TESTING LABORATORY
CERTIFICATE #4820.01

FCC PART 15.249

TEST REPORT

For

Skyrocket Toys LLC

12910 Culver Blvd, Suite F, Los Angeles, CA 90066, U.S.A

FCC ID: O5301942TX24G

Report Type:	**Product Name:**
Original Report	DASH Nano Remote

Report Number:	RDG180409013-00B
Report Date:	2018-04-26
Reviewed By:	Jerry Zhang EMC Manager Jerry Zhang
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Dongguan) No.69 Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn

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* This report may contain data that are not covered by the A2LA accreditation and are marked with an asterisk "*".

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

EUT Name:	DASH Nano Remote
EUT Model:	01942TX
FCC ID:	O5301942TX24G
Rated Input Voltage:	DC 4.5V
External Dimension:	Length (114 mm)*Width (72 mm)*High (52 mm)
Serial Number:	180409013
EUT Received Date:	2018.04.09

Objective

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

The tests were performed in order to determine compliance with FCC Rules Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.249 rules.

Related Submittal(s)/Grant(s)

Submitted with the part of a system with FCC ID: O5301942RX24G.

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 and Bay Area Compliance Laboratories Corp. (Dongguan).

Measurement Uncertainty

Parameter	Measurement Uncertainty
Occupied Channel Bandwidth	±5 %
Unwanted Emissions, radiated	30M~200MHz: 4.58 dB for Horizontal, 4.59 dB for Vertical 200M~1GHz: 4.83 dB for Horizontal, 5.85 dB for Vertical 1G~6GHz: 4.45 dB, 6G~26.5GHz: 5.23 dB
Temperature	±1℃
Humidity	±5%
DC and low frequency voltages	±0.4%
Duty Cycle	1%
AC Power Lines Conducted Emission	3.12 dB (150 kHz to 30 MHz)

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, 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. : 897218, the FCC Designation No. : CN1220.

The test site has been registered with ISED Canada under ISED Canada Registration Number 3062D.

SYSTEM TEST CONFIGURATION

Justification

The EUT was configured for testing in an engineering mode which was provided by the manufacturer.

The device employs 65 channels as below list:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2408	34	2440
2	2410	35	2441
~	~	~	~
~	~	64	2471
32	2439	65	2472
33	2440		

EUT was tested with Channel 1, 33, and 65.

EUT Exercise Software

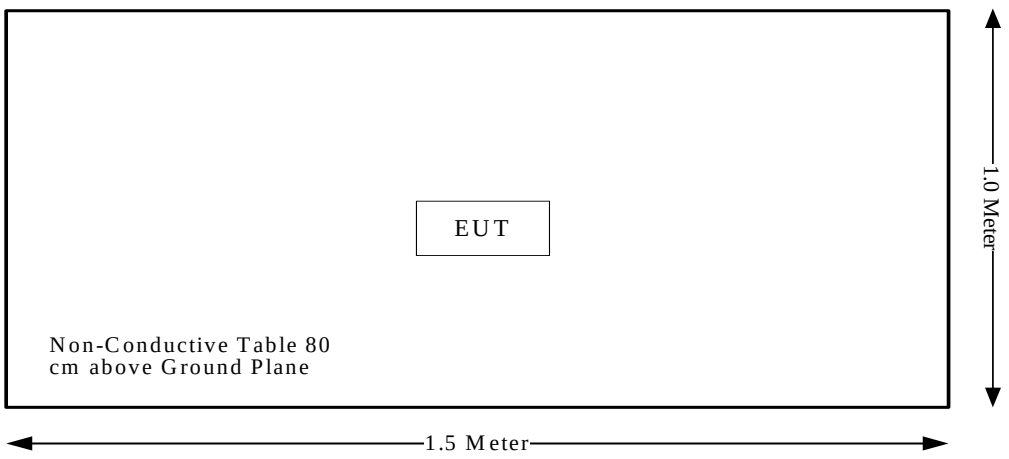
No software was used in test, the device was configured to engineer mode by manufacturer, test channel switched by keys.

Equipment Modifications

No modifications were made to the EUT.

Block Diagram of Test Setup

Below 1G:



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliance
§15.207(a)	Conduction Emissions	Not Applicable*
15.205, §15.209, §15.249	Radiated Emissions	Compliance
§15.215 (c)	20 dB Bandwidth	Compliance

Note:
Not Applicable*: the EUT is battery operated equipment.

