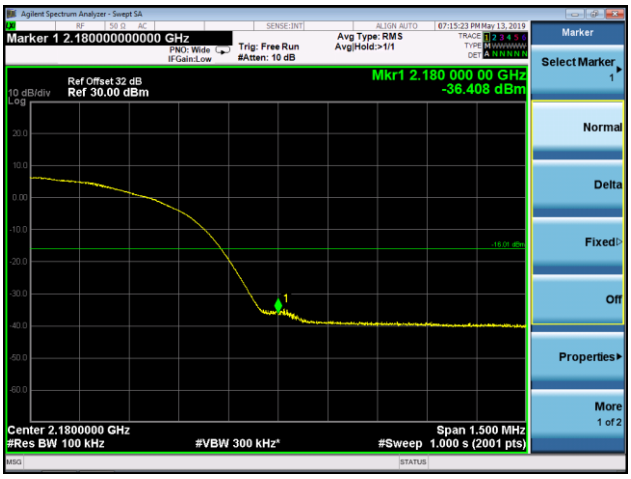
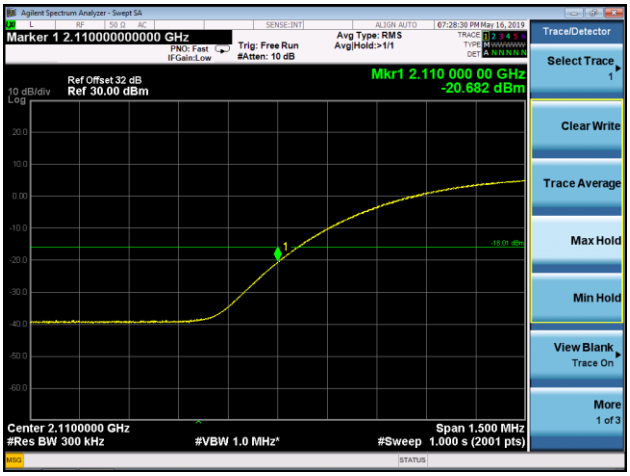
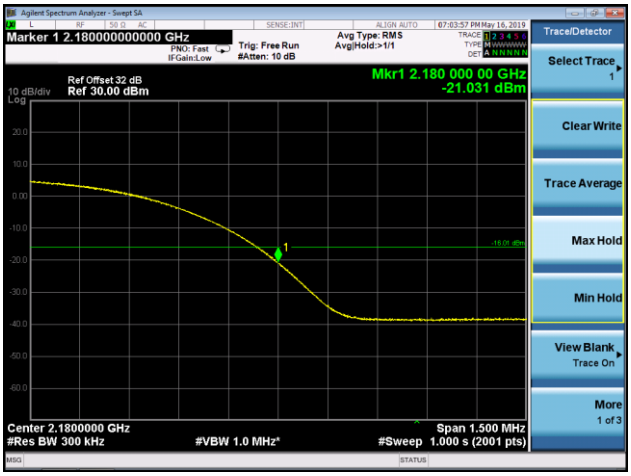
Band Edge - Ant 1 (16QAM)	
5MHz Channel Bandwidth	
2112.5MHz	2177.5MHz
	
5 + 5 + 5MHz Channel Bandwidth	
2112.5MHz + 2117.5MHz + 2122.5MHz	2167.5MHz + 2172.5MHz + 2177.5MHz
	

6.6. Peak to Average Ratio

6.6.1.Test Limit

In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

6.6.2.Test Procedure Used

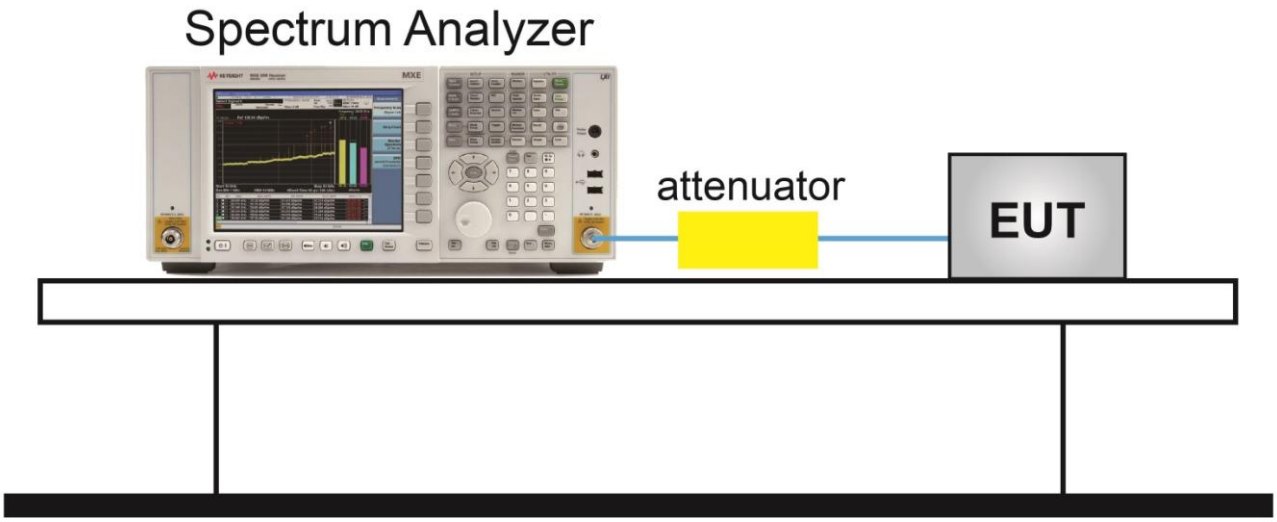
KDB 971168 D01v03r01 - Section 5.7

ANSI C63.26-2015 - Section 5.2.6

6.6.3.Test Setting

1. Set the resolution / measurement bandwidth ≥ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PARR level associated with a probability of 0.1%.

