

**FCC 15.247 & RSS-247
(Class II Permissive Change)
2.4 GHz Test Report**

for

FUTABA Corporation

**1080 Yabutsuka Chosei-mura Chosei-gun Chiba-ken
229-4395 JAPAN**

Product Name : Radio Control
Model Name : R7108SB
Brand Futaba
FCC ID : AZP-R7108SB-24G
IC : 2914D-R7108SB

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



The test report is based on a single evaluation of one sample of the above-mentioned products. It does not imply an assessment of the whole production and does not permit the use of the test lab logo.
The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the U.S. Government.

TABLE OF CONTENTS

Description	Page
TEST REPORT CERTIFICATION.....	4
1. REVISION RECORD OF TEST REPORT	4
2. SUMMARY OF TEST RESULTS	5
3. GENERAL INFORMATION	6
3.1. Description of Application	6
3.2. Description of EUT	6
3.3. Information for Class II Change Permissive	7
3.4. Antenna Information	8
3.5. EUT Specifications Assessed in Current Report	8
3.6. Descriptions of Key Components	8
3.7. Test Configuration	9
3.8. Tested Supporting System List	10
3.9. Setup Configuration	10
3.10. Operating Condition of EUT	10
3.11. Description of Test Facility	11
3.12. Measurement Uncertainty	11
4. MEASUREMENT EQUIPMENT LIST	12
4.1. Radiated Emission Measurement	12
4.2. RF Conducted Measurement	12
5. CONDUCTED EMISSION	13
6. RADIATED EMISSION	14
6.1. Block Diagram of Test Setup	14
6.2. Radiated Emission Limits	15
6.3. Test Procedure	16
6.4. Measurement Result Explanation	17
6.5. Test Results	17
7. MAXIMUM PEAK OUTPUT POWER	18
7.1. Block Diagram of Test Setup	18
7.2. Specification Limits	18
7.3. Test Procedure	18
7.4. Test Results	19
8. DEVIATION TO TEST SPECIFICATIONS	20
APPENDIX A TEST DATA AND PLOTS	
APPENDIX B TEST PHOTOGRAPHS	

TEST REPORT CERTIFICATION (Class II Permissive Change)

Applicant : FUTABA Corporation

Manufacturer : FUTABA Corporation

EUT Description

(1) Product : Radio Control

(2) Model : R7108SB

(3) Brand : Futaba

(4) Power Rating : DC 3.5 ~ 8.4V

Applicable Standards:

47 CFR FCC Part 15 Subpart C

RSS-Gen (Issue 5), April 2018

RSS-247 (Issue 2), February 2017

ANSI C63.10:2013

KDB 558074 D01 DTS Meas Guidance v05

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: 2019. 05. 30

Reviewed by:



(Sabrina Wang/Administrator)

Approved by:



(Ben Cheng/Manager)



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1. REVISION RECORD OF TEST REPORT

Edition No	Issued Date	Revision Summary	Report Number
0	2019. 05. 30	Original Report	EM-F190185

2. SUMMARY OF TEST RESULTS

Rule		Description	Results
FCC	IC		
15.207	RSS-Gen §8.8	Conducted Emission	N/A ^{Note 1, 2}
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	N/A ^{Note 2}
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	N/A ^{Note 2}
15.247 (e)	RSS-247 §5.2(2)	Peak Power Spectral Density	N/A ^{Note 2}
15.203	RSS-Gen §8.3	Antenna Requirement	Compliance
Note: 1. The EUT only employs battery power for operation, so it is unnecessary to test. 2. To add new Antenna and to change component value is not influence on this item.			

3. GENERAL INFORMATION

3.1. Description of Application

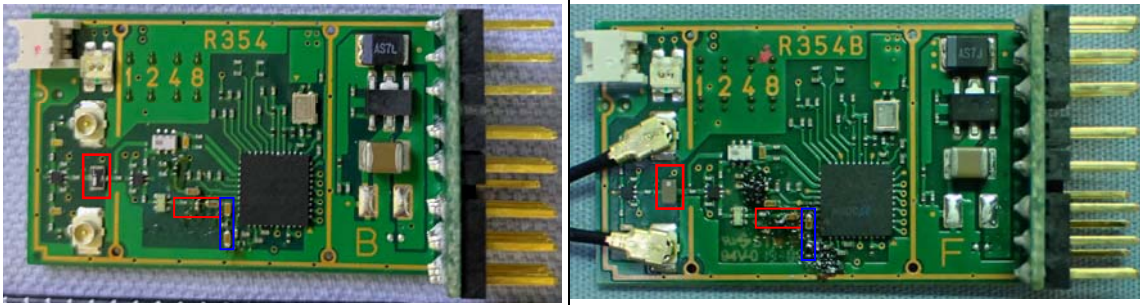
Applicant	FUTABA Corporation 1080 Yabutsuka Chosei-mura Chosei-gun Chiba-ken 229-4395 JAPAN
Manufacturer	FUTABA Corporation 1080 Yabutsuka Chosei-mura Chosei-gun Chiba-ken 229-4395 JAPAN
Product	Radio Control
Brand	Futaba
Model	R7108SB

3.2. Description of EUT

Test Model	R7108SB
Serial Number	N/A
Power Rating	DC 3.5~8.4V
RF Features	DSSS (1)FASSTest (2)FASST (Receive only)
Sample Status	Production
Date of Receipt	2019. 04. 18
Date of Test	2019. 05. 14
Interface Ports of EUT	• None
Accessories Supplied	• None

3.3. Information for Class II Change Permissive

- The EUT is an addition version with original FCC ID:AZP-R7108SB-24G and IC:2914D-R7108SB is as following.
 - (a) To add new Antenna.
 - (b) To reducing output power.
 - (c) To change some component information or value, others are totally identical.
- The differences between this application and original's ID as clarify in following list.