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 one monopole antenna arrangement, and the antenna gain is 0 dBi, fulfill the requirement of this section. Please refer to the EUT photos.

Result: Compliant.

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:

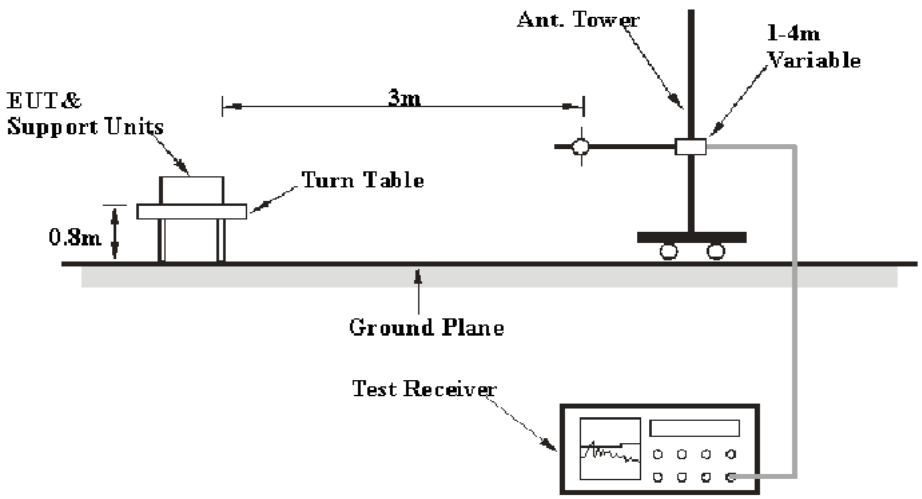
Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902–928 MHz	50	500
2400–2483.5 MHz	50	500
5725–5875 MHz	50	500
24.0–24.25 GHz	250	2500

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

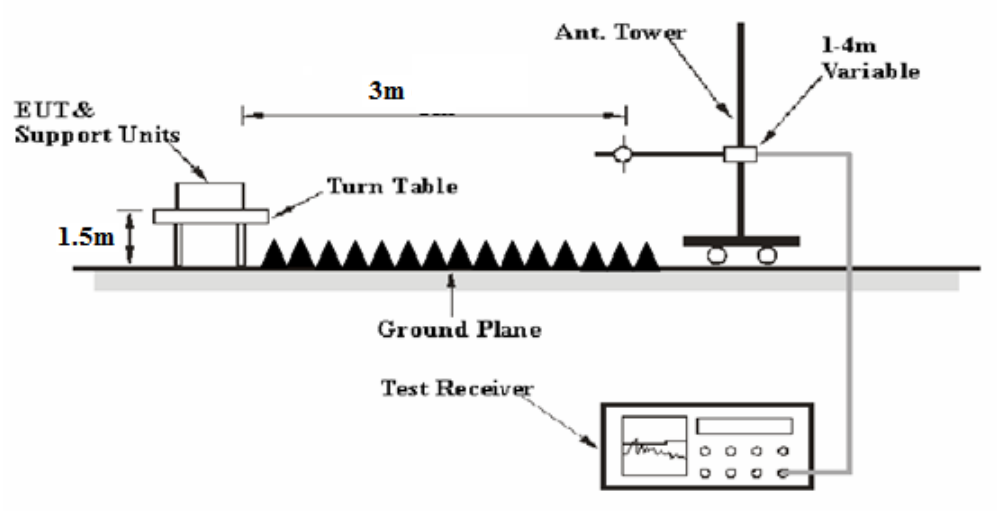
(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

EUT Setup

Below 1 GHz:



Above 1 GHz:



The radiated emission tests were performed in the 3 meters distance, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209/15.205 and FCC 15.249 limits.

Test Equipment Setup

The system was investigated from 30 MHz to 25 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Detector
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1MHz	3 MHz	/	PK
	1MHz	10 Hz	/	AV

Test Procedure

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

All data was recorded in the Quasi-peak detection mode from 30 MHz to 1GHz, peak detection mode above 1 GHz.

