



JAPAN RADIO TEST REPORT

Bluetooth

Product Name : Car Tablet
Model Name : AVIC-BX500, AVIC-BX500II, AVIC-BX500III, AVIC-BX500IV
Applicant : MiTAC Digital Technology Corporation
4F., NO.1, R&D ROAD 2, HSINCHU SCIENCE PARK,
HSINCHU 30076, TAIWAN, R.O.C.
Manufacturer : MITAC Computer (Kunshan) Co., Ltd.
No. 269, 2nd Avenue, District A, Comprehensive Free Trade
Zone, 215300 Kunshan City, Jiangsu, Province, China
Type Emissions : 78M4F1D(BR);
78M7G1D(EDR);
19M6F1D(BR_AFH);
20M0G1D(EDR_AFH);
Declaration Output Power : 0.020 mW/MHz (BR);
0.020 mW/MHz (EDR);
0.080 mW/MHz (BR_AFH);
0.080 mW/MHz (EDR_AFH);
Standard : Article 49-20 and the relevant articles of the Ordinance
Regulating Radio Equipment
Test Procedure : MIC Notice No.88 Appendix No.43

The product sample was received on Jun. 24, 2022 and testing was performed from Jul. 01, 2022 to Jul. 01, 2022. We, Sporton International Inc. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in MIC Notice No.88 Appendix No.43 and shown to be compliant with the applicable technical standards. Article 2 Paragraph 1 Item 19 of the Certificate Ordinance of the Radio Law indicates the classification of the specified radio equipment.

The test results in this variant report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Louis Wu

Approved by: Louis Wu

Sporton International Inc. EMC & Wireless Communications Laboratory
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)



Table of Contents

History of This Test Report.....	3
Summary of Test Result.....	4
1 General Description.....	5
1.1 Feature of Equipment Under Test	5
1.2 Modification of EUT	6
1.3 Testing Site.....	7
1.4 Applied Standards	7
1.5 Ancillary Equipment List	7
2 Test Configuration of Equipment Under Test.....	8
2.1 Carrier Frequency Channel	8
2.2 EUT Operation Test Setup	8
3 Test Result.....	9
3.1 Frequency Tolerance Measurement.....	9
3.2 Occupied Bandwidth and Spread-spectrum Bandwidth / Spread Factor Measurement.....	11
3.3 Unwanted Emission Intensity Measurement	12
3.4 RF Output Power / Tolerance	14
3.5 Limitation of Collateral Emission of Receiver Measurement.....	17
3.6 Transmission Antenna Gain (EIRP Antenna Power) Measurement	18
3.7 Transmission Radiation Angle Width (3dB Beam-width) Measurement	20
3.8 Radio Interference Prevention Capability Measurement.....	22
3.9 Hopping Frequency Dwell Time Measurement	23
3.10 Construction Protection Confirmation Method.....	24
4 List of Measuring Equipment	25
Appendix A. Setup Photographs	
Appendix B. Test Results	
Appendix C. Test Plots	
Appendix D. Original Reports	



History of This Test Report

Report No.	Version	Description	Issued Date
JR690725-05A	01	Initial issue of report	Jul. 13, 2022
JR690725-05A	02	Revise Model Name	Jul. 22, 2022

Summary of Test Result

Report Clause	Test Items	Result (PASS/FAIL)
3.1	Frequency Tolerance	Pass
3.2	Occupied Bandwidth and Spread-spectrum Bandwidth / Spread Factor	Pass
3.3	Unwanted Emission Intensity	Pass
3.4	RF Output Power / Tolerance	Pass
3.5	Limitation of Collateral Emission of Receiver	Pass
3.6	Transmission Antenna Gain (EIRP Antenna Power)	NA
3.7	Transmission Radiation Angle Width (3dB Beam width)	NA
3.8	Radio Interference Prevention Capability	Pass
3.9	Hopping Frequency Dwell Time	Pass
3.10	Construction Protection Confirmation	Pass

Note: This is a variant report which can be referred Product Equality Declaration. All the test cases were performed on original report which can be referred to Sporton Report Number JR690725-03 as appendix D. Based on the original report, the test cases were verified.

Declaration of Conformity:

- The test results (PASS/FAIL) with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers. It's means measurement values may risk exceeding the limit of regulation standards, if measurement uncertainty is include in test results.
- The measurement uncertainty please refer to this report "Testing Site".

Comments and Explanations:

The product specifications of the EUT presented in the report are declared by the manufacturer who shall take full responsibility for the authenticity.

Reviewed by: Dara Chiu

Report Producer: Vivian Hsu

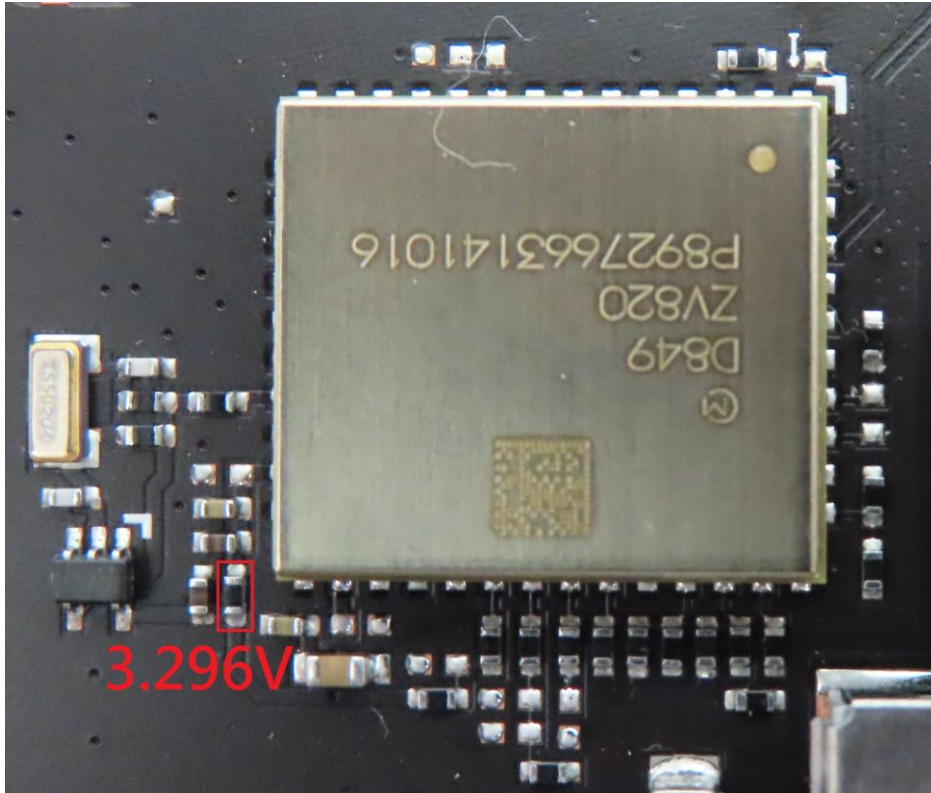
1 General Description

1.1 Feature of Equipment Under Test

Product Feature & Specification		
Product Name	Car Tablet	
Model Name	AVIC-BX500, AVIC-BX500II, AVIC-BX500III, AVIC-BX500IV	
Support Category / Frequency Range	Article 2-1-19 / 2400MHz ~ 2483.5MHz	
Type of Modulation	☐ Direct Spreading (DS) ☐ Orthogonal frequency-division multiplexing (OFDM) ☒ Frequency Hopping (FH) ☐ Other :GFSK	
Number of Channels	BR/EDR Mode	79
	AFH Mode	20
Channel Spacing	BR/EDR/AFH Mode	1MHz
Declaration RF Output Power	0.020 mW/MHz (BR) ; 0.020 mW/MHz (EDR) ; 0.080 mW/MHz (BR_AFH) ; 0.080 mW/MHz (EDR_AFH) ;	
Antenna Power (E.I.R.P)	-16.570 dBm/MHz (BR) -16.570 dBm/MHz (EDR) -10.549 dBm/MHz (BR_AFH) -10.549 dBm/MHz (EDR_AFH)	
Modulation	☒ GFSK ☒ $\pi/4$ -DQPSK ☒ 8-DPSK ☐ Other : FSK	
Power Source ^{NOTE}	☐ Commercial power	AC 100 ~ 240 V
	☒ External Power Source	DC 14.4 V
	☐ Lithium battery	DC 3.7 V
	☐ UM battery	DC 1.2V

Note:

1. When EUT be operated at $\pm 10\%$ from the normal supply voltage, the supply voltage of RF part was varied within $\pm 1\%$. All test cases were done under the normal supply voltage.
2. The AC charger as a supported unit is used during testing.

Power Supply voltage 14.400 Vdc (Nominal)	Power Supply voltage 15.840 Vdc (+10%)	Power Supply voltage 12.960Vdc (-10%)
3.296	3.296	3.296
Measurement point		
		

Antenna Information		
Main Antenna	Antenna Type : PIFA	Antenna Gain : 0.42 dBi

Remark: The above EUT's information was declared by manufacturer. Please refer to Comments and Explanations in report summary.

1.2 Modification of EUT

No modifications are made to the EUT during all test items.

1.3 Testing Site

Test Site	Sporton International Inc. EMC & Wireless Communications Laboratory
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.) TEL: +886-3-3273456 / FAX: +886-3-3284978
Test Site No.	Sporton Site No.: TH02-HY

Test Items	Uncertainty	Remark
Occupied Channel Bandwidth	$\pm 3.27\%$	Confidence 95%
RF output power, conducted	± 0.55 dB	Confidence 95%
Frequency Tolerance	± 5.3 Hz	Confidence 95%
Unwanted Emission	± 1.38 dB	Confidence 95%
Temperature	± 0.8 °C	Confidence 95%
Humidity	± 3 %	Confidence 95%

1.4 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- Article 49-20 and the relevant articles of the Ordinance Regulating Radio Equipment

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. The measurement was implemented in accordance with MIC Notice No. 88 Appendix No. 43.

1.5 Ancillary Equipment List

None.

2 Test Configuration of Equipment Under Test

2.1 Carrier Frequency Channel

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	27	2429	54	2456
1	2403	28	2430	55	2457
2	2404	29	2431	56	2458
3	2405	30	2432	57	2459
4	2406	31	2433	58	2460
5	2407	32	2434	59	2461
6	2408	33	2435	60	2462
7	2409	34	2436	61	2463
8	2410	35	2437	62	2464
9	2411	36	2438	63	2465
10	2412	37	2439	64	2466
11	2413	38	2440	65	2467
12	2414	39	2441	66	2468
13	2415	40	2442	67	2469
14	2416	41	2443	68	2470
15	2417	42	2444	69	2471
16	2418	43	2445	70	2472
17	2419	44	2446	71	2473
18	2420	45	2447	72	2474
19	2421	46	2448	73	2475
20	2422	47	2449	74	2476
21	2423	48	2450	75	2477
22	2424	49	2451	76	2478
23	2425	50	2452	77	2479
24	2426	51	2453	78	2480
25	2427	52	2454	-	-
26	2428	53	2455	-	-

2.2 EUT Operation Test Setup

The equipment under test (EUT) was linked with Bluetooth simulator or operated by commands in order to make the EUT into the engineering modes for transmitting, receiving signals continuously, and hopping mode.

3 Test Result

3.1 Frequency Tolerance Measurement

3.1.1 Limit

Item	Limits
Frequency Tolerance	$\leq \pm 50\text{ppm}$

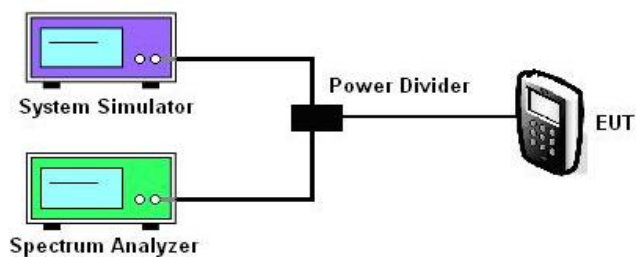
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedure

1. Frequency accuracy of instrument shall be less than 10% of limits tolerance (5ppm).
2. Three testing methods
 - a. Measure frequency tolerance by the system simulator.
 - b. CW Tone method
 - i. Setting of SA is following as: RBW:1kHz / VBW:30kHz.
 - ii. Maker Max. level to get measuring frequency f.
 - c. 10dB down method
 - i. Setting of SA is following as: RBW:30kHz / VBW: 30kHz / Trace: MaxHold
 - ii. Display line Level = Max. level – 10dB to place two markers, highest(fH) and lowest(fL) frequency
 - iii. Determine measuring frequency $f = (fH - fL)/2$
3. The frequency tolerance test case is directly measured using the frequency accuracy function of Bluetooth tester or spectrum analyzer. Then the frequency error formula is $(f - f_c)/f_c \times 10^6 \text{ ppm}$ and the limit is less than $\pm 50\text{ppm}$.

3.1.4 Test Setup



3.1.5 Test Result of Frequency Tolerance

Please refer to Appendix B.

3.2 Occupied Bandwidth and Spread-spectrum Bandwidth / Spread Factor Measurement

3.2.1 Limit

Item	Limits
Occupied Band Width	$\leq 83.5\text{MHz}$ (FH)
	$\leq 26\text{MHz}$ (OFDM, DS and Others)
Spreading Bandwidth	$\geq 500\text{ kHz}$ (FH, DS)

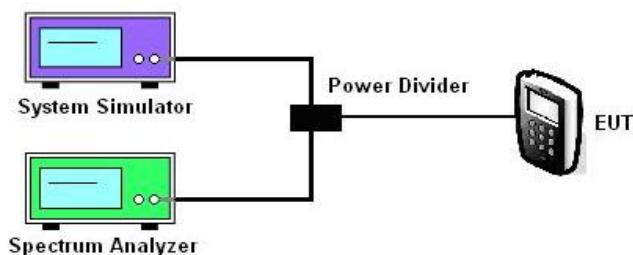
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. Setting of SA is following as: RBW $\leq 3\%$ of bandwidth / VBW = RBW / Sweep Mode: Continuous sweep / Detect mode: Positive peak / Trace mode: Max hold.
2. EUT have transmitted each modulation signal and fixed channelize (For DSSS or OFDM Device) or continuous maximum power of hopping mode (For FHSS Device). SA set to 99% of occupied bandwidth to measure occupied bandwidth. The limit is less than 26MHz (For DSSS or OFDM Device) or 83.5MHz (For FHSS Device).
3. SA set to 90% of occupied bandwidth to measure Spread Spectrum Bandwidth and must greater than 500kHz.
4. Spread Spectrum Factor = Spread Spectrum Bandwidth / modulation rate of EUT.
5. Spread Spectrum Factor limit is greater than 5.

3.2.4 Test Setup



3.2.5 Test Result of Occupied Bandwidth and Spread-spectrum Bandwidth / Spread Factor Measurement

Please refer to Appendix B.

3.3 Unwanted Emission Intensity Measurement

3.3.1 Limit

Item	Limits
Tx Spurious Emission	$\leq 2.5 \mu\text{W}$ (2387MHz > f ; 2496.5MHz < f)
	$\leq 25 \mu\text{W}$ (2387MHz $\leq$ f < 2400MHz) and (2483.5MHz < f $\leq$ 2496.5MHz)

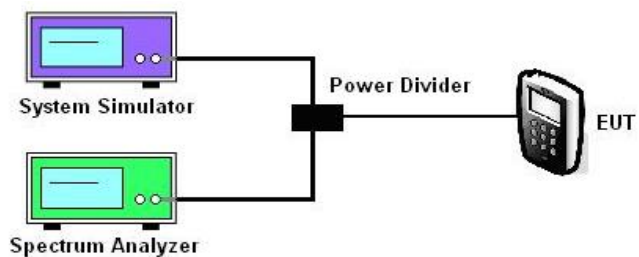
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

1. EUT have transmitted the maximum power and fixed channelize.
2. Setting of SA is following as: RBW:1MHz / VBW:1MHz above 1GHz, Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak / Trace mode: Max hold.
3. Setting of SA is following as: RBW:100KHz / VBW:100KHz under 1GHz, Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak / Trace mode: Max hold.
4. Setting of SA is following as 30MHz and stop frequency 2387MHz Then to mark peak reading value + cable loss shall be less than 2.5 μ W.
5. SA adjusted to start frequency 2387MHz and stop frequency 2400MHz. Then to mark peak reading value + cable loss shall be less than 25 μ W.
6. SA adjusted to start frequency 2483.5MHz and stop frequency 2496.5MHz Then to mark peak reading value + cable loss shall be less than 25 μ W.
7. SA adjusted to start frequency 2496.5MHz and stop frequency 12500MHz Then to mark peak reading value + cable loss shall be less than 2.5 μ W.
8. If the Result_Value is over the requirement, take total sum of 1MHz band centered at the spur frequency like ACLP measurement as Result_Value.

3.3.4 Test Setup



3.3.5 Test Result of Unwanted Emission Intensity

Please refer to Appendix B.

3.4 RF Output Power / Tolerance

3.4.1 Limit

Item	Limits
Antenna Power Density	$\leq 3\text{mW/MHz}$ (FH form 2400 ~ 2483.5MHz)
	$\leq 10\text{mW/MHz}$ (OFDM,DS from 2400 ~ 2483.5MHz)
	$\leq 10\text{mW}$ (Other from 2400 ~ 2483.5MHz)
Antenna Power Error	+20%, -80% (Base on manufacturer declare antenna power density)

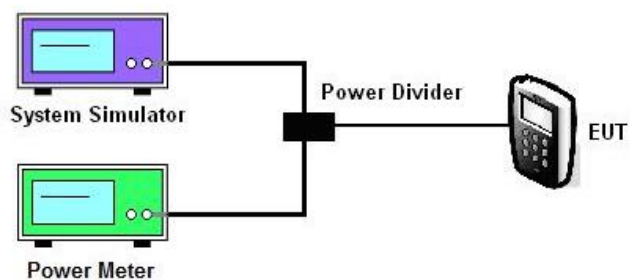
3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

3.4.3 Test Procedures

1. EUT have transmitted continuous maximum power on hopping mode (For FHSS Device).
2. Frequency hopping system or combined systems of direct spread and frequency hopping:
Test method 1:
 - i. Connect the high frequency power meter to the output of the attenuator and measure the total power (without bandwidth limitation)
 - ii. Divide the total power by the spread bandwidth to find the "average" power per MHz.
The average power per MHz is equal to the power meter value dBm + cable loss dB + $10 \log_{10} (1/\text{Duty Cycle})$ dB + $10 \log_{10} (1/\text{Spread Bandwidth})$ dB.
 - iii. Confirm that frequency distribution of the hopping frequencies is homogeneous according to the supporting data.
If frequency distribution of the frequencies is not homogeneous, consider other measurement or correction methods based on the supporting data.
 - iv. Set the antenna power as follows:
- Continuous waves: value in ii.
Test method 2:
 - i. Peak search by use setting of SA is following as:
Span = 2 time of occupied bandwidth
RBW = 1MHz / VBW = 3 time of RBW
Sweep Mode: Continuous sweep
Detect mode = Positive peak / Trace mode = Max hold.
Mark the peak value
 - ii. Measure maximum average power per MHz by use setting of SA is following as:
Center frequency = frequency of peak value
Span = 0Hz
RBW = 1MHz / VBW = RBW
Sweep Mode: Continuous sweep
Detect mode = Sample / Trace mode = Max hold.
Calculated the mean power value
3. Antenna RF Output Power Tolerance is definition that actual measure antenna power tolerance between + 20% to - 80% power range that manufacturer declare the conducted power density.

3.4.4 Test Setup



3.4.5 Test Result of RF Output Power / Tolerance

Please refer to Appendix B.

3.5 Limitation of Collateral Emission of Receiver Measurement

3.5.1 Limit

Item	Limits
Rx Spurious Emission	$\leq 4\text{nW}$ ($f < 1\text{GHz}$)
	$\leq 20\text{nW}$ ($1\text{GHz} \leq f$)

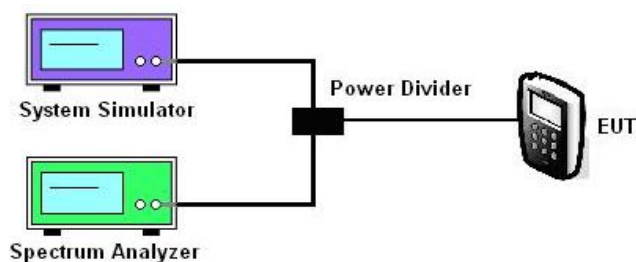
3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

3.5.3 Test Procedures

1. EUT have the continuous reception mode and fixed only one channelize.
2. SA set RBW: 100KHz and VBW: 100KHz. Then adjust to start frequency 30MHz and stop frequency 1GHz. Search to mark peak reading value + cable loss shall be less than 4nW.
3. SA set RBW: 1MHz and VBW: 1MHz. Then adjust to start frequency 1000MHz and stop frequency 12.5GHz. Search to mark peak reading value + cable loss shall be less than 20nW.
4. If power level of lower emissions are more than 1/10 of limit (.0.4nW for $f < 1\text{GHz}$, 2nW for $f \geq 1\text{GHz}$), all those are to be indicated in the 2nd and 3rd lines. If others are 1/10 or less more of the limit, no necessary to be indicated.

