Testing Laboratory
1332

FCC TEST REPORT

according to

FCC Part 15, Subpart C (15.239) / ANSI C63.4: 2009

Applicant	:	AzureWave Technologies, Inc.
Address	:	8F, No. 94, Baozhong Rd., Xindian, Taiwan 231
Equipment	:	R1 digireader
Model No.	:	R1
FCC ID.	:	AZVKAS-R1

- The test result refers exclusively to the test presented test model / sample.,
- Without written approval of ***Cerpass Technology Corp.*** the test report shall not be reproduced except in full.

Contents

History of this test report

■ ORIGINAL.

☐ Additional attachment as following record:

Attachment No.	Issue Date	Description
TEFM1109153	Oct. 26, 2011	Original.

CERTIFICATE OF COMPLIANCE

according to

FCC Part 15, Subpart C (15.239) / ANSI C63.4: 2009

Applicant	:	AzureWave Technologies, Inc.
Address	:	8F, No. 94, Baozhong Rd., Xindian, Taiwan 231
Equipment	:	R1 digireader
Model No.	:	R1
FCC ID	:	AZVKAS-R1

I **HEREBY** CERTIFY THAT :

The measurements shown in this test report were made in accordance with the procedures given in **ANSI C63.4.** The equipment was ***passed*** the test performed according to **FCC Part 15, Subpart C (15.239) / ANSI C63.4: 2009.**

The test was carried out on Oct. 24, 2011 at ***Cerpass Technology Corp.***

Signature

Hill Chen
EMC/RF B.U. Assistant Manager

1. Report of Measurements and Examinations

1.1. List of Measurements and Examinations

FCC Rule	Test Type	Result
15.203	Antenna Requirement	Pass
15.209	General Requirement	Pass
15.239(a)	Emission Bandwidth Testing	Pass
15.239(b)	Radiated Emission	Pass
15.239©	Out of band emission Testing	Pass

Note: the information of measurement uncertainty is available upon the customer's request.

2. Test Configuration of Equipment under Test

2.1. Feature of Equipment under Test

CPU	Marvell PXA 166e, 800 MHz
Memory	256MB SLC NAND FLASH for boot code 256MB LP-DDR1-200 for working memory
Buttons &Navigation Controls	6” Capacitive Single Touch screen Home, Menu, Back, Power, Reset, Volume up/down keys, < , > G-sensor
Display	6” e-INK EPD, 800 x 600, 16 Level Grey Scale
Battery & Adapter	3.7V, 1,530 mAh, rechargeable Lithium-Polymer AC-DC power adapter, 5V/1A, USB Type-B connector
Connectivity	USB 2.0 device and power connection SD memory card slot X1 Menca Card slot X1 WiFi 802.11 b/g/n Bluetooth 2.1+EDR FM Transmitter: SILICON LABS Si4710
Audio	Speaker Internal 1.0W x1 3.5mm headphone jack X1
Dimension	170x118x11.7mm
Weight	205 +- 5 gm
Operating System	Android 2.1
Content formats	eBook: ePUB, PDF Music: MP3, AAC, OGG, WAV, WMA Audio Book: MP3, WMA
3rd Party Integration Required	Danish, Finnish, Norwegian, Swedish, Germany, English software keyboard apk. files
Localization for build-in applications	English, German, Danish, Finish, Norwegian, Swedish, French, Spanish

2.2. Test Mode and Test Software

a. During testing, the interface cables and equipment positions were varied according to ANSI C63.4.

b. The complete test system included Notebook and EUT for RF test.

c. The EUT was executed to keep transmitting and receiving data via FM.

d. The following test mode were performed for conduction and radiation test:

- Mode1: 88.1MHz TX
- Mode2: 98MHz TX
- Mode3: 107.9MHz TX

2.3. Description of Support System

Device	Manufacturer	Model No.	Description
Notebook	DELL	PP10L	Power Cable, Unshielding 1.8m

3. General Information of Test

Test Site :	Cerpass Technology Corp. 2F-11, No. 3, Yuan Qu St. (Nankang Software Park), Taipei, Taiwan 115, R.O.C.
Test Site Location (OATS1-SD):	No. 68-1, Shibachong Si, Shihding Township, Taipei County, Taiwan, R.O.C.
FCC Registration Number :	TW1061, TW1056, 390316, 488071
IC Registration Number :	4934B-1, 4934D-1
VCCI Registration Number :	T-543 for Telecommunication Test C-3328 for Conducted emission test R-3428 for Radiated emission test G-97 for Radiated emission test above 1GHz.
Test in Compliance with:	FCC Part 15, Subpart C (15.239) / ANSI C63.4: 2009
Frequency Range Investigated:	Conducted Emission Test: from 150kHz to 30 MHz Radiated Emission Test: from 30 MHz to 1200 MHz
Modulation Type:	FM
Test Distance:	The test distance of radiated emission above 1GHz from antenna to EUT is 3 M.

4. Antenna Requirements

4.1. Standard Applicable

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. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.231, 15.217, 15.219 or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

4.2. Antenna Construction and Directional Gain

Antenna Type: PCB Antenna

Antenna Gain: 2.49dBi

5. Test of Conducted Emission

5.1. Test Limit

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 KHz on the 120 VAC power and return leads of the EUT according to the methods defined in ANSI C63.4-2003 Section 3.1. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane as shown in section 2.2. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

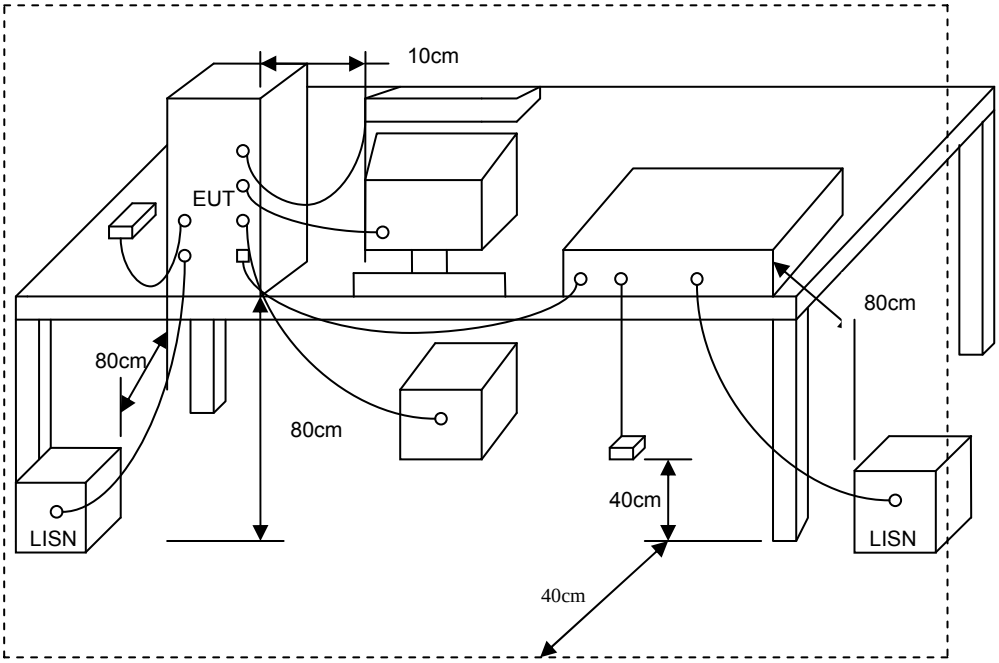
Frequency (MHz)	Quasi Peak (dB μ V)	Average (dB μ V)
0.15 – 0.5	66-56*	56-46*
0.5 – 5.0	56	46
5.0 – 30.0	60	50

*Decreases with the logarithm of the frequency.

5.2. Test Procedures

a. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
b. Connect EUT to the power mains through a line impedance stabilization network (LISN).
c. All the support units are connecting to the other LISN.
d. The LISN provides 50 ohm coupling impedance for the measuring instrument.
e. The FCC states that a 50 ohm, 50 micro-Henry LISN should be used.
f. Both sides of AC line were checked for maximum conducted interference.
g. The frequency range from 150 kHz to 30 MHz was searched.
h. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

5.3. Typical Test Setup

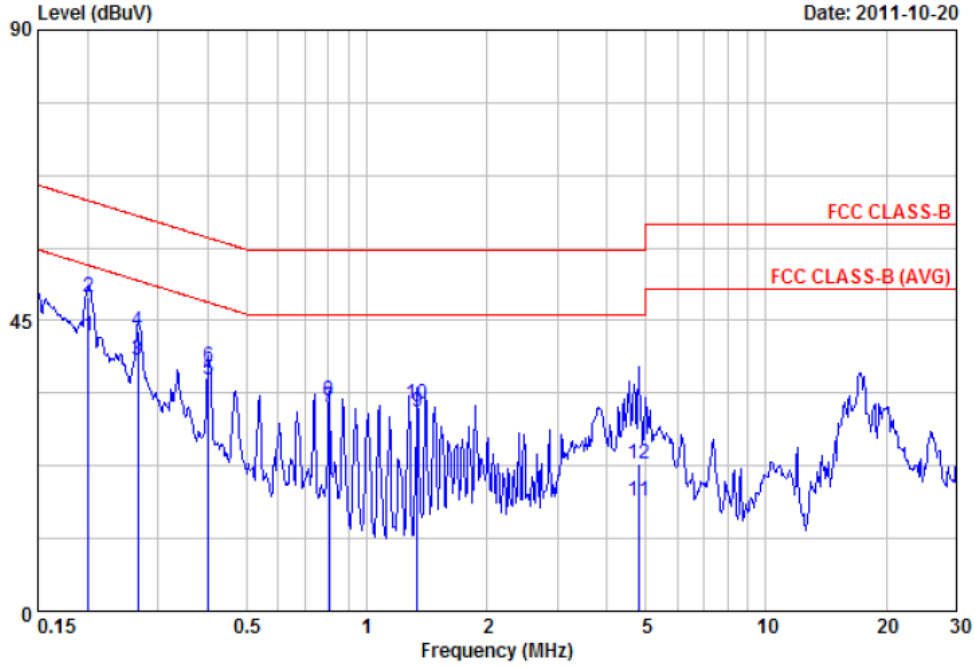


5.4. Measurement equipment

Instrument/Ancillary	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
EMI Receiver	R&S	ESCI	100443	2011/02/08	2012/02/07
LISN	Schwarzbeck	NSLK 8127	8127-516	2011/05/05	2012/05/04
LISN	Schwarzbeck	NSLK 8127	8127-568	2011/08/24	2012/08/23

5.5. Test Result and Data

Power	:	AC 120V	Pol/Phase	:	LINE
Test Mode 1	:		Temperature	:	25 °C
Memo	:		Humidity	:	65 %

