



NVLAP LAB CODE 200707-0



FCC PART 15.239
MEASUREMENT AND TEST REPORT

For

Power 7 Technology Corp.

2F, No. 176, Jian-Yi Road, Chung-Ho City, Taipei Hsien, Taiwan

FCC ID: TQN0901JC100

Report Type: Original Report	Product Type: Jensen Bluetooth / FM Transmitter
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Report Number: RSZ09010802-15.239	
Report Date: 2009-03-04	
Reviewed By: EMC Manager	<i>Green Xu</i>
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* This report may contain data that are not covered by the NVLAP accreditation and are marked with an asterisk "*" (Rev.2)

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The *Power 7 Technology Corp.*'s product, *FCC ID: TQN0901JC100* model: *JC100* or the "EUT" as referred to in this report is a *Jensen Bluetooth / FM Transmitter* which measures approximately 8.5 cm L x 8.5 cm W x 14.6 cm H, rated input voltage: DC 12V/24V power supply.

Technical Specification:

FM Transmitter		
1	Operating Frequency Band	88.1~107.9 MHz
2	Channel Step	100 kHz
3	Output power	48dBμV@3m
4	Antenna	Wire
5	Antenna Gain	0dBi

Bluetooth		
1	Bluetooth specification	V2.
2	Operating Frequency Band	2.4 - 2.4835 GHz
3	Output power class 2	Class 2
4	Modulation	GFSK
5	Crystal	26 MHz
6	Transmitter Power	4dBm max
7	Antenna	PCB Layout
8	Antenna Gain	0dBi
9	Bluetooth function range	10m Max.

** All measurement and test data in this report was gathered from production sample serial number: 0901018 (Assigned by BACL, Shenzhen). The EUT was received on 2009-01-08.*

Objective

This report is prepared on behalf of *Power 7 Technology Corp.* in accordance with FCC Part 15, Subpart C, section 15.203, 15.205, 15.207, 15.209, and 15.239 rules.

Related Submittal(s)/Grant(s)

FCC ID: TQN0901JC100, Part15.247 submission of Bluetooth portion.

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 Laboratories 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 Laboratories 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 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 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 Laboratories 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/Standards/scopes/2007070.htm>

SYSTEM TEST CONFIGURATION

Justification

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

Equipment Modifications

No modification was made to the unit tested.

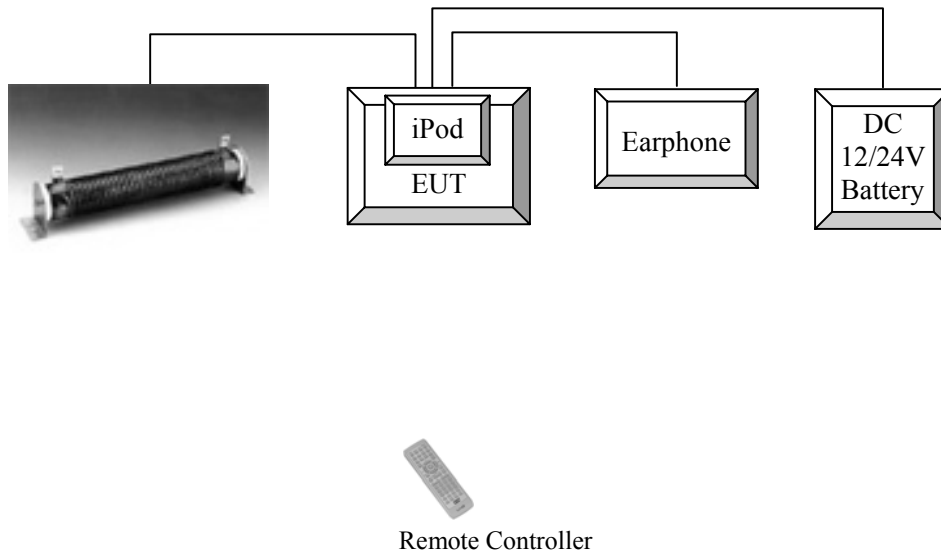
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
/	Load	50W8RJ	/	N/A
Ipod	Ipod	A1136	4J550056TXL	N/A

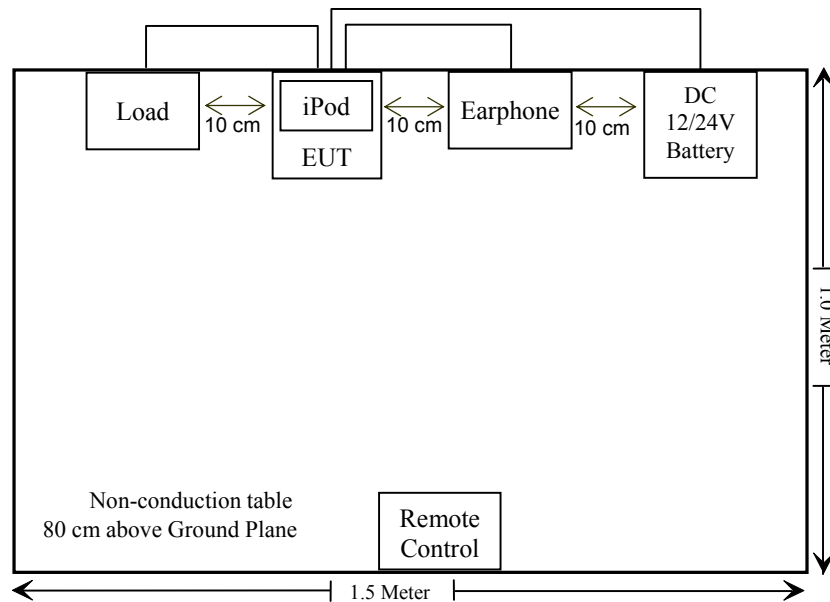
External I/O Cable

Cable Description	Length (m)	From Port	To
Unshielded Detachable DC Cable	0.5	EUT	Carkit
Unshielded Detachable DC Cable with a core	0.5	EUT	Load

Configuration of Test Setup



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Test Result
§15.203	Antenna Requirement	Compliant
§15.207	Conducted Emissions	N/A *
§15.205, §15.209, §15.239	Radiated Emissions	Compliant
§15.239 (a)	Band Edges	Compliant
§15.239 (a)	Emission Bandwidth	Compliant

Note: 12V/24V DC power operation.

