

FCC 15.247 DSS 2.4GHz Report

for

FUTABA Corporation

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

Brand : Futaba
Product Name : Radio Control
Model Name : T4PV
FCC ID : AZPT4PV-24G

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



TABLE OF CONTENTS

Description	Page
TEST REPORT CERTIFICATION	4
1. REPORT HISTORY.....	5
2. SUMMARY OF TEST RESULTS	6
3. GENERAL INFORMATION	7
3.1. Description of EUT	7
3.2. EUT Specifications Assessed in Current Report.....	8
3.3. Test Configuration.....	10
3.4. Tested Supporting System List.....	12
3.5. Setup Configuration	12
3.6. Operating Condition of EUT	12
3.7. Description of Test Facility	13
3.8. Measurement Uncertainty	13
4. MEASUREMENT EQUIPMENT LIST	14
4.1. Radiated Emission Measurement.....	14
4.2. RF Conducted Measurement.....	14
5. CONDUCTED EMISSION MEASUREMENT	15
6. RADIATED EMISSION MEASUREMENT	16
6.1. Block Diagram of Test Setup	16
6.2. Radiated Emission Limits	17
6.3. Test Procedure	18
6.4. Measurement Result Explanation	19
6.5. Test Results.....	19
7. 20dB BANDWIDTH MEASUREMENT	38
7.1. Block Diagram of Test Setup	38
7.2. Specification Limits	38
7.3. Test Procedure	38
7.4. Test Results.....	38
8. CARRIER FREQUENCY SEPARATION MEASUREMENT	39
8.1. Block Diagram of Test Setup	39
8.2. Specification Limits	39
8.3. Test Procedure	39
8.4. Test Results.....	39
9. TIME OF OCCUPANCY MEASUREMENT.....	40
9.1. Block Diagram of Test Setup	40
9.2. Specification Limits	40
9.3. Test Procedure	40
9.4. Test Results.....	40
10. NUMBER OF HOPPING CHANNELS MEASUREMENT	41
10.1. Block Diagram of Test Setup	41
10.2. Specification Limits	41
10.3. Test Procedure	41
10.4. Test Results.....	41

11. MAXIMUM PEAK OUTPUT POWER MEASUREMENT	42
11.1. Block Diagram of Test Setup	42
11.2. Specification Limits	42
11.3. Test Procedure	42
11.4. Test Results	42
12. EMISSION LIMITATIONS MEASUREMENT	43
12.1. Block Diagram of Test Setup	43
12.2. Specification Limits	43
12.3. Test Procedure	43
12.4. Test Results	43
13. DEVIATION TO TEST SPECIFICATIONS.....	44

APPENDIX A TEST PLOTS

APPENDIX B TEST PHOTOGRAPHS

TEST REPORT CERTIFICATION

Applicant : FUTABA Corporation
Manufacture : FUTABA Corporation
Product Name : Radio Control
Model No. : T4PV
Serial No. : N/A
Brand : Futaba

Rules of Compliance and Measurement Standards:

47 CFR FCC Part 15 Subpart C: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: 2016. 08. 16 ~ 19

Date of Report: 2016. 08. 22

Producer: Sabrina Wang
(Sabrina Wang/Administrator)

Signatory: Ben Cheng
(Ben Cheng/Manager)

1. REPORT HISTORY

Revision	Date	Revision Summary	Report Number
0	2016. 08. 22	Original Report.	EM-F160571

2. SUMMARY OF TEST RESULTS

Rule	Description	Results
15.207	Conducted Emission	N/A
15.247(d)/15.209	Radiated Band Edge and Radiated Spurious Emission	PASS
15.247(a)(1)	20dB Bandwidth	PASS
15.247(a)(1)	Carrier Frequency Separation	PASS
15.247(a)(1)(iii)	Time of Occupancy	PASS
15.247(a)(1)(iii)	Number of Hopping Channels	PASS
15.247(b)(1)	Maximum Peak Output Power	PASS
15.247(d)/15.205	Conducted Band Edges and Conducted Spurious Emission	PASS
15.203	Antenna Requirement	PASS
Note: The EUT only employs battery power for operation, so it is unnecessary to test.		

3. GENERAL INFORMATION

3.1. Description of EUT

Product	Radio Control
Model Number	T4PV
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	T-FHSS, S-FHSS Modulation
Radio Technology	FSK
Transmit Type	1T1R
Antenna Type/Gain	Di-pole Type Antenna, Gain: 2.14dBi
Date of Receipt of Sample	2016. 07. 01

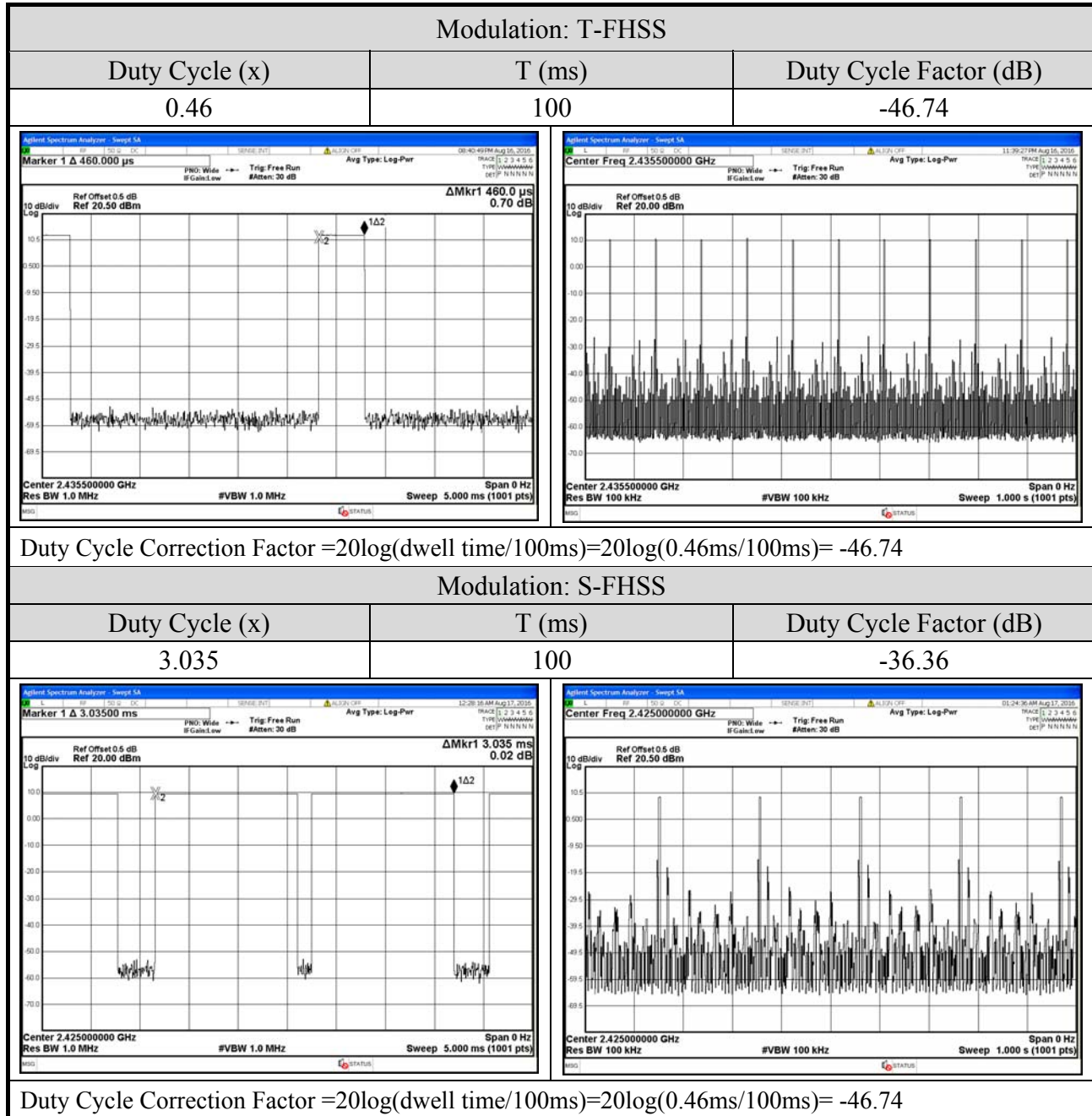
3.2. EUT Specifications Assessed in Current Report

Fundamental Range (MHz)	Channel Number	Modulation	Data Rate (kbps)
2407.5-2467.5	31	T-FHSS	384
2403.25-2447.50	60	S-FHSS	128

Modulation: T-FHSS			
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		

Modulation: S-FHSS					
Channel List					
Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)
1	2403.25	21	2418.25	41	2433.25
2	2404.00	22	2419.00	42	2434.00
3	2404.75	23	2419.75	43	2434.75
4	2405.50	24	2420.50	44	2435.50
5	2406.25	25	2421.25	45	2436.25
6	2407.00	26	2422.00	46	2437.00
7	2407.75	27	2422.75	47	2437.75
8	2408.50	28	2423.50	48	2438.50
9	2409.25	29	2424.25	49	2439.25
10	2410.00	30	2425.00	50	2440.00
11	2410.75	31	2425.75	51	2440.75
12	2411.50	32	2426.50	52	2441.50
13	2412.25	33	2427.25	53	2442.25
14	2413.00	34	2428.00	54	2443.00
15	2413.75	35	2428.75	55	2443.75
16	2414.50	36	2429.50	56	2444.50
17	2415.25	37	2430.25	57	2445.25
18	2416.00	38	2431.00	58	2446.00
19	2416.75	39	2431.75	59	2446.75
20	2417.50	40	2432.50	60	2447.50

3.3. Test Configuration



Note: When duty cycle is less than 98% (0.98) that duty cycle factor $10\log(1/x)$ is needed to add in conducted test items measured in average detector.

Item		Modulation	Test Channel
Radiated Test Case	Radiated Band Edge ^{Note1}	T-FHSS	1/31
		S-FHSS	1/60
	Radiated Spurious Emission ^{Note1}	T-FHSS	1/15/31
		S-FHSS	1/30/60
Conducted Test Case	20dB Bandwidth	T-FHSS	1/15/31
		S-FHSS	1/30/60
	Carrier Frequency Separation	T-FHSS	1/15/31
		S-FHSS	1/30/60
	Time of Occupancy	T-FHSS	1/15/31
		S-FHSS	1/30/60
	Number of Hopping Channels	T-FHSS	15
		S-FHSS	30
	Maximum Peak Output Power	T-FHSS	1/15/31
		S-FHSS	1/30/60
	Band Edges	T-FHSS	1/31
		S-FHSS	1/60
	Spurious Emission	T-FHSS	1/15/31
		S-FHSS	1/30/60

Note 1:

☐ Mobile Device

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

☐ Lie

☐ Side

☒ Stand

3.4. Tested Supporting System List

3.4.1. Support Peripheral Unit

No.	Product	Brand	Model No.	Serial No.	FCC ID
1.	Notebook PC	IBM	2652	99NXMML	ANOVNCBDC80211B
2.	DC Power Supply	TOP WARD	3303A	721773	N/A
3.	Test JIG	Futaba	N/A	N/A	N/A

3.4.2. Cable Lists

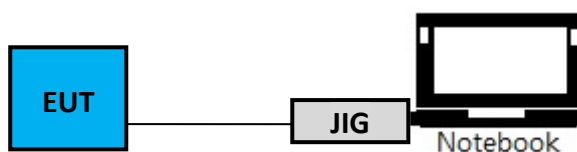
No.	Cable Description Of The Above Support Units
1.	Adapter: IBM, M/N 02K6747 DC Power Cord: Unshielded, Undetachable, 1.8m, Bonded a ferrite core AC Power Cord: Unshielded, Detachable, 1.0m
2.	DC Power Cord*2: Unshielded, Detachable, 0.5m AC Power Cord: Unshielded, Undetachable, 1.8m
3.	Data Cable: Unshielded, Detachable, 0.5m

3.5. Setup Configuration

3.5.1. EUT Configuration for Radiated Emission



3.5.2. EUT Configuration for Conducted Test Items



3.6. Operating Condition of EUT

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

3.7. 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. 53-11, Dingfu, Linkou Dist., New Taipei City 244, Taiwan
NVLAP Lab. Code	:	200077-0
TAF Accreditation No	:	1724
FCC OET Designation	:	TW1004 & TW1090

3.8. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty
Radiation Test (Distance: 3m)	30MHz~1000MHz	± 3.68dB
	Above 1GHz	± 5.82dB

Remark : Uncertainty = $k_{uc}(y)$

Test Item	Uncertainty
6dB Bandwidth	± 0.05kHz
Maximum peak output power	± 0.33dB
Power spectral density	± 0.13dB
Conducted Emission Limitations	± 0.13dB

4. MEASUREMENT EQUIPMENT LIST

4.1. Radiated Emission Measurement

4.1.1. Frequency Range 9kHz~1000MHz (Semi-Anechoic Chamber)

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	CHASE	CBL6112D	33821	2016. 01. 30	1 Year
5.	Loop Antenna	R&S	HFH2-Z2	891847/27	2015. 12. 24	1 Year
6.	Test Software	Audix	e3	V.6.110601	N.C.R.	N.C.R.

4.1.2. Frequency Range Above 1GHz (Fully Anechoic Chamber)

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Spectrum Analyzer	Agilent	E4446A	US44300366	2015. 08. 20	1 Year
2.	Amplifier	Sonoma	310N	187161	2016. 06. 14	1 Year
3.	2.4GHz Notch Filter	K&L	7NSL10-2441. 5E130.5-00	1	2015. 07. 28	1 Year
4.	Horn Antenna	ETS-Lindgren	3117	00135902	2016. 03. 05	1 Year
5.	Horn Antenna	EMCO	3116	2653	2015. 10. 20	1 Year
6.	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	N9010A-507	MY52220264	2015. 08. 20	1 Year
2.	Power Meter	Anritsu	ML2495A	1145008	2015. 10. 23	1 Year
3.	Power Sensor	Anritsu	MA2411B	1126096	2015. 10. 23	1 Year

5. CONDUCTED EMISSION MEASUREMENT

【The EUT only employs battery power for operation, no conductive emission limits are required according to FCC Part 15 Section §15.207】

