

FCC PART 15.247
TEST REPORT

For

SVAT ELECTRONICS

4080 Montrose Rd, Niagara Falls, Ontario, Canada

FCC ID: SMH32012

Report Type: Original Report	Product Type: 2.4GHz Digital Video Baby Monitor (Parent Unit)
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Note: This test report is prepared for the customer shown above and for the equipment described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp.

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The SVAT ELECTRONICS's product, model number: 32012 (FCC ID: SMH32012) (the "EUT") in this report was a monitor unit of 2.4GHz Digital Video Baby Monitor, which was measured approximately: 11.5 cm (L) x 8.2 cm (W) x 2.2 cm (H), rated with input voltage: 3.7V battery or DC 6.0V from adapter.

Adapter Information: AC Adapter
Model: 5E-AD060080-U
Input: 100-240V~50/60 Hz 0.15A
Output: DC 6V 0.8A

Note: The product 2.4GHz Digital Video Baby Monitor, models 32012, 32016 20502, 22502, 20503 and 22503 are different in model numbers due to different combinations, trade name and packaging, which have the same baby unit and parent unit, the difference among them was explained in the attached product similarity declaration letter provided by applicant. The model 32012 was selected for testing.

** All measurement and test data in this report was gathered from production sample serial number: 1303107 (Assigned by BAACL, Shenzhen). The EUT supplied by the applicant was received on 2013-03-27.*

Objective

This report is prepared on behalf of SVAT ELECTRONICS in accordance with Part 2-Subpart J, 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, section 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

Related Submittal(s)/Grant(s)

Submitted with the baby unit of a system with FCC ID: SMH32014

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 emissions measurement was performed and 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

Description of Test Configuration

The system was configured for testing in an engineering mode which was selected by manufacturer.

EUT Exercise Software

No exercise software was used.

Equipment Modifications

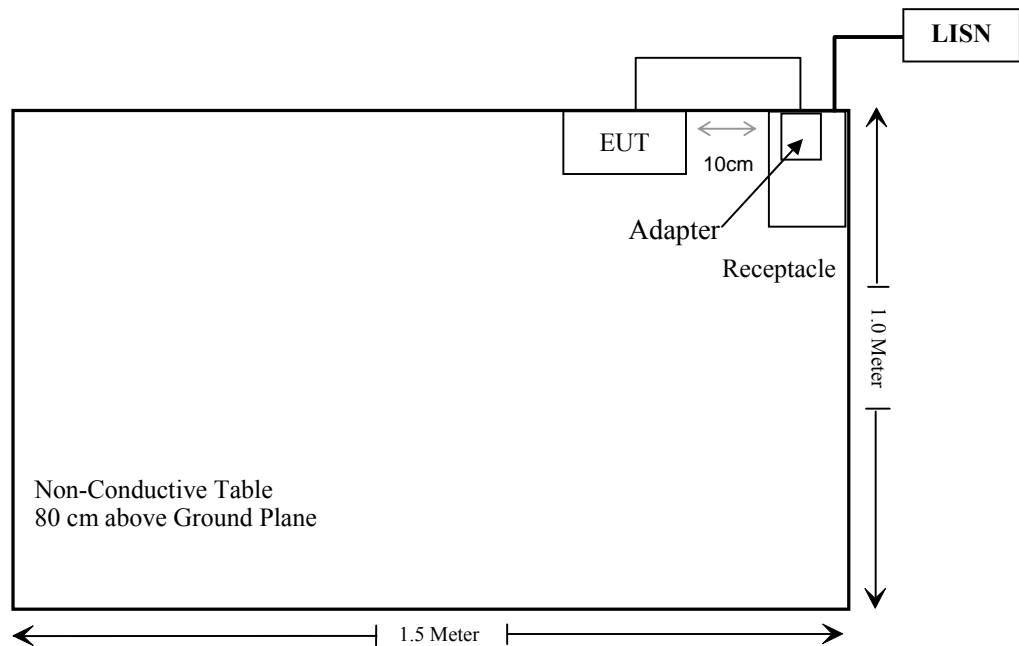
No modification was made to the EUT tested.

External I/O Cable

Cable Description	Length (m)	From/Port	To
Un-shielding Power Cable	2.0	EUT	Adapter

Block Diagram of Test Setup

For Conducted Emission



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (i), §1.1307 (b)(1), §2.1091	Maximum Permissible Exposure (MPE)	Compliance
§15.203	Antenna Requirement	Compliance
§15.207 (a)	AC Line Conducted Emissions	Compliance
§15.205, §15.209, §15.247(d)	Radiated Emissions	Compliance
§15.247 (a)(1)	20 dB Emission Bandwidth	Compliance
§15.247(a)(1)	Channel Separation	Compliance
§15.247(a)(1)(iii)	Time of Occupancy (Dwell Time)	Compliance
§15.247(a)(1)(iii)	Quantity of hopping channel	Compliance
§15.247(b)(1)	Peak Output Power Measurement	Compliance
§15.247(d)	Band Edges	Compliance

FCC §15.247 (i) & §1.1307 (b) (1) & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

According to subpart 15.247 (i) and subpart 1.1307 (b)(1), 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

Limits for General Population/Uncontrolled Exposure

Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (Minutes)
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f ²)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz

* = Plane-wave equivalent power density

Result

Calculated Formulary:

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

S = power density (in appropriate units, e.g. mW/cm²)

P = power input to the antenna (in appropriate units, e.g., mW).

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain.

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

Frequency (MHz)	Antenna Gain		Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
	(dBi)	(numeric)	(dBm)	(mW)			
2410.875	2	1.58	15.43	34.91	20	0.010979	1

Note: To maintain compliance with the FCC’s RF exposure guidelines, place the equipment at least 20cm from nearby persons.

Result: Compliance

FCC §15.203 – ANTENNA REQUIREMENT

Applicable Standard

According to FCC § 15.203, 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. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Antenna Connector Construction

The EUT has one integral antenna which was permanently attached and the antenna gain is 2dBi, fulfill the requirement of this section. Please refer to the internal photos.

Result: Compliance.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC §15.207

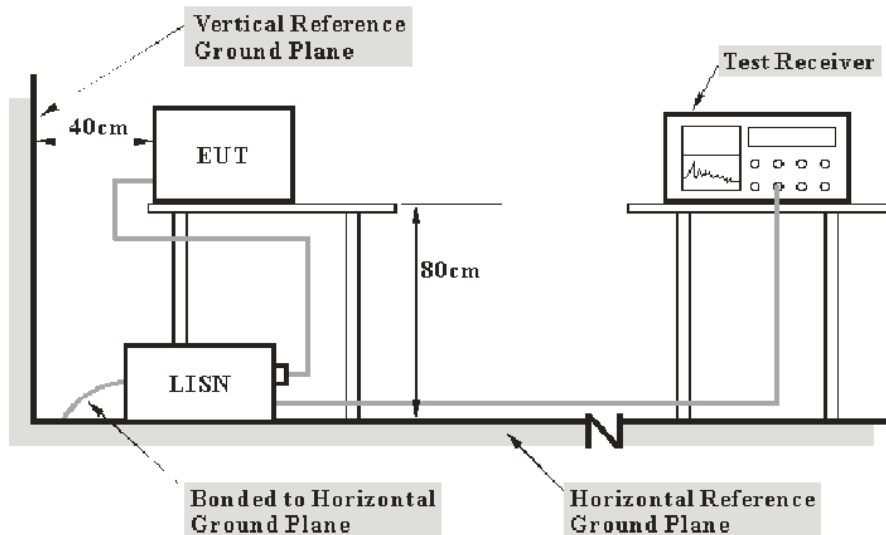
Measurement Uncertainty

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 limits.

