

TEST REPORT

Reference No...... : WTS17S0786116X1E
FCC ID : 2ALR9-KDL-BT1501
Applicant..... : SHENZHEN G-KINDLY ELECTRONIC CO., LTD
Address..... : 4F, No. 8 Fifth Road, Loucun First Industry Zone, GongMing Town,
GuangMing New District, Shenzhen, China
Manufacturer : SHENZHEN G-KINDLY ELECTRONIC CO., LTD
Address..... : 4F, No. 8 Fifth Road, Loucun First Industry Zone, GongMing Town,
GuangMing New District, Shenzhen, China
Product Name..... : WIRELESS SPEAKER
Model No : KDL-BT1501, BB730, BB731, BB733
Standards..... : FCC CFR47 Part 15.247:2016
Date of Receipt sample : 2017-07-31
Date of Test : 2017-10-20 to 2017-10-27
Date of Issue..... : 2017-10-30
Test Result..... : **Pass**

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

Prepared By:

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1 Laboratories Introduction

Waltek Services Test Group Ltd. is one of the largest and the most comprehensive third party testing organizations in China, our headquarter located in Shenzhen (CNAS Registration No. L3110, A2LA Certificate Number: 4243.01) and have branches in Foshan (CNAS Registration No. L6478), Dongguan (CNAS Registration No. L9950), Zhongshan, Suzhou (CNAS Registration No. L7754), Ningbo and Hong Kong, Our test capability covered four large fields: safety test. Electronic Magnetic Compatibility(EMC), reliability and energy performance, Chemical test. Meanwhile, Waltek has got recognition as registration and accreditation laboratory from EMSD (Electrical and Mechanical Services Department), and American Energy star, FCC(The Federal Communications Commission), CPSC(Consumer Product Safety Commission), CEC(California energy efficiency), IC(Industry Canada) and ELI(Efficient Lighting Initiative). It's the strategic partner and data recognition laboratory of international authoritative organizations, such as UL, Intertek(ETL-SEMKO), CSA, TÜV Rheinland, TÜV SÜD, etc. As a professional, comprehensive, justice international test organization, we still keep the scientific and rigorous work attitude to help each client satisfy the international standards and assist their product enter into globe market smoothly.

Waltek Services (Shenzhen) Co., Ltd.

A. Accreditations for Conformity Assessment (International)

| Country/Region | Accreditation Body | Scope | Note |
|---|---|-------------------------------|------|
| USA | CNAS (Registration No.: L3110) A2LA (Certificate No.: 4243.01) | FCC ID \ DOC \ VOC | 1 |
| Canada | | IC ID \ VOC | 2 |
| Japan | | MIC-T \ MIC-R | - |
| Europe | | EMCD \ RED | - |
| Taiwan | | NCC | - |
| Hong Kong | | OFCA | - |
| Australia | | RCM | - |
| India | | International Services | WPC |
| Thailand | NTC | | - |
| Singapore | IDA | | - |
| Note: | | | |
| 1. FCC Designation No.: CN1201. Test Firm Registration No.: 523476. | | | |
| 2. IC Canada Registration No.: 7760A | | | |

B. TCBs and Notify Bodies Recognized Testing Laboratory.

| Recognized Testing Laboratory of ... | Notify body number |
|--|--------------------|
| TUV Rheinland | Optional. |
| Intertek | |
| TUV SUD | |
| SGS | |
| Phoenix Testlab GmbH | 0700 |
| Element Materials Technology Warwick Ltd | 0891 |
| Timco Engineering, Inc. | 1177 |
| Eurofins Product Service GmbH | 0681 |

2 Contents

| | Page |
|--|-------------|
| COVER PAGE..... | 1 |
| 1 LABORATORIES INTRODUCTION..... | 2 |
| 2 CONTENTS..... | 3 |
| 3 REVISION HISTORY..... | 4 |
| 4 GENERAL INFORMATION..... | 5 |
| 4.1 GENERAL DESCRIPTION OF E.U.T..... | 5 |
| 4.2 DETAILS OF E.U.T..... | 5 |
| 4.3 CHANNEL LIST..... | 6 |
| 4.4 TEST MODE..... | 6 |
| 5 EQUIPMENT USED DURING TEST..... | 7 |
| 5.1 EQUIPMENTS LIST..... | 7 |
| 5.2 MEASUREMENT UNCERTAINTY..... | 7 |
| 5.3 SUBCONTRACTED..... | 7 |
| 6 TEST SUMMARY..... | 8 |
| 7 RADIATED SPURIOUS EMISSIONS..... | 9 |
| 7.1 EUT OPERATION..... | 9 |
| 7.2 TEST SETUP..... | 10 |
| 7.3 SPECTRUM ANALYZER SETUP..... | 11 |
| 7.4 TEST PROCEDURE..... | 12 |
| 7.5 CORRECTED AMPLITUDE & MARGIN CALCULATION..... | 12 |
| 7.6 SUMMARY OF TEST RESULTS..... | 13 |
| 8 CONDUCTED SPURIOUS EMISSIONS..... | 15 |
| 8.1 TEST PROCEDURE..... | 15 |
| 8.2 TEST RESULT..... | 16 |
| 9 PHOTOGRAPHS-MODEL BB733 TEST SETUP..... | 21 |
| 9.1 PHOTOGRAPH - SPURIOUS EMISSIONS RADIATED TEST SETUP..... | 21 |

