FCC CFR47 PART 15 SUBPART C
CLASS II PERMISSIVE CHANGE
CERTIFICATION TEST REPORT

FOR

NOTEBOOK PC

MODEL NUMBER: NP-Q1

FCC ID: A3L-NP-Q1

REPORT NUMBER: 06I10409-1, REVISION B

ISSUE DATE: JULY 24, 2006

Prepared for
SAMSUNG ELECTRONICS CO., LTD.
416 MAETAN 3- DONG, YEONGTONG-GU
SUWON-SI, GYEONGGI-DO 443-742
KOREA

Prepared by
COMPLIANCE CERTIFICATION SERVICES
561F MONTEREY ROAD
MORGAN HILL, CA 95037, USA
TEL: (408) 463-0885
FAX: (408) 463-0888

LAB CODE:200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	7/18/06	Initial Issue	Thu
B	7/24/06	Update section 5.3	Thu

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SAMSUNG ELECTRONICS CO., LTD.
416 Maetan 3-Dong, Yeongtong-Gu
Suwon-Si, Gyeonggi-Do 443-742, KOREA

EUT DESCRIPTION: NOTEBOOK PC

MODEL: NP-Q1

SERIAL NUMBER: 625C1047762

DATE TESTED: JULY 7-9, 2006

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 15 SUBPART C	NO NON-COMPLIANCE NOTED

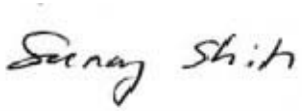
Compliance Certification Services, Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document. No part of this report may be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any government agency.

Approved & Released For CCS By:

THU CHAN
EMC SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

Tested By:



SUNNY SHIH
EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2003, FCC CFR 47 Part 2 and FCC CFR 47 Part 15.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 561F Monterey Road, Morgan Hill, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.4, ANSI C63.7 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://www.ccsemc.com.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

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

4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Radiated Emission, 30 to 200 MHz	+/- 3.3 dB
Radiated Emission, 200 to 1000 MHz	+4.5 / -2.9 dB
Radiated Emission, 1000 to 2000 MHz	+4.5 / -2.9 dB
Power Line Conducted Emission	+/- 2.9 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a notebook PC with 802.11b/g transceiver and BT module installed.

The WLAN transceiver radio module is manufactured by Atheros.
The BT radio module is manufactured by Broadcom.It is already certified under FCC ID: QDS-BRCM1018.

5.2. MAXIMUM OUTPUT POWER

The maximum peak conducted output power of the transmitter remains the same as originally granted as follows:

2400 to 2483.5 MHz Authorized Band

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2412 - 2462	802.11b	20.23	105.44
2412 - 2462	802.11g	24.00	251.19

5.3. DESCRIPTION OF CLASS II CHANGES

This Class II filing is to add one antenna for the WLAN module. The antenna being added is of the same type and maximum gain as one of the two antennas covered under original filing, with only change on the shape of the antenna:

PIFA Antenna:
Manufacturer: Amphenol KAE Co., Ltd.
P/N: SS-03-03-076
Peak gain with cable loss: 1.71dBi (2400-2500 MHz)

Therefore, only radiated emissions above 1 GHz were re-evaluated under this project.

5.4. DESCRIPTION OF AVAILABLE ANTENNAS

The WLAN module uses a PIFA antenna with a maximum gain of 1.71 dBi.

5.5. SOFTWARE AND FIRMWARE

The EUT driver software installed in the host support equipment during testing was art Wid=7105

The test utility software used during testing was Atheros ART 5.3.Build #11

5.6. WORST-CASE CONFIGURATION AND MODE

EUT was tested in three orthogonal orientations to find out the worst orientation, the worst orientation was found out to be X orientation.

For the frequency range of 30 MHz to 25 GHz, radiated emissions, Low, Mid and High channels for both 11b and 11g modes were tested. Low channel was at 2412 MHz, Mid channel was at 2437 MHz, and high channel was at 2462 MHz.

For 11b mode, 1 Mbps data rate was selected. For 11g mode, 6 Mbps data rate was selected.

