

Fig. 43 Conducted Spurious Emission (802.11ac-HT80, Ch155, 1 GHz -12 GHz)

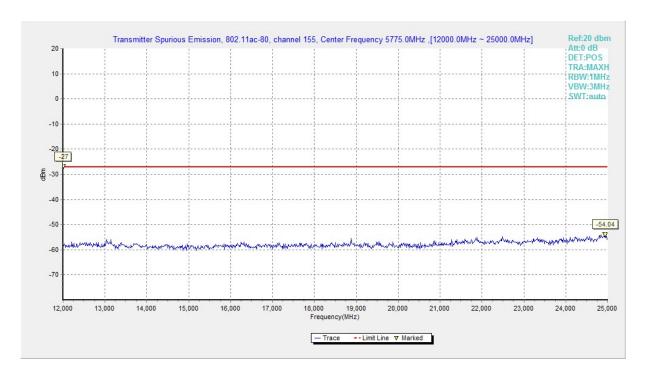


Fig. 44 Conducted Spurious Emission (802.11ac-HT80, Ch155, 12 GHz-25 GHz)



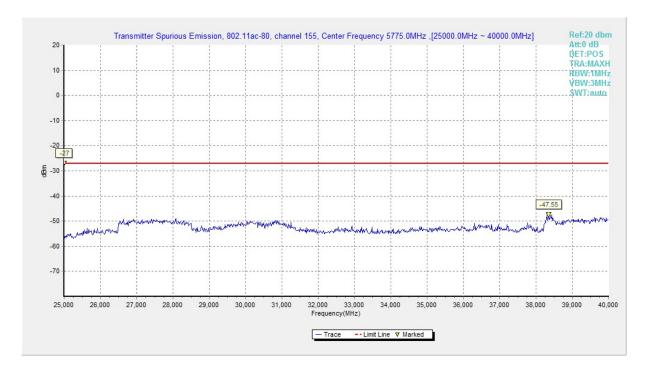


Fig. 45 Conducted Spurious Emission (802.11ac-HT80, Ch155, 25 GHz-40 GHz)



A.5.2 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
		1 GHz ~ 3 GHz	Fig.46	Р
	149	3 GHz ~ 6 GHz	Fig.47	Р
		6 GHz ~ 18 GHz	Fig.48	Р
		30 MHz ~1 GHz	Fig.49	Р
	157	1 GHz ~ 3 GHz	Fig.50	Р
802.11a		3 GHz ~ 6 GHz	Fig.51	Р
002.11a		6 GHz ~ 18 GHz	Fig.52	Р
		18 GHz ~ 26.5 GHz Fig.53	Fig.53	Р
		26.5 GHz~ 40 GHz	Fig.54	Р
		1 GHz ~ 3 GHz	Fig.55	Р
	165	3 GHz ~ 6 GHz	Fig.56	Р
		6 GHz ~ 18 GHz	Fig.57	Р

802.11n-HT20 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
		1 GHz ~ 3 GHz	Fig.58	Р
	149	3 GHz ~ 6 GHz	Fig.59	Р
		6 GHz ~ 18 GHz	Fig.60	Р
		30 MHz ~1 GHz	Fig.61	Р
	157	1 GHz ~ 3 GHz	Fig.62	Р
802.11n		3 GHz ~ 6 GHz	Fig.63	Р
(HT20)		6 GHz ~ 18 GHz	Fig.64	Р
		18 GHz ~ 26.5 GHz	Fig.65	Р
		26.5 GHz~ 40 GHz	Fig.66	Р
		1 GHz ~ 3 GHz	Fig.67	Р
	165	3 GHz ~ 6 GHz	Fig.68	Р
		6 GHz ~ 18 GHz	Fig.69	Р

802.11n-HT40 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n	151	30 MHz ~1 GHz	Fig.70	Р
(HT40)	151	1 GHz ~ 3 GHz	Fig.71	Р



	3 GHz ~ 6 GHz	Fig.72	Р
	6 GHz ~ 18 GHz	Fig.73	Р
	18 GHz ~ 26.5 GHz	Fig.74	Р
	26.5 GHz~ 40 GHz	Fig.75	Р
	1 GHz ~ 3 GHz	Fig.76	Р
159	3 GHz ~ 6 GHz	Fig.77	Р
	6 GHz ~ 18 GHz	Fig.78	Р

802.11ac-HT80 mode

MODE	Channel	Frequency Range	Test Results	Conclusion
		30 MHz ~1 GHz	Fig.79	Р
		1 GHz ~ 3 GHz	Fig.80	Р
802.11ac	155	3 GHz ~ 6 GHz	Fig.81	Р
HT80	155	6 GHz ~ 18 GHz	Fig.82	Р
		18 GHz ~ 26.5 GHz	Fig.83	Р
		26.5 GHz~ 40 GHz	Fig.84	Р

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

Fraguenov/MUz)	Result	Cable	Antenna	P _{Mea}	Polarization
Frequency(MHz)	(dBuV/m)	Loss(dB)	Factor	(dBuV/m)	
5724.976	62.0	-18.2	34.8	45.364	Н
17569.200	58.3	-14.9	41.2	32.018	Н
17170.800	58.2	-15.1	41.4	31.893	V
17301.600	58.2	-13.9	41.2	30.923	Н
17475.600	57.9	-14.9	41.2	31.618	V
17737.200	57.8	-13.0	41.2	29.605	Н

Ch157

Fraguenov/MUz)	Result	Cable	Antenna	P _{Mea}	Polarization
Frequency(MHz)	(dBuV/m)	Loss(dB)	Factor	(dBuV/m)	
17950.800	58.7	-13.5	41.0	31.162	Н
17641.800	58.3	-13.0	41.2	30.105	V
17813.400	58.1	-13.5	41.0	30.562	V
17715.000	58.1	-13.0	41.2	29.905	Н
17928.600	58.0	-13.5	41.0	30.462	Н
17742.600	57.9	-13.0	41.2	29.705	V



Ch165

Fraguenov/MUz)	Result	Cable	Antenna	P _{Mea}	Polarization
Frequency(MHz)	(dBuV/m)	Loss(dB)	Factor	(dBuV/m)	
5852.812	52.9	-20.0	34.9	38.003	Н
17563.800	58.6	-14.9	41.2	32.318	V
17653.800	58.5	-13.0	41.2	30.305	Н
17650.800	58.4	-13.0	41.2	30.205	Н
17280.000	58.3	-15.1	41.2	32.193	V
17560.200	58.3	-14.9	41.2	32.018	Н

