FCC CFR47 PART 15 SUBPART E

CERTIFICATION TEST REPORT

FOR

10.1” TABLET WITH LTE/CELLULAR AND WLAN RADIO WITH BLUETOOTH

MODEL NUMBER: TP00043A

FCC ID: PU5-TP00043ASF

REPORT NUMBER: 12U14463

ISSUE DATE: 2012-10-11

Prepared for
WISTRON CORPORATION
21F, 88, SEC. 1, HSIN TAI WU RD., HSICHIH
TAIPEI HSIEN 221,
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Revision History

Rev.	Issue Date	Revisions	Revised By
--	10/11/12	Initial Issue	M. Antola

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: WISTRON CORPORATION
21F, 88, SEC. 1, HSIN TAI WU RD., HSICHIH
TAIPEI HSIEN 221, TAIWAN R.O.C

EUT DESCRIPTION: 10.1" TABLET WITH LTE/CELLULAR AND WLAN RADIO WITH BLUETOOTH

MODEL: TP00043ASF

SERIAL NUMBER: NON-SERIALIZED PROTOTYPE

DATE TESTED: 2012-10-01 to 2012-10-04

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart E	Pass

UL LLC tested the above equipment in accordance with the requirements set forth in the above standards, using test results reported in the test report documents referenced below and/or documentation furnished by the applicant. All indications of Pass/Fail in this report are opinions expressed by UL LLC based on interpretations of these calculations. The results show that the equipment 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 by the referenced documents. This document may not be altered or revised in any way unless done so by UL LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For UL By:

Bob DeLisi
WiSE Principle Engineer
UL LLC

Tested By:

Mike Antola
WiSE Project Lead
UL LLC

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2003, FCC CFR 47 Part 2, FCC CFR 47 Part 15 and FCC 06-96.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 1285 Walt Whitman Rd. Melville, NY 11747, USA.

UL Melville is accredited by NVLAP, Laboratory Code 100255-0. The full scope of accreditation can be viewed at http://ts.nist.gov/standards/scopes/1002550.htm.

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. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)
36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	± 3.3 dB
Radiated Disturbance, 30 to 1000 MHz	± 4.00 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is an 802.11a/b/g/n transceiver.

The radio module is manufactured by Broadcom, model BCM94330LGA.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum average conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5180 - 5240	802.11a	12.60	18.20
5180 - 5240	802.11n HT20	12.57	18.07
5260 - 5320	802.11a	12.63	18.32
5260 - 5320	802.11n HT20	12.55	17.99
5500 - 5700	802.11a	13.51	22.44
5500 - 5700	802.11n HT20	13.12	20.51

Note: Output power measurements are average power measurements and used to confirm the device was operating within expected tolerances (+/- 0.5dB) of the power during original tests

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a PIFA antenna, with a maximum gain of 1.88 dBi in the 2.4GHz band and 0.17 dBi in the 5GHz band.

Wistron NeWeb Corporation
Main Antenna : 25.90ADN.001 PIFA Antenna Gain: 1.88
Aux Antenna : 25.90ADP.001 PIFA Antenna Gain: 0.17

5.4. SOFTWARE AND FIRMWARE

The EUT driver software installed during testing was Broadcom version 5.93.97.48.

The test utility software used during testing was Broadcom “wl command” utility.

5.5. WORST-CASE CONFIGURATION AND MODE

The worst-case channel is determined as the channel with the highest output power.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Headphone	---	---	---	---
Mouse	Dell	M-UK	---	---

