

Report No.: SHEM210200120403

Page: 1 of 63

TEST REPORT

 Application No.:
 SHEM2102001204CR

 FCC ID:
 2AP42-WH12068

 IC:
 24006-WH12068

Applicant: WWZN Information Technology Company Limited

Address of Applicant: Room -101, B1 Floor, Building 1, No.42, Gaolianggiao Xiejie, Haidian

District, Beijing, China

Manufacturer: WWZN Information Technology Company Limited

Address of Manufacturer: Room -101, B1 Floor, Building 1, No.42, Gaoliangqiao Xiejie, Haidian

District, Beijing, China

Factory: Luxshare Electronic Technology (Kunshan) Co.,Ltd.

Address of Factory: No.158 Jinchang Road, Jinxi Town, Kunshan City, Jiangsu, China

Equipment Under Test (EUT):

EUT Name: Smart watch
Model No.: WH12068
Trade mark: Mobvoi

Standard(s): 47 CFR Part 15, Subpart C 15.247

RSS-247 Issue 2, February 2017

RSS-Gen Issue 5 Amendment 2 (February 2021)

Date of Receipt: 2021-02-05

Date of Test: 2021-02-25 to 2021-03-04

Date of Issue: 2021-03-09

Test Result: Pass*

parlan 2han

Parlam Zhan E&E Section Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

检验检测专用章 Inspection & Testing Services SGS-CSTO Masks Dechnical Services Testing Center First Accompany Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at http://www.sgs.com/en/Terms-and-Conditions.aspx and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Document.aspx. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

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^{*} In the configuration tested, the EUT complied with the standards specified above.



Report No.: SHEM210200120403

Page: 2 of 63

Revision Record						
Version Description Date Remark						
00	Original	2021-03-09	1			

Authorized for issue by:		
	Vint-m	
	Vincent Zhu / Project Engineer	
	Darlam Zhan	
	Parlam Zhan / Reviewer	



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Report No.: SHEM210200120403

Page: 3 of 63

2 Test Summary

Radio Spectrum Technical Requirement						
Item	FCC Requirement	IC Requirement	Method	Result		
Antenna Requirement	47 CFR Part 15, Subpart C 15.203 & 15.247(c)	RSS-Gen Clause 6.8	N/A	Customer Declaration		

N/A: Not applicable

Radio Spectrum Mat	ter Part				
Item	FCC Requirement	IC Requirement	Method	Result	
Minimum 6dB Bandwidth	47 CFR Part 15, Subpart C 15.247a(2)	RSS-247 Clause 5.2(a)	ANSI C63.10 (2013) Section 11.8.1	Pass	
Conducted Average Output Power	47 CFR Part 15, Subpart C 15.247(b)(3)	RSS-247 Clause 5.4(d)	ANSI C63.10 (2013) Section 11.9.2	Pass	
Power Spectrum Density	47 CFR Part 15, Subpart C 15.247(e)	RSS-247 Clause 5.2(b)	ANSI C63.10 (2013) Section 11.10.3	Pass	
Conducted Band Edges Measurement	47 CFR Part 15, Subpart C 15.247(d)	RSS-247 Clause 5.5	ANSI C63.10 (2013) Section 11.13.3.2	Pass	
Conducted Spurious Emissions	47 CFR Part 15, Subpart C 15.247(d)	RSS-247 Clause 5.5	ANSI C63.10 (2013) Section 11.11	Pass	
Radiated Emissions which fall in the restricted bands	47 CFR Part 15, Subpart C 15.209 & 15.247(d)	RSS-247 Section 3.3 & RSS-Gen Section 8.9	ANSI C63.10 (2013) Section 6.10.5	Pass	
Radiated Spurious Emissions	47 CFR Part 15, Subpart C 15.209 & 15.247(d)	RSS-247 Section 3.3 & RSS-Gen Section 8.9	ANSI C63.10 (2013) Section 6.4,6.5,6.6	Pass	
99% Bandwidth	-	RSS-Gen Section 6.7	ANSI C63.10 Section 6.9.3	Pass	



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Report No.: SHEM210200120403

Page: 4 of 63

3 Contents

		Page
1	COVER PAGE	1
•	TECT CLIMMA DV	•
2	TEST SUMMARY	3
3	CONTENTS	4
4	GENERAL INFORMATION	5
4.1	DETAILS OF E.U.T	5
4.2		
4.3		
4.4	MEASUREMENT UNCERTAINTY	6
4.5	5 TEST LOCATION	7
4.6		
4.7		
4.8	ABNORMALITIES FROM STANDARD CONDITIONS	7
5	EQUIPMENT LIST	8
6	RADIO SPECTRUM TECHNICAL REQUIREMENT	9
6.1	ANTENNA REQUIREMENT	g
7	RADIO SPECTRUM MATTER TEST RESULTS	10
7.1	MINIMUM 6DB BANDWIDTH	10
7.2		
7.3		
7.4		
7.5		
7.6	RADIATED EMISSIONS WHICH FALL IN THE RESTRICTED BANDS	17
7.7	7 RADIATED SPURIOUS EMISSIONS	39
7.8	B 99% BANDWIDTH	62
8	TEST SETUP PHOTOGRAPHS	63
_		
9	EUT CONSTRUCTIONAL DETAILS	63



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Report No.: SHEM210200120403

Page: 5 of 63

4 General Information

4.1 Details of E.U.T.

Power supply: Rechargeable Li-ion Battery (DC 3.88V 380mAh)

Test voltage: DC3.88V

Cable(Charging dock): DC charging cable 1m(Model:WF20088)

Antenna Gain: -4.4dBi (Provided by manufacturer)

Antenna Type: LDS Antenna

Channel Spacing: 5MHz

Modulation Type: 802.11b: DSSS (CCK, DQPSK, DBPSK)

802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)

Number of Channels: 802.11b/g/n(HT20):11

Operation Frequency: 802.11b/g/n(HT20): 2412MHz to 2462MHz

Hardware version: DVT1

Software version: PMKB.210129.00A S/N: AC01A0C XXXXX Firmware Version: PMKB.210129.00A

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Laptop	Lenovo	ThinkPad X100e	1

4.3 Power level setting using in test:

Channel	802.11b	802.11g	802.11n(HT20)
1	18	17	17
6	18	17	17
11	18	17	17



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Report No.: SHEM210200120403

Page: 6 of 63

4.4 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	8.4 x 10 ⁻⁸
2	Timeout	2s
3	Duty Cycle	0.37%
4	Occupied Bandwidth	3%
5	RF Conducted Power	0.6dB
6	RF Power Density	2.9dB
7	Conducted Spurious Emissions	0.75dB
0	DE Dadiated Dames	5.1dB (Below 1GHz)
8	RF Radiated Power	4.9dB (Above 1GHz)
		4.2dB (Below 30MHz)
	Dadistad Counisma Fosiasian Taat	4.5dB (30MHz-1GHz)
9	Radiated Spurious Emission Test	5.1dB (1GHz-18GHz)
		5.4dB (Above 18GHz)
10	Temperature Test	1°C
11	Humidity Test	3%
12	Supply Voltages	1.5%
13	Time	3%

Note: The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



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Report No.: SHEM210200120403

Page: 7 of 63

4.5 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd. Shanghai Branch 588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China

Tel: +86 21 6191 5666 Fax: +86 21 6191 5678

No tests were sub-contracted.

4.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• CNAS (No. CNAS L0599)

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

• NVLAP (LAB CODE: 201034-0)

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).

• FCC (Designation Number: CN5033)

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been recognized as an accredited testing laboratory.

• ISED (CAB Identifier: CN0020)

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. EMC Laboratory has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory. Company Number: 8617A

VCCI (Member No.: 3061)

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-13868, C-14336, T-12221, G-10830 respectively.

