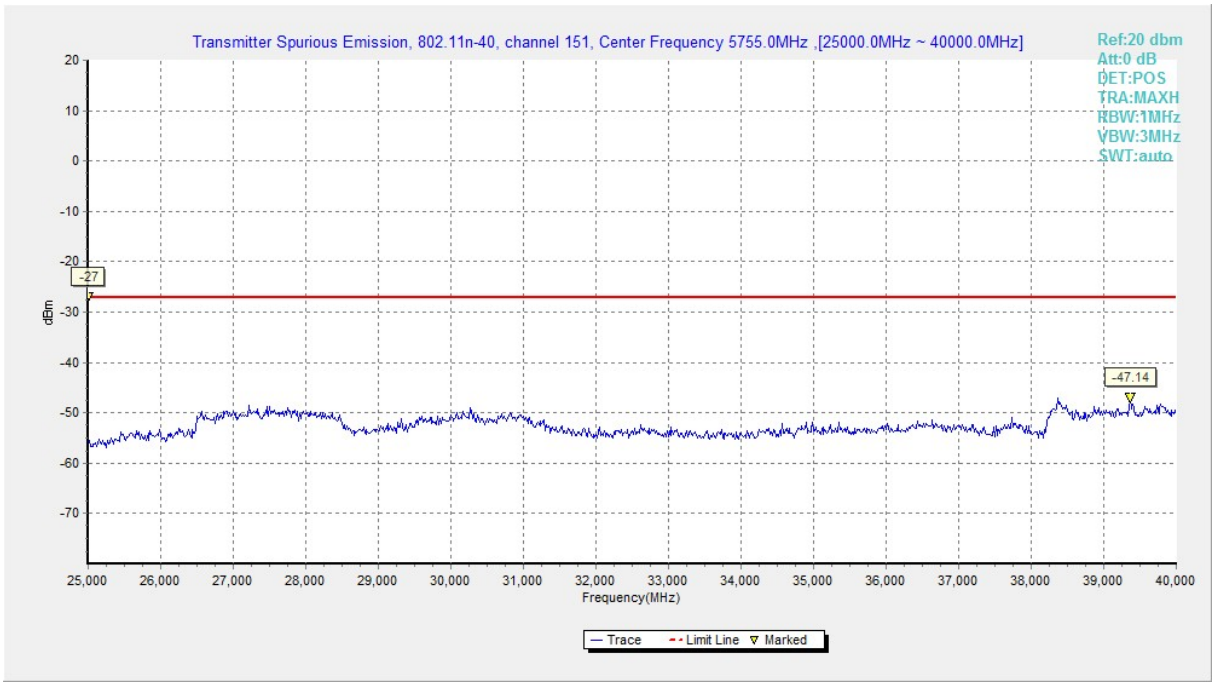

Fig. 36 Conducted Spurious Emission (802.11n-HT40, Ch151, 25 GHz-40 GHz)

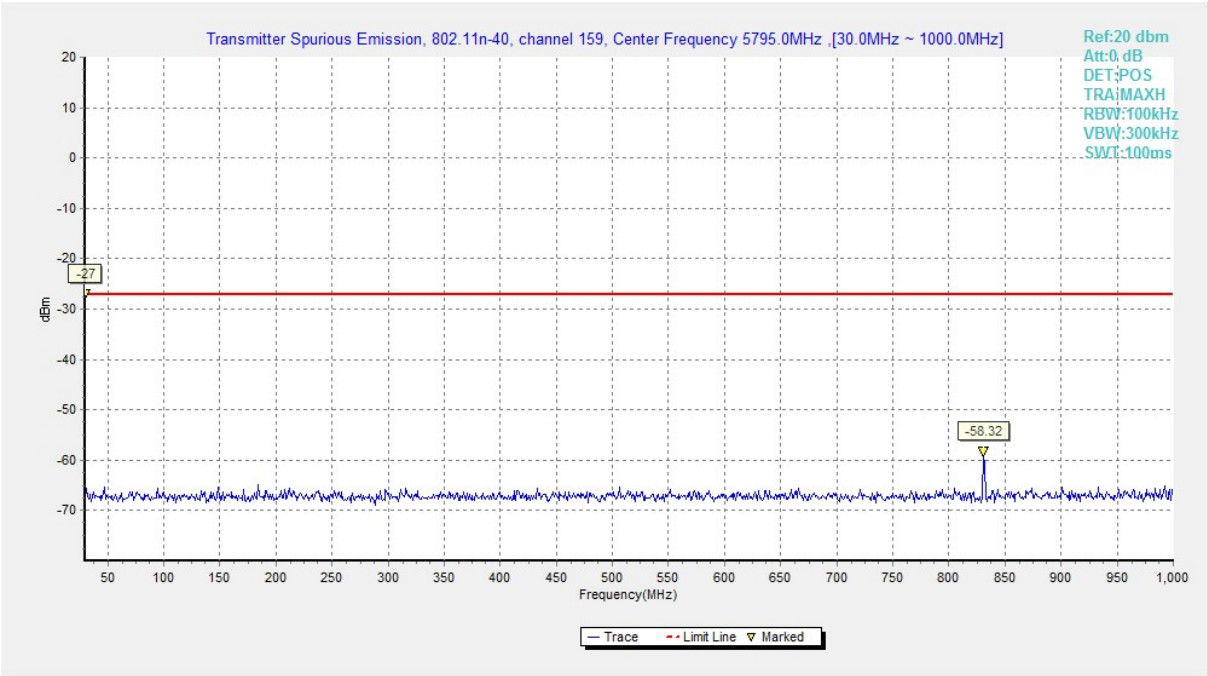

Fig. 37 Conducted Spurious Emission (802.11n-HT40, Ch159, 30 MHz-1 GHz)

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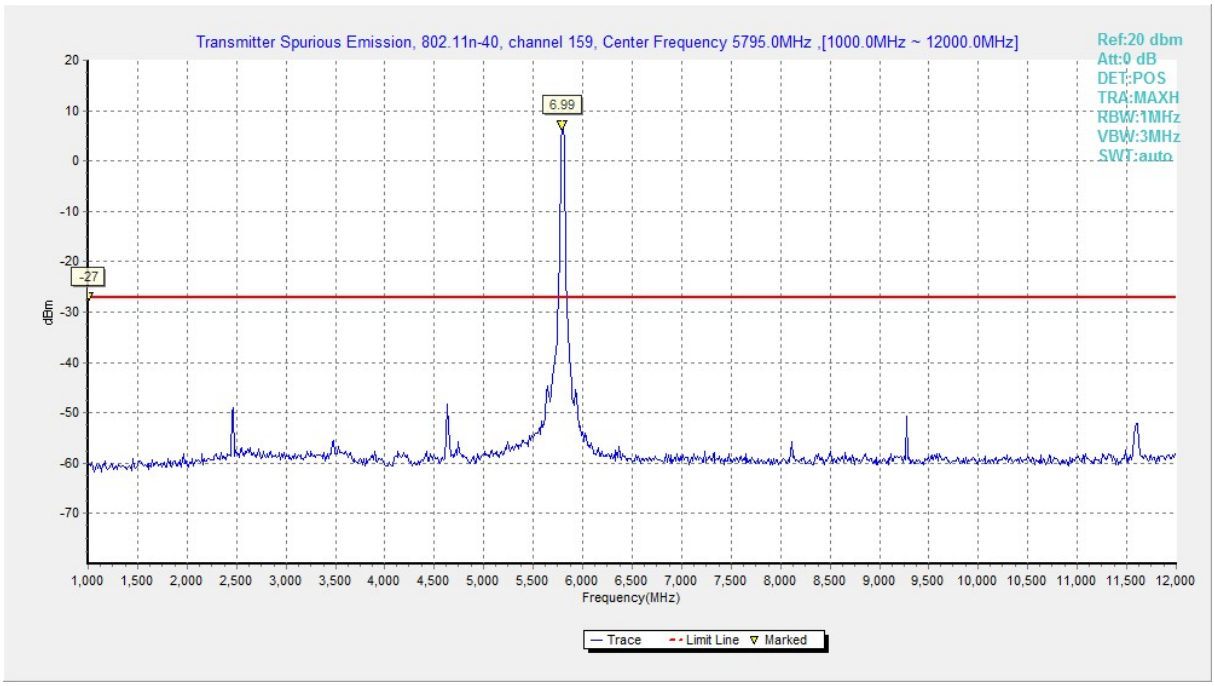

Fig. 38 Conducted Spurious Emission (802.11n-HT40, Ch159, 1 GHz -12 GHz)

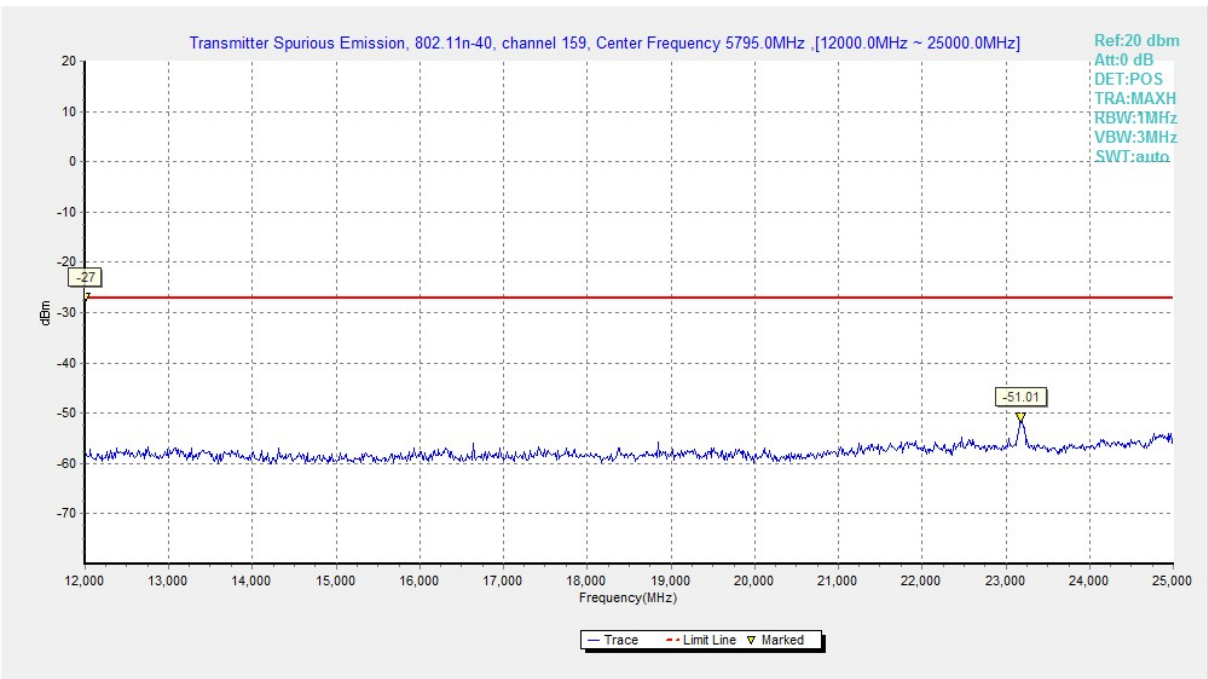

Fig. 39 Conducted Spurious Emission (802.11n-HT40, Ch159, 12 GHz-25 GHz)

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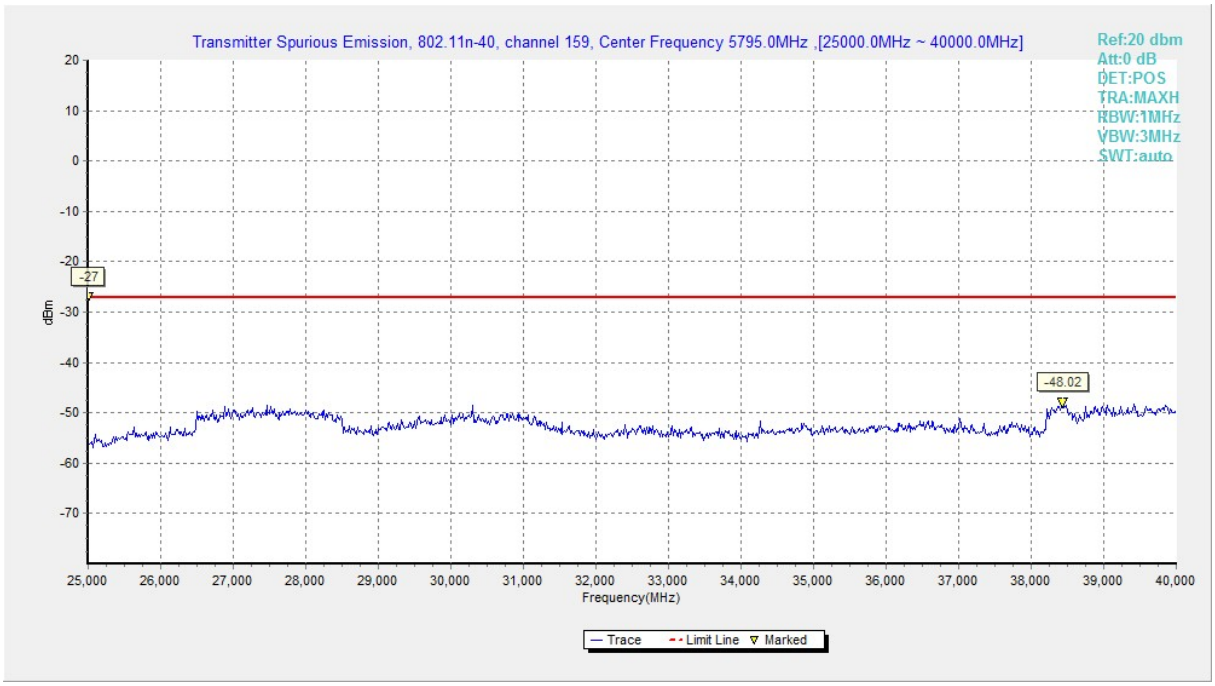

Fig. 40 Conducted Spurious Emission (802.11n-HT40, Ch159, 25 GHz-40 GHz)

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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
802.11a	149	1 GHz ~ 3 GHz	Fig.41	P
		3 GHz ~ 6 GHz	Fig.42	P
		6 GHz ~ 18 GHz	Fig.43	P
	157	30 MHz ~1 GHz	Fig.44	P
		1 GHz ~ 3 GHz	Fig.45	P
		3 GHz ~ 6 GHz	Fig.46	P
		6 GHz ~ 18 GHz	Fig.47	P
		18 GHz ~ 26.5 GHz	Fig.48	P
		26.5 GHz~ 40 GHz	Fig.49	P
	165	1 GHz ~ 3 GHz	Fig.50	P
		3 GHz ~ 6 GHz	Fig.51	P
		6 GHz ~ 18 GHz	Fig.52	P

