



NVLAP LAB CODE 200707-0



FCC PART 15.239

MEASUREMENT AND TEST REPORT

For

Uniconcept Asia Limited

4/F, Fook Cheong Building, 63 Hoi Yuen Road, Kwun Tong, Kowloon, Hong Kong

FCC ID: VPDU092007FT

This Report Concerns: <input checked="" type="checkbox"/> Original Report		Equipment Type: CAPDASE JOYSTICK FM Transmitter	
Test Engineer:	David Zhang <i>David Zhang</i>		
Report No.:	RSZ07080101		
Test Date:	2007-09-26 to 2007-09-27		
Report Date:	2007-10-15		
Reviewed By:	EMC Manager: Boni Baniqued <i>Boni Baniqued</i>		
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Note: This test report is for the customer shown above and their specific product only. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratory Corp. (Shenzhen). This report **must not** be used by the customer to claim product certification, approval, or endorsement by NVLAP or any agency of the U.S. Government.

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The *Uniconcept Asia Limited*'s product, models: *FTIP-0001/FTIP-0002/ FT00-0001/ FT00-0002* or the "EUT" as referred to in this report is marketed as a *CAPDASE JOYSTICK FM Transmitter* which measures approximately 12.0 cm L x 5.0 cm W x 5.0 cm H, rated input voltage: DC 12/24V battery.

The series products, model name: *FTIP-0001/FTIP-0002/ FT00-0001/ FT00-0002* only color is different, we select FTIP-0002 to test.

** The test data gathered are from an engineering sample, serial number: 0708001 provided by the manufacturer, we receive the EUT on 2007-08-01.*

Objective

This Type approval report is prepared on behalf of *Uniconcept Asia Limited* in accordance with FCC Part 15, Subpart C, and section 15.209, 15.35, 15.205, and 15.239 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 Laboratory 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).



NVLAP LAB CODE 200707-0

The current scope of accreditations can be found at
<http://ts.nist.gov/ts/htdocs/210/214/scopes/2007070.htm>.

SYSTEM TEST CONFIGURATION

Justification

The EUT was setup for testing in accordance with the FCC Part 15 general rules as well as those applicable under subpart 239.

EUT Exercise Software

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

Special Accessories

No special accessories were required during testing, only those accessories that were packaged or included for sale with the device were utilized.

Equipment Modifications

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

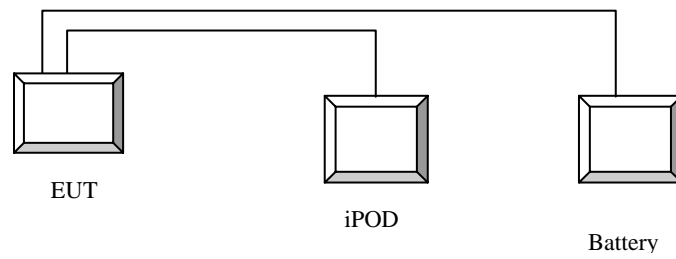
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
Apple	Ipod	A1136	2Z7053JQTXK	DoC

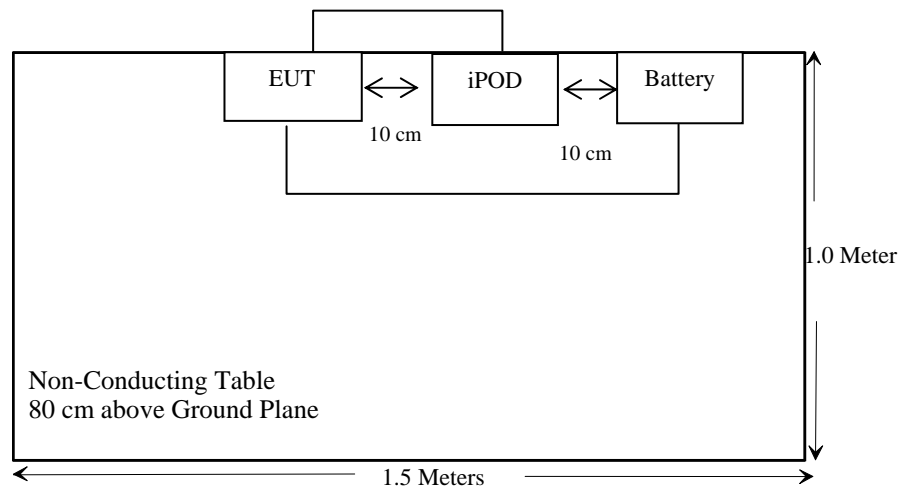
External I/O Cable

Cable Description	Length (M)	From/Port	To
Unshielded Detachable Power Cable	0.50	Battery	EUT
Unshielded Detachable Audio Cable	0.78	Ipod	EUT

Configuration of Test Setup



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

Rules	Description of Test	Test Result
§15.203	Antenna Requirement	Compliant
§15.209 §15.239	Radiated Emission	Compliant*
§15.239 (a)	Band Edges	Compliant
§15.239 (a)	Emission Bandwidth	Compliant

* Within measurement uncertainty.

§15.203 - ANTENNA REQUIREMENT

Standard Applicable

Standard Applicable

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 attached antenna, which, in accordance to the above section, is considered sufficient to comply with the provision of this section, please see EUT photo for details.