4.7 Deviation from Standards

None

4.8 Abnormalities from Standard Conditions

None



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Report No.: SHEM210200120403

Page: 8 of 63

5 Equipment List

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
RF Conducted Test					
Spectrum Analyzer	R&S	FSP-30	SHEM002-1	2020-12-20	2021-12-19
Spectrum Analyzer	Agilent	N9020A	SHEM181-1	2020-08-13	2021-08-12
Signal Generator	R&S	SMR20	SHEM006-1	2020-08-13	2021-08-12
Signal Generator	Agilent	N5182A	SHEM182-1	2020-08-13	2021-08-12
Communication Tester	R&S	CMW270	SHEM183-1	2020-08-13	2021-08-12
Switcher	Tonscend	JS0806	SHEM184-1	2020-08-13	2021-08-12
Power Sensor	Keysight	U2021XA * 4	SHEM184-1	2020-08-13	2021-08-12
Splitter	Anritsu	MA1612A	SHEM185-1	/	/
Coupler	e-meca	803-S-1	SHEM186-1	/	/
High-low Temp Cabinet	Suzhou Zhihe	TL-40	SHEM087-1	2018-09-25	2021-09-24
AC Power Stabilizer	APC	KDF-31020T-V0-F0	SHEM216-1	2020-12-20	2021-12-19
DC Power Supply	MCH	MCH-303A	SHEM210-1	2020-12-20	2021-12-19
Conducted test Cable	/	RF01~RF04	1	2020-12-20	2021-12-19
Test software	Tonscend	JS Tonscend BT/WIFI System	Version: 2.6	/	1
RF Radiated Test		<u> </u>			
EMI test Receiver	R&S	ESU40	SHEM051-1	2020-12-20	2021-12-19
Spectrum Analyzer	R&S	FSP-30	SHEM002-1	2020-12-20	2021-12-19
Loop Antenna (9kHz-30MHz)	Schwarzbeck	FMZB1519	SHEM135-1	2020-12-20	2021-12-19
Antenna (25MHz-2GHz)	Schwarzbeck	VULB9168	SHEM048-1	2019-10-14	2021-10-13
Antenna (25MHz-2GHz)	Schwarzbeck	VULB9168	SHEM202-1	2019-04-30	2021-04-29
Horn Antenna (1-18GHz)	Schwarzbeck	HF906	SHEM009-1	2018-10-24	2021-10-23
Horn Antenna (1-18GHz)	Schwarzbeck	BBHA9120D	SHEM050-1	2019-10-14	2021-10-13
Horn Antenna (14-40GHz)	Schwarzbeck	BBHA 9170	SHEM049-1	2018-10-31	2021-10-30
Pre-amplifier (9KHz-2GHz)	CLAVIIO	BDLNA-0001	SHEM164-1	2020-08-13	2021-08-12
Pre-amplifier (1-18GHz)	CLAVIIO	BDLNA-0118	SHEM050-2	2020-08-13	2021-08-12
High-amplifier (14-40GHz)	Schwarzbeck	10001	SHEM049-2	2020-12-20	2021-12-19
Signal Generator	R&S	SMR40	SHEM058-1	2020-08-13	2021-08-12
Band Filter	LORCH	9BRX-875/X150	SHEM156-1	1	/
Band Filter	LORCH	13BRX-1950/X500	SHEM083-2	1	/
Band Filter	LORCH	5BRX-2400/X200	SHEM155-1	1	/
Band Filter	LORCH	5BRX-5500/X1000	SHEM157-2	1	/
High pass Filter	Wainwright	WHK3.0/18G	SHEM157-1	1	/
High pass Filter	Wainwright	WHKS1700	SHEM157-3	/	/
Semi/Fully Anechoic	ST	11*6*6M	SHEM078-2	2020-05-25	2023-05-24
RE test Cable	/	RE01, RE02, RE06	/	2020-12-20	2021-12-19
Test software	ESE	E3	Version: 6.111221a	1	/



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Report No.: SHEM210200120403

Page: 9 of 63

6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203 & 15.247(b)(4)

6.1.2 Conclusion

Standard Requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

15.247(b) (4) requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

EUT Antenna:

The antenna is LDS antenna and no consideration of replacement. The best case gain of the antenna is -4.4dBi.

Antenna location: Refer to Appendix (Internal Photos)



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Report No.: SHEM210200120403

Page: 10 of 63

7 Radio Spectrum Matter Test Results

7.1 Minimum 6dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.247a(2)
Test Method: ANSI C63.10 (2013) Section 11.8.1

Limit: ≥500 kHz

7.1.1 E.U.T. Operation

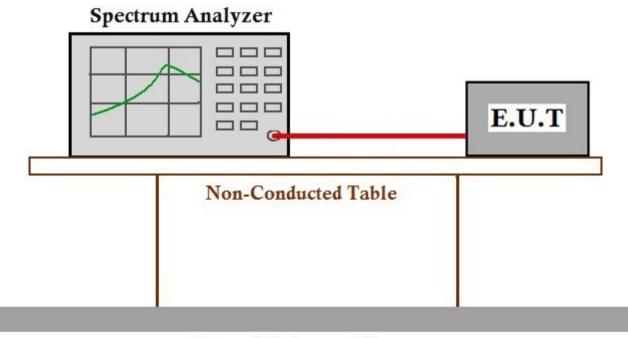
Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

Test mode d:TX mode_Keep the EUT in continuously transmitting mode with all modulation

types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20). Only the data of worst case is recorded in the report.

7.1.2 Test Setup Diagram



Ground Reference Plane

7.1.3 Measurement Procedure and Data

The detailed test data see: Appendix C for SHEM210200120403



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Report No.: SHEM210200120403

Page: 11 of 63

7.2 Conducted Average Output Power

Test Requirement 47 CFR Part 15, Subpart C 15.247(b)(3)
Test Method: ANSI C63.10 (2013) Section 11.9.2

Limit:

Frequency range(MHz)	Output power of the intentional radiator(watt)		
	1 for ≥50 hopping channels		
902-928	0.25 for 25≤ hopping channels <50		
	1 for digital modulation		
	1 for ≥75 non-overlapping hopping channels		
2400-2483.5	0.125 for all other frequency hopping systems		
	1 for digital modulation		
5725-5850	1 for frequency hopping systems and digital modulation		

7.2.1 E.U.T. Operation

Operating Environment:

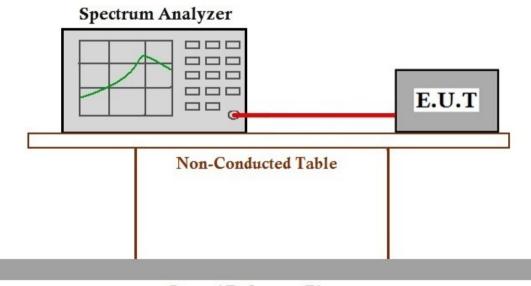
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

Test mode d:TX mode_Keep the EUT in continuously transmitting mode with all modulation

types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE

802.11n(HT20). Only the data of worst case is recorded in the report.

7.2.2 Test Setup Diagram



Ground Reference Plane

7.2.3 Measurement Procedure and Data

The detailed test data see: Appendix C for SHEM210200120403



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Report No.: SHEM210200120403

Page: 12 of 63

7.3 Power Spectrum Density

Test Requirement 47 CFR Part 15, Subpart C 15.247(e) Test Method: ANSI C63.10 (2013) Section 11.10.3

Limit: ≤8dBm in any 3 kHz band during any time interval of continuous

transmission

7.3.1 E.U.T. Operation

Operating Environment:

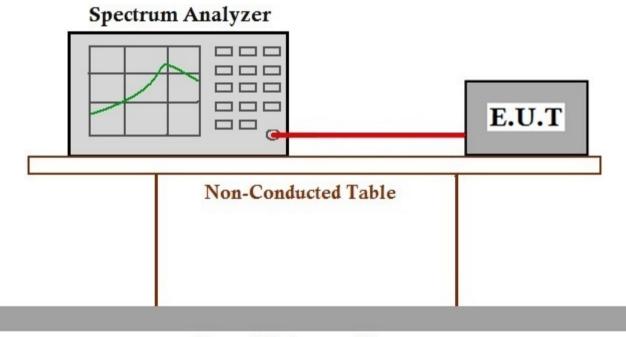
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

Test mode d:TX mode Keep the EUT in continuously transmitting mode with all modulation

types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE

802.11n(HT20. Only the data of worst case is recorded in the report.

7.3.2 Test Setup Diagram



Ground Reference Plane

7.3.3 Measurement Procedure and Data

The detailed test data see: Appendix C for SHEM210200120403



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Report No.: SHEM210200120403

Page: 13 of 63

7.4 Conducted Band Edges Measurement

Test Requirement 47 CFR Part 15, Subpart C 15.247(d)
Test Method: ANSI C63.10 (2013) Section 11.13.3.2

Limit:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)

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Report No.: SHEM210200120403

Page: 14 of 63

7.4.1 E.U.T. Operation

Operating Environment:

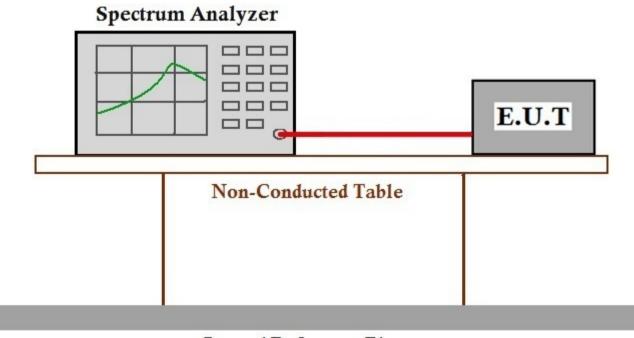
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

Test mode d:TX mode_Keep the EUT in continuously transmitting mode with all modulation

types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE

802.11n(HT20). Only the data of worst case is recorded in the report.

