



Test Report

Product Name: Audience response system Module

Model No.: QL-RFM21X

Brand Name: ENJOY, Qclick, Feedback Genius, Xpress

FCC ID: VUEQLRFM21X

Applicant: Guangzhou City Qile Technology Co., Ltd.

Address: 68 Meijing Street, Changxing Road, Tianhe district, Guangzhou City, Guangdong Province, China.

Date of Receipt: 2007-12-4

Date of Test: 2007-12-4 to 2007-12-7

Investigation Requested: FCC Part 15 Subpart C

Conclusions: The submitted product COMPLIED with the requirements of FCC Part 15: 2006, Subpart C.
The EMC tests were performed in accordance with the standards described above.

Prepared By:

Man MiaoLing

Reviewed By:

Yao Dao

Issued Date:

2007-12-7



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1.General Information

1.1. EUT Description

Model name:	Audience response system Module
Model number:	QL-RFM21X
Brand name:	ENJOY, Qclick, Feedback Genius, Xpress
FCC ID:	VUEQLRFM21X
Operation frequency:	2400MHz to 2483.5MHz
Channel Number:	80
Test Channel:	CH1: 2404MHz, CH2: 2444MHz, CH3: 2482MHz
Modulation Technology:	FSK
Antenna:	Permanently attached
Antenna gain:	3
Power Supply:	DC 3V(2 AAA Batteries)
Manufacturer:	Guangzhou City Qile Technology Co., Ltd.
Address:	68 Meijing Street, Changxing Road, Tianhe district, Guangzhou City, Guangdong Province, China.
EUT photos:	Refer to Clause 5 in this report



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1.2. Applicant Details

Applicant:	Guangzhou City Qile Technology Co., Ltd.
Address:	68 Meijing Street, Changxing Road, Tianhe district, Guangzhou City, Guangdong Province, China.

1.3. Test Facility

3m Anechoic Chamber: FCC

Registration Number: 597719

January 18, 2005

EMC Lab.

Certificated by Nemko, Shanghai

Aut. No.: ELA505

May 30, 2007

Industry Canada

Registration Number: 6664A

August 22, 2006

Certificated by China National Accreditation Service for Conformity

Assessment [CNAS]

CNAS Number: L0307

Name of Firm:

Guangdong Electronic & Electrical Products Inspection and Supervision
Institute. [CGEL]

Site Location:

45 South Street Shayongnan village Sanyuanli Guangzhou China.

Telephone: 86-20-36377897

Fax: 86-20-36377049



2. Test Information and Result Summary

2.1. Test Statement

The test results in the report apply only to the unit tested by CGEL.

There was no deviation from the requirements of test standards during the test.

DC 3V(**2 AAA new batteries**) was used during this test.

2.2. EUT Modification

No modification.

2.3. Investigations Requested

Perform Electromagnetic interference measurement in accordance with FCC Part 15: 2006, Subpart C and ANSI C63.4:2003 for FCC Certification.

2.4. Test Standard and Results Summary

Test standard and result summary			
Test description	Test Requirement	Limited	Test Result
Conducted Emission	FCC 47CFR 15.207	Table 15.207	N/A
Field strength of fundamental and harmonics	FCC 47CFR 15.249(a)	50mV/m Fundamental 500uV/m Harmonics	PASS
Radiated Emission	FCC 47CFR 15.249(d)	Table 15.209	PASS
20 dB Bandwidth	FCC 47CFR 15.215	/	/

Remark: N/A- not applicable



2.5.Description of EUT Connection

The EUT has been tested as an independent unit. The only connectors to the module are power supply and modulation/data inputs. The length of these lines is 50 centimeters.

2.6. Measurement Uncertainty

Item	Item	Uncertainty	Remark
1	Uncertainty for Conducted Emission Test	2.5dB	/
2	Uncertainty for Radiated Emission Test	3.7dB	Under 1GHz
3	Uncertainty for Radiated Emission Test	3.5dB	1GHz-7GHz
4	Uncertainty for Radiated Emission Test	3.9dB	Above 7GHz



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3. Conduct Emission

Test requirement:	FCC 47CFR 15.249
Test method:	ANSI C63.4:2003
Class/Severity:	Table 15.207
Test result:	N/A

The EUT is operated by 3V DC battery power. Therefore power line conducted emission was deemed unnecessary.



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4. Radiated Emission

Test requirement:	FCC 47CFR 15.249(a) and 15.249(d)
Test method:	ANSI C63.4:2003
Test date:	2007-12-06 to 2007-12-07
Environment condition:	Temperature:21 to 22 °C, Humidity: 55 to 56 %RH, Pressure: 101.0kPa
Conclusion::	Pass

4.1. Test equipment and test site

Frequency rang: 30~1000MHz

Item	Equipment	Manufacturer	Model No.	Last Cal.	Cal. Due date
1	EMI Receiver	R&S	ESIB7	2007/03/30	2008/03/29
2	Antenna	R&S	HL-562	2007/08/15	2008/08/14
3	RF Cable	R&S	/	2007/08/15	2008/08/14
4	RF Cable	R&S	/	2007/08/15	2008/08/14
5	RF Cable	R&S	/	2007/08/15	2008/08/14
6	3m anechoic chamber	ETS	RFD-F-100	2007/05/25	2008/05/24
7	Shielding Room	ETS	RFD-100	2007/05/25	2008/05/24

Frequency rang: 1GHz~7GHz

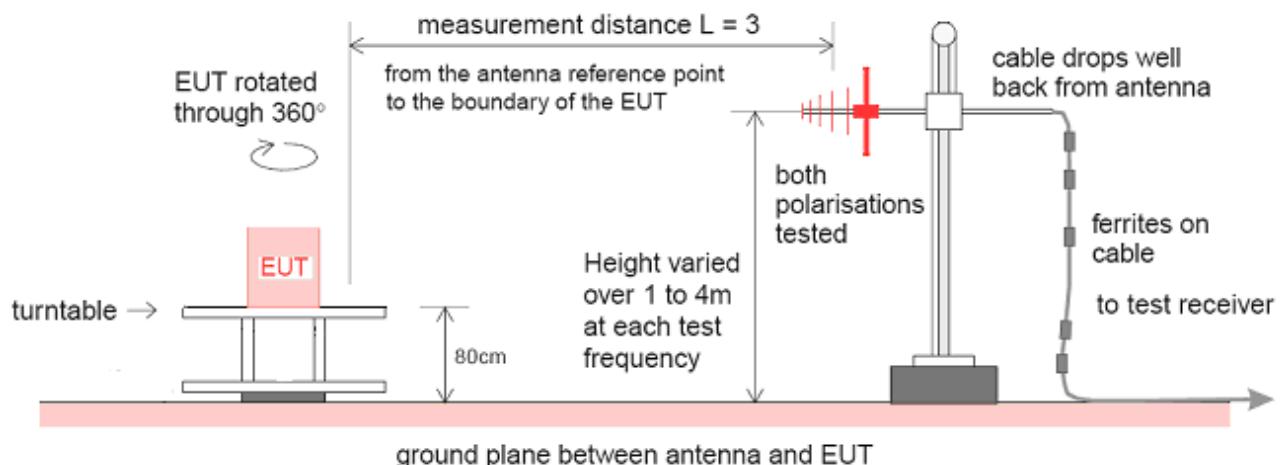
Item	Equipment	Manufacturer	Model No.	Last Cal.	Cal. Due date
1	EMI Receiver	R&S	ESIB7	2007/03/30	2008/03/29
2	Antenna	Xibao	GH18H	2007/05/25	2008/05/24
3	HF Cable	Xibao	/	2007/05/25	2008/05/24
4	3m anechoic chamber	ETS	RFD-F-100	2007/05/25	2008/05/24
5	Shielding Room	ETS	RFD-100	2007/05/25	2008/05/24

Frequency rang: above 7GHz

Item	Equipment	Manufacturer	Model No.	Last Cal.	Cal. Due date
1	Analyzer	HP	8562A	2007/07/03	2008/07/02
2	Antenna	Xibao	GH18H	2007/05/25	2008/05/24
3	HF Cable	Xibao	/	2007/05/25	2008/05/24
4	3m anechoic chamber	ETS	RFD-F-100	2007/05/25	2008/05/24
5	Shielding Room	ETS	RFD-100	2007/05/25	2008/05/24

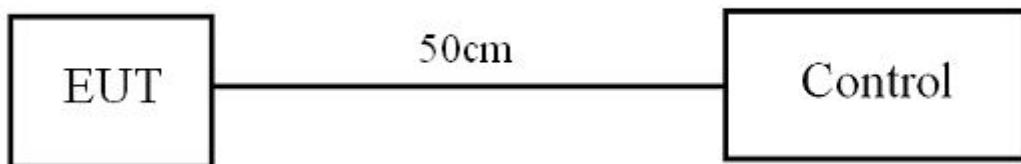


4.2. Test setup



Note: The EUT system was put on a wooden table with 0.8m heights above a ground plane.

Block diagram of connection between the EUT and support units:





4.3. Test Procedure

The sample was placed 0.8m above the ground plane on a standard radiated emission test site. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations.

The bandwidth of the EMI test receiver (R&S ESIB7) is set at 120kHz. Frequency range from 30MHz to 1000 MHz.

The bandwidth of the VBW is set at 3MHz and RBW is set at 1MHz for peak emissions measurement above 1GHz and 1MHz RBW 10Hz VBW for average emission above 1GHz.

The bandwidth of the Frequency analyzer (HP 8562A) is set at 3MHz. Frequency range from 7GHz to 26GHz.

The frequency range from 30MHz to 10th harmonic are checked.

The test mode (TX Mode) is tested in Anechoic Chamber and all the scanning waveforms are reported with antenna in horizontal and vertical polarization on Section 4.4.



4.4. Limits and Test Result

Limits of field strength for Fundamental and Harmonics

Fundamental frequency	Field strength of fundamental		Field strength of harmonics	
MHz	mV/m	dB μ V/m	μ V/m	dB μ V/m
2400-2483.5	50	94	500	54

Limits for Radiated Emissions -15.209

Frequency Range	Limits		Measurement Distance
MHz	μ V/m	dB μ V/m	m
30-88	100	40.0	3
88-216	150	43.5	3
216-960	200	46.0	3
960-1000	500	54.0	3
Above1000	54dB μ V/m (Average) 74dB μ V/m (Peak)		3

Remark:

- (1) In the emission table above, the tighter limit applies at the band edges.
- (2) The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.
- (3) According to FCC 47CFR15.35, the limit on the radio frequency emissions as measured using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules.
- (4) Measurement Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.



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Test Result

The frequency range from 30MHz to 1000MHz and above 1GHz is investigated. Please see the following pages.

Measurements of the field strength of fundamental were performed using a Peak detector with 2MHz RBW and 3MHz VBW. This test was performed with EUT in X, Y, Z position and with antenna on vertical and horizontal polarization, record the worst cases.

All measurements for radiated emissions within the restricted bands except fundamental were performed using a Quasi-Peak detector with 120kHz RBW below 1GHz and a Peak and Average detector with 1MHz RBW above 1GHz.

All measurements for radiated emissions within the restricted bands except fundamental were performed using a Quasi-Peak detector with 300kHz VBW below 1GHz and a Peak detector with 3MHz VBW above 1GHz, A average detector with 10Hz VBW above 1GHz.

All the emissions include harmonics from 7GHz~24GHz are at least 15dB below the limit, and do not record.

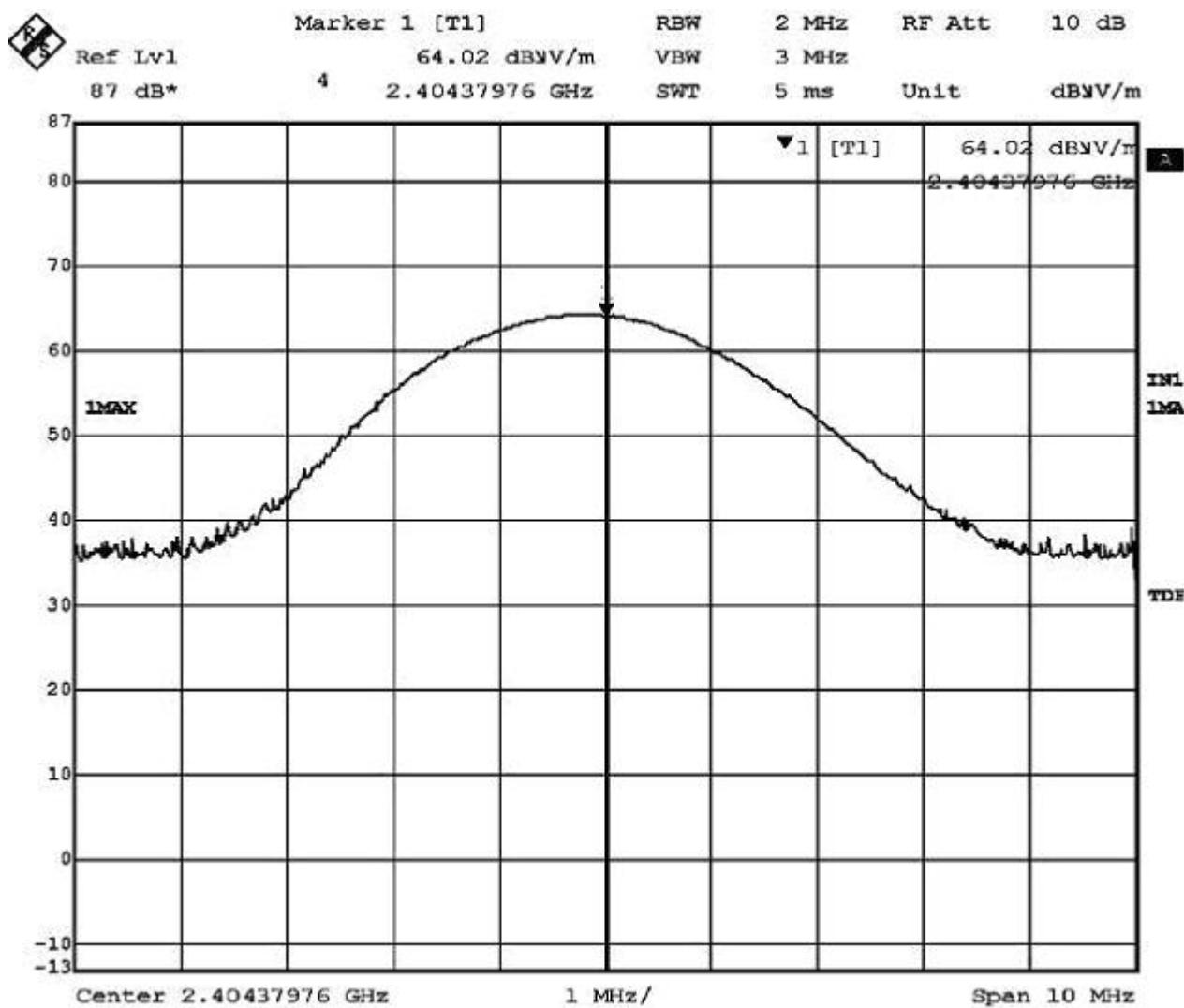


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Field strength for Fundamental of CH1: 2404MHz (Horizontal)



Date: 5.DEC.2007

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Reading dB μ V/m	Emission Level dB μ V/m	Limit dB μ V/m	Result	Remark
2404	24.26	3.26	64.02	64.02	94.00	Pass	Peak

Remark: Emission Level= Reading.