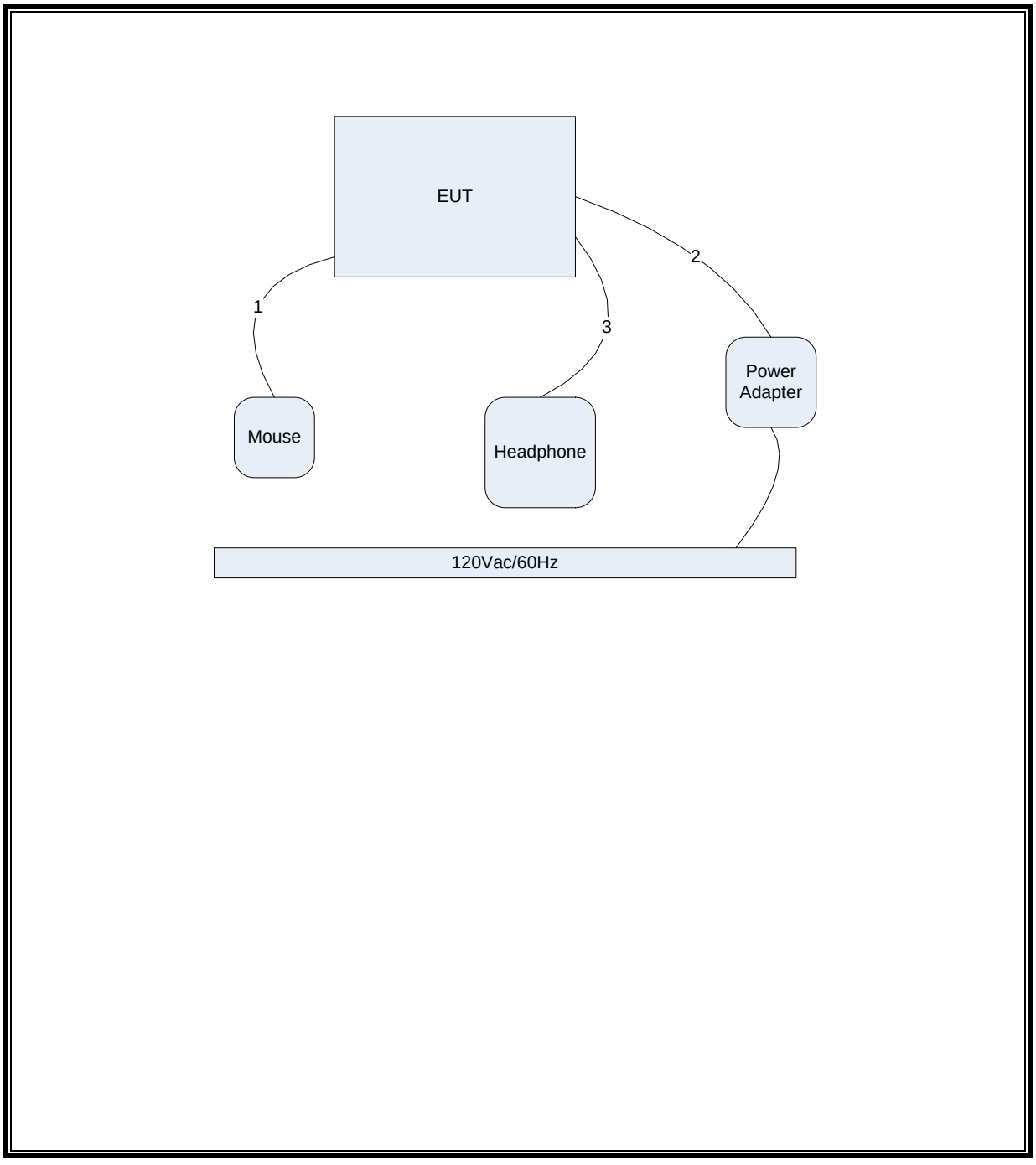
I/O CABLES

I/O Cable List						
Cable No	**Port**	**# of identical ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	USB	1	USB	USB	<3M	
2	Micro-USB	1	USB	USB	<3M	
3	Headphone	1	Phono	Phono	<3M	

TEST SETUP

The EUT is a stand-alone device. Test software exercised the radio module.

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

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

Radiated Emissions					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due Date
30-1000MHz					
EMI Receiver	Rohde & Schwarz	ESIB26	ME5B-081	2012-01-30	2013-01-30
Bicon Antenna	Schaffner	VBA6106A	54	2012-04-10	2013-04-10
Log-P Antenna	Schaffner	UPA6109	44067	2012-05-16	2013-05-16
Switch Driver	HP	11713A	ME7A-627	N/A	N/A
System Controller	Sunol Sciences	SC99V	44396	N/A	N/A
Camera Controller	Panasonic	WV-CU254	44395	N/A	N/A
RF Switch Box	UL	1	44398	N/A	N/A
Measurement Software	UL	Version 9.5	44740	N/A	N/A
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268	2010-12-07	2012-12-07
Multimeter	Fluke	83III	ME5B-305	2012-02-01	2013-02-28
Above 1GHz (Band Optimized System)					
EMI Receiver	Rohde & Schwarz	ESIB40	34968	2012-03-06	2013-03-06
Horn Antenna (1-2 GHz)	ETS	3161-01	51442	2008-03-28	See * below
Horn Antenna (2-4 GHz)	ETS	3161-02	48107	2007-09-27	See * below
Horn Antenna (4-8 GHz)	ETS	3161-03	48106	2007-09-27	See * below
Horn Antenna (8-12 GHz)	ETS	3160-07	8933	2008-11-24	See * below
Horn Antenna (12-18 GHz)	ETS	3160-08	8932	2007-09-27	See * below
Horn Antenna (18-26.5 GHz)	ETS	3160-09	8947	2007-09-26	See * below
Horn Antenna (26.5-40 GHz)	ETS	3160-10	73004	2007-09-26	See * below
Signal Path Controller	HP	11713A	50250	N/A	N/A
Gain Controller	HP	11713A	50251	N/A	N/A
RF Switch / Preamp Fixture	UL	BOMS1	50249	N/A	N/A
System Controller	UL	BOMS2	50252	N/A	N/A
Measurement Software	UL	Version 9.5	44740	N/A	N/A
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268	2010-12-07	2012-12-07
Multimeter	Fluke	83III	ME5B-305	2012-02-01	2013-02-28

* - Note: As allowed by the calibration standard ANSI C63.4 Section 4.4.2, standard gain horns need only a one-time calibration. Only if physical damage occurs will the horn antenna require re-calibration.
* Gain standard horn antennas (sometimes called standard gain horn antennas) need not be calibrated beyond that which is provided by the manufacturer unless they are damaged or deterioration is suspected, or they are used at a distance closer than $2D^2/\lambda$. Gain standard horn antennas have gains that are fixed by their dimensions and dimensional tolerances.

Conducted Emissions					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due Date
Conducted Emissions – GP 1					
EMI Receiver	Rohde & Schwarz	ESCI 7	75141	2012-01-05	2013-01-05
LISN	Solar	9252-50-R-24-BNC	ME5A-636	2012-02-03	2013-02-28
Switch Driver	HP	11713A	44397	N/A	N/A
RF Switch Box	UL	4	44404	N/A	N/A
Measurement Software	UL	Version 9.5	44736	N/A	N/A
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	43734	2012-03-13	2014-03-13
Multimeter	Fluke	83III	ME5B-305	2012-02-01	2013-02-28

7. RADIATED TEST RESULTS

7.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

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 1 kHz* for average measurements.

