FCC PART 15C/IC RSS-210 TEST REPORT

No. 2013WLN0841

for

Sony Mobile Communications AB

GSM/WCDMA/LTE mobile phone

Type: PM-0762-BV

FCC ID: PY7PM-0762

With

Hardware Version: AP1

Software Version: 19.0.A.0.250

Issued Date: 2014-01-17

Note: The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of TMC Beijing.

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1. TEST LATORATORY

1.1. Testing Location

Company Name:	TMC Beijing, Telecommunication Metrology Center of MIIT
Address:	No. 52, Huayuan Bei Road, Haidian District, Beijing, P. R. China
Postal Code:	100191
Telephone:	+86-10-62304633-2561
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1.2. Project data

Testing Start Date:	2013-12-28
Testing End Date:	2014-01-17

1.3. Signature

Xu Zhongfei

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(Reviewed this test report)

Xiao Li

Deputy Director of the laboratory

(Approved this test report)

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2. CLIENT INFORMATION

2.1. Applicant Information

Company Name:	Sony Mobile Communications AB
Address /Post:	Sony Mobile R&D Center, No. 16, Guangshun South Street, Chaoyang District
City:	Beijing
Postal Code:	100102
Country:	China
Contact Person:	Ma, Gang
Telephone:	+86-10-58656312
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2.2. Manufacturer Information

Company Name:	Sony Mobile Communications AB
Address /Post:	Sony Mobile R&D Center, No. 16, Guangshun South Street, Chaoyang District
City:	Beijing
Postal Code:	100102
Country:	China
Contact Person:	Ma, Gang
Telephone:	+86-10-58656312
Fax:	+86-10-58659049

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3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT(AE)

3.1. About EUT

Description	GSM 850/900/1800/1900 quad bands, GPRS, EDGE, WCDMA FDD bands 1/5/8, HSDPA, HSUPA, LTE FDD bands 1/3/5/7/8/20 Bluetooth (EDR and 4.0), ANT+, WLAN (802.11 a/b/g/n), NFC, FM, GPS mobile phone
Type	PM-0762-BV
FCC ID	PY7PM-0762
WLAN Frequency Range	ISM Band: 5725MHz~5850MHz
Type of modulation	OFDM
MAX Conducted Power	19.09dBm(OFDM)
MAX Radiated Power	20.30dBm(OFDM)
Extreme Temperature	-20/+55°C
Extreme vol. Limits	3.5VDC to 4.1VDC (nominal: 3.7VDC)

Note: Photographs of EUT are shown in ANNEX C of this test report. Components list, please refer to documents of the manufacturer; it is also included in the original test record of Telecommunication Metrology Center of MIIT of People's Republic of China.

3.2. Internal Identification of EUT used during the test

EUT ID*	S/N	IMEI	HW Version	SW Version
EUT1	CB512686FD	004402451819274	AP1	19.0.A.0.250
EUT2	CB512686RD	004402451819183	AP1	19.0.A.0.250

*EUT ID: is used to identify the test sample in the lab internally.

3.3. Internal Identification of AE used during the test

AE ID*	Description	Type	SN
AE1	Travel Charger	AC-0400-EU	4413W 18 511285
AE2	USB Cable	AI-0401	131307D20BE8904

*AE ID: is used to identify the test sample in the lab internally.

3.4. General Description

The Equipment Under Test (EUT) is a model of GSM/WCDMA/LTE Mobile Phone with integrated antenna and inbuilt battery.

The EUT supports GSM 850/900/1800/1900MHz bands, WCDMA FDD bands 1/5/8 and LTE FDD bands 1/3/5/7/8/20. It supports GPRS service with multi-slots class 33 and EGPRS service with multi-slots class 33. The HSDPA and HSUPA (Cat 6) features are also supported.

It has MP3, camera, USB memory, Mobile High-Definition Link (MHL), FM radio, GPS receiver, NFC, Bluetooth (EDR and Bluetooth 4.0), ANT+, WLAN (802.11 a/b/g/n) and Wi-Fi hotspot

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functions. For WLAN 802.11n, it supports 20MHz and 40MHz bandwidths on both 2.4GHz band and 5GHz/5.8GHz band.
It includes normal option: USB cable.
Manual and specifications of the EUT were provided to fulfil the test.
Samples undergoing test were selected by the client.

4. REFERENCE DOCUMENTS

4.1. Documents supplied by applicant

EUT feature information is supplied by the applicant or manufacturer, which is the basis of testing.

4.2. Reference Documents for testing

The following documents listed in this section are referred for testing.

FCC Part15	FCC CFR 47, Part 15, Subpart C: 15.205 Restricted bands of operation; 15.209 Radiated emission limits, general requirements; 15.247 Operation within the bands 902–928MHz, 2400–2483.5 MHz, and 5725–5850 MHz	Oct, 2012
ANSI C63.10	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2009
KDB558074	Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247	2013
RSS-GEN	Spectrum Management and Telecommunications - Radio Standards Specification General Requirements and Information for the Certification of Radio communication Equipment	Issue 3
RSS-210	Spectrum Management and Telecommunications - Radio Standards Specification Low-power License-exempt Radio communication Devices (All Frequency Bands): Category I Equipment	Issue 8

5. LABORATORY ENVIRONMENT

Conducted RF performance testing is performed in shielding room.

EMC performance testing is performed in Semi-anechoic chamber.

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6. SUMMARY OF TEST RESULTS

6.1. Summary of Test Results

SUMMARY OF MEASUREMENT RESULTS	Sub-clause of Part15C	Sub-clause of IC	Verdict
Maximum Peak Output Power	15.247 (b)	A8,A9	**P**
Peak Power Spectral Density	15.247 (e)	A8,A9	**P**
Occupied 6dB Bandwidth	15.247 (a)	A8	**P**
99% Occupied Bandwidth	/	RSS-Gen 4.6.1	**P**
Band Edges Compliance	15.247 (b)	A8	**P**
Transmitter Spurious Emission - Conducted	15.247	A8	**P**
Transmitter Spurious Emission - Radiated	15.247, 15.205, 15.209	A8	**P**
Transmitter Spurious Emission - Radiated < 30MHz	15.247, 15.209	7.2.2	**P**
AC Power line Conducted Emission	15.107, 15.207	A8,A9	**P**

Please refer to **ANNEX A** for detail.

Terms used in Verdict column

P	Pass, The EUT complies with the essential requirements in the standard.
NM	Not measured, The test was not measured by TMC
NA	Not Applicable, The test was not applicable
F	Fail, The EUT does not comply with the essential requirements in the standard

6.2. Statements

TMC has evaluated the test cases requested by the client/manufacturer as listed in section 6.1 of this report for the EUT specified in section 3 according to the standards or reference documents listed in section 4.1.

This report only deals with the WLAN function among the features described in section 3.

6.3. Test Conditions

For this report, all the test cases are tested under normal temperature and normal voltage, and also under norm humidity, the specific condition is shown as follows:

Temperature	26℃
Voltage	3.7V
Humidity	44%

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7. TEST EQUIPMENTS UTILIZED

Conducted test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration date	Calibration Due date
1	Vector Signal Analyzer	FSQ40	200089	Rohde & Schwarz	2013-07-08	2014-07-07
2	Test Receiver	ESS	847151/015	Rohde & Schwarz	2013-10-30	2014-10-29
3	LISN	ESH2-Z5	829991/012	Rohde & Schwarz	2013-4-15	2014-08-12
4	Shielding Room	S81	/	ETS-Lindgren	/	/

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration date	Calibration Due date
1	Test Receiver	ESU26	100376	Rohde & Schwarz	2013-11-8	2014-11-7
2	BiLog Antenna	VULB9163	9163-514	Schwarzbeck	2011-11-11	2014-11-10
3	Dual-Ridge Waveguide Horn Antenna	3117	00119024	ETS-Lindgren	2011-2-2	2014-2-1
4	Dual-Ridge Waveguide Horn Antenna	3116	2661	EMCO	2011-7-1	2014-06-30
5	Loop antenna	HFH2-Z2	829324/007	Rohde & Schwarz	2011-12-21	2014-12-20
6	Semi-anechoic chamber	/	CT000332-1074	Frankonia German	/	/

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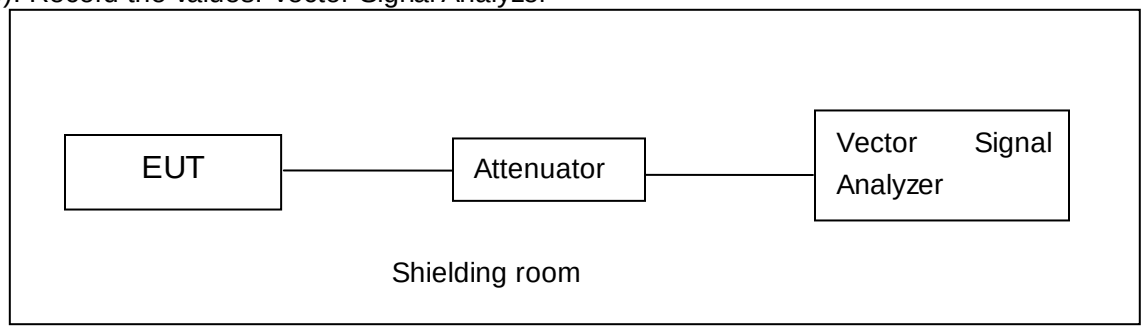
ANNEX A: MEASUREMENT RESULTS

A.1. Measurement Method

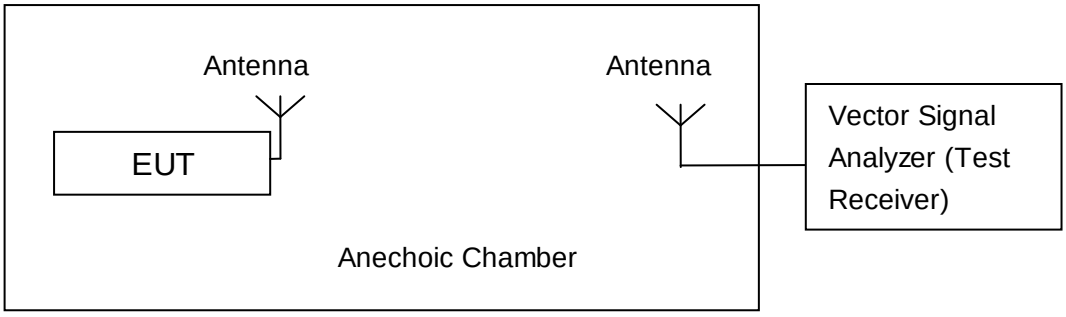
A.1.1. Conducted Measurements

1). Connect the EUT to the test system correctly.
2). Set the EUT to the required work mode.
3). Set the EUT to the required channel.
4). Set the spectrum analyzer to start measurement.
5). Record the values. Vector Signal Analyzer



A.1.2. Radiated Emission Measurements

In the case of radiated emission, the used settings are as follows,
Sweep frequency from 30 MHz to 1GHz, RBW = 100 kHz, VBW = 300 kHz;
Sweep frequency from 1 GHz to 26GHz, RBW = 1MHz, VBW = 10Hz;



The measurement is made according to ANSI C63.10 and KDB558074
The radiated emission test is performed in semi-anechoic chamber. The distance from the EUT to the reference point of measurement antenna is 3m. The test is carried out on both vertical and horizontal polarization and only maximization result of both polarizations is kept. During the test, the turntable is rotated 360° and the measurement antenna is moved from 1m to 4m to get the maximization result.

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A.2. Maximum Peak Output Power

Measurement Limit and Method:

Standard	Limit (dBm)
FCC CRF Part 15.247(b)	< 30

The measurement is made according to ANSI C63.10 .

Measurement Uncertainty:

Measurement Uncertainty	0.75dB

A.2.1. Output Power Verification

This test is only for mode verification, and the selected mode will be used for the future measurement.

Measurement Results:

OFDM/a mode	Maximum Conducted Power (dBm)							
data rate (Mbps)	6	9	12	18	24	36	48	54
149 (5745 MHz)	18.42	18.43	18.13	18.17	18.58	18.61	18.63	18.65

OFDM/n-HT20 mode	Maximum Conducted Power (dBm)							
data rate (Mbps)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
149 (5745 MHz)	18.44	18.23	18.21	18.61	18.52	18.58	18.67	17.98

OFDM/n-HT40 mode	Maximum Conducted Power (dBm)							
data rate (Mbps)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
151 (5755 MHz)	18.25	17.96	18.03	18.43	18.35	18.39	18.33	18.36

Selected data rate for all measurement:

OFDM /a-mode: 54Mbps

OFDM /n-HT20 mode: MCS6

OFDM /n-HT40 mode: MCS3

A.2.2. Antenna Gain

The antenna gain of the complete system is calculated by the difference of radiated power and the conducted power of the EUT.

Test	Channel		
Tnom,Vnom	149	157	165
Conducted Power(dBm)	13.90	14.05	13.29
Radiated Power(dBm)	15.53	14.79	14.64
Gain(dBi)	1.63	0.74	1.35

Antenna Gain = Radiated value (with radiated sample) - Conducted values (with conducted samples)

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A.2.3. Maximum Peak Output Power

Measurement Results:

802.11a

Mode	Test Result (dBm)					
	5745 MHz (Ch149)		5785 MHz (Ch157)		5825 MHz (Ch165)	
	Conducted	Radiated	Conducted	Radiated	Conducted	Radiated
802.11a	18.65	20.28	18.98	19.72	18.05	19.4

802.11n-HT20

Mode	Test Result (dBm)					
	5745 MHz (Ch149)		5785 MHz (Ch157)		5825 MHz (Ch165)	
	Conducted	Radiated	Conducted	Radiated	Conducted	Radiated
802.11n-HT20	18.67	20.30	19.09	19.83	18.06	19.41

802.11n-HT40

Mode	Test Result (dBm)			
	5755 MHz (Ch151)		5795 MHz (Ch159)	
	Conducted	Radiated	Conducted	Radiated
802.11n-HT40	18.43	20.06	17.99	19.34

Conclusion: PASS

A.3. Peak Power Spectral Density

Measurement Limit:

Standard	Limit
FCC CRF Part 15.247(e)	< 8 dBm/3 kHz

The measurement is made according to ANSI C63.10 and KDB558074

Measurement Uncertainty:

Measurement Uncertainty	0.75dB

Measurement Results:

Mode	Channel	Power Spectral Density (dBm/3 kHz)	Conclusion
802.11a	149	-14.57	P
	157	-14.50	P
	165	-15.52	P
802.11n HT20	149	-16.63	P
	157	-13.94	P
	165	-16.24	P
802.11n HT40	151	-18.24	P
	159	-16.80	P

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Conclusion: PASS

A.4. Occupied 6dB Bandwidth

Measurement Limit:

Standard	Limit (kHz)
FCC 47 CFR Part 15.247 (a)	≥ 500

The measurement is made according to ANSI C63.10 .

Measurement Uncertainty:

Measurement Uncertainty	60.80Hz

Measurement Result:

Mode	Channel	Occupied 6dB Bandwidth (kHz)		conclusion
802.11a	149	Fig.1	16667	P
	157	Fig.2	16667	P
	165	Fig.3	16667	P
802.11n HT20	149	Fig.4	17869	P
	157	Fig.5	17869	P
	165	Fig.6	17869	P
802.11n HT40	151	Fig.7	36474	P
	159	Fig.8	36571	P

Conclusion: PASS

Test graphs as below:

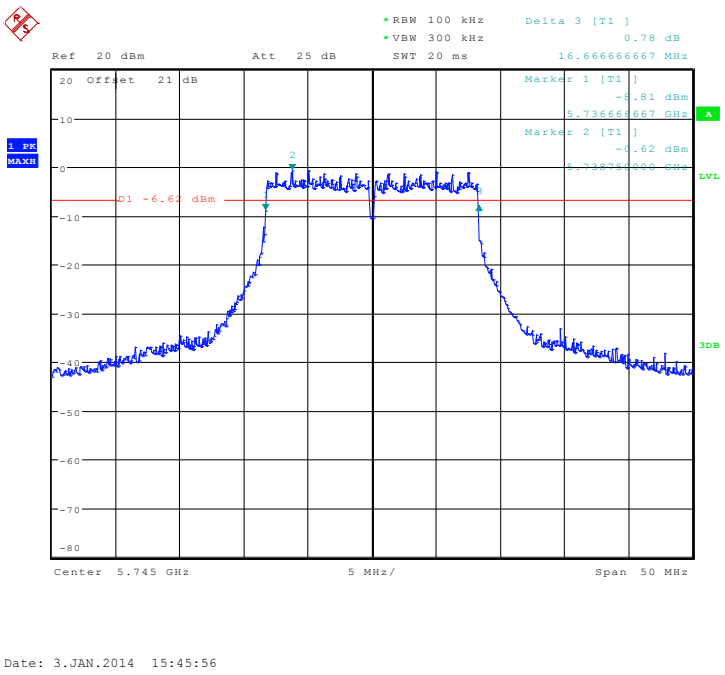

Fig. 1 Occupied 6dB Bandwidth (802.11a, Ch 149)

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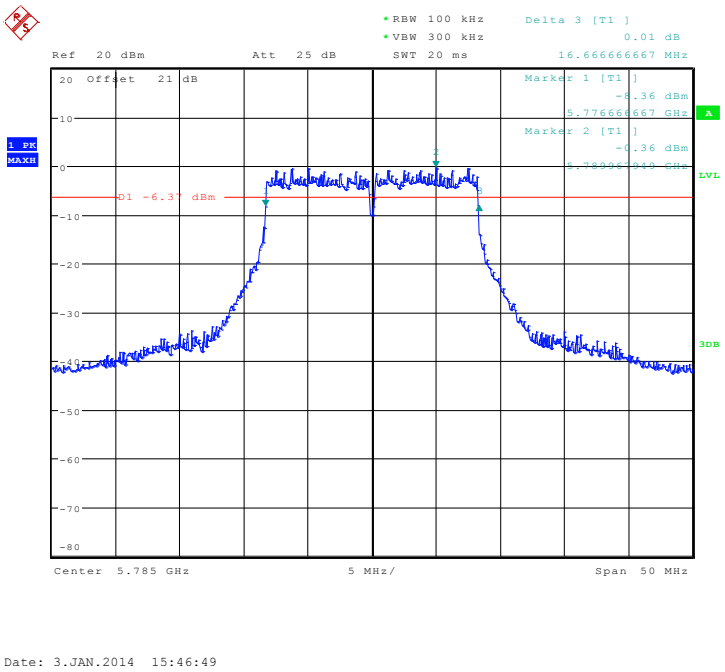

Fig. 2 Occupied 6dB Bandwidth (802.11a, Ch 157)

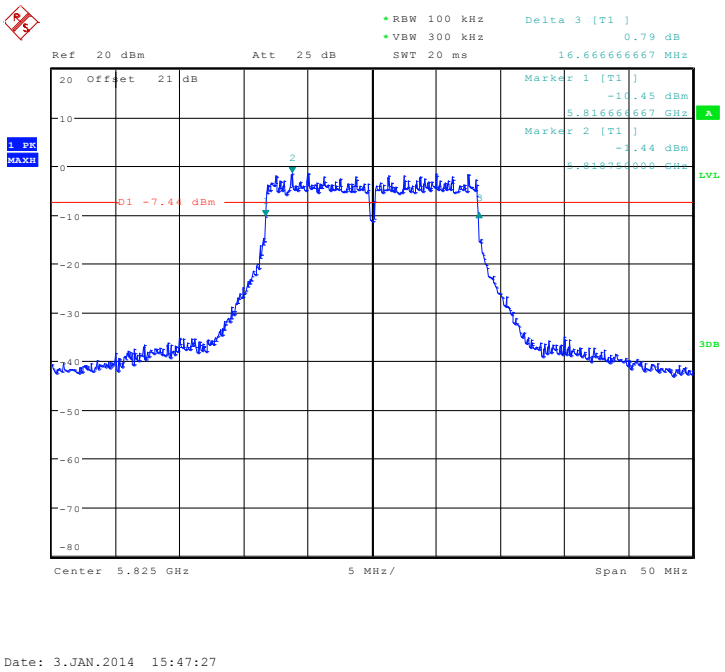

Fig. 3 Occupied 6dB Bandwidth (802.11a, Ch 165)

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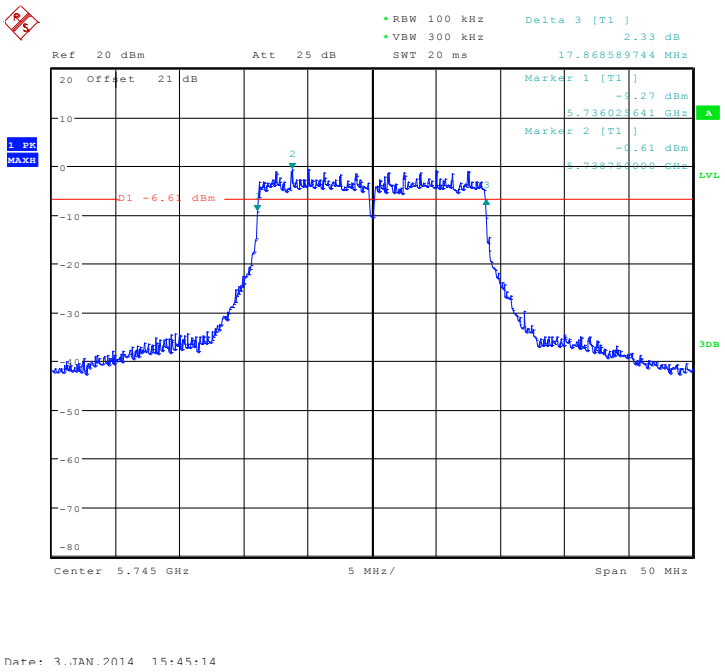

Fig. 4 Occupied 6dB Bandwidth (802.11n-HT20, Ch 149)

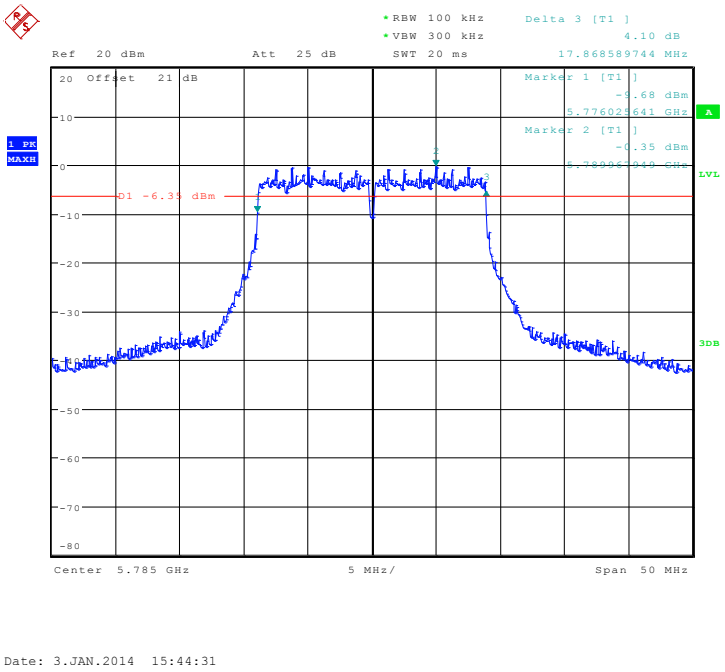

Fig. 5 Occupied 6dB Bandwidth (802.11n-HT20, Ch 157)

