

## 8. BANDWIDTH

### 8.1 LIMIT

According to FCC section 2.1049, OBW and EBW no limit.

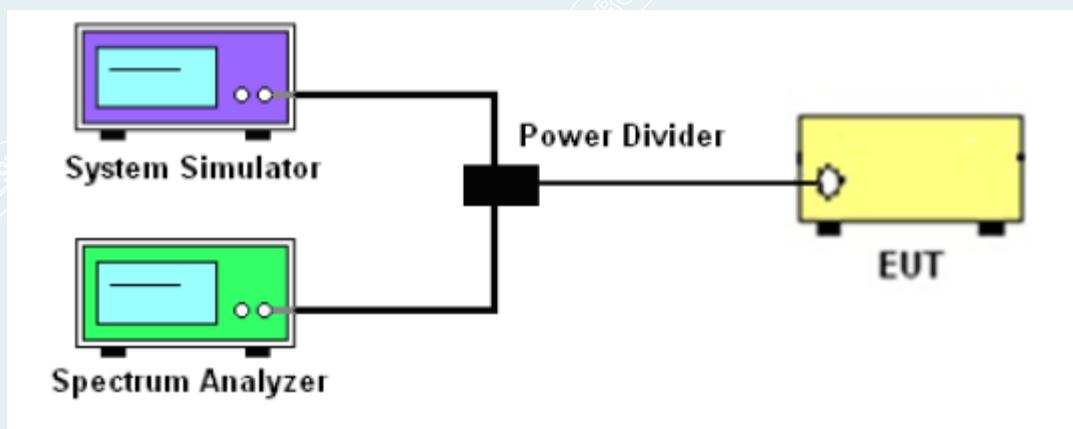
### 8.2 TEST PROCEDURES

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured. The transmitter output was connected to a calibrated coaxial cable, attenuator and Spectrum analyser, the other end of which was connected to a Base Station Simulator. The Base Station Simulator was set to force the EUT to its maximum power setting. The tests were performed at three frequencies (low channel, middle channel and high channel). The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set to as close to 1 percent of the selected span as is possible without being below 1 percent. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used since a peak or, peak hold, may produce a wider bandwidth than actual. The trace data points are recovered and are directly summed in linear terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 percent of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points. This frequency is recorded. The span between the two recorded frequencies is the occupied bandwidth.

#### Test Settings

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth and the 26dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW=1-5% of the expected OBW
3. VBW $\geq$ 3 $\times$ RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. The trace was allowed to stabilize
8. If necessary, steps 2 – 7 were repeated after changing the RBW such that it would be within 1- 5% of the 99% occupied bandwidth observed in Step 7

