

Page:

1 of 45

No. 1 Workshop, M-10, Middle section, Science & Technology Park, Report No.: SZEM170800932403

Shenzhen, Guangdong, China 518057
Telephone: +86 (0) 755 2601 2053
Fax: +86 (0) 755 2671 0594
Email: ee.shenzhen@sgs.com

TEST REPORT

Application No.: SZEM1708009324CR (SHEM1708005549CR)

Applicant: Shanghai PartnerX Robotics Co., Ltd

Address of Applicant: 8th Floor, Building 90, No. 1122 North Qinzhou Rd. Shanghai, China 200233

Manufacturer: Shanghai PartnerX Robotics Co., Ltd

Address of Manufacturer: 8th Floor, Building 90, No. 1122 North Qinzhou Rd. Shanghai, China 200233

Factory: PartnerX(Changzhou) Robotics Co., Ltd.

Address of Factory: Factory 23, Innovative Industrial Park, No.377 South Wuyi Rd., Wujin High-

tech Industrial Zone, China

FCC ID: 2AJ5L-M1 **IC**: 22130-M1

Equipment Under Test (EUT):

EUT Name: Abilix Educational Robot Mobile Series

Model No.: Oculus 2, Oculus 1¤

Please refer to section 2 of this report which indicates which model was

actually tested and which were electrically identical.

Trade mark: Abilix

Standards: 47 CFR Part 15, Subpart C 15.247

RSS-247 Issue 2 February 2017, RSS-Gen Issue-4 November 2014

Date of Receipt: 2017-08-22

Date of Test: 2017-09-04 to 2017-09-18

Date of Issue: 2017-09-19

Test Result : Pass*



Jack Zhang EMC Laboratory 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.

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 is 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 expert 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) are retained for 30 days only.

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



Report No.: SZEM170800932403

Page: 2 of 45

	Revision Record					
Version	Chapter	Date	Modifier	Remark		
00	1	2017-09-19	/	Original		

Authorized for issue by:		
Engineer	Forychon	2017-09-19
	Foray Chen /Project Engineer	Date
Reviewer	Eric Fu	2017-09-19
	Eric Fu /Reviewer	Date



Report No.: SZEM170800932403

Page: 3 of 45

2 Test Summary

Radio Spectrum Technical Requirement				
Item	Standard	Method	Requirement	Result
Antenna Requirement	47 CFR Part 15, Subpart C 15.247	N/A	47 CFR Part 15, Subpart C 15.203 & 15.247(c)	Pass

Radio Spectrum Matter Part				
Item	Standard	Method	Requirement	Result
Conducted Emissions at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.2	47 CFR Part 15, Subpart C 15.207	Pass
Minimum 6dB Bandwidth	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.8.1	47 CFR Part 15, Subpart C 15.247a(2)	Pass
Conducted Peak Output Power	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.9.1	47 CFR Part 15, Subpart C 15.247(b)(3)	Pass
Power Spectrum Density	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.10.2	47 CFR Part 15, Subpart C 15.247(e)	Pass
Conducted Band Edges Measurement	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.13.3.2	47 CFR Part 15, Subpart C 15.247(d)	Pass
Conducted Spurious Emissions	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.11	47 CFR Part 15, Subpart C 15.247(d)	Pass
Radiated Emissions which fall in the restricted bands	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.10.5	47 CFR Part 15, Subpart C 15.209 & 15.247(d)	Pass
Radiated Spurious Emissions	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.10.4	47 CFR Part 15, Subpart C 15.209 & 15.247(d)	Pass
99% Occupied bandwidth		RSS-Gen Clause 6.6	RSS-Gen Issue 4 section 6.6	PASS

Declaration of EUT Family Grouping:

Note: There are series models mentioned in this report, and they are the identical in electrical and electronic characters. Only the model Oculus 2 was tested since their differences were the model number and appearance.



Report No.: SZEM170800932403

Page: 4 of 45

3 Contents

			Page
1	COVE	R PAGE	1
2	TEST	SUMMARY	3
3	CONT	TENTS	4
4	GENE	ERAL INFORMATION	6
	4.1 DET	TAILS OF E.U.T.	6
		SCRIPTION OF SUPPORT UNITS.	
		ASUREMENT UNCERTAINTY	
		NDARDS APPLICABLE FOR TESTING	
		ST LOCATION	
		T FACILITY	
	4.7 DEV	VIATION FROM STANDARDS	9
	4.8 ABN	NORMALITIES FROM STANDARD CONDITIONS	9
5	FQUII	PMENT LIST	10
Ŭ			10
6	RADIO	O SPECTRUM TECHNICAL REQUIREMENT	11
	6.1 AN	TENNA REQUIREMENT	11
	6.1.1	Test Requirement:	11
	6.1.2	Conclusion	
7	DADIO	O SPECTRUM MATTER TEST RESULTS	12
•			
		NDUCTED EMISSIONS AT AC POWER LINE (150kHz-30MHz)	
	7.1.1	E.U.T. Operation	
	7.1.2	Test Setup Diagram	
	7.1.3	Measurement Data	
	7.2 MIN 7.2.1	NIMUM 6DB BANDWIDTH	
	7.2.1	Test Setup Diagram	
	7.2.3	Measurement Data	
		NDUCTED PEAK OUTPUT POWER	
	7.3.1	E.U.T. Operation	
	7.3.2	Test Setup Diagram	
	7.3.3	Measurement Data	
		WER SPECTRUM DENSITY	
	7.4.1	E.U.T. Operation	18
	7.4.2	Test Setup Diagram	18
	7.4.3	Measurement Data	
	7.5 Con	NDUCTED BAND EDGES MEASUREMENT	
	7.5.1	E.U.T. Operation	
	7.5.2	Test Setup Diagram	
	7.5.3	Measurement Data	
		NDUCTED SPURIOUS EMISSIONS	
	7.6.1	E.U.T. Operation	
	7.6.2	Test Setup Diagram	
	7.6.3	Measurement Data DIATED EMISSIONS WHICH FALL IN THE RESTRICTED BANDS	
	7.7.1	DIATED EMISSIONS WHICH FALL IN THE RESTRICTED BANDS	
	7.7.1	L.O. 1. Operation	21

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.sgs.com/en/Terms-and-Conditions.com/en



Report No.: SZEM170800932403

Page: 5 of 45

Q	FUT C	CONSTRUCTIONAL DETAILS	45
8	EQUIF	PMENT UNDER TEST PICTURES	45
	7.9 99%	OCCUPIED BANDWIDTH	44
		Measurement Data	
		Test Setup Diagram	
	7.8.1	E.U.T. Operation	36
		DIATED SPURIOUS EMISSIONS	
		Measurement Data	
	7.7.2	Test Setup Diagram	22



Report No.: SZEM170800932403

Page: 6 of 45

4 General Information

4.1 Details of E.U.T.

Power supply:	Adapter manufacturer: Xinsu Global Electronic Co., Limited Model: XSG0841000US Input: AC 100-240V, 50/60Hz 0.6A Max Output: 8.4V 1.0A
Test voltage:	AC 120V, 60Hz
Cable:	AC cable: 0cm DC cable: 120cm
Operation Frequency::	2412MHz-2462MHz
Modulation technique:	802.11 b DSSS(CCK, DQPSK, DBPSK) 802.11 g/n(HT20) OFDM(64QAM, 16QAM, QPSK, BPSK)
Data Rate: Antenna type:	802.11b: 1/2/5.5/11Mbps, 802.11g: 6/9/12/18/24/36/48/54Mbps 802.11n(HT20): MCS0-MCS7 PCB Antenna
Antenna gain:	2 dbi
Number of channels:	11

4.2 Description of Support Units

The EUT has been tested as an independent unit.

