



## Appendix A

### RF Test Data for BLE (Conducted Measurement)

Product Name: Bluetooth controller

Test Model: NR404

#### Environmental Conditions

|                    |           |
|--------------------|-----------|
| Temperature:       | 23.1° C   |
| Relative Humidity: | 52.3%     |
| ATM Pressure:      | 100.0 kPa |
| Test Engineer:     | Taylor Hu |
| Supervised by:     | Ling Zhu  |



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## A.1 DTS Bandwidth

### Test Result

| TestMode | Antenna | Channel | DTS BW [MHz] | FL[MHz]  | FH[MHz]  | Limit[MHz] | Verdict |
|----------|---------|---------|--------------|----------|----------|------------|---------|
| BLE_2M   | Ant1    | 2402    | 1.232        | 2401.368 | 2402.600 | 0.5        | PASS    |
|          |         | 2440    | 1.232        | 2439.368 | 2440.600 | 0.5        | PASS    |
|          |         | 2480    | 1.236        | 2479.364 | 2480.600 | 0.5        | PASS    |



## Test Graphs

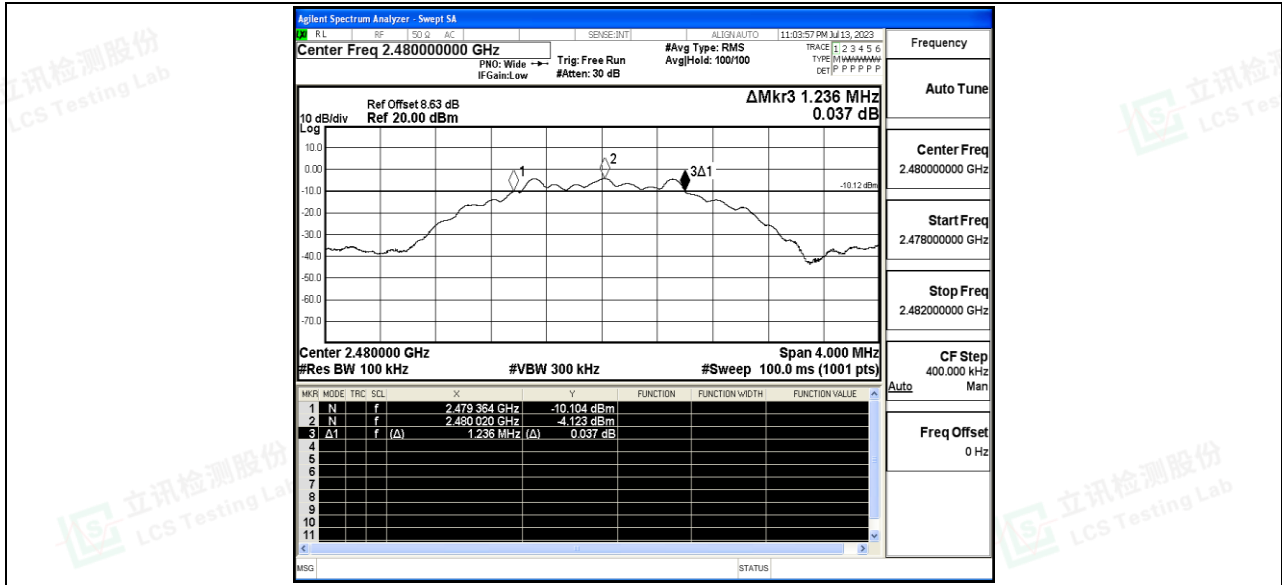


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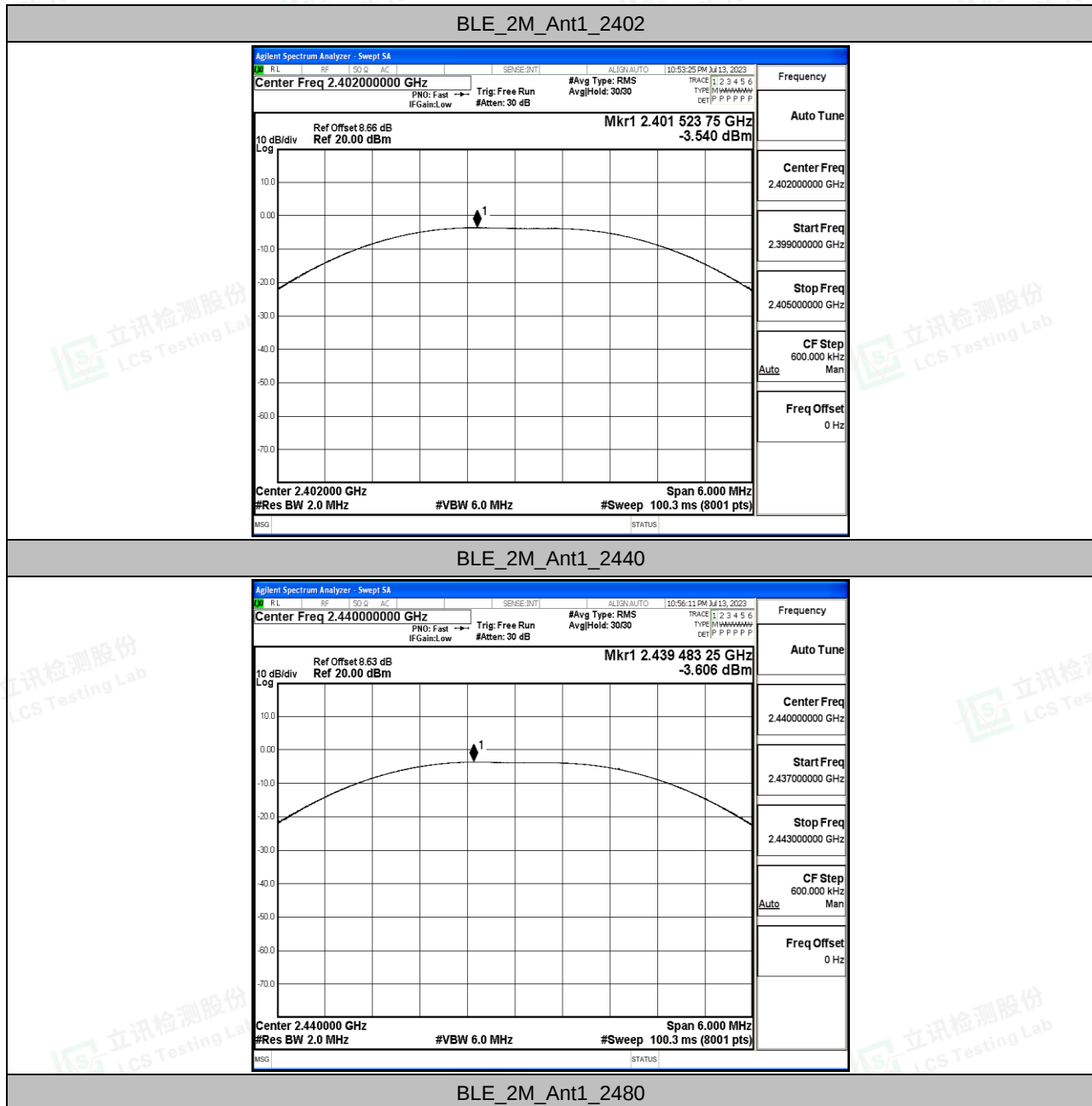
## A.2 Maximum conducted output power