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
R&S	EMI Test Receiver	ESCI	100224	2017-09-01	2018-09-01
Sunol Sciences	Antenna	JB3	A060611-1	2017-11-10	2018-11-10
HP	Amplifier	8447D	2727A05902	2017-09-05	2018-09-05
R&S	Spectrum Analyzer	FSEM	831259/019	2017-07-18	2018-07-18
ETS-Lindgren	Horn Antenna	3115	000 527 35	2016-01-05	2019-01-04
MITEQ	Amplifier	AFS42-00101800-25-S-42	2001271	2017-09-05	2018-09-05
Ducommun	Horn Antenna	ARH-4223-02	1007726-02 1304	2016-11-18	2019-11-18
Quinstar	Amplifier	QLW-18405536-JO	15964001001	2017-06-27	2018-06-27
Chengdu Ouli	Band Rejection Filter	2400-2483.5	002	2017-09-05	2018-09-05
N/A	Coaxial Cable	C-NJNJ-50	C-0400-01	2017-09-05	2018-09-05
N/A	Coaxial Cable	C-NJNJ-50	C-0075-01	2017-09-05	2018-09-05
N/A	Coaxial Cable	C-NJNJ-50	C-1000-01	2017-09-05	2018-09-05
N/A	Coaxial Cable	C-2.4J2.4J-50	C-0700-01	2017-06-27	2018-06-27
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A

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

Test Data

Environmental Conditions

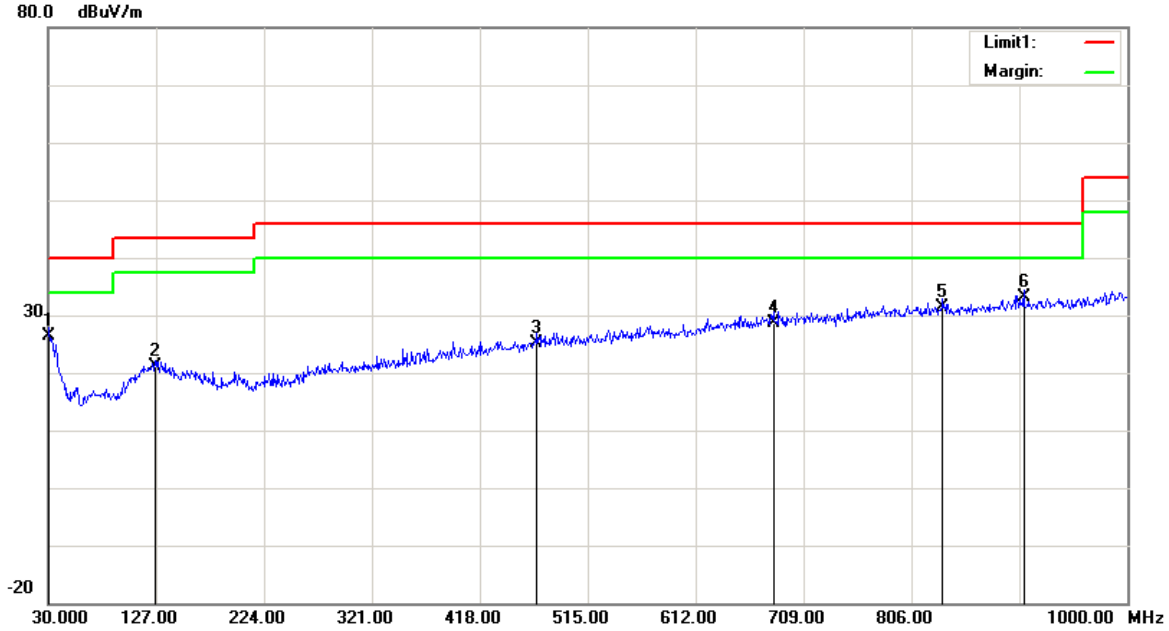
Temperature:	24.2~24.5 °C
Relative Humidity:	51~52 %
ATM Pressure:	100.4~101 kPa

The testing was performed by Steven Zuo and Blake Yang on 2018-04-19 and 2018-04-24.

