Zhong Shan City Richsound Electronic Industrial Ltd.

TEST REPORT

SCOPE OF WORK
FCC TESTING–TB523DW5, 100043839

REPORT NUMBER
211123006SZN-002

ISSUE DATE
30 DECEMBER 2021

PAGES
26

DOCUMENT CONTROL NUMBER
FCC ID 249_C
© 2017 INTERTEK

Zhong Shan City Richsound Electronic Industrial Ltd.

Application for Certification

FCC ID: Z8M-TB523DW5

onn. 5.1 wireless soundbar, Wireless Subwoofer, Surround Speaker(L/R)

Model: TB523DW5, 100043839

5.8GHz Transmitter

Report No.: 211123006SZN-002

We hereby certify that the sample of the above item is considered to comply with the requirements of FCC Part 15, Subpart C for Intentional Radiator, mention 47 CFR [10-1-20]

Prepared and Checked by:

Ryan Chen
Project Engineer

Approved by:

Sewen Guo
Senior Project Engineer
Date: 30 December 2021

This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

MEASUREMENT/TECHNICAL REPORT

This report concerns (check one:) Original Grant _X_ Class II Change _____

Equipment Type: DXX - Part 15 Low Power Communication Device Transmitter

---

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? Yes _____ No _X_

If yes, defer until: _____
date

Company Name agrees to notify the Commission by: _____
date
of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37? Yes _____ No _X_

If no, assumed Part 15, Subpart C for intentional radiator – the new 47 CFR [10-1-20 Edition] provision.

Report prepared by:

Ryan Chen
Intertek Testing Services Shenzhen Ltd. Longhua Branch
101, 201, Building B, No. 308 Wuhe Avenue, Zhangkengjing Community GuanHu Subdistrict, LongHua District, Shenzhen, People's Republic of China
Tel / Fax: 86-755-8614 0682/86-755-8601 6751

Table of Contents

1.0 Summary of Test Result

Applicant: Zhong Shan City Richsound Electronic Industrial Ltd.
Applicant Address: No.16, East Shagang Road, Gangkou, ZHONGSHAN, Guangdong 528447, China.
Manufacturer: Zhong Shan City Richsound Electronic Industrial Ltd.
Manufacturer Address: No.16, East Shagang Road, Gangkou, ZHONGSHAN, Guangdong 528447, China.

MODEL: TB523DW5
FCC ID: Z8M-TB523DW5

Test Specification	Reference	Results
Transmitter Radiated Emission Band edge	15.249 &15.209 &15.205	Pass
Conducted Emission	15.207	Pass
20dB Bandwidth	15.215(c)	Pass

Notes: The EUT uses an Integral Antenna which in accordance to Section 15.203 is considered sufficient to comply with the provisions of this section.

2.0 General Description

2.1 Product Description

The equipment under test (EUT) is a onn. 5.1 wireless soundbar, Wireless Subwoofer, Surround Speaker(L/R) with Bluetooth FHSS technology operating in 2402-2480MHz and SRD 5.8GHz transmitting function operating in 5727-5819MHz. The EUT is powered by AC 100-240V~ 50/60Hz. For more detail information pls. refer to the user manual.

Antenna Type: Integral antenna
Modulation Type: FSK
Antenna Gain: 3.95dBi

For electronic filing, the brief circuit description is saved with filename: descri.pdf.

The Model: 100043839 is the same as the Model: TB523DW5 in hardware and electrical aspect. The difference in model number and trademark serves as packaging and marketing purpose only.

The 5.8GHz transmitting module has two antenna, one is the transmitting antenna, the other is the receiving antenna, for detail please refer to internal photos.pdf.

2.2 Related Submittal(s) Grants

This is an application for certification of controller unit for the onn. 5.1 wireless soundbar, Wireless Subwoofer, Surround Speaker(L/R). Other digital functions were reported in the verification report: 211123006SZN-003.
For Bluetooth function is subjected to report: 211123006SZN-001.

2.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.10 (2013). Radiated emission measurement was performed in Semi-anechoic chamber and conducted emission measurement was performed in shield room. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst-case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "Justification Section" of this Application. All other measurements were made in accordance with the procedures in part 2 of CFR 47.

2.4 Test Facility

The Semi-Anechoic chamber and shield room used to collect the radiated data and conducted data are Intertek Testing Services Shenzhen Ltd. Longhua Branch and located at 101, 201, Building B, No. 308 Wuhe Avenue, Zhangkengjing Community, GuanHu Subdistrict, LongHua District, ShenZhen, P.R. China. This test facility and site measurement data have been fully placed on file with the FCC (Registration Number: CN1188).

3.0 System Test Configuration

3.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it), and in the confines as outlined in ANSI C63.10 (2013).

The EUT was powered by AC120V, 60Hz during the test, only the worst data was reported in this report.

For maximizing emissions below 30 MHz, the EUT was rotated through 360°, the centre of the loop antenna was placed 1 meter above the ground, and the antenna polarization was changed. For maximizing emissions, the EUT was rotated through 360°, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed. This step by step procedure for maximizing emissions led to the data reported in Section 4.

The EUT and transmitting antenna was centered on the turntable.

The equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). The EUT was placed on a turn table, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes.

3.2 EUT Exercising Software

There was no special software to exercise the device.

3.3 Special Accessories

No special accessories used.