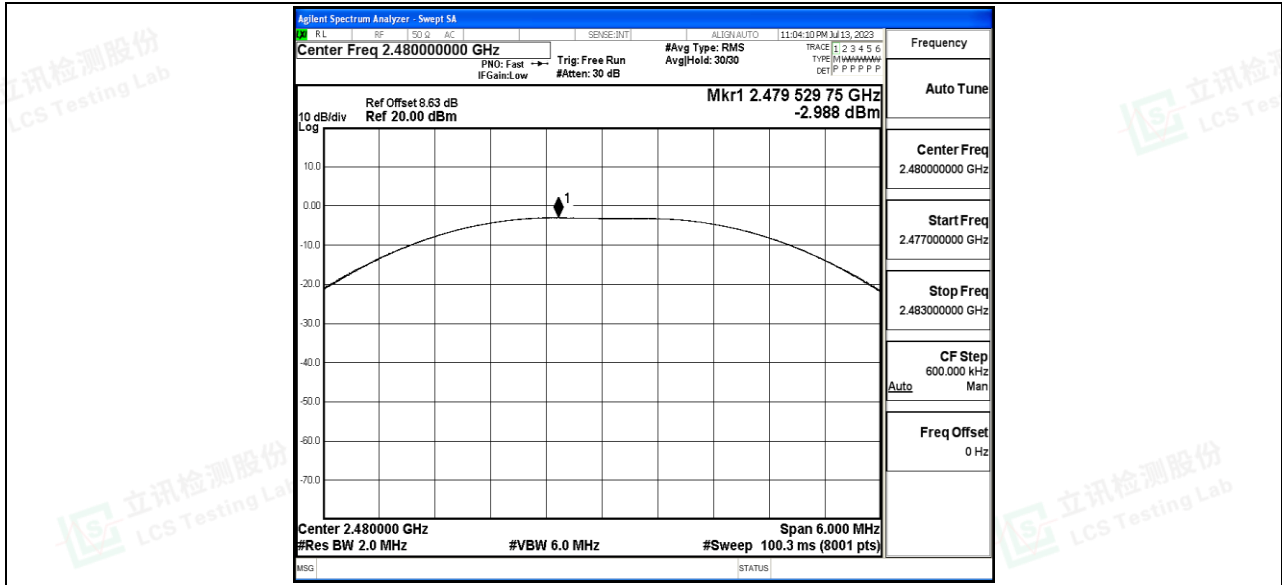
### Test Result

| TestMode | Antenna | Channel | Result[dBm] | Limit[dBm] | Verdict |
|----------|---------|---------|-------------|------------|---------|
| BLE_2M   | Ant1    | 2402    | -3.54       | ≤30        | PASS    |
|          |         | 2440    | -3.61       | ≤30        | PASS    |
|          |         | 2480    | -2.99       | ≤30        | PASS    |



## Test Graphs







### A.3 Maximum power spectral density

#### Test Result

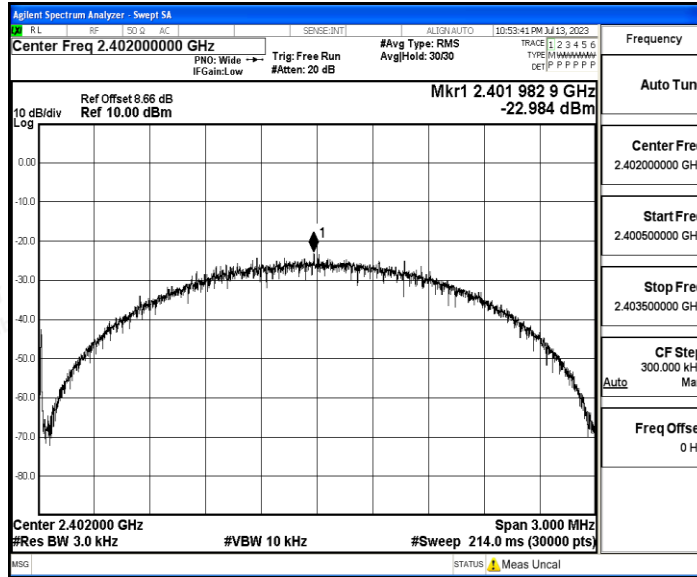
| TestMode | Antenna | Channel | Result[dBm/3kHz] | Limit[dBm/3kHz] | Verdict |
|----------|---------|---------|------------------|-----------------|---------|
| BLE_2M   | Ant1    | 2402    | -22.98           | ≤8.00           | PASS    |
|          |         | 2440    | -23.09           | ≤8.00           | PASS    |
|          |         | 2480    | -22.5            | ≤8.00           | PASS    |



