

Appendix A

RF Test Data for BT LE (Conducted Measurement)

Product Name: TAG

Test Model: FTAG05B

Environmental Conditions

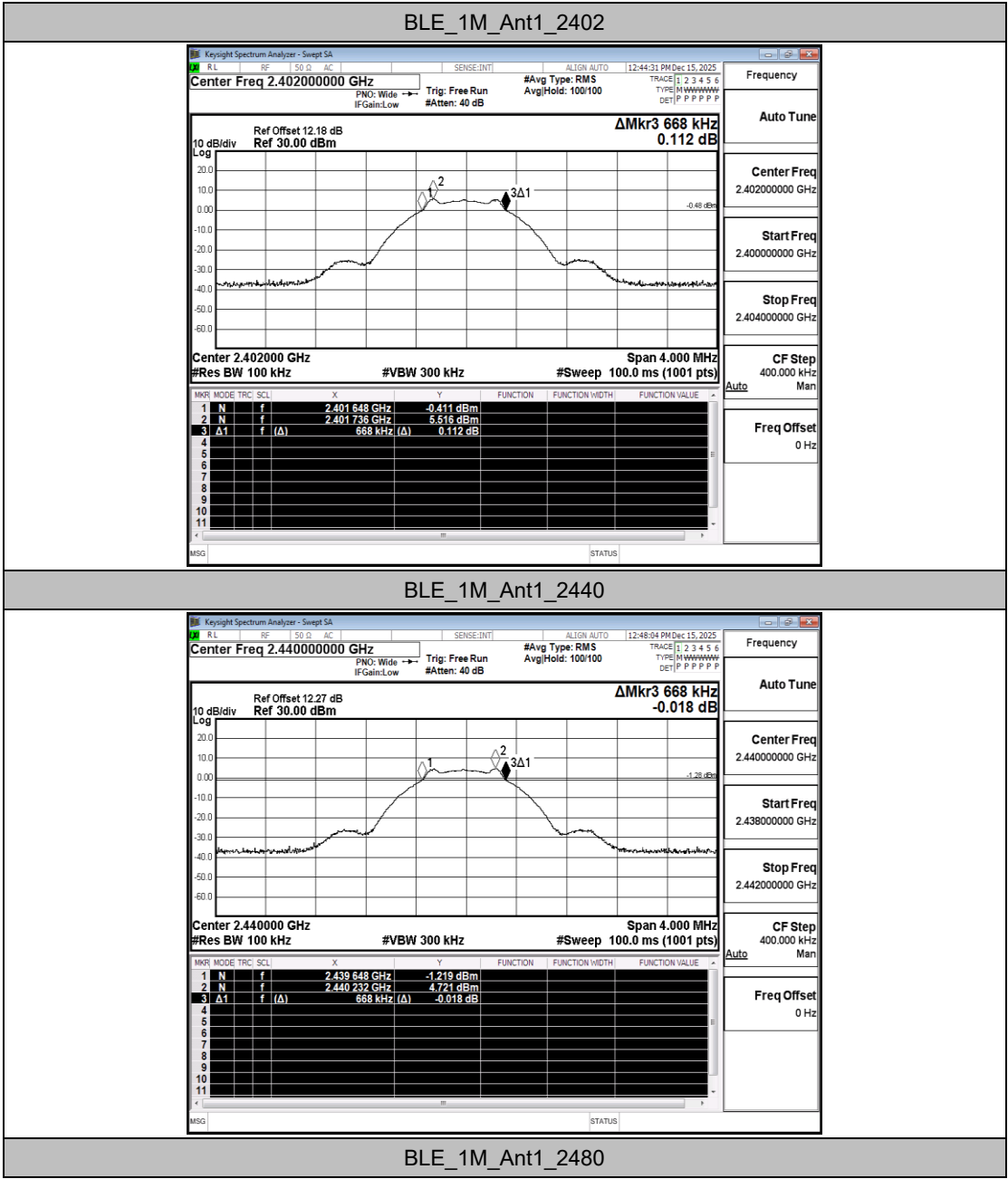
|                    |              |
|--------------------|--------------|
| Temperature:       | 23.8°C       |
| Relative Humidity: | 52.1%        |
| ATM Pressure:      | 100.0 kPa    |
| Test Engineer:     | Zhang hai    |
| Supervised by:     | Fengliu Tang |

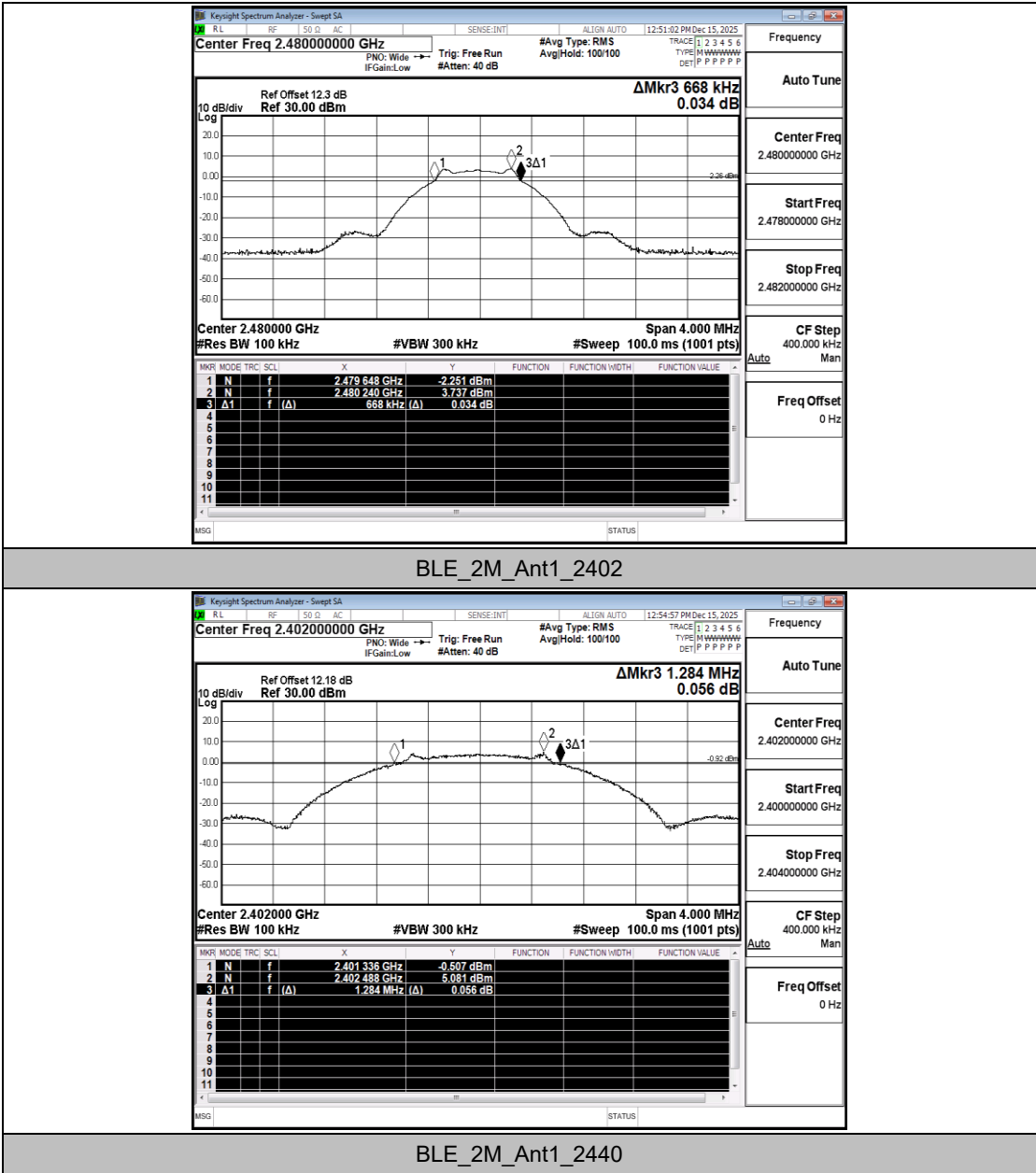
## A.1 DTS Bandwidth

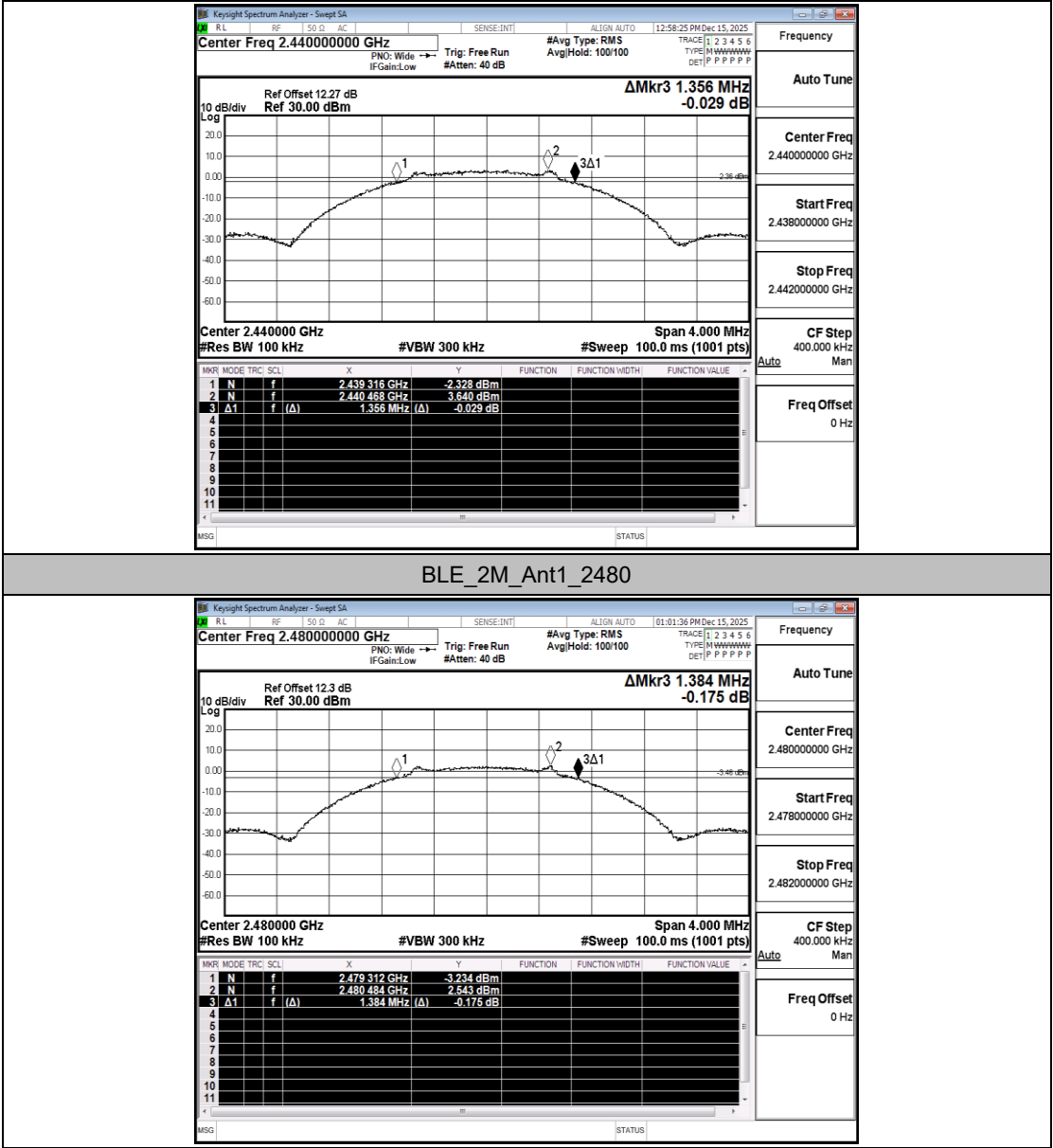
### Test Result

| TestMode | Antenna | Freq(MHz) | DTS BW [MHz] | FL[MHz]  | FH[MHz]  | Limit[MHz] | Verdict |
|----------|---------|-----------|--------------|----------|----------|------------|---------|
| BLE_1M   | Ant1    | 2402      | 0.668        | 2401.648 | 2402.316 | 0.5        | PASS    |
|          |         | 2440      | 0.668        | 2439.648 | 2440.316 | 0.5        | PASS    |
|          |         | 2480      | 0.668        | 2479.648 | 2480.316 | 0.5        | PASS    |
| BLE_2M   | Ant1    | 2402      | 1.284        | 2401.336 | 2402.620 | 0.5        | PASS    |
|          |         | 2440      | 1.356        | 2439.316 | 2440.672 | 0.5        | PASS    |
|          |         | 2480      | 1.384        | 2479.312 | 2480.696 | 0.5        | PASS    |

