NVLAP LAB CODE 200707-0

FCC PART 15.249

EMI MEASUREMENT AND TEST REPORT

For

JOYO Electronics Company Limited

Unit D, 13/F., World Tech Centre, 95 How Ming Street, Kwun Tong, Kowloon, Hong Kong

FCC ID: R4GTV9001

This Report Concerns:	Equipment Type:
☒ Original Report	Wireless Baby Monitor

Test Engineer:	Deny Xiong
Report No.:	RSZ06122801
Test Date:	2007-01-03 to 2007-01-05
Report Date:	2007-01-08
Reviewed By:	EMC Manager: Boni Baniqued
Prepared By:	Bay Area Compliance Laboratory 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

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *JOYO Electronics Company Limited*'s product, model number: *JY9001* or the "EUT" as referred to in this report is a *Wireless Baby Monitor*. The EUT is measured approximately 13.0 cm L x 9.8 cm W x 11.5 cm H, rated input voltage: DC 9V adapter.

Adapter Manufacturer: CLASS 2 TRANSFORMER, Model: PC-0950-DUL
Input: 120VAC 60Hz 9W, Output: 9VDC 500mA.

** The test data gathered are from production sample, serial number: 0612030 provided by the manufacturer, we received EUT on 2006-12-28.*

Objective

This Type approval report is prepared on behalf of *JOYO Electronics Company Limited* 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, 15.207, 15.209 and 15.249 rules.

Related Submittal(s)/Grant(s)

No Related Submittals.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, 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 Lab Corp. (ShenZhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The Test site used by Bay Area Compliance Laboratory Corp. (Shenzhen) to collect test data is located in 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 Laboratory 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 November 04, 2004. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

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.

Additionally, Bay Area Compliance Laboratory Corp. (ShenZhen) is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200707-0). The current scope of accreditations can be found at http://ts.nist.gov/ts/htdocs/210/214/scopes/2007070.htm

Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
NANYANG	Audio Generator	NY2201	N/A	DoC

SYSTEM TEST CONFIGURATION

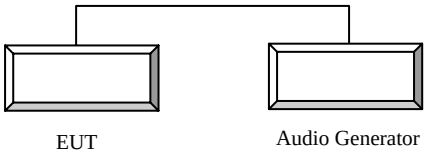
Justification

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

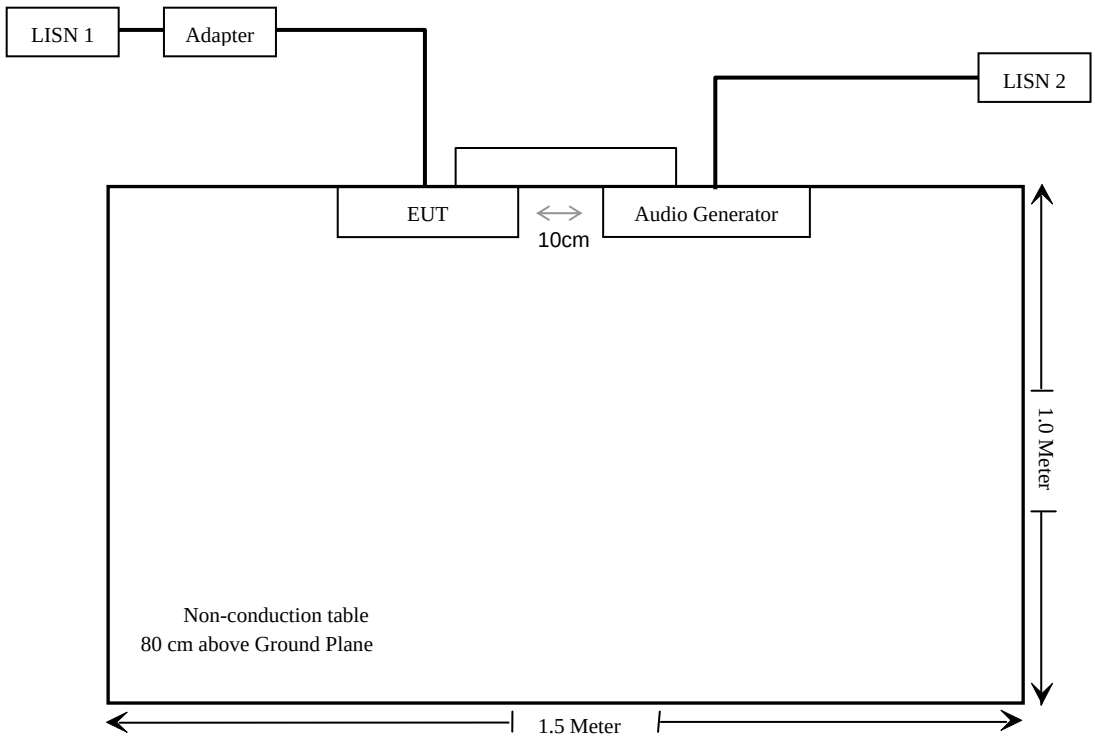
Equipment Modifications

Bay Area Compliance Laboratory Corp. (ShenZhen) has not done any modification on the EUT.

Configuration of Test Setup



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.203	Antenna Requirement	Compliant
§15.207(a)	Conduction Emission	Compliant
§15.205(a), §15.209(a), §15.249(a)	Radiated Emission	Compliant*
§15.249(d)	Out of band emission	Compliant

* Within measurement uncertainty.

§15.203 - ANTENNA REQUIREMENT

Standard Applicable

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 antenna is a build on board antenna, which in accordance to section 15.203, is considered sufficient to comply with the provisions of this section, please refer to the internal photo.

Result: Compliance.

