

Report No.: KSCR220300029401

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# **TEST REPORT**

 Application No.:
 KSCR2203000294AT

 FCC ID:
 2AL8S-0250C03E

 IC:
 25987-0250C03E

**Applicant:** Zhejiang Uniview Technologies Co., Ltd.

Address of Applicant: 88 Jiangling Road, Xixing Town, Binjiang District, Hangzhou City

Manufacturer: Zhejiang Uniview Technologies Co., Ltd.

Address of Manufacturer: 88 Jiangling Road, Xixing Town, Binjiang District, Hangzhou City

**Factory:** Zhejiang Uniview System Technology Co., Ltd.

Address of Factory: No.1277 Qingfeng South Road (South), Tongxiang Economic

Development Zone, Tongxiang City, Jiaxing City, Zhejiang Province

**Equipment Under Test (EUT):** 

EUT Name: Network Video Recorder

Model No.: NVR301-04LS3-W,NVR301-04LS3-W-NB,NVR301-xxxxLxxxx-yyyyWyyyy-

zzz("x" can be 0-9,A-Z,a-z or blank, denoting difference in interface;"y" can be 0-9,A-Z,a-z or blank, denoting performance difference;"z"can be 0-9,A-Z,a-z or blank,denoting target regional; "a" can be 0-9, A or blank, denoting

infrared level;"-" is optional) .

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

actually tested and which were electrically identical.

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:** 2022-03-07

**Date of Test:** 2022-03-14 to 2022-03-23

**Date of Issue:** 2022-03-23

Test Result: Pass\*

Eric Lin
EMC Laboratory Manager



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<sup>\*</sup> In the configuration tested, the EUT complied with the standards specified above.



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For IC Model No: NVR301-04LS3-W,NVR301-04LS3-W-NB



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	Revision Record						
Version	Version Chapter Date Modifier						
01		2022-03-23		Original			

Authorized for issue by:		
	Damon zhou	
	Damon_zhou/Project Engineer	-
	Eria fri	
	Eric Lin/Reviewer	-



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# 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 Matter Part						
Item	FCC Requirement	IC Requirement	Method	Result		
Conducted Emissions at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart C 15.207	RSS-Gen Clause 8.8	ANSI C63.10 (2013) Section 6.2	Pass		
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 11.10.2	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		

## **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 NVR301-04LS3-W was tested since their differences were the model number and appearance.



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# 4 General Information

## 4.1 Details of E.U.T.

Power supply:	DC 12V,2A
Test Voltage:	AC120V/60Hz
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;802.11n(HT40):7
Channel Spacing:	5MHz
Antenna Type:	Dipole Antenna
Antenna Gain:	4.5dBi (Provided by the manufacturer)
Serial Number:	210235C0E51234567890
Firmware Version:	NVR-B3612.1.5.220215

4.2 Power level setting using in test:

Channal	802.11b	802.11g	802.11n(HT20)
Channel	Ant 1	Ant 1	Ant 1
1	20	28	28
6	20	28	28
11	20	28	28
Channal	802.11n(HT40)		
Channel	Ant 1		
3	28		
6	28		
9	28		

## 4.3 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Notebook	Lenovo	1	1
AC Adapter	SHENZHEN HONOR ELECTRONIC CO.,LTD	1	1



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## 4.4 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	8.4 x 10 <sup>-8</sup>
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
8	RF Radiated Power	5.2dB (Below 1GHz)
0	RF Radiated Power	5.9dB (Above 1GHz)
		4.2dB (Below 30MHz)
9	De lieta I Occasiona Franta de la Tanta	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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#### 4.5 Test Location

All tests were performed at:

Compliance Certification Services (Kunshan) Inc.

No.10 Weiye Rd, Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, China.

Tel: +86 512 5735 5888 Fax: +86 512 5737 0818

No tests were sub-contracted.

## 4.6 Test Facility

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

#### • CNAS (No. CNAS L4354)

CNAS has accredited Compliance Certification Services (Kunshan) Inc. 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.

#### A2LA (Certificate No. 2541.01)

Compliance Certification Services (Kunshan) Inc. is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 2541.01.

#### • FCC (Designation Number: CN1172)

Compliance Certification Services (Kunshan) Inc. has been recognized as an accredited testing laboratory.

Designation Number: CN1172.

## • ISED (CAB identifier: CN0072)

Compliance Certification Services (Kunshan) Inc. has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory.

Company Number: 2324E

• VCCI (Member No.: 1938)

The 3m and 10m Semi-anechoic chamber and Shielded Room of Compliance Certification Services (Kunshan) Inc. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-20134, R-11600, C-11707, T-11499, G-10216 respectively.

## 4.7 Deviation from Standards

None

#### 4.8 Abnormalities from Standard Conditions

None



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# 5 Equipment List

Item	Equipment	Manufacturer	Model	Serial Number	Cal Date	Cal. Due Date
	ducted Emission at Mains Terminals (150					
1	EMI Test Receive	R&S	ESCI	100781	01/22/2022	01/21/2023
2	LISN	R&S	ENV216	101604	10/12/2021	10/11/2022
3	LISN	Schwarzbeck	NNLK 8129	8129-143	10/12/2021	10/11/2022
4	Pulse Limiter	R&S	ESH3-Z2	100609	01/22/2022	01/21/2023
5	CE test Cable	Thermax	/	14	10/16/2021	10/15/2022
6	Test Software	Faratronic	EZ-EMC	CCS-03A1	N.C.R	N.C.R
RF	Conducted Test	I.				
1	Spectrum Analyzer	Agilent	E4446A	MY44020154	04/16/2021	04/15/2022
2	Spectrum Analyzer	Keysight	N9020A	MY55370209	10/11/2021	10/10/2022
4	Signal Generator	Agilent	N5182A	MY50142015	08/27/2021	08/26/2022
5	Spectrum Analyzer	Keysight	N9030B	MY61330164	01/22/2022	01/21/2023
6	Vector Signal Generator	R&S	SMW200A	110074	10/12/2021	10/11/2022
7	Radio Communication Test Station	Anritsu	MT8000A	6262012849	09/23/2021	09/22/2022
8	Radio Communication Analyzer	Anritsu	MT8821C	6201692222	09/23/2021	09/22/2022
9	Universal Radio Communication Tester	R&S	CMW500	159275	10/12/2021	10/11/2022
10	Universal Radio Communication Tester	R&S	CMW500	167239	04/16/2021	04/15/2022
11	Power Meter	Anritsu	ML2495A	1445010	04/15/2021	04/14/2022
12	Switcher	CCSRF	FY562	KUS2001M001-3	10/12/2021	10/11/2022
13	AC Power Source	EXTECH	6605	1570106	N.C.R	N.C.R
14	DC Power Supply	Aglient	E3632A	MY50340053	N.C.R	N.C.R
15	6dB Attenuator	Mini-Circuits	NAT-6-2W	15542-1	N.C.R	N.C.R
16	Power Divider	AISI	IOWOPE2068	PE2068	N.C.R	N.C.R
17	Filter	MICRO-TRONICS	BRM50701	5	N.C.R	N.C.R
18	Conducted Test Cable	1	RF01-RF04	/	04/15/2021	04/14/2022
19	Software	BST	TST-PASS	N/A	N/A	N/A
20	Temp. / Humidity Chamber	TERCHY	MHK-120AK	X30109	04/15/2021	04/14/2022
21	Thermometer	Anymetre	TH603	CCS007	10/14/2021	10/13/2022
RF R	adiated Test					
1	Spectrum Analyzer	R&S	FSV40	101493	10/11/2021	10/10/2022
2	Signal Generator	Agilent	E8257C	MY43321570	10/18/2021	10/17/2022
3	Loop Antenna	Com-Power	AL-130R	10160008	04/13/2021	04/12/2023
4	Bilog Antenna	TESEQ	CBL 6112D	35403	06/21/2021	06/20/2023
5	Bilog Antenna	SCHWARZBECK	VULB9160	9160-3342	04/13/2021	04/12/2023
6	Horn-antenna(1-18GHz)	Schwarzbeck	BBHA9120D	267	10/26/2020	10/25/2022
7	Horn-antenna(1-18GHz)	ETS-LINDGREN	3117	00143290	02/22/2021	02/21/2023
8	Horn Antenna(18-40GHz)	Schwarzbeck	BBHA9170	BBHA9170171	02/20/2022	02/19/2023
9	Pre-Amplifier(30MHz~18GHz)	LNA	/	/	04/15/2021	04/14/2022
10	Amplifier(18~40GHz)	COM-POWER	PAM-840A	461332	10/18/2021	10/17/2022
11	Low Pass Filter	MICRO-TRONICS	VLFX-950	RV142900829	N.C.R	N.C.R
12	High Pass Filter	Mini-Circuits	VHF-1200	15542	N.C.R	N.C.R
13	Filter (5450MHz~5770 MHz)	MICRO-TRONICS	BRC50704-01	2	N.C.R	N.C.R
14	Filter (5690 MHz~5930 MHz)	MICRO-TRONICS	BRC50705-01	4	N.C.R	N.C.R
15	Filter (5150 MHz~5350 MHz)	MICRO-TRONICS	BRC50703-01	2	N.C.R	N.C.R
10	1 11161 (3 130 IVII 12 - 3330 IVII 12)	WILCING-TINGINICS	ן מ-נט ומכטאום		N.O.N	N.O.IN



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16	Filter (885 MHz~915 MHz)	MICRO-TRONICS	BRM14698	1	N.C.R	N.C.R
17	Filter (815 MHz~860 MHz)	MICRO-TRONICS	BRM14697	1	N.C.R	N.C.R
18	Filter (1745 MHz~1910 MHz)	MICRO-TRONICS	BRM14700	1	N.C.R	N.C.R
19	Filter (1922 MHz~1977 MHz)	MICRO-TRONICS	BRM50715	1	N.C.R	N.C.R
20	Filter (2550 MHz)	MICRO-TRONICS	HPM13362	5	N.C.R	N.C.R
21	Filter (1532 MHz $\sim$ 1845 MHz)	MICRO-TRONICS	BRM50713	1	N.C.R	N.C.R
22	Filter (2.4GHz)	MICRO-TRONICS	BRM50701	5	N.C.R	N.C.R
23	RE test cable	1	RE01-RE04	/	04/15/2021	04/14/2022
24	Software	Faratronic	EZ_EMC	N/A	N/A	N/A



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# 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 Dipole antenna and no consideration of replacement. The best case gain of the antenna is 4.5 dBi.

