章
Stamp only for EMC Dept. Report
Signature:

Approved & Authorized Signer : David Jin / Manager

1. SUMMARY OF STANDARDS AND RESULTS

1.1.Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below.

EMISSION		
Description of Test Item	**Standard**	**Results**
Power Line Conducted Emission Test	FCC Part 15C: 15.207 ANSI C63.10-2013	PASS
Radiated Emission Test	FCC Part 15C: 15.209 FCC Part 15C: 15.249 ANSI C63.10-2013	PASS
Band Edge Compliance Test	FCC Part 15: 15.249 ANSI C63.10-2013	PASS
20dB Bandwidth Test	FCC Part 15: 15.215 ANSI C63.10-2013	PASS
N/A is an abbreviation for Not Applicable.		

2. GENERAL INFORMATION

2.1.Description of Device (EUT)

Product	:	2.4GHz Wireless Receiver
Model No.	:	R070
FCC ID	:	GDDR070REV
Operation frequency	:	2403MHz-2479MHz
Antenna	:	Internal Antenna, -2.268dBi
Modulation	:	GFSK
Applicant	:	Cherry GmbH Cherrystraße, 91275 Auerbach/Opf. GERMANY
Manufacturer	:	Cherry GmbH Cherrystraße, 91275 Auerbach/Opf. GERMANY
Factory	:	G.Tech Technology Ltd. No.8, Jinyuan 1st Road, High-tech Zone, Zhuhai City, Guangdong, China, 519085
USB Cable	:	Shielded, Detachable, 1.5m
Date of Test	:	Apr.20~23,2018
Date of Receipt	:	Apr.17,2018
Sample Type	:	Prototype production

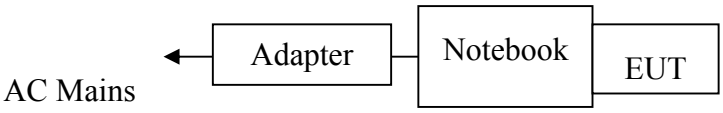
2.2. Tested Supporting System Details

No.	Description	ACS No.	Manufacturer	Model	Serial Number
1.	Notebook	N/A	DELL	PP09S	N/A
		Power Cord: Unshielded, Detachabled, 1.8m Power Adapter: Manufacturer: DELL, M/N: LA65NS1-00 Cable: Unshielded, Detachabled, 4.0m(Bond one ferrite core)			

2.3. Channel list of EUT

Channel list	Frequency
1	2403MHz
2	2407MHz
3	2414MHz
4	2419MHz
5	2422MHz
6	2426MHz
7	2436MHz
8	2439MHz
9	2441MHz
10	2445MHz
11	2453MHz
12	2459MHz
13	2463MHz
14	2466MHz
15	2473MHz
16	2479MHz

2.4. Block Diagram of connection between EUT and simulators



(EUT: 2.4GHz Wireless Receiver)

2.5.Test Facility

Site Description

Name of Firm	:	Audix Technology (Shenzhen) Co., Ltd. No. 6, Kefeng Road, Science & Technology Park, Nanshan District , Shenzhen, Guangdong, China
EMC Lab.	:	Certificated by Industry Canada Registration Number: IC 5183A-1 Valid Date: May.07,2020
	:	Certificated by DAkkS, Germany Registration No: D-PL-12151-01-00 Valid Date: Dec.07, 2021
	:	Accredited by NVLAP, USA NVLAP Code: 200372-0 Valid Date: Mar.31, 2019
	:	Certificated by FCC, USA Designation No: CN5022 Valid Date: Mar.31, 2019

2.6.Measurement Uncertainty (95% confidence levels, k=2)

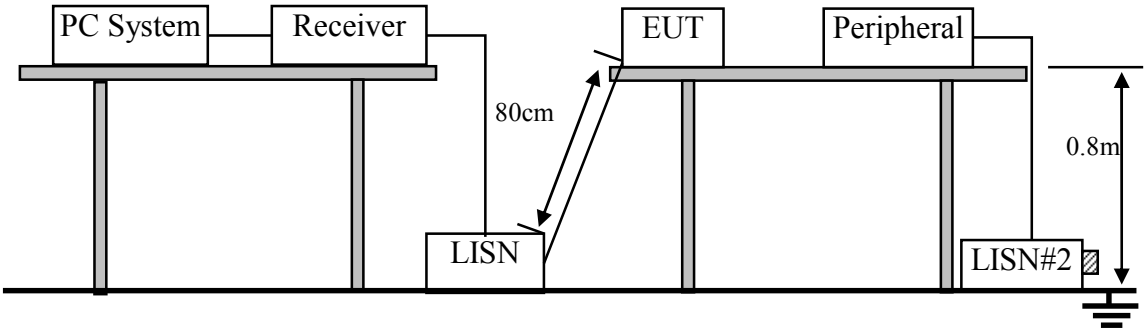
Test Item	Uncertainty
Uncertainty for Conducted emission test in No.2 Conduction	2.4dB (150KHz to 30MHz)
Uncertainty for Radiation Emission test in 3m chamber	2.8dB(30~200MHz, Polarization: H)
	2.8dB(30~200MHz, Polarization: V)
	3.0dB(200M~1GHz, Polarization: H)
	3.0dB(200M~1GHz, Polarization: V)
Uncertainty for Radiation Emission test in 3m chamber (1GHz-18GHz)	5.8dB (1~6GHz, Distance: 3m)
	5.8dB (6~18GHz, Distance: 3m)
Uncertainty for Radiated Spurious Emission test in RF chamber	3.6 dB
Uncertainty for Conduction Spurious emission test	2.0 dB
Uncertainty for Output power test	0.8 dB
Uncertainty for Bandwidth test	83 kHz
Uncertainty for DC power test	0.1 %
Uncertainty for test site temperature and humidity	0.6℃
	3%

3. POWER LINE CONDUCTED EMISSION TEST

3.1.Test Equipments

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	1# Shielding Room	AUDIX	N/A	N/A	May.17,17	1 Year
2.	Test Receiver	Rohde & Schwarz	ESCI	100842	Apr.23,18	1 Year
3.	L.I.S.N	Rohde & Schwarz	ENV216	102160	Jan.12,18	1 Year
4.	L.I.S.N.#2	Kyoritsu	K NW-403D	8-1750-2	Apr.23,18	1 Year
5.	Terminator	Hubersuhner	50Ω	No.1	Apr.23,18	1 Year
6.	Terminator	Hubersuhner	50Ω	No.2	Apr.23,18	1 Year
7.	RF Cable	Fujikura	RG55/U	No.2	Apr.23.18	1Year
8.	Coaxial Switch	Anritsu	MP59B	6201397223	Apr.23,18	1 Year
9.	Test Software	AUDIX	e3	6.100913a	N/A	N/A
Note: N/A means Not applicable.						

3.2.Block Diagram of Test Setup



▨ :50Ω Terminator

3.3.Power Line Conducted Emission Test Limits

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

Notes: 1. * Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

3.4.Configuration of EUT on Test

The following equipment are installed on Power Line Conducted Emission Test to meet the commission requirement and operating regulations in a manner which tends to maximize its emission characteristics in a normal application.

3.4.1. 2.4GHz Wireless Receiver (EUT)

Model Number : R070
Serial Number : N/A

3.4.2. Support Equipment: As Tested Supporting System Details, in Section 2.2.

3.5. Operating Condition of EUT

3.5.1. Setup the EUT and simulator as shown as Section 3.2.

3.5.2. Turn on the power of all equipments.

3.5.3. PC run test software to control EUT work in Tx mode.

3.6. Test Procedure

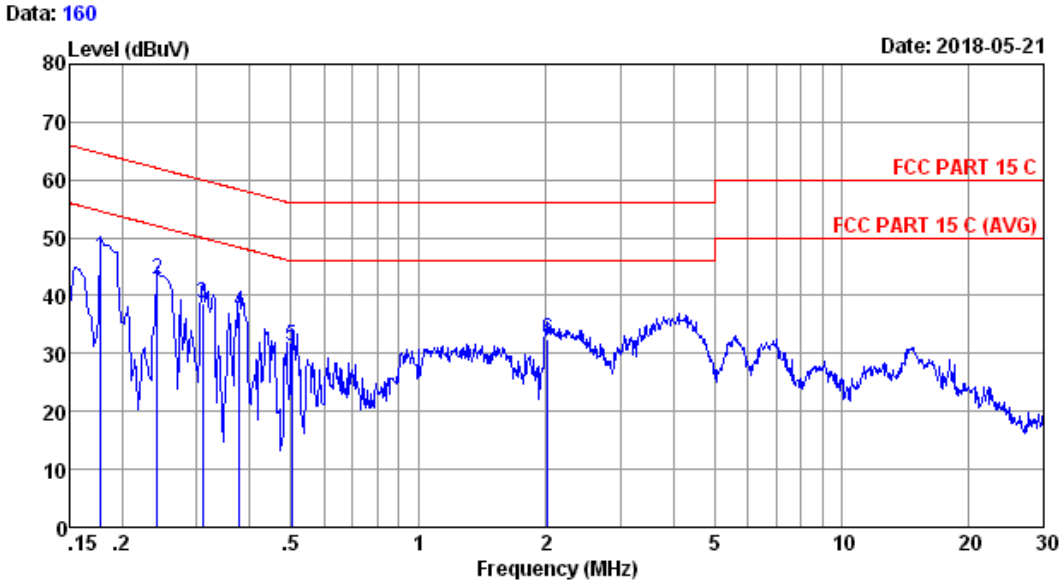
The EUT was placed on a non-metallic table, 80cm above the ground plane. The EUT Power Via PC connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm coupling impedance for the EUT (Please refer the block diagram of the test setup and photographs). The AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.10: 2013 on Conducted Emission Test.

The bandwidth of test receiver (R & S ESCI) is set at 9kHz.

The frequency range from 150kHz to 30MHz is checked.

3.7. Power Line Conducted Emission Test Results

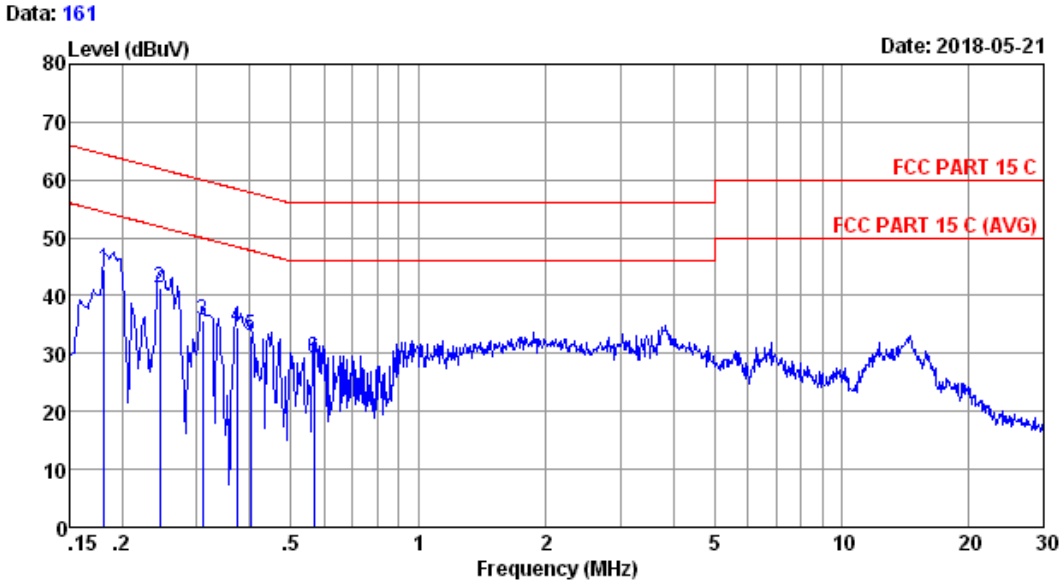
PASS. **(**All emissions not reported below are too low against the prescribed limits.)



Site no :1# CE Data No :160
Dis./Lisn :2018 LISN ENV216-L
Limit :FCC PART 15 C
Env./Ins. :22.1*C/50% Engineer : Garry
EUT :2.4GHz Wireless Receiver M/N:RO70
Power Rating :DC 5V
Test Mode :TX

No	Freq (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.178	9.53	0.15	36.97	46.65	64.59	17.94	QP
2	0.242	9.35	0.15	33.40	42.90	62.04	19.14	QP
3	0.310	9.05	0.15	29.60	38.80	59.97	21.17	QP
4	0.377	9.50	0.15	27.41	37.06	58.34	21.28	QP
5	0.502	9.52	0.18	21.50	31.20	56.00	24.80	QP
6	2.023	9.49	0.18	22.67	32.34	56.00	23.66	QP

Remarks: 1.Emission Level=LISN Factor+Cable Loss+Reading.
2.If the average limit is met when using a quasi-peak detector.
the EUT shall be deemed to meet both limits and measurement
with average detector is unnecessary.



