

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

Telephone: +86 (0) 755 2601 2053 Report No.: SZEM171101195502

Fax: +86 (0) 755 2671 0594 Page: 1 of 132

TEST REPORT

Application No.: SZEM1711011955CR **Applicant:** VOXX Accessories Corp.

Address of Applicant: 3502 Woodview Trace, Suite 220, Indianapolis IN 46268, USA

Manufacturer: Shenzhen Gospell Smarthome Electronic Co., Ltd

Address of Manufacturer: East of 01st-04th Floor, Block A, No.1 Industrial park, Fenghuanggang,

South of No.1 Baotian Road, Xixiang street, Bao'an District, Shenzhen,

Guangdong, China

Factory: Shenzhen Gospell Smarthome Electronic Co., Ltd

Address of Factory: East of 01st-04th Floor, Block A, No.1 Industrial park, Fenghuanggang,

South of No.1 Baotian Road, Xixiang street, Bao'an District, Shenzhen,

Guangdong, China

Equipment Under Test (EUT):

EUT Name: SMART WI-FI BABY MONITOR

Model No.: PNMAL2
FCC ID: VIXPNMAL2
Trade mark: Project Nursery

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

Date of Receipt: 2017-11-28

Date of Test: 2017-12-01 to 2017-12-06

Date of Issue: 2017-12-13

Test Result: Pass*

SERVICES CO.

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Jack Zhang EMC Laboratory Manager

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

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



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	Revision Record						
Version Chapter Date Modifier Re							
01		2017-12-13		Original			

Authorized for issue by:		
	Gray Gao	
	Gray Gao /Project Engineer	-
	EvicFu	
	Eric Fu /Reviewer	_



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2 Test Summary

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

Radio Spectrum Matter Part						
Item	Standard	Method	Requirement	Result		
Conducted Emissions at AC Power Line (150kHz- 30MHz)	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.2	47 CFR Part 15, Subpart C 15.207	Pass		
Minimum 6dB Bandwidth	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.8.1	47 CFR Part 15, Subpart C 15.247a(2)	Pass		
Conducted Peak Output Power	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.9.1	47 CFR Part 15, Subpart C 15.247(b)(3)	Pass		
Power Spectrum Density	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.10.2	47 CFR Part 15, Subpart C 15.247(e)	Pass		
Conducted Band Edges Measurement	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.13.3.2	47 CFR Part 15, Subpart C 15.247(d)	Pass		
Conducted Spurious Emissions	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.11	47 CFR Part 15, Subpart C 15.247(d)	Pass		
Radiated Emissions which fall in the restricted bands	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.10.5	47 CFR Part 15, Subpart C 15.209 & 15.247(d)	Pass		
Radiated Spurious Emissions	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.4,6.5,6.6	47 CFR Part 15, Subpart C 15.209 & 15.247(d)	Pass		



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4 General Information

4.1 Details of E.U.T.

Power supply:	For camera:
	DC input: 5V 1A
	For adaptor
	Input: 100-240V 50/60Hz
	DC output: 5V 1A
Cable:	DC cable: 310cm shielded.
Type of Modulation:	IEEE for 802.11b: DSSS (CCK, DQPSK, DBPSK)
	IEEE for 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK)
	IEEE for 802.11n (HT20 and HT40): OFDM (64QAM, 16QAM, QPSK, BPSK)
Operating Frequency:	IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz
	IEEE 802.11n(HT40): 2422MHz to 2452MHz
Channel Number:	IEEE 802.11b/g, IEEE 802.11n(HT20): 11 Channels
	IEEE 802.11n(HT40): 7 Channels
Channels Step:	Channels with 5MHz step
Antenna Type:	Dipole
Antenna Gain:	2.0dBi

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 ⁻⁸
2	Duty cycle	0.37%
3	Occupied Bandwidth	3%
4	RF conducted power	0.75dB
5	RF power density	2.84dB
6	Conducted Spurious emissions	0.75dB
7	DE Dadiated naver	4.5dB (below 1GHz)
/	RF Radiated power	4.8dB (above 1GHz)
0	Dedicted Courieus emission test	4.5dB (Below 1GHz)
8	Radiated Spurious emission test	4.8dB (Above 1GHz)
9	Temperature test	1℃
10	Humidity test	3%
11	Supply voltages	1.5%
12	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 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-823, R-4188, T-1153 and C-2383 respectively.

FCC –Designation Number: CN1178

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

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

Industry Canada (IC)

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

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None



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5 Equipment List

Conducted Emissions at AC Power Line (150kHz-30MHz)						
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date	
Shielding Room	ZhongYu Electron	GB-88	SEM001-06	2017-05-10	2018-05-09	
Measurement Software	AUDIX	e3 V5.4.1221d	N/A	N/A	N/A	
Coaxial Cable	SGS	N/A	SEM024-01	2017-07-13	2018-07-12	
LISN	Rohde & Schwarz	ENV216	SEM007-01	2017-09-27	2018-09-26	
LISN	ETS-LINDGREN	3816/2	SEM007-02	2017-04-14	2018-04-13	
EMI Test Receiver	Rohde & Schwarz	ESCI	SEM004-02	2017-04-14	2018-04-13	

Minimum 6dB Bandwidth						
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date	
DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2017-09-27	2018-09-26	
Spectrum Analyzer	Rohde & Schwarz	FSP	SEM004-06	2017-09-27	2018-09-26	
Measurement Software	JS Tonscend	JS1120-2 BT/WIFI V2.	N/A	N/A	N/A	
Coaxial Cable	SGS	N/A	SEM031-02	2017-07-13	2018-07-12	
Attenuator	Weinschel Associates	WA41	SEM021-09	N/A	N/A	
Signal Generator	KEYSIGHT	N5173B	SEM006-05	2017-09-27	2018-09-26	
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2017-09-27	2018-09-26	

Conducted Peak Output Power						
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date	
DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2017-09-27	2018-09-26	
Spectrum Analyzer	Rohde & Schwarz	FSP	SEM004-06	2017-09-27	2018-09-26	
Measurement Software	JS Tonscend	JS1120-2 BT/WIFI V2.	N/A	N/A	N/A	
Coaxial Cable	SGS	N/A	SEM031-02	2017-07-13	2018-07-12	
Attenuator	Weinschel Associates	WA41	SEM021-09	N/A	N/A	
Signal Generator	KEYSIGHT	N5173B	SEM006-05	2017-09-27	2018-09-26	
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2017-09-27	2018-09-26	



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Power Spectrum Density						
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date	
DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2017-09-27	2018-09-26	
Spectrum Analyzer	Rohde & Schwarz	FSP	SEM004-06	2017-09-27	2018-09-26	
Measurement Software	JS Tonscend	JS1120-2 BT/WIFI V2.	N/A	N/A	N/A	
Coaxial Cable	SGS	N/A	SEM031-02	2017-07-13	2018-07-12	
Attenuator	Weinschel Associates	WA41	SEM021-09	N/A	N/A	
Signal Generator	KEYSIGHT	N5173B	SEM006-05	2017-09-27	2018-09-26	
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2017-09-27	2018-09-26	

Conducted Band Edges Measurement											
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date						
DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2017-09-27	2018-09-26						
Spectrum Analyzer	Rohde & Schwarz	FSP	SEM004-06	2017-09-27	2018-09-26						
Measurement Software	JS Tonscend	JS1120-2 BT/WIFI V2.	N/A	N/A	N/A						
Coaxial Cable	SGS	N/A	SEM031-02	2017-07-13	2018-07-12						
Attenuator	Weinschel Associates	WA41	SEM021-09	N/A	N/A						
Signal Generator	KEYSIGHT	N5173B	SEM006-05	2017-09-27	2018-09-26						
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2017-09-27	2018-09-26						

Conducted Spurious Emissions											
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date						
DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2017-09-27	2018-09-26						
Spectrum Analyzer	Rohde & Schwarz	FSP	SEM004-06	2017-09-27	2018-09-26						
Measurement Software	JS Tonscend	JS1120-2 BT/WIFI V2.	N/A	N/A	N/A						
Coaxial Cable	SGS	N/A	SEM031-02	2017-07-13	2018-07-12						
Attenuator	Weinschel Associates	WA41	SEM021-09	N/A	N/A						
Signal Generator KEYSIGHT		N5173B	SEM006-05	2017-09-27	2018-09-26						
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2017-09-27	2018-09-26						



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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	2017-05-02	2020-05-01				
Measurement Software	AUDIX	e3 V8.2014-6- 27	N/A	N/A	N/A				
Coaxial Cable	SGS	N/A	SEM026-01	2017-07-13	2018-07-12				
Spectrum Analyzer	Rohde & Schwarz	FSU43	SEM004-08	2017-04-14	2018-04-13				
BiConiLog Antenna (26-3000MHz)	ETS-Lindgren	3142C	SEM003-01	2017-06-27	2020-06-26				
Horn Antenna (1-18GHz)	Rohde & Schwarz	HF907	SEM003-07	2015-06-14	2018-06-13				
Horn Antenna (15GHz-40GHz)	Schwarzbeck	BBHA 9170	SEM003-15	2017-10-17	2020-10-16				
Pre-amplifier (0.1-1300MHz)	HP	8447D	SEM005-02	2017-09-27	2018-09-26				
Low Noise Amplifier (100MHz-18GHz)	Black Diamond Series	BDLNA-0118- 352810	SEM005-05	2017-09-27	2018-09-27				
Pre-amplifier (18-26GHz)	Rohde & Schwarz	CH14-H052	SEM005-17	2017-12-04	2018-12-03				
Pre-amplifier (26GHz-40GHz)	Compliance Directions Systems Inc.	PAP-2640-50	SEM005-08	2017-04-14	2018-04-13				
DC Power Supply	Zhao Xin	RXN-305D	SEM011-02	2017-09-27	2018-09-26				
Active Loop Antenna	ETS-Lindgren	6502	SEM003-08	2017-08-22	2020-08-21				
Band filter	N/A	N/A	SEM023-01	N/A	N/A				

	RE in Chamber										
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (yyyy-mm- dd)	Cal. Due date (yyyy-mm- dd)					
1	3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEM001-01	2017-08-05	2020-08-04					
2	MXE EMI Receiver (20Hz-8.4GHz)	Agilent Technologies	N9038A	SEM004-05	2017-09-27	2018-09-26					
3	BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEM003-01	2017-06-27	2020-06-26					
4	Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEM005-01	2017-04-14	2018-04-13					
5	Measurement Software	AUDIX	e3 V8.2014-6- 27	N/A	N/A	N/A					
6	Coaxial Cable	SGS	N/A	SEM025-01	2017-07-13	2018-07-12					



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Radiated Spurious Emissions									
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date				
3m Semi-Anechoic Chamber	AUDIX	N/A	N/A SEM001-02		2020-05-01				
Measurement Software	AUDIX	e3 V8.2014-6- 27	N/A	N/A	N/A				
Coaxial Cable	SGS	N/A	SEM026-01	2017-07-13	2018-07-12				
Spectrum Analyzer	Rohde & Schwarz	FSU43	SEM004-08	2017-04-14	2018-04-13				
BiConiLog Antenna (26-3000MHz)	ETS-Lindgren	3142C	SEM003-01	2017-06-27	2020-06-26				
Horn Antenna (1-18GHz)	Rohde & Schwarz	HF907	SEM003-07	2015-06-14	2018-06-13				
Horn Antenna (15GHz-40GHz)	Schwarzbeck	BBHA 9170	SEM003-15	2017-10-17	2020-10-16				
Pre-amplifier (0.1-1300MHz)	HP	8447D	SEM005-02	2017-09-27	2018-09-26				
Low Noise Amplifier (100MHz-18GHz)	Black Diamond Series	BDLNA-0118- 352810	SEM005-05	2017-09-27	2018-09-27				
Pre-amplifier (18-26GHz)	Rohde & Schwarz	CH14-H052	SEM005-17	2017-12-04	2018-12-03				
Pre-amplifier Compliance Directions System		PAP-2640-50	SEM005-08	2017-04-14	2018-04-13				
DC Power Supply	Zhao Xin	RXN-305D	SEM011-02	2017-09-27	2018-09-26				
Active Loop Antenna	ETS-Lindgren	6502	SEM003-08	2017-08-22	2020-08-21				
Band filter	N/A	N/A	SEM023-01	N/A	N/A				

General used equipment										
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date					
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-03	2017-09-29	2018-09-28					
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-04	2017-09-29	2018-09-28					
Humidity/ Temperature Indicator	Mingle	N/A	SEM002-08	2017-09-29	2018-09-28					
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2017-04-18	2018-04-17					



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6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

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

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 2.0dBi.



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7 Radio Spectrum Matter Test Results

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

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

Limit:

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



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7.1.1 E.U.T. Operation

Operating Environment:

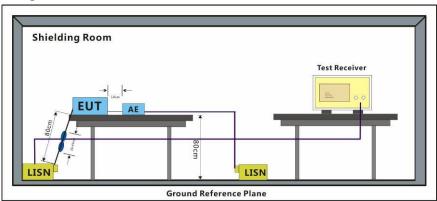
Temperature: 19.2 °C Humidity: 46 % RH Atmospheric Pressure: 1005 mbar

Test mode b:Charge + TX mode Keep the EUT in charging and 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



7.1.3 Measurement Procedure and Data

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

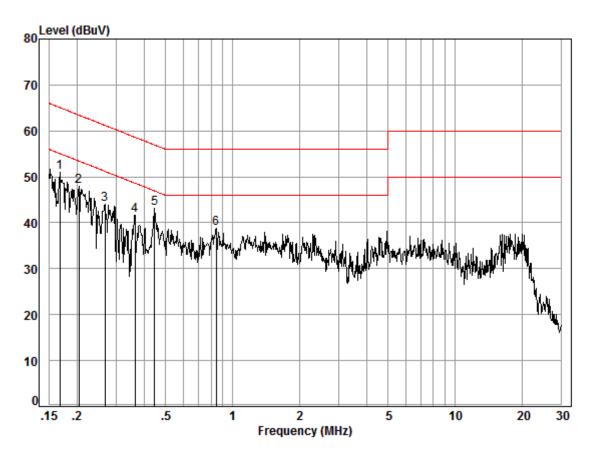
Remark: LISN=Read Level+ Cable Loss+ LISN Factor



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Mode:b; Line:Live Line



Site : Shielding Room

Condition: Line Job No. : 11955CR

Test mode: b

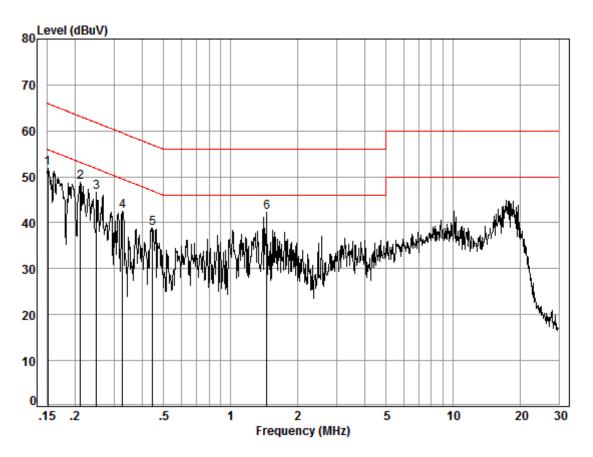
		Cable	LISN	Read		Limit	0ver	
	Freq	Loss	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.17	0.02	9.52	41.49	51.03	55.08	-4.05	Peak
2	0.20	0.02	9.50	38.33	47.85	53.45	-5.60	Peak
3	0.27	0.01	9.51	34.52	44.04	51.20	-7.16	Peak
4	0.37	0.01	9.50	32.07	41.58	48.61	-7.03	Peak
5	0.45	0.01	9.49	33.59	43.09	46.93	-3.84	Peak
6	0.84	0.02	9.50	29.31	38.83	46.00	-7.17	Peak



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Mode:b; Line:Neutral Line



Site : Shielding Room

Condition: Neutral Job No. : 11955CR

Test mode: b

		Cable	LISN	Read		Limit	0ver	
	Freq	Loss	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.15	0.02	9.58	42.32	51.92	55.96	-4.04	Peak
2	0.21	0.02	9.57	39.24	48.83	53.14	-4.31	Peak
3	0.25	0.01	9.58	37.12	46.71	51.78	-5.07	Peak
4	0.33	0.01	9.58	32.98	42.57	49.53	-6.96	Peak
5	0.45	0.01	9.59	29.30	38.90	46.93	-8.03	Peak
6	1.46	0.02	9.63	32.62	42.27	46.00	-3.73	Peak



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7.2 Minimum 6dB Bandwidth

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

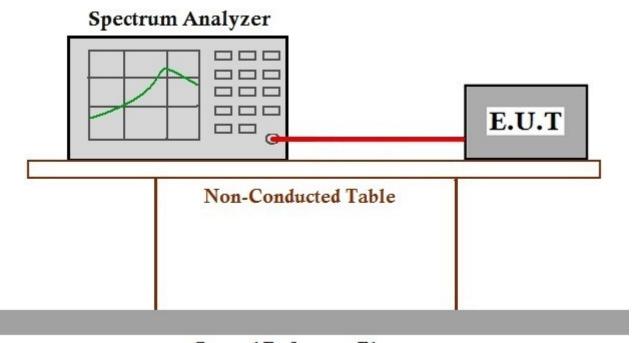
Limit: ≥500 kHz

7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 24.8 °C Humidity: 47.2 % RH Atmospheric Pressure: 1005 mbar

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 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:

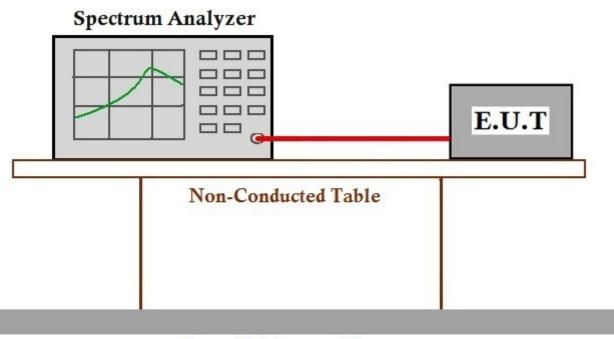
Frequency range(MHz)	Output power of the intentional radiator(watt)
	1 for ≥50 hopping channels
902-928	0.25 for 25≤ hopping channels <50
	1 for digital modulation
	1 for ≥75 non-overlapping hopping channels
2400-2483.5	0.125 for all other frequency hopping systems
	1 for digital modulation
5725-5850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

7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 24.8 °C Humidity: 47.2 % RH Atmospheric Pressure: 1005 mbar

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 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

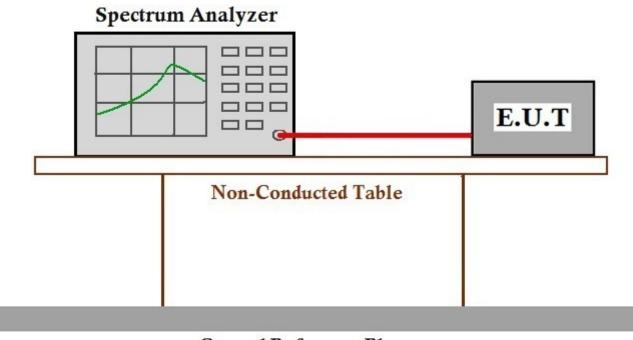
transmission

7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 24.8 °C Humidity: 47.2 % RH Atmospheric Pressure: 1005 mbar

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 Band Edges Measurement

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

Limit:

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

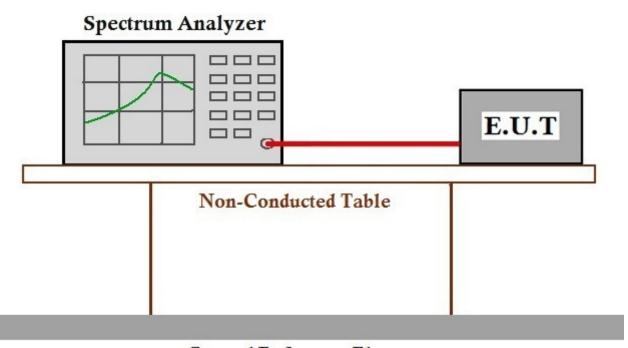
§15.209(a) (see §15.205(c)

7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 24.8 °C Humidity: 47.2 % RH Atmospheric Pressure: 1005 mbar

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 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

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

§15.205(a), must also comply with the radiated emission limits specified in

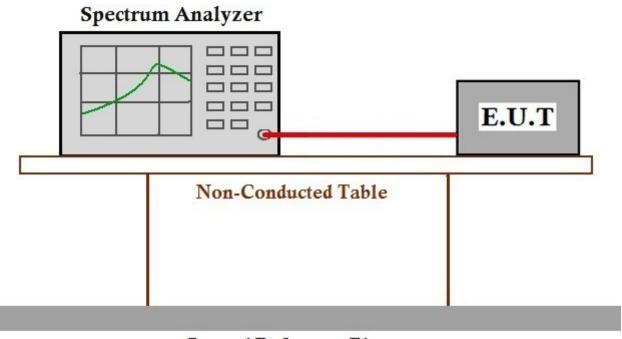
§15.209(a) (see §15.205(c)

7.6.1 E.U.T. Operation

Operating Environment:

Temperature: 24.8 °C Humidity: 47.2 % RH Atmospheric Pressure: 1005 mbar

7.6.2 Test Setup Diagram



Ground Reference Plane

7.6.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.247

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7.7 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.



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7.7.1 E.U.T. Operation

Operating Environment:

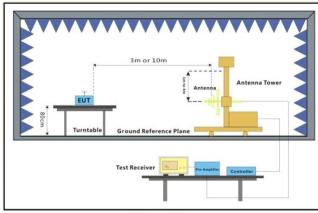
Temperature: 24.9 °C Humidity: 45.2 % RH Atmospheric Pressure: 1020 mbar

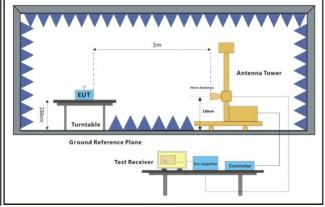
Test mode b:Charge + TX mode Keep the EUT in charging and continuously transmitting

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





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.