3.4 Equipment Modification

Any modifications installed previous to testing by Zhong Shan City Richsound Electronic Industrial Ltd. will be incorporated in each production model sold / leased in the United States.

No modifications were installed by Intertek Testing Services Shenzhen Ltd Longhua Branch.

3.5 Measurement Uncertainty

When determining the test conclusion, the Measurement Uncertainty of test has been considered.

3.6 Support Equipment List and Description

Description	Manufacturer	Model No.
Mobile Phone (Provided by Intertek)	SAMSUNG	SM-G9300
Test TV (Provided by Intertek)	SONY	KDL-24EX520
USB Memory (Provided by Intertek)	TOSHIBA	UHYBS-004G-BL
3.5mm to 3.5mm audio Cable (Provided by Applicant)	Richsound	Unshielded, Length 100cm
HDMI In Cable (Provided by Applicant)	Richsound	Shielded, Length 150cm
Detached AC power cord (Provided by Applicant)	Richsound	Unshielded, Length 150cm
Optical Cable	Richsound	Unshielded, Length 120cm
HDMI In Cable (Provided by Intertek)	N/A	Unshielded, Length 150cm
Dummy Load (Provided by Intertek)	N/A	Audio: 1kΩ HDMI: 100Ω

4.0 Emission Results

Data is included worst-case configuration (the configuration which resulted in the highest emission levels).

4.1 Radiated Test Results

A sample calculation, configuration photographs and data tables of the emissions are included.

4.1.1 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

FS = RA + AF + CF - AG + PD + AV

Where FS = Field Strength in dBµV/m
RA = Receiver Amplitude (including preamplifier) in dBµV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB/m
AG = Amplifier Gain in dB
PD = Pulse Desensitization in dB
AV = Average Factor in -dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

FS = RA + AF + CF - AG + PD + AV

Assume a receiver reading of 62.0 dBµV is obtained. The antenna factor of 7.4 dB/m and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0 dB, and the resultant average factor was -10 dB. The net field strength for comparison to the appropriate emission limit is 32 dBµV/m. This value in dBµV/m was converted to its corresponding level in µV/m.

RA = 62.0 dBµV
AF = 7.4 dB/m
CF = 1.6 dB
AG = 29.0 dB
PD = 0 dB
AV = -10 dB
FS = 62 + 7.4 + 1.6 - 29 + 0 = 42 dBµV/m

Level in µV/m = Common Antilogarithm [(42 dBµV/m)/20] = 125.9 µV/m

4.1.2 Radiated Emission Configuration Photograph

For electronic filing, the worst case radiated emission configuration photograph is saved with filename: radiated photos. pdf.

4.1.3 Radiated Emissions

The data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Worst Case Radiated Emission
at
64.640000/239.96000 MHz

Judgement: Passed by 9.1 dB

TEST PERSONNEL:

Sign on file

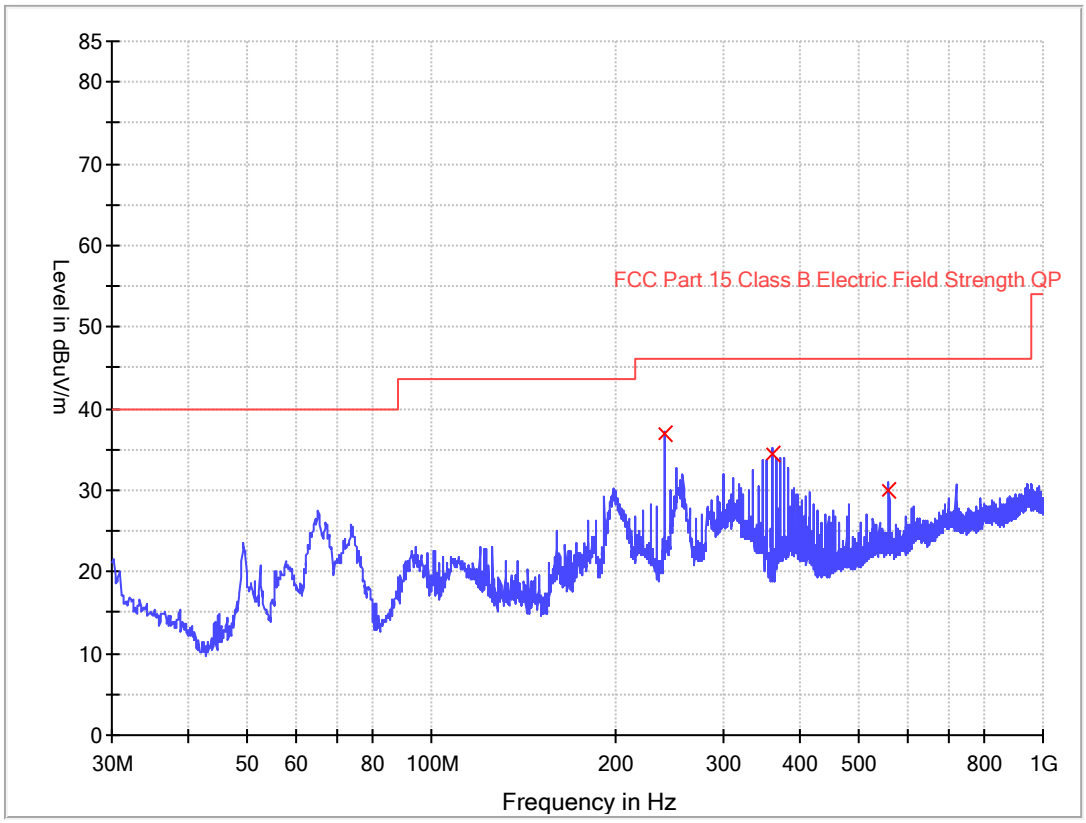
Ryan Chen, Project Engineer
Typed/Printed Name

