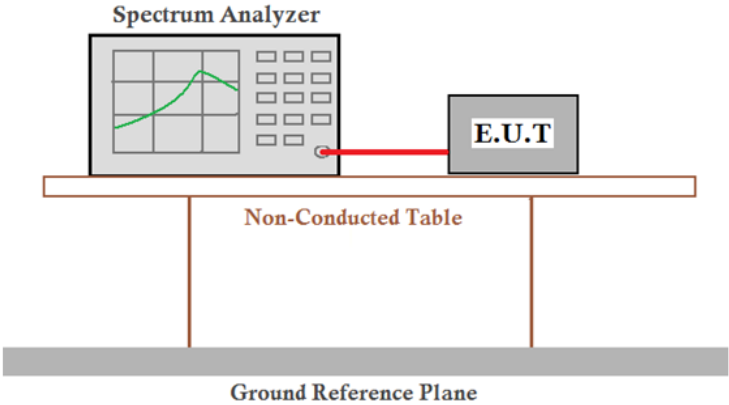


## 5.9 Spurious RF Conducted Emissions

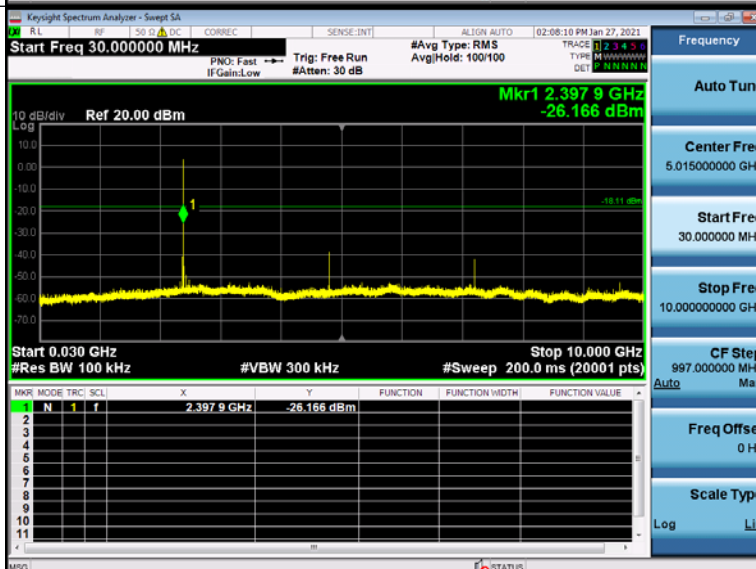
|                        |                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Requirement:      | 47 CFR Part 15C Section 15.247 (d)                                                                                                                                                                                                                                                                                                                                                     |
| Test Method:           | ANSI C63.10:2013                                                                                                                                                                                                                                                                                                                                                                       |
| Test Setup:            |  <p>Remark: Offset=cable loss+ attenuation factor.</p>                                                                                                                                                                                                                                               |
| Limit:                 | In any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. |
| Exploratory Test Mode: | Non-hopping transmitting with all kind of modulation and all kind of data type                                                                                                                                                                                                                                                                                                         |
| Final Test Mode:       | Through Pre-scan, find the DH5 of data type is the worst case of GFSK modulation type, 2-DH5 of data type is the worst case of $\pi/4$ DQPSK modulation type, 3-DH5 of data type is the worst case of 8DPSK modulation type.                                                                                                                                                           |
| Test Results:          | Pass                                                                                                                                                                                                                                                                                                                                                                                   |

GFSK LCH\_Graphs

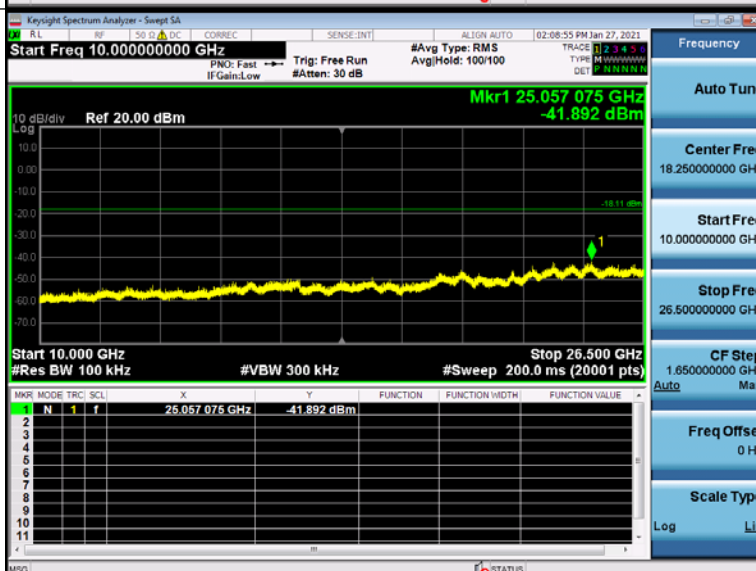
Reference

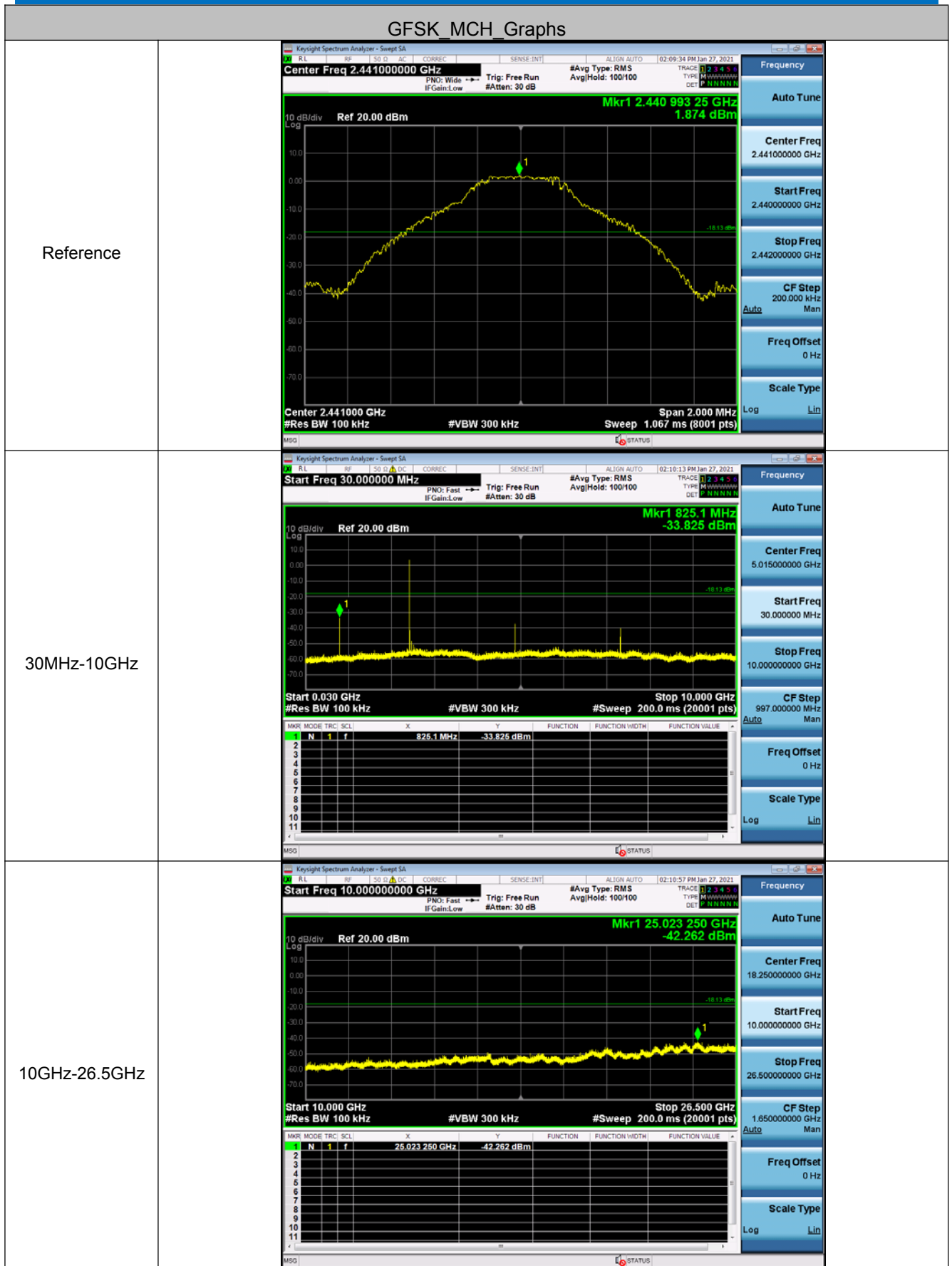


30MHz-10GHz

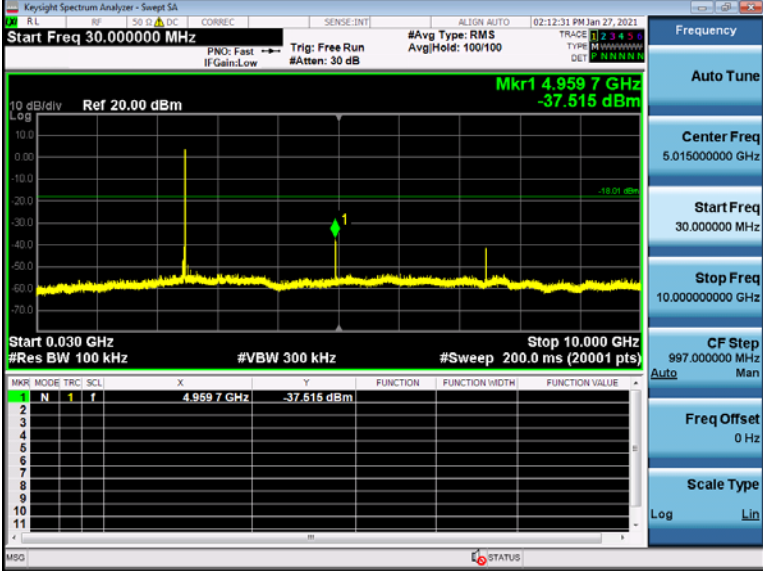
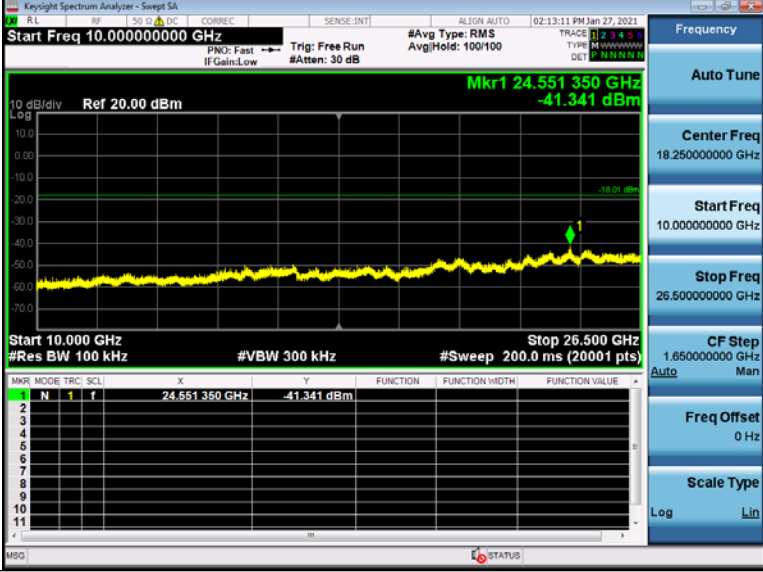