Test Result: Compliant

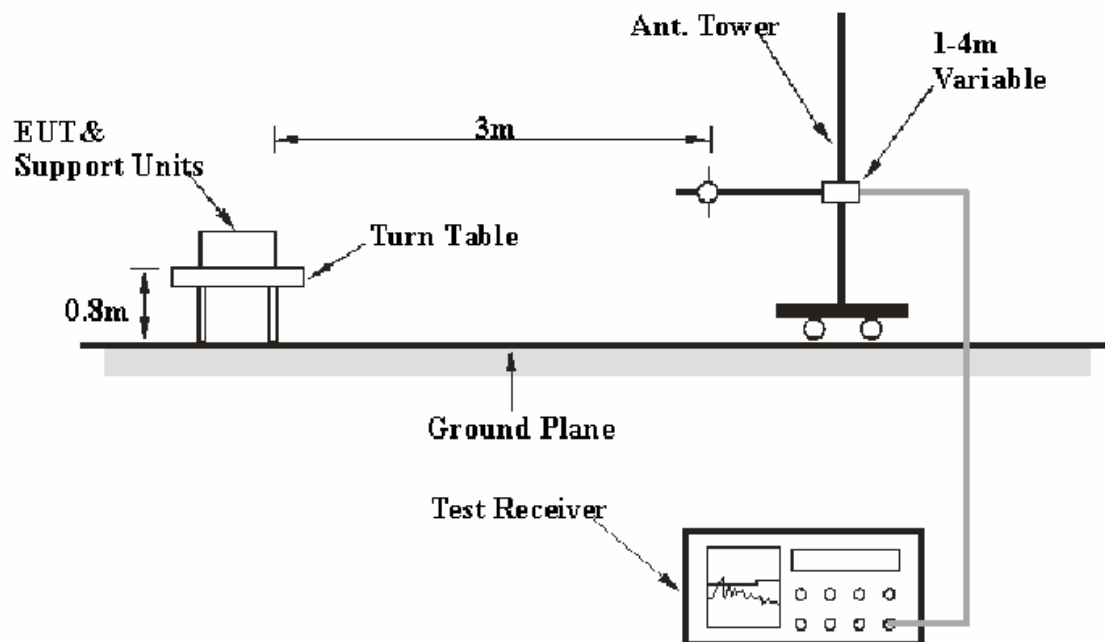
§15.209 and §15.239- RADIATED EMISSION

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 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.

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
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	2007-09-25	2008-09-25
Rohde & Schwarz	EMI Test Receiver	ESCI	100224	2006-11-15	2007-11-15
HP	Amplifier	8447E	1937A01046	2006-11-15	2007-11-15
Sunol Sciences	Bilog Antenna	JB1	A040904-2	2007-08-14	2008-08-14

* **Statement of Traceability:** Bay Area Compliance Laboratory 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:

$$\text{Corr. Ampl.} = \text{Meter Reading} + \text{Antenna Loss} + \text{Cable Loss} - \text{Amplifier Gain}$$

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:

$$\text{Margin} = \text{Limit} - \text{Corr. Ampl.}$$

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:

Powered by Battery:

7.16 dB at **88.1 MHz** in the **Horizontal** polarization, Low Channel.

5.03 dB at **98.1 MHz** in the **Horizontal** polarization, Middle Channel.

1.09 dB at **107.90 MHz** in the **Horizontal** polarization, High Channel.

Powered by Car:

14.65 dB at **204.038 MHz** in the **Horizontal** polarization, Low Channel.

14.49 dB at **204.025MHz** in the **Horizontal** polarization, Middle Channel.

14.66 dB at **204.009 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 David Zhang on 2007-09-27.

Test Mode: Transmitting (Low channel), Powered by battery

Frequency	Meter Reading	Detector	Azimuth	Height	Polar	Antenna Loss	Cable loss	Amplifier Gain	Corr. Ampl.	FCC PART 15.239 & 15.209		
MHz	dBuV	PK/QP/AV	Degrees	Meters	H / V	dB/m	dB	dB	dBuV/m	Limit dBuV/m	Margin dB	Remarks
88.1	60.8	AV	78	398	H	5.5	0.44	25.9	40.84	48.0	7.16	Fundamental
88.1	56.4	AV	344	334	V	5.5	0.44	25.9	36.44	48.0	11.56	Fundamental
176.2	40.7	QP	98	160	H	10	0.71	25.2	26.21	43.5	17.29	Harmonic
176.2	36.8	QP	275	160	V	10	0.71	25.2	22.31	43.5	21.19	Harmonic
264.3	38.1	QP	147	174	H	10.5	1.02	25.1	24.52	46.0	21.48	Harmonic
352.4	33.3	QP	216	196	H	12.8	1.59	25.5	22.19	46.0	23.81	Harmonic
264.3	35.3	QP	225	174	V	10.5	1.02	25.1	21.72	46.0	24.28	Harmonic
440.5	31.1	QP	170	254	H	14.6	1.75	26.2	21.25	46.0	24.75	Harmonic
352.4	31.2	QP	42	196	V	12.8	1.59	25.5	20.09	46.0	25.91	Harmonic
88.1	61.1	PK	78	398	H	5.5	0.44	25.9	41.14	68.0	26.86	Fundamental
440.5	28.7	QP	170	254	V	14.6	1.75	26.2	18.85	46.0	27.15	Harmonic
528.6	26.2	QP	87	165	H	15.9	2.83	26.3	18.63	46.0	27.37	Harmonic
528.6	22.7	QP	87	165	V	15.9	2.83	26.3	15.13	46.0	30.87	Harmonic
88.1	56.8	PK	344	334	V	5.5	0.44	25.9	36.84	68.0	31.16	Fundamental