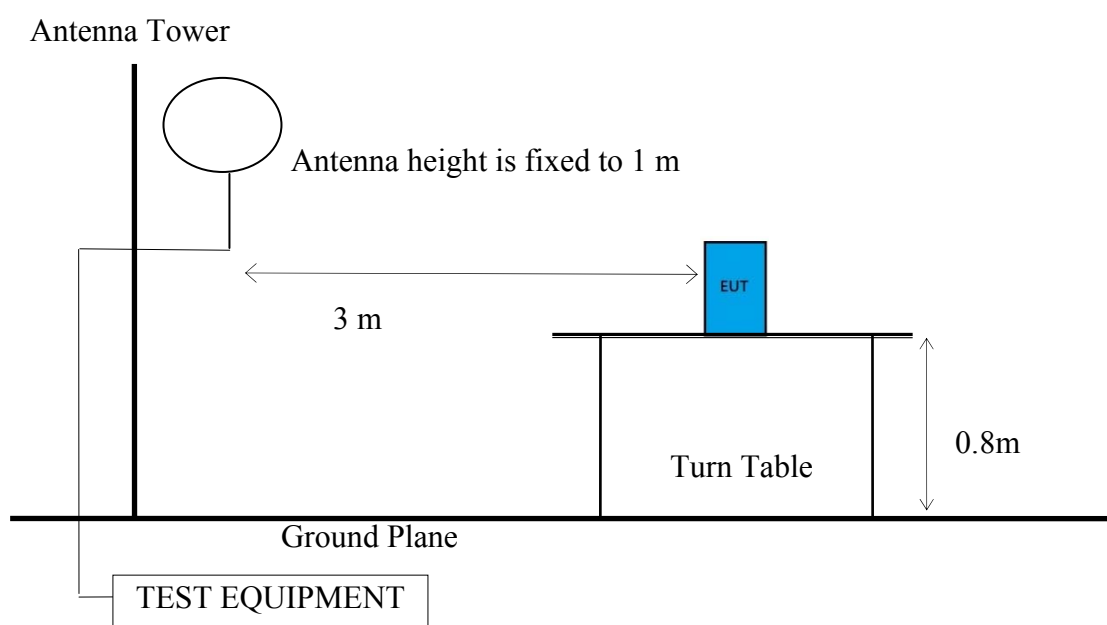
6. RADIATED EMISSION MEASUREMENT

6.1. Block Diagram of Test Setup

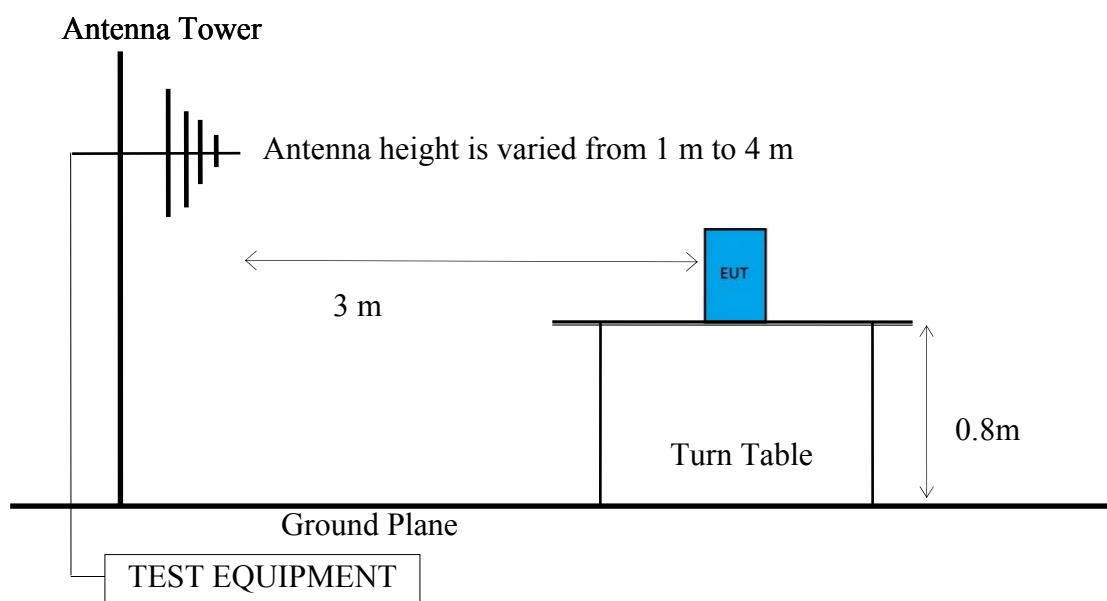
6.1.1. Block Diagram of connection between EUT and simulators

Indicated as section 3.7

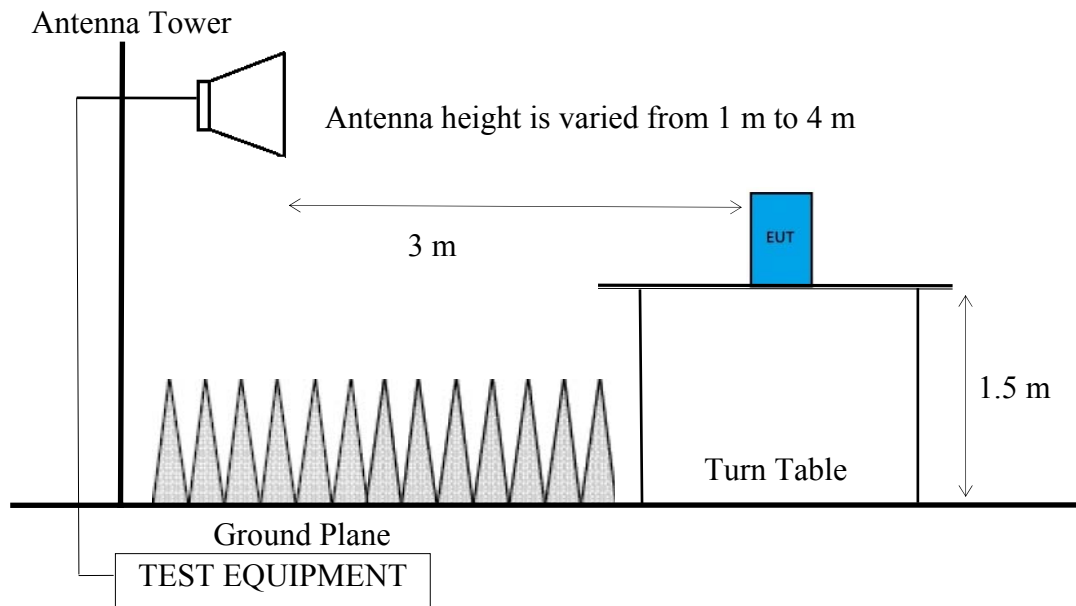
6.1.2. Semi Anechoic Chamber (3m) Setup Diagram for 9kHz-30MHz



6.1.3. Semi Anechoic Chamber (3m) Setup Diagram for 30-1000 MHz



6.1.4. 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/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 ~ 40GHz:

The EUT setup on the turn 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 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 = 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 Detector:☐ **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) = $20\log(TX_{on}/TX_{on+off})$ presented in section 3.5

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

6.5. Test Results

PASSED.

Test Date	2016/08/19	Temp./Hum.	24°C/47%
Test Voltage	DC 6.0V		

6.5.1. Emissions within Restricted Frequency Bands

6.5.1.1. Frequency 9kHz~30MHz

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

6.5.1.2. Frequency Below 1 GHz

Modulation	T-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
38.73	16.03	0.52	16.03	32.58	40.00	7.42	Peak
266.68	13.29	1.47	26.37	41.13	46.00	4.87	Peak
332.64	14.50	1.65	28.68	44.83	46.00	1.17	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	15.41	0.53	22.30	38.24	40.00	1.76	Peak
104.69	11.78	0.88	27.12	39.78	43.50	3.72	Peak
456.80	16.91	2.00	26.11	45.02	46.00	0.98	Peak

Modulation	T-FHSS	Frequency	TX 2435.5MHz
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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
332.64	14.50	1.65	28.66	44.81	43.50	-1.31	Peak
375.32	15.39	1.78	25.51	42.68	46.00	3.32	Peak
576.11	18.54	2.29	14.16	34.99	54.00	19.01	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
70.74	7.58	0.70	29.84	38.12	40.00	1.88	Peak
456.80	16.91	2.00	26.33	45.24	46.00	0.76	Peak
521.79	17.88	2.15	22.39	42.42	46.00	3.58	Peak

Modulation	T-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
266.68	13.29	1.47	26.87	41.63	46.00	4.37	Peak
332.64	14.50	1.65	28.67	44.82	46.00	1.18	Peak
801.15	19.89	2.79	16.81	39.49	46.00	6.51	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
92.08	10.55	0.82	25.78	37.15	43.50	6.35	Peak
456.80	16.91	2.00	26.05	44.96	46.00	1.04	Peak
521.79	17.88	2.15	25.08	45.11	46.00	0.89	Peak

Modulation	S-FHSS	Frequency	TX 2403.25MHz
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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
38.73	16.03	0.52	14.57	31.12	40.00	8.88	Peak
333.61	14.52	1.65	28.40	44.57	46.00	1.43	Peak
335.55	14.58	1.66	28.71	44.95	46.00	1.05	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
79.47	8.97	0.74	27.81	37.52	40.00	2.48	Peak
456.80	16.91	2.00	26.18	45.09	46.00	0.91	Peak
521.79	17.88	2.15	23.79	43.82	46.00	2.18	Peak

Modulation	S-FHSS	Frequency	TX 2425.0MHz
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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
266.68	13.29	1.47	26.14	40.90	46.00	5.10	Peak
333.61	14.52	1.65	28.84	45.01	46.00	0.99	Peak
335.55	14.58	1.66	28.41	44.65	46.00	1.35	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
74.62	8.21	0.72	28.37	37.30	40.00	2.70	Peak
456.80	16.91	2.00	26.46	45.37	46.00	0.63	Peak
521.79	17.88	2.15	24.24	44.27	46.00	1.73	Peak

Modulation	S-FHSS	Frequency	TX 2447.5MHz
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Antenna at Horizontal Polarization

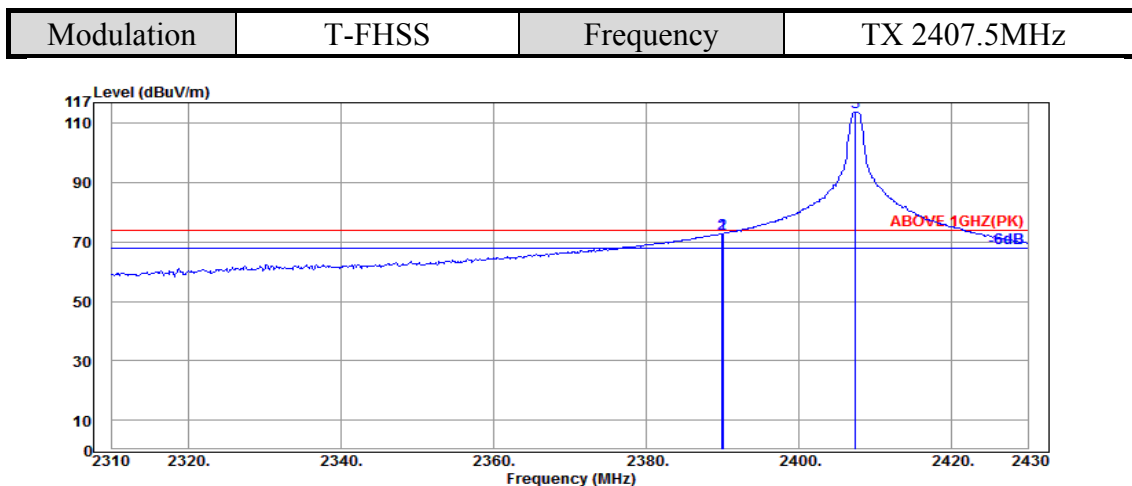
Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
333.61	14.52	1.65	28.34	44.51	46.00	1.49	Peak
384.05	15.54	1.80	21.92	39.26	46.00	6.74	Peak
466.50	17.08	2.03	19.04	38.15	46.00	7.85	Peak

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
86.26	9.81	0.78	25.76	36.35	40.00	3.65	Peak
366.59	15.21	1.75	21.24	38.20	46.00	7.80	Peak
456.80	16.91	2.00	25.78	44.69	46.00	1.31	Peak

6.5.1.3. Frequency Above 1 GHz to 10th harmonics

Band Edge:

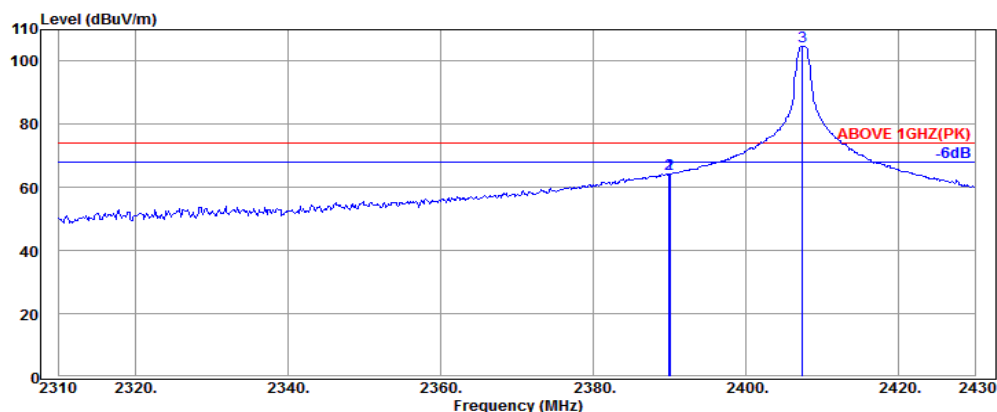


Antenna at Horizontal Polarization

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	31.68	6.08	35.03	72.79	74.00	1.21	Peak
2390.04	31.68	6.08	35.09	72.85	74.00	1.15	Peak
2407.44	31.70	6.10	75.89	113.69	---	---	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
2389.92	72.79	-46.74	26.05	54.00	27.95	Average
2390.04	72.85	-46.74	26.11	54.00	27.89	Average

Modulation	T-FHSS	Frequency	TX 2407.5MHz
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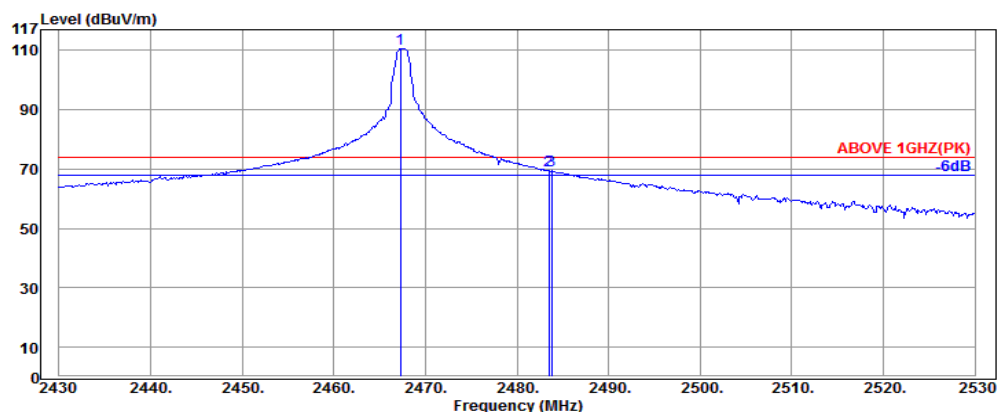


Antenna at Vertical Polarization

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	25.98	64.22	74.00	9.78	Peak
2390.04	32.16	6.08	26.13	64.37	74.00	9.63	Peak
2407.44	32.18	6.10	66.38	104.66	---	---	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
2389.92	64.22	-46.74	17.48	54.00	36.52	Average
2390.04	64.37	-46.74	17.63	54.00	36.37	Average

Modulation	T-FHSS	Frequency	TX 2467.5MHz
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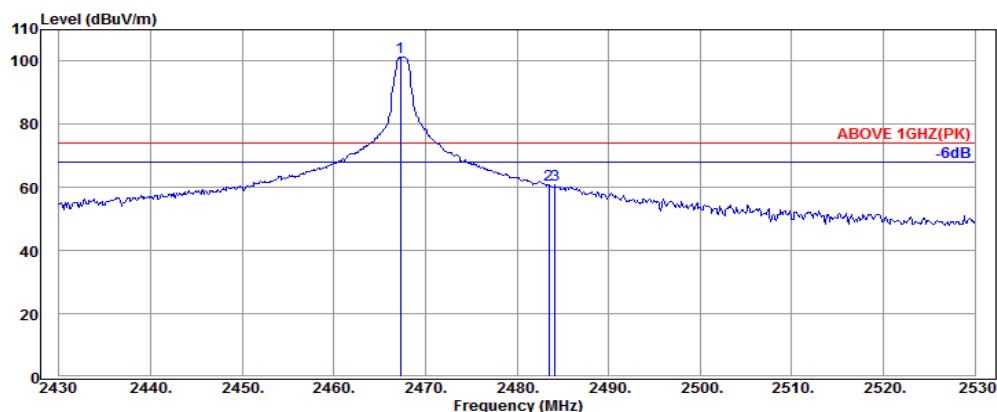


Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2467.30	31.76	6.17	72.70	110.63	---	---	Peak
2483.50	31.78	6.19	31.65	69.62	74.00	4.38	Peak
2483.80	31.78	6.19	31.43	69.40	74.00	4.60	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
2483.50	69.62	-46.74	22.88	54.00	31.12	Average
2483.80	69.40	-46.74	22.66	54.00	31.34	Average

Modulation	T-FHSS	Frequency	TX 2467.5MHz
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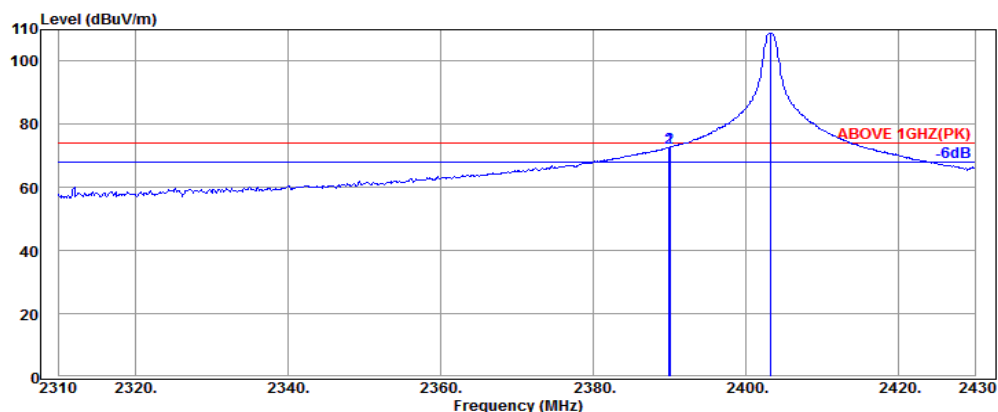


Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2467.30	31.76	6.17	63.50	101.43	---	---	Peak
2483.50	31.78	6.19	22.90	60.87	74.00	13.13	Peak
2484.20	31.78	6.19	22.87	60.84	74.00	13.16	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
2483.50	60.87	-46.74	14.13	54.00	39.87	Average
2484.20	60.84	-46.74	14.10	54.00	39.90	Average

Modulation	S-FHSS	Frequency	TX 2403.25MHz
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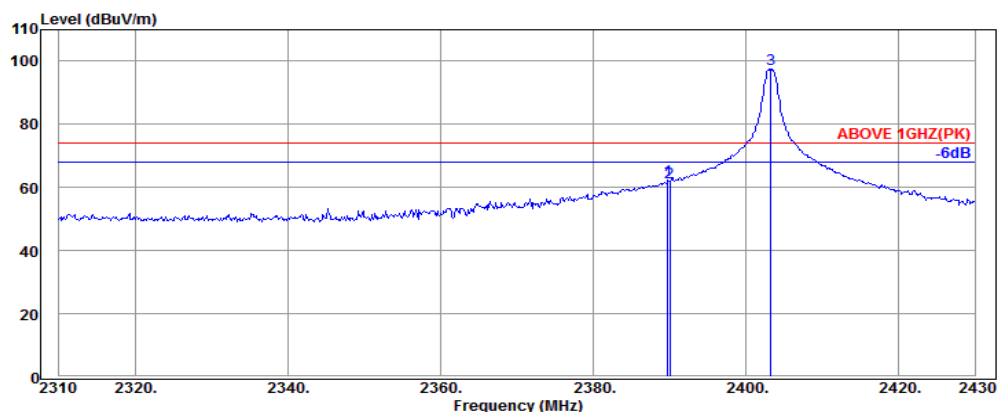


Antenna at Horizontal Polarization

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	31.68	6.08	34.78	72.54	74.00	1.46	Peak
2390.04	31.68	6.08	34.86	72.62	74.00	1.38	Peak
2403.24	31.69	6.10	71.18	108.97	---	---	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
2389.92	72.54	-36.36	36.18	54.00	17.82	Average
2390.04	72.62	-36.36	36.26	54.00	17.74	Average

Modulation	S-FHSS	Frequency	TX 2403.25MHz
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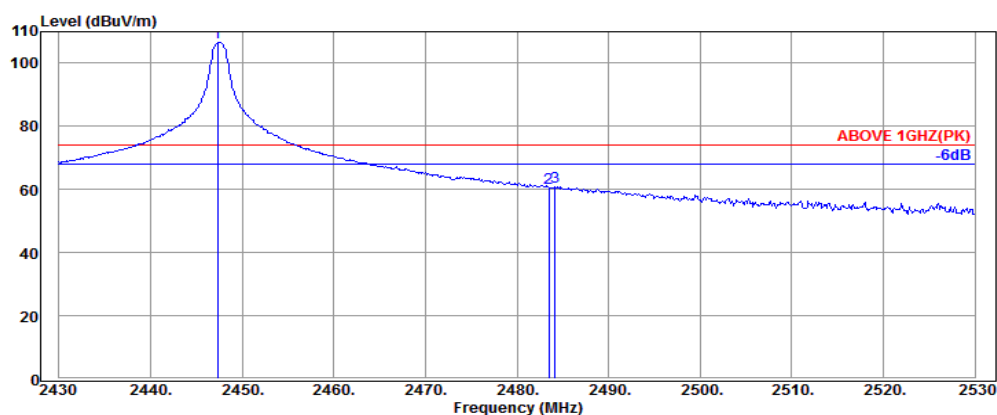


Antenna at Vertical Polarization

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	31.68	6.08	24.55	62.31	74.00	11.69	Peak
2390.04	31.68	6.08	23.85	61.61	74.00	12.39	Peak
2403.24	31.69	6.10	59.62	97.41	---	---	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
2389.80	62.31	-36.36	25.95	54.00	28.05	Average
2390.04	61.61	-36.36	25.25	54.00	28.75	Average

Modulation	S-FHSS	Frequency	TX 2447.5MHz
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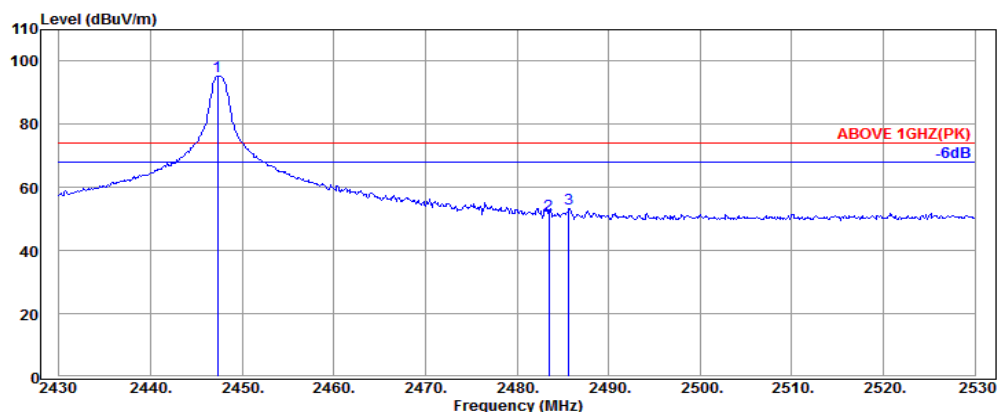


Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2447.30	31.75	6.14	68.67	106.56	---	---	Peak
2483.50	31.78	6.19	22.59	60.56	74.00	13.44	Peak
2484.20	31.78	6.19	23.05	61.02	74.00	12.98	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
2483.50	60.56	-36.36	24.20	54.00	29.80	Average
2484.20	61.02	-36.36	24.66	54.00	29.34	Average

Modulation	S-FHSS	Frequency	TX 2447.5MHz
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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
2447.30	31.75	6.14	57.43	95.32	---	---	Peak
2483.50	31.78	6.19	13.28	51.25	74.00	22.75	Peak
2485.70	31.78	6.19	15.34	53.31	74.00	20.69	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
2483.50	51.25	-36.36	14.89	54.00	39.11	Average
2485.70	53.31	-36.36	16.95	54.00	37.05	Average

6.5.2. Emissions outside the frequency band:

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

Modulation	T-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	18.29	61.44	74.00	12.56	Peak
7225.00	35.80	11.27	5.12	52.19	74.00	21.81	Peak
9630.00	36.64	12.69	-3.76	45.57	74.00	28.43	Peak
Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark	
4815.00	61.44	-46.74	14.70	54.00	39.30	Average	
7225.00	52.19	-46.74	5.45	54.00	48.55	Average	
9630.00	45.57	-46.74	-1.17	54.00	55.17	Average	

Antenna at Vertical Polarization

Emission Frequency	Antenna Factor	Cable Loss	Meter Reading	Emission Level	Limits	Margin	Detector
(MHz)	(dB/m)	(dB)	(dBμV)	(dBμV/m)	(dBμV/m)	(dB)	
4815.00	34.22	8.93	18.51	61.66	74.00	12.34	Peak
7225.00	35.80	11.27	2.25	49.32	74.00	24.68	Peak
9630.00	36.64	12.69	-4.19	45.14	74.00	28.86	Peak

Emission Frequency	Peak Emission Level	DCCF	Average Emission Level	Limits	Margin	Remark
(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4815.00	61.66	-46.74	14.92	54.00	39.08	Average
7225.00	49.32	-46.74	2.58	54.00	51.42	Average
9630.00	45.14	-46.74	-1.60	54.00	55.60	Average

Modulation	T-FHSS	Frequency	TX 2435.5MHz
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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
4865.00	33.85	9.09	12.97	55.91	74.00	18.09	Peak
7305.00	35.64	11.80	-1.43	46.01	74.00	27.99	Peak
9740.00	36.75	13.48	-4.23	46.00	74.00	28.00	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
4865.00	55.91	-46.74	9.17	54.00	44.83	Average
7305.00	46.01	-46.74	-0.73	54.00	54.73	Average
9740.00	46.00	-46.74	-0.74	54.00	54.74	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	33.85	9.09	16.40	59.34	74.00	14.66	Peak
7305.00	35.64	11.80	-0.47	46.97	74.00	27.03	Peak
9740.00	36.75	13.48	-3.73	46.50	74.00	27.50	Peak

Emission Frequency (MHz)	Peak Emission Level (dBμV/m)	DCCF (dB)	Average Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
4875.00	59.34	-46.74	12.60	54.00	41.40	Average
7305.00	46.97	-46.74	0.23	54.00	53.77	Average
9740.00	46.50	-46.74	-0.24	54.00	54.24	Average

Modulation	T-FHSS	Frequency	TX 2467.5MHz
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Antenna at Horizontal Polarization

Emission Frequency	Antenna Factor	Cable Loss	Meter Reading	Emission Level	Limits	Margin	Detector
(MHz)	(dB/m)	(dB)	(dBμV)	(dBμV/m)	(dBμV/m)	(dB)	
4935.00	33.87	9.30	6.80	49.97	74.00	24.03	Peak
7400.00	35.62	12.41	-1.08	46.95	74.00	27.05	Peak
9870.00	36.86	13.50	-2.60	47.76	74.00	26.24	Peak
Emission Frequency	Peak Emission Level		DCCF	Average Emission Level	Limits	Margin	Remark
(MHz)	(dBμV/m)		(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4935.00	49.97		-46.74	3.23	54.00	50.77	Average
7400.00	46.95		-46.74	0.21	54.00	53.79	Average
9870.00	47.76		-46.74	1.02	54.00	52.98	Average

Antenna at Vertical Polarization

Emission Frequency	Antenna Factor	Cable Loss	Meter Reading	Emission Level	Limits	Margin	Detector
(MHz)	(dB/m)	(dB)	(dBμV)	(dBμV/m)	(dBμV/m)	(dB)	
4935.00	33.87	9.30	9.57	52.74	74.00	21.26	Peak
7400.00	35.62	12.41	-2.28	45.75	74.00	28.25	Peak
9870.00	36.86	13.50	-3.13	47.23	74.00	26.77	Peak

Emission Frequency	Peak Emission Level	DCCF	Average Emission Level	Limits	Margin	Remark
(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4935.00	52.74	-46.74	6.00	54.00	48.00	Average
7400.00	45.75	-46.74	-0.99	54.00	54.99	Average
9870.00	47.23	-46.74	0.49	54.00	53.51	Average

Modulation	S-FHSS	Frequency	TX 2403.25MHz
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Antenna at Horizontal Polarization

Emission Frequency	Antenna Factor	Cable Loss	Meter Reading	Emission Level	Limits	Margin	Detector
(MHz)	(dB/m)	(dB)	(dBμV)	(dBμV/m)	(dBμV/m)	(dB)	
4815.00	33.83	8.93	3.76	46.52	74.00	27.48	Peak
7210.00	35.66	11.27	-0.18	46.75	74.00	27.25	Peak
9610.00	36.61	12.50	-2.60	46.51	74.00	27.49	Peak

Emission Frequency	Peak Emission Level	DCCF	Average Emission Level	Limits	Margin	Remark
(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4815.00	46.52	-36.36	10.16	54.00	43.84	Average
7210.00	46.75	-36.36	10.39	54.00	43.61	Average
9610.00	46.51	-36.36	10.15	54.00	43.85	Average

Antenna at Vertical Polarization

Emission Frequency	Antenna Factor	Cable Loss	Meter Reading	Emission Level	Limits	Margin	Detector
(MHz)	(dB/m)	(dB)	(dBμV)	(dBμV/m)	(dBμV/m)	(dB)	
4810.00	33.82	8.87	2.78	45.47	74.00	28.53	Peak
7210.00	35.66	11.27	-1.67	45.26	74.00	28.74	Peak
9610.00	36.61	12.50	-2.48	46.63	74.00	27.37	Peak

Emission Frequency	Peak Emission Level	DCCF	Average Emission Level	Limits	Margin	Remark
(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4810.00	45.47	-36.36	9.11	54.00	44.89	Average
7210.00	45.26	-36.36	8.90	54.00	45.10	Average
9610.00	46.63	-36.36	10.27	54.00	43.73	Average

Modulation	S-FHSS	Frequency	TX 2425.0MHz
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Antenna at Horizontal Polarization

Emission Frequency	Antenna Factor	Cable Loss	Meter Reading	Emission Level	Limits	Margin	Detector
(MHz)	(dB/m)	(dB)	(dBμV)	(dBμV/m)	(dBμV/m)	(dB)	
4850.00	33.84	9.03	1.76	44.63	74.00	29.37	Peak
7275.00	35.64	11.65	-0.43	46.86	74.00	27.14	Peak
9700.00	36.69	13.09	-1.78	48.00	74.00	26.00	Peak
Emission Frequency	Peak Emission Level	DCCF	Average Emission Level	Limits	Margin	Remark	
(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		
4850.00	44.63	-36.36	8.27	54.00	45.73	Average	
7275.00	46.86	-36.36	10.50	54.00	43.50	Average	
9700.00	48.00	-36.36	11.64	54.00	42.36	Average	