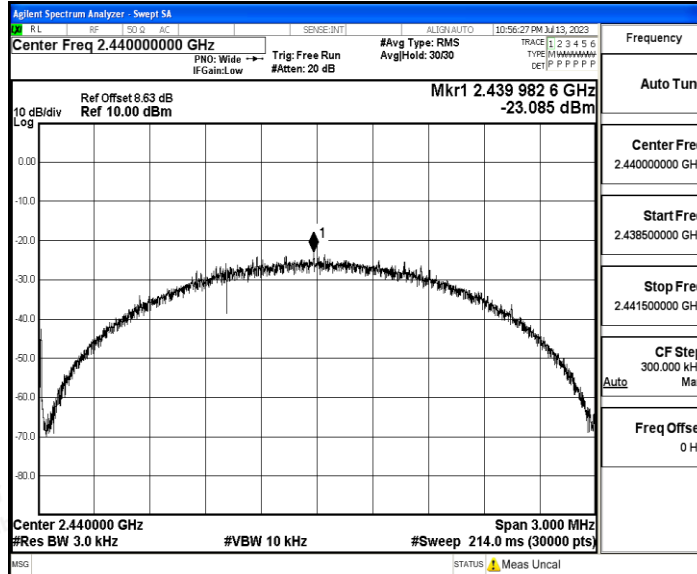


## Test Graphs

BLE\_2M\_Ant1\_2402



BLE\_2M\_Ant1\_2440



BLE\_2M\_Ant1\_2480

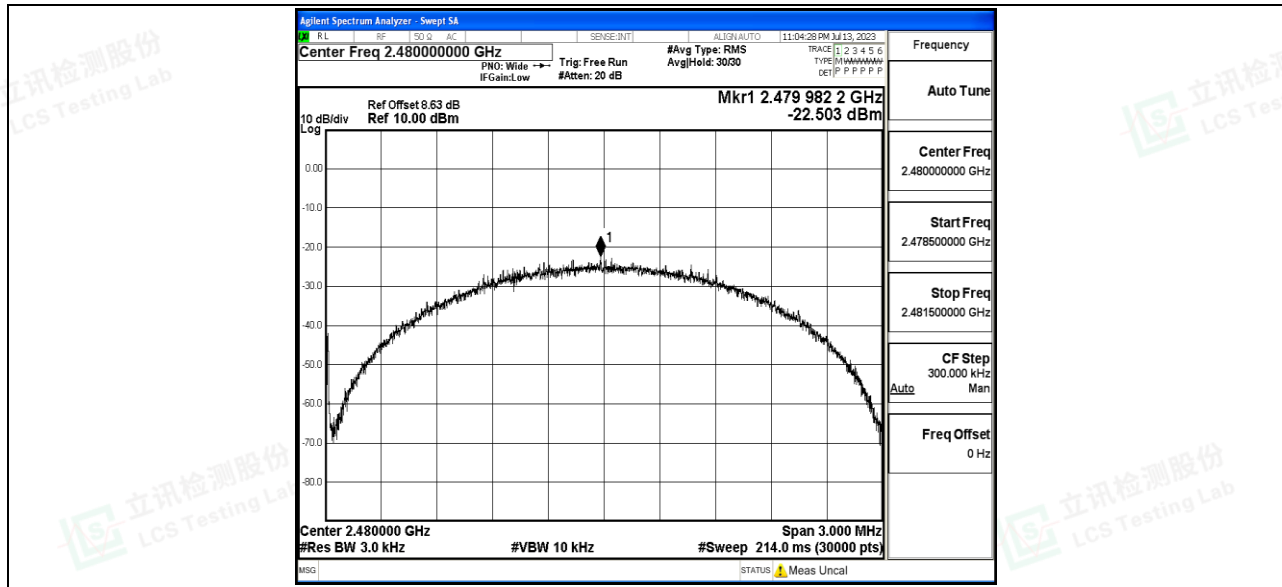


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## A.4 Band edge measurements

### Test Result

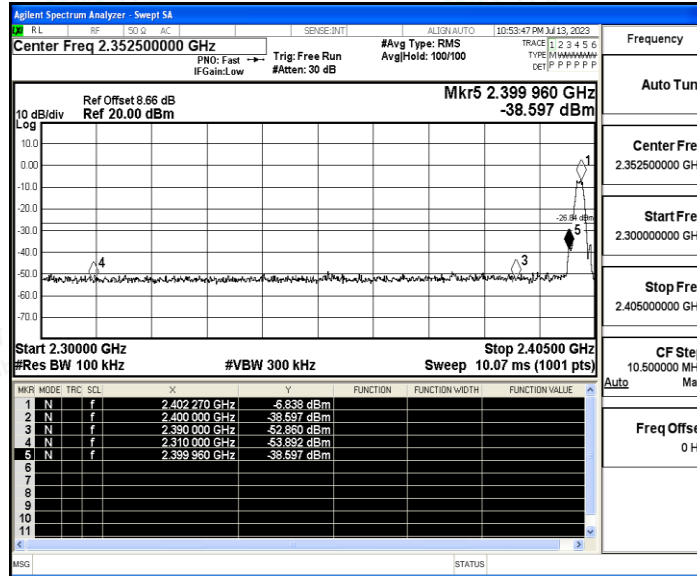
| TestMode | Antenna | ChName | Channel | RefLevel[dBm] | Result[dBm] | Limit[dBm]    | Verdict |
|----------|---------|--------|---------|---------------|-------------|---------------|---------|
| BLE_2M   | Ant1    | Low    | 2402    | -6.84         | -38.6       | $\leq -26.84$ | PASS    |
|          |         | High   | 2480    | -4.25         | -48.79      | $\leq -24.25$ | PASS    |



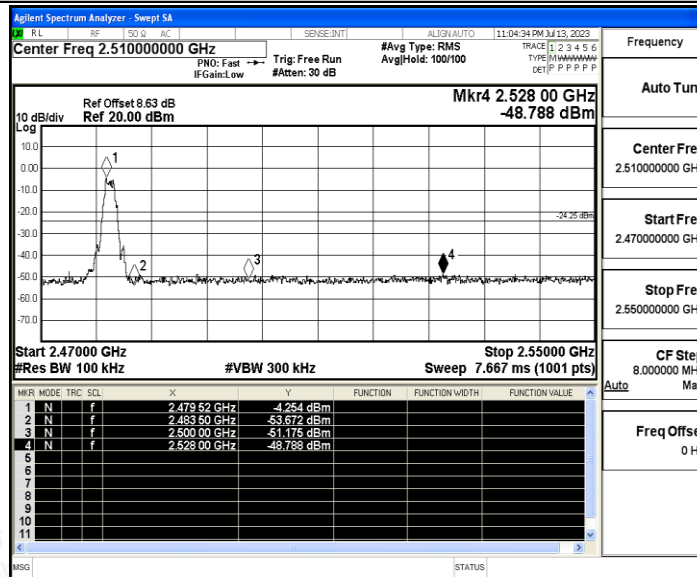


## Test Graphs

BLE\_2M\_Ant1\_Low\_2402



BLE\_2M\_Ant1\_High\_2480



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## A.5 Conducted Spurious Emission