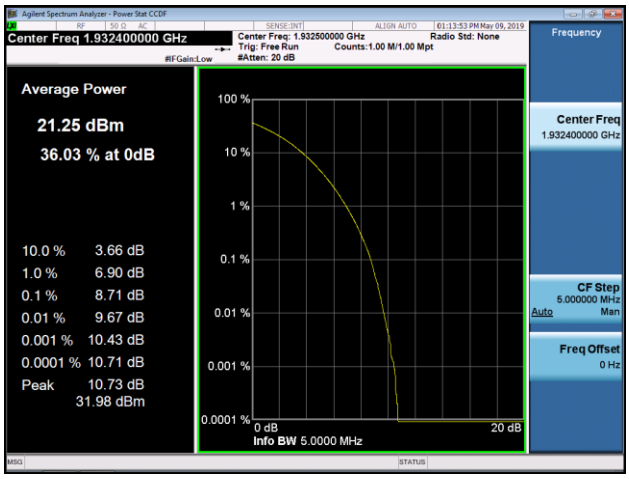
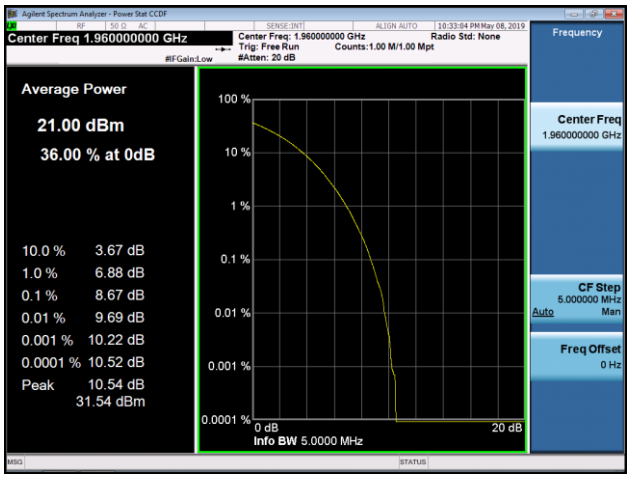
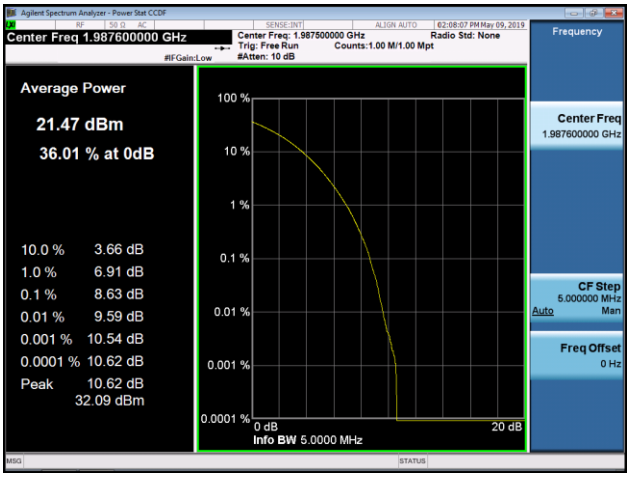
6.6.4.Test Setup

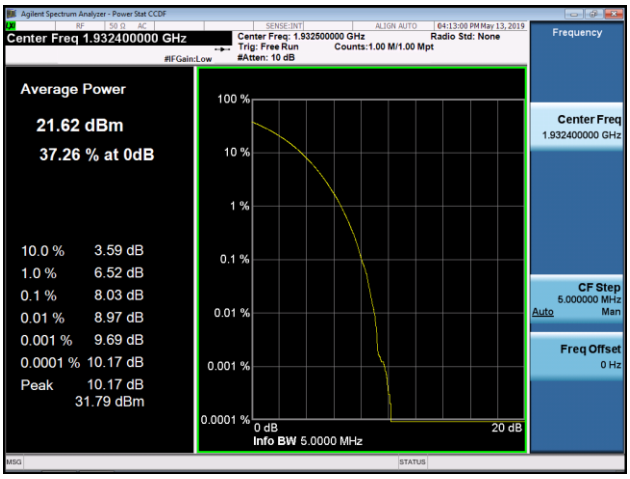
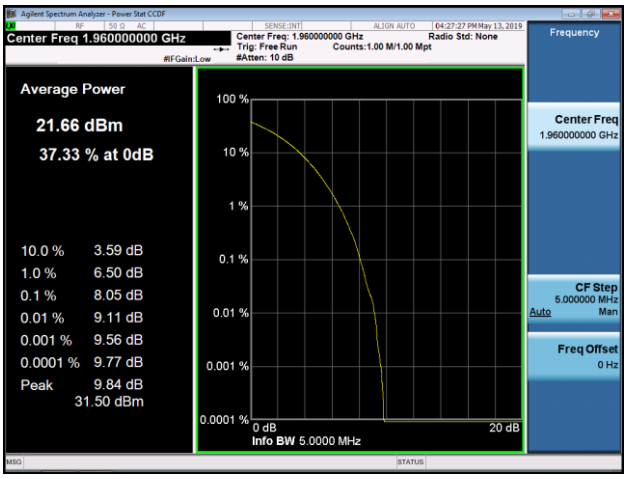
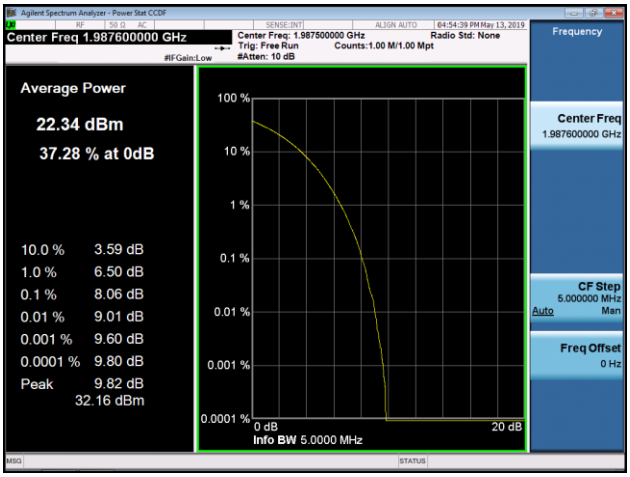


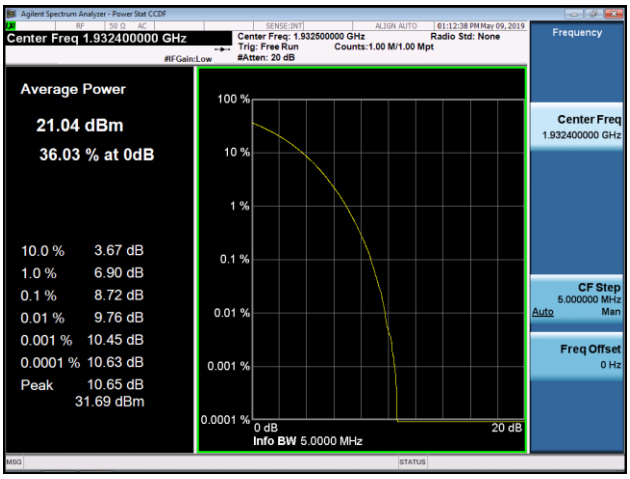
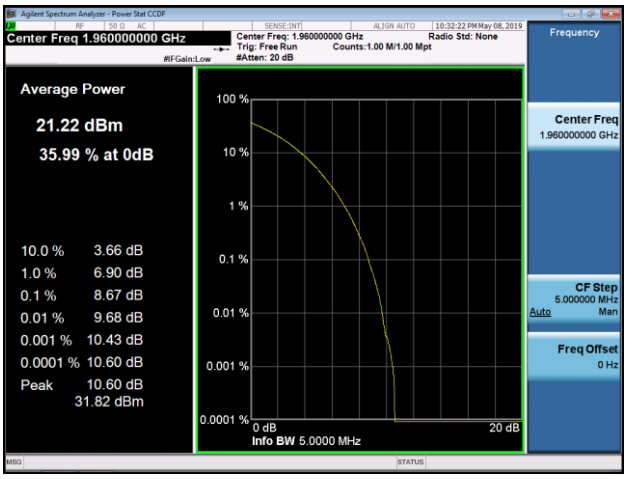
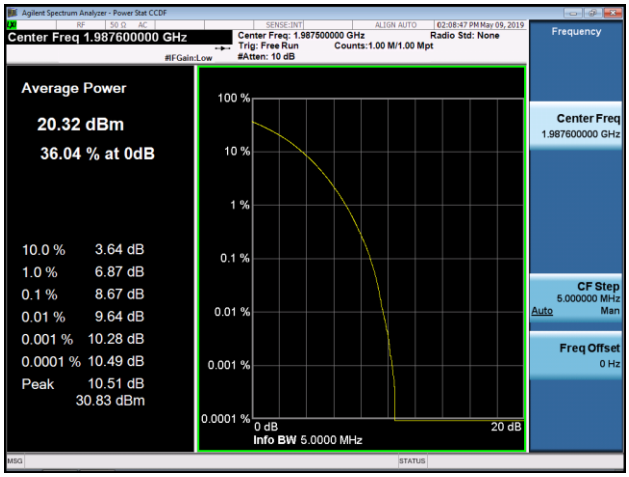
6.6.5.Test Result

