

FCC 15.247 2.4 GHz Test Report

for

FUTABA Corporation

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

Product Name : Radio Control
Model Name : T7PX
Brand : Futaba
FCC ID : AZPT7PX-24G

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



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TEST REPORT CERTIFICATION

Applicant : FUTABA Corporation
Manufacture : FUTABA Corporation
EUT Description
(1) Product : Radio Control
(2) Model : T7PX
(3) Brand : Futaba

Applicable Standards:

47 CFR FCC Part 15 Subpart C
ANSI C63.10:2013
KDB 558074 D01 DTS Meas Guidance v04

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. 08. 07

Reviewed by:



(Tina Huang/Administrator)

Approved by:



(Ben Cheng/Manager)

1. REVISION RECORD OF TEST REPORT

Edition No	Issued Data	Revision Summary	Report Number
0	2017. 08. 07	Original Report	EM-F170499

2. SUMMARY OF TEST RESULTS

Rule	Description	Results
15.207	Conducted Emission	N/A, Note
15.247(d)/15.205	Radiated Band Edge and Radiated Spurious Emission	PASS
15.247(a)(2)	6dB Bandwidth	PASS
15.247(b)(3)	Maximum Peak Output	PASS
15.247(d)	Conducted Band Edges and Conducted Spurious Emission	PASS
15.247 (e)	Peak Power Spectral Density	PASS
15.203	Antenna Requirement	Compliance
Note: The EUT only employs battery power for operation, so it is unnecessary to test.		

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
Model	T7PX
Brand	Futaba

3.2. Description of EUT

Test Model	T7PX
Serial Number	N/A
Power Rating	6.6Vdc
Firmware Version	N/A
RF Features	FHSS (S-FHSS, T-FHSS, T-FHSS SR) and DSSS (FASST)
Transmit Type	1T1R
Sample Status	Production
Date of Receipt	2017. 06. 22
Date of Test	2017. 06. 27 ~ 08. 04
I/O Ports List	None
Accessories Supplied	Battery: Futaaba, M/N FT2F1700BV2

3.3. Antenna Information

No.	Antenna Part Number	Manufacture	Antenna Type	Frequency (MHz)	Max Gain (dBi)
1	ANTB24-094A0	SANSEI ELECTRIC CO., LTD	1/2λ di-pole	2400 ~ 2500	1.48

3.4. EUT Specifications Assessed in Current Report

Fundamental Range (MHz)	Channel Number	Modulation	Data Rate (kbps)
2405.376 to 2477.056	36	FASST	136

Modulation: FASST			
Channel List			
Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)
02	2405.376	38	2442.240
04	2407.424	40	2444.288
06	2409.472	42	2446.336
08	2411.520	44	2448.384
10	2413.568	46	2450.432
12	2415.616	48	2452.480
14	2417.664	50	2454.528
16	2419.712	52	2456.576
18	2421.760	54	2458.624
20	2423.808	56	2460.672
22	2425.856	58	2462.720
24	2427.904	60	2464.768
26	2429.952	62	2466.816
28	2432.000	64	2468.864
30	2434.048	66	2470.912
32	2436.096	68	2472.960
34	2438.144	70	2475.008
36	2440.192	72	2477.056

3.6. Test Configuration

Mode	Duty Cycle (x)	T (ms)	Duty Cycle Factor (dB)
FASST	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}	FASST	2/72
	Radiated Spurious Emission ^{Note1}	FASST	2/36/72
Conducted Test Case	6dB Bandwidth	FASST	2/36/72
	Peak Power Spectral Density	FASST	2/36/72
	Peak Output Power	FASST	2/36/72
	Band Edge	FASST	2/72
	Spurious Emission	FASST	2/36/72

Note 1:

☐ Mobile Device.

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

☒ Lie

☐ Side

☐ Stand

3.7. Tested Supporting System List

None.

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 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)

3.11. Measurement Uncertainty

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

Remark : Uncertainty = $ku_c(y)$

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

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	2017. 06. 19	1 Year
3.	Amplifier	HP	8447D	2944A06305	2017. 02. 16	1 Year
4.	Amplifier	HP	8449B	3008A00529	2017. 02. 08	1 Year
5.	Bilog Antenna	CHASE	CBL6112D	33821	2017. 01. 21	1 Year
6.	HornAntenna	EMCO	3115	9609-4927	2017. 06. 27	1 Year
7.	Double-Ridged Waveguide Horn	ETS-Lindgren	3117	00135902	2017. 03. 08	1 Year
8.	2.4GHz Notch Filter	K&L	7NSL10-244 1.5E130.5-00	1	2017. 07. 27	1 Year
9.	3GHz Notch Filter	Microwave	H3G018G1	484798	2016. 08. 25	1 Year
10	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

