

# TEST REPORT

Report No..... : KS2306S3146E01

FCC ID..... : 2BBQH-ZQC-P1

Applicant..... : Shenzhen Zhong Qing Chuang Technology Co.,Ltd

Address..... : 5F Building D, No. 18 Guangyao Industrial Plant, Fourth Industrial Zone, Zhulongtian Road, Shuitian Community, Shiyan Street, Baoan District, Shenzhen

Manufacturer..... : Shenzhen Zhong Qing Chuang Technology Co.,Ltd

Address..... : 5F Building D, No. 18 Guangyao Industrial Plant, Fourth Industrial Zone, Zhulongtian Road, Shuitian Community, Shiyan Street, Baoan District, Shenzhen

Product Name..... : Tablet

Model/Type reference..... : **ZQC-P1**,M104,M105,M107,M108,M109,M112,M113,M114,M115,M116,M117,M118,M119,M20,H717,H719,H720,H821,H822,H823,H824,H825,H826,H827,P701

Standard..... : 47 CFR Part 15.247

Date of Receipt..... : June 15, 2023

Date of Test Date..... : June 15, 2023 to June 25, 2023

Date of issue..... : June 26, 2023

**Test result..... : Pass**

Prepared by:  
( Printed name + Signature )      Pai Zheng      *Pai Zheng*

Approved by:  
( Printed name + Signature )      Sky Dong      *Sky Dong*

**Testing Laboratory Name....: KSIGN(Guangdong) Testing Co., Ltd.**

Address..... : West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

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## TABLE OF CONTENTS

Page

TRF RF\_R1

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|                                                                 |           |
|-----------------------------------------------------------------|-----------|
| <b>1. TEST SUMMARY .....</b>                                    | <b>3</b>  |
| 1.1. Test Standards .....                                       | 3         |
| 1.2. Report Version .....                                       | 3         |
| 1.3. Test Description .....                                     | 4         |
| 1.4. Test Facility .....                                        | 5         |
| 1.5. Measurement Uncertainty .....                              | 5         |
| <b>2. GENERAL INFORMATION .....</b>                             | <b>6</b>  |
| 2.1. General Description Of EUT .....                           | 6         |
| 2.2. Accessory Equipment Information .....                      | 6         |
| 2.3. Description of Test Modes .....                            | 6         |
| 2.4. Measurement Instruments List .....                         | 7         |
| <b>3. Evaluation Results (Evaluation) .....</b>                 | <b>11</b> |
| 3.1. Antenna requirement .....                                  | 11        |
| <b>4. Radio Spectrum Matter Test Results (RF) .....</b>         | <b>11</b> |
| 4.1. Conducted Emission at AC power line .....                  | 11        |
| 4.2. Occupied Bandwidth .....                                   | 14        |
| 4.3. Maximum Conducted Output Power .....                       | 15        |
| 4.4. Power Spectral Density .....                               | 17        |
| 4.5. Emissions in non-restricted frequency bands .....          | 18        |
| 4.6. Band edge emissions (Radiated) .....                       | 20        |
| 4.7. Emissions in restricted frequency bands (below 1GHz) ..... | 25        |
| 4.8. Emissions in restricted frequency bands (above 1GHz) ..... | 28        |
| <b>5. EUT TEST PHOTOS .....</b>                                 | <b>35</b> |
| <b>6. PHOTOGRAPHS OF EUT CONSTRUCTIONAL .....</b>               | <b>37</b> |
| <b>Appendix .....</b>                                           | <b>38</b> |
| 6.1. Appendix A: DTS Bandwidth .....                            | 39        |
| 6.2. Appendix B: Occupied Channel Bandwidth .....               | 43        |
| 6.3. Appendix C: Maximum conducted output power .....           | 47        |
| 6.4. Appendix D: Maximum power spectral density .....           | 51        |
| 6.5. ppendix E: Reference level measurement .....               | 55        |
| 6.6. Appendix F: Band edge measurements .....                   | 59        |
| 6.7. Appendix G: Conducted Spurious Emission .....              | 62        |
| 6.8. Appendix H: Duty Cycle .....                               | 68        |

## 1. TEST SUMMARY

### 1.1. Test Standards

The tests were performed according to following standards:

**47 CFR Part 15.247:** Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz

### 1.2. Report Version

| Revised No. | Date of issue | Description |
|-------------|---------------|-------------|
| 01          | June 26, 2023 | Original    |
|             |               |             |
|             |               |             |
|             |               |             |

### 1.3. Test Description

| Test Item                                            | Standard           | Requirement         | Result |
|------------------------------------------------------|--------------------|---------------------|--------|
| Antenna requirement                                  | 47 CFR Part 15.247 | Part 15.203         | Pass   |
| Conducted Emission at AC power line                  | 47 CFR Part 15.247 | 47 CFR 15.207(a)    | Pass   |
| Occupied Bandwidth                                   | 47 CFR Part 15.247 | 47 CFR 15.247(a)(2) | Pass   |
| Maximum Conducted Output Power                       | 47 CFR Part 15.247 | 47 CFR 15.247(b)(3) | Pass   |
| Power Spectral Density                               | 47 CFR Part 15.247 | 47 CFR 15.247(e)    | Pass   |
| Emissions in non-restricted frequency bands          | 47 CFR Part 15.247 | 47 CFR 15.247(d)    | Pass   |
| Band edge emissions (Radiated)                       | 47 CFR Part 15.247 | 47 CFR 15.247(d)    | Pass   |
| Emissions in restricted frequency bands (below 1GHz) | 47 CFR Part 15.247 | 47 CFR 15.247(d)    | Pass   |
| Emissions in restricted frequency bands (above 1GHz) | 47 CFR Part 15.247 | 47 CFR 15.247(d)    | Pass   |

## 1.4. Test Facility

### KSIGN(Guangdong) Testing Co., Ltd.

West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

The test facility is recognized, certified, or accredited by the following organizations:

#### CNAS-Lab Code: L13261

KSIGN(Guangdong) Testing Co., Ltd. has been assessed and proved to be in Compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2017 General Requirements) for the Competence of Testing and Calibration Laboratories.

#### A2LA-Lab Cert. No.: 5457.01

KSIGN(Guangdong) Testing Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing

#### ISED#: 25693 CAB identifier.: CN0096

KSIGN(Guangdong) Testing Co., Ltd. has been listed by Innovation, Science and Economic Development Canada to perform electromagnetic emission measurement.

#### FCC-Registration No.: 294912 Designation Number: CN1328

KSIGN(Guangdong) Testing Co., Ltd. EMC Laboratory has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

## 1.5. Measurement Uncertainty

| Test Items                      | Measurement Uncertainty |
|---------------------------------|-------------------------|
| Conducted Emission (150k-30MHz) | ± 3.34dB                |
| Output Power, Conducted         | ± 1.4dB                 |
| PSD, Conducted                  | ± 1.0dB                 |
| Spurious Emissions, Conducted   | ± 3.3dB                 |
| RSE (1-18GHz)                   | ± 4.68dB                |
| RSE (30-1000MHz)                | ± 5.7dB                 |
| RSE (18-40GHz)                  | ± 5.18dB                |

The reported uncertainty of measurement  $y \pm U$ , where expended uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95 %.

## 2. GENERAL INFORMATION

### 2.1. General Description Of EUT

|                         |                                                                                                                                                                                                                                                                                                      |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Sample Number:     | 1-1(Normal Sample), 1-2(Engineering Sample)                                                                                                                                                                                                                                                          |
| Product Name:           | Tablet                                                                                                                                                                                                                                                                                               |
| Model / Type reference: | <b>ZQC-P1</b> ,M104,M105,M107,M108,M109,M112,M113,M114,M115,M116,M117,M118,M119,M20,H717,H719,H720,H821,H822,H823,H824,H825,H826,H827,P701                                                                                                                                                           |
| Model Description       | The only difference between product models is the color . Different model names are available to meet market demands. Other power supply methods, internal structures, circuits, appearance and key components are the same, and do not affect safety and electromagnetic compatibility performance. |
| Power Supply:           | DC 3.8V from battery/DC 5V from adapter                                                                                                                                                                                                                                                              |
| Operation Frequency:    | 2402MHz to 2480MHz                                                                                                                                                                                                                                                                                   |
| Number of Channels:     | 40                                                                                                                                                                                                                                                                                                   |
| Test Channel:           | CH00:2402MHz, CH19:2440MHz, CH39:2480MHz                                                                                                                                                                                                                                                             |
| Modulation Type:        | GFSK                                                                                                                                                                                                                                                                                                 |
| Antenna Type:           | FPC                                                                                                                                                                                                                                                                                                  |
| Antenna Gain:           | 2.6dBi                                                                                                                                                                                                                                                                                               |
| Max TX Power:           | -8.10dBm                                                                                                                                                                                                                                                                                             |

### 2.2. Accessory Equipment Information

The EUT was tested as an independent device.

### 2.3. Description of Test Modes

| No.        | Title   | Description of Mode                                                                                     |
|------------|---------|---------------------------------------------------------------------------------------------------------|
| Test Mode1 | TX mode | Keep the EUT connect to AC power line and works in continuously transmitting mode with GFSK modulation. |

## 2.4. Measurement Instruments List

| Conducted Emission at AC power line |              |           |              |            |
|-------------------------------------|--------------|-----------|--------------|------------|
| Test Equipment                      | Manufacturer | Model No. | Serial No.   | Cal. Until |
| LISN                                | R&S          | ENV432    | 1326.6105.02 | 2024-02-17 |
| EMI Test Receiver                   | R&S          | ESR       | 102524       | 2024-02-17 |
| Manual RF Switch                    | JS TOYO      | /         | MSW-01/002   | 2024-02-17 |
| ISN CAT6                            | Schwarzbeck  | CAT5 8158 | 227          | 2024-02-17 |
| Color Signal Generator              | Philips      | PM5418    | 672926       | 2024-02-17 |
| Power Absorbing Clamp               | R&S          | MDS-21    | 100925       | 2024-02-19 |

| Occupied Bandwidth                  |                            |                     |            |            |
|-------------------------------------|----------------------------|---------------------|------------|------------|
| Test Equipment                      | Manufacturer               | Model No.           | Serial No. | Cal. Until |
| Wideband Radio Communication Tester | R&S                        | CMU200              | 115297     | 2024-02-17 |
| Audio Analyzer                      | R&S                        | UPL16               | 100001     | 2024-02-17 |
| Shielding box                       | Gxiong                     | GX-5915A            | 2201113    | 2024-02-17 |
| High Pass Filter                    | COM-MW Technology Co., Ltd | ZHPF-M1.2-9G-1 87   | 09203403   | 2024-02-17 |
| Band Stop Filter                    | COM-MW Technology Co., Ltd | ZBSF6-C820-920 -188 | 09203401   | 2024-02-17 |
| Splitter                            | COM-MW Technology Co., Ltd | ZPD-M1-8-2103       | 09203407   | 2024-02-17 |
| Coaxial Cable                       | BEBES                      | A40-2.92M2.92F-4.5M | 1907021    | 2024-02-17 |
| Hygrothermograph                    | Anymetre                   | JB913               | /          | 2024-02-17 |
| Climate Chamber                     | Angul                      | AGNH80L             | 1903042120 | 2024-02-17 |
| Spectrum Analyzer                   | HP                         | 8593E               | 3831U02087 | 2024-02-17 |
| Dual Output DC Power Supply         | Agilent                    | E3646A              | MY40009992 | 2024-02-17 |
| RF Control Unit                     | Tonscend                   | JS0806-2            | /          | 2024-02-17 |
| Analog Signal Generator             | HP                         | 83752A              | 3344A00337 | 2024-02-17 |
| Vector Signal Generator             | Agilent                    | N5182A              | MY50142520 | 2024-02-17 |
| Wideband Radio Communication Tester | R&S                        | CMW500              | 157282     | 2024-02-17 |
| Spectrum Analyzer                   | R&S                        | FSV40-N             | 101798     | 2024-02-17 |

| Maximum Conducted Output Power      |                            |                     |            |            |
|-------------------------------------|----------------------------|---------------------|------------|------------|
| Test Equipment                      | Manufacturer               | Model No.           | Serial No. | Cal. Until |
| Wideband Radio Communication Tester | R&S                        | CMU200              | 115297     | 2024-02-17 |
| Audio Analyzer                      | R&S                        | UPL16               | 100001     | 2024-02-17 |
| Shielding box                       | Gxiong                     | GX-5915A            | 2201113    | 2024-02-17 |
| High Pass Filter                    | COM-MW Technology Co., Ltd | ZHPF-M1.2-9G-1 87   | 09203403   | 2024-02-17 |
| Band Stop Filter                    | COM-MW Technology Co., Ltd | ZBSF6-C820-920 -188 | 09203401   | 2024-02-17 |
| Splitter                            | COM-MW Technology Co., Ltd | ZPD-M1-8-2103       | 09203407   | 2024-02-17 |
| Coaxial Cable                       | BEBES                      | A40-2.92M2.92F-4.5M | 1907021    | 2024-02-17 |
| Hygrothermograph                    | Anymetre                   | JB913               | /          | 2024-02-17 |

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|                                     |          |          |            |            |
|-------------------------------------|----------|----------|------------|------------|
| Climate Chamber                     | Angul    | AGNH80L  | 1903042120 | 2024-02-17 |
| Spectrum Analyzer                   | HP       | 8593E    | 3831U02087 | 2024-02-17 |
| Dual Output DC Power Supply         | Agilent  | E3646A   | MY40009992 | 2024-02-17 |
| RF Control Unit                     | Tonscend | JS0806-2 | /          | 2024-02-17 |
| Analog Signal Generator             | HP       | 83752A   | 3344A00337 | 2024-02-17 |
| Vector Signal Generator             | Agilent  | N5182A   | MY50142520 | 2024-02-17 |
| Wideband Radio Communication Tester | R&S      | CMW500   | 157282     | 2024-02-17 |
| Spectrum Analyzer                   | R&S      | FSV40-N  | 101798     | 2024-02-17 |

| Power Spectral Density              |                            |                     |            |            |
|-------------------------------------|----------------------------|---------------------|------------|------------|
| Test Equipment                      | Manufacturer               | Model No.           | Serial No. | Cal. Until |
| Wideband Radio Communication Tester | R&S                        | CMU200              | 115297     | 2024-02-17 |
| Audio Analyzer                      | R&S                        | UPL16               | 100001     | 2024-02-17 |
| Shielding box                       | Gxiong                     | GX-5915A            | 2201113    | 2024-02-17 |
| High Pass Filter                    | COM-MW Technology Co., Ltd | ZHPF-M1.2-9G-1 87   | 09203403   | 2024-02-17 |
| Band Stop Filter                    | COM-MW Technology Co., Ltd | ZBSF6-C820-920 -188 | 09203401   | 2024-02-17 |
| Splitter                            | COM-MW Technology Co., Ltd | ZPD-M1-8-2103       | 09203407   | 2024-02-17 |
| Coaxial Cable                       | BEBES                      | A40-2.92M2.92F-4.5M | 1907021    | 2024-02-17 |
| Hygrothermograph                    | Anymetre                   | JB913               | /          | 2024-02-17 |
| Climate Chamber                     | Angul                      | AGNH80L             | 1903042120 | 2024-02-17 |
| Spectrum Analyzer                   | HP                         | 8593E               | 3831U02087 | 2024-02-17 |
| Dual Output DC Power Supply         | Agilent                    | E3646A              | MY40009992 | 2024-02-17 |
| RF Control Unit                     | Tonscend                   | JS0806-2            | /          | 2024-02-17 |
| Analog Signal Generator             | HP                         | 83752A              | 3344A00337 | 2024-02-17 |
| Vector Signal Generator             | Agilent                    | N5182A              | MY50142520 | 2024-02-17 |
| Wideband Radio Communication Tester | R&S                        | CMW500              | 157282     | 2024-02-17 |
| Spectrum Analyzer                   | R&S                        | FSV40-N             | 101798     | 2024-02-17 |

| Emissions in non-restricted frequency bands |                            |                     |            |            |
|---------------------------------------------|----------------------------|---------------------|------------|------------|
| Test Equipment                              | Manufacturer               | Model No.           | Serial No. | Cal. Until |
| Wideband Radio Communication Tester         | R&S                        | CMU200              | 115297     | 2024-02-17 |
| Audio Analyzer                              | R&S                        | UPL16               | 100001     | 2024-02-17 |
| Shielding box                               | Gxiong                     | GX-5915A            | 2201113    | 2024-02-17 |
| High Pass Filter                            | COM-MW Technology Co., Ltd | ZHPF-M1.2-9G-1 87   | 09203403   | 2024-02-17 |
| Band Stop Filter                            | COM-MW Technology Co., Ltd | ZBSF6-C820-920 -188 | 09203401   | 2024-02-17 |
| Splitter                                    | COM-MW Technology Co., Ltd | ZPD-M1-8-2103       | 09203407   | 2024-02-17 |
| Coaxial Cable                               | BEBES                      | A40-2.92M2.92F-4.5M | 1907021    | 2024-02-17 |
| Hygrothermograph                            | Anymetre                   | JB913               | /          | 2024-02-17 |

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|                                     |          |          |            |            |
|-------------------------------------|----------|----------|------------|------------|
| Climate Chamber                     | Angul    | AGNH80L  | 1903042120 | 2024-02-17 |
| Spectrum Analyzer                   | HP       | 8593E    | 3831U02087 | 2024-02-17 |
| Dual Output DC Power Supply         | Agilent  | E3646A   | MY40009992 | 2024-02-17 |
| RF Control Unit                     | Tonscend | JS0806-2 | /          | 2024-02-17 |
| Analog Signal Generator             | HP       | 83752A   | 3344A00337 | 2024-02-17 |
| Vector Signal Generator             | Agilent  | N5182A   | MY50142520 | 2024-02-17 |
| Wideband Radio Communication Tester | R&S      | CMW500   | 157282     | 2024-02-17 |
| Spectrum Analyzer                   | R&S      | FSV40-N  | 101798     | 2024-02-17 |

| Band edge emissions (Radiated)             |               |             |            |            |
|--------------------------------------------|---------------|-------------|------------|------------|
| Test Equipment                             | Manufacturer  | Model No.   | Serial No. | Cal. Until |
| Color Signal Generator                     | Philips       | PM5418      | 672926     | 2024-02-17 |
| Ultra-Broadband logarithmic period Antenna | Schwarzbeck   | VULB 9163   | 1230       | 2025-02-18 |
| Pre-Amplifier                              | Schwarzbeck   | BBV 9745    | 9745#129   | 2024-02-17 |
| Broadcast Television Signal Generator      | R&S           | SFE100      | 141038     | 2024-02-17 |
| Analog Signal Generator                    | Agilent       | 8648A       | 3847M00445 | 2024-02-17 |
| EMI Test Receiver                          | R&S           | ESR         | 102525     | 2024-02-17 |
| Loop Antenna                               | Beijin ZHINAN | ZN30900C    | 18050      | 2024-02-19 |
| Horn Antenna                               | Schwarzbeck   | BBHA 9120 D | 2023       | 2026-02-19 |
| Pre-Amplifier                              | EMCI          | EMC051835SE | 980662     | 2024-02-17 |
| Spectrum Analyzer                          | Keysight      | N9020A      | MY46471971 | 2024-02-17 |

| Emissions in restricted frequency bands (below 1GHz) |               |             |            |            |
|------------------------------------------------------|---------------|-------------|------------|------------|
| Test Equipment                                       | Manufacturer  | Model No.   | Serial No. | Cal. Until |
| Color Signal Generator                               | Philips       | PM5418      | 672926     | 2024-02-17 |
| Ultra-Broadband logarithmic period Antenna           | Schwarzbeck   | VULB 9163   | 1230       | 2025-02-18 |
| Pre-Amplifier                                        | Schwarzbeck   | BBV 9745    | 9745#129   | 2024-02-17 |
| Broadcast Television Signal Generator                | R&S           | SFE100      | 141038     | 2024-02-17 |
| Analog Signal Generator                              | Agilent       | 8648A       | 3847M00445 | 2024-02-17 |
| EMI Test Receiver                                    | R&S           | ESR         | 102525     | 2024-02-17 |
| Loop Antenna                                         | Beijin ZHINAN | ZN30900C    | 18050      | 2024-02-19 |
| Horn Antenna                                         | Schwarzbeck   | BBHA 9120 D | 2023       | 2026-02-19 |
| Pre-Amplifier                                        | EMCI          | EMC051835SE | 980662     | 2024-02-17 |
| Spectrum Analyzer                                    | Keysight      | N9020A      | MY46471971 | 2024-02-17 |

| Emissions in restricted frequency bands (above 1GHz) |              |           |            |            |
|------------------------------------------------------|--------------|-----------|------------|------------|
| Test Equipment                                       | Manufacturer | Model No. | Serial No. | Cal. Until |
| Color Signal Generator                               | Philips      | PM5418    | 672926     | 2024-02-17 |
| Ultra-Broadband logarithmic period Antenna           | Schwarzbeck  | VULB 9163 | 1230       | 2025-02-18 |
| Pre-Amplifier                                        | Schwarzbeck  | BBV 9745  | 9745#129   | 2024-02-17 |

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|                                       |               |             |            |            |
|---------------------------------------|---------------|-------------|------------|------------|
| Broadcast Television Signal Generator | R&S           | SFE100      | 141038     | 2024-02-17 |
| Analog Signal Generator               | Agilent       | 8648A       | 3847M00445 | 2024-02-17 |
| EMI Test Receiver                     | R&S           | ESR         | 102525     | 2024-02-17 |
| Loop Antenna                          | Beijin ZHINAN | ZN30900C    | 18050      | 2024-02-19 |
| Horn Antenna                          | Schwarzbeck   | BBHA 9120 D | 2023       | 2026-02-19 |
| Pre-Amplifier                         | EMCI          | EMC051835SE | 980662     | 2024-02-17 |
| Spectrum Analyzer                     | Keysight      | N9020A      | MY46471971 | 2024-02-17 |

### 3. Evaluation Results (Evaluation)

#### 3.1. Antenna requirement

|                   |                                                                                                                                                                                                                                                                                                                                                        |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Requirement: | An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. 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 provisions of this section. |
| Conclusion:       | The directional gain of the antenna less than 6dBi, please refer to the EUT internal photographs antenna photo.                                                                                                                                                                                                                                        |

### 4. Radio Spectrum Matter Test Results (RF)

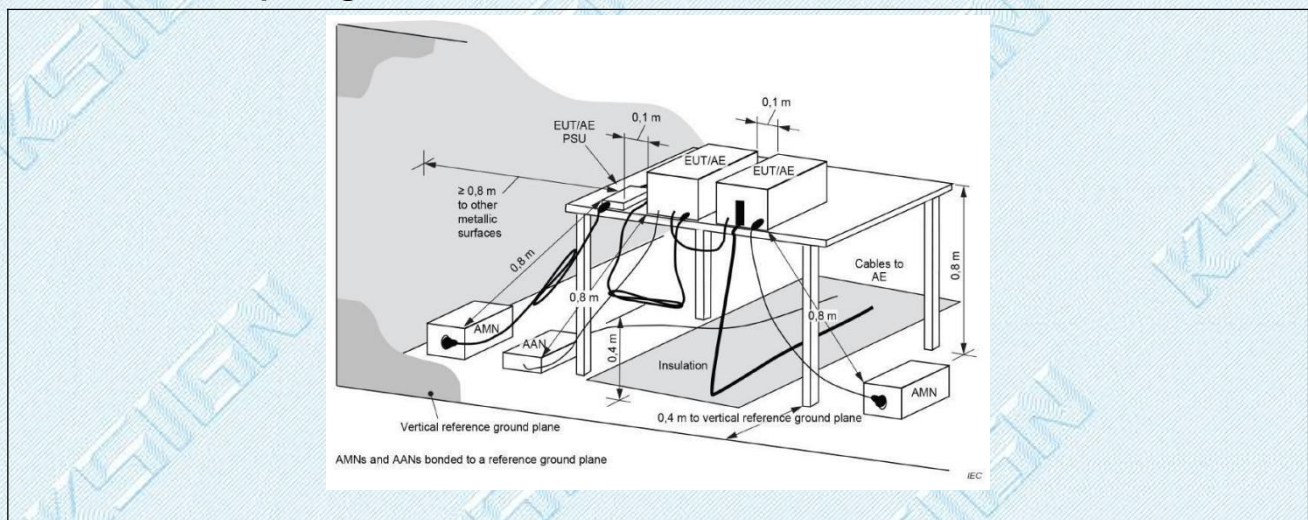
#### 4.1. Conducted Emission at AC power line