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 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.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	100176	2012-11-24	2013-11-23
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2012-08-22	2013-08-21
Rohde & Schwarz	Attenuator	ESH3Z2	DE25985	2012-08-09	2013-08-08
BACL	CE Test software	BACL-CE	V1.0	-	-

* **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 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:

8.37 dB at 0.345 MHz in the **Line** conducted mode

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

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

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

Test Data

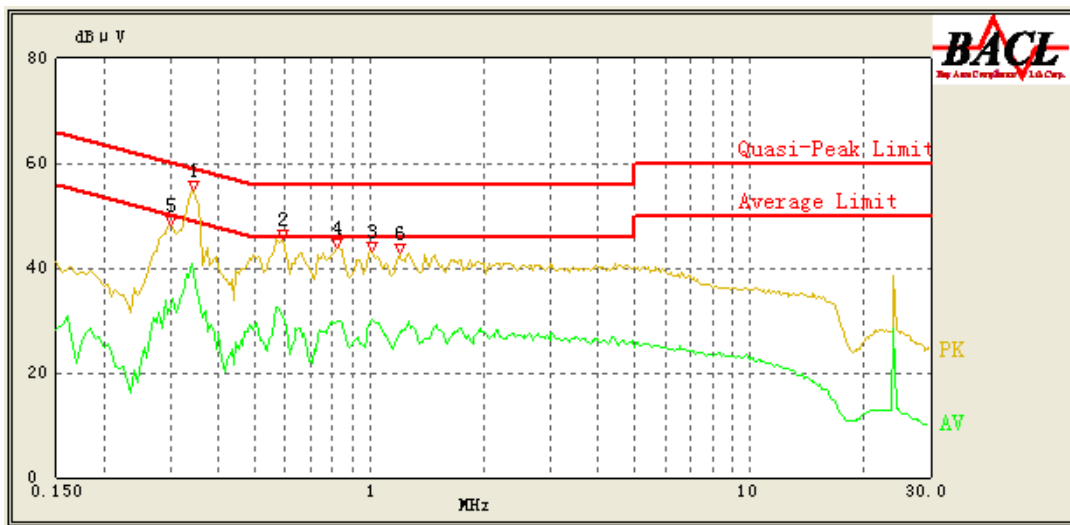
Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

The testing was performed by Gardon Zhang on 2013-04-08.

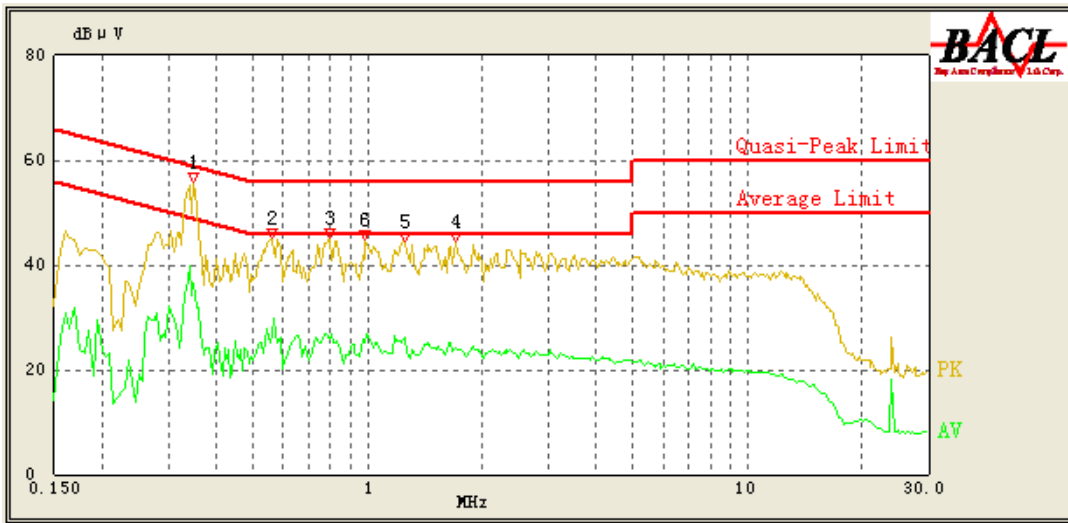
Test Mode: Charging&Transmitting

AC 120 V, 60 Hz, Line:



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/QP/Ave.)
0.345	52.06	10.20	60.43	8.37	QP
0.345	39.09	10.20	50.43	11.34	Ave.
0.590	41.86	10.20	56.00	14.14	QP
0.590	30.82	10.20	46.00	15.18	Ave.
1.015	30.13	10.20	46.00	15.87	Ave.
1.015	40.08	10.20	56.00	15.92	QP
0.300	45.68	10.20	61.71	16.03	QP
0.820	29.87	10.20	46.00	16.13	Ave.
0.820	39.80	10.20	56.00	16.20	QP
1.200	38.03	10.20	56.00	17.97	QP
1.200	27.76	10.20	46.00	18.24	Ave.
0.300	32.42	10.20	51.71	19.29	Ave.

AC 120V, 60 Hz, Neutral:



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/QP/Ave.)
0.350	36.57	10.10	50.29	13.72	Ave.
0.350	46.26	10.10	60.29	14.03	QP
0.990	26.72	10.20	46.00	19.28	Ave.
0.560	26.46	10.20	46.00	19.54	Ave.
0.560	36.19	10.20	56.00	19.81	QP
1.255	26.10	10.20	46.00	19.90	Ave.
0.795	25.90	10.20	46.00	20.10	Ave.
0.795	34.35	10.20	56.00	21.65	QP
1.700	24.27	10.20	46.00	21.73	Ave.
0.985	33.90	10.20	56.00	22.10	QP
1.250	33.59	10.20	56.00	22.41	QP
1.715	32.57	10.20	56.00	23.43	QP

Note:

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

FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS

Applicable Standard

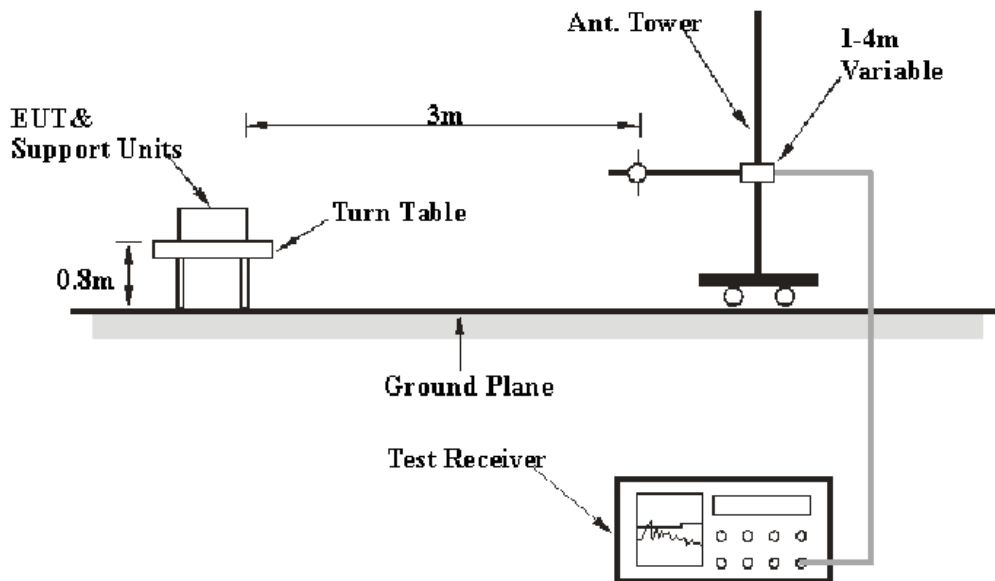
FCC §15.247 (d); §15.209; §15.205;

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 expanded combined standard uncertainty of radiation emissions at Bay Area Compliance Laboratories Corp. (Shenzhen) will not be taken into consideration for the test data recorded in the report

EUT Setup



The radiated emission tests were performed in the 3 meters test site, using the setup accordance with the ANSI C63.4-2009. The specification used was the FCC 15.209 and FCC 15.247 limits.

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 & Spectrum Analyzer 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
30MHz – 1000 MHz	100 kHz	300 kHz	120kHz	QP
Above 1 GHz	1MHz	3 MHz	/	PK
	1MHz	10 Hz	/	Ave.

Test Procedure

For the radiated emissions test, the adapter was connected to the outlet of the LISN.

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

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz to 1GHz and peak and Average detection modes for frequencies above 1GHz.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	8447E	1937A01057	2012-11-24	2013-11-23
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2013-05-09	2014-05-09
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2011-11-28	2014-11-27
SUPER ULTRA	Amplifier	ZVA-213+	N/A	2012-11-24	2013-11-23
Sunol Sciences	Horn Antenna	DRH-118	A052304	2011-12-01	2014-11-30
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2012-11-24	2013-11-23
Agilent	Spectrum Analyzer	8564E	3943A01781	2013-05-09	2014-05-09
the electro-Mechanics Co.	Horn Antenna	3116	9510-2270	2010-10-14	2013-10-13

* **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).

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:

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

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

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Title 47, Part 15, Subpart C, section 15.205, 15.209 and 15.247, with the worst margin reading of:

6.83 dB at 2489.6 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

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

in BAACL, $U_{(L_m)}$ 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 °C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

The testing was performed by Gardon Zhang on 2013-04-07 and 2013-08-12.