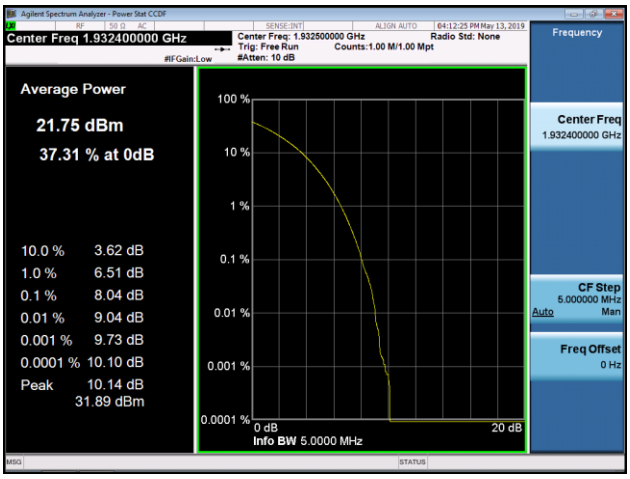
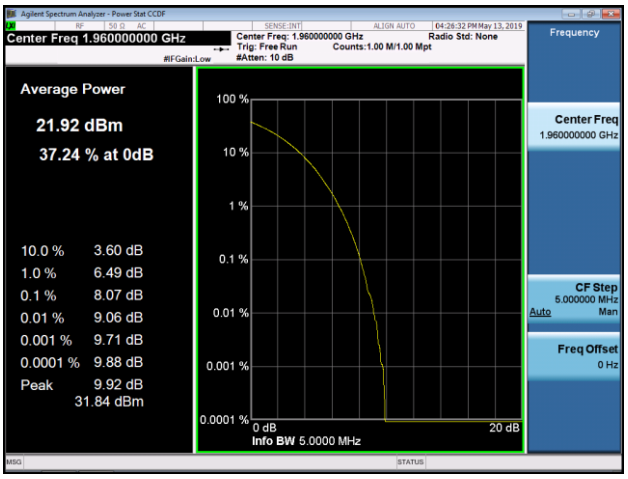
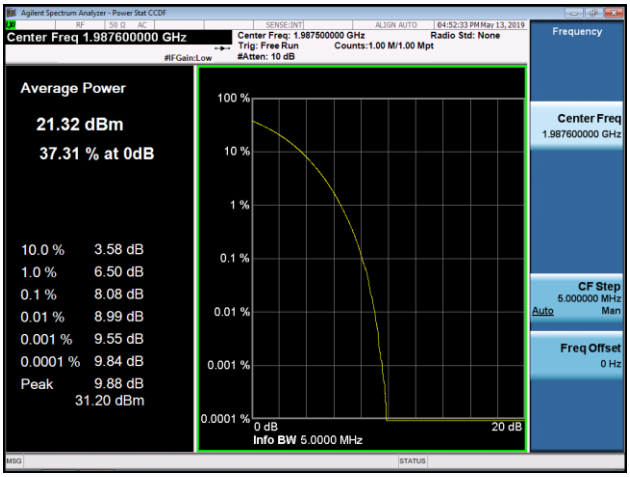
Product	AirScale Indoor Radio ASiR-pRRH	Test Engineer	Peter Xu
Test Site	SR2	Test Date	2019/05/09
Test Item	Peak to Average Ratio - WCDMA Band 2		

Frequency (MHz)	Channel Bandwidth (MHz)	Peak to Average Ratio (dB)		Limit (dBm)	Result
		Ant 0	Ant 1		
QPSK					
1932.4	5	8.71	8.72	≤ 13.00	Pass
1960.0	5	8.67	8.67	≤ 13.00	Pass
1987.6	5	8.63	8.67	≤ 13.00	Pass
16QAM					
1932.4	5	8.03	8.04	≤ 13.00	Pass
1960.0	5	8.05	8.07	≤ 13.00	Pass
1987.6	5	8.06	8.08	≤ 13.00	Pass

Peak to Average Ratio - Ant 0 (QPSK)	
5MHz Channel Bandwidth	
1932.4MHz	1960.0MHz
	
1987.6MHz	
	

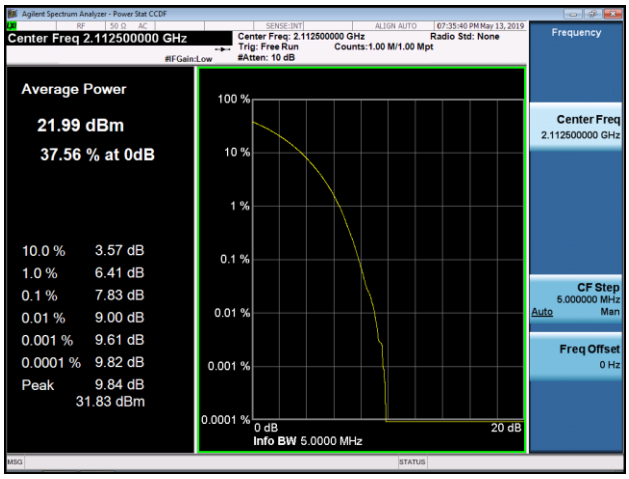
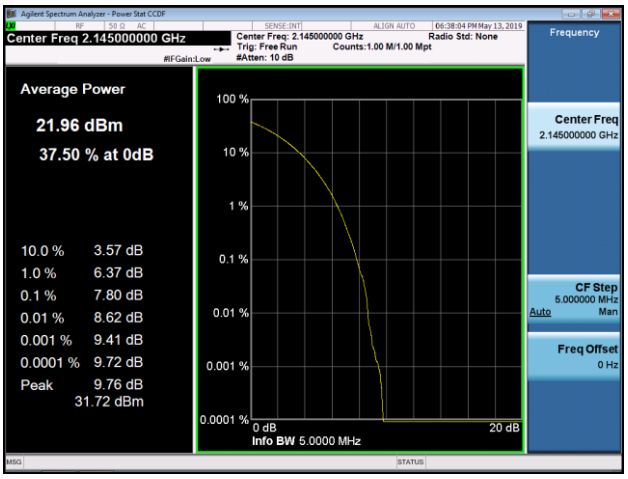
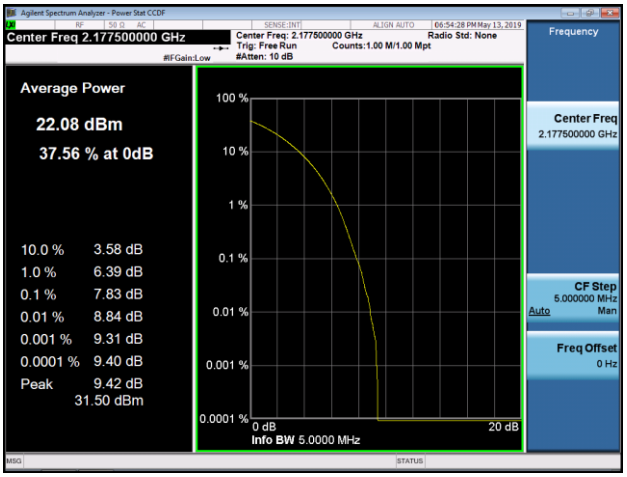
Peak to Average Ratio - Ant 0 (16QAM)	
5MHz Channel Bandwidth	
1932.4MHz	1960.0MHz
	