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                              |           |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-----------|
| Test Requirement: | Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator 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, as measured using a 50 $\mu$ H/50 ohms line impedance stabilization network (LISN). |                              |           |
| Test Limit:       | Frequency of emission (MHz)                                                                                                                                                                                                                                                                                                                                                                                                                          | Conducted limit (dB $\mu$ V) |           |
|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 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.                                                                                                                                                                                                                                                                                                                                                                                                      |                              |           |
| Test Method:      | Refer to ANSI C63.10-2013 section 6.2, standard test method for ac power-line conducted emissions from unlicensed wireless devices                                                                                                                                                                                                                                                                                                                   |                              |           |

##### 4.1.1. E.U.T. Operation:

|                        |            |
|------------------------|------------|
| Operating Environment: |            |
| Temperature:           | 24.5 °C    |
| Humidity:              | 43.7 %     |
| Atmospheric Pressure:  | 101 kPa    |
| Final test mode:       | Test Mode1 |

##### 4.1.2. Test Setup Diagram:



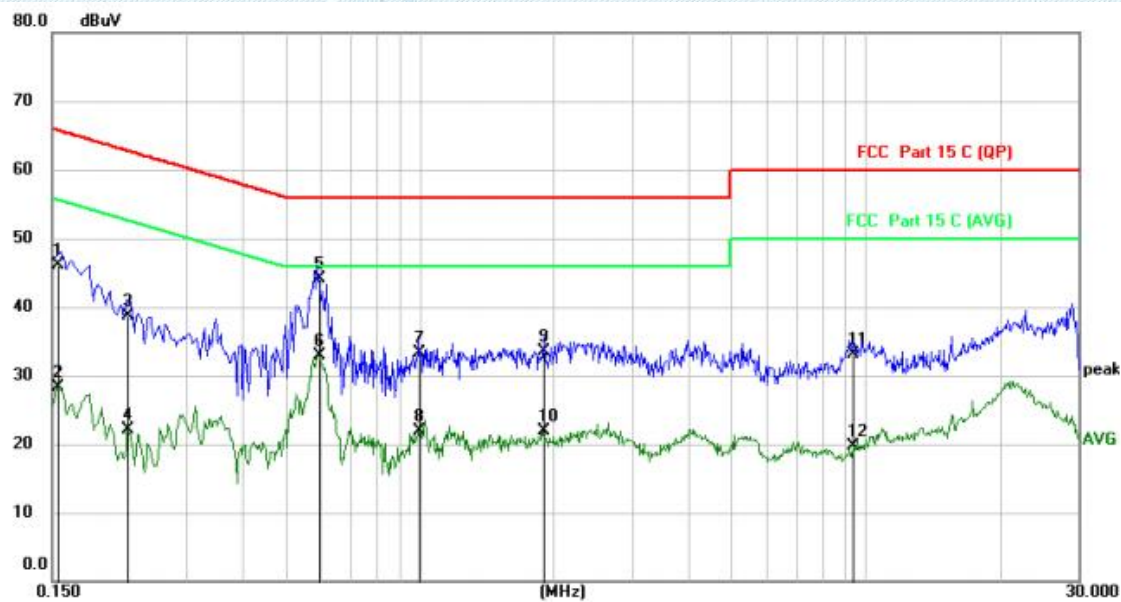
TRF RF\_R1

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### 4.1.3. Test Data:

Test Mode1 / Line: Line

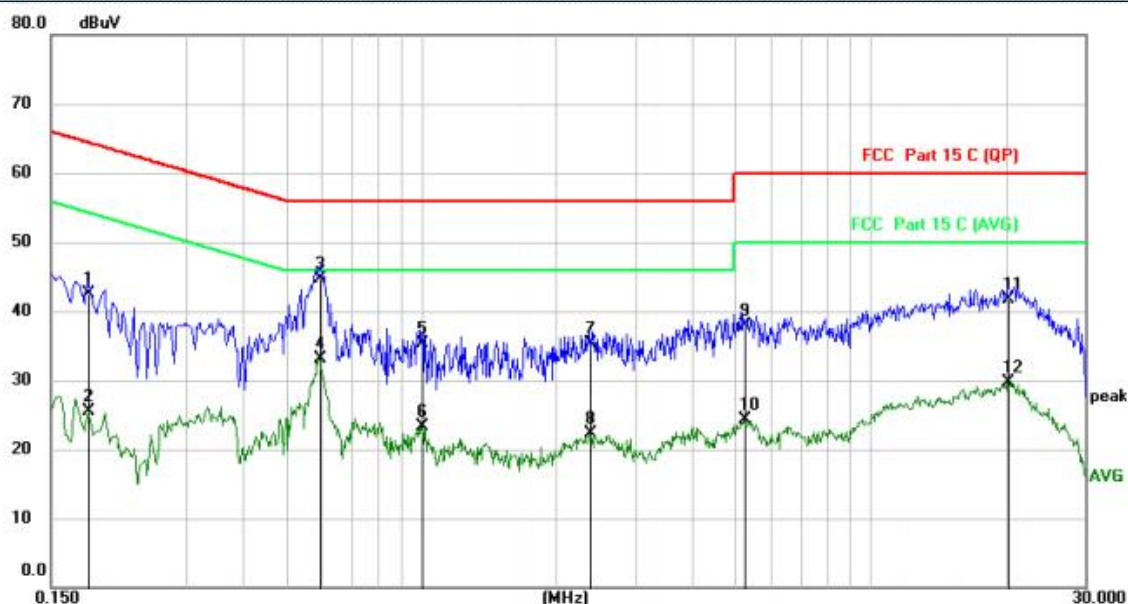


| No. Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV | Limit<br>dBuV | Over<br>dB | Detector | Comment |
|---------|--------------|--------------------------|-------------------------|--------------------------|---------------|------------|----------|---------|
| 1       | 0.1547       | 35.03                    | 11.14                   | 46.17                    | 65.74         | -19.57     | QP       |         |
| 2       | 0.1547       | 17.13                    | 11.14                   | 28.27                    | 55.74         | -27.47     | AVG      |         |
| 3       | 0.2220       | 27.76                    | 11.04                   | 38.80                    | 62.74         | -23.94     | QP       |         |
| 4       | 0.2220       | 11.11                    | 11.04                   | 22.15                    | 52.74         | -30.59     | AVG      |         |
| 5 *     | 0.5936       | 33.06                    | 11.00                   | 44.06                    | 56.00         | -11.94     | QP       |         |
| 6       | 0.5936       | 21.92                    | 11.00                   | 32.92                    | 46.00         | -13.08     | AVG      |         |
| 7       | 0.9979       | 22.24                    | 11.07                   | 33.31                    | 56.00         | -22.69     | QP       |         |
| 8       | 0.9979       | 10.83                    | 11.07                   | 21.90                    | 46.00         | -24.10     | AVG      |         |
| 9       | 1.8935       | 22.30                    | 11.15                   | 33.45                    | 56.00         | -22.55     | QP       |         |
| 10      | 1.8935       | 10.74                    | 11.15                   | 21.89                    | 46.00         | -24.11     | AVG      |         |
| 11      | 9.3900       | 20.77                    | 12.41                   | 33.18                    | 60.00         | -26.82     | QP       |         |
| 12      | 9.3900       | 7.30                     | 12.41                   | 19.71                    | 50.00         | -30.29     | AVG      |         |

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**Test Mode1 / Line: Neutral**


| No. Mk. | Freq.   | Reading Level | Correct Factor | Measurement | Limit | Over   |          |         |
|---------|---------|---------------|----------------|-------------|-------|--------|----------|---------|
|         | MHz     | dBuV          | dB             | dBuV        | dBuV  | dB     | Detector | Comment |
| 1       | 0.1819  | 31.41         | 11.07          | 42.48       | 64.40 | -21.92 | QP       |         |
| 2       | 0.1819  | 14.39         | 11.07          | 25.46       | 54.40 | -28.94 | AVG      |         |
| 3 *     | 0.5936  | 33.59         | 11.02          | 44.61       | 56.00 | -11.39 | QP       |         |
| 4       | 0.5936  | 22.04         | 11.02          | 33.06       | 46.00 | -12.94 | AVG      |         |
| 5       | 1.0020  | 24.35         | 11.05          | 35.40       | 56.00 | -20.60 | QP       |         |
| 6       | 1.0020  | 12.18         | 11.05          | 23.23       | 46.00 | -22.77 | AVG      |         |
| 7       | 2.3820  | 24.06         | 11.23          | 35.29       | 56.00 | -20.71 | QP       |         |
| 8       | 2.3820  | 11.00         | 11.23          | 22.23       | 46.00 | -23.77 | AVG      |         |
| 9       | 5.2378  | 26.32         | 11.61          | 37.93       | 60.00 | -22.07 | QP       |         |
| 10      | 5.2378  | 12.76         | 11.61          | 24.37       | 50.00 | -25.63 | AVG      |         |
| 11      | 20.2300 | 26.31         | 15.44          | 41.75       | 60.00 | -18.25 | QP       |         |
| 12      | 20.2300 | 14.21         | 15.44          | 29.65       | 50.00 | -20.35 | AVG      |         |

**Remark:**

1.Both 120 VAC, 50/60 Hz power supply have been tested, only the worst result of 120 VAC, 60 Hz was reported as below.

2.Measurement = Reading Level+ Correct Factor

3.Over = Measurement -Limit

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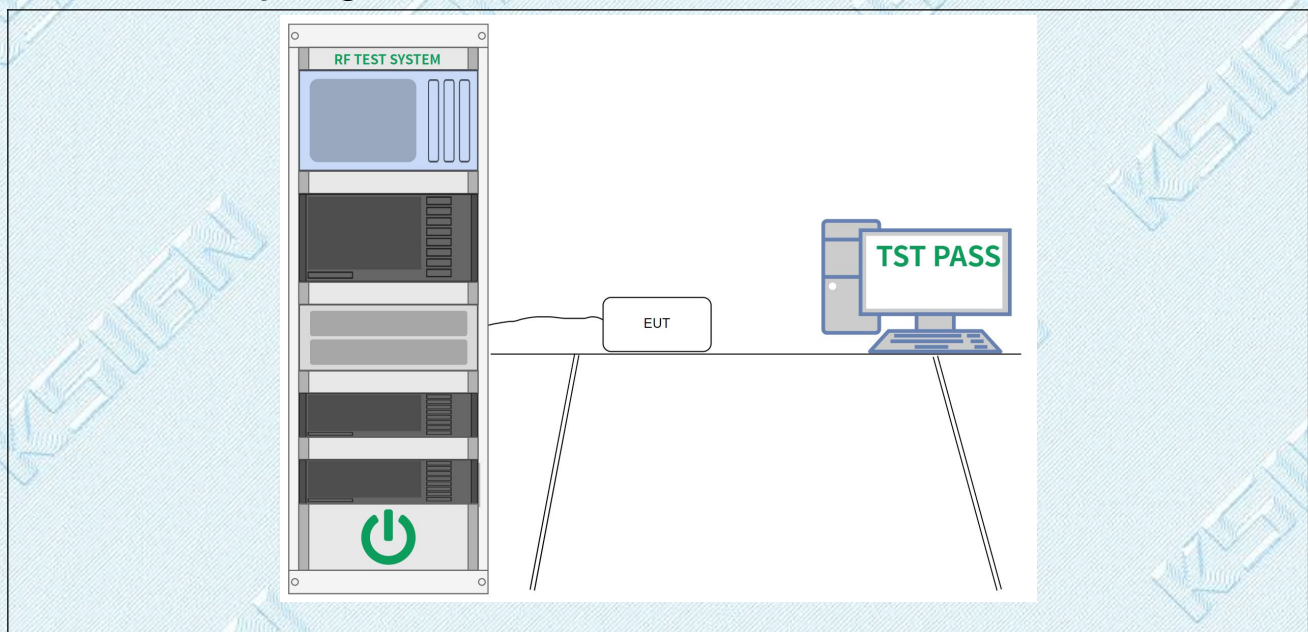
## 4.2. Occupied Bandwidth

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Requirement: | Systems using digital modulation techniques may operate in the 902-928 MHz, and 2400-2483.5 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.                                                                                                                                                                                                                                                                                                      |
| Test Limit:       | Section (a)(2), Systems using digital modulation techniques may operate in the 902-928 MHz, and 2400-2483.5 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.                                                                                                                                                                                                                                                                                      |
| Test Method:      | DTS bandwidth                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Procedure:        | a) Set RBW = 100 kHz.<br>b) Set the VBW $\geq [3 \times \text{RBW}]$ .<br>c) Detector = peak.<br>d) Trace mode = max hold.<br>e) Sweep = auto couple.<br>f) Allow the trace to stabilize.<br>g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission. |

### 4.2.1. E.U.T. Operation:

|                        |             |
|------------------------|-------------|
| Operating Environment: |             |
| Temperature:           | 24.5 °C     |
| Humidity:              | 43.7 %      |
| Atmospheric Pressure:  | 101 kPa     |
| Final test mode:       | Test Mode 1 |

### 4.2.2. Test Setup Diagram:



### 4.2.3. Test Data:

Please Refer to Appendix for Details.

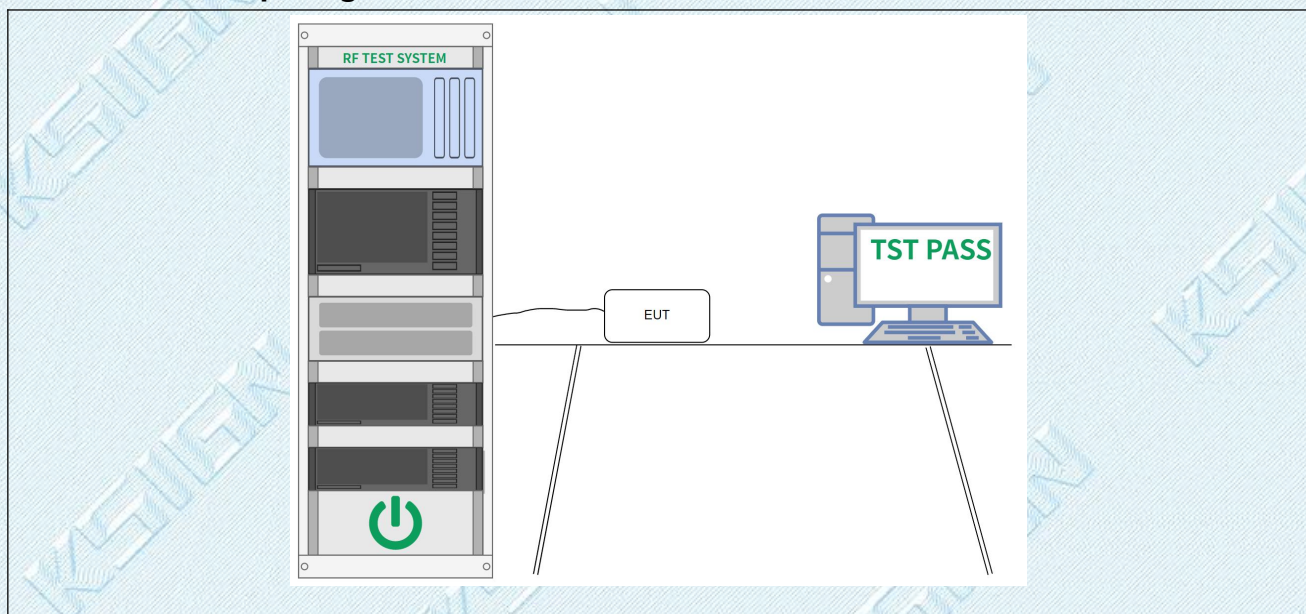
### 4.3. Maximum Conducted Output Power

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Requirement: | For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode. |
| Test Limit:       | For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode. |
| Test Method:      | Maximum conducted output power                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Procedure:        | ANSI C63.10-2013, section 11.9.1 Maximum conducted output power                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

#### 4.3.1. E.U.T. Operation:

|                        |             |
|------------------------|-------------|
| Operating Environment: |             |
| Temperature:           | 24.5 °C     |
| Humidity:              | 43.7 %      |
| Atmospheric Pressure:  | 101 kPa     |
| Final test mode:       | Test Mode 1 |

#### 4.3.2. Test Setup Diagram:



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#### 4.3.3. Test Data:

Please Refer to Appendix for Details.

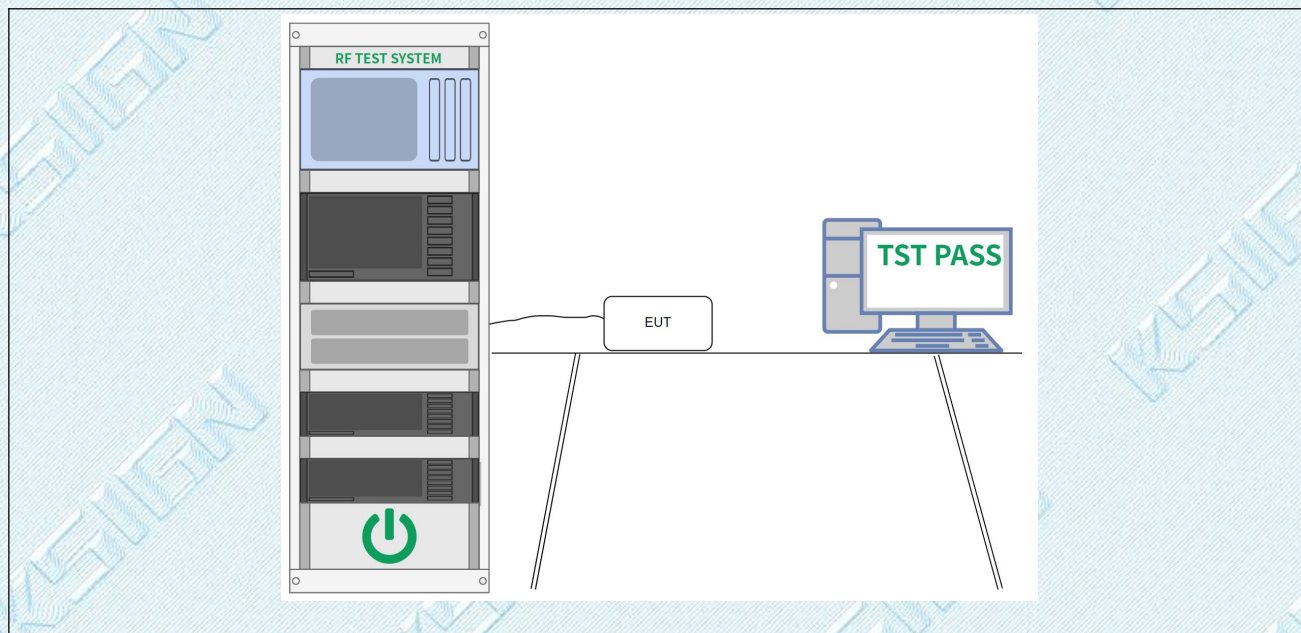
## 4.4. Power Spectral Density

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Requirement: | For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density. |
| Test Limit:       | For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density. |
| Test Method:      | Maximum power spectral density level in the fundamental emission                                                                                                                                                                                                                                                                                                                                                                                               |

### 4.4.1. E.U.T. Operation:

|                        |            |
|------------------------|------------|
| Operating Environment: |            |
| Temperature:           | 24.5 °C    |
| Humidity:              | 43.7 %     |
| Atmospheric Pressure:  | 101 kPa    |
| Final test mode:       | Test Mode1 |

### 4.4.2. Test Setup Diagram:



### 4.4.3. Test Data:

Please Refer to Appendix for Details.