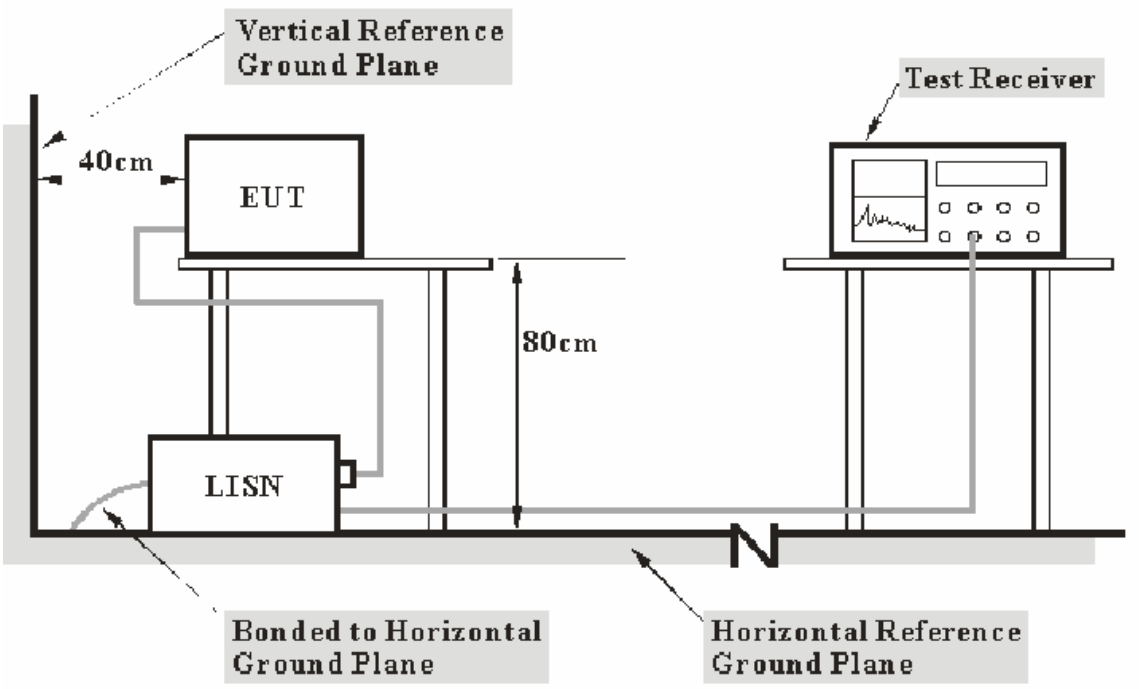
§15.207 - CONDUCTED EMISSION

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement at Bay Area Compliance Laboratory Corp. (Shenzhen) is ±2.4 dB.

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 C63.4-2003 measurement procedure. The specification used was with the FCC Part 15 .207 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 spacing between the peripherals was 10 cm.

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

EMI Test Receiver Setup

The 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	***IFBW***
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	DE25330	2006-03-20	2007-03-19
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2006-03-01	2007-03-01

***** Com-Power's LISN were used as the supporting equipment.
*** Statement of Traceability:** Bay Area Compliance Laboratory Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

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 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:

Transmitting (Channel A): **17.10 dB** at **11.170 MHz** in the **Live** conductor mode.
Transmitting (Channel B): **12.40 dB** at **11.100 MHz** in the **Live** conductor mode.

Test Data

Environmental Conditions

Temperature:	22 ° C
Relative Humidity:	55%
ATM Pressure:	1000mbar

The testing was performed by Deny Xiong on 2007-01-03.

Test Mode: Transmitting (Channel A)

LINE CONDUCTED EMISSIONS				FCC PART 15 .207	
Frequency (MHz)	Amplitude (dBμV)	Detector (QP/AV)	Phase (Live/Neutral)	Limit (dBμV)	Margin (dB)
11.170	42.90	QP	Live	60.00	17.10
15.770	38.00	QP	Live	60.00	22.00
11.290	25.70	AV	Live	50.00	24.30
24.205	25.30	AV	Neutral	50.00	24.70
19.910	34.80	QP	Live	60.00	25.20
24.205	32.60	QP	Neutral	60.00	27.40
11.245	32.30	QP	Neutral	60.00	27.70
19.820	32.00	QP	Neutral	60.00	28.00
15.770	20.90	AV	Live	50.00	29.10
0.700	26.40	QP	Live	56.00	29.60
1.185	25.40	QP	Neutral	56.00	30.60
11.180	19.20	AV	Neutral	50.00	30.80
19.910	18.60	AV	Live	50.00	31.40
0.700	13.60	AV	Live	46.00	32.40
19.820	16.30	AV	Neutral	50.00	33.70
0.350	25.20	QP	Neutral	58.96	33.76
0.375	24.00	QP	Live	58.39	34.39
0.350	14.00	AV	Neutral	48.96	34.96
1.185	10.90	AV	Neutral	46.00	35.10
0.375	11.00	AV	Live	48.39	37.39
0.160	26.90	QP	Live	65.46	38.56
0.160	26.70	QP	Neutral	65.46	38.76
0.160	13.20	AV	Live	55.46	42.26
0.160	13.00	AV	Neutral	55.46	42.46

Test Mode: Transmitting (Channel B)

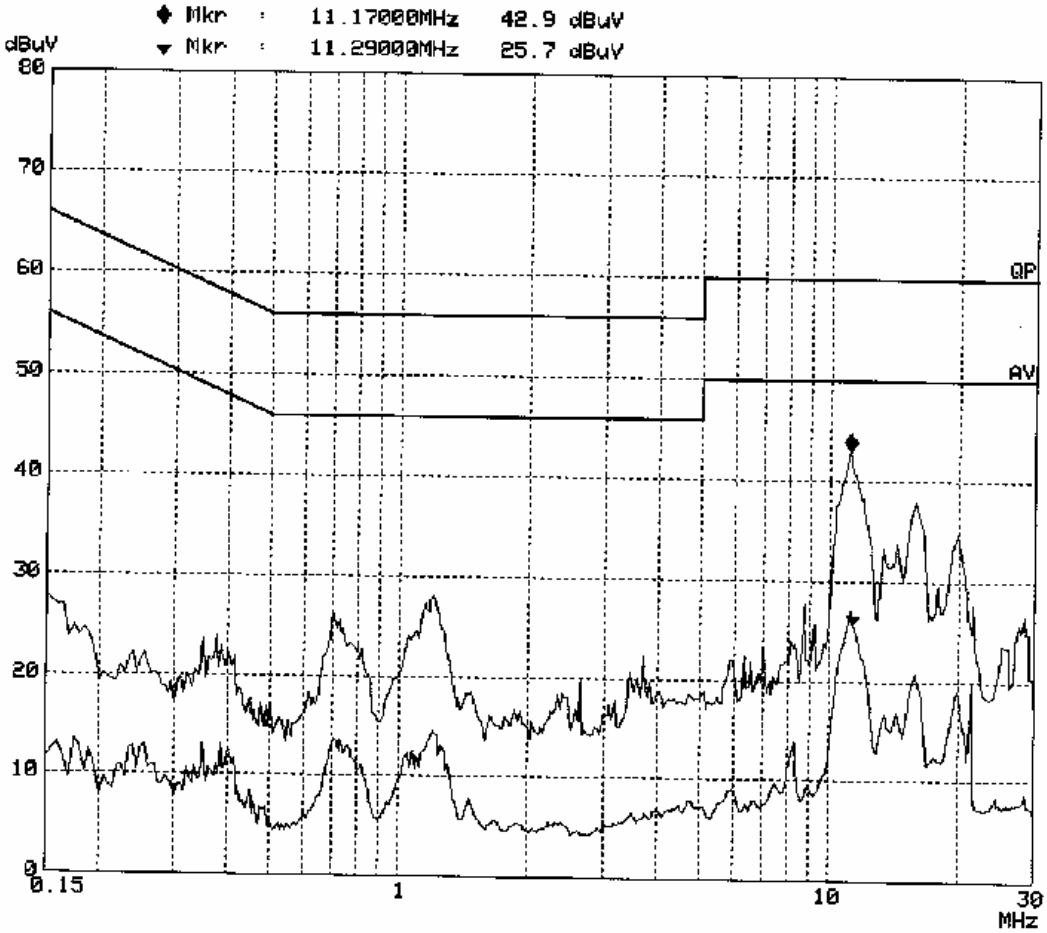
LINE CONDUCTED EMISSIONS				FCC PART 15 .207	
Frequency (MHz)	Amplitude (dBμV)	Detector (QP/AV)	Phase (Live/Neutral)	Limit (dBμV)	Margin (dB)
11.100	37.60	AV	Live	50.00	12.40
11.010	46.00	QP	Live	60.00	14.00
27.650	28.10	AV	Live	50.00	21.90
25.005	26.70	AV	Neutral	50.00	23.30
19.960	36.20	QP	Live	60.00	23.80
27.650	35.30	QP	Live	60.00	24.70
12.040	25.20	AV	Neutral	50.00	24.80
12.040	34.90	QP	Neutral	60.00	25.10
10.030	24.00	AV	Neutral	50.00	26.00
24.930	33.80	QP	Neutral	60.00	26.20
10.030	31.80	QP	Neutral	60.00	28.20
1.150	27.40	QP	Live	56.00	28.60
1.205	24.70	QP	Neutral	56.00	31.30
19.960	18.40	AV	Live	50.00	31.60
0.400	26.00	QP	Live	57.85	31.85
0.400	15.00	AV	Live	47.85	32.85
1.150	12.50	AV	Live	46.00	33.50
0.400	24.30	QP	Neutral	57.85	33.55
1.205	11.00	AV	Neutral	46.00	35.00
0.400	12.60	AV	Neutral	47.85	35.25
0.160	27.70	QP	Live	65.46	37.76
0.160	26.40	QP	Neutral	65.46	39.06
0.160	13.60	AV	Live	55.46	41.86
0.160	12.80	AV	Neutral	55.46	42.66

