



FCC PART 15.235

TEST REPORT

For

PLAY TEK LIMITED

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SHA TSUI EAST, KOWLOON HONG KONG

FCC ID: 2AI54-08810929

Report Type: Original Report	Product Type: 1:22 MONZOO MONSTER
Report Number: SZ3211012-52309E-RF-00	
Report Date: 2021-10-29	
Reviewed By: RF Engineer	<i>Candy Li</i>
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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

Product	1:22 MONZOO MONSTER
Model	0881
Multiple Model	0820, 0821, 0822, 0823, 0824, 0825, 0826, 0827, 0828, 0829, 0830, 0831
Model Differences	Refer to the DoS letter
Frequency Range	49.86MHz
Antenna Specification	0dBi
Voltage Supply	DC 1.5V*2 AA battery
Date of Test	2021-10-13 to 2021-10-22
Sample serial number	SZ3211012-52309E-RF
Received date	2021-10-12
Sample/EUT Status	Good condition

Objective

This test report is in accordance with Part 2, Subpart J, and Part 15, Subparts A and C of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC rules, section 15.203, 15.205, 15.209, 15.215 and 15.235 rules.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

All emissions measurement was performed at Shenzhen Accurate Technology Co., Ltd. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement uncertainty with radiated emission is 4.28 dB for 30MHz-1GHz, and 4.98 dB for 1GHz - 18GHz.

Test Facility

The test site used by Shenzhen Accurate Technology Co., Ltd. to collect test data is located on the 1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No.: 708358, the FCC Designation No.: CN1189. Accredited by American Association for Laboratory Accreditation (A2LA) The Certificate Number is 429 7.01.

Listed by Innovation, Science and Economic Development Canada (ISED), the Registration Number is 5077A.

SYSTEM TEST CONFIGURATION

Justification

The system was configured for testing in a typical fashion (as normally used by a typical user).

Special Accessories

No special accessories was used

Equipment Modifications

No modification was made to the EUT.

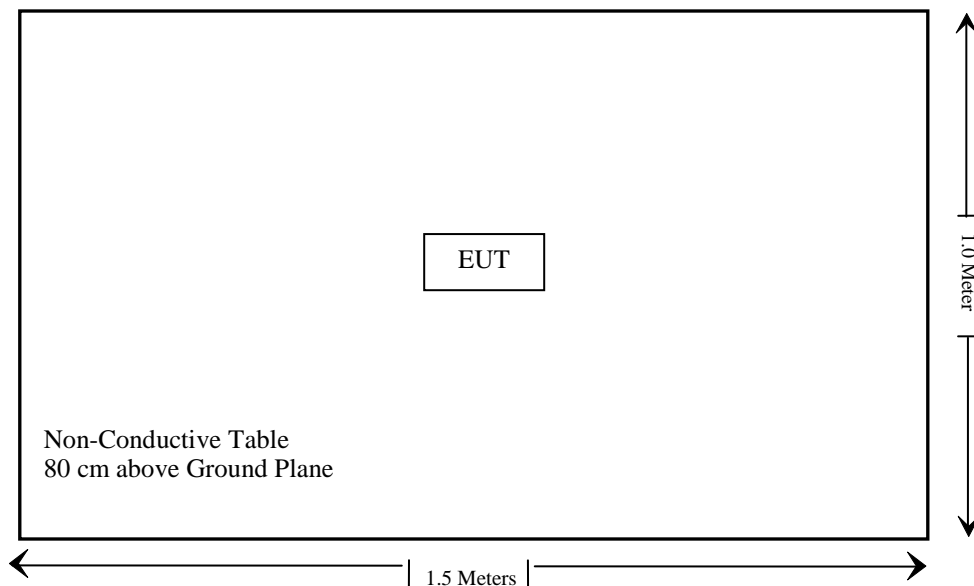
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
/	/	/	/

External I/O Cable

Cable Description	Length (m)	From Port	To
/	/	/	/

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.203	Antenna requirement	Compliant
§15.207(a)	AC Line Conducted Emissions	Not Applicable
§15.235(a)& 15.235(b)&15.209	Radiated Emissions and Band Edges	Compliant
§15.215	20 dB bandwidth	Compliant

