



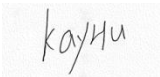
## Appendix A

### RF Test Data for BT LE (Conducted Measurement)

Product Name: digital lock

Test Model: HFAM10B-L-NB

#### Environmental Conditions

|                    |                                                                                                 |
|--------------------|-------------------------------------------------------------------------------------------------|
| Temperature:       | 23.8℃                                                                                           |
| Relative Humidity: | 52.3%                                                                                           |
| ATM Pressure:      | 100.0 kPa                                                                                       |
| Test Engineer:     | <br>Kay Hu    |
| Supervised by:     | <br>Li Huan |



## A.1 DTS Bandwidth

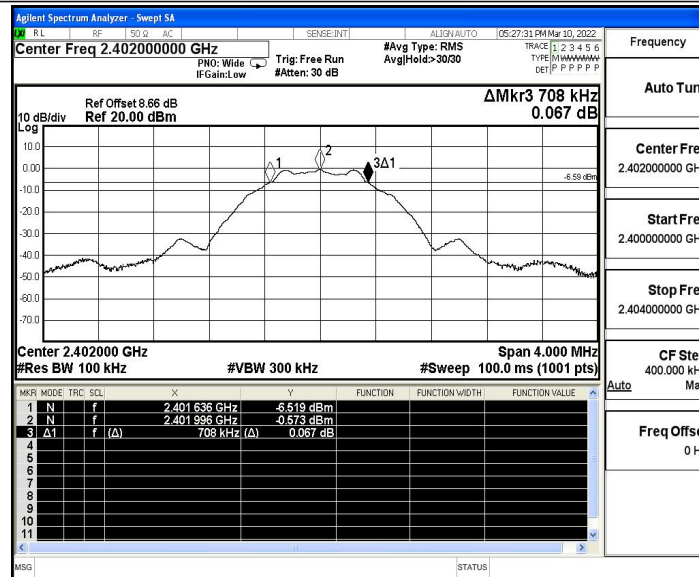
### Test Result

| TestMode | Antenna | Channel | DTS BW [MHz] | FL[MHz]  | FH[MHz]  | Limit[MHz] | Verdict |
|----------|---------|---------|--------------|----------|----------|------------|---------|
| BLE_1M   | Ant1    | 2402    | 0.708        | 2401.636 | 2402.344 | 0.5        | PASS    |
|          |         | 2440    | 0.708        | 2439.640 | 2440.348 | 0.5        | PASS    |
|          |         | 2480    | 0.712        | 2479.636 | 2480.348 | 0.5        | PASS    |