Antenna location: Refer to Appendix (Internal Photos)



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# 7 Radio Spectrum Matter Test Results

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

Test Requirement 47 CFR Part 15, Subpart C 15.207 Test Method: ANSI C63.10 (2013) Section 6.2

#### Limit:

Frequency of	Conducted limit(dBμV)				
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.					
Detector: Peak for pre-scan (9k	:Hz resolution bandwidth) 0.15M	1 to 30MHz			

## 7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 19.4 °C Humidity: 37.1 % RH Atmospheric Pressure: 1010 mbar

#### 7.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	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); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.



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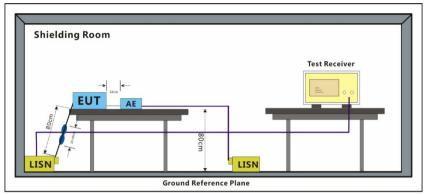
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## 7.1.3 Test Setup Diagram



#### 7.1.4 Measurement Procedure and 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.

Remark: Level=Read Level+ Cable Loss+ LISN Factor



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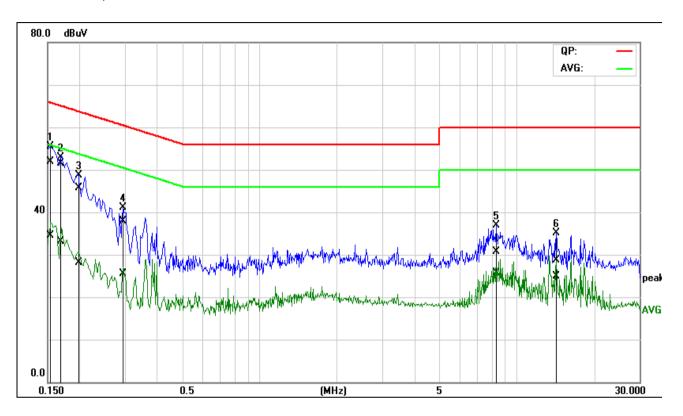
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Test Mode: 00; Line: Live line



No.	Frequency	QuasiPeak	Average	Correction	QuasiPeak	Average	QuasiPeak	Average	QuasiPeak	Average	Remark
		reading	reading	factor	result	result	limit	limit	margin	margin	
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1	0.1545	32.37	15.06	19.50	51.87	34.56	65.75	55.75	-13.88	-21.19	Pass
2*	0.1665	32.02	13.59	19.50	51.52	33.09	65.13	55.13	-13.61	-22.04	Pass
3	0.1975	26.24	8.58	19.50	45.74	28.08	63.72	53.72	-17.98	-25.64	Pass
4	0.2959	18.36	5.99	19.51	37.87	25.50	60.36	50.36	-22.49	-24.86	Pass
5	8.4009	10.68	5.64	20.00	30.68	25.64	60.00	50.00	-29.32	-24.36	Pass
6	14.2159	8.51	4.74	20.18	28.69	24.92	60.00	50.00	-31.31	-25.08	Pass



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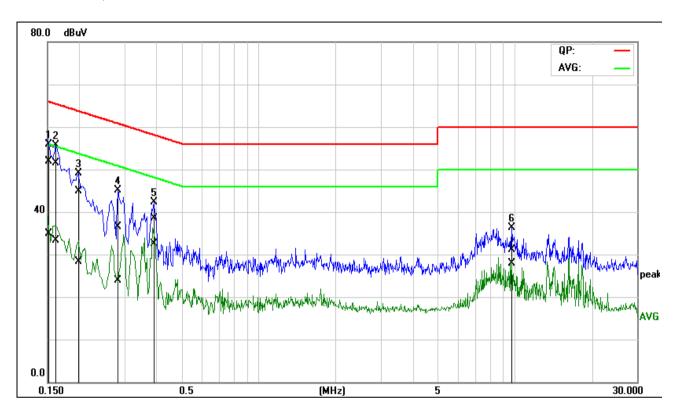
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Test Mode: 00; Line: Neutral Line



No.	Frequency	QuasiPeak	Average	Correction	QuasiPeak	Average	QuasiPeak	Average	QuasiPeak	Average	Remark
		reading	reading	factor	result	result	limit	limit	margin	margin	
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1*	0.1527	32.52	15.34	19.48	52.00	34.82	65.85	55.85	-13.85	-21.03	Pass
2	0.1596	32.08	13.88	19.48	51.56	33.36	65.48	55.48	-13.92	-22.12	Pass
3	0.1983	25.36	8.75	19.49	44.85	28.24	63.68	53.68	-18.83	-25.44	Pass
4	0.2830	17.00	4.36	19.50	36.50	23.86	60.73	50.73	-24.23	-26.87	Pass
5	0.3903	18.98	12.98	19.52	38.50	32.50	58.06	48.06	-19.56	-15.56	Pass
6	9.7343	11.02	7.80	20.04	31.06	27.84	60.00	50.00	-28.94	-22.16	Pass
6	9.7343	11.02	7.80	20.04	31.06	27.84	60.00	50.00	-28.94	-22.16	



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## 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: 22.2 °C Humidity: 59.2 % RH Atmospheric Pressure: 1010 mbar

7.2.2 Test Mode Description

Pre-scan /	Mode	Description
Final test	Code	200011011011
Final test	00	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); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.



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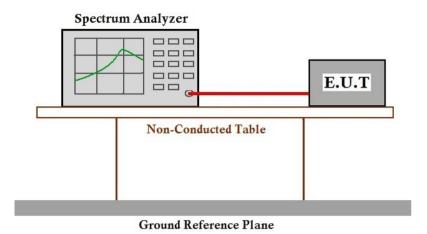
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### 7.2.3 Test Setup Diagram



#### 7.2.4 Measurement Procedure and Data

The detailed test data see: Appendix A for KSCR220300029401



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#### 7.3 Minimum 6dB Bandwidth

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

Limit:

≥500 kHz

#### 7.3.1 E.U.T. Operation

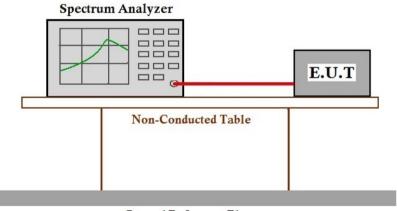
Operating Environment:

Humidity: 59.2 % RH Atmospheric Pressure: 1010 mbar Temperature: 22.2 °C

### 7.3.2 Test Mode Description

	1012 1001 mode 2000 phon					
Pre-scan / Final test	Mode Code	Description				
Final test	00	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); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.				

## 7.3.3 Test Setup Diagram



**Ground Reference Plane** 

#### 7.3.4 Measurement Procedure and Data

The detailed test data see: Appendix A for KSCR220300029401



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## 7.4 Power Spectrum Density

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

Limit:

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

#### 7.4.1 E.U.T. Operation

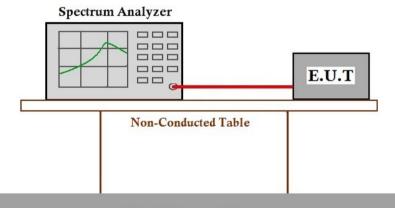
Operating Environment:

19.4 °C Humidity: 37.1 % RH Temperature: Atmospheric Pressure: 1010 mbar

## 7.4.2 Test Mode Description

	· · · · · · · · · · · · · · · · · · ·					
Pre-scan / Final test	Mode Code	Description				
Final test	00	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); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.				

## 7.4.3 Test Setup Diagram



**Ground Reference Plane** 

#### 7.4.4 Measurement Procedure and Data

The detailed test data see: Appendix A for KSCR220300029401



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## 7.5 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).

#### 7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 22.2 °C Humidity: 59.5 % RH Atmospheric Pressure: 1010 mbar

#### 7.5.2 Test Mode Description

7.5.2 Test IV	7.5.2 Test mode Description					
Pre-scan / Final test	Mode Code	Description				
Final test	00	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); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.				