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

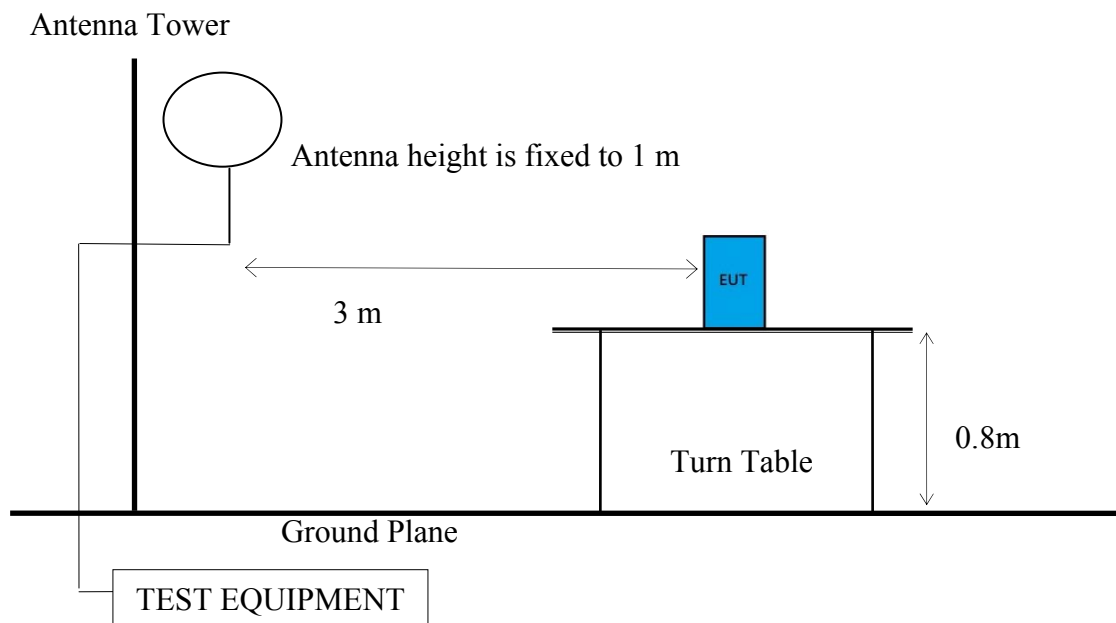
6. RADIATED EMISSION

6.1. Block Diagram of Test Setup

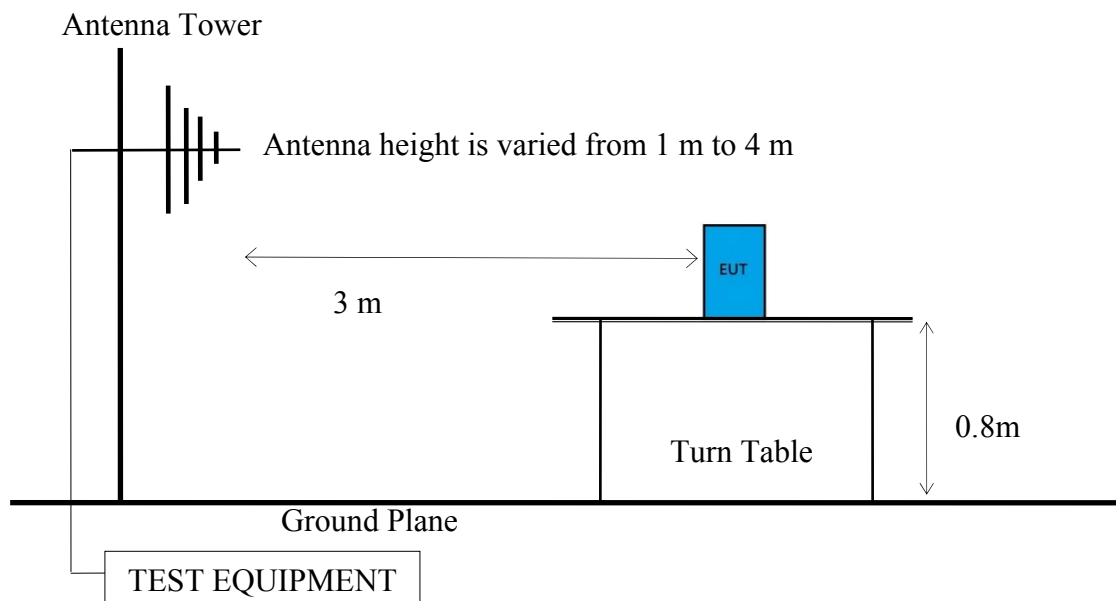
6.1.1. Block Diagram of EUT

Indicated as section 3.8

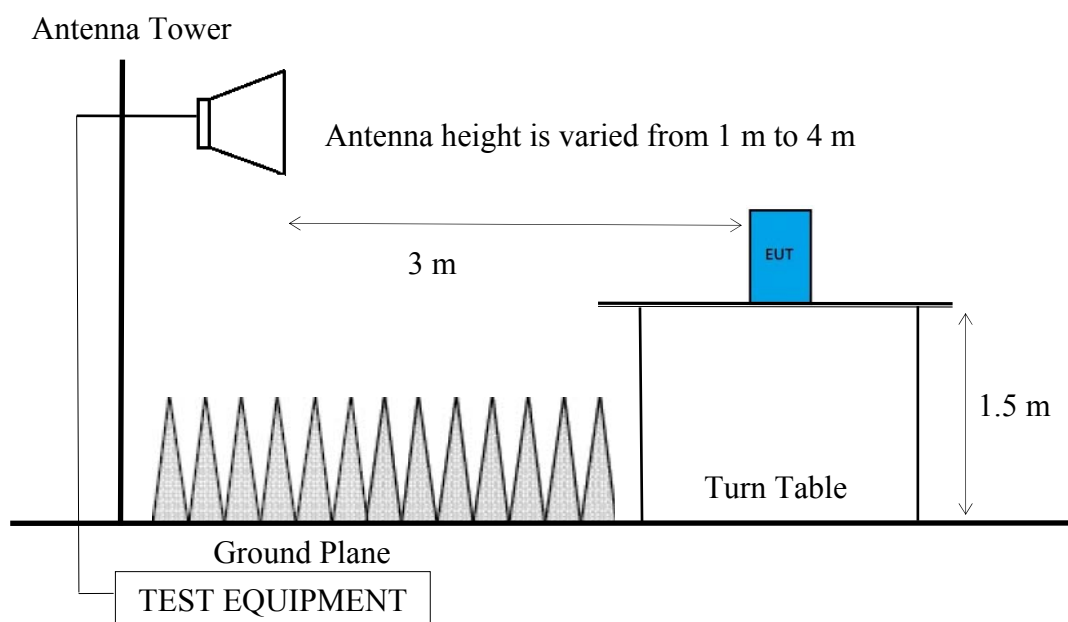
6.1.2. Setup Diagram for 9kHz-30MHz



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

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

6.3. Test Procedure

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 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 (up to 25 GHz):

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 detector for finally measurement.

Average Detector:☒ **Option 1:**

(1) RBW = 1MHz

(2) $VBW \geq 1/T$.

Modulation Type	T (ms)	1/T (kHz)	VBW Setting (Hz)
FASST	N/A	N/A	500

N/A: 1/T is not implemented when duty cycle presented in section 3.6 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:**

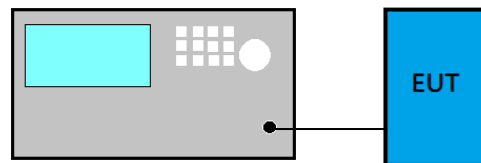
Average Emission Level = Peak Emission Level + D.C.C.F.

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 + DCCFDuty Cycle Correction Factor (DCCF) = $20 \log (TX_{on}/TX_{on+off})$ presented in section 3.7☐ ERP = Peak Emission Level - 95.2dB - 2.14dB**6.5. Test Results**

Please refer to Appendix A.

7. 6dB BANDWIDTH

7.1. Block Diagram of Test Setup



7.2. Specification Limits

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

7.3. Test Procedure

Following measurement procedure is reference to KDB 558074 D01 DTS Meas Guidance v04:

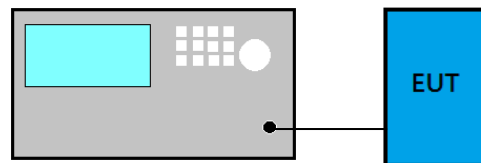
- (1) Set RBW = 100 kHz.
- (2) Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
- (3) Detector = Peak.
- (4) Trace mode = max hold.
- (5) Sweep = auto couple.
- (6) Allow the trace to stabilize.
- (7) Setting channel bandwidth function x dB to -6 dB to record the final bandwidth.

7.4. Test Results

Please refer to Appendix A

8. MAXIMUM PEAK OUTPUT POWER

8.1. Block Diagram of Test Setup



8.2. Specification Limits

The Limits of maximum Peak Output Power for digital modulation in 2400-2483.5MHz is : 1Watt. (30dBm)

8.3. Test Procedure

Following measurement procedure is reference to KDB 558074 D01 DTS Meas Guidance v04:

☐ **Method PKPM Peak power meter method:**

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

☒ **Method PKSA (Spectrum Analyzer):**

- (1) Set the RBW $\geq$ DTS bandwidth.
- (2) Set VBW ≥ 3 RBW.
- (3) Set span ≥ 3 RBW
- (4) Sweep time = auto couple.
- (5) Detector = peak.
- (6) Trace mode = max hold.
- (7) Allow trace to fully stabilize.
- (8) Use peak marker function to determine the peak amplitude level.

☐ **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 3.6 is < 98%.