Test Mode: Transmitting

30 MHz -25 GHz:

Frequency (MHz)	Receiver		Turn table Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBuV/m)	FCC Part 15.247/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
Low Channel (2410.875 MHz)									
2410.875	99.20	PK	101	1.1	H	6.13	105.33	/	/
2410.875	104.09	PK	35	1.2	V	6.13	110.22	/	/
143.975	49.78	QP	136	1.2	V	-14.5	35.28	43.5	8.22
9643.5	31.42	PK	136	1.0	V	19.29	50.71	74	23.29
7323.625	33.56	PK	217	1.1	V	16.49	50.05	74	23.95
4821.75	37.21	PK	85	1.2	V	12.40	49.61	74	24.39
2312.6	52.38	PK	128	1.3	V	5.48	57.86	74	16.14
2312.6	29.36	Ave.	128	1.3	V	5.48	34.84	54	19.16
2363.5	48.69	PK	150	1.2	V	5.53	54.22	74	19.78
2363.5	26.75	Ave.	150	1.2	V	5.53	32.28	54	21.72
2491.4	46.24	PK	270	1.1	V	7.21	53.45	74	20.55
2491.4	24.06	Ave.	270	1.1	V	7.21	31.27	54	22.73
Middle Channel (2444.625 MHz)									
2444.625	99.78	PK	35	1.1	H	7.21	106.99	/	/
2444.625	105.25	PK	132	1.2	V	7.21	112.46	/	/
143.975	49.82	QP	140	1.2	V	-14.5	35.32	43.5	8.18
9778.5	31.08	PK	104	1.0	V	19.29	50.37	74	23.63
4889.25	37.03	PK	35	1.2	V	12.46	49.49	74	24.51
7333.875	32.56	PK	98	1.3	V	16.49	49.05	74	24.95
2374.2	39.36	PK	210	1.2	V	6.13	45.49	74	28.51
2374.2	19.86	Ave.	210	1.2	V	6.13	25.99	54	28.01
2354.8	50.24	PK	240	1.6	V	5.52	55.76	74	18.24
2354.8	27.69	Ave.	240	1.6	V	5.52	33.21	54	20.79
2496.8	49.89	PK	41	1.1	V	7.21	57.10	74	16.90
2496.8	25.96	Ave.	41	1.1	V	7.21	33.17	54	20.83

Frequency (MHz)	Receiver		Turn table Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBuV/m)	FCC Part 15.247/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
High Channel (2471.625 MHz)									
2471.625	99.39	PK	68	1.2	H	7.21	106.60	/	/
2471.625	104.08	PK	64	1.1	V	7.21	111.29	/	/
143.975	50.14	QP	124	1.2	V	-14.5	35.64	43.5	7.86
9886.5	31.72	PK	36	1.2	V	19.39	51.11	74	22.89
7414.875	32.11	PK	102	1.3	V	15.90	48.01	74	25.99
4943.25	34.73	PK	244	1.1	V	12.50	47.23	74	26.77
2318.4	49.98	PK	19	1.5	V	5.48	55.46	74	18.54
2318.4	25.68	Ave.	19	1.5	V	5.48	31.16	54	22.84
2378.6	51.37	PK	250	1.2	V	6.13	57.50	74	16.50
2378.6	28.19	Ave.	250	1.2	V	6.13	34.32	54	19.68
2489.6	59.96	PK	240	1.3	V	7.21	67.17	74	6.83
2489.6	36.02	Ave.	240	1.3	V	7.21	43.23	54	10.77

Note:

Corrected Amplitude = Corrected Factor + Reading

Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor

Margin = Limit- Corr. Amplitude

Field Strength of Radiated Emission Average							
Freq. (MHz)	Peak Corrected Amplitude. @3m (dBµV/m)	Polar (H/V)	Duty Cycle Factor (dB)	Corrected Amplitude. (dBµV/m)	FCC 15.247		Comment
					Limit (dBµV/m)	Margin	
Low Channel (2410.875 MHz)							
2410.875	105.33	H	-37.35	67.98	/	/	Fundamental
2410.875	110.22	V	-37.35	72.87	/	/	Fundamental
4821.75	49.61	V	-37.35	12.26	54	41.74	Harmonic
7323.625	50.05	V	-37.35	12.70	54	41.30	Harmonic
9643.5	50.71	V	-37.35	13.36	54	40.64	Harmonic
Middle Channel (2444.625 MHz)							
2444.625	106.99	H	-37.35	69.64	/	/	Fundamental
2444.625	112.46	V	-37.35	75.11	/	/	Fundamental
4889.25	49.49	V	-37.35	12.14	54	41.86	Harmonic
7333.875	49.05	V	-37.35	11.70	54	42.30	Harmonic
9778.5	50.37	V	-37.35	13.02	54	40.98	Harmonic
High Channel (2471.625 MHz)							
2471.625	106.60	H	-37.35	69.25	/	/	Fundamental
2471.625	111.29	V	-37.35	73.94	/	/	Fundamental
4943.25	47.23	V	-37.35	9.88	54	44.12	Harmonic
7414.875	48.01	V	-37.35	10.66	54	43.34	Harmonic
9886.5	51.11	V	-37.35	13.76	54	40.24	Harmonic

Note:

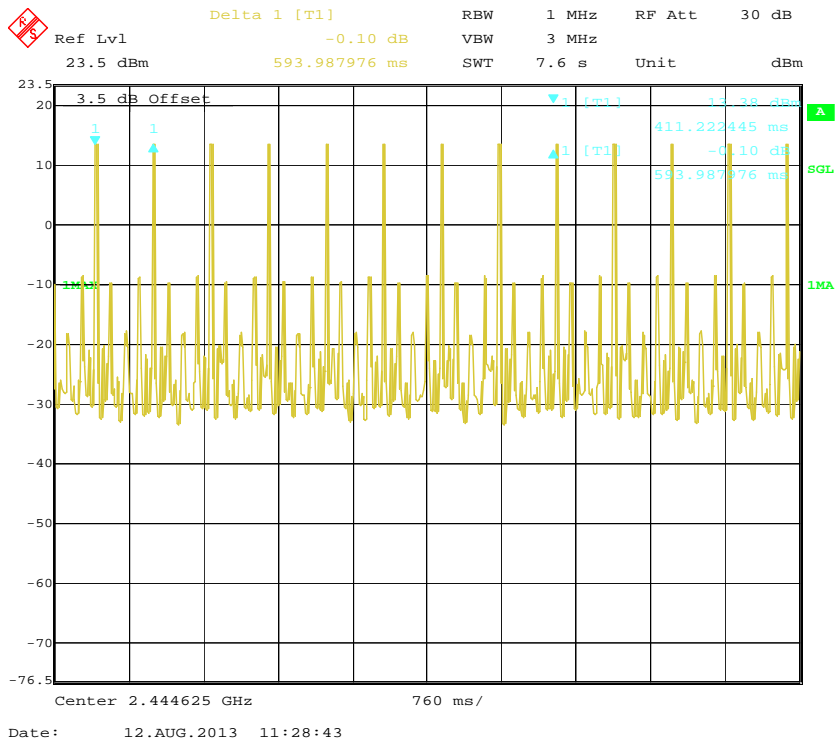
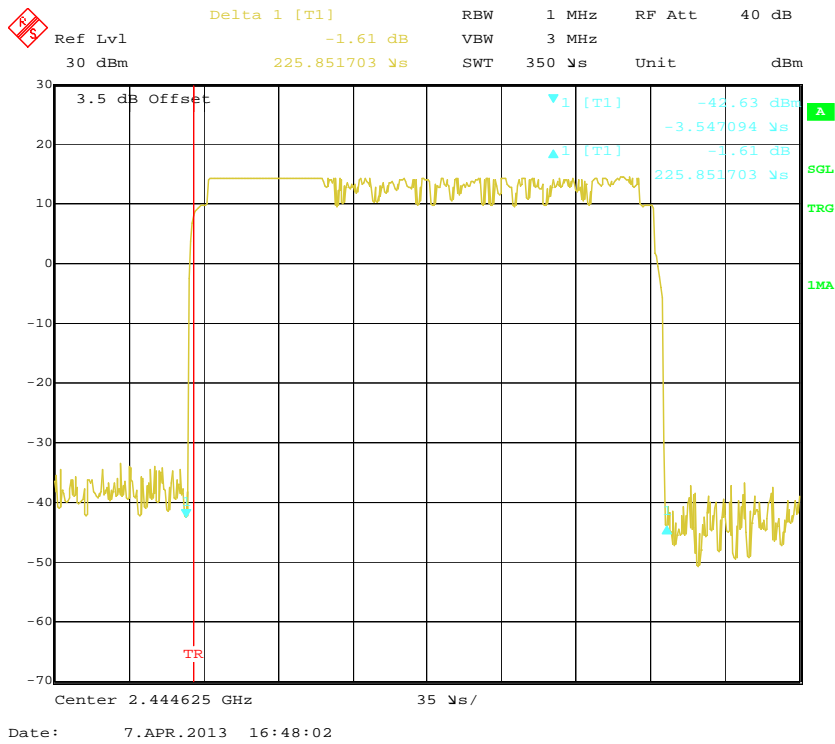
The field strength of average radiated emission is calculated by the following formula:

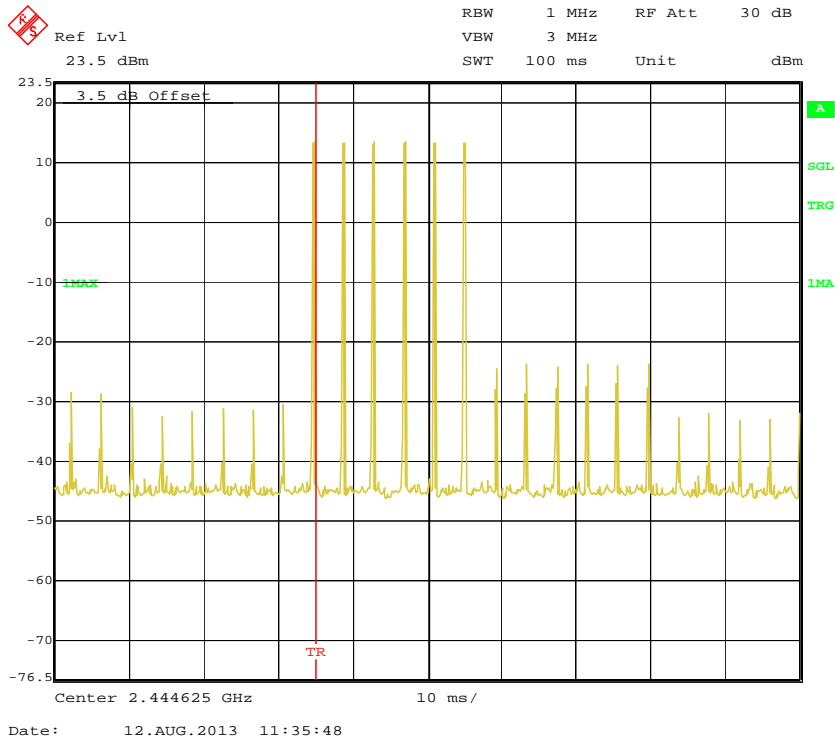
$Ton=0.226*6ms=1.356ms$

$Tp=100ms$

$Duty\ Cycle = Ton/Tp*100\%$, Duty cycle factor = $20lg(Duty\ Cycle) = -37.35\ dB$

$Ave. = PK+20*lg(Duty\ Cycle)$





FCC §15.247(a) (1) - CHANNEL SEPARATION

Applicable Standard

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20dB 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 20dB bandwidth of the hopping channel, whichever is greater provided the systems operate with an output power no greater than 125 mW.

Test Procedure

1. Set the EUT in operating mode, RBW was set at 100 kHz, VBW \geq 3RBW maxhold the channel.
2. Set the adjacent channel of the EUT maxhold another trace
3. Measure the channel separation.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2012-11-24	2013-11-23

* **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 Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

The testing was performed by Gardon Zhang on 2013-04-03.

Test Result: Compliance.

Please refer to following tables and plots

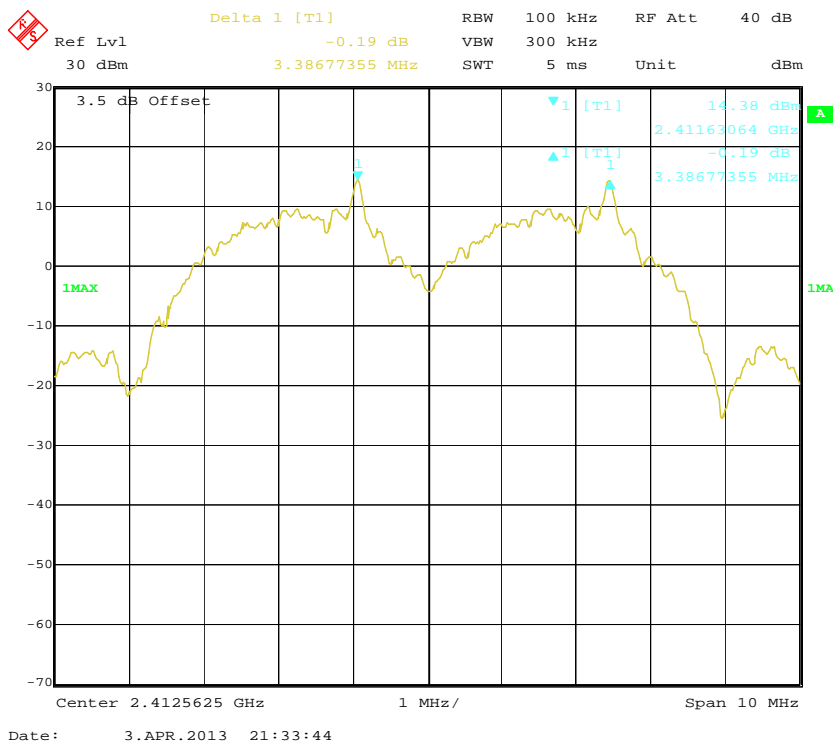
Test Mode: Transmitting

Channel	Channel Frequency (MHz)	Channel Separation (MHz)	>Limit (MHz)	Result
Low	2410.875	3.387	2.351	Pass
Adjacent	2414.250			
Middle	2444.625	3.387	2.351	
Adjacent	2448.000			
High	2471.625	3.387	2.351	
Adjacent	2468.250			

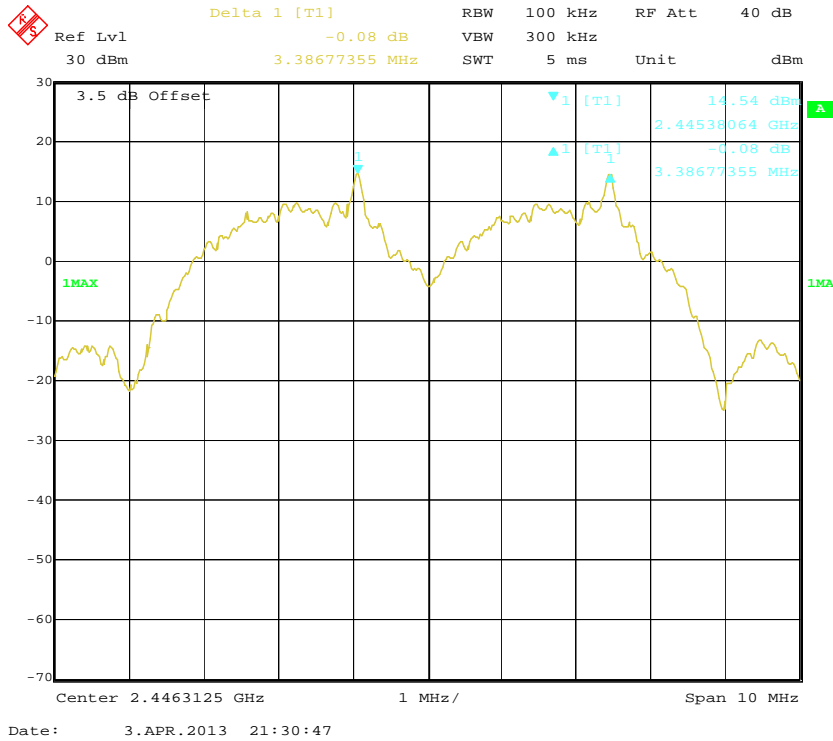
Note: limit =2/3 of bandwidth

Please refer to the following plots.

