



FCC 47 CFR PART 15 SUBPART C

TEST REPORT

FOR

Product Name: Navigator 820

Model : GM-080023/T

Trade Name: Genius

Issued to

KYE SYSTEMS CORP.

No.492,Sec.5, Chung Hsin Rd., San Chung, Taipei Hsien, 24160, Taiwan, R.O.C.

Issued by

Global Certification Corp.

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EMC Test Site	Sijhih office and Lab	No. 146. Sec.2. Siangjhang Rd. Sijhih City. Taipei County 221, Taiwan(R.O.C.)

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1. GENERAL INFORMATION

Applicant : KYE SYSTEMS CORP.

Address : No.492,Sec.5, Chung Hsin Rd., San Chung, Taipei Hsien, 24160, Taiwan, R.O.C.

Manufacturer : KYE SYSTEMS CORP.

Address : No.492,Sec.5, Chung Hsin Rd., San Chung, Taipei Hsien, 24160, Taiwan, R.O.C.

EUT : Navigator 820

Model Name : GM-080023/T

Model Differences : N/A

Is here with confirmed to comply with the requirements set out in the FCC Rules and Regulations Part 15 Subpart C and the measurement procedures were according to ANSI C63.4-2003. The said equipment in the configuration described in this report shows the maximum emission levels emanating from equipment are within the compliance requirements.

FCC part 15 subpart C

Receipt Date : 08/04/2009

Final Test Date : 11/03/2009

Taipei, Taiwan

Nov. 03,2009

Alex Chou / Manager

(Place)

(Date)

(Signature)

Designation Number: TW1030



1.1 DESCRIPTION OF THE TESTED SAMPLES

EUT Name : Navigator 820
Model Number : GM-080023/T
FCC ID : FSUGMZIY
Input Voltage : 3Vdc
Power From ☒Inside ☐Outside
☐Adaptor ☒BATTERY ☐AC Power Source ☐DC Power Source
☐Support Unit PC
Operate Frequency : Refer to the channel list as described below
Modulation Technique : GFSK
Number of Channels : 16
Channel spacing : ☒N/A ☐_____ MHz
Operating Mode : ☐Simplex ☒Duplex
Antenna Type : ☒integral antenna: PCB Printing ☐a dedicated antenna
Antenna gain : -3dBi

Channel	Frequency (MHz)
0	2402
1	2425
2	2448
3	2471
4	2405
5	2428
6	2451
7	2474
8	2408
9	2431
10	2454
11	2477
12	2411
13	2434
14	2457
15	2480



2. TEST METHODOLOGY

All testing as described bellowed were performed in accordance with ANSI C63.4:2003 and FCC CFR 47 Part 15 Subpart C.

2.1 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on a wood table, which is at 0.8 m above ground plane acceding to clause 15.207 and requirements of ANSI C63.4:2003. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz are using CISPR Quasi-Peak / Average detectors.

Radiated Emissions

The EUT is a placed on a turn table, which is 0.8 m above ground plane. The turntable was rotated through 360 degrees to determine the position of maximum emission level. The EUT is placed at 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

2.2 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
10.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)
13.36 - 13.41			

1 Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

2 Above 38.6



(b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

2.3 DESCRIPTION OF TEST MODES

The EUT was tested under following modes:

Modes:

1. Continuous transmitting

Channels:

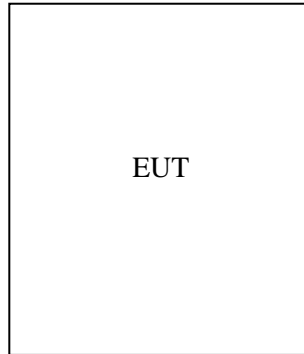
- 1. 2.402GHz (Lowest Channel)**
- 2. 2.448GHz (Middle Channel)**
- 3. 2.480GHz (Highest Channel)**



2.4 DESCRIPTION OF THE SUPPORT EQUIPMENTS

Setup Diagram

See test photographs attached in appendix 1 for the actual connections between EUT and support equipment.





Support Equipment

Peripherals Devices:

OUTSIDE SUPPORT EQUIPMENT							
No.	Equipment	Model	Serial No.	FCC ID/ BSMI ID	Trade name	Data Cable	Power Cord
	N/A						
INSIDE SUPPORT EQUIPMENT							
No.	Equipment	Model	Serial No.	FCC ID/ BSMI ID	Trade name	Data Cable	Power Cord
	N/A						

Note: All the above equipment /cable were placed in worse case position to maximize emission signals during emission test

Grounding: Grounding was in accordance with the manufacturer's requirement and conditions for the intended use.