### 8.3 TEST SETUP

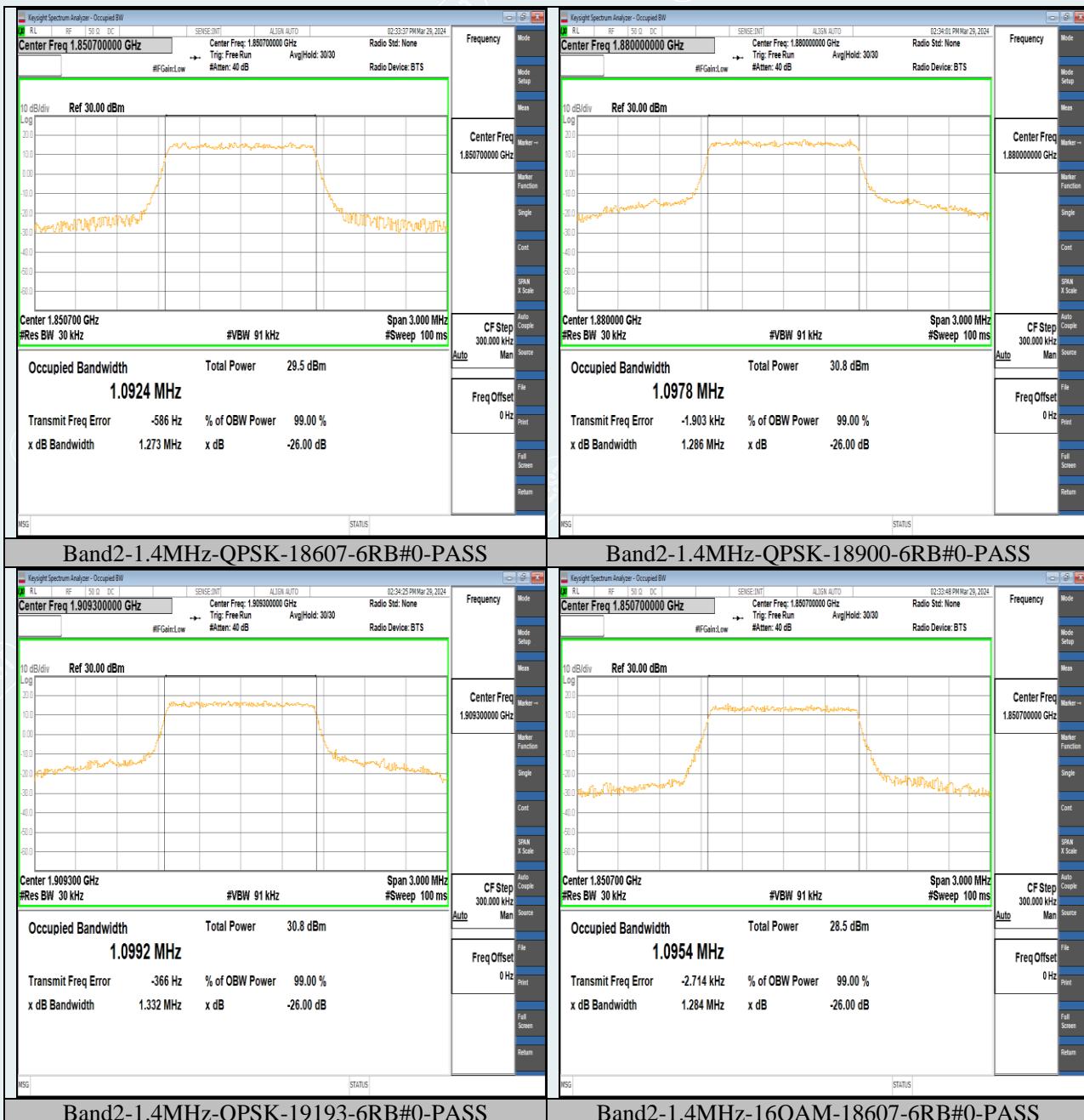


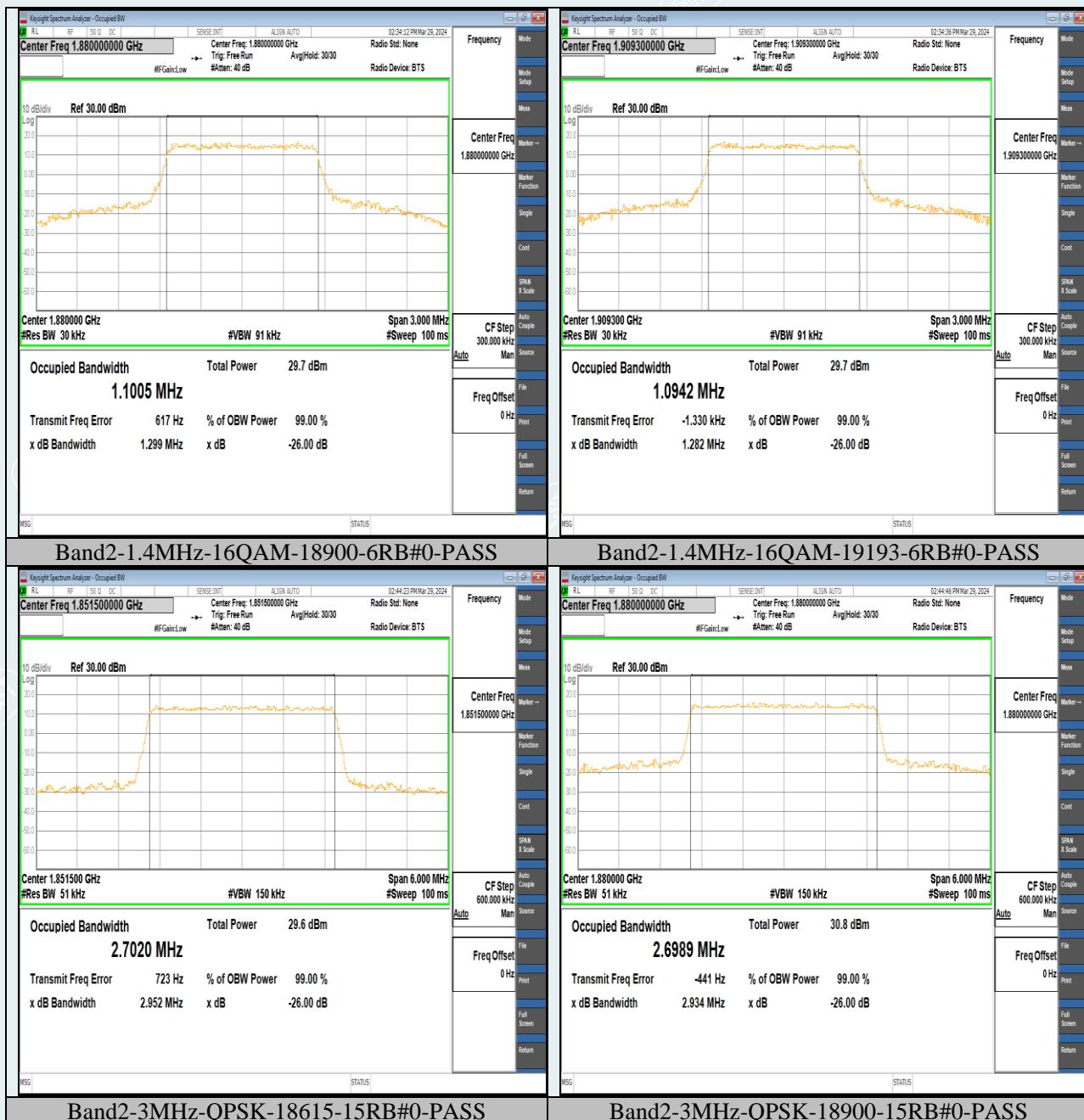
## 8.4 TEST RESULTS

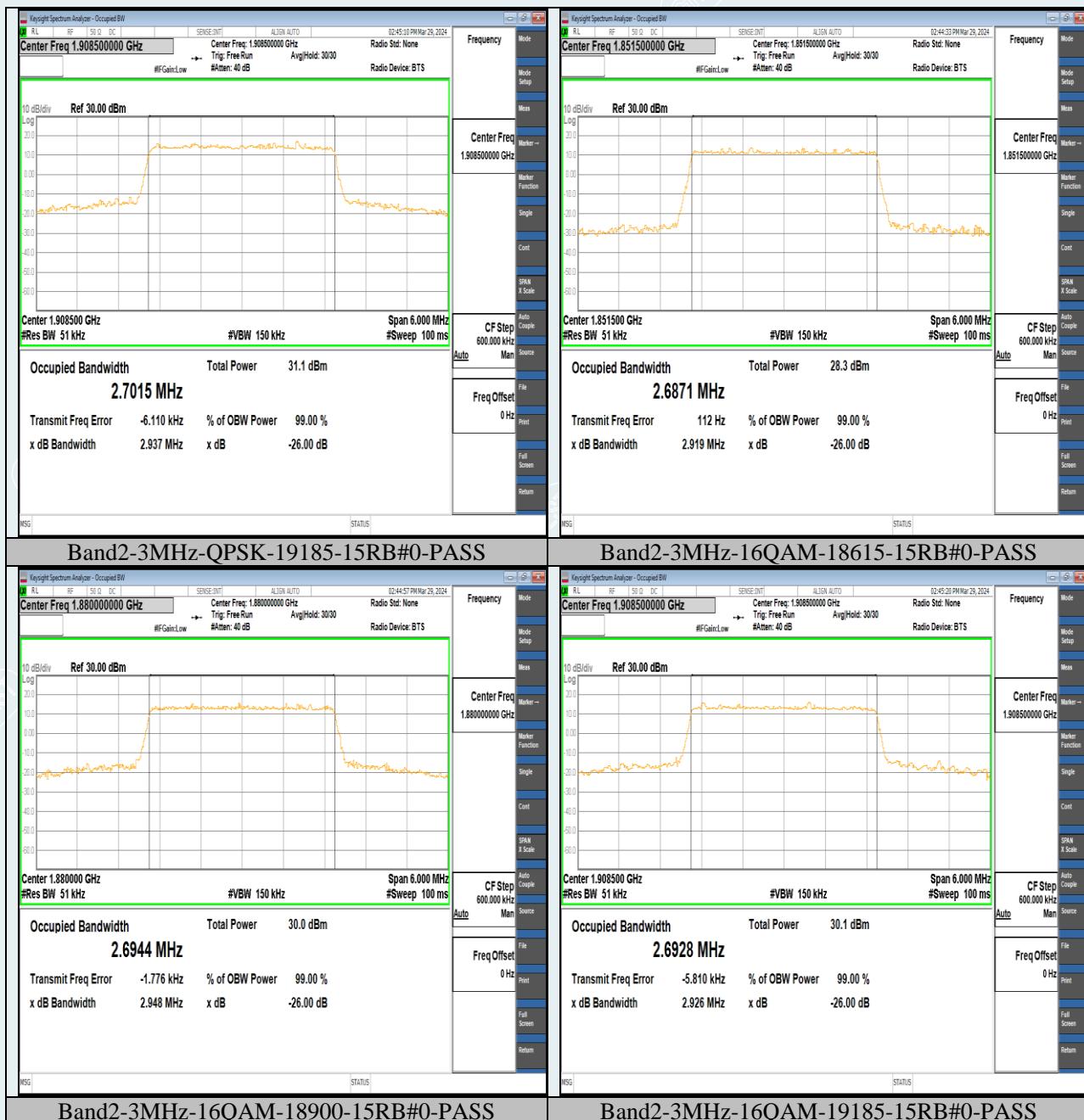
|              |                          |  |                          |                        |
|--------------|--------------------------|--|--------------------------|------------------------|
| EUT Name     | Pet Tracker              |  | Model                    | M200d                  |
| Sample No.   | E202403143863-0002       |  | Test Mode                | LTE                    |
| Power supply | DC 3.85V                 |  | Environmental Conditions | Temp:25.8°C;Humi:45%RH |
| Test Date    | 2024-03-27 to 2024-03-30 |  | Test Site                | /                      |
| Tested By    | Zhu rongting             |  | Reviewed by              | Zhao Zetian            |