08 December 2021
Date

Applicant: Zhong Shan City Richsound Electronic Industrial Ltd.
Date of Test: 08 December 2021 Model: TB523DW5
Worst Case Operating Mode: Synchronous transmission

ANT Polarity: Horizontal

FCC Part 15



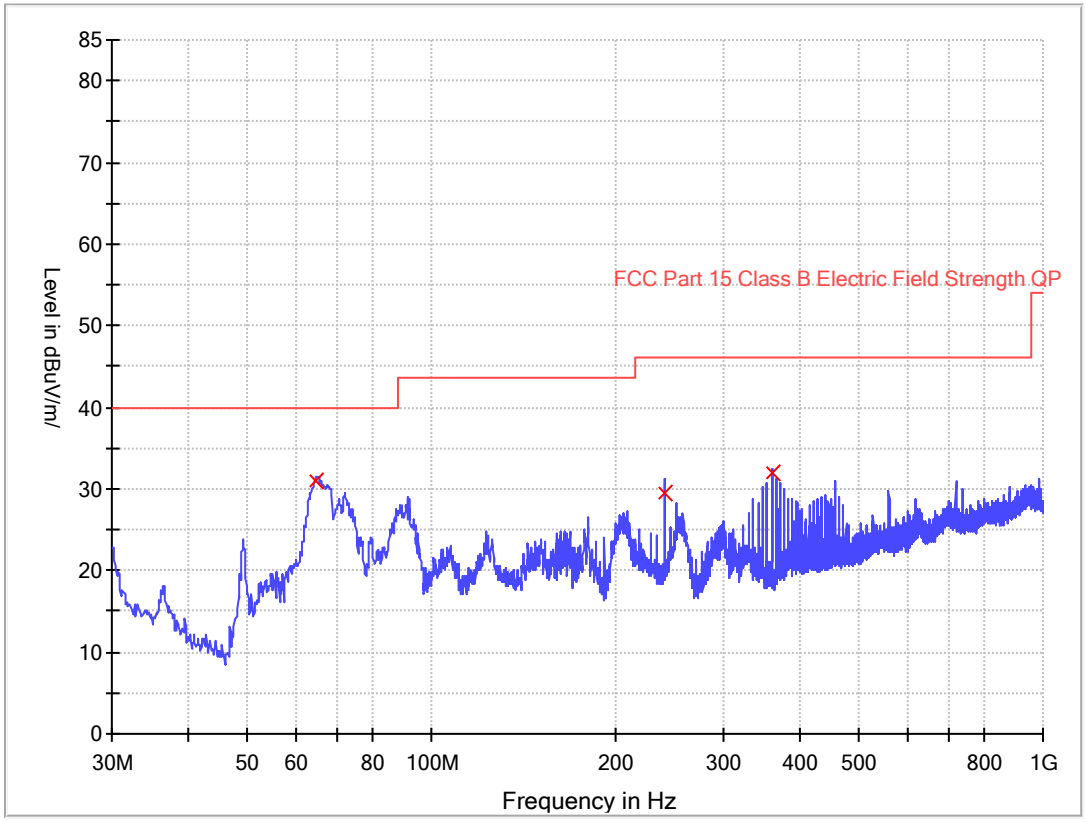
Frequency (MHz)	Quasi Peak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Polarization	Corr. (dB/m)	Margin - QPK (dB)	Limit – QPK dBµV/m)
239.960000	36.9	1000.0	120.000	H	14.5	9.1	46.0
359.921250	34.5	1000.0	120.000	H	18.4	11.5	46.0
559.983750	30.0	1000.0	120.000	H	23.2	16.0	46.0

Remark:
1. Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
2. Quasi Peak (dBµV/m) = Corr. (dB/m) + Read Level (dBµV)
3. Margin (dB) = Limit Line (dBµV/m) – Level (dBµV/m)

Applicant: Zhong Shan City Richsound Electronic Industrial Ltd.
Date of Test: 08 December 2021 Model: TB523DW5
Worst Case Operating Mode: Synchronous transmission

ANT Polarity: Vertical

FCC Part 15



Frequency (MHz)	Quasi Peak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Polarization	Corr. (dB/m)	Margin - QPK (dB)	Limit – QPK (dBµV/m)
64.640000	30.9	1000.0	120.000	V	8.1	9.1	40.0
240.005000	29.4	1000.0	120.000	V	14.5	16.6	46.0
359.921250	31.9	1000.0	120.000	V	18.4	14.1	46.0

Remark:
1. Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
2. Quasi Peak (dBµV/m) = Corr. (dB/m) + Read Level (dBµV)
3. Margin (dB) = Limit Line (dBµV/m) – Level (dBµV/m)

4.1.4 Transmitter Spurious Emissions (Radiated)

Worst Case Radiated Emission
at
5875.136 MHz

For electronic filing, the worst case radiated emission configuration photograph is saved with filename: radiated photos. pdf.