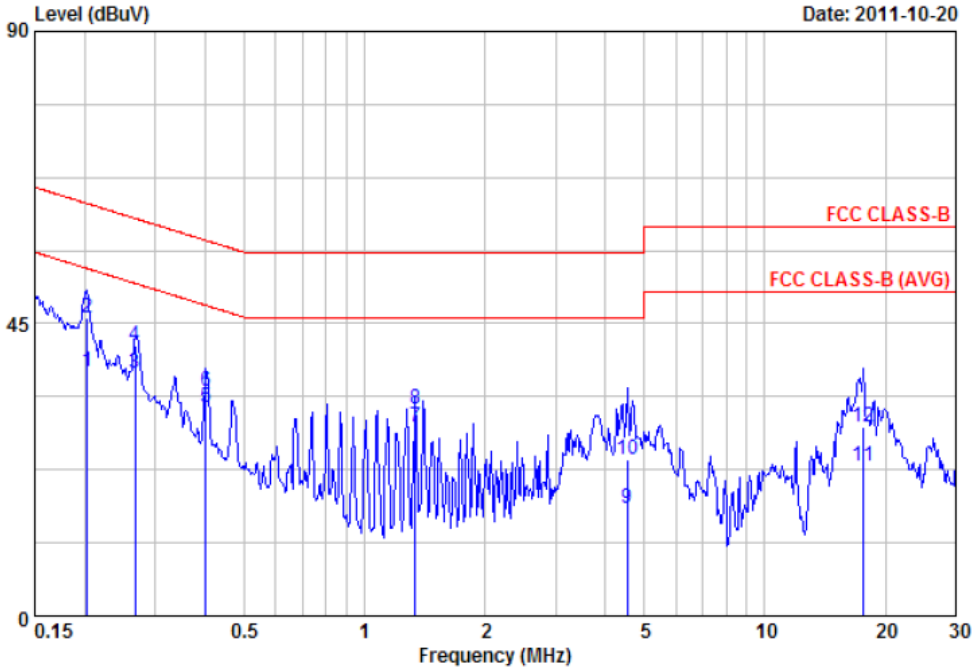


Item	Freq	Read Value	Factor	Result	Limit	Margin	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	0.201	42.47	0.12	42.59	53.58	-10.99	Average
2	0.201	48.60	0.12	48.72	63.58	-14.86	QP
3	0.267	38.70	0.12	38.82	51.20	-12.38	Average
4	0.267	43.19	0.12	43.31	61.20	-17.89	QP
5	0.402	35.61	0.13	35.74	47.81	-12.07	Average
6	0.402	37.69	0.13	37.82	57.81	-19.99	QP
7	0.804	31.46	0.18	31.64	46.00	-14.36	Average
8	0.804	32.53	0.18	32.71	56.00	-23.29	QP
9	1.338	30.61	0.22	30.83	46.00	-15.17	Average
10	1.338	31.79	0.22	32.01	56.00	-23.99	QP
11	4.802	16.74	0.38	17.12	46.00	-28.88	Average
12	4.802	22.40	0.38	22.78	56.00	-33.22	QP

Notes:

1. Result = Read Value + Factor
2. Factor = LISN Factor + Cable Loss
3. According to technical experiences, all spurious emission of FM mode at channel 88,98,108 are almost the same below 1GHz, so that the channel 88 was chosen as representative in final test.
4. The data is worst case.

Power	:	AC 120V	Pol/Phase	:	NEUTRAL
Test Mode 1	:		Temperature	:	25 °C
Memo	:		Humidity	:	65 %



Item	Freq	Read Value	Factor	Result	Limit	Margin	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	0.203	37.47	0.10	37.57	53.49	-15.92	Average
2	0.203	45.68	0.10	45.78	63.49	-17.71	QP
3	0.267	37.17	0.10	37.27	51.20	-13.93	Average
4	0.267	41.57	0.10	41.67	61.20	-19.53	QP
5	0.402	31.88	0.12	32.00	47.81	-15.81	Average
6	0.402	34.46	0.12	34.58	57.81	-23.23	QP
7	1.338	28.79	0.20	28.99	46.00	-17.01	Average
8	1.338	31.53	0.20	31.73	56.00	-24.27	QP
9	4.525	16.14	0.34	16.48	46.00	-29.52	Average
10	4.525	23.63	0.34	23.97	56.00	-32.03	QP
11	17.590	22.44	0.69	23.13	50.00	-26.87	Average
12	17.590	28.41	0.69	29.10	60.00	-30.90	QP

Notes:

1. Result = Read Value + Factor
2. Factor = LISN Factor + Cable Loss
3. According to technical experiences, all spurious emission of FM mode at channel 88,98,108 are almost the same below 1GHz, so that the channel 88 was chosen as representative in final test.
4. The data is worst case.

Test engineer: Ben

6. Test of Radiated Emission

6.1. Test Limit

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.

Frequency (MHz)	Distance	Limit (μV/ m)
0.09 ~ 0.490	300m	2400/F(kHz)
0.490 ~ 1.705	30m	24000/ F(kHz)
1.705 ~ 30	30m	30
30 ~ 88	3m	100
88 ~ 216	3m	150
216 ~ 960	3m	200
Above 960	3m	500

Fundamental Frequency:

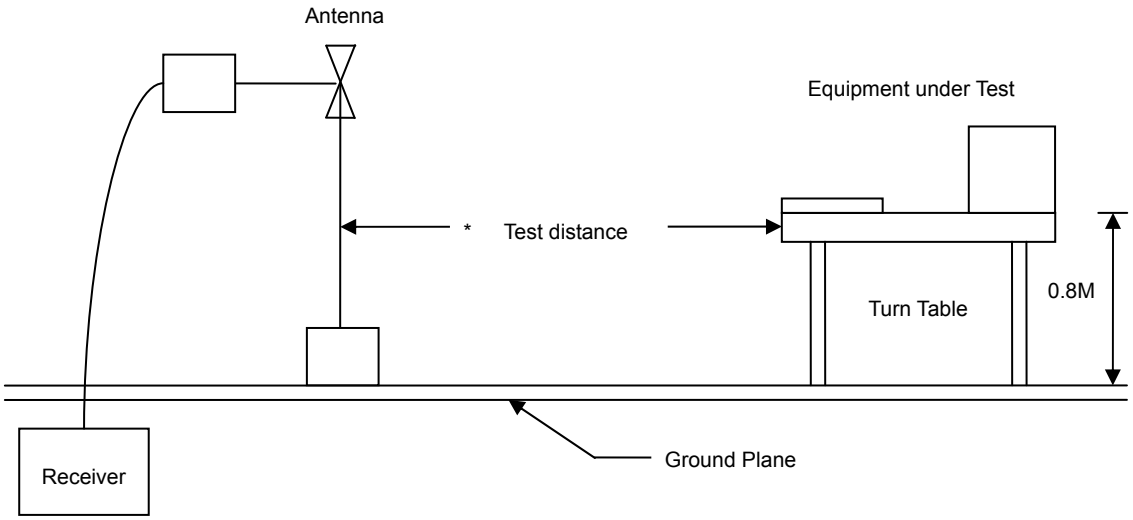
Fundamental Frequency (MHz)	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
2400-2483.5	50	500
5725-5875	50	500
24000-24250	250	2500

6.2. Test Procedures

a. The EUT was placed on a rotatable table top 0.8 meter above ground.
b. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
c. The table was rotated 360 degrees to determine the position of the highest radiation.
d. The antenna is a broadband antenna and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
f. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
g. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.
h. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
i. "Cone of radiation" has been considered to be 3dB beamwidth of the measurement antenna.

NOTE:
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.

6.3. Typical Test Setup Layout of Radiated Emission



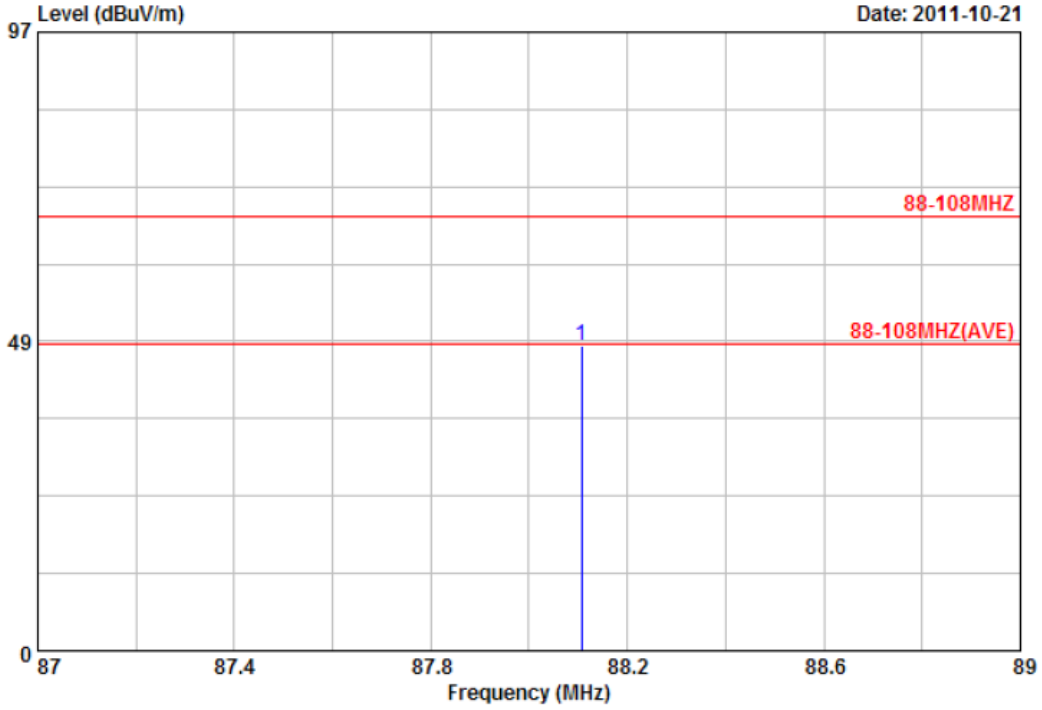
6.4. Measurement equipment

Instrument/Ancillary	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
Amplifier	Agilent	8447D	2944A10531	2011/01/21	2012/01/20
Bilog Antenna	Schaffner	CBL6112D	22242	2011/02/09	2012/02/08
EMI Receiver	R&S	ESCI	101200	2011/07/26	2012/07/25
SPECTRUM ANALYZER	R&S	FSP40	100219	2010/11/05	2011/11/04
HORN ANTENNA	EMCO	3115	31589	2011/05/02	2012/05/01
Preamplifier	Agilent	8449B	3008A01954	2011/03/02	2012/03/01