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

*- A VBW of 1 kHz was used based on the measured duty cycle of the EUT (see below).

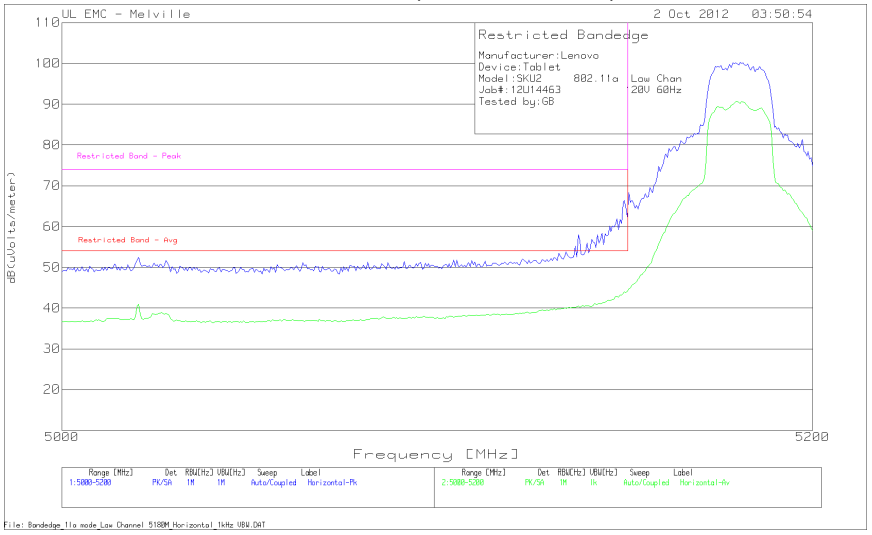
Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
802.11a 20 MHz	1.40	1.43	0.979	97.9%	0.09	0.714
802.11n HT20	1.30	1.33	0.972	97.2%	0.13	0.772

7.2. TRANSMITTER ABOVE 1 GHz

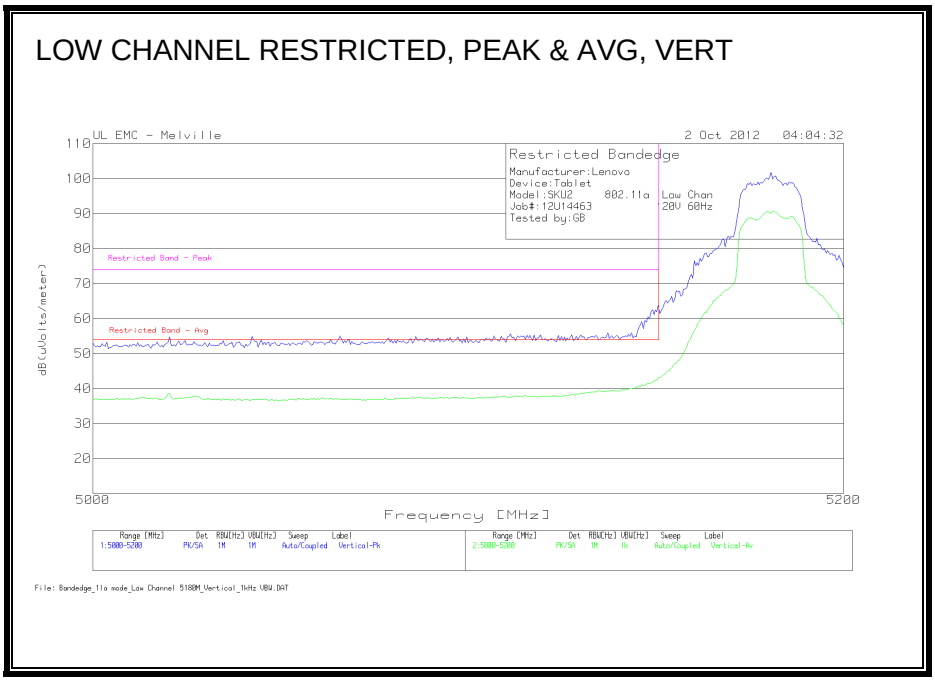
7.2.1. TX ABOVE 1 GHz FOR 802.11a MODE IN THE LOWER 5.2 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

