

FCC 15.247& RSS-247
2.4 GHz Report

for

FUTABA Corporation

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

Brand : Futaba
Product Name : Radio Control Module
Model Name : FEX01TB
FCC ID : AZP-FEX01T
IC : 2914D-FEX01T

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APPENDIX A TEST PLOTS

APPENDIX B TEST PHOTOGRAPHS

TEST REPORT CERTIFICATION

Applicant : FUTABA Corporation
Manufacture : FUTABA Corporation
Product Name : Radio Control Module
Model No. : FEX01TB
Serial No. : N/A
Brand : Futaba
Power Supply : DC 3.3V (Via test jig)

Applicable Standards:

47 CFR FCC Part 15 Subpart C:2015
RSS-Gen (Issue 4), November 2014
RSS-247 (Issue 1), May 2015
ANSI C63.10:2013
FCC Public Notice DA 00-705

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 Test: 2015. 04. 27 ~ 2016. 08. 16

Date of Report: 2016. 08. 22

Producer: 
(Anne Yu/Administrator)

Signatory: 
(Ben Cheng/Manager)

1. REPORT HISTORY

Revision	Date	Revision Summary	Report Number
0	2016. 08. 22	Original Report.	EM-F150538

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	---	Antenna Requirement	PASS

3. GENERAL INFORMATION

3.1. Description of EUT

Product	Radio Control Module
Model Number	FEX01TB
Serial Number	N/A
Brand Name	Futaba
Applicant	FUTABA Corporation 1080 YabutsukaChosei-son Chosei-gun Chiba, 299-4395 Japan.
Manufacture	FUTABA Corporation 1080 YabutsukaChosei-son Chosei-gun Chiba, 299-4395 Japan.
RF Features	FSK (FHSS)
Transmit Type	3 Antennas (diversity)
Device Category	Outdoor Access Point Fixed point-to-point Access Point Indoor Access Point Mobile and Portable client device
Date of Receipt of Sample	2015. 04. 17

3.2. EUT Specifications Assessed in Current Report

Fundamental Range (MHz)	Channel Number	Modulation	Data Rate (Mbps)
2407.5-2467.5	31	FHSS	128

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		

3.3. Antenna Information

Antenna Model Number	Manufacture	Antenna Type	Frequency	Max Gain (dBi)
TNHW 2450 RP	CHILDS ANTENNA COMPANY	Omnidirectional Antenna	2400-2500MHz	2.4
ANT-2.4-CW-RH	Linx	Omnidirectional Antenna	2390-2490MHz	-0.9
ANT-2.4-WRT-SMA	Linx	Dipole Antenna	2400-250MHz	3.5

3.4. Test Configuration

Modulation	T _{on} (ms)	D.C.C.F
FHSS	1.51	-36.42dB

Antenna A		Antenna B	
Test Frequency (MHz)	Output Power (dBm)	Test Frequency (MHz)	Output Power (dBm)
2407.5	16.627	2407.5	16.550
2437.5	16.416	2437.5	16.352
2467.5	16.110	2467.5	16.092

Note: This device has 2 antennas for diversity, they cannot transmit simultaneously. The power of both antennas are above as follow table. We assessed ANT A has worse power, thus all test items presented in this report were test in ANT A.

AC Conduction	
Test Case	Normal operation

	Item	Modulation	Data Rate	Test Channel
Radiated Test Case	Radiated Band Edge ^{Note1}	FHSS	128Mbps	1/31
	Radiated Spurious Emission ^{Note1}	FHSS	128Mbps	1/16/31
Conducted Test Case ^{Note2}	20dB Bandwidth	FHSS	128Mbps	1/16/31
	Carrier Frequency Separation	FHSS	128Mbps	1/16/31
	Time of Occupancy	FHSS	128Mbps	1/16/31
	Number of Hopping Channels	FHSS	128Mbps	16
	Maximum Peak Output Power	FHSS	128Mbps	1/16/31
	Band Edges	FHSS	128Mbps	1/31
	Spurious Emission	FHSS	128Mbps	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: We performed testing of the highest and lowest data rate.

3.5. Tested Supporting System List

3.5.1. Support Peripheral Unit

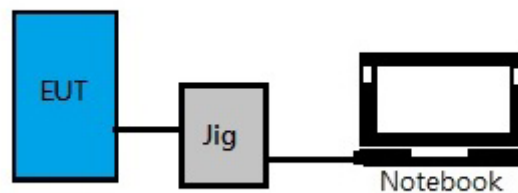
No.	Product	Brand	Model No.	Serial No.	FCC ID
1.	Notebook PC	IBM	2652	99NXMML	ANOVNCBDC8021 1B
2.	Test Jig	N/A	N/A	N/A	N/A
3.	DC Power Supply	TOP WARD	3303A	721773	N/A

3.5.2. Cable Lists

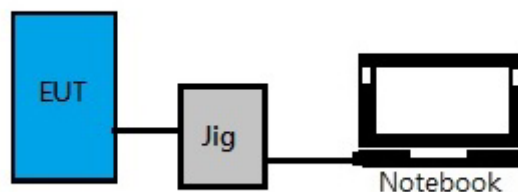
No.	Cable Description Of The Above Support Units
1.	RS232 Cable: Shielded, Detachable, 1.95m Adapter: IBM, M/N 02K6747, DC Cord: Shielded, Undetachable, 1.8m Bonded a ferrite core AC Power Cord: Unshielded, Detachable, 1.0m
2.	Cable: Unshielded, Detachable, 0.05m*4
3.	DC Power Cord*2: Unshielded, Detachable, 0.6+0.8m*2

3.6. Setup Configuration

3.6.1. EUT Configuration for Power Line and Radiated Emission



3.6.2. EUT Configuration for Conducted Test Items



3.7. Operating Condition of EUT

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

3.8. Description of Test Facility

Test Firm Name	:	AUDIX Technology Corporation EMC Department No. 53-11, Dingfu, Linkou Dist., New Taipei City 244, Taiwan
Test Location & Facility	:	No. 8 Shielded Room No. 53-11, Dingfu, Linkou Dist., New Taipei City 244, Taiwan No. 1 3m Semi-Anechoic Chamber & No. 53-11, Dingfu, Linkou Dist., New Taipei City 244, Taiwan, R.O.C. May 06, 2015 Renewal on Federal Communication Commission Registration Number: 90993 IC Test Site Registration No.: 5183B-1 Renewal on September 17, 2014 Fully Anechoic Chamber No. 53-11, Dingfu, Linkou Dist., New Taipei City 244, Taiwan, R.O.C. IC Test Site Registration No.: 5183B-4 Renewal on August 31, 2015
NVLAP Lab. Code	:	200077-0
TAF Accreditation No	:	1724

3.9. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty
Conduction Test	150kHz~30MHz	±3.5dB
Radiation Test (Distance: 3m)	30MHz~300MHz	± 3.64dB
	300MHz~1000MHz	± 0.20dB
	Above 1GHz	± 1.60dB

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 EQUIPMENT LIST

4.1. Conducted Emission Measurement

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Test Receiver	R&S	ESR3	101774	2015. 02. 06	1 Year
2.	A.M.N.	R&S	ENV4200	100169	2015. 05. 08	1 Year
3.	L.I.S.N.	Kyoritsu	KNW-407	8-855-9	2014. 12. 26	1 Year
4.	Pulse Limiter	R&S	ESH3-Z2	100354	2015. 01. 17	1 Year

4.2. Radiated Emission Measurement

4.2.1. Frequency Range 30MHz~1000MHz

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Spectrum Analyzer	Agilent	N9010A-526	MY53400071	2015. 09. 14	1 Year
2.	Test Receiver	R & S	ESCS30	100338	2016. 06. 22	1 Year
3.	Amplifier	HP	8447D	2944A06305	2016. 02. 23	1 Year
4.	Bilog Antenna	TESEQ	CBL6112D	33821	2016. 01. 30	1 Year