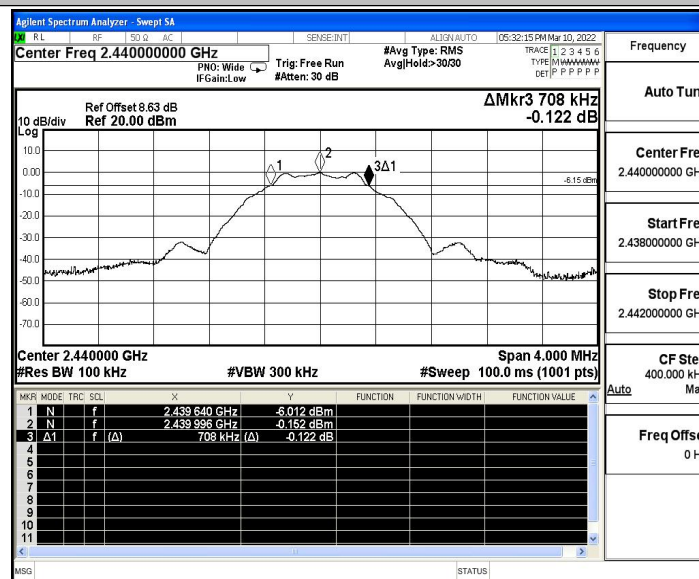


## Test Graphs

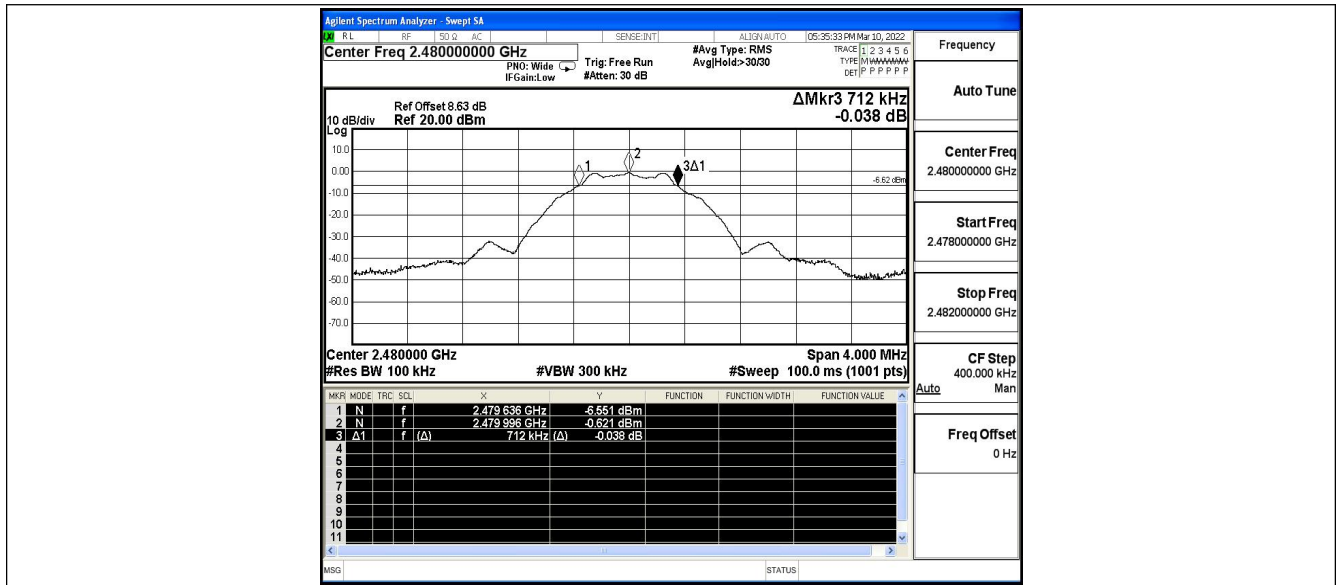
BLE\_1M\_Ant1\_2402



BLE\_1M\_Ant1\_2440



BLE\_1M\_Ant1\_2480





## A.2 Maximum peak conducted output power

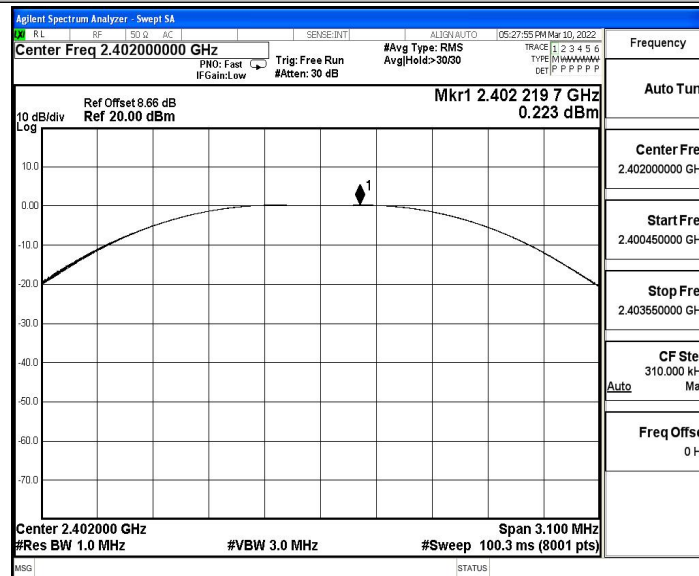
### Test Result

| TestMode | Antenna | Channel | Result[dBm] | Limit[dBm] | Verdict |
|----------|---------|---------|-------------|------------|---------|
| BLE_1M   | Ant1    | 2402    | 0.22        | ≤30        | PASS    |
|          |         | 2440    | 0.65        | ≤30        | PASS    |
|          |         | 2480    | 0.17        | ≤30        | PASS    |

