

**FCC 15.247& RSS-247
2.4 GHz Report**

for

FUTABA Corporation

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

Product Name : Radio Control
Brand : Futaba
Model Name : FMT-03
FCC ID : AZP-FMT-03-24G
IC : 2914D-FMT03

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



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APPENDIX A TEST PHOTOGRAPHS
APPENDIX B TEST PLOTS

TEST REPORT CERTIFICATION

Applicant : FUTABA Corporation
Factory : FUTABA Corporation
Product Name : Radio Control
Model No. : FMT-03
Serial No. : N/A
Brand Name : Futaba
Power Supply : DC 6.6V

Applicable Standards:

47 CFR FCC Part 15 Subpart C: 2016
RSS-Gen (Issue 4), November 2014
RSS-247 (Issue 1), May 2015
ANSI C63.10:2013
KDB 558074 D01 DTS Meas Guidance v03r05

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: 2017. 01. 11

Date of Report: 2017. 01. 18

Producer: Annie Yu
(Annie Yu/Administrator)

Signatory: Ben Cheng
(Ben Cheng/Manager)

1. REPORT HISTORY

Revision	Date	Revision Summary	Report Number
0	2017. 01. 18	Original Report.	EM-F170028

2. SUMMARY OF TEST RESULTS

Rule		Description	Results
FCC	IC		
15.207	RSS-Gen §8.8	Conducted Emission	N/A, NOTE
15.247(d)/ 15.205	RSS-Gen §8.9 RSS-247 §5.5	Radiated Band Edge and Radiated Spurious Emission	PASS
15.247(a)(2)	RSS-247 §5.2(1)	6dB Bandwidth	PASS
15.247(b)(3)	RSS-247 §5.4(4)	Maximum Peak Output	PASS
15.247(d)	RSS-247 §5.5	Conducted Band Edges and Conducted Spurious Emission	PASS
15.247 (e)	RSS-247 §5.2(2)	Peak Power Spectral Density	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	FMT-03
Serial Number	N/A
Brand	Futaba
Applicant	FUTABA Corporation 1080 YabutsukaChosei-son Chosei-gun Chiba, 299-4395 Japan.
Factory	FUTABA Corporation 1080 YabutsukaChosei-son Chosei-gun Chiba, 299-4395 Japan.
RF Features	2.4GHz
Transmit Type	1T1R
Date of Receipt of Sample	2016. 11. 28

3.2. Antenna Information

No.	Antenna Part Number	Manufacture	Antenna Type	Frequency (MHz)	Max Gain (dBi)
1	MEIWX-2102RSA X-2400	MAP electronics co. ltd	1/2λ Pencil type antenna	2400 ~ 2483.5	2.25

3.3. EUT Specifications Assessed in Current Report

Fundamental Range (MHz)	Channel Number	Modulation	Data Rate (kbps)
2405.376 ~ 2472.960	23	FASSTest	136

Modulation: FASSTest			
Channel List			
Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)
0	2405.376	12	2442.240
1	2408.448	13	2445.312
2	2411.520	14	2448.384
3	2414.592	15	2451.456
4	2417.664	16	2454.528
5	2420.736	17	2457.600
6	2423.808	18	2460.672
7	2462.880	19	2463.744
8	2429.952	20	2466.816
9	2433.024	21	2469.888
10	2436.096	22	2472.960
11	2439.168		

3.4. Test Configuration

Mode	Duty Cycle (x)	T (ms)	Duty Cycle Factor (dB)
FASSTest	1.00	N/A	N/A

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		Mode	Test Channel
Radiated Test Case	Radiated Band Edge ^{Note1}	FASSTest	0/22
	Radiated Spurious Emission ^{Note1}	FASSTest	0/11/22
Conducted Test Case	6dB Bandwidth	FASSTest	0/11/22
	Peak Power Spectral Density	FASSTest	0/11/22
	Peak Output Power	FASSTest	0/11/22
	Band Edge	FASSTest	0/22
	Spurious Emission	FASSTest	0/11/22

Note 1:

☐ Mobile Device

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

☐ Lie

☐ Side

☒ Stand

3.5. Tested Supporting System List

3.5.1. Support Peripheral Unit

No.	Product	Brand	Model No.	Serial No.	FCC ID
1.	DC Power Supply	TOP WARD	3303A	721773	N/A

3.5.2. Cable Lists

No.	Cable Description Of The Above Support Units
1.	DC Power Cord*2: Unshielded, Detachable, 2.0m

3.6. Setup Configuration

3.6.1. EUT Configuration for Power Line & 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	:	Semi-Anechoic Chamber No. 53-11, Dingfu, Linkou Dist., New Taipei City 244, Taiwan 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 IC Test Site Registration No.: 5183B-4 Renewal on August 31, 2015
NVLAP Lab. Code	:	200077-0
TAF Accreditation No	:	1724
FCC OET Designation	:	TW1004 & TW1090

3.9. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty
Conduction Test	150kHz~30MHz	±3.5dB
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	2016. 09. 19	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	2016. 12. 23	1 Year
6.	Test Software	Audix	e3	V.120619C	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	Keysight	N9010B-544	MY55460198	2016. 04. 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	2016. 07. 27	1 Year
4.	Horn Antenna	ETS-Lindgren	3117	00135902	2016. 03. 05	1 Year
5.	Horn Antenna	EMCO	3116	2653	2016. 10. 24	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	N9030A-526	MY53310269	2017. 01. 03	1 Year