5.7. DESCRIPTION OF TEST SETUP

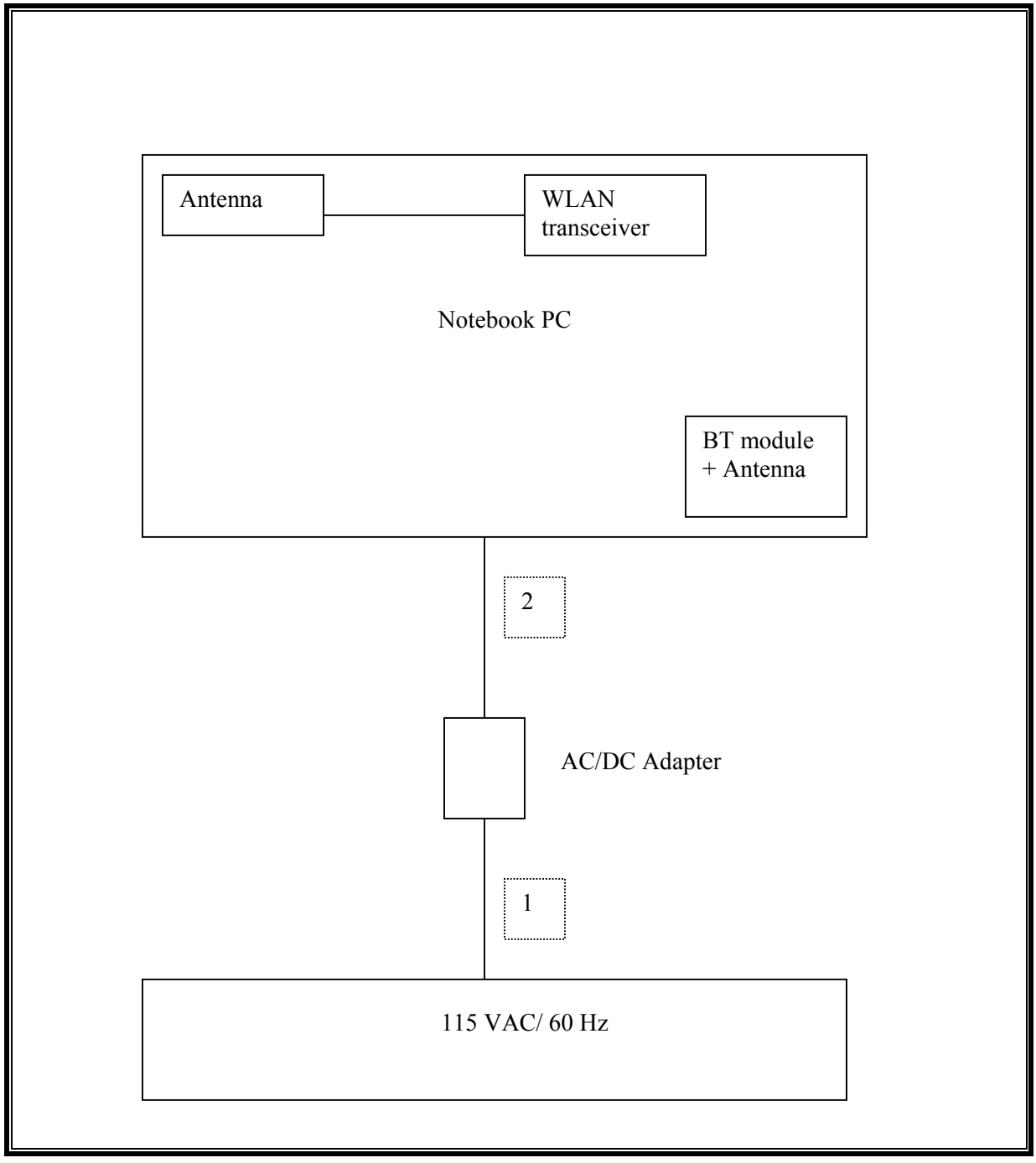
COMPONENTS OF SYSTEM UNDER TEST

COMPONENTS OF SYSTEM UNDER TEST				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
AC/DC Adapter	AcBel	API1AD02	CNBA4400162ABJ6F5CR0547	DoC
Laptop Computer	Samsung	NP-Q1	467F93AYC00017W	A3L-NP-Q1
WLAN Transceiver	Atheros	AR5BXB61	625C1047762	NA
BT Module	Broadcom	BCN92045NMD	20050J0891	QDS-BRCM1018

I/O CABLES

I/O CABLE LIST						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length**	**Remarks**
1	AC	1	AC	Unshielded	1m	N/A
2	DC	1	DC	Unshielded	1.8m	N/A

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**Cal Due**
Spectrum Analyzer 3 Hz ~ 44 GHz	Agilent	E4446A	US42070220	07/29/06
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	2238	04/22/07
Preamplifier, 1 ~ 26.5 GHz	Agilent	8449B	3008A00561	10/03/07
Antenna, Horn 18 ~ 26 GHz	ARA	MWH-1826/B	1049	09/12/06
Power Meter	HP	437B	3125U11347	04/18/07
Power Sensor	HP	8481A	2702A66876	01/11/07
Antenna, Bilog 30 MHz ~ 2 GHz	Sunol Sciences	JB1	A121003	09/03/06
EMI Receiver, 9 kHz ~ 2.9 GHz	HP	8542E	3942A00286	02/04/07
RF Filter Section	HP	85420E	3705A00256	02/04/07
EMI Test Receiver	R & S	ESHS 20	827129/006	11/03/06
LISN, 10 kHz ~ 30 MHz	FCC	LISN-50/250-25-2	2023	08/30/06
(2.4-2.5) GHz Band Reject Filter	MicroTronics	BRM50702	001	C.N.R

7. LIMITS AND RESULTS

7.1. RADIATED EMISSIONS

7.1.1. TRANSMITTER RADIATED SPURIOUS EMISSIONS

LIMITS

§15.205 (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
[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	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

§15.205 (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.

§15.209 (a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
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.

§15.209 (b) In the emission table above, the tighter limit applies at the band edges.

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each 5 GHz band.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

SUPPLEMENTAL TEST PROCEDURE FOR CO-LOCATED TRANSMITTERS

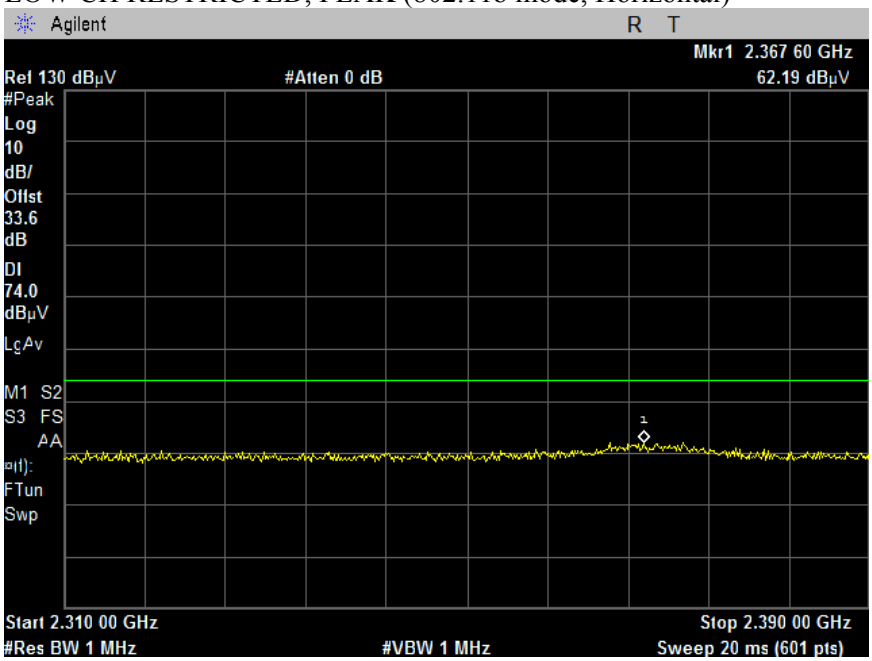
The dominant transmitter is set to the worst case channel. The spurious emissions performance of the dominant transmitter is investigated as the settings of the non-dominant transmitter are varied. The spectrum is searched for intermodulation products. Worst-case results are reported.

