6. UNWANTED EMISSIONS AND BAND EDGE

6.1. Limit

The maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (4) For transmitters operating in the 5.725-5.85 GHz band:All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

The unwanted emissions which fall in Restricted bands shall not exceed the field strength levels specified in the following table:

| | 13.207 Radiated Chilission 1 | IIIItS |
|-----------------|------------------------------|-------------|
| Frequency (MHz) | Field Strength(μV/m) | Distance(m) |
| 0.009-0.490 | 2400/F(kHz) | 300 |
| 0.490-1.705 | 24000/F(kHz) | 30 |
| 1.705-30 | 30 | 30 |
| 30-88 | 100 | 3 |
| 88-216 | 150 | 3 |
| 216-960 | 200 | 3 |
| Above 960 | 500 | 3 |

15 209 Radiated emission limits

15.205 Restricted frequency band

| MHz | MHz | MHz | GHz |
|----------------------------|-----------------------|-----------------|---------------|
| 0.090 - 0.110 | 16.42 - 16.423 | 399.9 - 410 | 4.5 - 5.15 |
| ¹ 0.495 - 0.505 | 16.69475 - 16.69525 | 608 - 614 | 5.35 - 5.46 |
| 2.1735 - 2.1905 | 16.80425 - 16.80475 | 960 - 1240 | 7.25 - 7.75 |
| 4.125 - 4.128 | 25.5 - 25.67 | 1300 - 1427 | 8.025 - 8.5 |
| 4.17725 - 4.17775 | 37.5 - 38.25 | 1435 - 1626.5 | 9.0 - 9.2 |
| 4.20725 - 4.20775 | 73 - 74.6 | 1645.5 - 1646.5 | 9.3 - 9.5 |
| 6.215 - 6.218 | 74.8 - 75.2 | 1660 - 1710 | 10.6 - 12.7 |
| 6.26775 - 6.26825 | 108 - 121.94 | 1718.8 - 1722.2 | 13.25 - 13.4 |
| 6.31175 - 6.31225 | 123 - 138 | 2200 - 2300 | 14.47 - 14.5 |
| 8.291 - 8.294 | 149.9 - 150.05 | 2310 - 2390 | 15.35 - 16.2 |
| 8.362 - 8.366 | 156.52475 - 156.52525 | 2483.5 - 2500 | 17.7 - 21.4 |
| 8.37625 - 8.38675 | 156.7 - 156.9 | 2690 - 2900 | 22.01 - 23.12 |
| 8.41425 - 8.41475 | 162.0125 - 167.17 | 3260 - 3267 | 23.6 - 24.0 |
| 12.29 - 12.293 | 167.72 - 173.2 | 3332 - 3339 | 31.2 - 31.8 |
| 12.51975 - 12.52025 | 240 - 285 | 3345.8 - 3358 | 36.43 - 36.5 |
| 12.57675 - 12.57725 | 322 - 335.4 | 3600 - 4400 | (2) |

EST Technology Co., Ltd Report No. ESTE-R2205108 Page 51 of 105

Note:

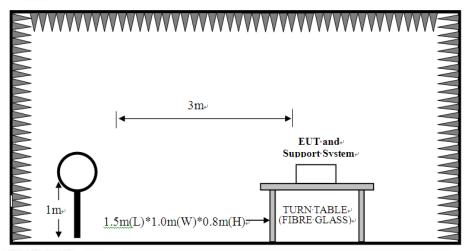
- 1. $dB\mu V/m=20Log(\mu V/m)$
- 2. Above 1GHz the formula is used to convert the EIRP to field strength $E[dB\mu V/m] = EIRP[dBm] 20 \log (d[m]) + 104.77$,

where E is field strength and d is distance at which the field strength limit is specified in the applicable requirements.

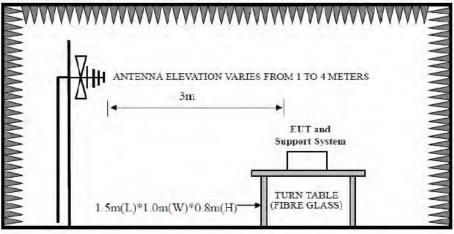
for example,3m field strength(dBμV/m)=EIRP-20log(3)+104.77=EIRP+95.2

6.2. Test Setup

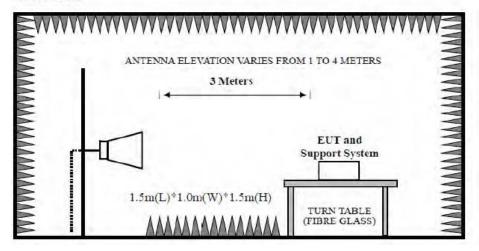
9kHz~30MHz



30~1000MHz



Above 1GHz



EST Technology Co., Ltd Report No. ESTE-R2205108 Page 52 of 105

6.3. Spectrum Analyzer Setting

For 9KHz-150KHz

| Spectrum Parameters | Setting |
|---------------------|---|
| RBW | 300Hz(for Peak&AVG)/CISPR 200Hz(for QP) |
| VBW | 300Hz(for Peak&AVG)/CISPR 200Hz(for QP) |
| Start frequency | 9KHz |
| Stop frequency | 150KHz |
| Sweep Time | Auto |
| Detector | PEAK/QP/AVG |
| Trace Mode | Max Hold |

Note: For 9KHz-90KHz&110KHz-150KHz, the detector is average, other frequency is CISPR QP detector.

For 150KHz-30MHz

| Spectrum Parameters | Setting |
|---------------------|----------|
| RBW | 9KHz |
| VBW | 9KHz |
| Start frequency | 150KHz |
| Stop frequency | 30MHz |
| Sweep Time | Auto |
| Detector | QP |
| Trace Mode | Max Hold |

Note: For 150KHz-490KHz, the detector is average, other frequency is CISPR QP detector.

For 30MHz-1GHz

| Spectrum Parameters | Setting |
|---------------------|----------|
| RBW | 120KHz |
| VBW | 300KHz |
| Start frequency | 30MHz |
| Stop frequency | 1GHz |
| Sweep Time | Auto |
| Detector | QP |
| Trace Mode | Max Hold |

For Above 1GHz

| Spectrum Parameters | Setting | | | | |
|---------------------|------------------|-----------------------------|--|--|--|
| RBW | 1MHz | | | | |
| | PEAK Measurement | AVG Measurement | | | |
| | | Duty cycle≥98%,VBW=10Hz | | | |
| VBW | 3MHz | Duty cycle < 98%, VBW ≥ 1/T | | | |
| | SWIFIZ | Video bandwidth mode=RMS | | | |
| | | (power averaging) | | | |
| Start frequency | | 1GHz | | | |
| Stop frequency | 2 | 25GHz | | | |
| Sweep Time | Auto | | | | |
| Detector | I | PEAK | | | |
| Trace Mode | M | ax Hold | | | |

Note: T is the on-time time of the duty cycle, when EUT transmit continuously with maximum output power, unit is seconds. reference section 2.7 for the on-time time.

EST Technology Co., Ltd Report No. ESTE-R2205108 Page 53 of 105

6.4. Test Procedure

- a. EUT was placed on a turn table, which is 0.8 meter high above ground for below 1GHz test, and which is 1.5 meter high above ground for above 1GHz test.
- b. EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower.
- c. Set the EUT transmit continuously with maximum output power.
- d. The turn table can rotate 360 degrees to determine the position of the maximum emission level.
- e. The antenna can be moved up and down between 1 meter and 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on test.
- Spectrum analyzer setting parameters in accordance with section 6.3.
- g. Repeat above procedures until all channels were measured.
- h. Record the results in the test report.
- i. IEEE 802.11a, IEEE 802.11n HT20, IEEE 802.11n HT40, IEEE 802.11ac VHT20, IEEE 802.11ac VHT40, IEEE 802.11ac VHT80 all have been tested. The antenna 2 test data is recorded in report, only worst case 802.11ac VHT20 is recorded.

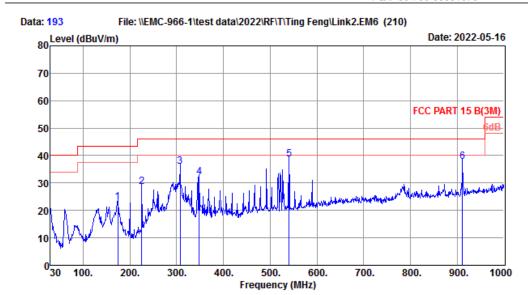
EST Technology Co., Ltd Report No. ESTE-R2205108 Page 54 of 105

6.5. Test Result

Radiated Emissions Below 1GHz

EST Technology

Chilingxiang, Qishantou, Santun, Houjie, Dongguan,Guangdong,China Tel:+86-769-83081888 Fax:+86-769-83081878



: 1# 966 Chamber Site no. Data no. : 193 Dis. / Ant. : 3m 37062 Ant. pol. : HORIZONTAL

: FCC PART 15 B(3M) Limit

Env. / Ins. : Temp:23.9°C, Humi:52.3%; Press:101.82KPa

Engineer : XJF

EUT : MULTIROOM WIFI PLAYER

Power : AC 120V/60Hz : LINK2 M/N Test Mode : TX Mode

| | Freq. | ANT Factor (dB/m) | Cable Loss (dB) | Reading (dBuV) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|---|--------|-------------------------|-----------------------|-------------------|-------------------------------|-------------------|----------------|--------|
| 1 | 174.53 | 10.00 | 1.17 | 11.73 | 22.90 | 43.50 | 20.60 | QP |
| 2 | 224.97 | 10.60 | 1.44 | 16.65 | 28.69 | 46.00 | 17.31 | QP |
| 3 | 307.42 | 13.90 | 1.66 | 20.31 | 35.87 | 46.00 | 10.13 | QP |
| 4 | 348.16 | 15.46 | 1.79 | 14.87 | 32.12 | 46.00 | 13.88 | QP |
| 5 | 540.22 | 19.20 | 2.14 | 17.23 | 38.57 | 46.00 | 7.43 | QP |
| 6 | 911.73 | 24.22 | 2.82 | 10.67 | 37.71 | 46.00 | 8.29 | QP |

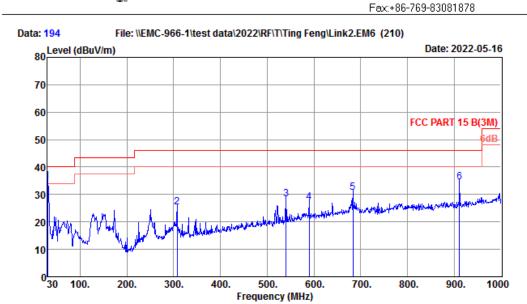
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.

2. Margin= Limit - Emission Level.

3. The emission levels that are 20dB below the official limit are not reported.

Report No. ESTE-R2205108

Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China Tel:+86-769-83081888



Site no. : 1# 966 Chamber Data no. : 194
Dis. / Ant. : 3m 37062 Ant. pol. : VERTICAL

Limit : FCC PART 15 B(3M)

Env. / Ins. : Temp:23.9°C, Humi:52.3%; Press:101.82KPa

Engineer : XJF

EUT : MULTIROOM WIFI PLAYER

Power : AC 120V/60Hz M/N : LINK2 Test Mode : TX Mode

| | Freq. | ANT Factor (dB/m) | Cable Loss (dB) | Reading (dBuV) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|---|--------|-------------------------|-----------------------|-------------------|-------------------------------|-------------------|----------------|--------|
| 1 | 30.00 | 18.90 | 0.59 | 15.44 | 34.93 | 40.00 | 5.07 | QP |
| 2 | 307.42 | 13.90 | 1.66 | 9.93 | 25.49 | 46.00 | 20.51 | QP |
| 3 | 540.22 | 19.20 | 2.14 | 7.07 | 28.41 | 46.00 | 17.59 | QP |
| 4 | 589.69 | 20.50 | 2.23 | 4.45 | 27.18 | 46.00 | 18.82 | QP |
| 5 | 683.78 | 21.86 | 2.42 | 6.38 | 30.66 | 46.00 | 15.34 | QP |
| 6 | 911.73 | 24.22 | 2.82 | 7.45 | 34.49 | 46.00 | 11.51 | QP |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.