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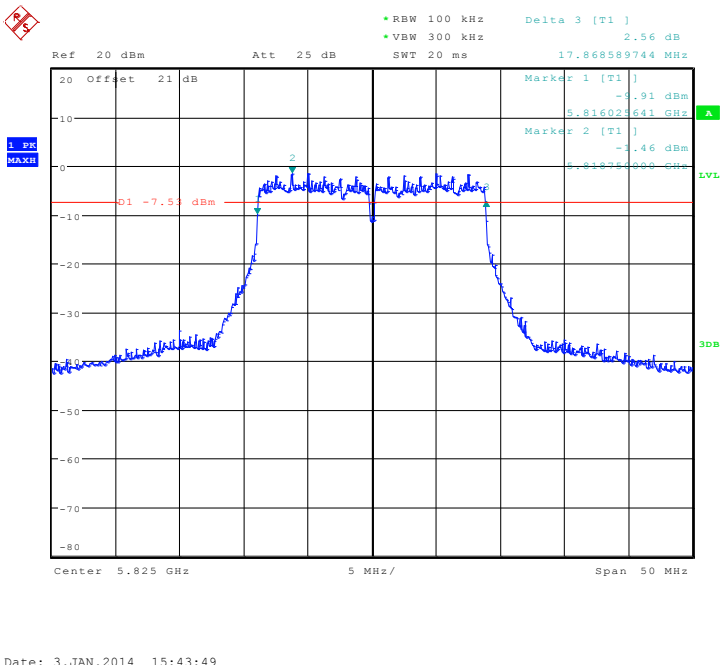

Fig. 6 Occupied 6dB Bandwidth (802.11n-HT20, Ch 165)

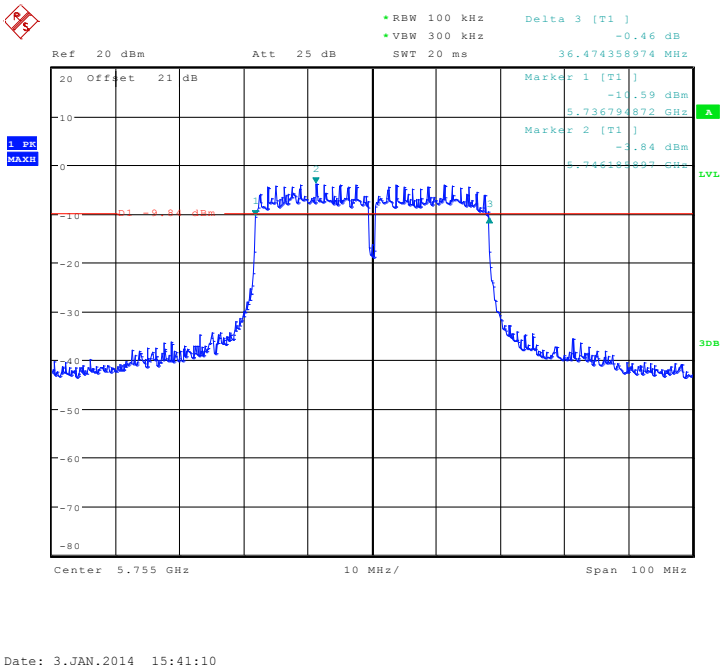

Fig. 7 Occupied 6dB Bandwidth (802.11n-HT40, Ch 151)

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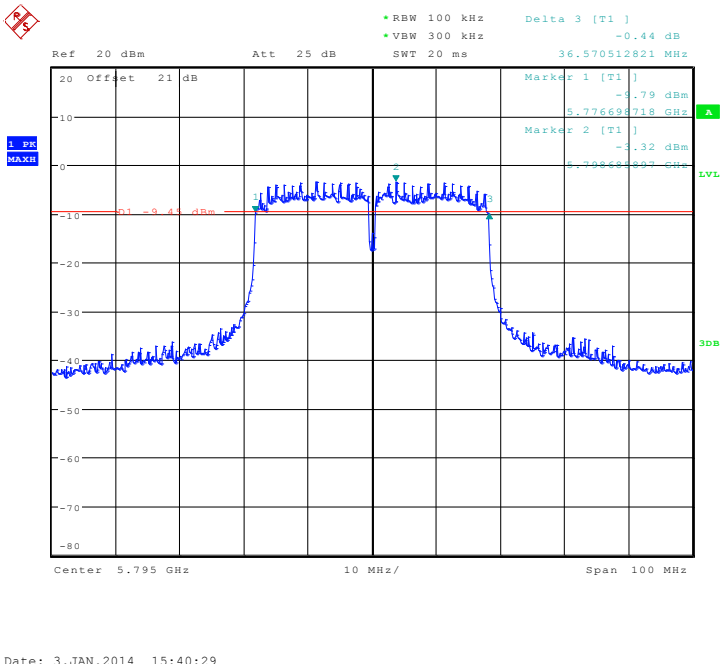

Fig. 8 Occupied 6dB Bandwidth (802.11n-HT40, Ch 159)

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A.5 99% Occupied Channel Bandwidth

Reference : RSS-Gen 4.6.1

Measurement Uncertainty:

Measurement Uncertainty	60.80Hz

Measurement Result:

Mode	Channel	Occupied Bandwidth (kHz)		conclusion
802.11a	149	Fig.9	18942	P
	157	Fig.10	18846	P
	165	Fig.11	18846	P
802.11n HT20	149	Fig.12	19615	P
	157	Fig.13	19519	P
	165	Fig.14	19615	P
802.11n HT40	151	Fig.15	37179	P
	159	Fig.16	37051	P

Conclusion: PASS

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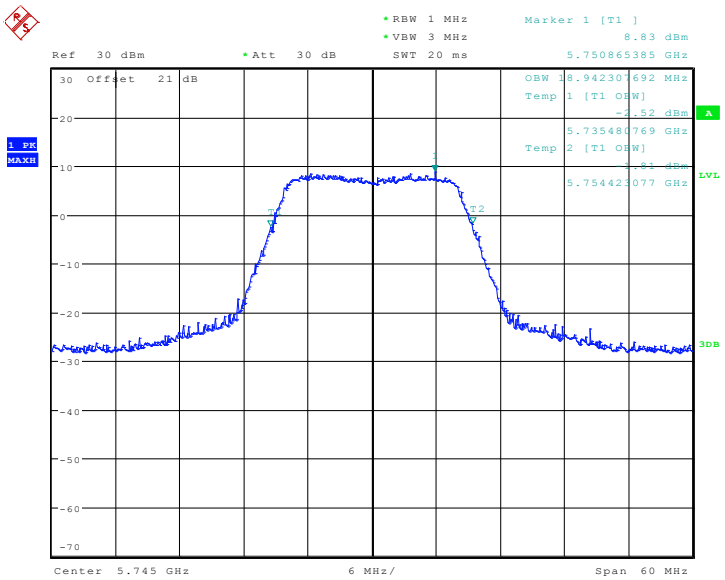
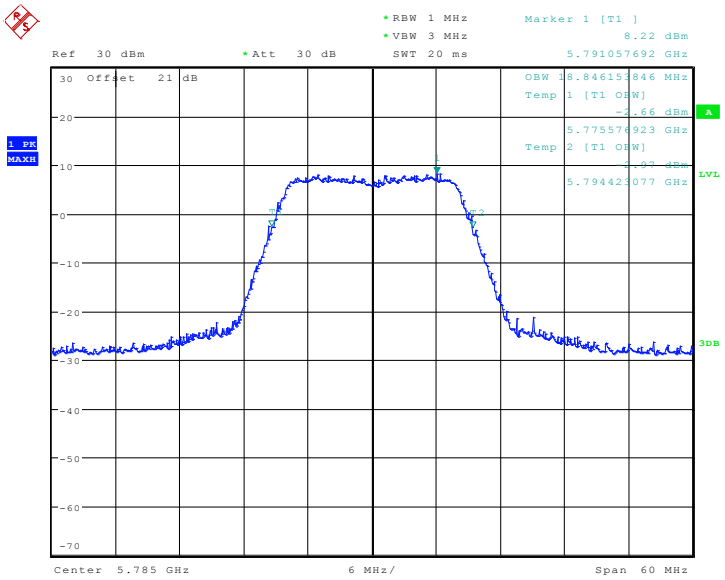


Date: 12.JAN.2014 14:46:34

Fig. 9 99%Occupied Bandwidth: Channel 149, 802.11a



Date: 12.JAN.2014 14:47:42

Fig. 10 99%Occupied Bandwidth: Channel 157, 802.11a

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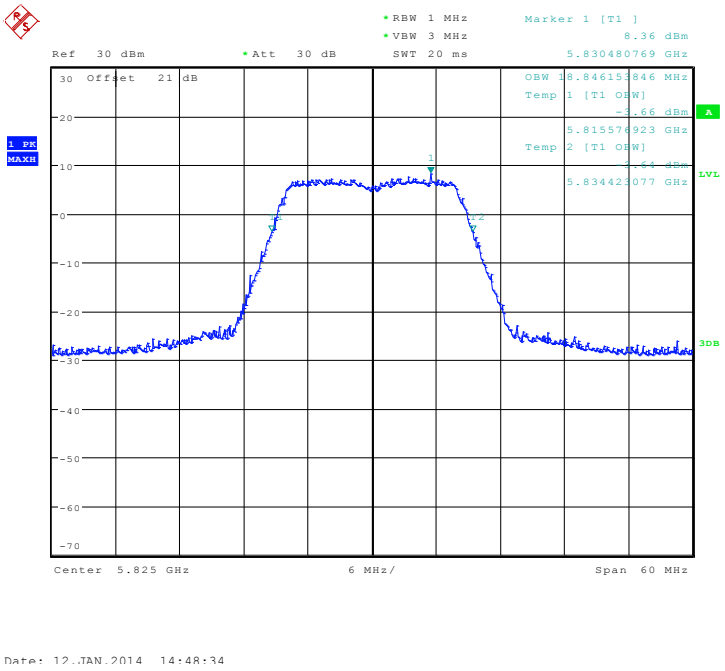

Fig. 11 99%Occupied Bandwidth: Channel 161, 802.11a

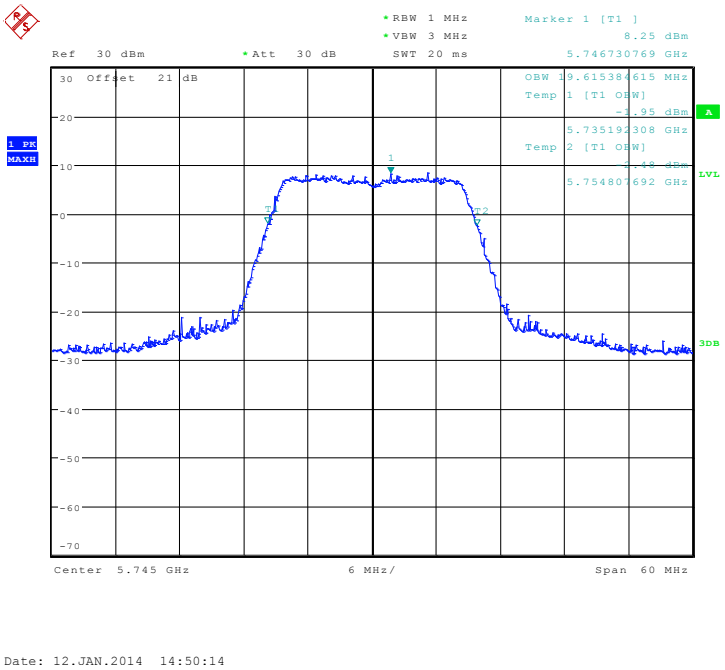

Fig. 12 99%Occupied Bandwidth: Channel 149, 802.11n-HT20

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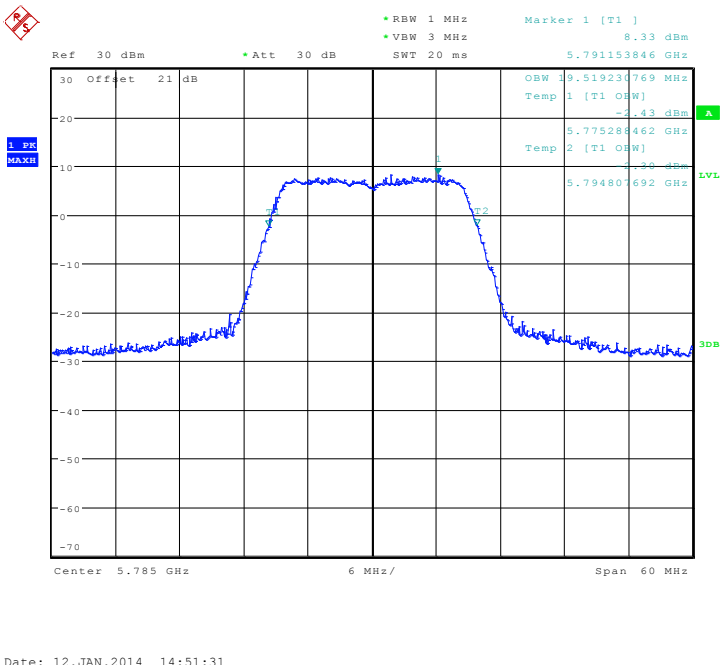
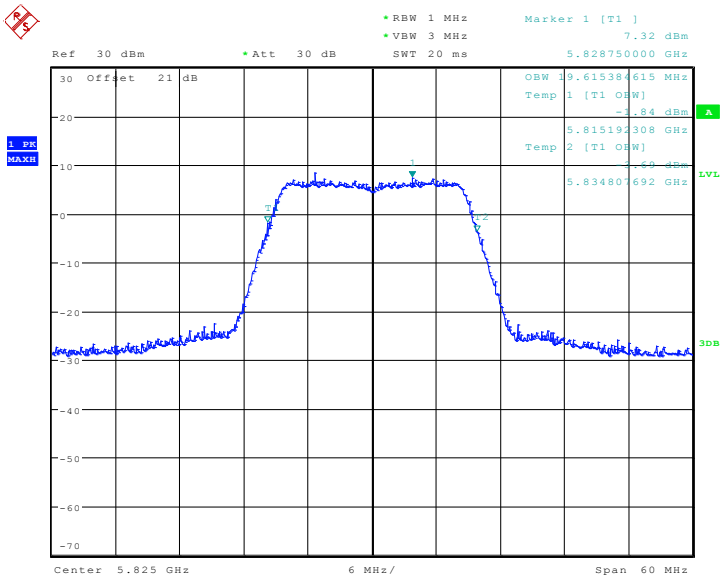


Date: 12.JAN.2014 14:51:31

Fig. 13 99%Occupied Bandwidth: Channel 157, 802.11n-HT20



Date: 12.JAN.2014 14:56:31

Fig. 14 99%Occupied Bandwidth: Channel 161, 802.11n-HT20

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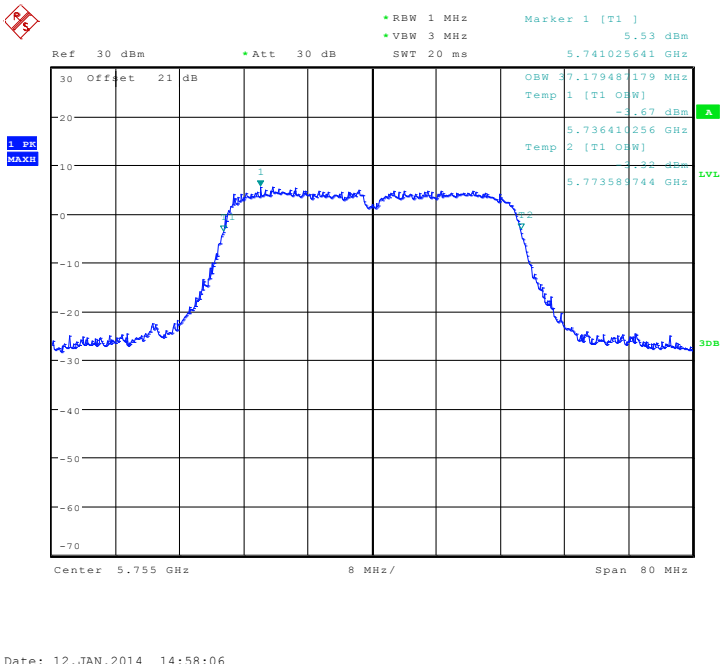

Fig. 15 99%Occupied Bandwidth: Channel 151, 802.11n-HT40

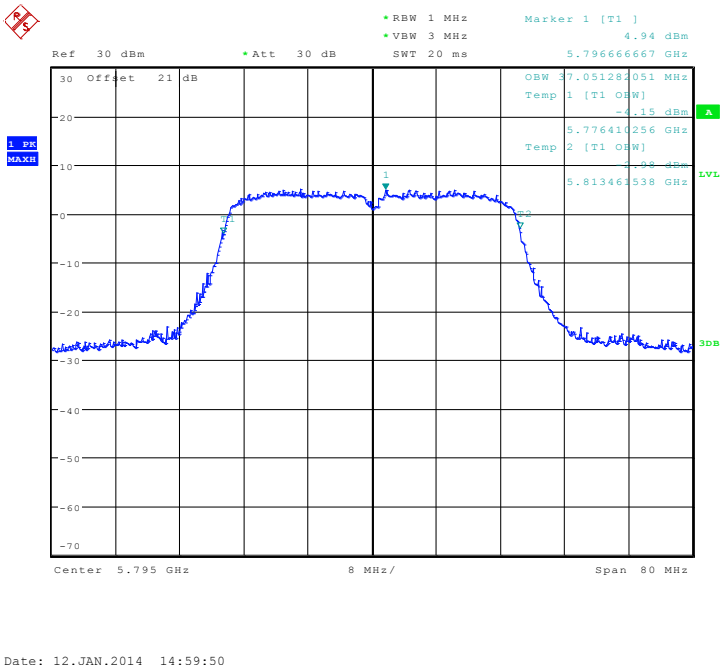

Fig. 16 99%Occupied Bandwidth: Channel 159, 802.11n-HT40

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A.6. Band Edges Compliance

Measurement Limit:

Standard	Limit (dBc)
FCC 47 CFR Part 15.247 (d)	> 20

The measurement is made according to ANSI C63.10 .

Measurement Result:

802.11a mode

Mode	Channel	Test Results	Conclusion
802.11a	149	Fig.17	**P**
	165	Fig.18	**P**

802.11n-HT20 mode

Mode	Channel	Test Results	Conclusion
802.11n (HT20)	149	Fig.19	**P**
	165	Fig.20	**P**

802.11n-HT40 mode

Mode	Channel	Test Results	Conclusion
802.11n (HT40)	151	Fig.21	**P**
	159	Fig.22	**P**

Conclusion: Pass

Measurement Uncertainty:

Measurement Uncertainty	0.75dB

Test graphs as below:

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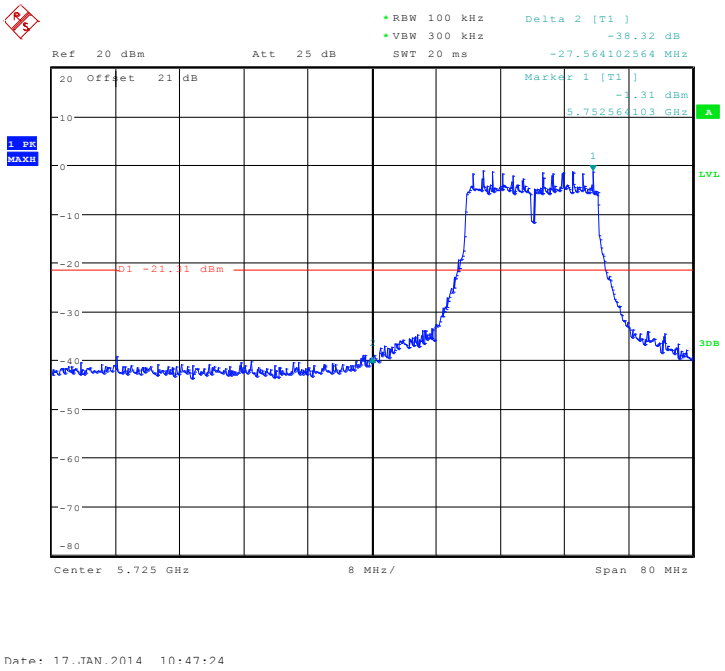

Fig. 17 Band Edges (802.11a, Ch 149)

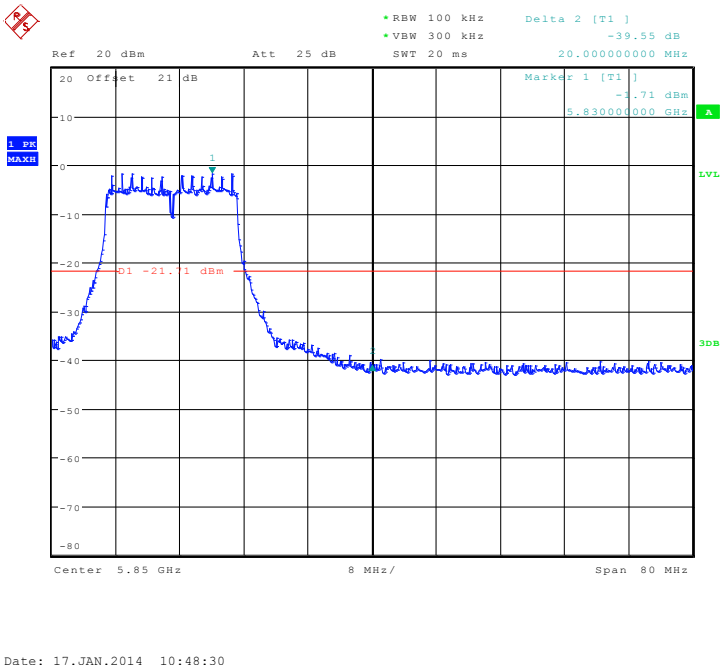

Fig. 18 Band Edges (802.11a, Ch 165)