3.5.4 Test Setup



3.5.5 Test Result of Limitation of Collateral Emission of Receiver

Please refer to Appendix B.

3.6 Transmission Antenna Gain (EIRP Antenna Power) Measurement

3.6.1 Limit

Item	Limits
EIRP Power Density	$\leq 6.91\text{dBm/MHz}$ (FH form 2400 ~ 2483.5MHz)
	$\leq 12.14\text{dBm/MHz}$ (OFDM,DS from 2400 ~ 2483.5MHz)
	$\leq 12.14\text{dBm}$ (Other from 2400 ~ 2483.5MHz)
Remark: This test item will not be applied to EIRP power of EUT is lower than 12.14 dBm/MHz.	

3.6.2 Measuring Instruments

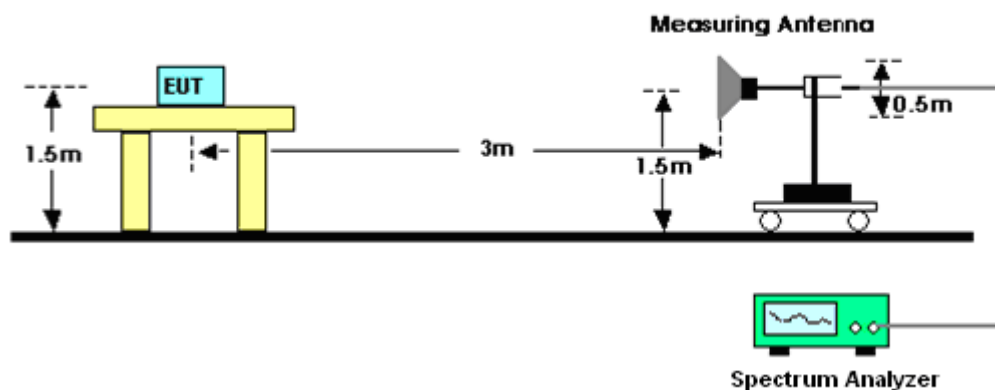
See list of measuring instruments of this test report.

3.6.3 Test Procedures

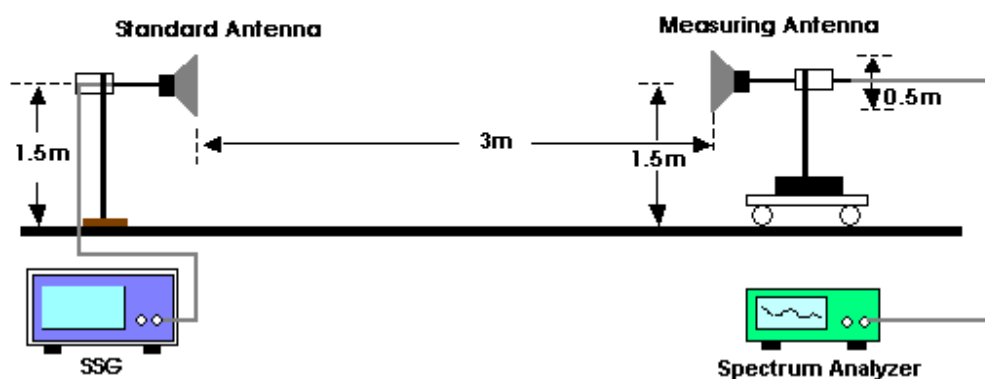
1. Set EUT and measuring antenna at the same height and roughly facing each other.
2. Move the measuring antenna height up and down within $\pm 50\text{cm}$ of EUT height and swing it to find the maximum output of the measuring antenna. The output level at the spectrum analyzer is read as "E".
3. Remove the EUT from the turn table and put the replacing antenna facing to measuring antenna at same height. Set the standard signal generator (SSG) at same frequency and transmit on then receive the signal.
4. Swing the replacing antenna give a maximum receiving level.
5. Move the measuring antenna height up and down within $\pm 50\text{cm}$ of replacing antenna height and swing it to find the maximum receiving level.
6. Set SSG output power at P_t to give the equivalent output level of "E" or calculate P_t with SSG output which gives the nearest of "E" and difference ($\pm 1\text{dB}$). Record the P_t .
7. Calculate EIRP by the formula below $\text{EIRP} = G_t - L + P_t$.
 G_t : gain of replacing antenna (dBi)
 L : feeder loss between SSG and replacing antenna
 P_t : Output power of the SSG
8. If the antenna for the EUT has circular polarization, sum of V-field and H-field will be result if measuring antenna is linear polarization.

3.6.4 Test Setup

<For EUT radiation measurement>



<For standard antenna measurement>



3.6.5 Test Result of Transmission Antenna Gain (EIRP Antenna Power)

Please refer to Appendix B. For the antenna gain, please refer to antenna test report.

Remark: This test item will not be applied to EIRP power of EUT is lower than 12.14dBm/MHz.

3.7 Transmission Radiation Angle Width (3dB Beam-width) Measurement

3.7.1 Limit

Item	Limits
3dB antenna beam-width	$360/A$ (If $A < 1$; then $A = 1$) $A = \{\text{EIRP Power [mW]} / 16.36 \text{ for DS, OFDM}\}$ or $A = \{\text{EIRP Power [mW]} / 4.9 \text{ for FH}\}$
Remark: This test item will not be applied to EIRP power of EUT is lower than 12.14 dBm/MHz.	

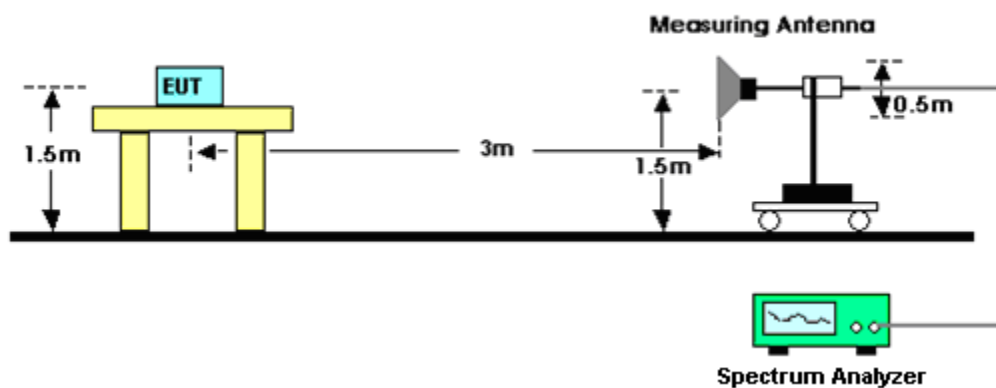
3.7.2 Measuring Instruments

See list of measuring instruments of this test report.

3.7.3 Test Procedures

1. Set EUT and measuring antenna at the same height and roughly facing each other.
2. Set spectrum analyzer with condition in section 3.7.2 and tune reference level to observe receiving signal position.
3. Rotate directions of the EUT horizontally and vertically to find the maximum receiving power.
4. Move the measuring antenna height up and down within $\pm 50\text{cm}$ of EUT height and swing it to find the maximum output of measuring antenna. The output level at the spectrum analyzer is read as "E".
5. Calculate permitted radiation angle in horizontal and vertical using EIRP measured in another test method.
6. Calculate 3dB antenna beam width by the formula below $360/A$ (If $A < 1$; then $A = 1$).
 $A = \{\text{EIRP Power [mW]} / 16.36 \text{ for DS, OFDM}\}$ or
 $A = \{\text{EIRP Power [mW]} / 4.9 \text{ for FH}\}$

3.7.4 Test Setup



3.7.5 Test Result of Transmission Radiation Angle Width (3dB Beam-width)

Please refer to Appendix B.

For the antenna gain, please refer to antenna test report.

Remark: This test item will not be applied to EIRP power of EUT is lower than 12.14 dBm/MHz.

3.8 Radio Interference Prevention Capability Measurement

3.8.1 Limit

Item	Limits
Identification code	≥ 48 bits

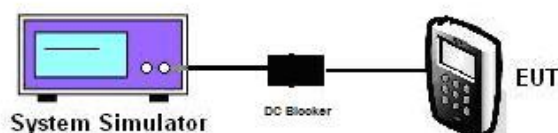
3.8.2 Measuring Instruments

See list of measuring instruments of this test report.

3.8.3 Test Procedures

1. In the case that the EUT has the function of automatically transmitting the identification code: a. Transmit the predetermined identification codes from EUT. b. Check the transmitted identification codes with the demodulator.
2. In the case of receiving the identification code: a. Transmit the predetermined identification codes from the counterpart. b. Check if communication is normal. c. Transmit the signals other than predetermined ID codes from the counterpart. d. check if the EUT stops the transmission, or if it displays that identification codes are different from the predetermined ones.

3.8.4 Test Setup



3.8.5 Test Result of Radio Interference Prevention Capability

Please refer to Appendix B.

3.9 Hopping Frequency Dwell Time Measurement

3.9.1 Limit

Item	Limits
Hopping Freq. Dwell Time	≤ 0.4 seconds

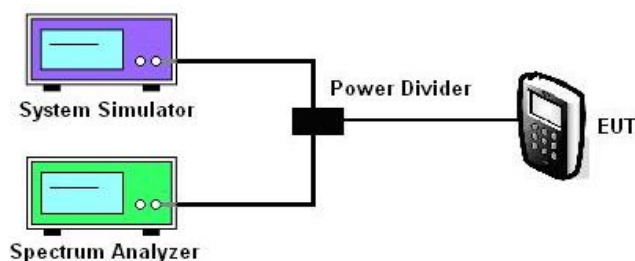
3.9.2 Measuring Instruments

See list of measuring instruments of this test report.

3.9.3 Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. Set RBW of spectrum analyzer to 1MHz and VBW to 1MHz.
3. Use a video trigger with the trigger level set to enable triggering only on full pulses.
4. Sweep Time is more than once pulse time.
5. Set the center frequency on any frequency would be measured and set the frequency span to zero span.
6. Measure the maximum time duration of one single pulse.
7. Set the EUT in continuous transmitting for each supported maximum packet format.
8. Measure the maximum time duration of one single pulse.
9. Use the marker-delta function to calculate the dwell time.
10. Dwell Time = Total Number of channels x 0.4(s) x Average Hopping Channel x package transfer time
11. Average Hopping Channel = Total Number of hopping / sweep time

3.9.4 Test Setup



3.9.5 Test Result of Hopping Frequency Dwell Time

Please refer to Appendix B.

3.10 Construction Protection Confirmation Method

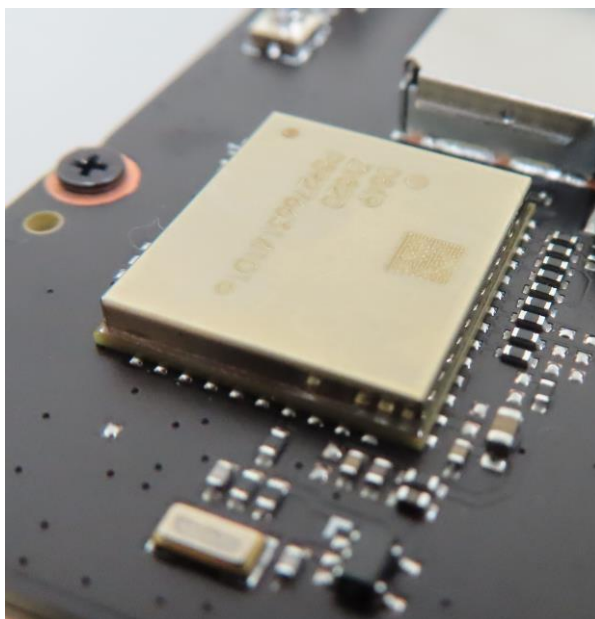
3.10.1 Limit

The high-frequency section and modulation section of the radio equipment except for the antenna system shall not be capable of being opened easily.

3.10.2 Confirmation Method

☐	Sealed with special screws.
☐	Plastic chassis is being welded using ultrasonic waves.
☐	Chassis is glued using a special adhesive.
☐	Metal covers are spot-fused.
☐	Cover is specially interlocked.
☒	RF and Modulation components are covered with shielding case and this shielding case is soldered.
☐	Shield case is welded at RF and modulation parts, and ID-ROM is welded using the BGA Method.
☐	Shield case is welded at RF and modulation parts, and ID-ROM is glued at its lead with a special adhesive.
☐	Shield case is welded at RF and modulation parts, and ID-ROM is glued with a non-transparent laminating agent.
☐	Other :

3.10.3 The Photos of Construction Protection





4 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Calibration Date	Test Periods	Due Date	Calibration Body	Calibration Method
Spectrum Analyzer	Rohde & Schwarz	FSV 40	101909	Aug. 13, 2021	Jul. 01, 2022	Aug. 12, 2022	ETC, R.O.C	C
BT Base Station	Rohde & Schwarz	CBT	101136	Oct. 17, 2021	Jul. 01, 2022	Oct. 16, 2022	ETC, R.O.C	C
USB Power Sensor	DARE	RPR3006W	16I00054SNO11 (NO:117)	Dec. 09, 2021	Jul. 01, 2022	Dec. 08, 2022	ETC, R.O.C	C
Programmable Power Supply	GW Instek	GPP-2323	GEU810970	Nov. 26, 2021	Jul. 01, 2022	Nov. 25, 2022	ETC, R.O.C	C
Multimeter	GW Instek	GDM-461	GUT210214	Nov. 13, 2021	Jul. 01, 2022	Nov. 12, 2022	ETC, R.O.C	C

Note: Above test equipment was used and kept valid calibration period during test.

Calibration Method :

a) : Calibration conducted by the National Institute of Information and Communications Technology ~ NICT ~ or a designated calibration agency under Article 102-18 paragraph

(1) TELEC Engineering Center, Intertek Japan K.K., Keysight Technologies, Inc ~.

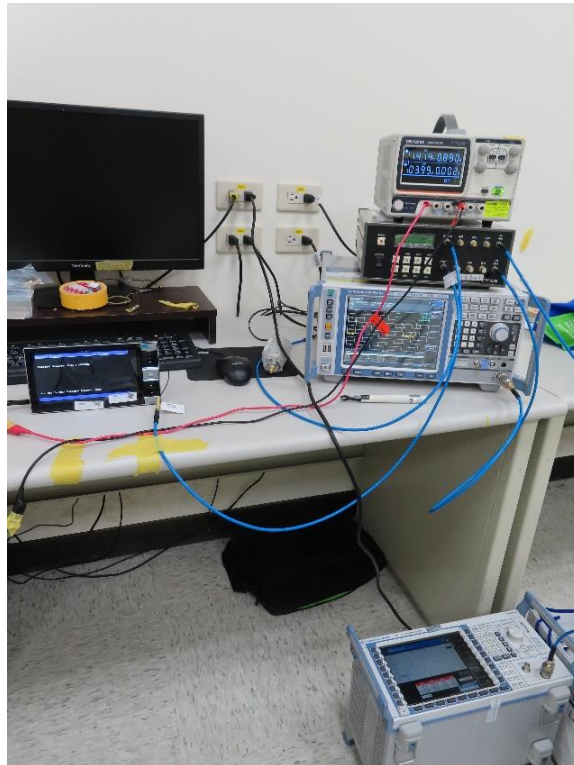
b) : Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Law (Law No. 51 of 1992) ~ Japan Calibration Service System ~

c) : Calibration conducted in foreign countries, which shall be equivalent to the calibration conducted by the NICT or a designated calibration agency under Article 102-18 paragraph

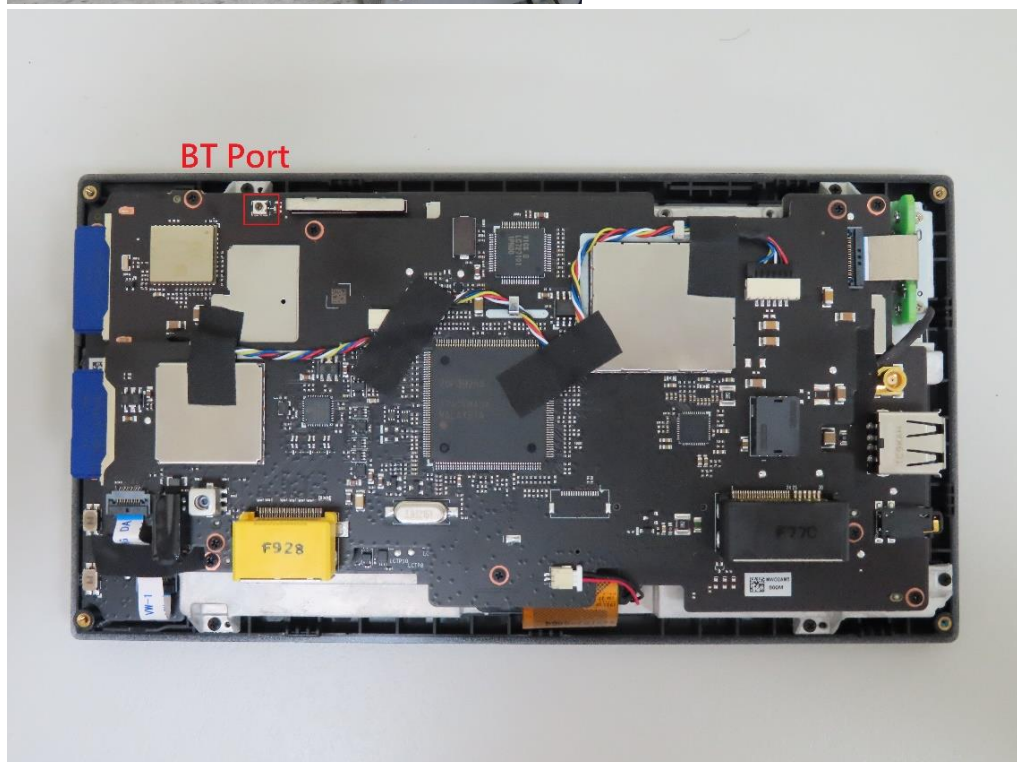
(1) ~ TELEC Engineering Center, Intertek Japan K.K., Keysight Technologies, Inc ~.

Appendix A. Setup Photographs

Front View



Near View





Appendix B. Test Results

Please refer to the following pages for test results.

1. TEST RESULTS DATA **BLUETOOTH - BR (Normal Voltage)**

Environment of Test Room	Temperature	23.4~24.9 °C
	Humidity	52.0~55.6 %
Tool & Version	Engineering mode	
Test Engineer	Sylvia Li	

Modulatoion Type :	GFSK
Type Emissions :	78M4F1D

Declaration Output Power	0.020	mW/MHz
Declaration Output Power	-16.990	dBm/MHz
Antenna Power (E.I.R.P)	-16.570	dBm/MHz
Input Power Voltage	14.400	Vdc

Path Loss		23.80	dB
Burst	ON TIME	2.906	msec
	OFF TIME	0.848	msec
	Ratio	77.42	%
Packet Type (Mode)		DH5	mode

Antenna Information:

Antenna Model	Antenna Type	Gain(dBi)
Refer to antenna report	PIFA	0.42

1.1. Test Results (Normal Voltage)

Measurement Frequency	MHz	2402	2441	2480	Limit	Result			Note
Channel Number	Ch.	0	39	78		0	39	78	
Reading Frequency	MHz	2401.983	2440.983	2479.983		-----	-----	-----	
Frequency Tolerance	ppm	-7.244	-7.128	-7.016	±50	PASS	PASS	PASS	

Occupied Bandwidth	MHz	78.44	83.5	PASS	
Spread Bandwidth	MHz	70.91	0.5	PASS	
RF Output Power	mW/MHz	0.011	3	PASS	
RF Output Power Tolerance	%	-43.99	-80~+20	PASS	
Output Power (With burst radi	dBm	-1.00	-----	-----	-----

Unwanted Emission Intensity	Under 2387MHz	μW/MHz	0.03069	0.02844	0.02864	2.5	PASS	PASS	PASS	
		MHz	949.323	823.623	476.980		-----	-----	-----	
	2387MHz - 2400MHz	μW/MHz	0.21878	0.02891	0.02564	25	PASS	PASS	PASS	
		MHz	2399.984	2387.205	2392.688		-----	-----	-----	
	2483.5MHz - 2496.5MHz	μW/MHz	0.02692	0.03177	0.02825	25	PASS	PASS	PASS	
		MHz	2488.226	2492.761	2486.934		-----	-----	-----	
	2496.5MHz - 12.5GHz	μW/MHz	0.03155	0.03556	0.03243	2.5	PASS	PASS	PASS	
		MHz	5861.841	5851.839	5854.839		-----	-----	-----	
Limitation of Collateral Emission of Receiver	Under 1GHz	nW	0.021	0.021	0.028	4	PASS	PASS	PASS	
		MHz	877.647	565.629	793.071		-----	-----	-----	
	1 -12.5GHz	nW	0.224	0.282	0.264	20	PASS	PASS	PASS	
		MHz	5867.449	5946.984	5855.950		-----	-----	-----	

Spread Factor	-----	70.91	5	PASS	
Dwell Time	mSec	305.08	400	PASS	
Radio Interference Prevention Capability	-----	good		PASS	

2. TEST RESULTS DATA

BLUETOOTH - EDR (Normal Voltage)

Environment of Test Room	Temperature	23.4~24.9 °C
	Humidity	52.0~55.6 %
Tool & Version	Engineering mode	
Test Engineer	Sylvia Li	