802.11n-HT20

Ch149

Eroguenov/MHz)	Result	Cable	Antenna	P _{Mea}	Polarization
Frequency(MHz)	(dBuV/m)	Loss(dB)	Factor	(dBuV/m)	
5723.800	56.5	-18.2	34.8	39.864	V
17558.400	58.9	-14.9	41.2	32.618	V
17663.400	58.3	-13.0	41.2	30.105	V
17259.600	58.2	-15.1	41.2	32.093	Н
17634.000	58.1	-13.0	41.2	29.905	Н
17271.600	58.1	-15.1	41.2	31.993	Н

Ch157

Fraguenov/MHz)	Result	Cable	Antenna	P _{Mea}	Polarization
Frequency(MHz)	(dBuV/m)	Loss(dB)	Factor	(dBuV/m)	
17673.600	58.7	-13.0	41.2	30.505	Н
17952.600	58.5	-13.5	41.0	30.962	Н
17961.600	58.2	-13.5	41.0	30.662	V
17741.400	58.1	-13.0	41.2	29.905	V
17663.400	58.0	-13.0	41.2	29.805	Н
17271.600	58.0	-15.1	41.2	31.893	V

Ch165

Frequency(MHz)	Result	Cable	Antenna	P _{Mea}	Polarization
Frequency(winz)	(dBuV/m)	Loss(dB)	Factor	(dBuV/m)	
5860.528	50.4	-20.0	34.9	35.503	Н
17655.000	58.5	-13.0	41.2	30.305	Н
17686.200	58.1	-13.0	41.2	29.905	Н
17671.800	58.0	-13.0	41.2	29.805	V
17565.600	57.9	-14.9	41.2	31.618	V
17636.400	57.8	-13.0	41.2	29.605	Н



802.11n-HT40

Ch151

Fraguanov/MUz)	Result	Cable	Antenna	P _{Mea}	Polarization
Frequency(MHz)	(dBuV/m)	Loss(dB)	Factor	(dBuV/m)	
5724.956	68.7	-18.2	34.8	52.064	V
17890.800	59.0	-13.5	41.0	31.462	Н
17528.400	58.6	-14.9	41.2	32.318	Н
17667.000	58.3	-13.0	41.2	30.105	V
17662.800	58.1	-13.0	41.2	29.905	V
17698.200	58.1	-13.0	41.2	29.905	V

Ch159

Fraguenov/MHz)	Result	Cable	Antenna	P _{Mea}	Polarization
Frequency(MHz)	(dBuV/m)	Loss(dB)	Factor	(dBuV/m)	
5851.712	61.9	-20.0	34.9	47.003	V
17614.200	58.7	-14.9	41.2	32.418	V
17932.200	58.5	-13.5	41.0	30.962	Н
17745.600	58.4	-13.0	41.2	30.205	V
17475.000	58.4	-14.9	41.2	32.118	Н
17694.000	58.3	-13.0	41.2	30.105	V

802.11ac-HT80

Ch155

Eroguopov/MHz)	Result	Cable	Antenna	P _{Mea}	Polarization
Frequency(MHz)	(dBuV/m)	Loss(dB)	Factor	(dBuV/m)	
17688.600	46.4	-13.0	41.2	18.205	Н
17729.400	46.4	-13.0	41.2	18.205	Н
17704.200	46.4	-13.0	41.2	18.205	V
17664.600	46.3	-13.0	41.2	18.105	V
17659.200	46.3	-13.0	41.2	18.105	V
17717.400	46.3	-13.0	41.2	18.105	V



Test graphs as below:



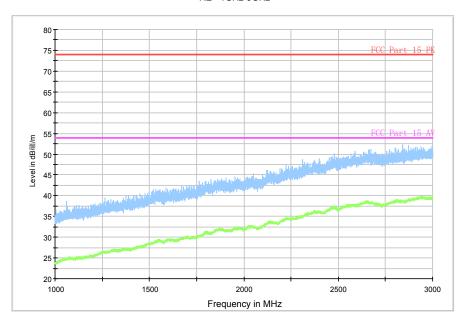


Fig. 46 Radiated Spurious Emission (802.11a, Ch149, 1 GHz-3 GHz)



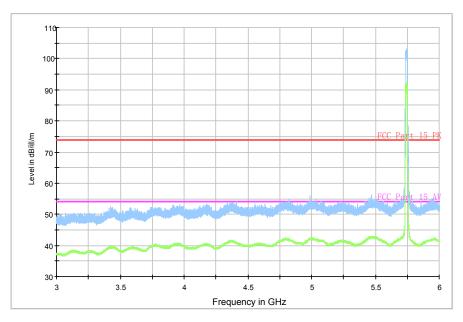


Fig. 47 Radiated Spurious Emission (802.11a, Ch149, 3 GHz-6 GHz)



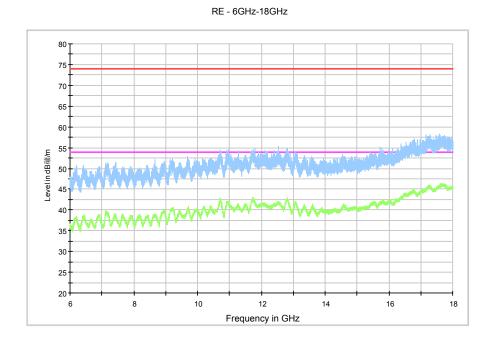


Fig. 48 Radiated Spurious Emission (802.11a, Ch149, 6 GHz-18 GHz)

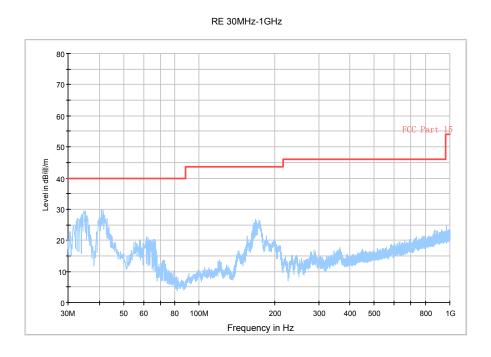


Fig. 49 Radiated Spurious Emission (802.11a, Ch157, 30 MHz-1 GHz)





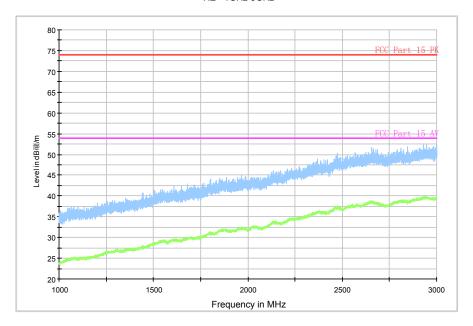


Fig. 50 Radiated Spurious Emission (802.11a, Ch157, 1 GHz-3 GHz)



