

FCC 15.247 & RSS-247 2.4GHz Test Report

for

FUTABA Corporation

**1080 YabutsukaChosei-son Chosei-gun
Chiba, 299-4395 Japan.**

Brand : Futaba
Product Name : Radio Control Module
Model Name : FEX02TB
FCC ID : AZP-FEX02T
IC : 2914D-FEX02T

**Prepared by: : AUDIX Technology Corporation,
EMC Department**



The test report is based on a single evaluation of one sample of the above-mentioned products. It does not imply an assessment of the whole production and does not permit the use of the test lab logo.
The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the U.S. Government.

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TEST REPORT

Applicant : FUTABA Corporation
Manufacture : FUTABA Corporation
EUT Description
(1) Product : Radio Control Module
(2) Model : FEX02TB
(3) Brand : Futaba
(4) Power Rating : DC 3.8~8.5V

Applicable Standards:

47 CFR FCC Part 15 Subpart C
RSS-Gen (Issue 5), April 2018
RSS-247 (Issue 2), February 2017
ANSI C63.10:2013

Audix Technology Corp. tested the equipment mentioned in accordance with the requirements set forth in the above standards. Test results indicate that the equipment tested is capable of demonstrating compliance with the requirements as documented within this report.

Audix Technology Corp. does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens and samples.

Date of Report: 2020. 05. 18

Reviewed by:



(Tina Huang/Section Manager)

Approved by:



(Johnny Hsueh/Section Manager)



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1. REVISION RECORD OF TEST REPORT

Edition No	Issued Data	Revision Summary	Report Number
0	2020. 05. 18	Original Report.	EM-F200207

2. SUMMARY OF TEST RESULTS

Rule		Description	Results
FCC	IC		
15.207	RSS-Gen §8.8	Conducted Emission	PASS
15.247(d)/15.205	RSS-Gen §8.9 RSS-247 §5.5	Radiated Band Edge and Radiated Spurious Emission	PASS
15.247(a)(1)	RSS-247 §5.1(2)	20dB Bandwidth	PASS
15.247(a)(1)	RSS-247 §5.1(2)	Carrier Frequency Separation	PASS
15.247(a)(1)(iii)	RSS-247 §5.1(4)	Time of Occupancy	PASS
15.247(a)(1)(iii)	RSS-247 §5.1(4)	Number of Hopping Channels	PASS
15.247(b)(1)	RSS-247 §5.1(2)	Maximum Peak Output Power	PASS
15.247(d)	RSS-247 §5.5	Conducted Band Edges and Conducted Spurious Emission	PASS
15.203	RSS-Gen §6.8	Antenna Requirement	Compliance

Note: The uncertainties value is not used in determining the result.

3. GENERAL INFORMATION

3.1. Description of Application

Applicant	FUTABA Corporation 1080 Yabutsuka Chosei-mura Chosei-gun Chiba-ken, 299-4395 Japan.
Manufacturer	FUTABA Corporation 1080 Yabutsuka Chosei-mura Chosei-gun Chiba-ken, 299-4395 Japan.
Product	Radio Control Module
Model	FEX02TB
Brand	Futaba

3.2. Description of Application

Test Model	FEX02TB
Serial Number	N/A
Power Rating	DC 3.8 ~ 8.5V
Firmware Version	N/A
RF Features	FHSS
Transmit Type	1T1R
Sample Status	Mass production
Date of Receipt	2019. 12. 11
Date of Test	2020. 02. 10 ~ 05. 15
Interface Ports of EUT	None
Accessories Supplied	Antenna x4 (Please refer to section 3.3)

3.3. Antenna Information

No.	Antenna Model	Manufacture	Antenna Type	Connector Type	Frequency (GHz)	Max Gain
1	ANT-2.4-CW-RH-RPS	Linx	Omni-directional (1/4 Wave Antenna)	RP-SMA	2.39-2.49	-0.9dBi
2	ANT-2.4-WRT-RPS	Linx	Omni-directional (1/2 Wave Antenna)	RP-SMA	2.4-2.5	3.5dBi
3	TNHW 2450 RP	CHILDS Antenna Company	Omni-directional (1/2 Wave Antenna)	TNC reverse	2.4-2.5	2.4dBi
4	ANTB24-073A0	SANSET Electric Co., Ltd.	Omni-directional	MHF(I-PEX)	2.4-2.484	2.14dBi

3.4. EUT Specifications Assessed in Current Report

Fundamental Range (MHz)	Channel Number	Modulation	Data Rate (kbps)
2407.500 to 2467.500	31	FHSS	128.143

Channel List			
Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)
1	2407.5	17	2439.5
2	2409.5	18	2441.5
3	2411.5	19	2443.5
4	2413.5	20	2445.5
5	2415.5	21	2447.5
6	2417.5	22	2449.5
7	2419.5	23	2451.5
8	2421.5	24	2453.5
9	2423.5	25	2455.5
10	2425.5	26	2457.5
11	2427.5	27	2459.5
12	2429.5	28	2461.5
13	2431.5	29	2463.5
14	2433.5	30	2465.5
15	2435.5	31	2467.5
16	2437.5		

3.5. Test Configuration

Modulation	T _{on} (ms)	Duty Cycle Correction Factor (dB)
FHSS	4.38	-27.17

Note: Duty Cycle Correction Factor (DCCF) = 20log (TX_{on}/100ms)

Item		Test Voltage	Modulation	Test Channel
Radiated Test Case	Radiated Band Edge ^{Note1}	DC 5V ^{Note 2} (Via DC Power Supply)	FHSS	1/31
	Radiated Spurious Emission ^{Note1}		FHSS	1/16/31
Conducted Test Case	20dB Bandwidth		FHSS	1/16/31
	Carrier Frequency Separation		FHSS	1/16/31
	Time of Occupancy		FHSS	1/16/31
	Number of Hopping Channels		FHSS	1/16/31
	Maximum Peak Output Power		FHSS	1/16/31
	Band Edges		FHSS	1/31
	Spurious Emission		FHSS	1/16/31

Note 1: Mobile Device

Portable Device, and 3 axis were assessed. The worst scenario for Radiated Spurious Emission as follow: Lie Side Stand

Note 2: The test voltage was selected based on preliminary testing with test voltage (DC 3.8V, 5V or 8.5V), the test voltage DC 5V is the worst case for output power.

3.6. Tested Supporting System List

3.6.1. Support Peripheral Unit

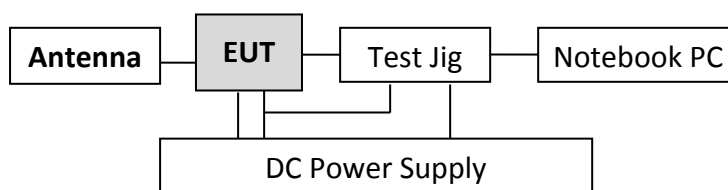
No.	Product	Brand	Model No.	Serial No.	Approval
1.	Notebook PC	ASUS	X402C	N/A	Contains FCC ID: VQF-RT3290 Contains IC: 7542A-RT3290
2.	Test Jig	N/A	N/A	N/A	N/A
3.	DC Power Supply	TOP WARD	3303A	721773	N/A

3.6.2. Cable Lists

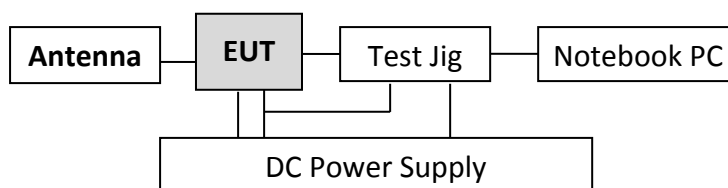
No.	Cable Description Of The Above Support Units
1.	RS232 to USB Cable : Shielded, Detachable, 1.0 Adapter: ASUS, M/N ADP-650W A DC Cord : Unshielded, Undetachable, 1.8m AC Power Cord: Unshielded, Detachable, 1.8m
2.	Power Wire: Unshielded, Detachable, 0.05m*2 Power Wire (1 to 2): Unshielded, Detachable, 0.05m
3.	DC Power Cord*2: Unshielded, Detachable, 1.0m AC Power Cord: Unshielded, Undetachable, 1.8m

3.7. Setup Configuration

3.7.1. EUT Configuration for Power Line and Radiated Emission



3.7.2. EUT Configuration for RF Conducted Test Items



3.8. Operating Condition of EUT

Test program “Futaba Term” is used for enabling EUT RF function under continues transmitting and choosing data rate/ channel.

3.9. Description of Test Facility

Name of Test Firm	Audix Technology Corporation / EMC Department No. 53-11, Dingfu, Linkou Dist., New Taipei City 244, Taiwan Tel: +886-2-26092133 Fax: +886-2-26099303 Website : www.audixtech.com Contact e-mail: attemc_report@audixtech.com
Accreditations	The laboratory is accredited by following organizations under ISO/IEC 17025:2017 (1) NVLAP(USA) NVLAP Lab Code 200077-0 (2) TAF(Taiwan) No. 1724
Test Facilities	FCC OET Designation Number under APEC MRA by NCC is : TW1724 ISED CAB Identifier Number under APEC TEL MRA by NCC is TW1724 (1) No.8 Shielded Room (2) No.1 3m Semi Anechoic Chamber (3) Fully Anechoic Chamber

3.10.Measurement Uncertainty

Test Items/Facilities		Frequency Range	Uncertainty	
Conduction Test		9kHz-150kHz	±3.7dB	
		150kHz-30MHz	±3.5dB	
Radiation Test	<input checked="" type="checkbox"/>	No.1 3m Semi Anechoic Chamber	30MHz-200MHz, 3m, Horizontal	±4.1dB
			200MHz-1000MHz, 3m, Horizontal	±3.9dB
			30MHz-200MHz, 3m, Vertical	±4.2dB
			200MHz-1000MHz, 3m, Vertical	±4.1dB
			1GHz-6GHz, 3m	±4.2dB
			6GHz-18GHz, 3m	±4.6dB
	<input type="checkbox"/>	No.3 3m Semi Anechoic Chamber	30MHz-200MHz, 3m, Horizontal	±3.9dB
			200MHz-1000MHz, 3m, Horizontal	±3.9dB
			30MHz-200MHz, 3m, Vertical	±4.4dB
			200MHz-1000MHz, 3m, Vertical	±4.1dB
	<input type="checkbox"/>	No.4 3m Semi Anechoic Chamber	30MHz-200MHz, 3m, Horizontal	±4.3dB
			200MHz-1000MHz, 3m, Horizontal	±4.0dB
			30MHz-200MHz, 3m, Vertical	±4.3dB
			200MHz-1000MHz, 3m, Vertical	±4.4dB
			1GHz-6GHz, 3m	±4.5dB
			6GHz-18GHz, 3m	±4.6dB
	<input type="checkbox"/>	No.5 3m Semi Anechoic Chamber	30MHz-200MHz, 3m, Horizontal	±4.0dB
			200MHz-1000MHz, 3m, Horizontal	±3.9dB
			30MHz-200MHz, 3m, Vertical	±4.2dB
			200MHz-1000MHz, 3m, Vertical	±4.3dB
			1GHz-6GHz, 3m	±4.3dB
			6GHz-18GHz, 3m	±4.7dB
	<input checked="" type="checkbox"/>	Fully Anechoic Chamber	30MHz~1000MHz	±4.7dB
			1GHz~18GHz	±5.3dB

Remark : Uncertainty = $ku_c(y)$

Test Item	Uncertainty
20dB Bandwidth	±0.2kHz
Carrier Frequency Separation	±0.2kHz
Time of Occupancy	±0.03sec
Maximum peak Output power	± 0.52dB
Conducted Emission Limitations	± 0.13dB

4. MEASUREMENT EQUIPMENTLIST

4.1. Conducted Emission Measurement

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Test Receiver	R&S	ESR3	101774	2020. 02. 04	1 Year
2.	A.M.N.	R&S	ENV4200	100169	2019. 11. 13	1 Year
3.	L.I.S.N.	Kyoritsu	KNW-407	8-855-9	2019. 12. 10	1 Year
4.	Pulse Limiter	R&S	ESH3-Z2	100354	2020. 01. 05	1 Year
5.	Digital Thermo-Hygro Meter	iMax	HTC-1	No.8 S/R	2019. 04. 20	1 Year
6.	Test Software	Audix	e3	V6.120619c	N.C.R.	N.C.R.

4.2. Radiated Emission Measurement

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Spectrum Analyzer	Agilent	N9010A-507	MY52220264	2019. 08. 07	1 Year
2.	Spectrum Analyzer	Agilent	N9030A-526	MY53310269	2020. 01. 16	1 Year
3.	Test Receiver	R & S	ESCS30	100338	2019. 06. 12	1 Year
4.	Amplifier	HP	8447D	2944A06305	2020. 01. 16	1 Year
5.	Amplifier	HP	8449B	3008A02678	2020. 02. 27	1 Year
6.	Amplifier	Keysight	83051A	MY53010042	2019. 08. 08	1 Year
7.	Bilog Antenna	TESEQ	CBL6112D	33821	2020. 01. 17	1 Year
8.	Loop Antenna	R&S	HFH2-Z2	891847/27	2019. 12. 26	2 Years
9	Double-Ridged Waveguide Horn	ETS-Lindgren	3117	00135902	2020. 03. 10	1 Year
10.	Horn Antenna	COM-POWER	AH-840	101092	2019 .05. 14	1 Year
11.	2.4GHz Notch Filter	K&L	7NSL10-244 1.5/E130.5-O /O	1	2019. 07. 24	1 Year
12.	3GHz Notch Filter	Microwave	H3G018G1	484796	2019. 08. 21	1 Year
13.	Coaxial Cable	MIYAZAKI	5D2W	RE-11	2020. 01. 31	1 Year
14.	Coaxial Cable	HUBER+SUHNER	SUCOFLEX 104	RF CABLE-01	2019. 09. 20	1 Year
15.	Coaxial Cable	HUBER+SUHNER	SUCOFLEX 102	No.1 18-40GHz Cable	2019. 09. 20	1 Year
16.	Digital Thermo-Hygro Meter	iMax	HTC-1	No.1 3m A/C	2020. 04. 17	1 Year
17.	Digital Thermo-Hygro Meter	EVERY DAY	E-512	RF-02	2020. 04. 17	1 Year
18.	Test Software	Audix	e3	V6.120619c	N.C.R.	N.C.R.
19.	Test Software	Audix	e3	V6.110601	N.C.R.	N.C.R.

4.3. RF Conducted Measurement

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Spectrum Analyzer	Keysight	N9020B-544	MY57120357	2020. 01. 10	1 Year
2.	Digital Thermo-Hygro Meter	Shenzhen Datronn Electronics	KT-905	RF	2020. 04. 14	1 Year

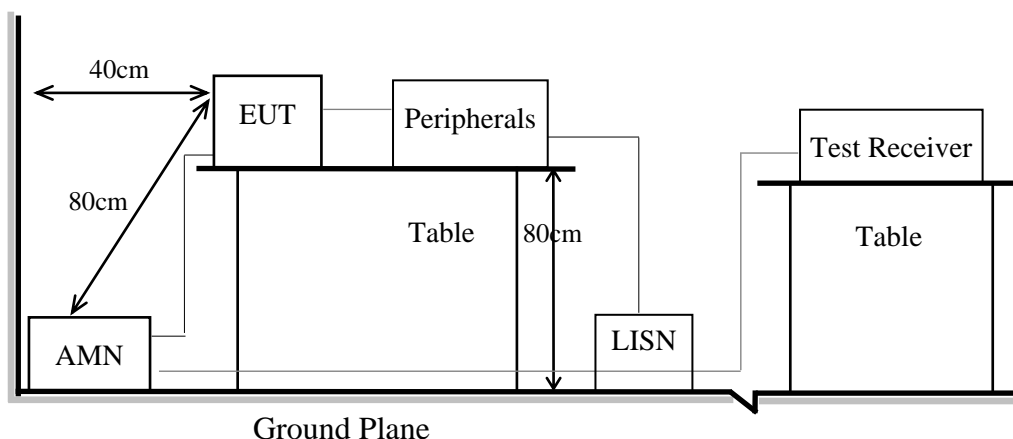
5. CONDUCTED EMISSION

5.1. Block Diagram of Test Setup

5.1.1. Block Diagram of EUT

Indicated as section 3.7

5.1.2. Shielded Room Setup Diagram



5.2. Conducted Emission Limit

Frequency	Conducted Limit	
	Quasi-Peak Level	Average Level
150kHz ~ 500kHz	66 ~ 56 dB μ V	56 ~ 46 dB μ V
500kHz ~ 5MHz	56 dB μ V	46 dB μ V
5MHz ~ 30MHz	60 dB μ V	50 dB μ V

Remark1.: If the average limit is met when using a Quasi-Peak detector, the measurement using the average detector is not required.

2.: The lower limit applies to the band edges.

5.3. Test Procedure

- 5.3.1. To set up the EUT as indicated in ANSI C 63.10. The EUT was placed on the table which has 80 cm height to the ground and 40 cm distance to the conducting wall.
- 5.3.2. Power supplier of the EUT was connected to the AC mains through an Artificial Mains Network (A.M.N.).
- 5.3.3. The AC power supplies to all peripheral devices must be provided through line impedance stabilization network (L.I.S.N.)
- 5.3.4. Checking frequency range from 150kHz to 30 MHz and record the emission which does not have 20 dB below limit.