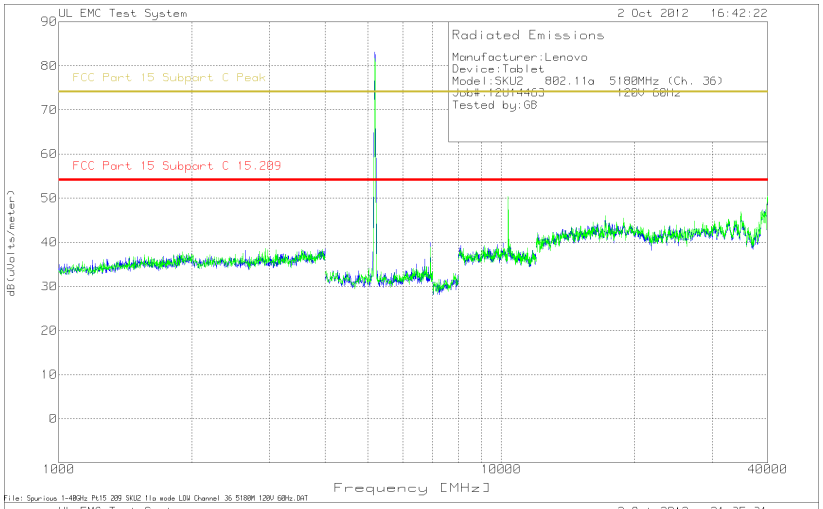
LOW CHANNEL RESTRICTED, PEAK & AVG, HORIZ

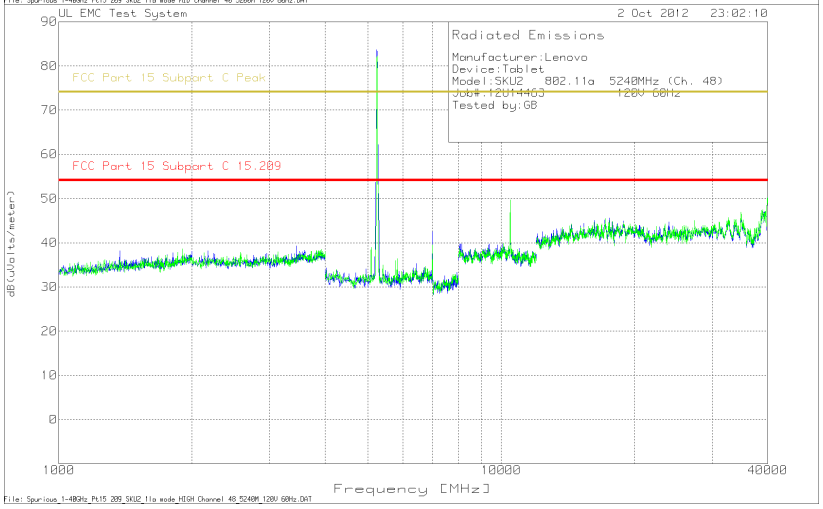


RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



HARMONICS AND SPURIOUS EMISSIONS - PLOTS





HARMONICS AND SPURIOUS EMISSIONS - DATA

Manufacturer:Lenovo
Device:Tablet
Model:SKU2 802.11a Mode
Job#:12U14463 120V 60Hz
Tested by:GB

Low Channel - 5180MHz

Test Frequency	Meter Reading	Detector	AF-8933 [dB]	BOMS Factor [dB]	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
10360	68.72	PK	33.3	-49.18	52.84	54	-1.16	74	-21.16	193	194	Vert
10360	70.96	PK	33.3	-49.18	55.08	54	1.08	74	-18.92	325	298	Horz
10360	56.21	LnAv	33.3	-49.18	40.33	54	-13.67	74	-33.67	325	298	Horz
10360	60.45	LnAv	33.3	-49.18	44.57	54	-9.43	74	-29.43	193	194	Vert
20719.99	64.39	PK	40.8	-54.37	50.82	54	-3.18	74	-23.18	46	158	Vert
20719.99	63.76	PK	40.8	-54.37	50.19	54	-3.81	74	-23.81	329	375	Horz

Mid Channel - 5200MHz

Test Frequency	Meter Reading	Detector	AF-8933 [dB]	BOMS Factor [dB]	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
10400	58.75	PK	33.2	-48.32	43.63	54	-10.37	74	-30.37	169	211	Horz
10400	66.64	PK	33.2	-48.32	51.52	54	-2.48	74	-22.48	302	340	Vert
10400	59.23	LnAv	33.2	-48.32	44.11	54	-9.89	74	-29.89	169	211	Vert
10400	59.04	LnAv	33.2	-48.32	43.92	54	-10.08	74	-30.08	302	340	Horz
20800.15	63.25	PK	40.8	-53.95	50.1	54	-3.9	74	-23.9	44	100	Vert
20800.15	62.27	PK	40.8	-53.95	49.12	54	-4.88	74	-24.88	134	346	Horz

High Channel - 5240MHz

Test Frequency	Meter Reading	Detector	AF-8933 [dB]	BOMS Factor [dB]	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
10480	66.8	PK	33.2	-48.92	51.08	54	-2.92	74	-22.92	229	317	Vert
10480	63.7	PK	33.2	-48.92	47.98	54	-6.02	74	-26.02	297	361	Horz
10480	57.45	LnAv	33.2	-48.92	41.73	54	-12.27	74	-32.27	297	361	Horz
10480	57.72	LnAv	33.2	-48.92	42	54	-12	74	-32	229	317	Vert
20960.09	64.42	PK	40.8	-53.8	51.42	54	-2.58	74	-22.58	54	100	Vert
20960.09	62.68	PK	40.8	-53.8	49.68	54	-4.32	74	-24.32	203	100	Horz

