

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

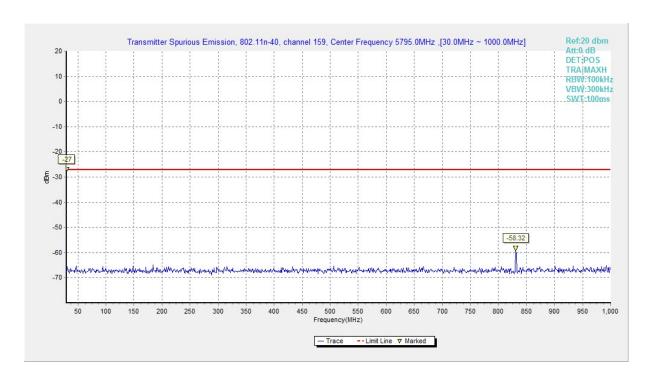


Fig. 37 Conducted Spurious Emission (802.11n-HT40, Ch159, 30 MHz-1 GHz)



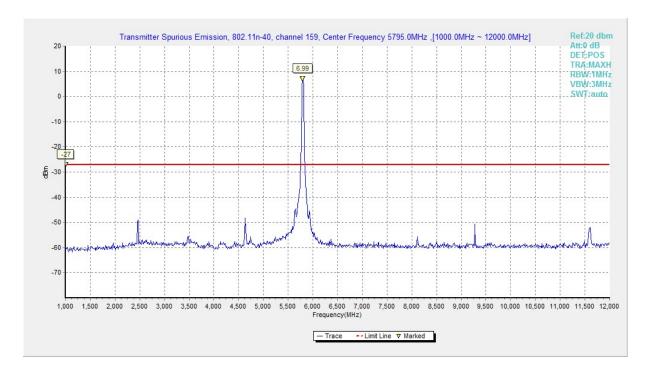


Fig. 38 Conducted Spurious Emission (802.11n-HT40, Ch159, 1 GHz -12 GHz)

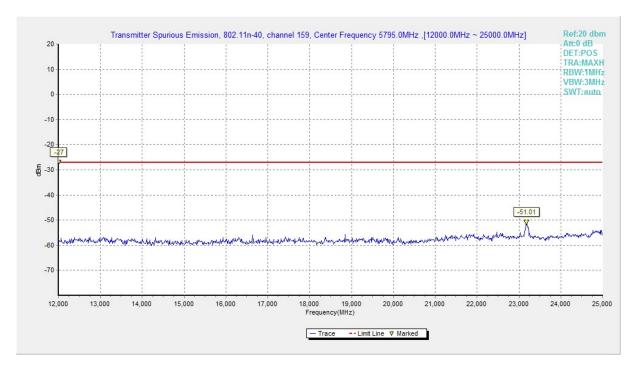


Fig. 39 Conducted Spurious Emission (802.11n-HT40, Ch159, 12 GHz-25 GHz)



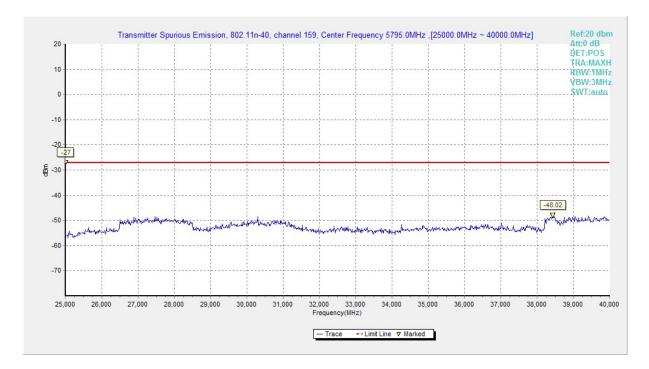


Fig. 40 Conducted Spurious Emission (802.11n-HT40, Ch159, 25 GHz-40 GHz)



# 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.41	Р
	149	3 GHz ~ 6 GHz	Fig.42	Р
		6 GHz ~ 18 GHz	Fig.43	Р
		30 MHz ~1 GHz	Fig.44	Р
		1 GHz ~ 3 GHz	Fig.45	Р
802.11a	457	3 GHz ~ 6 GHz	Fig.46	Р
002.11a	157	6 GHz ~ 18 GHz	Fig.47	Р
		18 GHz ~ 26.5 GHz	Fig.48	Р
		26.5 GHz~ 40 GHz	Fig.49	Р
		1 GHz ~ 3 GHz	Fig.50	Р
	165	3 GHz ~ 6 GHz	Fig.51	Р
		6 GHz ~ 18 GHz	Fig.52	Р

## 802.11n-HT20 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
		1 GHz ~ 3 GHz	Fig.53	Р
	149	3 GHz ~ 6 GHz	Fig.54	Р
		6 GHz ~ 18 GHz	Fig.55	Р
		30 MHz ~1 GHz	Fig.56	Р
		1 GHz ~ 3 GHz	Fig.57	Р
802.11n	157	3 GHz ~ 6 GHz	Fig.58	Р
(HT20)	157	6 GHz ~ 18 GHz	Fig.59	Р
		18 GHz ~ 26.5 GHz	Fig.60	Р
		26.5 GHz~ 40 GHz	Fig.61	Р
		1 GHz ~ 3 GHz	Fig.62	Р
	165	3 GHz ~ 6 GHz	Fig.63	Р
		6 GHz ~ 18 GHz	Fig.64	Р



### 802.11n-HT40 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
		30 MHz ~1 GHz	Fig.65	Р
		1 GHz ~ 3 GHz	Fig.66	Р
	151	3 GHz ~ 6 GHz	Fig.67	Р
902 11n	151	6 GHz ~ 18 GHz	Fig.68	Р
802.11n (HT40)		18 GHz ~ 26.5 GHz	Fig.69	Р
(11140)		26.5 GHz~ 40 GHz	Fig.70	Р
		1 GHz ~ 3 GHz	Fig.71	Р
	159	3 GHz ~ 6 GHz	Fig.72	Р
		6 GHz ~ 18 GHz	Fig.73	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.