☐ **Method AVGSA-2 (Spectrum channel power)**

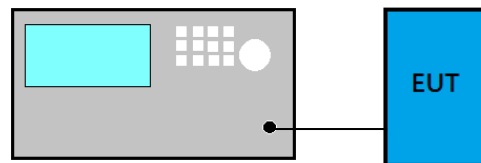
- (1) Set span to at least 1.5 times the OBW
- (2) Set RBW = 1 -5% of OBW
- (3) Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
- (4) Detector = RMS.
- (5) Trace mode = trace average at least 100 traces
- (6) Sweep = auto couple.
- (7) Compute power by integrating the spectrum across the OBW of the 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 3.6 is < 98%.

8.4. Test Results

Please refer to Appendix A

9. EMISSION LIMITATIONS

9.1. Block Diagram of Test Setup



9.2. Specification Limits

In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, that the required attenuation shall be 30 dB instead of 20 dB.

Attenuation below the general limits specified in 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)).

9.3. Test Procedure

Following measurement procedure is reference to KDB 558074 D01 DTS Meas Guidance v04:

■ 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

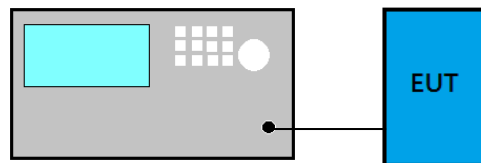
- (1) Set analyzer center frequency to DTS channel center frequency.
- (2) Set the span to 1.5 times the DTS bandwidth.
- (3) Set the RBW to: 100 kHz.
- (4) Set the VBW $\geq 3 \times$ RBW.
- (5) Detector = peak.
- (6) Sweep time = auto couple.
- (7) Trace mode = max hold.
- (8) Allow trace to fully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

9.4. Test Results

Please refer to Appendix A

10. POWER SPECTRAL DENSITY

10.1. Block Diagram of Test Setup



10.2. 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.

10.3. Test Procedure

Following measurement procedure is reference to KDB 558074 D01 DTS Meas Guidance v04:

☒ 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 3.6 < 98%.
- (7) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

10.4. Test Results

Please refer to Appendix A

11.DEVIATION TO TEST SPECIFICATIONS

【NONE】



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APPENDIX A

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APPDNDIX A

TEST DATA AND PLOTS

(Model: T7PX)

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A.1 RADIATED EMISSION

Test Date	2017/08/04	Temp./Hum.	22°C/51%
Test Voltage	DC 6.6V (Via Battery)		

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	FASST	Frequency	TX 2477.056MHz
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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
101.78	17.38	2.29	7.25	26.92	43.50	16.58	Peak
194.90	15.65	3.29	7.95	26.89	43.50	16.61	Peak
246.31	18.66	3.77	6.19	28.62	46.00	17.38	Peak
340.40	21.09	4.86	9.53	35.48	46.00	10.52	Peak
359.80	21.63	5.09	10.88	37.60	46.00	8.40	Peak
421.88	22.99	5.76	15.02	43.77	46.00	2.23	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
157.07	16.46	2.90	12.52	31.88	43.50	11.62	Peak
195.87	15.67	3.30	18.65	37.62	43.50	5.88	Peak
259.89	19.10	3.92	10.03	33.05	46.00	12.95	Peak
420.91	22.97	5.75	8.73	37.45	46.00	8.55	Peak
480.08	23.58	6.27	8.28	38.13	46.00	7.87	Peak
500.45	23.77	6.43	7.40	37.60	46.00	8.40	Peak

Remark: The TX 2447.056MHz is a worst mode of FASST modulation.

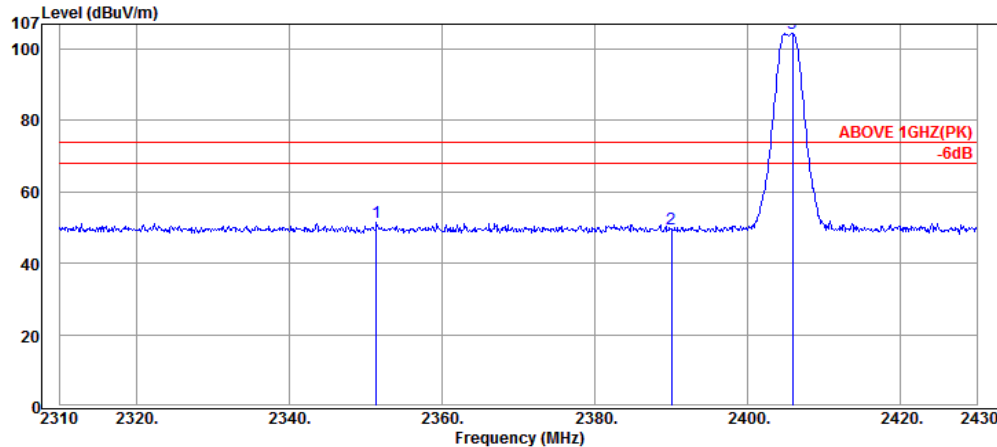
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A.2.1.3 Frequency Above 1 GHz to 10th harmonics

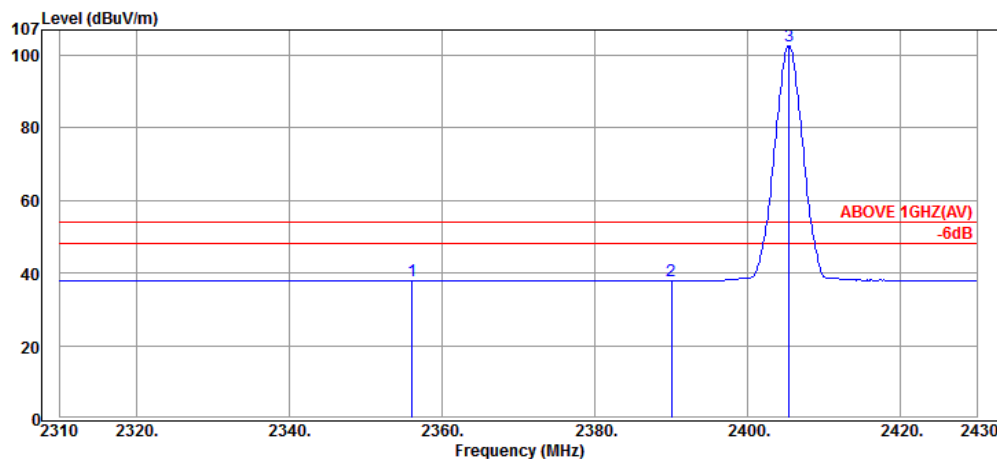
Band Edge:

Mode	FASST	Frequency	TX 2405.376MHz
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Antenna at Horizontal Polarization