6.5. Test Result and Data

6.5.1. Test Result of Fundamental Emission

Power	:	AC 120V	Pol/Phase	:	VERTICAL
Test Mode 1	:	Transmit	Temperature	:	28 °C
Operation Frequency	:	88.1	Humidity	:	51 %
Modulation Type	:	FM	Atmospheric Pressure	:	1020 hPa

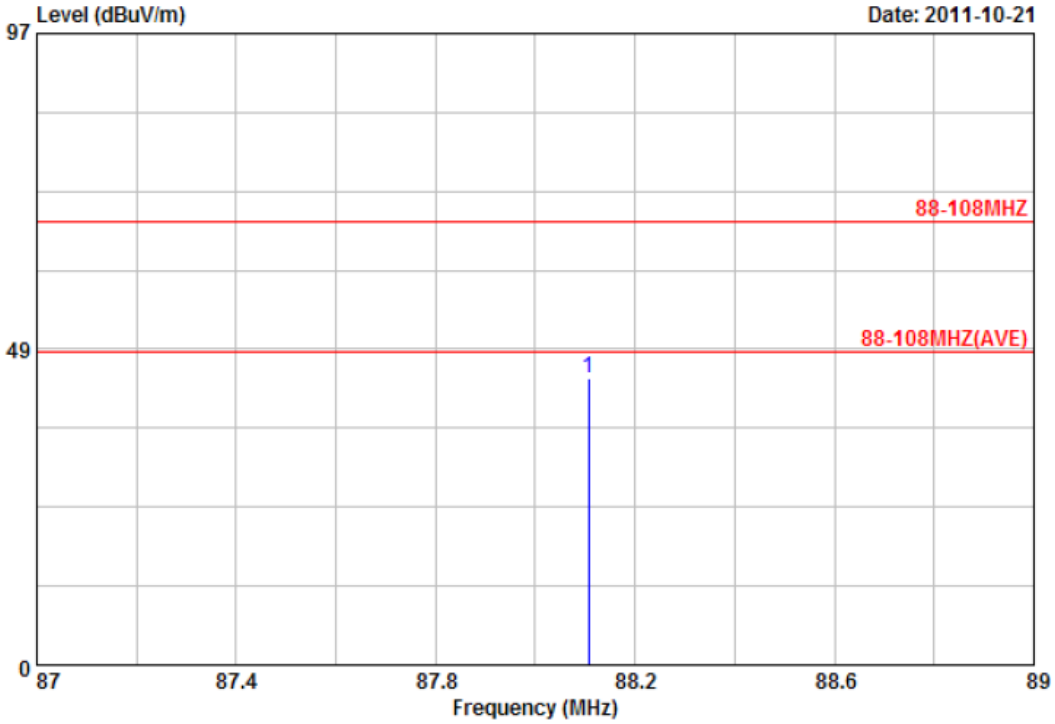


Item	Freq	Read Value	Factor	Result	Limit	Margin	Remark	Ant Pos	Tab Pos
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	Deg
1	88.11	50.42	-2.67	47.75	68.00	-20.25	Peak	100	0

Notes:

1. Result = Read Value + Factor
2. Factor = Antenna Factor + Cable Loss - Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 120KHz and video bandwidth is 300kHz for Peak detection and Quasi-peak detection at frequency below 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
5. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz.
6. The other emissions is too low to be measured.
7. The data is worse case.

Power	:	AC 120V	Pol/Phase	:	HORIZONTAL
Test Mode 1	:	Transmit	Temperature	:	28 °C
Operation Frequency	:	88.1	Humidity	:	51 %
Modulation Type	:	FM	Atmospheric Pressure	:	1020 hPa

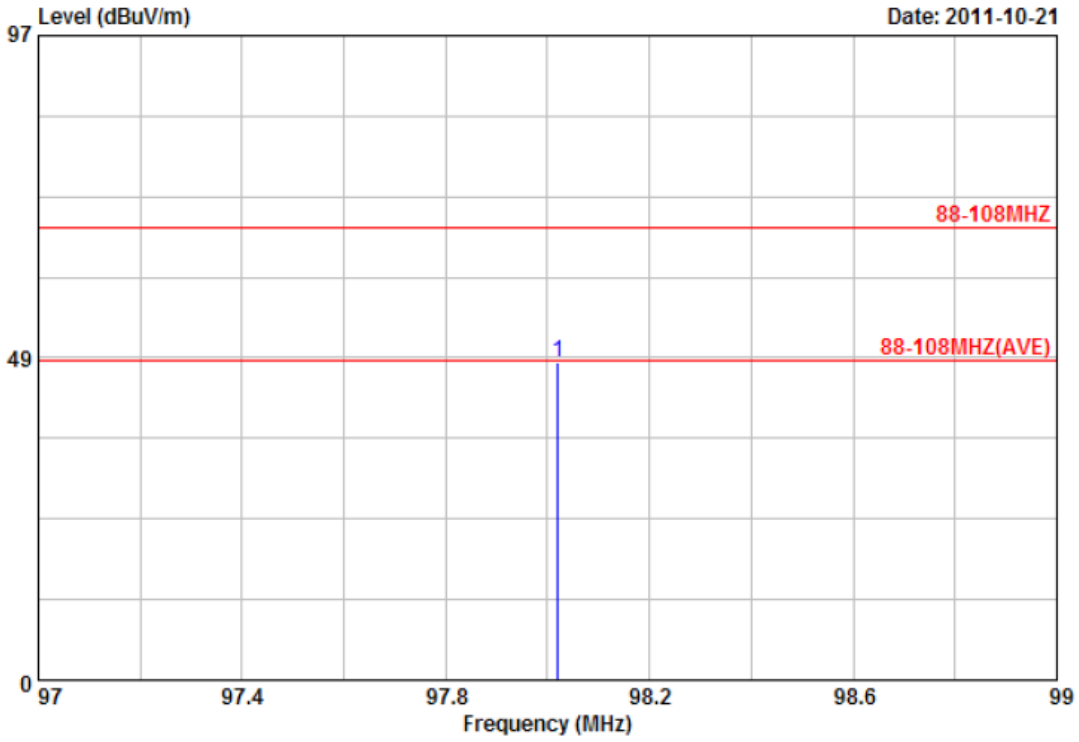


Item	Freq	Read Value	Factor	Result	Limit	Margin	Remark	Ant Pos	Tab Pos
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	Deg
1	88.11	55.85	-11.93	43.92	68.00	-24.08	Peak	100	360

Notes:

1. Result = Read Value + Factor
2. Factor = Antenna Factor + Cable Loss - Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 120KHz and video bandwidth is 300kHz for Peak detection and Quasi-peak detection at frequency below 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
5. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz.
6. The other emissions is too low to be measured.
7. The data is worse case.

Power	:	AC 120V	Pol/Phase	:	VERTICAL
Test Mode 2	:	Transmit	Temperature	:	28 °C
Operation Frequency	:	98	Humidity	:	51 %
Modulation Type	:	FM	Atmospheric Pressure	:	1020 hPa

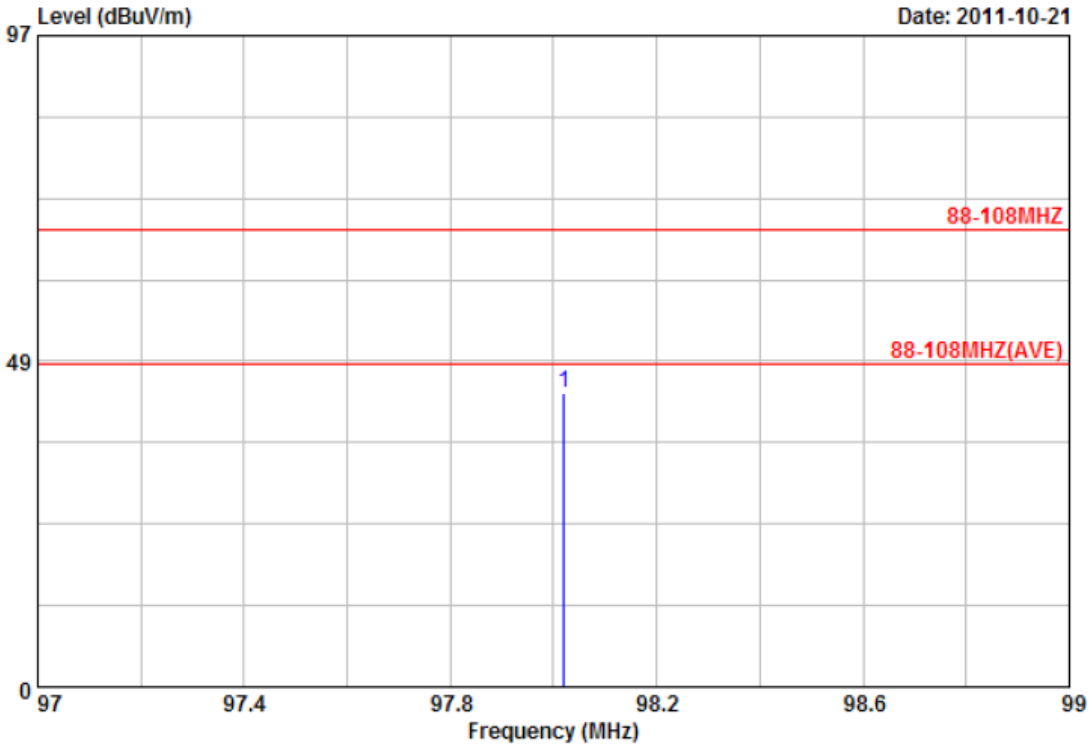


Item	Freq	Read Value	Factor	Result	Limit	Margin	Remark	Ant Pos	Tab Pos
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	Deg
1	98.02	48.56	-0.69	47.87	68.00	-20.13	Peak	100	0

Notes:

1. Result = Read Value + Factor
2. Factor = Antenna Factor + Cable Loss - Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 120KHz and video bandwidth is 300kHz for Peak detection and Quasi-peak detection at frequency below 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
5. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz.
6. The other emissions is too low to be measured.
7. The data is worse case.