7.4.2 Test Setup Diagram



Ground Reference Plane

7.4.3 Measurement Procedure and Data

The detailed test data see: Appendix C for SHEM210200120403



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Report No.: SHEM210200120403

Page: 15 of 63

7.5 Conducted Spurious Emissions

Test Requirement 47 CFR Part 15, Subpart C 15.247(d)
Test Method: ANSI C63.10 (2013) Section 11.11

§15.209(a) (see §15.205(c)

Limit:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in

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Report No.: SHEM210200120403

Page: 16 of 63

7.5.1 E.U.T. Operation

Operating Environment:

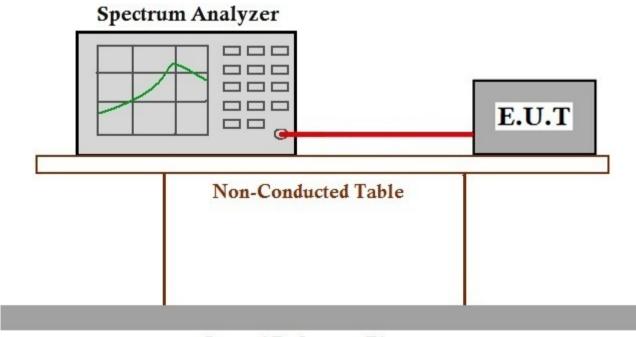
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

Test mode d:TX mode_Keep the EUT in continuously transmitting mode with all modulation

types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE

802.11n(HT20). Only the data of worst case is recorded in the report.

7.5.2 Test Setup Diagram



Ground Reference Plane

7.5.3 Measurement Procedure and Data

The detailed test data see: Appendix C for SHEM210200120403



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Report No.: SHEM210200120403

Page: 17 of 63

7.6 Radiated Emissions which fall in the restricted bands

Test Requirement 47 CFR Part 15, Subpart C 15.209 & 15.247(d)

Test Method: ANSI C63.10 (2013) Section 6.10.5

Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.



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Report No.: SHEM210200120403

Page: 18 of 63

7.6.1 E.U.T. Operation

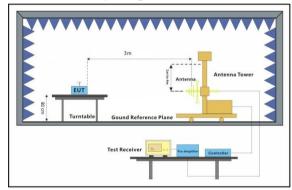
Operating Environment:

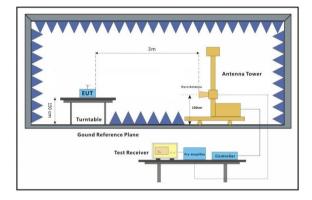
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

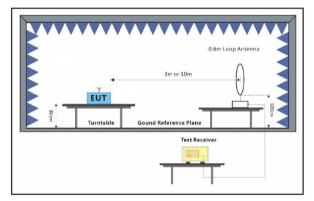
Test mode d:TX mode_Keep the EUT in continuously transmitting mode with all modulation

types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20). Only the data of worst case is recorded in the report.

7.6.2 Test Setup Diagram









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Report No.: SHEM210200120403

Page: 19 of 63

7.6.3 Measurement Procedure and Data

a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

- b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.

Remark 1: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Remark 2: For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.



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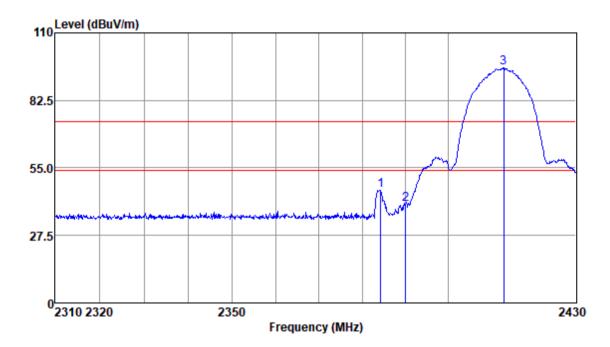
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Report No.: SHEM210200120403

Page: 20 of 63

Mode:d; Polarization:Horizontal; Modulation:b; bandwidth:20MHz; Channel:Low



Antenna Polarity : HORIZONTAL

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2384.29	52.67	27.23	8.46	42.37	45.99	74.00	-28.01	Peak
2390.00	46.80	27.23	8.46	42.37	40.12	74.00	-33.88	Peak
2412.95	102.41	27.32	8.46	42.40	95.79	74.00	21.79	Peak

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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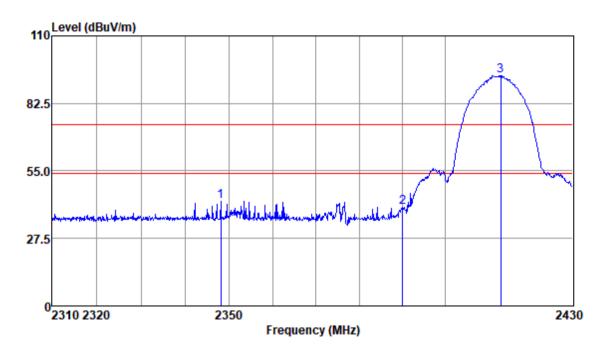
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Report No.: SHEM210200120403

Page: 21 of 63

Mode:d; Polarization:Vertical; Modulation:b; bandwidth:20MHz; Channel:Low



Antenna Polarity : VERTICAL

Freq					Emission Level			Remark
					dBuv/m			Dark
2390.00	46.80	27.23	8.46	42.37	42.80 40.12	74.00	-33.88	Peak
2412.95	100.52	27.32	8.46	42.40	93.90	74.00	19.90	Peak

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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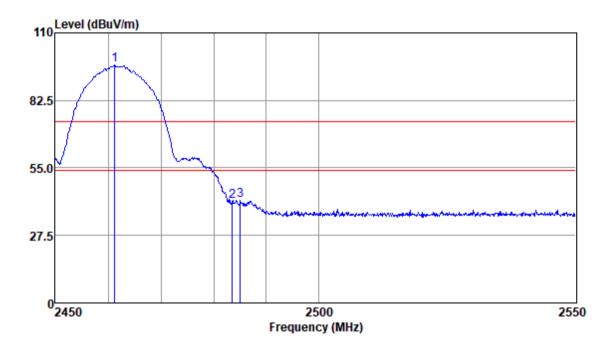
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Report No.: SHEM210200120403

Page: 22 of 63

Mode:d; Polarization:Horizontal; Modulation:b; bandwidth:20MHz; Channel:High



Antenna Polarity : HORIZONTAL

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2461.20	103.15	27.48	8.60	42.40	96.83	74.00	22.83	Peak
2483.50	47.65	27.55	8.60	42.40	41.40	74.00	-32.60	Peak
2485.04	48.03	27.55	8.67	42.40	41.85	74.00	-32.15	Peak

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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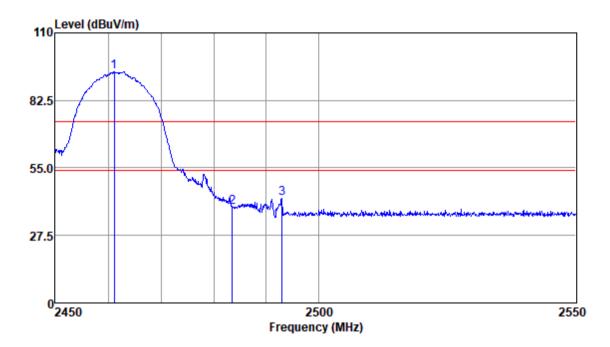
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Report No.: SHEM210200120403

Page: 23 of 63

Mode:d; Polarization:Vertical; Modulation:b; bandwidth:20MHz; Channel:High



Antenna Polarity : VERTICAL

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2461.10	100.57	27.48	8.60	42.40	94.25	74.00	20.25	Peak
2483.50	45.10	27.55	8.60	42.40	38.85	74.00	-35.15	Peak
2493.01	48.69	27.58	8.67	42.40	42.54	74.00	-31.46	Peak

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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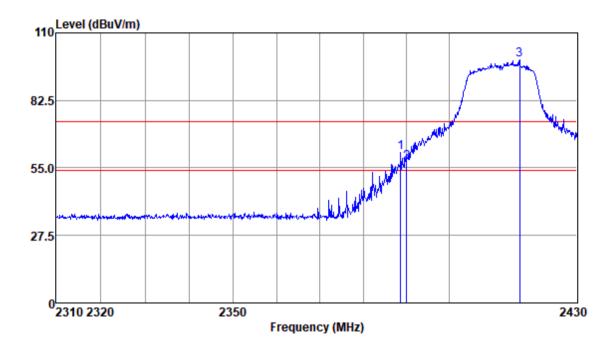
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Report No.: SHEM210200120403

Page: 24 of 63

Mode:d; Polarization:Horizontal; Modulation:g; bandwidth:20MHz; Channel:Low



Antenna Polarity : HORIZONTAL

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
					61.09			Peak
2390.00	63.90	27.23	8.46	42.37	57.22	74.00	-16.78	Peak
2416.50	105.51	27.32	8.53	42.40	98.96	74.00	24.96	Peak