Test Graphs





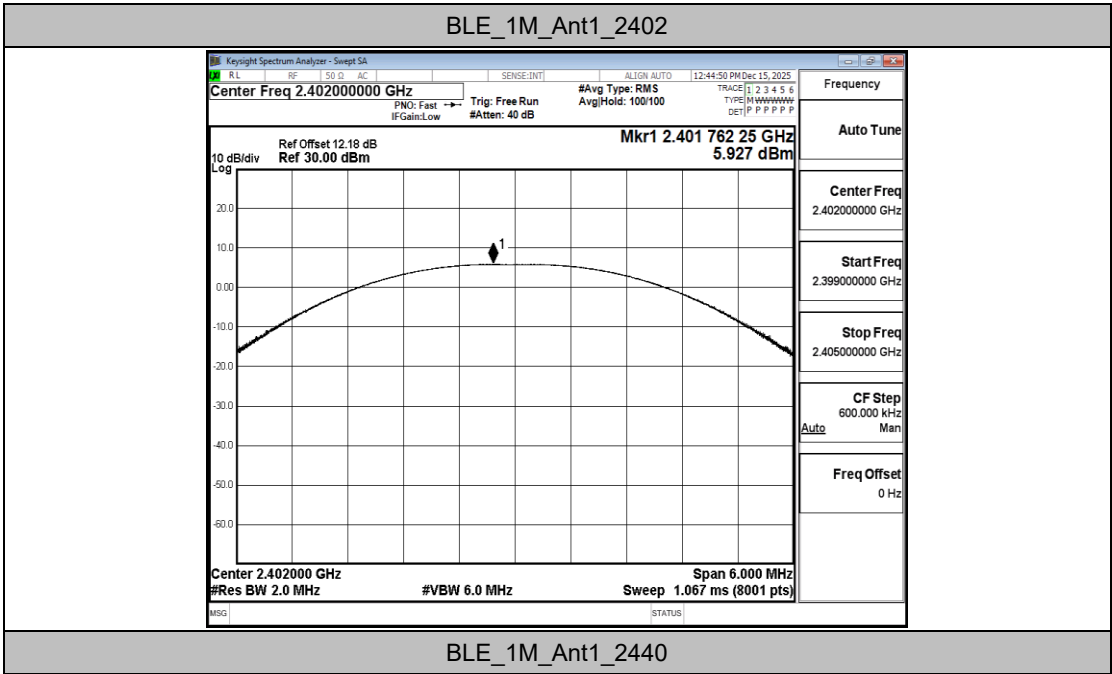


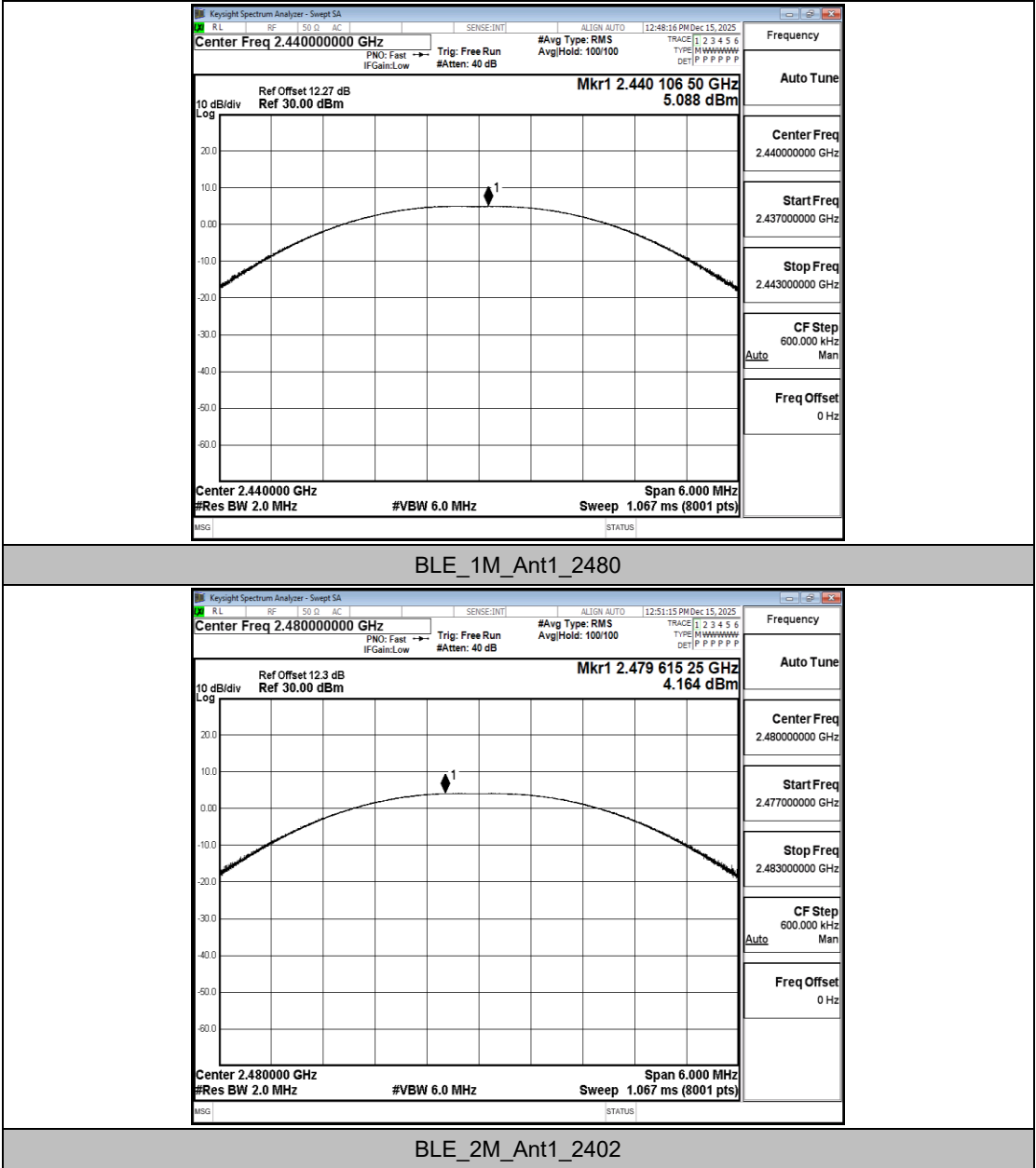
A.2 Maximum conducted output power

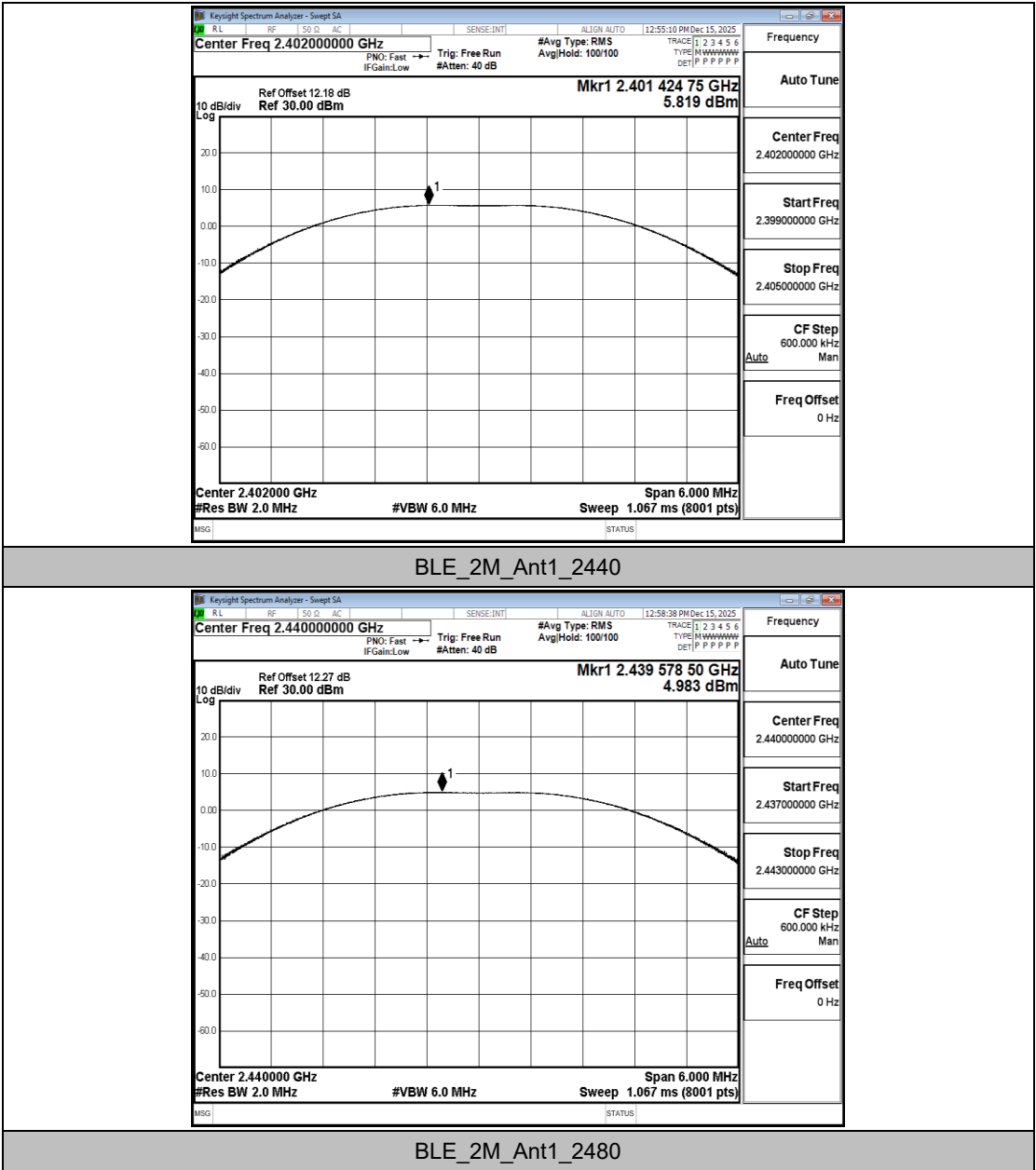
Test Result Peak

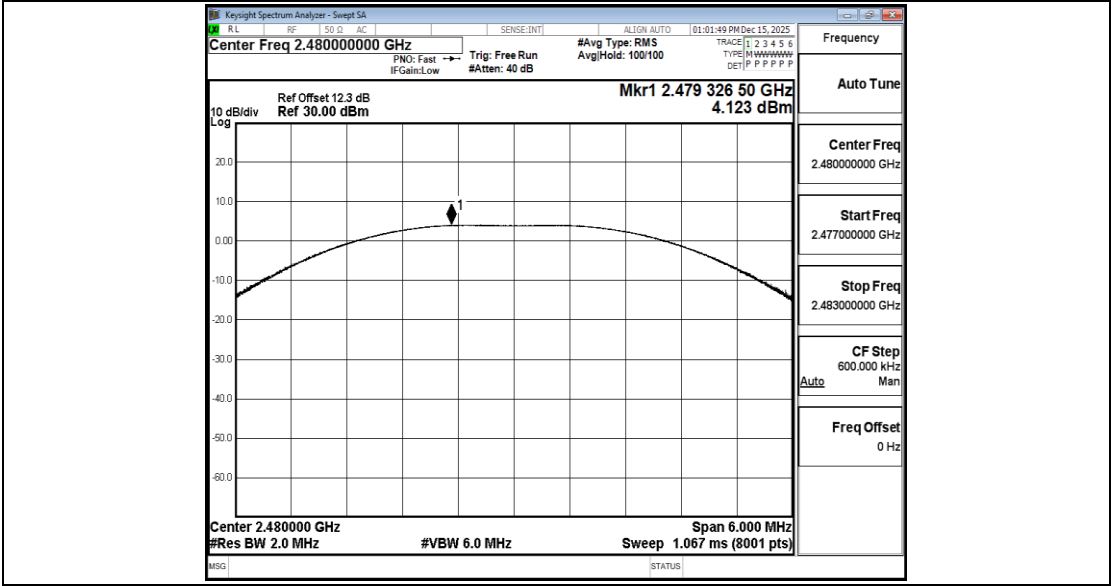
| TestMode | Antenna | Freq(MHz) | Conducted Peak Power[dBm] | Conducted Limit[dBm] | Verdict |
|----------|---------|-----------|---------------------------|----------------------|---------|
| BLE_1M   | Ant1    | 2402      | 5.93                      | ≤30                  | PASS    |
|          |         | 2440      | 5.09                      | ≤30                  | PASS    |
|          |         | 2480      | 4.16                      | ≤30                  | PASS    |
| BLE_2M   | Ant1    | 2402      | 5.82                      | ≤30                  | PASS    |
|          |         | 2440      | 4.98                      | ≤30                  | PASS    |
|          |         | 2480      | 4.12                      | ≤30                  | PASS    |

