



# SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

No. 1 Workshop, M-10, Middle section, Science & Technology Park,

Shenzhen, Guangdong, China 518057

Telephone: +86 (0) 755 2601 2053

Fax: +86 (0) 755 2671 0594

Email: ee.shenzhen@sgs.com

Report No.: SZEM180300241705

Page: 1 of 75

## FCC REPORT

**Application No.:** SZEM1803002417RG  
**Applicant:** GREAT TALENT TECHNOLOGY LIMITED  
**Manufacturer:** GREAT TALENT TECHNOLOGY LIMITED  
**Factory:** GREAT TALENT TECHNOLOGY LIMITED  
**Product Name:** L50  
**Model No.(EUT):** L50  
**Trade Mark:** ANS  
**FCC ID:** 2ALZM-L50  
**Standards:** 47 CFR Part 15, Subpart C  
**Test Method:** ANSI C63.10 (2013)  
**Date of Receipt:** 2018-04-18  
**Date of Test:** 2018-04-20 to 2018-04-23  
**Date of Issue:** 2018-05-29

|                     |               |
|---------------------|---------------|
| <b>Test Result:</b> | <b>PASS *</b> |
|---------------------|---------------|

\* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Derek Yang

Wireless Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.



## 2 Version

| Revision Record |         |            |          |          |
|-----------------|---------|------------|----------|----------|
| Version         | Chapter | Date       | Modifier | Remark   |
| 01              |         | 2018-05-29 |          | Original |
|                 |         |            |          |          |
|                 |         |            |          |          |

|                          |  |                                                                                              |  |            |
|--------------------------|--|----------------------------------------------------------------------------------------------|--|------------|
| Authorized for issue by: |  |                                                                                              |  |            |
| Tested By                |  | <br><hr/>   |  | 2018-05-29 |
|                          |  |                                                                                              |  | Date       |
| Checked By               |  | <br><hr/> |  | 2018-05-29 |
|                          |  |                                                                                              |  | Date       |
|                          |  | (Mike Hu) /Project Engineer                                                                  |  |            |
|                          |  | (Jim Huang) /Reviewer                                                                        |  |            |



### 3 Test Summary

| Test Item                                                         | Test Requirement                                    | Test method        | Result |
|-------------------------------------------------------------------|-----------------------------------------------------|--------------------|--------|
| Antenna Requirement                                               | 47 CFR Part 15, Subpart C Section 15.203/15.247 (c) | ANSI C63.10 (2013) | PASS   |
| AC Power Line Conducted Emission                                  | 47 CFR Part 15, Subpart C Section 15.207            | ANSI C63.10 (2013) | PASS   |
| Conducted Peak Output Power                                       | 47 CFR Part 15, Subpart C Section 15.247 (a)(1)     | ANSI C63.10 (2013) | PASS   |
| 20dB Occupied Bandwidth                                           | 47 CFR Part 15, Subpart C Section 15.247 (a)(1)     | ANSI C63.10 (2013) | PASS   |
| Carrier Frequencies Separation                                    | 47 CFR Part 15, Subpart C Section 15.247 (a)(1)     | ANSI C63.10 (2013) | PASS   |
| Hopping Channel Number                                            | 47 CFR Part 15, Subpart C Section 15.247 (a)(1)     | ANSI C63.10 (2013) | PASS   |
| Dwell Time                                                        | 47 CFR Part 15, Subpart C Section 15.247 (a)(1)     | ANSI C63.10 (2013) | PASS   |
| Band-edge for RF Conducted Emissions                              | 47 CFR Part 15, Subpart C Section 15.247(d)         | ANSI C63.10 (2013) | PASS   |
| RF Conducted Spurious Emissions                                   | 47 CFR Part 15, Subpart C Section 15.247(d)         | ANSI C63.10 (2013) | PASS   |
| Radiated Spurious emissions                                       | 47 CFR Part 15, Subpart C Section 15.205/15.209     | ANSI C63.10 (2013) | PASS   |
| Restricted bands around fundamental frequency (Radiated Emission) | 47 CFR Part 15, Subpart C Section 15.205/15.209     | ANSI C63.10 (2013) | PASS   |



## Contents

|                                                                 | Page      |
|-----------------------------------------------------------------|-----------|
| <b>1 COVER PAGE .....</b>                                       | <b>1</b>  |
| <b>2 VERSION .....</b>                                          | <b>2</b>  |
| <b>3 TEST SUMMARY .....</b>                                     | <b>3</b>  |
| <b>4 CONTENTS .....</b>                                         | <b>4</b>  |
| <b>5 GENERAL INFORMATION .....</b>                              | <b>5</b>  |
| 5.1 CLIENT INFORMATION .....                                    | 5         |
| 5.2 GENERAL DESCRIPTION OF EUT .....                            | 5         |
| 5.3 TEST ENVIRONMENT .....                                      | 7         |
| 5.4 DESCRIPTION OF SUPPORT UNITS .....                          | 7         |
| 5.5 TEST LOCATION .....                                         | 7         |
| 5.6 TEST FACILITY .....                                         | 7         |
| 5.7 DEVIATION FROM STANDARDS .....                              | 7         |
| 5.8 ABNORMALITIES FROM STANDARD CONDITIONS .....                | 8         |
| 5.9 OTHER INFORMATION REQUESTED BY THE CUSTOMER .....           | 8         |
| 5.10 MEASUREMENT UNCERTAINTY (95% CONFIDENCE LEVELS, K=2) ..... | 8         |
| 5.11 EQUIPMENT LIST .....                                       | 9         |
| <b>6 TEST RESULTS AND MEASUREMENT DATA .....</b>                | <b>12</b> |
| 6.1 ANTENNA REQUIREMENT .....                                   | 12        |
| 6.2 CONDUCTED EMISSIONS .....                                   | 13        |
| 6.3 CONDUCTED PEAK OUTPUT POWER .....                           | 17        |
| 6.4 20dB OCCUPY BANDWIDTH .....                                 | 24        |
| 6.5 CARRIER FREQUENCIES SEPARATION .....                        | 30        |
| 6.6 HOPPING CHANNEL NUMBER .....                                | 33        |
| 6.7 DWELL TIME .....                                            | 36        |
| 6.8 BAND-EDGE FOR RF CONDUCTED EMISSIONS .....                  | 43        |
| 6.9 SPURIOUS RF CONDUCTED EMISSIONS .....                       | 50        |
| 6.10 RADIATED SPURIOUS EMISSION .....                           | 56        |
| 6.10.1 Radiated Emission below 1GHz .....                       | 59        |
| 6.10.2 Transmitter Emission above 1GHz .....                    | 62        |
| 6.11 RESTRICTED BANDS AROUND FUNDAMENTAL FREQUENCY .....        | 69        |
| <b>7 PHOTOGRAPHS - EUT CONSTRUCTIONAL DETAILS .....</b>         | <b>75</b> |



## 4 General Information

### 4.1 Client Information

|                          |                                                                       |
|--------------------------|-----------------------------------------------------------------------|
| Applicant:               | GREAT TALENT TECHNOLOGY LIMITED                                       |
| Address of Applicant:    | RM602, T3 Software park, Hi-Tech Park South, Nanshan, Shenzhen, China |
| Manufacturer:            | GREAT TALENT TECHNOLOGY LIMITED                                       |
| Address of Manufacturer: | RM602, T3 Software park, Hi-Tech Park South, Nanshan, Shenzhen, China |
| Factory:                 | GREAT TALENT TECHNOLOGY LIMITED                                       |
| Address of Factory:      | RM602, T3 Software park, Hi-Tech Park South, Nanshan, Shenzhen, China |

### 4.2 General Description of EUT

|                       |                                                                              |
|-----------------------|------------------------------------------------------------------------------|
| Product Name:         | L50                                                                          |
| Model No.:            | L50                                                                          |
| Trade Mark:           | ANS                                                                          |
| Operation Frequency:  | 2402MHz~2480MHz                                                              |
| Bluetooth Version:    | V2.0 Dual mode; V3.0 Dual mode                                               |
| Modulation Technique: | Frequency Hopping Spread Spectrum(FHSS)                                      |
| Modulation Type:      | GFSK, $\pi/4$ DQPSK, 8DPSK                                                   |
| Number of Channel:    | 79                                                                           |
| Hopping Channel Type: | Adaptive Frequency Hopping systems                                           |
| Sample Type:          | Portable production                                                          |
| Antenna Type:         | PIFA                                                                         |
| Antenna Gain:         | 2.2dBi                                                                       |
| Power Supply          | DC3.8V (1 x 3.85V Rechargeable battery)2000mAh<br>Battery: Charge by DC 3.8V |
| AC adaptor:           | Model:Q5003<br>Input: AC100-240V 50/60Hz 0.2A<br>Output:DC5.0V 1.0A          |



**SGS-CSTC Standards Technical Services Co., Ltd.**  
**Shenzhen Branch**

Report No.: SZEM180300241705

Page: 6 of 75

| Operation Frequency each of channel |           |         |           |         |           |         |           |
|-------------------------------------|-----------|---------|-----------|---------|-----------|---------|-----------|
| Channel                             | Frequency | Channel | Frequency | Channel | Frequency | Channel | Frequency |
| 0                                   | 2402MHz   | 20      | 2422MHz   | 40      | 2442MHz   | 60      | 2462MHz   |
| 1                                   | 2403MHz   | 21      | 2423MHz   | 41      | 2443MHz   | 61      | 2463MHz   |
| 2                                   | 2404MHz   | 22      | 2424MHz   | 42      | 2444MHz   | 62      | 2464MHz   |
| 3                                   | 2405MHz   | 23      | 2425MHz   | 43      | 2445MHz   | 63      | 2465MHz   |
| 4                                   | 2406MHz   | 24      | 2426MHz   | 44      | 2446MHz   | 64      | 2466MHz   |
| 5                                   | 2407MHz   | 25      | 2427MHz   | 45      | 2447MHz   | 65      | 2467MHz   |
| 6                                   | 2408MHz   | 26      | 2428MHz   | 46      | 2448MHz   | 66      | 2468MHz   |
| 7                                   | 2409MHz   | 27      | 2429MHz   | 47      | 2449MHz   | 67      | 2469MHz   |
| 8                                   | 2410MHz   | 28      | 2430MHz   | 48      | 2450MHz   | 68      | 2470MHz   |
| 9                                   | 2411MHz   | 29      | 2431MHz   | 49      | 2451MHz   | 69      | 2471MHz   |
| 10                                  | 2412MHz   | 30      | 2432MHz   | 50      | 2452MHz   | 70      | 2472MHz   |
| 11                                  | 2413MHz   | 31      | 2433MHz   | 51      | 2453MHz   | 71      | 2473MHz   |
| 12                                  | 2414MHz   | 32      | 2434MHz   | 52      | 2454MHz   | 72      | 2474MHz   |
| 13                                  | 2415MHz   | 33      | 2435MHz   | 53      | 2455MHz   | 73      | 2475MHz   |
| 14                                  | 2416MHz   | 34      | 2436MHz   | 54      | 2456MHz   | 74      | 2476MHz   |
| 15                                  | 2417MHz   | 35      | 2437MHz   | 55      | 2457MHz   | 75      | 2477MHz   |
| 16                                  | 2418MHz   | 36      | 2438MHz   | 56      | 2458MHz   | 76      | 2478MHz   |
| 17                                  | 2419MHz   | 37      | 2439MHz   | 57      | 2459MHz   | 77      | 2479MHz   |
| 18                                  | 2420MHz   | 38      | 2440MHz   | 58      | 2460MHz   | 78      | 2480MHz   |
| 19                                  | 2421MHz   | 39      | 2441MHz   | 59      | 2461MHz   |         |           |

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

| Channel             | Frequency |
|---------------------|-----------|
| The Lowest channel  | 2402MHz   |
| The Middle channel  | 2441MHz   |
| The Highest channel | 2480MHz   |



#### 4.3 Test Environment

| Operating Environment |          |
|-----------------------|----------|
| Temperature:          | 24.0 °C  |
| Humidity:             | 55 % RH  |
| Atmospheric Pressure: | 1005 MPa |

#### 4.4 Description of Support Units

The EUT has been tested independent unit.

#### 4.5 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China.  
518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

#### 4.6 Test Facility

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

- **CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- **VCCI**

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

- **FCC –Designation Number: CN1178**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

- **Industry Canada (IC)**

Two 3m Semi-anechoic chambers and the 10m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1, 4620C-2, 4620C-3.

#### 4.7 Deviation from Standards

None.



#### **4.8 Abnormalities from Standard Conditions**

None.

#### **4.9 Other Information Requested by the Customer**

None.

#### **4.10 Measurement Uncertainty (95% confidence levels, k=2)**

| No. | Item                            | Measurement Uncertainty |
|-----|---------------------------------|-------------------------|
| 1   | Total RF power, conducted       | 0.75dB                  |
| 2   | RF power density, conducted     | 2.84dB                  |
| 3   | Spurious emissions, conducted   | 0.75dB                  |
| 4   | Radiated Spurious emission test | 4.5dB (30MHz-1GHz)      |
|     |                                 | 4.8dB (1GHz-25GHz)      |
| 5   | Conduct emission test           | 3.12 dB(9KHz- 30MHz)    |
| 6   | Temperature test                | 1°C                     |
| 7   | Humidity test                   | 3%                      |
| 8   | DC and low frequency voltages   | 0.5%                    |



#### 4.11 Equipment List

| Conducted Emission |                   |                                    |                 |               |                           |                             |
|--------------------|-------------------|------------------------------------|-----------------|---------------|---------------------------|-----------------------------|
| Item               | Test Equipment    | Manufacturer                       | Model No.       | Inventory No. | Cal. date<br>(yyyy-mm-dd) | Cal.Duedate<br>(yyyy-mm-dd) |
| 1                  | Shielding Room    | ZhongYu Electron                   | GB-88           | SEM001-06     | 2018/3/10                 | 2019/3/9                    |
| 2                  | LISN              | Rohde & Schwarz                    | ENV216          | SEM007-01     | 2017/10/9                 | 2018/10/9                   |
| 3                  | LISN              | ETS-LINDGREN                       | 3816/2          | SEM007-02     | 2018/2/14                 | 2019/2/13                   |
| 4                  | 8 Line ISN        | Fischer Custom Communications Inc. | FCC-TLISN-T8-02 | EMC0120       | 2017/9/28                 | 2018/9/28                   |
| 5                  | 4 Line ISN        | Fischer Custom Communications Inc. | FCC-TLISN-T4-02 | EMC0121       | 2017/9/28                 | 2018/9/28                   |
| 6                  | 2 Line ISN        | Fischer Custom Communications Inc. | FCC-TLISN-T2-02 | EMC0122       | 2017/9/28                 | 2018/9/28                   |
| 7                  | EMI Test Receiver | Rohde & Schwarz                    | ESCI            | SEM004-02     | 2018/2/14                 | 2019/2/13                   |
| 8                  | DC Power Supply   | Zhao Xin                           | RXN-305D        | SEM011-02     | 2017/10/9                 | 2018/10/9                   |

| RF connected test |                  |                      |           |               |                           |                             |
|-------------------|------------------|----------------------|-----------|---------------|---------------------------|-----------------------------|
| Item              | Test Equipment   | Manufacturer         | Model No. | Inventory No. | Cal. date<br>(yyyy-mm-dd) | Cal.Duedate<br>(yyyy-mm-dd) |
| 1                 | DC Power Supply  | ZhaoXin              | RXN-305D  | SEM011-02     | 2017/10/9                 | 2018/10/9                   |
| 2                 | Signal Analyzer  | Rohde &Schwarz       | FSV       | W005-02       | 2018/3/13                 | 2019/3/12                   |
| 3                 | Signal Generator | Rohde &Schwarz       | SML03     | SEM006-02     | 2018/2/14                 | 2019/2/13                   |
| 4                 | Power Meter      | Rohde &Schwarz       | NRVS      | SEM014-02     | 2017/10/9                 | 2018/10/9                   |
| 5                 | Power Sensor     | Agilent Technologies | U2021XA   | SEM009-01     | 2017/10/9                 | 2018/10/9                   |



**SGS-CSTC Standards Technical Services Co., Ltd.**  
**Shenzhen Branch**

Report No.: SZEM180300241705

Page: 10 of 75

| RE in Chamber |                                |                                    |           |               |                           |                              |
|---------------|--------------------------------|------------------------------------|-----------|---------------|---------------------------|------------------------------|
| Item          | Test Equipment                 | Manufacturer                       | Model No. | Inventory No. | Cal. date<br>(yyyy-mm-dd) | Cal.Due date<br>(yyyy-mm-dd) |
| 1             | 3m Semi-Anechoic Chamber       | ETS-LINDGREN                       | N/A       | SEM001-01     | 2018/3/10                 | 2019/3/9                     |
| 2             | EMI Test Receiver              | Agilent Technologies               | N9038A    | SEM004-05     | 2017/10/9                 | 2018/10/9                    |
| 3             | BiConiLog Antenna (26-3000MHz) | ETS-LINDGREN                       | 3142C     | SEM003-01     | 2017/11/1                 | 2020/11/1                    |
| 4             | Double-ridged horn (1-18GHz)   | ETS-LINDGREN                       | 3117      | SEM003-11     | 2015/10/17                | 2018/10/17                   |
| 5             | Horn Antenna (18-26GHz)        | ETS-LINDGREN                       | 3160      | SEM003-12     | 2017/11/24                | 2020/11/24                   |
| 6             | Pre-amplifier (0.1-1300MHz)    | Agilent Technologies               | 8447D     | SEM005-01     | 2018/2/14                 | 2019/2/13                    |
| 7             | Pre-Amplifier (0.1-26.5GHz)    | Compliance Directions Systems Inc. | PAP-0126  | SEM004-10     | 2017-10-17                | 2018-10-17                   |
| 8             | Band filter                    | Amindeon                           | Asi 3314  | SEM023-01     | N/A                       | N/A                          |
| 9             | DC Power Supply                | Zhao Xin                           | RXN-305D  | SEM011-02     | 2017/10/9                 | 2018/10/9                    |
| 10            | Loop Antenna                   | Beijing Daze                       | ZN30401   | SEM003-09     | 2018/3/10                 | 2019/3/9                     |

| RE in Chamber |                                    |                      |           |               |                           |                               |
|---------------|------------------------------------|----------------------|-----------|---------------|---------------------------|-------------------------------|
| Item          | Test Equipment                     | Manufacturer         | Model No. | Inventory No. | Cal. Date<br>(yyyy-mm-dd) | Cal. Due date<br>(yyyy-mm-dd) |
| 1             | 10m Semi-Anechoic Chamber          | SAEMC                | FSAC1018  | SEM001-03     | 2018/3/10                 | 2019/3/9                      |
| 2             | EMI Test Receiver (9k-7GHz)        | Rohde & Schwarz      | ESR       | SEM004-03     | 2018/2/14                 | 2019/2/13                     |
| 3             | Trilog-Broadband Antenna(30M-1GHz) | Schwarzbeck          | VULB9168  | SEM003-18     | 2016/6/29                 | 2019/6/29                     |
| 4             | Pre-amplifier                      | Sonoma Instrument Co | 310N      | SEM005-03     | 2017/7/6                  | 2018/7/6                      |
| 5             | .Loop Antenna                      | ETS-Lindgren         | 6502      | SEM003-08     | 2015/8/14                 | 2018/8/14                     |



**SGS-CSTC Standards Technical Services Co., Ltd.**  
**Shenzhen Branch**

Report No.: SZEM180300241705

Page: 11 of 75

| RE in Chamber |                                |                                    |                   |               |                        |                           |
|---------------|--------------------------------|------------------------------------|-------------------|---------------|------------------------|---------------------------|
| Item          | Test Equipment                 | Manufacturer                       | Model No.         | Inventory No. | Cal. date (yyyy-mm-dd) | Cal.Due date (yyyy-mm-dd) |
| 1             | 3m Semi-Anechoic Chamber       | AUDIX                              | N/A               | SEM001-02     | 2018/3/10              | 2019/3/9                  |
| 2             | EXA Spectrum Analyzer          | Agilent Technologies Inc           | N9010A            | SEM004-09     | 2017/7/19              | 2018/7/19                 |
| 3             | BiConiLog Antenna (26-3000MHz) | ETS-Lindgren                       | 3142C             | SEM003-02     | 2017/11/15             | 2020/11/15                |
| 4             | Amplifier (0.1-1300MHz)        | HP                                 | 8447D             | SEM005-02     | 2017/10/9              | 2018/10/9                 |
| 5             | Pre-Amplifier (0.1-26.5GHz)    | Compliance Directions Systems Inc. | PAP-0126          | SEM004-10     | 2017-10-17             | 2018-10-17                |
| 6             | Horn Antenna (1-18GHz)         | Rohde & Schwarz                    | HF907             | SEM003-07     | 2015/6/14              | 2018/6/14                 |
| 7             | Horn Antenna (18-26GHz)        | ETS-Lindgren                       | 3160              | SEM003-12     | 2017/11/24             | 2020/11/24                |
| 8             | HornAntenna (26GHz-40GHz)      | A.H.Systems, inc.                  | SAS-573           | SEM003-13     | 2017/10/17             | 2020/10/16                |
| 9             | Low Noise Amplifier            | Black Diamond Series               | BDLNA-0118-352810 | SEM005-05     | 2017/10/9              | 2018/10/9                 |
| 10            | Band filter                    | Amindeon                           | Asi 3314          | SEM023-01     | N/A                    | N/A                       |



## 5 Test results and Measurement Data

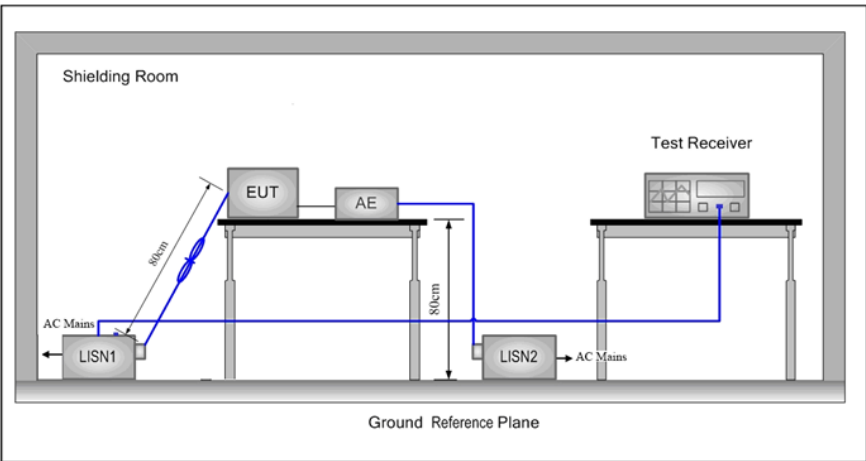
### 5.1 Antenna Requirement

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| Standard requirement:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 47 CFR Part 15C Section 15.203 /247(c) |
| <p>15.203 requirement:</p> <p>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, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.</p> <p>15.247(b) (4) requirement:</p> <p>The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.</p> <p>The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 2.2dBi.</p> |                                        |



## 5.2 Conducted Emissions

|                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |              |           |
|--------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-----------|
| Test Requirement:                                | 47 CFR Part 15C Section 15.207                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |              |           |
| Test Method:                                     | ANSI C63.10: 2013                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |              |           |
| Test Frequency Range:                            | 150kHz to 30MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |              |           |
| Limit:                                           | Frequency range (MHz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Limit (dBuV) |           |
|                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 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 Procedure:                                  | <ol style="list-style-type: none"><li>1) The mains terminal disturbance voltage test was conducted in a shielded room.</li><li>2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a <math>50\Omega/50\mu\text{H} + 5\Omega</math> linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.</li><li>3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,</li><li>4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.</li><li>5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.</li></ol> |              |           |

|                        |                                                                                                                                                                                          |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Setup:            |                                                                                                        |
| Exploratory Test Mode: | Non-hopping transmitting mode with all kind of modulation and all kind of data type at the lowest, middle, high channel.<br>Charge + Transmitting mode.                                  |
| Final Test Mode:       | Through Pre-scan, find the DH5 of data type and GFSK modulation at the lowest channel is the worst case.<br>Charge + Transmitting mode<br>Only the worst case is recorded in the report. |
| Instruments Used:      | Refer to section 5.10 for details                                                                                                                                                        |
| Test Results:          | Pass                                                                                                                                                                                     |

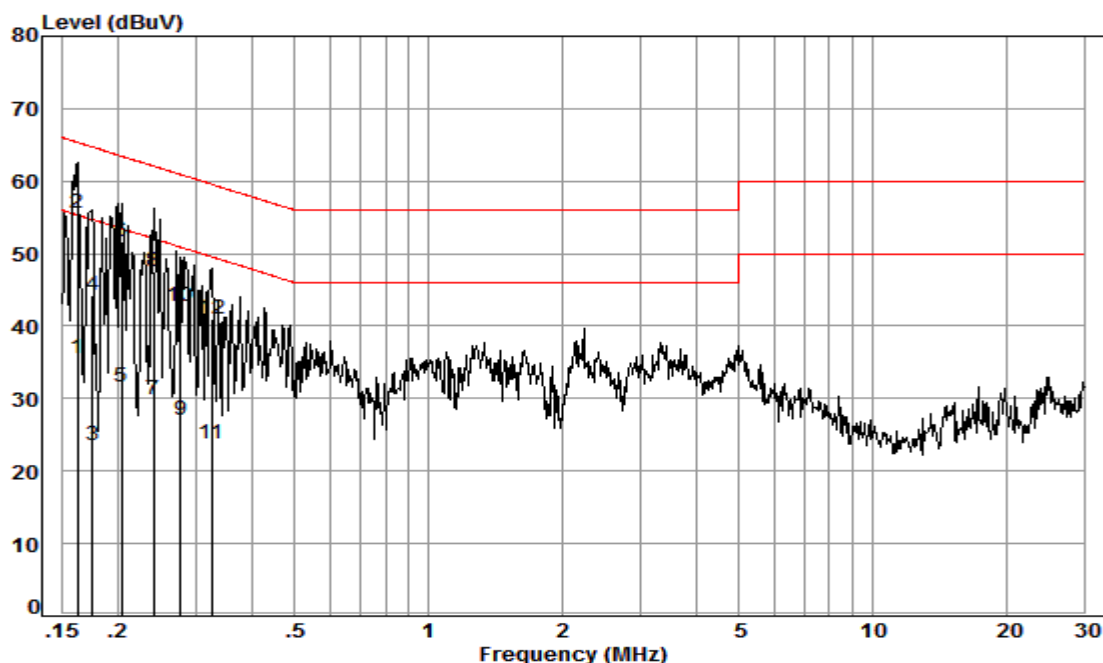


## Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

Live line:



Site : Shielding Room  
Condition: Line  
Job No. : 02417RG  
Test mode: b

|    | Freq | Cable Loss | LISN Factor | Read Level | Level | Limit Line | Over Limit | Remark  |
|----|------|------------|-------------|------------|-------|------------|------------|---------|
|    | MHz  | dB         | dB          | dBuV       | dBuV  | dBuV       | dB         |         |
| 1  | 0.16 | 0.02       | 9.52        | 25.90      | 35.44 | 55.34      | -19.90     | Average |
| 2  | 0.16 | 0.02       | 9.52        | 46.05      | 55.59 | 65.34      | -9.75      | QP      |
| 3  | 0.17 | 0.03       | 9.52        | 13.91      | 23.46 | 54.72      | -31.26     | Average |
| 4  | 0.17 | 0.03       | 9.52        | 34.64      | 44.19 | 64.72      | -20.53     | QP      |
| 5  | 0.20 | 0.03       | 9.50        | 22.01      | 31.54 | 53.45      | -21.91     | Average |
| 6  | 0.20 | 0.03       | 9.50        | 42.20      | 51.73 | 63.45      | -11.72     | QP      |
| 7  | 0.24 | 0.03       | 9.51        | 20.29      | 29.83 | 52.08      | -22.25     | Average |
| 8  | 0.24 | 0.03       | 9.51        | 37.92      | 47.46 | 62.08      | -14.62     | QP      |
| 9  | 0.28 | 0.03       | 9.51        | 17.50      | 27.04 | 50.90      | -23.86     | Average |
| 10 | 0.28 | 0.03       | 9.51        | 33.23      | 42.77 | 60.90      | -18.13     | QP      |
| 11 | 0.33 | 0.03       | 9.50        | 14.17      | 23.70 | 49.57      | -25.87     | Average |
| 12 | 0.33 | 0.03       | 9.50        | 31.52      | 41.05 | 59.57      | -18.52     | QP      |