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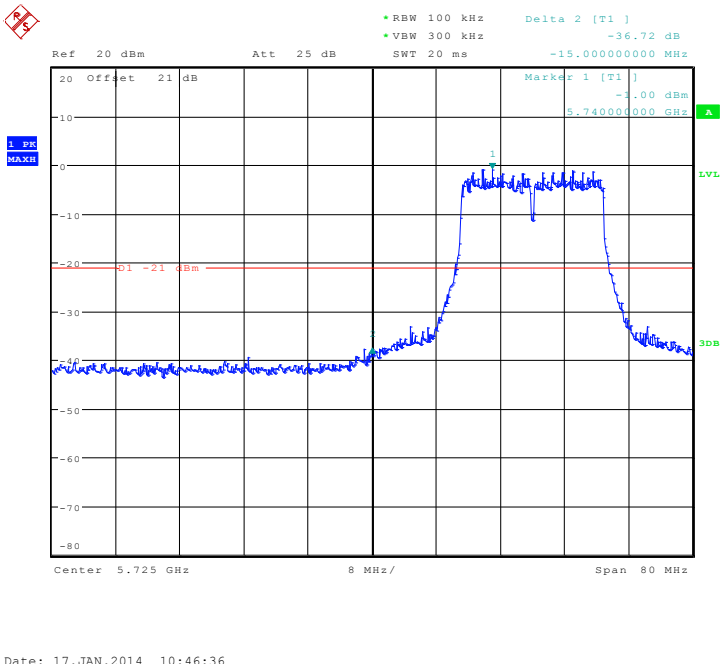
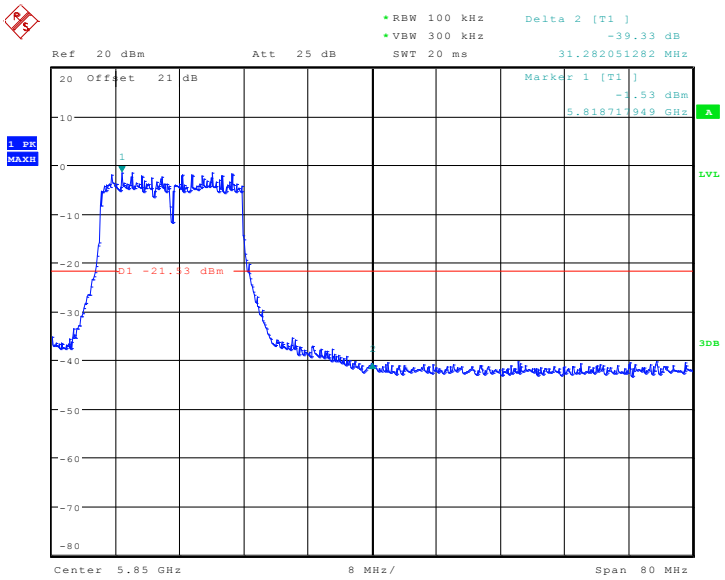


Date: 17.JAN.2014 10:46:36

Fig. 19 Band Edges (802.11n-HT20, Ch 149)



Date: 17.JAN.2014 10:45:43

Fig. 20 Band Edges (802.11n-HT20, Ch 165)

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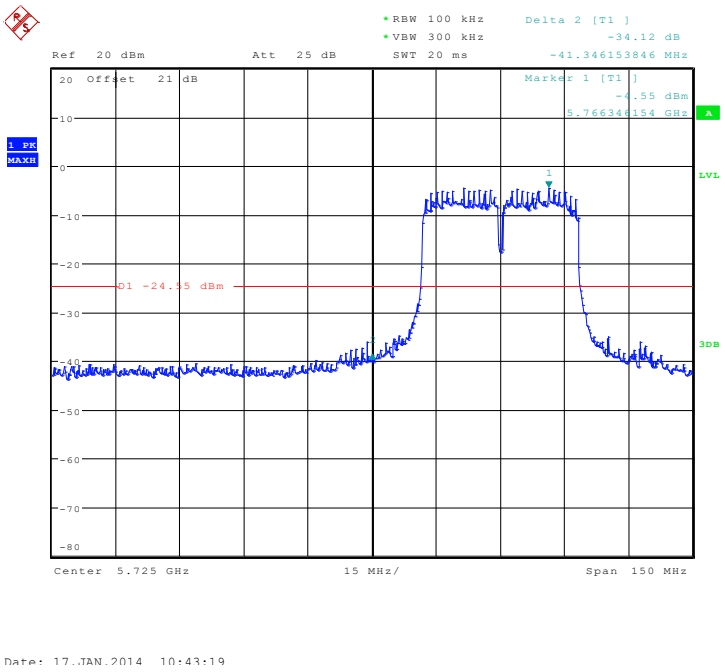

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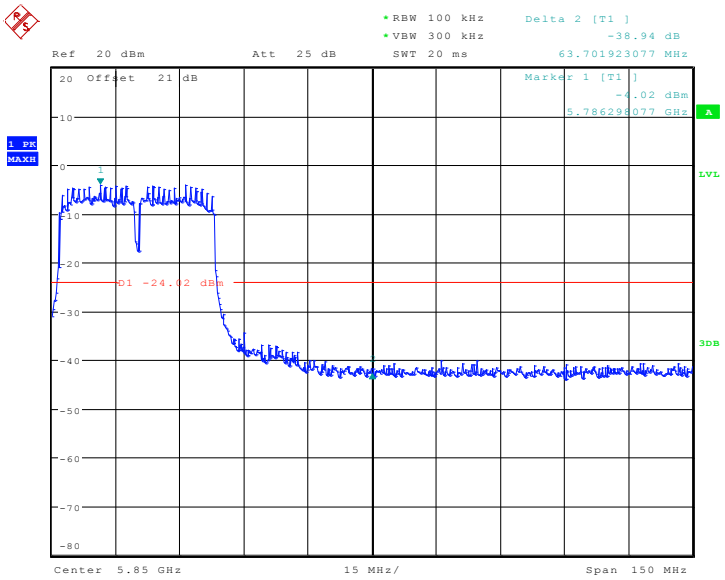
Fig. 21 Band Edges (802.11n-HT40, Ch 151)



Date: 17.JAN.2014 10:44:20

Fig. 22 Band Edges (802.11n- HT40, Ch 159)

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A.7. Transmitter Spurious Emission

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247 (d)	20dB below peak output power in 100 kHz bandwidth

The measurement is made according to ANSI C63.10 .

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)).

Frequency of emission (MHz)	Field strength(uV/m)	Field strength(dBuV/m)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Measurement Uncertainty:

Frequency Range	Uncertainty(dB)
30MHz ≤ f ≤ 2GHz	0.63
2GHz ≤ f ≤3.6GHz	0.82
3.6GHz ≤ f ≤8GHz	1.55
8GHz ≤ f ≤20GHz	1.86
20GHz ≤ f ≤22GHz	1.90
22GHz ≤ f ≤26GHz	2.20

A.7.1 Transmitter Spurious Emission - Conducted

Measurement Results:

802.11a mode

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11a	149	5.745 GHz	Fig.23	P
		30 MHz ~ 12 GHz	Fig.24	P
		12 GHz ~ 25 GHz	Fig.25	P
		25 GHz ~ 40 GHz	Fig.26	P
	157	5.785 GHz	Fig.27	P
		30 MHz ~ 12 GHz	Fig.28	P
		12 GHz ~ 25 GHz	Fig.29	P
		25 GHz ~ 40 GHz	Fig.30	P
	165	5.825 GHz	Fig.31	P
		30 MHz ~ 12 GHz	Fig.32	P
		12 GHz ~ 25 GHz	Fig.33	P
		25 GHz ~ 40 GHz	Fig.34	P

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802.11n-HT20 mode

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11n HT20	149	5.745 GHz	Fig.35	P
		30 MHz ~ 12 GHz	Fig.36	P
		12 GHz ~ 25 GHz	Fig.37	P
		25 GHz ~ 40 GHz	Fig.38	P
	157	5.785 GHz	Fig.39	P
		30 MHz ~ 12 GHz	Fig.40	P
		12 GHz ~ 25 GHz	Fig.41	P
		25 GHz ~ 40 GHz	Fig.42	P
	165	5.825 GHz	Fig.43	P
		30 MHz ~ 12 GHz	Fig.44	P
		12 GHz ~ 25 GHz	Fig.45	P
		25 GHz ~ 40 GHz	Fig.46	P

802.11n-HT40 mode

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11n HT40	151	5.755 GHz	Fig.47	P
		30 MHz ~ 12 GHz	Fig.48	P
		12 GHz ~ 25 GHz	Fig.49	P
		25 GHz ~ 40 GHz	Fig.50	P
	159	5.795 GHz	Fig.51	P
		30 MHz ~ 12 GHz	Fig.52	P
		12 GHz ~ 25 GHz	Fig.53	P
		25 GHz ~ 40 GHz	Fig.54	P

Conclusion: PASS

Test graphs as below:

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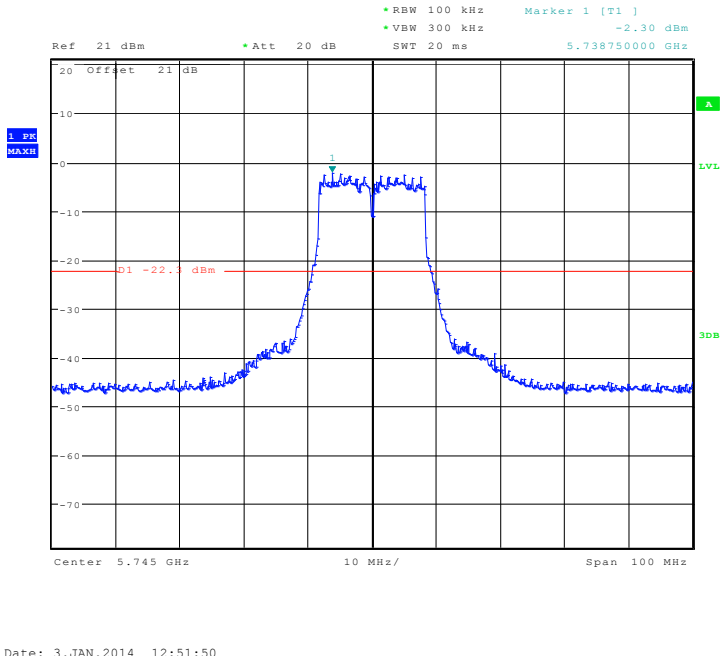

Fig. 23 Conducted Spurious Emission (802.11a, Ch149, Center Frequency)

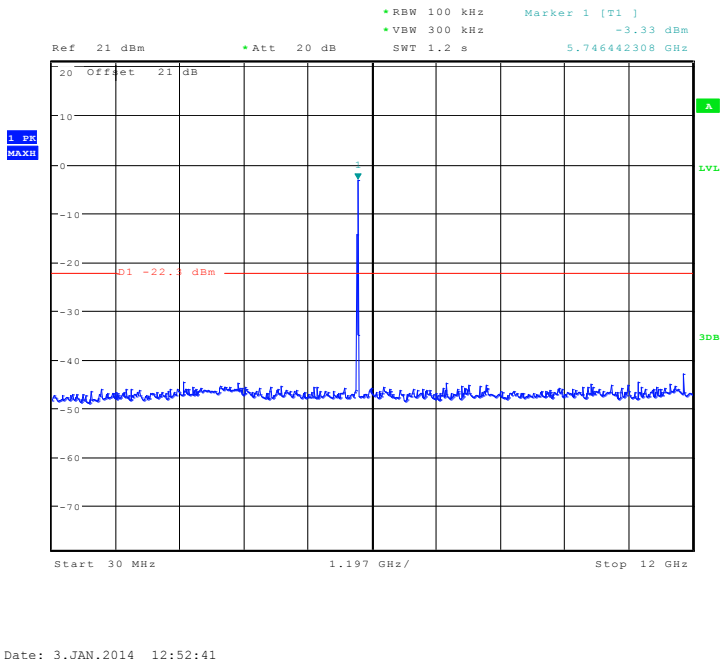

Fig. 24 Conducted Spurious Emission (802.11a, Ch149, 30 MHz-12 GHz)

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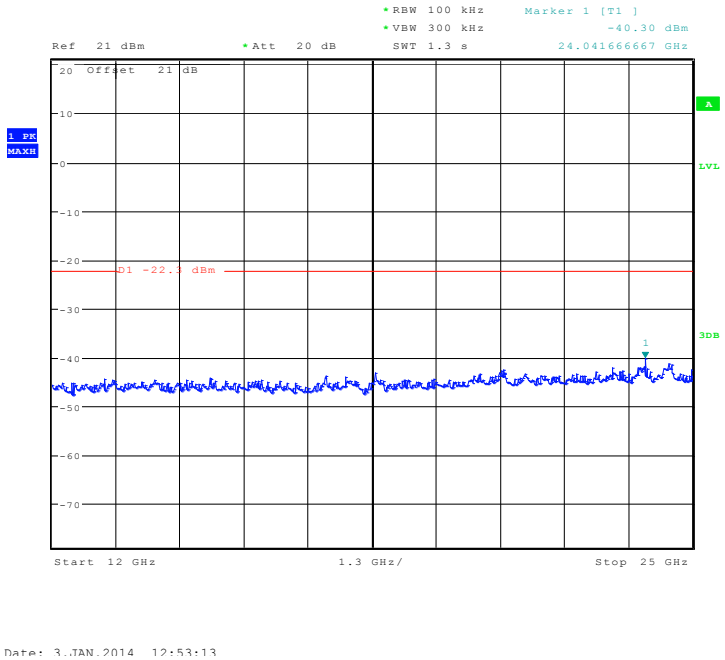

Fig. 25 Conducted Spurious Emission (802.11a, Ch149, 12 GHz-25 GHz)

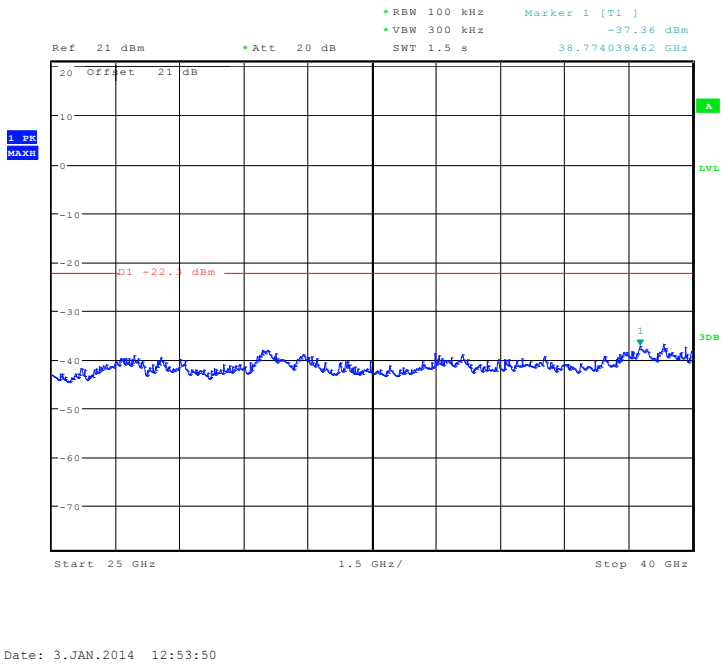

Fig. 26 Conducted Spurious Emission (802.11a, Ch149, 25 GHz-40 GHz)

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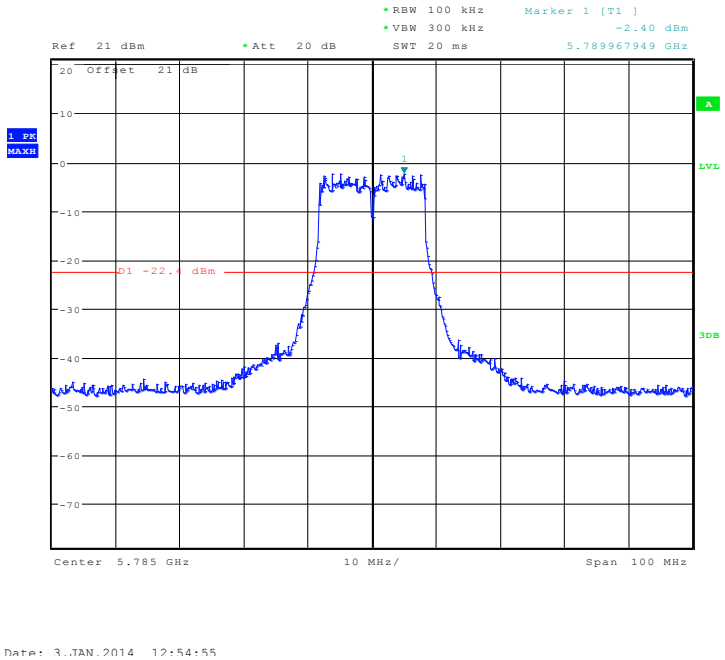

Fig. 27 Conducted Spurious Emission (802.11a, Ch157, Center Frequency)

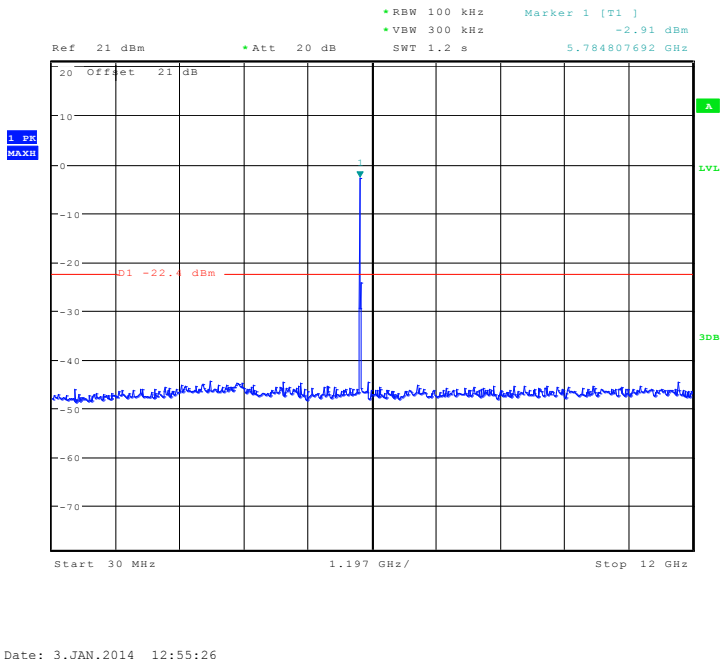

Fig. 28 Conducted Spurious Emission (802.11a, Ch157, 30 MHz-12 GHz)

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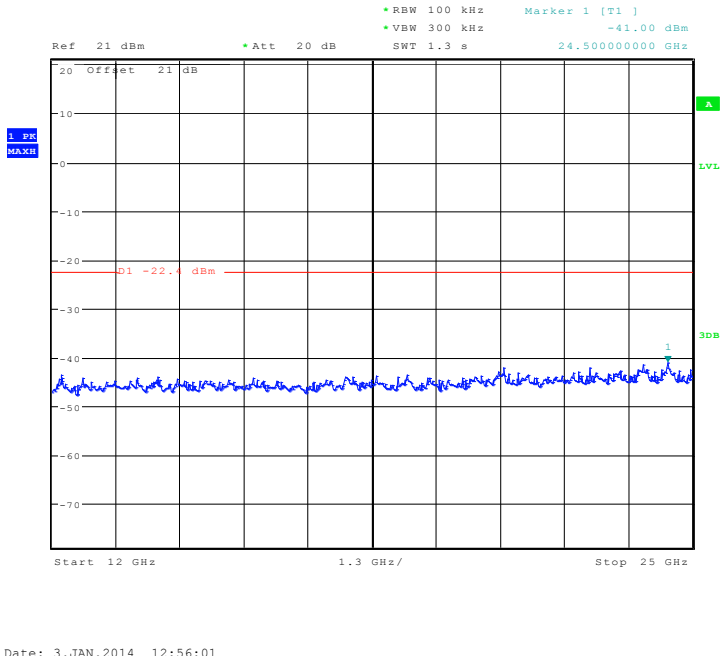

Fig. 29 Conducted Spurious Emission (802.11a, Ch157, 12 GHz-25 GHz)

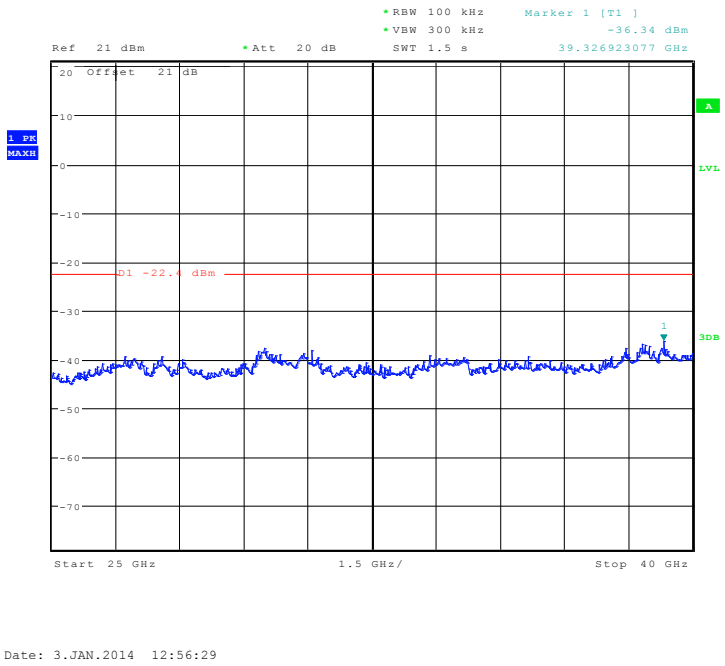

Fig. 30 Conducted Spurious Emission (802.11a, Ch157, 25 GHz-40 GHz)

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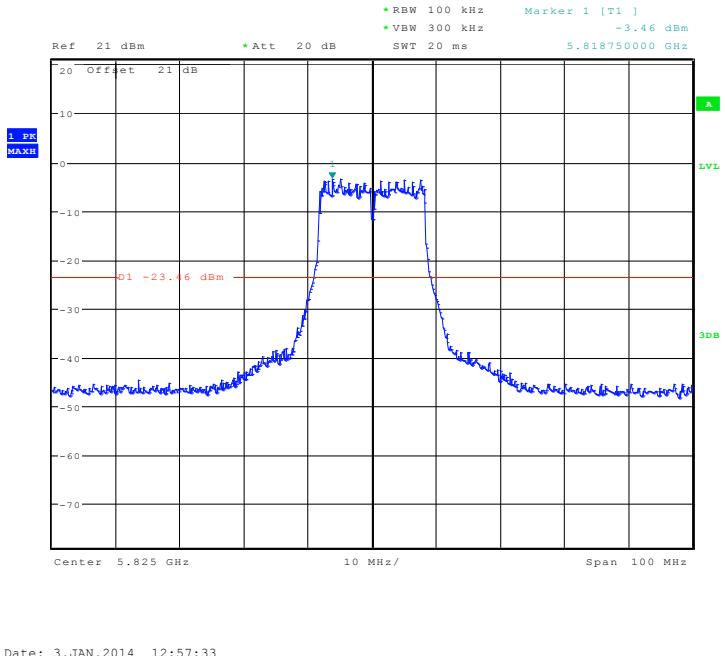