Item	Original		Class II Change Permissive	
Model	R7108SB		R7108SB	
FVIN	R7108SB_V1.000_01		R7108SB_V1.000_01	
Output Power	0.0056W		0.0037W	
Antenna Part Number	JA1R0227A		ANTB24-104A0	
Manufacture	Wanshih Electronic Co., Ltd.		SANSEI ELECTRIC CO., LTD	
Antenna	2.4GHz Ant A	2.4GHz Ant B	2.4GHz Ant A	2.4GHz Ant B
Antenna Type	1/4λ Antenna, 150mm	1/4λ Antenna, 150mm	1/4λ Antenna, 174mm	1/4λ Antenna, 174mm
Antenna Gain	-5.16dBi	-5.16dBi	2.10dBi	2.10dBi
PCB Board				
Remark	(1)The reason of component F1001 changed is cost down. (TBF-2012 → LFB212G45CG1B982) (2)The reason of component R1005 changed is following with the F1001. (10Ω → 5.1Ω) (3)The reason of capacitance and inductance value changed to reduce output power, the firmware is the same. ①To add resistor R1003 10Ω. ②To change inductor L1006 from 15nH to 0Ω. ③To change resistor R1005 from 5.1Ω to 10Ω.			

- Due to above different item, there have some test item should be re-tested (see section 2), the test data are recorded in this report.

3.4. Antenna Information

Antenna Part Number	Manufacture	Frequency (MHz)	Antenna Type	Length of Antenna (Gain)
ANTB24-104A0	SANSEI ELECTRIC CO., LTD	2.4GHz Ant A	1/4λ Antenna	174mm (2.10dBi)
		2.4GHz Ant B	1/4λ Antenna	174mm (2.10dBi)

3.5. EUT Specifications Assessed in Current Report

Mode	Fundamental Range (MHz)	Channel Number	Modulation	Data Rate (kbps)
DSSS	2405.376 to 2472.960	23	FASSTest	Up to 214.3
DSSS	2405.376 to 2477.056	36	FASST (Receive only)	Up to 136

FASSTest Channel List				FASST Channel List (Receive only)			
Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)
00	2405.376	18	2460.672	00	2405.376	18	2442.240
01	2408.448	19	2463.744	01	2407.424	19	2444.288
02	2411.520	20	2466.816	02	2409.472	20	2446.336
03	2414.592	21	2469.888	03	2411.520	21	2448.384
04	2417.664	22	2472.960	04	2413.568	22	2450.432
05	2420.736			05	2415.616	23	2452.480
06	2423.808			06	2417.664	24	2454.528
07	2462.880			07	2419.712	25	2456.576
08	2429.952			08	2421.760	26	2458.624
09	2433.024			09	2423.808	27	2460.672
10	2436.096			10	2425.856	28	2462.720
11	2439.168			11	2427.904	29	2464.768
12	2442.240			12	2429.952	30	2466.816
13	2445.312			13	2432.000	31	2468.864
14	2448.384			14	2434.048	32	2470.912
15	2451.456			15	2436.096	33	2472.960
16	2454.528			16	2438.144	34	2475.008
17	2457.600			17	2440.192	35	2477.056

3.6. Descriptions of Key Components

None

3.7. Test Configuration

Mode	Duty Cycle (x)	T (ms)	Duty Cycle Factor (dB)
FASSTest	1	N/A	0

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.

Mode	Duty Cycle (x)
FASSTest	

Item	Mode	Test Channel
Radiated Test Case	Radiated Band Edge ^{Note1}	FASSTest
	Radiated Spurious Emission ^{Note1}	FASSTest
Conducted Test Case	Peak Output Power ^{Note2}	FASSTest

Note 1: ☒ Mobile Device

☐ Portable Device, and 3 axis were assessed. The worst scenario for Radiated Spurious Emission as follow: ☐ Lie ☐ Side ☐ Stand

Note 2: Due to used different Antenna Type So this test item would be test.

Note 3: The worse Ant A was tested on this test item.

3.8. Tested Supporting System List

3.8.1. Support Peripheral Unit

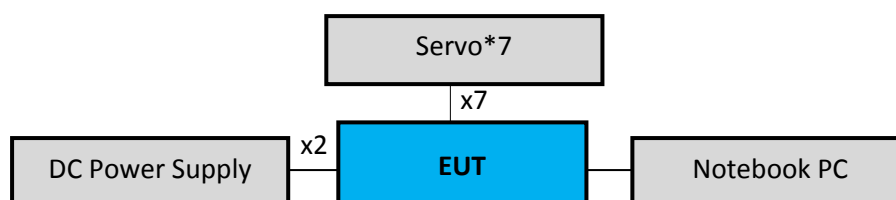
No.	Product	Brand	Model No.	Serial No.	Approval
1.	DC Power Supply	TOP WARD	6303A	N/A	N/A
2.	Notebook PC	hp	TPN-Q189	5CD8175992	Contains FCC ID: PD93168NG Contains IC: 1000M-3168NG
3.	Servo*7	Futaba	S3003	N/A	N/A

3.8.2. Cable Lists

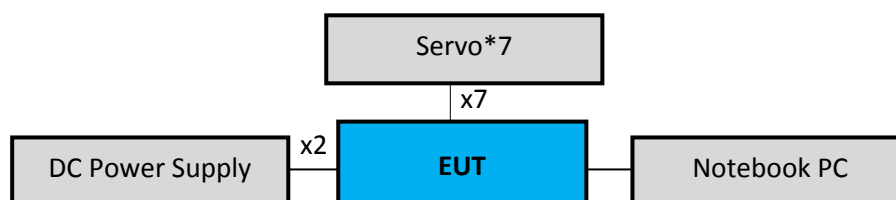
No.	Cable Description Of The Above Support Units
1.	DC Power Cord*2: Unshielded, Detachable, 0.7m AC Power Cord: Unshielded, Undetectable, 1.8m
2.	USB Jig Cable: Unshielded, Detachable, 0.5m Adapter: hp, M/N: PPP-012C-S DC Cord: Shielded, Undetachable, 1.8m,Bonded a ferrite core AC Power Cord: Unshielded, Detachable, 1.0m
3.	Power Wire: Unshielded, Undetectable, 0.20m*7

3.9. Setup Configuration

3.9.1. EUT Configuration for Radiated Emission



3.9.2. EUT Configuration for RF Conducted Test Items



3.10.Operating Condition of EUT

Test program “Futaba Term” is used for enabling EUT RF function under continue transmitting and choosing channel.

