



Appendix B

RF Test Data for BT LE (Conducted Measurement)

Product Name: Portable keyboard piano

Test Model: BX-20

Environmental Conditions

|                    |                                |
|--------------------|--------------------------------|
| Temperature:       | 23.8 ° C                       |
| Relative Humidity: | 52.1%                          |
| ATM Pressure:      | 100.0 kPa                      |
| Test Engineer:     | <div>Wunder Wu</div> Wunder Wu |
| Supervised by:     | <div>Li Huan</div> Li Huan     |





## B.1 DTS Bandwidth

### Test Result

| TestMode | Antenna | Frequency[MHz] | DTS BW [MHz] | FL[MHz]  | FH[MHz]  | Limit[MHz] | Verdict |
|----------|---------|----------------|--------------|----------|----------|------------|---------|
| BLE      | Ant     | 2402           | 0.696        | 2401.644 | 2402.340 | 0.5        | PASS    |
|          |         | 2440           | 0.708        | 2439.636 | 2440.344 | 0.5        | PASS    |
|          |         | 2480           | 0.708        | 2479.636 | 2480.344 | 0.5        | PASS    |

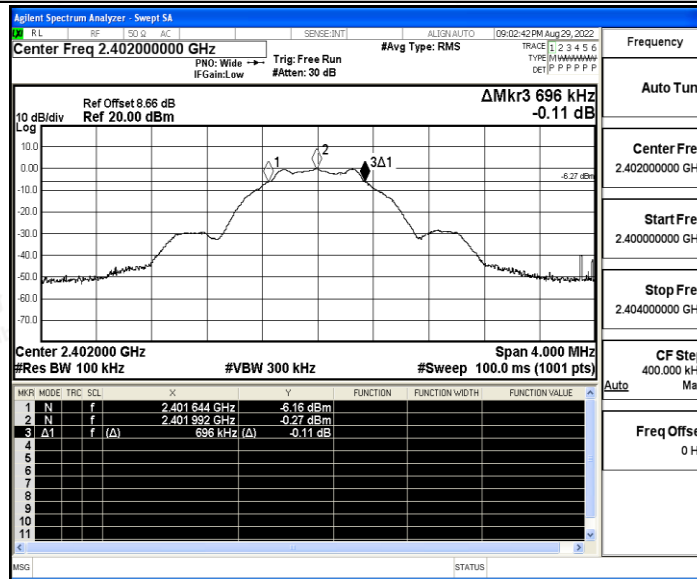


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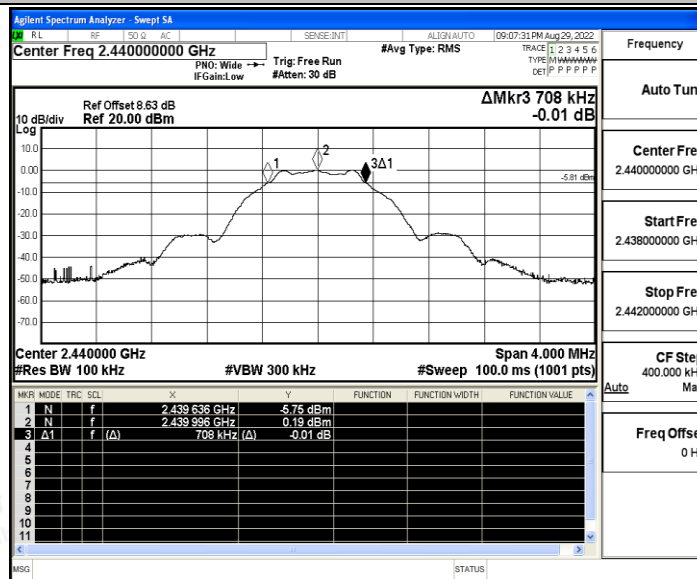


## Test Graphs

BLE\_Ant\_2402

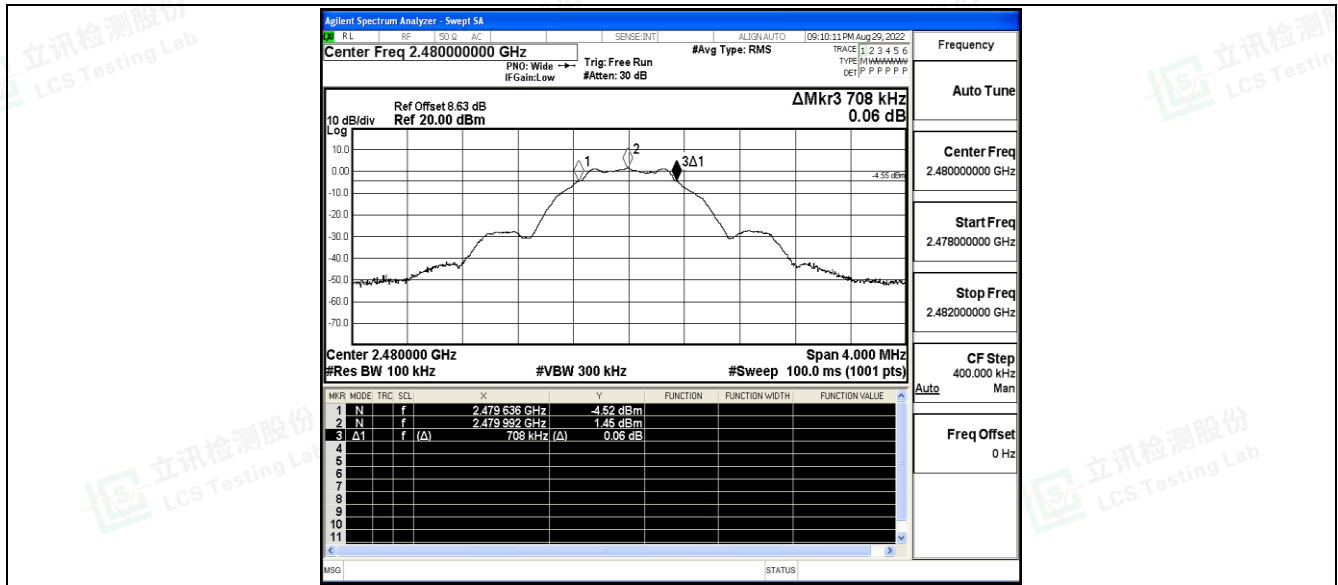


BLE\_Ant\_2440



BLE\_Ant\_2480







## B.2 Occupied Channel Bandwidth

### Test Result

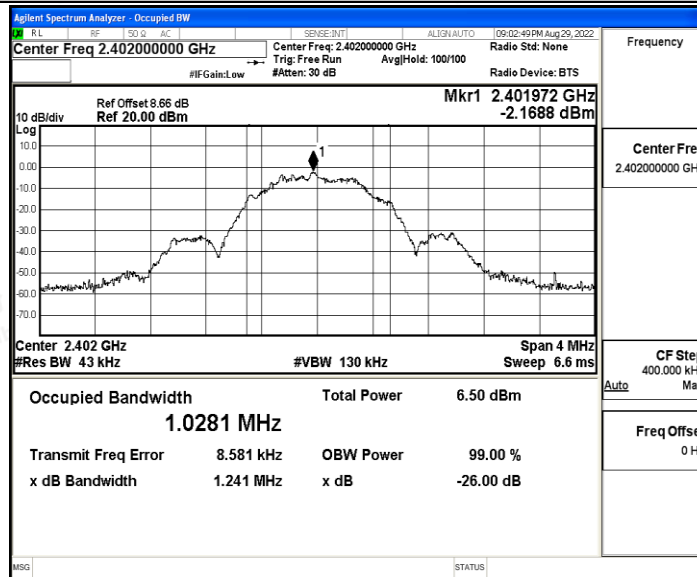
| TestMode | Antenna | Frequency[MHz] | OCB [MHz] | FL[MHz]   | FH[MHz]   | Limit[MHz] | Verdict |
|----------|---------|----------------|-----------|-----------|-----------|------------|---------|
| BLE      | Ant     | 2402           | 1.0281    | 2401.4945 | 2402.5226 | ---        | ---     |
|          |         | 2440           | 1.0284    | 2439.4949 | 2440.5233 | ---        | ---     |
|          |         | 2480           | 1.0189    | 2479.4959 | 2480.5148 | ---        | ---     |