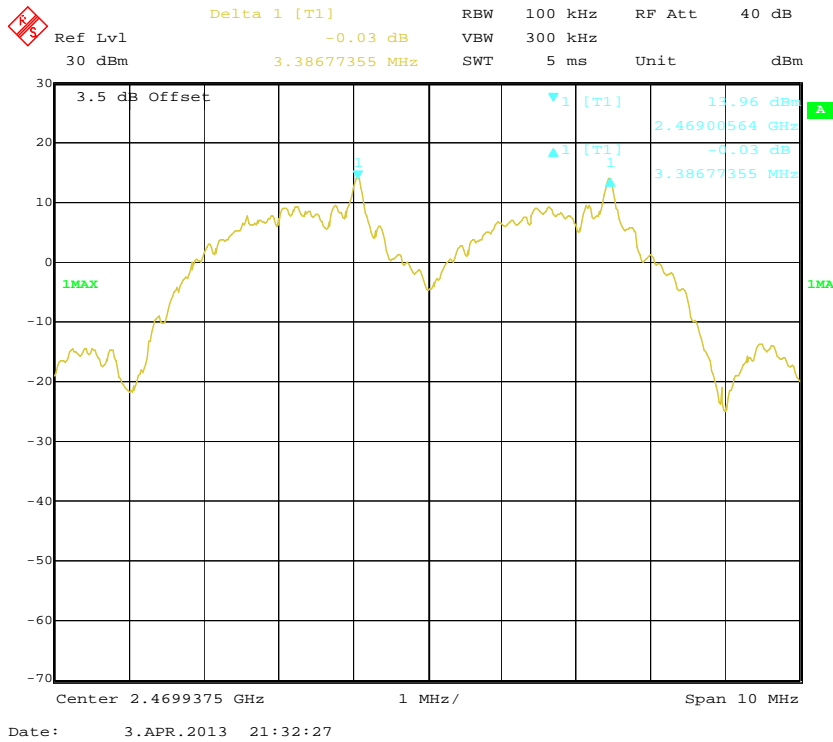
Low Channel



Middle Channel



High Channel



FCC §15.247(a) (1) – 20 dB EMISSION BANDWIDTH

Applicable Standard

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 125mW.

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 on the test table without connection to measurement instrument. Turn on the EUT. 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 were attenuated 20 dB from the reference level. Record the frequency difference as the emission 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	2012-11-24	2013-11-23

* **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 Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

The testing was performed by Gardon Zhang on 2013-04-03.

Test Result: Compliance.

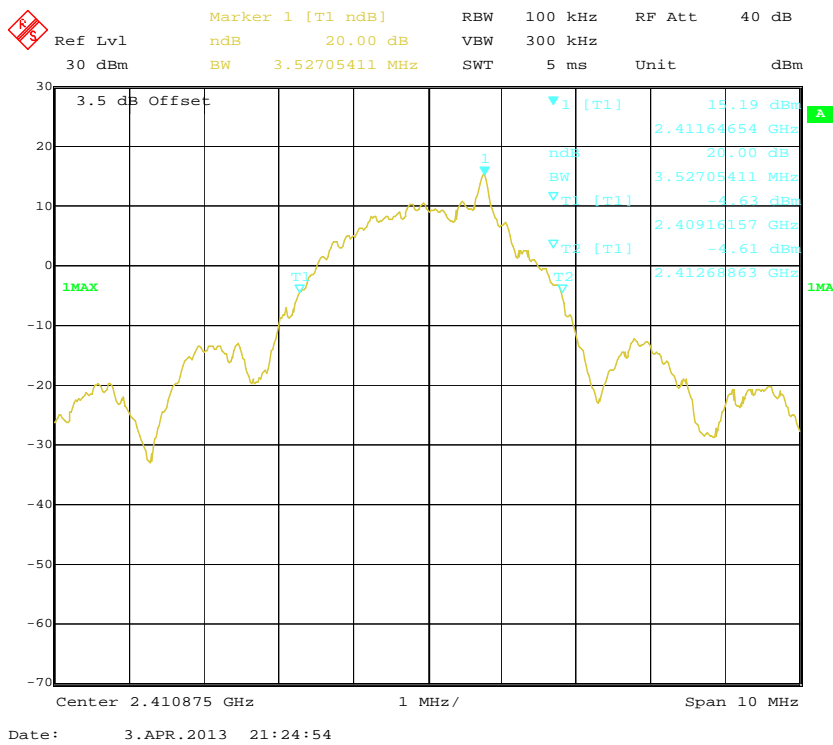
Please refer to following tables and plots

Test Mode: Transmitting

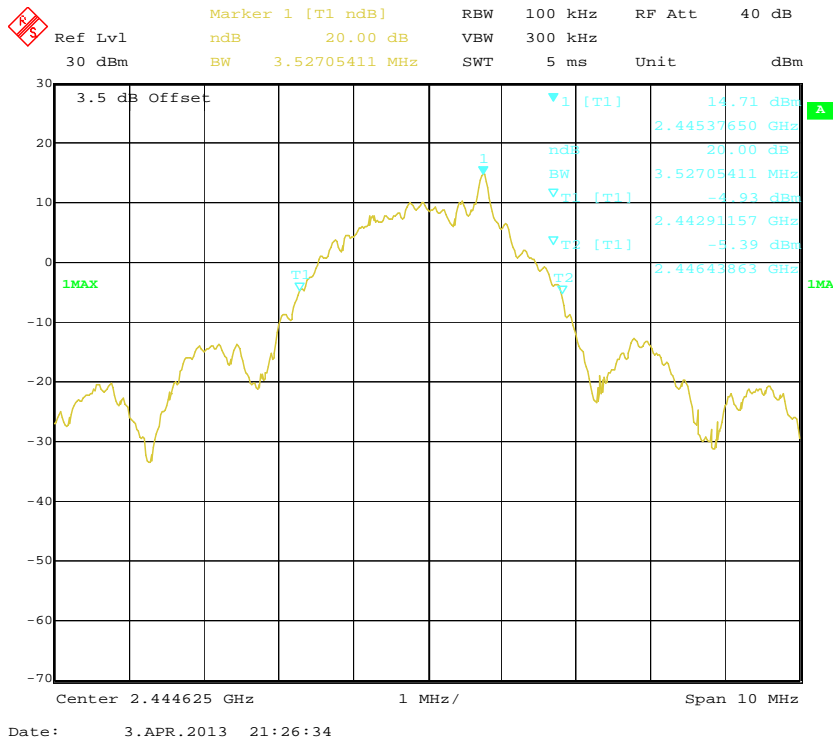
Channel	Frequency (MHz)	20 dB Emission Bandwidth (MHz)
Low	2410.875	3.527
Middle	2444.625	3.527
High	2471.625	3.527

Please refer to the following plots.

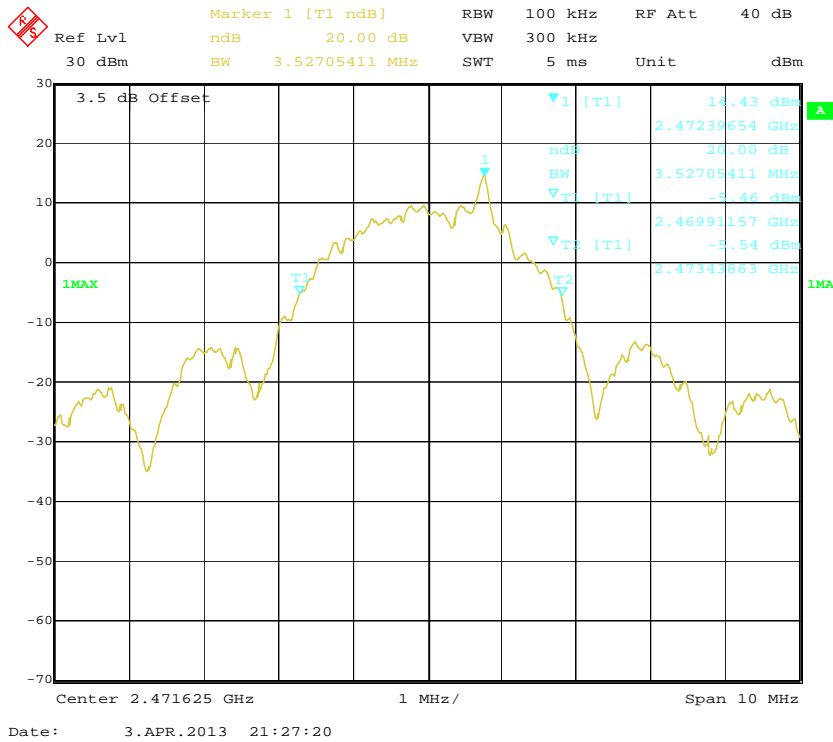
Low Channel



Middle Channel



High Channel



FCC §15.247(a) (1) (iii)-QUANTITY OF HOPPING CHANNEL

Applicable Standard

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

Test Procedure

1. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
2. Set the EUT in hopping mode from first channel to last.
3. By using the max-hold function record the quantity of the channel.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2012-11-24	2013-11-23

* **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 Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

The testing was performed by Gardon Zhang on 2013-04-07.