- 2. Margin= Limit Emission Level.
- 3. The emission levels that are 20dB below the official limit are not reported.

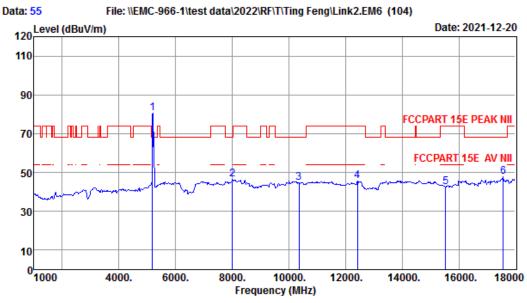
Note:

- 1. The amplitude of 9KHz to 30MHz spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.
- 2. All channels had been pre-test, only the worst case was reported.

Radiated Emissions Above 1G

EST Technology

Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China Tel:+86-769-83081888 Fax:+86-769-83081878



Data no. : 55 Site no. : 1# 966 Chamber

Ant. pol. : HORIZONTAL : 3m ANT9120D 1-18G Dis. / Ant.

: FCCPART 15E PEAK NII

Env. / Ins. : Temp:23.4';Humi:50%;Press:101.52kPa

Engineer : JBR

: MULTIROOM WIFI PLAYER EUT

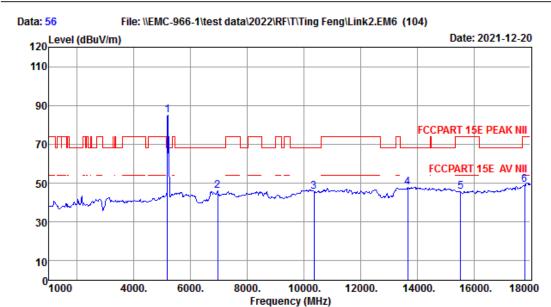
: AC 120V/60Hz Power M/N : LINK2

: IEEE 802.11ac 20 TX 5180MHz Test Mode

| | Freq. | Ant. Factor (dB/m) | Cable Loss (dB) | Amp Factor (dB) | Reading (dBuV) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
|---|----------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 5180.00 | 32.20 | 3.52 | 34.63 | 79.63 | 80.72 | 68.20 | -12.52 | Peak |
| 2 | 8004.00 | 36.90 | 5.82 | 34.90 | 38.54 | 46.36 | 68.20 | 21.84 | Peak |
| 3 | 10360.00 | 39.27 | 5.99 | 34.31 | 33.65 | 44.60 | 68.20 | 23.60 | Peak |
| 4 | 12424.00 | 39.69 | 6.17 | 34.63 | 34.32 | 45.55 | 74.00 | 28.45 | Peak |
| 5 | 15540.00 | 40.31 | 6.46 | 34.39 | 30.05 | 42.43 | 74.00 | 31.57 | Peak |
| 6 | 17575.00 | 45.51 | 7.96 | 34.34 | 28.63 | 47.76 | 68.20 | 20.44 | Peak |

- 2. Margin= Limit Emission Level.
- 3. The emission levels that are 20dB below the official limit are not reported.

Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China Tel:+86-769-83081888 Fax:+86-769-83081878



: 1# 966 Chamber Site no. Data no. : 56 : 3m ANT9120D 1-18G Ant. pol. : VERTICAL Dis. / Ant.

Limit : FCCPART 15E PEAK NII

Env. / Ins. : Temp:23.4';Humi:50%;Press:101.52kPa

Engineer : JBR

EUT : MULTIROOM WIFI PLAYER

Power : AC 120V/60Hz

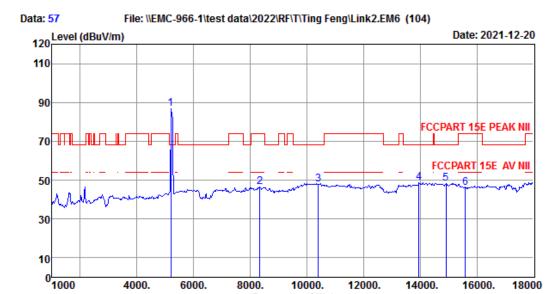
M/N : LINK2

Test Mode : IEEE 802.11ac 20 TX 5180MHz

| | | Ant. | Cable | Amp | | Emission | | | |
|---|----------------|------------------|--------------|----------------|-------------------|-------------------|--------------------|----------------|--------|
| | Freq. (MHz) | Factor (dB/m) | Loss (dB) | Factor (dB) | Reading (dBuV) | Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
| 1 | 5180.00 | 32.20 | 3.52 | 34.63 | 83.75 | 84.84 | 68.20 | -16.64 | Peak |
| 2 | 6950.00 | 35.68 | 5.09 | 34.77 | 39.85 | 45.85 | 68.20 | 22.35 | Peak |
| 3 | 10360.00 | 39.27 | 5.99 | 34.31 | 34.76 | 45.71 | 68.20 | 22.49 | Peak |
| 4 | 13665.00 | 40.52 | 6.40 | 34.33 | 35.10 | 47.69 | 68.20 | 20.51 | Peak |
| 5 | 15540.00 | 40.31 | 6.46 | 34.39 | 33.05 | 45.43 | 74.00 | 28.57 | Peak |
| 6 | 17796.00 | 47.27 | 8.11 | 34.32 | 27.93 | 48.99 | 74.00 | 25.01 | Peak |

- 2. Margin= Limit Emission Level.
- 3. The emission levels that are 20dB below the official limit are not reported.

Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China Tel:+86-769-83081888 Fax:+86-769-83081878



Frequency (MHz)

: 1# 966 Chamber Site no. Data no. : 57 : 3m ANT9120D 1-18G Ant. pol. : VERTICAL Dis. / Ant.

Limit : FCCPART 15E PEAK NII

Env. / Ins. : Temp:23.4';Humi:50%;Press:101.52kPa

Engineer : JBR

EUT : MULTIROOM WIFI PLAYER

Power : AC 120V/60Hz

M/N : LINK2

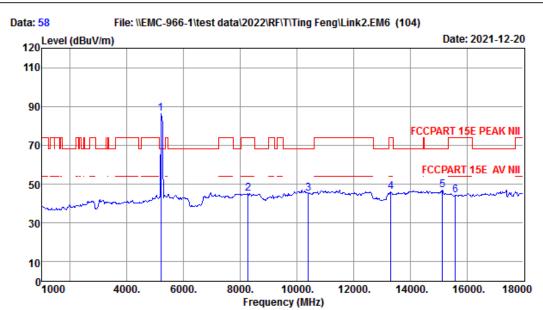
Test Mode : IEEE 802.11ac 20 TX 5200MHz

| | | Ant. | Cable | Amp | | Emission | | | |
|---|----------------|---------------|--------------|----------------|-------------------|-------------------|-----------------|----------------|--------|
| | Freq. (MHz) | Factor (dB/m) | Loss (dB) | Factor (dB) | Reading (dBuV) | Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
| 1 | 5200.00 | 32.24 | 3.53 | 34.62 | 85.69 | 86.84 | 68.20 | -18.64 | Peak |
| 2 | 8344.00 | 36.90 | 5.39 | 34.73 | 38.79 | 46.35 | 74.00 | 27.65 | Peak |
| 3 | 10400.00 | 39.31 | 5.99 | 34.32 | 36.89 | 47.87 | 68.20 | 20.33 | Peak |
| 4 | 13954.00 | 41.01 | 6.51 | 34.31 | 35.43 | 48.64 | 68.20 | 19.56 | Peak |
| 5 | 14906.00 | 40.92 | 6.83 | 34.57 | 35.29 | 48.47 | 68.20 | 19.73 | Peak |
| 6 | 15600.00 | 40.24 | 6.53 | 34.36 | 33.75 | 46.16 | 74.00 | 27.84 | Peak |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.

2. Margin= Limit - Emission Level.

Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China Tel:+86-769-83081888 Fax:+86-769-83081878



: 1# 966 Chamber Site no. Data no. : 58

: 3m ANT9120D 1-18G Dis. / Ant. Ant. pol. : HORIZONTAL

Limit : FCCPART 15E PEAK NII

Env. / Ins. : Temp:23.4';Humi:50%;Press:101.52kPa

Engineer : JBR

EUT : MULTIROOM WIFI PLAYER

Power : AC 120V/60Hz

M/N : LINK2

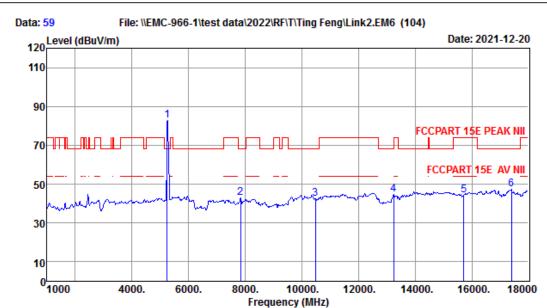
Test Mode : IEEE 802.11ac 20 TX 5200MHz

| | Ant. Cable A | | | | | Emission | | | |
|---|----------------|---------------|--------------|----------------|-------------------|-------------------|-----------------|----------------|--------|
| | Freq. (MHz) | Factor (dB/m) | Loss (dB) | Factor (dB) | Reading (dBuV) | Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
| 1 | 5200.00 | 32.24 | 3.53 | 34.62 | 85.22 | 86.37 | 68.20 | -18.17 | Peak |
| 2 | 8276.00 | 36.90 | 5.47 | 34.76 | 37.74 | 45.35 | 74.00 | 28.65 | Peak |
| 3 | 10400.00 | 39.31 | 5.99 | 34.32 | 34.37 | 45.35 | 68.20 | 22.85 | Peak |
| 4 | 13325.00 | 39.95 | 6.31 | 34.37 | 34.05 | 45.94 | 74.00 | 28.06 | Peak |
| 5 | 15144.00 | 40.75 | 6.71 | 34.54 | 34.09 | 47.01 | 68.20 | 21.19 | Peak |
| 6 | 15600.00 | 40.24 | 6.53 | 34.36 | 31.70 | 44.11 | 74.00 | 29.89 | Peak |
| | | | | | | | | | |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.

2. Margin= Limit - Emission Level.

Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China Tel:+86-769-83081888 Fax:+86-769-83081878



: 1# 966 Chamber Site no. Data no. : 59 : 3m ANT9120D 1-18G Ant. pol. : VERTICAL Dis. / Ant.

Limit : FCCPART 15E PEAK NII

Env. / Ins. : Temp:23.4';Humi:50%;Press:101.52kPa

Engineer : JBR

EUT : MULTIROOM WIFI PLAYER

Power : AC 120V/60Hz

M/N : LINK2

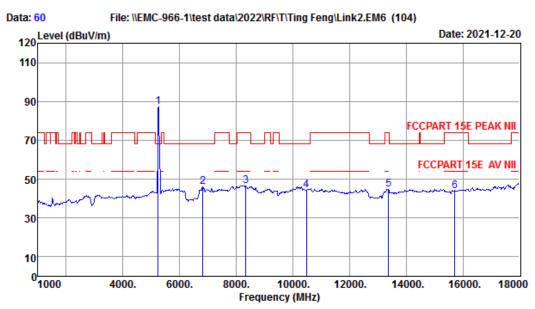
Test Mode : IEEE 802.11ac 20 TX 5240MHz

| | | Ant. | Cable | Amp | | Emission | | | |
|---|----------------|------------------|--------------|----------------|-------------------|-------------------|--------------------|----------------|--------|
| | Freq. (MHz) | Factor (dB/m) | Loss (dB) | Factor (dB) | Reading (dBuV) | Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
| 1 | 5240.00 | 32.31 | 3.55 | 34.61 | 81.71 | 82.96 | 68.20 | -14.76 | Peak |
| 2 | 7834.00 | 36.87 | 5.64 | 34.88 | 35.53 | 43.16 | 68.20 | 25.04 | Peak |
| 3 | 10480.00 | 39.39 | 6.02 | 34.35 | 31.34 | 42.40 | 68.20 | 25.80 | Peak |
| 4 | 13240.00 | 39.80 | 6.30 | 34.38 | 33.16 | 44.88 | 68.20 | 23.32 | Peak |
| 5 | 15720.00 | 40.10 | 6.65 | 34.31 | 31.91 | 44.35 | 74.00 | 29.65 | Peak |
| 6 | 17405.00 | 44.15 | 7.82 | 34.36 | 29.55 | 47.16 | 68.20 | 21.04 | Peak |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.