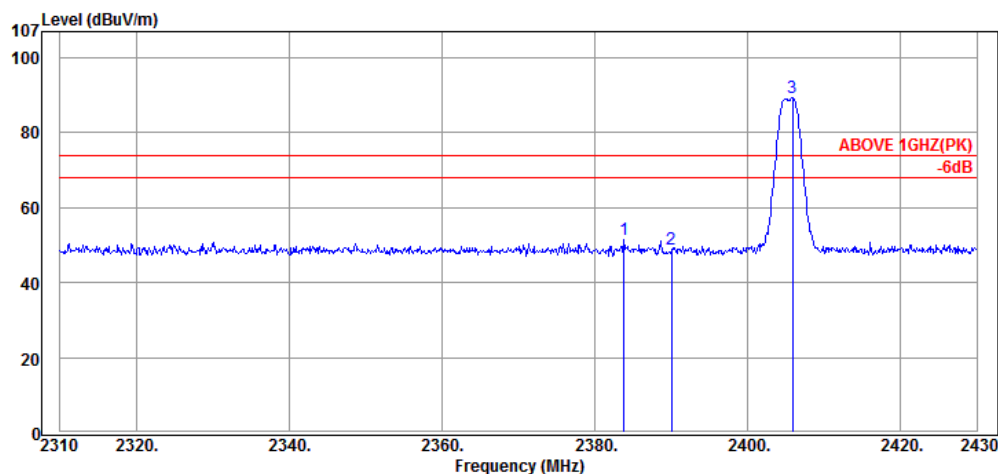
Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2351.40	28.25	5.21	18.17	51.63	74.00	22.37	Peak
2390.04	28.17	5.24	16.27	49.68	74.00	24.32	Peak
2405.88	28.14	5.25	71.04	104.43	---	---	Peak



Antenna at Horizontal Polarization

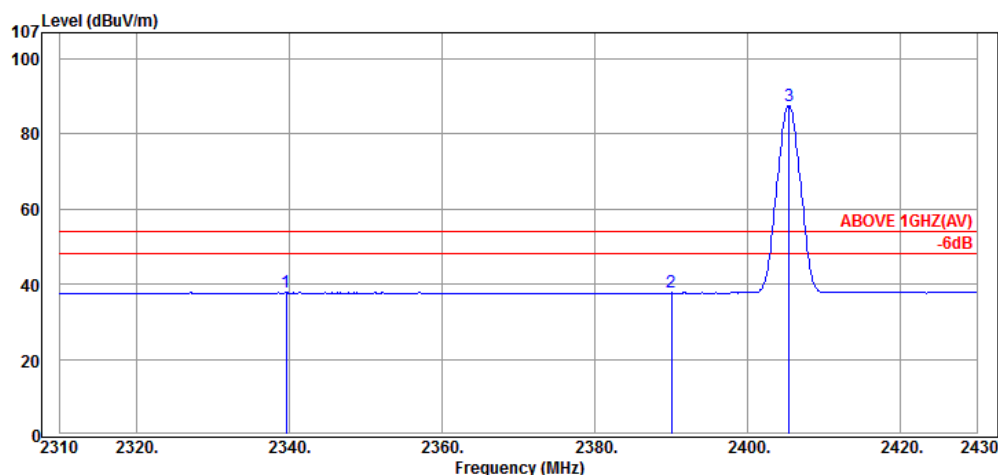
Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2356.08	28.22	5.21	4.56	37.99	54.00	16.01	Average
2390.04	28.17	5.24	4.51	37.92	54.00	16.08	Average
2405.40	28.14	5.25	69.22	102.61	---	---	Average

Mode	FASST	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
2383.80	28.19	5.23	17.88	51.30	74.00	22.70	Peak
2390.04	28.17	5.24	15.49	48.90	74.00	25.10	Peak
2405.88	28.14	5.25	55.89	89.28	---	---	Peak



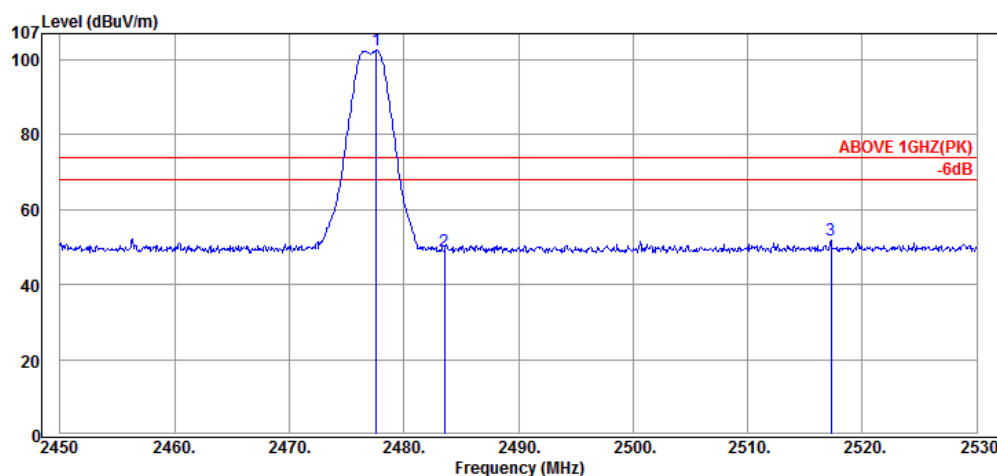
Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2339.64	28.25	5.20	4.26	37.71	54.00	16.29	Average
2390.04	28.17	5.24	4.29	37.70	54.00	16.30	Average
2405.40	28.14	5.25	54.18	87.57	---	---	Average

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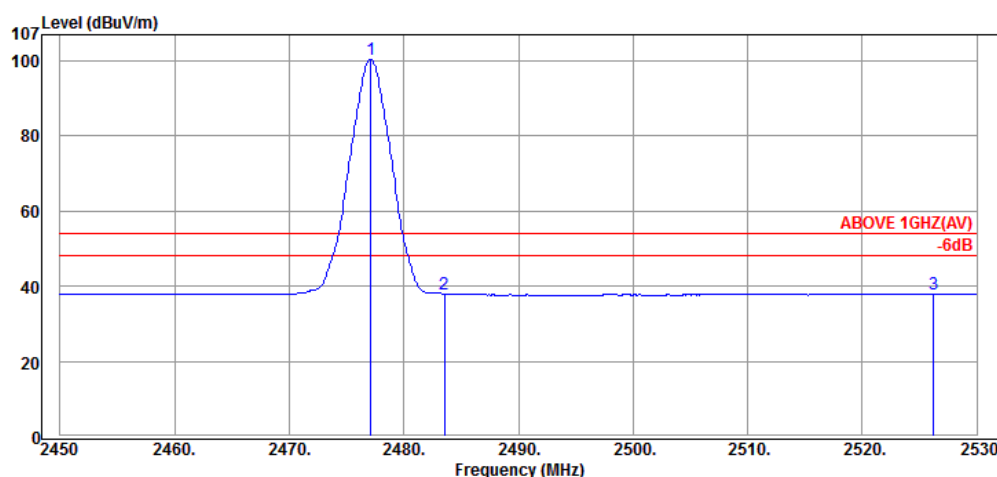
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Mode	FASST	Frequency	TX 2477.056MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2477.60	28.03	5.30	69.14	102.47	---	---	Peak
2483.52	28.03	5.31	15.73	49.07	74.00	24.93	Peak
2517.28	28.05	5.33	18.62	52.00	74.00	22.00	Peak