Description	Manufacturer	Model No.	Serial No.
Laptop	Lenovo	ThinkPad X100e	SGS
USB to TTL Bridge Controller	/	FT232	SGS
Serial debugging tools	/	Ver 1.3	Client



Report No.: SZEM170800932403

Page: 7 of 45

4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.25 x 10-8
2	Timeout	2s
3	Duty cycle	0.37%
4	Occupied Bandwidth	3%
5	RF conducted power	0.75dB
6	RF power density	2.84dB
7	Conducted Spurious emissions	0.75dB
8	DE Dadiated newer	4.5dB (below 1GHz)
0	RF Radiated power	4.8dB (above 1GHz)
9	Dadiated Churique emission test	4.5dB (30MHz-1GHz)
9	Radiated Spurious emission test	4.8dB (1GHz-18GHz)
10	Temperature test	1℃
11	Humidity test	3%
12	Supply voltages	1.5%
13	Time	3%



Report No.: SZEM170800932403

Page: 8 of 45

4.4 Standards Applicable for Testing

Table 1: Tests Carried Out Under 47 CFR Part 15, Subpart C 15.247

Item	Status
Antenna Requirement	√
Conducted Emissions at AC Power Line (150kHz-30MHz)	√
Minimum 6dB Bandwidth	√
Conducted Peak Output Power	√
20dB Bandwidth	×
Carrier Frequencies Separation	×
Hopping Channel Number	×
Dwell Time	×
Power Spectrum Density	√
Conducted Band Edges Measurement	√
Conducted Spurious Emissions	√
Radiated Emissions which fall in the restricted bands	√
Radiated Spurious Emissions	√
Other requirements Frequency Hopping Spread Spectrum System Hopping Sequence	×
99% Occupied bandwidth	√

- x Indicates that the test is not applicable
- $\sqrt{}$ Indicates that the test is applicable



Report No.: SZEM170800932403

Page: 9 of 45

4.5 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China. 518057

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

4.6 Test Facility

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

· CNAS (No. CNAS L2929)

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 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.

A2LA (Certificate No. 3816.01)

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

VCCI

The 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-823, R-4188, T-1153 and C-2383 respectively.

FCC –Designation Number: CN1178

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

Industry Canada (IC)

Two 3m Semi-anechoic chambers and the 10m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1, 4620C-2, 4620C-3.

4.7 Deviation from Standards

None

4.8 Abnormalities from Standard Conditions

None



Report No.: SZEM170800932403

Page: 10 of 45

5 Equipment List

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Conducted Emission at AC			in to the state of the		0.11 2.00 2.00
EMI test receiver	R&S	ESR7	SHEM162-1	2016-12-29	2017-12-28
LISN	Schwarzbeck	NSLK8127	SHEM061-1	2016-12-29	2017-12-28
LISN	EMCO	3816/2	SHEM019-1	2016-12-29	2017-12-28
Pulse limiter	R&S	ESH3-Z2	SHEM029-1	2017-08-12	2018-08-11
CE test Cable	/	CE01	/	2016-12-29	2017-12-28
Conducted Test	<u>'</u>	<u> </u>	<u> </u>		
Spectrum Analyzer	R&S	FSP-30	SHEM002-1	2017-04-24	2018-04-23
Spectrum Analyzer	Agilent	N9020A	SHEM181-1	2017-07-03	2018-07-02
Power meter	R&S	NRP	SHEM057-1	2016-12-29	2017-12-28
Power Sensor	R&S	NRP-Z22	SHEM136-1	2017-07-22	2018-07-21
Power Sensor	R&S	NRP-Z91	SHEM057-2	2016-12-29	2017-12-28
Signal Generator	R&S	SMR40	SHEM058-1	2017-07-03	2018-07-02
Signal Generator	Agilent	N5182A	SHEM182-1	2017-07-03	2018-07-02
Communication Tester	R&S	CMW500	SHEM183-1	2017-07-03	2018-07-02
Switcher	Tonscend	JS0806	SHEM184-1	/	/
Splitter	Anritsu	MA1612A	SHEM185-1	/	/
Coupler	e-meca	803-S-1	SHEM186-1	/	/
High-low Temp Cabinet	Suzhou Zhihe	TL-40	SHEM087-1	2017-09-13	2018-09-12
AC Power Stabilizer	WOCEN	6100	SHEM045-1	2017-01-14	2018-01-13
DC Power Supply	QJE	QJ30003SII	SHEM046-1	2017-01-14	2018-01-13
Radiated Test					
EMI test receiver	R&S	ESU40	SHEM051-1	2017-09-26	2018-09-25
Spectrum Analyzer	R&S	FSP-30	SHEM002-1	2017-04-24	2018-04-23
Loop Antenna (9kHz-30MHz)	Schwarzbeck	FMZB1519	SHEM135-1	2017-04-10	2018-04-09
Antenna (25MHz-2GHz)	Schwarzbeck	VULB9168	SHEM048-1	2017-02-28	2018-02-27
Antenna (25MHz-3GHz)	Schwarzbeck	HL562	SHEM010-1	2017-02-28	2018-02-27
Horn Antenna (1-8GHz)	Schwarzbeck	HF906	SHEM009-1	2016-09-24	2018-09-23
Horn Antenna (1-18GHz)	Schwarzbeck	BBHA9120D	SHEM050-1	2017-01-14	2018-01-13
Horn Antenna (14-40GHz)	Schwarzbeck	BBHA 9170	SHEM049-1	2017-02-13	2018-01-15
Pre-amplifier (9KHz-2GHz)	CLAVIIO	BDLNA-0001-412010	SHEM164-1	2017-08-22	2018-08-21
Pre-amplifier (1-26.5GHz)	CLAVIIO	BDLNA-0118-352810	SHEM050-2	2017-08-22	2018-08-21
Band filter	LORCH	9BRX-875/X150-SR	SHEM156-1	/	/
Band filter	LORCH	13BRX-1950/X500-SR	SHEM083-2	/	/
Band filter	LORCH	5BRX-2400/X200-SR	SHEM155-1	/	/
Band filter	LORCH	5BRX-5500/X1000-SR	SHEM157-2	/	/
High pass Filter	Wainwright	WHK3.0/18G-100SS	SHEM157-1	/	/
High pass Filter	Wainwright	WHKS1700-3SS	SHEM157-3	/	/
Semi/Fully Anechoic	ST	11*6*6M	SHEM078-2	2017-07-22	2018-07-21
RE test Cable	/	RE01, RE02, RE06	/	2016-12-29	2017-12-28



Report No.: SZEM170800932403

Page: 11 of 45

6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.247

6.1.2 Conclusion

Standard Requirment:

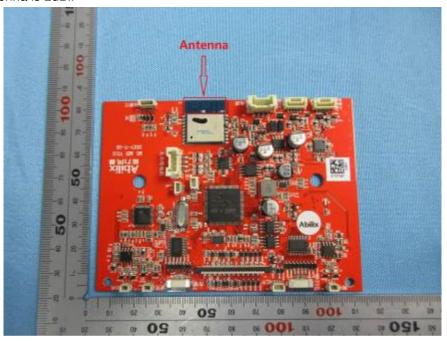
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit 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 integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 2dBi.