2. Margin= Limit - Emission Level.

Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China Tel:+86-769-83081888 Fax:+86-769-83081878



: 1# 966 Chamber Site no. Data no. : 60

: 3m ANT9120D 1-18G Dis. / Ant. Ant. pol. : HORIZONTAL

Limit : FCCPART 15E PEAK NII

Env. / Ins. : Temp:23.4';Humi:50%;Press:101.52kPa

Engineer : JBR

EUT : MULTIROOM WIFI PLAYER

Power : AC 120V/60Hz

M/N : LINK2

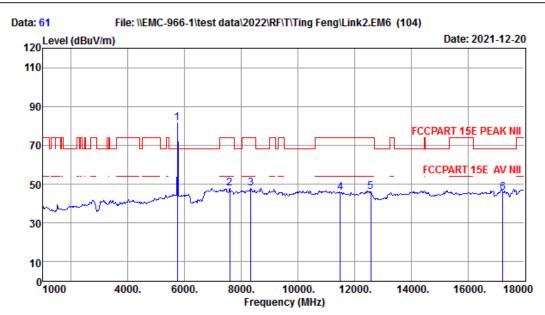
Test Mode : IEEE 802.11ac 20 TX 5240MHz

| Freq. Fac | Ant. | Cable | Amp | | Emission | | | |
|-----------|--|--|--|---|--|---|---|--|
| | Factor (dB/m) | Loss (dB) | Factor (dB) | Reading (dBuV) | Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
| 5240.00 | 32.31 | 3.55 | 34.61 | 85.94 | 87.19 | 68.20 | -18.99 | Peak |
| 6814.00 | 35.34 | 4.97 | 34.71 | 40.23 | 45.83 | 68.20 | 22.37 | Peak |
| 8344.00 | 36.90 | 5.39 | 34.73 | 39.11 | 46.67 | 74.00 | 27.33 | Peak |
| 10480.00 | 39.39 | 6.02 | 34.35 | 33.39 | 44.45 | 68.20 | 23.75 | Peak |
| 13376.00 | 40.03 | 6.32 | 34.36 | 32.76 | 44.75 | 74.00 | 29.25 | Peak |
| 15720.00 | 40.10 | 6.65 | 34.31 | 31.59 | 44.03 | 74.00 | 29.97 | Peak |
| | (MHz) 5240.00 6814.00 8344.00 10480.00 13376.00 | Freq. Factor (MHz) (dB/m) 5240.00 32.31 6814.00 35.34 8344.00 36.90 10480.00 39.39 13376.00 40.03 | Freq. Factor Loss (MHz) (dB/m) (dB) 5240.00 32.31 3.55 6814.00 35.34 4.97 8344.00 36.90 5.39 10480.00 39.39 6.02 13376.00 40.03 6.32 | Freq. Factor Loss Factor (MHz) (dB/m) (dB) (dB) 5240.00 32.31 3.55 34.61 6814.00 35.34 4.97 34.71 8344.00 36.90 5.39 34.73 10480.00 39.39 6.02 34.35 13376.00 40.03 6.32 34.36 | Freq. Factor Loss Factor Reading (MHz) (dB/m) (dB) (dB) (dBuV) 5240.00 32.31 3.55 34.61 85.94 6814.00 35.34 4.97 34.71 40.23 8344.00 36.90 5.39 34.73 39.11 10480.00 39.39 6.02 34.35 33.39 13376.00 40.03 6.32 34.36 32.76 | Freq. Factor Loss Factor Reading Level (MHz) (dB/m) (dB) (dB) (dBuV) (dBuV/m) 5240.00 32.31 3.55 34.61 85.94 87.19 6814.00 35.34 4.97 34.71 40.23 45.83 8344.00 36.90 5.39 34.73 39.11 46.67 10480.00 39.39 6.02 34.35 33.39 44.45 13376.00 40.03 6.32 34.36 32.76 44.75 | Freq. Factor Loss Factor Reading Level Limits (MHz) (dB/m) (dB) (dB) (dBuV) (dBuV/m) (dBuV/m) 5240.00 32.31 3.55 34.61 85.94 87.19 68.20 6814.00 35.34 4.97 34.71 40.23 45.83 68.20 8344.00 36.90 5.39 34.73 39.11 46.67 74.00 10480.00 39.39 6.02 34.35 33.39 44.45 68.20 13376.00 40.03 6.32 34.36 32.76 44.75 74.00 | Freq. Factor Loss Factor Reading Level Limits Margin (MHz) (dB/m) (dB) (dB) (dBuV) (dBuV/m) (dBuV/m) (dB) 5240.00 32.31 3.55 34.61 85.94 87.19 68.20 -18.99 6814.00 35.34 4.97 34.71 40.23 45.83 68.20 22.37 8344.00 36.90 5.39 34.73 39.11 46.67 74.00 27.33 10480.00 39.39 6.02 34.35 33.39 44.45 68.20 23.75 13376.00 40.03 6.32 34.36 32.76 44.75 74.00 29.25 |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.

2. Margin= Limit - Emission Level.

Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China Tel:+86-769-83081888 Fax:+86-769-83081878



: 1# 966 Chamber Site no. Data no. : 61

: 3m ANT9120D 1-18G Ant. pol. : HORIZONTAL Dis. / Ant.

Limit : FCCPART 15E PEAK NII

Env. / Ins. : Temp:23.4';Humi:50%;Press:101.52kPa

Engineer : JBR

EUT : MULTIROOM WIFI PLAYER

Power : AC 120V/60Hz

M/N : LINK2

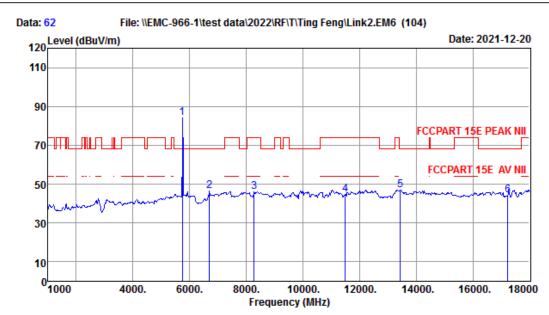
Test Mode : IEEE 802.11ac 20 TX 5745MHz

| | Freg. | Ant. Factor | Cable Loss | Amp Factor | Reading | Emission Level | Limits | Margin | Remark |
|---|----------|----------------|---------------|---------------|---------|-------------------|----------|--------|--------|
| | (MHz) | (dB/m) | (dB) | (dB) (dB) | (dBuV) | (dBuV/m) | (dBuV/m) | (dB) | |
| 1 | 5745.00 | 32.85 | 4.00 | 34.40 | 78.92 | 81.37 | 68.20 | -13.17 | Peak |
| 2 | 7596.00 | 36.82 | 5.38 | 34.86 | 40.31 | 47.65 | 74.00 | 26.35 | Peak |
| 3 | 8344.00 | 36.90 | 5.39 | 34.73 | 40.32 | 47.88 | 74.00 | 26.12 | Peak |
| 4 | 11490.00 | 39.90 | 6.15 | 34.65 | 34.25 | 45.65 | 74.00 | 28.35 | Peak |
| 5 | 12577.00 | 39.61 | 6.22 | 34.57 | 34.58 | 45.84 | 74.00 | 28.16 | Peak |
| 6 | 17235.00 | 42.80 | 7.65 | 34.38 | 29.70 | 45.77 | 68.20 | 22.43 | Peak |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.

2. Margin= Limit - Emission Level.

Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China Tel:+86-769-83081888 Fax:+86-769-83081878



: 1# 966 Chamber Site no. Data no. : 62 : 3m ANT9120D 1-18G Ant. pol. : VERTICAL Dis. / Ant.

Limit : FCCPART 15E PEAK NII

Env. / Ins. : Temp:23.4';Humi:50%;Press:101.52kPa

Engineer : JBR

EUT : MULTIROOM WIFI PLAYER

Power : AC 120V/60Hz

M/N : LINK2

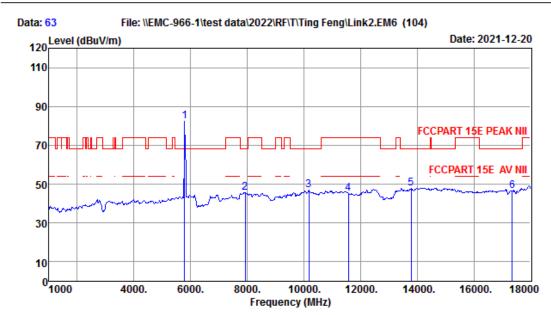
Test Mode : IEEE 802.11ac 20 TX 5745MHz

| | | Ant. | Cable | Amp | | Emission | | | |
|---|----------|-------|-------|----------------|-------------------|-------------------|-----------------|----------------|--------|
| | - | - | | Factor (dB) | Reading (dBuV) | Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
| 1 | 5745.00 | 32.85 | 4.00 | 34.40 | 81.67 | 84.12 | 68.20 | -15.92 | Peak |
| 2 | 6695.00 | 35.06 | 4.88 | 34.65 | 41.12 | 46.41 | 68.20 | 21.79 | Peak |
| 3 | 8276.00 | 36.90 | 5.47 | 34.76 | 38.52 | 46.13 | 74.00 | 27.87 | Peak |
| 4 | 11490.00 | 39.90 | 6.15 | 34.65 | 33.21 | 44.61 | 74.00 | 29.39 | Peak |
| 5 | 13444.00 | 40.15 | 6.32 | 34.36 | 34.94 | 47.05 | 68.20 | 21.15 | Peak |
| 6 | 17235.00 | 42.80 | 7.65 | 34.38 | 28.26 | 44.33 | 68.20 | 23.87 | Peak |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.

2. Margin= Limit - Emission Level.

Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China Tel:+86-769-83081888 Fax:+86-769-83081878



: 1# 966 Chamber Site no. Data no. : 63

: 3m ANT9120D 1-18G Dis. / Ant. Ant. pol. : HORIZONTAL

Limit : FCCPART 15E PEAK NII

Env. / Ins. : Temp:23.4';Humi:50%;Press:101.52kPa

Engineer : JBR

EUT : MULTIROOM WIFI PLAYER

Power : AC 120V/60Hz

M/N : LINK2

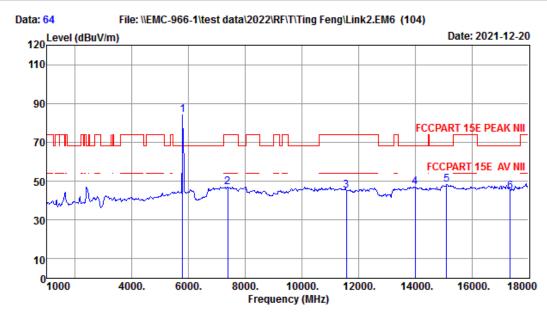
Test Mode : IEEE 802.11ac 20 TX 5785MHz

| | • | Ant. | Cable | Amp | | Emission | | | |
|---|----------|------------------|--------------|----------------|-------------------|-------------------|-----------------|----------------|--------|
| | | Factor (dB/m) | Loss (dB) | Factor (dB) | Reading (dBuV) | Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
| 1 | 5785.00 | 32.84 | 4.05 | 34.39 | 79.65 | 82.15 | 68.20 | -13.95 | Peak |
| 2 | 7936.00 | 36.89 | 5.75 | 34.89 | 37.97 | 45.72 | 68.20 | 22.48 | Peak |
| 3 | 10180.00 | 39.09 | 5.94 | 34.26 | 35.96 | 46.73 | 68.20 | 21.47 | Peak |
| 4 | 11570.00 | 39.90 | 6.12 | 34.67 | 33.91 | 45.26 | 74.00 | 28.74 | Peak |
| 5 | 13784.00 | 40.73 | 6.44 | 34.32 | 34.96 | 47.81 | 68.20 | 20.39 | Peak |
| 6 | 17355.00 | 43.75 | 7.77 | 34.36 | 29.24 | 46.40 | 68.20 | 21.80 | Peak |
| | | | | | | | | | |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.