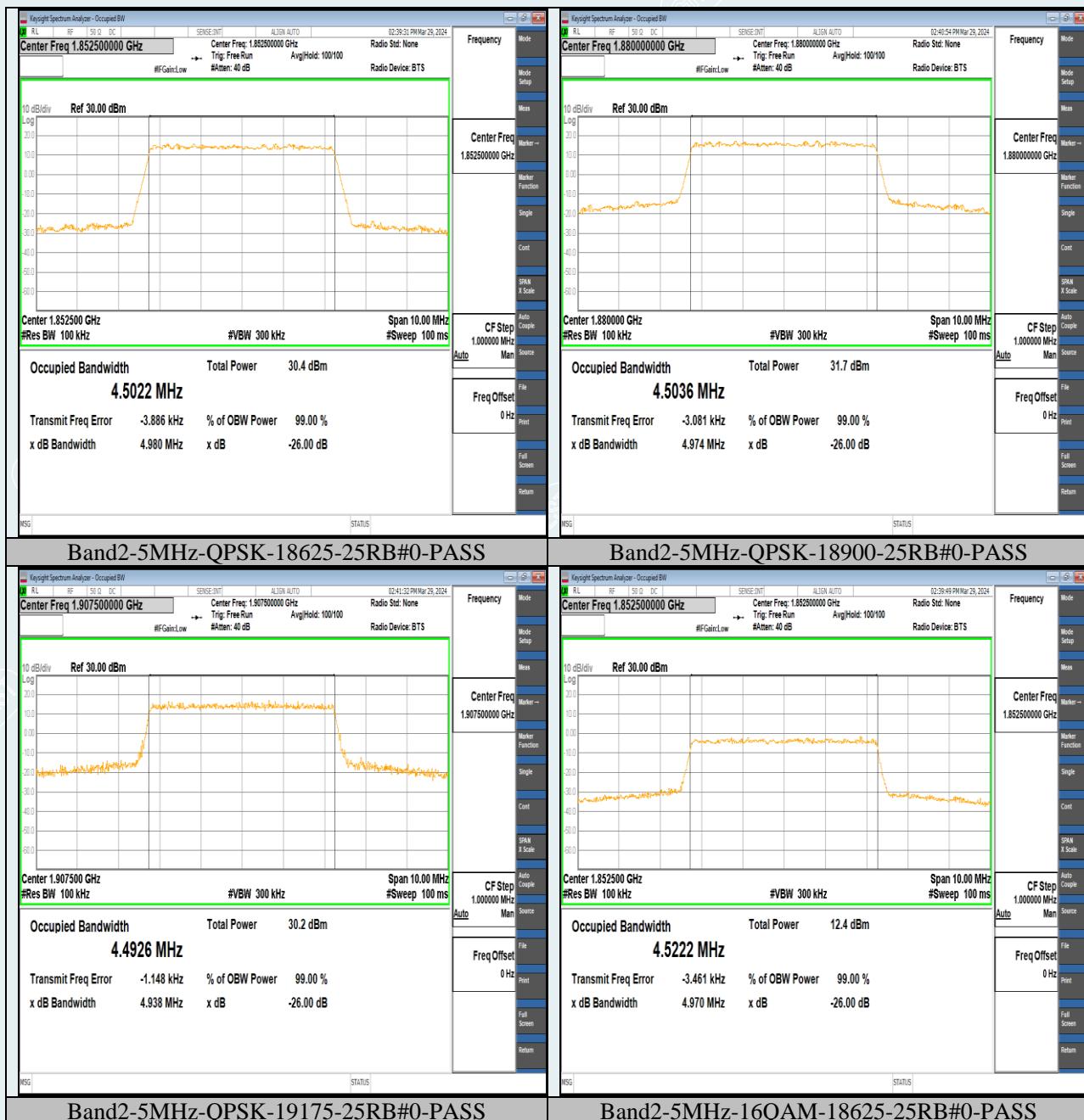
| Band  | Bandwidth | Modulation | Channel | RB Configuration | Occupied Bandwidth (MHz) | 26dB Bandwidth (MHz) | Verdict |
|-------|-----------|------------|---------|------------------|--------------------------|----------------------|---------|
| Band2 | 1.4MHz    | QPSK       | 18607   | 6RB#0            | 1.0924                   | 1.273                | PASS    |
| Band2 | 1.4MHz    | QPSK       | 18900   | 6RB#0            | 1.0978                   | 1.286                | PASS    |
| Band2 | 1.4MHz    | QPSK       | 19193   | 6RB#0            | 1.0992                   | 1.332                | PASS    |
| Band2 | 1.4MHz    | 16QAM      | 18607   | 6RB#0            | 1.0954                   | 1.284                | PASS    |
| Band2 | 1.4MHz    | 16QAM      | 18900   | 6RB#0            | 1.1005                   | 1.299                | PASS    |
| Band2 | 1.4MHz    | 16QAM      | 19193   | 6RB#0            | 1.0942                   | 1.282                | PASS    |
| Band2 | 3MHz      | QPSK       | 18615   | 15RB#0           | 2.7020                   | 2.952                | PASS    |
| Band2 | 3MHz      | QPSK       | 18900   | 15RB#0           | 2.6989                   | 2.934                | PASS    |
| Band2 | 3MHz      | QPSK       | 19185   | 15RB#0           | 2.7015                   | 2.937                | PASS    |
| Band2 | 3MHz      | 16QAM      | 18615   | 15RB#0           | 2.6871                   | 2.919                | PASS    |
| Band2 | 3MHz      | 16QAM      | 18900   | 15RB#0           | 2.6944                   | 2.948                | PASS    |
| Band2 | 3MHz      | 16QAM      | 19185   | 15RB#0           | 2.6928                   | 2.926                | PASS    |
| Band2 | 5MHz      | QPSK       | 18625   | 25RB#0           | 4.5022                   | 4.980                | PASS    |
| Band2 | 5MHz      | QPSK       | 18900   | 25RB#0           | 4.5036                   | 4.974                | PASS    |
| Band2 | 5MHz      | QPSK       | 19175   | 25RB#0           | 4.4926                   | 4.938                | PASS    |
| Band2 | 5MHz      | 16QAM      | 18625   | 25RB#0           | 4.5222                   | 4.970                | PASS    |
| Band2 | 5MHz      | 16QAM      | 18900   | 25RB#0           | 4.5002                   | 4.955                | PASS    |
| Band2 | 5MHz      | 16QAM      | 19175   | 25RB#0           | 4.5014                   | 4.975                | PASS    |
| Band2 | 10MHz     | QPSK       | 18650   | 50RB#0           | 8.9724                   | 9.746                | PASS    |
| Band2 | 10MHz     | QPSK       | 18900   | 50RB#0           | 8.9743                   | 9.750                | PASS    |
| Band2 | 10MHz     | QPSK       | 19150   | 50RB#0           | 8.9650                   | 9.808                | PASS    |
| Band2 | 15MHz     | QPSK       | 18675   | 75RB#0           | 13.450                   | 14.66                | PASS    |
| Band2 | 15MHz     | QPSK       | 18900   | 75RB#0           | 13.418                   | 14.50                | PASS    |
| Band2 | 15MHz     | QPSK       | 19125   | 75RB#0           | 13.470                   | 14.61                | PASS    |
| Band2 | 20MHz     | QPSK       | 18700   | 100RB#0          | 17.934                   | 19.13                | PASS    |
| Band2 | 20MHz     | QPSK       | 18900   | 100RB#0          | 17.906                   | 19.19                | PASS    |
| Band2 | 20MHz     | QPSK       | 19100   | 100RB#0          | 17.915                   | 19.15                | PASS    |