4.2.2. Frequency Range 30MHz~1000MHz

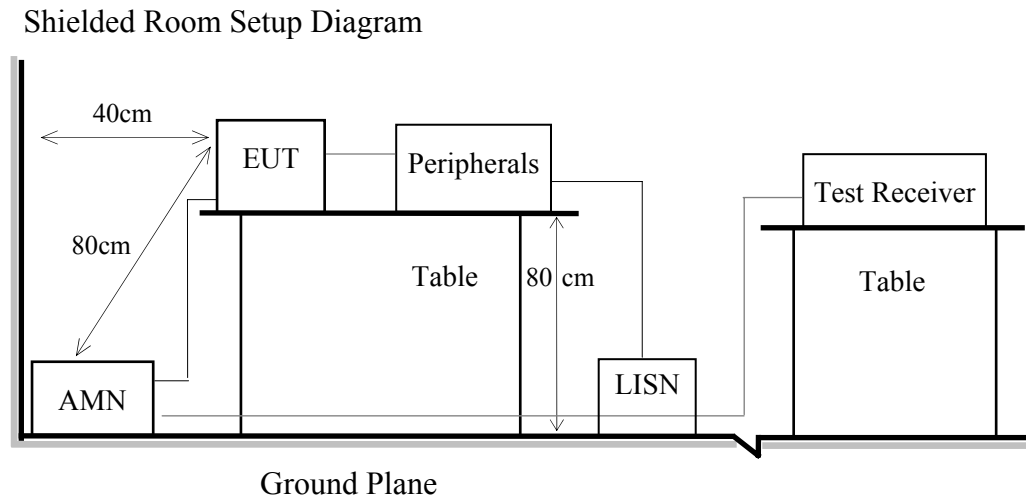
Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Spectrum Analyzer	Agilent	E4446A	US44300366	2015. 08. 20	1 Year
2.	Pre-Amplifier	HP	8449B	3008A02678	2016. 03. 04	1 Year
3.	2.4GHz Notch Filter	K&L	7NSL10-244 1.5E130.5-0 0	1	2016. 07. 27	1 Year
4.	3G High Pass Filter	Microwave Circuits	H3G018G1	484796	2015. 08. 24	1 Year
5.	Horn Antenna	ETS-Lindgr en	3117	00135902	2016. 03. 09	1 Year
6.	Horn Antenna	EMCO	3116	2653	2015. 10. 13	1 Year

4.3. RF Conducted Measurement

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Spectrum Analyzer	Agilent	N9030A-544	US51350140	2015. 07. 10	1 Year

5. CONDUCTED EMISSION MEASUREMENT

5.1. Block Diagram of Test Setup



5.2. Power Line 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

Remark 1.: 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.

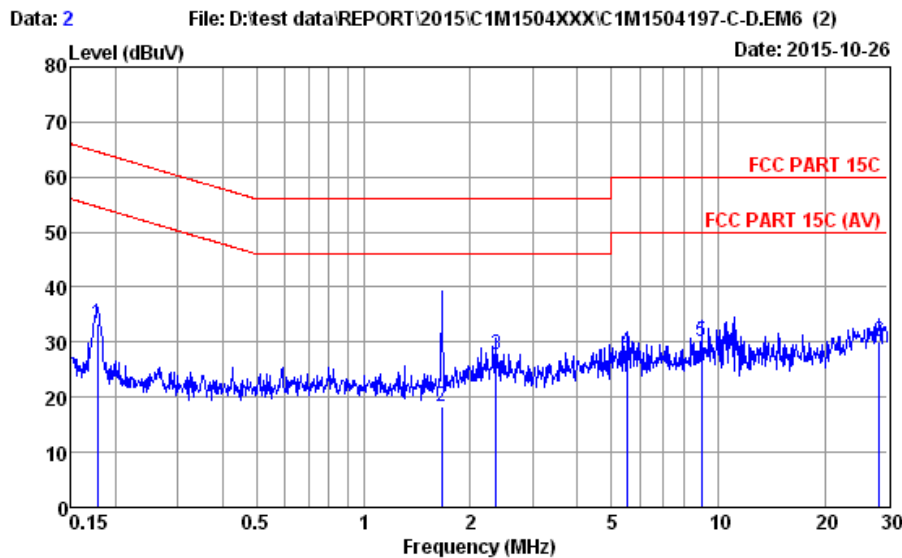
5.3. Test Procedure

- 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 150 kHz to 30 MHz and record the emission which does not have 20 dB below limit.

5.4. Conducted Emission Measurement Results

PASSED.

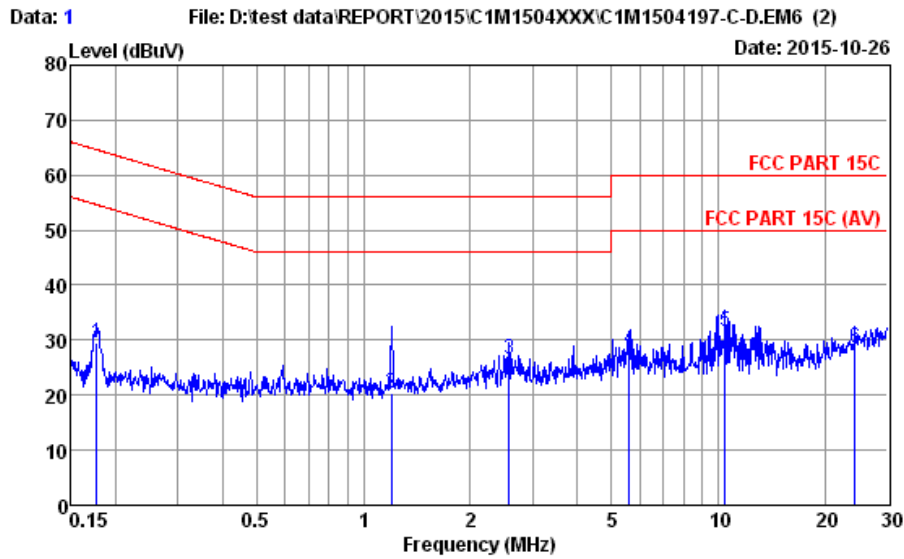
Test Date	2015/10/26	Temp./Hum.	25 /56%
Test Voltage	DC 3.3V		



Site no. : No.8 Shielded Room Data no. : 2
 Condition : ENV4200 100169 Phase : NEUTRAL
 Limit : FCC PART 15C
 Env. / Ins. : 25°C / 56% ESR3 (1774) Engineer : Tim
 EUT : FEX01TB
 Power Rating : DC 3.3V
 Test Mode : Operating

	Freq. (MHz)	AMN Factor (dB)	Cable Loss (dB)	Pulse Att. (dB)	Reading (dBμV)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Remark
1	0.178	11.33	0.03	9.87	12.02	33.25	64.59	31.34	QP
2	1.662	10.99	0.07	9.87	-2.62	18.31	56.00	37.69	QP
3	2.358	11.04	0.09	9.87	6.66	27.66	56.00	28.34	QP
4	5.505	11.49	0.15	9.90	6.71	28.25	60.00	31.75	QP
5	8.964	11.97	0.20	9.90	7.91	29.98	60.00	30.02	QP
6	28.452	16.42	0.31	10.00	3.45	30.18	60.00	29.82	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.



Site no. : No.8 Shielded Room Data no. : 1
 Condition : ENV4200 100169 Phase : LINE
 Limit : FCC PART 15C
 Env. / Ins. : 25°C / 56% ESR3 (1774) Engineer : Tim
 EUT : FEX01TB
 Power Rating : DC 3.3V
 Test Mode : Operating

	Freq. (MHz)	AMN Factor (dB)	Cable Loss (dB)	Pulse Att. (dB)	Reading (dBμV)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Remark
1	0.177	10.71	0.03	9.87	8.79	29.40	64.64	35.24	QP
2	1.197	10.55	0.06	9.87	-0.05	20.43	56.00	35.57	QP
3	2.567	10.60	0.10	9.88	6.05	26.63	56.00	29.37	QP
4	5.594	10.86	0.15	9.90	7.43	28.34	60.00	31.66	QP
5	10.452	11.34	0.21	9.90	10.04	31.49	60.00	28.51	QP
6	24.271	14.43	0.29	9.97	3.82	28.51	60.00	31.49	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.