Plot(s) of Test Data

Plot(s) of Test Data is presented hereinafter as reference.

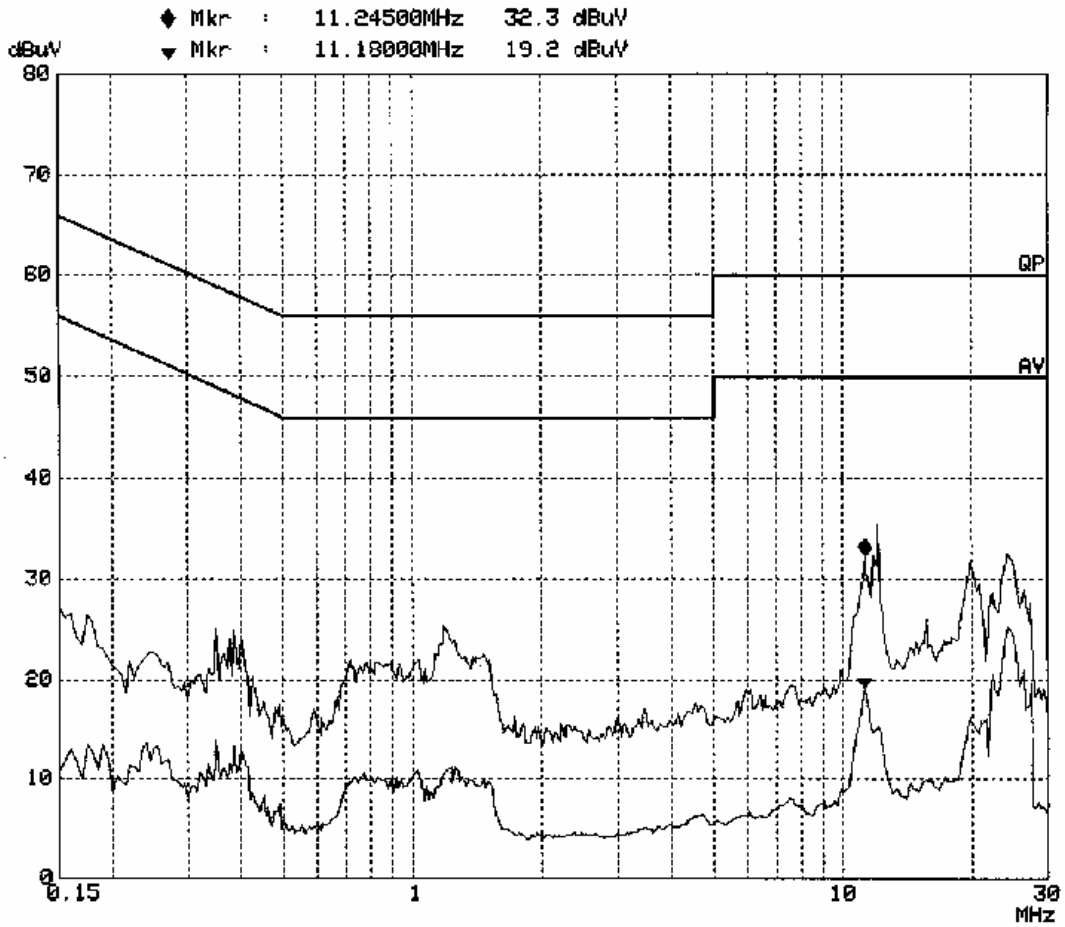
Conducted Distrubance Test
FCC Part 15

EUT:	Wireless Baby Monitor M/N:JY9001
Manuf:	JOYO
Op Cond:	Transmitting channel A
Operator:	Deny
Test Spec:	AC 120V/60Hz L
Comment:	Temp:25'C Humi:56%
Date:	03. Jan 07 13:17