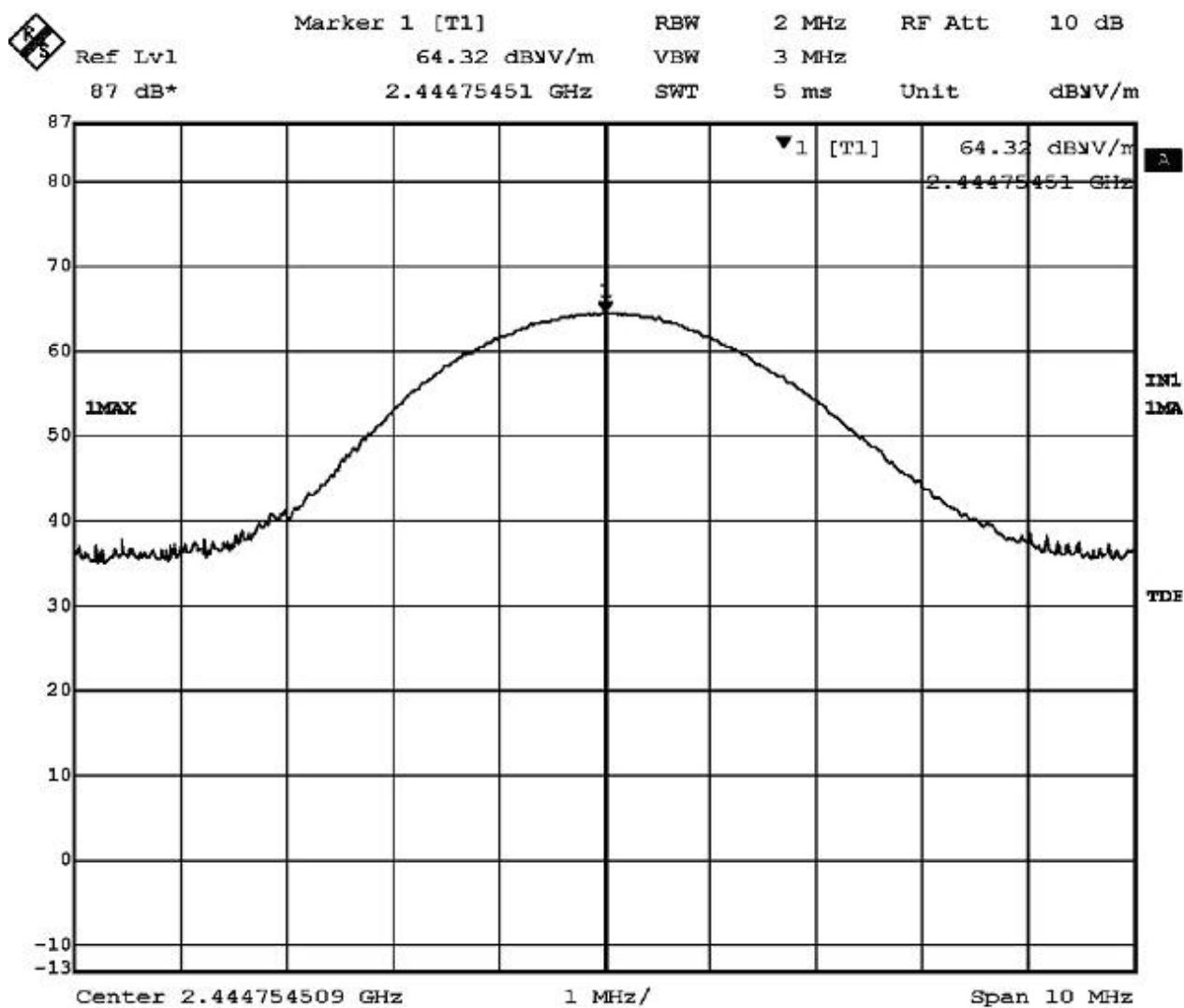


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Field strength for Fundamental of CH2: 2.44 (Horizontal)



Date: 5.DEC.2007

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Reading dB μ V/m	Emission Level dB μ V/m	Limit dB μ V/m	Result	Remark
2444	24.59	3.38	64.32	64.32	94.00	Pass	Peak

Remark: Emission Level= Reading.

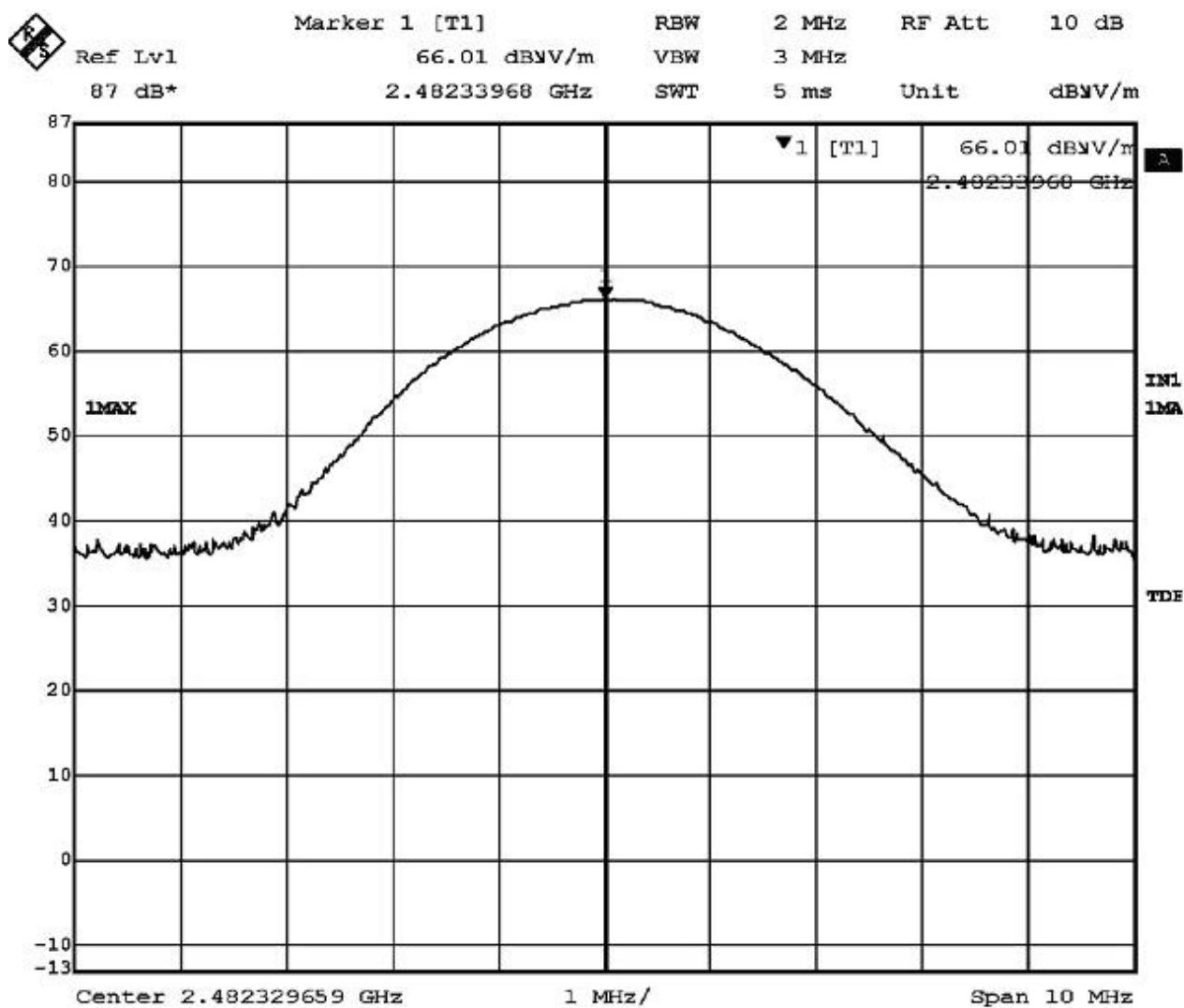


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Field strength for Fundamental of CH3: 2.48 (Horizontal)



Date: 5.DEC.2007

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Reading dB μ V/m	Emission Level dB μ V/m	Limit dB μ V/m	Result	Remark
2482	24.93	3.56	66.01	66.01	94.00	Pass	Peak

Remark: Emission Level= Reading.



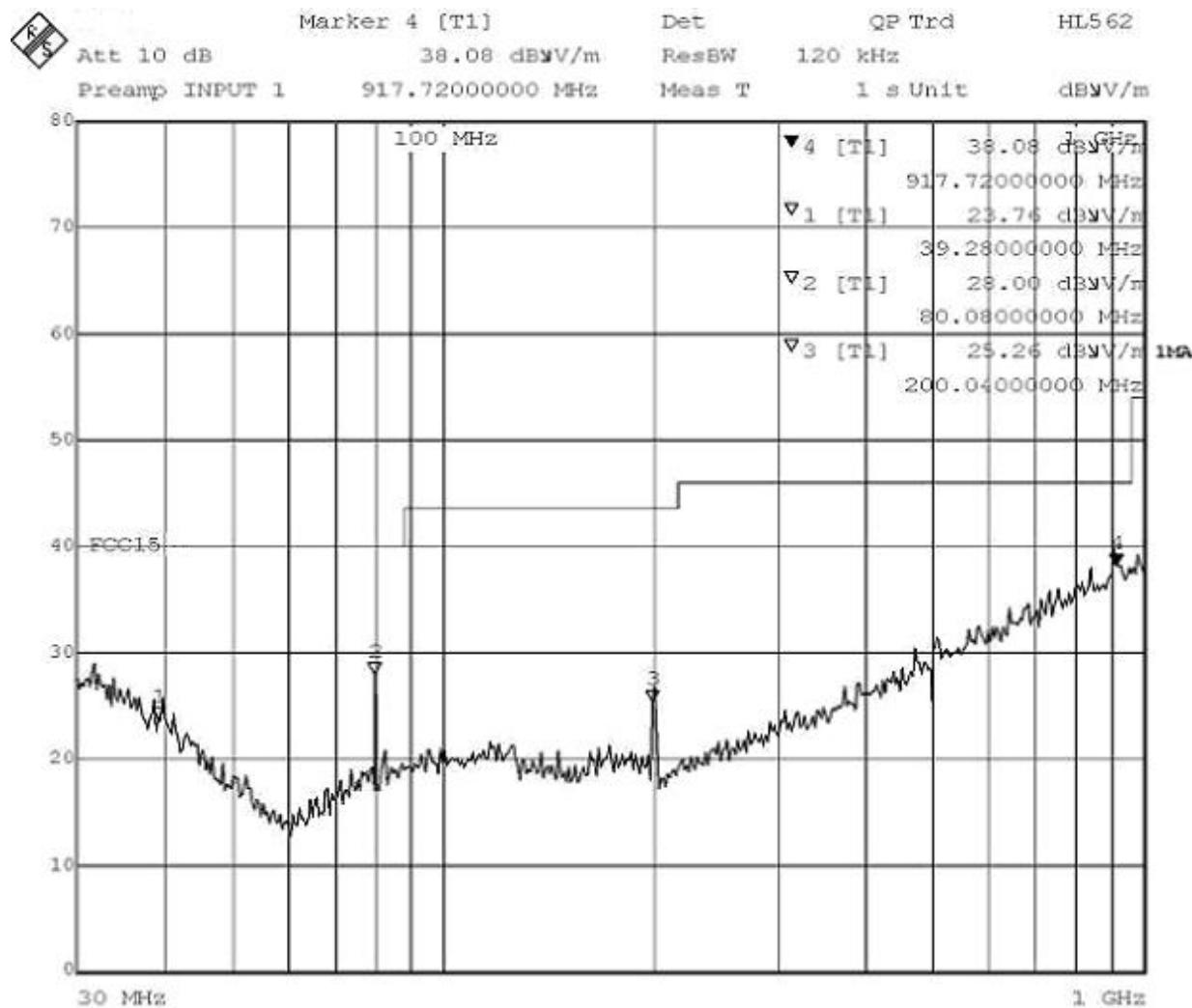
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Test Results of Radiated Emissions Under 1GHz:

Frequency Range: 30MHz-1000MHz (Vertical)



Date: 6.DEC.2007

Frequency MHz	Emission Level dB μ V/m	Limits dB μ V/m	Margin dB	Remark
39.28	23.76	40.00	16.24	QP
80.08	28.00	40.00	12.00	QP
200.04	25.26	43.50	18.24	QP
917.72	38.08	46.00	7.92	QP

Remark: Emission Level=Reading.



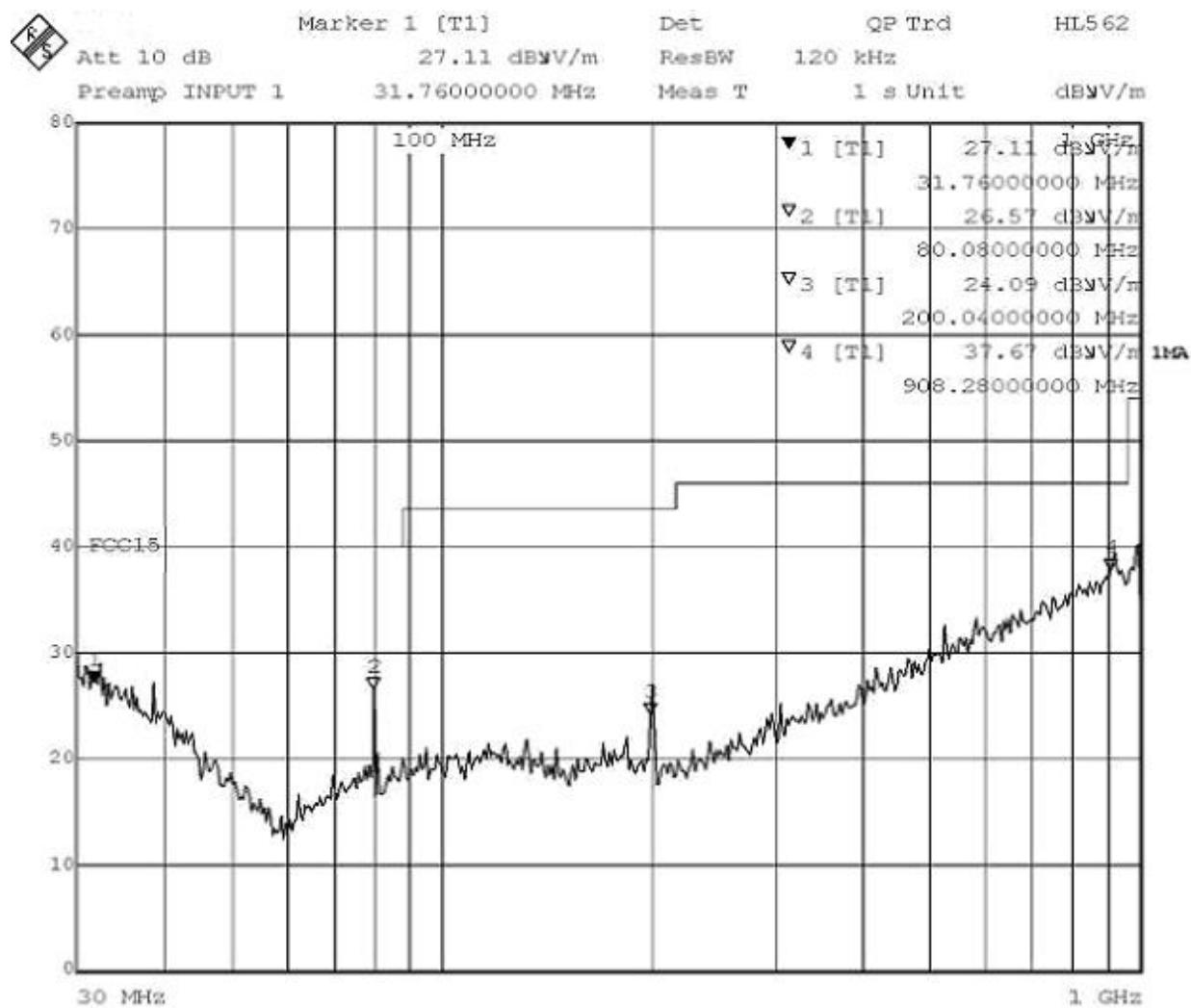
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Test Results of Radiated Emissions Under 1GHz:

Frequency Range: 30MHz-1000MHz (Horizontal)



Date: 6.DEC.2007

Frequency MHz	Emission Level dB μ V/m	Limits dB μ V/m	Margin dB	Remark
31.76	27.11	40.00	12.89	QP
80.08	26.57	40.00	13.43	QP
200.04	24.09	43.50	19.41	QP
908.28	37.67	46.00	8.33	QP

Remark: Emission Level=Reading.