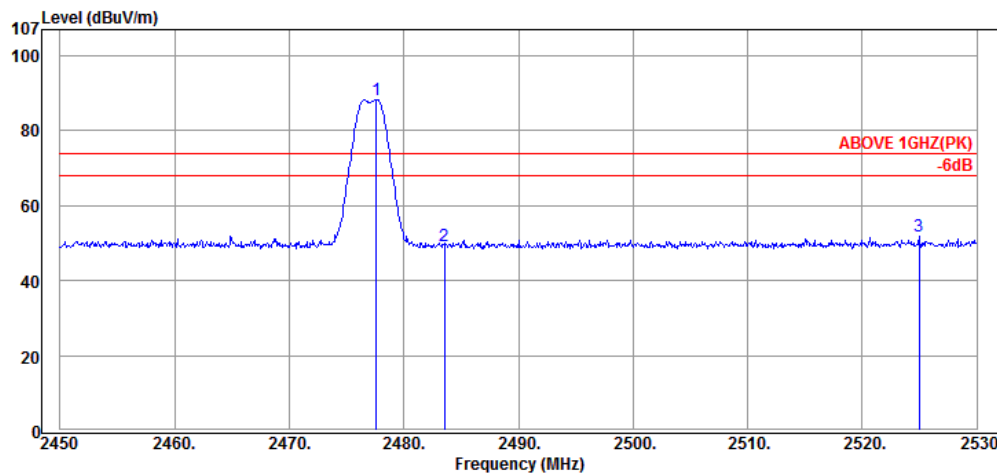
Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2477.12	28.03	5.30	67.01	100.34	---	---	Average
2483.52	28.03	5.31	4.59	37.93	54.00	16.07	Average
2526.24	28.09	5.34	4.55	37.98	54.00	16.02	Average

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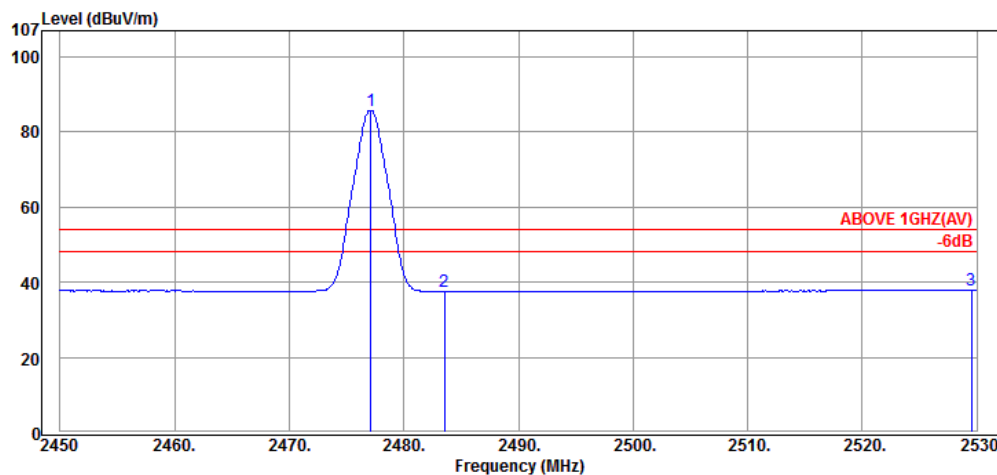
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Mode	FASST	Frequency	TX 24777.056MHz
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Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2477.60	28.03	5.30	54.99	88.32	---	---	Peak
2483.52	28.03	5.31	15.78	49.12	74.00	24.88	Peak
2524.96	28.09	5.34	18.30	51.73	74.00	22.27	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
2477.12	28.03	5.30	52.52	85.85	---	---	Average
2483.52	28.03	5.31	4.19	37.53	54.00	16.47	Average
2529.52	28.09	5.35	4.44	37.88	54.00	16.12	Average

A.1.2 Emissions outside the frequency band:

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

Mode	FASST	Frequency	TX 2405.376MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
3210.00	29.81	6.20	17.17	53.18	54.00	0.82	Peak

Mode	FASST	Frequency	TX 2440.192MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
3255.00	29.92	6.31	16.36	52.59	54.00	1.41	Peak
4880.00	32.71	9.08	9.60	51.39	54.00	2.61	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
4880.00	32.71	9.08	10.18	51.97	54.00	2.03	Peak

Mode	FASST	Frequency	TX 2477.056MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
3300.00	29.99	6.42	11.13	47.54	54.00	6.46	Peak
4955.00	32.92	9.18	11.34	53.44	54.00	0.56	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
4955.00	32.92	9.18	4.46	46.56	54.00	7.44	Average
4955.00	32.92	9.18	13.15	55.25	74.00	18.75	Peak
7430.00	37.00	10.69	0.62	48.31	54.00	5.69	Average
7430.00	37.00	10.69	9.01	56.70	74.00	17.30	Peak

A.1.3 Emissions in Non-restricted Frequency Bands:

Pursuant to KDB 558074 D01 DTS Meas Guidance v04 that emission levels below the 15.209 general radiated emissions limits is not required.

A.2 6dB BANDWIDTH

Test Date	2017/06/27	Temp./Hum.	22°C/50%
Cable Loss	3.5dB	Test Voltage	DC 6.6V (Via Battery)