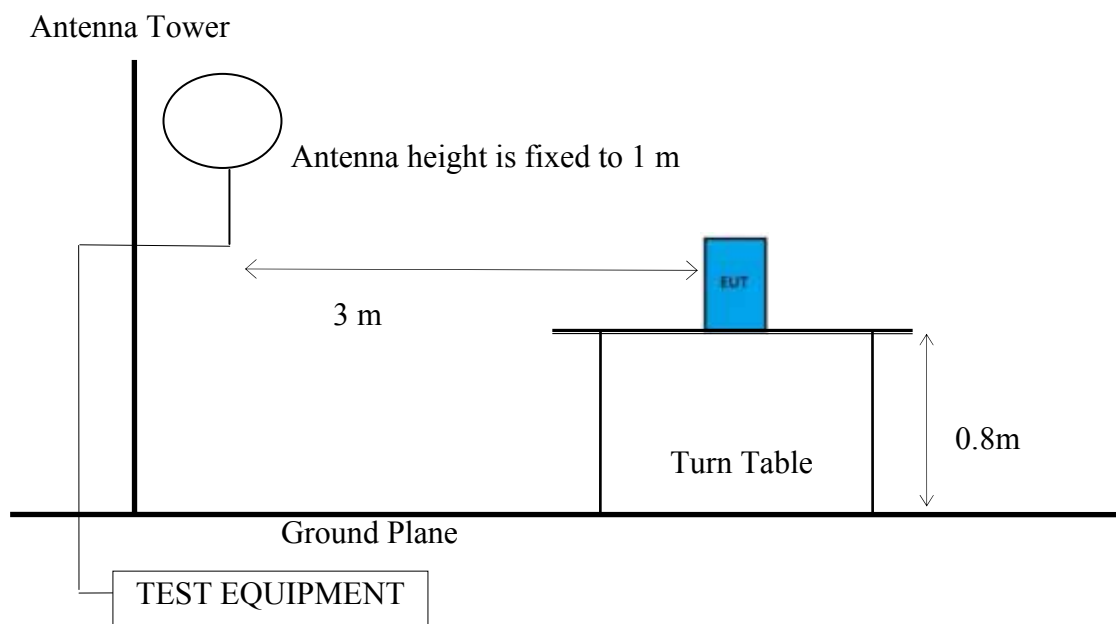
5. RADIATED EMISSION MEASUREMENT

5.1. Block Diagram of Test Setup

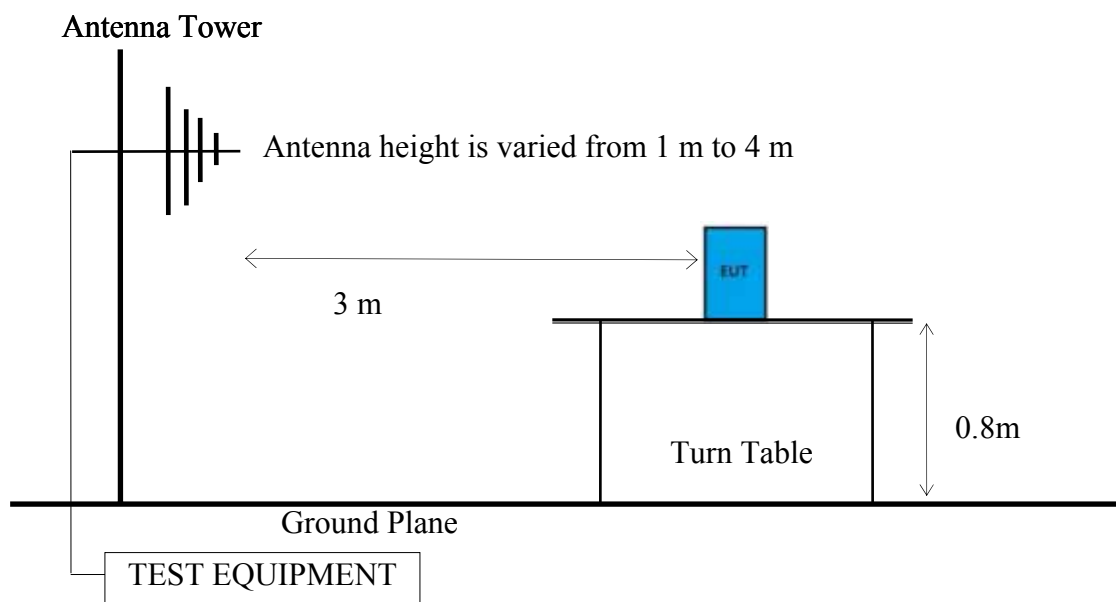
5.1.1. Block Diagram of connection between EUT and simulators

Indicated as section 3.6

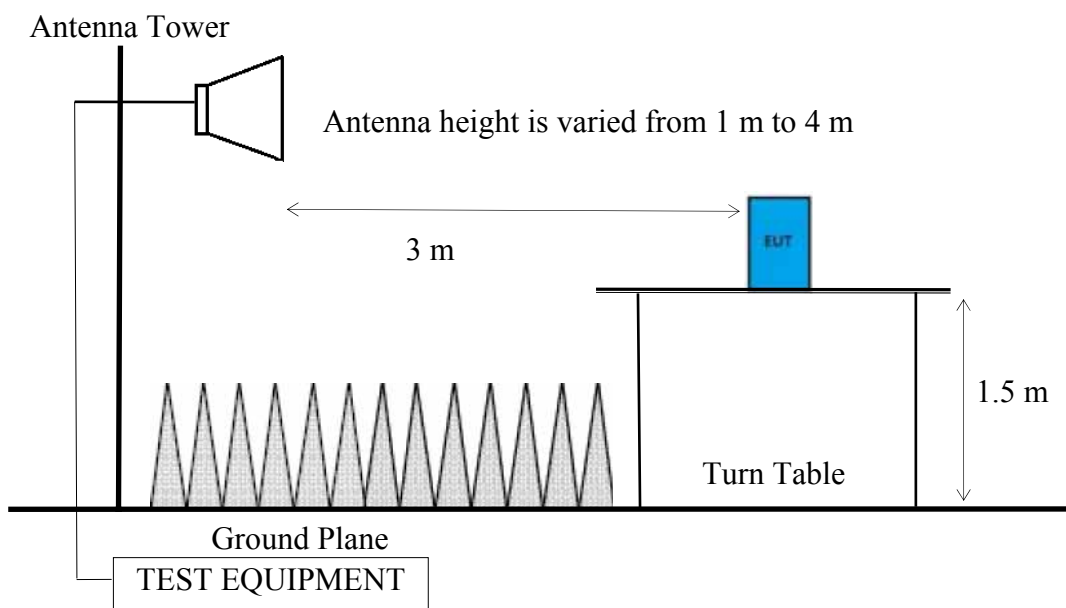
5.1.2. Semi Anechoic Chamber (3m) Setup Diagram for 9kHz-30MHz



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



5.1.4. Fully Anechoic Chamber (3m) Setup Diagram for above 1GHz



5.2. 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.

5.3. 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 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 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 Detector:**■ Option 1:**

- (1) RBW = 1MHz
(2) VBW $\geq$ 1/ T.

Modulation Type	T (ms)	1/ T (kHz)	VBW Setting(kHz)
FASSTest	N/A	N/A	N/A

N/A: 1/ T is not implemented when duty cycle presented in section 3.4 is $\geq$ 98 %.

- (1) Detector = Peak.
(2) Sweep time = auto.
(3) Trace mode = max hold.
(4) Allow sweeps to continue until the trace stabilizes.

□ Option 2:

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

5.4. 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

5.5. Test Results

PASSED.

Test Date	2017/01/11	Temp./Hum.	24°C/59%
Test Voltage	DC 6.6V (via Battery)		

5.5.1. Emissions within Restricted Frequency Bands

5.5.1.1. Frequency 9kHz~30MHz

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

5.5.1.2. Frequency Below 1 GHz

Worst mode as representative

Mode	FASSTest	Frequency	TX 2405.376MHz
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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
31.94	19.93	1.25	6.92	28.10	40.00	11.90	Peak
215.27	10.55	3.49	15.08	29.12	43.50	14.38	Peak
288.02	13.54	4.19	11.14	28.87	46.00	17.13	Peak

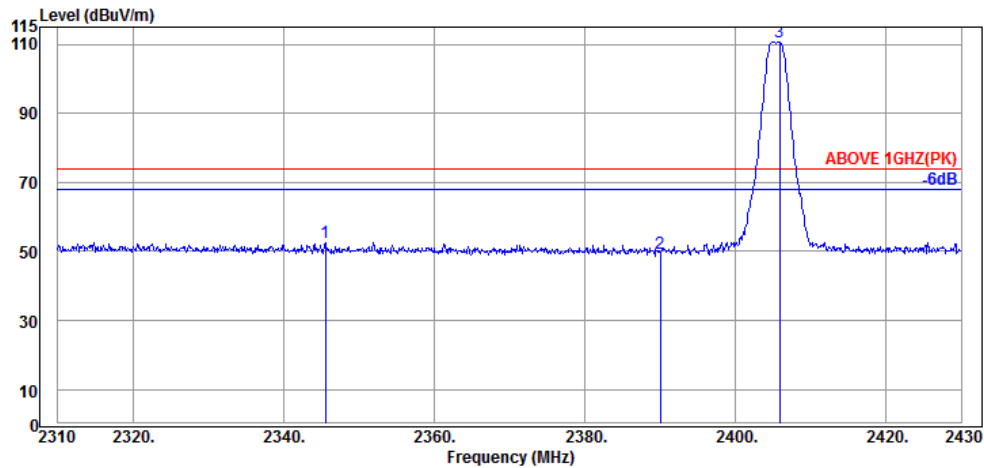
Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
30.00	21.21	1.20	7.78	30.19	40.00	9.81	Peak
95.96	11.45	2.22	12.38	26.05	43.50	17.45	Peak
897.18	20.42	8.15	8.45	37.02	46.00	8.98	Peak