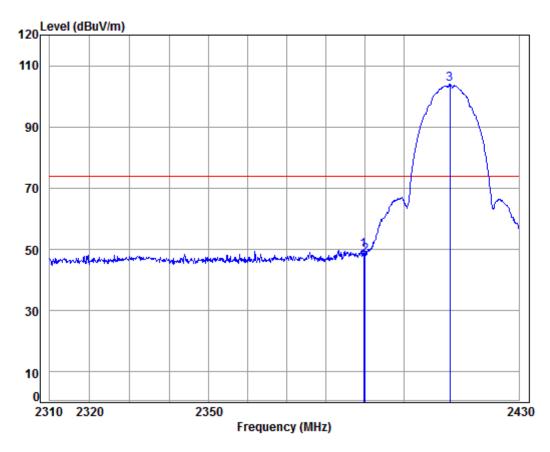
Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor



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



Condition: 3m HORIZONTAL Job No : 11955CR/11956CR Mode : 2412 Band edge

: 11B

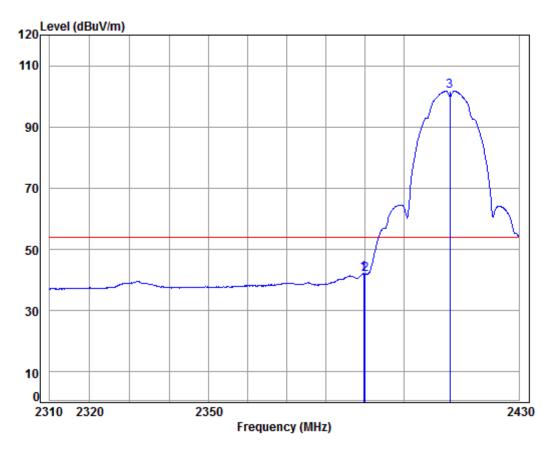
	Freq						Limit Line		Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1									-
2	2390.000	5.47	29.08	37.66	51.09	47.98	74.00	-26.02	peak
3 p	p 2412.000	5.50	29.14	37.65	106.93	103.92	74.00	29.92	peak



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



Condition: 3m HORIZONTAL Job No : 11955CR/11956CR Mode : 2412 Band edge

: 11B

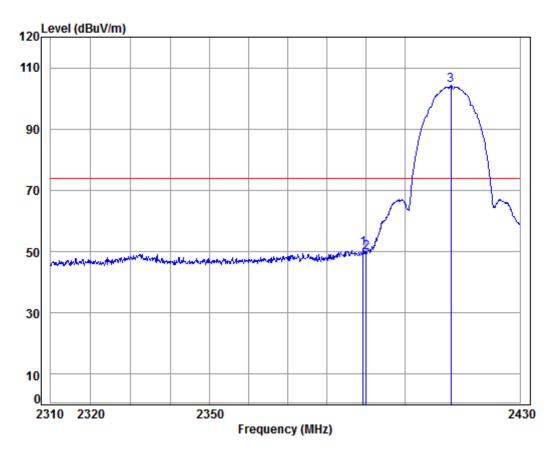
	Freq						Limit Line		Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
	2389.605								_
pp	2390.000 2412.000								Average Average



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



Condition: 3m VERTICAL

Job No : 11955CR/11956CR Mode : 2412 Band edge

: 11B

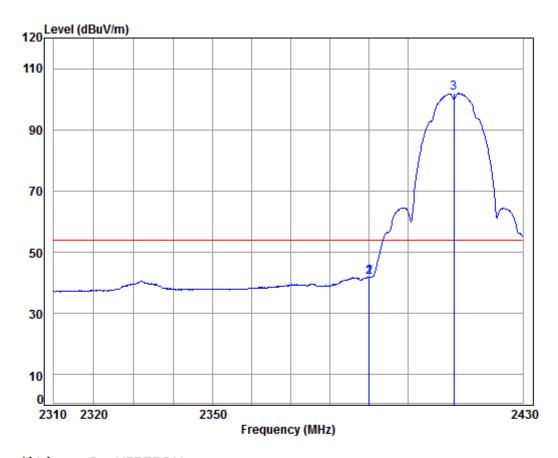
	Freq						Limit Line		Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
	2389.242 2390.000						74.00 74.00		
pp	2412.000	5.50	29.14	37.65	107.24	104.23	74.00	30.23	Peak



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



Condition: 3m VERTICAL Job No : 11955CR/11956CR

Mode : 2412 Band edge

: 11B

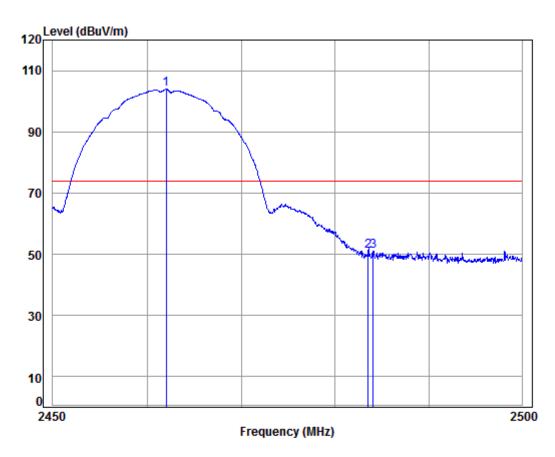
		Freq						Limit Line		Remark
	-	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1		2389.968	5.47	29.08	37.66	45.04	41.93	54.00	-12.07	Average
2		2390.000	5.47	29.08	37.66	45.04	41.93	54.00	-12.07	Average
3	pp	2412.000	5.50	29.14	37.65	104.88	101.87	54.00	47.87	Average



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



Condition: 3m HORIZONTAL Job No : 11955CR/11956CR Mode : 2462 Band edge

: 11B

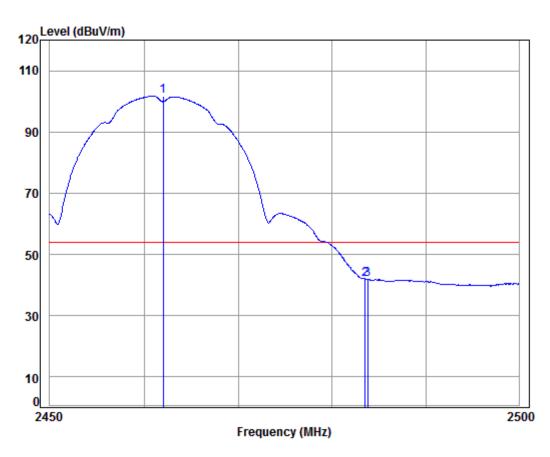
	Freq				Read Level				
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp	2462.000	5.57	29.29	37.65	106.78	103.99	74.00	29.99	peak
2	2483.500	5.60	29.35	37.65	53.77	51.07	74.00	-22.93	peak
3	2484.041	5.60	29.35	37.65	53.67	50.97	74.00	-23.03	peak



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



Condition: 3m HORIZONTAL Job No : 11955CR/11956CR Mode : 2462 Band edge

: 11B

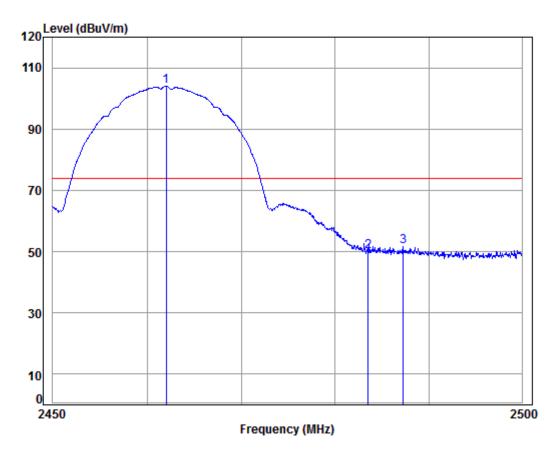
	Freq						Limit Line		
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp	2462.000	5.57	29.29	37.65	104.50	101.71	54.00	47.71	Average
2	2483.500	5.60	29.35	37.65	44.67	41.97	54.00	-12.03	Average
3	2483.790	5.60	29.35	37.65	44.61	41.91	54.00	-12.09	Average



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



Condition: 3m VERTICAL
Job No : 11955CR/11956CR
Mode : 2462 Band edge

: 11B

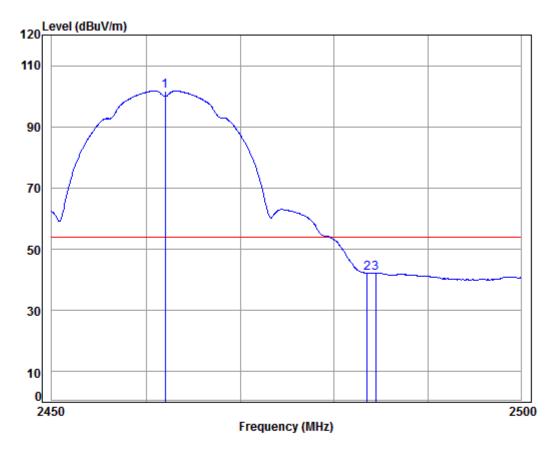
Freq		Ant Factor						Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
pp 2462.000 2483.500 2487.254	5.60	29.29 29.35 29.36	37.65	52.69	49.99	74.00	-24.01	Peak



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



Condition: 3m VERTICAL
Job No : 11955CR/11956CR
Mode : 2462 Band edge

: 11B

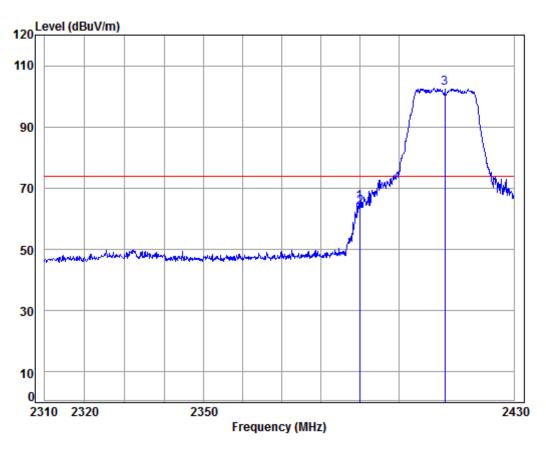
		Freq				Read Level				Remark
	-	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
	рр	2462.000	5.57	29.29	37.65	104.56	101.77	54.00	47.77	Average
		2483.500	5.60	29.35	37.65	44.92	42.22	54.00	-11.78	Average
;		2484.442	5.60	29.36	37.65	44.97	42.28	54.00	-11.72	Average



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



Condition: 3m HORIZONTAL Job No : 11955CR/11956CR Mode : 2412 Band edge

: 11G

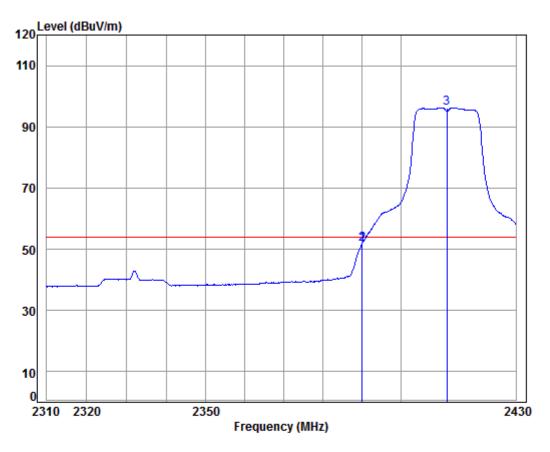
	Freq						Limit Line		Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 2 3 pp	2389.847 2390.000 2412.000	5.47	29.08	37.66	66.74	63.63	74.00	-10.37	peak



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



Condition: 3m HORIZONTAL Job No : 11955CR/11956CR Mode : 2412 Band edge

: 11G

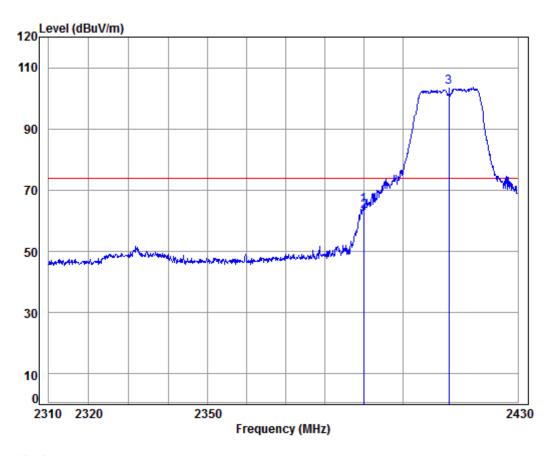
	Freq						Limit Line		Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 2 3	2389.968 2390.000 pp 2412.000	5.47	29.08	37.66	54.82	51.71	54.00	-2.29	Average



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



Condition: 3m VERTICAL

Job No : 11955CR/11956CR Mode : 2412 Band edge

: 11G

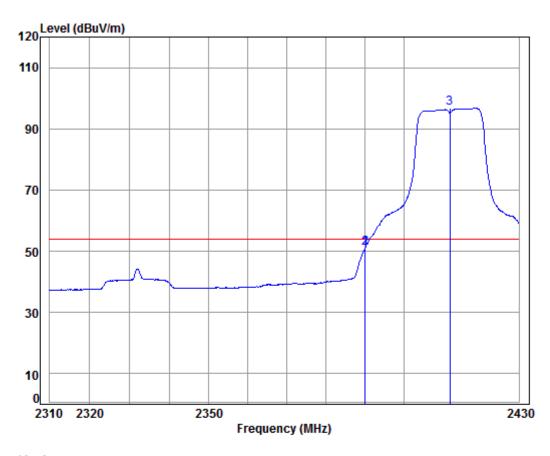
	Freq						Limit Line		Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2389.847	5.47	29.08	37.66	68.02	64.91	74.00	-9.09	Peak
2	2390.000	5.47	29.08	37.66	66.14	63.03	74.00	-10.97	Peak
3 рр	2412.000	5.50	29.14	37.65	106.53	103.52	74.00	29.52	Peak



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



Condition: 3m VERTICAL : 11955CR/11956CR Job No Mode : 2412 Band edge

: 11G

1

2

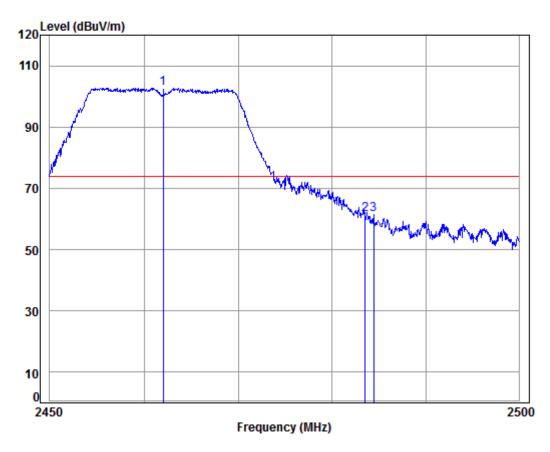
Ant Preamp Cable Read Limit 0ver Loss Factor Factor Line Limit Remark Level Level MHz dBuV dBuV/m dBuV/m dB dB/m dB dB 2389.968 29.08 37.66 54.12 51.01 54.00 -2.99 Average 5.47 2390.000 5.47 29.08 37.66 54.12 51.01 54.00 -2.99 Average 5.50 29.14 37.65 99.72 96.71 54.00 42.71 Average 3 pp 2412.000



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



Condition: 3m HORIZONTAL
Job No : 11955CR/11956CR
Mode : 2462 Band edge

: 11G

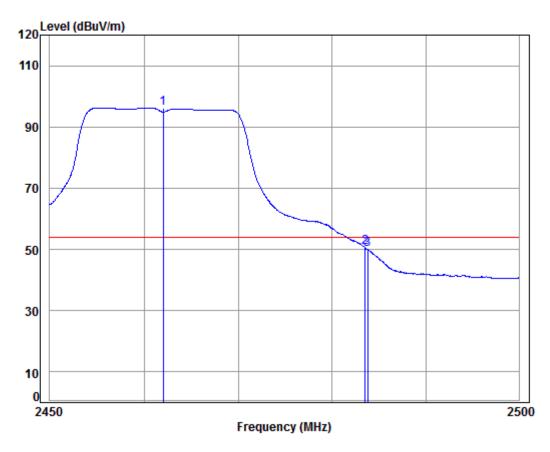
Freq		Ant Factor						
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
pp 2462.000 2483.500 2484.442	5.60	29.35	37.65	64.28	61.58	74.00	-12.42	peak



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



Condition: 3m HORIZONTAL Job No : 11955CR/11956CR Mode : 2462 Band edge

: 11G

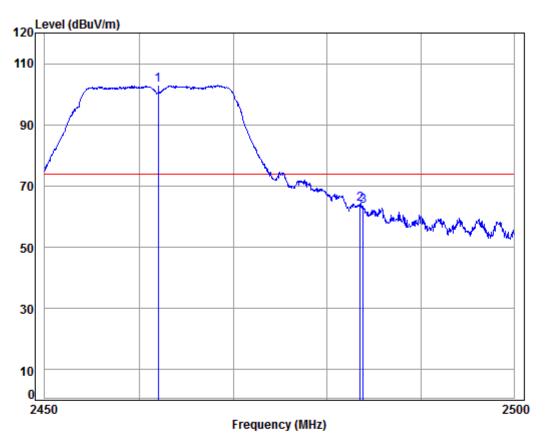
Freq			Preamp Factor					Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
pp 2462.000 2483.500 2483.790	5.60	29.35	37.65	53.33	50.63	54.00	-3.37	Average Average Average



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



Condition: 3m VERTICAL Job No : 11955CR/11956CR Mode : 2462 Band edge

: 11G

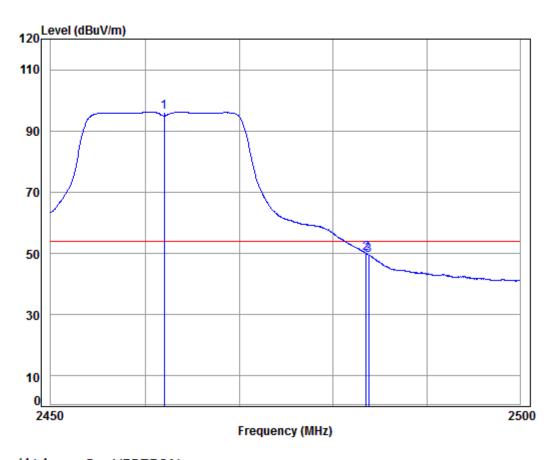
	Freq						Limit Line		Remark
-	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
рр	2462.000								
	2483.500	5.60	29.35	37.65	66.62	63.92	74.00	-10.08	Peak
	2483.840	5.60	29.35	37.65	66.10	63.40	74.00	-10.60	Peak



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



Condition: 3m VERTICAL Job No : 11955CR/11956CR

Mode : 2462 Band edge

: 11G

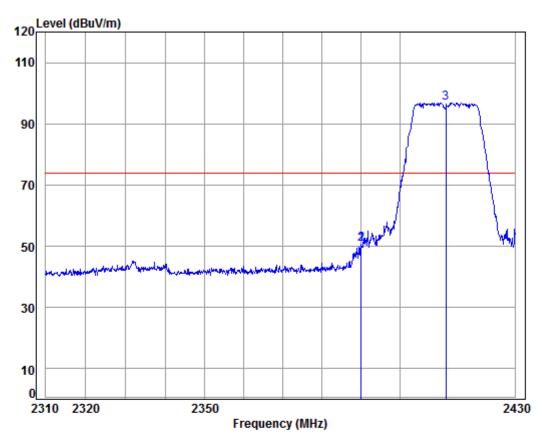
		Freq			Preamp Factor					Remark
	-	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
	рр	2462.000	5.57	29.29	37.65	98.92	96.13	54.00	42.13	Average
		2483.500	5.60	29.35	37.65	52.75	50.05	54.00	-3.95	Average
,		2483.790	5.60	29.35	37.65	52.21	49.51	54.00	-4.49	Average



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



Condition: 3m HORIZONTAL Job No : 11955CR/11956CR Mode : 2412 Band edge

> : 11N20 : 44

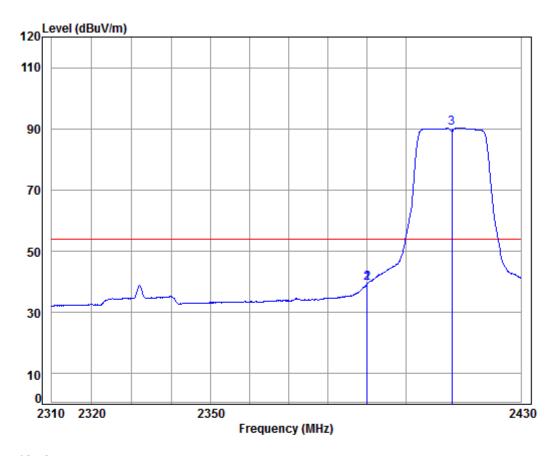
		Freq			Preamp Factor						
	-				——dB						
		2389.968								•	
2		2390.000	5.47	29.08	37.66	53.86	50.75	74.00	-23.25	peak	
3	pp	2412.000	5.50	29.14	37.65	99.95	96.94	74.00	22.94	peak	



Report No.: SZEM171101195502

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



Condition: 3m HORIZONTAL
Job No : 11955CR/11956CR
Mode : 2412 Band edge

: 11N20 : 44

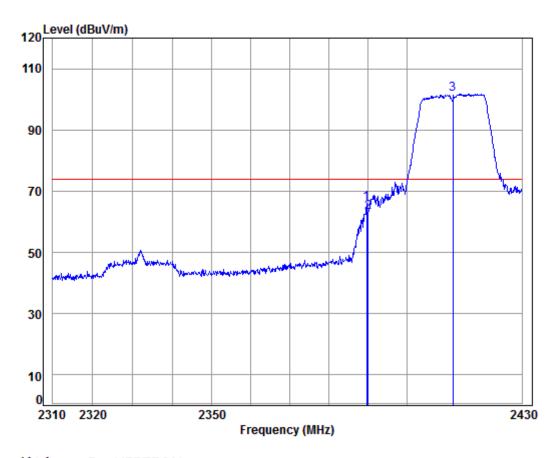
	Cable	Ant	Preamp	Read		Limit	0ver	
Fred	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
MHz	: dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 2389.968	5.47	29.08	37.66	42.55	39.44	54.00	-14.56	Average
2 2390.000	5.47	29.08	37.66	42.55	39.44	54.00	-14.56	Average
3 pp 2412.000	5.50	29.14	37.65	93.35	90.34	54.00	36.34	Average



Report No.: SZEM171101195502

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



Condition: 3m VERTICAL

Job No : 11955CR/11956CR

Mode : 2412 Band edge

: 11N20

: 44

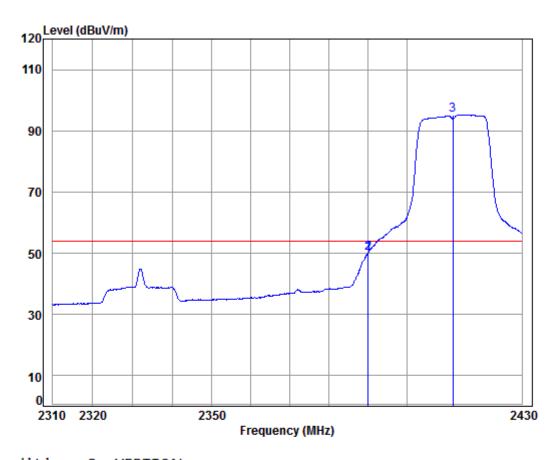
	Freq						Limit Line		Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
2	2389.605 2390.000 2412.000	5.47	29.08	37.66	66.26	63.15	74.00	-10.85	Peak