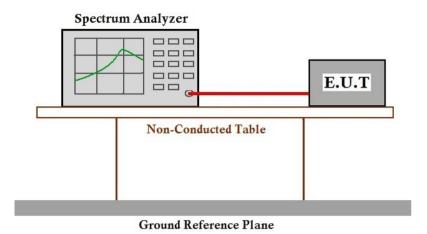
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### 7.5.3 Test Setup Diagram



#### 7.5.4 Measurement Procedure and Data

The detailed test data see: Appendix A for KSCR220300029401



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## 7.6 Conducted Spurious Emissions

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

#### 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).

#### 7.6.1 E.U.T. Operation

Operating Environment:

Temperature: 22.2 °C Humidity: 59.5 % RH Atmospheric Pressure: 1010 mbar

#### 7.6.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description				
Final test	00	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); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.				



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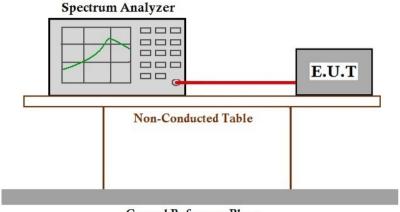
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### 7.6.3 Test Setup Diagram



**Ground Reference Plane** 

### 7.6.4 Measurement Procedure and Data

The detailed test data see: Appendix A for KSCR220300029401



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#### 7.7 Radiated Emissions which fall in the restricted bands

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209

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.

#### 7.7.1 E.U.T. Operation

Operating Environment:

Temperature: 22.6 °C Humidity: 60.7 % RH Atmospheric Pressure: 1010 mbar

#### 7.7.2 Test Mode Description

	7.7.2 Test mode Beschption					
Pre-scan / Final test	Mode Code	Description				
Final test	00	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); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.				



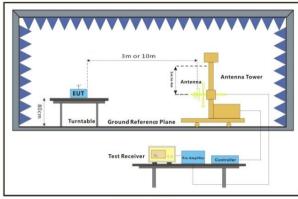
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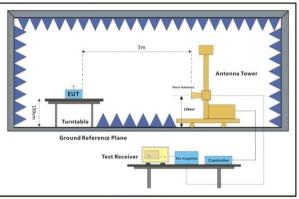


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### 7.7.3 Test Setup Diagram





30MHz-1GHz

Above 1GHz

#### 7.7.4 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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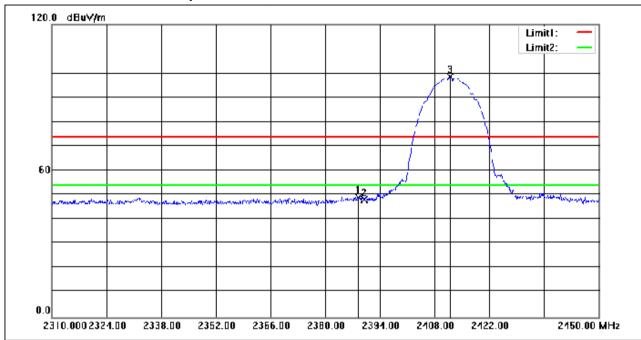
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No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2388.540	63.16	-14.01	49.15	74.00	-24.85	peak
2	2390.000	62.23	-14.01	48.22	74.00	-25.78	peak
3	2412.060	112.35	-13.94	98.41	74.00	24.41	peak



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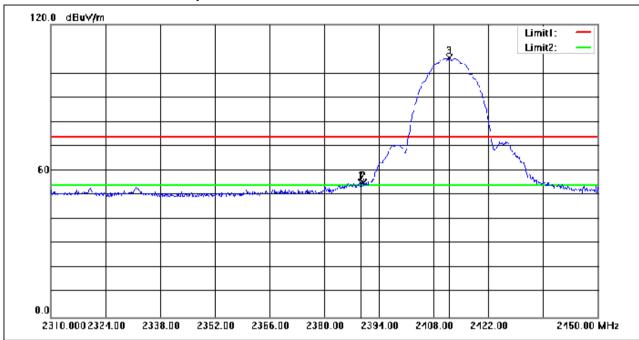
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Test Mode: 00; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2389.380	69.15	-14.01	55.14	74.00	-18.86	peak
2	2390.000	69.16	-14.01	55.15	74.00	-18.85	peak
3	2412.060	120.28	-13.94	106.34	74.00	32.34	peak



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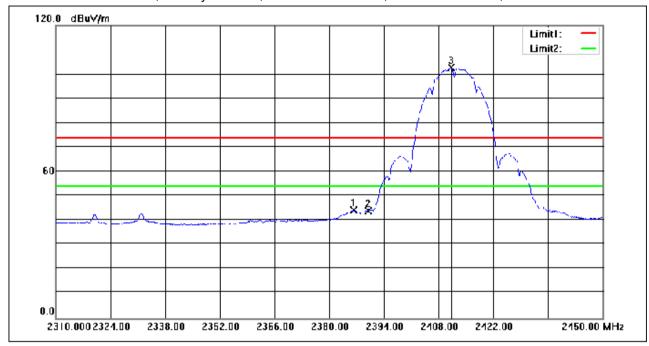
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Test Mode: 00; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2386.300	58.32	-14.02	44.30	54.00	-9.70	AVG
2	2390.000	57.92	-14.01	43.91	54.00	-10.09	AVG
3	2411.220	116.66	-13.94	102.72	54.00	48.72	AVG



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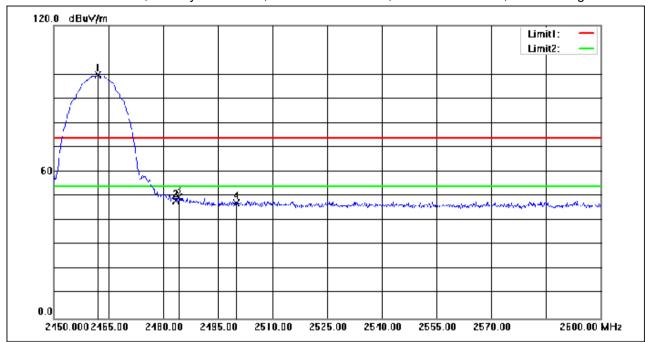
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Test Mode: 00; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:High



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2462.000	113.49	-13.78	99.71	74.00	25.71	peak
2	2483.500	61.73	-13.71	48.02	74.00	-25.98	peak
3	2484.350	63.26	-13.70	49.56	74.00	-24.44	peak
4	2500.000	60.95	-13.64	47.31	74.00	-26.69	peak



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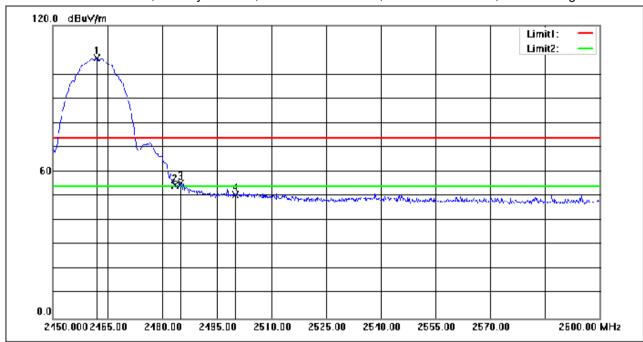
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Test Mode: 00; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:High



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2462.000	120.33	-13.78	106.55	74.00	32.55	peak
2	2483.500	68.20	-13.71	54.49	74.00	-19.51	peak
3	2485.100	69.05	-13.70	55.35	74.00	-18.65	peak
4	2500.000	64.14	-13.64	50.50	74.00	-23.50	peak



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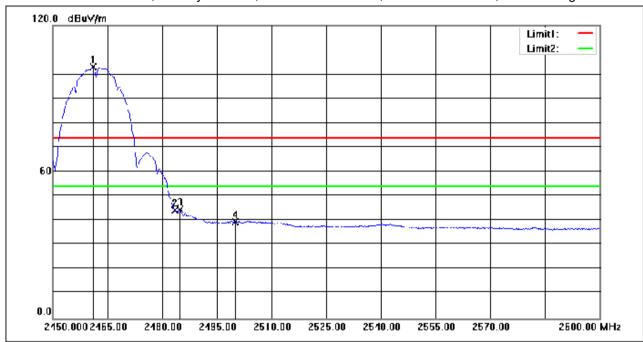
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Test Mode: 00; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:High



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2461.100	116.77	-13.78	102.99	54.00	48.99	AVG
2	2483.500	58.10	-13.71	44.39	54.00	-9.61	AVG
3	2484.950	58.11	-13.70	44.41	54.00	-9.59	AVG
4	2500.000	53.04	-13.64	39.40	54.00	-14.60	AVG



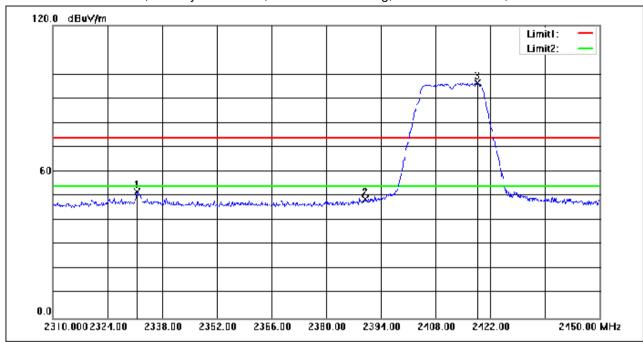
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Test Mode: 00; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:Low