1987.6MHz	
	

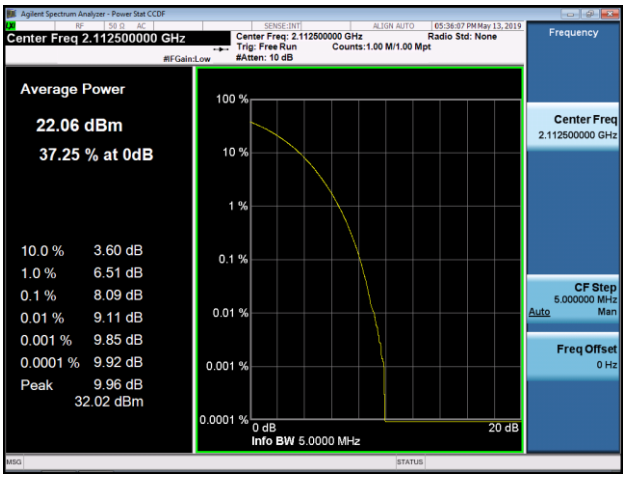
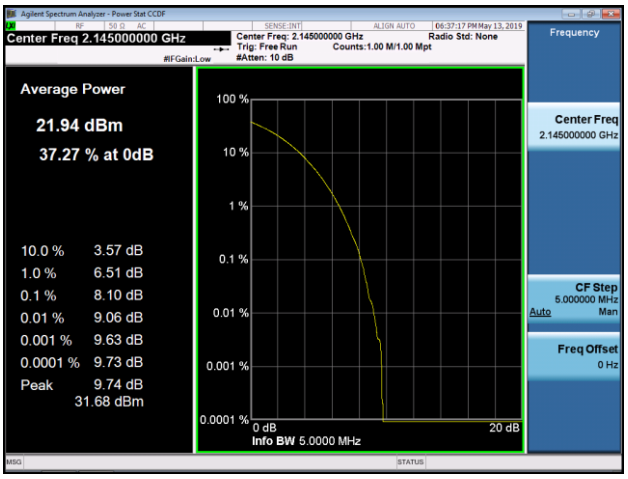
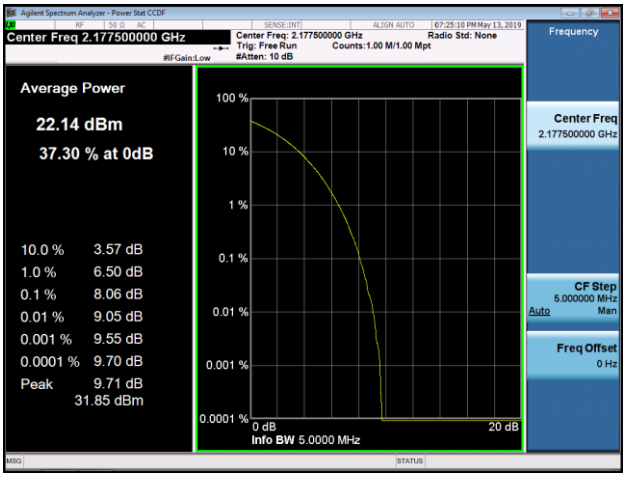
Peak to Average Ratio - Ant 1 (QPSK)	
5MHz Channel Bandwidth	
1932.4MHz	1960.0MHz
	
1987.6MHz	
	

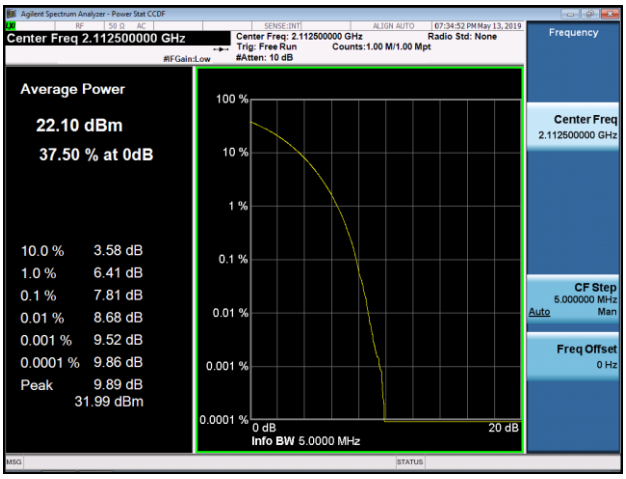
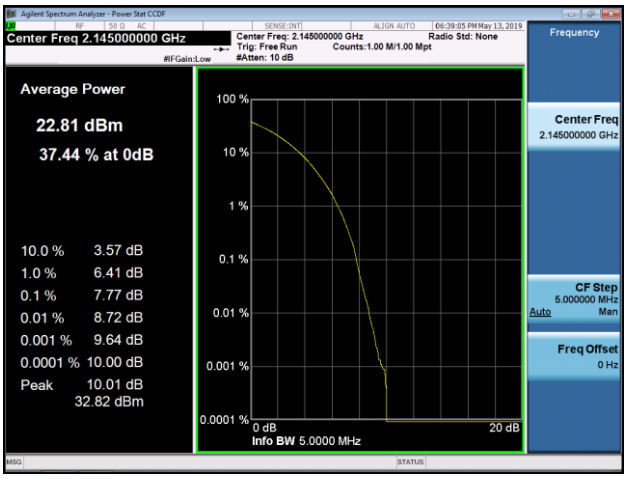
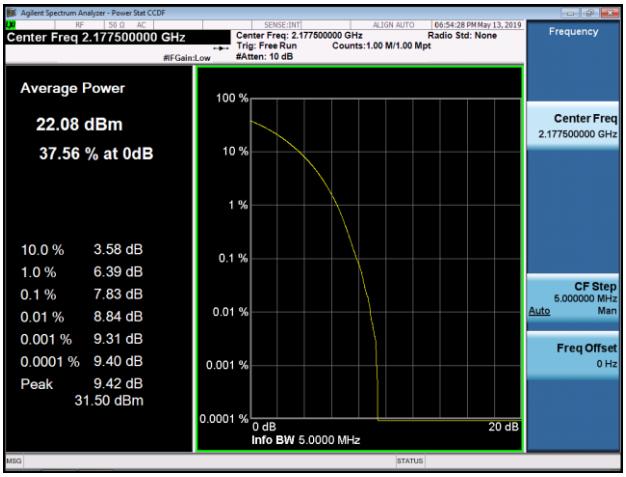
Peak to Average Ratio - Ant 1 (16QAM)	
5MHz Channel Bandwidth	
1932.4MHz	1960.0MHz
	
