



Report No.: SZEM190501402702

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# TEST REPORT

Application No.: SZEM1905014027CR

Applicant: Hub6 Inc.

Address of Applicant: 11 Gwendolen Cres, North York, M2N2L9, Canada

Manufacturer: Hub6 Inc.

Address of Manufacturer: 11 Gwendolen Cres, North York, M2N2L9, Canada

**Equipment Under Test (EUT):** 

**EUT Name:** Safe By Hub6

Model No.: H2

Trade mark: Safe By hub6

FCC ID: 2APTZSASAFEHUB6B

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

**Date of Receipt:** 2019-05-16

**Date of Test:** 2019-05-27 to 2019-07-16

**Date of Issue:** 2019-07-19

Test Result: Pass\*

Keny Xu 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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	Revision Record						
Version Chapter Date Modifier Rema							
01		2019-07-19		Original			

Authorized for issue by:		
	Hary Ul	
	Harry Wu /Project Engineer	
	EvicFu	
	Eric Fu /Reviewer	



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# **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(b)(4)	Pass		

Radio Spectrum Matter Part						
Item	Standard	Method	Requirement	Result		
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 6.4,6.5,6.6	47 CFR Part 15, Subpart C 15.209 & 15.247(d)	Pass		



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### **General Information**

#### 4.1 Details of E.U.T.

Power supply:	Input: DC 12V
Cable:	Power Cable: 100cm, Unshielded;
	Network Cable: 100cm, Unshielded
Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz
	802.11n(HT40): 2422MHz to 2452MHz
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:	Integral Antenna
Antenna Gain:	0dBi

### 4.2 Description of Support Units

The EUT has been tested as an independent unit.

### 4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	± 7.25 x 10 <sup>-8</sup>
2	Duty cycle	± 0.37%
3	Occupied Bandwidth	± 3%
4	Conduction emission	± 3.0dB (150kHz to 30MHz)
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	Dedicted Courieus emission test	± 4.5dB (Below 1GHz)
9	Radiated Spurious emission test	± 4.8dB (Above 1GHz)
10	Temperature test	± 1℃
11	Humidity test	± 3%
12	Supply voltages	± 1.5%
13	Time	± 3%



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#### 4.4 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.

### 4.5 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 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 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.

#### Innovation, Science and Economic Development Canada

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

CAB identifier: CN0006.

IC#: 4620C.

#### 4.6 Deviation from Standards

#### **Abnormalities from Standard Conditions** 4.7

None



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# **Equipment List**

Minimum 6dB Bandwidth						
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date	
Shielding Doom	SAEMC	MSR733	SEM001-09	2018-06-14	2019-06-13	
Shielding Room	SALIVIO	IVION/33	3EM001-09	2019-06-13	2024-06-12	
DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2018-09-25	2019-09-24	
Spectrum Analyzer	Rohde & Schwarz	FSP	SEM004-06	2018-09-27	2019-09-26	
Measurement Software	JS Tonscend	JS1120-2 BT/WIFI V2.	N/A	N/A	N/A	
Coaxial Cable	000	NI/A	SEM031-02	2018-07-12	2019-07-11	
Coaxiai Cable	SGS	N/A	SEIVIU31-02	2019-07-11	2020-07-10	
Attenuator	Weinschel Associates	WA41	SEM021-09	N/A	N/A	
Signal Generator	KEYSIGHT	N5173B	SEM006-05	2018-09-27	2019-09-26	
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2018-09-25	2019-09-24	

Conducted Peak Output Power						
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date	
Objektion Deem	SAEMC	MSR733	SEM001-09	2018-06-14	2019-06-13	
Shielding Room	SAEIVIC	MOL/33	2EM001-09	2019-06-13	2024-06-12	
DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2018-09-25	2019-09-24	
Spectrum Analyzer	Rohde & Schwarz	FSP	SEM004-06	2018-09-27	2019-09-26	
Measurement Software	JS Tonscend	JS1120-2 BT/WIFI V2.	N/A	N/A	N/A	
Cooxial Cable	000	N1/A	CEM001 00	2018-07-12	2019-07-11	
Coaxial Cable	SGS	N/A	SEM031-02	2019-07-11	2020-07-10	
Attenuator	Weinschel Associates	WA41	SEM021-09	N/A	N/A	
Signal Generator	KEYSIGHT	N5173B	SEM006-05	2018-09-27	2019-09-26	
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2018-09-25	2019-09-24	

Power Spectrum Density						
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date	
Chielding Doom	SAEMC	MSR733	CEM001 00	2018-06-14	2019-06-13	
Shielding Room	SAEIVIC	MOH/33	SEM001-09	2019-06-13	2024-06-12	
DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2018-09-25	2019-09-24	
Spectrum Analyzer	Rohde & Schwarz	FSP	SEM004-06	2018-09-27	2019-09-26	
Measurement Software	JS Tonscend	JS1120-2 BT/WIFI V2.	N/A	N/A	N/A	
Cooviel Coble	5	NI/A	CEM021 02	2018-07-12	2019-07-11	
Coaxial Cable	SGS	N/A	SEM031-02	2019-07-11	2020-07-10	
Attenuator	Weinschel Associates	WA41	SEM021-09	N/A	N/A	



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Signal Generator	KEYSIGHT	N5173B	SEM006-05	2018-09-27	2019-09-26
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2018-09-25	2019-09-24

Conducted Band Edges Measurement											
Equipment	Inventory No	Cal Date	Cal Due Date								
Chielding Doom	SAEMC	MSR733	SEM001-09	2018-06-14	2019-06-13						
Shielding Room	SALIVIC	MOL/33	2EM001-09	2019-06-13	2024-06-12						
DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2018-09-25	2019-09-24						
Spectrum Analyzer	Rohde & Schwarz FSP SEM004-06		2018-09-27	2019-09-26							
Measurement Software	JS Tonscend	JS1120-2 BT/WIFI V2.	N/A	N/A	N/A						
Coaxial Cable	SGS	N1/A	SEM031-02	2018-07-12	2019-07-11						
Coaxiai Cable	363	N/A	SEIVIU31-02	2019-07-11	2020-07-10						
Attenuator	Attenuator Weinschel Associates WA41 SEM021		SEM021-09	N/A	N/A						
Signal Generator	Signal Generator KEYSIGHT		SEM006-05	2018-09-27	2019-09-26						
Power Meter Rohde & Schwa		NRVS	SEM014-02	2018-09-25	2019-09-24						

Conducted Spurious Emissions											
Equipment	Cal Date	Cal Due Date									
Chielding Doom	SAEMC	MSR733	SEM001-09	2018-06-14	2019-06-13						
Shielding Room	SAEIVIC	MOL/33	2EIVIUU1-09	2019-06-13	2024-06-12						
DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2018-09-25	2019-09-24						
Spectrum Analyzer	Rohde & Schwarz	Rohde & Schwarz FSP SEM004-06		2018-09-27	2019-09-26						
Measurement Software	JS Tonscend	JS1120-2 BT/WIFI V2.	N/A	N/A	N/A						
Coaxial Cable	SGS	N1/A	SEM031-02	2018-07-12	2019-07-11						
Coaxiai Cable	363	N/A	SEIVIUS 1-02	2019-07-11	2020-07-10						
Attenuator	Weinschel Associates	WA41 SEM021-09		N/A	N/A						
Signal Generator	Signal Generator KEYSIGHT N5173B		SEM006-05	2018-09-27	2019-09-26						
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2018-09-25	2019-09-24						

Radiated Emissions which fall in the restricted bands											
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date						
3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2018-03-13	2021-03-12						
Measurement Software	AUDIX	e3 V8.2014-6- 27	N/A	N/A	N/A						
Cooviel Cable	200	N1/A	SEM026-01	2018-07-12	2019-07-11						
Coaxial Cable	SGS	N/A	SEIVIU26-U I	2019-07-11	2020-07-10						
EXA Spectrum Analyzer	AgilentTechnologies Inc	N9010A	SEM004-12	2019-04-12	2020-04-11						



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Horn Antenna (1-18GHz)	Rohde & Schwarz	HF907	SEM003-07	2018-04-13	2021-04-12
Horn Antenna (15GHz-40GHz)	Schwarzbeck	BBHA 9170	SEM003-15	2017-10-17	2020-10-16
Pre-Amplifier (0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	SEM004-11	2018-11-12	2019-11-11
Pre-amplifier(18-26GHz)	Rohde & Schwarz	CH14-H052	SEM005-17	2019-04-01	2020-03-31
Pre-amplifier (26GHz-40GHz)	Compliance Directions Systems Inc.	PAP-2640-50	SEM005-08	2019-04-01	2020-03-31
DC Power Supply	Zhao Xin	RXN-305D	SEM011-02	2018-09-25	2019-09-24
Active Loop Antenna	ETS-Lindgren	6502	SEM003-08	2017-08-22	2020-08-21

Radiated Spurious Emissions									
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date				
3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2018-03-13	2021-03-12				
Measurement Software	AUDIX	e3 V8.2014-6- 27	N/A	N/A	N/A				
Cooviel Cable	202	NI/A	0514000 04	2018-07-12	2019-07-11				
Coaxial Cable	SGS	N/A	SEM026-01	2019-07-11	2020-07-10				
EXA Spectrum Analyzer	AgilentTechnologies Inc	N9010A	SEM004-12	2019-04-12	2020-04-11				
Horn Antenna (1-18GHz)	Rohde & Schwarz	HF907	SEM003-07	2018-04-13	2021-04-12				
Horn Antenna (15GHz-40GHz)	Schwarzbeck	BBHA 9170	SEM003-15	2017-10-17	2020-10-16				
Pre-Amplifier (0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	SEM004-11	2018-11-12	2019-11-11				
Pre-amplifier(18-26GHz)	Rohde & Schwarz	CH14-H052	SEM005-17	2019-04-01	2020-03-31				
Pre-amplifier Compliance (26GHz-40GHz) Compliance Directions System		PAP-2640-50	SEM005-08	2019-04-01	2020-03-31				
DC Power Supply	Zhao Xin	RXN-305D	SEM011-02	2018-09-25	2019-09-24				
Active Loop Antenna	ETS-Lindgren	6502	SEM003-08	2017-08-22	2020-08-21				



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Radiated Emissions (30MHz-1GHz)											
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date						
3m Semi-Anechoic Chamber	ETS-LINDGREN	GREN N/A SEM001-01		2017-08-05	2020-08-04						
Measurement Software	AUDIX	e3 V8.2014-6- 27	N/A	N/A	N/A						
Coaxial Cable	200	N/A	SEM025-01	2018-07-12	2019-07-11						
Goaxiai Gable	SGS	IN/A	SEIVIU25-U1	2019-07-11	2020-07-10						
EMI Test Receiver	Agilent Technologies	N9038A	SEM004-05	2018-09-25	2019-09-24						
BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEM003-01	2017-06-27	2020-06-26						
Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEM005-01	2019-04-01	2020-03-31						

General used equipmen	t					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date	
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-03	2018-09-27	2019-09-26	
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-04	2018-09-27	2019-09-26	
Humidity/ Temperature Indicator	Mingle	N/A	SEM002-08	2018-09-27	2019-09-26	
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2019-04-04	2020-04-03	



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#### Radio Spectrum Technical Requirement 6

### **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 integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 0dBi.

Antenna location: Refer to Appendix(Internal photos)





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#### 7 **Radio Spectrum Matter Test Results**

### Minimum 6dB Bandwidth

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

Limit: ≥500 kHz

### 7.1.1 E.U.T. Operation

Operating Environment:

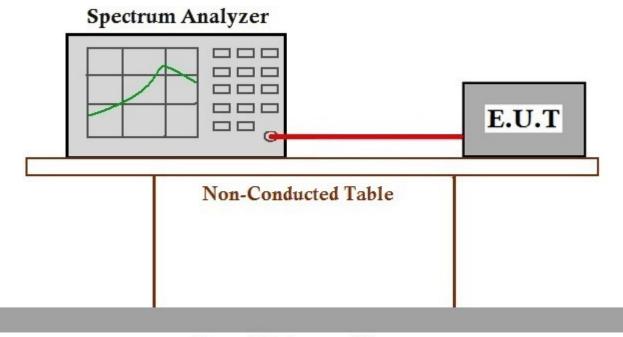
Temperature: 23.6 °C Humidity: 50.3 % RH Atmospheric Pressure: 1005 mbar

Test mode a: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.

#### 7.1.2 Test Setup Diagram



### Ground Reference Plane

#### 7.1.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.247



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### 7.2 Conducted Peak Output Power

Test Requirement 47 CFR Part 15, Subpart C 15.247(b)(3) Test Method: ANSI C63.10 (2013) Section 11.9.1

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				



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#### 7.2.1 E.U.T. Operation

Operating Environment:

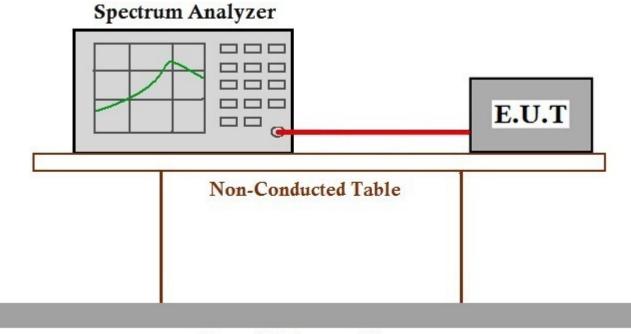
Humidity: 50.3 % RH Temperature: 23.6 °C Atmospheric Pressure: 1005 mbar

Test mode a: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.

#### 7.2.2 Test Setup Diagram



### Ground Reference Plane

#### 7.2.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.247



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### 7.3 Power Spectrum Density

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

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

transmission

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

Operating Environment:

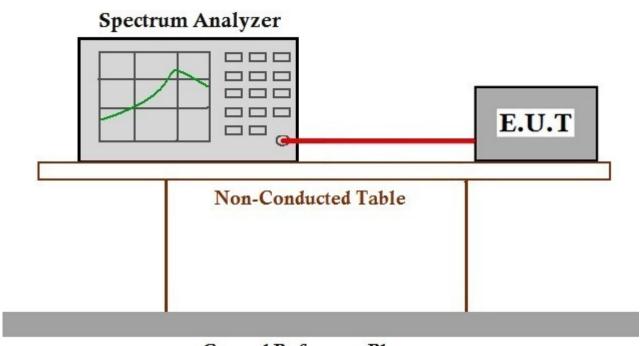
Atmospheric Pressure: 1005 mbar Temperature: 23.6 °C Humidity: 50.2 % RH

Test mode a: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.

#### 7.3.2 Test Setup Diagram



### Ground Reference Plane

#### 7.3.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.247



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### 7.4 Conducted Band Edges Measurement

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

Limit:

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



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

Operating Environment:

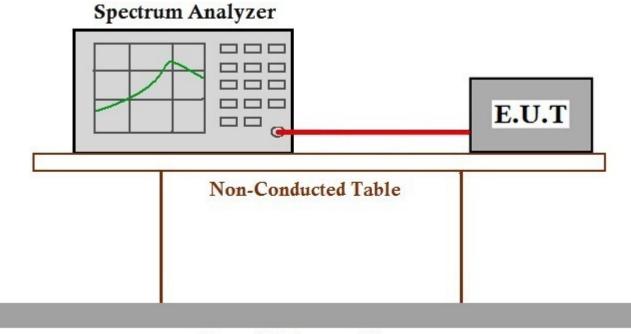
Humidity: 50.2 % RH Temperature: 23.6 °C Atmospheric Pressure: 1005 mbar

Test mode a: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.

#### 7.4.2 Test Setup Diagram



### Ground Reference Plane

#### 7.4.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.247



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### 7.5 Conducted Spurious Emissions

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

Limit:

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

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### 7.5.1 E.U.T. Operation

Operating Environment:

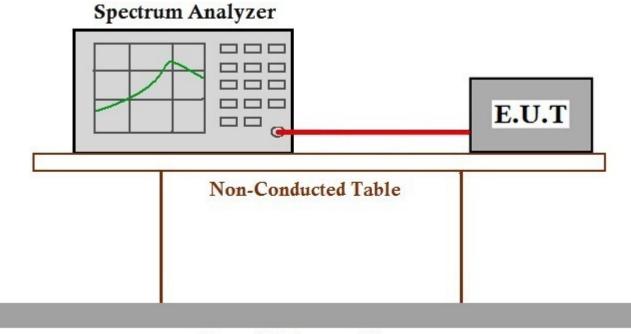
Humidity: 50.2 % RH Temperature: 23.6 °C Atmospheric Pressure: 1005 mbar

Test mode a: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.

#### 7.5.2 Test Setup Diagram



### Ground Reference Plane

#### 7.5.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.247



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

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

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

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.

### 7.6.1 E.U.T. Operation

Operating Environment:

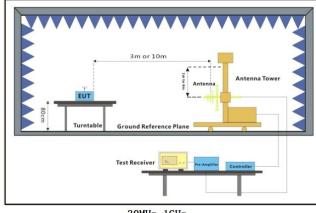
Humidity: 54 % RH Temperature: Atmospheric Pressure: 1005 mbar

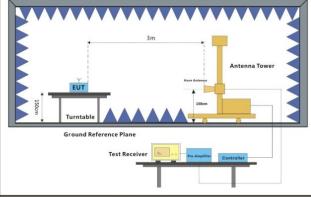
Test mode a:TX mode Keep the EUT in continuously transmitting mode with all modulation

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.

### 7.6.2 Test Setup Diagram





Above 1GHz 30MHz-1GHz



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### 7.6.3 Measurement Procedure and Data

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.