10GHz-26.5GHz

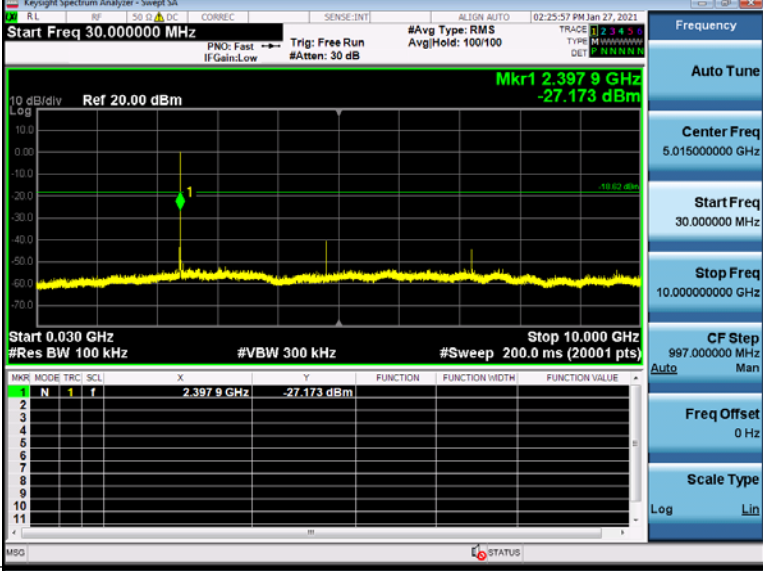
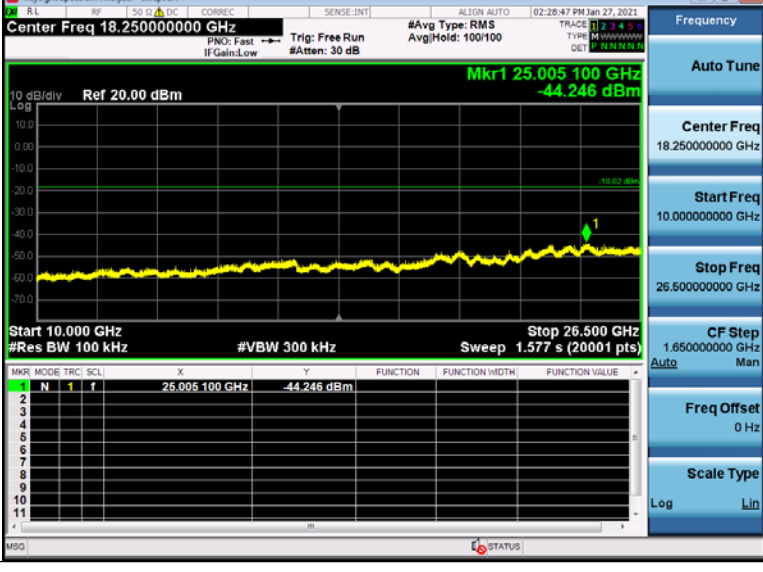




GFSK HCH\_Graphs

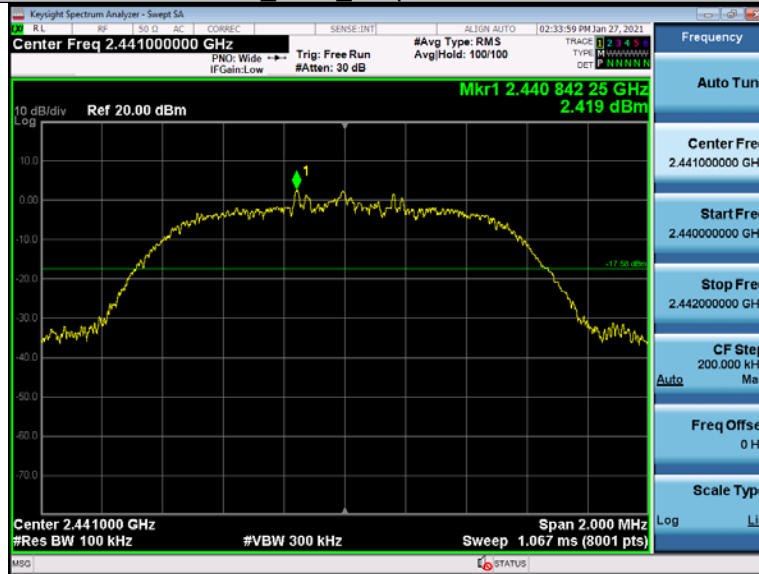
|               |                                                                                                                                                                                                                                                                                                                            |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Reference     |  <p>Keysight Spectrum Analyzer - Sweep SA<br/>Center Freq 2.48000000 GHz<br/>#Res BW 100 kHz<br/>#VBW 300 kHz<br/>Sweep 1.067 ms (8001 pts)<br/>Mkr1 2.480172 00 GHz<br/>1.994 dBm<br/>Ref 20.00 dBm<br/>Span 2.000 MHz<br/>Log</p>      |
| 30MHz-10GHz   |  <p>Keysight Spectrum Analyzer - Sweep SA<br/>Start Freq 30.000000 MHz<br/>#Res BW 100 kHz<br/>#VBW 300 kHz<br/>#Sweep 200.0 ms (20001 pts)<br/>Mkr1 4.9597 GHz<br/>-37.515 dBm<br/>Ref 20.00 dBm<br/>Stop 10.000 GHz<br/>Log</p>       |
| 10GHz-26.5GHz |  <p>Keysight Spectrum Analyzer - Sweep SA<br/>Start Freq 10.00000000 GHz<br/>#Res BW 100 kHz<br/>#VBW 300 kHz<br/>#Sweep 200.0 ms (20001 pts)<br/>Mkr1 24.551350 GHz<br/>-41.341 dBm<br/>Ref 20.00 dBm<br/>Stop 26.500 GHz<br/>Log</p> |

$\pi/4$ DQPSK LCH\_Graphs

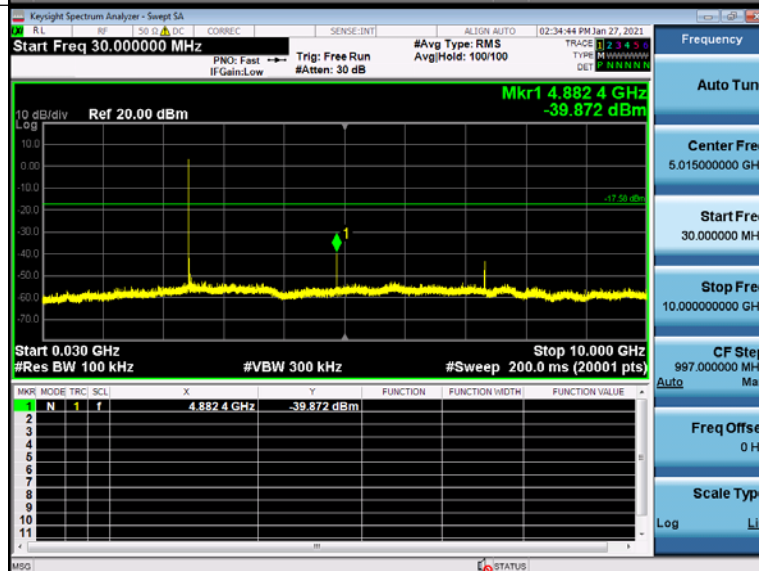
|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Reference     |  <p>Keysight Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.40200000 GHz</p> <p>Trig: Free Run</p> <p>#Avg Type: RMS</p> <p>Avg/Hold: 100/100</p> <p>Mkr1 2.40186325 GHz</p> <p>1.382 dBm</p> <p>Ref 20.00 dBm</p> <p>10 dB/div</p> <p>Log</p> <p>Center 2.402000 GHz</p> <p>#Res BW 100 kHz</p> <p>#VBW 300 kHz</p> <p>Sweep 1.067 ms (8001 pts)</p> <p>Span 2.000 MHz</p> <p>MSG</p> <p>STATUS</p> <p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.402000000 GHz</p> <p>Start Freq 2.401000000 GHz</p> <p>Stop Freq 2.403000000 GHz</p> <p>CF Step 200.000 kHz</p> <p>Man</p> <p>Freq Offset 0 Hz</p> <p>Scale Type Log</p> <p>Lin</p>          |
| 30MHz-10GHz   |  <p>Keysight Spectrum Analyzer - Swept SA</p> <p>Start Freq 30.000000 MHz</p> <p>Trig: Free Run</p> <p>#Avg Type: RMS</p> <p>Avg/Hold: 100/100</p> <p>Mkr1 2.3979 GHz</p> <p>-27.173 dBm</p> <p>Ref 20.00 dBm</p> <p>10 dB/div</p> <p>Log</p> <p>Start 0.030 GHz</p> <p>#Res BW 100 kHz</p> <p>#VBW 300 kHz</p> <p>#Sweep 200.0 ms (20001 pts)</p> <p>Stop 10.000 GHz</p> <p>MSG</p> <p>STATUS</p> <p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 5.015000000 GHz</p> <p>Start Freq 30.000000 MHz</p> <p>Stop Freq 10.000000000 GHz</p> <p>CF Step 997.000000 MHz</p> <p>Man</p> <p>Freq Offset 0 Hz</p> <p>Scale Type Log</p> <p>Lin</p>            |
| 10GHz-26.5GHz |  <p>Keysight Spectrum Analyzer - Swept SA</p> <p>Center Freq 18.25000000 GHz</p> <p>Trig: Free Run</p> <p>#Avg Type: RMS</p> <p>Avg/Hold: 100/100</p> <p>Mkr1 25.005100 GHz</p> <p>-44.246 dBm</p> <p>Ref 20.00 dBm</p> <p>10 dB/div</p> <p>Log</p> <p>Start 10.000 GHz</p> <p>#Res BW 100 kHz</p> <p>#VBW 300 kHz</p> <p>Sweep 1.577 s (20001 pts)</p> <p>Stop 26.500 GHz</p> <p>MSG</p> <p>STATUS</p> <p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 18.250000000 GHz</p> <p>Start Freq 10.000000000 GHz</p> <p>Stop Freq 26.500000000 GHz</p> <p>CF Step 1.650000000 GHz</p> <p>Man</p> <p>Freq Offset 0 Hz</p> <p>Scale Type Log</p> <p>Lin</p> |