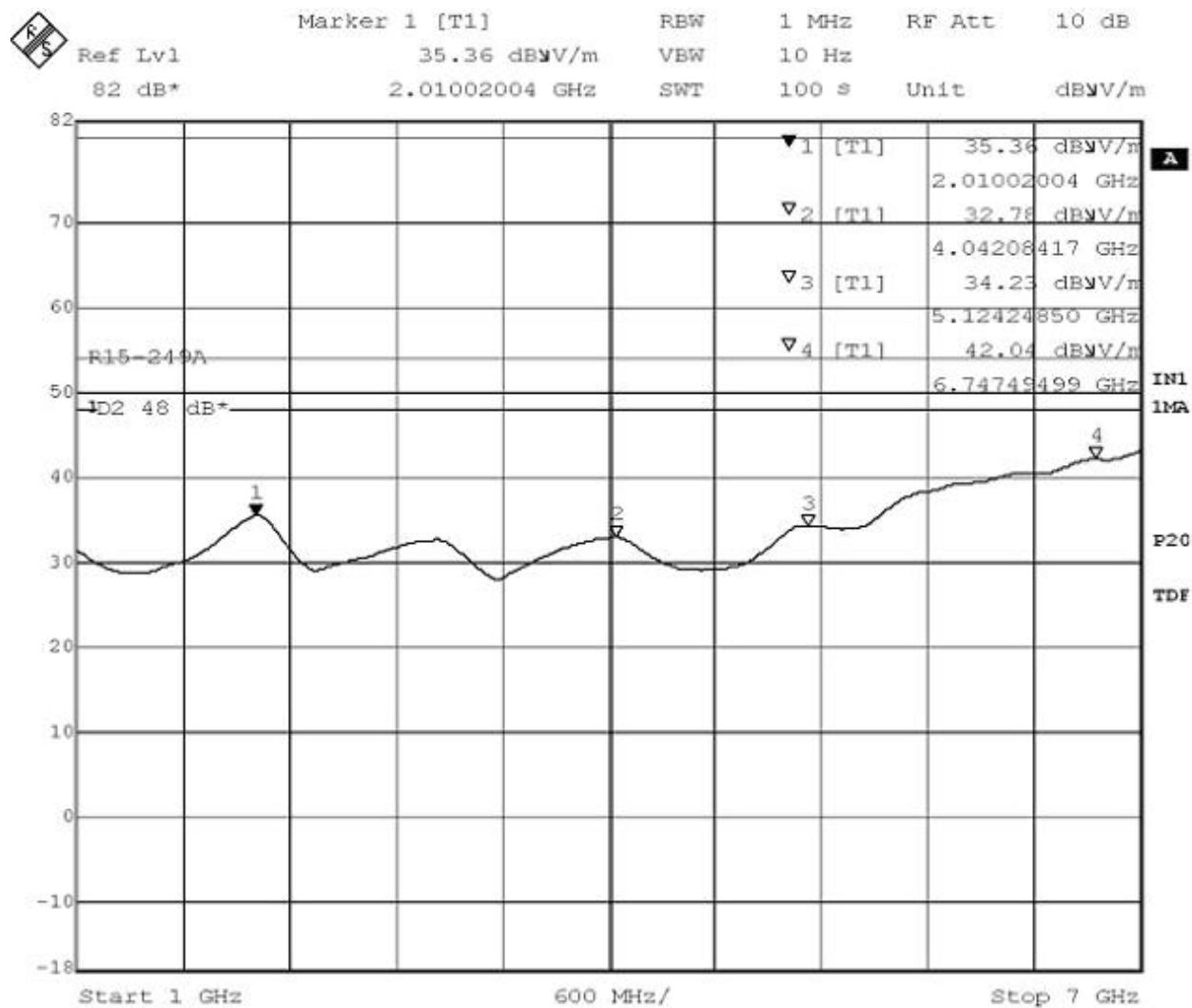
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Test Results of Radiated Emissions Except Fundamental: CH1 (2404MHz)

Frequency Range: 1GHz-7GHz (Vertical)



Date: 7.DEC.2007

Frequency MHz	Emission Level dB μ V/m	Limits dB μ V/m	Margin dB	Remark
2010	35.36	54.00	18.64	Average
4042	32.78	54.00	21.22	Average
5124	34.23	54.00	19.77	Average
6747	42.04	54.00	11.96	Average

Remark: Emission Level=Reading.



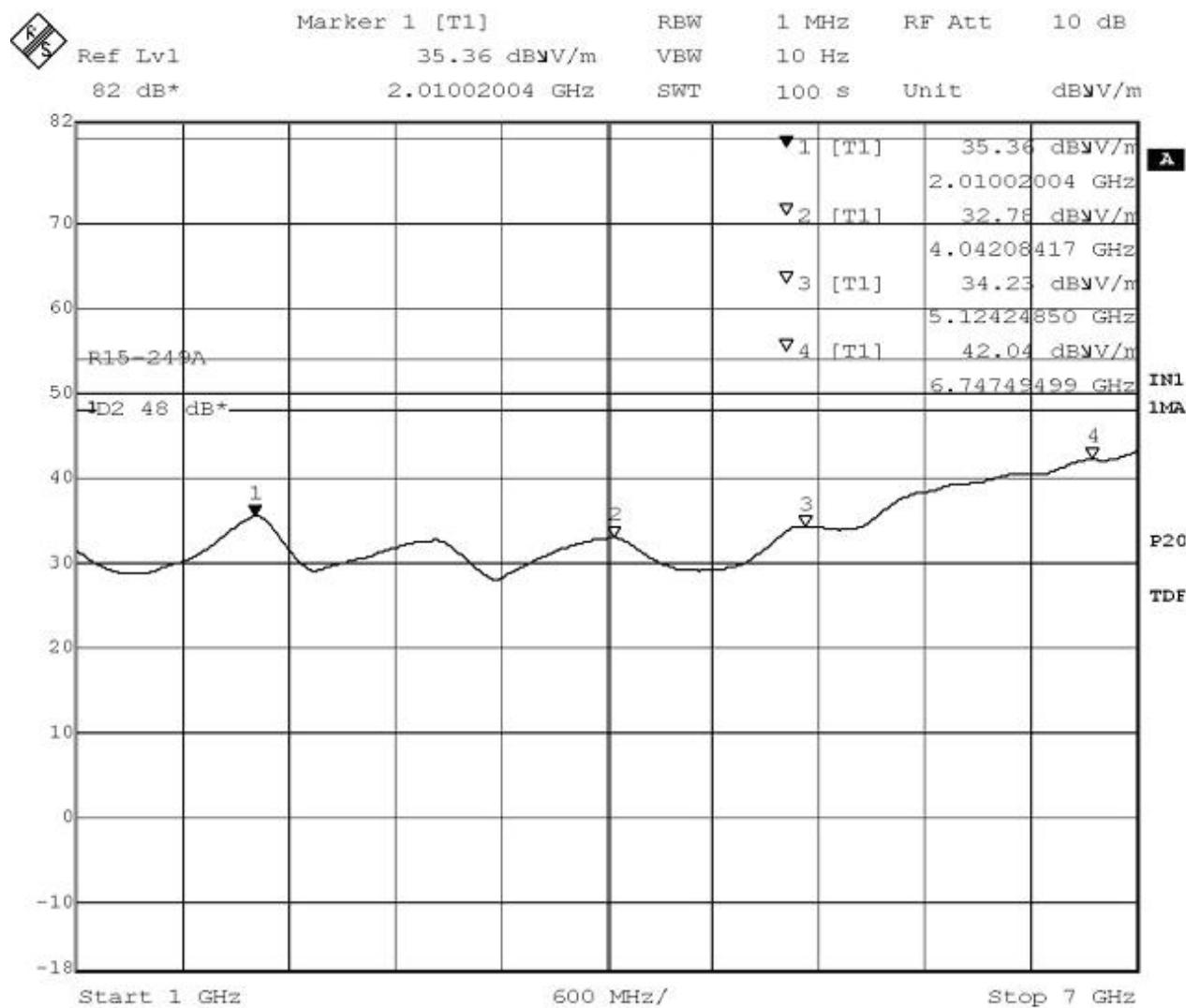
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Test Results of Radiated Emissions Except Fundamental: CH1 (2404MHz)

Frequency Range: 1GHz-7GHz (Horizontal)



Frequency MHz	Emission Level dB μ V/m	Limits dB μ V/m	Margin dB	Remark
2010	35.36	54.00	18.64	Average
4042	32.78	54.00	21.22	Average
5124	34.23	54.00	19.77	Average
6747	42.04	54.00	11.96	Average

Remark: Emission Level=Reading.



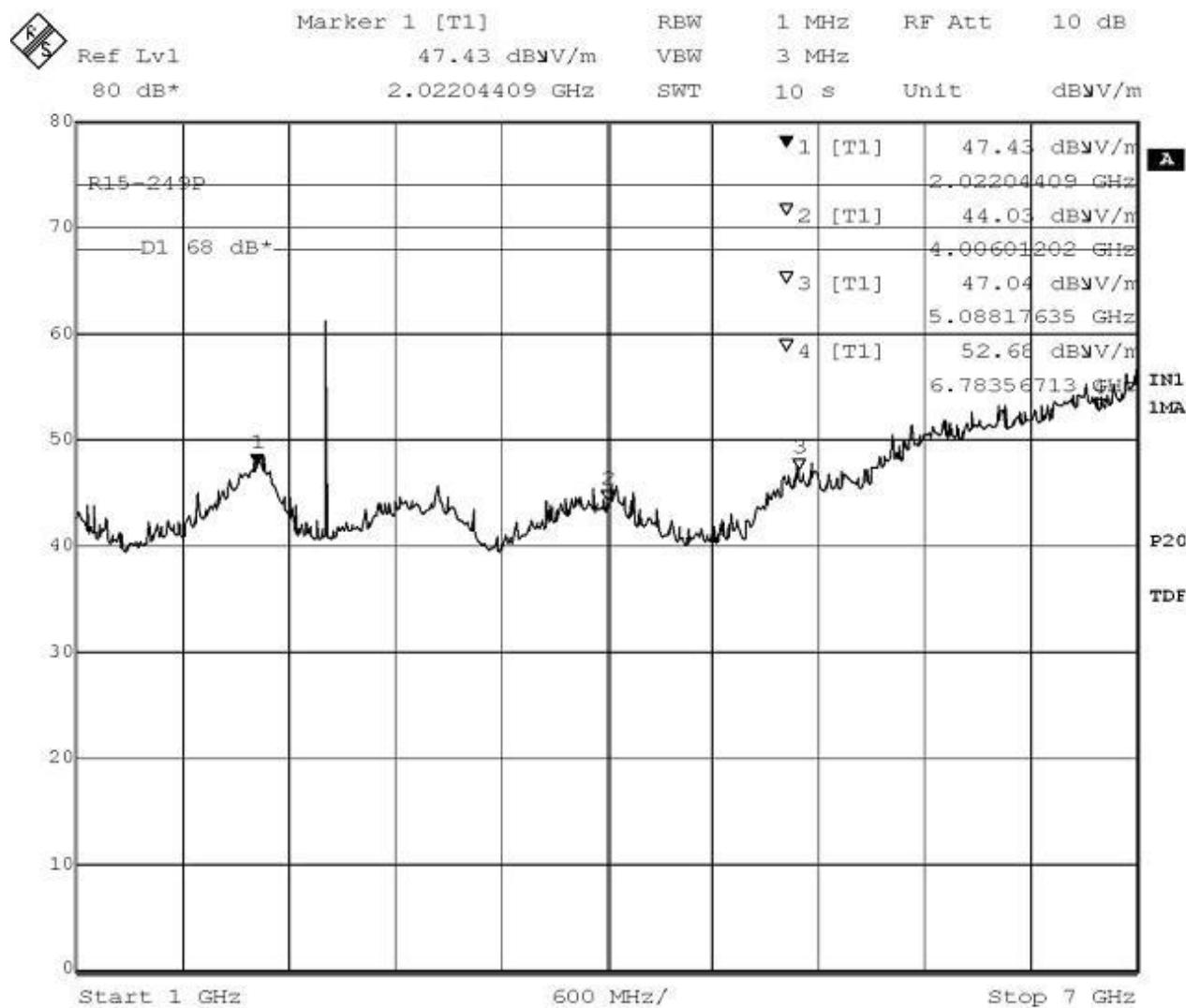
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Test Results of Radiated Emissions Except Fundamental: CH1 (2404MHz)

Frequency Range: 1GHz-7GHz (Vertical)



Date: 7.DEC.2007

Frequency MHz	Emission Level dB μ V/m	Limits dB μ V/m	Margin dB	Remark
2022	47.43	74.00	26.57	Peak
4006	44.03	74.00	29.97	Peak
5088	47.04	74.00	26.96	Peak
6783	52.68	74.00	21.32	Peak

Remark: Emission Level=Reading.



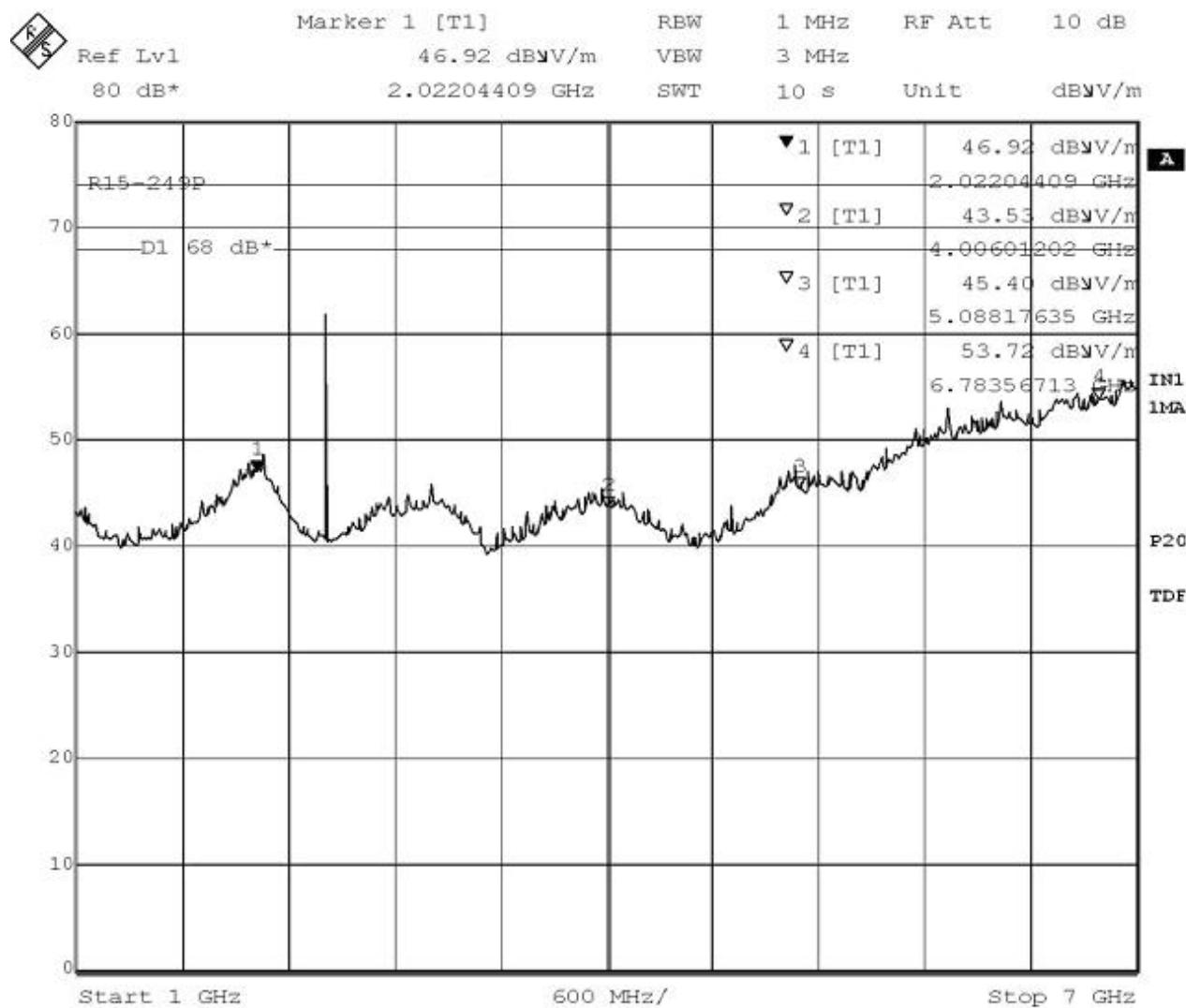
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Test Results of Radiated Emissions Except Fundamental: CH1 (2404MHz)

Frequency Range: 1GHz-7GHz (Horizontal)



Frequency MHz	Emission Level dB μ V/m	Limits dB μ V/m	Margin dB	Remark
2022	46.92	74.00	27.08	Peak
4006	43.53	74.00	30.47	Peak
5088	45.40	74.00	28.60	Peak
6783	53.72	74.00	20.28	Peak

Remark: Emission Level=Reading.



