



3.5 Radiated Band Edges and Spurious Emission Measurement

3.5.1 Limit of Radiated Band Edges and Spurious Emission

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device is measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the limits as below.

| Frequency (MHz) | Field Strength (microvolts/meter) | Measurement Distance (meters) |
|--------------------|--------------------------------------|----------------------------------|
| 0.009 – 0.490 | 2400/F(kHz) | 300 |
| 0.490 – 1.705 | 24000/F(kHz) | 30 |
| 1.705 – 30.0 | 30 | 30 |
| 30 – 88 | 100 | 3 |
| 88 – 216 | 150 | 3 |
| 216 - 960 | 200 | 3 |
| Above 960 | 500 | 3 |

3.5.2 Measuring Instruments

Please refer to the measuring equipment list in this test report.

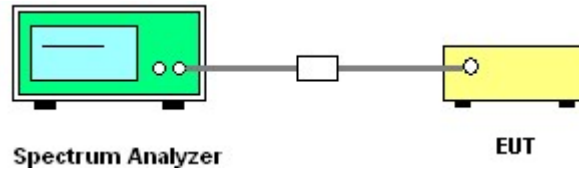
**3.5.3 Test Procedures**

1. The testing follows the ANSI C63.10 Section 11.12.2 Antenna-port conducted measurements.
2. Measure the conducted output power (in dBm) using the peak detector.
3. Add the maximum transmit antenna gain (in dBi) to the measured output power level to determine the EIRP.
4. Add the appropriate maximum ground reflection factor to the EIRP (6 dB for frequencies \leq 30 MHz; 4.7 dB for frequencies between 30 MHz and 1000 MHz, inclusive; and 0 dB for frequencies $>$ 1000 MHz).
5. Convert the resultant EIRP to an equivalent electric field strength using the following relationship:
$$E = \text{EIRP} - 20 \log d + 104.8,$$
where
E is the electric field strength in dB μ V/m
EIRP is the equivalent isotropically radiated power in dBm
d is the specified measurement distance in 3m
6. Compare the resultant electric field strength level with the applicable regulatory limit.
7. Corrected Reading for conducted spurious emission: Antenna Factor + Cable Loss + Read Level = Level
8. Perform the cabinet radiated spurious emission test.
9. The EUT is arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
10. The EUT is placed on a turntable with 0.8 meter for frequency below 1 GHz and 1.5 meter for frequency above 1 GHz respectively above ground.
11. The EUT is set 3 meters away from the receiving antenna, which is mounted on the top of a variable height antenna tower.
12. Corrected Reading for cabinet radiated spurious emission: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
13. Radiated testing below 1 GHz is performed by adjusting the antenna tower from 1 m to 4 m and by rotating the turn table from 0 degree to 360 degrees to find the peak maximum hold reading. When there is no suspected emission found and the emission level is with at least 6 dB margin against QP limit line, the position is marked as "-".
14. Radiated testing above 1 GHz is performed by adjusting the antenna tower from 1 m to 4 m and by rotating the turn table from 0 degree to 360 degrees to find the peak maximum hold reading for scanning all frequencies. When there is no suspected emission found and the harmonic emission level is with at least 6 dB margin against average limit line, the position is marked as "-".

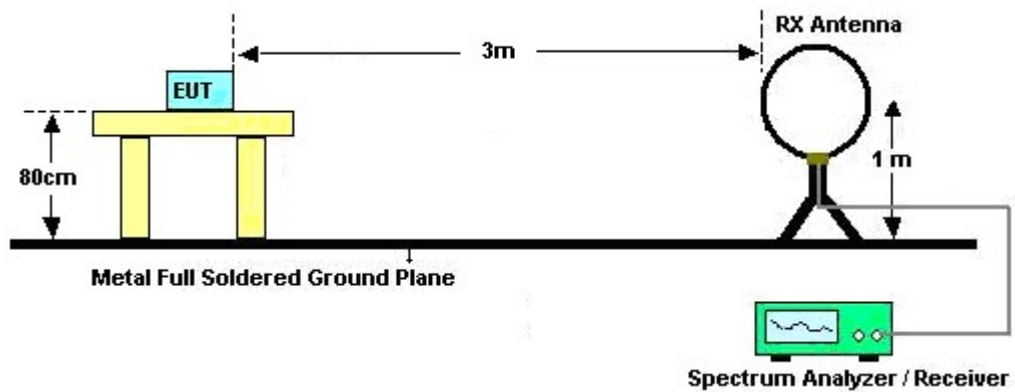
15. Use the following spectrum analyzer settings:
- (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Set RBW = 100 kHz for $f < 1$ GHz; VBW \geq RBW; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW = 3 MHz for $f \geq 1$ GHz for peak measurement.
- For average measurement:
- VBW = 10 Hz, when duty cycle is no less than 98 percent.
 - VBW $\geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

3.5.4 Test Setup

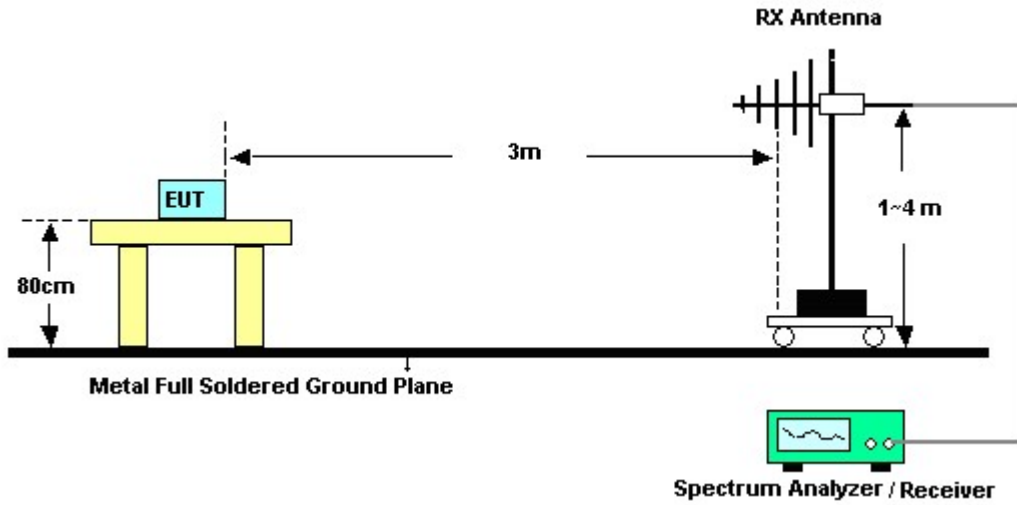
For Conducted Measurement Setup:



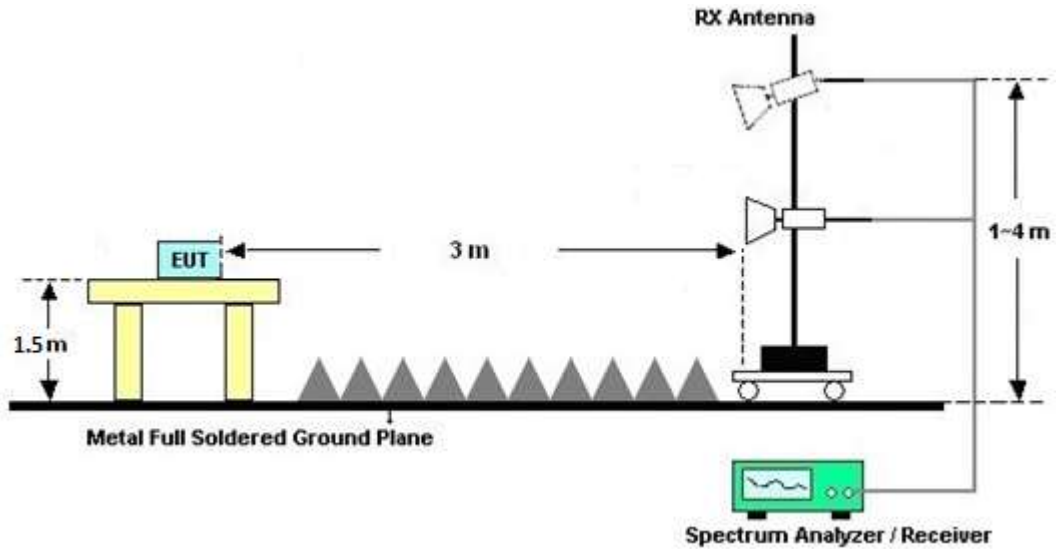
For radiated test below 30MHz



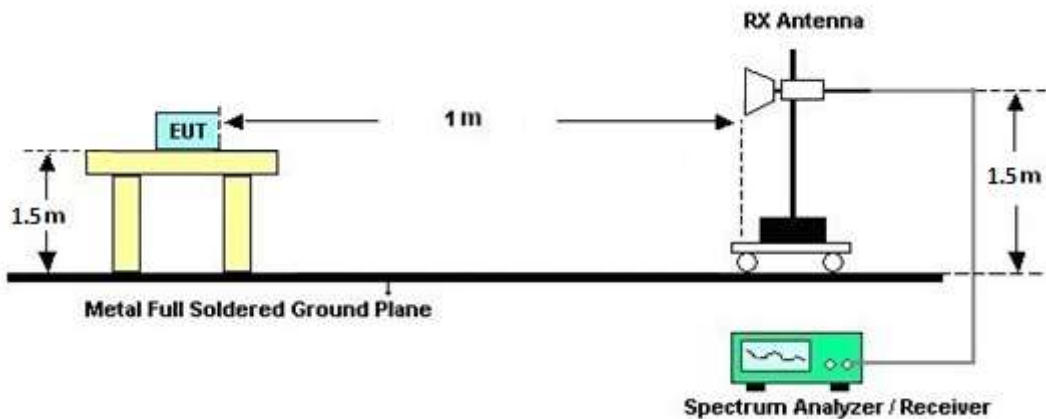
For radiated test from 30MHz to 1GHz



For radiated test from 1GHz to 18GHz



For radiated test above 18GHz





3.5.5 Test Results of Radiated Spurious Emissions (9 kHz ~ 30 MHz)

The low frequency, which starts from 9 kHz to 30 MHz, is pre-scanned and the result which is 20 dB lower than the limit line is not reported.

There is adequate comparison measurement of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result comes out very similar.

3.5.6 Test Result of Conduced Spurious at Band Edges in the Restricted Band

Please refer to Appendix C and D.

3.5.7 Test Result of Conduced Spurious Emission in the Restricted Band

Please refer to Appendix C and D.

3.5.8 Test Result of Cabinet Radiated Spurious at Band Edges

Please refer to Appendix E and F.

3.5.9 Test Result of Cabinet Radiated Spurious Emission (30 MHz ~ 10th Harmonic)

Please refer to Appendix E and F.

3.5.10 Duty Cycle

Please refer to Appendix G.



3.6 AC Conducted Emission Measurement

3.6.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

| Frequency of emission (MHz) | Conducted limit (dBµV) | |
|-----------------------------|------------------------|-----------|
| | Quasi-peak | Average |
| 0.15-0.5 | 66 to 56* | 56 to 46* |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |

*Decreases with the logarithm of the frequency.

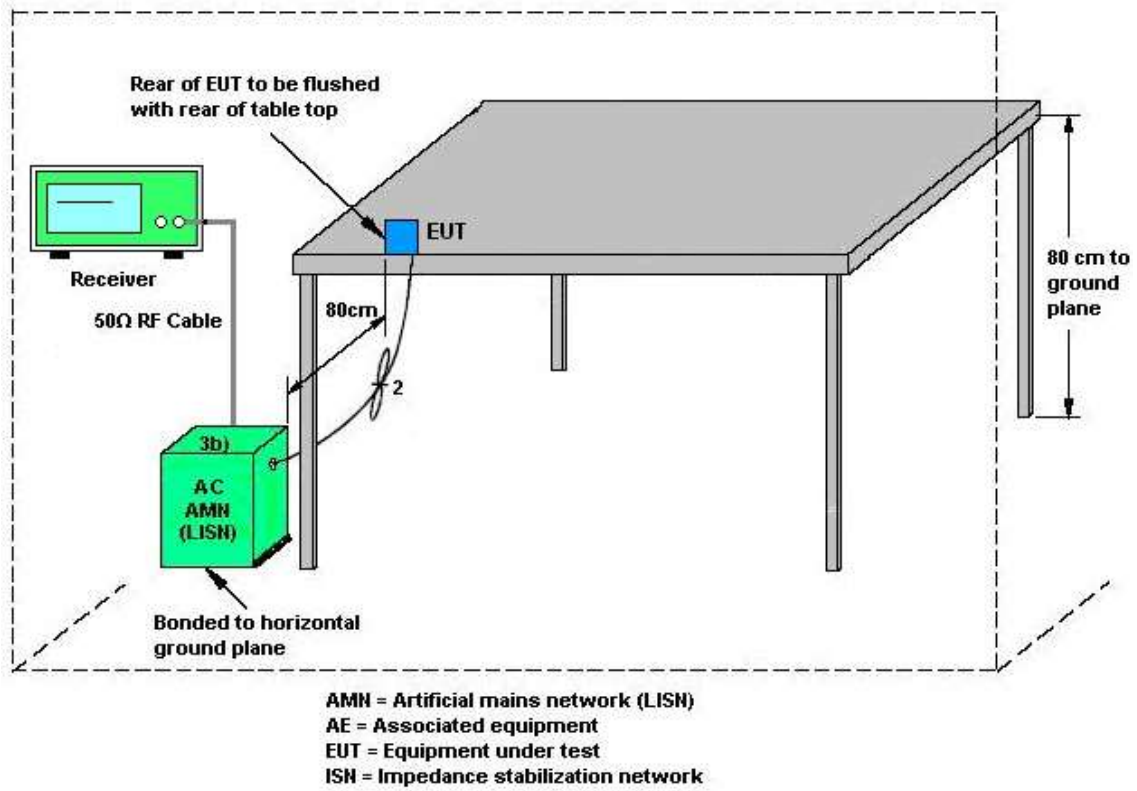
3.6.2 Measuring Instruments

Please refer to the measuring equipment list in this test report.

3.6.3 Test Procedures

1. The EUT is placed 0.4 meter away from the conducting wall of the shielding room, and is kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN shall be used.
6. Both Line and Neutral shall be tested in order to find out the maximum conducted emission.
7. The frequency range from 150 kHz to 30 MHz is scanned.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9 kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

3.6.4 Test Setup



3.6.5 Test Result of AC Conducted Emission

Please refer to Appendix B.



3.7 Antenna Requirements

3.7.1 Standard Applicable

If directional gain of transmitting antennas is greater than 6 dBi, the power shall be reduced by the same level in dB comparing to gain minus 6 dBi. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the rule.

3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.7.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.