The data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Judgement: Passed by 1.3 dB

TEST PERSONNEL:

Sign on file

Ryan Chen, Project Engineer
Typed/Printed Name

08 December 2021
Date

Applicant: Zhong Shan City Richsound Electronic Industrial Ltd.
Date of Test: 08 December 2021 Model: TB523DW5
Worst Case Operating Mode: Transmitting

Table 1

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	5727.000	102.2	36.7	38.1	103.6	114.0	-10.4
Horizontal	11454.000	52.2	36.3	38.9	54.8	74.0	-19.2
Horizontal	17181.000	54.8	34.7	41.0	61.1	74.0	-12.9

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m	Margin (dB)
Horizontal	5727.000	82.4	36.7	38.1	83.8	94.0	-10.2
Horizontal	11454.000	40.4	36.3	38.9	43.0	54.0	-11.0
Horizontal	17181.000	41.6	34.7	41.0	47.9	54.0	-6.1

Notes:
1. Peak Detector Data unless otherwise stated.
2. All measurements were made at 3 meter. Harmonic emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna is used for the emission over 1000MHz.

Applicant: Zhong Shan City Richsound Electronic Industrial Ltd.
Date of Test: 08 December 2021 Model: TB523DW5
Worst Case Operating Mode: Transmitting

Table 2

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	5773.000	102.9	36.7	38.1	104.3	114.0	-9.7
Horizontal	11546.000	46.9	36.3	38.9	49.5	74.0	-24.5
Horizontal	17319.000	48.7	34.7	41.0	55.0	74.0	-19.0

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Average Factor (-dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)
Horizontal	5773.000	84.5	36.7	38.1	85.9	94.0	-8.1
Horizontal	11546.000	38.7	36.3	38.9	41.3	54.0	-12.7
Horizontal	17319.000	40.9	34.7	41.0	47.2	54.0	-6.8

Notes:
1. Peak Detector Data unless otherwise stated.
2. All measurements were made at 3 meter. Harmonic emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna is used for the emission over 1000MHz.

Applicant: Zhong Shan City Richsound Electronic Industrial Ltd.
Date of Test: 08 December 2021 Model: TB523DW5
Worst Case Operating Mode: Transmitting

Table 3

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	5819.000	103.7	36.7	38.1	105.1	114.0	-8.9
Horizontal	11638.000	48.8	36.3	38.9	51.4	74.0	-22.6
Horizontal	17457.000	48.5	34.7	41.0	54.8	74.0	-19.2

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Average Factor (-dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)
Horizontal	5819.000	75.9	36.7	38.1	77.3	94.0	-16.7
Horizontal	11638.000	41.7	36.3	38.9	44.3	54.0	-9.7
Horizontal	17457.000	39.9	34.7	41.0	46.2	54.0	-7.8

Notes:
1. Peak Detector Data unless otherwise stated.
2. All measurements were made at 3 meter. Harmonic emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna is used for the emission over 1000MHz.

4.2 Conducted Emission Configuration Photograph

For electronic filing, the worst case radiated emission configuration photographs are saved with filename: conducted photos.pdf.

4.2.1 Conducted Emission

Worst Case Conducted Configuration
at
0.306000MHz

Judgement: Passed by 13.2dB margin

TEST PERSONNEL:

Sign on file

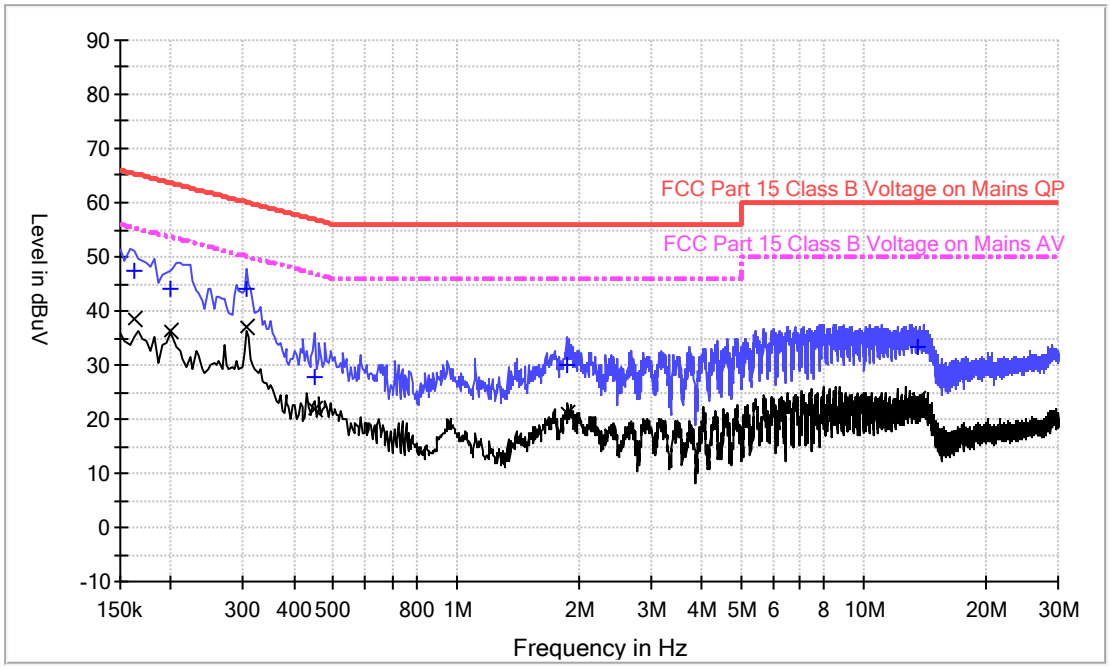
Ryan Chen, Project Engineer
Typed/Printed Name