Site no :1# CE Data No :161
Dis./Lisn :2018 LISN ENV216-N
Limit :FCC PART 15 C
Env./Ins. :22.1*C/50% Engineer : Garry
EUT :2.4GHz Wireless Receiver M/N:R070
Power Rating :DC 5V
Test Mode :TX

No	Freq (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.182	9.48	0.15	34.89	44.52	64.42	19.90	QP
2	0.246	9.46	0.15	31.75	41.36	61.91	20.55	QP
3	0.310	9.44	0.15	26.18	35.77	59.97	24.20	QP
4	0.373	9.43	0.15	24.83	34.41	58.43	24.02	QP
5	0.402	9.42	0.15	23.46	33.03	57.81	24.78	QP
6	0.567	9.36	0.18	19.83	29.37	56.00	26.63	QP

Remarks: 1.Emission Level=LISN Factor+Cable Loss+Reading.
2.If the average limit is met when using a quasi-peak detector.
the EUT shall be deemed to meet both limits and measurement
with average detector is unnecessary.

4. RADIATED EMISSION TEST

4.1.Test Equipment

Frequency range: 30~1000MHz

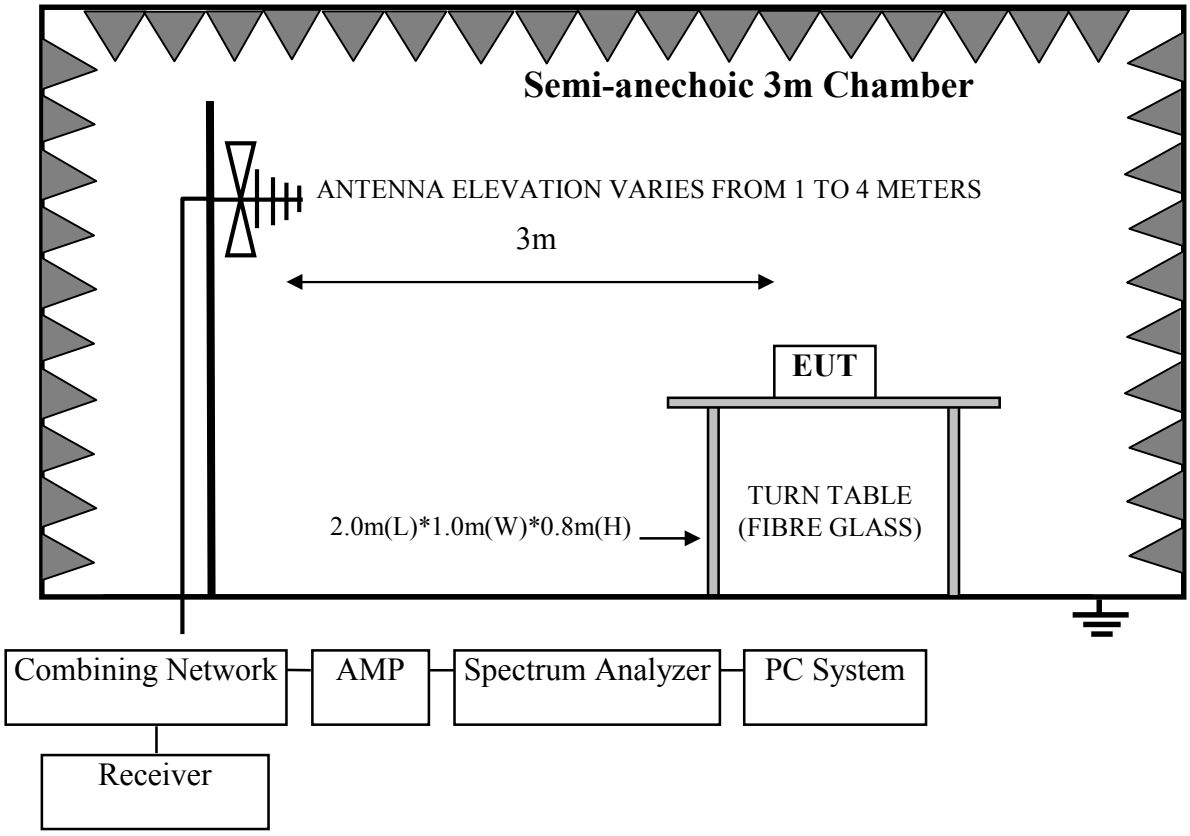
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	3#Chamber	AUDIX	N/A	N/A	Jun.19,17	1 Year
2.	EMC Analyzer	Agilent	E7405A	MY45116588	Dec.19,17	1 Year
3.	EMI Test Receiver	Rohde & Schwarz	ESR7	101547	Apr.23.18	1 Year
4.	Amplifier	HP	8447D	2648A04738	Apr.23,18	1 Year
5.	Bilog Antenna	TESEQ	CBL6112D	35375	Aug.29,17	1 Year
6.	RF Cable	SPUMA	CFD400NL-LW	No.3	Sep.02.17	1 Year
7.	Coaxial Switch	Anritsu	MP59B	6201397222	Apr.23,18	1 Year
8.	Test Software	AUDIX	e3	6.2009-5-21a(n)	N/A	N/A
Note: N/A means Not applicable.						

Frequency range: above 1000MHz

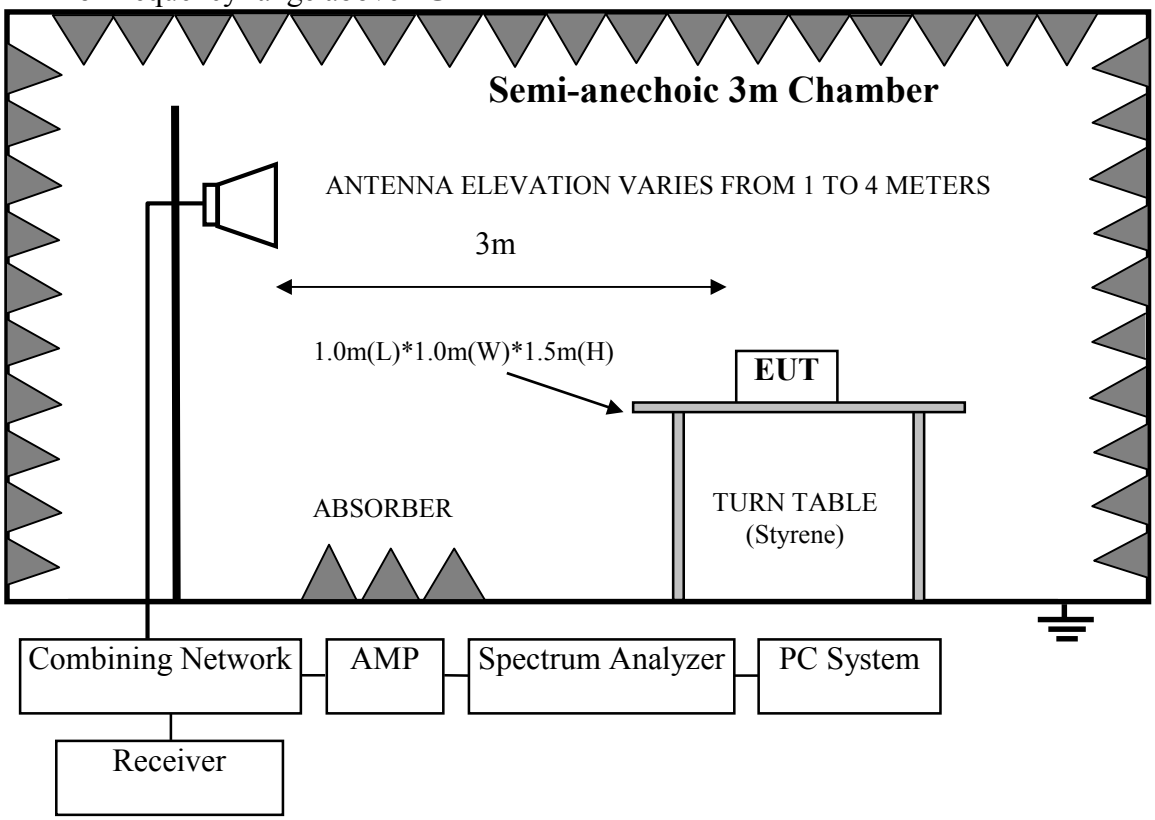
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	3#Chamber	AUDIX	N/A	N/A	May.17,17	1 Year
2.	Spectrum Analyzer	Agilent	E7405A	MY45116588	Dec.19,17	1 Year
3.	Horn Antenna	ETS	3115	9510-4580	Dec.01,17	1 Year
4.	Horn Antenna	ETS	3116	00060089	Dec.03,17	1 Year
5.	Amplifier	Agilent	83017A	MY53270084	Dec.19,17	1 Year
6.	RF Cable	Hubersuhner	SUCOFLEX106	505239/6	Apr.23.18	1 Year
7.	Test Software	AUDIX	e3	6.2009-5-21a(n)	N/A	N/A
Note: N/A means Not applicable.						

4.2.Block Diagram of Test Setup

For frequency range 30MHz-1000MHz



For frequency range above 1GHz



4.3. Radiated Emission Limit Standard: FCC 15.209 and 15.249

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		μV/m	dB(μV)/m
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000MHz	3	74.0 dB(μV)/m (Peak) 54.0 dB(μV)/m (Average)	
Field Strength of fundamental emissions for 2.4GHz-2.4835GHz	3	114.0 dB(μV)/m (Peak) 94.0 dB(μV)/m (Average)	

Remark： (1) Emission level dBμV = 20 log Emission level μV/m

(2) The smaller limit shall apply at the cross point between two frequency bands.

(3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

(4) The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

4.4.EUT Configuration on Test

The following equipment are installed on Radiated Emission Test to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

4.5.Operating Condition of EUT

4.5.1.Setup the EUT and simulator as shown as Section 4.2.
4.5.2.Turn on the power of all equipments.
4.5.3.Let EUT work in Tx mode.

4.6.Test Procedure

Frequency below 30MHz:
The EUT setup on the turn table which has 0.8 m height to the ground. The turn table rotated 360 degrees and antenna fixed to 1 m to find the maximum emission level. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10-2013 regulation.

EUT and its simulators are placed on a turn table, which is 0.8 meter high above ground for frequency 30MHz~1000MHz, 1.5 meter high above ground for frequency above 1GHz and put the absorbing with 2.4m(L)*2.4m(W)*0.3m(H) on the ground . The turn table can rotate 360 degrees to determine the position of the maximum emission level. Power on the EUT and let it working in test mode, then test it.EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna for frequency 30MHz~1000MHz, and the Horm antenna is used as receiving antenna for frequency above 1GHz. Both horizontal and vertical polarization of the antenna is set on Test. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.10-2013 on radiated emission Test.

During the pretest the EUT was rotated through three orthogonal axes to determine the attitude that maximizes the emissions.

After that the EUT was manually handled to find the orientation that has the maximum emission, which is the orientation show in the test setup photos.

The bandwidth of the EMI test receiver (R&S ESVS10) is set at 120kHz for frequency range from 30MHz to 1000 MHz.

The bandwidth of the Spectrum's RBW is set at 1MHz and VBW is set at 3MHz for peak emissions measurement above 1GHz

This device is pulse modulated, a duty cycle factor was used to calculate average level based measured peak level.

The frequency range from 30MHz to 10th harmonic (25GHz) is checked. And no any emissions were found from 18GHz to 25 GHz, So the radiated emissions from 18GHz to 25GHz were not record.

4.7.Radiated Emission Test Results

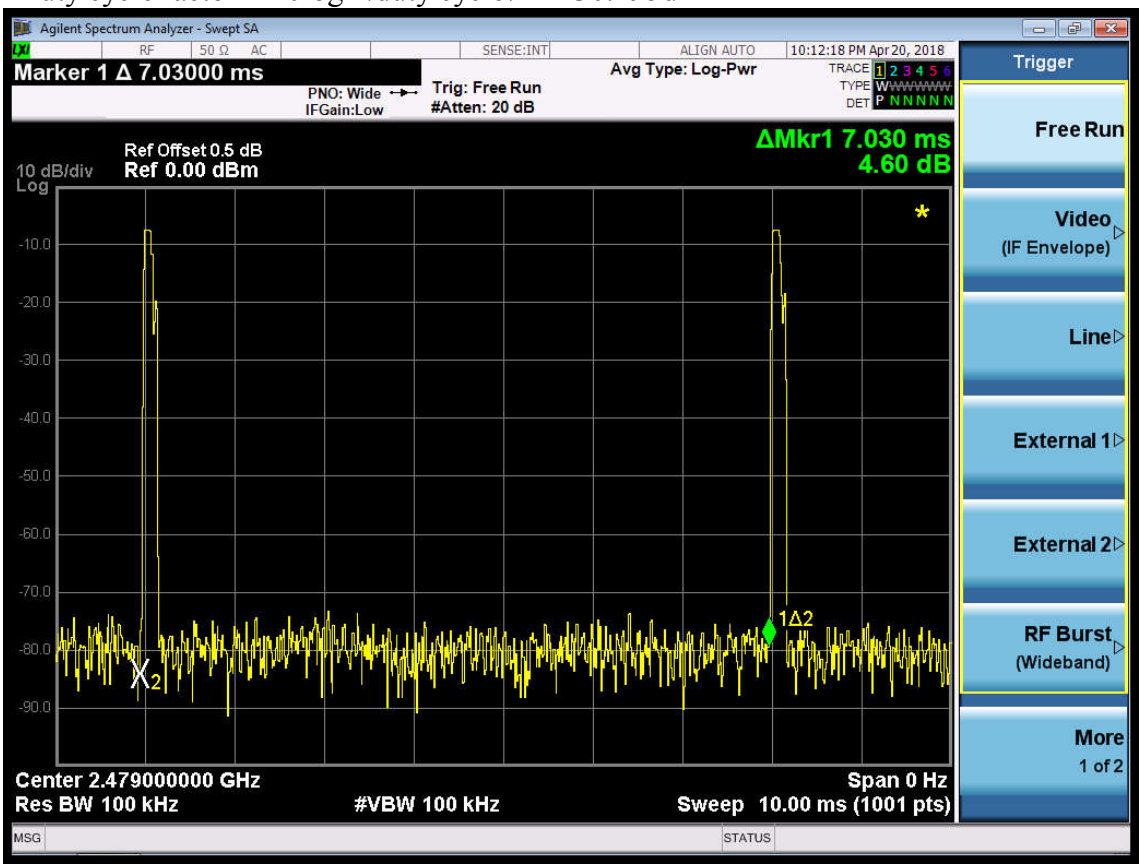
PASS.