802.11n-HT20 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n (HT20)	149	1 GHz ~ 3 GHz	Fig.53	P
		3 GHz ~ 6 GHz	Fig.54	P
		6 GHz ~ 18 GHz	Fig.55	P
	157	30 MHz ~1 GHz	Fig.56	P
		1 GHz ~ 3 GHz	Fig.57	P
		3 GHz ~ 6 GHz	Fig.58	P
		6 GHz ~ 18 GHz	Fig.59	P
		18 GHz ~ 26.5 GHz	Fig.60	P
		26.5 GHz~ 40 GHz	Fig.61	P
	165	1 GHz ~ 3 GHz	Fig.62	P
		3 GHz ~ 6 GHz	Fig.63	P
		6 GHz ~ 18 GHz	Fig.64	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.65	P
		1 GHz ~ 3 GHz	Fig.66	P
		3 GHz ~ 6 GHz	Fig.67	P
		6 GHz ~ 18 GHz	Fig.68	P
		18 GHz ~ 26.5 GHz	Fig.69	P
		26.5 GHz~ 40 GHz	Fig.70	P
	159	1 GHz ~ 3 GHz	Fig.71	P
		3 GHz ~ 6 GHz	Fig.72	P
		6 GHz ~ 18 GHz	Fig.73	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
5724.880	69.7	-18.2	34.8	53.064	H
17272.800	59.6	-15.1	41.2	33.493	V
17719.200	59.4	-13.0	41.2	31.205	H
17615.400	58.6	-14.9	41.2	32.318	V
17545.200	58.6	-14.9	41.2	32.318	V
17743.200	58.3	-13.0	41.2	30.105	V

Ch157

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17629.800	59.0	-14.9	41.2	32.718	H
17710.800	58.4	-13.0	41.2	30.205	V
17227.200	58.3	-15.1	41.4	31.993	V
17505.000	58.3	-14.9	41.2	32.018	H
17578.800	58.2	-14.9	41.2	31.918	H
17281.200	58.1	-15.1	41.2	31.993	V

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Ch165

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5850.912	69.0	-20.0	34.9	54.103	V
17728.200	58.4	-13.0	41.2	30.205	V
17731.800	58.4	-13.0	41.2	30.205	V
17240.400	58.2	-15.1	41.4	31.893	V
17170.800	58.2	-15.1	41.4	31.893	H
17725.200	58.1	-13.0	41.2	29.905	H

802.11n-HT20

Ch149

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5724.148	73.2	-18.2	34.8	56.564	V
17799.600	58.3	-13.0	41.0	30.305	V
17706.600	58.3	-13.0	41.2	30.105	H
17388.000	58.2	-13.9	41.2	30.923	V
17633.400	58.1	-13.0	41.2	29.905	V
17701.200	58.1	-13.0	41.2	29.905	H

Ch157

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17740.800	58.5	-13.0	41.2	30.305	V
17679.000	58.2	-13.0	41.2	30.005	V
17760.600	58.1	-13.0	41.0	30.105	V
17697.600	58.0	-13.0	41.2	29.805	H
17647.200	57.9	-13.0	41.2	29.705	V
17084.400	57.9	-16.3	41.4	32.841	V

Ch165

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5850.000	61.1	-20.0	34.9	46.203	V
17701.800	58.6	-13.0	41.2	30.405	H
17272.800	58.4	-15.1	41.2	32.293	V
17295.600	58.3	-13.9	41.2	31.023	H
17656.800	58.0	-13.0	41.2	29.805	V
17958.600	58.0	-13.5	41.0	30.462	H

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802.11n-HT40

Ch151

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5722.568	72.6	-18.2	34.8	55.964	H
17745.000	58.7	-13.0	41.2	30.505	V
17718.000	58.3	-13.0	41.2	30.105	V
17617.800	58.2	-14.9	41.2	31.918	H
17698.200	58.2	-13.0	41.2	30.005	H
17251.800	58.1	-15.1	41.2	31.993	V

Ch159

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5850.880	62.1	-20.0	34.9	47.203	H
17520.000	58.6	-14.9	41.2	32.318	V
17682.600	58.3	-13.0	41.2	30.105	H
17648.400	58.1	-13.0	41.2	29.905	V
17724.000	58.0	-13.0	41.2	29.805	V
17776.200	57.8	-13.0	41.0	29.805	H

Test graphs as below:

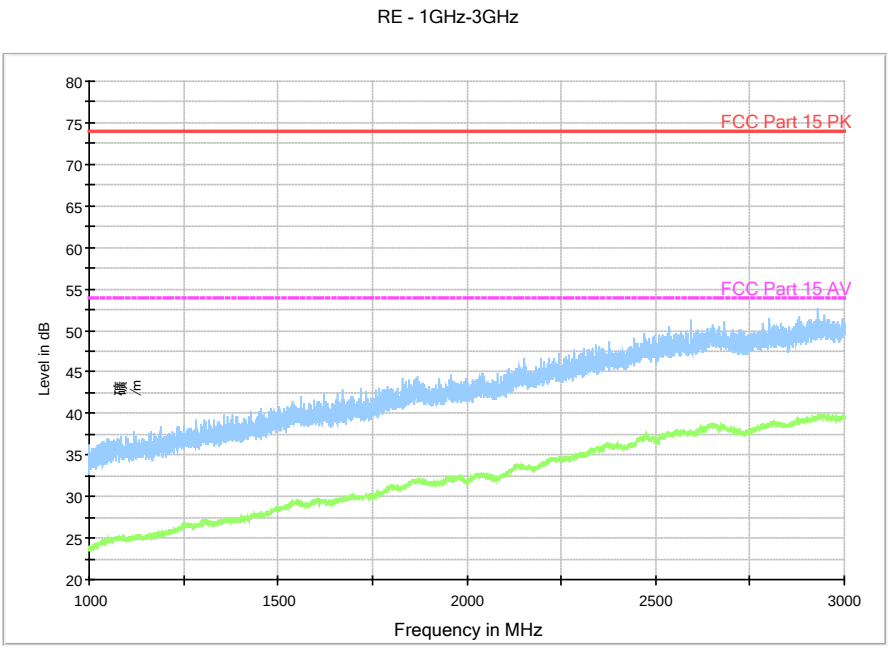

Fig. 41 Radiated Spurious Emission (802.11a, Ch149, 1 GHz-3 GHz)

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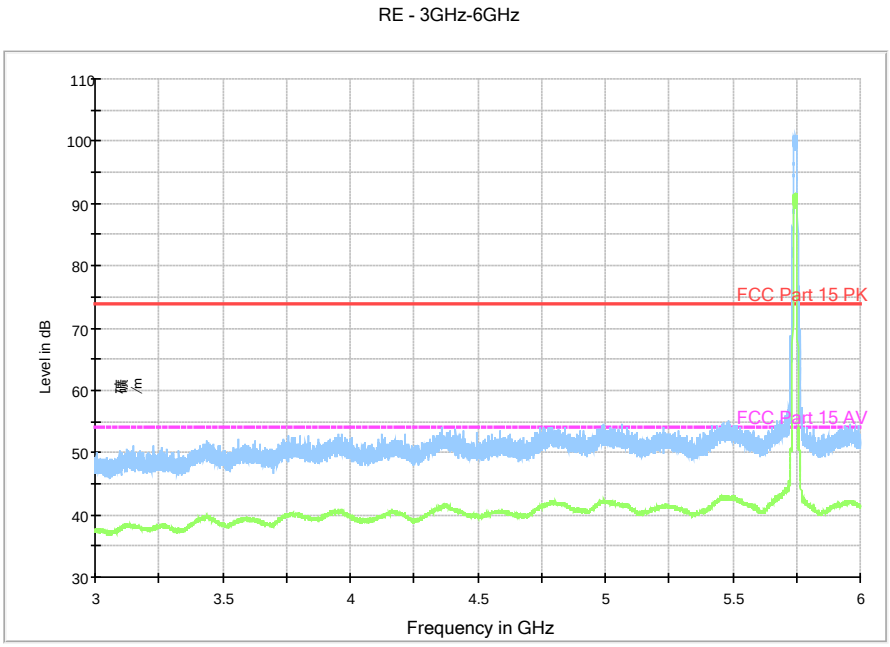

Fig. 42 Radiated Spurious Emission (802.11a, Ch149, 3 GHz-6 GHz)

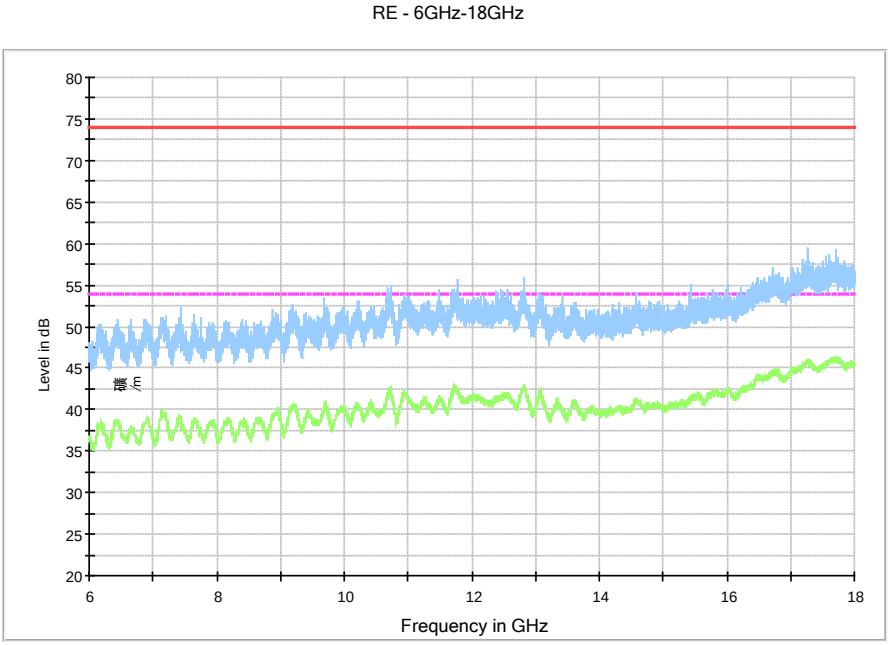

Fig. 43 Radiated Spurious Emission (802.11a, Ch149, 6 GHz-18 GHz)

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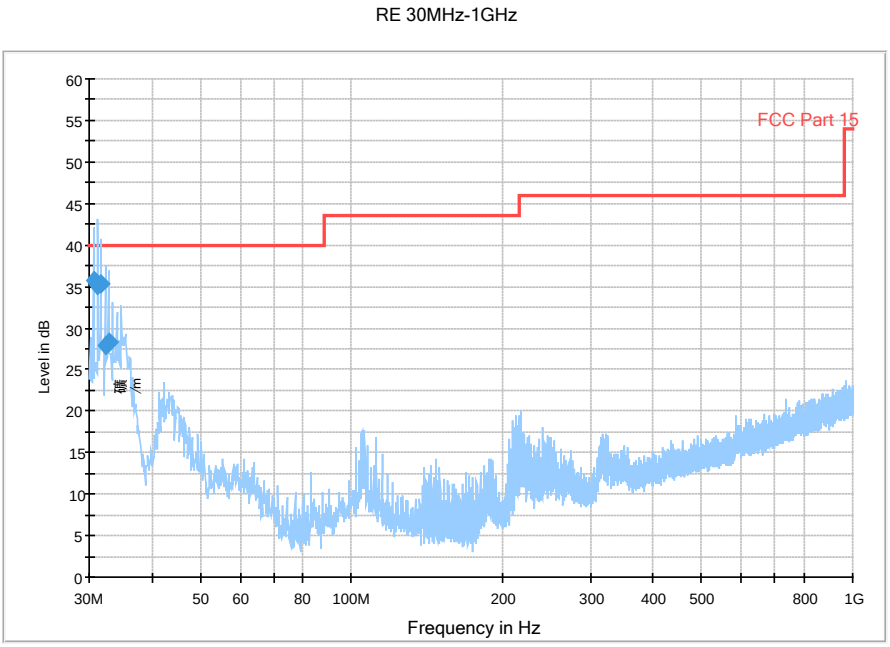

Fig. 44 Radiated Spurious Emission (802.11a, Ch157, 30 MHz-1 GHz)

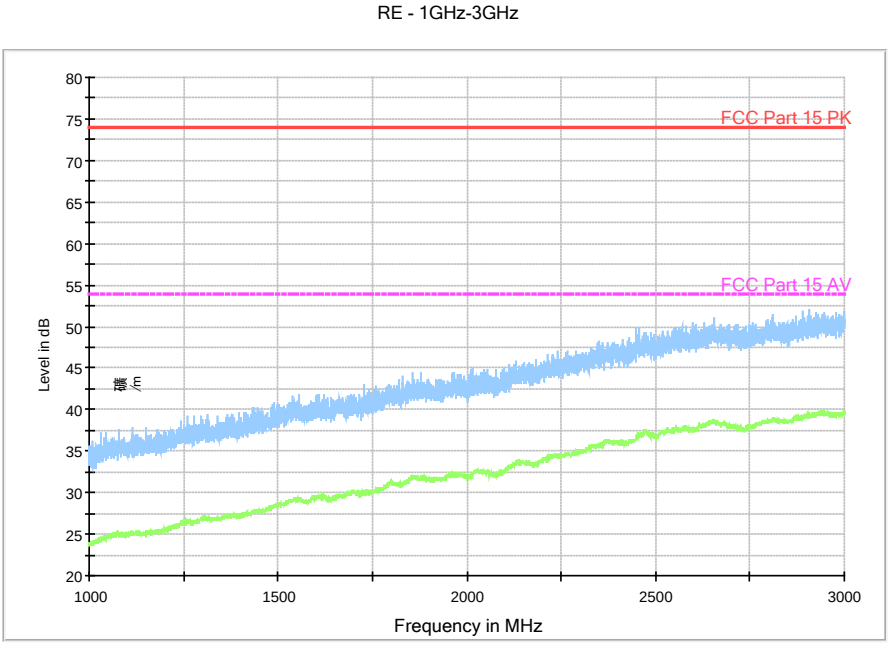

Fig. 45 Radiated Spurious Emission (802.11a, Ch157, 1 GHz-3 GHz)

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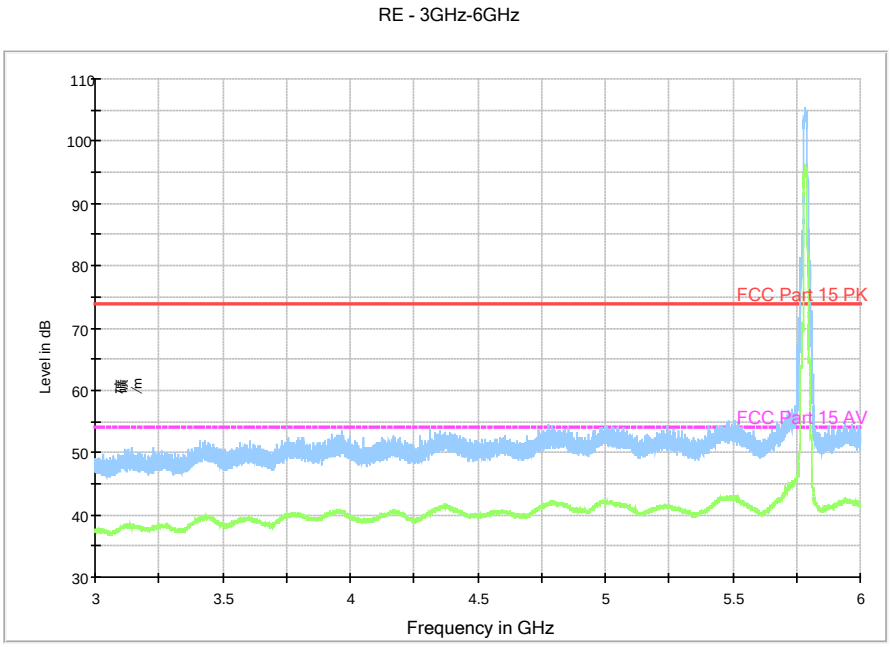