Not Applicable: The EUT is powered by battery.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde& Schwarz	Test Receiver	ESR	101817	2020/12/24	2021/12/23
SONOMA INSTRUMENT	Amplifier	310 N	186131	2020/12/25	2021/12/24
Anritsu Corp	50 Coaxial Switch	MP59B	6100237248	2020/12/25	2021/12/24
Schwarzbeck	Bilog Antenna	VULB9163	9163-323	2020/01/05	2023/01/04
Radiated Emission Test Software: EZ_EMV V 1.1.4.2					
Unknown	RF Coaxial Cable	N-5m	No.3	2020/12/25	2021/12/24
Unknown	RF Coaxial Cable	N-1m	No.5	2020/12/25	2021/12/24

* **Statement of Traceability:** Shenzhen Accurate Technology Co., Ltd. attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

FCC §15.203 - ANTENNA REQUIREMENT

Applicable Standard

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

Antenna Connector Construction

The EUT has a monopole antenna arrangement, which was permanently attached and the antenna gain is 0 dBi, fulfill the requirement of this section. Please refer to EUT photos.

Result: Compliance.

FCC §15.235(a) & 15.235 (b)&15.209 - RADIATED EMISSIONS AND BAND EDGES

Applicable Standard

FCC 15.235(a)

The field strength of any emission within this band shall not exceed 10,000 microvolts/meter at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply.

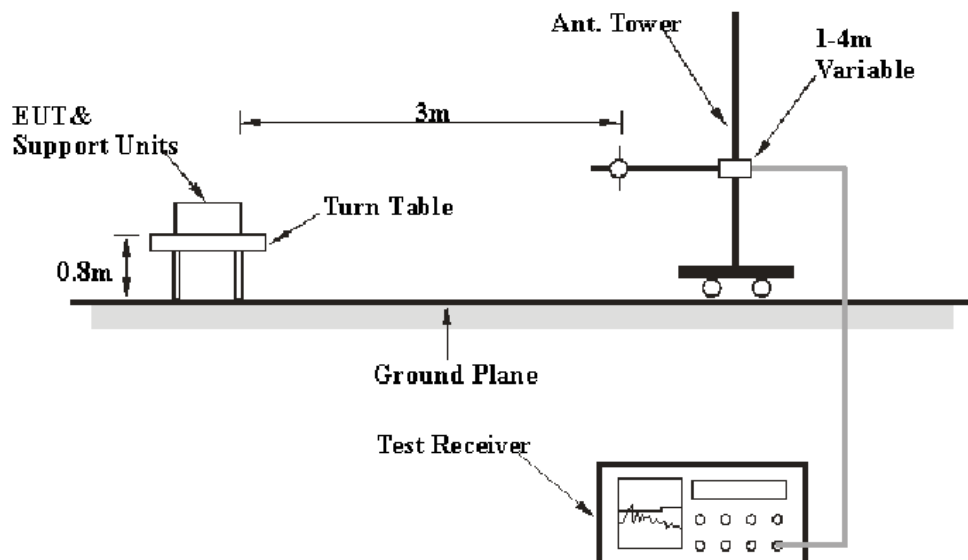
FCC 15.235(b)

The field strength of any emissions appearing between the band edges and up to 10 kHz above and below the band edges shall be attenuated at least 26 dB below the level of the unmodulated carrier or to the general limits in §15.209, whichever permits the higher emission levels. The field strength of any emissions removed by more than 10 kHz from the band edges shall not exceed the general radiated emission limits in §15.209. All signals exceeding 20 microvolts/meter at 3 meters shall be reported in the application for certification.

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

EUT Setup



The radiated emission tests were performed in the 3 meters, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC Part 15.235(a) & 15.235 (b) &15.209 limits.

EMI Test Receiver Setup

The system was investigated from 30 MHz to 1000 MHz.

During the radiated emission test, the EMI test receiver was set with the following configurations:

Frequency Range	RBW	Video B/W
30MHz – 1000 MHz	120 kHz	300 kHz

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All radiated emission data was recorded in the Quasi-peak detection mode from 30MHz to 1GHz, Peak and average detection mode for fundamental test.

Corrected Factor & Margin Calculation

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

$$\text{Corrected Factor} = \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

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

$$\begin{aligned} \text{Result} &= \text{Reading} + \text{Corrected Factor} \\ \text{Margin} &= \text{Corrected Amplitude/Result} - \text{Limit} \end{aligned}$$

Test Results Summary

According to the data in the following table, the EUT complied with the FCC Part 15.235(a) & 15.235 (b) & 15.209.

