

**FCC 15.247 & RSS-247
(Class II Permissive Change)
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 : FEX01TB
FCC ID : AZP-FEX01T
IC : 2914D-FEX01T

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



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TEST REPORT CERTIFICATION (Class II Permissive Change)

Applicant : FUTABA Corporation
Manufacture : FUTABA Corporation
EUT Description
(1) Product : Radio Control Module
(2) Model : FEX01TB
(3) Brand : Futaba
(4) Power Supply: DC 3.3V

Applicable Standards:

47 CFR FCC Part 15 Subpart C
RSS-Gen (Issue 4), November 2014
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: 2017. 11. 03

Reviewed by: Annie Yu (Annie Yu/Administrator)

Approved by: Ben Cheng (Ben Cheng/Manager)

1. REVISION RECORD OF TEST REPORT

Edition No	Issued Data	Revision Summary	Report Number
0	2017. 11. 03	Original Report.	EM-F170685

2. SUMMARY OF TEST RESULTS

Rule		Description	Results
FCC	IC		
15.207	RSS-Gen §8.8	Conducted Emission	N/A Note 1
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	N/A Note 2
15.247(a)(1)	RSS-247 §5.1(2)	Carrier Frequency Separation	N/A Note 2
15.247(a)(1)(iii)	RSS-247 §5.1(4)	Time of Occupancy	N/A Note 2
15.247(a)(1)(iii)	RSS-247 §5.1(4)	Number of Hopping Channels	N/A Note 2
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	N/A Note 2
15.203	---	Antenna Requirement	Compliance
Note: 1. The EUT only employs battery power for operation, so it is unnecessary to test. 2. The Class II Permissive Change is not influence on this report.			

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	FEX01TB
Brand	Futaba

3.2. Description of Application

Test Model	FEX01TB
Serial Number	N/A
Power Rating	DC 3.3V
Firmware Version	N/A
RF Features	FSK (FHSS)
Transmit Type	1 Antenna (diversity)
Sample Status	Production
Date of Receipt	2017. 10. 13
Date of Test	2017. 10. 27 ~ 30
I/O Ports List	None
Accessories Supplied	None

3.3. Information for Class II Change Permissive

Item	Original	Class II Change Permissive
Standard	RSS-247 (Issue 1)	RSS-247 (Issue 2)
Antenna	(1) CHILDS ANTENNA COMPANY, TNHW 2450 RP, Gain: 2.4dBi (2) Linx, ANT-2.4-CW-RH, Gain: -0.9dBi (3) Linx, ANT-2.4-WRT-SMA, Gain: 3.5dBi	SANSEI, ANTB24-073A0, Gain: 2.14dBi
Due to Class II Permissive for FCC ID: AZP-FEX01T and IC: 2914D-FEX01T are as follows: (1) To update RSS standard for RSS-210 Issue 8 to RSS-247 Issue 2. (2) To add adding new antenna with lower gain from original approval.		

3.4. Antenna Information

No.	Antenna Part Number	Manufacture	Antenna Type	Frequency (MHz)	Max Gain (dBi)
1	TNHW 2450 RP	CHILDS ANTENNA COMPANY	Omnidirectional Antenna	2400-2500	2.4
2	ANT-2.4-CW-RH	Linx	Omnidirectional Antenna	2390-2490	-0.9
3	ANT-2.4-WRT-SMA	Linx	Dipole Antenna	2400-250	3.5
4	ANTB24-073A0	SANSEI	Omni-Directional	2400-2500	2.14

3.5. EUT Specifications Assessed in Current Report

Mode	Fundamental Range (MHz)	Channel Number	Modulation	Data Rate (kbps)
FHSS	2407.5-2467.5	1	FSK	128

Antenna A		Antenna B	
Test Frequency (MHz)	Output Power (dBm)	Test Frequency (MHz)	Output Power (dBm)
2407.5	16.417	2407.5	16.444
2437.5	16.093	2437.5	16.170
2467.5	15.755	2467.5	15.768

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 B has worse power, thus all test items presented in this report were test in ANT B.

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		

3.6. Test Configuration

Modulation	T _{on} (ms)	Duty Cycle Factor (dB)
FHSS	1.51	-36.42

Item		Modulation	Test Channel
Radiated Test Case	Radiated Band Edge ^{Note1}	FHSS	1/31
	Radiated Spurious Emission ^{Note1}	FHSS	1/16/31
Conducted Test Case	Maximum Peak Output Power	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: We performed testing of the highest and lowest data rate.