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5.4. Test Results

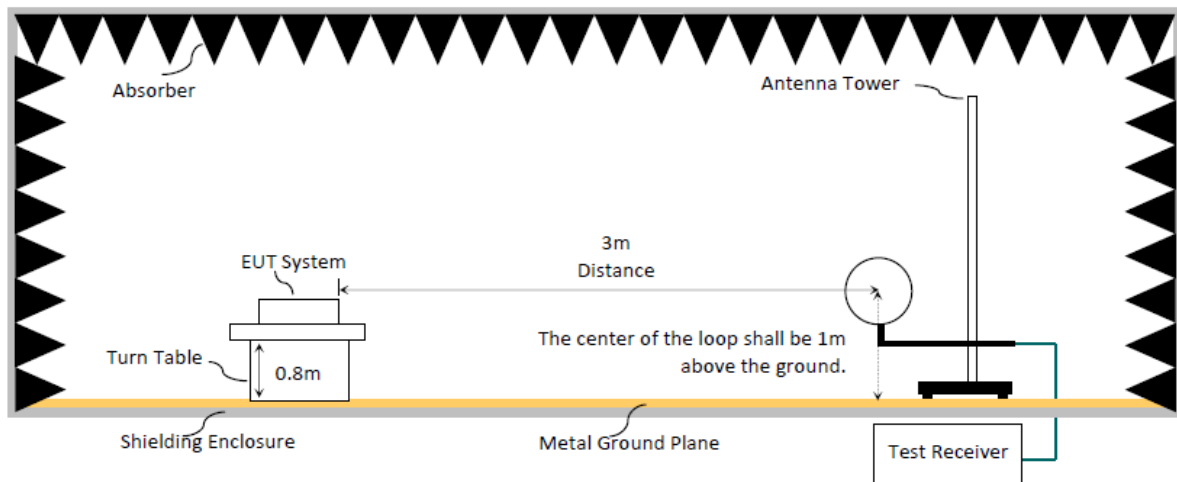
Please refer to Appendix A.

6. RADIATED EMISSION

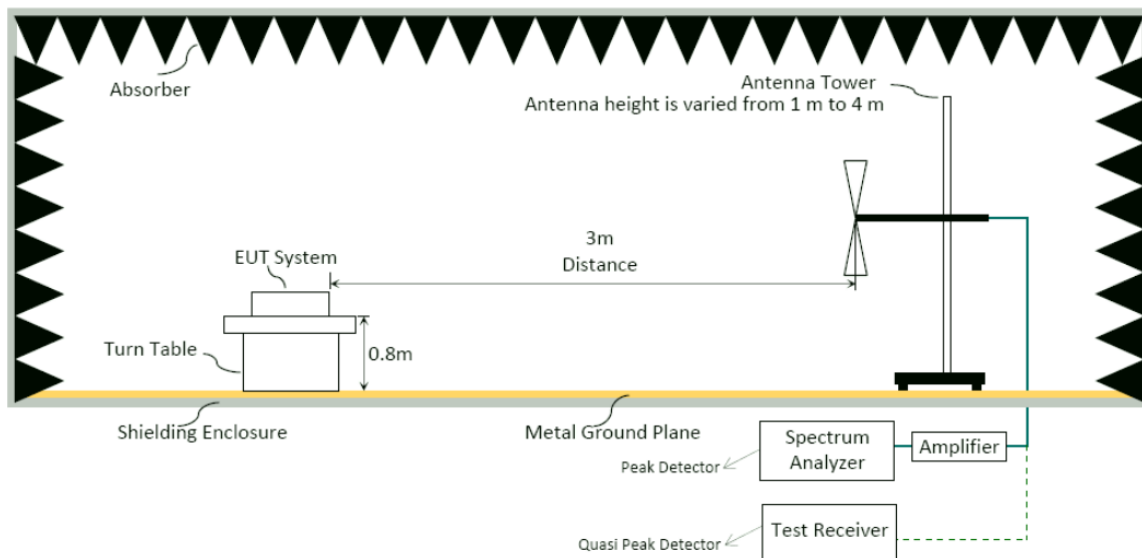
6.1. Block Diagram of Test Setup

6.1.1. Block Diagram of connection between EUT and simulators
 Indicated as section 3.7

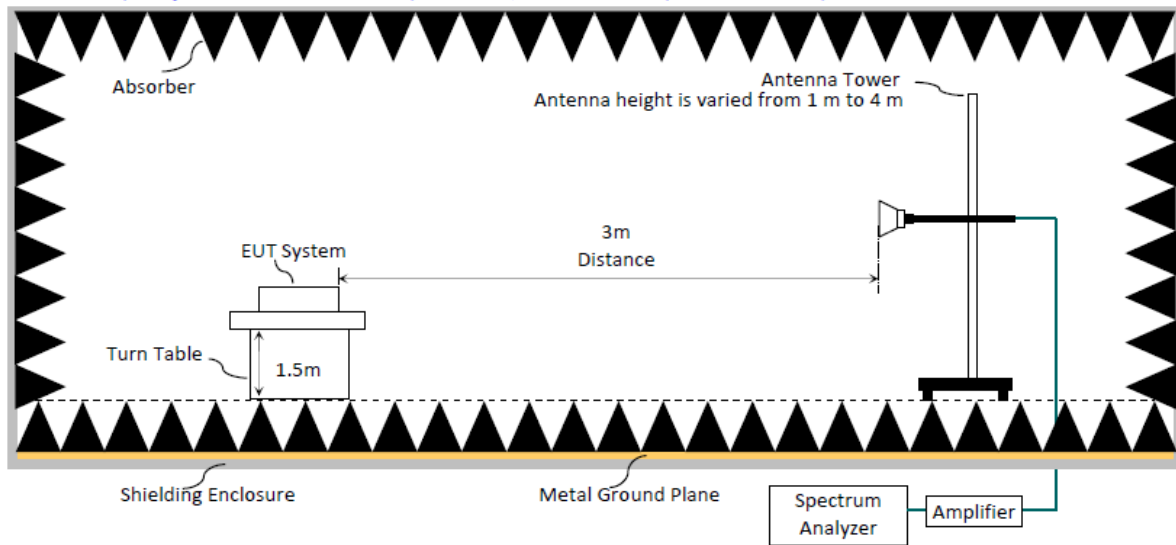
6.1.2. Setup Diagram for 9kHz-30MHz



6.1.3. Setup Diagram for 30-1000 MHz



6.1.4. Setup Diagram for above 1GHz



6.2. Radiated Emission Limits

In any 100kHz bandwidth outside the frequency band, the radio frequency power produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level. In addition, radiated emissions which fall in restricted bands, as defined in Section 15.205/RSS-Gen Section 8.10 table 6, must also comply with the radiated emission limits specified as below.

Frequency (MHz)	Distance (m)	Limits	
		dB μ V/m	μ V/m
0.009 - 0.490	300	67.6-20 log f(kHz)	2400/f kHz
0.490 - 1.705	30	87.6-20 log f(kHz)	24000/f kHz
1.705 - 30	30	29.5	30
30 - 88	3	40.0	100
88- 216	3	43.5	150
216- 960	3	46.0	200
Above 960	3	54.0	500
Above 1000	3	74.0 dB μ V/m (Peak) 54.0 dB μ V/m (Average)	

Remark : (1) dB μ V/m = 20 log (μ V/m)

- (2) The tighter limit applies to the edge between two frequency bands.
- (3) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
- (4) Fundamental and emission fall within operation band are exempted from this section.
- (5) Pursuant to ANSI C63.10: 6.6.4.3, if the maximized peak measured value complies with the average limit, then it is unnecessary to perform an average measurement

6.3. Test Procedure

Frequency Range 9kHz~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.

- (1) RBW = 9kHz with peak and average detector.
- (2) Detector: average and peak (9kHz-490kHz)
Q.P. (490kHz-30MHz)

Frequency Range 30MHz ~ 25GHz:

The EUT setup on the turn table which has 80 cm (for 30-1000MHz) and 1.5m (for above 1GHz) height to the ground. The turn table rotated 360 degrees and antenna varied from 1 m to 4 m (for 30-1000MHz) or antenna varied from 1 m to 3 m (for above 1GHz) to find the maximum emission level. Both horizontal and vertical polarization are required. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10-2013 regulation.

Frequency below 1GHz:

Spectrum Analyzer is used for pre-testing with following setting:

- (1) RBW = 120KHz
- (2) VBW $\geq 3 \times$ RBW.
- (3) Detector = Peak.
- (4) Sweep time = auto.
- (5) Trace mode = max hold.
- (6) Allow sweeps to continue until the trace stabilizes.

Note 1: When peak-detected value is lower than limit that the measurement using the Q.P. detector is not required, otherwise using Q.P. for final measurement.

Note 2: When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds.

Frequency above 1GHz to 10th harmonic (up to 25 GHz):

Peak Measurement:

- (1) RBW = 1 MHz
- (2) VBW $\geq 3 \times$ RBW.
- (3) Detector = Peak.
- (4) Sweep time = auto.
- (5) Trace mode = max hold.
- (6) Allow sweeps to continue until the trace stabilizes.

Note: When peak-detected value is lower than limit that the measurement using the average detector is not required, otherwise using average detector for final measurement.

Average Measurement: **Option 1:**

- (1) RBW = 1MHz
- (2) VBW \geq 1/ T.
- (3) Detector = Peak.
- (4) Sweep time = auto.
- (5) Trace mode = max hold.
- (6) Allow sweeps to continue until the trace stabilizes.

 Option 2:

Average Emission Level= Peak Emission Level+ D.C.C.F.

6.4. Measurement Result Explanation

Peak Emission Level=Antenna Factor + Cable Loss – Preamp Gain + Meter Reading

Average Emission Level I= Antenna Factor + Cable Loss – Preamp Gain
+ Meter Reading

Average Emission Level= Peak Emission Level+ DCCF

Duty Cycle Correction Factor (DCCF)= $20\log(TX_{on}/100ms)$ presented in section 3.5

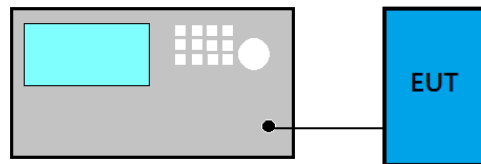
ERP= Peak Emission Level-95.2dB-2.14dB

6.5. Test Results

Please refer to Appendix A.

7. 20dB/OCCUPIED BANDWIDTH

7.1. Block Diagram of Test Setup



7.2. Specification Limits

Alternatively, frequency hopping systems operating in the 2400-2483.5MHz band may have hopping channel carrier frequencies that are separated by 25kHz or two-thirds of the 20dB bandwidth of the hopping channel, whichever is greater.

7.3. Test Procedure

Following measurement procedure is reference to ANSI C63.10-2013:

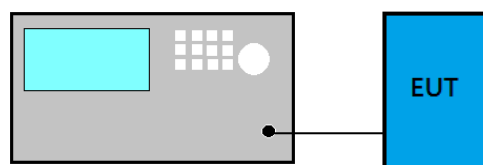
- (1) Set RBW close to 1 ~ 5% of OBW.
- (2) Set VBW= 3 three times RBW.
- (3) Detector = Peak.
- (4) Trace mode = max hold.
- (5) Sweep = auto couple.
- (6) Allow the trace to stabilize.
- (7) Setting channel bandwidth function x dB to -20 dB to record the final bandwidth.

7.4. Test Results

Please refer to Appendix A

8. CARRIER FREQUENCY SEPARATION

8.1. Block Diagram of Test Setup



8.2. Specification Limits

Alternatively, frequency hopping systems operating in the 2400-2483.5MHz band may have hopping channel carrier frequencies that are separated by 25kHz or two-thirds of the 20dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125mW.

8.3. Test Procedure

Following measurement procedure is reference to ANSI C63.10-2013:

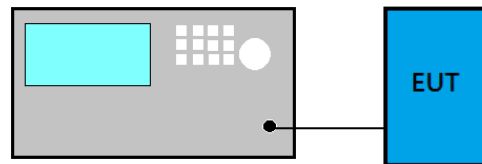
- (1) Span = Wide enough to capture the peaks of two adjacent channels.
- (2) RBW = Start with the RBW set to approximately 30% of the channel spacing; adjust as necessary to best identify the center of each individual channel.
- (3) VBW \geq RBW
- (4) Sweep = Auto
- (5) Detector function = peak
- (6) Trace = max hold
- (7) Allow the trace to stabilize

8.4. Test Results

Please refer to Appendix A

9. TIME OF OCCUPANCY

9.1. Block Diagram of Test Setup



9.2. Specification Limits

Frequency hopping systems in the 2400-2483.5MHz shall use at least 15 non-overlapping channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by number of hopping channels employed.

9.3. Test Procedure

Following measurement procedure is reference to ANSI C63.10-2013:

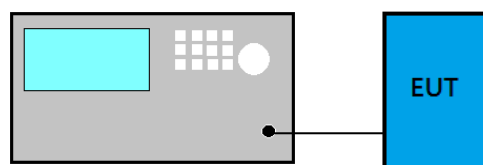
- (1) Span = Zero span, centered on a hopping channel.
- (2) RBW shall be \leq channel spacing and where possible RBW should be set $\gg 1/T$, where T is the expected dwell time per channel.
- (3) Sweep= As necessary to capture the entire dwell time per hopping channel; where possible use a video trigger and trigger delay so that the transmitted signal starts a little to the right of the start of the plot. The trigger level might need slight adjustment to prevent triggering when the system hops on an adjacent channel; a second plot might be needed with a longer sweep time to show two successive hops on a channel.
- (4) Detector function= Peak
- (5) Trace = max hold

9.4. Test Results

Please refer to Appendix A

10. NUMBER OF HOPPING CHANNELS

10.1. Block Diagram of Test Setup



10.2. Specification Limits

Frequency hopping systems which use fewer than 20 hopping frequencies may employ intelligent hopping techniques to avoid interference to other transmissions. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 non-overlapping channels.

10.3. Test Procedure

Following measurement procedure is reference to ANSI C63.10-2013:

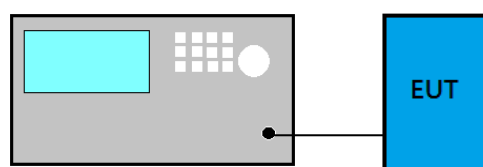
- (1) Span = The frequency band of operation. Depending on the number of channels the device supports, it may be necessary to divide the frequency range of operation across multiple spans, to allow the individual channels to be clearly seen.
- (2) RBW = To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.
- (3) VBW \geq RBW
- (4) Sweep = Auto
- (5) Detector function = Peak
- (6) Trace = max hold
- (7) Allow the trace to stabilize.

10.4. Test Results

Please refer to Appendix A

11. MAXIMUM PEAK OUTPUT POWER

11.1. Block Diagram of Test Setup



11.2. Specification Limits

The Limits of maximum Peak Output Power for frequency hopping systems in 2400-2483.5MHz is: 0.125Watt. (21dBm)

11.3. Test Procedure

Following measurement procedure is reference to ANSI C63.10:2013:

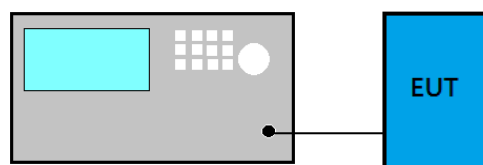
- (a) Use the following spectrum analyzer settings
 - (1) Span: Approximately five times the 20 dB bandwidth, centered on a hopping channel.
 - (2) RBW > 20 dB bandwidth of the emission being measured.
 - (3) VBW \geq RBW
 - (4) Sweep: Auto
 - (5) Detector function: Peak
 - (6) Trace: Max hold
- (b) Allow trace to stabilize.
- (c) Use the marker-to-peak function to set the marker to the peak of the emission.

11.4. Test Results

Please refer to Appendix A

12. EMISSION LIMITATIONS

12.1. Block Diagram of Test Setup



12.2. Specification Limits

In any 100kHz 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 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, that the required attenuation shall be 30 dB instead of 20 dB.

Attenuation below the general limits specified in FCC Section 15.209(a) and RSS-Gen Section 8.9 table 4 is not required. In addition, radiated emissions which fall in restricted bands, as defined in Section 15.205(a) and RSS-Gen Section 8.10 table 6, must also comply with the radiated emission limits specified in Section 15.209(a) and RSS-Gen Section 8.9 table 4 (See Section 15.205(c)).