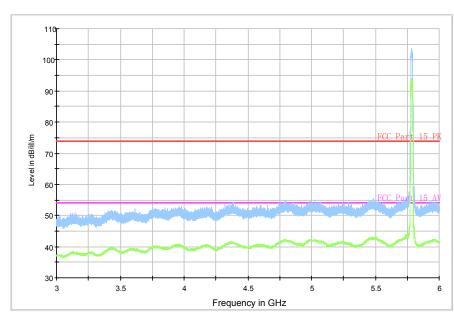


Fig. 51 Radiated Spurious Emission (802.11a, Ch157, 3 GHz-6 GHz)



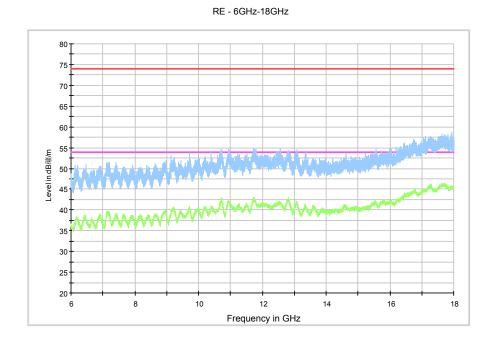


Fig. 52 Radiated Spurious Emission (802.11a, Ch157, 6 GHz-18 GHz)

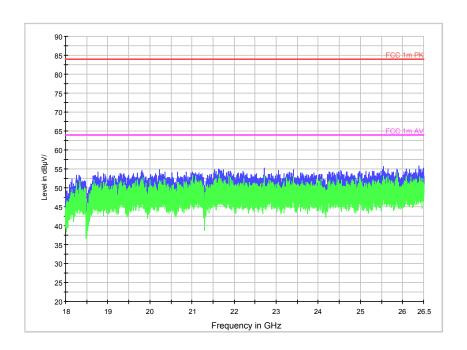


Fig. 53 Radiated Spurious Emission (802.11a, Ch157, 18 GHz-26.5 GHz)



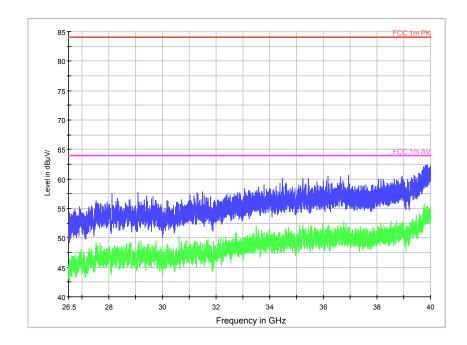


Fig. 54 Radiated emission: 802.11n, (802.11a, Ch157, 26.5 GHz - 40 GHz)



Fig. 55 Radiated Spurious Emission (802.11a, Ch165, 1 GHz-3 GHz)



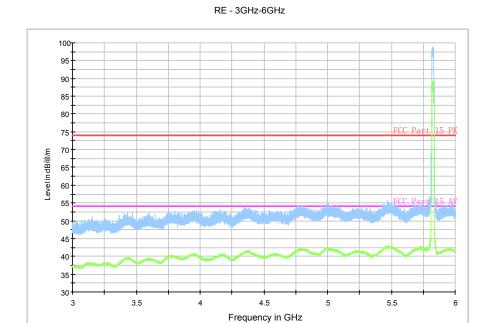


Fig. 56 Radiated Spurious Emission (802.11a, Ch165, 3 GHz-6 GHz)

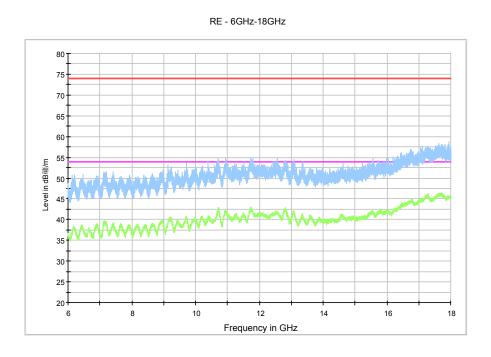


Fig. 57 Radiated Spurious Emission (802.11a, Ch165, 6 GHz-18 GHz)





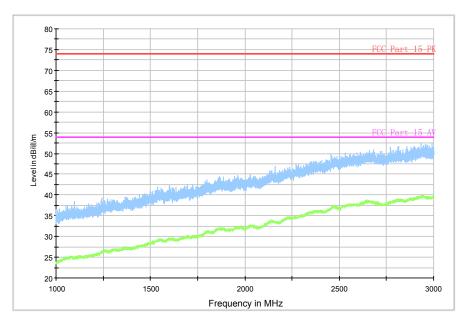


Fig. 58 Radiated Spurious Emission (802.11n-HT20, Ch149, 1 GHz-3 GHz)



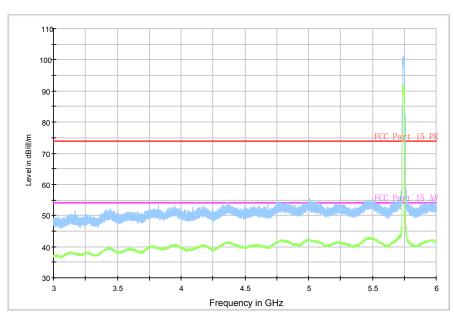


Fig. 59 Radiated Spurious Emission (802.11n-HT20, Ch149, 3 GHz-6 GHz)



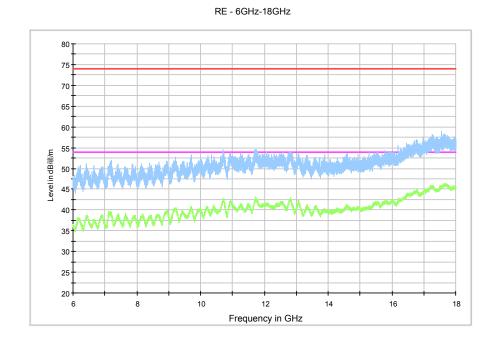


Fig. 60 Radiated Spurious Emission (802.11n-HT20, Ch149, 6 GHz-18 GHz)

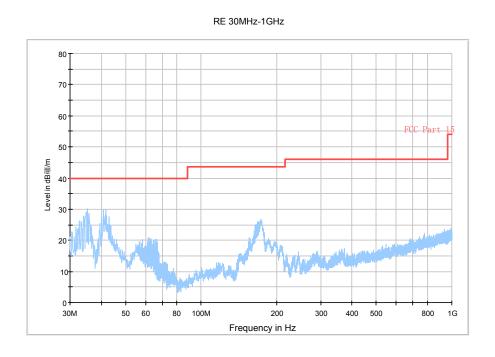


Fig. 61 Radiated Spurious Emission (802.11n-HT20, Ch157, 30 MHz-1 GHz)