5.5.2. Frequency Above 1 GHz to 10th harmonics

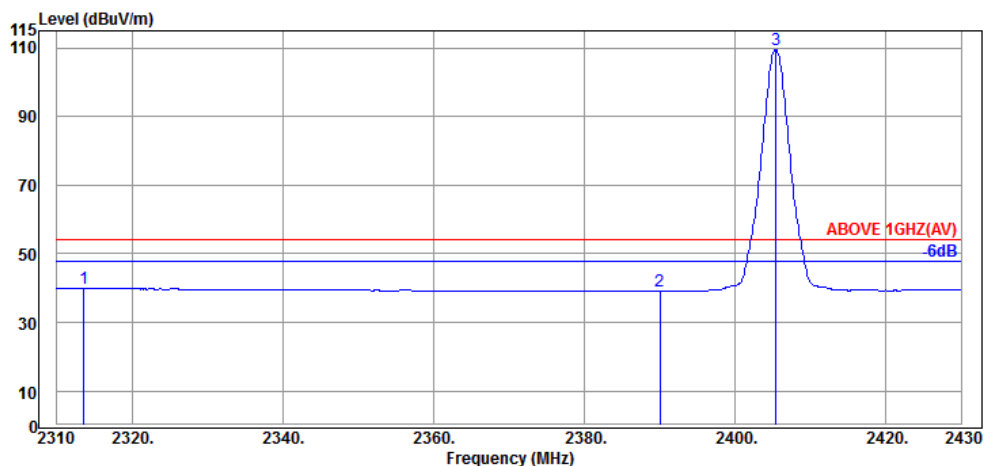
Band Edge:

Mode	FASSTest	Frequency	TX 2405.376MHz
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Antenna at Horizontal Polarization

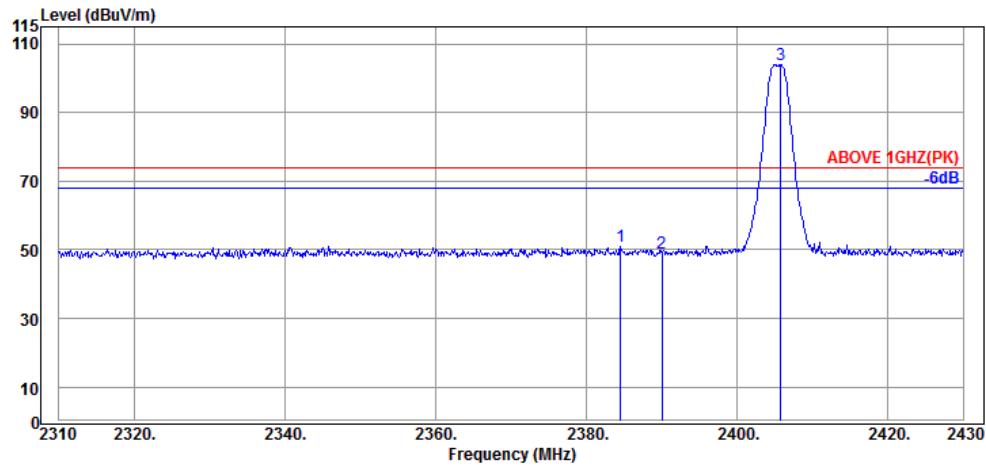
Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2345.52	32.08	5.68	14.94	52.70	74.00	21.30	Peak
2390.04	32.16	5.72	11.62	49.50	74.00	24.50	Peak
2405.88	32.18	5.74	72.88	110.80	---	---	Peak



Antenna at Horizontal Polarization

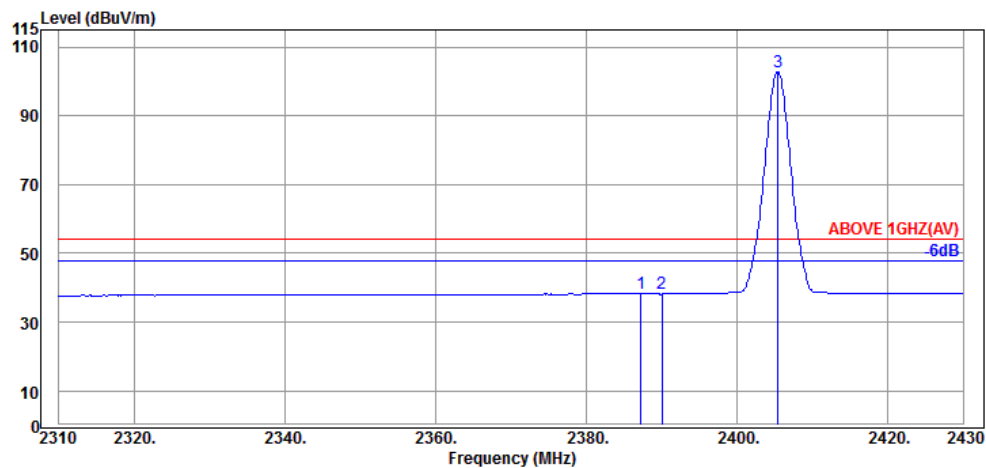
Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2313.60	32.03	5.65	2.20	39.88	54.00	14.12	Average
2390.04	32.16	5.72	1.17	39.05	54.00	14.95	Average
2405.40	32.18	5.74	71.66	109.58	---	---	Average

Mode	FASSTest	Frequency	TX 2405.376MHz
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Antenna at Vertical Polarization

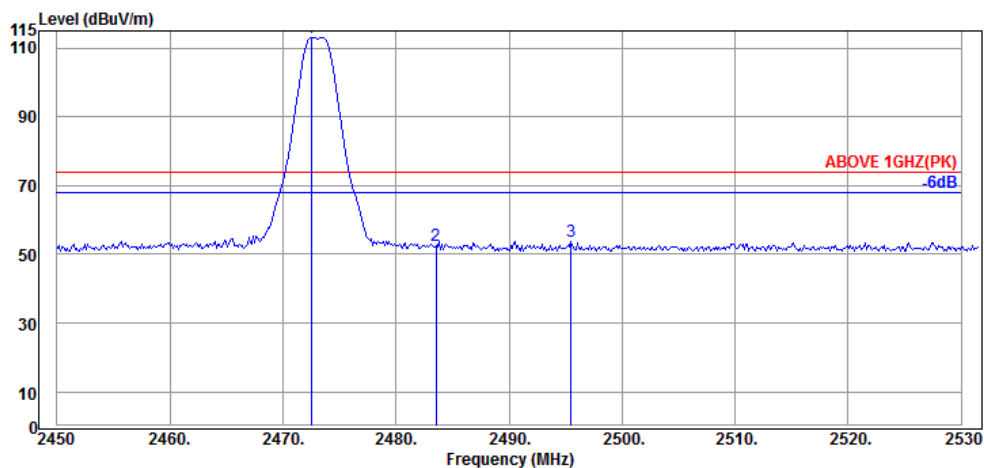
Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2384.52	32.13	5.71	13.06	50.90	74.00	23.10	Peak
2390.04	32.16	5.72	11.29	49.17	74.00	24.83	Peak
2405.76	32.18	5.74	65.93	103.85	---	---	Peak