08 December 2021
Date

Applicant: Zhong Shan City Richsound Electronic Industrial Ltd.
Date of Test: 08 December 2021 Model: TB523DW5
Worst Case Operating Mode: Synchronous transmission
Phase: Live

Graphic / Data Table

Conducted Emissions
Pursuant to FCC 15.207: Emissions Requirement



Result Table QP

Frequency (MHz)	Quasi Peak (dBµ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµ
0.162000	47.4	9.000	L1	9.6	18.0	65.4
0.198000	44.2	9.000	L1	9.6	19.5	63.7
0.306000	43.9	9.000	L1	9.6	16.2	60.1
0.450000	27.7	9.000	L1	9.6	29.2	56.9
1.866000	29.9	9.000	L1	9.6	26.1	56.0
13.518000	33.4	9.000	L1	10.0	26.6	60.0

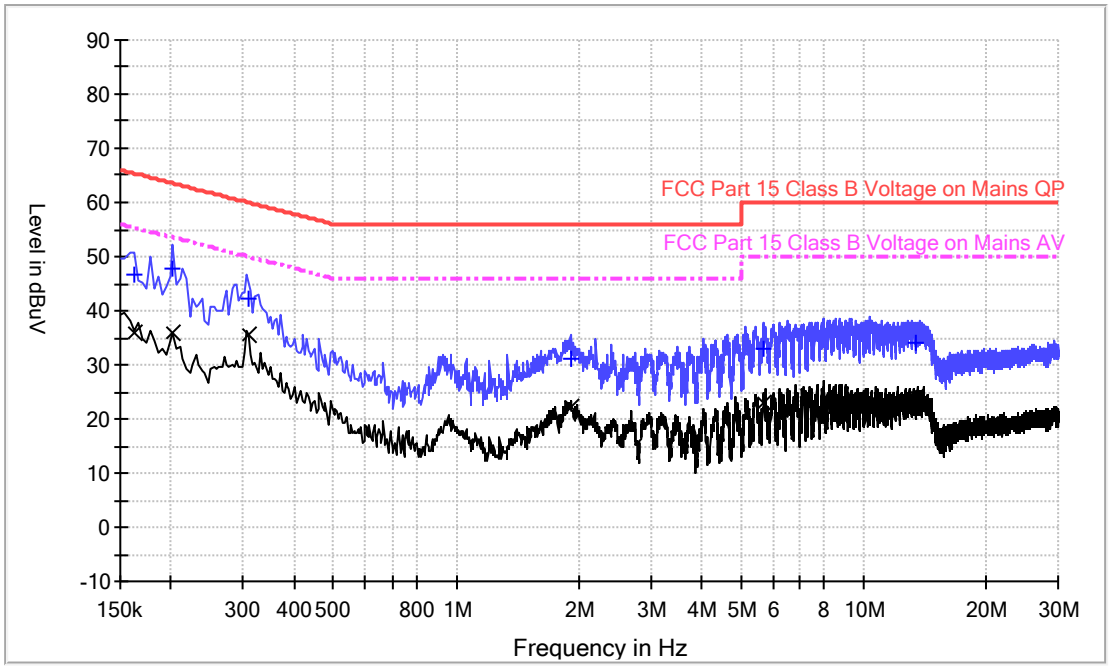
Result Table AV

Frequency (MHz)	Average (dBµ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµ
0.162000	38.6	9.000	L1	9.6	16.8	55.4
0.198000	36.4	9.000	L1	9.6	17.3	53.7
0.306000	36.9	9.000	L1	9.6	13.2	50.1
0.450000	21.7	9.000	L1	9.6	25.2	46.9
1.866000	21.1	9.000	L1	9.6	24.9	46.0
13.518000	23.6	9.000	L1	10.0	26.4	50.0

Applicant: Zhong Shan City Richsound Electronic Industrial Ltd.
Date of Test: 08 December 2021 Model: TB523DW5
Worst Case Operating Mode: Synchronous transmission
Phase: Neutral

Graphic / Data Table

Conducted Emissions
Pursuant to FCC 15.207: Emissions Requirement



Result Table QP

Frequency (MHz)	Quasi Peak (dBµ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµ V)
0.162000	46.5	9.000	N	9.5	18.9	65.4
0.202000	47.6	9.000	N	9.5	15.9	63.5
0.310000	42.2	9.000	N	9.5	17.8	60.0
1.906000	31.3	9.000	N	9.5	24.7	56.0
5.678000	33.1	9.000	N	9.6	26.9	60.0
13.494000	34.1	9.000	N	9.9	25.9	60.0

Result Table AV

Frequency (MHz)	Average (dBµ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin	Limit (dBµ V
0.162000	35.8	9.000	N	9.5	19.6	55.4
0.202000	35.8	9.000	N	9.5	17.7	53.5
0.310000	35.7	9.000	N	9.5	14.3	50.0
1.906000	22.3	9.000	N	9.5	23.7	46.0
5.678000	22.8	9.000	N	9.6	27.2	50.0
13.494000	24.0	9.000	N	9.9	26.0	50.0

5.0 Equipment Photographs

For electronic filing, the photographs of the tested EUT are saved with filename: external photos.pdf & internal photos.pdf.