3 Revision History

| Test report No. | Date of Receipt sample | Date of Test | Date of Issue | Purpose | Comment | Approved |
|--|------------------------|--------------------------|---------------|----------|---------|----------|
| WTS17S0786116X1E | 2017-07-31 | 2017-10-20 to 2017-10-27 | 2017-10-30 | original | - | valid |
| This report is based on WTS17S0786116E, added the Radiated Spurious Emissions (18GHz to 25GHz) and Conducted Spurious Emissions (18GHz to 25GHz) test. | | | | | | |

4 General Information

4.1 General Description of E.U.T

| | |
|-------------------|---|
| Product Name | : WIRELESS SPEAKER |
| Model No. | : KDL-BT1501, BB730, BB731, BB733 |
| Model Description | : Only the color, model names and brand names are different for different market requirement. The model BB733 is the tested sample. |
| Hardware Version | : V1.2 |
| Software Version | : V2.0 |

4.2 Details of E.U.T

| | |
|----------------------|---|
| Operation Frequency | : 2402~2480MHz |
| Max. RF output power | : 0.46dBm |
| Type of Modulation | : GFSK, Pi/4 DQPSK, 8DPSK |
| Antenna installation | : PCB Printed Antenna |
| Antenna Gain | : 0dBi |
| Technical Data | : DC 3.7V by Battery; Charging: DC 5V by USB from PC |

4.3 Channel List

Bluetooth Classic mode

| Channel No. | Frequency (MHz) | Channel No. | Frequency (MHz) | Channel No. | Frequency (MHz) | Channel No. | Frequency (MHz) |
|-------------|-----------------|-------------|-----------------|-------------|-----------------|-------------|-----------------|
| 0 | 2402 | 1 | 2403 | 2 | 2404 | 3 | 2405 |
| 4 | 2406 | 5 | 2407 | 6 | 2408 | 7 | 2409 |
| 8 | 2410 | 9 | 2411 | 10 | 2412 | 11 | 2413 |
| 12 | 2414 | 13 | 2415 | 14 | 2416 | 15 | 2417 |
| 16 | 2418 | 17 | 2419 | 18 | 2420 | 19 | 2421 |
| 20 | 2422 | 21 | 2423 | 22 | 2424 | 23 | 2425 |
| 24 | 2426 | 25 | 2427 | 26 | 2428 | 27 | 2429 |
| 28 | 2430 | 29 | 2431 | 30 | 2432 | 31 | 2433 |
| 32 | 2434 | 33 | 2435 | 34 | 2436 | 35 | 2437 |
| 36 | 2438 | 37 | 2439 | 38 | 2440 | 39 | 2441 |
| 40 | 2442 | 41 | 2443 | 42 | 2444 | 43 | 2445 |
| 44 | 2446 | 45 | 2447 | 46 | 2448 | 47 | 2449 |
| 48 | 2450 | 49 | 2451 | 50 | 2452 | 51 | 2453 |
| 52 | 2454 | 53 | 2455 | 54 | 2456 | 55 | 2457 |
| 56 | 2458 | 57 | 2459 | 58 | 2460 | 59 | 2461 |
| 60 | 2462 | 61 | 2463 | 62 | 2464 | 63 | 2465 |
| 64 | 2466 | 65 | 2467 | 66 | 2468 | 67 | 2469 |
| 68 | 2470 | 69 | 2471 | 70 | 2472 | 71 | 2473 |
| 72 | 2474 | 73 | 2475 | 74 | 2476 | 75 | 2477 |
| 76 | 2478 | 77 | 2479 | 78 | 2480 | - | - |

4.4 Test Mode

All test mode(s) and condition(s) mentioned were considered and evaluated respectively by performing full tests; the worst data were recorded and reported.

| Test mode | Low channel | Middle channel | High channel |
|--------------|-------------|----------------|--------------|
| Transmitting | 2402MHz | 2441MHz | 2480MHz |

5 Equipment Used during Test

5.1 Equipments List

| RF Conducted Spurious Emissions Testing (Shenzhen Balun Technology Co.,Ltd.) | | | | | | |
|---|--------------------------|--------------|-----------------|------------|-----------------------|----------------------|
| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Calibration Date | Calibration Due Date |
| 1. | Spectrum Analyzer | R&S | FSV-40 | 101544 | 2017-02-17 | 2018-02-16 |
| 10m Semi-anechoic Chamber for Radiation Emissions (Above18GHz) (Shenzhen Balun Technology Co.,Ltd.) | | | | | | |
| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Calibration Date | Calibration Due Date |
| 1. | Spectrum Analyzer | R&S | FSV-40 | 101544 | 2017-02-17 | 2018-02-16 |
| 2 | Antenna-Horn (18-40 GHz) | A-INFO | LB-180400KF | J211060273 | 2017-01-07 | 2018-01-06 |
| 3 | Amplifier | COM-MV | ZLNA-18-40G-021 | 1608001 | 2017-02-17 | 2018-02-16 |
| 4 | Cable | Top | 18-40GHz | - | 2017-02-17 | 2018-02-16 |

5.2 Measurement Uncertainty

| Parameter | Uncertainty |
|------------------------------|-------------|
| Radiated Spurious Emissions | ± 7.5 dB |
| Conducted Spurious emissions | ± 2.2 dB |

5.3 Subcontracted

Whether parts of tests for the product have been subcontracted to other labs:

☒ Yes ☐ No

If Yes, list the related test items and lab information:

Test Lab: Shenzhen Balun Technology Co.,Ltd.

FCC Designation No.: CN1196, Test Firm Registration No.: 935607.

