



FCC TEST REPORT

**Test report
On Behalf of
Mercury Communication Co., Ltd
For
Smart Phone
Model No.: Cirrus C2**

FCC ID: 2ALAS-C2

Prepared for : Mercury Communication Co., Ltd
6F,1 Bldg, Jia'an Science&Technology Park, No.1 Liuxian Road, Bao an District,
Shenzhen, China.

Prepared By : Shenzhen HUAK Testing Technology Co., Ltd.
1F, B2 Building, Junfeng Zhongcheng Zhizao Innovation Park, Fuhai Street, Bao'an
District, Shenzhen City, China

Date of Test: July 30, 2018~Aug. 22, 2018

Date of Report: Sep. 04, 2018

Report Number: HUAK180904961E

**TEST RESULT CERTIFICATION**

Applicant's name : Mercury Communication Co., Ltd
Address : 6F,1 Bldg, Jia'an Science&Technology Park, No.1 Liuxian Road, Bao an District, Shenzhen, China.

Manufacture's Name : Mercury Communication Co., Ltd
Address : 6F,1 Bldg, Jia'an Science&Technology Park, No.1 Liuxian Road, Bao an District, Shenzhen, China.

Product description Smart Phone
Brand Name Cloud Mobile
Mode Name Cirrus C2

Standards : FCC Rules and Regulations Part 15 Subpart C Section 15.247
KDB 558074 D01 15.247 Meas Guidance v05

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Date of Test :

Date (s) of performance of tests : July 30, 2018~Aug. 22, 2018

Date of Issue : Sep.04, 2018

Test Result : **Pass**

Testing Engineer

:

(Gary Qian)

Technical Manager

:

(Eden Hu)

Authorized Signatory :

(Jason Zhou)



| Revision | Issue Date | Revisions | Revised By |
|----------|--------------|---------------|------------|
| V1.0 | Sep.04, 2018 | Initial Issue | Jason Zhou |



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1. GENERAL INFORMATION

1.1. PRODUCT DESCRIPTION

The EUT is designed as "Smart Phone". It is designed by way of utilizing the DSSS and OFDM technology to achieve the system operation.

A major technical description of EUT is described as following

| | |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Operation Frequency | 2.412 GHz~2.462GHz |
| Output Power | IEEE 802.11b: 15.70 dBm, IEEE 802.11g: 13.77 dBm; IEEE 802.11n(20): 13.74 dBm, IEEE 802.11n(40): 13.29 dBm |
| Modulation | DSSS(DBPSK/DQPSK/CCK);OFDM(BPSK/QPSK/16-QAM/64-QAM) |
| Number of channels | 11 Channels (IEEE802.11b/g/n20)& 7 Channels (IEEE802.11n40) |
| Hardware Version | T52_MB_V20 |
| Software Version | Cirrus_C2_20180822 |
| Antenna Designation | PIFA Antenna |
| Antenna Gain | 1.0dBi |
| Power Supply | DC3.8V by Built-in Li-ion Battery |

1.2. TABLE OF CARRIER FREQUENCYS

| Frequency Band | Channel Number | Frequency |
|-----------------------|-----------------------|------------------|
| 2400~2483.5MHZ | 1 | 2412 MHZ |
| | 2 | 2417 MHZ |
| | 3 | 2422 MHZ |
| | 4 | 2427 MHZ |
| | 5 | 2432 MHZ |
| | 6 | 2437 MHZ |
| | 7 | 2442 MHZ |
| | 8 | 2447 MHZ |
| | 9 | 2452 MHZ |
| | 10 | 2457 MHZ |
| | 11 | 2462 MHZ |

Note: For 20MHZ bandwidth system use Channel 1 to Channel 11

For 802.11n 40MHZ bandwidth system use Channel 3 to Channel 9.