4 List of Measuring Equipment

| Instrument | Brand Name | Model No. | Serial No. | Characteristics | Calibration Date | Test Date | Due Date | Remark |
|---------------------------|-----------------|-----------------------------|---------------------|------------------------|------------------|--------------------------------|---------------|--------------------------|
| Power Meter | Anritsu | ML2495A | 932001 | N/A | Sep. 30, 2021 | May 02, 2022~ Jun. 13, 2022 | Sep. 29, 2022 | Conducted (TH05-HY) |
| Power Sensor | Anritsu | MA2411B | 846202 | 300MHz~40GHz | Sep. 30, 2021 | May 02, 2022~ Jun. 13, 2022 | Sep. 29, 2022 | Conducted (TH05-HY) |
| Signal Analyzer | Rohde & Schwarz | FSV40 | 101566 | 10Hz~40GHz | Aug. 30, 2021 | May 02, 2022~ Jun. 13, 2022 | Aug. 29, 2022 | Conducted (TH05-HY) |
| Switch Control Mainframe | E-IUSTRUMENT | ETF-1405-0 | EC1900067 (BOX7) | N/A | Aug. 12, 2021 | May 02, 2022~ Jun. 13, 2022 | Aug. 11, 2022 | Conducted (TH05-HY) |
| Spectrum Analyzer | ROHDE & SCHWARZ | FSV40 | 101565 | 10Hz~40GHz | Dec. 29, 2021 | May 11, 2022~ Jun. 13, 2022 | Dec. 28, 2022 | CSE (TH05-HY) |
| RF Cable | HUBER + SUHNER | SUCOFLEX 104 | MY9837/4PE | 9kHz~30MHz | Mar. 10, 2022 | May 11, 2022~ Jun. 13, 2022 | Mar. 09, 2023 | CSE (TH05-HY) |
| RF Cable | HUBER + SUHNER | SUCOFLEX 126E | 0058/126E | 30MHz~18GHz | Dec. 10, 2021 | May 11, 2022~ Jun. 13, 2022 | Dec. 09, 2022 | CSE (TH05-HY) |
| RF Cable | HUBER + SUHNER | SUCOFLEX 102 | 505134/2 | 30MHz~40GHz | Feb. 21, 2022 | May 11, 2022~ Jun. 13, 2022 | Feb. 20, 2023 | CSE (TH05-HY) |
| Filter | Wainwright | WLKS1200-12SS | SN2 | 1.2GHz Low Pass Filter | Mar. 15, 2022 | May 11, 2022~ Jun. 13, 2022 | Mar. 14, 2023 | CSE (TH05-HY) |
| Filter | Wainwright | WHKX12-2700-3000-18000-60ST | SN2 | 3GHz High Pass Filter | Jul. 12, 2021 | May 11, 2022~ Jun. 13, 2022 | Jul. 11, 2022 | CSE (TH05-HY) |
| AC Power Source | ChainTek | APC-1000W | N/A | N/A | N/A | Jun. 07, 2022 | N/A | Conduction (CO05-HY) |
| EMI Test Receiver | Rohde & Schwarz | ESR3 | 102388 | 9kHz~3.6GHz | Dec. 01, 2021 | Jun. 07, 2022 | Nov. 30, 2022 | Conduction (CO05-HY) |
| LISN | Rohde & Schwarz | ENV216 | 100080 | 9kHz~30MHz | Dec. 03, 2021 | Jun. 07, 2022 | Dec. 02, 2022 | Conduction (CO05-HY) |
| LISN | Rohde & Schwarz | ENV216 | 100081 | 9kHz~30MHz | Nov. 16, 2021 | Jun. 07, 2022 | Nov. 15, 2022 | Conduction (CO05-HY) |
| Software | Rohde & Schwarz | EMC32 | N/A | N/A | N/A | Jun. 07, 2022 | N/A | Conduction (CO05-HY) |
| Pulse Limiter | SCHWARZBECK | VTSD 9561-FN | 00691 | N/A | Jul. 28, 2021 | Jun. 07, 2022 | Jul. 27, 2022 | Conduction (CO05-HY) |
| LISN Cable | MVE | RG-400 | 260260 | N/A | Dec. 30, 2021 | Jun. 07, 2022 | Dec. 29, 2022 | Conduction (CO05-HY) |
| Loop Antenna | Rohde & Schwarz | HFH2-Z2 | 100315 | 9 kHz~30 MHz | Jan. 07, 2022 | May 11, 2022~ May 12, 2022 | Jan. 06, 2023 | Radiation (03CH07-HY) |
| Bilog Antenna | TESEQ | CBL 6111D & 00800N1D01N-06 | 35419 & 03 | 30MHz~1GHz | Apr. 24, 2022 | May 11, 2022~ May 12, 2022 | Apr. 23, 2023 | Radiation (03CH07-HY) |
| Double Ridge Horn Antenna | ESCO | 3117 | 00075962 | 1GHz ~ 18GHz | Dec. 03, 2021 | May 11, 2022~ May 12, 2022 | Dec. 02, 2022 | Radiation (03CH07-HY) |
| SHF-EHF Horn Antenna | SCHWARZBECK | BBHA 9170 | BBHA9170251 | 18GHz~40GHz | Nov. 30, 2021 | May 11, 2022~ May 12, 2022 | Nov. 29, 2022 | Radiation (03CH07-HY) |
| Preamplifier | MITEQ | AMF-7D-0010 1800-30-10P | 1590075 | 1GHz~18GHz | Apr. 21, 2022 | May 11, 2022~ May 12, 2022 | Apr. 20, 2023 | Radiation (03CH07-HY) |
| Preamplifier | COM-POWER | PA-103A | 161241 | 10MHz~1GHz | Oct. 04, 2021 | May 11, 2022~ May 12, 2022 | Oct. 03, 2022 | Radiation (03CH07-HY) |
| Preamplifier | Agilent | 8449B | 3008A02362 | 1GHz~26.5GHz | Oct. 04, 2021 | May 11, 2022~ May 12, 2022 | Oct. 03, 2022 | Radiation (03CH07-HY) |
| Preamplifier | EMEC | EM18G40G | 0600789 | 18-40GHz | Jul. 23, 2021 | May 11, 2022~ May 12, 2022 | Jul. 22, 2022 | Radiation (03CH07-HY) |
| Spectrum Analyzer | Agilent | N9030A | MY52350276 | 3Hz~44GHz | Jul. 22, 2021 | May 11, 2022~ May 12, 2022 | Jul. 21, 2022 | Radiation (03CH07-HY) |



| Instrument | Brand Name | Model No. | Serial No. | Characteristics | Calibration Date | Test Date | Due Date | Remark |
|-----------------|----------------|---------------|-------------|----------------------|------------------|-------------------------------|---------------|-----------------------|
| RF Cable | HUBER + SUHNER | SUCOFLEX 104 | MY15682/4 | 30MHz to 18GHz | Feb. 23, 2022 | May 11, 2022~ May 12, 2022 | Feb. 22, 2023 | Radiation (03CH07-HY) |
| RF Cable | HUBER + SUHNER | SUCOFLEX 104 | MY24971/4 | 9kHz to 18GHz | Feb. 23, 2022 | May 11, 2022~ May 12, 2022 | Feb. 22, 2023 | Radiation (03CH07-HY) |
| RF Cable | HUBER + SUHNER | SUCOFLEX 104 | MY28655/4 | 9kHz to 18GHz | Feb. 23, 2022 | May 11, 2022~ May 12, 2022 | Feb. 22, 2023 | Radiation (03CH07-HY) |
| RF Cable | HUBER + SUHNER | SUCOFLEX 126 | 532078/126E | 30MHz~18GHz | Sep. 17, 2021 | May 11, 2022~ May 12, 2022 | Sep. 16, 2022 | Radiation (03CH07-HY) |
| RF Cable | HUBER + SUHNER | SUCOFLEX 102 | MY2858/2 | 18GHz~40GHz | Feb. 23, 2022 | May 11, 2022~ May 12, 2022 | Feb. 22, 2023 | Radiation (03CH07-HY) |
| RF Cable | HUBER + SUHNER | SUCOFLEX 102 | 801606/2 | 9KHz ~ 40GHz | Apr. 14, 2022 | May 11, 2022~ May 12, 2022 | Apr. 13, 2023 | Radiation (03CH07-HY) |
| Antenna Mast | EMEC | AM-BS-4500E | N/A | Boresight mast 1M~4M | N/A | May 11, 2022~ May 12, 2022 | N/A | Radiation (03CH07-HY) |
| Turn Table | ChainTek | Chaintek 3000 | N/A | 0~360 Degree | N/A | May 11, 2022~ May 12, 2022 | N/A | Radiation (03CH07-HY) |
| Software | Audix | E3 | N/A | N/A | N/A | May 11, 2022~ May 12, 2022 | N/A | Radiation (03CH07-HY) |
| USB Data Logger | TECPEL | TR-32 | HE17XB1148 | N/A | Oct. 25, 2021 | May 11, 2022~ May 12, 2022 | Oct. 24, 2022 | Radiation (03CH07-HY) |



5 Uncertainty of Evaluation

Uncertainty of Conducted Emission Measurement (150 kHz ~ 30 MHz)

| | |
|---|--------|
| Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$) | 3.1 dB |
|---|--------|

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

| | |
|---|--------|
| Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$) | 5.1 dB |
|---|--------|

Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

| | |
|---|--------|
| Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$) | 5.8 dB |
|---|--------|

Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

| | |
|---|--------|
| Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$) | 4.0 dB |
|---|--------|

Appendix A. Test Result of Conducted Test Items

| | | | | |
|----------------|------------------------|--------------------|-------|----|
| Test Engineer: | Kai Liao | Temperature: | 21~25 | °C |
| Test Date: | 2022/05/02 ~2022/06/13 | Relative Humidity: | 51~54 | % |

TEST RESULTS DATA
6dB and 99% Occupied Bandwidth

| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | 99% Occupied BW (MHz) | 6dB BW (MHz) | 6dB BW Limit (MHz) | Pass/Fail |
|------|-----------|-----|-----|-------------|-----------------------|--------------|--------------------|-----------|
| BLE | 1Mbps | 1 | 0 | 2402 | 1.070 | 0.696 | 0.50 | Pass |
| BLE | 1Mbps | 1 | 19 | 2440 | 1.093 | 0.720 | 0.50 | Pass |
| BLE | 1Mbps | 1 | 39 | 2480 | 1.089 | 0.710 | 0.50 | Pass |

TEST RESULTS DATA
Peak Power Table

| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | Peak Conducted Power (dBm) | Conducted Power Limit (dBm) | DG (dBi) | EIRP Power (dBm) | EIRP Power Limit (dBm) | Pass /Fail |
|------|-----------|-----|-----|-------------|----------------------------|-----------------------------|----------|------------------|------------------------|------------|
| BLE | 1Mbps | 1 | 0 | 2402 | 4.98 | 30.00 | 3.30 | 8.28 | 36.00 | Pass |
| BLE | 1Mbps | 1 | 19 | 2440 | 5.13 | 30.00 | 3.30 | 8.43 | 36.00 | Pass |
| BLE | 1Mbps | 1 | 39 | 2480 | 4.97 | 30.00 | 3.30 | 8.27 | 36.00 | Pass |

TEST RESULTS DATA
Average Power Table
(Reporting Only)

| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | Average Conducted Power (dBm) | Conducted Power Limit (dBm) | DG (dBi) | EIRP Power (dBm) | EIRP Power Limit (dBm) | Pass /Fail |
|------|-----------|-----|-----|-------------|-------------------------------|-----------------------------|----------|------------------|------------------------|------------|
| BLE | 1Mbps | 1 | 0 | 2402 | 4.68 | 30.00 | 3.30 | 7.98 | 36.00 | Pass |
| BLE | 1Mbps | 1 | 19 | 2440 | 4.77 | 30.00 | 3.30 | 8.07 | 36.00 | Pass |
| BLE | 1Mbps | 1 | 39 | 2480 | 4.66 | 30.00 | 3.30 | 7.96 | 36.00 | Pass |

TEST RESULTS DATA
Peak Power Density

| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | Peak PSD (dBm /100kHz) | Peak PSD (dBm /3kHz) | DG (dBi) | Peak PSD Limit (dBm /3kHz) | Pass/Fail |
|------|-----------|-----|-----|-------------|------------------------|----------------------|----------|----------------------------|-----------|
| BLE | 1Mbps | 1 | 0 | 2402 | 3.74 | -8.24 | 3.30 | 8.00 | Pass |
| BLE | 1Mbps | 1 | 19 | 2440 | 3.82 | -8.61 | 3.30 | 8.00 | Pass |
| BLE | 1Mbps | 1 | 39 | 2480 | 3.80 | -8.19 | 3.30 | 8.00 | Pass |

Note: PSD (dBm/ 100kHz) is a reference level used for Conducted Band Edges and Conducted Spurious Emission 20dBc limit.

TEST RESULTS DATA
6dB and 99% Occupied Bandwidth

| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | 99% Occupied BW (MHz) | 6dB BW (MHz) | 6dB BW Limit (MHz) | Pass/Fail |
|------|-----------|-----|-----|-------------|-----------------------|--------------|--------------------|-----------|
| BLE | 2Mbps | 1 | 0 | 2402 | 2.062 | 1.292 | 0.50 | Pass |
| BLE | 2Mbps | 1 | 19 | 2440 | 2.058 | 1.328 | 0.50 | Pass |
| BLE | 2Mbps | 1 | 39 | 2480 | 2.074 | 1.400 | 0.50 | Pass |

TEST RESULTS DATA
Peak Power Table

| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | Peak Conducted Power (dBm) | Conducted Power Limit (dBm) | DG (dBi) | EIRP Power (dBm) | EIRP Power Limit (dBm) | Pass /Fail |
|------|-----------|-----|-----|-------------|----------------------------|-----------------------------|----------|------------------|------------------------|------------|
| BLE | 2Mbps | 1 | 0 | 2402 | 4.97 | 30.00 | 3.30 | 8.27 | 36.00 | Pass |
| BLE | 2Mbps | 1 | 19 | 2440 | 5.10 | 30.00 | 3.30 | 8.40 | 36.00 | Pass |
| BLE | 2Mbps | 1 | 39 | 2480 | 4.92 | 30.00 | 3.30 | 8.22 | 36.00 | Pass |

TEST RESULTS DATA
Average Power Table
(Reporting Only)

| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | Average Conducted Power (dBm) | Conducted Power Limit (dBm) | DG (dBi) | EIRP Power (dBm) | EIRP Power Limit (dBm) | Pass /Fail |
|------|-----------|-----|-----|-------------|-------------------------------|-----------------------------|----------|------------------|------------------------|------------|
| BLE | 2Mbps | 1 | 0 | 2402 | 4.67 | 30.00 | 3.30 | 7.97 | 36.00 | Pass |
| BLE | 2Mbps | 1 | 19 | 2440 | 4.76 | 30.00 | 3.30 | 8.06 | 36.00 | Pass |
| BLE | 2Mbps | 1 | 39 | 2480 | 4.65 | 30.00 | 3.30 | 7.95 | 36.00 | Pass |

TEST RESULTS DATA
Peak Power Density

| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | Peak PSD (dBm /100kHz) | Peak PSD (dBm /3kHz) | DG (dBi) | Peak PSD Limit (dBm /3kHz) | Pass/Fail |
|------|-----------|-----|-----|-------------|------------------------|----------------------|----------|----------------------------|-----------|
| BLE | 2Mbps | 1 | 0 | 2402 | 3.12 | -10.57 | 3.30 | 8.00 | Pass |
| BLE | 2Mbps | 1 | 19 | 2440 | 3.20 | -10.47 | 3.30 | 8.00 | Pass |
| BLE | 2Mbps | 1 | 39 | 2480 | 3.25 | -10.62 | 3.30 | 8.00 | Pass |

Note: PSD (dBm/ 100kHz) is a reference level used for Conducted Band Edges and Conducted Spurious Emission 20dBc limit.