Report No.: SZEM171101195502

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



Condition: 3m VERTICAL

Job No : 11955CR/11956CR Mode : 2412 Band edge

> : 11N20 : 44

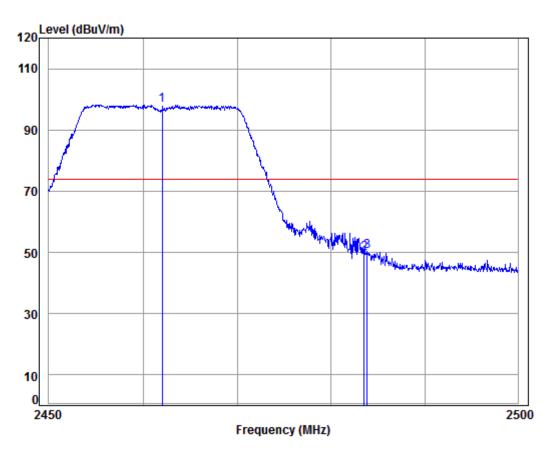
		Freq			Preamp Factor					
	-	MHz	dB	dB/m	——dB	dBuV	dBuV/m	dBuV/m	dB	
1		2389.968	5.47	29.08	37.66	53.11	50.00	54.00	-4.00	Average
2		2390.000	5.47	29.08	37.66	53.11	50.00	54.00	-4.00	Average
3	pp	2412.000	5.50	29.14	37.65	98.14	95.13	54.00	41.13	Average



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



Condition: 3m HORIZONTAL Job No : 11955CR/11956CR Mode : 2462 Band edge

> : 11N20 : 44

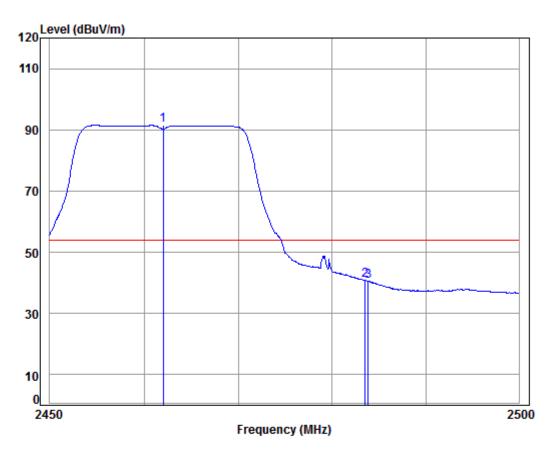
	Freq				Read Level				
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp	2462.000	5.57	29.29	37.65	100.98	98.19	74.00	24.19	peak
2	2483.500	5.60	29.35	37.65	52.34	49.64	74.00	-24.36	peak
3	2483.840	5.60	29.35	37.65	53.21	50.51	74.00	-23.49	peak



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



Condition: 3m HORIZONTAL Job No : 11955CR/11956CR Mode : 2462 Band edge

> : 11N20 : 44

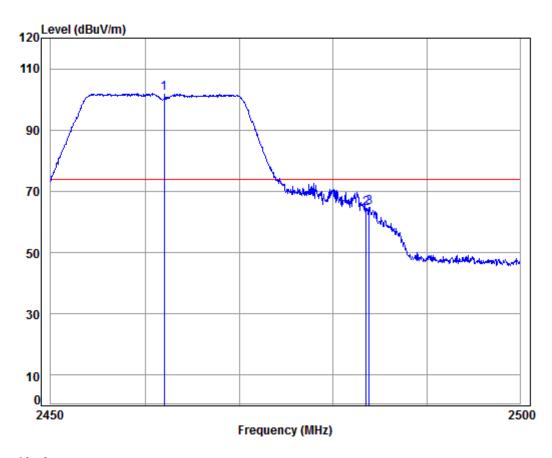
		Freq			Preamp Factor					Remark
	-	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
		2462.000 2483.500								Average Average
,		2483.840								_



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



Condition: 3m VERTICAL

2

3

Job No : 11955CR/11956CR

Mode : 2462 Band edge

> : 11N20 : 44

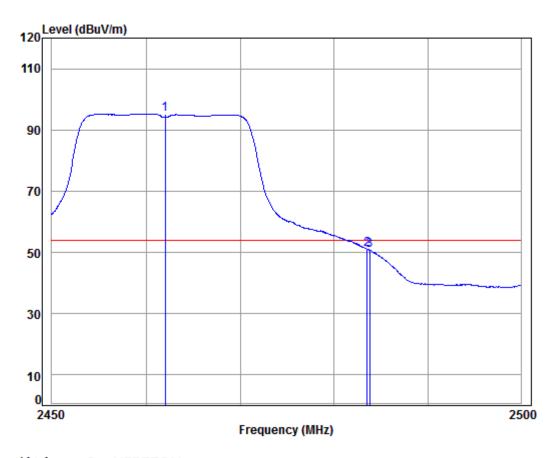
Cable Ant Preamp Limit 0ver Read Freq Loss Factor Factor Level Level Line Limit Remark MHz dΒ dΒ dBuV dBuV/m dBuV/m dB dB/m 1 pp 2462.000 29.29 37.65 104.71 101.92 74.00 27.92 Peak 5.57 2483.500 5.60 29.35 37.65 67.09 64.39 74.00 -9.61 Peak 2483.840 5.60 29.35 37.65 67.59 64.89 74.00 -9.11 Peak



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



Condition: 3m VERTICAL

Job No : 11955CR/11956CR Mode : 2462 Band edge

: 11N20

: 44

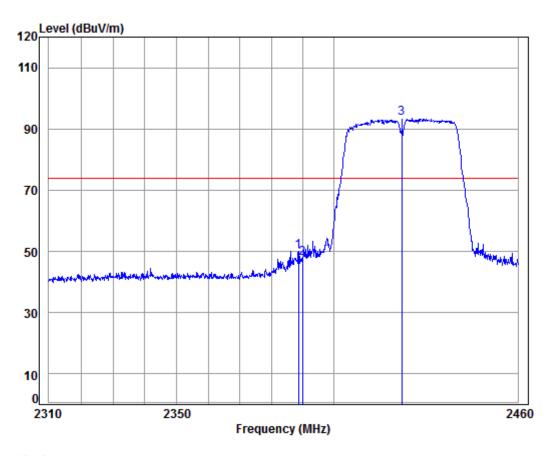
		Freq						Limit Line		Remark
	-	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1		2462.000 2483.500								_
3		2483.790	5.60	29.35	37.65	53.43	50.73	54.00	-3.27	Average



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



Condition: 3m HORIZONTAL Job No : 11955CR/11956CR Mode : 2422 Band edge

> : 11N40 : 44

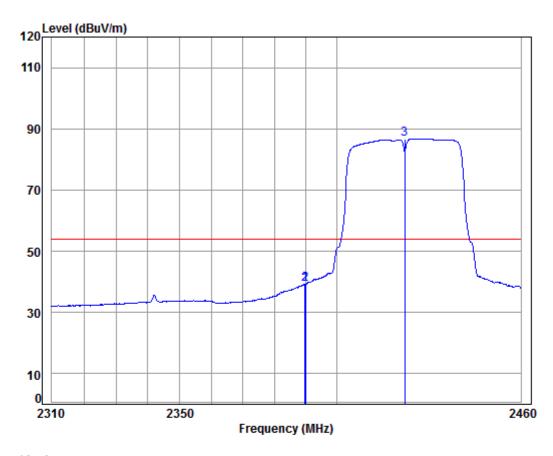
		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2388.775	5.47	29.07	37.66	53.14	50.02	74.00	-23.98	peak
2	2390.000	5.47	29.08	37.66	50.86	47.75	74.00	-26.25	peak
3 рр	2422.000	5.52	29.17	37.65	96.36	93.40	74.00	19.40	peak



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



Condition: 3m HORIZONTAL
Job No : 11955CR/11956CR
Mode : 2422 Band edge

: 11N40 : 44

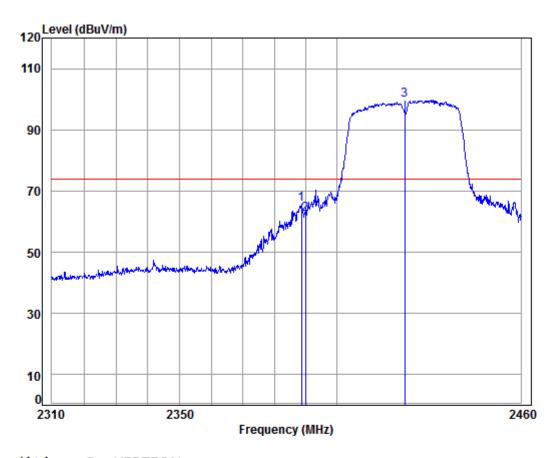
			Cable	Ant	Preamp	Read		Limit	0ver	
		Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
		MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
		2389.827	5.47	29.08	37.66	42.35	39.24	54.00	-14.76	Average
)		2390.000	5.47	29.08	37.66	42.32	39.21	54.00	-14.79	Average
,	pp	2422.000	5.52	29.17	37.65	89.62	86.66	54.00	32.66	Average



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



Condition: 3m VERTICAL

Job No : 11955CR/11956CR Mode : 2422 Band edge

: 11N40

1

2

: 44

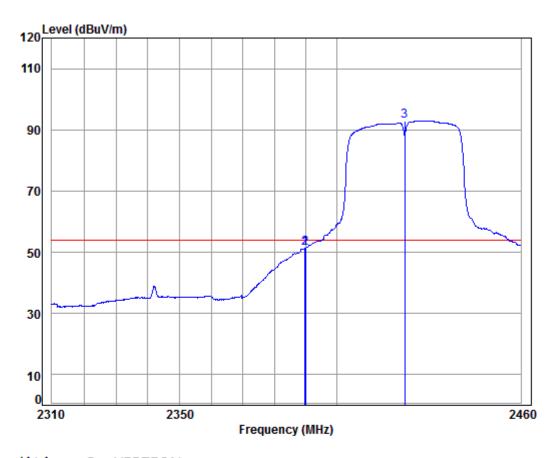
Cable Ant Preamp Read Limit 0ver Loss Factor Factor Line Freq Level Level Limit Remark dBuV dBuV/m dBuV/m MHz dB dB/m dΒ dB 2388.775 5.47 29.07 37.66 68.75 65.63 74.00 -8.37 Peak 2390.000 5.47 29.08 37.66 65.70 62.59 74.00 -11.41 Peak 3 pp 2422.000 5.52 29.17 37.65 102.68 99.72 74.00 25.72 Peak



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



Condition: 3m VERTICAL

Job No : 11955CR/11956CR Mode : 2422 Band edge

: 11N40

: 44

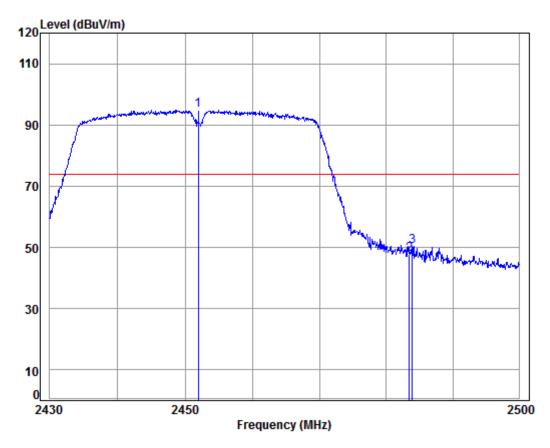
	Freq						Limit Line		Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 2 3 pp	2389.827 2390.000 2422.000	5.47	29.08	37.66	54.48	51.37	54.00	-2.63	Average



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



Condition: 3m HORIZONTAL Job No : 11955CR/11956CR Mode : 2452 Band edge

> : 11N40 : 44

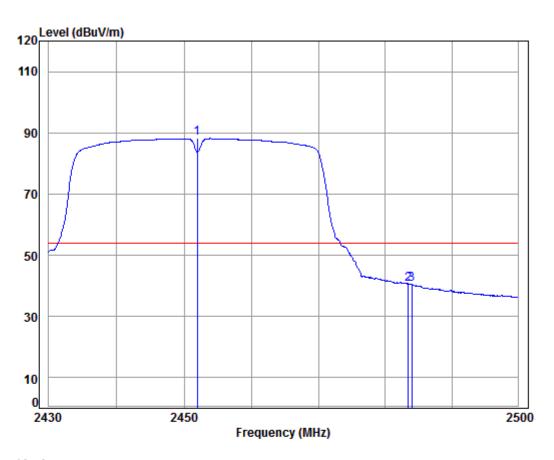
	Freq			Preamp Factor					Remark
-	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp	2452.000	5.56	29.26	37.65	97.64	94.81	74.00	20.81	peak
2	2483.500	5.60	29.35	37.65	50.35	47.65	74.00	-26.35	peak
3	2483.935	5.60	29.35	37.65	53.14	50.44	74.00	-23.56	peak



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



Condition: 3m HORIZONTAL
Job No : 11955CR/11956CR
Mode : 2452 Band edge

: 11N40 : 44

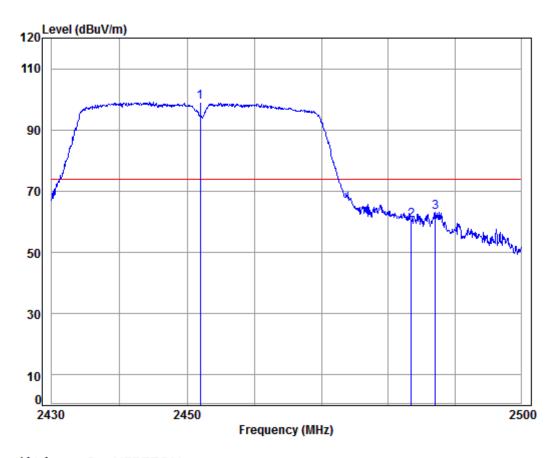
		Freq			Preamp Factor					
	-	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
	рр	2452.000	5.56	29.26	37.65	90.96	88.13	54.00	34.13	Average
		2483.500	5.60	29.35	37.65	43.25	40.55	54.00	-13.45	Average
,		2484.006	5.60	29.35	37.65	43.18	40.48	54.00	-13.52	Average



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



Condition: 3m VERTICAL

Job No : 11955CR/11956CR Mode

: 2452 Band edge

: 11N40 : 44

2

3

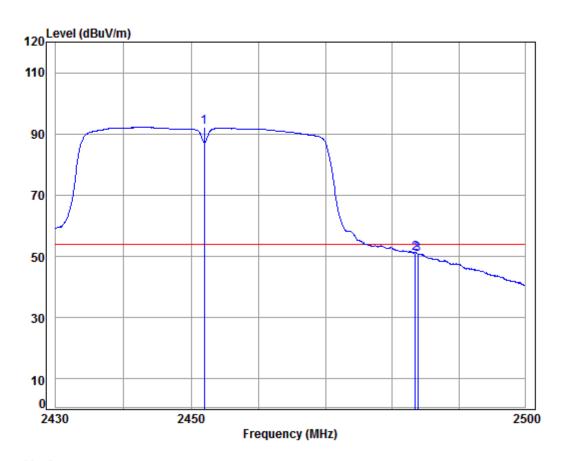
Cable Ant Preamp Read Limit 0ver Freq Loss Factor Factor Level Level Line Limit Remark MHz dB/m dBuV dBuV/m dBuV/m dB dB dΒ 1 pp 2452.000 5.56 29.26 37.65 101.78 98.95 74.00 24.95 Peak 2483.500 29.35 5.60 37.65 63.19 60.49 74.00 -13.51 Peak 2487.112 5.60 29.36 37.65 65.92 63.23 74.00 -10.77 Peak



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



Condition: 3m VERTICAL

Job No : 11955CR/11956CR Mode : 2452 Band edge

> : 11N40 : 44

	Freq			Preamp Factor					
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp	2452.000	5.56	29.26	37.65	95.01	92.18	54.00	38.18	Average
2	2483.500	5.60	29.35	37.65	53.72	51.02	54.00	-2.98	Average
3	2483.865	5.60	29.35	37.65	53.54	50.84	54.00	-3.16	Average



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7.8 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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7.8.1 E.U.T. Operation

Operating Environment:

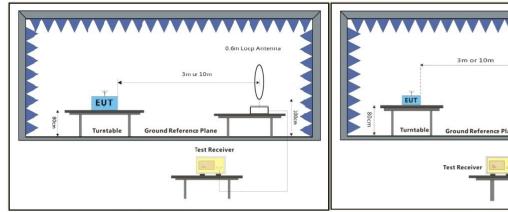
Temperature: 23.3 °C Humidity: 47.9 % RH Atmospheric Pressure: 1020 mbar

Test mode b:Charge + TX mode Keep the EUT in charging and continuously transmitting

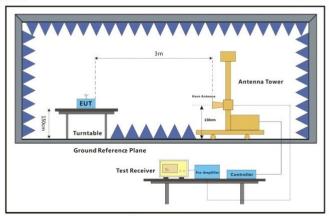
mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE

802.11n(HT40). Only the data of worst case is recorded in the report.

7.8.2 Test Setup Diagram







Above 1GHz



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7.8.3 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: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

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



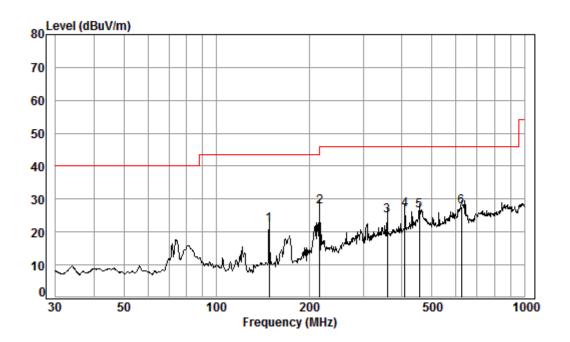
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30MHz~1GHz

QP value:

Mode:b; Polarization:Horizontal;



Condition: 3m HORIZONTAL

Job.No : 11955CR

mode : b

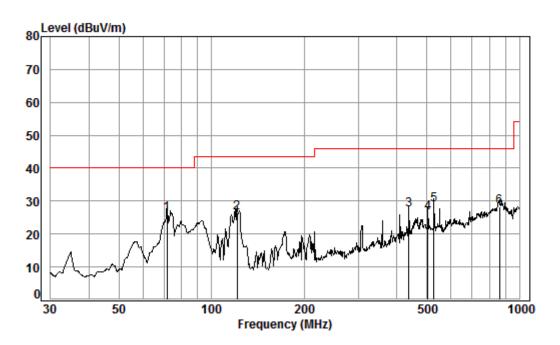
		Cable	Ant	Preamp	Read		Limit	0ver
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
_								
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	148.44	1.31	7.14	27.52	41.31	22.24	43.50	-21.26
2 pp	216.02	1.49	11.00	27.53	42.87	27.83	46.00	-18.17
3	359.19	2.09	15.30	27.66	35.30	25.03	46.00	-20.97
4	408.95	2.24	15.63	27.75	36.55	26.67	46.00	-19.33
5	455.91	2.43	17.10	27.82	34.85	26.56	46.00	-19.44
6	625.08	2.75	19.70	27.66	32.76	27.55	46.00	-18.45



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Mode:b; Polarization:Vertical



Condition: 3m VERTICAL

Job.No : 11955CR

mode : b

		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 pp	71.83	0.86	7.11	27.52	45.85	26.30	40.00	-13.70
2	121.12	1.26	6.57	27.52	46.06	26.37	43.50	-17.13
3	437.12	2.36	16.07	27.79	36.80	27.44	46.00	-18.56
4	504.71	2.61	17.25	27.87	34.43	26.42	46.00	-19.58
5	528.25	2.63	16.92	27.83	37.09	28.81	46.00	-17.19
6	863.06	3.46	23.48	27.20	28.68	28.42	46.00	-17.58

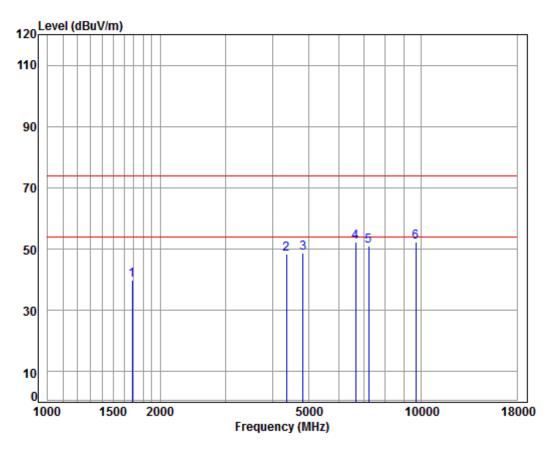


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Above 1GHz

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



Condition: 3m HORIZONTAL
Job No : 11955CR/11956CR
Mode : 2412 TX RSE
Note : 2.4G WIFI 11B

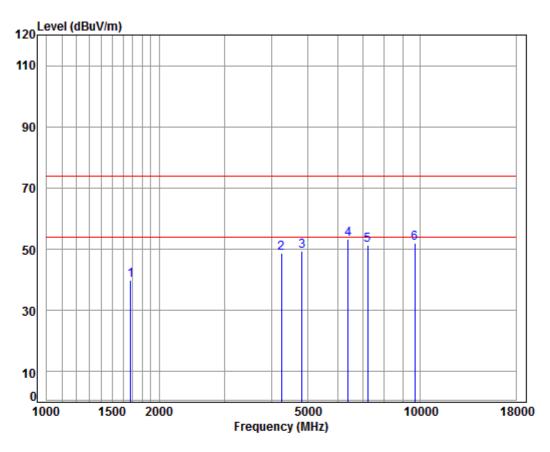
0.00									
		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1682.477	5.25	26.60	37.72	45.79	39.92	74.00	-34.08	peak
2	4354.454	7.40	33.60	37.18	44.46	48.28	74.00	-25.72	peak
3	4824.000	7.91	34.19	37.27	43.95	48.78	74.00	-25.22	peak
4	6659.763	11.08	35.56	37.70	43.24	52.18	74.00	-21.82	peak
5	7236.000	10.07	36.40	37.55	42.02	50.94	74.00	-23.06	peak
6	op 9648.000	10.77	37.53	35.77	39.83	52.36	74.00	-21.64	peak



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



Condition: 3m VERTICAL
Job No : 11955CR/11956CR
Mode : 2412 TX RSE
Note : 2.4G WIFI 11B