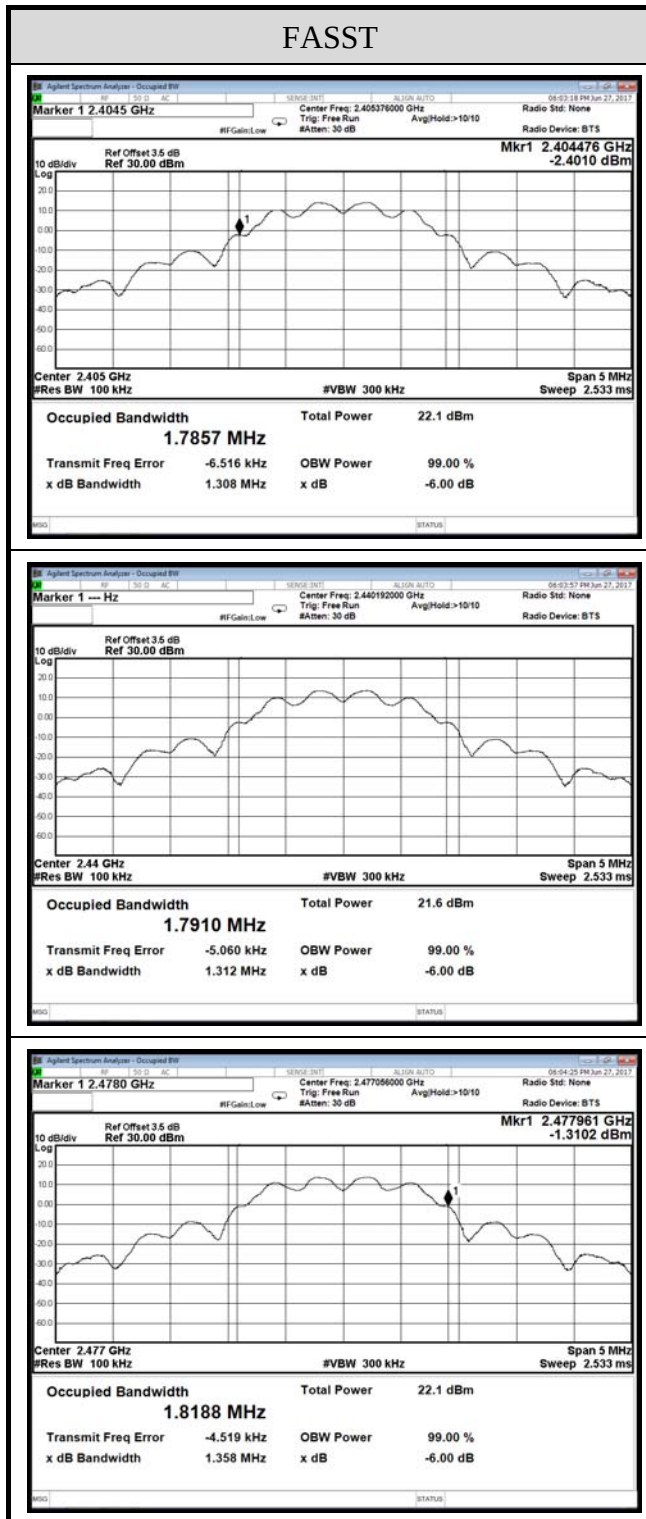
A.2.1 6dB Bandwidth Result

Mode	Centre Frequency (MHz)	6 dB Bandwidth (MHz)	Limit
FASST	2405.376	1.308	>500kHz
	2440.192	1.312	
	2477.056	1.358	

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A.2.2 Measurement Plots



A.3 MAXIMUM PEAK OUTPUT POWER

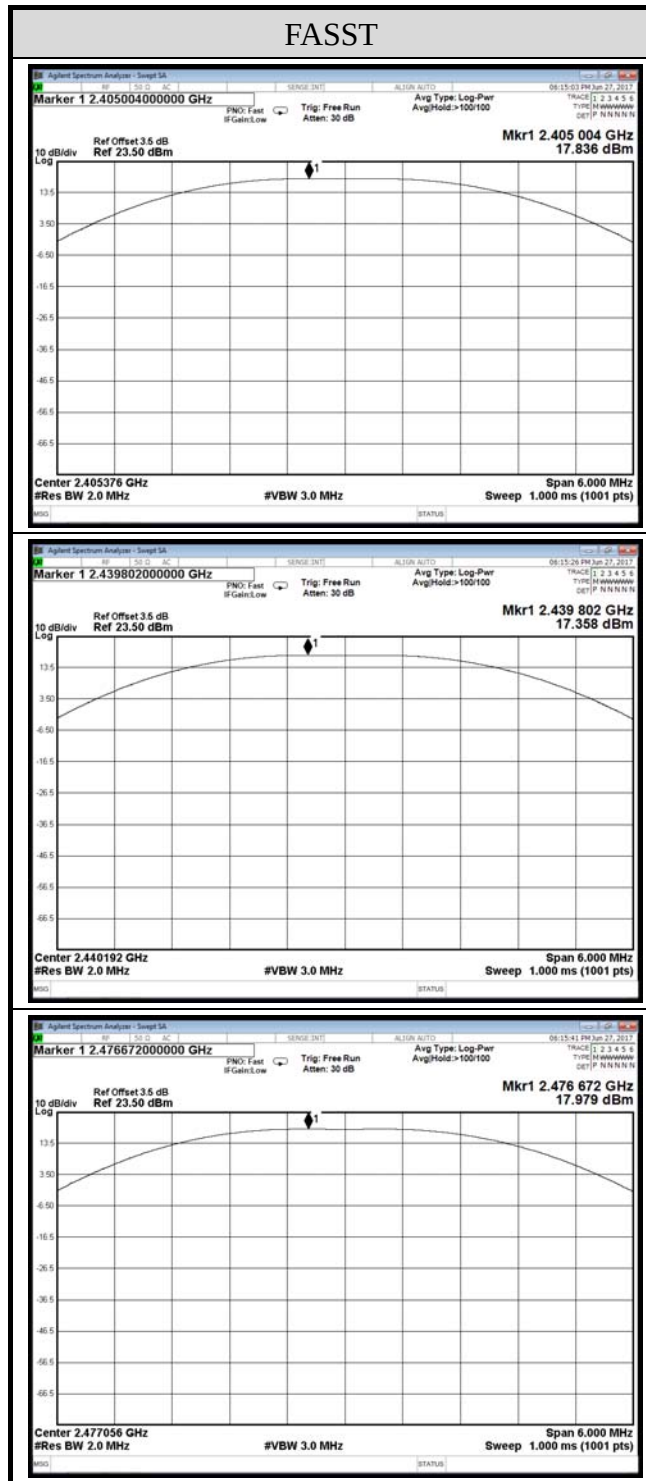
Test Date	2017/06/27	Temp./Hum.	22°C/50%
Cable Loss	3.5dB	Test Voltage	DC 6.6V (Via Battery)

A.3.1 Peak Output Power

Mode	Centre Frequency (MHz)	Peak Output Power		Limit
		(dBm)	(W)	
FASST	2405.376	17.836	0.060758	< 30dBm (1W)
	2440.192	17.358	0.054425	
	2477.056	17.979	0.062791	

Note: The results have been included cable loss.