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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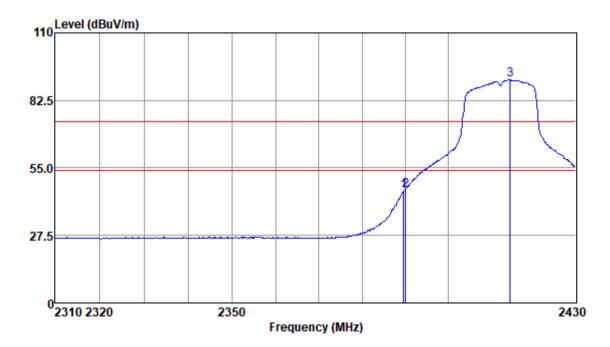
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Report No.: SHEM210200120403

Page: 25 of 63

Mode:d; Polarization:Horizontal; Modulation:g; bandwidth:20MHz; Channel:Low



Antenna Polarity : HORIZONTAL

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2389.61	52.20	27.23	8.46	42.37	45.52	54.00	-8.48	Average
2390.00	52.74	27.23	8.46	42.37	46.06	54.00	-7.94	Average
2414.42	97.35	27.32	8.53	42.40	90.80	54.00	36.80	Average

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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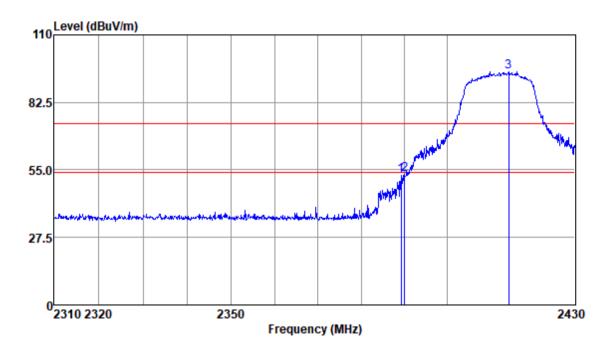
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Report No.: SHEM210200120403

Page: 26 of 63

Mode:d; Polarization:Vertical; Modulation:g; bandwidth:20MHz; Channel:Low



Antenna Polarity : VERTICAL

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2389.24	59.43	27.23	8.46	42.37	52.75	74.00	-21.25	Peak
2390.00	59.74	27.23	8.46	42.37	53.06	74.00	-20.94	Peak
2414.30	101.62	27.32	8.53	42.40	95.07	74.00	21.07	Peak

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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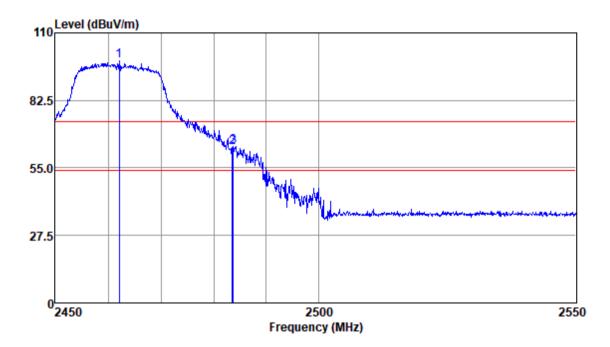
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Report No.: SHEM210200120403

Page: 27 of 63

Mode:d; Polarization:Horizontal; Modulation:g; bandwidth:20MHz; Channel:High



Antenna Polarity : HORIZONTAL

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2462.09	104.85	27.48	8.60	42.40	98.53	74.00	24.53	Peak
2483.50	69.66	27.55	8.60	42.40	63.41	74.00	-10.59	Peak
2483.75	70.15	27.55	8.60	42.40	63.90	74.00	-10.10	Peak

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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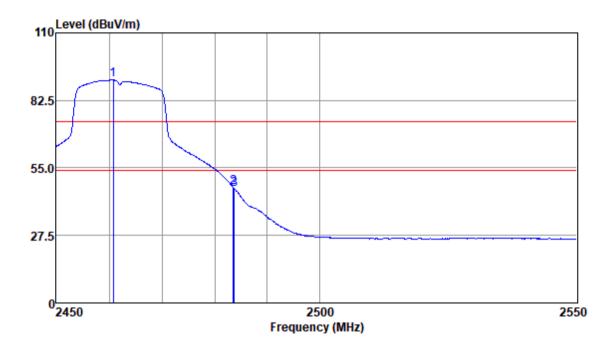
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Report No.: SHEM210200120403

Page: 28 of 63

Mode:d; Polarization:Horizontal; Modulation:g; bandwidth:20MHz; Channel:High



Antenna Polarity : HORIZONTAL

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2460.71	97.08	27.48	8.60	42.40	90.76	54.00	36.76	Average
2483.50	53.45	27.55	8.60	42.40	47.20	54.00	-6.80	Average
2483.75	52.62	27.55	8.60	42.40	46.37	54.00	-7.63	Average

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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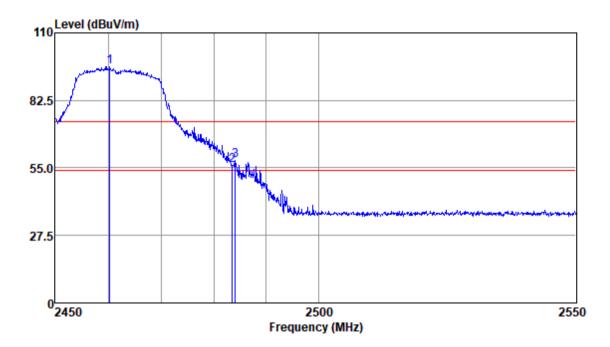
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Report No.: SHEM210200120403

Page: 29 of 63

Mode:d; Polarization:Vertical; Modulation:g; bandwidth:20MHz; Channel:High



Antenna Polarity : VERTICAL

Freq			Emission Level		Remark
			dBuv/m		
			96.27 55.91		
			58.24		

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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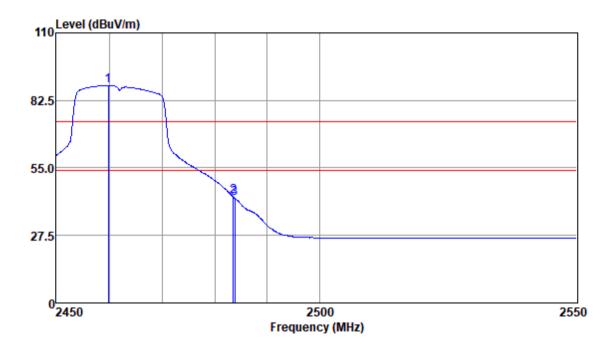
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Report No.: SHEM210200120403

Page: 30 of 63

Mode:d; Polarization:Vertical; Modulation:g; bandwidth:20MHz; Channel:High



Antenna Polarity : VERTICAL

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2459.82	94.80	27.46	8.60	42.40	88.46	54.00	34.46	Average
2483.50	49.55	27.55	8.60	42.40	43.30	54.00	-10.70	Average
2483.85	48.86	27.55	8.60	42.40	42.61	54.00	-11.39	Average

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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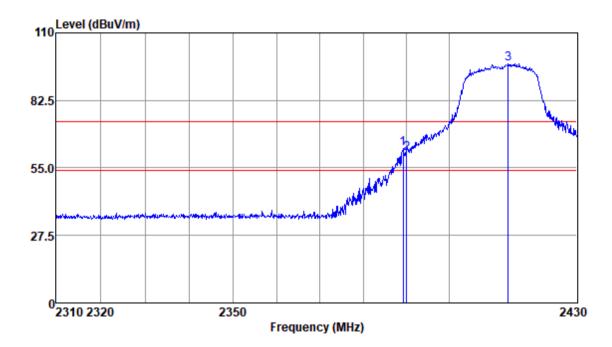
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Report No.: SHEM210200120403

Page: 31 of 63

Mode:d; Polarization:Horizontal; Modulation:n; bandwidth:20MHz; Channel:Low



Antenna Polarity : HORIZONTAL

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2389.24	69.74	27.23	8.46	42.37	63.06	74.00	-10.94	Peak
2390.00	67.58	27.23	8.46	42.37	60.90	74.00	-13.10	Peak
2413.81	104.03	27.32	8.53	42.40	97.48	74.00	23.48	Peak

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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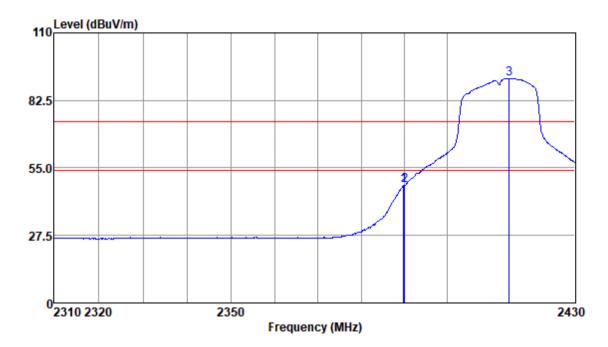
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Report No.: SHEM210200120403