2. Margin= Limit - Emission Level.

Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China Tel:+86-769-83081888 Fax:+86-769-83081878



: 1# 966 Chamber Site no. Data no. : 64 : 3m ANT9120D 1-18G Ant. pol. : VERTICAL Dis. / Ant.

Limit : FCCPART 15E PEAK NII

Env. / Ins. : Temp:23.4';Humi:50%;Press:101.52kPa

Engineer : JBR

EUT : MULTIROOM WIFI PLAYER

Power : AC 120V/60Hz

M/N : LINK2

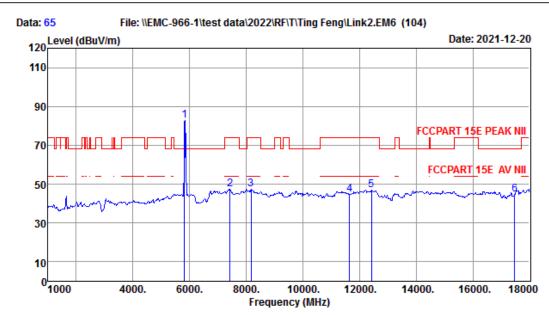
Test Mode : IEEE 802.11ac 20 TX 5785MHz

| | | Ant. | Cable | Amp | | Emission | | | |
|---|----------------|-------|--------------|----------------|----------------------------------|----------|--------------------|----------------|--------|
| | Freq. (MHz) | • | Loss (dB) | Factor (dB) | Reading Level (dBuV) (dBuV/m) | | Limits (dBuV/m) | Margin (dB) | Remark |
| 1 | 5785.00 | 32.84 | 4.05 | 34.39 | 81.57 | 84.07 | 68.20 | -15.87 | Peak |
| 2 | 7375.00 | 36.56 | 5.24 | 34.84 | 40.14 | 47.10 | 74.00 | 26.90 | Peak |
| 3 | 11570.00 | 39.90 | 6.12 | 34.67 | 33.99 | 45.34 | 74.00 | 28.66 | Peak |
| 4 | 14005.00 | 41.10 | 6.53 | 34.30 | 33.78 | 47.11 | 68.20 | 21.09 | Peak |
| 5 | 15110.00 | 40.79 | 6.73 | 34.56 | 35.42 | 48.38 | 68.20 | 19.82 | Peak |
| 6 | 17355.00 | 43.75 | 7.77 | 34.36 | 27.59 | 44.75 | 68.20 | 23.45 | Peak |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.

2. Margin= Limit - Emission Level.

Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China Tel:+86-769-83081888 Fax:+86-769-83081878



: 1# 966 Chamber Site no. Data no. : 65 : 3m ANT9120D 1-18G Ant. pol. : VERTICAL Dis. / Ant.

Limit : FCCPART 15E PEAK NII

Env. / Ins. : Temp:23.4';Humi:50%;Press:101.52kPa

Engineer : JBR

EUT : MULTIROOM WIFI PLAYER

Power : AC 120V/60Hz

M/N : LINK2

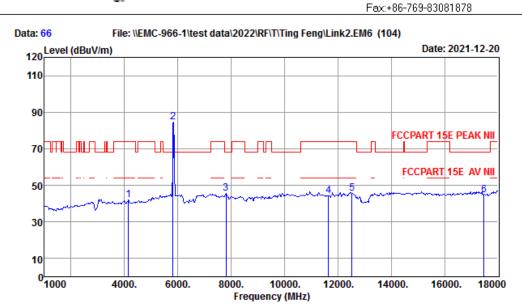
Test Mode : IEEE 802.11ac 20 TX 5825MHz

| | | Ant. | Cable | Amp | | Emission | | | |
|---|----------------|------------------|--------------|-------|-------------------|-------------------|--------------------|----------------|--------|
| | Freq. (MHz) | Factor (dB/m) | Loss (dB) | | Reading (dBuV) | Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
| 1 | 5825.00 | 32.83 | 4.11 | 34.37 | 80.24 | 82.81 | 68.20 | -14.61 | Peak |
| 2 | 7426.00 | 36.66 | 5.25 | 34.84 | 40.14 | 47.21 | 74.00 | 26.79 | Peak |
| 3 | 8174.00 | 36.90 | 5.60 | 34.82 | 39.74 | 47.42 | 74.00 | 26.58 | Peak |
| 4 | 11650.00 | 39.90 | 6.08 | 34.69 | 33.48 | 44.77 | 74.00 | 29.23 | Peak |
| 5 | 12424.00 | 39.69 | 6.17 | 34.63 | 35.49 | 46.72 | 74.00 | 27.28 | Peak |
| 6 | 17475.00 | 44.70 | 7.89 | 34.35 | 26.28 | 44.52 | 68.20 | 23.68 | Peak |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.

2. Margin= Limit - Emission Level.

Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China Tel:+86-769-83081888



Site no. : 1# 966 Chamber Data no. : 66 Dis. / Ant. : 3m ANT9120D 1-18G Ant. pol. : HORIZONTAL

Limit : FCCPART 15E PEAK NII

: Temp:23.4';Humi:50%;Press:101.52kPa Env. / Ins.

Engineer : JBR

EUT : MULTIROOM WIFI PLAYER

Power : AC 120V/60Hz

M/N : LINK2

Test Mode : IEEE 802.11ac 20 TX 5825MHz

| | Freq. | Ant. Factor (dB/m) | Cable Loss (dB) | Amp Factor (dB) | Reading (dBuV) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
|---|----------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 4145.00 | 29.86 | 2.93 | 34.53 | 43.93 | 42.19 | 74.00 | 31.81 | Peak |
| 2 | 5825.00 | 32.83 | 4.11 | 34.37 | 82.16 | 84.73 | 68.20 | -16.53 | Peak |
| 3 | 7800.00 | 36.86 | 5.60 | 34.88 | 38.24 | 45.82 | 68.20 | 22.38 | Peak |
| 4 | 11650.00 | 39.90 | 6.08 | 34.69 | 33.04 | 44.33 | 74.00 | 29.67 | Peak |
| 5 | 12526.00 | 39.64 | 6.21 | 34.59 | 34.54 | 45.80 | 74.00 | 28.20 | Peak |
| 6 | 17475.00 | 44.70 | 7.89 | 34.35 | 26.40 | 44.64 | 68.20 | 23.56 | Peak |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading. 2. Margin= Limit - Emission Level.

- 3. The emission levels that are 20dB below the official limit are not reported.

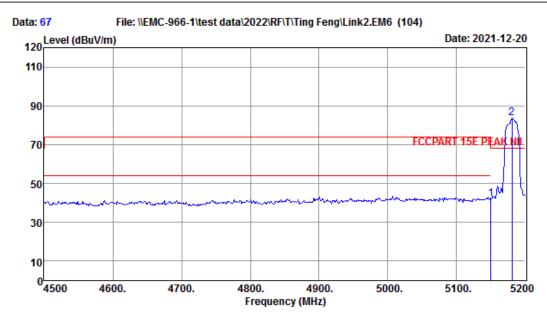
Note:

The amplitude of 18GHz to 25GHz spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

Radiated Band Edge

EST Technology

Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China Tel:+86-769-83081888 Fax:+86-769-83081878



Site no. : 1# 966 Chamber Data no. : 67

Ant. pol. : HORIZONTAL : 3m ANT9120D 1-18G Dis. / Ant.

: FCCPART 15E PEAK NII

Env. / Ins. : Temp:23.4'; Humi:50%; Press:101.52kPa

Engineer : JBR

: MULTIROOM WIFI PLAYER EUT

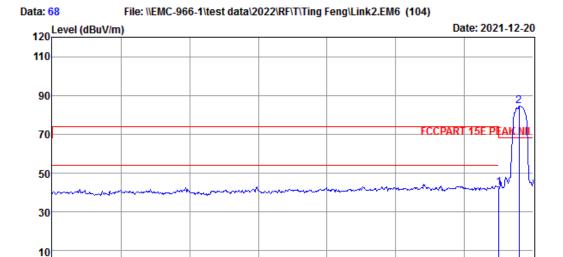
: AC 120V/60Hz Power M/N : LINK2

: IEEE 802.11ac 20 TX 5180MHz Test Mode

| Freq. (MHz) | | | Factor (dB) | Reading (dBuV) | Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
|----------------|------------------|-------------------------------|---|-------------------|---|--|---|--|
| | | | | 41.22 82.68 | 42.21 83.77 | 68.20 68.20 | 25.99 -15.57 | Peak Peak |
| | (MHz) 5150.00 | (MHz) (dB/m) 5150.00 32.13 | (MHz) (dB/m) (dB) 5150.00 32.13 3.50 | | (MHz) (dB/m) (dB) (dB) (dBuV) 5150.00 32.13 3.50 34.64 41.22 | (MHz) (dB/m) (dB) (dB) (dBuV) (dBuV/m) 5150.00 32.13 3.50 34.64 41.22 42.21 | (MHz) (dB/m) (dB) (dB) (dBuV) (dBuV/m) (dBuV/m) 5150.00 32.13 3.50 34.64 41.22 42.21 68.20 | (MHz) (dB/m) (dB) (dB) (dBuV) (dBuV/m) (dBuV/m) (dB) 5150.00 32.13 3.50 34.64 41.22 42.21 68.20 25.99 |

- 2. Margin= Limit Emission Level.
- 3. The emission levels that are 20dB below the official limit are not reported.

Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China Tel:+86-769-83081888 Fax:+86-769-83081878



4800.

Frequency (MHz)

4900.

5000.

5100.

5200

: 1# 966 Chamber Site no. Data no. : 68 : 3m ANT9120D 1-18G Ant. pol. : VERTICAL Dis. / Ant.

4700.

: FCCPART 15E PEAK NII

4600.

Env. / Ins. : Temp:23.4';Humi:50%;Press:101.52kPa

Engineer : JBR

0<mark>4500</mark>

EUT : MULTIROOM WIFI PLAYER

Power : AC 120V/60Hz

M/N : LINK2

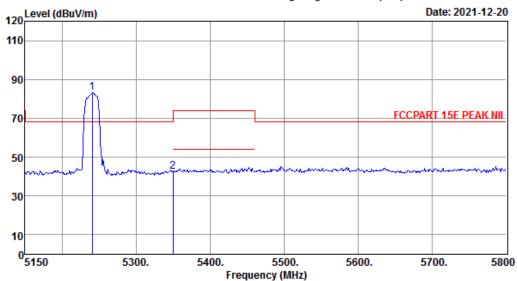
Test Mode : IEEE 802.11ac 20 TX 5180MHz

| Freq (MHz | . Factor | | - | Reading (dBuV) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
|--------------|----------------------|--------------|---|-------------------|-------------------------------|-----------------|-----------------|--------------|
| | 00 32.13 00 32.20 | 3.50 3.52 | | 41.56 83.60 | 42.55 84.69 | 68.20 68.20 | 25.65 -16.49 | Peak Peak |

- 2. Margin= Limit Emission Level.
- 3. The emission levels that are 20dB below the official limit are not reported.

Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China Tel:+86-769-83081888 Fax:+86-769-83081878





: 1# 966 Chamber Site no. Data no. : 69

: 3m ANT9120D 1-18G Dis. / Ant. Ant. pol. : HORIZONTAL

: FCCPART 15E PEAK NII

Env. / Ins. : Temp:23.4';Humi:50%;Press:101.52kPa

Engineer : JBR

EUT : MULTIROOM WIFI PLAYER

Power : AC 120V/60Hz

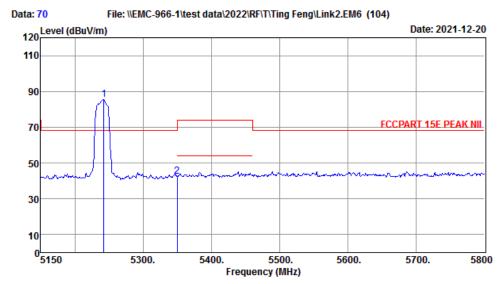
M/N : LINK2

Test Mode : IEEE 802.11ac 20 TX 5240MHz

| | Freq. (MHz) | Cable Loss (dB) | _ | Reading (dBuV) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
|-----|--------------------|-----------------------|---|-------------------|-------------------------------|-----------------|-----------------|--------------|
| 1 2 | 5241.00 5350.00 | | | 81.85 40.88 | 83.10 42.51 | 68.20 68.20 | -14.90 25.69 | Peak Peak |

- 2. Margin= Limit Emission Level.
- 3. The emission levels that are 20dB below the official limit are not reported.