Report No.: SZEM170800932403

Page: 12 of 45

7 Radio Spectrum Matter Test Results

7.1 Conducted Emissions at AC Power Line (150kHz-30MHz)

Test Requirement: 47 CFR Part 15, Subpart C 15.247
Test Method: ANSI C63.10 (2013) Section 6.2

Limit:

	Conducte	ed limit(dBµV)	
Frequency of emission(MHz)	Quasi-peak	Average	
0.15-0.5	66 to 56*	56 to 46*	
0.5-5	56	46	
5-30	60	50	
*Decreases with the logarithm of the frequency.			

7.1.1 E.U.T. Operation

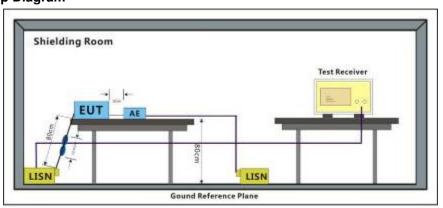
Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

Test mode c: Engineering Mode: Using test software to control EUT working in continuous

transmitting and receiving, and select channel and modulation type

7.1.2 Test Setup Diagram





Report No.: SZEM170800932403

Page: 13 of 45

7.1.3 Measurement Data

1) The mains terminal disturbance voltage test was conducted in a shielded room.

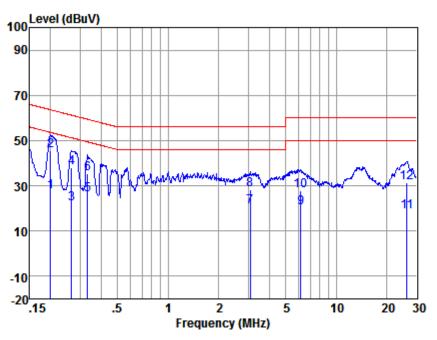
- 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a $50 \text{ohm}/50 \mu\text{H} + 5 \text{ohm}$ linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
- 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,
- 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
- 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.



Report No.: SZEM170800932403

Page: 14 of 45

AC Live Line



Site : chamber Condition : LISN-L-2017

Project No: 5549CR

Test mode : a

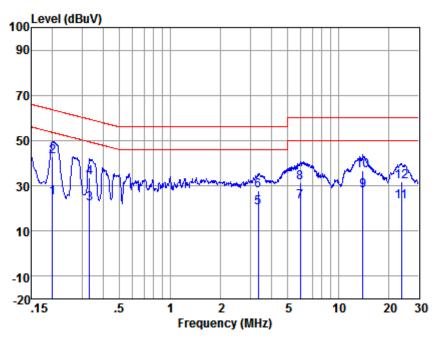
	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.200	17.52	0.11	9.81	27.44	53.62	-26.18	Average
2	0.200	35.62	0.11	9.81	45.54	63.62	-18.08	QP
3	0.267	12.29	0.11	9.81	22.21	51.20	-28.99	Average
4	0.267	28.08	0.11	9.81	38.00	61.20	-23.20	QP
5	0.332	15.92	0.11	9.81	25.84	49.40	-23.56	Average
6	0.332	25.59	0.11	9.81	35.51	59.40	-23.89	QP
7	3.074	10.96	0.12	9.85	20.93	46.00	-25.07	Average
8	3.074	18.29	0.12	9.85	28.26	56.00	-27.74	QP
9	6.153	10.48	0.11	9.86	20.45	50.00	-29.55	Average
10	6.153	17.87	0.11	9.86	27.84	60.00	-32.16	QP
11	26.418	8.09	0.21	10.05	18.35	50.00	-31.65	Average
12	26.418	21.17	0.21	10.05	31.43	60.00	-28.57	QP



Report No.: SZEM170800932403

Page: 15 of 45

AC Neutral Line



Site : chamber Condition : LISN-N-2017

Project No: 5549CR

Test mode : a

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.200	14.79	0.12	9.81	24.72	53.62	-28.90	Average
2	0.200	32.99	0.12	9.81	42.92	63.62	-20.70	QP
3	0.332	12.31	0.11	9.81	22.23	49.40	-27.17	Average
4	0.332	23.88	0.11	9.81	33.80	59.40	-25.60	QP
5	3.346	10.49	0.13	9.85	20.47	46.00	-25.53	Average
6	3.346	17.81	0.13	9.85	27.79	56.00	-28.21	QP
7	5.961	13.15	0.13	9.86	23.14	50.00	-26.86	Average
8	5.961	21.33	0.13	9.86	31.32	60.00	-28.68	QP
9	14.063	17.50	0.16	10.00	27.66	50.00	-22.34	Average
10	14.063	26.34	0.16	10.00	36.50	60.00	-23.50	QP
11	23.762	12.57	0.22	10.04	22.83	50.00	-27.17	Average
12	23.762	21.67	0.22	10.04	31.93	60.00	-28.07	QP



Report No.: SZEM170800932403

Page: 16 of 45

7.2 Minimum 6dB Bandwidth

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

Measurement Distance: 3m

Limit: ≥500 kHz

7.2.1 E.U.T. Operation

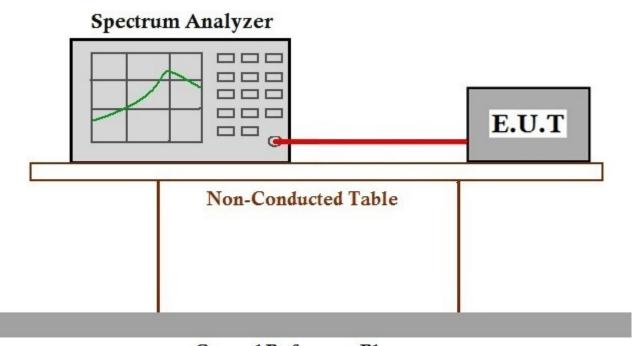
Operating Environment:

Temperature: 21 °C Humidity: 45 % RH Atmospheric Pressure: 1010 mbar

Test mode c: Engineering Mode: Using test software to control EUT working in continuous

transmitting and receiving, and select channel and modulation type

7.2.2 Test Setup Diagram



Ground Reference Plane

7.2.3 Measurement Data

The detailed test data see: Appendix 15.247



Report No.: SZEM170800932403

Page: 17 of 45

7.3 Conducted Peak Output Power

Test Requirement: 47 CFR Part 15, Subpart C 15.247
Test Method: ANSI C63.10 (2013) Section 11.9.1

Measurement Distance: 3m

Limit:

Frequency range(MHz)	Output power of the intentional radiator(watt)					
	1 for ≥50 hopping channels					
902-928	0.25 for <50 hopping channels					
	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					

7.3.1 E.U.T. Operation

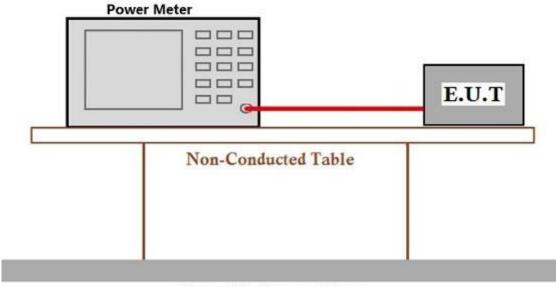
Operating Environment:

Temperature: 21 °C Humidity: 45 % RH Atmospheric Pressure: 1010 mbar

Test mode c: Engineering Mode: Using test software to control EUT working in continuous

transmitting and receiving, and select channel and modulation type

7.3.2 Test Setup Diagram



Ground Reference Plane

7.3.3 Measurement Data

The detailed test data see: Appendix 15.247

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 is 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 faisification 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.