$\pi/4$ DQPSK\_MCH\_Graphs

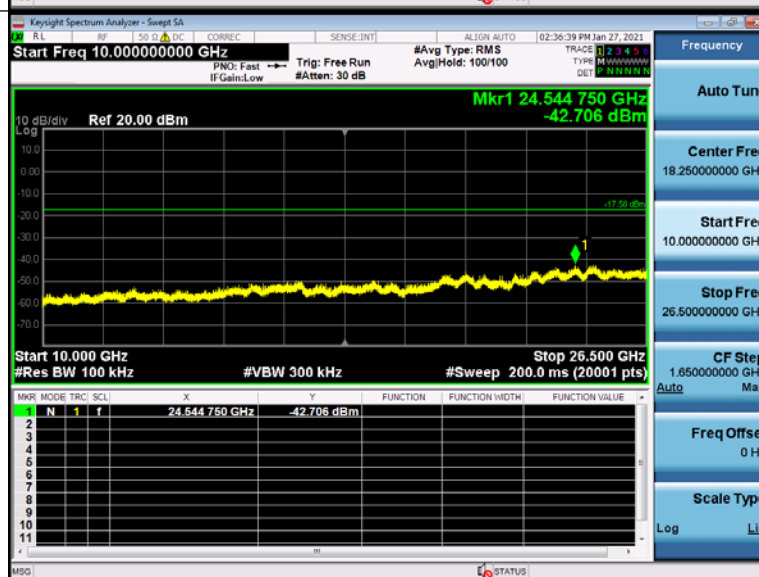
Reference



30MHz-10GHz

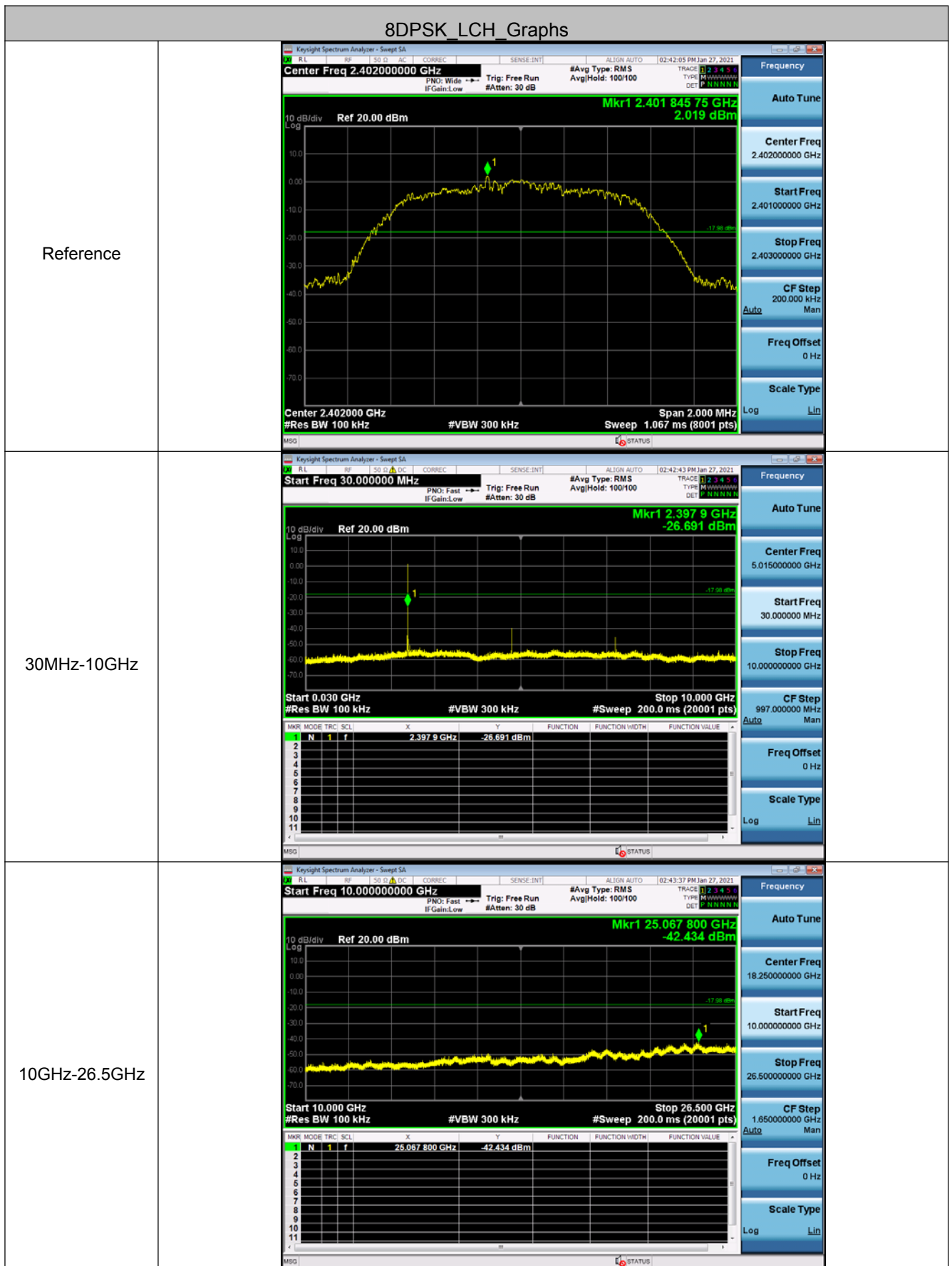


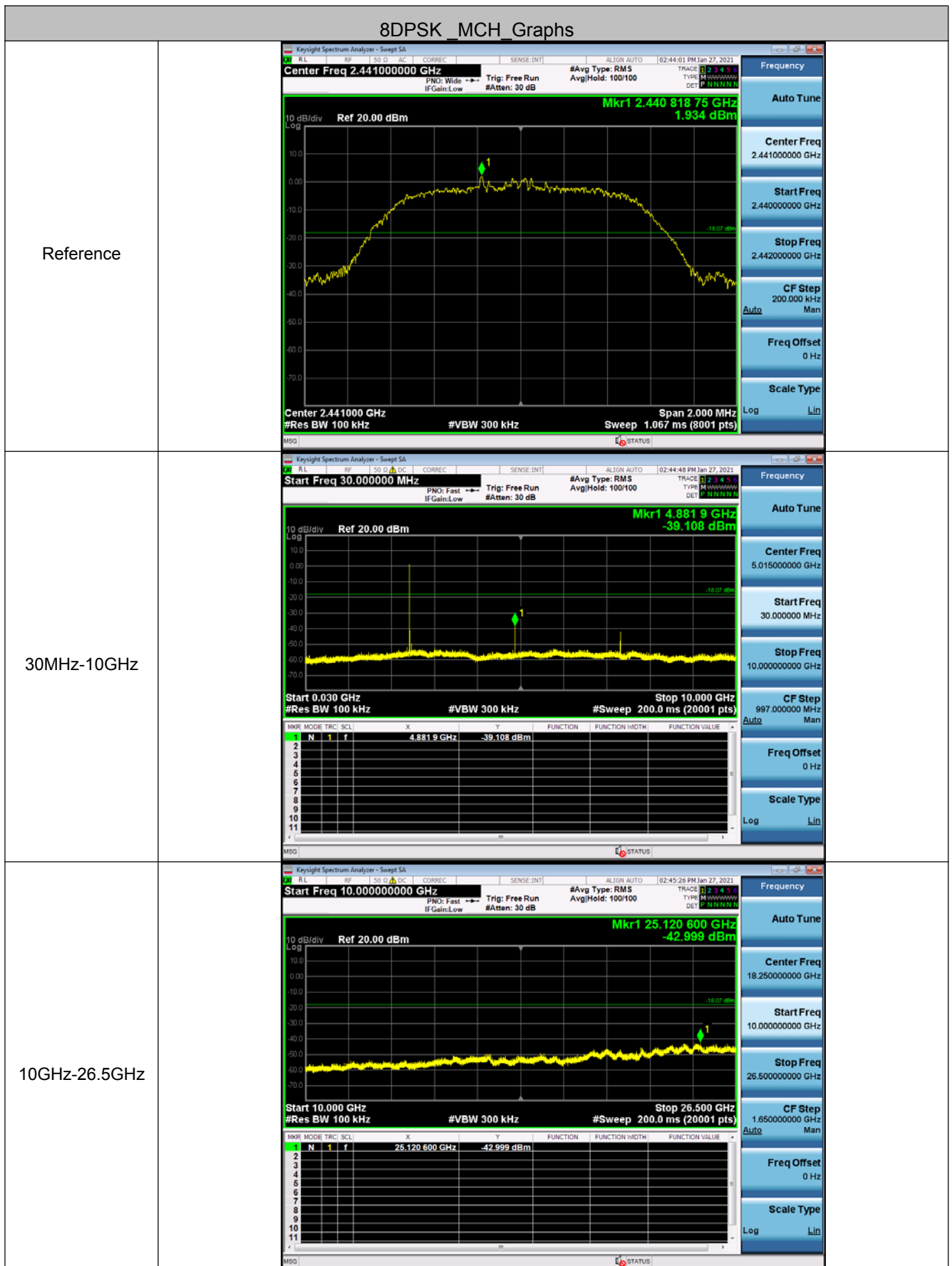
10GHz-26.5GHz



$\pi/4$ DQPSK\_HCH\_Graphs

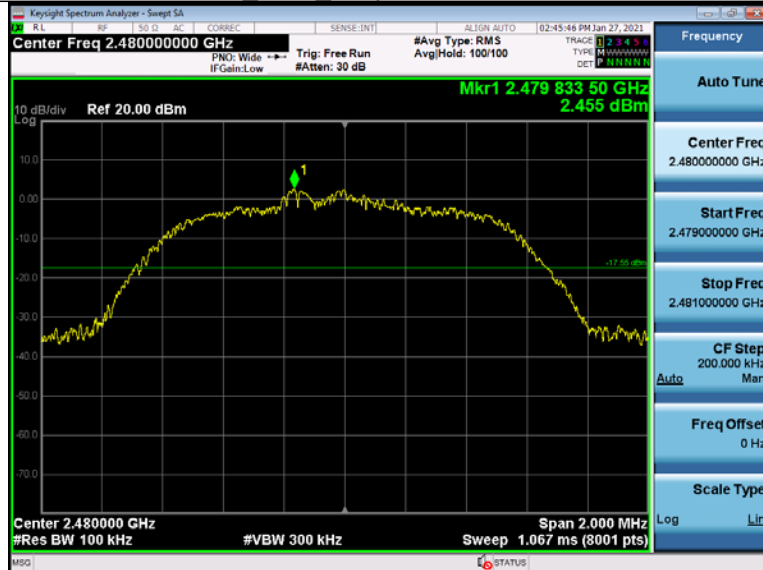
| Reference     | <p>Keysight Spectrum Analyzer - Sweep SA<br/>Center Freq 2.48000000 GHz<br/>#Res BW 100 kHz<br/>#VBW 300 kHz<br/>Sweep 1.067 ms (8001 pts)<br/>Span 2.000 MHz<br/>Mkr1 2.479 840 75 GHz<br/>2.202 dBm<br/>Ref 20.00 dBm<br/>10 dB/div<br/>Log<br/>PNO: Wide<br/>IF Gain: Low<br/>Trig: Free Run<br/>#Atten: 30 dB<br/>#Avg Type: RMS<br/>Avg/Hold: 100/100<br/>ALIGN AUTO<br/>02:37:47 PM Jan 27, 2021<br/>TRACE 1 2 3 4 5<br/>TYPE M W W W W W W W<br/>DET P H H H H H H H</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <p>Frequency</p> <p>Auto Tune</p> <p>Center Freq<br/>2.480000000 GHz</p> <p>Start Freq<br/>2.479000000 GHz</p> <p>Stop Freq<br/>2.481000000 GHz</p> <p>CF Step<br/>200.000 kHz<br/>Man</p> <p>Freq Offset<br/>0 Hz</p> <p>Scale Type<br/>Log<br/>Lin</p> |      |                |             |          |                |                |                |                |   |   |   |   |                |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                 |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----------------|-------------|----------|----------------|----------------|----------------|----------------|---|---|---|---|----------------|-------------|--|--|--|---|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|----|--|--|--|--|--|--|--|--|----|--|--|--|--|--|--|--|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 30MHz-10GHz   | <p>Keysight Spectrum Analyzer - Sweep SA<br/>Start Freq 30.000000 MHz<br/>#Res BW 100 kHz<br/>#VBW 300 kHz<br/>#Sweep 200.0 ms (20001 pts)<br/>Stop 10.000 GHz<br/>Mkr1 4.960 2 GHz<br/>-40.332 dBm<br/>Ref 20.00 dBm<br/>10 dB/div<br/>Log<br/>PNO: Fast<br/>IF Gain: Low<br/>Trig: Free Run<br/>#Atten: 30 dB<br/>#Avg Type: RMS<br/>Avg/Hold: 100/100<br/>ALIGN AUTO<br/>02:38:26 PM Jan 27, 2021<br/>TRACE 1 2 3 4 5<br/>TYPE M W W W W W W W<br/>DET P H H H H H H H</p> <table><thead><tr><th>MARKER</th><th>MODE</th><th>TRIG</th><th>SCL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr></thead><tbody><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>4.960 2 GHz</td><td>-40.332 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>10</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>11</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></tbody></table>          | MARKER                                                                                                                                                                                                                                                   | MODE | TRIG           | SCL         | X        | Y              | FUNCTION       | FUNCTION WIDTH | FUNCTION VALUE | 1 | N | 1 | f | 4.960 2 GHz    | -40.332 dBm |  |  |  | 2 |  |  |  |  |  |  |  |  | 3 |  |  |  |  |  |  |  |  | 4 |  |  |  |  |  |  |  |  | 5 |  |  |  |  |  |  |  |  | 6 |  |  |  |  |  |  |  |  | 7 |  |  |  |  |  |  |  |  | 8 |  |  |  |  |  |  |  |  | 9 |  |  |  |  |  |  |  |  | 10 |  |  |  |  |  |  |  |  | 11 |  |  |  |  |  |  |  |  | <p>Frequency</p> <p>Auto Tune</p> <p>Center Freq<br/>5.015000000 GHz</p> <p>Start Freq<br/>30.000000 MHz</p> <p>Stop Freq<br/>10.000000000 GHz</p> <p>CF Step<br/>997.000000 MHz<br/>Man</p> <p>Freq Offset<br/>0 Hz</p> <p>Scale Type<br/>Log<br/>Lin</p>      |
| MARKER        | MODE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | TRIG                                                                                                                                                                                                                                                     | SCL  | X              | Y           | FUNCTION | FUNCTION WIDTH | FUNCTION VALUE |                |                |   |   |   |   |                |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                 |
| 1             | N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 1                                                                                                                                                                                                                                                        | f    | 4.960 2 GHz    | -40.332 dBm |          |                |                |                |                |   |   |   |   |                |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                 |
| 2             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                          |      |                |             |          |                |                |                |                |   |   |   |   |                |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                 |
| 3             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                          |      |                |             |          |                |                |                |                |   |   |   |   |                |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                 |
| 4             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                          |      |                |             |          |                |                |                |                |   |   |   |   |                |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                 |
| 5             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                          |      |                |             |          |                |                |                |                |   |   |   |   |                |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                 |
| 6             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                          |      |                |             |          |                |                |                |                |   |   |   |   |                |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                 |
| 7             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                          |      |                |             |          |                |                |                |                |   |   |   |   |                |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                 |
| 8             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                          |      |                |             |          |                |                |                |                |   |   |   |   |                |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                 |
| 9             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                          |      |                |             |          |                |                |                |                |   |   |   |   |                |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                 |