3. TEST AND MEASUREMENT EQUIPMENT

3.1 CALIBRATION

The measuring equipment utilized to perform the tests documented in the report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

3.2 EQUIPMENT

The following list contains measurement equipment used for testing. The equipment conforms to the requirement of CISPR 16-1, ANSI C63.2 and. Other required standards.

Calibration of all test and measurement, including any accessories that may effect such calibration, is checked frequently to ensure the accuracy. Adjustments are made and correction factors are applied in accordance with the instructions contained in the respective.

TABLE 1 LIST OF TEST AND MEASUREMENT EQUIPMENT

Instrument	Manufacturer	Model No.	Serial No.	Calibration Due Date	Note
EMC Test Receiver	R&S	ESCI	100438	Apr 29, 2010	
Bilog Antenna	SUNOL	JB1	A052104	Sep.30, 2010	
Turn table	EMCO	2080	9508-1805	N/A	
Controller	EMCO	2090	9804-1328	N/A	
Amplifier	G.W	GAP-801	EF150001	Jul.18, 2010	
Amplifier	Schwarzbeck	BBV 9718	9718-008	Aug. 10, 2010	
Spectrum Analyzer	NEX1	NS-265	5044006	Aug.8, 2010	
RF Cable	BELDEN	RG-8/U	E037	Jun.07, 2010	
RF Cable	Huber Suhner	SUCOFLEX 104	293864/4	Nov. 13, 2009	
Thermo-Hygro meter	WISEWIND	4-IN-1	0412	Apr.10, 2010	
Loop Antenna	Teseq GmbH	HLA 6120	26439	Sep. 11, 2010	



Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-491	Aug. 05, 2010	
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※ Calibration interval of instruments listed above is one year



**4. SECTION 15.249 REQUIREMENTS (FUNDAMENTAL/
HARMONICS)**

4.1 TEST SETUP

Refer to paragraph 6.1.

4.2 LIMIT

Fundamental Frequency (MHz)	Field Strength of Fundamental (dBμV/m at 3-meter)	Detector
902 - 928 2400 – 2483 5725 - 5875	114	Peak
902 - 928 2400 – 2483 5725 - 5875	94	AV

Fundamental Frequency (MHz)	Field Strength of Harmonics (dBμV/m at 3-meter)	Detector
902 - 928 2400 – 2483 5725 - 5875	74	Peak
902 - 928 2400 – 2483 5725 - 5875	54	AV

4.3 RESULT: PASSED

4.4 TEST DATA:



Fundamental

Horizontal

Freq	Over Limit	Limit Line	Read Level	Level	Factor	Remark
MHz	dB	dBuV/m	dBuV	dBuV/m	dB/m	
2402.29	-40.38	114.00	80.06	73.62	-6.44	Peak

Vertical

Freq	Over Limit	Limit Line	Read Level	Level	Factor	Remark
MHz	dB	dBuV/m	dBuV	dBuV/m	dB/m	
2402.44	-38.13	114.00	82.31	75.87	-6.44	Peak

Horizontal

Freq	Over Limit	Limit Line	Read Level	Level	Factor	Remark
MHz	dB	dBuV/m	dBuV	dBuV/m	dB/m	
2448.37	-40.16	114.00	79.89	73.84	-6.05	Peak

Vertical

Freq	Over Limit	Limit Line	Read Level	Level	Factor	Remark
MHz	dB	dBuV/m	dBuV	dBuV/m	dB/m	
2448.40	-40.02	114.00	80.03	73.98	-6.05	Peak

Horizontal

Freq	Over Limit	Limit Line	Read Level	Level	Factor	Remark
MHz	dB	dBuV/m	dBuV	dBuV/m	dB/m	
2480.34	-38.19	114.00	81.57	75.81	-5.76	Peak

**Vertical**

Freq	Over Limit	Limit	Read	Level	Factor	Remark
MHz	dB	dBuV/m	dBuV	dBuV/m	dB/m	
2480.25	-37.77	114.00	81.99	76.23	-5.76	Peak

Harmonics -Lowest Channel

Freq	Read Level	Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
4855.00	41.97	0.99	42.96	54.00	-11.04	HORIZONTAL	Peak
7240.00	42.05	7.53	49.58	54.00	-4.42	HORIZONTAL	Peak
9655.00	41.40	10.57	51.97	54.00	-2.03	HORIZONTAL	Peak