Antenna at Vertical Polarization

Emission Frequency	Antenna Factor	Cable Loss	Meter Reading	Emission Level	Limits	Margin	Detector
(MHz)	(dB/m)	(dB)	(dBμV)	(dBμV/m)	(dBμV/m)	(dB)	
4850.00	33.84	9.03	3.81	46.68	74.00	27.32	Peak
7275.00	35.64	11.65	-0.66	46.63	74.00	27.37	Peak
9700.00	36.69	13.09	-3.34	46.44	74.00	27.56	Peak

Emission Frequency	Peak Emission Level	DCCF	Average Emission Level	Limits	Margin	Remark
(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4850.00	46.68	-36.36	10.32	54.00	43.68	Average
7275.00	46.63	-36.36	10.27	54.00	43.73	Average
9700.00	46.44	-36.36	10.08	54.00	43.92	Average

Modulation	S-FHSS	Frequency	TX 2447.5MHz
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Antenna at Horizontal Polarization

Emission Frequency	Antenna Factor	Cable Loss	Meter Reading	Emission Level	Limits	Margin	Detector
(MHz)	(dB/m)	(dB)	(dBμV)	(dBμV/m)	(dBμV/m)	(dB)	
4895.00	33.86	9.19	0.54	43.59	74.00	30.41	Peak
7340.00	35.63	11.95	-0.25	47.33	74.00	26.67	Peak
9790.00	36.78	13.48	-2.70	47.56	74.00	26.44	Peak
Emission Frequency	Peak Emission Level		DCCF	Average Emission Level	Limits	Margin	Remark
(MHz)	(dBμV/m)		(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4895.00	43.59		-36.36	7.23	54.00	46.77	Average
7340.00	47.33		-36.36	10.97	54.00	43.03	Average
9790.00	47.56		-36.36	11.20	54.00	42.80	Average

Antenna at Vertical Polarization

Emission Frequency	Antenna Factor	Cable Loss	Meter Reading	Emission Level	Limits	Margin	Detector
(MHz)	(dB/m)	(dB)	(dBμV)	(dBμV/m)	(dBμV/m)	(dB)	
4890.00	33.86	9.14	3.40	46.40	74.00	27.60	Peak
7430.00	35.61	12.56	-0.23	47.94	74.00	26.06	Peak
9790.00	36.78	13.48	-2.08	48.18	74.00	25.82	Peak

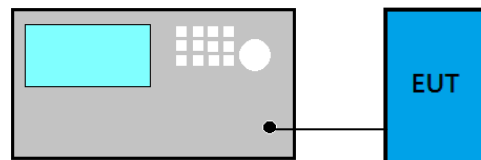
Emission Frequency	Peak Emission Level	DCCF	Average Emission Level	Limits	Margin	Remark
(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4890.00	46.40	-36.36	10.04	54.00	43.96	Average
7430.00	47.94	-36.36	11.58	54.00	42.42	Average
9790.00	48.18	-36.36	11.82	54.00	42.18	Average

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:

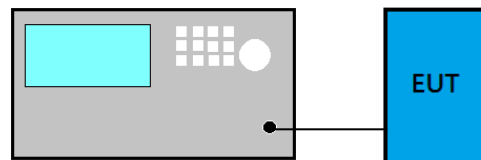
- (1) Set RBW close to 1% of OBW.
- (2) Set $VBW \geq RBW$.
- (3) Detector = Peak.
- (4) Trace mode = max hold.
- (5) Sweep = auto couple.
- (6) Allow the trace to stabilize.
- (7) Setting channel bandwidth function x dB to -20 dB to record the final bandwidth.

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:

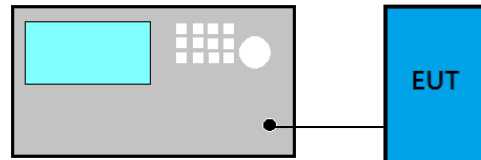
- (1) Span = wide enough to capture the peaks of two adjacent channels
- (2) RBW $\geq$ 1% of the span
- (3) VBW $\geq$ RBW
- (4) Sweep = auto
- (5) Detector function = peak
- (6) Trace = max hold

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:

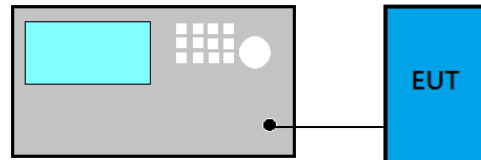
- (1) Span = zero span, centered on a hopping channel
- (2) RBW = 1 MHz
- (3) VBW $\geq$ RBW
- (4) Sweep = as necessary to capture the entire dwell time per hopping channel
- (5) Detector function = peak
- (6) Trace = max hold

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:

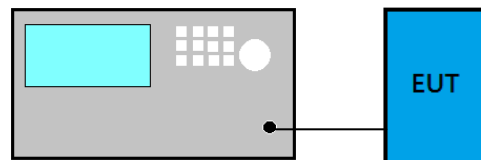
- (1) Span = the frequency band of operation
- (2) RBW $\geq$ 1% of the span
- (3) VBW $\geq$ RBW
- (4) Sweep = auto
- (5) Detector function = peak
- (6) Trace = max hold

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:

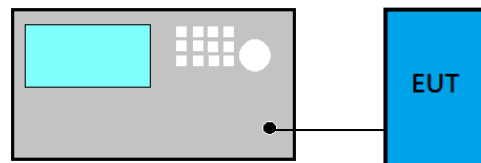
- (1) Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel
- (2) $RBW \geq OBW$
- (3) $VBW \geq RBW$
- (4) Sweep = auto
- (5) Detector function = peak
- (6) Trace = max hold

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)). (※ This test result attaching to §3.6.3)

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 ≥ 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】



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APPENDIX A

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APPENDIX A

TEST PLOTS

(Model: T4PV)

TABLE OF CONTENTS

A.1	20DB BANDWIDTH MEASUREMENT	2
A.1.1	20dB Bandwidth Result.....	2
A.1.2	Measurement Plots	3
A.2	CARRIER FREQUENCY SEPARATION MEASUREMENT.....	4
A.2.1	Measurement Plots	4
A.3	TIME OF OCCUPANCY MEASUREMENT	6
A.3.1	Time of Occupancy.....	6
A.3.2	Measurement Plots	8
A.4	NUMBER OF HOPPING CHANNELS MEASUREMENT	10
A.4.1	Measurement Plots	10
A.5	MAXIMUM PEAK OUTPUT POWER MEASUREMENT	11
A.5.1	Measurement Plots	12
A.6	EMISSION LIMITATIONS MEASUREMENT	13
A.6.1	Band Edge	13
A.6.2	Spurious Emission	15

A.1 20DB BANDWIDTH MEASUREMENT

Test Date	2016/08/16 ~ 17	Temp./Hum.	26°C/54~57%
Cable Loss	0.5dB	Test Voltage	DC 6.0V

A.1.1 20dB Bandwidth Result

Modulation	Centre Frequency (MHz)	20 dB Bandwidth (MHz)	Limit 2/3 (20dB Bandwidth)
T-FHSS	2407.50	0.8788	0.585867
	2435.50	0.8798	0.586533
	2467.50	0.8815	0.587667

Remark: The maximum two-thirds of the 20dB bandwidth shall be at maximum 0.588MHz.

Modulation	Centre Frequency (MHz)	20 dB Bandwidth (MHz)	Limit 2/3 (20dB Bandwidth)
S-FHSS	2403.25	0.2594	0.172933
	2425.00	0.2586	0.172400
	2447.50	0.2590	0.172667

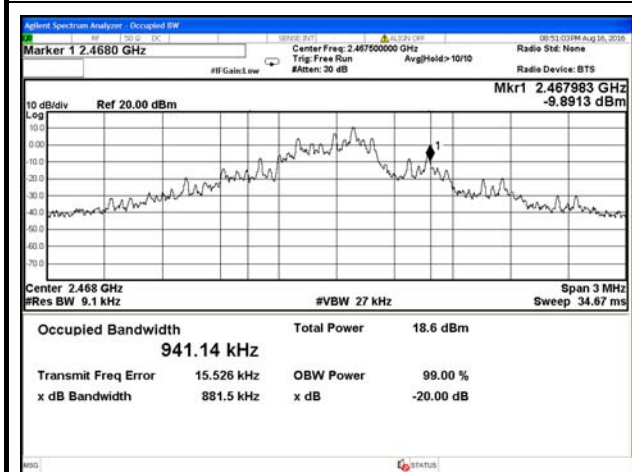
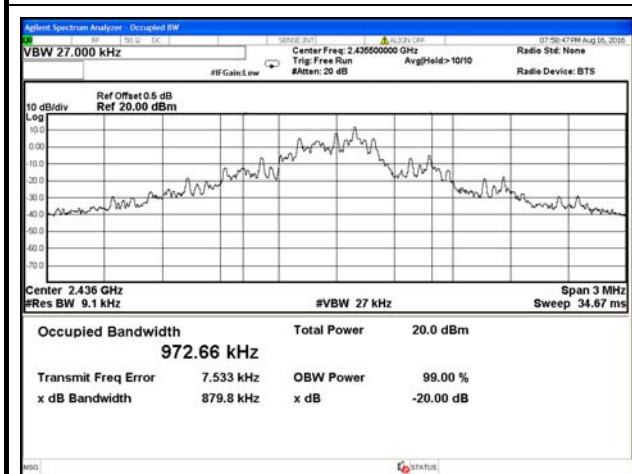
Remark: The maximum two-thirds of the 20dB bandwidth shall be at maximum 0.173MHz.

A.1.2 Measurement Plots

T-FHSS



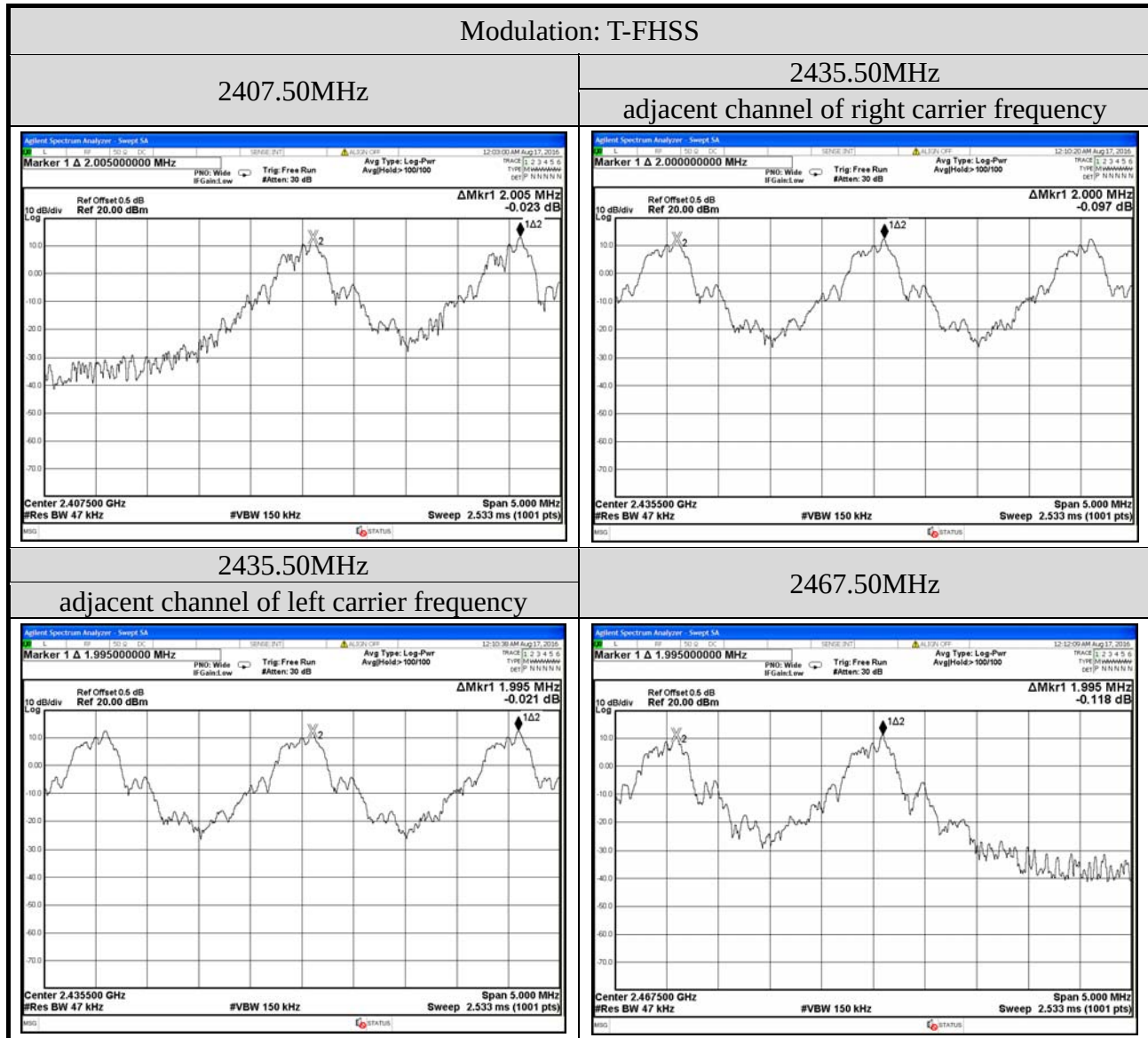
S-FHSS



A.2 CARRIER FREQUENCY SEPARATION MEASUREMENT

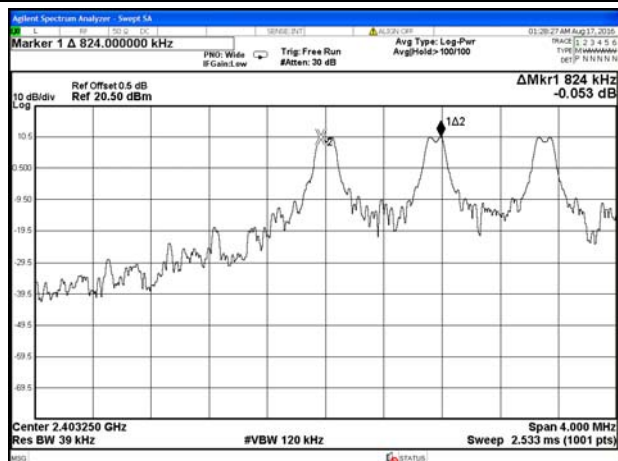
Test Date	2016/08/17	Temp./Hum.	26°C/57%
Cable Loss	0.5dB	Test Voltage	DC 6.0V