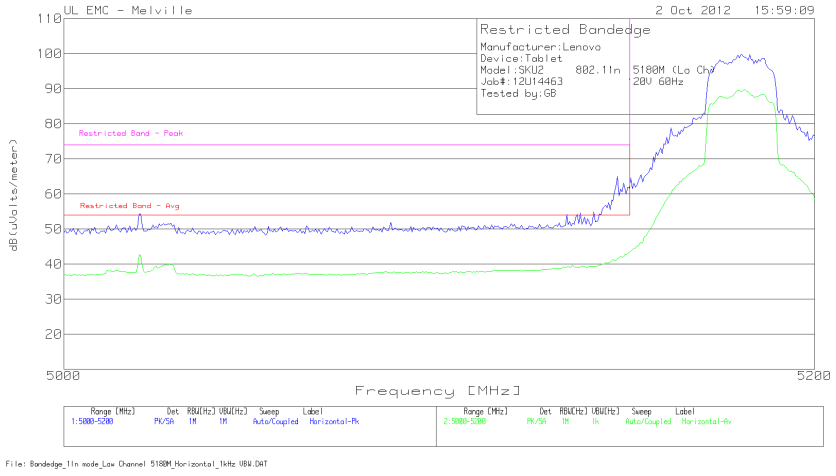
PK - Peak detector (Maximized)
LnAv - Linear Average

Note: No other emissions detected above the system noise floor

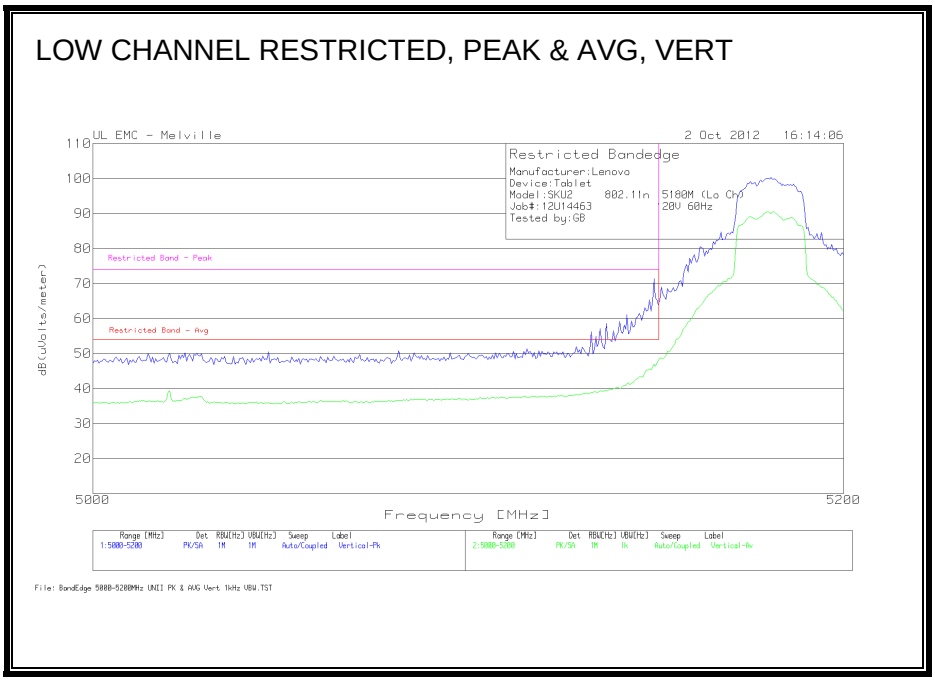
7.2.2. TX ABOVE 1 GHz FOR 802.11n HT20 MODE IN THE LOWER 5.2 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