Test Mode: Transmitting (Middle channel) , Powered by battery

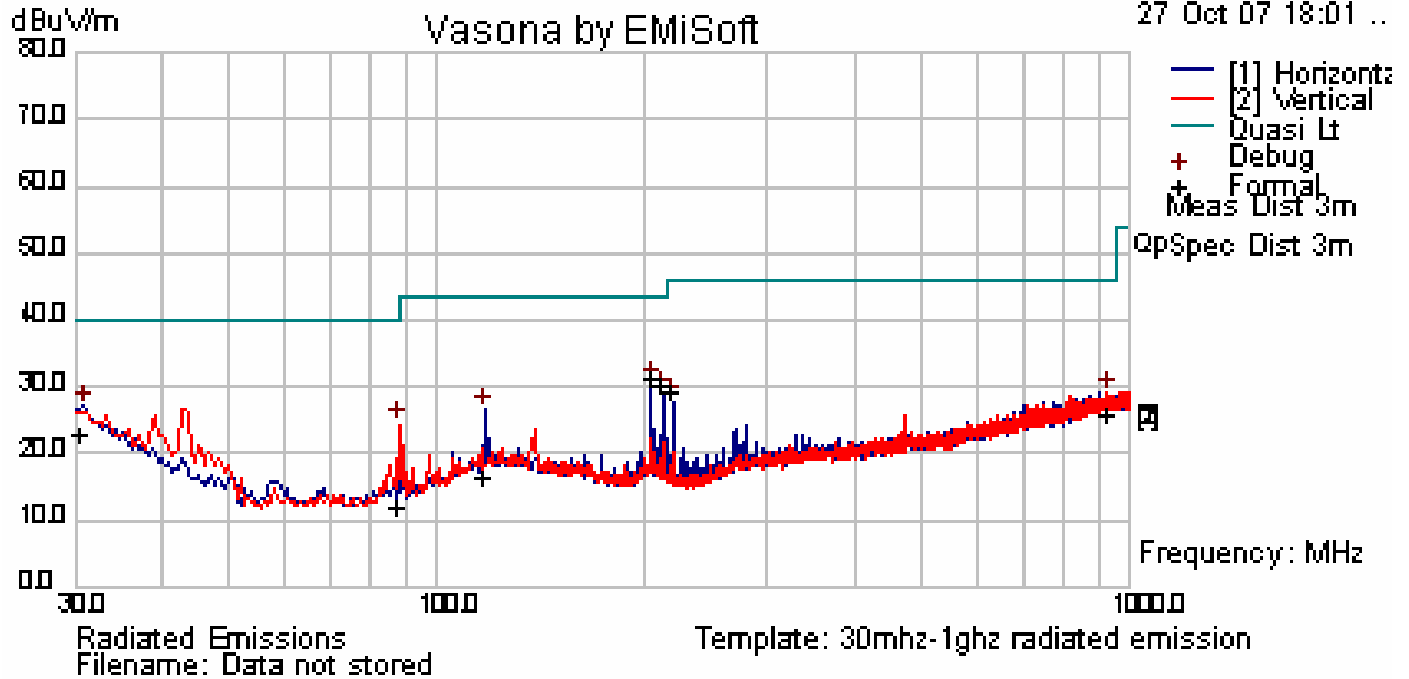
Frequency	Meter Reading	Detector	Azimuth	Height	Polar	Antenna Loss	Cable loss	Amplifier Gain	Corr. Ampl.	FCC PART 15.239 & 15.209		
MHz	dBuV	PK/QP/AV	Degrees	Meters	H / V	dB/m	dB	dB	dBuV/m	Limit dBuV/m	Margin dB	Remarks
98.1	61.7	AV	84	189	H	6.6	0.47	25.8	42.97	48.0	5.03	Fundamental
98.1	54.7	AV	278	318	V	6.6	0.47	25.8	35.97	48.0	12.03	Fundamental
196.2	43.3	QP	0	180	H	10.6	0.83	25.2	29.53	43.5	13.97	Harmonic
294.3	41.2	QP	74	165	H	11.7	1.41	25.1	29.21	46.0	16.79	Harmonic
294.3	38.7	QP	245	165	V	11.7	1.41	25.1	26.71	46.0	19.29	Harmonic
392.4	36.5	QP	74	186	H	13.6	1.65	25.7	26.05	46.0	19.95	Harmonic
490.5	33.7	QP	256	147	H	15.9	1.82	26.2	25.22	46.0	20.78	Harmonic
196.2	35.6	QP	280	180	V	10.6	0.83	25.2	21.83	43.5	21.67	Harmonic
392.4	34.1	QP	285	202	V	13.6	1.65	25.7	23.65	46.0	22.35	Harmonic
490.5	30.2	QP	184	147	V	15.9	1.82	26.2	21.72	46.0	24.28	Harmonic
98.1	62.1	PK	84	189	H	6.6	0.47	25.8	43.37	68.0	24.63	Fundamental
588.6	26.7	QP	156	178	H	16.9	3.46	26.2	20.86	46.0	25.14	Harmonic
588.6	22.6	QP	156	178	V	16.9	3.46	26.2	16.76	46.0	29.24	Harmonic
98.1	55.1	PK	278	318	V	6.6	0.47	25.8	36.37	68.0	31.63	Fundamental