3.7. Tested Supporting System List

3.7.1. Support Peripheral Unit

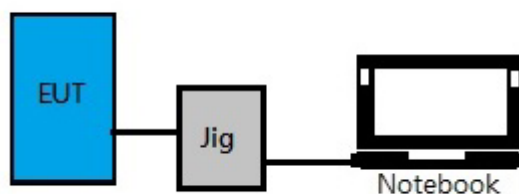
No.	Product	Brand	Model No.	Serial No.	FCC ID
1.	Notebook PC	IBM	2652	99NXMML	ANOVNCBDC80211 B
2.	Test Jig	N/A	N/A	N/A	N/A
3.	DC Power Supply	TOP WARD	6303A	N/A	N/A

3.7.2. Support Peripheral Unit

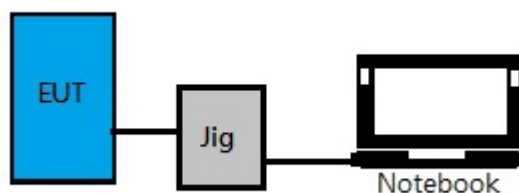
No.	Cable Description Of The Above Support Units
1.	RS232 Cable: Shielded, Detachable, 2.0m Adapter: IBM, M/N 02K6747, DC Cord: Shielded, Undetachable, 1.8m Bonded a ferrite core AC Power Cord: Unshielded, Detachable, 1.0m
2.	Cable: Unshielded, Detachable, 0.06m*4
3.	DC Power Cord*2: Unshielded, Detachable, 0.08+0.1m*2

3.8. Setup Configuration

3.8.1. EUT Configuration for Radiated Emission



3.8.2. EUT Configuration for RF Conducted Test Items



3.9. Operating Condition of EUT

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

3.10. 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: sales@audixtech.com
Accreditations	The laboratory is accredited by following organizations under ISO/IEC 17025:2005 (1) NVLAP(USA) NVLAP Lab Code 200077-0 (2) TAF(Taiwan) No. 1724 (3) FCC OET Designation No. TW1004 & TW1090 & TW1724
Test Facilities	(1) Semi-Anechoic Chamber (IC Test Site Registration No.: 5183B-1) (2) Fully Anechoic Chamber (IC Test Site Registration No.: 5183B-4)

3.11. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty
Radiation Test (Distance: 3m)	30MHz~1000MHz	$\pm 3.68\text{dB}$
	Above 1GHz	$\pm 5.82\text{dB}$

Remark : Uncertainty = $ku_c(y)$

Test Item	Uncertainty
Maximum peak Output power	$\pm 0.52\text{dB}$

4. MEASUREMENT EQUIPMENT LIST

4.1. Radiated Emission Measurement

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Spectrum Analyzer	Agilent	N9010A-526	MY53400071	2017. 09. 13	1 Year
2.	Spectrum Analyzer	Agilent	N9010A-526	MY52220368	2016. 12. 01	1 Year
3.	Test Receiver	R & S	ESCS30	100338	2017. 06. 19	1 Year
4.	Amplifier	HP	8447D	2944A06305	2017. 02. 16	1 Year
5.	Amplifier	Sonoma	310N	187161	2017. 06. 08	1 Year
6.	Bilog Antenna	CHASE	CBL6112D	33821	2017. 01. 21	1 Year
7.	Loop Antenna	R&S	HFH2-Z2	891847/27	2016. 12. 23	1 Year
8.	Double-Ridged Waveguide Horn	ETS-Lindgren	3117	00135902	2017. 03. 08	1 Year
9.	2.4GHz Notch Filter	K&L	7NSL10-244 1.5E130.5-00	1	2017. 07. 26	1 Year
10.	3GHz Notch Filter	Microwave	H3G018G1	484798	2017. 08. 25	1 Year
11.	Test Software	Audix	e3	V.6.110601	N.C.R.	N.C.R.

4.2. RF Conducted Measurement

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Spectrum Analyzer	Agilent	N9030A-526	MY53310269	2017. 01. 03	1 Year