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

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



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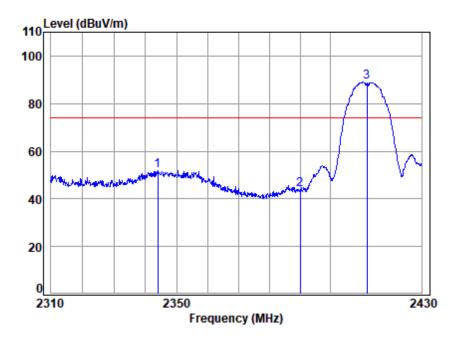
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Mode:a; Polarization:Horizontal; Modulation:802.11b; bandwidth:20MHz; Channel:Low



Site : chamber

Condition: 3m HORIZONTAL Job No : 14027CR\14028CR Mode : 2412 Band edge : 2.4G WIFI 11B Note

Freq			Preamp Factor					Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
2344.058 2390.000								•
2412.000								•



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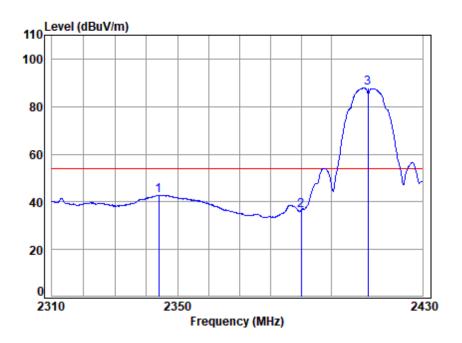
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Mode:a; Polarization:Horizontal; Modulation:802.11b; bandwidth:20MHz; Channel:Low



Site : chamber

Condition: 3m HORIZONTAL Job No : 14027CR\14028CR Mode : 2412 Band edge : 2.4G WIFI 11B Note

Freq			Preamp Factor					Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
2343.939 2390.000 * 2412.000	5.47	28.52	41.17	43.65	36.47	54.00	-17.53	_



1 2 3

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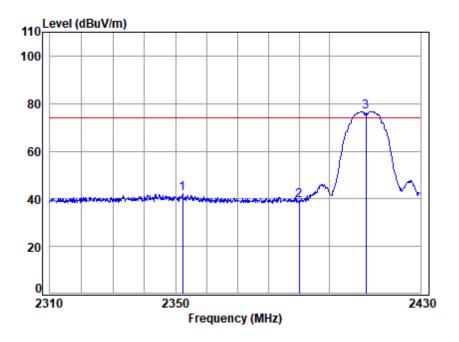
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Mode:a; Polarization:Vertical; Modulation:802.11b; bandwidth:20MHz; Channel:Low



Site : chamber Condition: 3m VERTICAL

Job No : 14027CR\14028CR Mode : 2412 Band edge : 2.4G WIFI 11B Note

Freq			Preamp Factor					Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
2352.263 2390.000 * 2412.000	5.47	28.52	41.17	46.30	39.12	74.00	-34.88	Peak



1

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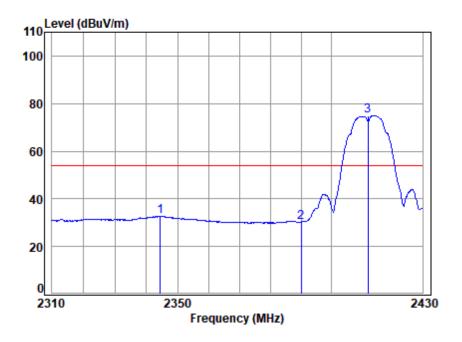
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Mode:a; Polarization:Vertical; Modulation:802.11b; bandwidth:20MHz; Channel:Low



Site : chamber Condition: 3m VERTICAL

Job No : 14027CR\14028CR Mode : 2412 Band edge : 2.4G WIFI 11B Note

Freq			Preamp Factor					Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
	5.47	28.52	41.17	37.48	30.30	54.00	-23.70	Average Average Average



1

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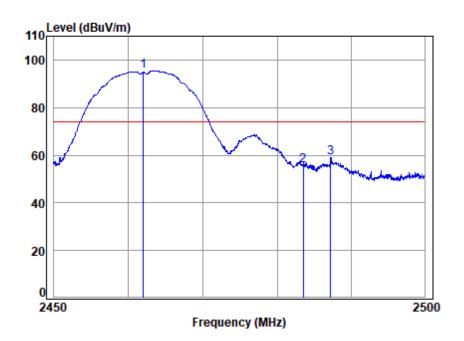
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Mode:a; Polarization:Horizontal; Modulation:802.11b; bandwidth:20MHz; Channel:High



: chamber

Condition: 3m HORIZONTAL : 14027CR\14028CR Job No Mode : 2462 Band edge Note : 2.4G WIFI 11B

	Freq		Ant Factor						Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 *	2462.000	5.57	28.64	41.20	102.45	95.46	74.00	21.46	peak
2	2483.500	5.60	28.67	41.21	62.59	55.65	74.00	-18.35	peak
3	2487.254	5.60	28.68	41.21	65.72	58.79	74.00	-15.21	peak



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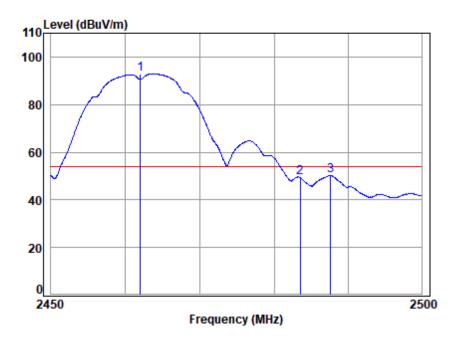
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Mode:a; Polarization:Horizontal; Modulation:802.11b; bandwidth:20MHz; Channel:High



Site : chamber

Condition: 3m HORIZONTAL Job No : 14027CR\14028CR Mode : 2462 Band edge Note : 2.4G WIFI 11B

	Freq						Limit Line		Remark	
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		-
1 *	2462.000	5.57	28.64	41.20	99.86	92.87	54.00	38.87	Average	
2	2483.500	5.60	28.67	41.21	56.34	49.40	54.00	-4.60	Average	
3	2487.606	5.60	28.68	41.21	57.16	50.23	54.00	-3.77	Average	



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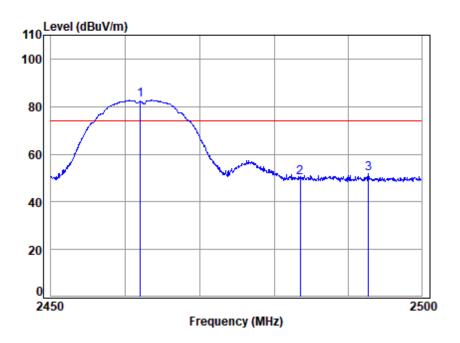
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Mode:a; Polarization: Vertical; Modulation: 802.11b; bandwidth: 20MHz; Channel: High



Site : chamber Condition: 3m VERTICAL

Job No : 14027CR\14028CR Mode : 2462 Band edge : 2.4G WIFI 11B Note

Freq			Preamp Factor					Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 * 2462.000 2 2483.500 3 2492.788	5.60	28.67	41.21	56.94	50.00	74.00	-24.00	Peak



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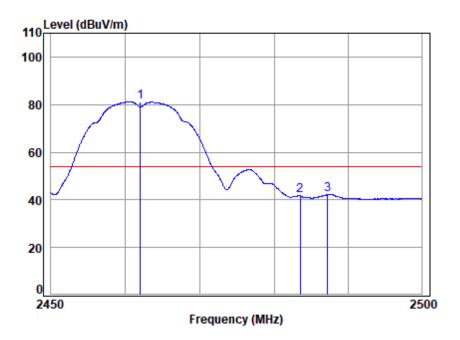
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Mode:a; Polarization: Vertical; Modulation: 802.11b; bandwidth: 20MHz; Channel: High



Site : chamber Condition: 3m VERTICAL

Job No : 14027CR\14028CR Mode : 2462 Band edge : 2.4G WIFI 11B Note

Freq			Preamp Factor					Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
2462.000 2483.500								_
2487.254								_



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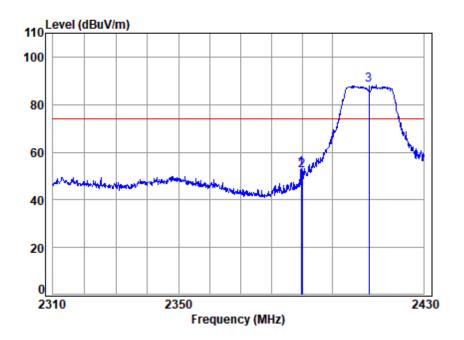
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Mode:a; Polarization:Horizontal; Modulation:802.11g; bandwidth:20MHz; Channel:Low



Site : chamber

Condition: 3m HORIZONTAL Job No : 14027CR\14028CR Mode : 2412 Band edge Note : 2.4G WIFI 11G

	F===			Preamp					
	Freq	LOSS	Factor	Factor	revei	rever	Line	LIMIC	Kemark
	MU-				4D. W	4D. 1//m	4D. 1//m		
	MUZ	uБ	ub/m	dB	abuv	abuv/m	abuv/m	ab	
	2389.726	5.4/	28.52	41.1/	60.25	53.0/	/4.00	-20.93	peak
	2390.000	5.47	28.52	41.17	59.32	52.14	74.00	-21.86	peak
*	2412.000	5.50	28.56	41.18	95.51	88.39	74.00	14.39	peak



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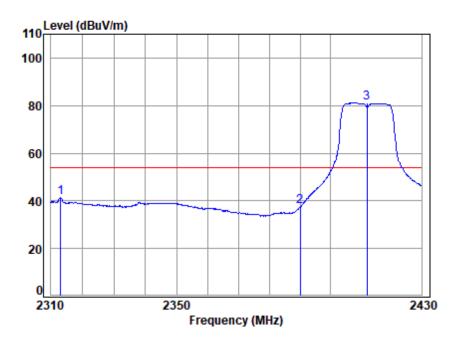
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Report No.: SZEM190501402702

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Mode:a; Polarization:Horizontal; Modulation:802.11g; bandwidth:20MHz; Channel:Low



Site : chamber

Condition: 3m HORIZONTAL Job No : 14027CR\14028CR Mode : 2412 Band edge : 2.4G WIFI 11G Note

Freq			Preamp Factor					Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
2313.044 2390.000 * 2412.000	5.47	28.52	41.17	44.69	37.51	54.00	-16.49	_



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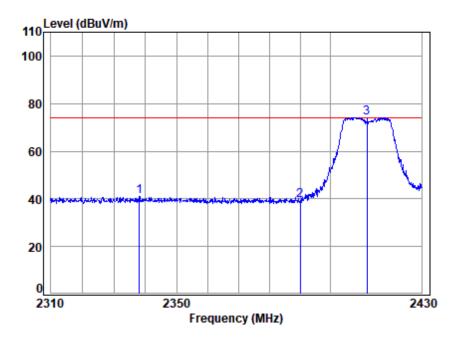
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Mode:a; Polarization:Vertical; Modulation:802.11g; bandwidth:20MHz; Channel:Low



Site : chamber Condition: 3m VERTICAL

Job No : 14027CR\14028CR Mode : 2412 Band edge : 2.4G WIFI 11G Note

Freq			Preamp Factor					
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
	5.47	28.52	41.15 41.17 41.18	46.44	39.26	74.00	-34.74	Peak



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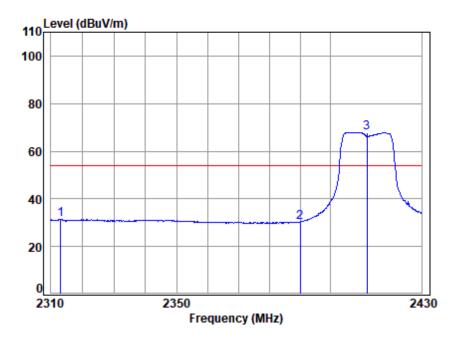
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Mode:a; Polarization:Vertical; Modulation:802.11g; bandwidth:20MHz; Channel:Low



Site : chamber Condition: 3m VERTICAL

Job No : 14027CR\14028CR Mode : 2412 Band edge : 2.4G WIFI 11G Note

Freq			Preamp Factor					Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
2313.044 2390.000	5.47	28.52	41.17	37.46	30.28	54.00	-23.72	Average
								Average



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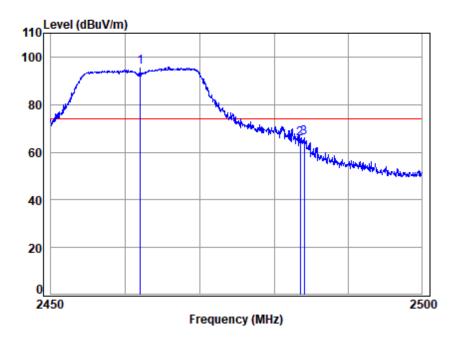
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Mode:a; Polarization:Horizontal; Modulation:802.11g; bandwidth:20MHz; Channel:High



Site : chamber

Condition: 3m HORIZONTAL Job No : 14027CR\14028CR Mode : 2462 Band edge : 2.4G WIFI 11G Note

	Freq						Limit Line		Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
	2462.000								•
2	2483.500	5.60	28.67	41.21	72.64	65.70	74.00	-8.30	peak
3	2484.041	5.60	28.67	41.21	73.03	66.09	74.00	-7.91	peak



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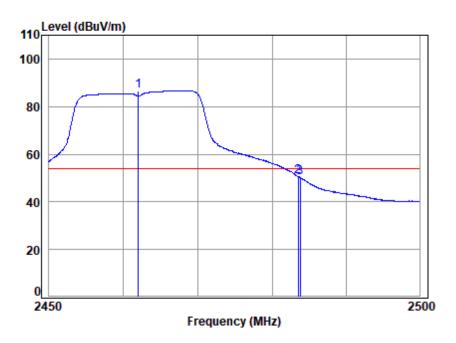
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Mode:a; Polarization:Horizontal; Modulation:802.11g; bandwidth:20MHz; Channel:High



Site : chamber

Condition: 3m HORIZONTAL : 14027CR\14028CR Job No Mode : 2462 Band edge : 2.4G WIFI 11G Note

Freq						Limit Line		Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
* 2462.000 2483.500 2483.790	5.60	28.67	41.21	57.67	50.73	54.00	-3.27	Average



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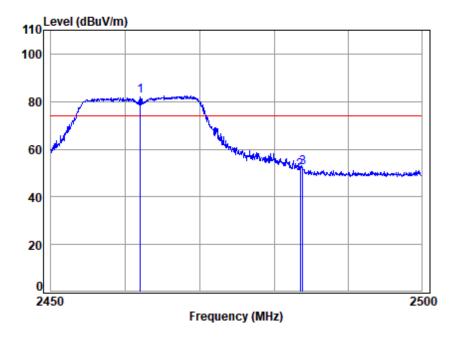
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Mode:a; Polarization: Vertical; Modulation: 802.11g; bandwidth: 20MHz; Channel: High



Site : chamber Condition: 3m VERTICAL

Job No : 14027CR\14028CR Mode : 2462 Band edge : 2.4G WIFI 11G Note

	Freq			Preamp Factor					Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	* 2462.000	5.57	28.64	41.20	89.42	82.43	74.00	8.43	Peak
2	2483.500	5.60	28.67	41.21	58.11	51.17	74.00	-22.83	Peak
3	2483.890	5.60	28.67	41.21	59.05	52.11	74.00	-21.89	Peak



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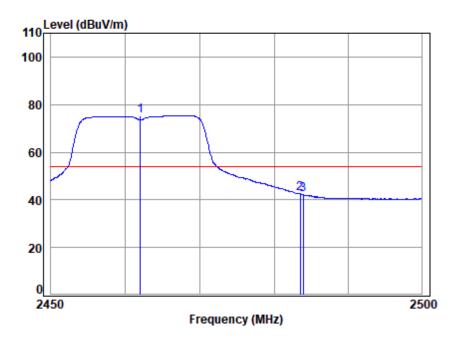
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Mode:a; Polarization: Vertical; Modulation: 802.11g; bandwidth: 20MHz; Channel: High



Site : chamber

Condition: 3m VERTICAL Job No : 14027CR\14028CR

Mode : 2462 Band edge Note : 2.4G WIFI 11G

	Freq			Preamp Factor					
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	——dB	
*	2462.000	5.57	28.64	41.20	82.32	75.33	54.00	21.33	Average
	2483.500	5.60	28.67	41.21	49.57	42.63	54.00	-11.37	Average
	2483.940	5.60	28.67	41.21	49.06	42.12	54.00	-11.88	Average



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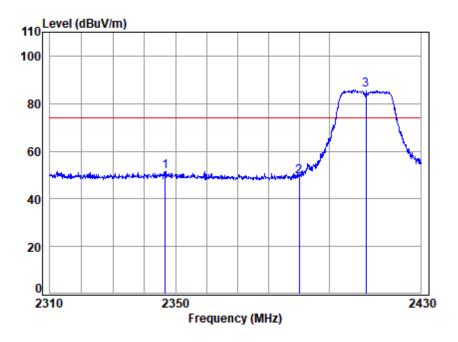
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Mode:a; Polarization:Horizontal; Modulation:802.11n; bandwidth:20MHz; Channel:Low



Site : chamber

Condition: 3m HORIZONTAL Job No : 14027CR\14028CR Mode : 2412 Band edge Note : 2.4G WIFI 11N20

	Freq			Preamp Factor					
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	——dB	
L	2346.671	5.42	28.44	41.15	58.92	51.63	74.00	-22.37	peak
2	2390.000	5.47	28.52	41.17	56.58	49.40	74.00	-24.60	peak
*	2412.000	5.50	28.56	41.18	92.81	85.69	74.00	11.69	peak



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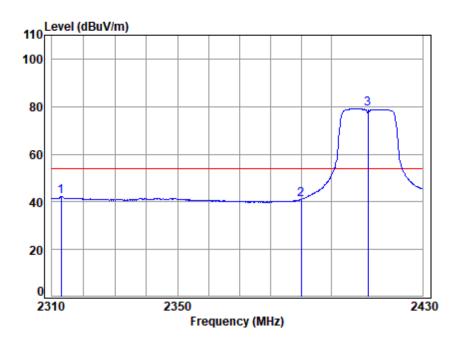
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Mode:a; Polarization:Horizontal; Modulation:802.11n; bandwidth:20MHz; Channel:Low



Site : chamber

Condition: 3m HORIZONTAL Job No : 14027CR\14028CR Mode : 2412 Band edge Note : 2.4G WIFI 11N20

Freq			Preamp Factor					Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
2312.927 2390.000 * 2412.000	5.47	28.52	41.17	48.27	41.09	54.00	-12.91	_



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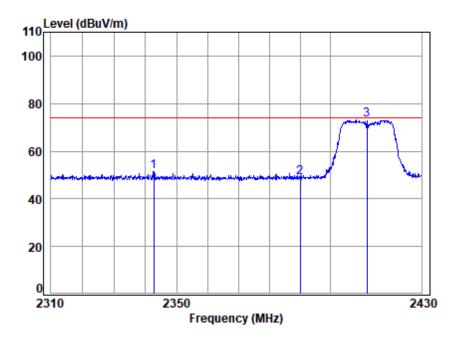
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Mode:a; Polarization:Vertical; Modulation:802.11n; bandwidth:20MHz; Channel:Low



Site : chamber Condition: 3m VERTICAL

Job No : 14027CR\14028CR Mode : 2412 Band edge Note : 2.4G WIFI 11N20

Freq			Preamp Factor					Remark	
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
2342.634	5.41	28.44	41.15	58.78	51.48	74.00	-22.52	Peak	
2390.000	5.47	28.52	41.17	56.10	48.92	74.00	-25.08	Peak	
2412.000	5.50	28.56	41.18	80.21	73.09	74.00	-0.91	Peak	



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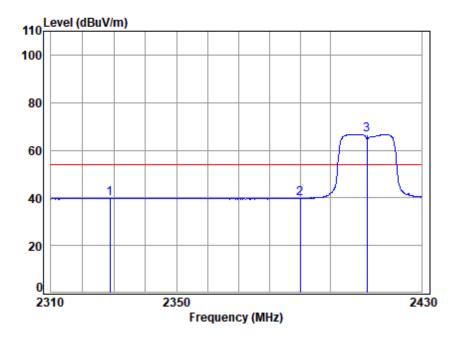
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Mode:a; Polarization:Vertical; Modulation:802.11n; bandwidth:20MHz; Channel:Low



Site : chamber Condition: 3m VERTICAL

Job No : 14027CR\14028CR Mode : 2412 Band edge Note : 2.4G WIFI 11N20

Freq			Preamp Factor					Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
2328.676 2390.000 * 2412.000	5.47	28.52	41.17	46.85	39.67	54.00	-14.33	Average



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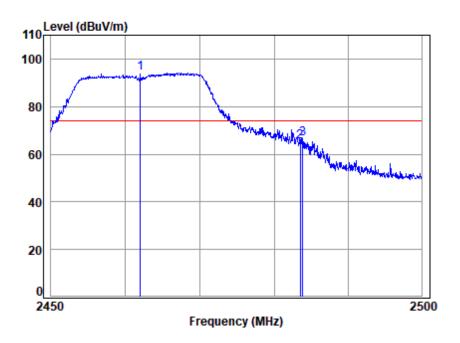
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Mode:a; Polarization:Horizontal; Modulation:802.11n; bandwidth:20MHz; Channel:High



Site : chamber

Condition: 3m HORIZONTAL Job No : 14027CR\14028CR Mode : 2462 Band edge Note : 2.4G WIFI 11N20

Freq						Limit Line		Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
2462.000								•
2483.500 2483.840								•



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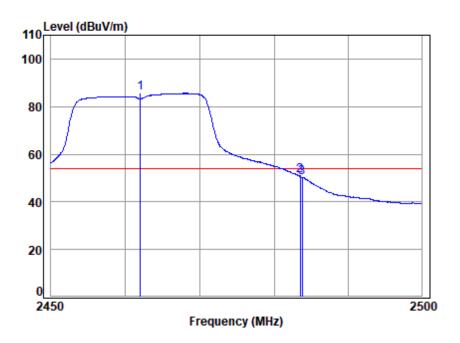
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Mode:a; Polarization:Horizontal; Modulation:802.11n; bandwidth:20MHz; Channel:High



Site : chamber

Condition: 3m HORIZONTAL Job No : 14027CR\14028CR Mode : 2462 Band edge Note : 2.4G WIFI 11N20

Freq			Preamp Factor					Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
* 2462.000 2483.500 2483.790	5.60	28.67	41.21	57.77	50.83	54.00	-3.17	Average