A.2.1 Measurement Plots



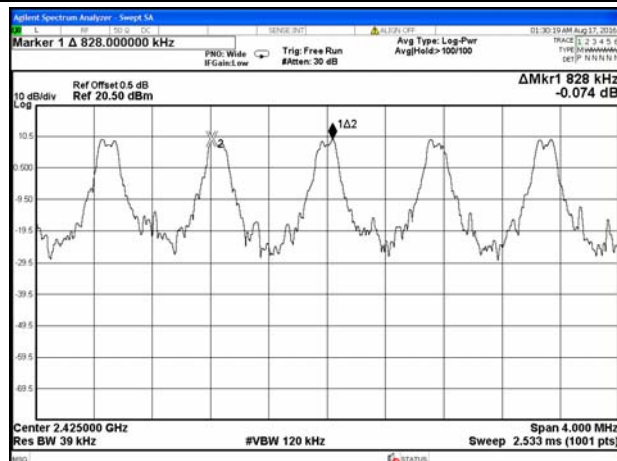
Modulation: S-FHSS

2403.25MHz



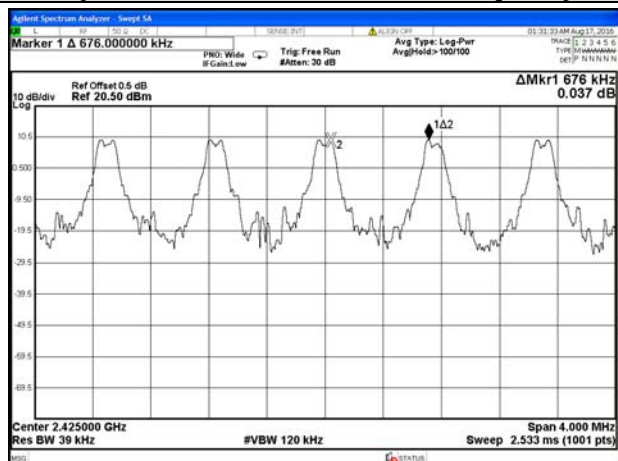
2425.00MHz

adjacent channel of right carrier frequency

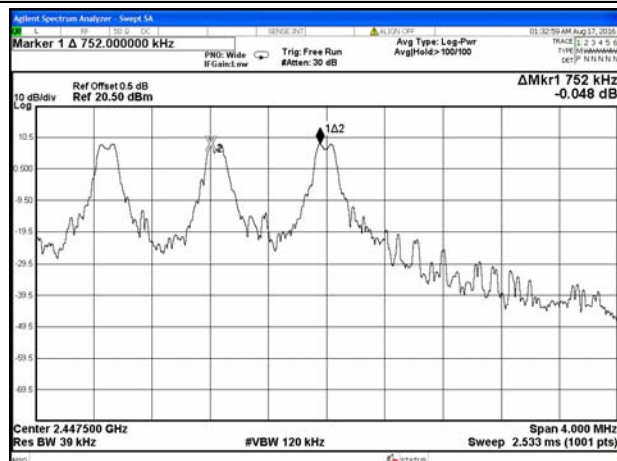


2425.00MHz

adjacent channel of left carrier frequency



2447.50MHz



A.3 TIME OF OCCUPANCY MEASUREMENT

Test Date	2016/08/16 ~ 17	Temp./Hum.	26°C/54~57%
Cable Loss	0.5dB	Test Voltage	DC 6.0V

A.3.1 Time of Occupancy

Modulation	Centre Frequency (MHz)	Time of Occupancy (ms)	Maximum accumulated Time of Occupancy (ms)	Limit (ms)
T-FHSS	2407.500	0.460	62.744	<400
	2435.500	0.460	62.744	<400
	2467.500	0.460	62.744	<400

Modulation	Centre Frequency (MHz)	Time of Occupancy (ms)	Maximum accumulated Time of Occupancy (ms)	Limit (ms)
S-FHSS	2403.25	3.015	361.800	<400
	2425.00	3.035	364.200	<400
	2447.50	3.035	364.200	<400

T-FHSS Modulation

Duty cycle: 31 channels*0.4 seconds = 12.4 seconds

Test Frequency: 2407.500MHz

For each 1 second of 11 channel appearance, the longest time of occupancy for each of 12.4 seconds is:

$$11 \text{ channels} * 12.4 \text{ seconds} * 0.460 \text{ ms} = 62.744 \text{ ms}$$

Test Frequency: 2435.500MHz

For each 1 second of 11 channel appearance, the longest time of occupancy for each of 12.4 seconds is:

$$11 \text{ channels} * 12.4 \text{ seconds} * 0.460 \text{ ms} = 62.744 \text{ ms}$$

Test Frequency: 2467.500MHz

For each 1 second of 11 channel appearance, the longest time of occupancy for each of 12.4 seconds is:

$$11 \text{ channels} * 12.4 \text{ seconds} * 0.460 \text{ ms} = 62.744 \text{ ms}$$

S-FHSS Modulation

Duty cycle: 60 channels*0.4 seconds = 24 seconds

Test Frequency: 2403.250MHz

For each 1 second of 5 channel appearance, the longest time of occupancy for each of 24 seconds is:

$$5 \text{ channels} * 24 \text{ seconds} * 3.015 \text{ ms} = 361.800 \text{ ms}$$

Test Frequency: 2425.00MHz

For each 1 second of 5 channel appearance, the longest time of occupancy for each of 24 seconds is:

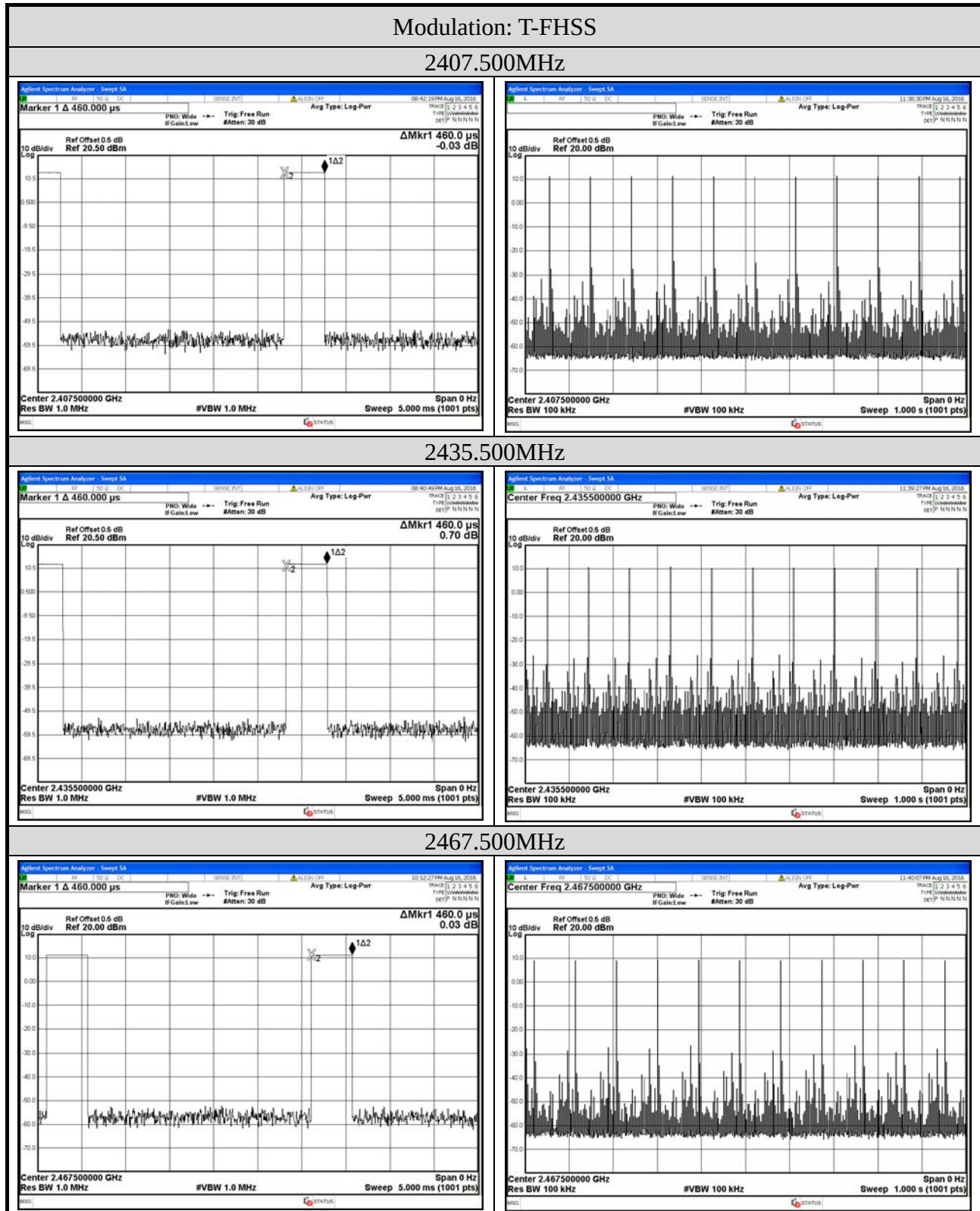
$$5 \text{ channels} * 24 \text{ seconds} * 3.035 \text{ ms} = 364.200 \text{ ms}$$

Test Frequency: 2447.50MHz

For each 1 second of 5 channel appearance, the longest time of occupancy for each of 24 seconds is:

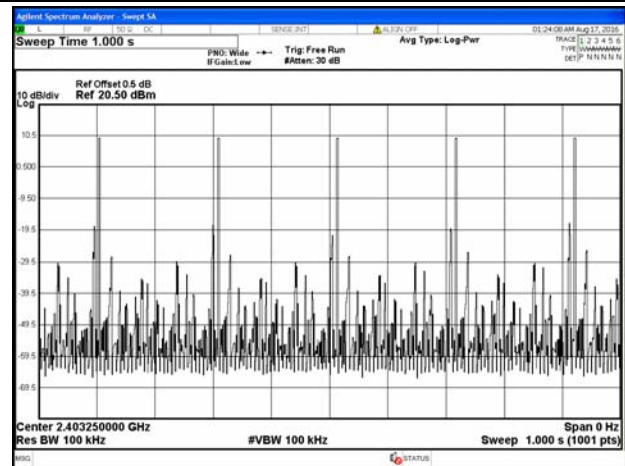
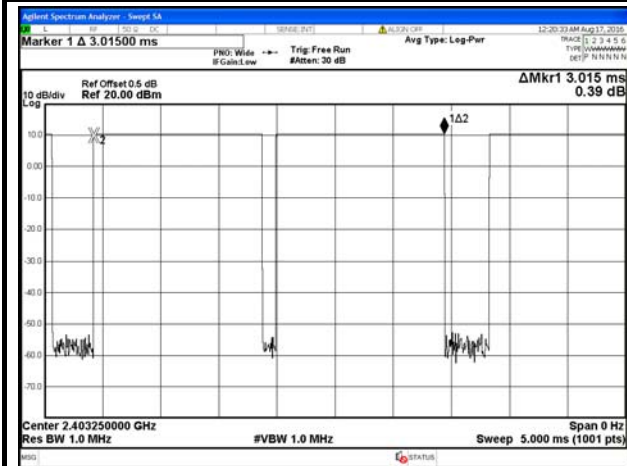
$$5 \text{ channels} * 24 \text{ seconds} * 3.035 \text{ ms} = 364.200 \text{ ms}$$

A.3.2 Measurement Plots

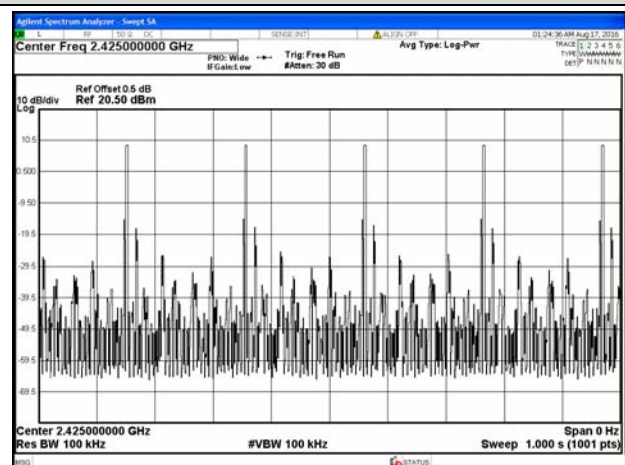
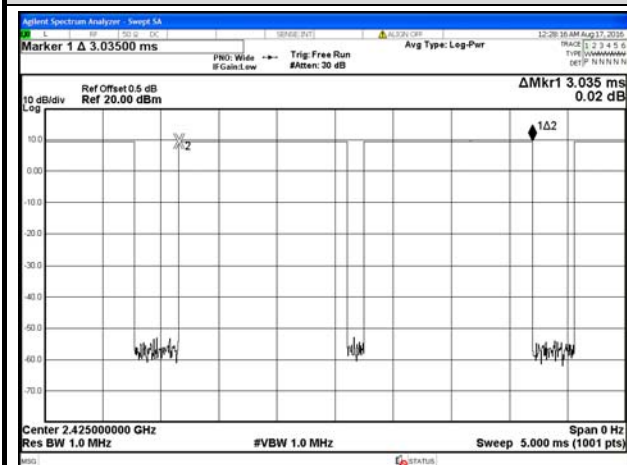


Modulation: S-FHSS

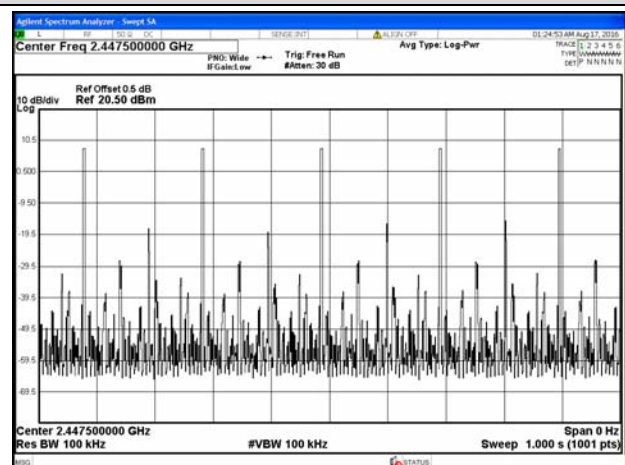
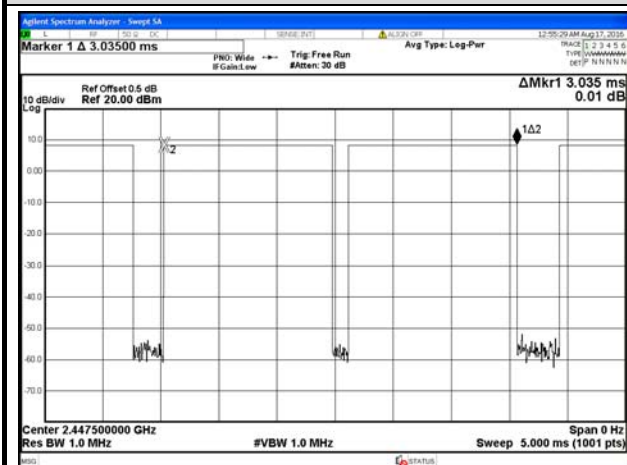
2403.25MHz



2425.00MHz



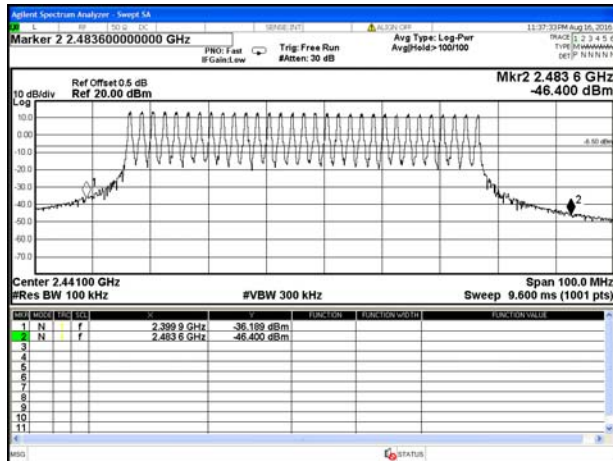
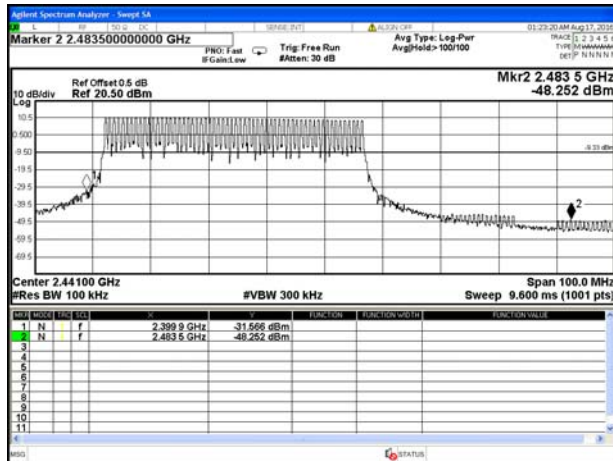
2447.50MHz



A.4 NUMBER OF HOPPING CHANNELS MEASUREMENT

Test Date	2016/08/16 ~ 17	Temp./Hum.	26°C/54~57%
Cable Loss	0.5dB	Test Voltage	DC 6.0V

A.4.1 Measurement Plots

Modulation: T-FHSS	Modulation: S-FHSS
 Marker 2 2.483600000000 GHz Mkr2 2.483 6 GHz -46.400 dBm Center 2.44100 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 9.600 ms (1001 pts)	 Marker 2 2.483500000000 GHz Mkr2 2.483 5 GHz -48.252 dBm Center 2.44100 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 9.600 ms (1001 pts)
The number hopping channel is 31 .	The number hopping channel is 60 .