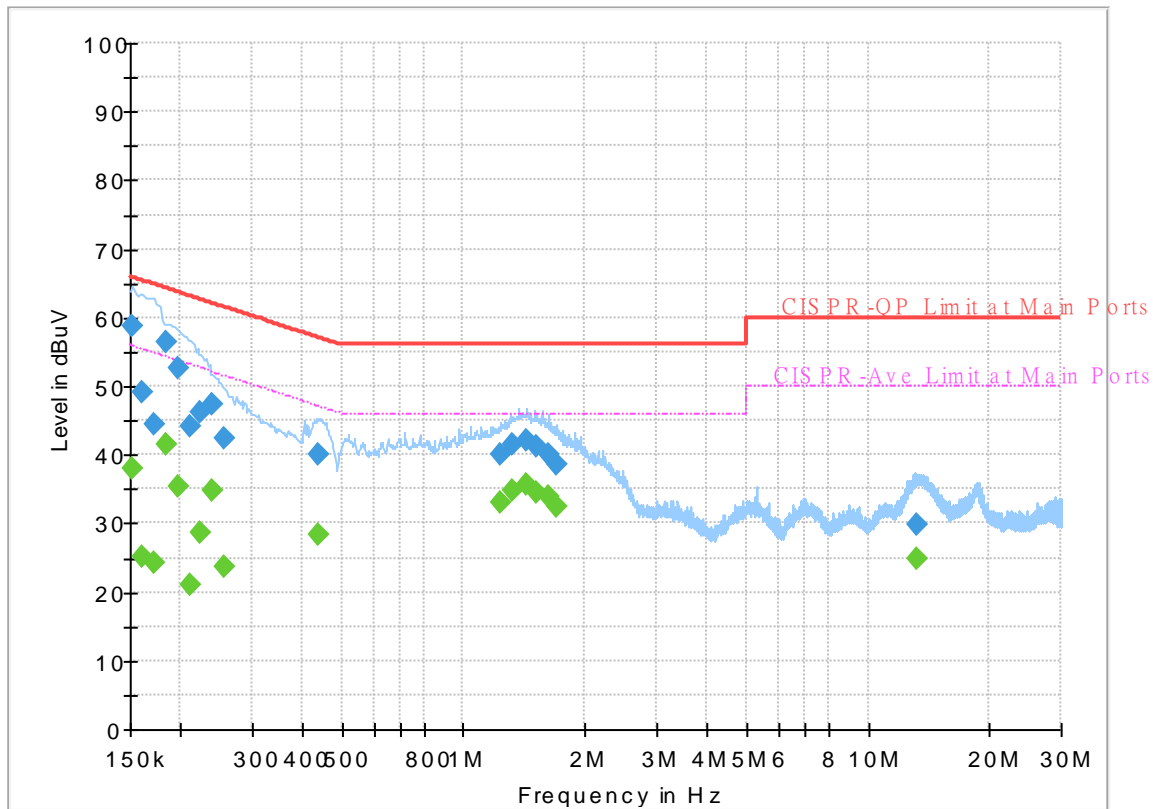
Appendix B. AC Conducted Emission Test Results

| | | | |
|-----------------|---------|---------------------|---------|
| Test Engineer : | Tom Lee | Temperature : | 23~26°C |
| | | Relative Humidity : | 45~55% |

EUT Information

Report NO : 242614
 Test Mode : Mode 1
 Test Voltage : Power From System
 Phase : Line

Full Spectrum



Final_Result

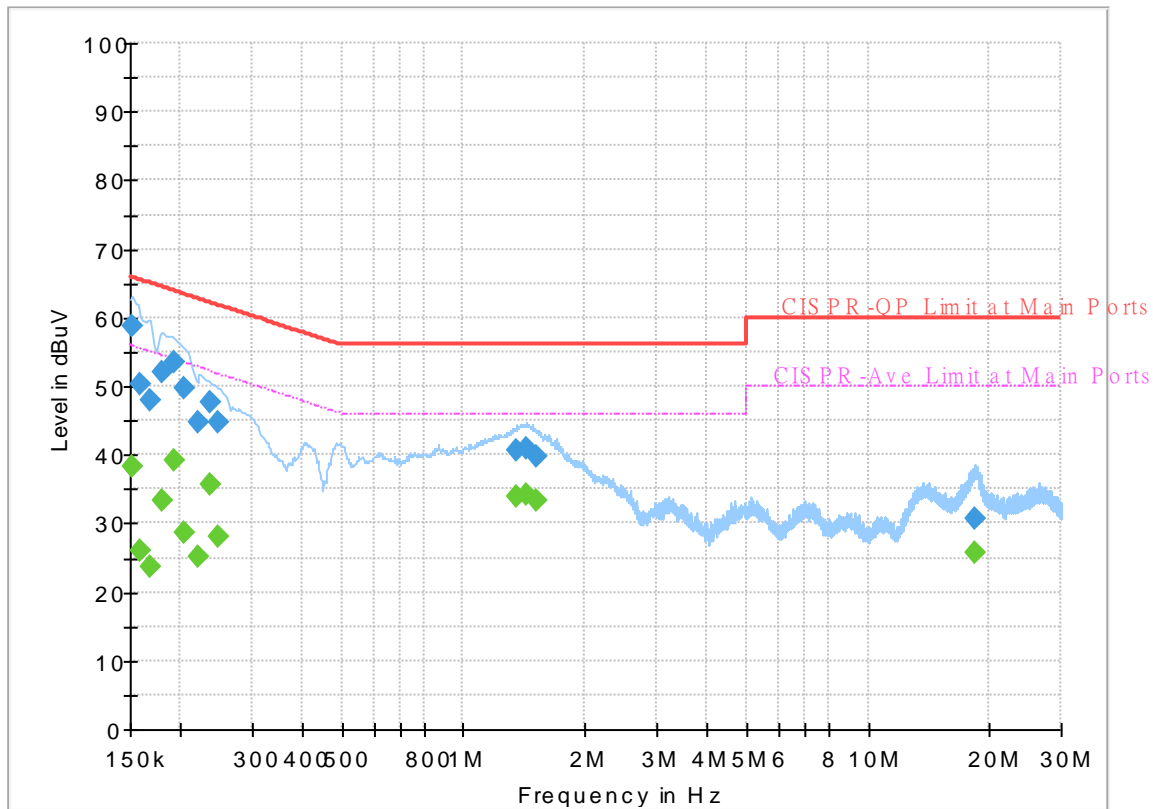
| Frequency (MHz) | QuasiPeak (dBuV) | CAverage (dBuV) | Limit (dBuV) | Margin (dB) | Line | Filter | Corr. (dB) |
|-----------------|------------------|-----------------|--------------|-------------|------|--------|------------|
| 0.152250 | --- | 38.00 | 55.88 | 17.88 | L1 | OFF | 19.6 |
| 0.152250 | 58.79 | --- | 65.88 | 7.09 | L1 | OFF | 19.6 |
| 0.161250 | --- | 25.03 | 55.40 | 30.37 | L1 | OFF | 19.6 |
| 0.161250 | 49.03 | --- | 65.40 | 16.37 | L1 | OFF | 19.6 |
| 0.172500 | --- | 24.30 | 54.84 | 30.54 | L1 | OFF | 19.6 |
| 0.172500 | 44.32 | --- | 64.84 | 20.52 | L1 | OFF | 19.6 |
| 0.183750 | --- | 41.61 | 54.31 | 12.70 | L1 | OFF | 19.6 |
| 0.183750 | 56.55 | --- | 64.31 | 7.76 | L1 | OFF | 19.6 |
| 0.197250 | --- | 35.35 | 53.73 | 18.38 | L1 | OFF | 19.6 |
| 0.197250 | 52.69 | --- | 63.73 | 11.04 | L1 | OFF | 19.6 |
| 0.210750 | --- | 21.18 | 53.18 | 32.00 | L1 | OFF | 19.6 |
| 0.210750 | 44.10 | --- | 63.18 | 19.08 | L1 | OFF | 19.6 |
| 0.224250 | --- | 28.59 | 52.66 | 24.07 | L1 | OFF | 19.6 |
| 0.224250 | 46.12 | --- | 62.66 | 16.54 | L1 | OFF | 19.6 |
| 0.240000 | --- | 34.70 | 52.10 | 17.40 | L1 | OFF | 19.6 |
| 0.240000 | 47.33 | --- | 62.10 | 14.77 | L1 | OFF | 19.6 |
| 0.255750 | --- | 23.56 | 51.57 | 28.01 | L1 | OFF | 19.6 |
| 0.255750 | 42.49 | --- | 61.57 | 19.08 | L1 | OFF | 19.6 |
| 0.438000 | --- | 28.42 | 47.10 | 18.68 | L1 | OFF | 19.6 |
| 0.438000 | 39.93 | --- | 57.10 | 17.17 | L1 | OFF | 19.6 |
| 1.236750 | --- | 33.13 | 46.00 | 12.87 | L1 | OFF | 19.6 |

| | | | | | | | |
|-----------|-------|-------|-------|-------|----|-----|------|
| 1.236750 | 40.20 | --- | 56.00 | 15.80 | L1 | OFF | 19.6 |
| 1.329000 | --- | 34.69 | 46.00 | 11.31 | L1 | OFF | 19.6 |
| 1.329000 | 41.57 | --- | 56.00 | 14.43 | L1 | OFF | 19.6 |
| 1.430250 | --- | 35.58 | 46.00 | 10.42 | L1 | OFF | 19.6 |
| 1.430250 | 42.24 | --- | 56.00 | 13.76 | L1 | OFF | 19.6 |
| 1.518000 | --- | 34.51 | 46.00 | 11.49 | L1 | OFF | 19.6 |
| 1.518000 | 41.19 | --- | 56.00 | 14.81 | L1 | OFF | 19.6 |
| 1.626000 | --- | 33.90 | 46.00 | 12.10 | L1 | OFF | 19.6 |
| 1.626000 | 40.10 | --- | 56.00 | 15.90 | L1 | OFF | 19.6 |
| 1.707000 | --- | 32.35 | 46.00 | 13.65 | L1 | OFF | 19.6 |
| 1.707000 | 38.65 | --- | 56.00 | 17.35 | L1 | OFF | 19.6 |
| 13.276500 | --- | 24.94 | 50.00 | 25.06 | L1 | OFF | 19.8 |
| 13.276500 | 29.76 | --- | 60.00 | 30.24 | L1 | OFF | 19.8 |

EUT Information

Report NO : 242614
 Test Mode : Mode 1
 Test Voltage : Power From System
 Phase : Neutral

Full Spectrum



Final_Result

| Frequency (MHz) | QuasiPeak (dBuV) | CAverage (dBuV) | Limit (dBuV) | Margin (dB) | Line | Filter | Corr. (dB) |
|-----------------|------------------|-----------------|--------------|-------------|------|--------|------------|
| 0.152250 | --- | 38.25 | 55.88 | 17.63 | N | OFF | 19.6 |
| 0.152250 | 58.67 | --- | 65.88 | 7.21 | N | OFF | 19.6 |
| 0.159000 | --- | 26.15 | 55.52 | 29.37 | N | OFF | 19.6 |
| 0.159000 | 50.21 | --- | 65.52 | 15.31 | N | OFF | 19.6 |
| 0.168000 | --- | 23.66 | 55.06 | 31.40 | N | OFF | 19.6 |
| 0.168000 | 48.05 | --- | 65.06 | 17.01 | N | OFF | 19.6 |
| 0.179250 | --- | 33.23 | 54.52 | 21.29 | N | OFF | 19.6 |
| 0.179250 | 52.09 | --- | 64.52 | 12.43 | N | OFF | 19.6 |
| 0.192750 | --- | 39.26 | 53.92 | 14.66 | N | OFF | 19.6 |
| 0.192750 | 53.58 | --- | 63.92 | 10.34 | N | OFF | 19.6 |
| 0.204000 | --- | 28.59 | 53.45 | 24.86 | N | OFF | 19.6 |
| 0.204000 | 49.57 | --- | 63.45 | 13.88 | N | OFF | 19.6 |
| 0.222000 | --- | 25.01 | 52.74 | 27.73 | N | OFF | 19.6 |
| 0.222000 | 44.64 | --- | 62.74 | 18.10 | N | OFF | 19.6 |
| 0.237750 | --- | 35.78 | 52.17 | 16.39 | N | OFF | 19.6 |
| 0.237750 | 47.56 | --- | 62.17 | 14.61 | N | OFF | 19.6 |
| 0.249000 | --- | 27.99 | 51.79 | 23.80 | N | OFF | 19.6 |
| 0.249000 | 44.83 | --- | 61.79 | 16.96 | N | OFF | 19.6 |
| 1.358250 | --- | 33.83 | 46.00 | 12.17 | N | OFF | 19.6 |
| 1.358250 | 40.52 | --- | 56.00 | 15.48 | N | OFF | 19.6 |
| 1.425750 | --- | 34.19 | 46.00 | 11.81 | N | OFF | 19.6 |

| | | | | | | | |
|-----------|-------|-------|-------|-------|---|-----|------|
| 1.425750 | 40.97 | --- | 56.00 | 15.03 | N | OFF | 19.6 |
| 1.520250 | --- | 33.19 | 46.00 | 12.81 | N | OFF | 19.6 |
| 1.520250 | 39.87 | --- | 56.00 | 16.13 | N | OFF | 19.6 |
| 18.478500 | --- | 25.76 | 50.00 | 24.24 | N | OFF | 19.9 |
| 18.478500 | 30.78 | --- | 60.00 | 29.22 | N | OFF | 19.9 |



Appendix C. Conducted Spurious Emission

| | | | |
|-----------------|----------|---------------------|---------------|
| Test Engineer : | Kal Liao | Temperature : | 21.2 ~ 24.7°C |
| | | Relative Humidity : | 54.4 ~ 66.8% |

<1Mbps>

2.4GHz 2400~2483.5MHz

BLE (Band Edge)

| BLE | Note | Frequency | Level | Over | Limit | Read | Antenna | Path | MIMO | Grounding | Peak |
|-------------------------|---|-----------|---------|--------|---------|--------|---------|--------|--------|-----------|-------|
| | | (MHz) | (dBm) | Limit | Line | Level | Gain | Loss | Factor | Factor | Avg. |
| | | | | (dB) | (dBm) | (dBm) | (dBi) | (dB) | (dB) | (dB) | (P/A) |
| BLE CH 00 2402MHz | | 2363.025 | -41.76 | -20.56 | -21.2 | -46.59 | 3.3 | 1.53 | 0 | 0 | P |
| | | 2388.33 | -55.12 | -13.92 | -41.2 | -59.92 | 3.3 | 1.5 | 0 | 0 | A |
| | * | 2402 | 11.13 | - | - | 6.33 | 3.3 | 1.5 | 0 | 0 | P |
| | * | 2402 | 9.53 | - | - | 4.73 | 3.3 | 1.5 | 0 | 0 | A |
| | | | | | | | | | | | |
| BLE CH 19 2440MHz | | 2316.86 | -42.09 | -20.89 | -21.2 | -46.9 | 3.3 | 1.51 | 0 | 0 | P |
| | | 2389.8 | -55.91 | -14.71 | -41.2 | -60.71 | 3.3 | 1.5 | 0 | 0 | A |
| | * | 2440 | 11.1 | - | - | 6.22 | 3.3 | 1.58 | 0 | 0 | P |
| | * | 2440 | 9.52 | - | - | 4.64 | 3.3 | 1.58 | 0 | 0 | A |
| | | 2489.92 | -41.03 | -19.83 | -21.2 | -45.95 | 3.3 | 1.62 | 0 | 0 | P |
| | | 2487.96 | -54.89 | -13.69 | -41.2 | -59.66 | 3.3 | 1.47 | 0 | 0 | A |
| | | | | | | | | | | | |
| BLE CH 39 2480MHz | * | 2480 | 11.14 | - | - | 6.37 | 3.3 | 1.47 | 0 | 0 | P |
| | * | 2480 | 9.64 | - | - | 4.87 | 3.3 | 1.47 | 0 | 0 | A |
| | | 2483.48 | -38.11 | -16.91 | -21.2 | -42.88 | 3.3 | 1.47 | 0 | 0 | P |
| | | 2483.48 | -48.53 | -7.33 | -41.2 | -53.3 | 3.3 | 1.47 | 0 | 0 | A |
| | | | | | | | | | | | |
| Remark | 1. No other spurious found. 2. All results are PASS against Peak and Average limit line. | | | | | | | | | | |



2.4GHz 2400~2483.5MHz
BLE (Harmonic)

Table with 12 columns: BLE, Note, Frequency (MHz), Level (dBm), Over Limit (dB), Limit Line (dBm), Read Level (dBm), Antenna Gain (dBi), Path Loss (dB), MIMO Factor (dB), Grounding Factor (dB), Peak Avg. (P/A). Rows include data for BLE CH 00 (2402MHz), BLE CH 19 (2440MHz), and BLE CH 39 (2480MHz), plus a Remark section.