Report No.: SZEM170800932403

Page: 18 of 45

7.4 Power Spectrum Density

Test Requirement: 47 CFR Part 15, Subpart C 15.247
Test Method: ANSI C63.10 (2013) Section 11.10.2

Measurement Distance: 3m

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

transmission

7.4.1 E.U.T. Operation

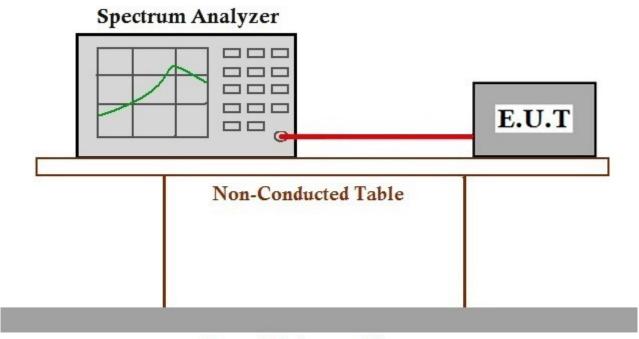
Operating Environment:

Temperature: 21 °C Humidity: 45 % RH Atmospheric Pressure: 1010 mbar

Test mode c: Engineering Mode: Using test software to control EUT working in continuous

transmitting and receiving, and select channel and modulation type

7.4.2 Test Setup Diagram



Ground Reference Plane

7.4.3 Measurement Data

The detailed test data see: Appendix 15.247



Report No.: SZEM170800932403

Page: 19 of 45

7.5 Conducted Band Edges Measurement

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

Measurement Distance: 3m

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

transmi

7.5.1 E.U.T. Operation

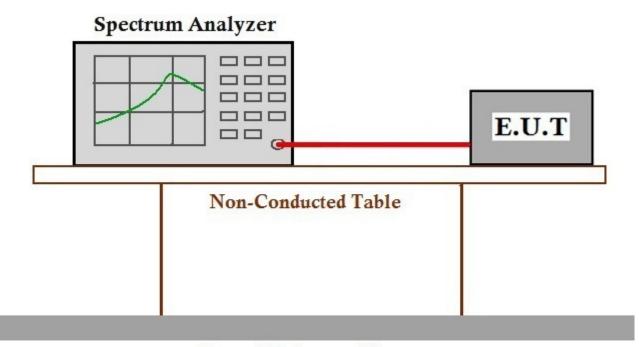
Operating Environment:

Temperature: 21 °C Humidity: 45 % RH Atmospheric Pressure: 1010 mbar

Test mode c: Engineering Mode: Using test software to control EUT working in continuous

transmitting and receiving, and select channel and modulation type

7.5.2 Test Setup Diagram



Ground Reference Plane

7.5.3 Measurement Data

The detailed test data see: Appendix 15.247

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 is 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.



Report No.: SZEM170800932403

Page: 20 of 45

7.6 Conducted Spurious Emissions

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

Measurement Distance: 3m

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

transmi

7.6.1 E.U.T. Operation

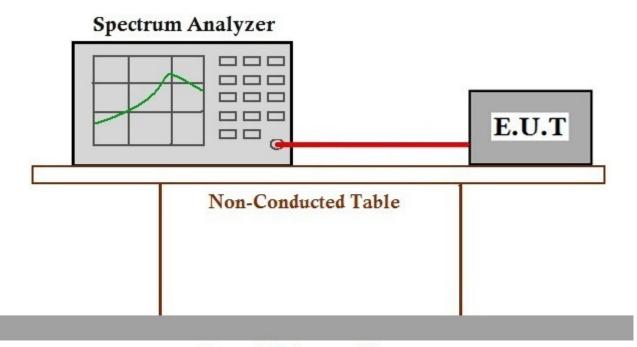
Operating Environment:

Temperature: 21 °C Humidity: 45 % RH Atmospheric Pressure: 1010 mbar

Test mode c: Engineering Mode: Using test software to control EUT working in continuous

transmitting and receiving, and select channel and modulation type

7.6.2 Test Setup Diagram



Ground Reference Plane

7.6.3 Measurement Data

The detailed test data see: Appendix 15.247

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 is 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.



Report No.: SZEM170800932403

Page: 21 of 45

7.7 Radiated Emissions which fall in the restricted bands

Test Requirement: 47 CFR Part 15, Subpart C 15.247
Test Method: ANSI C63.10 (2013) Section 6.10.5

Measurement Distance: 3m

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.

7.7.1 E.U.T. Operation

Operating Environment:

Temperature: 21 °C Humidity: 45 % RH Atmospheric Pressure: 1010 mbar

Test mode c: Engineering Mode: Using test software to control EUT working in continuous

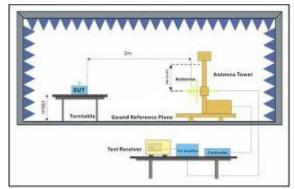
transmitting and receiving, and select channel and modulation type

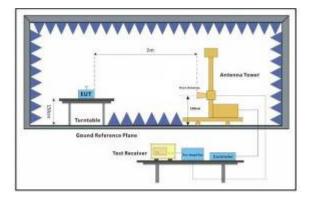


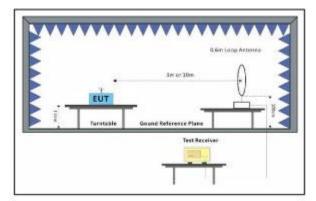
Report No.: SZEM170800932403

Page: 22 of 45

7.7.2 Test Setup Diagram









Report No.: SZEM170800932403

Page: 23 of 45

7.7.3 Measurement 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.



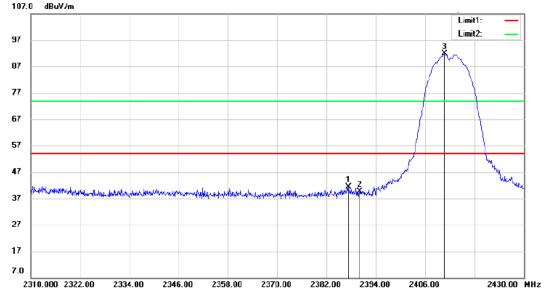
Report No.: SZEM170800932403

Page: 24 of 45

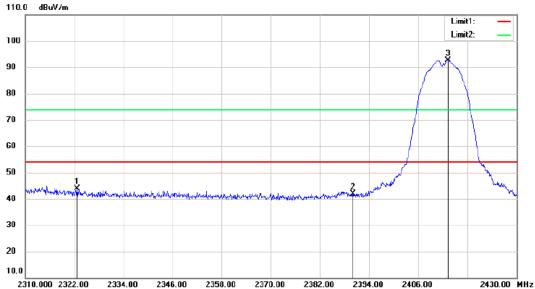
Test Mode: 802.11b Channel: 2412

MK	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Polarization
1	2387.4	45.21	-3.87	41.34	54	-12.66	Peak	Horizontal
2	2390	43.57	-3.89	39.68	54	-14.32	Peak	Horizontal
3	2410.68	95.79	-3.93	91.86	54	37.86	Peak	Horizontal
1	2322.72	47.66	-3.69	43.97	54	-10.03	Peak	Vertical
2	2390	45.73	-3.89	41.84	54	-12.16	Peak	Vertical
3	2413.2	96.57	-3.92	92.65	54	38.65	Peak	Vertical