Antenna at Vertical Polarization

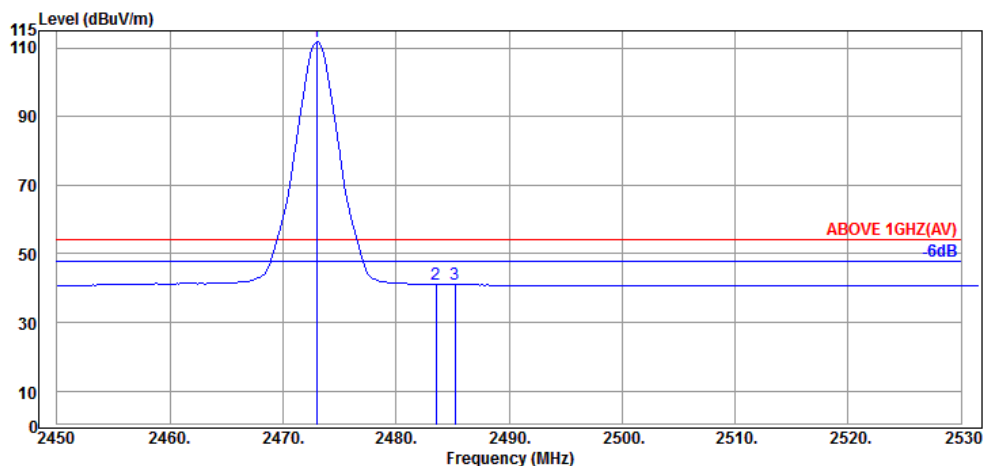
Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2387.28	32.16	5.72	0.34	38.22	54.00	15.78	Average
2390.04	32.16	5.72	0.28	38.16	54.00	15.84	Average
2405.40	32.18	5.74	64.71	102.63	---	---	Average

Mode	FASSTest	Frequency	TX 2472.960Hz
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Antenna at Horizontal Polarization

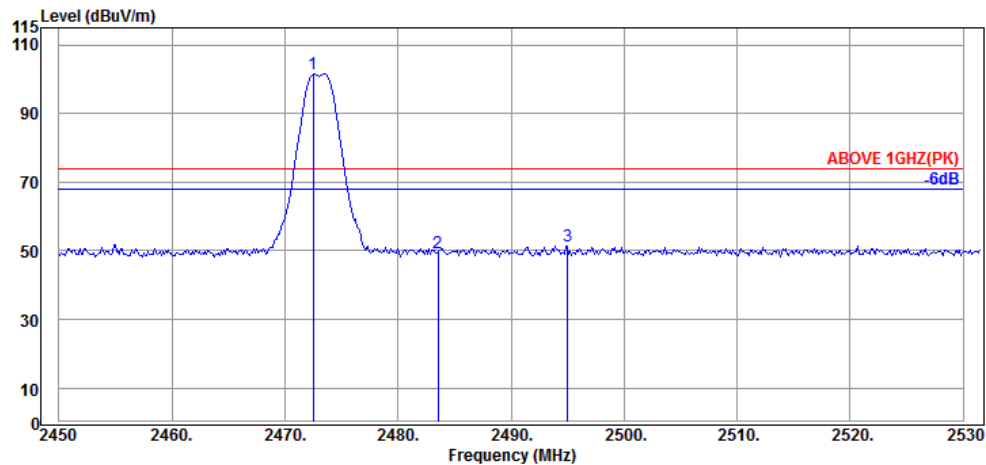
Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2472.48	32.28	5.82	75.06	113.16	---	---	Peak
2483.52	32.28	5.82	14.48	52.58	74.00	21.42	Peak
2495.52	32.30	5.84	15.51	53.65	74.00	20.35	Peak



Antenna at Horizontal Polarization

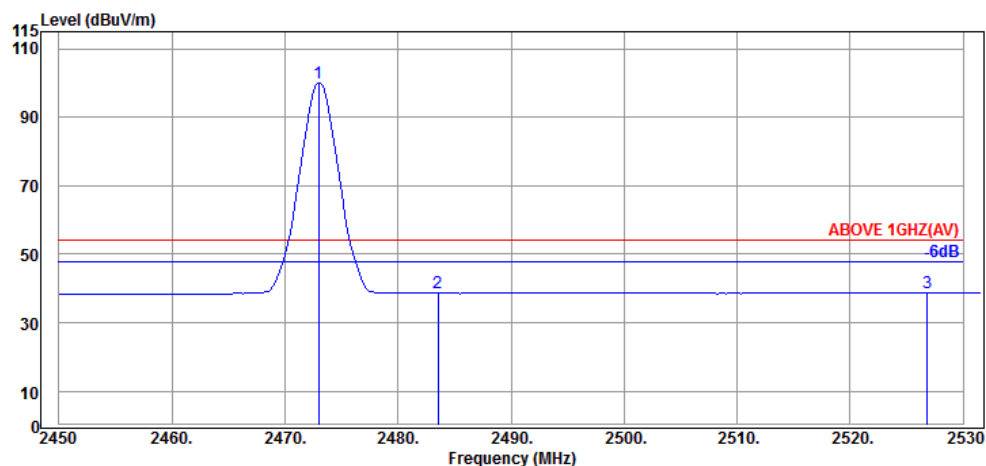
Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2472.96	32.28	5.82	73.59	111.69	---	---	Average
2483.52	32.28	5.82	2.95	41.05	54.00	12.95	Average
2485.20	32.28	5.82	2.99	41.09	54.00	12.91	Average

Mode	FASSTest	Frequency	TX 2472.960Hz
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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
2472.48	32.28	5.82	63.31	101.41	---	---	Peak
2483.52	32.28	5.82	11.24	49.34	74.00	24.66	Peak
2495.04	32.30	5.84	13.26	51.40	74.00	22.60	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
2472.96	32.28	5.82	61.86	99.96	---	---	Average
2483.52	32.28	5.82	0.53	38.63	54.00	15.37	Average
2526.84	32.34	5.89	0.49	38.72	54.00	15.28	Average

5.5.3. Emissions outside the frequency band:

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

Mode	FASSTest	Frequency	TX 2405.376MHz
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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
3210.00	32.86	6.48	7.49	46.83	54.00	7.17	Peak
4810.00	34.22	7.86	10.72	52.80	54.00	1.20	Peak
7215.00	35.80	9.32	7.34	52.46	54.00	1.54	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
3205.00	32.86	6.48	5.41	44.75	54.00	9.25	Peak
4810.00	34.22	7.86	9.35	51.43	54.00	2.57	Average
4810.00	34.22	7.86	12.06	54.14	74.00	19.86	Peak
7215.00	35.80	9.32	8.55	53.67	54.00	0.33	Peak

Mode	FASSTest	Frequency	TX 2439.168MHz
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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
3250.00	32.85	6.57	9.42	48.84	54.00	5.16	Peak
4880.00	34.25	8.35	10.59	53.19	54.00	0.81	Peak
7325.00	35.80	9.89	-0.97	44.72	54.00	9.28	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
3250.00	32.85	6.57	4.10	43.52	54.00	10.48	Peak
4880.00	34.25	8.35	9.17	51.77	54.00	2.23	Peak
7315.00	35.80	9.82	-0.25	45.37	54.00	8.63	Peak

Mode	FASSTest	Frequency	TX 2472.960MHz
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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
3295.00	32.84	6.72	10.59	50.15	54.00	3.85	Peak
4945.00	34.28	8.62	10.94	53.84	54.00	0.16	Peak
12360.00	39.12	12.75	-0.01	51.86	54.00	2.14	Peak

Antenna at Vertical Polarization

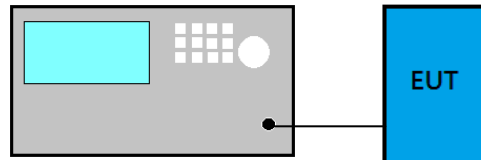
Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
3295.00	32.84	6.72	5.55	45.11	54.00	8.89	Peak
4945.00	34.28	8.62	6.76	49.66	54.00	4.34	Average
4945.00	34.28	8.62	13.49	56.39	74.00	17.61	Peak
12360.00	39.12	12.75	0.84	52.71	54.00	1.29	Peak

5.5.4. Emissions in Non-restricted Frequency Bands

Pursuant to KDB 558074 D01 v03r05 that emission levels below the 15.209/RSS-Gen Section 8.9 table 4 general radiated emissions limits is not required.