Emission below 1GHz

BLE (LF)

| BLE | Note | Frequency | Level | Over | Limit | Read | Antenna | Path | MIMO | Grounding | Peak |
|---------------------|--|-----------|---------|--------|---------|---------|---------|--------|--------|-----------|---------|
| | | (MHz) | (dBm) | (dB) | Limit | Level | Factor | Loss | Factor | Factor | Avg. |
| | | (MHz) | (dBm) | (dB) | (dBm) | (dBm) | (dBi) | (dB) | (dB) | (dB) | (P/A) |
| 2.4GHz BLE LF | | 77.79 | -80.16 | -24.96 | -55.2 | -88.51 | 3.3 | 0.35 | 0 | 4.7 | P |
| | | 156.63 | -78.34 | -26.64 | -51.7 | -86.86 | 3.3 | 0.52 | 0 | 4.7 | P |
| | | 231.15 | -78.35 | -29.15 | -49.2 | -86.98 | 3.3 | 0.63 | 0 | 4.7 | P |
| | | 729.1 | -72.05 | -22.85 | -49.2 | -81.24 | 3.3 | 1.19 | 0 | 4.7 | P |
| | | 743.8 | -64.52 | -15.32 | -49.2 | -73.64 | 3.3 | 1.12 | 0 | 4.7 | P |
| | | 840.4 | -64.7 | -15.5 | -49.2 | -74.04 | 3.3 | 1.34 | 0 | 4.7 | P |
| | | | | | | | | | | | |
| Remark | 1. No other spurious found. 2. All results are PASS against limit line. | | | | | | | | | | |



<2Mbps>

2.4GHz 2400~2483.5MHz

BLE (Band Edge)

| BLE | Note | Frequency | Level | Over | Limit | Read | Antenna | Path | MIMO | Grounding | Peak |
|-------------------------|---|-----------|---------|--------------|--------------|-------------|--------------|-------------|---------------|---------------|------------|
| | | (MHz) | (dBm) | Limit (dB) | Line (dBm) | Level (dBm) | Gain (dBi) | Loss (dB) | Factor (dB) | Factor (dB) | Avg. (P/A) |
| BLE CH 00 2402MHz | | 2385.6 | -41.95 | -20.75 | -21.2 | -46.75 | 3.3 | 1.5 | 0 | 0 | P |
| | | 2388.435 | -55.28 | -14.08 | -41.2 | -60.08 | 3.3 | 1.5 | 0 | 0 | A |
| | * | 2402 | 10.93 | - | - | 6.13 | 3.3 | 1.5 | 0 | 0 | P |
| | * | 2402 | 7.79 | - | - | 2.99 | 3.3 | 1.5 | 0 | 0 | A |
| | | | | | | | | | | | |
| BLE CH 19 2440MHz | | 2382.8 | -42.04 | -20.84 | -21.2 | -46.83 | 3.3 | 1.49 | 0 | 0 | P |
| | | 2389.1 | -56.02 | -14.82 | -41.2 | -60.82 | 3.3 | 1.5 | 0 | 0 | A |
| | * | 2440 | 10.9 | - | - | 6.02 | 3.3 | 1.58 | 0 | 0 | P |
| | * | 2440 | 7.85 | - | - | 2.97 | 3.3 | 1.58 | 0 | 0 | A |
| | | 2488.1 | -41.21 | -20.01 | -21.2 | -45.98 | 3.3 | 1.47 | 0 | 0 | P |
| | | 2487.82 | -55.05 | -13.85 | -41.2 | -59.82 | 3.3 | 1.47 | 0 | 0 | A |
| | | | | | | | | | | | |
| BLE CH 39 2480MHz | * | 2480 | 10.92 | - | - | 6.15 | 3.3 | 1.47 | 0 | 0 | P |
| | * | 2480 | 7.94 | - | - | 3.17 | 3.3 | 1.47 | 0 | 0 | A |
| | | 2483.55 | -34.67 | -13.47 | -21.2 | -39.44 | 3.3 | 1.47 | 0 | 0 | P |
| | | 2483.48 | -45.81 | -4.61 | -41.2 | -50.58 | 3.3 | 1.47 | 0 | 0 | A |
| | | | | | | | | | | | |
| Remark | 1. No other spurious found. 2. All results are PASS against Peak and Average limit line. | | | | | | | | | | |



2.4GHz 2400~2483.5MHz

BLE (Harmonic)

| BLE | Note | Frequency (MHz) | Level (dBm) | Over Limit (dB) | Limit Line (dBm) | Read Level (dBm) | Antenna Gain (dBi) | Path Loss (dB) | MIMO Factor (dB) | Groun ding Factor (dB) | Peak Avg. (P/A) |
|-------------------------|---|----------------------|------------------|-------------------------|--------------------------|------------------------|----------------------------|------------------------|--------------------------|-----------------------------------|-----------------------|
| BLE CH 00 2402MHz | | 4804 | -55.09 | -33.89 | -21.2 | -61.36 | 3.3 | 2.97 | 0 | 0 | P |
| | | 7206 | -55.28 | -34.08 | -21.2 | -62.07 | 3.3 | 3.49 | 0 | 0 | P |
| | | 9608 | -57.93 | -36.73 | -21.2 | -65.16 | 3.3 | 3.93 | 0 | 0 | P |
| | | 12010 | -55.38 | -34.18 | -21.2 | -62.96 | 3.3 | 4.28 | 0 | 0 | P |
| | | 14412 | -52.96 | -31.76 | -21.2 | -62.58 | 3.3 | 6.32 | 0 | 0 | P |
| BLE CH 19 2440MHz | | 4880 | -46.62 | -25.42 | -21.2 | -52.64 | 3.3 | 2.72 | 0 | 0 | P |
| | | 7320 | -59.69 | -38.49 | -21.2 | -66.46 | 3.3 | 3.47 | 0 | 0 | P |
| | | 9760 | -58.86 | -37.66 | -21.2 | -66.14 | 3.3 | 3.98 | 0 | 0 | P |
| | | 12200 | -51.66 | -30.46 | -21.2 | -59.65 | 3.3 | 4.69 | 0 | 0 | P |
| | | 14640 | -49.12 | -27.92 | -21.2 | -57.99 | 3.3 | 5.57 | 0 | 0 | P |
| BLE CH 39 2480MHz | | 4960 | -52.13 | -30.93 | -21.2 | -58.08 | 3.3 | 2.65 | 0 | 0 | P |
| | | 7440 | -53.91 | -32.71 | -21.2 | -60.7 | 3.3 | 3.49 | 0 | 0 | P |
| | | 9920 | -56.78 | -35.58 | -21.2 | -64.15 | 3.3 | 4.07 | 0 | 0 | P |
| | | 12400 | -54.93 | -33.73 | -21.2 | -62.92 | 3.3 | 4.69 | 0 | 0 | P |
| | | 14880 | -51.02 | -29.82 | -21.2 | -60.64 | 3.3 | 6.32 | 0 | 0 | P |
| Remark | 1. No other spurious found. 2. All results are PASS against Peak and Average limit line. | | | | | | | | | | |



Note symbol

| | |
|-----|--|
| * | Fundamental Frequency which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency. |
| ! | Test result is over limit line. |
| P/A | Peak or Average |
| H/V | Horizontal or Vertical |



A calculation example for conducted spurious emission is shown as below:

| BLE | Note | Frequency | Level | Over | Limit | Read | Antenna | Path | MIMO | Grounding | Peak |
|--------------|------|-----------|---------|--------|---------|---------|---------|--------|--------|-----------|---------|
| | | | | Limit | Line | Level | Factor | Loss | Factor | Factor | Avg. |
| | | (MHz) | (dBm) | (dB) | (dBm) | (dBm) | (dBi) | (dB) | (dB) | (dB) | (P/A) |
| BLE CH 00 | | 2390 | -45.8 | -24.6 | -21.2 | -48.44 | 2 | 0.64 | 0 | 0 | P |
| 2402MHz | | 2390 | -59.91 | -18.71 | -41.2 | -62.58 | 2 | 0.67 | 0 | 0 | A |

1. Path Loss(dB) = Cable loss(dB) + Filter loss(dB) + Attenuator loss(dB)
2. Level(dBm) =
Antenna Factor(dBi) + Path Loss(dB) + Read Level(dBm)
3. Over Limit(dB) = Level(dBm) – Limit Line(dBm)

For Peak Limit @ 2390MHz:

1. Level(dBm)
= Antenna Factor(dBi) + Path Loss(dB) + Read Level(dBm)
= 2(dBi) + 0.64(dB) - 48.44(dBm)
= -45.8 (dBm)
2. Over Limit(dB)
= Level(dBm) – Limit Line(dBm)
= -45.8(dBm) +21.2(dBm)
= -24.6(dB)

For Average Limit @ 2390MHz:

1. Level(dBm)
= Antenna Factor(dBi) + Path Loss(dB) + Read Level(dBm)
= 2(dBi) + 0.67(dB) - 62.58(dBm)
= -59.91 (dBm)
2. Over Limit(dB)
= Level(dBm) – Limit Line(dBm)
= -59.91(dBm) + 41.2(dBm)
= -18.71(dB)

Both peak and average measured complies with the limit line, so test result is “PASS”.



Appendix D. Conducted Spurious Emission Plots

| | | | |
|-----------------|----------|---------------------|---------------|
| Test Engineer : | Kal Liao | Temperature : | 21.2 ~ 24.7°C |
| | | Relative Humidity : | 54.4 ~ 66.8% |

Note symbol

| | |
|----|-----------------------|
| -L | Low channel location |
| -R | High channel location |



<1Mbps>

2.4GHz 2400~2483.5MHz

BLE (Band Edge)

| BLE | 2.4GHz 2400~2483.5MHz Band Edge | |
|------|--|--|
| | BLE CH00 2402MHz | |
| | CSE | Fundamental |
| Peak | <p>Site : TH05-HY Condition : FCC CLASS-B_CON ANT_GAIN+3.3 HORIZONTAL : RBW 1000.000kHz VIEW 3000.000kHz</p> | <p>Site : TH05-HY Condition : FCC CLASS-B_CON ANT_GAIN+3.3 HORIZONTAL : RBW 1000.000kHz VIEW 3000.000kHz</p> |
| Avg. | <p>Site : TH05-HY Condition : FCC CLASS-B(AVG)_CON ANT_GAIN+3.3 HORIZONTAL : RBW 1000.000kHz VIEW 0.010kHz</p> | <p>Site : TH05-HY Condition : FCC CLASS-B(AVG)_CON ANT_GAIN+3.3 HORIZONTAL : RBW 1000.000kHz VIEW 0.010kHz</p> |



| BLE | 2.4GHz 2400~2483.5MHz Band Edge | |
|------|--|--|
| | BLE CH19 2440MHz - L | |
| | CSE | Fundamental |
| Peak | <p>Site Condition: TH05-HY FCC CLASS-B_CON ANT_GAIN+3 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz</p> | <p>Site Condition: TH05-HY FCC CLASS-B_CON ANT_GAIN+3 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz</p> |
| Avg. | <p>Site Condition: TH05-HY FCC CLASS-B(AVG)_CON ANT_GAIN+3.3 HORIZONTAL RBW:1000.000kHz VBW:0.010kHz</p> | <p>Site Condition: TH05-HY FCC CLASS-B(AVG)_CON ANT_GAIN+3.3 HORIZONTAL RBW:1000.000kHz VBW:0.010kHz</p> |



| BLE | 2.4GHz 2400~2483.5MHz Band Edge | |
|----------------------|---|-------------|
| BLE CH19 2440MHz - R | | |
| | CSE | Fundamental |
| Peak | <p>Site : TH05-HY Condition : FCC CLASS B_CON ANT_GAIN+3.3 HORIZONTAL : RBW: 1000.000kHz VIEW: 3000.000kHz</p> | Left blank |
| Avg. | <p>Site : TH05-HY Condition : FCC CLASS B(AVG)_CON ANT_GAIN+3.3 HORIZONTAL : RBW: 1000.000kHz VIEW: 0.0100kHz</p> | Left blank |

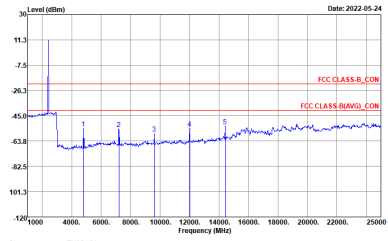
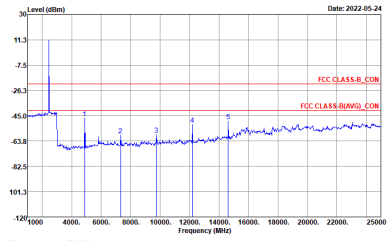


| BLE | 2.4GHz 2400~2483.5MHz Band Edge | |
|------------------|---|---|
| BLE CH39 2480MHz | | |
| | CSE | Fundamental |
| Peak | <p>Site : TH05-HY Condition : FCC CLASS-B_CON ANT_GAIN+3.3 HORIZONTAL REW: 1000.000kHz VIEW: 3000.000kHz</p> | <p>Site : TH05-HY Condition : FCC CLASS-B_CON ANT_GAIN+3.3 HORIZONTAL REW: 1000.000kHz VIEW: 3000.000kHz</p> |
| Avg. | <p>Site : TH05-HY Condition : FCC CLASS-B(AVG)_CON ANT_GAIN+3.3 HORIZONTAL REW: 1000.000kHz VIEW: 0.0100kHz</p> | <p>Site : TH05-HY Condition : FCC CLASS-B(AVG)_CON ANT_GAIN+3.3 HORIZONTAL REW: 1000.000kHz VIEW: 0.0100kHz</p> |

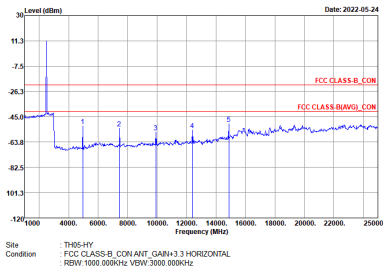


2.4GHz 2400~2483.5MHz

BLE (Harmonic)

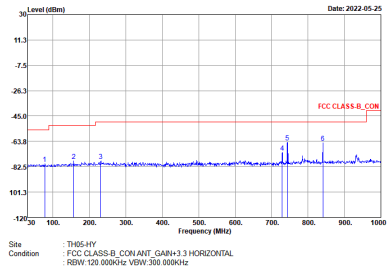
| BLE | 2.4GHz 2400~2483.5MHz Harmonic | |
|----------------------|---|--|
| BLE | | |
| CH00 2402MHz | | CH19 2440MHz |
| Peak Avg. |  <p>Site : TH05-HY Condition : FCC CLASS-B_CON ANT_GAIN+3.3 HORIZONTAL RESW: 1000.000kHz VIEW: 3000.000kHz</p> |  <p>Site : TH05-HY Condition : FCC CLASS-B_CON ANT_GAIN+3.3 HORIZONTAL RESW: 1000.000kHz VIEW: 3000.000kHz</p> |



| | | |
|----------------------|---|--|
| BLE | 2.4GHz 2400~2483.5MHz Harmonic | |
| | BLE | |
| | CH39 2480MHz | |
| Peak Avg. |  | |



Emission below 1GHz
2.4GHz BLE (LF)

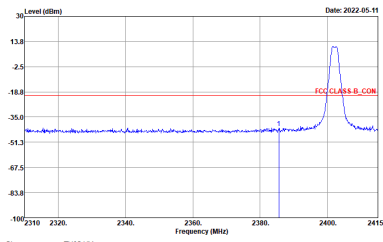
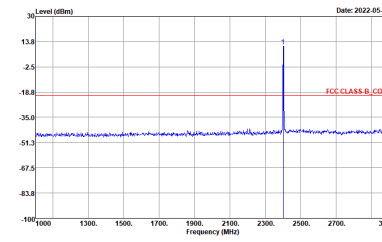
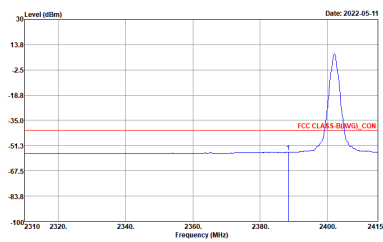
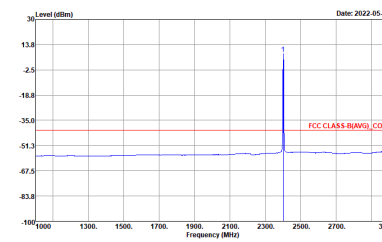
| BLE | 2.4GHz 2400~2483.5MHz | |
|-------------|--|-------------------|
| | BLE LF | |
| <p>Peak</p> |  <p>Site : TH05.HY Condition : FCC CLASS-B_COM ANT_GAIN+3.3 HORIZONTAL : RSNV 120.000GHz YSPAN 200.000GHz</p> | <p>Left blank</p> |