3.11. 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: attemc_report@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
Test Facilities	FCC OET Designation Number under APEC MRA by NCC is : TW1724 Semi-Anechoic Chamber (IC Test Site Registration No.:5183B-1)

3.12. Measurement Uncertainty

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

Remark : Uncertainty = $ku_c(y)$

Test Item	Uncertainty
6dB Bandwidth	$\pm 0.05\text{kHz}$
Maximum peak output power	$\pm 0.33\text{dB}$
Power spectral density	$\pm 0.13\text{dB}$
Conducted Emission Limitations	$\pm 0.13\text{dB}$

4. MEASUREMENT EQUIPMENT LIST

4.1. Radiated Emission Measurement

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Spectrum Analyzer	Agilent	N9010A-526	MY53400071	2018.09.12	1 Year
2.	Test Receiver	R & S	ESCS30	100338	2018.06.20	1 Year
3.	Amplifier	HP	8447D	2944A06305	2019.01.30	1 Year
4.	Amplifier	Agilent	8449B	3008A02676	2019.01.29	1 Year
5.	Loop Antenna	R&S	HFH2-Z2	891847/27	2017.12.18	2 Years
6.	Bilog Antenna	CHASE	CBL6112D	33821	2019.01.19	1 Year
7.	Horn Antenna	EMCO	3116	2653	2018.12.05	1 Year
8.	Horn Antenna	ETS-Lindgren	3115	00114104	2019.04.03	1 Year
9.	Notch Filter	K&L	7NSL10-2441.5/E130.5-O/O	1	2018.07.24	1 Year
10.	High-Pass Filter	Microwave	H3G018G1	484796	2018.08.22	1 Year
11.	Digital Thermo-Hygro Meter	iMax	HTC-1	No.1 3m A/C	2019.04.20	1 Year
12.	Signal Cable	MIYAZAKI	5D2W	RE-11	2019.02.01	1 Year
13.	Test Software	Audix	e3	V6.120619c	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	Keysight	N9020B-544	MY57120357	2019. 01. 17	1 Year
2.	Digital Thermo-Hygro Meter	Shenzhen Datronn Electronics	KT-905	RF	2019. 04. 20	1 Year



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5. CONDUCTED EMISSION

【The EUT only employs battery power for operation, no conductive emission limits are required according to FCC Part 15 Section §15.207 and RSS-Gen §8.8】