Lab address: Block B, FL1, Baisha Science and Technology Park,Shahe Xi Road, Nanshan District, ShenZhen, Guangdong Province, P. R. China

Test items: Radiated Spurious Emissions (18GHz to 25GHz),
Conducted Spurious Emissions (18GHz to 25GHz).

6 Test Summary

| Test Items | Test Requirement | Result |
|--|----------------------------------|--------|
| Radiated Spurious Emissions* | 15.205(a) 15.209 15.247(d) | Pass |
| Conducted Spurious emissions* | 15.247(d) | Pass |
| Note: Pass=Compliance; Fail=Not Compliance; NT=Not Tested; N/A=Not Applicable. *: The test is subcontracted to Shenzhen Balun Technology Co.,Ltd. | | |

7 Radiated Spurious Emissions

Test Requirement: FCC CFR47 Part 15 Section 15.209 & 15.247

Test Method: ANSI C63.10:2013

Test Result: PASS

Measurement Distance: 3m

Limit:

| Frequency (MHz) | Field Strength | | Field Strength Limit at 3m Measurement Dist | |
|--------------------|----------------|-----------------|---|---------------------------------------|
| | uV/m | Distance (m) | uV/m | dBuV/m |
| 0.009 ~ 0.490 | 2400/F(kHz) | 300 | $10000 * 2400/F(\text{kHz})$ | $20\log^{(2400/F(\text{kHz}))} + 80$ |
| 0.490 ~ 1.705 | 24000/F(kHz) | 30 | $100 * 24000/F(\text{kHz})$ | $20\log^{(24000/F(\text{kHz}))} + 40$ |
| 1.705 ~ 30 | 30 | 30 | $100 * 30$ | $20\log^{(30)} + 40$ |
| 30 ~ 88 | 100 | 3 | 100 | $20\log^{(100)}$ |
| 88 ~ 216 | 150 | 3 | 150 | $20\log^{(150)}$ |
| 216 ~ 960 | 200 | 3 | 200 | $20\log^{(200)}$ |
| Above 960 | 500 | 3 | 500 | $20\log^{(500)}$ |

7.1 EUT Operation

Operating Environment :

Temperature: 23.5 °C

Humidity: 51.1 % RH

Atmospheric Pressure: 101.2kPa

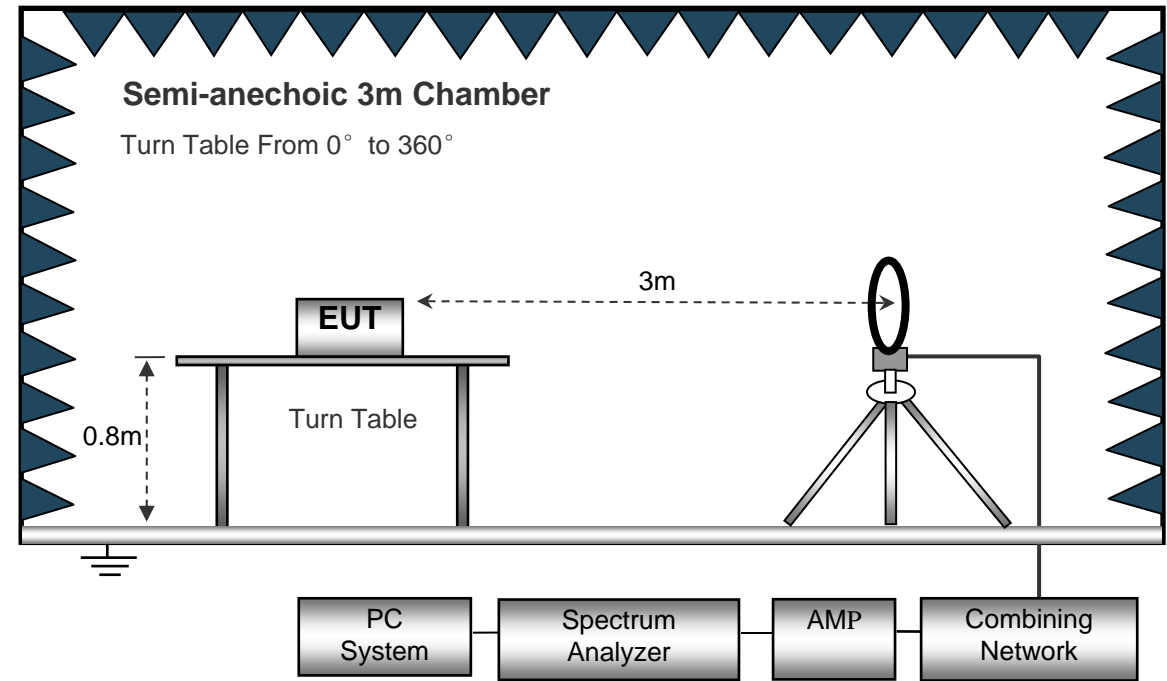
EUT Operation :

The test was performed in Charging + Transmitting mode, the worst test data (GFSK modulation Low Channel) were shown in the report.