6. 6dB BANDWIDTH MEASUREMENT

6.1. Block Diagram of Test Setup



6.2. Specification Limits

The minimum 6dB bandwidth shall be at least 500kHz.

6.3. Test Procedure

Following measurement procedure is reference to KDB 558074 D01 DTS Meas Guidance v03r05:

■ Option 2

- (1) Set RBW = 100 kHz.
- (2) Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
- (3) Detector = Peak.
- (4) Trace mode = max hold.
- (5) Sweep = auto couple.
- (6) Allow the trace to stabilize.
- (7) Setting channel bandwidth function x dB to -6 dB to record the final bandwidth.

6.4. 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 digital modulation in 2400-2483.5MHz is : 1Watt. (30dBm), and E.I.R.P.: 4Watt (36dBm)

7.3. Test Procedure

Following measurement procedure is reference to KDB 558074 D01 DTS Meas Guidance v03r05:

■PKPM1 Peak power meter method:

EUT is connected to power sensor and record the maximum output power.

□Method AVGPM (Measurement using an RF average power meter):

EUT is connected to power sensor and record the maximum average output power and duty cycle factor is added when duty cycle presented in section 3.5 is < 98%.

□Method AVGSA-2 (Spectrum channel power)

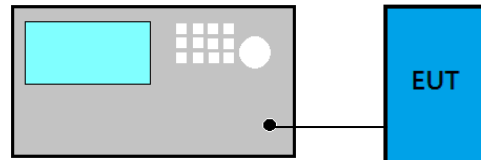
- (1) Set span to at least 1.5 times the OBW
- (2) Set RBW = 1 -5% of OBW
- (3) Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
- (4) Detector = RMS.
- (5) Trace mode = trace average at least 100 traces
- (6) Sweep = auto couple.
- (7) Compute power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function with band limits set equal to the OBW band edges.
- (8) Duty cycle factor is added when duty cycle presented in section 3.5 is < 98%.

7.4. Test Results

Please refer to Appendix A

8. EMISSION LIMITATIONS MEASUREMENT

8.1. Block Diagram of Test Setup



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

8.3. Test Procedure

Following measurement procedure is reference to KDB 558074 D01 DTS Meas Guidance v03r05:

■Reference Level

- (1) Set analyzer center frequency to DTS channel center frequency.
- (2) Set the span to 1.5 times the DTS bandwidth.
- (3) Set the RBW to: 100 kHz.
- (4) Set the VBW $\geq 3 \times$ RBW.
- (5) Detector = peak.
- (6) Sweep time = auto couple.
- (7) Trace mode = max hold.
- (8) Allow trace to fully stabilize to find the max PSD as reference level.

■ Emission Level Measurement

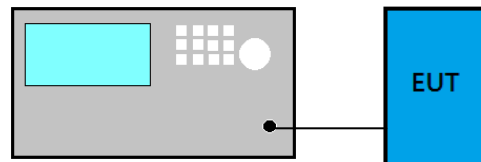
- (1) Set analyzer center frequency to DTS channel center frequency.
- (2) Set the span to 1.5 times the DTS bandwidth.
- (3) Set the RBW to: 100 kHz.
- (4) Set the VBW $\geq 3 \times$ RBW.
- (5) Detector = peak.
- (6) Sweep time = auto couple.
- (7) Trace mode = max hold.
- (8) Allow trace to fully stabilize to find the max level.

8.4. Test Results

Please refer to Appendix A

9. POWER SPECTRAL DENSITY

9.1. Block Diagram of Test Setup



9.2. Specification Limits

The peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band.

9.3. Test Procedure

Following measurement procedure is reference to KDB 558074 D01 DTS Meas Guidance v03r05:

■ Method PKPSD (peak PSD)

- (1) Set analyzer center frequency to DTS channel center frequency.
- (2) Set the span to 1.5 times the DTS bandwidth.
- (3) Set the RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- (4) Set the VBW $\geq 3 \times \text{RBW}$.
- (5) Detector = peak.
- (6) Sweep time = auto couple.
- (7) Trace mode = max hold.
- (8) Allow trace to fully stabilize.
- (9) Use the peak marker function to determine the maximum amplitude level.
- (10) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

□ Method AVGPSD-2

- (1) Using peak PSD procedure step 1 to step 4.
- (2) Detector = RMS detector
- (3) Sweep time = auto couple
- (4) Trace mode = trace averaging over a minimum of 100 traces
- (5) Use the peak marker function to determine the maximum amplitude level.
- (6) Duty cycle factor is added when duty cycle presented in section 3.5 $< 98\%$.
- (7) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

9.4. Test Results

Please refer to Appendix A

10.DEVIATION TO TEST SPECIFICATIONS

【NONE】



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APPENDIX A

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APPENDIX A

TEST PLOTS

(Model: FMT-03)

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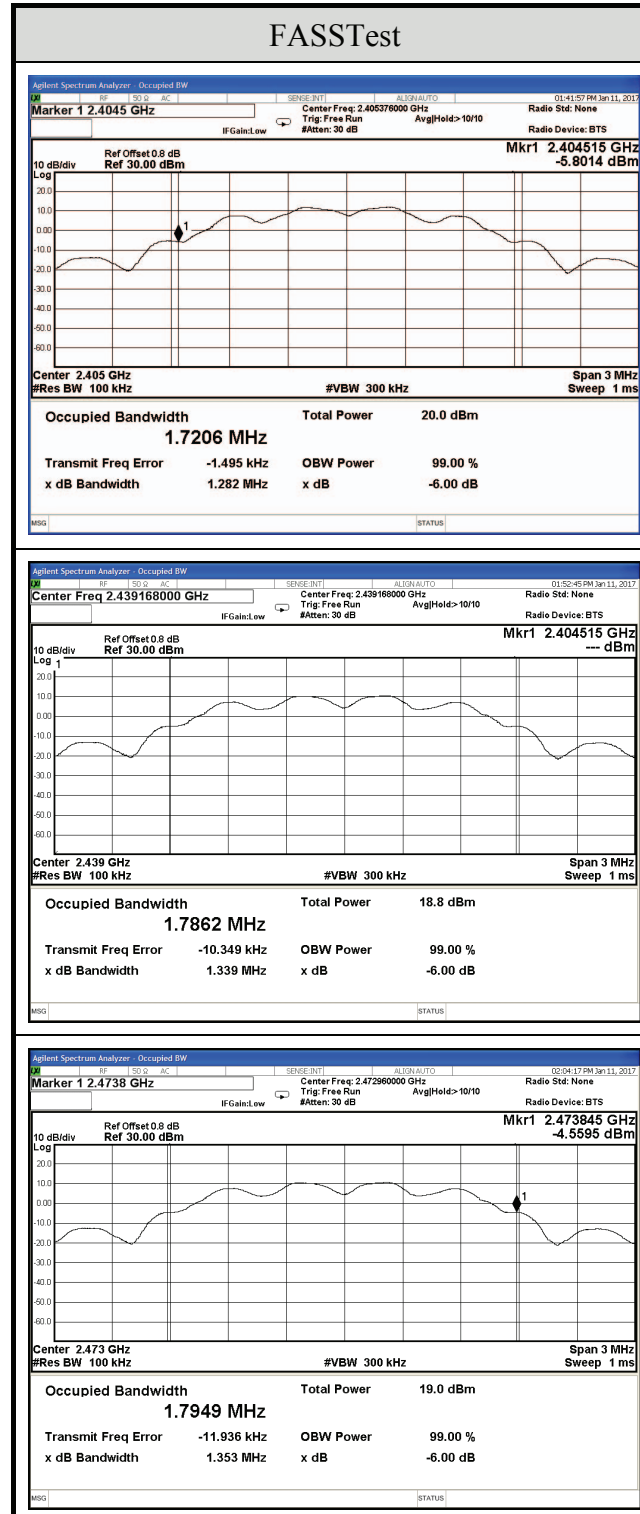
A.1 6dB BANDWIDTH MEASUREMENT