§15.203 - ANTENNA REQUIREMENT

Applicable Standard

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

Antenna Connector Construction

The EUT has permanently wire antenna, the maximum antenna gain is 0 dBi, which, in accordance to the above section, is considered sufficient to comply with the provision of this section, please see EUT photo for details.

Result: Compliance.

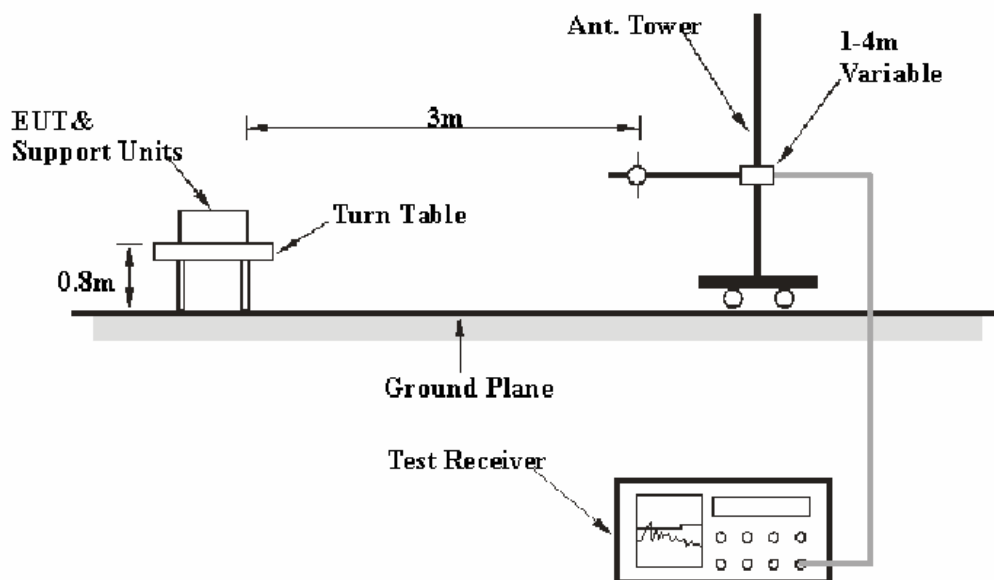
§15.205, §15.209, §15.239- RADIATED EMISSIONS

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 Laboratories Corp. (Shenzhen) is ± 4.0 dB.

EUT Setup



The radiated emission tests were performed in the 3 meters chamber B test site, using the setup accordance with the ANSI C63.4 - 2003. The specification used was the FCC Part 15.209 and FCC Part 15.239.

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

EMI Test Receiver Setup

The system was investigated from 30 MHz to 1000 MHz.

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

<i>Frequency Range</i>	<i>RBW</i>	<i>VBW</i>
30 – 1000 MHz	100 kHz	300 kHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	8447E	1937A01046	2008-11-15	2009-11-15
Rohde & Schwarz	EMI Test Receiver	ESCI	100224	2008-11-07	2009-11-06
Sunol Sciences	Bilog Antenna	JB1	A040904-2	2008-04-12	2009-04-12
HP	Amplifier	8449B	3008A00277	2008-09-29	2009-09-29
Sunol Sciences	Horn Antenna	DRH-118	A052604	2008-09-25	2009-09-25
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2008-05-09	2009-05-09

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed per the NVLAP requirements, traceable to NIST.

Test Procedure

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

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:

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

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 5.8dB means the emission is 5.8dB below the limit. The equation for margin calculation is as follows:

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

Test Results Summary

According to the data in the following table, the EUT complied with the FCC Part 15.209 and 15.239, with the worst margin reading of:

Below 1 GHz (DC 12V):

17.2 dB at 187.625120 MHz in the Horizontal polarization, Low Channel.
13.2 dB at 196.130350 MHz in the Horizontal polarization, Middle Channel.
13.0 dB at 215.740975 MHz in the Horizontal polarization, High Channel.

Below 1 GHz (DC 24V):

15.8 dB at 176.170525 MHz in the Horizontal polarization, Low Channel.
13.2 dB at 196.124125 MHz in the Horizontal polarization, Middle Channel.
8.1 dB at 215.718625 MHz in the Horizontal polarization, High Channel.

Above 1 GHz (Worst-Case):

23.45 dB at 1076.2 MHz in the Horizontal polarization, Low Channel.
22.06 dB at 1354.7 MHz in the Horizontal polarization, Middle Channel.
21.95 dB at 1354.7 MHz in the Horizontal polarization, High Channel.