Fig. 31 Conducted Spurious Emission (802.11a, Ch165, Center Frequency)

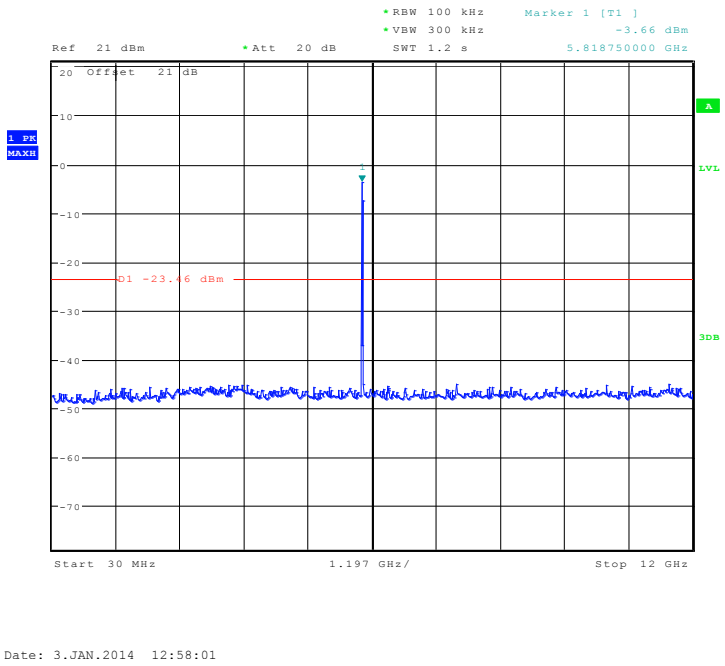

Fig. 32 Conducted Spurious Emission (802.11a, Ch165, 30 MHz-12 GHz)

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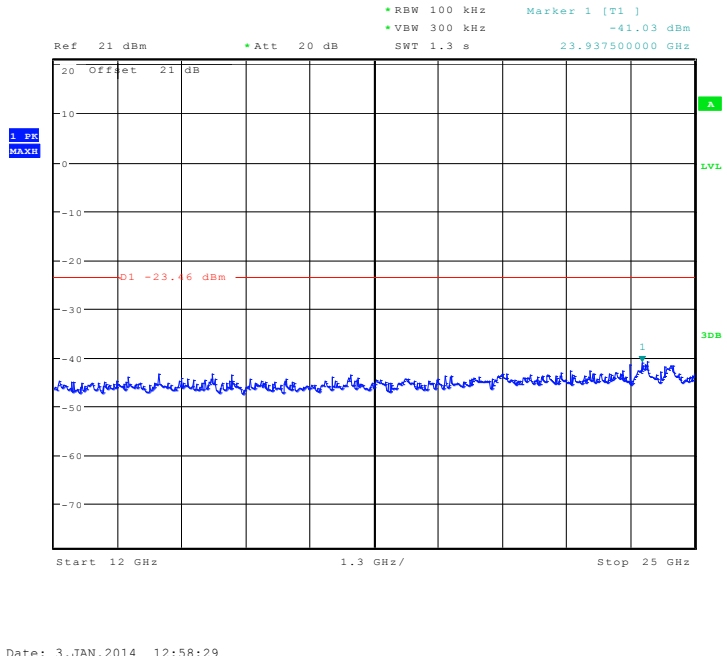

Fig. 33 Conducted Spurious Emission (802.11a, Ch165, 12 GHz-25 GHz)

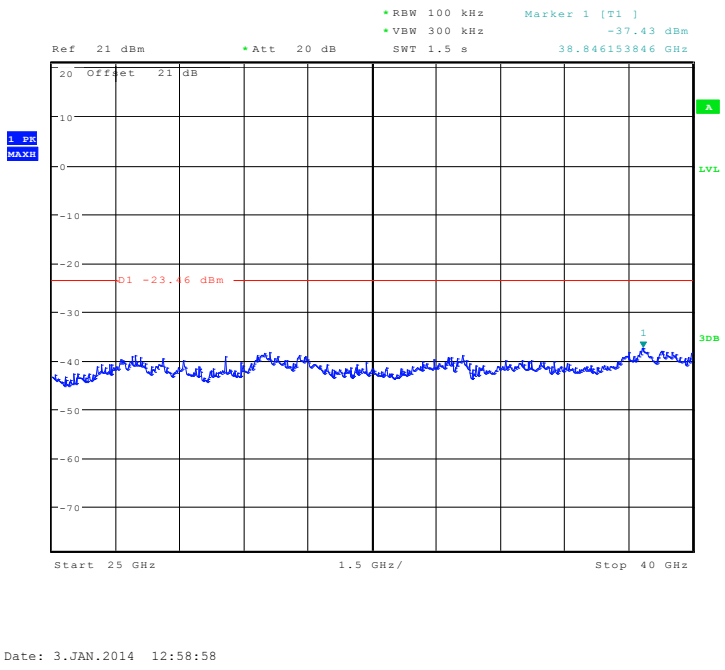

Fig. 34 Conducted Spurious Emission (802.11a, Ch165, 25 GHz-40 GHz)

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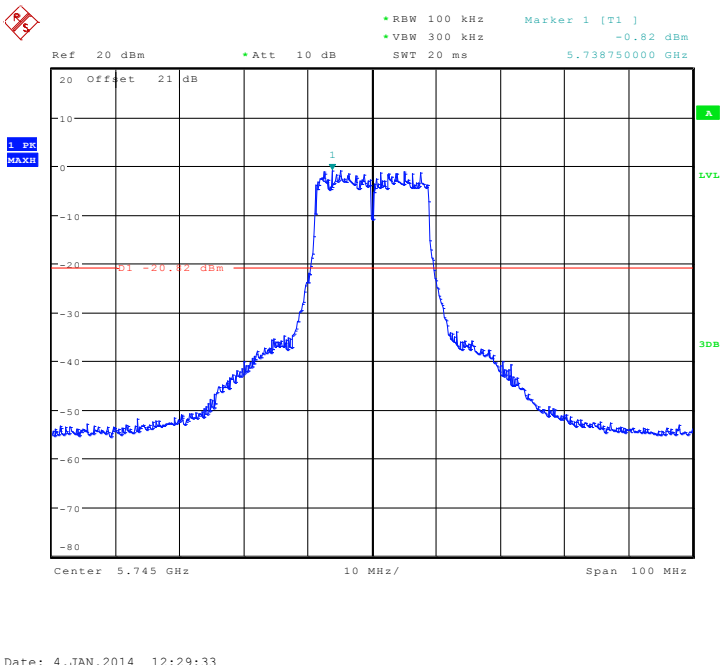

Fig. 35 Conducted Spurious Emission (802.11n-HT20, Ch149, Center Frequency)

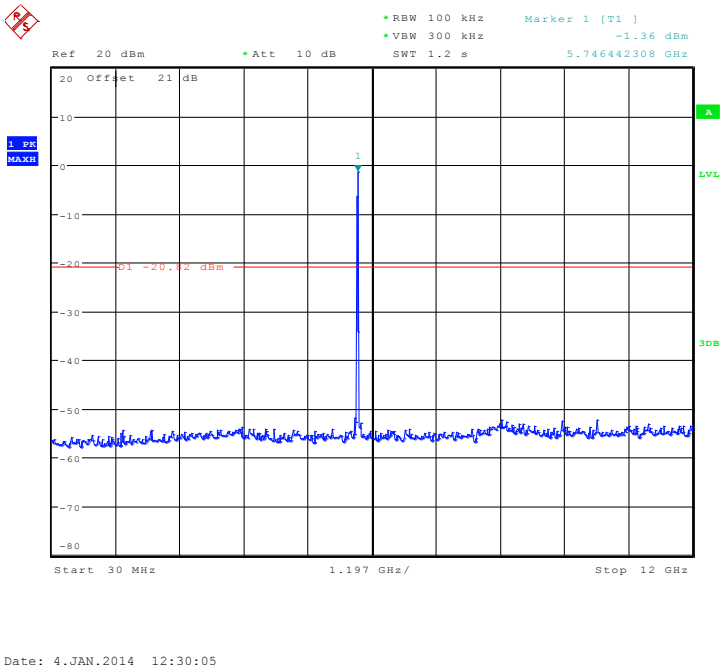

Fig. 36 Conducted Spurious Emission (802.11n-HT20, Ch149, 30 MHz-12 GHz)

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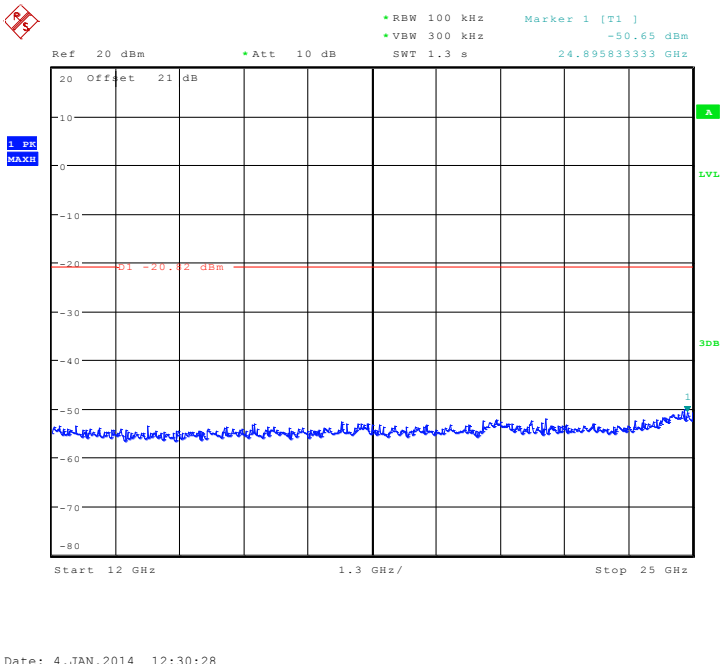

Fig. 37 Conducted Spurious Emission (802.11n-HT20, Ch149, 12 GHz-25 GHz)

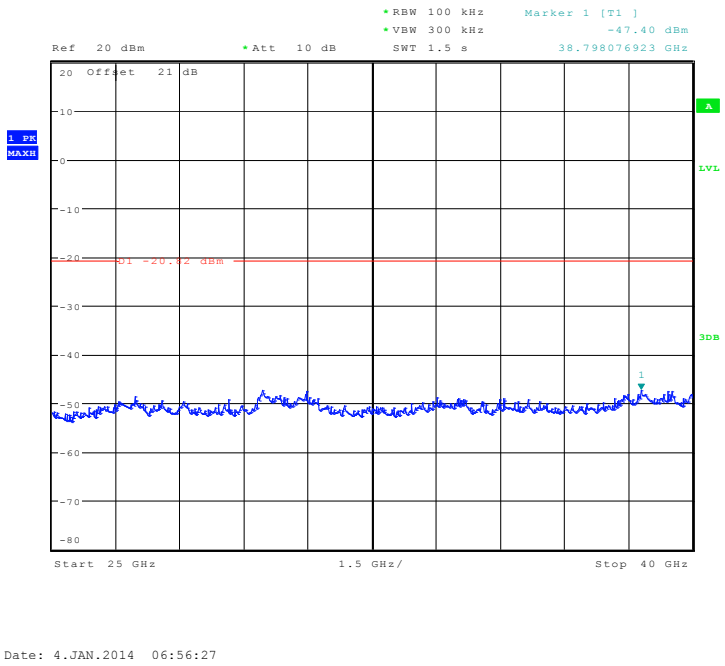

Fig. 38 Conducted Spurious Emission (802.11n-HT20, Ch149, 25 GHz-40 GHz)

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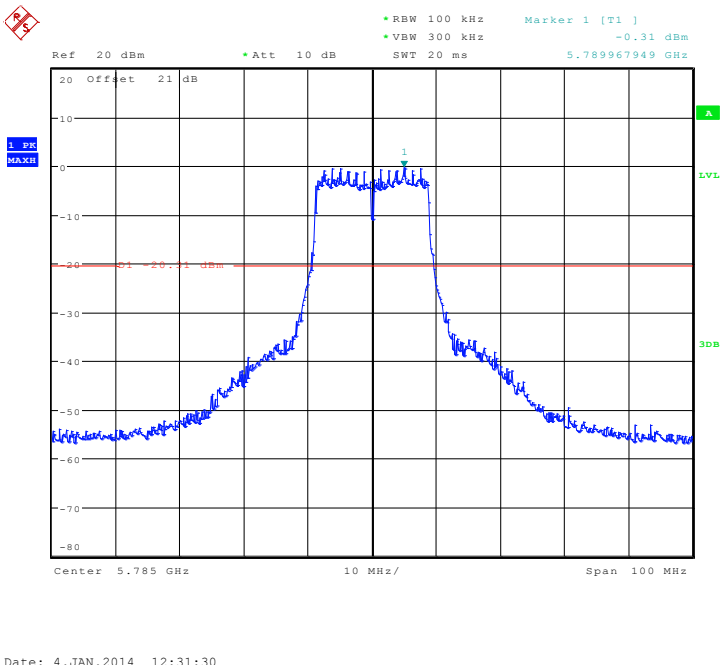

Fig. 39 Conducted Spurious Emission (802.11n-HT20, Ch157, Center Frequency)

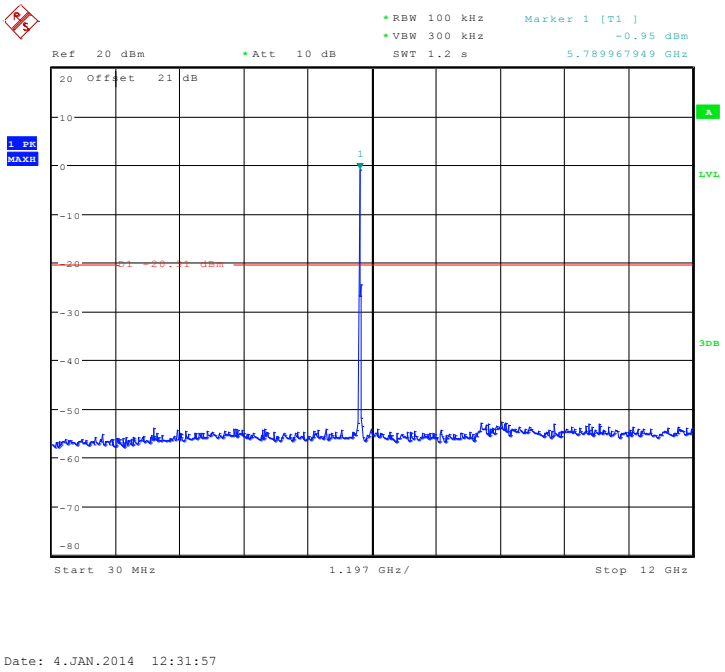

Fig. 40 Conducted Spurious Emission (802.11n-HT20, Ch157, 30 MHz-12 GHz)

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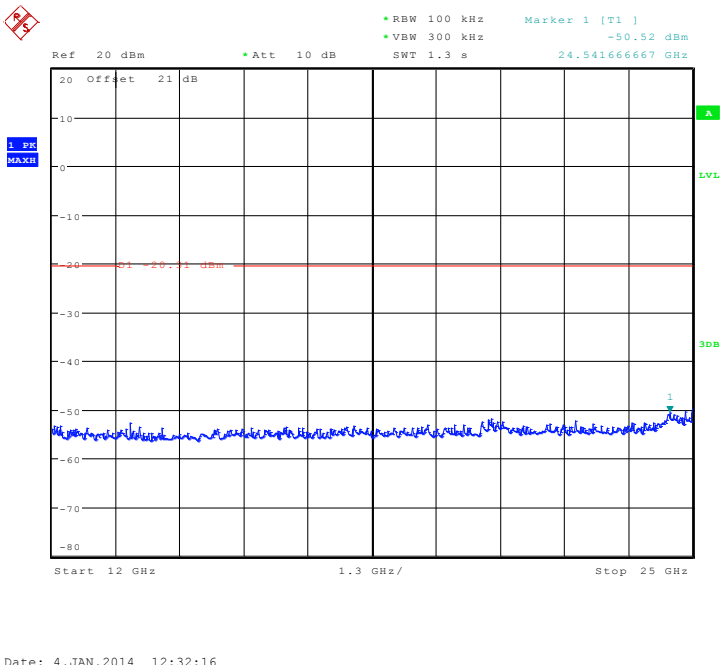

Fig. 41 Conducted Spurious Emission (802.11n-HT20, Ch157, 12 GHz-25 GHz)

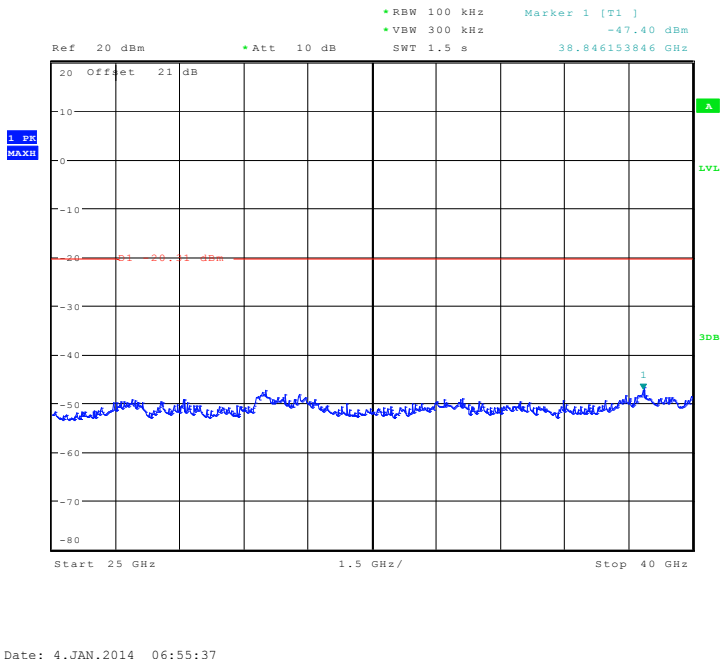

Fig. 42 Conducted Spurious Emission (802.11n-HT20, Ch157, 25 GHz-40 GHz)

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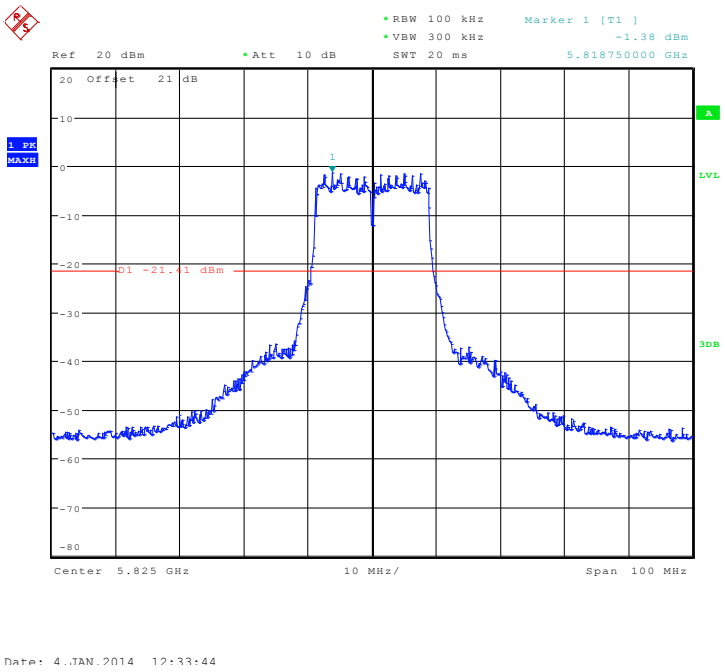

Fig. 43 Conducted Spurious Emission (802.11n-HT20, Ch165, Center Frequency)

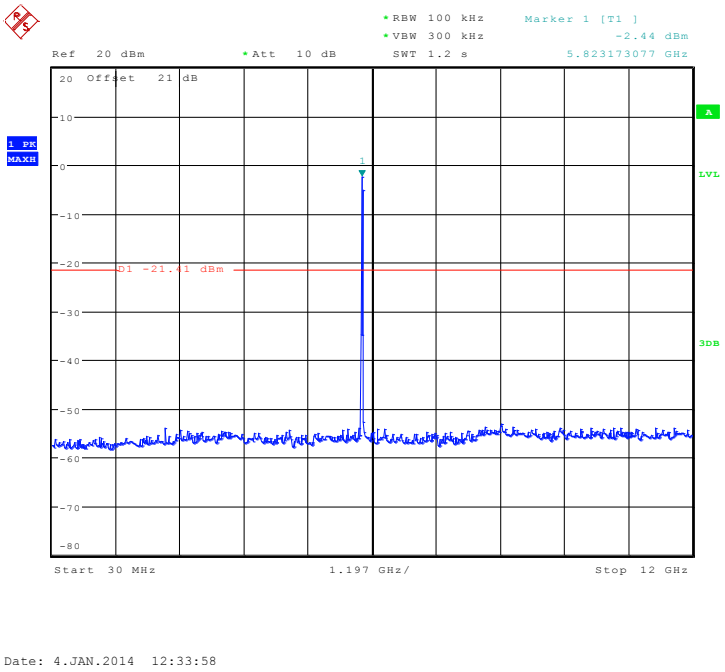

Fig. 44 Conducted Spurious Emission (802.11n-HT20, Ch165, 30 MHz-12 GHz)

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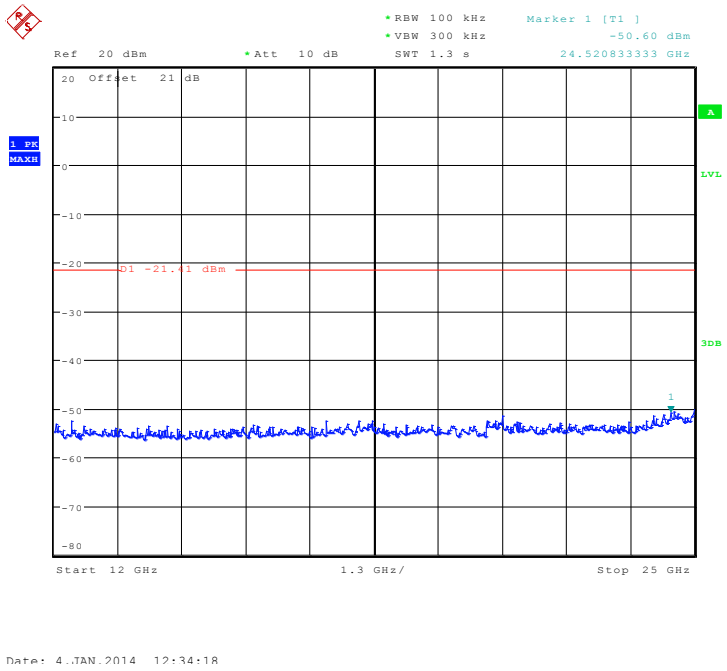