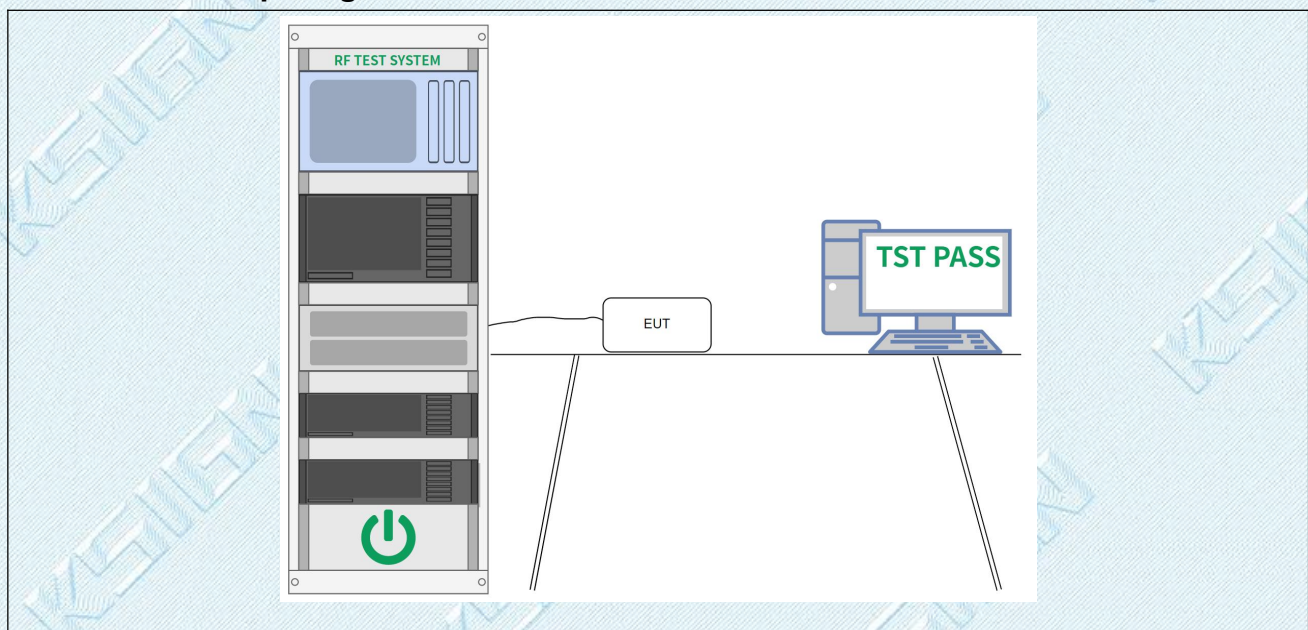
#### 4.5. Emissions in non-restricted frequency bands

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Requirement: | In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 15.209(a) is not required. |
| Test Limit:       | In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 15.209(a) is not required. |
| Test Method:      | Emissions in nonrestricted frequency bands                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Procedure:        | ANSI C63.10-2013<br>Section 11.11.1, Section 11.11.2, Section 11.11.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

##### 4.5.1. E.U.T. Operation:

|                        |            |
|------------------------|------------|
| Operating Environment: |            |
| Temperature:           | 24.5 °C    |
| Humidity:              | 43.7 %     |
| Atmospheric Pressure:  | 101 kPa    |
| Final test mode:       | Test Mode1 |

##### 4.5.2. Test Setup Diagram:



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#### 4.5.3. Test Data:

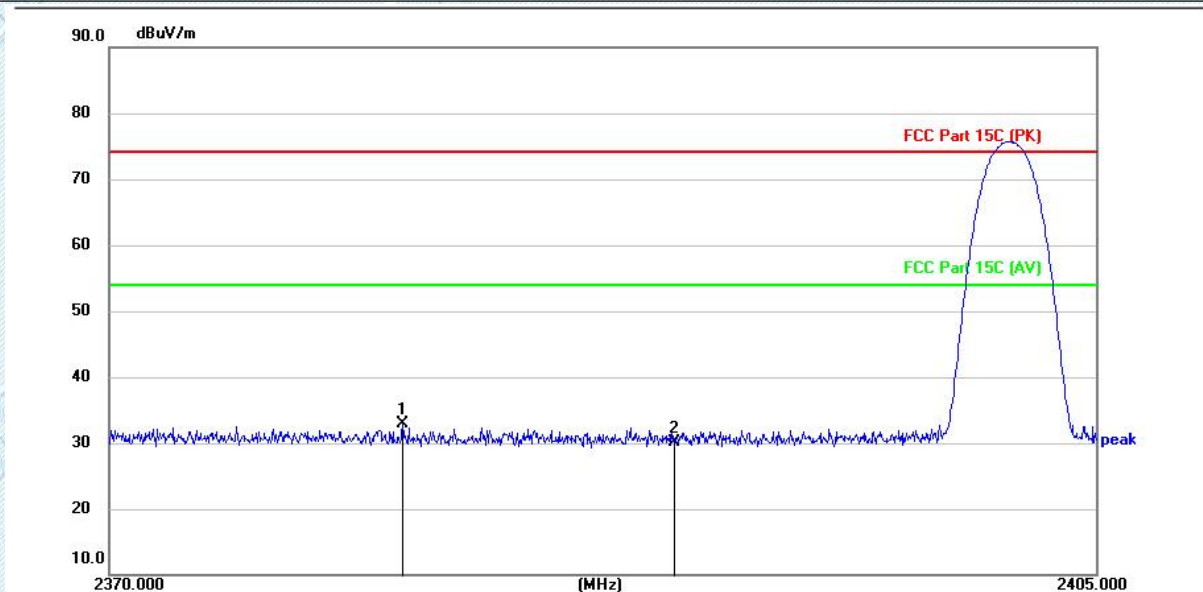
Please Refer to Appendix for Details.

|                   |                                                                                                                                                                                                                                                                                                                                                        |                                   |                               |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------------------------------|
| Test Requirement: | In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a)(see § 15.205(c)).`                                                                                                                                                          |                                   |                               |
| Test Limit:       | 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                             |
|                   | <p>** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.</p> |                                   |                               |
| Test Method:      | Radiated emissions tests                                                                                                                                                                                                                                                                                                                               |                                   |                               |
| Procedure:        | ANSI C63.10-2013 section 6.6.4                                                                                                                                                                                                                                                                                                                         |                                   |                               |

|                        |            |
|------------------------|------------|
| Operating Environment: |            |
| Temperature:           | 24.5 °C    |
| Humidity:              | 43.7 %     |
| Atmospheric Pressure:  | 101 kPa    |
| Final test mode:       | Test Mode1 |

### 4.6.3. Test Data:

Test Mode1 / Polarization: Horizontal / CH: L

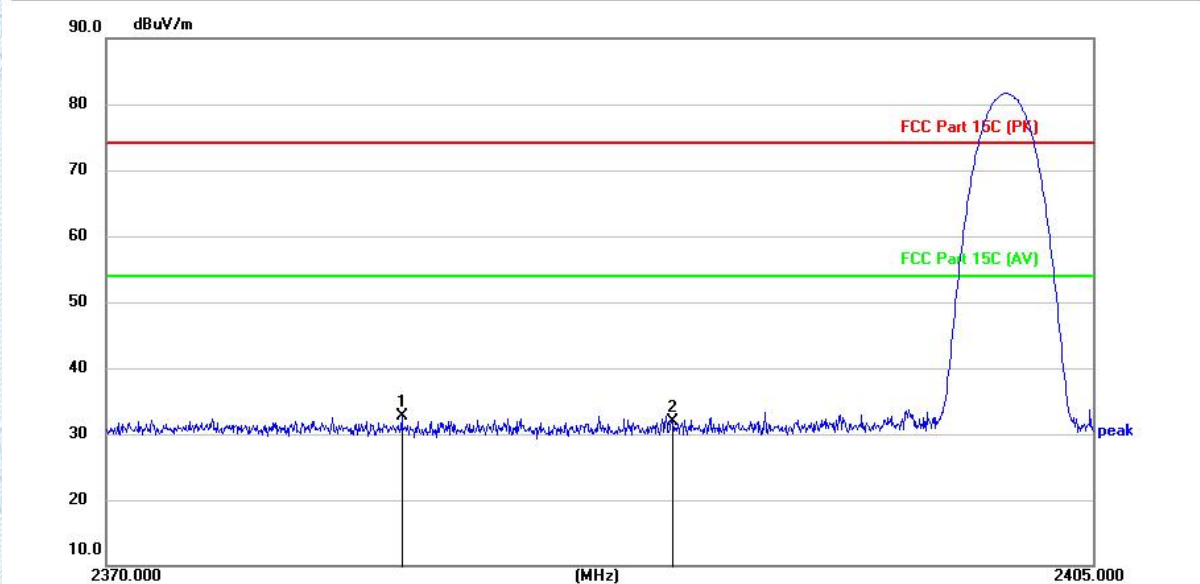


| No. | Mk. | Freq.<br>MHz | Reading Level<br>(dBuV) | Correct Factor<br>(dB/m) | Measurement<br>(dBuV/m) | Limit<br>(dBuV/m) | Over<br>(dB) | Detector |
|-----|-----|--------------|-------------------------|--------------------------|-------------------------|-------------------|--------------|----------|
| 1   | *   | 2380.398     | 43.81                   | -10.92                   | 32.89                   | 74.00             | 41.11        | peak     |
| 2   |     | 2390.000     | 40.93                   | -10.92                   | 30.01                   | 74.00             | 43.99        | peak     |

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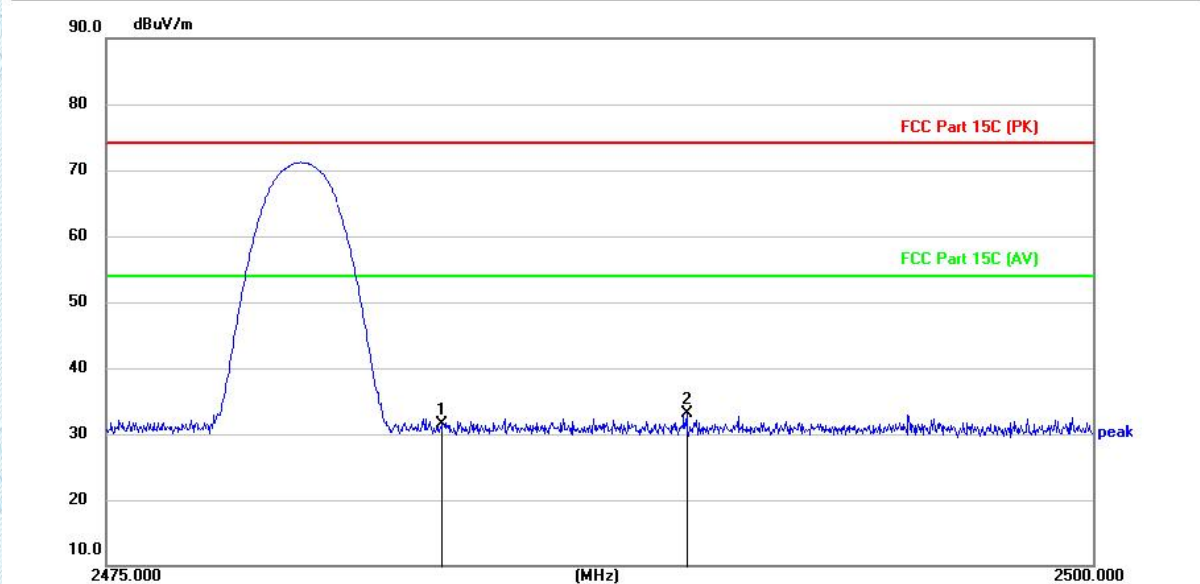
**Test Mode1 / Polarization: Vertical / CH: L**


| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measurement | Limit    | Over  |          |
|-----|-----|----------|---------------|----------------|-------------|----------|-------|----------|
|     |     | MHz      | (dBuV)        | (dB/m)         | (dBuV/m)    | (dBuV/m) | (dB)  | Detector |
| 1   | *   | 2380.479 | 43.63         | -10.92         | 32.71       | 74.00    | 41.29 | peak     |
| 2   |     | 2390.000 | 42.85         | -10.92         | 31.93       | 74.00    | 42.07 | peak     |

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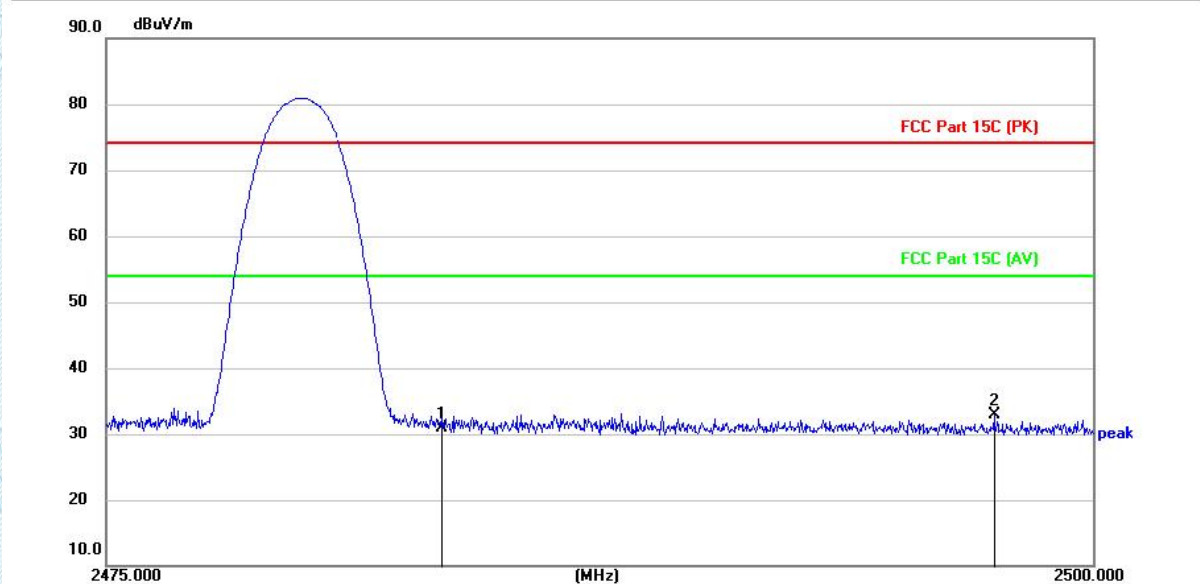
**Test Mode1 / Polarization: Horizontal / CH: H**


| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measurement | Limit    | Over  |          |
|-----|-----|----------|---------------|----------------|-------------|----------|-------|----------|
|     |     | MHz      | (dBuV)        | (dB/m)         | (dBuV/m)    | (dBuV/m) | (dB)  | Detector |
| 1   |     | 2483.500 | 42.35         | -10.88         | 31.47       | 74.00    | 42.53 | peak     |
| 2   | *   | 2489.677 | 43.99         | -10.89         | 33.10       | 74.00    | 40.90 | peak     |

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**Test Mode1 / Polarization: Vertical / CH: H**


| No. | Mk. | Freq.<br>MHz | Reading Level<br>(dBuV) | Correct Factor<br>(dB/m) | Measurement<br>(dBuV/m) | Limit<br>(dBuV/m) | Over<br>(dB) | Detector |
|-----|-----|--------------|-------------------------|--------------------------|-------------------------|-------------------|--------------|----------|
| 1   |     | 2483.500     | 41.69                   | -10.88                   | 30.81                   | 74.00             | 43.19        | peak     |
| 2   | *   | 2497.508     | 43.76                   | -10.88                   | 32.88                   | 74.00             | 41.12        | peak     |

**Note:**

1.Measurement = Reading level + Correct Factor

Correct Factor=Antenna Factor + Cable Loss - Preamplifier Factor

2.Pre-scan BLE 1M and BLE 2M mode, and found the BLE 1M mode which it is worse case, so only show the test data for worse case.

3. Since the peak value is less than the limit of the AVG value, there is no AVG data.

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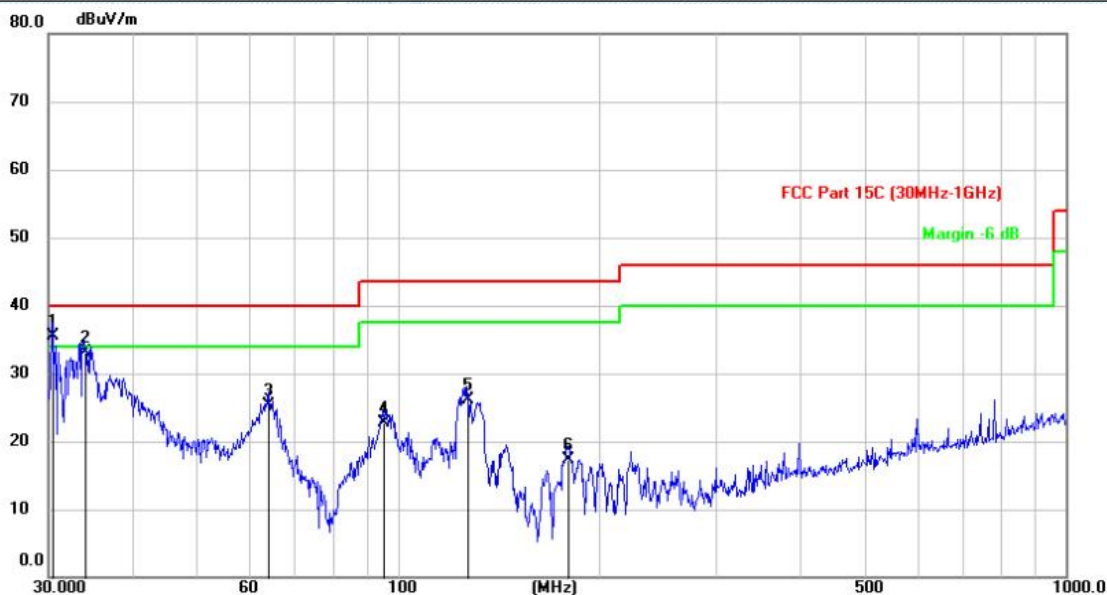
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|                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                               |                                   |                               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------------------------------|
| Test Requirement:                                                                                                                                                                                                                                                                                                                               | In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a)(see § 15.205(c)).` |                                   |                               |
| Test Limit:                                                                                                                                                                                                                                                                                                                                     | 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                             |
| ** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241. |                                                                                                                                                                                               |                                   |                               |
| Test Method:                                                                                                                                                                                                                                                                                                                                    | Radiated emissions tests                                                                                                                                                                      |                                   |                               |
| Procedure:                                                                                                                                                                                                                                                                                                                                      | ANSI C63.10-2013 section 6.6.4                                                                                                                                                                |                                   |                               |

|                        |            |
|------------------------|------------|
| Operating Environment: |            |
| Temperature:           | 24.5 °C    |
| Humidity:              | 43.7 %     |
| Atmospheric Pressure:  | 101 kPa    |
| Final test mode:       | Test Mode1 |

### 4.7.3. Test Data:

#### Test Mode1 / Polarization: Horizontal

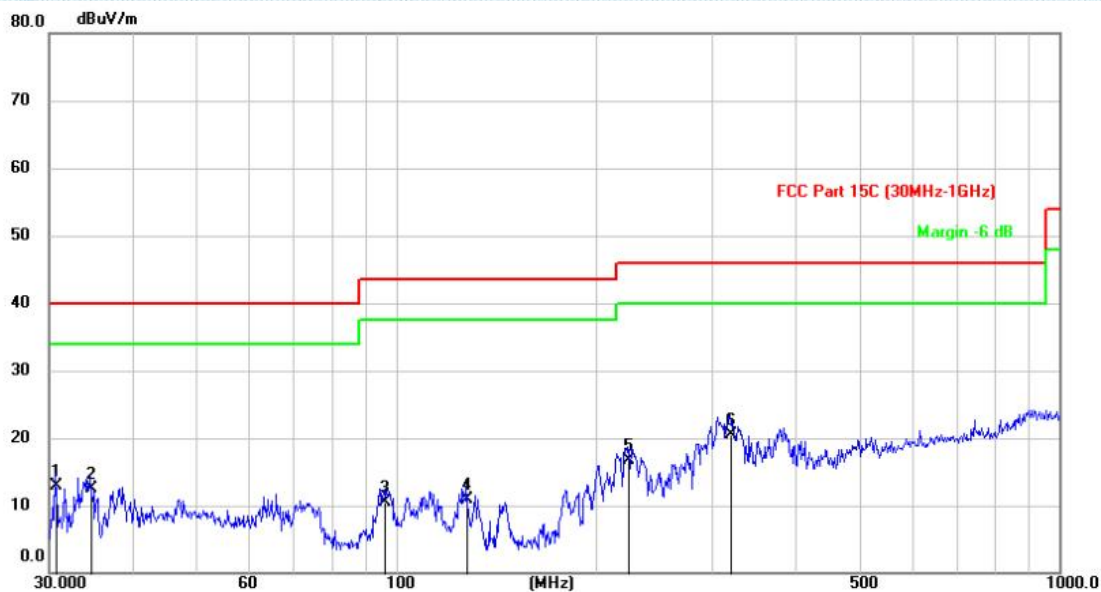


| No. | Mk. | Freq.<br>MHz | Reading Level<br>(dBuV) | Correct Factor<br>(dB/m) | Measurement<br>(dBuV/m) | Limit<br>(dBuV/m) | Over<br>(dB) | Detector |
|-----|-----|--------------|-------------------------|--------------------------|-------------------------|-------------------|--------------|----------|
| 1   | *   | 30.4131      | 54.49                   | -19.00                   | 35.49                   | 40.00             | -4.51        | QP       |
| 2   |     | 33.9887      | 51.95                   | -18.82                   | 33.13                   | 40.00             | -6.87        | QP       |
| 3   |     | 64.1400      | 43.86                   | -18.46                   | 25.40                   | 40.00             | -14.60       | QP       |
| 4   |     | 95.2598      | 41.20                   | -18.41                   | 22.79                   | 43.50             | -20.71       | QP       |
| 5   |     | 126.9057     | 46.64                   | -20.45                   | 26.19                   | 43.50             | -17.31       | QP       |
| 6   |     | 179.7642     | 36.48                   | -19.09                   | 17.39                   | 43.50             | -26.11       | QP       |

TRF RF\_R1

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**Test Mode1 / Polarization: Vertical**


| No. Mk. | Freq.<br>MHz | Reading Level<br>(dBuV) | Correct Factor<br>(dB/m) | Measurement<br>(dBuV/m) | Limit<br>(dBuV/m) | Over<br>(dB) | Detector |
|---------|--------------|-------------------------|--------------------------|-------------------------|-------------------|--------------|----------|
| 1       | 30.6916      | 31.82                   | -18.98                   | 12.84                   | 40.00             | -27.16       | QP       |
| 2       | 34.6871      | 31.25                   | -18.78                   | 12.47                   | 40.00             | -27.53       | QP       |
| 3       | 96.0986      | 28.70                   | -18.27                   | 10.43                   | 43.50             | -33.07       | QP       |
| 4       | 127.7093     | 31.57                   | -20.60                   | 10.97                   | 43.50             | -32.53       | QP       |
| 5       | 223.7334     | 33.70                   | -16.93                   | 16.77                   | 46.00             | -29.23       | QP       |
| 6 *     | 318.9289     | 34.29                   | -13.85                   | 20.44                   | 46.00             | -25.56       | QP       |

Note:

1. Measurement = Reading level + Correct Factor

2. Correct Factor = Antenna Factor + Cable Loss - Preamplifier Factor

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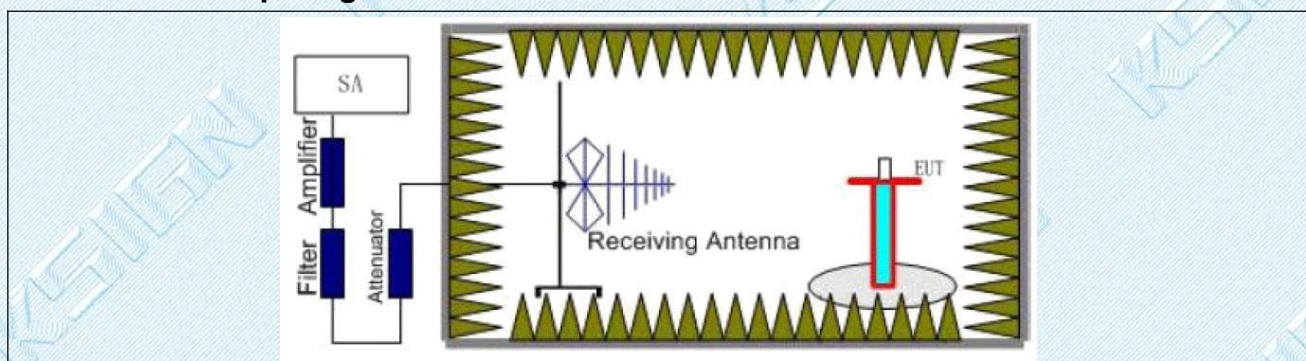
#### 4.8. Emissions in restricted frequency bands (above 1GHz)

|                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                               |                                   |                               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------------------------------|
| Test Requirement:                                                                                                                                                                                                                                                                                                                               | In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a)(see § 15.205(c)).` |                                   |                               |
| Test Limit:                                                                                                                                                                                                                                                                                                                                     | 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                             |
| ** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241. |                                                                                                                                                                                               |                                   |                               |
| Test Method:                                                                                                                                                                                                                                                                                                                                    | Radiated emissions tests                                                                                                                                                                      |                                   |                               |
| Procedure:                                                                                                                                                                                                                                                                                                                                      | ANSI C63.10-2013 section 6.6.4                                                                                                                                                                |                                   |                               |