### Test Result

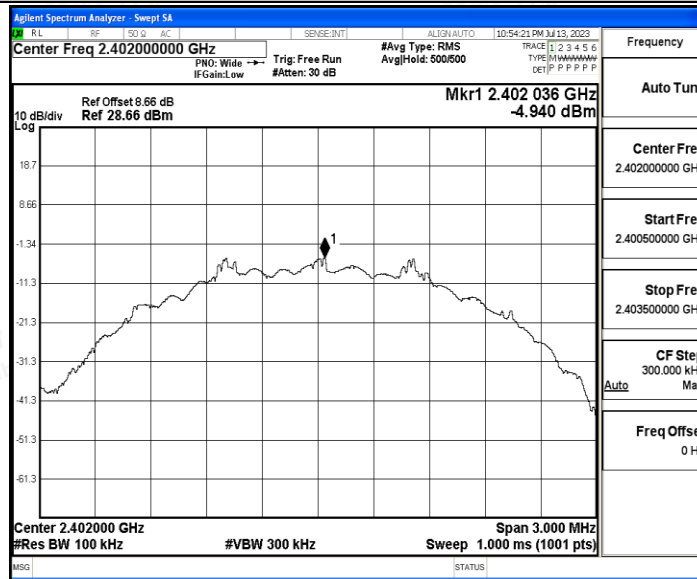
| TestMode | Antenna | Channel | FreqRange<br>[MHz] | RefLevel<br>[dBm] | Result[dBm] | Limit[dBm] | Verdict |
|----------|---------|---------|--------------------|-------------------|-------------|------------|---------|
| BLE_2M   | Ant1    | 2402    | Reference          | -4.94             | -4.94       | ---        | PASS    |
|          |         |         | 30~1000            | -4.94             | -60.97      | ≤-24.94    | PASS    |
|          |         |         | 1000~26500         | -4.94             | -46.51      | ≤-24.94    | PASS    |
|          |         | 2440    | Reference          | -4.92             | -4.92       | ---        | PASS    |
|          |         |         | 30~1000            | -4.92             | -61.47      | ≤-24.92    | PASS    |
|          |         |         | 1000~26500         | -4.92             | -45.13      | ≤-24.92    | PASS    |
|          |         | 2480    | Reference          | -4.26             | -4.26       | ---        | PASS    |
|          |         |         | 30~1000            | -4.26             | -61.46      | ≤-24.26    | PASS    |
|          |         |         | 1000~26500         | -4.26             | -45.66      | ≤-24.26    | PASS    |



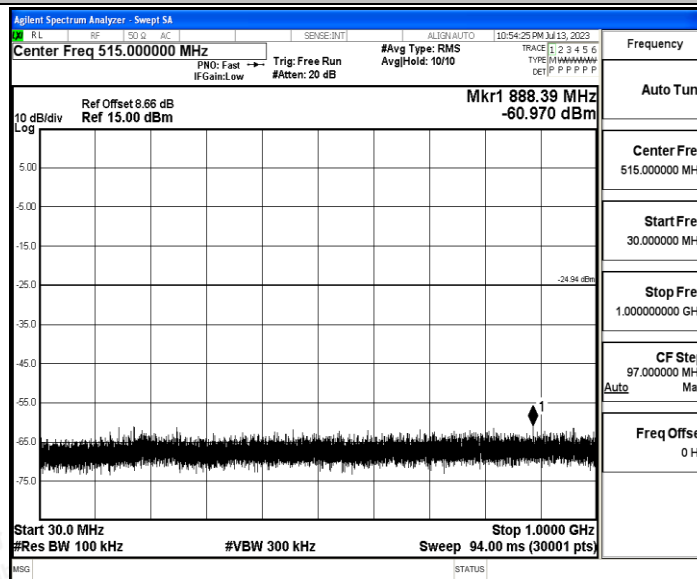


## Test Graphs

BLE\_2M\_Ant1\_2402\_0~Reference



BLE\_2M\_Ant1\_2402\_30~1000



BLE\_2M\_Ant1\_2402\_1000~26500

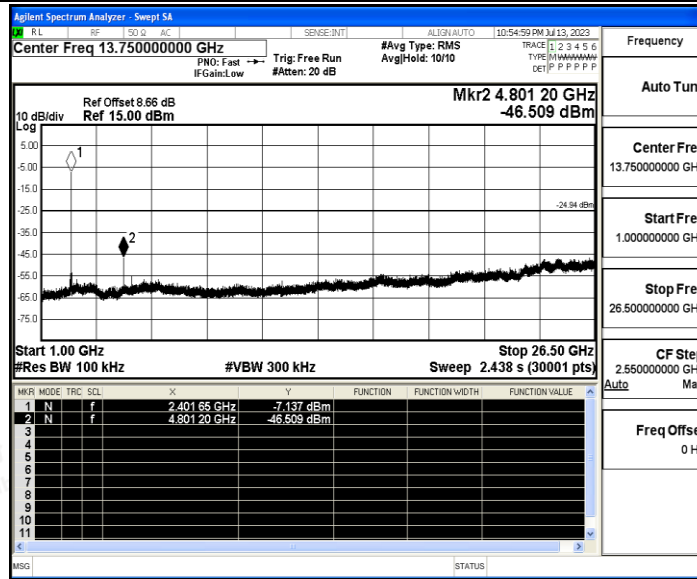


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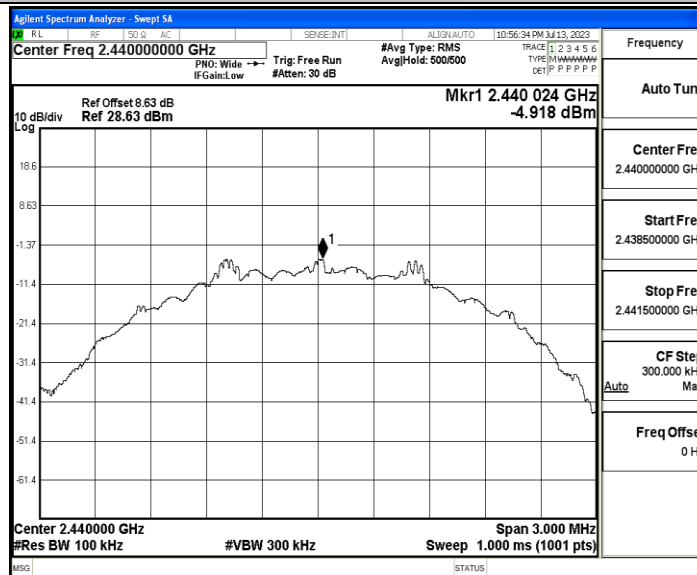
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BLE\_2M\_Ant1\_2440\_0~Reference