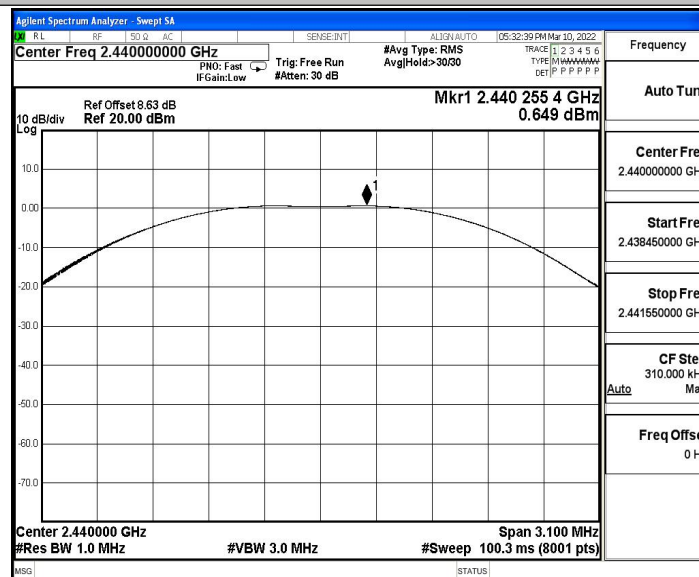


## Test Graphs

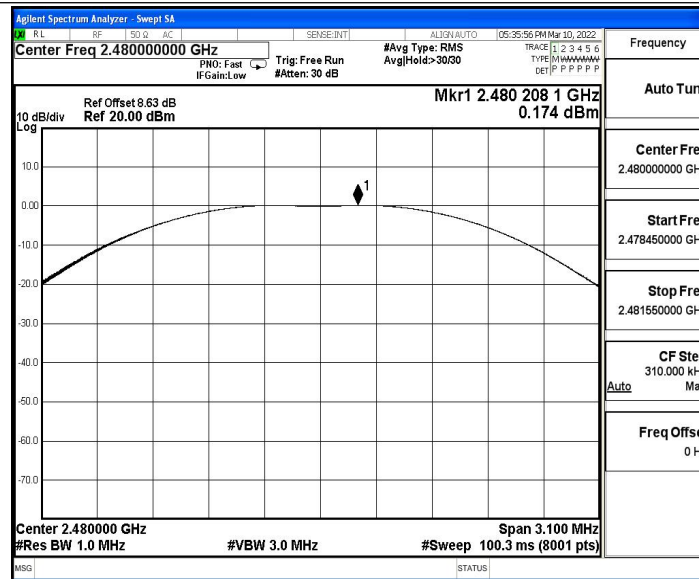
BLE\_1M\_Ant1\_2402



BLE\_1M\_Ant1\_2440



BLE\_1M\_Ant1\_2480





## A.3 Maximum power spectral density

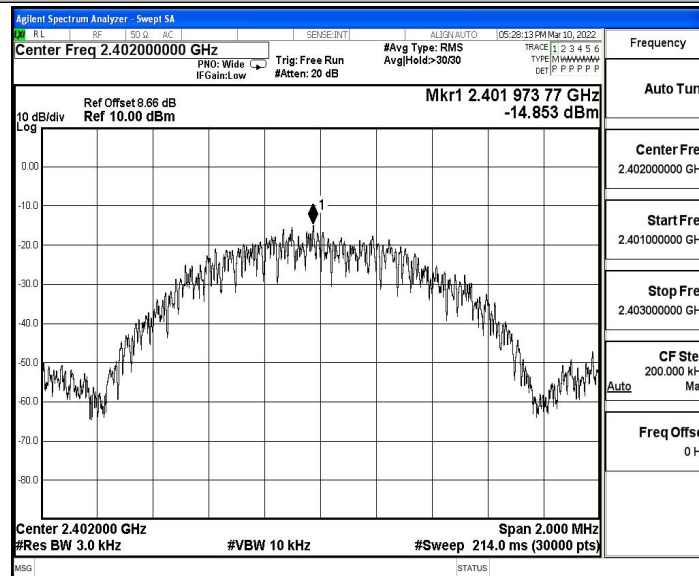
### Test Result

| TestMode | Antenna | Channel | Result[dBm/3kHz] | Limit[dBm/3kHz] | Verdict |
|----------|---------|---------|------------------|-----------------|---------|
| BLE_1M   | Ant1    | 2402    | -14.86           | ≤8.00           | PASS    |
|          |         | 2440    | -14.41           | ≤8.00           | PASS    |
|          |         | 2480    | -14.79           | ≤8.00           | PASS    |