| 10            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                          |      |                |             |          |                |                |                |                |   |   |   |   |                |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                 |
| 11            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                          |      |                |             |          |                |                |                |                |   |   |   |   |                |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                 |
| 10GHz-26.5GHz | <p>Keysight Spectrum Analyzer - Sweep SA<br/>Start Freq 10.000000000 GHz<br/>#Res BW 100 kHz<br/>#VBW 300 kHz<br/>#Sweep 200.0 ms (20001 pts)<br/>Stop 26.500 GHz<br/>Mkr1 24.939 100 GHz<br/>-42.604 dBm<br/>Ref 20.00 dBm<br/>10 dB/div<br/>Log<br/>PNO: Fast<br/>IF Gain: Low<br/>Trig: Free Run<br/>#Atten: 30 dB<br/>#Avg Type: RMS<br/>Avg/Hold: 100/100<br/>ALIGN AUTO<br/>02:39:03 PM Jan 27, 2021<br/>TRACE 1 2 3 4 5<br/>TYPE M W W W W W W W<br/>DET P H H H H H H H</p> <table><thead><tr><th>MARKER</th><th>MODE</th><th>TRIG</th><th>SCL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr></thead><tbody><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>24.939 100 GHz</td><td>-42.604 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>10</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>11</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></tbody></table> | MARKER                                                                                                                                                                                                                                                   | MODE | TRIG           | SCL         | X        | Y              | FUNCTION       | FUNCTION WIDTH | FUNCTION VALUE | 1 | N | 1 | f | 24.939 100 GHz | -42.604 dBm |  |  |  | 2 |  |  |  |  |  |  |  |  | 3 |  |  |  |  |  |  |  |  | 4 |  |  |  |  |  |  |  |  | 5 |  |  |  |  |  |  |  |  | 6 |  |  |  |  |  |  |  |  | 7 |  |  |  |  |  |  |  |  | 8 |  |  |  |  |  |  |  |  | 9 |  |  |  |  |  |  |  |  | 10 |  |  |  |  |  |  |  |  | 11 |  |  |  |  |  |  |  |  | <p>Frequency</p> <p>Auto Tune</p> <p>Center Freq<br/>18.250000000 GHz</p> <p>Start Freq<br/>10.000000000 GHz</p> <p>Stop Freq<br/>26.500000000 GHz</p> <p>CF Step<br/>1.650000000 GHz<br/>Man</p> <p>Freq Offset<br/>0 Hz</p> <p>Scale Type<br/>Log<br/>Lin</p> |
| MARKER        | MODE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | TRIG                                                                                                                                                                                                                                                     | SCL  | X              | Y           | FUNCTION | FUNCTION WIDTH | FUNCTION VALUE |                |                |   |   |   |   |                |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                 |
| 1             | N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 1                                                                                                                                                                                                                                                        | f    | 24.939 100 GHz | -42.604 dBm |          |                |                |                |                |   |   |   |   |                |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                 |
| 2             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                          |      |                |             |          |                |                |                |                |   |   |   |   |                |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                 |
| 3             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                          |      |                |             |          |                |                |                |                |   |   |   |   |                |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                 |
| 4             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                          |      |                |             |          |                |                |                |                |   |   |   |   |                |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                 |
| 5             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                          |      |                |             |          |                |                |                |                |   |   |   |   |                |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                 |
| 6             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                          |      |                |             |          |                |                |                |                |   |   |   |   |                |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                 |
| 7             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                          |      |                |             |          |                |                |                |                |   |   |   |   |                |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                 |
| 8             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                          |      |                |             |          |                |                |                |                |   |   |   |   |                |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                 |
| 9             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                          |      |                |             |          |                |                |                |                |   |   |   |   |                |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                 |
| 10            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                          |      |                |             |          |                |                |                |                |   |   |   |   |                |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                 |
| 11            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                          |      |                |             |          |                |                |                |                |   |   |   |   |                |             |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                 |



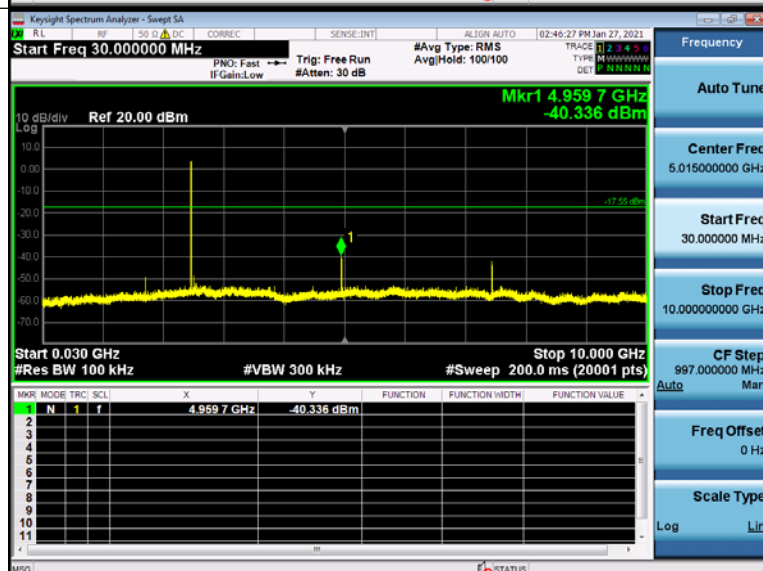


8DPSK\_HCH\_Graphs

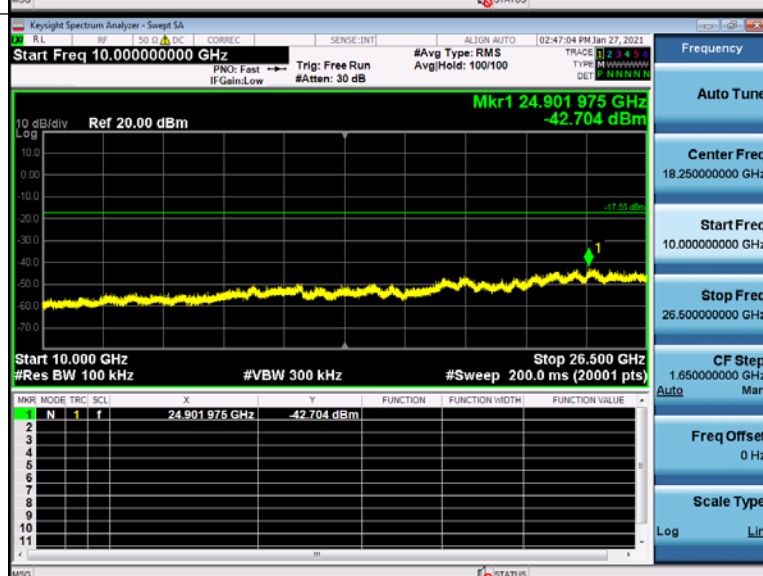
Reference



30MHz-10GHz



10GHz-26.5GHz



---

Remark:Pre test 9kHz to 25GHz, find the highest point when testing, so only the worst data were shown in the test report.  
Per FCC Part 15.33 (a) and 15.31 (o) ,The amplitude of spurious emissions from intentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this part.