Power	:	AC 120V	Pol/Phase	:	HORIZONTAL
Test Mode 2	:	Transmit	Temperature	:	28 °C
Operation Frequency	:	98	Humidity	:	51 %
Modulation Type	:	FM	Atmospheric Pressure	:	1020 hPa

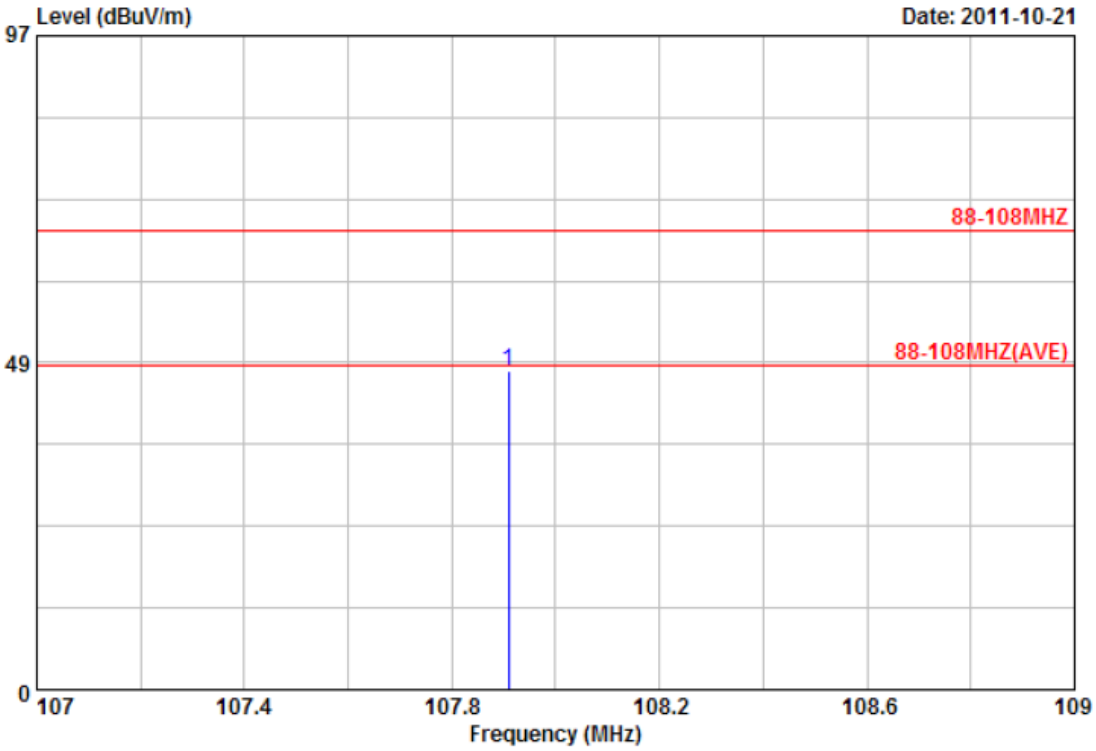


Item	Freq	Read Value	Factor	Result	Limit	Margin	Remark	Ant Pos	Tab Pos
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	Deg
1	98.02	52.93	-9.06	43.87	68.00	-24.13	Peak	100	360

Notes:

1. Result = Read Value + Factor
2. Factor = Antenna Factor + Cable Loss - Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 120KHz and video bandwidth is 300kHz for Peak detection and Quasi-peak detection at frequency below 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
5. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz.
6. The other emissions is too low to be measured.
7. The data is worse case.

Power	:	AC 120V	Pol/Phase	:	VERTICAL
Test Mode 3	:	Transmit	Temperature	:	28 °C
Operation Frequency	:	107.9	Humidity	:	51 %
Modulation Type	:	FM	Atmospheric Pressure	:	1020 hPa

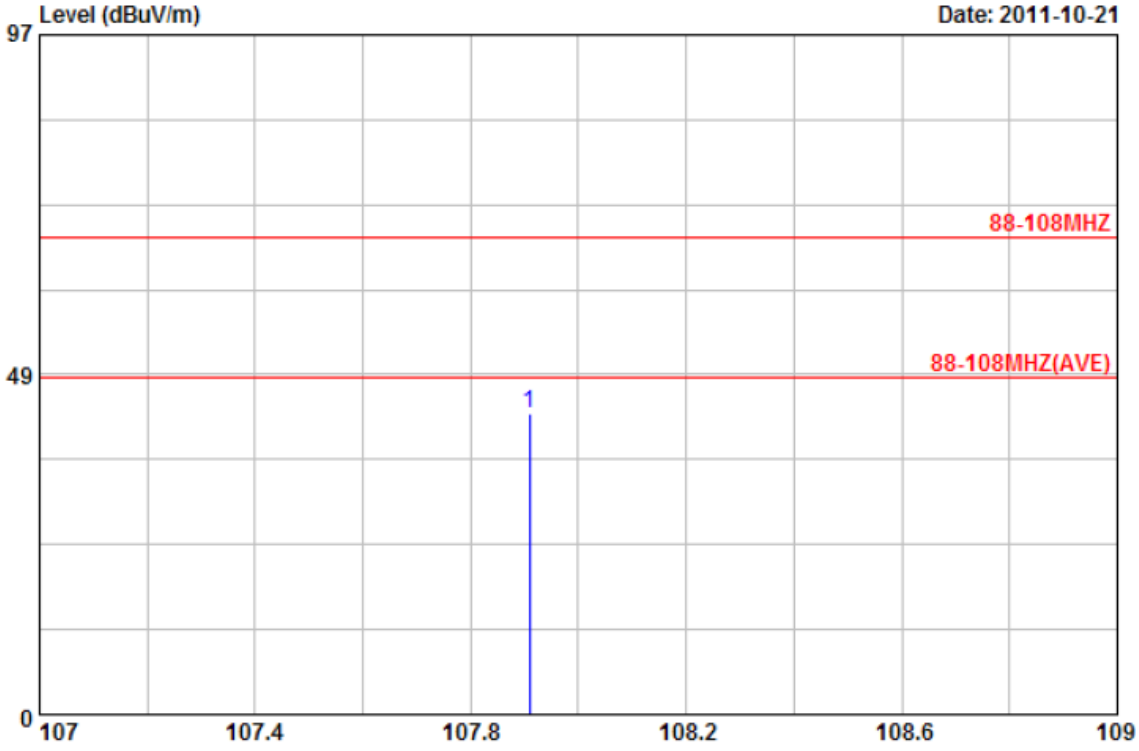


Item	Freq	Read Value	Factor	Result	Limit	Margin	Remark	Ant Pos	Tab Pos
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	Deg
1	107.91	46.22	1.00	47.22	68.00	-20.78	Peak	100	0

Notes:

1. Result = Read Value + Factor
2. Factor = Antenna Factor + Cable Loss - Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 120KHz and video bandwidth is 300kHz for Peak detection and Quasi-peak detection at frequency below 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
5. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz.
6. The other emissions is too low to be measured.
7. The data is worse case.

Power	:	AC 120V	Pol/Phase	:	HORIZONTAL
Test Mode 3	:	Transmit	Temperature	:	28 °C
Operation Frequency	:	107.9	Humidity	:	51 %
Modulation Type	:	FM	Atmospheric Pressure	:	1020 hPa



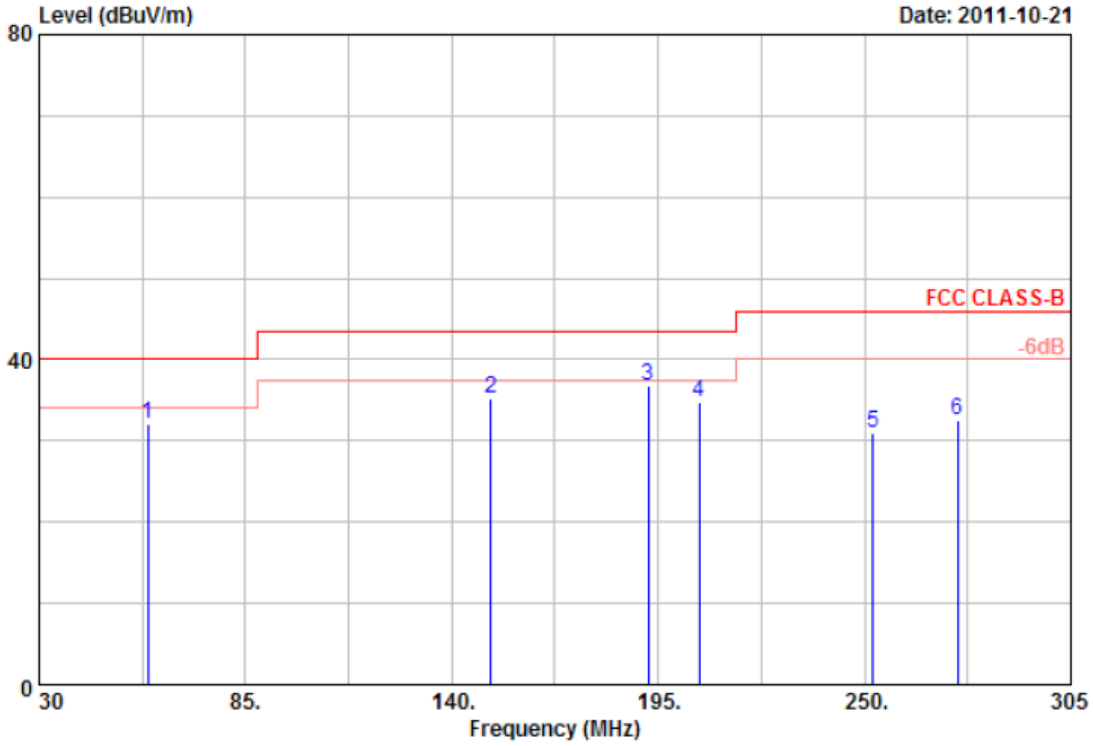
Item	Freq	Read Value	Factor	Result	Limit	Margin	Remark	Ant Pos	Tab Pos
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	Deg
1	107.91	56.01	-13.08	42.93	68.00	-25.07	Peak	100	360

Notes:

1. Result = Read Value + Factor
2. Factor = Antenna Factor + Cable Loss - Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 120KHz and video bandwidth is 300kHz for Peak detection and Quasi-peak detection at frequency below 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
5. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz.
6. The other emissions is too low to be measured.
7. The data is worse case.