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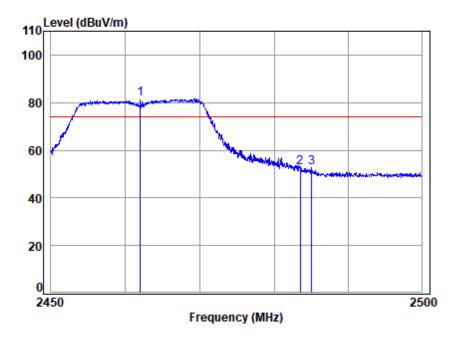
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Mode:a; Polarization: Vertical; Modulation: 802.11n; bandwidth: 20MHz; Channel: High



Site : chamber Condition: 3m VERTICAL

Job No : 14027CR\14028CR Mode : 2462 Band edge Note : 2.4G WIFI 11N20

Freq			Preamp Factor					Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
2462.000 2483.500								
2485.095								



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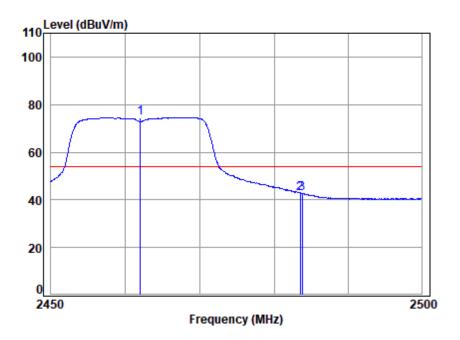
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Mode:a; Polarization: Vertical; Modulation: 802.11n; bandwidth: 20MHz; Channel: High



Site : chamber

Condition: 3m VERTICAL

Job No : 14027CR\14028CR Mode : 2462 Band edge Note : 2.4G WIFI 11N20

	Freq			Preamp Factor					Remark	
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		_
*	2462.000 2483.500								_	
	2483.790								_	



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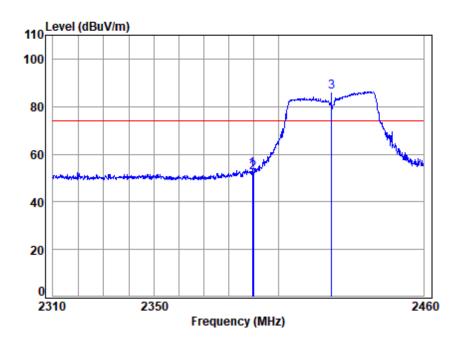
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Mode:a; Polarization:Horizontal; Modulation:802.11n; bandwidth:40MHz; Channel:Low



Site : chamber

Condition: 3m HORIZONTAL Job No : 14027CR\14028CR Mode : 2422 Band edge Note : 2.4G WIFI 11N40

Freq			Preamp Factor					Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
2389.526 2390.000								
2422.000								•



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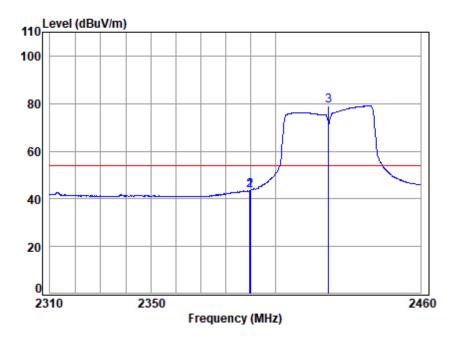
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Mode:a; Polarization:Horizontal; Modulation:802.11n; bandwidth:40MHz; Channel:Low



Site : chamber

Condition: 3m HORIZONTAL Job No : 14027CR\14028CR Mode : 2422 Band edge Note : 2.4G WIFI 11N40

Freq			Preamp Factor					Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
2389.677 2390.000 * 2422.000	5.47	28.52	41.17	50.79	43.61	54.00	-10.39	Average



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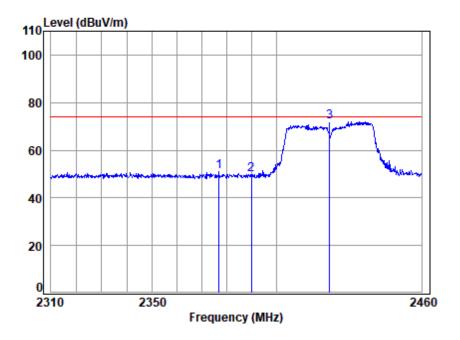
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Mode:a; Polarization:Vertical; Modulation:802.11n; bandwidth:40MHz; Channel:Low



Site : chamber Condition: 3m VERTICAL

Job No : 14027CR\14028CR Mode : 2422 Band edge Note : 2.4G WIFI 11N40

	Freq			Preamp Factor					Remark	
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
	2376.782 2390.000									
}	2422,000	5.52	28.57	41.19	79.16	72.06	74.00	-1.94	Peak	



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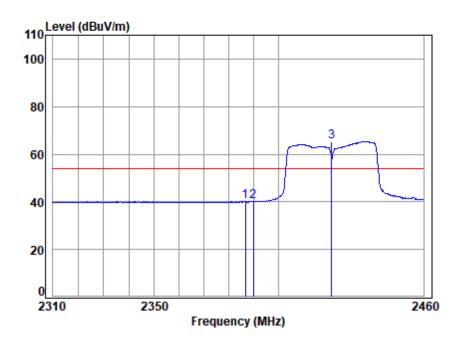
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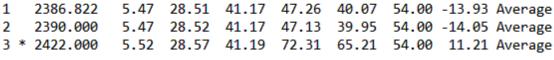
Mode:a; Polarization:Vertical; Modulation:802.11n; bandwidth:40MHz; Channel:Low



Site : chamber Condition: 3m VERTICAL

: 14027CR\14028CR Job No Mode : 2422 Band edge : 2.4G WIFI 11N40 Note

> Cable Ant Preamp Read Limit 0ver Loss Factor Factor Level Level Line Limit Remark Freq MHz dΒ dB/m dB dBuV dBuV/m dBuV/m dB





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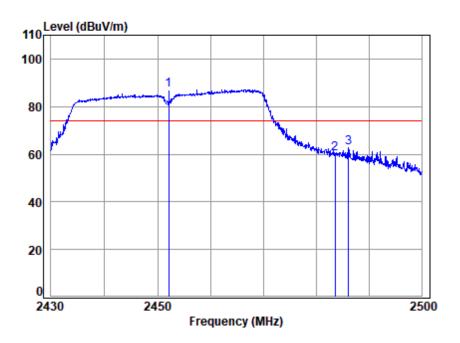
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Mode:a; Polarization:Horizontal; Modulation:802.11n; bandwidth:40MHz; Channel:High



Site : chamber

Condition: 3m HORIZONTAL Job No : 14027CR\14028CR Mode : 2452 Band edge Note : 2.4G WIFI 11N40

	Freq			Preamp Factor					Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
	2452.000								•
2	2483.500	5.60	28.67	41.21	67.29	60.35	74.00	-13.65	peak
3	2486.052	5.60	28.68	41.21	69.49	62.56	74.00	-11.44	peak



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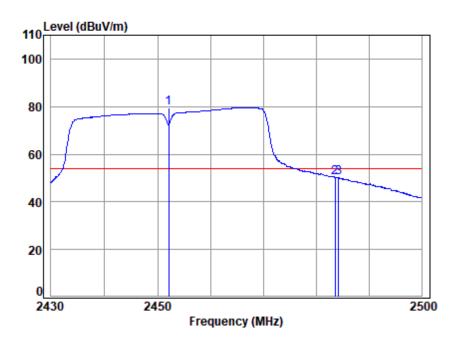
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Mode:a; Polarization:Horizontal; Modulation:802.11n; bandwidth:40MHz; Channel:High



Site : chamber

Condition: 3m HORIZONTAL Job No : 14027CR\14028CR Mode : 2452 Band edge Note : 2.4G WIFI 11N40

	Freq						Limit Line		Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
2	2452.000 2483.500 2484.147	5.60	28.67	41.21	57.24	50.30	54.00	-3.70	Average



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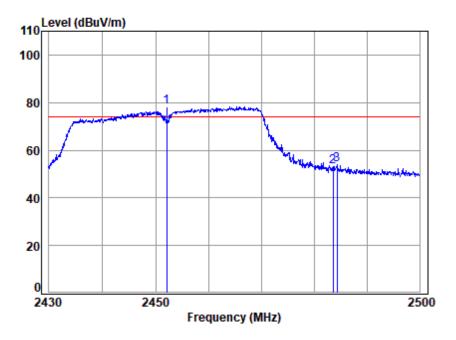
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Mode:a; Polarization: Vertical; Modulation: 802.11n; bandwidth: 40MHz; Channel: High



Site : chamber Condition: 3m VERTICAL

Job No : 14027CR\14028CR Mode : 2452 Band edge Note : 2.4G WIFI 11N40

Freq			Preamp Factor					Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
* 2452.000 2483.500 2484.217	5.60	28.67	41.21	60.13	53.19	74.00	-20.81	Peak



1 2 3

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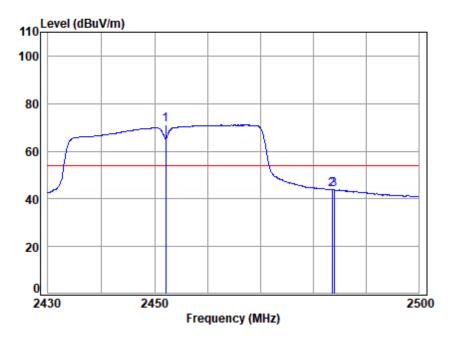
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Mode:a; Polarization: Vertical; Modulation: 802.11n; bandwidth: 40MHz; Channel: High



Site : chamber Condition: 3m VERTICAL

Job No : 14027CR\14028CR Mode : 2452 Band edge Note : 2.4G WIFI 11N40

_			Preamp					
Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Kemark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
* 2452.000	5.56	28.62	41.20	78.00	70.98	54.00	16.98	Average
2483.500	5.60	28.67	41.21	50.75	43.81	54.00	-10.19	Average
2483 865	5 60	28 67	41 21	50 68	43 74	54 00	-10 26	Average



1 2 3

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#### 7.7 Radiated Spurious Emissions

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

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

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.



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

Operating Environment:

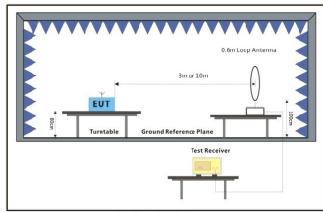
Humidity: 55 % RH Temperature: 25.1 °C Atmospheric Pressure: 1005 mbar

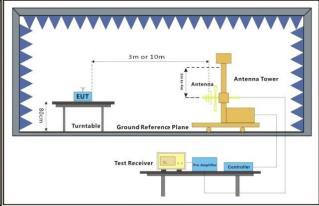
Test mode a:TX mode Keep the EUT in continuously transmitting mode with all modulation

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.

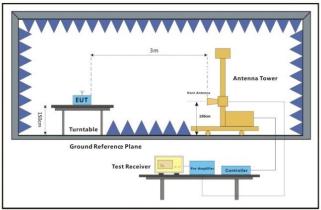
#### 7.7.2 Test Setup Diagram





Below 30MHz

30MHz-1GHz



Above 1GHz



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#### 7.7.3 Measurement Procedure and Data

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

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

#### Remark:

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

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

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



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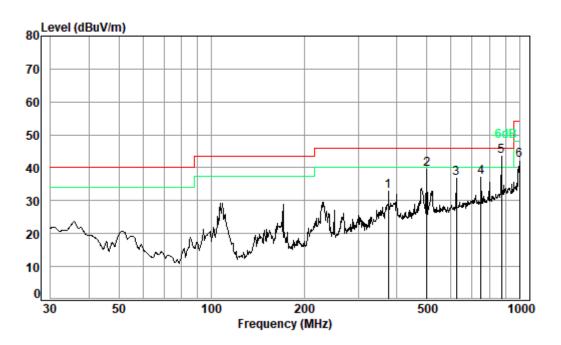
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30MHz~1GHz

QP value:

Mode: a; Polarization: Horizontal;



Condition: 3m HORIZONTAL

Job No. : 14027CR

Test Mode: a

		Cable	Ant	Preamp	Read		Limit	0ver
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
_								
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	375.94	2.13	21.80	27.31	36.36	32.98	46.00	-13.02
2	501.18	2.60	24.63	27.84	40.16	39.55	46.00	-6.45
3	625.08	2.75	26.95	28.11	35.25	36.84	46.00	-9.16
4	750.11	3.06	28.21	27.82	33.73	37.18	46.00	-8.82
5 pp	875.25	3.51	29.49	27.39	37.82	43.43	46.00	-2.57
6	1000.00	3.70	30.30	26.91	35.27	42.36	54.00	-11.64



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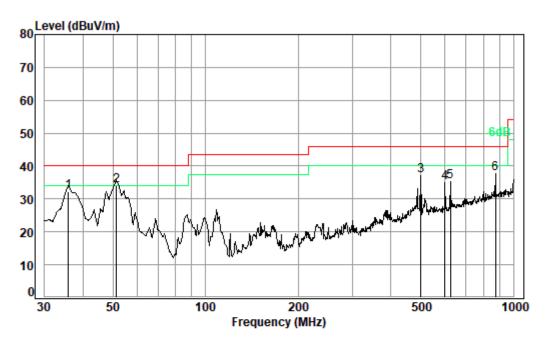
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Mode :a; Polarization: Vertical



Condition: 3m VERTICAL Job No. : 14027CR

Test Mode: a

	Freq			Preamp Factor				Over Limit
-	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	35.87	0.60	19.39	27.72	39.86	32.13	40.00	-7.87
2 pp	51.30	0.80	14.06	27.69	46.86	34.03	40.00	-5.97
3	501.18	2.60	24.63	27.84	37.59	36.98	46.00	-9.02
4	599.32	2.70	26.59	28.17	33.87	34.99	46.00	-11.01
5	625.08	2.75	26.95	28.11	33.59	35.18	46.00	-10.82
6	875.25	3.51	29.49	27.39	32.12	37.73	46.00	-8.27



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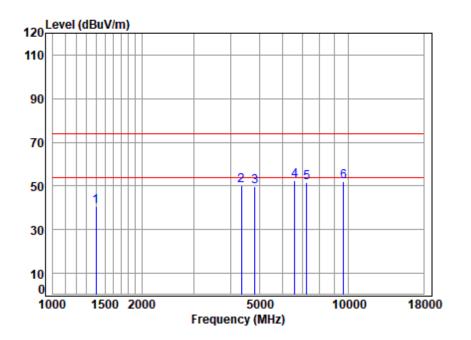


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#### **Above 1GHz**

Mode:a; Polarization:Horizontal; Modulation:802.11b; bandwidth:20MHz; Channel:Low



Site : chamber

Condition: 3m HORIZONTAL Job No : 14027CR\14028CR

Mode : 2412 TX RSE : 2.4G WIFI 11B Note

	. 2.	TO WITH	1 110						
		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1398.336	5.15	25.38	38.05	48.06	40.54	74.00	-33.46	peak
2	4354.454	7.40	33.60	38.19	47.24	50.05	74.00	-23.95	peak
3	4824.000	7.91	34.19	38.42	45.96	49.64	74.00	-24.36	peak
4	6602.265	11.24	35.39	37.68	43.49	52.44	74.00	-21.56	peak
5	7236.000	10.07	36.40	37.08	42.39	51.78	74.00	-22.22	peak
6	9648.000	10.77	37.53	35.07	38.58	51.81	74.00	-22.19	peak



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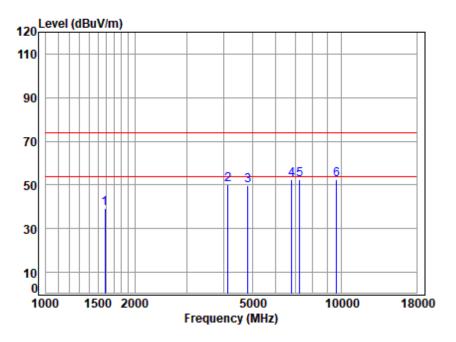
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Mode:a; Polarization:Vertical; Modulation:802.11b; bandwidth:20MHz; Channel:Low



Site : chamber Condition: 3m VERTICAL

Job No : 14027CR\14028CR

Mode : 2412 TX RSE : 2.4G WIFI 11B Note

OCC	. 2.	TO WILL	1 110						
		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1587.975	5.37	26.20	38.03	45.85	39.39	74.00	-34.61	peak
2	4133.699	7.14	33.60	38.07	47.60	50.27	74.00	-23.73	peak
3	4824.000	7.91	34.19	38.42	45.95	49.63	74.00	-24.37	peak
4	6795.879	10.69	35.94	37.49	43.19	52.33	74.00	-21.67	peak
5	7236.000	10.07	36.40	37.08	42.86	52.25	74.00	-21.75	peak
6	9648.000	10.77	37.53	35.07	39.05	52.28	74.00	-21.72	peak



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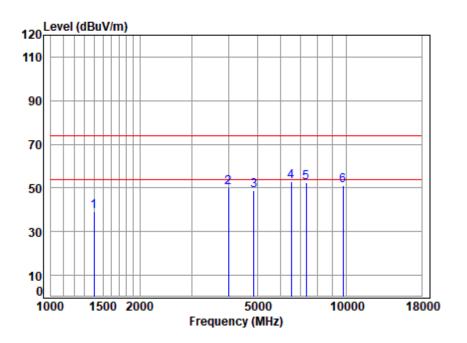
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Report No.: SZEM190501402702

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Mode:a; Polarization:Horizontal; Modulation:802.11b; bandwidth:20MHz; Channel:middle



Site : chamber

Condition: 3m HORIZONTAL : 14027CR\14028CR Job No

Mode : 2437 TX RSE Note : 2.4G WIFI 11B

		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1398.336	5.15	25.38	38.05	46.95	39.43	74.00	-34.57	peak
2	3992.781	6.97	33.58	38.00	47.51	50.06	74.00	-23.94	peak
3	4874.000	7.96	34.28	38.44	45.04	48.84	74.00	-25.16	peak
4	6526.373	11.46	35.18	37.75	44.24	53.13	74.00	-20.87	peak
5	7311.000	10.05	36.37	37.01	43.02	52.43	74.00	-21.57	peak
6	9748.000	10.82	37.55	35.02	37.88	51.23	74.00	-22.77	peak



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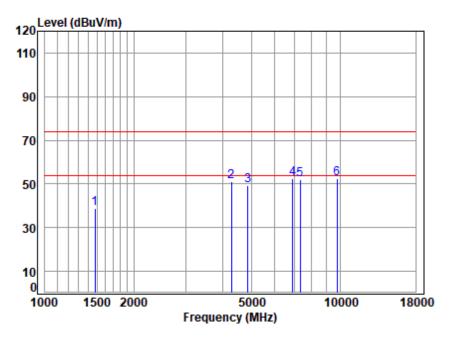
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Report No.: SZEM190501402702

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Mode:a; Polarization: Vertical; Modulation: 802.11b; bandwidth: 20MHz; Channel: middle



Site : chamber Condition: 3m VERTICAL

Job No : 14027CR\14028CR

Mode : 2437 TX RSE : 2.4G WIFI 11B Note

	. 2.	TO WITH	1 110						
		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1477.276	5.41	25.71	38.04	45.71	38.79	74.00	-35.21	peak
2	4279.589	7.31	33.60	38.15	48.16	50.92	74.00	-23.08	peak
3	4874.000	7.96	34.28	38.44	45.35	49.15	74.00	-24.85	peak
4	6894.806	10.42	36.21	37.40	43.12	52.35	74.00	-21.65	peak
5	7311.000	10.05	36.37	37.01	42.50	51.91	74.00	-22.09	peak
6	9748.000	10.82	37.55	35.02	39.30	52.65	74.00	-21.35	peak



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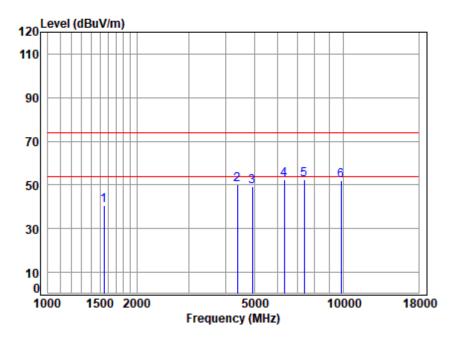
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Report No.: SZEM190501402702

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Mode:a; Polarization:Horizontal; Modulation:802.11b; bandwidth:20MHz; Channel:High