Modulatoion Type :	8DPSK
Type Emissions :	78M7G1D

Declaration Output Power	0.020	mW/MHz
Declaration Output Power	-16.990	dBm/MHz
Antenna Power (E.I.R.P)	-16.570	dBm/MHz
Input Power Voltage	14.400	Vdc

Path Loss		23.80	dB
Burst	ON TIME	2.906	msec
	OFF TIME	0.862	msec
	Ratio	77.12	%
Packet Type (Mode)		3-DH5	mode

Antenna Information:

Antenna Model	Antenna Type	Gain(dBi)
Refer to antenna report	PIFA	0.42

2.1. Test Results (Normal Voltage)

Measurement Frequency	MHz	2402	2441	2480	Limit	Result			Note
Channel Number	Ch.	0	39	78		0	39	78	
Reading Frequency	MHz	2401.991	2440.994	2479.994		-----	-----	-----	
Frequency Tolerance	ppm	-3.622	-2.376	-2.339	±50	PASS	PASS	PASS	

Occupied Bandwidth	MHz	78.73	83.5	PASS	
Spread Bandwidth	MHz	71.20	0.5	PASS	
RF Output Power	mW/MHz	0.012	3	PASS	
RF Output Power Tolerance	%	-40.23	-80~+20	PASS	
Output Power (With burst radi	dBm	-0.70	-----	-----	-----

Unwanted Emission Intensity	Under 2387MHz	μW/MHz	0.03767	0.02911	0.03105	2.5	PASS	PASS	PASS	
		MHz	833.904	976.480	872.797		-----	-----	-----	
	2387MHz - 2400MHz	μW/MHz	1.03992	0.02576	0.02649	25	PASS	PASS	PASS	
		MHz	2399.971	2391.103	2391.330		-----	-----	-----	
	2483.5MHz - 2496.5MHz	μW/MHz	0.02636	0.02427	0.02877	25	PASS	PASS	PASS	
		MHz	2488.701	2496.003	2493.924		-----	-----	-----	
	2496.5MHz - 12.5GHz	μW/MHz	0.03342	0.03639	0.03428	2.5	PASS	PASS	PASS	
		MHz	5831.834	5726.807	5968.868		-----	-----	-----	
Limitation of Collateral Emission of Receiver	Under 1GHz	nW	0.022	0.020	0.024	4	PASS	PASS	PASS	
		MHz	847.774	991.222	915.764		-----	-----	-----	
	1 -12.5GHz	nW	0.246	0.240	0.244	20	PASS	PASS	PASS	
		MHz	5871.282	5916.319	6209.545		-----	-----	-----	

Spread Factor	-----	71.20	5	PASS	
Dwell Time	mSec	316.70	400	PASS	3DH5
Radio Interference Prevention Capability	-----	good		PASS	

3. TEST RESULTS DATA **BLUETOOTH - AFH BR (Normal Voltage)**

Environment of Test Room	Temperature	23.4~24.9 °C
	Humidity	52.0~55.6 %
Tool & Version	Engineering mode	
Test Engineer	Sylvia Li	

Modulatoion Type :	GFSK
Type Emissions :	19M6F1D

Declaration Output Power	0.080	mW/MHz
Declaration Output Power	-10.969	dBm/MHz
Antenna Power (E.I.R.P)	-10.549	dBm/MHz
Input Power Voltage	14.400	Vdc

Path Loss		23.80	dB
Burst	ON TIME	2.906	msec
	OFF TIME	0.848	msec
	Ratio	77.42	%
Packet Type (Mode)		DH5	mode

Antenna Information:

Antenna Model	Antenna Type	Gain(dBi)
Refer to antenna report	PIFA	0.42

3.1. Test Results (Normal Voltage)

Measurement Frequency	MHz	2402	2411	2421	Limit	Result			Note
Channel Number	Ch.	0	9	19		0	9	19	
Reading Frequency	MHz	2401.983	2410.983	2420.983		-----	-----	-----	
Frequency Tolerance	ppm	-7.244	-7.217	-7.187	±50	PASS	PASS	PASS	

Occupied Bandwidth	MHz	19.61	83.5	PASS	
Spread Bandwidth	MHz	18.16	0.5	PASS	
RF Output Power	mW/MHz	0.044	3	PASS	
RF Output Power Tolerance	%	-45.33	-80~+20	PASS	
Output Power (With burst radi	dBm	-1.00	-----	-----	-----

Unwanted Emission Intensity	Under 2387MHz	μW/MHz	0.04315	0.03304	0.02793	2.5	PASS	PASS	PASS	
		MHz	875.804	614.415	858.249		-----	-----	-----	
	2387-2400MHz	μW/MHz	0.08933	0.02553	0.02582	25	PASS	PASS	PASS	
		MHz	2399.984	2392.558	2387.263		-----	-----	-----	
	2483.5-2496.5MHz	μW/MHz	0.02897	0.02735	0.03236	25	PASS	PASS	PASS	
		MHz	2486.401	2491.202	2487.486		-----	-----	-----	
	2496.5MHz - 12.5GHz	μW/MHz	0.03565	0.03508	0.03243	2.5	PASS	PASS	PASS	
		MHz	5830.833	6979.120	5787.823		-----	-----	-----	
Limitation of Collateral Emission of Receiver	Under 1GHz	nW	0.023	0.021	0.026	4	PASS	PASS	PASS	
		MHz	894.620	940.205	762.0343		-----	-----	-----	
	1 -12.5GHz	nW	0.232	0.236	0.262	20	PASS	PASS	PASS	
		MHz	6909.070	5857.866	5883.739		-----	-----	-----	

Spread Factor	-----	18.16	5	PASS	
Dwell Time	mSec	305.08	400	PASS	
Radio Interference Prevention Capability	-----	good		PASS	

4. TEST RESULTS DATA **BLUETOOTH - AFH EDR (Normal Voltage)**

Environment of Test Room	Temperature	23.4~24.9 °C
	Humidity	52.0~55.6 %
Tool & Version	Engineering mode	
Test Engineer	Sylvia Li	

Modulatoin Type :	8DPSK
Type Emissions :	20M0G1D

Declaration Output Power	0.080	mW/MHz
Declaration Output Power	-10.969	dBm/MHz
Antenna Power (E.I.R.P)	-10.549	dBm/MHz
Input Power Voltage	14.400	Vdc

Path Loss		23.80	dB
Burst	ON TIME	2.906	msec
	OFF TIME	0.862	msec
	Ratio	77.12	%
Packet Type (Mode)		3DH5	mode

Antenna Information:

Antenna Model	Antenna Type	Gain(dBi)
Refer to antenna report	PIFA	0.42

4.1. Test Results (Normal Voltage)

Measurement Frequency	MHz	2402	2411	2421	Limit	Result			Note
Channel Number	Ch.	0	9	19		0	9	19	
Reading Frequency	MHz	2401.991	2410.991	2420.991		-----	-----	-----	
Frequency Tolerance	ppm	-3.622	-3.608	-3.594	±50	PASS	PASS	PASS	

Occupied Bandwidth	MHz	20.04	83.5	PASS	
Spread Bandwidth	MHz	18.23	0.5	PASS	
RF Output Power	mW/MHz	0.047	3	PASS	
RF Output Power Tolerance	%	-41.65	-80~+20	PASS	
Output Power (With burst radi	dBm	-0.70	-----	-----	-----

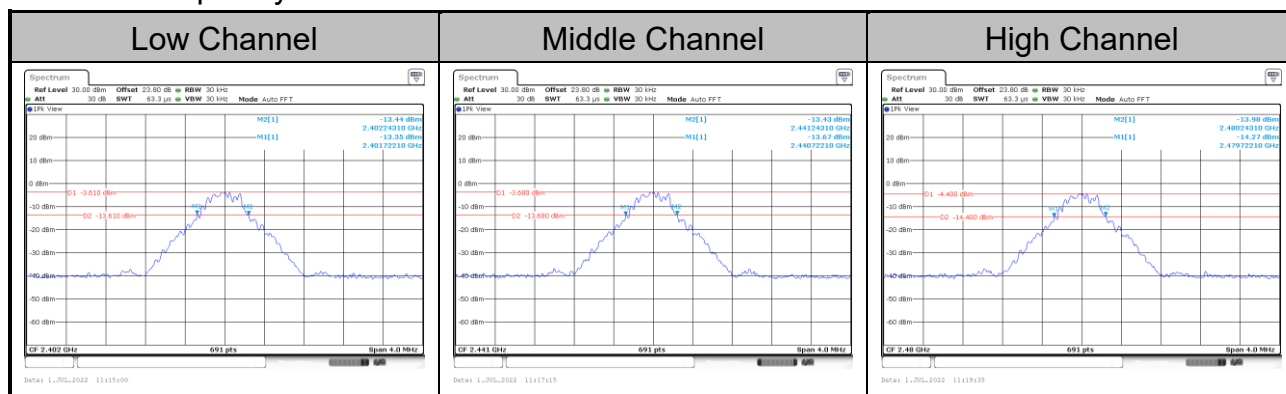
Unwanted Emission Intensity	Under 2387MHz	μW/MHz	0.03350	0.03141	0.03483	2.5	PASS	PASS	PASS	
		MHz	929.440	847.968	909.848		-----	-----	-----	
	2387-2400MHz	μW/MHz	1.07647	0.02393	0.02812	25	PASS	PASS	PASS	
		MHz	2399.990	2395.774	2387.003		-----	-----	-----	
	2483.5-2496.5MHz	μW/MHz	0.02938	0.02523	0.02904	25	PASS	PASS	PASS	
		MHz	2494.392	2484.029	2485.062		-----	-----	-----	
	2496.5MHz - 12.5GHz	μW/MHz	0.03443	0.03126	0.03199	2.5	PASS	PASS	PASS	
		MHz	5830.833	6955.114	5874.844		-----	-----	-----	
Limitation of Collateral Emission of Receiver	Under 1GHz	nW	0.022	0.021	0.025	4	PASS	PASS	PASS	
		MHz	925.560	879.781	804.8070		-----	-----	-----	
	1 -12.5GHz	nW	0.245	0.267	0.269	20	PASS	PASS	PASS	
		MHz	5869.365	5831.035	6977.106		-----	-----	-----	

Spread Factor	-----	18.23	5	PASS	
Dwell Time	mSec	316.70	400	PASS	3DH5
Radio Interference Prevention Capability	-----	good		PASS	

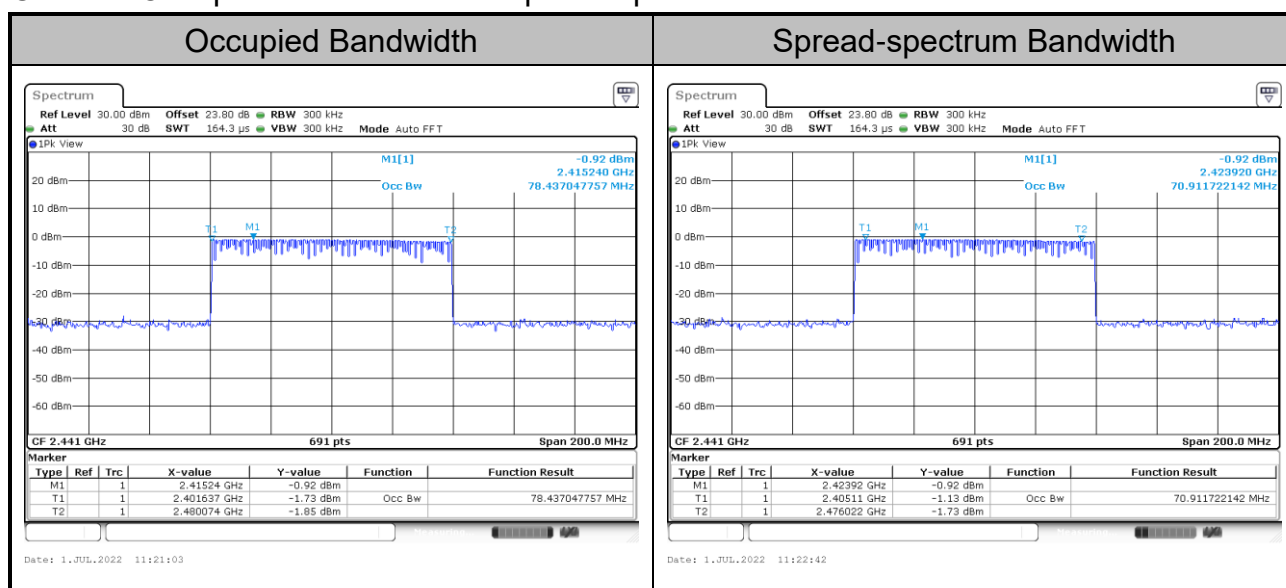
Appendix C. Test Plots

C.1. BR_NV (Basic Rate)

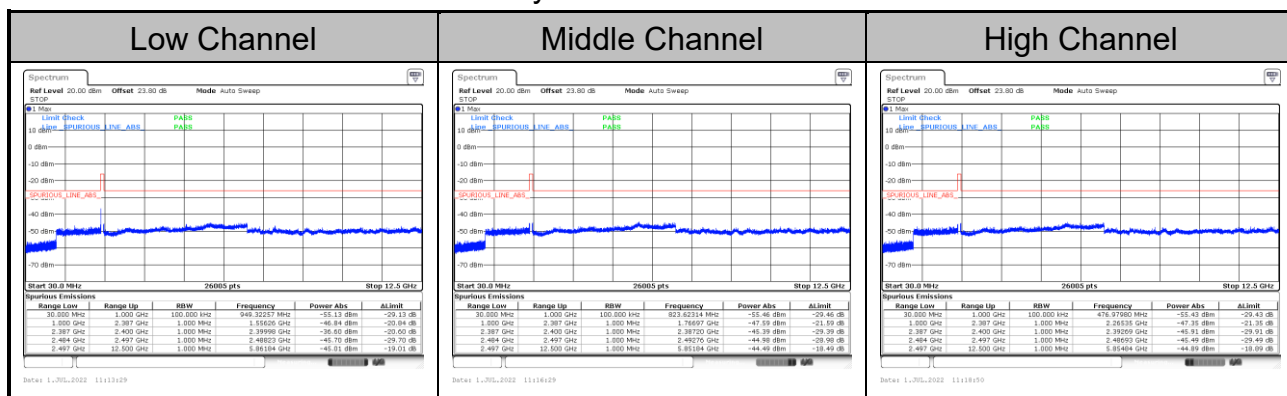
C.1.1. Frequency Tolerance



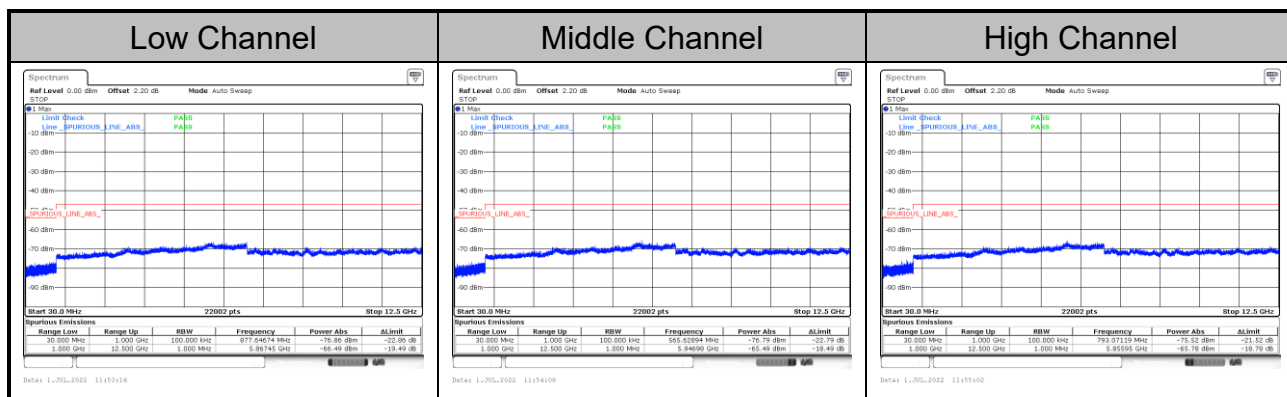
C.1.2. Occupied Bandwidth and Spread-spectrum Bandwidth



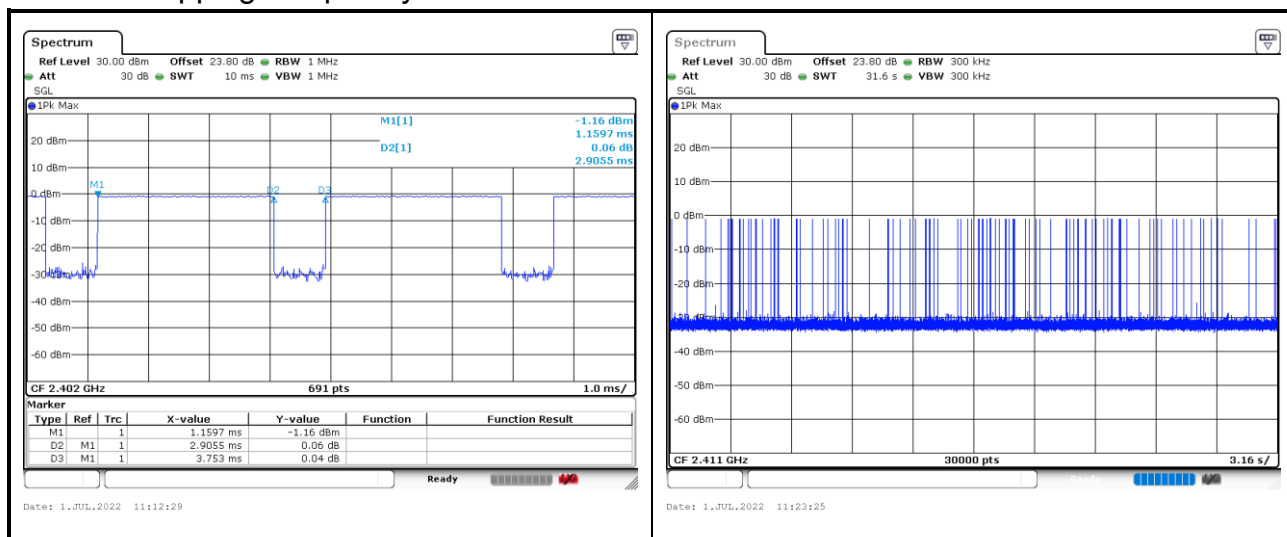
C.1.3. Unwanted Emission Intensity



C.1.4. Limitation of Collateral Emission of Receiver

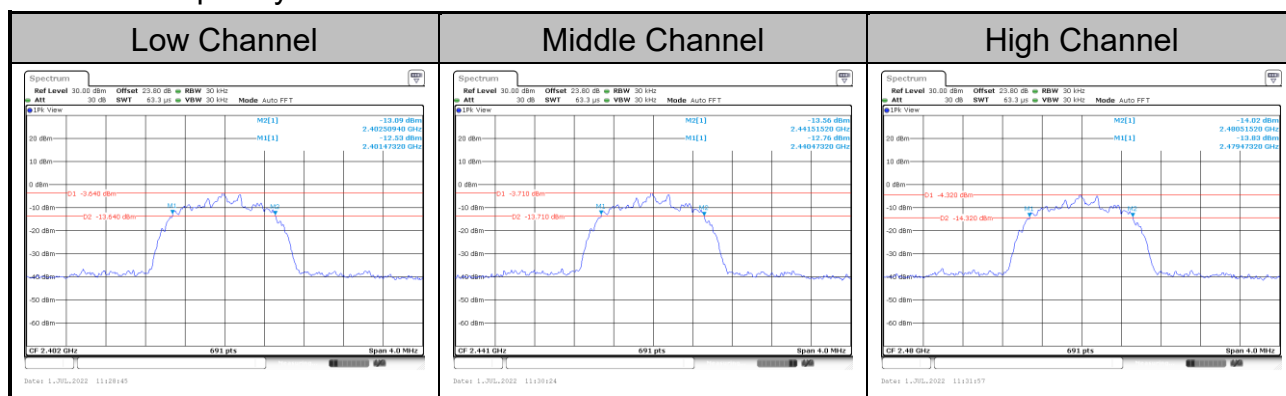


C.1.5. Hopping Frequency Dwell Time

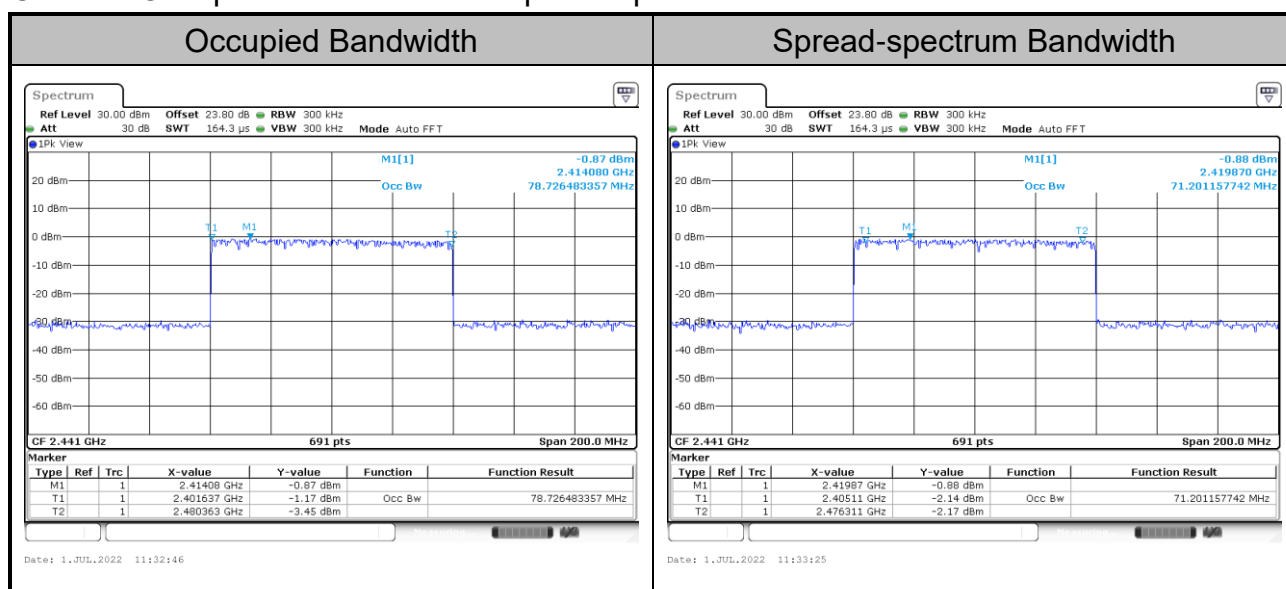


C.2. EDR_NV (Enhanced Data Rate)