7.1.2. TRANSMITTER ABOVE 1 GHz FOR 2400 TO 2483.5 MHz BAND

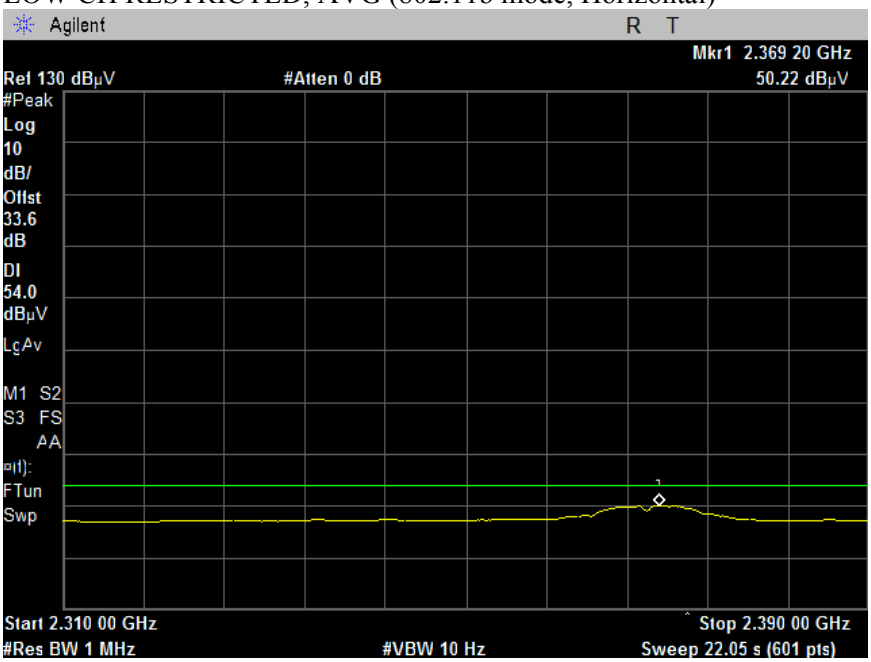
EUT with KAE Antenna

RESTRICTED BANDEDGE (b MODE, LOW CHANNEL, HORIZONTAL)

LOW CH RESTRICTED, PEAK (802.11b mode, Horizontal)

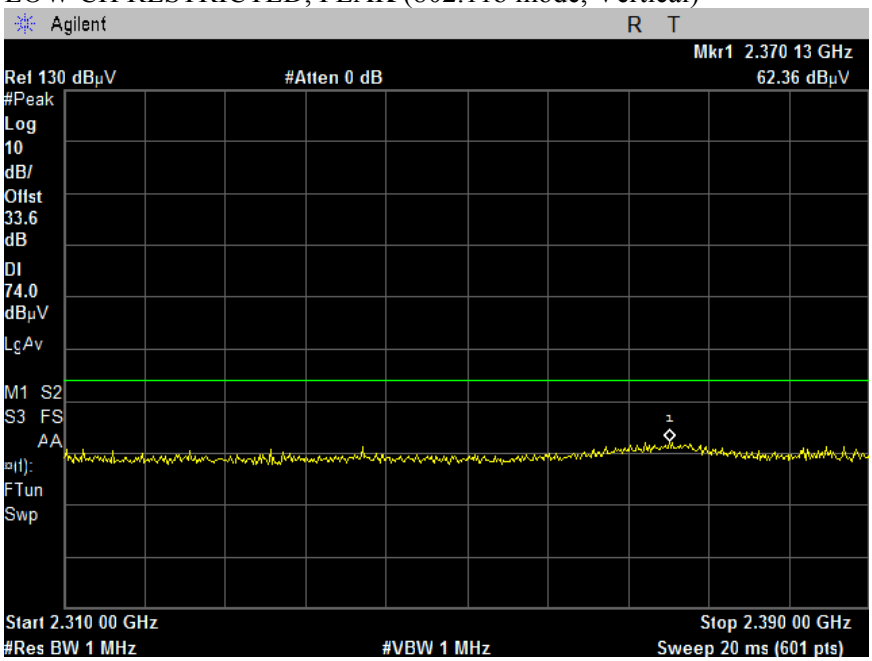


LOW CH RESTRICTED, AVG (802.11b mode, Horizontal)

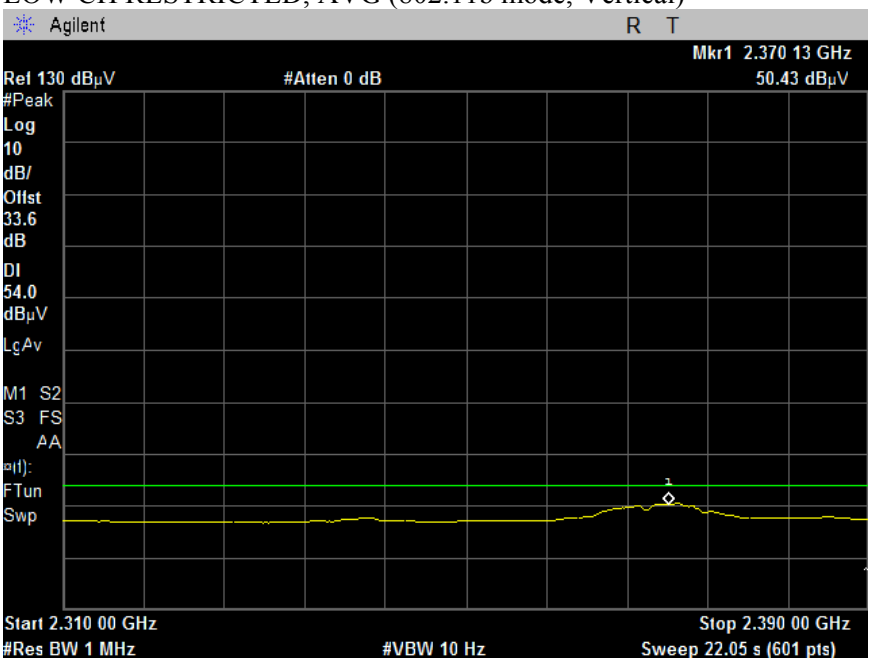


RESTRICTED BANDEDGE (b MODE, LOW CHANNEL, VERTICAL)