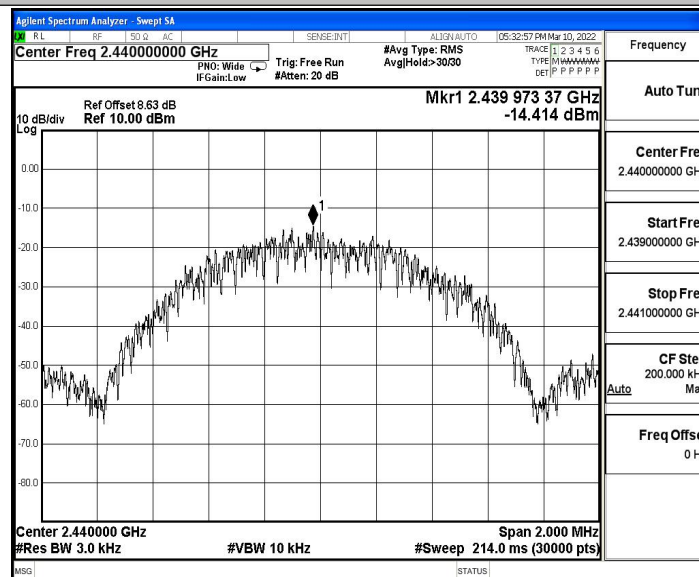


## Test Graphs

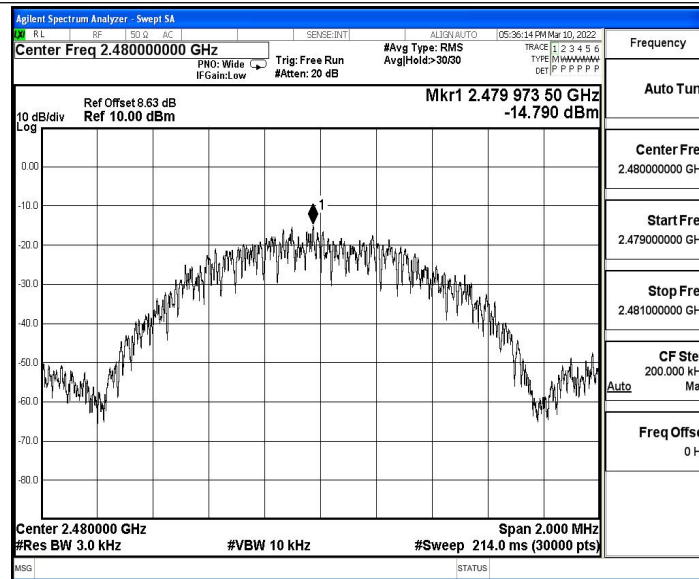
BLE\_1M\_Ant1\_2402



BLE\_1M\_Ant1\_2440



BLE\_1M\_Ant1\_2480





## A.4 Band edge measurements

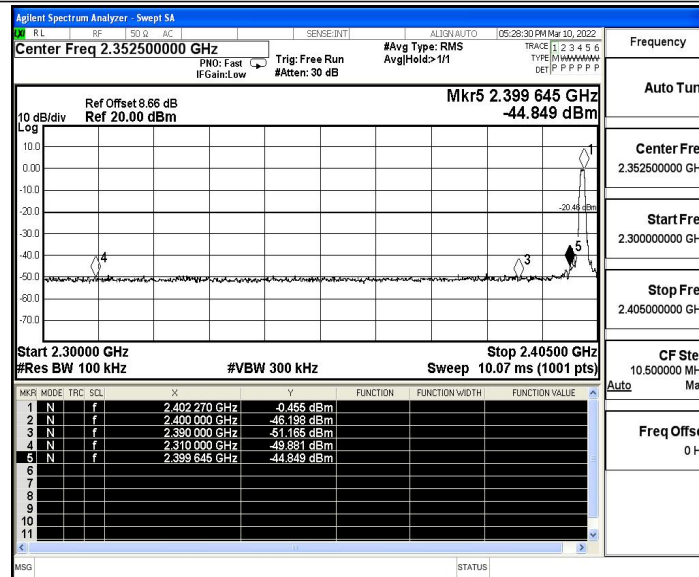
### Test Result

| TestMode | Antenna | ChName | Channel | RefLevel[dBm] | Result[dBm] | Limit[dBm]    | Verdict |
|----------|---------|--------|---------|---------------|-------------|---------------|---------|
| BLE_1M   | Ant1    | Low    | 2402    | -0.46         | -44.85      | $\leq -20.46$ | PASS    |
|          |         | High   | 2480    | -0.54         | -47.76      | $\leq -20.54$ | PASS    |

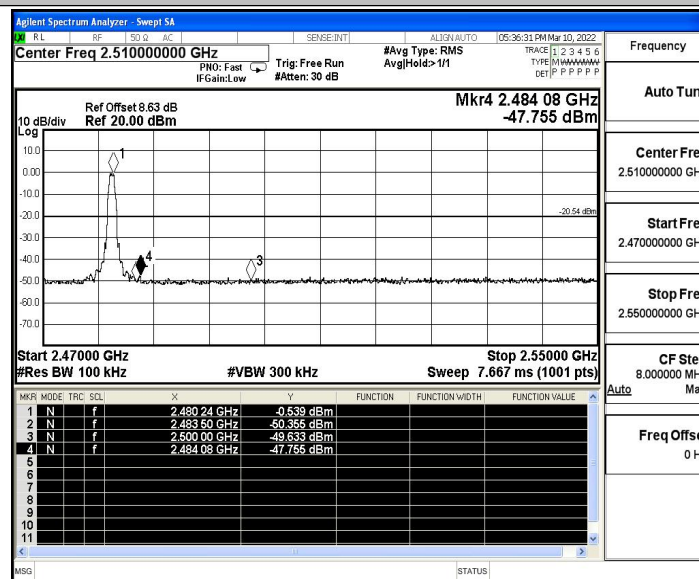


## Test Graphs

BLE\_1M\_Ant1\_Low\_2402



BLE\_1M\_Ant1\_High\_2480





## A.5 Conducted Spurious Emission

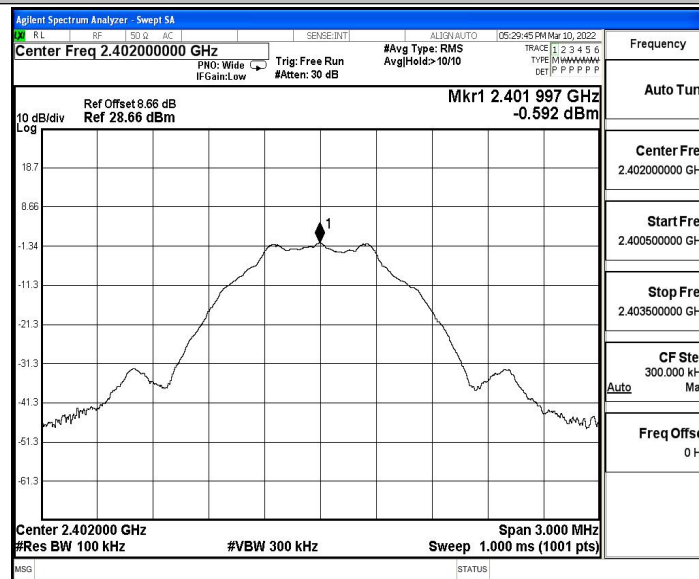
### Test Result

| TestMode | Antenna | Channel | FreqRange<br>[MHz] | RefLevel<br>[dBm] | Result[dBm] | Limit[dBm]    | Verdict |
|----------|---------|---------|--------------------|-------------------|-------------|---------------|---------|
| BLE_1M   | Ant1    | 2402    | Reference          | -0.59             | -0.59       | ---           | PASS    |
|          |         |         | 30~1000            | -0.59             | -58.74      | $\leq -20.59$ | PASS    |
|          |         |         | 1000~26500         | -0.59             | -46.22      | $\leq -20.59$ | PASS    |
|          |         | 2440    | Reference          | -0.17             | -0.17       | ---           | PASS    |
|          |         |         | 30~1000            | -0.17             | -58.78      | $\leq -20.17$ | PASS    |
|          |         |         | 1000~26500         | -0.17             | -46.37      | $\leq -20.17$ | PASS    |
|          |         | 2480    | Reference          | -0.65             | -0.65       | ---           | PASS    |
|          |         |         | 30~1000            | -0.65             | -59.56      | $\leq -20.65$ | PASS    |
|          |         |         | 1000~26500         | -0.65             | -39.73      | $\leq -20.65$ | PASS    |