BLE\_2M\_Ant1\_2440\_30~1000

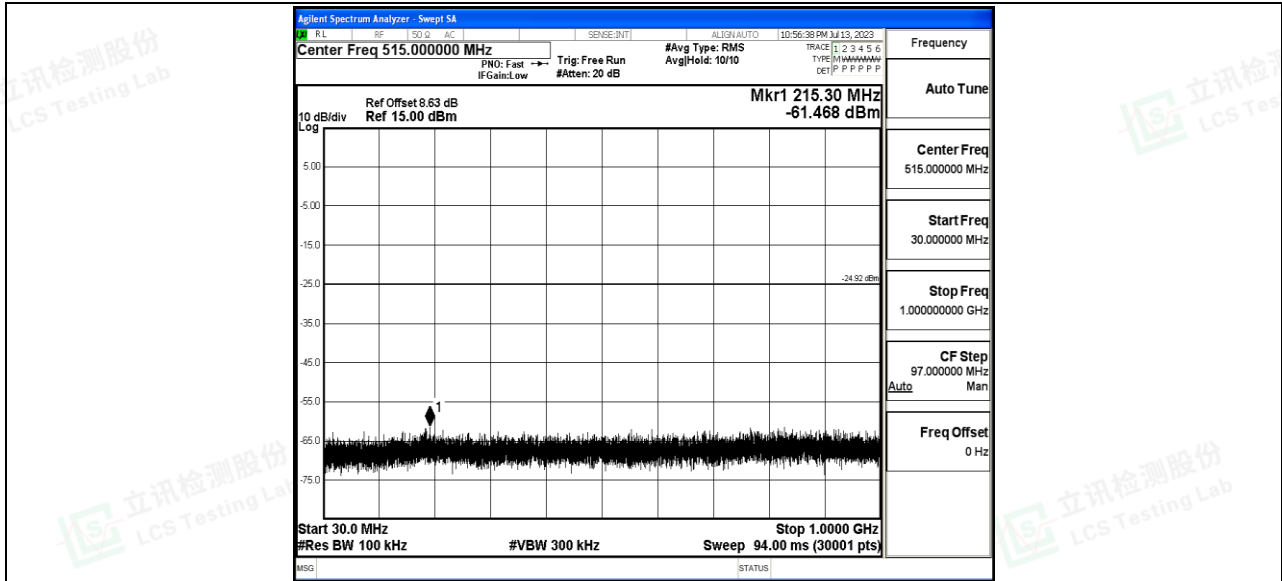


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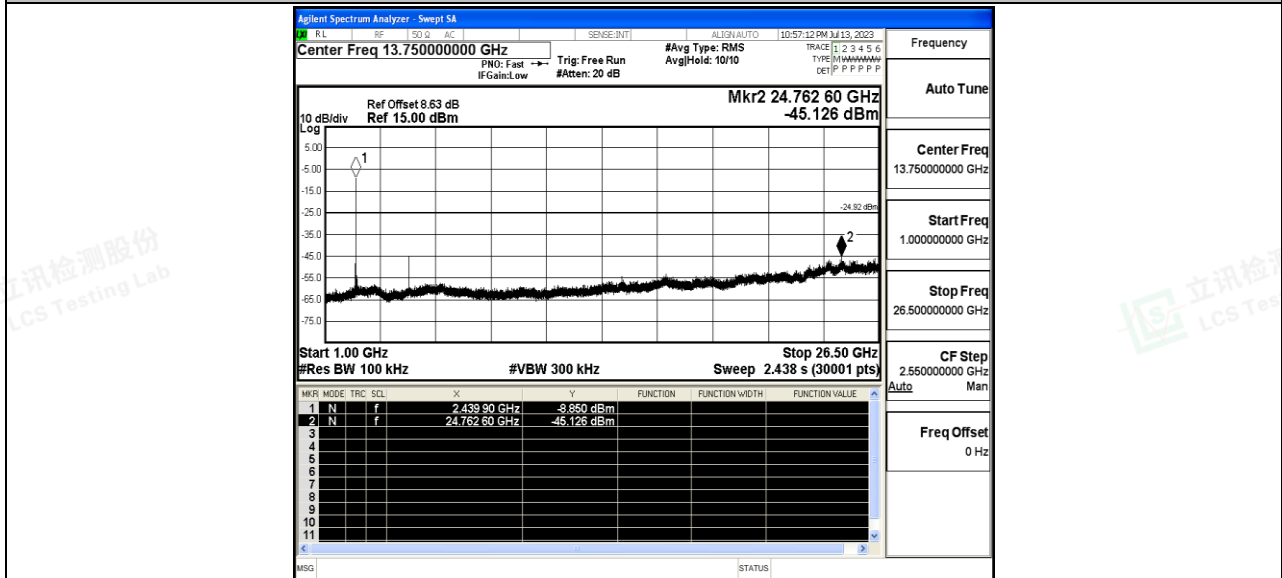
Add: 101, 201 Bldg A &amp; 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

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BLE\_2M\_Ant1\_2440\_1000~26500