A.5 MAXIMUM PEAK OUTPUT POWER MEASUREMENT

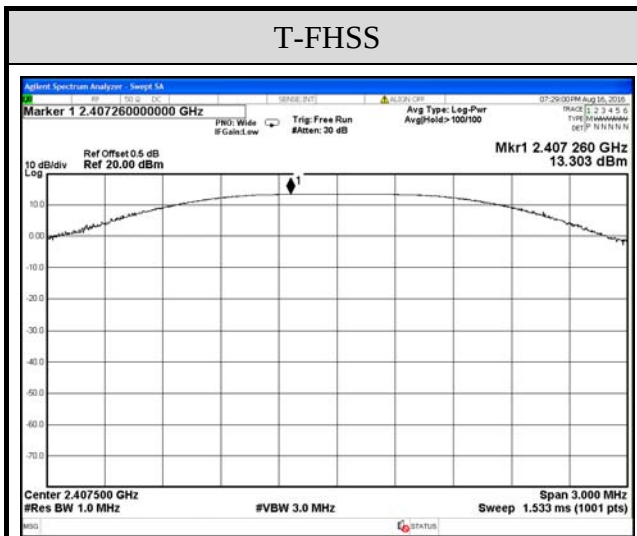
Test Date	2016/08/16 ~ 17	Temp./Hum.	26°C/54~57%
Cable Loss	0.5dB	Test Voltage	DC 6.0V

Modulation	Centre Frequency (MHz)	Peak Output Power		Limit
		dBm	W	
T-FHSS	2407.50	13.303	0.021394	21dBm (0.125W)
	2435.50	12.273	0.016877	
	2467.50	11.159	0.013059	

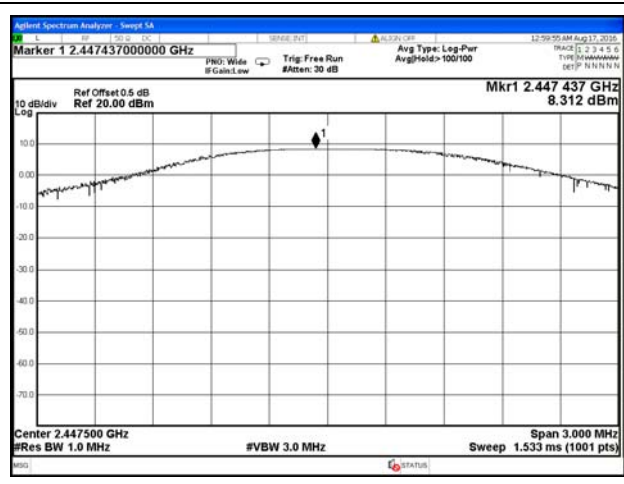
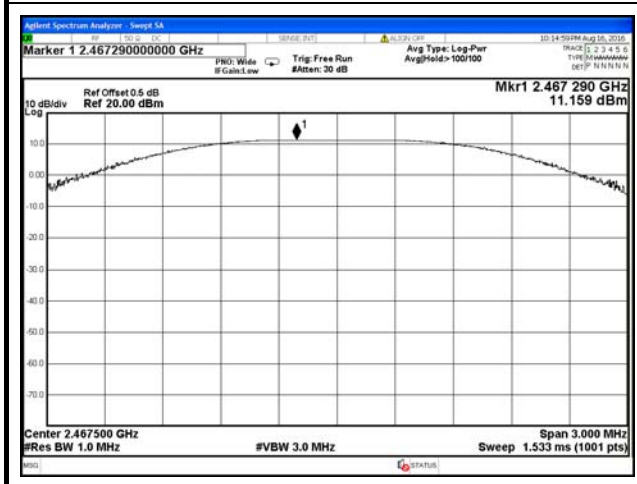
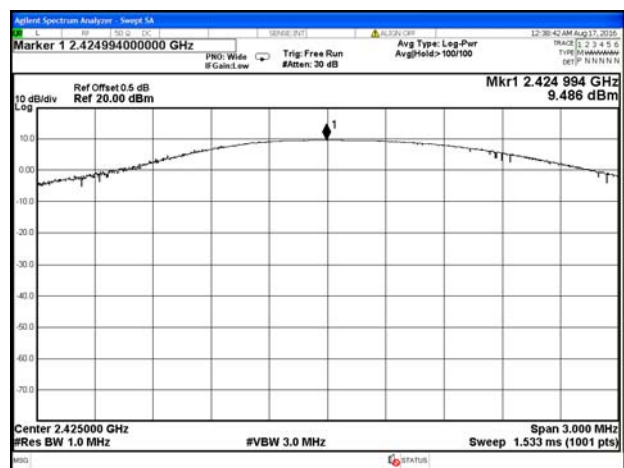
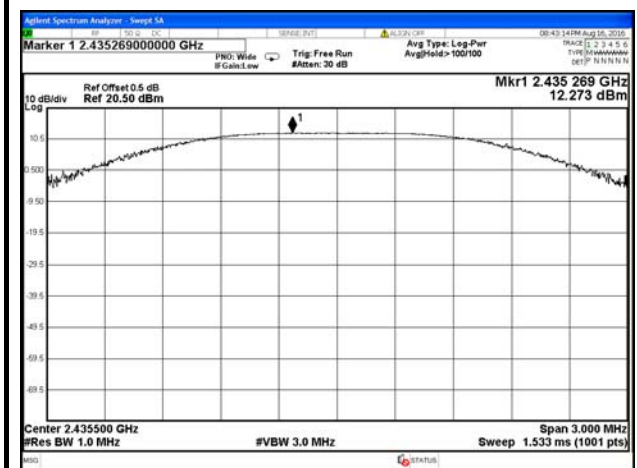
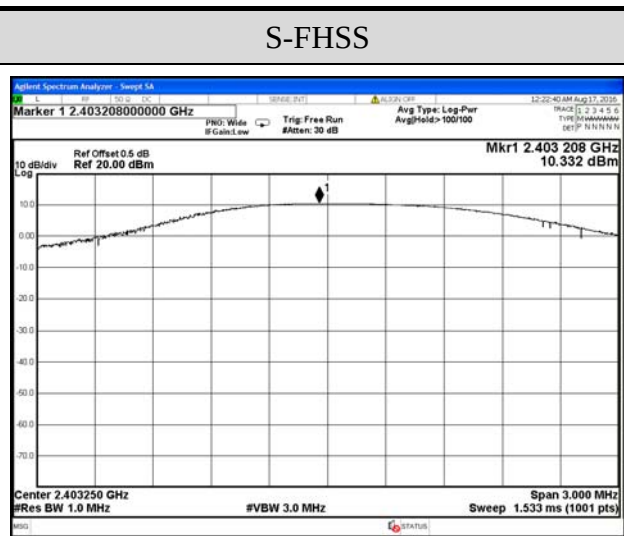
Modulation	Centre Frequency (MHz)	Peak Output Power		Limit
		dBm	W	
S-FHSS	2403.25	10.332	0.010794	21dBm (0.125W)
	2425.00	9.486	0.008884	
	2447.50	8.312	0.006780	

A.5.1 Measurement Plots

T-FHSS



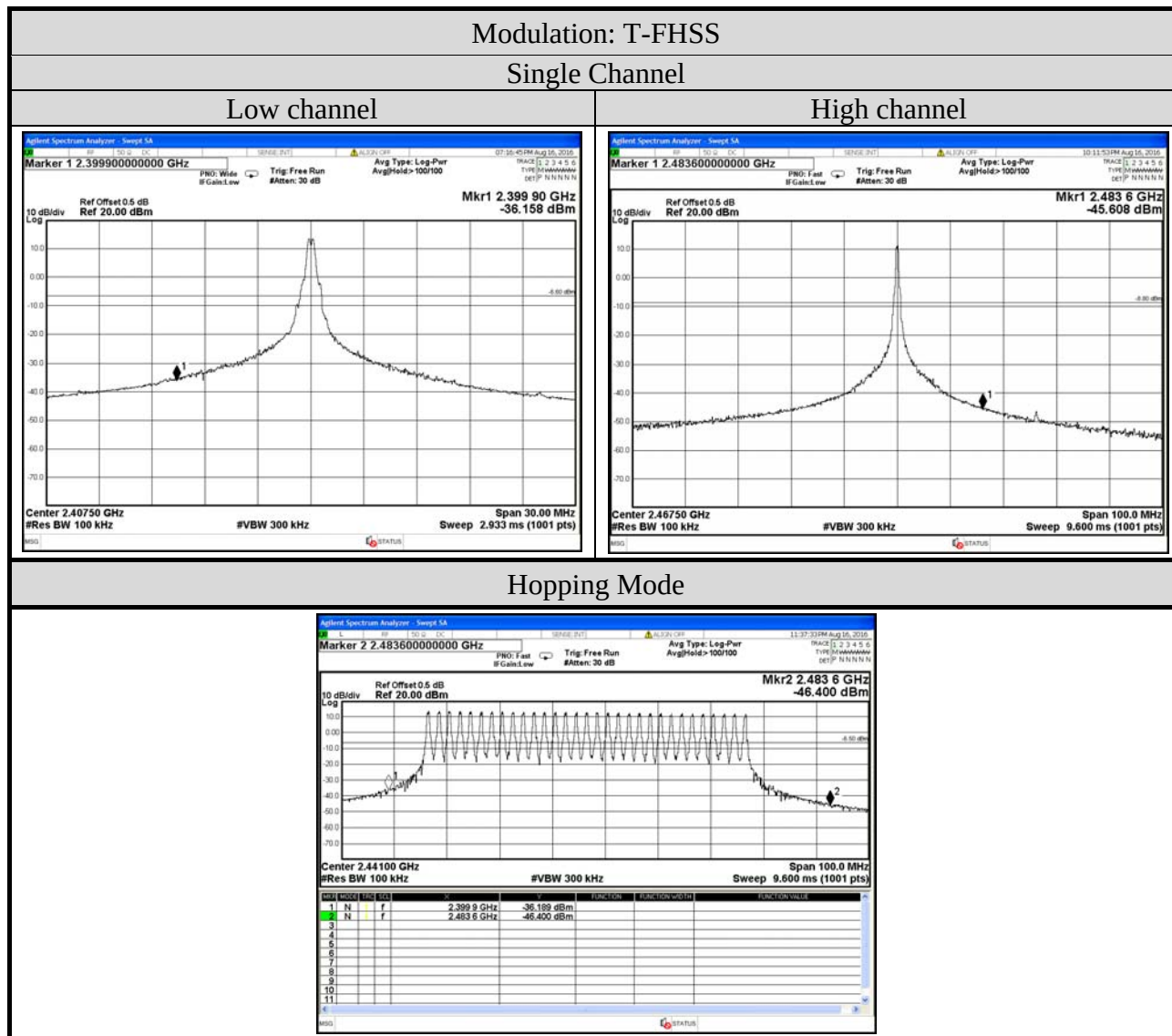
S-FHSS



A.6 EMISSION LIMITATIONS MEASUREMENT

A.6.1 Band Edge

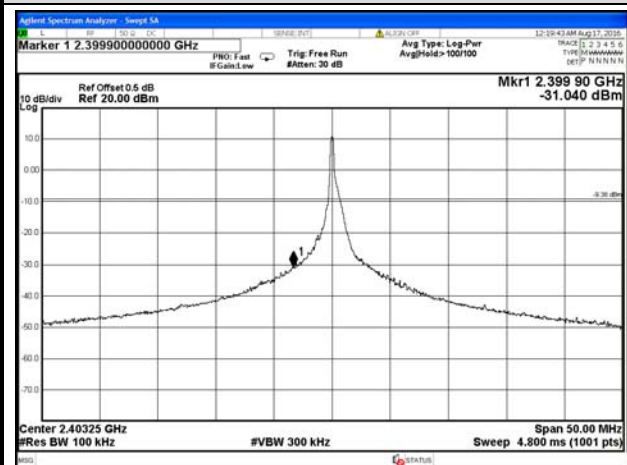
Test Date	2016/08/16 ~ 17	Temp./Hum.	26°C/54~57%
Cable Loss	0.5dB	Test Voltage	DC 6.0V