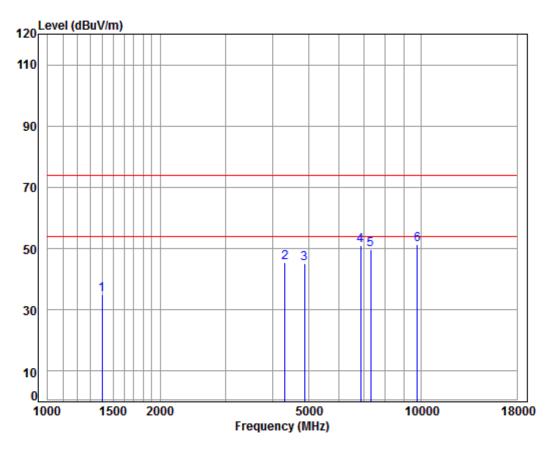
	Cable	Ant	Preamp	Read		Limit	0ver	
Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1677.621	5.25	26.58	37.73	45.82	39.92	74.00	-34.08	peak
4254.921	7.28	33.60	37.16	44.88	48.60	74.00	-25.40	peak
4824.000	7.91	34.19	37.27	44.51	49.34	74.00	-24.66	peak
p 6414.167	11.38	35.03	37.77	44.73	53.37	74.00	-20.63	peak
7236.000	10.07	36.40	37.55	42.35	51.27	74.00	-22.73	peak
9648.000	10.77	37.53	35.77	39.37	51.90	74.00	-22.10	peak
	MHz 1677.621 4254.921 4824.000 pp 6414.167 7236.000	Freq Loss MHz dB 1677.621 5.25 4254.921 7.28 4824.000 7.91 pp 6414.167 11.38 7236.000 10.07	Freq Loss Factor MHz dB dB/m 1677.621 5.25 26.58 4254.921 7.28 33.60 4824.000 7.91 34.19 pp 6414.167 11.38 35.03 7236.000 10.07 36.40	Freq Loss Factor Factor MHz dB dB/m dB 1677.621 5.25 26.58 37.73 4254.921 7.28 33.60 37.16 4824.000 7.91 34.19 37.27 op 6414.167 11.38 35.03 37.77 7236.000 10.07 36.40 37.55	Freq Loss Factor Factor Level MHz dB dB/m dB dBuV 1677.621 5.25 26.58 37.73 45.82 4254.921 7.28 33.60 37.16 44.88 4824.000 7.91 34.19 37.27 44.51 30p 6414.167 11.38 35.03 37.77 44.73 7236.000 10.07 36.40 37.55 42.35	Freq Loss Factor Factor Level Level MHz dB dB/m dB dBuV dBuV/m 1677.621 5.25 26.58 37.73 45.82 39.92 4254.921 7.28 33.60 37.16 44.88 48.60 4824.000 7.91 34.19 37.27 44.51 49.34 30p 6414.167 11.38 35.03 37.77 44.73 53.37 7236.000 10.07 36.40 37.55 42.35 51.27	Freq Loss Factor Factor Level Level Line MHz	



Report No.: SZEM171101195502

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



Condition: 3m HORIZONTAL
Job No : 11955CR/11956CR
Mode : 2437 TX RSE
Note : 2.4G WIFI 11B

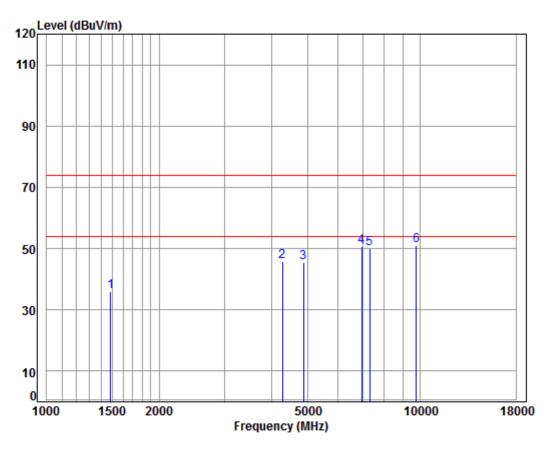
		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1398.336	5.15	25.38	38.05	42.64	35.12	74.00	-38.88	peak
2	4316.859	7.36	33.60	38.17	42.78	45.57	74.00	-28.43	peak
3	4874.000	7.96	34.28	38.44	41.35	45.15	74.00	-28.85	peak
4	6874.906	10.47	36.16	37.42	41.76	50.97	74.00	-23.03	peak
5	7311.000	10.05	36.37	37.01	40.32	49.73	74.00	-24.27	peak
6 p	p 9748.000	10.82	37.55	35.02	37.85	51.20	74.00	-22.80	peak



Report No.: SZEM171101195502

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



Condition: 3m VERTICAL
Job No : 11955CR/11956CR
Mode : 2437 TX RSE
Note : 2.4G WIFI 11B

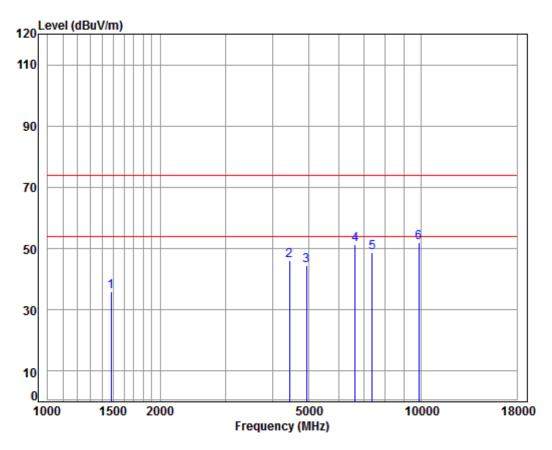
	_									
			Cable	Ant	Preamp	Read		Limit	0ver	
		Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	_									
		MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1		1481.553	5.42	25.73	38.04	42.88	35.99	74.00	-38.01	peak
2		4279.589	7.31	33.60	38.15	42.99	45.75	74.00	-28.25	peak
3		4874.000	7.96	34.28	38.44	41.57	45.37	74.00	-28.63	peak
4		6954.852	10.25	36.38	37.34	41.50	50.79	74.00	-23.21	peak
5		7311.000	10.05	36.37	37.01	40.63	50.04	74.00	-23.96	peak
6	pp	9748.000	10.82	37.55	35.02	37.82	51.17	74.00	-22.83	peak



Report No.: SZEM171101195502

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



Condition: 3m HORIZONTAL
Job No : 11955CR/11956CR
Mode : 2462 TX RSE
Note : 2.4G WIFI 11B

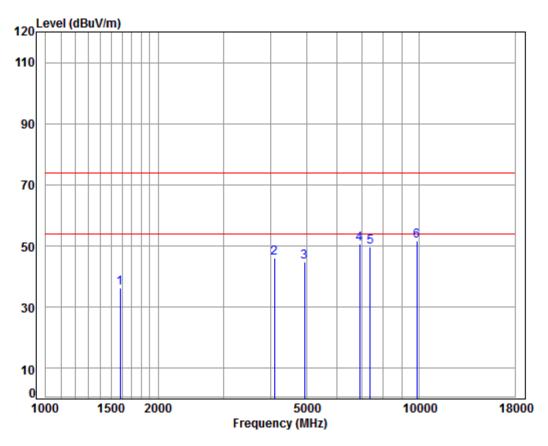
_									
		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
_									
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
	1477.276	5.41	25.71	38.04	42.86	35.94	74.00	-38.06	peak
	4430.628	7.48	33.60	38.23	43.14	45.99	74.00	-28.01	peak
	4924.000	8.01	34.37	38.47	40.48	44.39	74.00	-29.61	peak
	6640.542	11.13	35.50	37.64	42.33	51.32	74.00	-22.68	peak
	7386.000	10.03	36.34	36.94	39.41	48.84	74.00	-25.16	peak
pp	9848.000	10.87	37.57	34.97	38.38	51.85	74.00	-22.15	peak
		MHz 1477.276 4430.628 4924.000 6640.542 7386.000	Freq Loss MHz dB 1477.276 5.41 4430.628 7.48 4924.000 8.01 6640.542 11.13 7386.000 10.03	Freq Loss Factor MHz dB dB/m 1477.276 5.41 25.71 4430.628 7.48 33.60 4924.000 8.01 34.37 6640.542 11.13 35.50 7386.000 10.03 36.34	Freq Loss Factor Factor MHz dB dB/m dB 1477.276 5.41 25.71 38.04 4430.628 7.48 33.60 38.23 4924.000 8.01 34.37 38.47 6640.542 11.13 35.50 37.64 7386.000 10.03 36.34 36.94	Freq Loss Factor Factor Level MHz dB dB/m dB dBuV 1477.276 5.41 25.71 38.04 42.86 4430.628 7.48 33.60 38.23 43.14 4924.000 8.01 34.37 38.47 40.48 6640.542 11.13 35.50 37.64 42.33 7386.000 10.03 36.34 36.94 39.41	Freq Loss Factor Factor Level Level MHz dB dB/m dB dBuV dBuV/m 1477.276 5.41 25.71 38.04 42.86 35.94 4430.628 7.48 33.60 38.23 43.14 45.99 4924.000 8.01 34.37 38.47 40.48 44.39 6640.542 11.13 35.50 37.64 42.33 51.32 7386.000 10.03 36.34 36.94 39.41 48.84	Freq Loss Factor Factor Level Level Line MHz	1477.276 5.41 25.71 38.04 42.86 35.94 74.00 -38.06 4430.628 7.48 33.60 38.23 43.14 45.99 74.00 -28.01 4924.000 8.01 34.37 38.47 40.48 44.39 74.00 -29.61 6640.542 11.13 35.50 37.64 42.33 51.32 74.00 -22.68



Report No.: SZEM171101195502

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



Condition: 3m VERTICAL Job No : 11955CR/11956CR Mode : 2462 TX RSE

: 2.4G WIFI 11B

Note

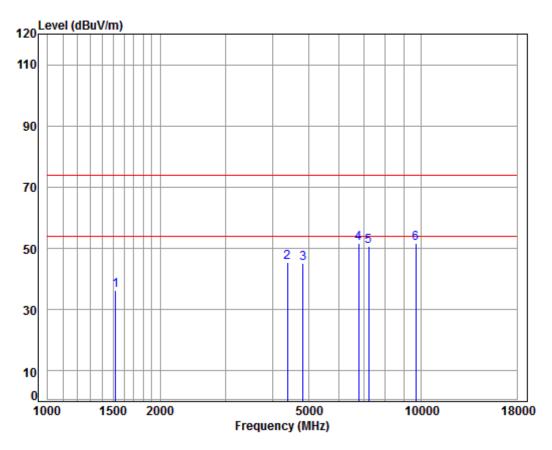
		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1583.392	5.37	26.18	38.03	42.78	36.30	74.00	-37.70	peak
2	4098.010	7.10	33.60	38.05	43.35	46.00	74.00	-28.00	peak
3	4924.000	8.01	34.37	38.47	40.86	44.77	74.00	-29.23	peak
4	6914.763	10.36	36.27	37.38	41.44	50.69	74.00	-23.31	peak
5	7386.000	10.03	36.34	36.94	40.25	49.68	74.00	-24.32	peak
6	pp 9848.000	10.87	37.57	34.97	38.17	51.64	74.00	-22.36	peak
									-



Report No.: SZEM171101195502

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



Condition: 3m HORIZONTAL
Job No : 11955CR/11956CR
Mode : 2412 TX RSE
Note : 2.4G WIFI 11G

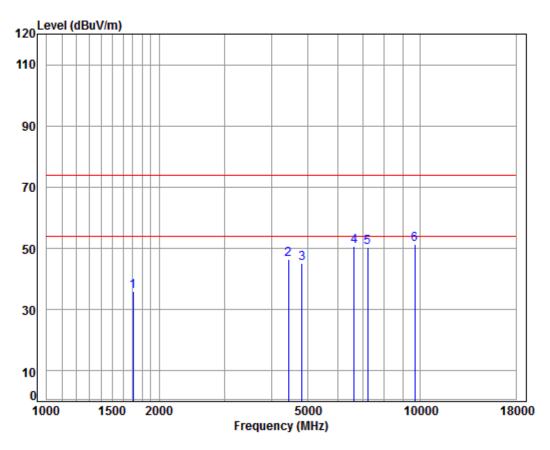
Ant Preamp Read Limit Over Factor Factor Level Level Line Limit Remark dB/m dB dBuV dBuV/m dBuV/m dB
dB/m dB dBuV dBuV/m dBuV/m dB
dB/m dB dBuV dBuV/m dBuV/m dB
25.89 38.04 43.06 36.36 74.00 -37.64 peak
33.60 38.20 42.49 45.32 74.00 -28.68 peak
34.19 38.42 41.57 45.25 74.00 -28.75 peak
35.94 37.49 42.38 51.52 74.00 -22.48 peak
36.40 37.08 41.31 50.70 74.00 -23.30 peak
37.53 35.07 38.46 51.69 74.00 -22.31 peak
35.94 37.49 42.38 51.52 74.00 -22.4 36.40 37.08 41.31 50.70 74.00 -23.3



Report No.: SZEM171101195502

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



Condition: 3m VERTICAL
Job No : 11955CR/11956CR
Mode : 2412 TX RSE
Note : 2.4G WIFI 11G

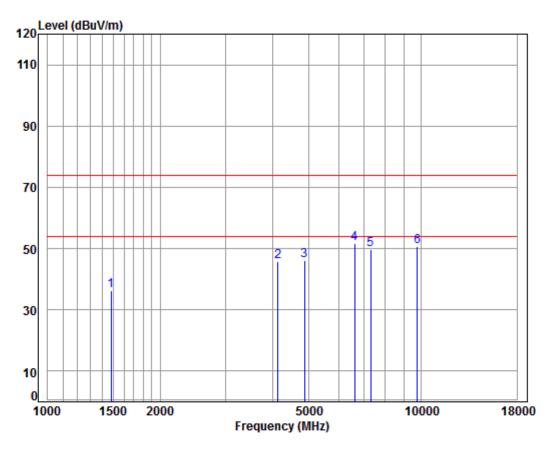
		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1702.042	5.23	26.68	38.02	42.09	35.98	74.00	-38.02	peak
2	4443.453	7.50	33.60	38.24	43.60	46.46	74.00	-27.54	peak
3	4824.000	7.91	34.19	38.42	41.35	45.03	74.00	-28.97	peak
4	6640.542	11.13	35.50	37.64	41.83	50.82	74.00	-23.18	peak
5	7236.000	10.07	36.40	37.08	40.89	50.28	74.00	-23.72	peak
6	pp 9648.000	10.77	37.53	35.07	38.11	51.34	74.00	-22.66	peak
ь	pp 9648.000	10.//	3/.53	35.07	38.11	51.34	74.00	-22.00	peak



Report No.: SZEM171101195502

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



Condition: 3m HORIZONTAL
Job No : 11955CR/11956CR
Mode : 2437 TX RSE
Note : 2.4G WIFI 11G

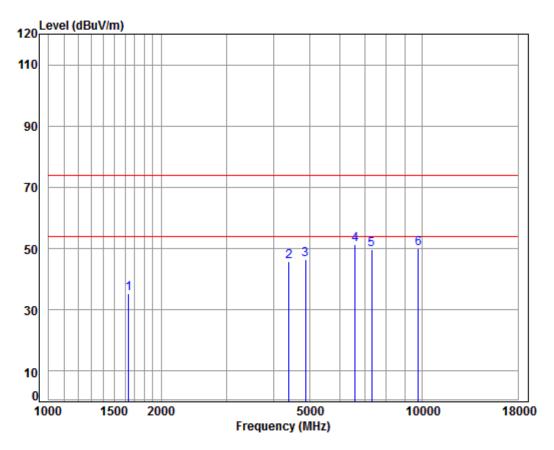
		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1477.276	5.41	25.71	38.04	43.34	36.42	74.00	-37.58	peak
2	4133.699	7.14	33.60	38.07	43.25	45.92	74.00	-28.08	peak
3	4874.000	7.96	34.28	38.44	42.28	46.08	74.00	-27.92	peak
4 p	p 6621.375	11.19	35.45	37.66	42.66	51.64	74.00	-22.36	peak
5	7311.000	10.05	36.37	37.01	40.15	49.56	74.00	-24.44	peak
6	9748.000	10.82	37.55	35.02	37.34	50.69	74.00	-23.31	peak



Report No.: SZEM171101195502

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



Condition: 3m VERTICAL
Job No : 11955CR/11956CR
Mode : 2437 TX RSE
Note : 2.4G WIFI 11G

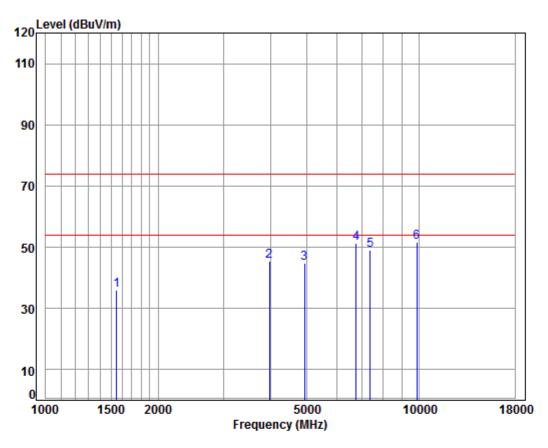
		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1639.274	5.30	26.42	38.03	41.68	35.37	74.00	-38.63	peak
2	4392.376	7.44	33.60	38.21	42.97	45.80	74.00	-28.20	peak
3	4874.000	7.96	34.28	38.44	42.58	46.38	74.00	-27.62	peak
4 p	p 6602.265	11.24	35.39	37.68	42.25	51.20	74.00	-22.80	peak
5	7311.000	10.05	36.37	37.01	40.18	49.59	74.00	-24.41	peak
6	9748.000	10.82	37.55	35.02	36.82	50.17	74.00	-23.83	peak



Report No.: SZEM171101195502

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



Condition: 3m HORIZONTAL Job No : 11955CR/11956CR Mode : 2462 TX RSE

: 2.4G WIFI 11G

Note

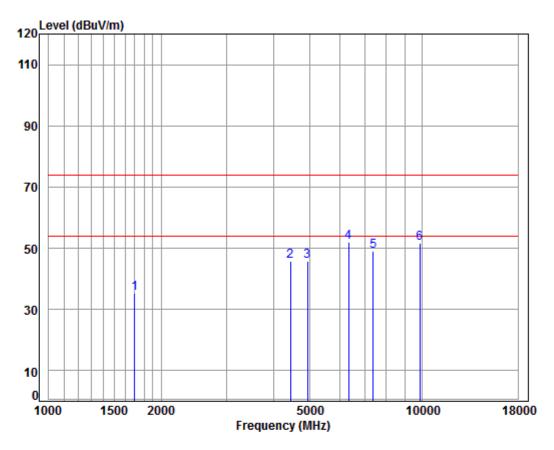
		Freq			Preamp Factor					Remark
	-	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1		1547.199	5.42	26.02	38.04	42.50	35.90	74.00	-38.10	peak
2		3969.767	6.95	33.52	38.00	42.98	45.45	74.00	-28.55	peak
3		4924.000	8.01	34.37	38.47	40.84	44.75	74.00	-29.25	peak
4		6776.265	10.75	35.89	37.51	42.20	51.33	74.00	-22.67	peak
5		7386.000	10.03	36.34	36.94	39.50	48.93	74.00	-25.07	peak
6	pp	9848.000	10.87	37.57	34.97	38.30	51.77	74.00	-22.23	peak



Report No.: SZEM171101195502

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



Condition: 3m VERTICAL
Job No : 11955CR/11956CR
Mode : 2462 TX RSE
Note : 2.4G WIFI 11G

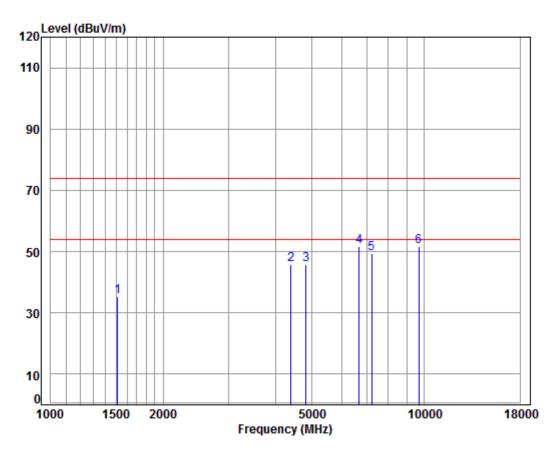
		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1697.129	5.23	26.66	38.02	41.33	35.20	74.00	-38.80	peak
2	4443.453	7.50	33.60	38.24	42.93	45.79	74.00	-28.21	peak
3	4924.000	8.01	34.37	38.47	41.84	45.75	74.00	-28.25	peak
4	pp 6340.436	11.24	34.98	37.94	43.87	52.15	74.00	-21.85	peak
5	7386.000	10.03	36.34	36.94	39.58	49.01	74.00	-24.99	peak
6	9848.000	10.87	37.57	34.97	38.20	51.67	74.00	-22.33	peak



Report No.: SZEM171101195502

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



Condition: 3m HORIZONTAL
Job No : 11955CR/11956CR
Mode : 2412 TX RSE

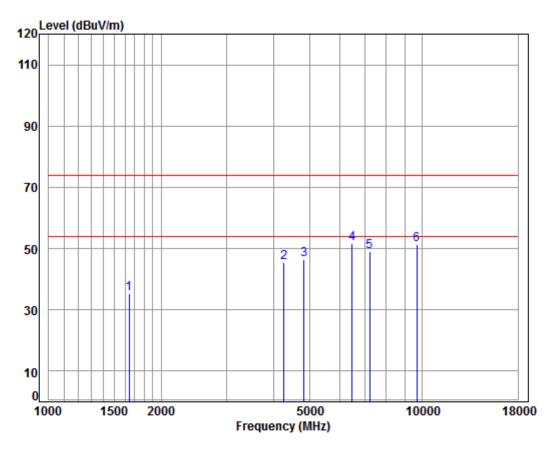
		Freq			Preamp Factor					Remark
	-	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1		1511.833	5.46	25.85	38.04	42.15	35.42	74.00	-38.58	peak
2		4392.376	7.44	33.60	38.21	43.10	45.93	74.00	-28.07	peak
3		4824.000	7.91	34.19	38.42	41.99	45.67	74.00	-28.33	peak
4	pp	6679.040	11.02	35.61	37.60	42.53	51.56	74.00	-22.44	peak
5		7236.000	10.07	36.40	37.08	40.09	49.48	74.00	-24.52	peak
6		9648.000	10.77	37.53	35.07	38.27	51.50	74.00	-22.50	peak