Freq	Read Level	Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
4825.00	44.59	0.95	45.54	54.00	-8.46	VERTICAL	Peak
7217.50	40.44	7.37	47.81	54.00	-6.19	VERTICAL	Peak
9610.00	40.64	10.50	51.14	54.00	-2.86	VERTICAL	Peak

Harmonics –Middle Channel

Freq	Read Level	Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
4930.00	46.78	1.04	47.82	54.00	-6.18	HORIZONTAL	Peak
7345.00	41.44	8.29	49.73	54.00	-4.27	HORIZONTAL	Peak
9790.00	41.06	10.82	51.88	54.00	-2.12	HORIZONTAL	Peak

Freq	Read Level	Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
4930.00	48.75	1.04	49.79	54.00	-4.21	VERTICAL	Peak
7330.00	42.01	8.17	50.18	54.00	-3.82	VERTICAL	Peak
9797.50	42.00	10.84	52.84	54.00	-1.16	VERTICAL	Peak



Harmonics -Highest Channel

Freq	Read Level	Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
4990.00	47.78	1.09	48.87	54.00	-5.13	HORIZONTAL	Peak
7450.00	39.72	9.04	48.76	54.00	-5.24	HORIZONTAL	Peak
9910.00	40.72	11.04	51.76	54.00	-2.24	HORIZONTAL	Peak

Freq	Read Level	Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
4990.00	45.42	1.09	46.51	54.00	-7.49	VERTICAL	Peak
7450.00	41.50	9.04	50.54	54.00	-3.46	VERTICAL	Peak
9925.00	40.24	11.05	51.29	54.00	-2.71	VERTICAL	Peak

Note:

1. Emission level = Reading level + Correction factor
2. Correction factor = Antenna factor + Cable loss - PreAmp
3. All emissions as described above were determining by rotating the EUT through three orthogonal axes to maximizing the emissions if the EUT belongs to hand-held or body-worn devices.
4. Measurements above 1000 MHz, Peak detector setting: use a 1 MHz RBW, a 3 MHz VBW.
5. Measurements above 1000 MHz, Average detector setting: 1 MHz RBW with 10 Hz VBW
6. Peak detector measurement data will represent the worst case results.
7. "---" denotes the data which is not available.



5. SECTION 15.205 REQUIREMENTS (BAND EDGE)

5.1 TEST SETUP

Refer to paragraph 6.1.

5.2 LIMIT

Restricted Bands:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)
13.36 - 13.41			

Operation within the bands:

902 - 928 MHz, 2400 - 2483.5 MHz, 5725 - 5875 MHz, and 24.0 - 24.25 GHz.

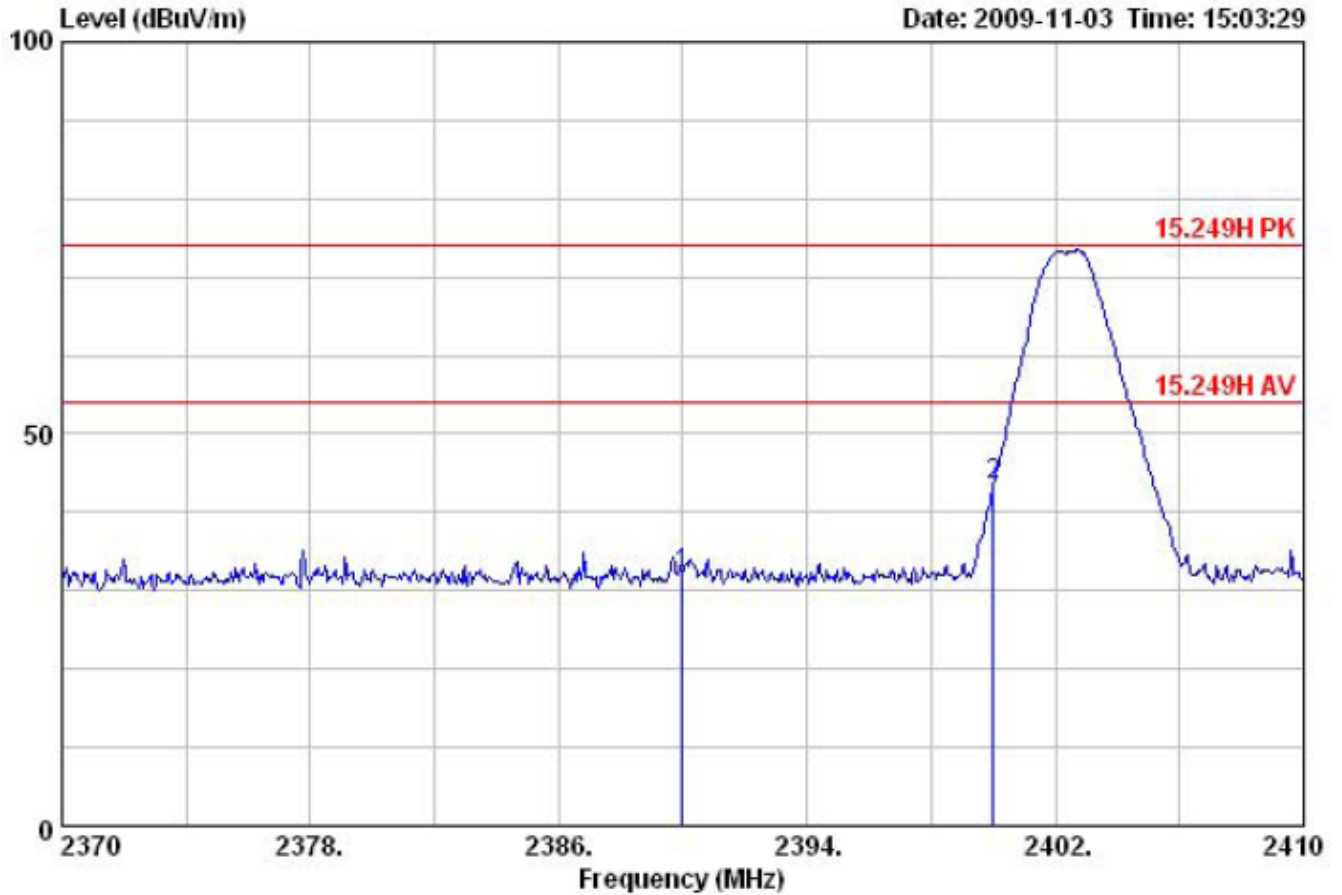
Frequency (Hz)	Field Strength (μ V/m at 3-meter)	Field Strength (dB μ V/m at 3-meter)
1.705-30	30 (at 30-meter)	49.5
30-88	100	40
88-216	150	43
216-960	200	46
Above 960	500	54