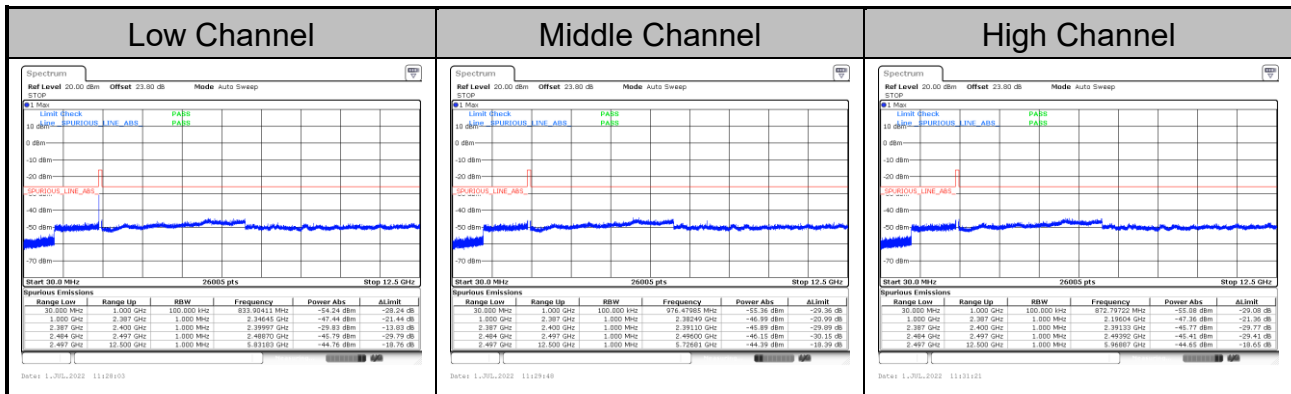
C.2.1. Frequency Tolerance



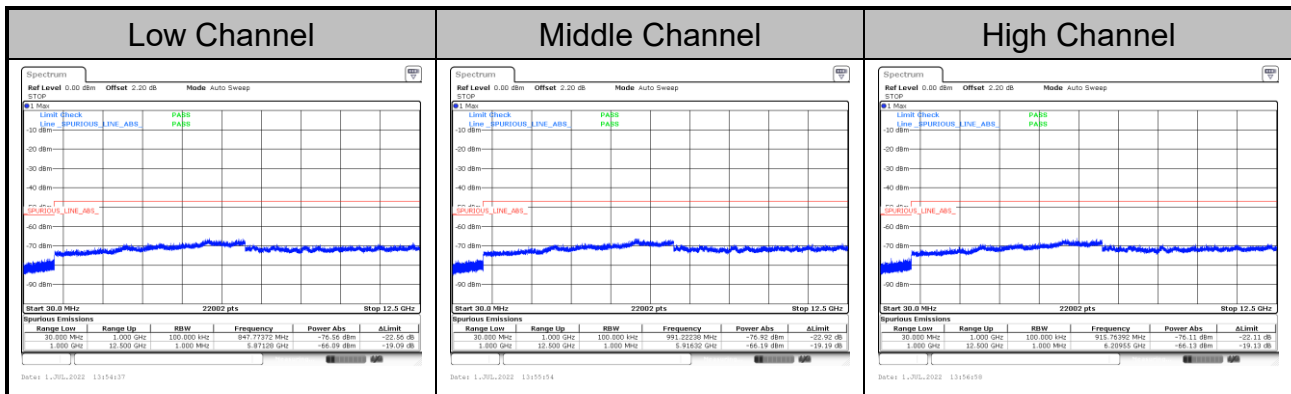
C.2.2. Occupied Bandwidth and Spread-spectrum Bandwidth



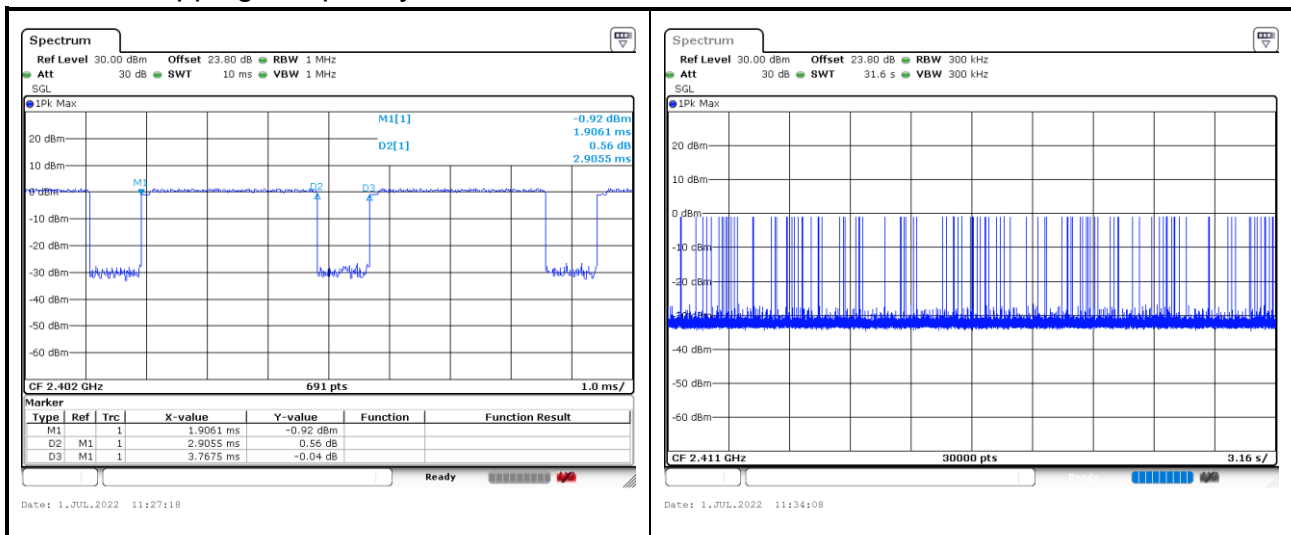
C.2.3. Unwanted Emission Intensity



C.2.4. Limitation of Collateral Emission of Receiver

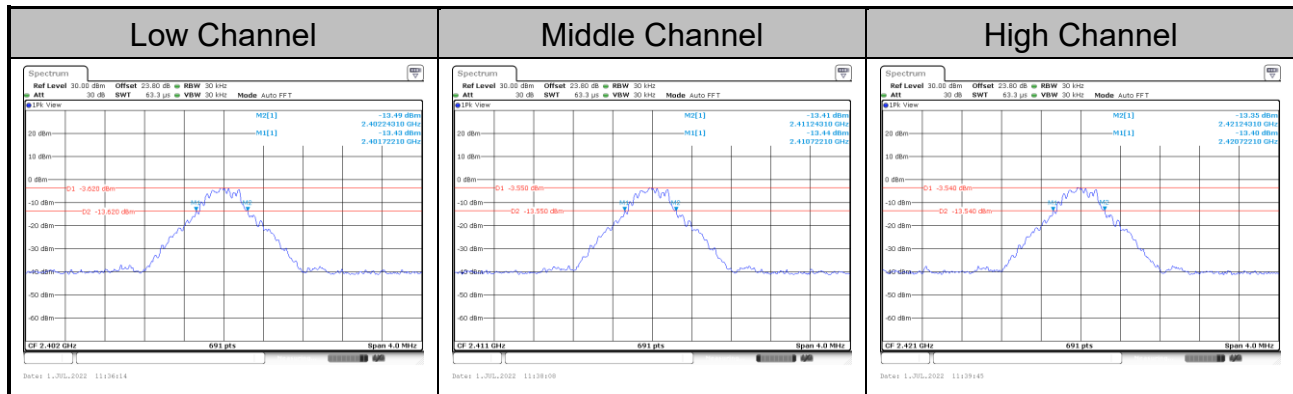


C.2.5. Hopping Frequency Dwell Time

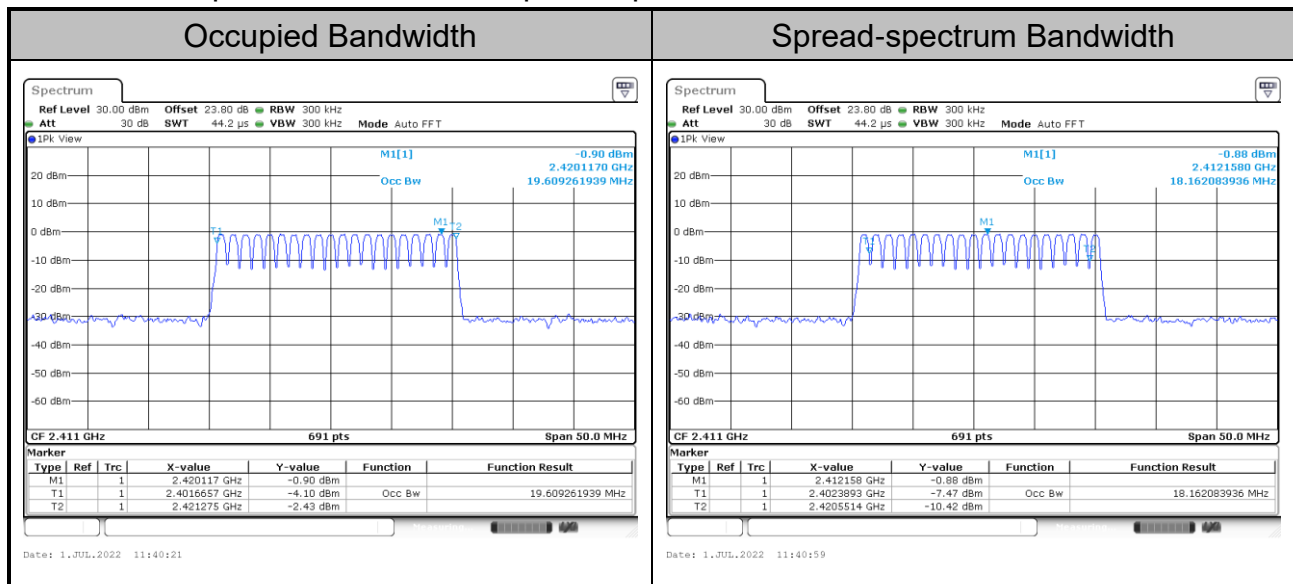


C.3. BR_AFH_NV (Adaptive Frequency Hopping)

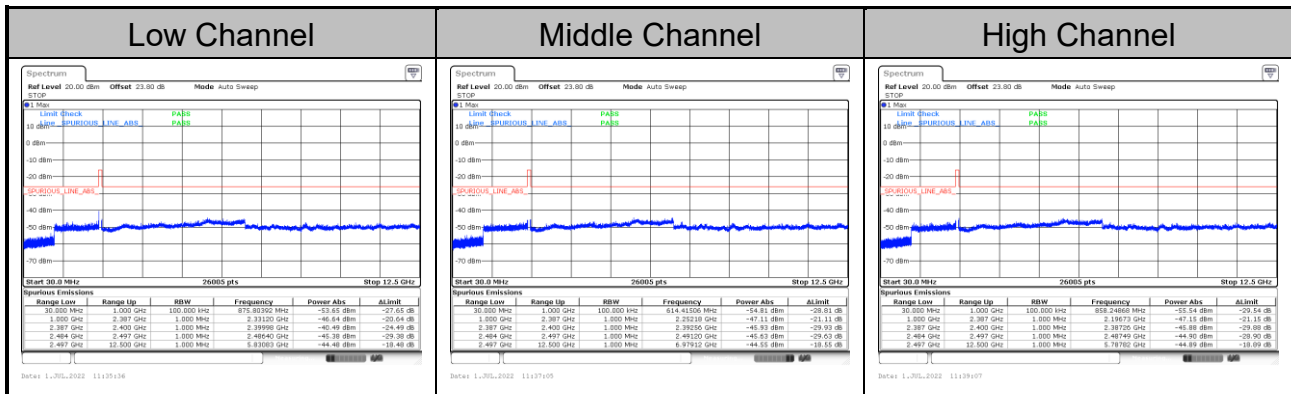
C.3.1. Frequency Tolerance



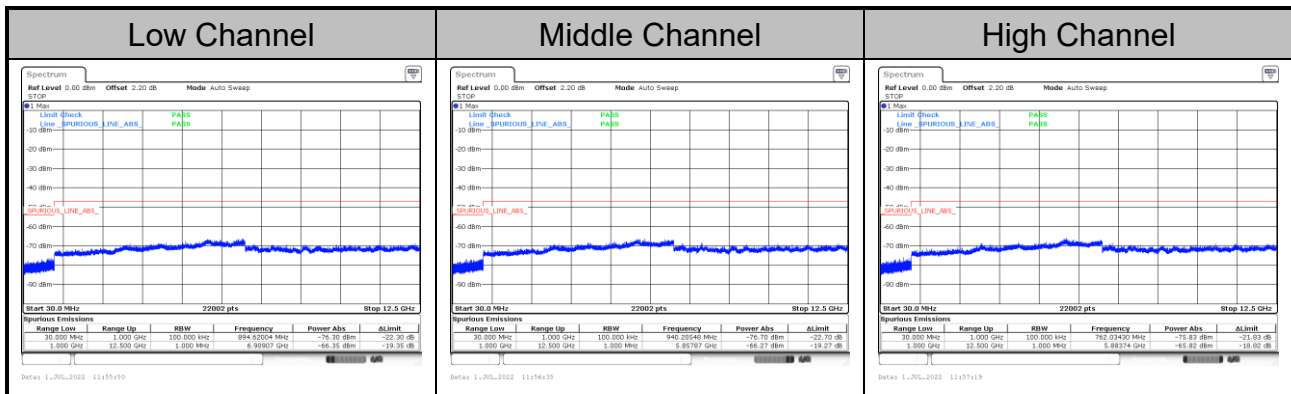
C.3.2. Occupied Bandwidth and Spread-spectrum Bandwidth



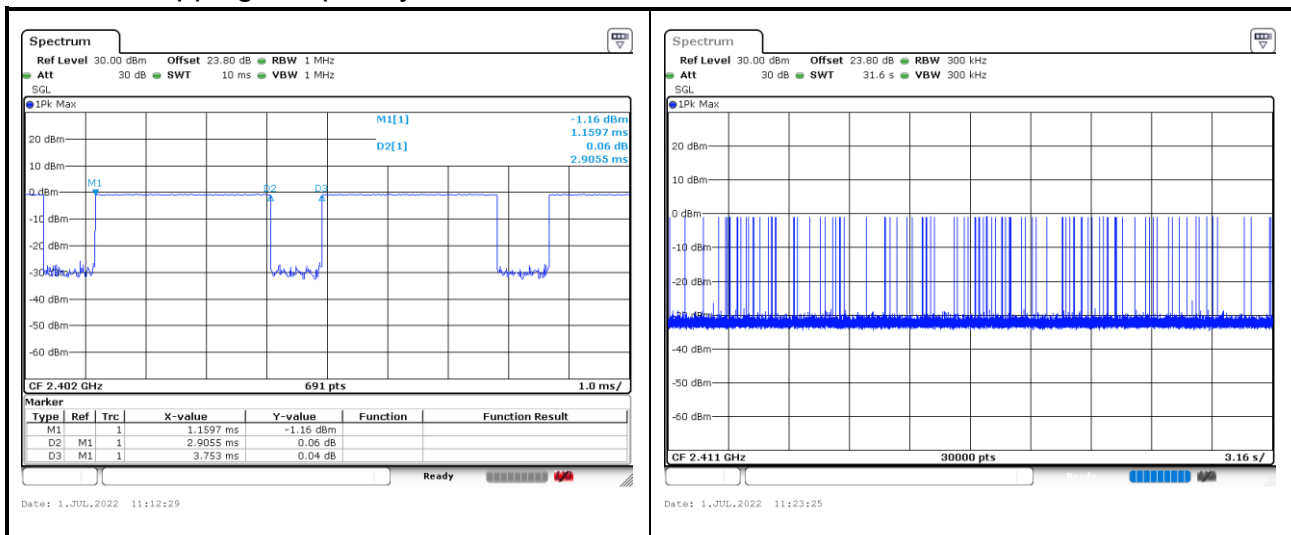
C.3.3. Unwanted Emission Intensity



C.3.4. Limitation of Collateral Emission of Receiver

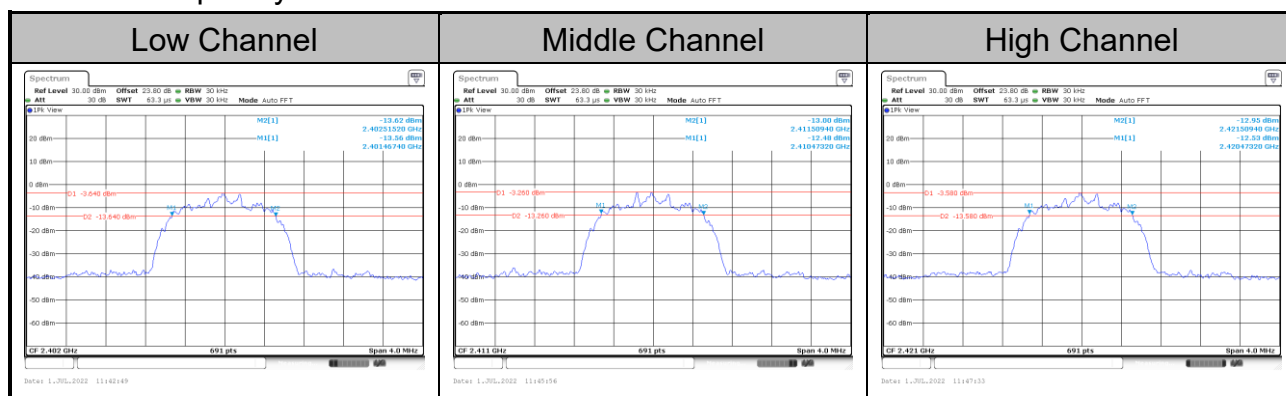


C.3.5. Hopping Frequency Dwell Time

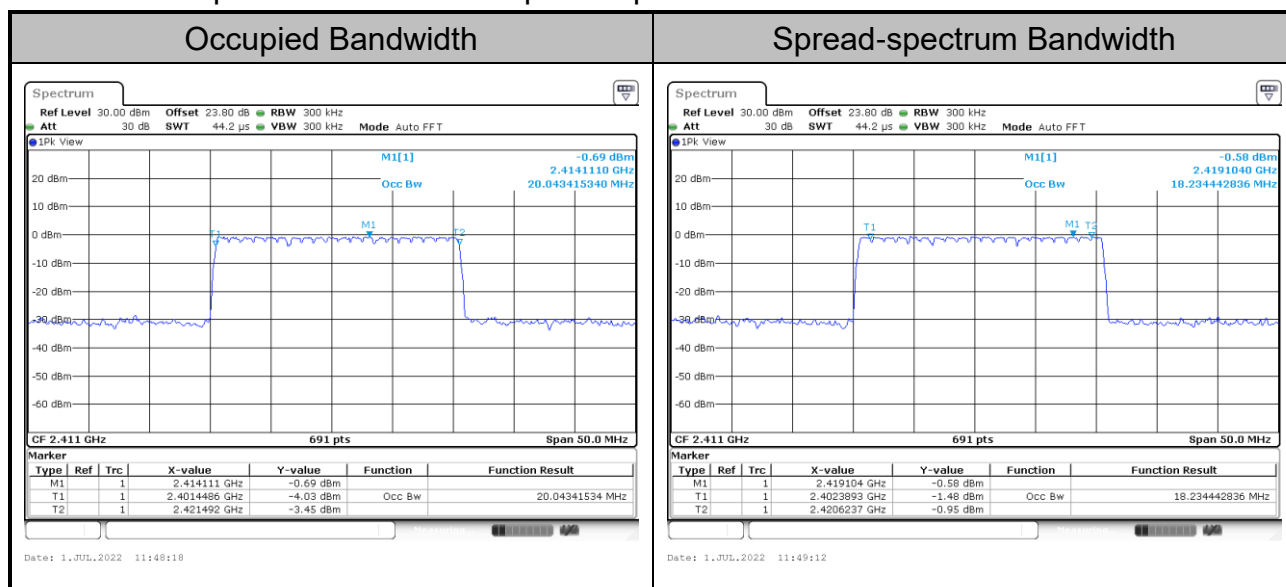


C.4. EDR_AFH_NV (Adaptive Frequency Hopping)