 $\ensuremath{\text{P}_{\text{Mea}}}$  is the field strength recorded from the instrument.

**802.11a** Ch149

Frequency(MHz)	Result	Cable	Antenna	P <sub>Mea</sub>	Polarization
r requericy(ivii iz)	(dBuV/m)	Loss(dB)	Factor	(dBuV/m)	
5724.880	69.7	-18.2	34.8	53.064	Н
17272.800	59.6	-15.1	41.2	33.493	V
17719.200	59.4	-13.0	41.2	31.205	Н
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 <sub>Mea</sub> (dBuV/m)	Polarization
17629.800	59.0	-14.9	41.2	32.718	Н
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	Н
17578.800	58.2	-14.9	41.2	31.918	Н
17281.200	58.1	-15.1	41.2	31.993	V



## Ch165

Fragues av (MHz)	Result	Cable	Antenna	P <sub>Mea</sub>	Polarization
Frequency(MHz)	(dBuV/m)	Loss(dB)	Factor	(dBuV/m)	
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	Н
17725.200	58.1	-13.0	41.2	29.905	Н

## 802.11n-HT20

## Ch149

Fraguenov/MHz)	Result	Cable	Antenna	P <sub>Mea</sub>	Polarization
Frequency(MHz)	(dBuV/m)	Loss(dB)	Factor	(dBuV/m)	
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	Н
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	Н

## Ch157

Fraguenov/MHz)	Result	Cable	Antenna	P <sub>Mea</sub>	Polarization
Frequency(MHz)	(dBuV/m)	Loss(dB)	Factor	(dBuV/m)	
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	Н
17647.200	57.9	-13.0	41.2	29.705	V
17084.400	57.9	-16.3	41.4	32.841	V

# Ch165

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



### 802.11n-HT40

## Ch151

Fraguenov/MHz)	Result	Cable	Antenna	P <sub>Mea</sub>	Polarization
Frequency(MHz)	(dBuV/m)	Loss(dB)	Factor	(dBuV/m)	
5722.568	72.6	-18.2	34.8	55.964	Н
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	Н
17698.200	58.2	-13.0	41.2	30.005	Н
17251.800	58.1	-15.1	41.2	31.993	V

### Ch159

Fraguenov/MHz)	Result	Cable	Antenna	P <sub>Mea</sub>	Polarization
Frequency(MHz)	(dBuV/m)	Loss(dB)	Factor	(dBuV/m)	
5850.880	62.1	-20.0	34.9	47.203	Н
17520.000	58.6	-14.9	41.2	32.318	V
17682.600	58.3	-13.0	41.2	30.105	Н
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	Н

## Test graphs as below:

RE - 1GHz-3GHz

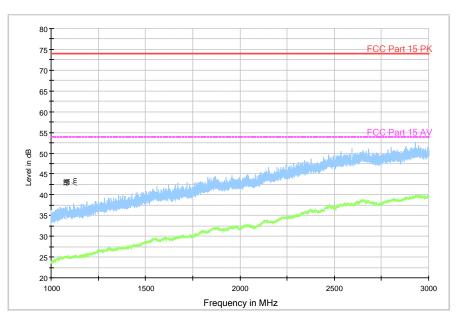


Fig. 41 Radiated Spurious Emission (802.11a, Ch149, 1 GHz-3 GHz)



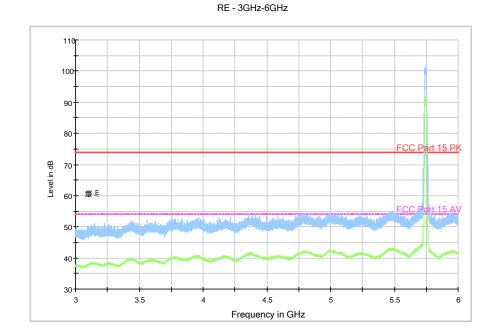


Fig. 42 Radiated Spurious Emission (802.11a, Ch149, 3 GHz-6 GHz)

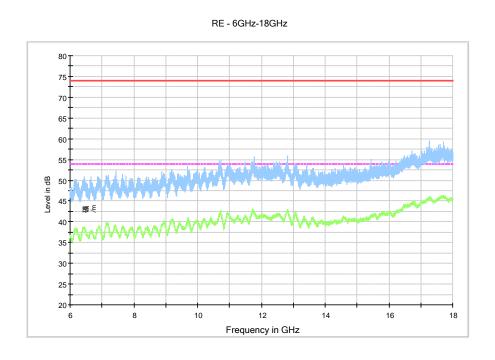


Fig. 43 Radiated Spurious Emission (802.11a, Ch149, 6 GHz-18 GHz)