1.3. IEEE 802.11N MODULATION SCHEME

| MCS Index | Nss | Modulation | R | NBPSC | NCBPS | | NDBPS | | Data rate(Mbps) | |
|-----------|-----|------------|-----|-------|-------|-------|-------|-------|-----------------|-------|
| | | | | | 20MHz | 40MHz | 20MHz | 40MHz | 20MHz | 40MHz |
| 0 | 1 | BPSK | 1/2 | 1 | 52 | 108 | 26 | 54 | 6.5 | 13.5 |
| 1 | 1 | QPSK | 1/2 | 2 | 104 | 216 | 52 | 108 | 13.0 | 27.0 |
| 2 | 1 | QPSK | 3/4 | 2 | 104 | 216 | 78 | 162 | 19.5 | 40.5 |
| 3 | 1 | 16-QAM | 1/2 | 4 | 208 | 432 | 104 | 216 | 26.0 | 54.0 |
| 4 | 1 | 16-QAM | 3/4 | 4 | 208 | 432 | 156 | 324 | 39.0 | 81.0 |
| 5 | 1 | 64-QAM | 2/3 | 6 | 312 | 648 | 208 | 432 | 52.0 | 108.0 |
| 6 | 1 | 64-QAM | 3/4 | 6 | 312 | 648 | 234 | 489 | 58.5 | 121.5 |
| 7 | 1 | 64-QAM | 5/6 | 6 | 312 | 648 | 260 | 540 | 65.0 | 135.0 |

| Symbol | Explanation |
|--------|-----------------------------------------|
| NSS | Number of spatial streams |
| R | Code rate |
| NBPSC | Number of coded bits per single carrier |
| NCBPS | Number of coded bits per symbol |
| NDBPS | Number of data bits per symbol |
| GI | Guard interval |

1.4. RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for FCC ID: 2ALAS-C2 filing to comply with the FCC Part 15 requirements.



1.5. TEST METHODOLOGY

Both conducted and radiated testing was performed according to the procedures in ANSI C63.10 (2013).

Radiated testing was performed at an antenna to EUT distance 3 meters.

Others testing (listed at item 5.3) was performed according to the procedures in FCC Part 15.247 rules KDB 558074 D01 DTS Meas Guidance v04.

1.6. SPECIAL ACCESSORIES

Refer to section 5.2.

1.7. EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.



2. MEASUREMENT UNCERTAINTY

| Test | Measurement Uncertainty | Notes |
|-----------------------------------------|-------------------------|-------|
| Transmitter power conducted | ±0.57 dB | (1) |
| Transmitter power Radiated | ±2.20 dB | (1) |
| Conducted spurious emission 9KHz-40 GHz | ±2.20 dB | (1) |
| Occupied Bandwidth | ±0.01ppm | (1) |
| Radiated Emission 30~1000MHz | ±4.10dB | (1) |
| Radiated Emission Above 1GHz | ±4.32dB | (1) |
| Conducted Disturbance 0.15~30MHz | ±3.20dB | (1) |

Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



3. DESCRIPTION OF TEST MODES

| NO. | TEST MODE DESCRIPTION |
|-----|-----------------------|
| 1 | Low channel TX |
| 2 | Middle channel TX |
| 3 | High channel TX |
| 4 | Normal operating |

Note:

Transmit by 802.11b with Date rate (1/2/5.5/11)

Transmit by 802.11g with Date rate (6/9/12/18/24/36/48/54)

Transmit by 802.11n (20MHz) with Date rate (6.5/13/19.5/26/39/52/58.5/65)

Transmit by 802.11n (40MHz) with Date rate (13.5/27/40.5/54/81/108/121.5/135)

Note:

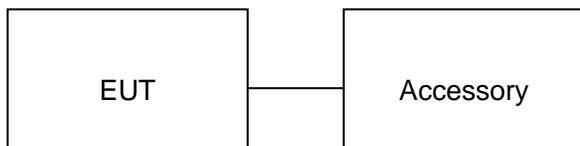
1. The EUT has been set to operate continuously on the lowest, middle and highest operation frequency individually, and the eut is operating at its maximum duty cycle>or equal 98%
2. All modes under which configure applicable have been tested and the worst mode test data recording in the test report, if no other mode data.
3. For Radiated Emission, 3axis were chosen for testing for each applicable mode.



4 SYSTEM TEST CONFIGURATION

4.1. CONFIGURATION OF EUT SYSTEM

Configure:



4.2. EQUIPMENT USED IN EUT SYSTEM

| Item | Equipment | Model No. | ID or Specification | Remark |
|------|-------------|-----------|---------------------|-----------|
| 1 | Smart Phone | Cirrus C2 | 2ALAS-C2 | EUT |
| 2 | Battery | Cirrus C2 | DC 3.8V/2100mAh | Accessory |
| 3 | USB | N/A | N/A | Accessory |

Note: All the accessories have been used during the test in conduction emission test.