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2331.560	65.92	-14.19	51.73	74.00	-22.27	peak
2	2390.000	62.78	-14.01	48.77	74.00	-25.23	peak
3	2418.640	110.28	-13.91	96.37	74.00	22.37	peak



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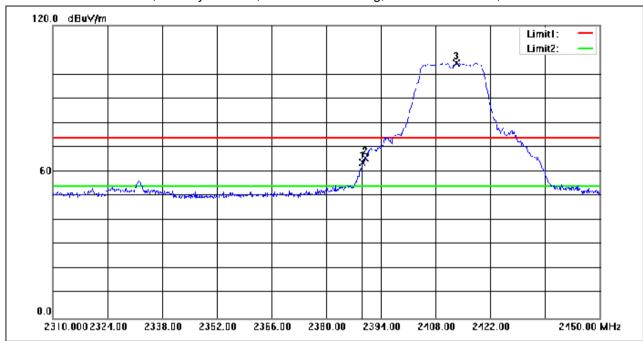
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Test Mode: 00; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:Low



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2389.240	77.73	-14.01	63.72	74.00	-10.28	peak
2	2390.000	79.64	-14.01	65.63	74.00	-8.37	peak
3	2413.320	118.61	-13.94	104.67	74.00	30.67	peak



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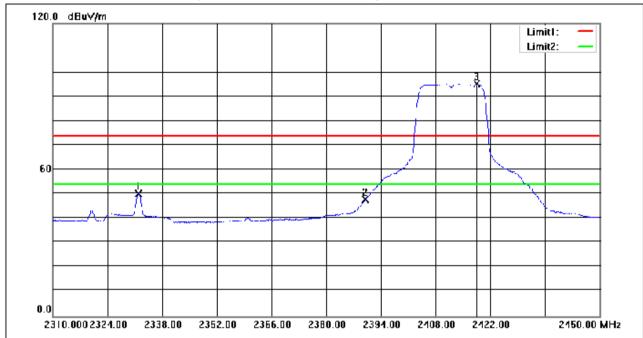
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No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2331.980	64.47	-14.19	50.28	54.00	-3.72	AVG
2	2390.000	61.82	-14.01	47.81	54.00	-6.19	AVG
3	2418.500	109.11	-13.91	95.20	54.00	41.20	AVG



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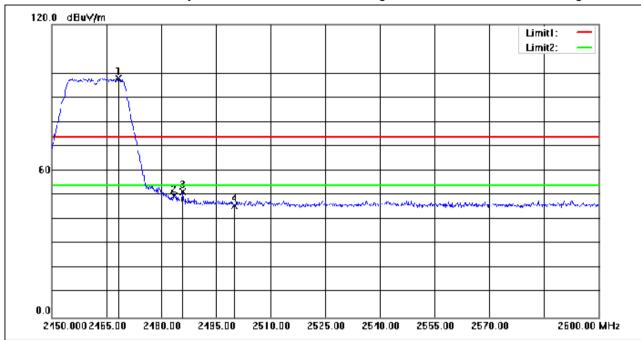
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No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2468.300	111.65	-13.75	97.90	74.00	23.90	peak
2	2483.500	63.24	-13.71	49.53	74.00	-24.47	peak
3	2485.850	65.05	-13.70	51.35	74.00	-22.65	peak
4	2500.000	59.51	-13.64	45.87	74.00	-28.13	peak



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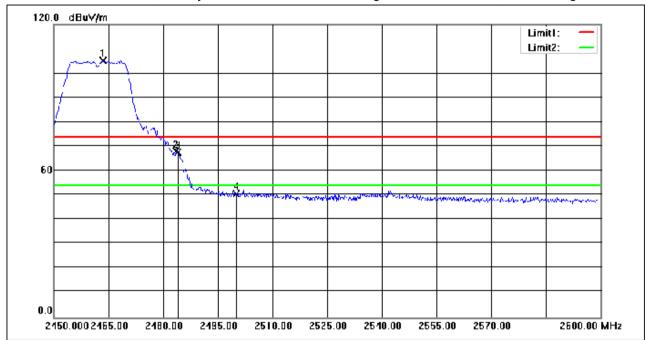
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No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2463.500	118.86	-13.77	105.09	74.00	31.09	peak
2	2483.500	81.78	-13.71	68.07	74.00	-5.93	peak
3	2484.050	81.43	-13.70	67.73	74.00	-6.27	peak
4	2500.000	64.16	-13.64	50.52	74.00	-23.48	peak



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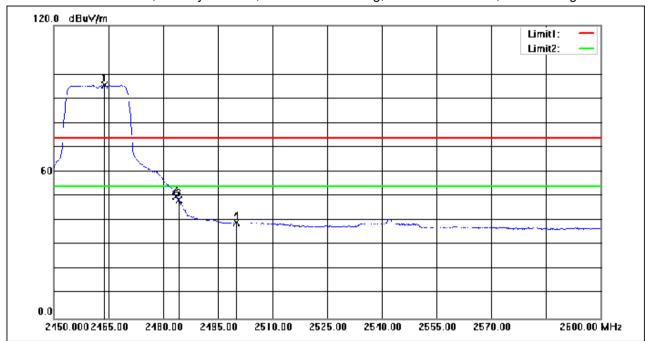
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No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2463.950	109.33	-13.77	95.56	54.00	41.56	AVG
2	2483.500	63.79	-13.71	50.08	54.00	-3.92	AVG
3	2484.350	62.23	-13.70	48.53	54.00	-5.47	AVG
4	2500.000	52.85	-13.64	39.21	54.00	-14.79	AVG



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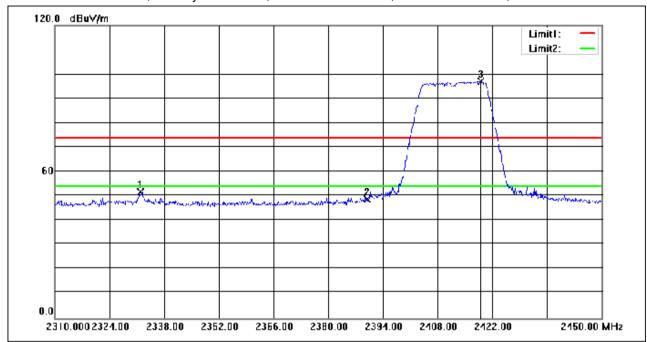
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Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2331.840	65.94	-14.19	51.75	74.00	-22.25	peak
2	2390.000	62.76	-14.01	48.75	74.00	-25.25	peak
3	2419.060	111.02	-13.91	97.11	74.00	23.11	peak



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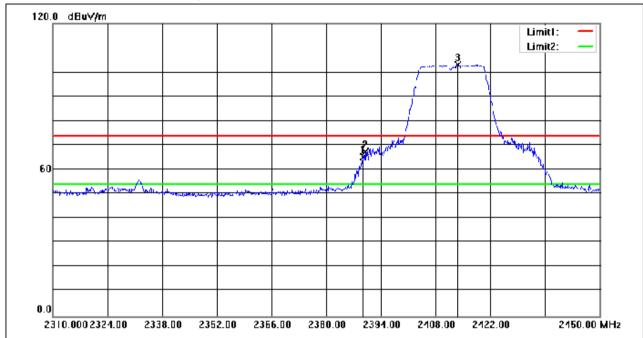
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Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2389.380	79.16	-14.01	65.15	74.00	-8.85	peak
2	2390.000	81.33	-14.01	67.32	74.00	-6.68	peak
3	2413.740	117.01	-13.94	103.07	74.00	29.07	peak



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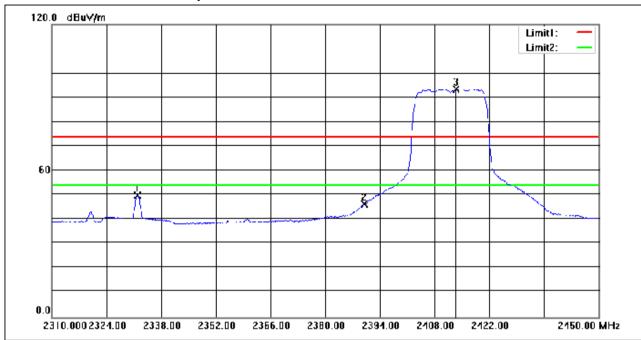
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Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2331.980	64.15	-14.19	49.96	54.00	-4.04	AVG
2	2390.000	60.24	-14.01	46.23	54.00	-7.77	AVG
3	2413.460	107.52	-13.94	93.58	54.00	39.58	AVG



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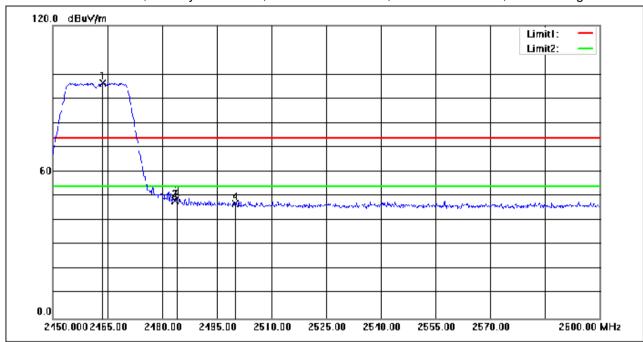
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Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:High