Test Data

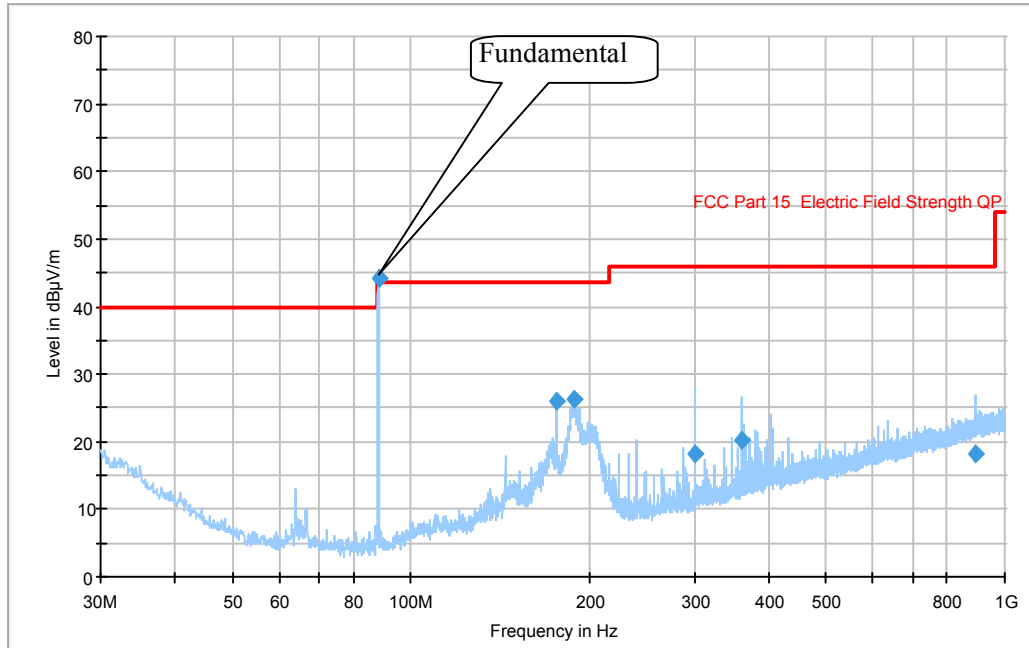
Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	56%
ATM Pressure:	100.2 kPa

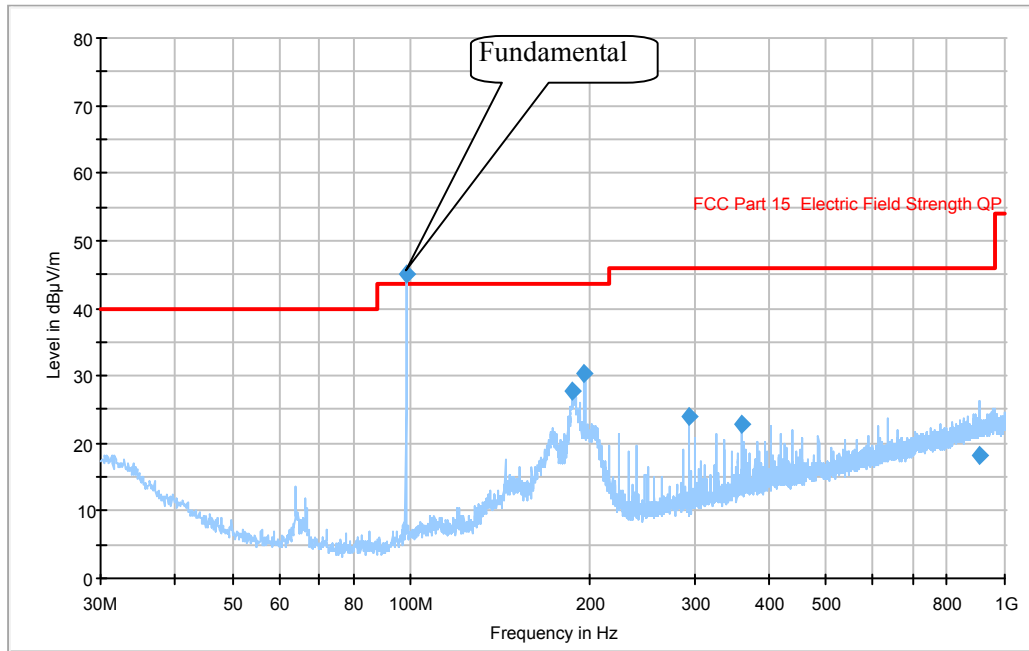
The testing was performed by Alvin Huang on 2009-02-18.

Below 1 GHz (DC 12V):

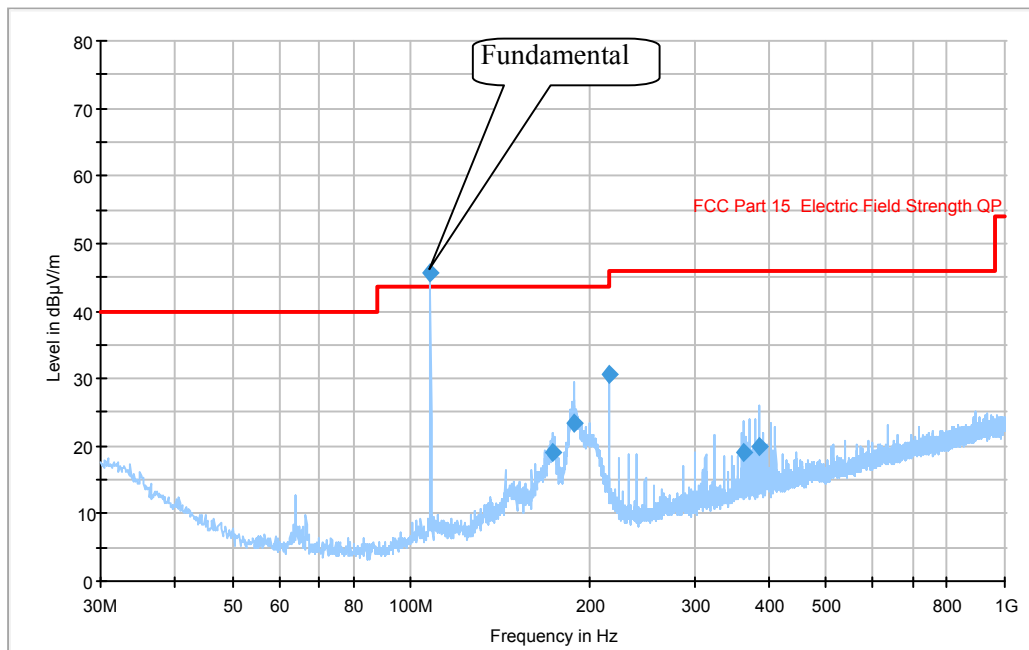
Low Channel (f = 88.1 MHz)