Page: 32 of 63

Mode:d; Polarization:Horizontal; Modulation:n; bandwidth:20MHz; Channel:Low



Antenna Polarity : HORIZONTAL

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2389.85	54.55	27.23	8.46	42.37	47.87	54.00	-6.13	Average
2390.00	54.72	27.23	8.46	42.37	48.04	54.00	-5.96	Average
2414.42	98.02	27.32	8.53	42.40	91.47	54.00	37.47	Average

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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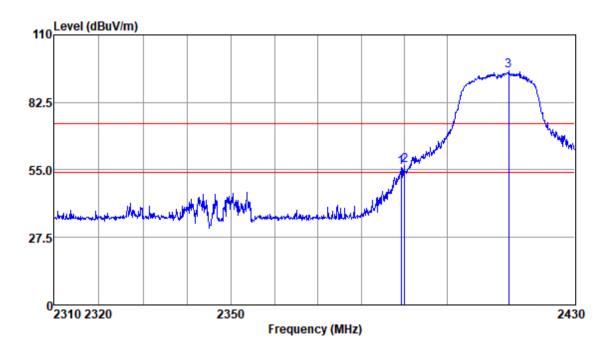
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Report No.: SHEM210200120403

Page: 33 of 63

Mode:d; Polarization:Vertical; Modulation:n; bandwidth:20MHz; Channel:Low



Antenna Polarity : VERTICAL

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2389.24	62.52	27.23	8.46	42.37	55.84	74.00	-18.16	Peak
2390.00	63.46	27.23	8.46	42.37	56.78	74.00	-17.22	Peak
2414.30	102.03	27.32	8.53	42.40	95.48	74.00	21.48	Peak

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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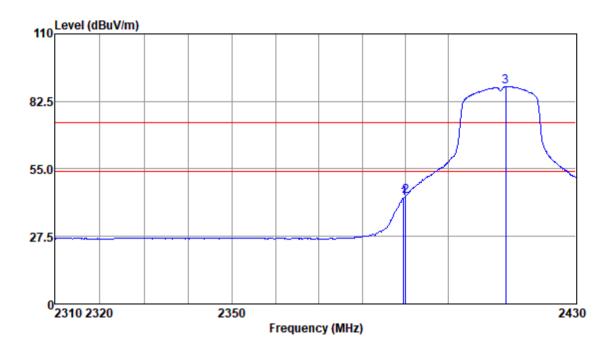
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Report No.: SHEM210200120403

Page: 34 of 63

Mode:d; Polarization:Vertical; Modulation:n; bandwidth:20MHz; Channel:Low



Antenna Polarity : VERTICAL

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2389.61	49.88	27.23	8.46	42.37	43.20	54.00	-10.80	Average
2390.00	50.37	27.23	8.46	42.37	43.69	54.00	-10.31	Average
2413.44	95.10	27.32	8.53	42.40	88.55	54.00	34.55	Average

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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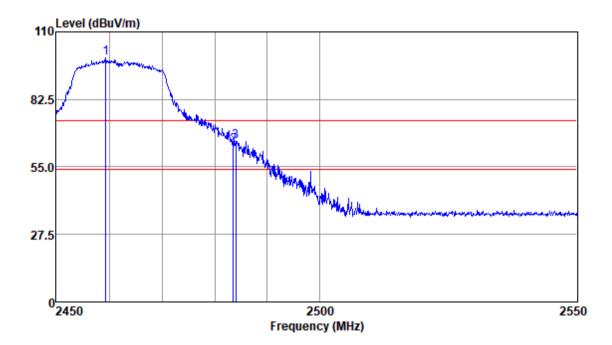
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Report No.: SHEM210200120403

Page: 35 of 63

Mode:d; Polarization:Horizontal; Modulation:n; bandwidth:20MHz; Channel:High



Antenna Polarity : HORIZONTAL

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2459.33	105.89	27.46	8.60	42.40	99.55	74.00	25.55	Peak
2483.50	69.91	27.55	8.60	42.40	63.66	74.00	-10.34	Peak
2484.05	71.58	27.55	8.60	42.40	65.33	74.00	-8.67	Peak

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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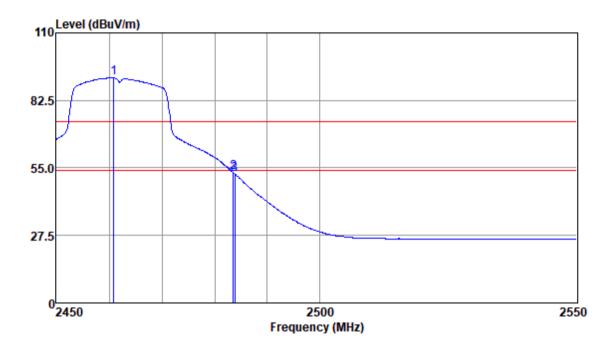
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Report No.: SHEM210200120403

Page: 36 of 63

Mode:d; Polarization:Horizontal; Modulation:n; bandwidth:20MHz; Channel:High



Antenna Polarity : HORIZONTAL

Freq					Emission Level			Remark
					dBuv/m			
2460.81	97.92	27.48	8.60	42.40	91.60	54.00	37.60	Average
2483.50	59.44	27.55	8.60	42.40	53.19	54.00	-0.81	Average
2483.85	58.71	27.55	8.60	42.40	52.46	54.00	-1.54	Average

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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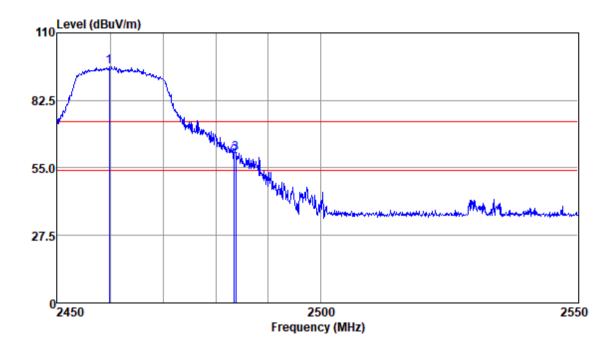
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Report No.: SHEM210200120403

Page: 37 of 63

Mode:d; Polarization:Vertical; Modulation:n; bandwidth:20MHz; Channel:High



Antenna Polarity : VERTICAL

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2459.82	102.66	27.46	8.60	42.40	96.32	74.00	22.32	Peak
2483.50	65.96	27.55	8.60	42.40	59.71	74.00	-14.29	Peak
2483.85	67.22	27.55	8.60	42.40	60.97	74.00	-13.03	Peak

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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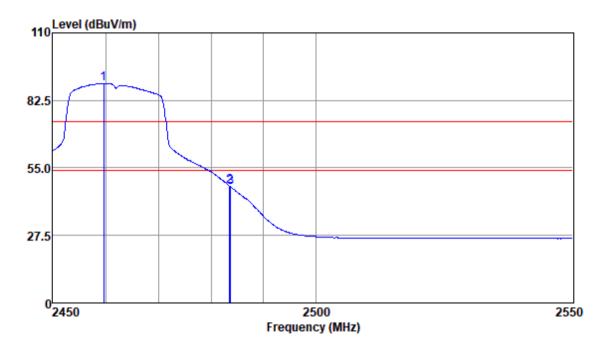
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Report No.: SHEM210200120403

Page: 38 of 63

Mode:d; Polarization:Vertical; Modulation:n; bandwidth:20MHz; Channel:High



Antenna Polarity : VERTICAL

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2459.62	95.64	27.46	8.60	42.40	89.30	54.00	35.30	Average
2483.50	53.88	27.55	8.60	42.40	47.63	54.00	-6.37	Average
2483.75	53.41	27.55	8.60	42.40	47.16	54.00	-6.84	Average

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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Report No.: SHEM210200120403

Page: 39 of 63

7.7 Radiated Spurious Emissions

Test Requirement 47 CFR Part 15, Subpart C 15.209 & 15.247(d)

Test Method: ANSI C63.10 (2013) Section 6.4,6.5,6.6

Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.



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Report No.: SHEM210200120403

Page: 40 of 63

7.7.1 E.U.T. Operation

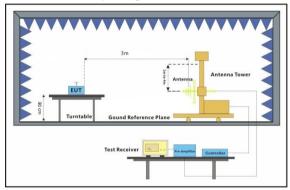
Operating Environment:

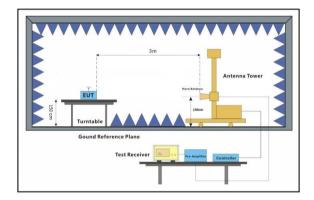
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

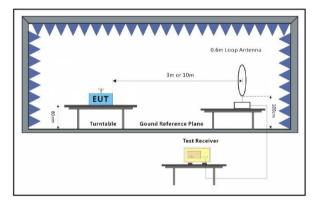
Test mode d:TX mode_Keep the EUT in continuously transmitting mode with all modulation

types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20). Only the data of worst case is recorded in the report.