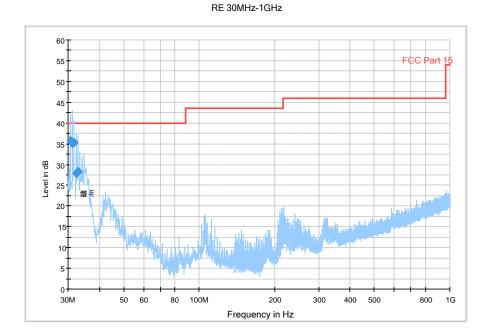


Fig. 44 Radiated Spurious Emission (802.11a, Ch157, 30 MHz-1 GHz)

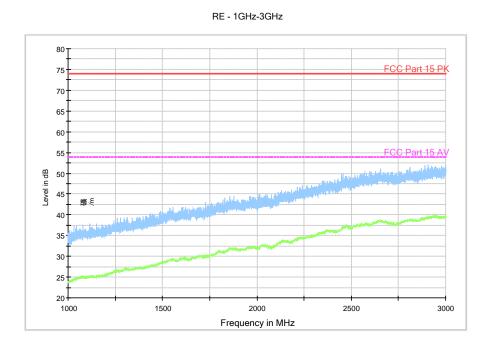


Fig. 45 Radiated Spurious Emission (802.11a, Ch157, 1 GHz-3 GHz)



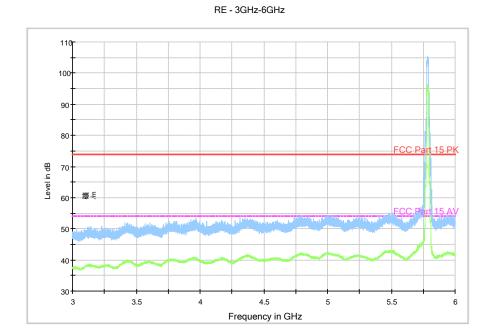


Fig. 46 Radiated Spurious Emission (802.11a, Ch157, 3 GHz-6 GHz)

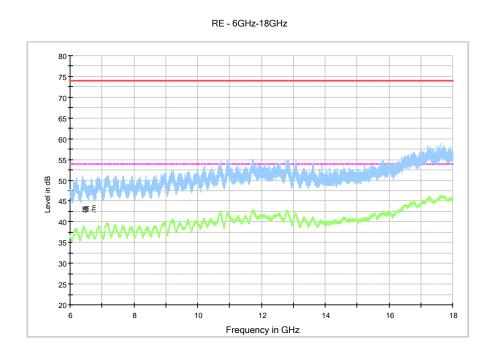


Fig. 47 Radiated Spurious Emission (802.11a, Ch157, 6 GHz-18 GHz)



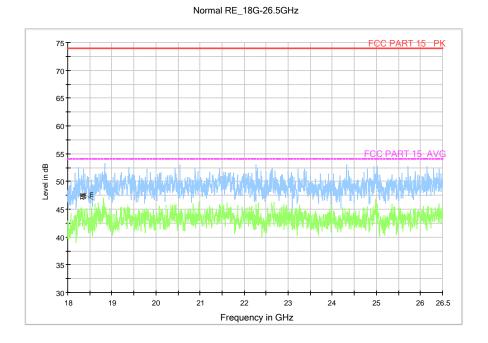


Fig. 48 Radiated Spurious Emission (802.11a, Ch157, 18 GHz-26.5 GHz)

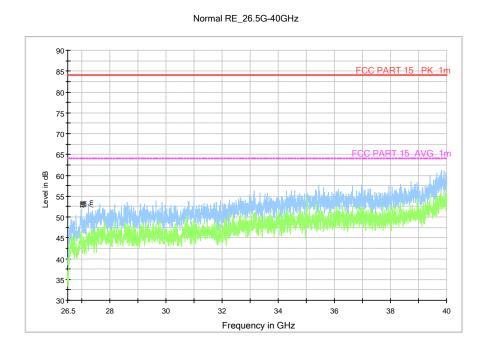


Fig. 49 Radiated emission: 802.11n, (802.11a, Ch157, 26.5 GHz - 40 GHz)





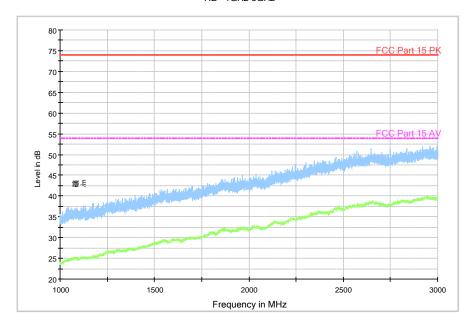


Fig. 50 Radiated Spurious Emission (802.11a, Ch165, 1 GHz-3 GHz)

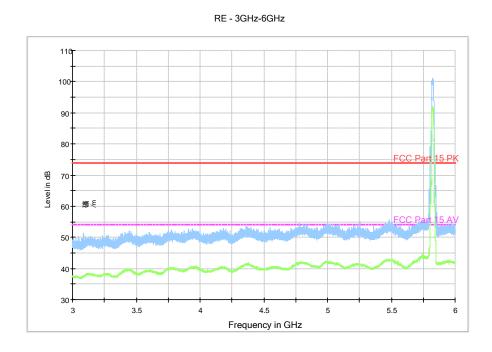


Fig. 51 Radiated Spurious Emission (802.11a, Ch165, 3 GHz-6 GHz)