5. CONDUCTED EMISSION MEASUREMENT

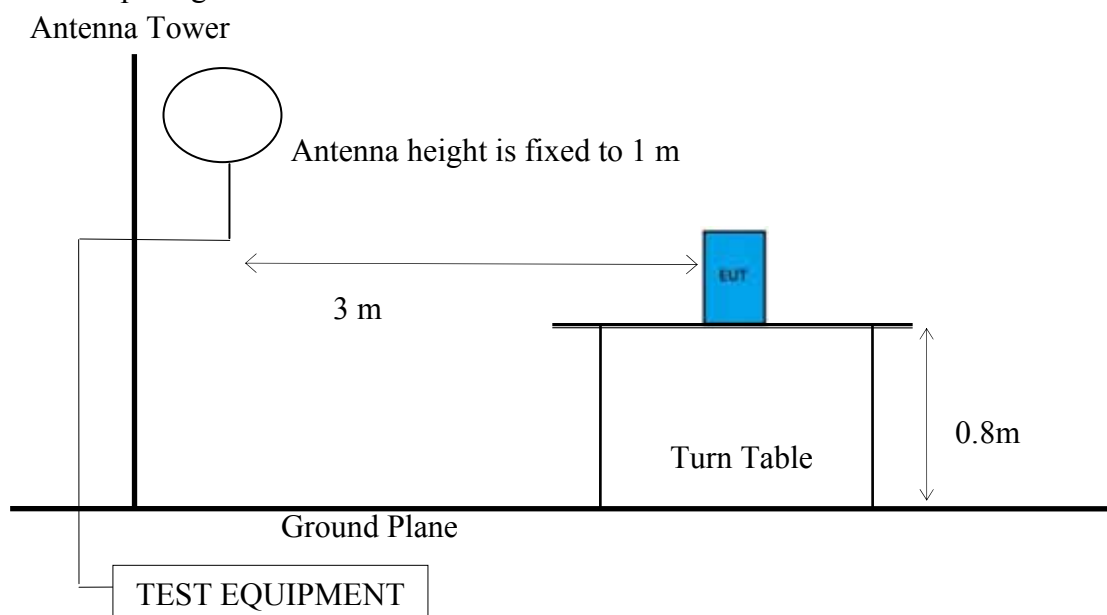
【The EUT only employs battery power for operation, no conductive emission limits are required according to FCC 15.207 and RSS-Gen §8.8】