Chilingxiang, Qishantou, Santun, Houjie, Dongguan,Guangdong,China. Tel:+86-769-83081888 Fax:+86-769-83081878



Site no. : 1# 966 Chamber Data no. : 70
Dis. / Ant. : 3m ANT9120D 1-18G Ant. pol. : VERTICAL

Limit : FCCPART 15E PEAK NII

Env. / Ins. : Temp:23.4'; Humi:50%; Press:101.52kPa

Engineer : JBR

EUT : MULTIROOM WIFI PLAYER

Power : AC 120V/60Hz

M/N : LINK2

Test Mode : IEEE 802.11ac 20 TX 5240MHz

| | Freq. (MHz) | Factor | Cable Loss (dB) | _ | Reading (dBuV) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
|-----|--------------------|--------|-----------------------|---|-------------------|-------------------------------|-----------------|-----------------|--------------|
| 1 2 | 5242.30 5350.00 | | 3.56 3.62 | | 84.33 40.71 | 85.64 42.34 | 68.20 68.20 | -17.44 25.86 | Peak Peak |

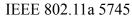
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.

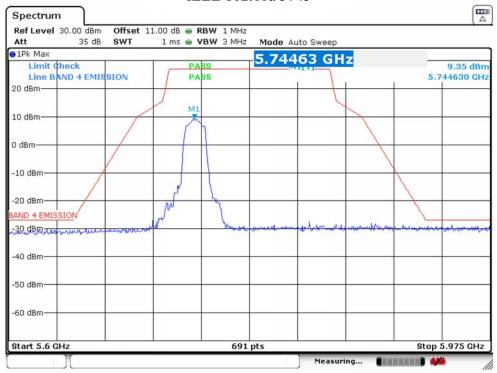
- 2. Margin= Limit Emission Level.
- The emission levels that are 20dB below the official limit are not reported.

Note:

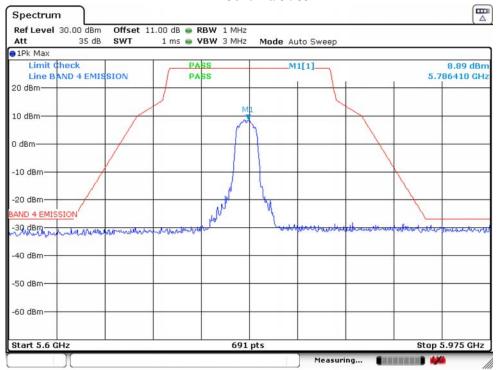
- 1. The amplitude of 18GHz to 40GHz spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.
- 2. All test mode had been pre-test, only Low/Middle/High Channel of the worst case modulation mode was reported

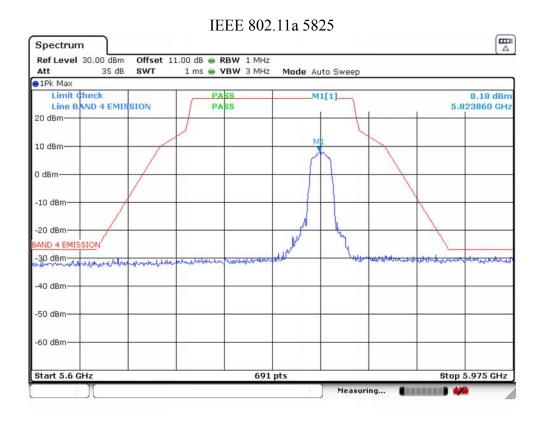
Band Edge

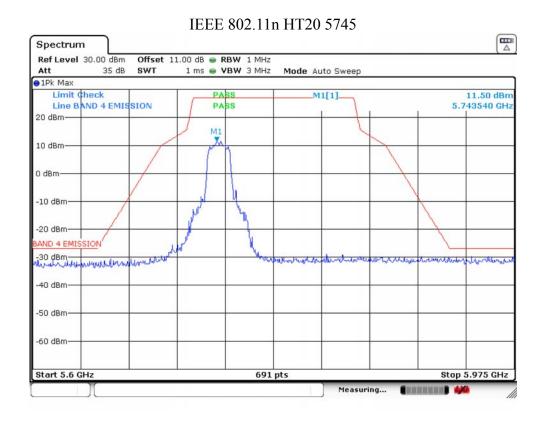




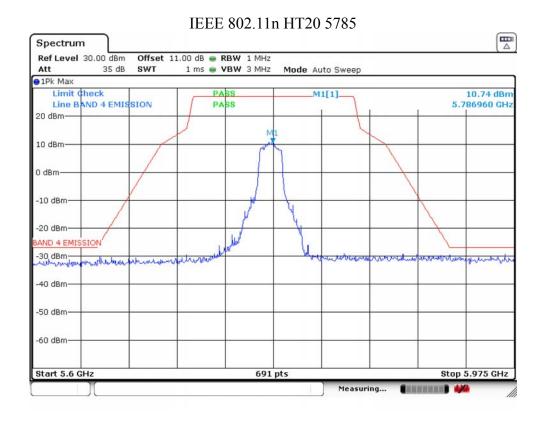
IEEE 802.11a 5785

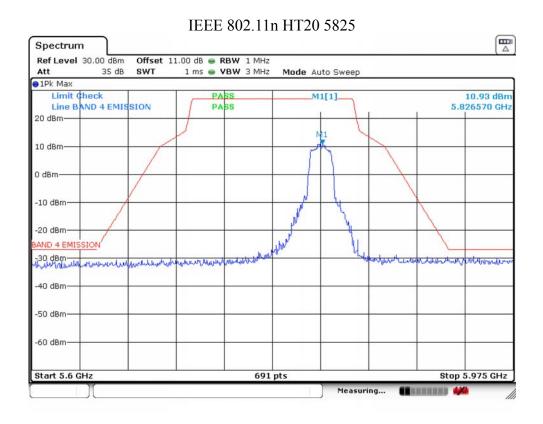


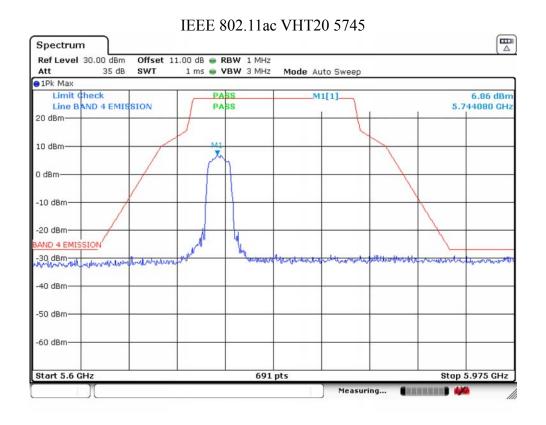


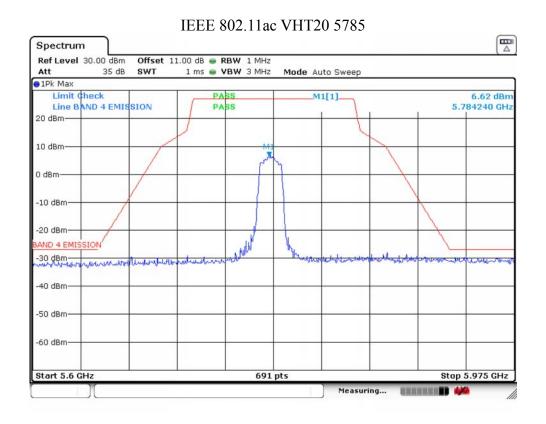


Report No. ESTE-R2205108

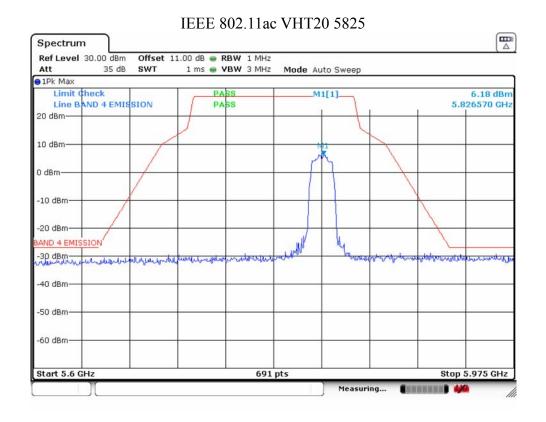


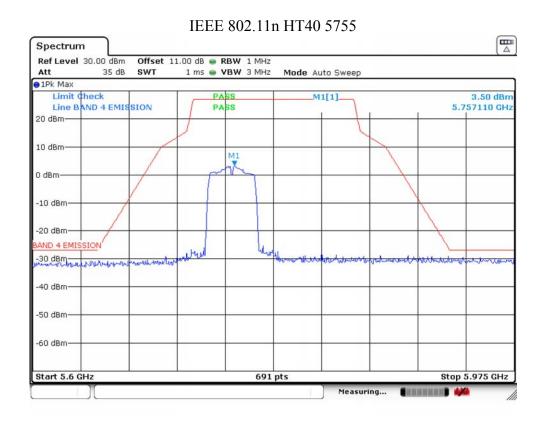




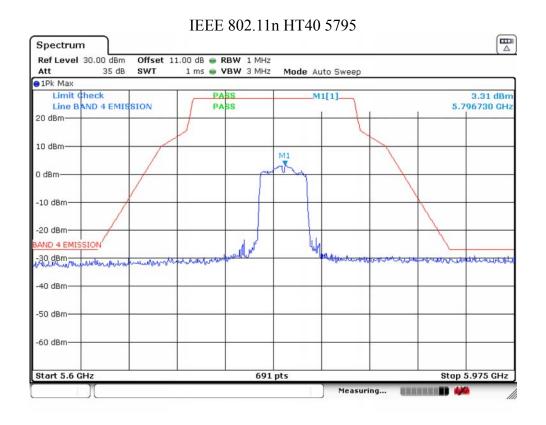


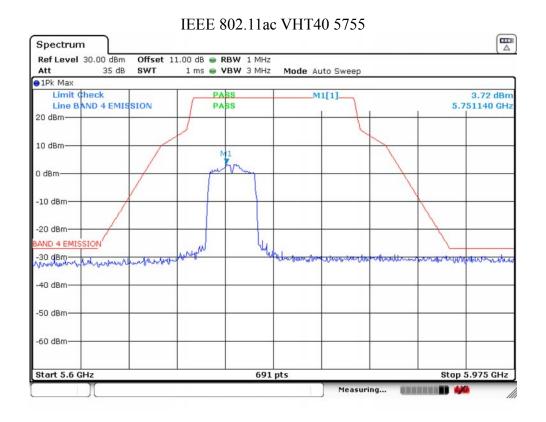
EST Technology Co., Ltd Report No. ESTE-R2205108



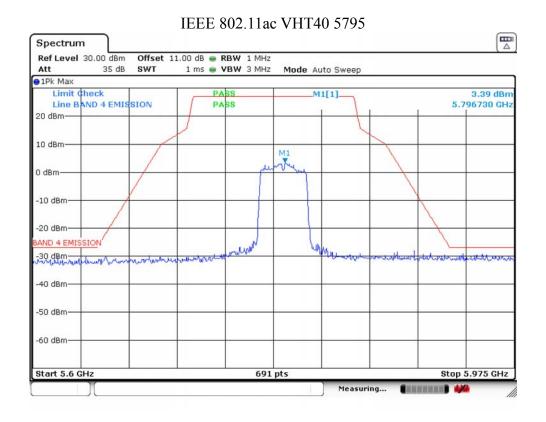


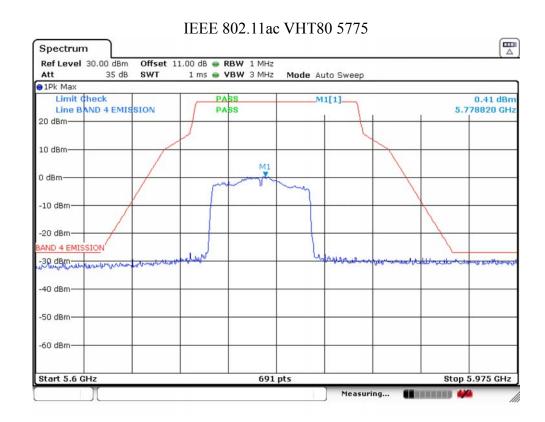
chnology Co., Ltd Report No. ESTE-R2205108





Report No. ESTE-R2205108





All modulations are tested, only worst case ANT 2 test data is reported. And The test data has a margin of more than 3dB, then the 5.8G band edge test data for MIMO mode are complies regulations.