6.0 Product Labelling

For electronic filing, the FCC ID label artwork and the label location are saved with filename: label.pdf.

7.0 Technical Specifications

For electronic filing, the block diagram and schematics of the tested EUT are saved with filename: block.pdf and circuit.pdf respectively.

8.0 Instruction Manual

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

This manual will be provided to the end-user with each unit sold/leased in the United States.

9.0 Miscellaneous Information

This miscellaneous information includes details of the measured bandedge, 20dB Bandwidth, the test procedure and calculation of factor such as pulse desensitization.

9.1 Band edge Plot

The test plots are attached as below. From the plot, the field strength of any emissions outside of the specified frequency band are attenuated to the general radiated emission limits in section 15.209. It fulfils the requirement of 15.249(d).

Peak Measurement

Restricted-band band-edge tests shall be performed as radiated measurements, i.e (Band-edge Plot).

(i) Lower channel 5727.000 MHz:

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	5724.922	59.6	36.7	38.0	60.9	74.0	-13.1

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	5724.922	51.0	36.7	38.0	52.3	54.0	-1.7

(ii) Upper channel 5819.000 MHz:

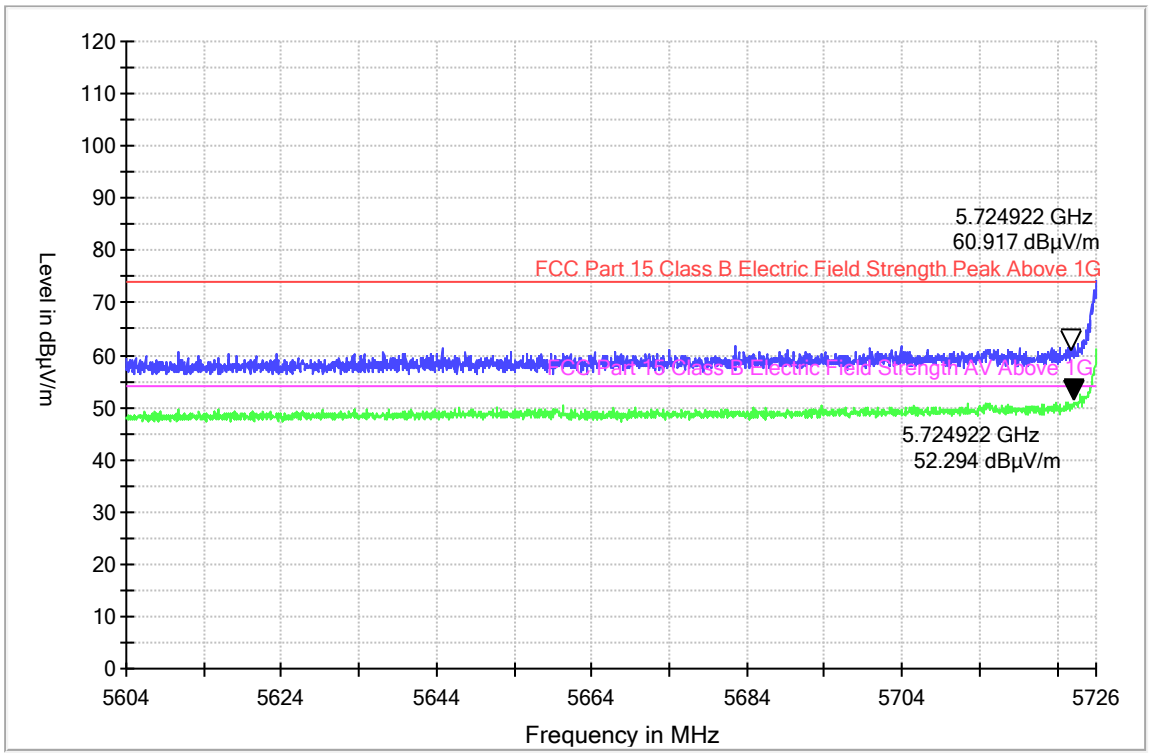
Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	5875.136	59.3	36.8	38.4	60.9	74.0	-13.1

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m	Margin (dB)
Horizontal	5875.136	51.1	36.8	38.4	52.7	54.0	-1.3

The resultant field strength meets the general radiated emission limit in section 15.209, which does not exceed 74dBµv/m (Peak Limit) and 54dBµv/m (Average Limit).