6.5.2. **Test Result of Unwanted Spurious emission**

Power	:	AC 120V	Pol/Phase	:	VERTICAL
Test Mode 1	:	Transmit	Temperature	:	28 °C
Operation Frequency	:	88.1	Humidity	:	51 %
Modulation Type	:	FM	Atmospheric Pressure	:	1020 hPa

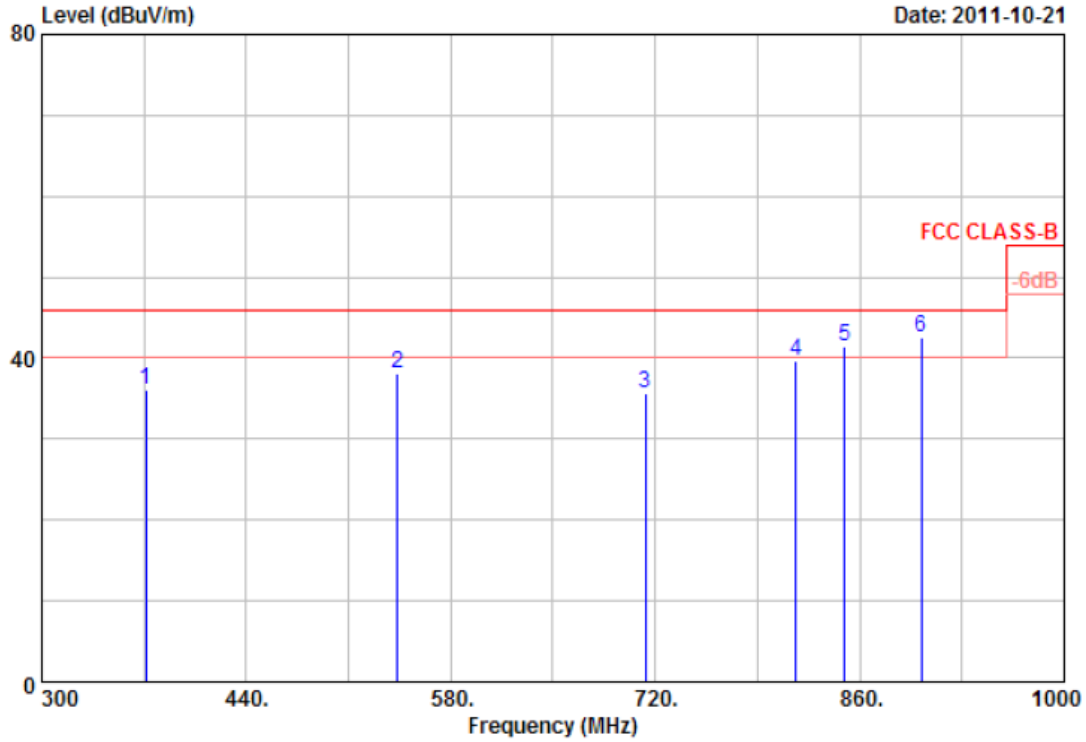


Item	Freq	Read Value	Factor	Result	Limit	Margin	Remark	Ant Pos	Tab Pos
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	Deg
1	58.88	36.56	-4.46	32.10	40.00	-7.90	Peak	100	360
2	150.45	34.36	0.87	35.23	43.50	-8.27	Peak	100	360
3	192.25	36.39	0.41	36.80	43.50	-6.70	Peak	100	360
4	206.00	37.35	-2.61	34.74	43.50	-8.76	Peak	100	360
5	252.20	36.15	-5.15	31.00	46.00	-15.00	Peak	100	360
6	274.75	35.60	-3.07	32.53	46.00	-13.47	Peak	100	360

Notes:

1. Result = Read Value + Factor
2. Factor = Antenna Factor + Cable Loss - Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 120KHz and video bandwidth is 300kHz for Peak detection and Quasi-peak detection at frequency below 1GHz.
4. According to technical experiences,all spurious emission of FM mode at channel 88,98,108 are almost the same below 1GHz,so that the channel 88 was chosen as representative in final test.
5. The data is worse case.

Power	:	AC 120V		Pol/Phase	:	VERTICAL	
Test Mode 1	:	Transmit		Temperature	:	28 °C	
Operation Frequency	:	88.1		Humidity	:	51 %	
Modulation Type	:	FM		Atmospheric Pressure	:	1020 hPa	

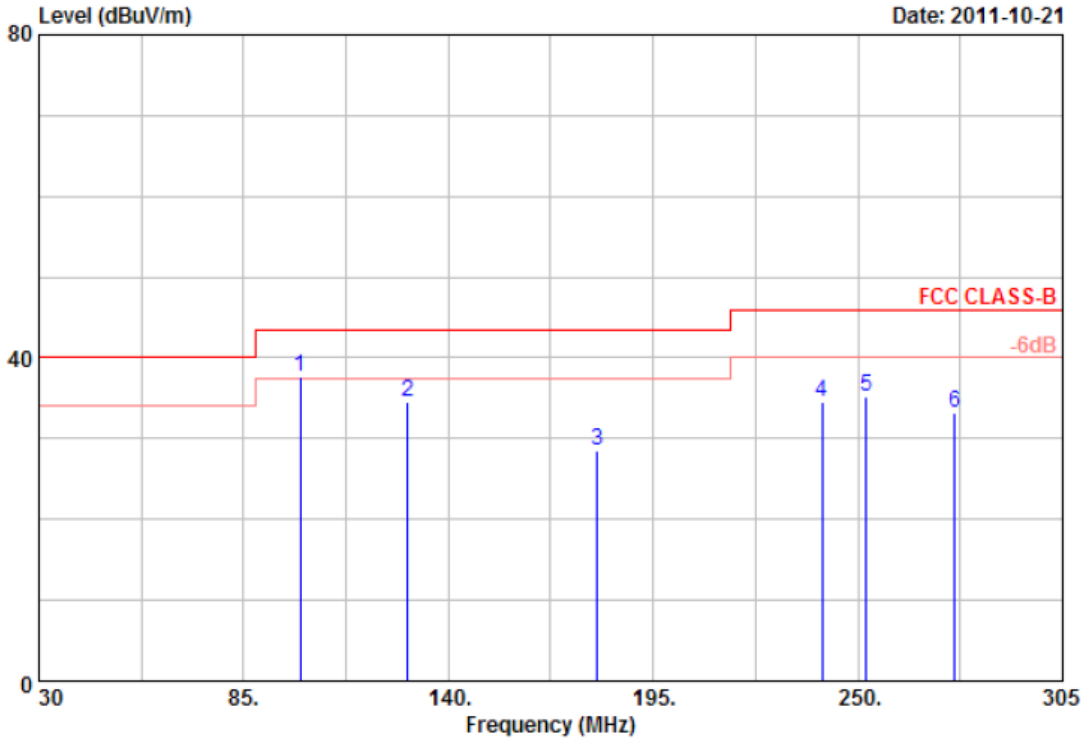


Item	Freq	Read Value	Factor	Result	Limit	Margin	Remark	Ant Pos	Tab Pos
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	Deg
1	371.40	39.04	-2.95	36.09	46.00	-9.91	Peak	100	0
2	543.60	29.67	8.52	38.19	46.00	-7.81	Peak	100	0
3	713.00	28.66	7.10	35.76	46.00	-10.24	Peak	100	0
4	816.60	28.64	11.03	39.67	46.00	-6.33	Peak	100	0
5	849.50	27.57	13.81	41.38	46.00	-4.62	QP	100	0
6	902.00	29.80	12.68	42.48	46.00	-3.52	QP	100	0

Notes:

1. Result = Read Value + Factor
2. Factor = Antenna Factor + Cable Loss - Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 120KHz and video bandwidth is 300kHz for Peak detection and Quasi-peak detection at frequency below 1GHz.
4. According to technical experiences,all spurious emission of FM mode at channel 88,98,108 are almost the same below 1GHz,so that the channel 88 was chosen as representative in final test.
5. The data is worse case.

Power	:	AC 120V	Pol/Phase	:	HORIZONTAL
Test Mode 1	:	Transmit	Temperature	:	28 °C
Operation Frequency	:	88.1	Humidity	:	51 %
Modulation Type	:	FM	Atmospheric Pressure	:	1020 hPa

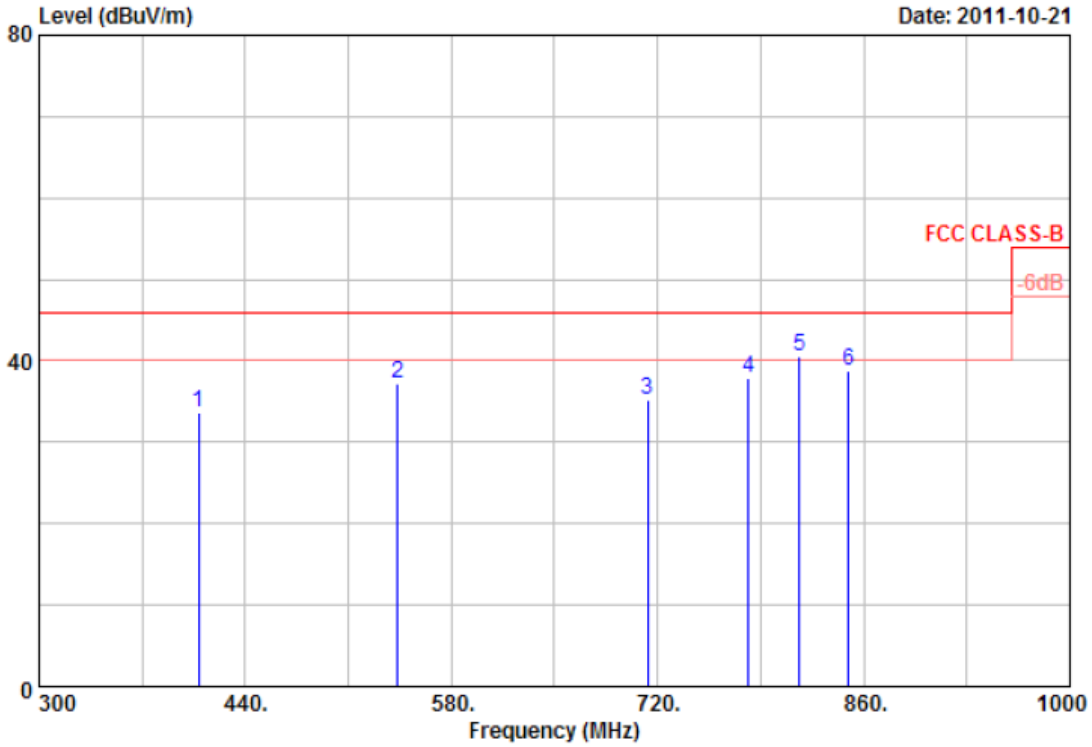


Item	Freq	Read Value	Factor	Result	Limit	Margin	Remark	Ant Pos	Tab Pos
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	Deg
1	100.13	45.64	-8.02	37.62	43.50	-5.88	QP	100	360
2	129.00	43.32	-8.77	34.55	43.50	-8.95	Peak	100	360
3	179.88	40.66	-12.09	28.57	43.50	-14.93	Peak	100	360
4	240.38	40.64	-6.01	34.63	46.00	-11.37	Peak	100	360
5	252.20	40.69	-5.56	35.13	46.00	-10.87	Peak	100	360
6	276.13	40.59	-7.43	33.16	46.00	-12.84	Peak	100	360

Notes:

1. Result = Read Value + Factor
2. Factor = Antenna Factor + Cable Loss - Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 120KHz and video bandwidth is 300kHz for Peak detection and Quasi-peak detection at frequency below 1GHz.
4. According to technical experiences,all spurious emission of FM mode at channel 88,98,108 are almost the same below 1GHz,so that the channel 88 was chosen as representative in final test.
5. The data is worse case.