## 5.10 Other requirements Frequency Hopping Spread Spectrum System

| Test Requirement:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 47 CFR Part 15C Section 15.247 (a)(1), (h) requirement: |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|
| <p>The system shall hop to channel frequencies that are selected at the system hopping rate from a Pseudorandom ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.</p> <p>Frequency hopping spread spectrum systems are not required to employ all available hopping channels during each transmission. However, the system, consisting of both the transmitter and the receiver, must be designed to comply with all of the regulations in this section should the transmitter be presented with a continuous data (or information) stream. In addition, a system employing short transmission bursts must comply with the definition of a frequency hopping system and must distribute its transmissions over the minimum number of hopping channels specified in this section.</p> <p>The incorporation of intelligence within a frequency hopping spread spectrum system that permits the system to recognize other users within the spectrum band so that it individually and independently chooses and adapts its hopsets to avoid hopping on occupied channels is permitted. The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.</p> |                                                         |
| Compliance for section 15.247(a)(1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                         |
| <p>According to Bluetooth Core Specification, the pseudorandom sequence may be generated in a nine-stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage. And the result is fed back to the input of the first stage. The sequence begins with the first ONE of 9 consecutive ONES; i.e. the shift register is initialized with nine ones.</p> <ul style="list-style-type: none"> <li>• Number of shift register stages: 9</li> <li>• Length of pseudo-random sequence: <math>2^9 - 1 = 511</math> bits</li> <li>• Longest sequence of zeros: 8 (non-inverted signal)</li> </ul> <div data-bbox="300 1328 1353 1478"> </div> <p style="text-align: center;"><i>Linear Feedback Shift Register for Generation of the PRBS sequence</i></p> <p>An example of Pseudorandom Frequency Hopping Sequence as follow:</p> <div data-bbox="274 1574 1262 1724"> </div> <p>Each frequency used equally on the average by each transmitter.</p> <p>According to Bluetooth Core Specification, Bluetooth receivers are designed to have input and IF bandwidths that match the hopping channel bandwidths of any Bluetooth transmitters and shift frequencies in synchronization with the transmitted signals.</p>                                                                                                                                                                                                                                                                                                                              |                                                         |
| Compliance for section 15.247(g)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                         |
| <p>According to Bluetooth Core Specification, the Bluetooth system transmits the packet with the pseudorandom hopping frequency with a continuous data and the short burst transmission from the Bluetooth system is also transmitted under the frequency hopping system with the pseudorandom hopping frequency system.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                         |

**Compliance for section 15.247(h)**

According to Bluetooth Core specification, the Bluetooth system incorporates with an adaptive system to detect other user within the spectrum band so that it individually and independently to avoid hopping on the occupied channels.

According to the Bluetooth Core specification, the Bluetooth system is designed not have the ability to coordinated with other FHSS System in an effort to avoid the simultaneous occupancy of individual hopping frequencies by multiple transmitter.

## 5.11 Radiated Spurious Emission & Restricted bands

|                   |                                                                                                                                                                                                                                                                             |                                  |                |            |                          |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|----------------|------------|--------------------------|
| Test Requirement: | 47 CFR Part 15C Section 15.209 and 15.205                                                                                                                                                                                                                                   |                                  |                |            |                          |
| Test Method:      | ANSI C63.10: 2013                                                                                                                                                                                                                                                           |                                  |                |            |                          |
| Test Site:        | Measurement Distance: 3m (Semi-Anechoic Chamber)                                                                                                                                                                                                                            |                                  |                |            |                          |
| Receiver Setup:   | Frequency                                                                                                                                                                                                                                                                   | Detector                         | RBW            | VBW        | Remark                   |
|                   | 0.009MHz-0.090MHz                                                                                                                                                                                                                                                           | Peak                             | 10kHz          | 30kHz      | Peak                     |
|                   | 0.009MHz-0.090MHz                                                                                                                                                                                                                                                           | Average                          | 10kHz          | 30kHz      | Average                  |
|                   | 0.090MHz-0.110MHz                                                                                                                                                                                                                                                           | Quasi-peak                       | 10kHz          | 30kHz      | Quasi-peak               |
|                   | 0.110MHz-0.490MHz                                                                                                                                                                                                                                                           | Peak                             | 10kHz          | 30kHz      | Peak                     |
|                   | 0.110MHz-0.490MHz                                                                                                                                                                                                                                                           | Average                          | 10kHz          | 30kHz      | Average                  |
|                   | 0.490MHz -30MHz                                                                                                                                                                                                                                                             | Quasi-peak                       | 10kHz          | 30kHz      | Quasi-peak               |
|                   | 30MHz-1GHz                                                                                                                                                                                                                                                                  | Peak                             | 100 kHz        | 300kHz     | Peak                     |
|                   | Above 1GHz                                                                                                                                                                                                                                                                  | Peak                             | 1MHz           | 3MHz       | Peak                     |
|                   |                                                                                                                                                                                                                                                                             | Peak                             | 1MHz           | 10Hz       | Average                  |
| Limit:            | Frequency                                                                                                                                                                                                                                                                   | Field strength (microvolt/meter) | Limit (dBuV/m) | Remark     | Measurement distance (m) |
|                   | 0.009MHz-0.490MHz                                                                                                                                                                                                                                                           | 2400/F(kHz)                      | -              | -          | 300                      |
|                   | 0.490MHz-1.705MHz                                                                                                                                                                                                                                                           | 24000/F(kHz)                     | -              | -          | 30                       |
|                   | 1.705MHz-30MHz                                                                                                                                                                                                                                                              | 30                               | -              | -          | 30                       |
|                   | 30MHz-88MHz                                                                                                                                                                                                                                                                 | 100                              | 40.0           | Quasi-peak | 3                        |
|                   | 88MHz-216MHz                                                                                                                                                                                                                                                                | 150                              | 43.5           | Quasi-peak | 3                        |
|                   | 216MHz-960MHz                                                                                                                                                                                                                                                               | 200                              | 46.0           | Quasi-peak | 3                        |
|                   | 960MHz-1GHz                                                                                                                                                                                                                                                                 | 500                              | 54.0           | Quasi-peak | 3                        |
|                   | Above 1GHz                                                                                                                                                                                                                                                                  | 500                              | 54.0           | Average    | 3                        |
|                   | Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device. |                                  |                |            |                          |

Test Setup:

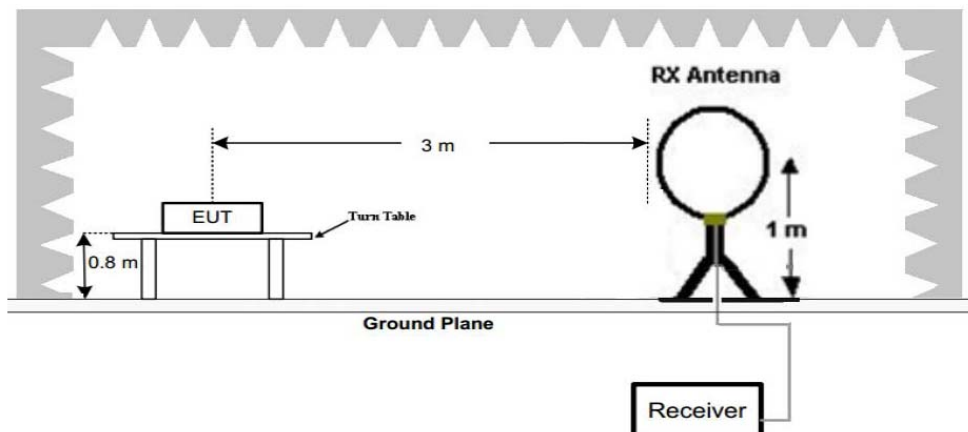


Figure 1. Below 30MHz

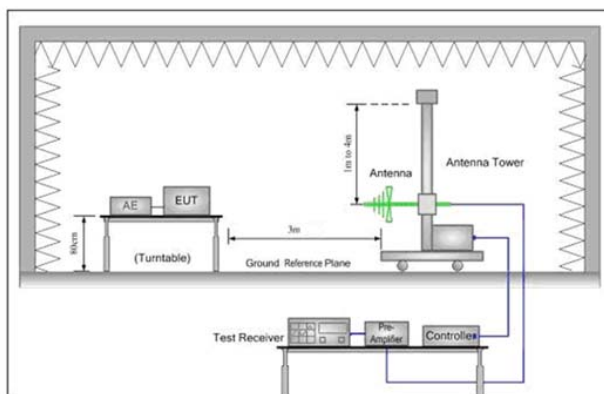


Figure 2. 30MHz to 1GHz

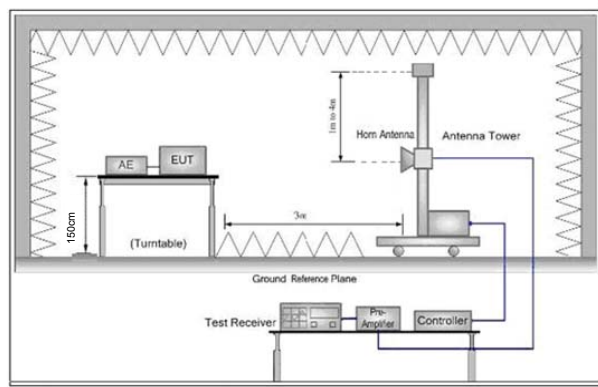


Figure 3. Above 1 GHz

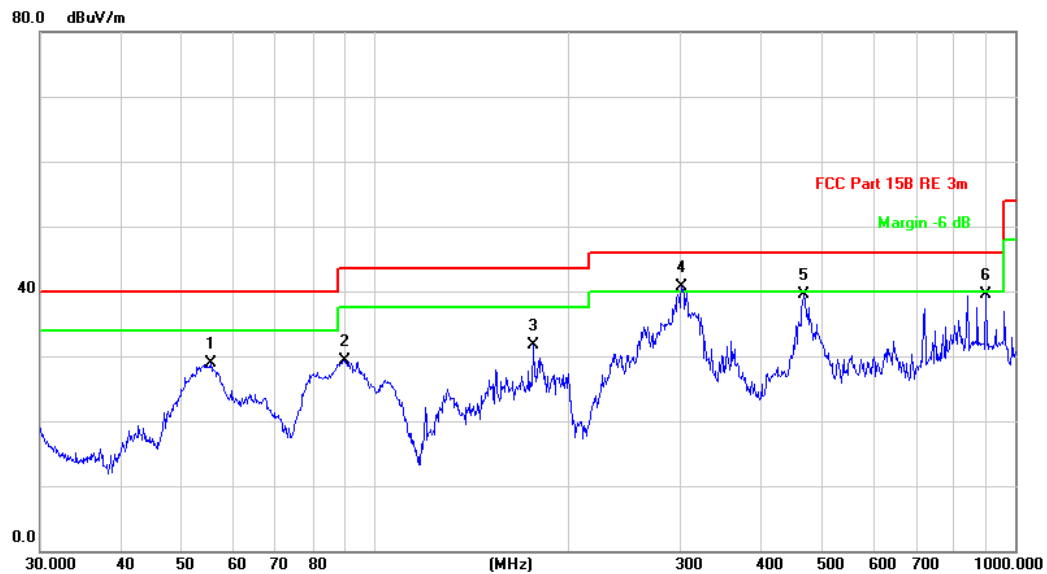
Test Procedure:

- a. 1) Below 1G: The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.  
2) Above 1G: The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.  
Note: For the radiated emission test above 1GHz:  
Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter)

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  | <p>and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.</p> <p>e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</p> <p>f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.</p> <p>g. Test the EUT in the lowest channel (2402MHz),the middle channel (2441MHz),the Highest channel (2480MHz)</p> <p>h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.</p> <p>i. Repeat above procedures until all frequencies measured was complete.</p> |
| Final Test Mode: | <p>Pretest the EUT at Charging mode, found the Charging +wifi+BT mode which it is worse case</p> <p>For below 1GHz part, through pre-scan, the worst case is the lowest channel. Only the worst case is recorded in the report.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Test Results:    | Pass                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