Fig. 46 Radiated Spurious Emission (802.11a, Ch157, 3 GHz-6 GHz)

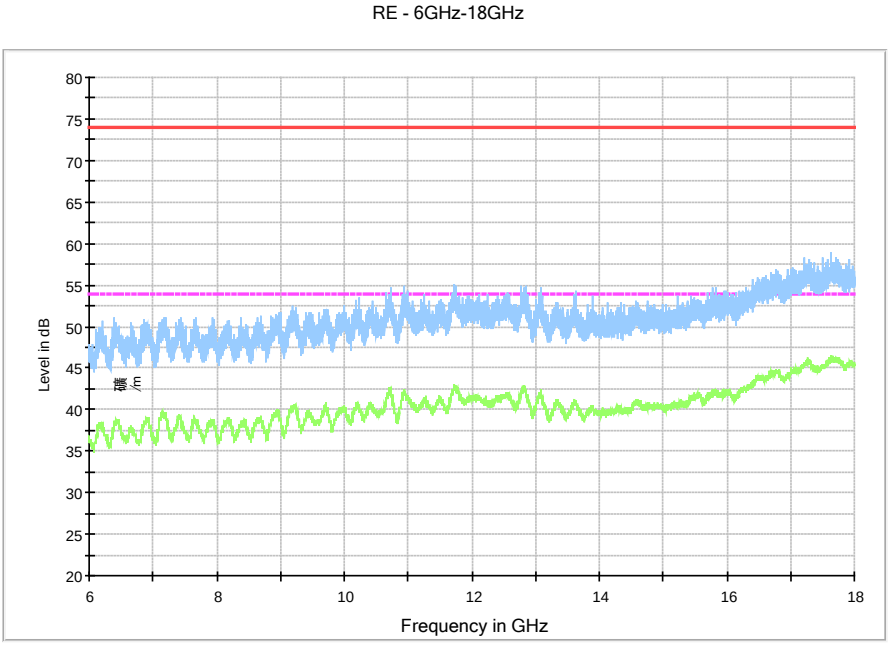

Fig. 47 Radiated Spurious Emission (802.11a, Ch157, 6 GHz-18 GHz)

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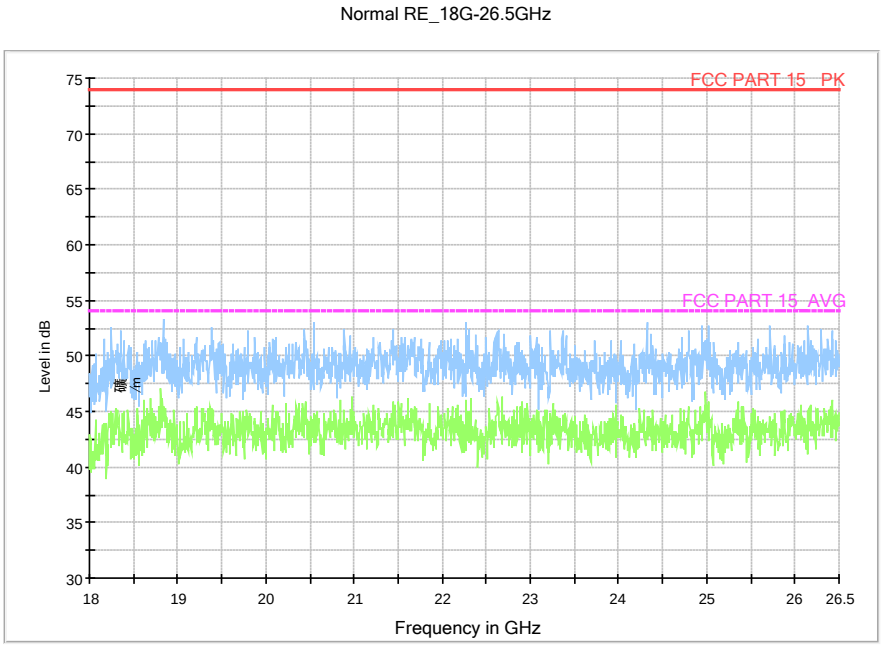

Fig. 48 Radiated Spurious Emission (802.11a, Ch157, 18 GHz-26.5 GHz)

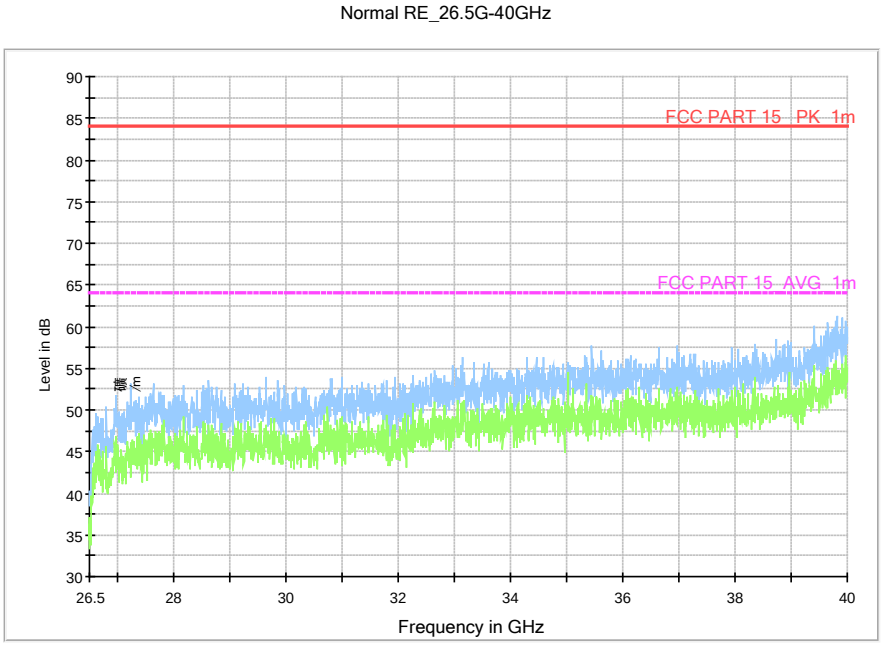

Fig. 49 Radiated emission: 802.11n, (802.11a, Ch157, 26.5 GHz - 40 GHz)

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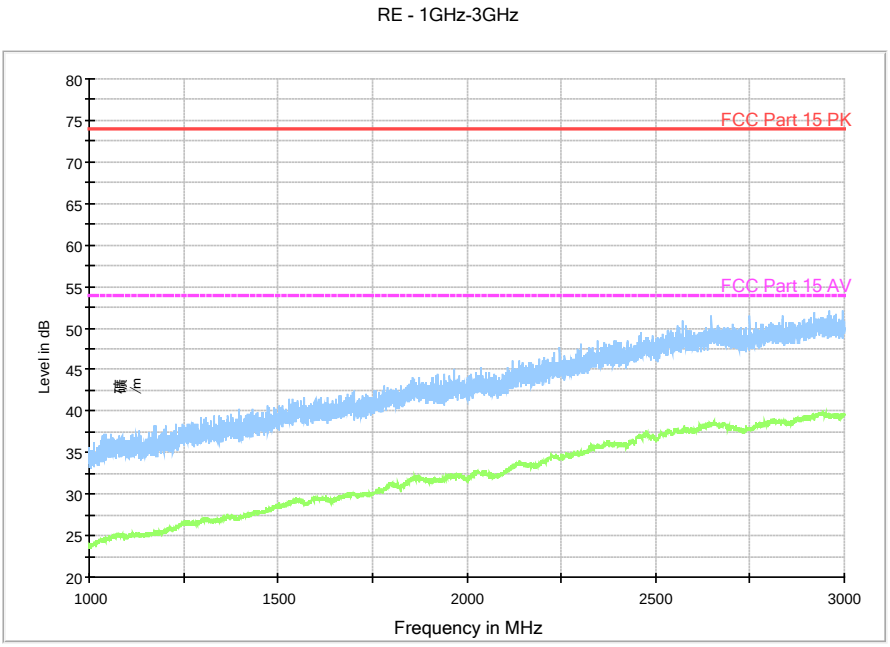

Fig. 50 Radiated Spurious Emission (802.11a, Ch165, 1 GHz-3 GHz)

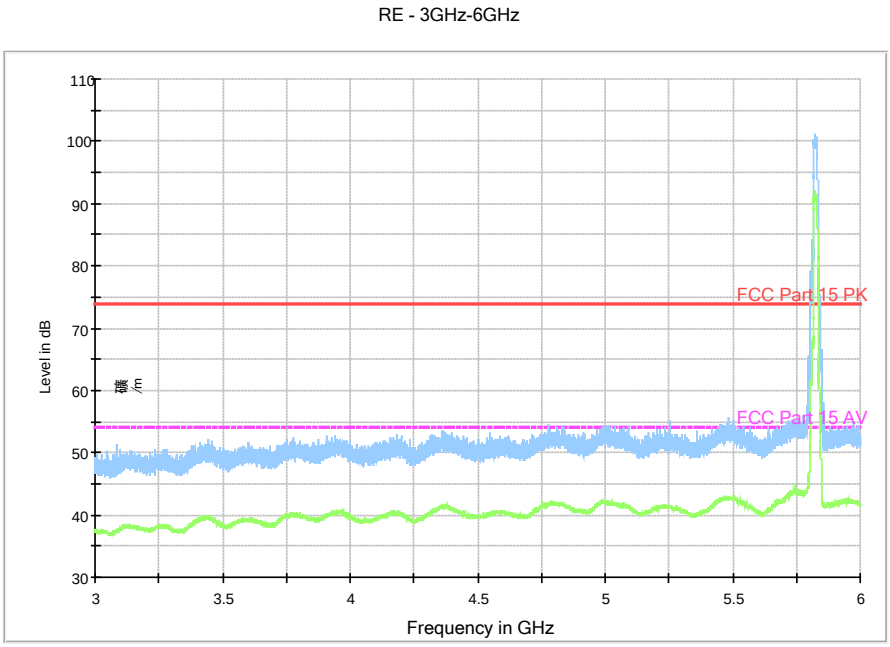

Fig. 51 Radiated Spurious Emission (802.11a, Ch165, 3 GHz-6 GHz)

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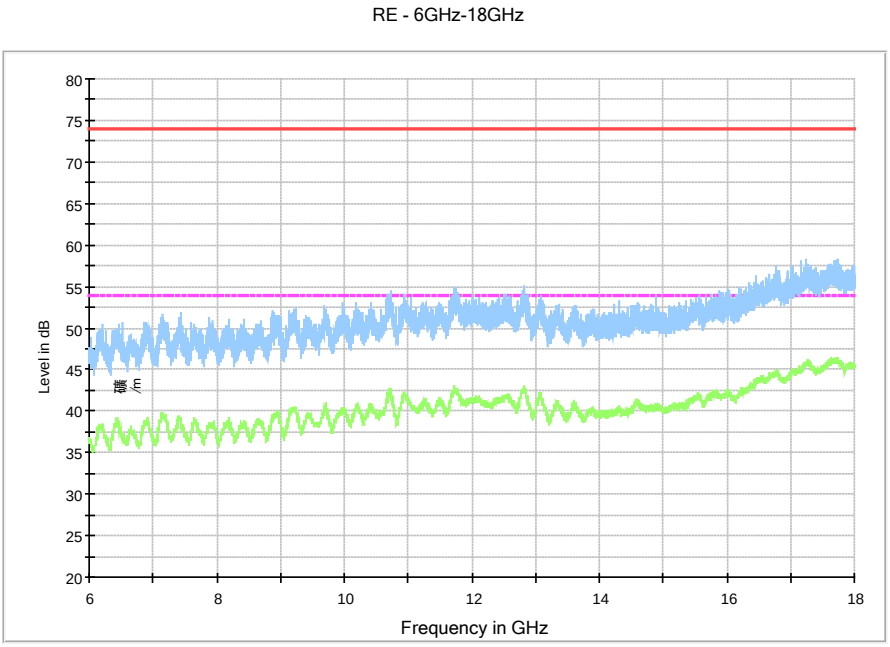

Fig. 52 Radiated Spurious Emission (802.11a, Ch165, 6 GHz-18 GHz)

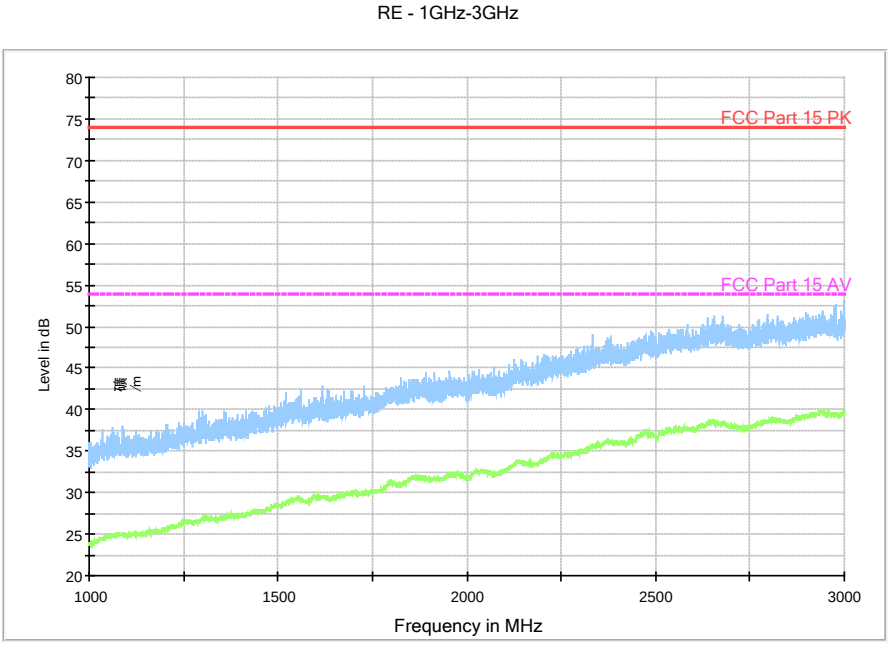

Fig. 53 Radiated Spurious Emission (802.11n-HT20, Ch149, 1 GHz-3 GHz)

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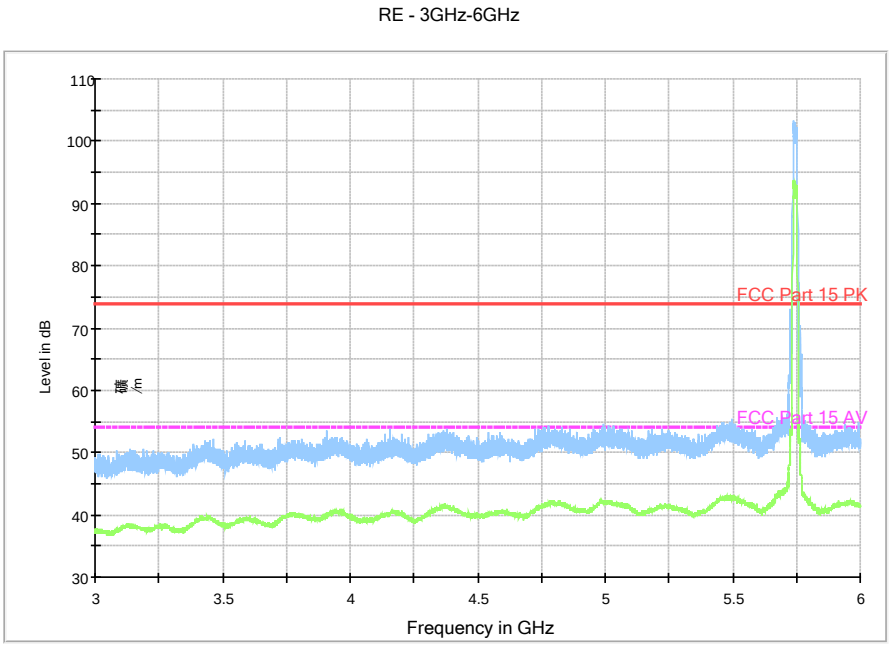