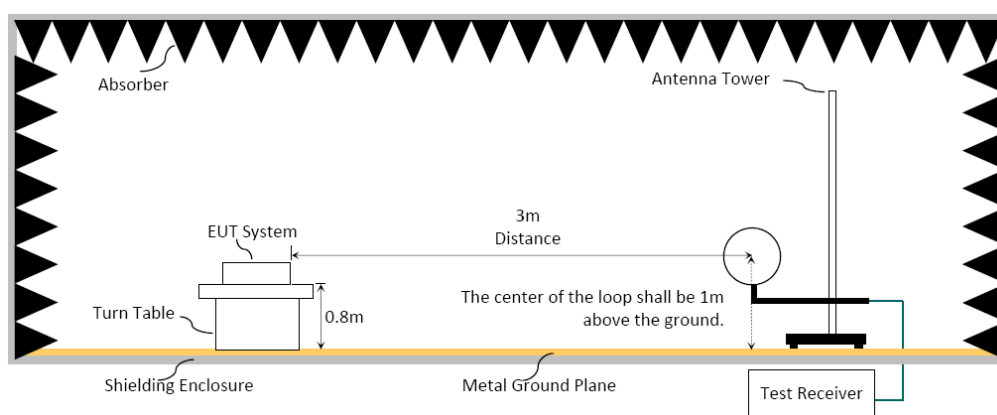
6. RADIATED EMISSION

6.1. Block Diagram of Test Setup

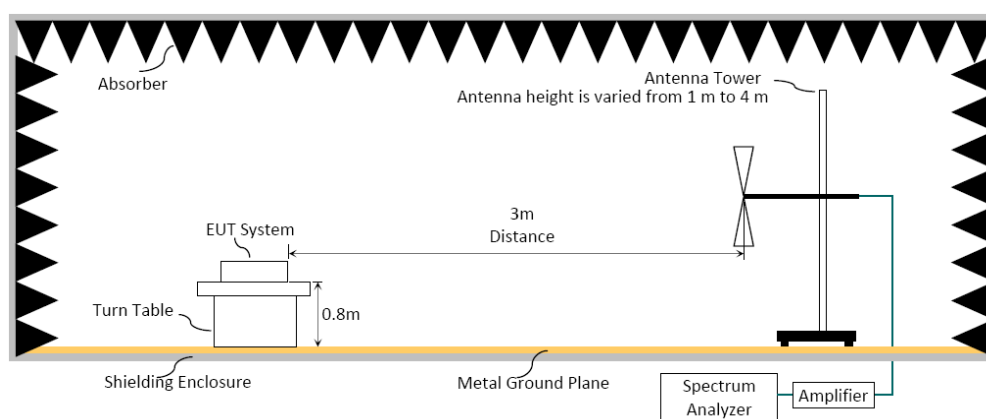
6.1.1. Block Diagram of EUT

Indicated as section 3.9

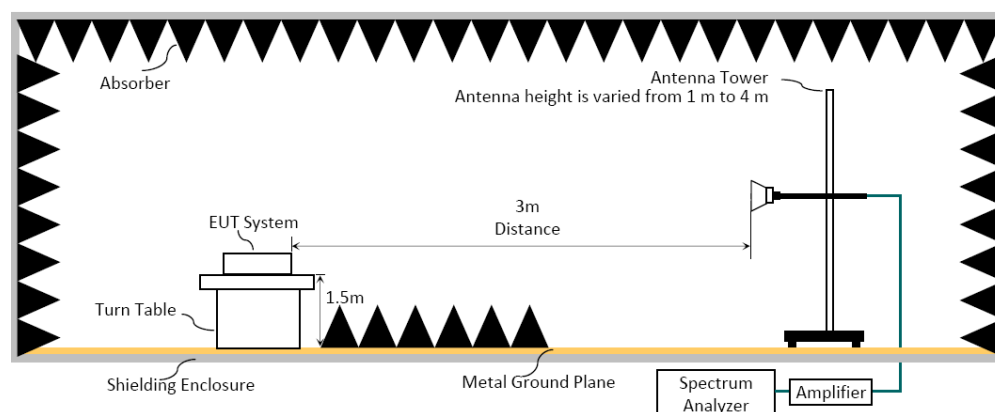
6.1.2. Setup Diagram for 9kHz-30MHz



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	67.6-20 log f(kHz)	2400/f kHz
0.490 - 1.705	30	87.6-20 log f(kHz)	24000/f kHz
1.705 - 30	30	29.5	30
30 - 88	3	40.0	100
88- 216	3	43.5	150
216- 960	3	46.0	200
Above 960	3	54.0	500
Above 1000	3	74.0 dB μ V/m (Peak) 54.0 dB μ V/m (Average)	

Remark : (1) dB μ V/m = 20 log (μ V/m)

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

6.3. Test Procedure

Frequency Range 9kHz~30MHz:

The EUT setup on the turn table which has 0.8 m height to the ground. The turn table rotated 360 degrees and antenna fixed to 1 m to find the maximum emission level. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10-2013 regulation.

- (1) RBW = 9kHz with peak and average detector.
- (2) Detector: average and peak (9kHz-490kHz)
Q.P. (490kHz-30MHz)

Frequency Range 30MHz ~ 25GHz:

The EUT setup on the turn 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 final 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 final 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	10Hz

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:

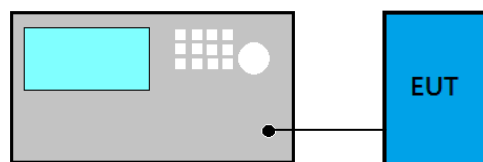
Average Emission Level= Peak Emission Level+ D.C.C.F.

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. MAXIMUM PEAK OUTPUT POWER

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 v05:

☐ **PKPM1 Peak power meter method:**

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

☒ **Maximum peak conducted output power method:**

- (1) Set the RBW $\geq$ DTS bandwidth
- (2) Set VBW $\geq 3 \times$ RBW
- (3) Set span $\geq 3 \times$ 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 3.7 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 3.7 is $< 98\%$.



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7.4. Test Results

Please refer to Appendix A



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8. DEVIATION TO TEST SPECIFICATIONS

【NONE】



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APPDNDIX A

TEST DATA AND PLOTS

(Model: R7108SB)

TABLE OF CONTENTS

A.1 RADIATED EMISSION	2
A.1.1 Emissions within Restricted Frequency Bands.....	2
A.1.2 Emissions outside the frequency band:.....	7
A.1.3 Emissions in Non-restricted Frequency Bands:.....	8
A.2 MAXIMUM PEAK OUTPUT POWER	9
A.2.1 Peak Output Power	9
A.2.2 Measurement Plots	10

A.1 RADIATED EMISSION

Test Date	2019/05/24	Temp./Hum.	23°C/53%
Test Voltage	DC 6V (Via Power Supply)		

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	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
30.97	25.03	1.21	1.49	27.73	40.00	12.27	Peak
199.75	16.27	3.42	12.59	32.28	43.50	11.22	Peak
330.70	20.60	4.92	7.46	32.98	46.00	13.02	Peak
417.03	22.65	6.03	6.26	34.94	46.00	11.06	Peak
710.94	25.58	7.42	4.08	37.08	46.00	8.92	Peak
967.99	27.84	8.86	2.14	38.84	54.00	15.16	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	25.72	1.19	3.89	30.80	40.00	9.20	Peak
167.74	16.05	3.10	15.22	34.37	43.50	9.13	Peak
443.22	23.00	6.27	3.39	32.66	46.00	13.34	Peak
664.38	25.21	7.20	2.62	35.03	46.00	10.97	Peak
856.44	26.97	8.22	2.27	37.46	46.00	8.54	Peak
972.84	27.87	8.89	2.09	38.85	54.00	15.15	Peak

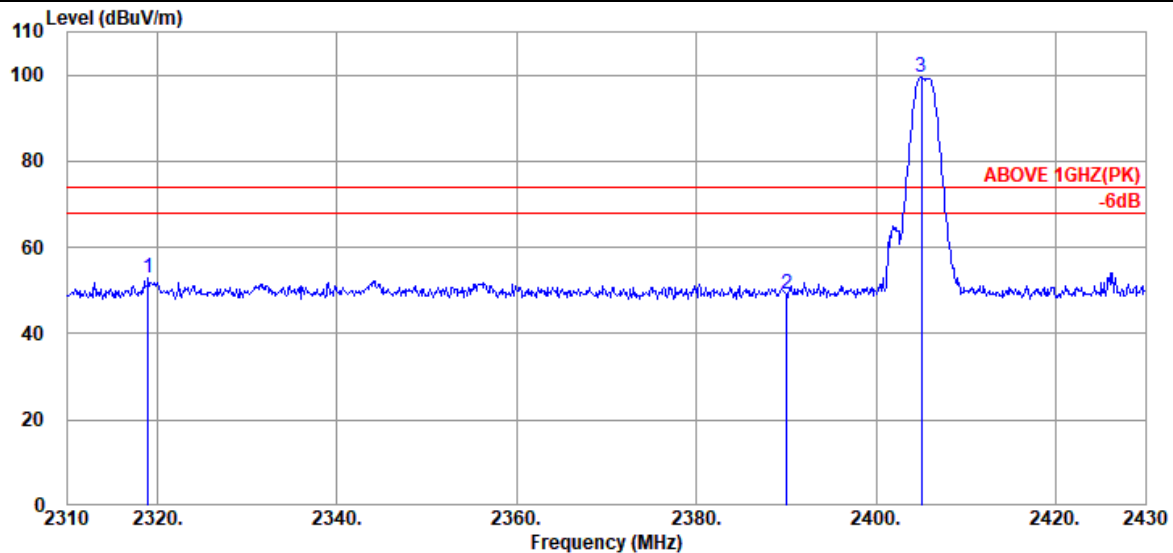
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A.2.1.3 Frequency Above 1 GHz to 10th harmonics