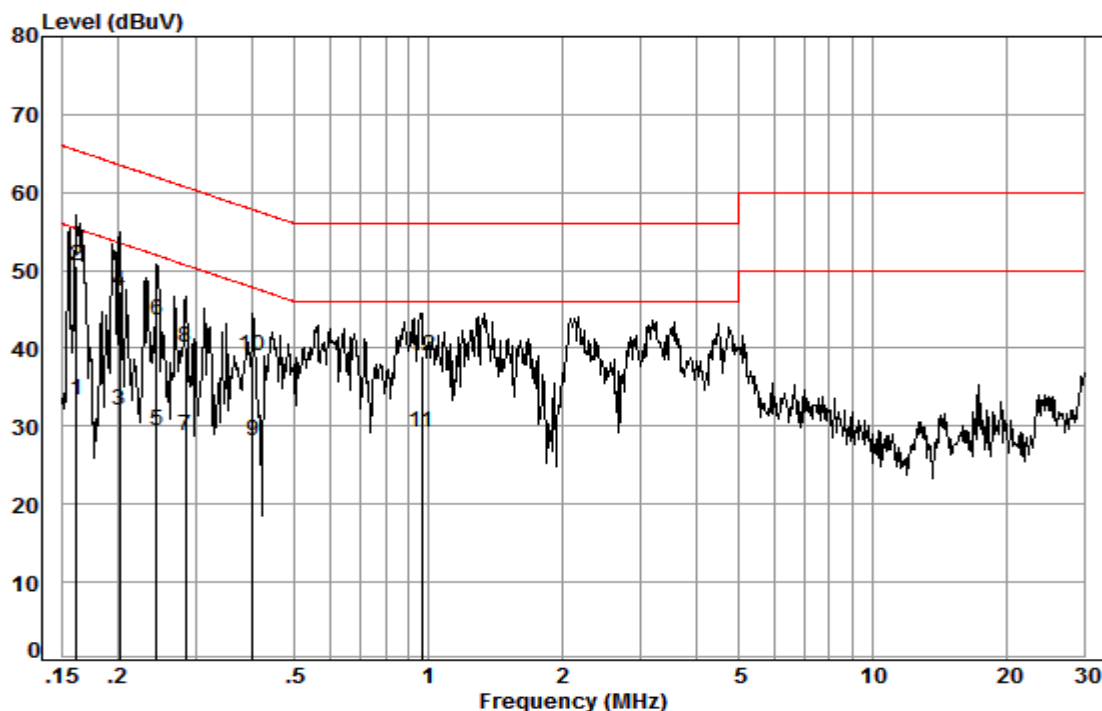


SGS-CSTC Standards Technical Services Co., Ltd.  
Shenzhen Branch

Report No.: SZEM180300241705

Page: 16 of 75

Neutral line:



Site : Shielding Room

Condition: Neutral

Job No. : 02417RG

Test mode: b

|    | Freq | Cable Loss | LISN Factor | Read Level | Level | Limit Line | Over Limit | Remark  |
|----|------|------------|-------------|------------|-------|------------|------------|---------|
|    | MHz  | dB         | dB          | dBuV       | dBuV  | dBuV       | dB         |         |
| 1  | 0.16 | 0.02       | 9.59        | 23.73      | 33.34 | 55.38      | -22.04     | Average |
| 2  | 0.16 | 0.02       | 9.59        | 41.07      | 50.68 | 65.38      | -14.70     | QP      |
| 3  | 0.20 | 0.03       | 9.57        | 22.47      | 32.07 | 53.54      | -21.47     | Average |
| 4  | 0.20 | 0.03       | 9.57        | 37.64      | 47.24 | 63.54      | -16.30     | QP      |
| 5  | 0.24 | 0.03       | 9.58        | 19.84      | 29.45 | 51.95      | -22.50     | Average |
| 6  | 0.24 | 0.03       | 9.58        | 33.88      | 43.49 | 61.95      | -18.46     | QP      |
| 7  | 0.28 | 0.03       | 9.58        | 19.25      | 28.86 | 50.68      | -21.82     | Average |
| 8  | 0.28 | 0.03       | 9.58        | 30.54      | 40.15 | 60.68      | -20.53     | QP      |
| 9  | 0.40 | 0.04       | 9.59        | 18.48      | 28.11 | 47.81      | -19.70     | Average |
| 10 | 0.40 | 0.04       | 9.59        | 29.45      | 39.08 | 57.81      | -18.73     | QP      |
| 11 | 0.97 | 0.09       | 9.62        | 19.44      | 29.15 | 46.00      | -16.85     | Average |
| 12 | 0.97 | 0.09       | 9.62        | 29.34      | 39.05 | 56.00      | -16.95     | QP      |

Notes:

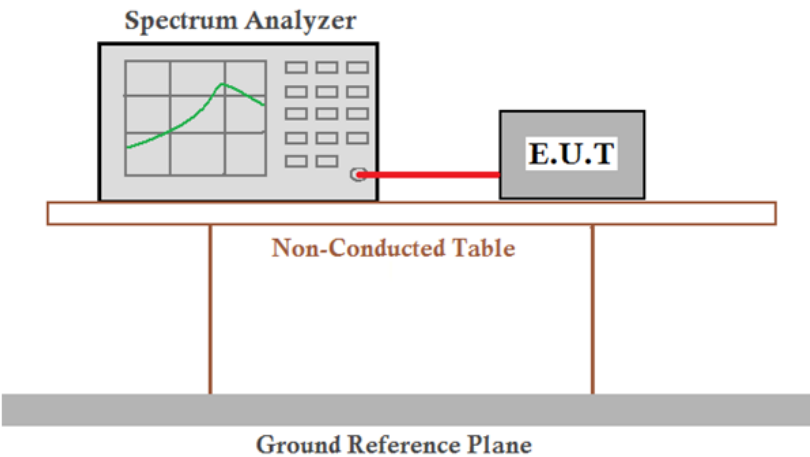
1. The following Quasi-Peak and Average measurements were performed on the EUT:

2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.



### 5.3 Conducted Peak Output Power

|                        |                                                                                                                                                                                                                                                                                                                                                     |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Requirement:      | 47 CFR Part 15C Section 15.247 (a)(1)                                                                                                                                                                                                                                                                                                               |
| Test Method:           | ANSI C63.10:2013 Section 7.8.5                                                                                                                                                                                                                                                                                                                      |
| Test Setup:            |  <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. Below the table is a Ground Reference Plane.</p> |
| Limit:                 | (20.97dBm) 125mW                                                                                                                                                                                                                                                                                                                                    |
| Exploratory Test Mode: | Non-hopping transmitting with all kind of modulation and all kind of data type.                                                                                                                                                                                                                                                                     |
| Final Test Mode:       | Through Pre-scan, find the DH5 of data type is the worst case of GFSK modulation type, 2-DH5 of data type is the worst case of $\pi/4$ DQPSK modulation type, 3-DH5 of data type is the worst case of 8DPSK modulation type.                                                                                                                        |
| Instruments Used:      | Refer to section 5.10 for details                                                                                                                                                                                                                                                                                                                   |
| Test Results:          | Pass                                                                                                                                                                                                                                                                                                                                                |



**SGS-CSTC Standards Technical Services Co., Ltd.**  
**Shenzhen Branch**

Report No.: SZEM180300241705

Page: 18 of 75

**Measurement Data**

| GFSK mode          |                         |             |        |
|--------------------|-------------------------|-------------|--------|
| Test channel       | Peak Output Power (dBm) | Limit (dBm) | Result |
| Lowest             | 3.61                    | 20.97       | Pass   |
| Middle             | 4.51                    | 20.97       | Pass   |
| Highest            | 3.71                    | 20.97       | Pass   |
| $\pi/4$ DQPSK mode |                         |             |        |
| Test channel       | Peak Output Power (dBm) | Limit (dBm) | Result |
| Lowest             | 4.63                    | 20.97       | Pass   |
| Middle             | 5.52                    | 20.97       | Pass   |
| Highest            | 4.67                    | 20.97       | Pass   |
| 8DPSK mode         |                         |             |        |
| Test channel       | Peak Output Power (dBm) | Limit (dBm) | Result |
| Lowest             | 4.93                    | 20.97       | Pass   |
| Middle             | 5.78                    | 20.97       | Pass   |
| Highest            | 4.95                    | 20.97       | Pass   |



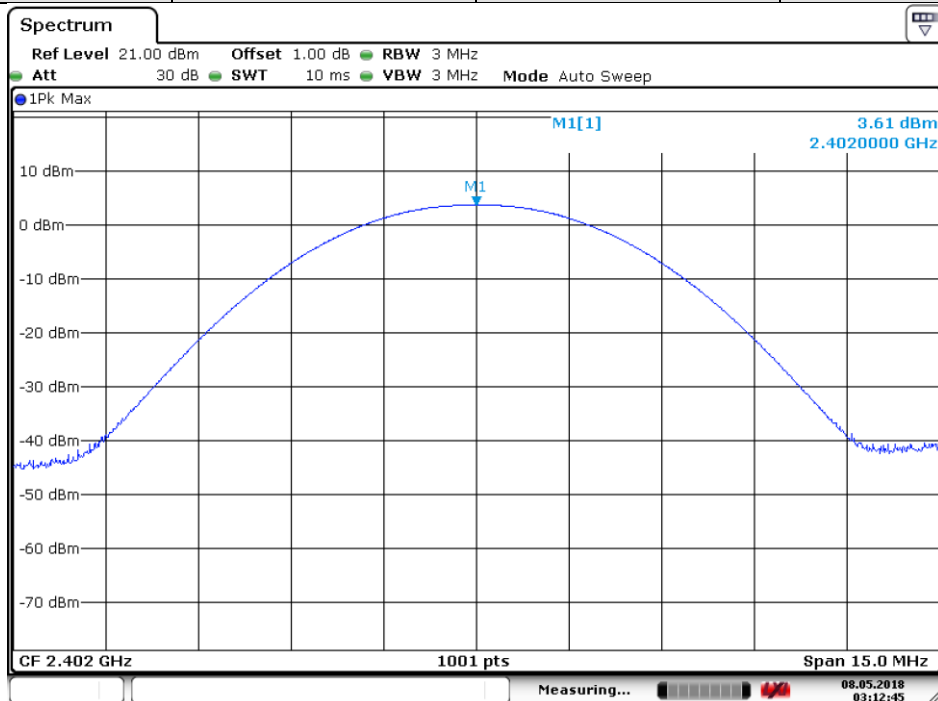
# SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

Report No.: SZEM180300241705

Page: 19 of 75

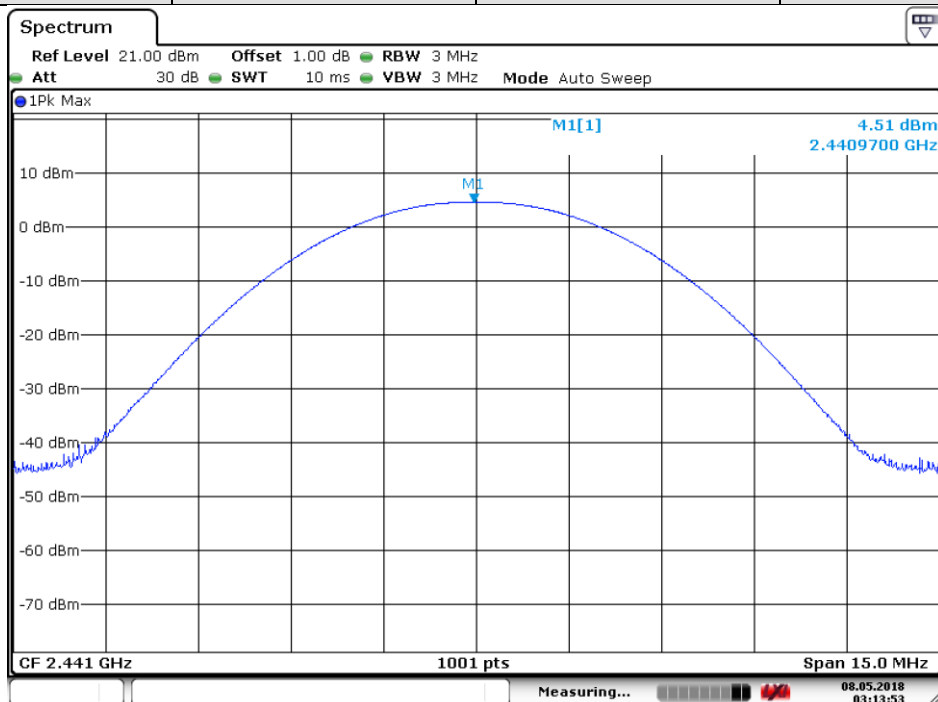
Test plot as follows:

|            |      |               |        |
|------------|------|---------------|--------|
| Test mode: | GFSK | Test channel: | Lowest |
|------------|------|---------------|--------|



Date: 8.MAY.2018 03:12:45

|            |      |               |        |
|------------|------|---------------|--------|
| Test mode: | GFSK | Test channel: | Middle |
|------------|------|---------------|--------|



Date: 8.MAY.2018 03:13:53

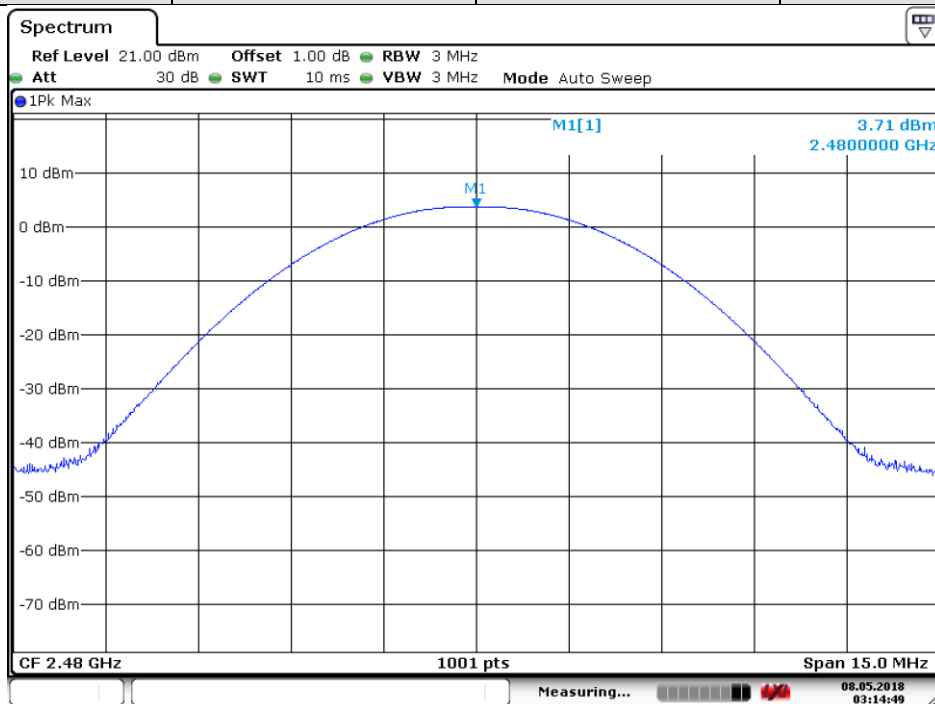


# SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

Report No.: SZEM180300241705

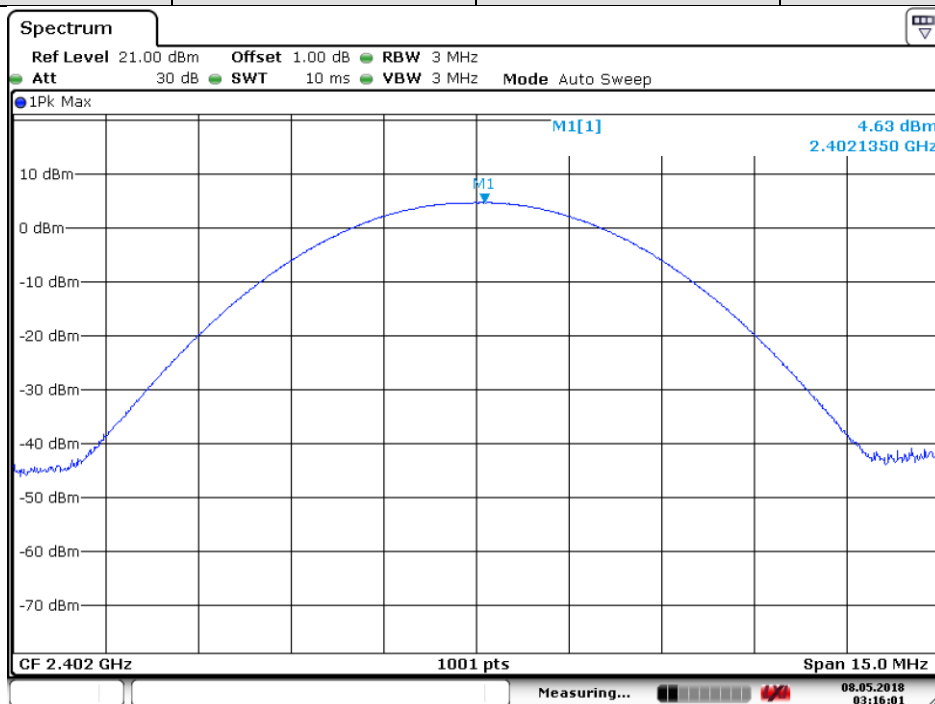
Page: 20 of 75

|            |      |               |         |
|------------|------|---------------|---------|
| Test mode: | GFSK | Test channel: | Highest |
|------------|------|---------------|---------|



Date: 8.MAY.2018 03:14:49

|            |               |               |        |
|------------|---------------|---------------|--------|
| Test mode: | $\pi/4$ DQPSK | Test channel: | Lowest |
|------------|---------------|---------------|--------|



Date: 8.MAY.2018 03:16:01

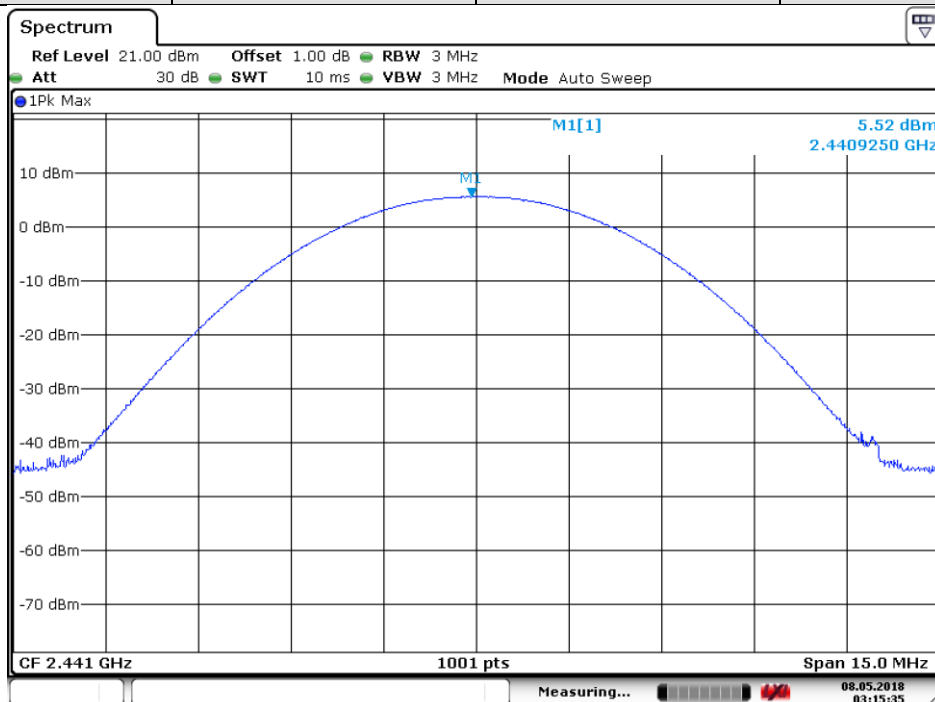


# SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

Report No.: SZEM180300241705

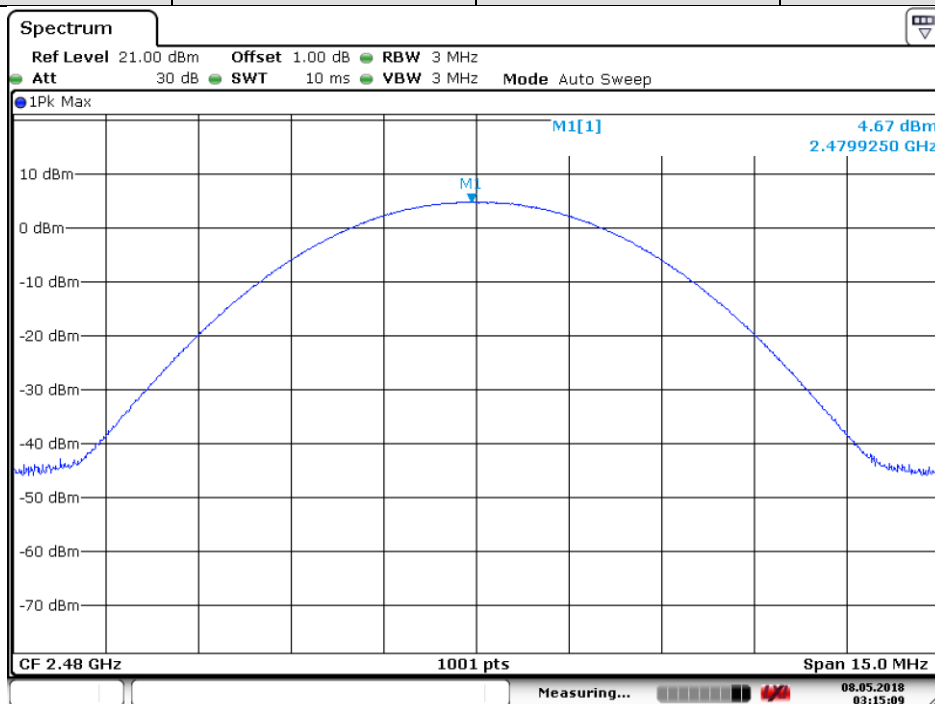
Page: 21 of 75

|            |               |               |        |
|------------|---------------|---------------|--------|
| Test mode: | $\pi/4$ DQPSK | Test channel: | Middle |
|------------|---------------|---------------|--------|



Date: 8.MAY.2018 03:15:35

|            |               |               |         |
|------------|---------------|---------------|---------|
| Test mode: | $\pi/4$ DQPSK | Test channel: | Highest |
|------------|---------------|---------------|---------|



Date: 8.MAY.2018 03:15:09

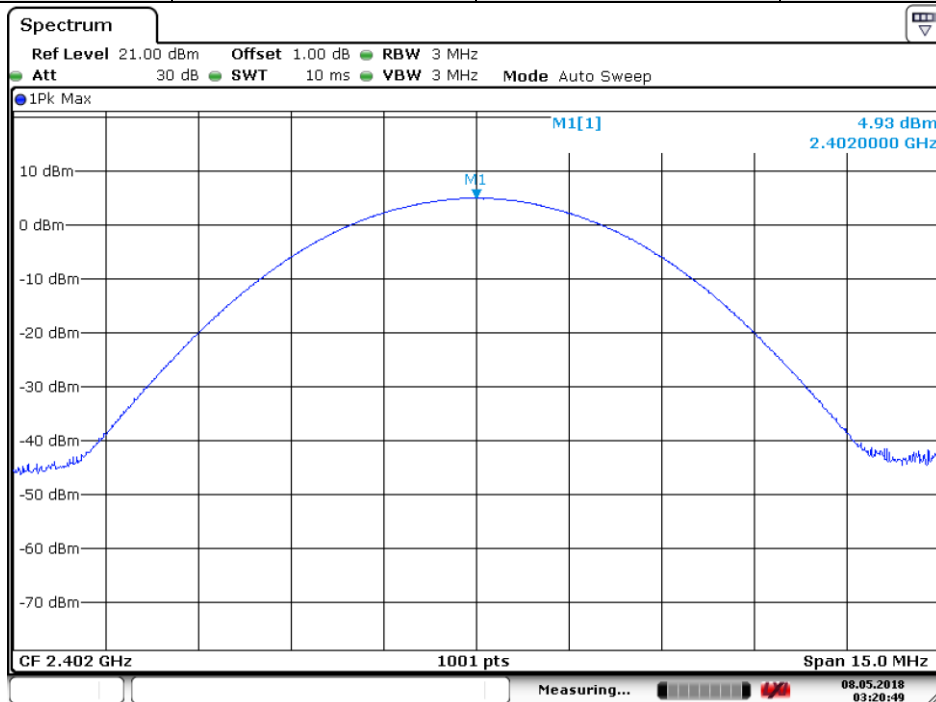


# SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

Report No.: SZEM180300241705

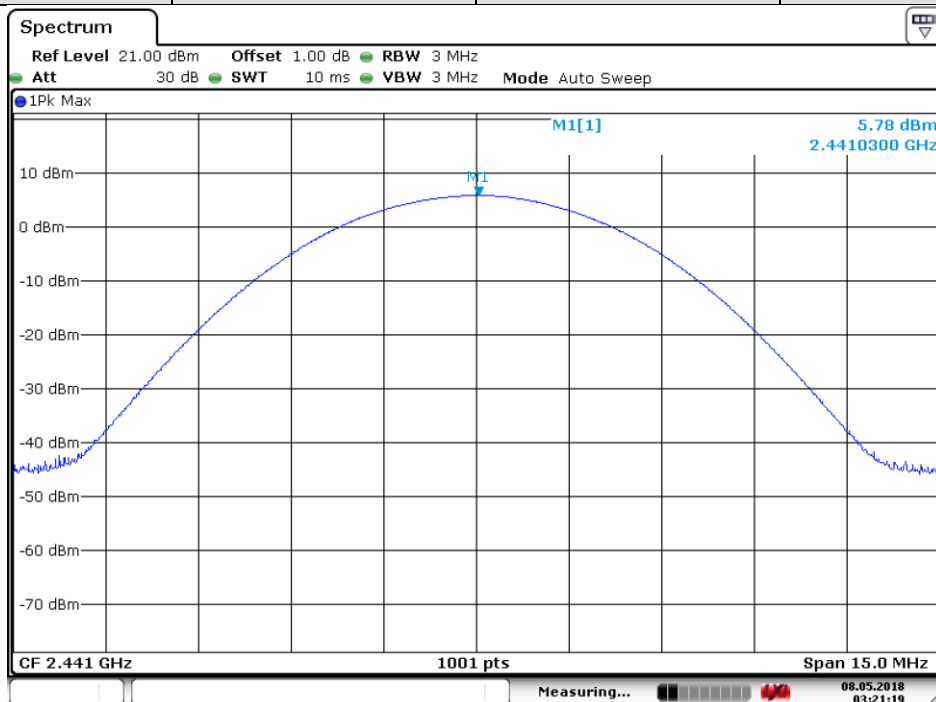
Page: 22 of 75

|            |       |               |        |
|------------|-------|---------------|--------|
| Test mode: | 8DPSK | Test channel: | Lowest |
|------------|-------|---------------|--------|



Date: 8.MAY.2018 03:20:50

|            |       |               |        |
|------------|-------|---------------|--------|
| Test mode: | 8DPSK | Test channel: | Middle |
|------------|-------|---------------|--------|



Date: 8.MAY.2018 03:21:19

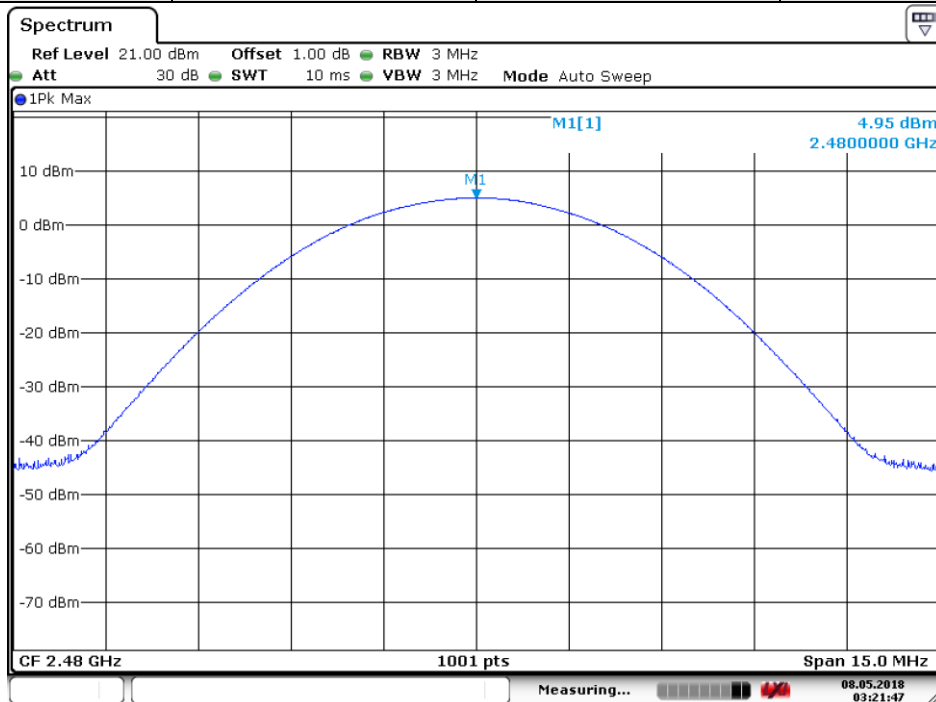


SGS-CSTC Standards Technical Services Co., Ltd.  
Shenzhen Branch

Report No.: SZEM180300241705

Page: 23 of 75

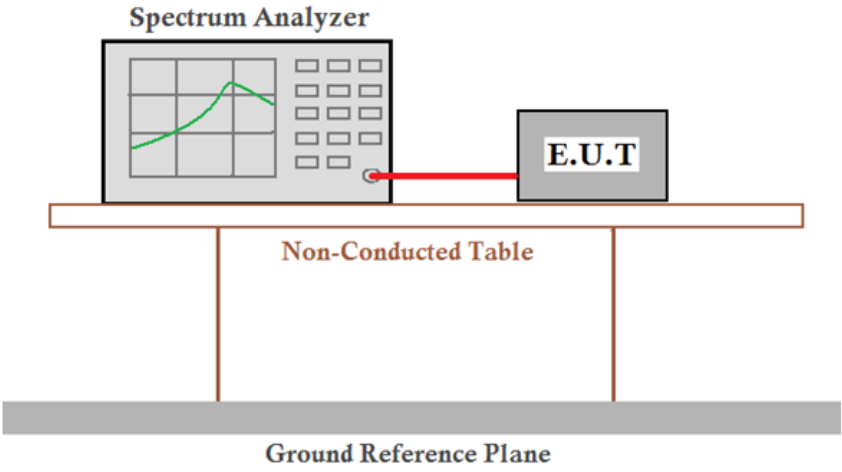
|            |       |               |         |
|------------|-------|---------------|---------|
| Test mode: | 8DPSK | Test channel: | Highest |
|------------|-------|---------------|---------|