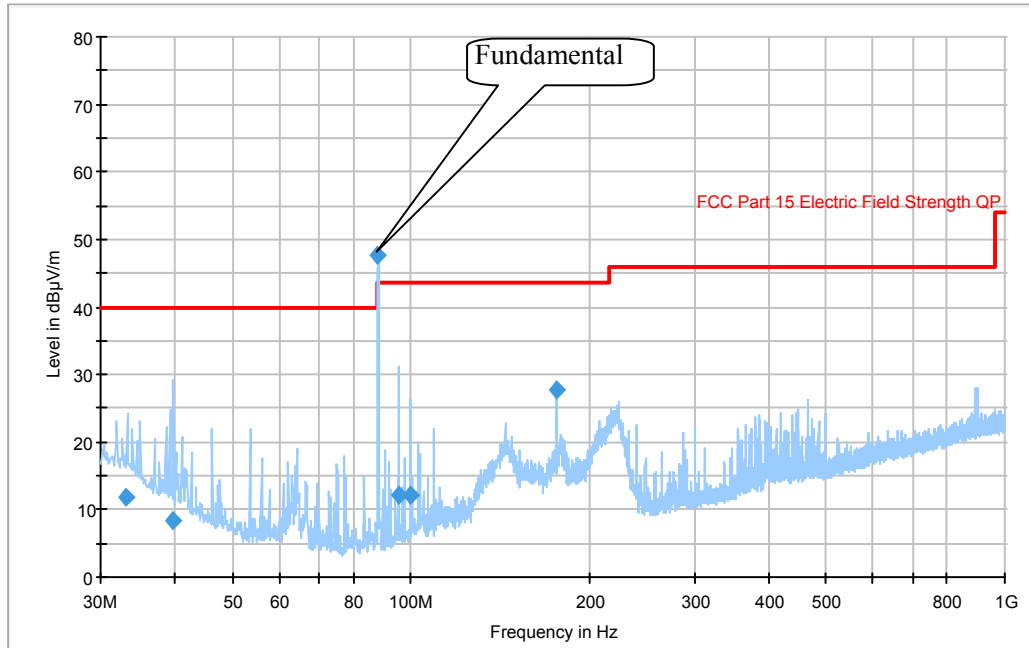
Frequency (MHz)	Corrected Amplitude (dBμV/m)	Ant. Height (cm)	Ant. Polarity (H/V)	Turntable Position (deg)	Correction Factor (dB)	Limit (dBμV/m)	Margin (dB)
187.625120	26.3	163.0	H	360.0	-17.2	43.5	17.2
176.137450	26.0	154.0	H	344.0	-17.5	43.5	17.5
359.982825	20.4	174.0	V	0.0	-12.9	46.0	25.6
300.451325	18.3	102.0	H	81.0	-14.6	46.0	27.7
894.632725	18.1	399.0	V	343.0	-3.9	46.0	27.9

Middle Channel (f = 98.1 MHz)

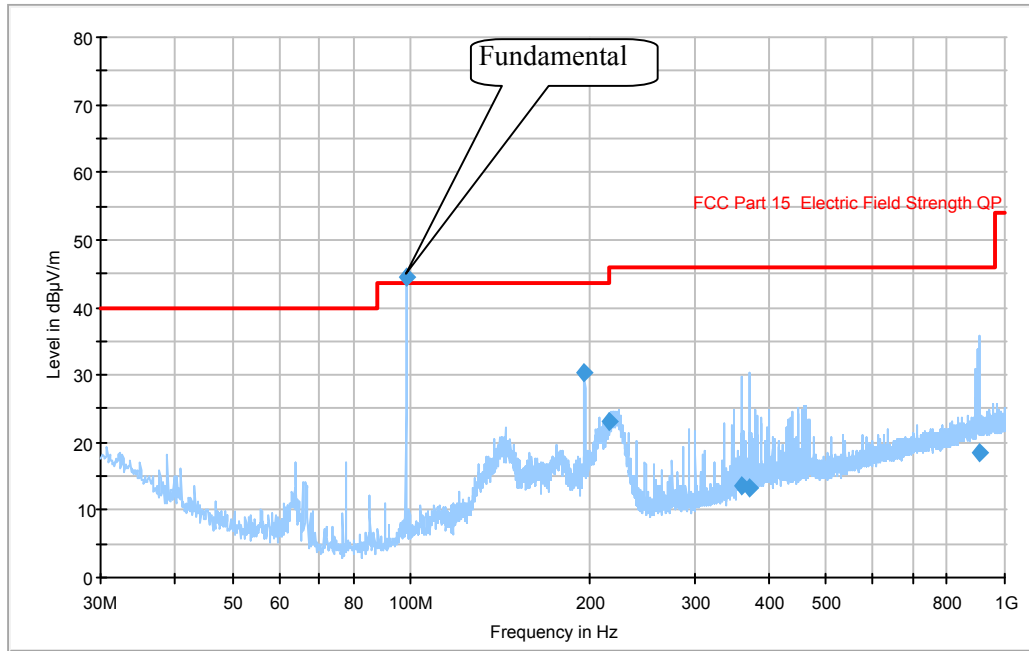
Frequency (MHz)	Corrected Amplitude (dBμV/m)	Ant. Height (cm)	Ant. Polarity (H/V)	Turntable Position (deg)	Correction Factor (dB)	Limit (dBμV/m)	Margin (dB)
196.130350	30.3	196.0	H	0.0	-17.3	43.5	13.2
187.382500	27.7	126.0	H	136.0	-17.2	43.5	15.8
294.203750	24.0	186.0	H	360.0	-14.6	46.0	22.0
359.921250	22.9	212.0	H	98.0	-12.9	46.0	23.1
905.505975	18.3	306.0	V	103.0	-3.6	46.0	27.7