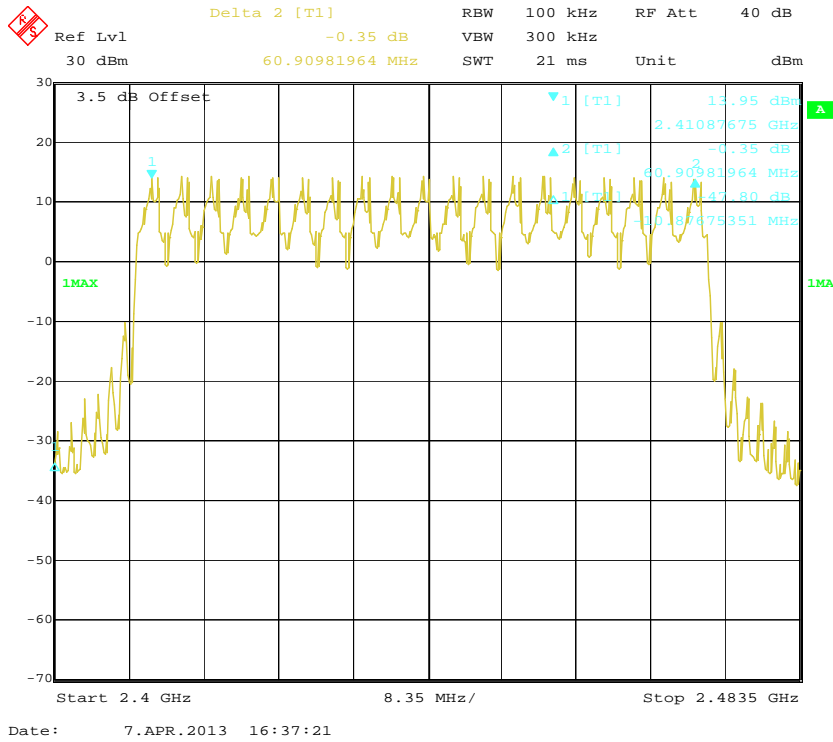
Test Result: Compliance.

Please refer to following tables and plots

Test Mode: Transmitting

Frequency Range (MHz)	Number of Hopping Channel	Limit
2400-2483.50	19	≥ 15

Number of Hopping Channels



FCC §15.247(a) (1) (iii) -TIME OF OCCUPANCY (DWELL TIME)**Applicable Standard**

Frequency hopping systems in the 2400-2483.5 MHz shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

Test Procedure

The EUT was worked in channel hopping; spectrum span was set as 0. Sweep was set as 0.4 X channel no. (s), the quantity of pulse was get from single sweep. In addition, the time of single pulses was tested.

Dwell Time= Pulse time (ms) *6*13

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2012-11-24	2013-11-23

* **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 Data**Environmental Conditions**

Temperature:	25°C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

The testing was performed by Gardon Zhang on 2013-04-07 and 2013-08-12.

Test Result: Compliance.

Please refer to following tables and plots

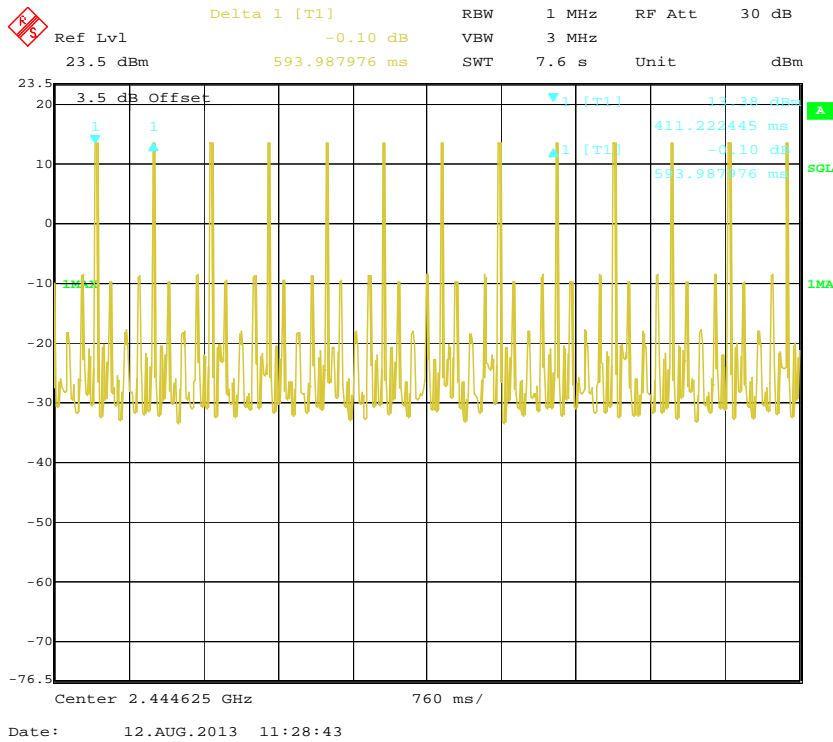
Test Mode: Transmitting

Channel	Pulse Width (ms)	Dwell Time (S)	Limit (S)	Result
Low	0.2259*6	0.018	0.4	Pass
Middle	0.2259*6	0.018	0.4	Pass
High	0.2259*6	0.018	0.4	Pass

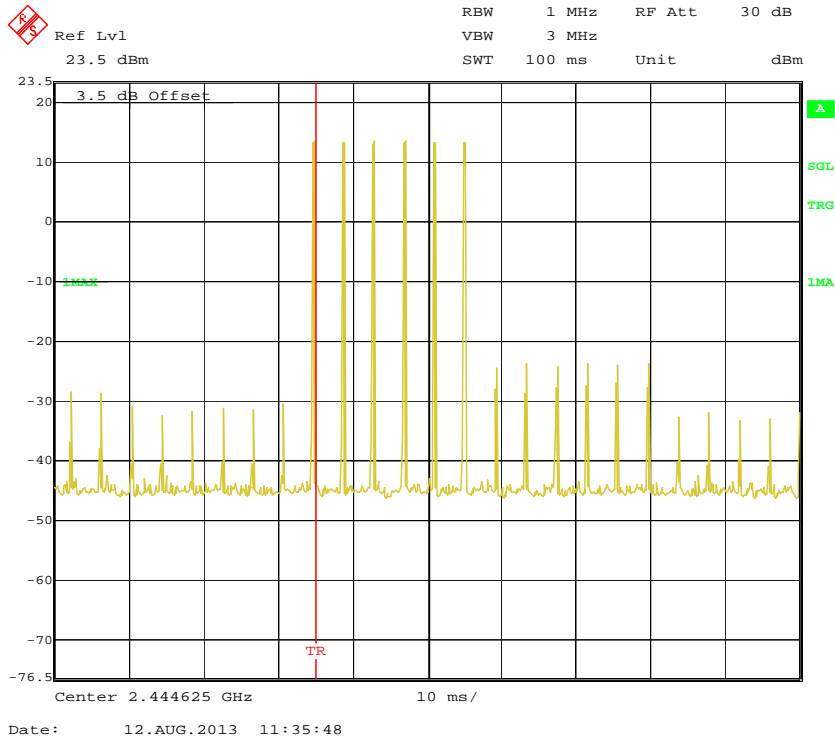
Note: Dwell time = Pulse time*6*13s
 Period = 0.4S* number of hopping channels = 0.4*19S = 7.6S

Please refer to the following plots.