Test Graphs Peak







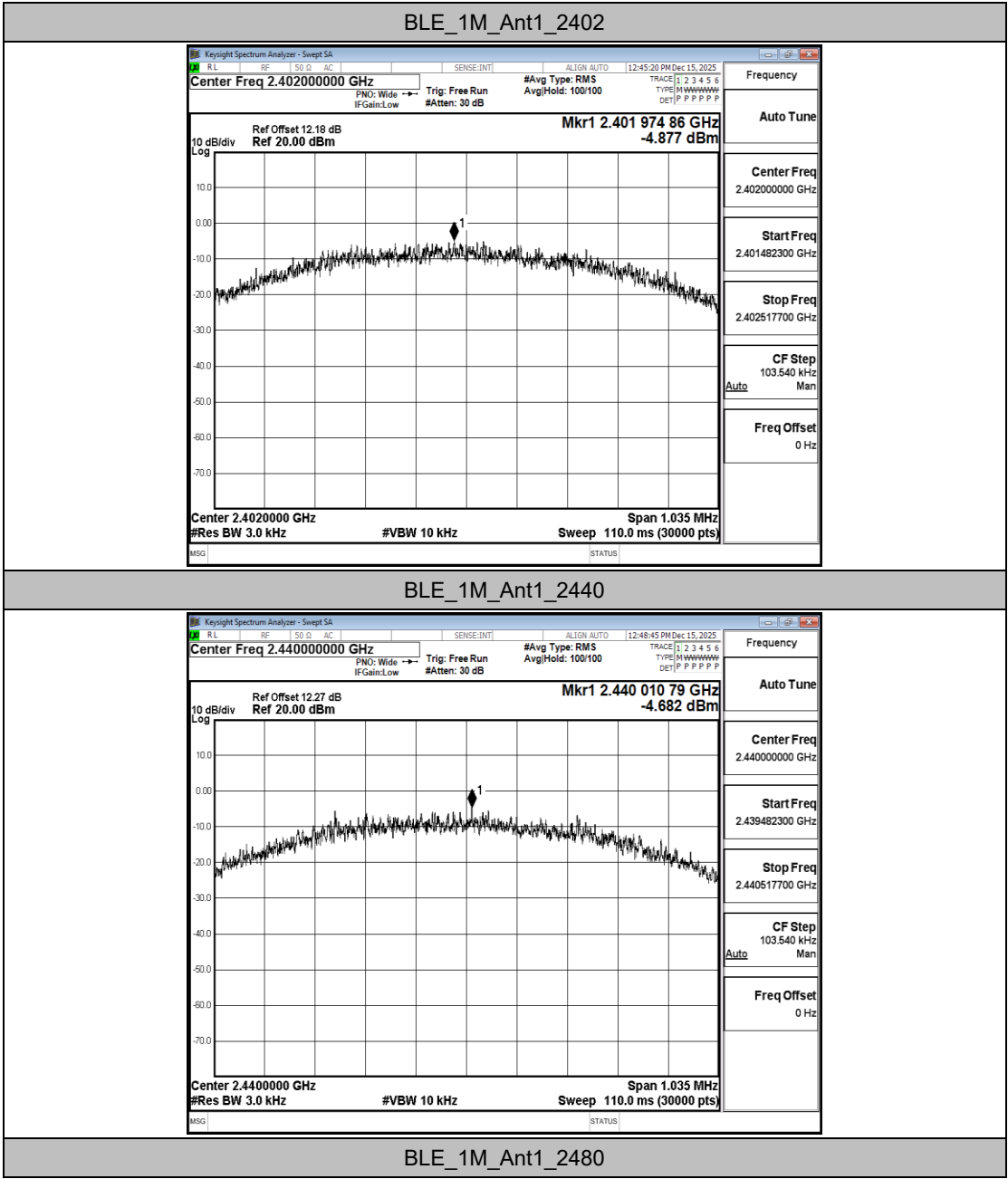


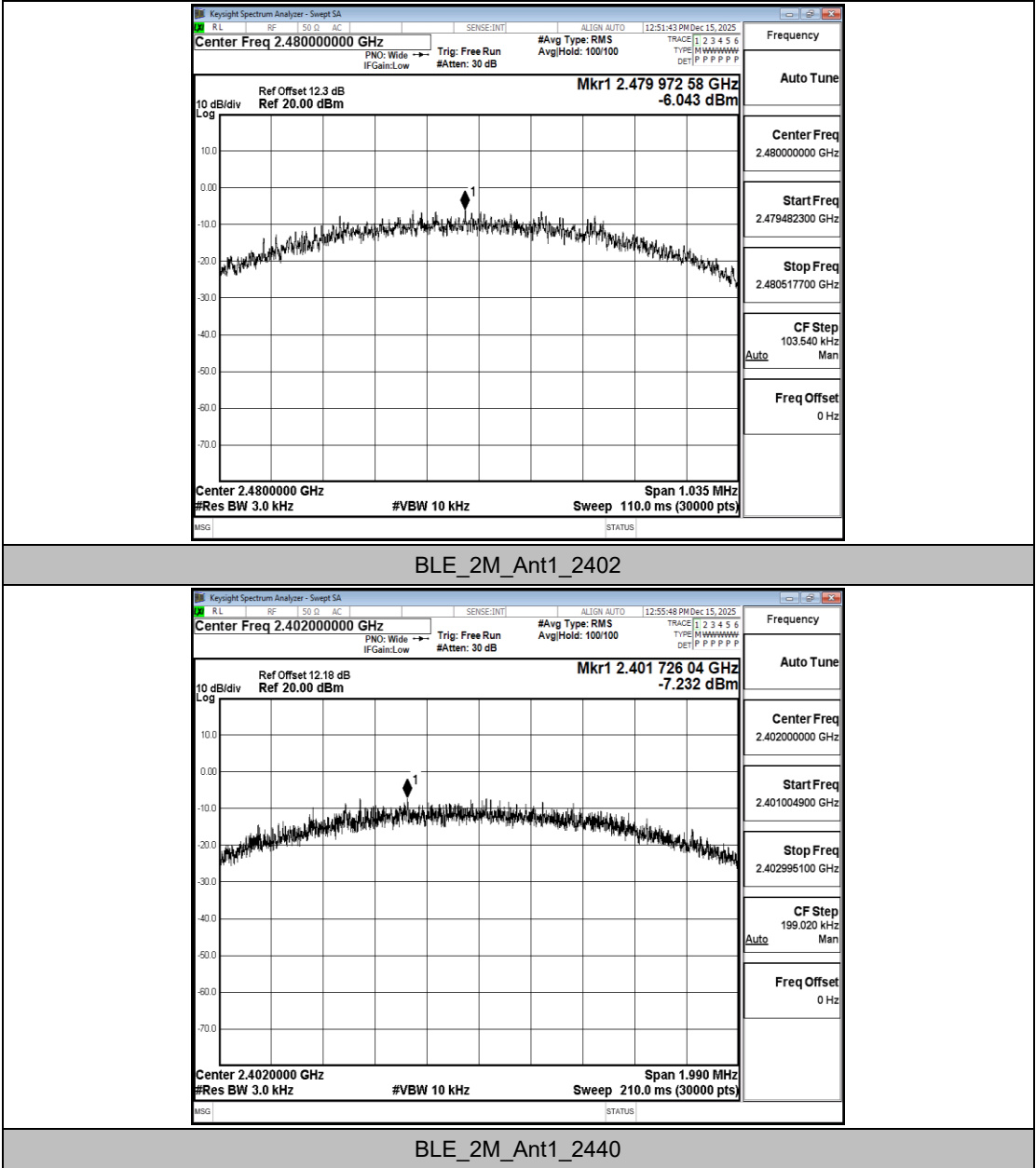
### A.3 Maximum power spectral density

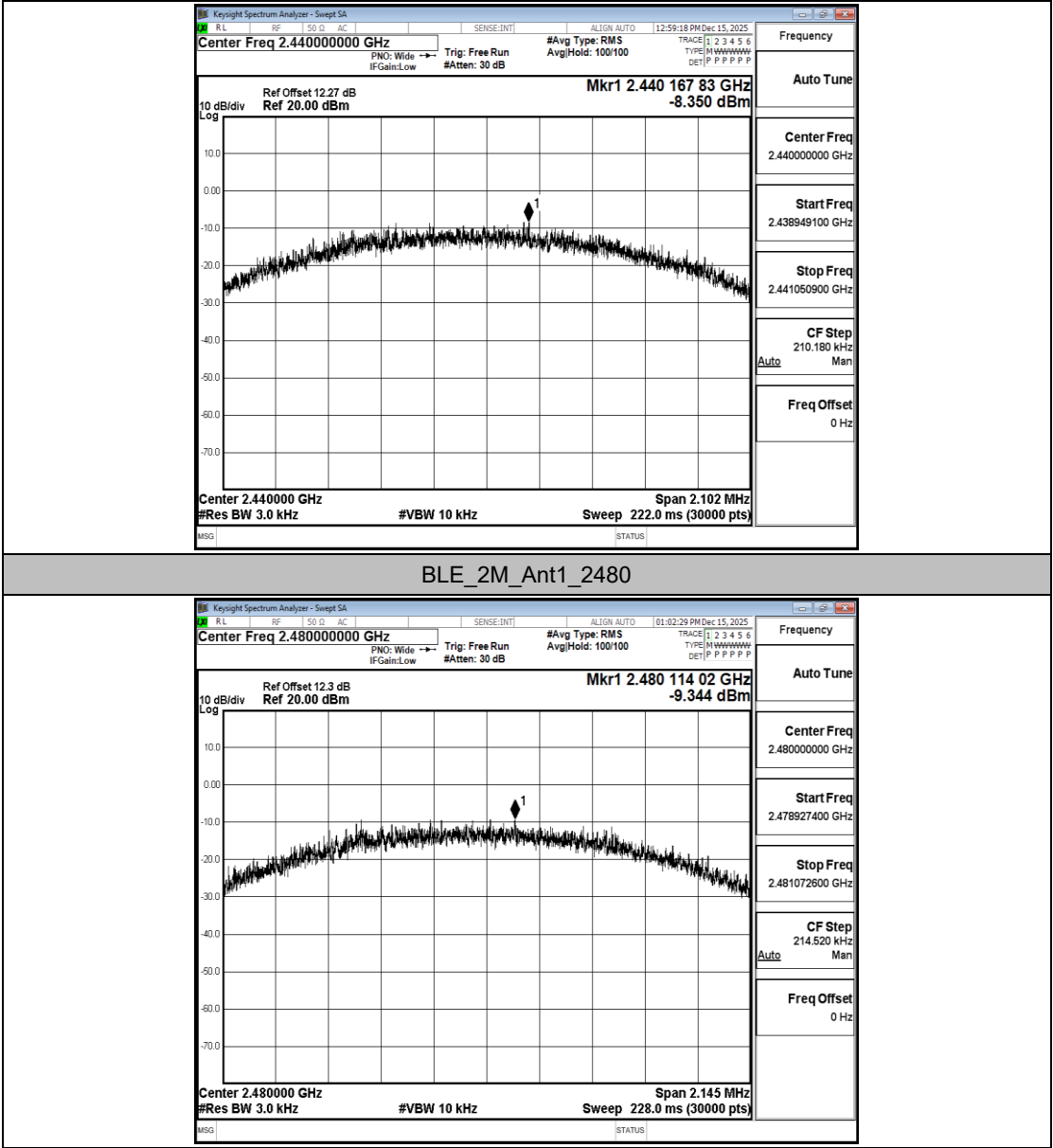
#### Test Result

| TestMode | Antenna | Freq(MHz) | Result[dBm/3kHz] | Limit[dBm/3kHz] | Verdict |
|----------|---------|-----------|------------------|-----------------|---------|
| BLE_1M   | Ant1    | 2402      | -4.88            | ≤8.00           | PASS    |
|          |         | 2440      | -4.68            | ≤8.00           | PASS    |
|          |         | 2480      | -6.04            | ≤8.00           | PASS    |
| BLE_2M   | Ant1    | 2402      | -7.23            | ≤8.00           | PASS    |
|          |         | 2440      | -8.35            | ≤8.00           | PASS    |
|          |         | 2480      | -9.34            | ≤8.00           | PASS    |