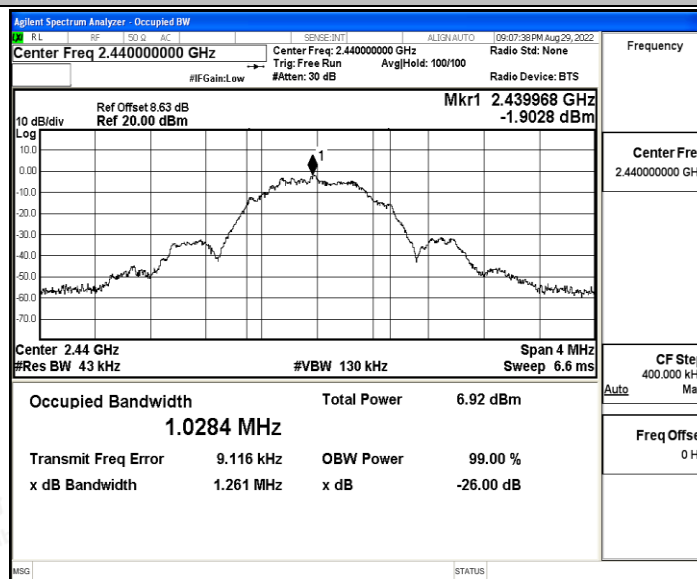


## Test Graphs

BLE\_Ant\_2402

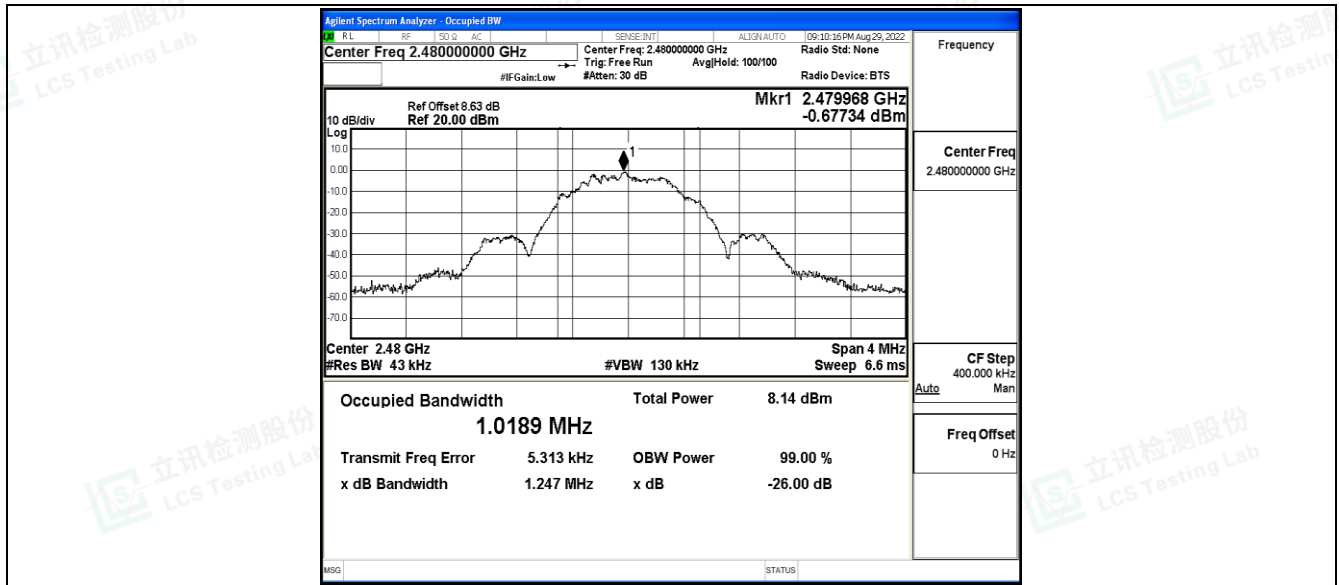


BLE\_Ant\_2440



BLE\_Ant\_2480







B.3 Maximum peak conducted output power

Test Result

| TestMode | Antenna | Channel | Result[dBm] | Limit[dBm] | Verdict |
|----------|---------|---------|-------------|------------|---------|
| BLE      | Ant     | 2402    | 0.29        | ≤30        | PASS    |
|          |         | 2440    | 0.34        | ≤30        | PASS    |
|          |         | 2480    | 0.24        | ≤30        | PASS    |