18000MHz-40000MHz

Note: The amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

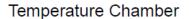
EST Technology Co., Ltd Page 80 of 105 Report No. ESTE-R2205108

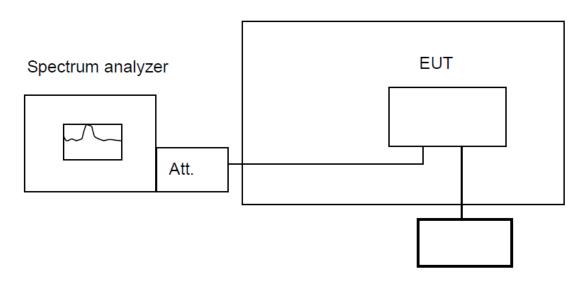
7. FREQUENCY STABILITY

7.1. Limit

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the operational description.

7.2. Test Setup





Variable Power Supply

7.3. Spectrum Analyzer Setting

| Spectrum Parameters | Setting |
|---------------------|----------|
| RBW | 10KHz |
| VBW | 10KHz |
| Span | 200KHz |
| Sweep Time | Auto |
| Detector | PEAK |
| Trace Mode | Max Hold |

EST Technology Co., Ltd Report No. ESTE-R2205108 Page 81 of 105

7.4. Test Procedure

For measurement frequency stability under temperature variation:

- Supply the EUT with a nominal ac voltage or install a new or fully charged battery in the EUT.
- b. Turn the EUT OFF and place it inside the environmental temperature chamber.
- c. Connect EUT antenna terminal to the spectrum analyzer with RF cable.
- d. Spectrum analyzer setting parameters in accordance with section 7.3.
- e. Set the temperature control on the chamber to the Specified temperature and allow the oscillator heater and the chamber temperature to stabilize.
- Turn the EUT ON with the rated voltage, and the EUT transmit continuously with maximum output power.
- g. Record the operating frequency at startup, and at 2 minutes, 5 minutes, and 10 minutes after the EUT is energized.
- h. Repeat step d through step f to measured the temperature form -20° C to $+50^{\circ}$ C in 10° C steps.

For frequency stability under voltage variation:

- a. Supply the EUT with a nominal ac voltage or install a new or fully charged battery in the EUT.
- b. Turn the EUT OFF and place it inside the environmental temperature chamber.
- c. Connect EUT antenna terminal to the spectrum analyzer with RF cable.
- d. Spectrum analyzer setting parameters in accordance with section 7.3.
- e. Unless otherwise specified, set the temperature control on the chamber to the ambient room temperature ($+15^{\circ}$ C to $+25^{\circ}$ C) and allow the oscillator heater and the chamber temperature to stabilize.
- f. Turn the EUT ON with the rated voltage, and the EUT transmit continuously with maximum output power.
- g. Record the operating frequency.
- h. Repeat step d through step f to measured the varied from 85% to 115% of the rated voltage.

EST Technology Co., Ltd Report No. ESTE-R2205108 Page 82 of 105

7.5. Test Result

| Frequency (MHz) | V(MHz) Voltage Temperature Time Value | | Measurement Value (MHz) | Frequency Error (ppm) | |
|-----------------|---|-----------|-------------------------------|-----------------------|-------|
| | 120 | 50 | 0 | 5179.979846 | -3.89 |
| | | | 2 | 5179.980024 | -3.86 |
| | | | 5 | 5179.979532 | -3.95 |
| | | | 10 | 5179.979714 | -3.92 |
| | | | 0 | 5179.979947 | -3.87 |
| | | | 2 | 5179.980043 | -3.85 |
| | 120 | 40 | 5 | 5179.979488 | -3.96 |
| | | | 10 | 5179.980319 | -3.80 |
| | | | 0 | 5179.980156 | -3.83 |
| | 100 | 2.0 | 2 | 5179.980005 | -3.86 |
| | 120 | 30 | 5 | 5179.979488 | -3.96 |
| | | | 10 | 5179.980096 | -3.84 |
| | | | 0 | 5179.980072 | -3.85 |
| | 120 | 2.0 | 2 | 5179.980230 | -3.82 |
| | | 20 | 5 | 5179.980115 | -3.84 |
| | | | 10 | 5179.979763 | -3.91 |
| | | | 0 | 5179.980263 | -3.81 |
| 5180 | 100 | 10 | 2 | 5179.980512 | -3.76 |
| 3100 | 120 | | 5 | 5179.979672 | -3.92 |
| | | | 10 | 5179.979599 | -3.94 |
| | 120 | 0 | 0 | 5179.980371 | -3.79 |
| | | | 2 | 5179.980048 | -3.85 |
| | | | 5 | 5179.979762 | -3.91 |
| | | | 10 | 5179.980326 | -3.80 |
| | 120 | 10 | 0 | 5179.979771 | -3.91 |
| | | | 2 | 5179.980010 | -3.86 |
| | | -10 | 5 | 5179.980182 | -3.83 |
| | | | 10 | 5179.980158 | -3.83 |
| | 120 | | 0 | 5179.980370 | -3.79 |
| | | 20 | 2 | 5179.980591 | -3.75 |
| | | -20 | 5 | 5179.980344 | -3.79 |
| | | | 10 | 5179.980453 | -3.77 |
| | 120 | 20 | / | 5179.980283 | -3.81 |
| | 102 | 20 | / | 5179.980047 | -3.85 |
| | 138 | 20 | / | 5179.980158 | -3.83 |
| | | MAX Frque | ncy Error(pp | om) | -3.75 |

EST Technology Co., Ltd Report No.ESTE-R2205108 Page 83 of 105

| Frequency (MHz) | Voltage (V) | Temperature (°C) | Time (minutes) | Measurement Value (MHz) | Frequency Error (ppm) |
|-----------------|-------------------------|------------------|-------------------|-------------------------------|-----------------------|
| | 120 | | 0 | 5744.977297 | -3.95 |
| | | | 2 | 5744.977273 | -3.96 |
| | | 50 | 5 | 5744.977180 | -3.97 |
| | | | 10 | 5744.976833 | -4.03 |
| | | | 0 | 5744.977127 | -3.98 |
| | | | 2 | 5744.977302 | -3.95 |
| | 120 | 40 | 5 | 5744.976476 | -4.09 |
| | | | 10 | 5744.977053 | -3.99 |
| | | | 0 | 5744.976761 | -4.05 |
| | 120 | 20 | 2 | 5744.976882 | -4.02 |
| | 120 | 30 | 5 | 5744.976981 | -4.01 |
| | | | 10 | 5744.976666 | -4.06 |
| | | | 0 | 5744.977130 | -3.98 |
| | 120 | 20 | 2 | 5744.976938 | -4.01 |
| | | 20 | 5 | 5744.977337 | -3.94 |
| | | | 10 | 5744.976620 | -4.07 |
| | | | 0 | 5744.976851 | -4.03 |
| 5745 | 120 | 10 | 2 | 5744.977173 | -3.97 |
| 0 / 10 | | | 5 | 5744.976926 | -4.02 |
| | | | 10 | 5744.977163 | -3.98 |
| | 120 | 0 | 0 | 5744.977213 | -3.97 |
| | | | 2 | 5744.976757 | -4.05 |
| | | | 5 | 5744.976549 | -4.08 |
| | | | 10 | 5744.976924 | -4.02 |
| | 120 | -10 | 0 | 5744.976994 | -4.00 |
| | | | 2 | 5744.976482 | -4.09 |
| | | | 5 | 5744.977429 | -3.93 |
| | | | 10 | 5744.976781 | -4.04 |
| | 120 | -20 | 0 | 5744.977097 | -3.99 |
| | | | 2 | 5744.977103 | -3.99 |
| | | | 5 | 5744.977216 | -3.97 |
| | | | 10 | 5744.977096 | -3.99 |
| | 120 | 20 | / | 5744.977384 | -3.94 |
| | 102 | 20 | / | 5744.977384 | -3.94 |
| | 138 | 20 | / | 5744.977387 | -3.94 |
| | MAX Frquency Error(ppm) | | | | |

EST Technology Co., Ltd Report No. ESTE-R2205108 Page 84 of 105

8. AC POWER LINE CONDUCTED EMISSIONS

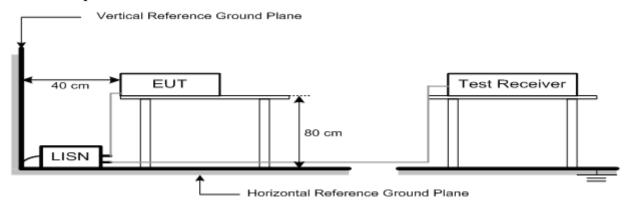
8.1. Limit

| | Maximum RF Line Voltage | | | |
|-----------------|-------------------------|---------------|--|--|
| Frequency | Quasi-Peak Level | Average Level | | |
| | dB(µV) | $dB(\mu V)$ | | |
| 150kHz ~ 500kHz | 66 ~ 56* | 56 ~ 46* | | |
| 500kHz ~ 5MHz | 56 | 46 | | |
| 5MHz ~ 30MHz | 60 | 50 | | |

Notes:

- 1. * Decreasing linearly with logarithm of frequency.
- 2. The lower limit shall apply at the transition frequencies.

8.2. Test Setup



8.3. Spectrum Analyzer Setting

| Spectrum Parameters | Setting | | |
|---------------------|----------|--|--|
| RBW | 9KHz | | |
| VBW | 9KHz | | |
| Start frequency | 150KHz | | |
| Stop frequency | 30MHz | | |
| Sweep Time | Auto | | |
| Detector | QP/AVG | | |
| Trace Mode | Max Hold | | |

8.4. Test Procedure

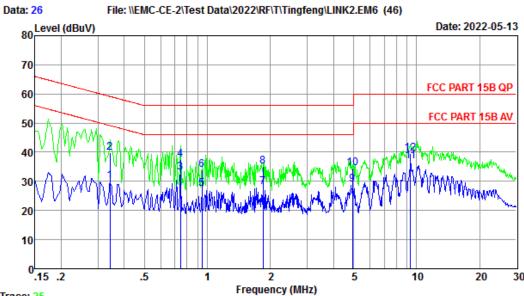
- a. The EUT was placed on a non-metallic table, 80cm above the ground plane.
- b. The EUT Power connected to the power mains through a line impedance stabilization network.
- c. Provides a 50 ohm coupling impedance for the EUT (Please refer the block diagram of the test setup and photographs).
- d. Set the EUT transmit continuously with maximum output power.
- e. Spectrum analyzer setting parameters in accordance with section 8.3.
- f. The AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.10: 2013 on Conducted Emission Test.
- g. Record the results in the test report.

EST Technology Co., Ltd Report No. ESTE-R2205108 Page 85 of 105

8.5. Test Result

EST Technology

Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China Tel:+86-769-83081888 Fax:+86-769-83081878



Trace: 25

Site no : 2#CE Shield Room Data no.