##### 4.8.1. E.U.T. Operation:

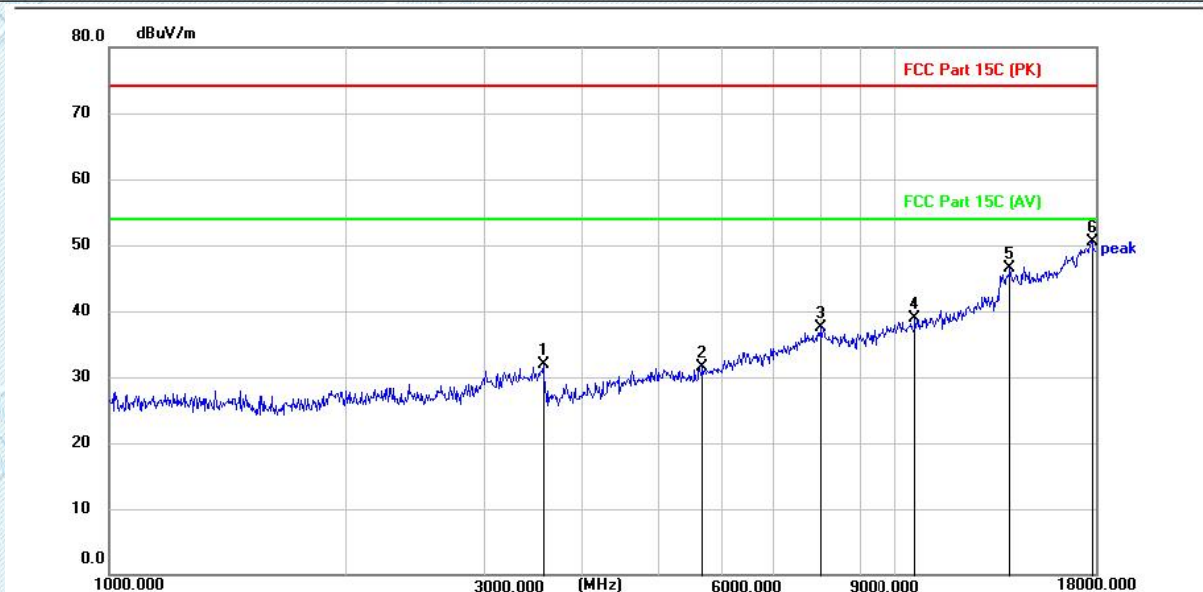
|                        |            |
|------------------------|------------|
| Operating Environment: |            |
| Temperature:           | 24.5 °C    |
| Humidity:              | 43.7 %     |
| Atmospheric Pressure:  | 101 kPa    |
| Final test mode:       | Test Mode1 |

##### 4.8.2. Test Setup Diagram:



### 4.8.3. Test Data:

Test Mode1 / Polarization: Horizontal / CH: L

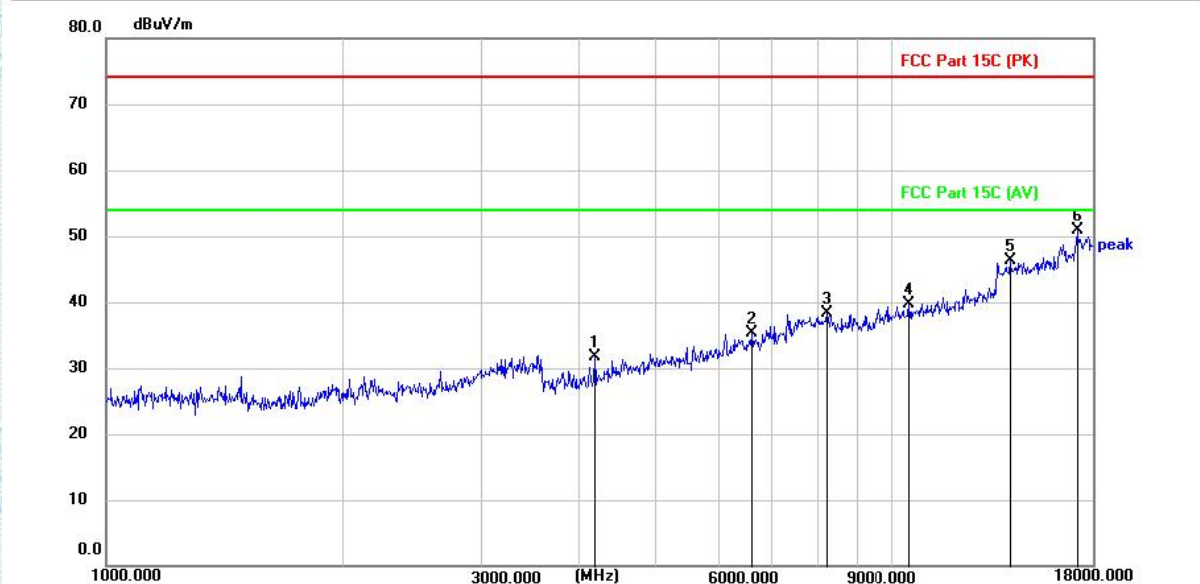


| No. | Mk. | Freq.<br>MHz | Reading Level<br>(dBuV) | Correct Factor<br>(dB/m) | Measurement<br>(dBuV/m) | Limit<br>(dBuV/m) | Over<br>(dB) | Detector |
|-----|-----|--------------|-------------------------|--------------------------|-------------------------|-------------------|--------------|----------|
| 1   |     | 3568.700     | 41.50                   | -9.52                    | 31.98                   | 74.00             | 42.02        | peak     |
| 2   |     | 5693.700     | 35.98                   | -4.49                    | 31.49                   | 74.00             | 42.51        | peak     |
| 3   |     | 8055.000     | 35.45                   | 2.05                     | 37.50                   | 74.00             | 36.50        | peak     |
| 4   |     | 10630.500    | 33.79                   | 5.12                     | 38.91                   | 74.00             | 35.09        | peak     |
| 5   |     | 14001.600    | 35.21                   | 11.23                    | 46.44                   | 74.00             | 27.56        | peak     |
| 6   | *   | 17813.000    | 37.04                   | 13.55                    | 50.59                   | 74.00             | 23.41        | peak     |

TRF RF\_R1

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**Test Mode1 / Polarization: Vertical / CH: L**


| No. | Mk. | Freq.<br>MHz | Reading Level<br>(dBuV) | Correct Factor<br>(dB/m) | Measurement<br>(dBuV/m) | Limit<br>(dBuV/m) | Over<br>(dB) | Detector |
|-----|-----|--------------|-------------------------|--------------------------|-------------------------|-------------------|--------------|----------|
| 1   |     | 4182.400     | 39.47                   | -7.82                    | 31.65                   | 74.00             | 42.35        | peak     |
| 2   |     | 6628.700     | 37.09                   | -1.75                    | 35.34                   | 74.00             | 38.66        | peak     |
| 3   |     | 8267.500     | 36.24                   | 2.00                     | 38.24                   | 74.00             | 35.76        | peak     |
| 4   |     | 10540.400    | 34.74                   | 4.98                     | 39.72                   | 74.00             | 34.28        | peak     |
| 5   |     | 14120.600    | 35.31                   | 11.08                    | 46.39                   | 74.00             | 27.61        | peak     |
| 6   | *   | 17199.300    | 37.67                   | 13.18                    | 50.85                   | 74.00             | 23.15        | peak     |

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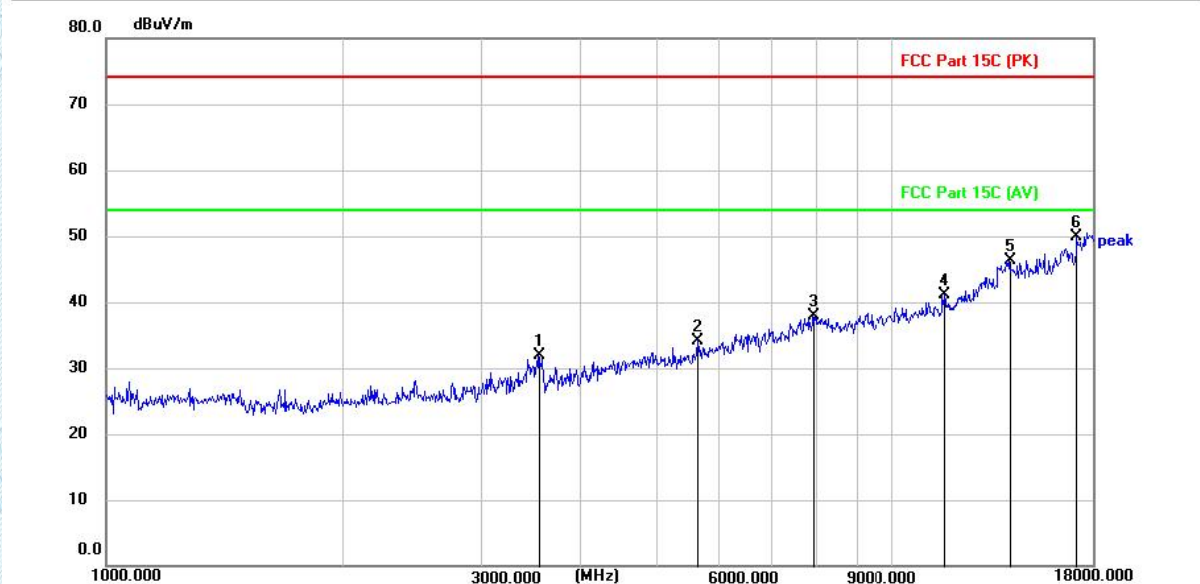
**Test Mode1 / Polarization: Horizontal / CH: M**


| No. | Mk. | Freq.     | Reading Level | Correct Factor | Measurement | Limit    | Over  | Detector |
|-----|-----|-----------|---------------|----------------|-------------|----------|-------|----------|
|     |     | MHz       | (dBuV)        | (dB/m)         | (dBuV/m)    | (dBuV/m) | (dB)  |          |
| 1   |     | 1938.400  | 39.33         | -11.11         | 28.22       | 74.00    | 45.78 | peak     |
| 2   |     | 3546.600  | 39.68         | -9.56          | 30.12       | 74.00    | 43.88 | peak     |
| 3   |     | 5212.600  | 37.23         | -5.20          | 32.03       | 74.00    | 41.97 | peak     |
| 4   |     | 8087.300  | 35.90         | 2.05           | 37.95       | 74.00    | 36.05 | peak     |
| 5   |     | 13952.300 | 34.49         | 11.17          | 45.66       | 74.00    | 28.34 | peak     |
| 6   | *   | 17554.600 | 36.29         | 13.42          | 49.71       | 74.00    | 24.29 | peak     |

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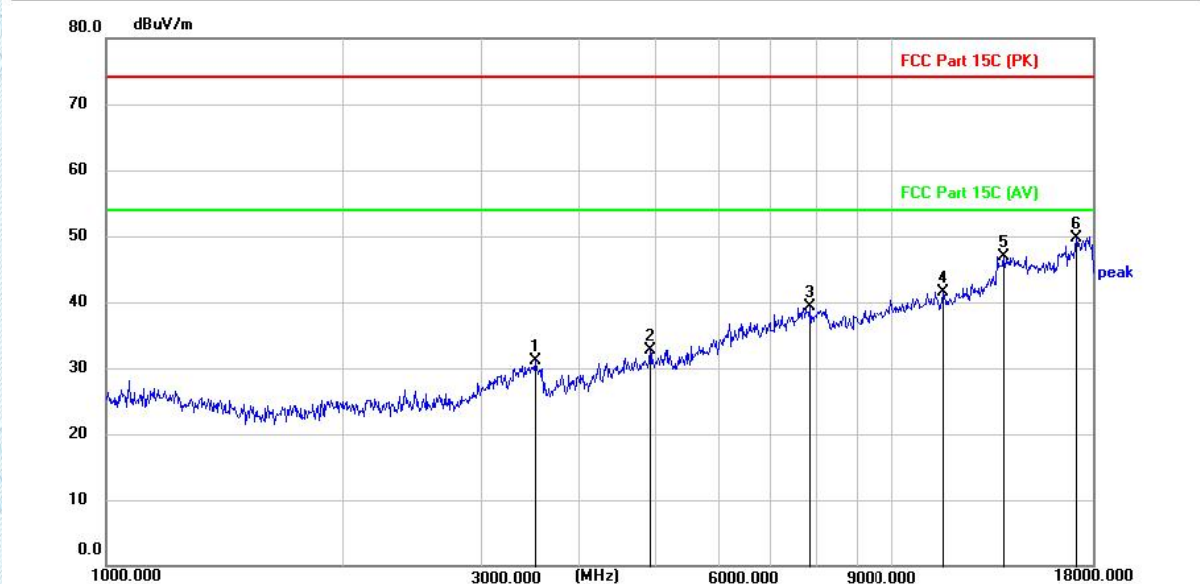
**Test Mode1 / Polarization: Vertical / CH: M**


| No. | Mk. | Freq.<br>MHz | Reading Level<br>(dBuV) | Correct Factor<br>(dB/m) | Measurement<br>(dBuV/m) | Limit<br>(dBuV/m) | Over<br>(dB) | Detector |
|-----|-----|--------------|-------------------------|--------------------------|-------------------------|-------------------|--------------|----------|
| 1   |     | 3551.074     | 41.49                   | -9.55                    | 31.94                   | 74.00             | 42.06        | peak     |
| 2   |     | 5657.973     | 38.78                   | -4.58                    | 34.20                   | 74.00             | 39.80        | peak     |
| 3   |     | 7914.405     | 35.99                   | 1.86                     | 37.85                   | 74.00             | 36.15        | peak     |
| 4   |     | 11662.540    | 33.86                   | 7.19                     | 41.05                   | 74.00             | 32.95        | peak     |
| 5   |     | 14116.404    | 35.18                   | 11.07                    | 46.25                   | 74.00             | 27.75        | peak     |
| 6   | *   | 17185.732    | 36.66                   | 13.16                    | 49.82                   | 74.00             | 24.18        | peak     |

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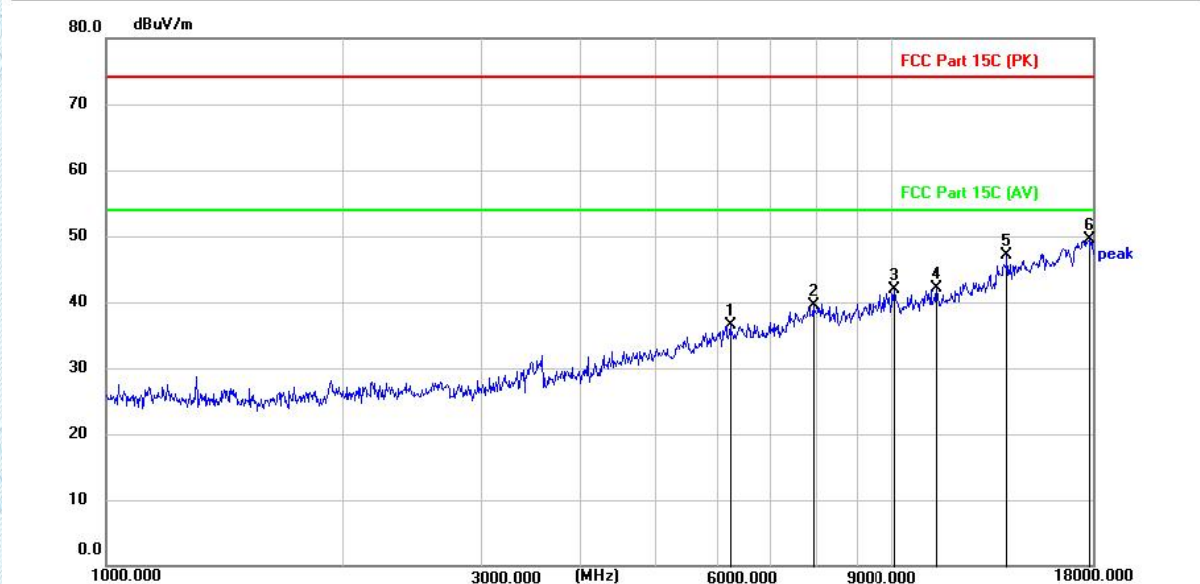
**Test Mode1 / Polarization: Horizontal / CH: H**


| No. | Mk. | Freq.<br>MHz | Reading Level<br>(dBuV) | Correct Factor<br>(dB/m) | Measurement<br>(dBuV/m) | Limit<br>(dBuV/m) | Over<br>(dB) | Detector |
|-----|-----|--------------|-------------------------|--------------------------|-------------------------|-------------------|--------------|----------|
| 1   |     | 3517.700     | 40.82                   | -9.64                    | 31.18                   | 74.00             | 42.82        | peak     |
| 2   |     | 4928.700     | 38.36                   | -5.58                    | 32.78                   | 74.00             | 41.22        | peak     |
| 3   |     | 7861.200     | 37.52                   | 1.73                     | 39.25                   | 74.00             | 34.75        | peak     |
| 4   |     | 11667.500    | 34.31                   | 7.20                     | 41.51                   | 74.00             | 32.49        | peak     |
| 5   |     | 13877.500    | 35.91                   | 11.08                    | 46.99                   | 74.00             | 27.01        | peak     |
| 6   | *   | 17153.400    | 36.64                   | 13.14                    | 49.78                   | 74.00             | 24.22        | peak     |

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**Test Mode1 / Polarization: Vertical / CH: H**


| No. | Mk. | Freq.     | Reading Level | Correct Factor | Measurement | Limit    | Over  |          |
|-----|-----|-----------|---------------|----------------|-------------|----------|-------|----------|
|     |     | MHz       | (dBuV)        | (dB/m)         | (dBuV/m)    | (dBuV/m) | (dB)  | Detector |
| 1   |     | 6229.200  | 39.51         | -3.03          | 36.48       | 74.00    | 37.52 | peak     |
| 2   |     | 7936.000  | 37.58         | 1.90           | 39.48       | 74.00    | 34.52 | peak     |
| 3   |     | 10079.700 | 37.75         | 4.21           | 41.96       | 74.00    | 32.04 | peak     |
| 4   |     | 11426.100 | 35.38         | 6.69           | 42.07       | 74.00    | 31.93 | peak     |
| 5   |     | 14011.800 | 35.83         | 11.21          | 47.04       | 74.00    | 26.96 | peak     |
| 6   | *   | 17801.100 | 36.04         | 13.53          | 49.57       | 74.00    | 24.43 | peak     |

**Note:**

- 1.From 18GHz to 26.5GHz,the amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
- 2.Since the peak value is less than the limit of the AVG value, there is no AVG data.

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## 5. EUT TEST PHOTOS

Conducted Emission at AC power line



Emissions in restricted frequency bands (below 1GHz)



**Emissions in restricted frequency bands (above 1GHz)**

TRF RF\_R1

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## 6. PHOTOGRAPHS OF EUT CONSTRUCTIONAL

Refer to Appendix - EUT Photos for KS2306S3146E.

# Appendix

## 6.1. Appendix A: DTS Bandwidth

### 6.1.1. Test Result

| TestMode | Antenna | Freq[MHz] | DTS BW [MHz] | FL[MHz] | FH[MHz] | Limit[MHz] | Verdict |
|----------|---------|-----------|--------------|---------|---------|------------|---------|
| BLE_1M   | Ant1    | 2402      | 0.65         | 2401.61 | 2402.26 | 0.5        | PASS    |
|          |         | 2440      | 0.65         | 2439.61 | 2440.26 | 0.5        | PASS    |
|          |         | 2480      | 0.65         | 2479.61 | 2480.26 | 0.5        | PASS    |
| BLE_2M   | Ant1    | 2402      | 1.13         | 2401.39 | 2402.52 | 0.5        | PASS    |
|          |         | 2440      | 1.13         | 2439.39 | 2440.52 | 0.5        | PASS    |
|          |         | 2480      | 1.12         | 2479.39 | 2480.51 | 0.5        | PASS    |

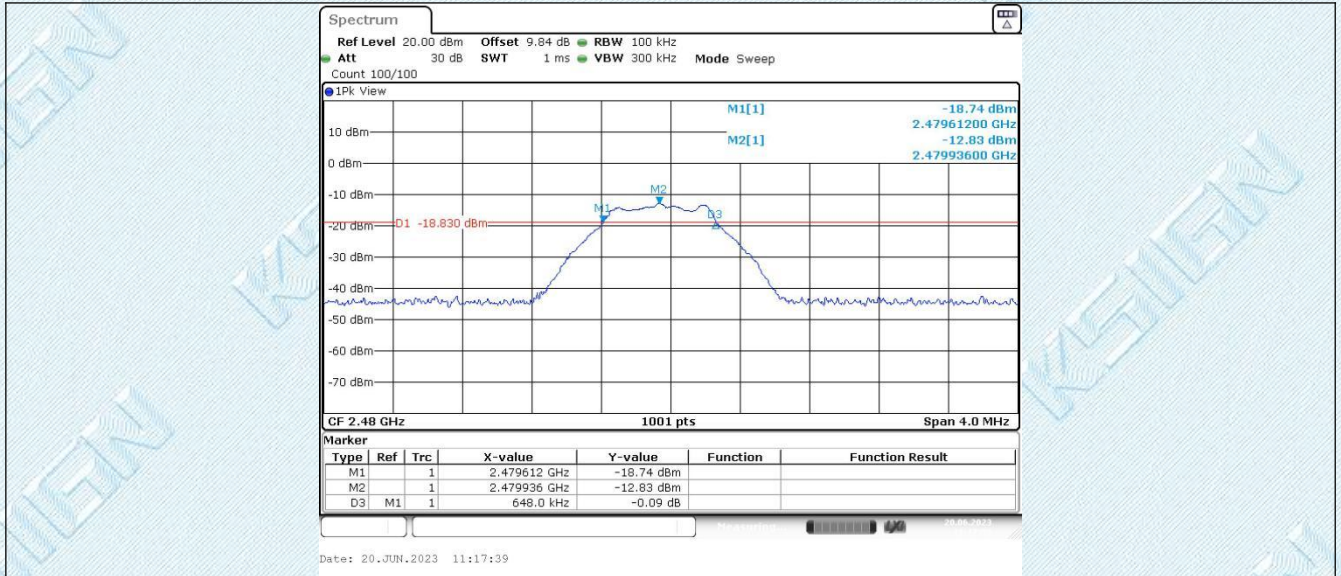
## 6.1.2. Test Graphs



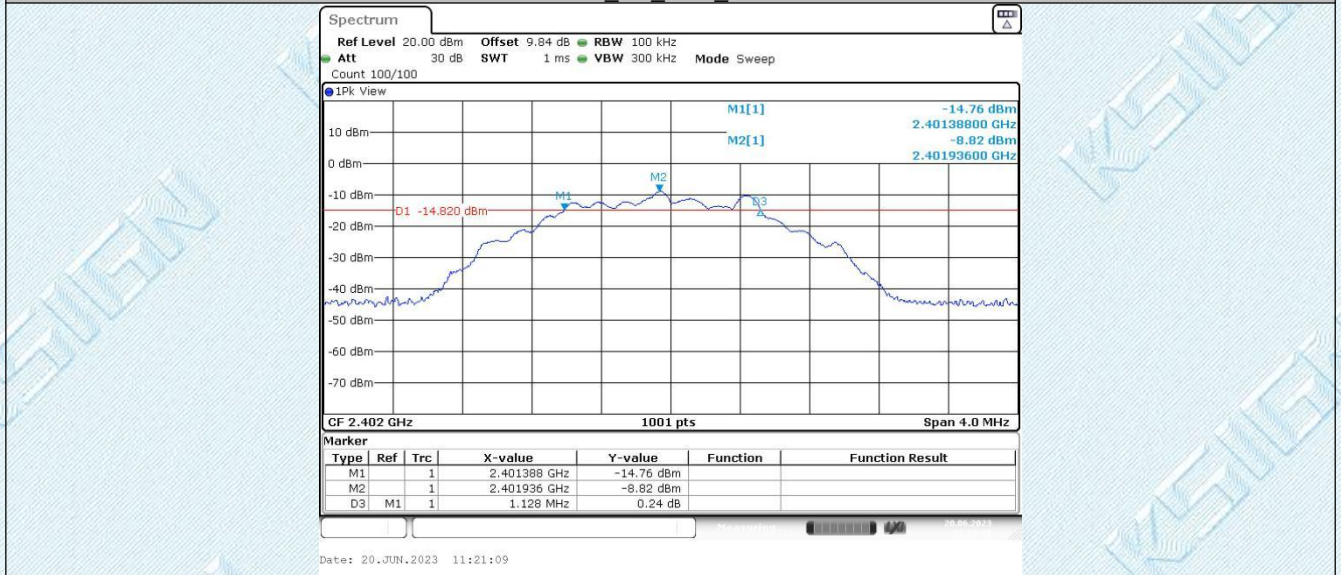
TRF RF\_R1

Add: West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

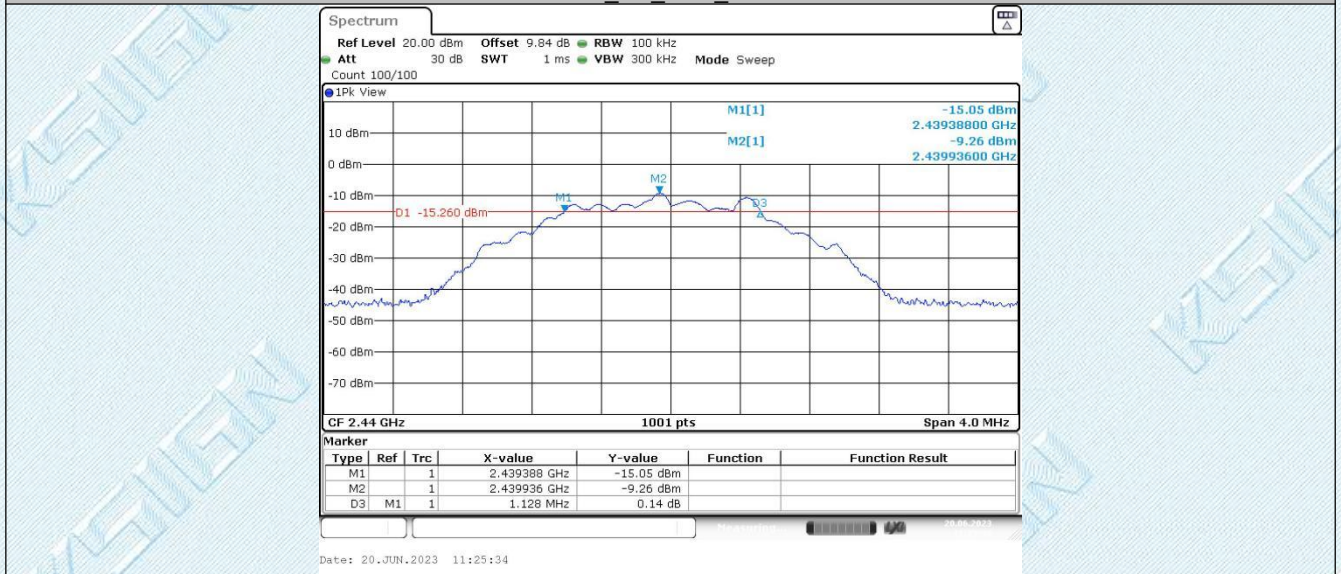
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BLE\_2M\_Ant1\_2402