Test Data**Environmental Conditions**

Temperature:	23 °C
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Ting Lv from 2021-10-13 to 2021-10-22.

Test Mode: Transmitting (Scan with X-AXIS, Y-AXIS, Z-AXIS, the worst case was recorded)

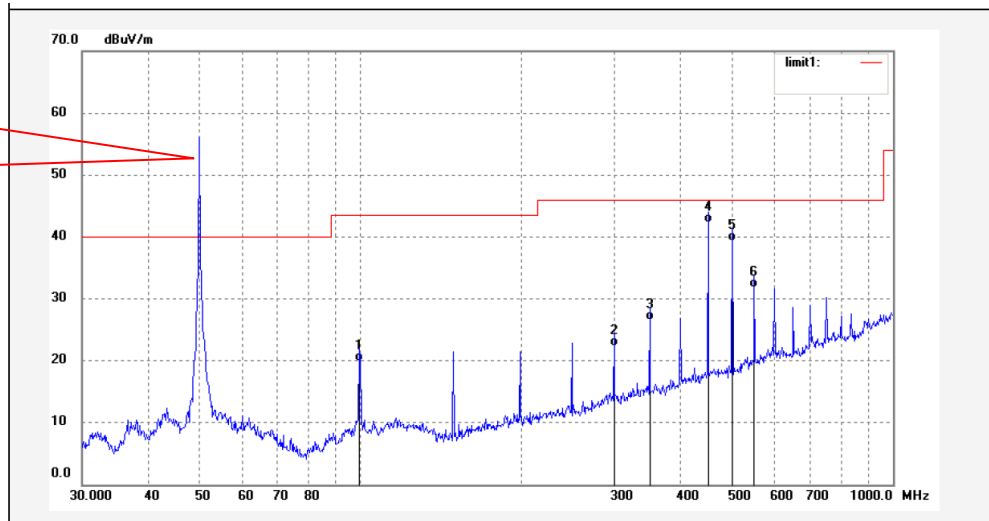
Frequency (MHz)	Corrected Amplitude (dB μ V/m)	PK/QP/Ave.	Turntable Degree	Rx Antenna		Corrected Factor (dB)	FCC Part 15.235(a)		Remark
				Height (m)	Polar (H / V)		Limit (dB μ V/m)	Margin (dB)	
49.86	56.65	PK	198	1.4	H	-17.28	100	-43.35	Fundamental
49.86	45.16	Ave.	198	1.4	H	-17.28	80	-34.84	
49.86	71.73	PK	105	1.1	V	-17.28	100	-28.27	
49.86	66.25	Ave.	105	1.1	V	-17.28	80	-13.75	

Spurious Emission:

30 MHz ~ 1GHz

Horizontal

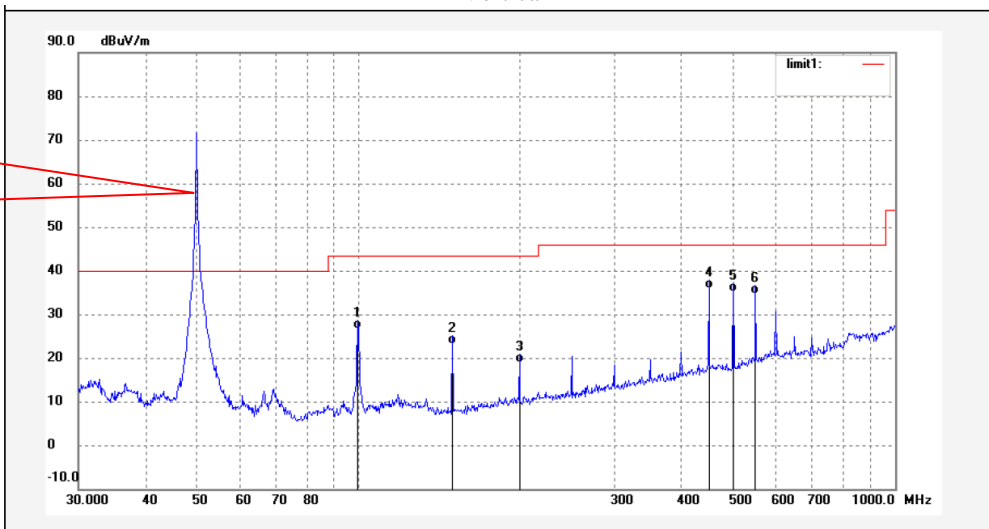
Fundamental



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	99.5281	38.16	-18.26	19.90	43.50	-23.60	QP			
2	299.3158	36.94	-14.54	22.40	46.00	-23.60	QP			
3	349.2500	39.86	-13.31	26.55	46.00	-19.45	QP			
4	448.7168	52.91	-10.71	42.20	46.00	-3.80	QP			
5	499.4247	49.92	-10.60	39.32	46.00	-6.68	QP			
6	549.0195	40.79	-9.09	31.70	46.00	-14.30	QP			