Env. / Ins. : Temp:23.5°C Humi:56% Press:101.80kPa LINE Phase : NEUTRAL

Limit : FCC PART 15B QP

Engineer : ZSX

EUT : MULTIROOM WIFI PLAYER

Power : DC 12V From Adapter Input AC 240V/60Hz

M/N : LINK2 : TX Mode Test Mode

| | Freq. | LISN Factor (dB) | Cable Loss (dB) | Reading (dBuV) | Emission Level (dBuv) | Limits (dBuv) | Margin (dB) | Remark |
|----|--------|------------------------|-----------------------|-------------------|-----------------------------|------------------|----------------|---------|
| 1 | 0.3428 | 9.76 | 9.92 | 10.54 | 30.22 | 49.13 | 18.91 | Average |
| 2 | 0.3428 | 9.76 | 9.92 | 20.24 | 39.92 | 59.13 | 19.21 | QP |
| 3 | 0.7430 | 9.79 | 9.93 | 13.46 | 33.18 | 46.00 | 12.82 | Average |
| 4 | 0.7430 | 9.79 | 9.93 | 17.85 | 37.57 | 56.00 | 18.43 | QP |
| 5 | 0.9431 | 9.85 | 9.94 | 7.56 | 27.35 | 46.00 | 18.65 | Average |
| 6 | 0.9431 | 9.85 | 9.94 | 14.21 | 34.00 | 56.00 | 22.00 | QP |
| 7 | 1.8483 | 9.93 | 9.95 | 8.11 | 27.99 | 46.00 | 18.01 | Average |
| 8 | 1.8483 | 9.93 | 9.95 | 15.14 | 35.02 | 56.00 | 20.98 | QP |
| 9 | 4.9257 | 10.06 | 10.00 | 8.91 | 28.97 | 46.00 | 17.03 | Average |
| 10 | 4.9257 | 10.06 | 10.00 | 14.47 | 34.53 | 56.00 | 21.47 | QP |
| 11 | 9.3518 | 10.08 | 10.06 | 16.73 | 36.87 | 50.00 | 13.13 | Average |
| 12 | 9.3518 | 10.08 | 10.06 | 19.29 | 39.43 | 60.00 | 20.57 | QP |

Remarks: 1. Emission Level= LISN Factor + Cable Loss + Reading.

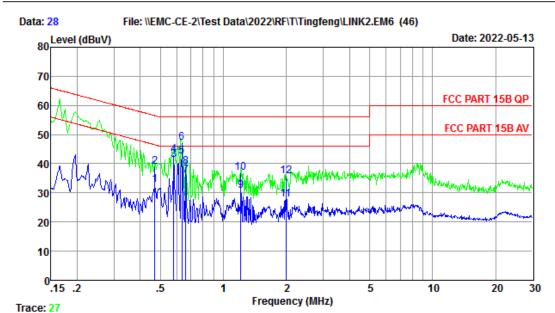
2. Margin=Limit - Emission Level.

3. If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

Report No. ESTE-R2205108

EST Technology

Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China Tel:+86-769-83081888 Fax:+86-769-83081878



: 2#CE Shield Room Site no Data no. : Temp:23.5°C Humi:56% Press:101.80kPa LINE Phase : LINE Env. / Ins.

Limit : FCC PART 15B QP

: ZSX Engineer

EUT : MULTIROOM WIFI PLAYER

Power : DC 12V From Adapter Input AC 240V/60Hz

M/N : LINK2 Test Mode : TX Mode

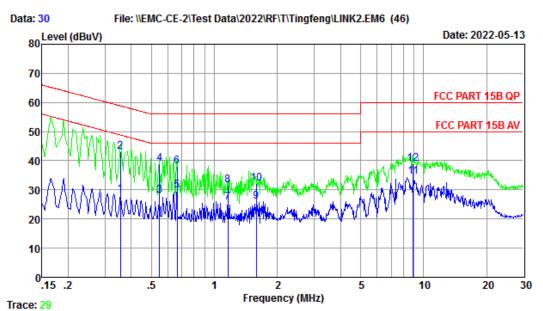
| | Freq. | LISN Factor (dB) | Cable Loss (dB) | Reading (dBuV) | Emission Level (dBuv) | Limits (dBuv) | Margin (dB) | Remark |
|----|--------|------------------------|-----------------------|-------------------|-----------------------------|------------------|----------------|---------|
| 1 | 0.4711 | 9.84 | 9.92 | 13.08 | 32.84 | 46.49 | 13.65 | Average |
| 2 | 0.4711 | 9.84 | 9.92 | 19.24 | 39.00 | 56.49 | 17.49 | QP |
| 3 | 0.5792 | 9.83 | 9.92 | 21.45 | 41.20 | 46.00 | 4.80 | Average |
| 4 | 0.5792 | 9.83 | 9.92 | 23.47 | 43.22 | 56.00 | 12.78 | QP |
| 5 | 0.6338 | 9.83 | 9.92 | 22.71 | 42.46 | 46.00 | 3.54 | Average |
| 6 | 0.6338 | 9.83 | 9.92 | 27.34 | 47.09 | 56.00 | 8.91 | QP |
| 7 | 0.6613 | 9.82 | 9.92 | 16.36 | 36.10 | 46.00 | 9.90 | Average |
| 8 | 0.6613 | 9.82 | 9.92 | 19.28 | 39.02 | 56.00 | 16.98 | QP |
| 9 | 1.2098 | 9.92 | 9.94 | 10.84 | 30.70 | 46.00 | 15.30 | Average |
| 10 | 1.2098 | 9.92 | 9.94 | 17.02 | 36.88 | 56.00 | 19.12 | QP |
| 11 | 1.9906 | 10.09 | 9.96 | 7.77 | 27.82 | 46.00 | 18.18 | Average |
| 12 | 1.9906 | 10.09 | 9.96 | 15.76 | 35.81 | 56.00 | 20.19 | QP |

Remarks: 1. Emission Level= LISN Factor + Cable Loss + Reading.

- 2. Margin=Limit Emission Level.
- 3. If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

EST Technology

Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China Tel:+86-769-83081888 Fax:+86-769-83081878



: 2#CE Shield Room Site no Data no. : Temp:23.5°C Humi:56% Press:101.80kPa LINE Phase : LINE Env. / Ins.

Limit : FCC PART 15B QP

Engineer : ZSX

EUT : MULTIROOM WIFI PLAYER

Power : DC 12V From Adapter Input AC 120V/60Hz

M/N : LINK2 Test Mode : TX Mode

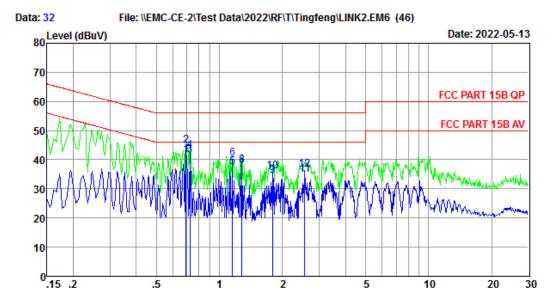
| | Freq. | LISN Factor (dB) | Cable Loss (dB) | Reading (dBuV) | Emission Level (dBuv) | Limits (dBuv) | Margin (dB) | Remark |
|----|--------|------------------------|-----------------------|-------------------|-----------------------------|------------------|----------------|---------|
| 1 | 0.3558 | 9.81 | 9.92 | 8.54 | 28.27 | 48.83 | 20.56 | Average |
| 2 | 0.3558 | 9.81 | 9.92 | 23.23 | 42.96 | 58.83 | 15.87 | QP |
| 3 | 0.5464 | 9.84 | 9.92 | 8.40 | 28.16 | 46.00 | 17.84 | Average |
| 4 | 0.5464 | 9.84 | 9.92 | 19.17 | 38.93 | 56.00 | 17.07 | QP |
| 5 | 0.6648 | 9.82 | 9.92 | 10.01 | 29.75 | 46.00 | 16.25 | Average |
| 6 | 0.6648 | 9.82 | 9.92 | 18.33 | 38.07 | 56.00 | 17.93 | QP |
| 7 | 1.1595 | 9.93 | 9.94 | 5.90 | 25.77 | 46.00 | 20.23 | Average |
| 8 | 1.1595 | 9.93 | 9.94 | 11.86 | 31.73 | 56.00 | 24.27 | QP |
| 9 | 1.5851 | 9.90 | 9.95 | 6.27 | 26.12 | 46.00 | 19.88 | Average |
| 10 | 1.5851 | 9.90 | 9.95 | 12.31 | 32.16 | 56.00 | 23.84 | QP |
| 11 | 8.9163 | 9.87 | 10.06 | 14.58 | 34.51 | 50.00 | 15.49 | Average |
| 12 | 8.9163 | 9.87 | 10.06 | 19.08 | 39.01 | 60.00 | 20.99 | QP |

Remarks: 1. Emission Level= LISN Factor + Cable Loss + Reading.

- 2. Margin=Limit Emission Level.
- 3. If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

EST Technology

Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China Tel:+86-769-83081888 Fax:+86-769-83081878



Frequency (MHz)

: 2#CE Shield Room Site no Data no. : Temp:23.5°C Humi:56% Press:101.80kPa LINE Phase : NEUTRAL Env. / Ins.

Limit : FCC PART 15B QP

Engineer : ZSX

Trace: 31

EUT : MULTIROOM WIFI PLAYER

Power : DC 12V From Adapter Input AC 120V/60Hz

M/N : LINK2 Test Mode : TX Mode

| | | LISN | Cable | | Emission | | | |
|----|--------|--------|-------|---------|----------|--------|--------|---------|
| | Freq. | Factor | Loss | Reading | Level | Limits | Margin | Remark |
| | (MHz) | (dB) | (dB) | (dBuV) | (dBuv) | (dBuv) | (dB) | |
| 1 | 0.6936 | 9.76 | 9.93 | 21.92 | 41.61 | 46.00 | 4.39 | Average |
| 2 | 0.6936 | 9.76 | 9.93 | 25.04 | 44.73 | 56.00 | 11.27 | QP |
| 3 | 0.7236 | 9.79 | 9.93 | 21.92 | 41.64 | 46.00 | 4.36 | Average |
| 4 | 0.7236 | 9.79 | 9.93 | 23.34 | 43.06 | 56.00 | 12.94 | QP |
| 5 | 1.1534 | 9.82 | 9.94 | 17.84 | 37.60 | 46.00 | 8.40 | Average |
| 6 | 1.1534 | 9.82 | 9.94 | 20.68 | 40.44 | 56.00 | 15.56 | QP |
| 7 | 1.2824 | 9.83 | 9.94 | 16.82 | 36.59 | 46.00 | 9.41 | Average |
| 8 | 1.2824 | 9.83 | 9.94 | 18.38 | 38.15 | 56.00 | 17.85 | QP |
| 9 | 1.7905 | 9.92 | 9.95 | 14.57 | 34.44 | 46.00 | 11.56 | Average |
| 10 | 1.7905 | 9.92 | 9.95 | 16.07 | 35.94 | 56.00 | 20.06 | QP |
| 11 | 2.5535 | 9.95 | 9.96 | 15.06 | 34.97 | 46.00 | 11.03 | Average |
| 12 | 2.5535 | 9.95 | 9.96 | 16.70 | 36.61 | 56.00 | 19.39 | QP |

Remarks: 1. Emission Level= LISN Factor + Cable Loss + Reading.