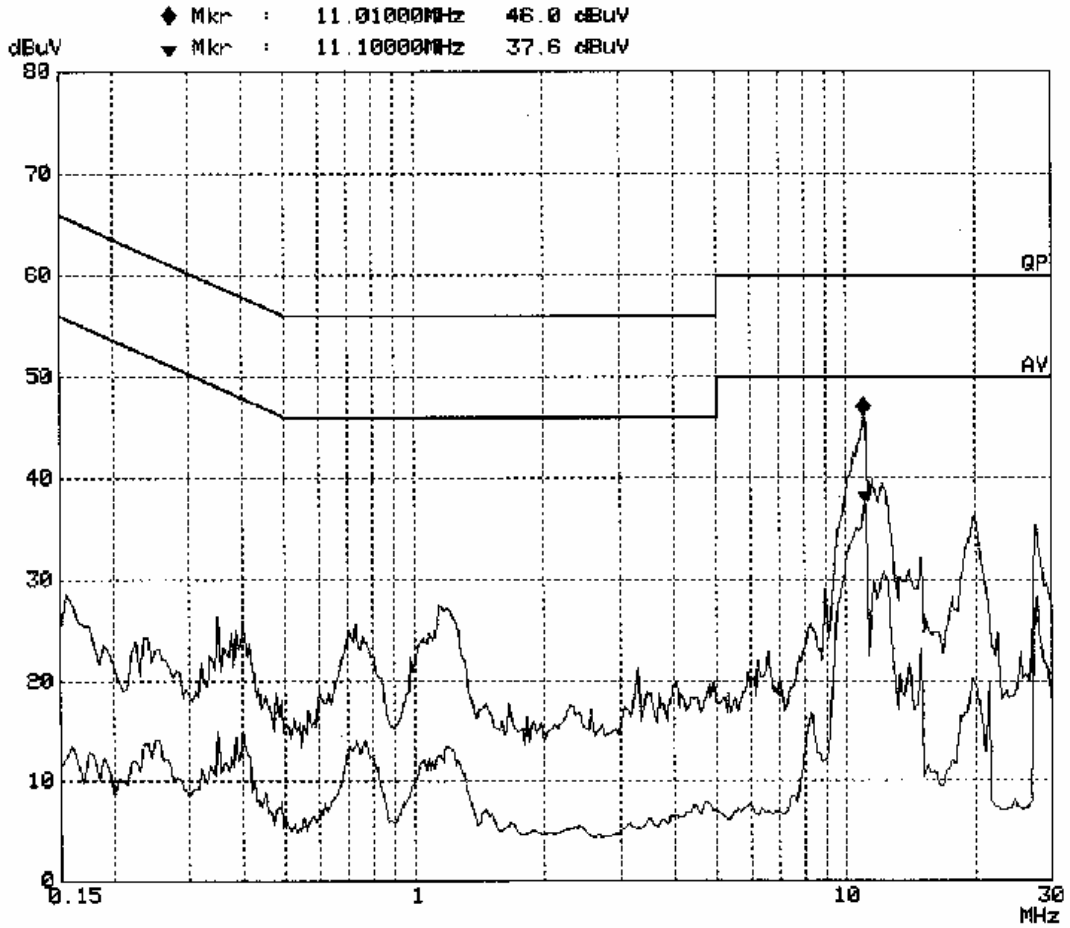
Conducted Distrubance Test
FCC Part 15

EUT: Wireless Baby Monitor M/N:JY9001
Manuf: JOYO
Op Cond: Transmitting channel A
Operator: Deny
Test Spec: AC 120V/60Hz N
Comment: Temp:25'C Humi:56%
Date: 03. Jan 07 13:35



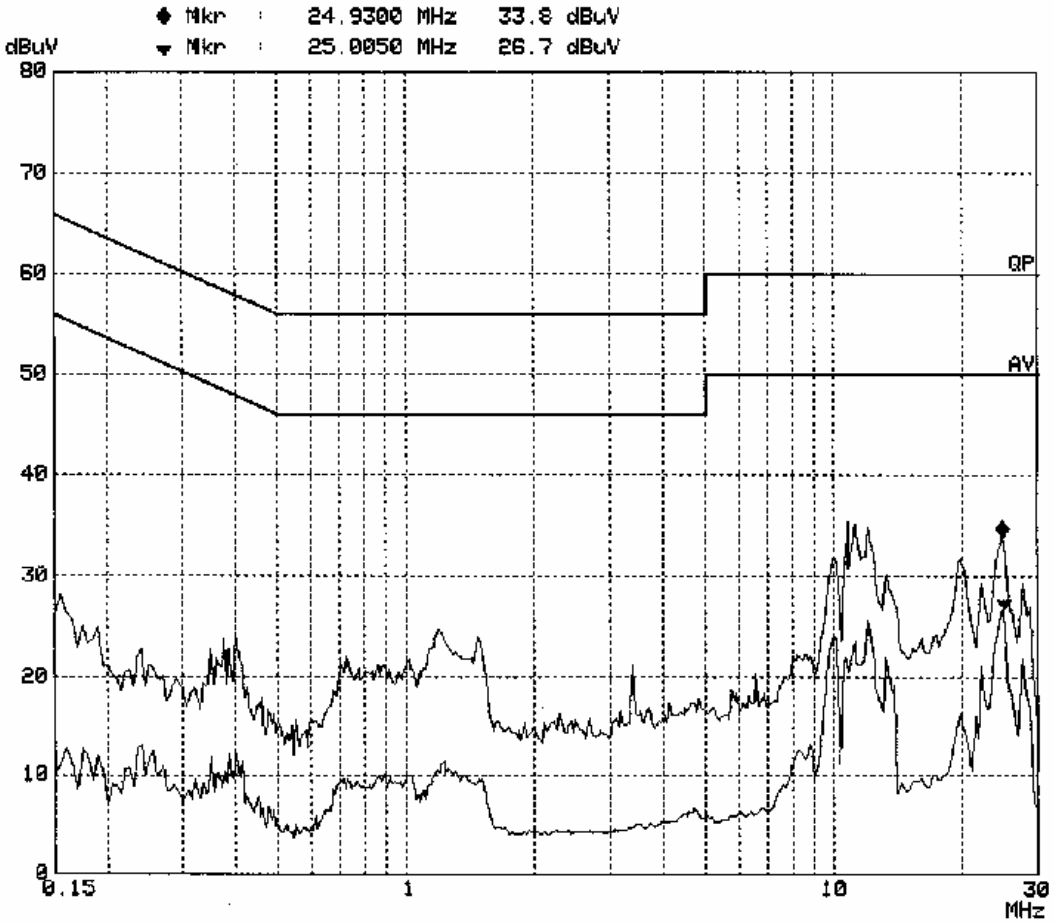
Conducted Distrubance Test
FCC Part 15

EUT:	Wireless Baby Monitor M/N:JY9001
Manuf:	JOYO
Op Cond:	Transmitting channel B
Operator:	Deny
Test Spec:	AC 120V/60Hz L
Comment:	Temp:25'C Humi:56%
Date:	03. Jan 07 14:10



Conducted Distrubance Test
FCC Part 15

EUT: Wireless Baby Monitor M/N:JY9001
Manuf: JOYO
Op Cond: Transmitting channel B
Operator: Deny
Test Spec: AC 120V/60Hz N
Comment: Temp:25'C Humi:56%
Date: 03. Jan 07 13:52