Horizontal



Vertical





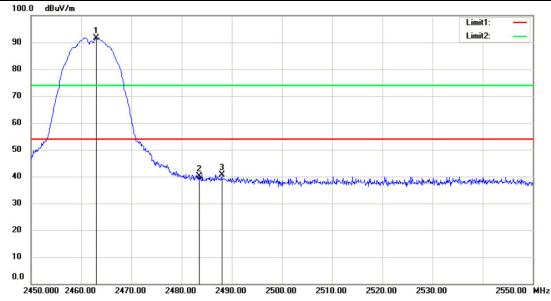
Report No.: SZEM170800932403

Page: 25 of 45

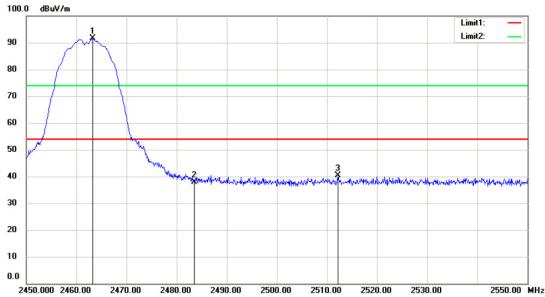
Test Mode: 802.11b Channel: 2462

MK	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Polarization
1	2463	95.68	-3.99	91.69	54	37.69	Peak	Horizontal
2	2483.5	44.08	-4.01	40.07	54	-13.93	Peak	Horizontal
3	2488	44.63	-4.01	40.62	54	-13.38	Peak	Horizontal
1	2463.3	95.49	-3.98	91.51	54	37.51	Peak	Vertical
2	2483.5	41.91	-4.01	37.9	54	-16.1	Peak	Vertical
3	2512.2	44.25	-3.89	40.36	54	-13.64	Peak	Vertical





Vertical





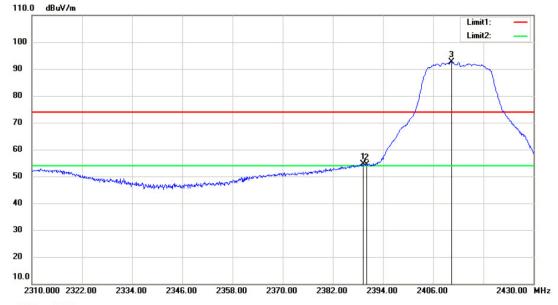
Report No.: SZEM170800932403

Page: 26 of 45

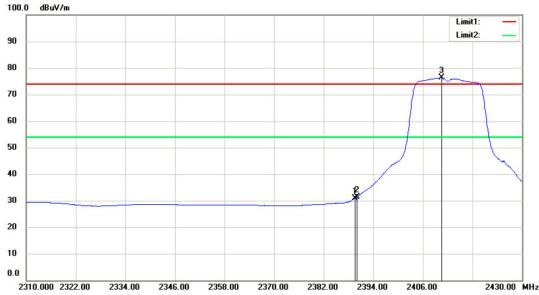
Test Mode: 802.11g Channel: 2412

MK	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Polarization			
1	2389.2	58.47	-3.89	54.58	74	-19.42	Peak	Horizontal			
2	2390	58.18	-3.89	54.29	74	-19.71	Peak	Horizontal			
3	2410.32	96.52	-3.93	92.59	74	18.59	Peak	Horizontal			
1	2389.56	34.81	-3.88	30.93	54	-23.07	Average	Horizontal			
2	2390	35.32	-3.89	31.43	54	-22.57	Average	Horizontal			
3	2410.56	80.25	-3.93	76.32	54	22.32	Average	Horizontal			





Average



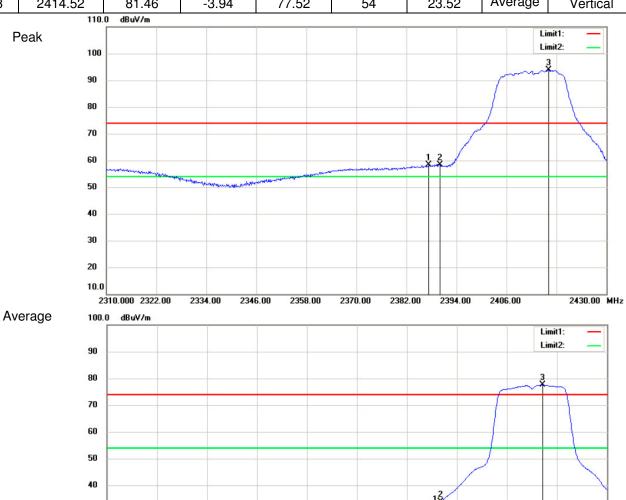


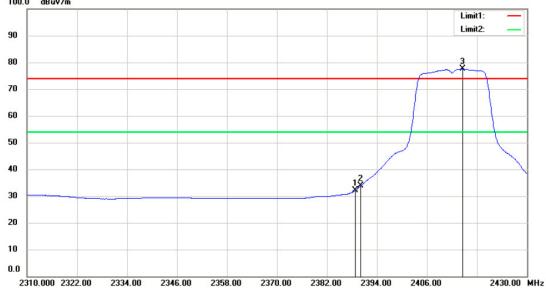
Report No.: SZEM170800932403

Page: 27 of 45

Test Mode: 802.11g Channel: 2412

MK	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Polarization
1	2387.4	62.24	-3.87	58.37	74	-15.63	Peak	Vertical
2	2390	62.27	-3.89	58.38	74	-15.62	Peak	Vertical
3	2416.08	97.7	-3.93	93.77	74	19.77	Peak	Vertical
1	2388.84	36.08	-3.89	32.19	54	-21.81	Average	Vertical
2	2390	37.69	-3.89	33.8	54	-20.2	Average	Vertical
3	2414.52	81.46	-3.94	77.52	54	23.52	Average	Vertical







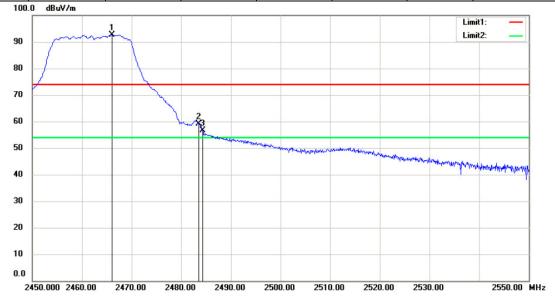
Report No.: SZEM170800932403

Page: 28 of 45

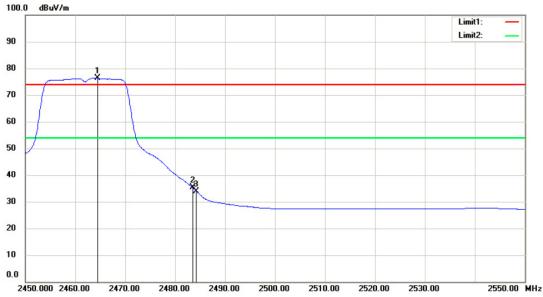
Test Mode: 802.11g Channel: 2462

MK	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Polarization		
1	2466	96.55	-3.99	92.56	74	18.56	Peak	Horizontal		
2	2483.5	63.26	-4.01	59.25	74	-14.75	Peak	Horizontal		
3	2484.3	60.76	-4.02	56.74	74	-17.26	Peak	Horizontal		
1	2464.5	80.32	-3.99	76.33	54	22.33	Average	Horizontal		
2	2483.5	39.33	-4.01	35.32	54	-18.68	Average	Horizontal		
3	2484.2	38.01	-4.02	33.99	54	-20.01	Average	Horizontal		