Test Date	2017/01/11	Temp./Hum.	24°C/59%
Cable Loss	0.8dB	Test Voltage	DC 6.6V (via DC Power Supply)

A.1.1 6dB Bandwidth Result

Modulation Type	Centre Frequency (MHz)	6 dB Bandwidth (MHz)	Limit
FASSTest	2405.376	1.282	>500kHz
	2439.168	1.339	
	2472.960	1.353	

A.1.2 Measurement Plots



A.2 MAXIMUM PEAK OUTPUT POWER MEASUREMENT

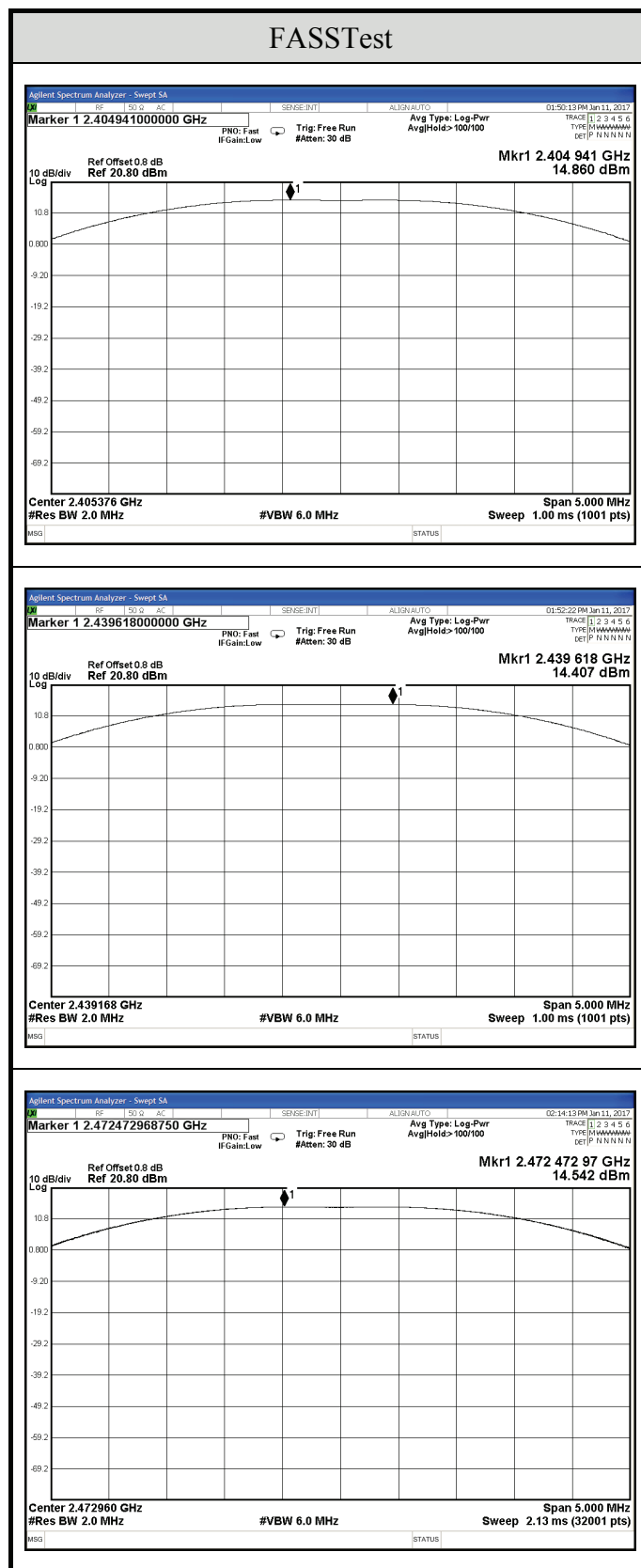
Test Date	2017/01/11	Temp./Hum.	24°C/59%
Cable Loss	0.8dB	Test Voltage	DC 6.6V (via DC Power Supply)

A.2.1 Peak Output Power

Modulation Type	Centre Frequency (MHz)	Maximum Output Power		Antenna Gain (dBi)	Output Power (E.I.R.P.)		Limit
		(dBm)	(W)		(dBm)	(W)	
FASSTest	2405.376	14.860	0.030620	2.25	17.11	0.051404	< 30dBm (1W) (Maximum Peak Output Power) < 36dBm (4W) (E.I.R.P)
	2439.168	14.407	0.027587		16.66	0.046345	
	2472.960	14.542	0.028458		16.79	0.047753	