Report No.: SZEM171101195502

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



Condition: 3m VERTICAL
Job No : 11955CR/11956CR
Mode : 2412 TX RSE

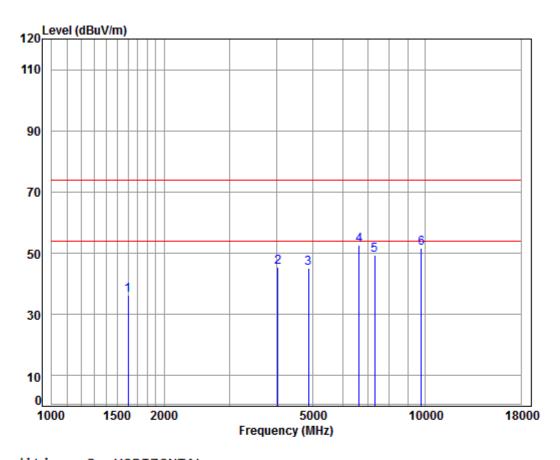
			Cable	Ant	Preamp	Read		Limit	0ver	
		Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	_									
		MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1		1644.019	5.30	26.44	38.03	41.57	35.28	74.00	-38.72	peak
2		4267.237	7.30	33.60	38.14	42.85	45.61	74.00	-28.39	peak
3		4824.000	7.91	34.19	38.42	42.84	46.52	74.00	-27.48	peak
4	pp	6488.754	11.52	35.09	37.79	42.77	51.59	74.00	-22.41	peak
5		7236.000	10.07	36.40	37.08	39.78	49.17	74.00	-24.83	peak
6		9648.000	10.77	37.53	35.07	38.08	51.31	74.00	-22.69	peak



Report No.: SZEM171101195502

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



Condition: 3m HORIZONTAL
Job No : 11955CR/11956CR
Mode : 2437 TX RSE

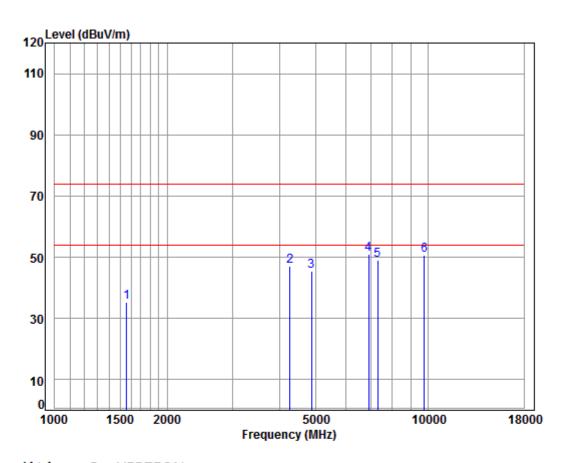
		Freq			Preamp Factor					Remark
	-	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1		1601.804	5.35	26.26	38.03	42.61	36.19	74.00	-37.81	peak
2		4027.554								
3		4874.000								
4	pp	6640.542	11.13	35.50	37.64	43.64	52.63	74.00	-21.37	peak
5		7311.000	10.05	36.37	37.01	39.83	49.24	74.00	-24.76	peak
6		9748.000	10.82	37.55	35.02	38.38	51.73	74.00	-22.27	peak



Report No.: SZEM171101195502

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



Condition: 3m VERTICAL Job No : 11955CR/11956CR

Mode : 2437 TX RSE

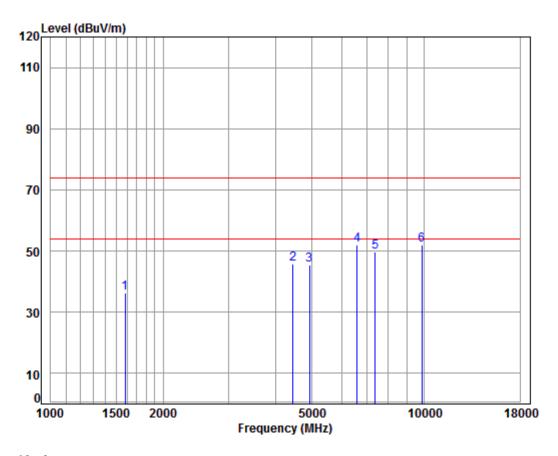
		-			Preamp					
		Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Kemark
	-	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1		1556.169	5.41	26.06	38.04	41.96	35.39	74.00	-38.61	peak
2		4267.237	7.30	33.60	38.14	44.34	47.10	74.00	-26.90	peak
3		4874.000	7.96	34.28	38.44	41.76	45.56	74.00	-28.44	peak
4	pp	6914.763	10.36	36.27	37.38	41.77	51.02	74.00	-22.98	peak
5		7311.000	10.05	36.37	37.01	39.79	49.20	74.00	-24.80	peak
6		9748.000	10.82	37.55	35.02	37.38	50.73	74.00	-23.27	peak



Report No.: SZEM171101195502

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



Condition: 3m HORIZONTAL
Job No : 11955CR/11956CR

Mode : 2462 TX RSE

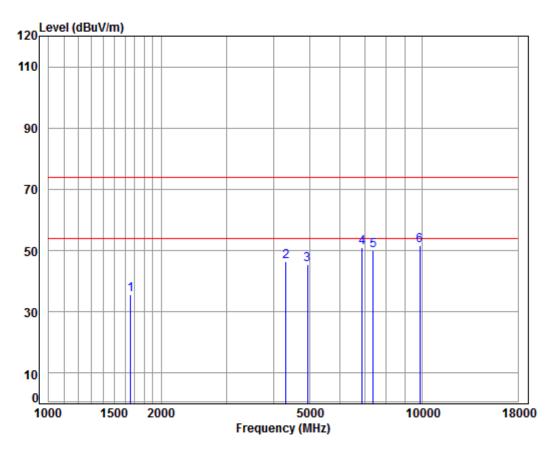
		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1583.392	5.37	26.18	38.03	42.79	36.31	74.00	-37.69	peak
2	4456.315	7.51	33.60	38.24	43.00	45.87	74.00	-28.13	peak
3	4924.000	8.01	34.37	38.47	41.50	45.41	74.00	-28.59	peak
4	6602.265	11.24	35.39	37.68	43.03	51.98	74.00	-22.02	peak
5	7386.000	10.03	36.34	36.94	40.20	49.63	74.00	-24.37	peak
6	pp 9848.000	10.87	37.57	34.97	38.53	52.00	74.00	-22.00	peak



Report No.: SZEM171101195502

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



Condition: 3m VERTICAL
Job No : 11955CR/11956CR
Mode : 2462 TX RSE

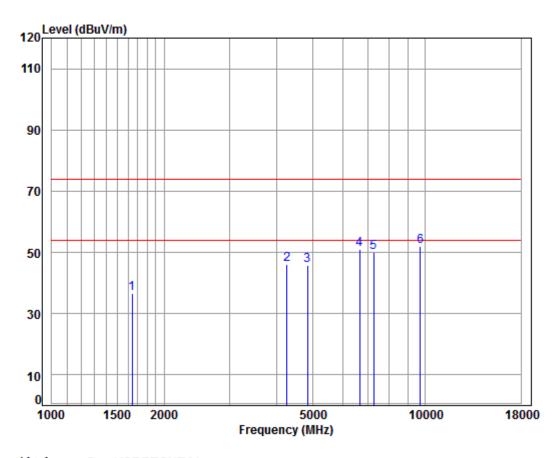
		Freq			Preamp Factor					Remark
	-	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1		1658.337	5.28	26.50	38.03	41.81	35.56	74.00	-38.44	peak
2		4316.859	7.36	33.60	38.17	43.64	46.43	74.00	-27.57	peak
3		4924.000	8.01	34.37	38.47	41.61	45.52	74.00	-28.48	peak
4		6894.806	10.42	36.21	37.40	41.92	51.15	74.00	-22.85	peak
5		7386.000	10.03	36.34	36.94	40.67	50.10	74.00	-23.90	peak
6	pp	9848.000	10.87	37.57	34.97	38.31	51.78	74.00	-22.22	peak



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



Condition: 3m HORIZONTAL
Job No : 11955CR/11956CR
Mode : 2422 TX RSE

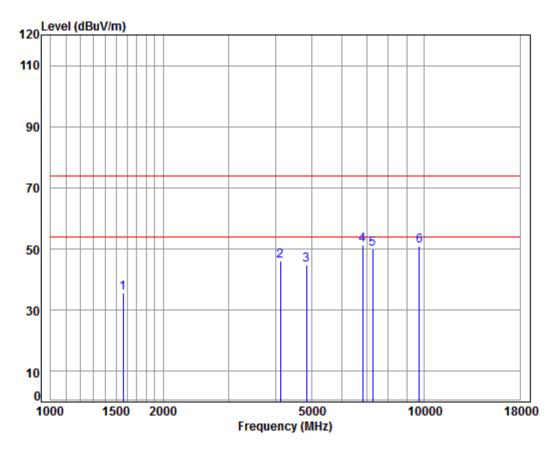
	Freq			Preamp Factor					Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1644.019	5.30	26.44	38.03	42.80	36.51	74.00	-37.49	peak
2	4267.237	7.30	33.60	38.14	43.46	46.22	74.00	-27.78	peak
3	4844.000	7.93	34.23	38.43	41.94	45.67	74.00	-28.33	peak
4	6659.763	11.08	35.56	37.62	41.99	51.01	74.00	-22.99	peak
5	7266.000	10.06	36.39	37.05	40.78	50.18	74.00	-23.82	peak
6 p	p 9688.000	10.79	37.54	35.05	38.86	52.14	74.00	-21.86	peak



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



Condition: 3m VERTICAL Job No : 11955CR/11956CR

Mode : 2422 TX RSE

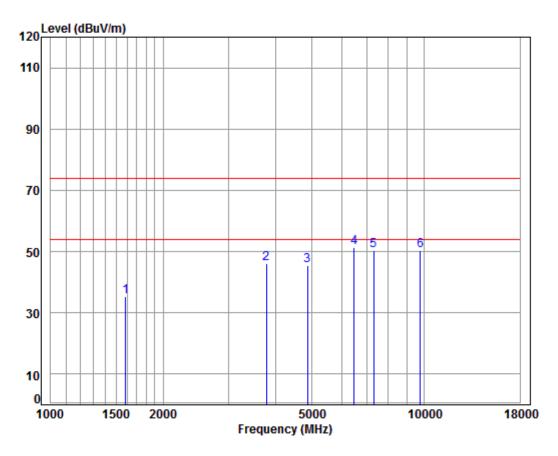
		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1565.191	5.39	26.10	38.04	42.19	35.64	74.00	-38.36	peak
2	4121.768	7.13	33.60	38.07	43.44	46.10	74.00	-27.90	peak
3	4844.000	7.93	34.23	38.43	40.96	44.69	74.00	-29.31	peak
4 pp	6835.278	10.58	36.05	37.45	42.29	51.47	74.00	-22.53	peak
5	7266.000	10.06	36.39	37.05	40.53	49.93	74.00	-24.07	peak
6	9688.000	10.79	37.54	35.05	37.57	50.85	74.00	-23.15	peak



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



Condition: 3m HORIZONTAL
Job No : 11955CR/11956CR
Mode : 2437 TX RSE

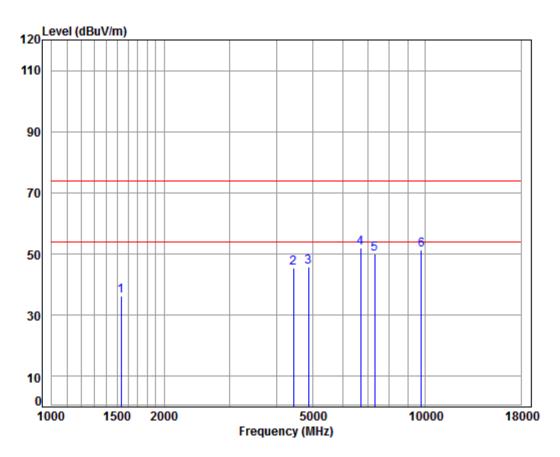
	Freq			Preamp Factor					Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1587.975	5.37	26.20	38.03	41.72	35.26	74.00	-38.74	peak
2	3779.422								-
3	4874.000	7.96	34.28	38.44	41.49	45.29	74.00	-28.71	peak
4 pp	6488.754	11.52	35.09	37.79	42.61	51.43	74.00	-22.57	peak
5	7311.000	10.05	36.37	37.01	41.01	50.42	74.00	-23.58	peak
6	9748.000	10.82	37.55	35.02	37.07	50.42	74.00	-23.58	peak



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



Condition: 3m VERTICAL Job No : 11955CR/11956CR

Mode : 2437 TX RSE

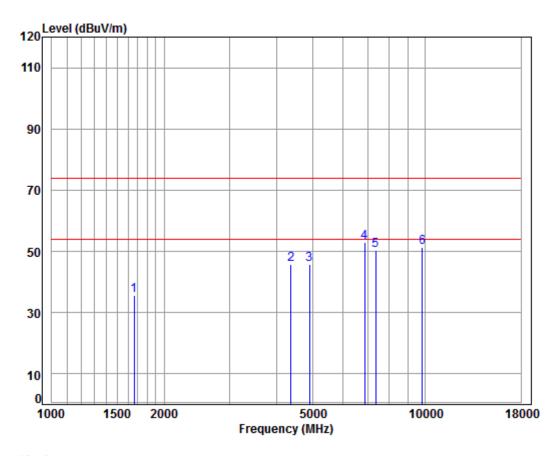
		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1533.841	5.44	25.96	38.04	42.79	36.15	74.00	-37.85	peak
2	4430.628	7.48	33.60	38.23	42.65	45.50	74.00	-28.50	peak
3	4874.000	7.96	34.28	38.44	41.95	45.75	74.00	-28.25	peak
4 pp	6717.762	10.91	35.72	37.57	42.83	51.89	74.00	-22.11	peak
5	7311.000	10.05	36.37	37.01	40.46	49.87	74.00	-24.13	peak
6	9748.000	10.82	37.55	35.02	38.10	51.45	74.00	-22.55	peak



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



Condition: 3m HORIZONTAL
Job No : 11955CR/11956CR
Mode : 2452 TX RSE

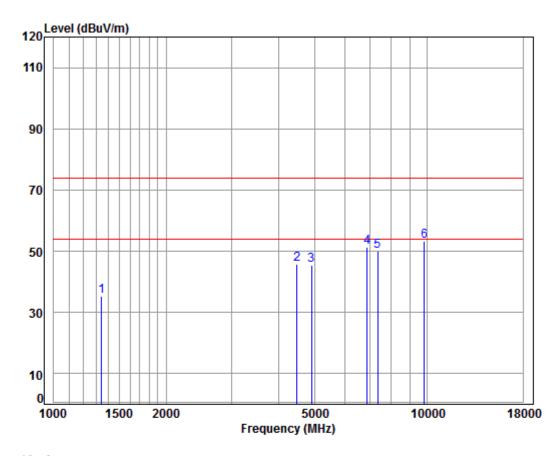
		Freq			Preamp Factor					Remark
	-	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1		1663.137	5.27	26.52	38.03	41.88	35.64	74.00	-38.36	peak
2		4367.058	7.41	33.60	38.20	43.02	45.83	74.00	-28.17	peak
3		4904.000	7.99	34.33	38.46	42.02	45.88	74.00	-28.12	peak
4	pp	6874.906	10.47	36.16	37.42	43.62	52.83	74.00	-21.17	peak
5		7356.000	10.04	36.36	36.97	40.79	50.22	74.00	-23.78	peak
6		9808.000	10.85	37.56	34.99	37.83	51.25	74.00	-22.75	peak



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



Condition: 3m VERTICAL Job No : 11955CR/11956CR

Mode : 2452 TX RSE

ote	. 2.4	G MILI	1111 4	0						
		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	12/12 002	4 OF	25 15	38.06	12 22	25 27	74 00	20 62	noole	
1	1342.882								•	
2	4482.150	7.54	33.60	38.26	42.88	45.76	74.00	-28.24	peak	
3	4904.000	7.99	34.33	38.46	41.56	45.42	74.00	-28.58	peak	
4	6894.806	10.42	36.21	37.40	42.13	51.36	74.00	-22.64	peak	
5	7356.000	10.04	36.36	36.97	40.56	49.99	74.00	-24.01	peak	
6 1	op 9808.000	10.85	37.56	34.99	39.96	53.38	74.00	-20.62	peak	



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Remark:

1) 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

- 2) Scan from 9kHz to 25GHz, the disturbance above 18GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.
- 3) As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. So, only the peak measurements were shown in the report.



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8 Appendix

Appendix 15.247

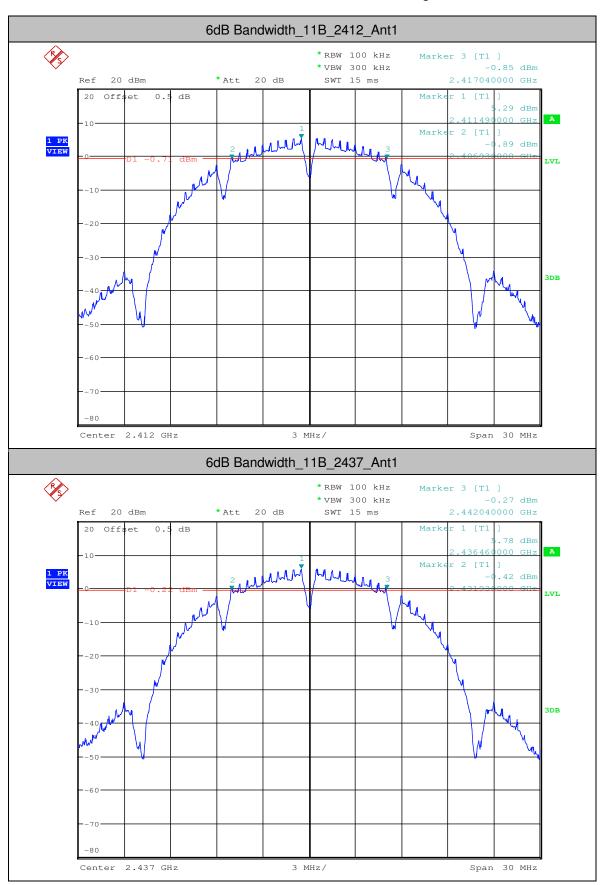
1.6dB Bandwidth

Test Mode	Test	Ant	EBW[MHz]	Limit[MHz	Verdict
11B	2412	Ant1	10.110	>=0.5	PASS
11B	2437	Ant1	10.110	>=0.5	PASS
11B	2462	Ant1	10.110	>=0.5	PASS
11G	2412	Ant1	16.620	>=0.5	PASS
11G	2437	Ant1	16.620	>=0.5	PASS
11G	2462	Ant1	16.605	>=0.5	PASS
11N20SISO	2412	Ant1	17.850	>=0.5	PASS
11N20SISO	2437	Ant1	17.850	>=0.5	PASS
11N20SISO	2462	Ant1	17.850	>=0.5	PASS
11N40SISO	2422	Ant1	36.480	>=0.5	PASS
11N40SISO	2437	Ant1	36.480	>=0.5	PASS
11N40SISO	2452	Ant1	36.480	>=0.5	PASS