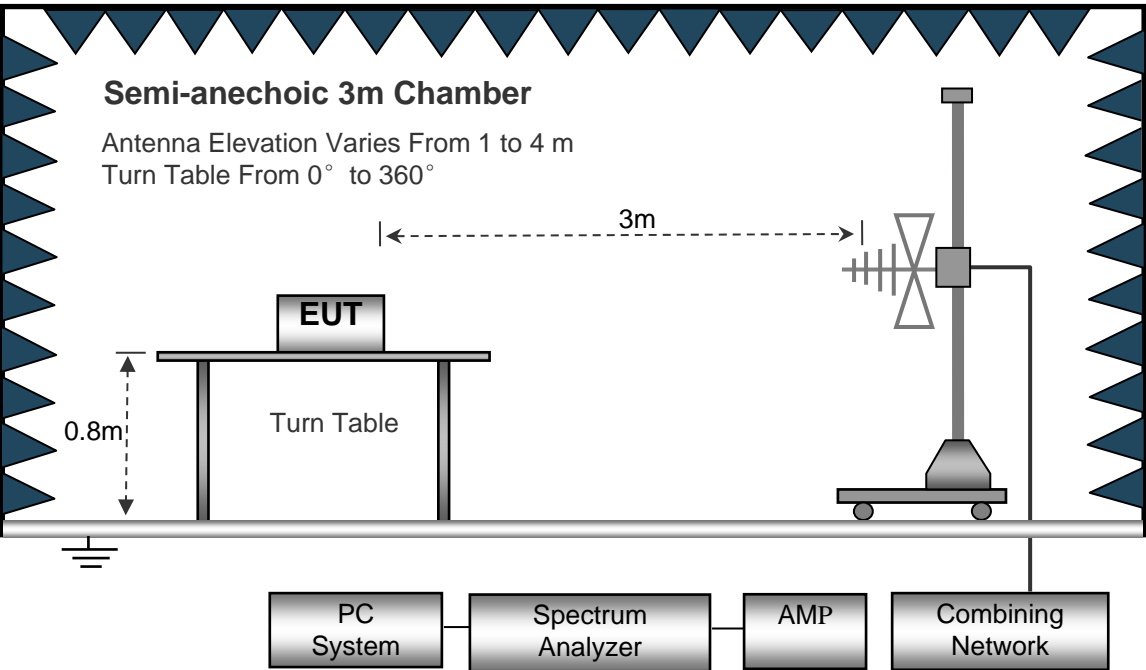
7.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.10:2013.

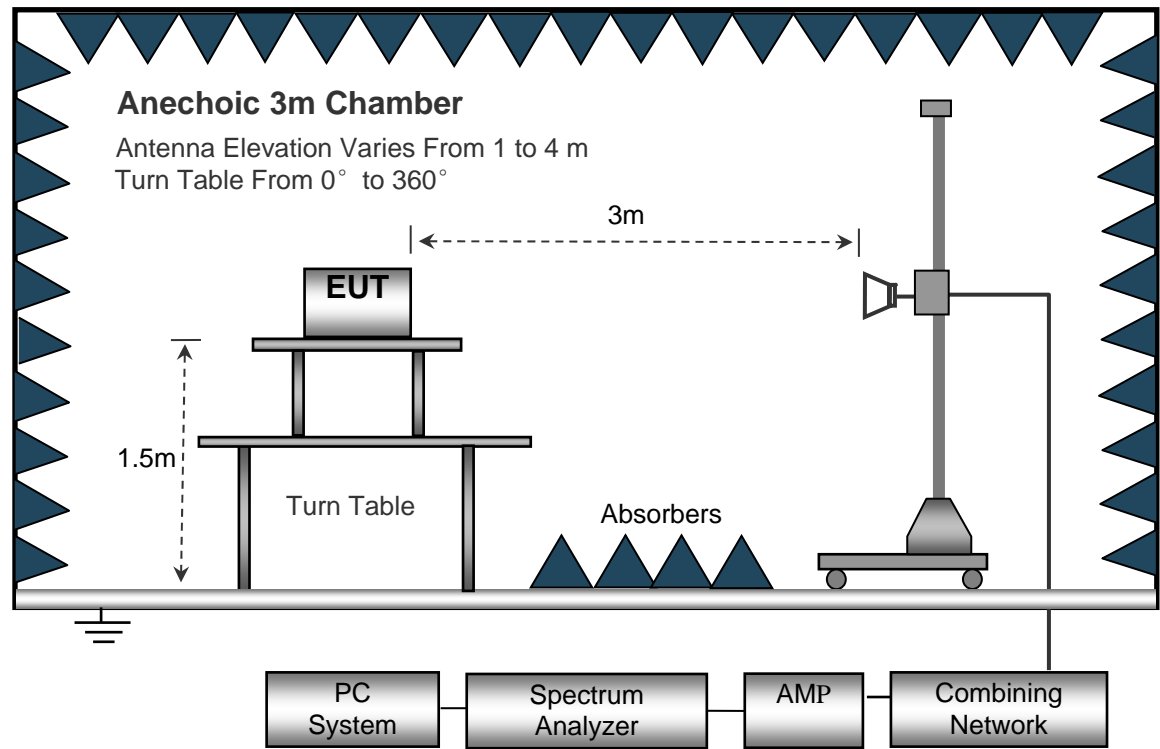
The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz.



7.3 Spectrum Analyzer Setup

Below 30MHz

- Sweep Speed Auto
- IF Bandwidth.....10kHz
- Video Bandwidth.....10kHz
- Resolution Bandwidth..... 10kHz

30MHz ~ 1GHz

- Sweep Speed Auto
- DetectorPK
- Resolution Bandwidth..... 100kHz
- Video Bandwidth.....300kHz

Above 1GHz

- Sweep Speed Auto
- DetectorPK
- Resolution Bandwidth..... 1MHz
- Video Bandwidth.....3MHz
- DetectorAve.
- Resolution Bandwidth..... 1MHz
- Video Bandwidth.....10Hz

7.4 Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane for below 1GHz and 1.5m for above 1GHz.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions. The spectrum was investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the Z position. So the data shown was the Z position only.