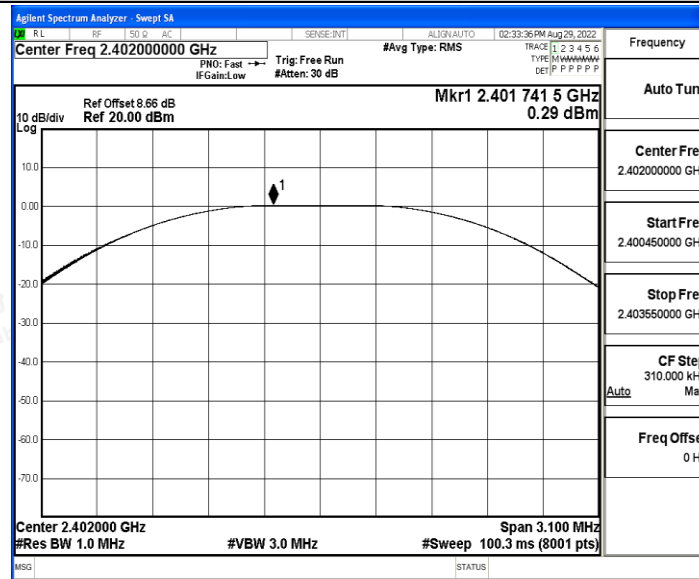




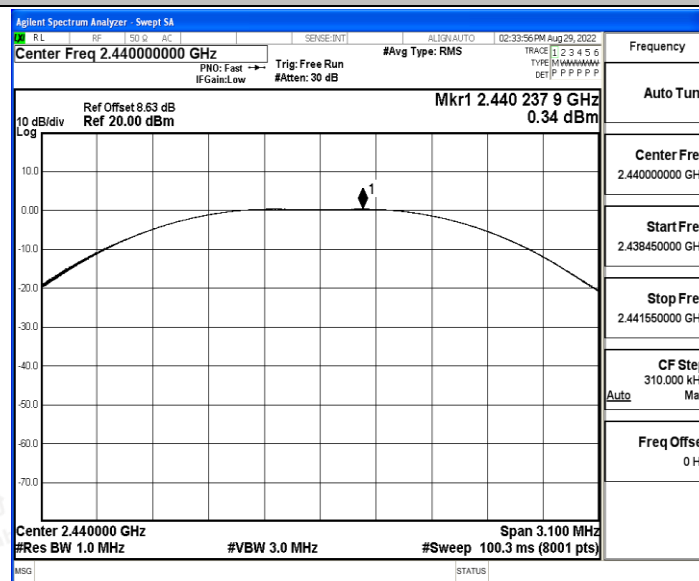


## Test Graphs

BLE\_Ant\_2402

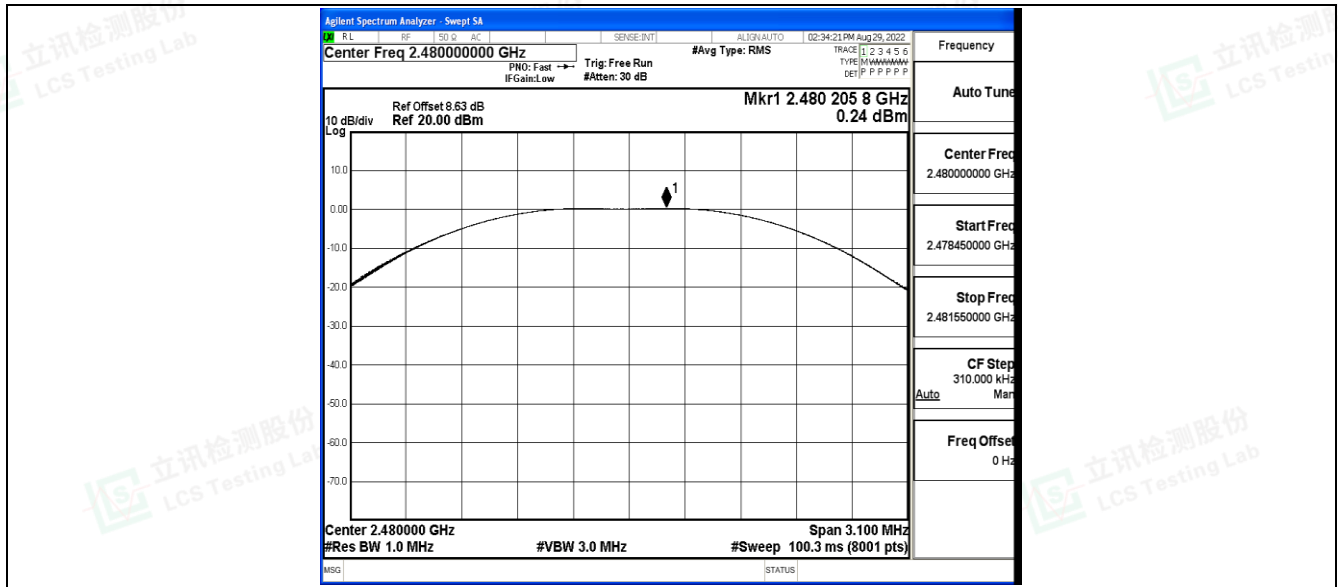


BLE\_Ant\_2440



BLE\_Ant\_2480







B.4 Maximum power spectral density

Test Result

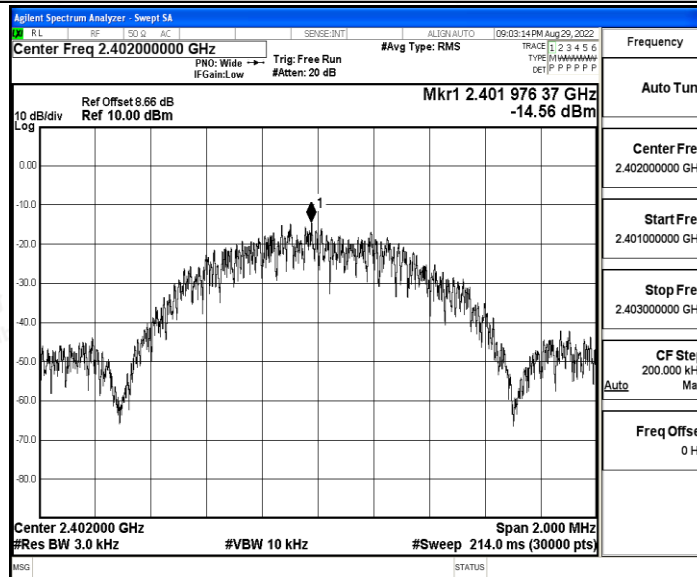
| TestMode | Antenna | Frequency[MHz] | Result[dBm/3kHz] | Limit[dBm/3kHz] | Verdict |
|----------|---------|----------------|------------------|-----------------|---------|
| BLE      | Ant     | 2402           | -14.56           | ≤8.00           | PASS    |
|          |         | 2440           | -14.14           | ≤8.00           | PASS    |
|          |         | 2480           | -12.86           | ≤8.00           | PASS    |