1987.6MHz	
	

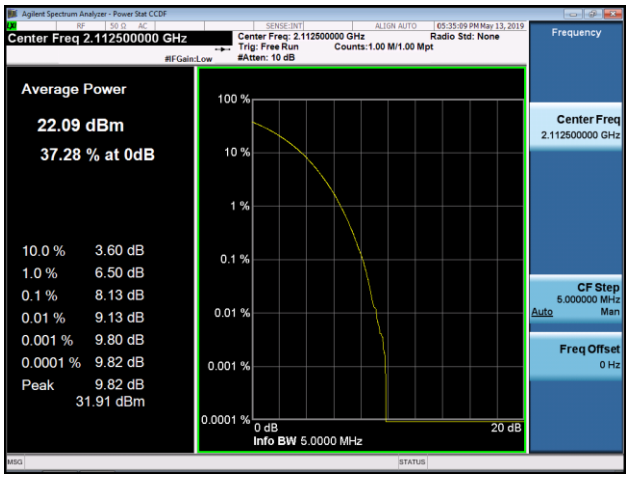
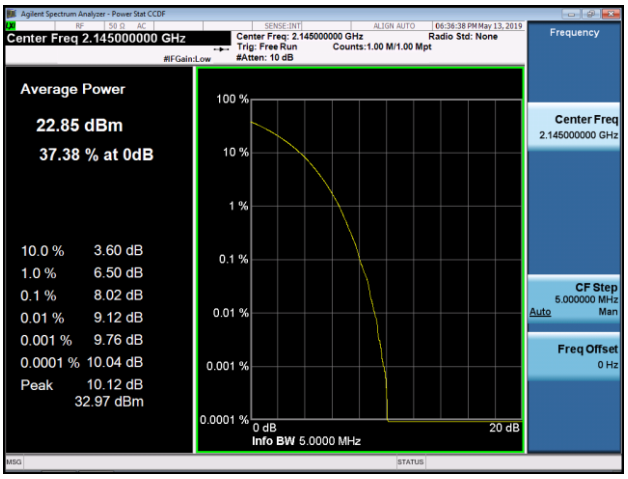
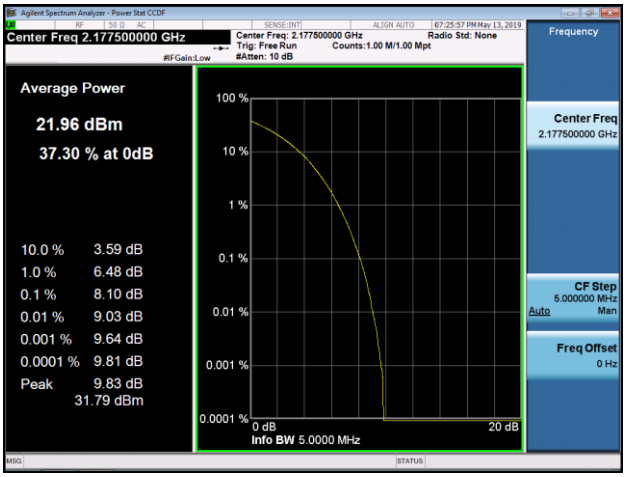
Product	AirScale Indoor Radio ASiR-pRRH	Test Engineer	Peter Xu
Test Site	SR2	Test Date	2019/05/13
Test Item	Peak to Average Ratio - WCDMA Band 66		

Frequency (MHz)	Channel Bandwidth (MHz)	Peak to Average Ratio (dB)		Limit (dBm)	Result
		Ant 0	Ant 1		
QPSK					
2112.5	20	7.83	7.81	≤ 13.00	Pass
2145.0	20	7.80	7.77	≤ 13.00	Pass
2177.5	20	7.83	7.83	≤ 13.00	Pass
16QAM					
2112.5	20	8.09	8.13	≤ 13.00	Pass
2145.0	20	8.10	8.02	≤ 13.00	Pass
2177.5	20	8.06	8.10	≤ 13.00	Pass

Peak to Average Ratio - Ant 0 (QPSK)	
5MHz Channel Bandwidth	
2112.5MHz	2145.0MHz
	
2177.5MHz	
	

Peak to Average Ratio - Ant 0 (16QAM)	
5MHz Channel Bandwidth	
2112.5MHz	2145.0MHz
	
2177.5MHz	
	

Peak to Average Ratio - Ant 1 (QPSK)	
5MHz Channel Bandwidth	
2112.5MHz	2145.0MHz
	
2177.5MHz	
	

Peak to Average Ratio - Ant 1 (16QAM)	
5MHz Channel Bandwidth	
2112.5MHz	2145.0MHz
	
2177.5MHz	
	

6.7. Conducted Spurious Emissions

6.7.1.Test Limit

In the FCC 24.238 and FCC 27.53(h), On any frequency outside a licensee's frequency block, The power of any emission shall be attenuated below the transmitter power (P) at least 43 + 10*log(P) dB, the emission limit equal to -13dBm.

Note: This device can be impelement MIMO function, so the limit os spurious emissions needs to be reduced 10*log($Numbers_{Ant}$) according to FCC KDB 662911 D01 guidance.