### 5.11.1 Radiated Emission below 1GHz

| 30MHz~1GHz |                       |          |
|------------|-----------------------|----------|
| Test mode: | Charge + Transmitting | Vertical |



| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measurement | Limit  | Over   | Antenna Height | Table Degree |         |
|-----|-----|----------|---------------|----------------|-------------|--------|--------|----------------|--------------|---------|
|     |     | MHz      | dBuV          | dB/m           | dBuV/m      | dBuV/m | dB     | cm             | degree       | Comment |
| 1   |     | 55.4147  | 45.72         | -16.86         | 28.86       | 40.00  | -11.14 | QP             |              |         |
| 2   |     | 89.9047  | 48.09         | -18.75         | 29.34       | 43.50  | -14.16 | QP             |              |         |
| 3   |     | 176.8877 | 48.27         | -16.52         | 31.75       | 43.50  | -11.75 | QP             |              |         |
| 4   | *   | 301.4223 | 53.64         | -12.95         | 40.69       | 46.00  | -5.31  | QP             |              |         |
| 5   |     | 467.2348 | 43.93         | -4.39          | 39.54       | 46.00  | -6.46  | QP             |              |         |
| 6   |     | 900.1473 | 32.22         | 7.33           | 39.55       | 46.00  | -6.45  | QP             |              |         |

Remark:

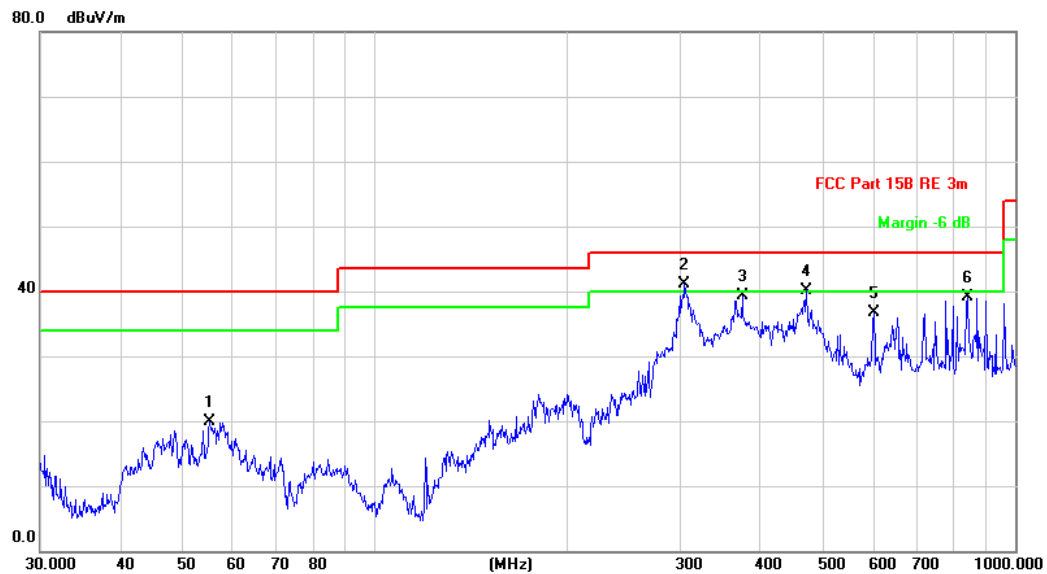
The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Factor= Antenna Factor + Cable Factor – Preamplifier Factor,

Level = Read Level + Factor,

Over Limit=Level-Limit Line.

|            |                       |            |
|------------|-----------------------|------------|
| Test mode: | Charge + Transmitting | Horizontal |
|------------|-----------------------|------------|



| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB/m | Measure-<br>ment<br>dBuV/m | Limit<br>dBuV/m | Over<br>dB | Antenna<br>Height<br>cm | Table<br>Degree<br>degree | Comment |
|-----|-----|--------------|--------------------------|---------------------------|----------------------------|-----------------|------------|-------------------------|---------------------------|---------|
| 1   |     | 55.2207      | 36.86                    | -16.87                    | 19.99                      | 40.00           | -20.01     | QP                      |                           |         |
| 2   | *   | 304.6099     | 53.41                    | -12.38                    | 41.03                      | 46.00           | -4.97      | QP                      |                           |         |
| 3   |     | 374.6225     | 46.98                    | -7.69                     | 39.29                      | 46.00           | -6.71      | QP                      |                           |         |
| 4   | !   | 472.1759     | 44.59                    | -4.52                     | 40.07                      | 46.00           | -5.93      | QP                      |                           |         |
| 5   |     | 601.4265     | 38.25                    | -1.52                     | 36.73                      | 46.00           | -9.27      | QP                      |                           |         |
| 6   |     | 842.1295     | 32.74                    | 6.44                      | 39.18                      | 46.00           | -6.82      | QP                      |                           |         |

**Remark:**

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Factor= Antenna Factor + Cable Factor – Preamplifier Factor,

Level = Read Level + Factor,

Over Limit=Level-Limit Line.

### 5.11.2 Transmitter Emission above 1GHz

| mode:       |               | GFSK(DH5) |                | Test channel: |        | Lowest        |           |
|-------------|---------------|-----------|----------------|---------------|--------|---------------|-----------|
| Frequency   | Meter Reading | Factor    | Emission Level | Limits        | Over   | Detector Type | Ant. Pol. |
| (MHz)       | (dBμV)        | (dB)      | (dBμV/m)       | (dBμV/m)      | (dB)   |               | H/V       |
| <b>2390</b> | 58.68         | -9.2      | 49.48          | 74            | -24.52 | <b>Peak</b>   | <b>H</b>  |
| 2400        | 58.62         | -9.39     | 49.23          | 74            | -24.77 | Peak          | H         |
| 4804        | 54.96         | -4.33     | 50.63          | 74            | -23.37 | Peak          | H         |
| 7206        | 53.17         | 1.01      | 54.18          | 74            | -19.82 | Peak          | H         |
| <b>2390</b> | 57.03         | -9.2      | 47.83          | 74            | -26.17 | <b>Peak</b>   | <b>V</b>  |
| 2400        | 58.61         | -9.39     | 49.22          | 74            | -24.78 | Peak          | V         |
| 4804        | 55.55         | -4.33     | 51.22          | 74            | -22.78 | Peak          | V         |
| 7206        | 52.17         | 1.01      | 53.18          | 74            | -20.82 | Peak          | V         |

| mode:     |               | GFSK(DH5) |                | Test channel: |        | Middle        |           |
|-----------|---------------|-----------|----------------|---------------|--------|---------------|-----------|
| Frequency | Meter Reading | Factor    | Emission Level | Limits        | Over   | Detector Type | Ant. Pol. |
| (MHz)     | (dBμV)        | (dB)      | (dBμV/m)       | (dBμV/m)      | (dB)   |               | H/V       |
| 4882      | 55.46         | -4.11     | 51.35          | 74            | -22.65 | <b>Peak</b>   | H         |
| 7323      | 48.77         | 1.51      | 50.28          | 74            | -23.72 | Peak          | H         |
| 4882      | 56.28         | -4.11     | 52.17          | 74            | -21.83 | <b>Peak</b>   | V         |
| 7323      | 48.19         | 1.51      | 49.70          | 74            | -24.30 | Peak          | V         |

| mode:         |               | GFSK(DH5) |                | Test channel: |        | Highest       |           |
|---------------|---------------|-----------|----------------|---------------|--------|---------------|-----------|
| Frequency     | Meter Reading | Factor    | Emission Level | Limits        | Over   | Detector Type | Ant. Pol. |
| (MHz)         | (dBμV)        | (dB)      | (dBμV/m)       | (dBμV/m)      | (dB)   |               | H/V       |
| <b>2483.5</b> | 54.35         | -9.29     | 45.06          | 74            | -28.94 | <b>Peak</b>   | <b>H</b>  |
| 4960          | 53.92         | -4.04     | 49.88          | 74            | -24.12 | Peak          | H         |
| 7440          | 49.44         | 1.57      | 51.01          | 74            | -22.99 | Peak          | H         |
| <b>2483.5</b> | 54.75         | -9.29     | 45.46          | 74            | -28.54 | <b>Peak</b>   | <b>V</b>  |
| 4960          | 53.75         | -4.04     | 49.71          | 74            | -24.29 | Peak          | V         |
| 7440          | 50.71         | 1.57      | 52.28          | 74            | -21.72 | Peak          | V         |

| mode:       |               | $\pi/4$ DQPSK (2DH5) |                | Test channel:  |        | Lowest        |           |
|-------------|---------------|----------------------|----------------|----------------|--------|---------------|-----------|
| Frequency   | Meter Reading | Factor               | Emission Level | Limits         | Over   | Detector Type | Ant. Pol. |
| (MHz)       | (dB $\mu$ V)  | (dB)                 | (dB $\mu$ V/m) | (dB $\mu$ V/m) | (dB)   |               | H/V       |
| <b>2390</b> | 58.71         | -9.2                 | 49.51          | 74             | -24.49 | <b>Peak</b>   | <b>H</b>  |
| 2400        | 59.06         | -9.39                | 49.67          | 74             | -24.33 | Peak          | H         |
| 4804        | 55.81         | -4.33                | 51.48          | 74             | -22.52 | Peak          | H         |
| 7206        | 53.26         | 1.01                 | 54.27          | 74             | -19.73 | Peak          | H         |
| <b>2390</b> | 57.08         | -9.2                 | 47.88          | 74             | -26.12 | <b>Peak</b>   | <b>V</b>  |
| 2400        | 59.40         | -9.39                | 50.01          | 74             | -23.99 | Peak          | V         |
| 4804        | 55.63         | -4.33                | 51.30          | 74             | -22.70 | Peak          | V         |
| 7206        | 53.56         | 1.01                 | 54.57          | 74             | -19.43 | Peak          | V         |

| mode:     |               | $\pi/4$ DQPSK (2DH5) |                | Test channel:  |        | Middle        |           |
|-----------|---------------|----------------------|----------------|----------------|--------|---------------|-----------|
| Frequency | Meter Reading | Factor               | Emission Level | Limits         | Over   | Detector Type | Ant. Pol. |
| (MHz)     | (dB $\mu$ V)  | (dB)                 | (dB $\mu$ V/m) | (dB $\mu$ V/m) | (dB)   |               | H/V       |
| 4882      | 56.59         | -4.11                | 52.48          | 74             | -21.52 | peak          | H         |
| 7323      | 49.66         | 1.51                 | 51.17          | 74             | -22.83 | peak          | H         |
| 4882      | 54.82         | -4.11                | 50.71          | 74             | -23.29 | peak          | V         |
| 7323      | 48.55         | 1.51                 | 50.06          | 74             | -23.94 | peak          | V         |