Fig. 45 Conducted Spurious Emission (802.11n-HT20, Ch165, 12 GHz-25 GHz)

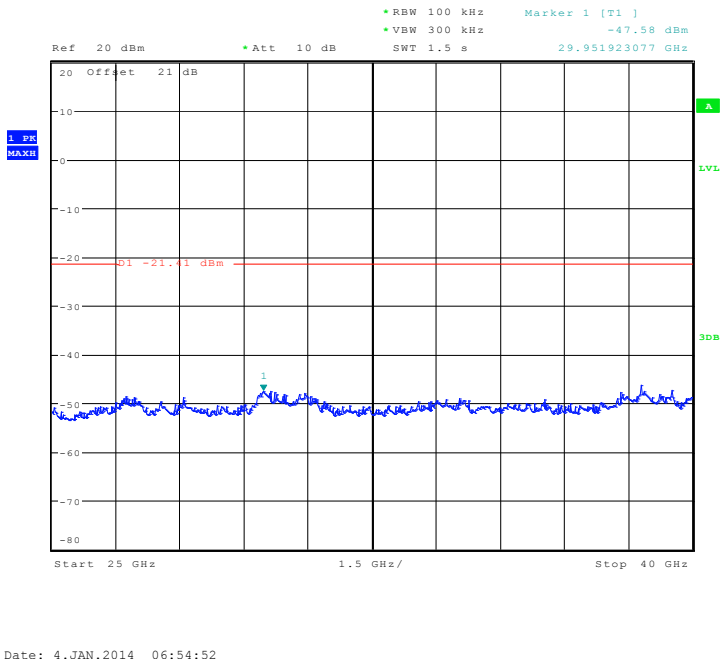

Fig. 46 Conducted Spurious Emission (802.11n-HT20, Ch165, 25 GHz-40 GHz)

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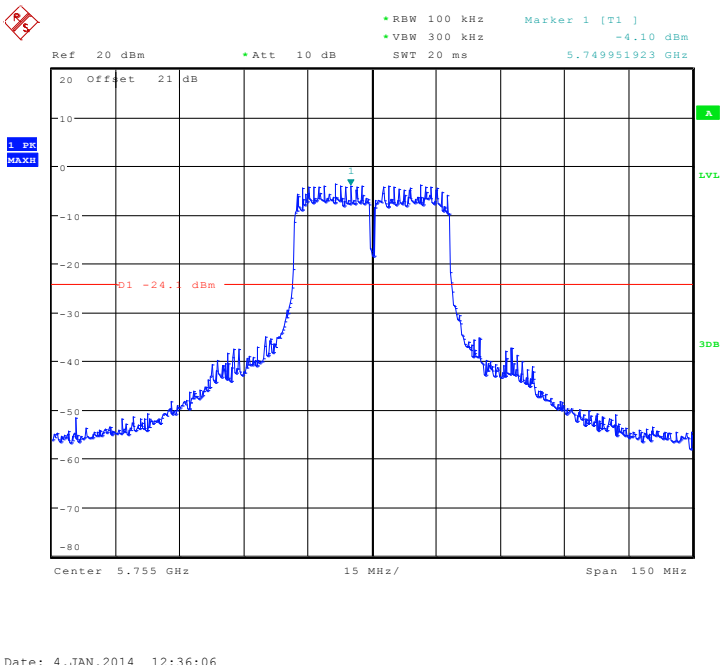

Fig. 47 Conducted Spurious Emission (802.11n-HT40, Ch151, Center Frequency)

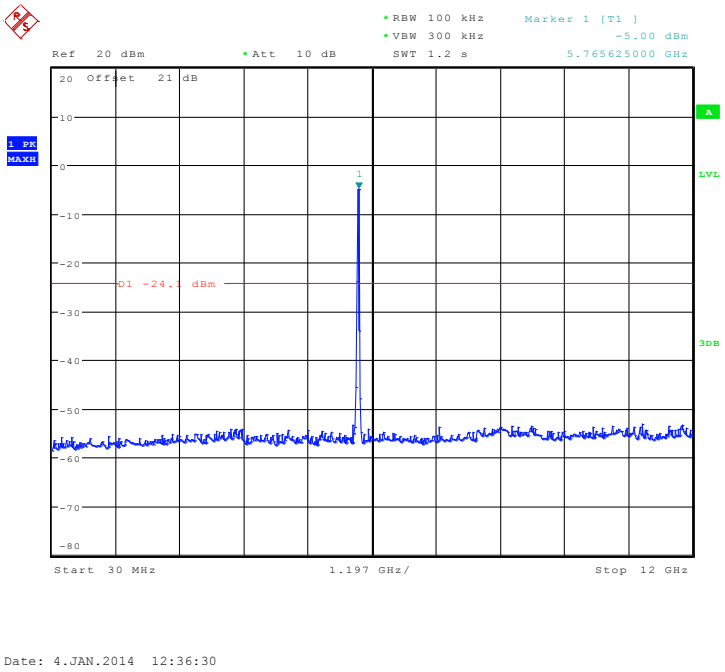

Fig. 48 Conducted Spurious Emission (802.11n-HT40, Ch151, 30 MHz-12 GHz)

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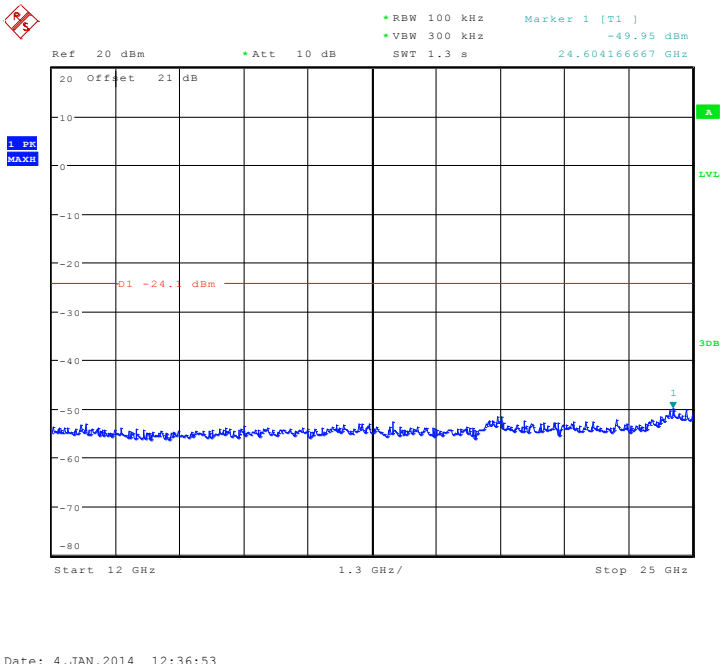

Fig. 49 Conducted Spurious Emission (802.11n-HT40, Ch151, 12 GHz-25 GHz)

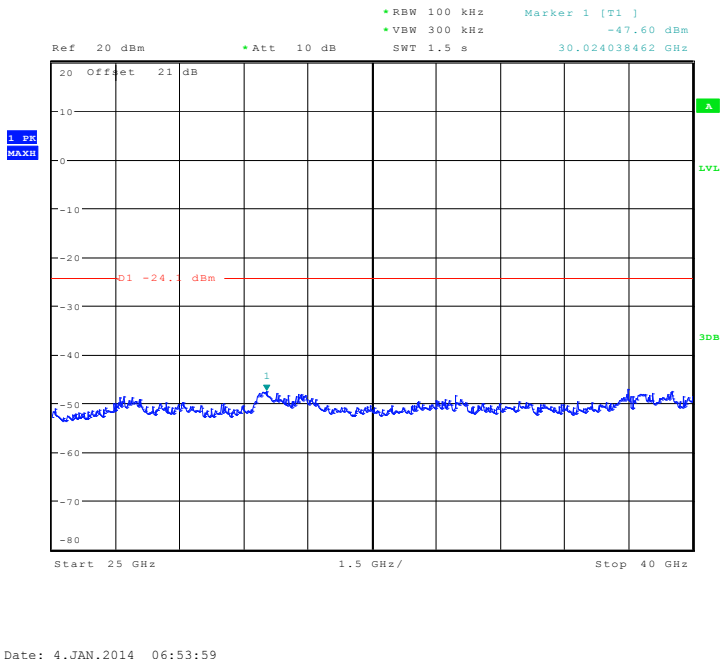

Fig. 50 Conducted Spurious Emission (802.11n-HT40, Ch151, 25 GHz-40 GHz)

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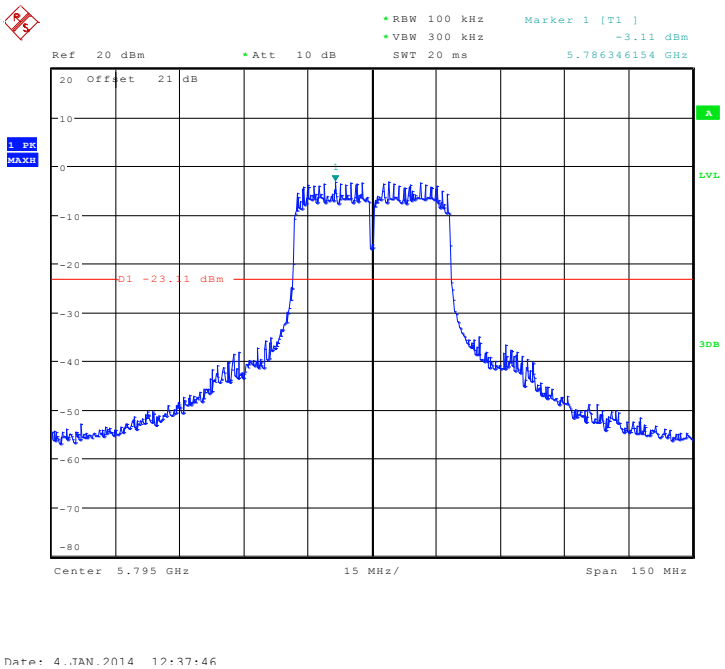

Fig. 51 Conducted Spurious Emission (802.11n-HT40, Ch159, Center Frequency)

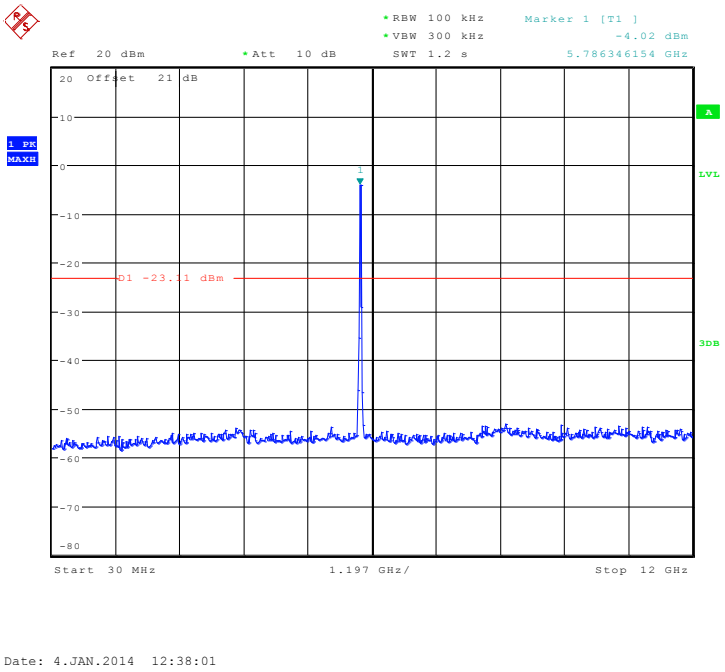

Fig. 52 Conducted Spurious Emission (802.11n-HT40, Ch159, 30 MHz-12 GHz)

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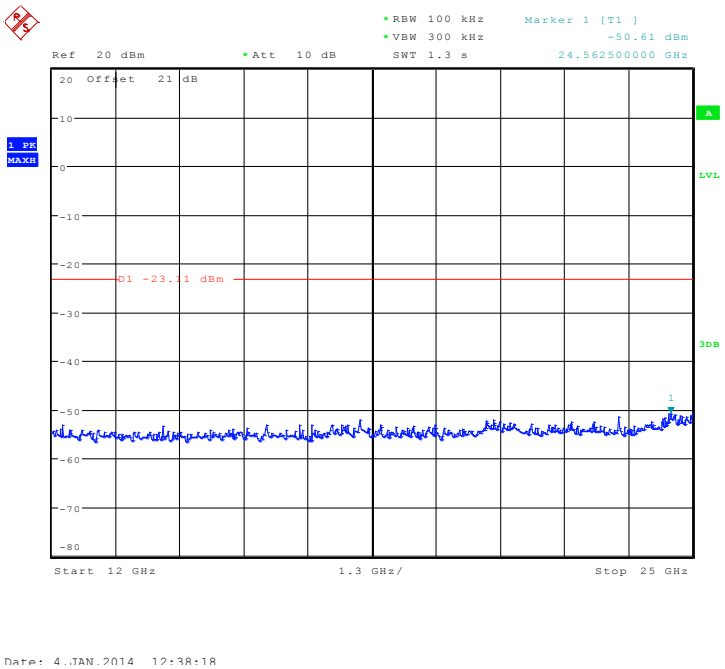

Fig. 53 Conducted Spurious Emission (802.11n-HT40, Ch159, 12 GHz-25 GHz)

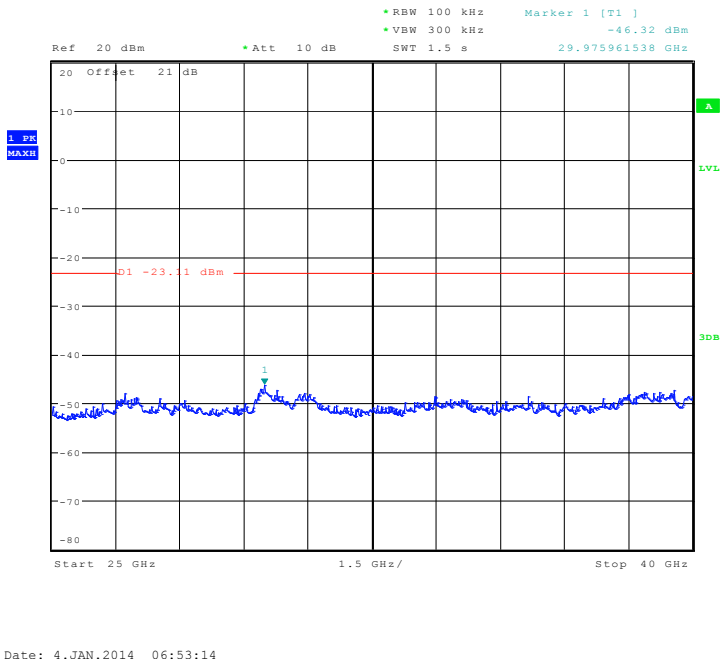

Fig. 54 Conducted Spurious Emission (802.11n-HT40, Ch159, 25 GHz-40 GHz)

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A.7.2 Transmitter Spurious Emission - Radiated

Measurement Uncertainty:

Frequency Range	Uncertainty(dB)
f ≤ 1GHz	3.9
f>1GHz	4.3

Measurement Results:

802.11a mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11a	149	30 MHz ~1 GHz	Fig.55	P
		1 GHz ~ 6 GHz	Fig.56	P
		6 GHz ~ 18 GHz	Fig.57	P
	157	30 MHz ~1 GHz	Fig.58	P
		1 GHz ~ 6 GHz	Fig.59	P
		6 GHz ~ 18 GHz	Fig.60	P
	165	30 MHz ~1 GHz	Fig.61	P
		1 GHz ~ 6 GHz	Fig.62	P
		6 GHz ~ 18 GHz	Fig.63	P
/	All channels	18 GHz ~ 26.5 GHz	Fig.64	P
		26.5 GHz~ 40 GHz	Fig.65	P

802.11n-HT20 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n (HT20)	149	30 MHz ~1 GHz	Fig.66	P
		1 GHz ~ 6 GHz	Fig.67	P
		6 GHz ~ 18 GHz	Fig.68	P
	157	30 MHz ~1 GHz	Fig.69	P
		1 GHz ~ 6 GHz	Fig.70	P
		6 GHz ~ 18 GHz	Fig.71	P
	165	30 MHz ~1 GHz	Fig.72	P
		1 GHz ~ 6 GHz	Fig.73	P
		6 GHz ~ 18 GHz	Fig.74	P
/	All channels	18 GHz ~ 26.5 GHz	Fig.75	P
		26.5 GHz~ 40 GHz	Fig.76	P

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802.11n-HT40 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n (HT40)	151	30 MHz ~1 GHz	Fig.77	P
		1 GHz ~ 6 GHz	Fig.78	P
		6 GHz ~ 18 GHz	Fig.79	P
	159	30 MHz ~1 GHz	Fig.80	P
		1 GHz ~ 6 GHz	Fig.81	P
		6 GHz ~ 18 GHz	Fig.82	P
/	All channels	18 GHz ~ 26.5 GHz	Fig.83	P
		26.5 GHz~ 40 GHz	Fig.84	P

Conclusion: PASS

Note:

A "reference path loss" is established and the A_{Rpl} is the attenuation of “reference path loss”, and including the gain of receive antenna, the gain of the preamplifier, the cable loss.

P_{Mea} is the field strength recorded from the instrument.

802.11a

Ch149

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17776.800	53.2	-18.5	45.6	26.100	H
17774.400	52.3	-18.5	45.6	25.200	H
17635.200	51.9	-18.9	45.6	25.200	H
17798.400	51.7	-18.5	45.6	24.600	V
17522.400	51.6	-19.2	45.6	25.200	V
17944.800	51.5	-17.7	45.6	23.600	V

Ch157

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17967.600	53.8	-17.7	45.6	25.900	V
17966.400	53.7	-17.7	45.6	25.800	V
17944.800	52.5	-17.7	45.6	24.600	V
17802.000	52.4	-18.5	45.6	25.300	H
17858.400	52.1	-18.5	45.6	25.000	H
17611.200	51.9	-18.9	45.6	25.200	H

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Ch165

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17770.800	53.4	-18.5	45.6	26.300	H
17851.200	52.1	-18.5	45.6	25.000	V
17938.800	52.1	-17.7	45.6	24.200	H
17685.600	52.0	-18.9	45.6	25.300	H
17776.800	51.6	-18.5	45.6	24.500	V
17802.000	51.6	-18.5	45.6	24.500	H

802.11n-HT20

Ch149

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17833.200	54.2	-18.5	45.6	27.100	H
17785.200	52.9	-18.5	45.6	25.800	V
17798.400	52.6	-18.5	45.6	25.500	V
17478.000	52.6	-19.2	41.5	30.300	V
17869.200	52.6	-18.5	45.6	25.500	H
17692.800	52.5	-18.9	45.6	25.800	V

Ch157

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17763.600	51.9	-18.5	45.6	24.800	V
17806.800	51.9	-18.5	45.6	24.800	V
17816.400	51.9	-18.5	45.6	24.800	V
17766.000	51.5	-18.5	45.6	24.400	H
17792.400	51.4	-18.5	45.6	24.300	H
17829.600	51.4	-18.5	45.6	24.300	H

Ch165

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17595.600	52.8	-18.9	45.6	26.100	V
17750.400	52.3	-18.5	45.6	25.200	V
17726.400	52.0	-18.9	45.6	25.300	H
17668.800	51.9	-18.9	45.6	25.200	V
17863.200	51.9	-18.5	45.6	24.800	H
17904.000	51.5	-18.5	45.6	24.400	V

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802.11n-HT40

Ch151

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17774.400	52.8	-18.5	45.6	25.700	H
17808.000	52.0	-18.5	45.6	24.900	V
17582.400	52.0	-18.9	45.6	25.300	H
17887.200	51.8	-18.5	45.6	24.700	V
17992.800	51.7	-17.7	45.6	23.800	V
17766.000	51.7	-18.5	45.6	24.600	V

Ch159

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17815.200	52.5	-18.5	45.6	25.400	V
17826.000	52.2	-18.5	45.6	25.100	V
17821.200	52.2	-18.5	45.6	25.100	H
17894.400	52.2	-18.5	45.6	25.100	V
17731.200	52.0	-18.9	45.6	25.300	H
17901.600	51.8	-18.5	45.6	24.700	H

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Test graphs as below:

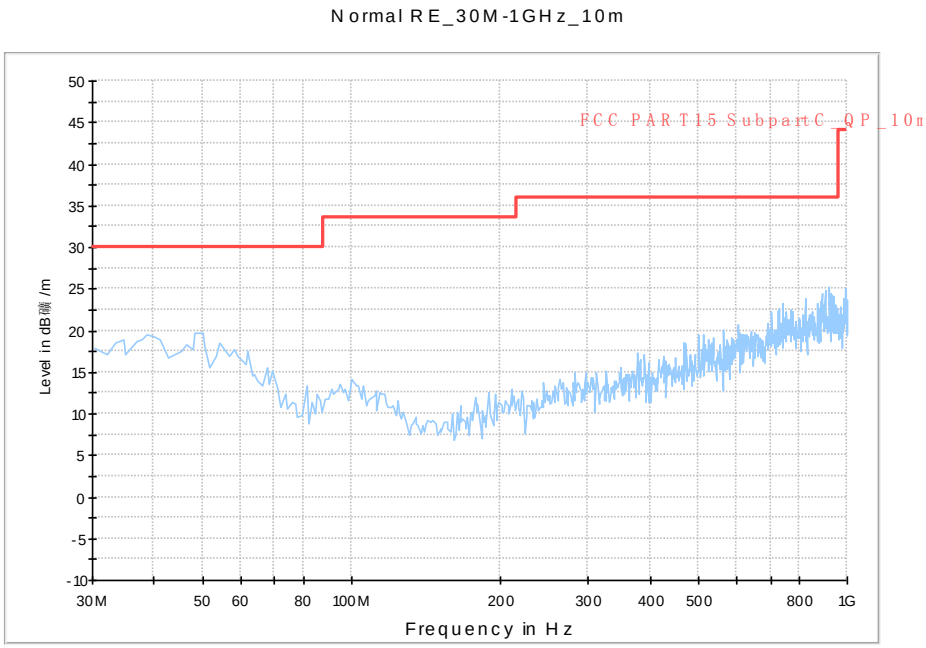

Fig. 55 Radiated Spurious Emission (802.11a, Ch149, 30 MHz-1 GHz)

