FCC PART 15.249

TEST REPORT

For

Dorel Juvenile Group

2525 State Street, Columbus, Indiana 47201-7494, United States

FCC ID: MNJ-MO126TX

Report Type:	**Product Type:**
Original Report	LumiSound 900MHz Audio Monitor (Transmitter Unit)

Test Engineer:	Haiguo Li
Report Number:	RSZ131018810-00TX
Report Date:	2013-11-25
Reviewed By:	Alvin Huang RF Leader
Prepared By:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Dorel Juvenile Group* 's product, model number: *MO126TX (FCC ID: MNJ-MO126TX)* or the "EUT" in this report was a transmitter unit of *LumiSound 900MHz Audio Monitor*, which was measured approximately: 8.0 cm (L) × 3.0 cm (W) × 9.7 cm (H), rated input voltage: DC 6V from adapter.

Adapter information:
Model: JT-H060030
Input: AC 100-240V, 50/60Hz, 125mA
Output: DC 6V, 300mA

Note: The product, series model MO126TX and MO142TX are electrically identical, they are just diffetent in model number due to market purposes , the model MO126TX was selected for fully testing, which was explained in the attached declaration letter provided and guaranteed by applicant.

**All measurement and test data in this report was gathered from production sample serial number: 1310281 (Assigned by BACL, Shenzhen). The EUT supplied by the applicant was received on 2013-10-18.*

Objective

This type approval report is prepared on behalf of *Dorel Juvenile Group* in accordance with Part 2-Subpart J, and Part 15-Subparts A, B and C of the Federal Communication Commissions rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.209 and 15.249 rules.

Related Submittal(s)/Grant(s)

Submitted with the receiver part with FCC ID: MNJ-MO126RX

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2009, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement uncertainty with radiated emission is 5.91 dB for 30MHz-1GHz.and 4.92 dB for above 1GHz, 1.95dB for conducted measurement.

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China.

Test site at Bay Area Compliance Laboratories Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on December 06, 2010. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2009.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

SYSTEM TEST CONFIGURATION

Justification

The system was configured in a testing mode which provided by manufacturer.

Equipment Modifications

No modifications were made to the unit tested.

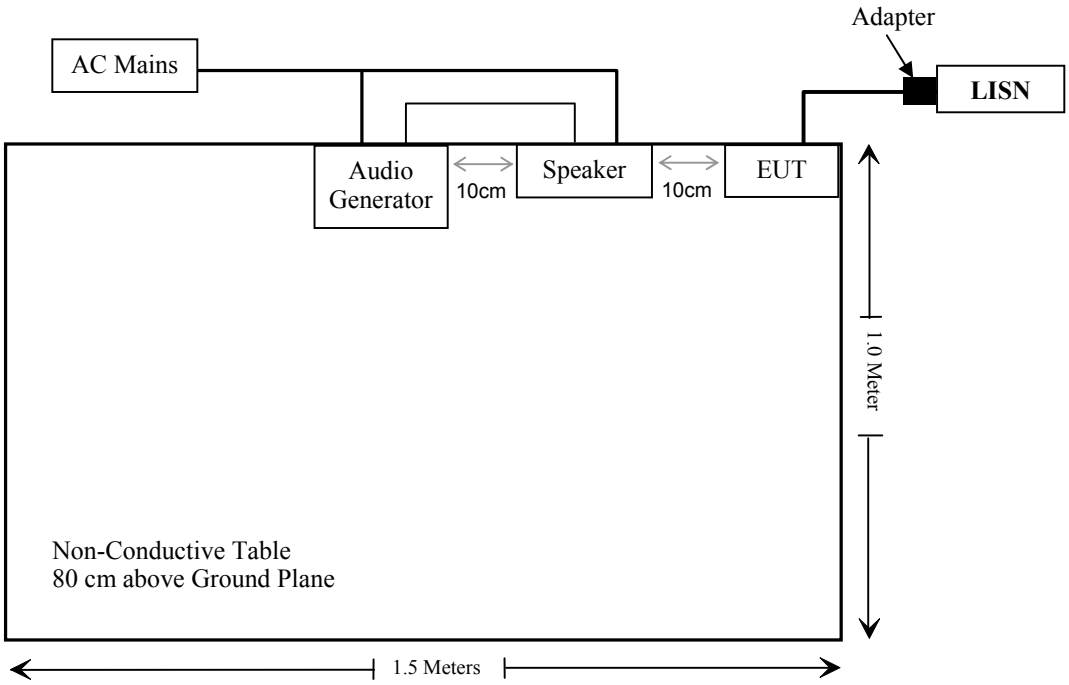
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
NanYan	Audio Generator	NY2201	019585
Ziguang	Speaker	SE-200	N/A