The limit is adjusted to -13dBm - 10 * log(2) = -16.01dBm

6.7.2.Test Procedure Used

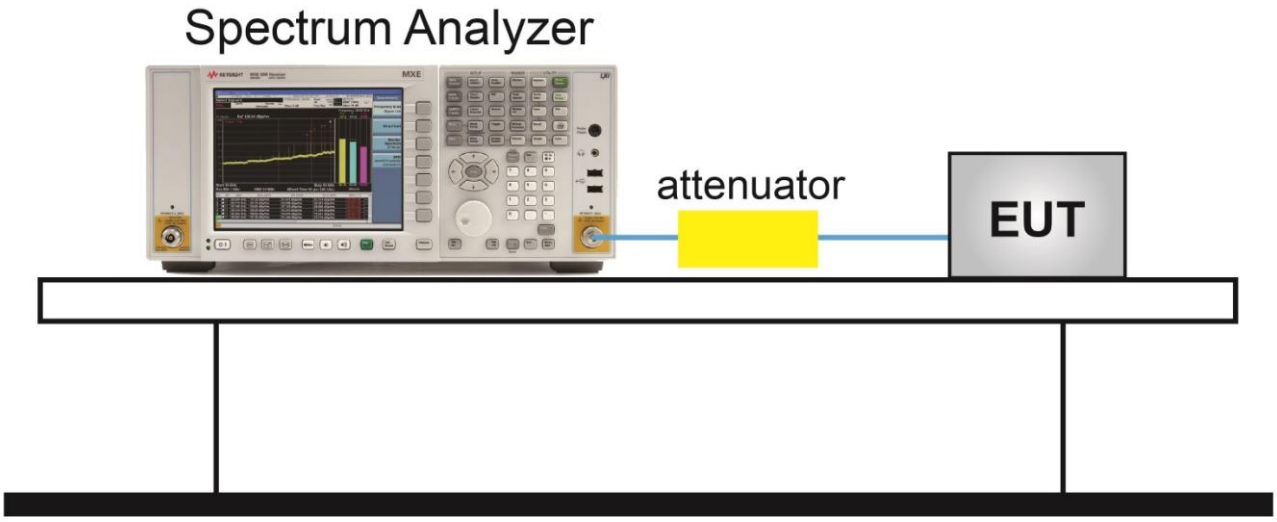
KDB 971168 D01v03r01 - Section 6

ANSI C63.26-2015 - Section 6.4.4.2

6.7.3.Test Setting

1. Set the analyzer frequency to low or high channel.
2. RBW = 100kHz or 1MHz
3. VBW ≥ 3*RBW
4. Sweep time = auto
5. Detector = power averaging (rms)
6. Set sweep trigger to "free run."
7. Trace average at least 100 traces in power averaging (rms) mode if sweep is set to auto-couple. To accurately determine the average power over the on and off time of the transmitter, it can be necessary to increase the number of traces to be averaged above 100, or if using a manually configured sweep time, increase the sweep time.

6.7.4.Test Setup



6.7.5.Test Result

Product	AirScale Indoor Radio ASiR-pRRH	Test Engineer	Peter Xu
Test Site	SR2	Test Date	2019/05/09
Test Item	Conducted Spurious Emissions - WCDMA Band 2_QPSK		

Frequency (MHz)	Bandwidth (MHz)	Max Spurious Emissions (dBm)		Limit (dBm)	Result
		Ant 0	Ant 1		
Single Carrier					
1932.4	5	-33.28	-33.98	≤ -16.01	Pass
1960.0	5	-34.01	-33.60	≤ -16.01	Pass
1987.6	5	-33.77	-33.52	≤ -16.01	Pass
Multi Carrier					
1932.4 + 1937.4 + 1942.4	5 + 5 + 5	-33.36	-33.57	≤ -16.01	Pass
1955.0 + 1960.0 + 1965.0	5 + 5 + 5	-33.51	-33.17	≤ -16.01	Pass
1977.6 + 1982.6 + 1987.6	5 + 5 + 5	-33.14	-33.02	≤ -16.01	Pass

Conducted Spurious Emissions - Ant 0 (QPSK)	
5MHz Channel Bandwidth	
1932.4MHz	1960.0MHz
	
1987.6MHz	
	

5 + 5 + 5MHz Channel Bandwidth	
1932.4MHz + 1937.4MHz + 1942.4MHz	1955.0MHz + 1960.0MHz + 1965.0MHz
	
1977.6MHz + 1982.6MHz + 1987.6MHz	
	

Conducted Spurious Emissions - Ant 1 (QPSK)	
5MHz Channel Bandwidth	
1932.4MHz	1960.0MHz
	
1987.6MHz	
	

5 + 5 + 5MHz Channel Bandwidth	
1932.4MHz + 1937.4MHz + 1942.4MHz	1955.0MHz + 1960.0MHz + 1965.0MHz
	
1977.6MHz + 1982.6MHz + 1987.6MHz	
	

Product	AirScale Indoor Radio ASiR-pRRH	Test Engineer	Peter Xu
Test Site	SR2	Test Date	2019/05/13
Test Item	Conducted Spurious Emissions - WCDMA Band 66_QPSK		

Frequency (MHz)	Bandwidth (MHz)	Max Spurious Emissions (dBm)		Limit (dBm)	Result
		Ant 0	Ant 1		
Single Carrier					
2112.5	5	-33.33	-34.15	≤ -16.01	Pass
2145.0	5	-33.50	-33.19	≤ -16.01	Pass
2177.5	5	-33.40	-33.23	≤ -16.01	Pass
Multi Carrier					
2112.5 + 2117.5 + 2122.5	5 + 5 + 5	-33.56	-33.59	≤ -16.01	Pass
2140.0 + 2145.0 + 2150.0	5 + 5 + 5	-33.09	-33.63	≤ -16.01	Pass
2167.5 + 2172.5 + 2177.5	5 + 5 + 5	-33.01	-33.84	≤ -16.01	Pass

Conducted Spurious Emissions - Ant 0 (QPSK)	
5MHz Channel Bandwidth	
2112.5MHz	2145.0MHz
	
2177.5MHz	
	

5 + 5 + 5MHz Channel Bandwidth	
2112.5MHz + 2117.5MHz + 2122.5MHz	2140.0MHz + 2145.0MHz + 2150.0MHz
	
2167.5MHz + 2172.5MHz + 2177.5MHz	
	

Conducted Spurious Emissions - Ant 1 (QPSK)	
5MHz Channel Bandwidth	
2112.5MHz	2145.0MHz
	
2177.5MHz	
	

5 + 5 + 5MHz Channel Bandwidth	
2112.5MHz + 2117.5MHz + 2122.5MHz	2140.0MHz + 2145.0MHz + 2150.0MHz
	
2167.5MHz + 2172.5MHz + 2177.5MHz	
	

6.8. Radiated Spurious Emissions Measurements

6.8.1.Test Limit

Out of band emissions: The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. The emission limit equal to -13dBm.

E (dBμV/m) = EIRP (dBm) – 20 log D + 104.8; where D is the measurement distance in meters. The emission limit equal to 82.3dBμV/m.