Test Graphs





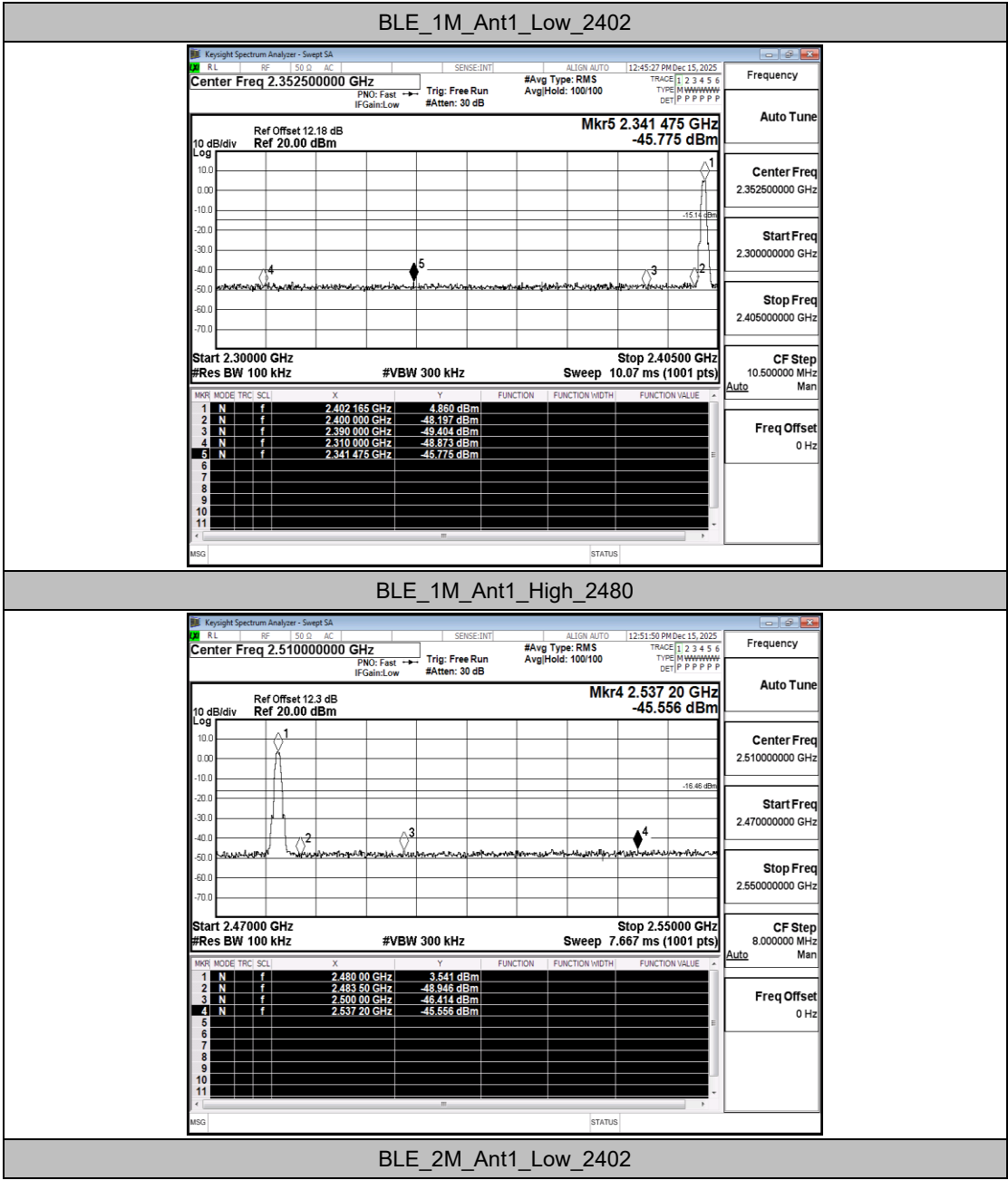


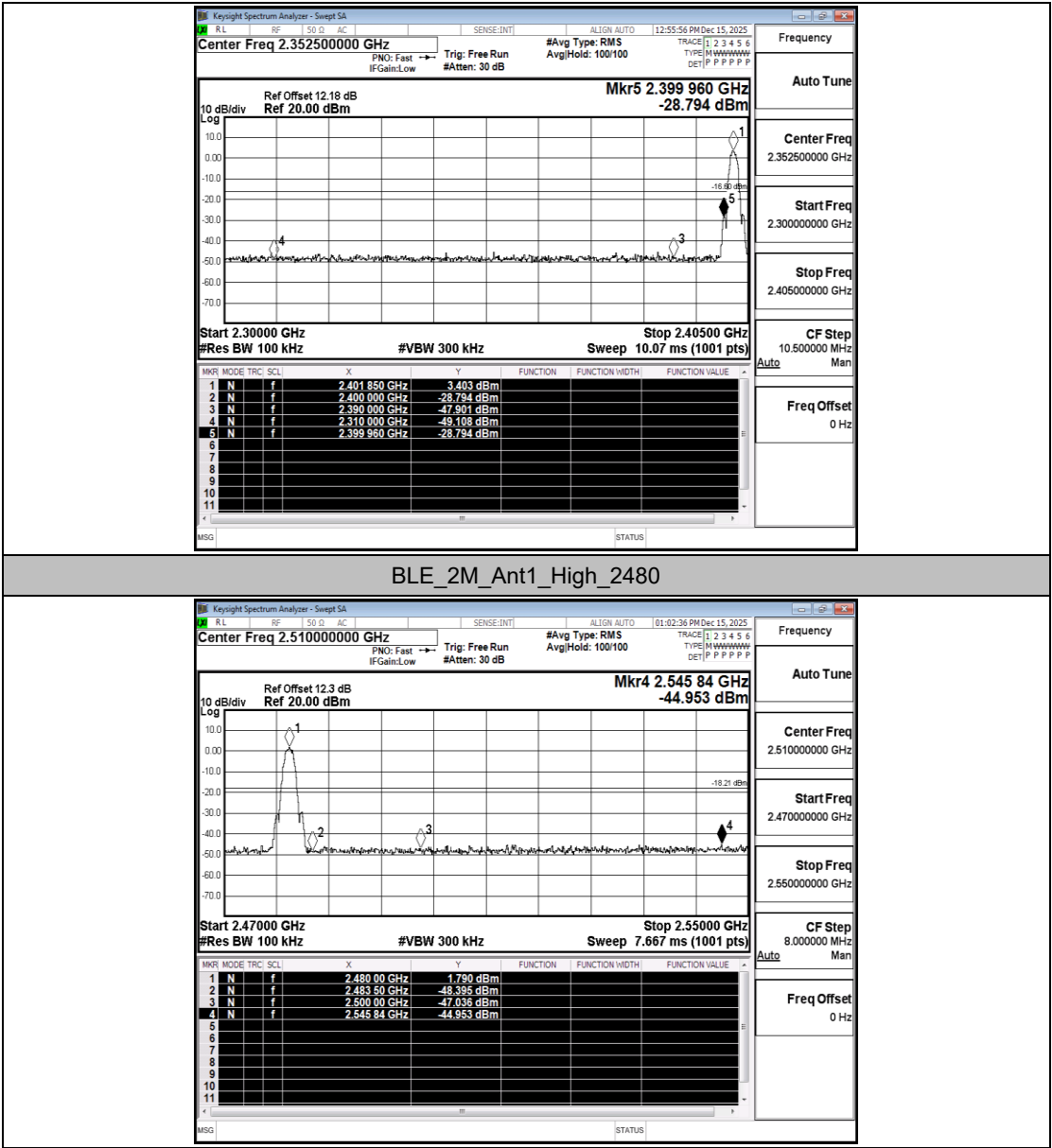
## A.4 Band edge measurements

### Test Result

| TestMode | Antenna | Channel | Freq(MHz) | RefLevel[dBm] | Result[dBm] | Limit[dBm] | Verdict |
|----------|---------|---------|-----------|---------------|-------------|------------|---------|
| BLE_1M   | Ant1    | Low     | 2402      | 4.86          | -45.78      | ≤-15.14    | PASS    |
|          |         | High    | 2480      | 3.54          | -45.56      | ≤-16.46    | PASS    |
| BLE_2M   | Ant1    | Low     | 2402      | 3.40          | -28.79      | ≤-16.6     | PASS    |
|          |         | High    | 2480      | 1.79          | -44.95      | ≤-18.21    | PASS    |