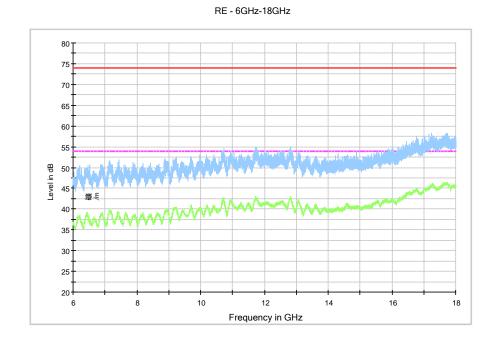


Fig. 52 Radiated Spurious Emission (802.11a, Ch165, 6 GHz-18 GHz)

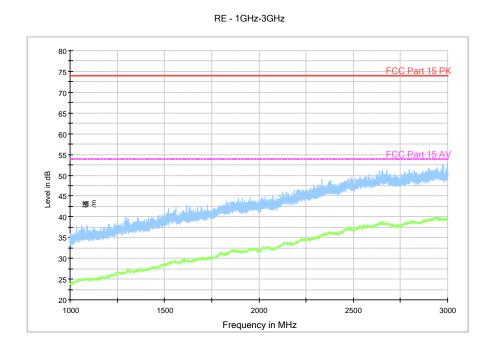


Fig. 53 Radiated Spurious Emission (802.11n-HT20, Ch149, 1 GHz-3 GHz)



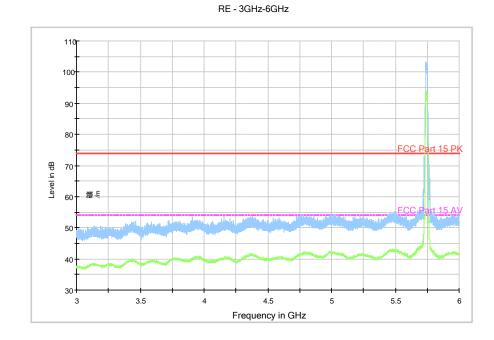


Fig. 54 Radiated Spurious Emission (802.11n-HT20, Ch149, 3 GHz-6 GHz)

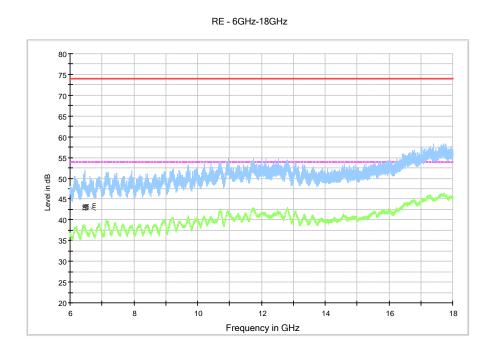


Fig. 55 Radiated Spurious Emission (802.11n-HT20, Ch149, 6 GHz-18 GHz)



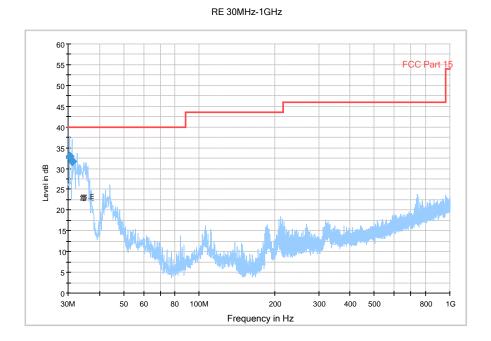


Fig. 56 Radiated Spurious Emission (802.11n-HT20, Ch157, 30 MHz-1 GHz)

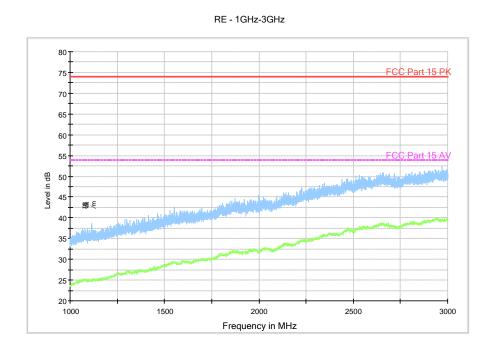


Fig. 57 Radiated Spurious Emission (802.11n-HT20, Ch157, 1 GHz-3 GHz)



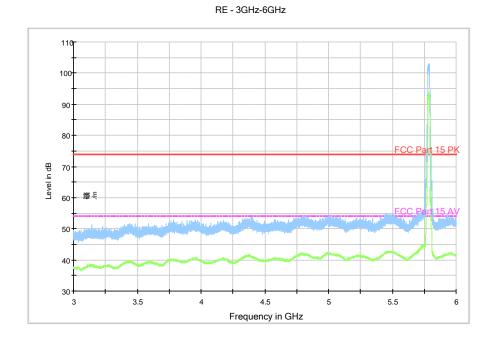


Fig. 58 Radiated Spurious Emission (802.11n-HT20, Ch157, 3 GHz-6 GHz)