Power	:	AC 120V	Pol/Phase	:	HORIZONTAL
Test Mode 1	:	Transmit	Temperature	:	28 °C
Operation Frequency	:	88.1	Humidity	:	51 %
Modulation Type	:	FM	Atmospheric Pressure	:	1020 hPa

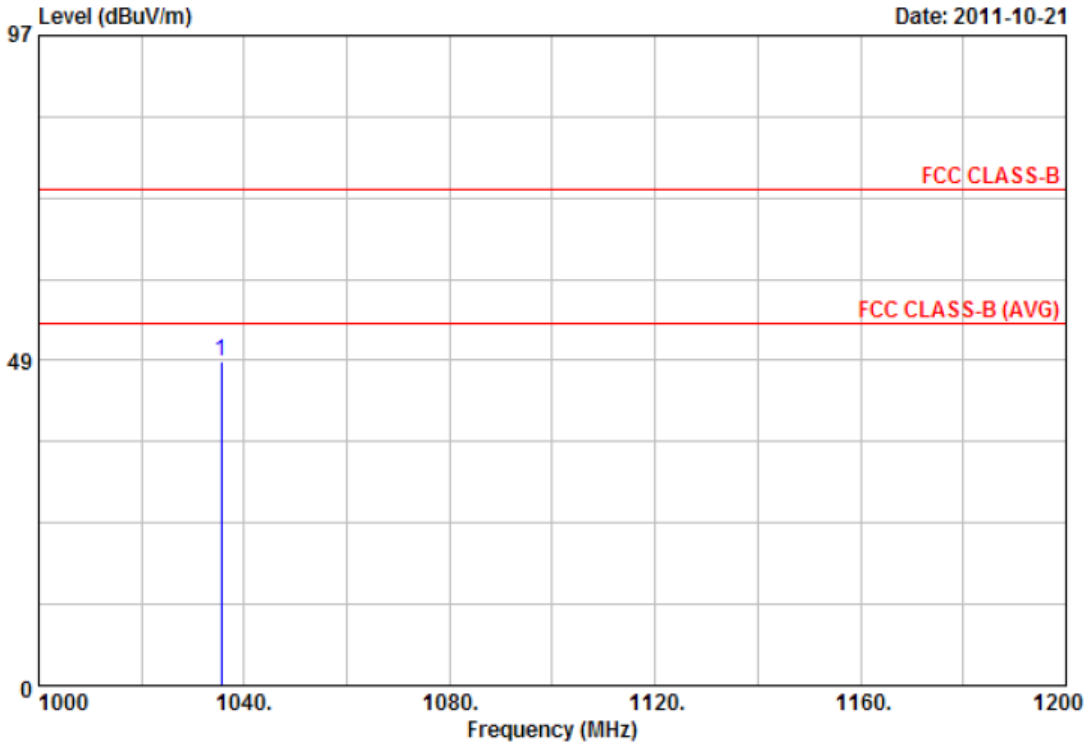


Item	Freq	Read Value	Factor	Result	Limit	Margin	Remark	Ant Pos	Tab Pos
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	Deg
1	408.50	34.58	-1.01	33.57	46.00	-12.43	Peak	100	0
2	543.60	30.84	6.39	37.23	46.00	-8.77	Peak	100	0
3	713.00	28.30	6.82	35.12	46.00	-10.88	Peak	100	0
4	781.60	29.50	8.44	37.94	46.00	-8.06	Peak	100	0
5	816.60	29.18	11.32	40.50	46.00	-5.50	QP	100	0
6	849.50	27.86	10.83	38.69	46.00	-7.31	Peak	100	0

Notes:

1. Result = Read Value + Factor
2. Factor = Antenna Factor + Cable Loss - Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 120KHz and video bandwidth is 300kHz for Peak detection and Quasi-peak detection at frequency below 1GHz.
4. According to technical experiences,all spurious emission of FM mode at channel 88,98,108 are almost the same below 1GHz,so that the channel 88 was chosen as representative in final test.
5. The data is worse case.

Power	:	AC 120V	Pol/Phase	:	VERTICAL
Test Mode 1	:	Transmit	Temperature	:	28 °C
Operation Frequency	:	88.1	Humidity	:	51 %
Modulation Type	:	FM	Atmospheric Pressure	:	1020 hPa

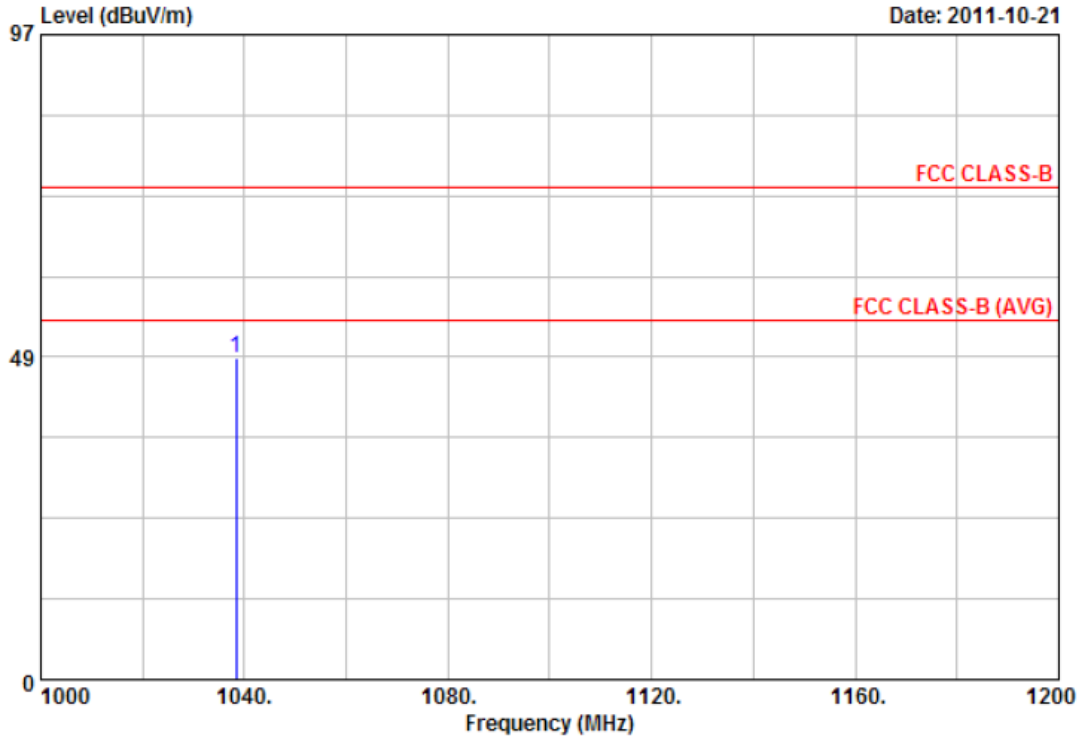


Item	Freq	Read Value	Factor	Result	Limit	Margin	Remark	Ant Pos	Tab Pos
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	Deg
1	1035.50	44.16	4.10	48.26	74.00	-25.74	Peak	100	0

Notes:

1. Result = Read Value + Factor
2. Factor = Antenna Factor + Cable Loss - Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 120KHz and video bandwidth is 300kHz for Peak detection and Quasi-peak detection at frequency below 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
5. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz.
6. The other emissions is too low to be measured.
7. The data is worse case.

Power	:	AC 120V	Pol/Phase	:	VERTICAL
Test Mode 1	:	Transmit	Temperature	:	28 °C
Operation Frequency	:	88.1	Humidity	:	51 %
Modulation Type	:	FM	Atmospheric Pressure	:	1020 hPa

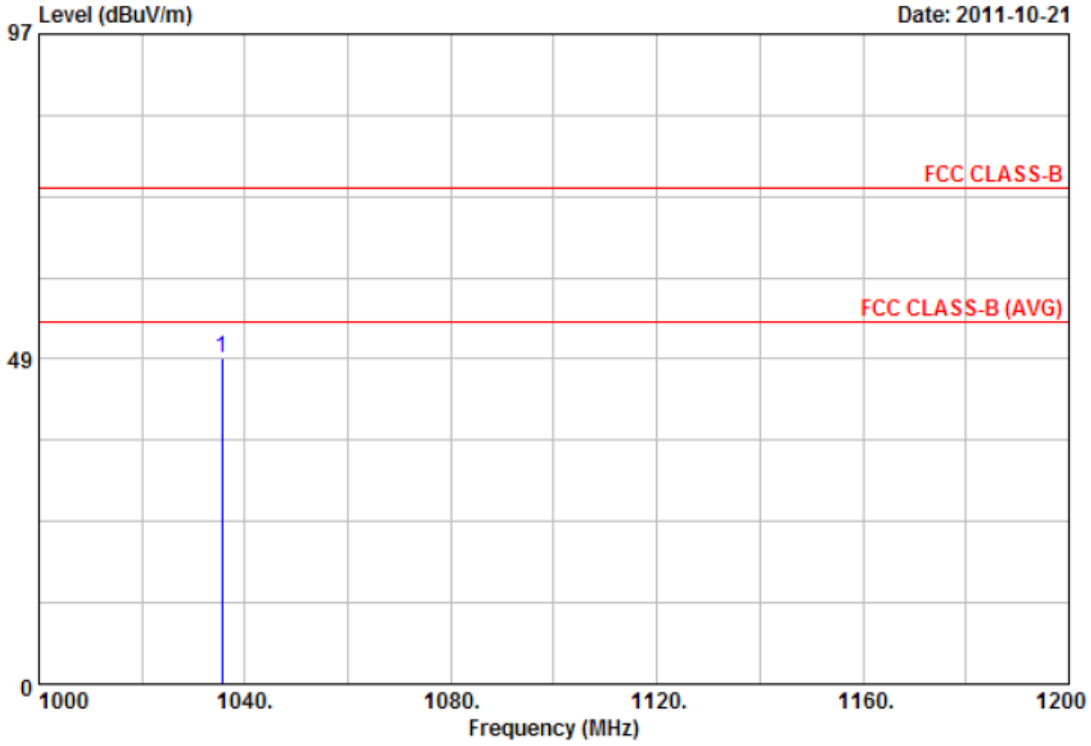


Item	Freq	Read Value	Factor	Result	Limit	Margin	Remark	Ant Pos	Tab Pos
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	Deg
1	1038.30	41.29	7.14	48.43	74.00	-25.57	Peak	100	360

Notes:

1. Result = Read Value + Factor
2. Factor = Antenna Factor + Cable Loss - Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 120KHz and video bandwidth is 300kHz for Peak detection and Quasi-peak detection at frequency below 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
5. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz.
6. The other emissions is too low to be measured.
7. The data is worse case.