High Channel (f = 107.9 MHz)

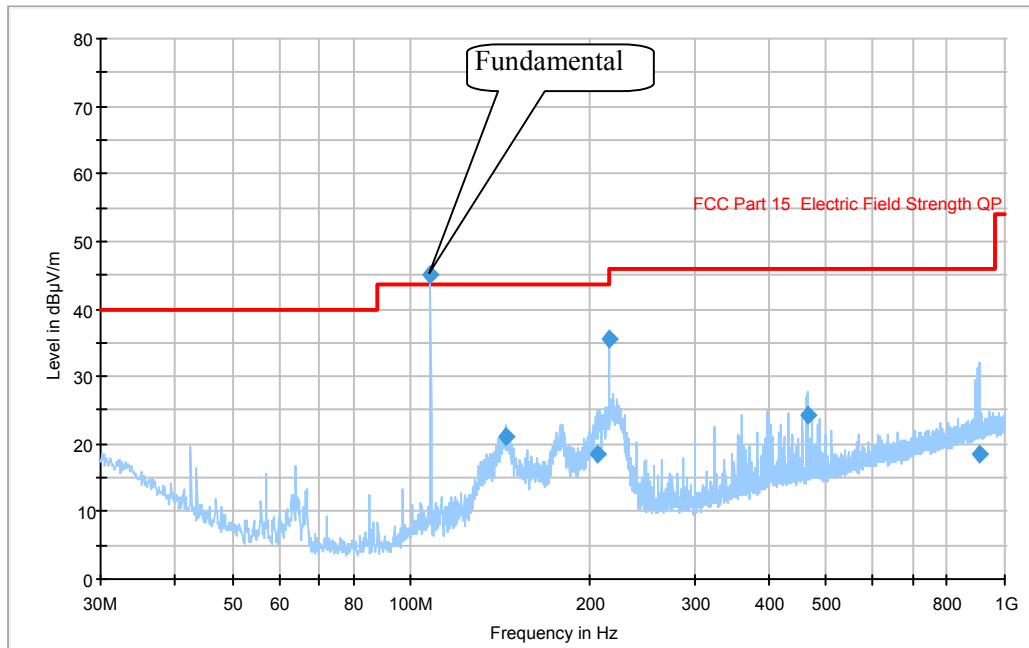
Frequency (MHz)	Corrected Amplitude (dBμV/m)	Ant. Height (cm)	Ant. Polarity (H/V)	Turntable Position (deg)	Correction Factor (dB)	Limit (dBμV/m)	Margin (dB)
215.740975	30.5	168.0	H	348.0	-17.3	43.5	13.0
187.616500	23.5	133.0	H	24.0	-18.0	43.5	20.0
172.832169	19.2	156.0	H	128.0	-17.8	43.5	24.3
385.626231	20.0	201.0	H	18.0	-12.9	46.0	26.0
362.836415	19.0	136.0	H	360.0	-12.8	46.0	27.0

Below 1GHz (DC 24V):**Low Channel (f = 88.1 MHz)**

Frequency (MHz)	Corrected Amplitude (dBμV/m)	Ant. Height (cm)	Ant. Polarity (H/V)	Turntable Position (deg)	Correction Factor (dB)	Limit (dBμV/m)	Margin (dB)
176.170525	27.7	243.0	H	3.0	-17.5	43.5	15.8
33.171600	11.9	384.0	V	225.0	-10.7	40.0	28.1
99.537775	12.2	378.0	H	91.0	-20.3	43.5	31.3
39.657375	8.5	106.0	V	241.0	-15.2	40.0	31.5
95.689650	12.0	369.0	H	295.0	-21.0	43.5	31.5

Middle Channel (f = 98.1 MHz)

Frequency (MHz)	Corrected Amplitude (dBμV/m)	Ant. Height (cm)	Ant. Polarity (H/V)	Turntable Position (deg)	Correction Factor (dB)	Limit (dBμV/m)	Margin (dB)
196.124125	30.3	170.0	H	0.0	-17.3	43.5	13.2
215.976200	23.2	167.0	H	357.0	-17.2	43.5	20.3
905.532875	18.5	309.0	H	0.0	-3.6	46.0	27.5
359.776125	13.7	166.0	V	283.0	-12.9	46.0	32.3
370.938325	13.2	264.0	H	14.0	-12.9	46.0	32.8

High Channel (f = 107.9 MHz)