<2Mbps>

2.4GHz 2400~2483.5MHz

BLE (Band Edge)

| BLE | 2.4GHz 2400~2483.5MHz Band Edge | |
|------|---|--|
| | BLE CH00 2402MHz | |
| | CSE | Fundamental |
| Peak |  <p>Site Condition : TH05-HY : FCC CLASS-B_CON ANT_GAIN+3.3 HORIZONTAL : RBW: 1000.000kHz VIEW: 3000.000kHz</p> |  <p>Site Condition : TH05-HY : FCC CLASS-B_CON ANT_GAIN+3.3 HORIZONTAL : RBW: 1000.000kHz VIEW: 3000.000kHz</p> |
| Avg. |  <p>Site Condition : TH05-HY : FCC CLASS-B(AVG)_CON ANT_GAIN+3.3 HORIZONTAL : RBW: 1000.000kHz VIEW: 0.0100kHz</p> |  <p>Site Condition : TH05-HY : FCC CLASS-B(AVG)_CON ANT_GAIN+3.3 HORIZONTAL : RBW: 1000.000kHz VIEW: 0.0100kHz</p> |



| BLE | 2.4GHz 2400~2483.5MHz Band Edge | |
|----------------------|---|---|
| BLE CH19 2440MHz - L | | |
| | CSE | Fundamental |
| Peak | <p>Site Condition: TH05-HY FCC CLASS_B_CON ANT_GAIN+3.3 HORIZONTAL RBW:1000.000kHz; VSW:3000.000kHz</p> | <p>Site Condition: TH05-HY FCC CLASS_B_CON ANT_GAIN+3.3 HORIZONTAL RBW:1000.000kHz; VSW:3000.000kHz</p> |
| Avg. | <p>Site Condition: TH05-HY FCC CLASS_B(AVG)_CON ANT_GAIN+3.3 HORIZONTAL RBW:1000.000kHz; VSW:0.010kHz</p> | <p>Site Condition: TH05-HY FCC CLASS_B(AVG)_CON ANT_GAIN+3.3 HORIZONTAL RBW:1000.000kHz; VSW:0.010kHz</p> |



| BLE | 2.4GHz 2400~2483.5MHz Band Edge | |
|----------------------|---|-------------------|
| BLE CH19 2440MHz - R | | |
| | CSE | Fundamental |
| <p>Peak</p> | <p>Site : TH05-HY Condition : FCC CLASS-B_CON ANT_GAIN+3.3 HORIZONTAL : RBW:1000.000kHz VIEW:3000.000kHz</p> | <p>Left blank</p> |
| <p>Avg.</p> | <p>Site : TH05-HY Condition : FCC CLASS-B(AVG)_CON ANT_GAIN+3.3 HORIZONTAL : RBW:1000.000kHz VIEW:0.0100kHz</p> | <p>Left blank</p> |



| BLE | 2.4GHz 2400~2483.5MHz Band Edge | |
|------------------|---|---|
| BLE CH39 2480MHz | | |
| | CSE | Fundamental |
| Peak | <p>Date: 2022-05-12</p> <p>Site Condition : TH05-HY : FCC CLASS-B_CON ANT_GAIN+3.3 HORIZONTAL : RBW: 1000.000kHz VIEW: 3000.000kHz</p> | <p>Date: 2022-05-11</p> <p>Site Condition : TH05-HY : FCC CLASS-B_CON ANT_GAIN+3.3 HORIZONTAL : RBW: 1000.000kHz VIEW: 3000.000kHz</p> |
| Avg. | <p>Date: 2022-05-12</p> <p>Site Condition : TH05-HY : FCC CLASS-B(AVG)_CON ANT_GAIN+3.3 HORIZONTAL : RBW: 1000.000kHz VIEW: 0.0100kHz</p> | <p>Date: 2022-05-12</p> <p>Site Condition : TH05-HY : FCC CLASS-B(AVG)_CON ANT_GAIN+3.3 HORIZONTAL : RBW: 1000.000kHz VIEW: 0.0100kHz</p> |

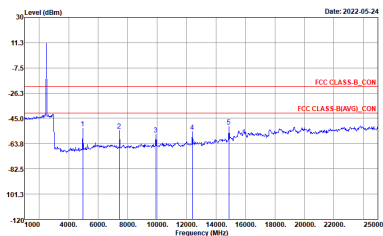


2.4GHz 2400~2483.5MHz

BLE (Harmonic)

| BLE | 2.4GHz 2400~2483.5MHz Harmonic | |
|---------------------------------------|---|---|
| BLE | | |
| CH00 2402MHz | | CH19 2440MHz |
| <p>Peak</p> <p>Avg.</p> | <p>Site : TH05-HY Condition : FCC CLASS-B_CON ANT_GAIN+3.3 HORIZONTAL RESW: 1000.000Hz VIEW: 3000.000Hz</p> | <p>Site : TH05-HY Condition : FCC CLASS-B_CON ANT_GAIN+3.3 HORIZONTAL RESW: 1000.000Hz VIEW: 3000.000Hz</p> |



| BLE | 2.4GHz 2400~2483.5MHz Harmonic | |
|------------------------------------|---|--|
| | BLE | |
| | CH39 2480MHz | |
| <p>Peak Avg.</p> |  <p>Date: 2022-05-24</p> <p>Site : TH05-HY Condition : FCC CLASS B_CON/ANT_GAIN+3.3 HORIZONTAL : RESV: 1000.0000Hz VIEW: 3000.0000Hz</p> | |



Appendix E. Cabinet Radiated Spurious Emission

| | | | |
|-----------------|-----------------------------------|---------------------|-----------|
| Test Engineer : | Jesse Wang, Stan Hsieh and Ken Wu | Temperature : | 23~26.2°C |
| | | Relative Humidity : | 55.3~61% |



<1Mbps>

2.4GHz 2400~2483.5MHz

BLE (Band Edge @ 3m)

| BLE | Note | Frequency | Level | Margin | Limit Line | Read Level | Antenna Factor | Path Loss | Preamp Factor | Ant Pos | Table Pos | Peak Avg. | Pol. | |
|-------------------------|------|-----------|------------|--------|------------|------------|----------------|-----------|---------------|---------|-----------|-----------|---------|---|
| | | (MHz) | (dBμV/m) | (dB) | (dBμV/m) | (dBμV) | (dB/m) | (dB) | (dB) | (cm) | (deg) | (P/A) | (H/V) | |
| BLE CH 00 2402MHz | | 2365.335 | 55.18 | -18.82 | 74 | 40.81 | 31.4 | 18.38 | 35.41 | 391 | 0 | P | H | |
| | | 2384.97 | 42.94 | -11.06 | 54 | 28.52 | 31.4 | 18.43 | 35.41 | 391 | 0 | A | H | |
| | * | 2402 | 86.5 | - | - | 72.02 | 31.42 | 18.48 | 35.42 | 391 | 0 | P | H | |
| | * | 2402 | 85.85 | - | - | 71.37 | 31.42 | 18.48 | 35.42 | 391 | 0 | A | H | |
| | | | | | | | | | | | | | H | |
| | | | | | | | | | | | | | H | |
| | | | 2313.57 | 53.68 | -20.32 | 74 | 39.3 | 31.55 | 18.22 | 35.39 | 393 | 246 | P | V |
| | | | 2382.345 | 42.93 | -11.07 | 54 | 28.51 | 31.4 | 18.43 | 35.41 | 393 | 246 | A | V |
| | * | | 2402 | 84.91 | - | - | 70.43 | 31.42 | 18.48 | 35.42 | 393 | 246 | P | V |
| | * | | 2402 | 84.26 | - | - | 69.78 | 31.42 | 18.48 | 35.42 | 393 | 246 | A | V |
| | | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | | V |
| BLE CH 19 2440MHz | | 2376.08 | 53.74 | -20.26 | 74 | 39.35 | 31.4 | 18.4 | 35.41 | 380 | 5 | P | H | |
| | | 2389.52 | 42.97 | -11.03 | 54 | 28.53 | 31.4 | 18.45 | 35.41 | 380 | 5 | A | H | |
| | * | 2440 | 85.25 | - | - | 70.42 | 31.72 | 18.54 | 35.43 | 380 | 5 | P | H | |
| | * | 2440 | 84.66 | - | - | 69.83 | 31.72 | 18.54 | 35.43 | 380 | 5 | A | H | |
| | | | 2489.01 | 54.85 | -19.15 | 74 | 39.58 | 32.11 | 18.61 | 35.45 | 380 | 5 | P | H |
| | | | 2499.86 | 43.93 | -10.07 | 54 | 28.56 | 32.2 | 18.63 | 35.46 | 380 | 5 | A | H |
| | | | 2341.36 | 53.37 | -20.63 | 74 | 39.04 | 31.43 | 18.3 | 35.4 | 386 | 137 | P | V |
| | | | 2382.52 | 42.92 | -11.08 | 54 | 28.5 | 31.4 | 18.43 | 35.41 | 386 | 137 | A | V |
| | * | | 2440 | 83.17 | - | - | 68.34 | 31.72 | 18.54 | 35.43 | 386 | 137 | P | V |
| | * | | 2440 | 82.51 | - | - | 67.68 | 31.72 | 18.54 | 35.43 | 386 | 137 | A | V |
| | | | 2489.92 | 53.78 | -20.22 | 74 | 38.5 | 32.12 | 18.61 | 35.45 | 386 | 137 | P | V |
| | | | 2499.86 | 43.86 | -10.14 | 54 | 28.49 | 32.2 | 18.63 | 35.46 | 386 | 137 | A | V |



| | | | | | | | | | | | | | |
|----------------------------------|---|---------|-------|--------|----|-------|-------|-------|-------|-----|-----|---|---|
| BLE CH 39 2480MHz | * | 2480 | 83.1 | - | - | 67.91 | 32.04 | 18.6 | 35.45 | 361 | 2 | P | H |
| | * | 2480 | 82.47 | - | - | 67.28 | 32.04 | 18.6 | 35.45 | 361 | 2 | A | H |
| | | 2488.28 | 54.83 | -19.17 | 74 | 39.57 | 32.11 | 18.6 | 35.45 | 361 | 2 | P | H |
| | | 2497.96 | 43.85 | -10.15 | 54 | 28.5 | 32.18 | 18.63 | 35.46 | 361 | 2 | A | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | * | 2480 | 79.23 | - | - | 64.04 | 32.04 | 18.6 | 35.45 | 369 | 114 | P | V |
| | * | 2480 | 78.4 | - | - | 63.21 | 32.04 | 18.6 | 35.45 | 369 | 114 | A | V |
| | | 2489.16 | 55.18 | -18.82 | 74 | 39.91 | 32.11 | 18.61 | 35.45 | 369 | 114 | P | V |
| | | 2500 | 43.84 | -10.16 | 54 | 28.48 | 32.2 | 18.62 | 35.46 | 369 | 114 | A | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| Remark | 1. No other spurious found. 2. All results are PASS against Peak and Average limit line. | | | | | | | | | | | | |



2.4GHz 2400~2483.5MHz
BLE (Harmonic @ 3m)

| BLE | Note | Frequency (MHz) | Level (dBμV/m) | Margin (dB) | Limit Line (dBμV/m) | Read Level (dBμV) | Antenna Factor (dB/m) | Path Loss (dB) | Preamp Factor (dB) | Ant Pos (cm) | Table Pos (deg) | Peak Avg. (P/A) | Pol. (H/V) | |
|-------------------------|------|----------------------|---------------------|------------------|-----------------------------|---------------------------|-------------------------------|------------------------|----------------------------|----------------------|-------------------------|-------------------------|-----------------|---|
| BLE CH 00 2402MHz | | 4804 | 40.78 | -33.22 | 74 | 53.07 | 34.01 | 12.7 | 59 | - | - | P | H | |
| | | 14499 | 46.99 | -27.01 | 74 | 43.25 | 39.6 | 21.66 | 57.52 | - | - | P | H | |
| | | 15870 | 48.52 | -25.48 | 74 | 41.36 | 40.84 | 22.52 | 56.2 | - | - | P | H | |
| | | 15870 | 38.92 | -15.08 | 54 | 31.76 | 40.84 | 22.52 | 56.2 | - | - | A | H | |
| | | 17850 | 50.57 | -23.43 | 74 | 40.57 | 41.5 | 23.62 | 55.12 | - | - | P | H | |
| | | 17850 | 41.06 | -12.94 | 54 | 31.06 | 41.5 | 23.62 | 55.12 | - | - | A | H | |
| | | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | | H |
| | | | 4804 | 43.35 | -30.65 | 74 | 55.64 | 34.01 | 12.7 | 59 | - | - | P | V |
| | | | 14499 | 47.41 | -26.59 | 74 | 43.67 | 39.6 | 21.66 | 57.52 | - | - | P | V |
| | | | 15975 | 49.02 | -24.98 | 74 | 41.49 | 40.97 | 22.59 | 56.03 | - | - | P | V |
| | | | 15975 | 39.4 | -14.6 | 54 | 31.87 | 40.97 | 22.59 | 56.03 | - | - | A | V |
| | | | 17925 | 50.78 | -23.22 | 74 | 40.76 | 41.43 | 23.67 | 55.08 | - | - | P | V |
| | | | 17925 | 40.9 | -13.1 | 54 | 30.88 | 41.43 | 23.67 | 55.08 | - | - | A | V |
| | | | | | | | | | | | | | V | |
| | | | | | | | | | | | | | V | |
| | | | | | | | | | | | | | V | |
| | | | | | | | | | | | | | V | |
| | | | | | | | | | | | | | V | |
| | | | | | | | | | | | | | V | |



| BLE | Note | Frequency (MHz) | Level (dBµV/m) | Margin (dB) | Limit Line (dBµV/m) | Read Level (dBµV) | Antenna Factor (dB/m) | Path Loss (dB) | Preamp Factor (dB) | Ant Pos (cm) | Table Pos (deg) | Peak Avg. (P/A) | Pol. (H/V) | |
|----------------------------------|------|----------------------|---------------------|------------------|-----------------------------|---------------------------|-------------------------------|------------------------|----------------------------|----------------------|-------------------------|-------------------------|-----------------|---|
| BLE CH 19 2440MHz | | 4880 | 41.69 | -32.31 | 74 | 53.76 | 34.04 | 12.75 | 58.86 | - | - | P | H | |
| | | 7320 | 44.53 | -29.47 | 74 | 51.32 | 35.68 | 15.03 | 57.5 | - | - | P | H | |
| | | 14499 | 47.18 | -26.82 | 74 | 43.44 | 39.6 | 21.66 | 57.52 | - | - | P | H | |
| | | 16125 | 48.64 | -25.36 | 74 | 40.84 | 41.2 | 22.67 | 56.07 | - | - | P | H | |
| | | 16125 | 38.64 | -15.36 | 54 | 30.84 | 41.2 | 22.67 | 56.07 | - | - | A | H | |
| | | 17850 | 51.47 | -22.53 | 74 | 41.47 | 41.5 | 23.62 | 55.12 | - | - | P | H | |
| | | 17850 | 40.78 | -13.22 | 54 | 30.78 | 41.5 | 23.62 | 55.12 | - | - | A | H | |
| | | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | | H |
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| | | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | | H |
| | | | 4880 | 43.99 | -30.01 | 74 | 56.06 | 34.04 | 12.75 | 58.86 | - | - | P | V |
| | | | 7320 | 45.83 | -28.17 | 74 | 52.62 | 35.68 | 15.03 | 57.5 | - | - | P | V |
| | | | 14499 | 47.25 | -26.75 | 74 | 43.51 | 39.6 | 21.66 | 57.52 | - | - | P | V |
| | | | 15705 | 48.61 | -25.39 | 74 | 42.25 | 40.42 | 22.41 | 56.47 | - | - | P | V |
| | | | 15705 | 38.21 | -15.79 | 54 | 31.85 | 40.42 | 22.41 | 56.47 | - | - | A | V |
| | | | 17925 | 51.05 | -22.95 | 74 | 41.03 | 41.43 | 23.67 | 55.08 | - | - | P | V |
| | | | 17925 | 40.87 | -13.13 | 54 | 30.85 | 41.43 | 23.67 | 55.08 | - | - | A | V |
| | | | | | | | | | | | | | V | |
| | | | | | | | | | | | | | V | |
| | | | | | | | | | | | | | V | |
| | | | | | | | | | | | | | V | |
| | | | | | | | | | | | | | V | |