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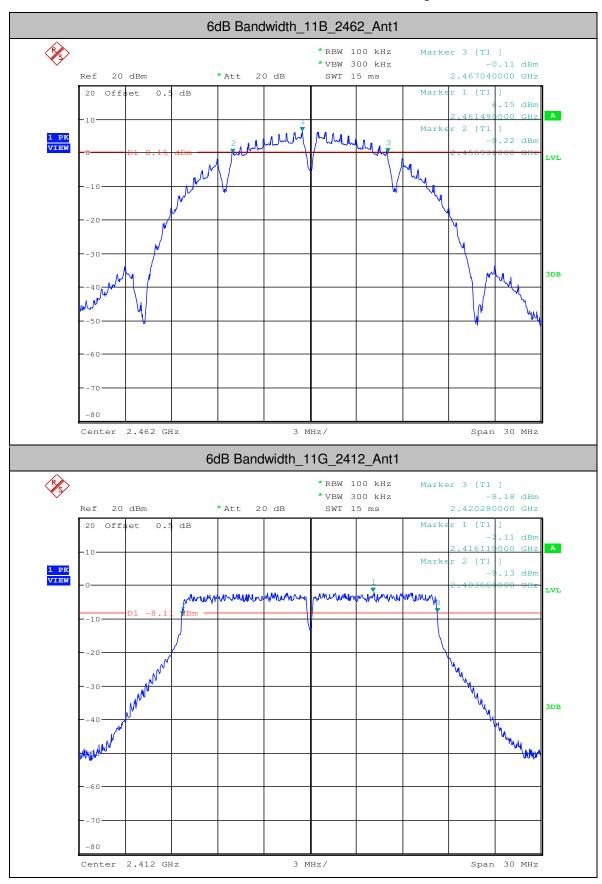
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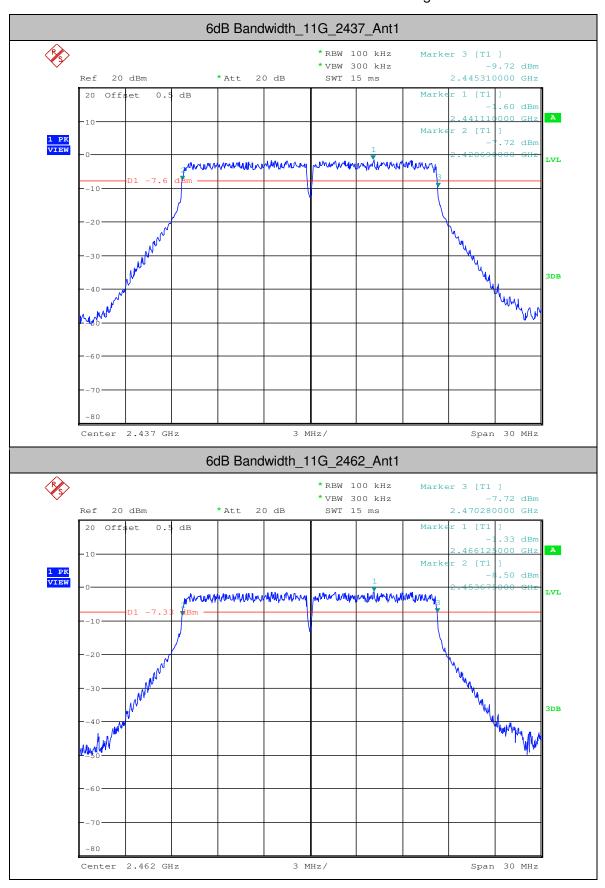
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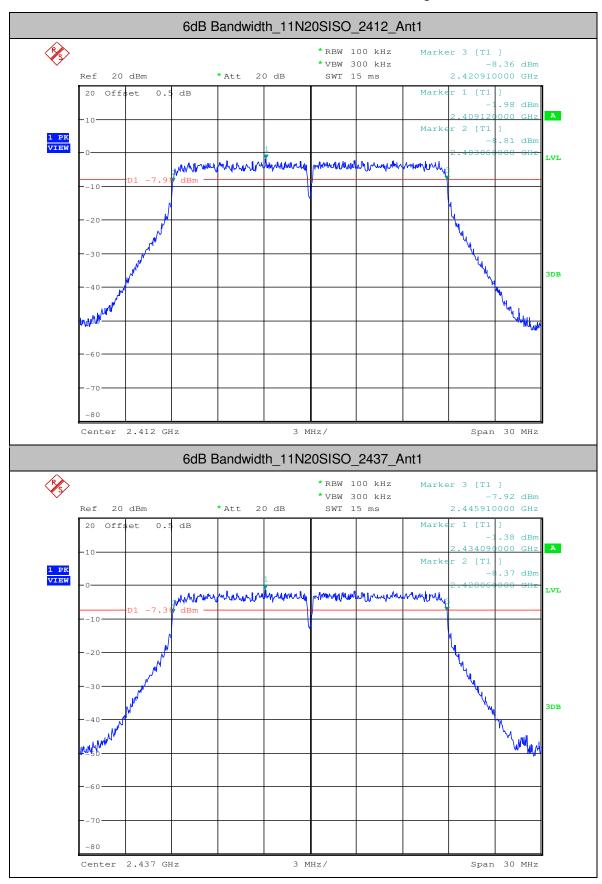
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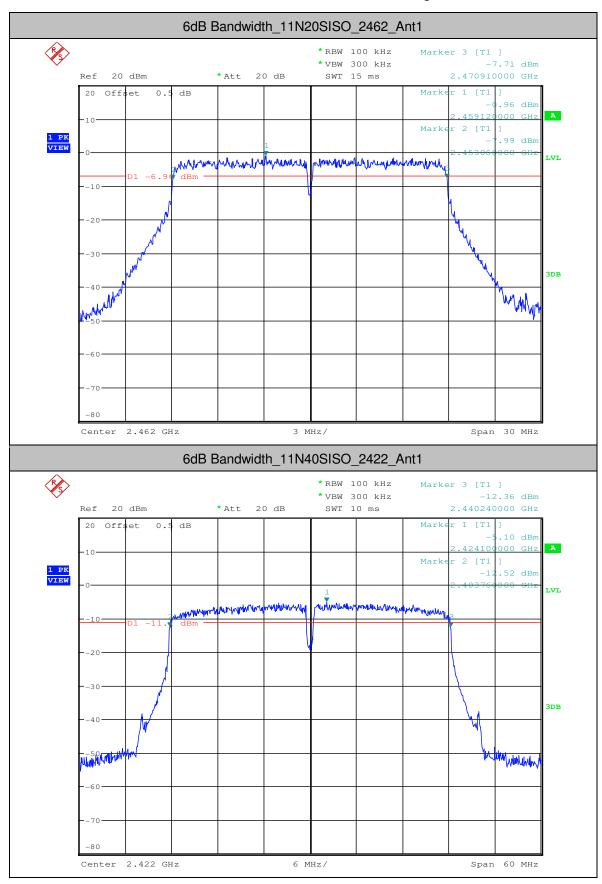
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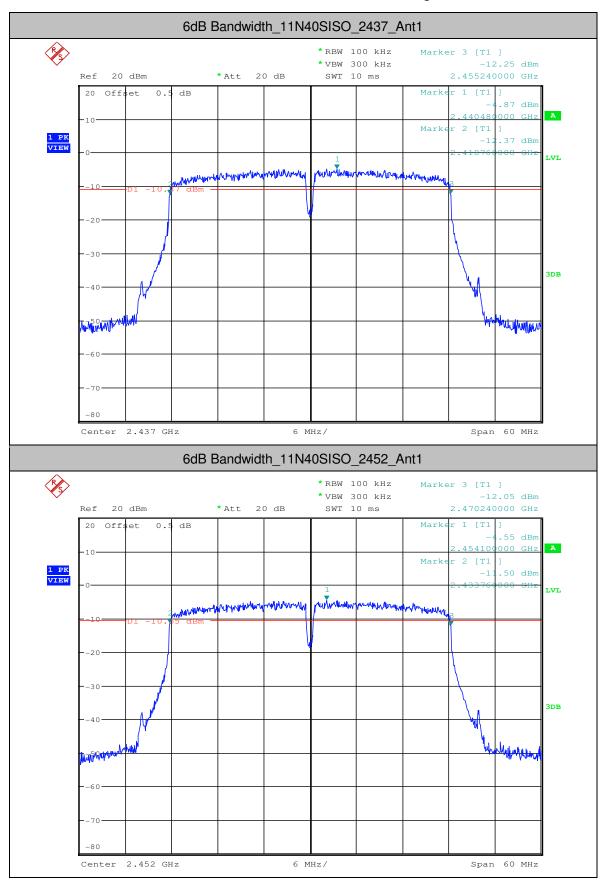
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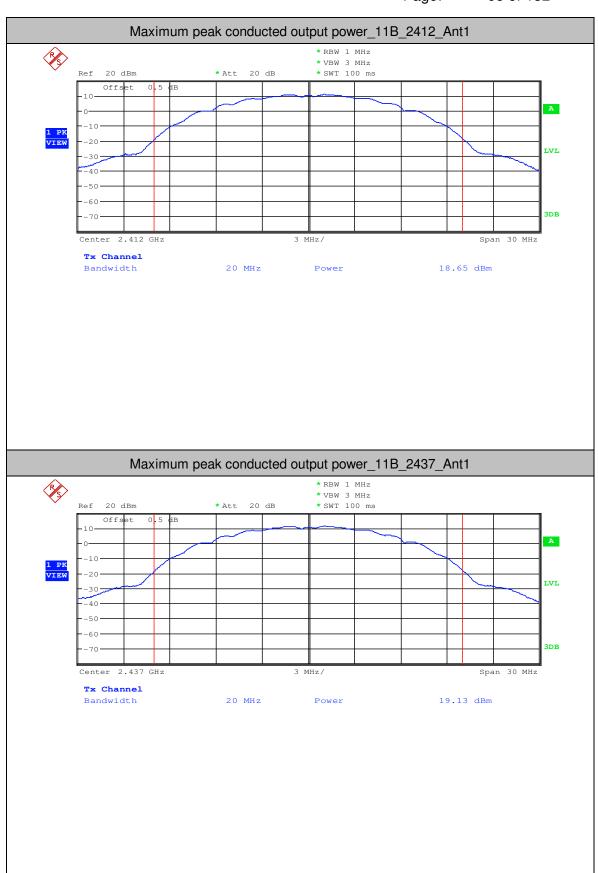
3. Maximum peak conducted output power

Test Mode	Test Channel	Ant	Power[dBm]	Limit[dBm]	Verdict
11B	2412	Ant1	18.65	<30	PASS
11B	2437	Ant1	19.13	<30	PASS
11B	2462	Ant1	19.47	<30	PASS
11G	2412	Ant1	20.26	<30	PASS
11G	2437	Ant1	20.73	<30	PASS
11G	2462	Ant1	21.04	<30	PASS
11N20SISO	2412	Ant1	17.59	<30	PASS
11N20SISO	2437	Ant1	18.13	<30	PASS
11N20SISO	2462	Ant1	18.59	<30	PASS
11N40SISO	2422	Ant1	17.2	<30	PASS
11N40SISO	2437	Ant1	17.5	<30	PASS
11N40SISO	2452	Ant1	17.74	<30	PASS



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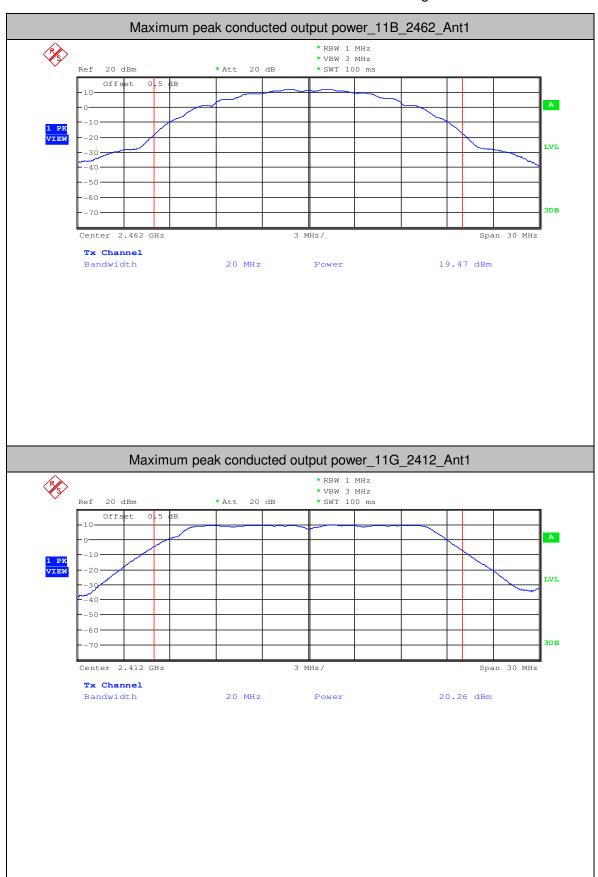
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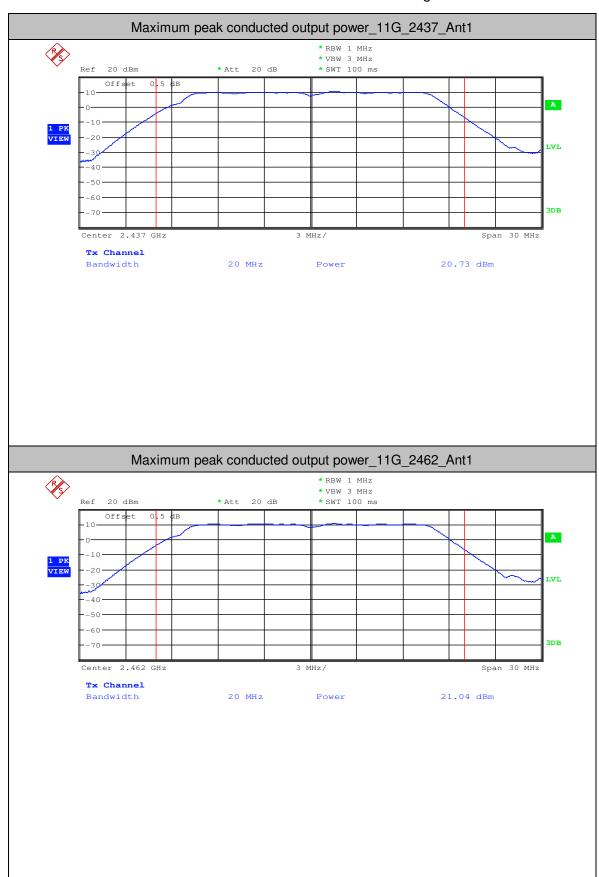
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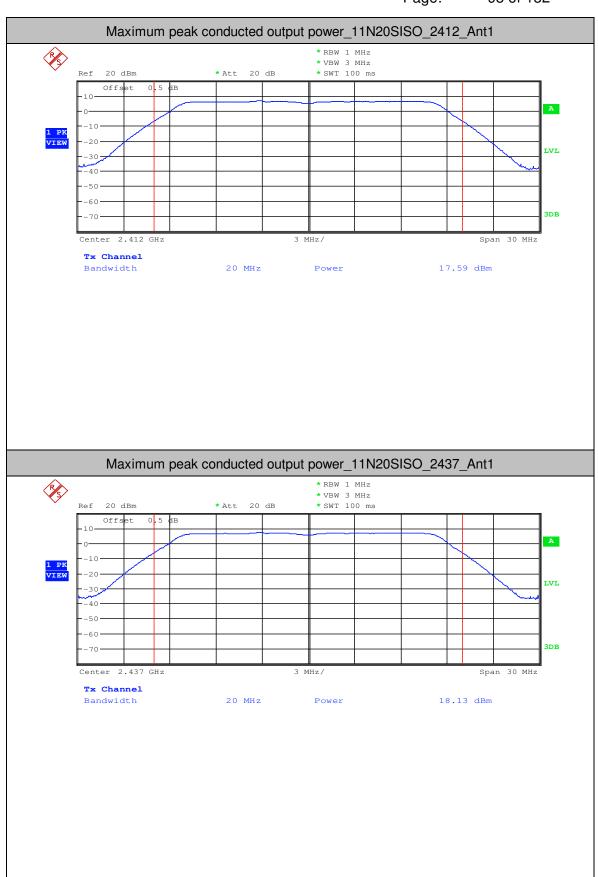
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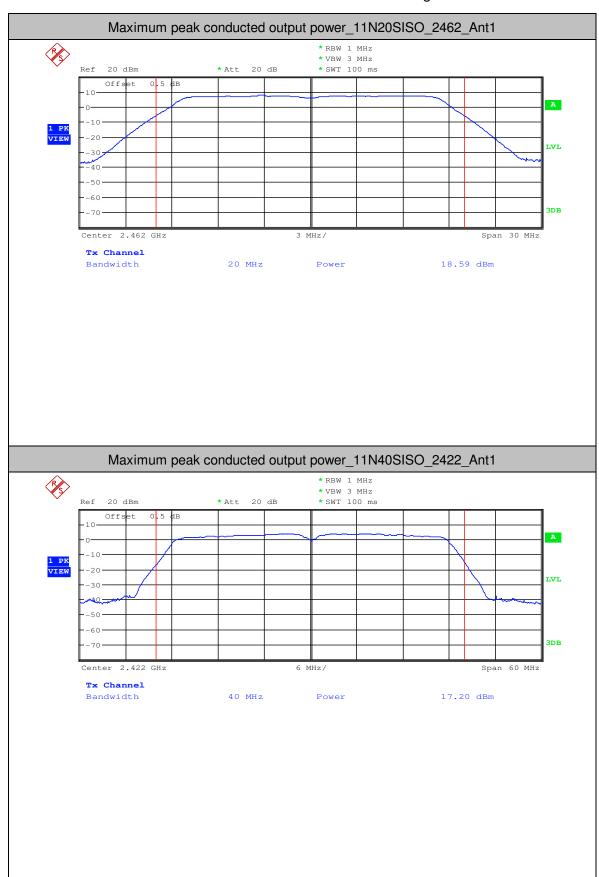
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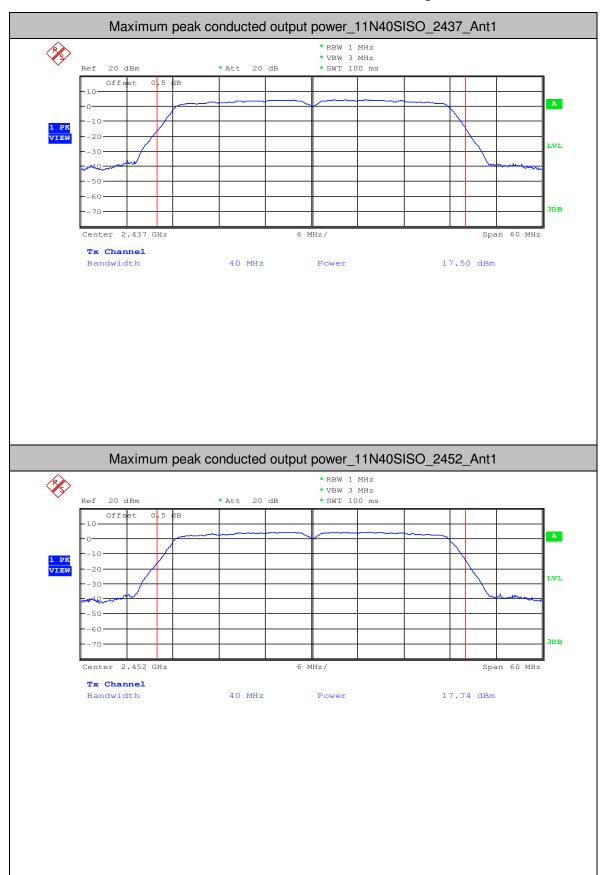
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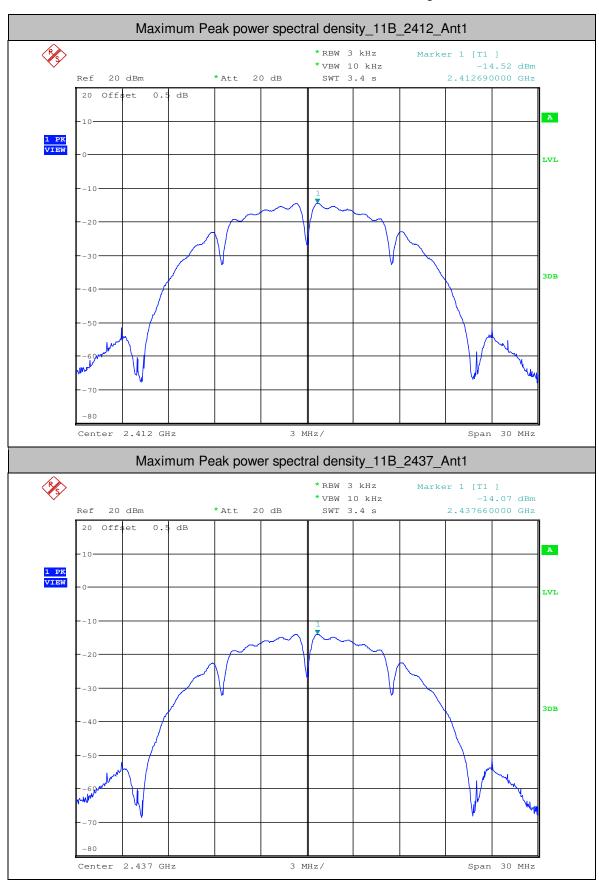
4. Maximum Peak power spectral density

Test Mode	Test Channel	Ant	PSD[dBm/3kHz]	Limit[dBm/3kHz	Verdict
11B	2412	Ant1	-14.52	<8.00	PASS
11B	2437	Ant1	-14.07	<8.00	PASS
11B	2462	Ant1	-13.7	<8.00	PASS
11G	2412	Ant1	-16.29	<8.00	PASS
11G	2437	Ant1	-15.54	<8.00	PASS
11G	2462	Ant1	-15.36	<8.00	PASS
11N20SISO	2412	Ant1	-18.7	<8.00	PASS
11N20SISO	2437	Ant1	-18.04	<8.00	PASS
11N20SISO	2462	Ant1	-18.1	<8.00	PASS
11N40SISO	2422	Ant1	-18.55	<8.00	PASS
11N40SISO	2437	Ant1	-19.9	<8.00	PASS
11N40SISO	2452	Ant1	-17.85	<8.00	PASS