Date: 8.MAY.2018 03:21:47



## 5.4 20dB Occupy Bandwidth

|                        |                                                                                                                                                                                                                              |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Requirement:      | 47 CFR Part 15C Section 15.247 (a)(1)                                                                                                                                                                                        |
| Test Method:           | ANSI C63.10:2013 Section 7.8.7                                                                                                                                                                                               |
| Test Setup:            |                                                                                                                                            |
| Limit:                 | NA                                                                                                                                                                                                                           |
| Exploratory Test Mode: | Non-hopping transmitting with all kind of modulation and all kind of data type.                                                                                                                                              |
| Final Test Mode:       | Through Pre-scan, find the DH5 of data type is the worst case of GFSK modulation type, 2-DH5 of data type is the worst case of $\pi/4$ DQPSK modulation type, 3-DH5 of data type is the worst case of 8DPSK modulation type. |
| Instruments Used:      | Refer to section 5.10 for details                                                                                                                                                                                            |
| Test Results:          | Pass                                                                                                                                                                                                                         |

### Measurement Data

| Test channel | 20dB Occupy Bandwidth (kHz) |               |        |
|--------------|-----------------------------|---------------|--------|
|              | GFSK                        | $\pi/4$ DQPSK | 8DPSK  |
| Lowest       | 905.1                       | 1282.7        | 1285.7 |
| Middle       | 902.1                       | 1282.7        | 1285.7 |
| Highest      | 902.1                       | 1282.7        | 1285.7 |



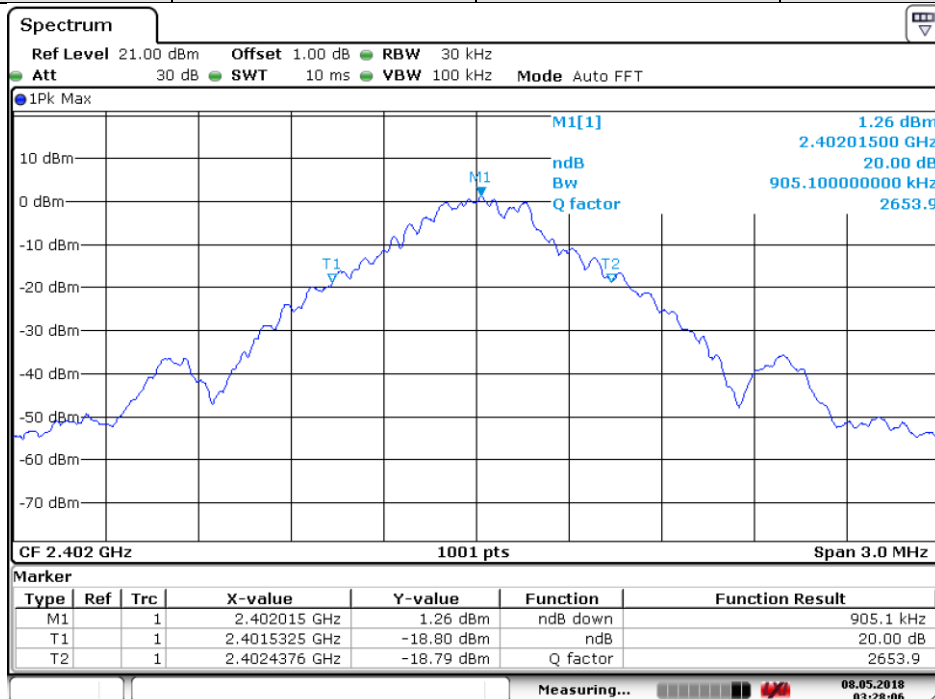
# SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

Report No.: SZEM180300241705

Page: 25 of 75

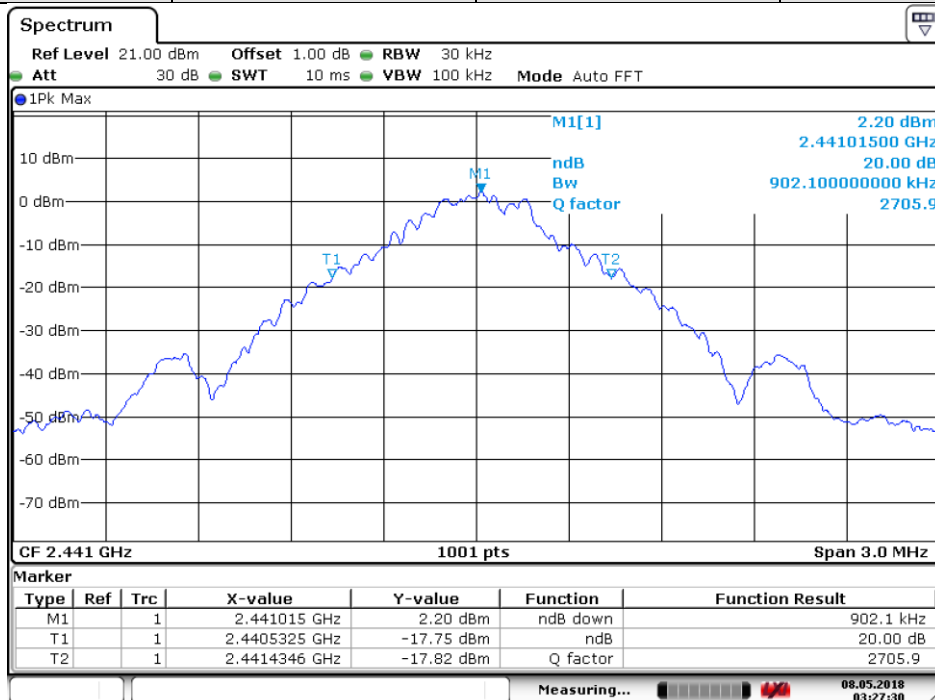
Test plot as follows:

|            |      |               |        |
|------------|------|---------------|--------|
| Test mode: | GFSK | Test channel: | Lowest |
|------------|------|---------------|--------|



Date: 8.MAY.2018 03:28:06

|            |      |               |        |
|------------|------|---------------|--------|
| Test mode: | GFSK | Test channel: | Middle |
|------------|------|---------------|--------|



Date: 8.MAY.2018 03:27:31

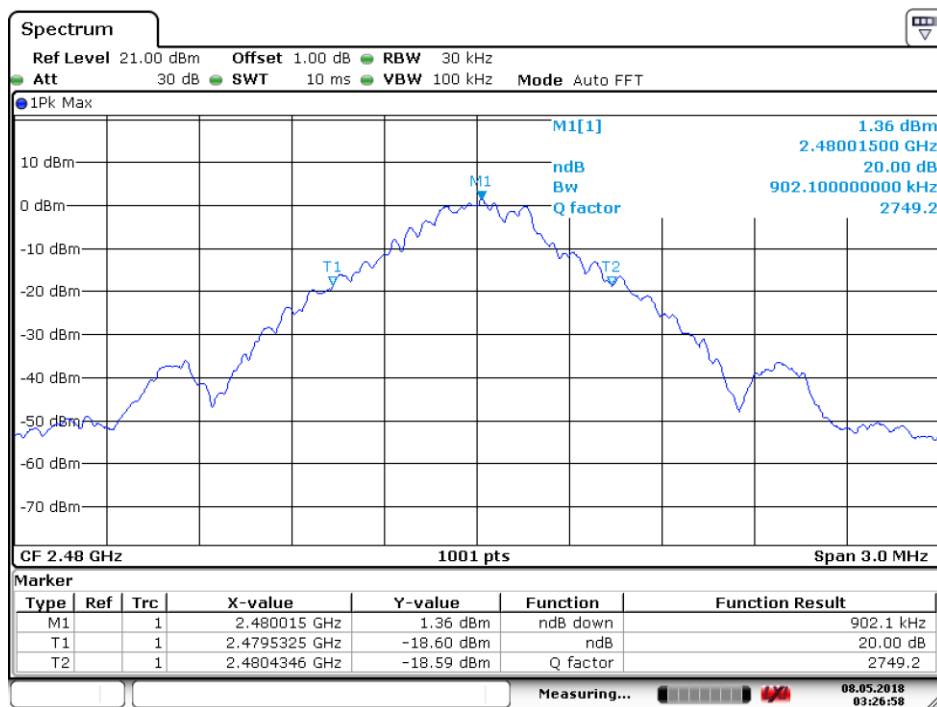


# SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

Report No.: SZEM180300241705

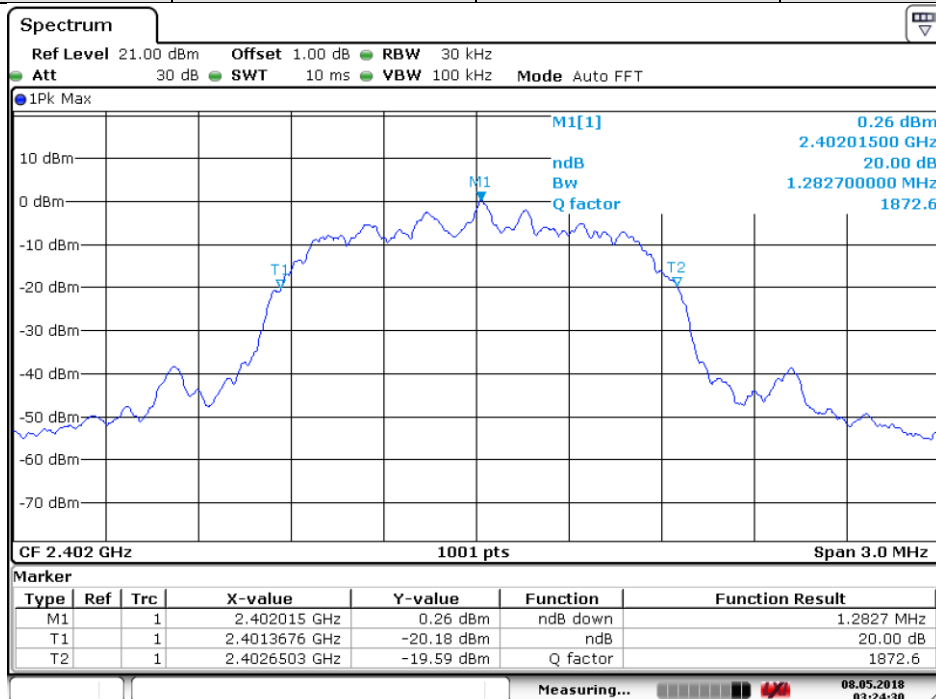
Page: 26 of 75

|            |      |               |         |
|------------|------|---------------|---------|
| Test mode: | GFSK | Test channel: | Highest |
|------------|------|---------------|---------|



Date: 8.MAY.2018 03:26:59

|            |              |               |        |
|------------|--------------|---------------|--------|
| Test mode: | $\pi/4$ QPSK | Test channel: | Lowest |
|------------|--------------|---------------|--------|



Date: 8.MAY.2018 03:24:30

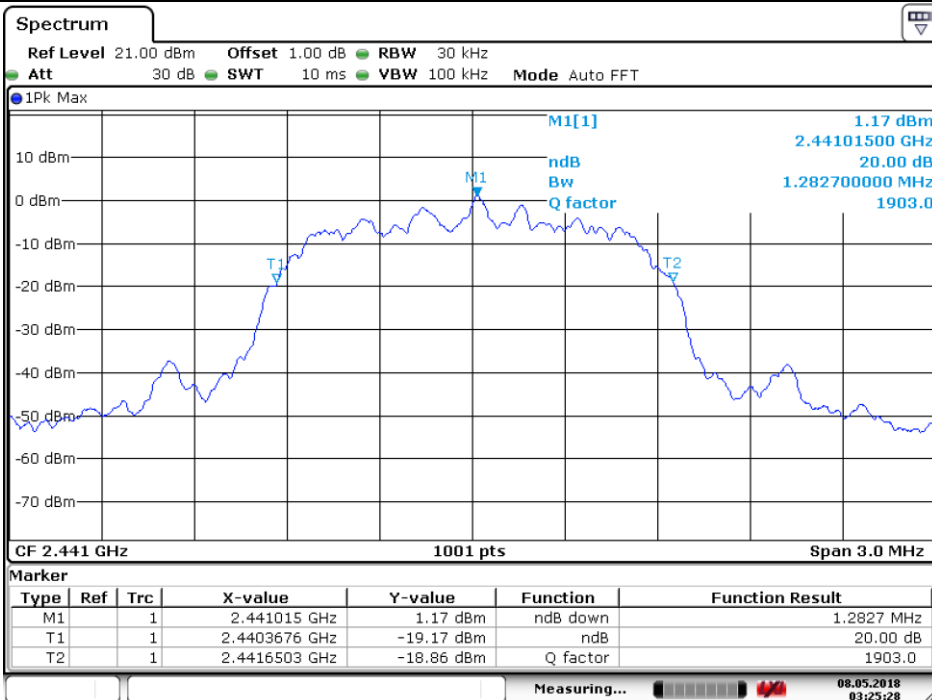


# SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

Report No.: SZEM180300241705

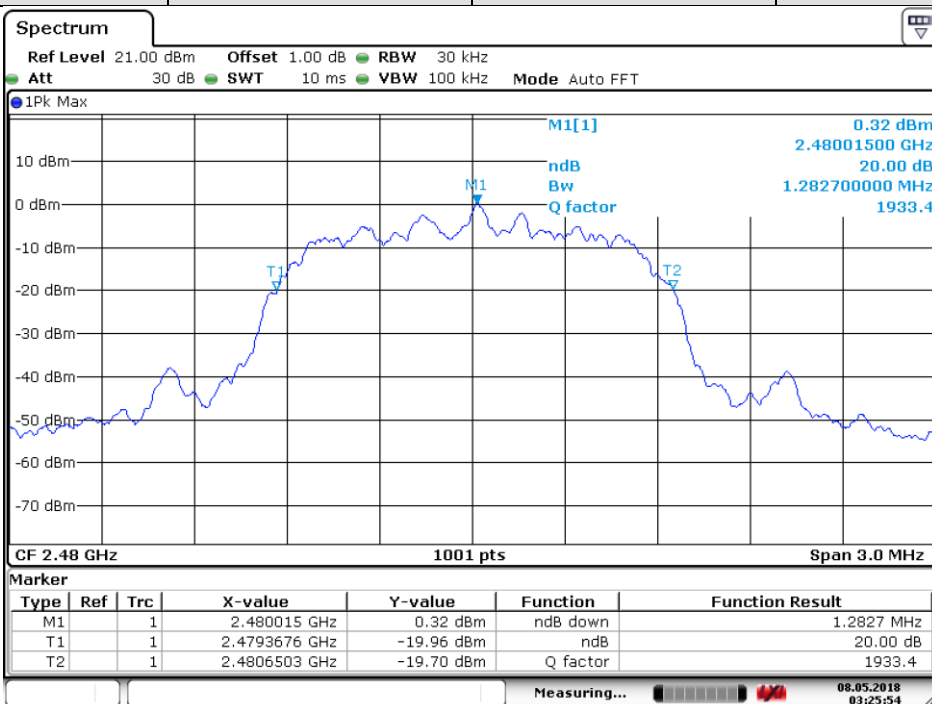
Page: 27 of 75

|            |               |               |        |
|------------|---------------|---------------|--------|
| Test mode: | $\pi/4$ DQPSK | Test channel: | Middle |
|------------|---------------|---------------|--------|



Date: 8.MAY.2018 03:25:28

|            |               |               |         |
|------------|---------------|---------------|---------|
| Test mode: | $\pi/4$ DQPSK | Test channel: | Highest |
|------------|---------------|---------------|---------|



Date: 8.MAY.2018 03:25:55

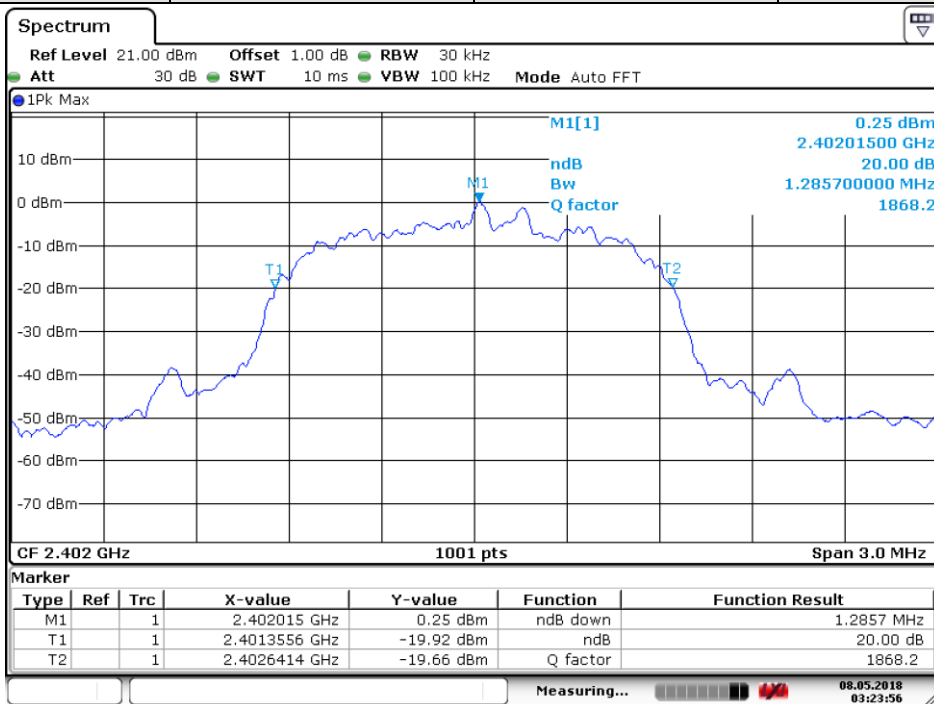


# SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

Report No.: SZEM180300241705

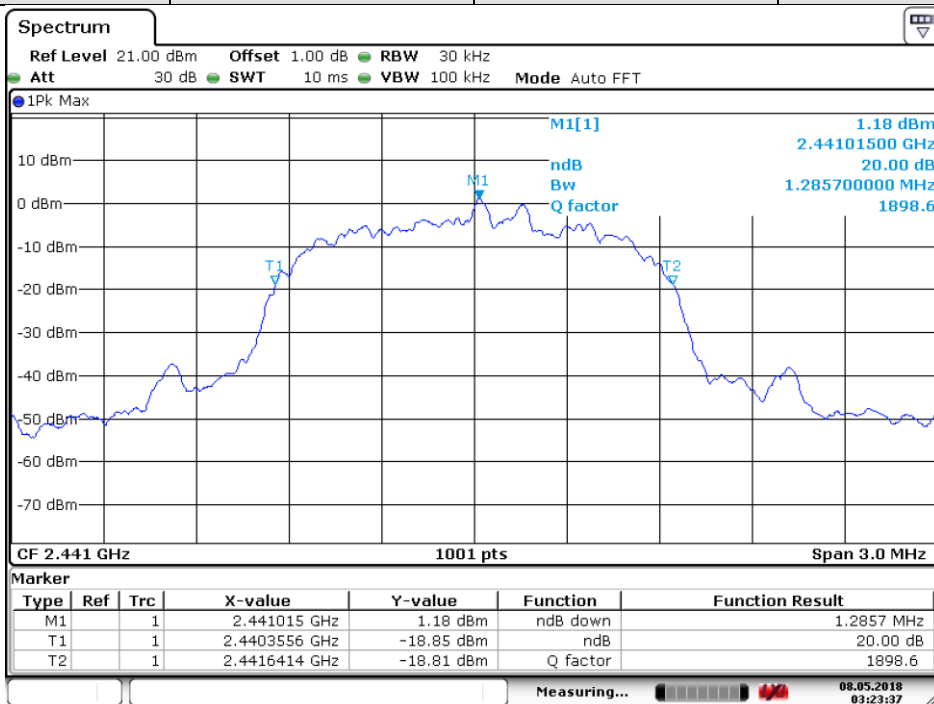
Page: 28 of 75

|            |       |               |        |
|------------|-------|---------------|--------|
| Test mode: | 8DPSK | Test channel: | Lowest |
|------------|-------|---------------|--------|



Date: 8.MAY.2018 03:23:56

|            |       |               |        |
|------------|-------|---------------|--------|
| Test mode: | 8DPSK | Test channel: | Middle |
|------------|-------|---------------|--------|



Date: 8.MAY.2018 03:23:37

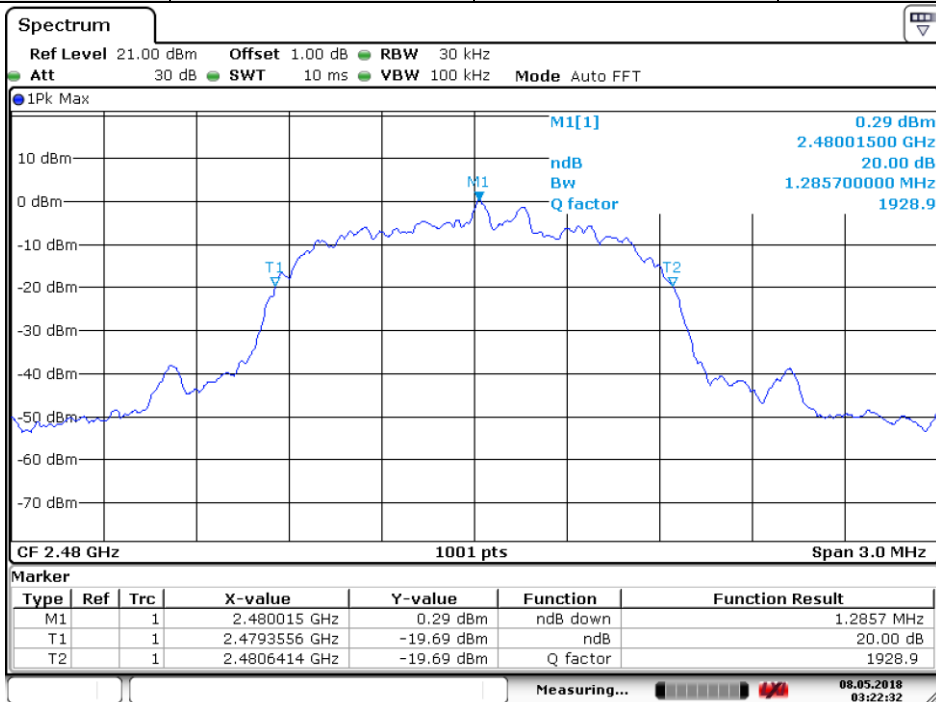


# SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

Report No.: SZEM180300241705

Page: 29 of 75

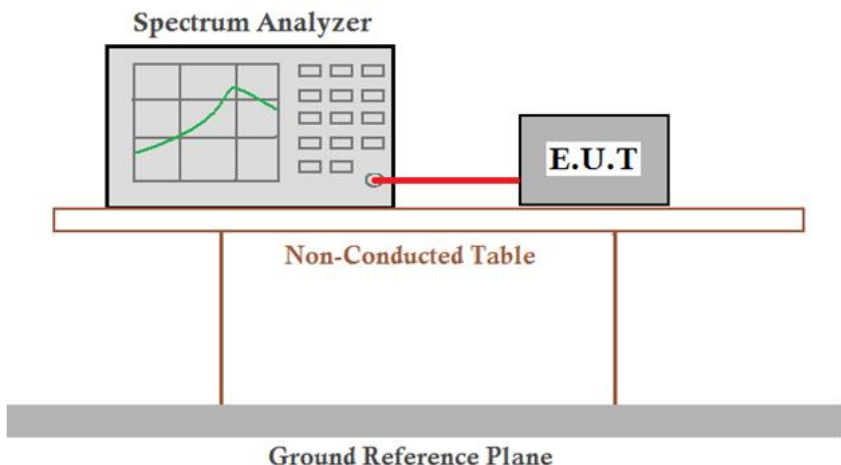
|            |       |               |         |
|------------|-------|---------------|---------|
| Test mode: | 8DPSK | Test channel: | Highest |
|------------|-------|---------------|---------|



Date: 8.MAY.2018 03:22:33



## 5.5 Carrier Frequencies Separation

|                        |                                                                                                                                                                                                                                                                                                                                                                                                |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Requirement:      | 47 CFR Part 15C Section 15.247 (a)(1)                                                                                                                                                                                                                                                                                                                                                          |
| Test Method:           | ANSI C63.10:2013 Section 7.8.2                                                                                                                                                                                                                                                                                                                                                                 |
| Test Setup:            |  <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T are placed on a Non-Conducted Table. The table is supported by two vertical legs. Below the table is a Ground Reference Plane.</p> |
| Limit:                 | 2/3 of the 20dB bandwidth                                                                                                                                                                                                                                                                                                                                                                      |
|                        | Remark: the transmission power is less than 0.125W.                                                                                                                                                                                                                                                                                                                                            |
| Exploratory Test Mode: | Hopping transmitting with all kind of modulation and all kind of data type.                                                                                                                                                                                                                                                                                                                    |
| Final Test Mode:       | Through Pre-scan, find the DH5 of data type is the worst case of GFSK modulation type, 2-DH5 of data type is the worst case of $\pi/4$ DQPSK modulation type, 3-DH5 of data type is the worst case of 8DPSK modulation type.                                                                                                                                                                   |
| Instruments Used:      | Refer to section 5.10 for details                                                                                                                                                                                                                                                                                                                                                              |
| Test Results:          | Pass                                                                                                                                                                                                                                                                                                                                                                                           |



# SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

Report No.: SZEM180300241705

Page: 31 of 75

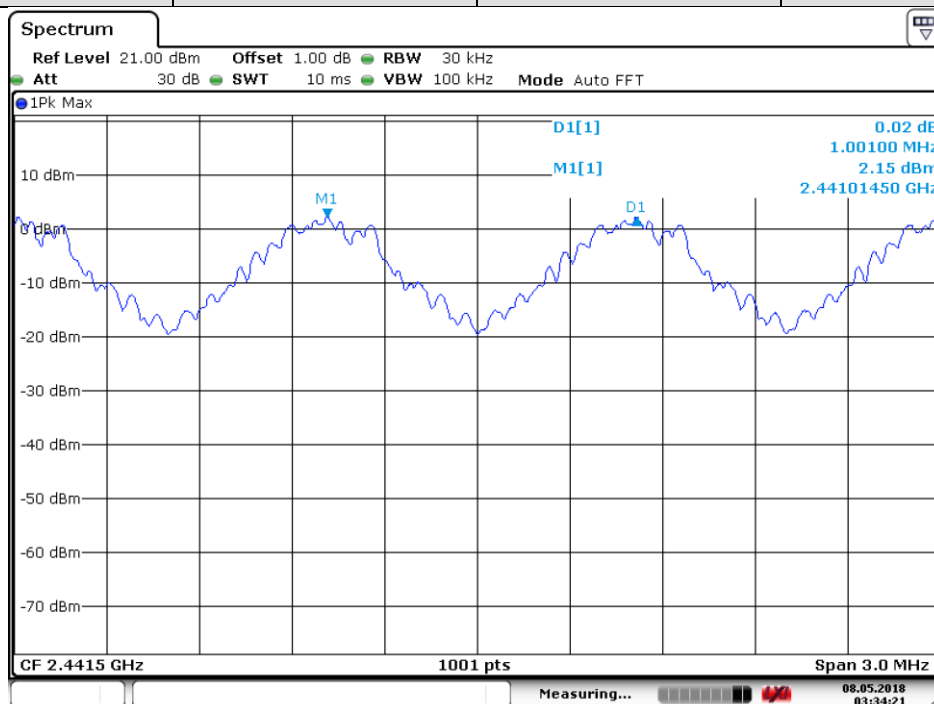
| GFSK mode          |                                      |             |        |
|--------------------|--------------------------------------|-------------|--------|
| Test channel       | Carrier Frequencies Separation (kHz) | Limit (kHz) | Result |
| Middle             | 1001                                 | 599.4       | Pass   |
| $\pi/4$ DQPSK mode |                                      |             |        |
| Test channel       | Carrier Frequencies Separation (kHz) | Limit (kHz) | Result |
| Middle             | 1001                                 | 835.1       | Pass   |
| 8DPSK mode         |                                      |             |        |
| Test channel       | Carrier Frequencies Separation (kHz) | Limit (kHz) | Result |
| Middle             | 1001                                 | 841.1       | Pass   |

Note: According to section 6.4,

| Mode          | 20dB bandwidth (kHz)<br>(worse case) | Limit (kHz)<br>(Carrier Frequencies Separation) |
|---------------|--------------------------------------|-------------------------------------------------|
| GFSK          | 905.1                                | 599.4                                           |
| $\pi/4$ DQPSK | 1282.7                               | 835.1                                           |
| 8DPSK         | 1285.7                               | 841.1                                           |

Test plot as follows:

|            |      |               |        |
|------------|------|---------------|--------|
| Test mode: | GFSK | Test channel: | Middle |
|------------|------|---------------|--------|