BLE\_2M\_Ant1\_2440

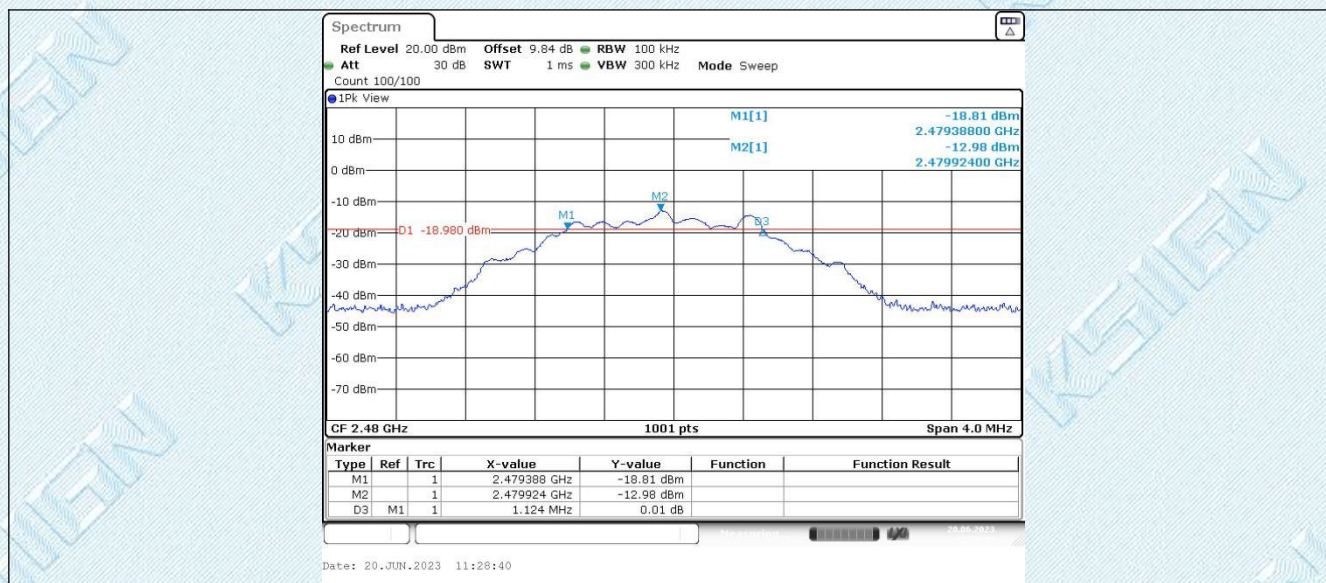


BLE\_2M\_Ant1\_2480

TRF RF\_R1

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## 6.2. Appendix B: Occupied Channel Bandwidth

### 6.2.1. Test Result

| TestMode | Antenna | Freq[MHz] | OCB [MHz] | FL[MHz]  | FH[MHz]  | Limit[MHz] | Verdict |
|----------|---------|-----------|-----------|----------|----------|------------|---------|
| BLE_1M   | Ant1    | 2402      | 0.947     | 2401.461 | 2402.408 | ---        | PASS    |
|          |         | 2440      | 0.951     | 2439.461 | 2440.412 | ---        | PASS    |
|          |         | 2480      | 0.983     | 2479.445 | 2480.428 | ---        | PASS    |
| BLE_2M   | Ant1    | 2402      | 1.938     | 2400.973 | 2402.911 | ---        | PASS    |
|          |         | 2440      | 1.942     | 2438.969 | 2440.911 | ---        | PASS    |
|          |         | 2480      | 1.982     | 2478.953 | 2480.935 | ---        | PASS    |

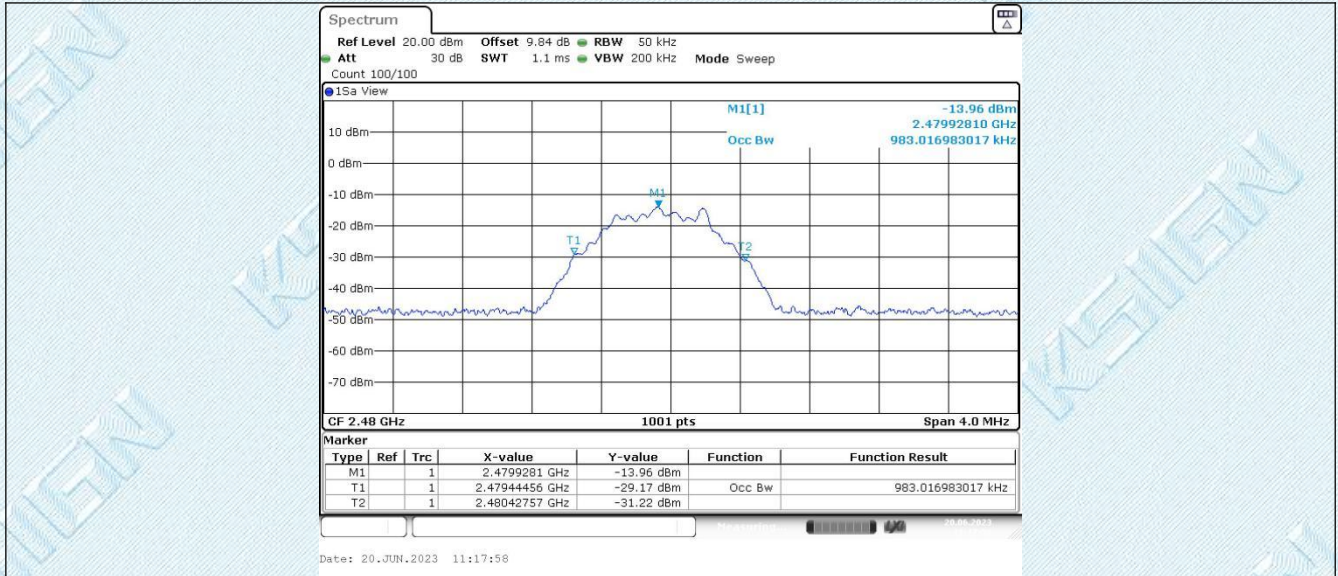
## 6.2.2. Test Graphs



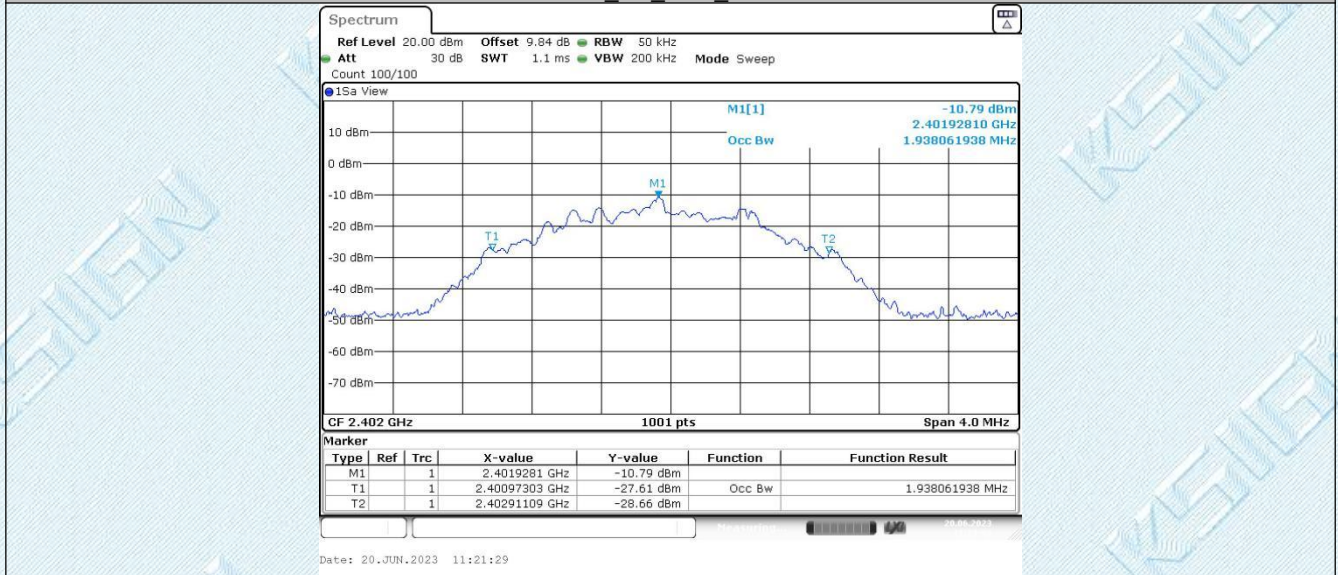
TRF RF\_R1

Add: West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

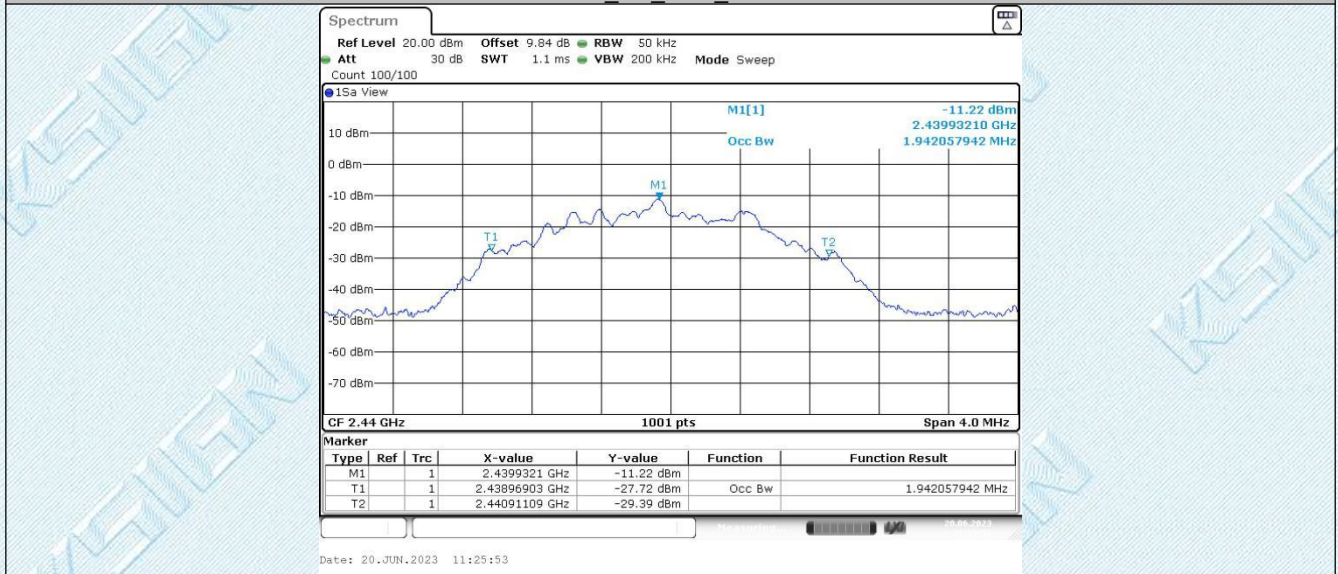
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BLE\_2M\_Ant1\_2402



BLE\_2M\_Ant1\_2440

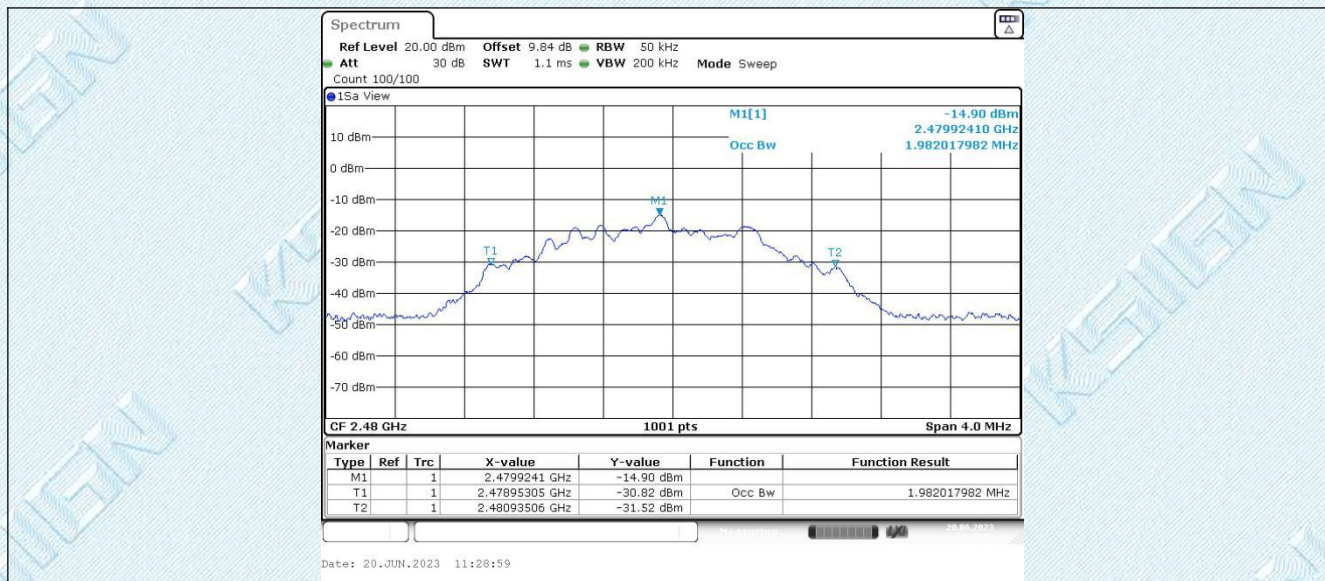


BLE\_2M\_Ant1\_2480

TRF RF\_R1

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### 6.3. Appendix C: Maximum conducted output power

#### 6.3.1. Test Result Peak

| TestMode | Antenna | Freq[MHz] | Conducted Power[dBm] | Conducted Limit[dBm] | Verdict |
|----------|---------|-----------|----------------------|----------------------|---------|
| BLE_1M   | Ant1    | 2402      | -8.10                | ≤30                  | PASS    |
|          |         | 2440      | -8.37                | ≤30                  | PASS    |
|          |         | 2480      | -11.87               | ≤30                  | PASS    |
| BLE_2M   | Ant1    | 2402      | -8.11                | ≤30                  | PASS    |
|          |         | 2440      | -8.50                | ≤30                  | PASS    |
|          |         | 2480      | -12.08               | ≤30                  | PASS    |

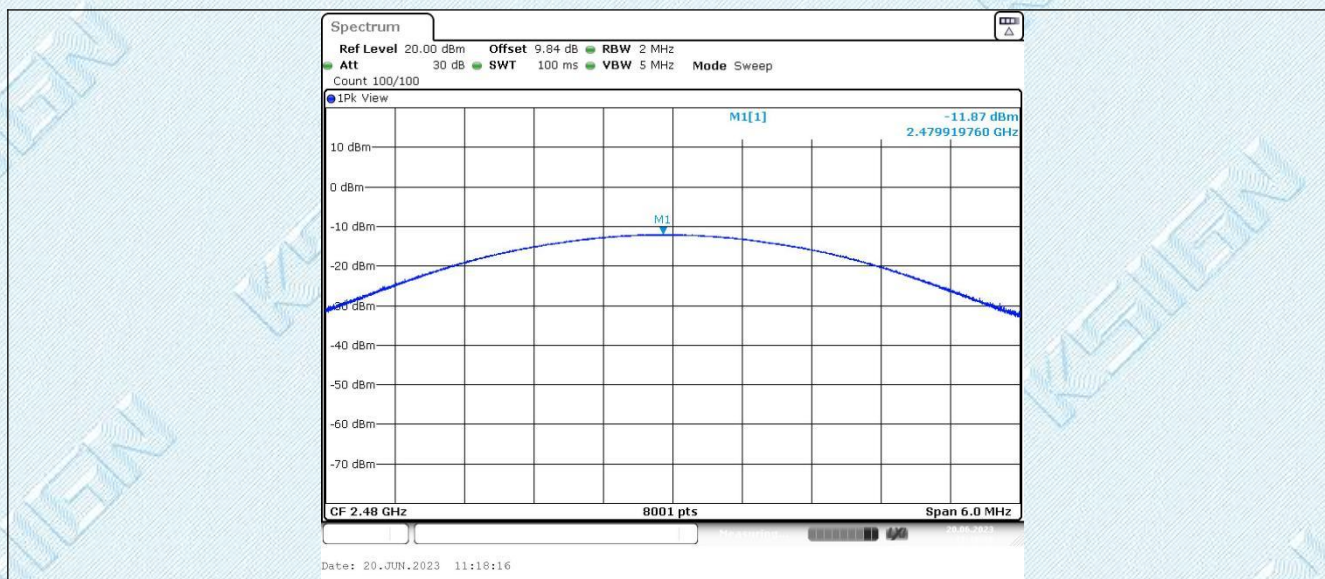
### 6.3.2. Test Graphs Peak



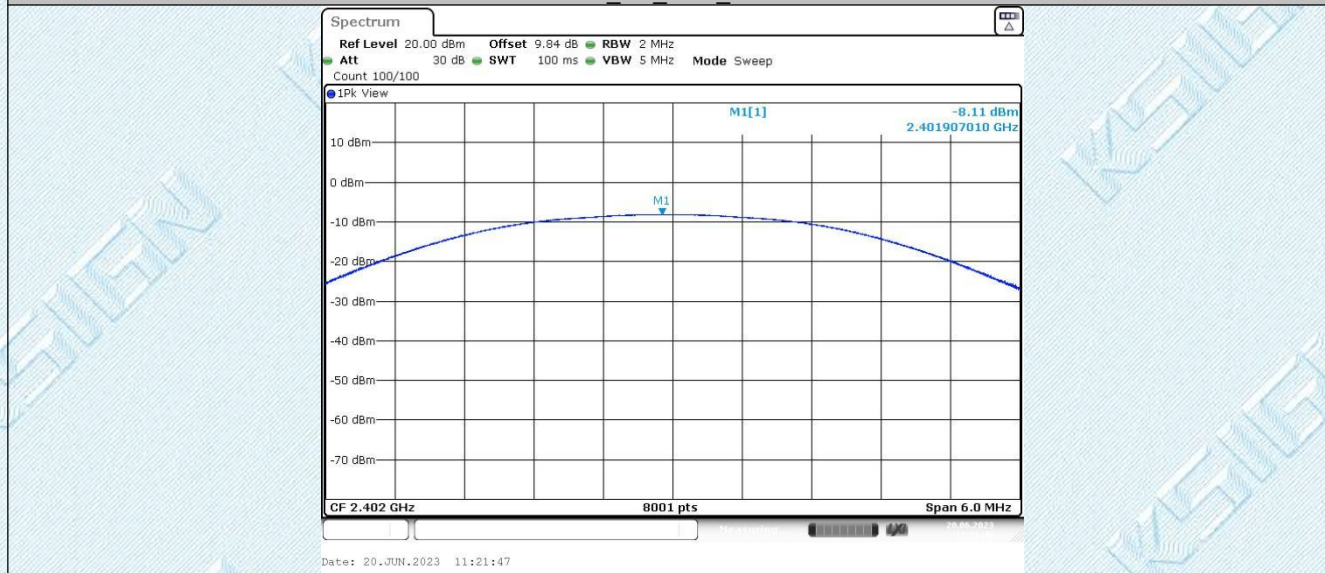
TRF RF\_R1

Add: West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

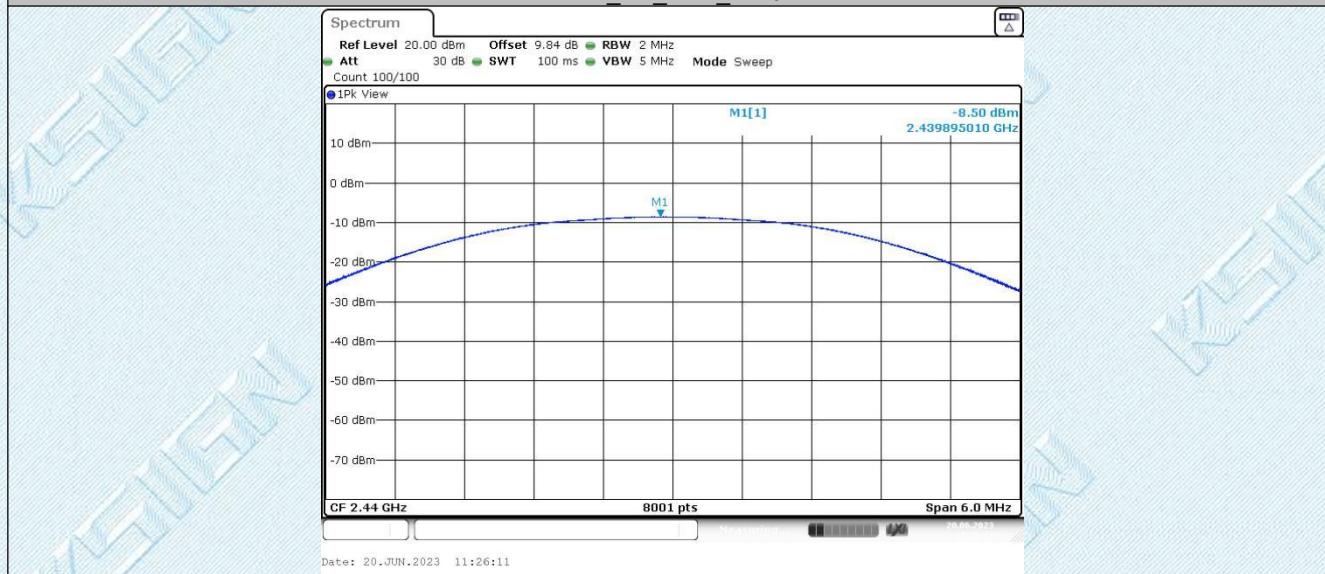
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BLE\_2M\_Ant1\_2402