LOW CH RESTRICTED, PEAK (802.11b mode, Vertical)

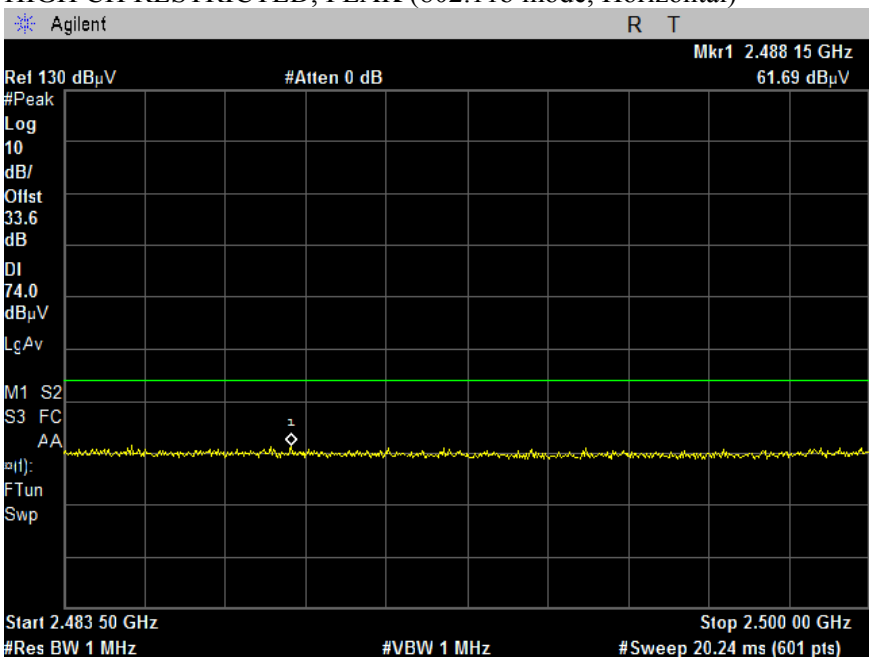


LOW CH RESTRICTED, AVG (802.11b mode, Vertical)

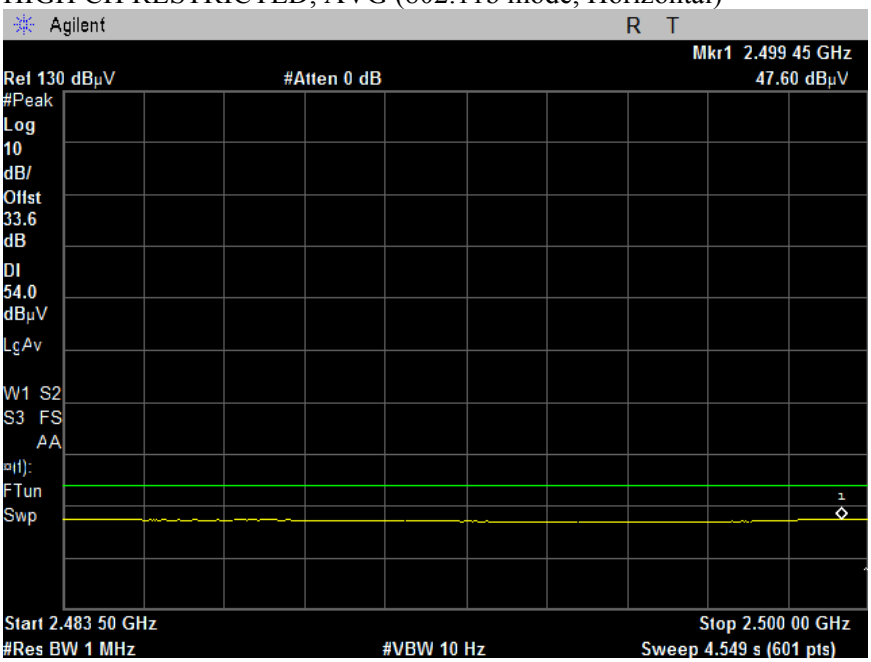


RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, HORIZONTAL)

HIGH CH RESTRICTED, PEAK (802.11b mode, Horizontal)

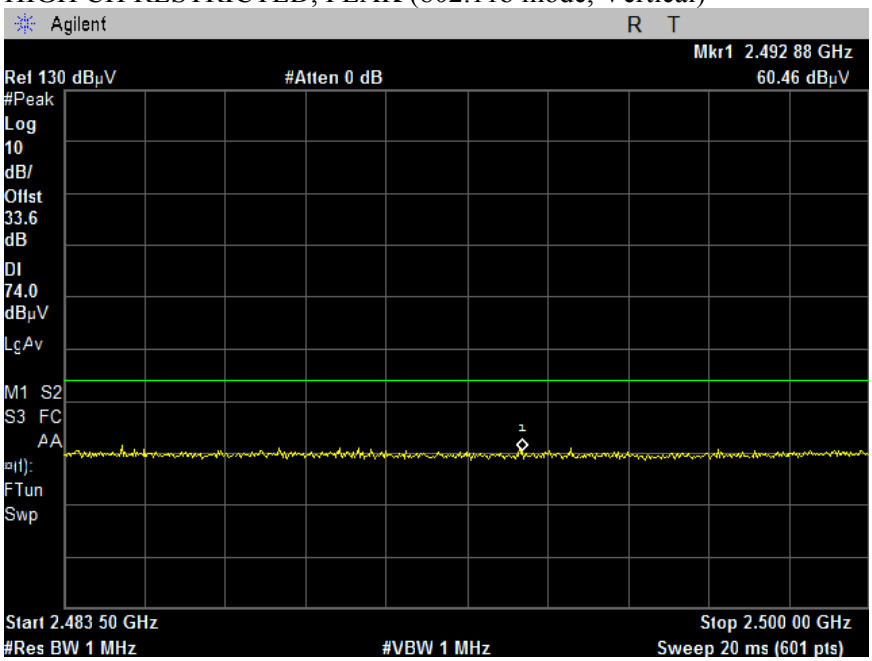


HIGH CH RESTRICTED, AVG (802.11b mode, Horizontal)