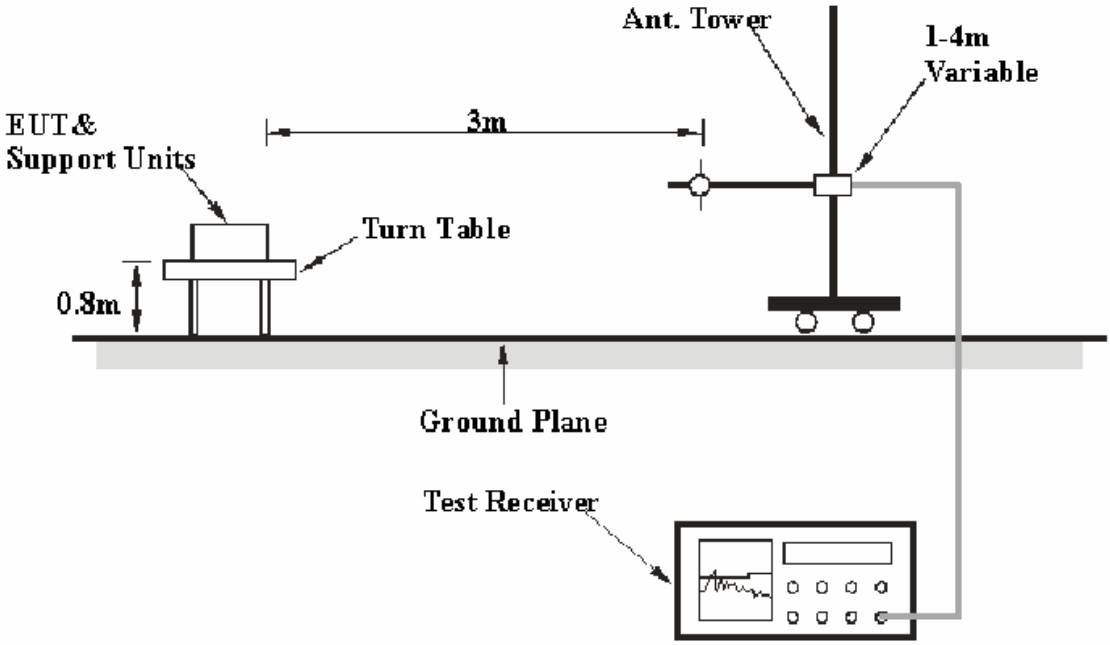
§15.205 §15.209(a) §15.249(a) - RADIATED EMISSION

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 NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Bay Area Compliance Laboratory Corp. (ShenZhen) is ±4.0 dB.

EUT Setup



The radiated emission and out of band emission tests were performed in the 3 meters chamber B, using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC 15.209 and FCC 15.249 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 spacing between the peripherals was 10 cm.

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

EMI Test Receiver Setup

The system was investigated from 30 MHz to 25000 MHz.

During the radiated emission and out of band emission test, the test receiver was set with the following configurations:

Frequency Range	***RBW***	***Video B/W***
30 – 1000 MHz	100 kHz	300 kHz
1000 MHz – 25000 MHz	1MHz	3 MHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2006-09-29	2007-09-29
HP	Amplifier	8447E	1937A01046	2006-11-15	2007-11-15
Sunol Sciences	Bilog Antenna	JB1	A040904-2	2006-08-14	2007-08-14
Agilent	Spectrum Analyzer	8564E	3943A01781	2006-11-22	2007-11-22
HP	Amplifier	8449B	3008A00277	2006-09-29	2007-09-29
Sunol Sciences	Horn Antenna	DRH-118	A052604	2006-07-20	2007-07-20

*** Statement of Traceability:** Bay Area Compliance Laboratory Corp. (ShenZhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

For the radiated emissions test, the adapter was connected to the AC floor outlet.

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

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

Corrected Amplitude & Margin Calculation

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

Corr. Ampl. = Meter Reading + Antenna Loss + 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 - Corr. Ampl.

Test Results Summary

According to the data in the following table, the EUT complied with the FCC Part 15.209 & 15.249, with the worst margin reading of:

Transmitting (Channel A): 0.60 dB at **909.3 MHz** in the **Vertical** polarization.
Transmitting (Channel B): 1.32 dB at **921 MHz** in the **Vertical** polarization.

Test Data

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	53%
ATM Pressure:	1000mbar

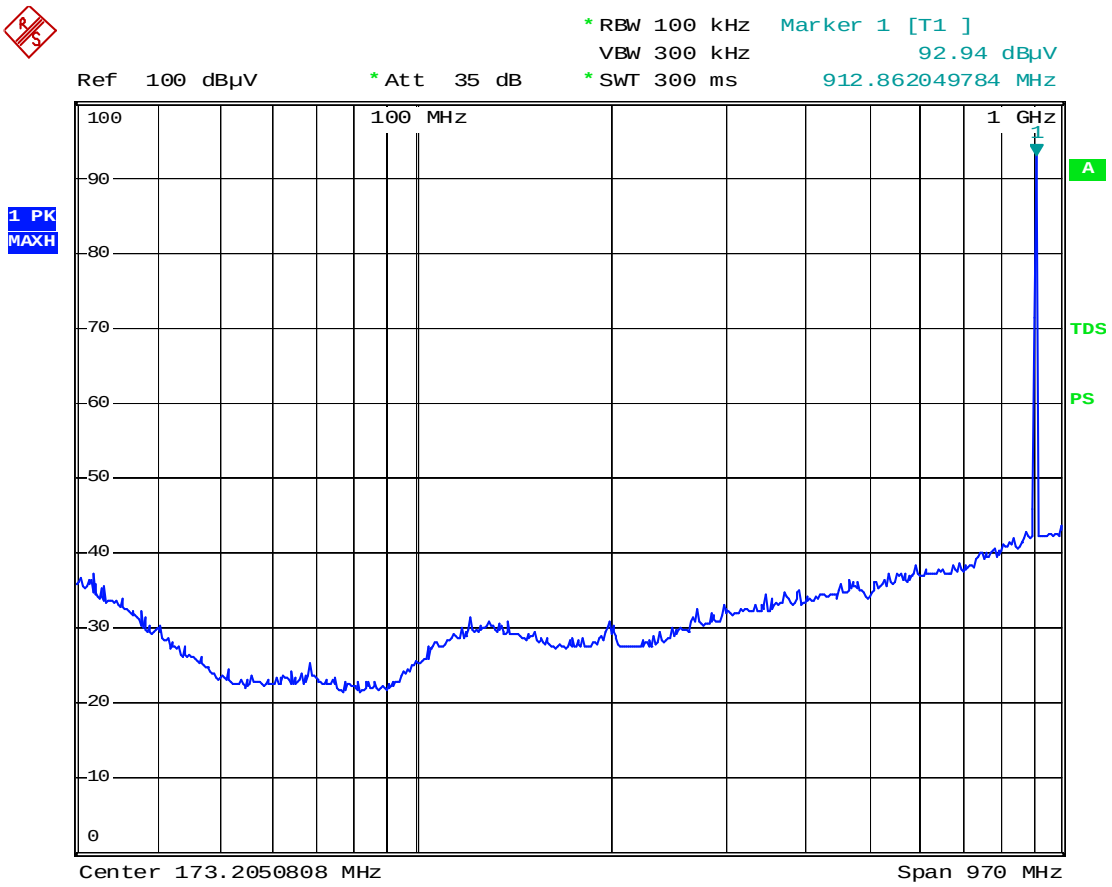
The testing was performed by Deny Xiong on 2007-01-05.