BLE\_2M\_Ant1\_2440

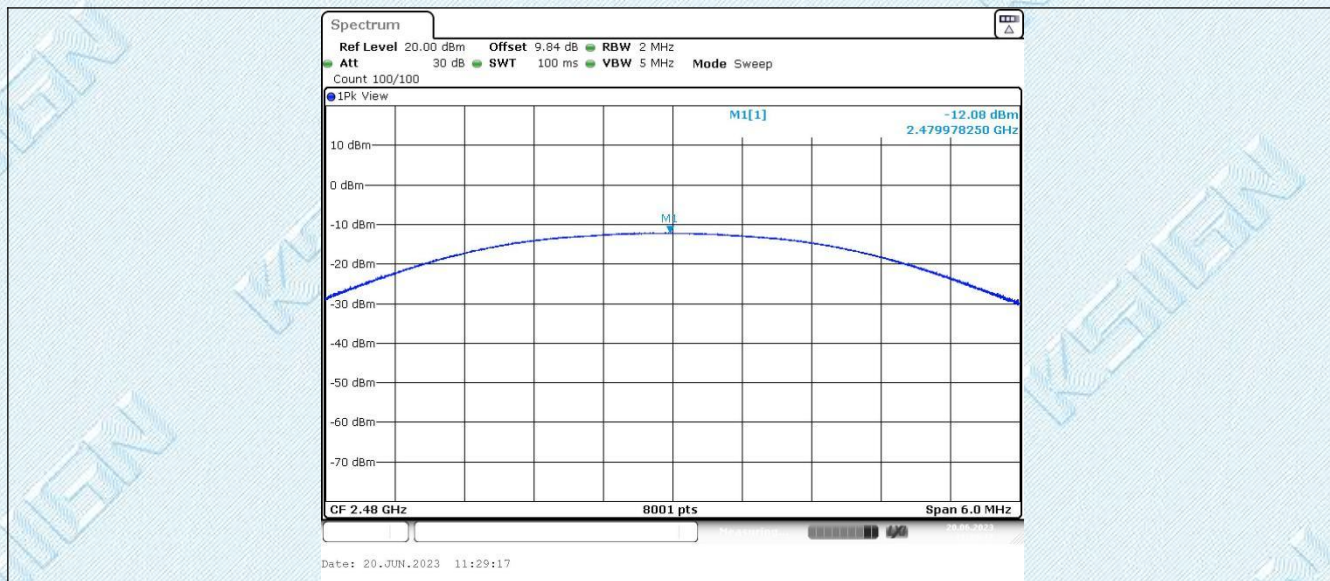


BLE\_2M\_Ant1\_2480

TRF RF\_R1

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TRF RF\_R1

Add: West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

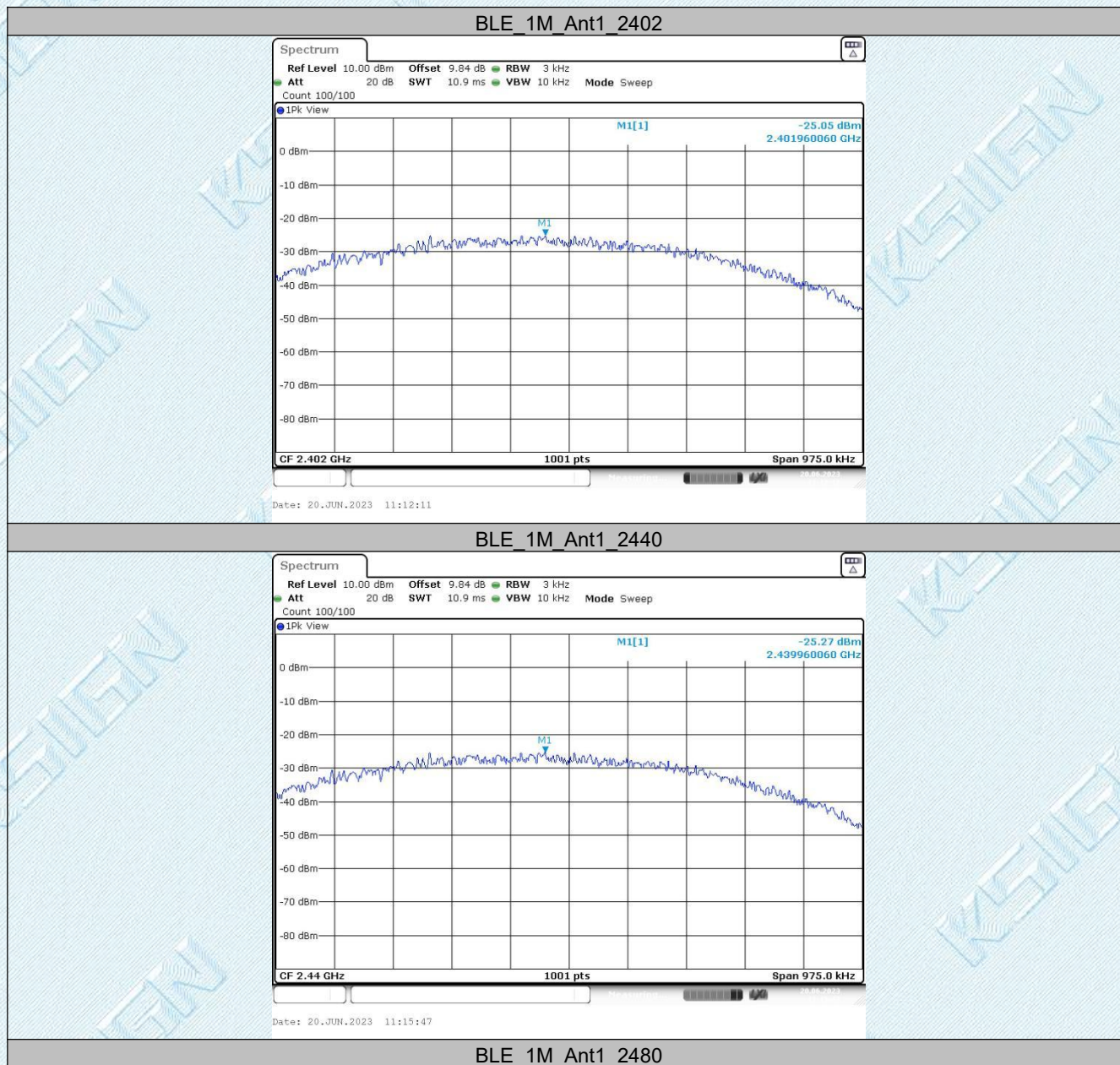
Tel: +(86) 0755-2985 2678 Fax: +(86) 0755-2985 2397 E-mail: info@gdksign.cn Web: www.gdksign.com

## 6.4. Appendix D: Maximum power spectral density

### 6.4.1. Test Result

| TestMode | Antenna | Freq[MHz] | Result[dBm/3kHz] | Limit[dBm/3kHz] | Verdict |
|----------|---------|-----------|------------------|-----------------|---------|
| BLE_1M   | Ant1    | 2402      | -25.05           | ≤8.00           | PASS    |
|          |         | 2440      | -25.27           | ≤8.00           | PASS    |
|          |         | 2480      | -29.13           | ≤8.00           | PASS    |
| BLE_2M   | Ant1    | 2402      | -26.79           | ≤8.00           | PASS    |
|          |         | 2440      | -27.23           | ≤8.00           | PASS    |
|          |         | 2480      | -30.96           | ≤8.00           | PASS    |

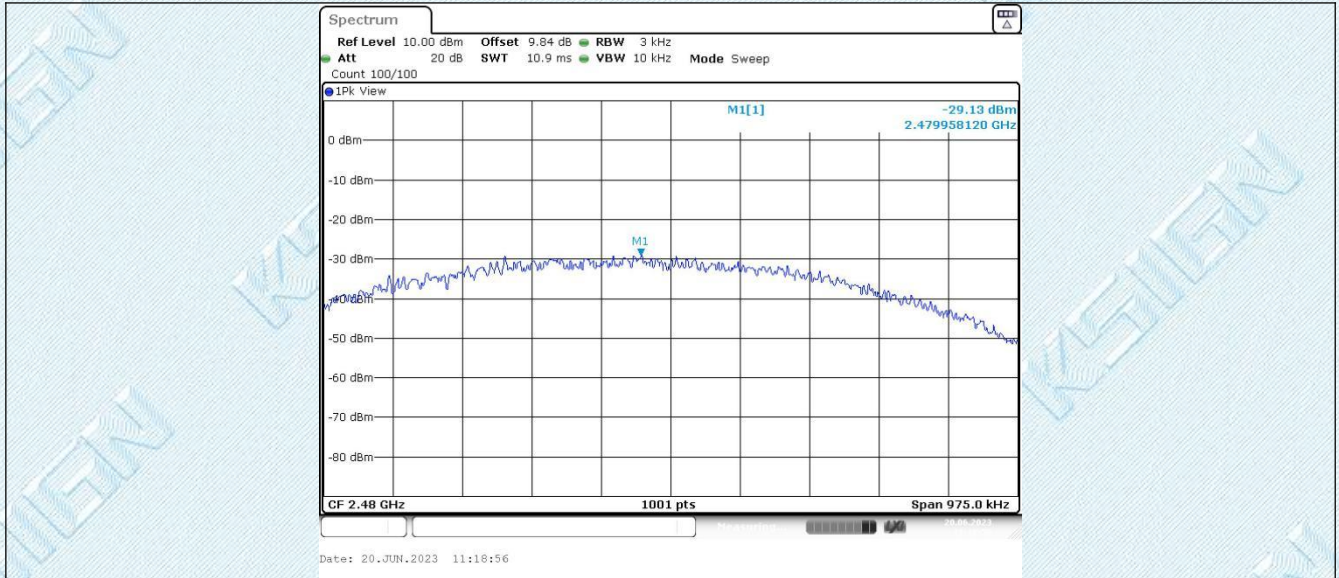
## 6.4.2. Test Graphs



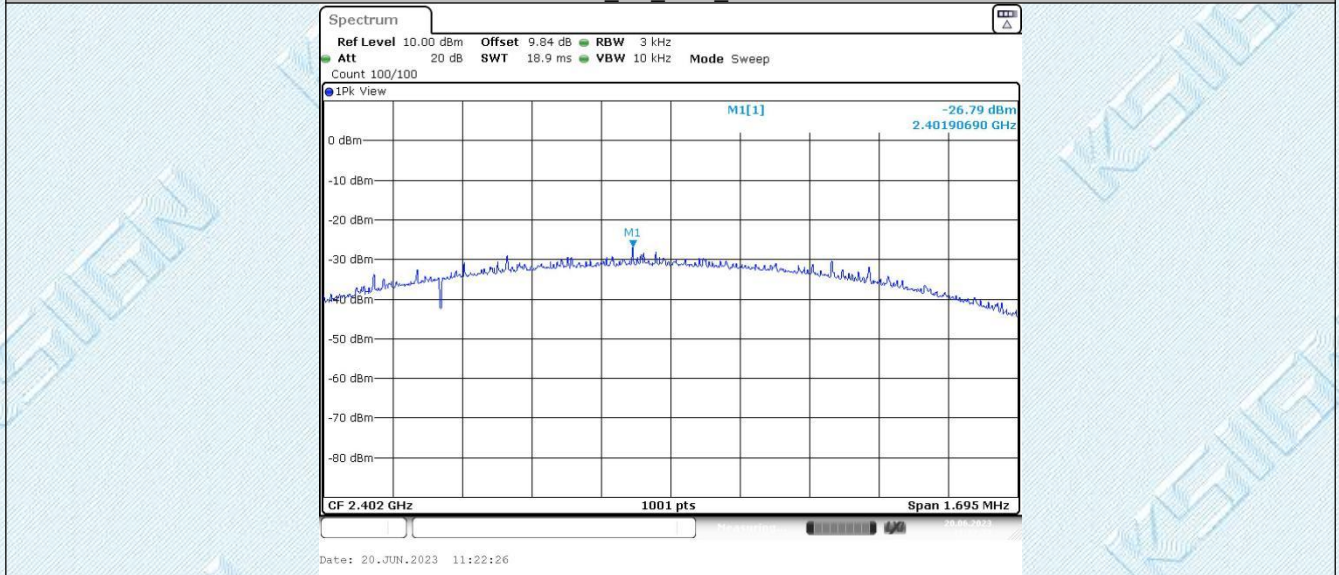
TRF RF\_R1

Add: West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

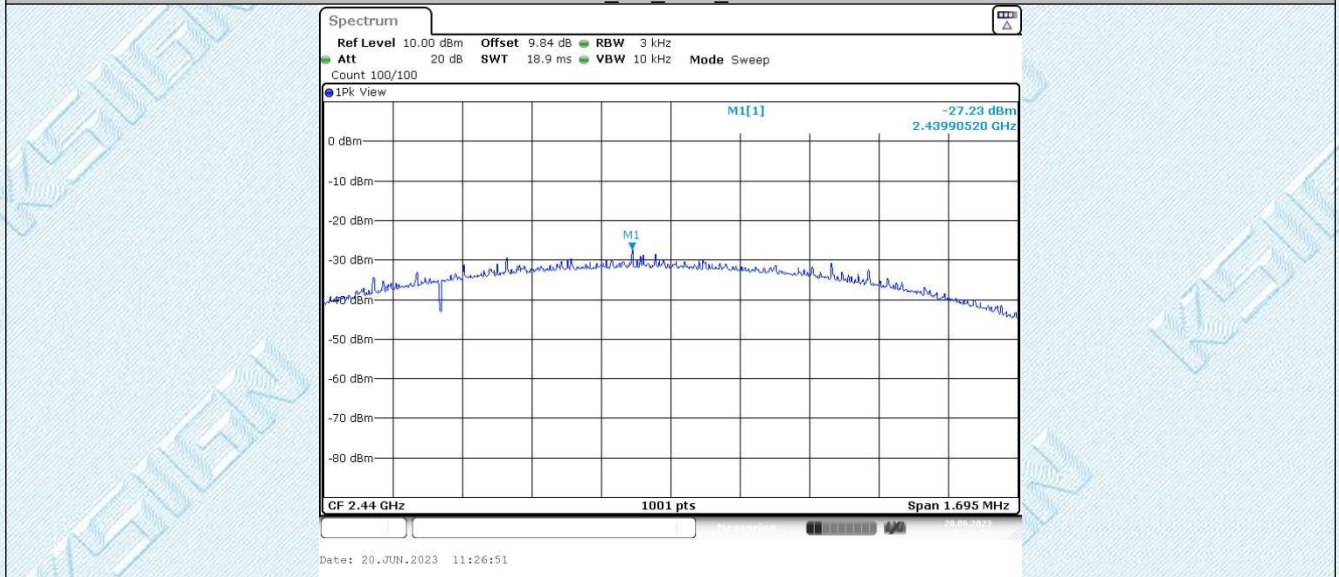
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BLE\_2M\_Ant1\_2402



BLE\_2M\_Ant1\_2440

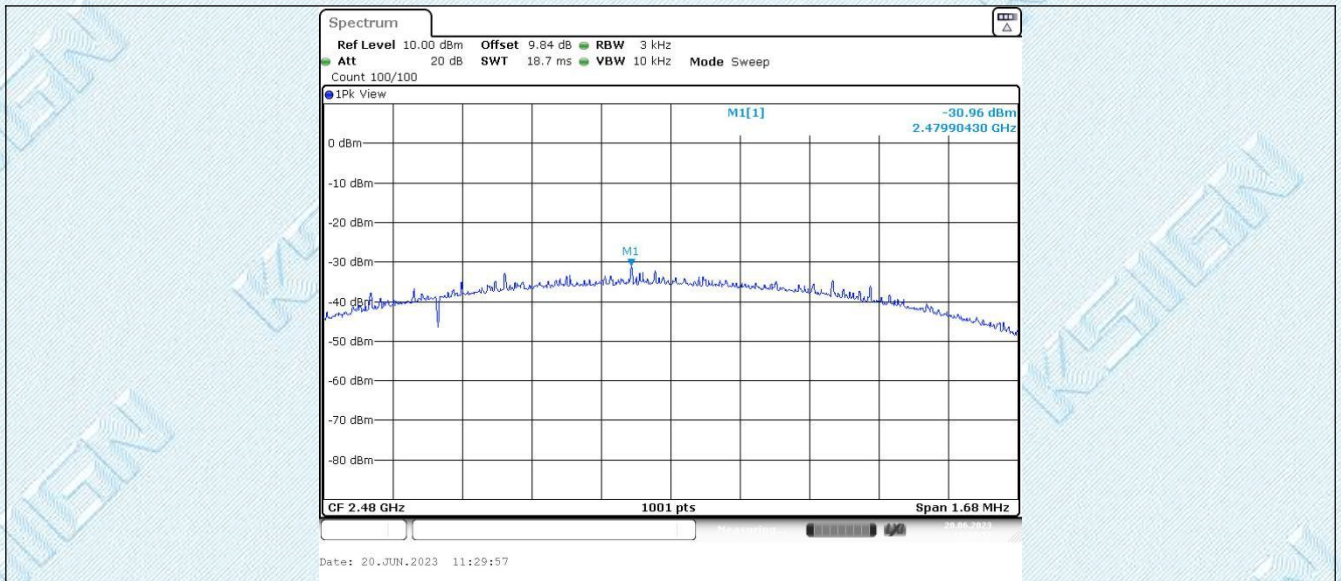


BLE\_2M\_Ant1\_2480

TRF RF\_R1

Add: West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

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TRF RF\_R1

Add: West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

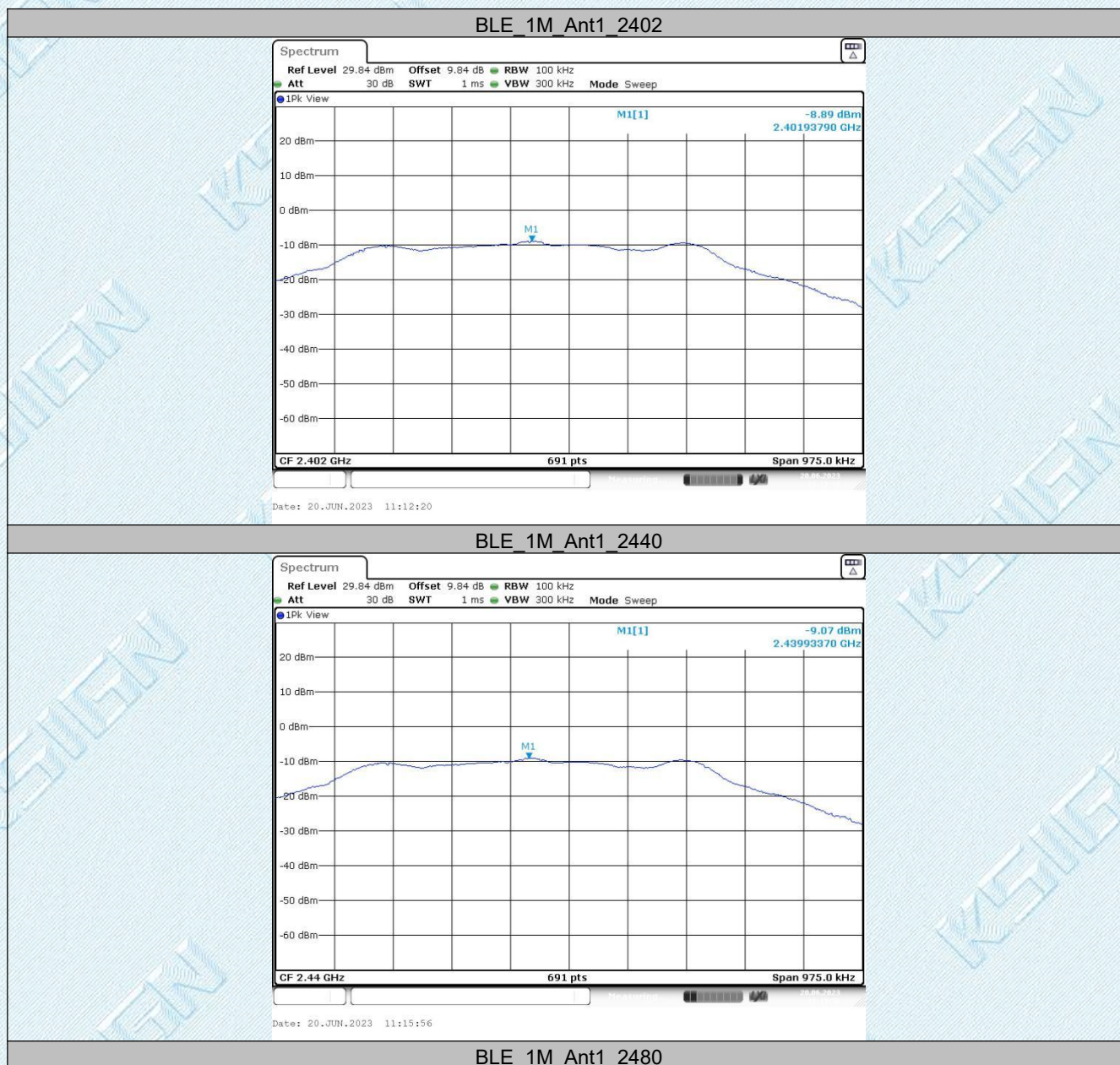
Tel: +(86) 0755-2985 2678 Fax: +(86) 0755-2985 2397 E-mail: info@gdkesign.cn Web: www.gdkesign.com

## 6.5. ppendix E: Reference level measurement

### 6.5.1. Test Result

| TestMode | Antenna | Freq[MHz] | Max.Point[MHz] | Result[dBm] |
|----------|---------|-----------|----------------|-------------|
| BLE_1M   | Ant1    | 2402      | 2401.94        | -8.89       |
|          |         | 2440      | 2439.93        | -9.07       |
|          |         | 2480      | 2479.94        | -12.84      |
| BLE_2M   | Ant1    | 2402      | 2401.94        | -8.79       |
|          |         | 2440      | 2439.93        | -9.29       |
|          |         | 2480      | 2479.93        | -12.94      |