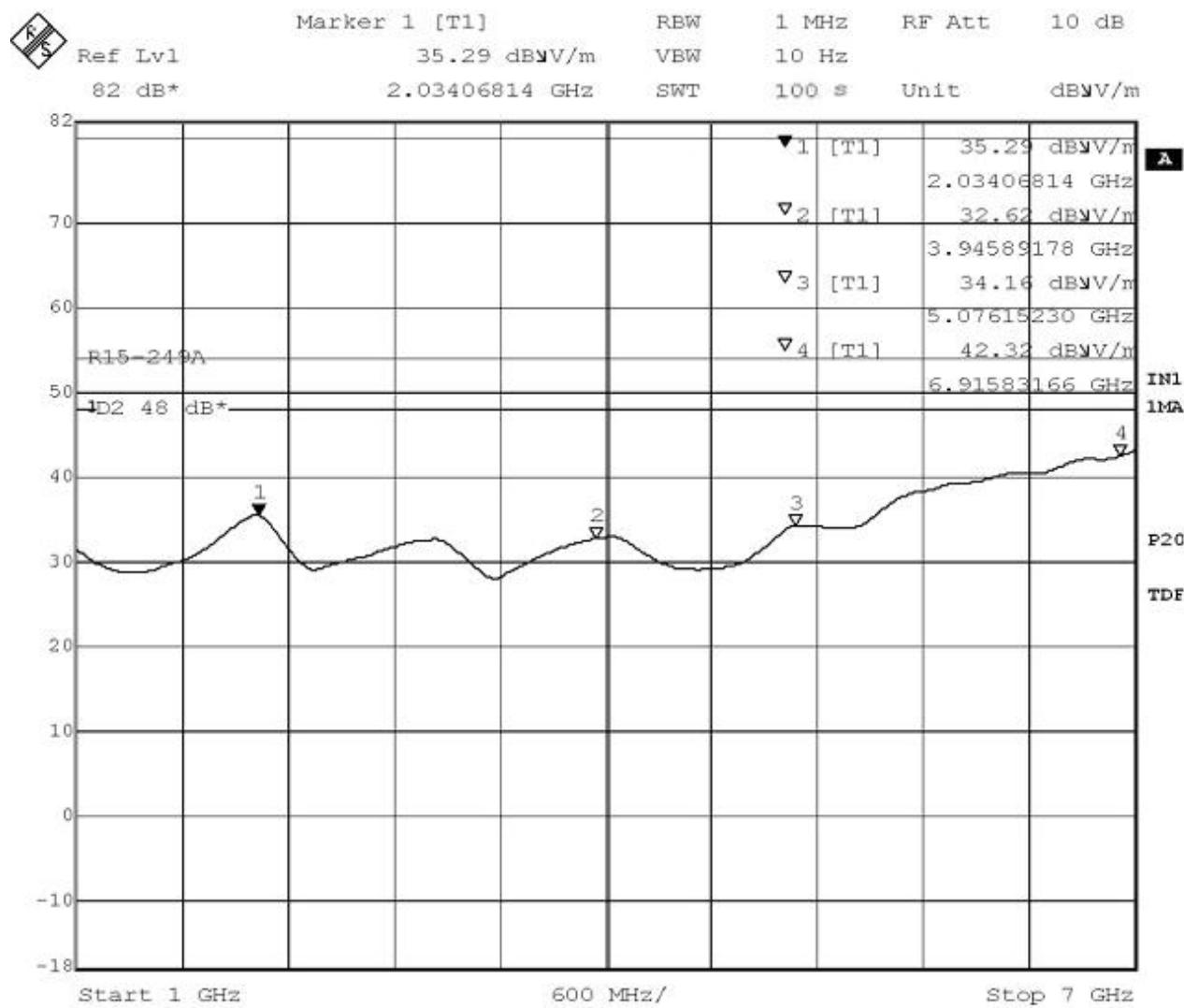
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Test Results of Radiated Emissions Except Fundamental: CH2 (2444MHz)

Frequency Range: 1GHz-7GHz (Vertical)



Date: 7.DEC.2007

Frequency MHz	Emission Level dB μ V/m	Limits dB μ V/m	Margin dB	Remark
2034	35.29	54.00	18.71	Average
3945	32.62	54.00	21.38	Average
5076	34.16	54.00	19.84	Average
6915	42.32	54.00	11.68	Average

Remark: Emission Level=Reading.



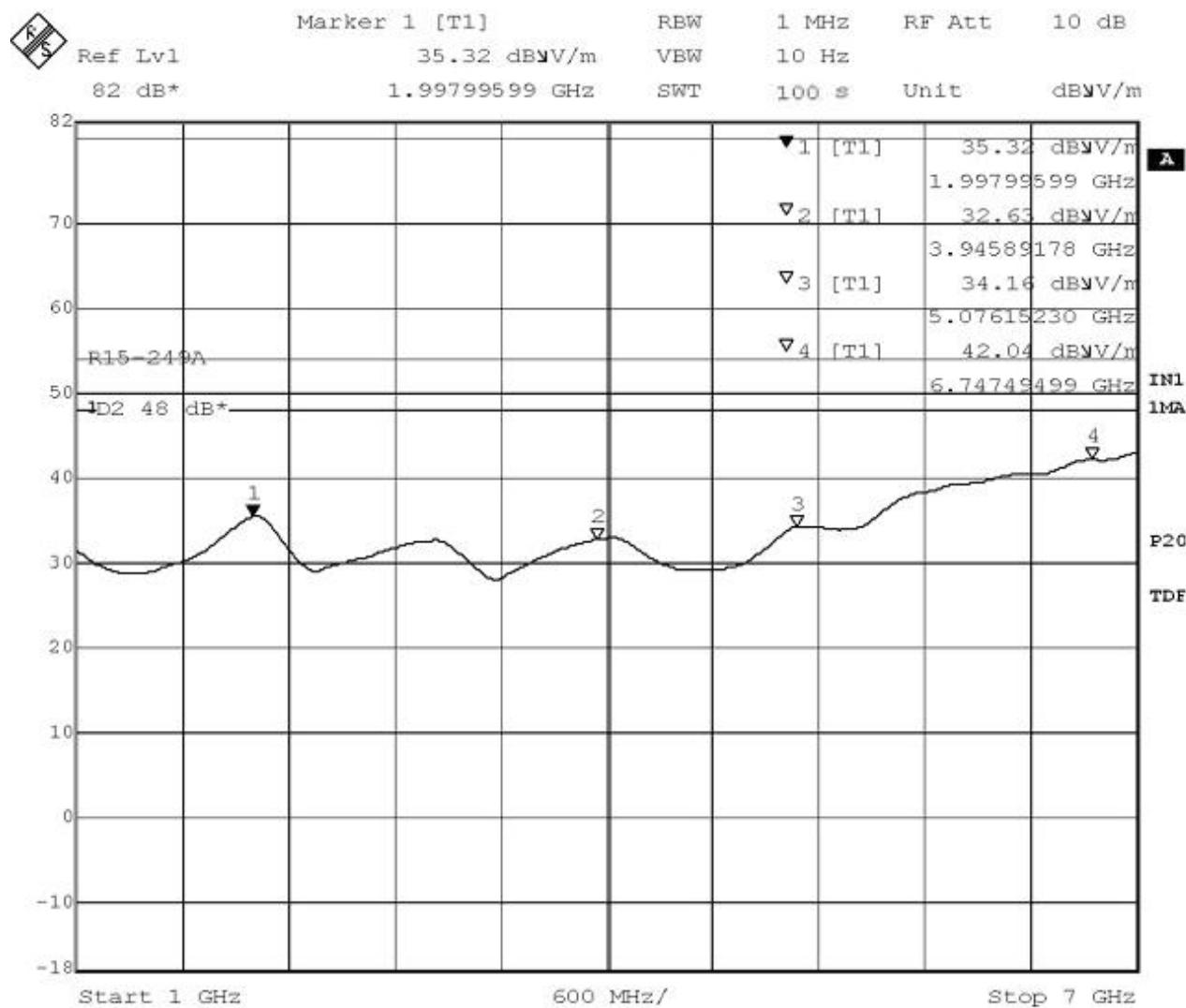
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Test Results of Radiated Emissions Except Fundamental: CH2 (2444MHz)

Frequency Range: 1GHz-7GHz (Horizontal)



Frequency MHz	Emission Level dB μ V/m	Limits dB μ V/m	Margin dB	Remark
1998	35.32	54.00	18.68	Average
3946	32.63	54.00	21.37	Average
5076	34.16	54.00	19.84	Average
6747	42.04	54.00	11.96	Average

Remark: Emission Level=Reading.



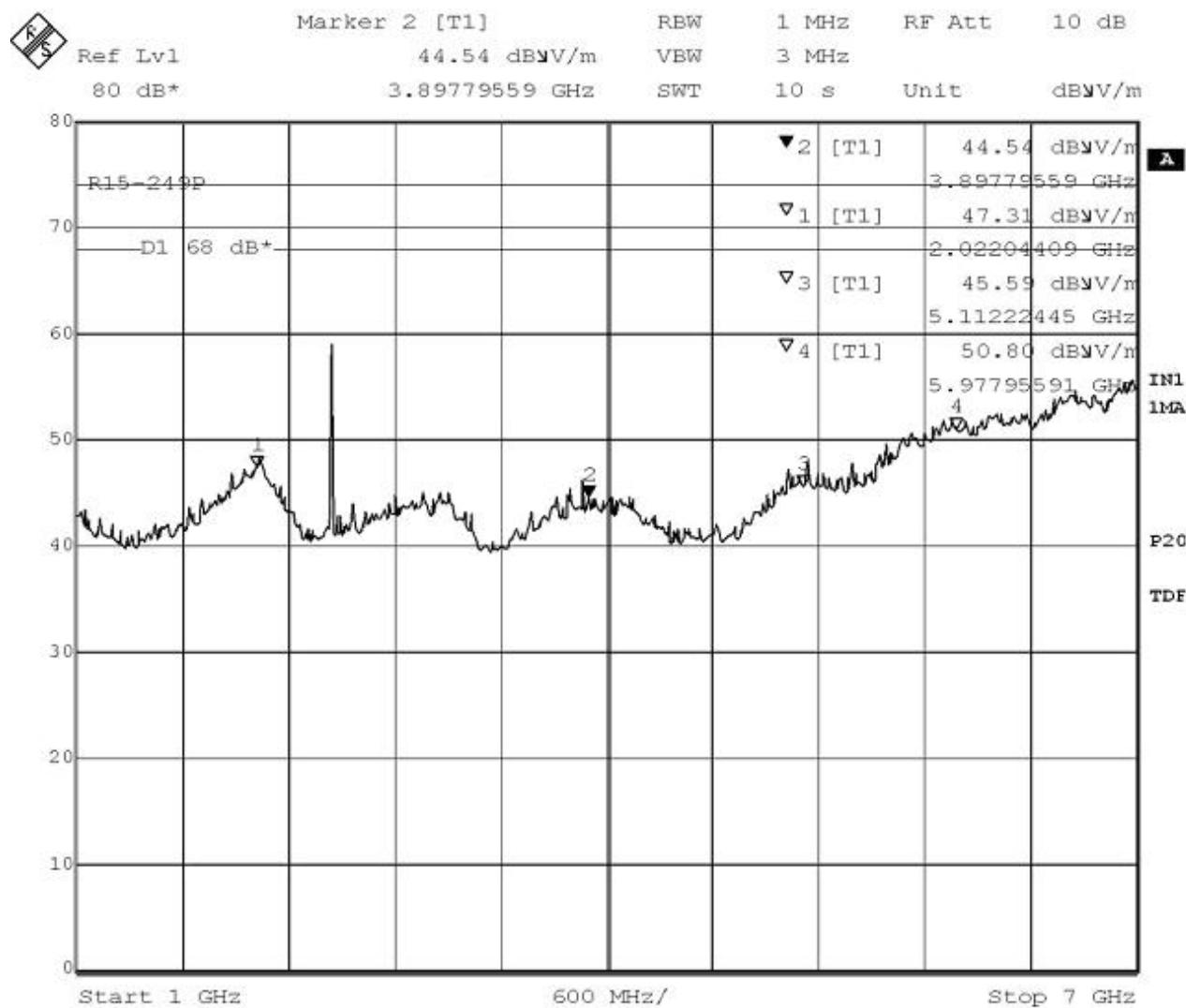
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Test Results of Radiated Emissions Except Fundamental: CH2 (2444MHz)

Frequency Range: 1GHz-7GHz (Vertical)



Date: 7.DEC.2007

Frequency MHz	Emission Level dB μ V/m	Limits dB μ V/m	Margin dB	Remark
3898	44.54	74.00	29.46	Peak
2022	47.31	74.00	26.69	Peak
5112	45.59	74.00	28.41	Peak
5978	50.80	74.00	23.20	Peak

Remark: Emission Level=Reading.



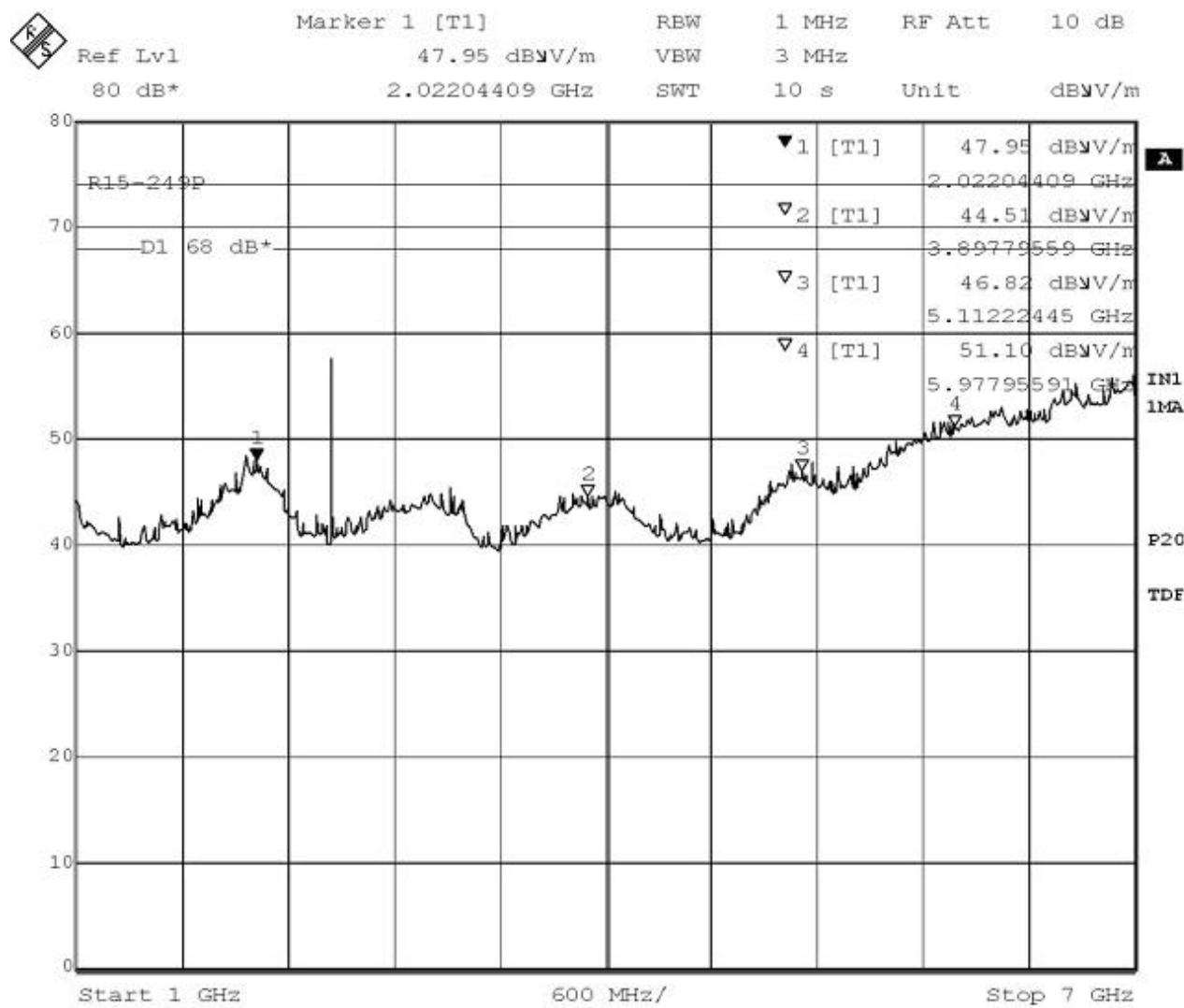
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Test Results of Radiated Emissions Except Fundamental: CH2 (2444MHz)

Frequency Range: 1GHz-7GHz (Horizontal)



Date: 7.DEC.2007

Frequency MHz	Emission Level dB μ V/m	Limits dB μ V/m	Margin dB	Remark
2022	47.95	74.00	26.05	Peak
3898	44.51	74.00	29.49	Peak
5112	46.82	74.00	27.18	Peak
5978	51.10	74.00	22.90	Peak

Remark: Emission Level=Reading.



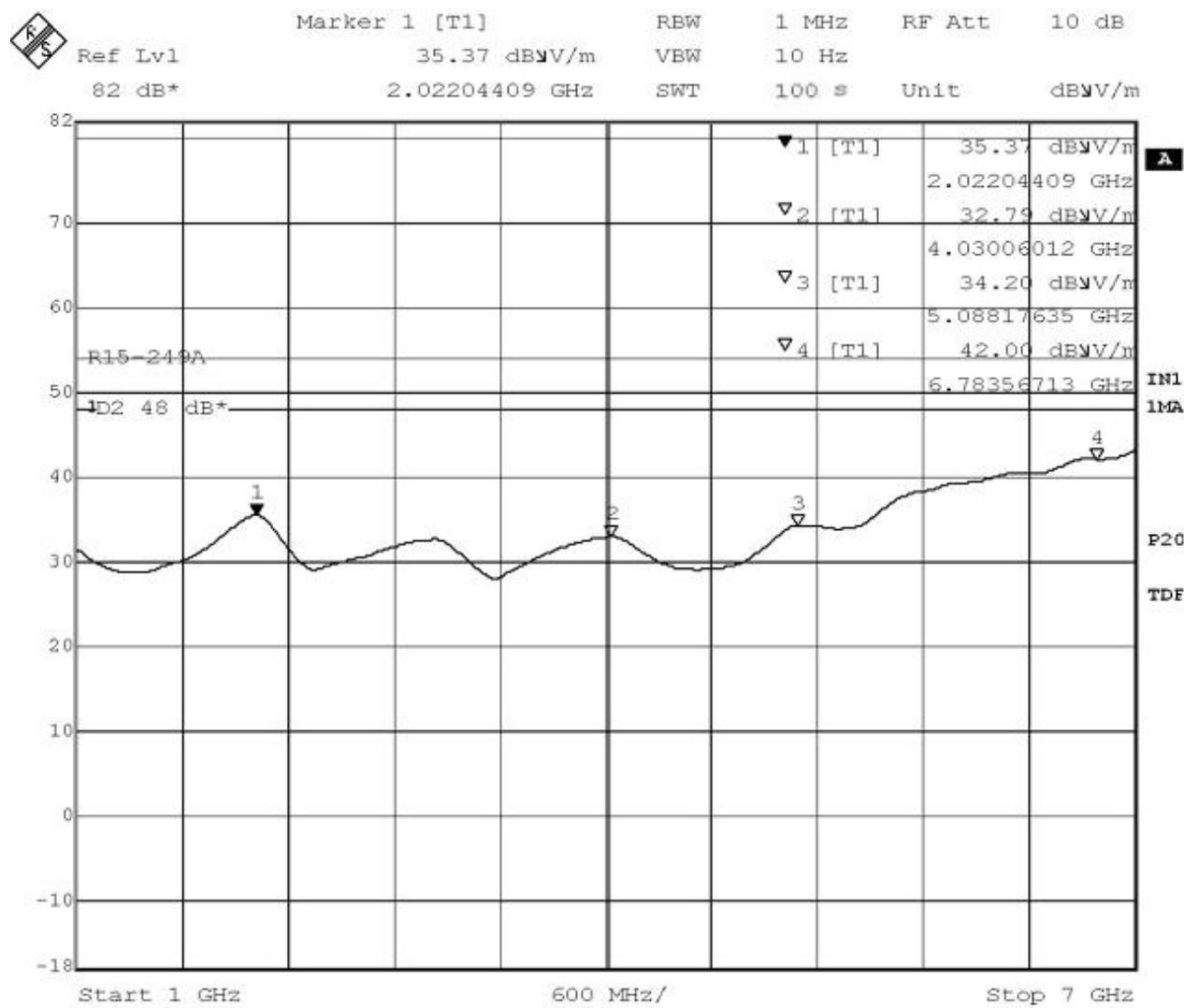
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Test Results of Radiated Emissions Except Fundamental: CH3 (2482MHz)

Frequency Range: 1GHz-7GHz (Vertical)



Date: 7.DEC.2007

Frequency MHz	Emission Level dB μ V/m	Limits dB μ V/m	Margin dB	Remark
2022	35.37	54.00	18.63	Average
4030	32.79	54.00	21.21	Average
5088	34.20	54.00	19.8	Average
6783	42.00	54.00	12.00	Average

Remark: Emission Level=Reading.