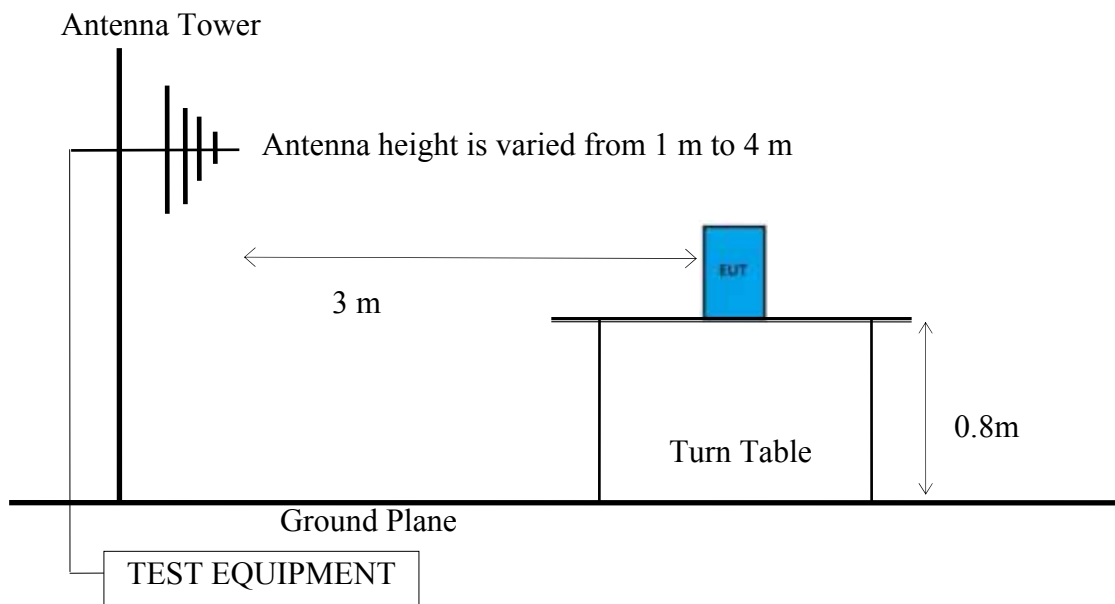
6. RADIATED EMISSION MEASUREMENT

6.1. Block Diagram of Test Setup

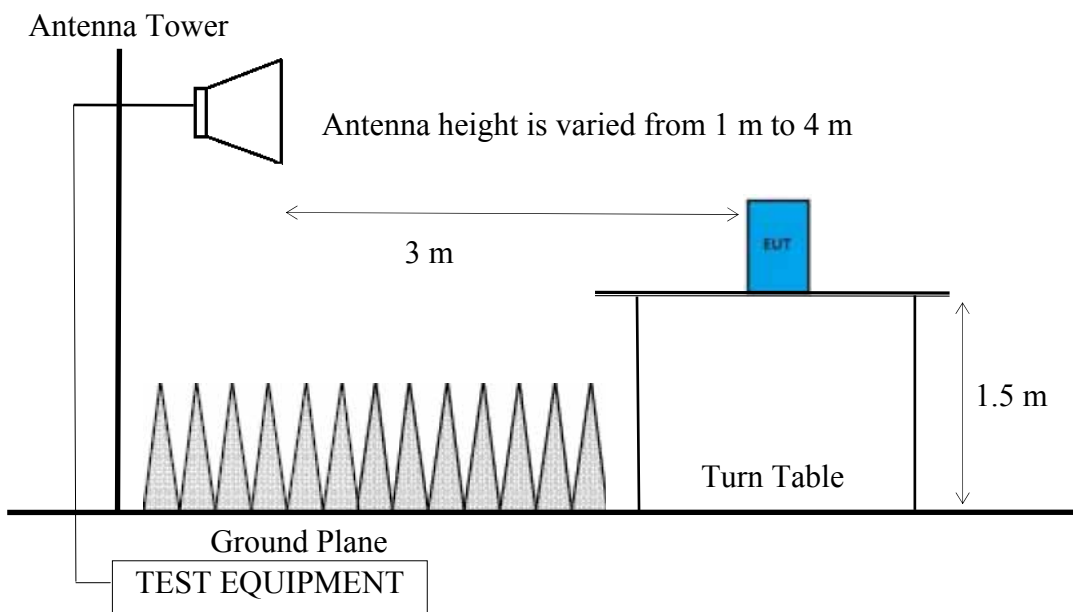
6.1.1. Block Diagram of EUT

Indicated as section 3.6

6.1.2. Setup Diagram for 30-1000 MHz



6.1.3. Fully Anechoic Chamber (3m) 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 and RSS-Gen Section 8.10 table 6, must also comply with the radiated emission limits specified as below.

Frequency (MHz)	Distance (m)	Field Strengths Limits	
		$\mu\text{V/m}$	$\text{dB}\mu\text{V/m}$
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
Above 960	3	500	54.0
Above 1000	3	74.0 $\text{dB}\mu\text{V/m}$ (Peak) 54.0 $\text{dB}\mu\text{V/m}$ (Average)	

Remark : (1) $\text{dB}\mu\text{V/m} = 20 \log (\mu\text{V/m})$

- (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

The EUT setup on the turn table which has 1.5m height to the ground. The turn table rotated 360 degrees and antenna varied from 1 m to 4 m 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, RSS-Gen and RSS-247 regulation.

Frequency below 1 GHz:

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.
- (7) When peak-detected value is lower than limit that the measurement using the Q.P. detector is not required. Otherwise using Q.P. for finally measurement.

Frequency above 1GHz to 10th harmonic:

Peak Detector:

- (1) RBW = 1MHz
- (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.
- (7) When peak-detected value is lower than limit that the measurement using the average detector is not required. Otherwise using average for finally measurement.

Average Measurement:

Option 1:

- (1) RBW = 1 MHz
- (2) VBW = 1/T, where T is Tx-on presented in Appendix A.3.
- (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 + Meter Reading

Average Emission Level = Antenna Factor + Cable Loss + Meter Reading

Average Emission Level = Peak Emission Level + DCCF

Duty Cycle Correction Factor (DCCF) = $20 \log (TX_{on}/100ms)$ presented in section 3.4

EPR = Peak Emission Level - 95.2dB - 2.14dBi

6.5. Test Results

PASSED.

Test Date	2015/10/15 ~ 2016/08/16	Temp./Hum.	22 /48%
Test Voltage	DC 3.3V (Via test jig)		

6.5.1. Emissions within Restricted Frequency Bands

6.5.1.1. Frequency Below 1 GHz

Test ANT: TNHW 2450 RP

Modulation	FHSS	Frequency	TX 2407.5MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
132.82	11.61	3.47	20.09	44.37	43.50	1.63	Peak
333.61	14.02	5.03	24.99	44.59	46.00	1.41	Peak
366.59	14.82	5.36	18.49	45.04	46.00	0.96	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
39.70	13.51	2.51	15.91	37.09	40.00	2.91	Peak
332.64	13.99	5.01	19.82	44.30	46.00	1.70	Peak
456.80	16.40	6.13	22.43	44.97	46.00	1.03	Peak

Modulation	FHSS	Frequency	TX 2437.5MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
132.82	11.61	3.47	19.09	42.37	43.50	3.63	Peak
332.64	13.99	5.01	24.69	45.04	46.00	0.96	Peak
336.52	14.08	5.05	24.30	42.81	46.00	3.19	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
40.67	12.98	2.52	15.45	42.88	40.00	3.12	Peak
333.61	14.02	5.03	19.22	43.69	46.00	2.31	Peak
456.80	16.40	6.13	21.43	44.37	46.00	1.63	Peak

Modulation	FHSS	Frequency	TX 2467.5MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
132.82	11.61	3.47	18.09	41.65	43.50	4.35	Peak
332.64	13.99	5.01	25.69	43.33	46.00	2.67	Peak
336.52	14.08	5.05	24.30	44.15	46.00	1.85	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
39.70	13.51	2.51	14.91	37.05	40.00	2.95	Peak
456.80	16.40	6.13	21.43	44.62	46.00	1.38	Peak
665.35	18.60	6.65	14.37	44.67	46.00	1.33	Peak

Test ANT: ANT-2.4-CW-RH

Modulation	FHSS	Frequency	TX 2407.5MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
178.41	9.19	3.82	29.39	42.40	43.50	1.10	Peak
299.66	13.12	4.65	27.47	45.24	46.00	0.76	Peak
333.61	14.02	5.03	26.54	45.59	46.00	0.41	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
265.71	12.64	4.44	27.74	44.82	46.00	1.18	Peak
332.64	13.99	5.01	26.46	45.46	46.00	0.54	Peak
598.42	18.32	6.50	19.35	44.17	46.00	1.83	Peak