- 2. Margin=Limit Emission Level.
- 3. If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

9. ANTENNA REQUIREMENTS

9.1. Limit

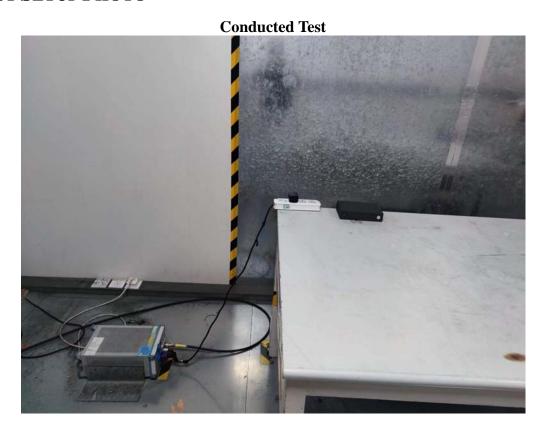
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §§15.211, 15.213, 15.217, 15.219, 15.221, or §15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

9.2. Test Result

The antennas used for this product is integral antenna, so compliance with antenna requirements. (Please refer to the EUT photo for details)

EST Technology Co., Ltd Report No. ESTE-R2205108 Page 90 of 105

10. TEST SETUP PHOTO



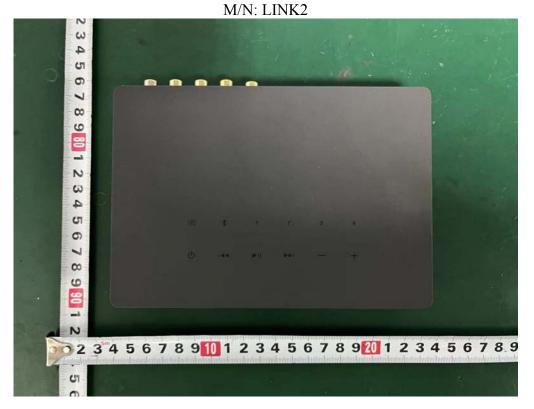






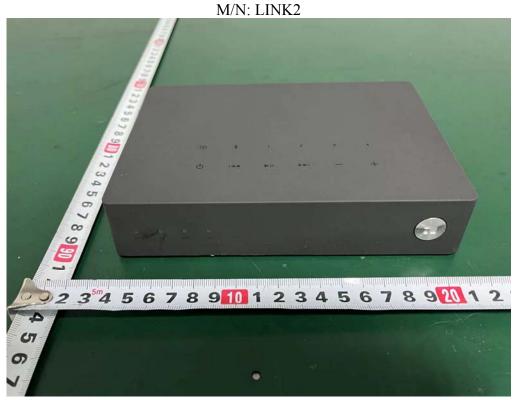
11. EUT PHOTO

External Photos



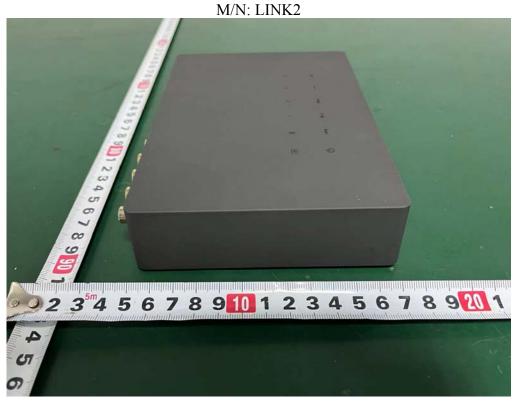


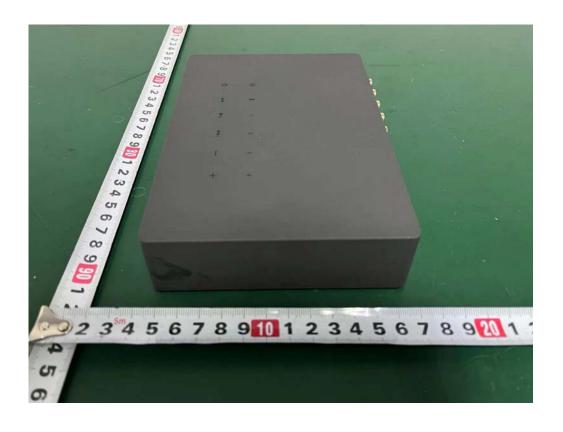
External Photos





External Photos





External Photos

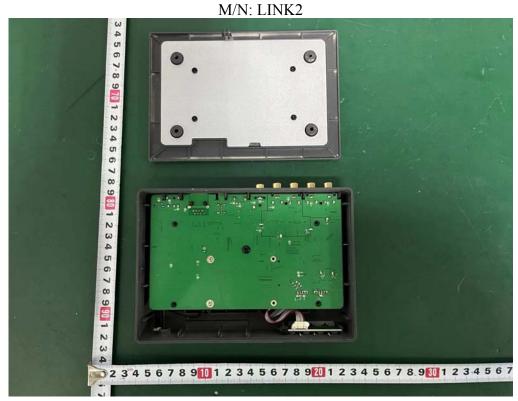






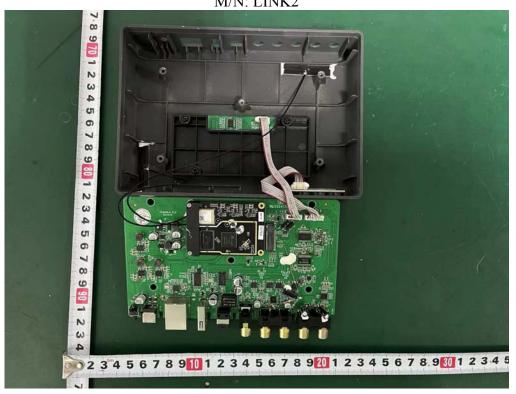




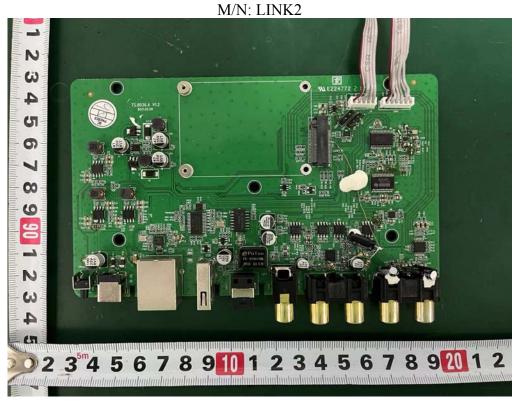


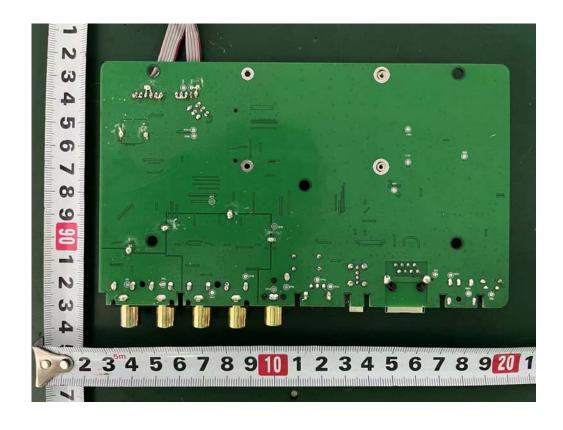


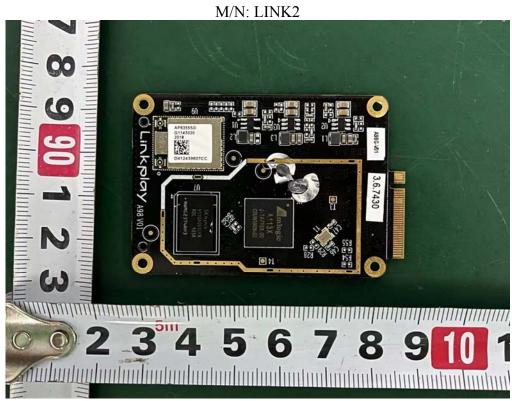
Internal Photos M/N: LINK2

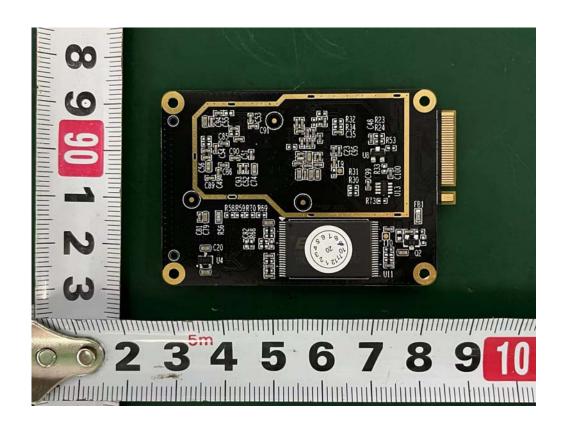




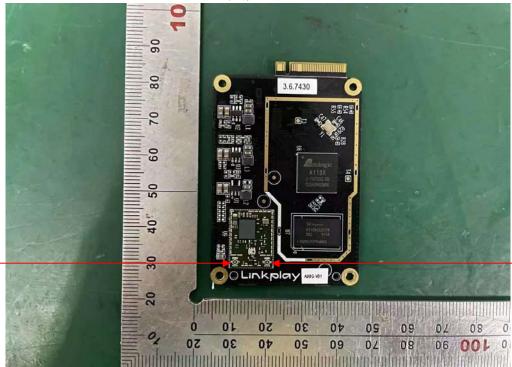






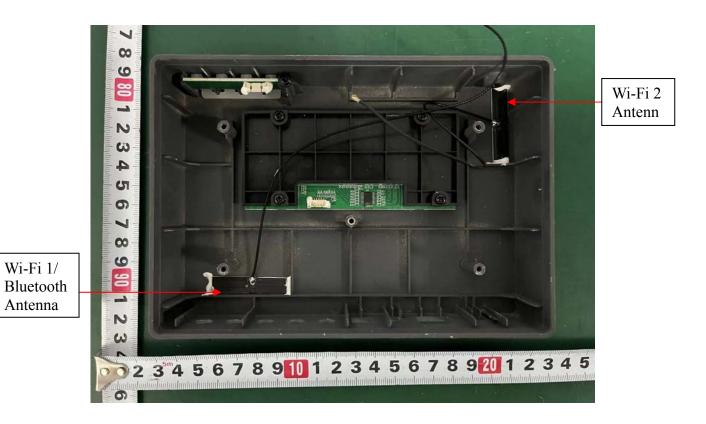


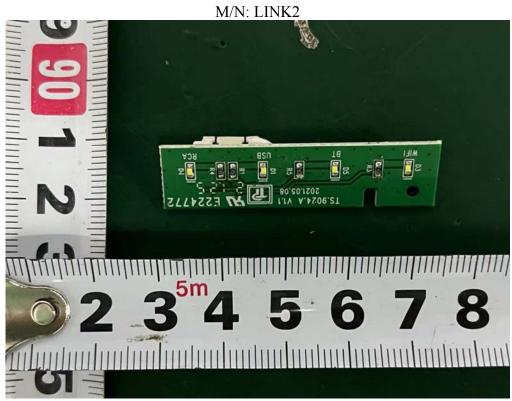
M/N: LINK2

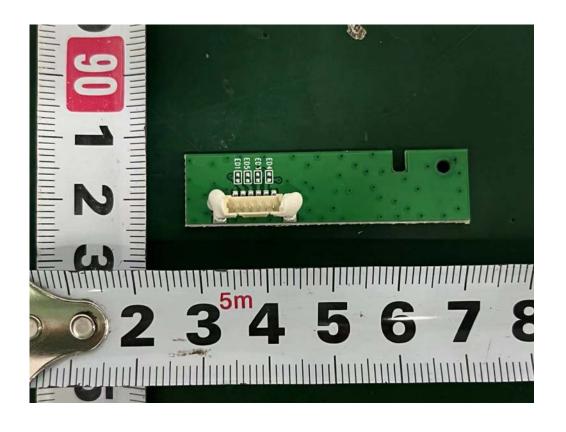


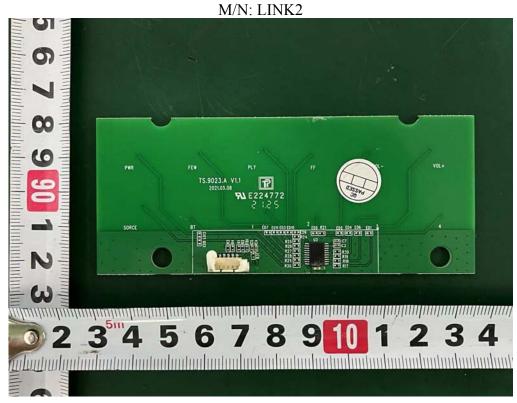
Wi-Fi 2 Antenna Connector

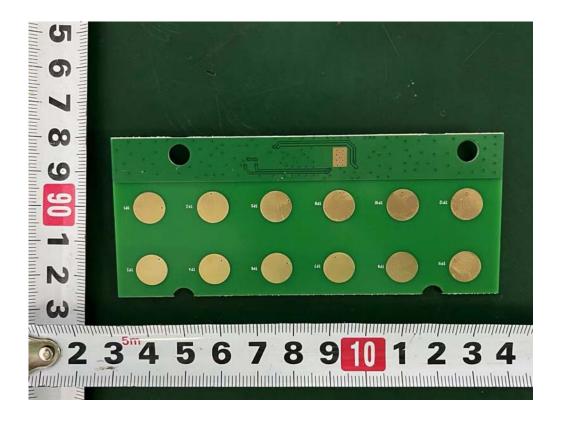
Wi-Fi 1/ Bluetooth Antenna Connector











End of Test Report