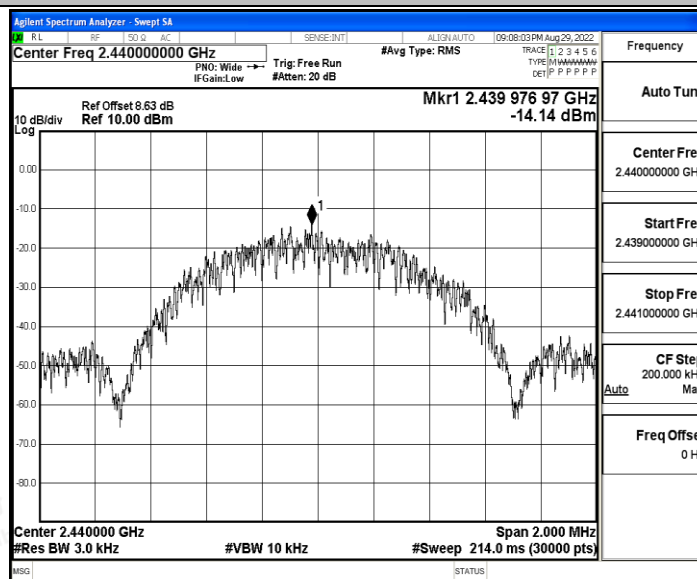


## Test Graphs

BLE\_Ant\_2402

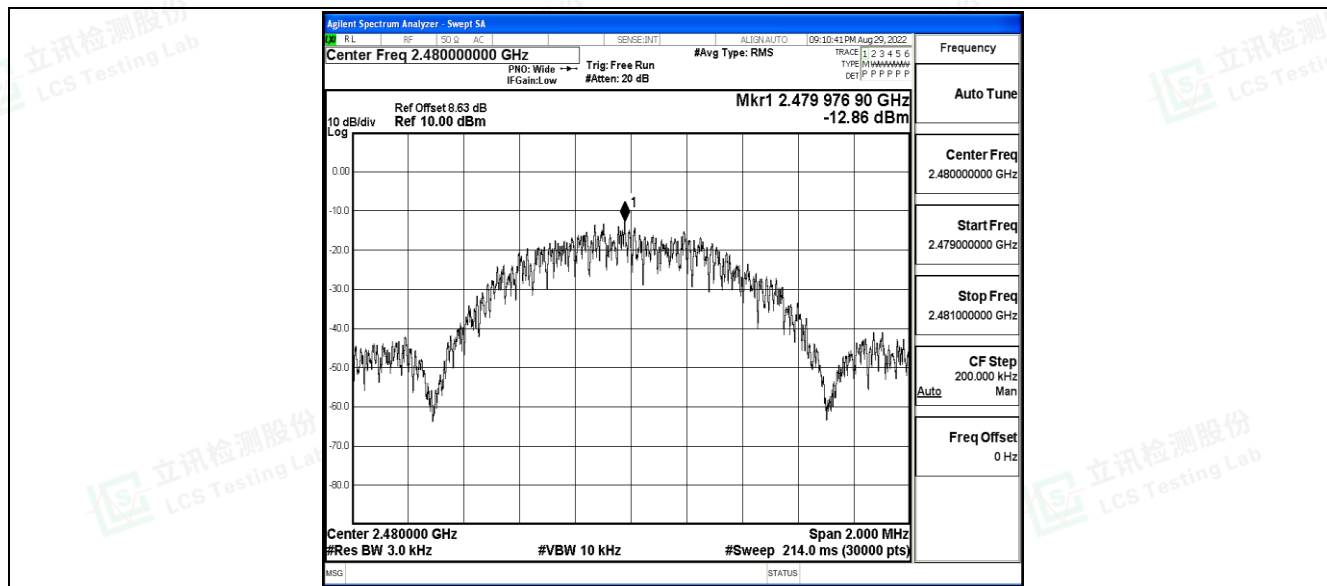


BLE\_Ant\_2440



BLE\_Ant\_2480





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B.5 Band edge measurements

Test Result

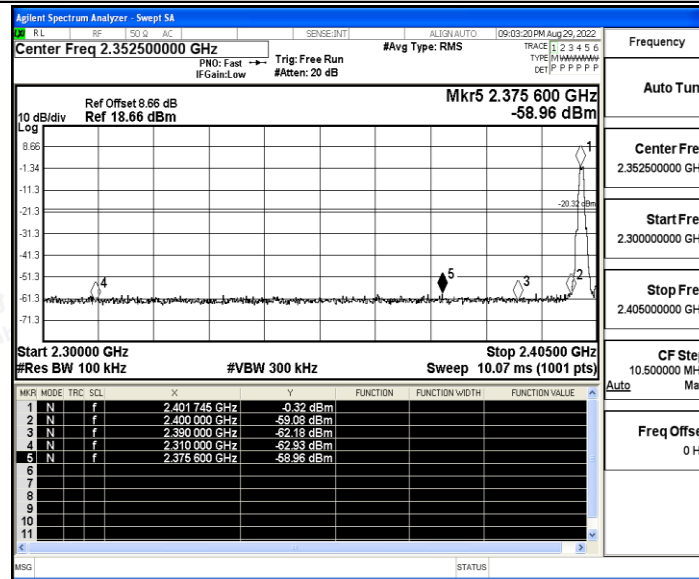
| TestMode | Antenna | ChName | Frequency[MHz] | RefLevel[dBm] | Result[dBm] | Limit[dBm] | Verdict |
|----------|---------|--------|----------------|---------------|-------------|------------|---------|
| BLE      | Ant     | Low    | 2402           | -0.32         | -58.96      | ≤-20.32    | PASS    |
|          |         | High   | 2480           | 1.45          | -57.92      | ≤-18.55    | PASS    |



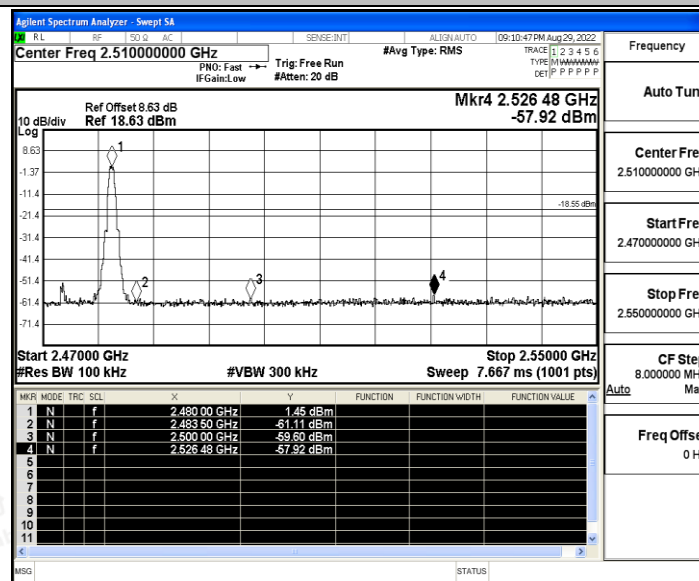


## Test Graphs

BLE\_Ant\_Low\_2402



BLE\_Ant\_High\_2480





## B.6 Conducted Spurious Emission

### Test Result

| TestMode | Antenna | Frequency[MHz] | FreqRange [MHz] | RefLevel [dBm] | Result[dBm] | Limit[dBm]    | Verdict |
|----------|---------|----------------|-----------------|----------------|-------------|---------------|---------|
| BLE      | Ant     | 2402           | Reference       | -1.17          | -1.17       | ---           | PASS    |
|          |         |                | 30~1000         | -1.17          | -60.32      | $\leq -21.17$ | PASS    |
|          |         |                | 1000~26500      | -1.17          | -46.18      | $\leq -21.17$ | PASS    |
|          |         | 2440           | Reference       | -0.32          | -0.32       | ---           | PASS    |
|          |         |                | 30~1000         | -0.32          | -60.52      | $\leq -20.32$ | PASS    |
|          |         |                | 1000~26500      | -0.32          | -32.28      | $\leq -20.32$ | PASS    |
|          |         | 2480           | Reference       | 0.26           | 0.26        | ---           | PASS    |
|          |         |                | 30~1000         | 0.26           | -61.04      | $\leq -19.74$ | PASS    |
|          |         |                | 1000~26500      | 0.26           | -42.58      | $\leq -19.74$ | PASS    |