BLE\_2M\_Ant1\_2480\_0~Reference

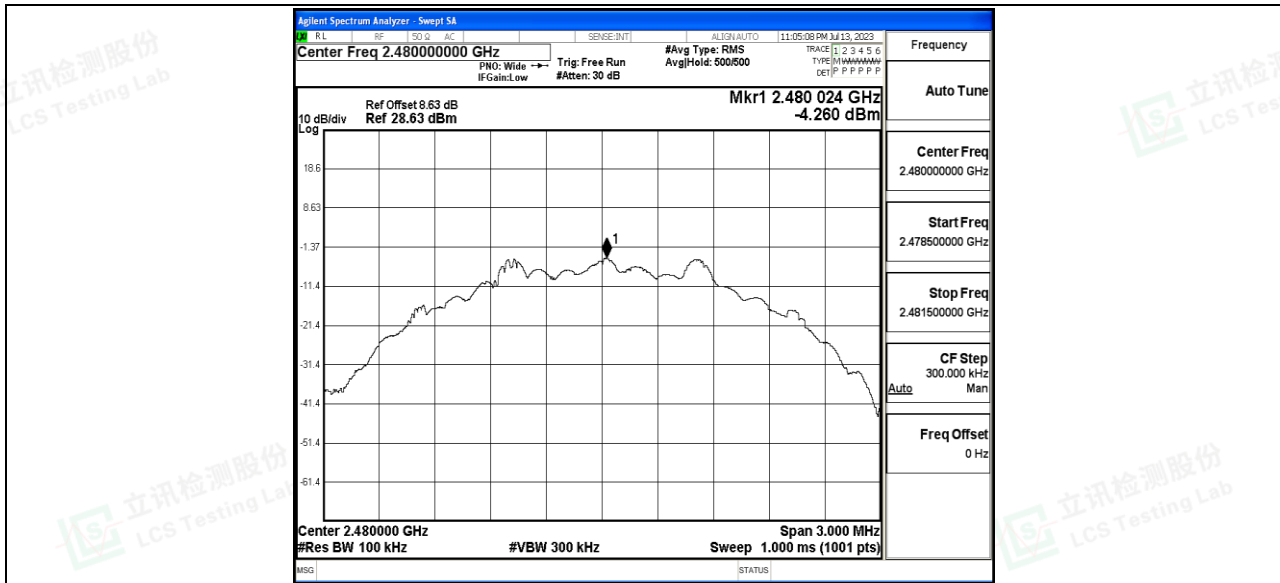


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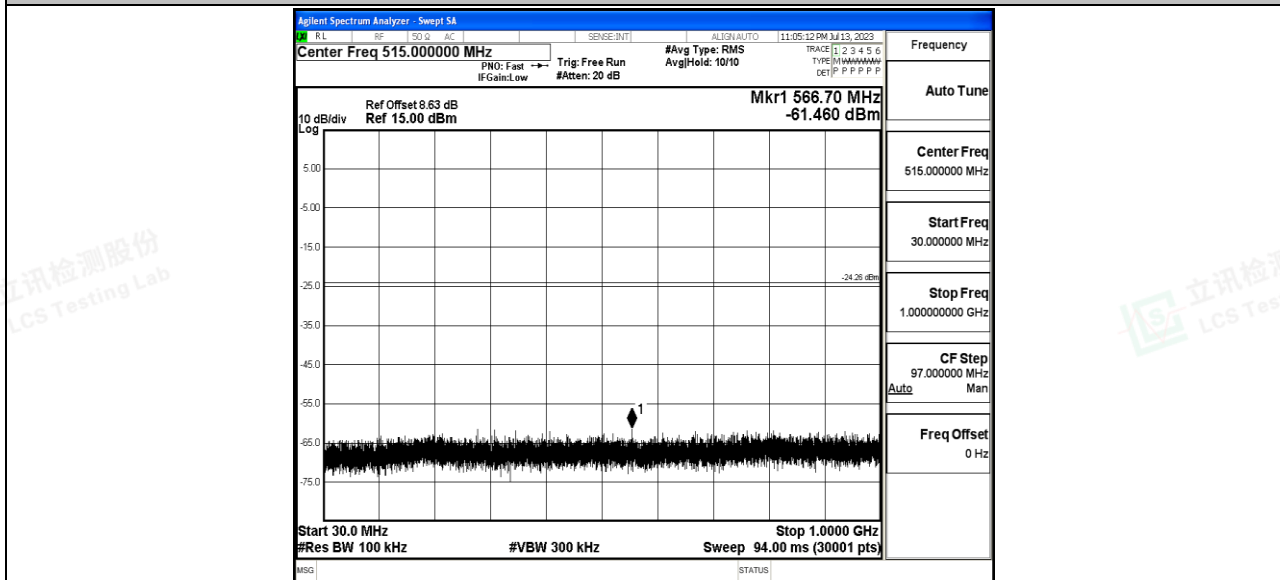
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BLE\_2M\_Ant1\_2480\_30~1000



BLE\_2M\_Ant1\_2480\_1000~26500

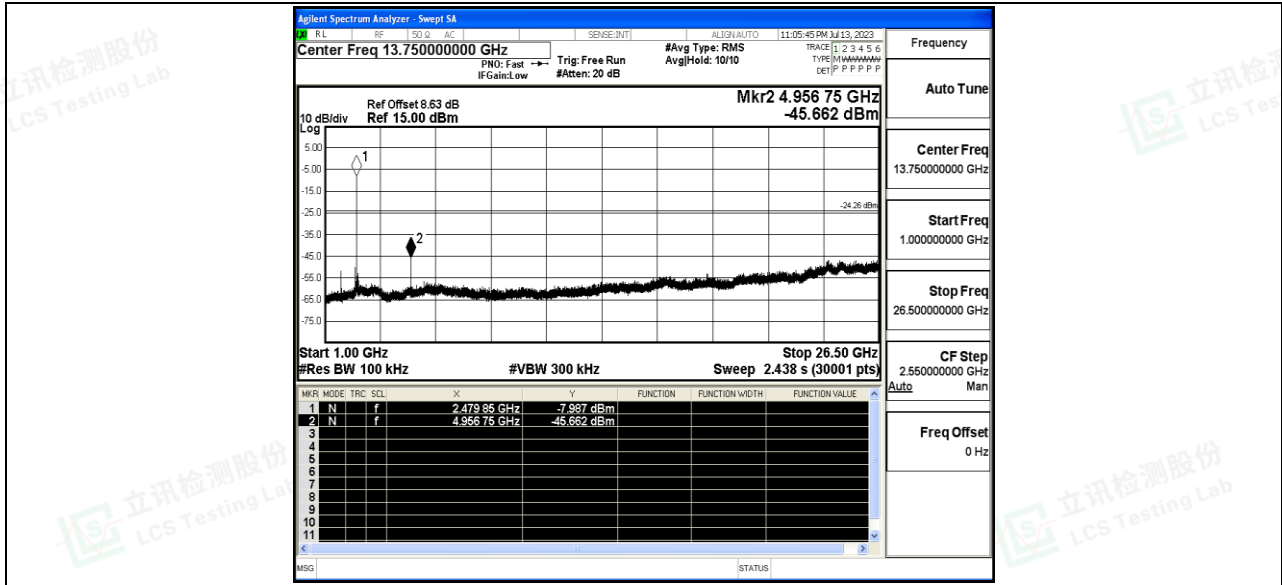


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## A.6 Duty Cycle

### Test Result

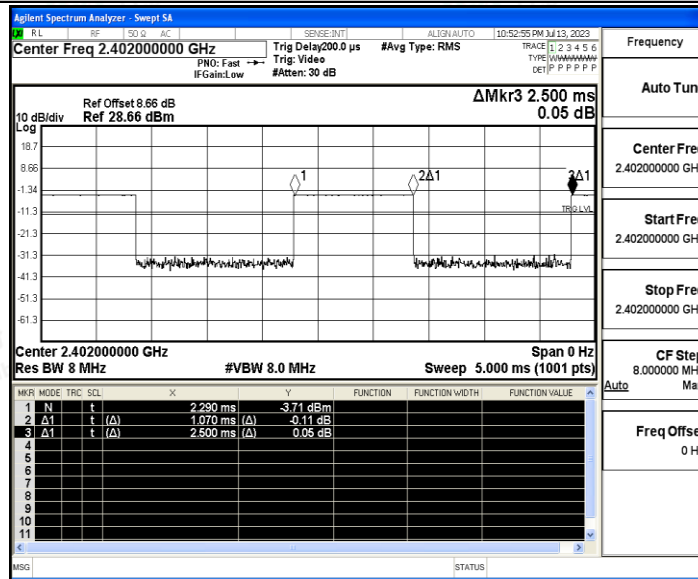
| TestMode | Antenna | Channel | ON Time<br>[ms] | Period<br>[ms] | X      | DC [%] | xFactor | 1/T  | Limit | Verdict |
|----------|---------|---------|-----------------|----------------|--------|--------|---------|------|-------|---------|
| BLE_2M   | Ant1    | 2402    | 1.07            | 2.50           | 0.4280 | 42.80  | 3.69    | 0.93 | ---   | ---     |
|          |         | 2440    | 1.07            | 2.50           | 0.4280 | 42.80  | 3.69    | 0.93 | ---   | ---     |
|          |         | 2480    | 1.07            | 2.50           | 0.4280 | 42.80  | 3.69    | 0.93 | ---   | ---     |