6. RADIATED EMISSION MEASUREMENT

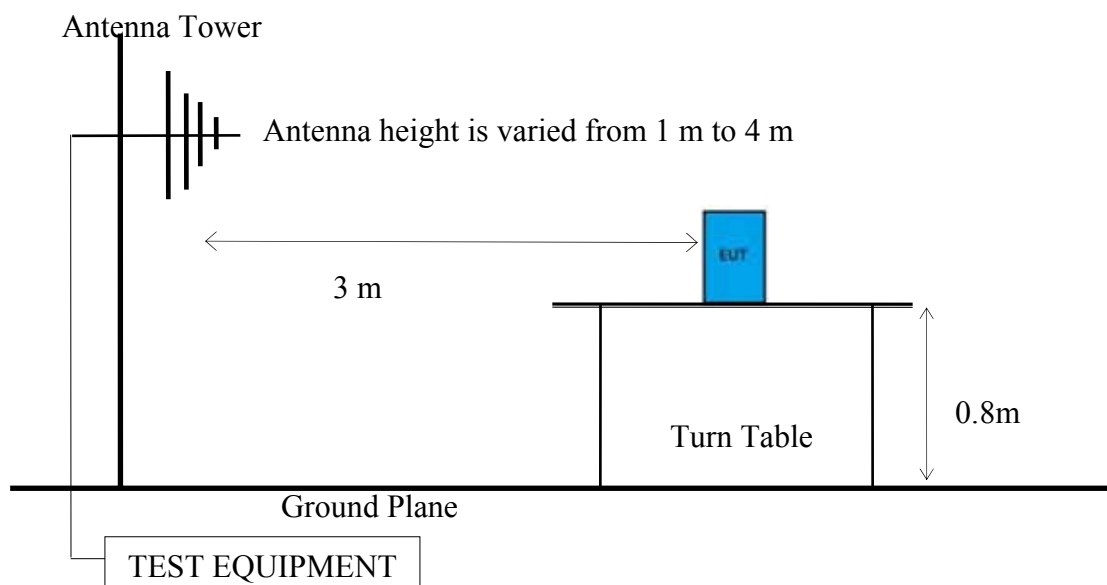
6.1. Block Diagram of Test Setup

6.1.1. Block Diagram of connection between EUT and simulators
Indicated as section 3.8

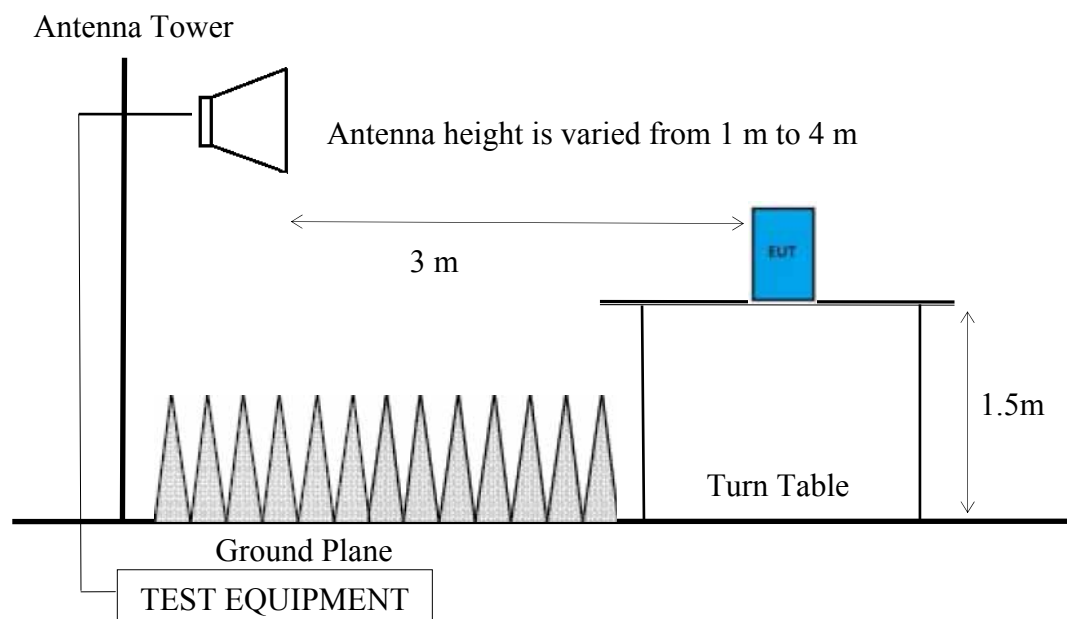
6.1.2. Setup Diagram for 9kHz-30MHz



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	2400/kHz
0.490 - 1.705	30	87.6	24000/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 find table which has 80 cm (for 30-1000 MHz) 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 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.
- (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 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.
- (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.4.
- (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 3.5

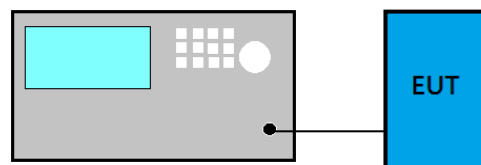
☐ ERP = Peak Emission Level - 95.2dB - 2.14dB

6.5. Test Results

Please refer to Appendix A.

7. MAXIMUM PEAK OUTPUT POWER MEASUREMENT

7.1. Block Diagram of Test Setup



7.2. Specification Limits

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

7.3. Test Procedure

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

- (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

7.4. Test Results

Please refer to Appendix A

8. DEVIATION TO TEST SPECIFICATIONS

【NONE】



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APPENDIX A

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APPDNDIX A

TEST DATA AND PLOTS

(Model: FEX01TB)

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A.1 RADIATED EMISSION

Test Date	2017/10/30	Temp./Hum.	26°C/43%
Test Voltage	DC 3.3V (Via test jig)		

A.1.1 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
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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
366.59	21.28	5.18	16.36	42.82	46.00	3.18	Peak
431.58	22.43	5.85	14.10	42.38	46.00	3.62	Peak
456.80	22.72	6.08	12.00	40.80	46.00	5.20	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
187.14	15.55	3.21	20.34	39.10	43.50	4.40	Peak
456.80	22.72	6.08	14.86	43.66	46.00	2.34	Peak
480.08	22.95	6.27	13.91	43.13	46.00	2.87	Peak

Mode	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
299.66	19.48	4.30	16.22	40.00	46.00	6.00	Peak
335.55	20.50	4.80	18.32	43.62	46.00	2.38	Peak
431.58	22.43	5.85	14.05	42.33	46.00	3.67	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
185.20	15.52	3.19	19.00	37.71	43.50	5.79	Peak
456.80	22.72	6.08	13.88	42.68	46.00	3.32	Peak
480.08	22.95	6.27	13.81	43.03	46.00	2.97	Peak

Mode	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
299.66	19.48	4.30	19.79	43.57	46.00	2.43	Peak
365.62	21.25	5.16	15.64	42.05	46.00	3.95	Peak
797.27	25.88	7.59	10.89	44.36	46.00	1.64	Peak

