



FCC PART 15 SUBPART C FCC PART 15.247 TEST REPORT

FCC ID:2BVTQ-ST520

Report No: CTSL2610330031E

Product Name: Computer Speaker

Main Test Model: ST520

Series Models: /

Applicant: Huizhou Zhulin Technology CO.,Ltd

EXECUTIVE SUMMARY

A sample of this product was tested and found to be in compliance with
FCC PART 15C, FCC PART 15 SUBPART C (15.247).

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applicable to presented Test sample.

CTSL Testing (Dongguan) Co., Ltd.

Main company address: Building 1, Houjie Road, Houjie Town, Guangdong
Province Dongguan City, China

Test Report

FCC ID:2BVTQ-ST520

Applicant Name	Huizhou Zhulin Technology CO.,Ltd				
Applicant Address	Rm 406-408, 4/F, Comprehensive Tech Center Bldg, 3-1 Lixin Rd, Zhongkai High-tech Zone, Huizhou, Guangdong, China				
Manufacturer Name	Huizhou Zhulin Technology CO.,Ltd				
Manufacturer Address	Rm 406-408, 4/F, Comprehensive Tech Center Bldg, 3-1 Lixin Rd, Zhongkai High-tech Zone, Huizhou, Guangdong, China				
Trade Mark	/				
Product name	Computer Speaker				
Main Test Model	ST520				
Series Models	/				
Standard	FCC Part 15 Subpart C (15.247) ANSI C63.10:2020 FCC KDB 558074 D01 15.247 Meas Guidance v05r02				
Test Location	ISO/IEC 17025 by ILAC-MRA is A2LA 7556.01 CTSL Testing (Dongguan) Co., Ltd. Room 112, Building 1, No. 15, Jiaoyuansongshan Hetian Village, Houjie Town Dongguan City, Guangdong, People's Republic of China				
Receipt Date	2026.04.01	Test period	2026.04.01-2026.04.23	Issue Date	2026.04.24
Conclusion	The equipment under test was found to be compliance with the requirements of the standards applied.				
Performs Testing:	Ethan Zhao	(Special seal)			
Test Report Reviewer:	Steve Qin				
Test Report Authorizer:	Alan Li				

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1. GENERAL INFORMATION

1.1. General Description of EUT (Equipment Under Test)

Product Information	
Product Name	: Computer Speaker
Main Test Model	: ST520
Series Models	: /
Power supply	: Input: USB-A/Type-C DC 5V/1A-2A Operating Power: 5W*2.
Battery	: -
Software Version	: V1.0
Hardware Version	: SB-520BT CNE LINE REV:1.1
Equipment Under Test	
Testing sample ID	: CTSL2610330031-S1 (Engineer sample) CTSL2610330031-S2 (Normal sample)
Test supplied	: ☐ supplied by the manufacturer ☒ supplied by the lab
PC information (Auxiliary test supplied by test Lab)	: EUT: DC 5V from Notebook PC, Input: AC 120V/60Hz Notebook PC Input: AC 100-240V, 50/60Hz
Wireless Specification	
Supported Type	: Bluetooth V5.4 (BR/EDR)
Modulation Type	: BT BDR(1Mbps): GFSK BT EDR(2Mbps): $\pi/4$ -DQPSK BT EDR(3Mbps): 8-DPSK
Operation frequency	: 2402MHz-2480MHz
Number of channels	: 79
Channel separation	: 1MHz
Max Output Power (PEAK)	: 0.85(0±1.0)dBm
Antenna Gain& type	: Refer to Section 1.2 of the report.
Sample Type	: Prototype production
Type of Device	: ☐ Portable Device; ☒ Mobile Device; ☐ Modular Device

Note: For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

1.2. Antenna Information

Ant No.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	2400 ~ 2500MHz	Antenna module on the system board	PCB Antenna	N/A	-0.58
Note: 1. The antenna gain is declared by the customer and the laboratory is not responsible for the accuracy of the antenna gain. 2. The test results of this report only apply to the sample as received.					

1.3. Information of RF Cable

Cable Loss(dB)	Provided by
1.0	Huizhou Zhulin Technology CO.,Ltd
Note: 1. The customer declared the loss value of the RF Cable. and the test results of this report only apply to the sample as received. 2. The laboratory is not responsible for the accuracy of the cable loss.	

2.SUMMARY OF TEST

2.1.Test Standards

FCC Rules Part 15.247: Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.