Test Mode: Transmitting (High channel), Powered by battery

Frequency	Meter Reading	Detector	Azimuth	Height	Polar	Antenna Loss	Cable loss	Amplifier Gain	Corr. Ampl.	FCC PART 15.239 & 15.209		
MHz	dBuV	PK/QP/AV	Degrees	Meters	H / V	dB/m	dB	dB	dBuV/m	Limit dBuV/m	Margin dB	Remarks
107.9	62.3	AV	232	271	H	9.8	0.51	25.7	46.91	48.0	1.09*	Fundamental
107.9	58.5	AV	320	335	V	9.8	0.51	25.7	43.11	48.0	4.89	Fundamental
215.8	45.2	QP	320	155	H	9.4	0.89	25.1	30.39	43.5	13.11	Harmonic
215.8	42.4	QP	320	155	V	9.4	0.89	25.1	27.59	43.5	15.91	Harmonic
323.7	40.5	QP	260	182	H	12.3	1.52	25.2	29.12	46.0	16.88	Harmonic
323.7	37.9	QP	118	182	V	12.3	1.52	25.2	26.52	46.0	19.48	Harmonic
107.9	63.2	PK	232	271	H	9.8	0.51	25.7	47.81	68.0	20.19	Fundamental
431.6	35.1	QP	153	148	H	14.5	1.73	26	25.33	46.0	20.67	Harmonic
539.5	29.8	QP	90	137	H	16.2	3.11	26.3	22.81	46.0	23.19	Harmonic
431.6	31.6	QP	245	148	V	14.5	1.73	26	21.83	46.0	24.17	Harmonic
107.9	58.9	PK	320	335	V	9.8	0.51	25.7	43.51	68.0	24.49	Fundamental
647.4	24.7	QP	254	123	H	17.8	3.56	26.6	19.46	46.0	26.54	Harmonic
539.5	26.4	QP	156	137	V	16.2	3.11	26.3	19.41	46.0	26.59	Harmonic
647.4	21.3	QP	65	123	V	17.8	3.56	26.6	16.06	46.0	29.94	Harmonic

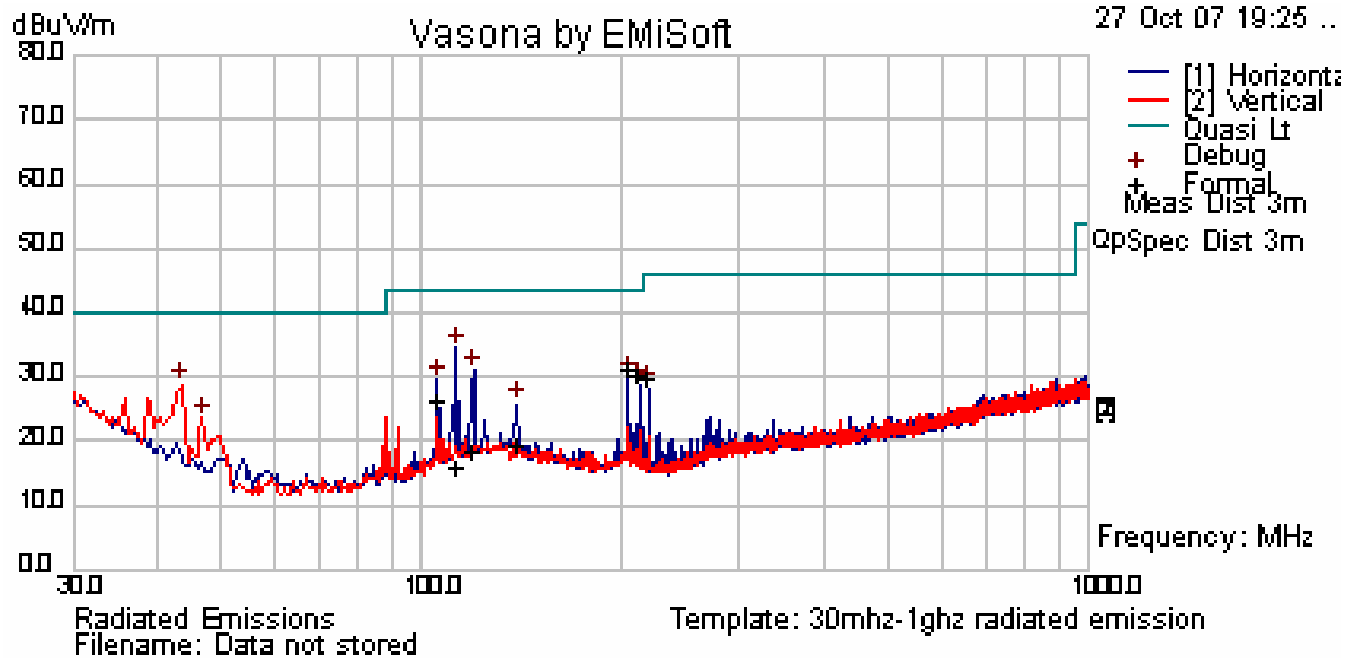
* Within measurement uncertainty.