7.7.2 Test Setup Diagram









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Report No.: SHEM210200120403

Page: 41 of 63

7.7.3 Measurement Procedure and Data

a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

- b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.

Remark:

- 1) For emission below 1GHz, through pre-scan found the worst case is the lowest channel. Only the worst case is recorded in the report.
- 2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor - Preamplifier Factor

- 3) Scan from 9kHz to 25GHz, the disturbance above 18GHz and below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.
- 4) For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown



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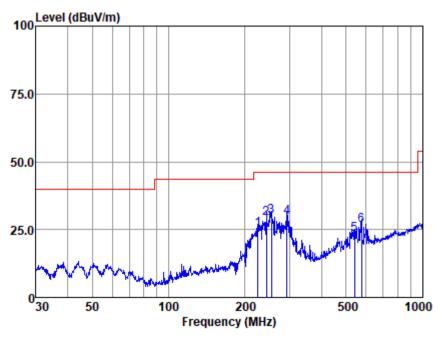
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Report No.: SHEM210200120403

Page: 42 of 63

Below 1GHz



Antenna Polarity : HORIZONTAL EUT/Project :1203CR Test mode

Read Antenna Cable Preamp Emission Limit Over Freq Level Factor Loss Factor Level Line Limit Remark MHz dBuV dB/m dB dB dBuV/m dBuV/m dB 225.308 55.24 9.60 2.42 42.15 25.11 46.00 -20.89 OP 57.76 11.14 2.54 42.11 29.33 46.00 -16.67 243.377 QΡ 57.54 11.85 2.61 42.10 29.90 46.00 -16.10 QΡ 253.837 55.52 13.13 2.79 42.10 29.34 46.00 -16.66 QΡ 293.084

3.69 41.70 23.15

3.83 41.70 26.70

46.00 -22.85

46.00 -19.30

QΡ

QΡ

: d

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



1 2

3

4

5

539.478

42.99 18.17

574.626 45.62 18.95

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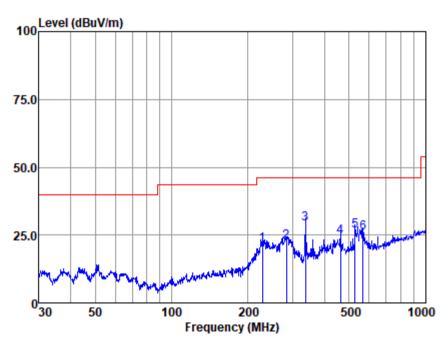
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Report No.: SHEM210200120403

Page: 43 of 63



Antenna Polarity :VERTICAL EUT/Project :1203CR

Test mode :d

		Read	Antenna	Cable	Preamp	Emission	ı Limit	0ver	
	Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	227.691	51.31	9.81	2.45	42.14	21.43	46.00	-24.57	QP
2	283.979	48.83	12.92	2.76	42.10	22.41	46.00	-23.59	QP
3	337.216	54.17	14.15	2.95	41.96	29.31	46.00	-16.69	QP
4	462.346	45.85	17.05	3.40	41.77	24.53	46.00	-21.47	QP
5	528.246	46.64	18.04	3.66	41.70	26.64	46.00	-19.36	QP
6	568.613	44.83	18.79	3.81	41.70	25.73	46.00	-20.27	QP

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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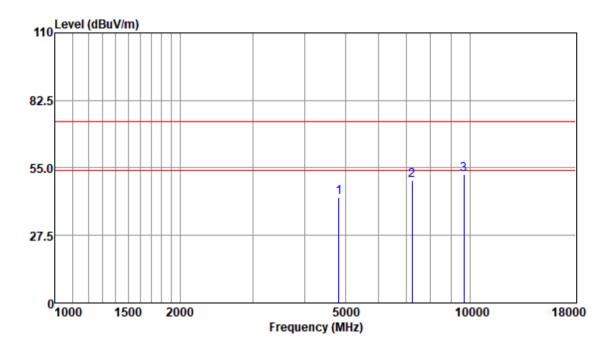


Report No.: SHEM210200120403

Page: 44 of 63

Above 1GHz

Mode:d; Polarization:Horizontal; Modulation:b; bandwidth:20MHz; Channel:Low



Antenna Polarity : HORIZONTAL

	Read	Antenna	Cable	Preamp	Emission	Limit	0ver	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4824.00	41.56	31.25	12.62	42.40	43.03	74.00	-30.97	Peak
7236.00	41.10	36.45	15.28	42.75	50.08	74.00	-23.92	Peak
9648.00	40.25	38.24	16.48	42.64	52.33	74.00	-21.67	Peak

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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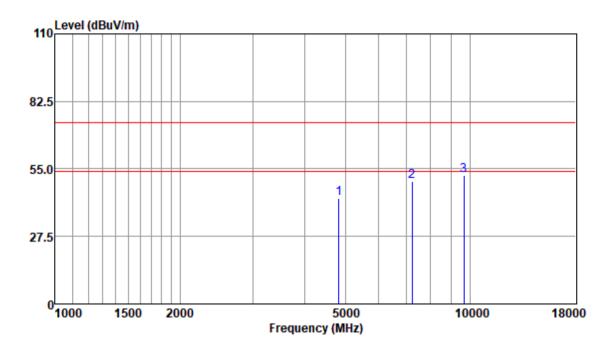
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Report No.: SHEM210200120403

Page: 45 of 63

Mode:d; Polarization:Vertical; Modulation:b; bandwidth:20MHz; Channel:Low



Antenna Polarity : VERTICAL

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4824.00	41.68	31.25	12.62	42.40	43.15	74.00	-30.85	Peak
7236.00	40.84	36.45	15.28	42.75	49.82	74.00	-24.18	Peak
9648.00	40.30	38.24	16.48	42.64	52.38	74.00	-21.62	Peak

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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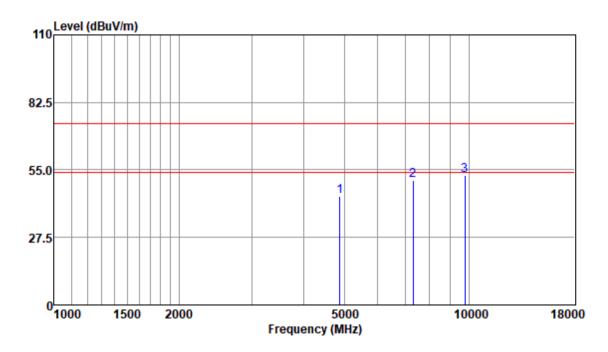
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Report No.: SHEM210200120403

Page: 46 of 63

Mode:d; Polarization:Horizontal; Modulation:b; bandwidth:20MHz; Channel:middle



Antenna Polarity : HORIZONTAL

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4884.00	42.69	31.38	12.67	42.40	44.34	74.00	-29.66	Peak
7326.00	41.46	36.67	15.30	42.77	50.66	74.00	-23.34	Peak
9768.00	40.54	38.38	16.60	42.59	52.93	74.00	-21.07	Peak

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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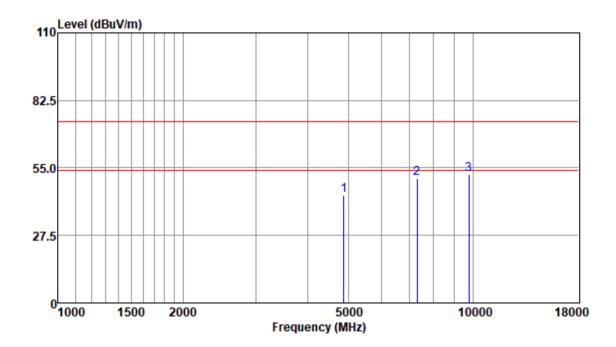
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Report No.: SHEM210200120403

Page: 47 of 63

Mode:d; Polarization:Vertical; Modulation:b; bandwidth:20MHz; Channel:middle



Antenna Polarity : VERTICAL

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4884.00	42.05	31.38	12.67	42.40	43.70	74.00	-30.30	Peak
7326.00	41.73	36.67	15.30	42.77	50.93	74.00	-23.07	Peak
9768.00	40.09	38.38	16.60	42.59	52.48	74.00	-21.52	Peak

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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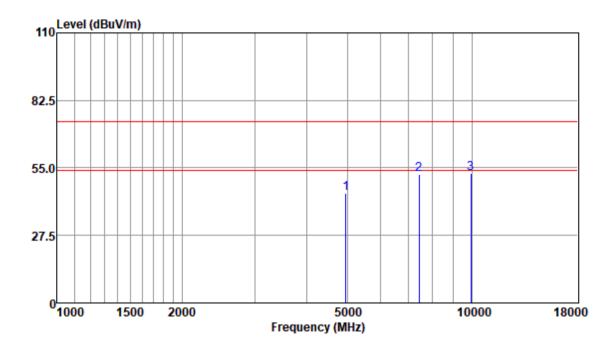
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Report No.: SHEM210200120403