6.8.2.Test Procedure Used

KDB 971168 D01v03r01 - Section 5.8 & 7

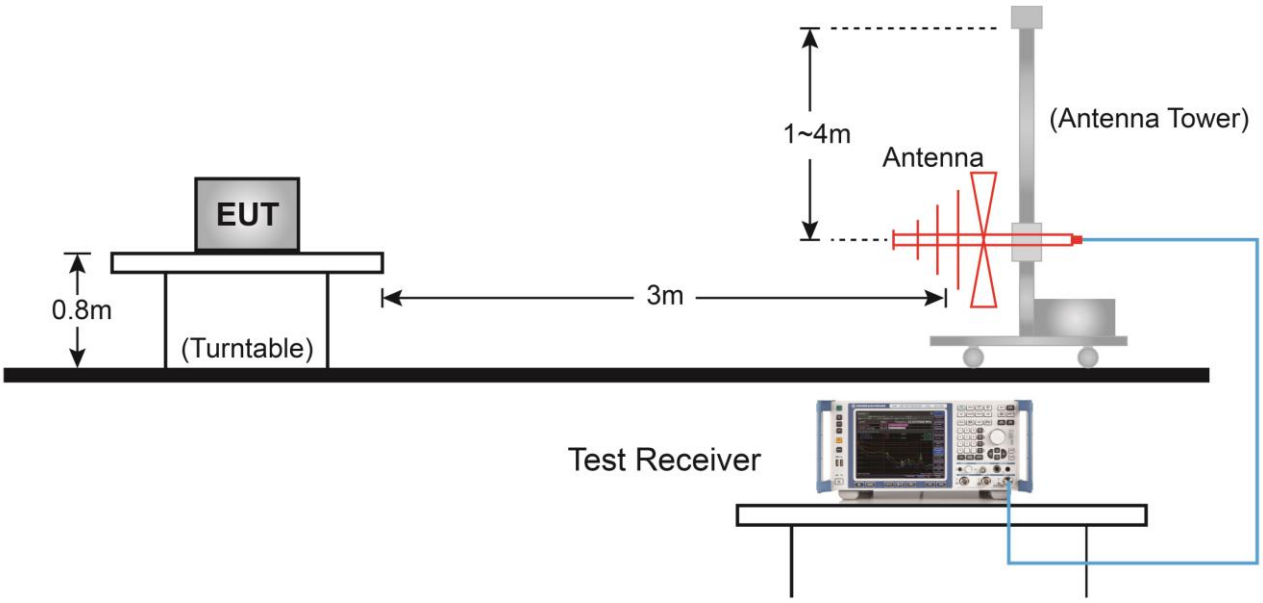
ANSI C63.26-2015 - Section 5.2.7 & 5.5

6.8.3.Test Setting

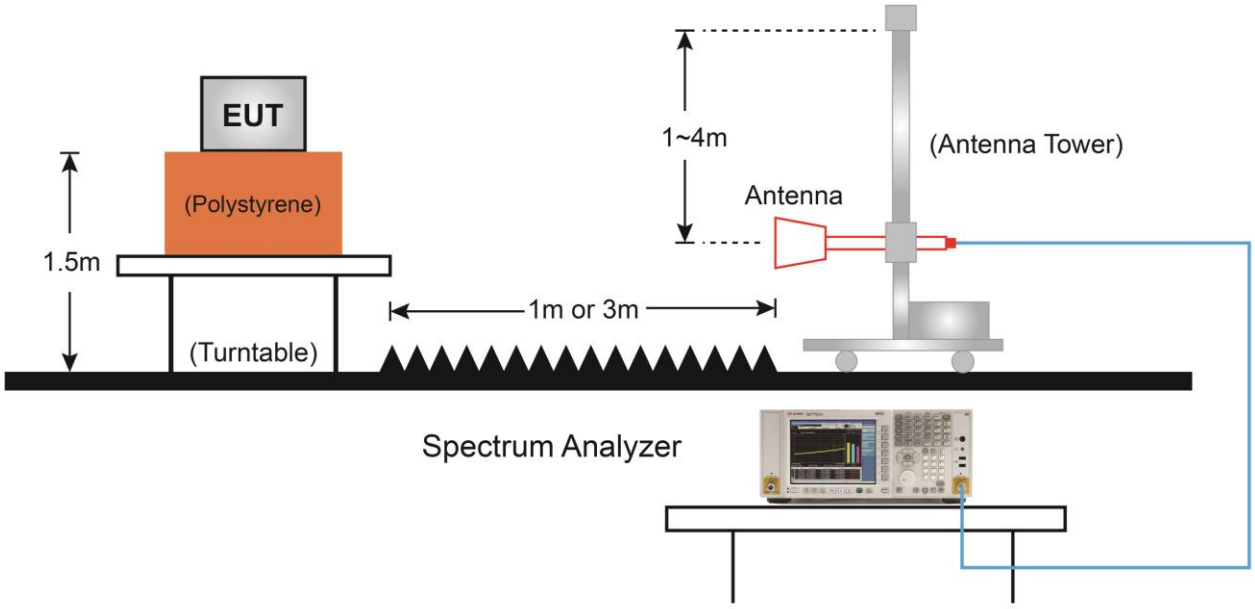
1. RBW = 100kHz or 1MHz
2. VBW ≥ 3*RBW
3. Sweep time ≥ 10 × (number of points in sweep) × (transmission symbol period)
4. Detector = Peak
5. Trace mode = max hold
6. The trace was allowed to stabilize

6.8.4.Test Setup

Below 1GHz Test Setup:



Above 1GHz Test Setup:



6.8.5.Test Result

Product	AirScale Indoor Radio ASiR-pRRH	Test Engineer	Peter Xu
Test Site	AC1	Test Date	2019/05/10 ~ 2019/05/16
Test Item	WCDMA Band 2_QPSK_Single Carrier		

Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
B2 Bottom CH_1932.4MHz							
142.5	12.5	15.6	28.1	82.3	-54.2	Peak	Horizontal
341.4	4.6	23.0	27.6	82.3	-54.7	Peak	Horizontal
172.1	12.5	16.6	29.1	82.3	-53.2	Peak	Vertical
378.2	7.9	23.7	31.6	82.3	-50.7	Peak	Vertical
7196.5	36.2	11.9	48.1	82.3	-34.2	Peak	Horizontal
11599.5	41.3	19.2	60.5	82.3	-21.8	Peak	Horizontal
7341.0	36.8	12.3	49.1	82.3	-33.2	Peak	Vertical
11599.5	35.6	19.2	54.8	82.3	-27.5	Peak	Vertical
B2 Middle CH_1960.0MHz							
138.2	14.2	15.8	30.0	82.3	-52.3	Peak	Horizontal
378.7	10.5	23.7	34.2	82.3	-48.1	Peak	Horizontal
164.3	12.3	16.3	28.6	82.3	-53.7	Peak	Vertical
378.7	8.0	23.7	31.7	82.3	-50.6	Peak	Vertical
7426.0	36.4	12.5	48.9	82.3	-33.4	Peak	Horizontal
10877.0	33.9	18.8	52.7	82.3	-29.6	Peak	Horizontal
7970.0	36.4	12.9	49.3	82.3	-33.0	Peak	Vertical
10877.0	34.8	18.8	53.6	82.3	-28.7	Peak	Vertical
B2 Top CH_1987.6MHz							
144.0	14.3	15.6	29.9	82.3	-52.4	Peak	Horizontal
377.3	10.1	23.7	33.8	82.3	-48.5	Peak	Horizontal
138.2	16.7	15.8	32.5	82.3	-49.8	Peak	Vertical
380.7	7.9	23.7	31.6	82.3	-50.7	Peak	Vertical
7162.5	36.7	11.8	48.5	82.3	-33.8	Peak	Horizontal
11149.0	33.9	19.1	53.0	82.3	-29.3	Peak	Horizontal
6542.0	37.8	8.7	46.5	82.3	-35.8	Peak	Vertical
11608.0	33.9	19.2	53.1	82.3	-29.2	Peak	Vertical
Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)							
Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)							

Product	AirScale Indoor Radio ASiR-pRRH	Test Engineer	Peter Xu
Test Site	AC1	Test Date	2019/05/10 ~ 2019/05/16
Test Item	WCDMA Band 2_QPSK_Multi Carrier		