ANSI C63.10:2020: American National Standard for Testing Unlicensed Wireless Devices
FCC KDB 558074 D01 15.247 Meas Guidance v05r02

2.2.Summary of test result

No.	Description of Test Item	FCC Standard Section	Results
1	Maximum Peak Output Power	§15.247(a)(1)	PASS
2	20dB Bandwidth	§15.247(a)(1)	PASS
3	Carrier Frequency Separation	§15.247(a)(1)	PASS
4	Number Of Hopping Channels	§15.247(a)(1)(iii)	PASS
5	Time of Occupancy (Time of Occupancy (Dwell Time))	§15.247(a)(1)(iii)	PASS
6	Conducted Band Edge	§15.247(d)	PASS
7	Conducted Spurious Emissions	§15.247(d)	PASS
8	Radiated Spurious Emissions and Band Edge	§15.205 §15.209(a) §15.247(d)	PASS
9	AC Power Line Conducted Emissions	§15.107(a) §15.207	PASS
10	Antenna Requirement	§15.203	PASS

Note: "N/A" denotes test is not applicable in this test report.

2.3. Test Facilities

EMC Lab :

A2LA Certificate Number: 7556.01;
CTSL Testing (Dongguan) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.
The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.10 and CISPR 16-1-4:2010.

FCC Designation Number: CN1425;
Test Firm Registration Number: 750639;
CTSL Testing (Dongguan) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

Industry Canada Registration Number. Is: 34801;
CAB identifier: CN0192;
CTSL Testing (Dongguan) Co., Ltd. The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing.

Name of Firm : CTSL Testing (Dongguan) Co., Ltd.

EMC test location/satellite location:
Room 112, Building 1, No. 15, Jiaoyuansongshan Hetian Village, Houjie Town Dongguan City, Guangdong, People's Republic of China City, Guangdong, China

2.4. Measurement uncertainty

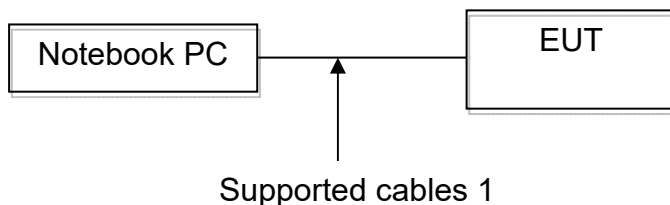
Test Item	Uncertainty
Uncertainty for Conduction emission test	$\pm 3.48\text{dB}$
Uncertainty for spurious emissions test (Below 30MHz)	$\pm 1.62\text{ dB}$
Uncertainty for spurious emissions test (30MHz-1GHz)	$\pm 4.60\text{ dB(Polarize: H)}$
	$\pm 4.68\text{ dB(Polarize: V)}$
Uncertainty for spurious emissions test (1GHz to 25GHz)	$\pm 4.96\text{dB}$
Uncertainty for radio frequency	7×10^{-8}
Uncertainty for conducted RF Power	1.08dB
Uncertainty for Power density test	0.26dB

Note: This uncertainty represents an expanded uncertainty expressed at approximately The 95% confidence level using a coverage factor of k=2.

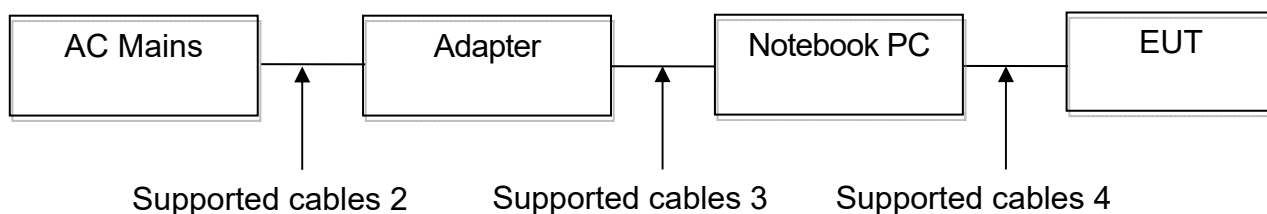
2.5. Block Diagram

For radiated emissions test: EUT was placed on a turn table, which is 0.8 (or 1.5) meter high above ground. EUT was beset into Bluetooth test mode by software before test.

Connect EUT Antenna Terminal, Radiated Spurious Emissions& Band Edge Test



AC Power Line Conducted Emissions& Radiated Emission Test (30-1000MHz):



(EUT: Computer Speaker)

2.6. Assistant equipment used for test

Item	Equipment	Brand	Model Name/Type No.	FCC ID	Series No.
1	Notebook PC	-	Inspiron 14R-5421 (Manufacturer: Dell)	-	25TZHW1
2	Notebook PC ADAPTER (supplied by the Lab.)	-	LA90PM111	-	PA-1900-32D2

Supported cables				
Item	Shielded Type	Ferrite Core	Length	Note
1	NO	NO	1.5m	USB Extension Cable (supplied by the Lab.)
2	NO	NO	0.8m	AC Line-Detachable (supplied by the Lab.-Use for Notebook PC)
3	NO	NO		DC Line Non-Detachable (supplied by the Lab.-Use for Notebook PC)
4	NO	NO		Non-Detachable USB-C/A Cable for EUT power in (supplied by the manufacturer)

2.7. Test mode

Combining all the rates, modulations, and packet types, the Pre-scans had been carried out. The worst-case test mode was selected for the final test as listed below.