A.3.2 Measurement Plots

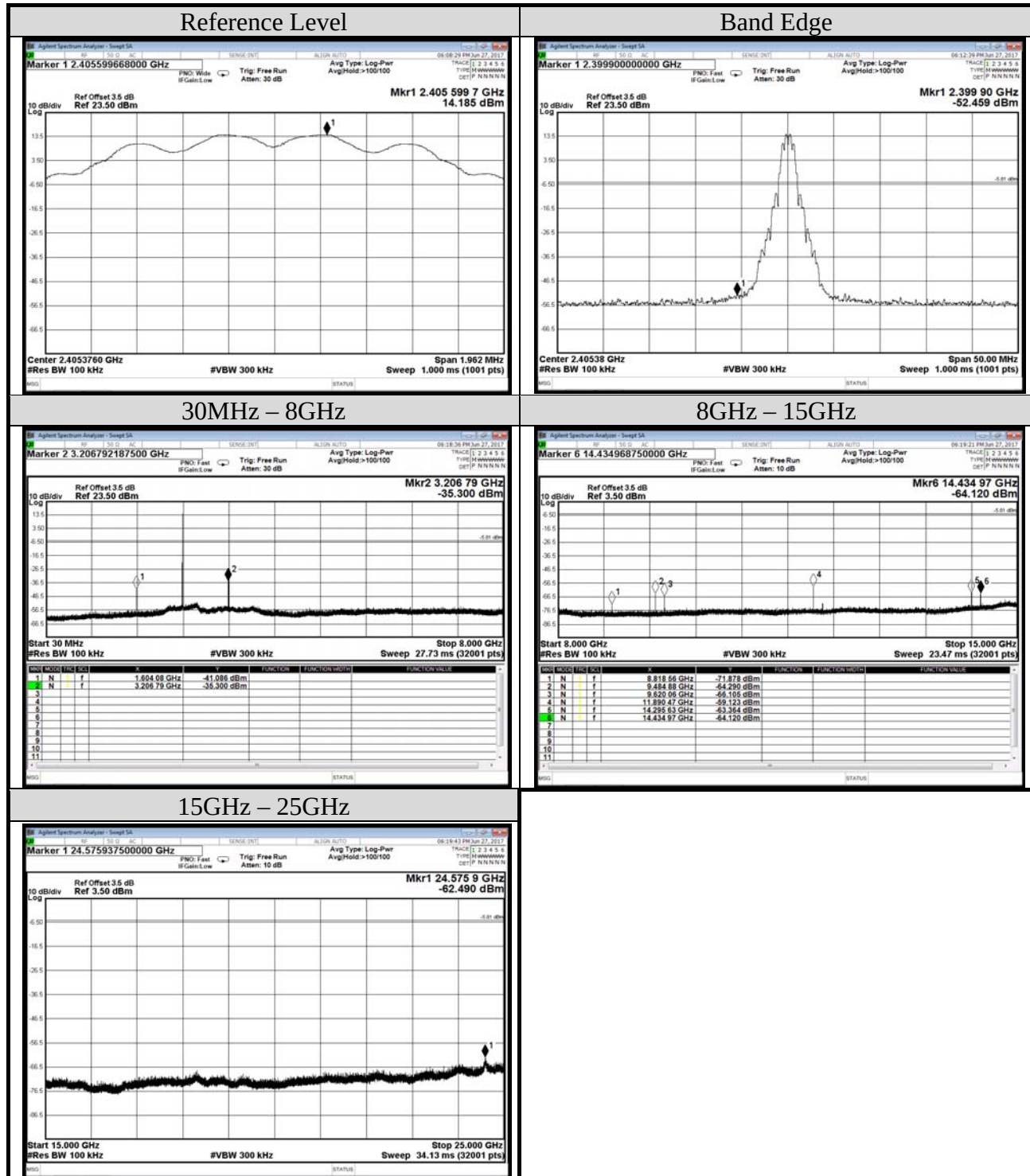


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A.4 EMISSION LIMITATIONS

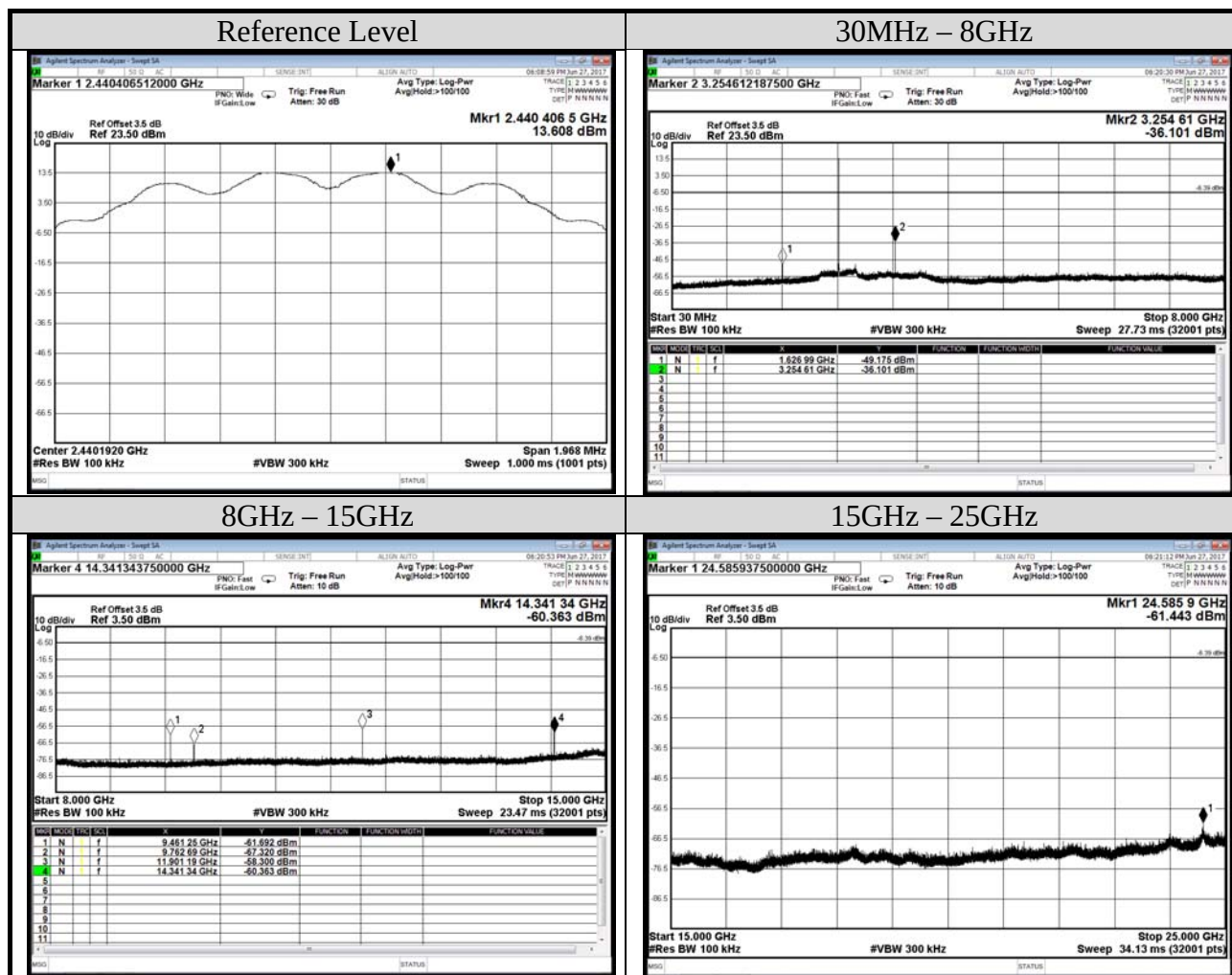
Test Date	2017/06/27	Temp./Hum.	22°C/50%
Cable Loss	3.5dB	Test Voltage	DC 6.6V (Via Battery)
Mode	FASST	Frequency	TX 2405.376MHz
Simultaneous Factor	10 log(n) (Note: “n” is antenna number)		0