5.3 RESULT: PASSED

5.4 TEST DATA:

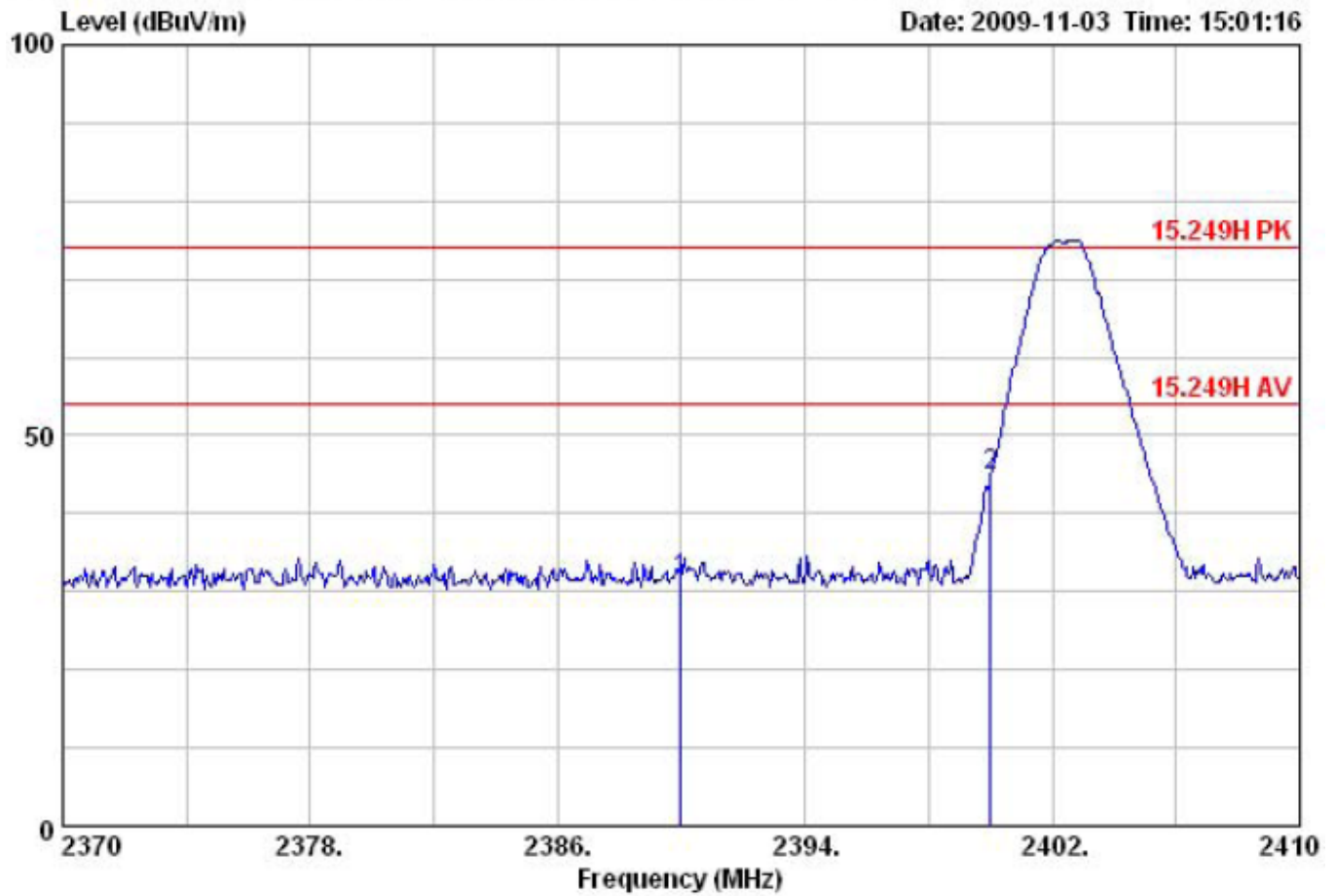
Lowest Channel-Horizontal



Freq	Over Limit	Limit Line	Read Level	Level	Factor	Remark
MHz	dB	dBuV/m	dBuV	dBuV/m	dB/m	
2390.00	-41.85	74.00	38.69	32.15	-6.54	Peak
2400.00	-30.57	74.00	49.89	43.43	-6.46	Peak