Fig. 54 Radiated Spurious Emission (802.11n-HT20, Ch149, 3 GHz-6 GHz)

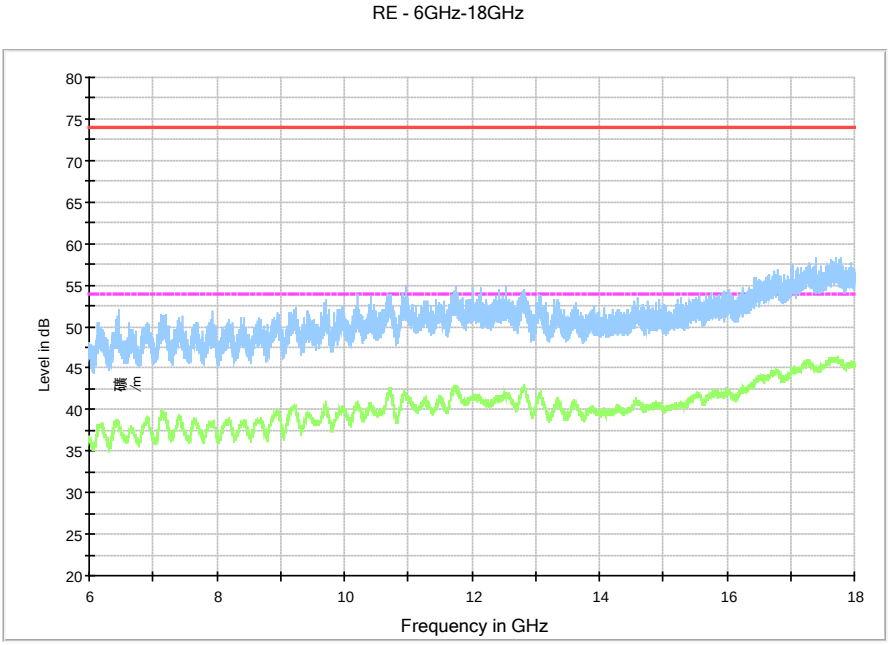

Fig. 55 Radiated Spurious Emission (802.11n-HT20, Ch149, 6 GHz-18 GHz)

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RE 30MHz-1GHz

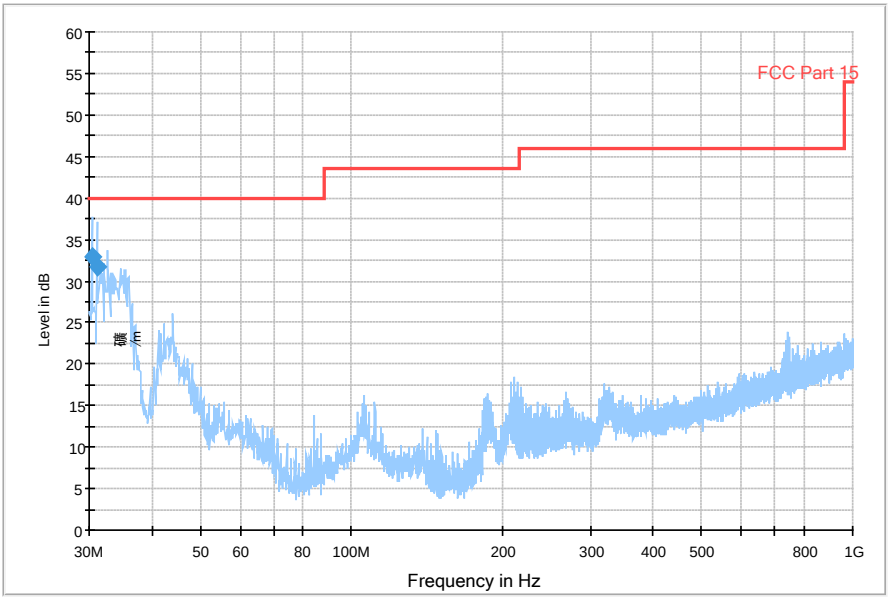

Fig. 56 Radiated Spurious Emission (802.11n-HT20, Ch157, 30 MHz-1 GHz)

RE - 1GHz-3GHz

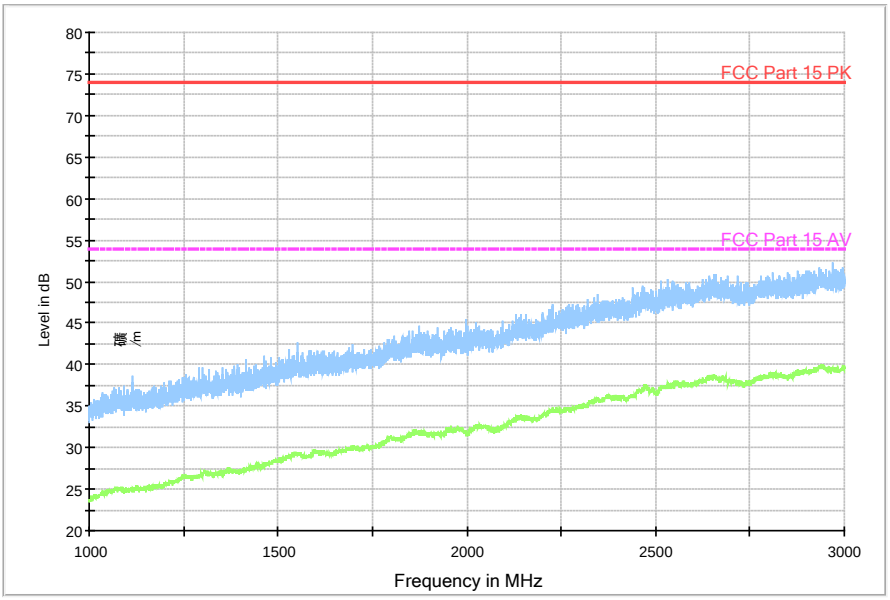

Fig. 57 Radiated Spurious Emission (802.11n-HT20, Ch157, 1 GHz-3 GHz)

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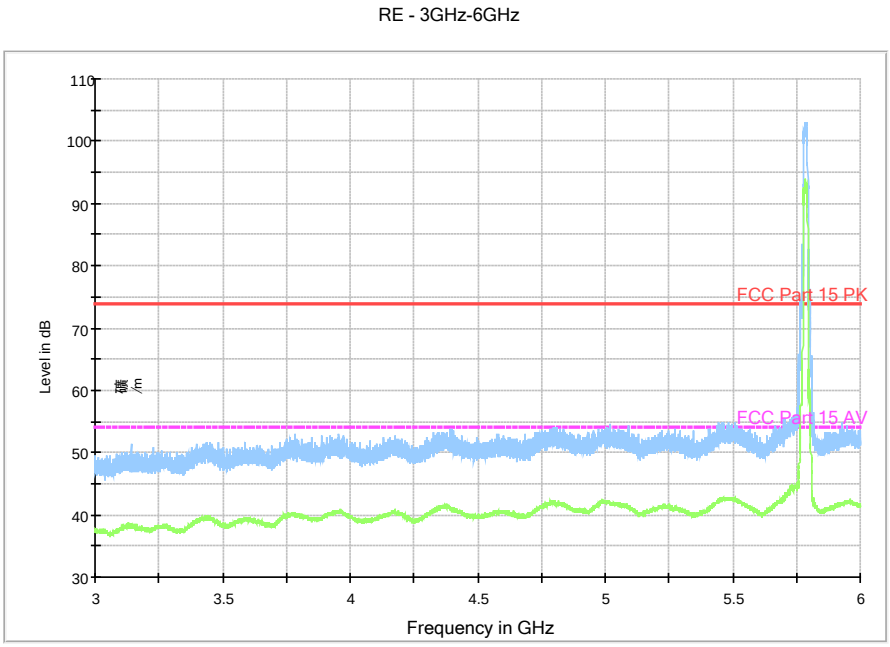

Fig. 58 Radiated Spurious Emission (802.11n-HT20, Ch157, 3 GHz-6 GHz)

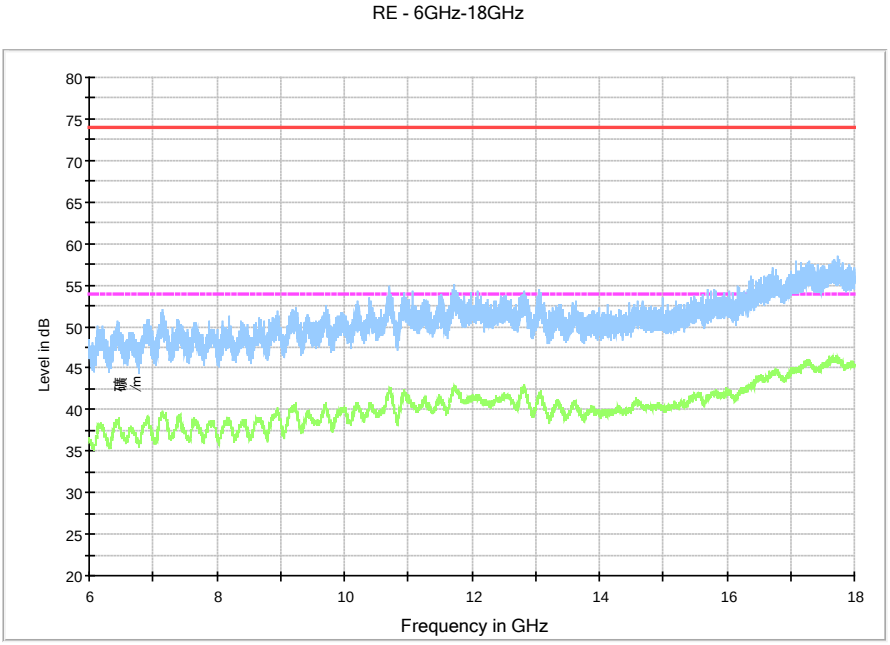

Fig. 59 Radiated Spurious Emission (802.11n-HT20, Ch157, 6 GHz-18 GHz)

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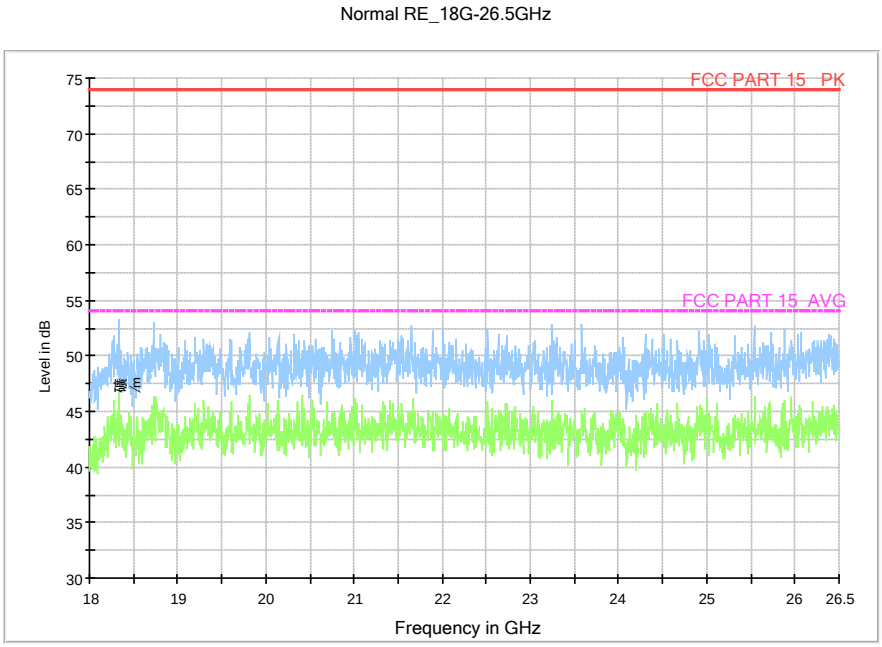

Fig. 60 Radiated Spurious Emission (802.11n-HT20, Ch157, 18 GHz-26.5 GHz)

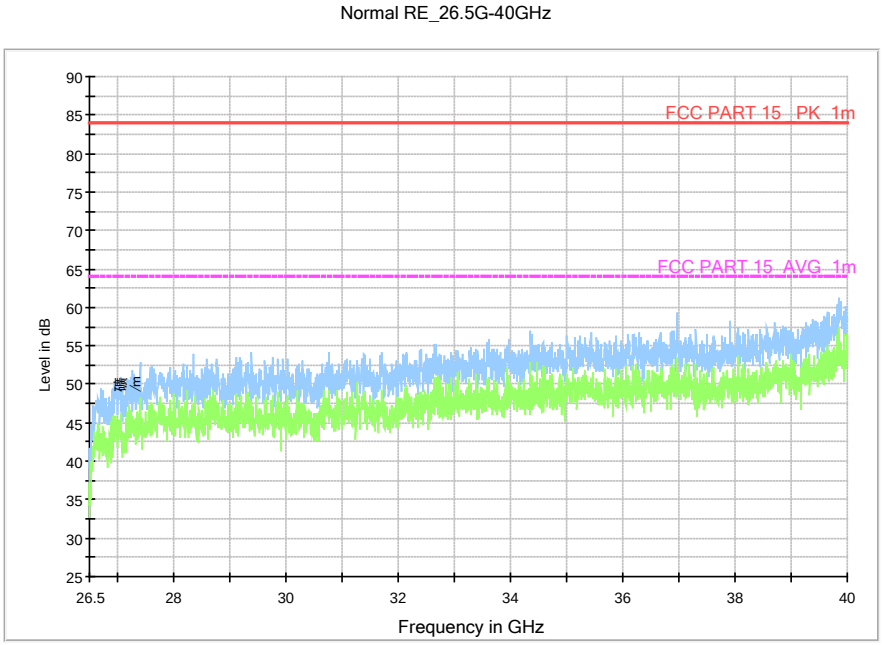

Fig. 61 Radiated emission: 802.11n, (802.11n-HT20, Ch157, 26.5 GHz - 40 GHz)