Site : chamber

Condition: 3m HORIZONTAL Job No : 14027CR\14028CR

Mode : 2462 TX RSE : 2.4G WIFI 11B Note

		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1547.199	5.42	26.02	38.04	47.37	40.77	74.00	-33.23	peak
2	4379.699	7.43	33.60	38.20	47.48	50.31	74.00	-23.69	peak
3	4924.000	8.01	34.37	38.47	45.59	49.50	74.00	-24.50	peak
4	6322.136	11.20	34.96	37.96	44.13	52.33	74.00	-21.67	peak
5	7386.000	10.03	36.34	36.94	42.94	52.37	74.00	-21.63	peak
	9848.000								•



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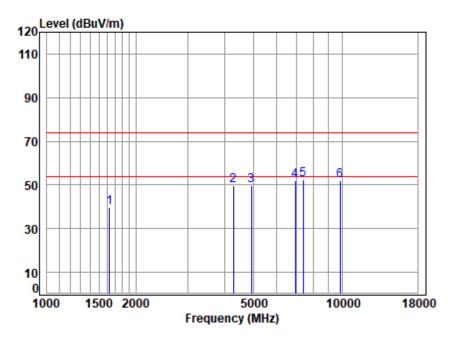
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Report No.: SZEM190501402702

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Mode:a; Polarization: Vertical; Modulation: 802.11b; bandwidth: 20MHz; Channel: High



Site : chamber Condition: 3m VERTICAL

Job No : 14027CR\14028CR

Mode : 2462 TX RSE : 2.4G WIFI 11B Note

000	. 2.	TO WILL	1 110						
		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
_									
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1629.825	5.31	26.38	38.03	45.82	39.48	74.00	-34.52	peak
2	4279.589	7.31	33.60	38.15	47.01	49.77	74.00	-24.23	peak
3	4924.000	8.01	34.37	38.47	45.79	49.70	74.00	-24.30	peak
4	6934.778	10.31	36.32	37.36	42.94	52.21	74.00	-21.79	peak
5	7386.000	10.03	36.34	36.94	42.89	52.32	74.00	-21.68	peak
6	9848.000	10.87	37.57	34.97	38.54	52.01	74.00	-21.99	peak



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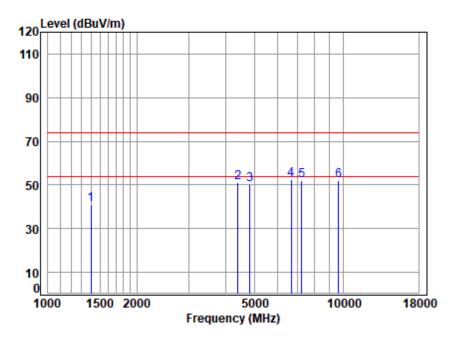
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Report No.: SZEM190501402702

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Mode:a; Polarization:Horizontal; Modulation:802.11g; bandwidth:20MHz; Channel:Low



Site : chamber

Condition: 3m HORIZONTAL Job No : 14027CR\14028CR

Mode : 2412 TX RSE : 2.4G WIFI 11G Note

000		14 111							
		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1398.336	5.15	25.38	38.05	48.61	41.09	74.00	-32.91	peak
2	4405.090	7.46	33.60	38.22	48.09	50.93	74.00	-23.07	peak
3	4824.000	7.91	34.19	38.42	46.59	50.27	74.00	-23.73	peak
4	6659.763	11.08	35.56	37.62	43.43	52.45	74.00	-21.55	peak
5	7236.000	10.07	36.40	37.08	42.74	52.13	74.00	-21.87	peak
6	9648.000	10.77	37.53	35.07	38.72	51.95	74.00	-22.05	peak



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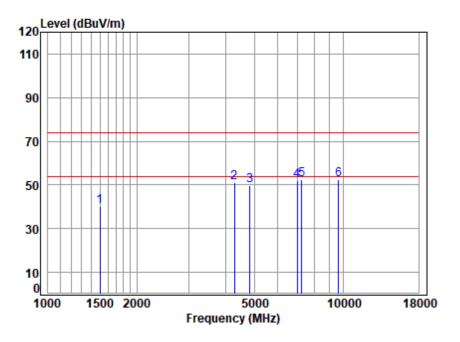
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Report No.: SZEM190501402702

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Mode:a; Polarization:Vertical; Modulation:802.11g; bandwidth:20MHz; Channel:Low



Site : chamber Condition: 3m VERTICAL

Job No : 14027CR\14028CR

Mode : 2412 TX RSE : 2.4G WIFI 11G Note

	. 2.	TO WITH	1 110						
		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1503.119	5.48	25.81	38.04	46.96	40.21	74.00	-33.79	peak
2	4291.977	7.33	33.60	38.16	48.36	51.13	74.00	-22.87	peak
3	4824.000	7.91	34.19	38.42	46.00	49.68	74.00	-24.32	peak
4	6995.172	10.14	36.49	37.30	42.75	52.08	74.00	-21.92	peak
5	7236.000	10.07	36.40	37.08	42.88	52.27	74.00	-21.73	peak
6	9648.000	10.77	37.53	35.07	39.14	52.37	74.00	-21.63	peak



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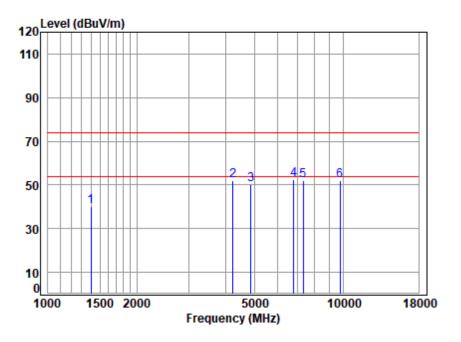
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Report No.: SZEM190501402702

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Mode:a; Polarization:Horizontal; Modulation:802.11g; bandwidth:20MHz; Channel:middle



Site : chamber

Condition: 3m HORIZONTAL : 14027CR\14028CR Job No

Mode : 2437 TX RSE : 2.4G WIFI 11G Note

0.00		14 111							
		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1398.336	5.15	25.38	38.05	47.57	40.05	74.00	-33.95	peak
2	4230.396	7.26	33.60	38.13	49.13	51.86	74.00	-22.14	peak
3	4874.000	7.96	34.28	38.44	46.42	50.22	74.00	-23.78	peak
4	6795.879	10.69	35.94	37.49	43.51	52.65	74.00	-21.35	peak
5	7311.000	10.05	36.37	37.01	42.43	51.84	74.00	-22.16	peak
6	9748.000	10.82	37.55	35.02	38.89	52.24	74.00	-21.76	peak



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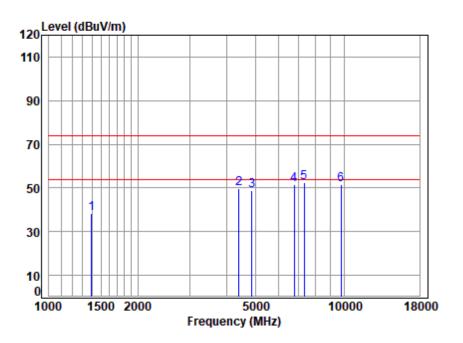
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Report No.: SZEM190501402702

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Mode:a; Polarization: Vertical; Modulation: 802.11g; bandwidth: 20MHz; Channel: middle



Site : chamber Condition: 3m VERTICAL

Job No : 14027CR\14028CR

Mode : 2437 TX RSE : 2.4G WIFI 11G Note

0.0		10 111							
		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
_									
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1394.300	5.13	25.37	38.05	45.83	38.28	74.00	-35.72	peak
2	4405.090	7.46	33.60	38.22	46.93	49.77	74.00	-24.23	peak
3	4874.000	7.96	34.28	38.44	45.15	48.95	74.00	-25.05	peak
4	6776.265	10.75	35.89	37.51	42.28	51.41	74.00	-22.59	peak
5	7311.000	10.05	36.37	37.01	43.09	52.50	74.00	-21.50	peak
6	9748.000	10.82	37.55	35.02	38.39	51.74	74.00	-22.26	peak



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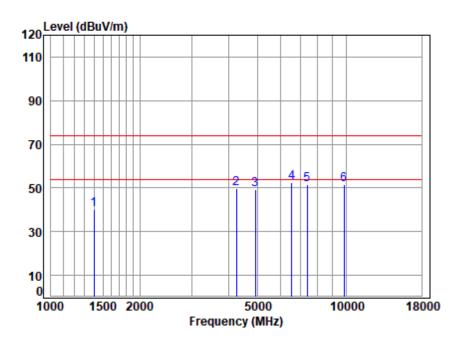
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Report No.: SZEM190501402702

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Mode:a; Polarization:Horizontal; Modulation:802.11g; bandwidth:20MHz; Channel:High



Site : chamber

Condition: 3m HORIZONTAL : 14027CR\14028CR Job No

Mode : 2462 TX RSE Note : 2.4G WIFI 11G

		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1398.336	5.15	25.38	38.05	47.47	39.95	74.00	-34.05	peak
2	4242.641	7.27	33.60	38.13	47.01	49.75	74.00	-24.25	peak
3	4924.000	8.01	34.37	38.47	45.18	49.09	74.00	-24.91	peak
4	6545.263	11.41	35.23	37.74	43.40	52.30	74.00	-21.70	peak
5	7386.000	10.03	36.34	36.94	42.18	51.61	74.00	-22.39	peak
6	9848.000	10.87	37.57	34.97	38.19	51.66	74.00	-22.34	peak



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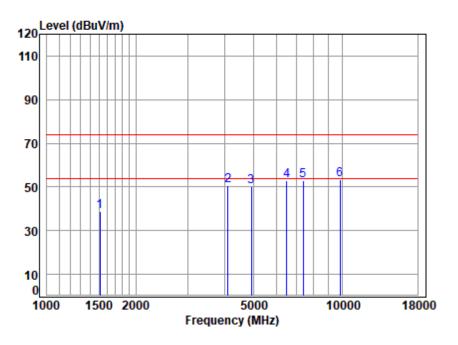
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Report No.: SZEM190501402702

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Mode:a; Polarization: Vertical; Modulation: 802.11g; bandwidth: 20MHz; Channel: High



Site : chamber Condition: 3m VERTICAL

Job No : 14027CR\14028CR

Mode : 2462 TX RSE : 2.4G WIFI 11G Note

,,,,	. 2	TO WILL	1 110						
		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1511.833	5.46	25.85	38.04	45.65	38.92	74.00	-35.08	peak
2	4109.872	7.11	33.60	38.06	48.04	50.69	74.00	-23.31	peak
3	4924.000	8.01	34.37	38.47	46.42	50.33	74.00	-23.67	peak
4	6488.754	11.52	35.09	37.79	43.89	52.71	74.00	-21.29	peak
5	7386.000	10.03	36.34	36.94	43.52	52.95	74.00	-21.05	peak
6	9848.000	10.87	37.57	34.97	39.86	53.33	74.00	-20.67	peak



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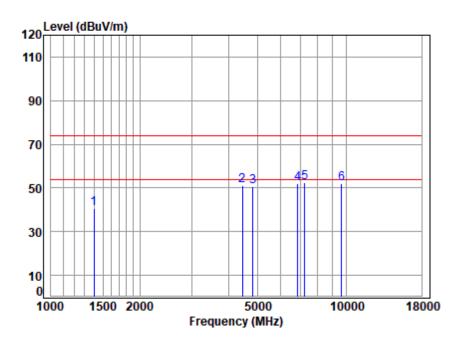
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Report No.: SZEM190501402702

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Mode:a; Polarization:Horizontal; Modulation:802.11n; bandwidth:20MHz; Channel:Low



Site : chamber

Condition: 3m HORIZONTAL : 14027CR\14028CR Job No

Mode : 2412 TX RSE

Note : 2.4G WIFI 11N20

		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1398.336	5.15	25.38	38.05	47.98	40.46	74.00	-33.54	peak
2	4456.315	7.51	33.60	38.24	48.17	51.04	74.00	-22.96	peak
3	4824.000	7.91	34.19	38.42	46.97	50.65	74.00	-23.35	peak
4	6855.063	10.53	36.10	37.44	42.88	52.07	74.00	-21.93	peak
5	7236.000	10.07	36.40	37.08	42.91	52.30	74.00	-21.70	peak
6	9648.000	10.77	37.53	35.07	38.81	52.04	74.00	-21.96	peak



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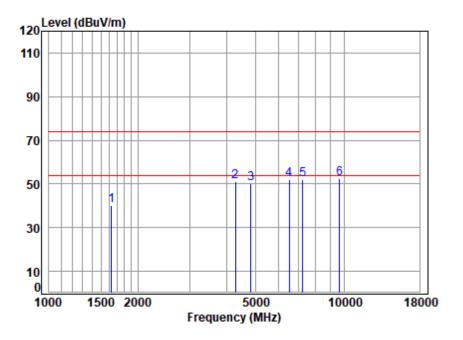
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Report No.: SZEM190501402702

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Mode:a; Polarization:Vertical; Modulation:802.11n; bandwidth:20MHz; Channel:Low



Site : chamber Condition: 3m VERTICAL

Job No : 14027CR\14028CR

Mode : 2412 TX RSE

Note : 2.4G WIFI 11N20

				_					
		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1629.825	5.31	26.38	38.03	46.33	39.99	74.00	-34.01	peak
2	4279.589	7.31	33.60	38.15	48.41	51.17	74.00	-22.83	peak
3	4824.000	7.91	34.19	38.42	46.65	50.33	74.00	-23.67	peak
4	6507.536	11.52	35.12	37.77	42.97	51.84	74.00	-22.16	peak
5	7236.000	10.07	36.40	37.08	42.60	51.99	74.00	-22.01	peak
	9648.000								•



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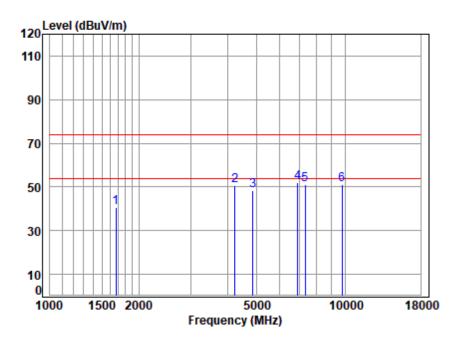
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Report No.: SZEM190501402702

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Mode:a; Polarization:Horizontal; Modulation:802.11n; bandwidth:20MHz; Channel:middle



Site : chamber

Condition: 3m HORIZONTAL : 14027CR\14028CR Job No

Mode : 2437 TX RSE

Note : 2.4G WIFI 11N20

				_					
		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1672.779	5.26	26.56	38.03	46.99	40.78	74.00	-33.22	peak
2	4230.396	7.26	33.60	38.13	47.92	50.65	74.00	-23.35	peak
3	4874.000	7.96	34.28	38.44	44.75	48.55	74.00	-25.45	peak
4	6914.763	10.36	36.27	37.38	42.62	51.87	74.00	-22.13	peak
5	7311.000	10.05	36.37	37.01	41.75	51.16	74.00	-22.84	peak
6	9748.000	10.82	37.55	35.02	37.75	51.10	74.00	-22.90	peak



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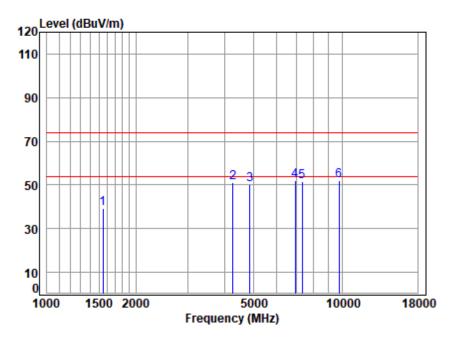
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Report No.: SZEM190501402702

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Mode:a; Polarization: Vertical; Modulation: 802.11n; bandwidth: 20MHz; Channel: middle



Site : chamber Condition: 3m VERTICAL

Job No : 14027CR\14028CR

Mode : 2437 TX RSE

Note : 2.4G WIFI 11N20

		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1547.199	5.42	26.02	38.04	45.72	39.12	74.00	-34.88	peak
2	4267.237	7.30	33.60	38.14	48.32	51.08	74.00	-22.92	peak
3	4874.000	7.96	34.28	38.44	46.56	50.36	74.00	-23.64	peak
4	6934.778	10.31	36.32	37.36	42.73	52.00	74.00	-22.00	peak
5	7311.000	10.05	36.37	37.01	42.02	51.43	74.00	-22.57	peak
6	9748.000	10.82	37.55	35.02	38.48	51.83	74.00	-22.17	peak



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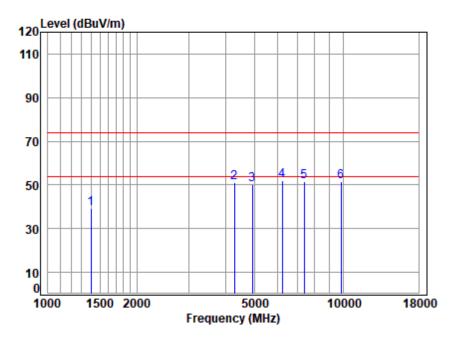
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Report No.: SZEM190501402702

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Mode:a; Polarization:Horizontal; Modulation:802.11n; bandwidth:20MHz; Channel:High



Site : chamber

Condition: 3m HORIZONTAL : 14027CR\14028CR Job No

Mode : 2462 TX RSE : 2.4G WIFI 11N20 Note

Cabla Ant Docume

		Cable	Ant	Preamp	Kead		Limit	Over		
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark	
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		-
1	1402.384	5.16	25.40	38.05	46.76	39.27	74.00	-34.73	peak	
2	4279.589	7.31	33.60	38.15	48.35	51.11	74.00	-22.89	peak	
3	4924.000	8.01	34.37	38.47	46.06	49.97	74.00	-24.03	peak	
4	6213.441	10.99	34.87	38.07	44.33	52.12	74.00	-21.88	peak	
5	7386.000	10.03	36.34	36.94	42.29	51.72	74.00	-22.28	peak	
6	9848.000	10.87	37.57	34.97	37.98	51.45	74.00	-22.55	neak	



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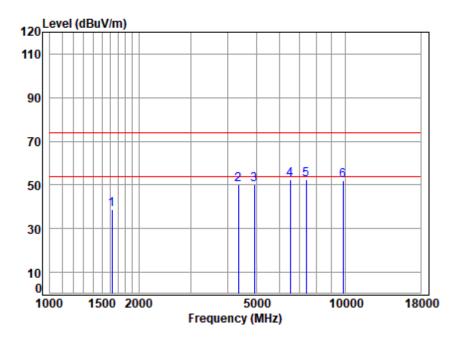
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Report No.: SZEM190501402702

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Mode:a; Polarization:Vertical; Modulation:802.11n; bandwidth:20MHz; Channel:High



Site : chamber Condition: 3m VERTICAL

Job No : 14027CR\14028CR

Mode : 2462 TX RSE

Note : 2.4G WIFI 11N20

		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1620.431	5.32	26.34	38.03	45.29	38.92	74.00	-35.08	peak
2	4354.454	7.40	33.60	38.19	47.25	50.06	74.00	-23.94	peak
3	4924.000	8.01	34.37	38.47	46.07	49.98	74.00	-24.02	peak
4	6507.536	11.52	35.12	37.77	43.64	52.51	74.00	-21.49	peak
5	7386.000	10.03	36.34	36.94	42.82	52.25	74.00	-21.75	peak
	9848.000								•



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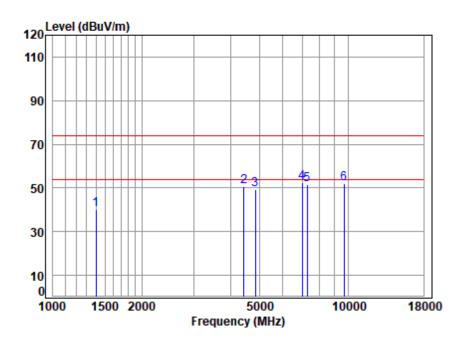
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Mode:a; Polarization:Horizontal; Modulation:802.11n; bandwidth:40MHz; Channel:Low