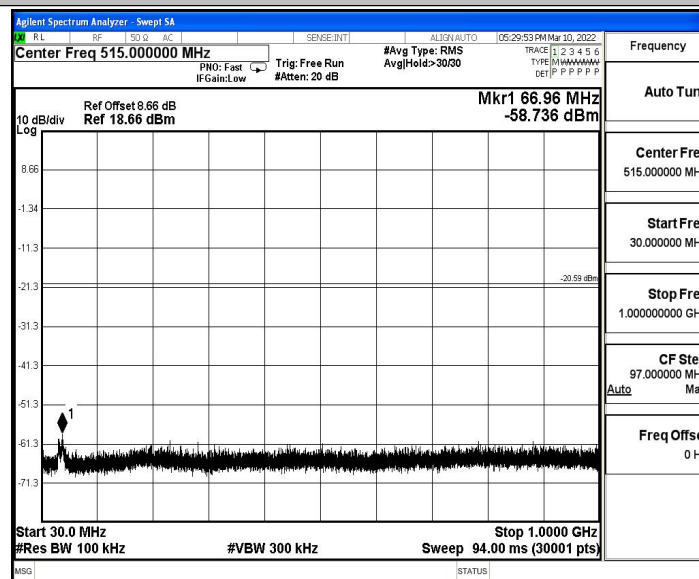


## Test Graphs

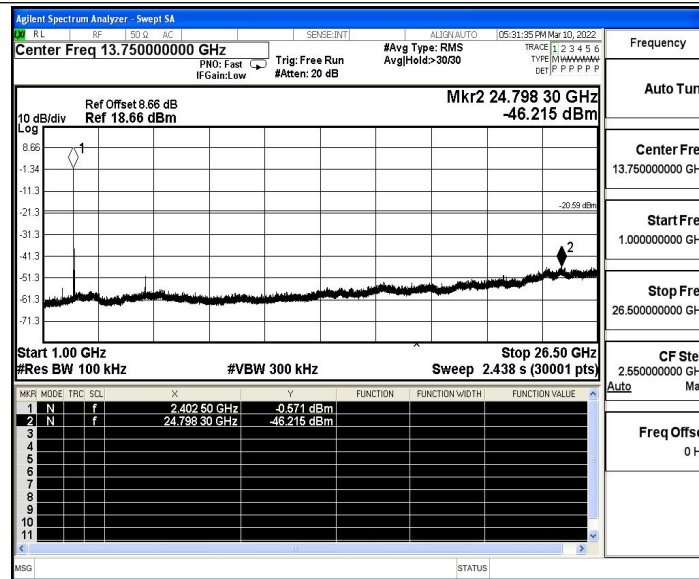
BLE\_1M\_Ant1\_2402\_0~Reference



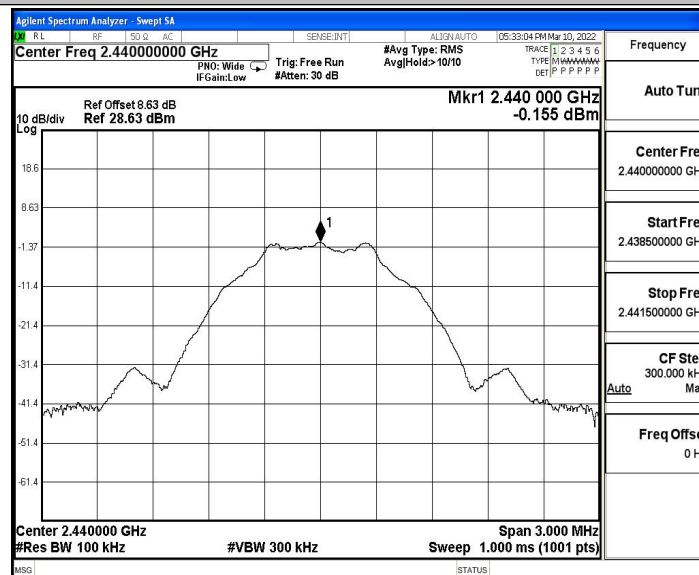
BLE\_1M\_Ant1\_2402\_30~1000



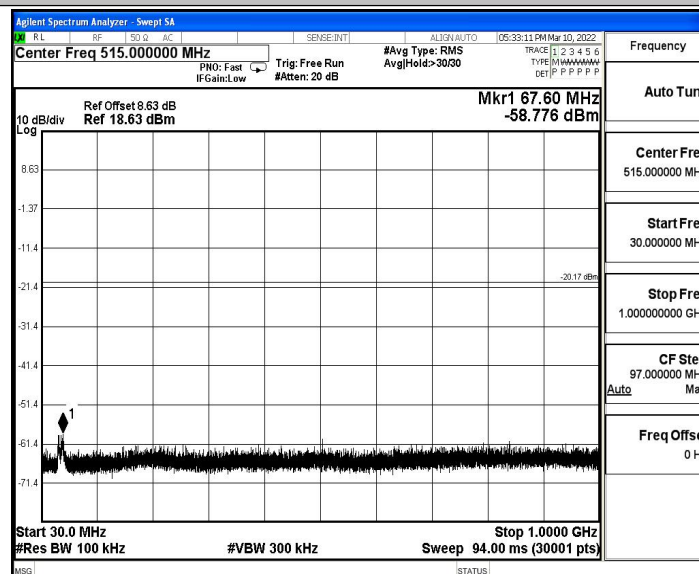
BLE\_1M\_Ant1\_2402\_1000~26500



BLE\_1M\_Ant1\_2440\_0~Reference

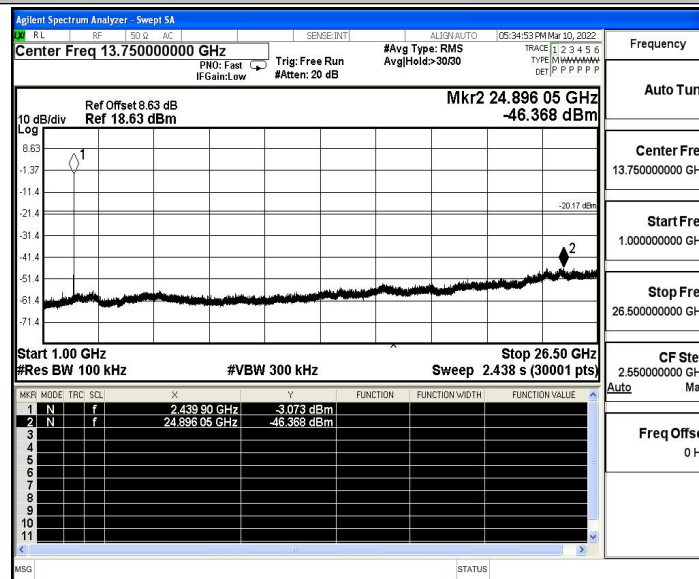


BLE\_1M\_Ant1\_2440\_30~1000

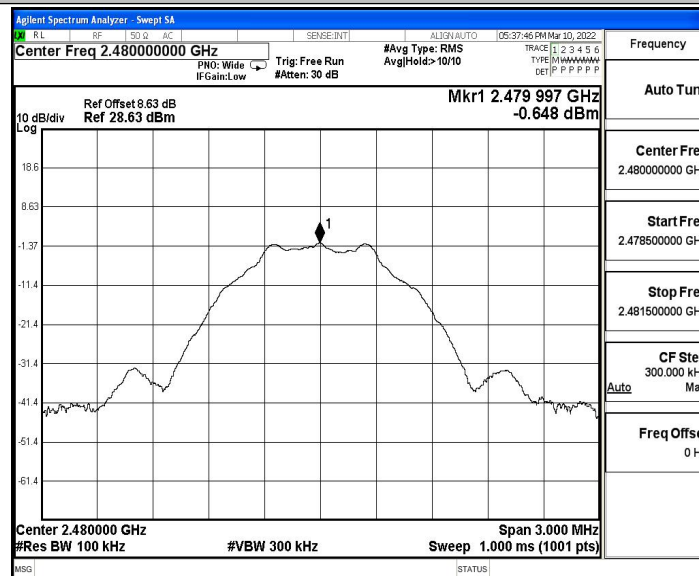




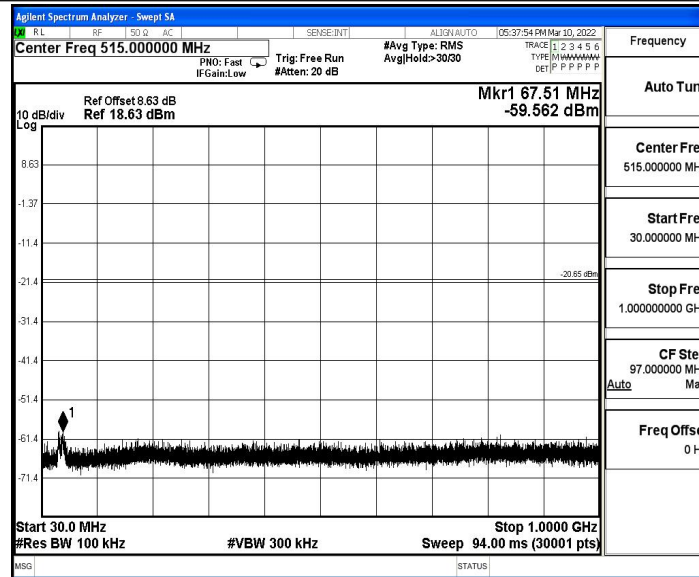
## BLE\_1M\_Ant1\_2440\_1000~26500



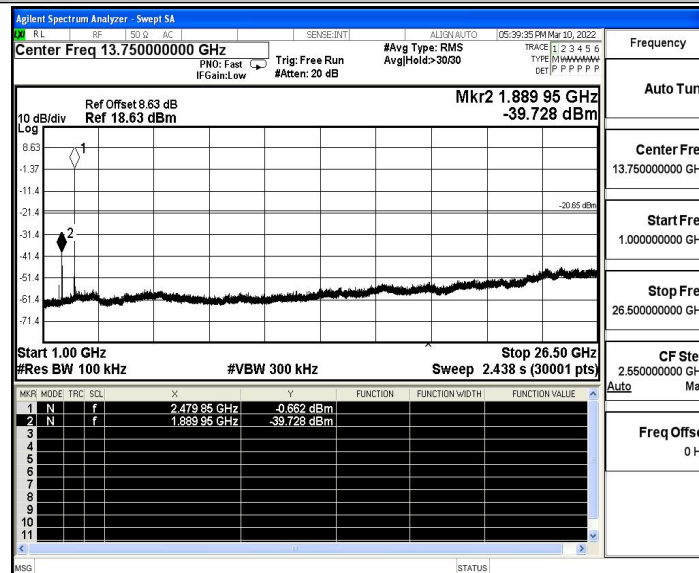
## BLE\_1M\_Ant1\_2480\_0~Reference



## BLE\_1M\_Ant1\_2480\_30~1000



BLE\_1M\_Ant1\_2480\_1000~26500