Test Graphs



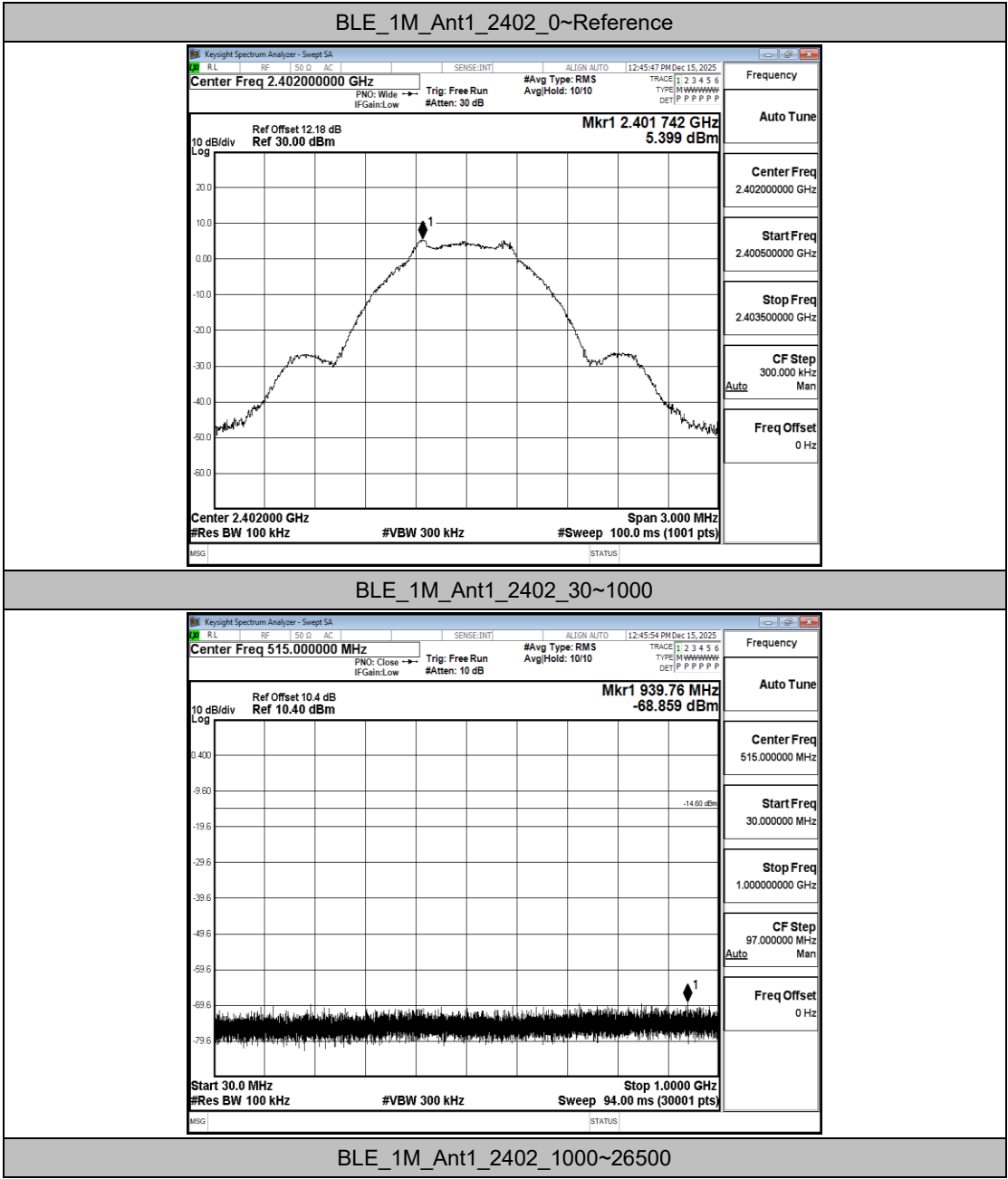


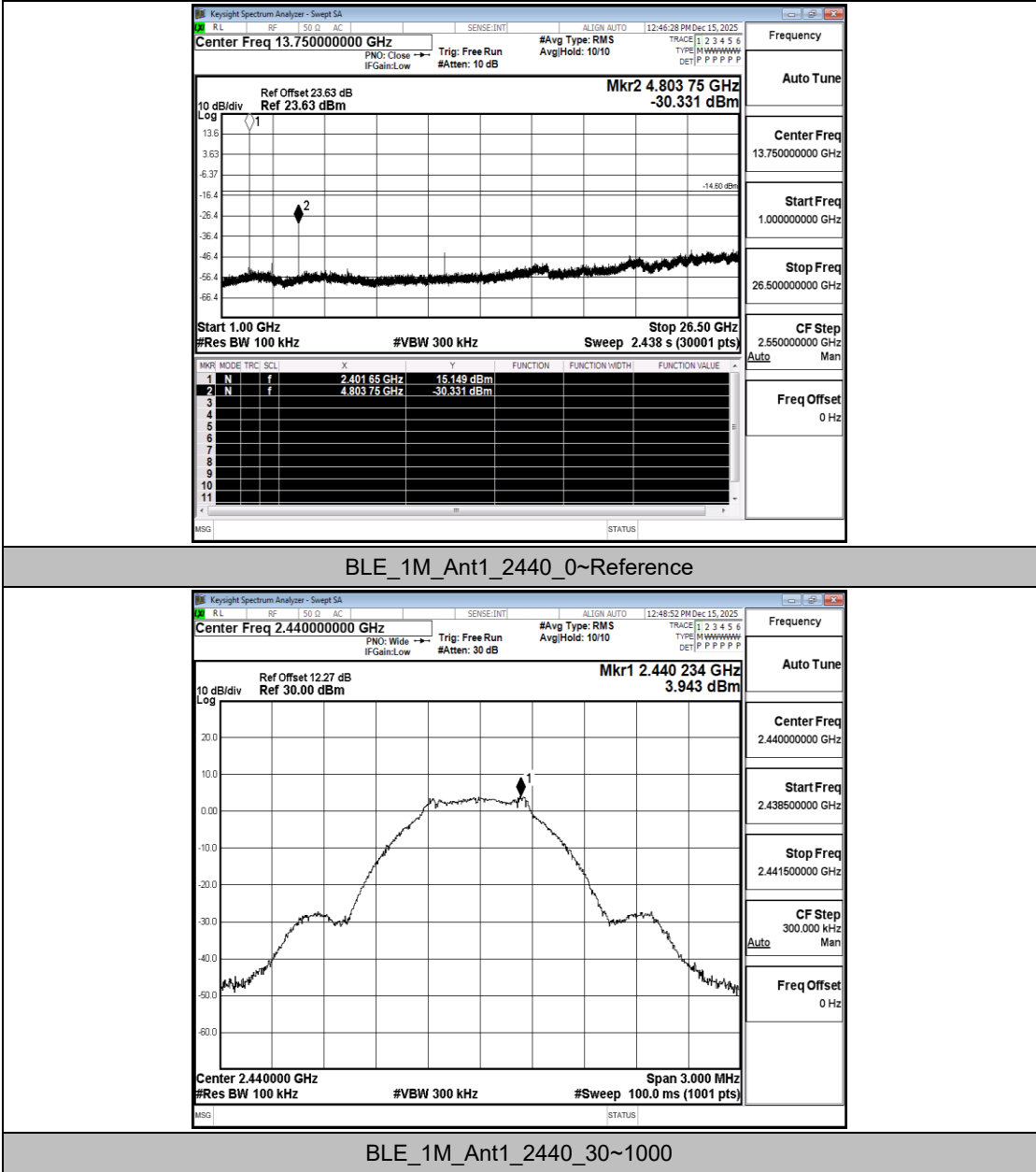
## A.5 Conducted Spurious Emission

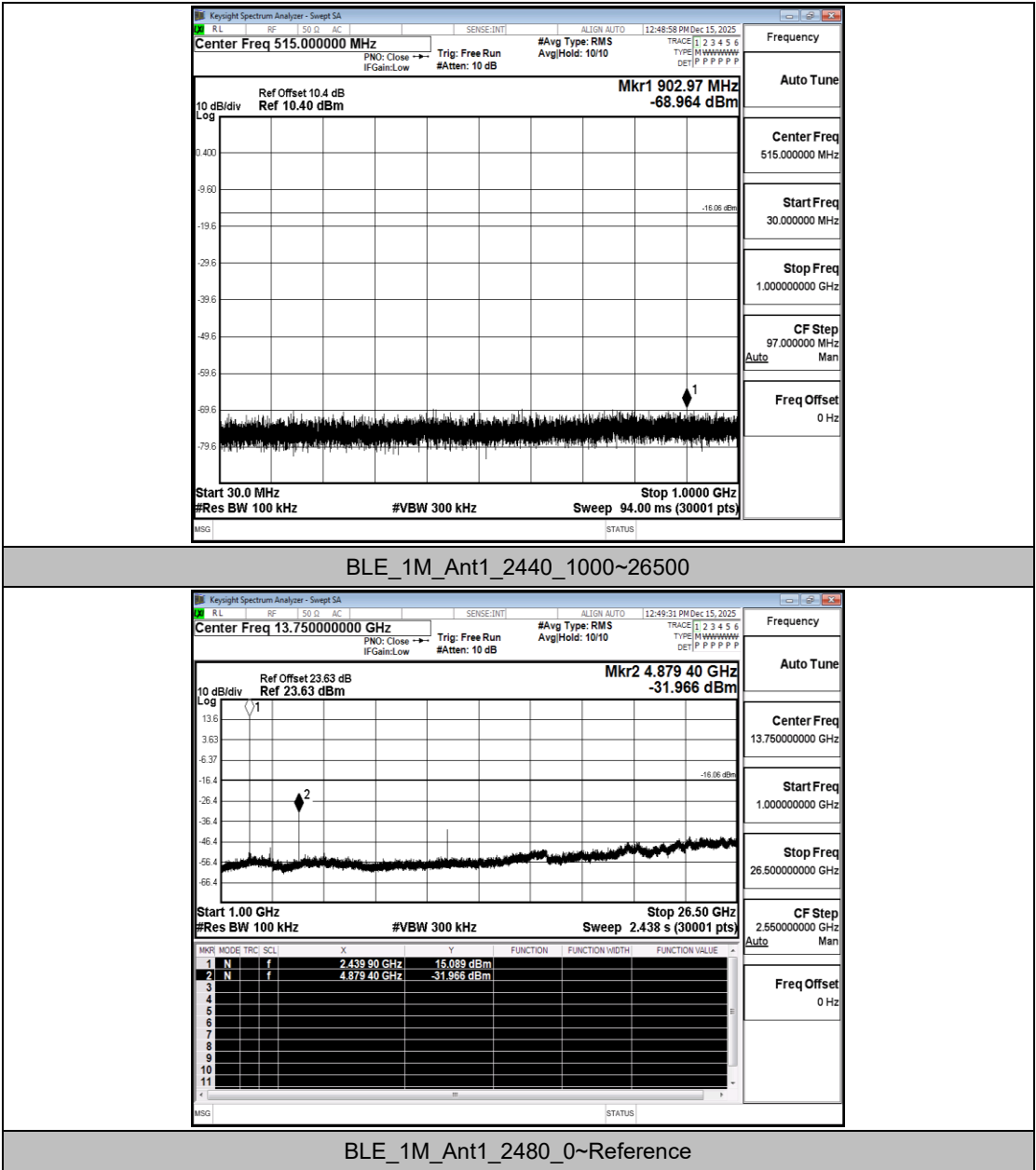
### Test Result

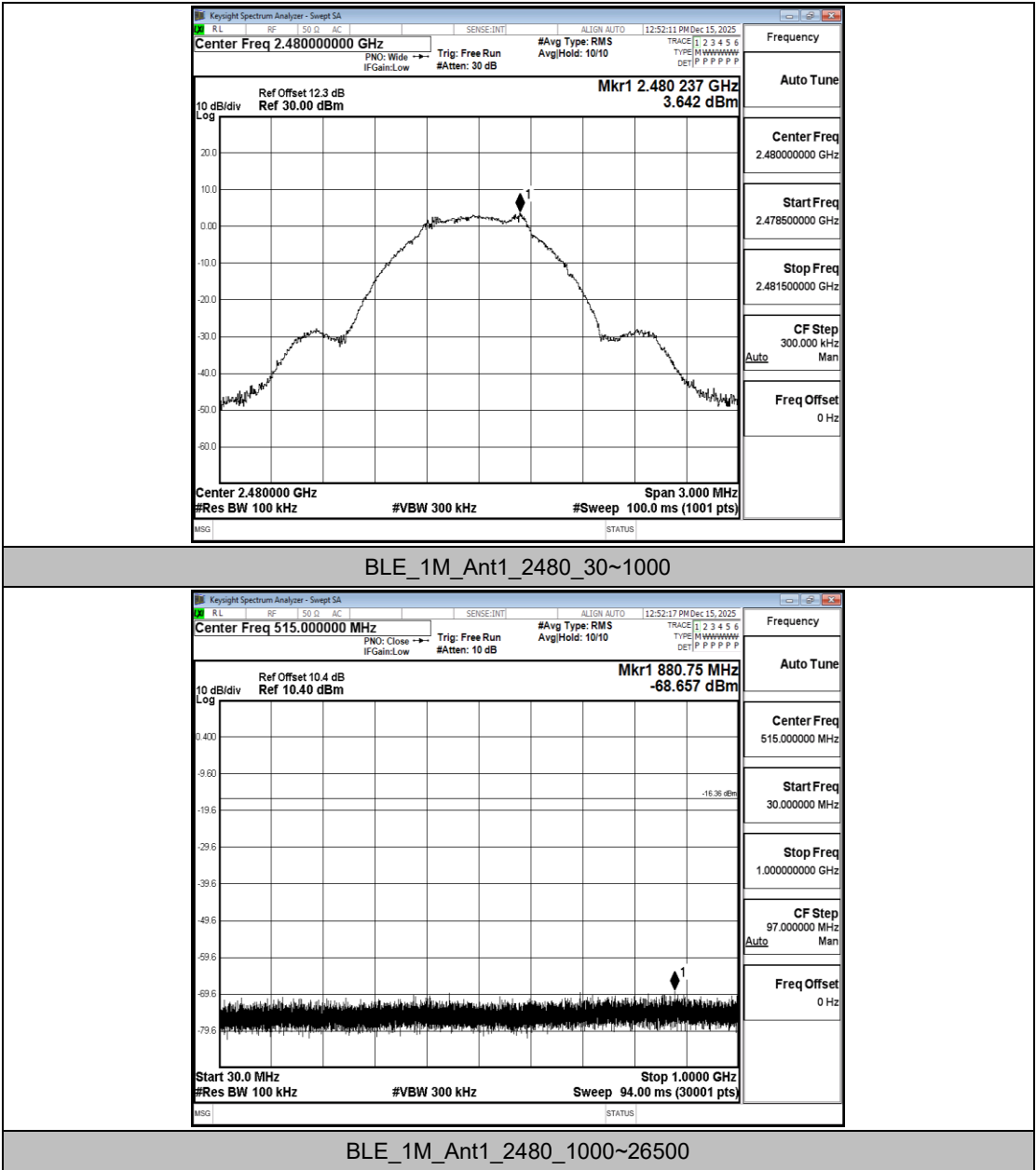
| TestMode | Antenna | Freq(MHz) | FreqRange [MHz] | RefLevel [dBm] | Result[dBm] | Limit[dBm] | Verdict |
|----------|---------|-----------|-----------------|----------------|-------------|------------|---------|
| BLE_1M   | Ant1    | 2402      | Reference       | 5.40           | 5.40        | ---        | PASS    |
|          |         |           | 30~1000         | 5.40           | -68.86      | ≤-14.6     | PASS    |
|          |         |           | 1000~26500      | 5.40           | -30.33      | ≤-14.6     | PASS    |
|          |         | 2440      | Reference       | 3.94           | 3.94        | ---        | PASS    |
|          |         |           | 30~1000         | 3.94           | -68.96      | ≤-16.06    | PASS    |
|          |         |           | 1000~26500      | 3.94           | -31.97      | ≤-16.06    | PASS    |
|          |         | 2480      | Reference       | 3.64           | 3.64        | ---        | PASS    |
|          |         |           | 30~1000         | 3.64           | -68.66      | ≤-16.36    | PASS    |
|          |         |           | 1000~26500      | 3.64           | -31.43      | ≤-16.36    | PASS    |
| BLE_2M   | Ant1    | 2402      | Reference       | 3.62           | 3.62        | ---        | PASS    |
|          |         |           | 30~1000         | 3.62           | -68.65      | ≤-16.38    | PASS    |
|          |         |           | 1000~26500      | 3.62           | -33.03      | ≤-16.38    | PASS    |
|          |         | 2440      | Reference       | 3.04           | 3.04        | ---        | PASS    |
|          |         |           | 30~1000         | 3.04           | -68.71      | ≤-16.96    | PASS    |
|          |         |           | 1000~26500      | 3.04           | -30.97      | ≤-16.96    | PASS    |
|          |         | 2480      | Reference       | 1.98           | 1.98        | ---        | PASS    |
|          |         |           | 30~1000         | 1.98           | -68.3       | ≤-18.02    | PASS    |
|          |         |           | 1000~26500      | 1.98           | -33.32      | ≤-18.02    | PASS    |