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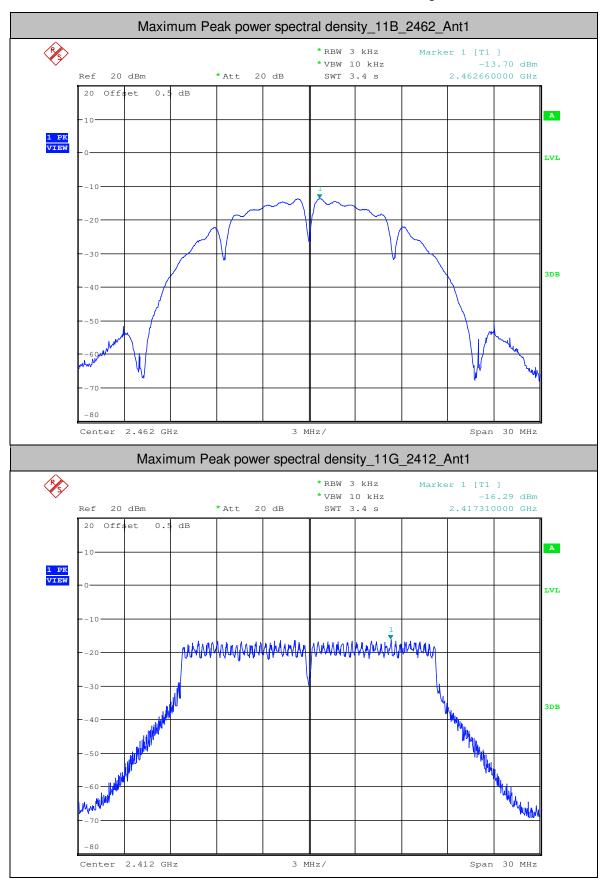
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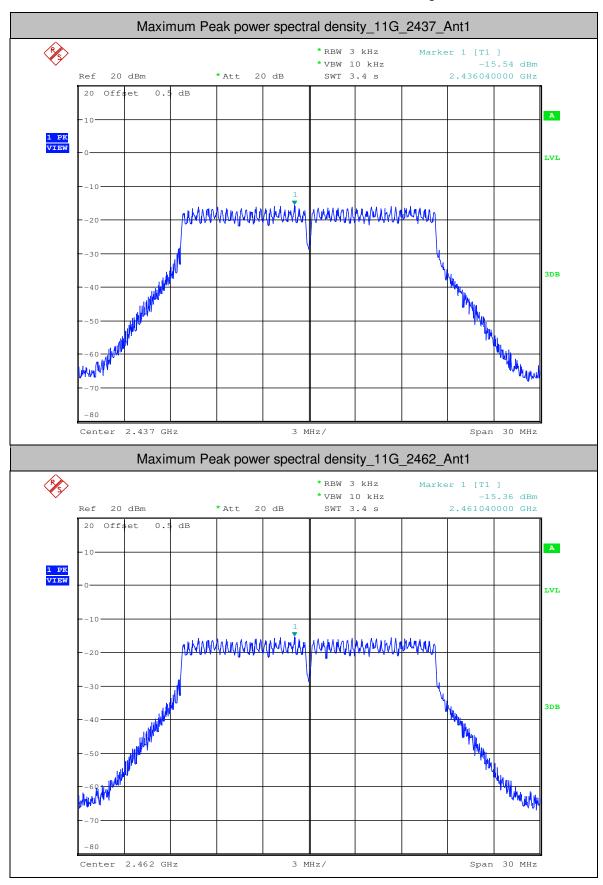
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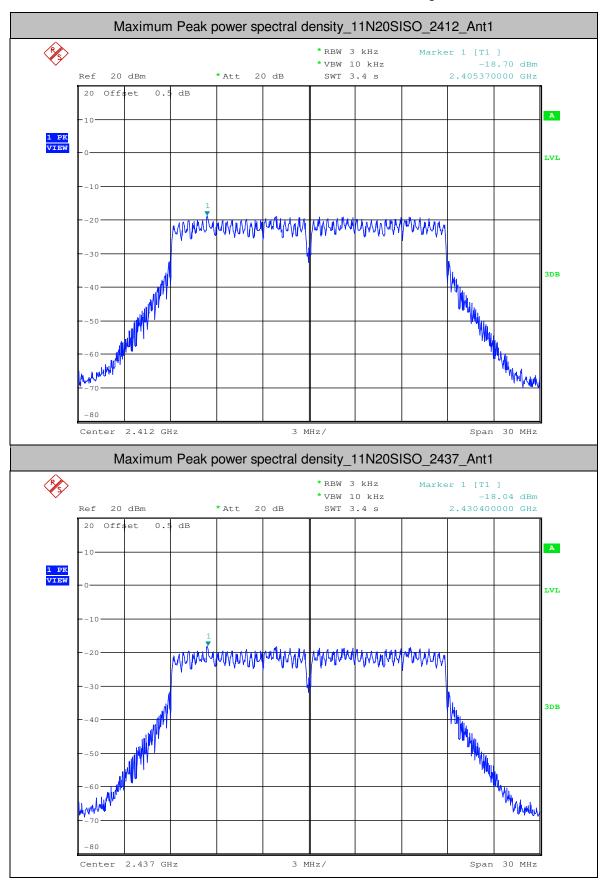
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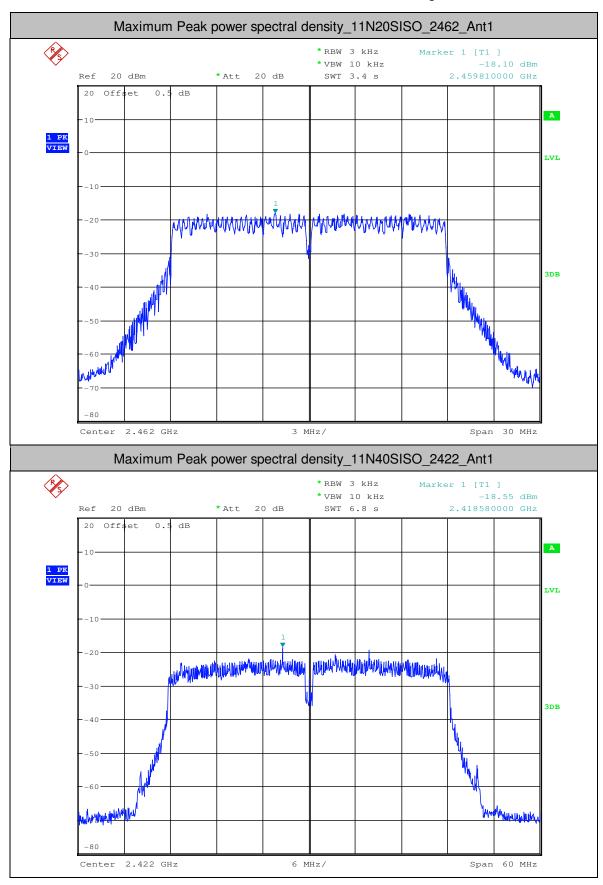
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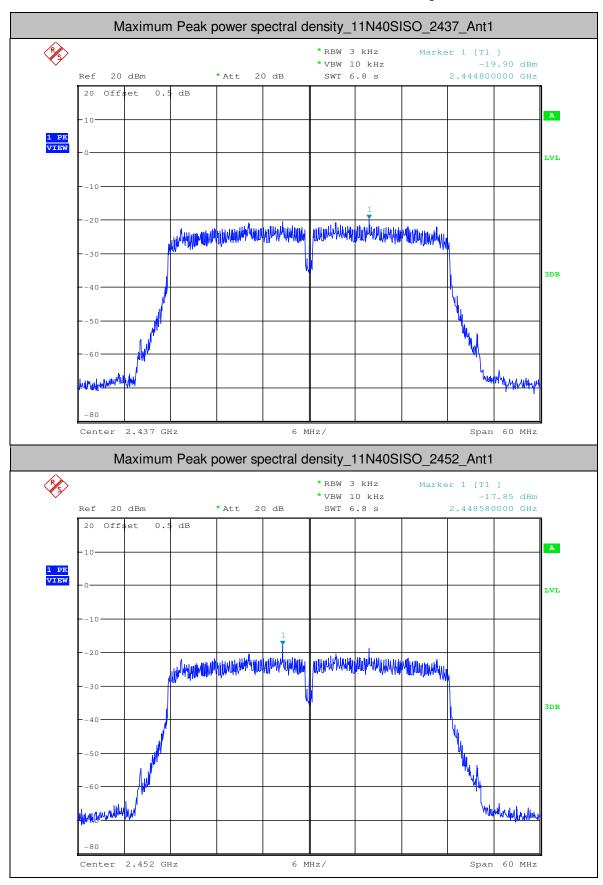
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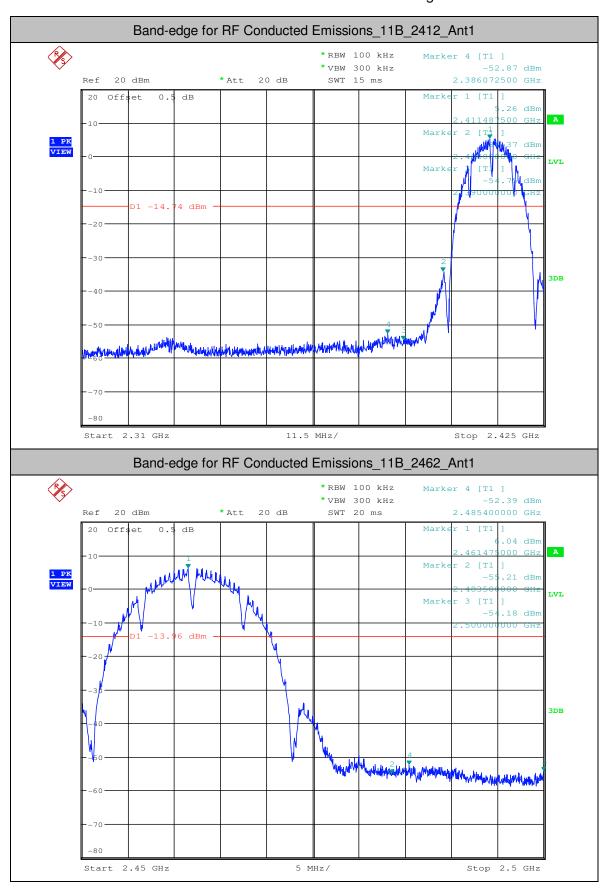
5.Band-edge for RF Conducted Emissions

Test Mode	Test Channel	Ant	Carrier Power[dBm]	Max. Spurious Level [dBm]	Limit [dBm]	Verdict
11B	2412	Ant1	5.260	-52.866	<-14.74	PASS
11B	2462	Ant1	6.040	-52.393	<-13.96	PASS
11G	2412	Ant1	-2.270	-49.250	<-22.27	PASS
11G	2462	Ant1	-1.370	-46.895	<-21.37	PASS
11N20SISO	2412	Ant1	-2.280	-49.797	<-22.28	PASS
11N20SISO	2462	Ant1	-1.090	-48.318	<-21.09	PASS
11N40SISO	2422	Ant1	-5.020	-52.762	<-25.02	PASS
11N40SISO	2452	Ant1	-4.680	-49.160	<-24.68	PASS



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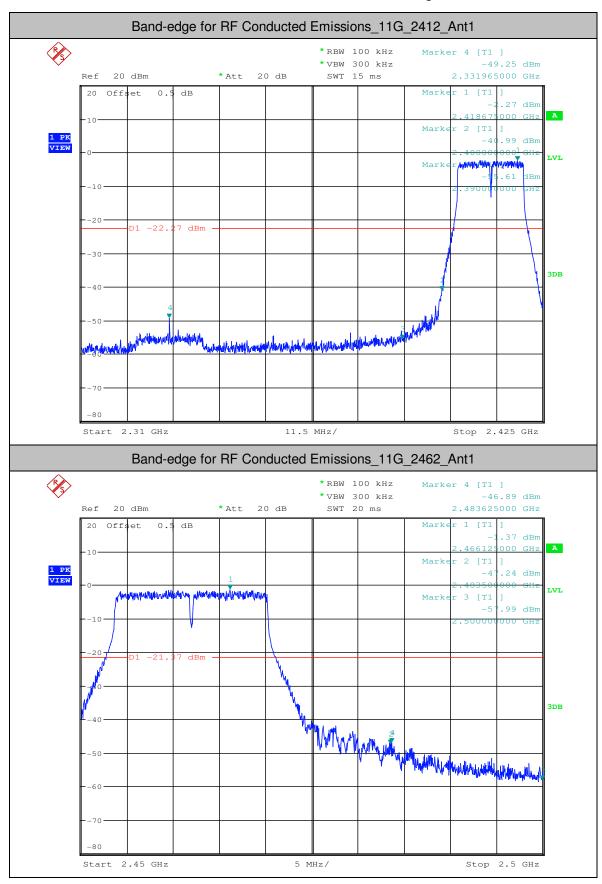
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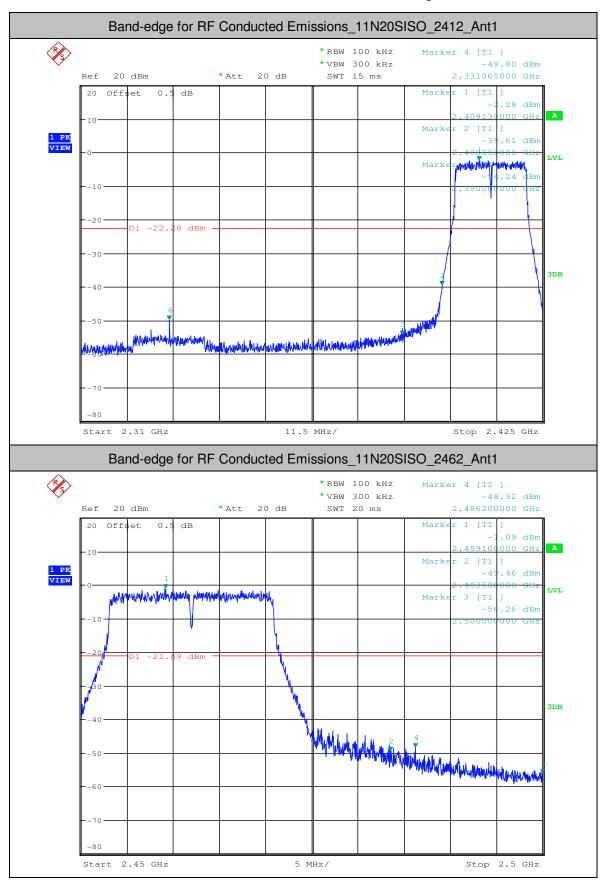
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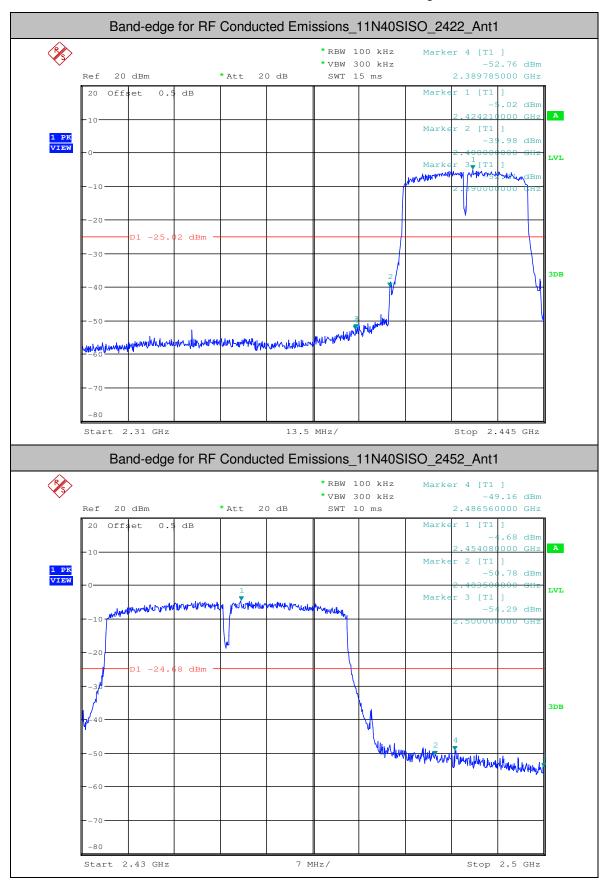
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6.RF Conducted Spurious Emissions

Test Mode	Test Channel	StartFre [MHz]	StopFre [MHz]	RBW [kHz]	VBW [kHz]	Pref[dBm	Max. Level [dBm]	Limit [dBm]	Verdic t
11B	2412	30	10000	1000	3000	5.15	-30.120	<- 14.85	PASS
11B	2412	10000	25000	1000	3000	5.15	-55.460	<- 14.85	PASS
11B	2437	30	10000	1000	3000	5.63	-29.770	<- 14.37	PASS
11B	2437	10000	25000	1000	3000	5.63	-55.810	<- 14.37	PASS
11B	2462	30	10000	1000	3000	5.95	-29.090	<- 14.05	PASS
11B	2462	10000	25000	1000	3000	5.95	-56.010	<- 14.05	PASS
11G	2412	30	10000	1000	3000	-2.03	-36.530	<- 22.03	PASS
11G	2412	10000	25000	1000	3000	-2.03	-55.180	<- 22.03	PASS
11G	2437	30	10000	1000	3000	-1.52	-35.690	<- 21.52	PASS
11G	2437	10000	25000	1000	3000	-1.52	-55.430	<- 21.52	PASS
11G	2462	30	10000	1000	3000	-1.19	-34.590	<- 21.19	PASS
11G	2462	10000	25000	1000	3000	-1.19	-55.710	<- 21.19	PASS
11N20SISO	2412	30	10000	1000	3000	-1.89	-33.760	<- 21.89	PASS
11N20SISO	2412	10000	25000	1000	3000	-1.89	-55.460	<- 21.89	PASS
11N20SISO	2437	30	10000	1000	3000	-1.37	-34.030	<- 21.37	PASS
11N20SISO	2437	10000	25000	1000	3000	-1.37	-55.710	<- 21.37	PASS
11N20SISO	2462	30	10000	1000	3000	-1.09	-34.770	<- 21.09	PASS
11N20SISO	2462	10000	25000	1000	3000	-1.09	-55.340	<- 21.09	PASS
11N40SISO	2422	30	10000	1000	3000	-5.51	-39.050	<- 25.51	PASS



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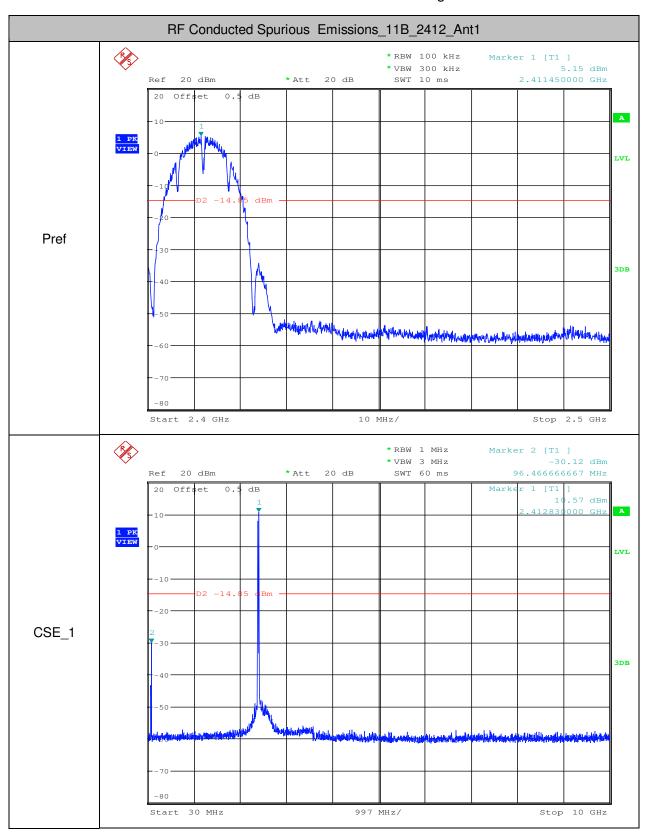
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11N40SISO	2422	10000	25000	1000	3000	-5.51	-55.030	<- 25.51	PASS
11N40SISO	2437	30	10000	1000	3000	-4.93	-38.800	<- 24.93	PASS
11N40SISO	2437	10000	25000	1000	3000	-4.93	-55.700	<- 24.93	PASS
11N40SISO	2452	30	10000	1000	3000	-4.47	-38.950	<- 24.47	PASS
11N40SISO	2452	10000	25000	1000	3000	-4.47	-55.260	<- 24.47	PASS