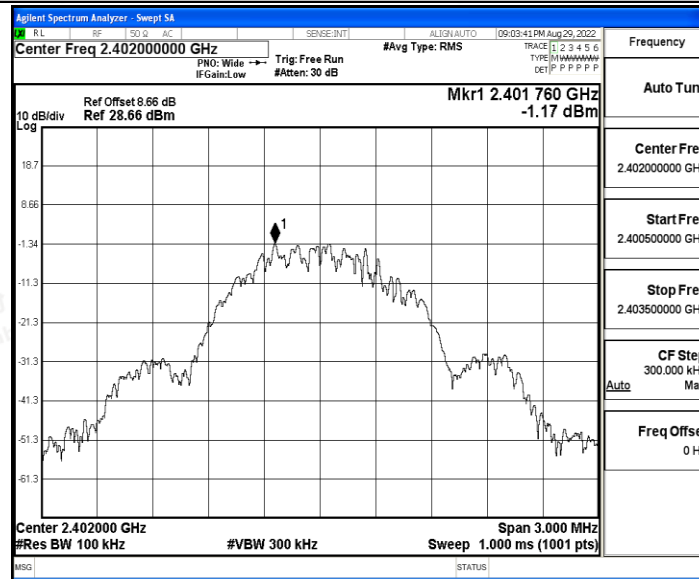
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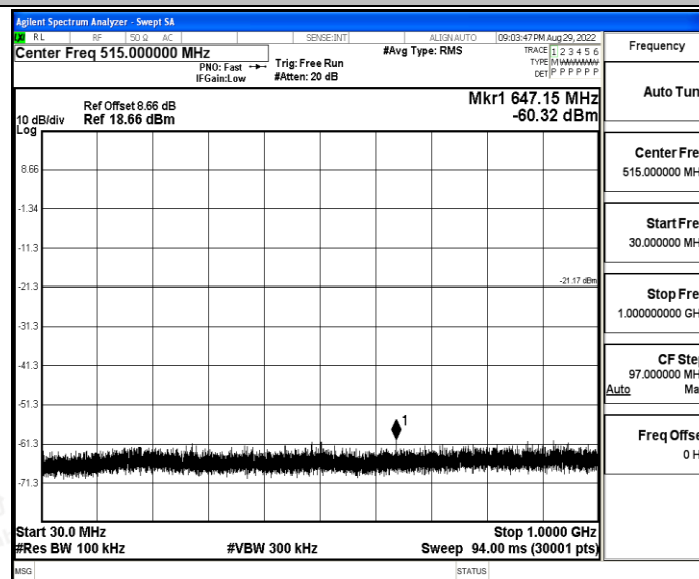