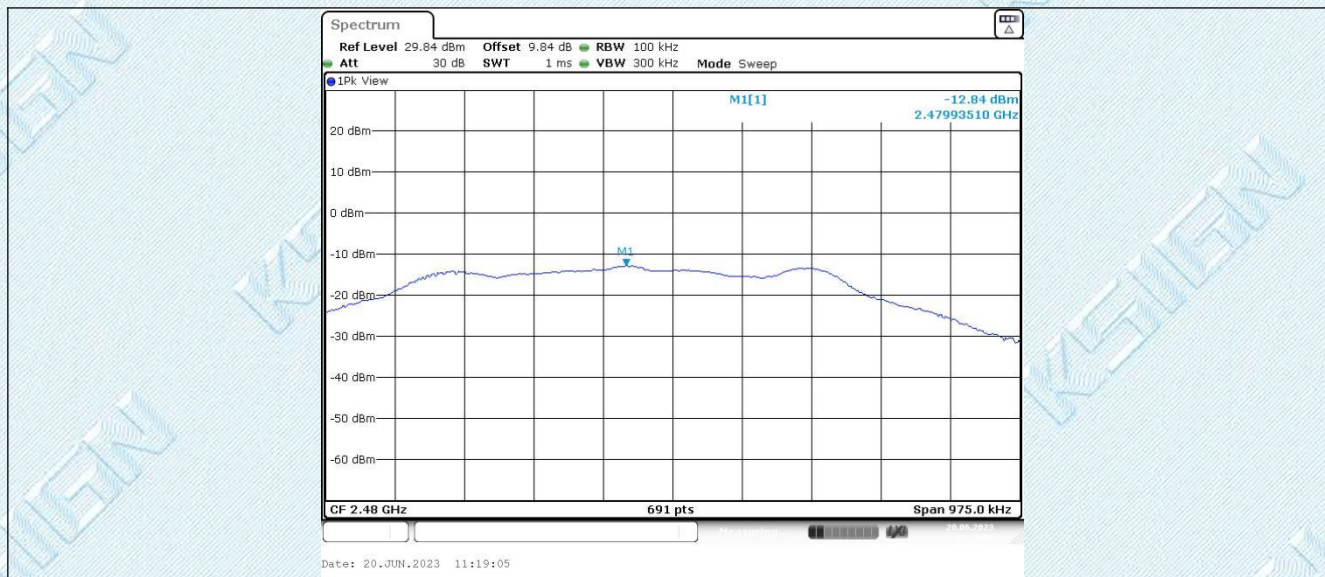
## 6.5.2. Test Graphs



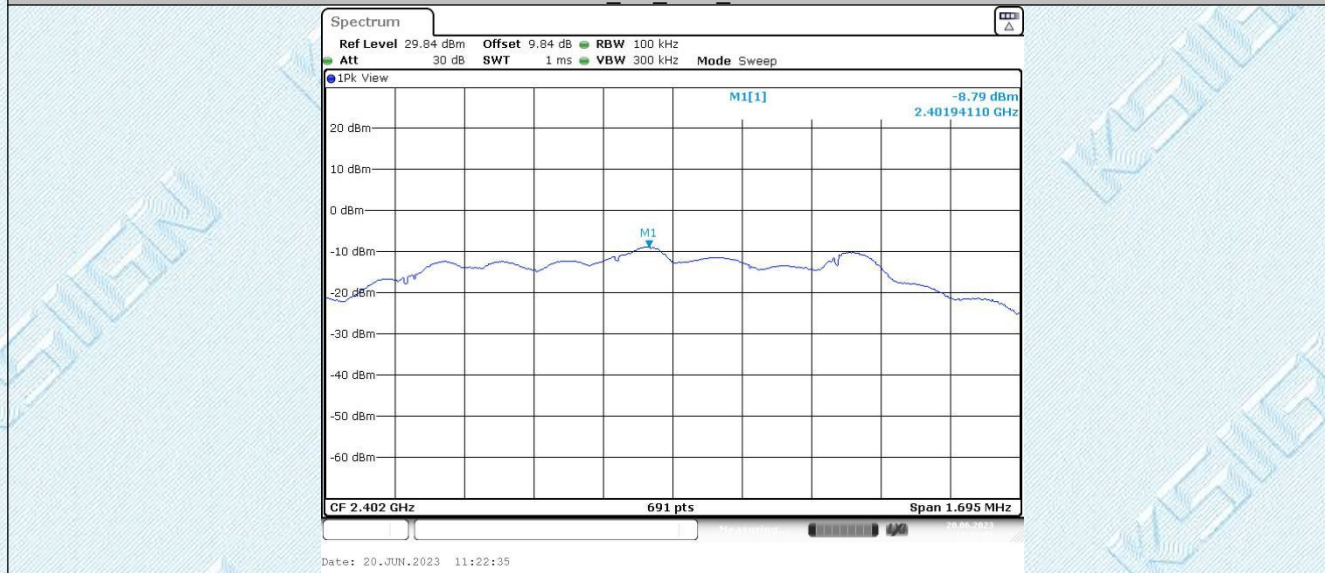
TRF RF\_R1

Add: West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

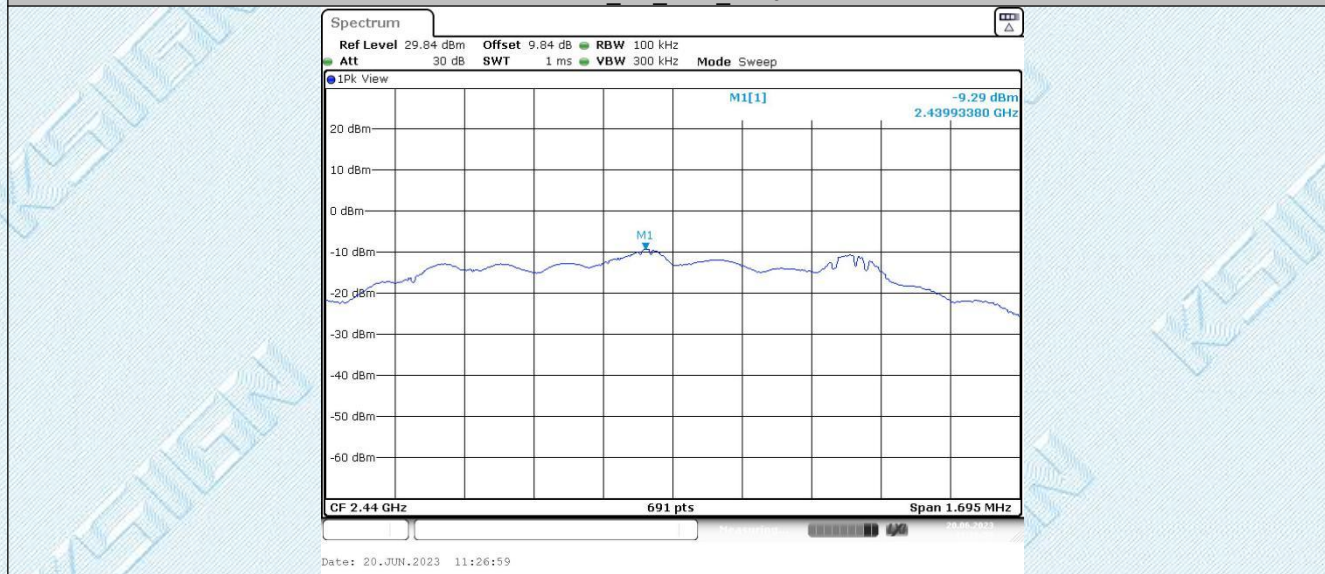
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BLE\_2M\_Ant1\_2402



BLE\_2M\_Ant1\_2440

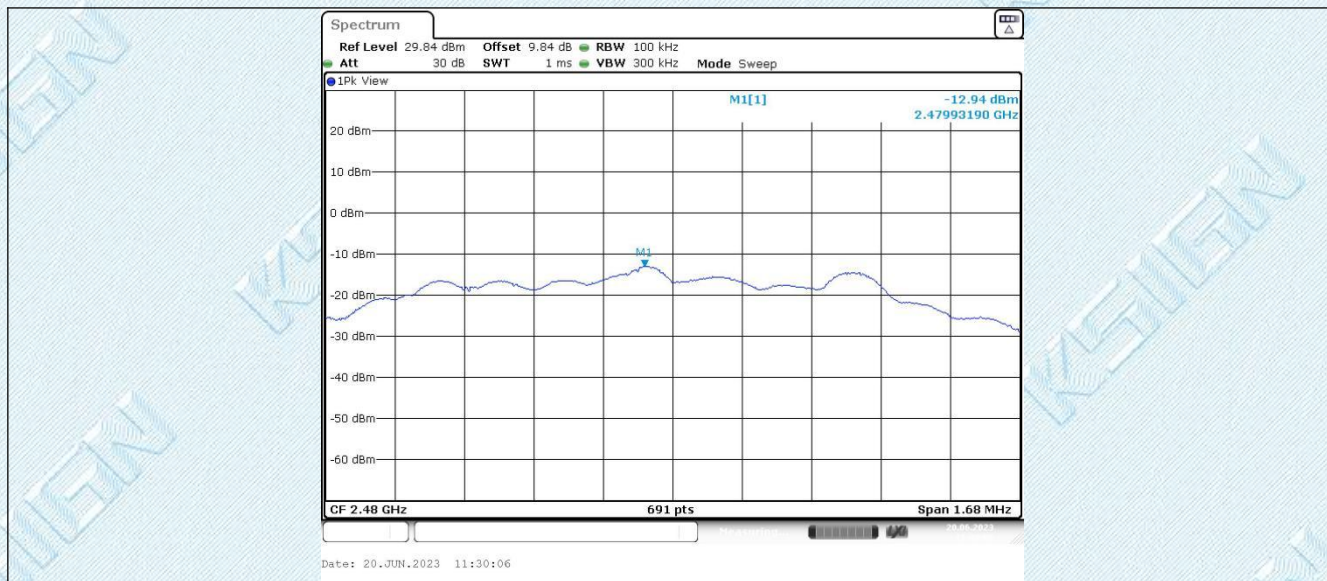


BLE\_2M\_Ant1\_2480

TRF RF\_R1

Add: West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

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TRF RF\_R1

Add: West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

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## 6.6. Appendix F: Band edge measurements

### 6.6.1. Test Result

| TestMode | Antenna | ChName | Freq[MHz] | RefLevel[dBm] | Result[dBm] | Limit[dBm] | Verdict |
|----------|---------|--------|-----------|---------------|-------------|------------|---------|
| BLE_1M   | Ant1    | Low    | 2402      | -8.89         | -40.82      | ≤-28.89    | PASS    |
|          |         | High   | 2480      | -12.84        | -39.77      | ≤-32.84    | PASS    |
| BLE_2M   | Ant1    | Low    | 2402      | -8.79         | -40.8       | ≤-28.79    | PASS    |
|          |         | High   | 2480      | -12.94        | -40.87      | ≤-32.94    | PASS    |

## 6.6.2. Test Graphs



TRF RF\_R1

Add: West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

Tel: +(86) 0755-2985 2678 Fax: +(86) 0755-2985 2397 E-mail: info@gdkesign.cn Web: www.gdkesign.com



TRF RF\_R1

Add: West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

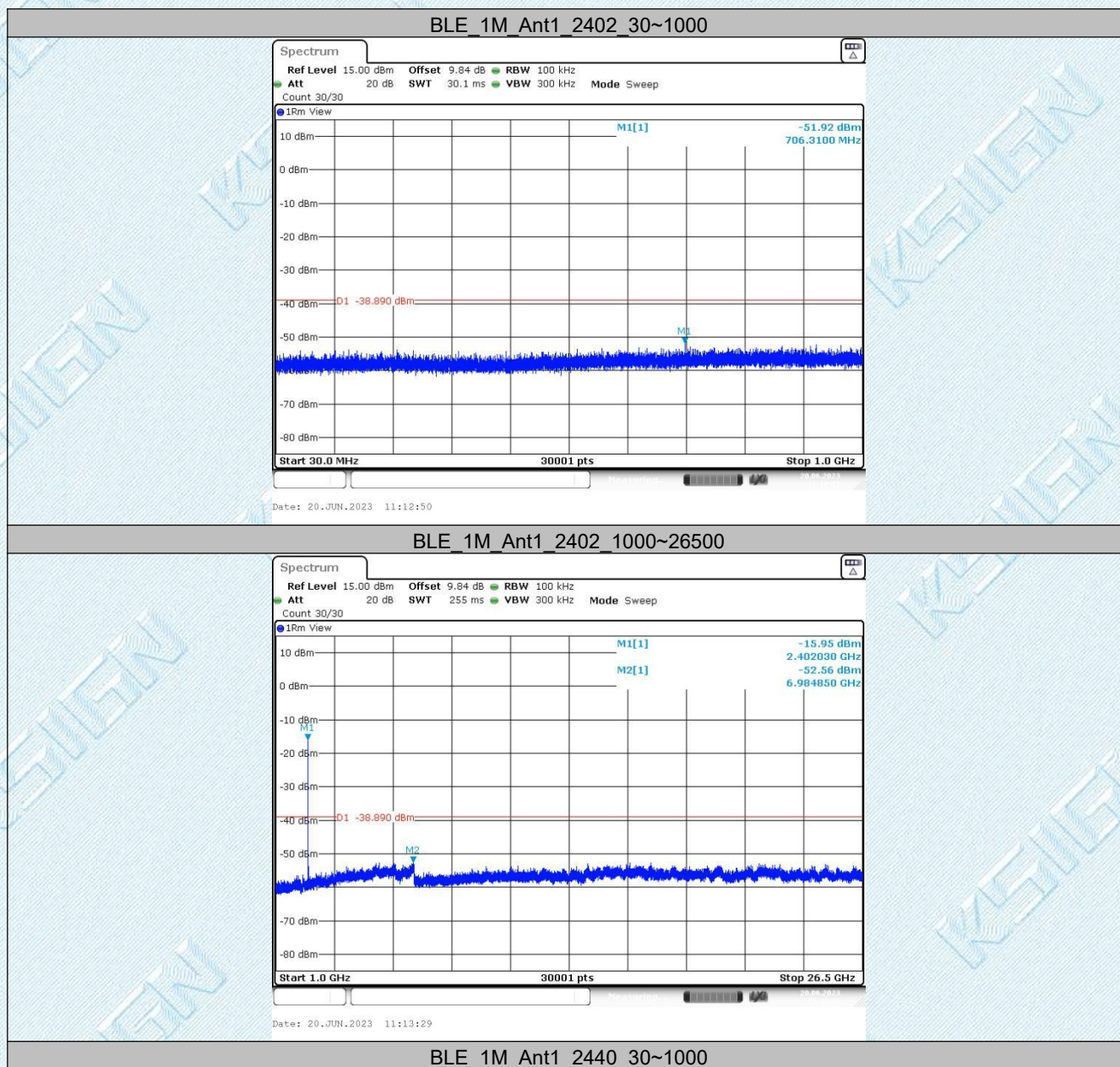
Tel: +(86) 0755-2985 2678 Fax: +(86) 0755-2985 2397 E-mail: info@gdkesign.cn Web: www.gdkesign.com

## 6.7. Appendix G: Conducted Spurious Emission

### 6.7.1. Test Result

| TestMode | Antenna | Freq[MHz] | FreqRange [MHz] | RefLevel [dBm] | Result[dBm] | Limit[dBm] | Verdict |
|----------|---------|-----------|-----------------|----------------|-------------|------------|---------|
| BLE_1M   | Ant1    | 2402      | 30~1000         | -8.89          | -51.92      | ≤-38.89    | PASS    |
|          |         |           | 1000~26500      | -8.89          | -52.56      | ≤-38.89    | PASS    |
|          |         | 2440      | 30~1000         | -9.07          | -52.19      | ≤-39.07    | PASS    |
|          |         |           | 1000~26500      | -9.07          | -52.47      | ≤-39.07    | PASS    |
|          |         | 2480      | 30~1000         | -12.84         | -51.29      | ≤-42.84    | PASS    |
|          |         |           | 1000~26500      | -12.84         | -52.11      | ≤-42.84    | PASS    |
| BLE_2M   | Ant1    | 2402      | 30~1000         | -8.79          | -52.14      | ≤-38.79    | PASS    |
|          |         |           | 1000~26500      | -8.79          | -51.78      | ≤-38.79    | PASS    |
|          |         | 2440      | 30~1000         | -9.29          | -51.59      | ≤-39.29    | PASS    |
|          |         |           | 1000~26500      | -9.29          | -52.24      | ≤-39.29    | PASS    |
|          |         | 2480      | 30~1000         | -12.94         | -51.45      | ≤-42.94    | PASS    |
|          |         |           | 1000~26500      | -12.94         | -51.88      | ≤-42.94    | PASS    |

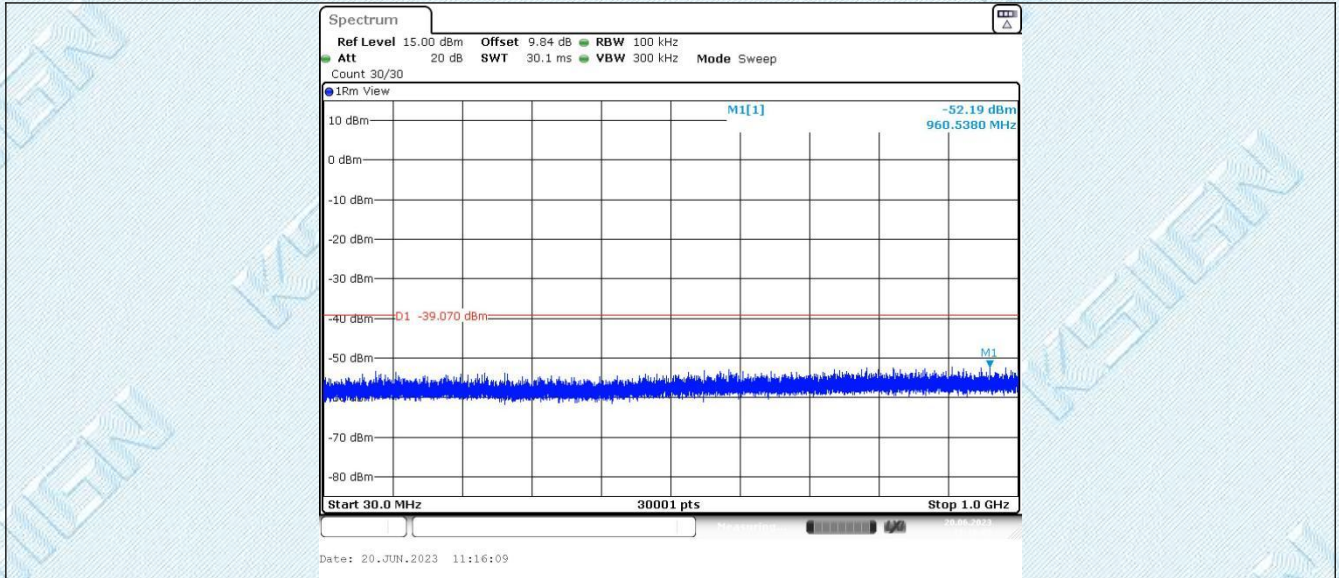
## 6.7.2. Test Graphs



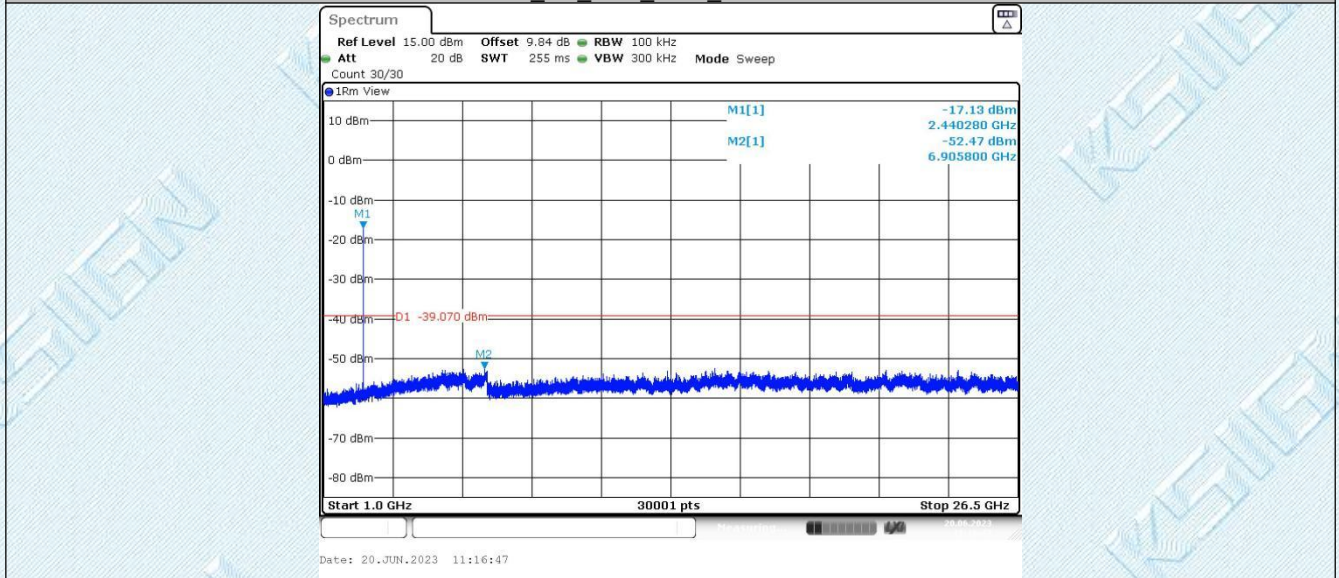
TRF RF\_R1

Add: West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

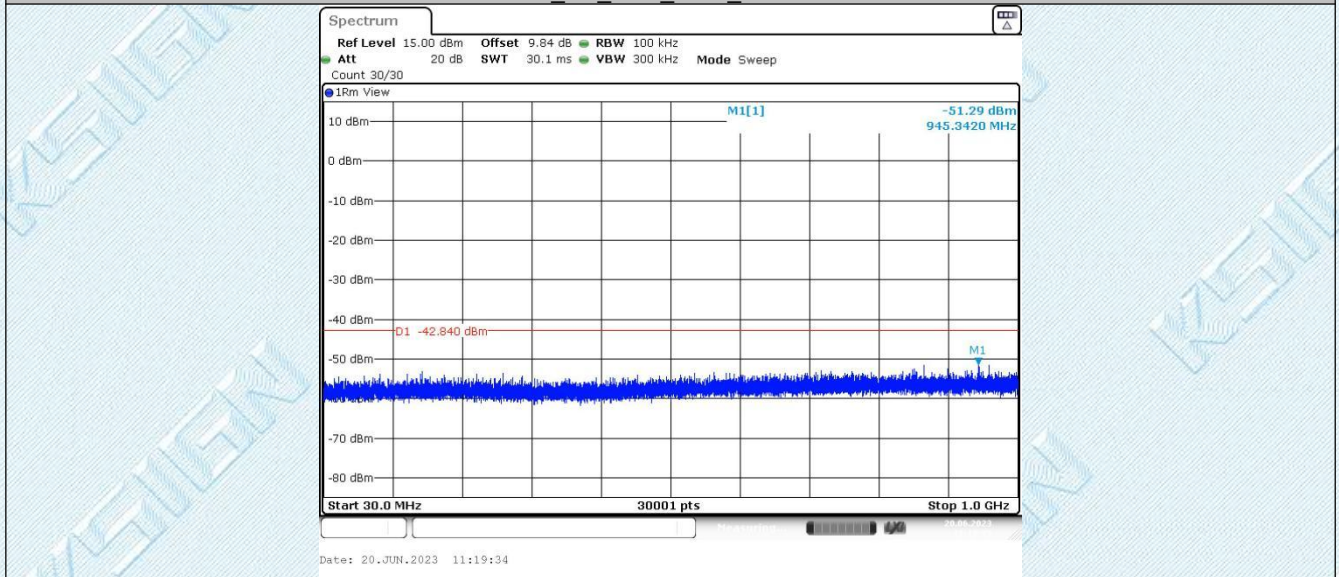
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BLE\_1M\_Ant1\_2440\_1000~26500