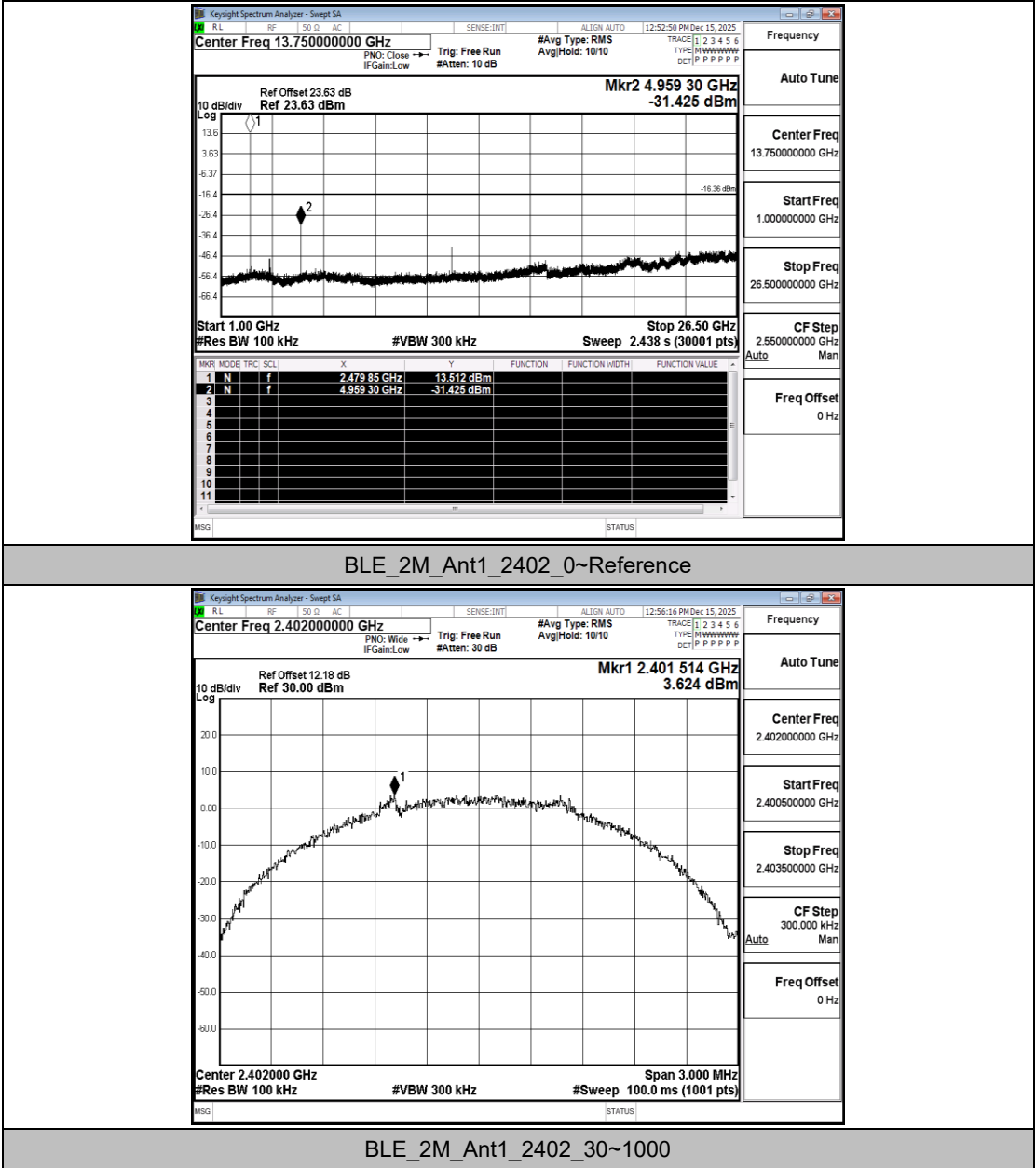
Test Graphs

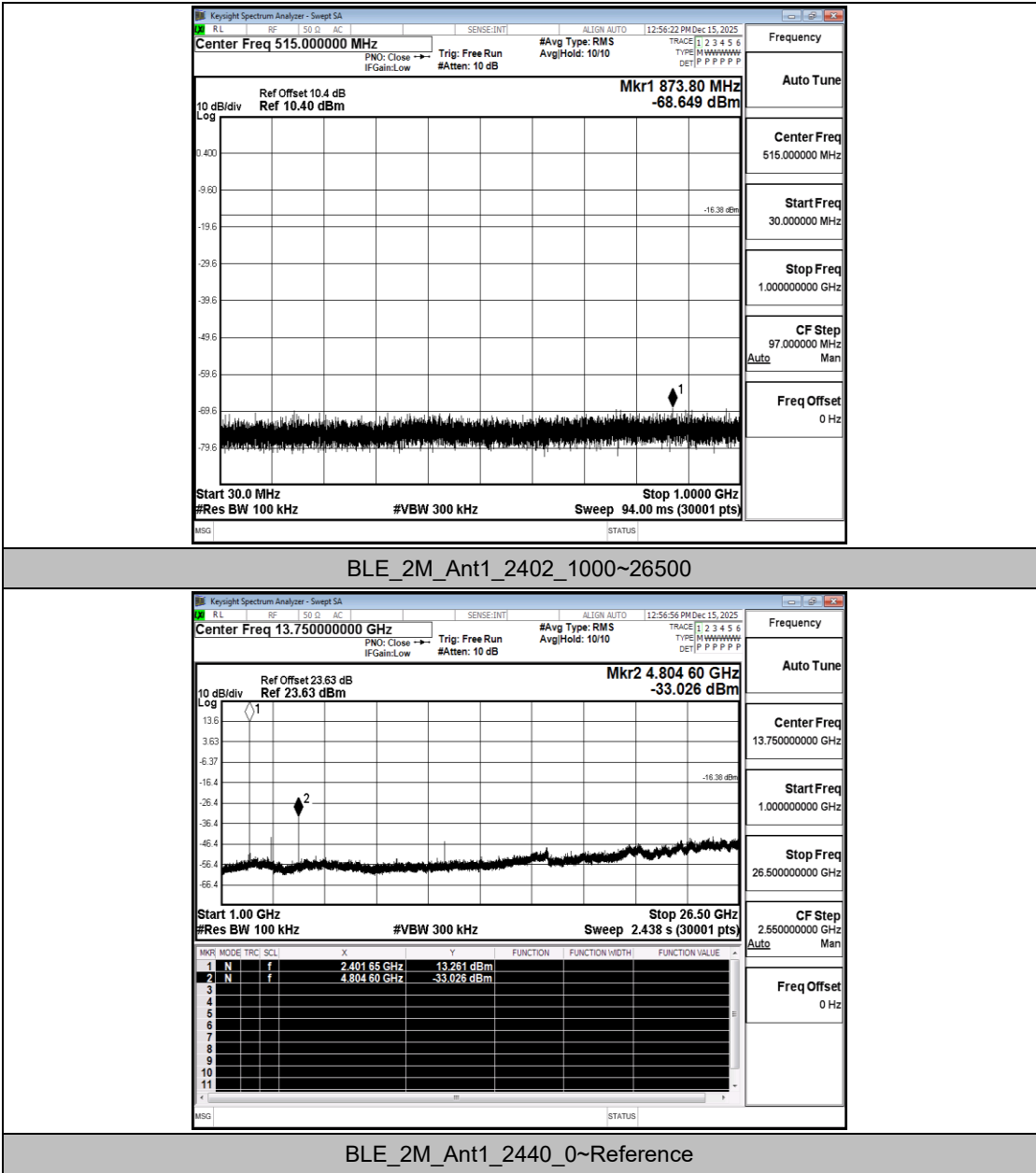


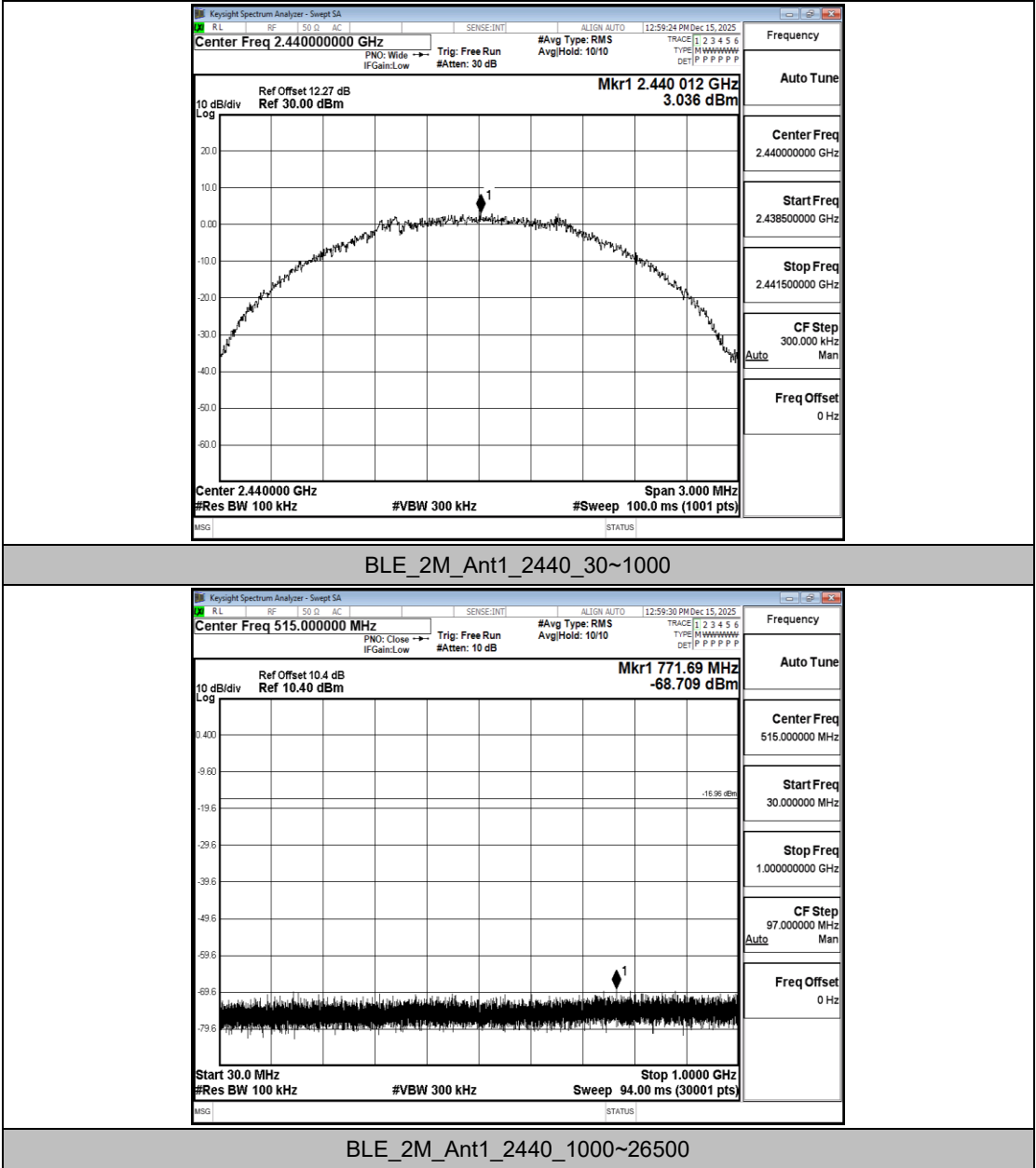


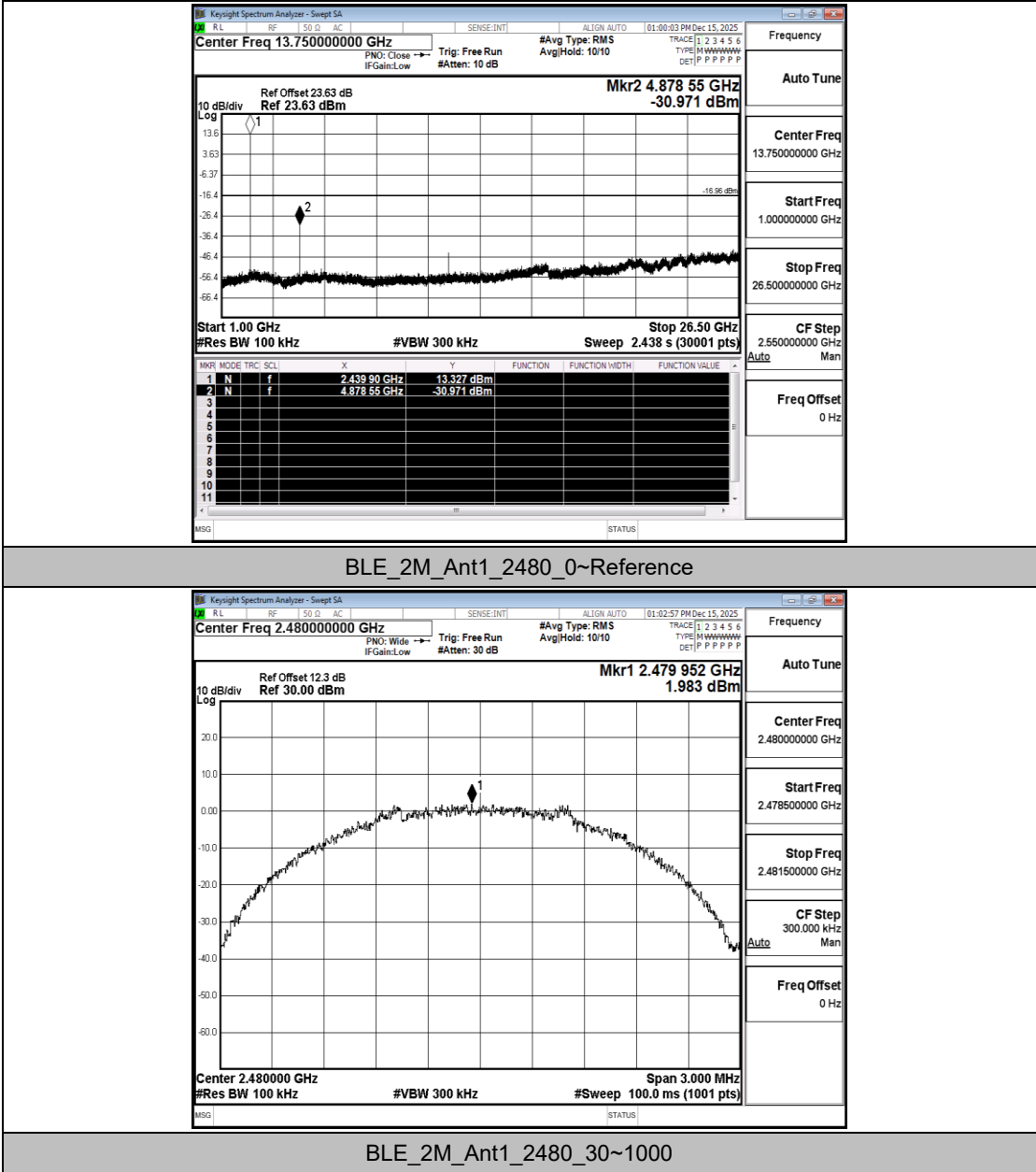


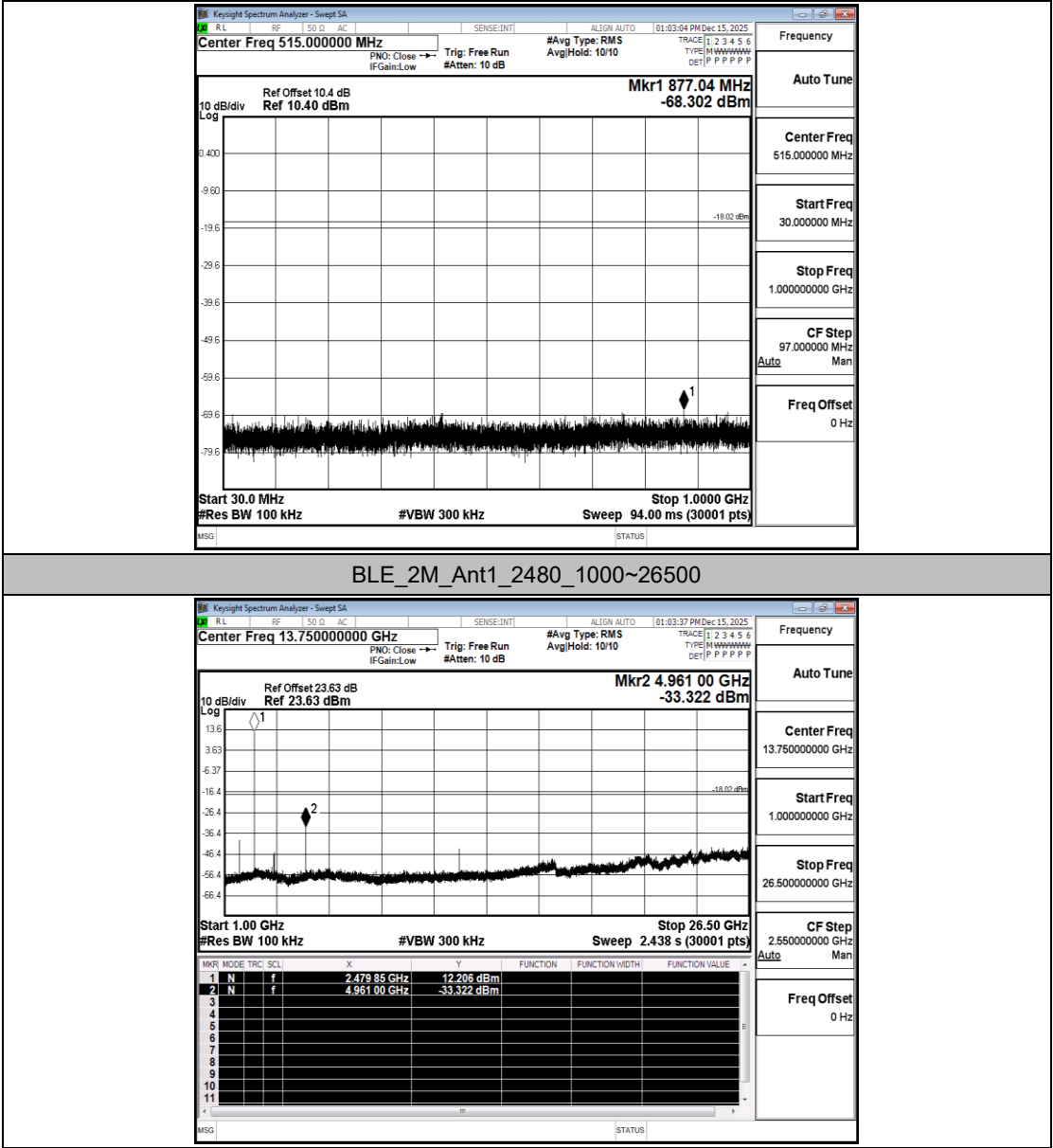










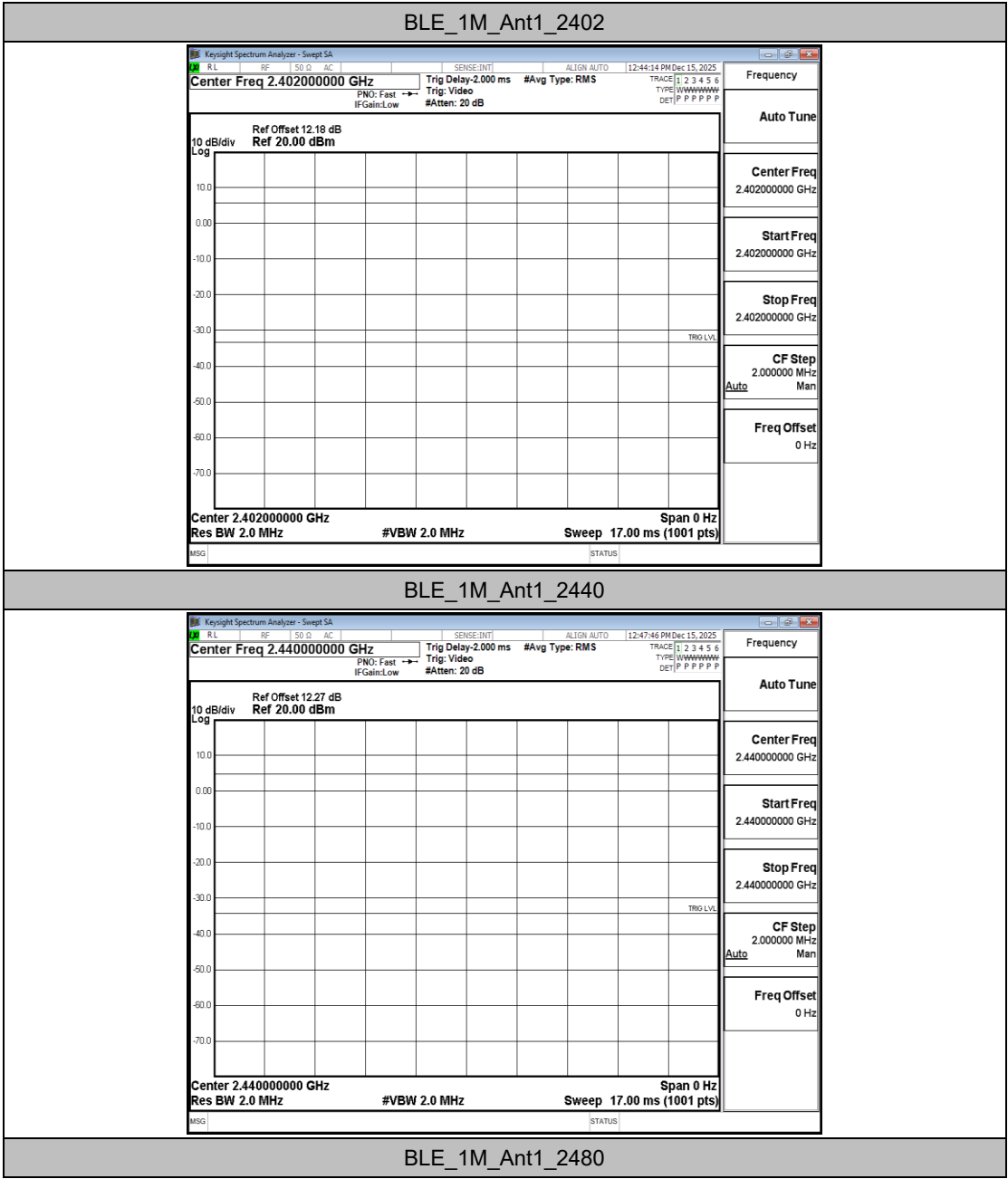


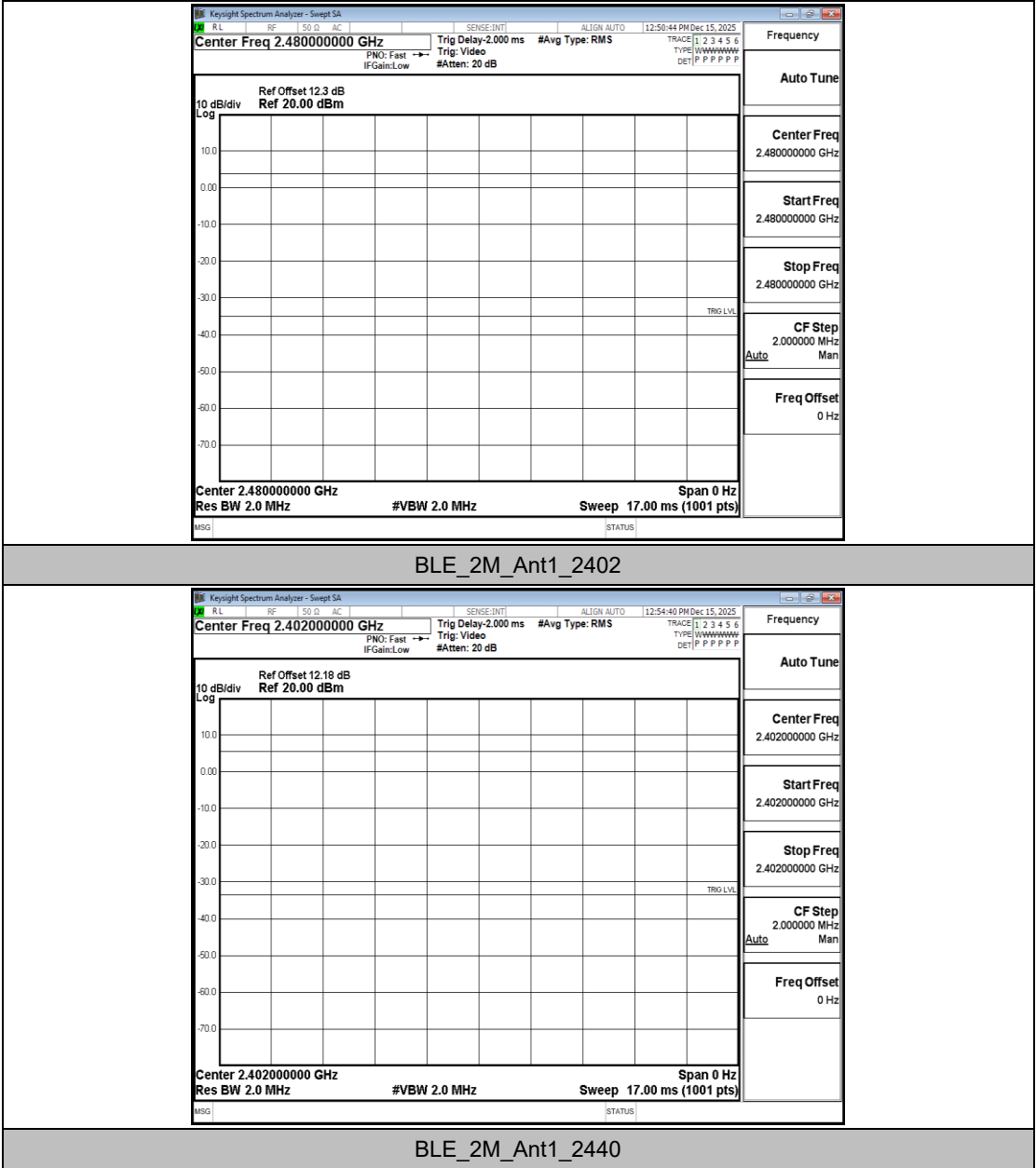
## A.6 Duty Cycle

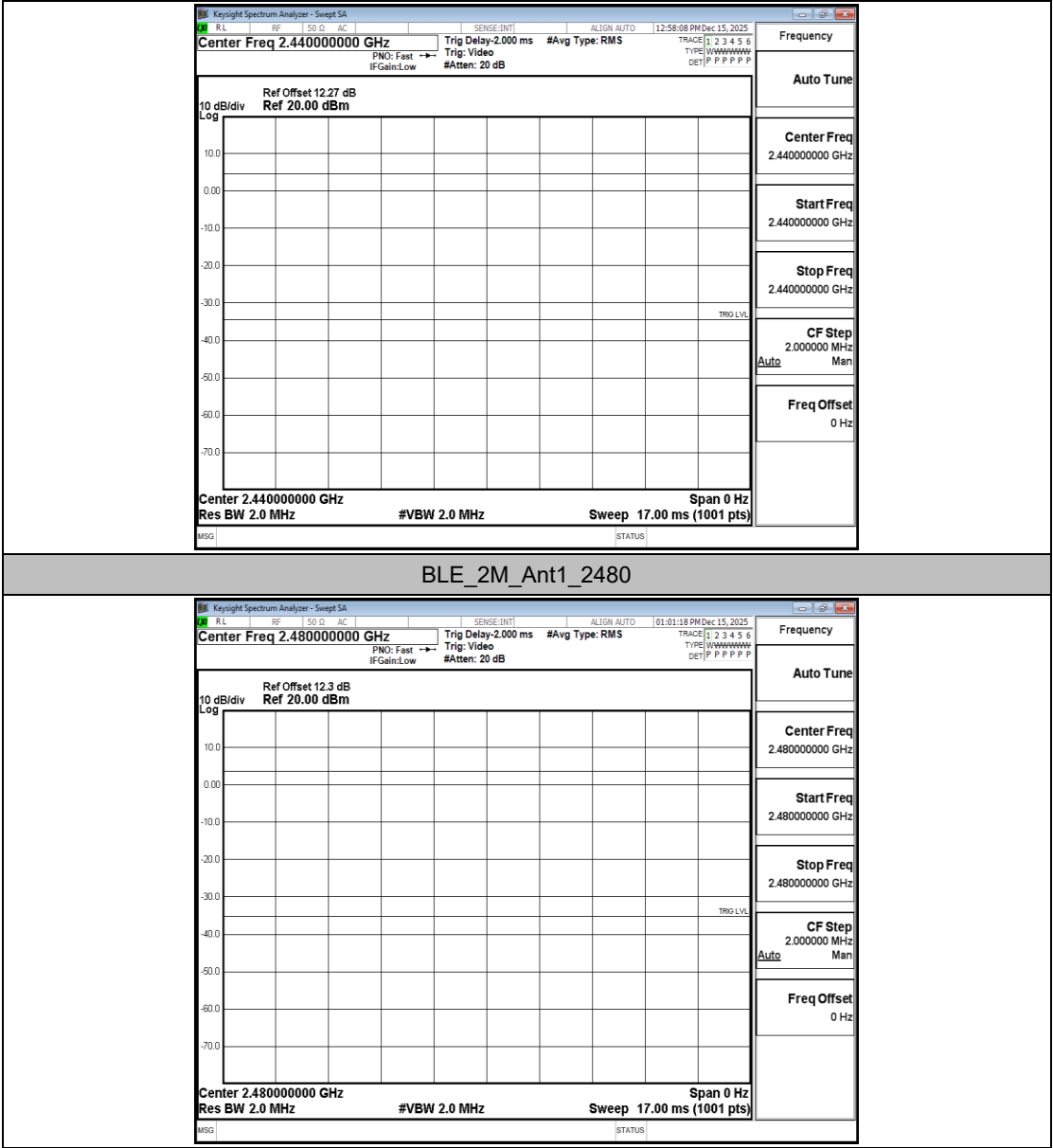
### Test Result

| TestMode | Antenna | Freq(MHz) | ON Time<br>[ms] | Period<br>[ms] | X    | DC<br>[%] | xFactor | Limit | Verdict |
|----------|---------|-----------|-----------------|----------------|------|-----------|---------|-------|---------|
| BLE_1M   | Ant1    | 2402      | 17.00           | 17.00          | 1.00 | 100       | 0.00    | ---   | ---     |
|          |         | 2440      | 17.00           | 17.00          | 1.00 | 100       | 0.00    | ---   | ---     |
|          |         | 2480      | 17.00           | 17.00          | 1.00 | 100       | 0.00    | ---   | ---     |
| BLE_2M   | Ant1    | 2402      | 17.00           | 17.00          | 1.00 | 100       | 0.00    | ---   | ---     |
|          |         | 2440      | 17.00           | 17.00          | 1.00 | 100       | 0.00    | ---   | ---     |
|          |         | 2480      | 17.00           | 17.00          | 1.00 | 100       | 0.00    | ---   | ---     |

Test Graphs







## A.7 Emissions in Restricted Bands

### Test Result

| TestMode | Antenna | ChName | Freq(MHz) | Detector | Freq [MHz] | Result [dBm] | Limit [dBm] | Gain [dBi] | DC Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Verdict |
|----------|---------|--------|-----------|----------|------------|--------------|-------------|------------|----------------|-----------------|----------------|---------|
| BLE_1M   | Ant1    | Low    | 2402      | AV       | 2310.000   | -58.16       | ≤-45.54     | 4.34       | 0.00           | 41.38           | ≤54            | PASS    |