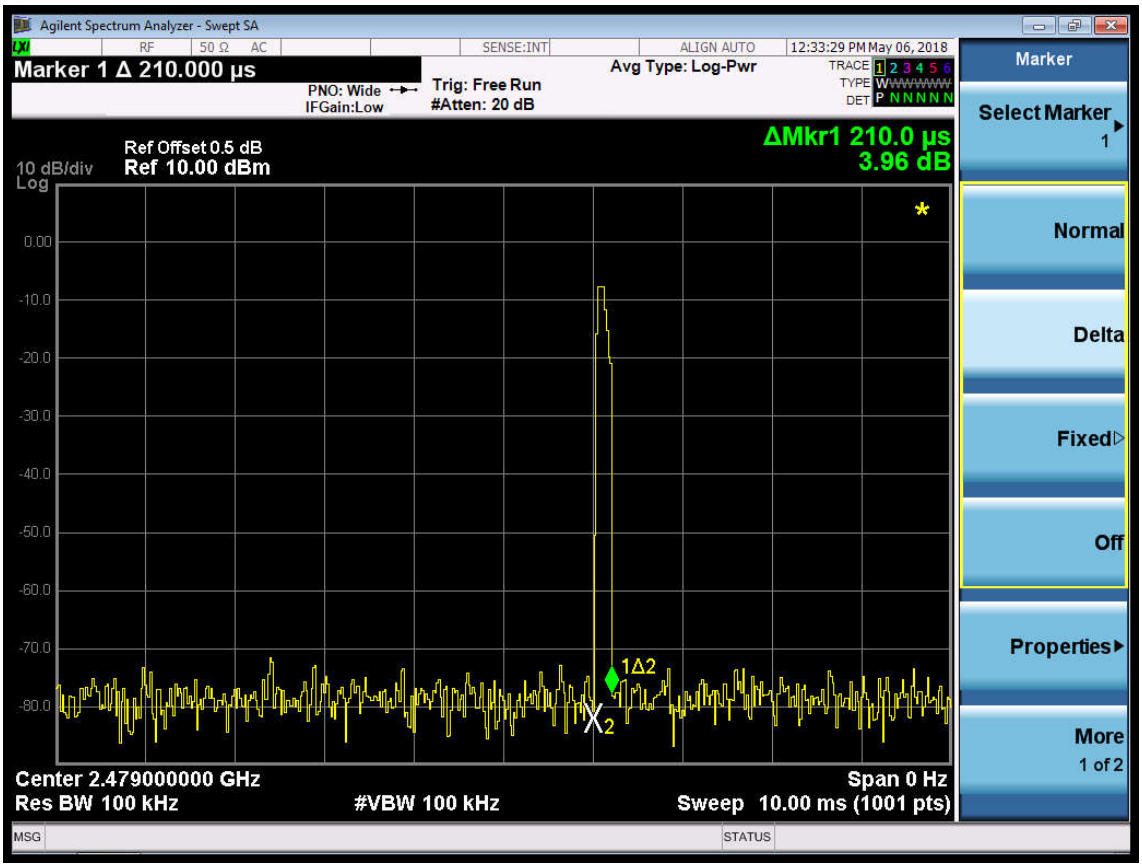
All the emissions from 30MHz to 25GHz were comply with the 15.209 Limit.

Note 1:The duty cycle factor for calculate average level is -30.495dB, and average limit is 20dB below peak limit, so if peak measured level comply with average limit, the average level was deemed to comply with average limit.

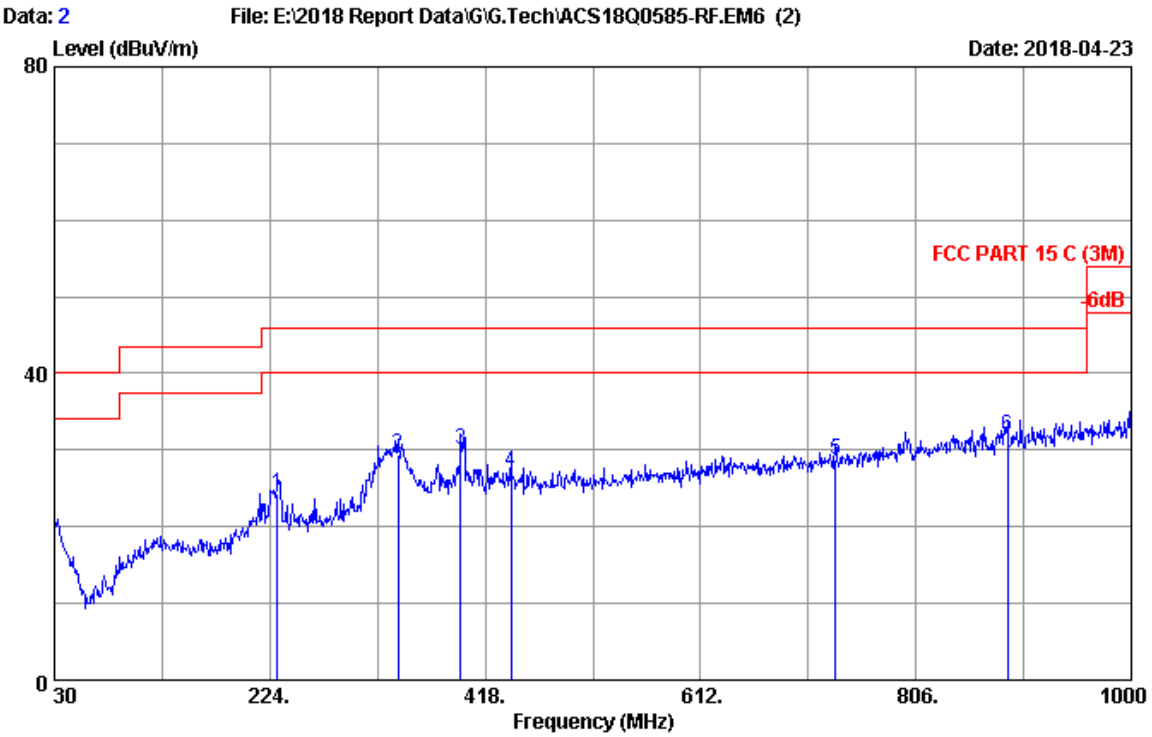
Note 2:The emissions (9kHz~30MHz) not reported for there is no emission be found.

Duty cycle factor = 20log（duty cycle）= -30.495dB





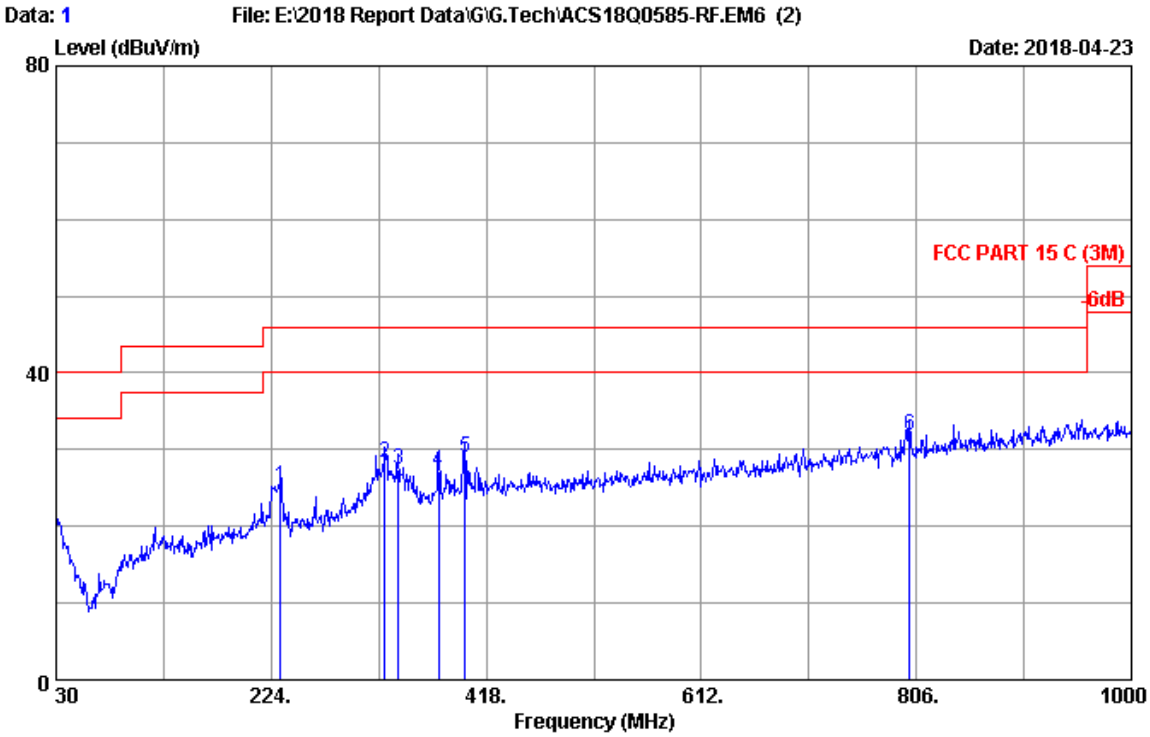
Frequency: 30MHz~1GHz



Site : 3m Chamber Data no. : 2
Dis. / Ant. : 3m 2017 CBL6112D 35375 Ant. pol. : HORIZONTAL
Limit : FCC PART 15 C (3M)
Env. / Ins. : 22.1*C/50% Engineer : Garry
EUT : 2.4GHz Wireless Receiver M/N:RO70
Power rating : DC 5V
Test Mode : TX

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	230.790	17.73	1.83	4.63	24.19	46.00	21.81	QP
2	339.430	21.05	2.50	5.85	29.40	46.00	16.60	QP
3	395.690	22.69	2.86	4.54	30.09	46.00	15.91	QP
4	441.280	23.42	3.01	0.70	27.13	46.00	18.87	QP
5	733.250	26.36	4.26	-1.91	28.71	46.00	17.29	QP
6	888.450	27.90	5.02	-1.01	31.91	46.00	14.09	QP