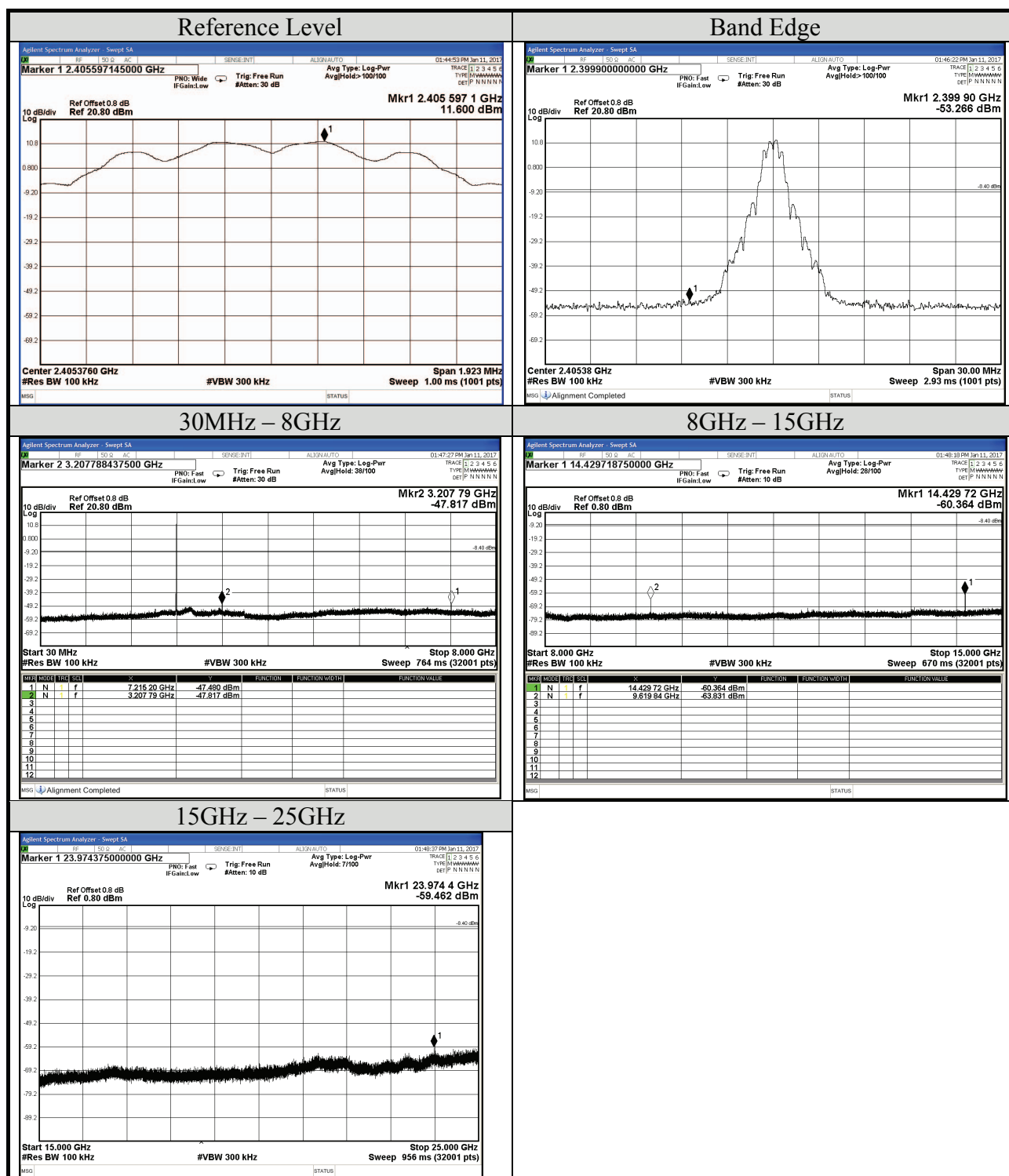
Note: The results have been included cable loss.

A.2.2 Measurement Plots

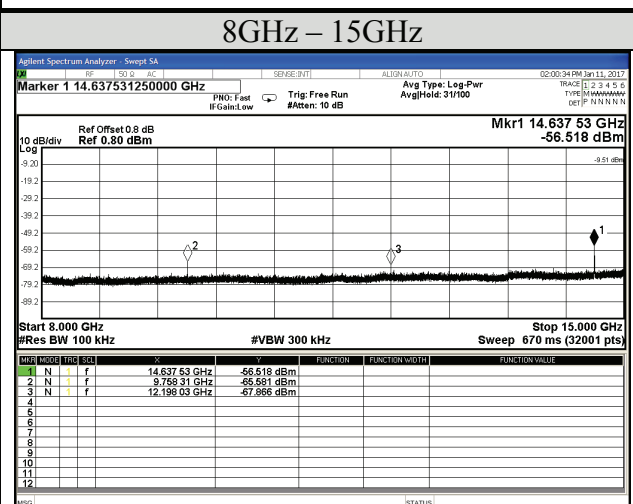
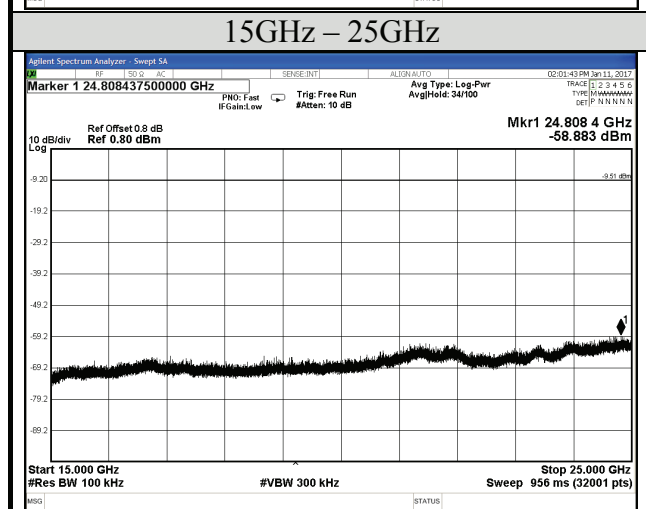
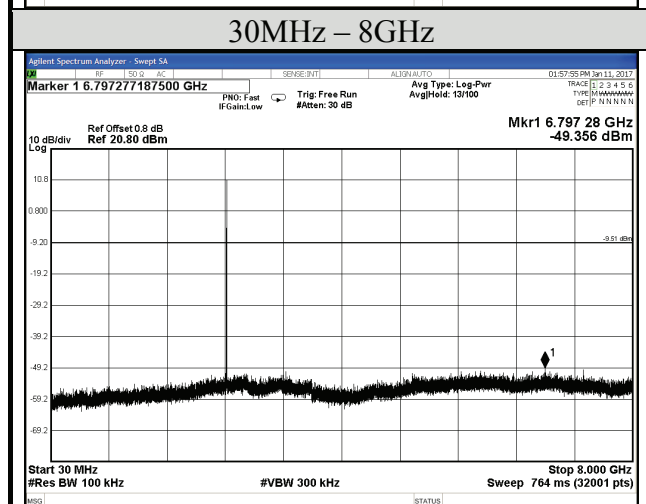
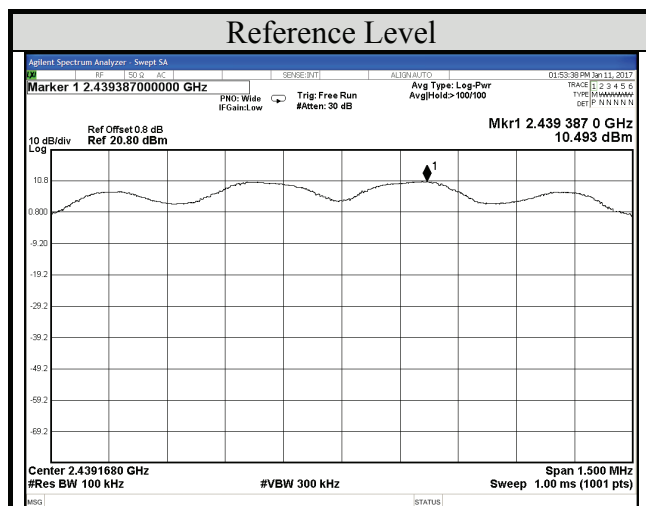


A.3 EMISSION LIMITATIONS MEASUREMENT

Test Date	2017/01/11	Temp./Hum.	24°C/59%
Cable Loss	0.8dB	Test Voltage	DC 6.6V (via DC Power Supply)
Mode	FASSTest	Frequency	TX 2405.376MHz
Simultaneous Factor	10 log(n) (Note: "n" is antenna number)		0