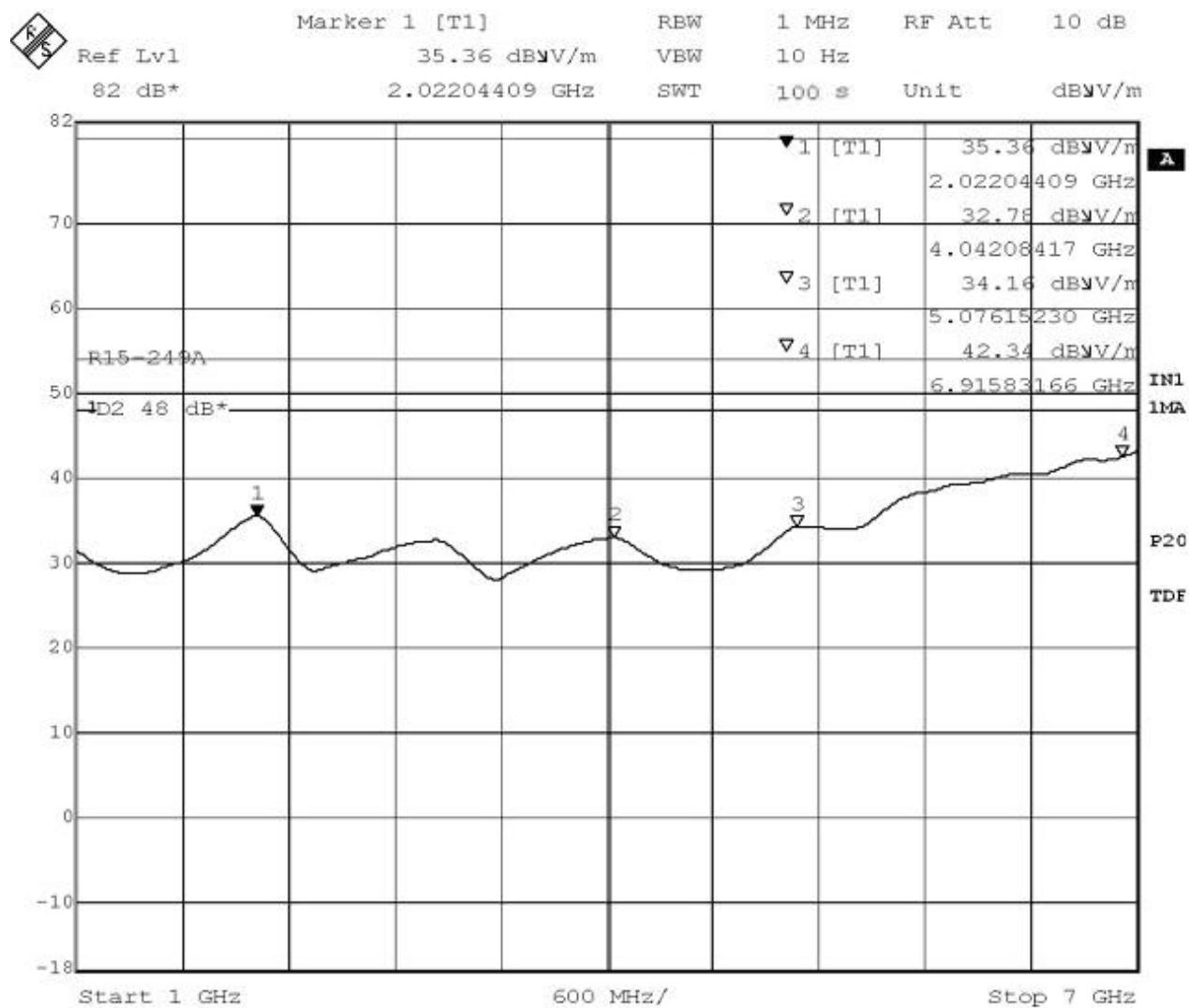
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Test Results of Radiated Emissions Except Fundamental: CH3 (2482MHz)

Frequency Range: 1GHz-7GHz (Horizontal)



Date: 7.DEC.2007

Frequency MHz	Emission Level dB μ V/m	Limits dB μ V/m	Margin dB	Remark
2022	35.36	54.00	18.64	Average
4042	32.78	54.00	21.22	Average
5076	34.16	54.00	19.84	Average
6916	42.34	54.00	11.66	Average

Remark: Emission Level=Reading.



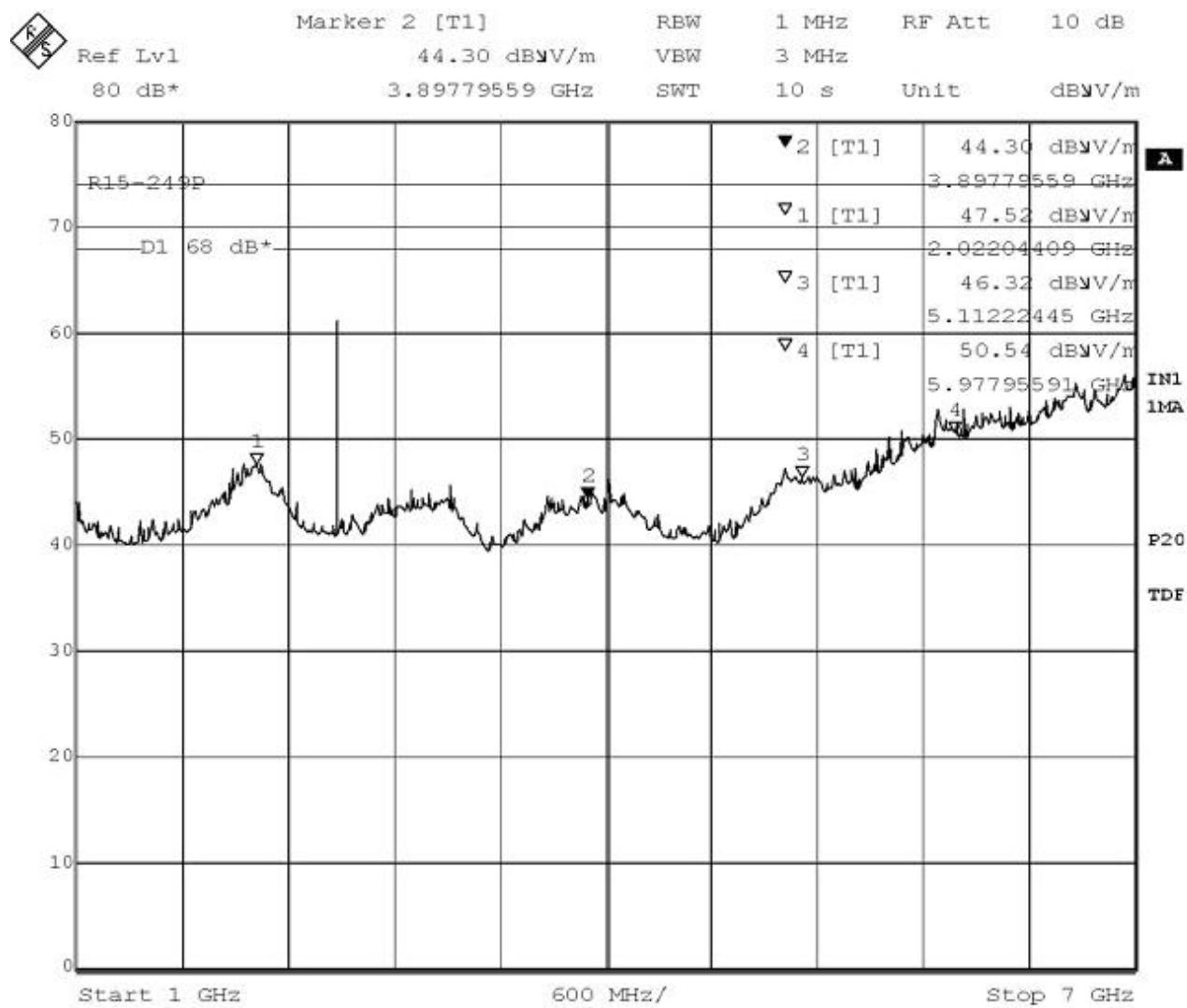
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Test Results of Radiated Emissions Except Fundamental: CH3 (2482MHz)

Frequency Range: 1GHz-7GHz (Vertical)



Frequency MHz	Emission Level dB μ V/m	Limits dB μ V/m	Margin dB	Remark
2022	47.52	74.00	26.48	Peak
3898	44.30	74.00	29.70	Peak
5112	46.32	74.00	27.68	Peak
5978	50.54	74.00	23.46	Peak

Remark: Emission Level=Reading.



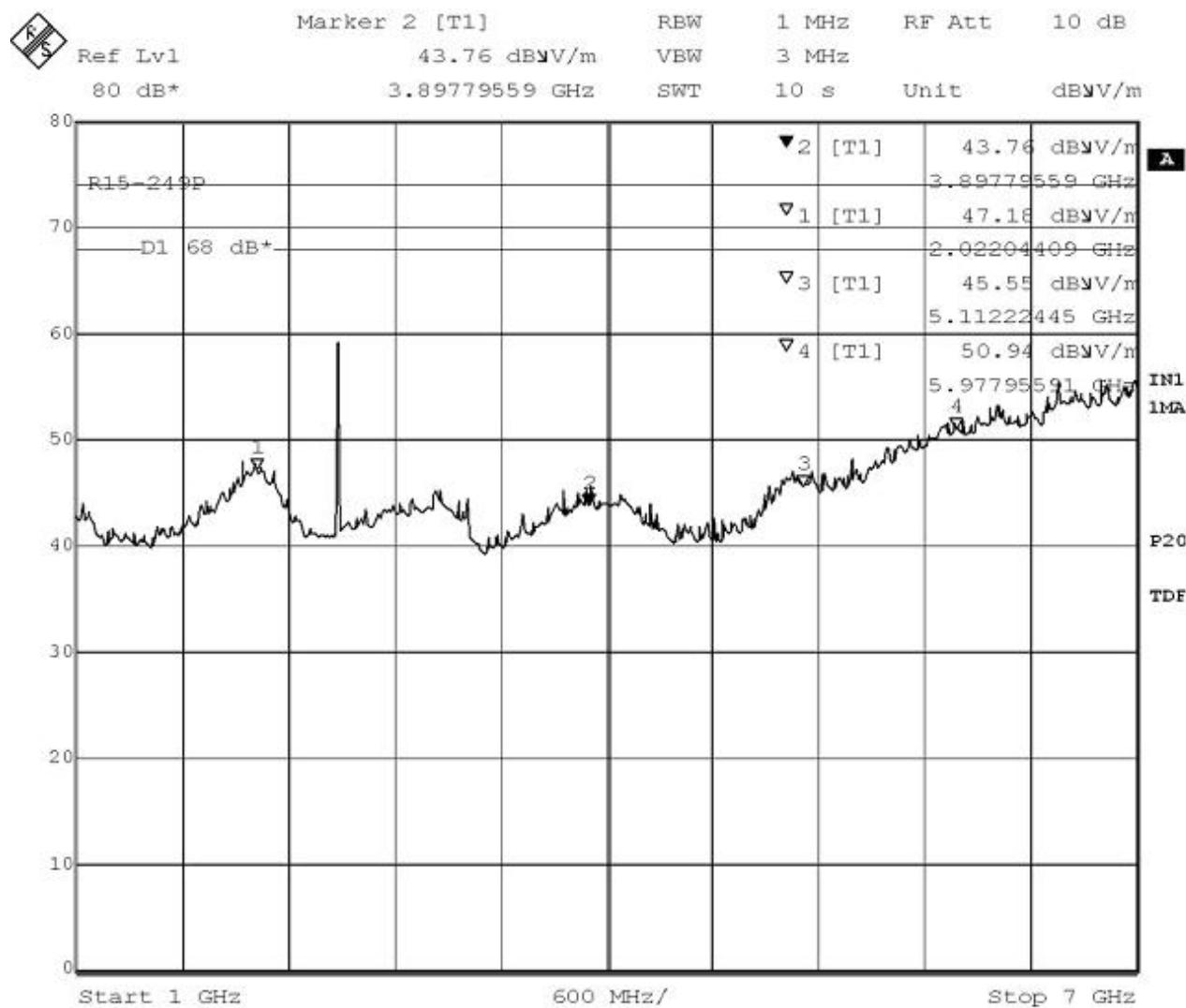
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Test Results of Radiated Emissions Except Fundamental: CH3 (2482MHz)

Frequency Range: 1GHz-7GHz (Horizontal)



Date: 7.DEC.2007

Frequency MHz	Emission Level dB μ V/m	Limits dB μ V/m	Margin dB	Remark
2022	47.18	74.00	26.82	Peak
3898	43.76	74.00	30.24	Peak
5112	45.58	74.00	28.42	Peak
5978	50.94	74.00	23.06	Peak

Remark: Emission Level=Reading.



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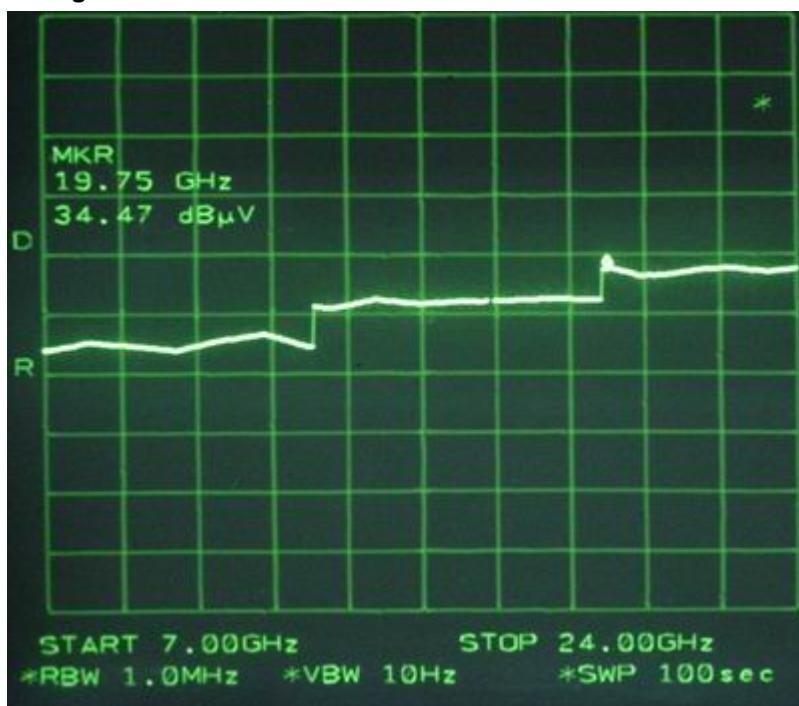
FCC ID: VUEQLRFM21X

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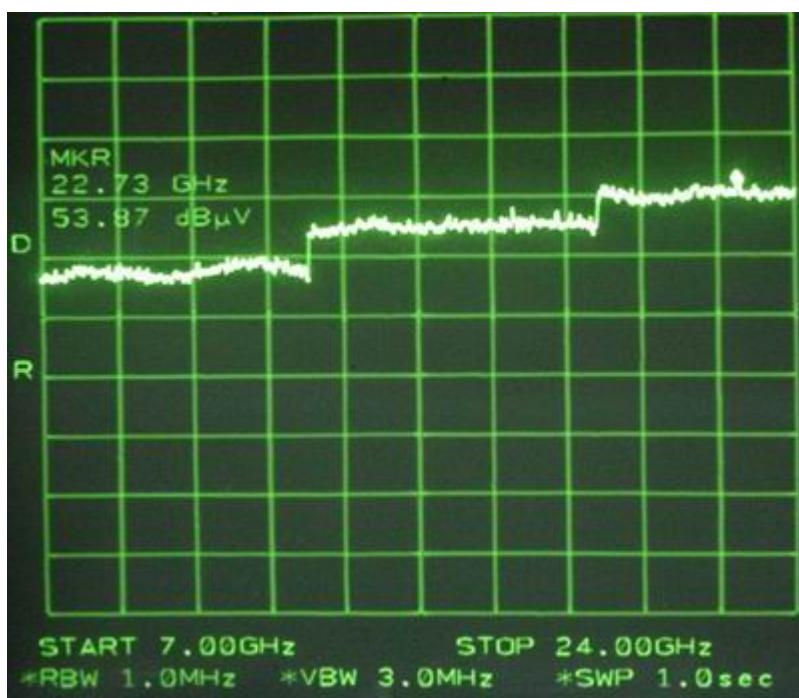
Test Results of Radiated Emissions above 7GHz: CH1 (2404MHz)

Frequency Range: 7GHz-24GHz (Vertical)

Average



Peak



Remark: Emission Level= Reading.