Test Mode: Transmitting

Frequency (MHz)	Meter Reading dBuV/m	Detector PK/ AV	Direction Degree	Height Meter	Polar H / V	Antenna Factor (dB/m)	Cable loss (dB)	Amplifier Gain dB	Corr. Ampl. dBuV/m	FCC Part 15.209 & 15.249		
										Limit dBuV/m	Margin (dB)	Comment
Channel A												
909.3	91.14	QP	20	1.2	V	22.8	5.96	26.5	93.40	94	0.60*	Fundamental
909.3	90.34	QP	263	1.4	H	22.8	5.96	26.5	92.60	94	1.40*	Fundamental
1818	53.17	AV	270	1.6	H	27.1	2.82	35.0	48.09	54	5.91	Harmonic
1818	51.0	AV	156	1.5	V	27.1	2.82	35.0	45.92	54	8.08	Harmonic
574.4	40.25	QP	145	1.4	V	19.2	4.40	27.1	36.75	46	9.25	Spurious
129.1	41.56	QP	204	1.4	V	14.5	1.69	26.6	31.15	43.5	12.35	Spurious
34.28	33.13	QP	35	1.7	V	18.2	1.15	26.8	25.68	40	14.32	Spurious
34.27	30.93	QP	153	1.6	H	18.2	1.15	26.8	23.48	40	16.52	Spurious
2727	38.57	AV	261	1.0	H	28.5	3.61	35.0	35.68	54	18.32	Harmonic
1818	58.67	PK	156	1.5	V	27.1	2.82	35.0	53.59	74	20.41	Harmonic
2727	36.33	AV	258	1.2	V	28.5	3.61	35.0	33.44	54	20.56	Harmonic
1818	58.33	PK	49	1.2	H	27.1	2.82	35.0	53.25	74	20.75	Harmonic
489.2	31.54	QP	268	1.5	H	16.2	4	27.1	24.64	46	21.36	Spurious
199.28	33.12	QP	268	1.6	H	10.4	2.35	26.0	19.87	43.5	23.63	Spurious
2727	49.33	PK	180	1.3	H	28.5	3.61	35.0	46.44	74	27.56	Harmonic
2727	48.33	PK	258	1.2	V	28.5	3.61	35.0	45.44	74	28.56	Harmonic

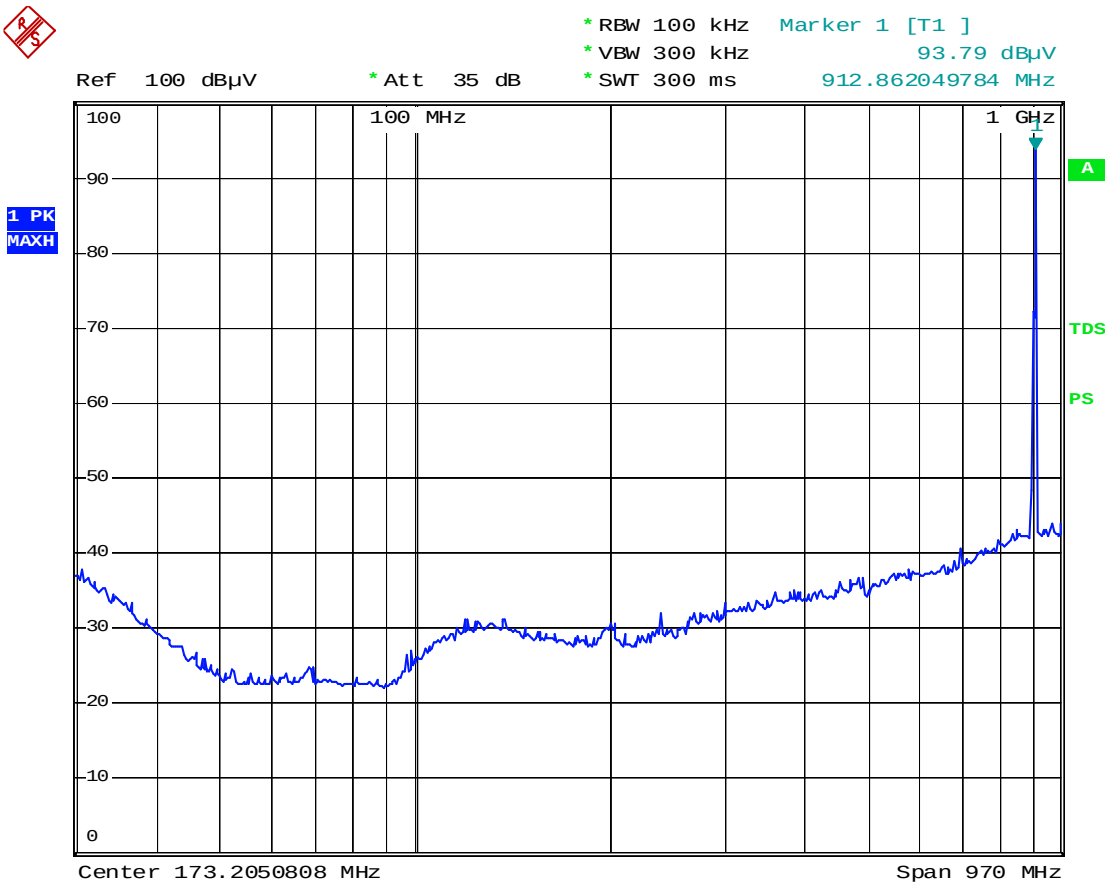
Frequency (MHz)	Meter Reading dBuV/m	Detector PK/ AV	Direction Degree	Height Meter	Polar H / V	Antenna Factor (dB/m)	Cable loss (dB)	Amplifier Gain dB	Corr. Ampl. dBuV/m	FCC Part 15.209 & 15.249		
										Limit dBuV/m	Margin (dB)	Comment
Channel B												
921	90.42	QP	18	1.6	V	22.8	5.96	26.5	92.68	94	1.32*	Fundamental
921	88.63	QP	45	1.0	H	22.8	5.96	26.5	90.89	94	3.11*	Fundamental
35.4	42.59	QP	156	1.5	H	18.2	1.15	26.8	35.14	40	4.86	Spurious
36.5	41.48	QP	148	1.8	V	18.2	1.15	26.8	34.03	40	5.97	Spurious
1818	51.42	AV	156	1.4	H	27.1	2.82	35.0	46.34	54	7.66	Harmonic
1818	50.40	AV	258	1.3	V	27.1	2.82	35.0	45.32	54	8.68	Harmonic
407.5	42.45	QP	156	1.6	H	16.3	3.55	26.5	35.8	46	10.20	Spurious
468.2	41.12	QP	23	1.4	V	17.5	3.88	27.1	35.4	46	10.60	Spurious
133.6	42.39	QP	21	1.4	H	14.2	1.69	26.6	31.68	43.5	11.82	Spurious
128.1	41.21	QP	256	1.7	V	14.5	1.69	26.6	30.8	43.5	12.70	Spurious
2727	41.57	AV	238	1.8	H	28.5	3.61	35.0	38.68	54	15.32	Harmonic
2727	41.20	AV	146	1.5	V	28.5	3.61	35.0	38.31	54	15.69	Harmonic
1818	57.28	PK	258	1.3	V	27.1	2.82	35.0	52.20	74	21.80	Harmonic
1818	56.28	PK	156	1.4	H	27.1	2.82	35.0	51.20	74	22.80	Harmonic
2727	46.33	PK	238	1.8	H	28.5	3.61	35.0	43.44	74	30.56	Harmonic
2727	45.37	PK	146	1.5	V	28.5	3.61	35.0	42.48	74	31.52	Harmonic

* Within measurement uncertainty.