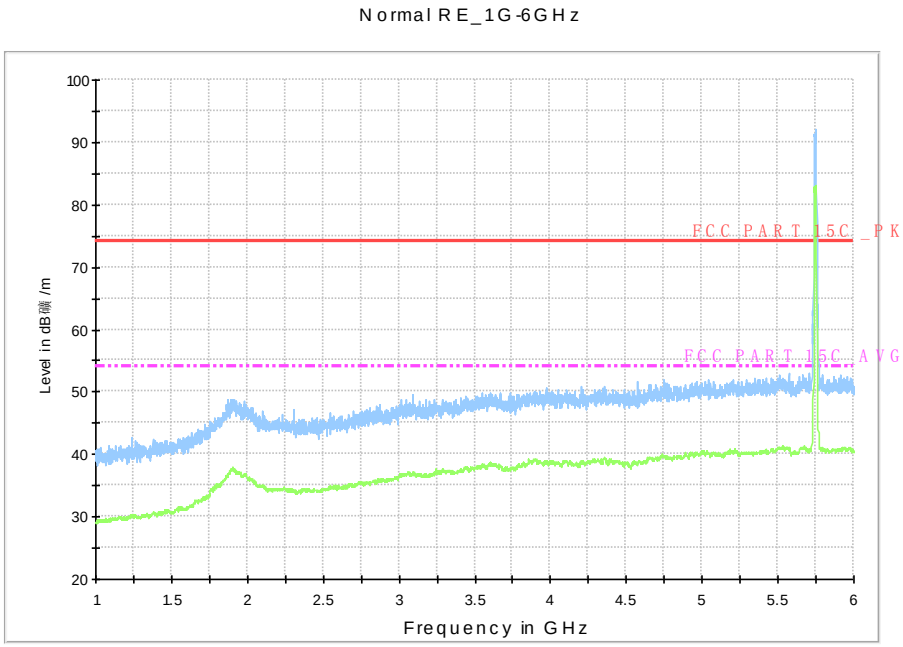

Fig. 56 Radiated Spurious Emission (802.11a, Ch149, 1 GHz-6 GHz)

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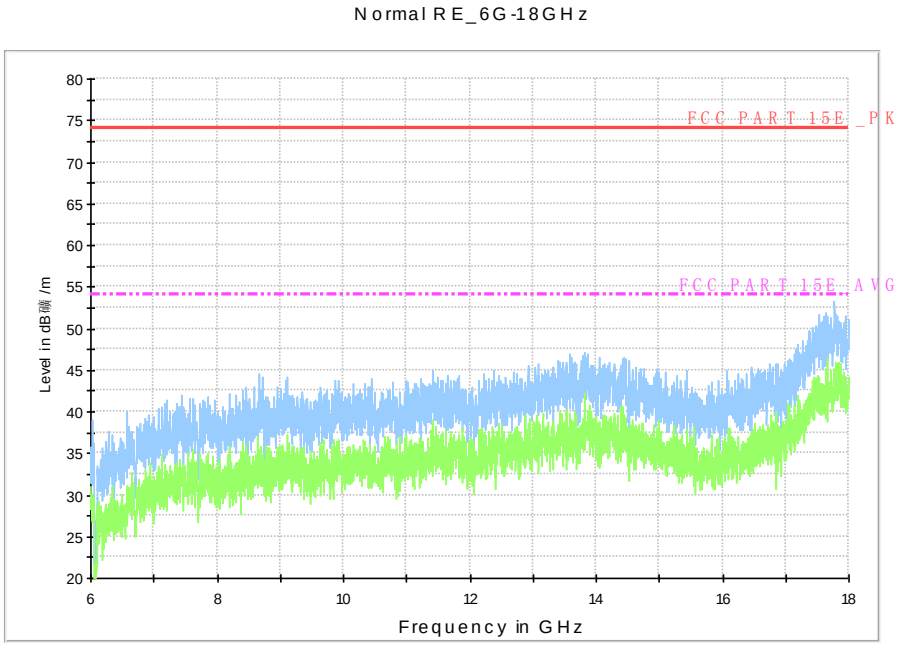

Fig. 57 Radiated Spurious Emission (802.11a, Ch149, 6 GHz-18 GHz)

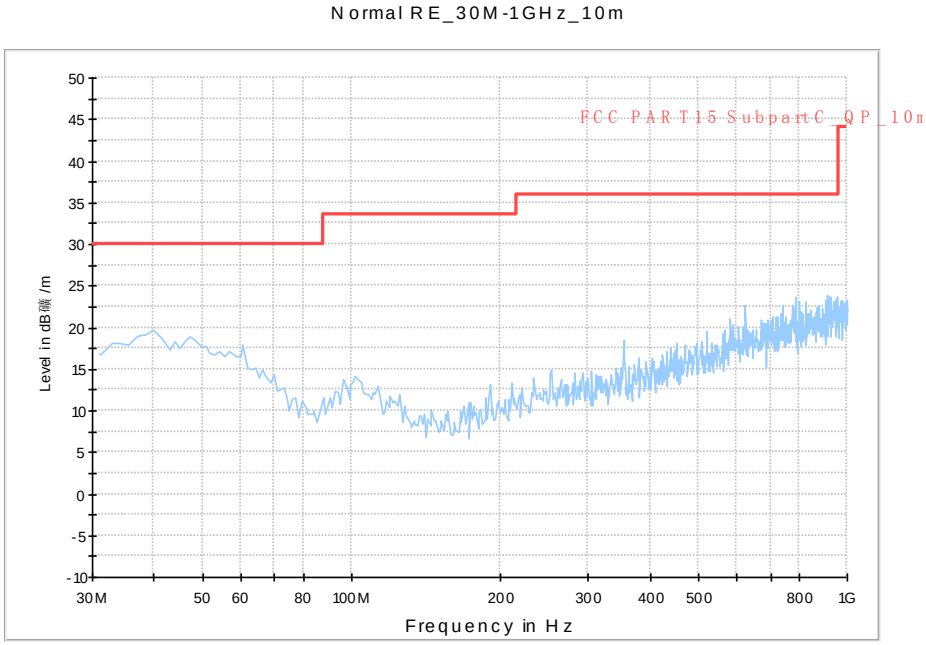

Fig. 58 Radiated Spurious Emission (802.11a, Ch157, 30 MHz-1 GHz)

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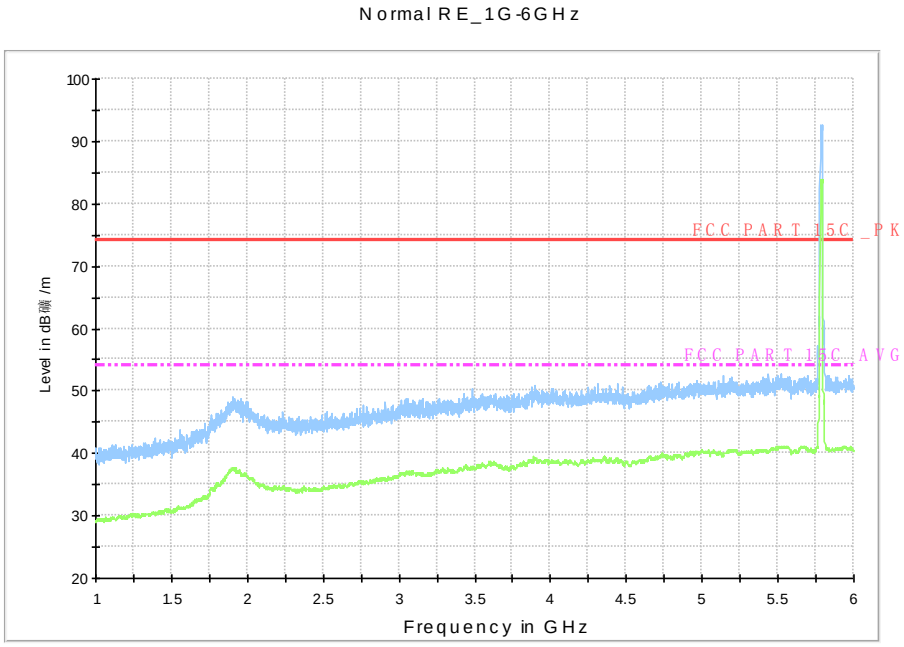

Fig. 59 Radiated Spurious Emission (802.11a, Ch157, 1 GHz-6 GHz)

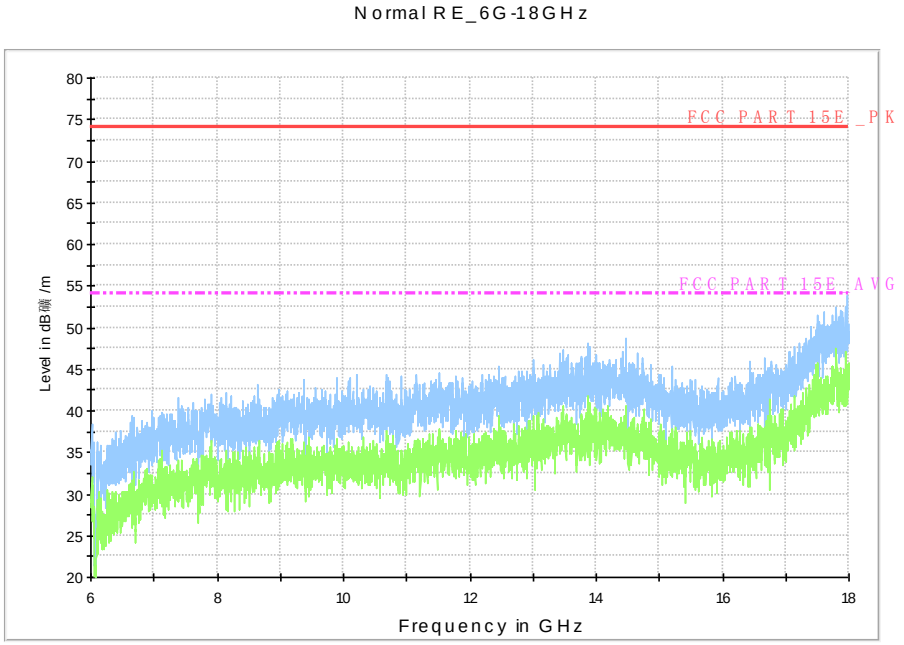

Fig. 60 Radiated Spurious Emission (802.11a, Ch157, 6 GHz-18 GHz)

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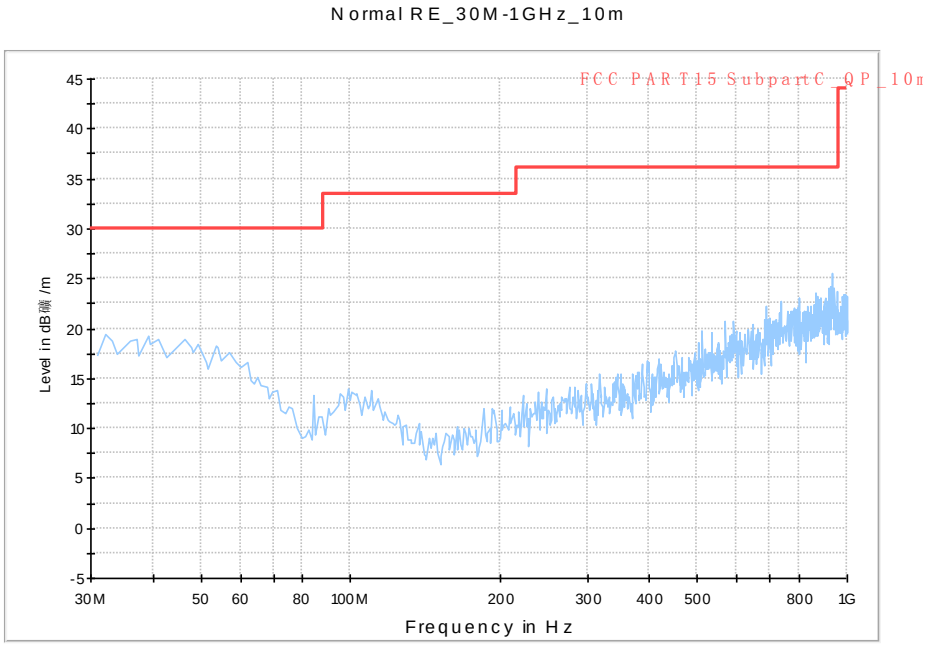

Fig. 61 Radiated Spurious Emission (802.11a, Ch165, 30 MHz-1 GHz)

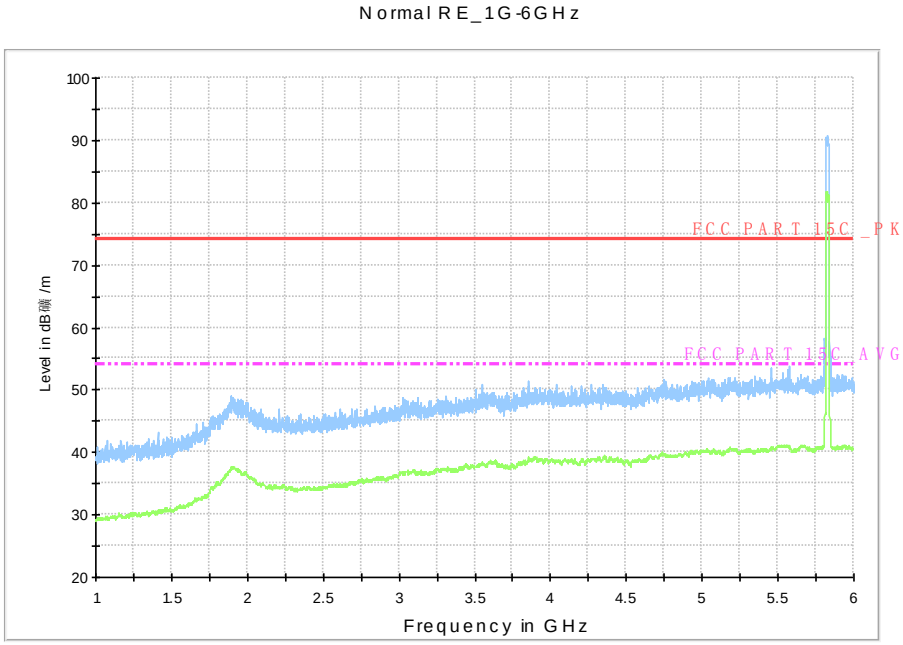

Fig. 62 Radiated Spurious Emission (802.11a, Ch165, 1 GHz-6 GHz)

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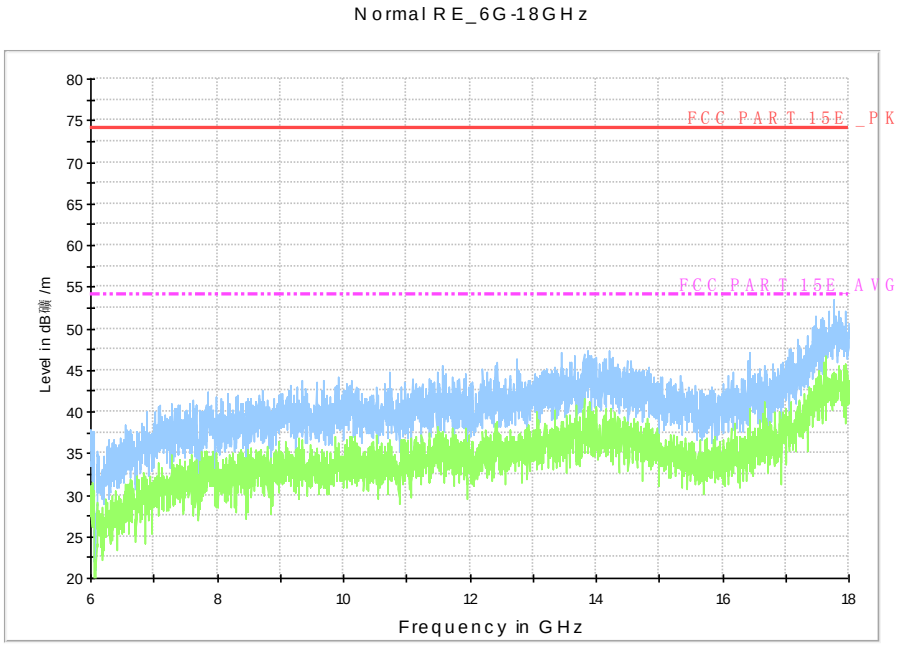

Fig. 63 Radiated Spurious Emission (802.11a, Ch165, 6 GHz-18 GHz)

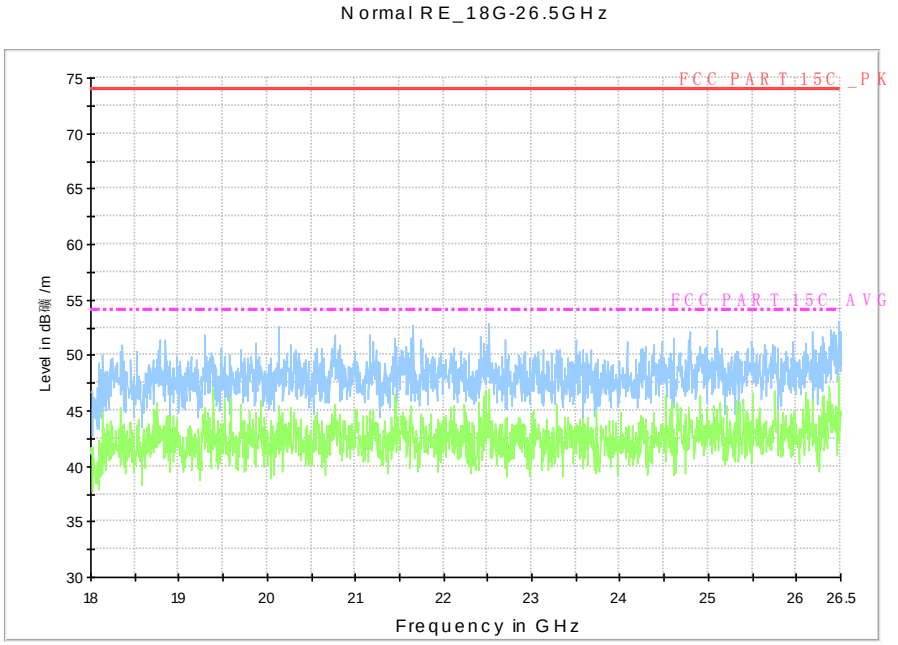

Fig. 64 Radiated Spurious Emission (802.11a, Ch157, 18 GHz-26.5 GHz)

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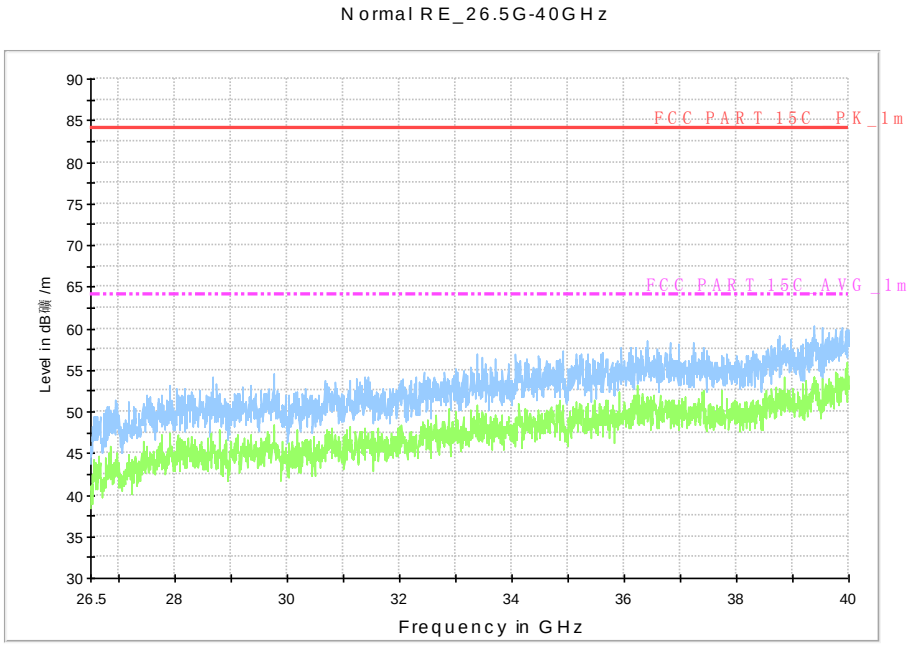

Fig. 65 Radiated emission: 802.11n, (802.11a, Ch157, 26.5 GHz - 40 GHz)

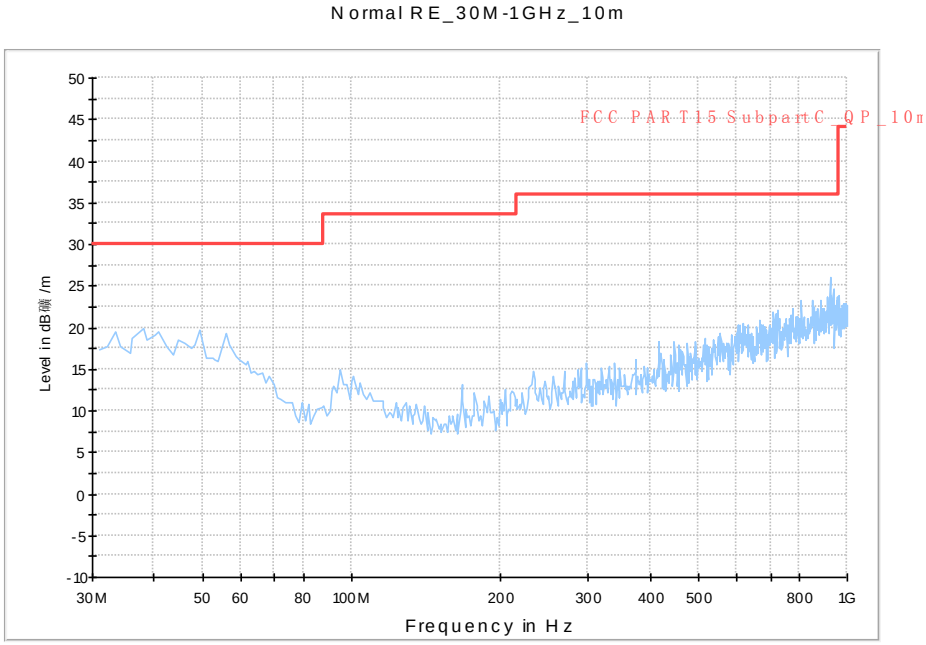

Fig. 66 Radiated Spurious Emission (802.11n-HT20, Ch149, 30 MHz-1 GHz)