External I/O Cable

Cable Description	Length (m)	From/Port	To
Unshielded Detachable DC Cable	0.8	Audio Generator	Speaker
Unshielded Undetachable DC Cable	1.5	EUT	Adapter

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliance
§15.207(a)	Conduction Emissions	Compliance
§15.205, §15.209, §15.249	Radiated Emissions	Compliance
§15.215(c)	20 dB Emission Bandwidth	Compliance

FCC §15.203 - ANTENNA REQUIREMENT

Applicable Standard

For intentional device, according to §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used.

Antenna Connector Construction

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

Result: Compliant.

FCC §15.207 – AC LINE CONDUCTED EMISSION

Applicable Standard

FCC §15.207

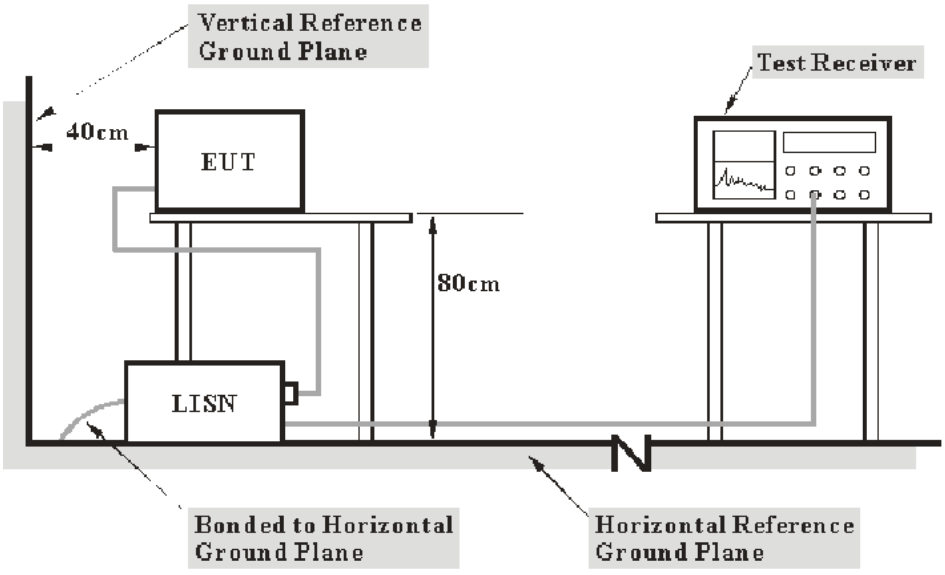
Measurement Uncertainty

Input quantities to be considered for conducted disturbance measurements maybe receiver reading, attenuation of the connection between AMN/ISN and receiver, AMN/ISN voltage division factor, AMN/ISN VDF frequency interpolation and receiver related input quantities, etc.