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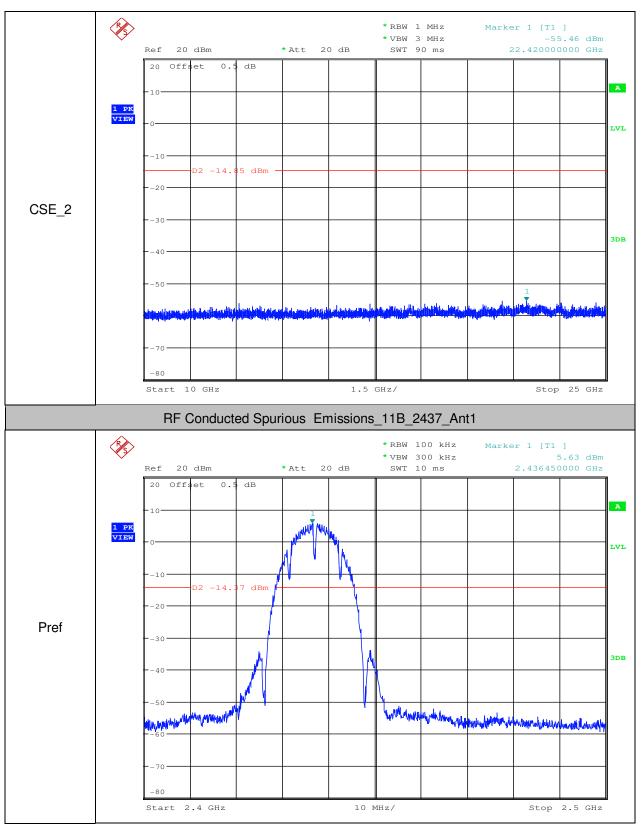
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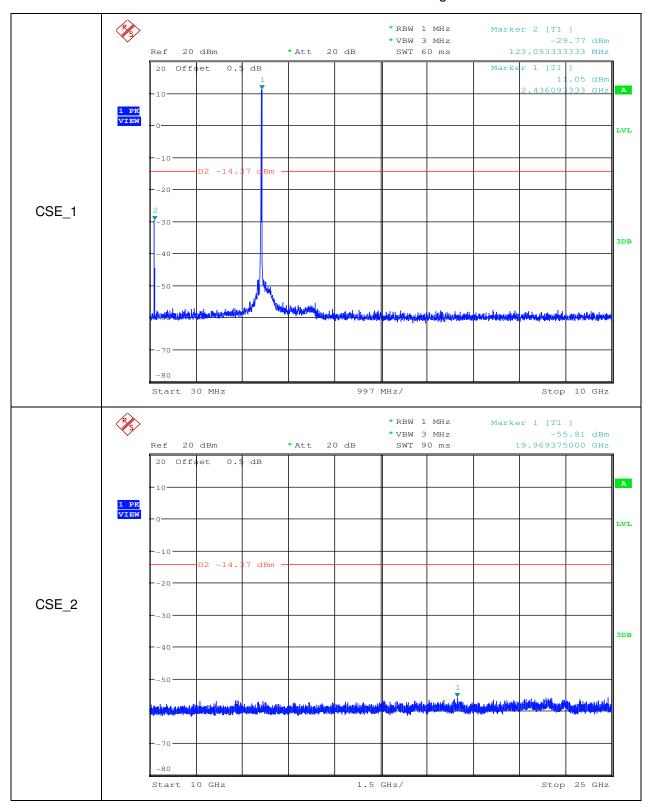
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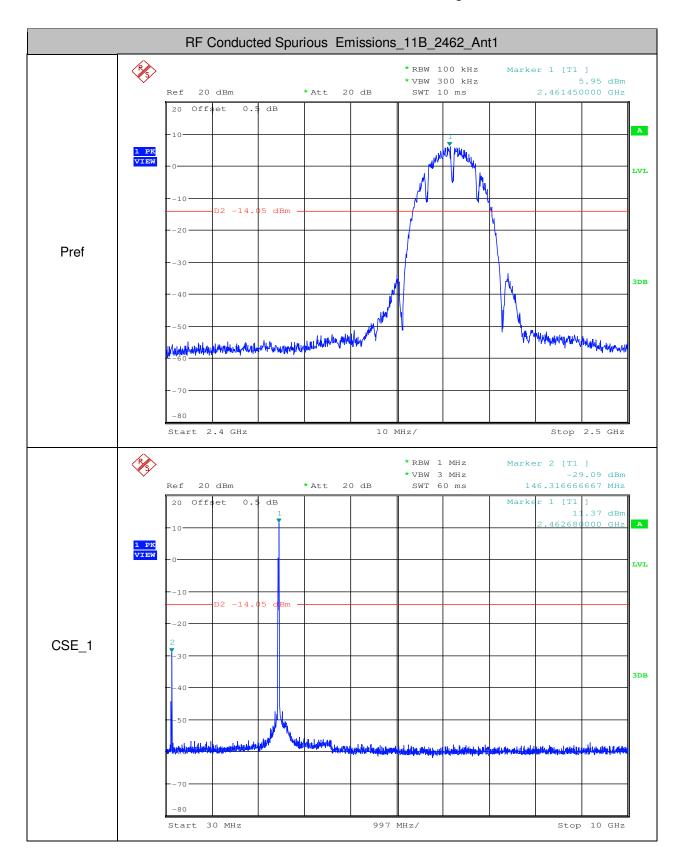
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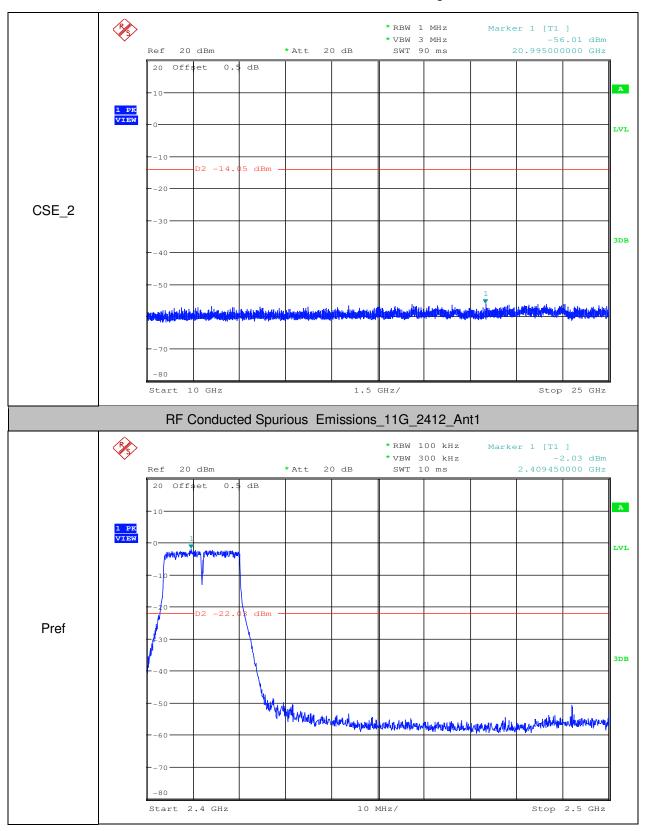
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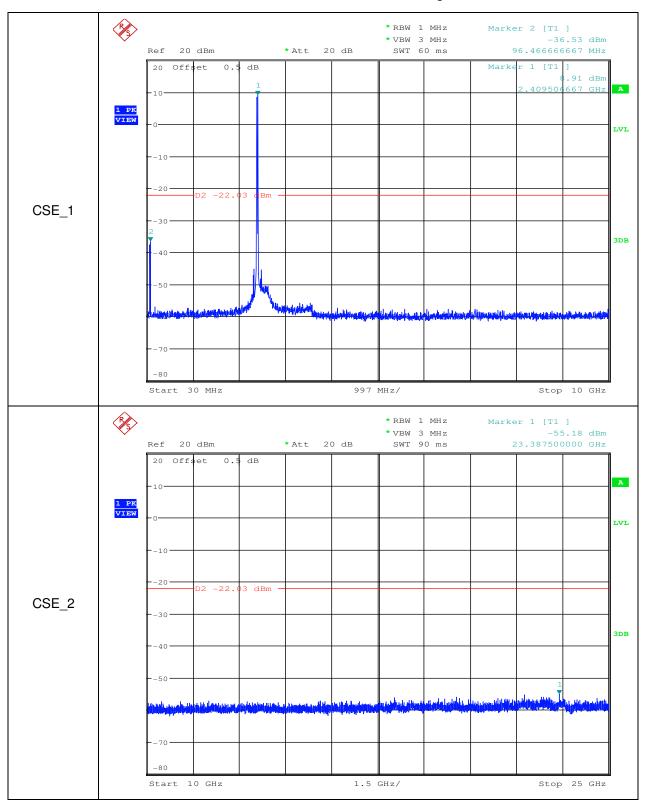
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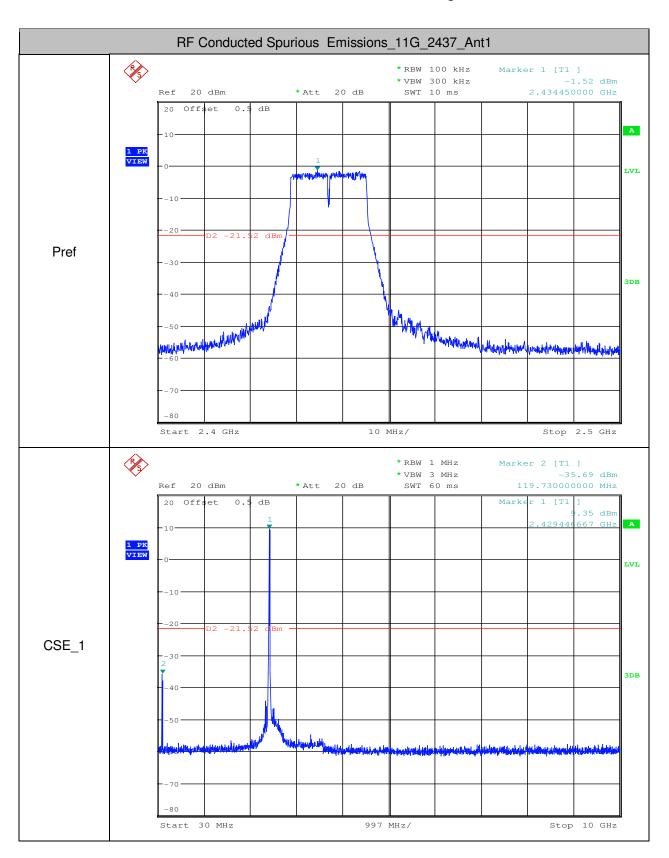
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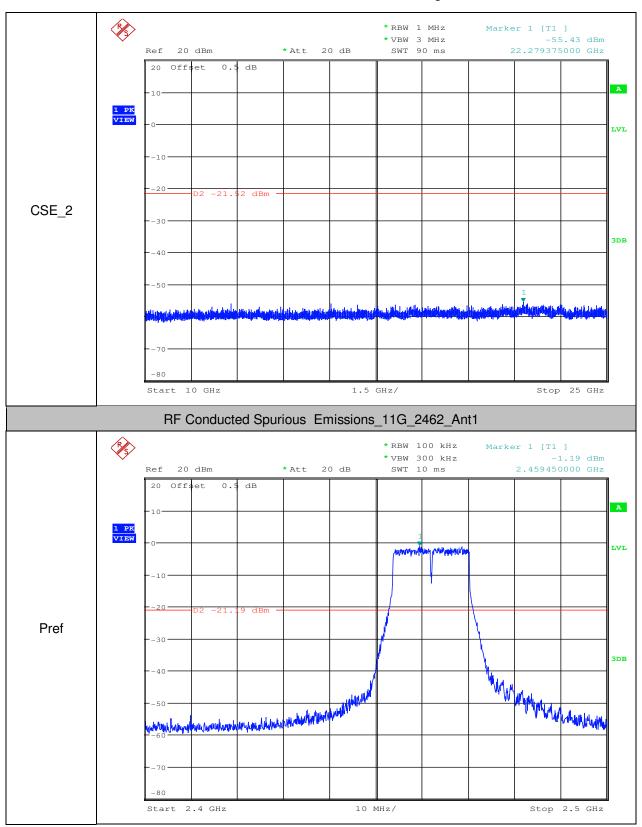
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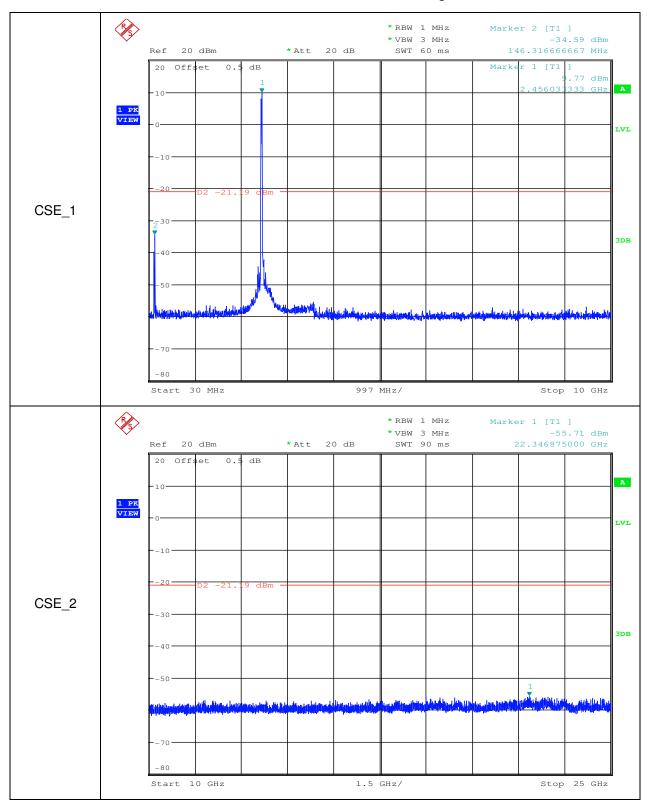
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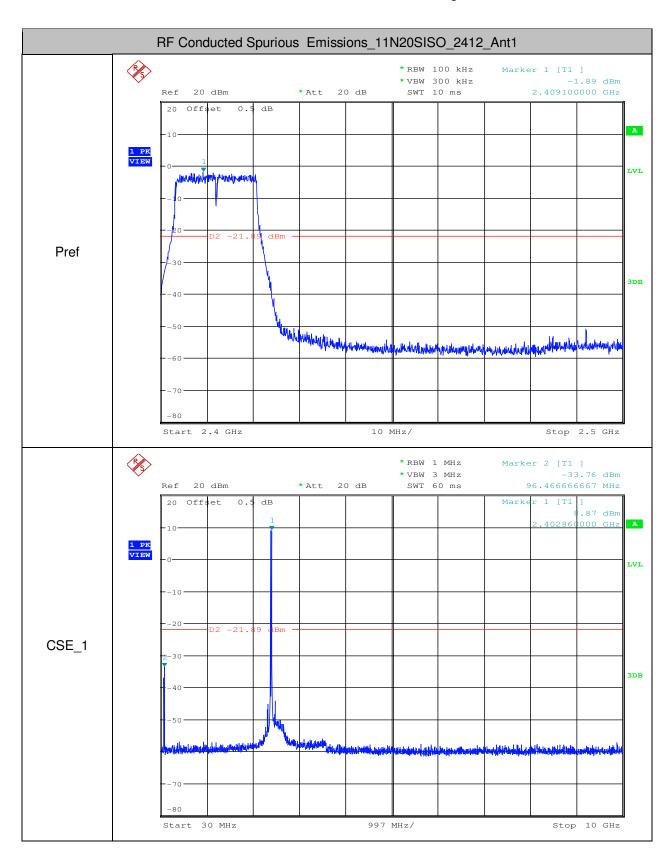
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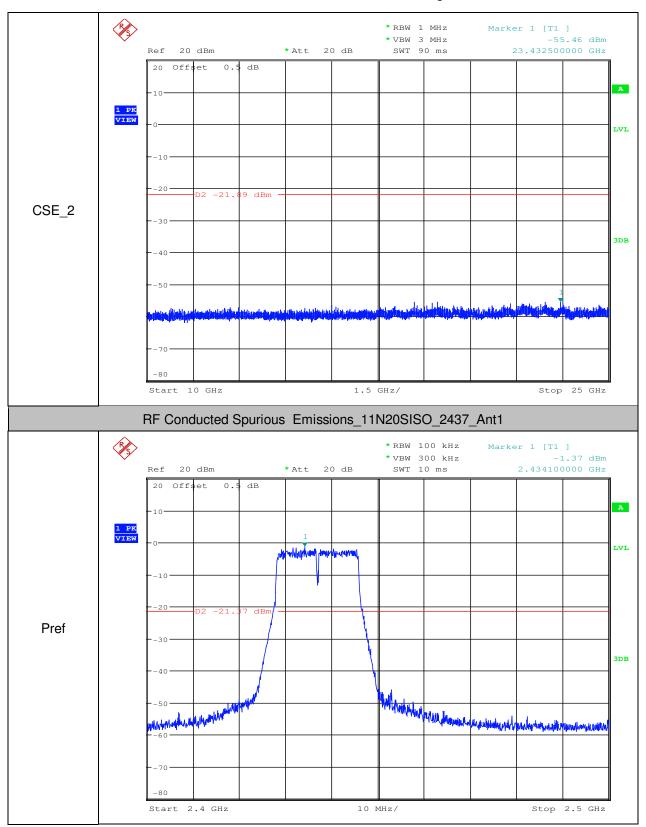
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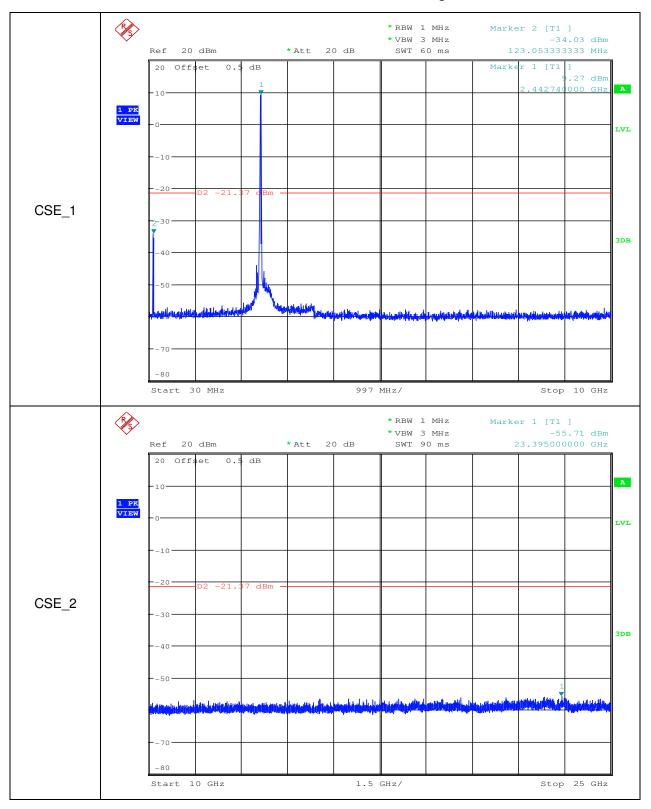
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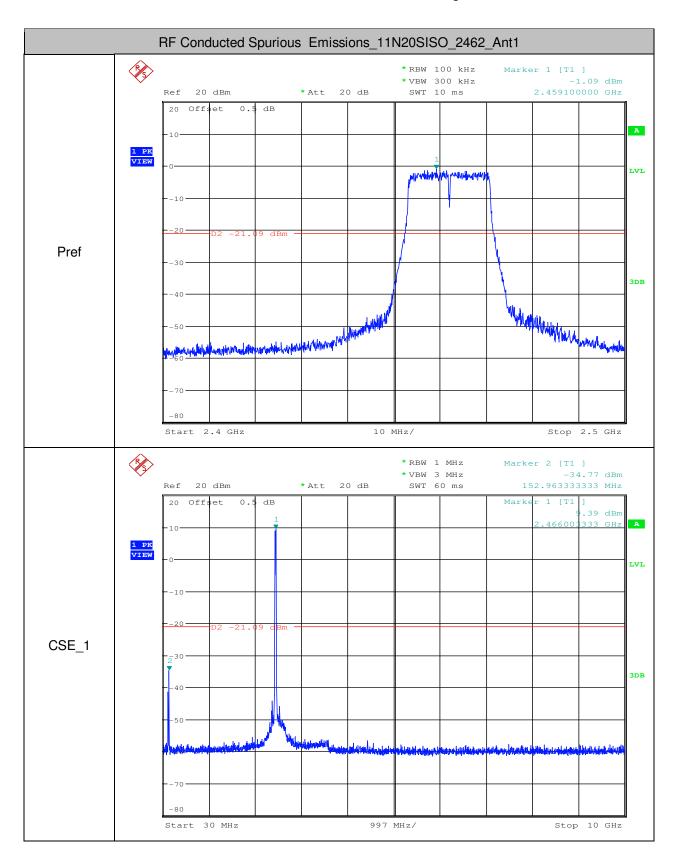
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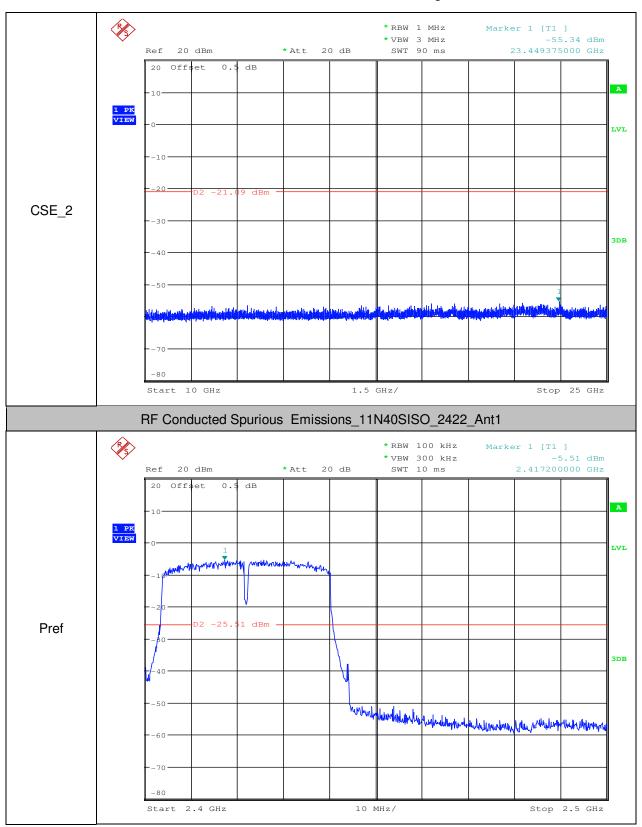
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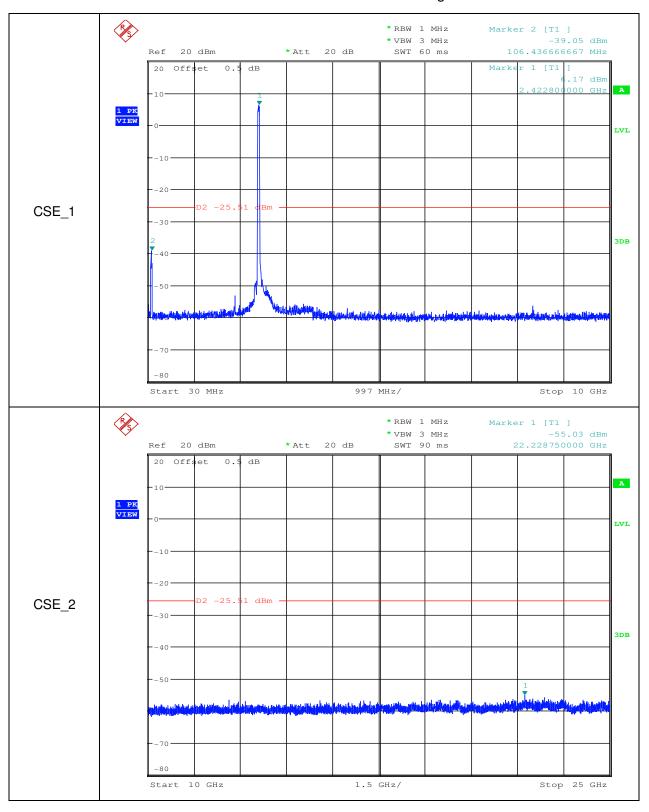
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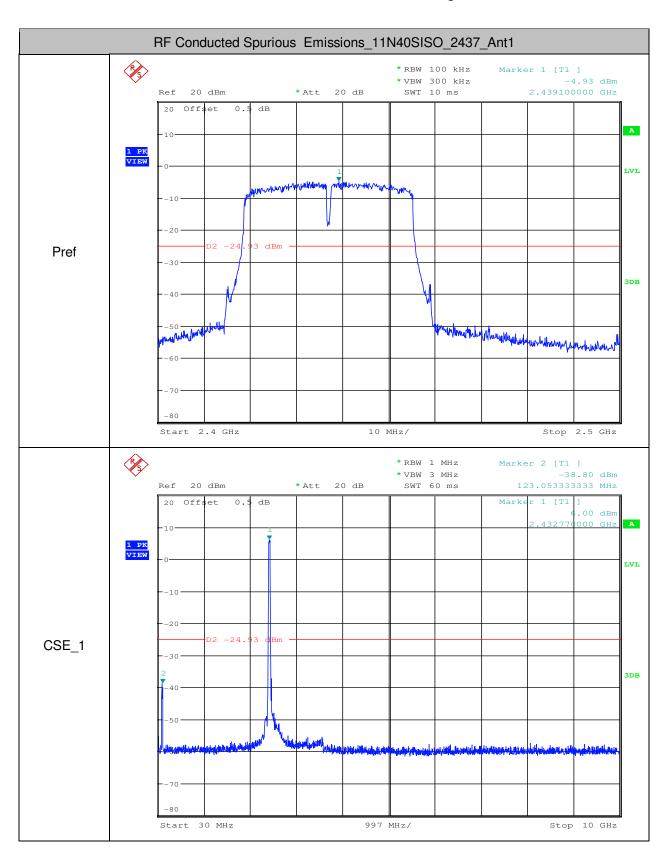
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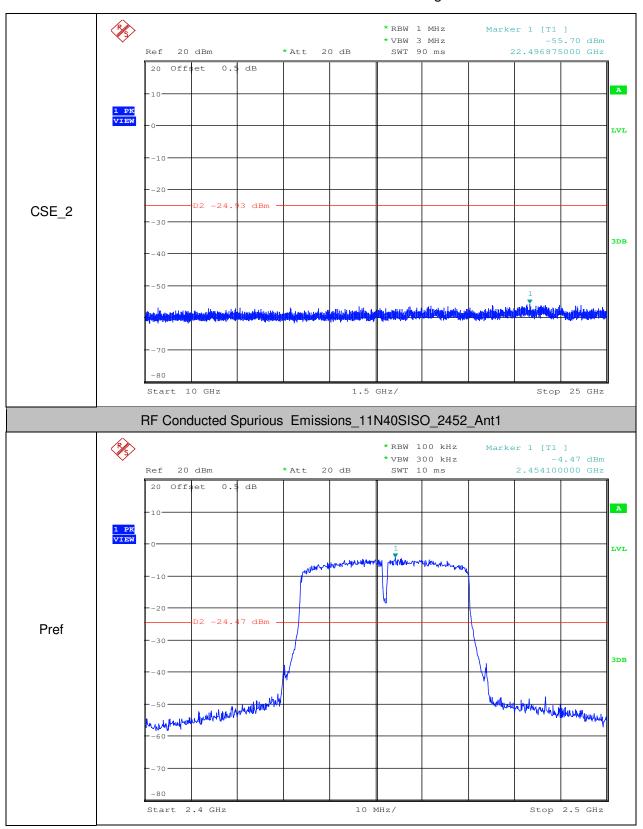
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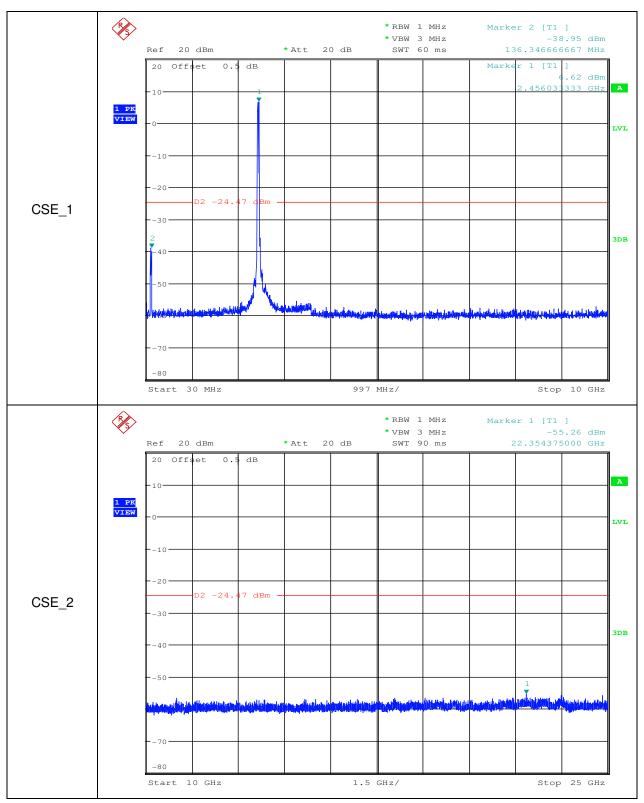
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