Frequency (MHz)	Corrected Amplitude (dBμV/m)	Ant. Height (cm)	Ant. Polarity (H/V)	Turntable Position (deg)	Correction Factor (dB)	Limit (dBμV/m)	Margin (dB)
215.718625	35.4	177.0	H	0.0	-17.3	43.5	8.1
464.494625	24.3	134.0	V	207.0	-11.0	46.0	21.7
143.975236	21.0	136.0	V	136.0	-18.6	43.5	22.5
206.001650	18.6	165.0	H	172.0	-17.2	43.5	24.9
905.529525	18.4	400.0	H	48.0	-3.6	46.0	27.6

Field Strength of Fundamental:

Frequency (MHz)	Meter Reading (dBμV)	Detector (PK/AV)	Table Direction Degree	Test Antenna			Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	FCC Part 15.239	
				Height (m)	Polar (H/V)	Factor (dB/m)				Limit (dBμV/m)	Result
88.1	65.76	PK	105	1.2	V	5.5	0.44	25.9	45.8	68	Pass
88.1	64.16	AV	360	1.1	V	5.5	0.44	25.9	44.2	48	Pass
98.1	64.53	PK	0	1.3	V	6.6	0.47	25.8	45.8	68	Pass
98.1	63.63	AV	197	1.2	V	6.6	0.47	25.8	44.9	48	Pass
107.9	60.48	PK	36	1.4	V	10.9	0.52	25.7	46.2	68	Pass
107.9	59.28	AV	263	1.2	V	10.9	0.52	25.7	45.0	48	Pass

Note: Measured at 3 meter.

Above 1 GHz:**Spurious Emission:**

Frequency (MHz)	S.A. Reading (dBμV)	Detector (PK/AV)	Table Direction Degree	Test Antenna			Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	FCC Part15.239/15.209		
				Height (m)	Polar (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	Remarks
Low Channel 88.1 MHz												
1076.2	35.67	AV	360	1.7	H	25.1	4.78	35	30.55	54	23.45	Spurious
1126.3	35.56	AV	90	1.3	V	24.5	5	34.9	30.16	54	23.84	Spurious
1126.3	48.66	PK	276	1.2	V	24.5	5	34.9	43.26	74	30.74	Spurious
1076.2	48.25	PK	360	1.6	H	25.1	4.78	35	43.13	74	30.87	Spurious
Middle Channel 98.1 MHz												
1354.7	35.89	AV	0	1.6	H	25.5	5.25	34.7	31.94	54	22.06	Spurious
1131.5	35.89	AV	98	1.1	V	24.5	5.00	34.9	30.49	54	23.51	Spurious
1354.7	48.97	PK	180	1.6	H	25.5	5.25	34.7	45.02	74	28.98	Spurious
1131.5	48.23	PK	169	1.2	V	24.5	5.00	34.9	42.83	74	31.17	Spurious
High Channel 107.9 MHz												
1354.7	36.00	AV	0	1.5	H	25.5	5.25	34.7	32.05	54	21.95	Spurious
1137.9	36.11	AV	0	1.1	V	24.5	5.00	34.9	30.71	54	23.29	Spurious
1354.7	49.35	PK	360	1.6	H	25.5	5.25	34.7	45.4	74	28.6	Spurious
1137.9	49.63	PK	0	1.2	V	24.5	5.00	34.9	44.23	74	29.77	Spurious

§15.239(a) – BAND EDGES

Standard applicable

Emissions from the intentional radiator shall be confined within a band 200 kHz wide centered on the operating frequency. The 200 kHz band shall lie wholly within the frequency range of 88–108 MHz.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100224	2008-11-07	2009-11-06
HP	Amplifier	8447E	1937A01046	2008-11-15	2009-11-15
Sunol Sciences	Bilog Antenna	JB1	A040904-2	2008-08-14	2009-08-14

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed per the NVLAP requirements, traceable to NIST.

Test Procedure

With the EUT's antenna attached, the EUT's radiated emission power was received by the test antenna which was connected to the spectrum analyzer with the START and STOP frequencies set to the EUT's operation band.

Test Data

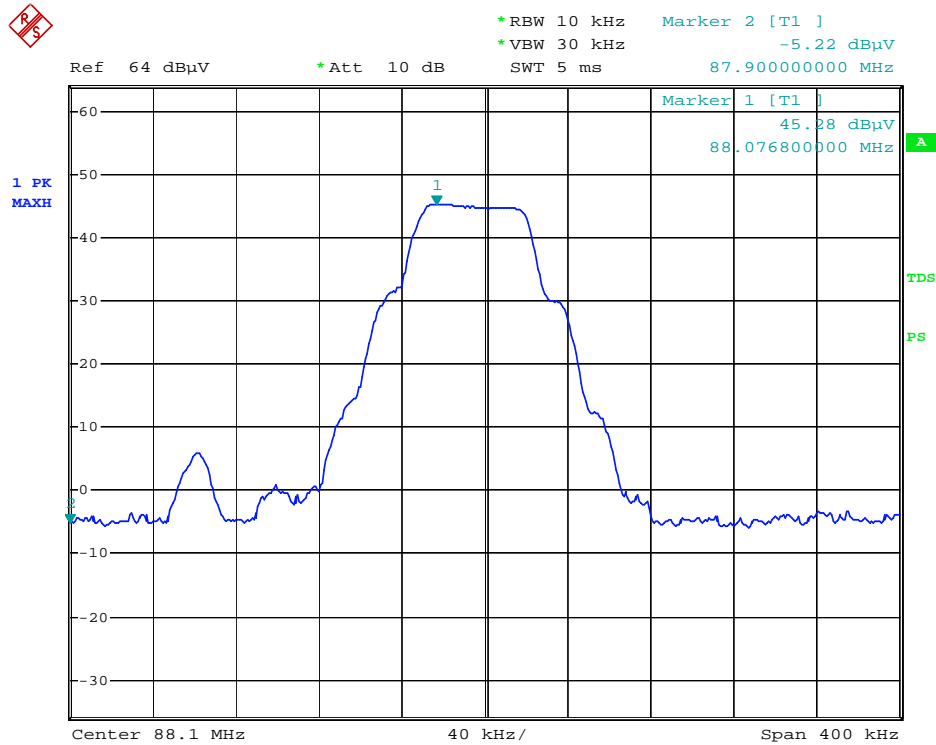
Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	56%
ATM Pressure:	100.2kPa