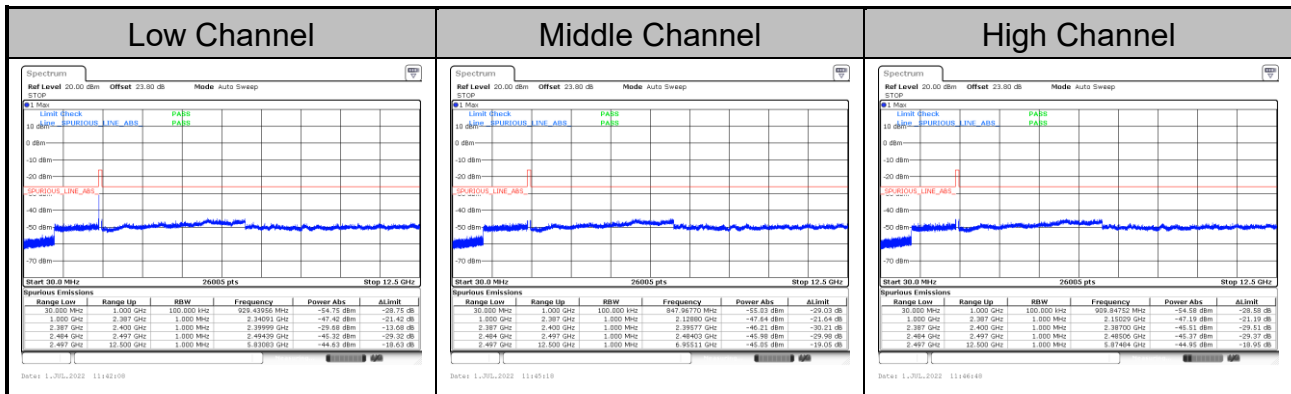
C.4.1. Frequency Tolerance



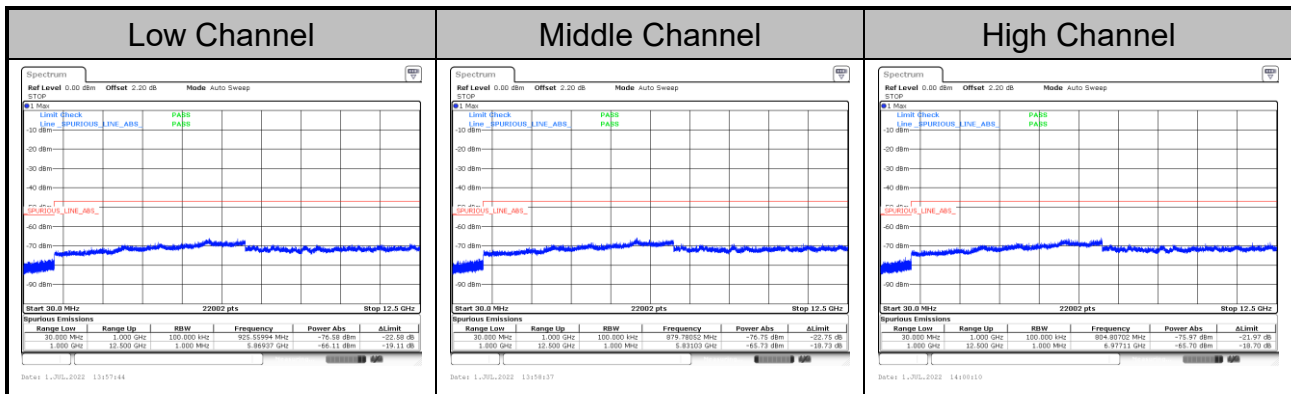
C.4.2. Occupied Bandwidth and Spread-spectrum Bandwidth



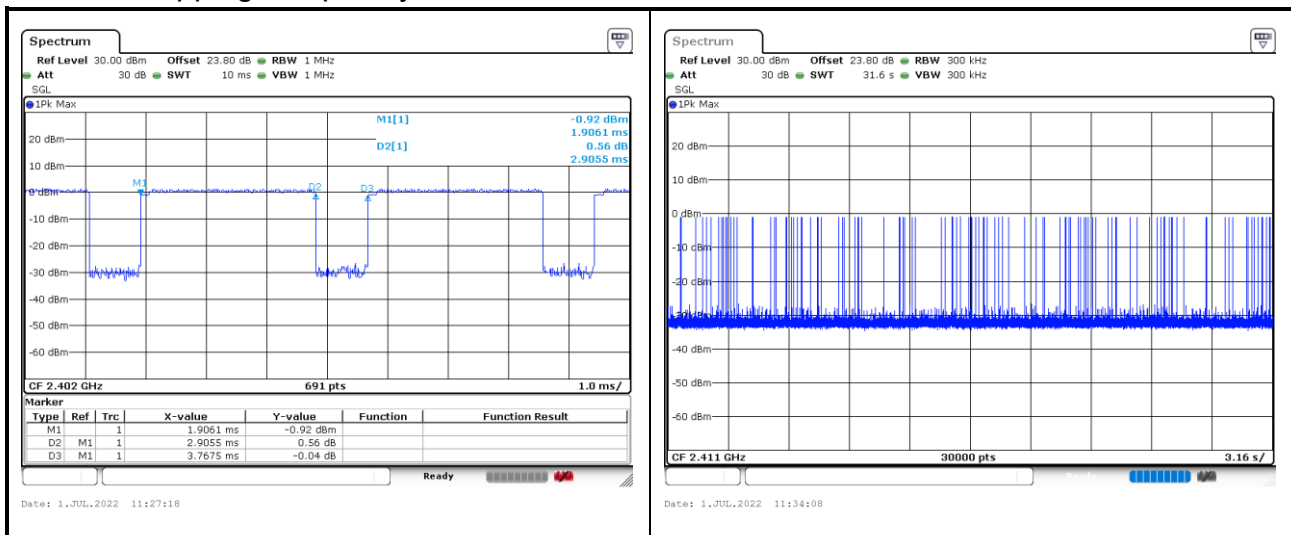
C.4.3. Unwanted Emission Intensity



C.4.4. Limitation of Collateral Emission of Receiver



C.4.5. Hopping Frequency Dwell Time





Appendix D. Original Report

Please refer to Sporton report number JR690725-03 as below.

JAPAN RADIO TEST REPORT

BLUETOOTH

Product Name : MITAC International Corp
Model Name : AVIC-BX500, AVIC-BX500II, AVIC-BX500IV
Applicant : MITAC International Corp
No. 200, Huaya 2nd Rd., Guishan Dist.,
Taoyuan City 333, Taiwan (R.O.C.)
Manufacturer : MITAC Computer (Kunshan) Co., Ltd.
No. 269, 2nd Avenue, District A, Comprehensive
Free Trade Zone, 300 Kunshan, China
Standard : Article 49-20 and the relevant articles of the
Ordinance Regulating Radio Equipment
Test Procedure : MIC Notice No.88 Appendix No.43

The product sample was completed on Dec. 10, 2019. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in MIC Notice No.88 Appendix No.43 and shown to be compliant with the applicable technical standards. Article 2 Paragraph 1 Item 19 of the Certificate Ordinance of the Radio Law indicates the classification of the specified radio equipment.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this variant report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.



Reviewed by: Jones Tsai

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)



Table of Contents

History of this test report	3
1 General Description.....	4
1.1 Feature of Equipment Under Test.....	4
1.2 Modification of EUT	4
Appendix A. Original Reports	



History of this test report

Report No.	Version	Description	Issued Date
JR690725-03	01	Initial issue of report	Dec. 23, 2019

Reviewed by: Louis Wu

Report Producer: Wii Chang

1 General Description

1.1 Feature of Equipment Under Test

Product Feature & Specification		
Product Name	MITAC International Corp	
Model Name	AVIC-BX500, AVIC-BX500II, AVIC-BX500IV	
Support Category / Frequency Range	Article 2-1-19 / 2400MHz ~ 2483.5MHz	
Type of Modulation	☐ Direct Spreading (DS) ☐ Orthogonal frequency-division multiplexing (OFDM) ☒ Frequency Hopping (FH) ☒ Other :GFSK	
Number of Channels	BR/EDR Mode	79
	AFH Mode	20
	Other : BT LE	40
Channel Spacing	BR/EDR/AFH Mode	1MHz
	Other : BT LE	2MHz
Modulation	☒ GFSK ☒ $\pi/4$ -DQPSK ☒ 8-DPSK ☐ Other : FSK	

NOTE: When EUT be operated at $\pm 10\%$ from the normal supply voltage, the supply voltage of RF part was varied within $\pm 1\%$. All test cases were done under the normal supply voltage.

1.2 Modification of EUT

No modifications are made to the EUT during all test items.



Appendix A. Original Report

Please refer to Sporton report number JR690725-02 as below.



JAPAN Radio Test Report

Bluetooth

APPLICANT : MITAC International Corp
MODEL NAME : AVIC-BX500, AVIC-BX500II , AVIC-BX500III
STANDARD : Article 49-20 and the relevant articles of the
Ordinance Regulating Radio Equipment
TEST : MIC Notice No.88 Appendix No.43
PROCEDURE

This is variant report. The product sample received on Oct. 22, 2018. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in MIC Notice No.88 Appendix No.43 and shown to be compliant with the applicable technical standards. Article 2 Paragraph 1 Item 19 of the Certificate Ordinance of the Radio Law indicates the classification of the specified radio equipment.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Review by: Louis Wu

Approved by: Jones Tsai / Manager

SPORTON INTERNATIONAL INC.

No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C.



TABLE OF CONTENTS

REVISION HISTORY.....	3
1 GENERAL DESCRIPTION.....	4
1.1 Applicant.....	4
1.2 Manufacturer.....	4
1.3 Feature of Equipment Under Test.....	4
1.4 Modification of EUT	4
APPENDIX A. ORIGINAL REPORT	



REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
JR690725-02	Rev. 01	Initial issue of report	Oct. 25, 2018

1 General Description

1.1 Applicant

MITAC International Corp

No.200, Wen Hua 2nd Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)

1.2 Manufacturer

MITAC Computer (Kunshan) Co., Ltd.

No. 269, 2nd Avenue, District A, Comprehensive Free Trade Zone, 300 Kunshan, China

1.3 Feature of Equipment Under Test

Product Feature & Specification		
Model Name	AVIC-BX500, AVIC-BX500II , AVIC-BX500III	
Support Category / Frequency Range	Article 2-1-19 / 2400MHz ~ 2483.5MHz	
Type of Modulation	☐ Direct Spreading (DS) ☐ Orthogonal frequency-division multiplexing (OFDM) ☒ Frequency Hopping (FH) ☐ Other :GFSK	
Number of Channels	BR/EDR Mode	79
	AFH Mode	20
Channel Spacing	BR/EDR/AFH Mode	1MHz
Modulation	☒ GFSK ☒ $\pi/4$ -DQPSK ☒ 8-DPSK ☐ Other : FSK	

NOTE: This is a variant report by change model name. All the test cases were performed on original report which can be referred to Sporton Report Number JR690725-01 as appendix A.

1.4 Modification of EUT

No modifications are made to the EUT during all test items.



Appendix A. Original Report

Please refer to Sporton report number JR690725-01 as below.



JAPAN Radio Test Report

Bluetooth

APPLICANT : MITAC International Corp
MODEL NAME : AVIC-BX500, AVIC-BX500II
STANDARD : Article 49-20 and the relevant articles of the
Ordinance Regulating Radio Equipment
TEST : MIC Notice No.88 Appendix No.43
PROCEDURE

This is variant report. The product sample received on Nov. 23, 2017. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in MIC Notice No.88 Appendix No.43 and shown to be compliant with the applicable technical standards. Article 2 Paragraph 1 Item 19 of the Certificate Ordinance of the Radio Law indicates the classification of the specified radio equipment.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Louis Wu

Review by: Louis Wu

Jones Tsai

Approved by: Jones Tsai / Manager

SPORTON INTERNATIONAL INC.

No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C.

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TEL : 886-3-327-3456

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Page Number : 1 of 4

Report Issued Date : Nov. 24, 2017

Report Version : Rev. 01

Report Template No.: BU5-JRRADIOBT Version 1.0



TABLE OF CONTENTS

REVISION HISTORY.....	3
1 GENERAL DESCRIPTION.....	4
1.1 Applicant	4
1.2 Manufacturer.....	4
1.3 Feature of Equipment Under Test	4
1.4 Modification of EUT	4
APPENDIX A. ORIGINAL REPORT	



REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
JR690725-01	Rev. 01	Initial issue of report	Nov. 24, 2017

1 General Description

1.1 Applicant

MITAC International Corp

Building B, No. 209, Sec.1, Nan Gang Rd., Nan Gang Dist., Taipei City 11568, Taiwan, R.O.C.

1.2 Manufacturer

MITAC Computer (Kunshan) Co., Ltd.

No. 269, 2nd Avenue, District A, Comprehensive Free Trade Zone, 300 Kunshan, China

1.3 Feature of Equipment Under Test

Product Feature & Specification		
Model Name	AVIC-BX500, AVIC-BX500II	
Support Category / Frequency Range	Article 2-1-19 / 2400MHz ~ 2483.5MHz	
Type of Modulation	☐ Direct Spreading (DS) ☐ Orthogonal frequency-division multiplexing (OFDM) ☒ Frequency Hopping (FH) ☐ Other :GFSK	
Number of Channels	BR/EDR Mode	79
	AFH Mode	20
Channel Spacing	BR/EDR/AFH Mode	1MHz
Modulation	☒ GFSK ☒ $\pi/4$ -DQPSK ☒ 8-DPSK ☐ Other : FSK	

NOTE: This is a variant report by change model name. All the test cases were performed on original report which can be referred to Sporton Report Number JR690725 as appendix A.

1.4 Modification of EUT

No modifications are made to the EUT during all test items.



Appendix A. Original Report

Please refer to Sporton report number JR690725 as below.

JAPAN Radio Test Report

Bluetooth

APPLICANT : MITAC International Corp

MODEL NAME : AVIC-BX500

TYPE EMISSIONS : 78M1F1D(BR);
78M7G1D(EDR);
20M0F1D(BR_AFH)

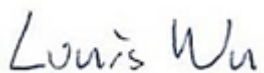
DECLARATION : 0.012 mW/MHz (BR);
OUTPUT POWER 0.012 mW/MHz (EDR);
0.048 mW/MHz (BR_AFH)

STANDARD : Article 49-20 and the relevant articles of the
Ordinance Regulating Radio Equipment

TEST : MIC Notice No.88 Appendix No.43
PROCEDURE

The product sample received on Sep. 07, 2016 and completely tested on Nov. 10, 2016. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in MIC Notice No.88 Appendix No.43 and shown to be compliant with the applicable technical standards. Article 2 Paragraph 1 Item 19 of the Certificate Ordinance of the Radio Law indicates the classification of the specified radio equipment.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.



Review by: Louis Wu



Approved by: Jones Tsai / Manager

SPORTON INTERNATIONAL INC.

No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C.

TABLE OF CONTENTS

REVISION HISTORY.....	3
SUMMARY OF TEST RESULT	4
1 GENERAL DESCRIPTION.....	5
1.1 Applicant	5
1.2 Manufacturer.....	5
1.3 Feature of Equipment Under Test	5
1.4 Modification of EUT	7
1.5 Testing Site	7
1.6 Applied Standards	7
1.7 Ancillary Equipment List	7
2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST.....	8
2.1 Carrier Frequency Channel	8
2.2 EUT Operation Test Setup	8
3 TEST RESULT	9
3.1 Frequency Tolerance Measurement.....	9
3.2 Occupied Bandwidth and Spread-spectrum Bandwidth / Spread Factor Measurement.....	10
3.3 Unwanted Emission Intensity Measurement	11
3.4 RF Output Power / Tolerance	12
3.5 Limitation of Collateral Emission of Receiver Measurement	14
3.6 Transmission Antenna Gain (EIRP Antenna Power) Measurement	15
3.7 Transmission Radiation Angle Width (3dB Beamwidth) Measurement.....	17
3.8 Radio Interference Prevention Capability Measurement.....	19
3.9 Hopping Frequency Dwell Time Measurement	20
3.10 Construction Protection Confirmation Method.....	21
4 LIST OF MEASURING EQUIPMENT.....	22
APPENDIX A. SETUP PHOTOGRAPHS	
APPENDIX B. TEST RESULTS	
APPENDIX C. TEST PLOTS	



REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
JR690725	Rev. 01	Initial issue of report	Dec. 06, 2016

SUMMARY OF TEST RESULT

Report Section	Description	Result
3.1	Frequency Tolerance	Pass
3.2	Occupied Bandwidth and Spread-spectrum Bandwidth / Spread Factor	Pass
3.3	Unwanted Emission Intensity	Pass
3.4	RF Output Power / Tolerance	Pass
3.5	Limitation of Collateral Emission of Receiver	Pass
3.6	Transmission Antenna Gain (EIRP Antenna Power)	NA
3.7	Transmission Radiation Angle Width (3dB Beam width)	NA
3.8	Radio Interference Prevention Capability	Pass
3.9	Hopping Frequency Dwell Time	Pass
3.10	Construction Protection Confirmation	Pass

1 General Description

1.1 Applicant

MITAC International Corp

Building B, No. 209, Sec.1, Nan Gang Rd., Nan Gang Dist., Taipei City 11568, Taiwan, R.O.C.

1.2 Manufacturer

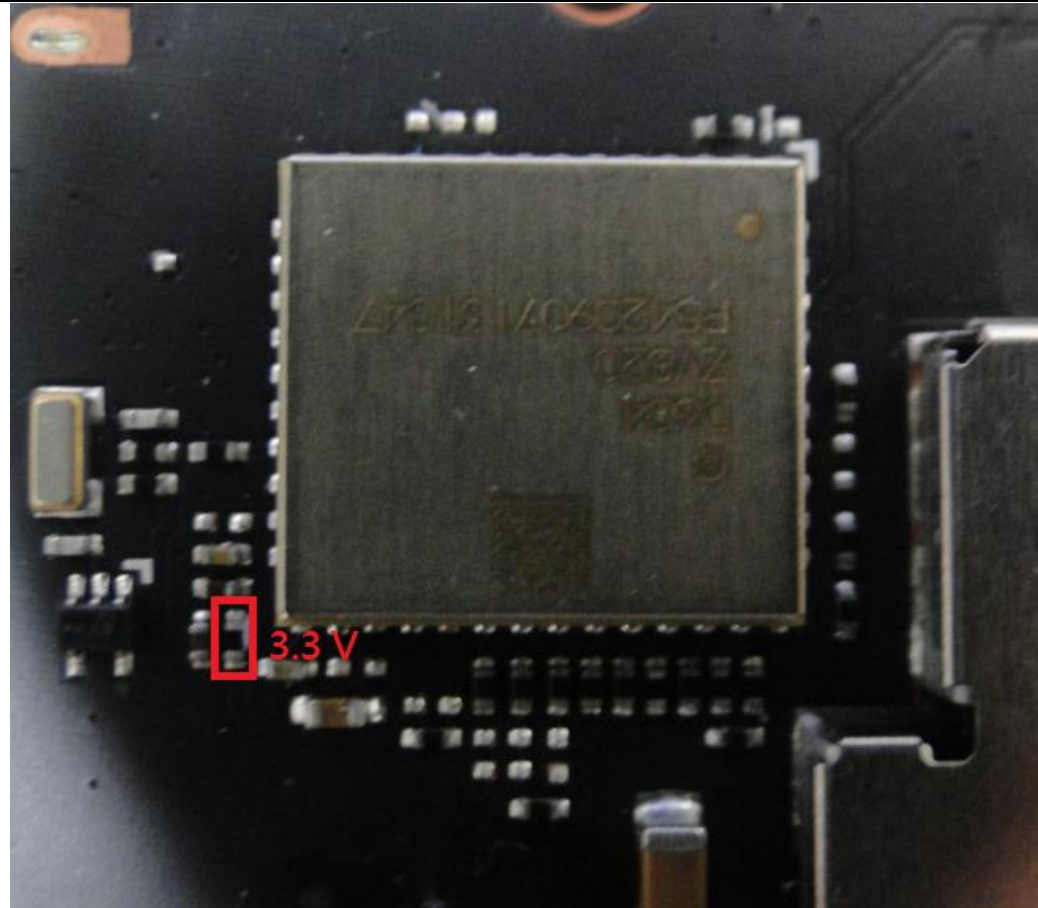
MITAC Computer (Kunshan) Co., Ltd.