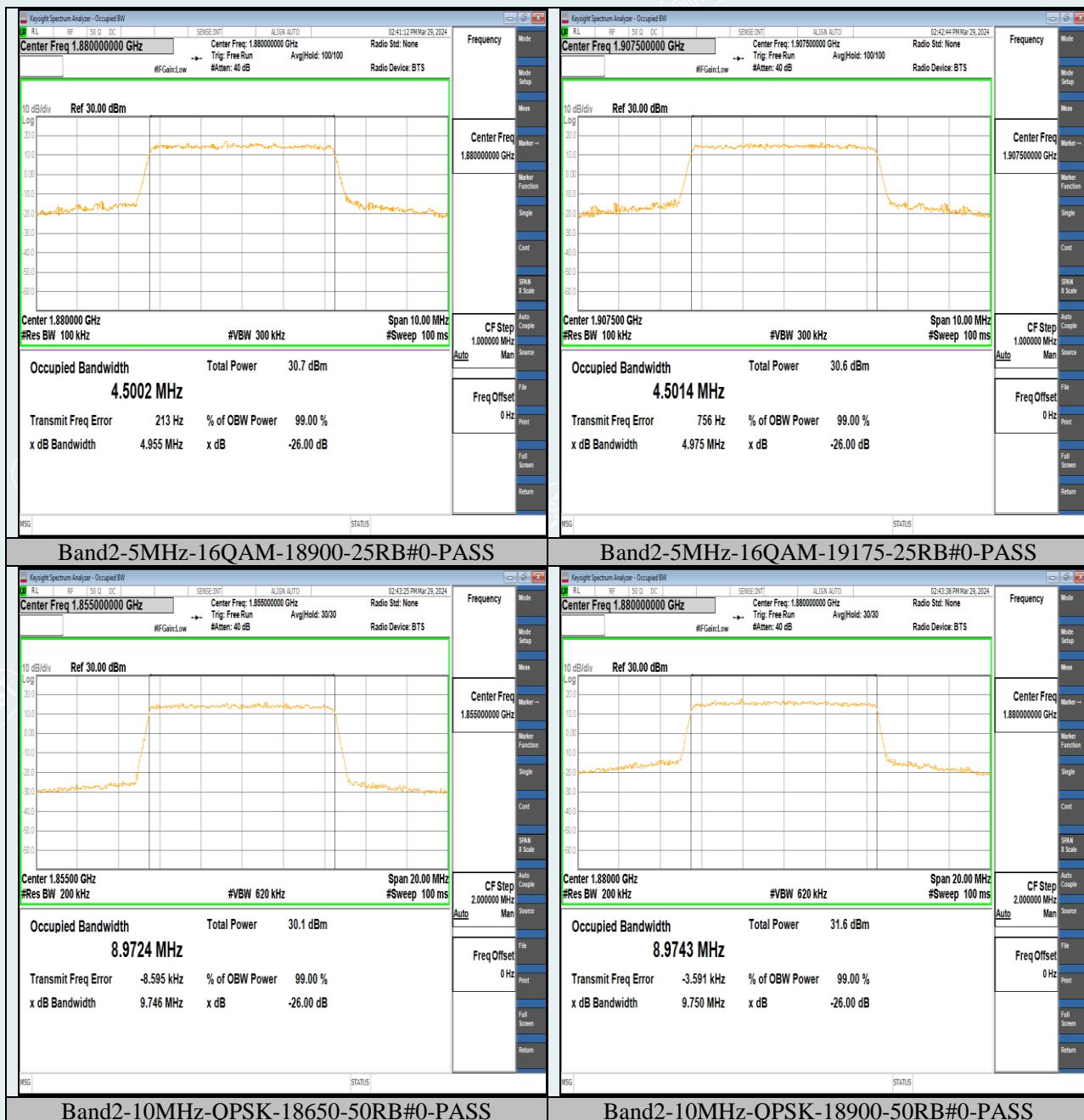
Note: For 10MHz, 15MHz, 20MHz bandwidth support QPSK only.