Test Mode: Transmitting (Low channel), Powered by car

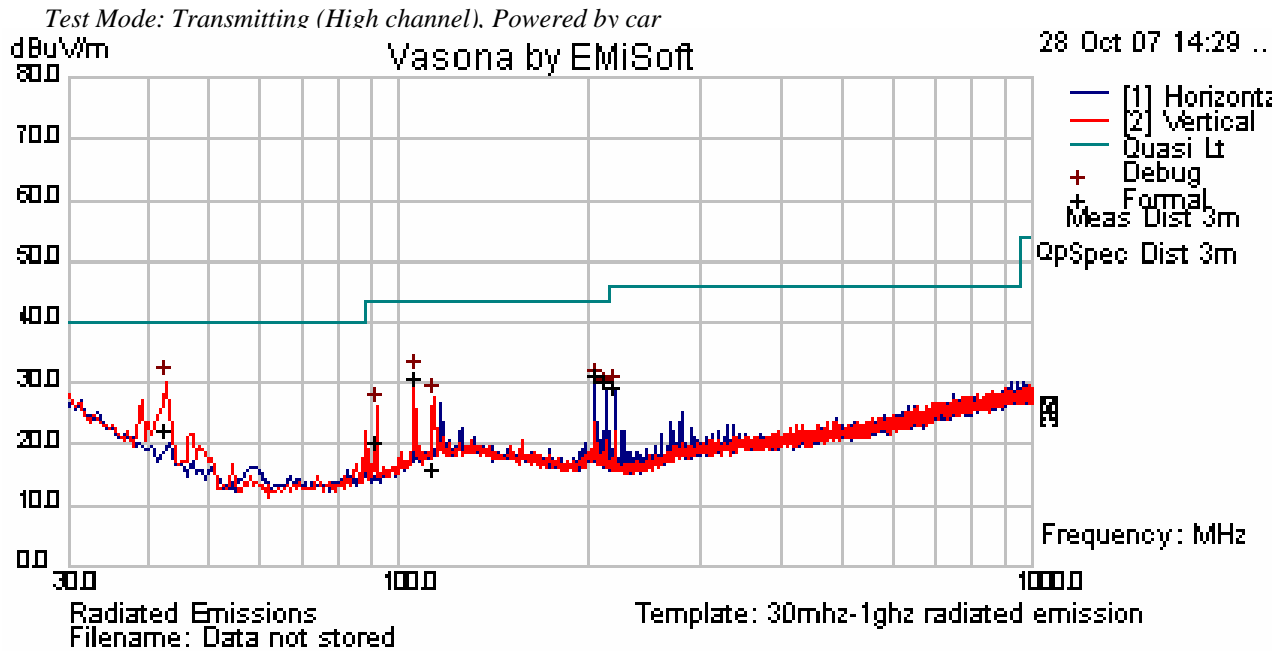


Frequency	Raw	Cable Loss	AF dB	Meter Reading	Polar	Height	Azimuth	Limit	Margin
MHz	dBuV	dB		dBuV	H / V	Meters	Degrees	dBuV/m	dB
204.038	30.94	11.1	-13.18	28.85	H	109	41	43.5	14.65
212.002	30.41	11.12	-13.73	27.8	H	106	61	43.5	15.7
220.056	29.91	11.2	-14.26	26.85	H	133	12	46	19.15
30.808	15.53	10.42	-5.34	20.61	V	160	12	40	19.39
928.917	15.78	12.6	-4.84	23.54	H	323	314	46	22.46
117.5	15.63	10.9	-12.32	14.21	H	99	-2	43.5	29.29
88.207	16.36	10.78	-17.44	9.71	V	401	279	43.5	33.79
88.1	61.3	Fundamental							

Test Mode: Transmitting (Middle channel) , Powered by car



Frequency	Raw	Cable Loss	AF dB	Meter Reading	Polar	Height	Azimuth	Limit	Margin
MHz	dBuV	dB		dBuV	H / V	Meters	Degrees	dBuV/m	dB
204.025	31.1	11.1	-13.18	29.01	H	100	51	43.5	14.49
212.021	30.42	11.12	-13.73	27.81	H	100	51	43.5	15.69
220.021	30.39	11.2	-14.26	27.33	H	111	-2	46	18.67
105.773	27.07	10.86	-13.78	24.14	V	311	332	43.5	19.36
139.326	18.74	11	-12.85	16.9	H	131	209	43.5	26.6
120.158	17.28	10.9	-12.1	16.08	H	129	189	43.5	27.42
113.072	15.59	10.9	-12.72	13.77	V	168	339	43.5	29.73
98.1	63.2	Fundamental							



Frequency	Raw	Cable Loss	AF dB	Meter Reading	Polar	Height	Azimuth	Limit	Margin
MHz	dBuV	dB		dBuV	H / V	Meters	Degrees	dBuV/m	dB
204.009	30.92	11.1	-13.18	28.84	H	100	55	43.5	14.66
105.71	31.2	10.86	-13.79	28.27	V	99	94	43.5	15.23
212.04	30.4	11.12	-13.73	27.79	H	135	48	43.5	15.71
220.008	30.24	11.2	-14.26	27.18	H	143	333	46	18.82
42.811	23.73	10.6	-14.37	19.97	V	174	198	40	20.03
92.225	24.12	10.8	-16.74	18.17	V	362	108	43.5	25.33
113.888	15.54	10.9	-12.64	13.8	H	174	172	43.5	29.7
107.9	60.6	Fundamental							

§15.239(a) – BAND EDGE

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	2006-09-29	2007-09-29
HP	Amplifier	8447E	1937A01046	2006-11-15	2007-11-15
Sunol Sciences	Bilog Antenna	JB1	A040904-2	2007-08-14	2008-08-14