M/N:JY9001 Transmitting channel A Horizontal

Date: 5.JAN.2007 07:31:41



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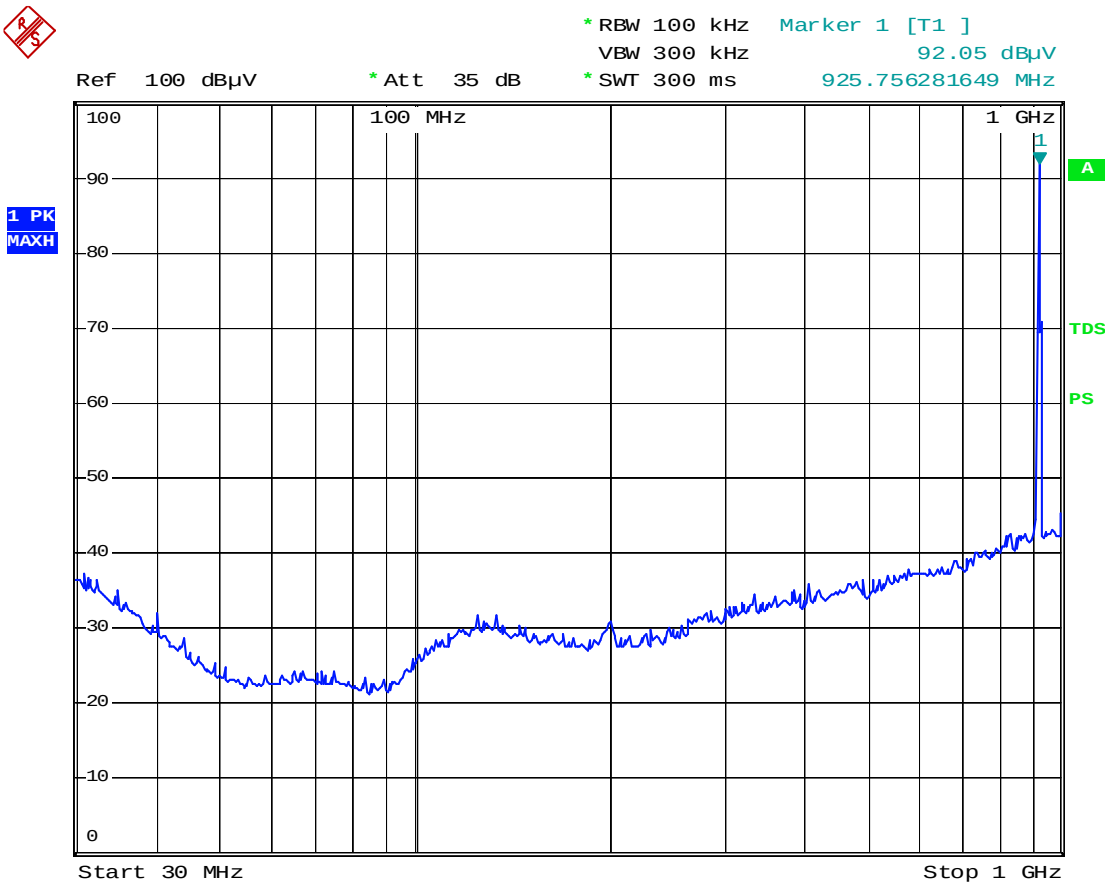

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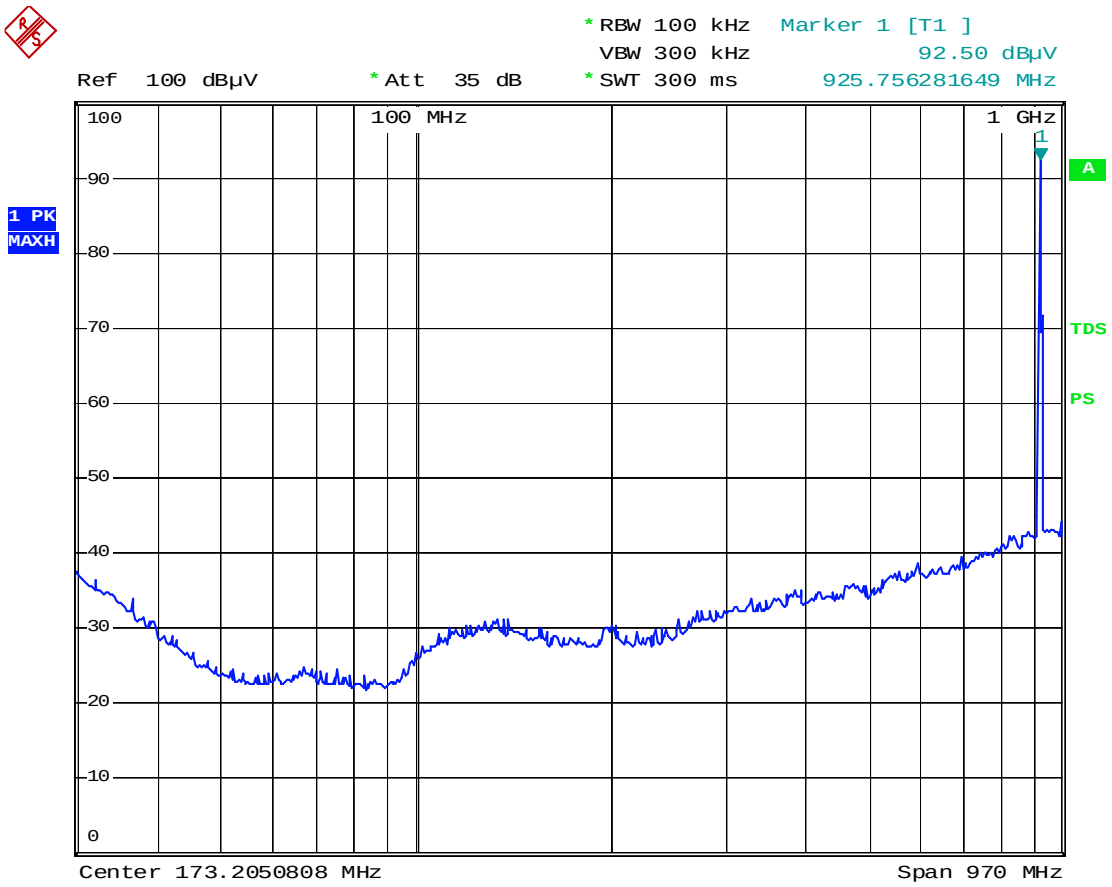


M/N:JY9001 Transmitting channel B Vertical

Date: 5.JAN.2007 07:36:06

§15.249(d) – OUT OF BAND EMISSION

Standard Applicable

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.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	Spectrum Analyzer	8564E	3943A01781	2006-11-22	2007-11-22

*** Statement of Traceability:** Bay Area Compliance Laboratory Corp. (ShenZhen) Corp. attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

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 its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100kHz bandwidth from band edge.
4. 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.
5. Repeat above procedures until all measured frequencies were complete.