Site : chamber

Condition: 3m HORIZONTAL : 14027CR\14028CR Job No

Mode : 2422 TX RSE

Note : 2.4G WIFI 11N40

		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1398.336	5.15	25.38	38.05	47.52	40.00	74.00	-34.00	peak
2	4443.453	7.50	33.60	38.24	47.86	50.72	74.00	-23.28	peak
3	4844.000	7.93	34.23	38.43	45.40	49.13	74.00	-24.87	peak
4	6974.982	10.20	36.43	37.32	43.33	52.64	74.00	-21.36	peak
5	7266.000	10.06	36.39	37.05	42.19	51.59	74.00	-22.41	peak
6	9688,000	10.79	37.54	35.05	38.87	52.15	74.00	-21.85	peak



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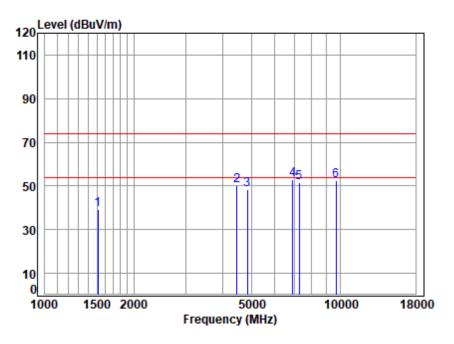
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Mode:a; Polarization:Vertical; Modulation:802.11n; bandwidth:40MHz; Channel:Low



Site : chamber Condition: 3m VERTICAL

: 14027CR\14028CR Job No

Mode : 2422 TX RSE

Note : 2.4G WIFI 11N40

				_					
		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1511.833	5.46	25.85	38.04	45.78	39.05	74.00	-34.95	peak
2	4469.214	7.53	33.60	38.25	47.34	50.22	74.00	-23.78	peak
3	4844.000	7.93	34.23	38.43	44.57	48.30	74.00	-25.70	peak
4	6894.806	10.42	36.21	37.40	43.58	52.81	74.00	-21.19	peak
5	7266.000	10.06	36.39	37.05	42.18	51.58	74.00	-22.42	peak
6	9688.000	10.79	37.54	35.05	39.32	52,60	74.00	-21.40	peak



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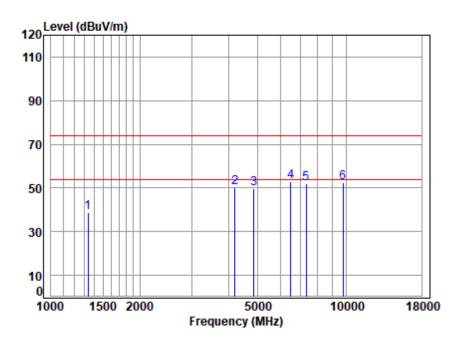
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Mode:a; Polarization:Horizontal; Modulation:802.11n; bandwidth:40MHz; Channel:middle



Site : chamber

Condition: 3m HORIZONTAL : 14027CR\14028CR Job No Mode : 2437 TX RSE

Note : 2.4G WIFI 11N40

				_					
		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1335.141	4.93	25.11	38.06	47.03	39.01	74.00	-34.99	peak
2	4206.011	7.23	33.60	38.11	47.61	50.33	74.00	-23.67	peak
3	4874.000	7.96	34.28	38.44	46.10	49.90	74.00	-24.10	peak
4	6488.754	11.52	35.09	37.79	44.05	52.87	74.00	-21.13	peak
5	7311.000	10.05	36.37	37.01	42.69	52.10	74.00	-21.90	peak
6	9748.000	10.82	37.55	35.02	39.02	52.37	74.00	-21.63	peak



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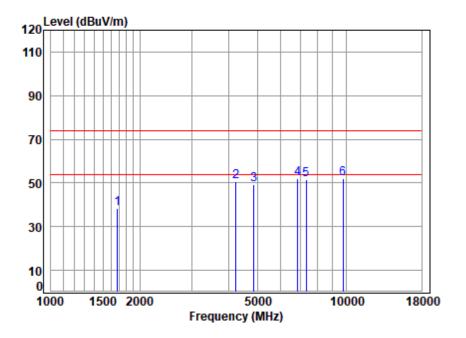
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Mode:a; Polarization: Vertical; Modulation: 802.11n; bandwidth: 40MHz; Channel: middle



Site : chamber Condition: 3m VERTICAL

: 14027CR\14028CR Job No

Mode : 2437 TX RSE

Note : 2.4G WIFI 11N40

		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1677.621	5.25	26.58	38.03	44.67	38.47	74.00	-35.53	peak
2	4230.396	7.26	33.60	38.13	47.71	50.44	74.00	-23.56	peak
3	4874.000	7.96	34.28	38.44	45.29	49.09	74.00	-24.91	peak
4	6855.063	10.53	36.10	37.44	42.83	52.02	74.00	-21.98	peak
5	7311.000	10.05	36.37	37.01	42.19	51.60	74.00	-22.40	peak
6	9748.000	10.82	37.55	35.02	38.62	51.97	74.00	-22.03	peak



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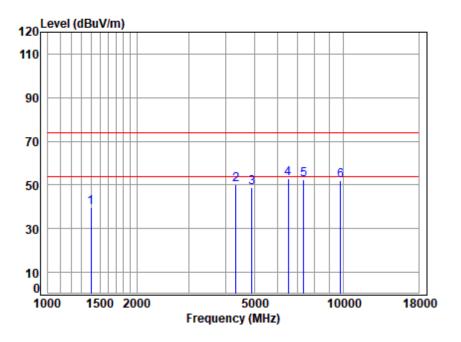
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Mode:a; Polarization:Horizontal; Modulation:802.11n; bandwidth:40MHz; Channel:High



Site : chamber

Condition: 3m HORIZONTAL : 14027CR\14028CR Job No

Mode : 2452 TX RSE

Note : 2.4G WIFI 11N40

		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1398.336	5.15	25.38	38.05	47.15	39.63	74.00	-34.37	peak
2	4341.886	7.38	33.60	38.18	47.42	50.22	74.00	-23.78	peak
3	4904.000	7.99	34.33	38.46	45.11	48.97	74.00	-25.03	peak
4	6507.536	11.52	35.12	37.77	44.23	53.10	74.00	-20.90	peak
5	7356.000	10.04	36.36	36.97	43.06	52.49	74.00	-21.51	peak
6	9808,000	10.85	37.56	34.99	38.42	51.84	74.00	-22.16	peak



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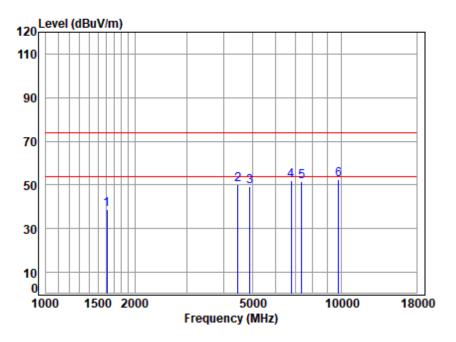
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Mode:a; Polarization: Vertical; Modulation: 802.11n; bandwidth: 40MHz; Channel: High



Site : chamber Condition: 3m VERTICAL

: 14027CR\14028CR Job No

Mode : 2452 TX RSE

Note : 2.4G WIFI 11N40

				_						
		Cable	Ant	Preamp	Read		Limit	0ver		
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark	
	MHz	dB	dB/m	dB	dBuV	d Bu V/m	d Bu V/m	dB		
1	1611.091	5.34	26.30	38.03	45.14	38.75	74.00	-35.25	peak	
2	4469.214	7.53	33.60	38.25	47.20	50.08	74.00	-23.92	peak	
3	4904.000	7.99	34.33	38.46	45.49	49.35	74.00	-24.65	peak	
4	6776.265	10.75	35.89	37.51	42.74	51.87	74.00	-22.13	peak	
5	7356.000	10.04	36.36	36.97	42.04	51.47	74.00	-22.53	peak	
6	9808.000	10.85	37.56	34.99	38.87	52.29	74.00	-21.71	peak	



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#### **Photographs** 8

#### 8.1 Test Setup

Please refer to setup photos.

#### 8.2 EUT Constructional Details (EUT Photos)

Please refer to external and internal photos for details.



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#### **Appendix** 9

#### 9.1 Appendix 15.247

#### 1.6dB Bandwidth

Test Mode	Test	Ant	EBW[MHz]	Limit[MHz]	Verdict
11B	2412	Ant1	10.110	>=0.5	PASS
11B	2437	Ant1	10.170	>=0.5	PASS
11B	2462	Ant1	10.140	>=0.5	PASS
11G	2412	Ant1	16.590	>=0.5	PASS
11G	2437	Ant1	16.590	>=0.5	PASS
11G	2462	Ant1	16.530	>=0.5	PASS
11N20SISO	2412	Ant1	17.850	>=0.5	PASS
11N20SISO	2437	Ant1	17.850	>=0.5	PASS
11N20SISO	2462	Ant1	17.760	>=0.5	PASS
11N40SISO	2422	Ant1	36.660	>=0.5	PASS
11N40SISO	2437	Ant1	36.660	>=0.5	PASS
11N40SISO	2452	Ant1	36.540	>=0.5	PASS



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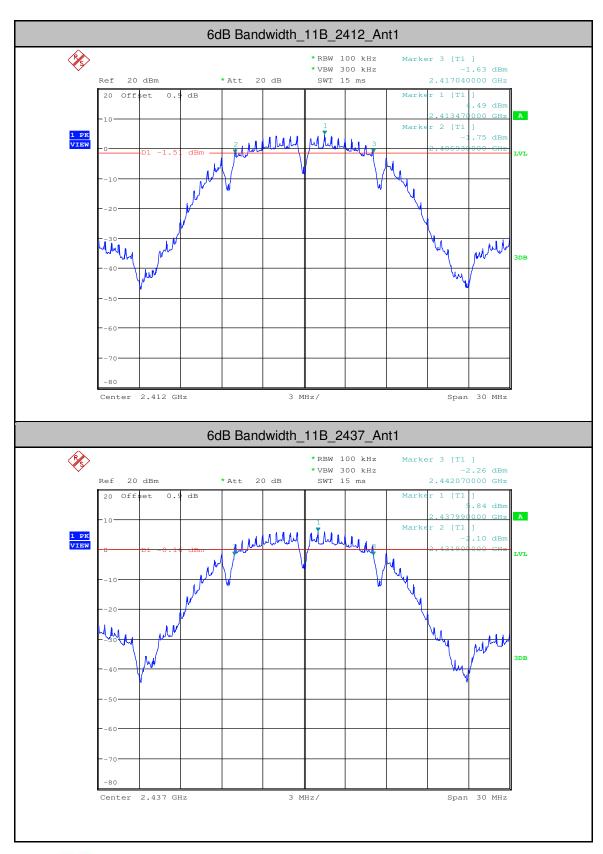
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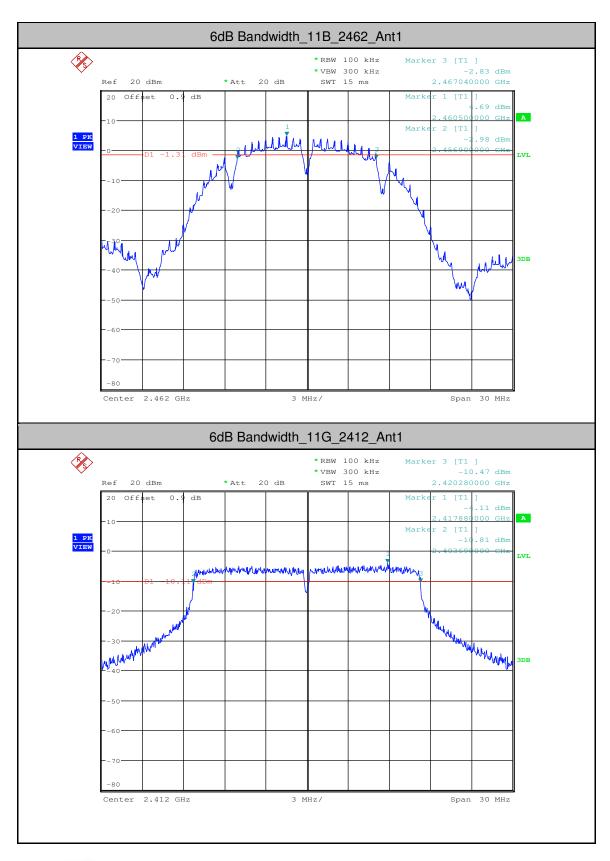
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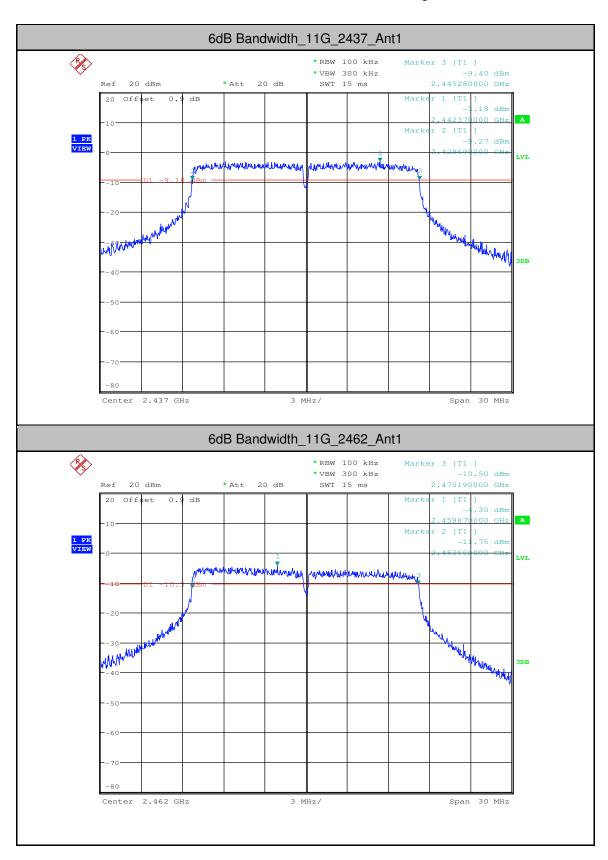
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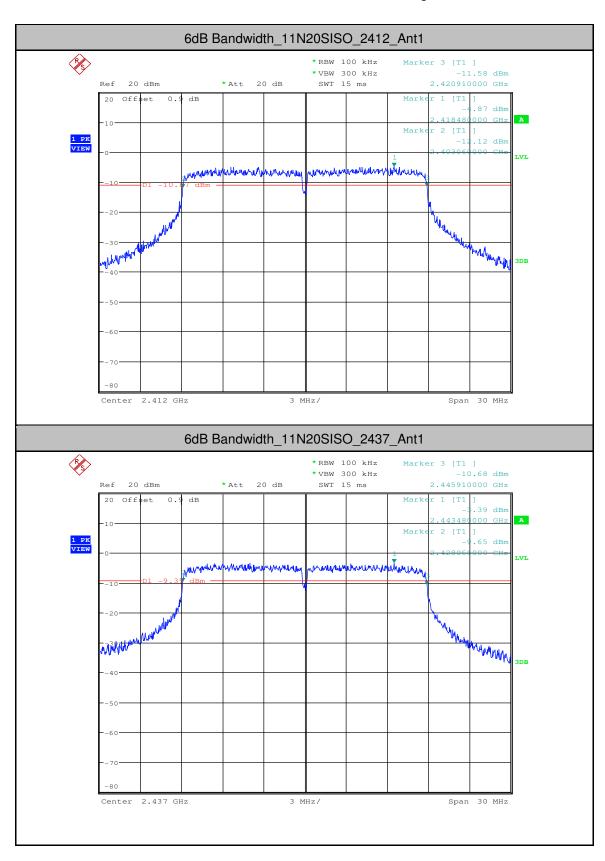
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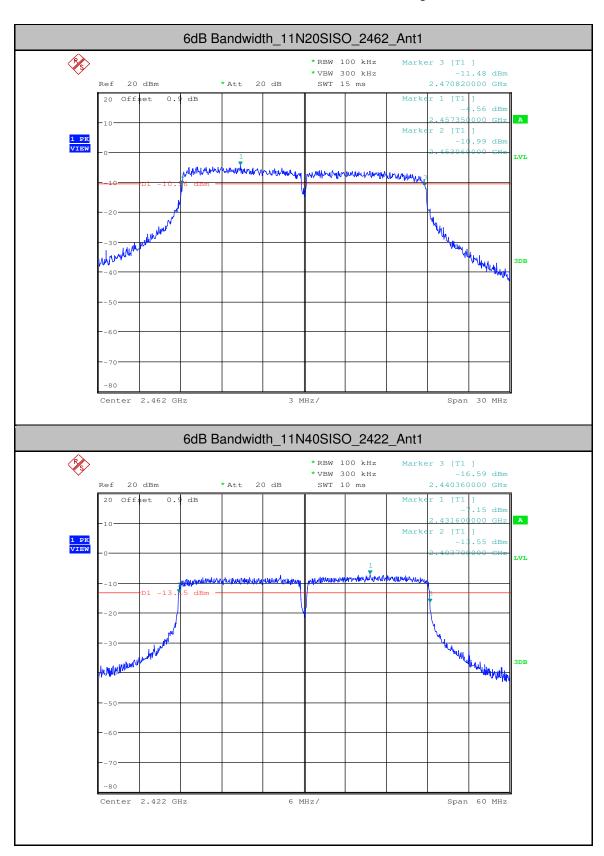
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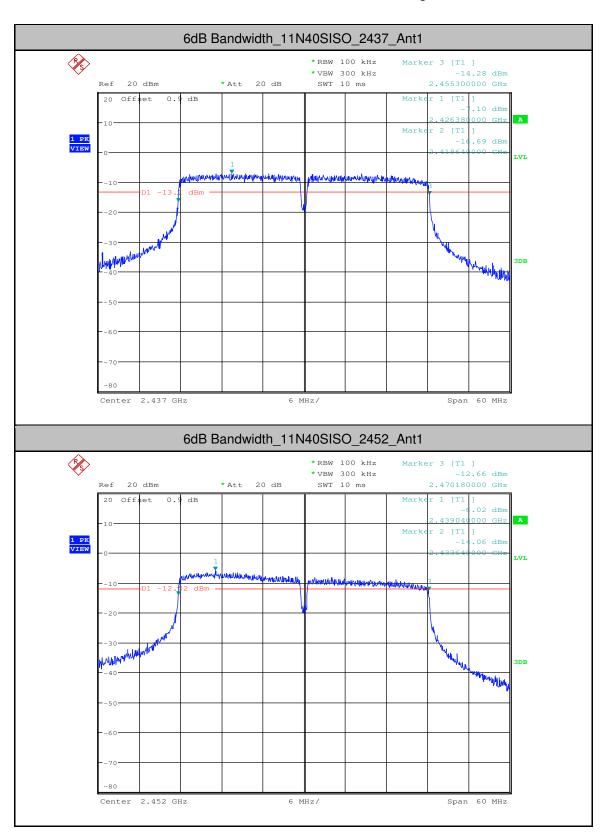
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#### 2.Maximum peak conducted output power

Test Mode	Test Channel	Ant	Power[dBm]	Limit[dBm]	Verdict
11B	2412	Ant1	17.17	<30	PASS
11B	2437	Ant1	18.73	<30	PASS
11B	2462	Ant1	17.17	<30	PASS
11G	2412	Ant1	17.96	<30	PASS
11G	2437	Ant1	19.48	<30	PASS
11G	2462	Ant1	17.7	<30	PASS
11N20SISO	2412	Ant1	17.91	<30	PASS
11N20SISO	2437	Ant1	19.42	<30	PASS
11N20SISO	2462	Ant1	17.68	<30	PASS
11N40SISO	2422	Ant1	18.56	<30	PASS
11N40SISO	2437	Ant1	18.95	<30	PASS
11N40SISO	2452	Ant1	18.59	<30	PASS