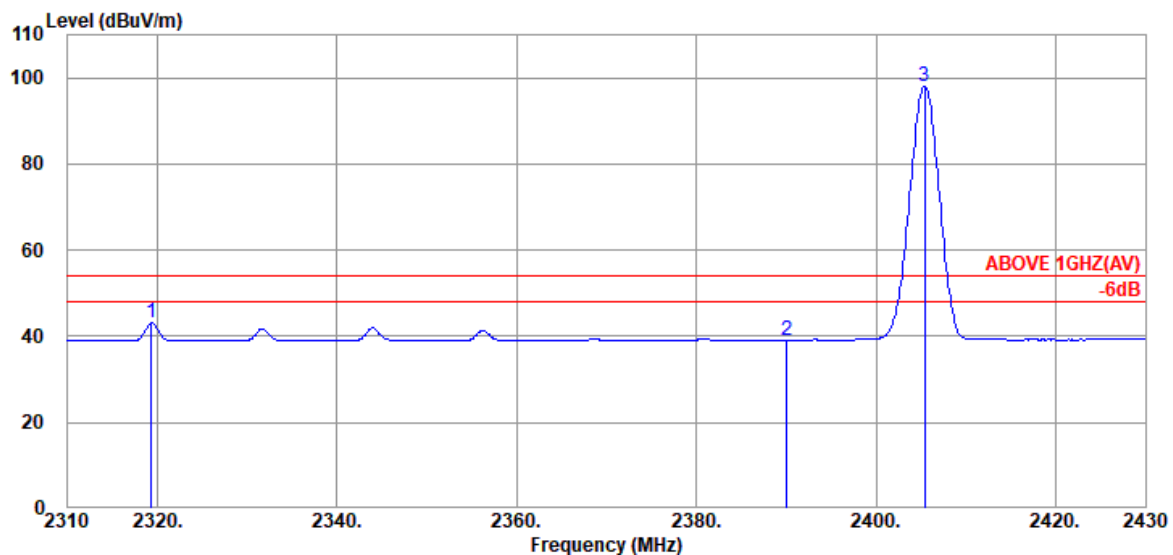
Band Edge:

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
2319.00	28.20	5.94	18.64	52.78	74.00	21.22	Peak
2390.04	28.28	6.03	14.72	49.03	74.00	24.97	Peak
@ 2405.04	28.30	6.04	64.97	99.31	---	---	Peak



Antenna at Horizontal Polarization

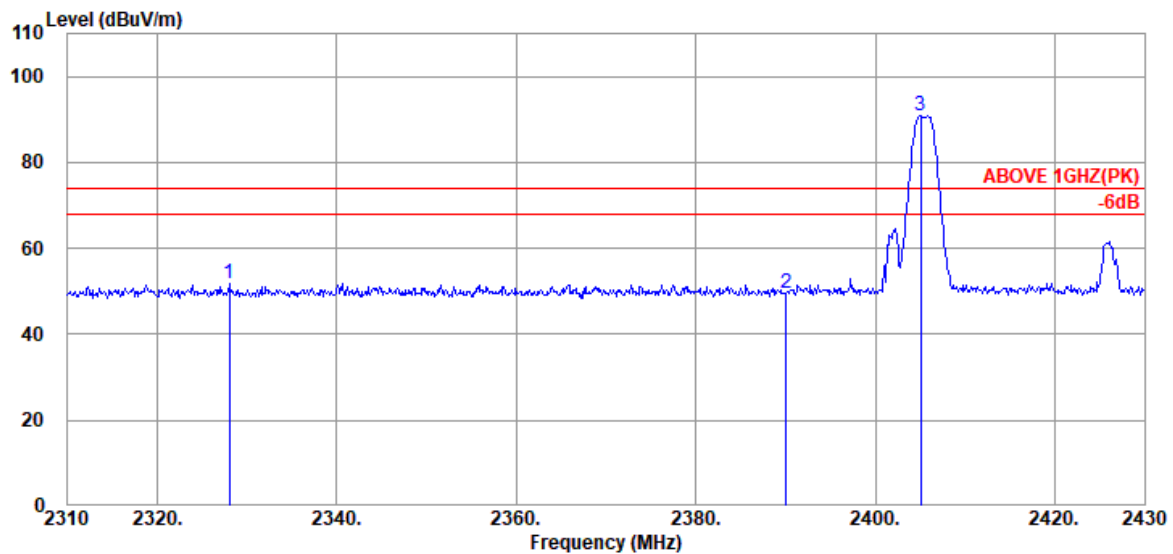
Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2319.36	28.20	5.94	8.96	43.10	54.00	10.90	Average
2390.04	28.28	6.03	4.81	39.12	54.00	14.88	Average
@ 2405.40	28.30	6.04	63.70	98.04	---	---	Average

Remark: The "@" means fundamental frequency, it is ignored in this section.