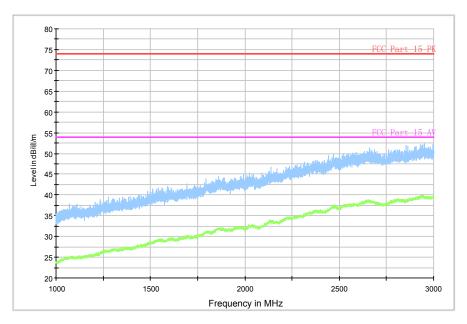


Fig. 62 Radiated Spurious Emission (802.11n-HT20, Ch157, 1 GHz-3 GHz)



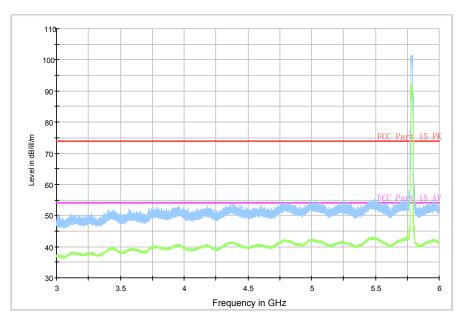


Fig. 63 Radiated Spurious Emission (802.11n-HT20, Ch157, 3 GHz-6 GHz)



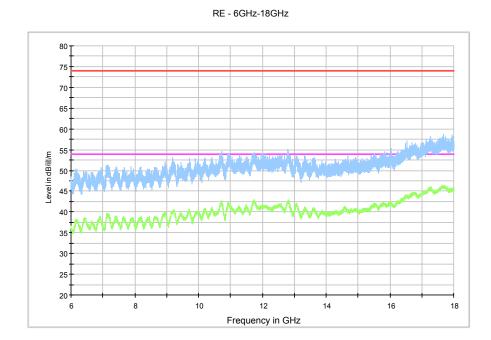


Fig. 64 Radiated Spurious Emission (802.11n-HT20, Ch157, 6 GHz-18 GHz)

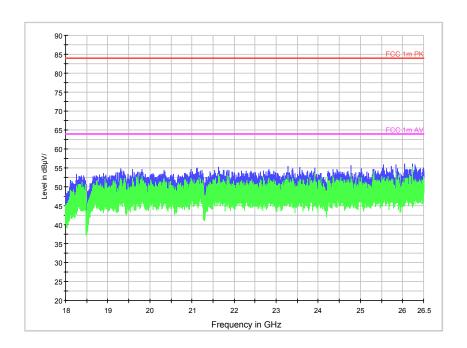


Fig. 65 Radiated Spurious Emission (802.11n-HT20, Ch157, 18 GHz-26.5 GHz)



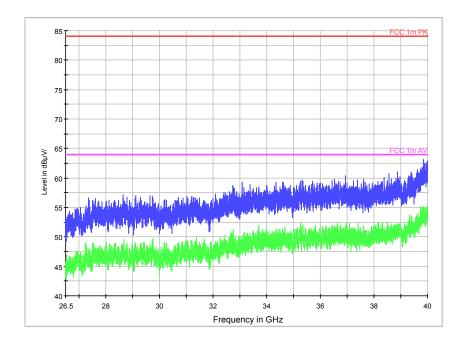


Fig. 66 Radiated emission: 802.11n, (802.11n-HT20, Ch157, 26.5 GHz - 40 GHz)



Fig. 67 Radiated Spurious Emission (802.11n-HT20, Ch165, 1 GHz-3 GHz)





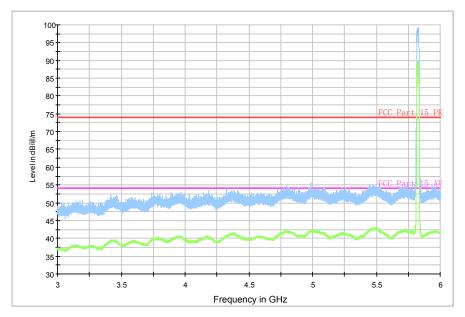


Fig. 68 Radiated Spurious Emission (802.11n-HT20, Ch165, 3 GHz-6 GHz)

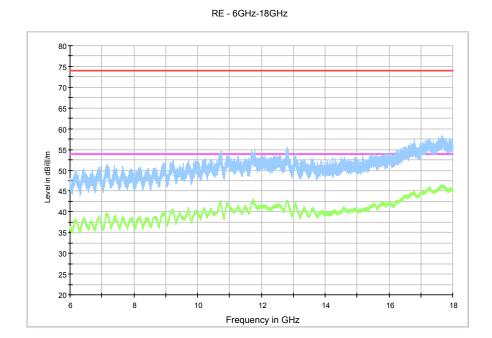


Fig. 69 Radiated Spurious Emission (802.11n-HT20, Ch165, 6 GHz-18 GHz)



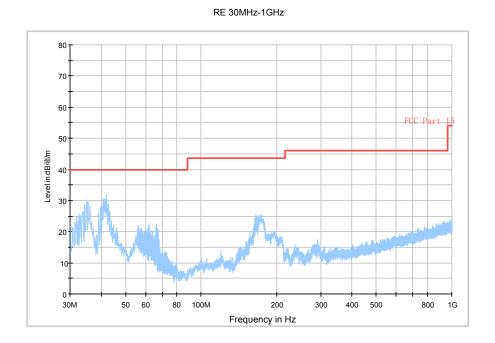


Fig. 70 Radiated Spurious Emission (802.11n-HT40, Ch151, 30 MHz-1 GHz)

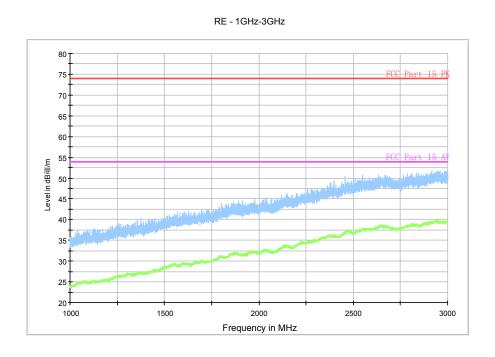


Fig. 71 Radiated Spurious Emission (802.11n-HT40, Ch151, 1 GHz-3 GHz)



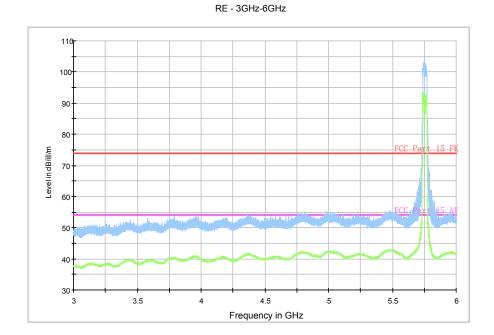


Fig. 72 Radiated Spurious Emission (802.11n-HT40, Ch151, 3 GHz-6 GHz)