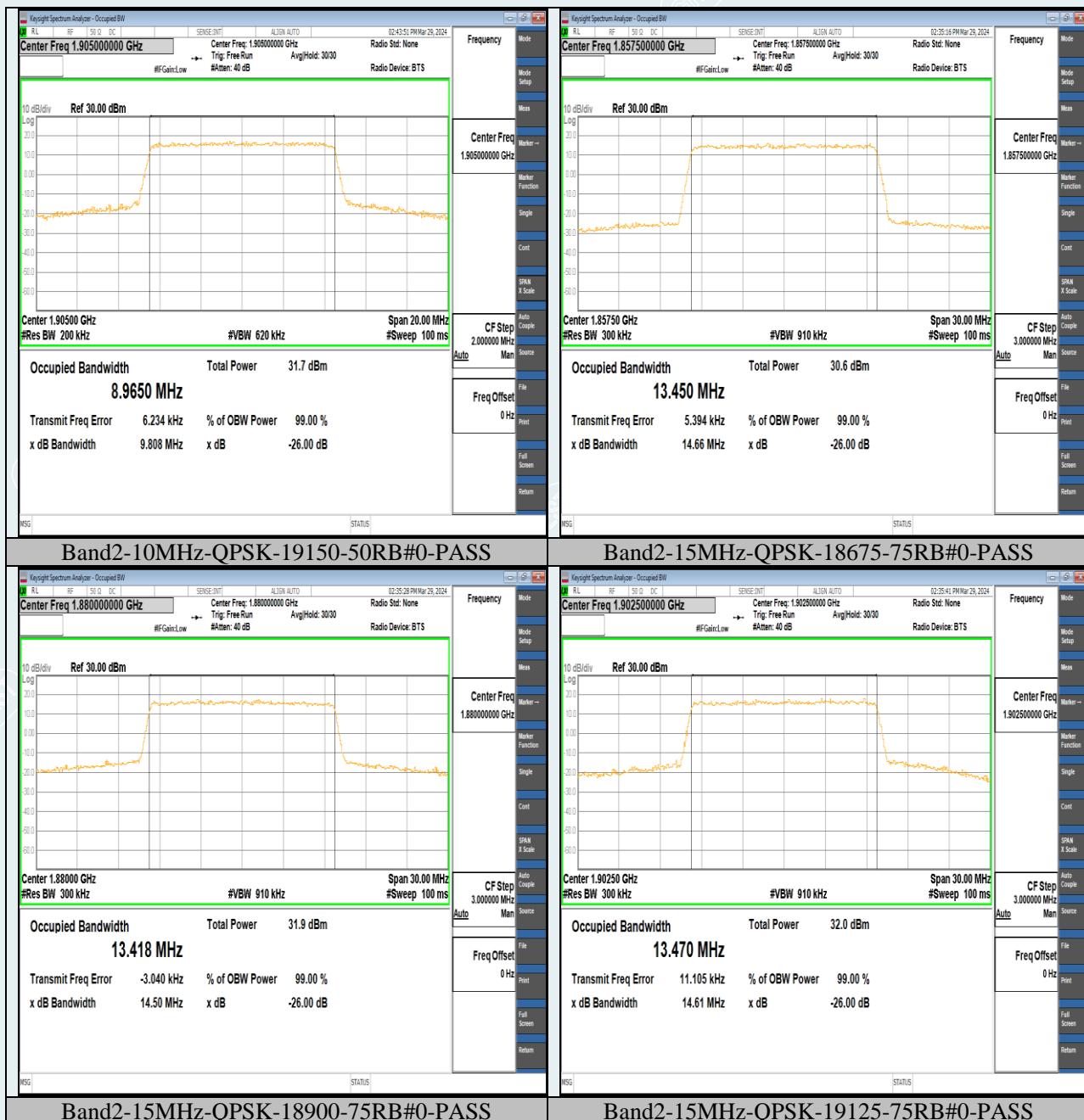


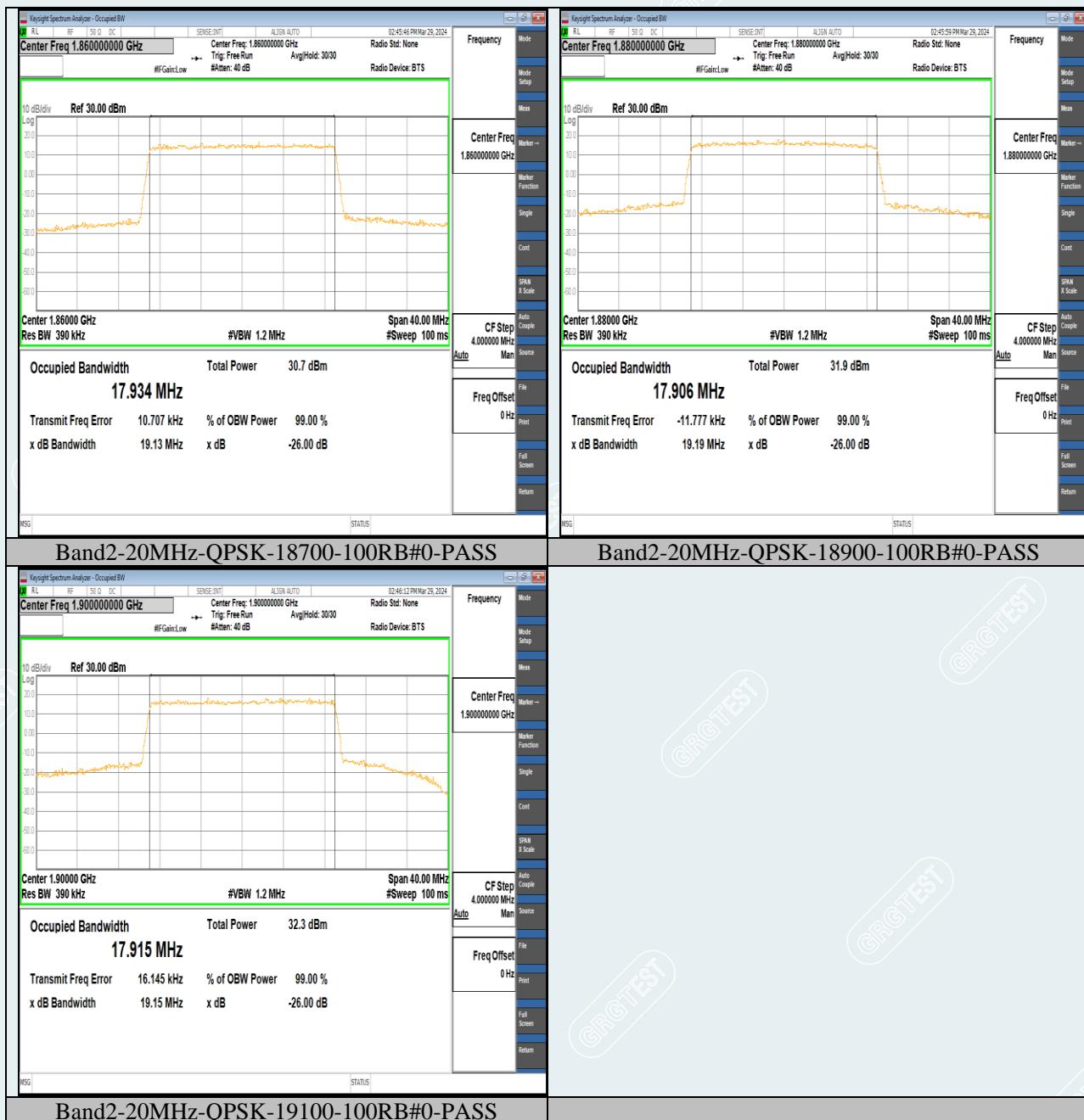












## 9. BAND EDGES COMPLIANCE

### 9.1 LIMIT

According to FCC section 24.238(a)(b), 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.