4.3. SUMMARY OF TEST RESULTS

| FCC RULES | DESCRIPTION OF TEST | RESULT |
|-----------|-------------------------------------------------|-----------|
| §15.247 | Output Power | Compliant |
| §15.247 | 6 dB Bandwidth | Compliant |
| §15.247 | Conducted Spurious Emission | Compliant |
| §15.247 | Maximum Conducted Output Power SPECTRAL Density | Compliant |
| §15.209 | Radiated Emission | Compliant |
| §15.247 | Band Edges | Compliant |
| §15.207 | Line Conduction Emission | Compliant |



5. TEST FACILITY

| | |
|----------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| Site | Shenzhen HUAK Testing Technology Co., Ltd. |
| Location | 1F, B2 Building, Junfeng Zhongcheng Zhizao Innovation Park, Fuhai Street, Bao'an District, Shenzhen City, China |
| Designation Number | CN1229 |
| Test Firm Registration Number : 616276 | |

ALL TEST EQUIPMENT LIST

| RF Test Room | | | | |
|----------------------------|--------------|--------------------|---------------|-----------------|
| Equipment | Manufacturer | Model | Serial Number | Calibration Due |
| Power Sensor | Agilent | E9327A | HKE-113 | Dec. 28, 2018 |
| RF cable | Times | 1-40G | HKE-034 | Dec. 28, 2018 |
| RF automatic control unit | Tonscend | JS0806-2 | HKE-060 | Dec. 28, 2018 |
| Spectrum analyzer | Agilent | N9020A | HKE-048 | Dec. 28, 2018 |
| RF Cable (9KHz-26.5GHz) | Tonscend | 170660 | N/A | Dec. 28, 2018 |
| Signal generator | Agilent | N5183A | HKE-071 | Dec. 28, 2018 |
| Receiver | R&S | ESCI-7 | HKE-010 | Dec. 28, 2018 |
| Spectrum analyzer | Agilent | N9020A | HKE-048 | Dec. 28, 2018 |
| Preamplifier | EMCI | EMC051845SE | HKE-015 | Dec. 28, 2018 |
| Preamplifier | Agilent | 83051A | HKE-016 | Dec. 28, 2018 |
| Loop antenna | Schwarzbeck | FMZB 1519 B | HKE-014 | Dec. 28, 2018 |
| Broadband antenna | Schwarzbeck | VULB 9163 | HKE-012 | Dec. 28, 2018 |
| Horn antenna | Schwarzbeck | 9120D | HKE-013 | Dec. 28, 2018 |
| Antenna Mast | Keleto | CC-A-4M | N/A | N/A |
| Position controller | Taiwan MF | MF7802 | HKE-011 | Dec. 28, 2018 |
| Radiated test software | Tonscend | TS+ Rev 2.5.0.0 | HKE-082 | N/A |
| RF cable (9KHz-1GHz) | Times | 381806-001 | N/A | N/A |
| RF cable | Times | 1-40G | HKE-034 | Dec. 28, 2018 |



6. OUTPUT POWER

7.1. MEASUREMENT PROCEDURE

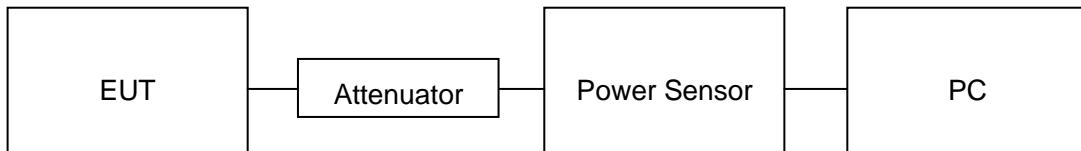
For max average conducted output power test:

1. Connect EUT RF output port to power probe through an RF attenuator.
2. Connect the power probe to the PC.
3. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
4. Record the maximum power from the software.

Note : The EUT was tested according to KDB 558074 for compliance to FCC 47CFR 15.247 requirements.