Date: 8.MAY.2018 03:34:21

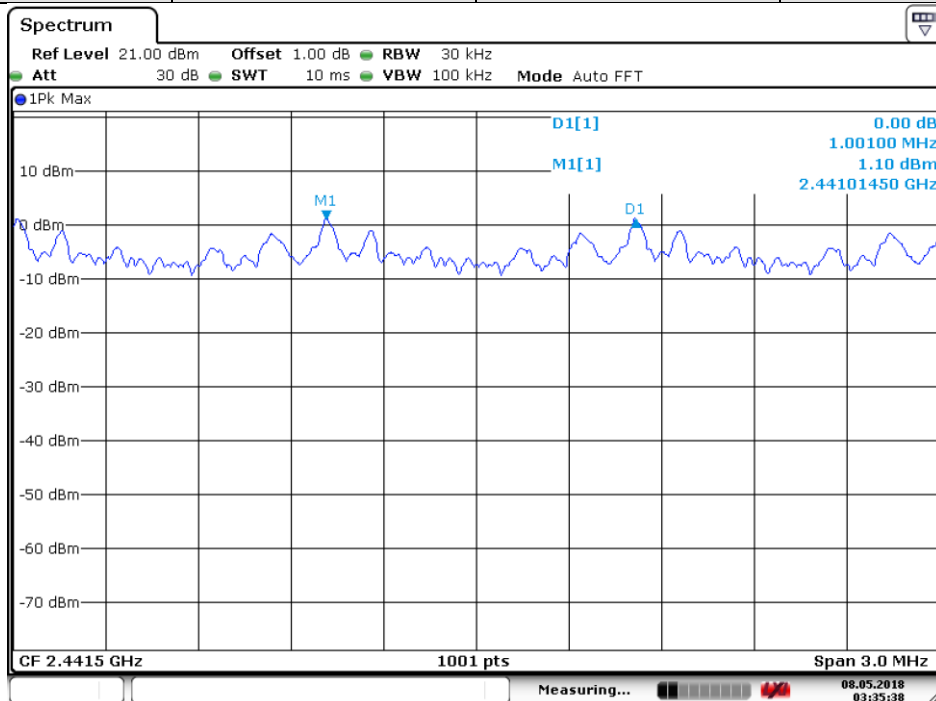


# SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

Report No.: SZEM180300241705

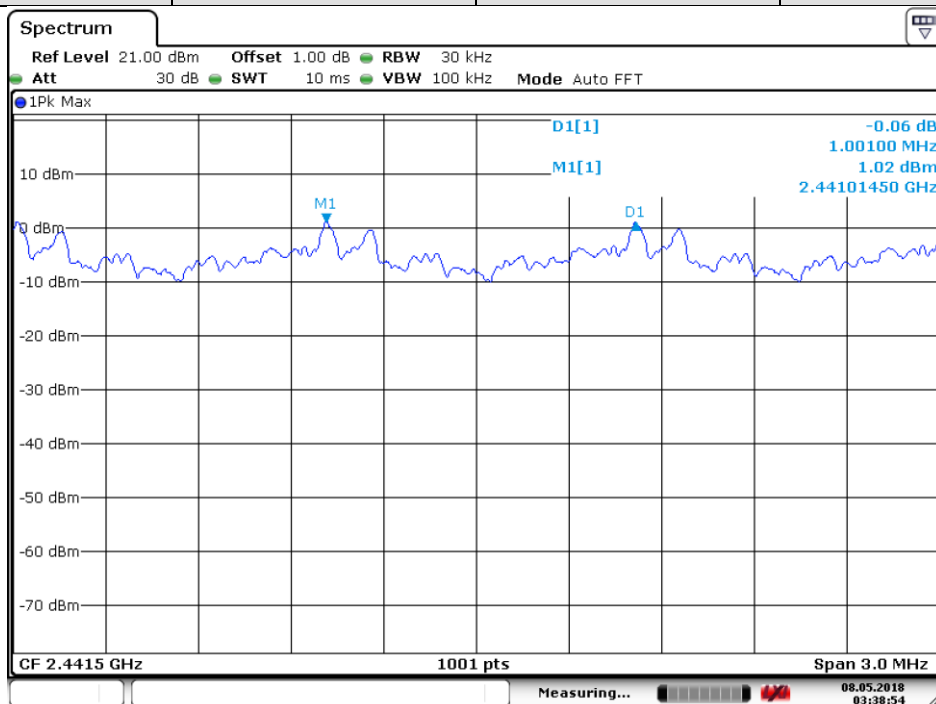
Page: 32 of 75

|            |               |               |        |
|------------|---------------|---------------|--------|
| Test mode: | $\pi/4$ DQPSK | Test channel: | Middle |
|------------|---------------|---------------|--------|



Date: 8.MAY.2018 03:35:38

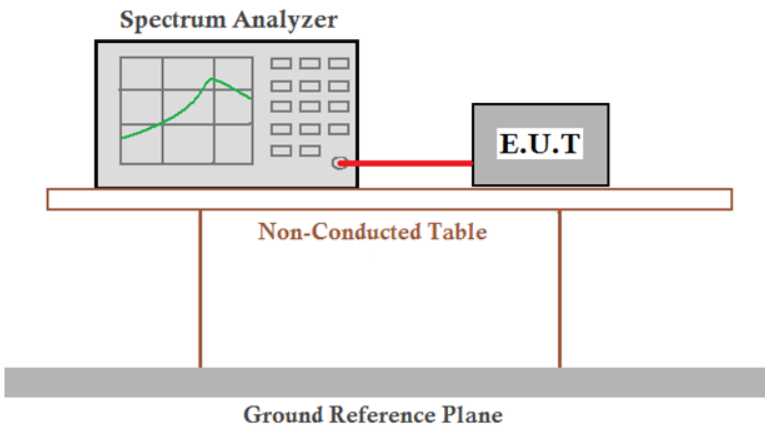
|            |       |               |        |
|------------|-------|---------------|--------|
| Test mode: | 8DPSK | Test channel: | Middle |
|------------|-------|---------------|--------|



Date: 8.MAY.2018 03:38:54



## 5.6 Hopping Channel Number

|                   |                                                                                    |
|-------------------|------------------------------------------------------------------------------------|
| Test Requirement: | 47 CFR Part 15C Section 15.247 (a)(1)                                              |
| Test Method:      | ANSI C63.10:2013 Section 7.8.3                                                     |
| Test Setup:       |  |
| Limit:            | At least 15 channels                                                               |
| Test Mode:        | Hopping transmitting with all kind of modulation                                   |
| Instruments Used: | Refer to section 5.10 for details                                                  |
| Test Results:     | Pass                                                                               |

### Measurement Data

| Mode          | Hopping channel numbers | Limit |
|---------------|-------------------------|-------|
| GFSK          | 79                      | ≥15   |
| $\pi/4$ DQPSK | 79                      | ≥15   |
| 8DPSK         | 79                      | ≥15   |



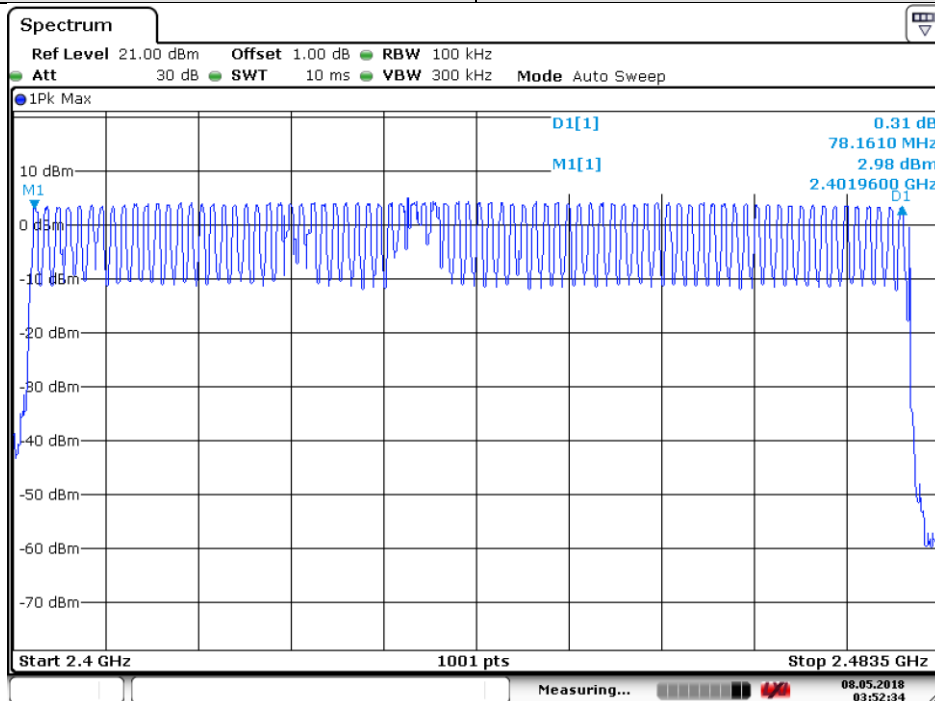
# SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

Report No.: SZEM180300241705

Page: 34 of 75

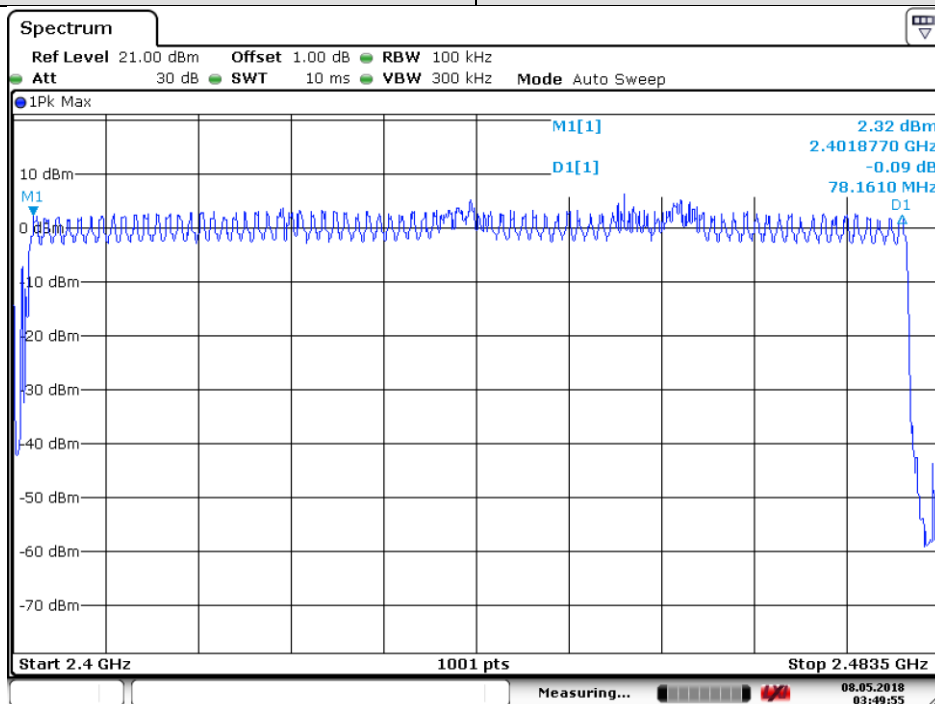
Test plot as follows

|            |      |
|------------|------|
| Test mode: | GFSK |
|------------|------|



Date: 8.MAY.2018 03:52:34

|            |               |
|------------|---------------|
| Test mode: | $\pi/4$ DQPSK |
|------------|---------------|



Date: 8.MAY.2018 03:49:56



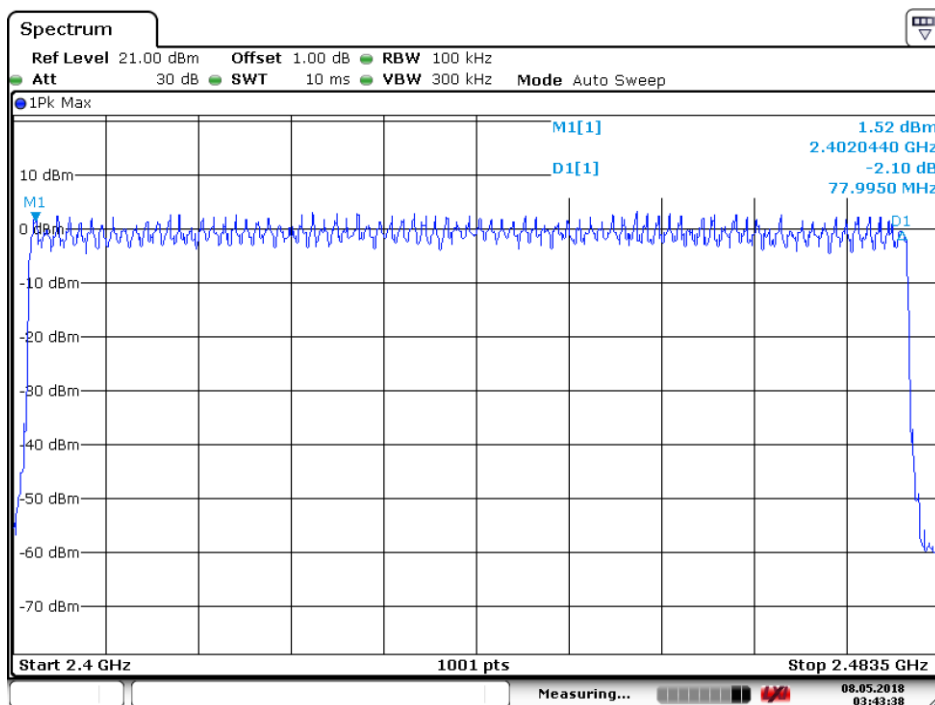
SGS-CSTC Standards Technical Services Co., Ltd.  
Shenzhen Branch

Report No.: SZEM180300241705

Page: 35 of 75

Test mode:

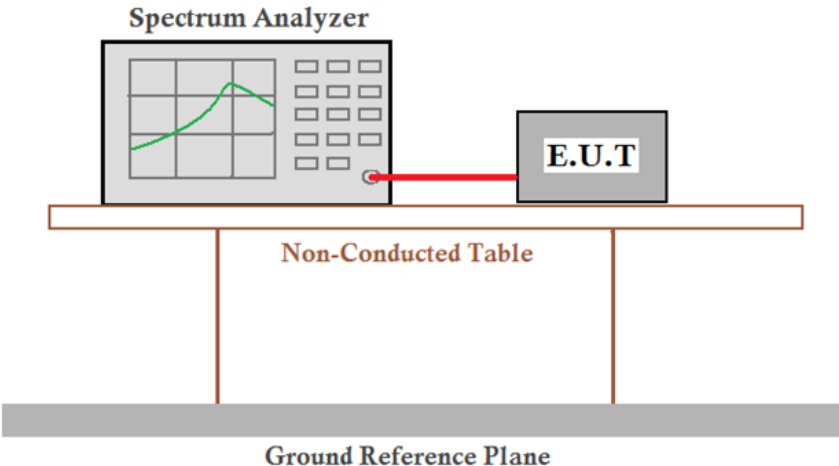
8DPSK



Date: 8.MAY.2018 03:43:38



## 5.7 Dwell Time

|                   |                                                                                    |
|-------------------|------------------------------------------------------------------------------------|
| Test Requirement: | 47 CFR Part 15C Section 15.247 (a)(1)                                              |
| Test Method:      | ANSI C63.10:2013 Section 7.8.4                                                     |
| Test Setup:       |  |
| Instruments Used: | Refer to section 5.10 for details                                                  |
| Test Mode:        | Hopping transmitting with all kind of modulation and all kind of data type.        |
| Limit:            | 0.4 Second                                                                         |
| Test Results:     | Pass                                                                               |

### Measurement Data

| Operation Modes | On time (ms) on one channel |
|-----------------|-----------------------------|
| DH1             | 0.401                       |
| DH3             | 1.644                       |
| DH5             | 2.914                       |
| 2DH1            | 0.408                       |
| 2DH3            | 1.667                       |
| 2DH5            | 2.914                       |
| 3DH1            | 0.407                       |
| 3DH3            | 1.664                       |
| 3DH5            | <b>2.919</b>                |



### **Bluetooth Time of Occupancy Calculation**

Typically, Bluetooth 1x/EDR mode has a channel hopping rate of 1600 hops/s, since 1x/EDR modes use 5 transmit and 1 receive slot, for a total of 6 slots, the Bluetooth transmitter is actually hopping at a rate of  $1600/6=266.67$  hops/slot

$400\text{ms} \times 79 \text{ Channel} = 31.6 \text{ s}$  (Time of Occupancy Limit)

Worst case BT has 266.67 hops/second (for 1x/EDR modes with 3DH5 operation)

$266.67 \text{ hops/second} / 79 \text{ channels} = 3.38 \text{ hops/second}$  (# of hops/second on one channel)

$3.38 \text{ hops/second} / \text{channel} \times 31.6 \text{ seconds} = 106.67 \text{ hops}$  (#hops over a 31.6 second period)

$106.67 \text{ hops} \times 2.919 \text{ ms/channel} = 311.37 \text{ ms}$  (worst case dwell time for one channel in 1x/EDR modes)

With AFH, the number of channels is reduced to a minimum of 20 channels and the channel hopping rate is reduced by 50% to 800hops/s, AFH mode also uses 6 slots so the Bluetooth transmitter hops at a rate of  $800/6=133.3$  hops/s/slot

$400\text{ms} \times 20 \text{ Channel} = 8 \text{ s}$  (Time of Occupancy Limit)

Worst case BT has 133.3 hops/second/slot (for AFH mode with 3DH5 operation)

$133.3 \text{ hops/second} / 20 \text{ channels} = 6.67 \text{ hops/second}$  (#hops/second on one channel)

$6.67 \text{ hops/second} \times 8 \text{ seconds} = 53.34 \text{ hops}$  (#hops over a 8 seconds period)

$53.34 \text{ hops} \times 2.919 \text{ ms/channel} = 155.70 \text{ ms}$  (worst case dwell time for one channel in AFH mode)

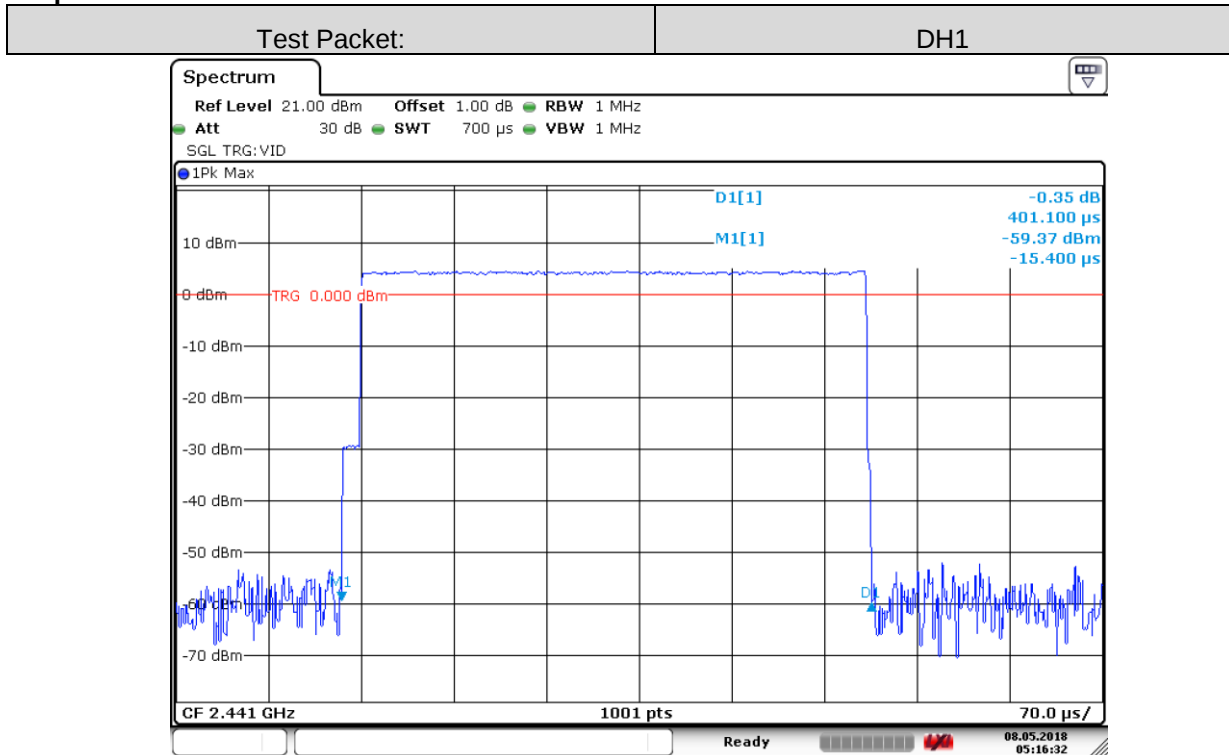


SGS-CSTC Standards Technical Services Co., Ltd.  
Shenzhen Branch

Report No.: SZEM180300241705

Page: 38 of 75

Test plot as follows:



Date: 8.MAY.2018 05:16:33

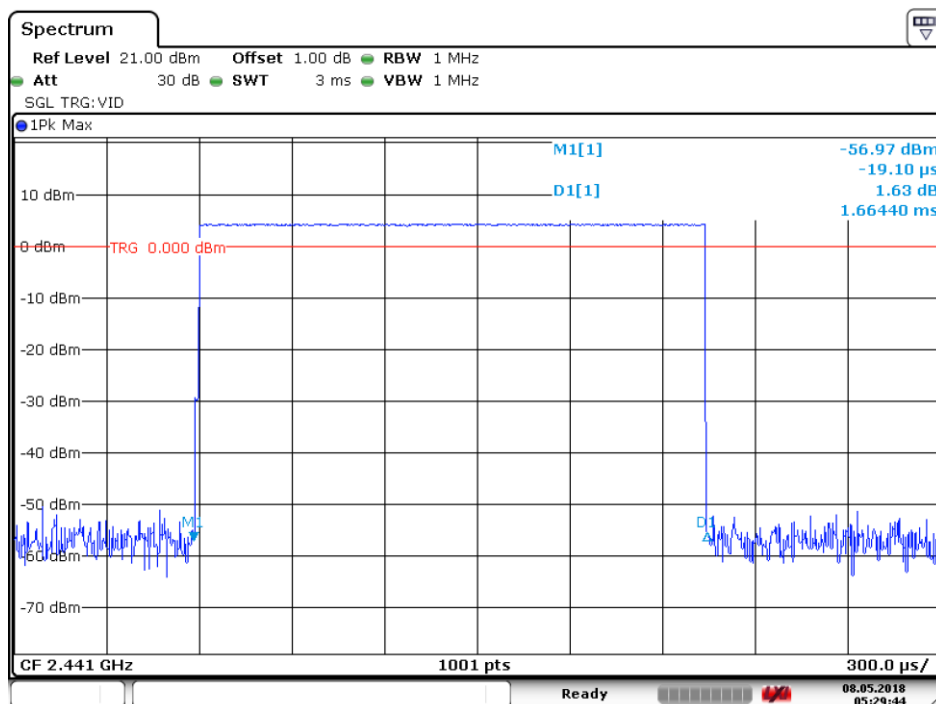


# SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

Report No.: SZEM180300241705

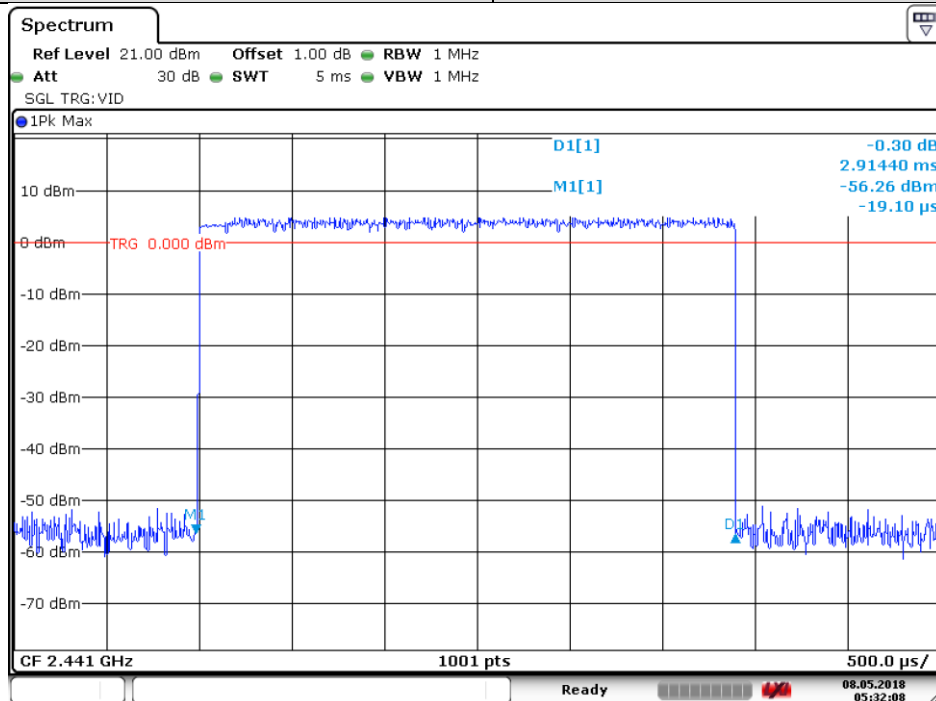
Page: 39 of 75

|              |     |
|--------------|-----|
| Test Packet: | DH3 |
|--------------|-----|



Date: 8.MAY.2018 05:29:44

|              |     |
|--------------|-----|
| Test Packet: | DH5 |
|--------------|-----|



Date: 8.MAY.2018 05:32:08

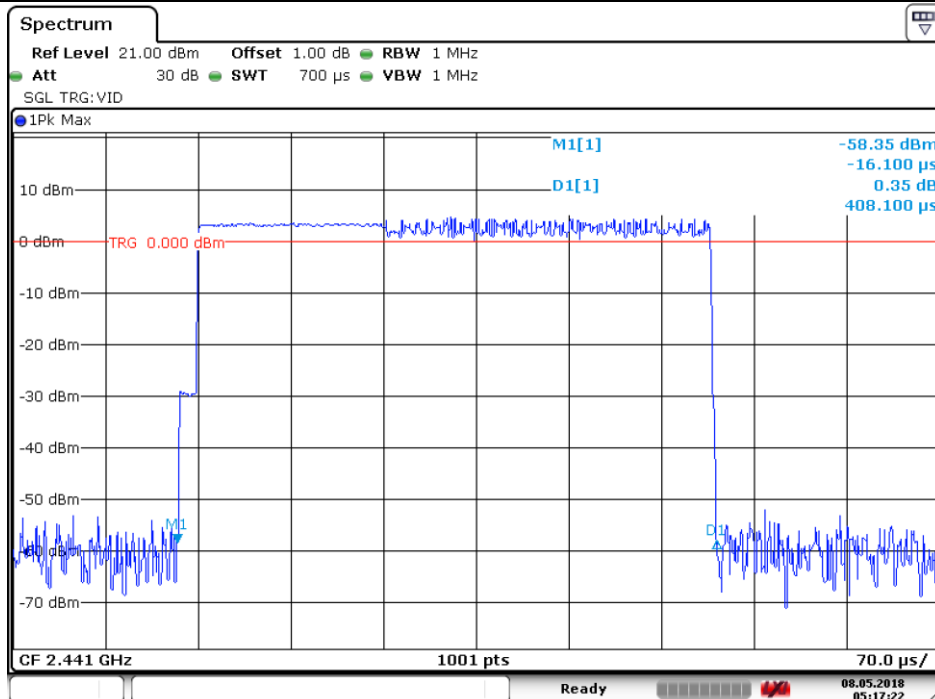


# SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

Report No.: SZEM180300241705

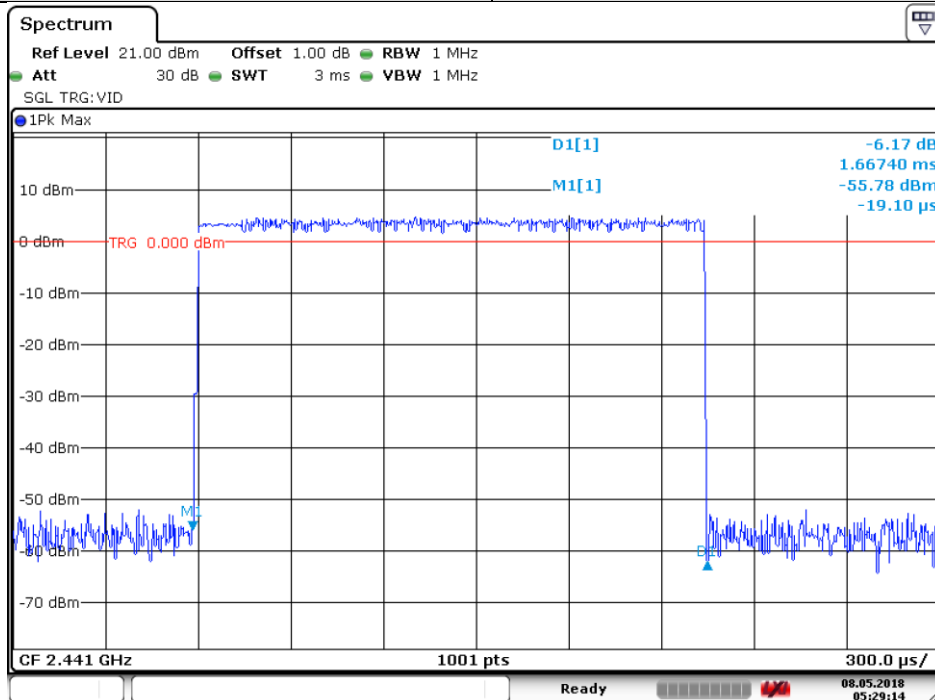
Page: 40 of 75

|              |       |
|--------------|-------|
| Test Packet: | 2-DH1 |
|--------------|-------|



Date: 8.MAY.2018 05:17:22

|              |       |
|--------------|-------|
| Test Packet: | 2-DH3 |
|--------------|-------|