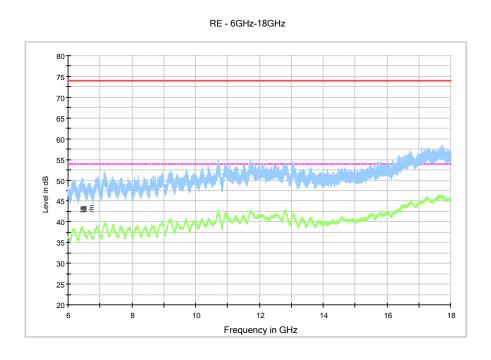


Fig. 59 Radiated Spurious Emission (802.11n-HT20, Ch157, 6 GHz-18 GHz)



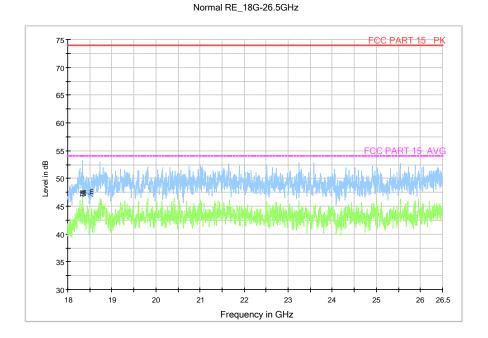


Fig. 60 Radiated Spurious Emission (802.11n-HT20, Ch157, 18 GHz-26.5 GHz)

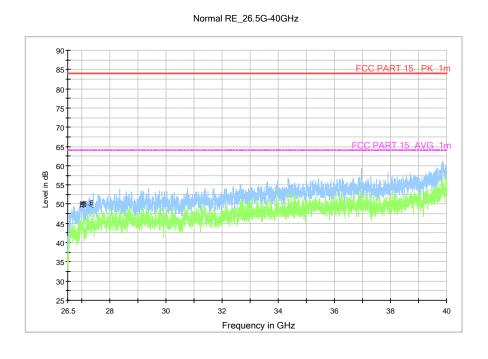


Fig. 61 Radiated emission: 802.11n, (802.11n-HT20, Ch157, 26.5 GHz - 40 GHz)





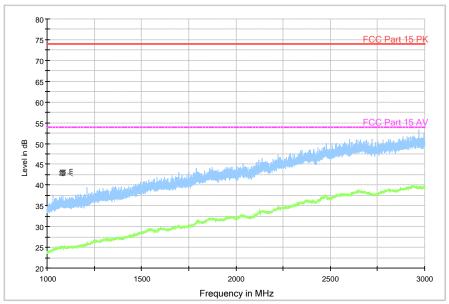


Fig. 62 Radiated Spurious Emission (802.11n-HT20, Ch165, 1 GHz-3 GHz)

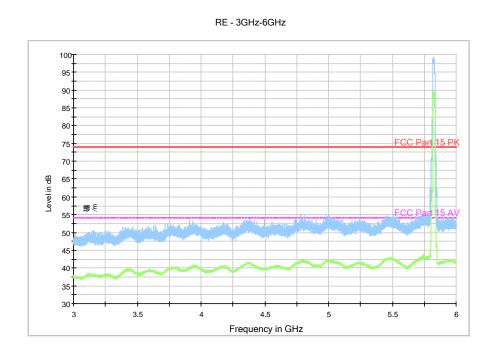


Fig. 63 Radiated Spurious Emission (802.11n-HT20, Ch165, 3 GHz-6 GHz)



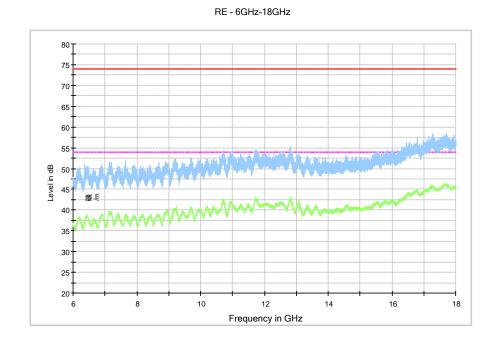


Fig. 64 Radiated Spurious Emission (802.11n-HT20, Ch165, 6 GHz-18 GHz)

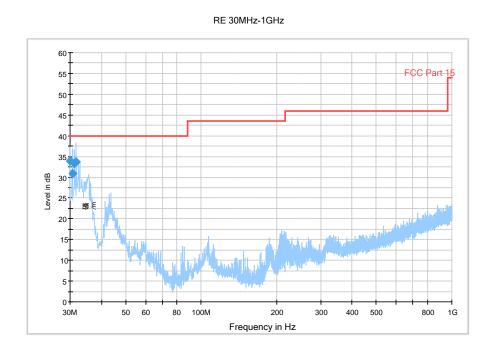


Fig. 65 Radiated Spurious Emission (802.11n-HT40, Ch151, 30 MHz-1 GHz)





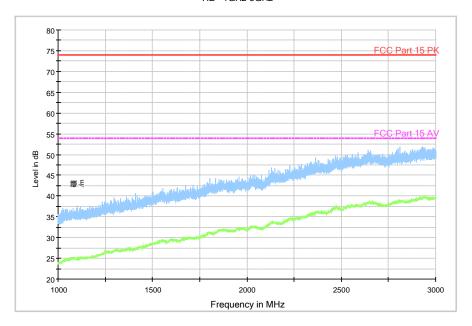


Fig. 66 Radiated Spurious Emission (802.11n-HT40, Ch151, 1 GHz-3 GHz)