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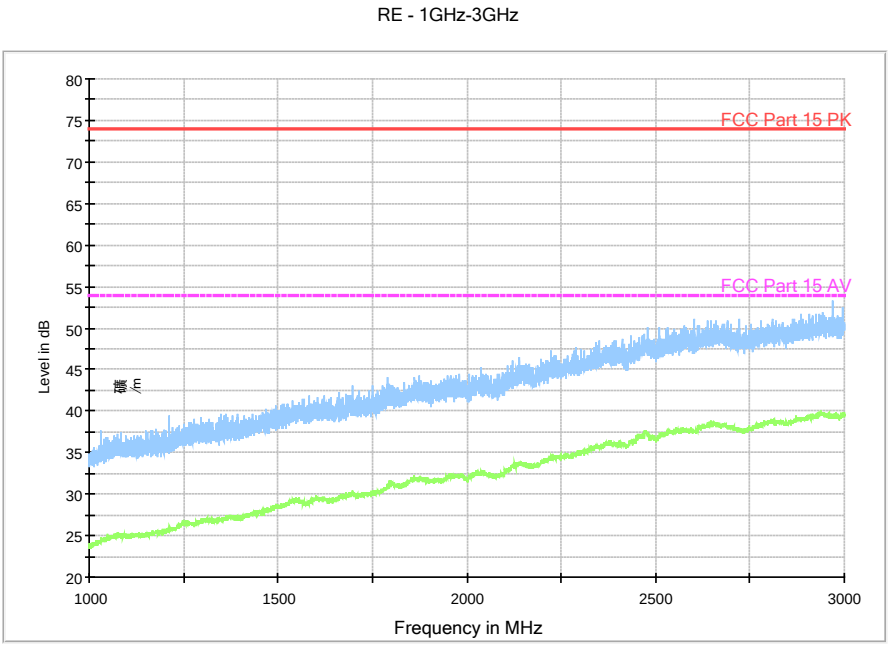

Fig. 62 Radiated Spurious Emission (802.11n-HT20, Ch165, 1 GHz-3 GHz)

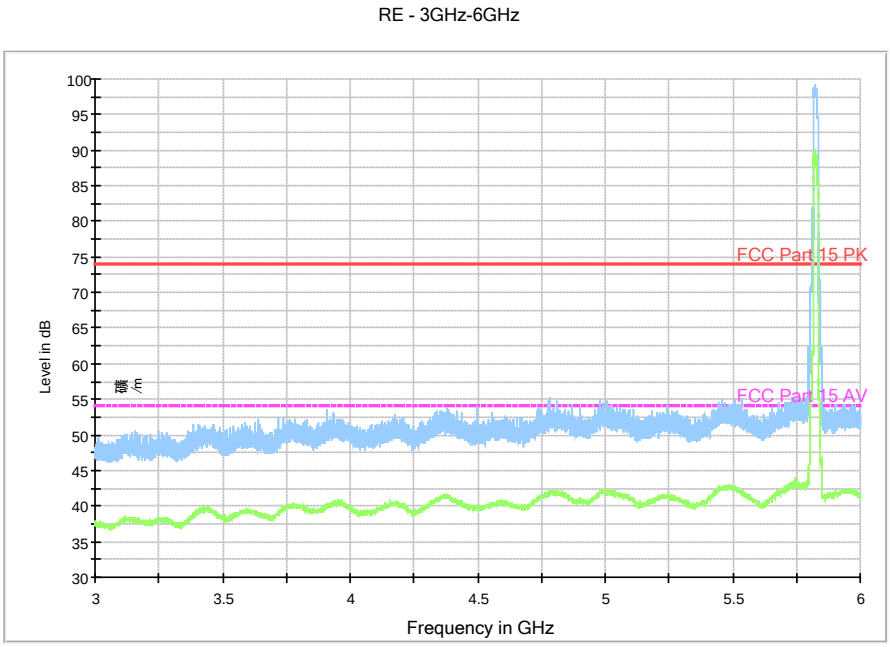

Fig. 63 Radiated Spurious Emission (802.11n-HT20, Ch165, 3 GHz-6 GHz)

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RE - 6GHz-18GHz

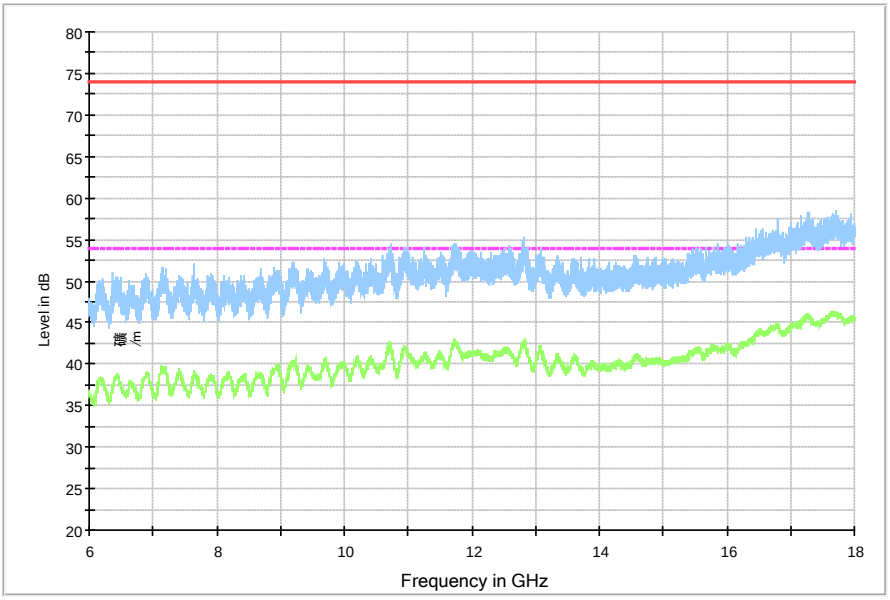

Fig. 64 Radiated Spurious Emission (802.11n-HT20, Ch165, 6 GHz-18 GHz)

RE 30MHz-1GHz

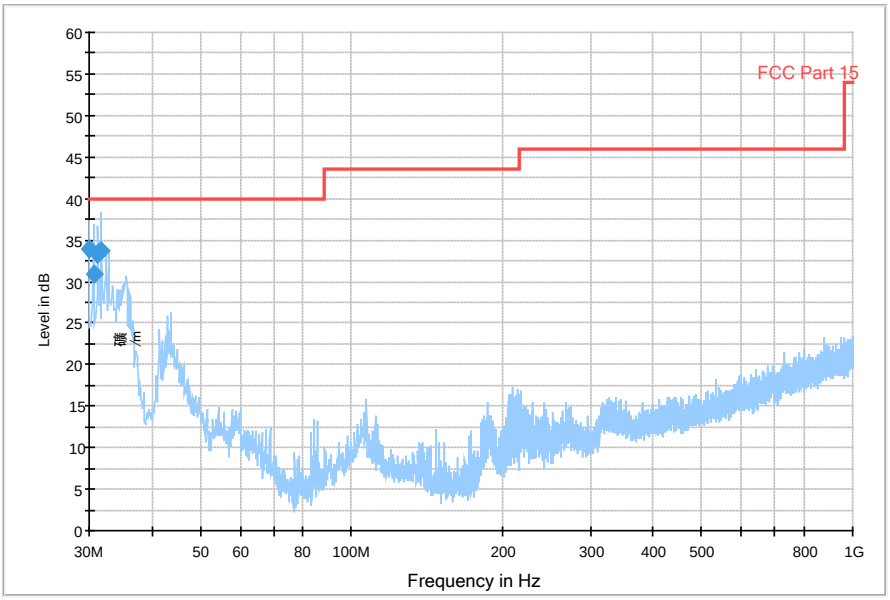

Fig. 65 Radiated Spurious Emission (802.11n-HT40, Ch151, 30 MHz-1 GHz)

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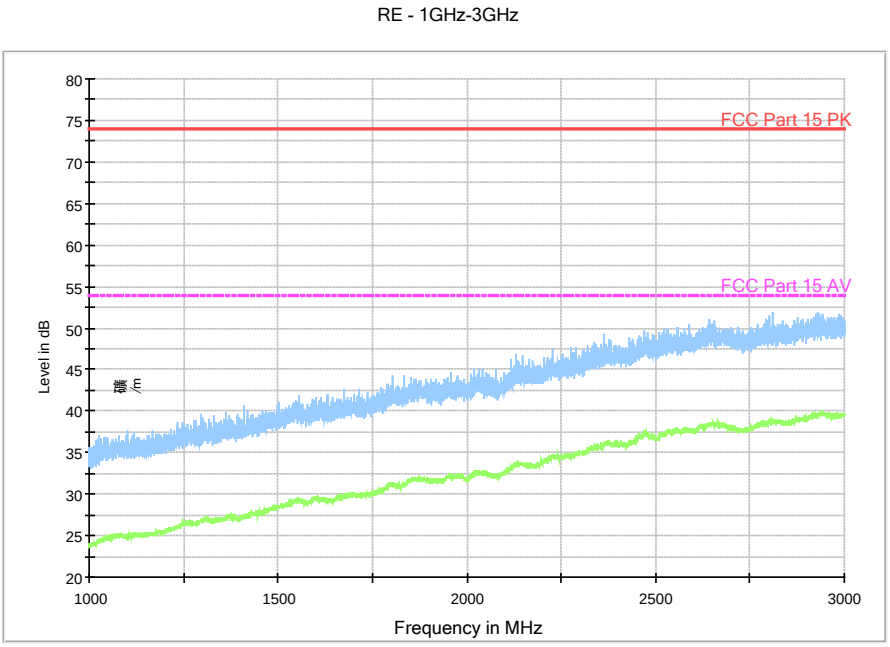

Fig. 66 Radiated Spurious Emission (802.11n-HT40, Ch151, 1 GHz-3 GHz)

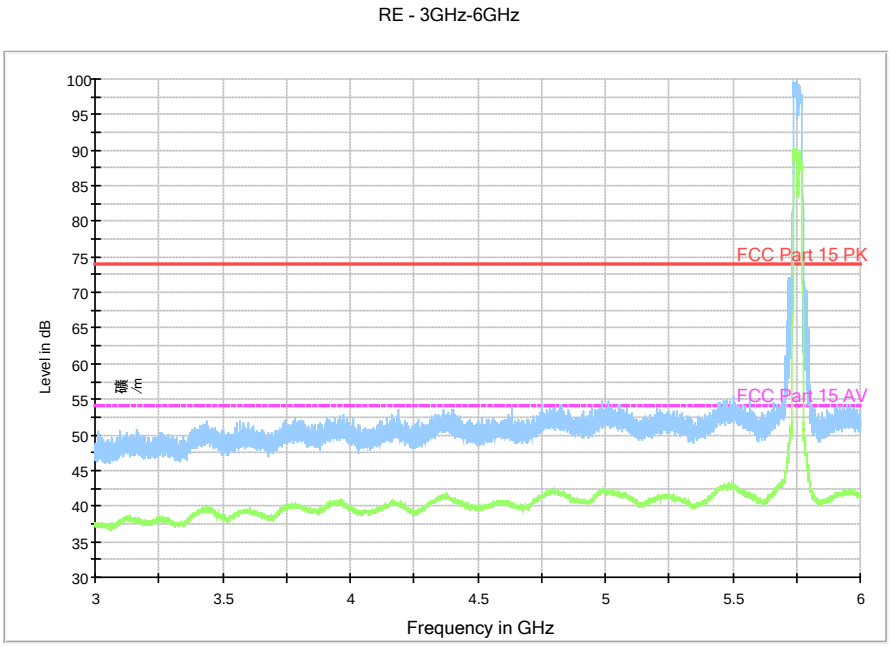

Fig. 67 Radiated Spurious Emission (802.11n-HT40, Ch151, 3 GHz-6 GHz)

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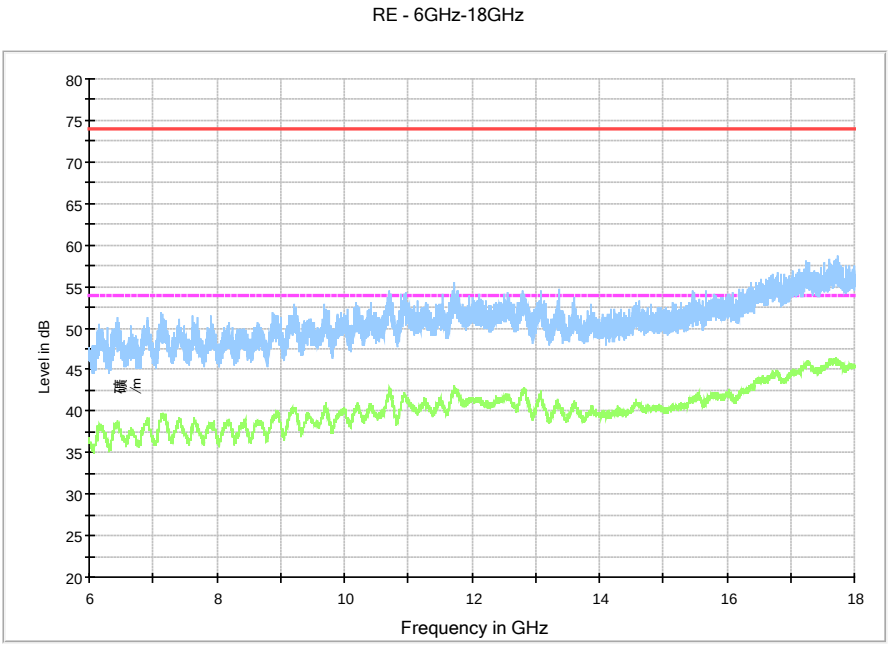

Fig. 68 Radiated Spurious Emission (802.11n-HT40, Ch151, 6 GHz-18 GHz)

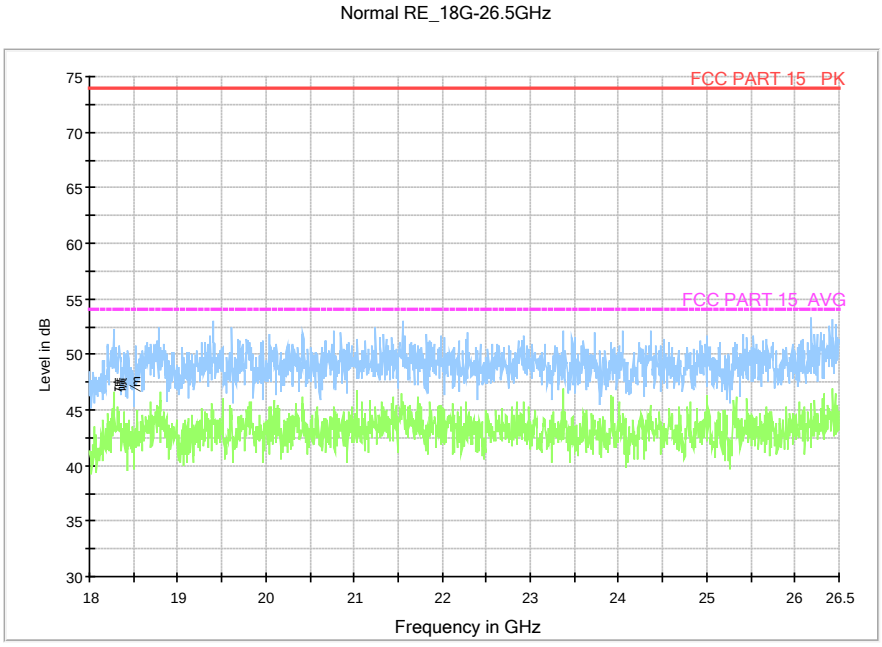

Fig. 69 Radiated Spurious Emission (802.11n-HT40, Ch151, 18 GHz-26.5 GHz)