Based on CISPR 16-4-2:2011, the expended combined standard uncertainty of conducted disturbance test at Bay Area Compliance Laboratories Corp. (Shenzhen) is shown as below. And the uncertainty will not be taken into consideration for the test data recorded in the report

Port	Measurement uncertainty
AC Mains	3.26 dB (k=2, 95% level of confidence)
CAT 3	3.70 dB (k=2, 95% level of confidence)
CAT 5	3.86 dB (k=2, 95% level of confidence)
CAT 6	4.64 dB (k=2, 95% level of confidence)

EUT Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.4-2009 measurement procedure. The specification used was with the FCC Part 15.207.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The adapter was connected to a 120 VAC/60 Hz power source.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

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

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	100176	2013-06-17	2014-06-17
Rohde & Schwarz	1st LISN	ENV216	3560.6650.12-101613-Yb	2013-05-07	2014-05-07
Rohde & Schwarz	Transient Limitor	ESH3Z2	DE25985	2013-10-15	2014-10-15
Rohde & Schwarz	CE Test software	EMC 32	8.95	-	-

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

Corrected Factor & Margin Calculation

The Corrected factor is calculated by adding LISN/ISN VDF (Voltage Division Factor), Cable Loss and transient Limiter Attenuation. The basic equation is as follows:

Correction Factor = LISN VDF + Cable Loss + Transient Limiter Attenuation

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 7 dB below the limit. The equation for margin calculation is as follows:

Margin = Limit – Corrected Amplitude

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.207, with the worst margin reading of:

13.0 dB at **0.270000 MHz** in the **Neutral** conducted mode

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level is in compliance with the limit if

$$L_m + U_{(Lm)} \leq L_{lim} + U_{cispr}$$

in BACL, $U_{(Lm)}$ is less than U_{cispr}, if L_m is less than L_{lim}, it implies that the EUT complies with the limit.

Test Data

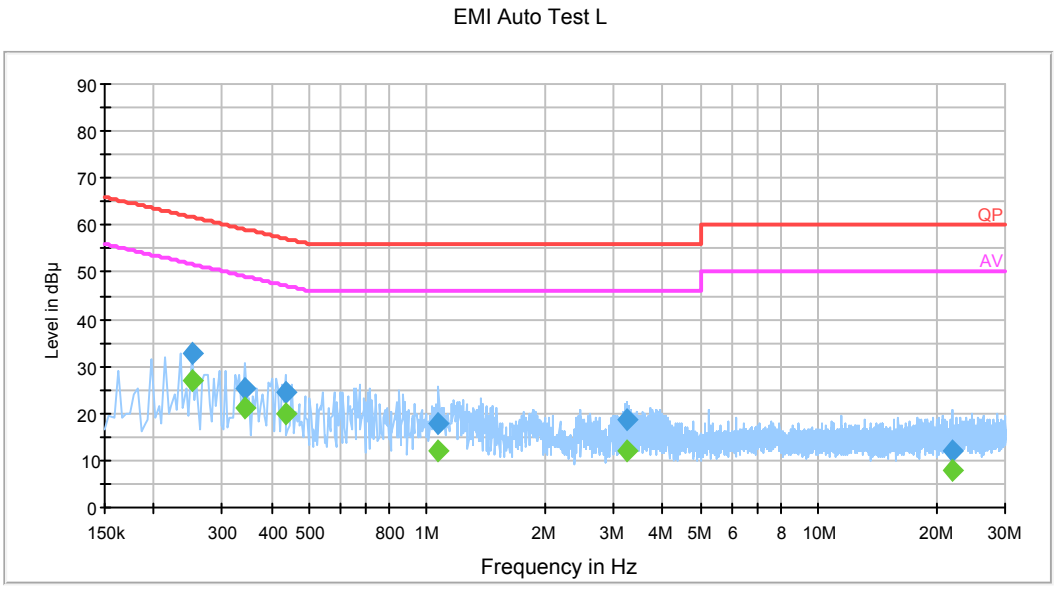
Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	55 %
ATM Pressure:	100.1 kPa

The testing was performed by Haiguo Li on 2013-11-06.