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

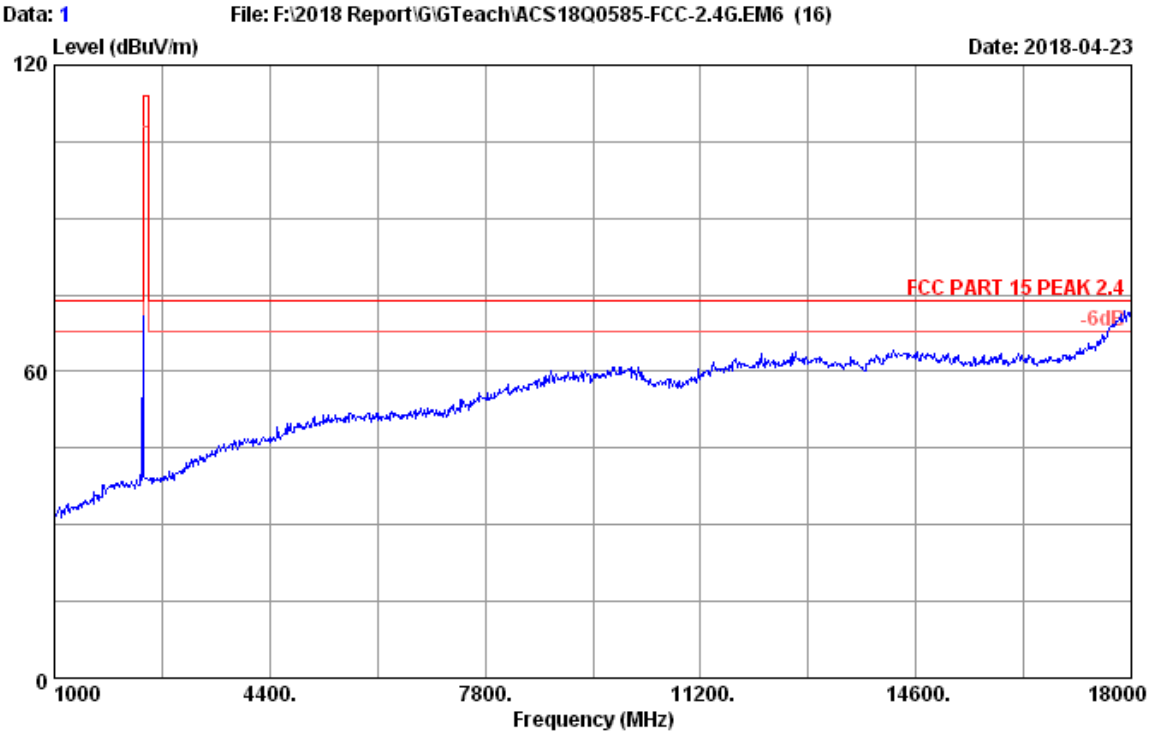


Site : 3m Chamber Data no. : 1
Dis. / Ant. : 3m 2017 CBL6112D 35375 Ant. pol. : VERTICAL
Limit : FCC PART 15 C (3M)
Env. / Ins. : 22.1*C/50% Engineer : Garry
EUT : 2.4GHz Wireless Receiver M/N:R070
Power rating : DC 5V
Test Mode : TX

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	232.730	17.88	1.84	5.48	25.20	46.00	20.80	QP
2	326.820	20.69	2.42	5.10	28.21	46.00	17.79	QP
3	338.460	21.03	2.50	3.94	27.47	46.00	18.53	QP
4	375.320	22.10	2.73	2.34	27.17	46.00	18.83	QP
5	398.600	22.77	2.88	3.26	28.91	46.00	17.09	QP
6	800.180	27.10	4.51	0.23	31.84	46.00	14.16	QP

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

Frequency: 1GHz~18GHz




```
Site no.      : 3m Chamber                    Data no.   : 1
Dis. / Ant.   : 3m   2017 3115(4580)          Ant. pol.  : HORIZONTAL
Limit         : FCC PART 15 PEAK 2.4
Env. / Ins.   : 22.6*C/57%                    Engineer   : Garry
EUT           : 2.4GHz Wireless Receiver  M/N:R070
Power rating  : DC 5V
Test Mode     : 2403MHz  Tx  Mode
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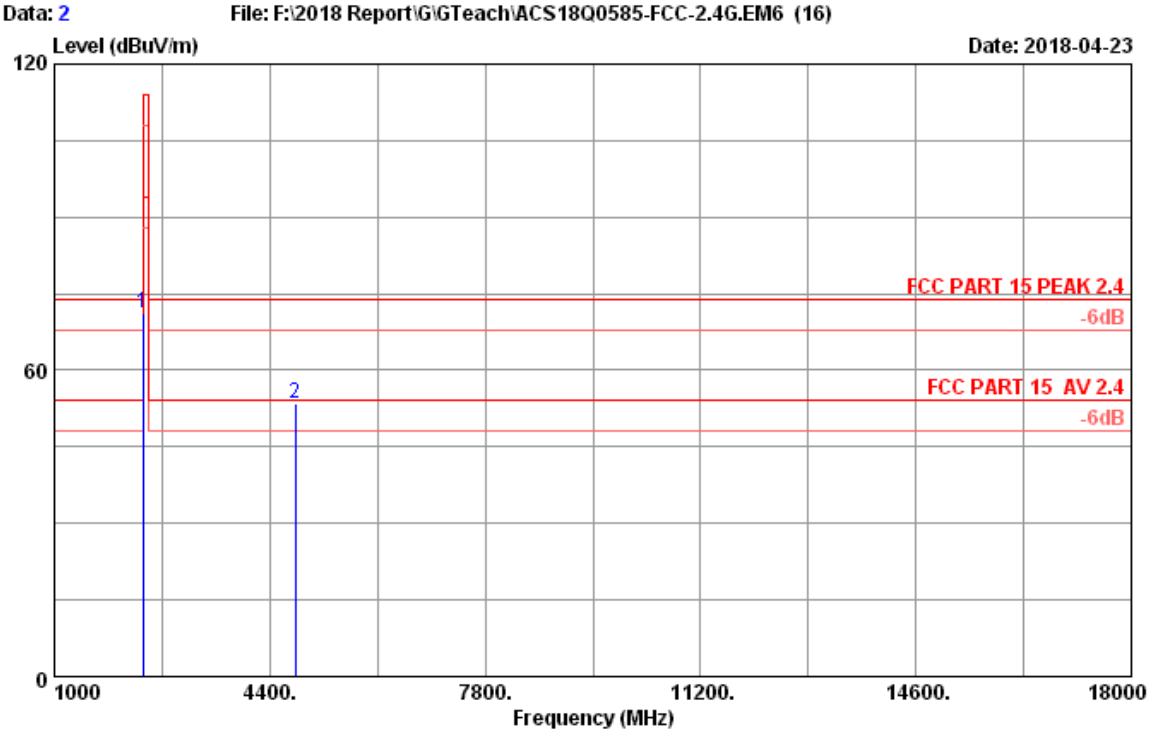
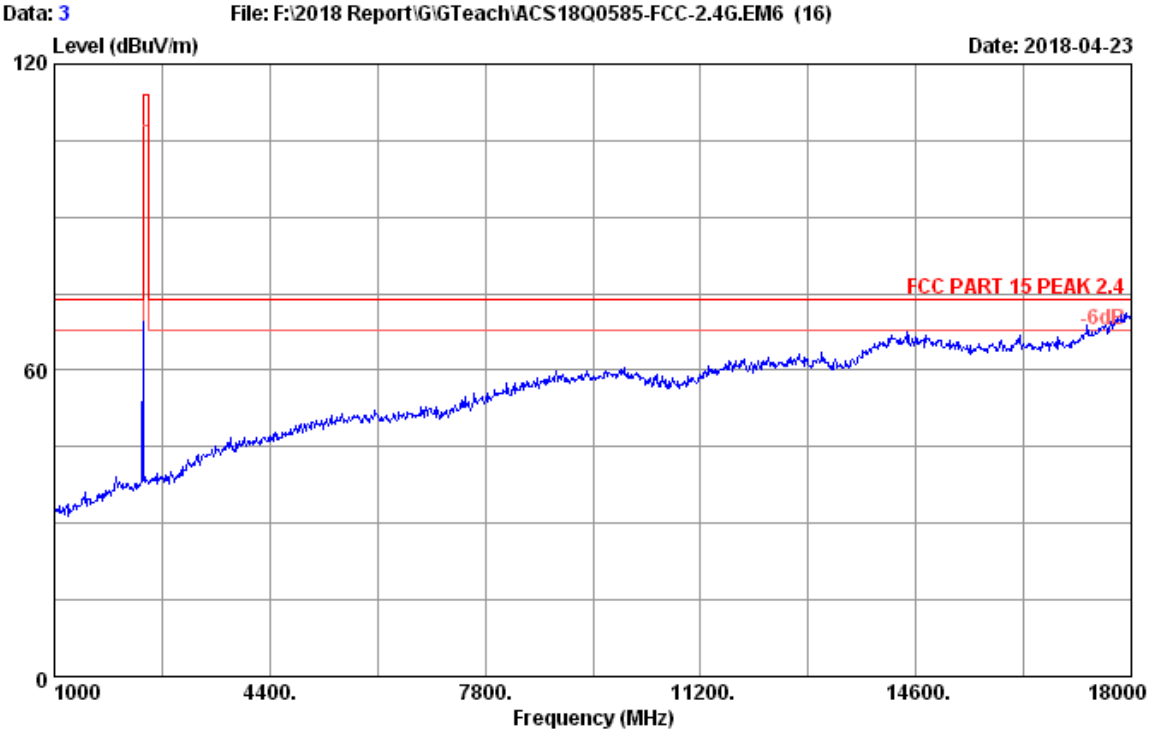


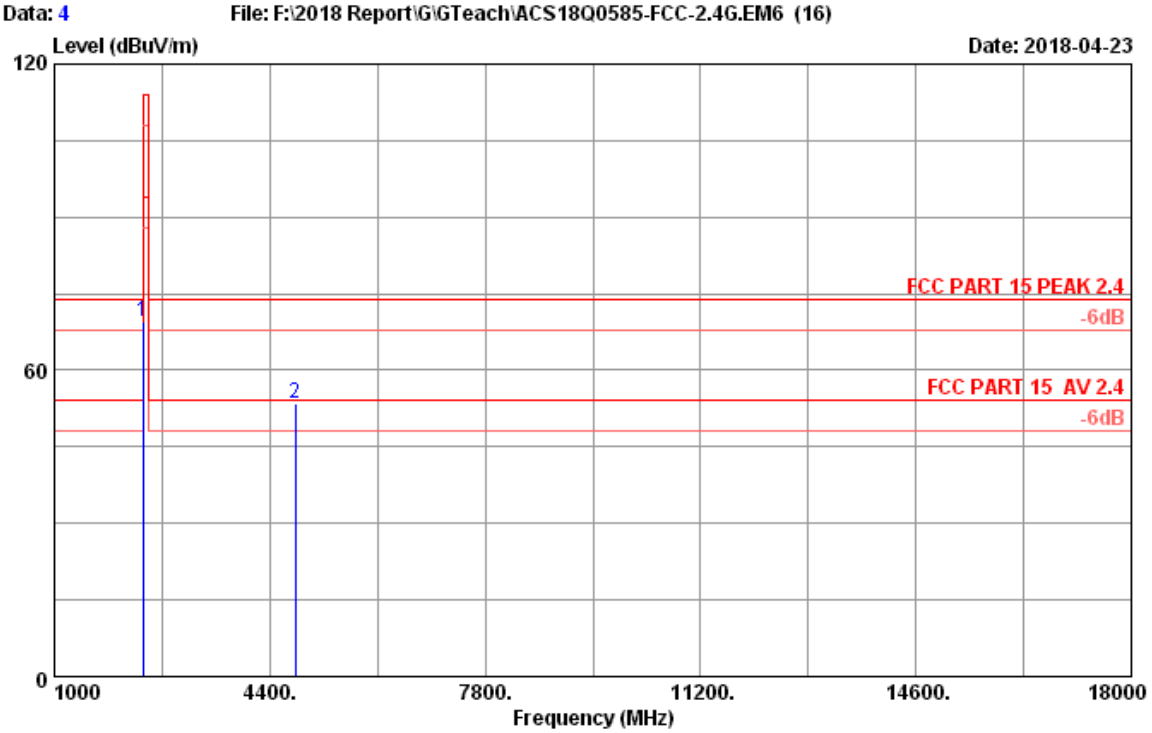
Site no. : 3m Chamber Data no. : 2
Dis. / Ant. : 3m 2017 3115(4580) Ant. pol. : HORIZONTAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : 22.6*C/57% Engineer : Garry
EUT : 2.4GHz Wireless Receiver M/N:R070
Power rating : DC 5V
Test Mode : 2403MHz Tx Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2403.00	27.87	10.30	68.53	35.61	71.09	114.00	42.91	Peak
2	4806.00	32.62	14.52	40.07	33.82	53.39	74.00	20.61	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp factor.
2. The emission levels that are 20dB below the official limit are not reported.



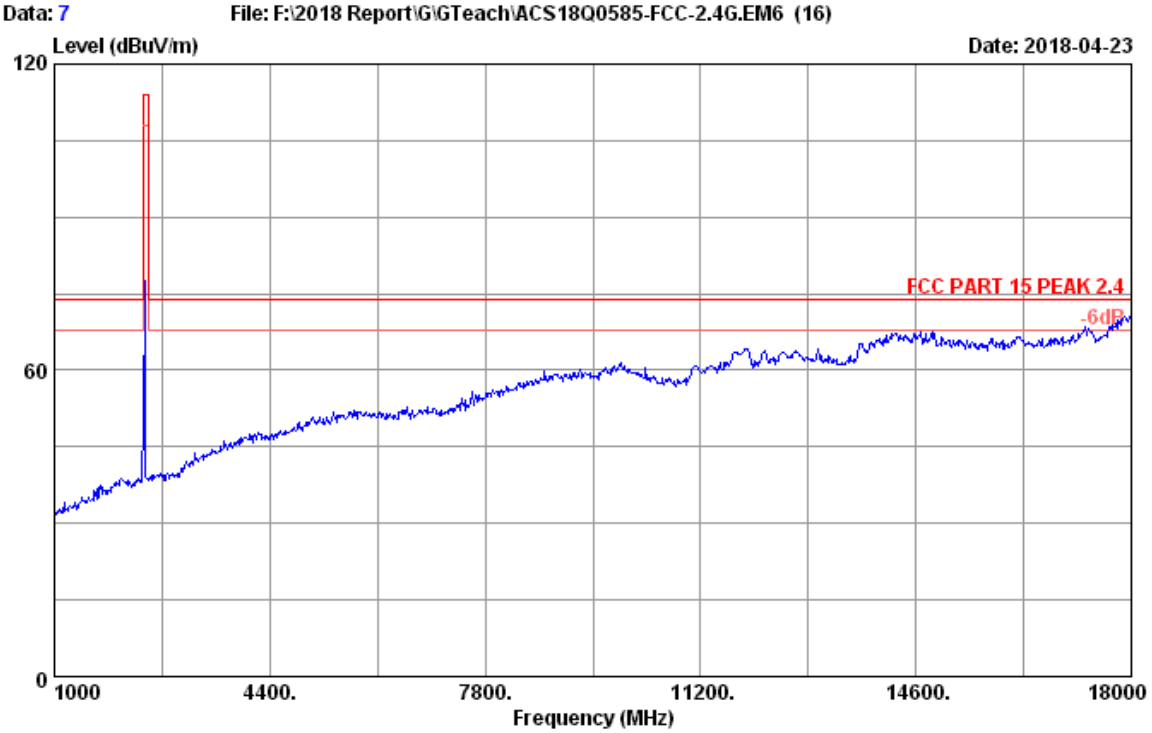