No. 269, 2nd Avenue, District A, Comprehensive Free Trade Zone, 300 Kunshan, China

1.3 Feature of Equipment Under Test

Product Feature & Specification		
Model Name	AVIC-BX500	
Support Category / Frequency Range	Article 2-1-19 / 2400MHz ~ 2483.5MHz	
Type of Modulation	☐ Direct Spreading (DS) ☐ Orthogonal frequency-division multiplexing (OFDM) ☒ Frequency Hopping (FH) ☐ Other :GFSK	
Number of Channels	BR/EDR Mode	79
	AFH Mode	20
Channel Spacing	BR/EDR/AFH Mode	1MHz
Declaration RF Output Power	0.012 mW/MHz (2.4GHz_BT_BR) ; 0.012 mW/MHz (2.4GHz_BT_EDR) ; 0.048 mW/MHz (2.4GHz_BT_BR_AFH) ;	
Antenna Power (E.I.R.P)	-18.79 dBm/MHz (BR mode) -18.79 dBm/MHz (EDR mode) -12.77 dBm/MHz (BR_AFH mode)	
Modulation	☒ GFSK ☒ π/4-DQPSK ☒ 8-DPSK ☐ Other : FSK	
Power Source ^{NOTE}	☐ Commercial power	AC 100 ~ 240V
	☒ External Power Source	DC 14.4V
	☐ Lithium battery	DC 3.7V, mAh
	☐ UM battery	DC 1.2V

NOTE: When EUT be operated at $\pm 10\%$ from the normal supply voltage, the supply voltage of RF part was varied within $\pm 1\%$. All test cases were done under the normal supply voltage.

Power Supply voltage 14.4 Vdc (Nominal)	Power Supply voltage 15.84 Vdc (+10%)	Power Supply voltage 12.96 Vdc (-10%)
3.3	3.3	3.3
Measurement point		
		

Antenna Information		
Main Antenna	Antenna Type : PIFA	Antenna Gain : 0.42 dBi

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Modification of EUT

No modifications are made to the EUT during all test items.

1.5 Testing Site

Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C. TEL: +886-3-3273456 / FAX: +886-3-3284978
Test Site No.	Sporton Site No.: TH02-HY

Test Items	Uncertainty	Remark
Occupied Channel Bandwidth	$\pm 0.49 \%$	Confidence 95%
RF output power, conducted	$\pm 0.61 \text{ dB}$	Confidence 95%
Power density, conducted	$\pm 0.60 \text{ dB}$	Confidence 95%
Temperature	$\pm 0.8 \text{ }^{\circ}\text{C}$	Confidence 95%
Humidity	$\pm 3 \%$	Confidence 95%
Time	$\pm 0.33 \%$	Confidence 95%

1.6 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ Article 49-20 and the relevant articles of the Ordinance Regulating Radio Equipment

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. The measurement was implemented in accordance with MIC Notice No. 88 Appendix No. 43.

1.7 Ancillary Equipment List

None.

2 Test Configuration of Equipment Under Test

2.1 Carrier Frequency Channel

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	27	2429	54	2456
1	2403	28	2430	55	2457
2	2404	29	2431	56	2458
3	2405	30	2432	57	2459
4	2406	31	2433	58	2460
5	2407	32	2434	59	2461
6	2408	33	2435	60	2462
7	2409	34	2436	61	2463
8	2410	35	2437	62	2464
9	2411	36	2438	63	2465
10	2412	37	2439	64	2466
11	2413	38	2440	65	2467
12	2414	39	2441	66	2468
13	2415	40	2442	67	2469
14	2416	41	2443	68	2470
15	2417	42	2444	69	2471
16	2418	43	2445	70	2472
17	2419	44	2446	71	2473
18	2420	45	2447	72	2474
19	2421	46	2448	73	2475
20	2422	47	2449	74	2476
21	2423	48	2450	75	2477
22	2424	49	2451	76	2478
23	2425	50	2452	77	2479
24	2426	51	2453	78	2480
25	2427	52	2454	-	-
26	2428	53	2455	-	-

2.2 EUT Operation Test Setup

The equipment under test (EUT) was linked with Bluetooth simulator or operated by commands in order to make the EUT into the engineering modes for transmitting, receiving signals continuously, and hopping mode.

3 Test Result

3.1 Frequency Tolerance Measurement

3.1.1 Limit

Item	Limits
Frequency Tolerance	$\leq \pm 50\text{ppm}$

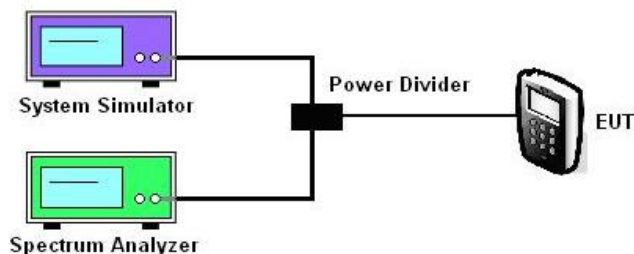
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedure

1. Frequency accuracy of instrument shall be less than 10% of limits tolerance (5ppm).
2. Three testing methods
 - a. Measure frequency tolerance by the system simulator.
 - b. CW Tone method
 - i. Setting of SA is following as: RBW:1kHz / VBW:30kHz.
 - ii. Maker Max. level to get measuring frequency f.
 - c. 10dB down method
 - i. Setting of SA is following as: RBW:30kHz / VBW: 30kHz / Trace: MaxHold
 - ii. Display line Level = Max. level – 10dB to place two markers, highest(fH) and lowest(fL) frequency
 - iii. Determine measuring frequency $f = (fH - fL)/2$
3. The frequency tolerance test case is directly measured using the frequency accuracy function of Bluetooth tester or spectrum analyzer. Then the frequency error formula is $(f - f_c)/f_c \times 10^6$ ppm and the limit is less than $\pm 50\text{ppm}$.

3.1.4 Test Setup



3.1.5 Test Result of Frequency Tolerance

Please refer to Appendix B.

3.2 Occupied Bandwidth and Spread-spectrum Bandwidth / Spread Factor Measurement

3.2.1 Limit

Item	Limits
Occupied Band Width	$\leq 83.5\text{MHz}$ (FH)
	$\leq 26\text{MHz}$ (OFDM, DS and Others)
Spreading Bandwidth	$\geq 500\text{ kHz}$ (FH, DS)

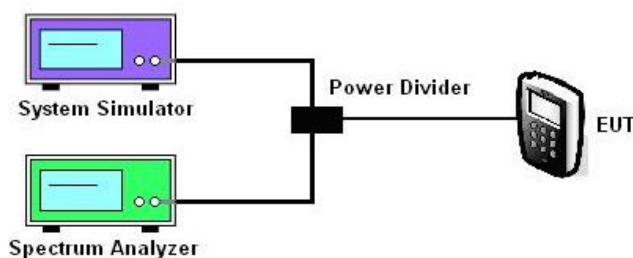
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. Setting of SA is following as: RBW $\leq 3\%$ of bandwidth / VBW = RBW / Sweep Mode: Continuous sweep / Detect mode: Positive peak / Trace mode: Max hold.
2. EUT have transmitted each modulation signal and fixed channelize (For DSSS or OFDM Device) or continuous maximum power of hopping mode (For FHSS Device). SA set to 99% of occupied bandwidth to measure occupied bandwidth. The limit is less than 26MHz (For DSSS or OFDM Device) or 83.5MHz (For FHSS Device).
3. SA set to 90% of occupied bandwidth to measure Spread Spectrum Bandwidth and must greater than 500kHz.
4. Spread Spectrum Factor = Spread Spectrum Bandwidth / modulation rate of EUT.
5. Spread Spectrum Factor limit is greater than 5.

3.2.4 Test Setup



3.2.5 Test Result of Occupied Bandwidth and Spread-spectrum Bandwidth / Spread Factor Measurement

Please refer to Appendix B.

3.3 Unwanted Emission Intensity Measurement

3.3.1 Limit

Item	Limits
Tx Spurious Emission	$\leq 2.5 \mu\text{W}$ ($2387\text{MHz} > f ; 2496.5\text{MHz} < f$)
	$\leq 25 \mu\text{W}$ ($2387\text{MHz} \leq f < 2400\text{MHz}$) and ($2483.5\text{MHz} < f \leq 2496.5\text{MHz}$)

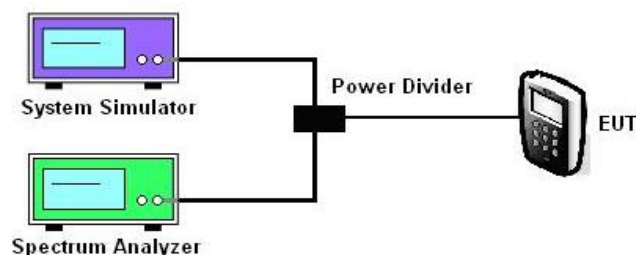
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

1. EUT have transmitted the maximum power and fixed channelize.
2. Setting of SA is following as: RBW:1MHz / VBW:1MHz above 1GHz, Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak / Trace mode: Max hold.
3. Setting of SA is following as: RBW:100KHz / VBW:100KHz under 1GHz, Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak / Trace mode: Max hold.
4. Setting of SA is following as 30MHz and stop frequency 2387MHz Then to mark peak reading value + cable loss shall be less than 2.5 μW .
5. SA adjusted to start frequency 2387MHz and stop frequency 2400MHz. Then to mark peak reading value + cable loss shall be less than 25 μW .
6. SA adjusted to start frequency 2483.5MHz and stop frequency 2496.5MHz Then to mark peak reading value + cable loss shall be less than 25 μW .
7. SA adjusted to start frequency 2496.5MHz and stop frequency 12500MHz Then to mark peak reading value + cable loss shall be less than 2.5 μW .
8. If the Result_Value is over the requirement, take total sum of 1MHz band centered at the spur frequency like ACLP measurement as Result_Value.

3.3.4 Test Setup



3.3.5 Test Result of Unwanted Emission Intensity

Please refer to Appendix B.

3.4 RF Output Power / Tolerance

3.4.1 Limit

Item	Limits
Antenna Power Density	$\leq 3\text{mW/MHz}$ (FH form 2400~2483.5MHz)
	$\leq 10\text{mW/MHz}$ (OFDM,DS from 2400~2483.5MHz)
	$\leq 10\text{mW}$ (Other from 2400~2483.5MHz)
Antenna Power Error	+20%, -80% (Base on manufacturer declare antenna power density)

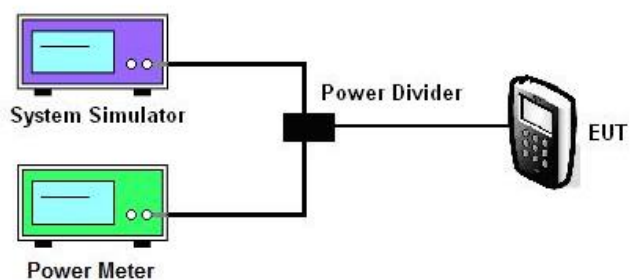
3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

3.4.3 Test Procedures

1. EUT have transmitted continuous maximum power on hopping mode (For FHSS Device).
2. Frequency hopping system or combined systems of direct spread and frequency hopping:
 - i. Connect the high frequency power meter to the output of the attenuator and measure the total power (without bandwidth limitation)
 - ii. Divide the total power by the spread bandwidth to find the “average” power per MHz.
The average power per MHz is equal to the power meter value dBm + cable loss dB + $10 \log_{10} (1/\text{Duty Cycle})$ dB + $10 \log_{10} (1/\text{Spread Bandwidth})$ dB.
 - iii. Confirm that frequency distribution of the hopping frequencies is homogeneous according to the supporting data.
If frequency distribution of the frequencies is not homogeneous, consider other measurement or correction methods based on the supporting data.
 - iv. Set the antenna power as follows:
 - Continuous waves: value in ii.
3. Antenna RF Output Power Tolerance is definition that actual measure antenna power tolerance between + 20% to - 80% power range that manufacturer declare the conducted power density.

3.4.4 Test Setup



3.4.5 Test Result of RF Output Power / Tolerance

Please refer to Appendix B.

3.5 Limitation of Collateral Emission of Receiver Measurement

3.5.1 Limit

Item	Limits
Rx Spurious Emission	$\leq 4\text{nW}$ ($f < 1\text{GHz}$)
	$\leq 20\text{nW}$ ($1\text{GHz} \leq f$)

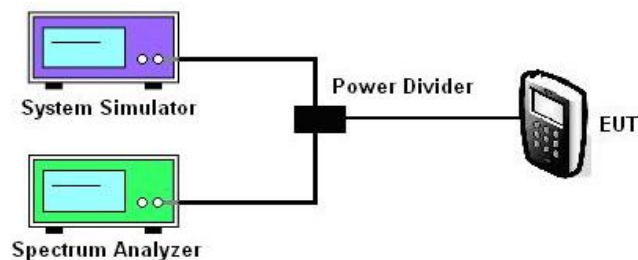
3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

3.5.3 Test Procedures

1. EUT have the continuous reception mode and fixed only one channelize.
2. SA set RBW: 100KHz and VBW: 100KHz. Then adjust to start frequency 30MHz and stop frequency 1GHz. Search to mark peak reading value + cable loss shall be less than 4nW.
3. SA set RBW: 1MHz and VBW: 1MHz. Then adjust to start frequency 1000MHz and stop frequency 12.5GHz. Search to mark peak reading value + cable loss shall be less than 20nW.
4. If power level of lower emissions are more than 1/10 of limit (.0.4nW for $f < 1\text{GHz}$, 2nW for $f \geq 1\text{GHz}$), all those are to be indicated in the 2nd and 3rd lines. If others are 1/10 or less more of the limit, no necessary to be indicated.

3.5.4 Test Setup



3.5.5 Test Result of Limitation of Collateral Emission of Receiver

Please refer to Appendix B.

3.6 Transmission Antenna Gain (EIRP Antenna Power) Measurement

3.6.1 Limit

Item	Limits
EIRP Power Density	$\leq 6.91\text{dBm/MHz}$ (FH form 2400~2483.5MHz)
	$\leq 12.14\text{dBm/MHz}$ (OFDM,DS from 2400~2483.5MHz)
	$\leq 12.14\text{dBm}$ (Other from 2400~2483.5MHz)
Remark: This test item will not be applied to EIRP power of EUT is lower than 12.14dBm/MHz.	

3.6.2 Measuring Instruments

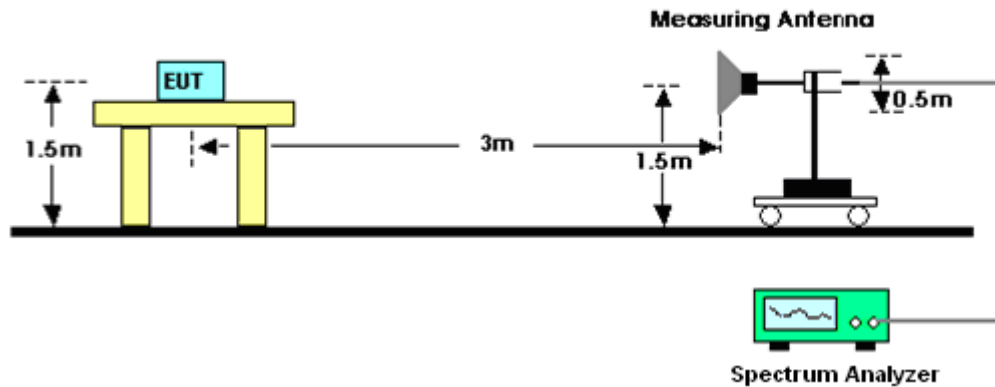
See list of measuring instruments of this test report.

3.6.3 Test Procedures

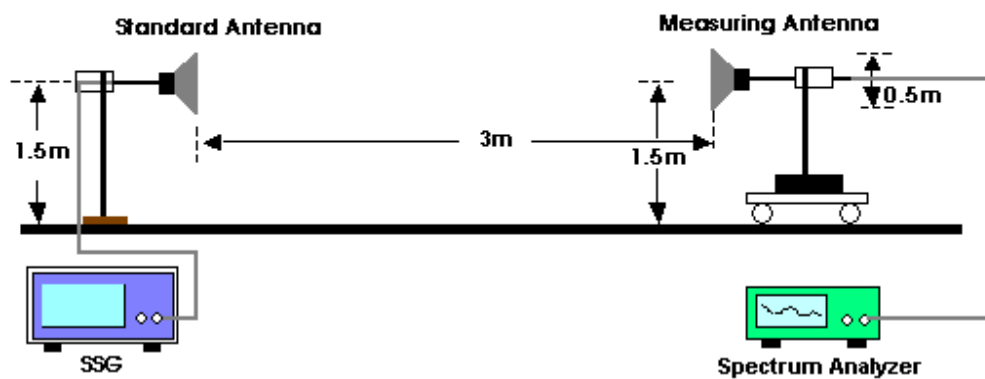
1. Set EUT ad measuring antenna at the same height and roughly facing each other.
2. Move the measuring antenna height up and down within $\pm 50\text{cm}$ of EUT height and swing it to find the maximum output of the measuring antenna. The output level at the spectrum analyzer is read as "E".
3. Remove the EUT from the turn table and put the replacing antenna facing to measuring antenna at same height. Set the standard signal generator (SSG) at same frequency and transmit on then receive the signal.
4. Swing the replacing antenna give a maximum receiving level.
5. Move the measuring antenna height up and down within $\pm 50\text{cm}$ of replacing antenna height and swing it to find the maximum receiving level.
6. Set SSG output power at Pt to give the equivalent output level of "E" or calculate Pt with SSG output which gives the nearest of "E" and difference ($\pm 1\text{dB}$). Record the Pt.
7. Calculate EIRP by the formula below $\text{EIRP} = G_t - L + P_t$.
 Gt: gain of replacing antenna (dBi)
 L: feeder loss between SSG and replacing antenna
 Pt: Output power of the SSG
8. If the antenna for the EUT has circular polarization, sum of V-field and H-field will be result if measuring antenna is linear polarization.

3.6.4 Test Setup

<For EUT radiation measurement>



<For standard antenna measurement>



3.6.5 Test Result of Transmission Antenna Gain (EIRP Antenna Power)

Please refer to Appendix B. For the antenna gain, please refer to antenna test report.

Remark: This test item will not be applied to EIRP power of EUT is lower than 12.14dBm/MHz.

3.7 Transmission Radiation Angle Width (3dB Beamwidth) Measurement

3.7.1 Limit

Item	Limits
3dB antenna beamwidth	360/A (If $A < 1$; then $A = 1$) $A = \{\text{EIRP Power [mW]} / 16.36 \text{ for DS, OFDM}\}$ or $A = \{\text{EIRP Power [mW]} / 4.9 \text{ for FH}\}$
Remark: This test item will not be applied to EIRP power of EUT is lower than 12.14dBm/MHz.	

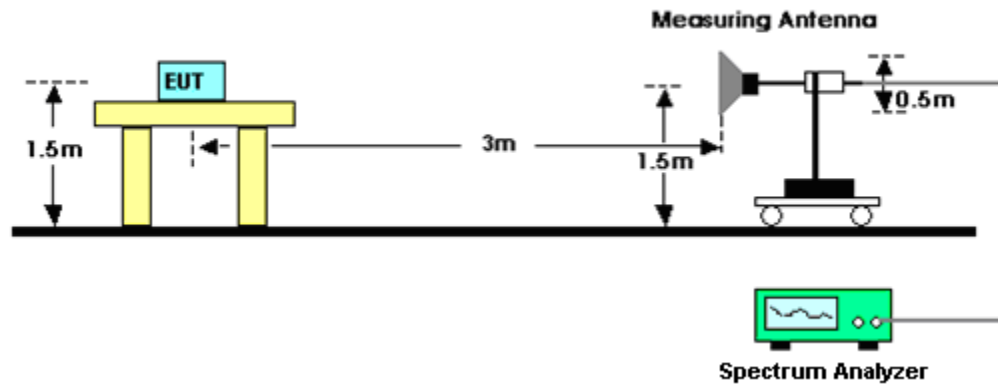
3.7.2 Measuring Instruments

See list of measuring instruments of this test report.

3.7.3 Test Procedures

1. Set EUT and measuring antenna at the same height and roughly facing each other.
2. Set spectrum analyzer with condition in section 3.7.2 and tune reference level to observe receiving signal position.
3. Rotate directions of the EUT horizontally and vertically to find the maximum receiving power.
4. Move the measuring antenna height up and down within $\pm 50\text{cm}$ of EUT height and swing it to find the maximum output of measuring antenna. The output level at the spectrum analyzer is read as "E".
5. Calculate permitted radiation angle in horizontal and vertical using EIRP measured in another test method.
6. Calculate 3dB antenna beam width by the formula below $360/A$ (If $A < 1$; then $A = 1$).
 $A = \{\text{EIRP Power [mW]} / 16.36 \text{ for DS, OFDM}\}$ or
 $A = \{\text{EIRP Power [mW]} / 4.9 \text{ for FH}\}$

3.7.4 Test Setup



3.7.5 Test Result of Transmission Radiation Angle Width (3dB Beamwidth)

Please refer to Appendix B.

For the antenna gain, please refer to antenna test report.

Remark: This test item will not be applied to EIRP power of EUT is lower than 12.14dBm/MHz.

3.8 Radio Interference Prevention Capability Measurement

3.8.1 Limit

Item	Limits
Identification code	$\geq$ 48 bits

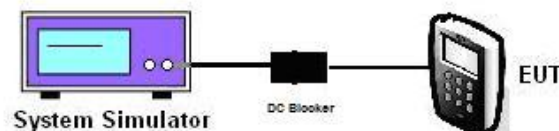
3.8.2 Measuring Instruments

See list of measuring instruments of this test report.