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2463.650	110.19	-13.77	96.42	74.00	22.42	peak
2	2483.500	61.83	-13.71	48.12	74.00	-25.88	peak
3	2484.050	63.15	-13.70	49.45	74.00	-24.55	peak
4	2500.000	60.55	-13.64	46.91	74.00	-27.09	peak



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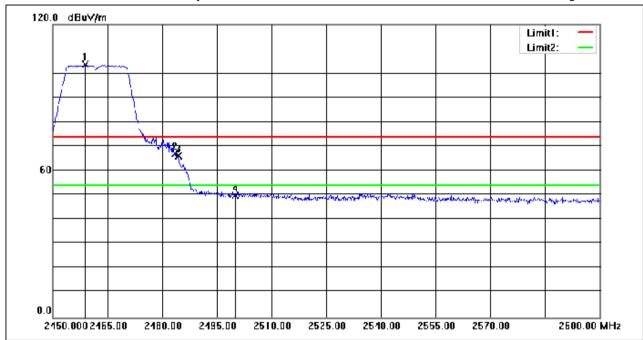
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Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:High



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2458.850	117.32	-13.79	103.53	74.00	29.53	peak
2	2483.500	80.88	-13.71	67.17	74.00	-6.83	peak
3	2484.500	79.84	-13.70	66.14	74.00	-7.86	peak
4	2500.000	63.73	-13.64	50.09	74.00	-23.91	peak



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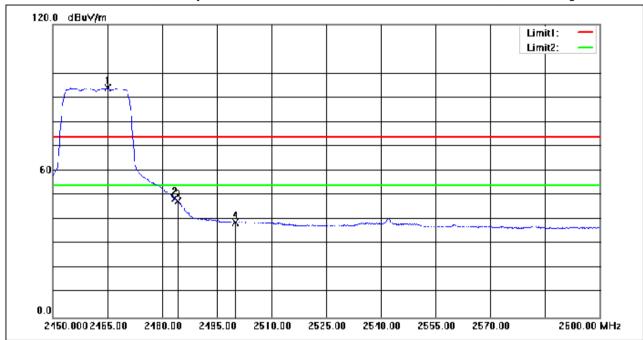
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Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:High



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2465.000	107.70	-13.76	93.94	54.00	39.94	AVG
2	2483.500	62.39	-13.71	48.68	54.00	-5.32	AVG
3	2484.350	61.17	-13.70	47.47	54.00	-6.53	AVG
4	2500.000	52.46	-13.64	38.82	54.00	-15.18	AVG



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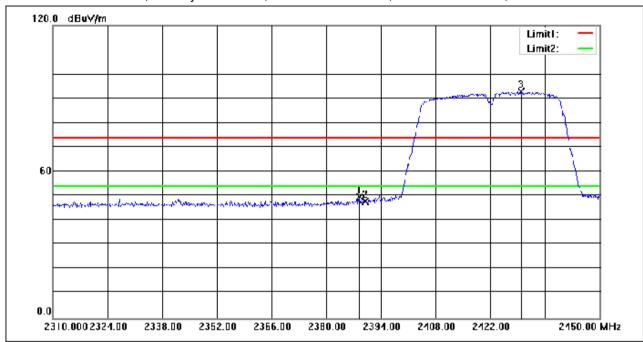
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Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:Low



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2388.540	63.74	-14.01	49.73	74.00	-24.27	peak
2	2390.000	61.92	-14.01	47.91	74.00	-26.09	peak
3	2429.840	106.66	-13.88	92.78	74.00	18.78	peak



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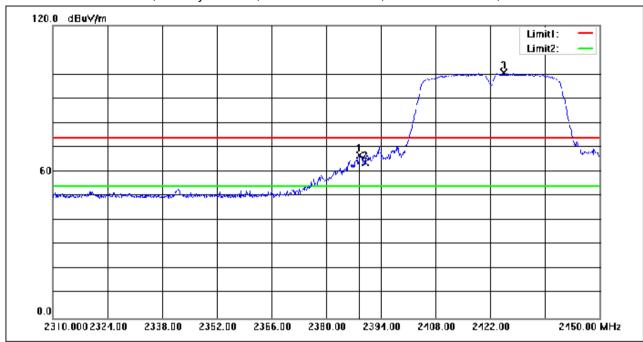
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Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:Low



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2388.540	80.78	-14.01	66.77	74.00	-7.23	peak
2	2390.000	77.79	-14.01	63.78	74.00	-10.22	peak
3	2425.360	114.53	-13.90	100.63	74.00	26.63	peak



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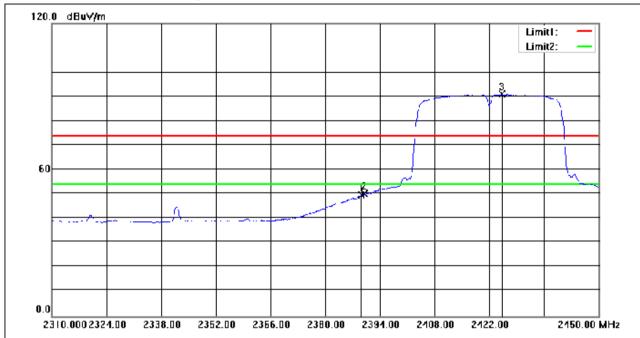
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Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:Low



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2389.240	63.68	-14.01	49.67	54.00	-4.33	AVG
2	2390.000	64.21	-14.01	50.20	54.00	-3.80	AVG
3	2425.220	104.84	-13.90	90.94	54.00	36.94	AVG



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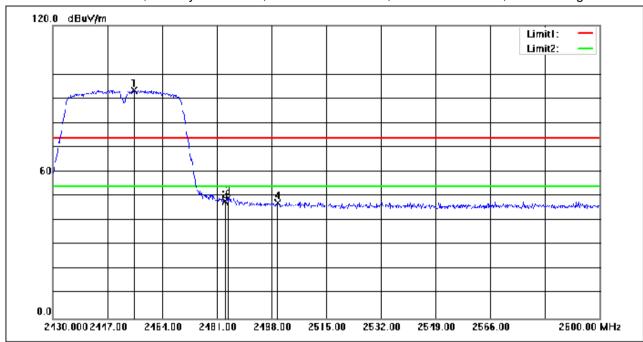
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Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:High



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2455.160	107.20	-13.79	93.41	74.00	19.41	peak
2	2483.500	61.68	-13.71	47.97	74.00	-26.03	peak
3	2484.400	62.92	-13.70	49.22	74.00	-24.78	peak
4	2500.000	60.82	-13.64	47.18	74.00	-26.82	peak



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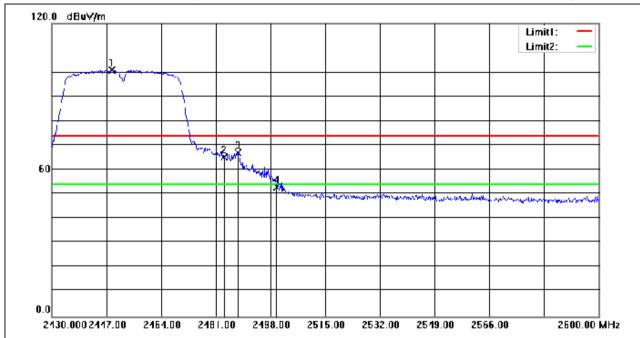
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Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:High



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2448.700	114.64	-13.82	100.82	74.00	26.82	peak
2	2483.500	79.08	-13.71	65.37	74.00	-8.63	peak
3	2487.970	80.72	-13.69	67.03	74.00	-6.97	peak
4	2500.000	66.71	-13.64	53.07	74.00	-20.93	peak



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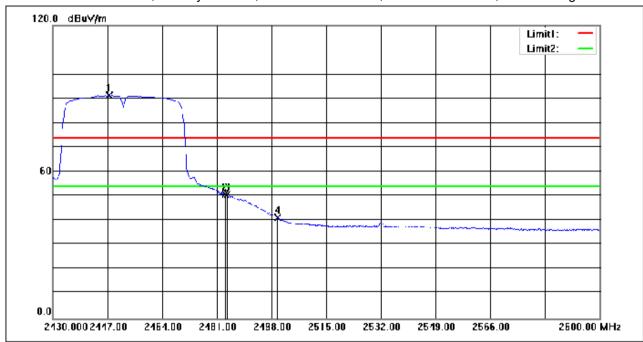
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Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:High



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2447.510	105.12	-13.82	91.30	54.00	37.30	AVG
2	2483.500	64.60	-13.71	50.89	54.00	-3.11	AVG
3	2484.230	64.46	-13.70	50.76	54.00	-3.24	AVG
4	2500.000	54.77	-13.64	41.13	54.00	-12.87	AVG



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### 7.8 Radiated Spurious Emissions Below 1GHz

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209

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

#### 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
960-1000	500	3

### 7.8.1 E.U.T. Operation

Operating Environment:

Temperature: 22.6 °C Humidity: 60.7 % RH Atmospheric Pressure: 1010 mbar

### 7.8.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description							
Final test	00	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); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.							