Frequency (MHz)	Reading Level (dBµV)	Factor (dB)	Measure Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Polarization
B2 Bottom CH_1932.4MHz + 1937.4MHz + 1942.4MHz							
143.5	11.7	15.6	27.3	82.3	-55.0	Peak	Horizontal
341.4	7.2	23.0	30.2	82.3	-52.1	Peak	Horizontal
142.5	16.5	15.6	32.1	82.3	-50.2	Peak	Vertical
378.2	7.3	23.7	31.0	82.3	-51.3	Peak	Vertical
7494.0	35.7	12.7	48.4	82.3	-33.9	Peak	Horizontal
9372.5	36.4	14.6	51.0	82.3	-31.3	Peak	Horizontal
8029.5	36.0	12.9	48.9	82.3	-33.4	Peak	Vertical
11106.5	34.1	19.1	53.2	82.3	-29.1	Peak	Vertical
B2 Middle CH_1955.0MHz + 1960.0MHz + 1965.0MHz							
143.5	13.8	15.6	29.4	82.3	-52.9	Peak	Horizontal
384.5	9.8	23.8	33.6	82.3	-48.7	Peak	Horizontal
143.5	16.8	15.6	32.4	82.3	-49.9	Peak	Vertical
375.8	7.9	23.7	31.6	82.3	-50.7	Peak	Vertical
7111.5	35.8	11.6	47.4	82.3	-34.9	Peak	Horizontal
10868.5	34.3	18.8	53.1	82.3	-29.2	Peak	Horizontal
7256.0	35.7	12.0	47.7	82.3	-34.6	Peak	Vertical
10834.5	33.6	18.7	52.3	82.3	-30.0	Peak	Vertical
B2 Top CH_1977.6MHz + 1982.6MHz + 1987.6MHz							
143.0	14.1	15.6	29.7	82.3	-52.6	Peak	Horizontal
379.7	10.4	23.7	34.1	82.3	-48.2	Peak	Horizontal
127.0	11.1	16.9	28.0	82.3	-54.3	Peak	Vertical
379.7	8.3	23.7	32.0	82.3	-50.3	Peak	Vertical
7664.0	35.9	12.8	48.7	82.3	-33.6	Peak	Horizontal
10783.5	34.0	18.6	52.6	82.3	-29.7	Peak	Horizontal
7502.5	35.4	12.7	48.1	82.3	-34.2	Peak	Vertical
10851.5	33.9	18.7	52.6	82.3	-29.7	Peak	Vertical

Note: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	AirScale Indoor Radio ASiR-pRRH	Test Engineer	Peter Xu
Test Site	AC1	Test Date	2019/05/10 ~ 2019/05/16
Test Item	WCDMA Band 66_QPSK_Single Carrier		

Frequency (MHz)	Reading Level (dBµV)	Factor (dB)	Measure Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Polarization
B66 Bottom CH_2112.5MHz							
142.0	11.3	15.6	26.9	82.3	-55.4	Peak	Horizontal
340.9	3.3	23.0	26.3	82.3	-56.0	Peak	Horizontal
183.7	11.6	17.6	29.2	82.3	-53.1	Peak	Vertical
378.7	7.5	23.7	31.2	82.3	-51.1	Peak	Vertical
7290.0	36.1	12.1	48.2	82.3	-34.1	Peak	Horizontal
10885.5	33.6	18.8	52.4	82.3	-29.9	Peak	Horizontal
6227.5	38.2	7.2	45.4	82.3	-36.9	Peak	Vertical
9117.5	36.3	14.4	50.7	82.3	-31.6	Peak	Vertical
B66 Middle CH_2145.0MHz							
138.6	14.8	15.7	30.5	82.3	-51.8	Peak	Horizontal
379.2	10.7	23.7	34.4	82.3	-47.9	Peak	Horizontal
142.5	17.1	15.6	32.7	82.3	-49.6	Peak	Vertical
380.7	6.6	23.7	30.3	82.3	-52.0	Peak	Vertical
7043.5	36.3	11.4	47.7	82.3	-34.6	Peak	Horizontal
9865.5	36.7	15.5	52.2	82.3	-30.1	Peak	Horizontal
6559.0	37.3	8.8	46.1	82.3	-36.2	Peak	Vertical
10783.5	33.9	18.6	52.5	82.3	-29.8	Peak	Vertical
B66 Top CH_2177.5MHz							
142.0	14.1	15.6	29.7	82.3	-52.6	Peak	Horizontal
375.3	10.5	23.6	34.1	82.3	-48.2	Peak	Horizontal
137.7	16.1	15.8	31.9	82.3	-50.4	Peak	Vertical
378.7	7.5	23.7	31.2	82.3	-51.1	Peak	Vertical
7987.0	36.1	12.9	49.0	82.3	-33.3	Peak	Horizontal
10860.0	33.6	18.8	52.4	82.3	-29.9	Peak	Horizontal
7137.0	36.2	11.7	47.9	82.3	-34.4	Peak	Vertical
10758.0	34.1	18.5	52.6	82.3	-29.7	Peak	Vertical

Note: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	AirScale Indoor Radio ASiR-pRRH	Test Engineer	Peter Xu
Test Site	AC1	Test Date	2019/05/10 ~ 2019/05/16
Test Item	WCDMA Band 66_QPSK_Multi Carrier		

Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
B66 Bottom CH_2112.5MHz + 2117.5MHz + 2122.5MHz							
145.9	15.3	15.7	31.0	82.3	-51.3	Peak	Horizontal
379.7	10.4	23.7	34.1	82.3	-48.2	Peak	Horizontal
143.5	17.5	15.6	33.1	82.3	-49.2	Peak	Vertical
383.6	4.7	23.8	28.5	82.3	-53.8	Peak	Vertical
7477.0	35.7	12.7	48.4	82.3	-33.9	Peak	Horizontal
10537.0	34.4	18.1	52.5	82.3	-29.8	Peak	Horizontal
7128.5	35.5	11.7	47.2	82.3	-35.1	Peak	Vertical
11183.0	33.7	19.1	52.8	82.3	-29.5	Peak	Vertical
B66 Middle CH_2140.0MHz + 2145.0MHz + 2150.0MHz							
136.7	13.6	15.9	29.5	82.3	-52.8	Peak	Horizontal
385.5	3.7	23.8	27.5	82.3	-54.8	Peak	Horizontal
147.4	15.9	15.7	31.6	82.3	-50.7	Peak	Vertical
377.7	7.9	23.7	31.6	82.3	-50.7	Peak	Vertical
6780.0	36.9	10.1	47.0	82.3	-35.3	Peak	Horizontal
10843.0	34.0	18.7	52.7	82.3	-29.6	Peak	Horizontal
7111.5	35.2	11.6	46.8	82.3	-35.5	Peak	Vertical
9806.0	35.9	15.3	51.2	82.3	-31.1	Peak	Vertical
B66 Top CH_2167.5MHz + 2172.5MHz + 2177.5MHz							
136.2	15.6	15.9	31.5	82.3	-50.8	Peak	Horizontal
378.7	10.3	23.7	34.0	82.3	-48.3	Peak	Horizontal
172.6	16.4	16.6	33.0	82.3	-49.3	Peak	Vertical
378.7	7.9	23.7	31.6	82.3	-50.7	Peak	Vertical
7366.5	35.4	12.3	47.7	82.3	-34.6	Peak	Horizontal
10562.5	35.1	18.1	53.2	82.3	-29.1	Peak	Horizontal
8004.0	36.0	12.9	48.9	82.3	-33.4	Peak	Vertical
10843.0	34.1	18.7	52.8	82.3	-29.5	Peak	Vertical

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

7. CONCLUSION

The data collected relate only the item(s) tested and show that the **AirScale Indoor Radio ASiR-pRRH, FCC ID: 2AD8UAHFIH01** is in compliance with FCC Rules.

The End