BLE\_1M\_Ant1\_2480\_30~1000

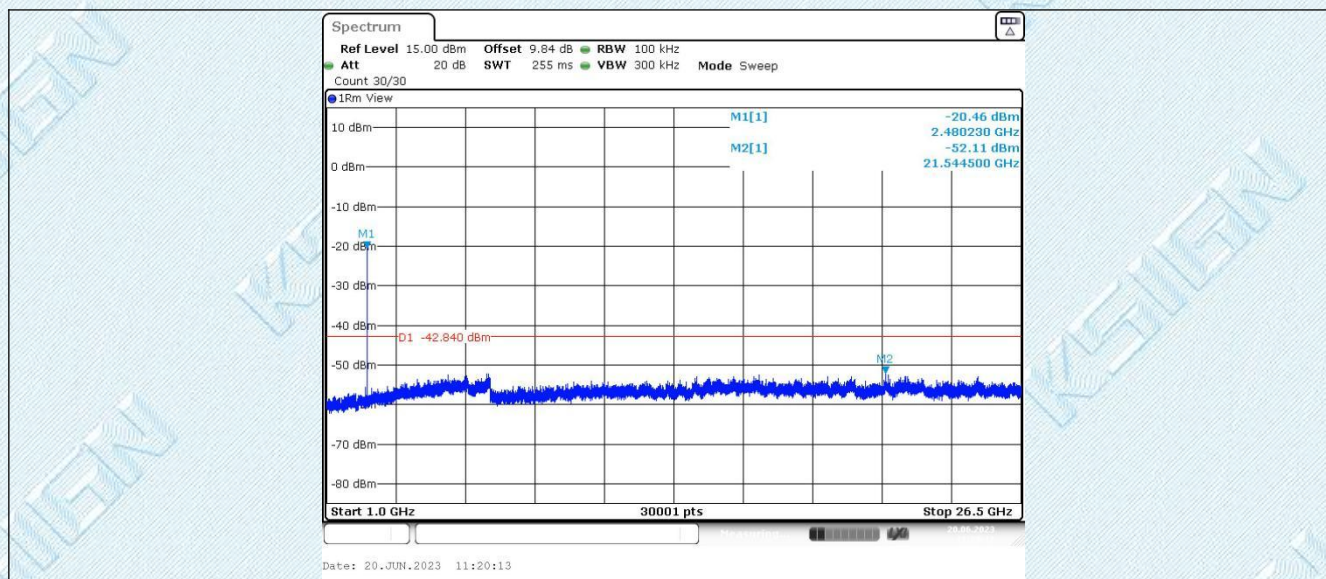


BLE\_1M\_Ant1\_2480\_1000~26500

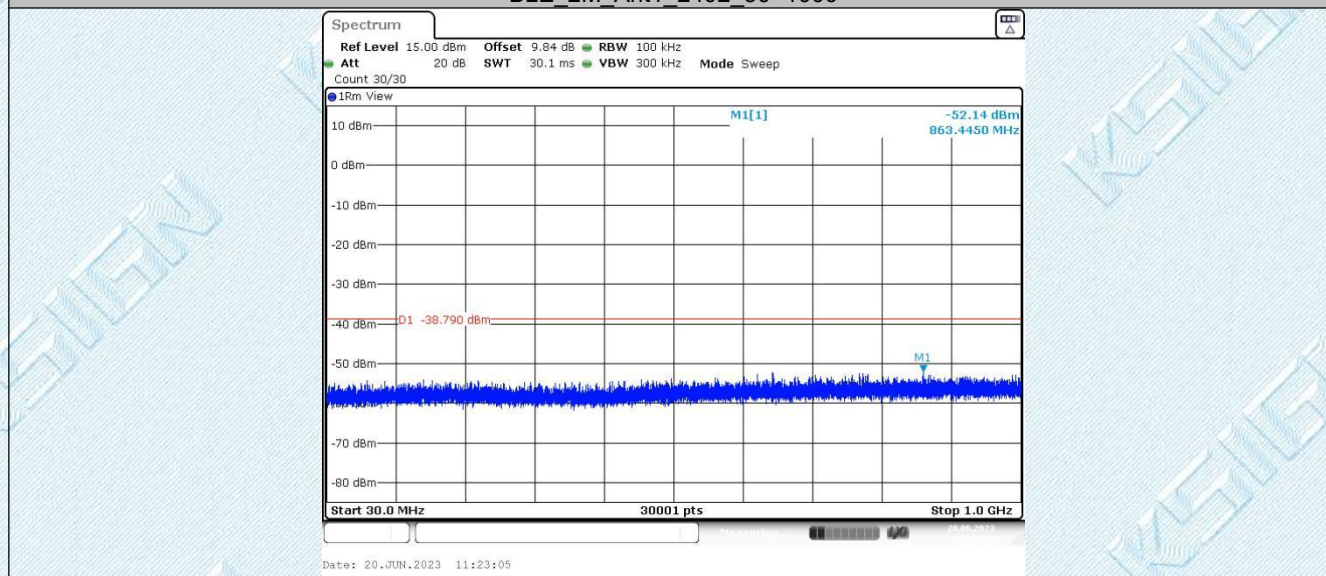
TRF RF\_R1

Add: West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

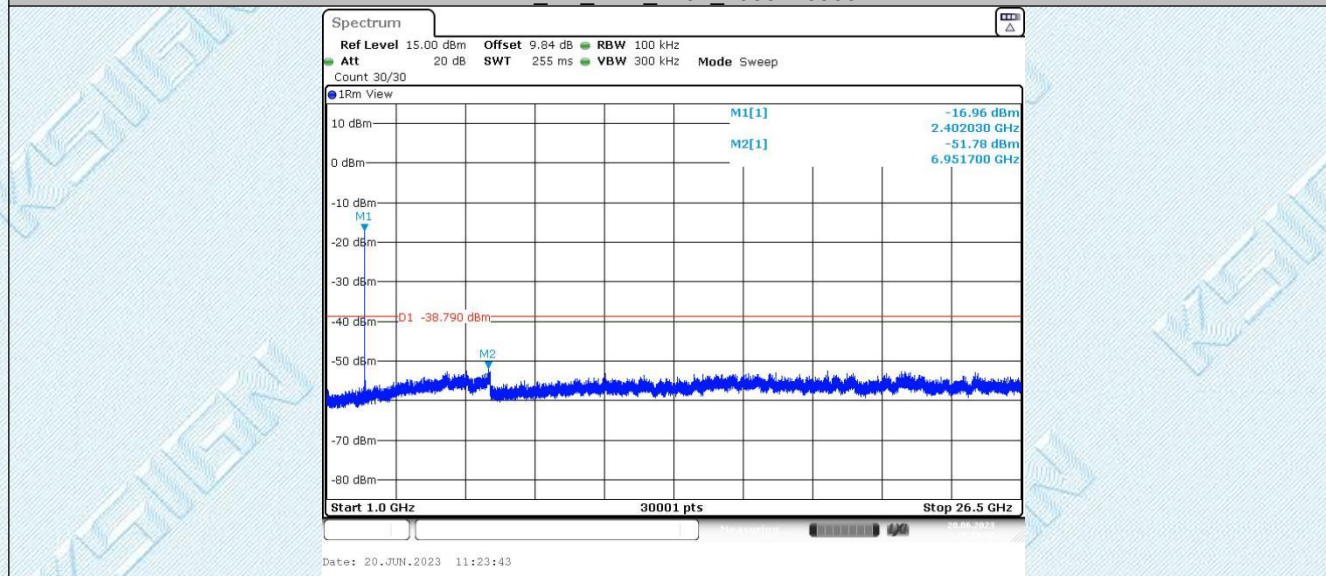
Tel: +(86) 0755-2985 2678 Fax: +(86) 0755-2985 2397 E-mail: info@gdksign.cn Web: www.gdksign.com



BLE 2M Ant1\_2402\_30~1000



BLE 2M Ant1\_2402\_1000~26500

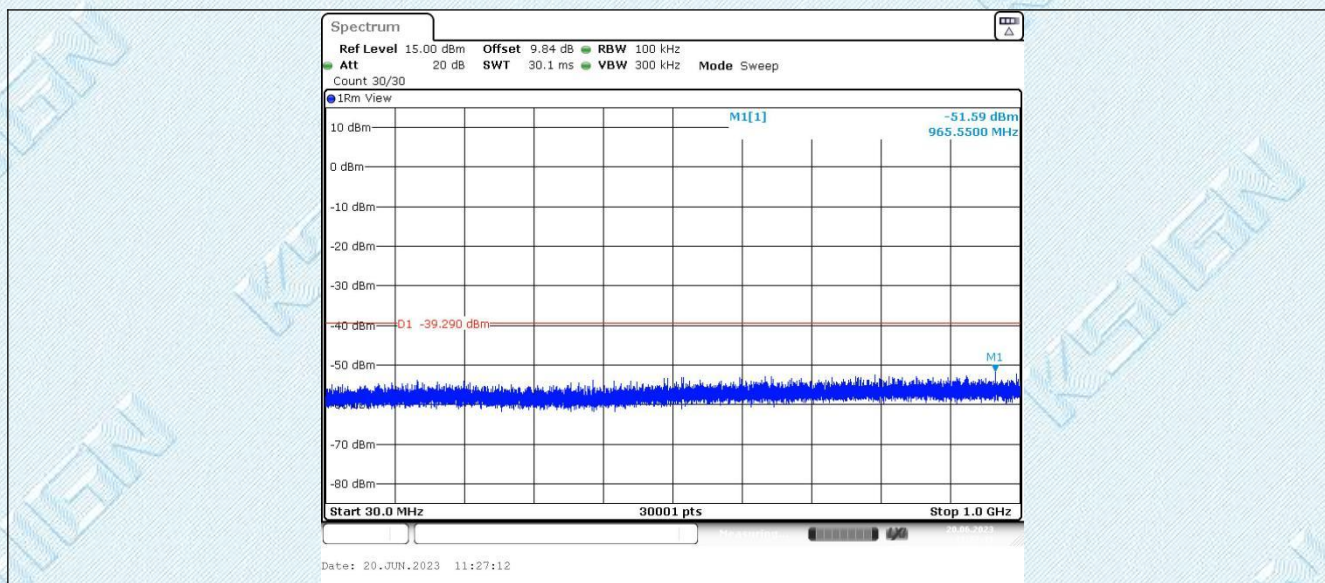


BLE 2M Ant1\_2440\_30~1000

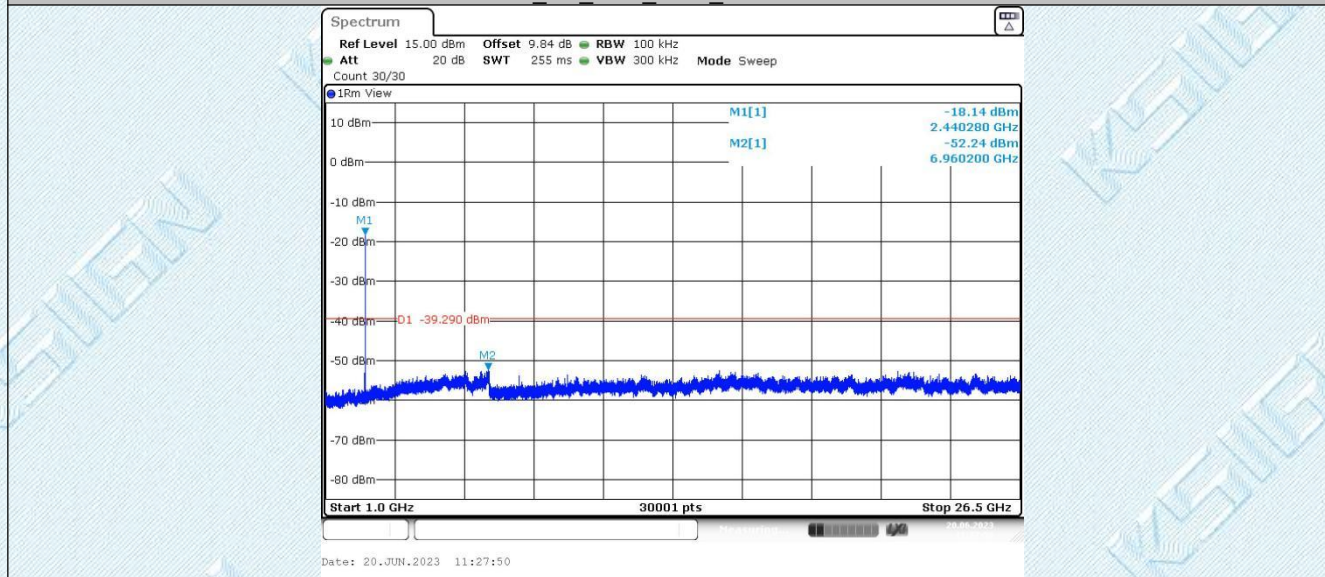
TRF RF\_R1

Add: West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

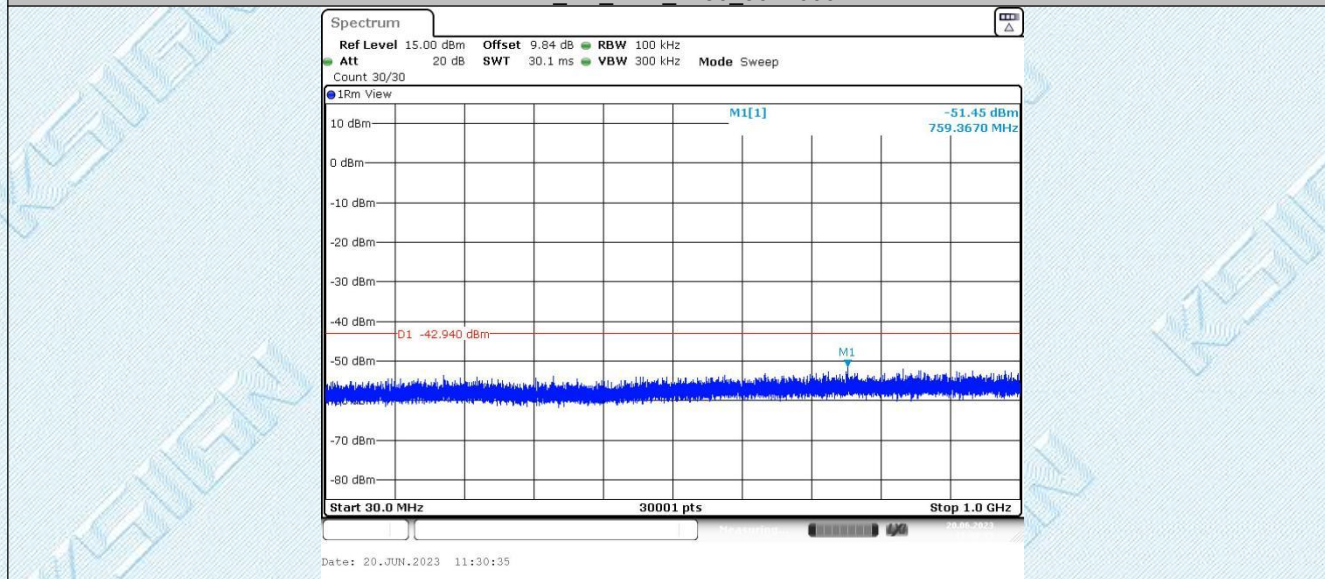
Tel: +(86) 0755-2985 2678 Fax: +(86) 0755-2985 2397 E-mail: info@gdkesign.cn Web: www.gdkesign.com



BLE\_2M\_Ant1\_2440\_1000~26500



BLE\_2M\_Ant1\_2480\_30~1000

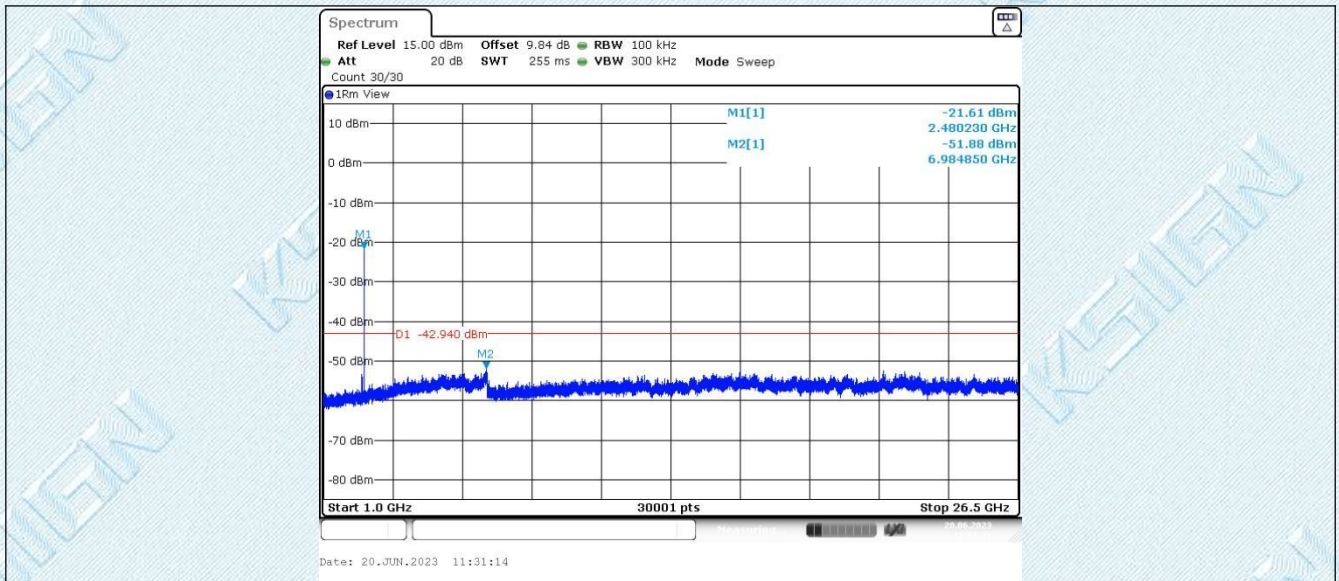


BLE\_2M\_Ant1\_2480\_1000~26500

TRF RF\_R1

Add: West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

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TRF RF\_R1

Add: West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

Tel: +(86) 0755-2985 2678 Fax: +(86) 0755-2985 2397 E-mail: info@gdksign.cn Web: www.gdksign.com

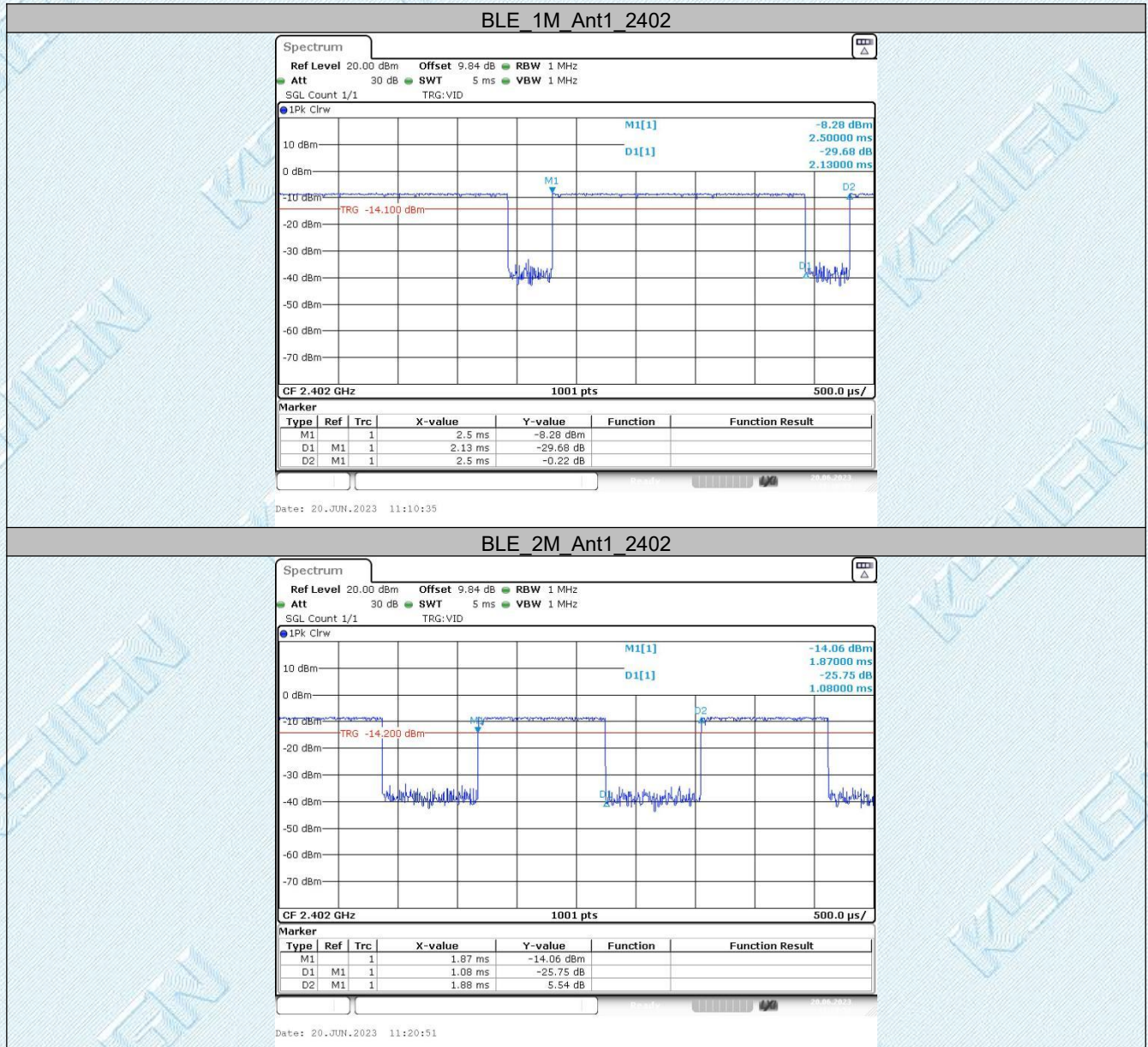
## 6.8. Appendix H: Duty Cycle

### 6.8.1. Test Result

| TestMode | Antenna | Freq[MHz] | ON Time<br>[ms] | Period<br>[ms] | DC [%] | Limit | Verdict |
|----------|---------|-----------|-----------------|----------------|--------|-------|---------|
| BLE_1M   | Ant1    | 2402      | 2.13            | 2.50           | 85.20  | ---   | PASS    |
|          |         | 2480      | 0.00            | 0.02           | 100    | ---   | PASS    |
| BLE_2M   | Ant1    | 2402      | 1.08            | 1.88           | 57.45  | ---   | PASS    |

DC=ON Time/Period\*100%

## 6.8.2. Test Graphs



--THE END--