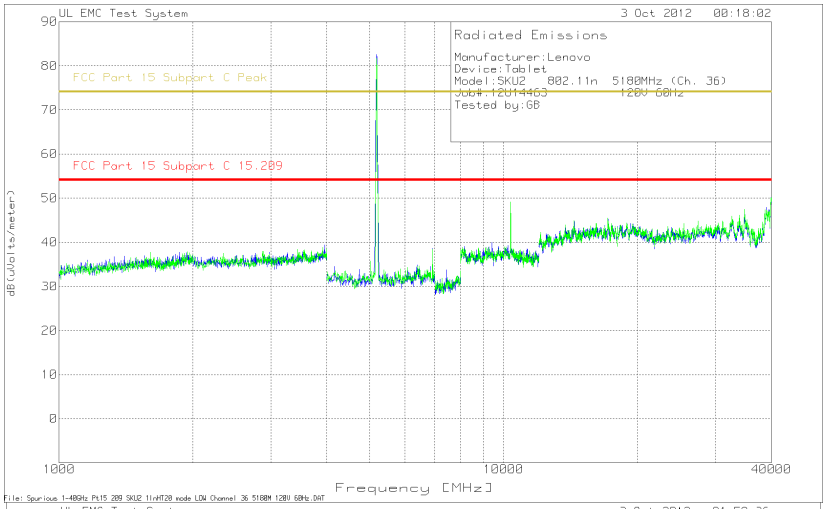
LOW CHANNEL RESTRICTED, PEAK & AVG, HORIZ

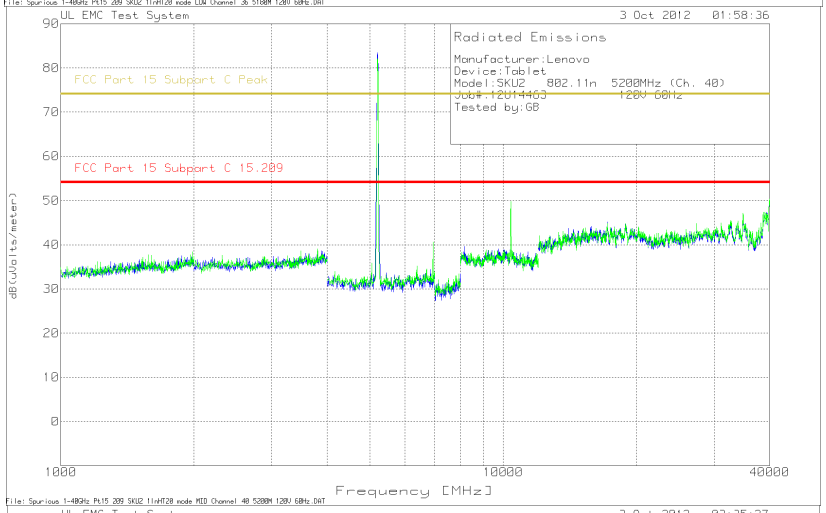


RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



HARMONICS AND SPURIOUS EMISSIONS - PLOTS





HARMONICS AND SPURIOUS EMISSIONS - DATA

Manufacturer:Lenovo
Device:Tablet
Model:SKU2 802.11n Mode
Job#:12U14463 120V 60Hz
Tested by:GB

Low Channel - 5180MHz

Test Frequency	Meter Reading	Detector	AF-8933 [dB]	BOMS Factor [dB]	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
10360	71.78	PK	33.3	-49.18	55.9	54	1.9	74	-18.1	280	346	Horz
10360	73.12	PK	33.3	-49.18	57.24	54	3.24	74	-16.76	212	331	Vert
10360	58.08	LnAv	33.3	-49.18	42.2	54	-11.8	74	-31.8	306	325	Horz
10360	58.16	LnAv	33.3	-49.18	42.28	54	-11.72	74	-31.72	235	211	Vert
20720.09	65.37	PK	40.8	-54.38	51.79	54	-2.21	74	-22.21	49	210	Vert
20720.09	62.92	PK	40.8	-54.38	49.34	54	-4.66	74	-24.66	264	150	Horz

Mid Channel - 5200MHz

Test Frequency	Meter Reading	Detector	AF-8933 [dB]	BOMS Factor [dB]	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
10400	73.63	PK	33.2	-48.32	58.51	54	4.51	74	-15.49	182	141	Vert
10400	58.15	LnAv	33.2	-48.32	43.03	54	-10.97	74	-30.97	182	141	Vert
10400	69.47	PK	33.2	-48.32	54.35	54	0.35	74	-19.65	76	337	Horz
10400	54.45	LnAv	33.2	-48.32	39.33	54	-14.67	74	-34.67	76	337	Horz
15601.503	58.83	PK	37.3	-49.22	46.91	54	-7.09	74	-27.09	36	164	Vert
15601.503	57.91	PK	37.3	-49.22	45.99	54	-8.01	74	-28.01	33	214	Horz
20799.94	64.38	PK	40.8	-53.95	51.23	54	-2.77	74	-22.77	57	215	Vert
20799.94	63.58	PK	40.8	-53.95	50.43	54	-3.57	74	-23.57	118	324	Horz

High Channel - 5240MHz

Test Frequency	Meter Reading	Detector	AF-8933 [dB]	BOMS Factor [dB]	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
10480	71.03	PK	33.2	-48.92	55.31	54	1.31	74	-18.69	304	264	Horz
10480	56.01	LnAv	33.2	-48.92	40.29	54	-13.71	74	-33.71	304	264	Horz
10480	70.21	PK	33.2	-48.92	54.49	54	0.49	74	-19.51	305	248	Horz
10480	55.75	LnAv	33.2	-48.92	40.03	54	-13.97	74	-33.97	305	248	Horz
15720.651	59.87	PK	37.4	-49.25	48.02	54	-5.98	74	-25.98	44	233	Vert
15720.651	58.51	PK	37.4	-49.25	46.66	54	-7.34	74	-27.34	93	322	Horz
20960.06	64.01	PK	40.8	-53.8	51.01	54	-2.99	74	-22.99	48	151	Vert
20960.06	63.06	PK	40.8	-53.8	50.06	54	-3.94	74	-23.94	310	341	Horz

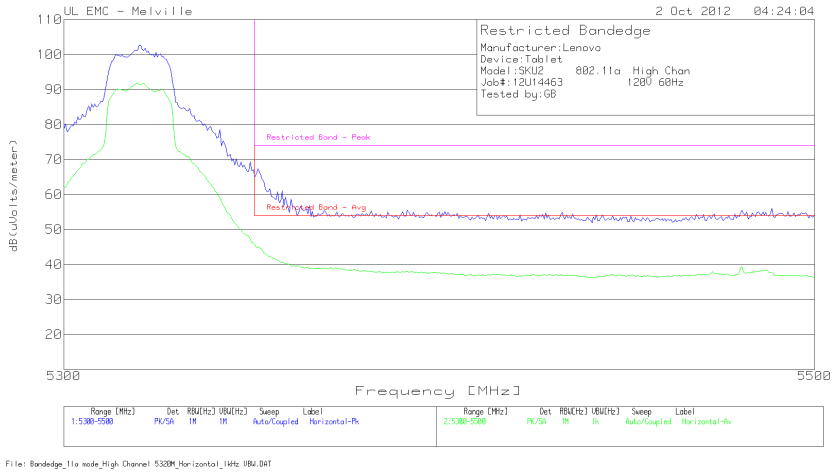
PK - Peak detector (Maximized)
LnAv - Linear Average