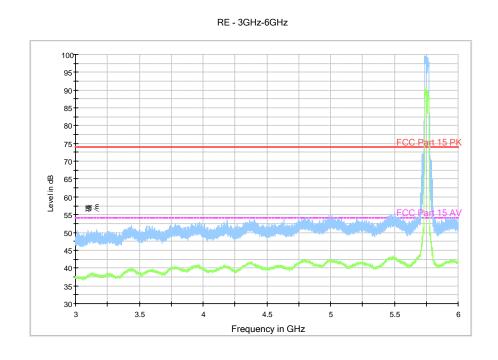


Fig. 67 Radiated Spurious Emission (802.11n-HT40, Ch151, 3 GHz-6 GHz)



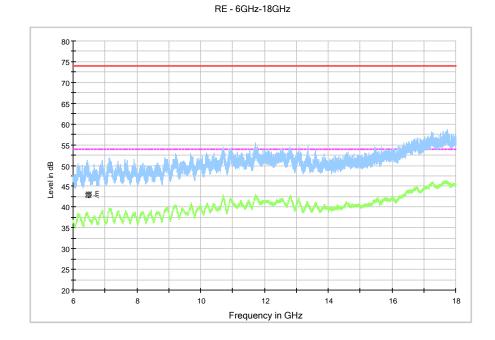


Fig. 68 Radiated Spurious Emission (802.11n-HT40, Ch151, 6 GHz-18 GHz)

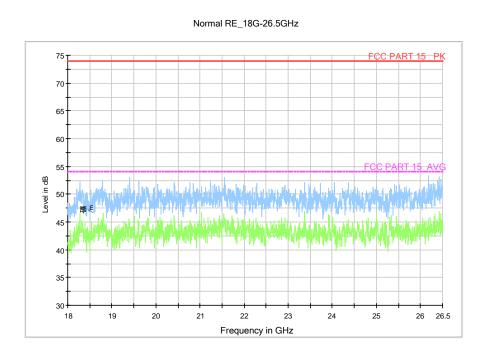


Fig. 69 Radiated Spurious Emission (802.11n-HT40, Ch151, 18 GHz-26.5 GHz)



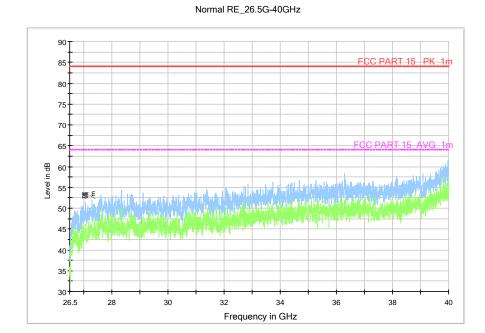


Fig. 70 Radiated emission: 802.11n, (802.11n-HT40, Ch151, 26.5 GHz - 40 GHz)

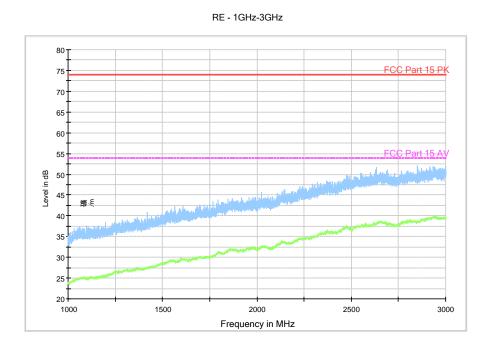


Fig. 71 Radiated Spurious Emission (802.11n-HT40, Ch159 1 GHz-3 GHz)



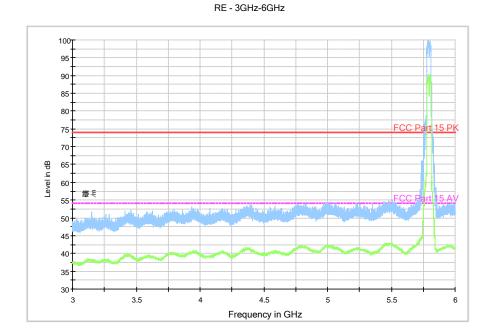


Fig. 72 Radiated Spurious Emission (802.11n-HT40, Ch159 3 GHz-6 GHz)

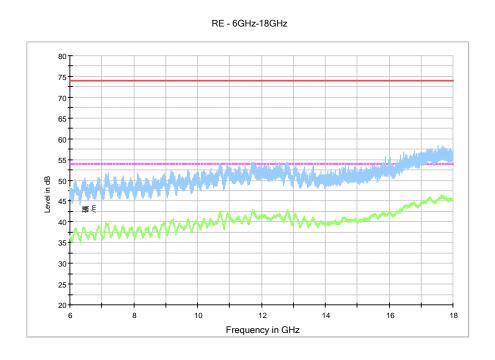


Fig. 73 Radiated Spurious Emission (802.11n-HT40, Ch159, 6 GHz-18 GHz)



## A.6. Band Edges Compliance

## A6.1 Band Edges - conducted

### **Measurement Limit:**

Standard	Frequency (MHz)	Limit (dBm/MHz)
ECC 47 CED Dort 15 407 (b) (4)	5715MHz~5860MHz	< -17
FCC 47 CFR Part 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
902 110	5745 MHz	Fig.74	Р
802.11a	5825 MHz	Fig.75	Р
802.11n	5745 MHz	Fig.76	Р
HT20	5825 MHz	Fig.77	Р
802.11n	5755 MHz	Fig.78	Р
HT40	5795 MHz	Fig.79	Р