Power	:	AC 120V	Pol/Phase	:	VERTICAL
Test Mode 2	:	Transmit	Temperature	:	28 °C
Operation Frequency	:	98	Humidity	:	51 %
Modulation Type	:	FM	Atmospheric Pressure	:	1020 hPa

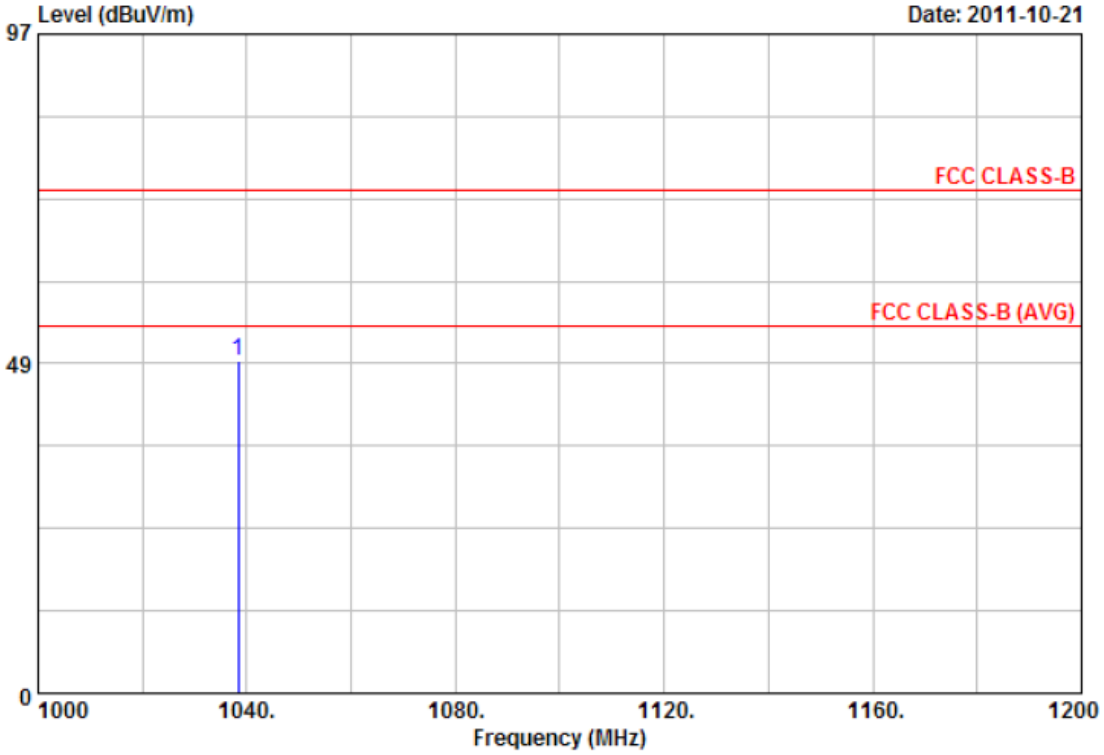


Item	Freq	Read Value	Factor	Result	Limit	Margin	Remark	Ant Pos	Tab Pos
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	Deg
1	1035.50	44.62	4.10	48.72	74.00	-25.28	Peak	100	0

Notes:

1. Result = Read Value + Factor
2. Factor = Antenna Factor + Cable Loss - Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 120KHz and video bandwidth is 300kHz for Peak detection and Quasi-peak detection at frequency below 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
5. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz.
6. The other emissions is too low to be measured.
7. The data is worse case.

Power	:	AC 120V	Pol/Phase	:	HORIZONTAL
Test Mode 2	:	Transmit	Temperature	:	28 °C
Operation Frequency	:	98	Humidity	:	51 %
Modulation Type	:	FM	Atmospheric Pressure	:	1020 hPa

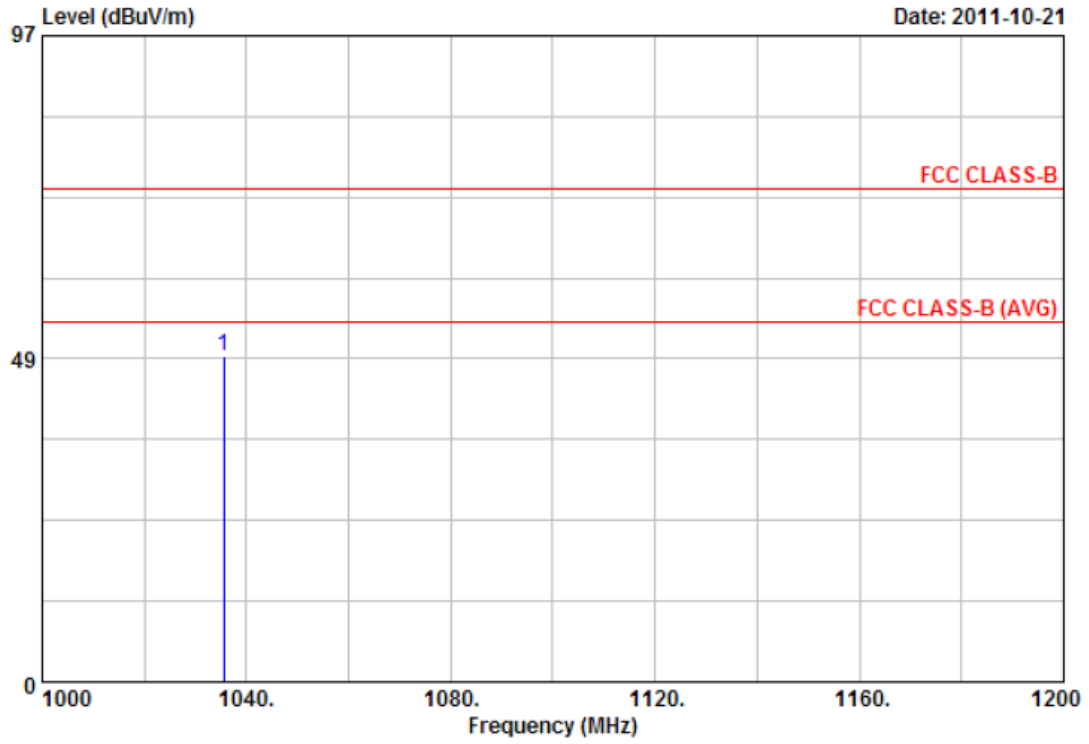


Item	Freq	Read Value	Factor	Result	Limit	Margin	Remark	Ant Pos	Tab Pos
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	Deg
1	1038.30	41.75	7.14	48.89	74.00	-25.11	Peak	100	360

Notes:

1. Result = Read Value + Factor
2. Factor = Antenna Factor + Cable Loss - Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 120KHz and video bandwidth is 300kHz for Peak detection and Quasi-peak detection at frequency below 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
5. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz.
6. The other emissions is too low to be measured.
7. The data is worse case.

Power	:	AC 120V	Pol/Phase	:	VERTICAL
Test Mode 3	:	Transmit	Temperature	:	28 °C
Operation Frequency	:	107.9	Humidity	:	51 %
Modulation Type	:	FM	Atmospheric Pressure	:	1020 hPa

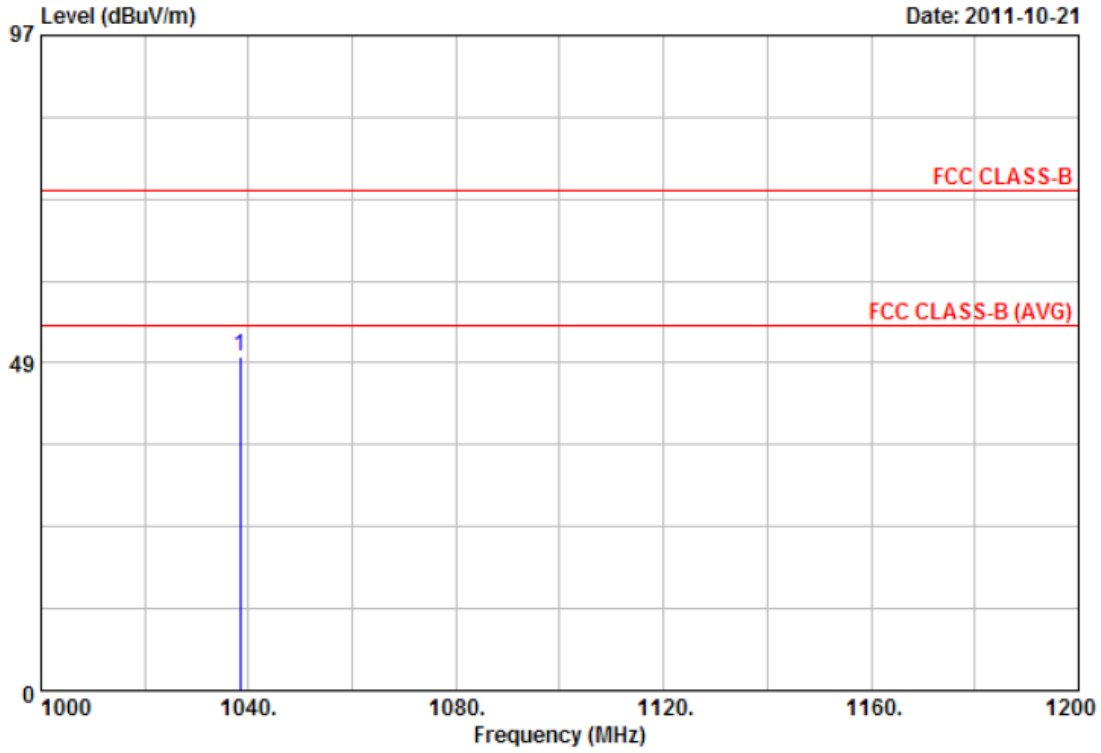


Item	Freq	Read Value	Factor	Result	Limit	Margin	Remark	Ant Pos	Tab Pos
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	Deg
1	1035.50	44.88	4.10	48.98	74.00	-25.02	Peak	100	0

Notes:

1. Result = Read Value + Factor
2. Factor = Antenna Factor + Cable Loss - Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 120KHz and video bandwidth is 300kHz for Peak detection and Quasi-peak detection at frequency below 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
5. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz.
6. The other emissions is too low to be measured.
7. The data is worse case.

Power	:	AC 120V	Pol/Phase	:	HORIZONTAL
Test Mode 3	:	Transmit	Temperature	:	28 °C
Operation Frequency	:	107.9	Humidity	:	51 %
Modulation Type	:	FM	Atmospheric Pressure	:	1020 hPa



Item	Freq	Read Value	Factor	Result	Limit	Margin	Remark	Ant Pos	Tab Pos
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	Deg
1	1038.30	42.33	7.14	49.47	74.00	-24.53	Peak	100	360

Notes:

1. Result = Read Value + Factor
2. Factor = Antenna Factor + Cable Loss - Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 120KHz and video bandwidth is 300kHz for Peak detection and Quasi-peak detection at frequency below 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
5. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz.
6. The other emissions is too low to be measured.
7. The data is worse case.