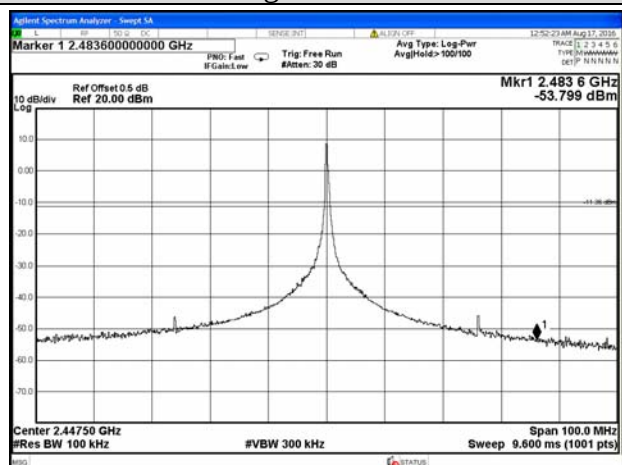
Modulation: S-FHSS

Single Channel

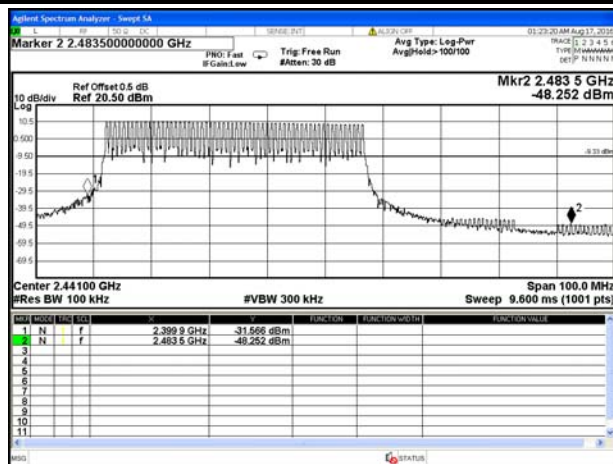
Low channel



High channel

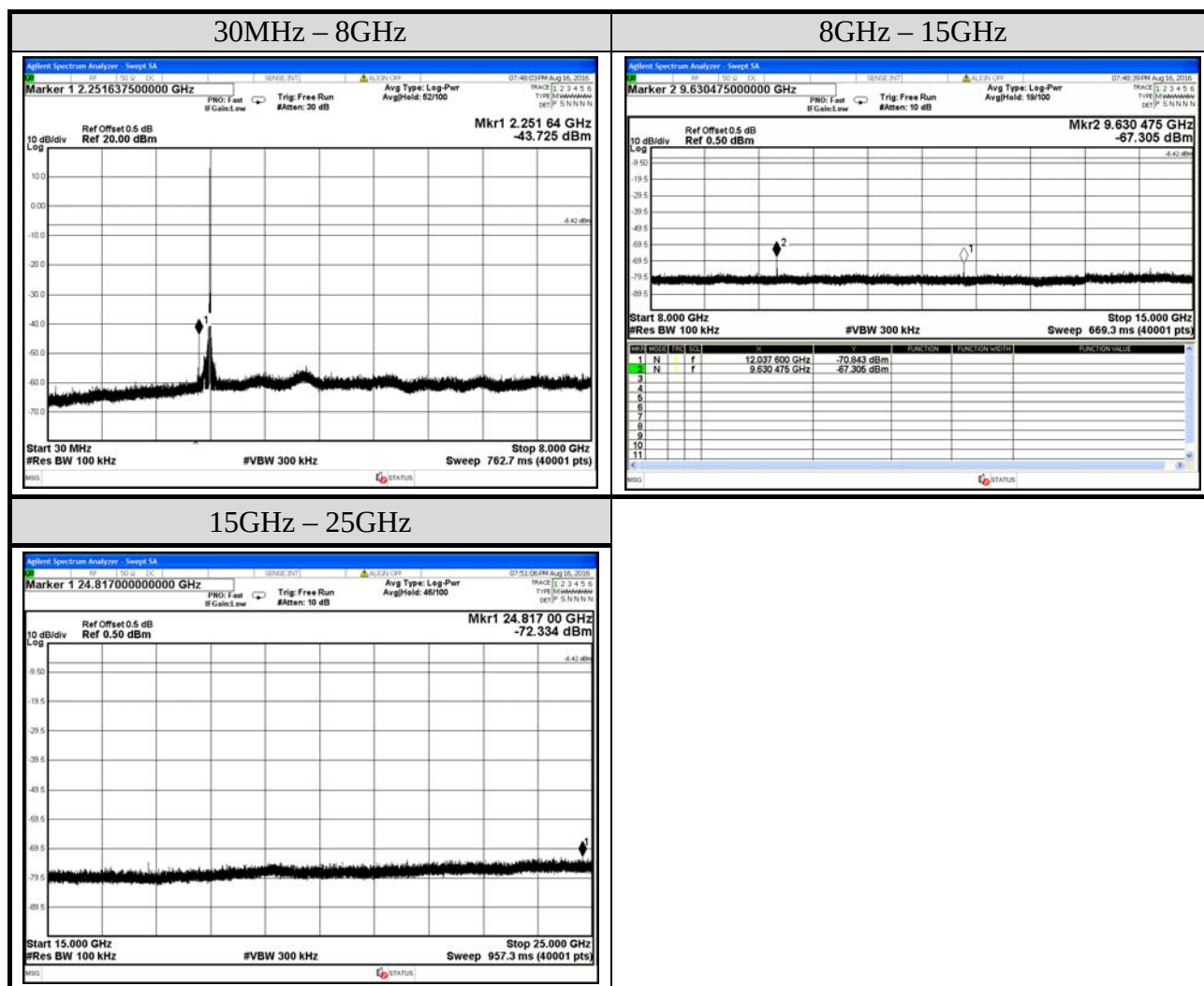


Hopping Mode



A.6.2 Spurious Emission

Test Date	2016/08/16	Temp./Hum.	26°C/54%
Mode	TX	Modulation	T-FHSS
		Frequency	2407.50MHz
Cable Loss	0.5dB	Test Voltage	DC 6.0V

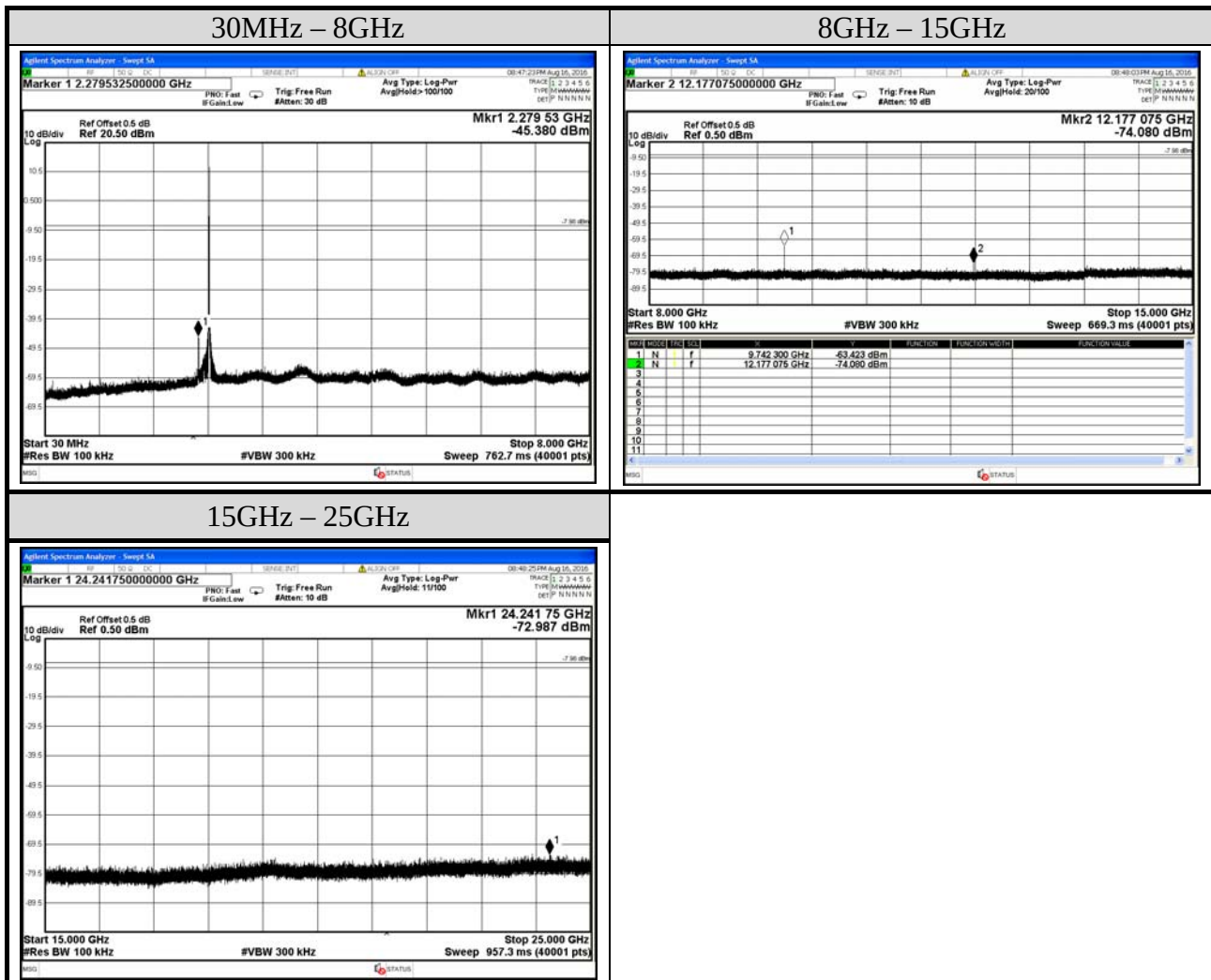


Note: All results have been included cable loss and simultaneous factor.

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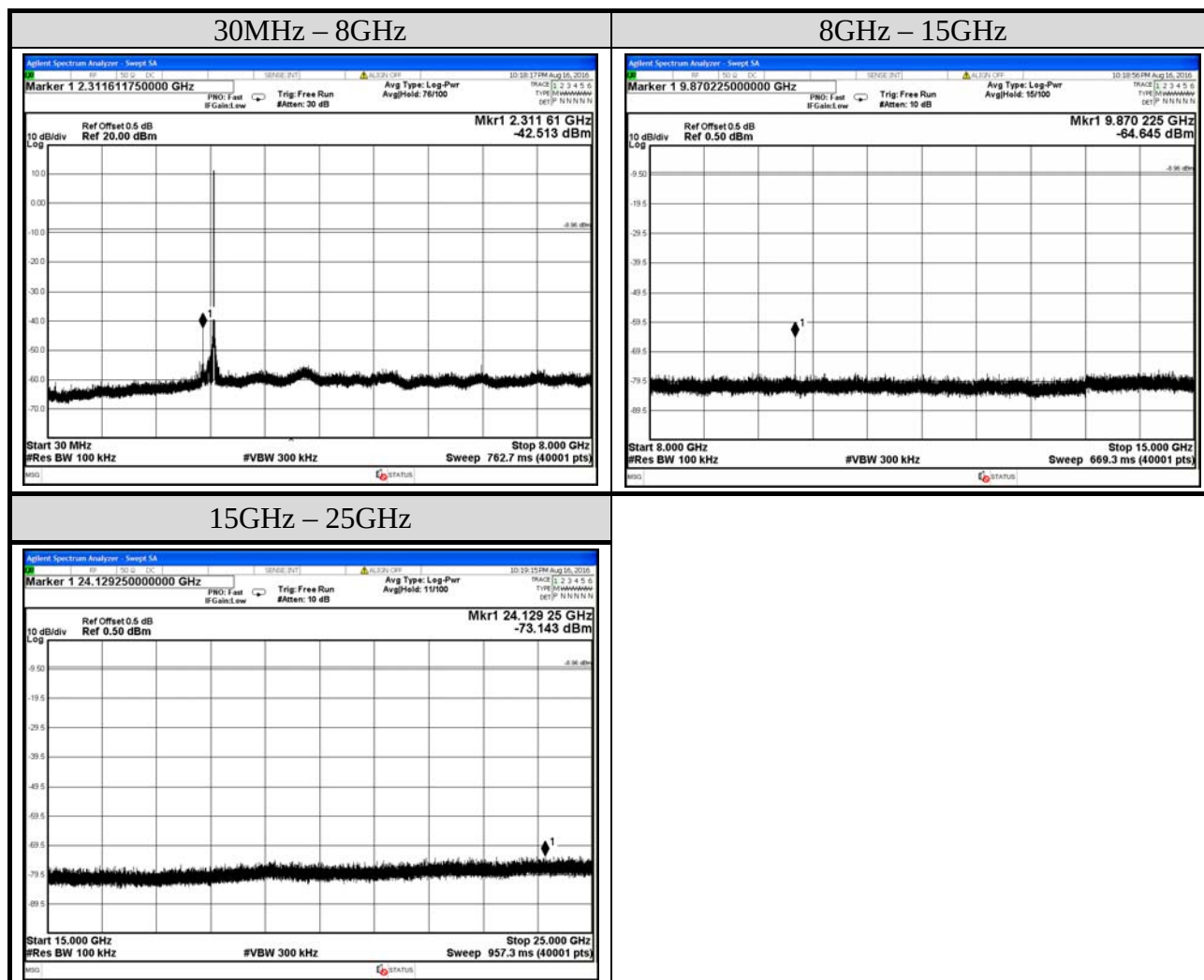
Tel: +886 2 26099301
Fax: +886 2 26099303

Test Date	2016/08/16	Temp./Hum.	26°C/54%
Mode	TX	Modulation	T-FHSS
		Frequency	2435.50MHz
Cable Loss	0.5dB	Test Voltage	DC 6.0V



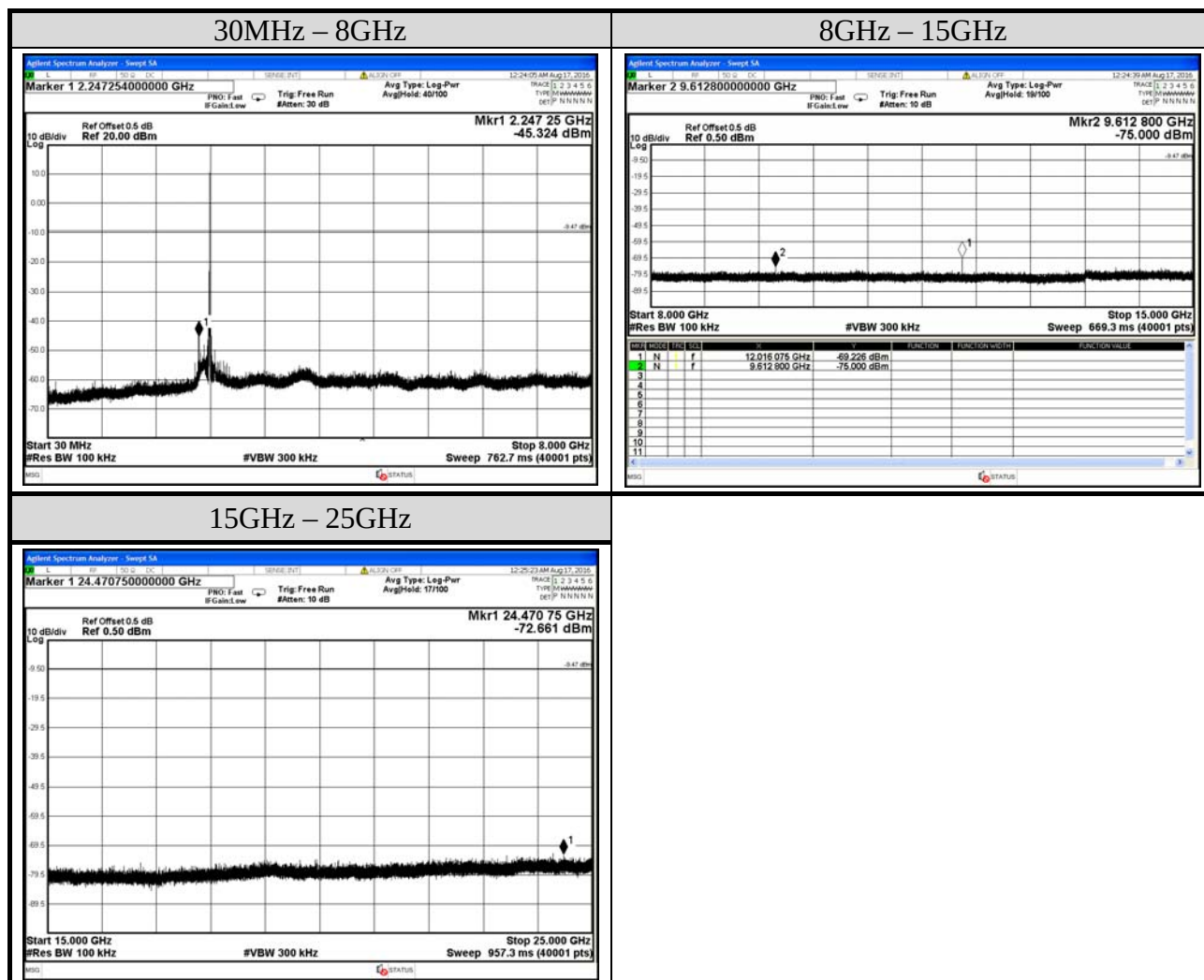
Note: All results have been included cable loss and simultaneous factor.