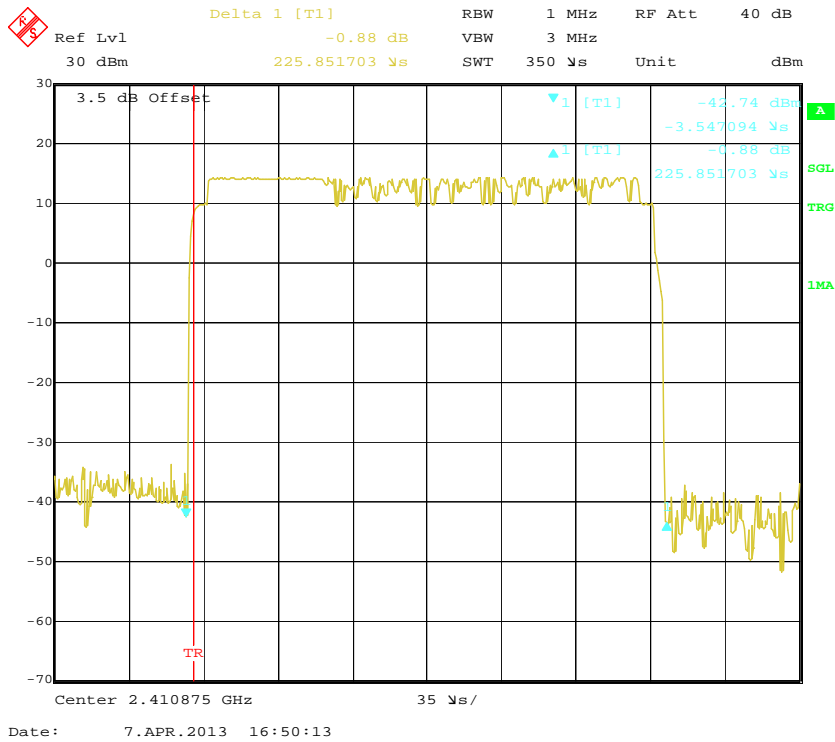
7.6 S



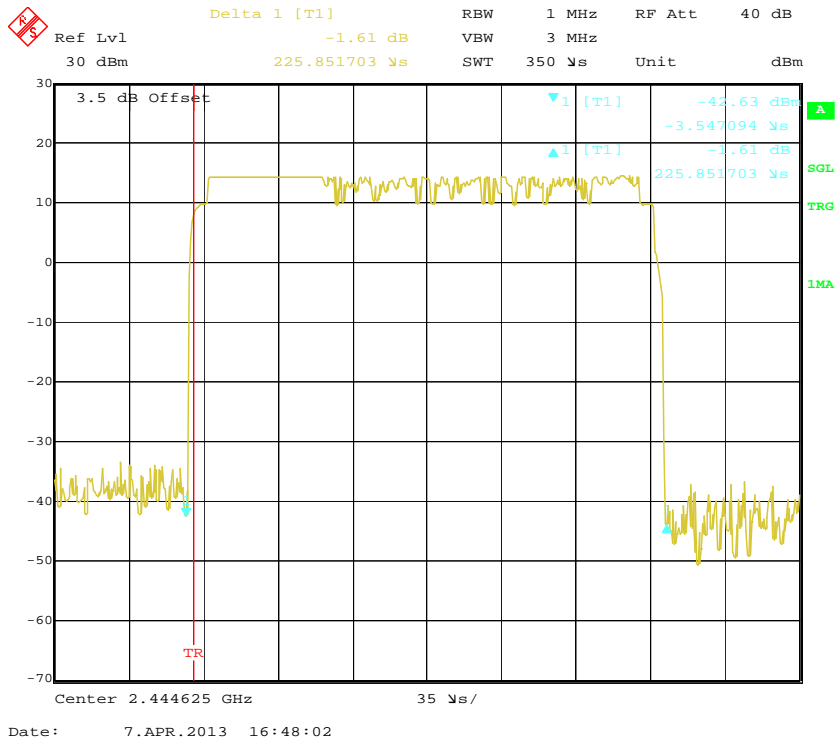
100 ms



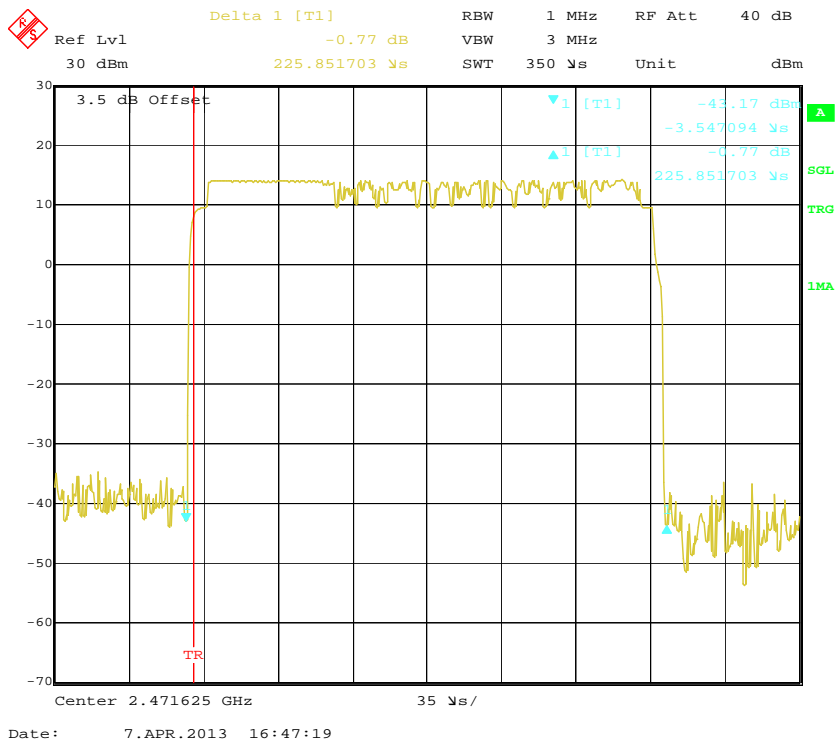
Low Channel



Middle Channel



High Channel



FCC §15.247(b) (1) - PEAK OUTPUT POWER MEASUREMENT

Applicable Standard

According to §15.247(b) (1), for frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725–5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125 watts.

Test Procedure

1. Place the EUT on a bench and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to an EMI Test Receiver.
3. Add a correction factor to the display.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2012-11-24	2013-11-23

* **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 Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

The testing was performed by Gardon Zhang on 2013-04-03 and 2013-04-17.

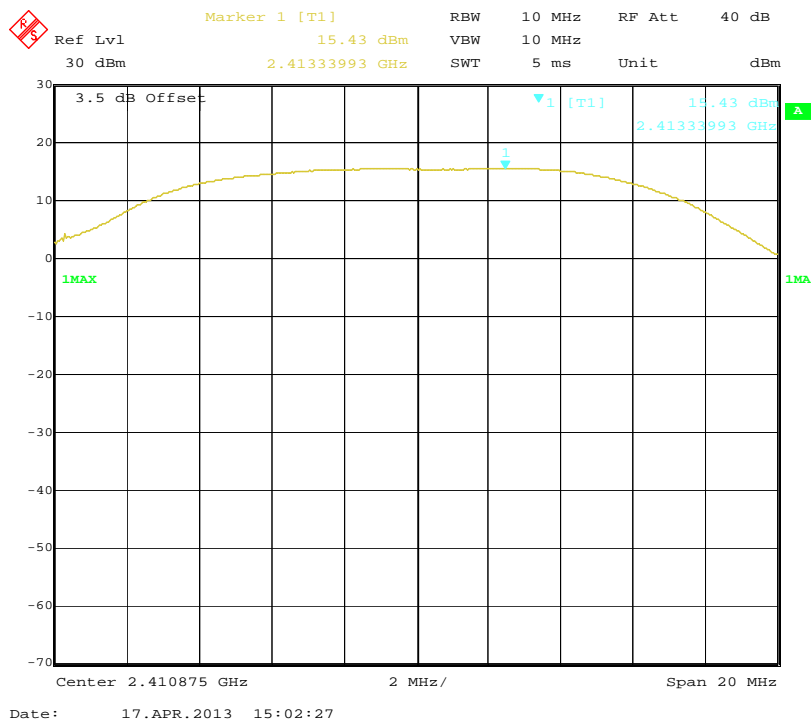
Test Result: Compliance.

Test Mode: Transmitting

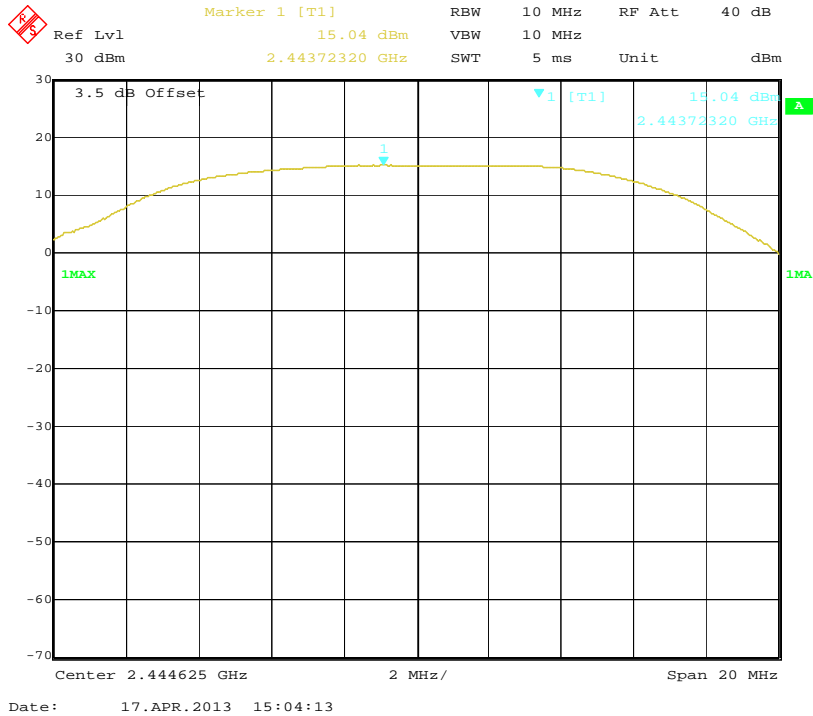
Channel	Channel Frequency (MHz)	Peak Output Power (dBm)	Power Output (mW)	Limit (mW)
Low channel	2410.875	15.43	34.91	125
Middle channel	2444.625	15.04	31.92	125
High channel	2471.625	14.30	26.92	125

Note: The data above was tested in conducted mode.