7.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

The "Margin" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the maximum limit for Class B. The equation for margin calculation is as follows:

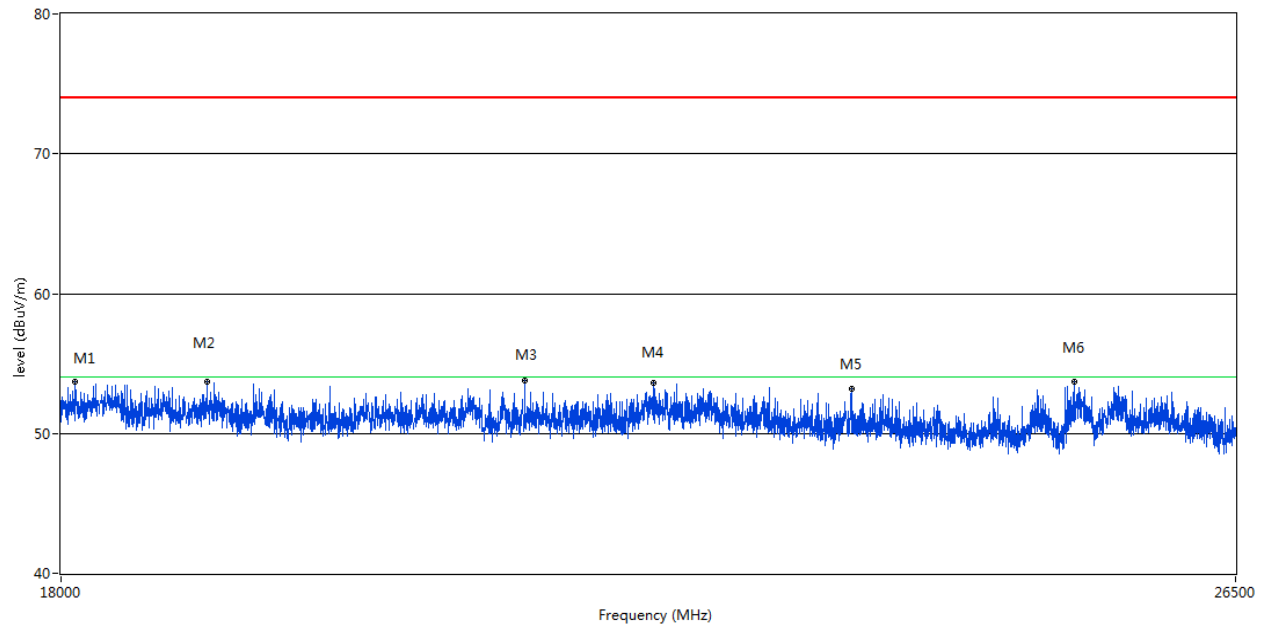
$$\text{Margin} = \text{Corr. Ampl.} - \text{Limit}$$

7.6 Summary of Test Results

Test Frequency: 18GHz ~ 25GHz

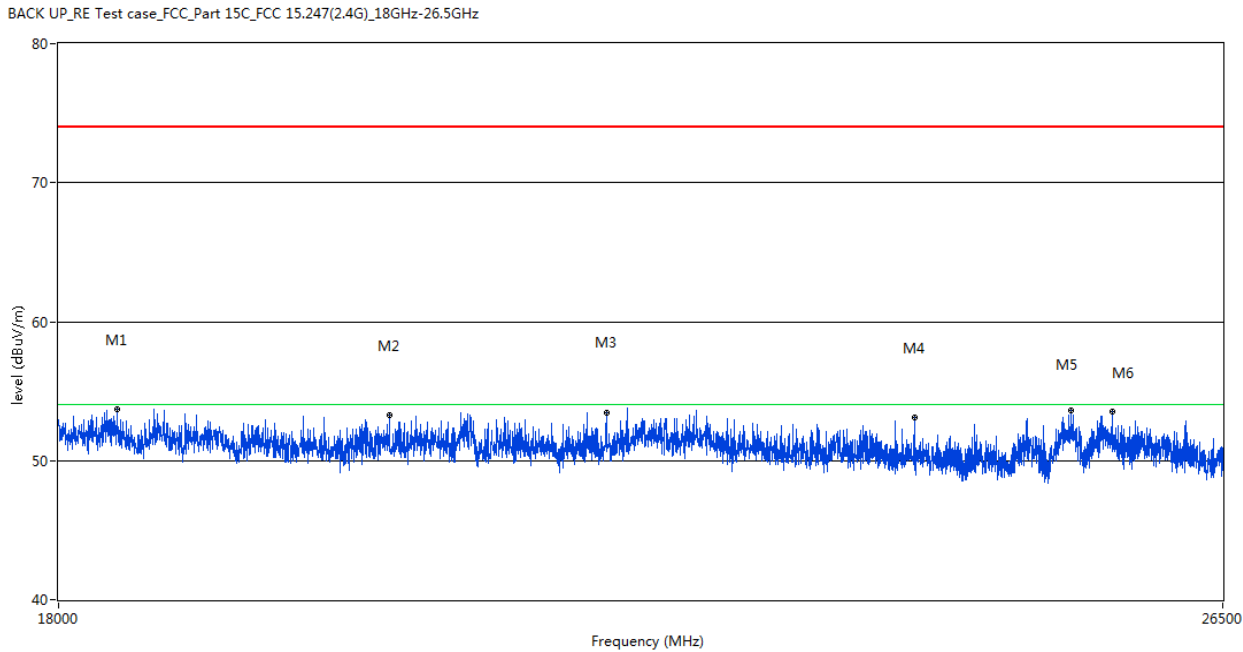
Remark: All the mode are tested and emissions more than 20dB below the limit, so only the worst data (GFSK modulation Low Channel) were reported.