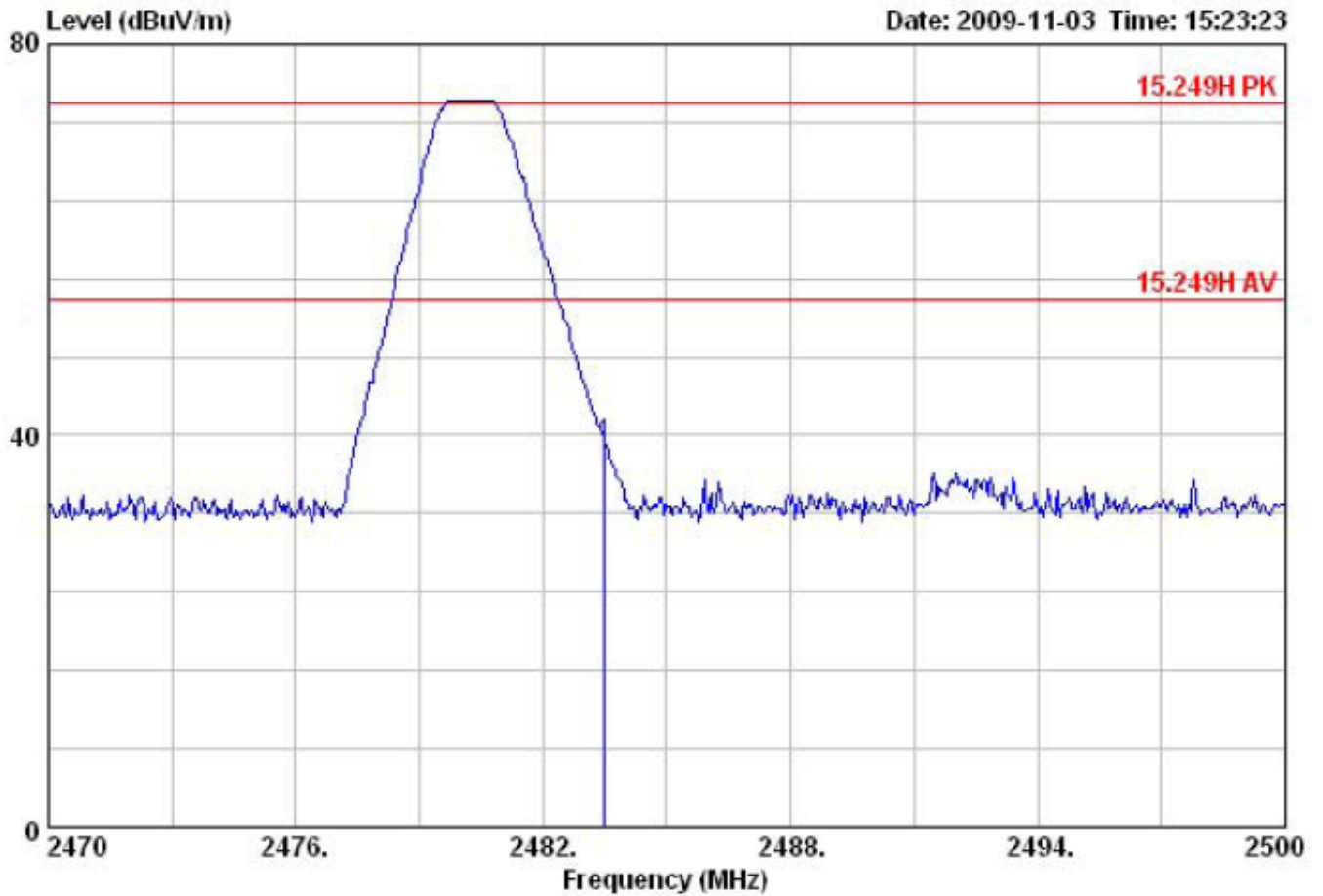
Lowest Channel-Vertical



Freq	Over Limit	Limit Line	Read Level	Level Factor	Remark
MHz	dB	dBuV/m	dBuV	dBuV/m	dB/m
2390.00	-42.43	74.00	38.11	31.57	-6.54 Peak
2400.00	-29.24	74.00	51.22	44.76	-6.46 Peak