Date: 8.MAY.2018 05:29:15

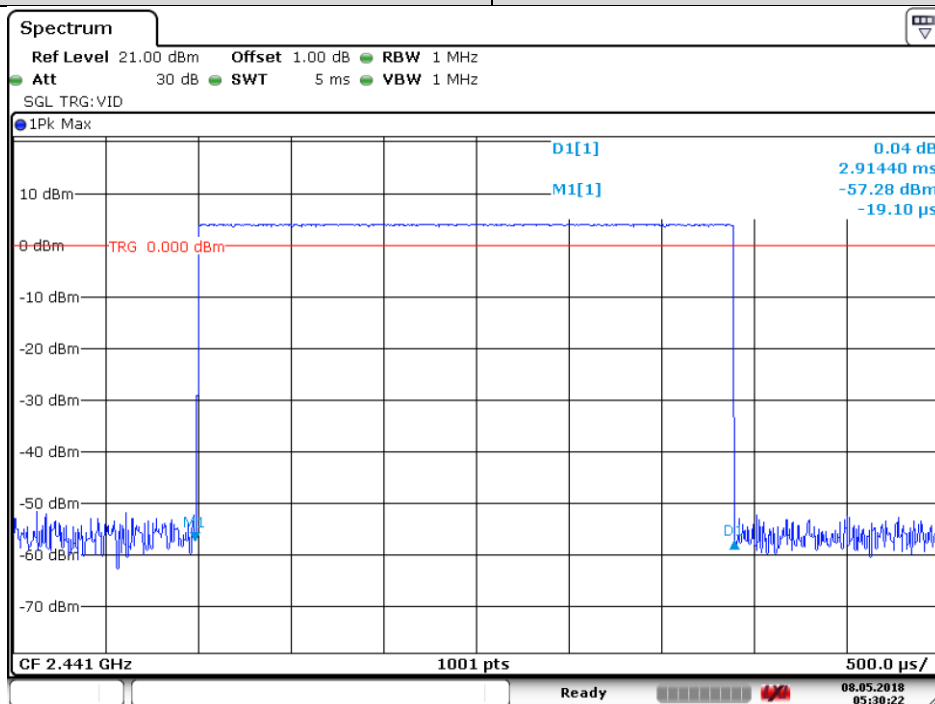


# SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

Report No.: SZEM180300241705

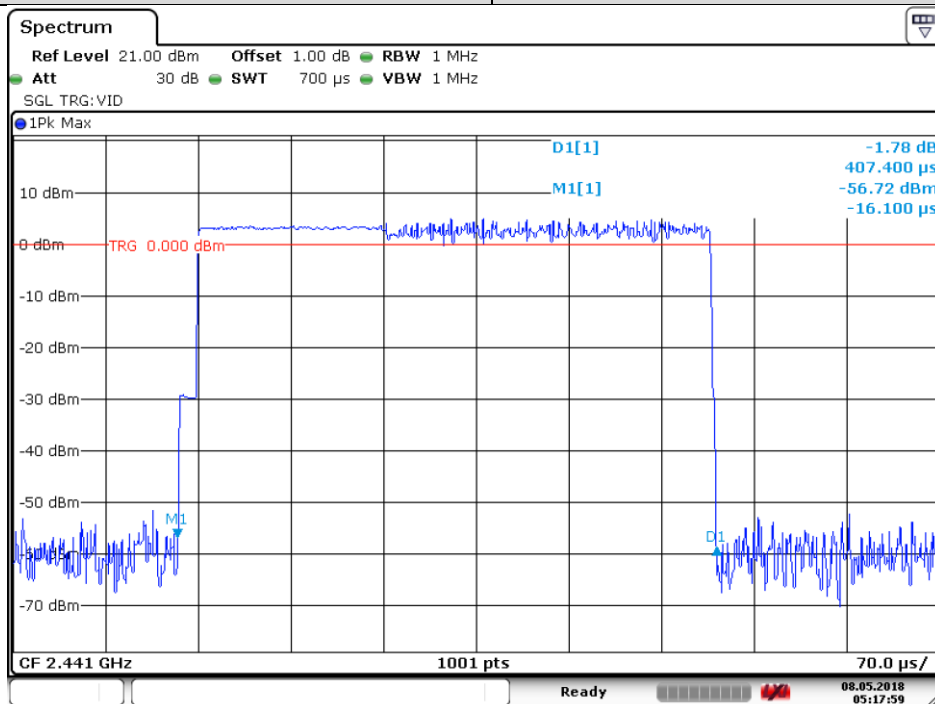
Page: 41 of 75

|              |       |
|--------------|-------|
| Test Packet: | 2-DH5 |
|--------------|-------|



Date: 8.MAY.2018 05:30:22

|              |       |
|--------------|-------|
| Test Packet: | 3-DH1 |
|--------------|-------|



Date: 8.MAY.2018 05:18:00

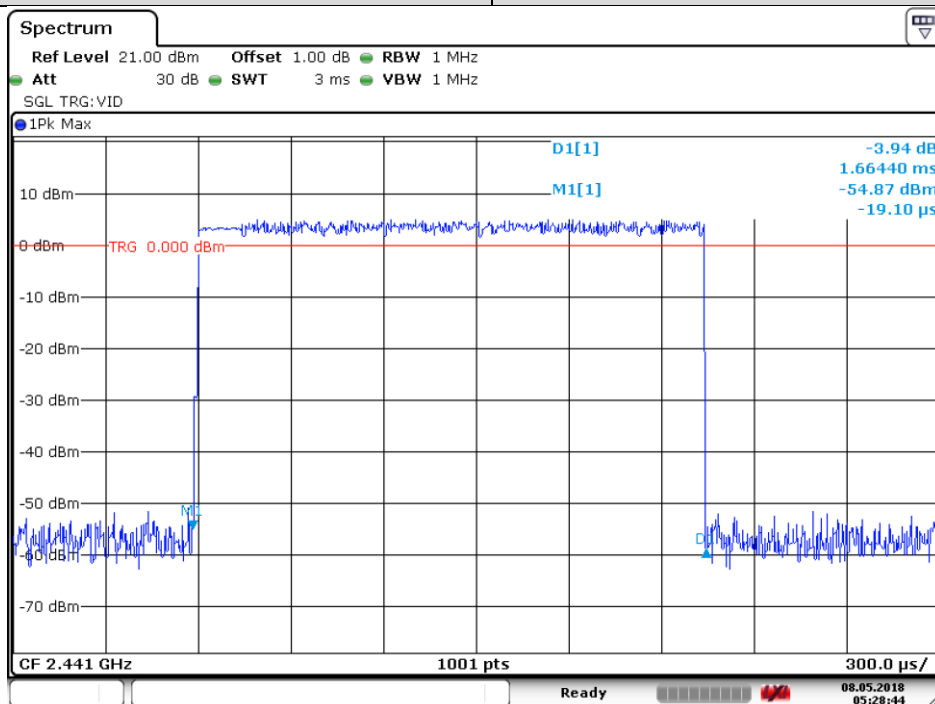


# SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

Report No.: SZEM180300241705

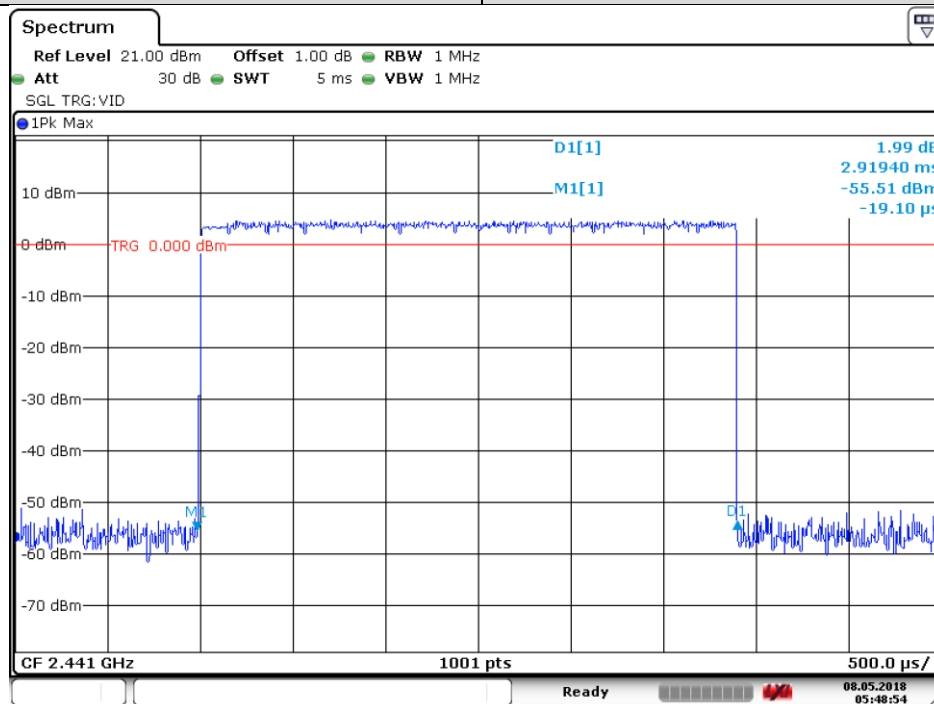
Page: 42 of 75

|              |       |
|--------------|-------|
| Test Packet: | 3-DH3 |
|--------------|-------|



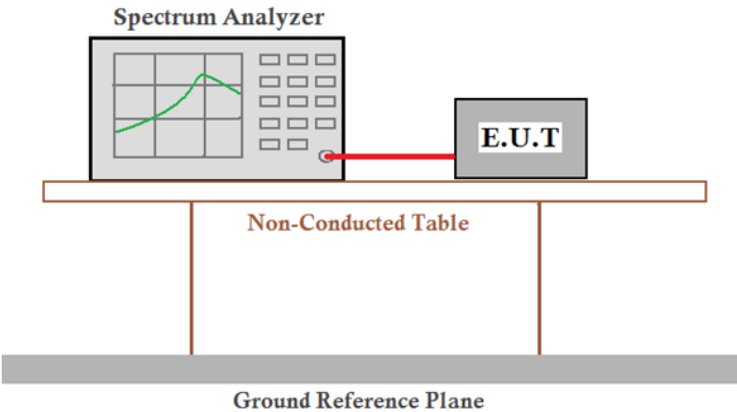
Date: 8.MAY.2018 05:28:44

|              |       |
|--------------|-------|
| Test Packet: | 3-DH5 |
|--------------|-------|



Date: 8.MAY.2018 05:48:54

## 5.8 Band-edge for RF Conducted Emissions

|                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Requirement:      | 47 CFR Part 15C Section 15.247 (d)                                                                                                                                                                                                                                                                                                                                                                                      |
| Test Method:           | ANSI C63.10:2013 Section 7.8.6                                                                                                                                                                                                                                                                                                                                                                                          |
| Test Setup:            |  <p>The diagram illustrates the test setup for RF conducted emissions. A Spectrum Analyzer is connected to an Equipment Under Test (E.U.T.) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table, which is supported by two vertical legs. Below the table is a Ground Reference Plane.</p> |
| Limit:                 | In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.                                 |
| Exploratory Test Mode: | Hopping and Non-hopping transmitting with all kind of modulation and all kind of data type                                                                                                                                                                                                                                                                                                                              |
| Final Test Mode:       | Through Pre-scan, find the DH5 of data type is the worst case of GFSK modulation type, 2-DH5 of data type is the worst case of $\pi/4$ DQPSK modulation type, 3-DH5 of data type is the worst case of 8DPSK modulation type.                                                                                                                                                                                            |
| Instruments Used:      | Refer to section 5.10 for details                                                                                                                                                                                                                                                                                                                                                                                       |
| Test Results:          | Pass                                                                                                                                                                                                                                                                                                                                                                                                                    |



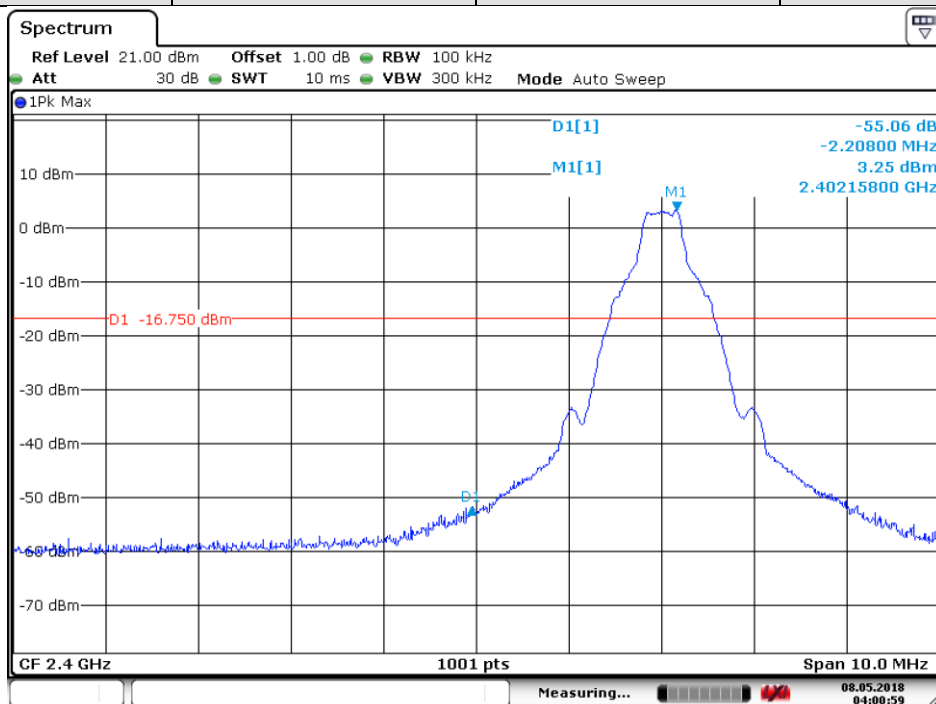
# SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

Report No.: SZEM180300241705

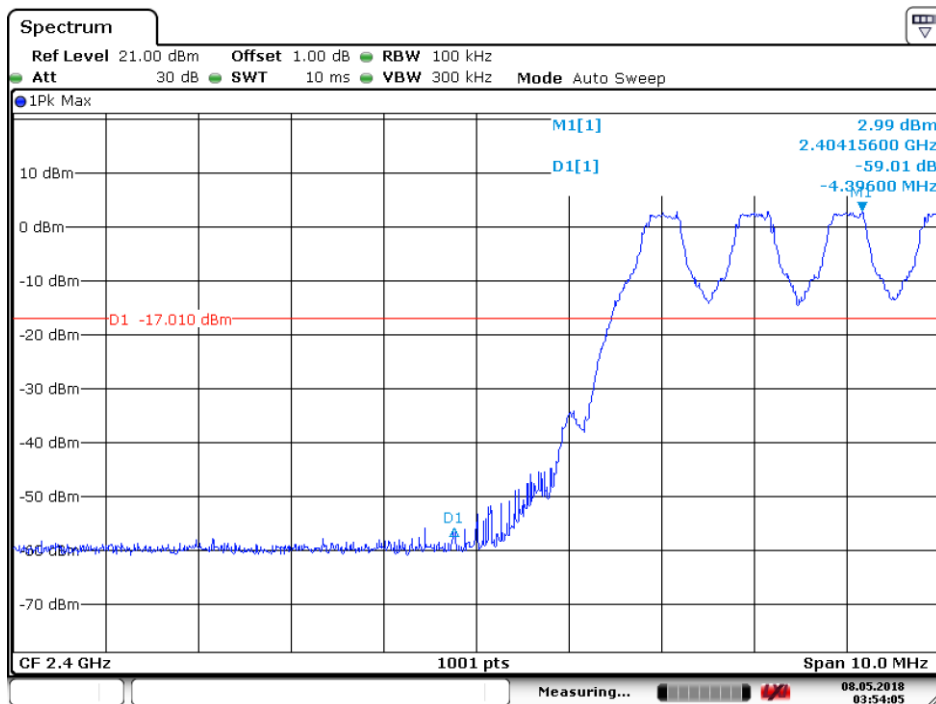
Page: 44 of 75

Test plot as follows:

|            |      |               |        |
|------------|------|---------------|--------|
| Test mode: | GFSK | Test channel: | Lowest |
|------------|------|---------------|--------|



Date: 8.MAY.2018 04:00:59



Date: 8.MAY.2018 03:54:06

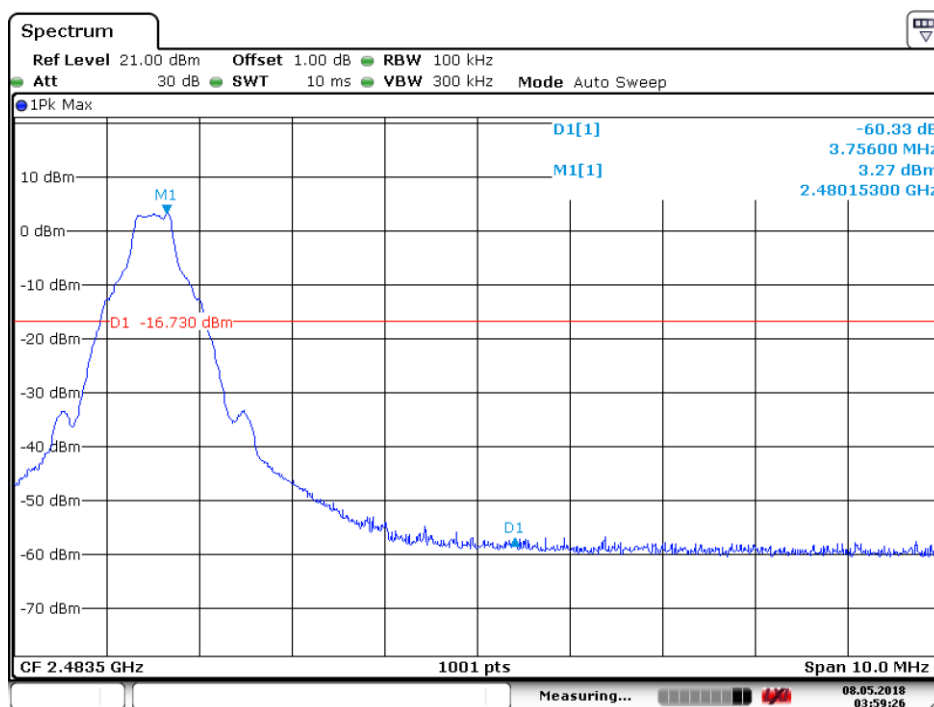


# SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

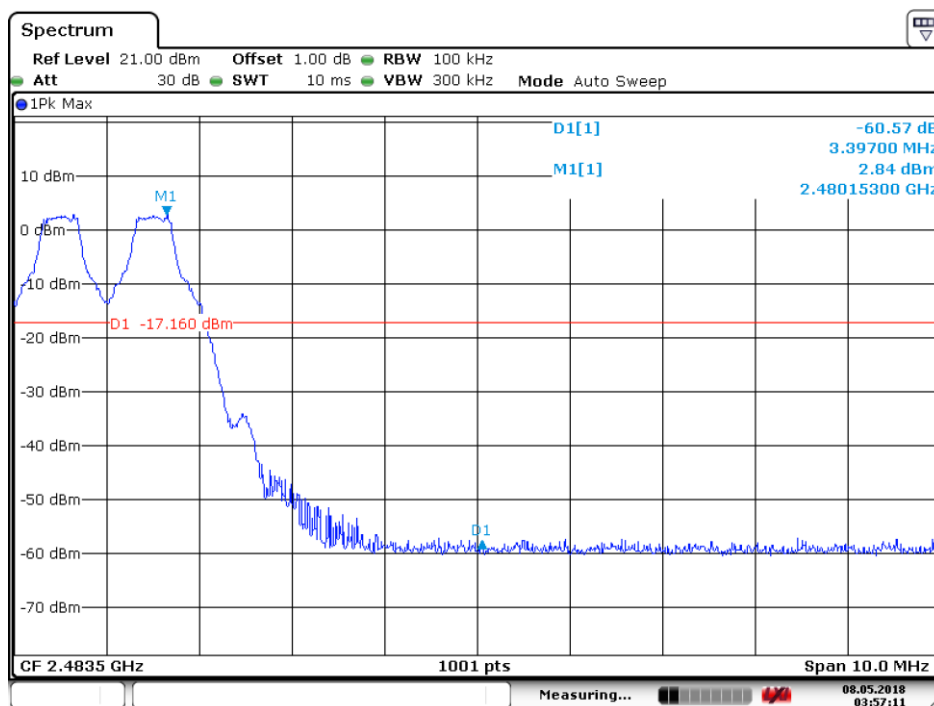
Report No.: SZEM180300241705

Page: 45 of 75

|            |      |               |         |
|------------|------|---------------|---------|
| Test mode: | GFSK | Test channel: | Highest |
|------------|------|---------------|---------|



Date: 8.MAY.2018 03:59:26



Date: 8.MAY.2018 03:57:11

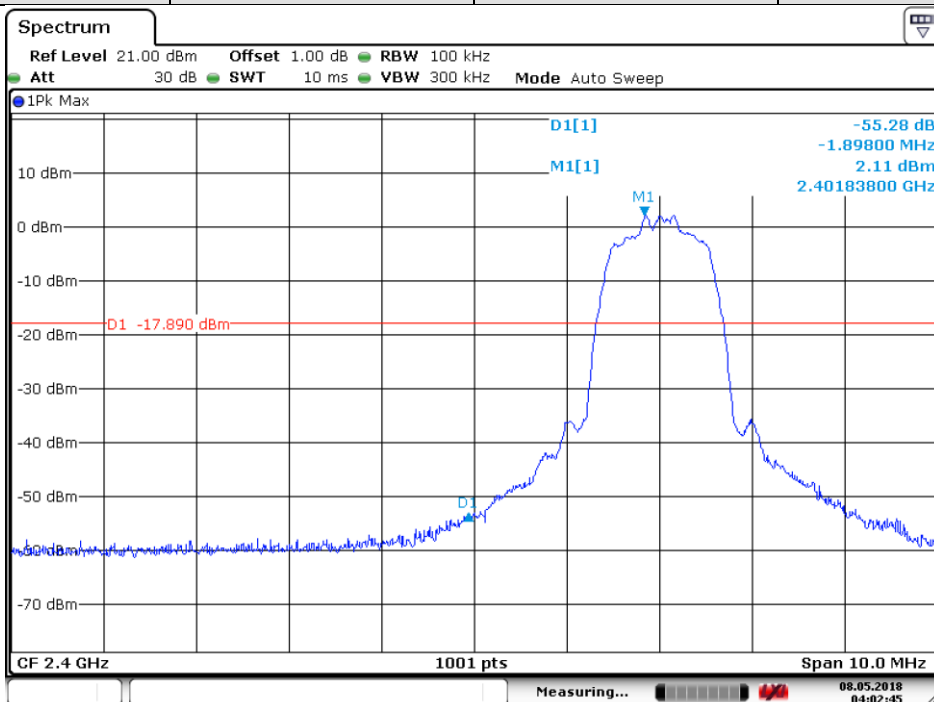


# SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

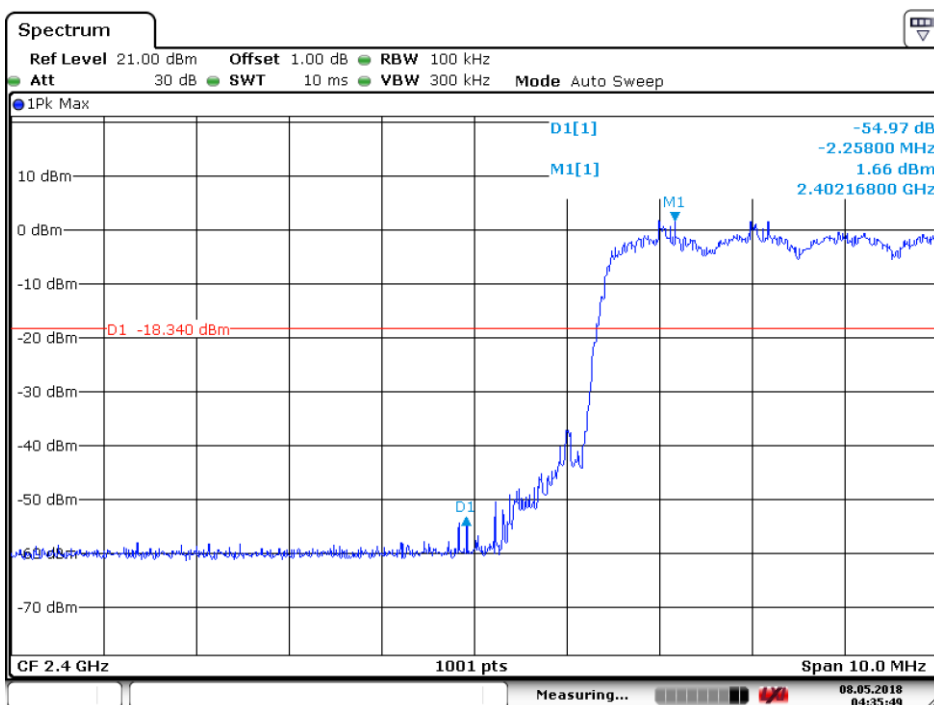
Report No.: SZEM180300241705

Page: 46 of 75

|            |               |               |        |
|------------|---------------|---------------|--------|
| Test mode: | $\pi/4$ DQPSK | Test channel: | Lowest |
|------------|---------------|---------------|--------|



Date: 8.MAY.2018 04:02:44



Date: 8.MAY.2018 04:35:49

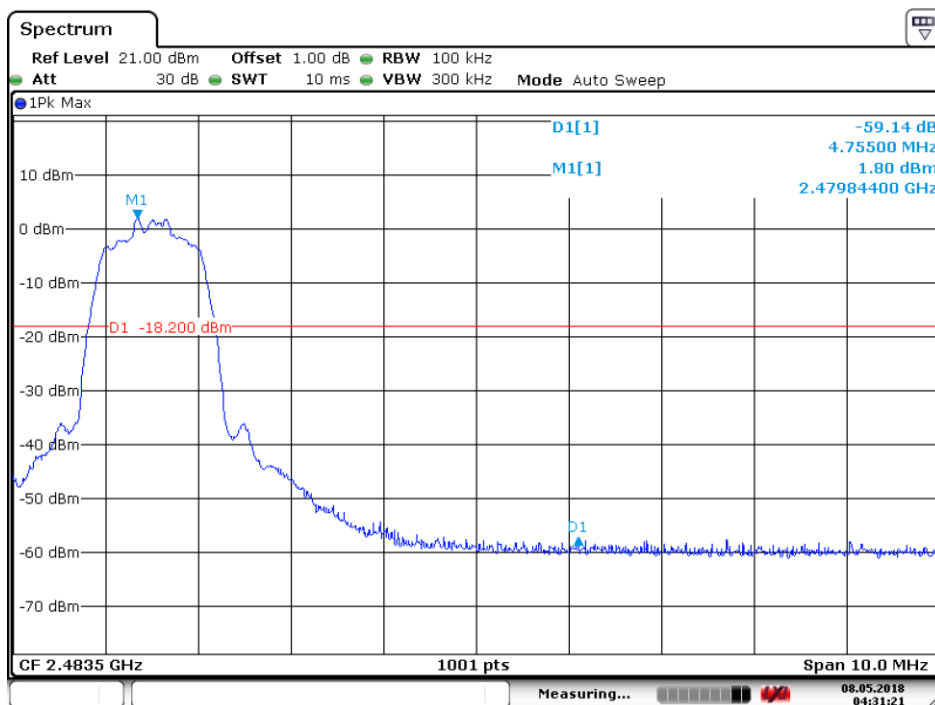


# SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

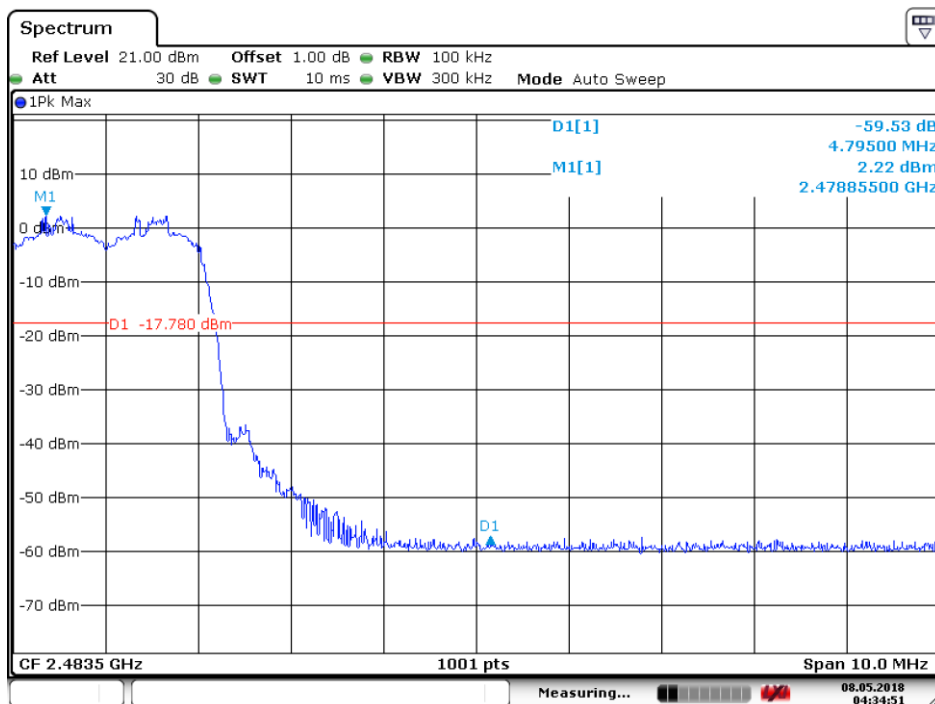
Report No.: SZEM180300241705

Page: 47 of 75

|            |               |               |         |
|------------|---------------|---------------|---------|
| Test mode: | $\pi/4$ DQPSK | Test channel: | Highest |
|------------|---------------|---------------|---------|