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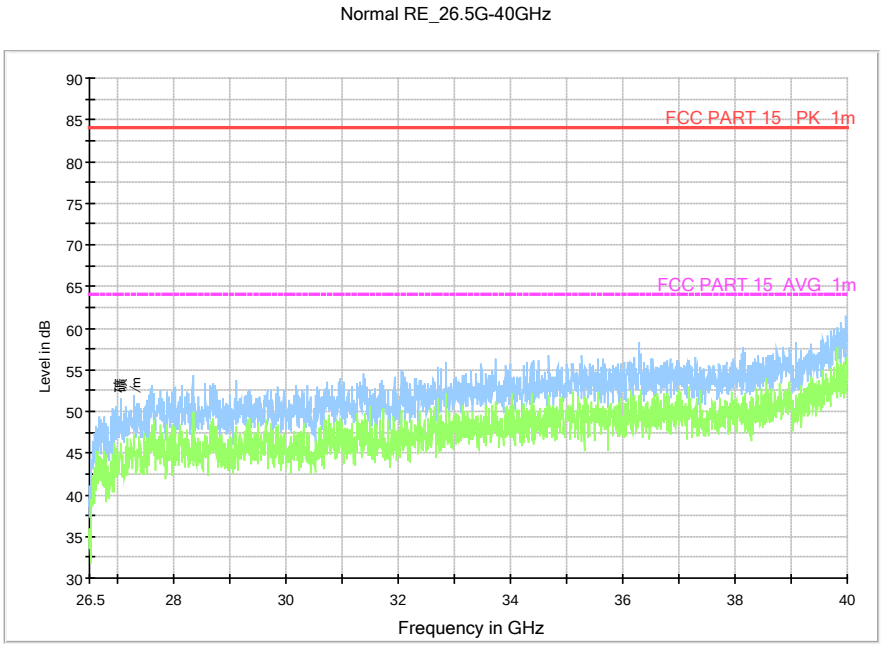

Fig. 70 Radiated emission: 802.11n, (802.11n-HT40, Ch151, 26.5 GHz - 40 GHz)

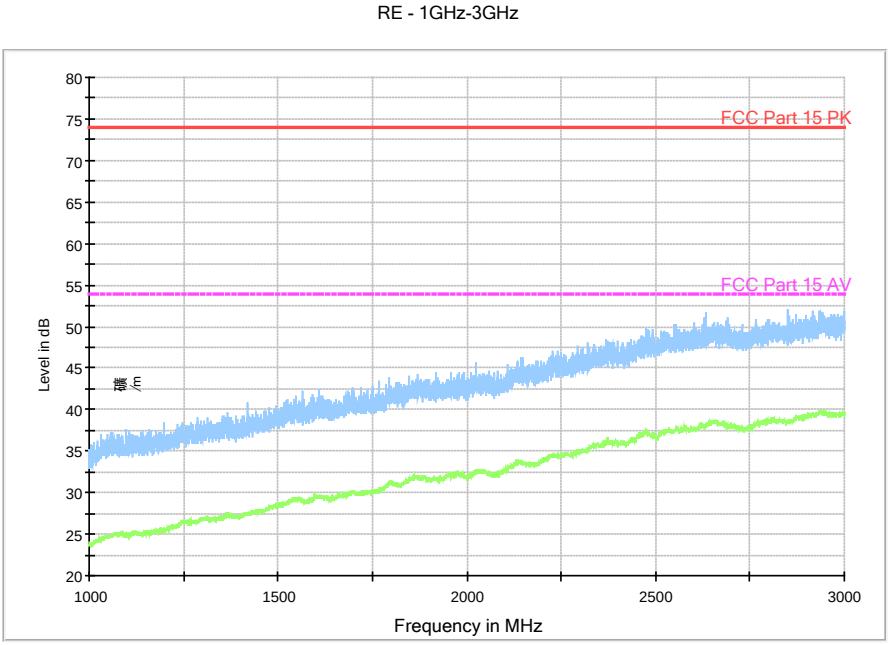

Fig. 71 Radiated Spurious Emission (802.11n-HT40, Ch159 1 GHz-3 GHz)

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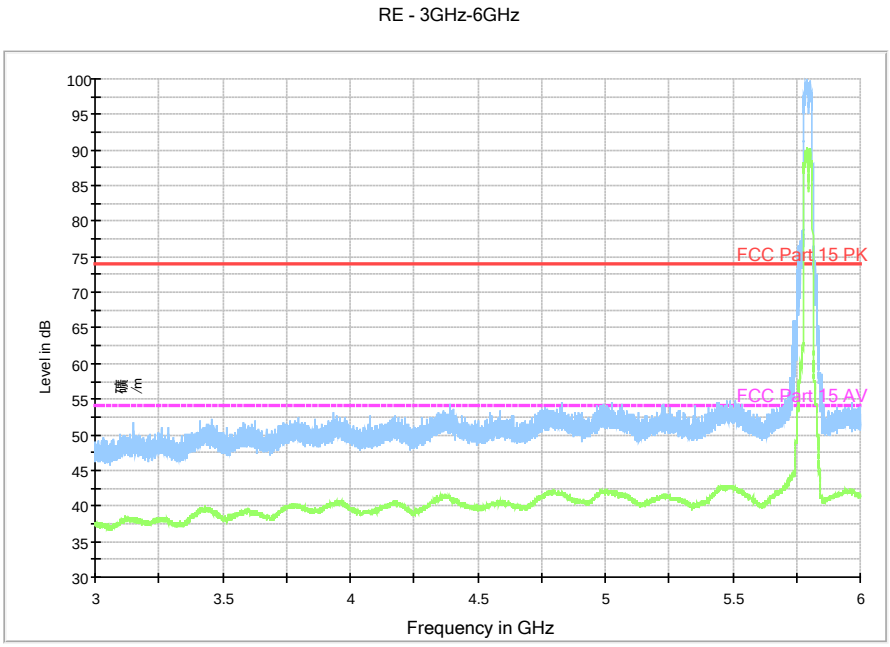

Fig. 72 Radiated Spurious Emission (802.11n-HT40, Ch159 3 GHz-6 GHz)

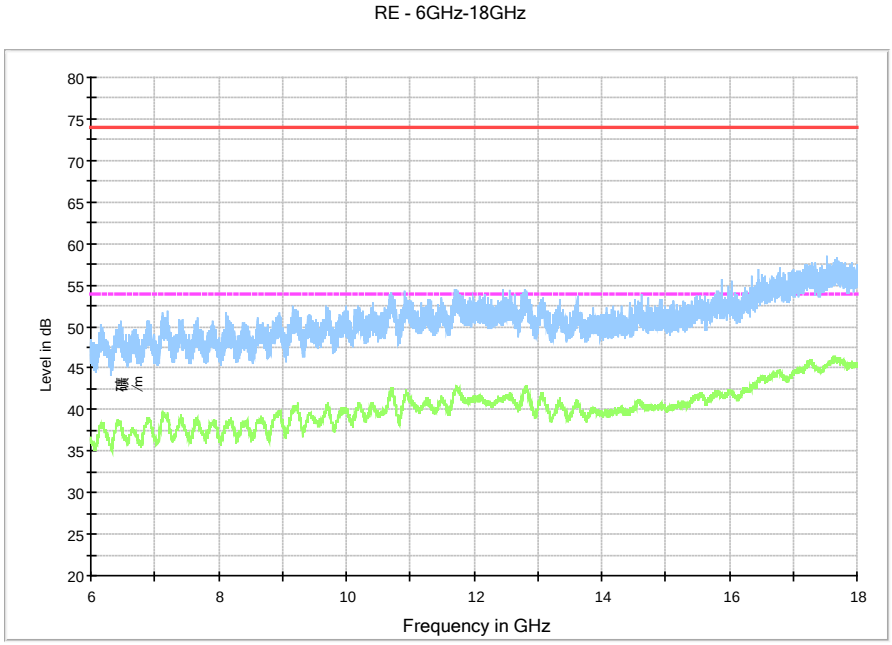

Fig. 73 Radiated Spurious Emission (802.11n-HT40, Ch159, 6 GHz-18 GHz)

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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
	Below 5715MHz, Above5860MHz	< -27

The measurement is made according to KDB 789033 D02

Measurement Uncertainty:

Measurement Uncertainty	0.75dB

Measurement Result:

Mode	Channel	Test Results	Conclusion
802.11a	5745 MHz	Fig.74	P
	5825 MHz	Fig.75	P
802.11n HT20	5745 MHz	Fig.76	P
	5825 MHz	Fig.77	P
802.11n HT40	5755 MHz	Fig.78	P
	5795 MHz	Fig.79	P

Conclusion: PASS

Test graphs as below:

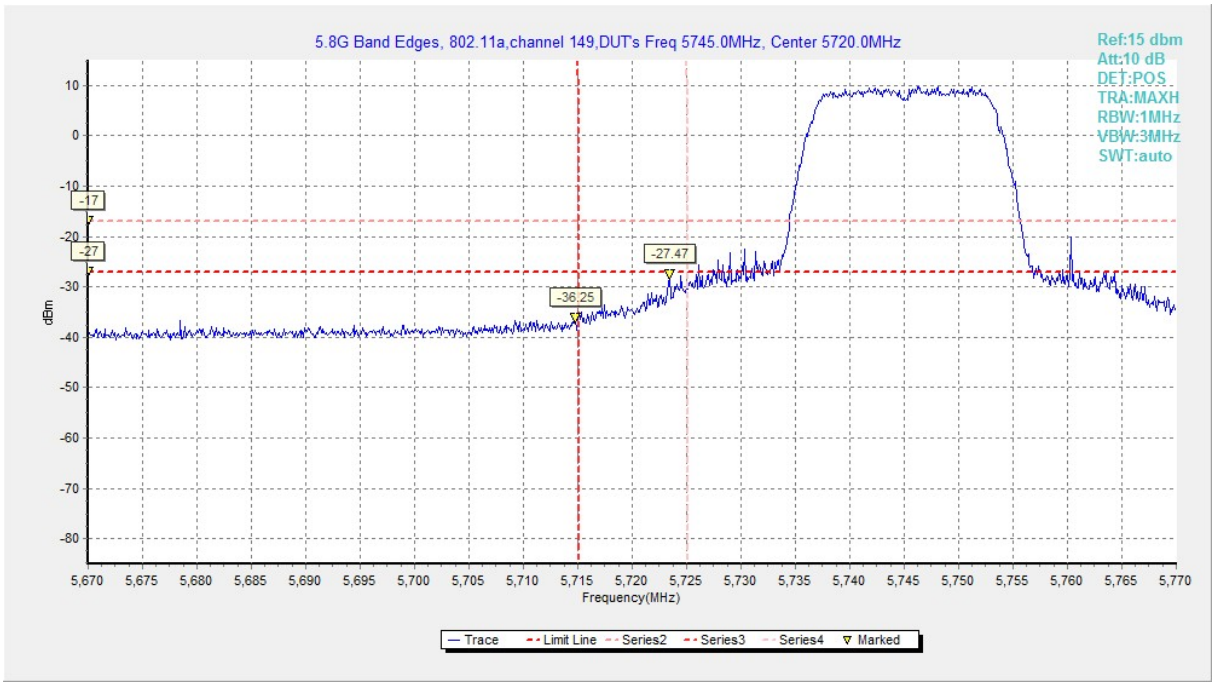

Fig. 74 Band Edges (802.11a, 5745MHz)

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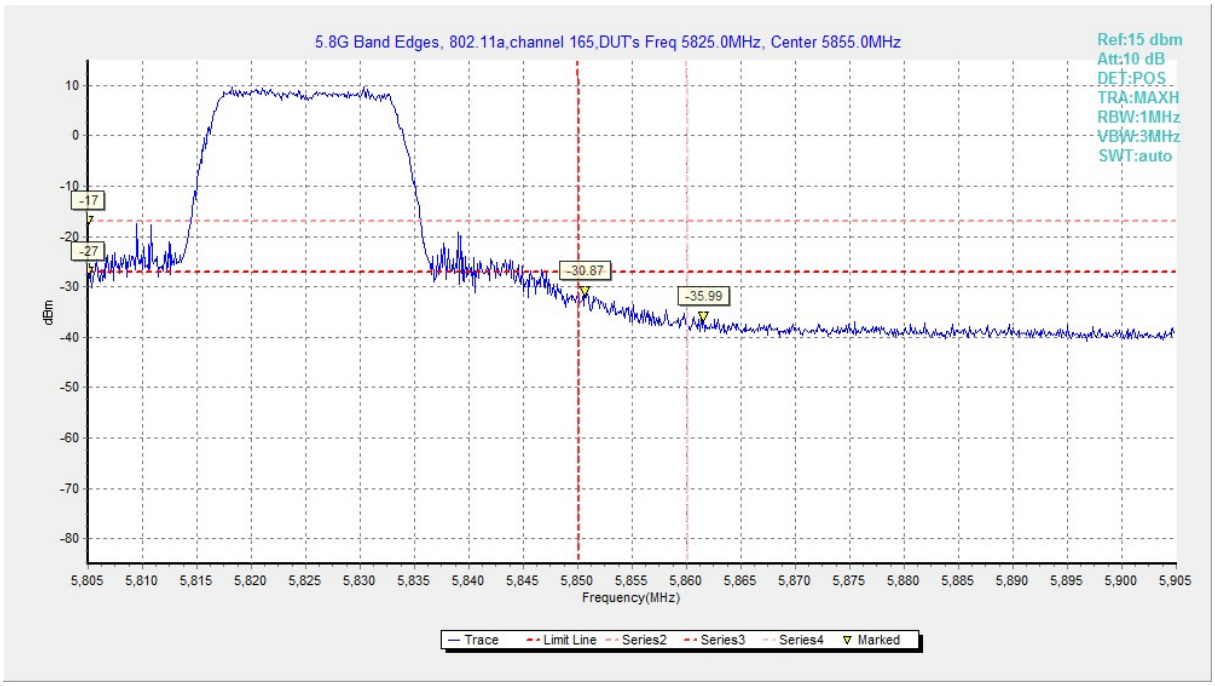

Fig. 75 Band Edges (802.11a, 5825MHz)

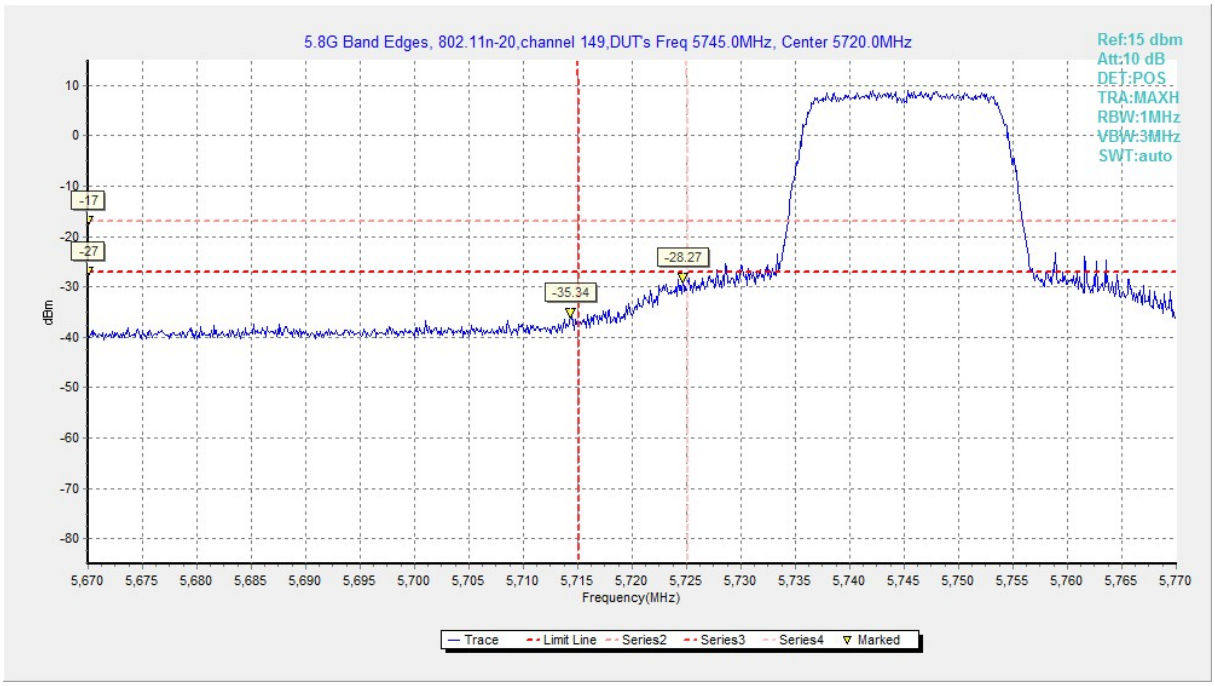

Fig. 76 Band Edges (802.11n-HT20, 5745MHz)