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



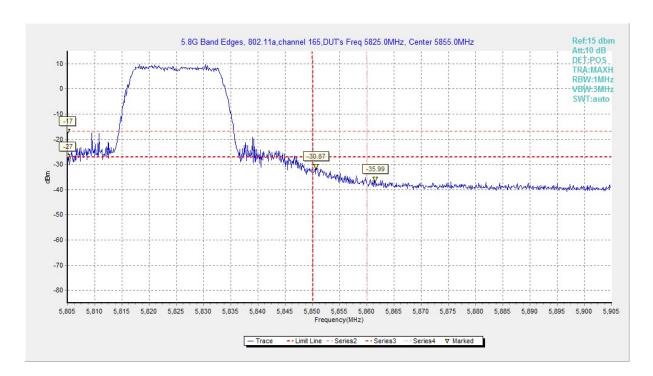


Fig. 75 Band Edges (802.11a, 5825MHz)

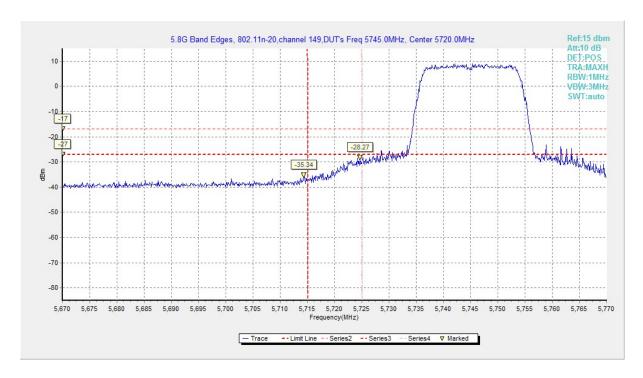


Fig. 76 Band Edges (802.11n-HT20, 5745MHz)





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

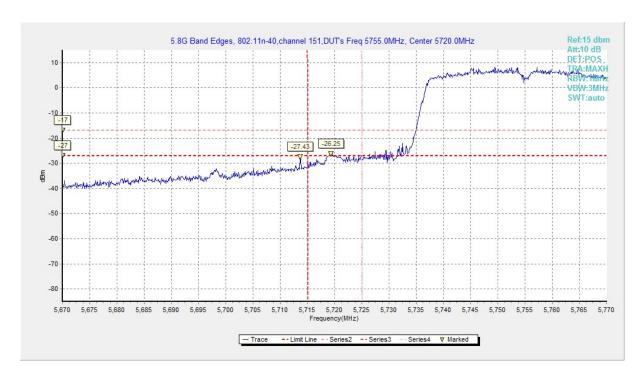


Fig. 78 Band Edges (802.11n-HT40, 5755MHz)



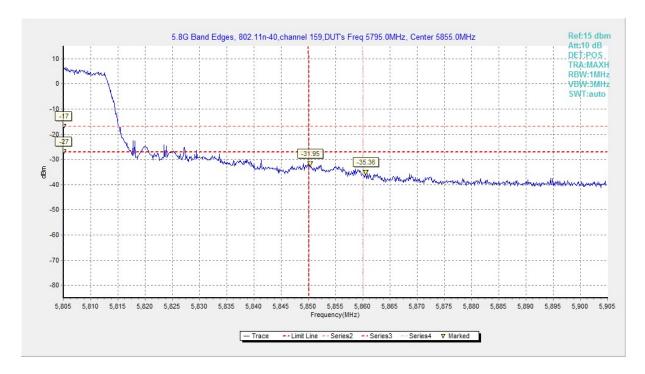


Fig. 79 Band Edges (802.11n-HT40, 5795MHz)

### A6.2 Band Edges - Radiated

### **Measurement Limit:**

Standard	Limit (dB μ V/m)		
FCC 47 CFR Part 15.209	Peak 74		
	Average	54	

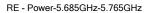
The measurement is made according to KDB 789033 D02

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	Р
002.11d	5825 MHz	Fig.81	Р
802.11n	5745 MHz	Fig.82	Р
HT20	5825 MHz	Fig.83	Р
802.11n	5755 MHz	Fig.84	Р
HT40	5795 MHz	Fig.85	Р





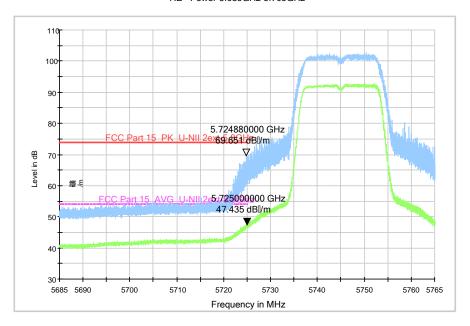
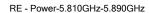


Fig. 80 Band Edges (802.11a, 5745MHz)



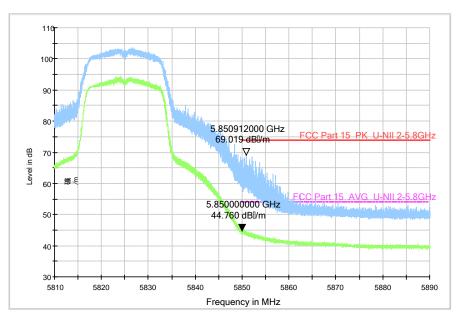
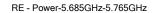


Fig. 81 Band Edges (802.11a, 5825MHz)