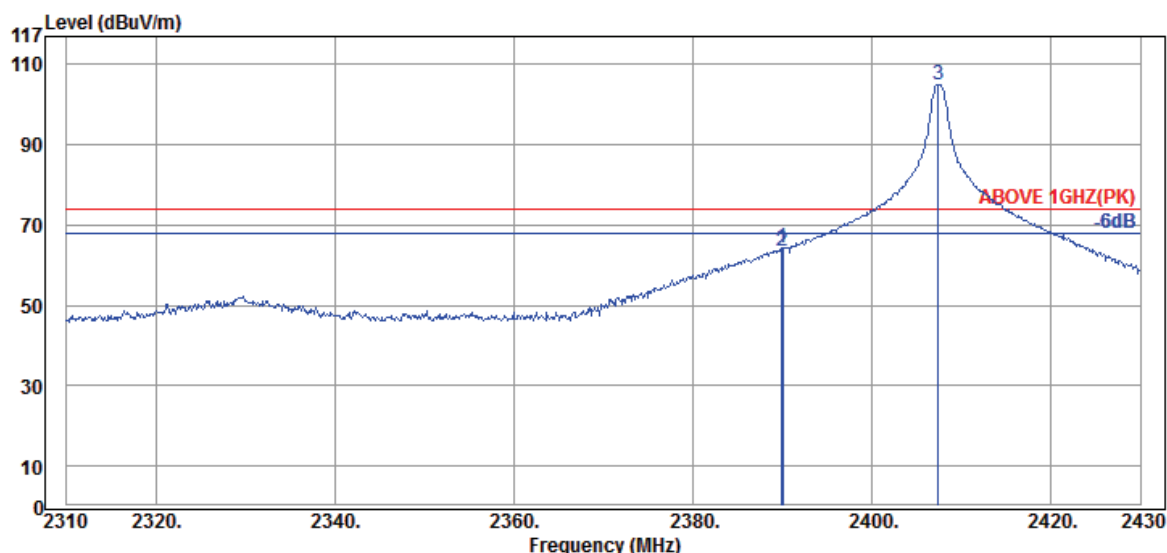
Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
391.81	21.88	5.47	12.07	39.42	46.00	6.58	Peak
456.80	22.72	6.08	14.53	43.33	46.00	2.67	Peak
599.39	24.64	6.75	11.17	42.56	46.00	3.44	Peak

A.2.1.3 Frequency Above 1 GHz to 10th harmonics

Band Edge:

Mode	FHSS	Frequency	TX 2407.5MHz
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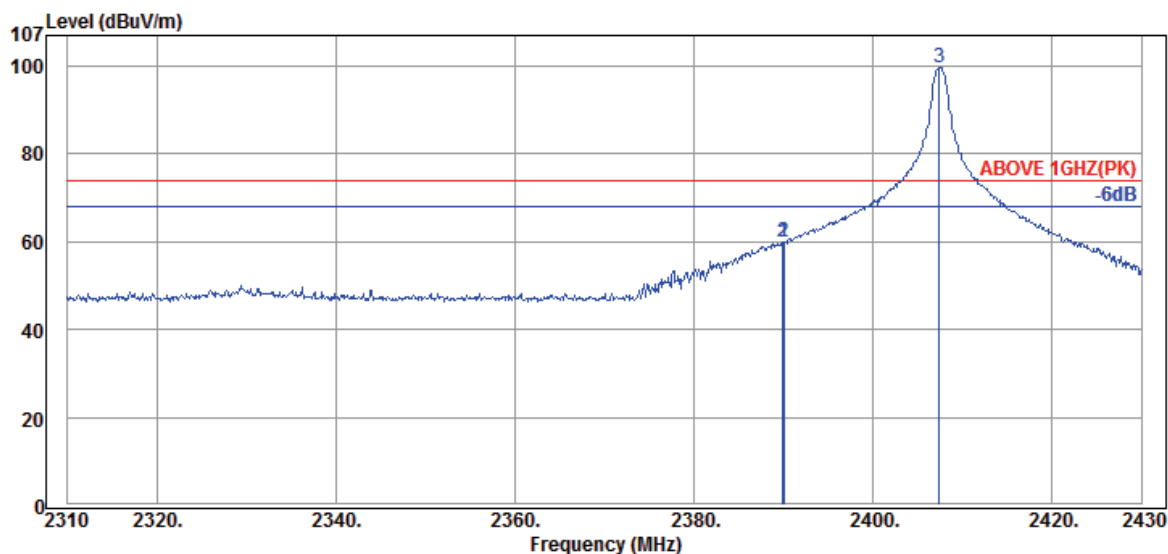