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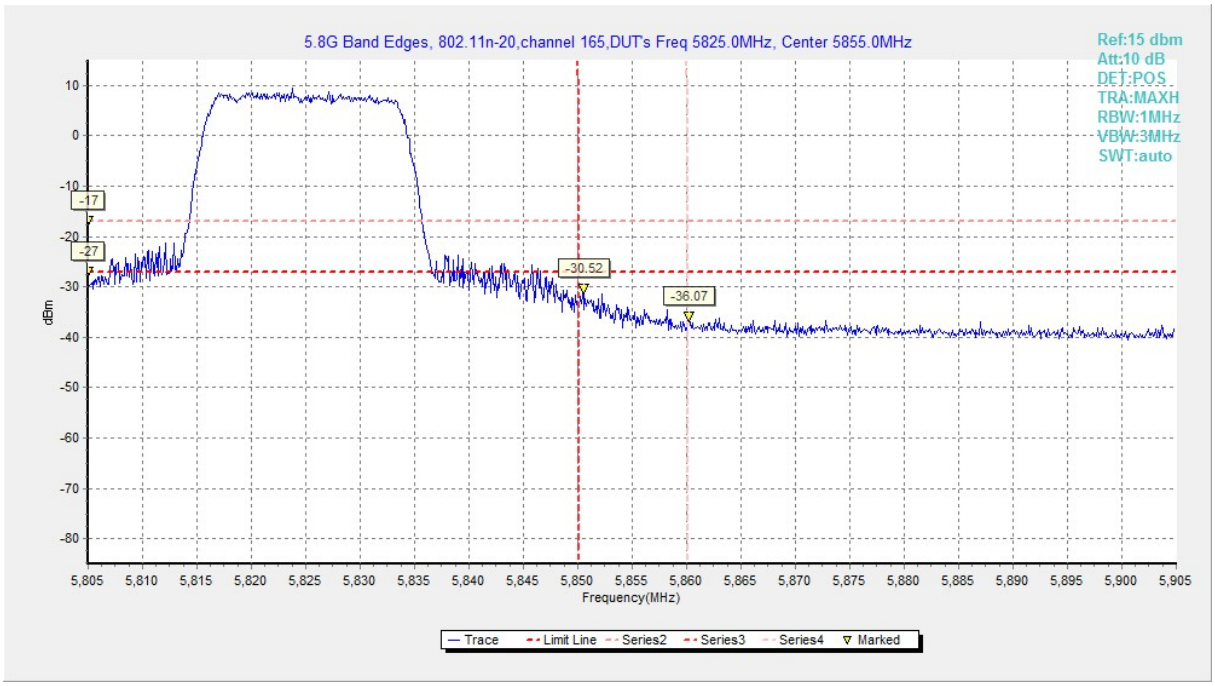

Fig. 77 Band Edges (802.11n-HT20, 5825MHz)

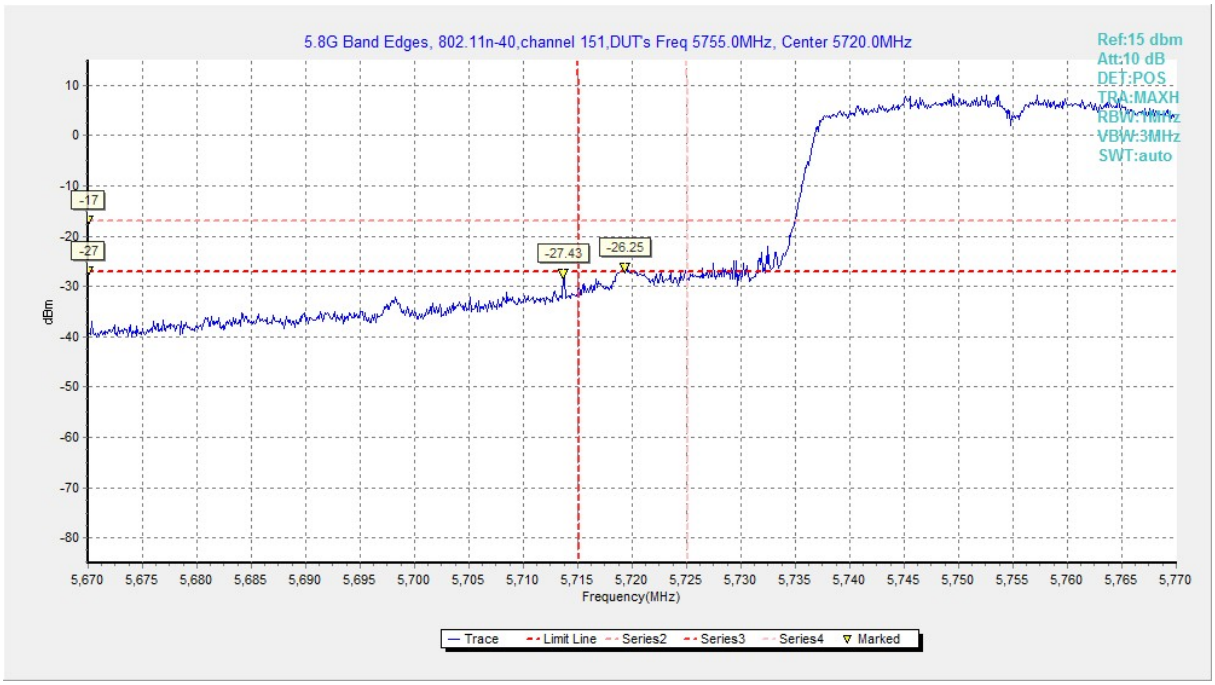

Fig. 78 Band Edges (802.11n-HT40, 5755MHz)

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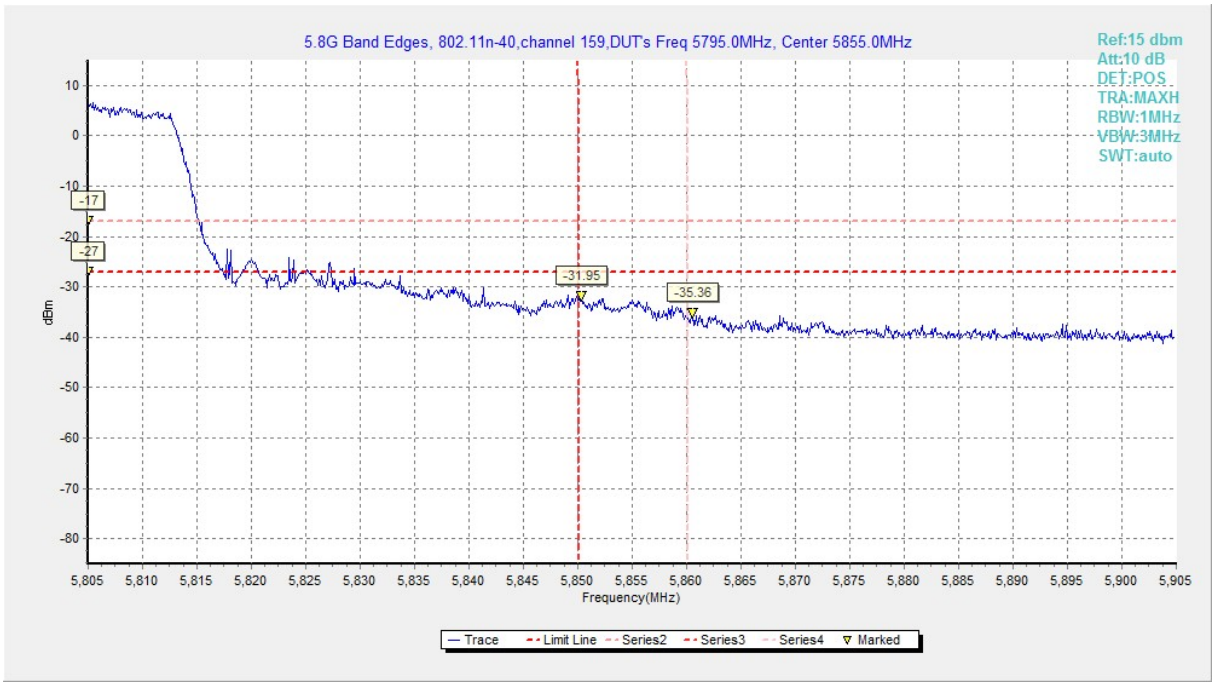

Fig. 79 Band Edges (802.11n-HT40, 5795MHz)

A6.2 Band Edges - Radiated

Measurement Limit:

Standard	Limit (dB μ V/m)	
FCC 47 CFR Part 15.209	Peak	74
	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.80	P
	5825 MHz	Fig.81	P
802.11n HT20	5745 MHz	Fig.82	P
	5825 MHz	Fig.83	P
802.11n HT40	5755 MHz	Fig.84	P
	5795 MHz	Fig.85	P

Conclusion: PASS

Test graphs as below:

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RE - Power-5.685GHz-5.765GHz

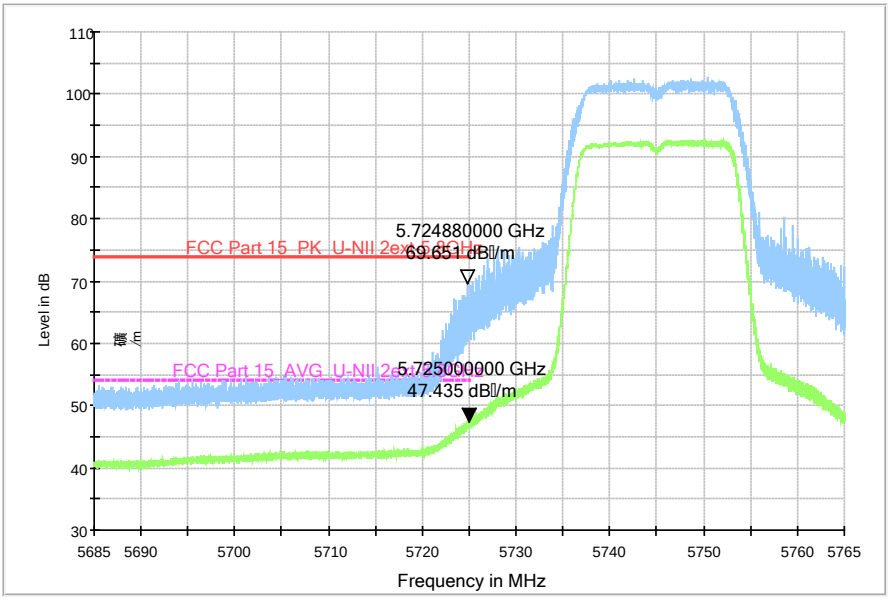

Fig. 80 Band Edges (802.11a, 5745MHz)

RE - Power-5.810GHz-5.890GHz

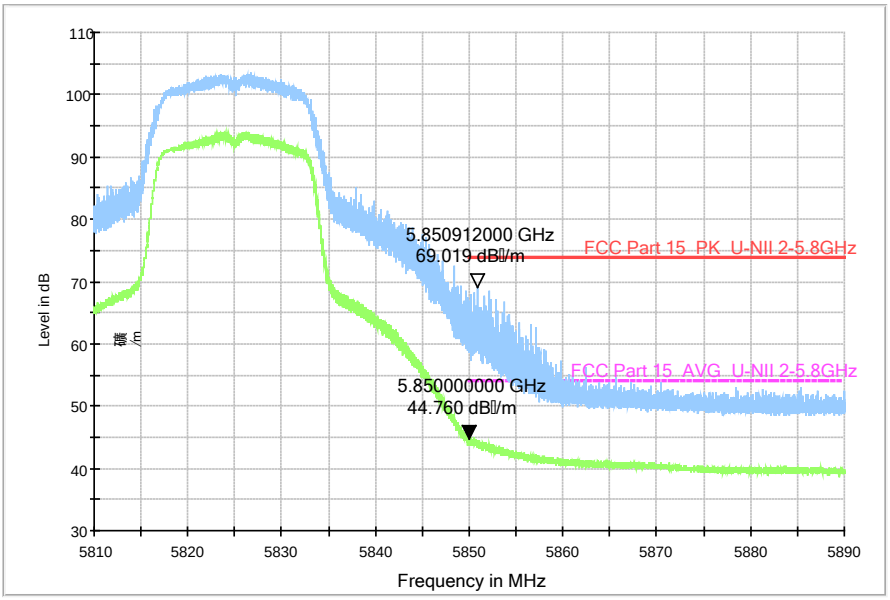

Fig. 81 Band Edges (802.11a, 5825MHz)

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RE - Power-5.685GHz-5.765GHz

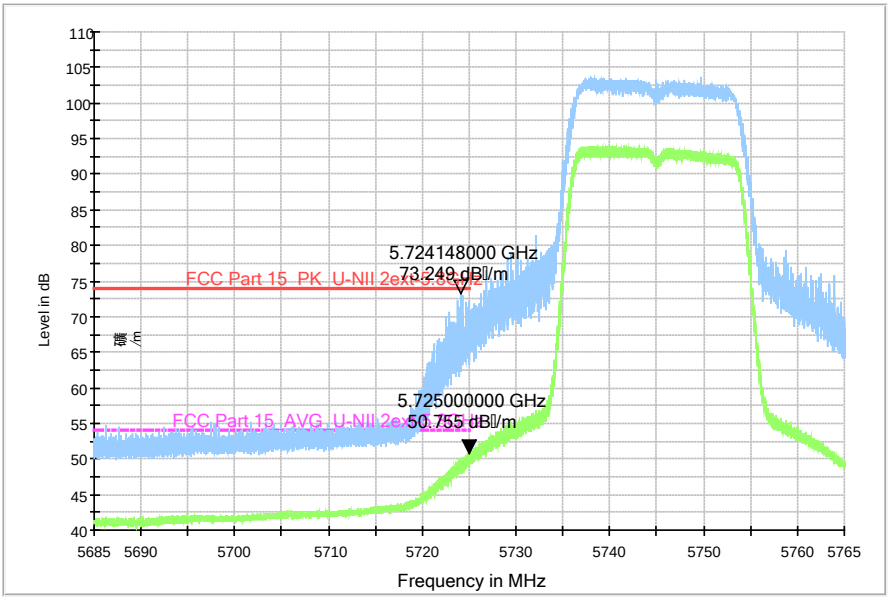

Fig. 82 Band Edges (802.11n-HT20, 5745MHz)