Vertical

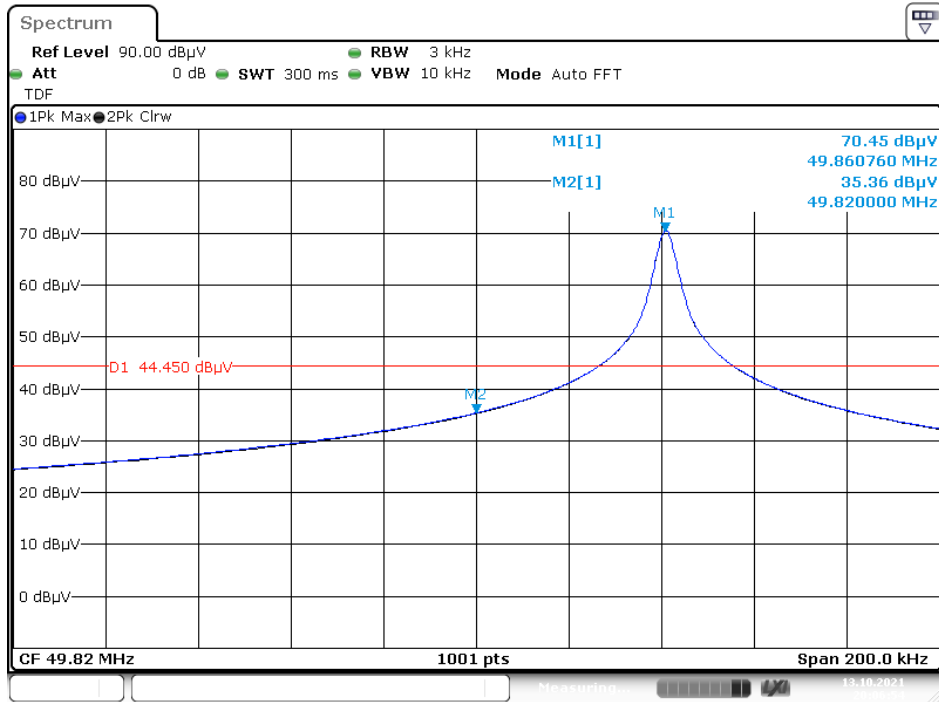
Fundamental



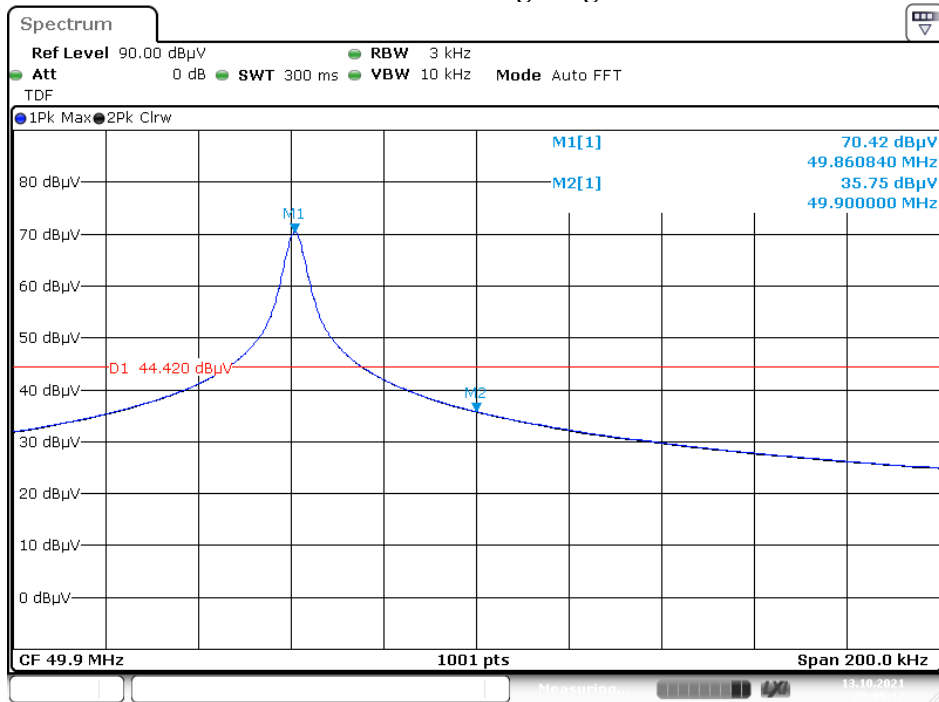
No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	99.5279	44.77	-18.26	26.51	43.50	-16.99	QP			
2	149.4857	43.28	-20.06	23.22	43.50	-20.28	QP			
3	199.2855	36.48	-17.63	18.85	43.50	-24.65	QP			
4	449.5557	46.63	-10.68	35.95	46.00	-10.05	QP			
5	499.4246	45.65	-10.60	35.05	46.00	-10.95	QP			
6	549.0193	43.68	-9.09	34.59	46.00	-11.41	QP			

Band Edge:

26 dB Band Edge-Left



26 dB Band Edge-Right



FCC §15.215(c) - 20dB EMISSION BANDWIDTH

Applicable Standard

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in § 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

Test Procedure

Per ANSI C63.10-2013 §6.4 & §6.9.

Test Data

Environmental Conditions

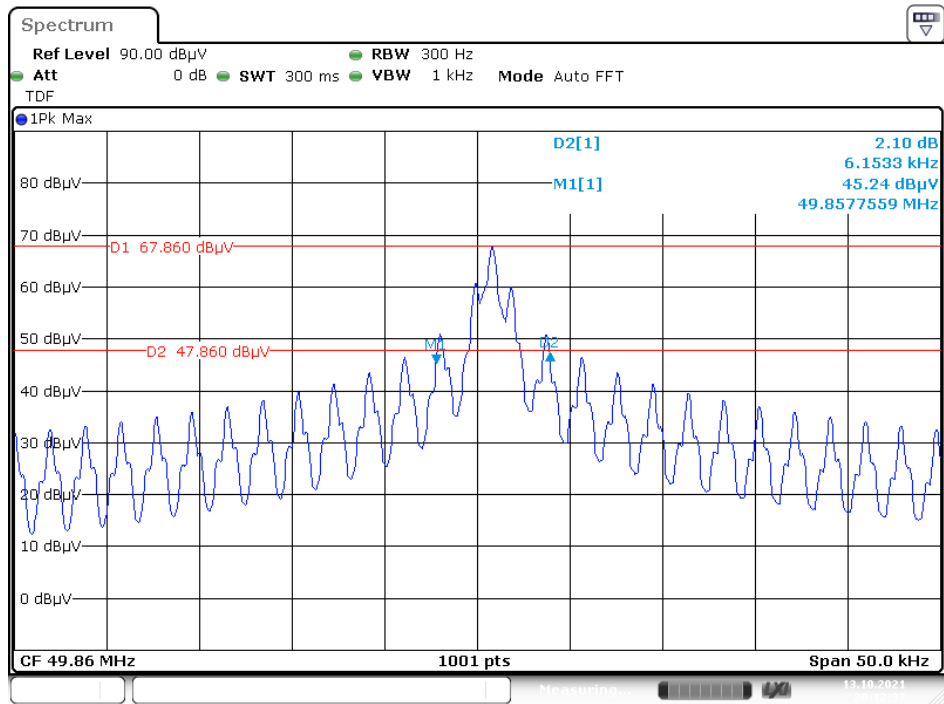
Temperature:	23 °C
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Ting Lv on 2021-10-13.

Test Mode: Transmitting

Please refer to following plot and table.

20 dB Emission Bandwidth



Date: 13.OCT.2021 20:12:38

F_L (MHz)	F_H (MHz)	Permitted frequency range (MHz)	Result
49.8577559	49.8639092	49.82-49.90	Compliant

***** END OF REPORT *****