12.3. Test Procedure

Following measurement procedure is reference to ANSI C63.10-2013:

- (1) Set span wide enough to capture the peak level of the in-band emission and all spurious emissions; up to 10th harmonic.
- (2) RBW = 100 kHz
- (3) VBW \geq RBW
- (4) Sweep = auto
- (5) Detector function = peak
- (6) Trace = max hold

12.4. Test Results

Please refer to Appendix A



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13.DEVIATION TO TEST SPECIFICATIONS

【NONE】



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APPDNDIX A

TEST DATA AND PLOTS

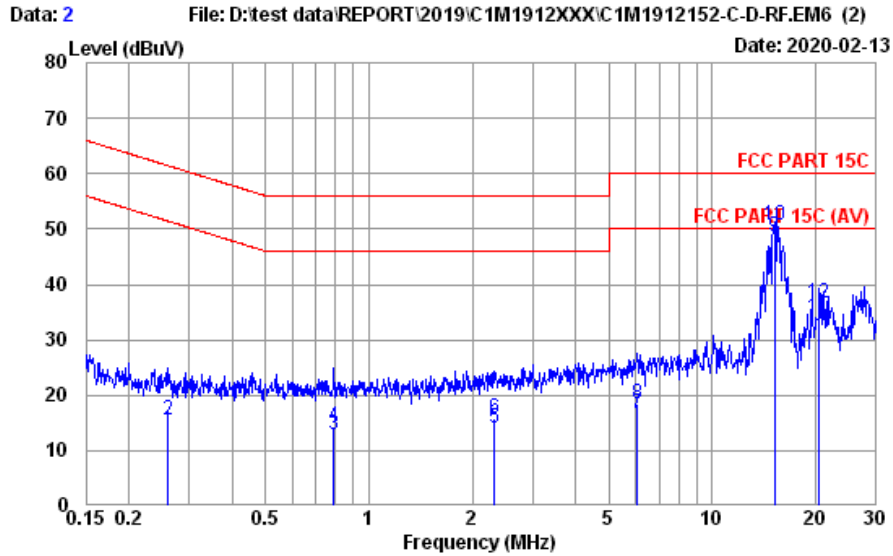
(Model: FEX02TB)

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A.1 CONDUCTED EMISSION

Test Date	2020/02/13	Temp./Hum.	22°C/60%
Test Voltage	DC 5V (Via DC Power Supply)	Tested By	Chucky Chiu
		Test Model	FEX20TB

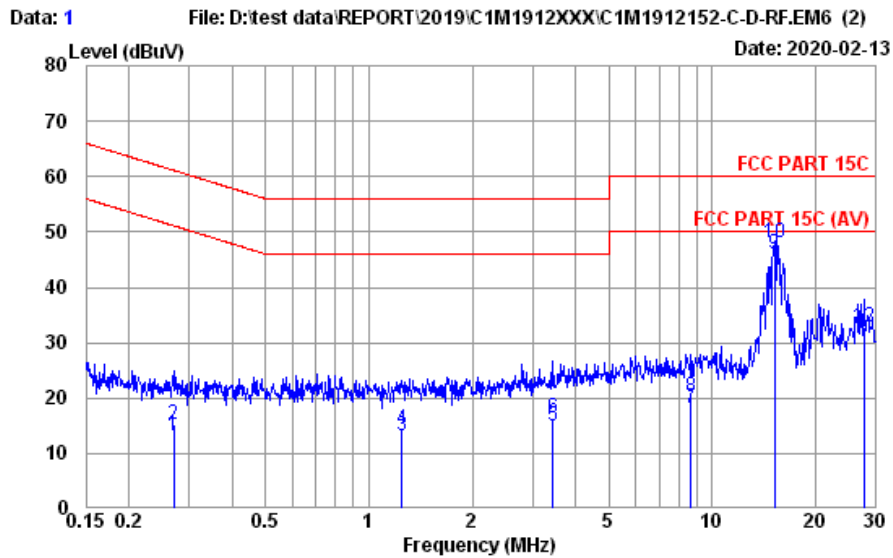


Site no. : No.8 Shielded Room Data no. : 2
 Condition : ENV4200 (169) (A) LISN Phase : NEUTRAL
 Limit : FCC PART 15C
 Env. / Ins. : 22°C / 60% ESR3 (774) Engineer : Chucky Chiu
 EUT : FEX02TB
 Power Rating : DC 5V
 Test Mode : Operating

	AMN	Cable	Pulse	Emission			Margin	Remark	
Freq. (MHz)	Factor (dB)	Loss (dB)	Att. (dB)	Reading (dBμV)	Level (dBμV)	Limits (dBμV)	(dB)		
1	0.260	10.60	0.04	9.86	-6.71	13.79	51.42	37.63	Average
2	0.260	10.60	0.04	9.86	-5.04	15.46	61.42	45.96	QP
3	0.788	10.51	0.05	9.86	-7.53	12.89	46.00	33.11	Average
4	0.788	10.51	0.05	9.86	-5.96	14.46	56.00	41.54	QP
5	2.321	10.57	0.07	9.86	-6.34	14.16	46.00	31.84	Average
6	2.321	10.57	0.07	9.86	-4.77	15.73	56.00	40.27	QP
7	6.056	11.02	0.11	9.88	-4.39	16.62	50.00	33.38	Average
8	6.056	11.02	0.11	9.88	-2.51	18.50	60.00	41.50	QP
9	15.161	12.74	0.16	9.92	25.79	48.61	50.00	1.39	Average
10	15.161	12.74	0.16	9.92	27.79	50.61	60.00	9.39	QP
11	20.481	13.80	0.19	9.95	10.12	34.06	50.00	15.94	Average
12	20.481	13.80	0.19	9.95	12.56	36.50	60.00	23.50	QP

Remarks: 1. Emission Level= AMN Factor + Cable Loss + Pulse Att. + 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.

Test Date	2020/02/13	Temp./Hum.	22°C/60%
Test Voltage	DC 5V (Via DC Power Supply)	Tested By	Chucky Chiu
		Test Model	FEX20TB



Site no. : No.8 Shielded Room Data no. : 1
 Condition : ENV4200 (169)(A) LISN Phase : LINE
 Limit : FCC PART 15C
 Env. / Ins. : 22°C / 60% ESR3 (774) Engineer : Chucky Chiu
 EUT : FEX02TB
 Power Rating : DC 5V
 Test Mode : Operating

	AMN	Cable	Pulse	Emission			Margin	Remark	
Freq. (MHz)	Factor (dB)	Loss (dB)	Att. (dB)	Reading (dBμV)	Level (dBμV)	Limits (dBμV)	(dB)		
1	0.270	10.56	0.04	9.86	-7.14	13.32	51.12	37.80	Average
2	0.270	10.56	0.04	9.86	-5.29	15.17	61.12	45.95	QP
3	1.249	10.48	0.06	9.86	-7.15	13.25	46.00	32.75	Average
4	1.249	10.48	0.06	9.86	-5.94	14.46	56.00	41.54	QP
5	3.436	10.59	0.09	9.87	-5.60	14.95	46.00	31.05	Average
6	3.436	10.59	0.09	9.87	-4.27	16.28	56.00	39.72	QP
7	8.683	11.12	0.13	9.89	-2.99	18.15	50.00	31.85	Average
8	8.683	11.12	0.13	9.89	-0.89	20.25	60.00	39.75	QP
9	15.160	12.41	0.16	9.92	23.61	46.10	50.00	3.90	Average
10	15.160	12.41	0.16	9.92	25.53	48.02	60.00	11.98	QP
11	27.719	15.33	0.24	10.00	5.28	30.85	50.00	19.15	Average
12	27.719	15.33	0.24	10.00	7.37	32.94	60.00	27.06	QP

Remarks: 1. Emission Level= AMN Factor + Cable Loss + Pulse Att. + 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.

A.2 RADIATED EMISSION

Test Date	2020/02/12~05/04	Temp./Hum.	19~22°C/45~64%
Test Voltage	DC 5V (Via DC Power Supply)	Tested By	Sam Chang
		Test Model	FEX02TB

A.2.1 Emissions within Restricted Frequency Bands

A.2.1.1 Frequency 9kHz~30MHz

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

A.2.1.2 Frequency Below 1 GHz

Mode	FHSS	Frequency	TX 2407.5MHz
Antenna Model	ANT-2.4-CW-RH-RPS		

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
123.120	18.60	2.72	26.18	29.50	24.64	43.50	18.86	Peak
194.900	15.23	3.50	25.88	32.94	25.79	43.50	17.71	Peak
485.900	23.27	6.80	27.13	29.27	32.21	46.00	13.79	Peak
573.200	24.47	7.00	27.43	29.11	33.15	46.00	12.85	Peak
779.810	25.89	8.03	27.43	28.65	35.14	46.00	10.86	Peak
926.280	26.97	8.84	27.07	29.50	38.24	46.00	7.76	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
126.030	18.52	2.76	26.17	28.61	23.72	43.50	19.78	Peak
500.450	23.51	6.93	27.22	28.81	32.03	46.00	13.97	Peak
634.310	24.87	7.23	27.49	29.23	33.84	46.00	12.16	Peak
773.990	25.83	8.00	27.44	29.01	35.40	46.00	10.60	Peak
962.170	27.19	8.99	26.95	28.54	37.77	54.00	16.23	Peak
997.090	27.38	9.15	26.84	28.63	38.32	54.00	15.68	Peak

Mode	FHSS	Frequency	TX 2407.5MHz
Antenna Model	ANT-2.4-WRT-RPS		

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
132.820	18.30	2.85	26.14	29.30	24.31	43.50	19.19	Peak
191.990	15.16	3.47	25.89	33.90	26.64	43.50	16.86	Peak
463.590	22.94	6.60	26.99	28.52	31.07	46.00	14.93	Peak
765.260	25.75	7.95	27.44	28.73	34.99	46.00	11.01	Peak
906.880	26.86	8.75	27.12	28.80	37.29	46.00	8.71	Peak
981.570	27.30	9.08	26.90	29.06	38.54	54.00	15.46	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
127.000	18.47	2.77	26.17	28.25	23.32	43.50	20.18	Peak
401.510	21.88	6.04	26.55	28.56	29.93	46.00	16.07	Peak
537.310	24.01	6.97	27.33	28.31	31.96	46.00	14.04	Peak
688.630	24.96	7.55	27.50	28.74	33.75	46.00	12.25	Peak
764.290	25.72	7.95	27.44	27.97	34.20	46.00	11.80	Peak
922.400	26.96	8.82	27.07	29.36	38.07	46.00	7.93	Peak

Mode	FHSS	Frequency	TX 2407.5MHz
Antenna Model	TNHW 2450 RP		

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
135.730	18.21	2.89	26.12	29.67	24.65	43.50	18.85	Peak
194.900	15.23	3.50	25.88	32.83	25.68	43.50	17.82	Peak
439.340	22.52	6.38	26.81	29.88	31.97	46.00	14.03	Peak
529.550	23.91	6.96	27.30	28.47	32.04	46.00	13.96	Peak
837.040	26.38	8.35	27.30	28.77	36.20	46.00	9.80	Peak
959.260	27.17	8.98	26.95	29.44	38.64	46.00	7.36	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
101.780	16.92	2.45	26.31	30.69	23.75	43.50	19.75	Peak
389.870	21.60	5.88	26.47	28.50	29.51	46.00	16.49	Peak
581.930	24.60	7.01	27.44	28.61	32.78	46.00	13.22	Peak
824.430	26.29	8.27	27.34	28.29	35.51	46.00	10.49	Peak
941.800	27.07	8.90	27.01	28.42	37.38	46.00	8.62	Peak
982.540	27.30	9.08	26.90	28.47	37.95	54.00	16.05	Peak

Mode	FHSS	Frequency	TX 2407.5MHz
Antenna Model	ANTB24-073A0		

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
123.120	18.60	2.72	26.18	29.40	24.54	43.50	18.96	Peak
197.810	15.29	3.53	25.88	32.52	25.46	43.50	18.04	Peak
665.350	24.92	7.41	27.49	29.35	34.19	46.00	11.81	Peak
797.270	26.07	8.12	27.42	29.11	35.88	46.00	10.12	Peak
929.190	26.99	8.85	27.04	28.71	37.51	46.00	8.49	Peak
972.840	27.25	9.04	26.92	29.29	38.66	54.00	15.34	Peak

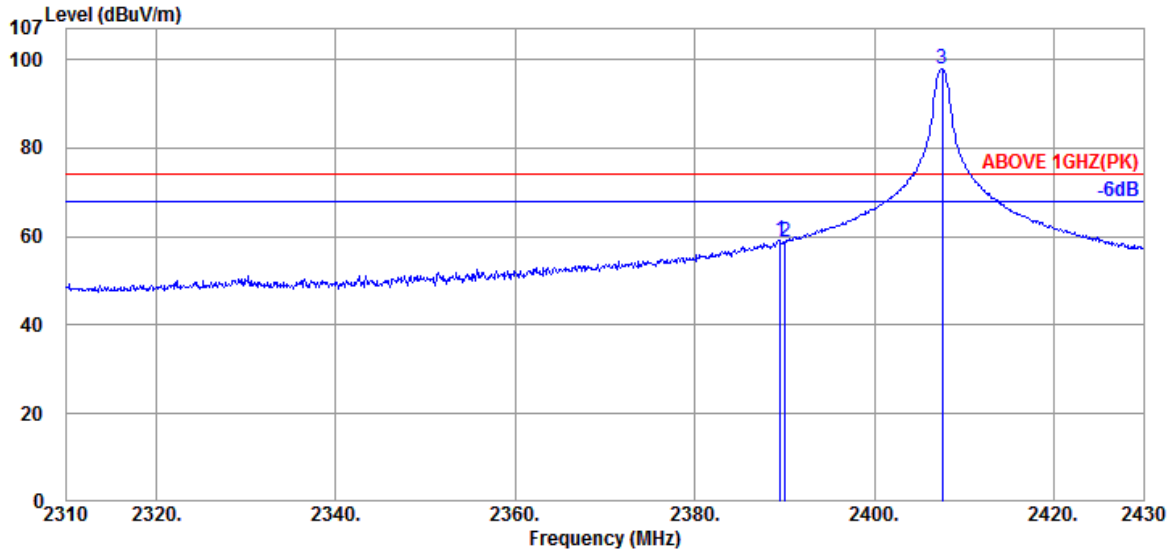
Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
37.760	20.34	1.43	26.52	33.83	29.08	40.00	10.92	Peak
118.270	18.57	2.66	26.21	29.17	24.19	43.50	19.31	Peak
501.420	23.51	6.93	27.22	29.41	32.63	46.00	13.37	Peak
691.540	24.97	7.57	27.50	29.04	34.08	46.00	11.92	Peak
869.050	26.61	8.54	27.24	29.57	37.48	46.00	8.52	Peak
932.100	27.01	8.86	27.04	29.67	38.50	46.00	7.50	Peak

A.2.1.3 Frequency Above 1 GHz to 10th harmonics

Band Edge:

Mode	FHSS	Frequency	TX 2407.5MHz
Antenna Model	ANT-2.4-CW-RH-RPS		

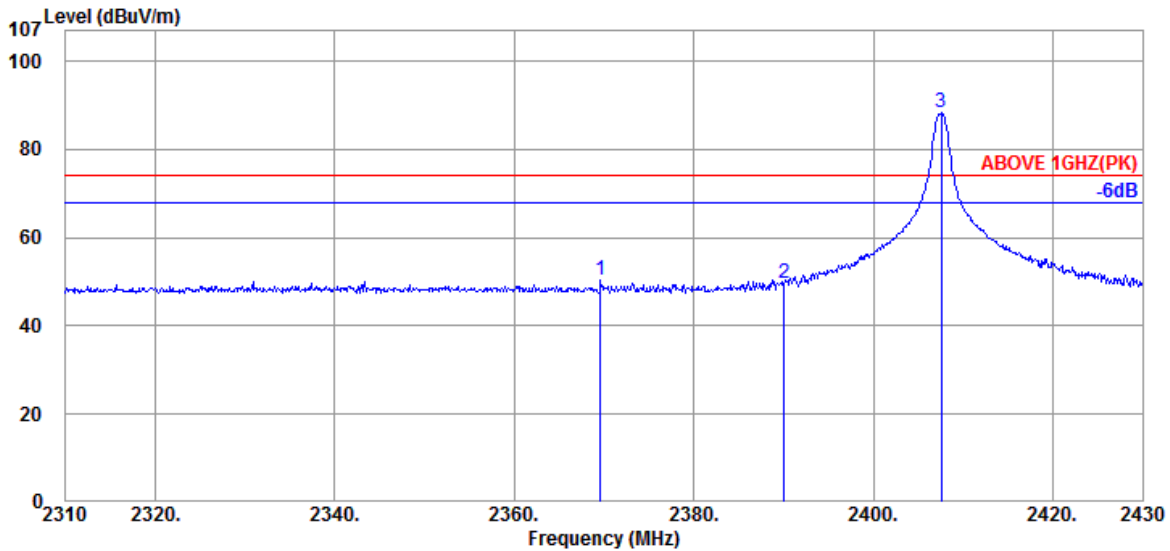


Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2389.560	32.00	8.52	34.58	53.09	59.03	74.00	14.97	Peak
2390.040	32.00	8.52	34.58	53.02	58.96	74.00	15.04	Peak
2407.560	32.23	8.53	34.59	91.58	97.75	---	---	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
2389.560	59.03	-27.17	31.86	54.00	22.14	Average
2390.040	58.96	-27.17	31.79	54.00	22.21	Average