Test Mode: Transmitting

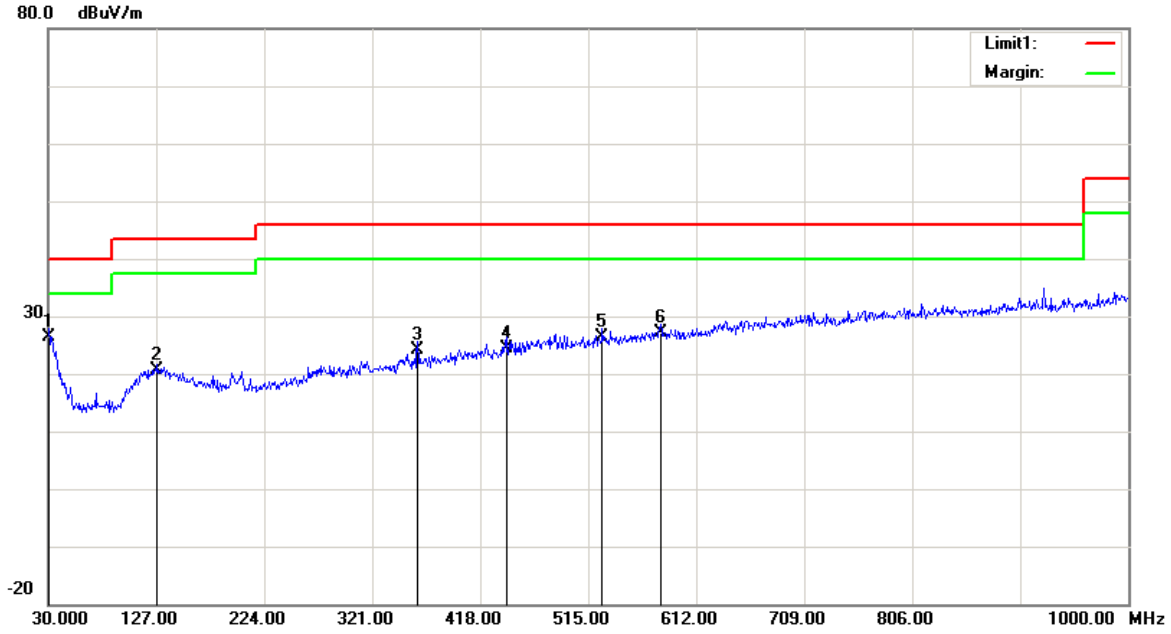
1) 30MHz-1GHz(Worst Case at Low Channel)

Horizontal:



Frequency (MHz)	Receiver Reading (dBuV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
30.0000	24.76	QP	1.54	26.30	40.00	13.70
126.0300	25.89	QP	-4.79	21.10	43.50	22.40
469.4100	25.69	QP	-0.49	25.20	46.00	20.80
681.8400	25.90	QP	2.70	28.60	46.00	17.40
834.1300	26.13	QP	5.37	31.50	46.00	14.50
906.8800	26.81	QP	6.29	33.10	46.00	12.90

Vertical:

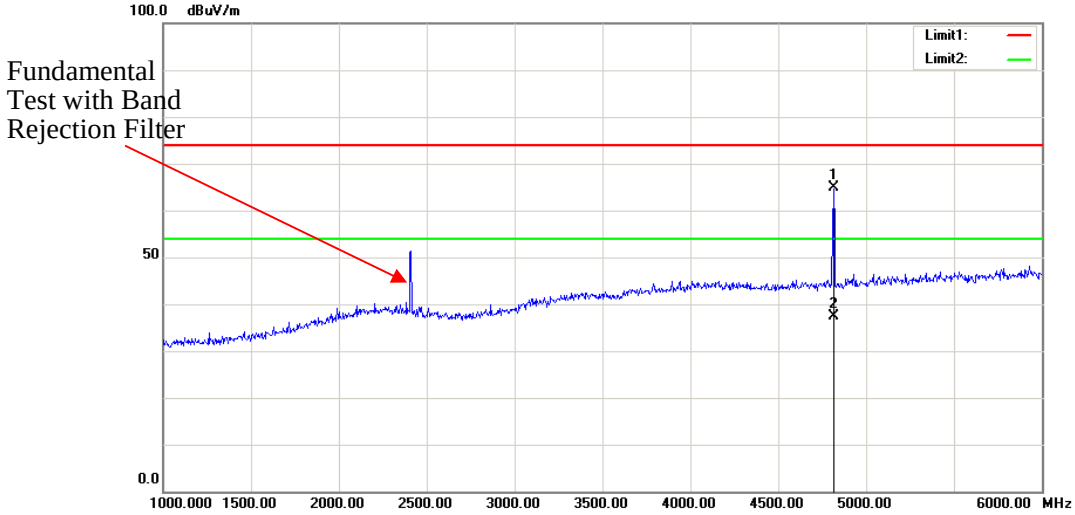


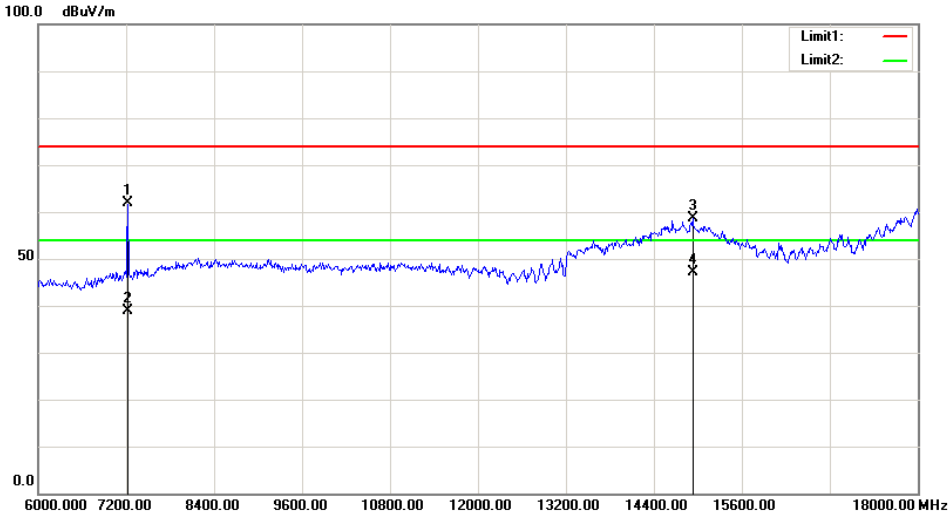
Frequency (MHz)	Receiver Reading (dBuV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
30.9700	25.49	QP	0.81	26.30	40.00	13.70
127.9700	25.56	QP	-4.86	20.70	43.50	22.80
361.7400	27.02	QP	-2.82	24.20	46.00	21.80
441.2800	25.66	QP	-1.26	24.40	46.00	21.60
527.6100	26.28	QP	0.22	26.50	46.00	19.50
579.9900	26.18	QP	1.02	27.20	46.00	18.80

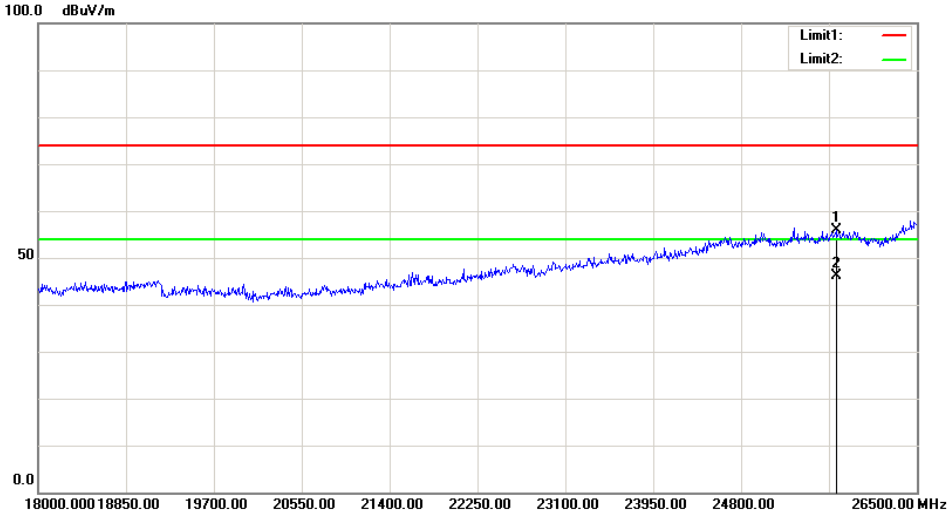
2) 1GHz-25GHz:

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	Detector	Polar (H/V)	Factor (dB/m)					
Low Channel: 2408 MHz									
2408.00	65.27	PK	H	28.12	1.80	0.00	95.19	113.98	18.79
2408.00	39.34	AV	H	28.12	1.80	0.00	69.26	93.98	24.72
2408.00	58.16	PK	V	28.12	1.80	0.00	88.08	113.98	25.90
2408.00	32.29	AV	V	28.12	1.80	0.00	62.21	93.98	31.77
2400.00	35.48	PK	H	28.10	1.80	0.00	65.38	74.00	8.62
2400.00	12.83	AV	H	28.10	1.80	0.00	42.73	54.00	11.27
4816.00	65.87	PK	H	32.93	3.18	37.20	64.78	74.00	9.22
4816.00	38.56	AV	H	32.93	3.18	37.20	37.47	54.00	16.53
7224.00	58.49	PK	H	35.78	4.79	37.25	61.81	74.00	12.19
7224.00	35.36	AV	H	35.78	4.79	37.25	38.68	54.00	15.32
Middle Channel: 2440 MHz									
2440.00	65.64	PK	H	28.18	1.82	0.00	95.64	113.98	18.34
2440.00	39.58	AV	H	28.18	1.82	0.00	69.58	93.98	24.40
2440.00	58.46	PK	V	28.18	1.82	0.00	88.46	113.98	25.52
2440.00	32.73	AV	V	28.18	1.82	0.00	62.73	93.98	31.25
4880.00	65.49	PK	H	33.06	3.27	37.21	64.61	74.00	9.39
4880.00	38.26	AV	H	33.06	3.27	37.21	37.38	54.00	16.62
7320.00	57.34	PK	H	36.03	4.62	37.37	60.62	74.00	13.38
7320.00	35.16	AV	H	36.03	4.62	37.37	38.44	54.00	15.56
High Channel: 2472 MHz									
2472.00	64.28	PK	H	28.24	1.84	0.00	94.36	113.98	19.62
2472.00	38.49	AV	H	28.24	1.84	0.00	68.57	93.98	25.41
2472.00	57.46	PK	V	28.24	1.84	0.00	87.54	113.98	26.44
2472.00	31.37	AV	V	28.24	1.84	0.00	61.45	93.98	32.53
2483.50	30.56	PK	H	28.27	1.84	0.00	60.67	74.00	13.33
2483.50	14.05	AV	H	28.27	1.84	0.00	44.16	54.00	9.84
4944.00	64.48	PK	H	33.19	3.25	37.24	63.68	74.00	10.32
4944.00	37.64	AV	H	33.19	3.25	37.24	36.84	54.00	17.16
7416.00	56.28	PK	H	36.28	4.46	37.49	59.53	74.00	14.47
7416.00	34.76	AV	H	36.28	4.46	37.49	38.01	54.00	15.99