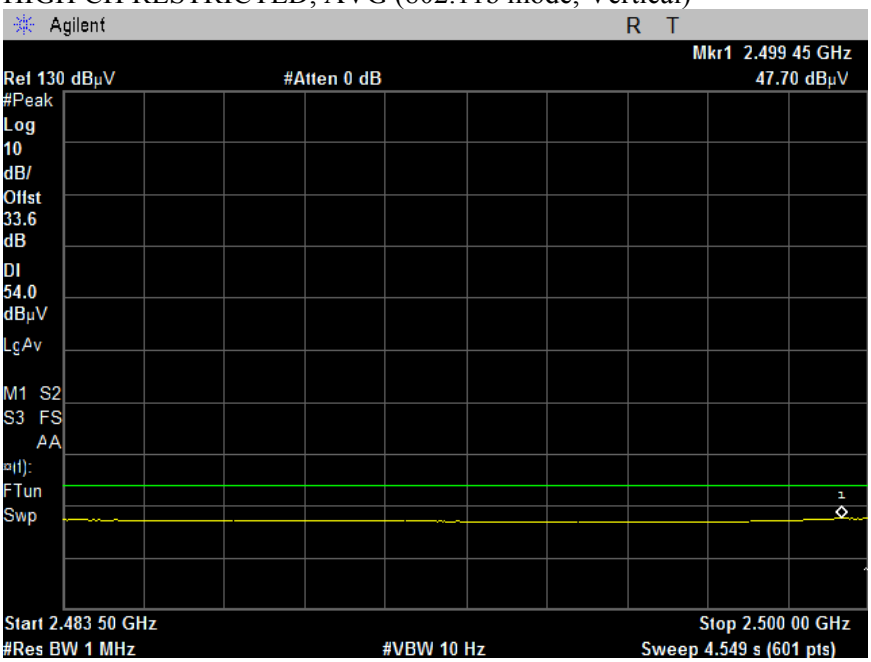


RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, VERTICAL)

HIGH CH RESTRICTED, PEAK (802.11b mode, Vertical)



HIGH CH RESTRICTED, AVG (802.11b mode, Vertical)



HARMONICS AND SPURIOUS EMISSIONS (b MODE) – WITH KAE ANTENNA

High Frequency Measurement
Compliance Certification Services, Morgan Hill Open Field Site

Test Engineer:	Sunny Shih
Project #:	06U10409
Company:	Samsung Electronics Co. Ltd.
EUT Description:	Notebook PC with KAE Antenna
EUT M/N:	NP-Q1
EUT S/N:	549G93AL200019E
Test Target:	FCC 15.247
Mode Of Operation:	TX ON in 11b mode, 1Mbps

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T136; M/N: 3117 @3m	T34 HP 8449B			FCC 15.205

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
Sunny 177079004		Sunny 197539001	HPF_4.0GHz	

Peak Measurements RBW=VBW=1MHz
Average Measurements RBW=1MHz ; VBW=10Hz

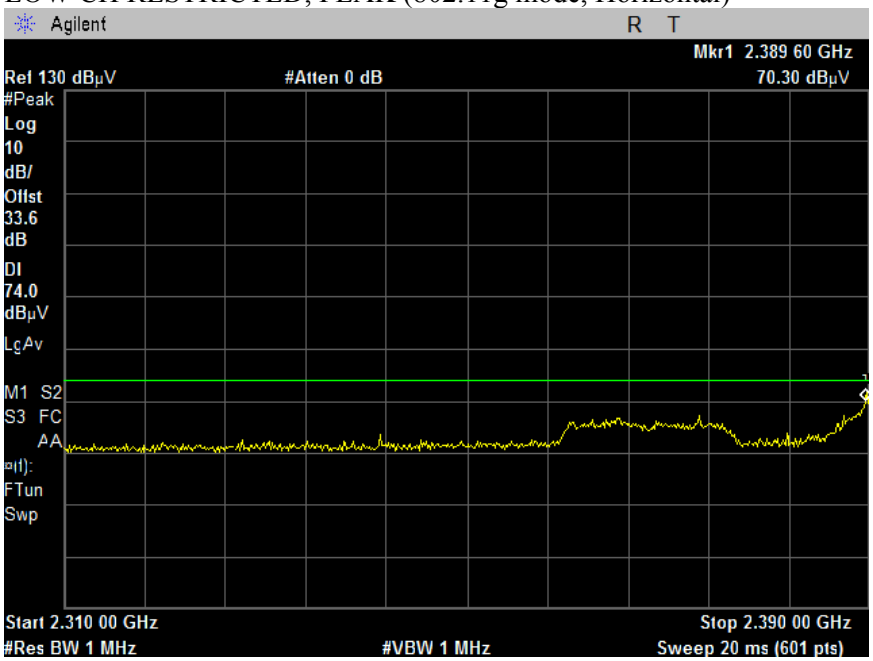
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Channel (2412 MHz)															
4.824	3.0	46.2	39.6	34.0	3.5	-34.8	0.0	0.6	49.6	42.9	74	54	-24.4	-11.1	V
4.824	3.0	45.8	38.5	34.0	3.5	-34.8	0.0	0.6	49.1	41.8	74	54	-24.9	-12.2	H
Mid Channel (2437 MHz)															
4.874	3.0	46.2	38.1	34.1	3.5	-34.8	0.0	0.6	49.6	41.5	74	54	-24.4	-12.5	V
4.874	3.0	47.2	41.0	34.1	3.5	-34.8	0.0	0.6	50.6	44.4	74	54	-23.4	-9.6	H
High Channel (2462 MHz)															
4.924	3.0	46.2	39.1	34.1	3.6	-34.8	0.0	0.6	49.7	42.6	74	54	-24.3	-11.4	V
4.924	3.0	48.3	42.6	34.1	3.6	-34.8	0.0	0.6	51.8	46.1	74	54	-22.2	-7.9	H

EUT was scanned from 1 GHz to 25 GHz, no other signals above noise floor were detected.