Date: 8.MAY.2018 04:31:21



Date: 8.MAY.2018 04:34:52

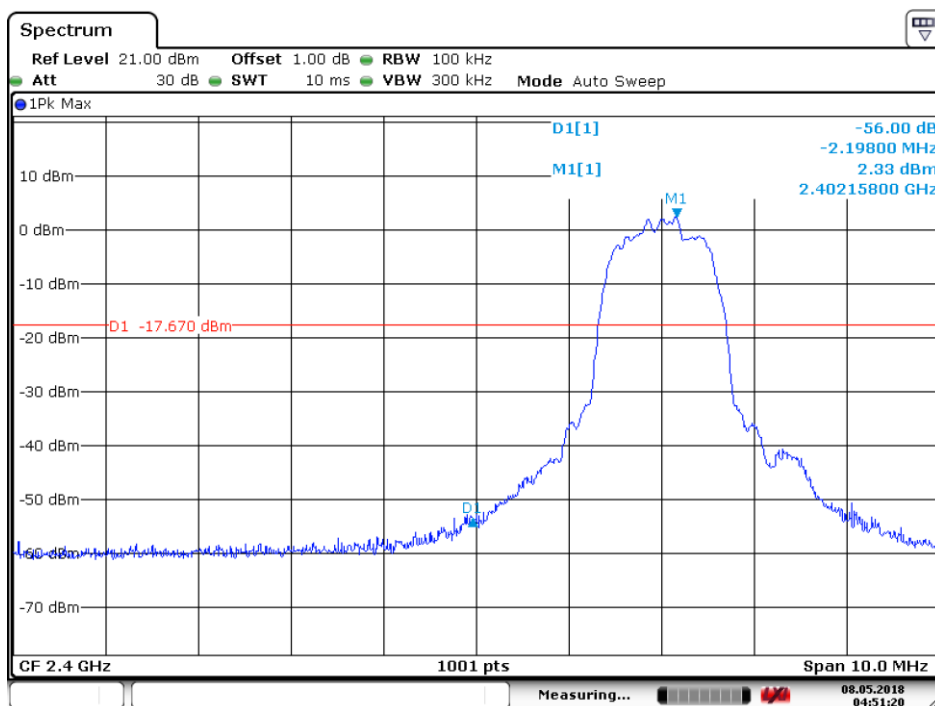


# SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

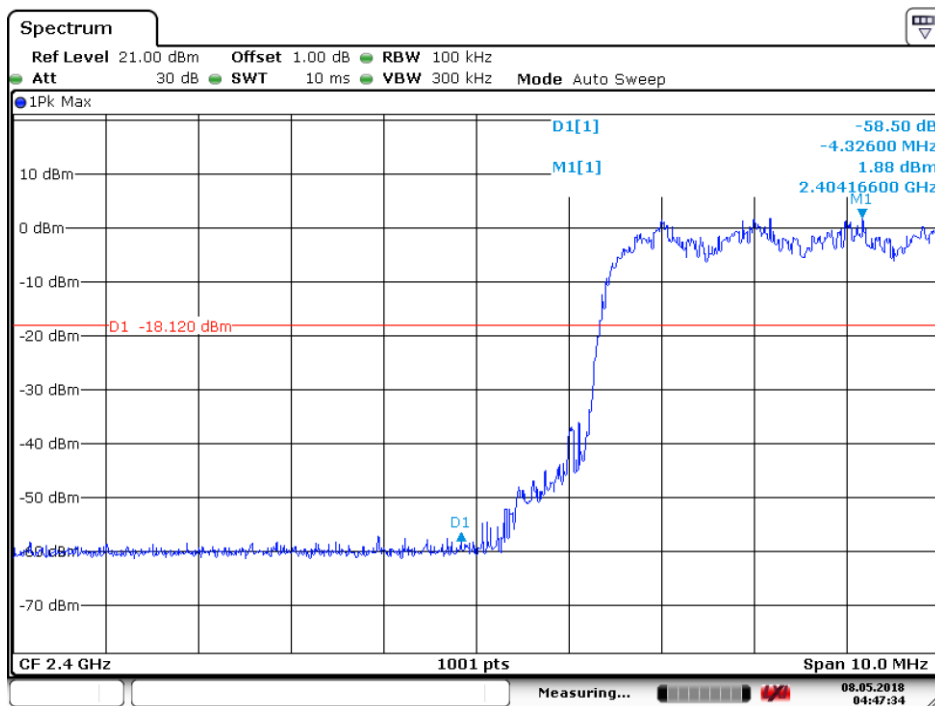
Report No.: SZEM180300241705

Page: 48 of 75

|            |       |               |        |
|------------|-------|---------------|--------|
| Test mode: | 8DPSK | Test channel: | Lowest |
|------------|-------|---------------|--------|



Date: 8.MAY.2018 04:51:20



Date: 8.MAY.2018 04:47:34

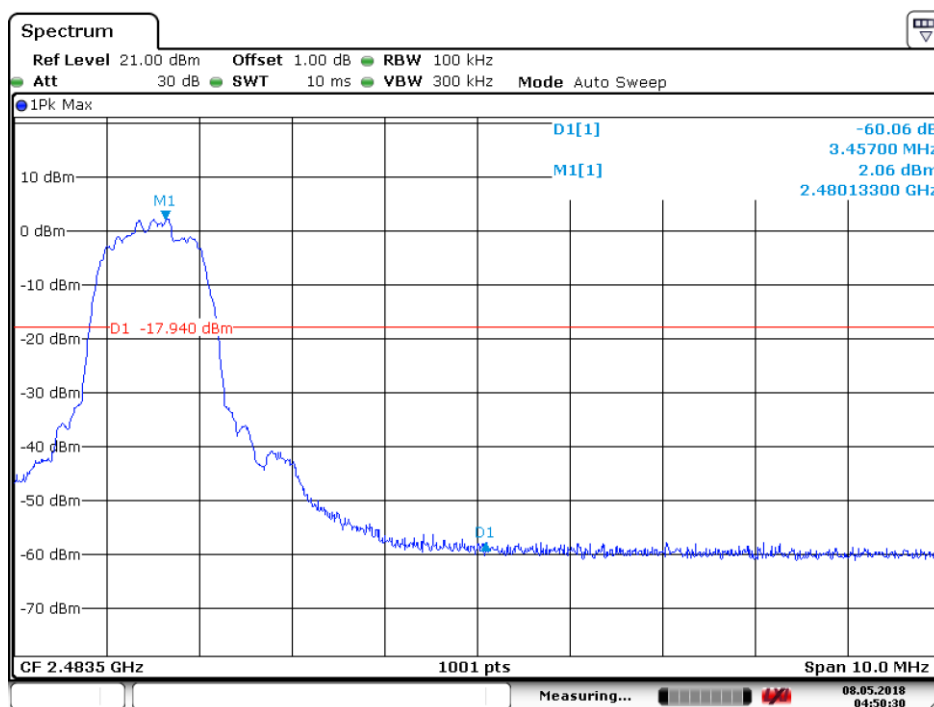


# SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

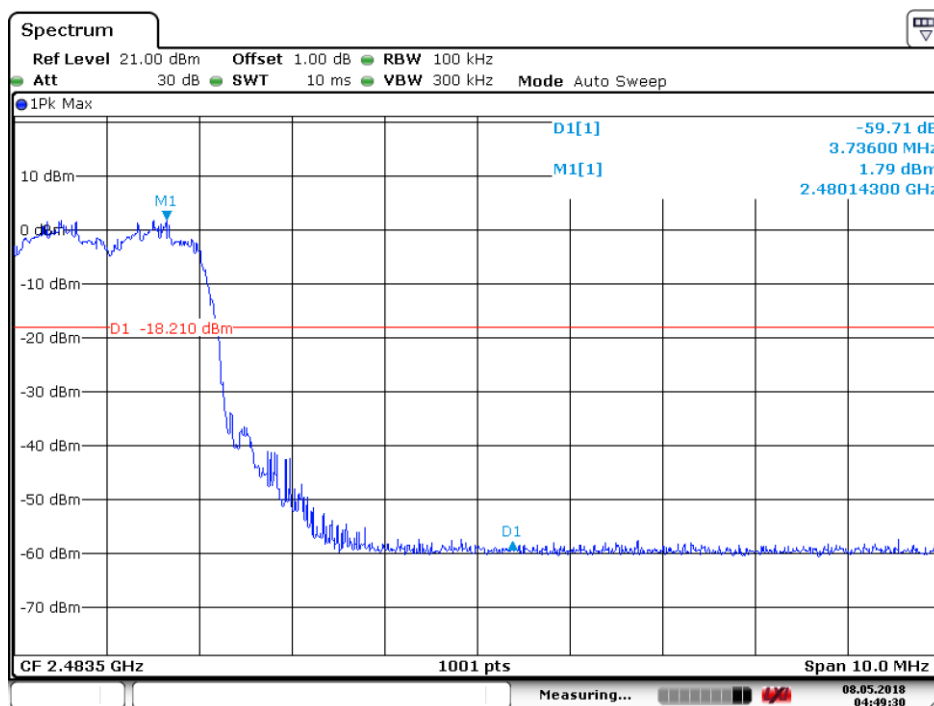
Report No.: SZEM180300241705

Page: 49 of 75

|            |       |               |         |
|------------|-------|---------------|---------|
| Test mode: | 8DPSK | Test channel: | Highest |
|------------|-------|---------------|---------|



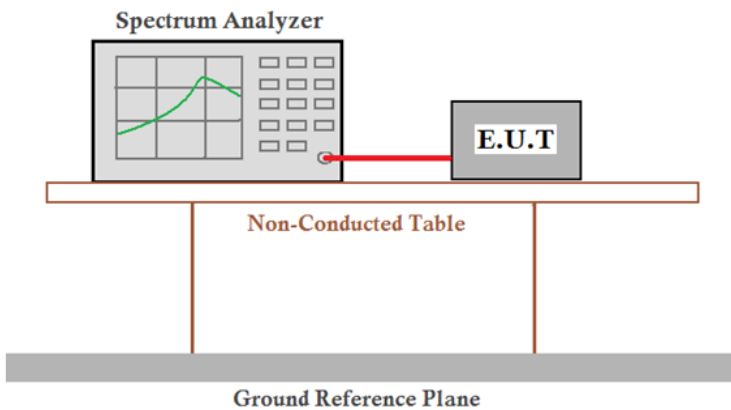
Date: 8.MAY.2018 04:50:30



Date: 8.MAY.2018 04:49:30



## 5.9 Spurious RF Conducted Emissions

|                        |                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Requirement:      | 47 CFR Part 15C Section 15.247 (d)                                                                                                                                                                                                                                                                                                                                                      |
| Test Method:           | ANSI C63.10:2013 Section 7.8.8                                                                                                                                                                                                                                                                                                                                                          |
| Test Setup:            |                                                                                                                                                                                                                                                                                                       |
| Limit:                 | In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. |
| Exploratory Test Mode: | Non-hopping transmitting with all kind of modulation and all kind of data type                                                                                                                                                                                                                                                                                                          |
| Final Test Mode:       | Through Pre-scan, find the DH5 of data type is the worst case of GFSK modulation type, 2-DH5 of data type is the worst case of $\pi/4$ DQPSK modulation type, 3-DH5 of data type is the worst case of 8DPSK modulation type.                                                                                                                                                            |
| Instruments Used:      | Refer to section 5.10 for details                                                                                                                                                                                                                                                                                                                                                       |
| Test Results:          | Pass                                                                                                                                                                                                                                                                                                                                                                                    |



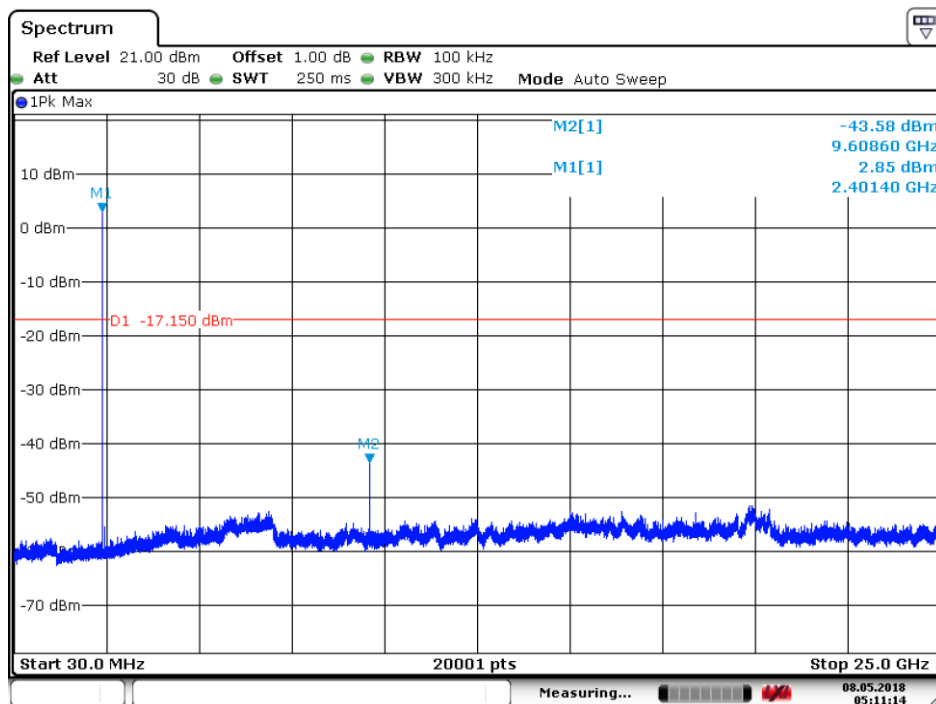
# SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

Report No.: SZEM180300241705

Page: 51 of 75

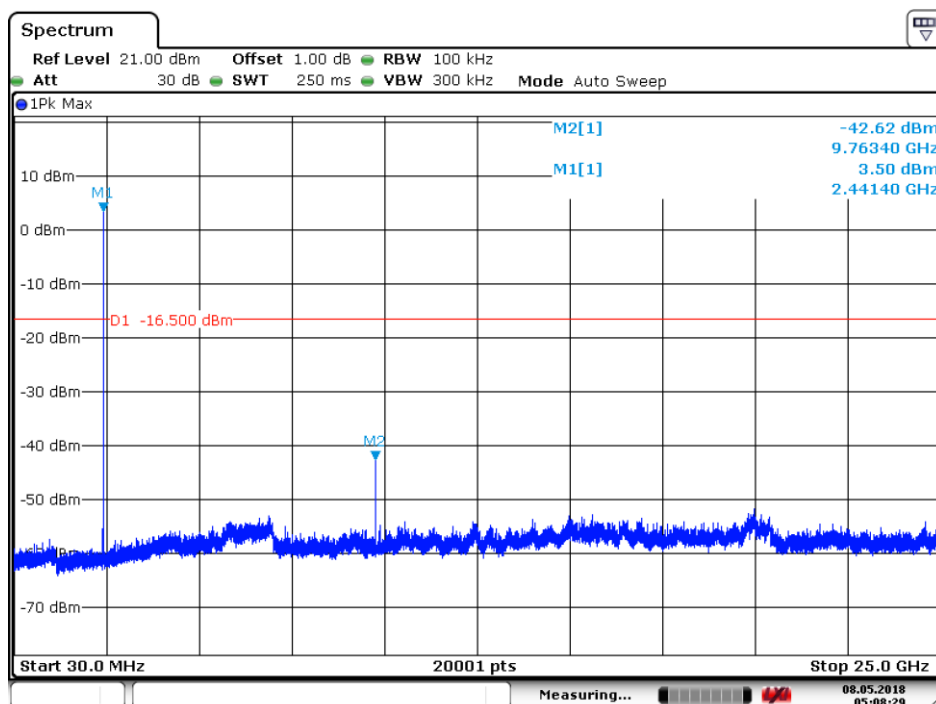
Test plot as follows:

|            |      |               |        |
|------------|------|---------------|--------|
| Test mode: | GFSK | Test channel: | Lowest |
|------------|------|---------------|--------|



Date: 8.MAY.2018 05:11:14

|            |      |               |        |
|------------|------|---------------|--------|
| Test mode: | GFSK | Test channel: | Middle |
|------------|------|---------------|--------|



Date: 8.MAY.2018 05:08:30

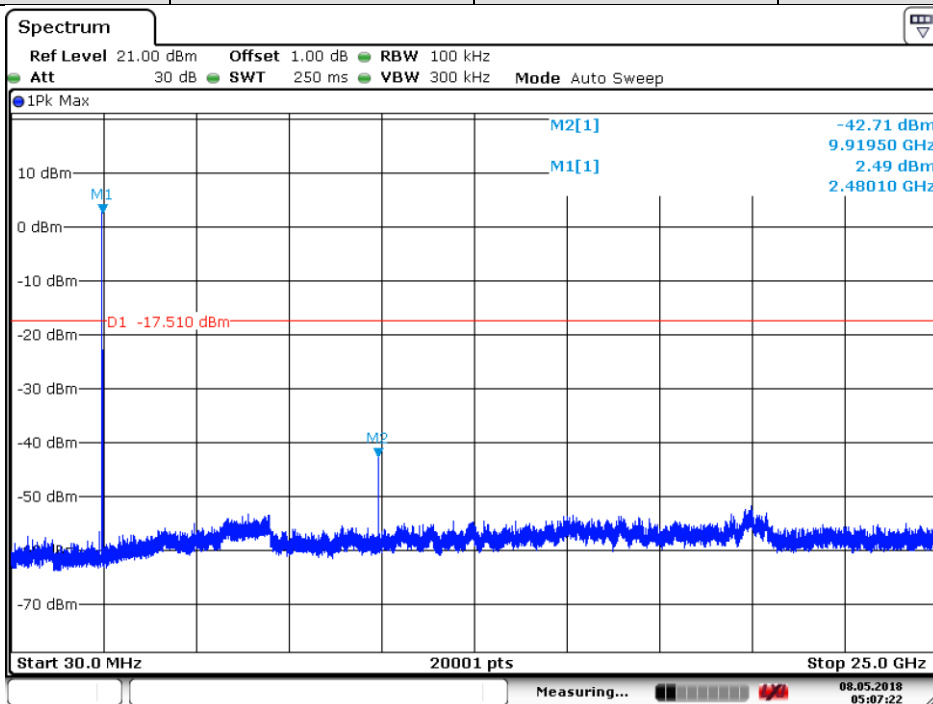


# SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

Report No.: SZEM180300241705

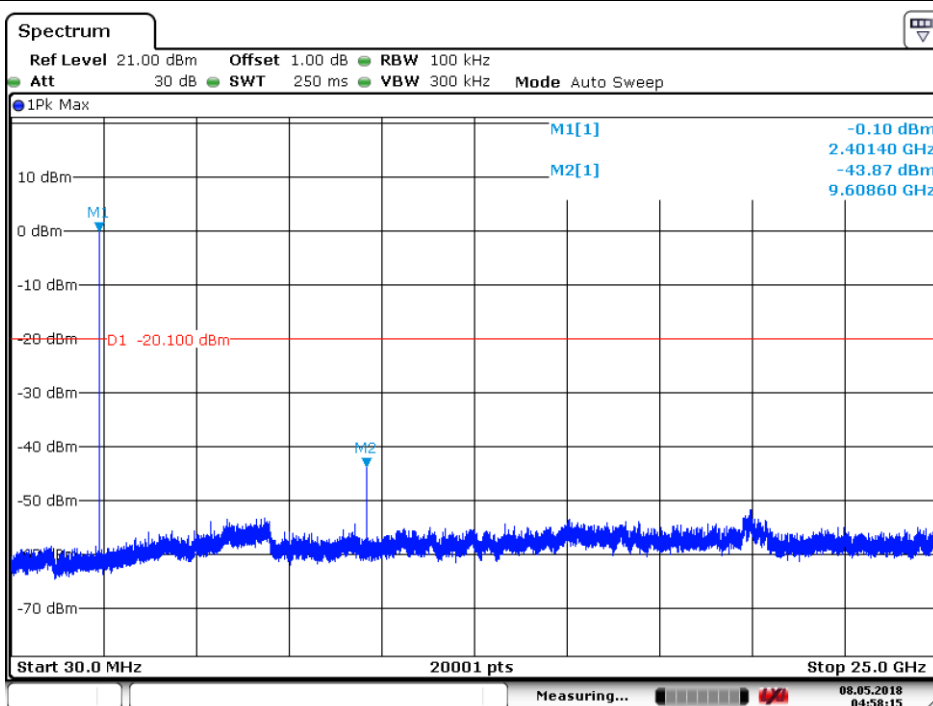
Page: 52 of 75

|            |      |               |         |
|------------|------|---------------|---------|
| Test mode: | GFSK | Test channel: | Highest |
|------------|------|---------------|---------|



Date: 8.MAY.2018 05:07:23

|            |               |               |        |
|------------|---------------|---------------|--------|
| Test mode: | $\pi/4$ DQPSK | Test channel: | Lowest |
|------------|---------------|---------------|--------|



Date: 8.MAY.2018 04:58:15

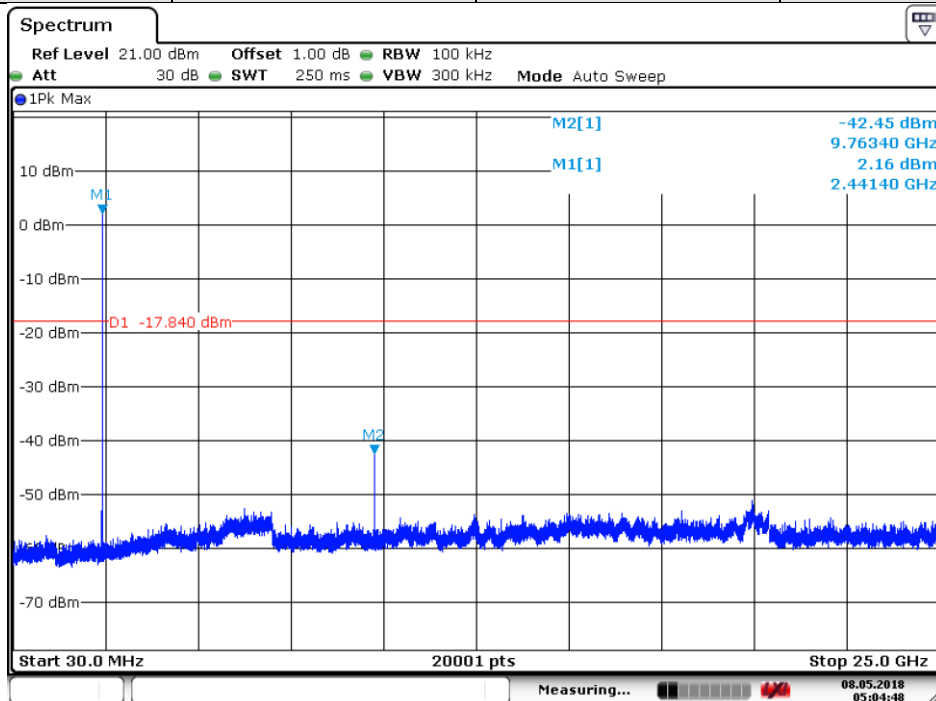


# SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

Report No.: SZEM180300241705

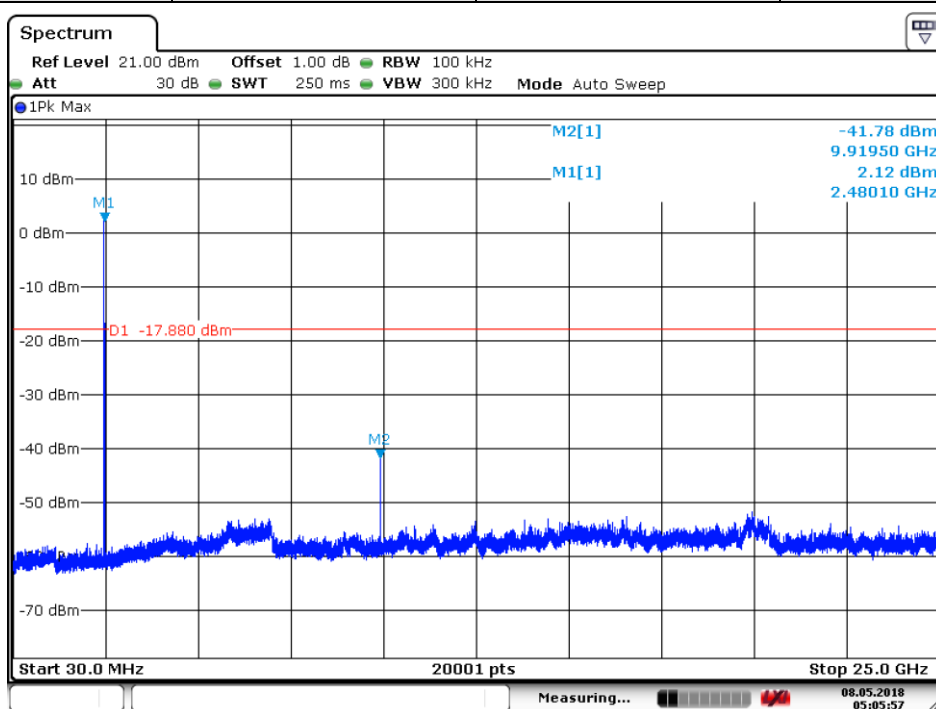
Page: 53 of 75

|            |               |               |        |
|------------|---------------|---------------|--------|
| Test mode: | $\pi/4$ DQPSK | Test channel: | Middle |
|------------|---------------|---------------|--------|



Date: 8.MAY.2018 05:04:48

|            |               |               |         |
|------------|---------------|---------------|---------|
| Test mode: | $\pi/4$ DQPSK | Test channel: | Highest |
|------------|---------------|---------------|---------|



Date: 8.MAY.2018 05:05:57

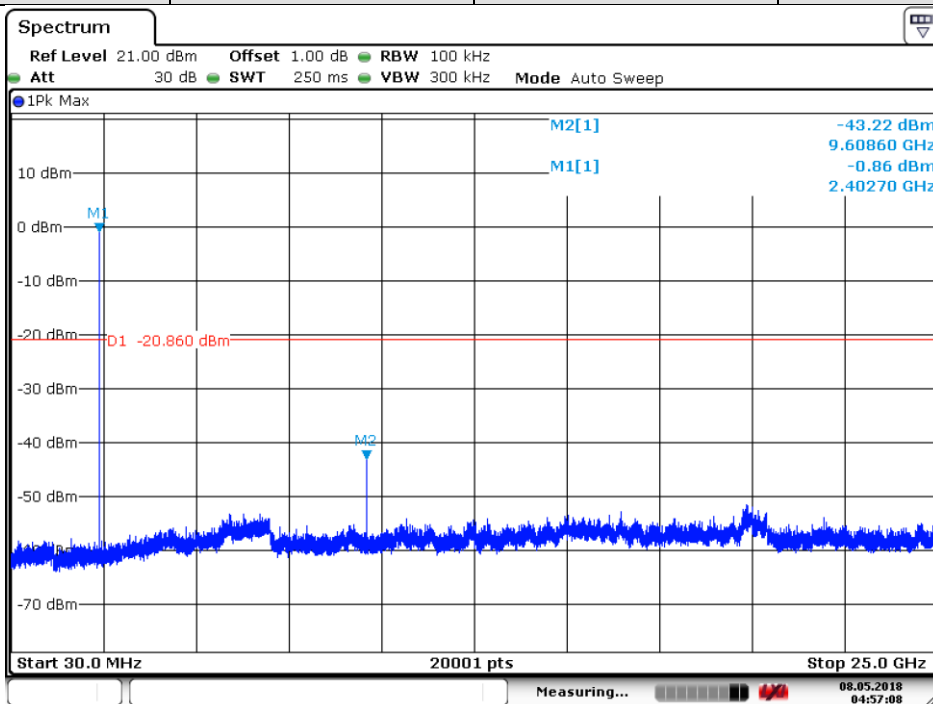


# SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

Report No.: SZEM180300241705

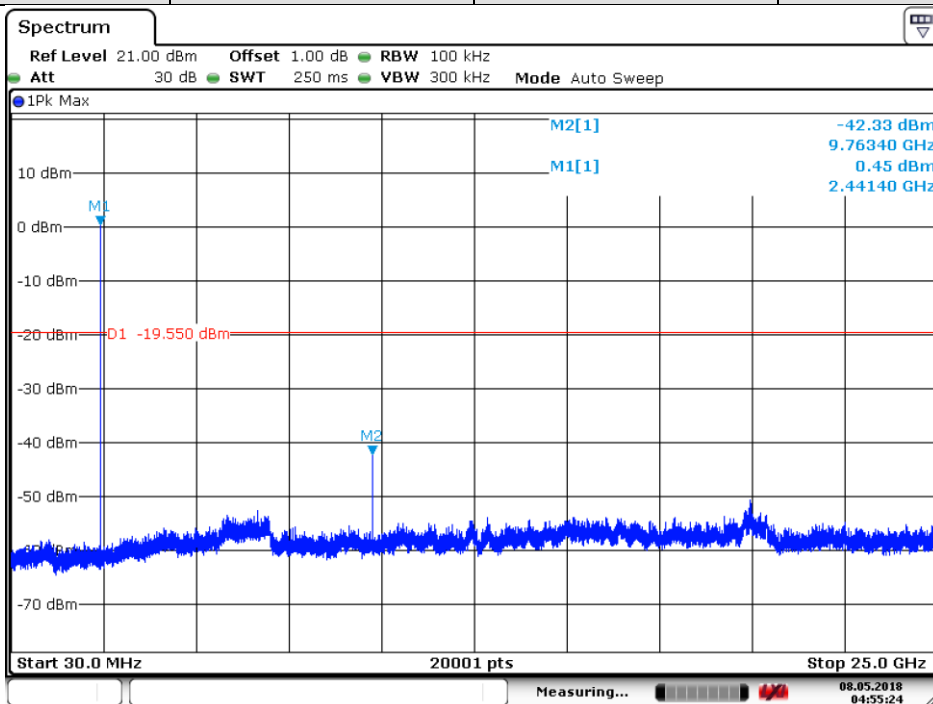
Page: 54 of 75

|            |       |               |        |
|------------|-------|---------------|--------|
| Test mode: | 8DPSK | Test channel: | Lowest |
|------------|-------|---------------|--------|