Average





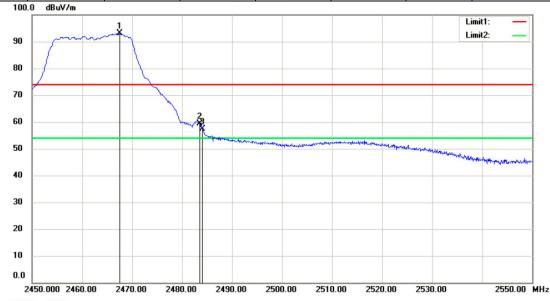
Report No.: SZEM170800932403

Page: 29 of 45

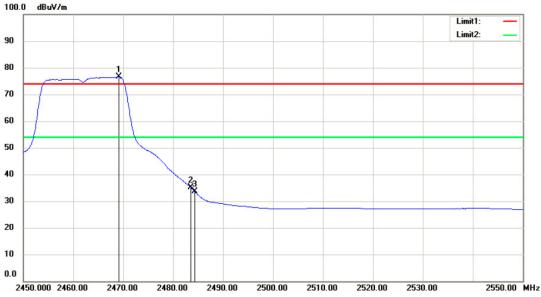
Test Mode: 802.11g Channel: 2462

MK	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Polarization			
1	2467.5	97.02	-4	93.02	74	19.02	Peak	Vertical			
2	2483.5	63.3	-4.01	59.29	74	-14.71	Peak	Vertical			
3	2484.1	61.34	-4.02	57.32	74	-16.68	Peak	Vertical			
1	2469.1	80.52	-3.99	76.53	54	22.53	Average	Vertical			
2	2483.5	39.11	-4.01	35.1	54	-18.9	Average	Vertical			
3	2484.3	37.58	-4.02	33.56	54	-20.44	Average	Vertical			





Average



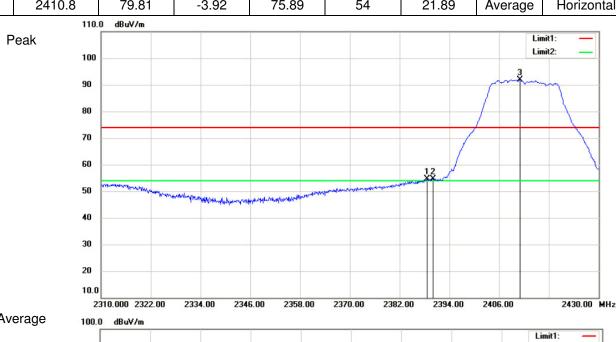


Report No.: SZEM170800932403

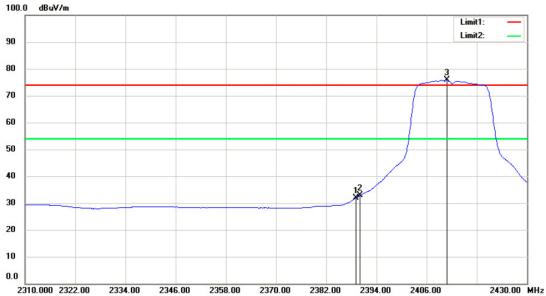
Page: 30 of 45

Test Mode: 802.11 n(HT20) Channel: 2412

MK	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Polarization
1	2388.6	58.43	-3.88	54.55	74	-19.45	Peak	Horizontal
2	2390	58.45	-3.89	54.56	74	-19.44	Peak	Horizontal
3	2411.04	95.86	-3.93	91.93	74	17.93	Peak	Horizontal
1	2389.08	35.8	-3.89	31.91	54	-22.09	Average	Horizontal
2	2390	36.66	-3.89	32.77	54	-21.23	Average	Horizontal
3	2410.8	79.81	-3.92	75.89	54	21.89	Average	Horizontal







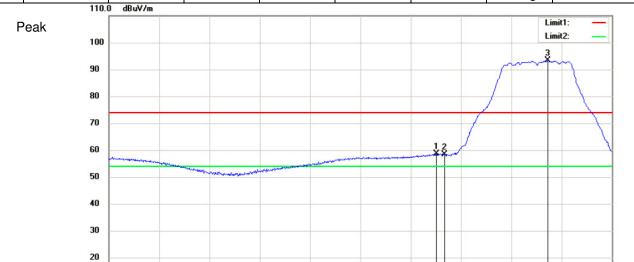


Report No.: SZEM170800932403

Page: 31 of 45

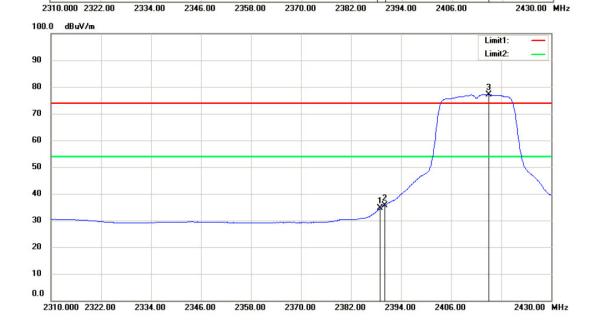
Test Mode: 802.11 n(HT20) Channel: 2412

MK	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Polarization			
1	2388.12	62.49	-3.88	58.61	74	-15.39	Peak	Vertical			
2	2390	62.39	-3.89	58.5	74	-15.5	Peak	Vertical			
3	2414.76	97.44	-3.94	93.5	74	19.5	Peak	Vertical			
1	2388.96	38.45	-3.89	34.56	54	-19.44	Average	Vertical			
2	2390	39.57	-3.89	35.68	54	-18.32	Average	Vertical			
3	2415	81.12	-3.94	77.18	54	23.18	Average	Vertical			



Average

10.0





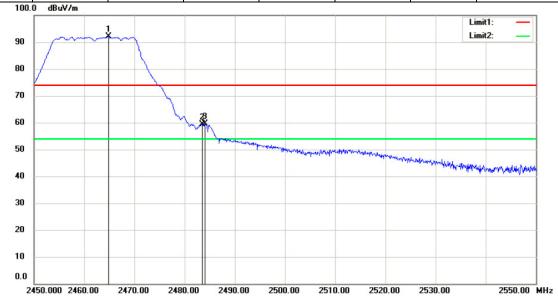
Report No.: SZEM170800932403

Page: 32 of 45

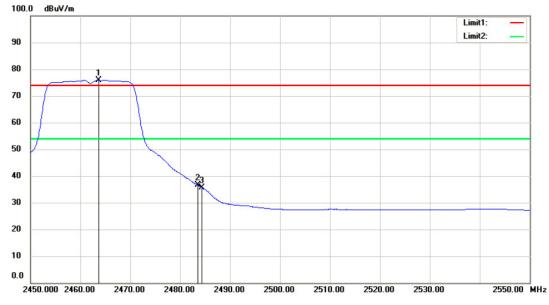
Test Mode: 802.11 n(HT20) Channel: 2462

MK	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Polarization
1	2464.8	96.05	-4	92.05	74	18.05	Peak	Horizontal
2	2483.5	63.33	-4.01	59.32	74	-14.68	Peak	Horizontal
3	2484	63.54	-4.02	59.52	74	-14.48	Peak	Horizontal
1	2463.6	79.85	-3.98	75.87	54	21.87	Average	Horizontal
2	2483.5	40.57	-4.01	36.56	54	-17.44	Average	Horizontal
3	2484.3	39.74	-4.02	35.72	54	-18.28	Average	Horizontal