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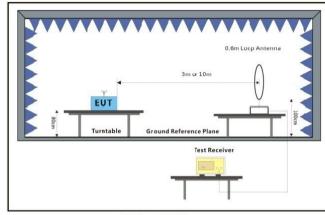
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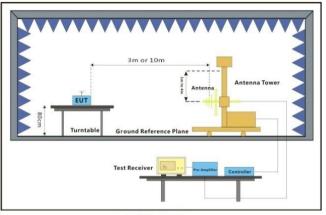


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#### 7.8.3 Test Setup Diagram





Below 30MHz

30MHz-1GHz

#### 7.8.4 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. 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.
- c. 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.
- d. 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.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. 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 quasi-peak method as specified and then reported in a data sheet.
- g. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- h. 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.
- i. Repeat above procedures until all frequencies measured was complete. Remark:
- 1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
- 2. Scan from 9kHz to 30MHz, the disturbance 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.
- 3. The disturbance below 1GHz was very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.



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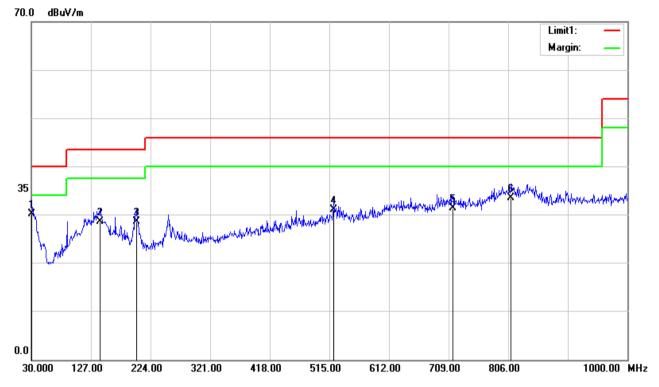
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#### Horizontal



No.	Frequency Reading		Correct Result		Limit Margin		Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	30.0000	4.33	25.93	30.26	40.00	-9.74	197	361	QP
2	141.5500	8.77	19.86	28.63	43.50	-14.87	163	361	QP
3	200.7200	12.34	16.29	28.63	43.50	-14.87	100	54	QP
4	521.7900	5.64	25.50	31.14	46.00	-14.86	200	208	QP
5	715.7900	3.96	27.49	31.45	46.00	-14.55	101	361	QP
6	810.8500	5.64	27.88	33.52	46.00	-12.48	100	206	QP



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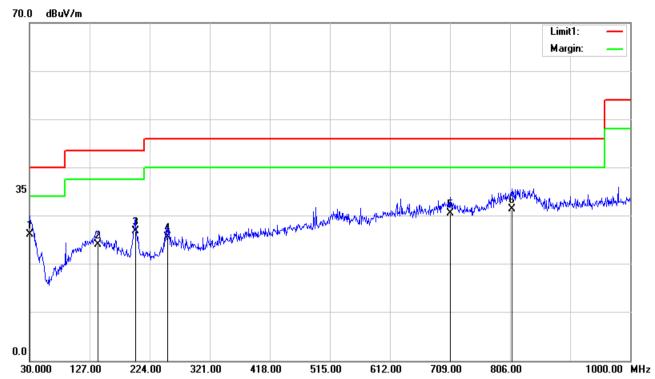
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#### Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	30.9700	0.87	25.38	26.25	40.00	-13.75	100	330	QP
2	140.5800	4.19	19.83	24.02	43.50	-19.48	135	360	QP
3	200.7200	10.66	16.29	26.95	43.50	-16.55	100	34	QP
4	253.1000	6.21	19.40	25.61	46.00	-20.39	100	332	QP
5	709.0000	3.04	27.50	30.54	46.00	-15.46	99	360	QP
6	808.9100	3.58	27.87	31.45	46.00	-14.55	100	193	QP



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#### 7.9 Radiated Spurious Emissions Above 1GHz

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209

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

#### Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
Above 1000	500	3

#### 7.9.1 E.U.T. Operation

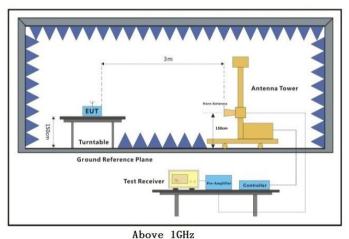
Operating Environment:

Temperature: 22.6 °C Humidity: 60.6 % RH Atmospheric Pressure: 1010 mbar

#### 7.9.2 Test Mode Description

Pre-scan / Final test	Description								
Final test	00	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); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.							

#### 7.9.3 Test Setup Diagram





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#### 7.9.4 Measurement Procedure and Data

- a. 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.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. 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.
- d. 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.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. 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 or average method as specified and then reported in a data sheet.
- g. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- h. 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.
- i. Repeat above procedures until all frequencies measured was complete.

#### Remark:

- 1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
- 2. Scan from 1GHz to 25GHz, the disturbance above 18GHz 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.
- 3. As shown in this section, 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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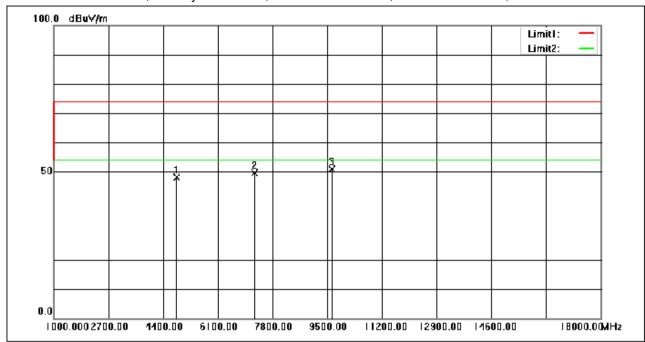
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Test Mode: 00; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4824.000	56.92	-8.78	48.14	74.00	-25.86	peak
2	7236.000	55.59	-5.86	49.73	74.00	-24.27	peak
3	9648.000	52.18	-1.31	50.87	74.00	-23.13	peak



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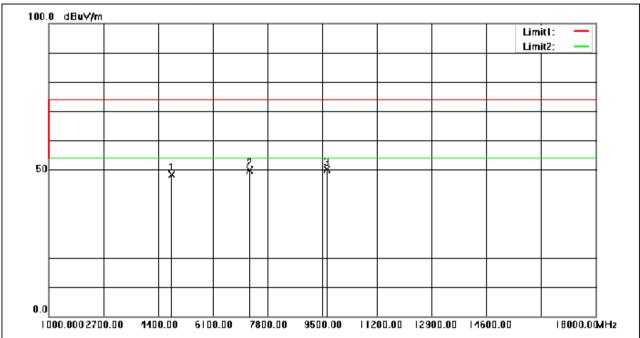
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Test Mode: 00; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4824.000	57.04	-8.78	48.26	74.00	-25.74	peak
2	7236.000	55.68	-5.86	49.82	74.00	-24.18	peak
3	9648.000	51.46	-1.31	50.15	74.00	-23.85	peak



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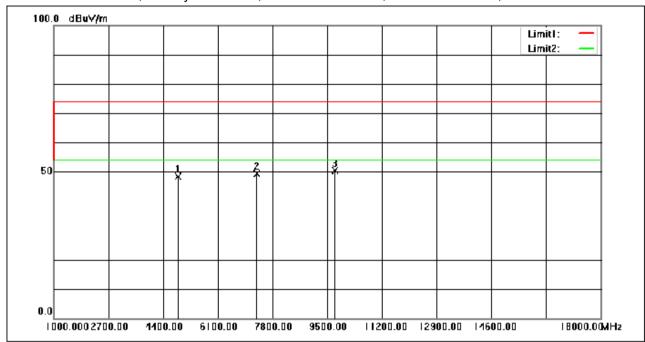
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Test Mode: 00; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:middle



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4874.000	56.96	-8.61	48.35	74.00	-25.65	peak
2	7311.000	55.14	-5.78	49.36	74.00	-24.64	peak
3	9748.000	51.84	-1.43	50.41	74.00	-23.59	peak



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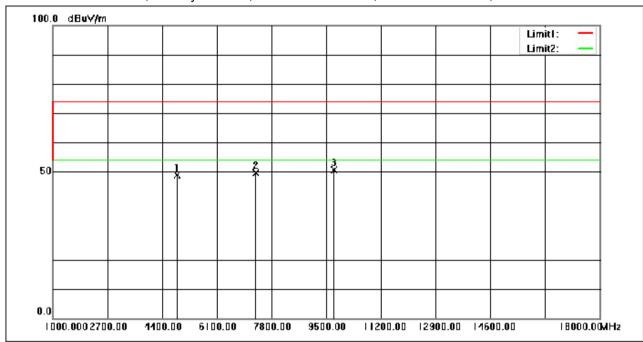
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Test Mode: 00; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:middle



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4874.000	57.47	-8.61	48.86	74.00	-25.14	peak
2	7311.000	55.30	-5.78	49.52	74.00	-24.48	peak
3	9748.000	52.03	-1.43	50.60	74.00	-23.40	peak



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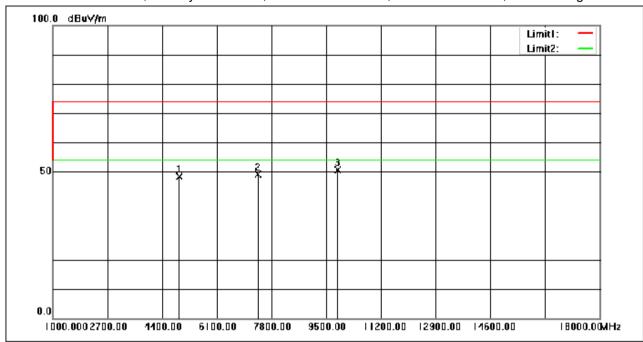
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No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4924.000	56.76	-8.44	48.32	74.00	-25.68	peak
2	7386.000	54.73	-5.69	49.04	74.00	-24.96	peak
3	9848.000	51.85	-1.27	50.58	74.00	-23.42	peak