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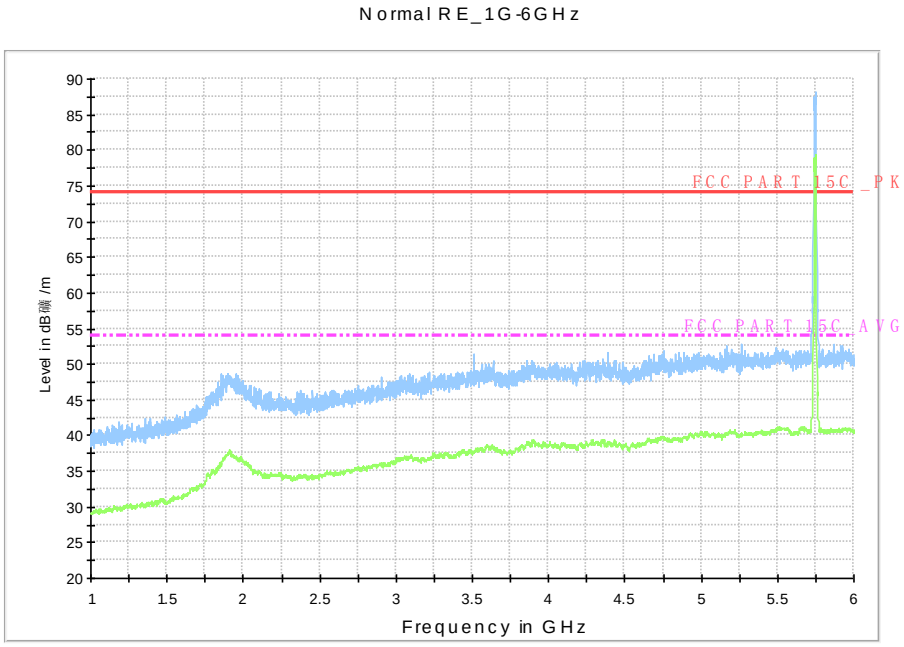

Fig. 67 Radiated Spurious Emission (802.11n-HT20, Ch149, 1 GHz-6 GHz)

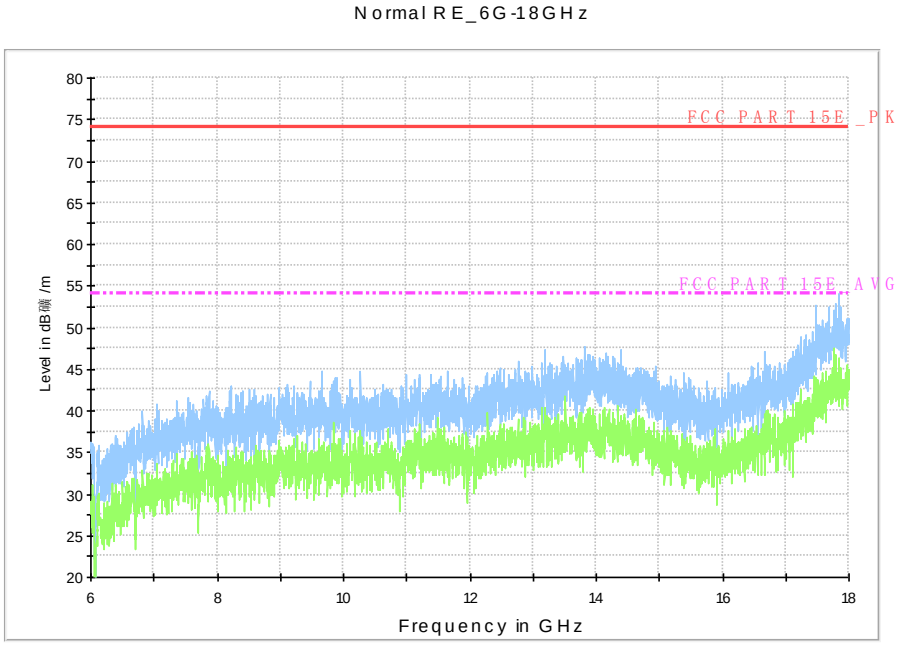

Fig. 68 Radiated Spurious Emission (802.11n-HT20, Ch149, 6 GHz-18 GHz)

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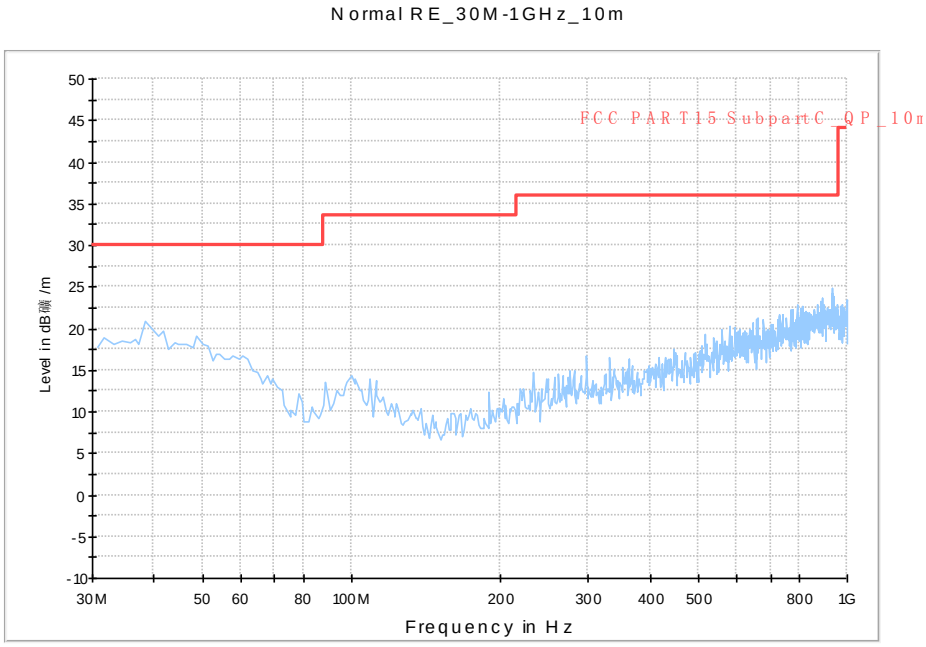

Fig. 69 Radiated Spurious Emission (802.11n-HT20, Ch157, 30 MHz-1 GHz)

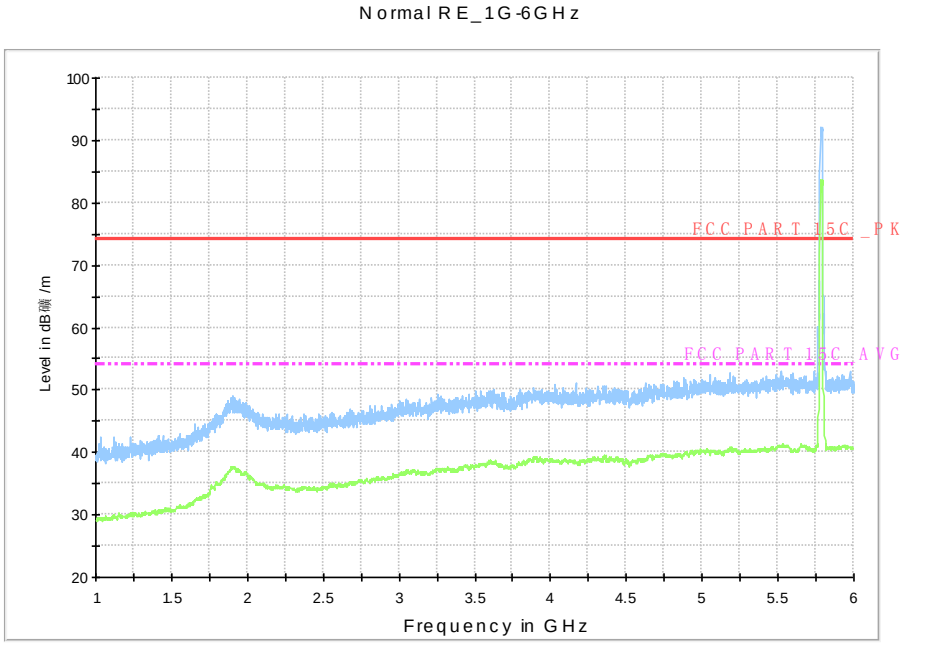

Fig. 70 Radiated Spurious Emission (802.11n-HT20, Ch157, 1 GHz-6 GHz)

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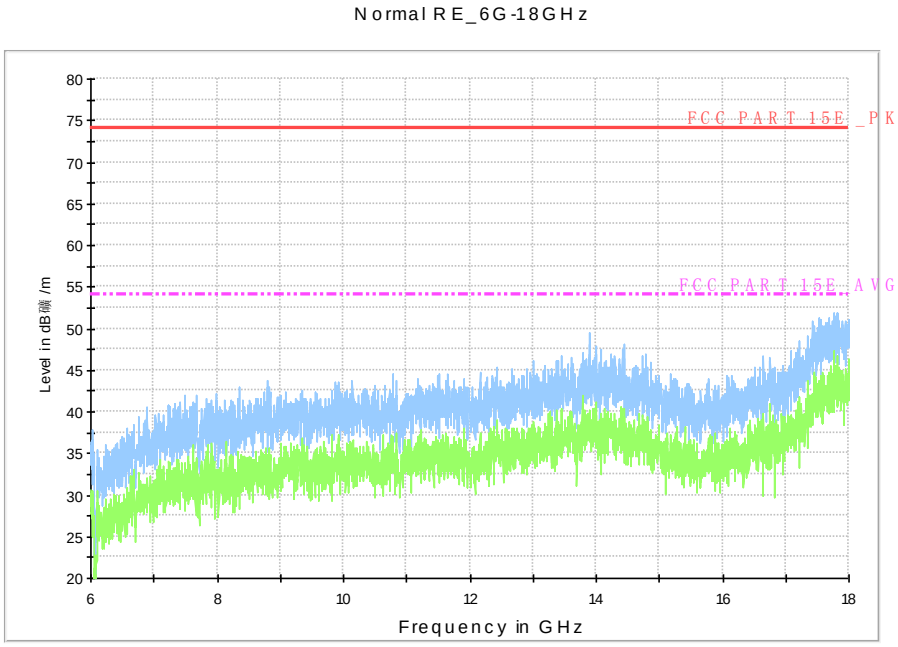

Fig. 71 Radiated Spurious Emission (802.11n-HT20, Ch157, 6 GHz-18 GHz)

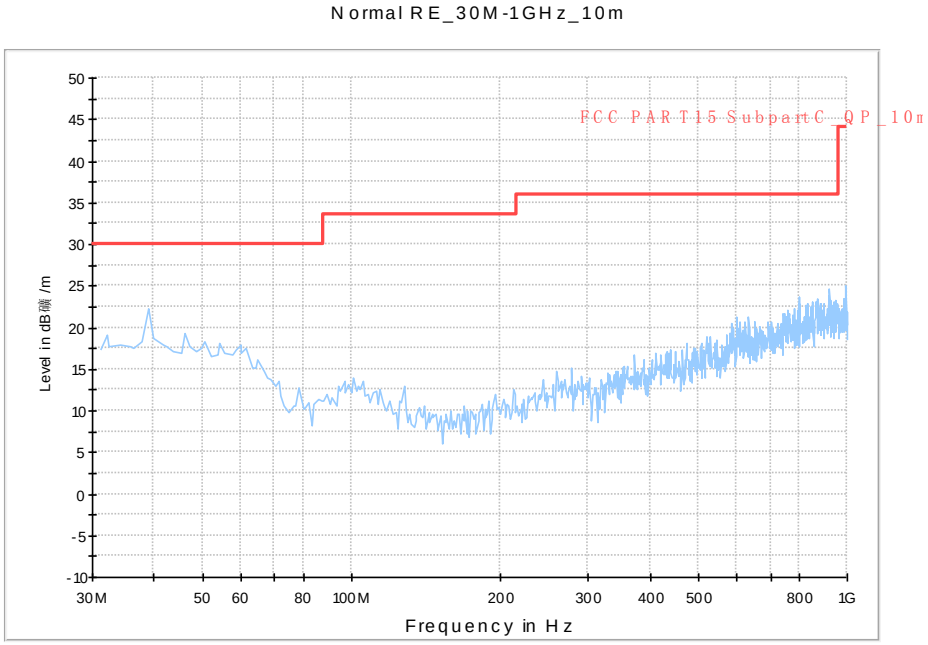

Fig. 72 Radiated Spurious Emission (802.11n-HT20, Ch165, 30 MHz-1 GHz)

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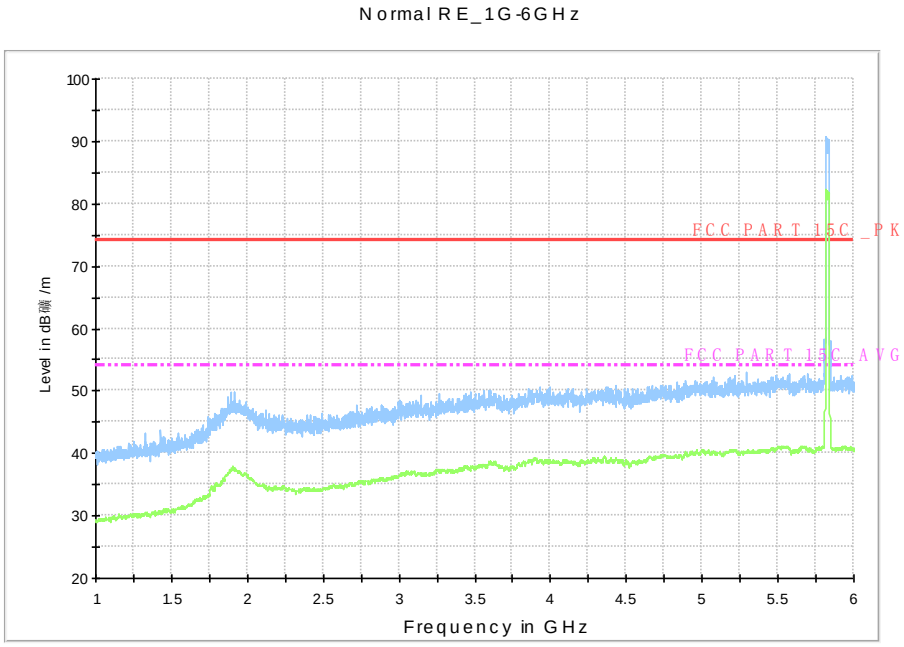

Fig. 73 Radiated Spurious Emission (802.11n-HT20, Ch165, 1 GHz-6 GHz)

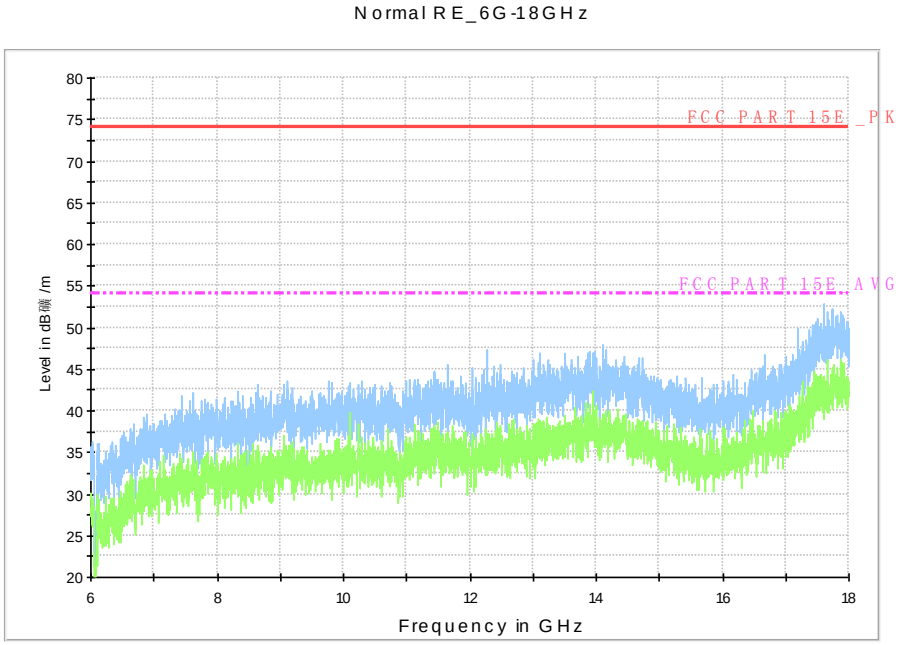

Fig. 74 Radiated Spurious Emission (802.11n-HT20, Ch165, 6 GHz-18 GHz)

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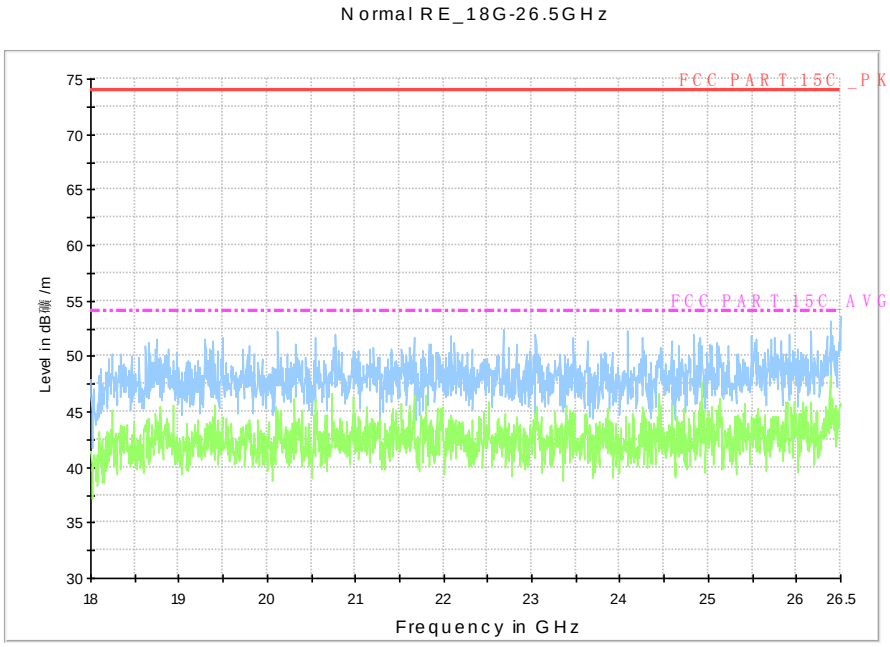

Fig. 75 Radiated Spurious Emission (802.11n-HT20, Ch157, 18 GHz-26.5 GHz)

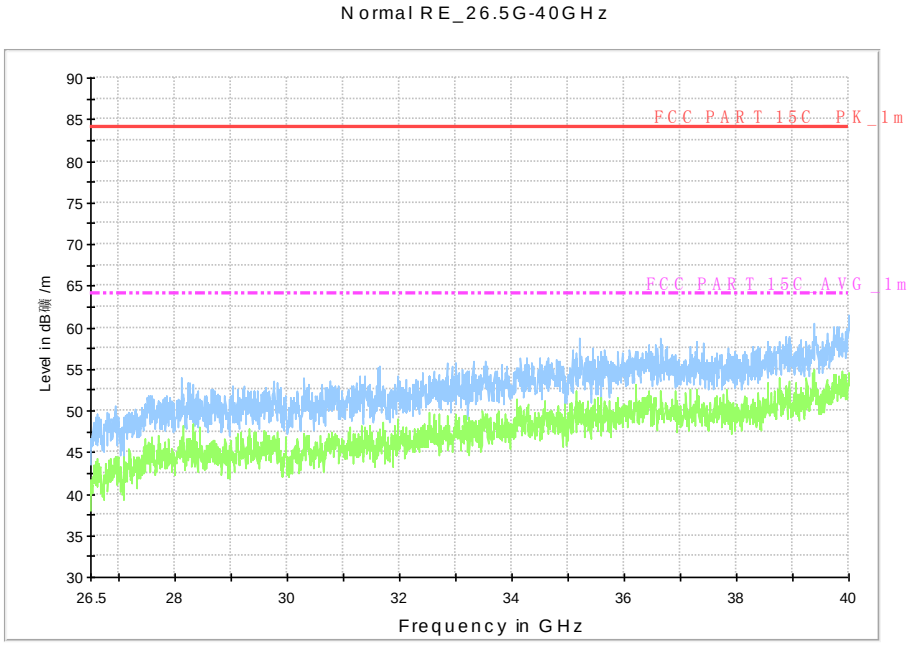

Fig. 76 Radiated emission: 802.11n, (802.11n-HT20, Ch157, 26.5 GHz - 40 GHz)

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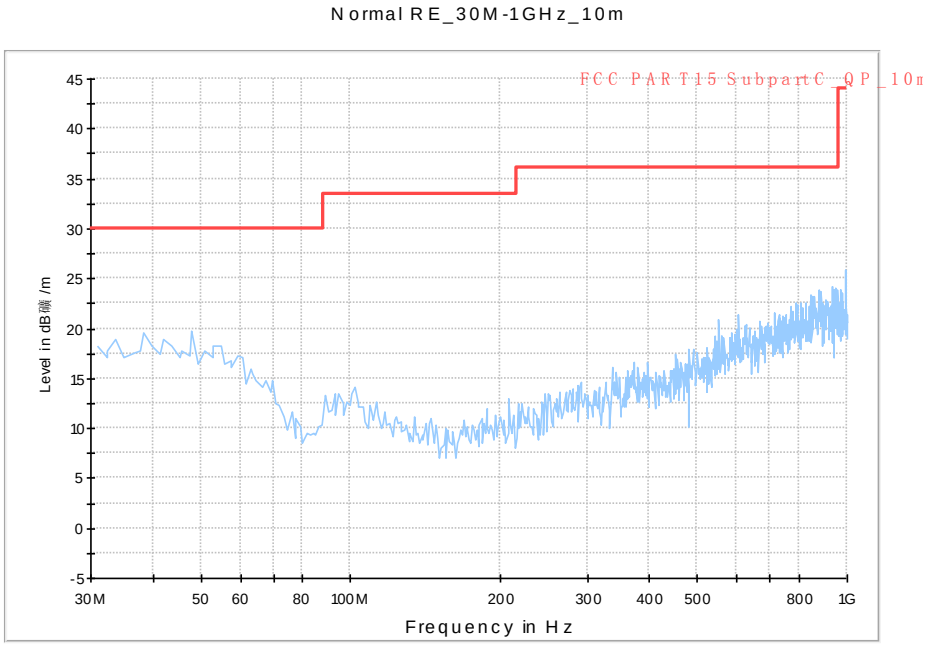

Fig. 77 Radiated Spurious Emission (802.11n-HT40, Ch151, 30 MHz-1 GHz)