| BLE | Note | Frequency (MHz) | Level (dBµV/m) | Margin (dB) | Limit Line (dBµV/m) | Read Level (dBµV) | Antenna Factor (dB/m) | Path Loss (dB) | Preamp Factor (dB) | Ant Pos (cm) | Table Pos (deg) | Peak Avg. (P/A) | Pol. (H/V) | |
|-------------------------|--|----------------------|---------------------|------------------|-----------------------------|---------------------------|-------------------------------|------------------------|----------------------------|----------------------|-------------------------|-------------------------|-----------------|---|
| BLE CH 39 2480MHz | | 4960 | 41.11 | -32.89 | 74 | 52.9 | 34.1 | 12.82 | 58.71 | - | - | P | H | |
| | | 7440 | 43.22 | -30.78 | 74 | 49.96 | 35.82 | 15.03 | 57.59 | - | - | P | H | |
| | | 14499 | 46.81 | -27.19 | 74 | 43.07 | 39.6 | 21.66 | 57.52 | - | - | P | H | |
| | | 16005 | 48.19 | -25.81 | 74 | 40.57 | 41.01 | 22.6 | 55.99 | - | - | P | H | |
| | | 16005 | 39.18 | -14.82 | 54 | 31.56 | 41.01 | 22.6 | 55.99 | - | - | A | H | |
| | | 17700 | 51.88 | -22.12 | 74 | 42.02 | 41.5 | 23.55 | 55.19 | - | - | P | H | |
| | | 17700 | 40.69 | -13.31 | 54 | 30.83 | 41.5 | 23.55 | 55.19 | - | - | A | H | |
| | | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | | H |
| | | | 4960 | 43.92 | -30.08 | 74 | 55.71 | 34.1 | 12.82 | 58.71 | - | - | P | V |
| | | | 7440 | 44.92 | -29.08 | 74 | 51.66 | 35.82 | 15.03 | 57.59 | - | - | P | V |
| | | | 14499 | 47.38 | -26.62 | 74 | 43.64 | 39.6 | 21.66 | 57.52 | - | - | P | V |
| | | | 15690 | 49.5 | -24.5 | 74 | 43.21 | 40.38 | 22.41 | 56.5 | - | - | P | V |
| | | | 15690 | 38.28 | -15.72 | 54 | 31.99 | 40.38 | 22.41 | 56.5 | - | - | A | V |
| | | | 17730 | 50.89 | -23.11 | 74 | 40.97 | 41.53 | 23.56 | 55.17 | - | - | P | V |
| | | | 17730 | 40.75 | -13.25 | 54 | 30.83 | 41.53 | 23.56 | 55.17 | - | - | A | V |
| | | | | | | | | | | | | | V | |
| | | | | | | | | | | | | | V | |
| | | | | | | | | | | | | | V | |
| | | | | | | | | | | | | | V | |
| | | | | | | | | | | | | | V | |
| Remark | <ol style="list-style-type: none"> No other spurious found. All results are PASS against Peak and Average limit line. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only. The emission level close to 18GHz is checked that the average emission level is noise floor only. | | | | | | | | | | | | | |



Emission above 18GHz

2.4GHz BLE (SHF)

| BT | Note | Frequency | Level | Margin | Limit | Read | Antenna | Path | Preamp | Ant | Table | Peak | Pol. |
|----------------------|---|-----------|------------|--------|------------|----------|----------|--------|--------|--------|---------|---------|---------|
| | | (MHz) | (dBμV/m) | (dB) | (dBμV/m) | (dBμV) | (dB/m) | (dB) | (dB) | (cm) | (deg) | (P/A) | (H/V) |
| 2.4GHz BLE SHF | | 23635 | 38.49 | -35.51 | 74 | 49.43 | 38.81 | 8.64 | 58.39 | - | - | P | H |
| | | | | | | | | | | | | | H |
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| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | | 23754 | 38.86 | -35.14 | 74 | 49.59 | 38.88 | 8.69 | 58.3 | - | - | P |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
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| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| Remark | 1. No other spurious found. 2. All results are PASS against limit line. 3. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only. | | | | | | | | | | | | |



<2Mbps>

2.4GHz 2400~2483.5MHz

BLE (Band Edge @ 3m)

| BLE | Note | Frequency | Level | Margin | Limit Line | Read Level | Antenna Factor | Path Loss | Preamp Factor | Ant Pos | Table Pos | Peak Avg. | Pol. | |
|-------------------------|------|-----------|------------|--------|------------|------------|----------------|-----------|---------------|---------|-----------|-----------|---------|---|
| | | (MHz) | (dBμV/m) | (dB) | (dBμV/m) | (dBμV) | (dB/m) | (dB) | (dB) | (cm) | (deg) | (P/A) | (H/V) | |
| BLE CH 00 2402MHz | | 2364.39 | 53.68 | -20.32 | 74 | 39.31 | 31.4 | 18.38 | 35.41 | 394 | 0 | P | H | |
| | | 2384.34 | 42.93 | -11.07 | 54 | 28.51 | 31.4 | 18.43 | 35.41 | 394 | 0 | A | H | |
| | * | 2402 | 86.54 | - | - | 72.06 | 31.42 | 18.48 | 35.42 | 394 | 0 | P | H | |
| | * | 2402 | 85.05 | - | - | 70.57 | 31.42 | 18.48 | 35.42 | 394 | 0 | A | H | |
| | | | | | | | | | | | | | H | |
| | | | | | | | | | | | | | H | |
| | | | 2377.2 | 53.71 | -20.29 | 74 | 39.31 | 31.4 | 18.41 | 35.41 | 393 | 236 | P | V |
| | | | 2384.865 | 42.93 | -11.07 | 54 | 28.51 | 31.4 | 18.43 | 35.41 | 393 | 236 | A | V |
| | * | | 2402 | 84.83 | - | - | 70.35 | 31.42 | 18.48 | 35.42 | 393 | 236 | P | V |
| | * | | 2402 | 83.21 | - | - | 68.73 | 31.42 | 18.48 | 35.42 | 393 | 236 | A | V |
| | | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | | V |
| BLE CH 19 2440MHz | | 2321.06 | 54.65 | -19.35 | 74 | 40.29 | 31.52 | 18.23 | 35.39 | 379 | 3 | P | H | |
| | | 2385.74 | 42.93 | -11.07 | 54 | 28.5 | 31.4 | 18.44 | 35.41 | 379 | 3 | A | H | |
| | * | 2440 | 85.24 | - | - | 70.41 | 31.72 | 18.54 | 35.43 | 379 | 3 | P | H | |
| | * | 2440 | 83.78 | - | - | 68.95 | 31.72 | 18.54 | 35.43 | 379 | 3 | A | H | |
| | | | 2491.32 | 54.32 | -19.68 | 74 | 39.03 | 32.13 | 18.61 | 35.45 | 379 | 3 | P | H |
| | | | 2498.88 | 43.85 | -10.15 | 54 | 28.49 | 32.19 | 18.63 | 35.46 | 379 | 3 | A | H |
| | | | 2361.8 | 54.45 | -19.55 | 74 | 40.09 | 31.4 | 18.36 | 35.4 | 331 | 259 | P | V |
| | | | 2385.74 | 42.94 | -11.06 | 54 | 28.51 | 31.4 | 18.44 | 35.41 | 331 | 259 | A | V |
| | * | | 2440 | 81.22 | - | - | 66.39 | 31.72 | 18.54 | 35.43 | 331 | 259 | P | V |
| | * | | 2440 | 79.62 | - | - | 64.79 | 31.72 | 18.54 | 35.43 | 331 | 259 | A | V |
| | | | 2491.39 | 53.98 | -20.02 | 74 | 38.69 | 32.13 | 18.61 | 35.45 | 331 | 259 | P | V |
| | | | 2499.09 | 43.88 | -10.12 | 54 | 28.52 | 32.19 | 18.63 | 35.46 | 331 | 259 | A | V |



| | | | | | | | | | | | | | |
|----------------------------------|---|---------|-------|--------|----|-------|-------|-------|-------|-----|-----|---|---|
| BLE CH 39 2480MHz | * | 2480 | 83.22 | - | - | 68.03 | 32.04 | 18.6 | 35.45 | 361 | 0 | P | H |
| | * | 2480 | 81.63 | - | - | 66.44 | 32.04 | 18.6 | 35.45 | 361 | 0 | A | H |
| | | 2492.2 | 54.74 | -19.26 | 74 | 39.45 | 32.14 | 18.61 | 35.46 | 361 | 0 | P | H |
| | | 2499.36 | 43.88 | -10.12 | 54 | 28.52 | 32.19 | 18.63 | 35.46 | 361 | 0 | A | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | * | 2480 | 79.48 | - | - | 64.29 | 32.04 | 18.6 | 35.45 | 362 | 259 | P | V |
| | * | 2480 | 77.75 | - | - | 62.56 | 32.04 | 18.6 | 35.45 | 362 | 259 | A | V |
| | | 2487.24 | 54.75 | -19.25 | 74 | 39.5 | 32.1 | 18.6 | 35.45 | 362 | 259 | P | V |
| | | 2500 | 43.86 | -10.14 | 54 | 28.5 | 32.2 | 18.62 | 35.46 | 362 | 259 | A | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| Remark | 1. No other spurious found. 2. All results are PASS against Peak and Average limit line. | | | | | | | | | | | | |



2.4GHz 2400~2483.5MHz
BLE (Harmonic @ 3m)

| BLE | Note | Frequency (MHz) | Level (dBμV/m) | Margin (dB) | Limit Line (dBμV/m) | Read Level (dBμV) | Antenna Factor (dB/m) | Path Loss (dB) | Preamp Factor (dB) | Ant Pos (cm) | Table Pos (deg) | Peak Avg. (P/A) | Pol. (H/V) | |
|-------------------------|------|----------------------|---------------------|------------------|-----------------------------|---------------------------|-------------------------------|------------------------|----------------------------|----------------------|-------------------------|-------------------------|-----------------|---|
| BLE CH 00 2402MHz | | 4804 | 40.99 | -33.01 | 74 | 53.28 | 34.01 | 12.7 | 59 | - | - | P | H | |
| | | 14499 | 47.28 | -26.72 | 74 | 43.54 | 39.6 | 21.66 | 57.52 | - | - | P | H | |
| | | 16020 | 48.78 | -25.22 | 74 | 41.12 | 41.04 | 22.62 | 56 | - | - | P | H | |
| | | 16020 | 39.13 | -14.87 | 54 | 31.47 | 41.04 | 22.62 | 56 | - | - | A | H | |
| | | 17880 | 50.17 | -23.83 | 74 | 40.19 | 41.44 | 23.65 | 55.11 | - | - | P | H | |
| | | 17880 | 40.69 | -13.31 | 54 | 30.71 | 41.44 | 23.65 | 55.11 | - | - | A | H | |
| | | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | | H |
| | | | 4804 | 42.91 | -31.09 | 74 | 55.2 | 34.01 | 12.7 | 59 | - | - | P | V |
| | | | 14499 | 47.47 | -26.53 | 74 | 43.73 | 39.6 | 21.66 | 57.52 | - | - | P | V |
| | | | 15840 | 48.46 | -25.54 | 74 | 41.43 | 40.78 | 22.5 | 56.25 | - | - | P | V |
| | | | 15840 | 38.61 | -15.39 | 54 | 31.58 | 40.78 | 22.5 | 56.25 | - | - | A | V |
| | | | 17730 | 51.13 | -22.87 | 74 | 41.21 | 41.53 | 23.56 | 55.17 | - | - | P | V |
| | | | 17730 | 40.55 | -13.45 | 54 | 30.63 | 41.53 | 23.56 | 55.17 | - | - | A | V |
| | | | | | | | | | | | | | V | |
| | | | | | | | | | | | | | V | |
| | | | | | | | | | | | | | V | |
| | | | | | | | | | | | | | V | |
| | | | | | | | | | | | | | V | |
| | | | | | | | | | | | | | V | |



| BLE | Note | Frequency (MHz) | Level (dBµV/m) | Margin (dB) | Limit Line (dBµV/m) | Read Level (dBµV) | Antenna Factor (dB/m) | Path Loss (dB) | Preamp Factor (dB) | Ant Pos (cm) | Table Pos (deg) | Peak Avg. (P/A) | Pol. (H/V) | |
|-------------------------|------|----------------------|---------------------|------------------|-----------------------------|---------------------------|-------------------------------|------------------------|----------------------------|----------------------|-------------------------|-------------------------|-----------------|---|
| BLE CH 19 2440MHz | | 4880 | 41.39 | -32.61 | 74 | 53.46 | 34.04 | 12.75 | 58.86 | - | - | P | H | |
| | | 7320 | 44.49 | -29.51 | 74 | 51.28 | 35.68 | 15.03 | 57.5 | - | - | P | H | |
| | | 14499 | 47.74 | -26.26 | 74 | 44 | 39.6 | 21.66 | 57.52 | - | - | P | H | |
| | | 15870 | 48.63 | -25.37 | 74 | 41.47 | 40.84 | 22.52 | 56.2 | - | - | P | H | |
| | | 15870 | 38.41 | -15.59 | 54 | 31.25 | 40.84 | 22.52 | 56.2 | - | - | A | H | |
| | | 17760 | 50.69 | -23.31 | 74 | 40.72 | 41.56 | 23.57 | 55.16 | - | - | P | H | |
| | | 17760 | 40.64 | -13.36 | 54 | 30.67 | 41.56 | 23.57 | 55.16 | - | - | A | H | |
| | | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | | H |
| | | | 4880 | 44.26 | -29.74 | 74 | 56.33 | 34.04 | 12.75 | 58.86 | - | - | P | V |
| | | | 7320 | 46.37 | -27.63 | 74 | 53.16 | 35.68 | 15.03 | 57.5 | - | - | P | V |
| | | | 14499 | 46.64 | -27.36 | 74 | 42.9 | 39.6 | 21.66 | 57.52 | - | - | P | V |
| | | | 16125 | 48.38 | -25.62 | 74 | 40.58 | 41.2 | 22.67 | 56.07 | - | - | P | V |
| | | | 16125 | 31.34 | -22.66 | 54 | 23.54 | 41.2 | 22.67 | 56.07 | - | - | A | V |
| | | | 17760 | 50.69 | -23.31 | 74 | 40.72 | 41.56 | 23.57 | 55.16 | - | - | P | V |
| | | | 17760 | 40.55 | -13.45 | 54 | 30.58 | 41.56 | 23.57 | 55.16 | - | - | A | V |
| | | | | | | | | | | | | | V | |
| | | | | | | | | | | | | | V | |
| | | | | | | | | | | | | | V | |
| | | | | | | | | | | | | | V | |
| | | | | | | | | | | | | | V | |



| BLE | Note | Frequency (MHz) | Level (dBµV/m) | Margin (dB) | Limit Line (dBµV/m) | Read Level (dBµV) | Antenna Factor (dB/m) | Path Loss (dB) | Preamp Factor (dB) | Ant Pos (cm) | Table Pos (deg) | Peak Avg. (P/A) | Pol. (H/V) | |
|-------------------------|--|----------------------|---------------------|------------------|-----------------------------|---------------------------|-------------------------------|------------------------|----------------------------|----------------------|-------------------------|-------------------------|-----------------|---|
| BLE CH 39 2480MHz | | 4960 | 40.8 | -33.2 | 74 | 52.59 | 34.1 | 12.82 | 58.71 | - | - | P | H | |
| | | 7440 | 42.37 | -31.63 | 74 | 49.11 | 35.82 | 15.03 | 57.59 | - | - | P | H | |
| | | 14499 | 47.28 | -26.72 | 74 | 43.54 | 39.6 | 21.66 | 57.52 | - | - | P | H | |
| | | 16170 | 48.66 | -25.34 | 74 | 40.87 | 41.2 | 22.69 | 56.1 | - | - | P | H | |
| | | 16170 | 38.42 | -15.58 | 54 | 30.63 | 41.2 | 22.69 | 56.1 | - | - | A | H | |
| | | 17760 | 50.98 | -23.02 | 74 | 41.01 | 41.56 | 23.57 | 55.16 | - | - | P | H | |
| | | 17760 | 40.39 | -13.61 | 54 | 30.42 | 41.56 | 23.57 | 55.16 | - | - | A | H | |
| | | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | | H |
| | | | 4960 | 44.31 | -29.69 | 74 | 56.1 | 34.1 | 12.82 | 58.71 | - | - | P | V |
| | | | 7440 | 45.7 | -28.3 | 74 | 52.44 | 35.82 | 15.03 | 57.59 | - | - | P | V |
| | | | 14499 | 46.86 | -27.14 | 74 | 43.12 | 39.6 | 21.66 | 57.52 | - | - | P | V |
| | | | 15825 | 48.75 | -25.25 | 74 | 41.79 | 40.75 | 22.49 | 56.28 | - | - | P | V |
| | | | 15825 | 37.78 | -16.22 | 54 | 30.82 | 40.75 | 22.49 | 56.28 | - | - | A | V |
| | | | 17715 | 50.75 | -23.25 | 74 | 40.87 | 41.51 | 23.55 | 55.18 | - | - | P | V |
| | | | 17715 | 40.34 | -13.66 | 54 | 30.46 | 41.51 | 23.55 | 55.18 | - | - | A | V |
| | | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V | |
| | | | | | | | | | | | | | V | |
| | | | | | | | | | | | | | V | |
| | | | | | | | | | | | | | V | |
| Remark | <ol style="list-style-type: none"> No other spurious found. All results are PASS against Peak and Average limit line. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only. The emission level close to 18GHz is checked that the average emission level is noise floor only. | | | | | | | | | | | | | |