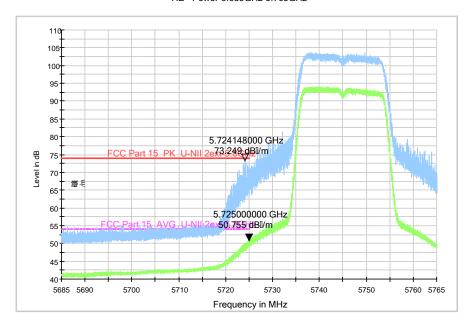
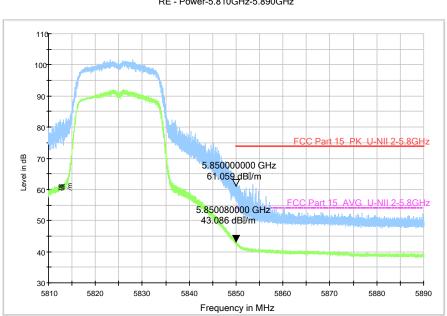


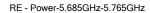
Fig. 82 Band Edges (802.11n-HT20, 5745MHz)



RE - Power-5.810GHz-5.890GHz

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





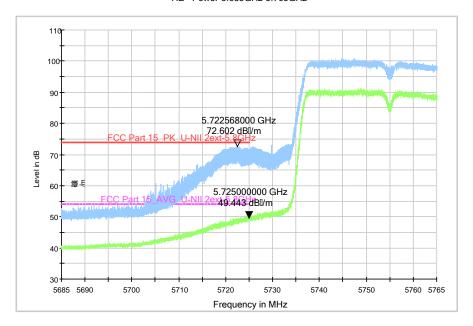
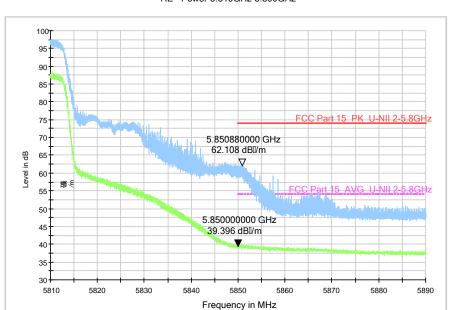


Fig. 84 Band Edges (802.11n-HT40, 5755MHz)



RE - Power-5.810GHz-5.890GHz

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



## 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)

\ I	,			
_		Result		
Frequency range (MHz)	Quasi-peak Limit (dBμV)	With charger Co		Conclusion
(11112)	Lillit (abµv)	802.11a	ldle	
0.15 to 0.5	66 to 56			
0.5 to 5	56	Fig.86	Fig.87	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 (dB <sub>µ</sub> V) With charger				Conclusion
(MHz)	(dBμV)	802.11a	ldle			
0.15 to 0.5	56 to 46					
0.5 to 5	46	Fig.88	Fig.89	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.



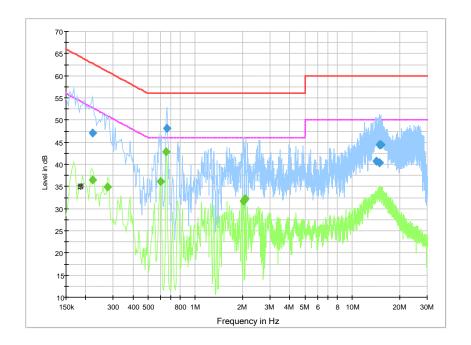


Fig. 86 AC Powerline Conducted Emission-802.11a

### Measurement Result 1:

Frequency	QuasiPeak	PE	Line	Corr.	Margin	Limit
(MHz)	(dBµV)			(dB)	(dB)	(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



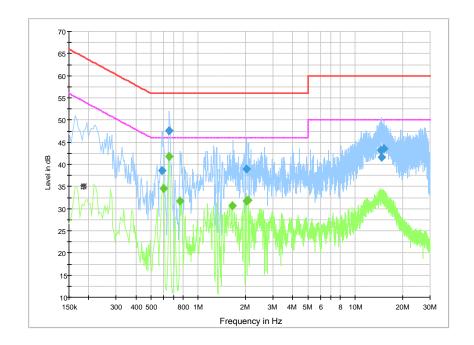


Fig. 87 AC Powerline Conducted Emission-Idle

### Measurement Result 1:

Frequency	QuasiPeak	PE	Line	Corr.	Margin	Limit
(MHz)	(dBµV)			(dB)	(dB)	(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	CAverage	PE	Line	Corr.	Margin	Limit
(MHz)	(dBµV)			(dB)	(dB)	(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



## 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	Р



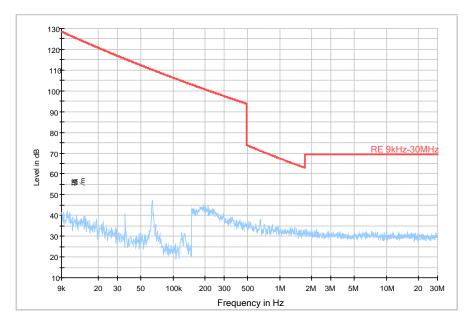


Fig. 88 Radiated Spurious Emission (802.11a, ch157, 9 kHz ~30 MHz)



# ANNEX B: PHOTOGRAPHS OF THE TEST SET-UP

**Layout of Radiated Spurious Emission Test** 



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