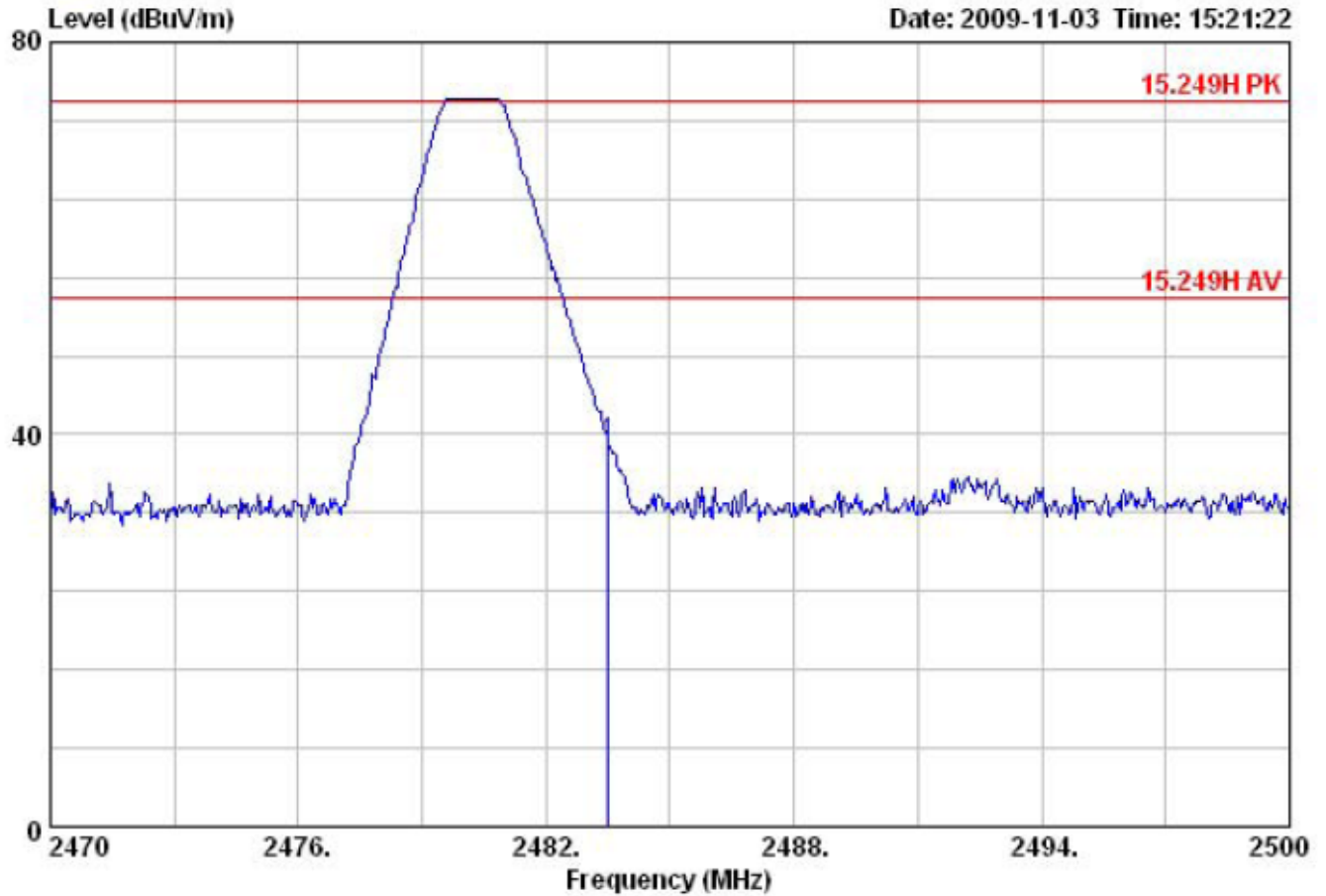
Highest Channel-Horizontal



Freq	Over Limit	Limit Line	Read Level	Level Factor	Remark
MHz	dB	dBuV/m	dBuV	dBuV/m	dB/m
2483.50	-35.08	74.00	44.66	38.92	-5.74 Peak



Highest Channel-Vertical



Freq	Over Limit	Limit Line	Read Level	Level Factor	Remark
MHz	dB	dBuV/m	dBuV	dBuV/m	dB/m
2483.50	-34.94	74.00	44.80	39.06	-5.74 Peak

Note:

1. Emission level = Reading level + Correction factor
2. Correction factor = Antenna factor + Cable loss - PreAmp

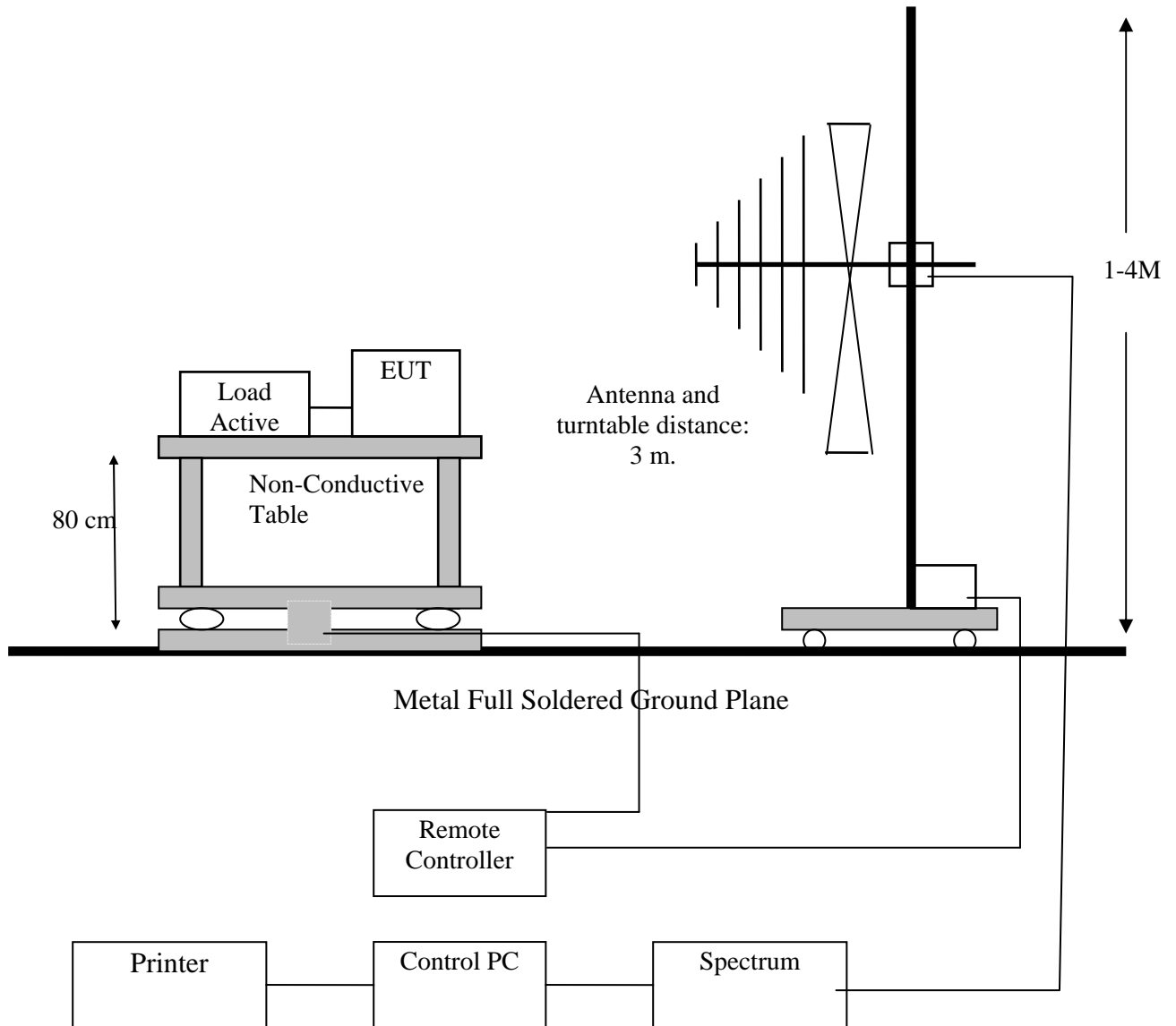


3. All emissions as described above were determining by rotating the EUT through three orthogonal axes to maximizing the emissions if the EUT belongs to hand-held or body-worn devices.
4. Measurements above 1000 MHz, Peak detector setting: use a 1 MHz RBW, a 3 MHz VBW.
5. Measurements above 1000 MHz, Average detector setting: 1 MHz RBW with 10 Hz VBW.
6. Peak detector measurement data will represent the worst case results.



6. SECTION 15.209 REQUIREMENTS (GENERAL RADIATED EMISSION)

6.1 TEST SETUP





6.2 LIMIT

The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in section 15.209 as below.

Frequency (MHz)	Field Strength (mV/m)	Measurement Distance (m)
1.705-30	30	30
30-88	100*	3
88-216	150*	3
216-960	200*	3
Above 960	500*	3

**Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.*

In the above emission table, the tighter limit applies at the band edges.

Frequency (Hz)	Field Strength (μ V/m at 3-meter)	Field Strength (dB μ V/m at 3-meter)
1.705-30	30 (at 30-meter)	49.5
30-88	100	40
88-216	150	43
216-960	200	46
Above 960	500	54

6.3 TEST PROCEDURE

1. The EUT was placed on a turntable, which was 0.8m above ground plane.
2. The turntable was rotated for 360 degrees to determine the position of maximum emission level.
3. EUT was set at 3m away from the receiving antenna, which was varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was maximized by changing the polarization of receiving antenna, both horizontal and vertical.
6. Repeated above procedures until the measurements for all frequencies are completed.

6.4 RESULT: PASSED



6.5 TEST DATA:

All frequencies not described in this test report and within the range of the general radiated emission limits are not detectable significantly. The table as below is representing worst emissions found.

Lowest Channel (worst emissions found)

<u>Frequency</u> (MHz)	<u>Ant.</u> <u>Polarization</u>	<u>Reading</u> (dBμV)	<u>Correction</u> factor(dB)	<u>Emission</u> (dBμV/m)	<u>Limit</u> (dBμV/m)
134.27	H	43.46	-22.92	20.54	43
240.97	H	41.93	-15.52	26.41	46
277.35	H	42.24	-15.76	26.48	46
299.17	H	39.84	-13.1	26.74	46
713.85	H	38.59	-7.82	30.77	46
983.02	H	38.65	-3.79	34.86	54
134.27	V	43.13	-26.45	16.68	43
250.67	V	39.96	-15.17	24.79	46
299.17	V	39.52	-13.1	26.42	46
352.52	V	37.83	-11.06	26.77	46
723.55	V	38.43	-8.07	30.36	46
985.45	V	37.91	-3.4	34.51	54

Note:

1. Emission level = Reading level + Correction factor
2. Correction factor = Antenna factor + Cable loss - PreAmp
3. All emissions as described above were determining by rotating the EUT through three orthogonal axes to maximizing the emissions if the EUT belongs to hand-held or body-worn devices.
4. Measurements from 9 kHz to 150 kHz, Peak detector setting: 100 Hz RBW
5. Measurements from 150 kHz to 30MHz, Peak detector setting: 10 kHz RBW
6. Measurements from 30 MHz to 1000 MHz, Peak detector setting: 100 kHz RBW
7. Measurements from 9 kHz to 150 kHz, CISPR Quasi-Peak detector: 200 Hz RBW
8. Measurements from 150 kHz to 30MHz, CISPR Quasi-Peak detector: 9 kHz RBW



9. Measurements from 30 MHz to 1000 MHz, CISPR Quasi-Peak detector: 120 kHz RBW
10. Peak detector measurement data will represent the worst case results.



7. SECTION 15.207 REQUIREMENTS (POWERLINE CONDUCTED EMISSIONS)

The EUT is powered by the battery; therefore this test item is not applicable.