```
Site no.      : 3m Chamber                  Data no.   : 3
Dis. / Ant.   : 3m   2017 3115(4580)        Ant. pol.  : VERTICAL
Limit         : FCC PART 15 PEAK 2.4
Env. / Ins.   : 22.6*C/57%                  Engineer   : Garry
EUT           : 2.4GHz Wireless Receiver  M/N:R070
Power rating  : DC 5V
Test Mode     : 2403MHz  Tx  Mode
```



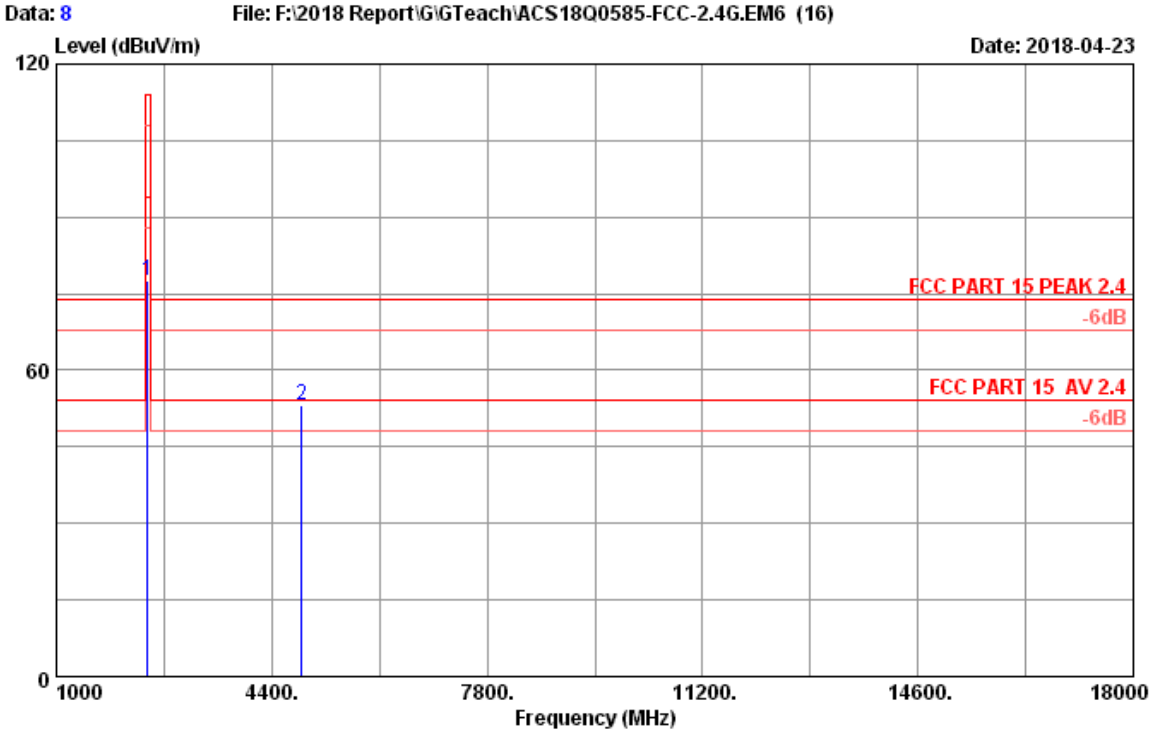
Site no. : 3m Chamber Data no. : 4
Dis. / Ant. : 3m 2017 3115(4580) Ant. pol. : VERTICAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : 22.6*C/57% Engineer : Garry
EUT : 2.4GHz Wireless Receiver M/N:R070
Power rating : DC 5V
Test Mode : 2403MHz Tx Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2403.00	27.87	10.30	67.12	35.61	69.68	114.00	44.32	Peak
2	4806.00	32.62	14.52	40.13	33.82	53.45	74.00	20.55	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp factor.
2. The emission levels that are 20dB below the official limit are not reported.



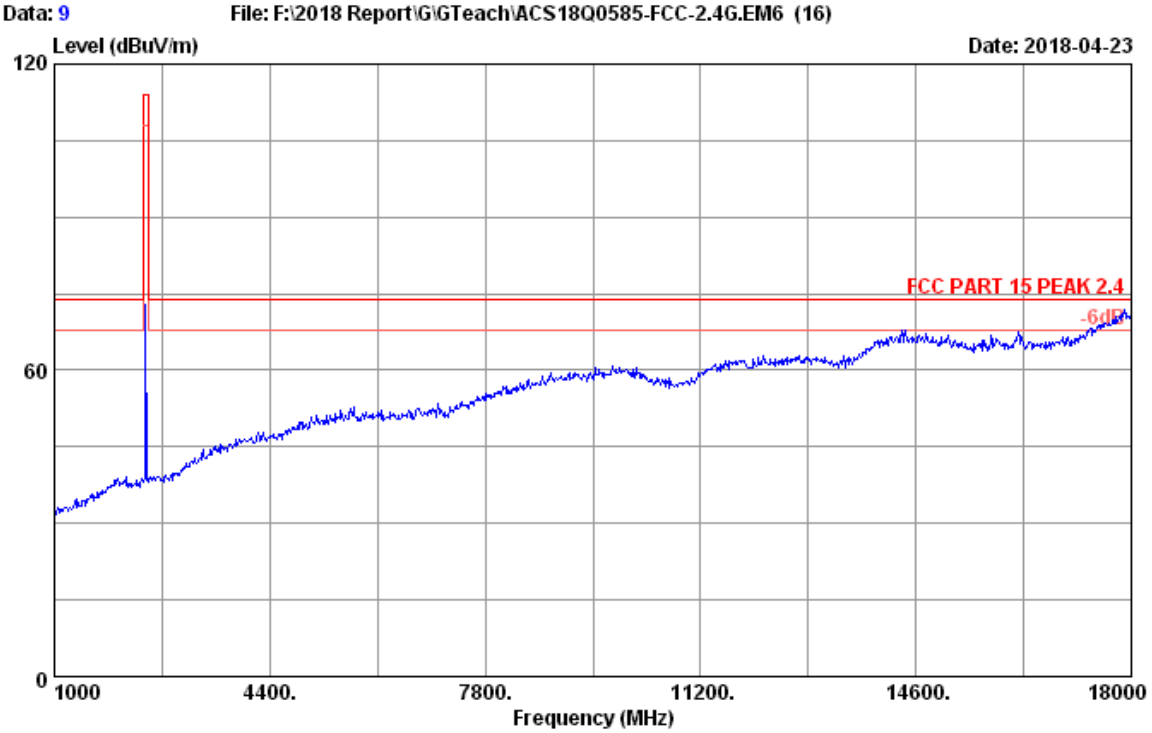
Site no. : 3m Chamber Data no. : 7
Dis. / Ant. : 3m 2017 3115(4580) Ant. pol. : HORIZONTAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : 22.6*C/57% Engineer : Garry
EUT : 2.4GHz Wireless Receiver M/N:R070
Power rating : DC 5V
Test Mode : 2439MHz Tx Mode



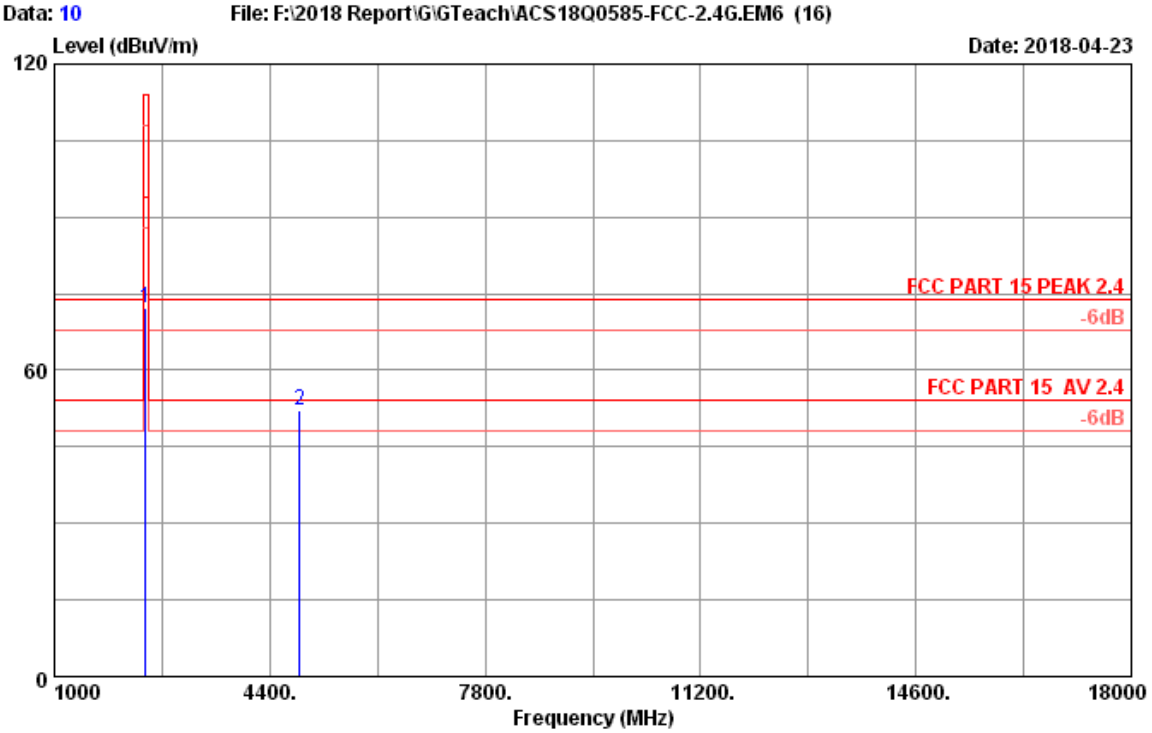
Site no. : 3m Chamber Data no. : 8
Dis. / Ant. : 3m 2017 3115(4580) Ant. pol. : HORIZONTAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : 22.6*C/57% Engineer : Garry
EUT : 2.4GHz Wireless Receiver M/N:R070
Power rating : DC 5V
Test Mode : 2439MHz Tx Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2439.00	28.04	10.37	74.80	35.64	77.57	114.00	36.43	Peak
2	4878.00	32.76	14.62	39.67	33.75	53.30	74.00	20.70	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp factor.
2. The emission levels that are 20dB below the official limit are not reported.



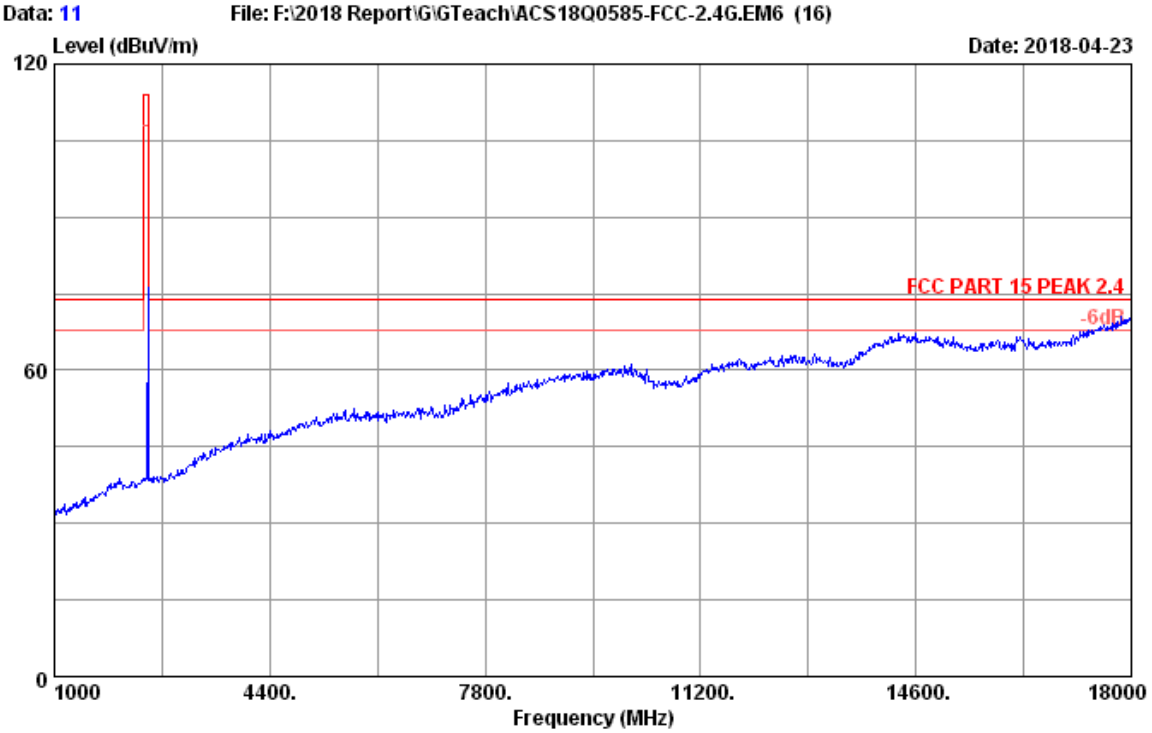