## Test Graphs

BLE\_Ant\_2402\_0~Reference

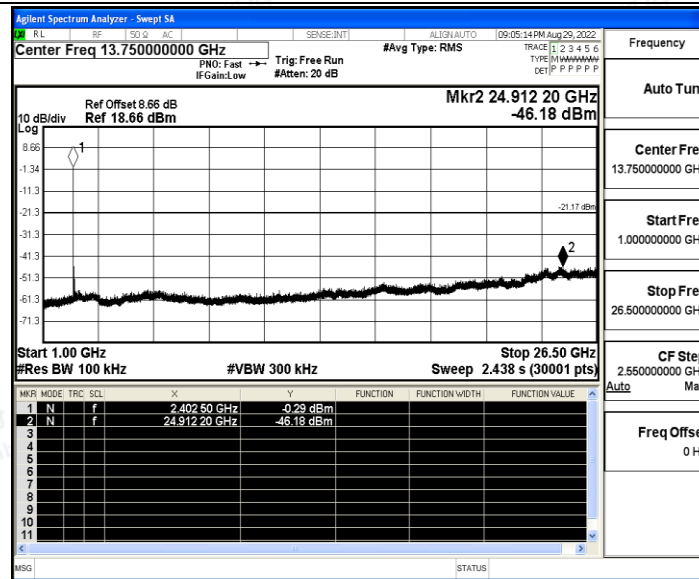


BLE\_Ant\_2402\_30~1000

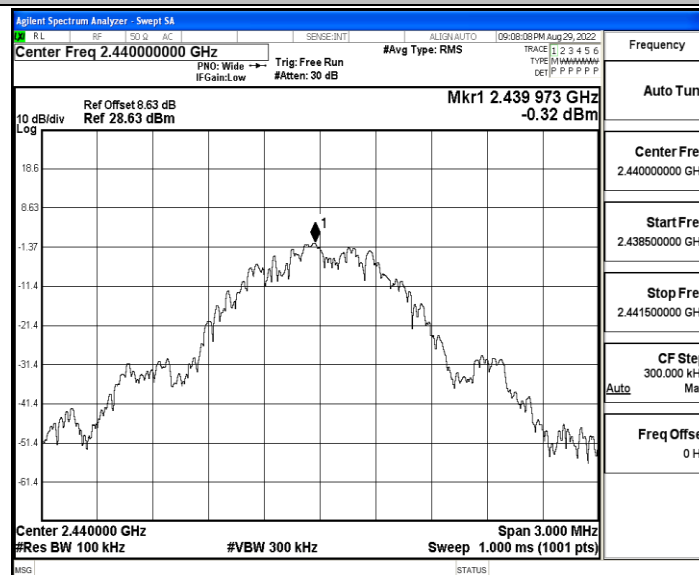


BLE\_Ant\_2402\_1000~26500



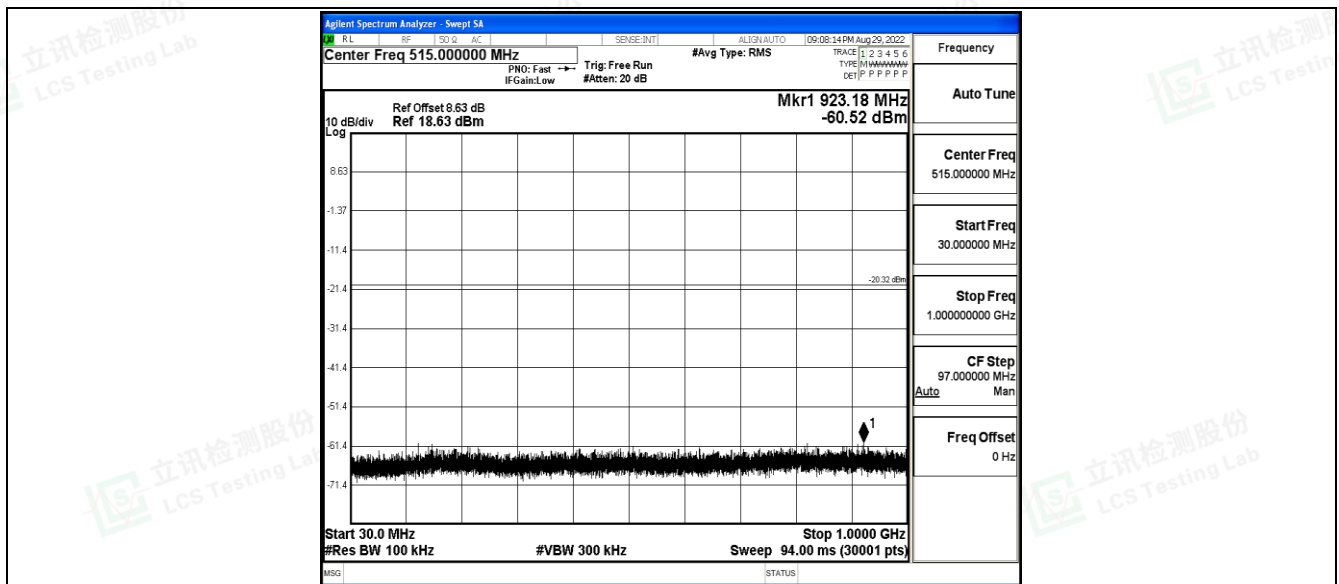


BLE\_Ant\_2440\_0~Reference

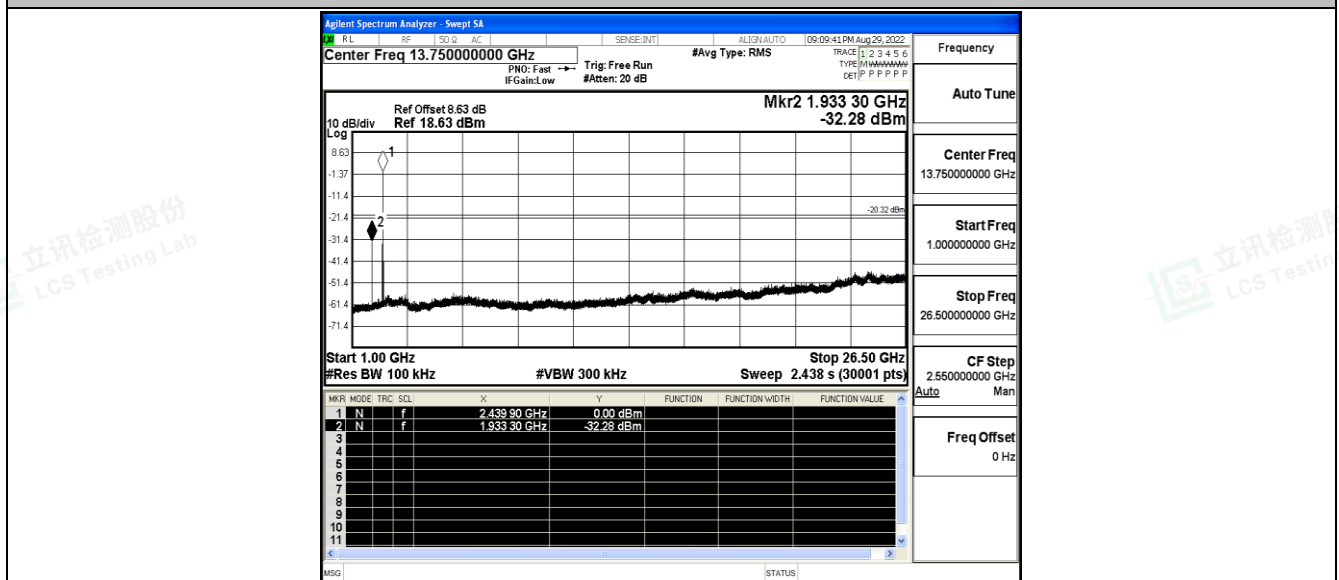


BLE\_Ant\_2440\_30~1000



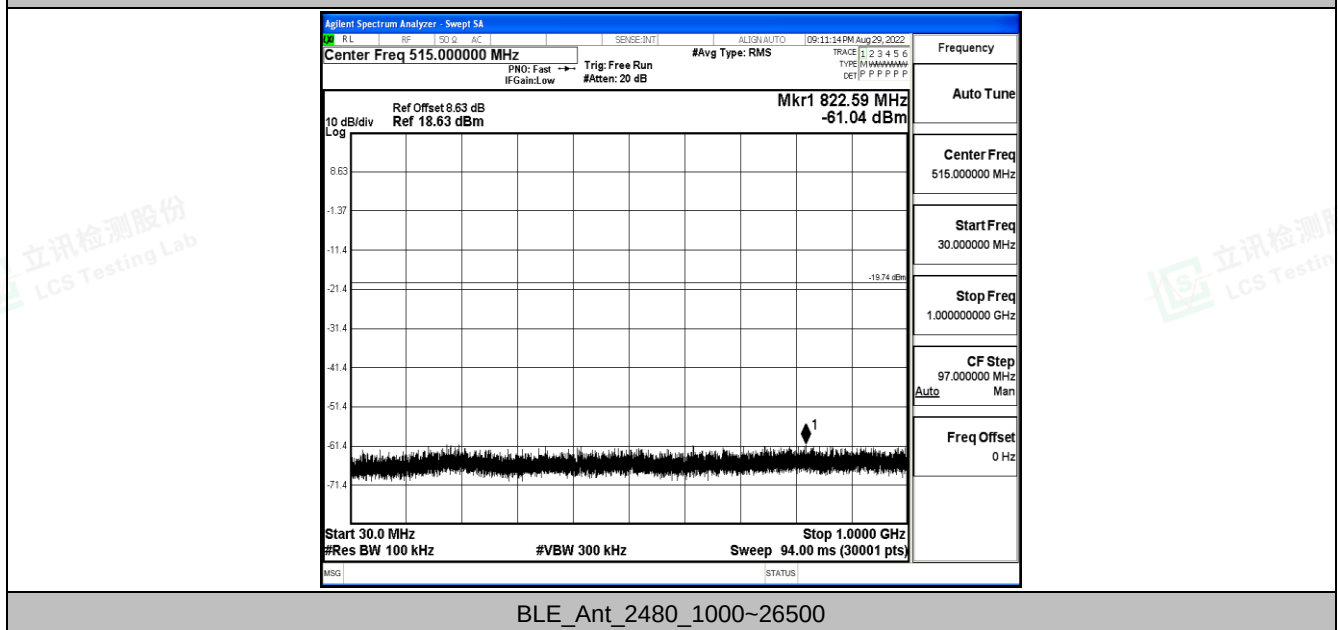
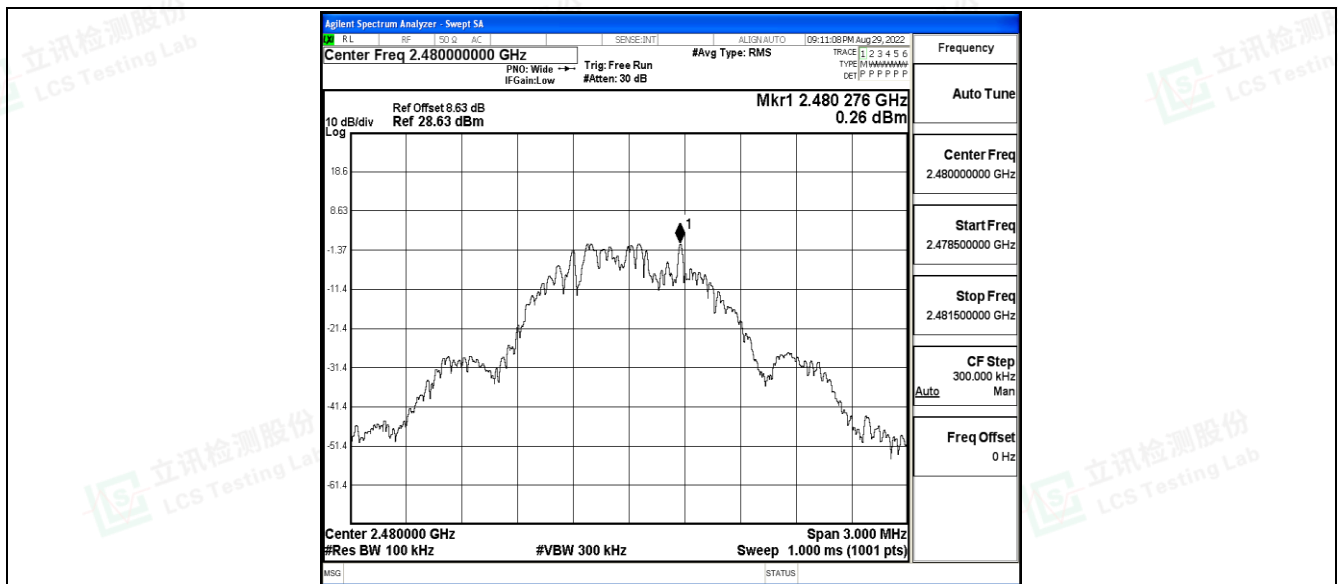