6.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

AVERAGE POWER SETUP





6.3. LIMITS AND MEASUREMENT RESULT

| | | | |
|-----------|--------------------------|--|--|
| TEST ITEM | OUTPUT POWER | | |
| TEST MODE | 802.11b with data rate 1 | | |

| Frequency (GHz) | Average Power (dBm) | Applicable Limits (dBm) | Pass or Fail |
|--------------------|------------------------|----------------------------|--------------|
| 2.412 | 15.69 | 30 | Pass |
| 2.437 | 15.70 | 30 | Pass |
| 2.462 | 15.61 | 30 | Pass |

| | | | |
|-----------|--------------------------|--|--|
| TEST ITEM | OUTPUT POWER | | |
| TEST MODE | 802.11g with data rate 6 | | |

| Frequency (GHz) | Average Power (dBm) | Applicable Limits (dBm) | Pass or Fail |
|--------------------|------------------------|----------------------------|--------------|
| 2.412 | 11.95 | 30 | Pass |
| 2.437 | 13.77 | 30 | Pass |
| 2.462 | 13.76 | 30 | Pass |

| | | | |
|-----------|-------------------------------|--|--|
| TEST ITEM | OUTPUT POWER | | |
| TEST MODE | 802.11n 20 with data rate 6.5 | | |

| Frequency (GHz) | Average Power (dBm) | Applicable Limits (dBm) | Pass or Fail |
|--------------------|------------------------|----------------------------|--------------|
| 2.412 | 11.84 | 30 | Pass |
| 2.437 | 13.74 | 30 | Pass |
| 2.462 | 13.64 | 30 | Pass |



| | |
|-----------|--------------------------------|
| TEST ITEM | OUTPUT POWER |
| TEST MODE | 802.11n 40 with data rate 13.5 |

| Frequency (GHz) | Average Power (dBm) | Applicable Limits (dBm) | Pass or Fail |
|--------------------|------------------------|----------------------------|--------------|
| 2.422 | 13.09 | 30 | Pass |
| 2.437 | 13.29 | 30 | Pass |
| 2.452 | 13.11 | 30 | Pass |



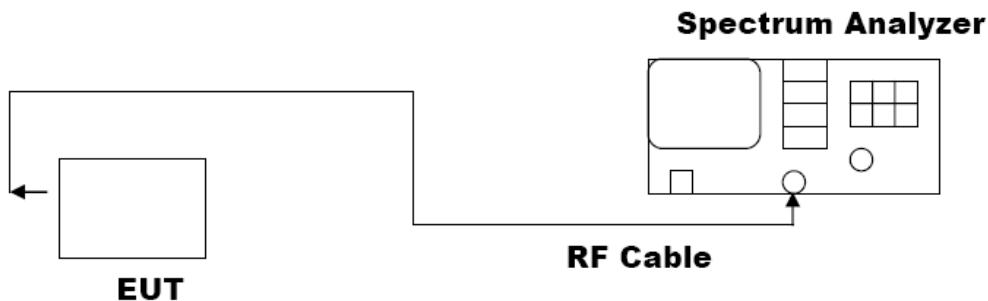
7. 6dB BANDWIDTH

7.1. MEASUREMENT PROCEDURE

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
3. Set SPA Centre Frequency = Operation Frequency, RBW= 100 KHz, VBW \geqslant 3 \times RBW.
4. Set SPA Trace 1 Max hold, then View.

Note: The EUT was tested according to KDB 558074 for compliance to FCC 47CFR 15.247 requirements.