Page: 48 of 63

Mode:d; Polarization:Horizontal; Modulation:b; bandwidth:20MHz; Channel:High



Antenna Polarity : HORIZONTAL

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4960.00	42.61	31.52	12.72	42.40	44.45	74.00	-29.55	Peak
7440.00	42.98	36.94	15.33	42.79	52.46	74.00	-21.54	Peak
9920.00	40.26	38.52	16.72	42.53	52.97	74.00	-21.03	Peak

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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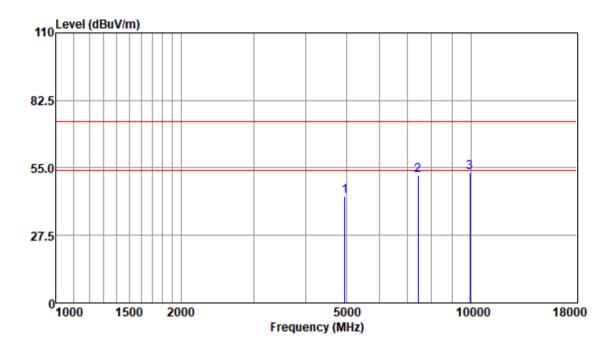
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Report No.: SHEM210200120403

Page: 49 of 63

Mode:d; Polarization:Vertical; Modulation:b; bandwidth:20MHz; Channel:High



Antenna Polarity : VERTICAL

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4960.00	41.68	31.52	12.72	42.40	43.52	74.00	-30.48	Peak
7440.00	42.42	36.94	15.33	42.79	51.90	74.00	-22.10	Peak
9920.00	40.28	38.52	16.72	42.53	52.99	74.00	-21.01	Peak

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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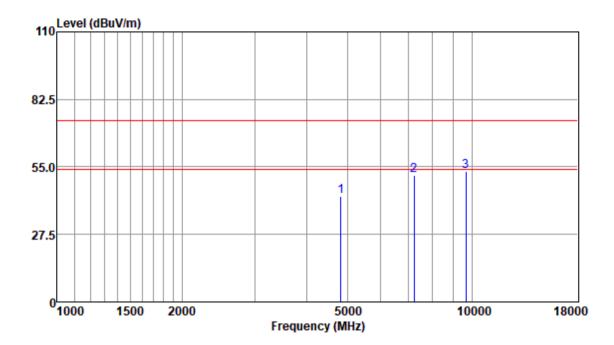
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Report No.: SHEM210200120403

Page: 50 of 63

Mode:d; Polarization:Horizontal; Modulation:g; bandwidth:20MHz; Channel:Low



Antenna Polarity : HORIZONTAL

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4824.00	41.66	31.25	12.62	42.40	43.13	74.00	-30.87	Peak
7236.00	42.42	36.45	15.28	42.75	51.40	74.00	-22.60	Peak
9648.00	40.92	38.24	16.48	42.64	53.00	74.00	-21.00	Peak

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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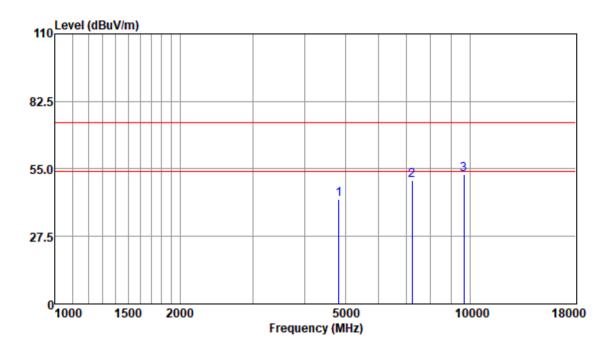
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Report No.: SHEM210200120403

Page: 51 of 63

Mode:d; Polarization:Vertical; Modulation:g; bandwidth:20MHz; Channel:Low



Antenna Polarity : VERTICAL

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4824.00	41.27	31.25	12.62	42.40	42.74	74.00	-31.26	Peak
7236.00	41.33	36.45	15.28	42.75	50.31	74.00	-23.69	Peak
9648.00	40.63	38.24	16.48	42.64	52.71	74.00	-21.29	Peak

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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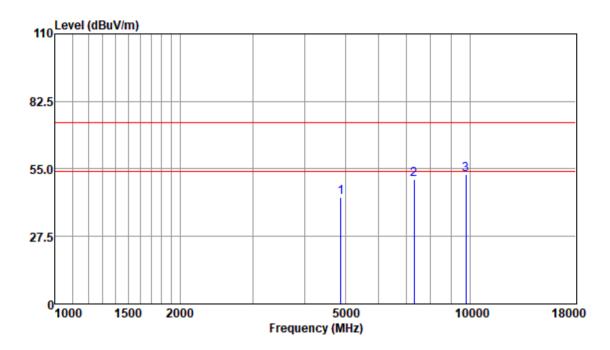
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Report No.: SHEM210200120403

Page: 52 of 63

Mode:d; Polarization:Horizontal; Modulation:g; bandwidth:20MHz; Channel:middle



Antenna Polarity : HORIZONTAL

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
					43.24			Peak
7326.00	41.34	36.67	15.30	42.77	50.54	74.00	-23.46	Peak
9768.00	40.44	38.38	16.60	42.59	52.83	74.00	-21.17	Peak

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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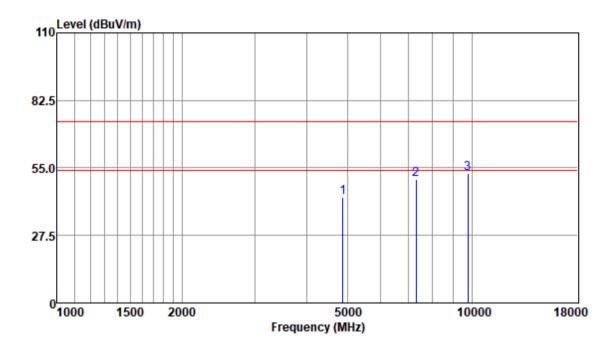
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Report No.: SHEM210200120403

Page: 53 of 63

Mode:d; Polarization:Vertical; Modulation:g; bandwidth:20MHz; Channel:middle



Antenna Polarity : VERTICAL

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4884.00	41.52	31.38	12.67	42.40	43.17	74.00	-30.83	Peak
7326.00	41.32	36.67	15.30	42.77	50.52	74.00	-23.48	Peak
9768.00	40.44	38.38	16.60	42.59	52.83	74.00	-21.17	Peak

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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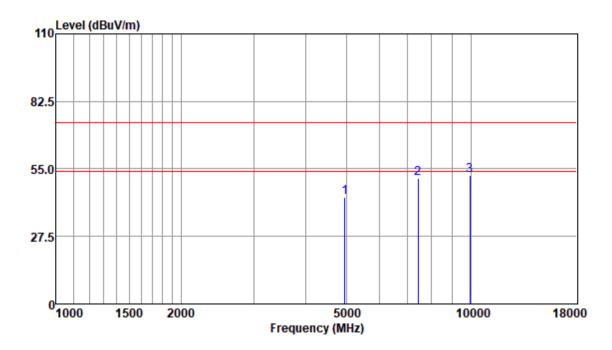
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Report No.: SHEM210200120403

Page: 54 of 63

Mode:d; Polarization:Horizontal; Modulation:g; bandwidth:20MHz; Channel:High



Antenna Polarity : HORIZONTAL

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4960.00	41.44	31.52	12.72	42.40	43.28	74.00	-30.72	Peak
7440.00	41.74	36.94	15.33	42.79	51.22	74.00	-22.78	Peak
9920.00	39.74	38.52	16.72	42.53	52.45	74.00	-21.55	Peak

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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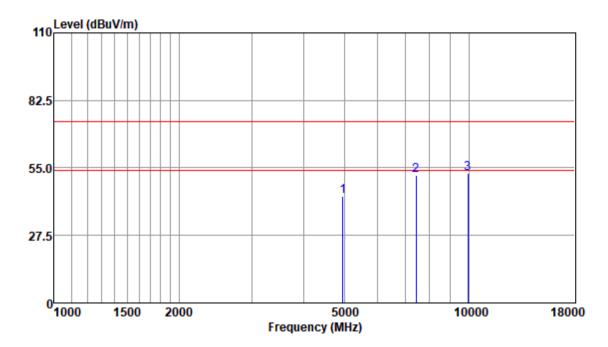
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Report No.: SHEM210200120403

Page: 55 of 63

Mode:d; Polarization:Vertical; Modulation:g; bandwidth:20MHz; Channel:High



Antenna Polarity : VERTICAL

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4960.00	41.70	31.52	12.72	42.40	43.54	74.00	-30.46	Peak
7440.00	42.45	36.94	15.33	42.79	51.93	74.00	-22.07	Peak
9920.00	40.14	38.52	16.72	42.53	52.85	74.00	-21.15	Peak