Antenna at Horizontal Polarization

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	6.57	25.43	64.16	74.00	9.84	Peak
2390.04	32.16	6.57	24.93	63.66	74.00	10.34	Peak
2407.44	32.18	6.59	66.28	105.05	---	---	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
2389.92	64.16	-36.42	27.74	54.00	26.26	Average
2390.04	63.66	-36.42	27.24	54.00	26.76	Average

Mode	FHSS	Frequency	TX 2407.5MHz
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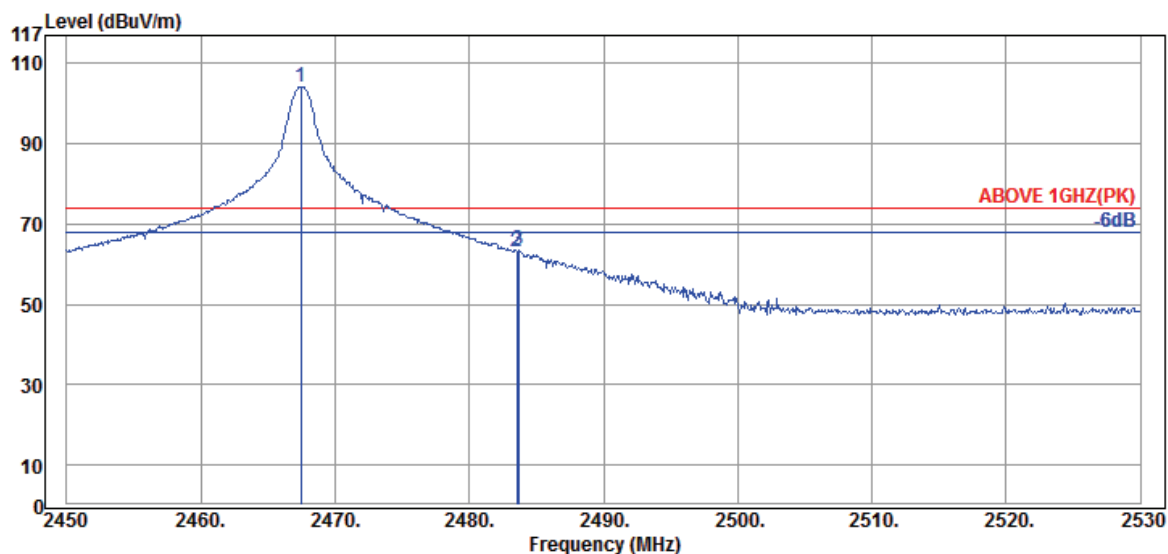


Antenna at Vertical Polarization

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	6.57	21.10	59.83	74.00	14.17	Peak
2390.04	32.16	6.57	21.35	60.08	74.00	13.92	Peak
2407.44	32.18	6.59	60.85	99.62	---	---	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
2389.92	59.83	-36.42	23.41	54.00	30.59	Average
2390.04	60.08	-36.42	23.66	54.00	30.34	Average

Mode	FHSS	Frequency	TX 246.5MHz
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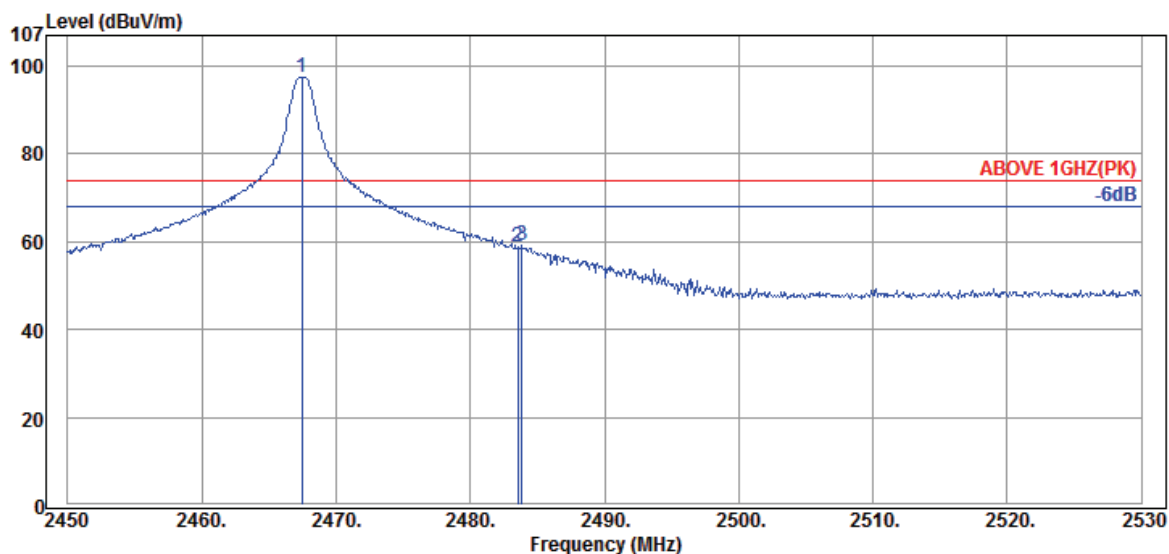