BACK UP_RE Test case_FCC_Part 15C_FCC 15.247(2.4G)_18GHz-26.5GHz



| No. | Frequency (MHz) | Results (dBuV/m) | Factor (dB) | Limit (dBuV/m) | Margin (dB) | Detector | ANT | Verdict |
|-----|-----------------|------------------|-------------|----------------|-------------|----------|------------|---------|
| 1 | 18084.999 | 53.66 | 20.76 | 74.0 | 20.34 | Peak | Horizontal | Pass |
| 2 | 18884.000 | 53.70 | 20.48 | 74.0 | 20.30 | Peak | Horizontal | Pass |
| 3 | 20968.624 | 53.78 | 19.74 | 74.0 | 20.22 | Peak | Horizontal | Pass |
| 4 | 21876.001 | 53.60 | 20.31 | 74.0 | 20.40 | Peak | Horizontal | Pass |
| 5 | 23357.125 | 53.17 | 19.91 | 74.0 | 20.83 | Peak | Horizontal | Pass |
| 6 | 25133.625 | 53.72 | 19.43 | 74.0 | 20.28 | Peak | Horizontal | Pass |

Note: Where limits are specified by regulations for both average and peak detection, if the maximized peak measured value complies with the average limit, then it is unnecessary to perform an average measurement.



| No. | Frequency (MHz) | Results (dBuV/m) | Factor (dB) | Limit (dBuV/m) | Margin (dB) | Detector | ANT | Verdict |
|-----|-----------------|------------------|-------------|----------------|-------------|----------|----------|---------|
| 1 | 18352.751 | 53.71 | 20.67 | 74.0 | 20.29 | Peak | Vertical | Pass |
| 2 | 20091.001 | 53.25 | 19.88 | 74.0 | 20.75 | Peak | Vertical | Pass |
| 3 | 21593.375 | 53.48 | 20.13 | 74.0 | 20.52 | Peak | Vertical | Pass |
| 4 | 23918.125 | 53.09 | 19.54 | 74.0 | 20.91 | Peak | Vertical | Pass |
| 5 | 25193.126 | 53.57 | 19.43 | 74.0 | 20.43 | Peak | Vertical | Pass |
| 6 | 25547.999 | 53.54 | 19.41 | 74.0 | 20.46 | Peak | Vertical | Pass |

Note: Where limits are specified by regulations for both average and peak detection, if the maximized peak measured value complies with the average limit, then it is unnecessary to perform an average measurement.

8 Conducted Spurious Emissions

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: ANSI C63.10:2013

Test Result: PASS

Limit:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

8.1 Test Procedure

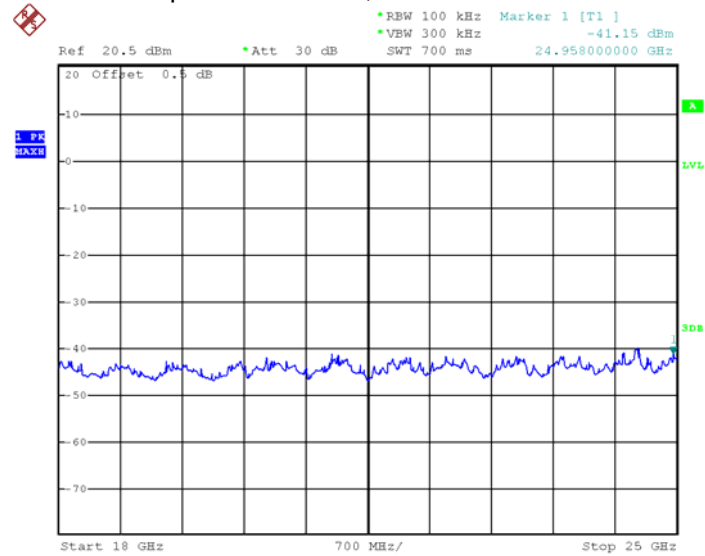
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer:
RBW = 100kHz, VBW = 300kHz, Sweep = auto
Detector function = peak, Trace = max hold

8.2 Test Result

18GHz – 25GHz

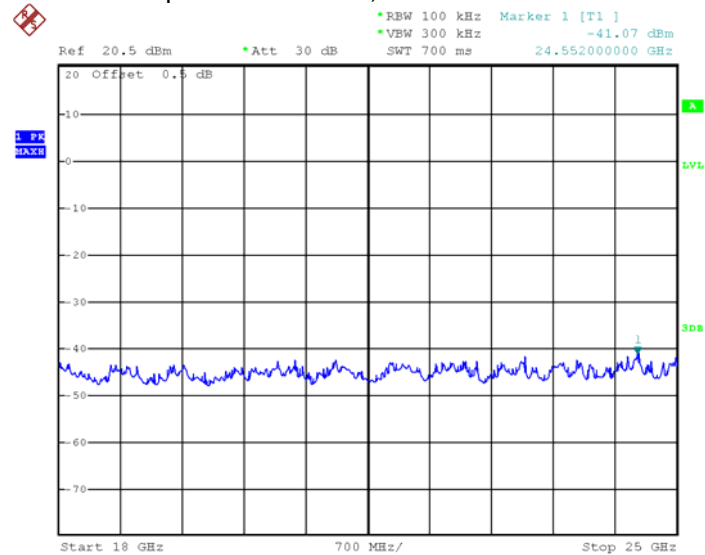
GFSK Low Channel

(Note: Fundamental power=0.46dBm; Limit=20dB down from Fundamental=-19.54dBm)