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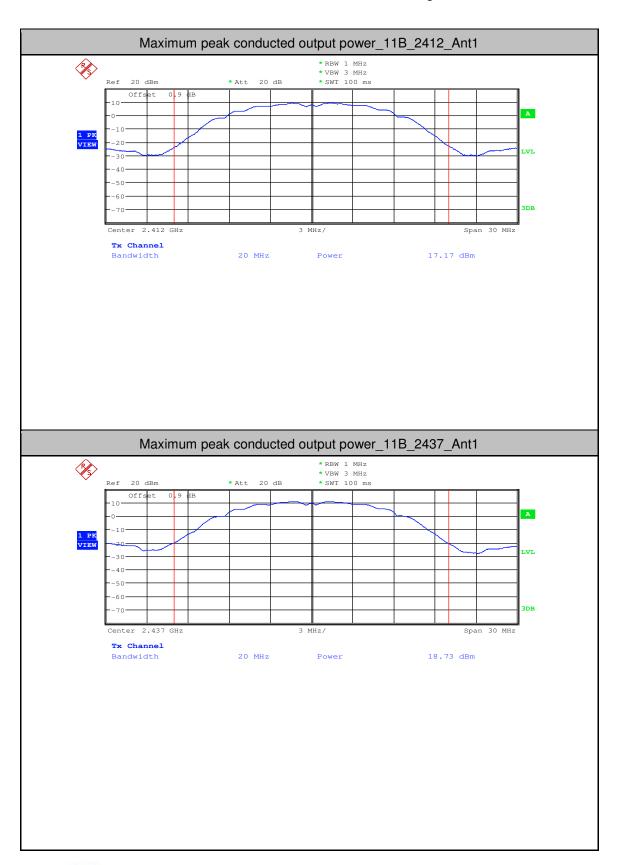
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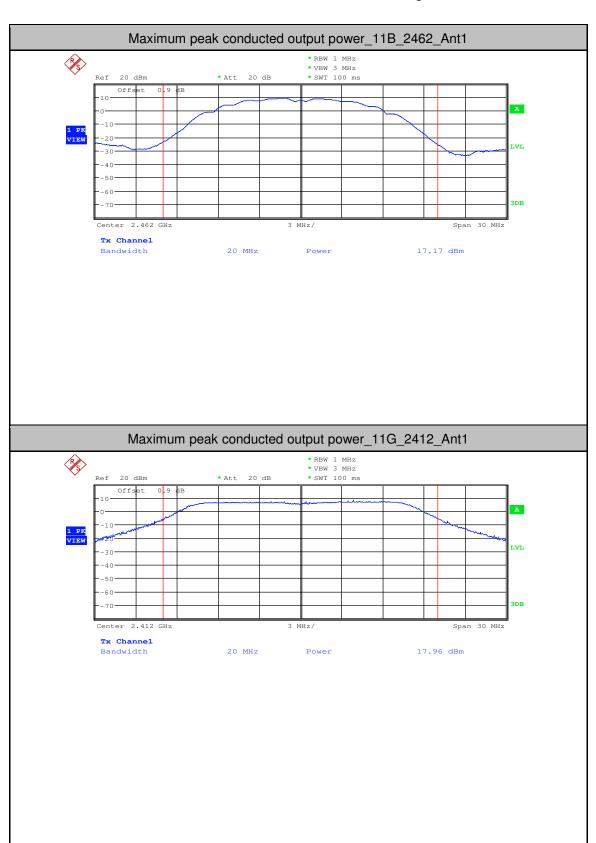
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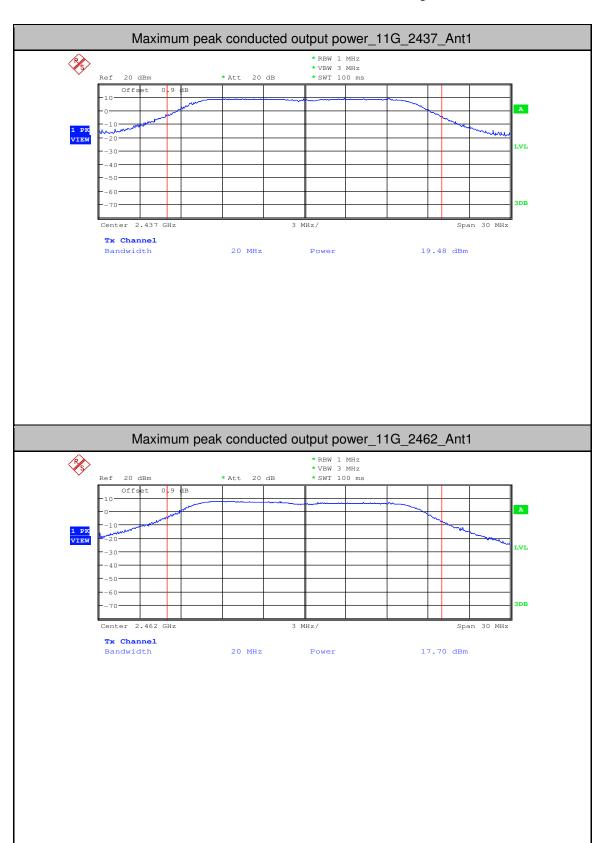
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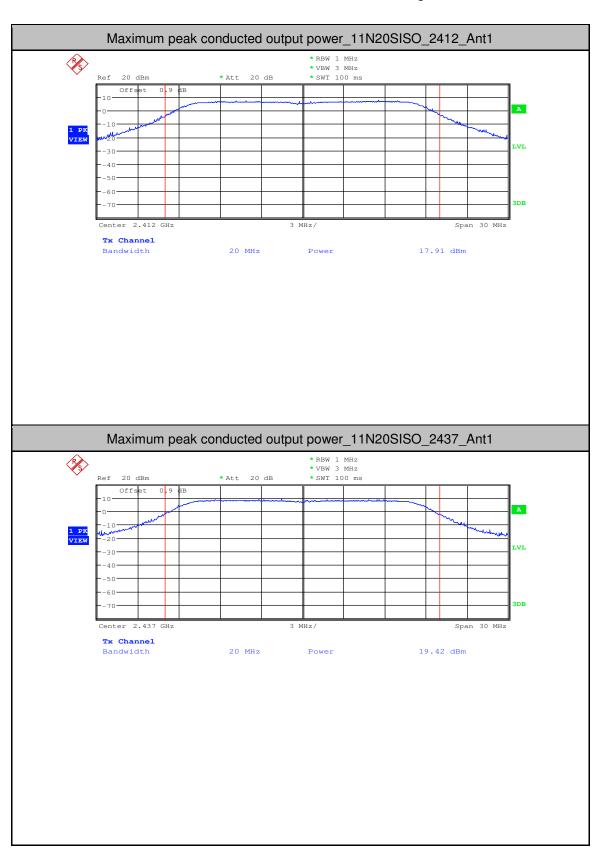
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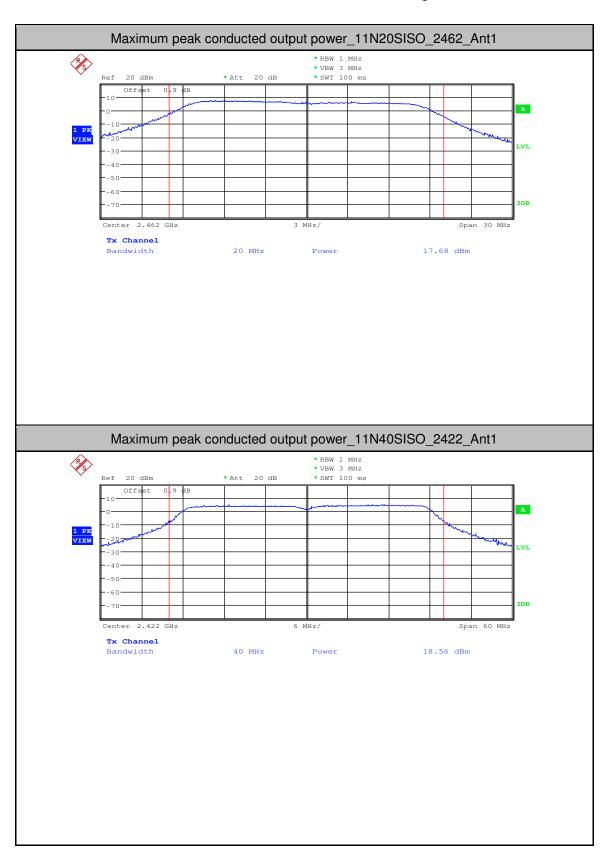
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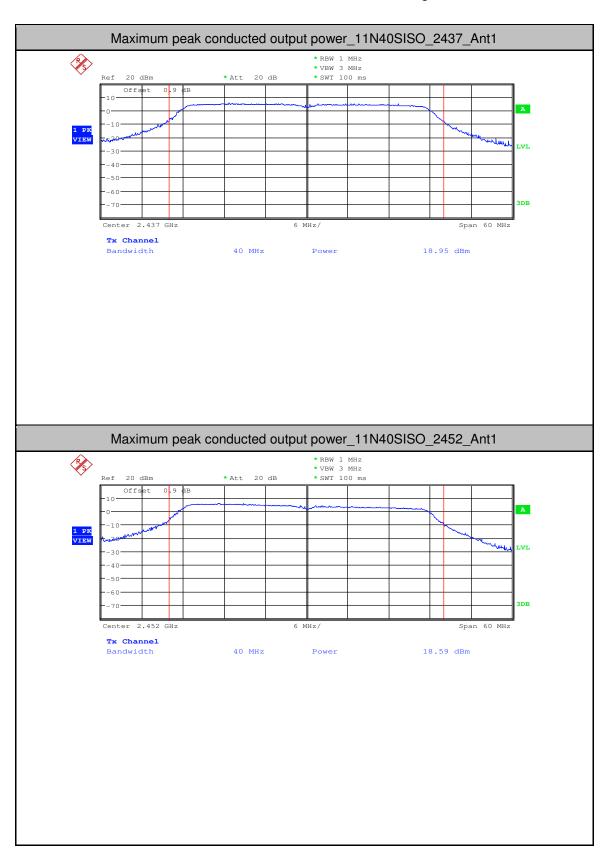
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#### 3.Maximum Peak power spectral density

Test Mode	Test Channel	Ant	PSD[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
11B	2412	Ant1	-10.6	<8.00	PASS
11B	2437	Ant1	-8.54	<8.00	PASS
11B	2462	Ant1	-9.04	<8.00	PASS
11G	2412	Ant1	-14.83	<8.00	PASS
11G	2437	Ant1	-14.88	<8.00	PASS
11G	2462	Ant1	-15.68	<8.00	PASS
11N20SISO	2412	Ant1	-16.07	<8.00	PASS
11N20SISO	2437	Ant1	-14.12	<8.00	PASS
11N20SISO	2462	Ant1	-16.73	<8.00	PASS
11N40SISO	2422	Ant1	-17.03	<8.00	PASS
11N40SISO	2437	Ant1	-18.25	<8.00	PASS
11N40SISO	2452	Ant1	-17.61	<8.00	PASS



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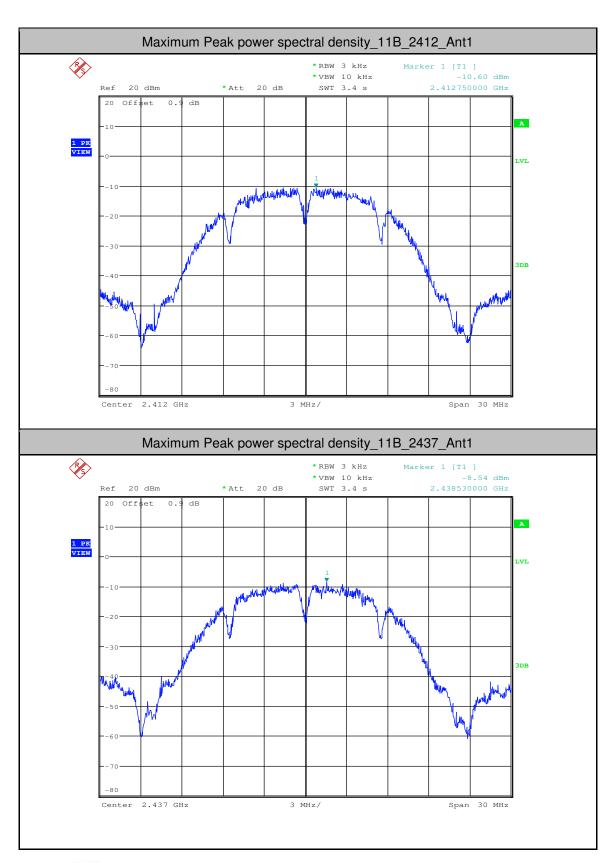
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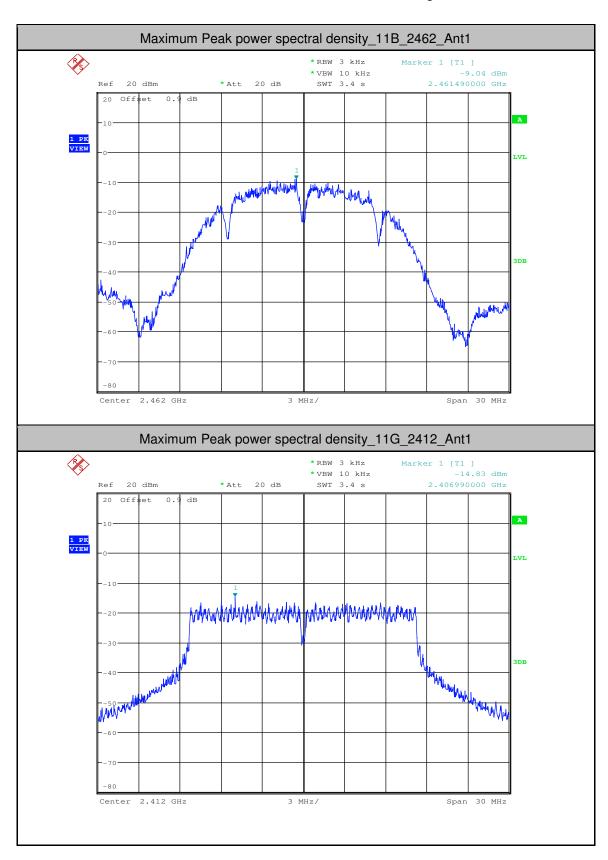
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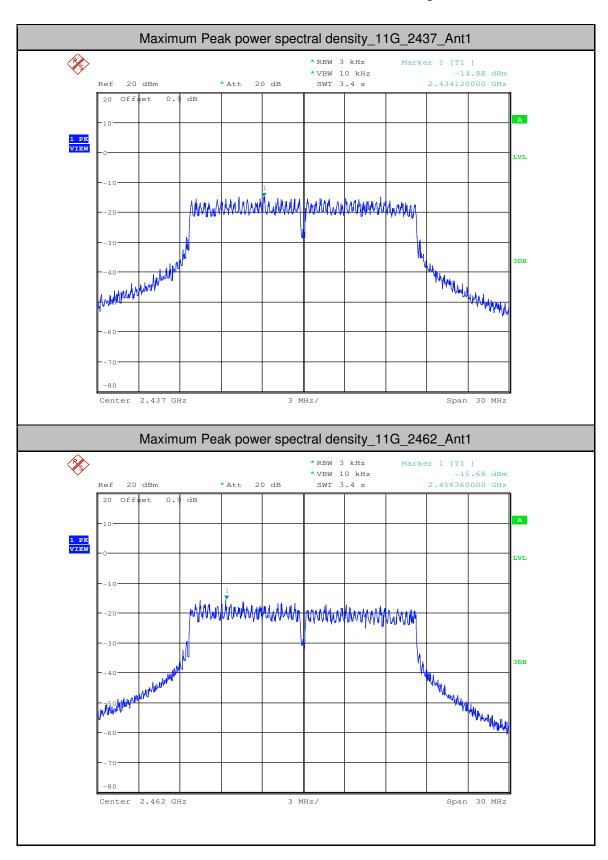
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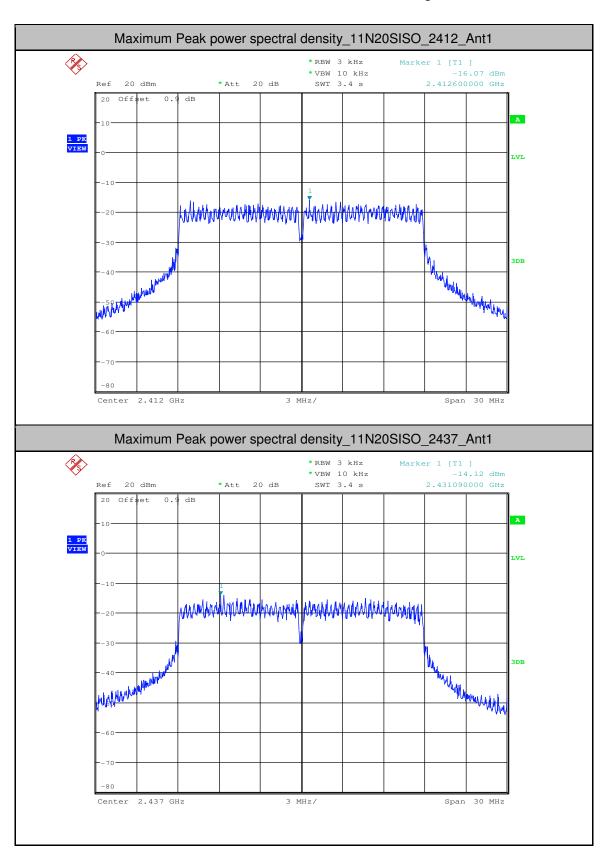
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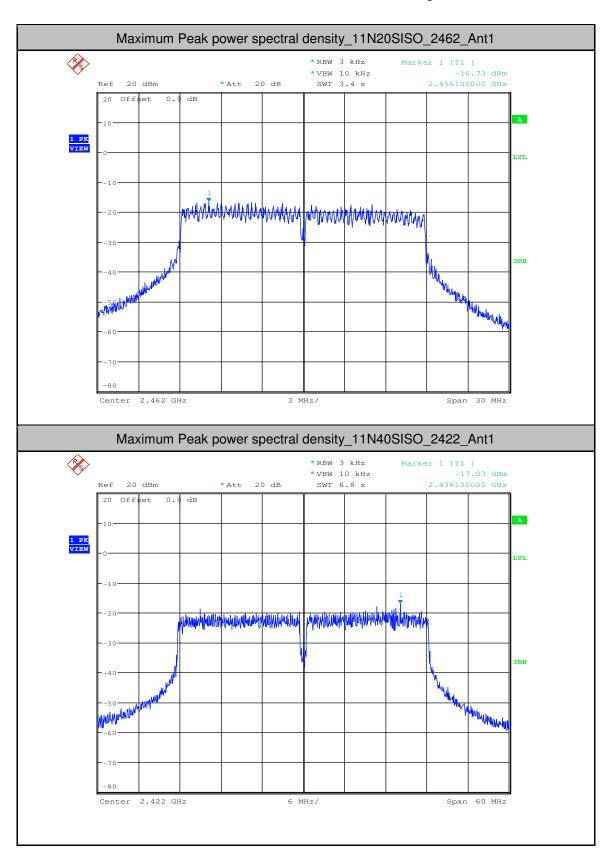
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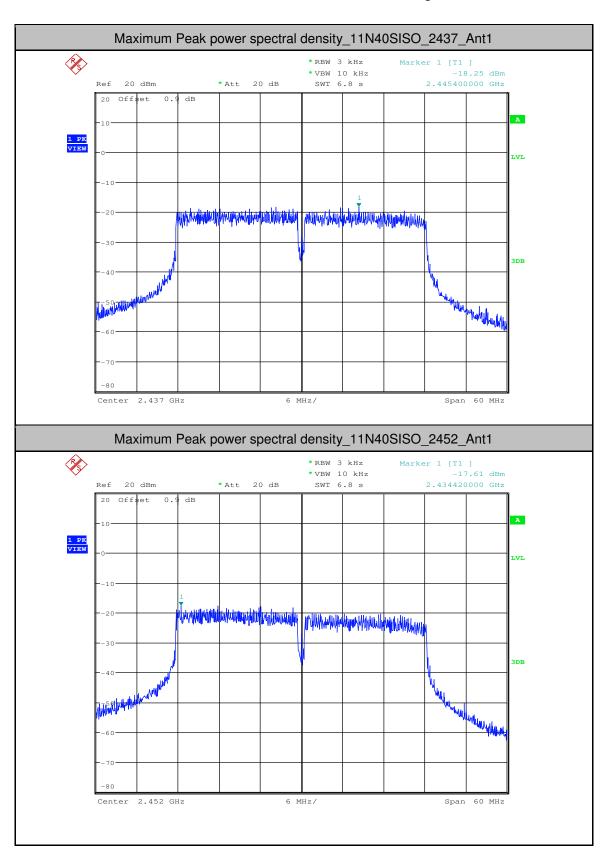
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#### 4.Band-edge for RF Conducted Emissions