Modulation	FHSS	Frequency	TX 2437.5MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
176.47	9.26	3.80	27.98	41.04	43.50	2.46	Peak
299.66	13.12	4.65	26.44	44.21	46.00	1.79	Peak
335.55	14.08	5.05	26.51	45.64	46.00	0.36	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
61.04	6.29	2.74	30.67	39.70	40.00	0.30	Peak
456.80	16.40	6.13	22.97	45.50	46.00	0.50	Peak
521.79	17.27	6.45	21.25	44.97	46.00	1.03	Peak

Modulation	FHSS	Frequency	TX 2467.5MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
180.35	9.12	3.84	28.14	41.10	43.50	2.40	Peak
299.66	13.12	4.65	26.97	44.74	46.00	1.26	Peak
332.64	13.99	5.01	25.40	44.40	46.00	1.60	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
111.48	11.73	3.31	24.38	39.42	43.50	4.08	Peak
365.62	14.79	5.34	24.99	45.12	46.00	0.88	Peak
665.35	18.60	6.65	19.09	44.34	46.00	1.66	Peak

Test ANT: ANT-2.4-WRT-SMA

Modulation	FHSS	Frequency	TX 2407.5MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
83.35	7.97	3.04	26.65	37.66	40.00	2.34	Peak
456.80	16.40	6.13	23.07	45.60	46.00	0.40	Peak
521.79	17.27	6.45	20.92	44.64	46.00	1.36	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
184.23	9.15	3.87	27.36	40.38	43.50	3.12	Peak
332.64	13.99	5.01	26.15	45.15	46.00	0.85	Peak
731.31	19.17	6.87	15.22	41.26	46.00	4.74	Peak

Modulation	FHSS	Frequency	TX 2437.5MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
132.82	11.61	3.47	26.16	41.24	43.50	2.26	Peak
333.61	14.02	5.03	25.72	44.77	46.00	1.23	Peak
456.80	16.40	6.13	19.58	42.11	46.00	3.89	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
81.41	7.68	3.01	28.74	39.43	40.00	0.57	Peak
132.82	11.61	3.47	27.93	43.01	43.50	0.49	Peak
521.79	17.27	6.45	21.58	45.30	46.00	0.70	Peak

Modulation	FHSS	Frequency	TX 2467.5MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
186.17	9.17	3.88	28.58	41.63	43.50	1.87	Peak
299.66	13.12	4.65	27.03	44.80	46.00	1.20	Peak
332.64	13.99	5.01	25.16	44.16	46.00	1.84	Peak

Antenna at Vertical Polarization

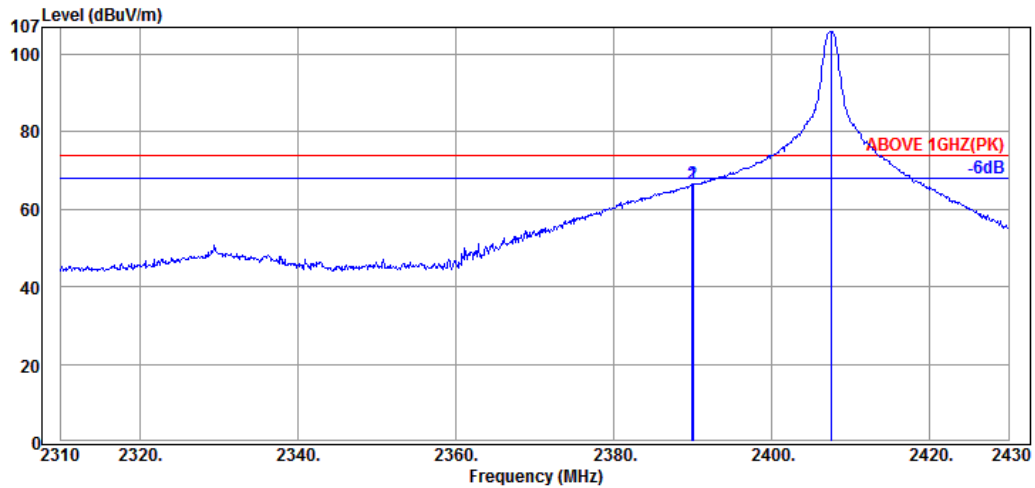
Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
366.59	14.82	5.36	24.70	44.88	46.00	1.12	Peak
456.80	16.40	6.13	22.18	44.71	46.00	1.29	Peak
521.79	17.27	6.45	21.62	45.34	46.00	0.66	Peak

6.5.1.2. Frequency Above 1 GHz to 10th harmonics

Band Edge:

Test ANT: TNHWH 2450 RP

Modulation	FHSS	Frequency	TX 2407.5MHz
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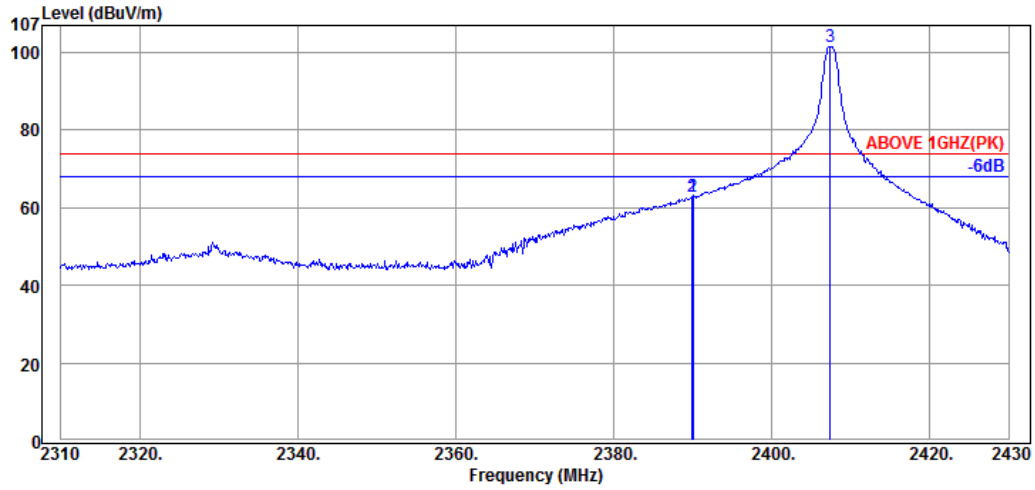


Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2389.92	32.16	6.08	28.34	66.58	74.00	7.42	Peak
2390.04	32.16	6.08	28.13	66.37	74.00	7.63	Peak
2407.56	32.18	6.10	67.58	105.86	---	---	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
2389.92	66.58	-36.42	28.13	54.00	25.87	Average
2390.04	66.37	-36.42	28.35	54.00	25.65	Average

Modulation	FHSS	Frequency	TX 2407.5MHz
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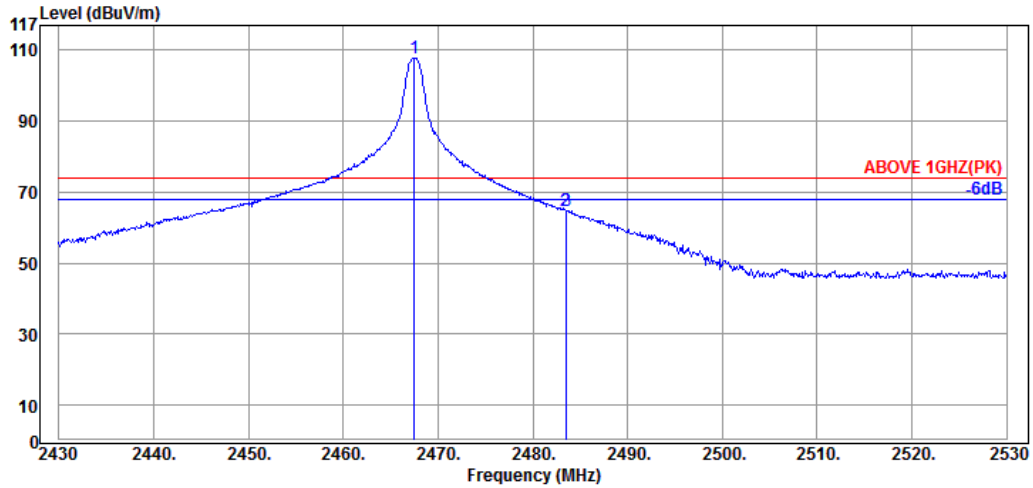


Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2389.92	32.16	6.08	24.70	62.94	74.00	11.06	Peak
2390.04	32.16	6.08	24.63	62.87	74.00	11.13	Peak
2407.44	32.18	6.10	63.20	101.48	---	---	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
2389.92	62.94	-36.42	26.52	54.00	27.48	Average
2390.04	62.87	-36.42	26.45	54.00	27.55	Average

Modulation	FHSS	Frequency	TX 2467.5MHz
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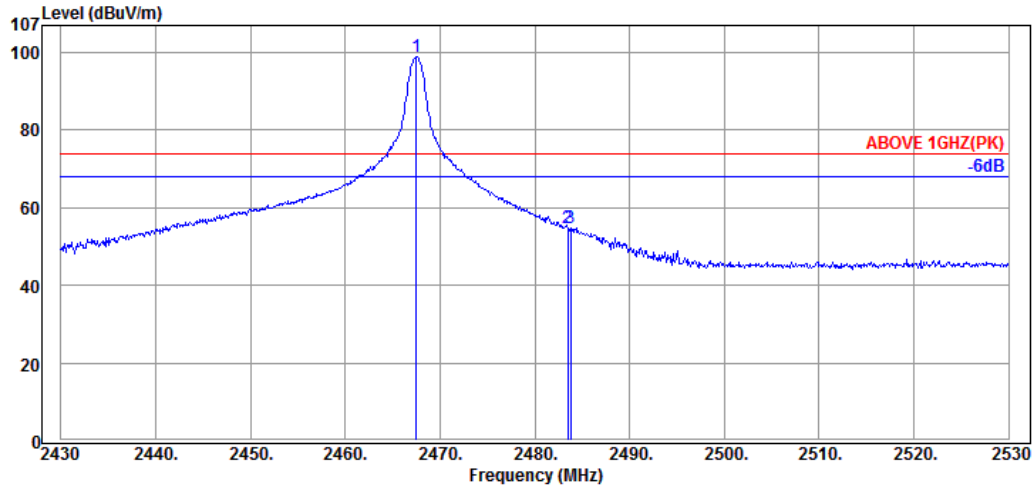


Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2467.50	32.25	6.17	69.36	107.78	---	---	Peak
2483.50	32.28	6.19	26.13	64.60	74.00	9.40	Peak
2483.60	32.28	6.19	26.42	64.89	74.00	9.11	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
2483.5	64.60	-36.42	28.18	54.00	25.82	Average
2483.6	64.89	-36.42	28.47	54.00	25.53	Average

Modulation	FHSS	Frequency	TX 2467.5MHz
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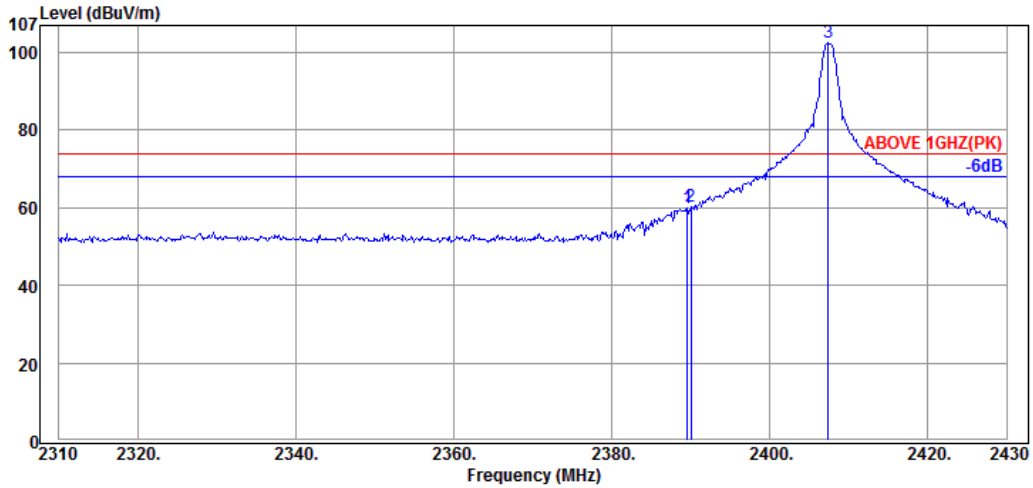
Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2467.50	32.25	6.17	60.50	98.92	---	---	Peak
2483.50	32.28	6.19	16.34	54.81	74.00	19.19	Peak
2483.80	32.28	6.19	16.29	54.76	74.00	19.24	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
2483.5	54.81	-36.42	18.39	54.00	35.61	Average
2483.8	54.76	-36.42	18.34	54.00	35.66	Average

Test ANT: ANT-2.4-CW-RH

Modulation	FHSS	Frequency	TX 2407.5MHz
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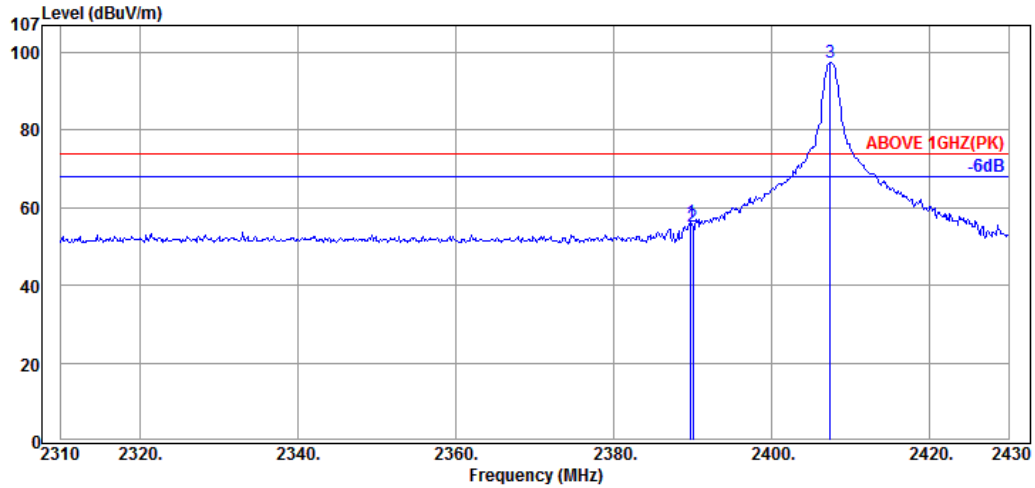


Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2389.56	32.16	6.08	21.67	59.91	74.00	14.09	Peak
2390.04	32.16	6.08	21.90	60.14	74.00	13.86	Peak
2407.44	32.18	6.10	64.13	102.41	---	---	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
2389.56	59.91	-36.42	23.49	54.00	30.51	Average
2390.04	60.14	-36.42	23.72	54.00	30.28	Average

Modulation	FHSS	Frequency	TX 2407.5MHz
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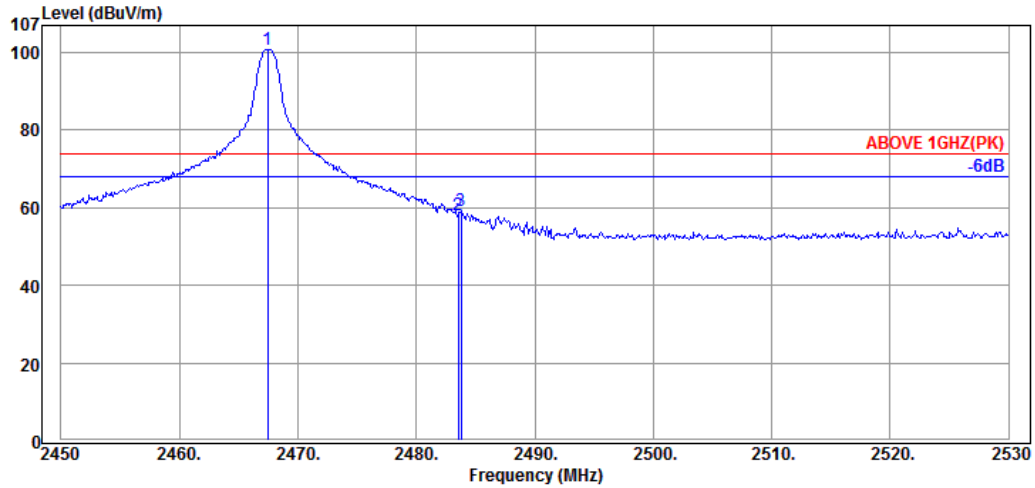


Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2389.80	32.16	6.08	17.97	56.21	74.00	17.79	Peak
2390.04	32.16	6.08	17.00	55.24	74.00	18.76	Peak
2407.44	32.18	6.10	59.06	97.34	---	---	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
2389.80	56.21	-36.42	19.79	54.00	34.21	Average
2390.04	55.24	-36.42	18.82	54.00	35.18	Average

Modulation	FHSS	Frequency	TX 2467.5MHz
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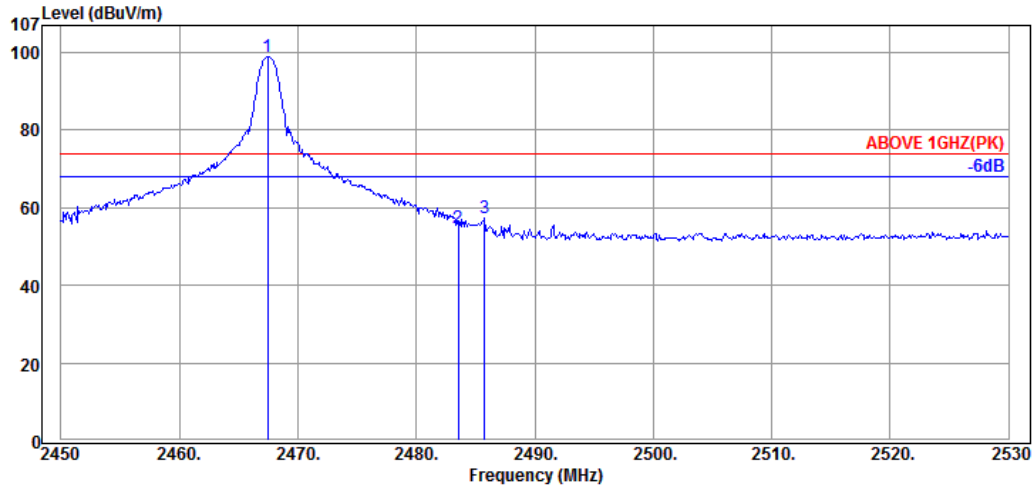


Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2467.44	32.25	6.17	62.47	100.89	---	---	Peak
2483.52	32.28	6.19	19.69	58.16	74.00	15.84	Peak
2483.76	32.28	6.19	20.78	59.25	74.00	14.75	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
2483.52	58.16	-36.42	21.74	54.00	32.26	Average
2483.76	59.78	-36.42	23.36	54.00	30.64	Average

Modulation	FHSS	Frequency	TX 2467.5MHz
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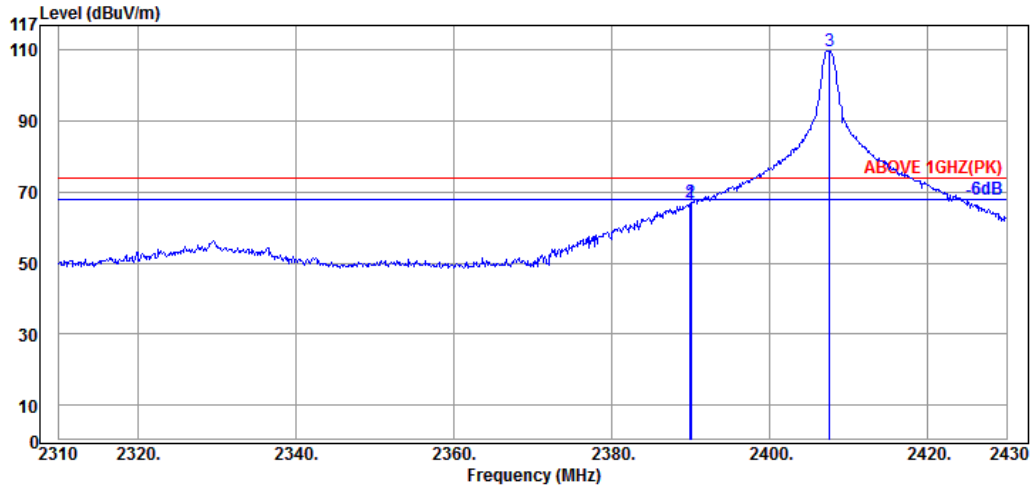
Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2467.44	32.25	6.17	60.33	98.75	---	---	Peak
2483.52	32.28	6.19	16.15	54.62	74.00	19.38	Peak
2485.76	32.28	6.19	18.74	57.21	74.00	16.79	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
2483.52	54.62	-36.42	18.20	54.00	35.80	Average
2485.76	57.21	-36.42	20.79	54.00	33.21	Average

Test ANT: ANT-2.4-WRT-SMA

Modulation	FHSS	Frequency	TX 2407.5MHz
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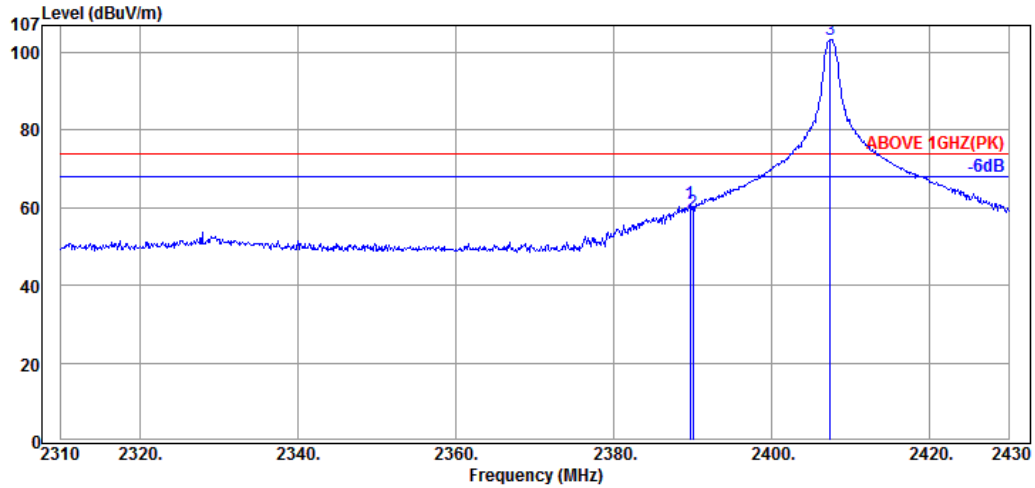


Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2389.92	32.16	6.08	28.51	66.75	74.00	7.25	Peak
2390.04	32.16	6.08	28.85	67.09	74.00	6.91	Peak
2407.56	32.18	6.10	71.67	109.95	---	---	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
2389.92	66.75	-36.42	30.33	54.00	23.67	Average
2390.04	67.09	-36.42	30.67	54.00	23.33	Average

Modulation	FHSS	Frequency	TX 2407.5MHz
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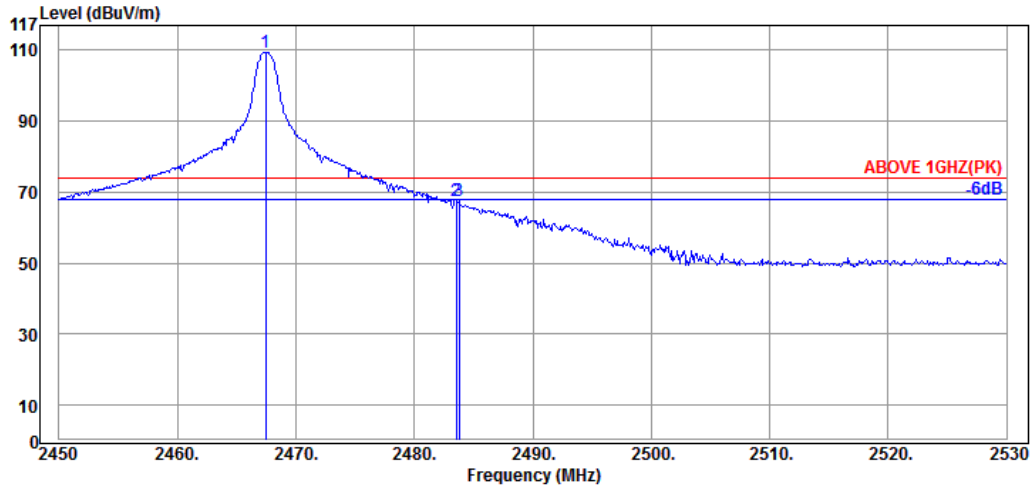


Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2389.68	32.16	6.08	22.84	61.08	74.00	12.92	Peak
2390.04	32.16	6.08	20.67	58.91	74.00	15.09	Peak
2407.44	32.18	6.10	64.95	103.23	---	---	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
2389.68	61.08	-36.42	24.66	54.00	29.34	Average
2390.04	58.91	-36.42	22.49	54.00	31.51	Average

Modulation	FHSS	Frequency	TX 2467.5MHz
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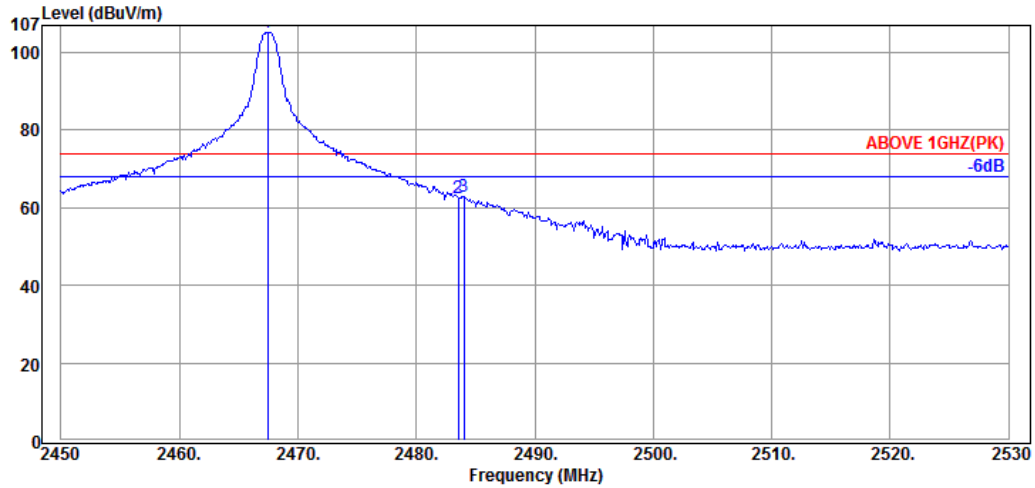


Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2467.44	32.25	6.17	70.98	109.40	---	---	Peak
2483.52	32.28	6.19	28.98	67.45	74.00	6.55	Peak
2483.76	32.28	6.19	28.91	67.38	74.00	6.62	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
2483.52	67.45	-36.42	31.03	54.00	22.97	Average
2483.76	67.38	-36.42	30.96	54.00	23.04	Average

Modulation	FHSS	Frequency	TX 2467.5MHz
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Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2467.44	32.25	6.17	66.78	105.20	---	---	Peak
2483.52	32.28	6.19	24.20	62.67	74.00	11.33	Peak
2484.00	32.28	6.19	24.47	62.94	74.00	11.06	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
2483.52	62.67	-36.42	26.25	54.00	27.75	Average
2484.00	62.94	-36.42	26.52	54.00	27.48	Average

6.5.2. Emissions outside the frequency band:

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

Test ANT: TNHW 2450 RP

Modulation	FHSS	Frequency	TX 2407.5MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4815.00	34.22	8.93	30.30	73.45	74.00	0.55	Peak
7220.00	35.80	11.27	15.63	62.70	74.00	11.30	Peak
9630.00	36.87	12.69	0.39	49.95	74.00	24.05	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
4815.00	73.45	-36.42	37.03	54.00	16.97	Average
7220.00	62.70	-36.42	26.28	54.00	27.72	Average
9630.00	49.95	-36.42	13.53	54.00	40.47	Average

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4815.00	34.22	8.93	25.09	68.24	74.00	5.76	Peak
7225.00	35.80	11.27	15.00	62.07	74.00	11.93	Peak
9630.00	36.87	12.69	-3.07	46.49	74.00	27.51	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
4815.00	68.24	-36.42	31.82	54.00	22.18	Average
7225.00	62.07	-36.42	25.65	54.00	28.35	Average
9630.00	46.49	-36.42	10.07	54.00	43.93	Average

Modulation	FHSS	Frequency	TX 2437.5MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4875.00	34.25	9.09	30.50	73.84	74.00	0.16	Peak
7310.00	35.80	11.80	4.42	52.02	74.00	21.98	Peak
9750.00	37.01	13.48	-6.91	43.58	74.00	30.42	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
4875.00	73.84	-36.42	37.42	54.00	16.58	Average
7310.00	52.02	-36.42	15.60	54.00	38.40	Average
9750.00	43.58	-36.42	7.16	54.00	46.84	Average

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4875.00	34.25	9.09	26.39	69.73	74.00	4.27	Peak
7315.00	35.80	11.80	4.72	52.32	74.00	21.68	Peak
9750.00	37.01	13.48	4.83	55.32	74.00	18.68	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
4875.00	69.73	-36.42	33.31	54.00	20.69	Average
7315.00	52.32	-36.42	15.90	54.00	38.10	Average
9750.00	55.32	-36.42	18.90	54.00	35.10	Average

Modulation	FHSS	Frequency	TX 2467.5MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4935.00	34.27	9.30	29.93	73.50	74.00	0.50	Peak
7400.00	35.80	12.41	-1.88	46.33	74.00	27.67	Peak
9870.00	37.16	13.50	6.81	57.47	74.00	16.53	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
4935.00	73.50	-36.42	37.08	54.00	16.92	Average
7400.00	46.33	-36.42	9.91	54.00	44.09	Average
9870.00	57.47	-36.42	21.05	54.00	32.95	Average

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4935.00	34.27	9.30	24.61	68.18	74.00	5.82	Peak
9870.00	37.16	13.50	5.52	56.18	74.00	17.82	Peak
12340.00	39.11	15.40	0.99	55.50	74.00	18.50	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
4935	68.18	-36.42	31.76	54.00	22.24	Average
9870	56.18	-36.42	19.76	54.00	34.24	Average
12340.00	55.50	-36.42	19.17	54.00	34.83	Average

Test ANT: ANT-2.4-CW-RH

Modulation	FHSS	Frequency	TX 2407.5MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4814.50	34.22	8.93	17.95	61.10	74.00	12.90	Peak
7224.00	35.80	11.27	9.29	56.36	74.00	17.64	Peak
9631.50	36.87	12.69	-2.82	46.74	74.00	27.26	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
4814.50	62.10	-36.42	25.68	54.00	28.32	Average
7224.00	56.36	-36.42	19.94	54.00	34.06	Average
9631.00	46.74	-36.42	10.32	54.00	43.68	Average

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4814.50	34.22	8.93	18.14	61.29	74.00	12.71	Peak
7224.00	35.80	11.27	7.70	54.77	74.00	19.23	Peak
9631.50	36.87	12.69	-2.05	47.51	74.00	26.49	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
4814.50	61.29	-36.42	24.87	54.00	29.13	Average
7224.00	54.77	-36.42	18.35	54.00	35.65	Average
9631.50	47.51	-36.42	11.09	54.00	42.91	Average

Modulation	FHSS	Frequency	TX 2437.5MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
4874.50	34.25	9.09	20.46	63.80	74.00	10.20	Peak
7314.00	35.80	11.80	1.25	48.85	74.00	25.15	Peak
9757.50	37.01	13.48	-1.26	49.23	74.00	24.77	Peak
12193.50	39.01	14.92	-2.02	51.91	74.00	22.09	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
4874.50	63.80	-36.42	27.38	54.00	26.62	Average
7314.00	48.85	-36.42	12.43	54.00	41.57	Average
9757.50	49.23	-36.42	12.81	54.00	41.19	Average
12193.50	51.91	-36.42	15.49	54.00	38.51	Average

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
4874.50	34.25	9.09	19.37	62.71	74.00	11.29	Peak
7314.00	35.80	11.80	0.50	48.10	74.00	25.90	Peak
9757.50	37.01	13.48	-1.39	49.10	74.00	24.90	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
4874.50	62.71	-36.42	26.29	54.00	27.71	Average
7314.00	48.10	-36.42	11.68	54.00	42.32	Average
9757.5	49.10	-36.42	12.68	54.00	41.32	Average