3.8.3 Test Procedures

1. In the case that the EUT has the function of automatically transmitting the identification code: a. Transmit the predetermined identification codes form EUT. b. Check the transmitted identification codes with the demodulator.
2. In the case of receiving the identification code: a. Transmit the predetermined identification codes form the counterpart. b . Check if communication is normal. c. Transmit the signals other than predetermined ID codes form the counterpart. d. check if the EUT stops the transmission, or if it displays that identification codes are different from the predetermined ones.

3.8.4 Test Setup



3.8.5 Test Result of Radio Interference Prevention Capability

Please refer to Appendix B.

3.9 Hopping Frequency Dwell Time Measurement

3.9.1 Limit

Item	Limits
Hopping Freq. Dwell Time	≤ 0.4 seconds

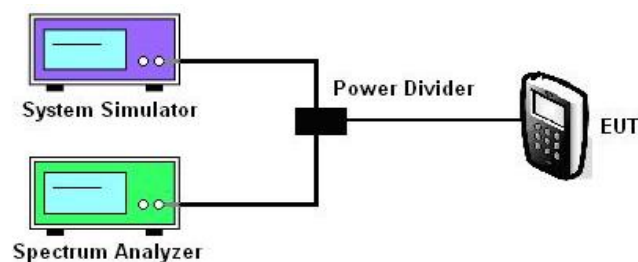
3.9.2 Measuring Instruments

See list of measuring instruments of this test report.

3.9.3 Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. Set RBW of spectrum analyzer to 1MHz and VBW to 1MHz.
3. Use a video trigger with the trigger level set to enable triggering only on full pulses.
4. Sweep Time is more than once pulse time.
5. Set the center frequency on any frequency would be measured and set the frequency span to zero span.
6. Measure the maximum time duration of one single pulse.
7. Set the EUT in continuous transmitting for each supported maximum packet format.
8. Measure the maximum time duration of one single pulse.
9. Use the marker-delta function to calculate the dwell time.
10. Dwell Time = Total Number of channels x 0.4(s) x Average Hopping Channel x package transfer time
11. Average Hopping Channel = Total Number of hopping / sweep time

3.9.4 Test Setup



3.9.5 Test Result of Hopping Frequency Dwell Time

Please refer to Appendix B.

3.10 Construction Protection Confirmation Method

3.10.1 Limit

The high-frequency section and modulation section of the radio equipment except for the antenna system shall not be capable of being opened easily.

3.10.2 Confirmation Method

☐	Sealed with special screws.
☐	Plastic chassis is being welded using ultrasonic waves.
☐	Chassis is glued using a special adhesive.
☐	Metal covers are spot-fused.
☐	Cover is specially interlocked.
☒	RF and Modulation components are covered with shielding case and this shielding case is soldered.
☐	Shield case is welded at RF and modulation parts, and ID-ROM is welded using the BGA Method.
☐	Shield case is welded at RF and modulation parts, and ID-ROM is glued at its lead with a special adhesive.
☐	Shield case is welded at RF and modulation parts, and ID-ROM is glued with a non-transparent laminating agent.
☐	Other :

3.10.3 The Photos of Construction Protection



4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Test Periods	Due Date	Calibration Body	Calibration Method
Spectrum Analyzer	Rohde & Schwarz	FSV 30	100895	Apr. 27, 2016	Nov. 09, 2016~ Nov. 10, 2016	Apr. 26, 2017	Rohde & Schwarz	C
Power Meter	Agilent	E4416A	GB41292344	Jan. 08, 2016	Nov. 09, 2016~ Nov. 10, 2016	Jan. 07, 2017	ETC, R.O.C	C
Power Sensor	Agilent	E9327A	US40441548	Jan. 07, 2016	Nov. 09, 2016~ Nov. 10, 2016	Jan. 06, 2017	ETC, R.O.C	C
BT Base Station	Rohde & Schwarz	CBT	101136	Sep. 21, 2016	Nov. 09, 2016~ Nov. 10, 2016	Sep. 20, 2017	ETC, R.O.C	C
Programmable Power Supply	GW Instek	PSS-2005	EL890089	Jan. 18, 2016	Nov. 09, 2016~ Nov. 10, 2016	Jan. 17, 2017	GW Instek	C
Multimeter	YFE	YF-303	1317563	Jan. 05, 2016	Nov. 09, 2016~ Nov. 10, 2016	Jan. 04, 2017	ETC , R.O.C	C

Note: Above test equipment was used and kept valid calibration period during test.

Calibration Method :

a) : Calibration conducted by the National Institute of Information and Communications Technology~
NICT~ or a designated calibration agency under Article 102-18 paragraph

(1) TELEC Engineering Center, Intertek Japan K.K., Keysight Technologies, Inc~.

b) : Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Law (Law No. 51 of 1992)~Japan Calibration Service Syste~

c) : Calibration conducted in foreign countries, which shall be equivalent to the calibration conducted by the NICT or a designated calibration agency under Article 102-18 paragraph

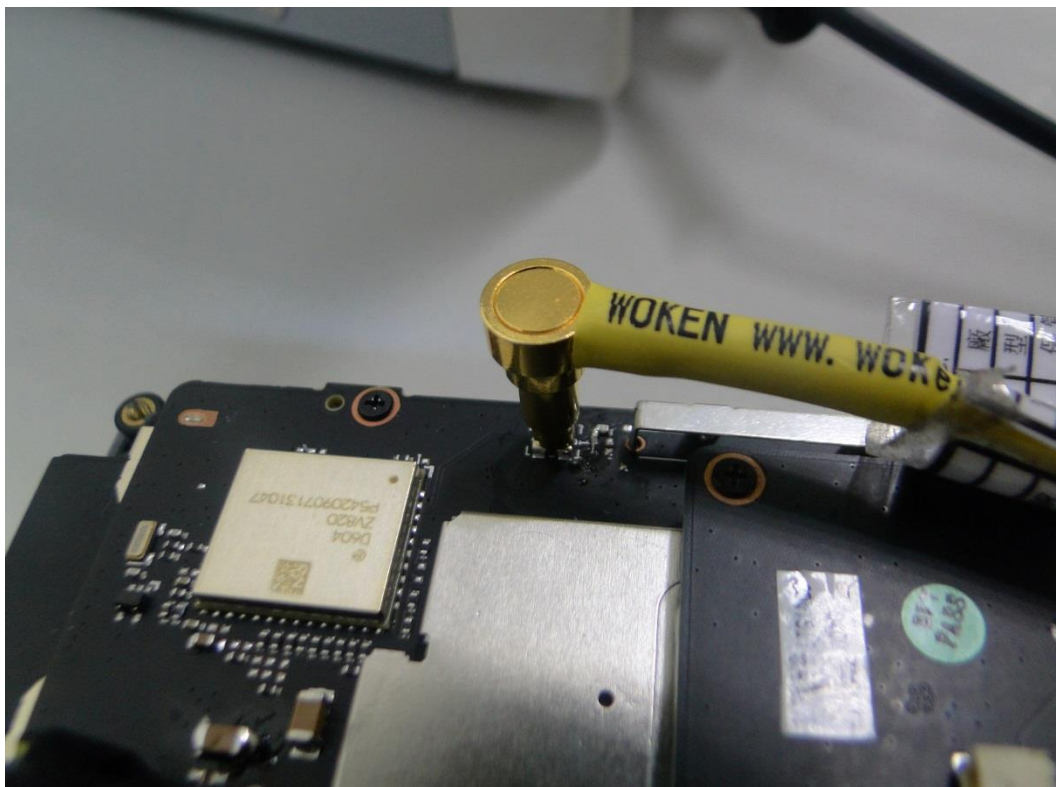
(1)~ TELEC Engineering Center, Intertek Japan K.K., Keysight Technologies, Inc~.

Appendix A. Setup Photographs

Front View



Near View





Appendix B. Test Results

Please refer to the following pages for test results.

1. TEST RESULTS DATA **BLUETOOTH - BR**

Environment of Test Room	Temperature	20~22 °C
	Humidity	50~52 %
Test Engineer	Kenny Chen	

Modulatoin Type :	GFSK
Type Emissions :	78M1F1D

Declaration Output Power	0.012	mW/MHz
Declaration Output Power	-19.21	dBm/MHz
Antenna Power (E.I.R.P)	-18.79	dBm/MHz
Input Power Voltage	14.400	Vdc

Path Loss		23.50	dB
Burst	ON TIME	2.884	msec
	OFF TIME	0.870	msec
	Ratio	76.84	%
Packet Type (Mode)		DH5	mode

Antenna Information:

Antenna Model	Antenna Type	Gain(dBi)
Metal Antenna	PIFA	0.42

1.1. Test Results (Normal Voltage)

Measurement Frequency	MHz	2402	2441	2480	Limit	Result			Note
Channel Number	Ch.	0	39	78		0	39	78	
Reading Frequency	MHz	2401.968	2440.971	2479.971		-----	-----	-----	
Frequency Tolerance	ppm	-13.239	-11.860	-11.673	±50	PASS	PASS	PASS	

Occupied Bandwidth	MHz	78.15	83.5	PASS	
Spread Bandwidth	MHz	70.91	0.5	PASS	
RF Output Power	mW/MHz	0.011	-----	-----	-----
RF Output Power Tolerance	%	-10.97	-80~+20	PASS	
Output Power (With burst ratio)	dBm	-1.21	-----	-----	-----

Unwanted Emission Intensity	Under 2387MHz	μW/MHz	0.03648	0.03475	0.03090	2.5	PASS	PASS	PASS	
		MHz	980.165	560.004	416.652		-----	-----	-----	
	2387MHz - 2400MHz	μW/MHz	0.11350	0.01963	0.02009	25	PASS	PASS	PASS	
		MHz	2399.990	2392.967	2387.393		-----	-----	-----	
	2483.5MHz - 2496.5MHz	μW/MHz	0.02061	0.02143	0.01986	25	PASS	PASS	PASS	
		MHz	2490.656	2484.497	2491.221		-----	-----	-----	
	2496.5MHz - 12.5GHz	μW/MHz	0.03990	0.03548	0.03631	2.5	PASS	PASS	PASS	
		MHz	6036.885	6789.073	6756.065		-----	-----	-----	
Limitation of Collateral Emission of Receiver	Under 1GHz	nW	0.017	0.018	0.022	4	PASS	PASS	PASS	
		MHz	946.219	950.486	908.490		-----	-----	-----	
	1 -12.5GHz	nW	0.232	0.214	0.219	20	PASS	PASS	PASS	
		MHz	6995.313	6837.201	6987.647		-----	-----	-----	

Spread Factor	-----	70.91	5	PASS	
Dwell Time	mSec	252.15	400	PASS	
Radio Interference Prevention Capability	-----	good		PASS	

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2. TEST RESULTS DATA **BLUETOOTH - EDR**

Environment of Test Room	Temperature	20~22 °C
	Humidity	50~52 %
Test Engineer	Kenny Chen	

Modulatoin Type :	8DPSK
Type Emissions :	78M7G1D

Declaration Output Power	0.012	mW/MHz
Declaration Output Power	-19.21	dBm/MHz
Antenna Power (E.I.R.P)	-18.79	dBm/MHz
Input Power Voltage	14.400	Vdc

Path Loss		23.50	dB
Burst	ON TIME	2.899	msec
	OFF TIME	0.855	msec
	Ratio	77.22	%
Packet Type (Mode)		3-DH5	mode

Antenna Information:

Antenna Model	Antenna Type	Gain(dBi)
Metal Antenna	PIFA	0.42

2.1. Test Results (Normal Voltage)

Measurement Frequency	MHz	2402	2441	2480	Limit	Result			Note
Channel Number	Ch.	0	39	78		0	39	78	
Reading Frequency	MHz	2401.974	2440.977	2479.977		-----	-----	-----	
Frequency Tolerance	ppm	-10.845	-9.484	-9.335	±50	PASS	PASS	PASS	

Occupied Bandwidth	MHz	78.44	83.5	PASS	
Spread Bandwidth	MHz	71.20	0.5	PASS	
RF Output Power	mW/MHz	0.011	-----	-----	-----
RF Output Power Tolerance	%	-8.25	-80~+20	PASS	
Output Power (With burst ratio)	dBm	-1.06	-----	-----	-----

Unwanted Emission Intensity	Under 2387MHz	μW/MHz	0.02985	0.02871	0.02904	2.5	PASS	PASS	PASS	
		MHz	883.369	975.898	963.774		-----	-----	-----	
	2387MHz - 2400MHz	μW/MHz	1.23310	0.01841	0.02576	25	PASS	PASS	PASS	
		MHz	2399.997	2394.059	2393.591		-----	-----	-----	
	2483.5MHz - 2496.5MHz	μW/MHz	0.02046	0.02270	0.02113	25	PASS	PASS	PASS	
		MHz	2490.903	2485.088	2486.537		-----	-----	-----	
	2496.5MHz - 12.5GHz	μW/MHz	0.03565	0.03467	0.03141	2.5	PASS	PASS	PASS	
		MHz	11763.316	6841.086	10705.051		-----	-----	-----	
Limitation of Collateral Emission of Receiver	Under 1GHz	nW	0.024	0.018	0.016	4	PASS	PASS	PASS	
		MHz	904.804	903.155	985.985		-----	-----	-----	
	1 -12.5GHz	nW	0.207	0.232	0.209	20	PASS	PASS	PASS	
		MHz	6995.313	11777.956	6979.023		-----	-----	-----	

Spread Factor	-----	71.20	5	PASS	
Dwell Time	mSec	262.57	400	PASS	3DH5
Radio Interference Prevention Capability	-----	good		PASS	

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3. TEST RESULTS DATA **BLUETOOTH - AFH BR**

Environment of Test Room	Temperature	20~22 °C
	Humidity	50~52 %
Test Engineer	Kenny Chen	

Modulatoin Type :	GFSK
Type Emissions :	20M0F1D

Declaration Output Power	0.048	mW/MHz
Declaration Output Power	-13.19	dBm/MHz
Antenna Power (E.I.R.P)	-12.77	dBm/MHz
Input Power Voltage	14.400	Vdc

Path Loss		23.50	dB
Burst	ON TIME	2.884	msec
	OFF TIME	0.870	msec
	Ratio	76.84	%
Packet Type (Mode)		DH5	mode

Antenna Information:

Antenna Model	Antenna Type	Gain(dBi)
Metal Antenna	PIFA	0.42

3.1. Test Results (Normal Voltage)

Measurement Frequency	MHz	2402	2411	2421	Limit	Result			Note
Channel Number	Ch.	0	9	19		0	9	19	
Reading Frequency	MHz	2401.965	2410.965	2420.968		-----	-----	-----	
Frequency Tolerance	ppm	-14.446	-14.392	-13.135	±50	PASS	PASS	PASS	

Occupied Bandwidth	MHz	19.97	83.5	PASS	
Spread Bandwidth	MHz	18.23	0.5	PASS	
RF Output Power	mW/MHz	0.042	-----	-----	-----
RF Output Power Tolerance	%	-13.44	-80~+20	PASS	
Output Power (With burst ratio)	dBm	-1.21	-----	-----	-----

Unwanted Emission Intensity	Under 2387MHz	μW/MHz	0.03076	0.02891	0.03334	2.5	PASS	PASS	PASS	
		MHz	952.135	985.209	972.309		-----	-----	-----	
	2387-2400MHz	μW/MHz	0.22699	0.01862	0.01710	25	PASS	PASS	PASS	
		MHz	2399.750	2398.964	2396.287		-----	-----	-----	
	2483.5-2496.5MHz	μW/MHz	0.02094	0.02239	0.02138	25	PASS	PASS	PASS	
		MHz	2483.874	2495.860	2485.485		-----	-----	-----	
	2496.5MHz - 12.5GHz	μW/MHz	0.03499	0.03954	0.03707	2.5	PASS	PASS	PASS	
		MHz	11974.369	6823.081	6996.125		-----	-----	-----	
Limitation of Collateral Emission of Receiver	Under 1GHz	nW	0.018	0.020	0.019	4	PASS	PASS	PASS	
		MHz	840.111	690.455	901.1184		-----	-----	-----	
	1 -12.5GHz	nW	0.219	0.261	0.230	20	PASS	PASS	PASS	
		MHz	6748.083	6994.355	11887.197		-----	-----	-----	

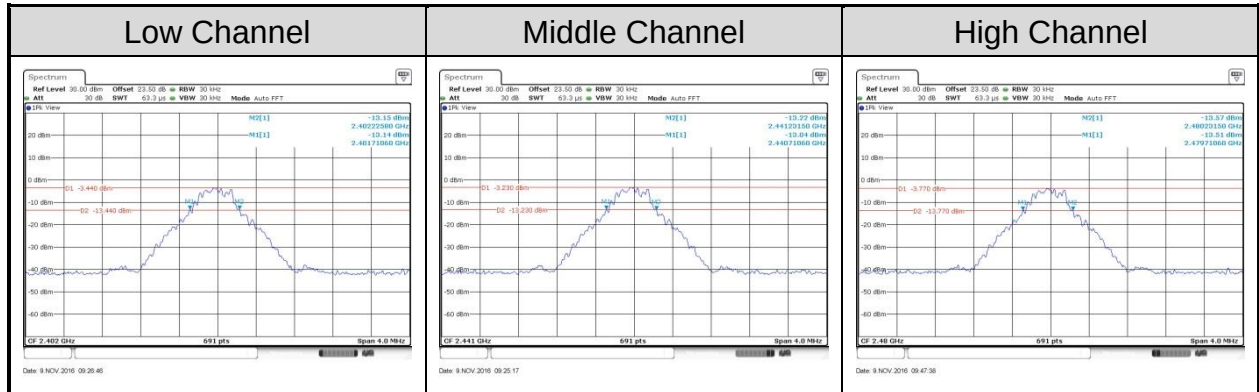
Spread Factor	-----	18.23	5	PASS	
Dwell Time	mSec	252.15	400	PASS	
Radio Interference Prevention Capability	-----	good		PASS	

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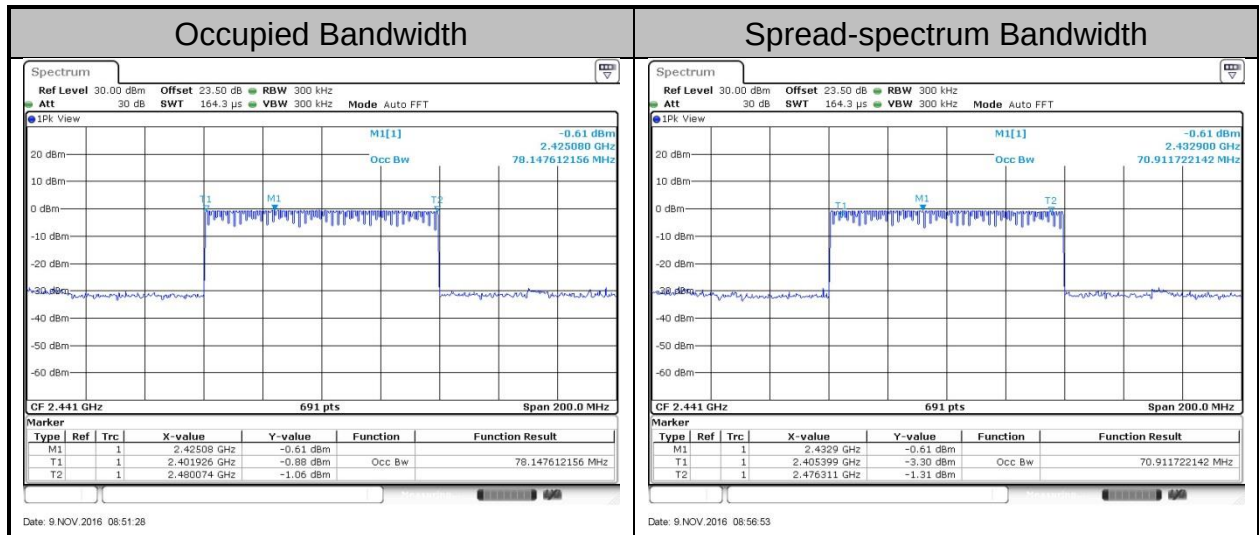
Appendix C. Test Plots

C.1. BR (Basic Rate)