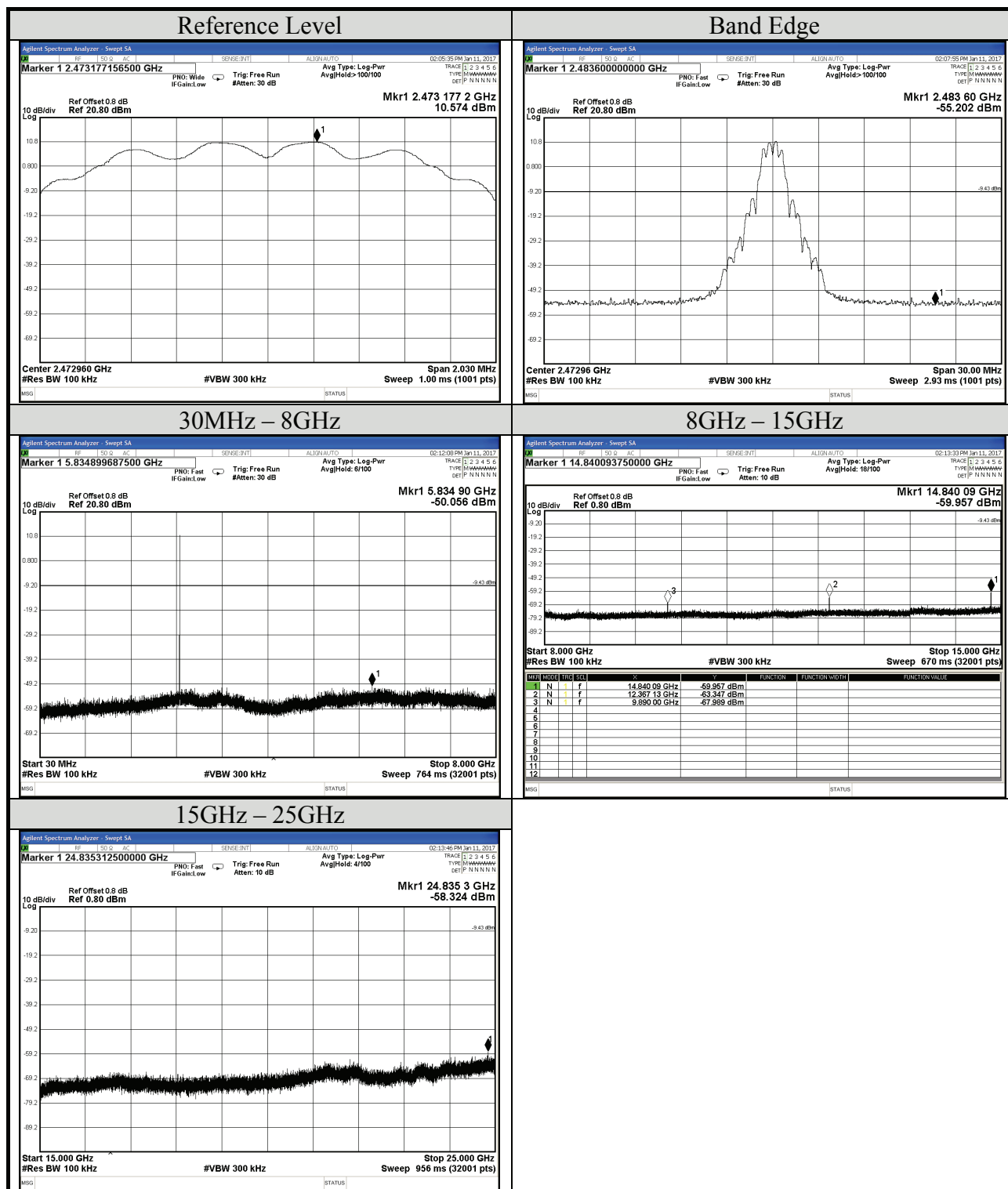
Test Date	2017/01/11	Temp./Hum.	24°C/59%
Cable Loss	0.8dB	Test Voltage	DC 6.6V (via DC Power Supply)
Mode	FASSTest	Frequency	TX 2439.168MHz
Simultaneous Factor	10 log(n) (Note: "n" is antenna number)		0



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Test Date	2017/01/11	Temp./Hum.	24°C/59%
Cable Loss	0.8dB	Test Voltage	DC 6.6V (via DC Power Supply)
Mode	FASSTest	Frequency	TX 2472.960MHz
Simultaneous Factor	10 log(n) (Note: "n" is antenna number)		0



A.4 POWER SPECTRAL DENSITY

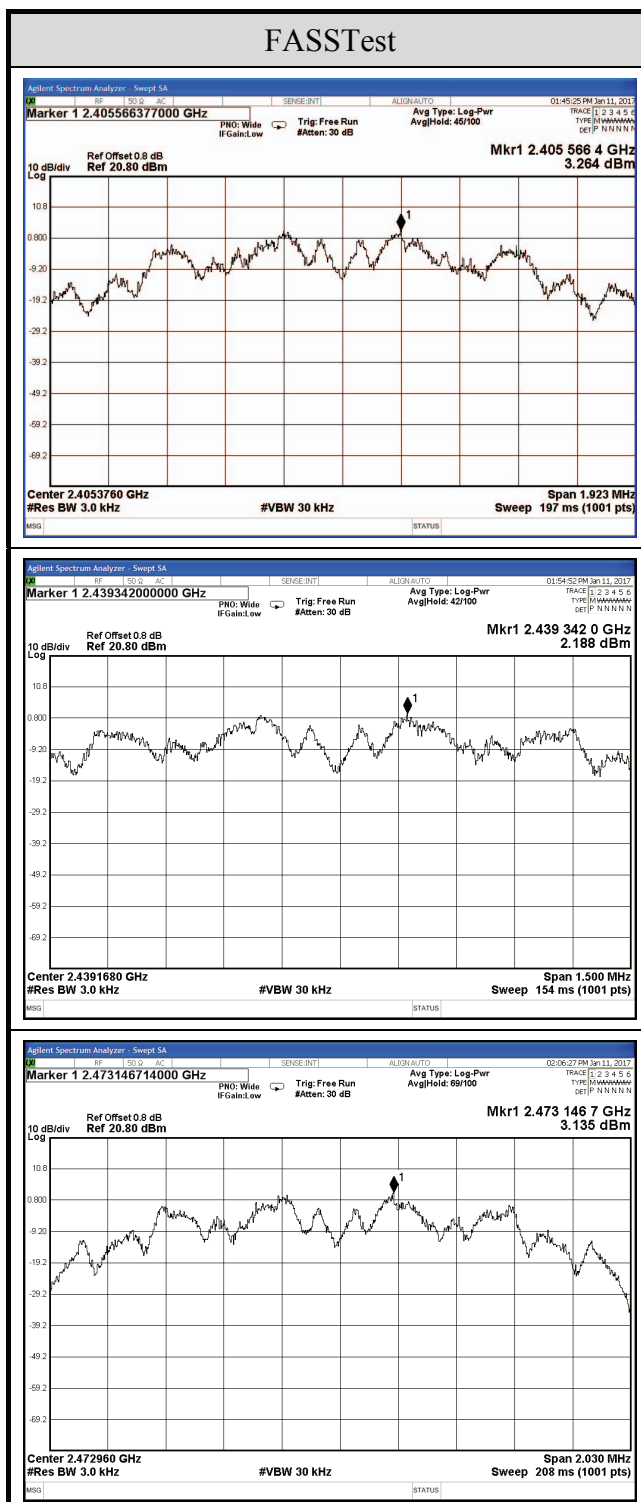
Test Date	2017/01/11	Temp./Hum.	24°C/59%
Cable Loss	0.8dB	Test Voltage	DC 6.6V (via DC Power Supply)
Simultaneous Factor $10 \log(n)$ (Note: "n" is antenna number)			0

A.4.1 Power Spectral Density Result

Modulation Type	Centre Frequency (MHz)	Power Spectral Density (dBm)	Limit
FASSTest	2405.376	3.264	< 8 dBm/3kHz
	2439.168	2.188	
	2472.960	3.135	

Note: All results have been included cable loss and Simultaneous Factor.

A.4.2 Measurement Plots



Note: All results have been included cable loss and Simultaneous Factor.