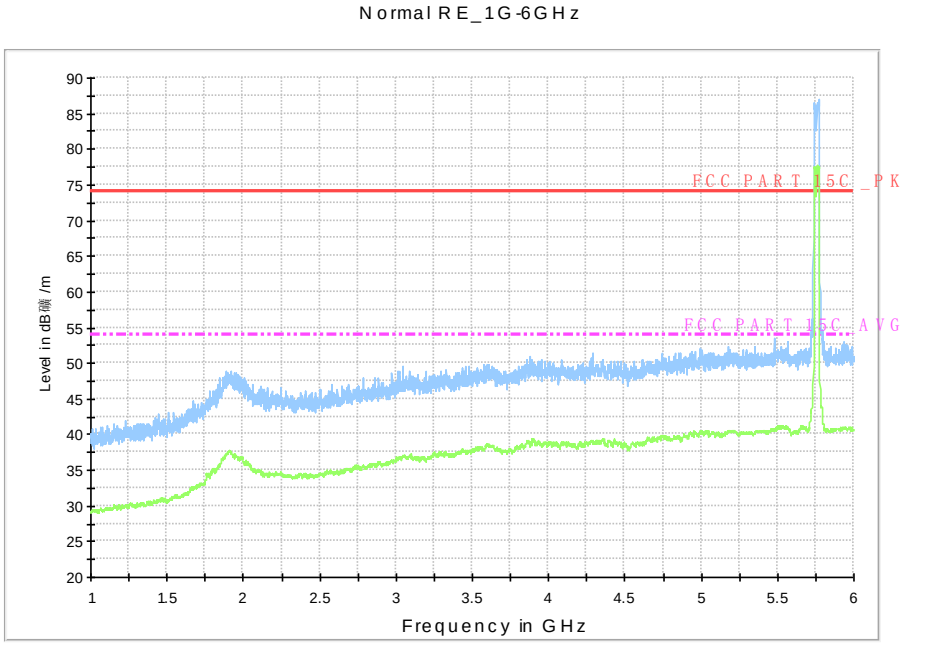

Fig. 78 Radiated Spurious Emission (802.11n-HT40, Ch151, 1 GHz-6 GHz)

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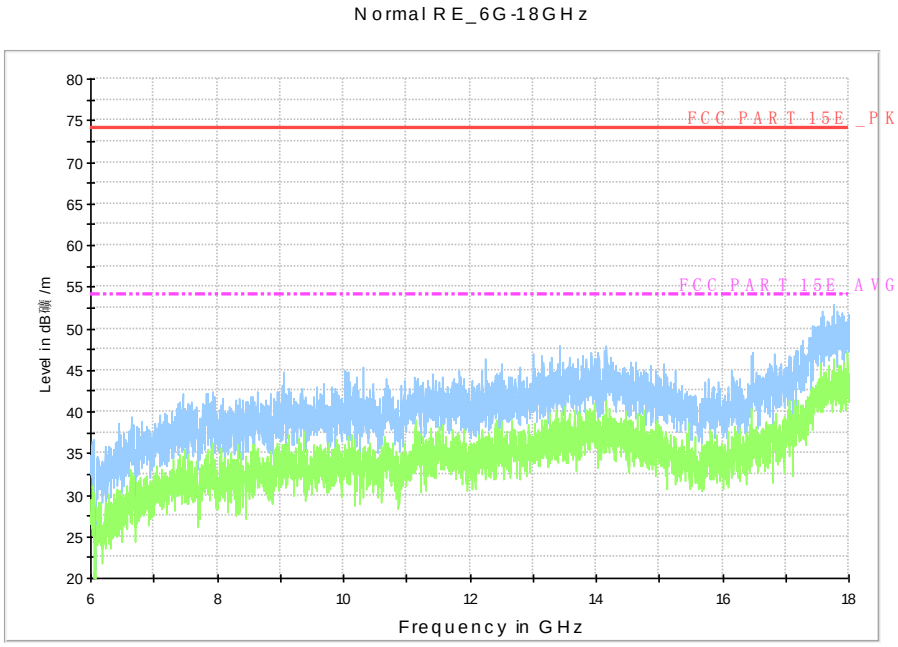

Fig. 79 Radiated Spurious Emission (802.11n-HT40, Ch151, 6 GHz-18 GHz)

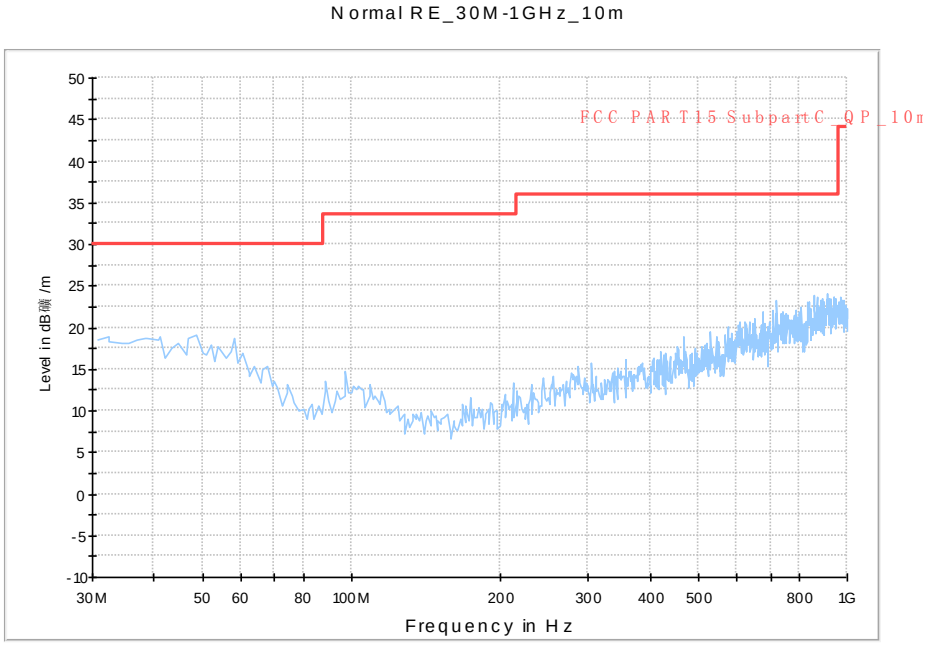

Fig. 80 Radiated Spurious Emission (802.11n-HT40, Ch159, 30 MHz-1 GHz)

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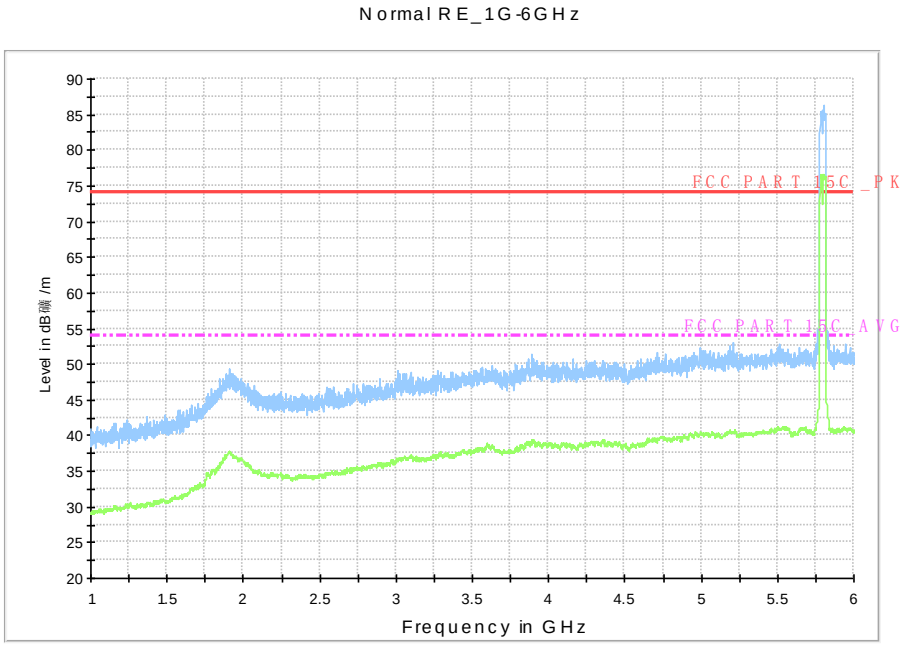

Fig. 81 Radiated Spurious Emission (802.11n-HT40, Ch159 1 GHz-6 GHz)

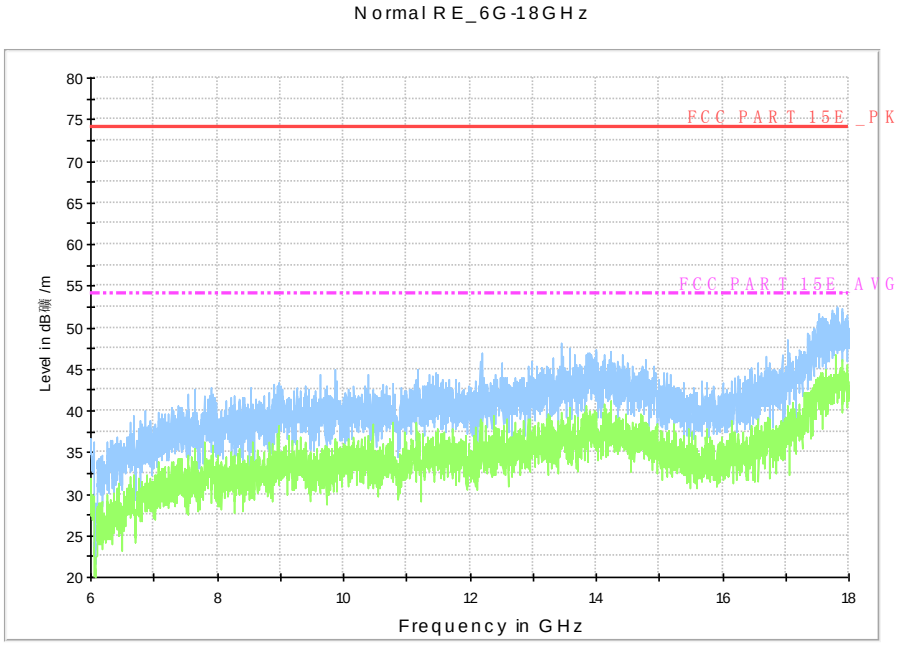

Fig. 82 Radiated Spurious Emission (802.11n-HT40, Ch159, 6 GHz-18 GHz)

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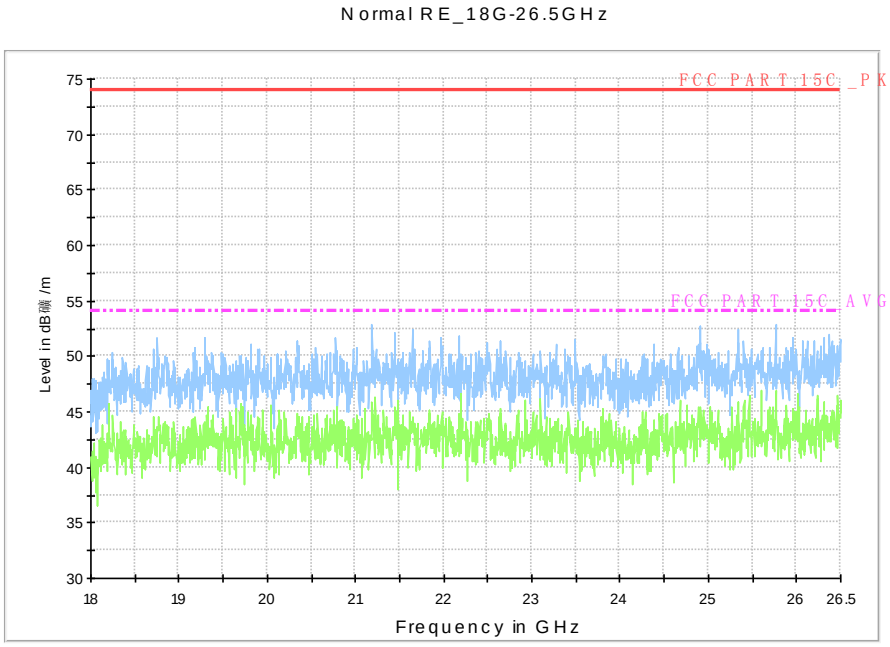

Fig. 83 Radiated Spurious Emission (802.11n-HT40, Ch151, 18 GHz-26.5 GHz)

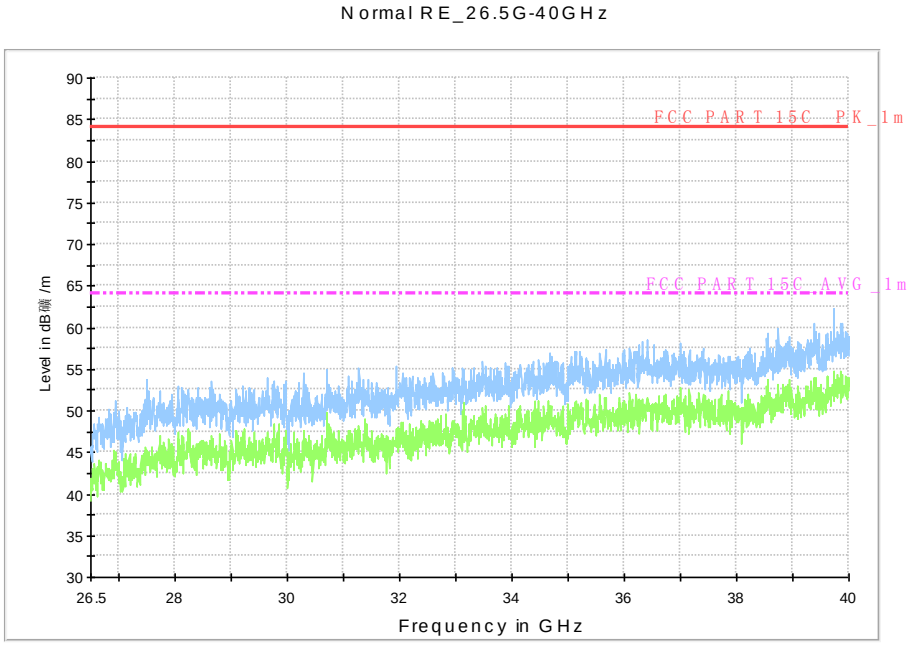

Fig. 84 Radiated emission: 802.11n, (802.11n-HT40, Ch151, 26.5 GHz - 40 GHz)

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A.8. Spurious Emissions Radiated < 30MHz

Measurement Limit:

Frequency (MHz)	Field strength(dBμV/m)	Measurement distance
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30

The measurement is made according to KDB 789033

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)).

Measurement Results:

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11a	157(5785MHz)	9 kHz ~30 MHz	Fig.85	P

Conclusion: PASS

Test graphs as below:

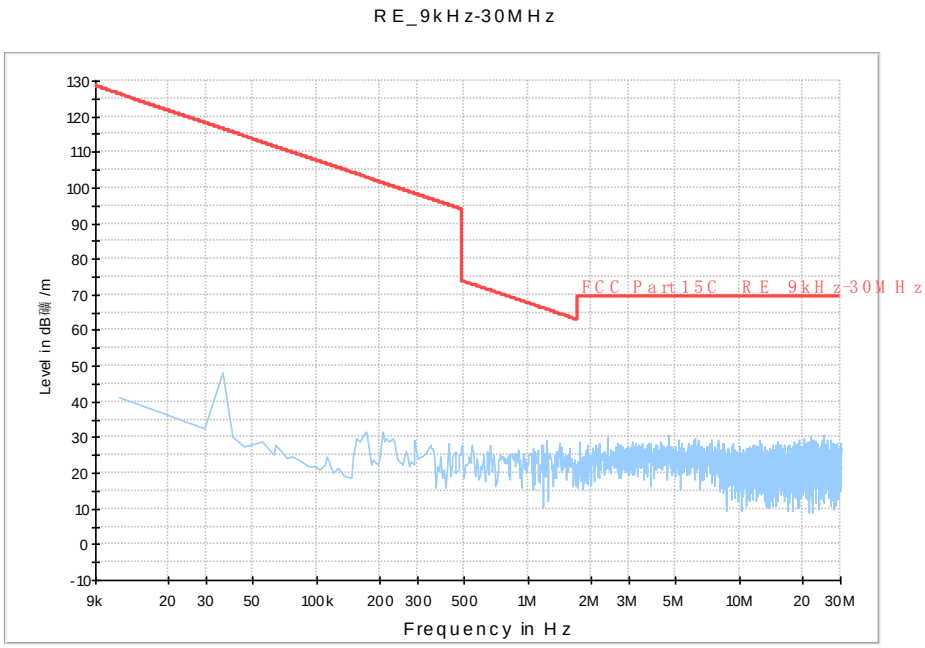

Fig. 85 Radiated Spurious Emission (802.11a, ch157, 9 kHz ~30 MHz)

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A.9. AC Power line Conducted Emission

Test Condition:

Voltage（V）	Frequency（Hz）
110	60

Measurement uncertainty:
Expanded measurement uncertainty for this test item is U =3.2dB, k=2.

Measurement Result and limit:
WLAN (Quasi-peak Limit)

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV)		Conclusion
		With charger		
		802.11a	Idle	
0.15 to 0.5	66 to 56	Fig.86	Fig.87	P
0.5 to 5	56			
5 to 30	60			
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.				

WLAN (Average Limit)

Frequency range (MHz)	Average Limit (dBμV)	Result (dBμV)		Conclusion
		With charger		
		802.11a	Idle	
0.15 to 0.5	56 to 46	Fig.86	Fig.87	P
0.5 to 5	46			
5 to 30	50			
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.				

The measurement is made according to ANSI C63.10 .

Conclusion: PASS
Test graphs as below:

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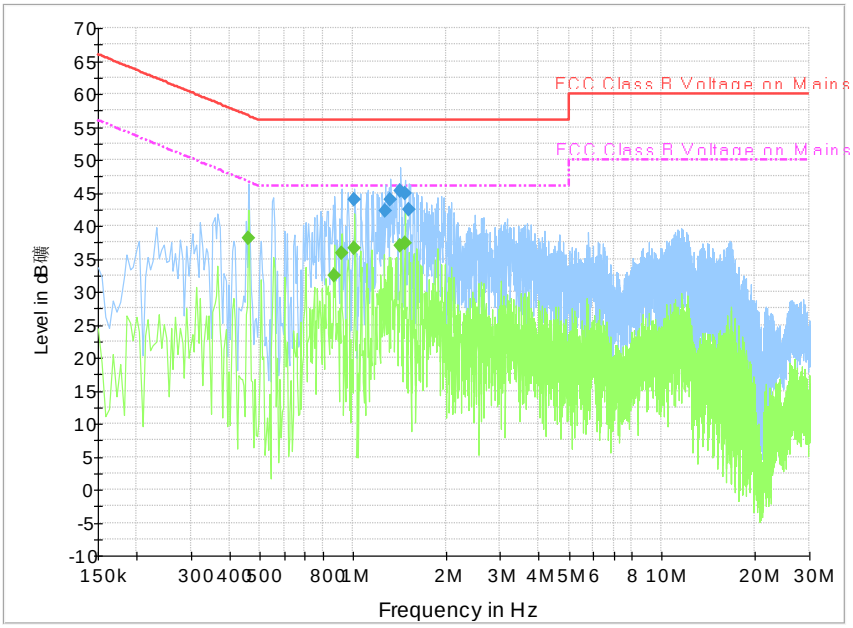

Fig. 86 AC Powerline Conducted Emission-802.11a

Measurement Result 1:

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
1.014000	43.9	GND	L1	9.7	12.1	56.0
1.275000	42.2	GND	L1	9.7	13.8	56.0
1.324500	43.9	GND	L1	9.7	12.1	56.0
1.423500	45.4	GND	L1	9.7	10.6	56.0
1.473000	44.9	GND	L1	9.7	11.1	56.0
1.518000	42.5	GND	N	9.7	13.5	56.0

Measurement Result 2:

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.460500	38.1	GND	L1	9.8	8.6	46.7
0.874500	32.4	GND	L1	9.7	13.6	46.0
0.919500	35.9	GND	L1	9.7	10.1	46.0
1.014000	36.6	GND	L1	9.7	9.4	46.0
1.428000	37.1	GND	L1	9.7	8.9	46.0
1.473000	37.4	GND	L1	9.7	8.6	46.0

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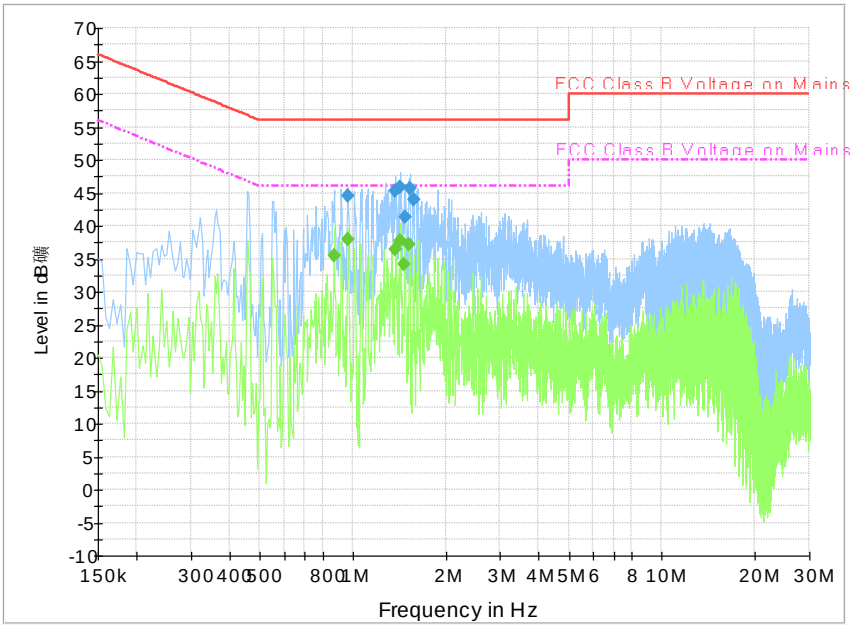

Fig. 87 AC Powerline Conducted Emission-Idle

Measurement Result 1:

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.964500	44.5	GND	L1	9.7	11.5	56.0
1.378500	45.2	GND	L1	9.7	10.8	56.0
1.423500	45.9	GND	L1	9.7	10.1	56.0
1.473000	41.3	GND	N	9.7	14.7	56.0
1.527000	45.6	GND	L1	9.7	10.4	56.0
1.576500	44.1	GND	L1	9.7	11.9	56.0

Measurement Result 2:

Frequency (MHz)	CAverage (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.870000	35.6	GND	L1	9.8	10.4	46.0
0.964500	37.9	GND	L1	9.7	8.1	46.0
1.378500	36.4	GND	L1	9.7	9.6	46.0
1.423500	37.8	GND	L1	9.7	8.2	46.0
1.468500	34.1	GND	L1	9.7	11.9	46.0
1.522500	37.2	GND	L1	9.7	8.8	46.0

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ANNEX B: PHOTOGRAPHS OF THE TEST SET-UP

Layout of Radiated Spurious Emission Test

No Display.

Layout of AC Powerline Conducted Emission

No Display.

***** END OF REPORT BODY *****

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