*** Statement of Traceability:** Bay Area Compliance Laboratory 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.

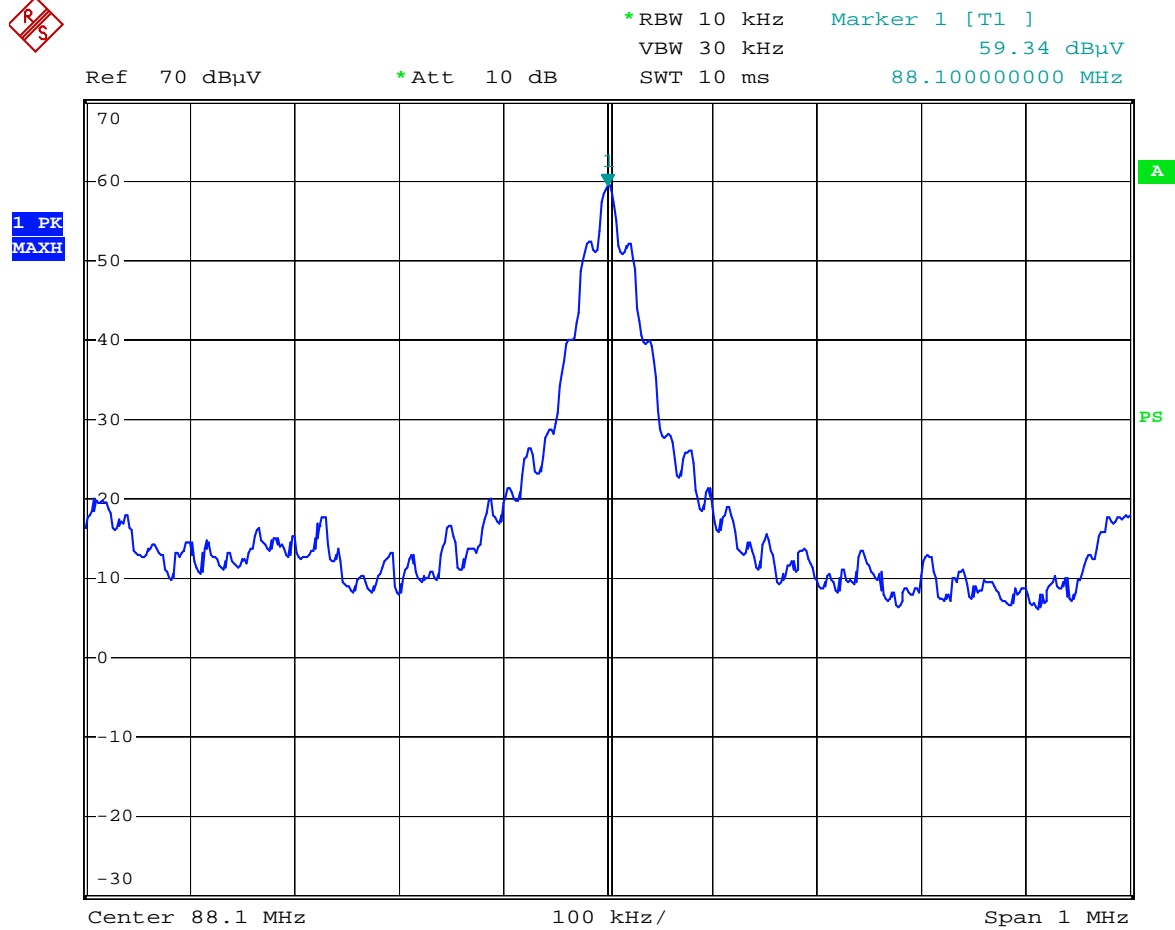
Test Data

Environmental Conditions

Temperature:	27 °C
Relative Humidity:	56 %
ATM Pressure:	100.2 kPa

The testing was performed by David Zhang on 2007-09-26.