Note symbol

| | |
|-----|--|
| * | Fundamental Frequency which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency. |
| ! | Test result is over limit line. |
| P/A | Peak or Average |
| H/V | Horizontal or Vertical |



A calculation example for radiated spurious emission is shown as below:

| BLE | Note | Frequency | Level | Over | Limit | Read | Antenna | Path | Preamp | Ant | Table | Peak | Pol. |
|-------------------------|------|-----------|------------|--------|------------|----------|----------|--------|--------|--------|---------|---------|---------|
| | | (MHz) | (dBμV/m) | (dB) | (dBμV/m) | (dBμV) | (dB/m) | (dB) | (dB) | (cm) | (deg) | (P/A) | (H/V) |
| BLE CH 00 2402MHz | | 2390 | 55.45 | -18.55 | 74 | 54.51 | 32.22 | 4.58 | 35.86 | 103 | 308 | P | H |
| | | 2390 | 43.54 | -10.46 | 54 | 42.6 | 32.22 | 4.58 | 35.86 | 103 | 308 | A | H |

1. Path Loss(dB) = Cable loss(dB) + Filter loss(dB) + Attenuator loss(dB)
2. Level(dBμV/m) =
Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
3. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)
= Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
= 32.22(dB/m) + 4.58(dB) + 54.51(dBμV) – 35.86 (dB)
= 55.45 (dBμV/m)
2. Over Limit(dB)
= Level(dBμV/m) – Limit Line(dBμV/m)
= 55.45(dBμV/m) – 74(dBμV/m)
= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)
= Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
= 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)
= 43.54 (dBμV/m)
2. Over Limit(dB)
= Level(dBμV/m) – Limit Line(dBμV/m)
= 43.54(dBμV/m) – 54(dBμV/m)
= -10.46(dB)

Both peak and average measured complies with the limit line, so test result is “PASS”.



Appendix F. Cabinet Radiated Spurious Emission Plots

| | | | |
|-----------------|-----------------------------------|---------------------|-----------|
| Test Engineer : | Jesse Wang, Stan Hsieh and Ken Wu | Temperature : | 23~26.2°C |
| | | Relative Humidity : | 55.3~61% |

Note symbol

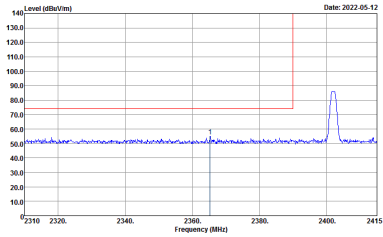
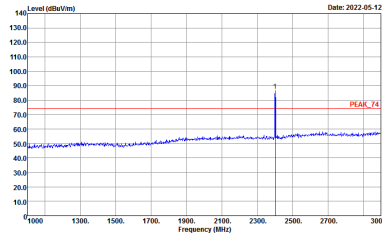
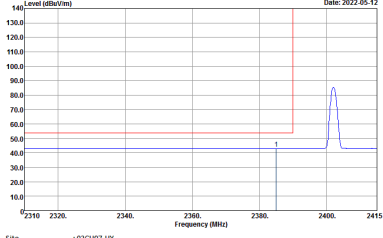
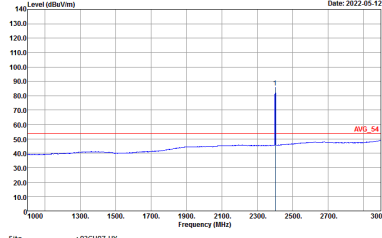
| | |
|----|-----------------------|
| -L | Low channel location |
| -R | High channel location |



<1Mbps>

2.4GHz 2400~2483.5MHz

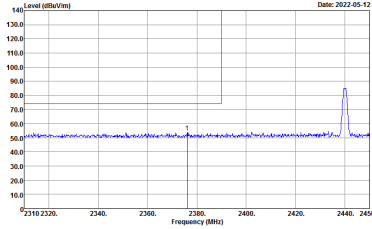
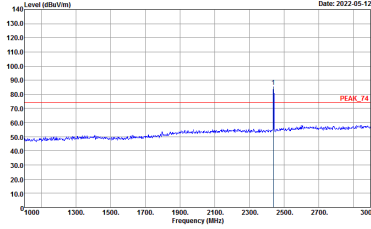
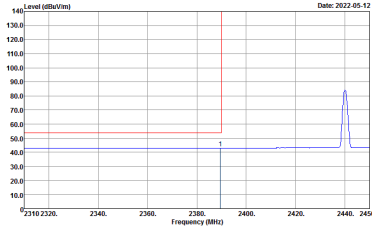
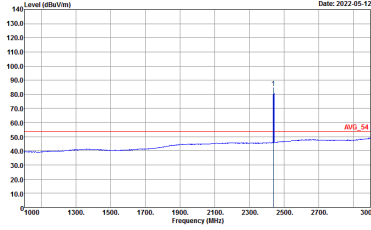
BLE (Band Edge @ 3m)

| BLE | 2.4GHz 2400~2483.5MHz Band Edge @ 3m | |
|------------------|---|---|
| BLE CH00 2402MHz | | |
| Horizontal | | Fundamental |
| Peak |  <p>Site : 03CH07-HY Condition : PEAK_BE_74 3m HF_ANT_00075962 HORIZONTAL : RBW:3000.000kHz VBW:3000.000kHz SWT:Auto</p> |  <p>Site : 03CH07-HY Condition : PEAK_74 3m HF_ANT_00075962 HORIZONTAL : RBW:3000.000kHz VBW:3000.000kHz SWT:Auto</p> |
| Avg. |  <p>Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto</p> |  <p>Site : 03CH07-HY Condition : AVG_54 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto</p> |



| BLE | 2.4GHz 2400~2483.5MHz Band Edge @ 3m | |
|------------------|---|--|
| BLE CH00 2402MHz | | |
| | Vertical | Fundamental |
| Peak | <p>Site : 03CH07-HY Condition : PEAK_BE_74 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p> | <p>Site : 03CH07-HY Condition : PEAK_74 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p> |
| Avg | <p>Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto</p> | <p>Site : 03CH07-HY Condition : AVG_54 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto</p> |

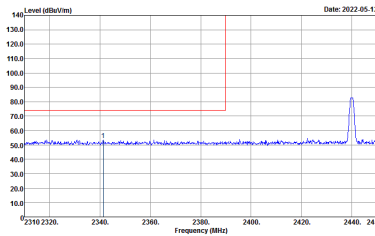
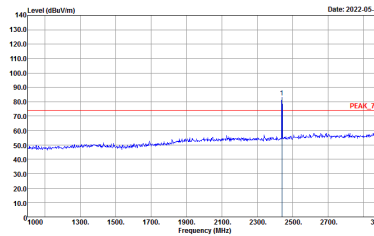
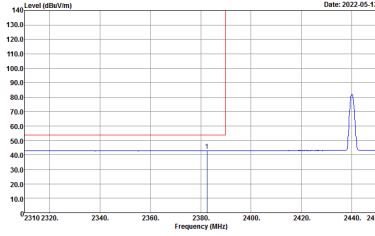
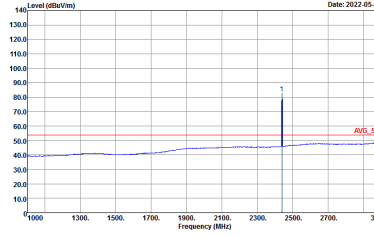


| BLE | 2.4GHz 2400~2483.5MHz Band Edge @ 3m | |
|----------------------|---|--|
| BLE CH19 2440MHz - L | | |
| | Horizontal | Fundamental |
| Peak |  <p>Level (dBm/1m) vs Frequency (MHz) plot for Horizontal Peak. The y-axis ranges from 10.0 to 140.0 dBm/1m, and the x-axis ranges from 2310 to 2450 MHz. A sharp peak is visible at approximately 2440 MHz, reaching a level of about 85 dBm/1m. A red horizontal line is drawn at approximately 75 dBm/1m. The plot includes a red box highlighting the peak area.</p> <p>Date: 2022-05-12</p> <p>Site : 03CH07-HY Condition : PEAK_BE_24 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p> |  <p>Level (dBm/1m) vs Frequency (MHz) plot for Fundamental Peak. The y-axis ranges from 10.0 to 140.0 dBm/1m, and the x-axis ranges from 1600 to 3000 MHz. A sharp peak is visible at approximately 2440 MHz, reaching a level of about 85 dBm/1m. A red horizontal line is drawn at approximately 75 dBm/1m. The plot includes a red box highlighting the peak area.</p> <p>Date: 2022-05-12</p> <p>Site : 03CH07-HY Condition : PEAK_24 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p> |
| Avg. |  <p>Level (dBm/1m) vs Frequency (MHz) plot for Horizontal Avg. The y-axis ranges from 10.0 to 140.0 dBm/1m, and the x-axis ranges from 2310 to 2450 MHz. A broad peak is visible at approximately 2440 MHz, reaching a level of about 85 dBm/1m. A red horizontal line is drawn at approximately 75 dBm/1m. The plot includes a red box highlighting the peak area.</p> <p>Date: 2022-05-12</p> <p>Site : 03CH07-HY Condition : AVG_BE_24 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p> |  <p>Level (dBm/1m) vs Frequency (MHz) plot for Fundamental Avg. The y-axis ranges from 10.0 to 140.0 dBm/1m, and the x-axis ranges from 1600 to 3000 MHz. A broad peak is visible at approximately 2440 MHz, reaching a level of about 85 dBm/1m. A red horizontal line is drawn at approximately 75 dBm/1m. The plot includes a red box highlighting the peak area.</p> <p>Date: 2022-05-12</p> <p>Site : 03CH07-HY Condition : AVG_24 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p> |



| BLE | 2.4GHz 2400~2483.5MHz Band Edge @ 3m | |
|------|---|-------------|
| | BLE CH19 2440MHz - R | |
| | Horizontal | Fundamental |
| Peak | <p>Site : 03CH07-HY Condition : PEAK_BE_74 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p> | Left blank |
| Avg. | <p>Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto</p> | Left blank |



| BLE | 2.4GHz 2400~2483.5MHz Band Edge @ 3m | |
|----------------------|--|--|
| BLE CH19 2440MHz - L | | |
| | Vertical | Fundamental |
| Peak |  <p>Level (dBm/1m) vs Frequency (MHz) plot showing a peak at 2440 MHz. The y-axis ranges from 10.0 to 140.0 dBm/1m, and the x-axis ranges from 2310 to 2450 MHz. A red line indicates the peak level at approximately 80 dBm/1m.</p> <p>Site : 03CH07-HY Condition : PEAK_BE_24 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p> |  <p>Level (dBm/1m) vs Frequency (MHz) plot showing a peak at 2440 MHz. The y-axis ranges from 10.0 to 140.0 dBm/1m, and the x-axis ranges from 1000 to 3000 MHz. A red line indicates the peak level at approximately 80 dBm/1m.</p> <p>Site : 03CH07-HY Condition : PEAK_24 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p> |
| Avg. |  <p>Level (dBm/1m) vs Frequency (MHz) plot showing the average spectrum. The y-axis ranges from 10.0 to 140.0 dBm/1m, and the x-axis ranges from 2310 to 2450 MHz. A red line indicates the average level at approximately 50 dBm/1m.</p> <p>Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto</p> |  <p>Level (dBm/1m) vs Frequency (MHz) plot showing the average spectrum. The y-axis ranges from 10.0 to 140.0 dBm/1m, and the x-axis ranges from 1000 to 3000 MHz. A red line indicates the average level at approximately 50 dBm/1m.</p> <p>Site : 03CH07-HY Condition : AVG_54 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto</p> |



| BLE | 2.4GHz 2400~2483.5MHz Band Edge @ 3m | |
|------|---|-------------|
| | BLE CH19 2440MHz - R | |
| | Vertical | Fundamental |
| Peak | <p>Site : 03CH07-HY Condition : PEAK_BE_74 3m HF_ANT_00073962 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p> | Left blank |
| Avg. | <p>Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00073962 VERTICAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto</p> | Left blank |



| BLE | 2.4GHz 2400~2483.5MHz Band Edge @ 3m | |
|------------------|---|--|
| BLE CH39 2480MHz | | |
| Horizontal | | Fundamental |
| Peak | <p>Date: 2022-05-12</p> <p>Site : 03CH07-HY Condition : PEAK_BE_74 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p> | <p>Date: 2022-05-12</p> <p>Site : 03CH07-HY Condition : PEAK_74 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p> |
| Avg. | <p>Date: 2022-05-12</p> <p>Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p> | <p>Date: 2022-05-12</p> <p>Site : 03CH07-HY Condition : AVG_54 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p> |

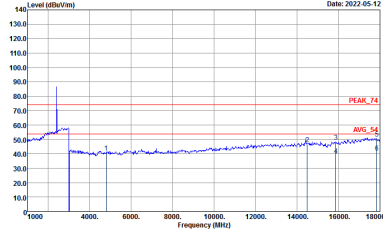
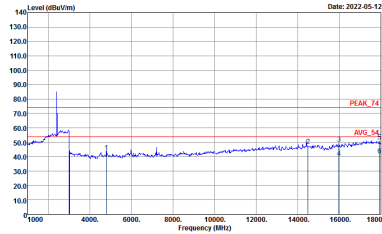


| BLE | 2.4GHz 2400~2483.5MHz Band Edge @ 3m | |
|------------------|--|---|
| BLE CH39 2480MHz | | |
| | Vertical | Fundamental |
| Peak | <p>Date: 2022-05-12</p> <p>Site Condition : 03CH07-HY : PEAK_BE_74 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWTA:Auto</p> | <p>Date: 2022-05-12</p> <p>Site Condition : 03CH07-HY : PEAK_74 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWTA:Auto</p> |
| Avg. | <p>Date: 2022-05-12</p> <p>Site Condition : 03CH07-HY : AVG_BE_54 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:0.010kHz SWTA:Auto</p> | <p>Date: 2022-05-12</p> <p>Site Condition : 03CH07-HY : AVG_54 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:0.010kHz SWTA:Auto</p> |

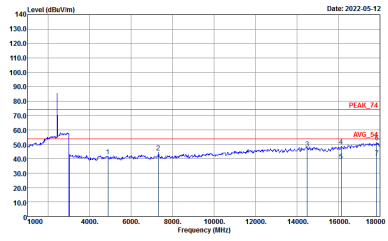
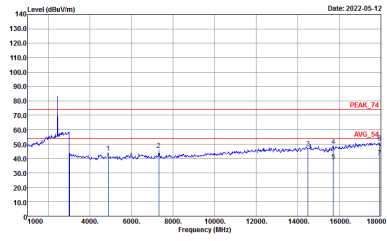


2.4GHz 2400~2483.5MHz

BLE (Harmonic @ 3m)

| BLE | 2.4GHz 2400~2483.5MHz Harmonic @ 3m | |
|------------------|---|--|
| BLE CH00 2402MHz | | |
| | Horizontal | Vertical |
| Peak Avg. |  <p>Site : 03CH07-HY Condition : PEAK_74 3m HF_ANT_00075962 HORIZONTAL</p> |  <p>Site : 03CH07-HY Condition : PEAK_74 3m HF_ANT_00075962 VERTICAL</p> |



| BLE | 2.4GHz 2400~2483.5MHz Harmonic @ 3m | |
|------------------|---|--|
| BLE CH19 2440MHz | | |
| | Horizontal | Vertical |
| Peak Avg. |  <p>Site : 03CH02-HY Condition : PEAK_74 3m HF_ANT_00075962 HORIZONTAL</p> |  <p>Site : 03CH02-HY Condition : PEAK_74 3m HF_ANT_00075962 VERTICAL</p> |



| BLE | 2.4GHz 2400~2483.5MHz Harmonic @ 3m | |
|--------------|---|---|
| | BLE CH39 2480MHz | |
| | Horizontal | Vertical |
| Peak Avg. | <p>Site : 03CH02-HY Condition : PEAK_74 3m HF_ANT_00075962 HORIZONTAL</p> | <p>Site : 03CH02-HY Condition : PEAK_74 3m HF_ANT_00075962 VERTICAL</p> |