## A.6 Duty Cycle

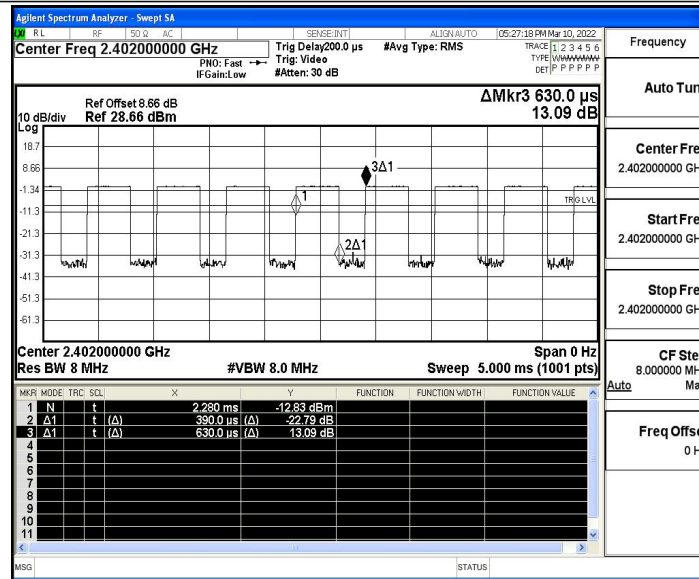
### Test Result

| TestMode | Antenna | Channel | ON Time<br>[ms] | Period<br>[ms] | X      | DC [%] | xFactor | 1/T[kHz] |
|----------|---------|---------|-----------------|----------------|--------|--------|---------|----------|
| BLE_1M   | Ant1    | 2402    | 0.39            | 0.63           | 0.6190 | 61.90  | 2.08    | 2.56     |
|          |         | 2440    | 0.39            | 0.62           | 0.6290 | 62.90  | 2.01    | 2.56     |
|          |         | 2480    | 0.39            | 0.63           | 0.6190 | 61.90  | 2.08    | 2.56     |