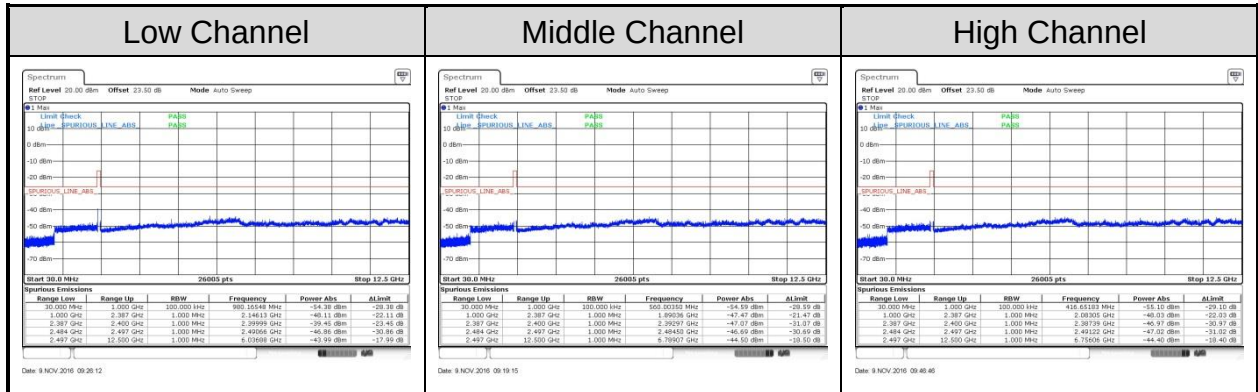
C.1.1. Frequency Tolerance



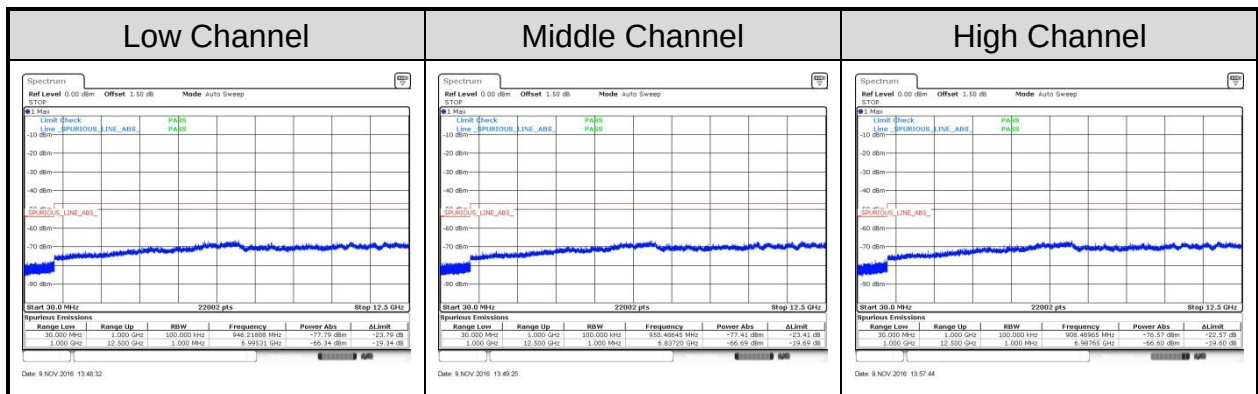
C.1.2. Occupied Bandwidth and Spread-spectrum Bandwidth



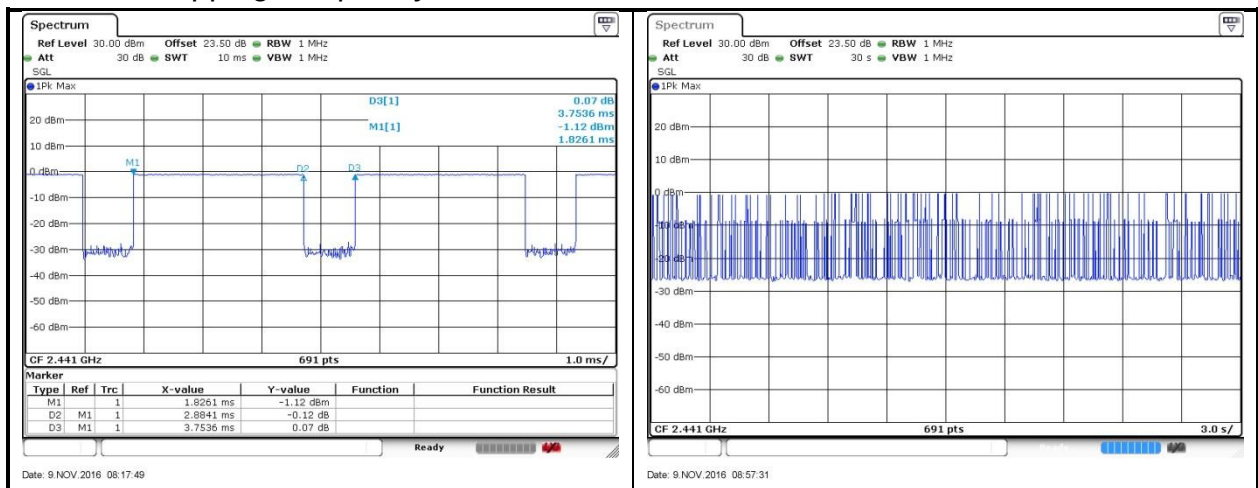
C.1.3. Unwanted Emission Intensity



C.1.4. Limitation of Collateral Emission of Receiver

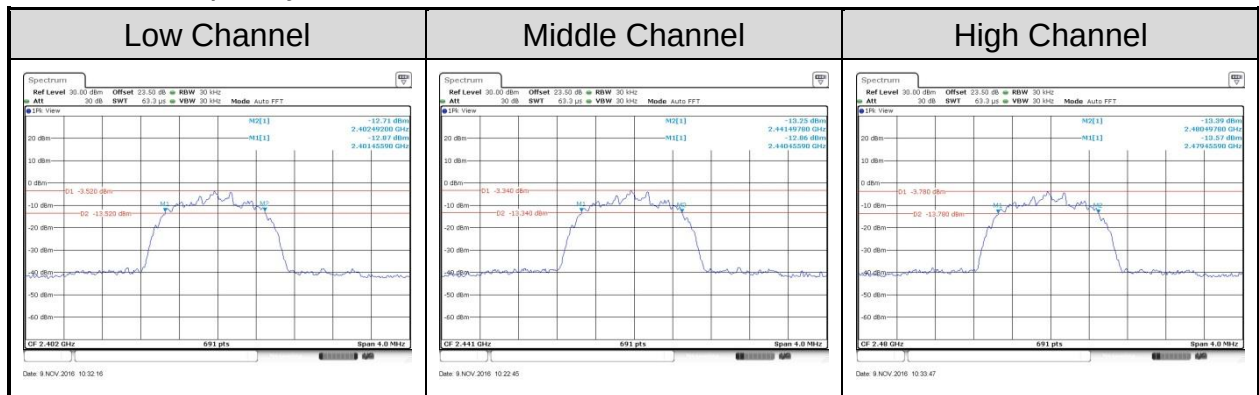


C.1.5. Hopping Frequency Dwell Time

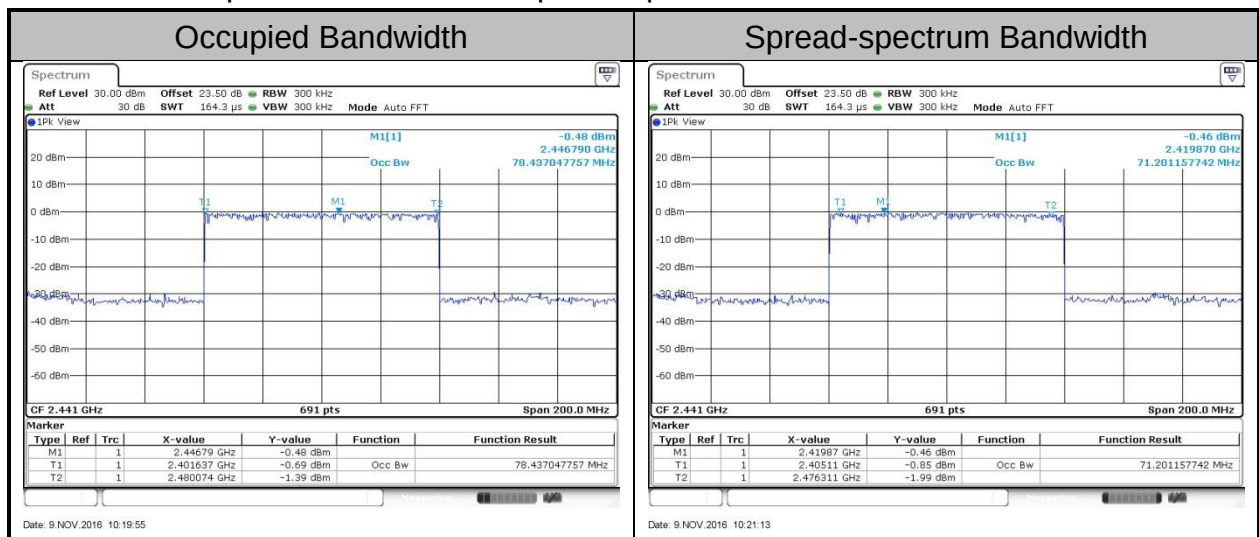


C.2. EDR (Enhanced Data Rate)

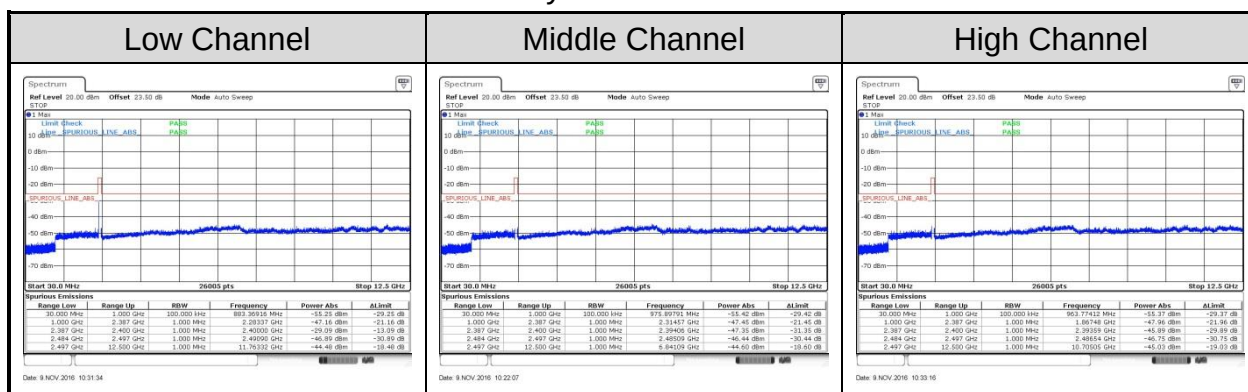
C.2.1. Frequency Tolerance



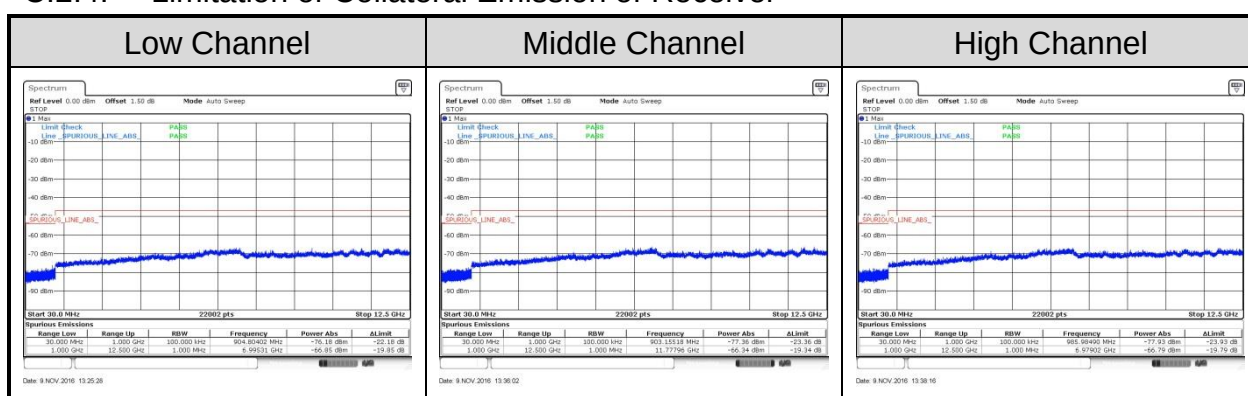
C.2.2. Occupied Bandwidth and Spread-spectrum Bandwidth



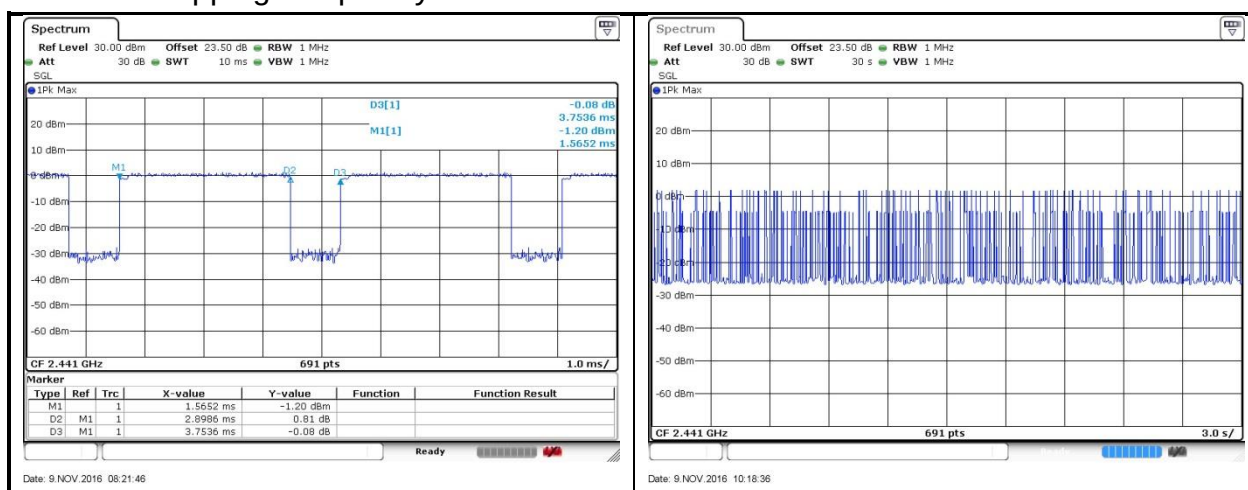
C.2.3. Unwanted Emission Intensity



C.2.4. Limitation of Collateral Emission of Receiver

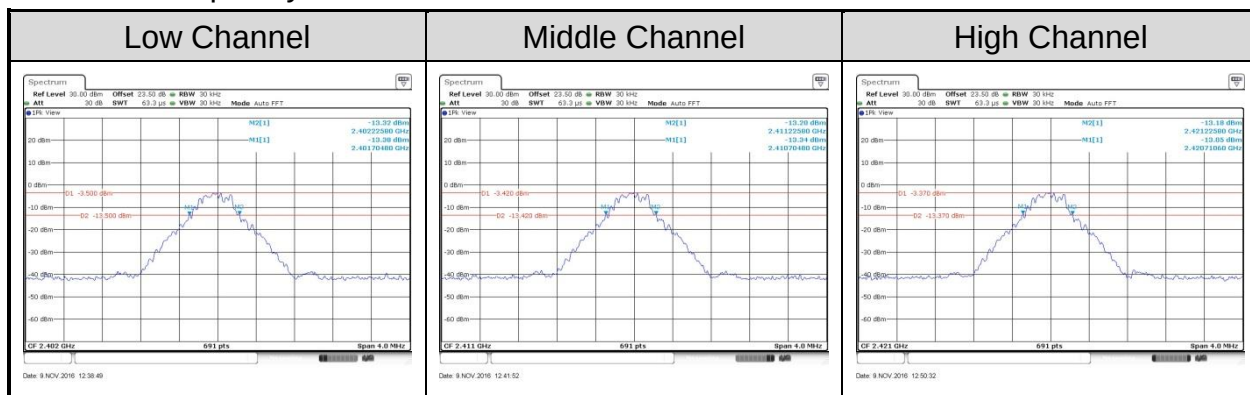


C.2.5. Hopping Frequency Dwell Time

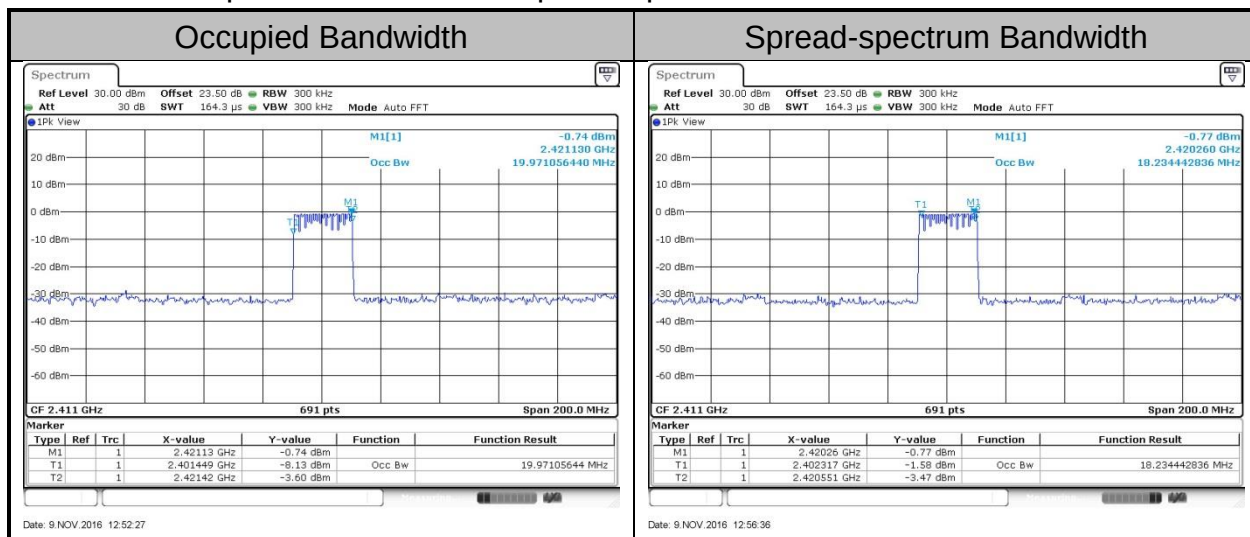


C.3. BR_AFH (Adaptive Frequency Hopping)

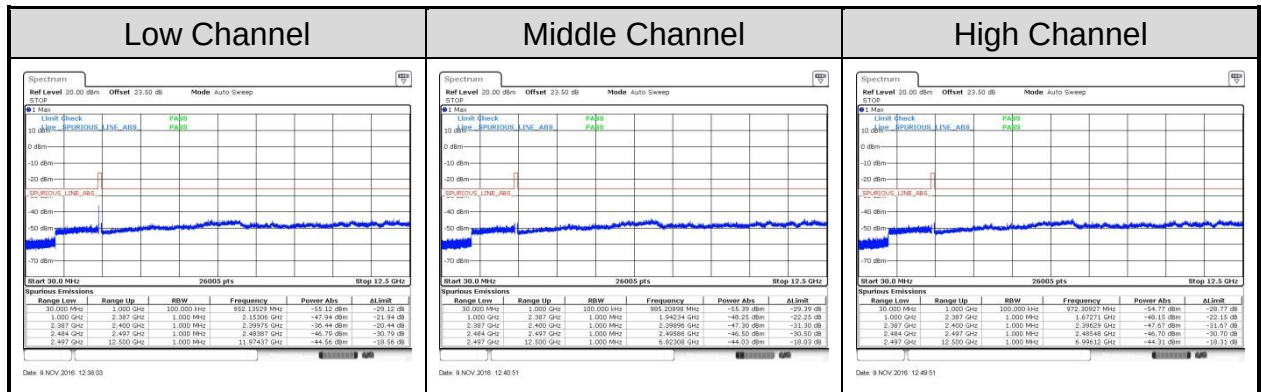
C.3.1. Frequency Tolerance



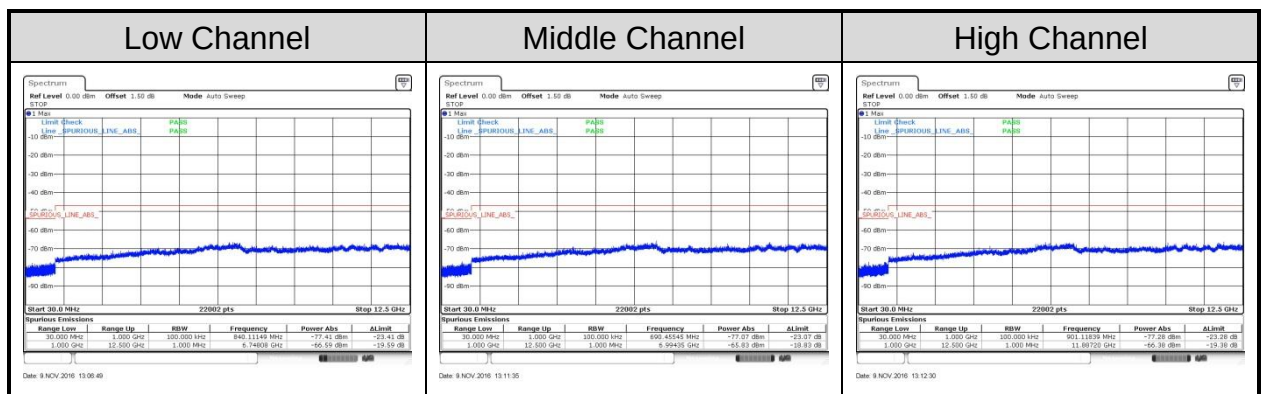
C.3.2. Occupied Bandwidth and Spread-spectrum Bandwidth



C.3.3. Unwanted Emission Intensity



C.3.4. Limitation of Collateral Emission of Receiver



C.3.5. Hopping Frequency Dwell Time