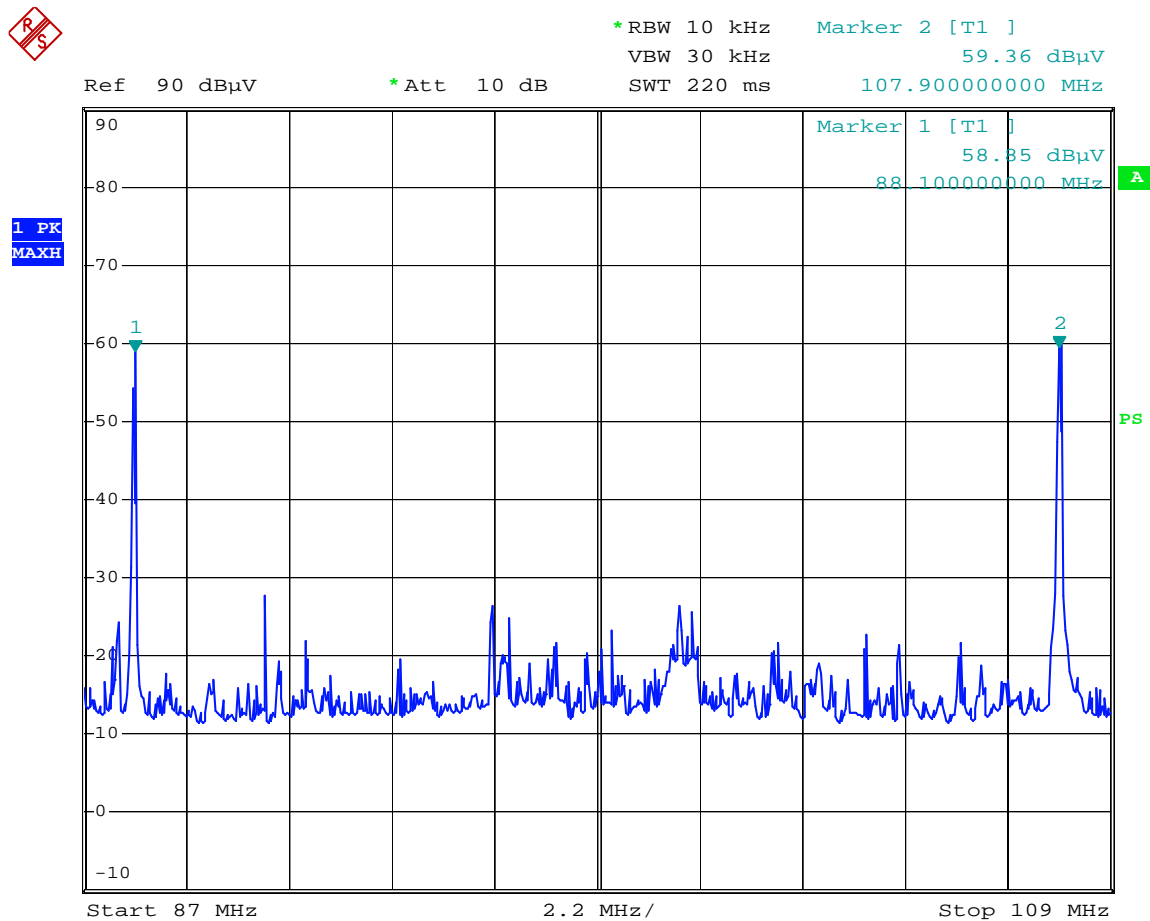
Low channel



Frequency range low channel

Date: 26.SEP.2007 11:30:16

Low-high channel



Frequency range low-high channel

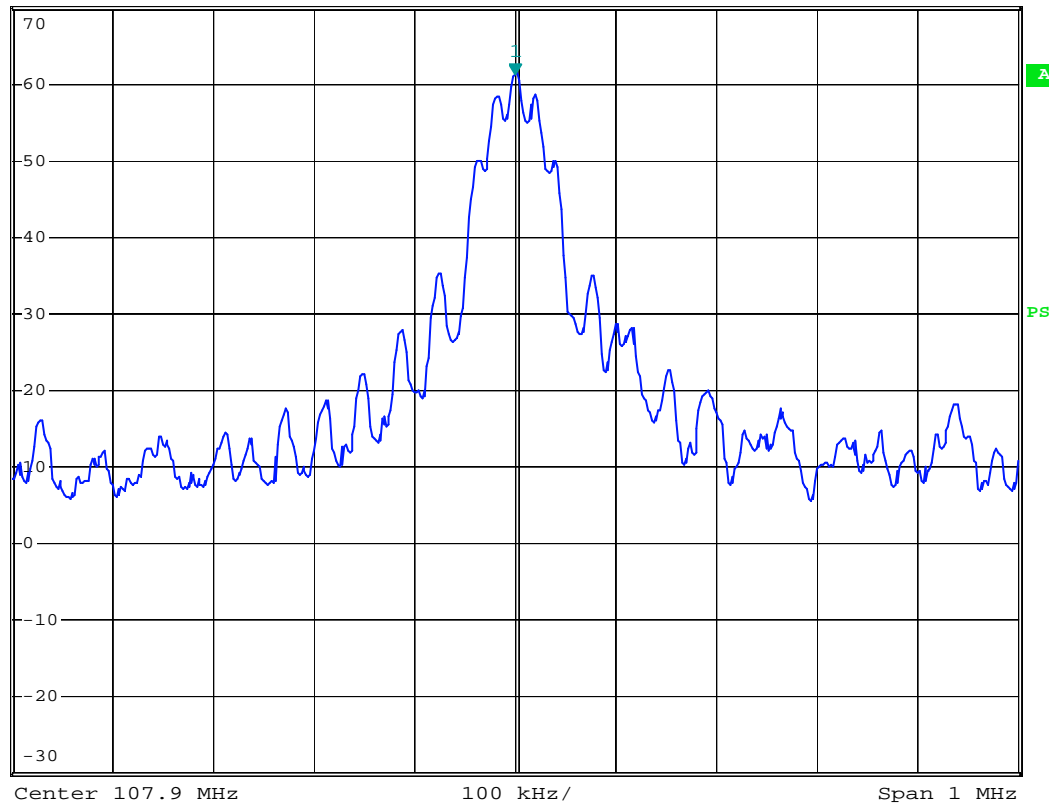
Date: 26.SEP.2007 12:01:11

High channel



Ref 70 dBμV *Att 10 dB *RBW 10 kHz VBW 30 kHz SWT 10 ms Marker 1 [T1] 61.33 dBμV 107.90000000 MHz

1 PK
MAXH



Frequency range high channel

Date: 26.SEP.2007 11:34:52

§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
Rohde & Schwarz	EMI Test Receiver	ESCI	100224	2006-09-29	2007-09-29
HP	Amplifier	8447E	1937A01046	2006-11-15	2007-11-15
Sunol Sciences	Bilog Antenna	JB1	A040904-2	2007-08-14	2008-08-14

* **Statement of Traceability:** Bay Area Compliance Laboratory 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

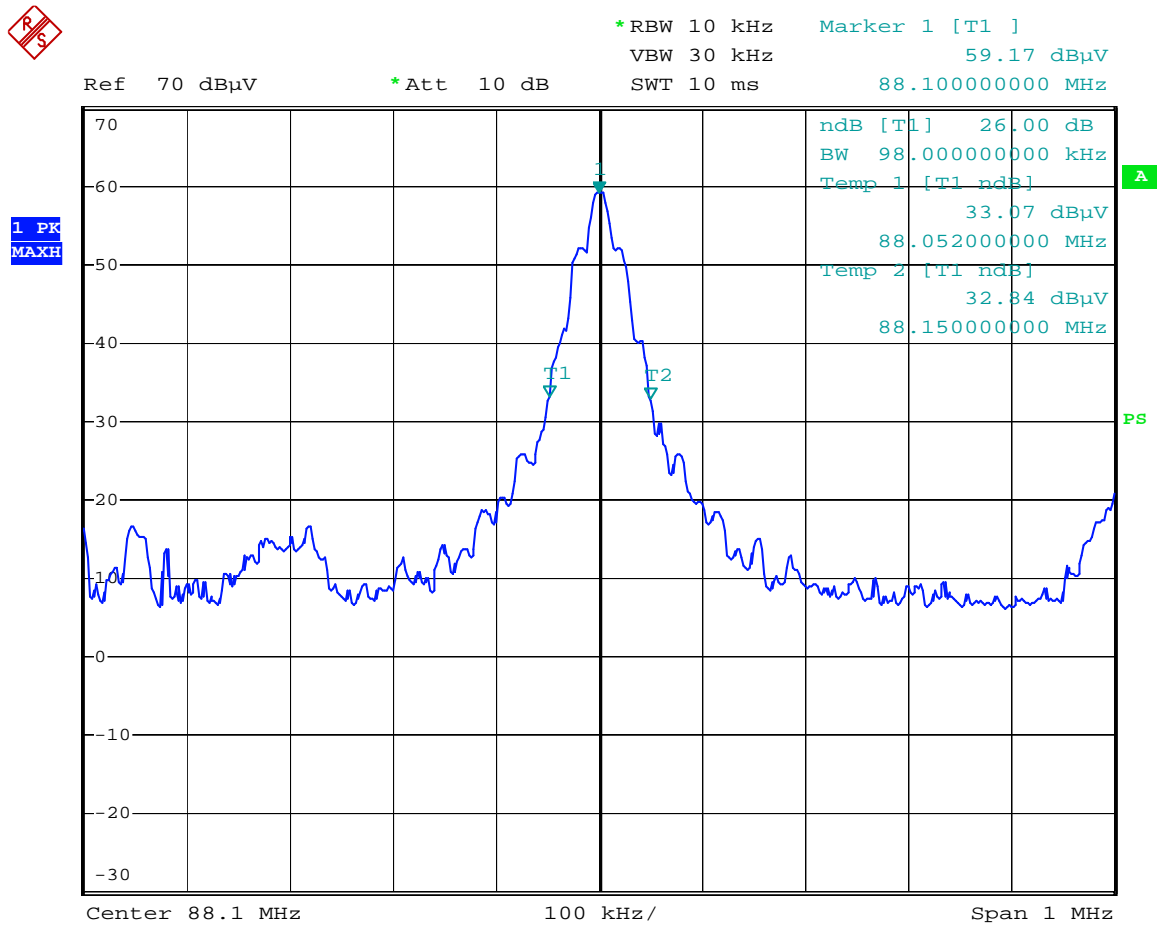
Temperature:	27 °C
Relative Humidity:	56 %
ATM Pressure:	100.2 kPa