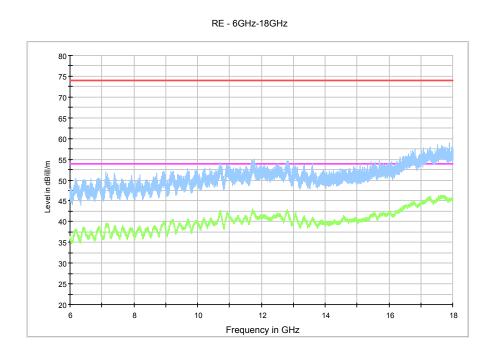


Fig. 73 Radiated Spurious Emission (802.11n-HT40, Ch151, 6 GHz-18 GHz)



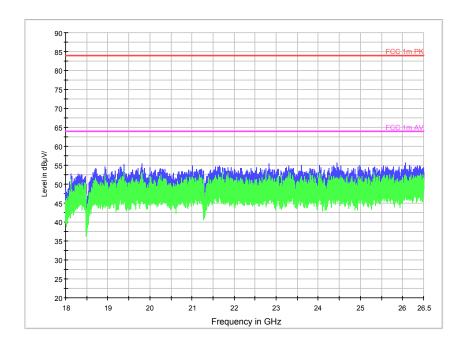


Fig. 74 Radiated Spurious Emission (802.11n-HT40, Ch151, 18 GHz-26.5 GHz)

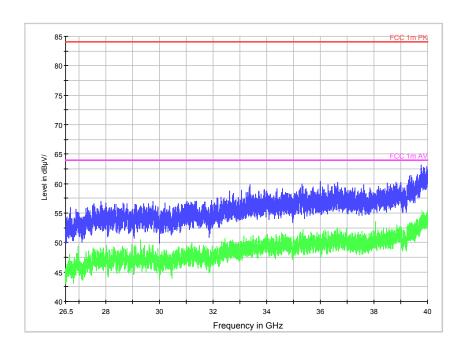


Fig. 75 Radiated emission: 802.11n, (802.11n-HT40, Ch151, 26.5 GHz - 40 GHz)





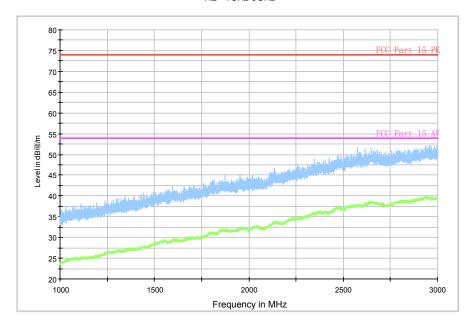


Fig. 76 Radiated Spurious Emission (802.11n-HT40, Ch159 1 GHz-3 GHz)



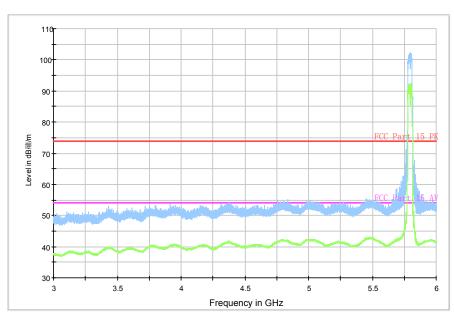


Fig. 77 Radiated Spurious Emission (802.11n-HT40, Ch159 3 GHz-6 GHz)



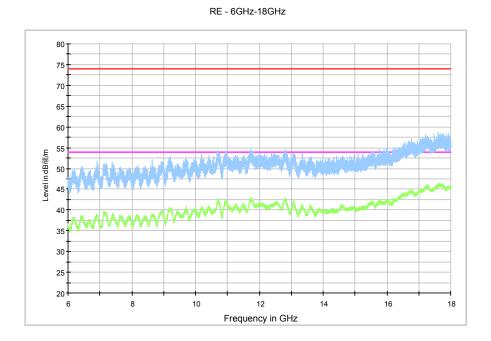


Fig. 78 Radiated Spurious Emission (802.11n-HT40, Ch159, 6 GHz-18 GHz)

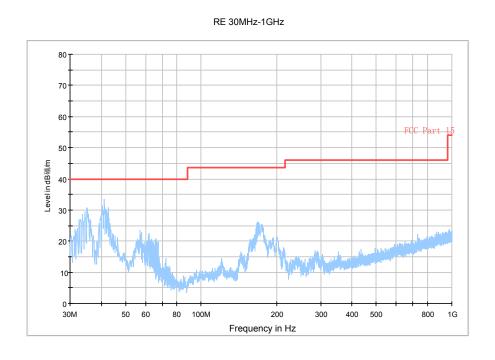


Fig. 79 Radiated Spurious Emission (802.11ac-HT80, Ch155, 30 MHz-1 GHz)





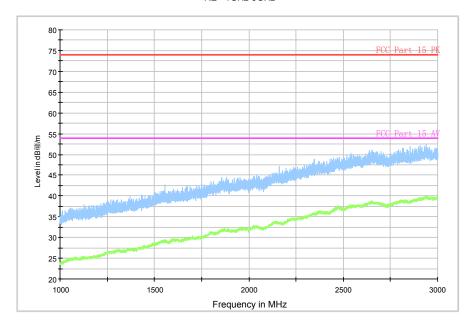


Fig. 80 Radiated Spurious Emission (802.11ac-HT80, Ch155, 1 GHz -3 GHz)



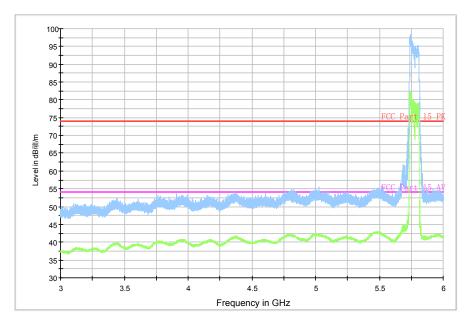


Fig. 81 Radiated Spurious Emission (802.11ac-HT80, Ch155, 3 GHz -6 GHz)



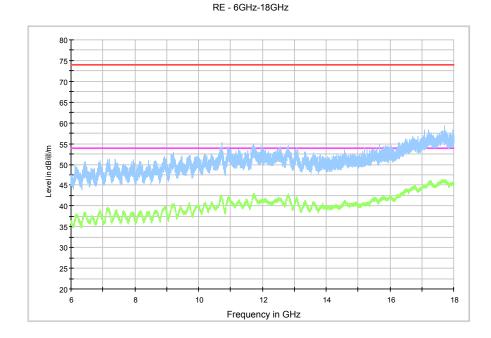


Fig. 82 Radiated Spurious Emission (802.11ac-HT80, Ch155, 6 GHz -18 GHz)