Test Mode	Test Channel	Ant	Carrier Power[dBm]	Max. Spurious Level [dBm]	Limit [dBm]	Verdict
11B	2412	Ant1	4.190	-44.295	<-15.81	PASS
11B	2462	Ant1	3.930	-47.818	<-16.07	PASS
11G	2412	Ant1	-4.430	-47.312	<-24.43	PASS
11G	2462	Ant1	-4.220	-50.334	<-24.22	PASS
11N20SISO	2412	Ant1	-5.190	-45.450	<-25.19	PASS
11N20SISO	2462	Ant1	-5.160	-48.497	<-25.16	PASS
11N40SISO	2422	Ant1	-7.550	-39.328	<-27.55	PASS
11N40SISO	2452	Ant1	-6.530	-43.257	<-26.53	PASS



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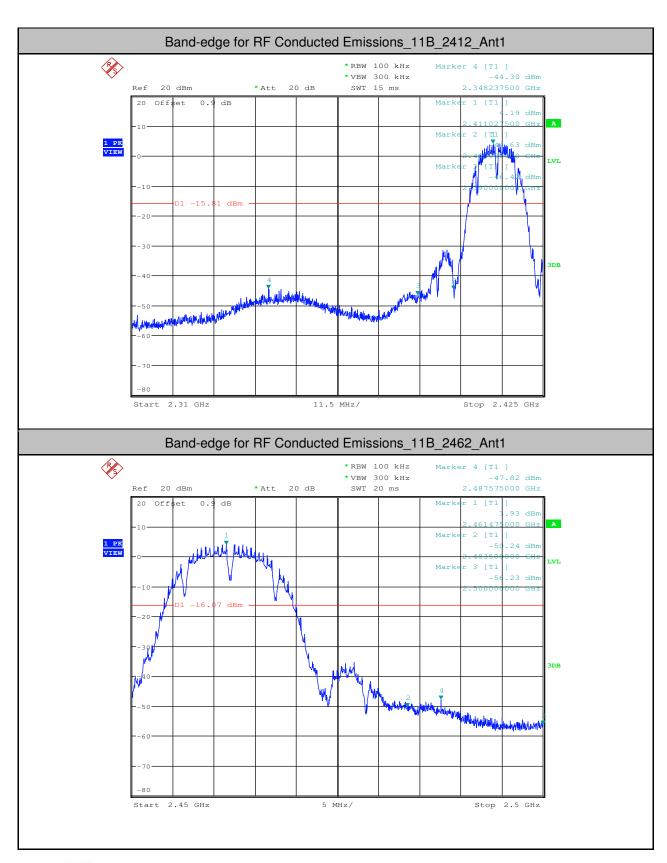
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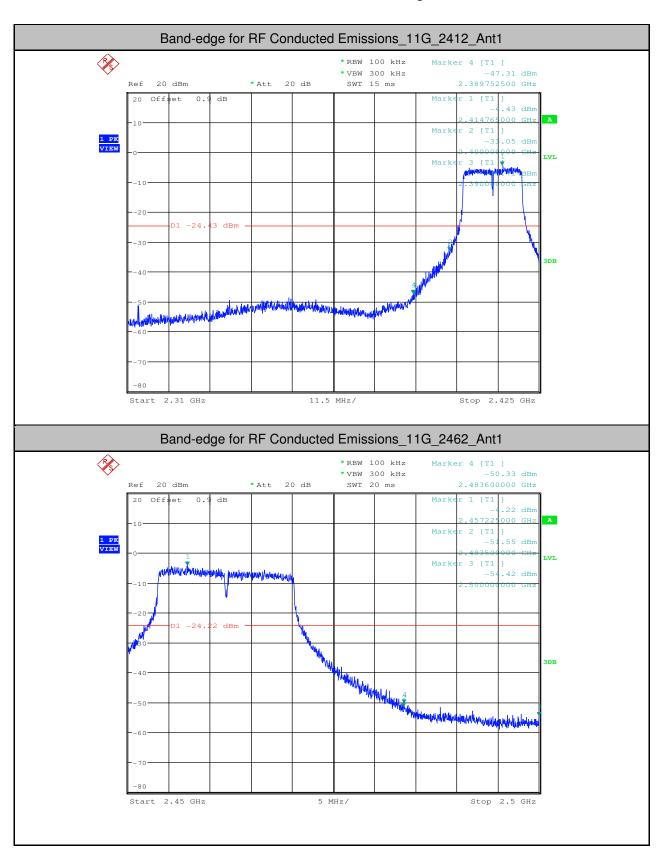
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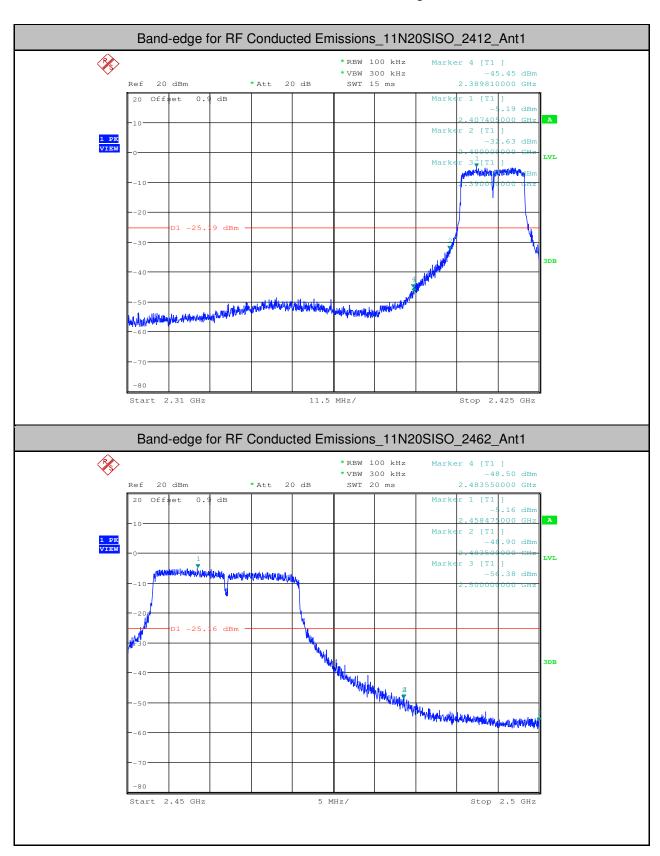
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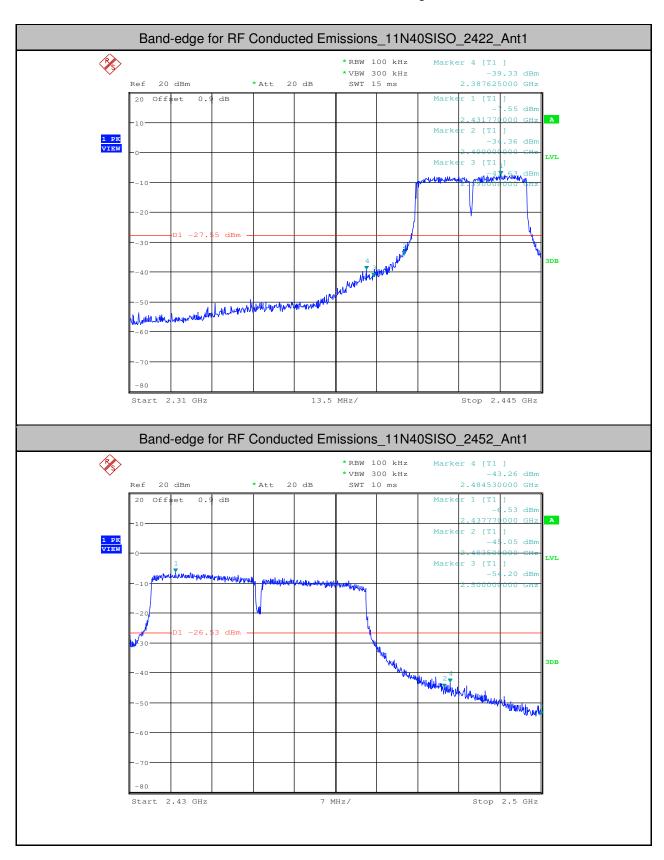
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#### **5.RF Conducted Spurious Emissions**

Test Mode	Test Channel	StartFre [MHz]	StopFre [MHz]	RBW [kHz]	VBW [kHz]	Pref[d Bm]	Max. Level [dBm]	Limit [dBm]	Verdict
11B	2412	30	10000	1000	3000	4.2	-34.120	<-15.8	PASS
11B	2412	10000	25000	1000	3000	4.2	-55.160	<-15.8	PASS
11B	2437	30	10000	1000	3000	5.96	-25.900	<-14.04	PASS
11B	2437	10000	25000	1000	3000	5.96	-55.180	<-14.04	PASS
11B	2462	30	10000	1000	3000	4.56	-29.220	<-15.44	PASS
11B	2462	10000	25000	1000	3000	4.56	-55.260	<-15.44	PASS
11G	2412	30	10000	1000	3000	-4.97	-43.380	<-24.97	PASS
11G	2412	10000	25000	1000	3000	-4.97	-54.570	<-24.97	PASS
11G	2437	30	10000	1000	3000	-3.24	-34.920	<-23.24	PASS
11G	2437	10000	25000	1000	3000	-3.24	-55.280	<-23.24	PASS
11G	2462	30	10000	1000	3000	-4.81	-36.870	<-24.81	PASS
11G	2462	10000	25000	1000	3000	-4.81	-54.880	<-24.81	PASS
11N20SISO	2412	30	10000	1000	3000	-5	-41.290	<-25	PASS
11N20SISO	2412	10000	25000	1000	3000	-5	-55.410	<-25	PASS
11N20SISO	2437	30	10000	1000	3000	-3.9	-35.410	<-23.9	PASS
11N20SISO	2437	10000	25000	1000	3000	-3.9	-55.010	<-23.9	PASS
11N20SISO	2462	30	10000	1000	3000	-5.05	-38.040	<-25.05	PASS
11N20SISO	2462	10000	25000	1000	3000	-5.05	-55.340	<-25.05	PASS
11N40SISO	2422	30	10000	1000	3000	-7.74	-42.390	<-27.74	PASS
11N40SISO	2422	10000	25000	1000	3000	-7.74	-55.030	<-27.74	PASS
11N40SISO	2437	30	10000	1000	3000	-6.9	-40.660	<-26.9	PASS
11N40SISO	2437	10000	25000	1000	3000	-6.9	-54.870	<-26.9	PASS
11N40SISO	2452	30	10000	1000	3000	-6.73	-38.890	<-26.73	PASS
11N40SISO	2452	10000	25000	1000	3000	-6.73	-54.990	<-26.73	PASS