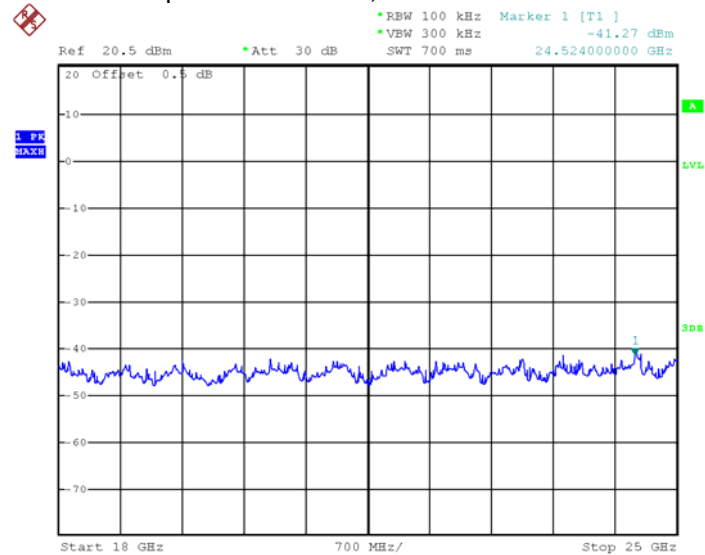
GFSK Middle Channel

(Note: Fundamental power=-0.90dBm; Limit=20dB down from Fundamental=-20.90dBm)



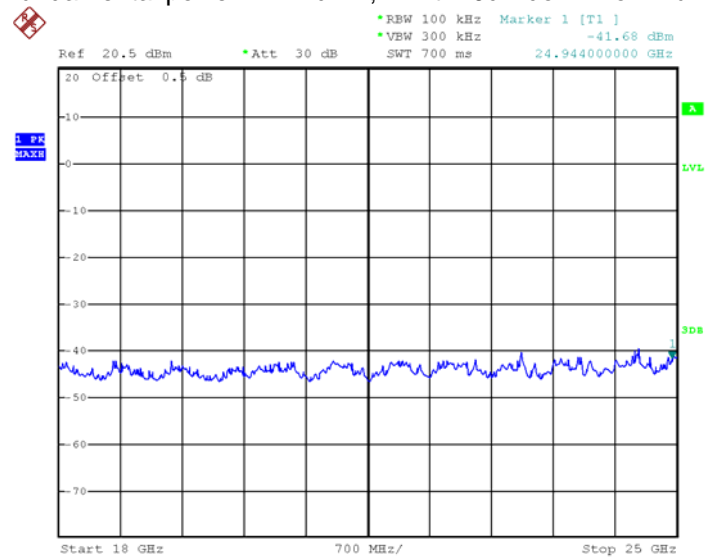
GFSK High Channel

(Note: Fundamental power=-1.58dBm; Limit=20dB down from Fundamental=-21.58dBm)



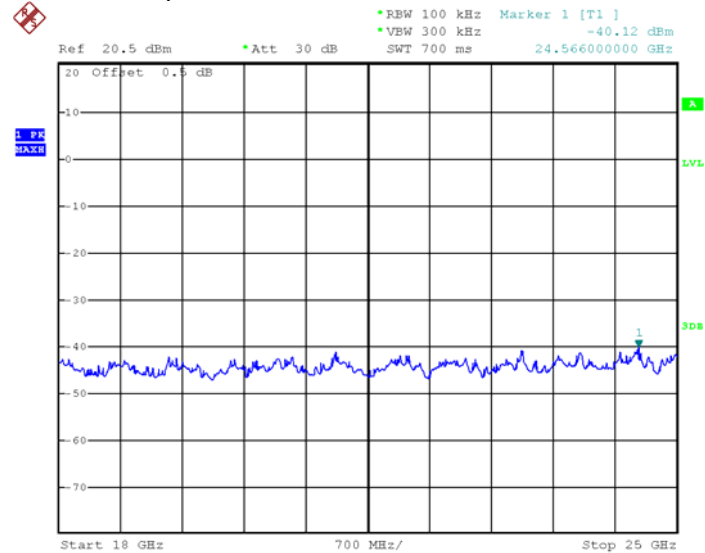
$\pi/4$ DQPSK Low Channel

(Note: Fundamental power=-1.44dBm; Limit=20dB down from Fundamental=-21.44dBm)