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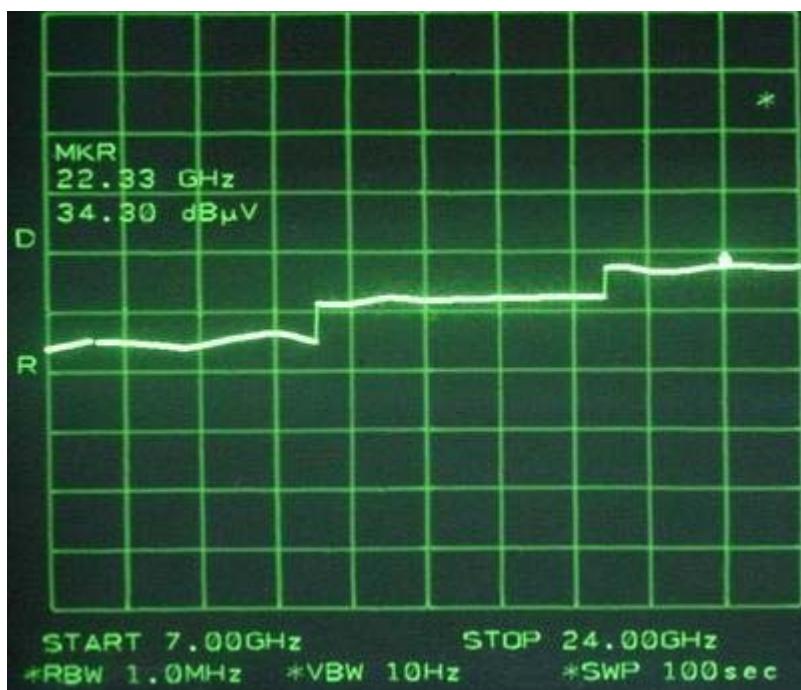
FCC ID: VUEQLRFM21X

Report No.:CGEL2007W0449

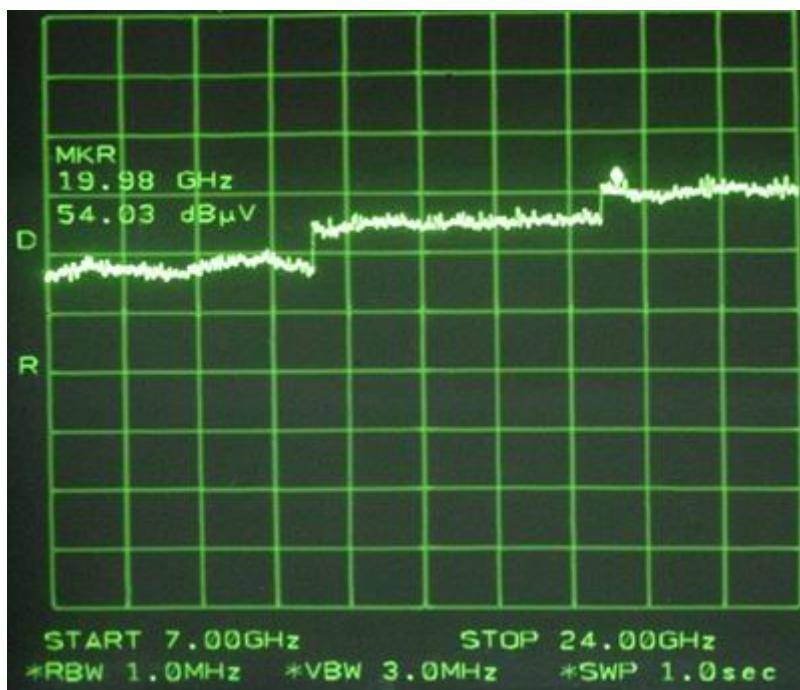
Test Results of Radiated Emissions above 7GHz: CH1 (2404MHz)

Frequency Range: 7GHz-24GHz (Horizontal)

Average



Peak



Remark: Emission Level= Reading.



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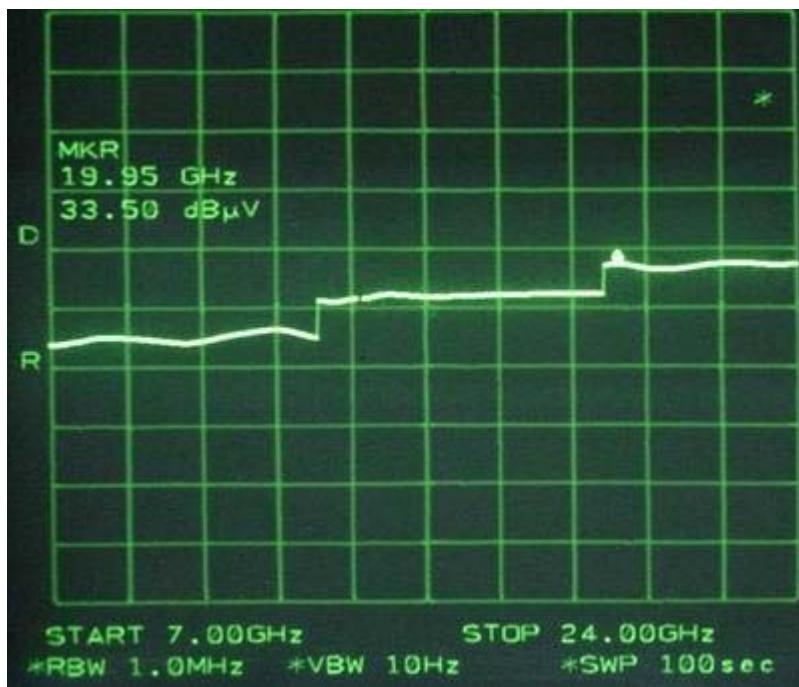
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Report No.:CGEL2007W0449

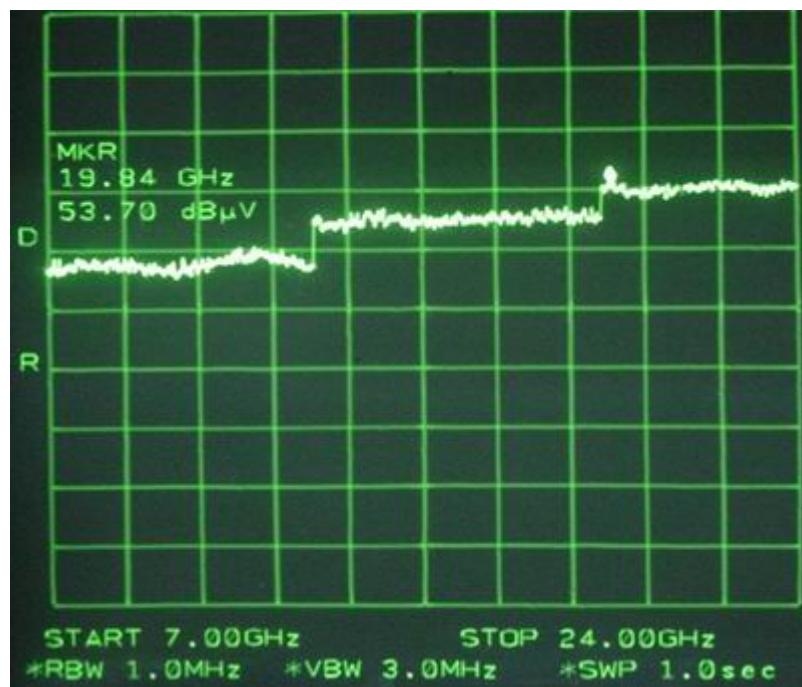
Test Results of Radiated Emissions above 7GHz: CH2 (2444MHz)

Frequency Range: 7GHz-24GHz (Vertical)

Average



Peak



Remark: Emission Level= Reading.



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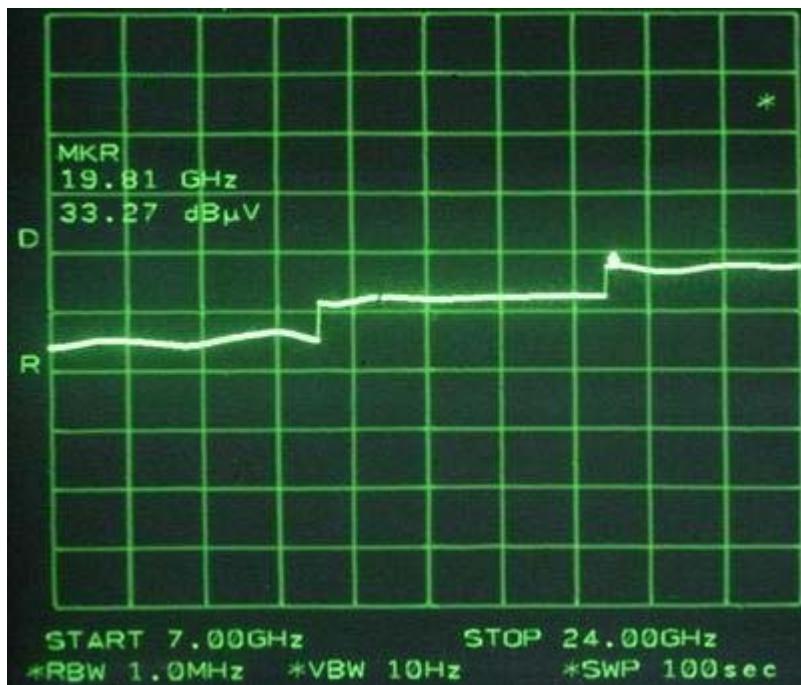
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Report No.:CGEL2007W0449

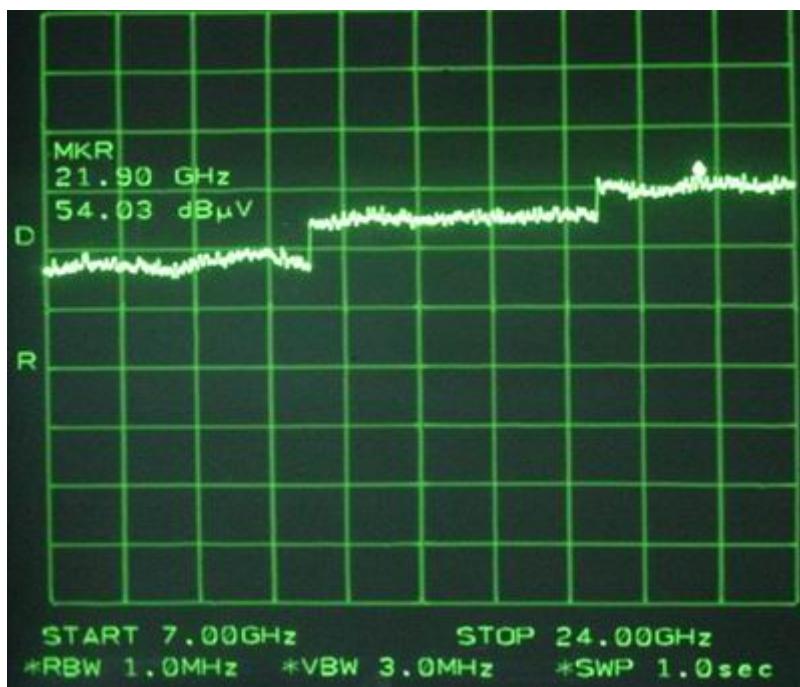
Test Results of Radiated Emissions above 7GHz: CH2 (2444MHz)

Frequency Range: 7GHz-24GHz (Horizontal)

Average



Peak



Remark: Emission Level= Reading.



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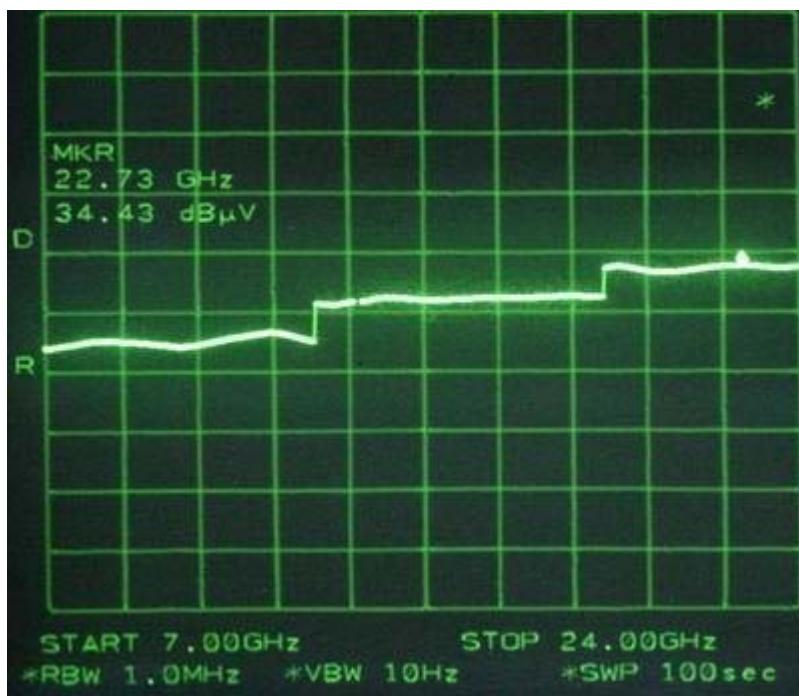
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Report No.:CGEL2007W0449

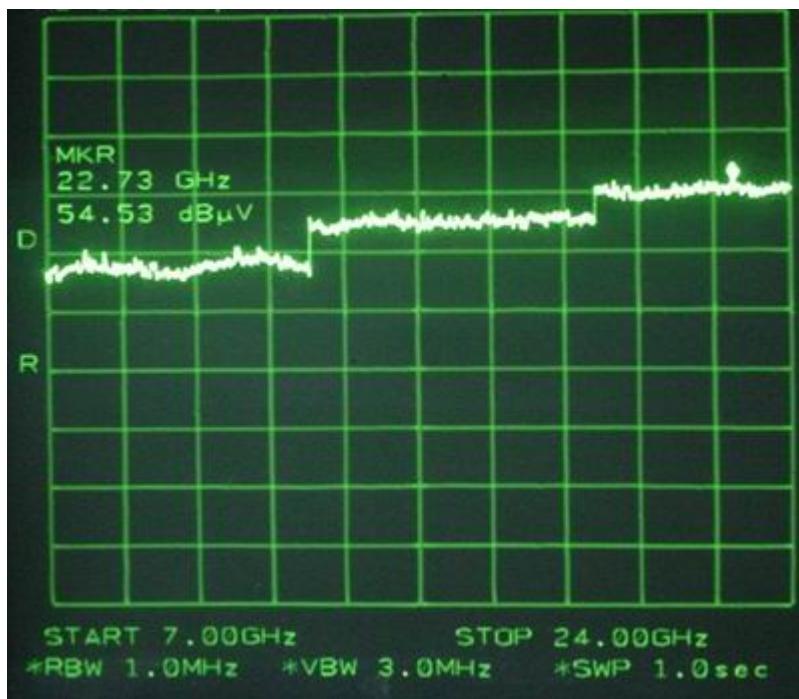
Test Results of Radiated Emissions above 7GHz: CH3 (2482MHz)

Frequency Range: 7GHz-24GHz (Vertical)

Average



Peak



Remark: Emission Level= Reading.