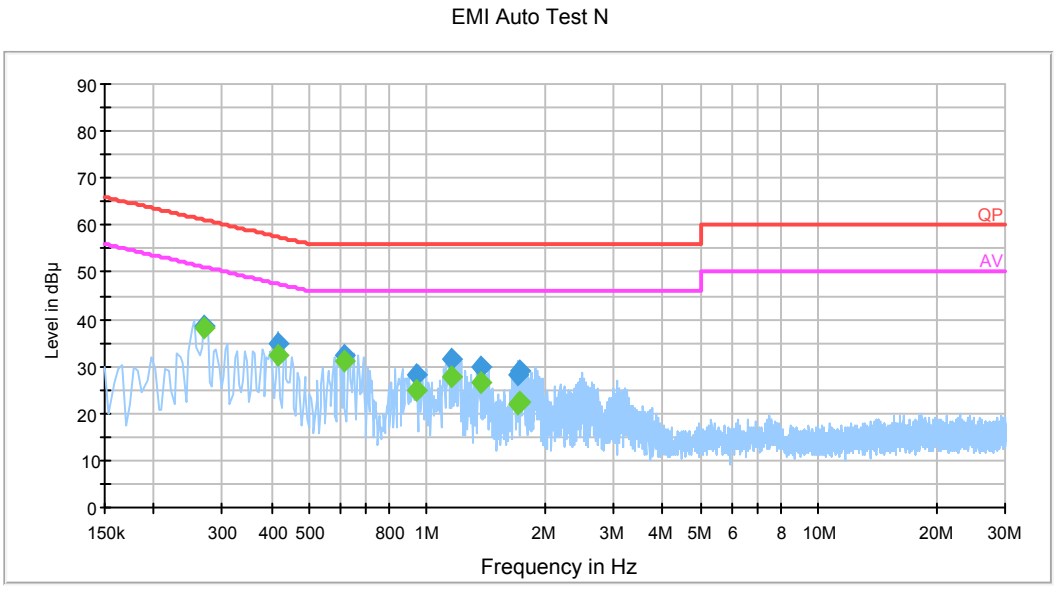
Test Mode: Transmitting

AC 120V/60 Hz, Line:



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/Ave./QP)
0.250000	32.9	19.5	61.8	28.9	QP
0.250000	26.8	19.5	51.8	25.0	Ave.
0.342000	25.4	19.5	59.2	33.8	QP
0.342000	21.2	19.5	49.2	28.0	Ave.
0.434000	24.3	19.5	57.2	32.9	QP
0.434000	19.7	19.5	47.2	27.5	Ave.
1.070000	17.9	19.5	56.0	38.1	QP
1.070000	12.2	19.5	46.0	33.8	Ave.
3.246000	18.8	19.6	56.0	37.2	QP
3.246000	12.1	19.6	46.0	33.9	Ave.
21.914000	12.0	20.1	60.0	48.0	QP
21.914000	8.0	20.1	50.0	42.0	Ave.

AC 120V/60 Hz, Neutral



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/Ave./QP)
0.270000	38.7	19.5	61.1	22.4	QP
0.270000	38.1	19.5	51.1	13.0	Ave.
0.414000	34.7	19.5	57.6	22.9	QP
0.414000	32.5	19.5	47.6	15.1	Ave.
0.614000	32.2	19.5	56.0	23.8	QP
0.614000	31.2	19.5	46.0	14.8	Ave.
0.938000	28.2	19.5	56.0	27.8	QP
0.938000	25.1	19.5	46.0	20.9	Ave.
1.154000	31.4	19.5	56.0	24.6	QP
1.154000	27.8	19.5	46.0	18.2	Ave.
1.374000	29.7	19.5	56.0	26.3	QP
1.374000	26.6	19.5	46.0	19.4	Ave.

Note:
1) Correction Factor =LISN VDF (Voltage Division Factor) + Cable Loss + Transient Limiter Attenuation
The corrected factor has been input into the transducer of the test software.
2) Corrected Amplitude = Reading + Correction Factor
3) Margin = Limit – Corrected Amplitude

FCC §15.205, §15.209 & §15.249 - RADIATED EMISSIONS

Applicable Standard

As per FCC §15.249 (a), except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902–928 MHz	50	500
2400–2483.5 MHz	50	500
5725–5875 MHz	50	500
24.0–24.25 GHz	250	2500

As per FCC §15.249 (c), Field strength limits are specified at a distance of 3 meters.