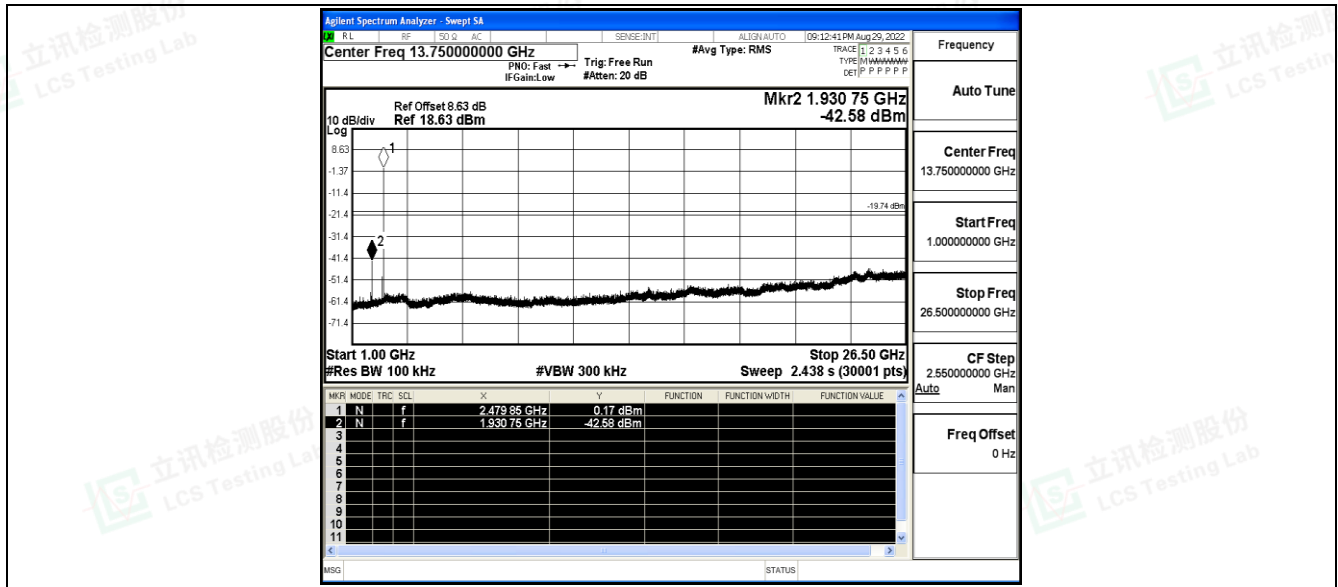
BLE\_Ant\_2440\_1000~26500



BLE\_Ant\_2480\_0~Reference









B.7 Duty Cycle

Test Result

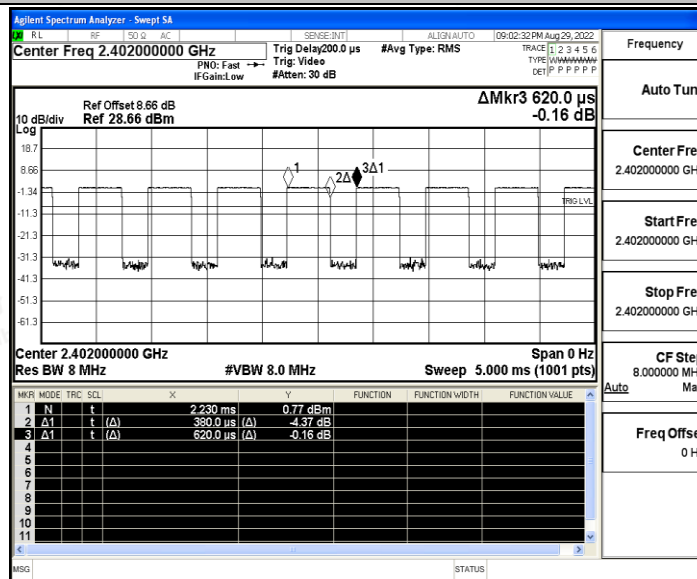
| TestMode | Antenna | Frequency[MHz] | ON Time [ms] | Period [ms] | Duty Cycle [%] | Duty Cycle Factor[dB] | 1/T Factor[dB] |
|----------|---------|----------------|--------------|-------------|----------------|-----------------------|----------------|
| BLE      | Ant     | 2402           | 0.38         | 0.62        | 61.29          | 2.13                  | 2.63           |
|          |         | 2440           | 0.38         | 0.63        | 60.32          | 2.20                  | 2.63           |
|          |         | 2480           | 0.38         | 0.63        | 60.32          | 2.20                  | 2.63           |