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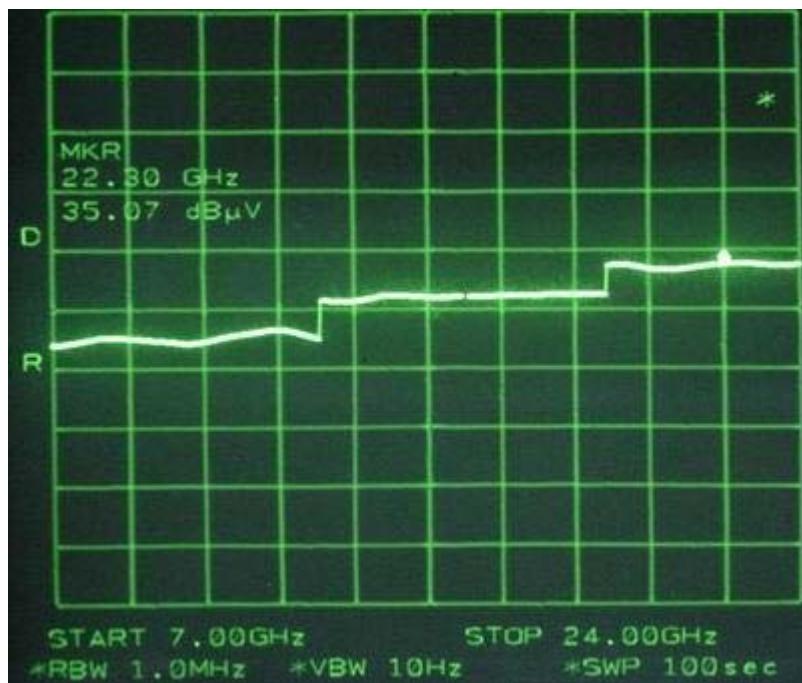
FCC ID: VUEQLRFM21X

Report No.:CGEL2007W0449

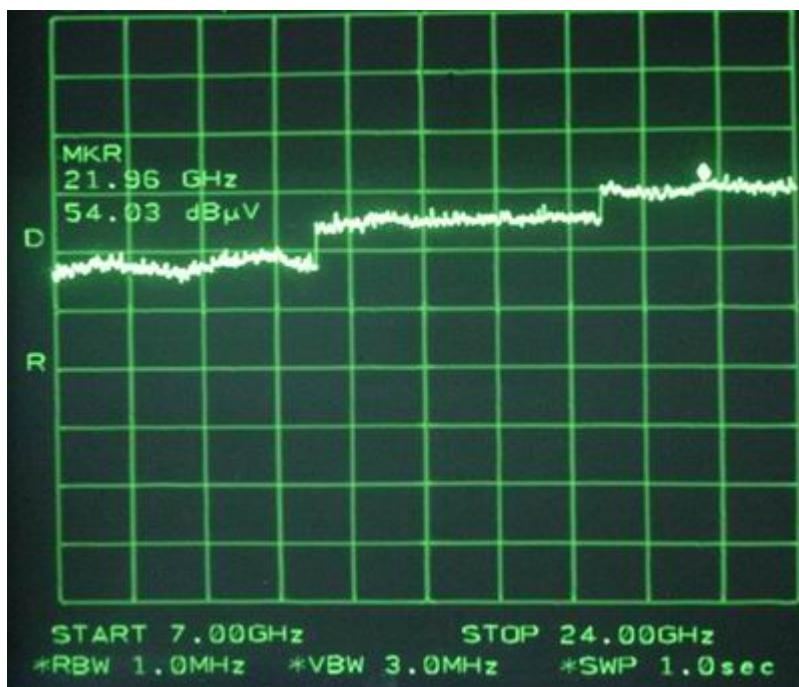
Test Results of Radiated Emissions above 7GHz: CH3 (2482MHz)

Frequency Range: 7GHz-24GHz (Horizontal)

Average



Peak



Remark: Emission Level= Reading.



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5. 20 dB Bandwidth

Test requirement:	FCC 47CFR 15.215(c)
Test date:	2007-12-05
Environment condition:	Temperature:20.0 °C, Humidity: 58.0 %RH, Pressure: 101.0kPa
Conclusion:	Pass

5.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Last Cal.	Cal. Due date
1	EMI Receiver	R&S	ESIB7	2007/03/30	2008/03/29
2	Antenna	Xibao	GH18H	2007/05/25	2008/05/24
3	HF Cable	Xibao	/	2007/05/25	2008/05/24
4	3m anechoic chamber	ETS	RFD-F-100	2007/05/25	2008/05/24
5	Shielding Room	ETS	RFD-100	2007/05/25	2008/05/24

5.2. Test Procedure

The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100kHz RBW and 100kHz VBW. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

5.3. Test Result

Test Result of 20dB Bandwidth

Channel	Test Frequency MHz	20dB Bandwidth kHz
1	2404	987
2	2444	991
3	2482	976

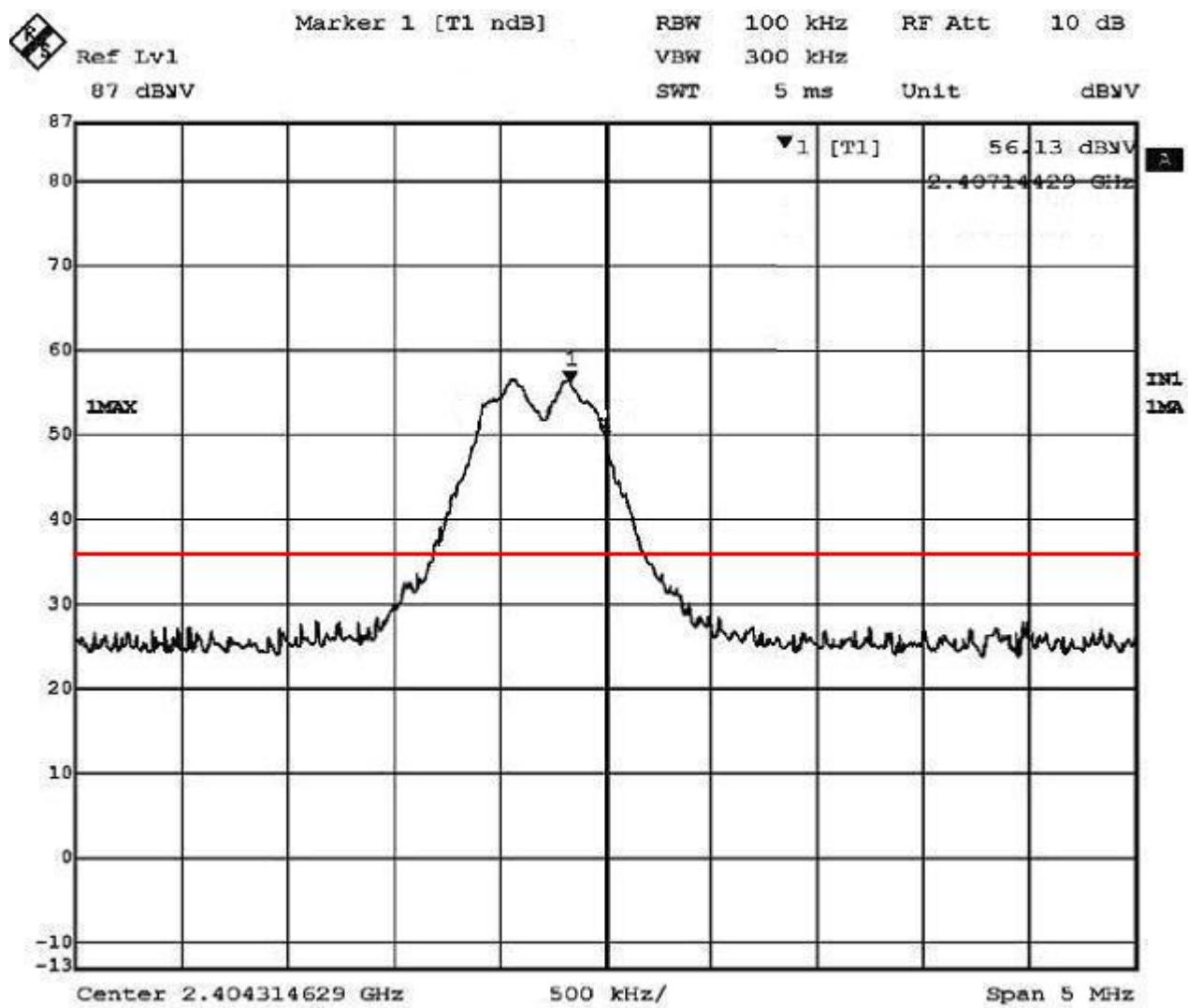


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20 dB Bandwidth of CH1: 2404MHz



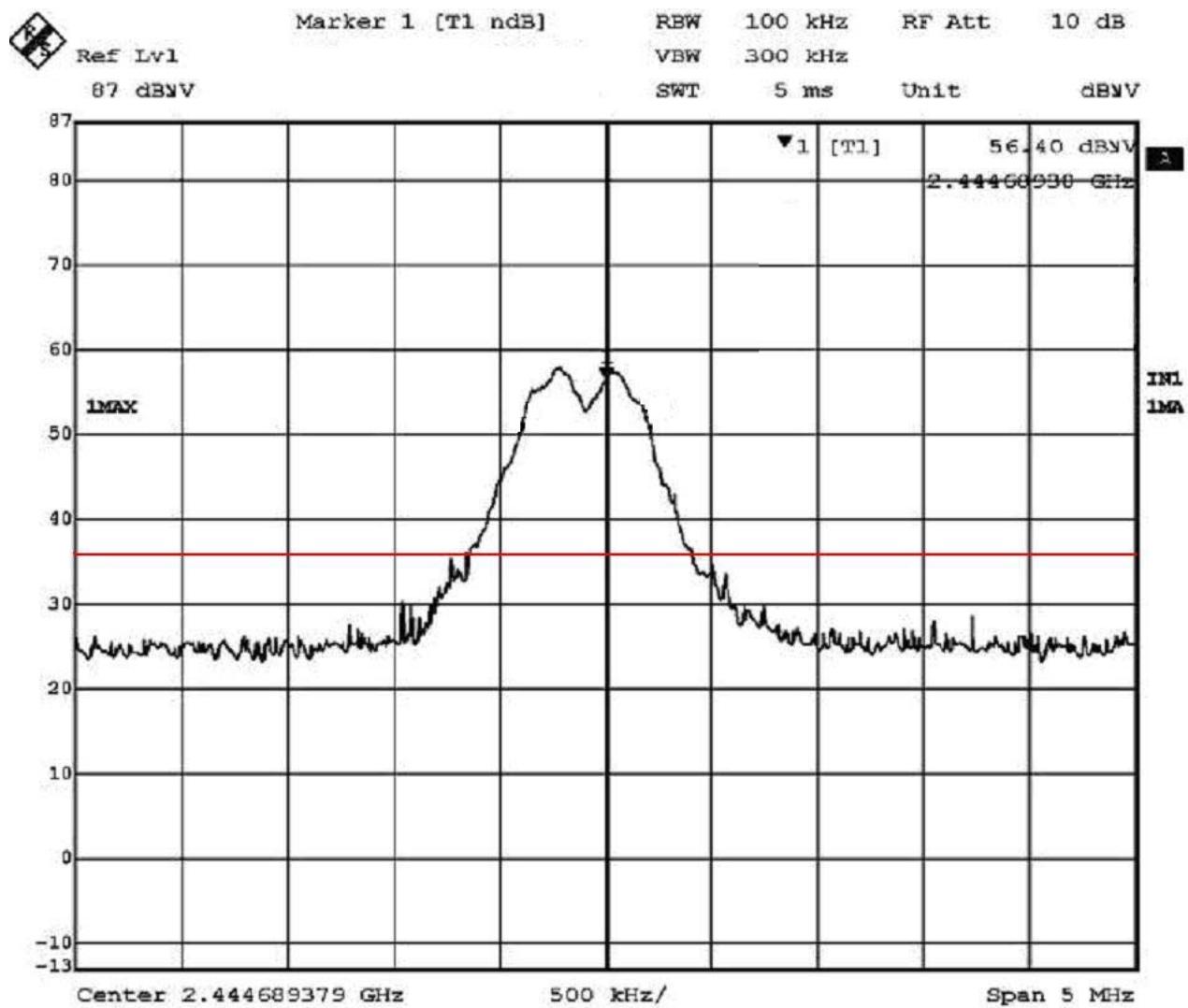


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FCC ID: VUEQLRFM21X

Report No.:CGEL2007W0449

20 dB Bandwidth of CH2: 2444MHz



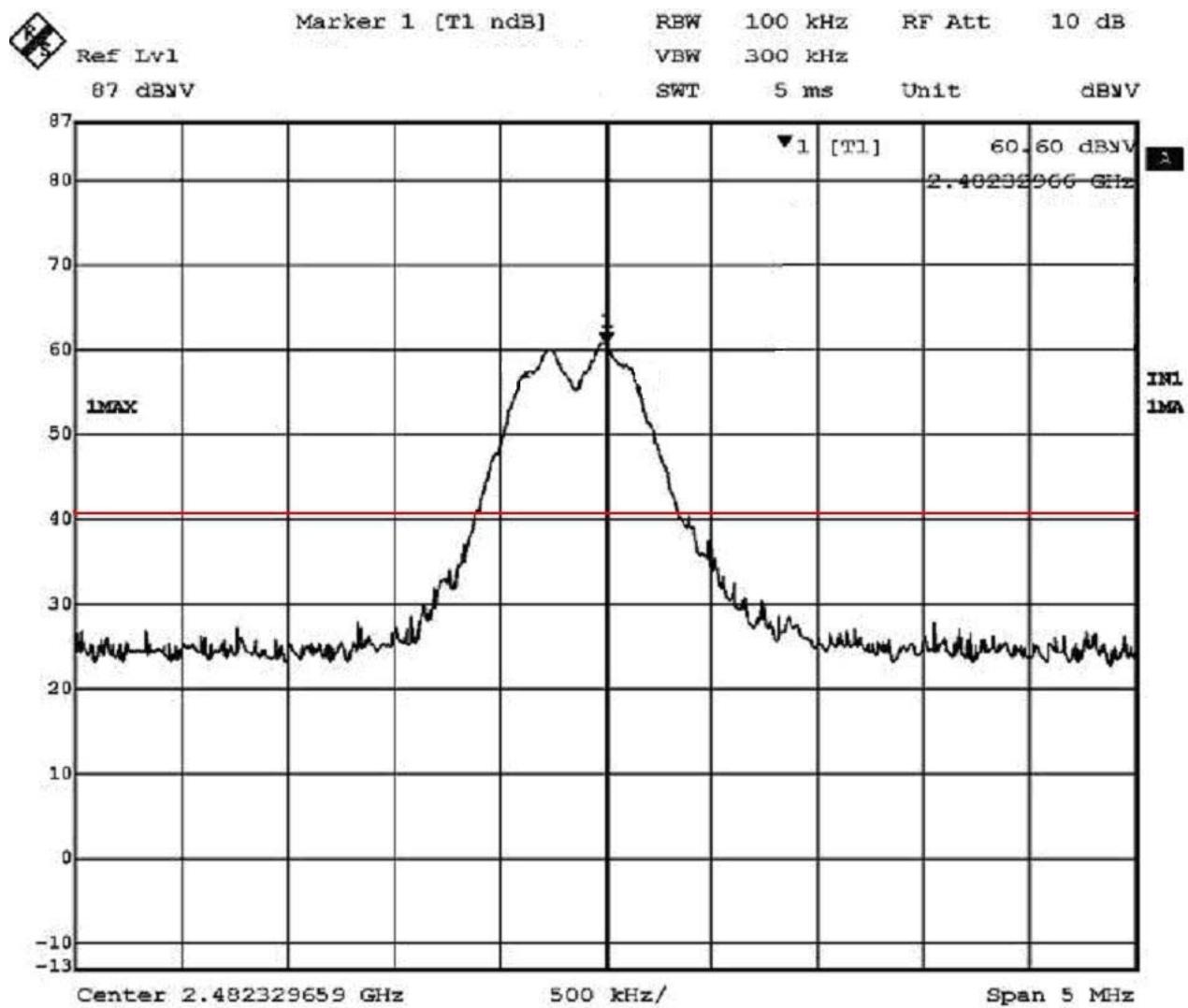


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6dB Bandwidth of CH2: 2482MHz