Mode	FHSS	Frequency	TX 2407.5MHz
Antenna Model	ANT-2.4-CW-RH-RPS		

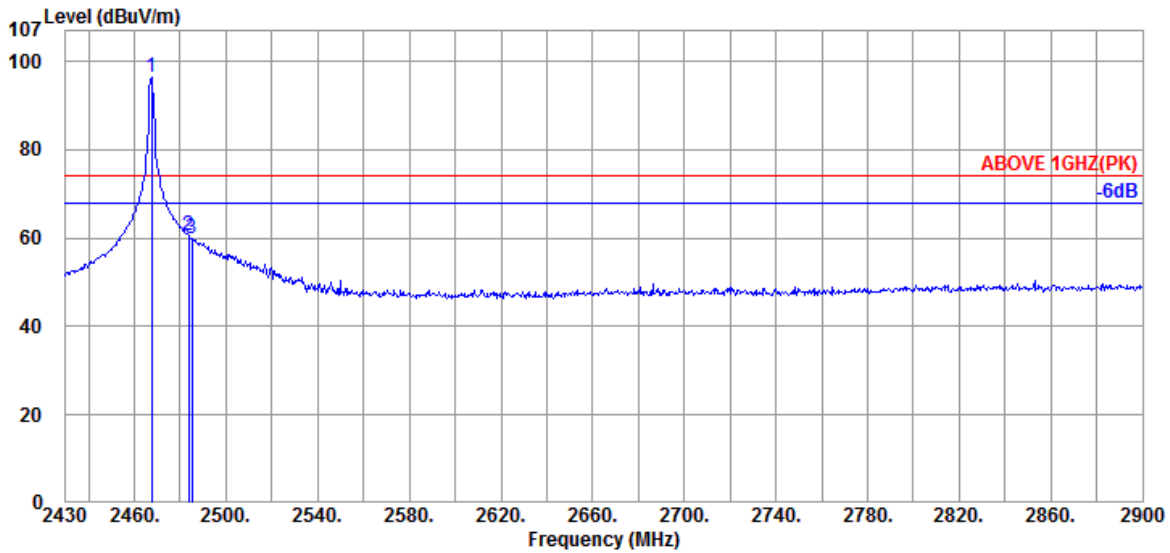


Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2369.640	32.00	8.51	34.58	44.38	50.31	74.00	23.69	Peak
2390.040	32.00	8.52	34.58	43.89	49.83	74.00	24.17	Peak
2407.560	32.23	8.53	34.59	82.07	88.24	---	---	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
2369.640	50.31	-27.17	23.14	54.00	30.86	Average
2390.040	49.83	-27.17	22.66	54.00	31.34	Average

Mode	FHSS	Frequency	TX 2467.5MHz
Antenna Model	ANT-2.4-CW-RH-RPS		

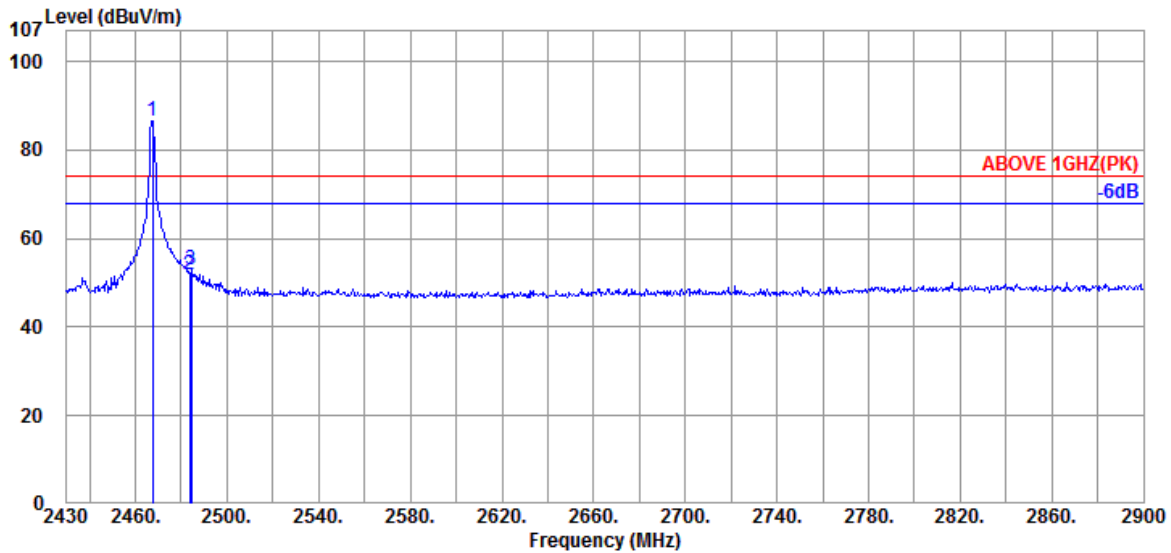


Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2467.600	32.63	8.57	34.60	89.80	96.40	---	---	Peak
2483.580	32.57	8.58	34.61	53.97	60.51	74.00	13.49	Peak
2484.990	32.57	8.58	34.61	53.44	59.98	74.00	14.02	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
2483.580	60.51	-27.17	33.34	54.00	20.66	Average
2484.990	59.98	-27.17	32.81	54.00	21.19	Average

Mode	FHSS	Frequency	TX 2467.5MHz
Antenna Model	ANT-2.4-CW-RH-RPS		

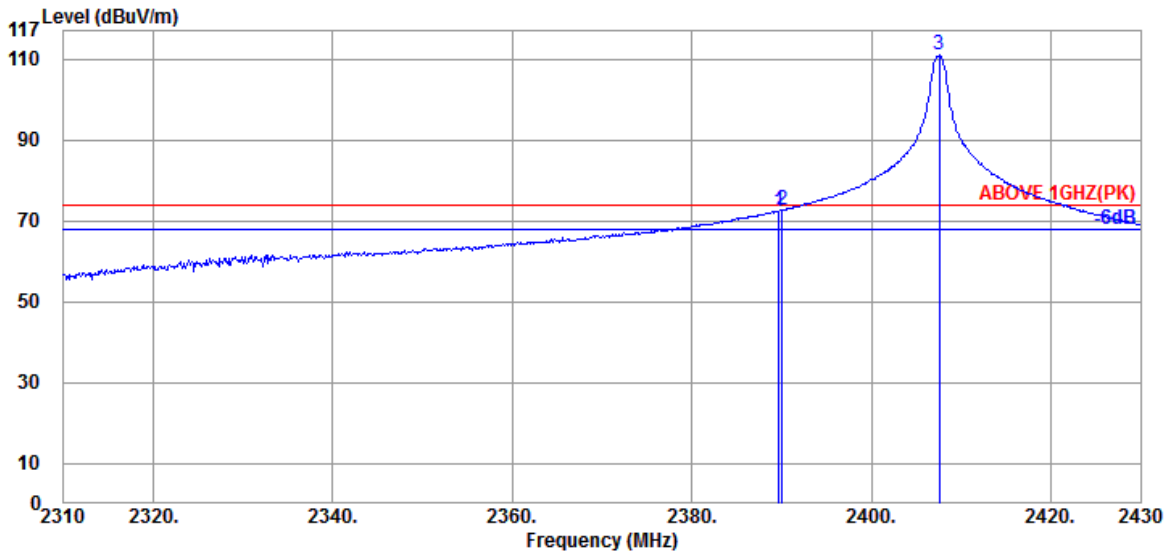


Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2467.600	32.63	8.57	34.60	79.99	86.59	---	---	Peak
2483.580	32.57	8.58	34.61	45.42	51.96	74.00	22.04	Peak
2484.520	32.57	8.58	34.61	46.35	52.89	74.00	21.11	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
2483.580	51.96	-27.17	24.79	54.00	29.21	Average
2484.520	52.89	-27.17	25.72	54.00	28.28	Average

Mode	FHSS	Frequency	TX 2407.5MHz
Antenna Model	ANT-2.4-WRT-RPS		

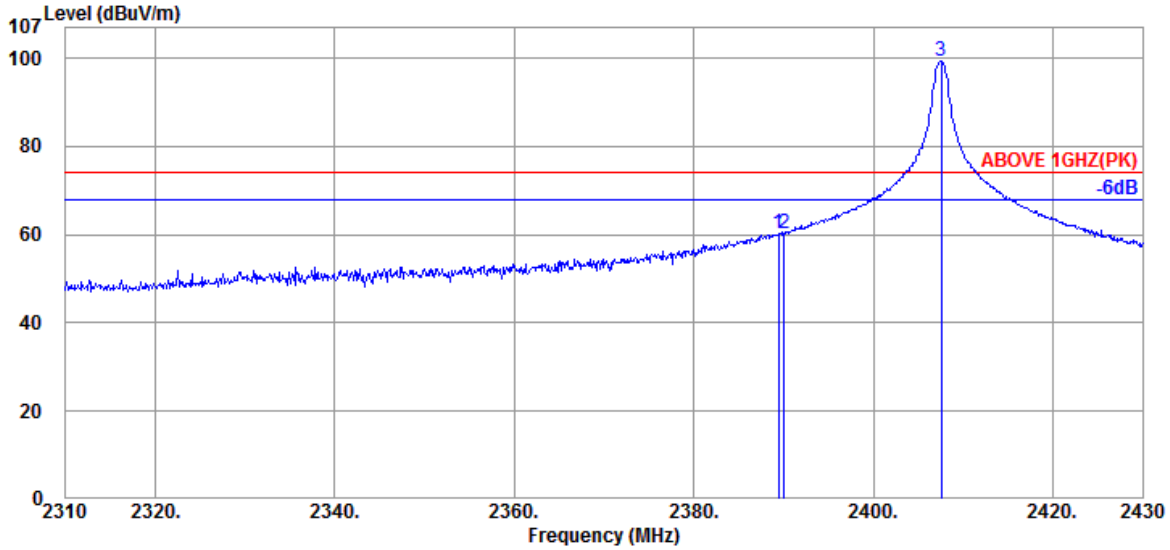


Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2389.680	32.00	8.52	34.58	66.38	72.32	74.00	1.68	Peak
2390.040	32.00	8.52	34.58	66.63	72.57	74.00	1.43	Peak
2407.560	32.23	8.53	34.59	104.67	110.84	---	---	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
2389.680	72.32	-27.17	45.15	54.00	8.85	Average
2390.040	72.57	-27.17	45.40	54.00	8.60	Average

Mode	FHSS	Frequency	TX 2407.5MHz
Antenna Model	ANT-2.4-WRT-RPS		

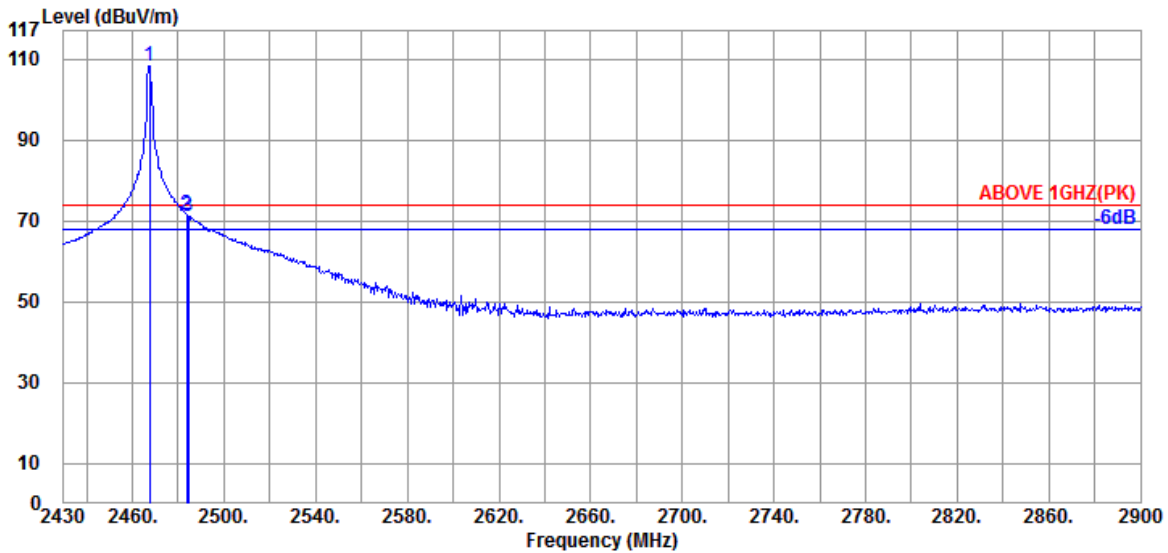


Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2389.440	32.00	8.52	34.58	54.46	60.40	74.00	13.60	Peak
2390.040	32.00	8.52	34.58	54.33	60.27	74.00	13.73	Peak
2407.560	32.23	8.53	34.59	93.04	99.21	---	---	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
2389.440	60.40	-27.17	33.23	54.00	20.77	Average
2390.040	60.27	-27.17	33.10	54.00	20.90	Average

Mode	FHSS	Frequency	TX 2467.5MHz
Antenna Model	ANT-2.4-WRT-RPS		

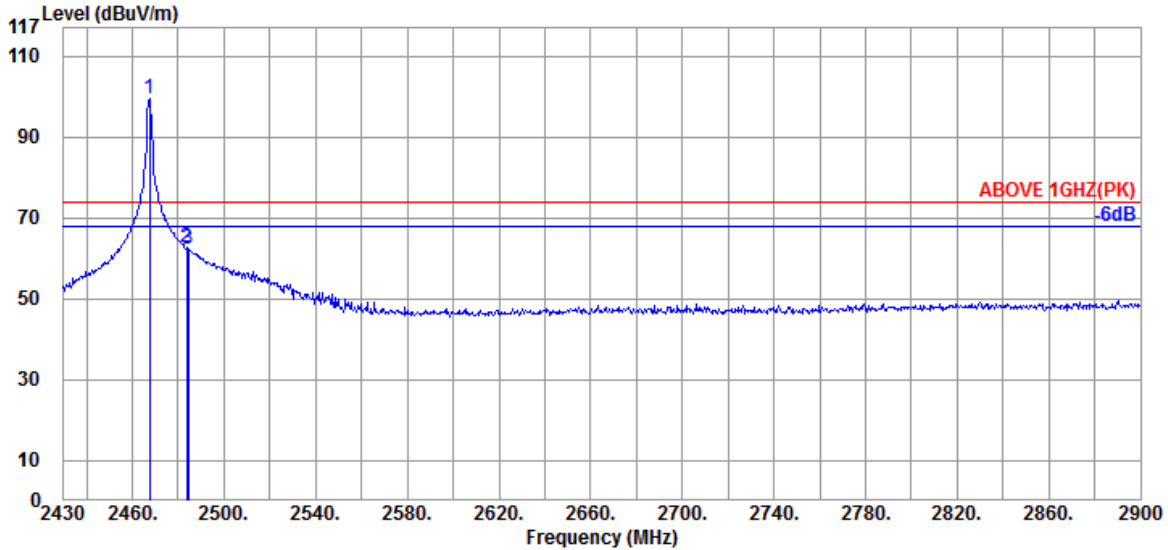


Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2467.600	32.63	8.57	34.60	101.79	108.39	---	---	Peak
2483.580	32.57	8.58	34.61	65.11	71.65	74.00	2.35	Peak
2484.520	32.57	8.58	34.61	64.62	71.16	74.00	2.84	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
2483.580	71.65	-27.17	44.48	54.00	9.52	Average
2484.520	71.16	-27.17	43.99	54.00	10.01	Average

Mode	FHSS	Frequency	TX 2467.5MHz
Antenna Model	ANT-2.4-WRT-RPS		

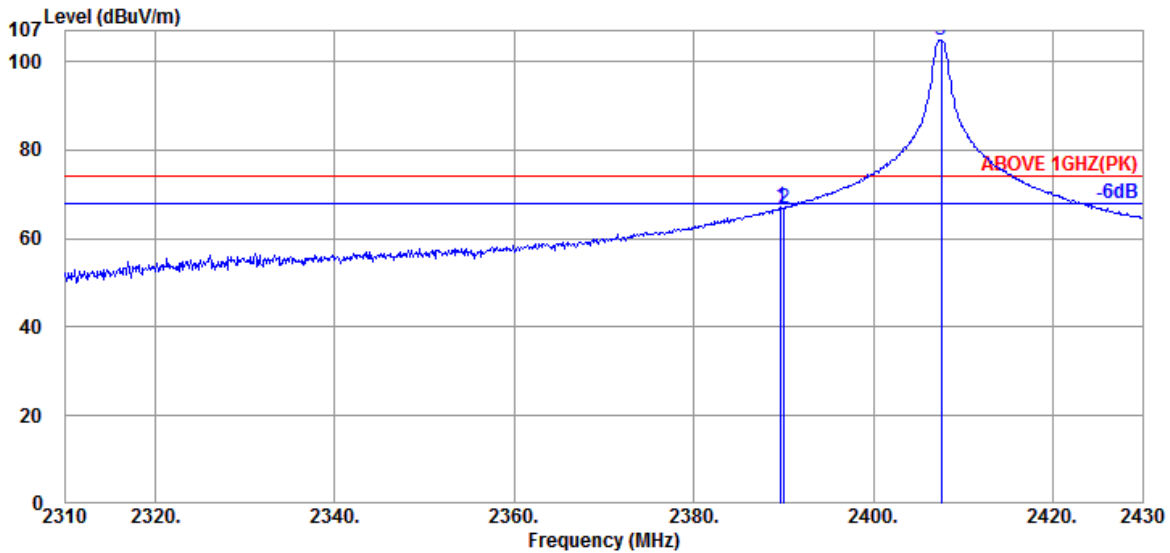


Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2467.600	32.63	8.57	34.60	92.71	99.31	---	---	Peak
2483.580	32.57	8.58	34.61	56.05	62.59	74.00	11.41	Peak
2484.520	32.57	8.58	34.61	55.66	62.20	74.00	11.80	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
2483.580	62.59	-27.17	35.42	54.00	18.58	Average
2484.520	62.20	-27.17	35.03	54.00	18.97	Average