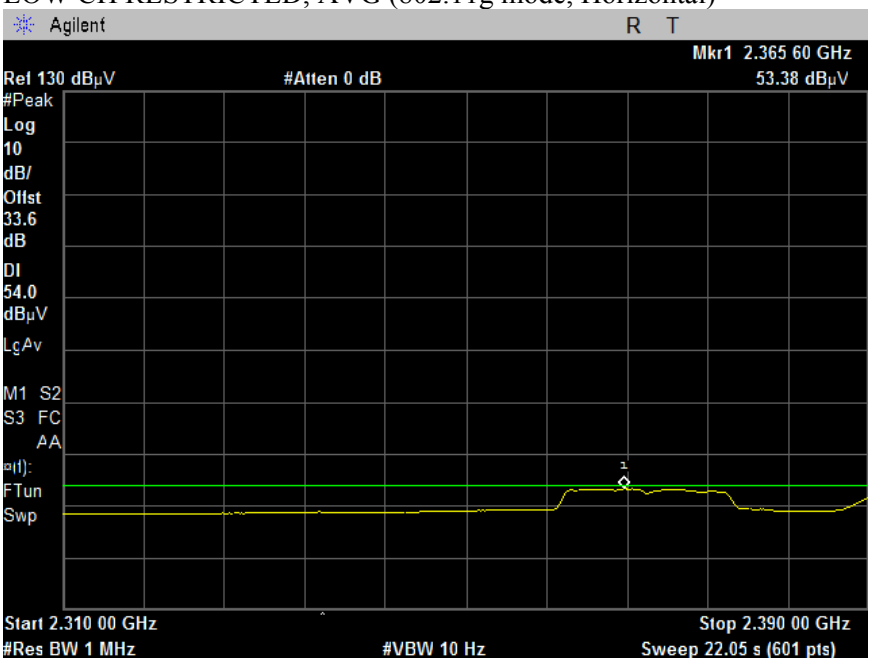
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

RESTRICTED BANDEDGE (g MODE, LOW CHANNEL, HORIZONTAL)

LOW CH RESTRICTED, PEAK (802.11g mode, Horizontal)

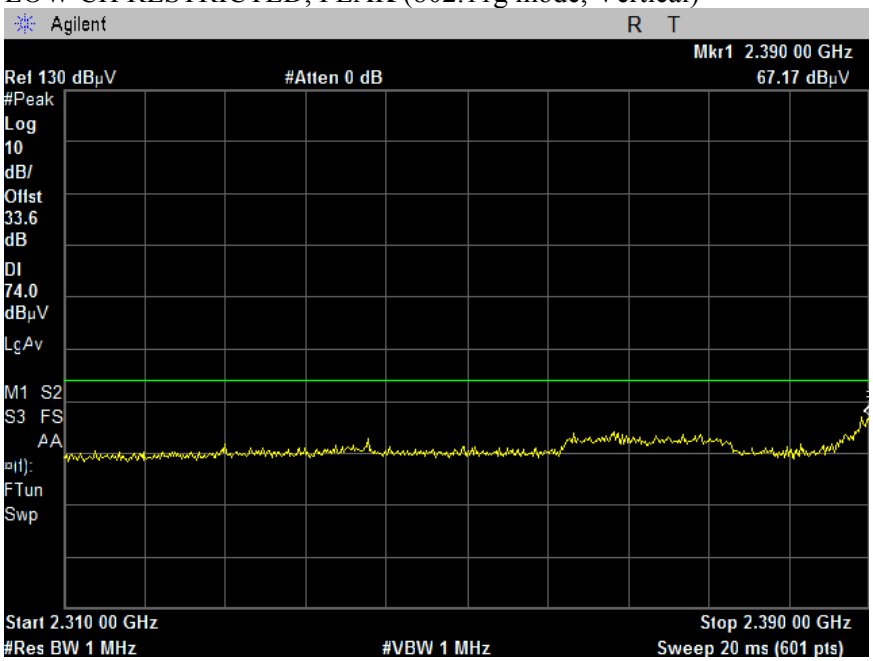


LOW CH RESTRICTED, AVG (802.11g mode, Horizontal)

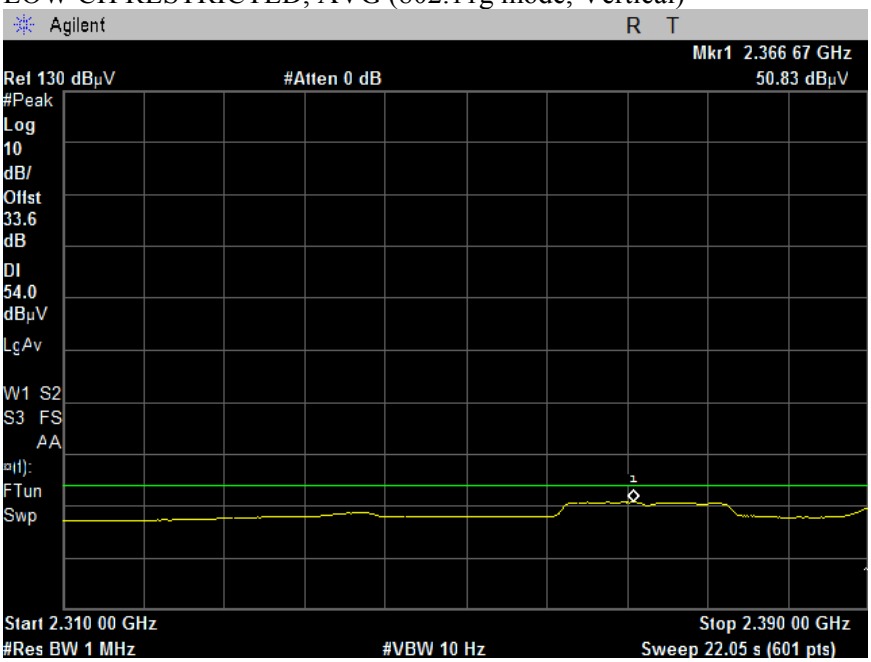


RESTRICTED BANDEDGE (g MODE, LOW CHANNEL, VERTICAL)

LOW CH RESTRICTED, PEAK (802.11g mode, Vertical)