```
Site no.      : 3m Chamber                  Data no.   : 9
Dis. / Ant.   : 3m   2017 3115(4580)        Ant. pol.  : VERTICAL
Limit         : FCC PART 15 PEAK 2.4
Env. / Ins.   : 22.6*C/57%                  Engineer   : Garry
EUT           : 2.4GHz Wireless Receiver  M/N:R070
Power rating  : DC 5V
Test Mode     : 2439MHz  Tx  Mode
```



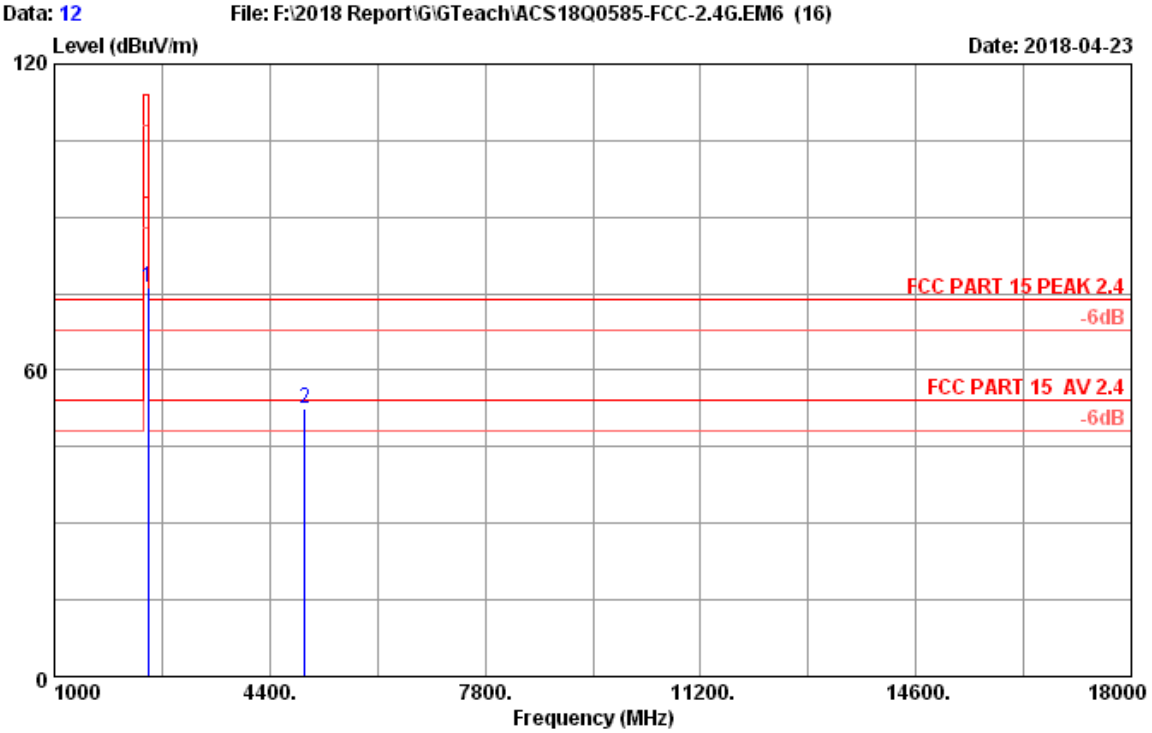
Site no. : 3m Chamber Data no. : 10
Dis. / Ant. : 3m 2017 3115(4580) Ant. pol. : VERTICAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : 22.6*C/57% Engineer : Garry
EUT : 2.4GHz Wireless Receiver M/N:R070
Power rating : DC 5V
Test Mode : 2439MHz Tx Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2439.00	28.04	10.37	69.48	35.64	72.25	114.00	41.75	Peak
2	4878.00	32.76	14.62	38.53	33.75	52.16	74.00	21.84	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp factor.
2. The emission levels that are 20dB below the official limit are not reported.



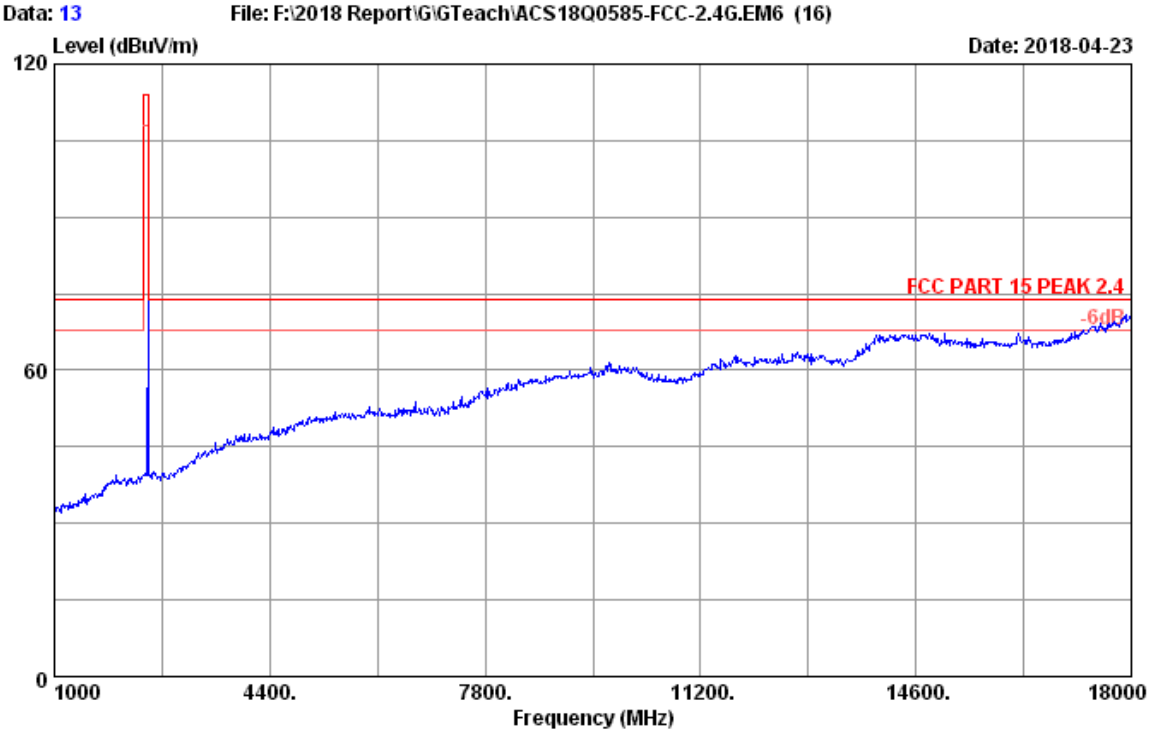
Site no. : 3m Chamber Data no. : 11
Dis. / Ant. : 3m 2017 3115(4580) Ant. pol. : HORIZONTAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : 22.6*C/57% Engineer : Garry
EUT : 2.4GHz Wireless Receiver M/N:R070
Power rating : DC 5V
Test Mode : 2479MHz Tx Mode



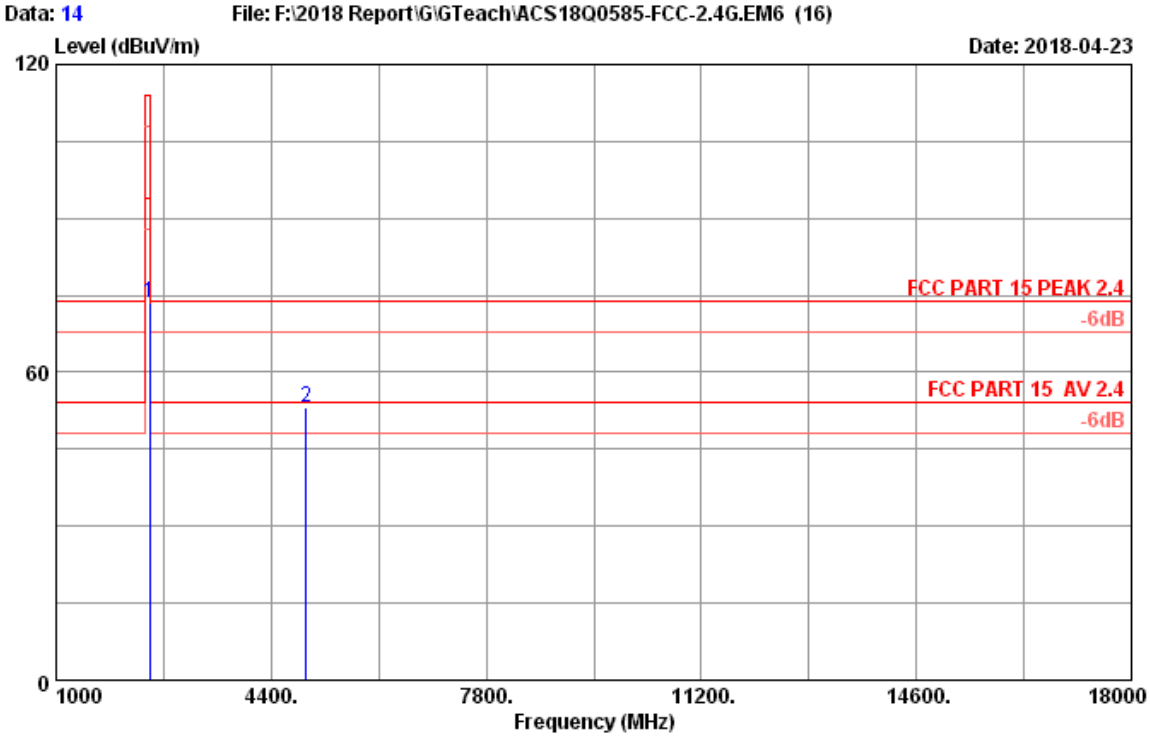
Site no. : 3m Chamber Data no. : 12
Dis. / Ant. : 3m 2017 3115(4580) Ant. pol. : HORIZONTAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : 22.6*C/57% Engineer : Garry
EUT : 2.4GHz Wireless Receiver M/N:R070
Power rating : DC 5V
Test Mode : 2479MHz Tx Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2479.00	28.21	10.45	73.13	35.71	76.08	114.00	37.92	Peak
2	4958.00	32.93	14.73	38.58	33.69	52.55	74.00	21.45	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp factor.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 3m Chamber Data no. : 13
Dis. / Ant. : 3m 2017 3115(4580) Ant. pol. : VERTICAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : 22.6*C/57% Engineer : Garry
EUT : 2.4GHz Wireless Receiver M/N:R070
Power rating : DC 5V
Test Mode : 2479MHz Tx Mode



Site no. : 3m Chamber Data no. : 14
Dis. / Ant. : 3m 2017 3115(4580) Ant. pol. : VERTICAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : 22.6*C/57% Engineer : Garry
EUT : 2.4GHz Wireless Receiver M/N:RO70
Power rating : DC 5V
Test Mode : 2479MHz Tx Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2479.00	28.21	10.45	70.45	35.71	73.40	114.00	40.60	Peak
2	4958.00	32.93	14.73	39.25	33.69	53.22	74.00	20.78	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp factor.
2. The emission levels that are 20dB below the official limit are not reported.

5. 20 DB BANDWIDTH TEST

5.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	Agilent	N9010A	MY52220804	Oct.14,17	1Year
2.	Attenuator(20dB)	Agilent	8491B	MY39262165	Oct.14,17	1 Year