Mode	FHSS	Frequency	TX 2407.5MHz
Antenna Model	TNHW 2450 RP		

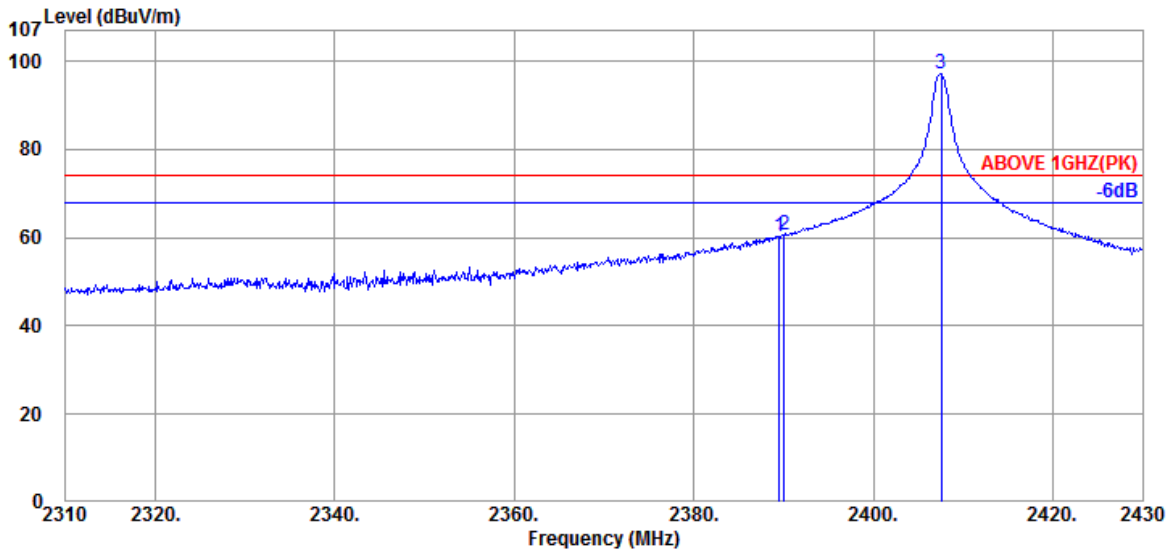


Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2389.680	32.00	8.52	34.58	61.09	67.03	74.00	6.97	Peak
2390.040	32.00	8.52	34.58	60.72	66.66	74.00	7.34	Peak
2407.560	32.23	8.53	34.59	98.80	104.97	---	---	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
2389.680	67.03	-27.17	39.86	54.00	14.14	Average
2390.040	66.66	-27.17	39.49	54.00	14.51	Average

Mode	FHSS	Frequency	TX 2407.5MHz
Antenna Model	TNHW 2450 RP		

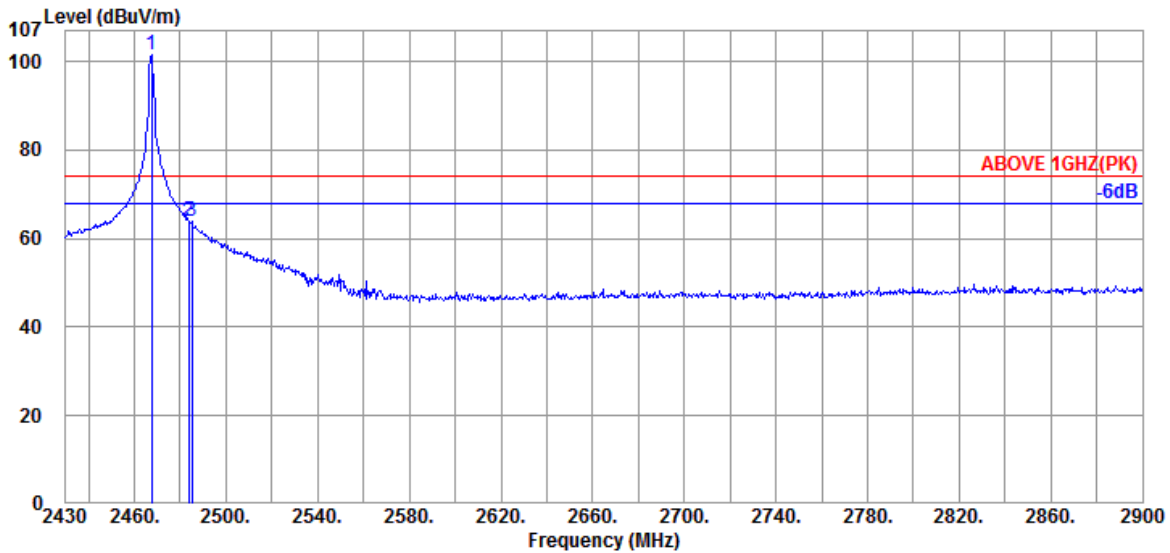


Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2389.560	32.00	8.52	34.58	54.43	60.37	74.00	13.63	Peak
2390.040	32.00	8.52	34.58	54.82	60.76	74.00	13.24	Peak
2407.560	32.23	8.53	34.59	90.83	97.00	---	---	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
2389.560	60.37	-27.17	33.20	54.00	20.80	Average
2390.040	60.76	-27.17	33.59	54.00	20.41	Average

Mode	FHSS	Frequency	TX 2467.5MHz
Antenna Model	TNHW 2450 RP		

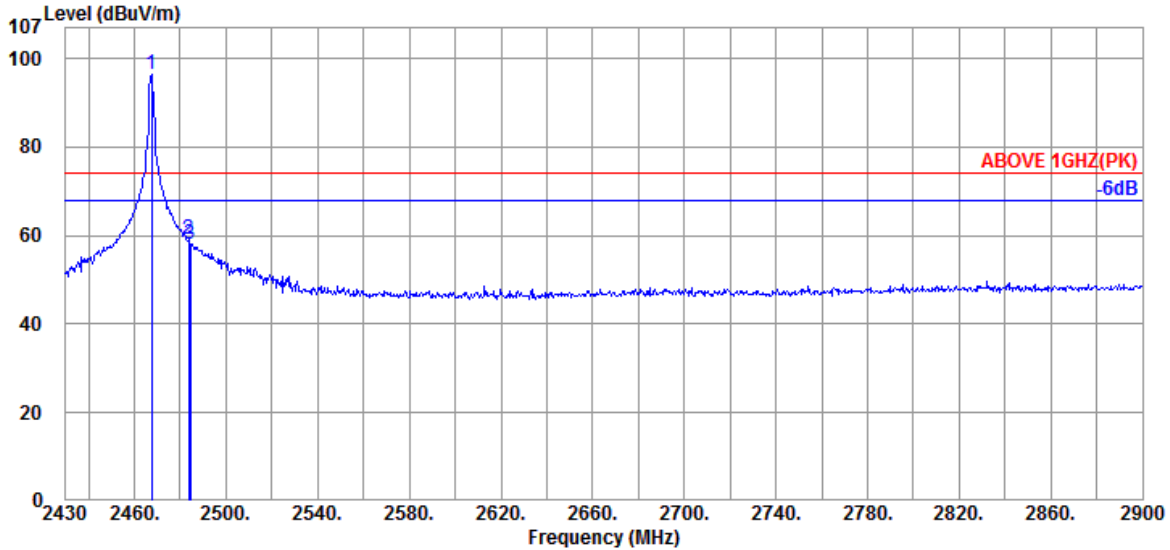


Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Meter Reading (dBμV)	Emission Level (dBUV/m)	Limits (dBUV/m)	Margin (dB)	Detector
2467.600	32.63	8.57	34.60	94.75	101.35	---	---	Peak
2483.580	32.57	8.58	34.61	57.49	64.03	74.00	9.97	Peak
2484.990	32.57	8.58	34.61	57.21	63.75	74.00	10.25	Peak

Emission Frequency (MHz)	Peak Emission Level (dBUV/m)	DCCF (dB)	Average Emission Level (dBUV/m)	Limits (dBUV/m)	Margin (dB)	Remark
2483.580	64.03	-27.17	36.86	54.00	17.14	Average
2484.990	63.75	-27.17	36.58	54.00	17.42	Average

Mode	FHSS	Frequency	TX 2467.5MHz
Antenna Model	TNHW 2450 RP		

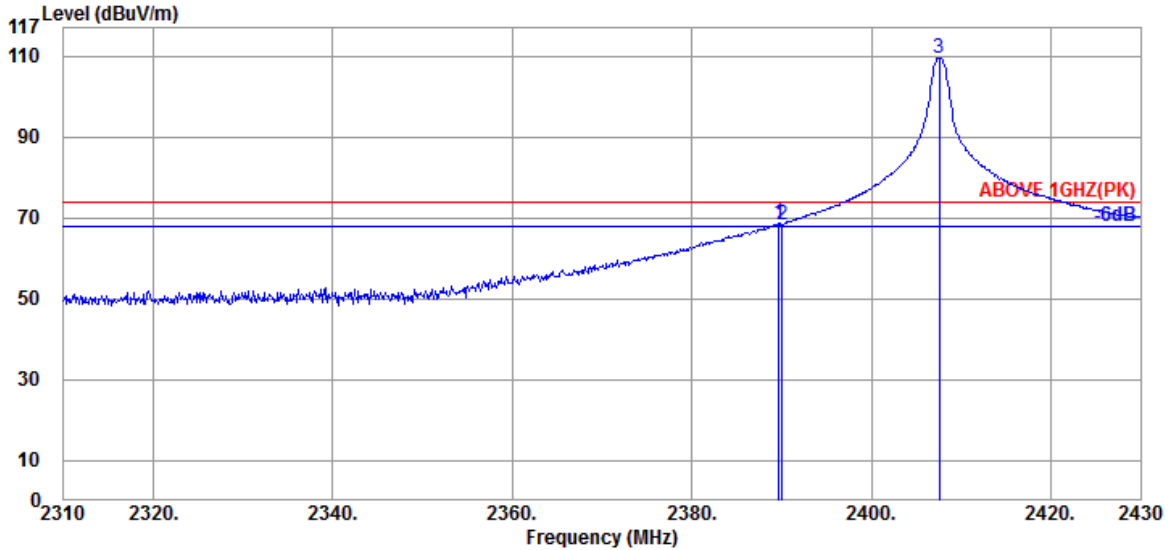


Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2467.600	32.63	8.57	34.60	89.71	96.31	---	---	Peak
2483.580	32.57	8.58	34.61	52.44	58.98	74.00	15.02	Peak
2484.520	32.57	8.58	34.61	51.64	58.18	74.00	15.82	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
2483.580	58.98	-27.17	31.81	54.00	22.19	Average
2484.520	58.18	-27.17	31.01	54.00	22.99	Average

Mode	FHSS	Frequency	TX 2407.5MHz
Antenna Model	ANTB24-073A0		

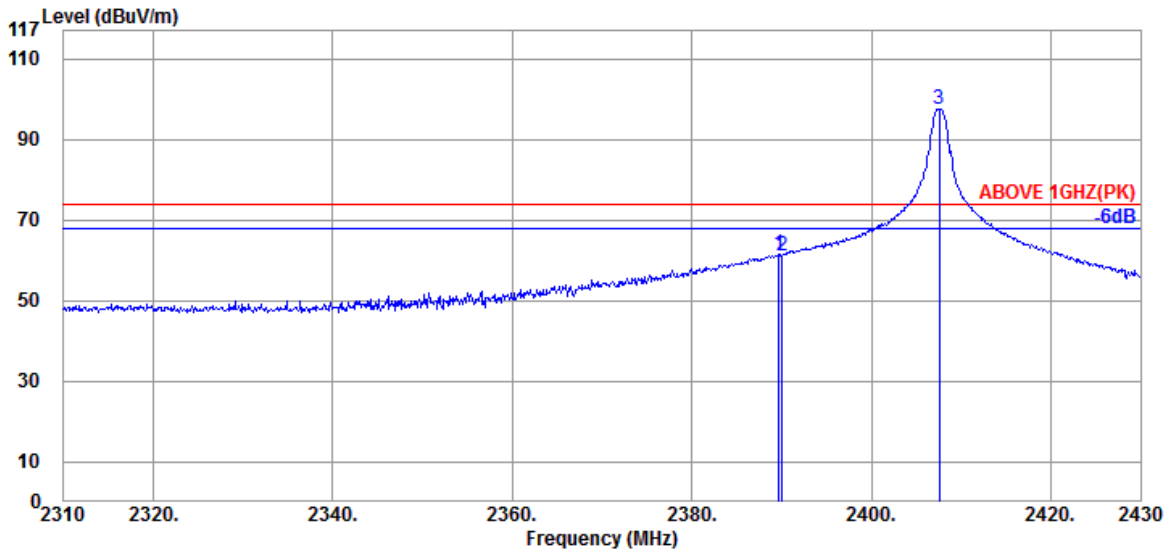


Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2389.680	32.00	8.52	34.58	62.56	68.50	74.00	5.50	Peak
2390.040	32.00	8.52	34.58	62.39	68.33	74.00	5.67	Peak
2407.560	32.23	8.53	34.59	103.32	109.49	---	---	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
2389.680	68.50	-27.17	41.33	54.00	12.67	Average
2390.040	68.33	-27.17	41.16	54.00	12.84	Average

Mode	FHSS	Frequency	TX 2407.5MHz
Antenna Model	ANTB24-073A0		

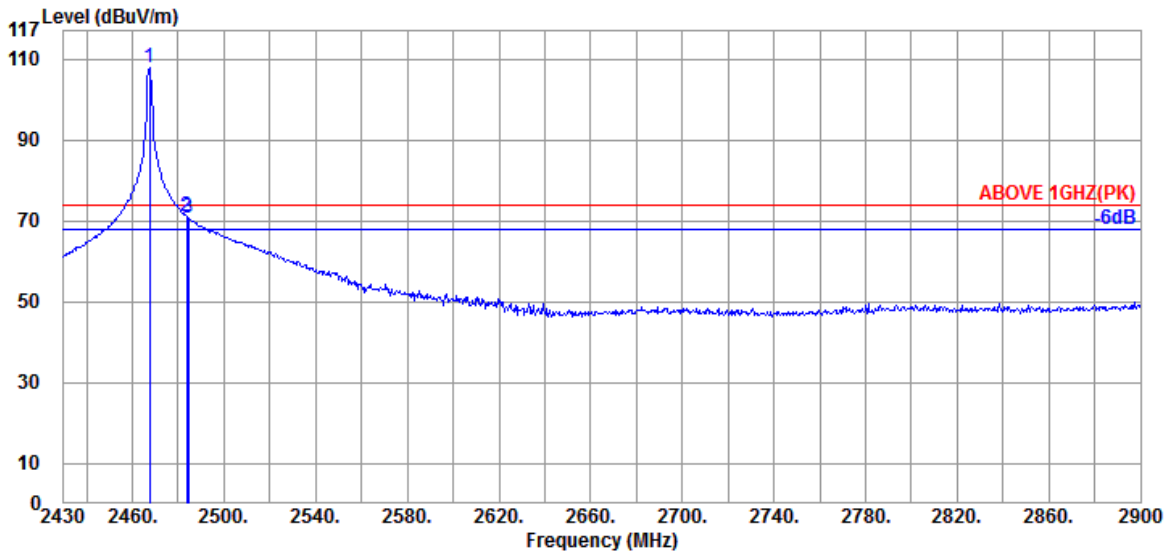


Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2389.680	32.00	8.52	34.58	55.36	61.30	74.00	12.70	Peak
2390.040	32.00	8.52	34.58	55.28	61.22	74.00	12.78	Peak
2407.560	32.23	8.53	34.59	91.38	97.55	---	---	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
2389.680	61.30	-27.17	34.13	54.00	19.87	Average
2390.040	61.22	-27.17	34.05	54.00	19.95	Average

Mode	FHSS	Frequency	TX 2467.5MHz
Antenna Model	ANTB24-073A0		

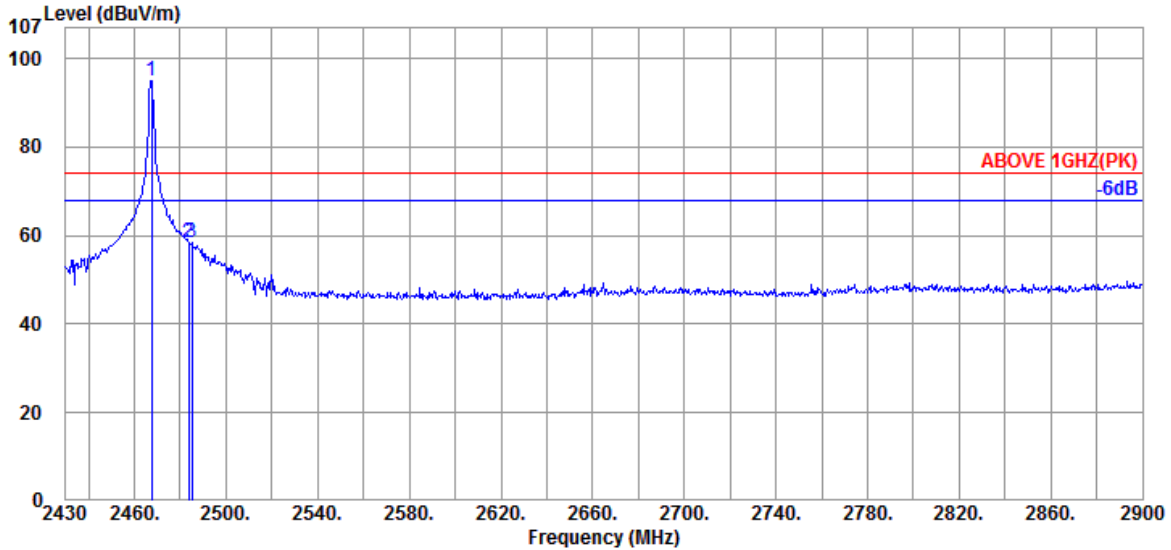


Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2467.600	32.63	8.57	34.60	101.26	107.86	---	---	Peak
2483.580	32.57	8.58	34.61	64.61	71.15	74.00	2.85	Peak
2484.520	32.57	8.58	34.61	64.05	70.59	74.00	3.41	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
2483.580	71.15	-27.17	43.98	54.00	10.02	Average
2484.520	70.59	-27.17	43.42	54.00	10.58	Average

Mode	FHSS	Frequency	TX 2467.5MHz
Antenna Model	ANTB24-073A0		



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2467.600	32.63	8.57	34.60	88.43	95.03	---	---	Peak
2483.580	32.57	8.58	34.61	51.76	58.30	74.00	15.70	Peak
2484.990	32.57	8.58	34.61	51.75	58.29	74.00	15.71	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
2483.580	58.30	-27.17	31.13	54.00	22.87	Average
2484.990	58.29	-27.17	31.12	54.00	22.88	Average

A.2.2 Emissions outside the frequency band:

The emissions (up to 25GHz) not reported for there is no emission be found.