Average





Report No.: SZEM170800932403

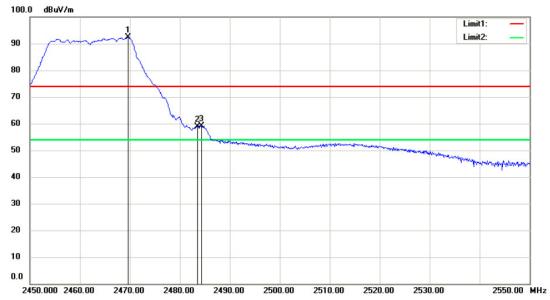
Channel: 2462

Page: 33 of 45

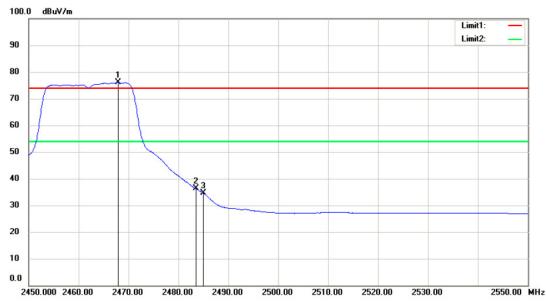
Test Mode: 802.11 n(HT20)

MK	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Polarization
1	2469.6	96.38	-4	92.38	74	18.38	Peak	Vertical
2	2483.5	62.96	-4.01	58.95	74	-15.05	Peak	Vertical
3	2484.3	63.08	-4.02	59.06	74	-14.94	Peak	Vertical
1	2467.9	80.04	-3.99	76.05	54	22.05	Average	Vertical
2	2483.5	40.27	-4.01	36.26	54	-17.74	Average	Vertical
3	2485	38.62	-4.01	34.61	54	-19.39	Average	Vertical





Average





Report No.: SZEM170800932403

Page: 34 of 45

Remark: 1). Test Level = Receiver Reading + Antenna Factor + Cable Loss- Preamplifier Factor 2). If the Peak value below the AV Limit, the AV test doesn't perform for this submission.

All frequencies within the "Restricted bands" have been evaluated to compliance. Except as shown in paragraph of this section, only spurious emissions are permitted in any of the frequency bands listed below:

a. FCC Part 15, Subpart C Section 15.205 Restricted bands of operation.

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
10.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.5 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	
13.36 - 13.41			



Report No.: SZEM170800932403

Page: 35 of 45

b. RSS-Gen section 7.2.2 Restricted bands of operation

MHz	MHz	GHz
0.090-0.110	240-285	9.0-9.2
2.1735-2.1905	322-335.4	9.3-9.5
3.020-3.026	399.9-410	10.6-12.7
4.125-4.128	608-614	13.25-13.4
4.17725-4.17775	960-1427	14.47-14.5
4.20725-4.20775	1435-1626.5	15.35-16.2
5.677-5.683	1645.5-1646.5	17.7-21.4
6.215-6.218	1660-1710	22.01-23.12
6.26775-6.26825	1718.8-1722.2	23.6-24.0
6.31175-6.31225	2200-2300	31.2-31.8
8.291-8.294	2310-2390	36.43-36.5
8.362-8.366	2655-2900	Above 38.6
8.37625-8.38675	3260-3267	
8.41425-8.41475	3332-3339	
12.29-12.293	3345.8-3358	
12.51975-12.52025	3500-4400	
12.57675-12.57725	4500-5150	
13.36-13.41	5350-5460	
16.42-16.423	7250-7750	
16.69475-16.69525	8025-8500	
16.80425-16.80475		
25.5-25.67		
37.5-38.25		
73-74.6		
74.8-75.2		
108-138		
156.52475-156.52525		
156.7-156.9		



Report No.: SZEM170800932403

Page: 36 of 45

7.8 Radiated Spurious Emissions

Test Requirement: 47 CFR Part 15, Subpart C 15.247
Test Method: ANSI C63.10 (2013) Section 6.10.4

Measurement Distance: 3m

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.

7.8.1 E.U.T. Operation

Operating Environment:

Temperature: 21 °C Humidity: 45 % RH Atmospheric Pressure: 1010 mbar

Test mode c: Engineering Mode: Using test software to control EUT working in continuous

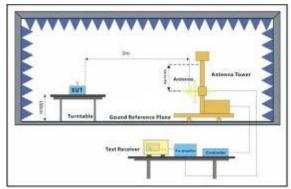
transmitting and receiving, and select channel and modulation type

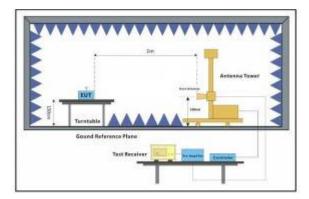


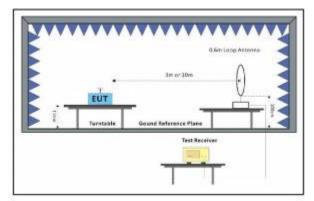
Report No.: SZEM170800932403

Page: 37 of 45

7.8.2 Test Setup Diagram









Report No.: SZEM170800932403

Page: 38 of 45

7.8.3 Measurement 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.



Report No.: SZEM170800932403

Page: 39 of 45

30MHz-1GHz:

Item	Freq.	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Result Level	Limit Line	Over Limit	Detector	Polarization
(Mark)	(MHz)	(dBµV)	(dB/m)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)		
1	31.18	48.28	15.43	42.60	0.19	21.30	40.00	-18.70	QP	Horizontal
2	72.34	52.05	10.59	42.67	0.35	20.32	40.00	-19.68	QP	Horizontal
3	107.89	60.01	9.58	42.70	0.49	27.38	43.50	-16.12	QP	Horizontal
4	163.76	62.09	12.52	42.58	0.64	32.67	43.50	-10.83	QP	Horizontal
5	176.27	60.87	11.79	42.56	0.66	30.76	43.50	-12.74	QP	Horizontal
6	236.65	55.03	10.97	42.47	0.75	24.28	46.00	-21.72	QP	Horizontal
1	31.18	62.25	15.43	42.60	0.19	35.27	40.00	-4.73	QP	Vertical
2	56.20	58.42	11.87	42.65	0.28	27.92	40.00	-12.08	QP	Vertical
3	97.80	65.09	9.22	42.69	0.45	32.07	43.50	-11.43	QP	Vertical
4	108.65	71.53	9.59	42.70	0.49	38.91	43.50	-4.59	QP	Vertical
5	131.30	60.76	12.59	42.65	0.58	31.28	43.50	-12.22	QP	Vertical
6	175.04	68.56	11.75	42.56	0.66	38.41	43.50	-5.09	QP	Vertical

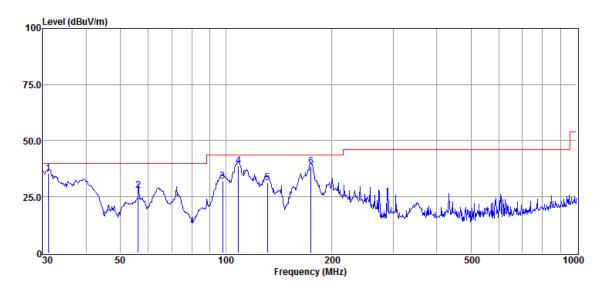
Result Level = Read Level + Antenna Factor + Cable loss - Preamp Factor