Antenna at Horizontal Polarization

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	6.65	65.12	104.02	---	---	Peak
2483.52	32.28	6.67	24.28	63.23	74.00	10.77	Peak
2483.68	32.28	6.67	24.52	63.47	74.00	10.53	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
2483.52	63.23	-36.42	26.81	54.00	27.19	Average
2483.68	63.47	-36.42	27.05	54.00	26.95	Average

Mode	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	6.65	58.62	97.52	---	---	Peak
2483.52	32.28	6.67	19.75	58.70	74.00	15.30	Peak
2483.84	32.28	6.67	20.14	59.09	74.00	14.91	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
2483.52	58.70	-36.42	22.28	54.00	31.72	Average
2483.84	59.09	-36.42	22.67	54.00	31.33	Average

A.1.2 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
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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	9.54	19.29	63.05	74.00	10.95	Peak
7225.00	35.80	11.82	21.98	69.60	74.00	4.40	Peak
9630.00	36.87	15.30	6.95	59.12	74.00	14.88	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
4815.00	63.05	-36.42	26.63	54.00	27.37	Average
7225.00	69.60	-36.42	33.18	54.00	20.82	Average
9630.00	59.12	-36.42	22.70	54.00	31.30	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	9.54	15.22	58.98	74.00	15.02	Peak
7225.00	35.80	11.82	16.36	63.98	74.00	10.02	Peak
9630.00	36.87	15.30	7.31	59.48	74.00	14.52	Peak
12040.00	38.92	16.58	3.39	58.89	74.00	15.11	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
4815.00	58.98	-36.42	22.56	54.00	31.44	Average
7225.00	63.98	-36.42	27.56	54.00	26.44	Average
9630.00	59.48	-36.42	23.06	54.00	30.94	Average
12040.00	58.89	-36.42	22.47	54.00	31.53	Average

Mode	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	9.56	19.16	62.97	74.00	11.03	Peak
7315.00	35.80	11.90	18.10	65.80	74.00	8.20	Peak
9750.00	37.01	15.47	12.99	65.47	74.00	8.53	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
4875.00	62.97	-36.42	26.55	54.00	27.45	Average
7315.00	65.80	-36.42	29.38	54.00	24.62	Average
9750.00	65.47	-36.42	29.05	54.00	24.95	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
4875.00	34.25	9.56	16.62	60.43	74.00	13.57	Peak
7315.00	35.80	11.90	16.22	63.92	74.00	10.08	Peak
9750.00	37.01	15.47	15.27	67.75	74.00	6.25	Peak
12190.00	39.01	16.65	3.96	59.62	74.00	14.38	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
4875.00	60.43	-36.42	24.01	54.00	29.99	Average
7315.00	63.92	-36.42	27.50	54.00	26.50	Average
9750.00	67.75	-36.42	31.33	54.00	22.67	Average
12190.00	59.62	-36.42	23.20	54.00	30.80	Average

Mode	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	9.58	19.14	62.99	74.00	11.01	Peak
7400.00	35.80	11.99	20.10	67.89	74.00	6.11	Peak
9870.00	37.16	15.64	13.15	65.95	74.00	8.05	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
4935.00	62.99	-36.42	26.57	54.00	27.43	Average
7400.00	67.89	-36.42	31.47	54.00	22.53	Average
9870.00	65.95	-36.42	29.53	54.00	24.47	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
4935.00	34.27	9.58	19.52	63.37	74.00	10.63	Peak
7400.00	35.80	11.99	16.77	64.56	74.00	9.44	Peak
9870.00	37.16	15.64	15.69	68.49	74.00	5.51	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
4935.00	63.37	-36.42	26.95	54.00	27.05	Average
7400.00	64.56	-36.42	28.14	54.00	25.86	Average
9870.00	68.49	-36.42	32.07	54.00	21.93	Average

A.1.3 Emissions in Non-restricted Frequency Bands:

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

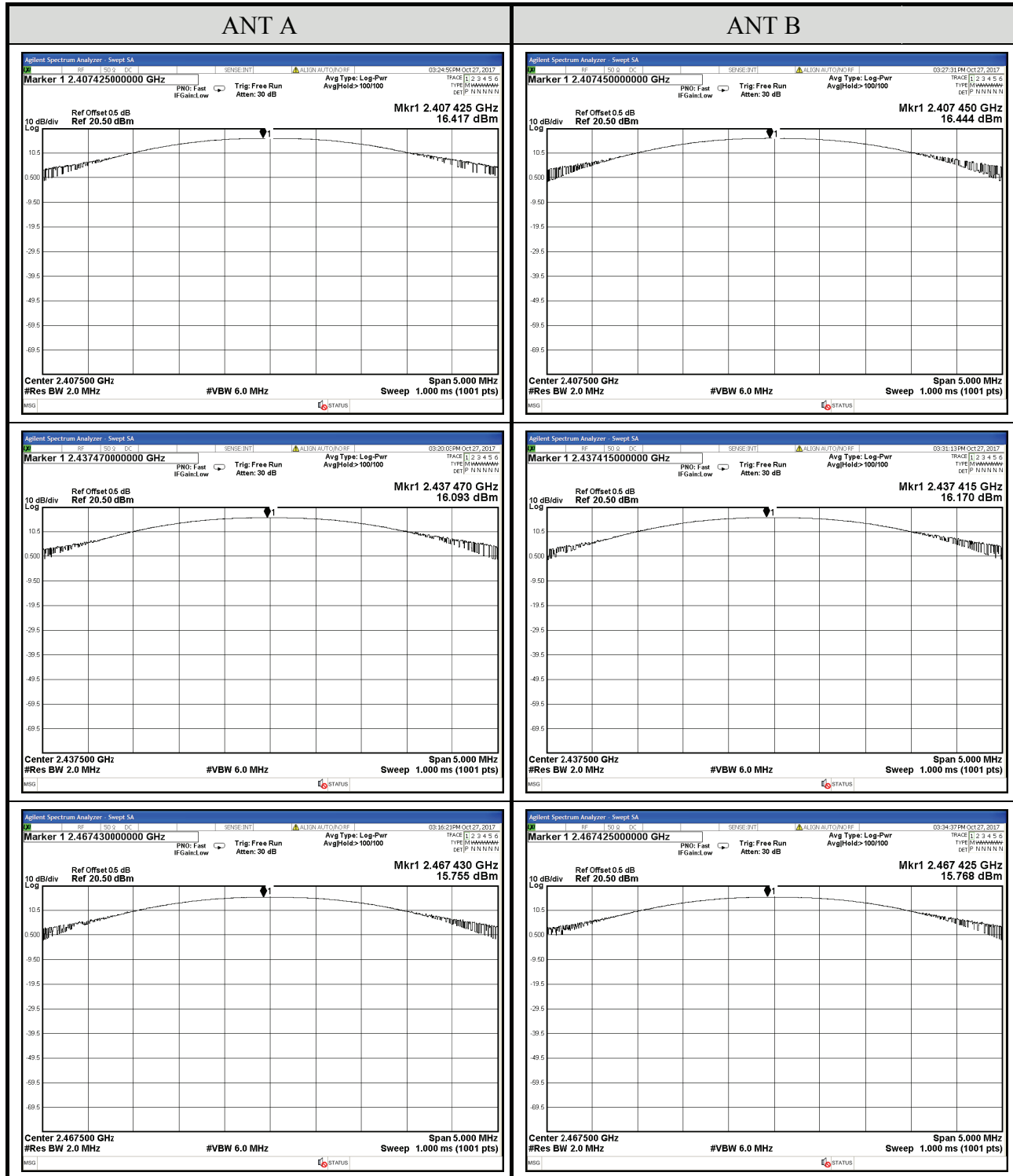
A.2 MAXIMUM PEAK OUTPUT POWER MEASUREMENT

Test Date	2017/10/27	Temp./Hum.	24°C/53%
Cable Loss	3.5dB	Test Voltage	DC 3.3V (Via test jig)

Antenna	Centre Frequency (MHz)	Peak Output Power		Limit
		dBm	W	
ANT A	2407.5	16.417	0.043823	21dBm (0.125W)
	2437.5	16.093	0.040672	
	2467.7	15.755	0.037627	

Antenna	Centre Frequency (MHz)	Peak Output Power		Limit
		dBm	W	
ANT B	2407.5	16.444	0.044096	21dBm (0.125W)
	2437.5	16.170	0.041400	
	2467.7	15.768	0.037740	

A.2.1 Measurement Plots





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APPENDIX B

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APPENDIX B

TEST PHOTOGRAPHS

(Model: FEX01TB)