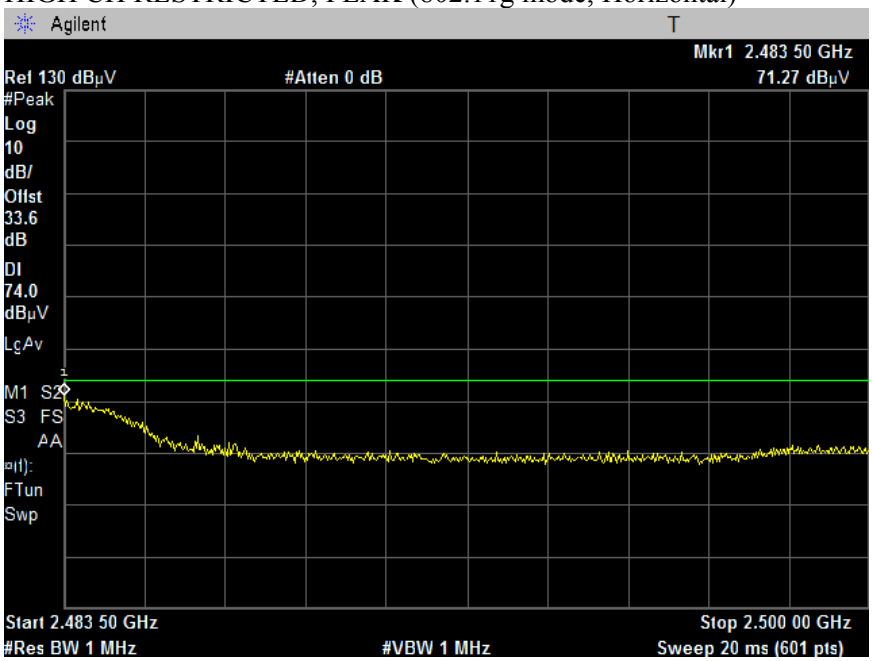


LOW CH RESTRICTED, AVG (802.11g mode, Vertical)

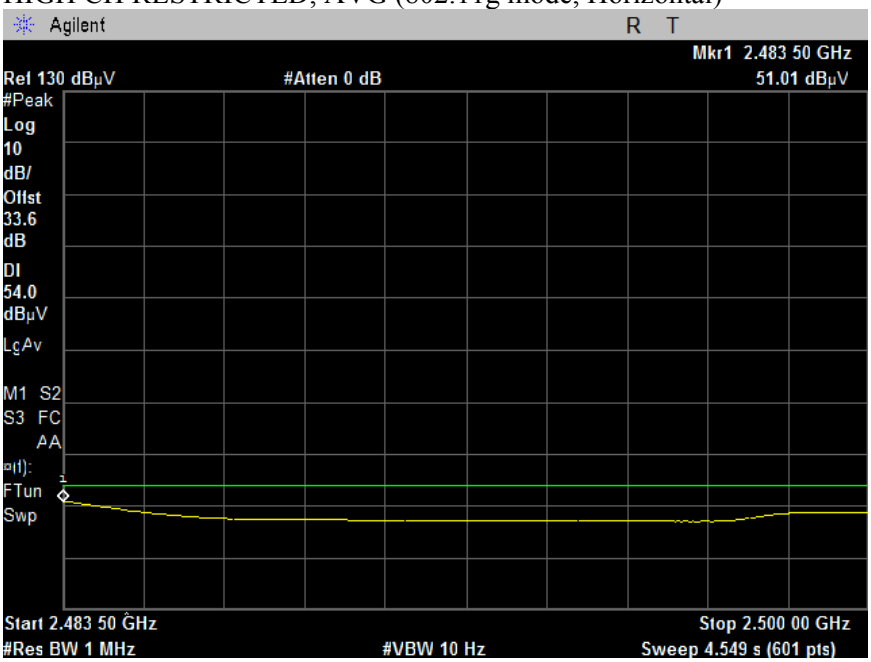


RESTRICTED BANDEDGE (g MODE, HIGH CHANNEL, HORIZONTAL)

HIGH CH RESTRICTED, PEAK (802.11g mode, Horizontal)

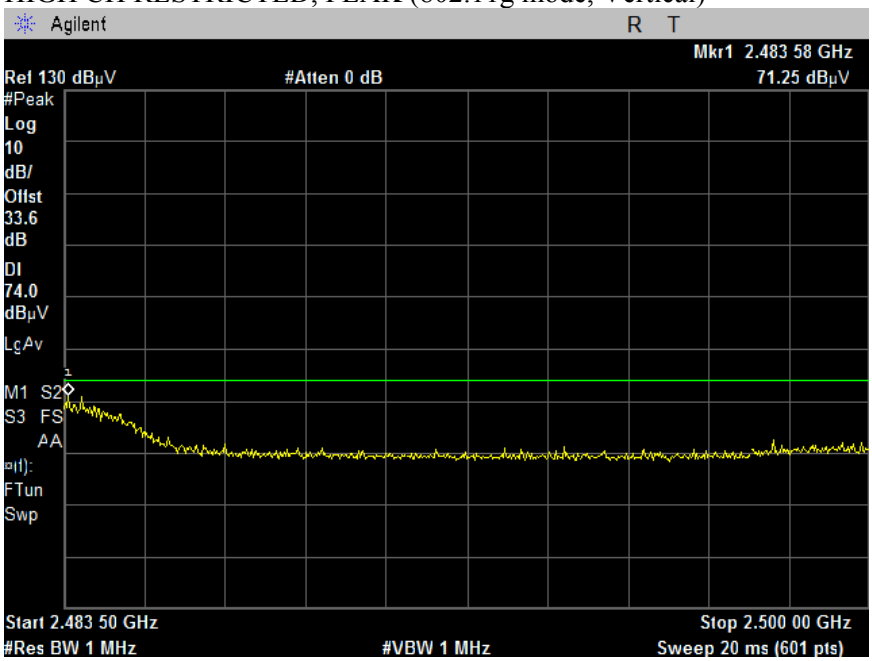


HIGH CH RESTRICTED, AVG (802.11g mode, Horizontal)