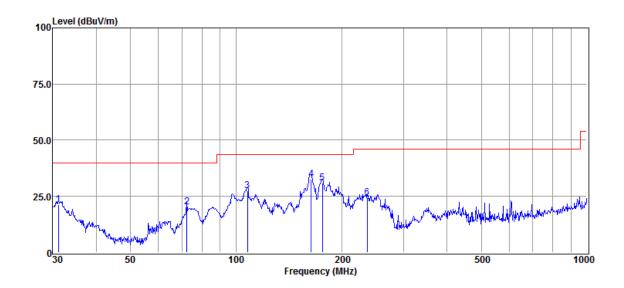
Report No.: SZEM170800932403

Page: 40 of 45

Test plot as below: Vertical:



Horizontal:





Report No.: SZEM170800932403

Page: 41 of 45

Above 1GHz:

Test mode: 802.11b Channel: 2412

Mark	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Polarization
1	4824	42.76	6.4	49.16	54	-4.84	peak	Horizontal
2	7236	37.55	10.76	48.31	54	-5.69	peak	Horizontal
3	9648	36.21	14.37	50.58	54	-3.42	peak	Horizontal
4	4824	41.09	6.4	47.49	54	-6.51	peak	Vertical
5	7236	38.43	10.76	49.19	54	-4.81	peak	Vertical
6	9648	34.65	14.37	49.02	54	-4.98	peak	Vertical

Test mode: 802.11b Channel: 2437

Mark	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Polarization
1	4874	41.04	6.92	47.96	54	-6.04	peak	Horizontal
2	7311	39.88	11.08	50.96	54	-3.04	peak	Horizontal
3	9748	34.37	14.36	48.73	54	-5.27	peak	Horizontal
4	4874	40.97	6.92	47.89	54	-6.11	peak	Vertical
5	7311	36.78	11.08	47.86	54	-6.14	peak	Vertical
6	9748	32.22	14.36	46.58	54	-7.42	peak	Vertical

Test mode: 802.11b Channel: 2462

Mark	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Polarization
1	4924	41.75	7.31	49.06	54	-4.94	peak	Horizontal
2	7386	38.12	11.41	49.53	54	-4.47	peak	Horizontal
3	9848	35.02	14.38	49.4	54	-4.6	peak	Horizontal
4	4924	40.03	7.31	47.34	54	-6.66	peak	Vertical
5	7386	38.04	11.41	49.45	54	-4.55	peak	Vertical
6	9848	33.2	14.38	47.58	54	-6.42	peak	Vertical



Report No.: SZEM170800932403

Page: 42 of 45

Test mode: 802.11g Channel: 2412

Mark	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Polarization
1	4824	41.04	6.4	47.44	54	-6.56	peak	Horizontal
2	7236	38	10.76	48.76	54	-5.24	peak	Horizontal
3	9648	35.15	14.37	49.52	54	-4.48	peak	Horizontal
4	4824	42.26	6.4	48.66	54	-5.34	peak	Vertical
5	7236	38.34	10.76	49.1	54	-4.9	peak	Vertical
6	9648	30.41	14.37	44.78	54	-9.22	peak	Vertical

Test mode: 802.11g Channel: 2437

Mark	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Polarization
1	4874	40.02	6.92	46.94	54	-7.06	peak	Horizontal
2	7311	36.94	11.08	48.02	54	-5.98	peak	Horizontal
3	9748	35.78	14.36	50.14	54	-3.86	peak	Horizontal
4	4874	42.92	6.92	49.84	54	-4.16	peak	Vertical
5	7311	37.11	11.08	48.19	54	-5.81	peak	Vertical
6	9748	34.12	14.36	48.48	54	-5.52	peak	Vertical

Test mode: 802.11g Channel: 2462

Mark	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Polarization
1	4924	42.18	7.31	49.49	54	-4.51	peak	Horizontal
2	7386	39.71	11.41	51.12	54	-2.88	peak	Horizontal
3	9848	36.34	14.38	50.72	54	-3.28	peak	Horizontal
4	4924	39.29	7.31	46.6	54	-7.4	peak	Vertical
5	7386	37.44	11.41	48.85	54	-5.15	peak	Vertical
6	9848	32.58	14.38	46.96	54	-7.04	peak	Vertical



Report No.: SZEM170800932403

Page: 43 of 45

Test mode: 802.11 n(HT20) Channel: 2412

Mark	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Polarization
1	4824	40.3	6.4	46.7	54	-7.3	peak	Horizontal
2	7236	36.09	10.76	46.85	54	-7.15	peak	Horizontal
3	9648	35.34	14.37	49.71	54	-4.29	peak	Horizontal
4	4824	40.56	6.4	46.96	54	-7.04	peak	Vertical
5	7236	37.74	10.76	48.5	54	-5.5	peak	Vertical
6	9648	37.61	14.37	51.98	54	-2.02	peak	Vertical

Test mode: 802.11 n(HT20) Channel: 2437

Mark	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Polarization
1	4874	41.01	6.92	47.93	54	-6.07	peak	Horizontal
2	7311	37.23	11.08	48.31	54	-5.69	peak	Horizontal
3	9748	32.43	14.36	46.79	54	-7.21	peak	Horizontal
4	4874	41.58	6.92	48.5	54	-5.5	peak	Vertical
5	7311	34.89	11.08	45.97	54	-8.03	peak	Vertical
6	9748	33.42	14.36	47.78	54	-6.22	peak	Vertical

Test mode: 802.11 n(HT20) Channel: 2462

Mark	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Polarization
1	4924	38.28	7.31	45.59	54	-8.41	peak	Horizontal
2	7386	36.75	11.41	48.16	54	-5.84	peak	Horizontal
3	9848	31.12	14.38	45.5	54	-8.5	peak	Horizontal
4	4924	41.65	7.31	48.96	54	-5.04	peak	Vertical
5	7386	34.49	11.41	45.9	54	-8.1	peak	Vertical
6	9848	33.83	14.38	48.21	54	-5.79	peak	Vertical

Remark:1) Emission = Receiver Reading + Factor

- 2) Factor = Antenna Factor + Cable Loss + Pre-amplifier Factor.
- 3) If the Peak value below the AV Limit, the AV test doesn't perform for this submission.
- 4) No spurious emissions were detected within 20dB of limit below 30MHz

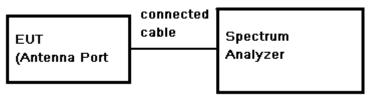


Report No.: SZEM170800932403

Page: 44 of 45

7.9 99% Occupied Bandwidth

Test Configuration:



Test Procedure:

- 1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
- 2. Set the spectrum analyzer: Span = approximately 2 to 3 times the 20dB bandwidth, centred on the hopping channel;
- 3. Set the spectrum analyzer: RBW >= 1% of the 20dB bandwidth (set 1MHz). VBW >= RBW. Sweep = auto; Detector Function = Peak. Trace = Max Hold.
- 4. Mark the peak frequency and -20dB points.

Test Date:

The detailed test data see: Appendix 15.247



Report No.: SZEM170800932403

Page: 45 of 45

8 Equipment Under Test Pictures

Refer to the < Test Setup Photos>

9 EUT Constructional Details

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

-- End of the Report--