The testing was performed by David Zhang on 2007-09-26.

Test Mode: Transmitting

Transmitting channel	Transmitting frequency (MHz)	Emission bandwidth (kHz)	Limit (kHz)	Result
Low channel	88.1	98	200	Pass
Mid channel	98.1	102	200	Pass
High channel	107.9	112	200	Pass

Low channel



Emission bandwidth

Date: 26.SEP.2007 11:00:06

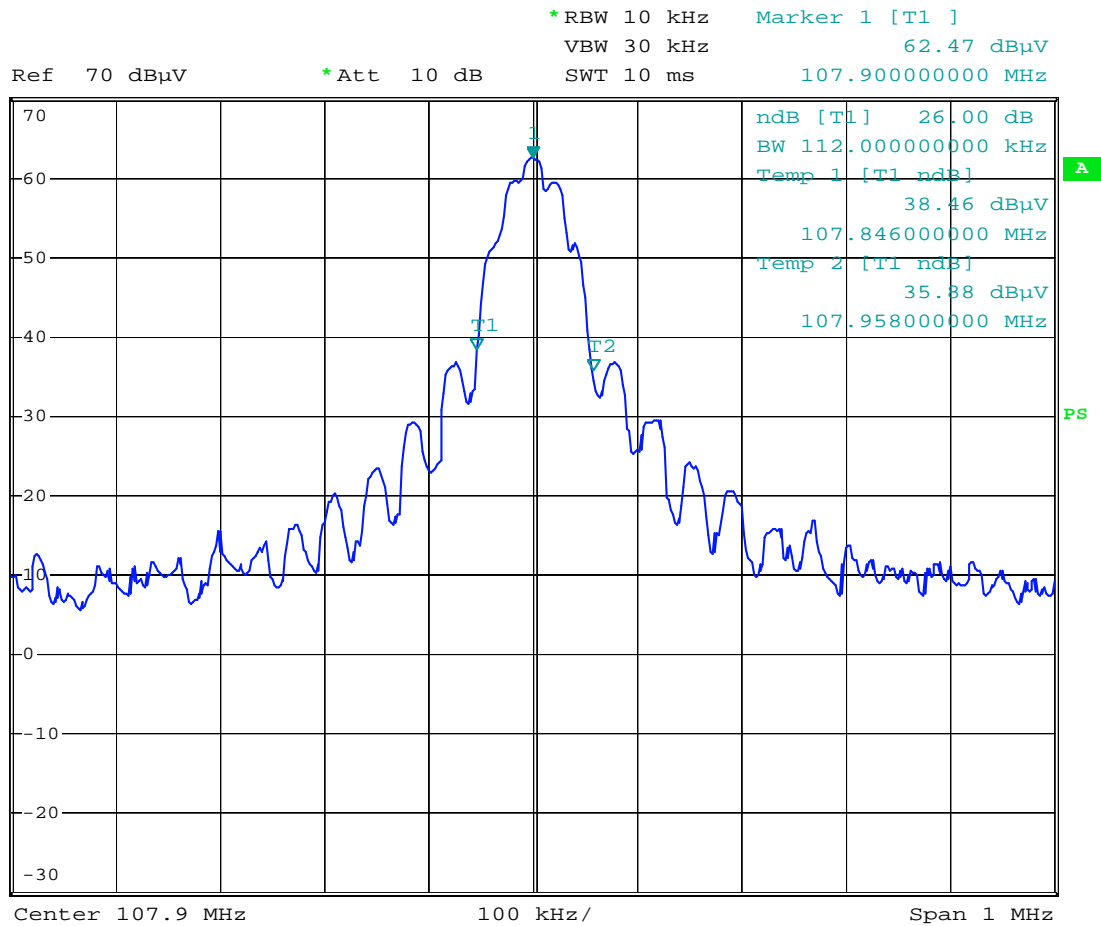
Middle channel



Emission bandwidth

Date: 26.SEP.2007 11:03:52

High channel



Emission bandwidth

Date: 26.SEP.2007 11:05:47