3.	RF Cable	Marvelous Microwave Inc	SFL402105FLEX	NO.1	Oct.15,17	1 Year

5.2. Limit

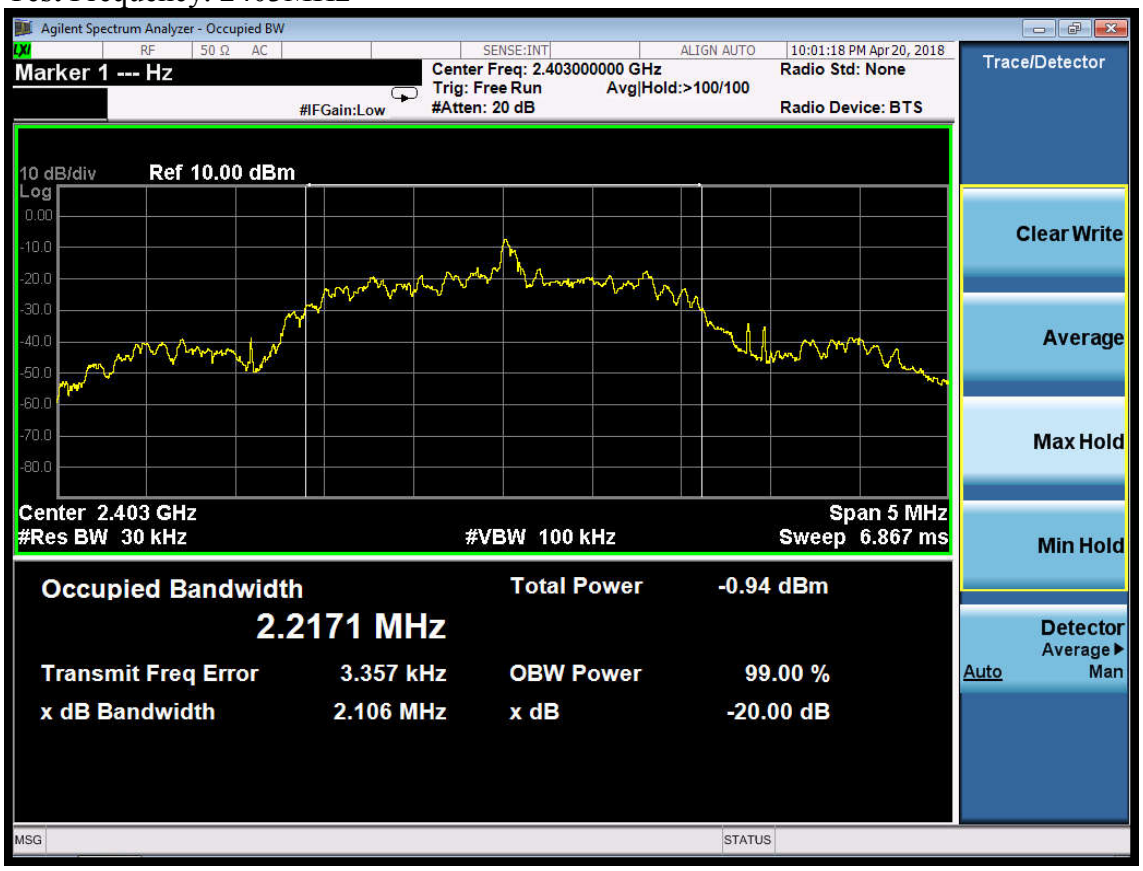
Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

5.3. Test Results

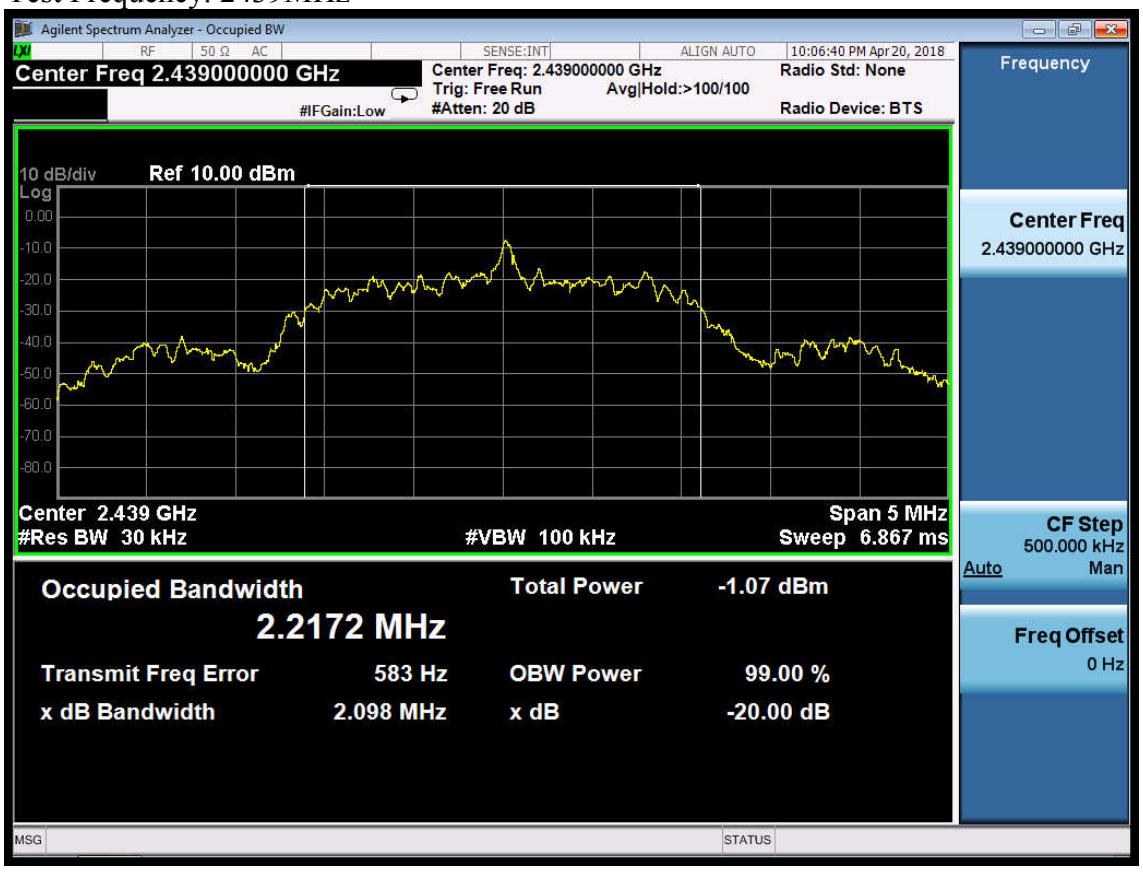
EUT: 2.4G Wireless Receiver		
M/N: R070		
Test date: 2018-04-20	Pressure: 103.2±1.0 kpa	Humidity: 53.1±3.0%
Tested by: Garry	Test site: RF site	Temperature:23.6±0.6 ℃

Voltage (V)	Frequency (MHz)	-20dB bandwidth (MHz)	Limit (KHz)
DC 5V	2403	2.106	N/A
	2439	2.098	N/A
	2479	2.049	N/A
Conclusion：PASS			

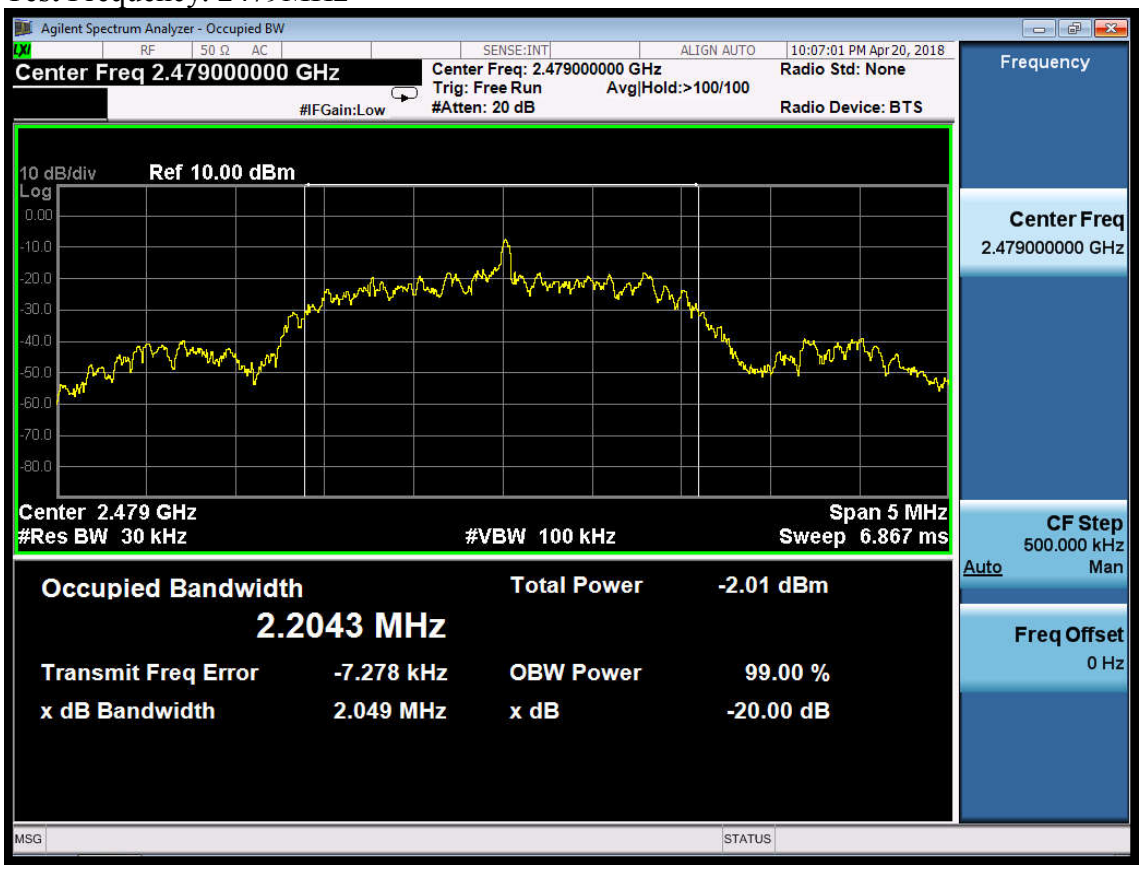
Test Frequency: 2403MHz



Test Frequency: 2439MHz



Test Frequency: 2479MHz



6. BAND EDGE COMPLIANCE TEST

6.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Preamplifier	Agilent	8449B	3008A02495	Apr.23,18	1 Year
2.	Horn Antenna	ETC	MCTD 1209	DRH15F03006	May.15,17	1 Year
3.	RF Cable	Hubersuhner	SUCOFLEX106	505239/6	Apr.23.18	1 Year

6.2. Limit

All the lower and upper band-edges emissions appearing within 2310MHz to 2390MHz and 2483.5MHz to 2500MHz restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions outside operation frequency band 2400MHz to 2483.5MHz shall be at least 50dB below the fundamental emissions, or comply with 15.209 limits.

6.3. Test Produce

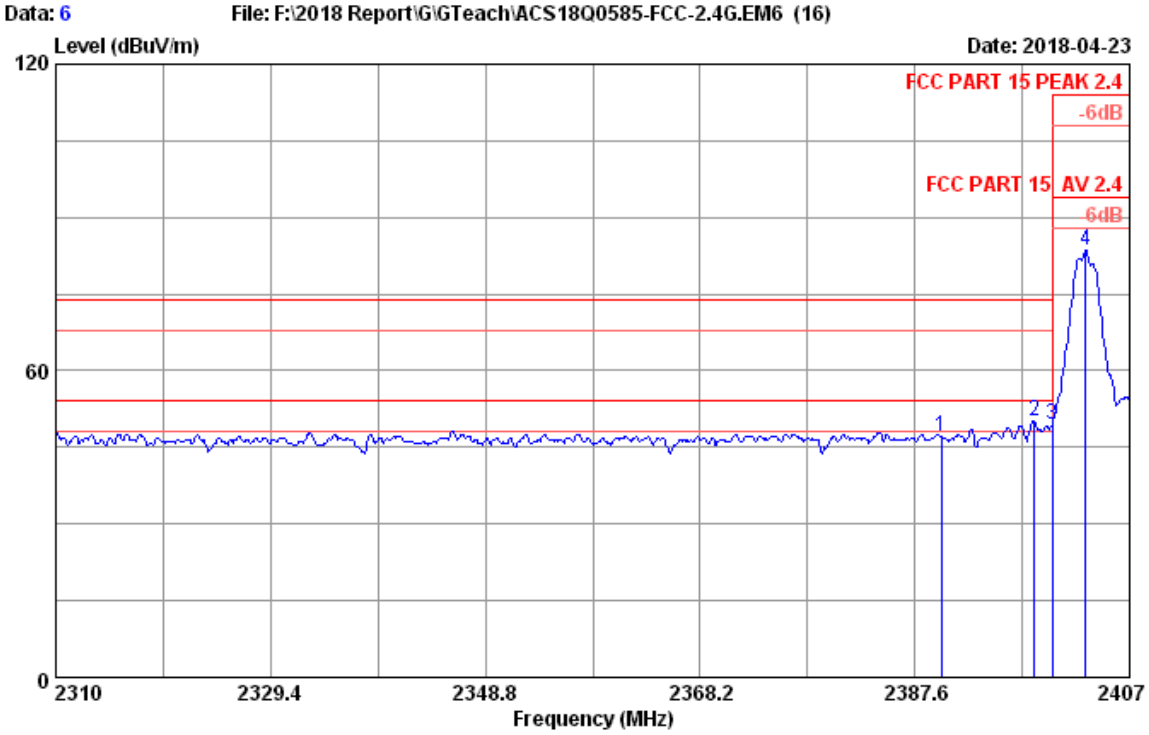
1. The EUT is placed on a turntable, which is 1.5m above the ground plane and worked at highest radiated power.
2. The turntable was rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
4. Set the spectrum analyzer in the following setting in order to capture the lower and upperband-edges of the emission:
   (a) PEAK: RBW=1MHz ;VBW=3MHz, PK detector, Sweep=AUTO
   (b)This device is pulse modulated, a duty cycle factor was used to calculate average level based measured peak level

6.4. Test Results

Pass (The testing data was attached in the next pages.)

Note: If the PK measured levels comply with average limit, then the average level were deemed to comply with average limit.

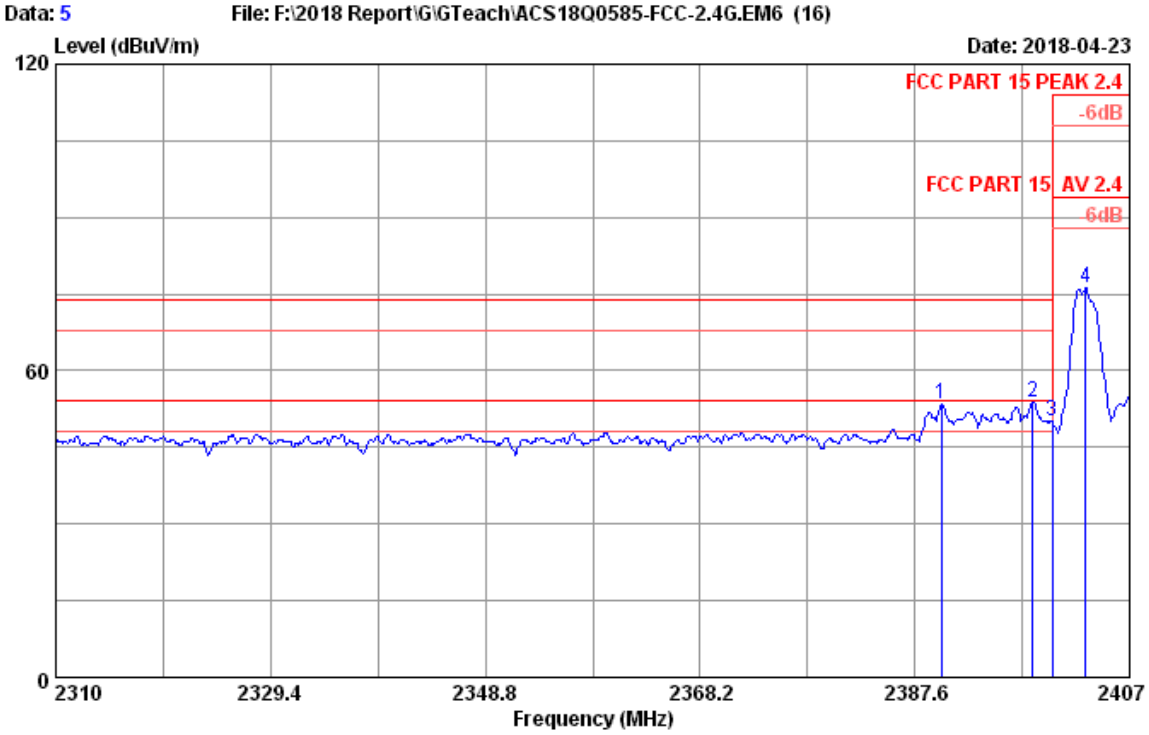
Note: The duty cycle factor for calculate average level is -30.495dB, and average limit is 50dB below peak limit, so if peak measured level comply with average limit, the average level was deemed to comply with average limit.



Site no. : 3m Chamber Data no. : 6
Dis. / Ant. : 3m 2017 3115(4580) Ant. pol. : HORIZONTAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : 22.6*C/57% Engineer : Garry
EUT : 2.4GHz Wireless Receiver M/N:RO70
Power rating : DC 5V
Test Mode : 2403MHz Tx Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2390.00	27.79	10.26	44.60	35.61	47.04	74.00	26.96	Peak
2	2398.37	27.79	10.30	47.60	35.61	50.08	74.00	23.92	Peak
3	2400.00	27.79	10.30	47.16	35.61	49.64	74.00	24.36	Peak
4	2403.02	27.87	10.30	80.91	35.61	83.47	114.00	30.53	Peak

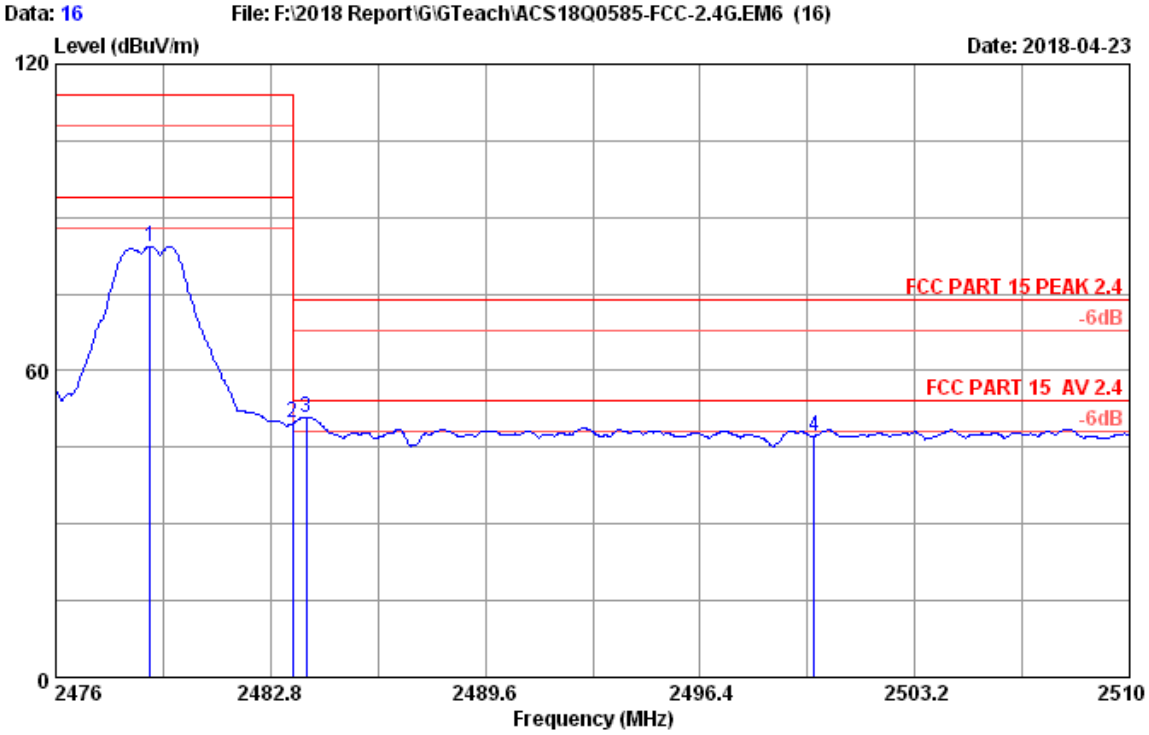