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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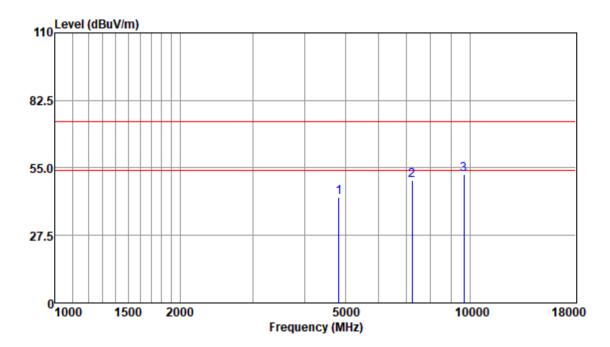
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Report No.: SHEM210200120403

Page: 56 of 63

Mode:d; Polarization:Horizontal; Modulation:n; bandwidth:20MHz; Channel:Low



Antenna Polarity : HORIZONTAL

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4824.00	41.64	31.25	12.62	42.40	43.11	74.00	-30.89	Peak
7236.00	41.03	36.45	15.28	42.75	50.01	74.00	-23.99	Peak
9648.00	40.23	38.24	16.48	42.64	52.31	74.00	-21.69	Peak

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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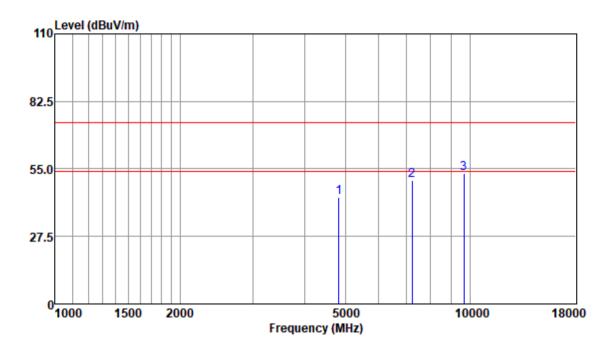
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Report No.: SHEM210200120403

Page: 57 of 63

Mode:d; Polarization:Vertical; Modulation:n; bandwidth:20MHz; Channel:Low



Antenna Polarity : VERTICAL

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4824.00	41.99	31.25	12.62	42.40	43.46	74.00	-30.54	Peak
7236.00	41.40	36.45	15.28	42.75	50.38	74.00	-23.62	Peak
9648.00	41.00	38.24	16.48	42.64	53.08	74.00	-20.92	Peak

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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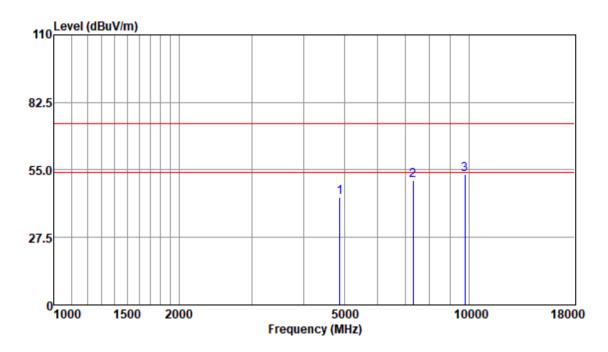
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Report No.: SHEM210200120403

Page: 58 of 63

Mode:d; Polarization:Horizontal; Modulation:n; bandwidth:20MHz; Channel:middle



Antenna Polarity : HORIZONTAL

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4884.00	42.19	31.38	12.67	42.40	43.84	74.00	-30.16	Peak
7326.00	41.45	36.67	15.30	42.77	50.65	74.00	-23.35	Peak
9768.00	40.59	38.38	16.60	42.59	52.98	74.00	-21.02	Peak

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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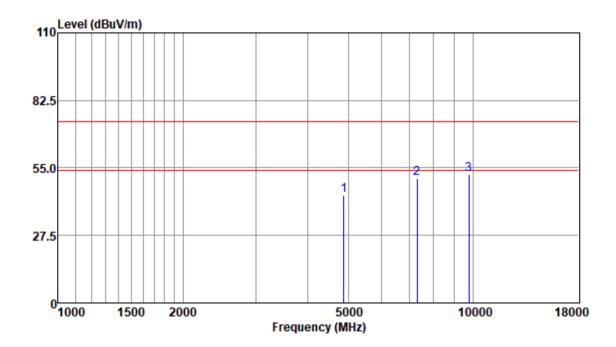
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Report No.: SHEM210200120403

Page: 59 of 63

Mode:d; Polarization:Vertical; Modulation:n; bandwidth:20MHz; Channel:middle



Antenna Polarity : VERTICAL

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4884.00	42.12	31.38	12.67	42.40	43.77	74.00	-30.23	Peak
7326.00	41.69	36.67	15.30	42.77	50.89	74.00	-23.11	Peak
9768.00	39.99	38.38	16.60	42.59	52.38	74.00	-21.62	Peak

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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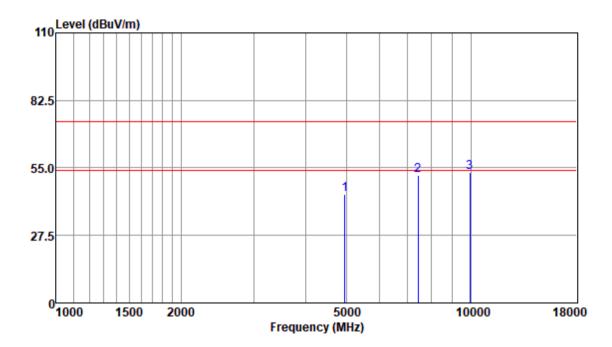
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Report No.: SHEM210200120403

Page: 60 of 63

Mode:d; Polarization:Horizontal; Modulation:n; bandwidth:20MHz; Channel:High



Antenna Polarity : HORIZONTAL

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4960.00	42.50	31.52	12.72	42.40	44.34	74.00	-29.66	Peak
7440.00	42.38	36.94	15.33	42.79	51.86	74.00	-22.14	Peak
9920.00	40.34	38.52	16.72	42.53	53.05	74.00	-20.95	Peak

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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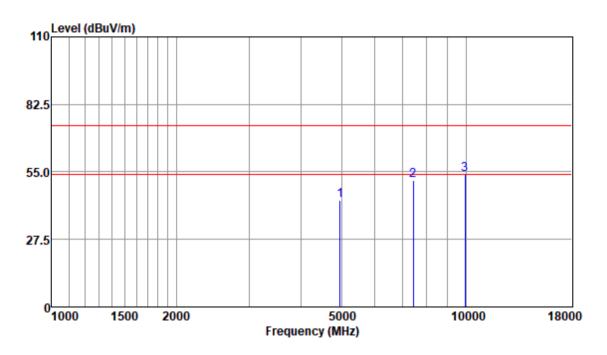
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Report No.: SHEM210200120403

Page: 61 of 63

Mode:d; Polarization:Vertical; Modulation:n; bandwidth:20MHz; Channel:High



Antenna Polarity : VERTICAL

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
					43.58			Peak
7440.00	42.01	36.94	15.33	42.79	51.49	74.00	-22.51	Peak
9920.00	41.09	38.52	16.72	42.53	53.80	74.00	-20.20	Peak

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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Report No.: SHEM210200120403

Page: 62 of 63

7.8 99% Bandwidth

Test Requirement RSS-Gen Section 6.7
Test Method: ANSI C63.10 Section 6.9.3

7.8.1 E.U.T. Operation

Operating Environment:

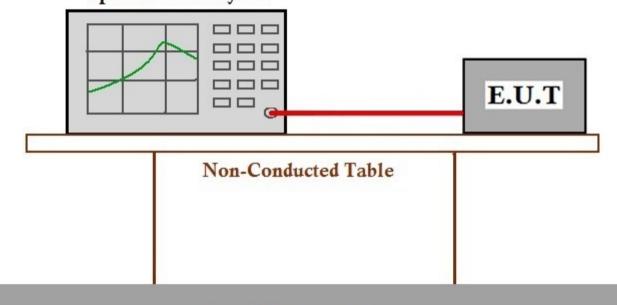
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

Test mode d:TX mode Keep the EUT in continuously transmitting mode with all modulation

types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20). Only the data of worst case is recorded in the report.

7.8.2 Test Setup Diagram

Spectrum Analyzer



Ground Reference Plane

7.8.3 Measurement Procedure and Data

The detailed test data see: Appendix C for SHEM210200120403



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Report No.: SHEM210200120403

Page: 63 of 63

8 Test Setup Photographs

Refer to the < Test Setup photos-FCC>.

9 EUT Constructional Details

Refer to the < External Photos > & < Internal Photos >.

- End of the Report -



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