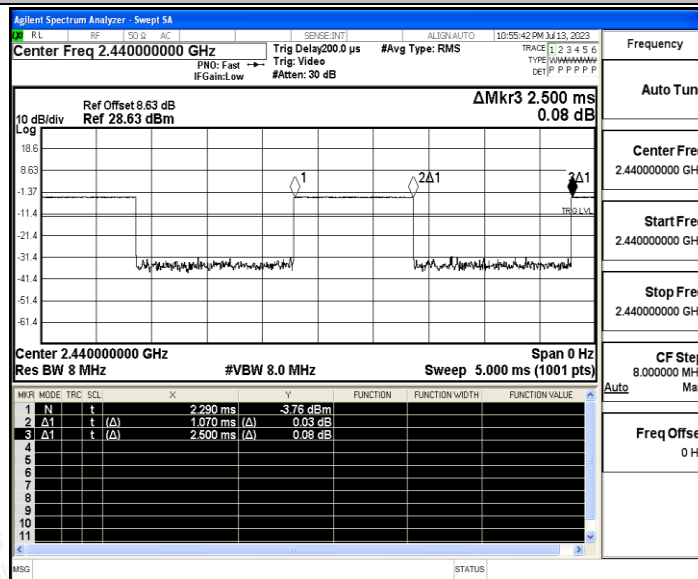


## Test Graphs

BLE\_2M\_Ant1\_2402



BLE\_2M\_Ant1\_2440



BLE\_2M\_Ant1\_2480

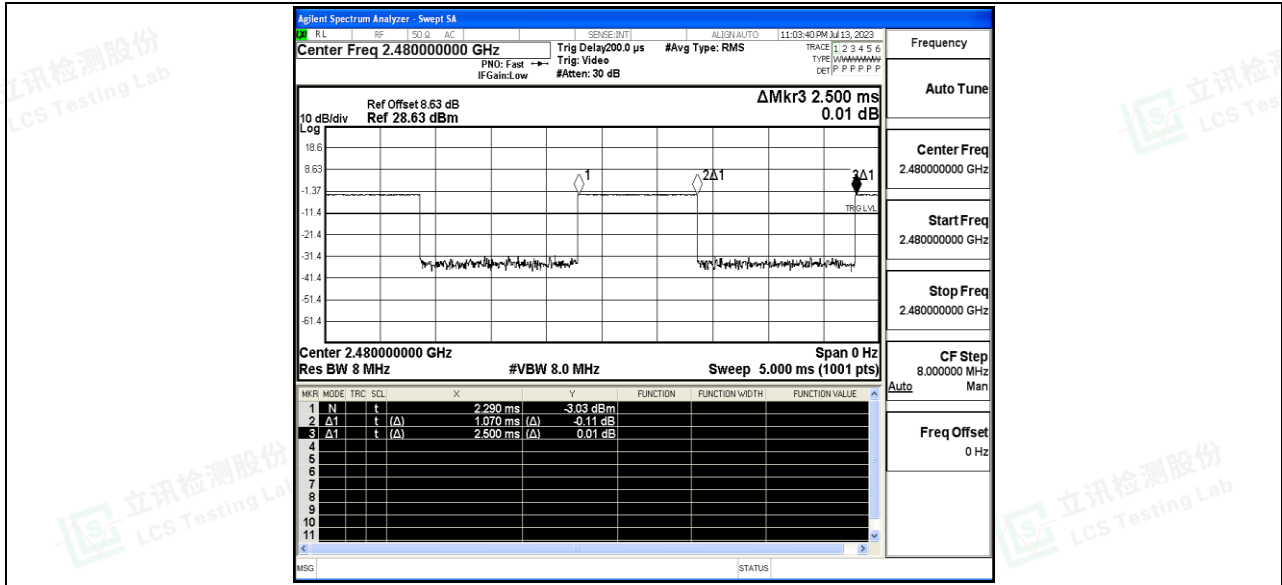


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## A.7 Emissions in Restricted Bands

### 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_2M   | Ant1    | Low    | 2402    | AV       | 2310.000       | -48.12          | ≤-41.20        | 47.08              | ≤54               | PASS    |
|          |         |        |         | AV       | 2377.805       | -45.67          | ≤-41.20        | 49.53              | ≤54               | PASS    |
|          |         |        |         | AV       | 2390.000       | -47.45          | ≤-41.20        | 47.75              | ≤54               | PASS    |
|          |         |        |         | Peak     | 2310.000       | -42.23          | ≤-21.20        | 52.97              | ≤74               | PASS    |
|          |         |        |         | Peak     | 2378.750       | -37.67          | ≤-21.20        | 57.53              | ≤74               | PASS    |
|          |         |        |         | Peak     | 2390.000       | -40.79          | ≤-21.20        | 54.41              | ≤74               | PASS    |
|          |         | High   | 2480    | AV       | 2483.500       | -45.96          | ≤-41.20        | 49.24              | ≤54               | PASS    |
|          |         |        |         | AV       | 2483.520       | -45.96          | ≤-41.20        | 49.24              | ≤54               | PASS    |
|          |         |        |         | AV       | 2500.000       | -46.44          | ≤-41.20        | 48.76              | ≤54               | PASS    |
|          |         |        |         | Peak     | 2483.500       | -39.2           | ≤-21.20        | 56.00              | ≤74               | PASS    |
|          |         |        |         | Peak     | 2496.080       | -36.98          | ≤-21.20        | 58.22              | ≤74               | PASS    |
|          |         |        |         | Peak     | 2500.000       | -39.2           | ≤-21.20        | 56.00              | ≤74               | PASS    |

Note:

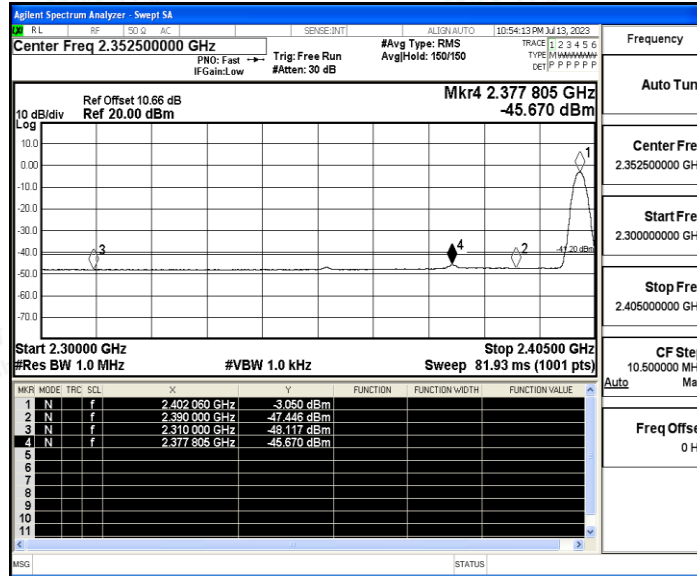
1. The Antenna Gain is compensated in the graph.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.



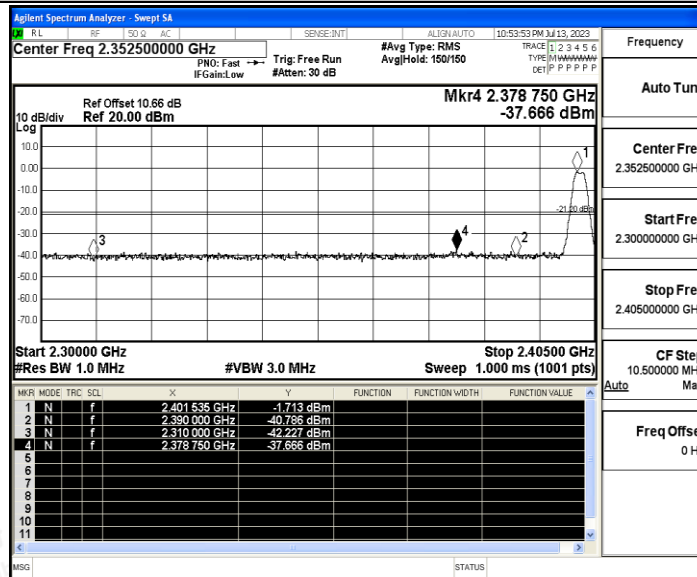


## Test Graphs

BLE\_2M\_Ant1\_Low\_2402\_AV



BLE\_2M\_Ant1\_Low\_2402\_Peak



BLE\_2M\_Ant1\_High\_2480\_AV

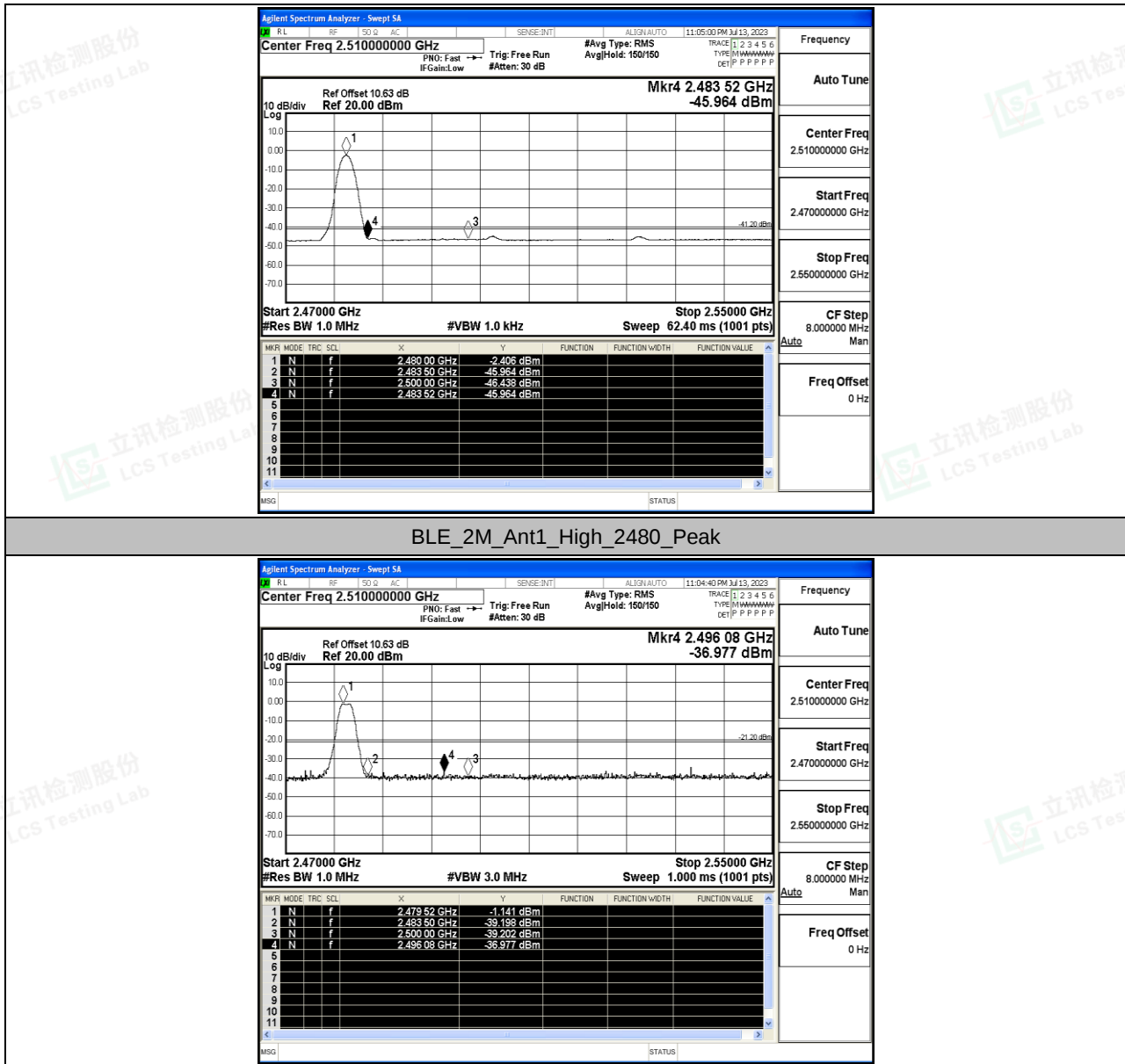


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