Emission above 18GHz
2.4GHz BLE (SHF @ 1m)

| BLE | 2.4GHz 2400~2483.5MHz | |
|----------------------------|---|---|
| | BLE SHF | |
| | Horizontal | Vertical |
| Peak Avg. | <p>Site : 03C107-RY Condition : PEAK_74 1m SHF-EHF_5170251 HORIZONTAL</p> | <p>Site : 03C107-RY Condition : PEAK_74 1m SHF-EHF_5170251 VERTICAL</p> |



Emission below 1GHz
2.4GHz BLE (LF)

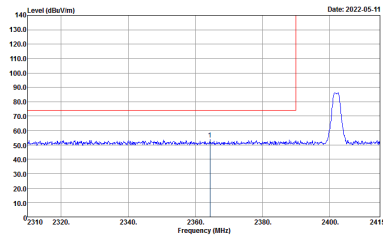
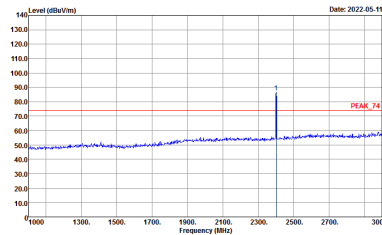
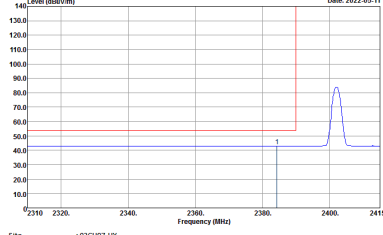
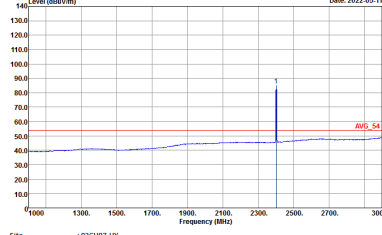
| BLE | 2.4GHz 2400~2483.5MHz | |
|--------------|---|---|
| | BLE LF | |
| | Horizontal | Vertical |
| QP / Peak | <p>Site : 03C1607-HY Condition : QP 3m LF-ANT-35413(6) HORIZONTAL</p> | <p>Site : 03C1607-HY Condition : QP 3m LF-ANT-35413(6) VERTICAL</p> |



<2Mbps>

2.4GHz 2400~2483.5MHz

BLE (Band Edge @ 3m)

| BLE | 2.4GHz 2400~2483.5MHz Band Edge @ 3m | |
|------|---|---|
| | BLE CH00 2402MHz | |
| | Horizontal | Fundamental |
| Peak |  <p>Site Condition : 03CH07-HY : PEAK_BE_74 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p> |  <p>Site Condition : 03CH07-HY : PEAK_F0 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p> |
| Avg. |  <p>Site Condition : 03CH07-HY : AVG_BE_54 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:5.000kHz SWT:Auto</p> |  <p>Site Condition : 03CH07-HY : AVG_F0 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:5.000kHz SWT:Auto</p> |

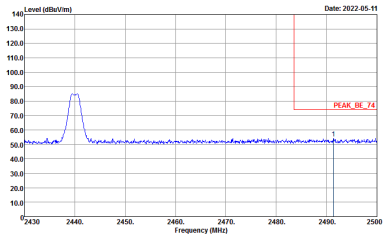
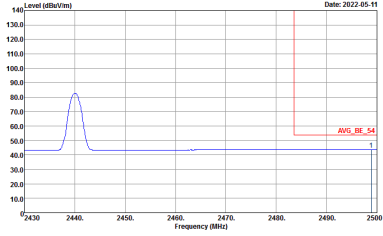


| BLE | 2.4GHz 2400~2483.5MHz Band Edge @ 3m | |
|------------------|---|--|
| BLE CH00 2402MHz | | |
| | Vertical | Fundamental |
| Peak | <p>Date: 2022-05-11</p> <p>Site : 03CH07-HY Condition : PEAK_BE_74 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p> | <p>Date: 2022-05-11</p> <p>Site : 03CH07-HY Condition : PEAK_74 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p> |
| Avg | <p>Date: 2022-05-11</p> <p>Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto</p> | <p>Date: 2022-05-11</p> <p>Site : 03CH07-HY Condition : AVG_54 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto</p> |

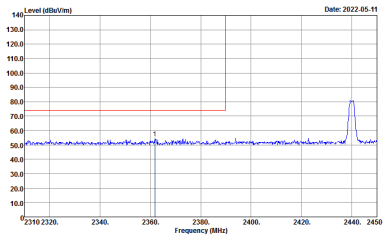
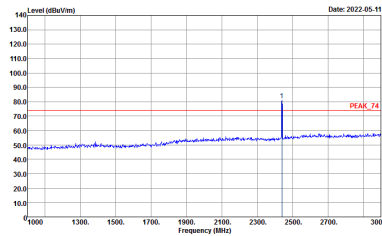
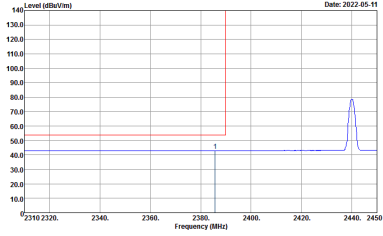
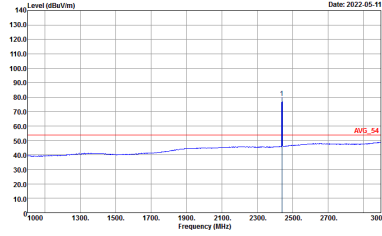


| BLE | 2.4GHz 2400~2483.5MHz Band Edge @ 3m | |
|----------------------|---|--|
| BLE CH19 2440MHz - L | | |
| | Horizontal | Fundamental |
| Peak | <p>Date: 2022-05-11</p> <p>Site : 03CH07-HY Condition : PEAK_BE_24 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p> | <p>Date: 2022-05-11</p> <p>Site : 03CH07-HY Condition : PEAK_24 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p> |
| Avg. | <p>Date: 2022-05-11</p> <p>Site : 03CH07-HY Condition : AVG_BE_24 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto</p> | <p>Date: 2022-05-11</p> <p>Site : 03CH07-HY Condition : AVG_24 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto</p> |

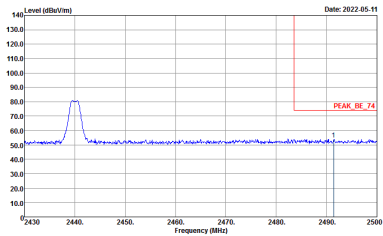
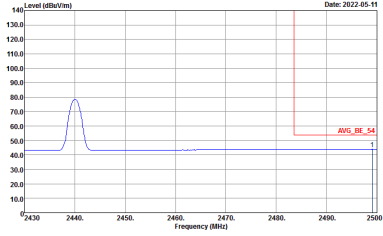


| BLE | 2.4GHz 2400~2483.5MHz Band Edge @ 3m | |
|----------------------|---|-------------------|
| BLE CH19 2440MHz - R | | |
| | Horizontal | Fundamental |
| <p>Peak</p> |  <p>Site : 03CH07-HY Condition : PEAK_BE_74 3m HF_ANT_00073962 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p> | <p>Left blank</p> |
| <p>Avg.</p> |  <p>Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00073962 HORIZONTAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto</p> | <p>Left blank</p> |

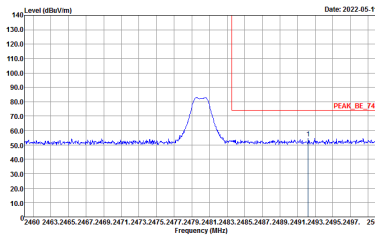
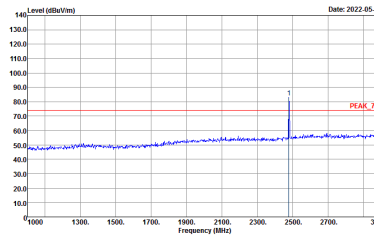
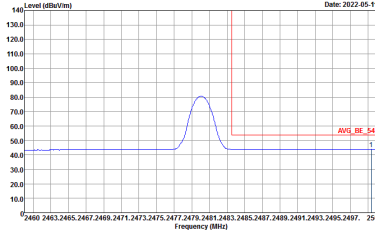
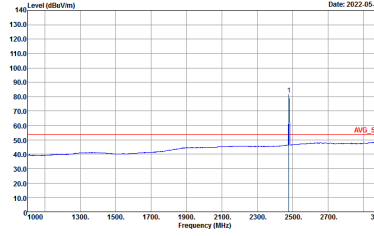


| BLE | 2.4GHz 2400~2483.5MHz Band Edge @ 3m | |
|----------------------|---|---|
| BLE CH19 2440MHz - L | | |
| | Vertical | Fundamental |
| Peak |  <p>Site : 03CH07-HY Condition : PEAK_BE_24 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p> |  <p>Site : 03CH07-HY Condition : PEAK_24 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p> |
| Avg. |  <p>Site : 03CH07-HY Condition : AVG_BE_24 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto</p> |  <p>Site : 03CH07-HY Condition : AVG_24 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto</p> |

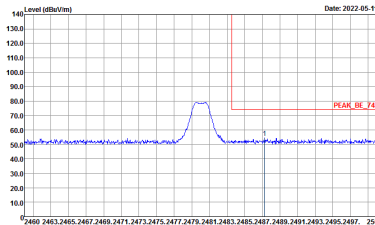
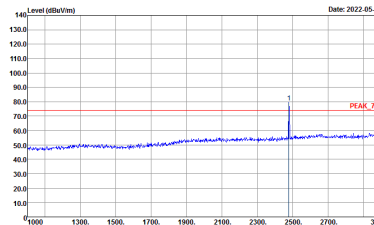
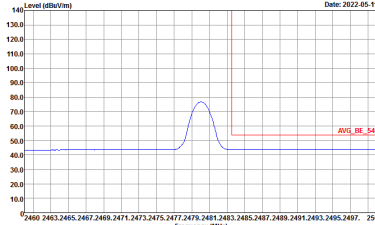
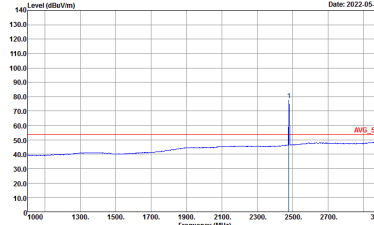


| BLE | 2.4GHz 2400~2483.5MHz Band Edge @ 3m | |
|----------------------|---|-------------|
| BLE CH19 2440MHz - R | | |
| | Vertical | Fundamental |
| Peak |  <p>Site : 03CH07-HY Condition : PEAK_BE_74 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p> | Left blank |
| Avg. |  <p>Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto</p> | Left blank |



| BLE | 2.4GHz 2400~2483.5MHz Band Edge @ 3m | |
|------------------|--|--|
| BLE CH39 2480MHz | | |
| | Horizontal | Fundamental |
| Peak |  <p>Level (dBm/1m) vs Frequency (MHz) plot showing a peak at 2480 MHz. The peak level is approximately 80 dBm/1m. The plot includes a red line indicating the peak level and a blue line for the spectrum. The x-axis ranges from 2460 to 2500 MHz, and the y-axis ranges from 10.0 to 140.0 dBm/1m.</p> <p>Site : 03CH07-HY Condition : PEAK_BE_74 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWTA:Auto</p> |  <p>Level (dBm/1m) vs Frequency (MHz) plot showing a peak at 2480 MHz. The peak level is approximately 80 dBm/1m. The plot includes a red line indicating the peak level and a blue line for the spectrum. The x-axis ranges from 1000 to 3000 MHz, and the y-axis ranges from 10.0 to 140.0 dBm/1m.</p> <p>Site : 03CH07-HY Condition : PEAK_74 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWTA:Auto</p> |
| Avg. |  <p>Level (dBm/1m) vs Frequency (MHz) plot showing the average spectrum. The average level is approximately 50 dBm/1m. The plot includes a red line indicating the average level and a blue line for the spectrum. The x-axis ranges from 2460 to 2500 MHz, and the y-axis ranges from 10.0 to 140.0 dBm/1m.</p> <p>Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:0.010kHz SWTA:Auto</p> |  <p>Level (dBm/1m) vs Frequency (MHz) plot showing the average spectrum. The average level is approximately 50 dBm/1m. The plot includes a red line indicating the average level and a blue line for the spectrum. The x-axis ranges from 1000 to 3000 MHz, and the y-axis ranges from 10.0 to 140.0 dBm/1m.</p> <p>Site : 03CH07-HY Condition : AVG_54 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:0.010kHz SWTA:Auto</p> |



| BLE | 2.4GHz 2400~2483.5MHz Band Edge @ 3m | |
|------------------|---|---|
| BLE CH39 2480MHz | | |
| | Vertical | Fundamental |
| Peak |  <p>Date: 2022-05-11</p> <p>Site : 03CH07-HY Condition : PEAK_BE_74 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p> |  <p>Date: 2022-05-11</p> <p>Site : 03CH07-HY Condition : PEAK_74 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p> |
| Avg. |  <p>Date: 2022-05-11</p> <p>Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto</p> |  <p>Date: 2022-05-11</p> <p>Site : 03CH07-HY Condition : AVG_54 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto</p> |

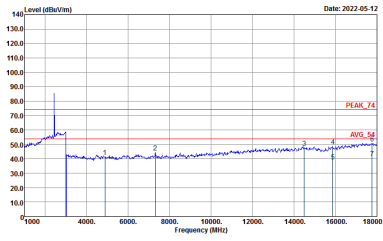
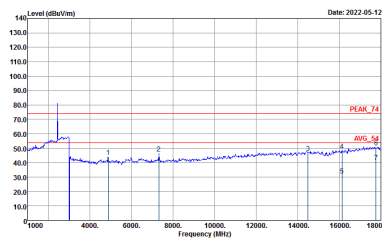


2.4GHz 2400~2483.5MHz

BLE (Harmonic @ 3m)

| BLE | 2.4GHz 2400~2483.5MHz Harmonic @ 3m | |
|--------------|---|---|
| | BLE CH00 2402MHz | |
| | Horizontal | Vertical |
| Peak Avg. | <p>Site : 03CH07-HY Condition : PEAK_74 3m HF_ANT_00075962 HORIZONTAL</p> | <p>Site : 03CH07-HY Condition : PEAK_74 3m HF_ANT_00075962 VERTICAL</p> |



| BLE | 2.4GHz 2400~2483.5MHz Harmonic @ 3m | |
|------------------|---|--|
| BLE CH19 2440MHz | | |
| | Horizontal | Vertical |
| Peak Avg. |  <p>Site : 03CH02-HY Condition : PEAK_74 3m HF_ANT_00075962 HORIZONTAL</p> |  <p>Site : 03CH02-HY Condition : PEAK_74 3m HF_ANT_00075962 VERTICAL</p> |



| BLE | 2.4GHz 2400~2483.5MHz Harmonic @ 3m | |
|--------------|---|---|
| | BLE CH39 2480MHz | |
| | Horizontal | Vertical |
| Peak Avg. | <p>Site : 03CH07-HY Condition : PEAK_74 3m HF_ANT_00075962 HORIZONTAL</p> | <p>Site : 03CH07-HY Condition : PEAK_74 3m HF_ANT_00075962 VERTICAL</p> |



Appendix G. Duty Cycle Plots

| Band | Duty Cycle(%) | T(us) | 1/T(kHz) | VBW Setting |
|-------------------------|---------------|-------|----------|-------------|
| Bluetooth –LE for 1Mbps | 100.00 | - | - | 10kHz |
| Bluetooth –LE for 2Mbps | 100.00 | - | - | 10kHz |