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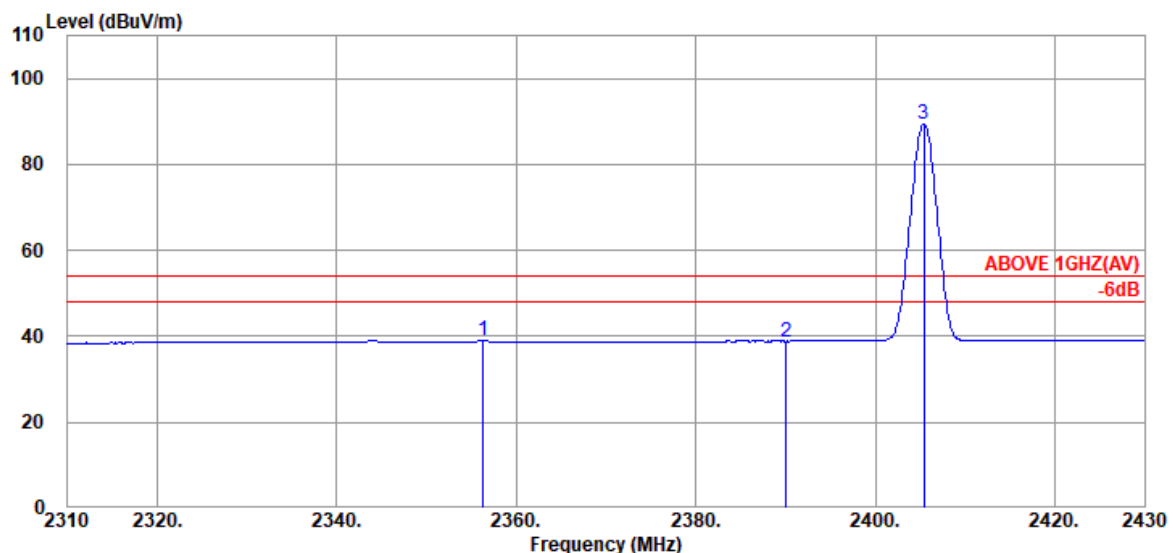
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Mode	FASSTest	Frequency	TX 2405.376MHz
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Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2328.00	28.21	5.95	17.63	51.79	74.00	22.21	Peak
2390.04	28.28	6.03	15.21	49.52	74.00	24.48	Peak
@ 2405.04	28.30	6.04	56.46	90.80	---	---	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
2356.32	28.24	5.99	4.76	38.99	54.00	15.01	Average
2390.04	28.28	6.03	4.52	38.83	54.00	15.17	Average
@ 2405.40	28.30	6.04	55.09	89.43	---	---	Average

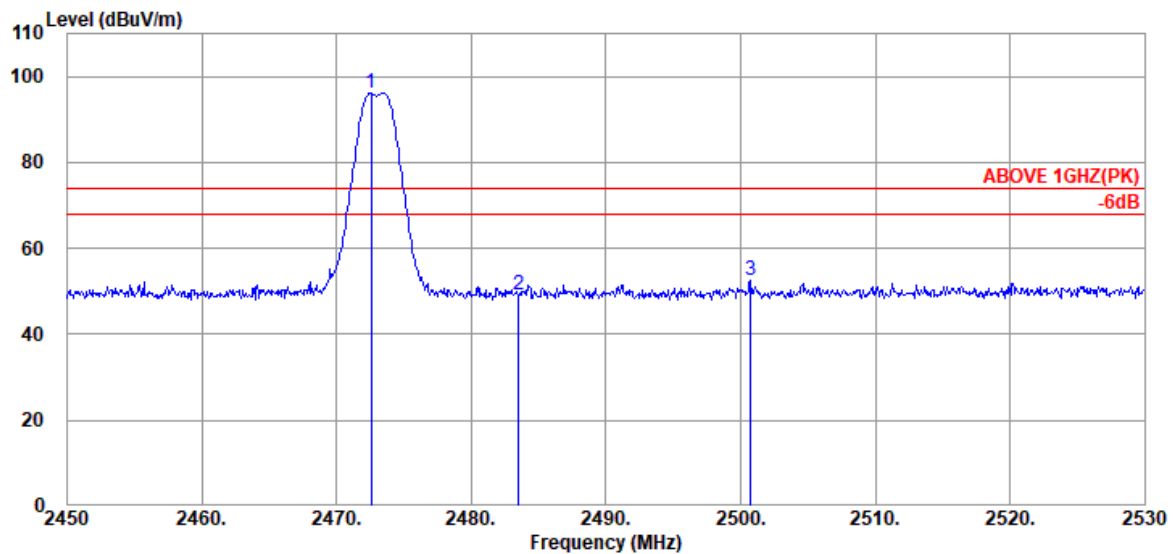
Remark: The "@" means fundamental frequency, it is ignored in this section.

File Number: C1M1904234

Report Number: EM-F190185

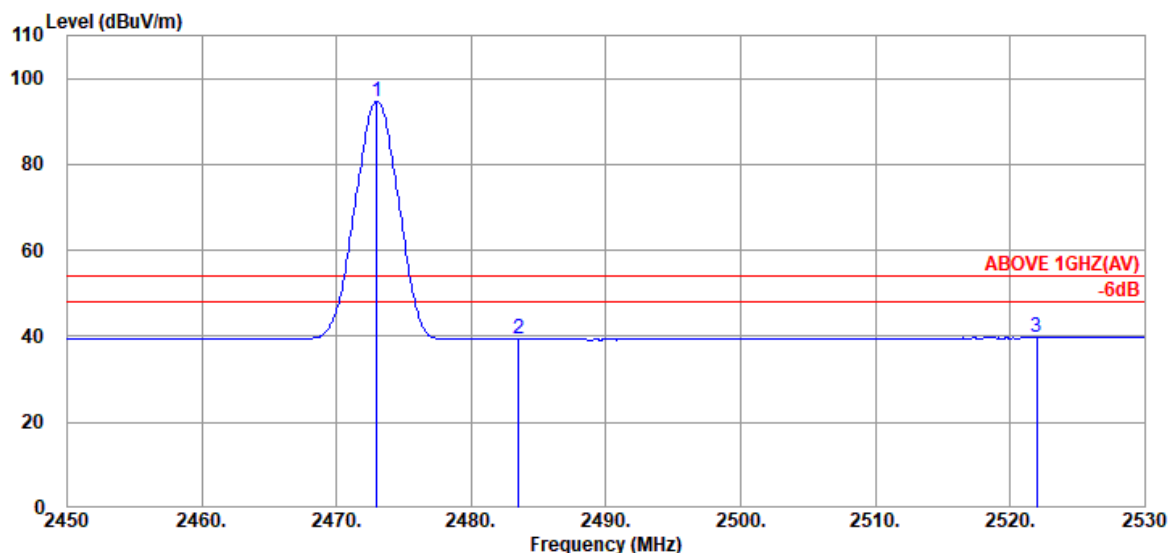
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Mode	FASSTest	Frequency	TX 2472.96MHz
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Antenna at Horizontal Polarization

	Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
@	2472.56	28.37	6.12	61.55	96.04	---	---	Peak
	2483.52	28.38	6.13	14.65	49.16	74.00	24.84	Peak
	2500.72	28.40	6.15	17.86	52.41	74.00	21.59	Peak



Antenna at Horizontal Polarization

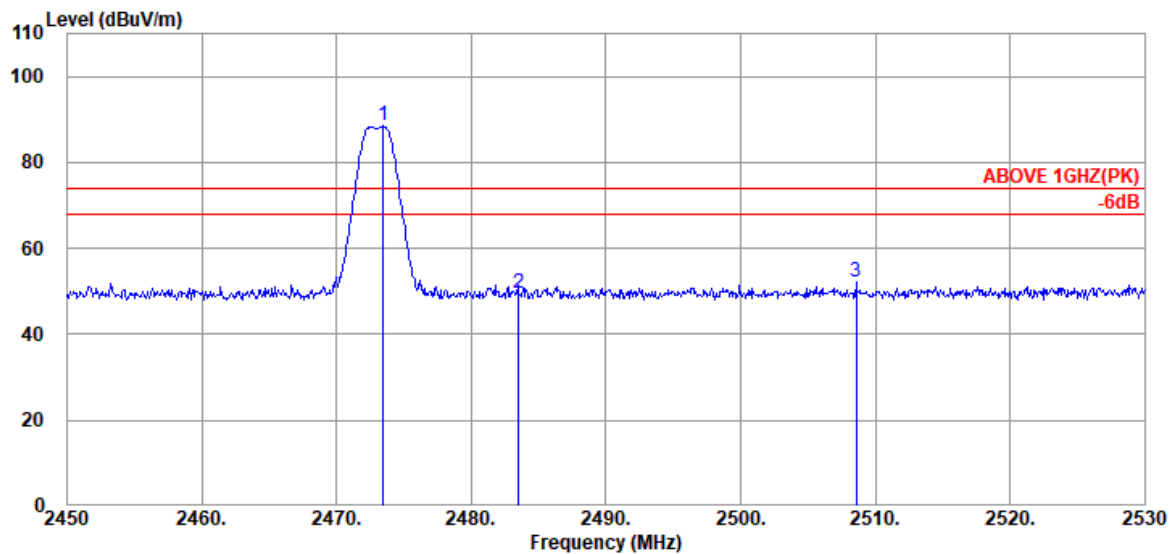
	Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
@	2472.96	28.37	6.12	60.03	94.52	---	---	Average
	2483.52	28.38	6.13	4.79	39.30	54.00	14.70	Average
	2522.00	28.48	6.18	5.22	39.88	54.00	14.12	Average

Remark: The "@" means fundamental frequency, it is ignored in this section.

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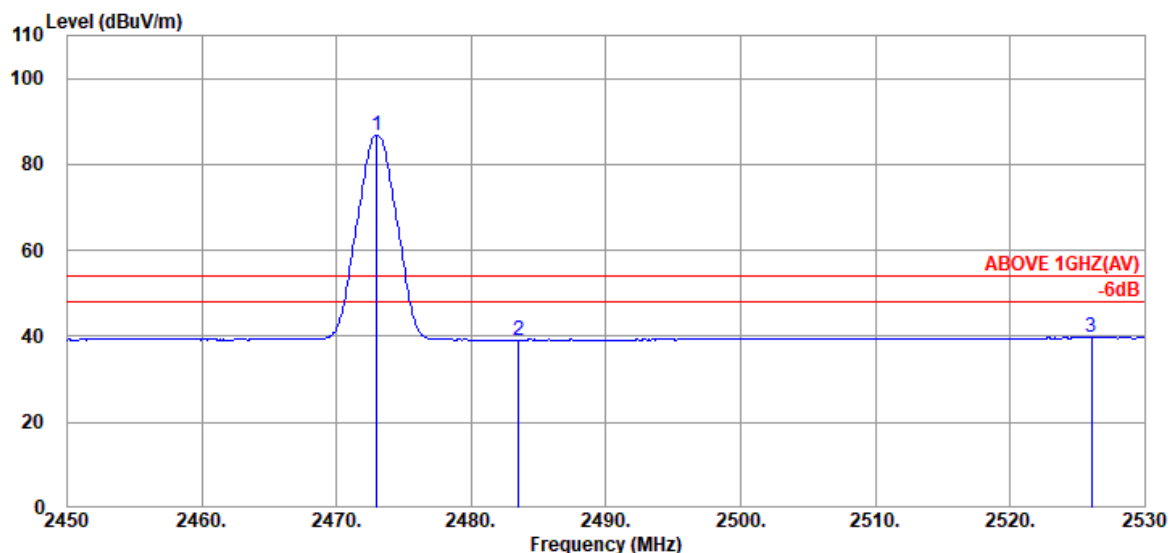
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Mode	FASSTest	Frequency	TX 2472.96MHz
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Antenna at Vertical Polarization

	Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
@	2473.44	28.37	6.12	53.94	88.43	---	---	Peak
	2483.52	28.38	6.13	15.09	49.60	74.00	24.40	Peak
	2508.56	28.43	6.16	17.59	52.18	74.00	21.82	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	28.37	6.12	52.36	86.85	---	---	Average
	2483.52	28.38	6.13	4.69	39.20	54.00	14.80	Average
	2526.08	28.51	6.18	5.03	39.72	54.00	14.28	Average

Remark: The "@" means fundamental frequency, it is ignored in this section.