Note: No other emissions detected above the system noise floor

7.2.3. TX ABOVE 1 GHz FOR 802.11a MODE IN THE UPPER 5.2 GHz BAND

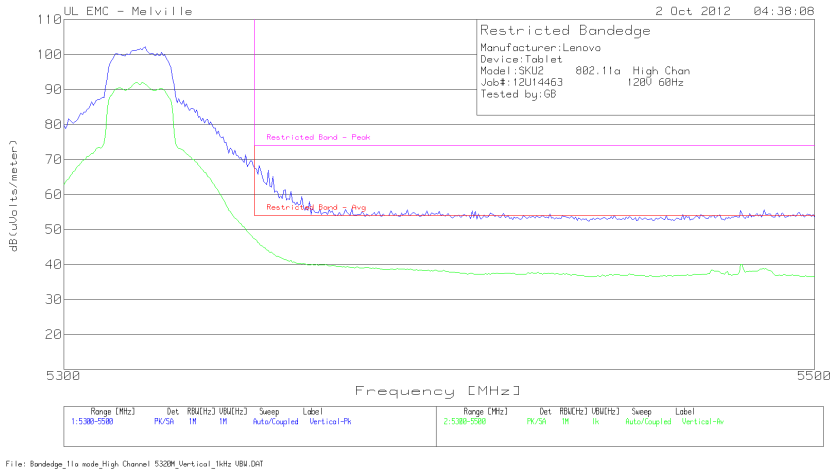
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

HIGH CHANNEL RESTRICTED, PEAK & AVG, HORIZ

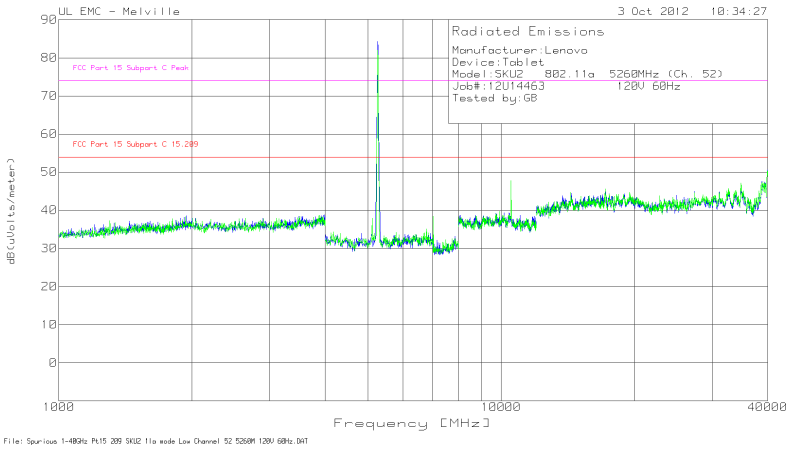


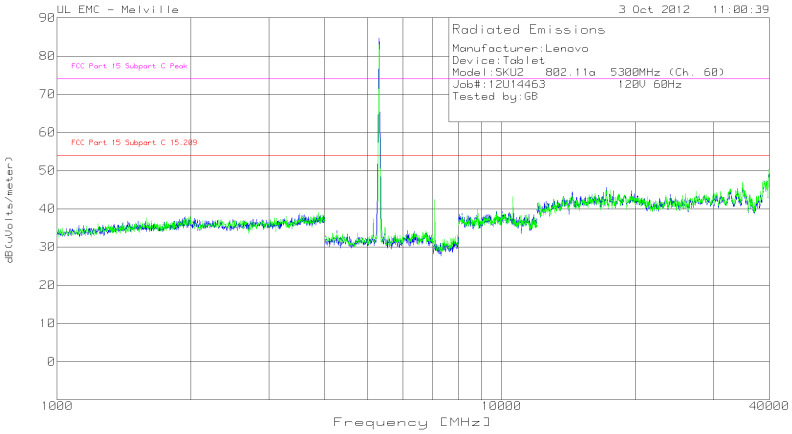
RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

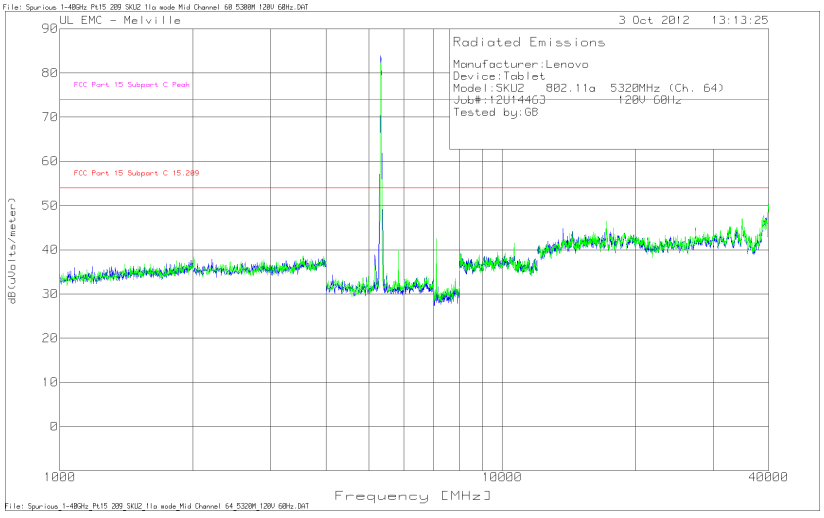
HIGH CHANNEL RESTRICTED, PEAK & AVG, VERT



HARMONICS AND SPURIOUS EMISSIONS - PLOTS







HARMONICS AND SPURIOUS EMISSIONS - DATA

Manufacturer:Lenovo
Device:Tablet
Model:SKU2 802.11a Mode
Job#:12U14463 120V 60Hz
Tested by:GB