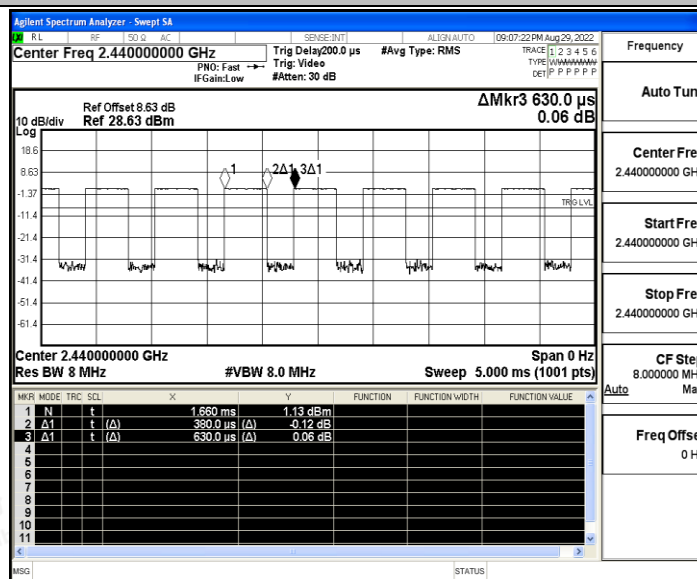


## Test Graphs

BLE\_Ant\_2402

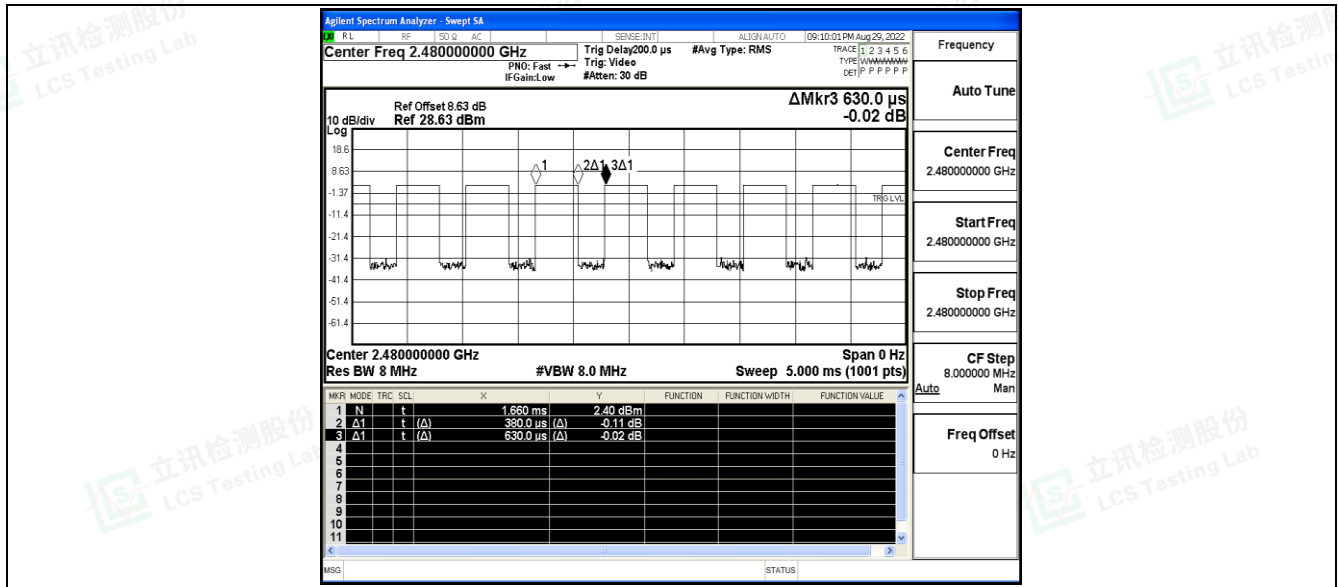


BLE\_Ant\_2440



BLE\_Ant\_2480









## B.8 Emissions in Restricted Bands

### Test Result

| TestMode | Antenna | ChName | Frequenc<br>y[MHz] | Detector | Freq<br>[MHz] | Result<br>[dBm] | Limit<br>[dBm] | Result<br>[dBuV/m] | Limit<br>[dBuV/m] | Verdict |
|----------|---------|--------|--------------------|----------|---------------|-----------------|----------------|--------------------|-------------------|---------|
| BLE      | Ant     | Low    | 2402               | AV       | 2310.000      | -57.4           | ≤-41.20        | 37.80              | ≤54               | PASS    |
|          |         |        |                    | AV       | 2389.250      | -52.71          | ≤-41.20        | 42.49              | ≤54               | PASS    |
|          |         |        |                    | AV       | 2390.000      | -54.84          | ≤-41.20        | 40.36              | ≤54               | PASS    |
|          |         |        |                    | Peak     | 2310.000      | -50.34          | ≤-21.20        | 44.86              | ≤74               | PASS    |
|          |         |        |                    | Peak     | 2332.445      | -48.25          | ≤-21.20        | 46.95              | ≤74               | PASS    |
|          |         |        |                    | Peak     | 2390.000      | -50.41          | ≤-21.20        | 44.79              | ≤74               | PASS    |
|          |         | High   | 2480               | AV       | 2483.500      | -52             | ≤-41.20        | 43.20              | ≤54               | PASS    |
|          |         |        |                    | AV       | 2483.520      | -52             | ≤-41.20        | 43.20              | ≤54               | PASS    |
|          |         |        |                    | AV       | 2500.000      | -56.62          | ≤-41.20        | 38.58              | ≤54               | PASS    |
|          |         |        |                    | Peak     | 2483.500      | -49.76          | ≤-21.20        | 45.44              | ≤74               | PASS    |
|          |         |        |                    | Peak     | 2487.360      | -47.64          | ≤-21.20        | 47.56              | ≤74               | PASS    |
|          |         |        |                    | Peak     | 2500.000      | -51.08          | ≤-21.20        | 44.12              | ≤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.

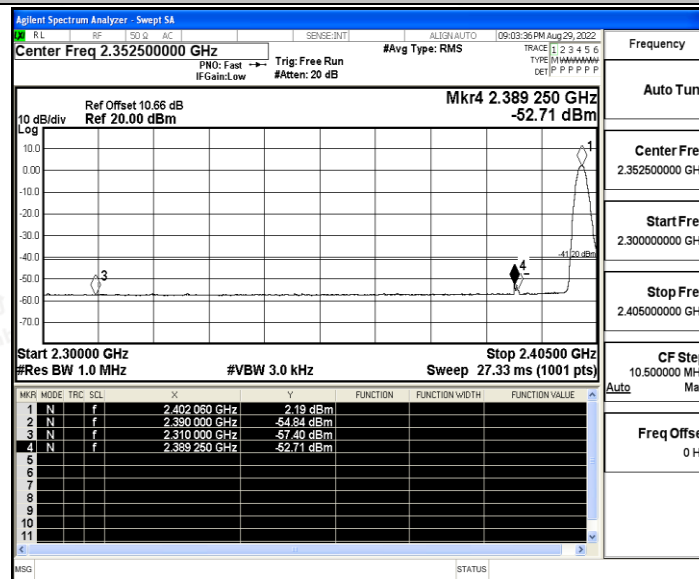


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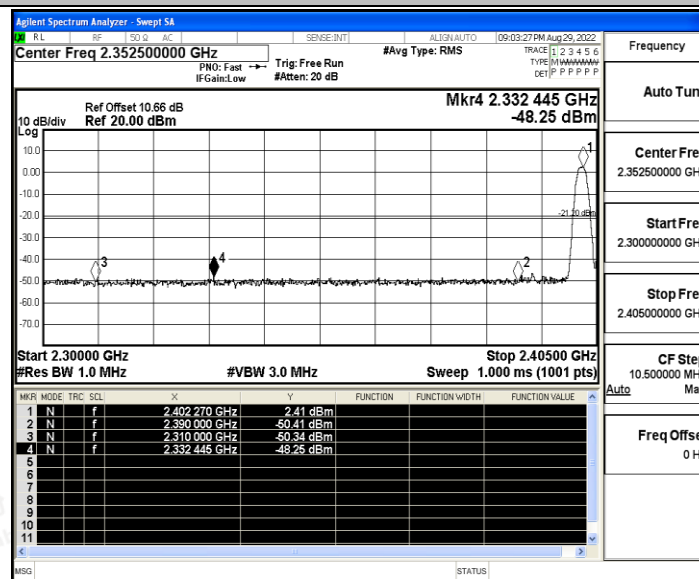


## Test Graphs

BLE\_Ant\_Low\_2402\_AV

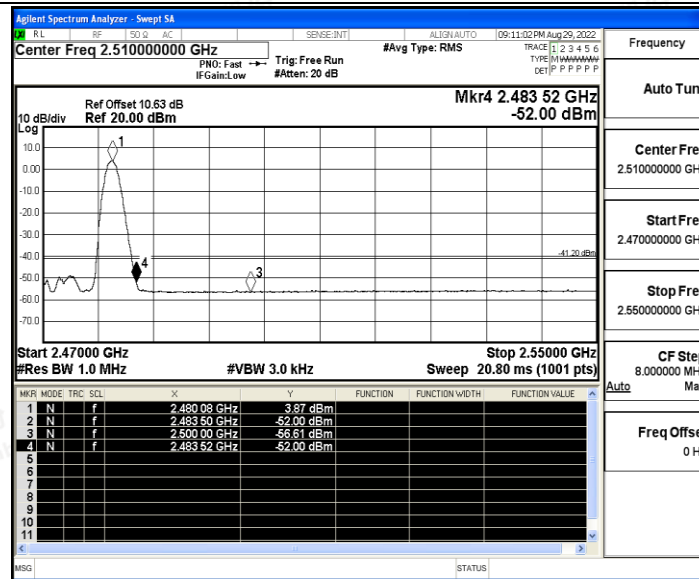


BLE\_Ant\_Low\_2402\_Peak



BLE\_Ant\_High\_2480\_AV





BLE\_Ant\_High\_2480\_Peak