Mode	FHSS	Frequency	TX 2407.5MHz
Antenna Model	ANT-2.4-CW-RH-RPS		

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
4814.000	33.90	10.22	34.47	41.74	51.39	74.00	22.61	Peak
7223.000	35.70	12.06	34.60	35.08	48.24	74.00	25.76	Peak
9630.000	37.13	14.38	35.19	41.20	57.52	74.00	16.48	Peak
12040.000	38.90	15.86	34.66	37.46	57.56	74.00	16.44	Peak

Emission Frequency (MHz)	Peak Emission Level (dB μ V/m)	DCCF (dB)	Average Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
4814.000	51.39	-27.17	24.22	54.00	29.78	Average
7223.000	48.24	-27.17	21.07	54.00	32.93	Average
9630.000	57.52	-27.17	30.35	54.00	23.65	Average
12040.000	57.56	-27.17	30.39	54.00	23.61	Average

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
4814.000	33.90	10.22	34.47	42.82	52.47	74.00	21.53	Peak
7223.000	35.70	12.06	34.60	34.60	47.76	74.00	26.24	Peak
9630.000	37.13	14.38	35.19	39.54	55.86	74.00	18.14	Peak
12040.000	38.90	15.86	34.66	37.69	57.79	74.00	16.21	Peak

Emission Frequency (MHz)	Peak Emission Level (dB μ V/m)	DCCF (dB)	Average Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
4814.000	52.47	-27.17	25.30	54.00	28.70	Average
7223.000	47.76	-27.17	20.59	54.00	33.41	Average
9630.000	55.86	-27.17	28.69	54.00	25.31	Average
12040.000	57.79	-27.17	30.62	54.00	23.38	Average

Mode	FHSS	Frequency	TX 2437.5MHz
Antenna Model	ANT-2.4-CW-RH-RPS		

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4876.000	34.37	10.24	34.46	37.20	47.35	74.00	26.65	Peak
7313.000	35.90	12.11	34.68	39.15	52.48	74.00	21.52	Peak
9750.000	37.10	14.43	35.18	38.68	55.03	74.00	18.97	Peak
12190.000	38.98	15.97	34.53	37.25	57.67	74.00	16.33	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
4876.000	47.35	-27.17	20.18	54.00	33.82	Average
7313.000	52.48	-27.17	25.31	54.00	28.69	Average
9750.000	55.03	-27.17	27.86	54.00	26.14	Average
12190.000	57.67	-27.17	30.50	54.00	23.50	Average

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4874.000	34.37	10.24	34.46	42.15	52.30	74.00	21.70	Peak
7313.000	35.90	12.11	34.68	34.92	48.25	74.00	25.75	Peak
9750.000	37.10	14.43	35.18	41.44	57.79	74.00	16.21	Peak
12190.000	38.98	15.97	34.53	37.84	58.26	74.00	15.74	Peak
16070.000	40.97	18.30	34.82	42.75	67.20	74.00	6.80	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
4874.000	52.30	-27.17	25.13	54.00	28.87	Average
7313.000	48.25	-27.17	21.08	54.00	32.92	Average
9750.000	57.79	-27.17	30.62	54.00	23.38	Average
12190.000	58.26	-27.17	31.09	54.00	22.91	Average
16070.000	67.20	-27.17	40.03	54.00	13.97	Average

Mode	FHSS	Frequency	TX 2467.5MHz
Antenna Model	ANT-2.4-CW-RH-RPS		

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4934.000	34.43	10.26	34.44	44.64	54.89	74.00	19.11	Peak
7403.000	35.90	12.16	34.76	44.42	57.72	74.00	16.28	Peak
9870.000	37.33	14.48	35.18	37.08	53.71	74.00	20.29	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
4934.000	54.89	-27.17	27.72	54.00	26.28	Average
7403.000	57.72	-27.17	30.55	54.00	23.45	Average
9870.000	53.71	-27.17	26.54	54.00	27.46	Average

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4934.000	34.43	10.26	34.44	48.44	58.69	74.00	15.31	Peak
7403.000	35.90	12.16	34.76	42.03	55.33	74.00	18.67	Peak
9870.000	37.33	14.48	35.18	36.91	53.54	74.00	20.46	Peak
12340.000	39.00	16.07	34.40	33.13	53.80	74.00	20.20	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
4934.000	58.69	-27.17	31.52	54.00	22.48	Average
7403.000	55.33	-27.17	28.16	54.00	25.84	Average
9870.000	53.54	-27.17	26.37	54.00	27.63	Average
12340.000	53.80	-27.17	26.63	54.00	27.37	Average

Mode	FHSS	Frequency	TX 2407.5MHz
Antenna Model	ANT-2.4-WRT-RPS		

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4814.000	33.90	10.22	34.47	43.49	53.14	74.00	20.86	Peak
7223.000	35.70	12.06	34.60	39.37	52.53	74.00	21.47	Peak
9630.000	37.13	14.38	35.19	44.52	60.84	74.00	13.16	Peak
12040.000	38.90	15.86	34.66	35.40	55.50	74.00	18.50	Peak
16090.000	41.00	18.35	34.76	35.15	59.74	74.00	14.26	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
4814.000	53.14	-27.17	25.97	54.00	28.03	Average
7223.000	52.53	-27.17	25.36	54.00	28.64	Average
9630.000	60.84	-27.17	33.67	54.00	20.33	Average
12040.000	55.50	-27.17	28.33	54.00	25.67	Average
16090.000	59.74	-27.17	32.57	54.00	21.43	Average

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4814.000	33.90	10.22	34.47	47.26	56.91	74.00	17.09	Peak
7223.000	35.70	12.06	34.60	40.56	53.72	74.00	20.28	Peak
9630.000	37.13	14.38	35.19	42.09	58.41	74.00	15.59	Peak
12040.000	38.90	15.86	34.66	42.86	62.96	74.00	11.04	Peak
16090.000	41.00	18.35	34.76	39.70	64.29	74.00	9.71	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
4814.000	56.91	-27.17	29.74	54.00	24.26	Average
7223.000	53.72	-27.17	26.55	54.00	27.45	Average
9630.000	58.41	-27.17	31.24	54.00	22.76	Average
12040.000	62.96	-27.17	35.79	54.00	18.21	Average
16090.000	64.29	-27.17	37.12	54.00	16.88	Average

Mode	FHSS	Frequency	TX 2437.5MHz
Antenna Model	ANT-2.4-WRT-RPS		

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
4874.000	34.37	10.24	34.46	46.49	56.64	74.00	17.36	Peak
7313.000	35.90	12.11	34.68	44.76	58.09	74.00	15.91	Peak
9750.000	37.10	14.43	35.18	46.67	63.02	74.00	10.98	Peak
12190.000	38.98	15.97	34.53	36.65	57.07	74.00	16.93	Peak
16090.000	41.00	18.35	34.76	35.30	59.89	74.00	14.11	Peak

Emission Frequency (MHz)	Peak Emission Level (dB μ V/m)	DCCF (dB)	Average Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
4874.000	56.64	-27.17	29.47	54.00	24.53	Average
7313.000	58.09	-27.17	30.92	54.00	23.08	Average
9750.000	63.02	-27.17	35.85	54.00	18.15	Average
12190.000	57.07	-27.17	29.90	54.00	24.10	Average
16090.000	59.89	-27.17	32.72	54.00	21.28	Average

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
4874.000	34.37	10.24	34.46	49.31	59.46	74.00	14.54	Peak
7313.000	35.90	12.11	34.68	45.15	58.48	74.00	15.52	Peak
9750.000	37.10	14.43	35.18	44.55	60.90	74.00	13.10	Peak
12190.000	38.98	15.97	34.53	41.12	61.54	74.00	12.46	Peak
16090.000	41.00	18.35	34.76	45.61	70.20	74.00	3.80	Peak

Emission Frequency (MHz)	Peak Emission Level (dB μ V/m)	DCCF (dB)	Average Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
4874.000	59.46	-27.17	32.29	54.00	21.71	Average
7313.000	58.48	-27.17	31.31	54.00	22.69	Average
9750.000	60.90	-27.17	33.73	54.00	20.27	Average
12190.000	61.54	-27.17	34.37	54.00	19.63	Average
16090.000	70.20	-27.17	43.03	54.00	10.97	Average

Mode	FHSS	Frequency	TX 2467.5MHz
Antenna Model	ANT-2.4-WRT-RPS		

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4934.000	34.43	10.26	34.44	45.90	56.15	74.00	17.85	Peak
7403.000	35.90	12.16	34.76	42.85	56.15	74.00	17.85	Peak
9870.000	37.33	14.48	35.18	39.50	56.13	74.00	17.87	Peak
16070.000	40.97	18.30	34.82	36.12	60.57	74.00	13.43	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
4934.000	56.15	-27.17	28.98	54.00	25.02	Average
7403.000	56.15	-27.17	28.98	54.00	25.02	Average
9870.000	56.13	-27.17	28.96	54.00	25.04	Average
16070.000	60.57	-27.17	33.40	54.00	20.60	Average

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4934.000	34.43	10.26	34.44	49.32	59.57	74.00	14.43	Peak
7403.000	35.90	12.16	34.76	43.17	56.47	74.00	17.53	Peak
9870.000	37.33	14.48	35.18	33.92	50.55	74.00	23.45	Peak
16080.000	40.98	18.32	34.76	40.91	65.45	74.00	8.55	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
4934.000	59.57	-27.17	32.40	54.00	21.60	Average
7403.000	56.47	-27.17	29.30	54.00	24.70	Average
9870.000	50.55	-27.17	23.38	54.00	30.62	Average
16080.000	65.45	-27.17	38.28	54.00	15.72	Average

Mode	FHSS	Frequency	TX 2407.5MHz
Antenna Model	TNHW 2450 RP		

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
4814.000	33.90	10.22	34.47	57.86	67.51	74.00	6.49	Peak
7223.000	35.70	12.06	34.60	47.66	60.82	74.00	13.18	Peak
9630.000	37.13	14.38	35.19	39.07	55.39	74.00	18.61	Peak
12040.000	38.90	15.86	34.66	35.57	55.67	74.00	18.33	Peak
16080.000	40.98	18.32	34.76	44.44	68.98	74.00	5.02	Peak

Emission Frequency (MHz)	Peak Emission Level (dB μ V/m)	DCCF (dB)	Average Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
4814.000	67.51	-27.17	40.34	54.00	13.66	Average
7223.000	60.82	-27.17	33.65	54.00	20.35	Average
9630.000	55.39	-27.17	28.22	54.00	25.78	Average
12040.000	55.67	-27.17	28.50	54.00	25.50	Average
16080.000	68.98	-27.17	41.81	54.00	12.19	Average

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
4814.000	33.90	10.22	34.47	56.56	66.21	74.00	7.79	Peak
7223.000	35.70	12.06	34.60	47.84	61.00	74.00	13.00	Peak
9630.000	37.13	14.38	35.19	40.69	57.01	74.00	16.99	Peak
12040.000	38.90	15.86	34.66	45.53	65.63	74.00	8.37	Peak
14440.000	39.50	17.38	33.58	37.48	60.78	74.00	13.22	Peak

Emission Frequency (MHz)	Peak Emission Level (dB μ V/m)	DCCF (dB)	Average Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
4814.000	66.21	-27.17	39.04	54.00	14.96	Average
7223.000	61.00	-27.17	33.83	54.00	20.17	Average
9630.000	57.01	-27.17	29.84	54.00	24.16	Average
12040.000	65.63	-27.17	38.46	54.00	15.54	Average
14440.000	60.78	-27.17	33.61	54.00	20.39	Average

Mode	FHSS	Frequency	TX 2437.5MHz
Antenna Model	TNHW 2450 RP		

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
4874.000	34.37	10.24	34.46	54.56	64.71	74.00	9.29	Peak
7313.000	35.90	12.11	34.68	52.22	65.55	74.00	8.45	Peak
9750.000	37.10	14.43	35.18	42.00	58.35	74.00	15.65	Peak
12190.000	38.98	15.97	34.53	33.62	54.04	74.00	19.96	Peak
16080.000	40.98	18.32	34.76	36.72	61.26	74.00	12.74	Peak

Emission Frequency (MHz)	Peak Emission Level (dB μ V/m)	DCCF (dB)	Average Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
4874.000	64.71	-27.17	37.54	54.00	16.46	Average
7313.000	65.55	-27.17	38.38	54.00	15.62	Average
9750.000	58.35	-27.17	31.18	54.00	22.82	Average
12190.000	54.04	-27.17	26.87	54.00	27.13	Average
16080.000	61.26	-27.17	34.09	54.00	19.91	Average

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
4874.000	34.37	10.24	34.46	55.16	65.31	74.00	8.69	Peak
7313.000	35.90	12.11	34.68	49.80	63.13	74.00	10.87	Peak
9750.000	37.10	14.43	35.18	42.40	58.75	74.00	15.25	Peak
12190.000	38.98	15.97	34.53	38.96	59.38	74.00	14.62	Peak
14620.000	39.52	17.47	33.75	37.95	61.19	74.00	12.81	Peak
16080.000	40.98	18.32	34.76	46.99	71.53	74.00	2.47	Peak

Emission Frequency (MHz)	Peak Emission Level (dB μ V/m)	DCCF (dB)	Average Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
4874.000	65.31	-27.17	38.14	54.00	15.86	Average
7313.000	63.13	-27.17	35.96	54.00	18.04	Average
9750.000	58.75	-27.17	31.58	54.00	22.42	Average
12190.000	59.38	-27.17	32.21	54.00	21.79	Average
14620.000	61.19	-27.17	34.02	54.00	19.98	Average
16080.000	71.53	-27.17	44.36	54.00	9.64	Average

Mode	FHSS	Frequency	TX 2467.5MHz
Antenna Model	TNHW 2450 RP		

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
4934.000	34.43	10.26	34.44	51.42	61.67	74.00	12.33	Peak
7403.000	35.90	12.16	34.76	48.21	61.51	74.00	12.49	Peak
9870.000	37.33	14.48	35.18	35.76	52.39	74.00	21.61	Peak
16080.000	40.98	18.32	34.76	35.74	60.28	74.00	13.72	Peak

Emission Frequency (MHz)	Peak Emission Level (dB μ V/m)	DCCF (dB)	Average Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
4934.000	61.67	-27.17	34.50	54.00	19.50	Average
7403.000	61.51	-27.17	34.34	54.00	19.66	Average
9870.000	52.39	-27.17	25.22	54.00	28.78	Average
16080.000	60.28	-27.17	33.11	54.00	20.89	Average

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
4934.000	34.43	10.26	34.44	53.22	63.47	74.00	10.53	Peak
7403.000	35.90	12.16	34.76	47.63	60.93	74.00	13.07	Peak
9870.000	37.33	14.48	35.18	37.73	54.36	74.00	19.64	Peak
12340.000	39.00	16.07	34.40	33.01	53.68	74.00	20.32	Peak
14800.000	39.70	17.57	33.88	34.67	58.06	74.00	15.94	Peak
16080.000	40.98	18.32	34.76	46.03	70.57	74.00	3.43	Peak

Emission Frequency (MHz)	Peak Emission Level (dB μ V/m)	DCCF (dB)	Average Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
4934.000	63.47	-27.17	36.30	54.00	17.70	Average
7403.000	60.93	-27.17	33.76	54.00	20.24	Average
9870.000	54.36	-27.17	27.19	54.00	26.81	Average
12340.000	53.68	-27.17	26.51	54.00	27.49	Average
14800.000	58.06	-27.17	30.89	54.00	23.11	Average
16080.000	70.57	-27.17	43.40	54.00	10.60	Average