|          |         |        |           | AV       | 2335.175   | -53.88       | ≤-45.54     | 4.34       | 0.00           | 45.66           | ≤54            | PASS    |
|          |         |        |           | AV       | 2390.000   | -56.74       | ≤-45.54     | 4.34       | 0.00           | 42.80           | ≤54            | PASS    |
|          |         |        |           | Peak     | 2310.000   | -51.83       | ≤-25.54     | 4.34       | 0.00           | 47.71           | ≤74            | PASS    |
|          |         |        |           | Peak     | 2333.390   | -46.78       | ≤-25.54     | 4.34       | 0.00           | 52.76           | ≤74            | PASS    |
|          |         |        |           | Peak     | 2390.000   | -49.33       | ≤-25.54     | 4.34       | 0.00           | 50.21           | ≤74            | PASS    |
|          |         | High   | 2480      | AV       | 2483.500   | -57.23       | ≤-45.54     | 4.34       | 0.00           | 42.31           | ≤54            | PASS    |
|          |         |        |           | AV       | 2483.840   | -53.43       | ≤-45.54     | 4.34       | 0.00           | 46.11           | ≤54            | PASS    |
|          |         |        |           | AV       | 2500.000   | -55.85       | ≤-45.54     | 4.34       | 0.00           | 43.69           | ≤54            | PASS    |
|          |         |        |           | Peak     | 2483.500   | -49.92       | ≤-25.54     | 4.34       | 0.00           | 49.62           | ≤74            | PASS    |
|          |         |        |           | Peak     | 2487.760   | -46.84       | ≤-25.54     | 4.34       | 0.00           | 52.70           | ≤74            | PASS    |
|          |         |        |           | Peak     | 2500.000   | -49.03       | ≤-25.54     | 4.34       | 0.00           | 50.51           | ≤74            | PASS    |
| BLE_2M   | Ant1    | Low    | 2402      | AV       | 2310.000   | -58.07       | ≤-45.54     | 4.34       | 0.00           | 41.47           | ≤54            | PASS    |