7.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



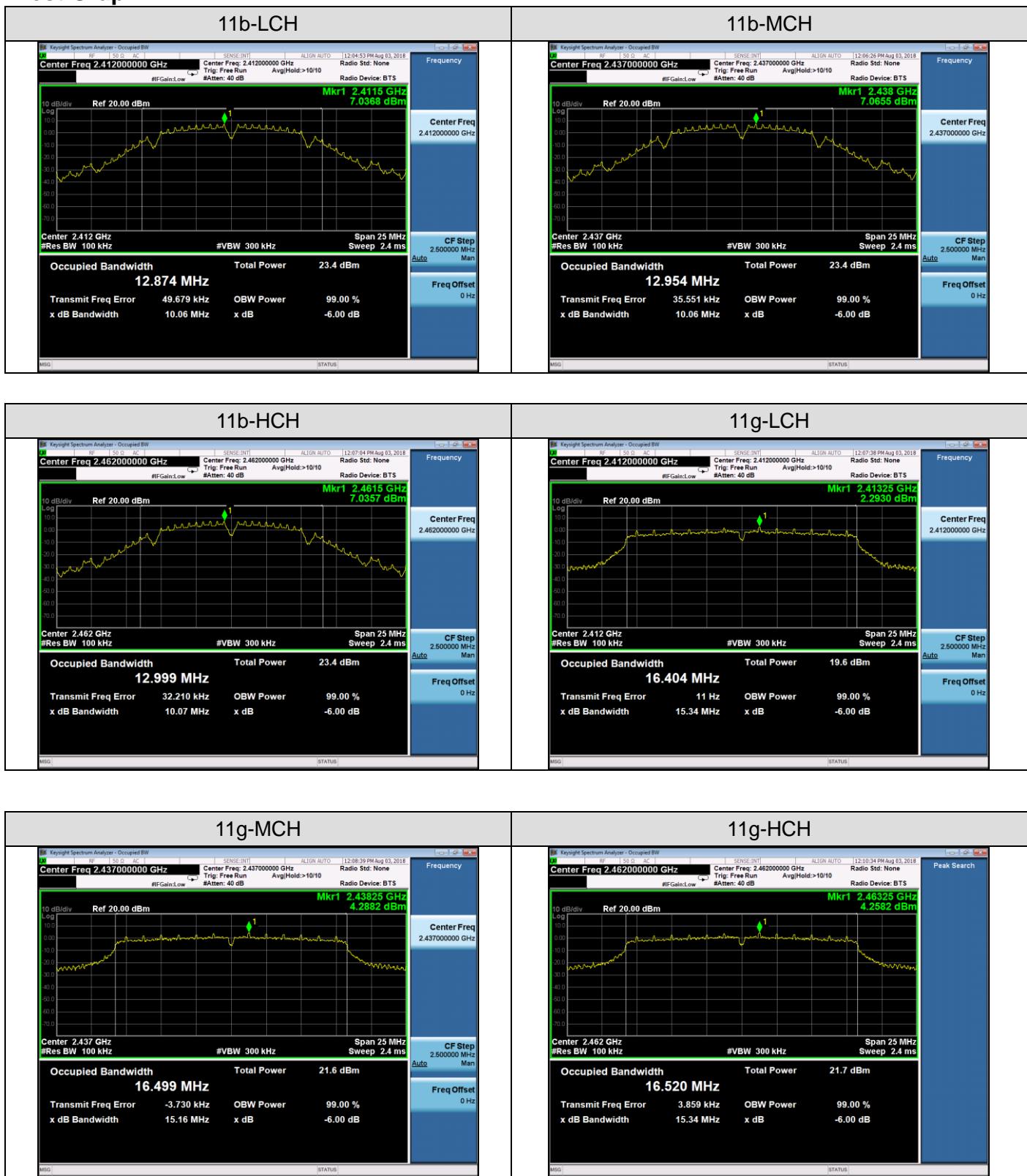


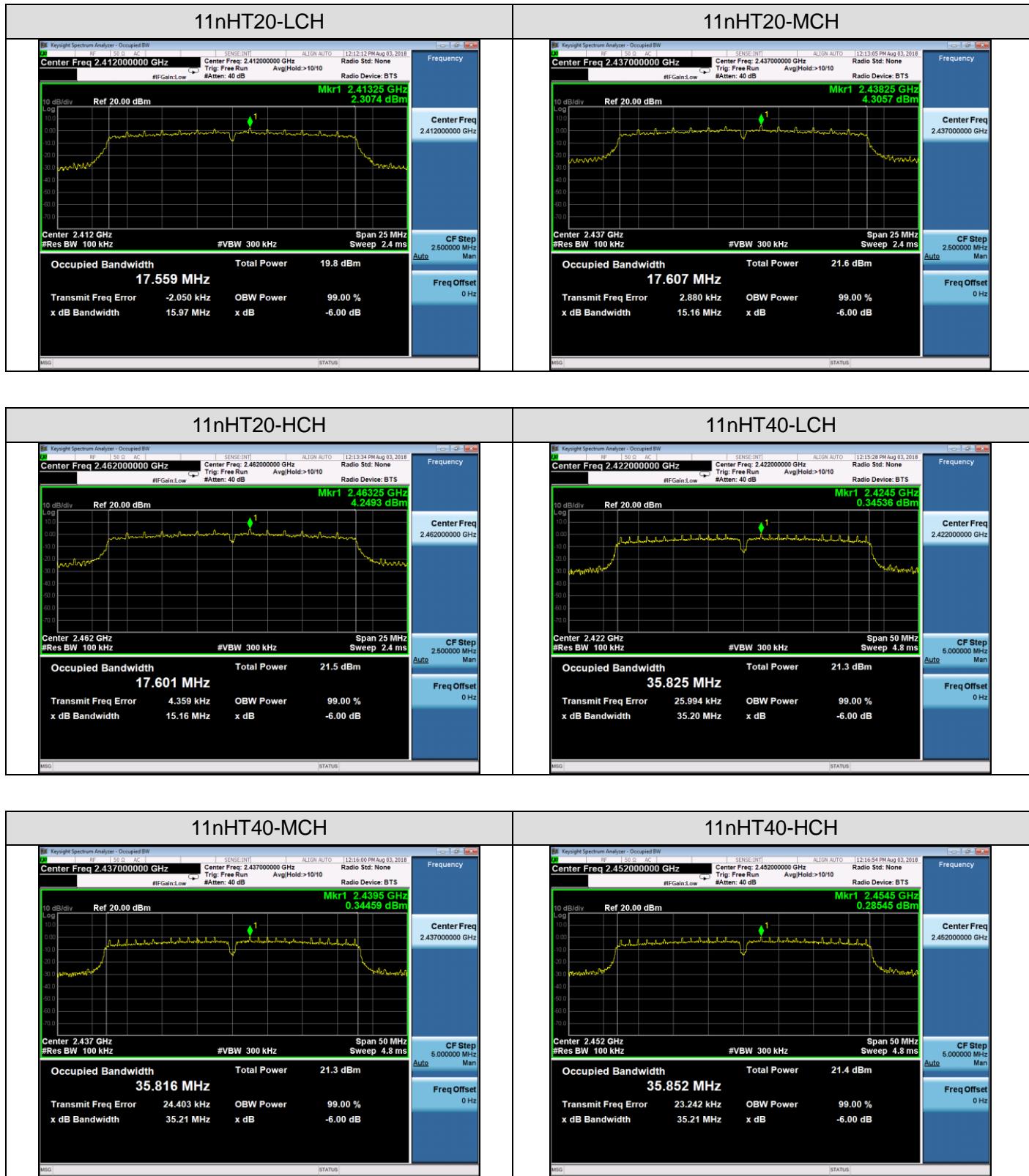
8.3. LIMITS AND MEASUREMENT RESULTS

| Mode | Channel | 6dB Bandwidth [MHz] | Verdict |
|---------|---------|---------------------|---------|
| 11b | LCH | 10.06 | PASS |
| | MCH | 10.06 | PASS |
| | HCH | 10.07 | PASS |
| 11g | LCH | 15.34 | PASS |
| | MCH | 15.16 | PASS |
| | HCH | 15.34 | PASS |
| 11nHT20 | LCH | 15.97 | PASS |
| | MCH | 15.16 | PASS |
| | HCH | 15.16 | PASS |
| 11nHT40 | LCH | 35.20 | PASS |
| | MCH | 35.21 | PASS |
| | HCH | 35.21 | PASS |



Test Graph







9. CONDUCTED SPURIOUS EMISSION

9.1. MEASUREMENT PROCEDURE

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
3. Set SPA Trace 1 Max hold, then View.

Note: The EUT was tested according to KDB 558074 for compliance to FCC 47CFR 15.247 requirements.

Owing to satisfy the requirements of the number of measurement points, we set the RBW=1MHz, VBW>RBW, scan up through 10th harmonic, and consider the tested results as the worst case, if the tested results conform to the requirement, we can deem that the real tested results(set the RBW=100KHz, VBW>RBW) are conform to the requirement.

9.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

The same as described in section 8.2.

9.3. MEASUREMENT EQUIPMENT USED

The same as described in section 6.



9.4. LIMITS AND MEASUREMENT RESULT

| LIMITS AND MEASUREMENT RESULT | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|----------|
| Applicable Limits | Measurement Result | |
| | Test Data | Criteria |
| In any 100 KHz Bandwidth Outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in 100KHz bandwidth within the band that contains the highest level of the desired power. In addition, radiation 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)) | At least -20dBc than the limit Specified on the BOTTOM Channel | PASS |
| | At least -20dBc than the limit Specified on the TOP Channel | PASS |

**Test Graph**