Test Item	Modulation Type	Operating Mode	Packet Type	Test Channel
Maximum Peak Output Power	GFSK; $\pi/4$ -DQPSK; 8-DPSK;	Non-Hopping	DH5; 2-DH5; 3-DH5	Low/Middle/High
20dB Bandwidth	GFSK; $\pi/4$ -DQPSK; 8-DPSK;	Non-Hopping	DH5; 2-DH5; 3-DH5	Low/Middle/High
Carrier Frequency Separation	GFSK; $\pi/4$ -DQPSK; 8-DPSK;	Hopping On	DH5; 2-DH5; 3-DH5	CH 38/CH 39
Number Of Hopping Channel	GFSK; $\pi/4$ -DQPSK; 8-DPSK;	Hopping On	DH5; 2-DH5; 3-DH5	All Channel Hopping
Time of Occupancy (Dwell Time)	GFSK; $\pi/4$ -DQPSK; 8-DPSK;	Hopping On	DH1/DH3/ DH5	Middle (All Channel Hopping)
Conducted Band Edge	GFSK; $\pi/4$ -DQPSK; 8-DPSK;	Non-Hopping & Hopping On	DH5; 2-DH5; 3-DH5	Low / High & All Channel Hopping
Conducted Spurious Emissions	GFSK; $\pi/4$ -DQPSK; 8-DPSK;	Non-Hopping	DH5; 2-DH5; 3-DH5	Low/Middle/High
Radiated Spurious Emissions (Below 1GHz)	GFSK; $\pi/4$ -DQPSK; 8-DPSK;	Non-Hopping	DH5; 2-DH5; 3-DH5	Low/Middle/High
Radiated Spurious Emissions (Above 1GHz)	GFSK; $\pi/4$ -DQPSK; 8-DPSK;	Non-Hopping	DH5; 2-DH5; 3-DH5	Low/Middle/High
Radiated Band Edge	GFSK; $\pi/4$ -DQPSK; 8-DPSK;	Non-Hopping	DH5; 2-DH5; 3-DH5	Low/High
AC Power Line Conducted Emissions	GFSK	Non-Hopping	DH5	Low/Middle/High

Note: In radiated measurement, the EUT had been pre-scan on the positioned of each 3 axis (X, Y, Z), the worst case was found when positioned on **X-plane**.

2.8.Channel List

Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
00	2402	01	2403	02	2404	03	2405
04	2406	05	2407	06	2408	07	2409
08	2410	09	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	-	-

2.9.Power Setting of Test Software

Software Name	bt_tool_v1.1.4		
Frequency (MHz)	2402	2441	2480
GFSK(1Mbps) Setting	6	6	6
$\pi/4$ -DQPSK (2Mbps) Setting	6	6	6
8-DPSK(3Mbps) Setting	6	6	6

Note: This information is provided by the applicant.

2.10.Test Equipment

For Conducted Emission Test						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESCI 3	AT005	GUANGZHOU NEM	May 16,25	May 15,26
LISN	Rohde & Schwarz	ENV216	AT006	LISAI	July 31,25	July 30,26
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	AT007	CCIC (Shenzhen)	July 10,25	July 09,26
CE Cable	Times Microwave	LMR195UF-N MNM-1.50M	AT041	GUANGZHOU NEM	May 16,25	May 15,26
Test Software	FARAD	EZ-EMC Ver.3A1.1+	N/A	N/A	N/A	N/A

For Radiated Emission Test (9kHz-30MHz)						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
EMI TestReceiver	Rohde& Schwarz	ESCI 7	AT001	Ti Group	July 31,24	July 30,26
Active Loop Antenna	ZHINAN	ZN30900C	AT063	LISAI	Aug 03,24	Aug 02,26
Test Software	FARAD	EZ-EMC Ver.3A1.1+	N/A	N/A	N/A	N/A
9kHz-30MHz Cable	Times Microwave	LMR195UF-N MNM-9M	AT045	GUANGZHOU NEM	May 16,25	May 15,26

For Radiated Emissions Test (30MHz-1000MHz)						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
EMI Test Receiver	Rohde& Schwarz	ESCI 7	AT001	Ti Group	Jun 12,25	Jun 11,26
Trilog-Broadband Antenna (included 6 dB attenuator)	SCHWARZBECK	VULB 9168	AT002	LISAI	Aug 03,24	Aug 02,26
Test Software	FARAD	EZ-EMC Ver.3A1.1+	N/A	N/A	N/A	N/A
30-1000MHz Cable	Times Microwave Systems	LMR195UF-N MRNMR-3.00M+ LMR400UF-N MNM-3.00M+ LMR400UF-N MNM-3.00M	AT042+AT043+AT044	GUANGZHOU NEM	May 16,25	May 15,26