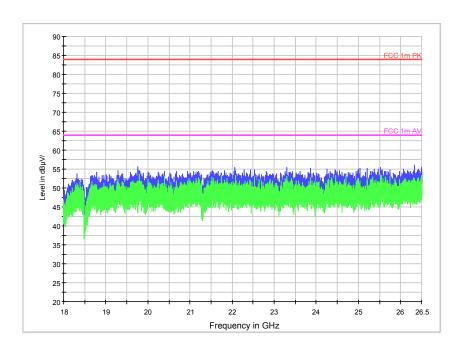


Fig. 83 Radiated Spurious Emission (802.11ac-HT80, Ch155, 18 GHz-26.5 GHz)



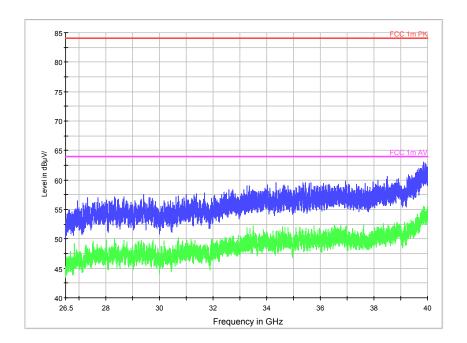


Fig. 84 Radiated Spurious Emission (802.11ac-HT80, Ch155, 26.5 GHz - 40 GHz)



A.6. Band Edges Compliance

A6.1 Band Edges - conducted

Measurement Limit:

Standard	Frequency (MHz)	Limit (dBm/MHz)
FCC 47 CFR Part 15.407 (b) (4)	5715MHz~5860MHz	< -17
FCC 47 CFR Fait 15.407 (b) (4)	Below 5715MHz, Above5860MHz	< -27

The measurement is made according to KDB 789033 D02

Measurement Uncertainty:

Measurement Uncertainty	0.75dB
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Measurement Result:

Mode	Channel	Test Results	Conclusion
902.446	5745 MHz	Fig.85	Р
802.11a	5825 MHz	Fig.86	Р
802.11n	5745 MHz	Fig.87	Р
HT20	5825 MHz	Fig.88	Р
802.11n	5755 MHz	Fig.89	Р
HT40	5795 MHz	Fig.90	Р
000 44 ca LIT00	5775 MHz	Fig.91	Р
802.11ac HT80	5775 MHz	Fig.92	Р







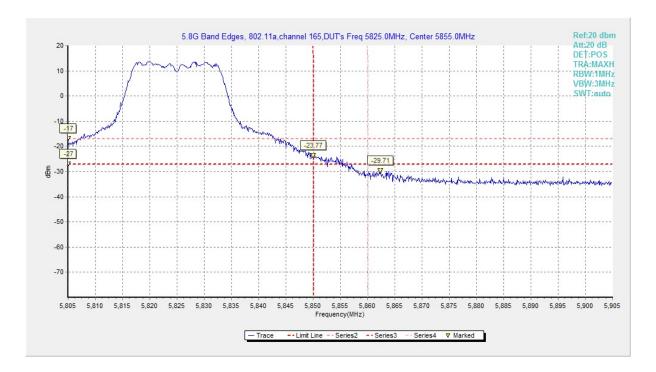


Fig. 86 Band Edges (802.11a, 5825MHz)

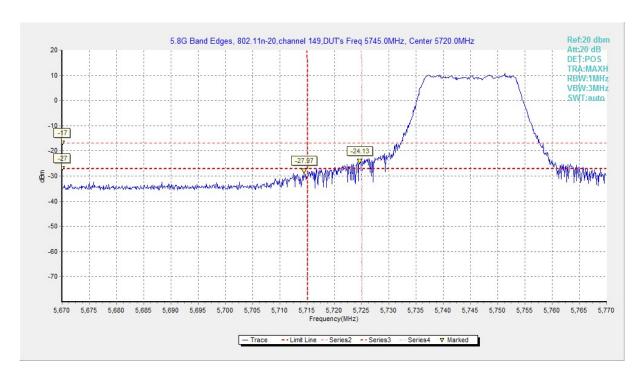


Fig. 87 Band Edges (802.11n-HT20, 5745MHz)



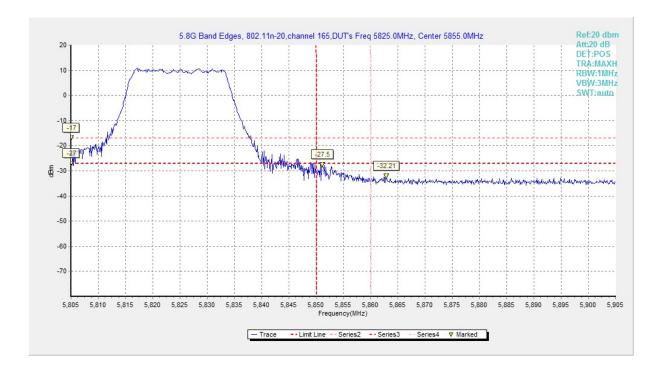


Fig. 88 Band Edges (802.11n-HT20, 5825MHz)

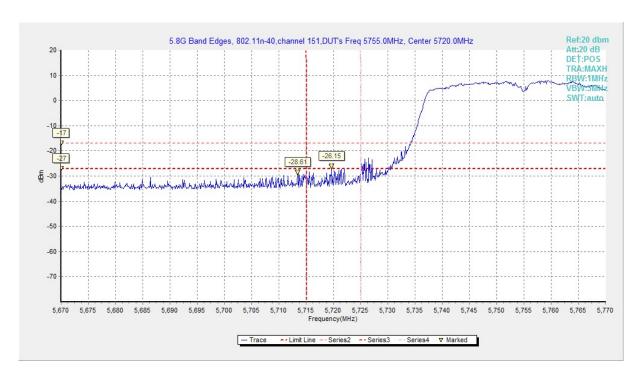


Fig. 89 Band Edges (802.11n-HT40, 5755MHz)



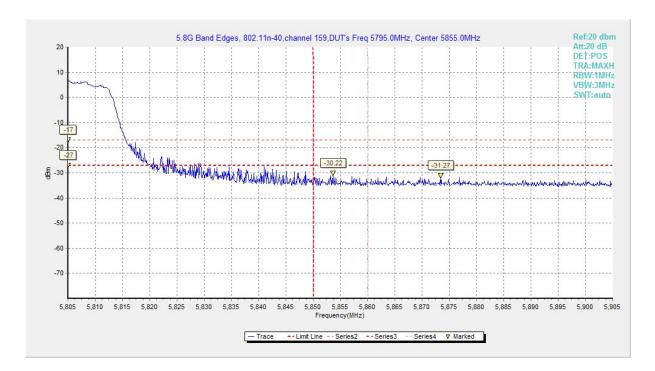


Fig. 90 Band Edges (802.11n-HT40, 5795MHz)