Date: 8.MAY.2018 04:57:08

|            |       |               |        |
|------------|-------|---------------|--------|
| Test mode: | 8DPSK | Test channel: | Middle |
|------------|-------|---------------|--------|



Date: 8.MAY.2018 04:55:24

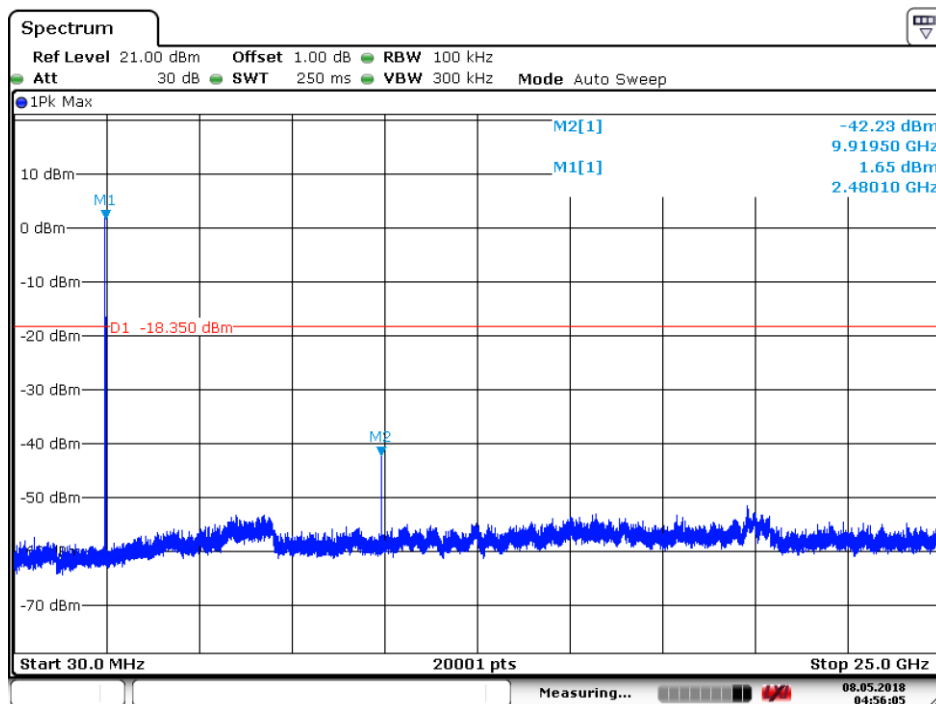


SGS-CSTC Standards Technical Services Co., Ltd.  
Shenzhen Branch

Report No.: SZEM180300241705

Page: 55 of 75

|            |       |               |         |
|------------|-------|---------------|---------|
| Test mode: | 8DPSK | Test channel: | Highest |
|------------|-------|---------------|---------|



Date: 8.MAY.2018 04:56:05

Remark:

Scan from 9kHz to 25GHz, the disturbance below 30MHz was very low, and the above harmonics were the highest point could be found when testing, The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported



## 5.10 Radiated Spurious Emission

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

**Test Setup:**

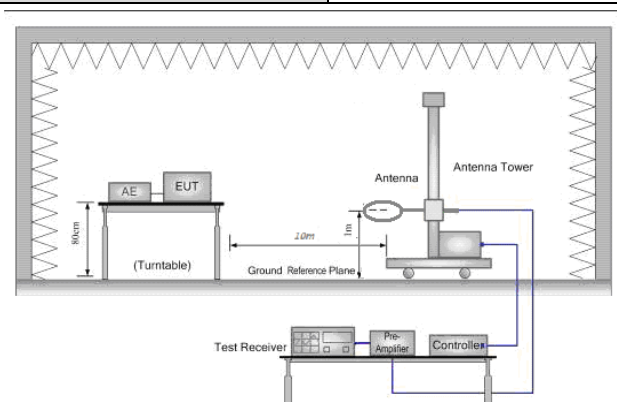


Figure 1. Below 30MHz

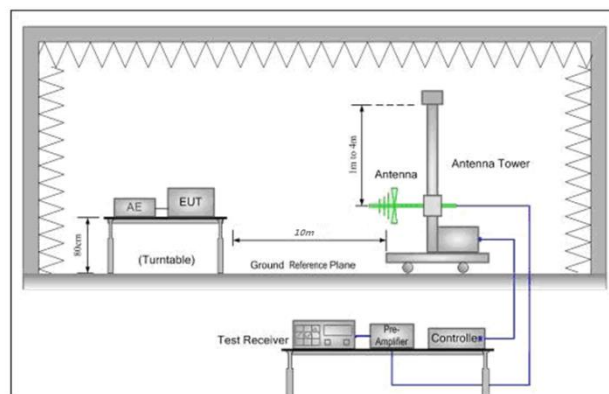


Figure 2. 30MHz to 1GHz

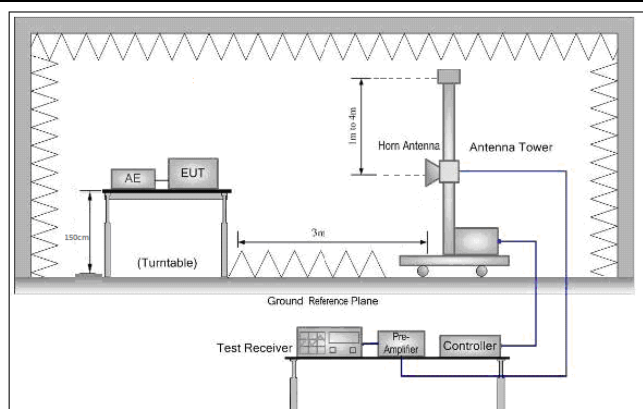


Figure 3. Above 1 GHz



**SGS-CSTC Standards Technical Services Co., Ltd.**  
**Shenzhen Branch**

Report No.: SZEM180300241705

Page: 58 of 75

|                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Procedure:        | <ul style="list-style-type: none"><li>a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</li><li>b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</li><li>c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</li><li>d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.</li><li>e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.</li><li>f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li><li>g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.</li><li>h. Test the EUT in the lowest channel (2402MHz), the middle channel (2441MHz), the Highest channel (2480MHz)</li><li>i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.</li><li>j. Repeat above procedures until all frequencies measured was complete.</li></ul> |
| Exploratory Test Mode: | Non-hopping transmitting mode with all kind of modulation and all kind of data type Charge + Transmitting mode.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Final Test Mode:       | Through Pre-scan, find the 3DH5 of data type and 8DPSK modulation is the worst case.<br>Pretest the EUT at Charge + Transmitting mode<br>For below 1GHz part, through pre-scan, the worst case is the lowest channel. Only the worst case is recorded in the report.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Instruments Used:      | Refer to section 5.10 for details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Test Results:          | Pass                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |



### 5.10.1 Radiated Emission below 1GHz

The test was performed at a 10m test site. According to below formulate and the test data at 10m test distance,

$$L_3 / L_{10} = D_{10} / D_3$$

Note:

L<sub>3</sub>: Level @ 3m distance. Unit: uV/m;

L<sub>10</sub>: Level @ 10m distance. Unit: uV/m;

D<sub>3</sub>: 3m distance. Unit: m

D<sub>10</sub>: 10m distance. Unit: m

The level at 3m test distance is below:

| Frequency (MHz) | Level @ 10m (dBuV/m) | Level @ 10m (uV/m) | Level @ 3m (uV/m) | Level @ 3m (dBuV/m) | Limit @ 3m (dBuV/m) | Over Limit (dB) | Ant. Polarization |
|-----------------|----------------------|--------------------|-------------------|---------------------|---------------------|-----------------|-------------------|
| 30.96           | 22.66                | 13.58              | 45.28             | 33.12               | 40                  | -6.88           | V                 |
| 33.92           | 22.66                | 13.58              | 45.28             | 33.12               | 40                  | -6.88           | V                 |
| 159.78          | 18.05                | 7.99               | 26.63             | 28.51               | 43.5                | -14.99          | V                 |
| 372             | 19.95                | 9.94               | 33.14             | 30.41               | 46                  | -15.59          | V                 |
| 552.88          | 26.24                | 20.51              | 68.37             | 36.70               | 46                  | -9.30           | V                 |
| 851.04          | 29.58                | 30.13              | 100.43            | 40.04               | 46                  | -5.96           | V                 |
| 30.96           | 17.86                | 7.82               | 26.05             | 28.32               | 40                  | -11.68          | H                 |
| 139.85          | 11.75                | 3.87               | 12.89             | 22.21               | 40                  | -17.79          | H                 |
| 193.09          | 16.3                 | 6.53               | 21.77             | 26.76               | 43.5                | -16.74          | H                 |
| 386.63          | 19.77                | 9.74               | 32.46             | 30.23               | 46                  | -15.77          | H                 |
| 475.5           | 24.41                | 16.61              | 55.38             | 34.87               | 46                  | -11.13          | H                 |
| 672.84          | 28.74                | 27.35              | 91.18             | 39.20               | 46                  | -6.80           | H                 |

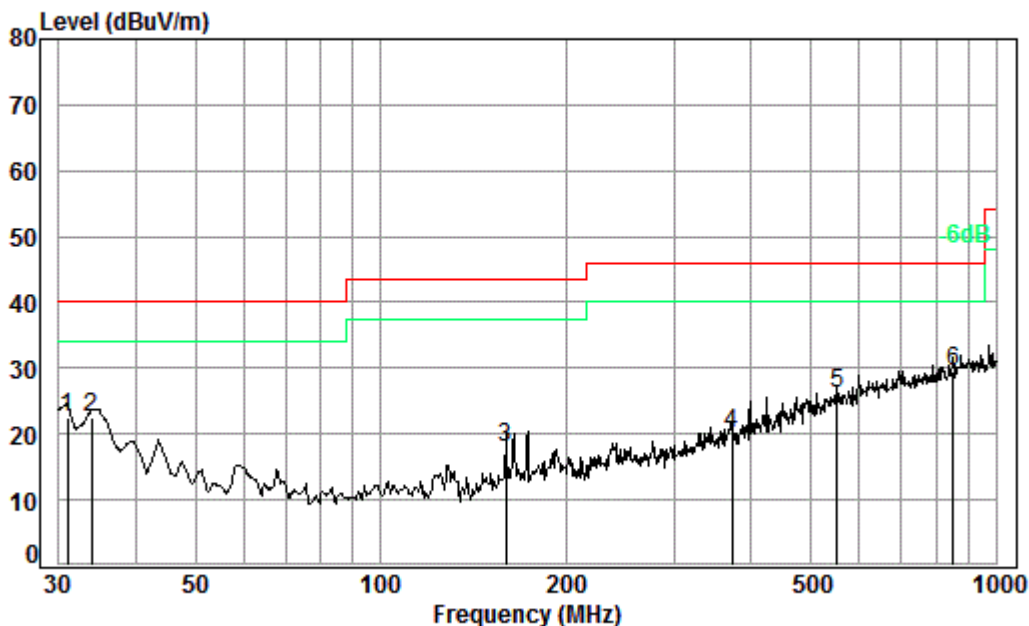


SGS-CSTC Standards Technical Services Co., Ltd.  
Shenzhen Branch

Report No.: SZEM180300241705

Page: 60 of 75

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



Condition: 3m VERTICAL

Job No. : 02417CR

Test mode: BT

|      |        | Cable | Ant    | Preamp | Read  |        | Limit  | Over   |
|------|--------|-------|--------|--------|-------|--------|--------|--------|
|      | Freq   | Loss  | Factor | Factor | Level | Level  | Line   | Limit  |
|      | MHz    | dB    | dB/m   | dB     | dBuV  | dBuV/m | dBuV/m | dB     |
| 1    | 30.96  | 0.60  | 21.95  | 27.67  | 27.78 | 22.66  | 40.00  | -17.34 |
| 2    | 33.92  | 0.60  | 20.37  | 27.65  | 29.34 | 22.66  | 40.00  | -17.34 |
| 3    | 159.78 | 1.34  | 15.48  | 27.52  | 28.75 | 18.05  | 43.50  | -25.45 |
| 4    | 372.00 | 2.12  | 21.69  | 27.68  | 23.82 | 19.95  | 46.00  | -26.05 |
| 5    | 552.88 | 2.66  | 25.70  | 27.78  | 25.66 | 26.24  | 46.00  | -19.76 |
| 6 pp | 851.04 | 3.41  | 29.18  | 27.24  | 24.23 | 29.58  | 46.00  | -16.42 |

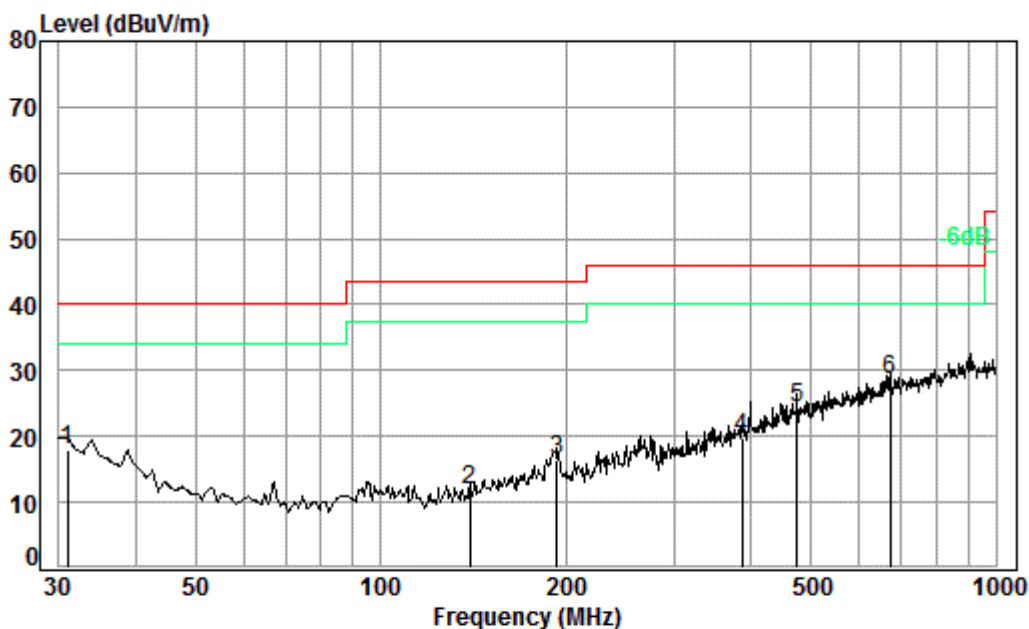


SGS-CSTC Standards Technical Services Co., Ltd.  
Shenzhen Branch

Report No.: SZEM180300241705

Page: 61 of 75

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



Condition: 3m HORIZONTAL

Job No. : 02417CR

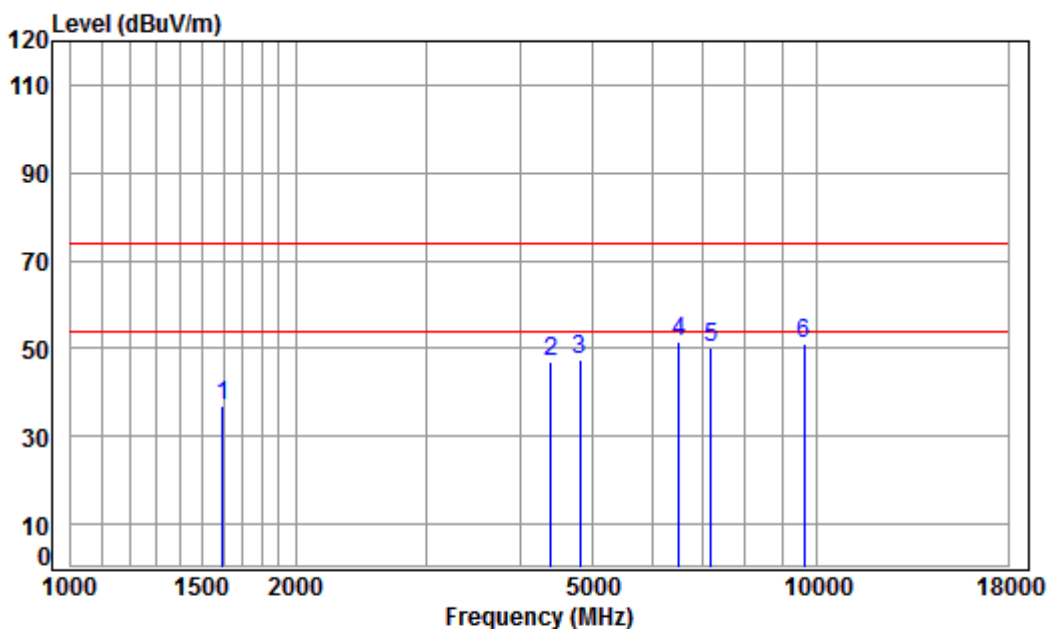
Test mode: BT

|      | Freq   | Cable | Ant    | Preamp | Read  |        | Limit  | Over   |
|------|--------|-------|--------|--------|-------|--------|--------|--------|
|      | MHz    | Loss  | Factor | Factor | Level | Level  | Line   | Limit  |
|      | MHz    | dB    | dB/m   | dB     | dBuV  | dBuV/m | dBuV/m | dB     |
| 1    | 30.96  | 0.60  | 21.95  | 27.67  | 22.98 | 17.86  | 40.00  | -22.14 |
| 2    | 139.85 | 1.30  | 13.70  | 27.52  | 24.27 | 11.75  | 43.50  | -31.75 |
| 3    | 193.09 | 1.39  | 16.30  | 27.53  | 26.14 | 16.30  | 43.50  | -27.20 |
| 4    | 386.63 | 2.16  | 22.07  | 27.71  | 23.25 | 19.77  | 46.00  | -26.23 |
| 5    | 475.50 | 2.51  | 24.10  | 27.85  | 25.65 | 24.41  | 46.00  | -21.59 |
| 6 pp | 672.84 | 2.85  | 27.57  | 27.59  | 25.91 | 28.74  | 46.00  | -17.26 |



### 5.10.2 Transmitter Emission above 1GHz

|            |              |               |        |         |      |          |
|------------|--------------|---------------|--------|---------|------|----------|
| Test mode: | 8DPSK (3DH5) | Test channel: | Lowest | Remark: | Peak | Vertical |
|------------|--------------|---------------|--------|---------|------|----------|



Condition: 3m VERTICAL

Job No : 02417RG

Mode : 2402 TX SE

Note : BT

|      | Freq     | Cable Loss | Ant Factor | Preamp Factor | Read Level | Level  | Limit Line | Over Limit | Remark |
|------|----------|------------|------------|---------------|------------|--------|------------|------------|--------|
|      | MHz      | dB         | dB/m       | dB            | dBuV       | dBuV/m | dBuV/m     | dB         |        |
| 1    | 1597.181 | 5.35       | 26.24      | 41.47         | 46.83      | 36.95  | 74.00      | -37.05     | peak   |
| 2    | 4392.376 | 7.44       | 33.60      | 42.40         | 48.30      | 46.94  | 74.00      | -27.06     | peak   |
| 3    | 4804.000 | 7.89       | 34.16      | 42.47         | 47.95      | 47.53  | 74.00      | -26.47     | peak   |
| 4 pp | 6526.373 | 11.46      | 35.18      | 41.20         | 46.03      | 51.47  | 74.00      | -22.53     | peak   |
| 5    | 7206.000 | 10.08      | 36.42      | 40.71         | 44.36      | 50.15  | 74.00      | -23.85     | peak   |
| 6    | 9608.000 | 10.75      | 37.52      | 37.74         | 40.49      | 51.02  | 74.00      | -22.98     | peak   |

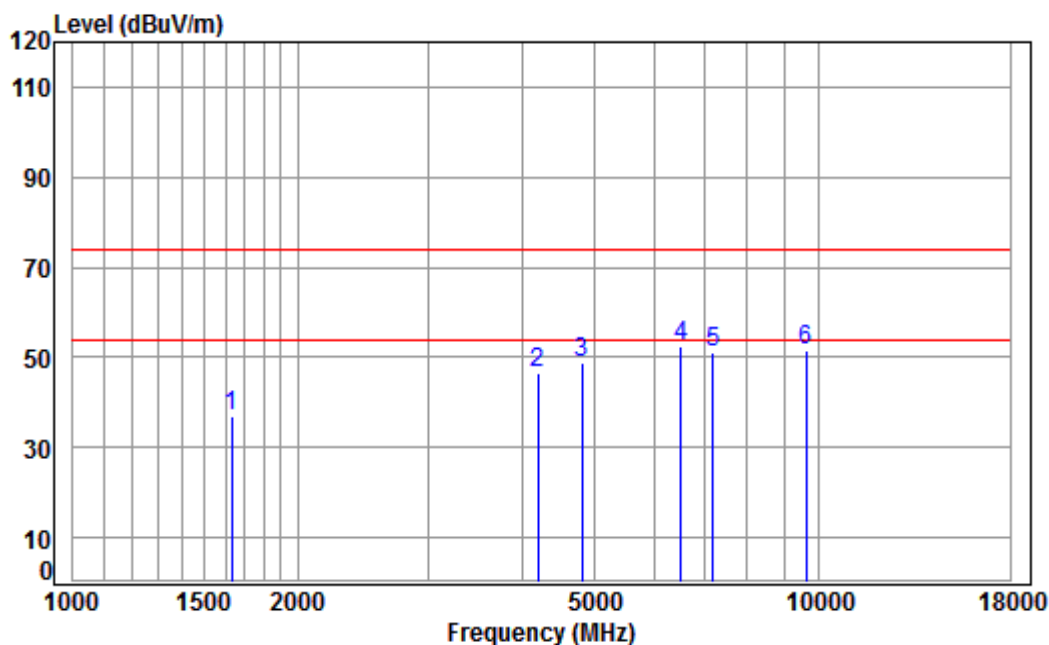


SGS-CSTC Standards Technical Services Co., Ltd.  
Shenzhen Branch

Report No.: SZEM180300241705

Page: 63 of 75

|            |              |               |        |         |      |            |
|------------|--------------|---------------|--------|---------|------|------------|
| Test mode: | 8DPSK (3DH5) | Test channel: | Lowest | Remark: | Peak | Horizontal |
|------------|--------------|---------------|--------|---------|------|------------|



Condition: 3m HORIZONTAL

Job No : 02417RG

Mode : 2402 TX SE

Note : BT

|      | Freq     | Cable Loss | Ant Factor | Preamplifier Factor | Read Level | Level  | Limit Line | Over Limit | Remark |
|------|----------|------------|------------|---------------------|------------|--------|------------|------------|--------|
|      | MHz      | dB         | dB/m       | dB                  | dBuV       | dBuV/m | dBuV/m     | dB         |        |
| 1    | 1634.543 | 5.31       | 26.40      | 41.49               | 46.92      | 37.14  | 74.00      | -36.86     | peak   |
| 2    | 4193.872 | 7.21       | 33.60      | 42.36               | 48.23      | 46.68  | 74.00      | -27.32     | peak   |
| 3    | 4804.000 | 7.89       | 34.16      | 42.47               | 49.17      | 48.75  | 74.00      | -25.25     | peak   |
| 4 pp | 6526.373 | 11.46      | 35.18      | 41.20               | 46.94      | 52.38  | 74.00      | -21.62     | peak   |
| 5    | 7206.000 | 10.08      | 36.42      | 40.71               | 45.39      | 51.18  | 74.00      | -22.82     | peak   |
| 6    | 9608.000 | 10.75      | 37.52      | 37.74               | 40.82      | 51.35  | 74.00      | -22.65     | peak   |

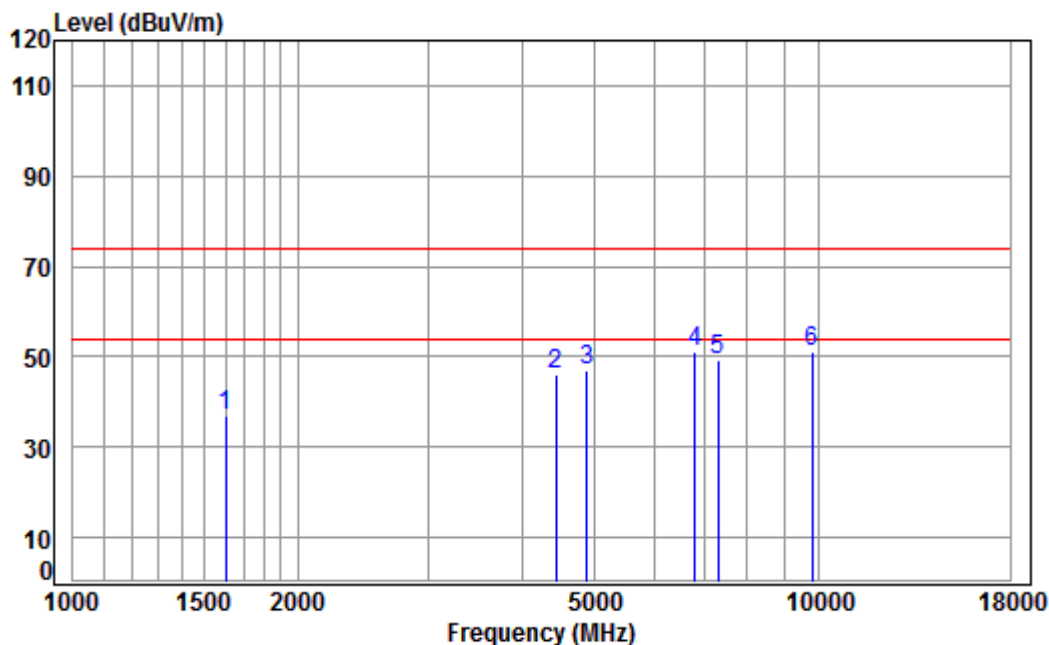


SGS-CSTC Standards Technical Services Co., Ltd.  
Shenzhen Branch

Report No.: SZEM180300241705

Page: 64 of 75

|            |              |               |        |         |      |          |
|------------|--------------|---------------|--------|---------|------|----------|
| Test mode: | 8DPSK (3DH5) | Test channel: | Middle | Remark: | Peak | Vertical |
|------------|--------------|---------------|--------|---------|------|----------|



Condition: 3m VERTICAL

Job No : 02417RG

Mode : 2441 TX SE

Note : BT

|      | Freq     | Cable Loss | Ant Factor | Preamplifier Factor | Read Level | Level  | Limit  | Over Limit | Remark |
|------|----------|------------|------------|---------------------|------------|--------|--------|------------|--------|
|      | MHz      | dB         | dB/m       | dB                  | dBuV       | dBuV/m | dBuV/m | dB         |        |
| 1    | 1601.804 | 5.35       | 26.26      | 41.47               | 46.61      | 36.75  | 74.00  | -37.25     | peak   |
| 2    | 4430.628 | 7.48       | 33.60      | 42.41               | 47.63      | 46.30  | 74.00  | -27.70     | peak   |
| 3    | 4882.000 | 7.97       | 34.30      | 42.48               | 47.00      | 46.79  | 74.00  | -27.21     | peak   |
| 4 pp | 6815.551 | 10.64      | 36.00      | 40.98               | 45.33      | 50.99  | 74.00  | -23.01     | peak   |
| 5    | 7323.000 | 10.05      | 36.37      | 40.63               | 43.56      | 49.35  | 74.00  | -24.65     | peak   |
| 6    | 9764.000 | 10.82      | 37.55      | 37.52               | 40.12      | 50.97  | 74.00  | -23.03     | peak   |

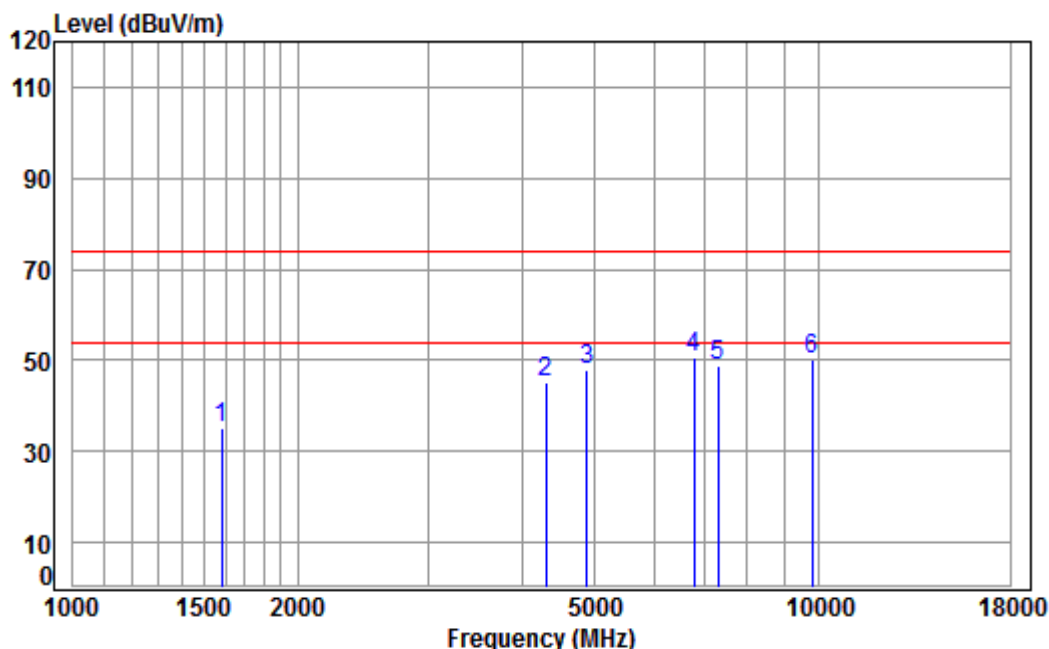


SGS-CSTC Standards Technical Services Co., Ltd.  
Shenzhen Branch

Report No.: SZEM180300241705

Page: 65 of 75

|            |              |               |        |         |      |            |
|------------|--------------|---------------|--------|---------|------|------------|
| Test mode: | 8DPSK (3DH5) | Test channel: | Middle | Remark: | Peak | Horizontal |
|------------|--------------|---------------|--------|---------|------|------------|