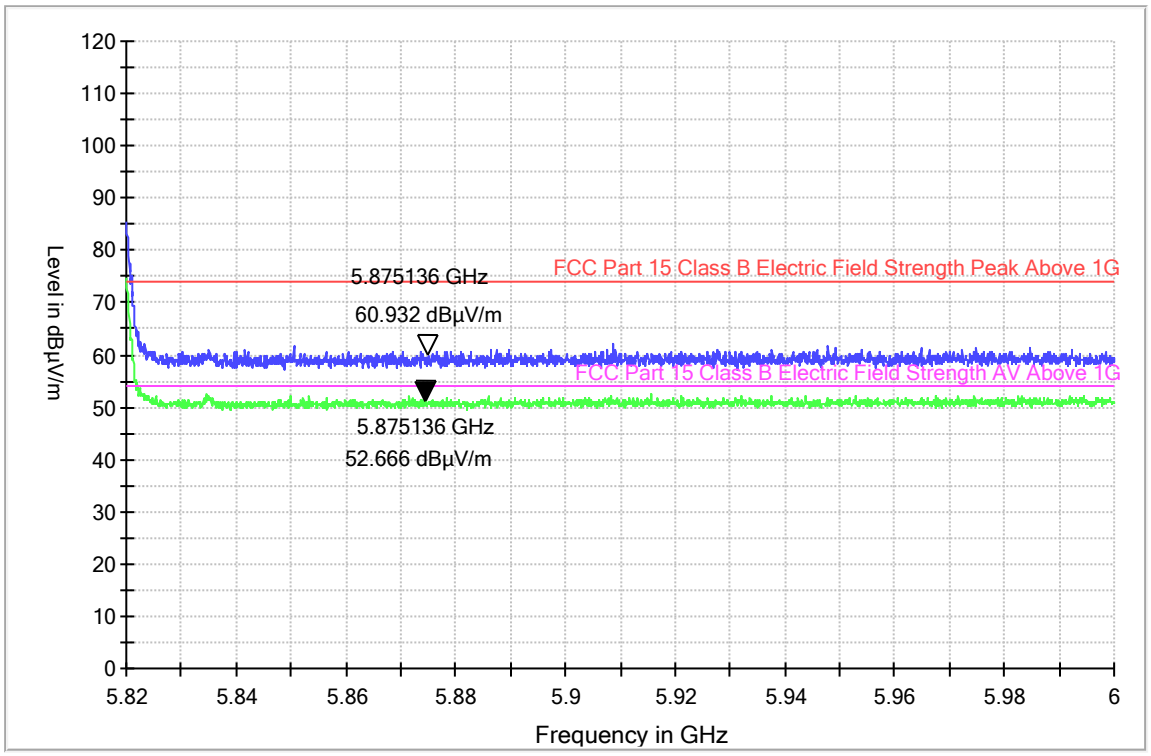
Lowest frequency Channel

Electric Field Strength 1-18GdBuV TX Band Edge



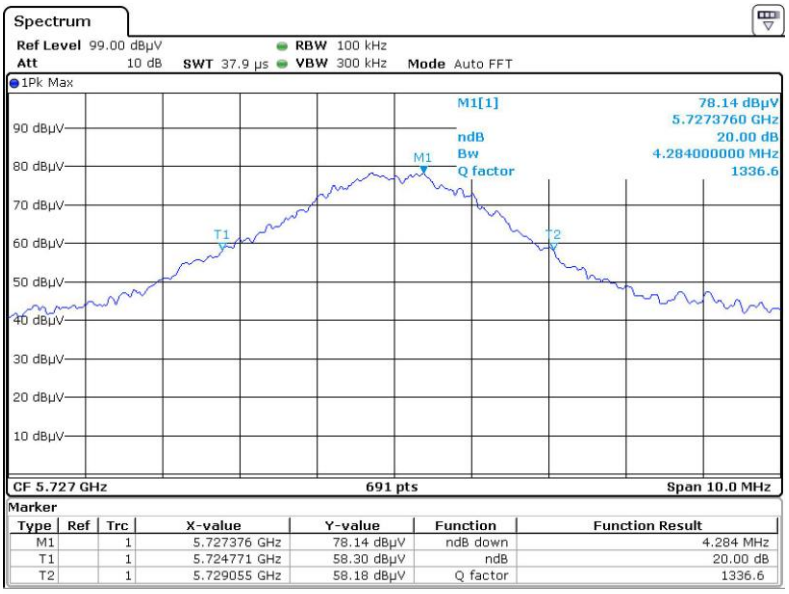
Highest frequency Channel

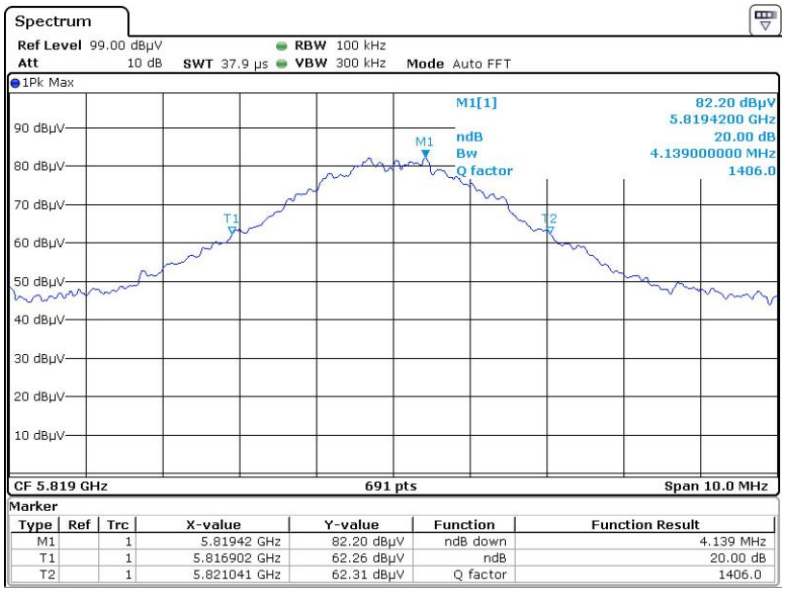
Electric Field Strength 1-18GdBuV TX Band Edge



9.2 20dB Bandwidth Bandwidth

Pursuant to FCC part 15 Section 15.215(c), the 20dB bandwidth of the emission was contained within the frequency band designated (mentioned as above) which the EUT operated. The effects, if any, from frequency sweeping, frequency hopping, other modulation techniques and frequency stability over excepted variations in temperature and supply voltage were considered. The test plots are reported as below.