Modulation	FHSS	Frequency	TX 2467.5MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4934.50	34.27	9.30	21.06	64.63	74.00	9.37	Peak
9862.50	37.13	13.49	4.27	54.89	74.00	19.11	Peak
12330.00	39.10	15.40	-0.83	53.67	74.00	20.33	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
4934.50	64.63	-36.42	28.21	54.00	25.79	Average
9862.50	54.89	-36.42	18.47	54.00	35.53	Average
12330.00	53.67	-36.42	17.25	54.00	35.53	Average

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4934.50	34.27	9.30	17.32	60.89	74.00	13.11	Peak
9862.50	37.13	13.49	6.00	56.62	74.00	17.38	Peak
12330.00	39.10	15.40	-0.20	54.30	74.00	19.70	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
4934.50	60.89	-36.42	24.47	54.00	29.53	Average
9862.50	56.62	-36.42	20.20	54.00	33.80	Average
12330.00	54.30	-36.42	17.88	54.00	33.80	Average

Test ANT: ANT-2.4-WRT-SMA

Modulation	FHSS	Frequency	TX 2407.5MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4814.50	34.22	8.93	18.95	62.10	74.00	11.90	Peak
7224.00	35.80	11.27	11.78	58.85	74.00	15.15	Peak
9631.50	36.87	12.69	2.31	51.87	74.00	22.13	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
4814.50	62.10	-36.42	25.68	54.00	28.32	Average
7224.00	58.85	-36.42	22.43	54.00	31.57	Average
9631.50	51.87	-36.42	15.45	54.00	38.55	Average

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4814.50	34.22	8.93	15.09	58.24	74.00	15.76	Peak
7224.00	35.80	11.27	11.58	58.65	74.00	15.35	Peak
9631.50	36.87	12.69	-1.75	47.81	74.00	26.19	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
4814.50	58.24	-36.42	21.82	54.00	32.18	Average
7224.00	58.65	-36.42	22.23	54.00	31.77	Average
9631.50	47.81	-36.42	11.39	54.00	42.61	Average

Modulation	FHSS	Frequency	TX 2437.5MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4874.50	34.25	9.09	22.72	66.06	74.00	7.94	Peak
7314.00	35.80	11.80	6.77	54.37	74.00	19.63	Peak
9757.50	37.01	13.48	4.21	54.70	74.00	19.30	Peak
12193.50	39.01	14.92	-1.68	52.25	74.00	21.75	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
4874.50	66.06	-36.42	29.64	54.00	24.36	Average
7314.00	54.37	-36.42	17.95	54.00	36.05	Average
9757.50	54.70	-36.42	18.28	54.00	35.72	Average
12193.5	52.25	-36.42	15.83	54.00	38.17	Average

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4874.50	34.25	9.09	18.14	61.48	74.00	12.52	Peak
7314.00	35.80	11.80	5.88	53.48	74.00	20.52	Peak
9757.50	37.01	13.48	3.46	53.95	74.00	20.05	Peak
12193.50	39.01	14.92	-1.07	52.86	74.00	21.14	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
4874.50	61.48	-36.42	25.06	54.00	28.94	Average
7314.00	53.48	-36.42	17.06	54.00	36.94	Average
9757.50	53.95	-36.42	17.53	54.00	36.47	Average
12193.50	52.86	-36.42	16.44	54.00	37.56	Average

Modulation	FHSS	Frequency	TX 2467.5MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4934.50	34.27	9.30	27.38	70.95	74.00	3.05	Peak
9862.50	37.13	13.49	3.54	54.16	74.00	19.84	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
4934.50	70.95	-36.42	34.53	54.00	19.47	Average
9862.50	54.16	-36.42	17.74	54.00	36.26	Average

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4934.50	34.27	9.30	18.95	62.52	74.00	11.48	Peak
9862.50	37.13	13.49	5.72	56.34	74.00	17.66	Peak
12330.00	39.10	15.40	1.09	55.59	74.00	18.41	Peak

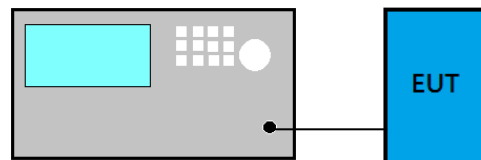
Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
4934.50	62.52	-36.42	26.10	54.00	27.90	Average
9862.50	56.34	-36.42	19.92	54.00	34.08	Average
12330.00	55.59	-36.42	19.17	54.00	34.83	Average

6.5.3. Emissions in Non-restricted Frequency Bands

All emission levels below the 15.209 general radiated emissions limits is not required.

7. 20dB BANDWIDTH MEASUREMENT

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 DA00-705:

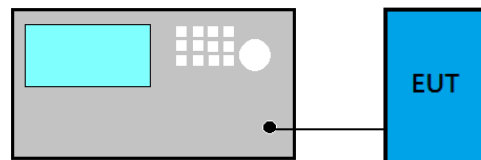
- (1) Set RBW close to 1% of OBW.
- (2) Set $VBW \geq RBW$.
- (3) Detector = Peak.
- (4) Trace mode = max hold.
- (5) Sweep = auto couple.
- (6) Allow the trace to stabilize.
- (7) Setting channel bandwidth function x dB to -20 dB to record the final bandwidth.

7.4. Test Results

Please refer to Appendix A

8. CARRIER FREQUENCY SEPARATION MEASUREMENT

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 no greater than 125mW.

8.3. Test Procedure

Following measurement procedure is reference to DA00-705:

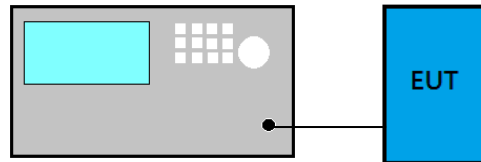
- (1) Span = wide enough to capture the peaks of two adjacent channels
- (2) RBW \geq 1% of the span
- (3) VBW \geq RBW
- (4) Sweep = auto
- (5) Detector function = peak
- (6) Trace = max hold

8.4. Test Results

Please refer to Appendix A

9. TIME OF OCCUPANCY MEASUREMENT

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 DA00-705:

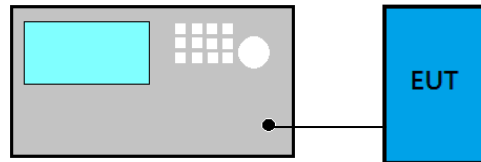
- (1) Span = zero span, centered on a hopping channel
- (2) RBW = 1 MHz
- (3) VBW \geq RBW
- (4) Sweep = as necessary to capture the entire dwell time per hopping channel
- (5) Detector function = peak
- (6) Trace = max hold

9.4. Test Results

Please refer to Appendix A

10. NUMBER OF HOPPING CHANNELS MEASUREMENT

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 DA00-705:

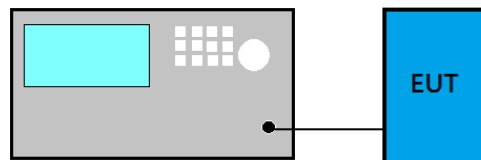
- (1) Span = the frequency band of operation
- (2) RBW \geq 1% of the span
- (3) VBW \geq RBW
- (4) Sweep = auto
- (5) Detector function = peak
- (6) Trace = max hold

10.4. Test Results

Please refer to Appendix A

11. MAXIMUM PEAK OUTPUT POWER MEASUREMENT

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 DA00-705:

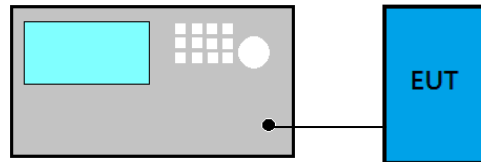
- (1) Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel
- (2) RBW \geq 1% of the span
- (3) VBW \geq RBW
- (4) Sweep = auto
- (5) Detector function = peak
- (6) Trace = max hold

11.4. Test Results

Please refer to Appendix A

12. EMISSION LIMITATIONS MEASUREMENT

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. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (See Section 15.205(c)).

12.3. Test Procedure

Following measurement procedure is reference to DA00-705:

- (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

13. DEVIATION TO TEST SPECIFICATIONS

【NONE】