### 9.2 TEST PROCEDURES

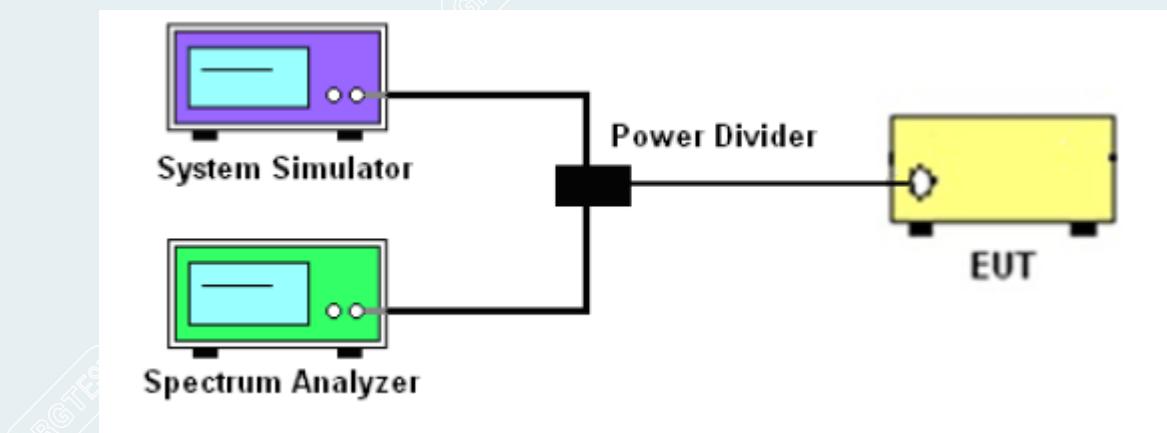
Measurement Procedure: FCC KDB 971168 D01 V03r01 Section 6

The transmitter output was connected to a calibrated coaxial cable, attenuator and Spectrum analyser, the other end of which was connected to a Base Station Simulator. The Base Station Simulator was set to force the EUT to its maximum power setting. The tests were performed at two frequencies (low channel and high channel).in the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of 100kHz or 1% of the emission bandwidth of the fundamental emission of the transmitter may be employed. The EUT emission bandwidth is measured as the width of the signal between two points, outside of which all emission are attenuated at least 26dB below the transmitter power. The video bandwidth of the spectrum analyzer was set at thrice the resolution bandwidth. Detector Mode was set to peak or peak hold power.

#### Test Settings

1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW  $\geq 1\%$  of the emission bandwidth
4. VBW  $\geq 3 \times$  RBW
5. Detector = RMS
6. Number of sweep points  $\geq 2 \times$  Span/RBW
7. Trace mode = trace average for continuous emissions, max hold for pulse emissions
8. Sweep time = auto couple
9. The trace was allowed to stabilize

### 9.3 TEST SETUP



## 9.4 TEST RESULTS

|              |                          |  |                          |                        |  |
|--------------|--------------------------|--|--------------------------|------------------------|--|
| EUT Name     | Pet Tracker              |  | Model                    | M200d                  |  |
| Sample No.   | E202403143863-0002       |  | Test Mode                | LTE                    |  |
| Power supply | DC 3.85V                 |  | Environmental Conditions | Temp:25.8°C;Humi:45%RH |  |
| Test Date    | 2024-03-27 to 2024-03-30 |  | Test Site                | /                      |  |
| Tested By    | Zhu rongting             |  | Reviewed by              | Zhao Zetian            |  |