|          |         |        |           | AV       | 2349.455   | -54.16       | ≤-45.54     | 4.34       | 0.00           | 45.38           | ≤54            | PASS    |
|          |         |        |           | AV       | 2390.000   | -55.89       | ≤-45.54     | 4.34       | 0.00           | 43.65           | ≤54            | PASS    |
|          |         |        |           | Peak     | 2310.000   | -53.57       | ≤-25.54     | 4.34       | 0.00           | 45.97           | ≤74            | PASS    |
|          |         |        |           | Peak     | 2369.825   | -47.11       | ≤-25.54     | 4.34       | 0.00           | 52.43           | ≤74            | PASS    |
|          |         |        |           | Peak     | 2390.000   | -49.19       | ≤-          | 4.34       | 0.00           | 50.35           | ≤74            | PASS    |

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|  |  |      |      |      |          |        |             |      |      |       |     |      |
|--|--|------|------|------|----------|--------|-------------|------|------|-------|-----|------|
|  |  |      |      |      |          |        | 25.54       |      |      |       |     |      |
|  |  |      |      | AV   | 2483.500 | -53.79 | ≤-<br>45.54 | 4.34 | 0.00 | 45.75 | ≤54 | PASS |
|  |  |      |      | AV   | 2492.000 | -53.6  | ≤-<br>45.54 | 4.34 | 0.00 | 45.94 | ≤54 | PASS |
|  |  |      |      | AV   | 2500.000 | -55.68 | ≤-<br>45.54 | 4.34 | 0.00 | 43.86 | ≤54 | PASS |
|  |  | High | 2480 | Peak | 2483.500 | -48.42 | ≤-<br>25.54 | 4.34 | 0.00 | 51.12 | ≤74 | PASS |
|  |  |      |      | Peak | 2483.680 | -47.26 | ≤-<br>25.54 | 4.34 | 0.00 | 52.28 | ≤74 | PASS |
|  |  |      |      | Peak | 2500.000 | -50.87 | ≤-<br>25.54 | 4.34 | 0.00 | 48.67 | ≤74 | PASS |

## Note:

1. The Antenna Gain is compensated in the graph.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

Test Graphs