Test Date	2016/08/16	Temp./Hum.	26°C/54%
Mode	TX	Modulation	T-FHSS
		Frequency	2467.50MHz
Cable Loss	0.5dB	Test Voltage	DC 6.0V



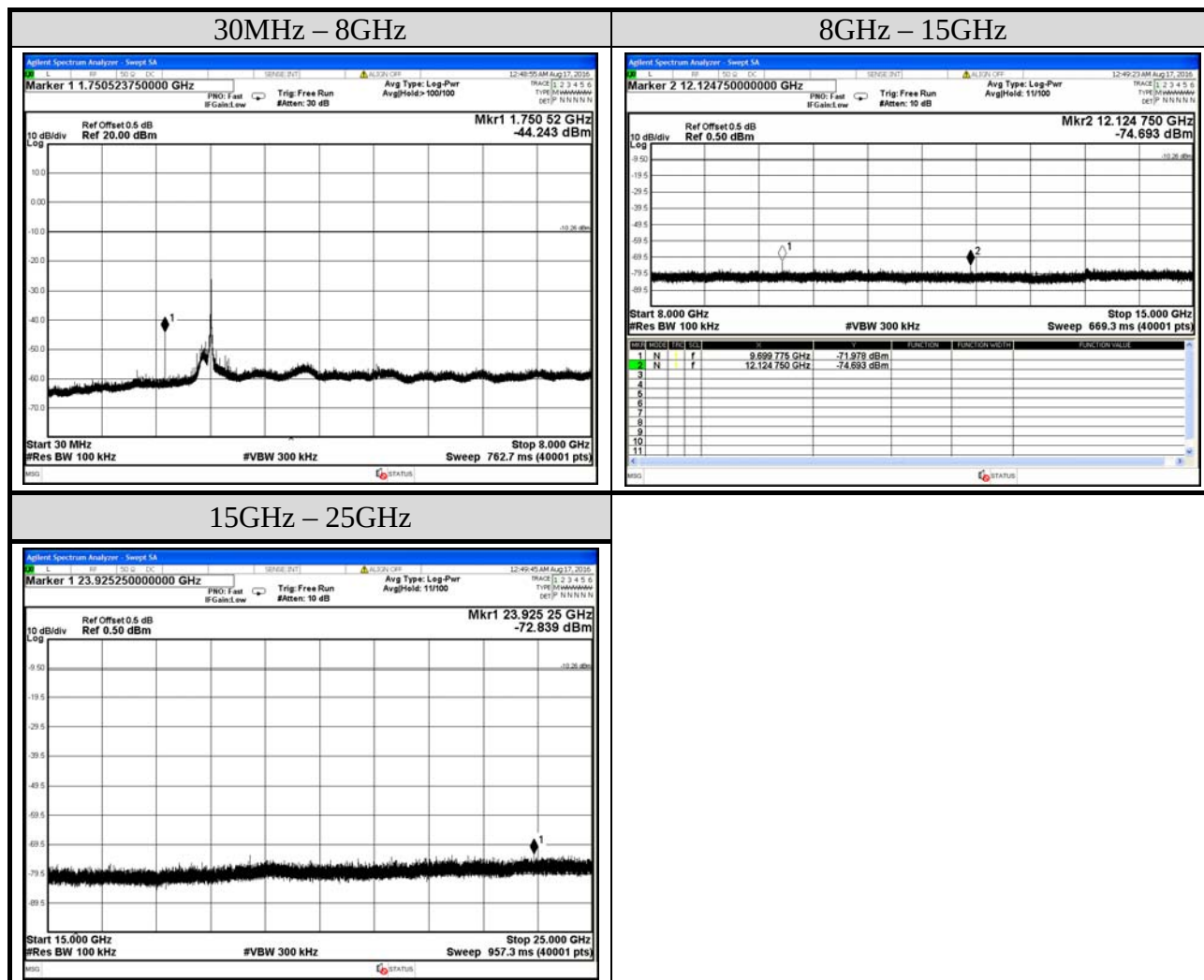
Note: All results have been included cable loss and simultaneous factor.

Test Date	2016/08/17	Temp./Hum.	26°C/57%
Mode	TX	Modulation	S-FHSS
		Frequency	2403.25MHz
Cable Loss	0.5dB	Test Voltage	DC 6.0V



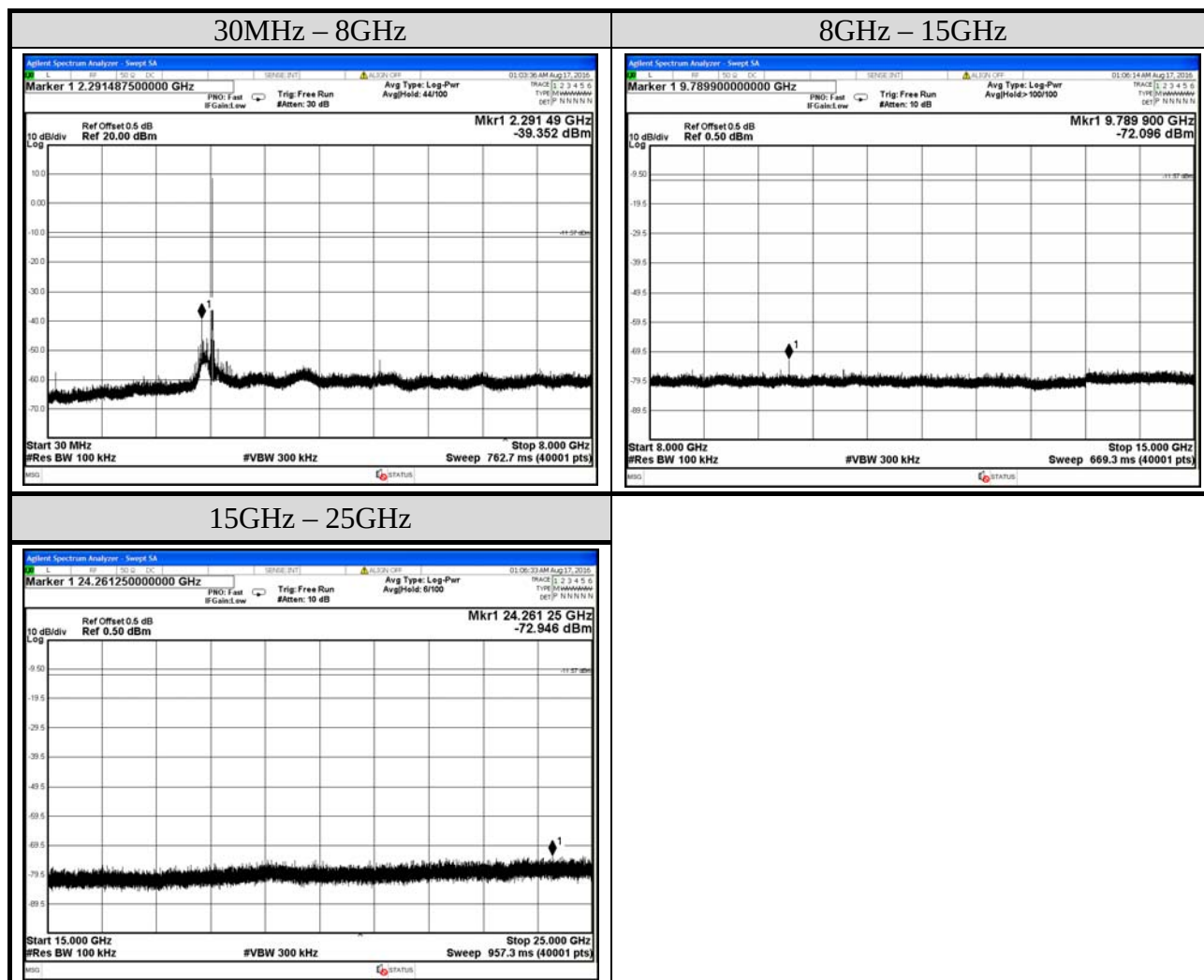
Note: All results have been included cable loss and simultaneous factor.

Test Date	2016/08/17	Temp./Hum.	26°C/57%
Mode	TX	Modulation	S-FHSS
		Frequency	2425.00MHz
Cable Loss	0.5dB	Test Voltage	DC 6.0V



Note: All results have been included cable loss and simultaneous factor.

Test Date	2016/08/17	Temp./Hum.	26°C/57%
Mode	TX	Modulation	S-FHSS
		Frequency	2447.50MHz
Cable Loss	0.5dB	Test Voltage	DC 6.0V



Note: All results have been included cable loss and simultaneous factor.



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APPENDIX B

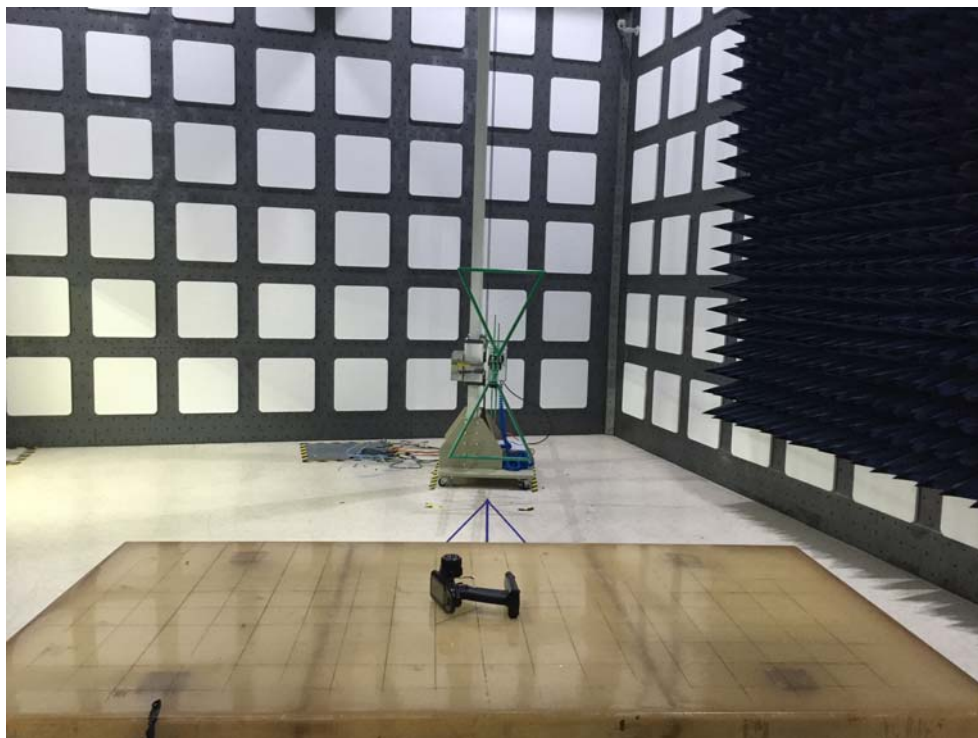
TEST PHOTOGRAPHS

(Model: T4PV)

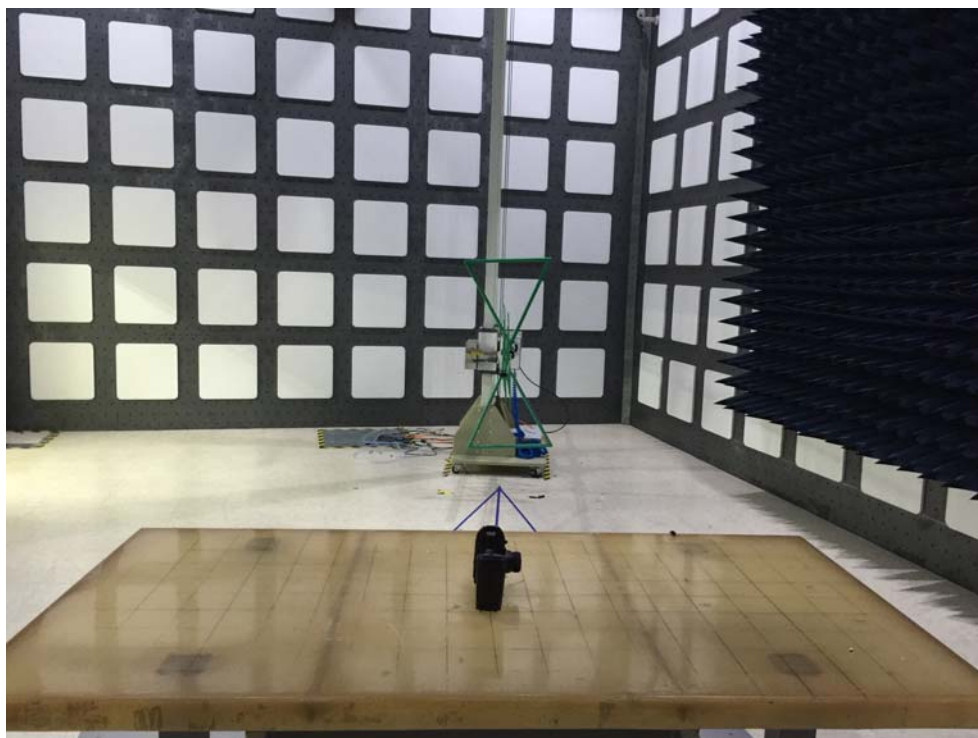
B.1 Radiated Measurement at Anechoic Chamber

Frequency Below 1GHz

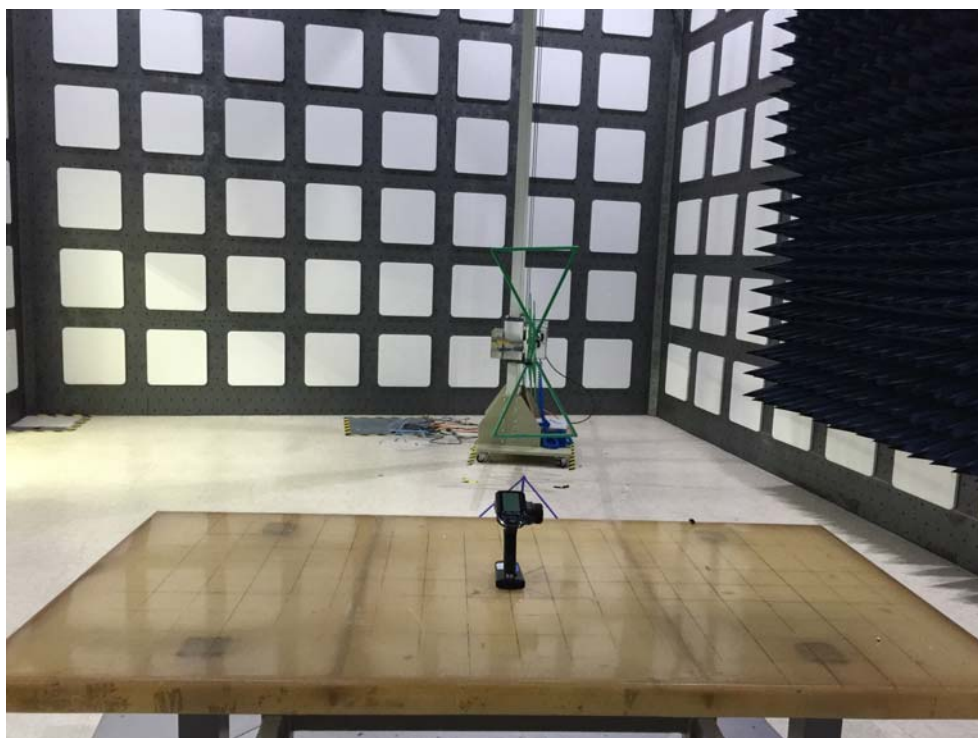
EUT on Lie



EUT on Side



EUT on Stand



Frequency Above 1GHz

EUT on Lie



EUT on Side



EUT on Stand



B.2 RF Conducted Measurement