9.3 Discussion of Pulse Desensitization

Pulse desensitivity is not applicable for this device since the transmitter transmits the RF signal continuously.

9.4 Calculation of Average Factor

he EUT antenna output port was connected to the input of the spectrum analyzer. The analyzer center frequency was set to EUT RF channel carrier. The SWEP function on the analyzer was set to ZERO SPAN. The Transmitter ON time was determined from the resultant time-amplitude display:

	See attached spectrum analyzer chart (s) for Transmitter timing
	See Transmitter timing diagram provided by manufacturer
x	Not applicable, duty cycle was not used.

9.5 Emissions Test Procedures

The following is a description of the test procedure used by Intertek Testing Services in the measurements of transmitters operating under Part 15, Subpart C rules.

The test set-up and procedures described below are designed to meet the requirements of ANSI C63.10 - 2013.

The transmitting equipment under test (EUT) is placed on a styrene turntable which is four feet in diameter and approximately 0.8 meter up to 1GHz and 1.5 meter above 1GHz in height above the ground plane. During the radiated emissions test, the turntable is rotated and any cables leaving the EUT are manipulated to find the configuration resulting in maximum emissions. The EUT is adjusted through all three orthogonal axes to obtain maximum emission levels. The antenna height and polarization are varied during the testing to search for maximum signal levels.

Detector function for radiated emissions is in peak mode. Average readings, when required, are taken by measuring the duty cycle of the equipment under test and subtracting the corresponding amount in dB from the measured peak readings. A detailed description for the calculation of the average factor can be found in Section 9.4.

The frequency range scanned is from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or 40 GHz, whichever is lower.

Detector function for conducted emissions is in QP & AV mode and IFBW setting is 9 kHz from the frequency band 150 kHz to 30MHz.

9.5 Emissions Test Procedures (cont'd)

The EUT is warmed up for 15 minutes prior to the test.

AC power to the unit is varied from 85% to 115% nominal and variation in the fundamental emission field strength is recorded. If battery powered, a new, fully charged battery is used.

Conducted measurements are made as described in ANSI C63.10 - 2013.

The IF bandwidth used for measurement of radiated signal strength was 10 kHz for emission below 30 MHz and 120 kHz for emission from 30 MHz to 1000 MHz. Where pulsed transmissions of short enough pulse duration warrant, a greater bandwidth is selected according to the recommendations of Hewlett Packard Application Note 150-2. A discussion of whether pulse desensitivity is applicable to this unit is included in this report (See Section 9.3). Above 1000 MHz, a resolution bandwidth of 1 MHz is used, RBW 10MHz used for fundamental emission.

Transmitter measurements are normally conducted at a measurement distance of three meters. However, to assure low enough noise floor in the restricted bands and above 1 GHz, signals are acquired at a distance of one meter or less. All measurements are extrapolated to three meters using inverse scaling, but those measurements taken at a closer distance are so marked.

10.0 Test Equipment List

Equipment No.	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
SZ061-12	BiConiLog Antenna	ETS	3142E	00166158	2021-08-04	2024-08-04
SZ185-02	EMI Receiver	R&S	ESCI	100547	2021-07-12	2022-07-12
SZ061-08	Horn Antenna	ETS	3115	00092346	2021-09-05	2024-09-05
SZ061-06	Active Loop Antenna	Electro-Metrics	EM-6876	217	2021-05-18	2023-05-18
SZ056-03	Spectrum Analyzer	R&S	FSP 30	101148	2021-05-10	2022-05-10
SZ056-06	Signal Analyzer	R&S	FSV 40	101101	2020-12-22	2021-12-22
SZ181-04	Preamplifier	Agilent	8449B	3008A02474	2021-05-10	2022-05-10
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	4102	2018-12-15	2021-12-15
SZ062-24	RF Cable	RADIALL	SF104PE	--	2021-10-26	2022-10-26
SZ062-25	RF Cable	RADIALL	SF104PE	--	2021-10-26	2022-10-26
SZ062-38	RF Cable	RADIALL	A50-3.5M3.5M-8M	--	2021-06-04	2022-06-04
SZ067-04	Notch Filter	Micro-Tronics	BRM50702-02	--	2021-05-11	2022-05-11
SZ185-02	EMI Test Receiver	R&S	ESCI	100692	2021-07-12	2022-07-12
SZ187-01	Two-Line V-Network	R&S	ENV216	100072	2021-11-02	2022-11-02
SZ187-02	Two-Line V-Network	R&S	ENV216	100072	2021-05-12	2022-05-12
SZ062-16	RF Cable	HUBER+SUHNER	CBL2-BN-1m	110127-2231000	2021-10-26	2022-10-26
SZ188-03	Shielding Room	ETS	RFD-100	4100	2020-01-07	2023-01-07

********** End of Report**********