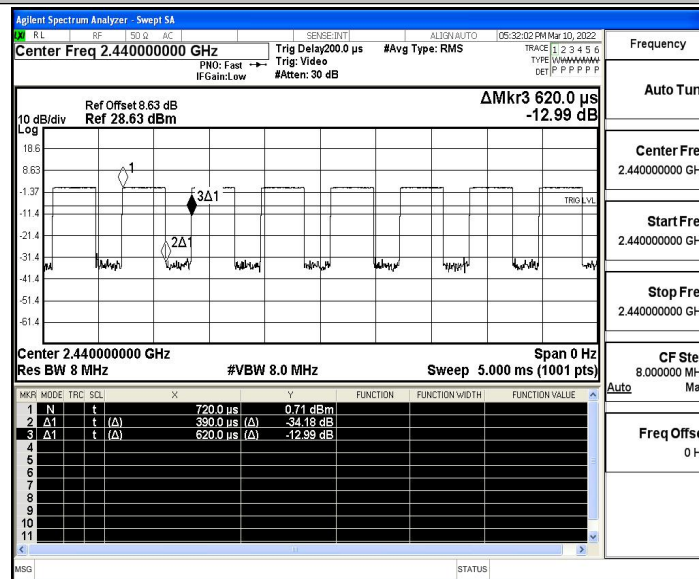


## Test Graphs

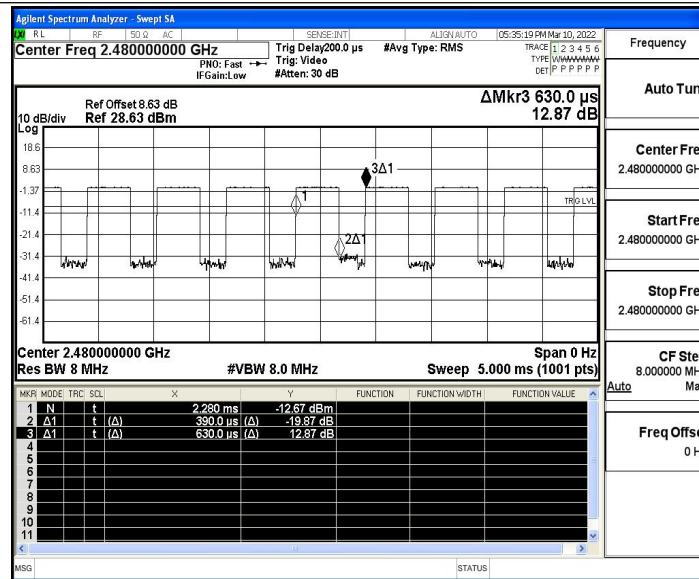
BLE\_1M\_Ant1\_2402



BLE\_1M\_Ant1\_2440



BLE\_1M\_Ant1\_2480





## A.7 Emissions in Restricted Bands

### Test Result

| TestMode | Antenna | ChName | Channel | Detector | Freq.<br>[MHz] | Result<br>[dBm] | Limit<br>[dBm] | Result<br>[dBuV/m] | Limit<br>[dBuV/m] | Verdict |
|----------|---------|--------|---------|----------|----------------|-----------------|----------------|--------------------|-------------------|---------|
| BLE_1M   | Ant1    | Low    | 2402    | AV       | 2310.000       | -47.49          | ≤-41.20        | 47.71              | ≤54               | PASS    |
|          |         |        |         | AV       | 2379.590       | -46.65          | ≤-41.20        | 48.55              | ≤54               | PASS    |
|          |         |        |         | AV       | 2390.000       | -47.13          | ≤-41.20        | 48.07              | ≤54               | PASS    |
|          |         |        |         | Peak     | 2310.000       | -38.86          | ≤-21.20        | 56.34              | ≤74               | PASS    |
|          |         |        |         | Peak     | 2347.880       | -36.97          | ≤-21.20        | 58.23              | ≤74               | PASS    |