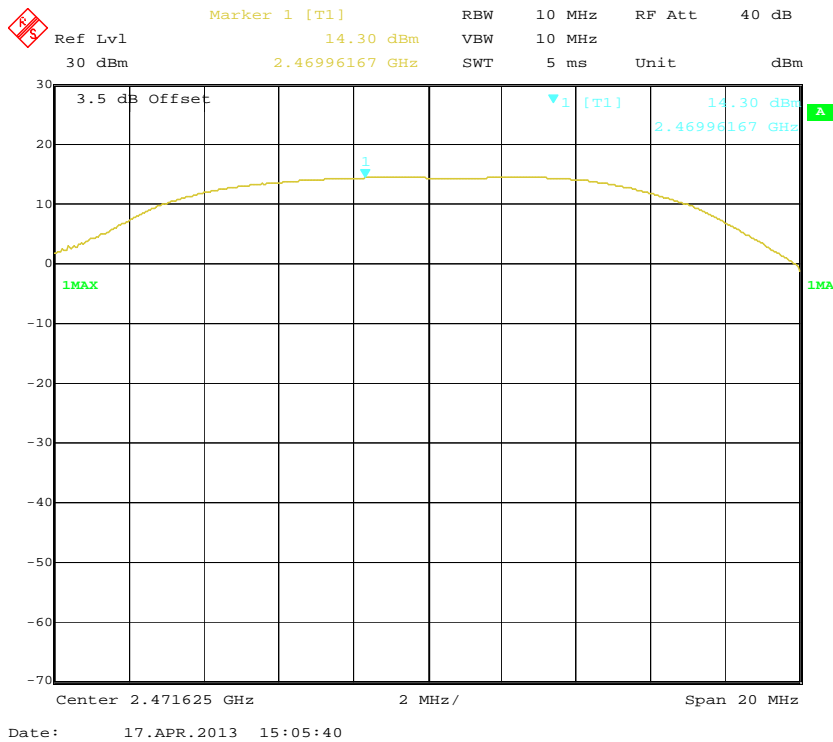
Low Channel



Middle Channel



High Channel



FCC §15.247(d) - BAND EDGES

Applicable Standard

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

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. Put it on the Rotated table and turn on the EUT and make it operate in Operating mode. Then set it to Low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range.
3. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
4. Repeat above procedures until all measured frequencies were complete.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2012-11-24	2013-11-23

* **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 Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

The testing was performed by Gardon Zhang on 2013-04-03.

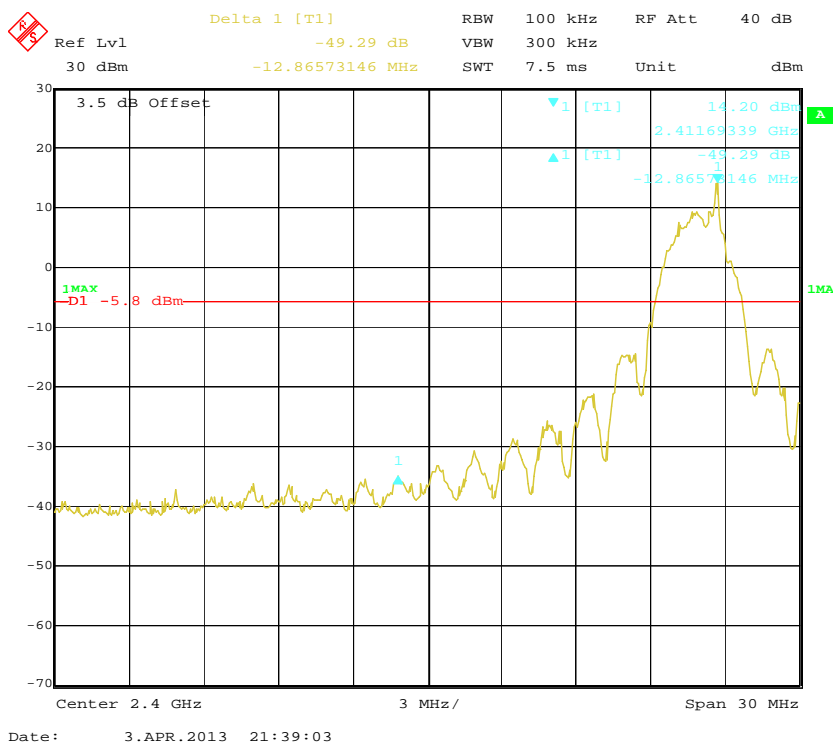
Test Result: Compliance.

Test Mode: Transmitting

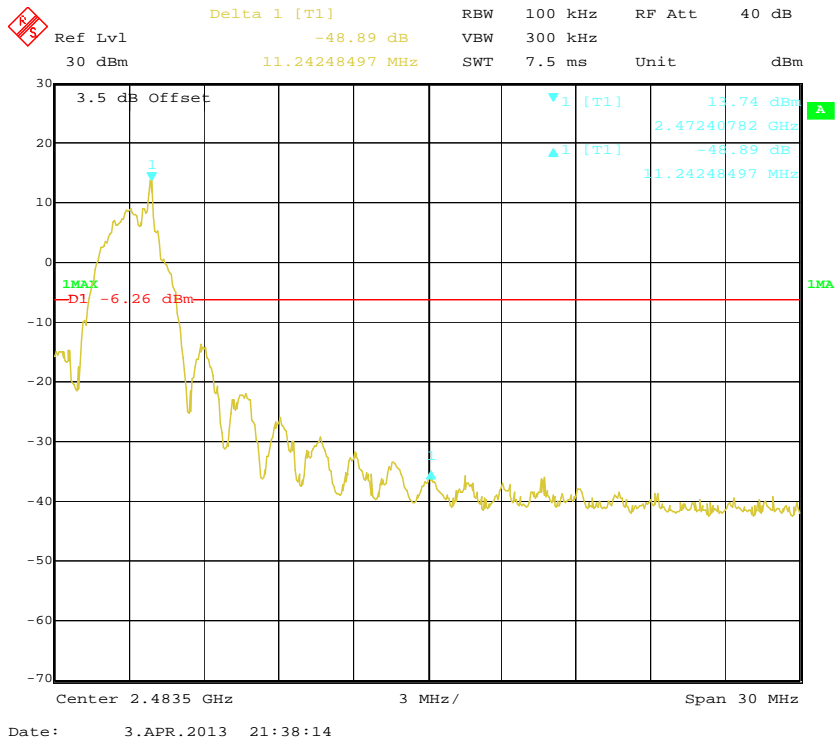
Frequency Band	Delta Peak to Band Emission (dBc)	>Limit (dBc)
Left Band	49.29	20
Right Band	48.89	20

Please refer to follow plots:

Band Edge: Left Side



Band Edge: Right Side



PRODUCT SIMILARITY DECLARATION LETTER



SVAT ELECTRONICS
 4080 Montrose Road | Niagara Falls, ON | Canada L2H 1J9 | T. 905.353.0732 | F. 905.353.1701 | www.svat.com

Company: SVAT Electronics
 Add: 4080 Montrose Rd, Niagara Falls, ON, Canada
 Tel: 1.905.353.0732
 Fax: 1.905.353.1701

2013-11-11

Product Similarity Declaration Letter

To Whom It May Concern,

We, SVAT ELECTRONICS, hereby declare that our product 2.4GHz Digital Video Baby Monitor, the models 32012, 32016,20502,22502,20503 and 22503 are different in model number due to different combinations, trade name and packaging, which have the same baby unit and parent unit on PCB layout and schematic, details as below:

Model	Combination	Trade name	Remark
32012	1 baby unit +1 parent unit	Levana	NA
32016	2 baby units +1 parent unit	Levana	NA
20502	1 baby unit +1 parent unit	Defender	Packaging ENGB
22502	1 baby unit +1 parent unit	Defender	Packaging Eco
20503	2 baby units +1 parent unit	Defender	Packaging ENGB
22503	2 baby units +1 parent unit	Defender	Packaging Eco

Model 32012 was tested by BACL.

Please contact me if you have any question.

Signature:

Andrea Mlinarevic
 Assistant Product Manager

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