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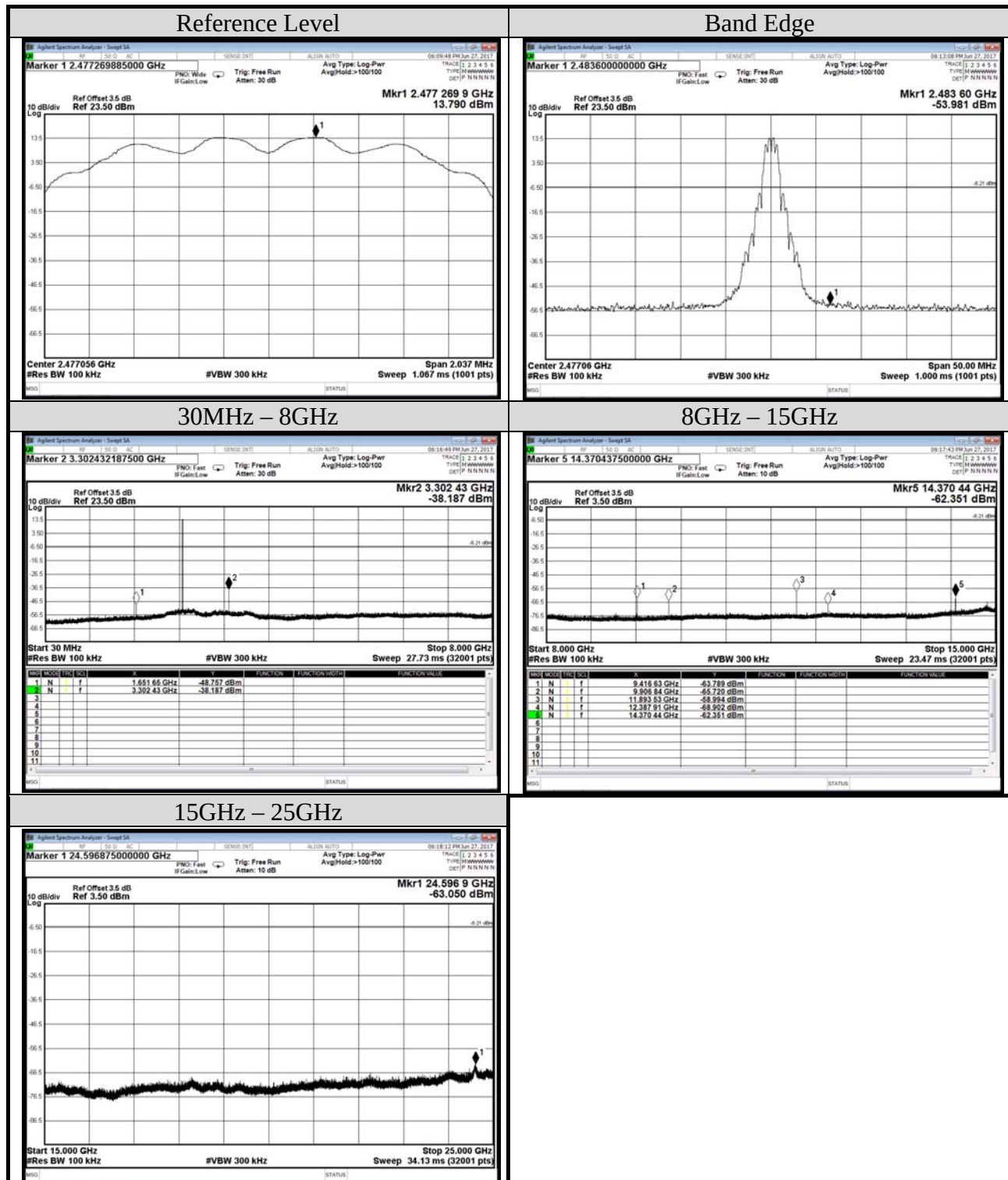
Test Date	2017/06/27	Temp./Hum.	22°C/50%
Cable Loss	3.5dB	Test Voltage	DC 6.6V (Via Battery)
Mode	FASST	Frequency	TX 2440.192MHz
Simultaneous Factor	10 log(n) (Note: "n" is antenna number)		0



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Test Date	2017/06/27	Temp./Hum.	22°C/50%
Cable Loss	3.5dB	Test Voltage	DC 6.6V (Via Battery)
Mode	FASST	Frequency	TX 2477.056MHz
Simultaneous Factor10 log(n) (Note: “n” is antenna number)	0		



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Report Number: EM-F170499

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A.5 POWER SPECTRAL DENSITY

Test Date	2017/06/27	Temp./Hum.	22°C/50%
Cable Loss	3.5	Test Voltage	DC 6.6V (Via Battery)
Simultaneous Factor $10 \log(n)$ (Note: "n" is antenna number)			0

A.5.1 Power Spectral Density Result

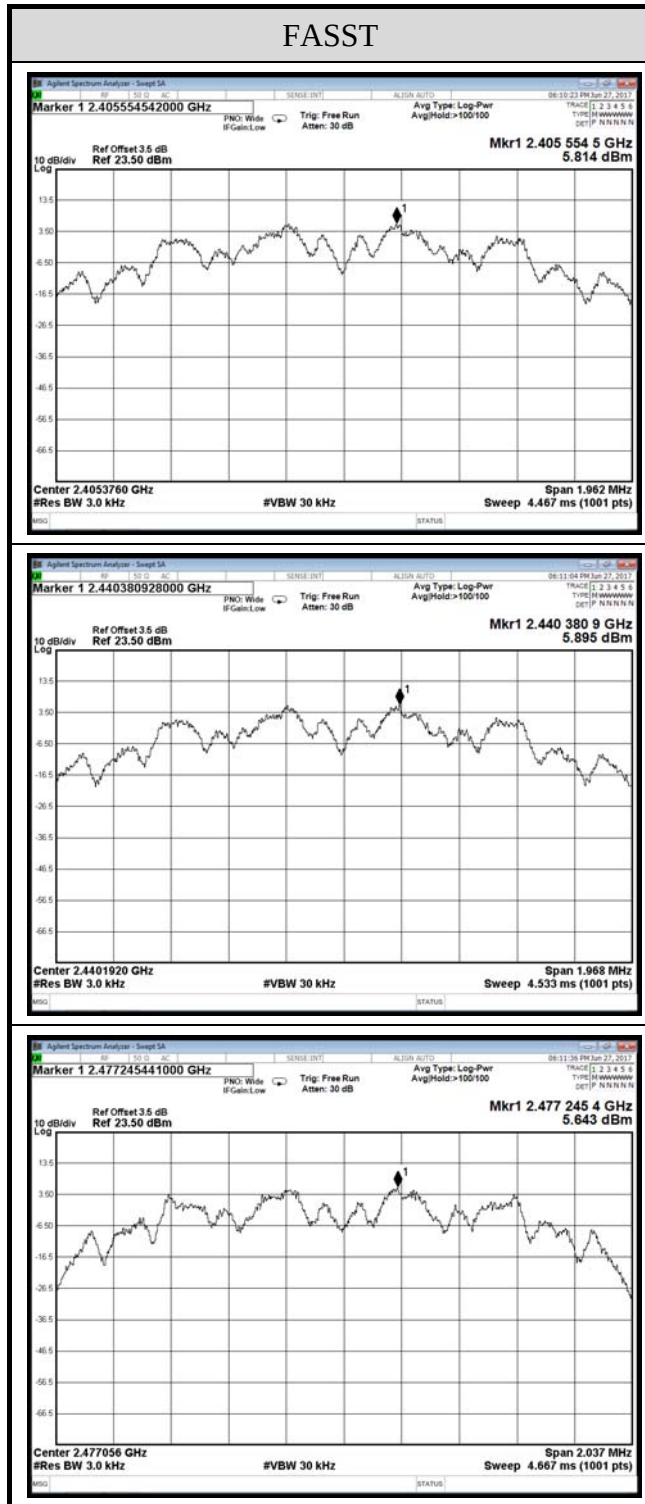
Mode	Centre Frequency (MHz)	Power Spectral Density (dBm)	Limit
FASST	2405.376	5.814	< 8 dBm/3kHz
	2440.192	5.895	
	2477.056	5.643	

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

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A.5.2 Measurement Plots



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



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APPENDIX B

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APPENDIX B

TEST PHOTOGRAPHS

(Model: T7PX)