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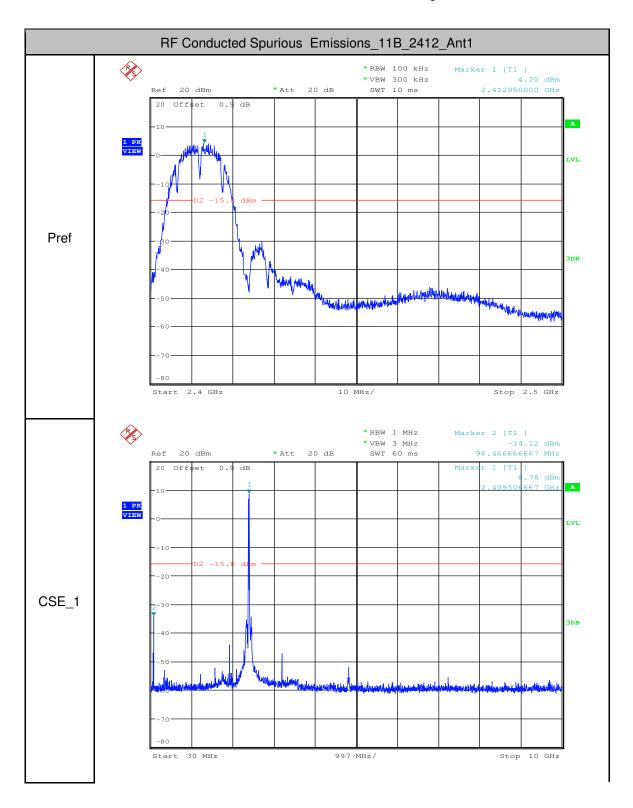
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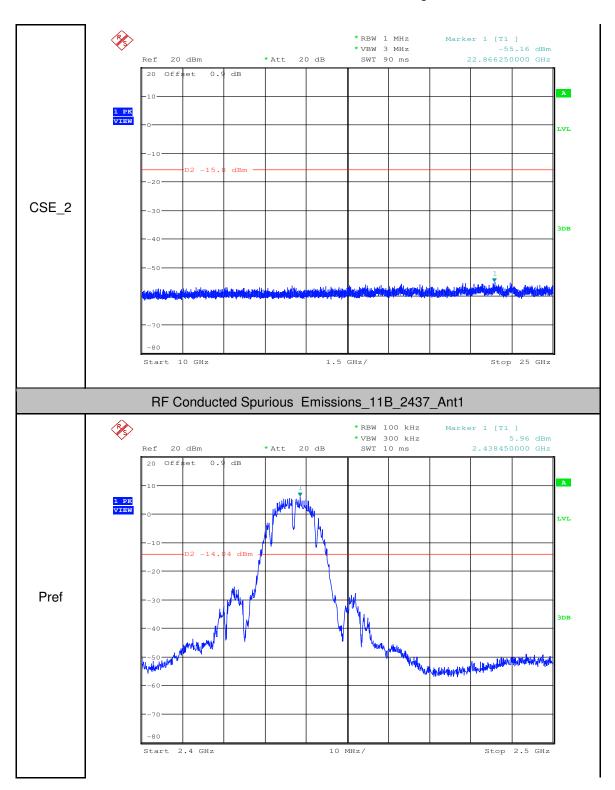
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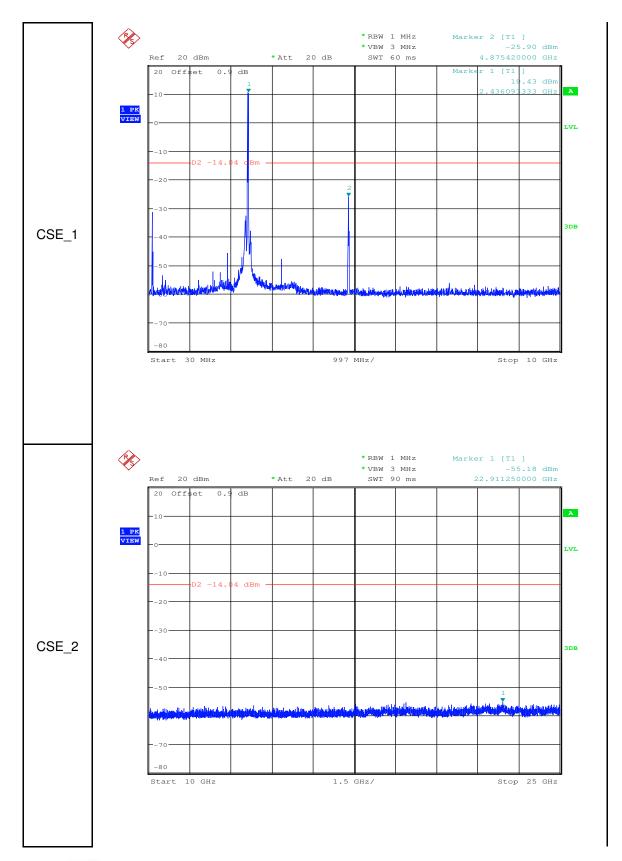
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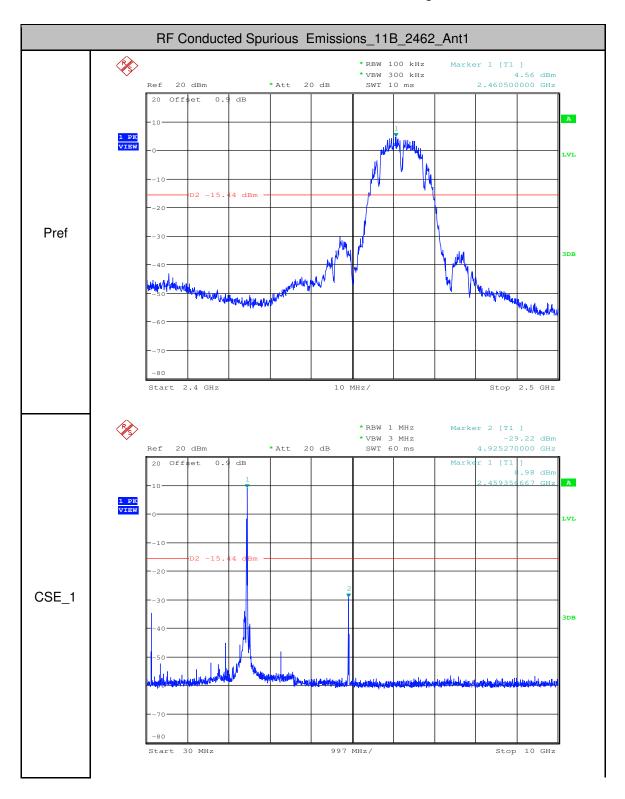
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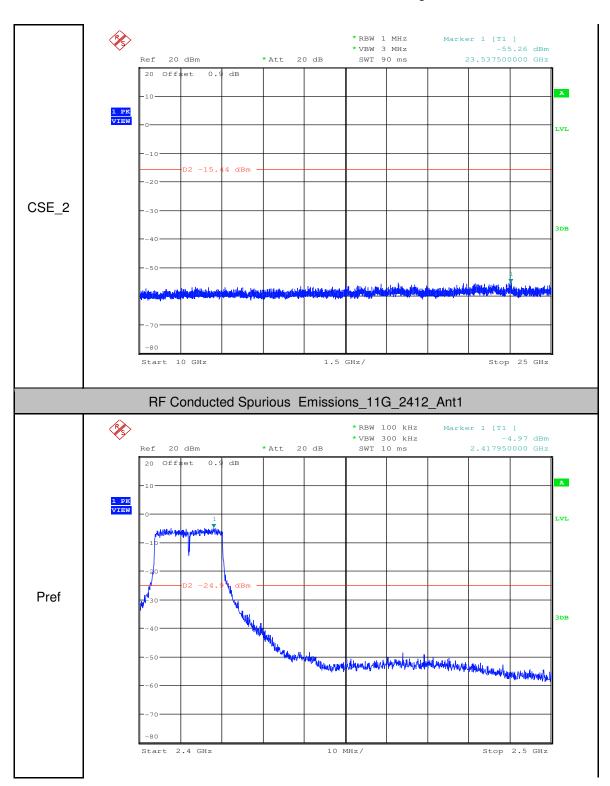
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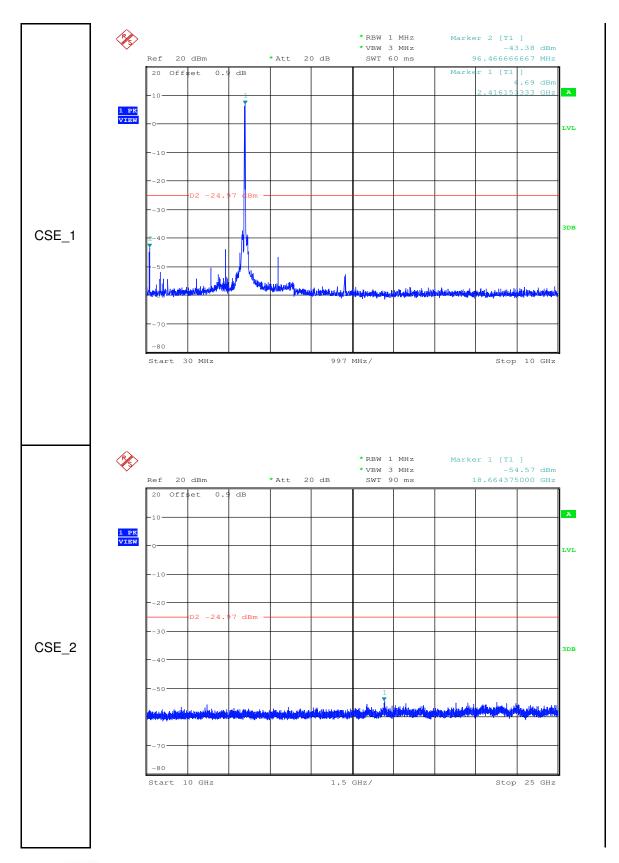
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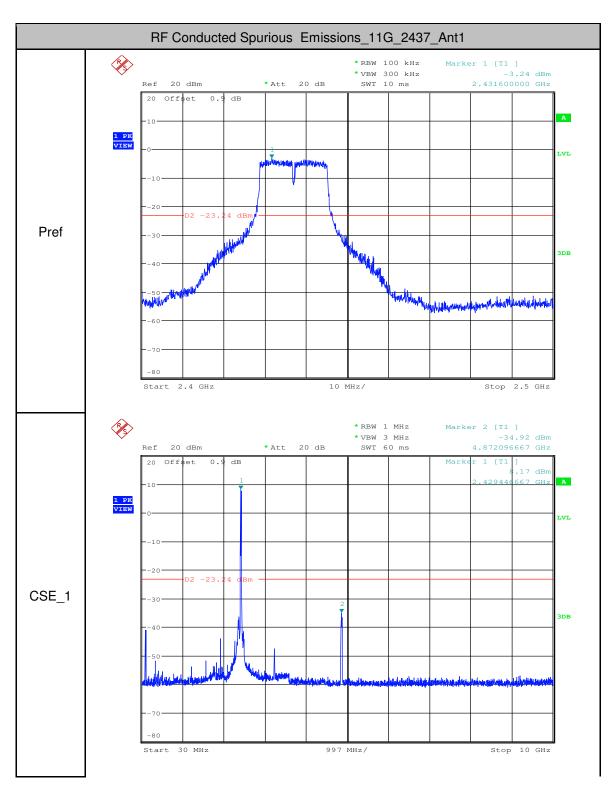
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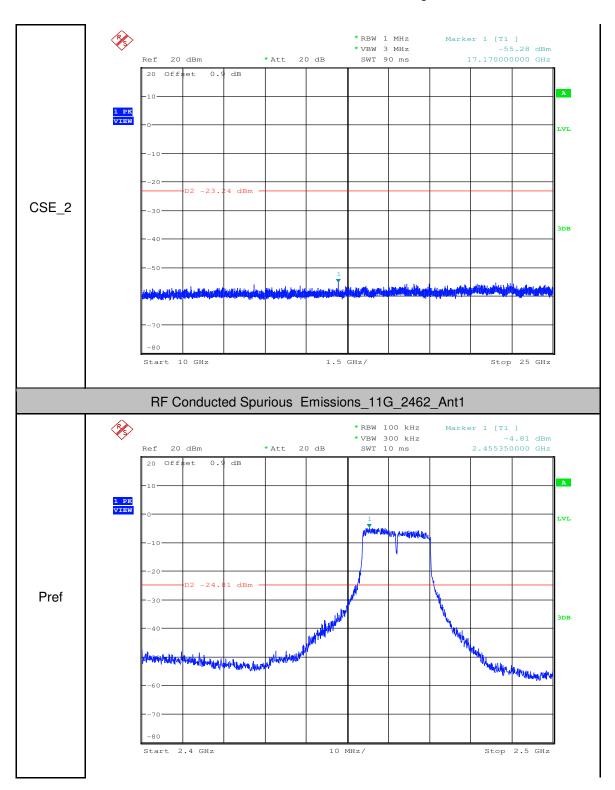
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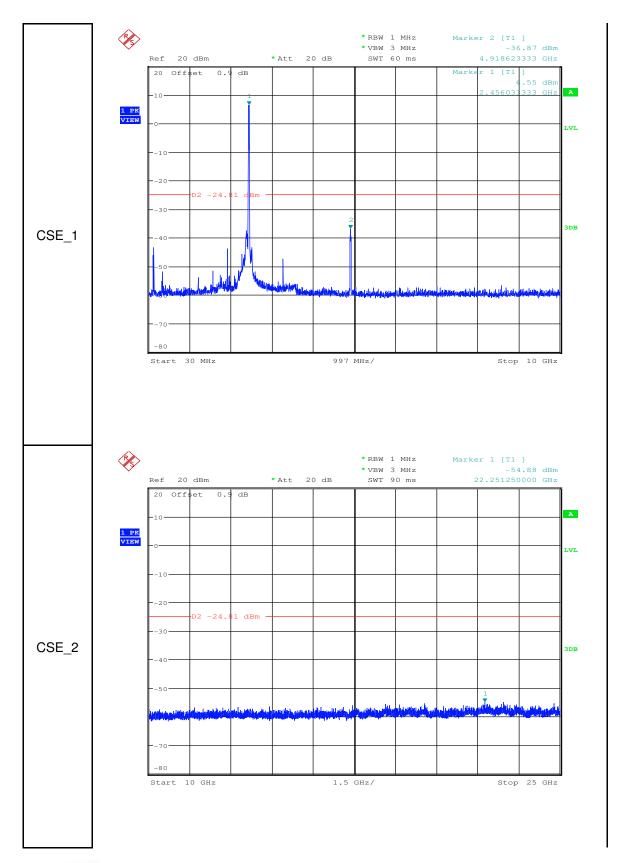
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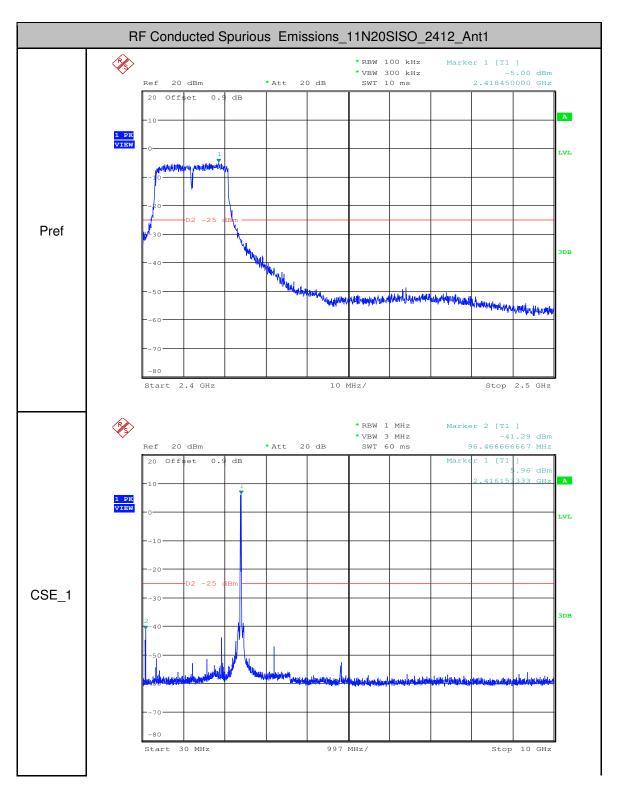
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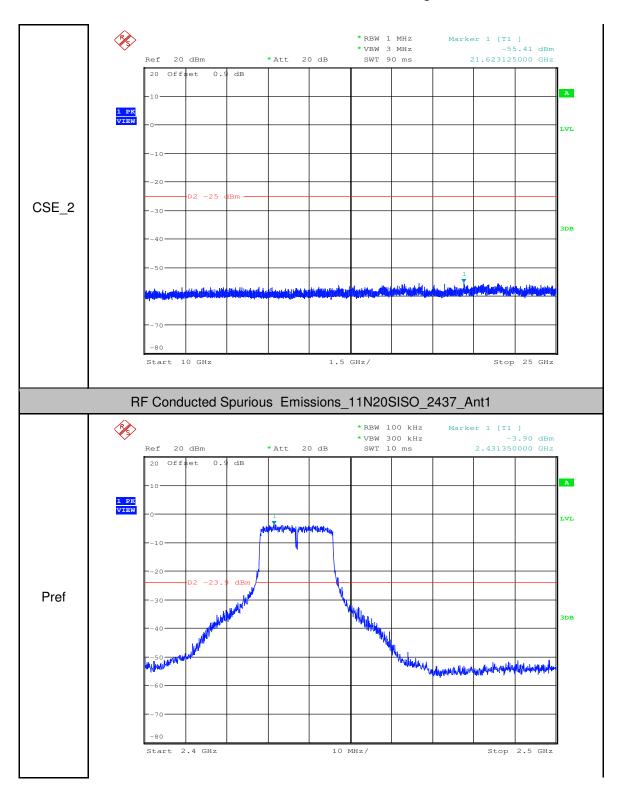
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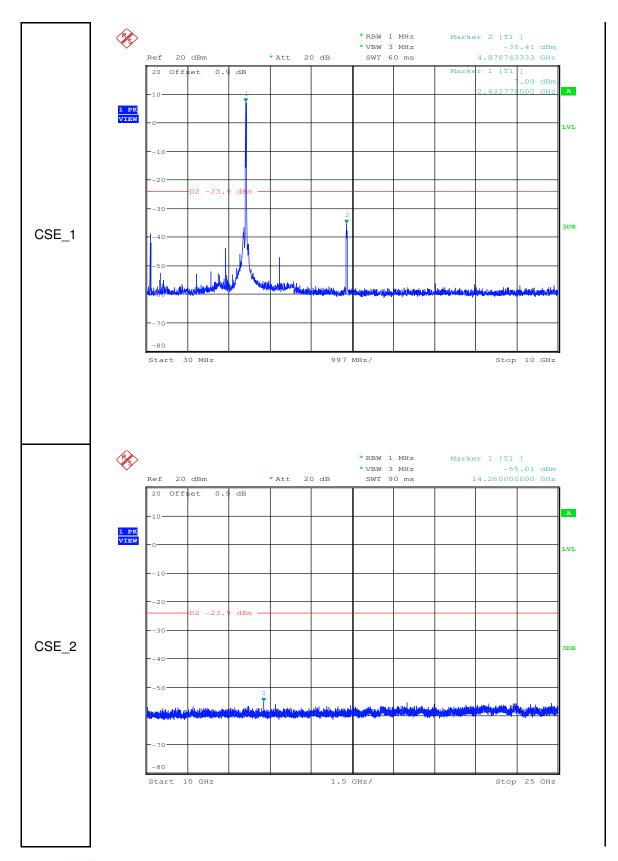
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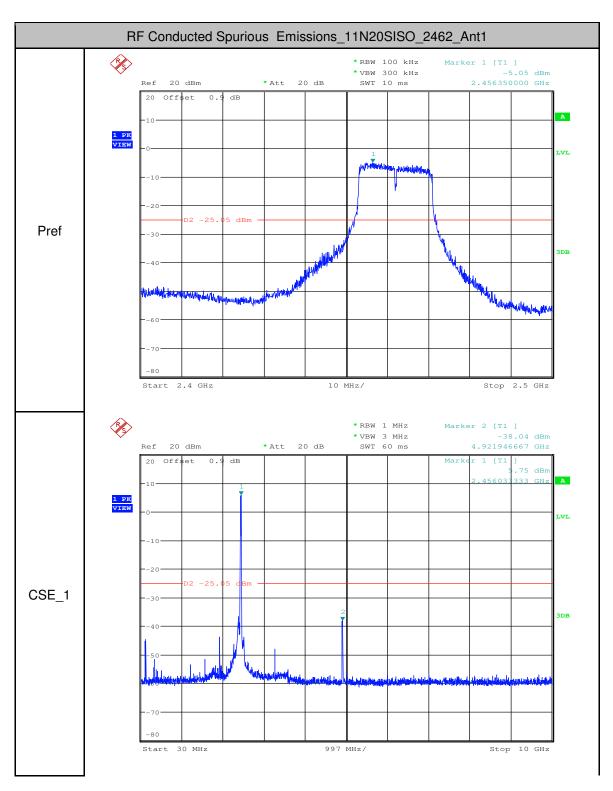
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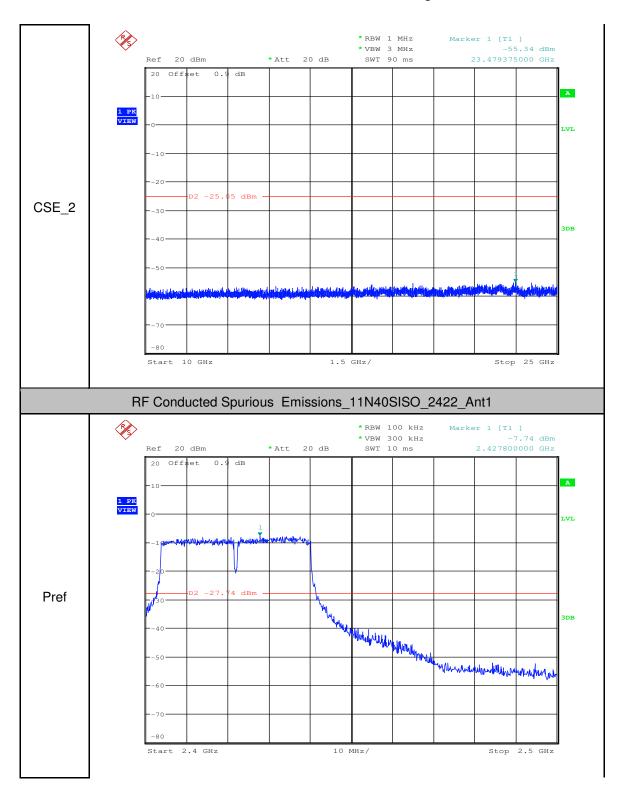
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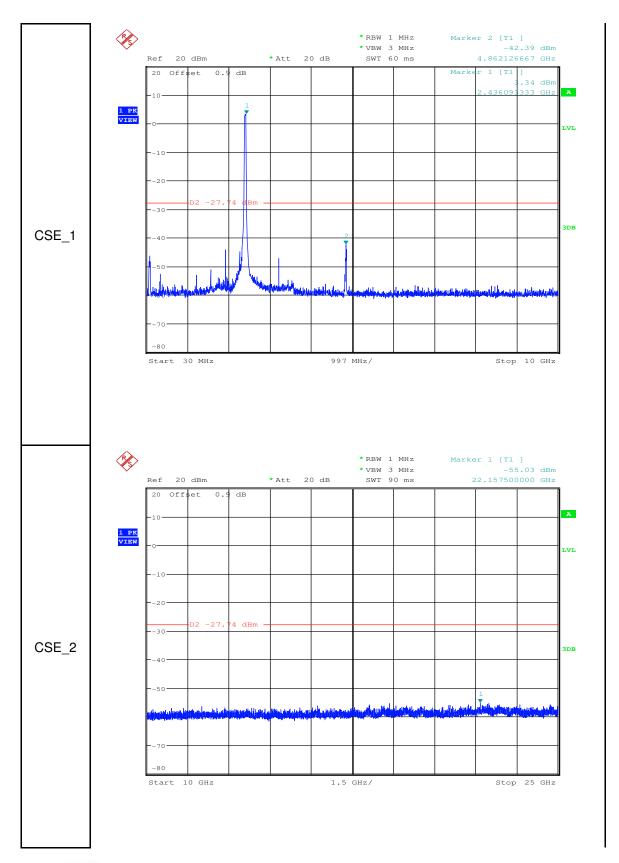
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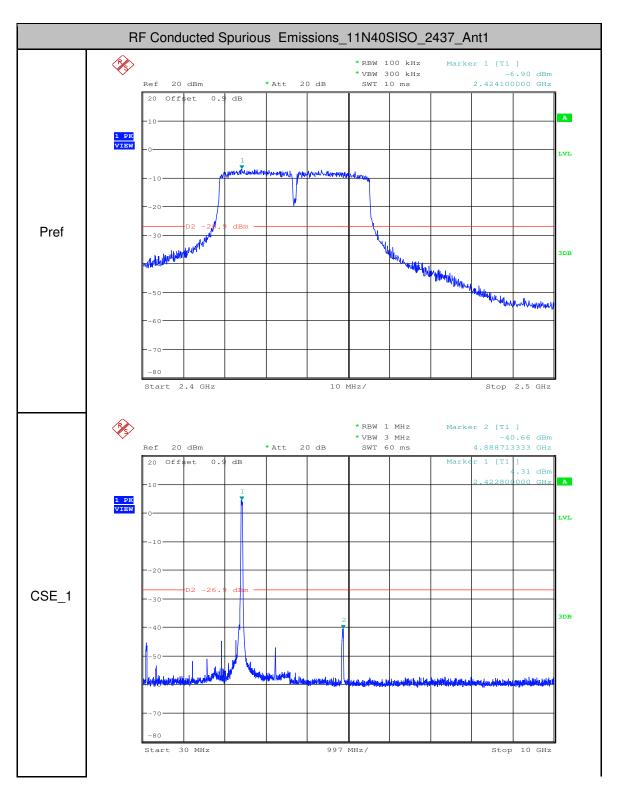
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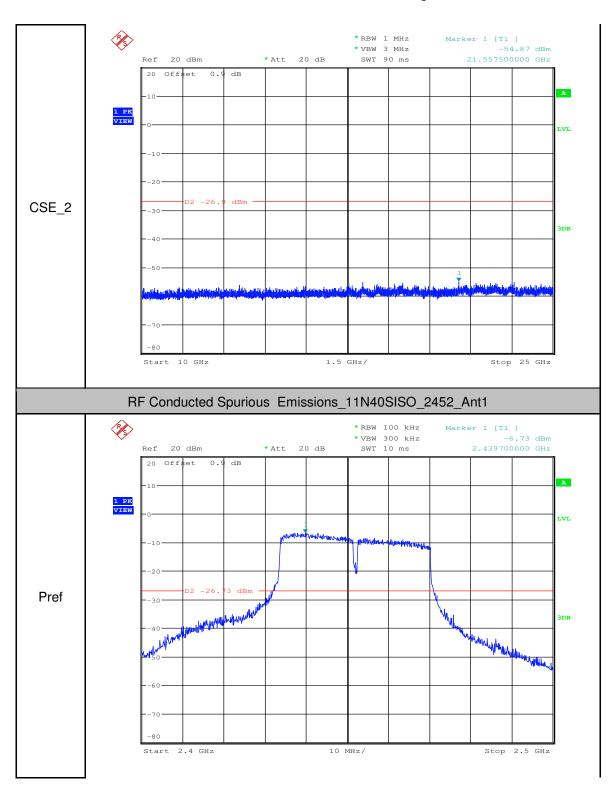
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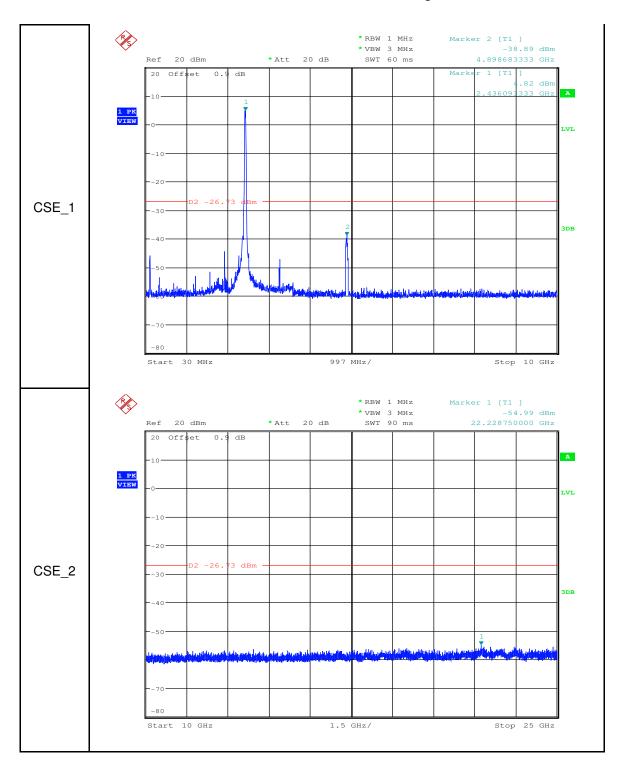
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