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

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.

Based on CISPR 16-4-2:2011, the expended combined standard uncertainty of radiation emissions at Bay Area Compliance Laboratories Corp. (Shenzhen) is 5.91 dB for 30MHz-1GHz, 4.92 dB for above 1GHz, and it will not be taken into consideration for the test data recorded in the report

Test Equipment Setup

The spectrum analyzer or receiver is set as:

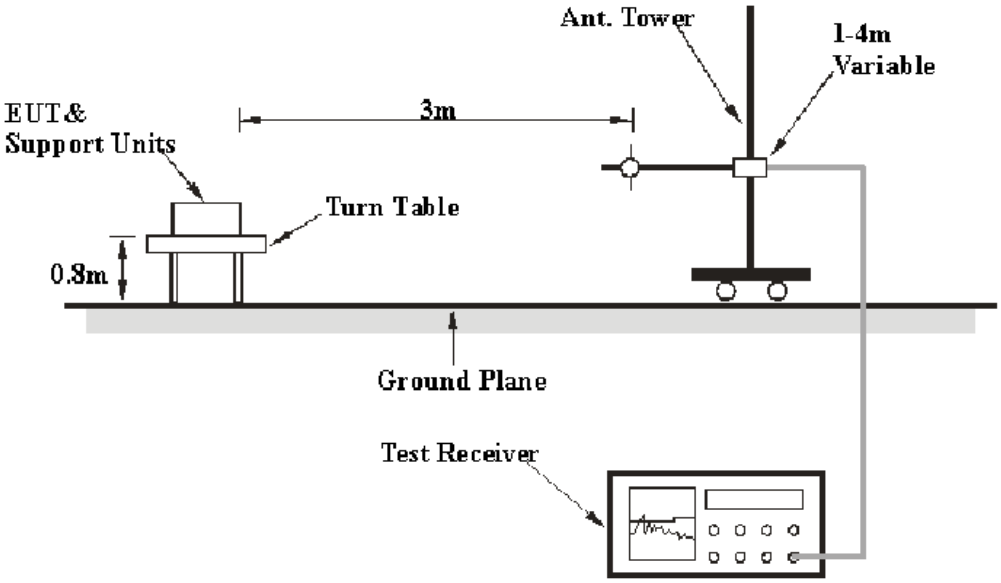
Below 1000MHz:

RBW = 100 kHz / VBW = 300 kHz / Sweep = Auto

Above 1000MHz:

Peak: RBW = 1MHz / VBW = 1MHz / Sweep = Auto
Average: RBW = 1MHz / VBW = 10Hz / Sweep = Auto

EUT Setup



The radiated emission and out of band emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.4-2009. The specification used was the FCC 15.209/15.205 and FCC 15.249 limits.

Test Procedure

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

The EUT is set 3 meter away from the testing antenna, which is varied from 1-4 mete, and the EUT is placed on a turntable, which is 0.8 meter above ground plane, the table shall be rotated for 360 degrees to find out the highest emission. The receiving antenna should be changed the polarization both of horizontal and vertical.

Corrected Amplitude & Margin Calculation

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

Corrected Amplitude = Meter Reading + Antenna Factor + Cable Loss - 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 limit. The equation for margin calculation is as follows:

Margin = Limit – Corrected Amplitude

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	8447E	1937A01046	2013-09-30	2014-09-30
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2013-09-17	2014-09-17
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2011-11-28	2014-11-27
Mini-Circuits	Pre-amplifier	ZVA-183-S+	5969001149	2013-04-03	2014-04-03
Sunol Sciences	Horn Antenna	DRH-118	A052304	2011-12-01	2014-11-30
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2013-11-12	2014-11-12

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements, traceable to National Primary Standards and International System of Units (SI).

Test Results Summary

According to the data in the following table, with the worst margin reading of:

14.21 dB at **3659.2 MHz** in the **Vertical** polarization

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level is in compliance with the limit if

$$L_m + U_{(Lm)} \leq L_{lim} + U_{cispr}$$

in BACL, $U_{(Lm)}$ is less than U_{cispr}, if L_m is less than L_{lim}, it implies that the EUT complies with the limit.