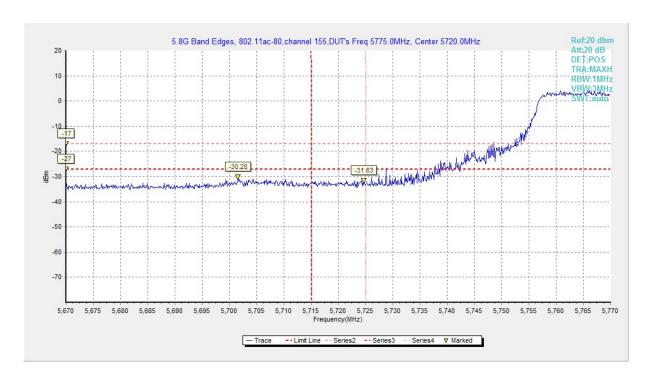


Fig. 91 Band Edges (802.11ac-HT80, 5775MHz)



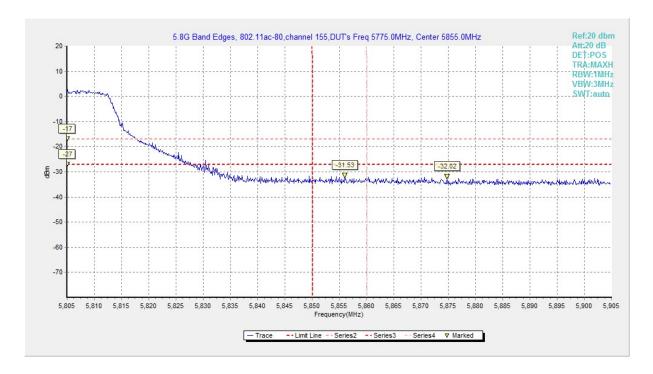


Fig. 92 Band Edges (802.11ac-HT80, 5775MHz)

A6.2 Band Edges - Radiated

Measurement Limit:

Standard	Limit (dB μ V/m)				
FCC 47 CFD Dor# 45 200	Peak	74			
FCC 47 CFR Part 15.209	Average	54			

The measurement is made according to KDB 789033 D02

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 Result:

Mode	Channel	Test Results	Conclusion
802.11a	5745 MHz	Fig.93	Р
002.11d	5825 MHz	Fig.94	Р
802.11n	5745 MHz	Fig.95	Р
HT20	5825 MHz	Fig.96	Р
802.11n	5755 MHz	Fig.97	Р
HT40	5795 MHz	Fig.98	Р





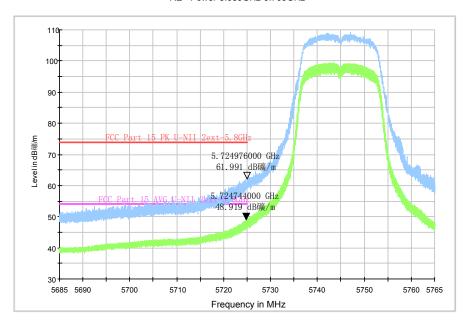


Fig. 93 Band Edges (802.11a, 5745MHz)



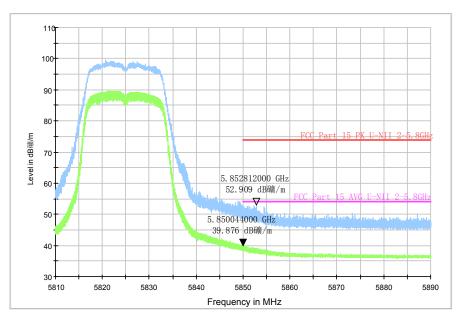


Fig. 94 Band Edges (802.11a, 5825MHz)





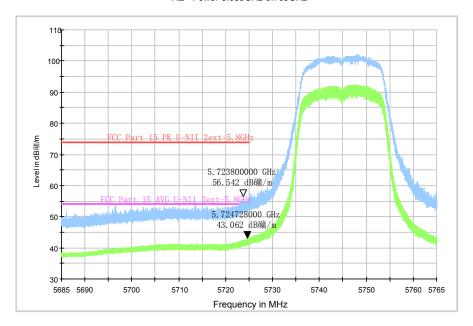


Fig. 95 Band Edges (802.11n-HT20, 5745MHz)



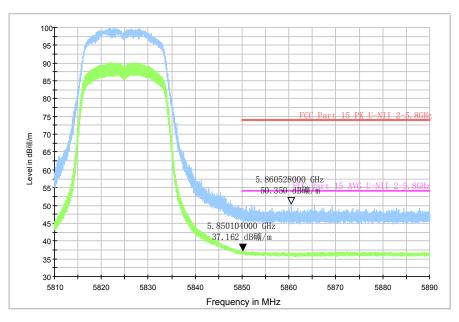


Fig. 96 Band Edges (802.11n-HT20, 5825MHz)





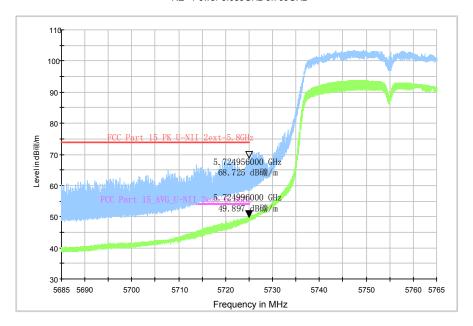
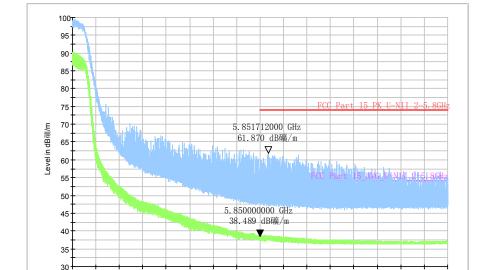


Fig. 97 Band Edges (802.11n-HT40, 5755MHz)



RE - Power-5.810GHz-5.890GHz

Fig. 98 Band Edges (802.11n-HT40, 5795MHz)

5850

Frequency in MHz

5840

5860

5870

5880

5890

5830

5810

5820



A.7. AC Powerline 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) With charger		Conclusion	
(11112)	Еппіс (авру)	802.11a	Idle		
0.15 to 0.5	66 to 56				
0.5 to 5	56	Fig.78	Fig.79	Р	
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	Average Limit	Result With c	Conclusion	
(MHz)	(dBμV)	802.11a	ldle	
0.15 to 0.5	56 to 46			
0.5 to 5	46	Fig.99	Fig.100	Р
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.