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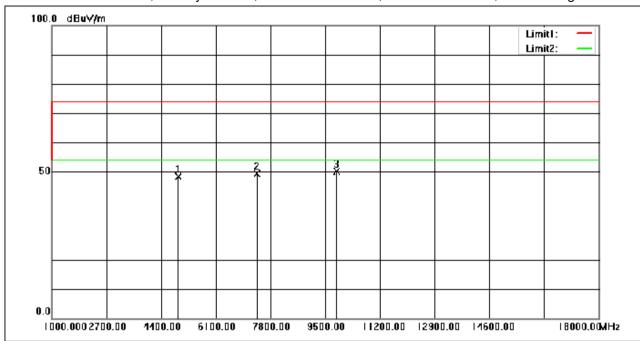
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Test Mode: 00; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:High



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4924.000	56.87	-8.44	48.43	74.00	-25.57	peak
2	7386.000	55.14	-5.69	49.45	74.00	-24.55	peak
3	9848.000	51.48	-1.27	50.21	74.00	-23.79	peak



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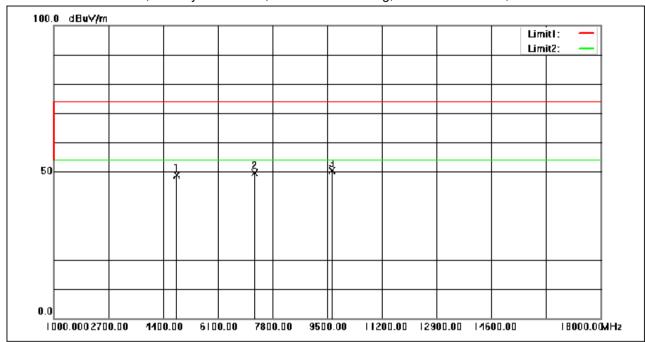
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No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4824.000	57.56	-8.78	48.78	74.00	-25.22	peak
2	7236.000	55.47	-5.86	49.61	74.00	-24.39	peak
3	9648.000	51.79	-1.31	50.48	74.00	-23.52	peak



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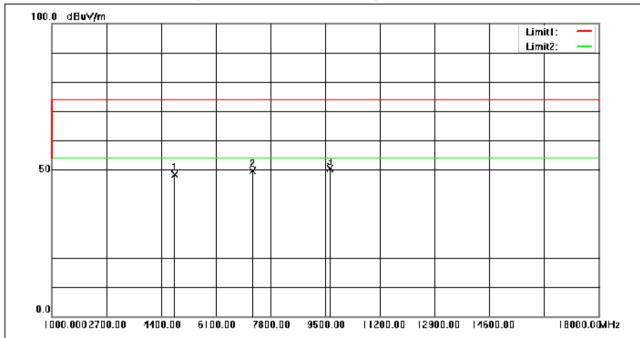
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Test Mode: 00; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:Low



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4824.000	57.19	-8.78	48.41	74.00	-25.59	peak
2	7236.000	55.52	-5.86	49.66	74.00	-24.34	peak
3	9648.000	51.70	-1.31	50.39	74.00	-23.61	peak



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Test Mode: 00; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:middle



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4874.000	57.36	-8.61	48.75	74.00	-25.25	peak
2	7311.000	55.70	-5.78	49.92	74.00	-24.08	peak
3	9748.000	51.56	-1.43	50.13	74.00	-23.87	peak



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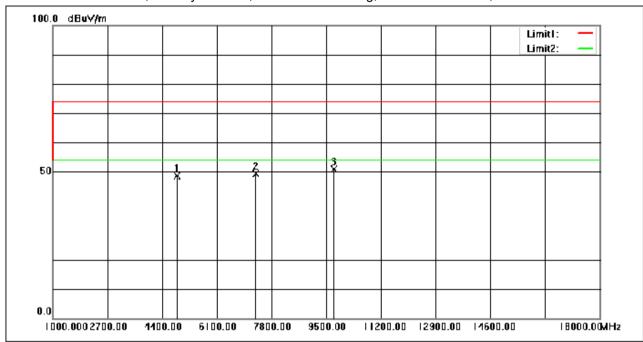
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Test Mode: 00; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:middle



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4874.000	57.15	-8.61	48.54	74.00	-25.46	peak
2	7311.000	55.26	-5.78	49.48	74.00	-24.52	peak
3	9748.000	52.39	-1.43	50.96	74.00	-23.04	peak



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Test Mode: 00; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:High



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4924.000	56.95	-8.44	48.51	74.00	-25.49	peak
2	7386.000	55.06	-5.69	49.37	74.00	-24.63	peak
3	9848.000	51.81	-1.27	50.54	74.00	-23.46	peak



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Test Mode: 00; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:High



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4924.000	56.78	-8.44	48.34	74.00	-25.66	peak
2	7386.000	54.92	-5.69	49.23	74.00	-24.77	peak
3	9848.000	52.08	-1.27	50.81	74.00	-23.19	peak



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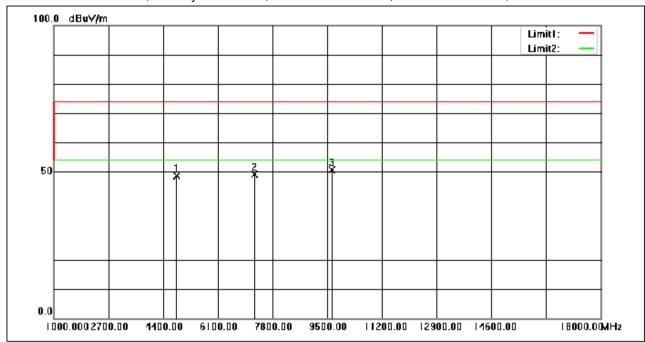
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Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4824.000	57.43	-8.78	48.65	74.00	-25.35	peak
2	7236.000	54.88	-5.86	49.02	74.00	-24.98	peak
3	9648.000	51.93	-1.31	50.62	74.00	-23.38	peak



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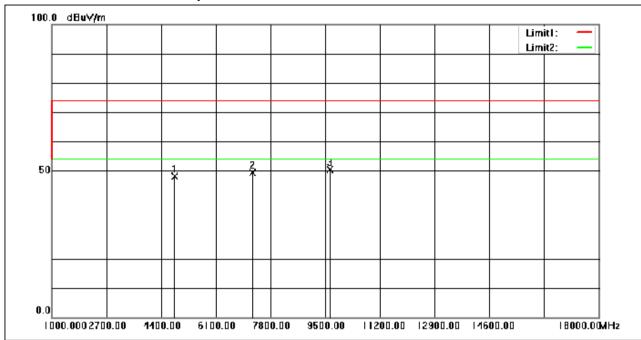
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Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4824.000	56.90	-8.78	48.12	74.00	-25.88	peak
2	7236.000	55.12	-5.86	49.26	74.00	-24.74	peak
3	9648.000	51.59	-1.31	50.28	74.00	-23.72	peak



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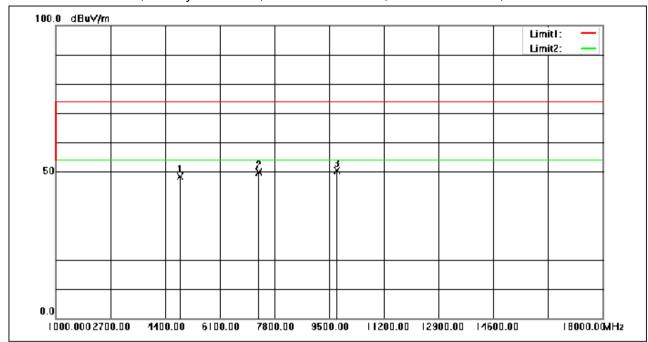
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Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:middle



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4874.000	56.90	-8.61	48.29	74.00	-25.71	peak
2	7311.000	55.63	-5.78	49.85	74.00	-24.15	peak
3	9748.000	51.89	-1.43	50.46	74.00	-23.54	peak



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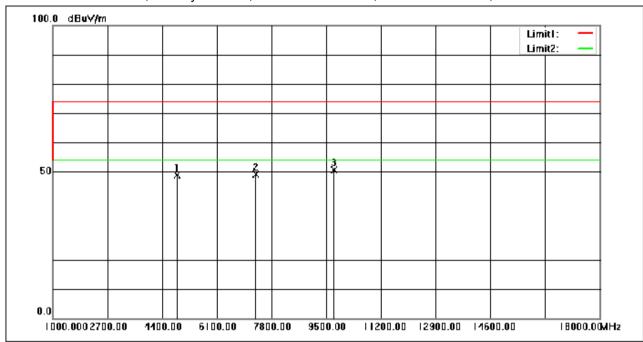
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No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4874.000	57.38	-8.61	48.77	74.00	-25.23	peak
2	7311.000	54.90	-5.78	49.12	74.00	-24.88	peak
3	9748.000	51.97	-1.43	50.54	74.00	-23.46	peak