For Radiated Emission Test (Above 1000MHz)						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
Horn Antenna 1-18G	SCHWARZBECK	BBHA 9120 D	AT003	Shenzhen Academy of Metrology & Quality Inspection	Sep 23,24	Sep 22,26
Horn Antenna 18-40GHz	XIBAO	XB-WDB18-40K	AT064	LISAI	Feb 25,25	Feb 24,27
Broadband Preamplifier	SCHWARZBECK	BBV 9718 D	AT004	CCIC (Shenzhen)	July 10,25	July 9,26
Low Noise Amplifier	MWRFTest	DLA8-18-40G-2078	AT065	GUANGZHOU NEM	July 10,25	July 9,26
Spectrum Analyzer 40G	Keysight	N9020B	AT066	GUANGZHOU NEM	May 13,25	May 12,26
Spectrum Analyzer 26.5G	Keysight	N9020A	AT050	GUANGZHOU NEM	Jun 12,25	Jun 11,26
Radio switching unit	TiGroup	SU319	AT055	N/A	N/A	N/A
Filtering unit	TiGroup	SU319F	AT056	N/A	N/A	N/A
Test Software	BL	BL410-E V25.5 en	N/A	N/A	N/A	N/A
Above 1GHz Cable	Times Microwave Systems	SFT205-NMN M-7.0M+ SFT205-NMN M-2.0M	AT057+ AT058	GUANGZHOU NEM	July 09,25	July 08,26

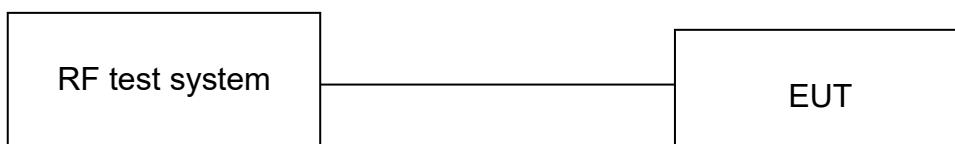
For Connect EUT Antenna Terminal Test (RF Test system)						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
Spectrum analyzer	Keysight	N9020A	AT050	GUANGZHOU NEM	Jun 12,25	Jun 11,26
Analog signal source	Keysight	N5173B	AT051	GUANGZHOU NEM	Jun 12,25	Jun 11,26
WIDEBAND RADIO COMMUNICATION TESTER	Rohde&Schwarz	CMW500	AT052	GUANGZHOU NEM	Jun 12,25	Jun 11,26
Power probe unit	Ti Group	SU319P	AT053	GUANGZHOU NEM	Jun 12,25	Jun 11,26
Switch unit	Ti Group	SU319S	AT054	N/A	N/A	N/A
Test Software	BL	BL410R 3.5.2.621	N/A	N/A	N/A	N/A

3. MAXIMUM PEAK OUTPUT POWER

3.1. Limit

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

3.2. Test Setup



3.3. Spectrum Analyzer Setting

Spectrum Parameters	Setting
RBW	3MHz
VBW	8MHz
Span	6MHz
Sweep Time	Auto
Detector	Peak
Trace Mode	Max Hold

3.4. Test Procedure

- Connect EUT antenna terminal to the spectrum analyzer with RF cable.
- Spectrum analyzer setting parameters in accordance with section 3.3.
- Set the EUT transmit continuously with maximum output power over fixed single hopping channel.
- Allow trace to stabilize, use the marker-to-peak function to set the marker to the peak of the emission.
- Repeat above procedures until all channels and test modes were measured.
- Record the results in the test report.

3.5. Test Result

Test Mode	Antenna	Channel & Frequency	Conducted Peak Power	Conducted Limit	Result
		MHz	dBm	dBm	
GFSK DH5 (Non-Hopping)	Ant1	CH00 2402	-1.84	≤20.97	PASS
		CH39 2441	-2.28	≤20.97	PASS
		CH78 2480	-2.70	≤20.97	PASS
$\pi/4$ -DQPSK 2-DH5 (Non-Hopping)	Ant1	CH00 2402	0.23	≤20.97	PASS
		CH39 2441	-0.12	≤20.97	PASS
		CH78 2480	-0.51	≤20.97	PASS
8-DPSK 3-DH5 (Non-Hopping)	Ant1	CH00 2402	0.85	≤20.97	PASS
		CH39 2441	0.44	≤20.97	PASS
		CH78 2480	0.09	≤20.97	PASS

3.6.Original Test Record