Condition: 3m HORIZONTAL

Job No : 02417RG

Mode : 2441 TX SE

Note : BT

|      | Freq     | Cable Loss | Ant Factor | Preamp Factor | Read Level | Level  | Limit Line | Over Limit | Remark |
|------|----------|------------|------------|---------------|------------|--------|------------|------------|--------|
|      | MHz      | dB         | dB/m       | dB            | dBuV       | dBuV/m | dBuV/m     | dB         |        |
| 1    | 1583.392 | 5.37       | 26.18      | 41.46         | 44.83      | 34.92  | 74.00      | -39.08     | peak   |
| 2    | 4304.400 | 7.34       | 33.60      | 42.38         | 46.75      | 45.31  | 74.00      | -28.69     | peak   |
| 3    | 4882.000 | 7.97       | 34.30      | 42.48         | 48.22      | 48.01  | 74.00      | -25.99     | peak   |
| 4 pp | 6795.879 | 10.69      | 35.94      | 41.00         | 45.07      | 50.70  | 74.00      | -23.30     | peak   |
| 5    | 7323.000 | 10.05      | 36.37      | 40.63         | 42.88      | 48.67  | 74.00      | -25.33     | peak   |
| 6    | 9764.000 | 10.82      | 37.55      | 37.52         | 39.36      | 50.21  | 74.00      | -23.79     | peak   |

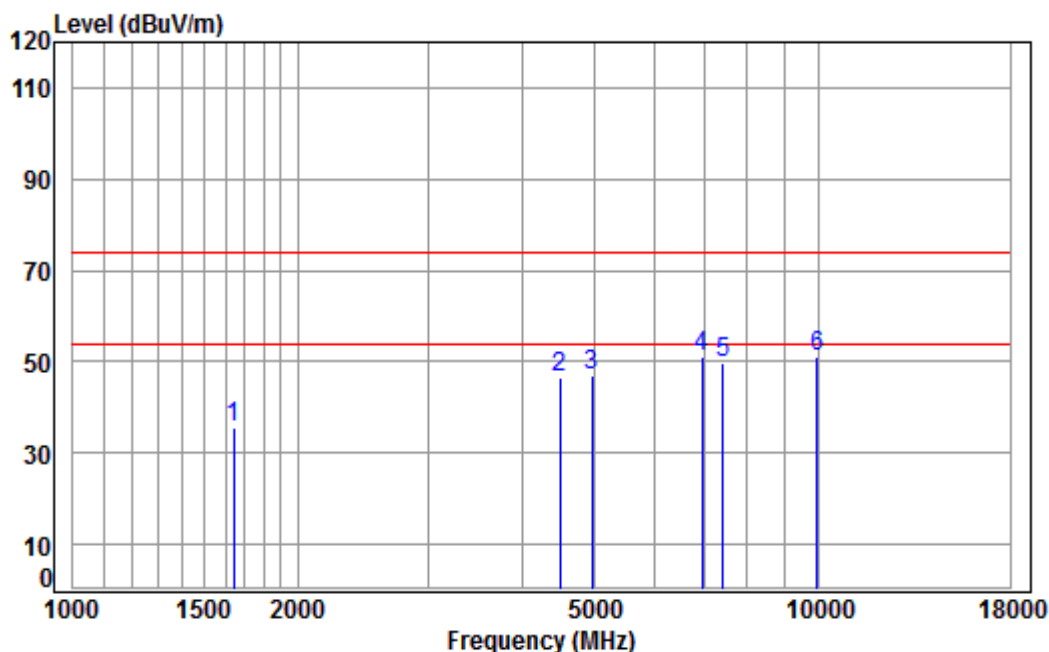


SGS-CSTC Standards Technical Services Co., Ltd.  
Shenzhen Branch

Report No.: SZEM180300241705

Page: 66 of 75

|            |              |               |         |         |      |          |
|------------|--------------|---------------|---------|---------|------|----------|
| Test mode: | 8DPSK (3DH5) | Test channel: | Highest | Remark: | Peak | Vertical |
|------------|--------------|---------------|---------|---------|------|----------|



Condition: 3m VERTICAL

Job No : 02417RG

Mode : 2480 TX SE

Note : BT

|      | Freq     | Cable Loss | Ant Factor | Preamplifier Factor | Read Level | Level  | Limit Line | Over Limit | Remark |
|------|----------|------------|------------|---------------------|------------|--------|------------|------------|--------|
|      | MHz      | dB         | dB/m       | dB                  | dBuV       | dBuV/m | dBuV/m     | dB         |        |
| 1    | 1644.019 | 5.30       | 26.44      | 41.50               | 45.25      | 35.49  | 74.00      | -38.51     | peak   |
| 2    | 4495.125 | 7.55       | 33.60      | 42.42               | 47.64      | 46.37  | 74.00      | -27.63     | peak   |
| 3    | 4960.000 | 8.05       | 34.43      | 42.49               | 47.05      | 47.04  | 74.00      | -26.96     | peak   |
| 4    | 6954.852 | 10.25      | 36.38      | 40.89               | 45.26      | 51.00  | 74.00      | -23.00     | peak   |
| 5    | 7440.000 | 10.02      | 36.32      | 40.56               | 43.78      | 49.56  | 74.00      | -24.44     | peak   |
| 6 pp | 9920.000 | 10.90      | 37.58      | 37.31               | 39.93      | 51.10  | 74.00      | -22.90     | peak   |

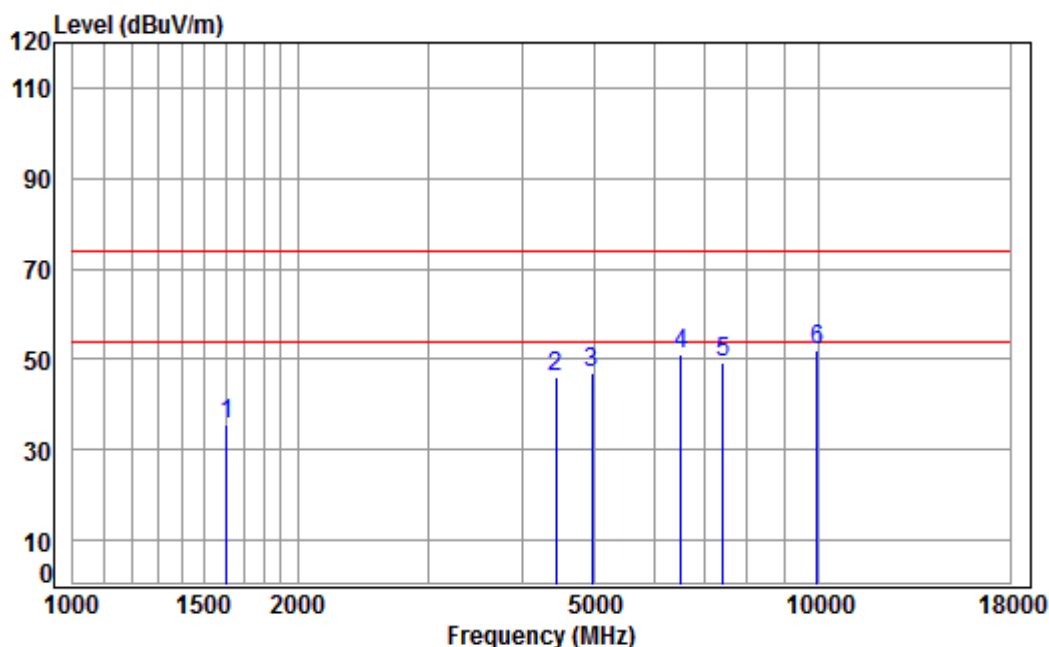


SGS-CSTC Standards Technical Services Co., Ltd.  
Shenzhen Branch

Report No.: SZEM180300241705

Page: 67 of 75

|            |              |               |         |         |      |            |
|------------|--------------|---------------|---------|---------|------|------------|
| Test mode: | 8DPSK (3DH5) | Test channel: | Highest | Remark: | Peak | Horizontal |
|------------|--------------|---------------|---------|---------|------|------------|



Condition: 3m HORIZONTAL

Job No : 02417RG

Mode : 2480 TX SE

Note : BT

|      | Freq     | Cable Loss | Ant Factor | Preamplifier Factor | Read Level | Level  | Limit  | Over Limit | Remark |
|------|----------|------------|------------|---------------------|------------|--------|--------|------------|--------|
|      | MHz      | dB         | dB/m       | dB                  | dBuV       | dBuV/m | dBuV/m | dB         |        |
| 1    | 1606.441 | 5.34       | 26.28      | 41.47               | 45.56      | 35.71  | 74.00  | -38.29     | peak   |
| 2    | 4443.453 | 7.50       | 33.60      | 42.41               | 47.50      | 46.19  | 74.00  | -27.81     | peak   |
| 3    | 4960.000 | 8.05       | 34.43      | 42.49               | 46.98      | 46.97  | 74.00  | -27.03     | peak   |
| 4    | 6526.373 | 11.46      | 35.18      | 41.20               | 45.55      | 50.99  | 74.00  | -23.01     | peak   |
| 5    | 7440.000 | 10.02      | 36.32      | 40.56               | 43.34      | 49.12  | 74.00  | -24.88     | peak   |
| 6 pp | 9920.000 | 10.90      | 37.58      | 37.31               | 40.70      | 51.87  | 74.00  | -22.13     | peak   |



**Remark:**

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

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

2) Scan from 9kHz to 25GHz, the disturbance above 13GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

3) As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. So, only the peak measurements were shown in the report.

## 5.11 Restricted bands around fundamental frequency

| Test Requirement: | 47 CFR Part 15C Section 15.209 and 15.205                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                  |           |                    |        |             |      |                  |              |      |                  |               |      |                  |             |      |                  |            |      |               |      |            |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-----------|--------------------|--------|-------------|------|------------------|--------------|------|------------------|---------------|------|------------------|-------------|------|------------------|------------|------|---------------|------|------------|
| Test Method:      | ANSI C63.10: 2013                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                  |           |                    |        |             |      |                  |              |      |                  |               |      |                  |             |      |                  |            |      |               |      |            |
| Test Site:        | Measurement Distance: 3m (Semi-Anechoic Chamber)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                  |           |                    |        |             |      |                  |              |      |                  |               |      |                  |             |      |                  |            |      |               |      |            |
| Limit:            | <table border="1"> <thead> <tr> <th>Frequency</th><th>Limit (dBuV/m @3m)</th><th>Remark</th></tr> </thead> <tbody> <tr> <td>30MHz-88MHz</td><td>40.0</td><td>Quasi-peak Value</td></tr> <tr> <td>88MHz-216MHz</td><td>43.5</td><td>Quasi-peak Value</td></tr> <tr> <td>216MHz-960MHz</td><td>46.0</td><td>Quasi-peak Value</td></tr> <tr> <td>960MHz-1GHz</td><td>54.0</td><td>Quasi-peak Value</td></tr> <tr> <td rowspan="2">Above 1GHz</td><td>54.0</td><td>Average Value</td></tr> <tr> <td>74.0</td><td>Peak Value</td></tr> </tbody> </table> |                  | Frequency | Limit (dBuV/m @3m) | Remark | 30MHz-88MHz | 40.0 | Quasi-peak Value | 88MHz-216MHz | 43.5 | Quasi-peak Value | 216MHz-960MHz | 46.0 | Quasi-peak Value | 960MHz-1GHz | 54.0 | Quasi-peak Value | Above 1GHz | 54.0 | Average Value | 74.0 | Peak Value |
| Frequency         | Limit (dBuV/m @3m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Remark           |           |                    |        |             |      |                  |              |      |                  |               |      |                  |             |      |                  |            |      |               |      |            |
| 30MHz-88MHz       | 40.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Quasi-peak Value |           |                    |        |             |      |                  |              |      |                  |               |      |                  |             |      |                  |            |      |               |      |            |
| 88MHz-216MHz      | 43.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Quasi-peak Value |           |                    |        |             |      |                  |              |      |                  |               |      |                  |             |      |                  |            |      |               |      |            |
| 216MHz-960MHz     | 46.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Quasi-peak Value |           |                    |        |             |      |                  |              |      |                  |               |      |                  |             |      |                  |            |      |               |      |            |
| 960MHz-1GHz       | 54.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Quasi-peak Value |           |                    |        |             |      |                  |              |      |                  |               |      |                  |             |      |                  |            |      |               |      |            |
| Above 1GHz        | 54.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Average Value    |           |                    |        |             |      |                  |              |      |                  |               |      |                  |             |      |                  |            |      |               |      |            |
|                   | 74.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Peak Value       |           |                    |        |             |      |                  |              |      |                  |               |      |                  |             |      |                  |            |      |               |      |            |
| Test Setup:       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                  |           |                    |        |             |      |                  |              |      |                  |               |      |                  |             |      |                  |            |      |               |      |            |

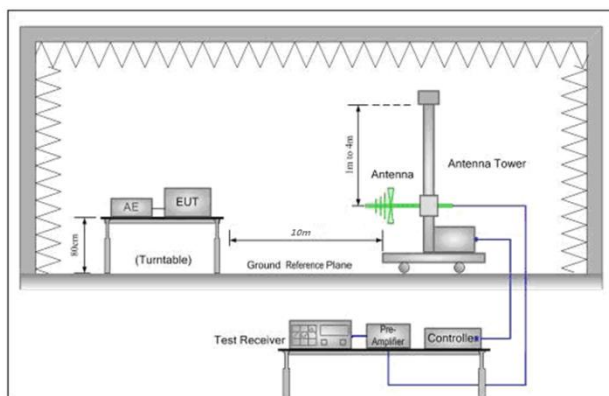


Figure 1. 30MHz to 1GHz

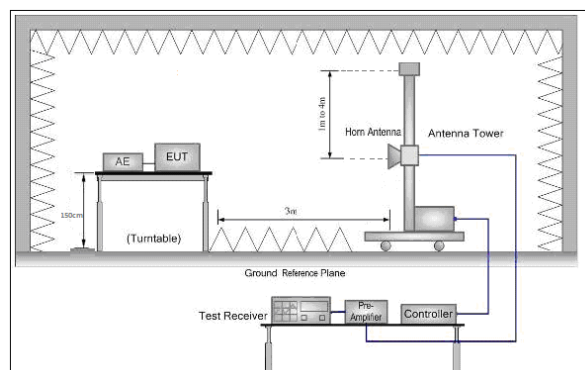


Figure 2. Above 1 GHz



**SGS-CSTC Standards Technical Services Co., Ltd.**  
**Shenzhen Branch**

Report No.: SZEM180300241705

Page: 70 of 75

|                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Procedure:        | <ul style="list-style-type: none"><li>a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</li><li>b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</li><li>c. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</li><li>d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.</li><li>e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.</li><li>f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li><li>g. Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channel</li><li>h. Test the EUT in the lowest channel , the Highest channel</li><li>i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.</li><li>j. Repeat above procedures until all frequencies measured was complete.</li></ul> |
| Exploratory Test Mode: | Non-hopping transmitting mode with all kind of modulation and all kind of data type<br>Charge + Transmitting mode.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Final Test Mode:       | Through Pre-scan, find the 3DH5 of data type and 8DPSK modulation is the worst case.<br>Pretest the EUT at Charge + Transmitting mode,<br>Only the worst case is recorded in the report.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Instruments Used:      | Refer to section 5.10 for details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Test Results:          | Pass                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |



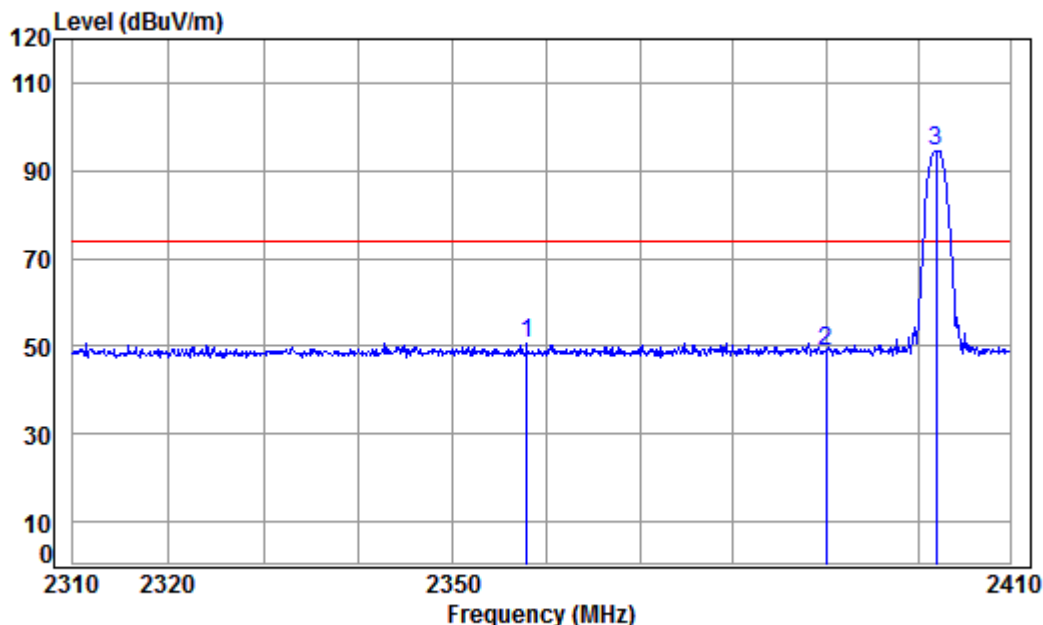
# SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

Report No.: SZEM180300241705

Page: 71 of 75

Test plot as follows:

|                  |              |               |        |         |      |          |
|------------------|--------------|---------------|--------|---------|------|----------|
| Worse case mode: | 8DPSK (3DH5) | Test channel: | Lowest | Remark: | Peak | Vertical |
|------------------|--------------|---------------|--------|---------|------|----------|



Condition: 3m VERTICAL

Job No : 02417RG

Mode : 2402 Band edge

Note : BT

|      | Freq     | Cable Loss | Ant Factor | Preamp Factor | Read Level | Level  | Limit Line | Over Limit | Remark |
|------|----------|------------|------------|---------------|------------|--------|------------|------------|--------|
|      | MHz      | dB         | dB/m       | dB            | dBuV       | dBuV/m | dBuV/m     | dB         |        |
| 1    | 2357.871 | 5.43       | 28.98      | 41.86         | 58.15      | 50.70  | 74.00      | -23.30     | peak   |
| 2    | 2390.000 | 5.47       | 29.08      | 41.87         | 56.36      | 49.04  | 74.00      | -24.96     | peak   |
| 3 pp | 2402.000 | 5.49       | 29.11      | 41.88         | 101.84     | 94.56  | 74.00      | 20.56      | peak   |

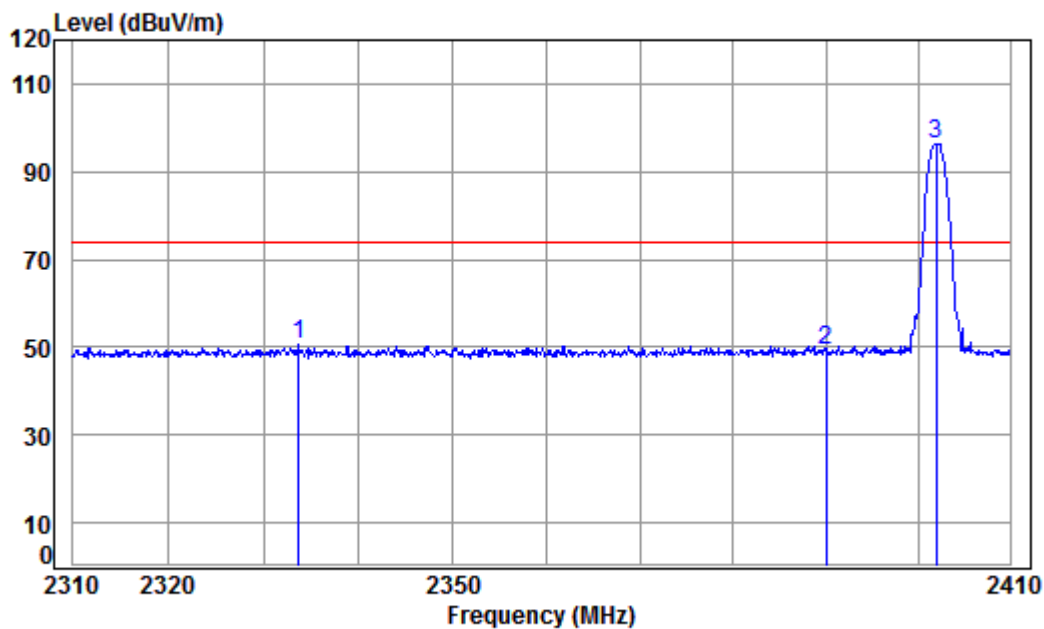


SGS-CSTC Standards Technical Services Co., Ltd.  
Shenzhen Branch

Report No.: SZEM180300241705

Page: 72 of 75

|                  |              |               |        |         |      |            |
|------------------|--------------|---------------|--------|---------|------|------------|
| Worse case mode: | 8DPSK (3DH5) | Test channel: | Lowest | Remark: | Peak | Horizontal |
|------------------|--------------|---------------|--------|---------|------|------------|



Condition: 3m HORIZONTAL

Job No : 02417RG

Mode : 2402 Band edge

Note : BT

|      | Freq     | Cable Loss | Ant Factor | Preamp Factor | Read Level | Level  | Limit  | Over Limit | Remark |
|------|----------|------------|------------|---------------|------------|--------|--------|------------|--------|
|      | MHz      | dB         | dB/m       | dB            | dBuV       | dBuV/m | dBuV/m | dB         |        |
| 1    | 2333.714 | 5.40       | 28.91      | 41.85         | 58.18      | 50.64  | 74.00  | -23.36     | peak   |
| 2    | 2390.000 | 5.47       | 29.08      | 41.87         | 56.53      | 49.21  | 74.00  | -24.79     | peak   |
| 3 pp | 2402.000 | 5.49       | 29.11      | 41.88         | 103.62     | 96.34  | 74.00  | 22.34      | peak   |

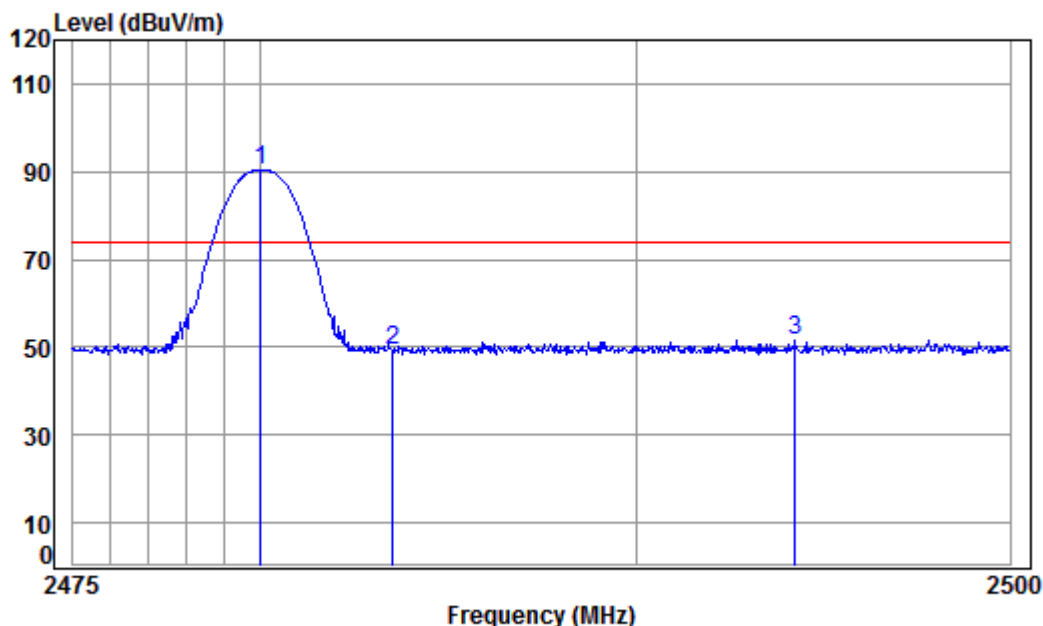


SGS-CSTC Standards Technical Services Co., Ltd.  
Shenzhen Branch

Report No.: SZEM180300241705

Page: 73 of 75

|                  |              |               |         |         |      |          |
|------------------|--------------|---------------|---------|---------|------|----------|
| Worse case mode: | 8DPSK (3DH5) | Test channel: | Highest | Remark: | Peak | Vertical |
|------------------|--------------|---------------|---------|---------|------|----------|



Condition: 3m VERTICAL

Job No : 02417RG

Mode : 2480 Band edge

Note : BT

|      | Freq     | Cable Loss | Ant Factor | Preamp Factor | Read Level | Level  | Limit  | Over   | Remark |
|------|----------|------------|------------|---------------|------------|--------|--------|--------|--------|
|      | MHz      | dB         | dB/m       | dB            | dBuV       | dBuV/m | dBuV/m | dB     |        |
| 1 pp | 2480.000 | 5.59       | 29.34      | 41.91         | 97.27      | 90.29  | 74.00  | 16.29  | peak   |
| 2    | 2483.500 | 5.60       | 29.35      | 41.91         | 56.40      | 49.44  | 74.00  | -24.56 | peak   |
| 3    | 2494.253 | 5.61       | 29.38      | 41.92         | 58.70      | 51.77  | 74.00  | -22.23 | peak   |

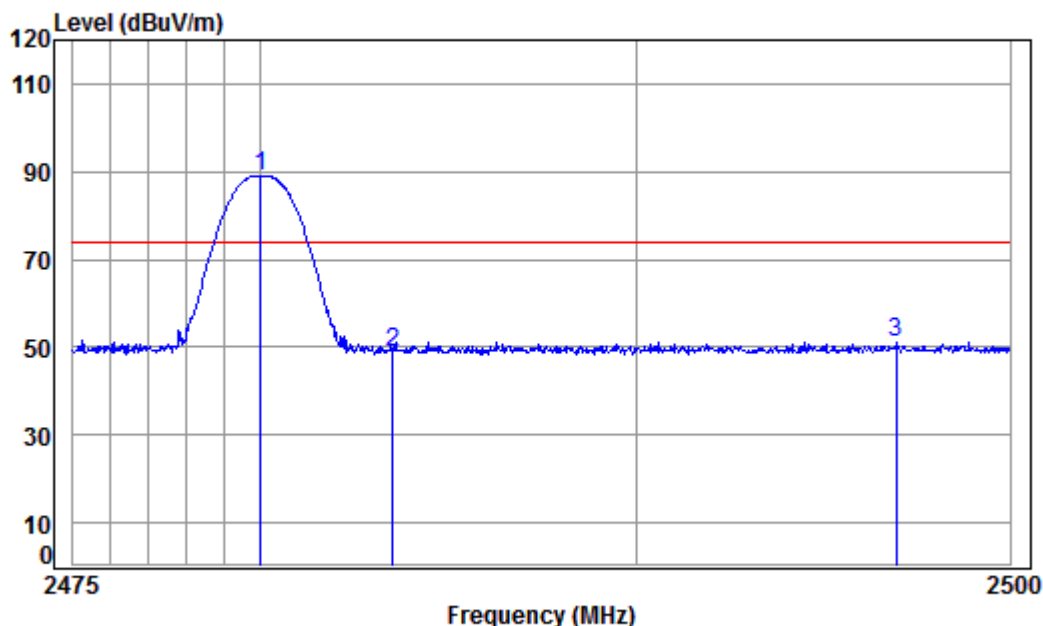


SGS-CSTC Standards Technical Services Co., Ltd.  
Shenzhen Branch

Report No.: SZEM180300241705

Page: 74 of 75

|                  |              |               |         |         |      |            |
|------------------|--------------|---------------|---------|---------|------|------------|
| Worse case mode: | 8DPSK (3DH5) | Test channel: | Highest | Remark: | Peak | Horizontal |
|------------------|--------------|---------------|---------|---------|------|------------|



Condition: 3m HORIZONTAL

Job No : 02417RG

Mode : 2480 Band edge

Note : BT

|      | Freq     | Cable Loss | Ant Factor | Preamp Factor | Read Level | Limit Level | Limit Line | Over Limit | Remark |
|------|----------|------------|------------|---------------|------------|-------------|------------|------------|--------|
|      | MHz      | dB         | dB/m       | dB            | dBuV       | dBUV/m      | dBUV/m     | dB         |        |
| 1 pp | 2480.000 | 5.59       | 29.34      | 41.91         | 96.03      | 89.05       | 74.00      | 15.05      | peak   |
| 2    | 2483.500 | 5.60       | 29.35      | 41.91         | 55.97      | 49.01       | 74.00      | -24.99     | peak   |
| 3    | 2496.937 | 5.62       | 29.39      | 41.92         | 58.07      | 51.16       | 74.00      | -22.84     | peak   |



*Note:*

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

*Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor*

## **6 Photographs - EUT Constructional Details**

Refer to Appendix A - Photographs of EUT Constructional Details for SZEM1803002417RG.