The testing was performed by Alvin Huang on 2009-02-19.

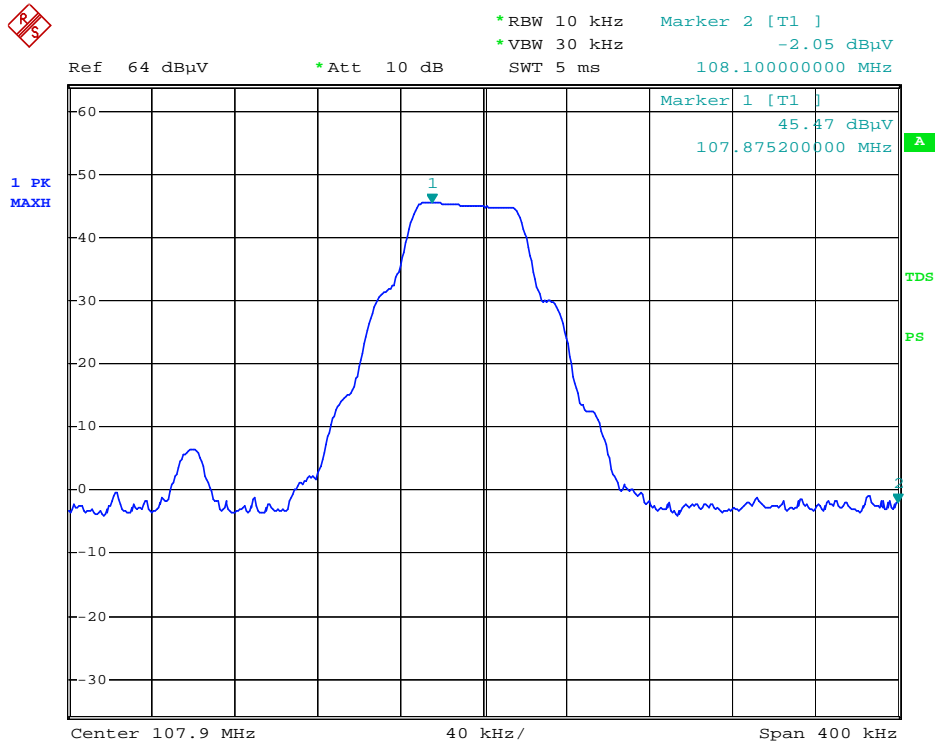
Note: The EUT has been verified the operation range. It turns in 88 MHz to 108 MHz range.

Lowest Channel



bandedges left

Date: 19.FEB.2009 20:39:51

Highest Channel

bandedges right

Date: 19.FEB.2009 20:43:33

§15.239(A) – EMISSION BANDWIDTH

Standard applicable

Emissions from the intentional radiator shall be confined within a band 200 kHz wide centered on the operating frequency. The 200 kHz band shall lie wholly within the frequency range of 88–108 MHz.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
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Test Data

Environmental Conditions

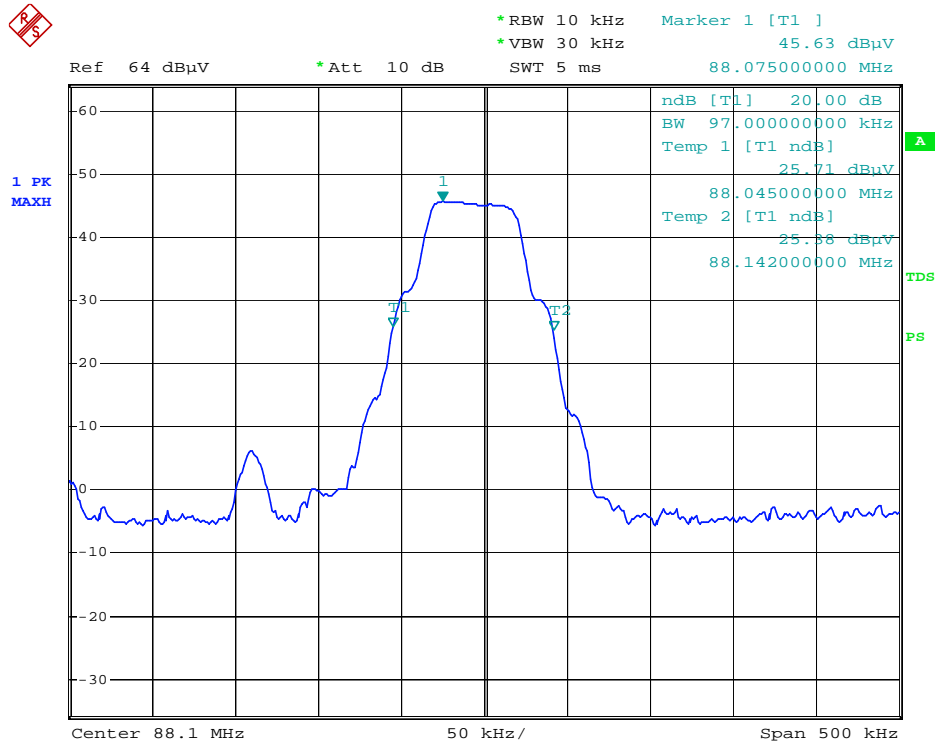
Temperature:	25 ° C
Relative Humidity:	56 %
ATM Pressure:	100.2kPa

The testing was performed by Alvin Huang on 2009-02-19.