| mode:         |               | $\pi/4$ DQPSK (2DH5) |                | Test channel:  |        | Highest       |           |
|---------------|---------------|----------------------|----------------|----------------|--------|---------------|-----------|
| Frequency     | Meter Reading | Factor               | Emission Level | Limits         | Over   | Detector Type | Ant. Pol. |
| (MHz)         | (dB $\mu$ V)  | (dB)                 | (dB $\mu$ V/m) | (dB $\mu$ V/m) | (dB)   |               | H/V       |
| <b>2483.5</b> | 54.96         | -9.29                | 45.67          | 74             | -28.33 | <b>Peak</b>   | <b>H</b>  |
| 4960          | 53.22         | -4.04                | 49.18          | 74             | -24.82 | Peak          | H         |
| 7440          | 50.36         | 1.57                 | 51.93          | 74             | -22.07 | Peak          | H         |
| <b>2483.5</b> | 54.02         | -9.29                | 44.73          | 74             | -29.27 | <b>Peak</b>   | <b>V</b>  |
| 4960          | 54.44         | -4.04                | 50.40          | 74             | -23.60 | Peak          | V         |
| 7440          | 49.06         | 1.57                 | 50.63          | 74             | -23.37 | Peak          | V         |

| mode:       |               | 8DPSK (3DH5) |                | Test channel: |        | Lowest        |           |
|-------------|---------------|--------------|----------------|---------------|--------|---------------|-----------|
| Frequency   | Meter Reading | Factor       | Emission Level | Limits        | Over   | Detector Type | Ant. Pol. |
| (MHz)       | (dBμV)        | (dB)         | (dBμV/m)       | (dBμV/m)      | (dB)   |               | H/V       |
| <b>2390</b> | 57.74         | -9.2         | 48.54          | 74            | -25.46 | <b>Peak</b>   | <b>H</b>  |
| 2400        | 58.98         | -9.39        | 49.59          | 74            | -24.41 | Peak          | H         |
| 4804        | 55.38         | -4.33        | 51.05          | 74            | -22.95 | Peak          | H         |
| 7206        | 52.85         | 1.01         | 53.86          | 74            | -20.14 | Peak          | H         |
| <b>2390</b> | 58.12         | -9.2         | 48.92          | 74            | -25.08 | <b>Peak</b>   | <b>V</b>  |
| 2400        | 58.00         | -9.39        | 48.61          | 74            | -25.39 | Peak          | V         |
| 4804        | 55.37         | -4.33        | 51.04          | 74            | -22.96 | Peak          | V         |
| 7206        | 51.74         | 1.01         | 52.75          | 74            | -21.25 | Peak          | V         |

| mode:     |               | 8DPSK (3DH5) |                | Test channel: |        | Middle        |           |
|-----------|---------------|--------------|----------------|---------------|--------|---------------|-----------|
| Frequency | Meter Reading | Factor       | Emission Level | Limits        | Over   | Detector Type | Ant. Pol. |
| (MHz)     | (dBμV)        | (dB)         | (dBμV/m)       | (dBμV/m)      | (dB)   |               | H/V       |
| 4882      | 56.33         | -4.11        | 52.22          | 74            | -21.78 | peak          | H         |
| 7323      | 48.53         | 1.51         | 50.04          | 74            | -23.96 | peak          | H         |
| 4882      | 55.03         | -4.11        | 50.92          | 74            | -23.08 | peak          | V         |
| 7323      | 48.68         | 1.51         | 50.19          | 74            | -23.81 | peak          | V         |

| mode:         |               | 8DPSK (3DH5) |                | Test channel: |        | Highest       |           |
|---------------|---------------|--------------|----------------|---------------|--------|---------------|-----------|
| Frequency     | Meter Reading | Factor       | Emission Level | Limits        | Over   | Detector Type | Ant. Pol. |
| (MHz)         | (dBμV)        | (dB)         | (dBμV/m)       | (dBμV/m)      | (dB)   |               | H/V       |
| <b>2483.5</b> | 53.87         | -9.29        | 44.58          | 74            | -29.42 | <b>Peak</b>   | <b>H</b>  |
| 4960          | 54.34         | -4.04        | 50.30          | 74            | -23.70 | Peak          | H         |
| 7440          | 50.02         | 1.57         | 51.59          | 74            | -22.41 | Peak          | H         |
| <b>2483.5</b> | 55.28         | -9.29        | 45.99          | 74            | -28.01 | <b>Peak</b>   | <b>V</b>  |
| 4960          | 54.49         | -4.04        | 50.45          | 74            | -23.55 | Peak          | V         |
| 7440          | 48.79         | 1.57         | 50.36          | 74            | -23.64 | Peak          | V         |

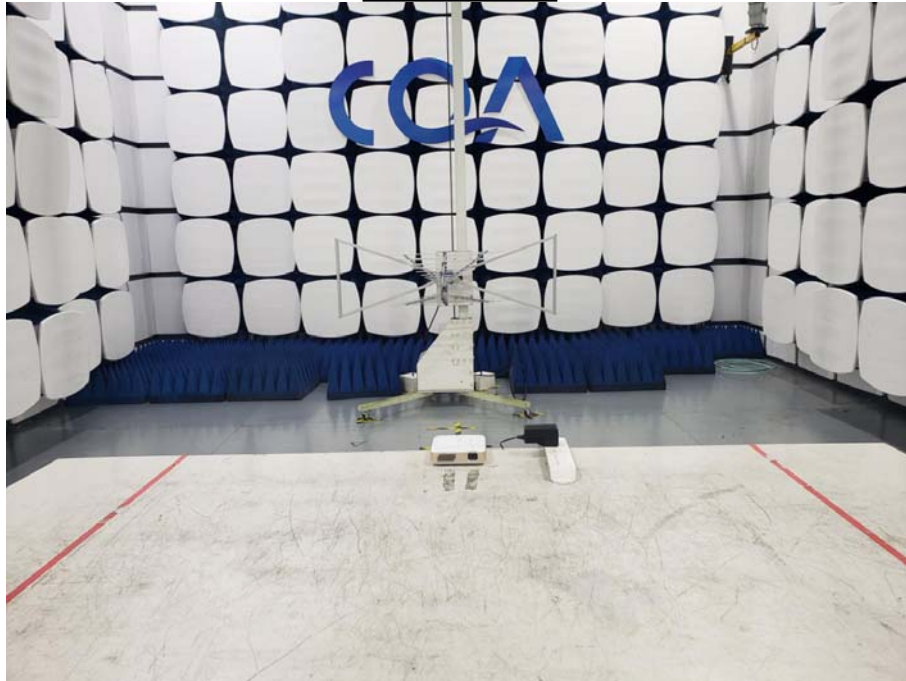
Remark:

- The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:  
Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor
- Scan from 9kHz to 25GHz, the disturbance above 10GHz and below 30MHz was very low. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. So, only the peak measurements were shown in the report.

## 6 Photographs - EUT Test Setup

Please see test setup file

30MHz~1GHz:



9kHz~30MHz:



Above 1GHz:



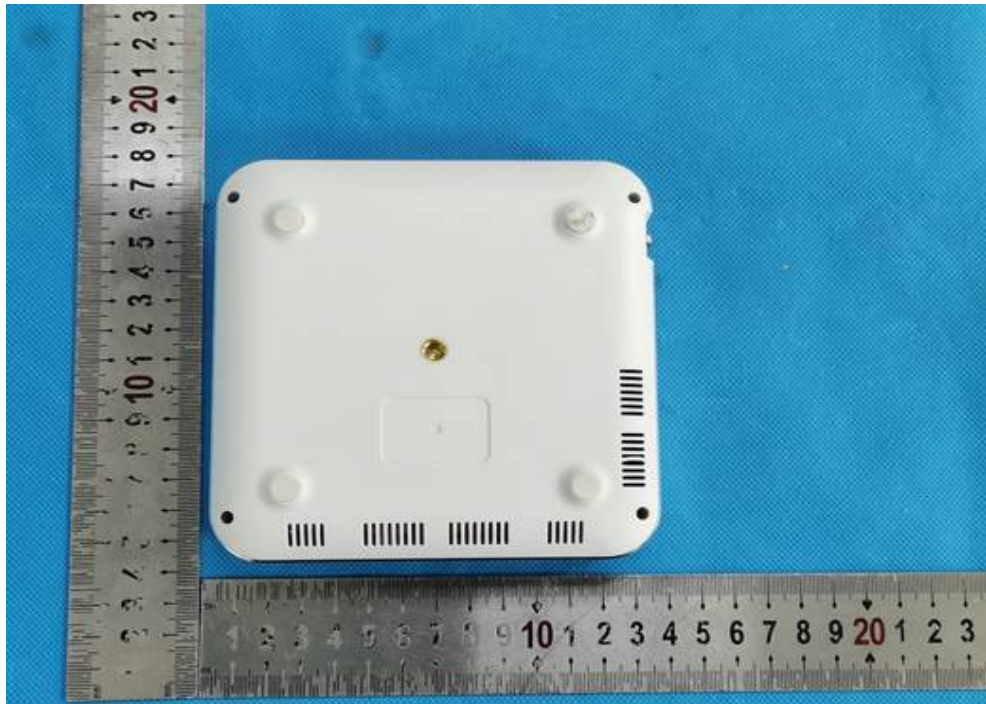
Conducted emission Test Setup



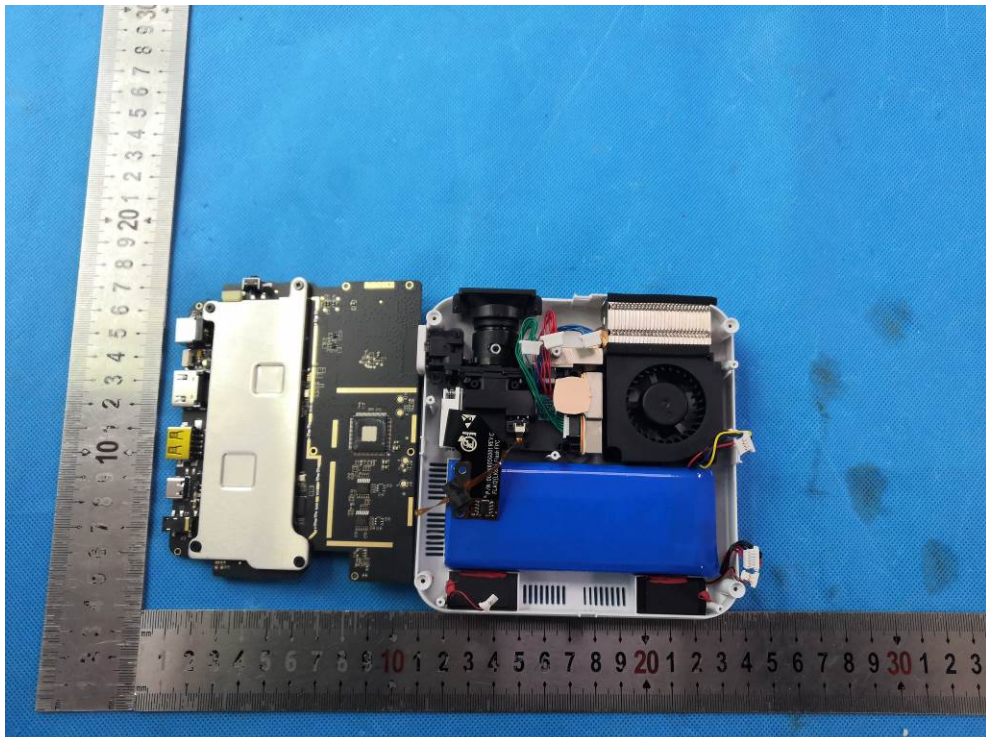
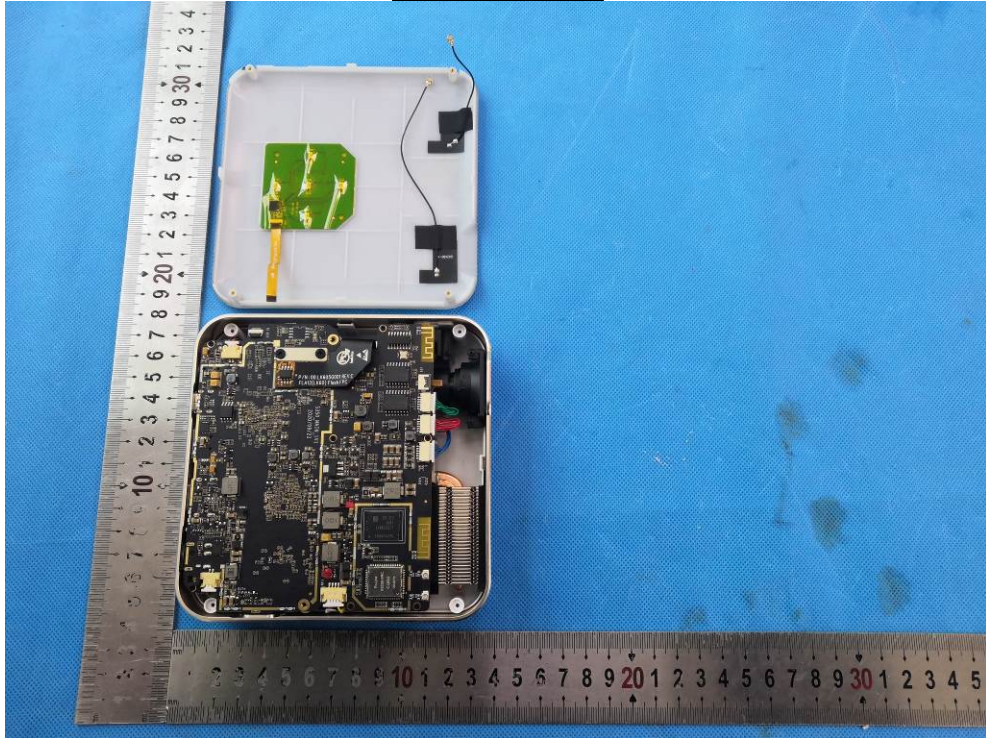
## 7 Photographs - EUT Constructional Details

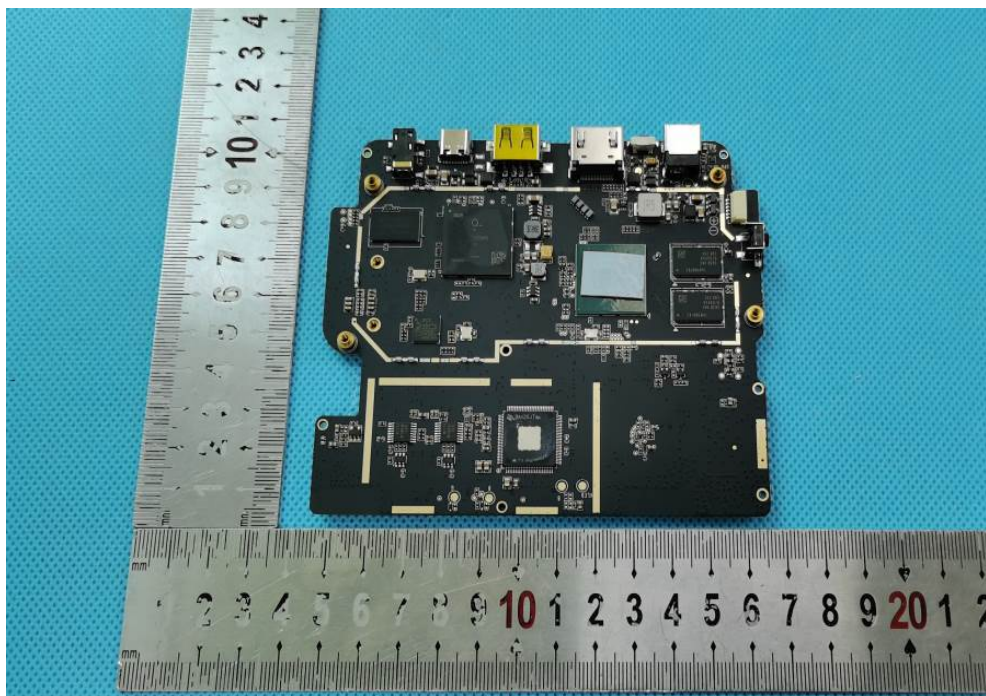
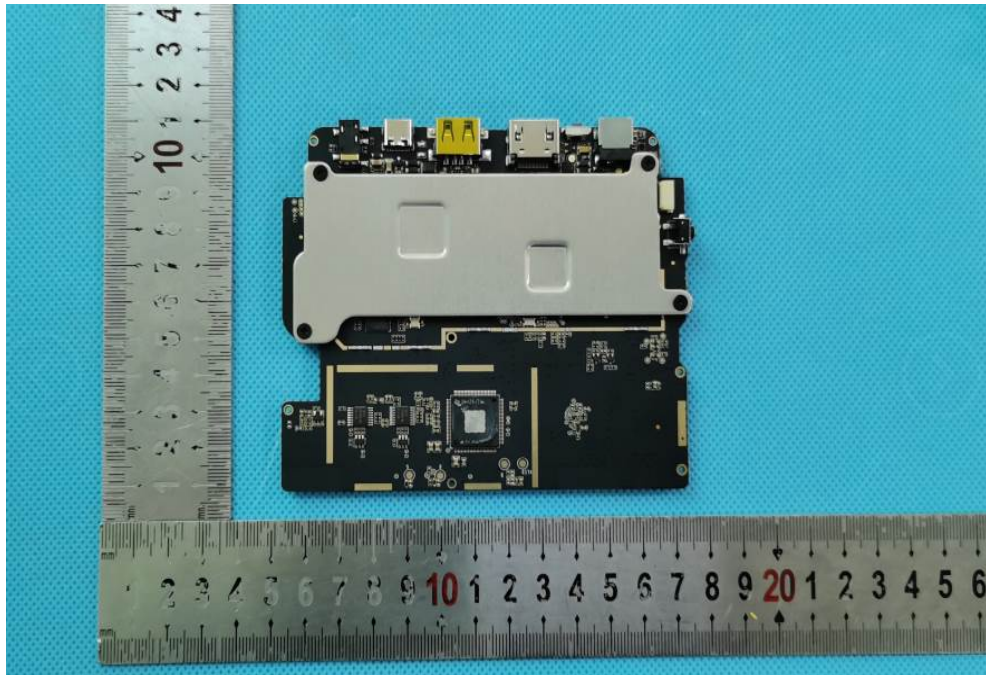
### External photos

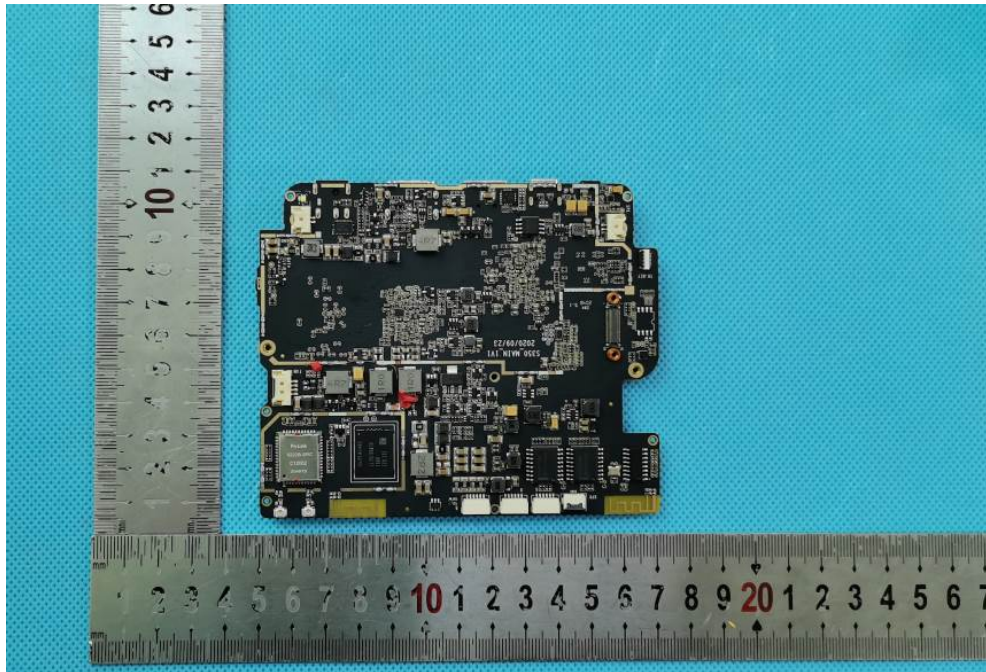


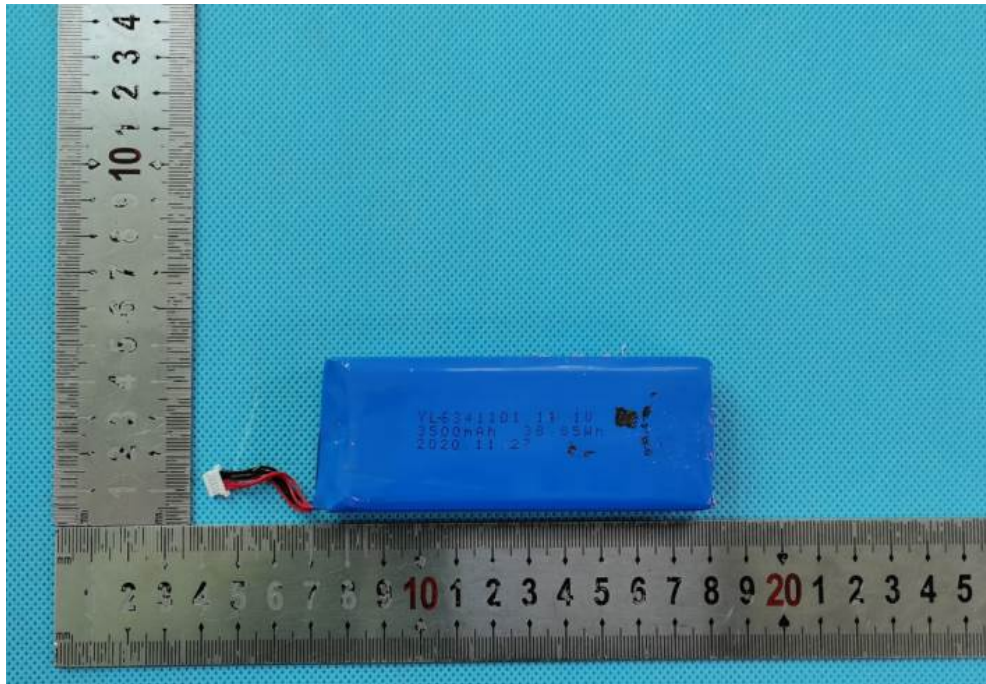


Internal photos









**The End**