RE - Power-5.810GHz-5.890GHz

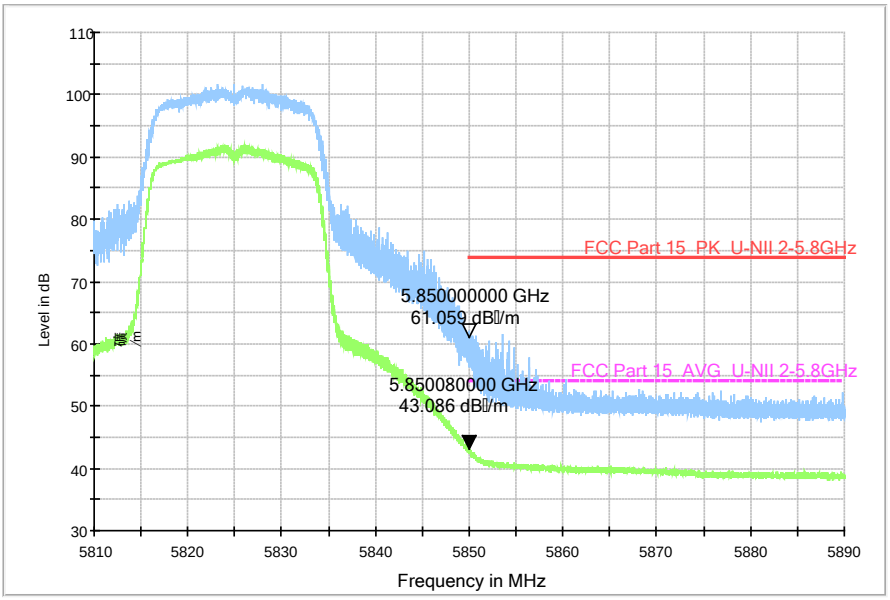

Fig. 83 Band Edges (802.11n-HT20, 5825MHz)

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RE - Power-5.685GHz-5.765GHz

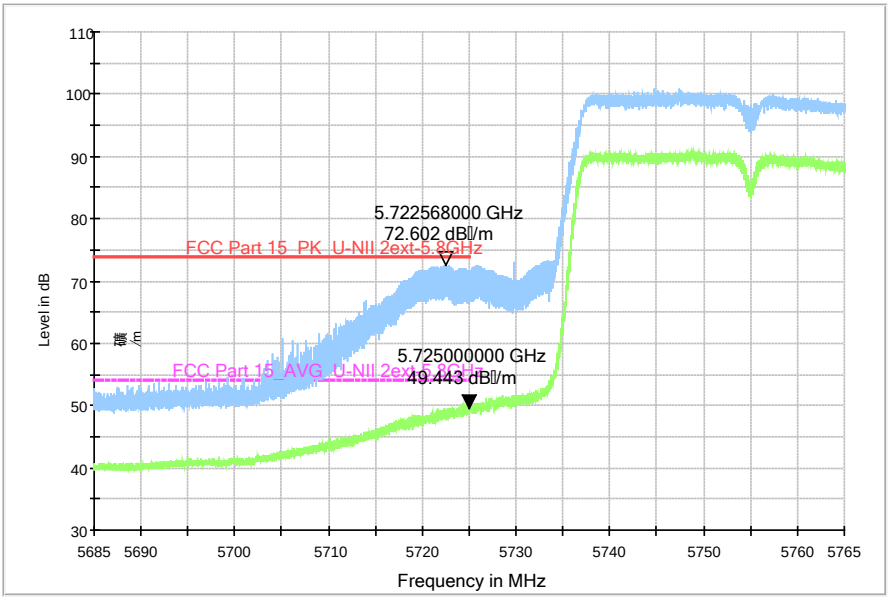

Fig. 84 Band Edges (802.11n-HT40, 5755MHz)

RE - Power-5.810GHz-5.890GHz

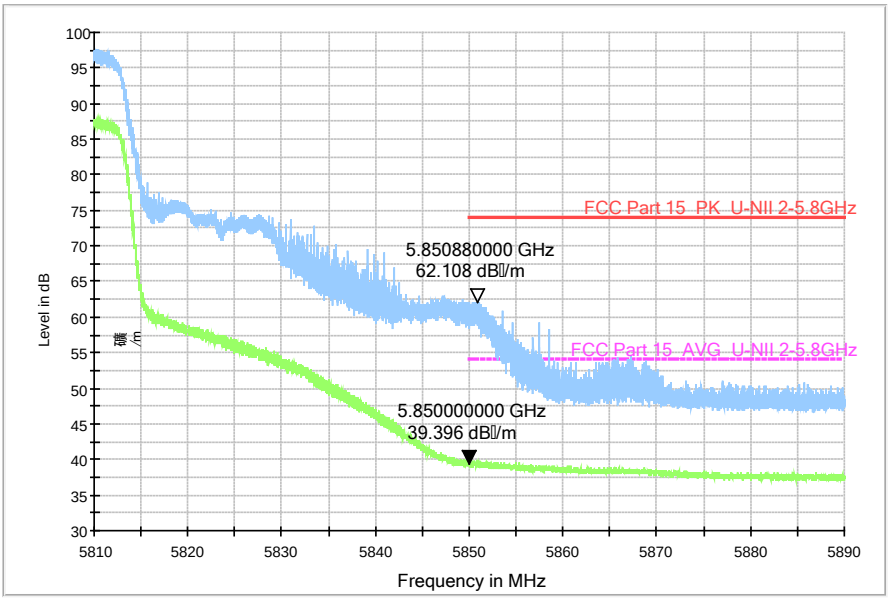

Fig. 85 Band Edges (802.11n-HT40, 5795MHz)

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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)		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.88	Fig.89	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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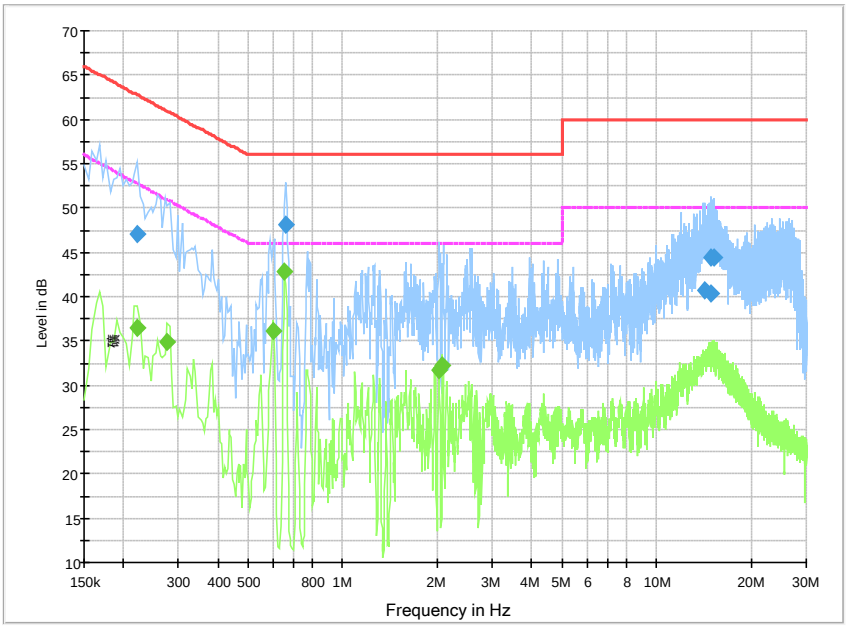

Fig. 86 AC Powerline Conducted Emission-802.11a

Measurement Result 1:

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.222001	47.1	GND	L1	10.3	15.6	62.7
0.658501	48.1	GND	N	10.3	7.9	56.0
14.167501	40.8	GND	N	10.6	19.2	60.0
14.824501	40.4	GND	N	10.6	19.6	60.0
14.914501	44.4	GND	L1	10.6	15.6	60.0
15.202501	44.4	GND	L1	10.6	15.6	60.0

Measurement Result 2:

Frequency (MHz)	CAverage (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.222001	36.4	GND	L1	10.3	16.3	52.7
0.276001	34.9	GND	L1	10.3	16.0	50.9
0.600001	36.2	GND	L1	10.3	9.8	46.0
0.654001	42.8	GND	L1	10.3	3.2	46.0
2.026501	31.7	GND	L1	10.3	14.3	46.0
2.085001	32.2	GND	L1	10.3	13.8	46.0

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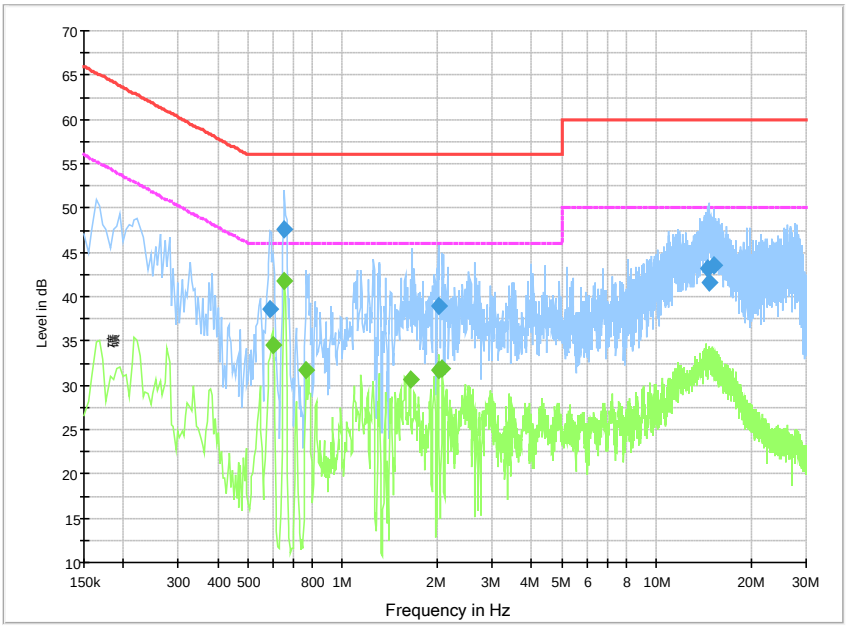

Fig. 87 AC Powerline Conducted Emission-Idle

Measurement Result 1:

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.586501	38.6	GND	N	10.3	17.4	56.0
0.654001	47.6	GND	N	10.3	8.4	56.0
2.026501	38.9	GND	N	10.3	17.1	56.0
14.550001	43.1	GND	L1	10.6	16.9	60.0
14.757001	41.7	GND	N	10.6	18.3	60.0
15.220501	43.5	GND	L1	10.6	16.5	60.0

Measurement Result 2:

Frequency (MHz)	CAverage (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.600001	34.5	GND	L1	10.3	11.5	46.0
0.654001	41.8	GND	L1	10.3	4.2	46.0
0.766501	31.7	GND	L1	10.3	14.3	46.0
1.639501	30.6	GND	L1	10.4	15.4	46.0
2.022001	31.7	GND	N	10.4	14.3	46.0
2.076001	31.8	GND	L1	10.3	14.2	46.0

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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.90	P

Conclusion: PASS

Test graphs as below:

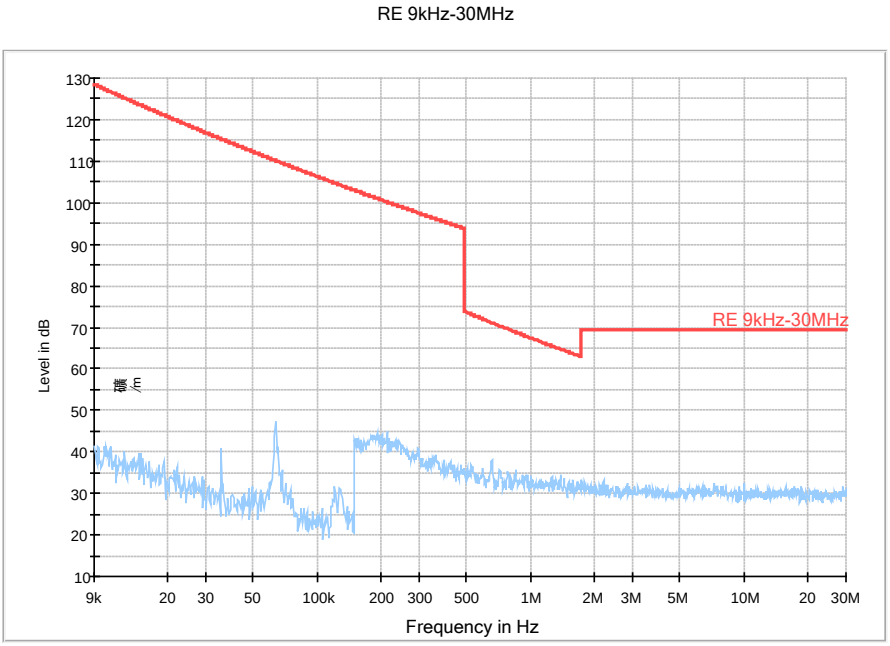

Fig. 88 Radiated Spurious Emission (802.11a, ch157, 9 kHz ~30 MHz)

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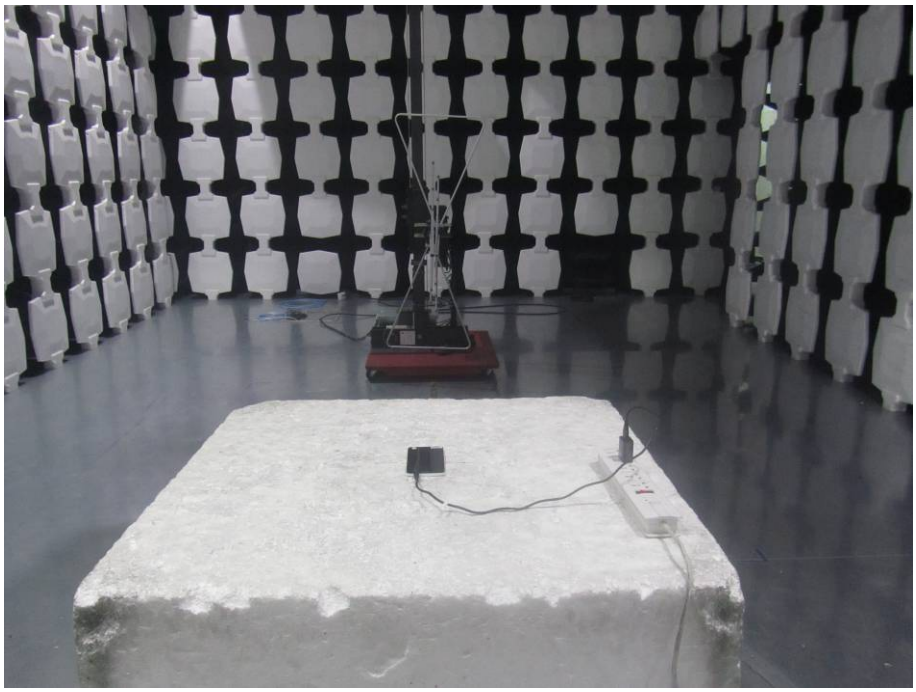
ANNEX B: PHOTOGRAPHS OF THE TEST SET-UP

Layout of Radiated Spurious Emission Test



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