| Band  | Bandwidth | Modulation | Channel | RB Configuration | Result(dBm) | Verdict |
|-------|-----------|------------|---------|------------------|-------------|---------|
| Band2 | 1.4MHz    | QPSK       | 18607   | 1RB#0            | -25.28      | PASS    |
| Band2 | 1.4MHz    | QPSK       | 18607   | 1RB#5            | -52.38      | PASS    |
| Band2 | 1.4MHz    | QPSK       | 18607   | 6RB#0            | -44.64      | PASS    |
| Band2 | 1.4MHz    | QPSK       | 19193   | 1RB#0            | -51.87      | PASS    |
| Band2 | 1.4MHz    | QPSK       | 19193   | 1RB#5            | -20.17      | PASS    |
| Band2 | 1.4MHz    | QPSK       | 19193   | 6RB#0            | -22.97      | PASS    |
| Band2 | 1.4MHz    | 16QAM      | 18607   | 1RB#0            | -26.13      | PASS    |
| Band2 | 1.4MHz    | 16QAM      | 18607   | 1RB#5            | -52.41      | PASS    |
| Band2 | 1.4MHz    | 16QAM      | 18607   | 6RB#0            | -45.74      | PASS    |
| Band2 | 1.4MHz    | 16QAM      | 19193   | 1RB#0            | -51.82      | PASS    |
| Band2 | 1.4MHz    | 16QAM      | 19193   | 1RB#5            | -22.05      | PASS    |
| Band2 | 1.4MHz    | 16QAM      | 19193   | 6RB#0            | -25.58      | PASS    |
| Band2 | 3MHz      | QPSK       | 18615   | 1RB#0            | -19.50      | PASS    |
| Band2 | 3MHz      | QPSK       | 18615   | 1RB#14           | -36.84      | PASS    |
| Band2 | 3MHz      | QPSK       | 18615   | 15RB#0           | -39.43      | PASS    |
| Band2 | 3MHz      | QPSK       | 19185   | 1RB#0            | -37.27      | PASS    |
| Band2 | 3MHz      | QPSK       | 19185   | 1RB#14           | -16.94      | PASS    |
| Band2 | 3MHz      | QPSK       | 19185   | 15RB#0           | -28.81      | PASS    |
| Band2 | 3MHz      | 16QAM      | 18615   | 1RB#0            | -22.19      | PASS    |
| Band2 | 3MHz      | 16QAM      | 18615   | 1RB#14           | -38.67      | PASS    |
| Band2 | 3MHz      | 16QAM      | 18615   | 15RB#0           | -39.41      | PASS    |
| Band2 | 3MHz      | 16QAM      | 19185   | 1RB#0            | -38.42      | PASS    |
| Band2 | 3MHz      | 16QAM      | 19185   | 1RB#14           | -20.13      | PASS    |
| Band2 | 3MHz      | 16QAM      | 19185   | 15RB#0           | -31.87      | PASS    |
| Band2 | 5MHz      | QPSK       | 18625   | 1RB#0            | -20.17      | PASS    |
| Band2 | 5MHz      | QPSK       | 18625   | 1RB#24           | -45.94      | PASS    |
| Band2 | 5MHz      | QPSK       | 18625   | 25RB#0           | -39.28      | PASS    |
| Band2 | 5MHz      | QPSK       | 19175   | 1RB#0            | -42.46      | PASS    |
| Band2 | 5MHz      | QPSK       | 19175   | 1RB#24           | -16.14      | PASS    |
| Band2 | 5MHz      | QPSK       | 19175   | 25RB#0           | -27.53      | PASS    |
| Band2 | 5MHz      | 16QAM      | 18625   | 1RB#0            | -19.18      | PASS    |
| Band2 | 5MHz      | 16QAM      | 18625   | 1RB#24           | -46.79      | PASS    |
| Band2 | 5MHz      | 16QAM      | 18625   | 25RB#0           | -37.94      | PASS    |
| Band2 | 5MHz      | 16QAM      | 19175   | 1RB#0            | -41.98      | PASS    |
| Band2 | 5MHz      | 16QAM      | 19175   | 1RB#24           | -19.30      | PASS    |
| Band2 | 5MHz      | 16QAM      | 19175   | 25RB#0           | -30.13      | PASS    |
| Band2 | 10MHz     | QPSK       | 18650   | 1RB#0            | -23.19      | PASS    |
| Band2 | 10MHz     | QPSK       | 18650   | 1RB#49           | -50.53      | PASS    |
| Band2 | 10MHz     | QPSK       | 18650   | 50RB#0           | -38.61      | PASS    |
| Band2 | 10MHz     | QPSK       | 19150   | 1RB#0            | -49.34      | PASS    |
| Band2 | 10MHz     | QPSK       | 19150   | 1RB#49           | -21.00      | PASS    |
| Band2 | 10MHz     | QPSK       | 19150   | 50RB#0           | -30.52      | PASS    |
| Band2 | 10MHz     | 16QAM      | 18650   | 1RB#0            | -24.85      | PASS    |
| Band2 | 10MHz     | 16QAM      | 18650   | 1RB#49           | -51.31      | PASS    |
| Band2 | 10MHz     | 16QAM      | 19150   | 1RB#0            | -50.44      | PASS    |
| Band2 | 10MHz     | 16QAM      | 19150   | 1RB#49           | -24.02      | PASS    |

|       |       |       |       |         |        |      |
|-------|-------|-------|-------|---------|--------|------|
| Band2 | 15MHz | QPSK  | 18675 | 1RB#0   | -29.00 | PASS |
| Band2 | 15MHz | QPSK  | 18675 | 1RB#74  | -39.02 | PASS |
| Band2 | 15MHz | QPSK  | 18675 | 75RB#0  | -36.83 | PASS |
| Band2 | 15MHz | QPSK  | 19125 | 1RB#0   | -40.90 | PASS |
| Band2 | 15MHz | QPSK  | 19125 | 1RB#74  | -26.17 | PASS |
| Band2 | 15MHz | QPSK  | 19125 | 75RB#0  | -29.46 | PASS |
| Band2 | 15MHz | 16QAM | 18675 | 1RB#0   | -32.29 | PASS |
| Band2 | 15MHz | 16QAM | 18675 | 1RB#74  | -44.01 | PASS |
| Band2 | 15MHz | 16QAM | 19125 | 1RB#0   | -40.55 | PASS |
| Band2 | 15MHz | 16QAM | 19125 | 1RB#74  | -28.30 | PASS |
| Band2 | 20MHz | QPSK  | 18700 | 1RB#0   | -42.02 | PASS |
| Band2 | 20MHz | QPSK  | 18700 | 1RB#99  | -46.47 | PASS |
| Band2 | 20MHz | QPSK  | 18700 | 100RB#0 | -36.53 | PASS |
| Band2 | 20MHz | QPSK  | 19100 | 1RB#0   | -47.38 | PASS |
| Band2 | 20MHz | QPSK  | 19100 | 1RB#99  | -42.41 | PASS |
| Band2 | 20MHz | QPSK  | 19100 | 100RB#0 | -30.04 | PASS |
| Band2 | 20MHz | 16QAM | 18700 | 1RB#0   | -43.22 | PASS |
| Band2 | 20MHz | 16QAM | 18700 | 1RB#99  | -47.70 | PASS |
| Band2 | 20MHz | 16QAM | 19100 | 1RB#0   | -48.11 | PASS |
| Band2 | 20MHz | 16QAM | 19100 | 1RB#99  | -43.40 | PASS |