Please refer to the following table and plots.

Channel	Frequency (MHz)	20 dB Bandwidth (kHz)
Low	88.1	97
Middle	98.1	98
High	107.9	95

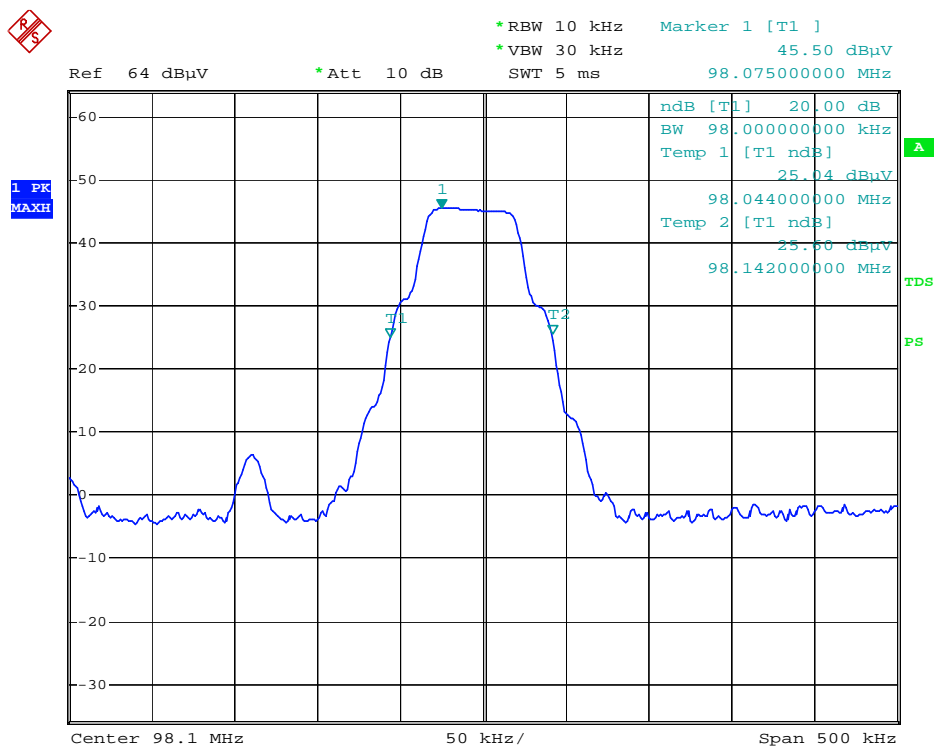
Low Channel



low channel

Date: 19.FEB.2009 20:35:18

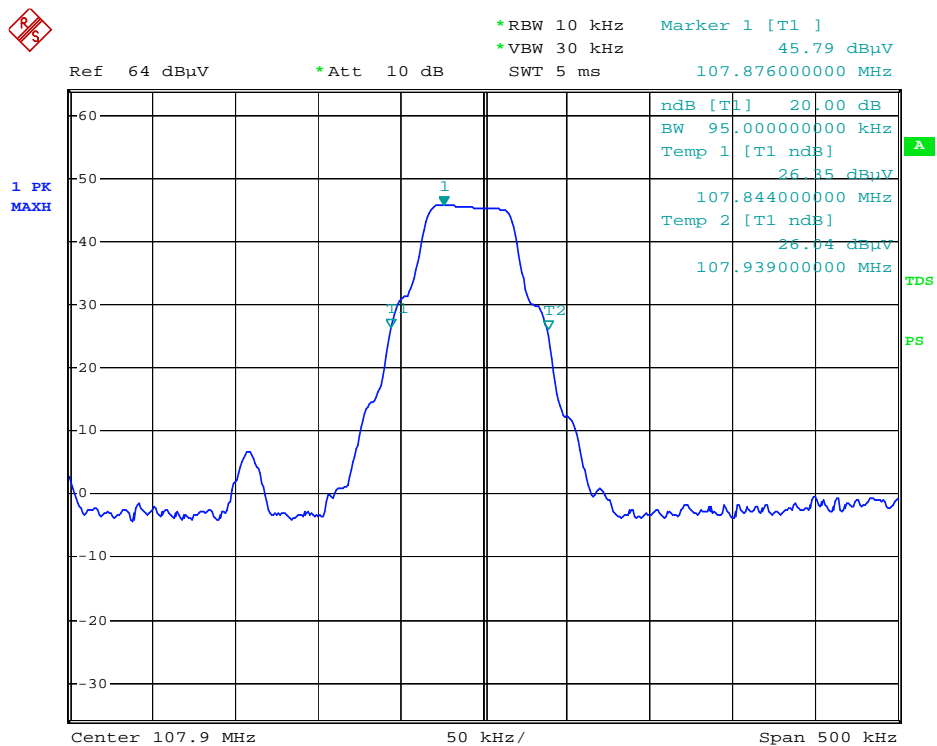
Middle Channel



middle channel

Date: 19.FEB.2009 20:31:09

High Channel



high channel

Date: 19.FEB.2009 20:44:35

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