Test engineer: Ben

7. Test of Emission Bandwidth

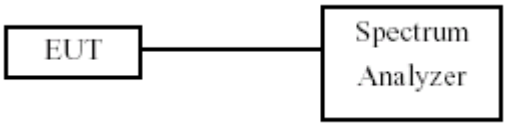
7.1. Standard Applicable

According to FCC 15.239(a), 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

7.2. Test Procedures

With the EUT's antenna attached, the EUT's 20dB Bandwidth 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.

7.3. Test Setup Layout



7.4. Measurement Equipment

Instrument/Ancillary	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
Spectrum Analyzer	R&S	FSP40	100219	2010/11/05	2011/11/04

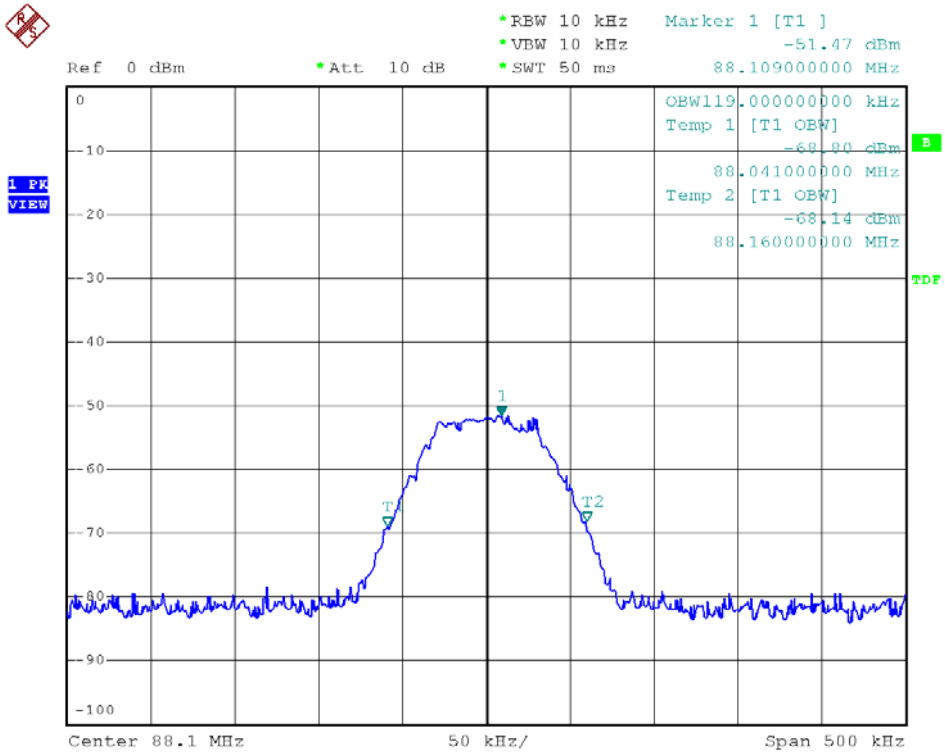
7.5. Test Result and Data

Test Date: Oct. 24, 2011 Temperature: 25℃

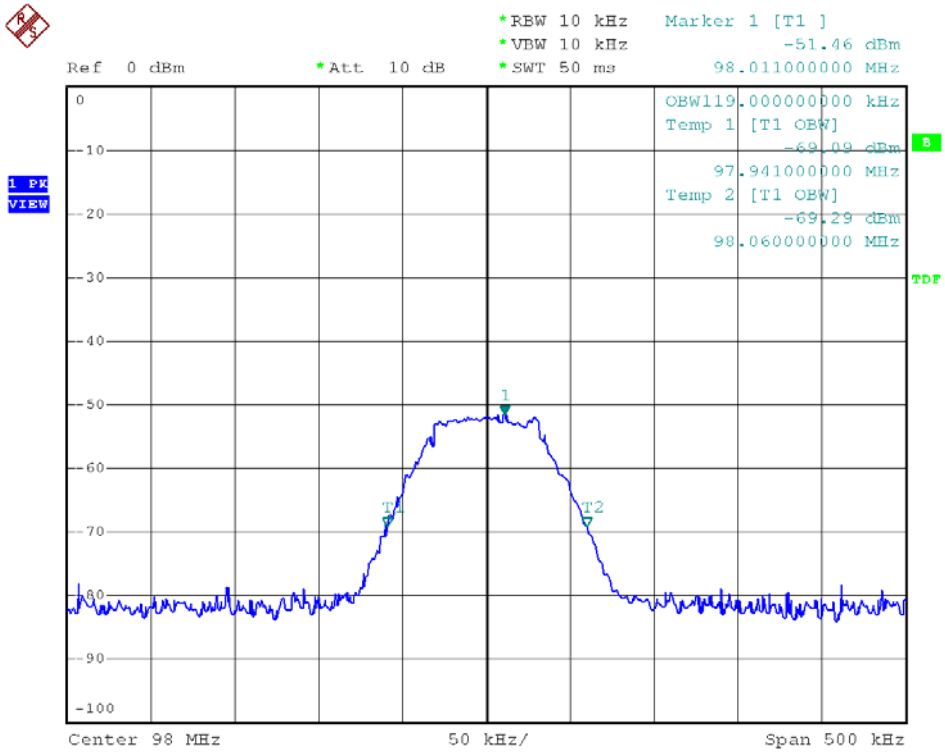
Atmospheric pressure: 1020 hPa Humidity: 61%

Frequency (MHz)	Emission Bandwidth(KHz)	Limit(KHz)
88.1	119.0	200
98	119.0	200
107.9	119.0	200

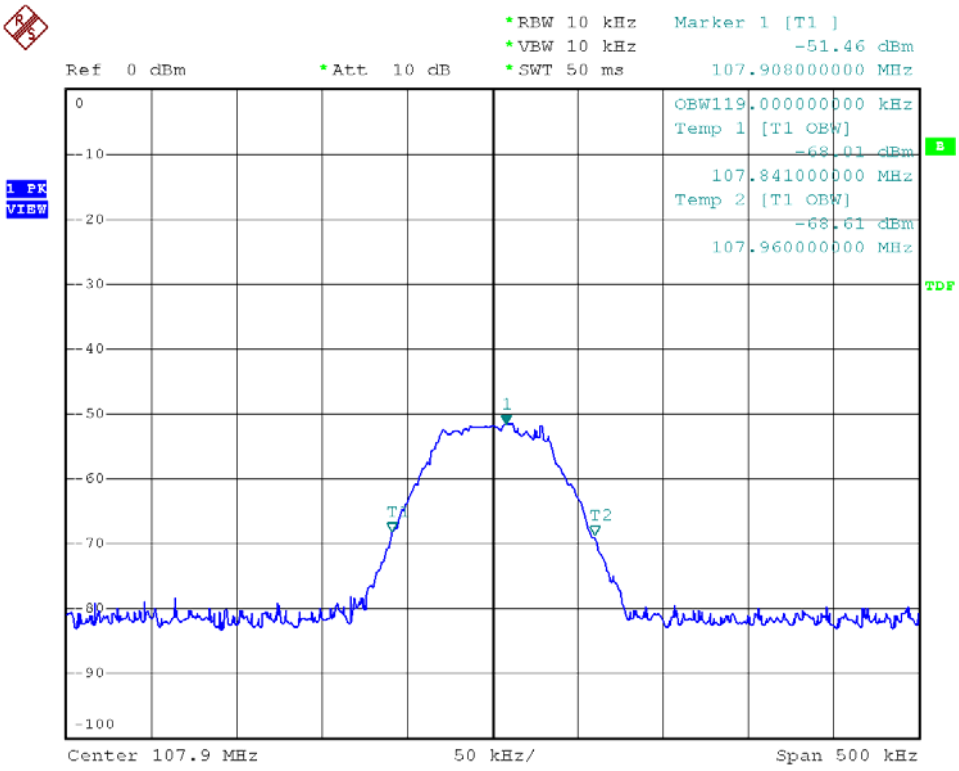
Operating Frequency: 88.1MHz



Operating Frequency: 98MHz



Operating Frequency: 107.9MHz

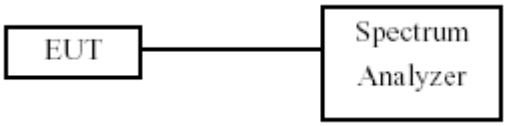


8. Test of Frequency Range

8.1. Standard Applicable

(a) 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 frequency range of 88-108MHz.

8.2. Test Setup Layout



8.3. Measurement Equipment

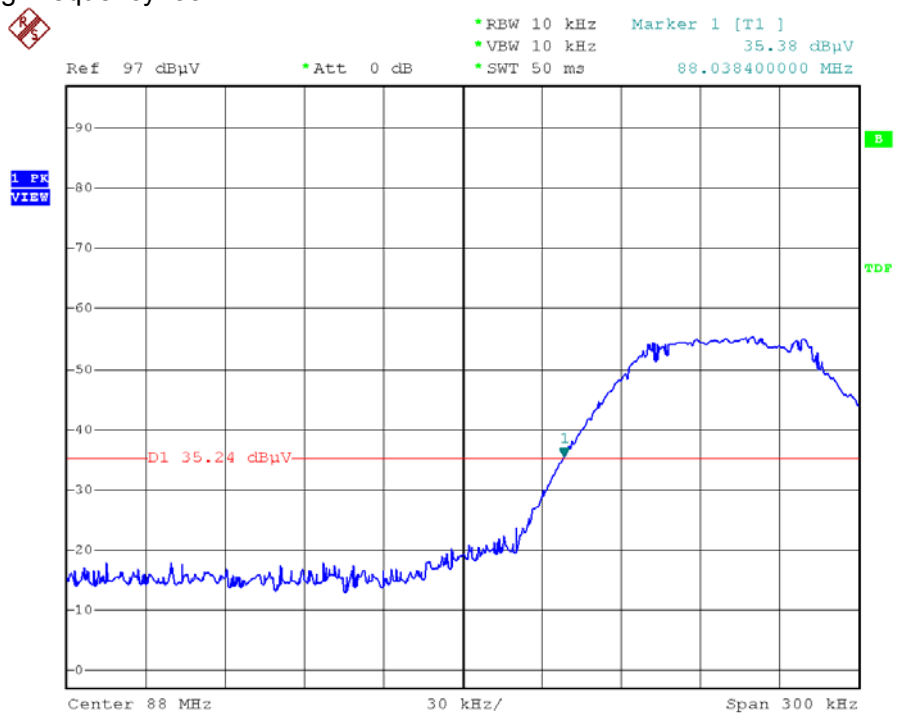
Instrument/Ancillary	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
Spectrum Analyzer	R&S	FSP40	100219	2010/11/05	2011/11/04

8.4. Test Result and Data

Test Date: Oct. 24, 2011 Temperature: 25℃

Atmospheric pressure: 1020 hPa Humidity: 61%

Operating Frequency: 88.1MHz



Operating Frequency: 107.9MHz