Test Data

Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	54 %
ATM Pressure:	100.1 kPa

The testing was performed by Haiguo Li on 2013-11-22.

Test Mode: Transmitting

30 MHz to 10 GHz:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.249/205/209		
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)	Comment
Channel A: 914.8 MHz										
43.3	36.55	QP	110	1.2	H	-17.6	18.95	40	21.05	Spurious
171.5	36.40	QP	244	1.4	H	-15.7	20.70	43.5	22.80	Spurious
280.0	40.24	QP	220	1.1	H	-14.3	25.94	46.0	20.06	Spurious
914.8	70.90	QP	235	1.3	V	-3.60	67.30	94	26.70	Fund.
1829.6	36.62	PK	55	1.5	H	2.63	39.25	74	34.75	Harmonic
1829.6	31.49	Ave.	55	1.5	H	2.63	34.12	54	19.88	Harmonic
2744.4	34.50	PK	211	1.3	H	7.93	42.43	74	31.57	Harmonic
2744.4	30.06	Ave.	211	1.3	H	7.93	37.99	54	16.01	Harmonic
3659.2	34.21	PK	232	1.2	V	9.79	44.00	74	30.00	Harmonic
3659.2	30.00	Ave.	232	1.2	V	9.79	39.79	54	14.21	Harmonic
Channel B: 914.2 MHz										
30.4	38.02	QP	128	1.3	H	-17.6	21.02	40	18.98	Spurious
180.1	36.05	QP	244	1.4	H	-16.0	20.05	43.5	23.45	Spurious
280.0	39.5	QP	210	1.2	H	-14.3	25.20	46.0	20.80	Spurious
914.2	70.00	QP	230	1.1	H	-3.60	66.40	94	27.60	Fund.
1828.4	37.36	PK	307	1.2	H	2.63	39.99	74	34.01	Harmonic
1828.4	32.09	Ave.	307	1.2	H	2.63	34.72	54	19.28	Harmonic
2742.6	34.94	PK	180	1.4	H	7.93	42.87	74	31.13	Harmonic
2742.6	30.23	Ave.	180	1.4	H	7.93	38.16	54	15.84	Harmonic
3656.8	34.66	PK	322	1.4	H	9.79	44.45	74	29.55	Harmonic
3656.8	29.95	Ave.	322	1.4	H	9.79	39.74	54	14.26	Harmonic

Note：
Corrected Amplitude = Corrected Factor + Reading
Corrected Factor=Antenna factor (RX) + Cable Loss – Amplifier Factor
Margin = Limit – Corr. Amplitude

FCC §15.215(c) - 20 dB 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

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.

2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.

3. Measure the frequency difference of two frequencies that indicated 20dB bandwidth.

4. Repeat above procedures until all frequencies measured were complete.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2013-11-12	2014-11-12

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

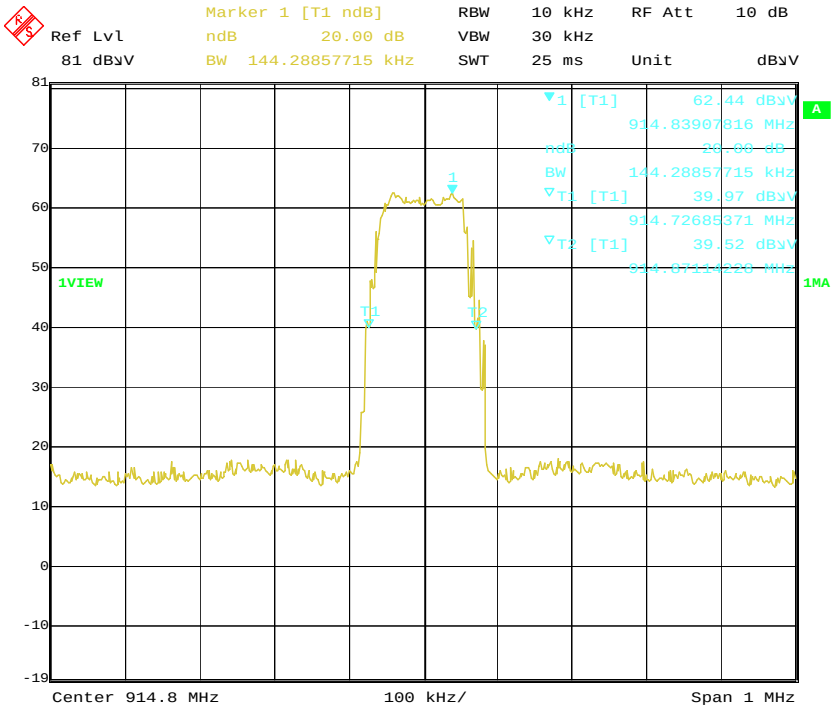
Temperature:	25 ℃
Relative Humidity:	54 %
ATM Pressure:	100.1 kPa