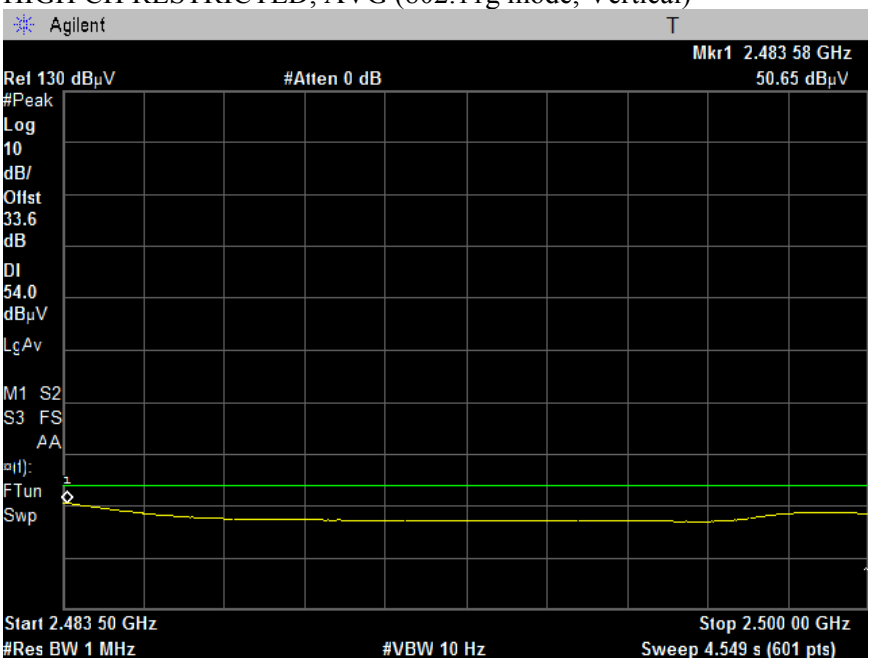


RESTRICTED BANDEDGE (g MODE, HIGH CHANNEL, VERTICAL)

HIGH CH RESTRICTED, PEAK (802.11g mode, Vertical)



HIGH CH RESTRICTED, AVG (802.11g mode, Vertical)



HARMONICS AND SPURIOUS EMISSIONS (g MODE) – WITH KAE ANTENNA

High Frequency Measurement
Compliance Certification Services, Morgan Hill Open Field Site

Test Engineer:	Sunny Shih
Project #:	06I10409
Company:	Samsung Electronics Co. Ltd.
EUT Description:	Notebook PC with KAE Antenna
EUT M/N:	NP-Q1
EUT S/N:	549G93AL200019E
Test Target:	FCC 15.247
Mode Of Operation:	TX ON in 11g mode, 6Mbps

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T136; M/N: 3117 @3m	T34 HP 8449B			FCC 15.205

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
Sunny 177079004		Sunny 197539001	HPF_4.0GHz	

Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Channel (2412 MHz)															
4.824	3.0	47.2	38.7	34.0	3.5	-34.8	0.0	0.6	50.6	42.0	74	54	-23.4	-12.0	V
4.824	3.0	46.8	37.4	34.0	3.5	-34.8	0.0	0.6	50.1	40.7	74	54	-23.9	-13.3	H
Mid Channel (2437 MHz)															
4.874	3.0	48.1	39.5	34.1	3.5	-34.8	0.0	0.6	51.5	42.9	74	54	-22.5	-11.1	V
4.874	3.0	47.3	41.6	34.1	3.5	-34.8	0.0	0.6	50.7	45.0	74	54	-23.3	-9.0	H
High Channel (2462 MHz)															
4.924	3.0	47.2	40.0	34.1	3.6	-34.8	0.0	0.6	50.7	43.5	74	54	-23.3	-10.5	V
4.924	3.0	49.6	43.8	34.1	3.6	-34.8	0.0	0.6	53.1	47.3	74	54	-20.9	-6.7	H

EUT was scanned from 1 GHz to 25 GHz, no other signals above noise floor were detected.

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

7.1.3. CO-LOCATED TRANSMITTER RADIATED EMISSIONS

RESULTS

No non-compliance noted:

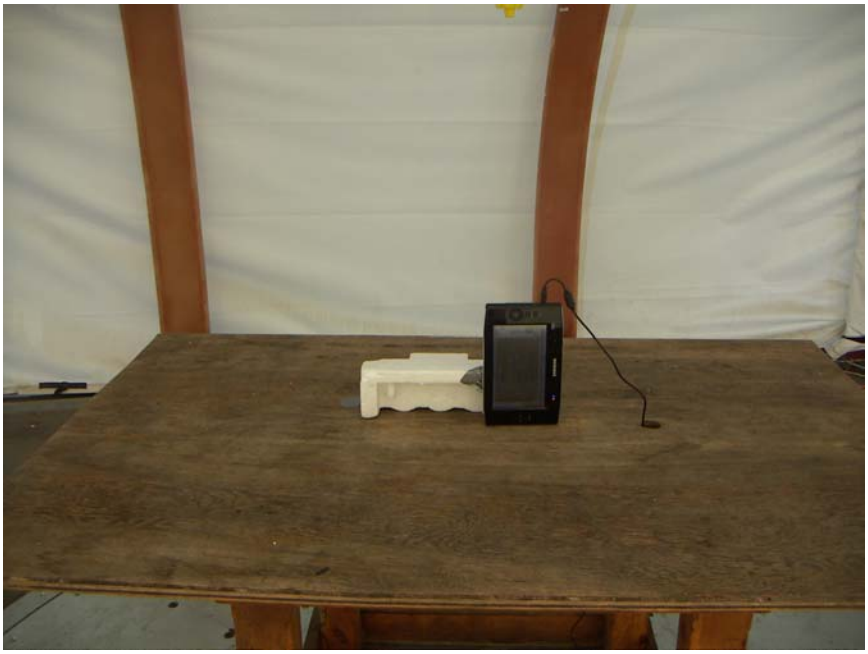
EUT was activated at mid channel in WLAN 11b mode (2437 MHz), and at mid channel in BT mode (2441 MHz). A pre-scan was performed to investigate whether there is any inter-modulation signal, all the signals that were detected were harmonics of individual transmitters, none of the inter-modulation signals were found in the frequency range of 1 to 25 GHz.

8. SETUP PHOTOS

RADIATED RF MEASUREMENT SETUP FOR PORTABLE CONFIGURATION

X-AXIS FRONT PHOTO

Y-AXIS FRONT PHOTO



Z-AXIS FRONT PHOTO

END OF REPORT