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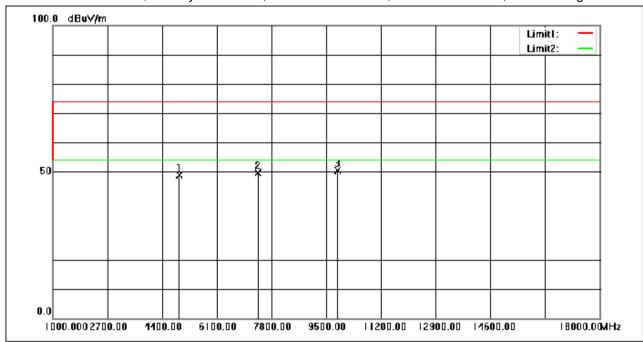
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No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4924.000	57.38	-8.44	48.94	74.00	-25.06	peak
2	7386.000	55.36	-5.69	49.67	74.00	-24.33	peak
3	9848.000	51.53	-1.27	50.26	74.00	-23.74	peak



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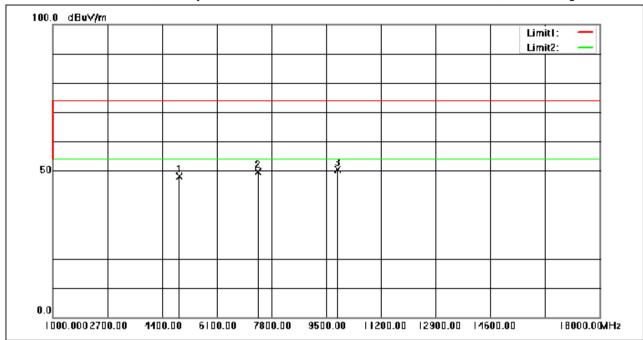
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Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:High



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4924.000	56.57	-8.44	48.13	74.00	-25.87	peak
2	7386.000	55.28	-5.69	49.59	74.00	-24.41	peak
3	9848.000	51.75	-1.27	50.48	74.00	-23.52	peak



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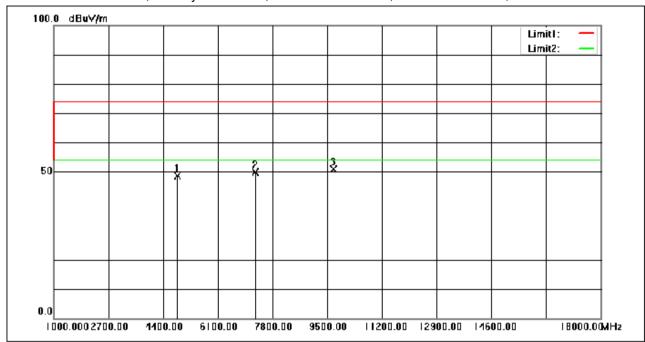
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Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:Low



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4844.000	57.24	-8.71	48.53	74.00	-25.47	peak
2	7266.000	55.81	-5.83	49.98	74.00	-24.02	peak
3	9688.000	52.33	-1.36	50.97	74.00	-23.03	peak



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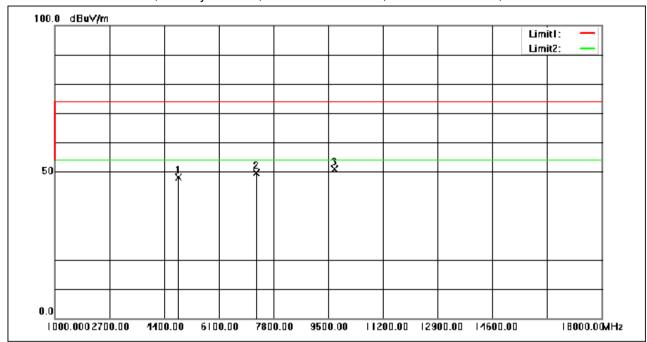
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Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:Low



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4844.000	56.96	-8.71	48.25	74.00	-25.75	peak
2	7266.000	55.53	-5.83	49.70	74.00	-24.30	peak
3	9688.000	52.27	-1.36	50.91	74.00	-23.09	peak



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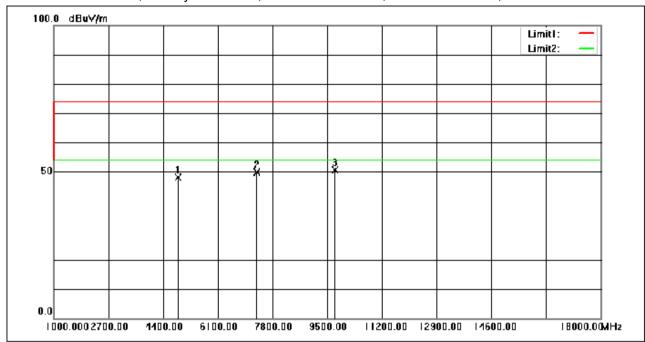
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Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:middle



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4874.000	56.76	-8.61	48.15	74.00	-25.85	peak
2	7311.000	55.66	-5.78	49.88	74.00	-24.12	peak
3	9748.000	52.02	-1.43	50.59	74.00	-23.41	peak



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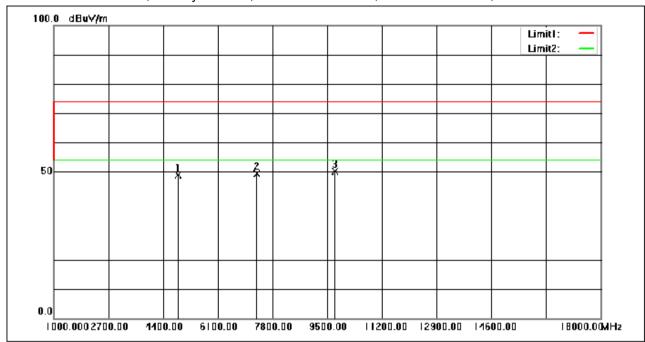
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Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:middle



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4874.000	57.37	-8.61	48.76	74.00	-25.24	peak
2	7311.000	55.13	-5.78	49.35	74.00	-24.65	peak
3	9748.000	51.67	-1.43	50.24	74.00	-23.76	peak



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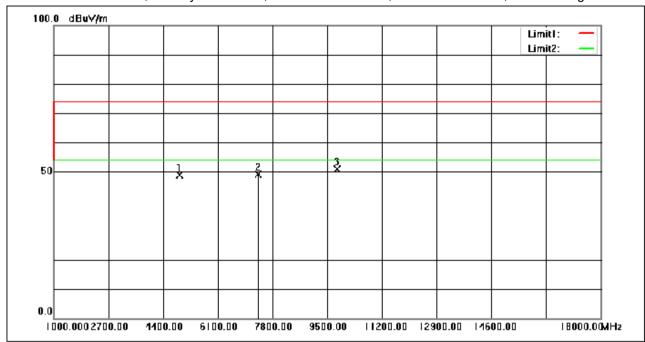
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Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:High



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4904.000	57.45	-8.51	48.94	74.00	-25.06	peak
2	7356.000	54.78	-5.73	49.05	74.00	-24.95	peak
3	9808.000	52.29	-1.47	50.82	74.00	-23.18	peak



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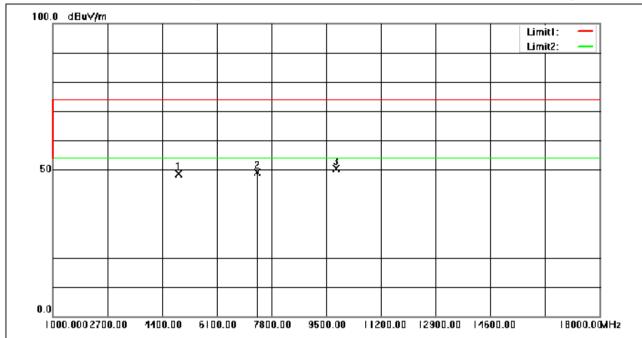
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Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:High



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4904.000	57.18	-8.51	48.67	74.00	-25.33	peak
2	7356.000	54.92	-5.73	49.19	74.00	-24.81	peak
3	9808.000	51.94	-1.47	50.47	74.00	-23.53	peak



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#### 7.10 99% Bandwidth

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

#### 7.10.1 E.U.T. Operation

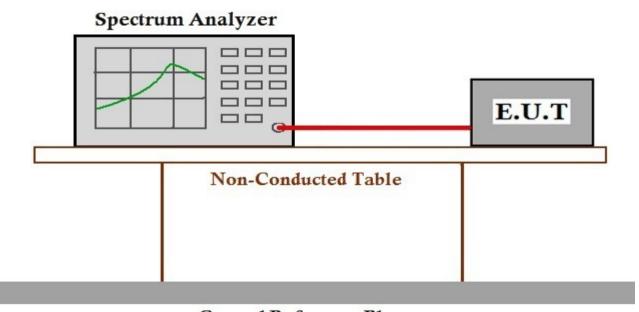
Operating Environment:

Temperature: 19.4 °C Humidity: 37.1 % RH Atmospheric Pressure: 1010 mbar

7.10.2 Test Mode Description

	The Later Hade Becomption								
Pre-scan / Final test	Mode Code	Description							
Final test	00	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); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.							

#### 7.10.3 Test Setup Diagram



### **Ground Reference Plane**

#### 7.10.4 Measurement Procedure and Data

The detailed test data see: Appendix A for KSCR220300029401



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# 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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