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp factor.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 3m Chamber Data no. : 5
Dis. / Ant. : 3m 2017 3115(4580) Ant. pol. : VERTICAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : 22.6*C/57% Engineer : Garry
EUT : 2.4GHz Wireless Receiver M/N:RO70
Power rating : DC 5V
Test Mode : 2403MHz Tx Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2390.00	27.79	10.26	50.89	35.61	53.33	74.00	20.67	Peak
2	2398.27	27.79	10.30	51.47	35.61	53.95	74.00	20.05	Peak
3	2400.00	27.79	10.30	47.71	35.61	50.19	74.00	23.81	Peak
4	2403.02	27.87	10.30	73.67	35.61	76.23	114.00	37.77	Peak

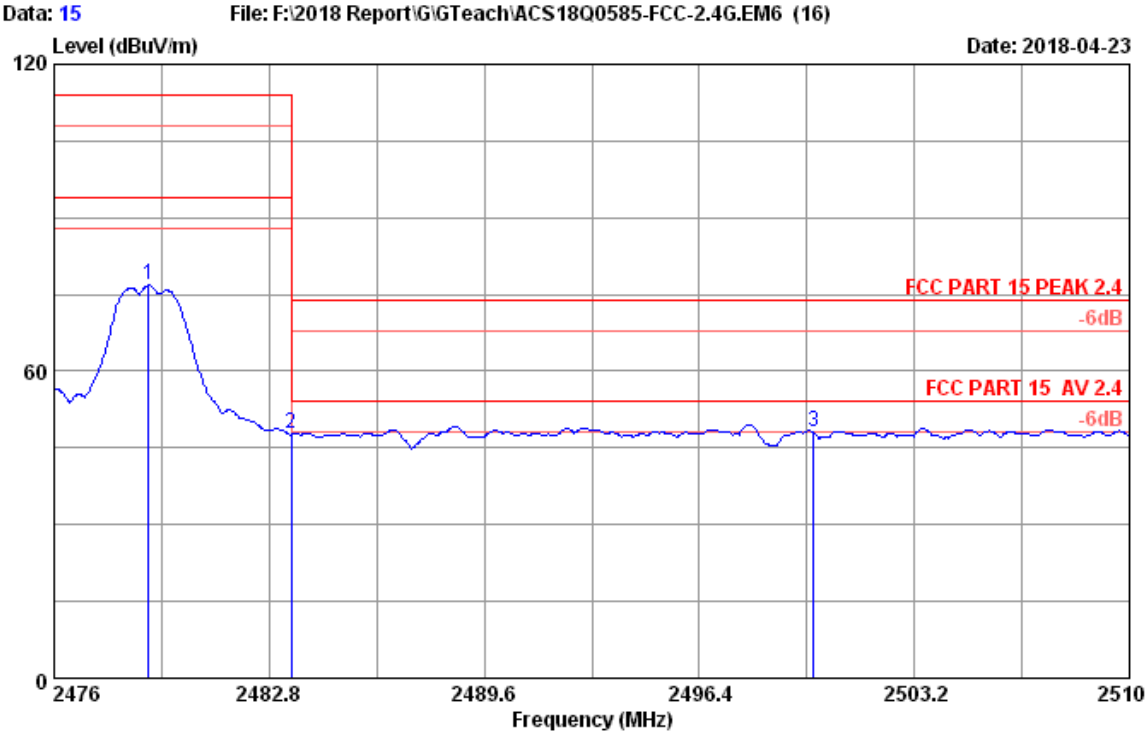
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp factor.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 3m Chamber Data no. : 16
Dis. / Ant. : 3m 2017 3115(4580) Ant. pol. : HORIZONTAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : 22.6*C/57% Engineer : Garry
EUT : 2.4GHz Wireless Receiver M/N:RO70
Power rating : DC 5V
Test Mode : 2479MHz Tx Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2478.99	28.21	10.45	81.39	35.71	84.34	114.00	29.66	Peak
2	2483.50	28.21	10.48	46.82	35.71	49.80	74.00	24.20	Peak
3	2483.92	28.21	10.48	47.97	35.71	50.95	74.00	23.05	Peak
4	2500.00	28.30	10.48	43.97	35.74	47.01	74.00	26.99	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp factor.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 3m Chamber Data no. : 15
Dis. / Ant. : 3m 2017 3115(4580) Ant. pol. : VERTICAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : 22.6*C/57% Engineer : Garry
EUT : 2.4GHz Wireless Receiver M/N:R070
Power rating : DC 5V
Test Mode : 2479MHz Tx Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2478.99	28.21	10.45	73.81	35.71	76.76	114.00	37.24	Peak
2	2483.50	28.21	10.48	44.73	35.71	47.71	74.00	26.29	Peak
3	2500.00	28.30	10.48	44.96	35.74	48.00	74.00	26.00	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp factor.
2. The emission levels that are 20dB below the official limit are not reported.

7. ANTENNA REQUIREMENT

RESULT : PASS

Test Date : Apr.20~23,2018

Test standard : FCC Part 15.203

Limit : 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

According to the manufacturer declared, the EUT has an Internal Antenna, the directional gain of antenna is -2.268dBi, and the antenna connector is designed with permanent attachment and no consideration of replacement. Therefore the EUT is considered sufficient to comply the provision.

8. RADIO FRREQUENCY EXPOSURE COMPLIANCE

RESULT : PASS

Test standard : FCC KDB Publication 447498 D01 V06

Since maximum peak output power of the transmitter is<10mW, i.e.0.000003284568mW<10mW, hence the EUT is excluded from SAR evaluation according to FCC KDB Publication 447498 D01: General RF Exposure Guidance V05.

9. DEVIATION TO TEST SPECIFICATIONS

[NONE]