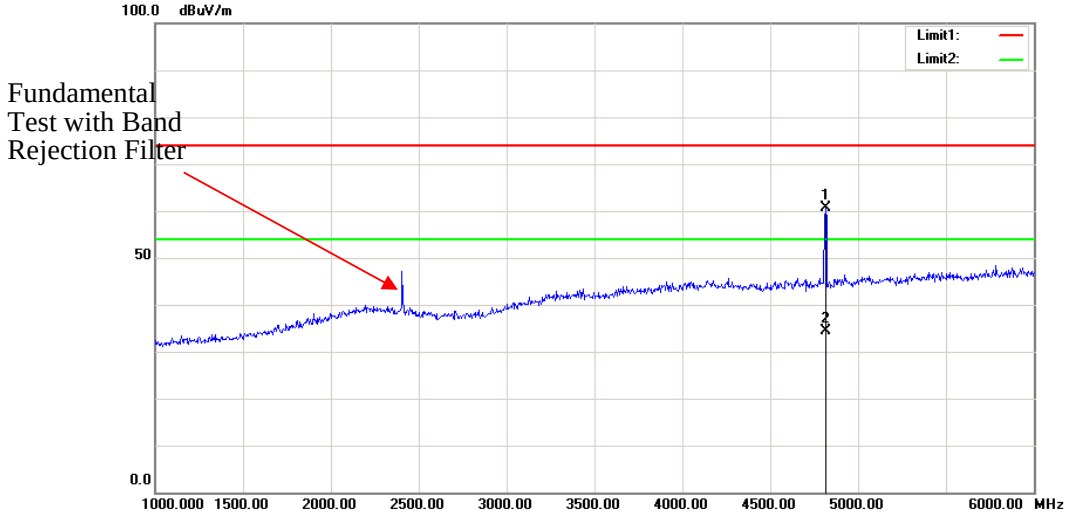
Test plots at Low Channel
Horizontal

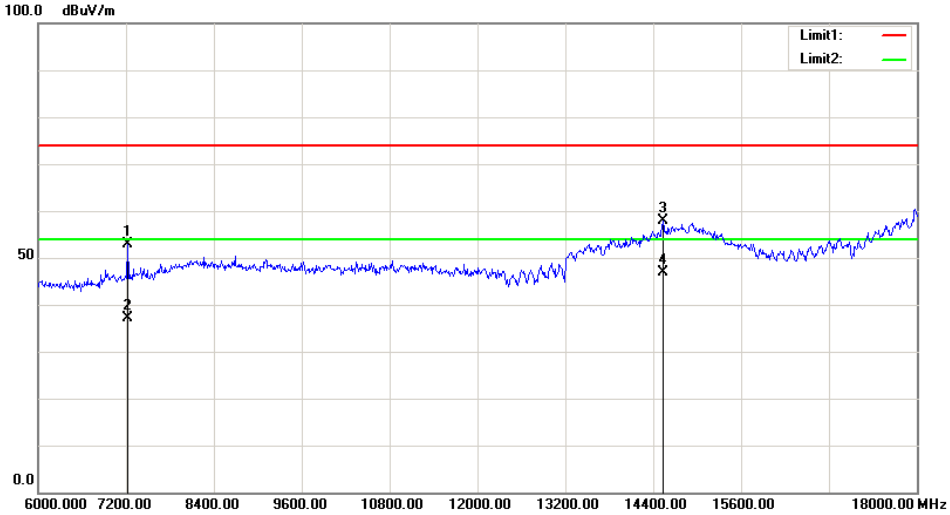


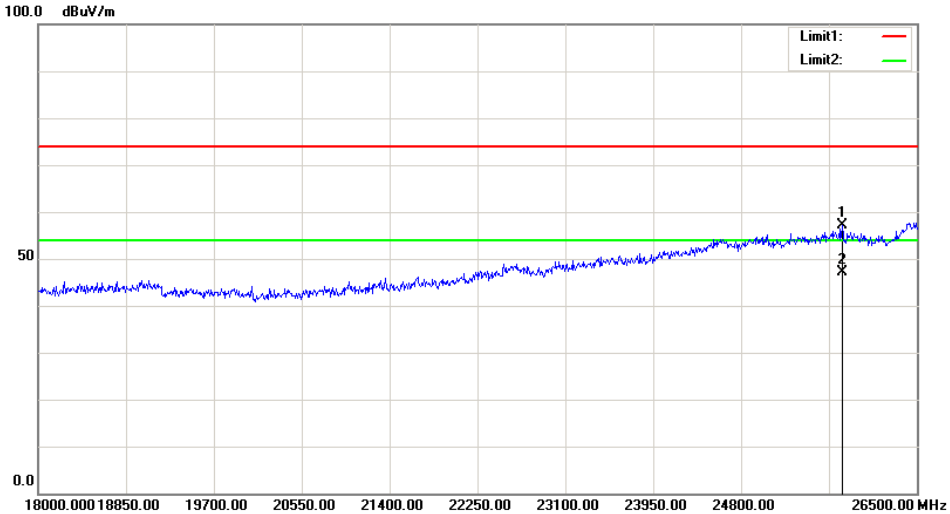




Vertical


Fundamental
Test with Band
Rejection Filter
100.0 dBuV/m
Limit1:
Limit2:
50
0.0
1000.000 1500.00 2000.00 2500.00 3000.00 3500.00 4000.00 4500.00 5000.00 6000.00 MHz


100.0 dBuV/m
Limit1:
Limit2:
50
0.0
6000.000 7200.00 8400.00 9600.00 10800.00 12000.00 13200.00 14400.00 15600.00 18000.00 MHz


100.0 dBuV/m
Limit1:
Limit2:
50
0.0
18000.000 18850.00 19700.00 20550.00 21400.00 22250.00 23100.00 23950.00 24800.00 26500.00 MHz

FCC §15.215(c) – 20 dB BANDWIDTH TESTING

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. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
3. Repeat above procedures until all frequencies measured were complete.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSU 26	200256	2017-12-08	2018-12-08
Unknown	Coaxial Cable	C-SJ00-0010	C0010/02	Each Time	/

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

Test Data

Environmental Conditions

Temperature:	25.6 °C
Relative Humidity:	50 %
ATM Pressure:	100.8 kPa

The testing was performed by Andy Huang on 2018-04-20.