The testing was performed by Haiguo Li on 2013-11-22.

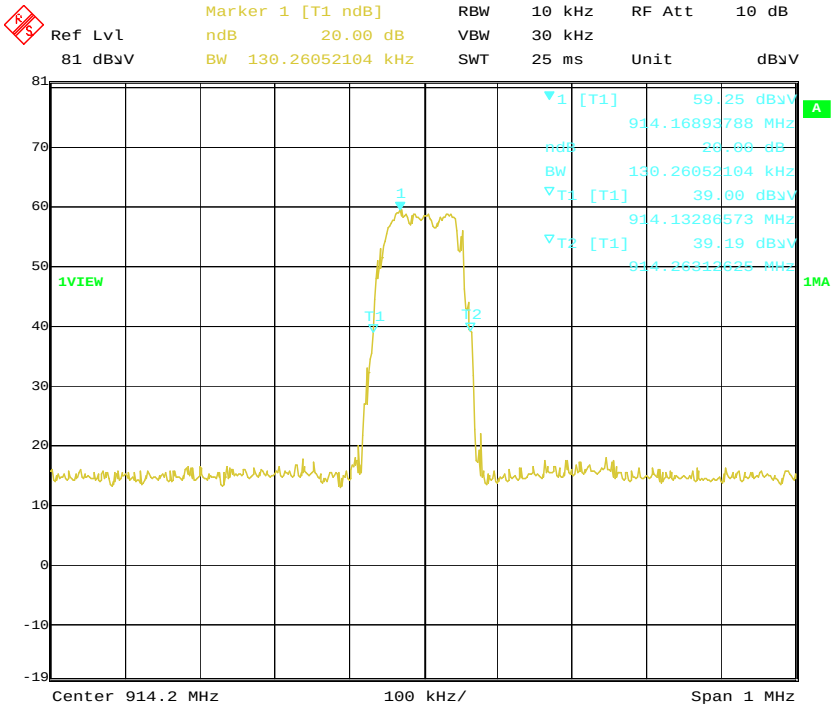
Test Mode: Transmitting

Pleas refer to the following plots.

Channel A: 914.8 MHz



Channel B: 914.2 MHz



PRODUCT SIMILARITY DECLARATION LETTER

Dorel Juvenile Group

Address: 2525 State Street, Columbus, Indiana, 47201-7494, United States

Tel: 508-216-1850 Fax: 508-216-1812

DECLARATION OF SIMILARITY

Date: 11/6/2013

To
Bay Area Compliance Labs Corp.(Shenzhen)
6/F, the 3rd Phase of Wan Li Industrial Bldg., Shihua Rd., FuTian Free Trade Zone, Shenzhen, China

Dear Sir or Madam:

We Dorel Juvenile Group hereby declare that our product: LumiSound 900 MHz Audio monitor, model number： MO142TX is the same with MO126TX which was tested by BACL.They are just different in model number due to market purposes

Please contact me if you have any question.

Best Regards

Signature: Tony Fernandes 

Title: Director, Regulatory Affairs & Compliance

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