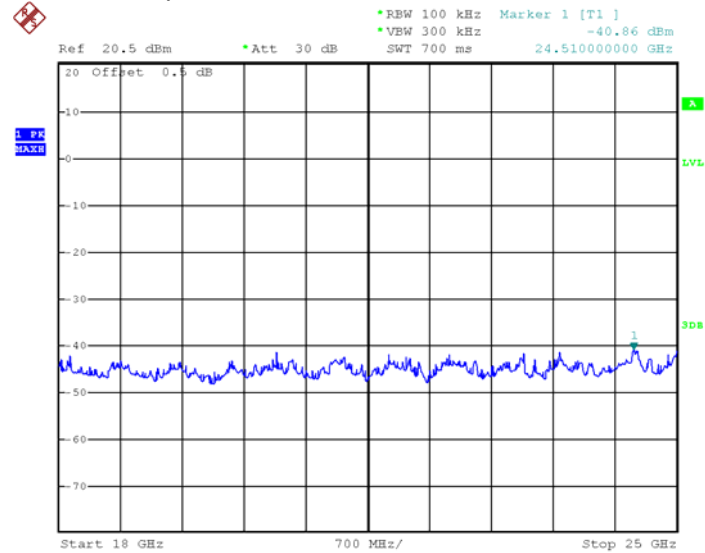
$\pi/4$ DQPSK Middle Channel

(Note: Fundamental power=-2.76dBm; Limit=20dB down from Fundamental=-22.76dBm)



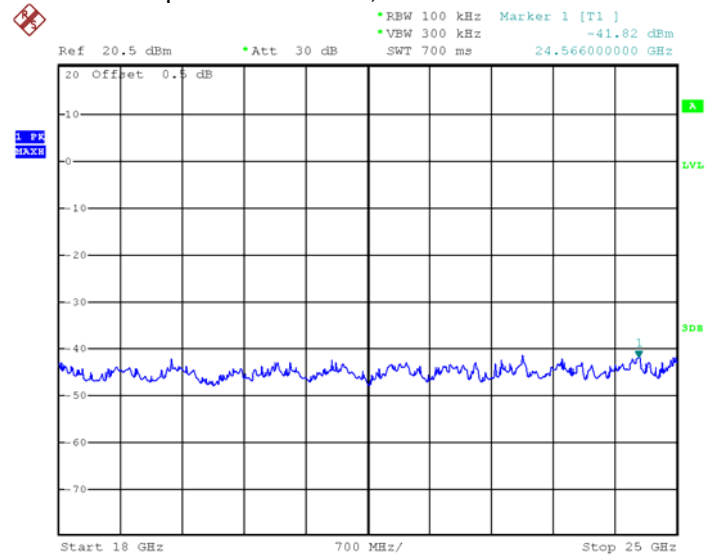
$\pi/4$ DQPSK High Channel

(Note: Fundamental power=-3.47dBm; Limit=20dB down from Fundamental=-23.47dBm)



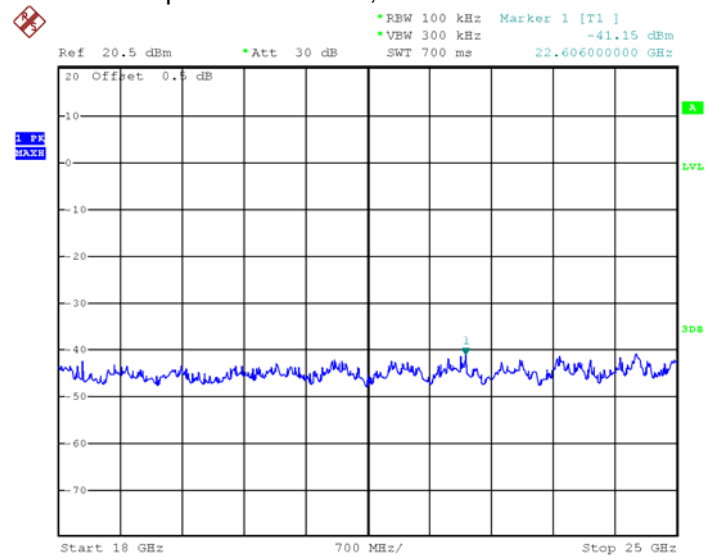
8DPSK Low Channel

(Note: Fundamental power=-0.86dBm; Limit=20dB down from Fundamental=-20.86dBm)



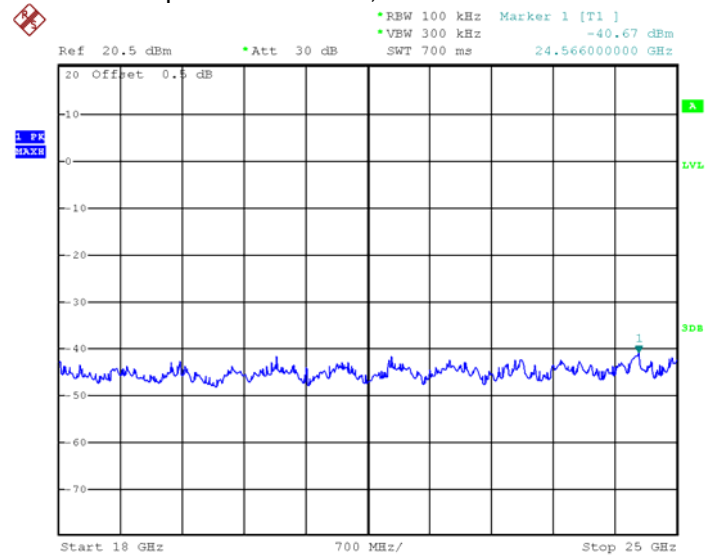
8DPSK Middle Channel

(Note: Fundamental power=-2.16dBm; Limit=20dB down from Fundamental=-22.16dBm)



8DPSK High Channel

(Note: Fundamental power=-2.89dBm; Limit=20dB down from Fundamental=-22.89dBm)



9 Photographs-Model BB733 Test Setup

9.1 Photograph - Spurious Emissions Radiated Test Setup

For 18GHz to 25GHz



=====End of Report=====