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6. Photographs

Figure 1: General Appearance

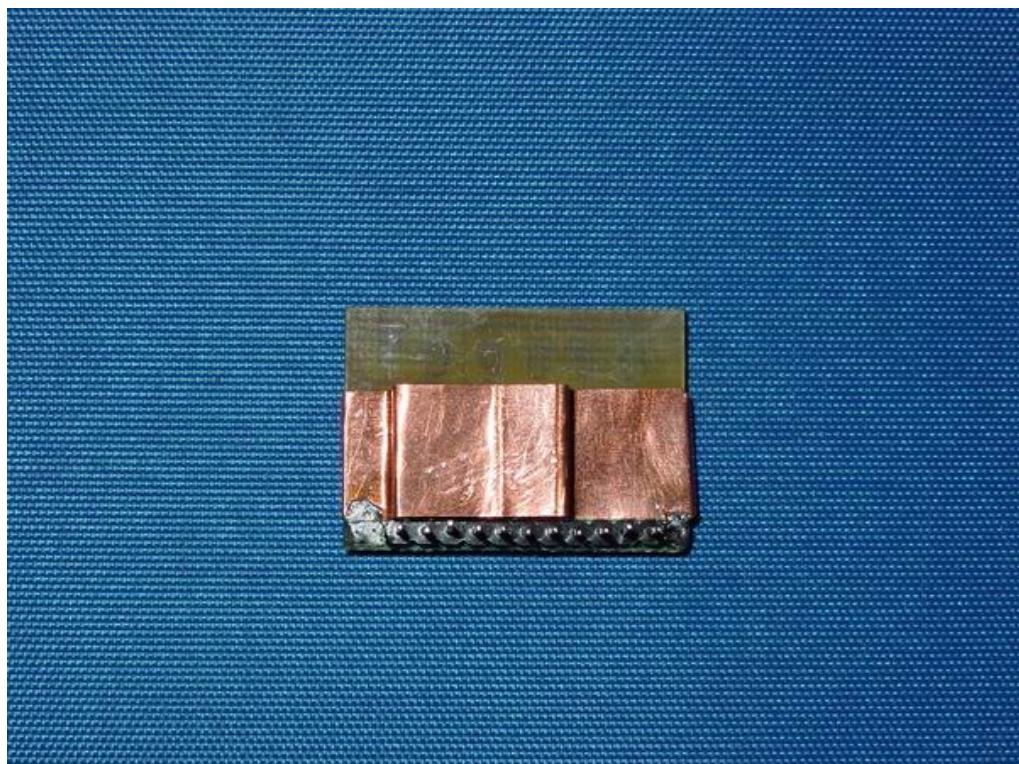
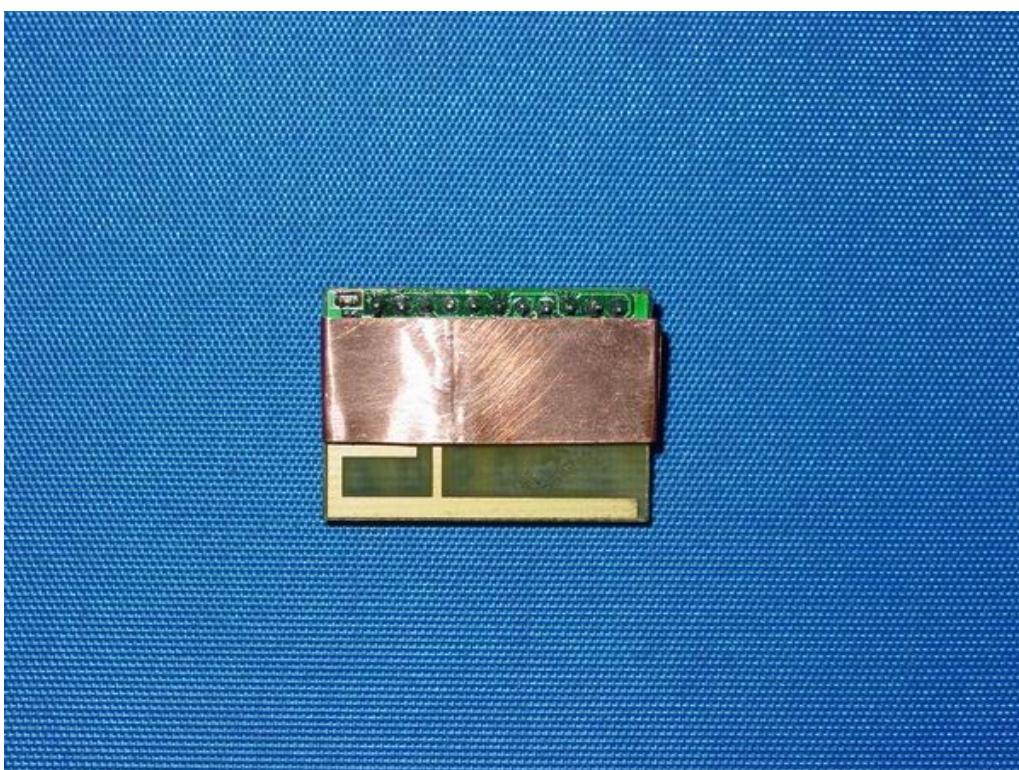


Figure 2: General Appearance





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Figure 3: Inside of the EUT

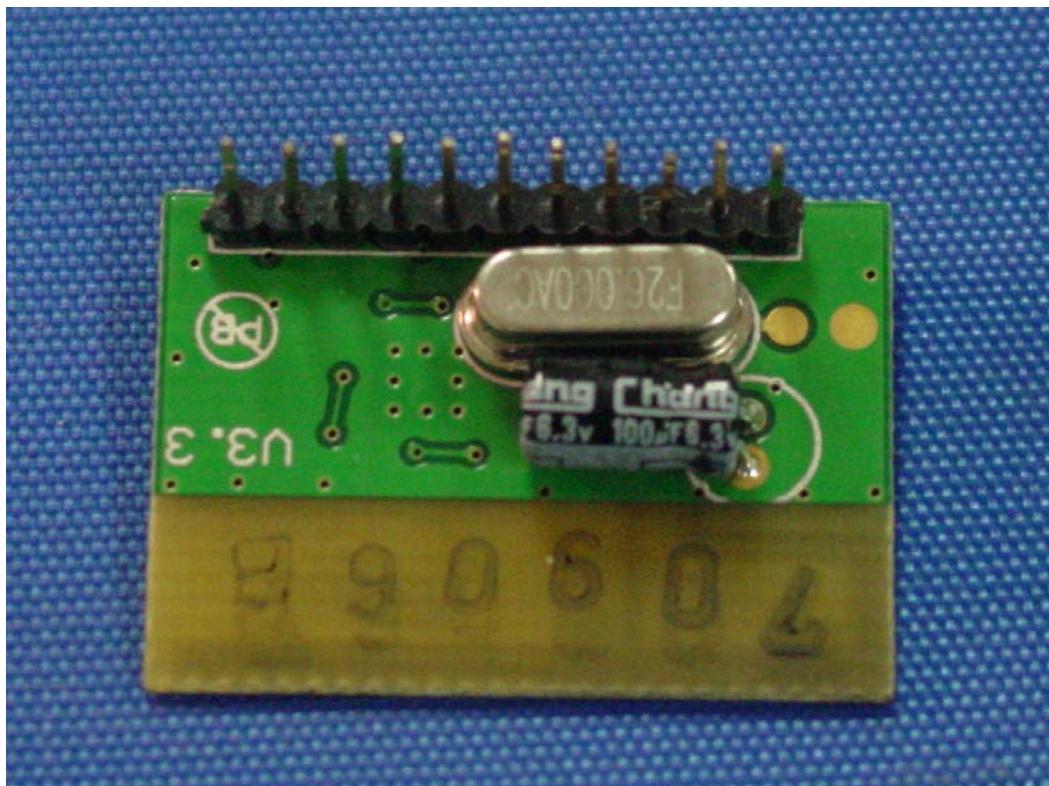
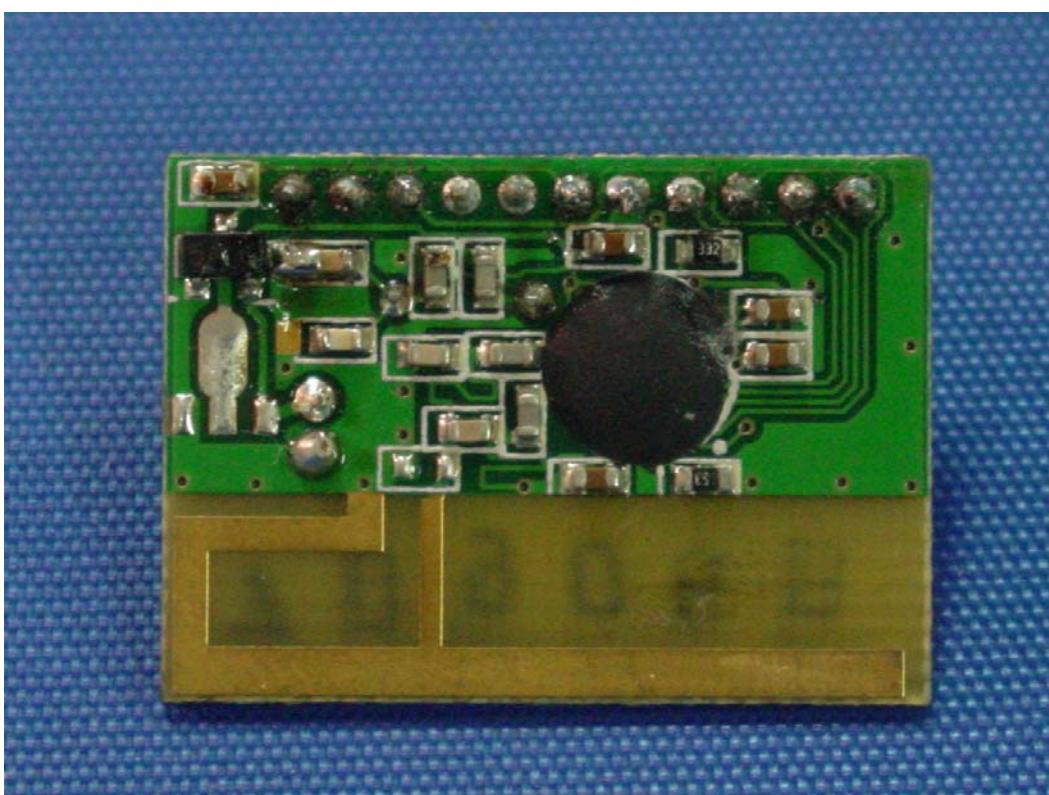


Figure 4: Inside of the EUT



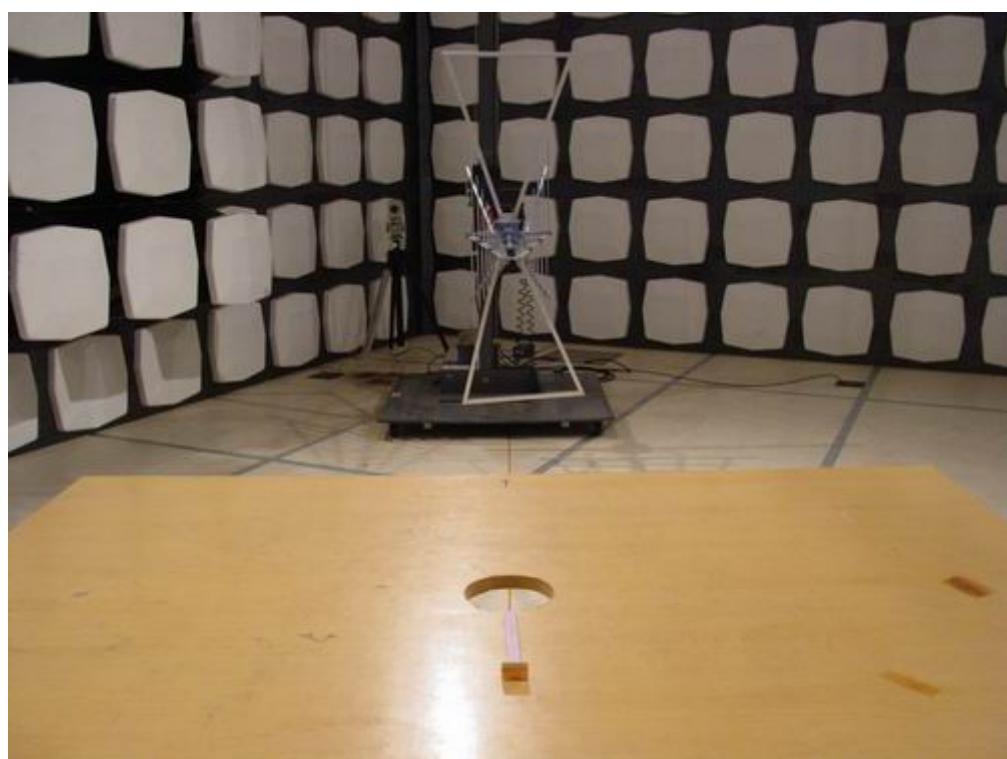
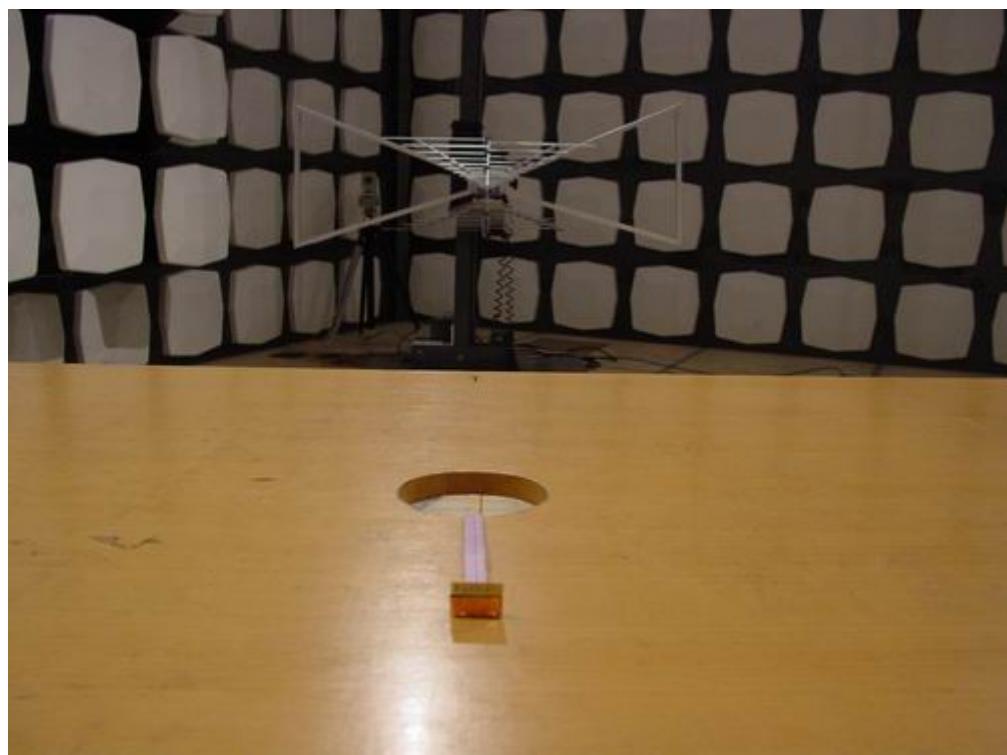


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Photos of Radiated Emission Test
30-1000MHz





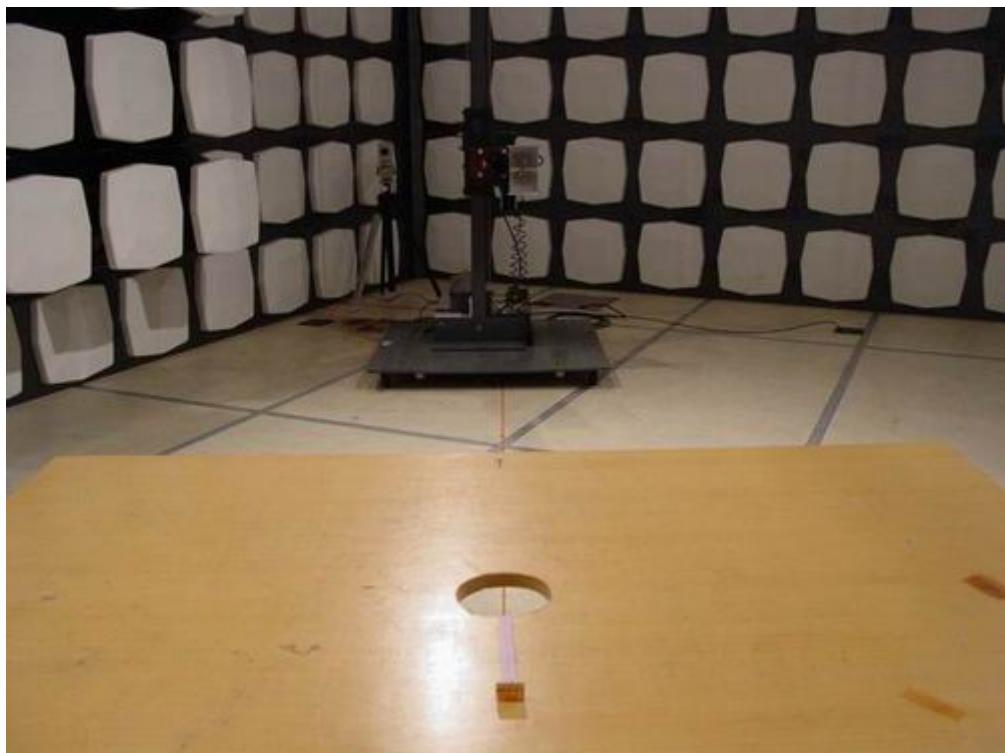
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FCC ID: VUEQLRFM21X

Report No.:CGEL2007W0449

Photos of Radiated Emission Test

Above 1000MHz



*****End of Test Report*****