Mode	FHSS	Frequency	TX 2407.5MHz
Antenna Model	ANTB24-073A0		

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4814.000	33.90	10.22	34.47	44.11	53.76	74.00	20.24	Peak
7223.000	35.70	12.06	34.60	35.17	48.33	74.00	25.67	Peak
9630.000	37.13	14.38	35.19	45.29	61.61	74.00	12.39	Peak
12040.000	38.90	15.86	34.66	39.12	59.22	74.00	14.78	Peak
16080.000	40.98	18.32	34.76	36.43	60.97	74.00	13.03	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
4814.000	53.76	-27.17	26.59	54.00	27.41	Average
7223.000	48.33	-27.17	21.16	54.00	32.84	Average
9630.000	61.61	-27.17	34.44	54.00	19.56	Average
12040.000	59.22	-27.17	32.05	54.00	21.95	Average
16080.000	60.97	-27.17	33.80	54.00	20.20	Average

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4814.000	33.90	10.22	34.47	44.92	54.57	74.00	19.43	Peak
7223.000	35.70	12.06	34.60	37.62	50.78	74.00	23.22	Peak
9630.000	37.13	14.38	35.19	42.46	58.78	74.00	15.22	Peak
12040.000	38.90	15.86	34.66	38.80	58.90	74.00	15.10	Peak
16060.000	40.97	18.30	34.82	36.67	61.12	74.00	12.88	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
4814.000	54.57	-27.17	27.40	54.00	26.60	Average
7223.000	50.78	-27.17	23.61	54.00	30.39	Average
9630.000	58.78	-27.17	31.61	54.00	22.39	Average
12040.000	58.90	-27.17	31.73	54.00	22.27	Average
16060.000	61.12	-27.17	33.95	54.00	20.05	Average

Mode	FHSS	Frequency	TX 2437.5MHz
Antenna Model	ANTB24-073A0		

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4874.000	34.37	10.24	34.46	43.64	53.79	74.00	20.21	Peak
7313.000	35.90	12.11	34.68	39.72	53.05	74.00	20.95	Peak
9750.000	37.10	14.43	35.18	51.02	67.37	74.00	6.63	Peak
12190.000	38.98	15.97	34.53	35.56	55.98	74.00	18.02	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
4874.000	53.79	-27.17	26.62	54.00	27.38	Average
7313.000	53.05	-27.17	25.88	54.00	28.12	Average
9750.000	67.37	-27.17	40.20	54.00	13.80	Average
12190.000	55.98	-27.17	28.81	54.00	25.19	Average

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4874.000	34.37	10.24	34.46	46.66	56.81	74.00	17.19	Peak
7313.000	35.90	12.11	34.68	40.93	54.26	74.00	19.74	Peak
9750.000	37.10	14.43	35.18	44.57	60.92	74.00	13.08	Peak
12190.000	38.98	15.97	34.53	39.05	59.47	74.00	14.53	Peak
16060.000	40.97	18.30	34.82	40.66	65.11	74.00	8.89	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
4874.000	56.81	-27.17	29.64	54.00	24.36	Average
7313.000	54.26	-27.17	27.09	54.00	26.91	Average
9750.000	60.92	-27.17	33.75	54.00	20.25	Average
12190.000	59.47	-27.17	32.30	54.00	21.70	Average
16060.000	65.11	-27.17	37.94	54.00	16.06	Average

Mode	FHSS	Frequency	TX 2467.5MHz
Antenna Model	ANTB24-073A0		

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4934.000	34.43	10.26	34.44	46.84	57.09	74.00	16.91	Peak
7403.000	35.90	12.16	34.76	43.96	57.26	74.00	16.74	Peak
9870.000	37.33	14.48	35.18	41.57	58.20	74.00	15.80	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
4934.000	57.09	-27.17	29.92	54.00	24.08	Average
7403.000	57.26	-27.17	30.09	54.00	23.91	Average
9870.000	58.20	-27.17	31.03	54.00	22.97	Average

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4934.000	34.43	10.26	34.44	50.89	61.14	74.00	12.86	Peak
7403.000	35.90	12.16	34.76	44.53	57.83	74.00	16.17	Peak
9870.000	37.33	14.48	35.18	38.14	54.77	74.00	19.23	Peak
12340.000	39.00	16.07	34.40	35.46	56.13	74.00	17.87	Peak
16070.000	40.97	18.30	34.82	44.20	68.65	74.00	5.35	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
4934.000	61.14	-27.17	33.97	54.00	20.03	Average
7403.000	57.83	-27.17	30.66	54.00	23.34	Average
9870.000	54.77	-27.17	27.60	54.00	26.40	Average
12340.000	56.13	-27.17	28.96	54.00	25.04	Average
16070.000	68.65	-27.17	41.48	54.00	12.52	Average

A.2.3 Emissions in Non-restricted Frequency Bands:

All emission levels below the FCC 15.209(a)/RSS-Gen Section 8.9 table 4 general radiated emissions limits is not required.

A.3 20dB/OCCUPIED BANDWIDTH

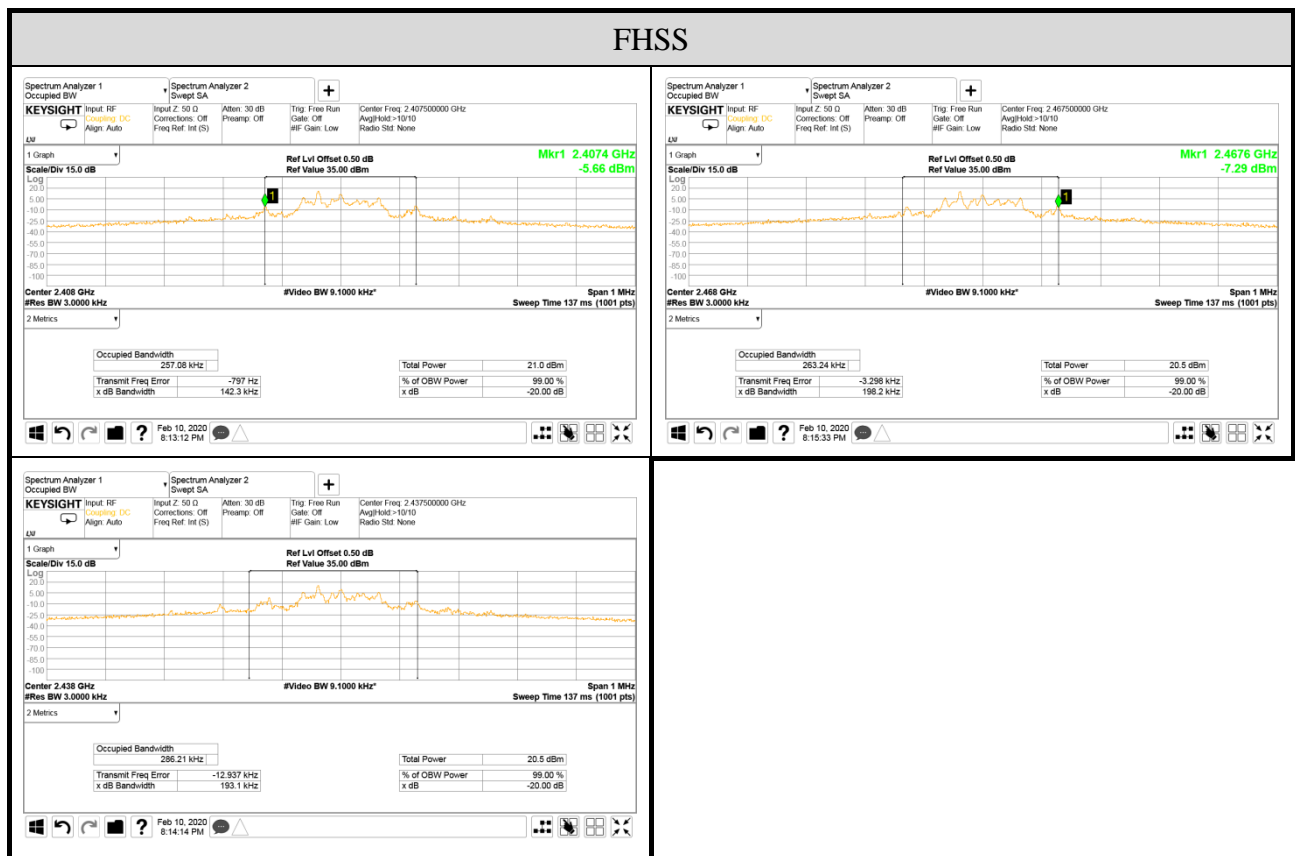
Test Date	2020/02/10	Temp./Hum.	16°C/61%
Cable Loss	0.50dB	Tested By	Sam Chang
Test Voltage	DC 5V (Via DC Power Supply)	Test Model	FEX02TB

A.3.1 Emission Bandwidth Result

Mode	Centre Frequency (MHz)	20 dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit 2/3 (20dB Bandwidth)
FHSS	2407.5	0.1423	0.25708	0.095
	2437.5	0.1931	0.28621	0.129
	2467.5	0.19820	0.26324	0.132

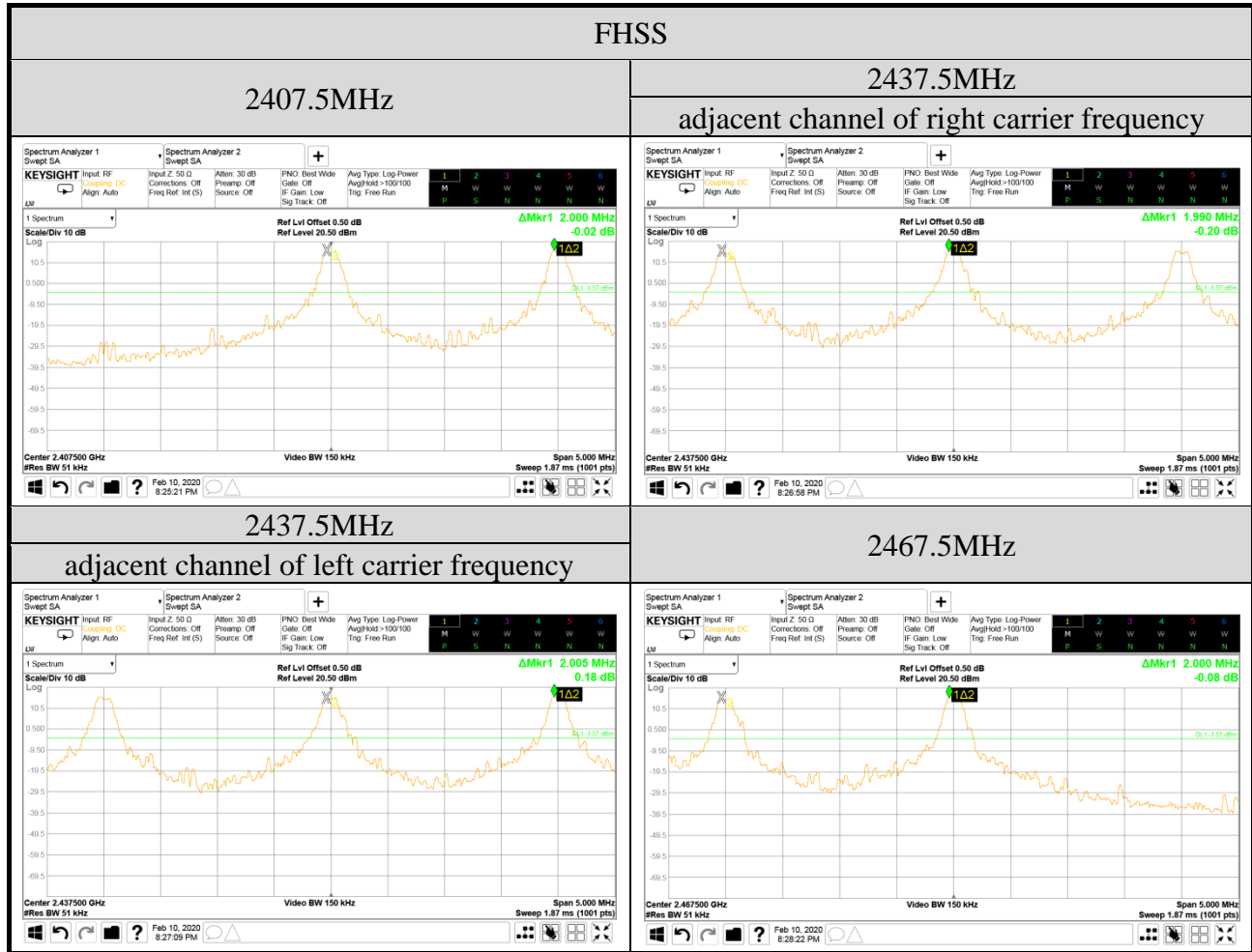
Remark: The maximum two-thirds of the 20dB bandwidth shall be at maximum 0.132MHz.

A.3.2 Measurement Plots



A.4 CARRIER FREQUENCY SEPARATION

Test Date	2020/02/10	Temp./Hum.	16°C/61%
Cable Loss	0.50dB	Tested By	Sam Chang
Test Voltage	DC 5V (Via DC Power Supply)	Test Model	FEX02TB



A.5 TIME OF OCCUPANCY

Test Date	2020/02/10	Temp./Hum.	16°C/61%
Cable Loss	0.50dB	Tested By	Sam Chang
Test Voltage	DC 5V (Via DC Power Supply)	Test Model	FEX02TB

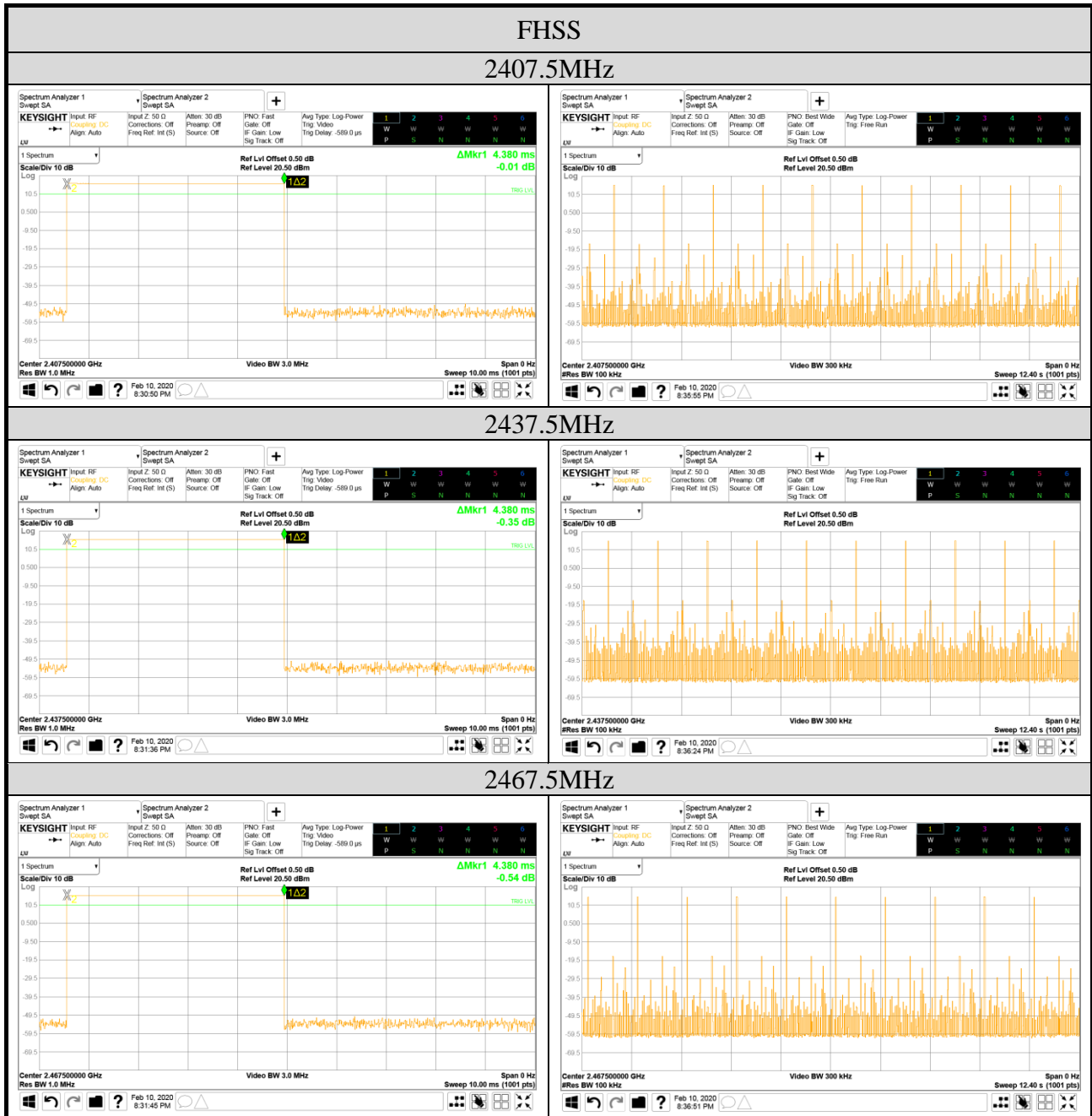
A.5.1 Time of Occupancy

Mode	Centre Frequency (MHz)	Each observation period appearance transmissio	Time of Occupancy (ms)	Maximum accumulated Time of Occupancy (ms)	Limit (ms)
FHSS	2407.5	10	4.38	43.80	<400
	2437.5	10	4.38	43.80	<400
	2467.5	10	4.38	43.80	<400