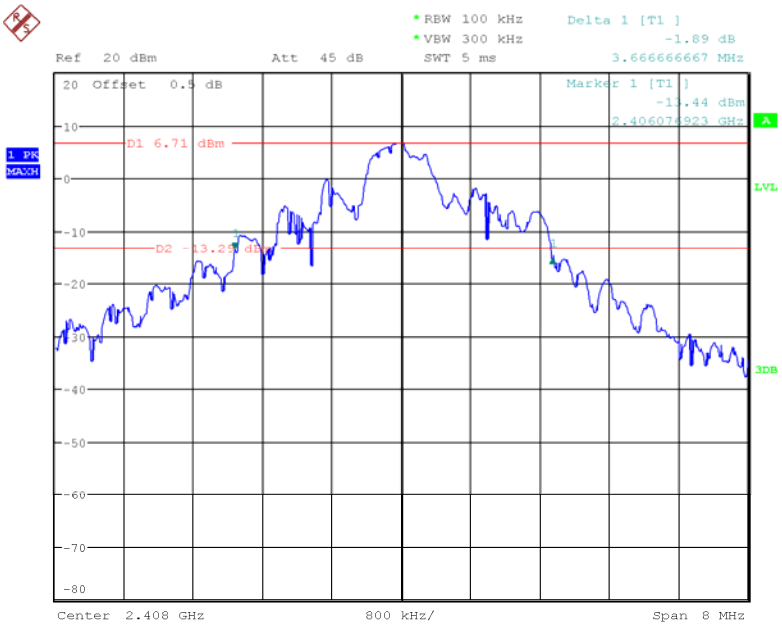
Test Result: Compliant.

Please refer to following tables and plots

Test Mode: Transmitting

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
Low	2408	3.67
Middle	2440	3.56
High	2472	3.50

Low Channel



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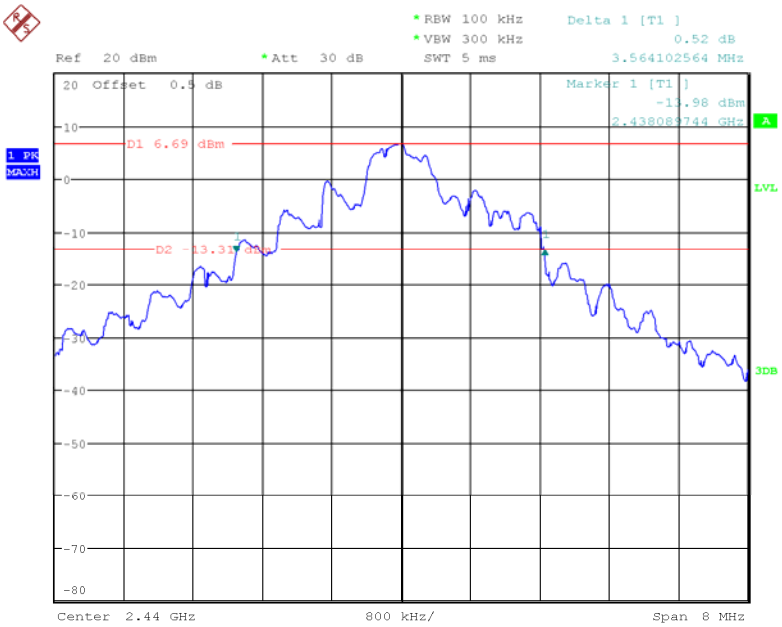
Middle Channel



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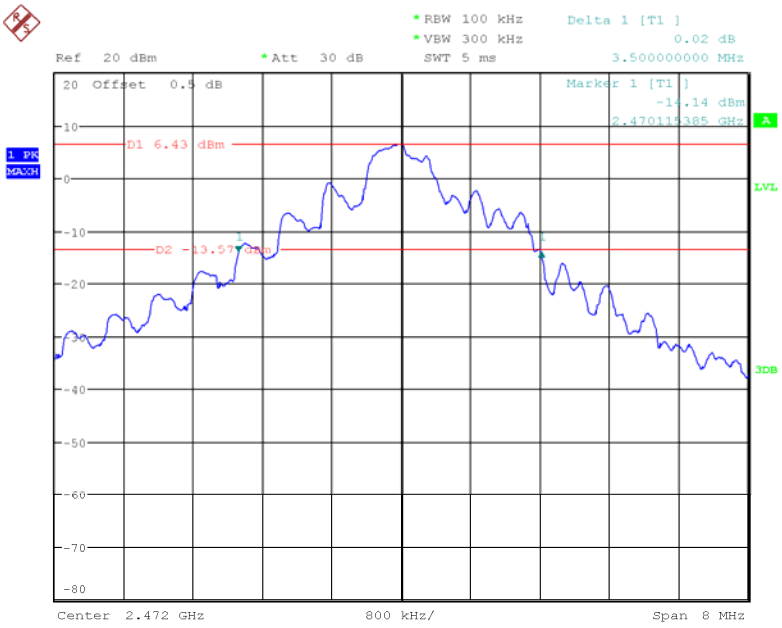
High Channel



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