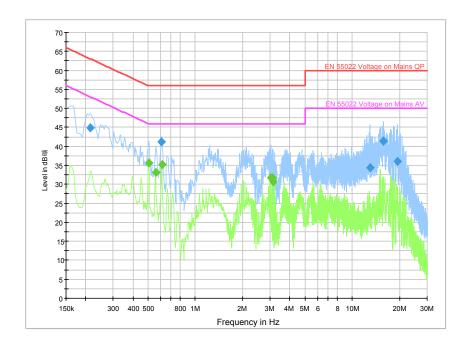


Fig. 99 AC Powerline Conducted Emission-802.11a

Measurement Result 1:

Frequency	QuasiPeak	Meas.	Bandwidth	Filter	Line	Corr.	Margin	Limit
(MHz)	(dBµV)	Time	(kHz)			(dB)	(dB)	(dBµV)
		(ms)						
0.213001	44.8	GND	L1	10.3	18.3	63.1	0.213001	44.8
0.609001	41.2	GND	L1	10.3	14.8	56.0	0.609001	41.2
12.970501	34.3	GND	L1	10.7	25.7	60.0	12.970501	34.3
45 770504	44.4	CND	1.4	40.0	40.0	60.0	45 770504	44.4
15.778501	41.4	GND	L1	10.8	18.6	60.0	15.778501	41.4
15.832501	41.3	GND	L1	10.8	18.7	60.0	15.832501	41.3
19.441501	36.1	GND	L1	11.0	23.9	60.0	19.441501	36.1

Measurement Result 2:

Frequency	QuasiPeak	Meas.	Bandwidth	Filter	Line	Corr.	Margin	Limit
(MHz)	(dBµV)	Time	(kHz)			(dB)	(dB)	(dBµV)
		(ms)						
0.505501	35.6	GND	L1	10.3	10.4	46.0	0.505501	35.6
0.559501	33.1	GND	L1	10.3	12.9	46.0	0.559501	33.1
0.613501	35.2	GND	L1	10.3	10.8	46.0	0.613501	35.2
3.030001	31.7	GND	L1	10.4	14.3	46.0	3.030001	31.7
2.004004	24.7	CND	1.4	10.4	112	46.0	2.004004	31.7
3.084001	31.7	GND	L1	10.4	14.3	46.0	3.084001	31.7
3.138001	30.7	GND	L1	10.4	15.3	46.0	3.138001	30.7

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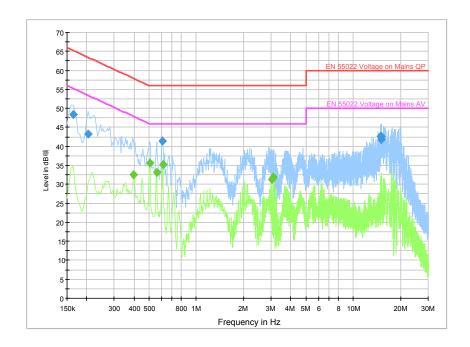


Fig. 100 AC Powerline Conducted Emission-Idle

Measurement Result 1:

Frequency	QuasiPeak	Meas.	Bandwidth	Filter	Line	Corr.	Margin	Limit
(MHz)	(dBµV)	Time	(kHz)			(dB)	(dB)	(dBµ
		(ms)						V)
0.163501	48.3	GND	L1	10.3	17.0	65.3	0.163501	48.3
0.204001	43.3	GND	L1	10.3	20.1	63.4	0.204001	43.3
0.609001	41.3	GND	L1	10.3	14.7	56.0	0.609001	41.3
14.959501	42.6	GND	L1	10.7	17.4	60.0	14.959501	42.6
15.009001	41.9	GND	L1	10.8	18.1	60.0	15.009001	41.9
15.067501	42.7	GND	L1	10.8	17.3	60.0	15.067501	42.7

Measurement Result 2:

Frequency	QuasiPeak	Meas.	Bandwidth	Filter	Line	Corr.	Margin	Limit
(MHz)	(dBµV)	Time	(kHz)			(dB)	(dB)	(dBµ
		(ms)						V)
0.397501	32.6	GND	L1	10.3	15.3	47.9	0.397501	32.6
0.505501	35.6	GND	L1	10.3	10.4	46.0	0.505501	35.6
0.559501	33.1	GND	L1	10.3	12.9	46.0	0.559501	33.1
0.613501	35.2	GND	L1	10.3	10.8	46.0	0.613501	35.2
3.030001	31.4	GND	L1	10.4	14.6	46.0	3.030001	31.4
3.084001	31.9	GND	L1	10.4	14.1	46.0	3.084001	31.9



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.101	Р



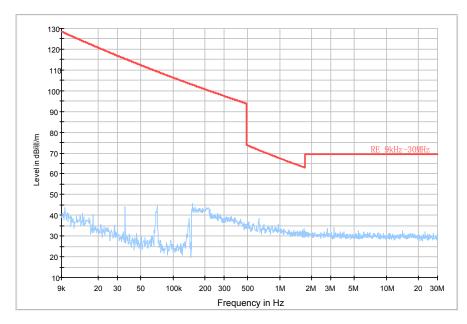


Fig. 101 Radiated Spurious Emission (802.11a, ch157, 9 kHz ~30 MHz)



ANNEX B: PHOTOGRAPHS OF THE TEST SET-UP

Layout of Radiated Spurious Emission Test





ANNEX C: Accreditation Certificate



China National Accreditation Service for Conformity Assessment

LABORATORY ACCREDITATION CERTIFICATE

(No. CNAS L0570)

Telecommunication Technology Labs,

Academy of Telecommunication Research, MIIT

No.52, Huayuan North Road, Haidian District, Beijing, China No.51, Xueyuan Road, Haidian District, Beijing, China

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 and calibration.

The scope of accreditation is detailed in the attached schedule bearing the same accreditation number as above. The schedule forms an integral part of this certificate.

Date of Issue: 2014-10-29
Date of Expiry: 2017-06-19

Date of Initial Accreditation: 1998-07-03



Signed on behalf of China National Accreditation Service for Conformity Assessment

China National Accreditation Service for Conformity Assessment (CNAS) is authorized by Certification and Accreditation Administration of the People's Republic of China (CNCA) to operate the national accreditation schemes for conformity assessment. CNAS is the signatory to International Laboratory Accreditation Cooperation Multilateral Recognition Arrangement (ILAC MRA) and Asia Pacific Laboratory Accreditation Cooperation Multilateral Recognition Arrangement (APLAC MRA).

No.CNASAL2

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*** END OF REPORT BODY ***