|          |         |        |         | Peak     | 2390.000       | -37.22          | ≤-21.20        | 57.98              | ≤74               | PASS    |
|          |         | High   | 2480    | AV       | 2483.500       | -45.9           | ≤-41.20        | 49.30              | ≤54               | PASS    |
|          |         |        |         | AV       | 2483.600       | -45.51          | ≤-41.20        | 49.69              | ≤54               | PASS    |
|          |         |        |         | AV       | 2500.000       | -46.55          | ≤-41.20        | 48.65              | ≤54               | PASS    |
|          |         |        |         | Peak     | 2483.500       | -32.24          | ≤-21.20        | 62.96              | ≤74               | PASS    |
|          |         |        |         | Peak     | 2483.520       | -32.24          | ≤-21.20        | 62.96              | ≤74               | PASS    |
|          |         |        |         | Peak     | 2500.000       | -37.78          | ≤-21.20        | 57.42              | ≤74               | PASS    |

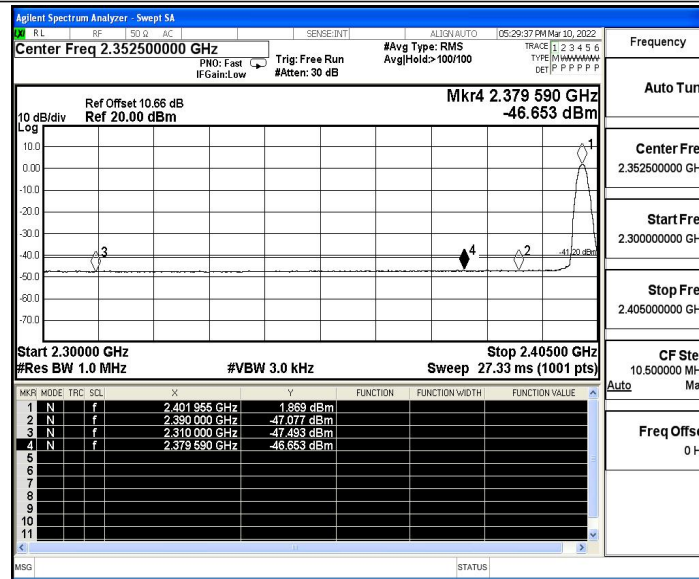
Note:

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.

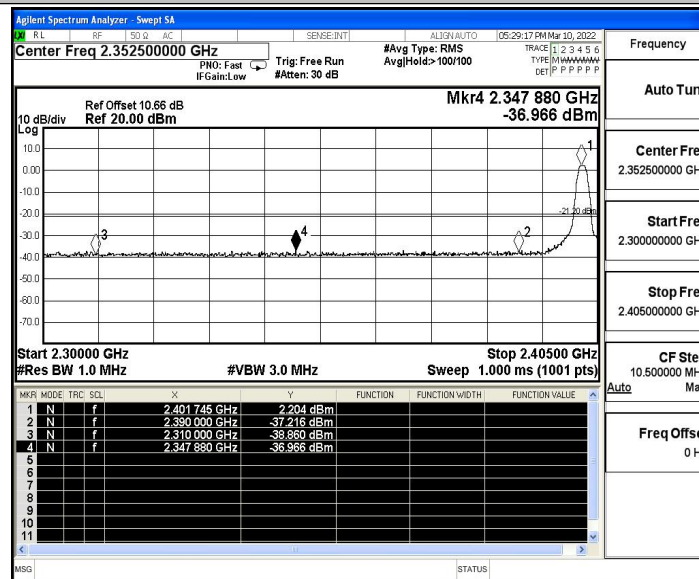


## Test Graphs

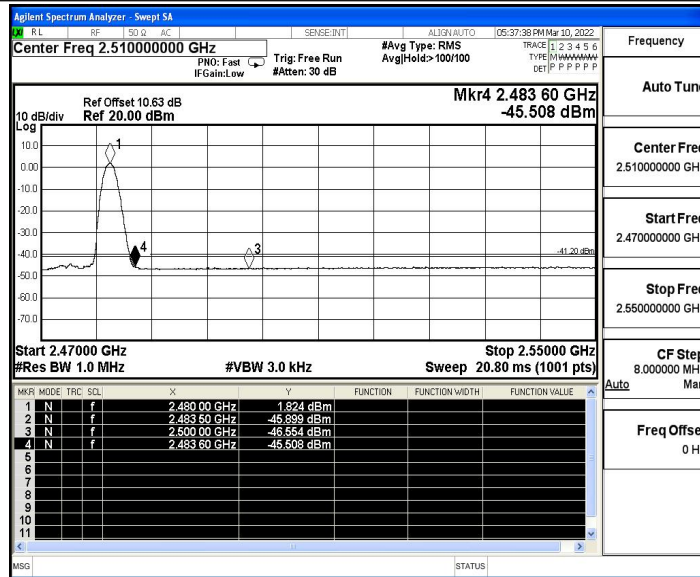
BLE\_1M\_Ant1\_Low\_2402\_AV



BLE\_1M\_Ant1\_Low\_2402\_Peak



BLE\_1M\_Ant1\_High\_2480\_AV



BLE\_1M\_Ant1\_High\_2480\_Peak