Observation Period:

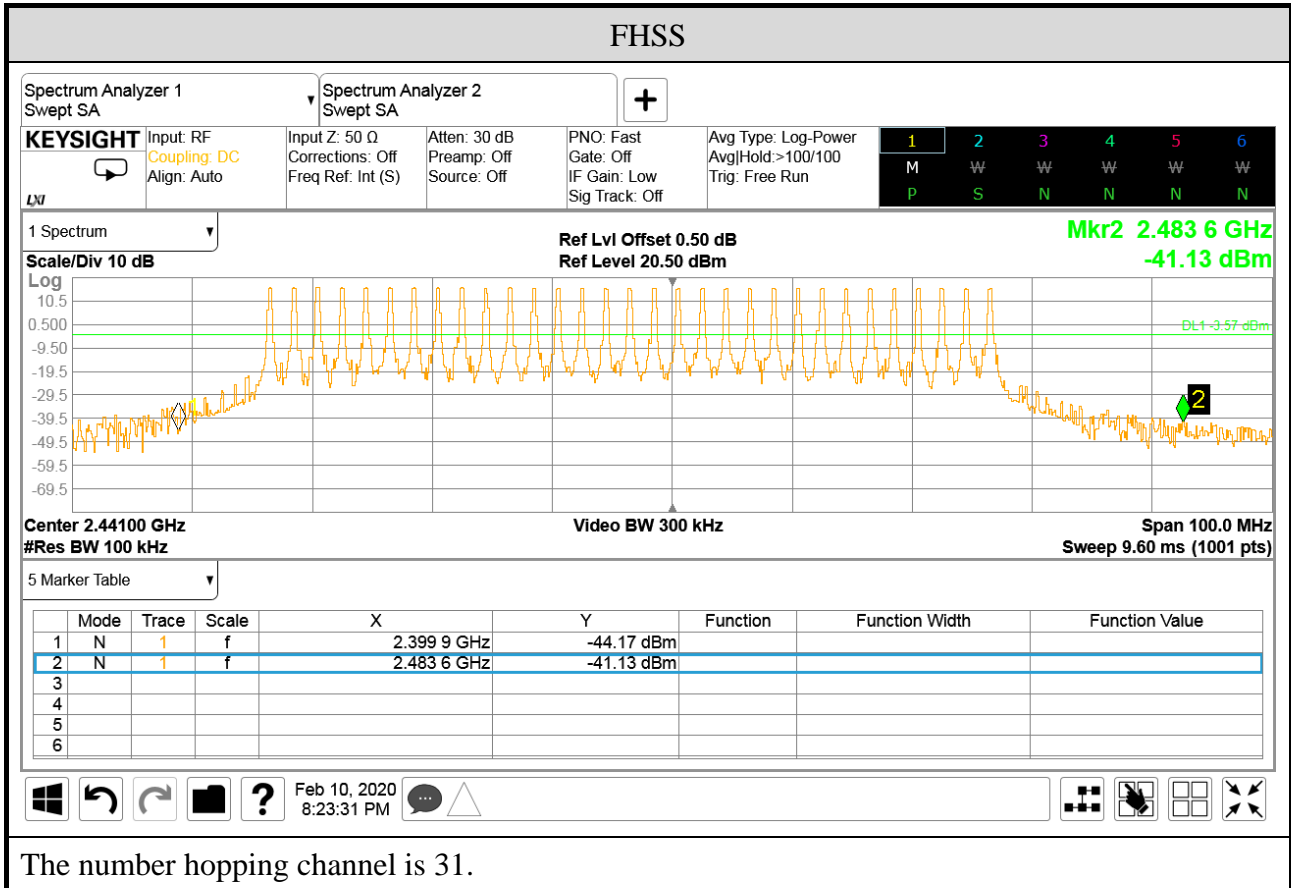
31 channels* **0.4** seconds= **12.4** seconds**Centre Frequency: 2407.5MHz**For each observation period **10** transmission appearance,the longest time of occupancy is **10** channels **12.4 /12.4* 4.38** ms= **43.80** ms (<400ms)**Centre Frequency: 2437.5MHz**For each observation period **10** transmission appearance,the longest time of occupancy is **10** channels **12.4 /12.4* 4.38** ms= **43.80** ms (<400ms)**Centre Frequency: 2467.5MHz**For each observation period **10** transmission appearance,the longest time of occupancy is **10** channels **12.4 /12.4* 4.38** ms= **43.80** ms (<400ms)

A.5.2 Measurement Plots



A.6 NUMBER OF HOPPING CHANNELS

Test Date	2020/02/10	Temp./Hum.	16°C/61%
Cable Loss	0.50dB	Tested By	Sam Chang
Test Voltage	DC 5V (Via DC Power Supply)	Test Model	FEX02TB



A.7 MAXIMUM PEAK OUTPUT POWER

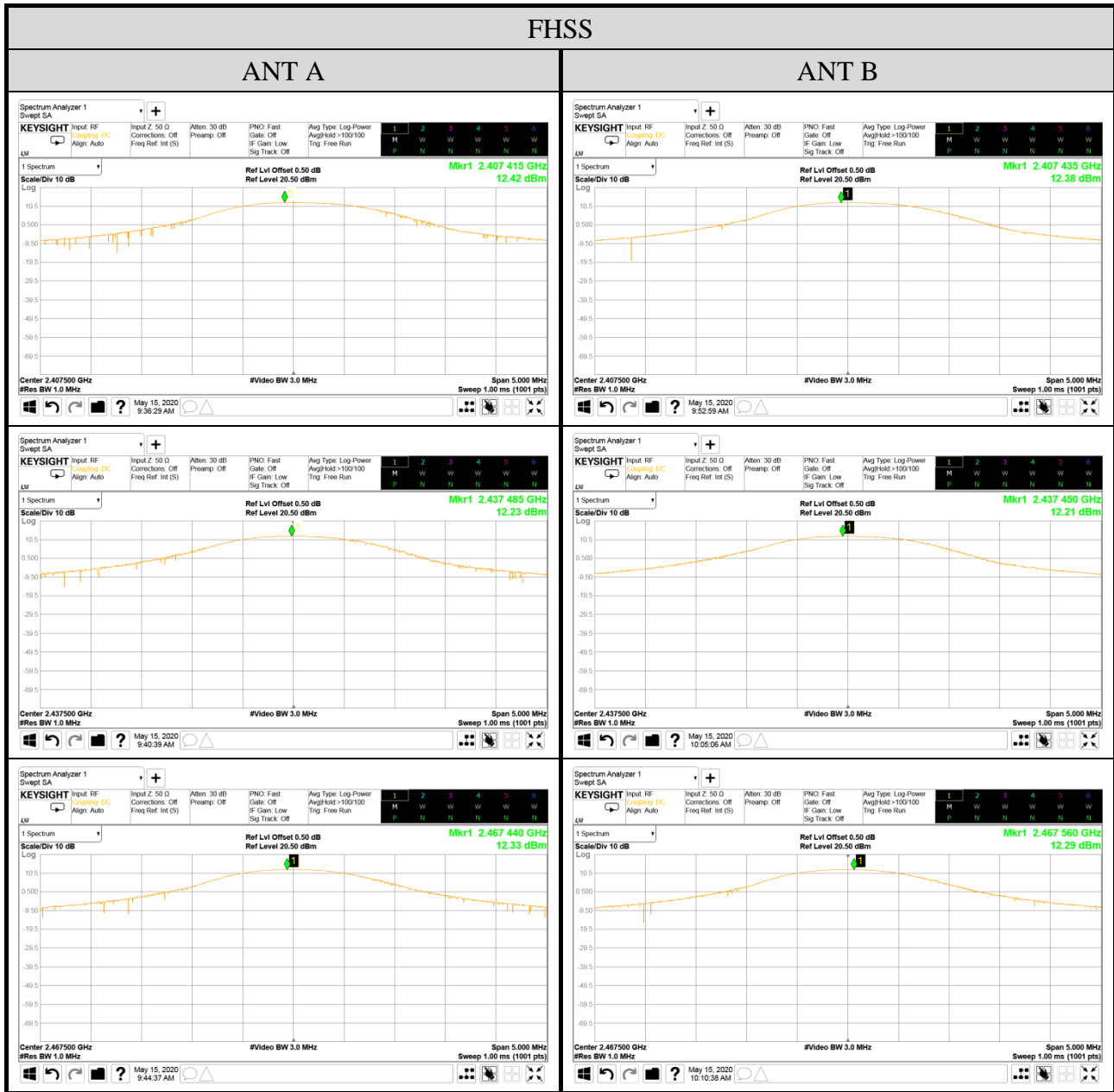
Test Date	2020/05/15	Temp./Hum.	25°C/48%
Cable Loss	0.50dB	Tested By	Sam Chang
Test Voltage	DC 5V (Via DC Power Supply)	Test Model	FEX02TB

A.7.1 Maximum Peak Output Power

Mode	Antenna	Centre Frequency (MHz)	Peak Output Power		Limit
			dBm	W	
FHSS	ANT A	2407.50	12.42	0.017458	21dBm (0.125W)
		2437.50	12.23	0.016711	
		2467.50	12.33	0.017100	

Mode	Antenna	Centre Frequency (MHz)	Peak Output Power		Limit
			dBm	W	
FHSS	ANT B	2407.50	12.38	0.017298	21dBm (0.125W)
		2437.50	12.21	0.016634	
		2467.50	12.29	0.016943	

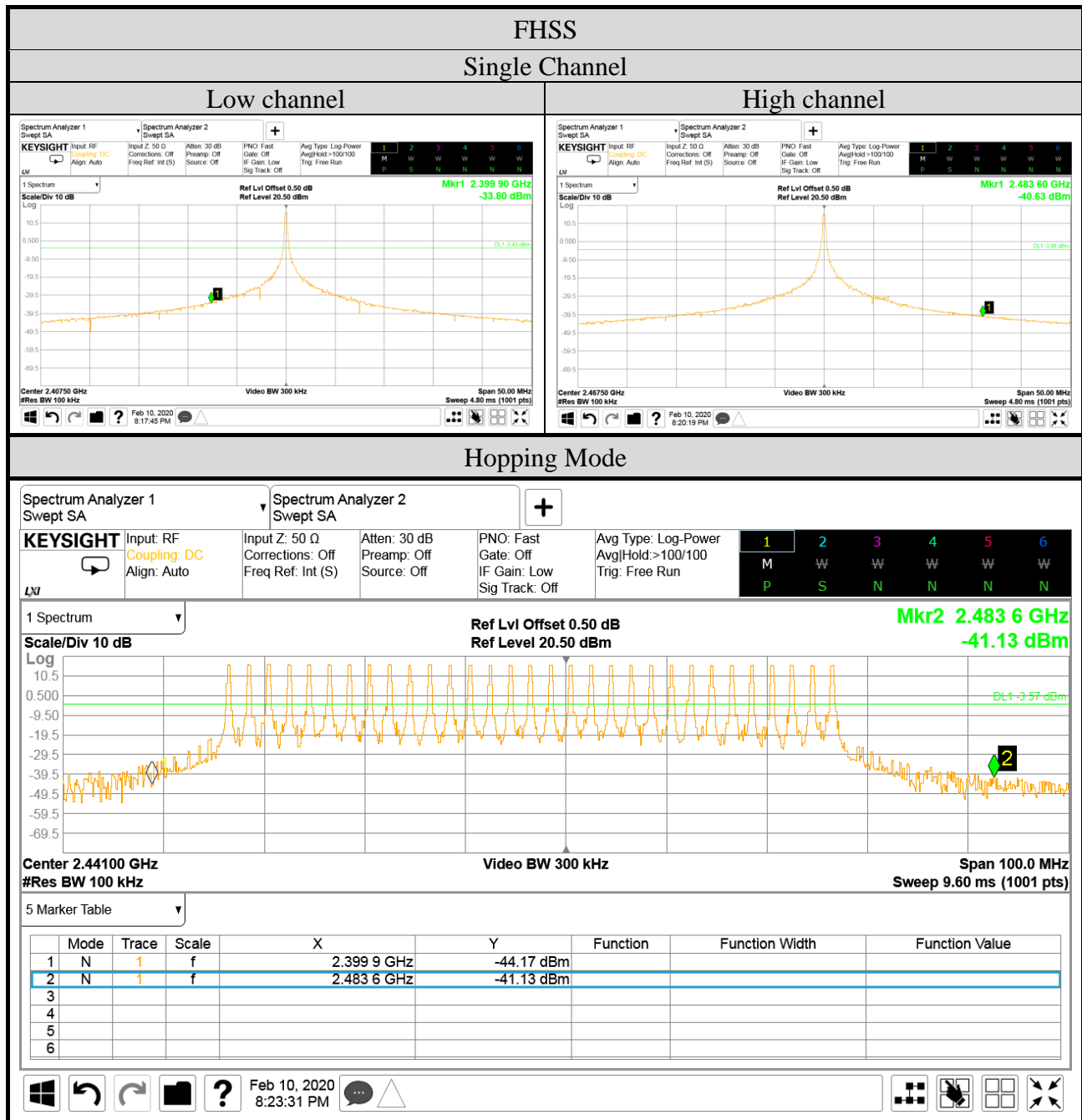
A.7.2 Measurement Plots



A.8 EMISSION LIMITATIONS MEASUREMENT

A.8.1 Band Edge

Test Date	2020/02/10	Temp./Hum.	16°C/61%
Cable Loss	0.50dB	Tested By	Sam Chang
Test Voltage	DC 5V (Via DC Power Supply)	Test Model	FEX02TB

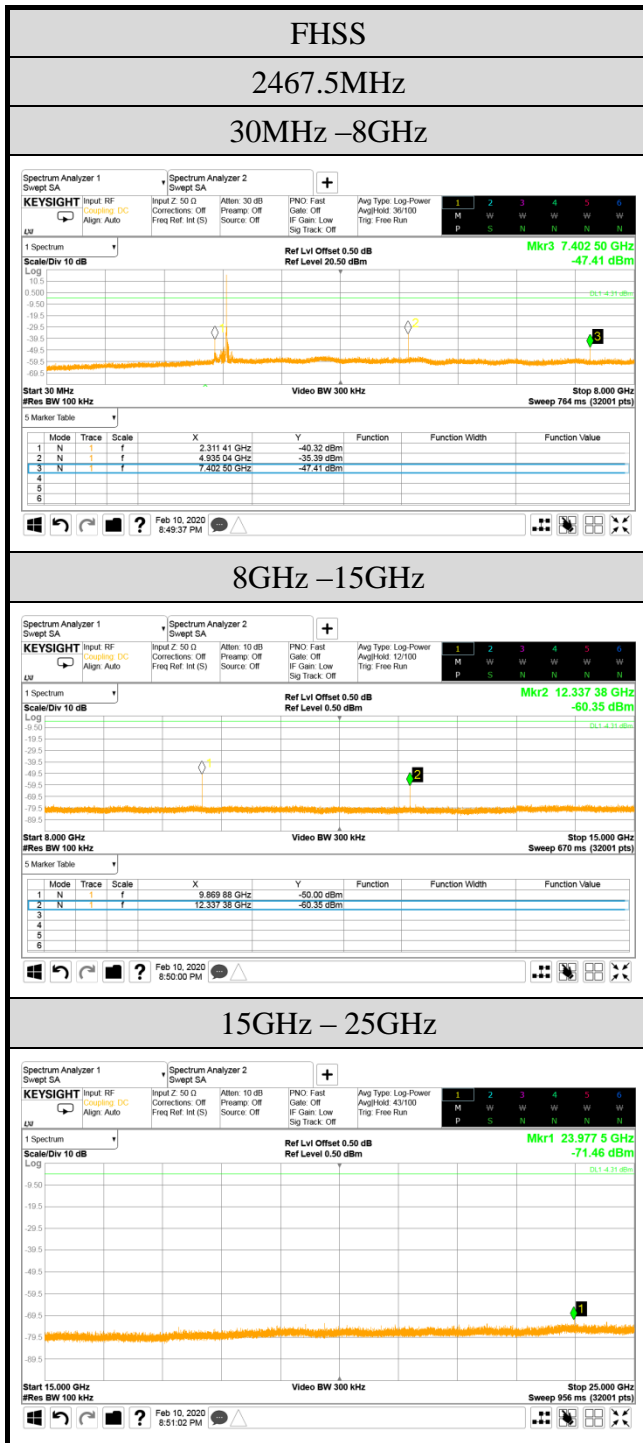


A.8.2 Spurious Emission

Test Date	2020/02/10	Temp./Hum.	16°C/61%
Cable Loss	0.50dB	Tested By	Sam Chang
Test Voltage	DC 5V (Via DC Power Supply)	Test Model	FEX02TB



Note: All results have been included cable loss.





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APPDNDIX B

TEST PHOTOGRAPHS

(Model: FEX02TB)