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Report Number: EM-F190185

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A.1.2 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
3208.00	30.49	6.93	12.90	50.32	54.00	3.68	Peak
4810.00	32.82	8.44	3.49	44.75	54.00	9.25	Average
4810.00	32.82	8.44	9.32	50.58	74.00	23.42	Peak
7214.00	35.80	9.44	4.60	49.84	54.00	4.16	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
3206.00	30.49	6.93	13.43	50.85	54.00	3.15	Peak
4810.00	32.82	8.44	12.31	53.57	54.00	0.43	Average
4810.00	32.82	8.44	18.39	59.65	74.00	14.35	Peak
7214.00	35.80	9.44	5.89	51.13	54.00	2.87	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
4880.00	32.96	8.52	2.49	43.97	54.00	10.03	Average
4880.00	32.96	8.52	9.08	50.56	74.00	23.44	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
4880.00	32.96	8.52	10.08	51.56	54.00	2.44	Average
4880.00	32.96	8.52	17.19	58.67	74.00	15.33	Peak

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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 (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
4946.00	33.09	8.58	3.21	44.88	54.00	9.12	Average
4946.00	33.09	8.58	10.82	52.49	74.00	21.51	Peak
7418.00	36.28	9.75	5.71	51.74	54.00	2.26	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
4946.00	33.09	8.58	9.94	51.61	54.00	2.39	Average
4946.00	33.09	8.58	17.55	59.22	74.00	14.78	Peak
7415.00	36.28	9.75	5.77	51.80	54.00	2.20	Peak

A.1.3 Emissions in Non-restricted Frequency Bands:

Pursuant to KDB 558074 D01 DTS Meas Guidance v05 that emission levels below the FCC 15.209(a)/RSS-Gen Section 8.9 table 4 general radiated emissions limits is not required.

A.2 MAXIMUM PEAK OUTPUT POWER

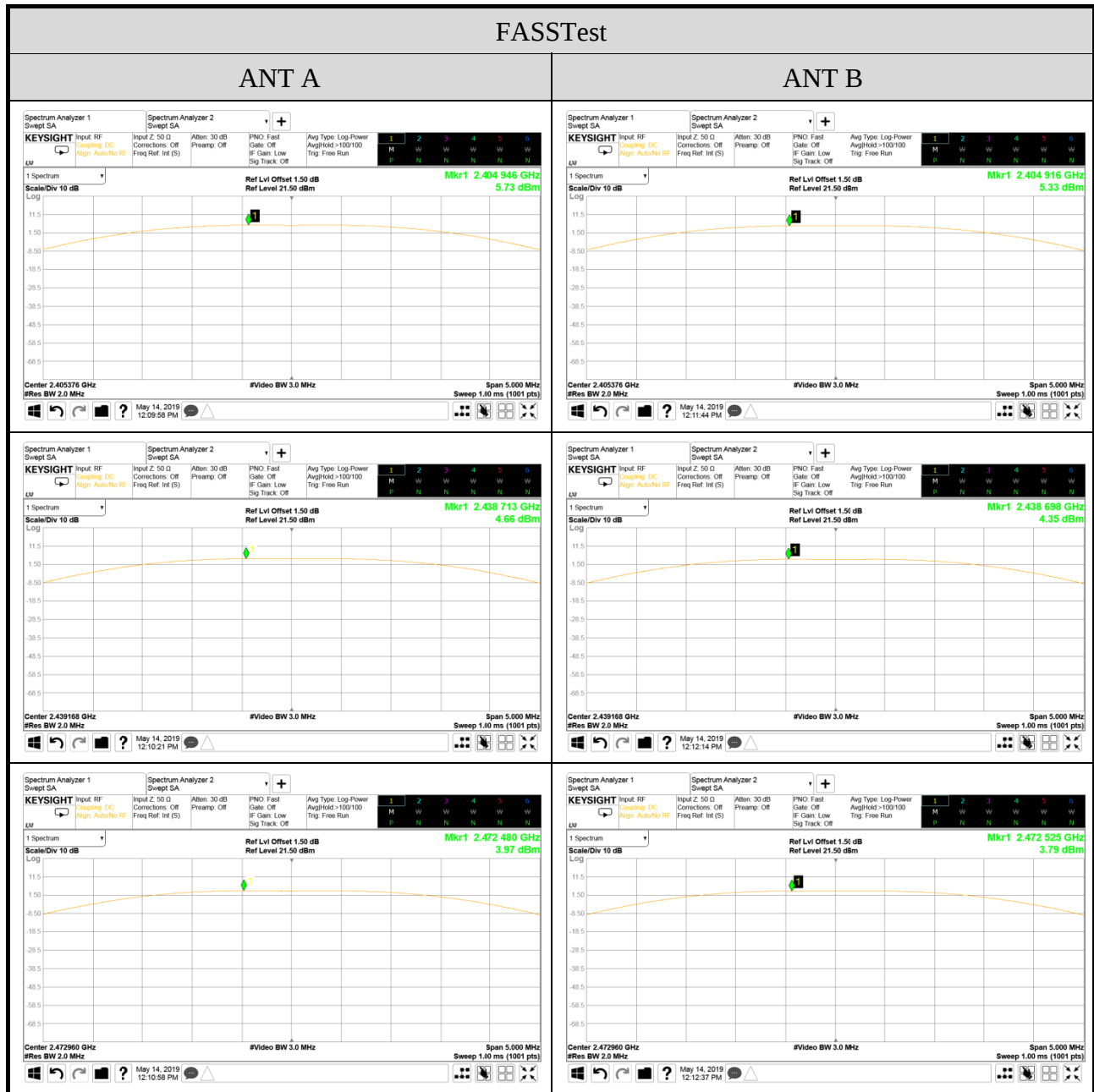
Test Date	2019/05/24	Temp./Hum.	23°C/53%
Cable Loss	0.50dB	Test Voltage	DC 6V (Via Power Supply)

A.2.1 Peak Output Power

Mode	Centre Frequency (MHz)	Peak Output Power (dBm)		Max. Peak Output Power		Antenna Gain (dBi)	Output Power (E.I.R.P.)		Limit
		ANT A	ANT B	(dBm)	(W)		(dBm)	(W)	
FASSTest	2405.376	5.73	5.33	5.73	0.0037	2.10	7.83	0.0061	< 30dBm (1W) (Maximum Peak Output Power) < 36dBm (4W) (E.I.R.P)
	2439.168	4.66	4.35	4.66	0.0029		6.76	0.0047	
	2472.960	3.97	3.79	3.97	0.0025		6.07	0.0040	

Note: The results have been included cable loss.

A.2.2 Measurement Plots





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APPENDIX B

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APPENDIX B

TEST PHOTOGRAPHS

(Model: R7108SB)