Test Data

Environmental Conditions

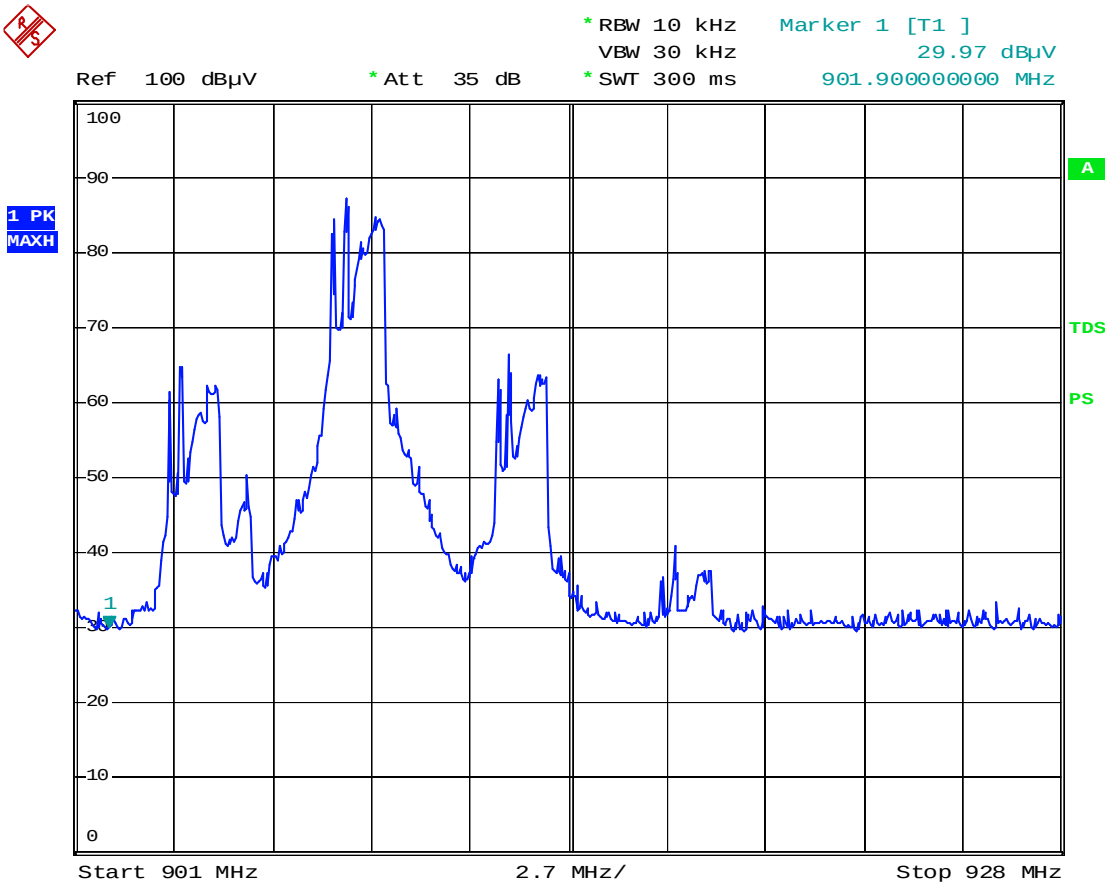
Temperature:	25 °C
Relative Humidity:	55%
ATM Pressure:	1016mbar

The testing was performed by Deny Xiong on 2007-01-05.

Test Result: Pass

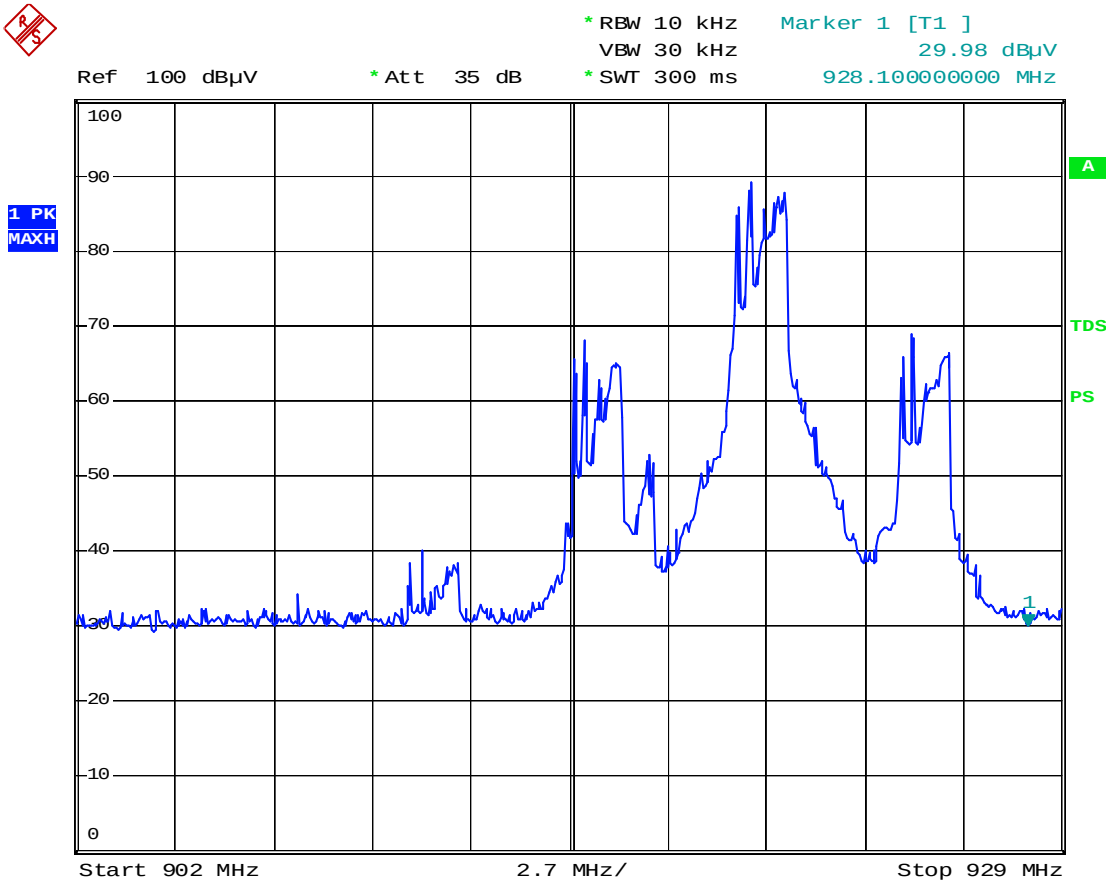
Test Mode: Transmitting

Frequency (MHz)	Emission Level (dBµV/m)	Limit (dBµV/m)	Result
901.9	29.97	46	Pass
928.1	29.98	46	Pass



M/N:JY9001 Bandedge1

Date: 5.JAN.2007 07:33:14



M/N:JY9001 bandedge2

Date: 5.JAN.2007 07:40:14