Low Channel - 5260MHz

Test Frequency	Meter Reading	Detector	AF-8933 [dB]	BOMS Factor [dB]	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
10520	67.47	PK	33.2	-49.25	51.42	54	-2.58	74	-22.58	279	377	Horz
10520	71.21	PK	33.2	-49.25	55.16	54	1.16	74	-18.84	224	224	Vert
10520	57.24	LnAv	33.2	-49.25	41.19	54	-12.81	74	-32.81	224	224	Vert

Mid Channel - 5300MHz

Test Frequency	Meter Reading	Detector	AF-8933 [dB]	BOMS Factor [dB]	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
10600	70.67	PK	33.2	-49.91	53.96	54	-0.04	74	-20.04	191	183	Vert
10600	56.82	LnAv	33.2	-49.91	40.11	54	-13.89	74	-33.89	187	182	Vert
10600	65.59	PK	33.2	-49.91	48.88	54	-5.12	74	-25.12	331	359	Horz
10600	50.65	LnAv	33.2	-49.91	33.94	54	-20.06	74	-40.06	331	359	Horz

High Channel - 5320MHz

Test Frequency	Meter Reading	Detector	AF-8933 [dB]	BOMS Factor [dB]	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
10639.649	66.81	PK	33.2	-49.51	50.5	54	-3.5	74	-23.5	264	323	Horz
10639.649	69.3	PK	33.2	-49.51	52.99	54	-1.01	74	-21.01	44	368	Vert
15960	62.61	PK	37.3	-49.4	50.51	54	-3.49	74	-23.49	57	250	Vert
15960	59.31	PK	37.3	-49.4	47.21	54	-6.79	74	-26.79	317	256	Horz

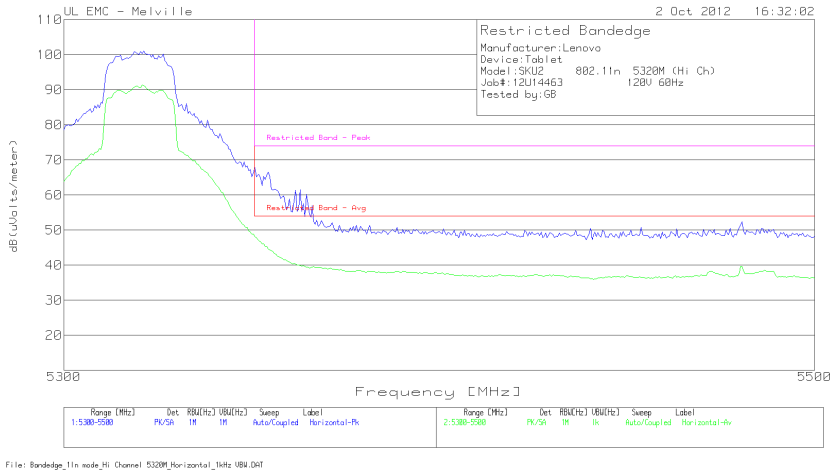
PK - Peak detector
LnAv - Linear Average

Note: No other emissions detected above the system noise floor.

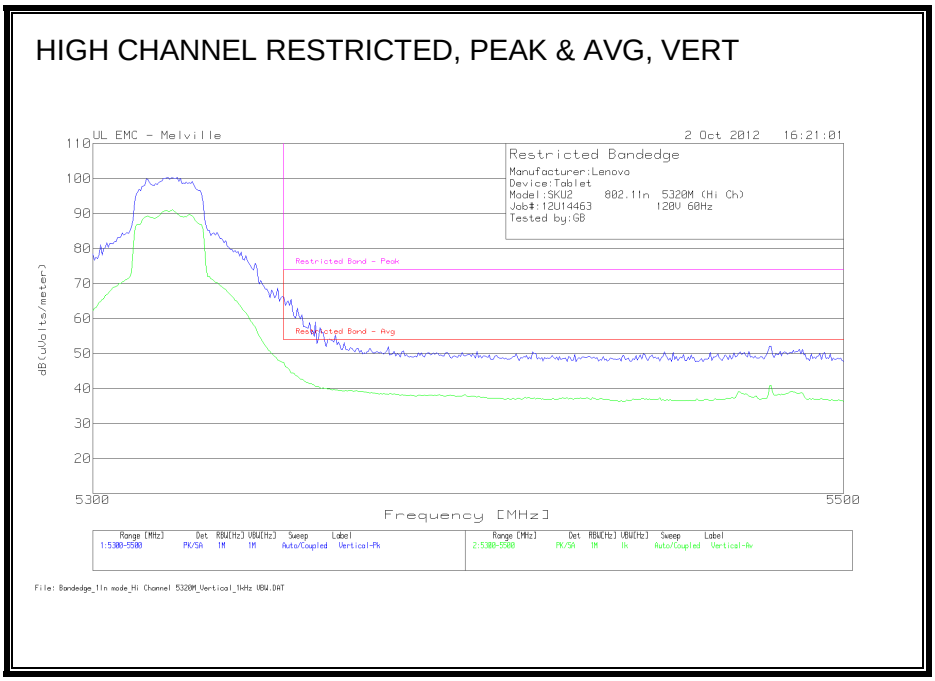
7.2.4. TX ABOVE 1 GHz FOR 802.11n HT20 MODE IN THE UPPER 5.2 GHz BAND

RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

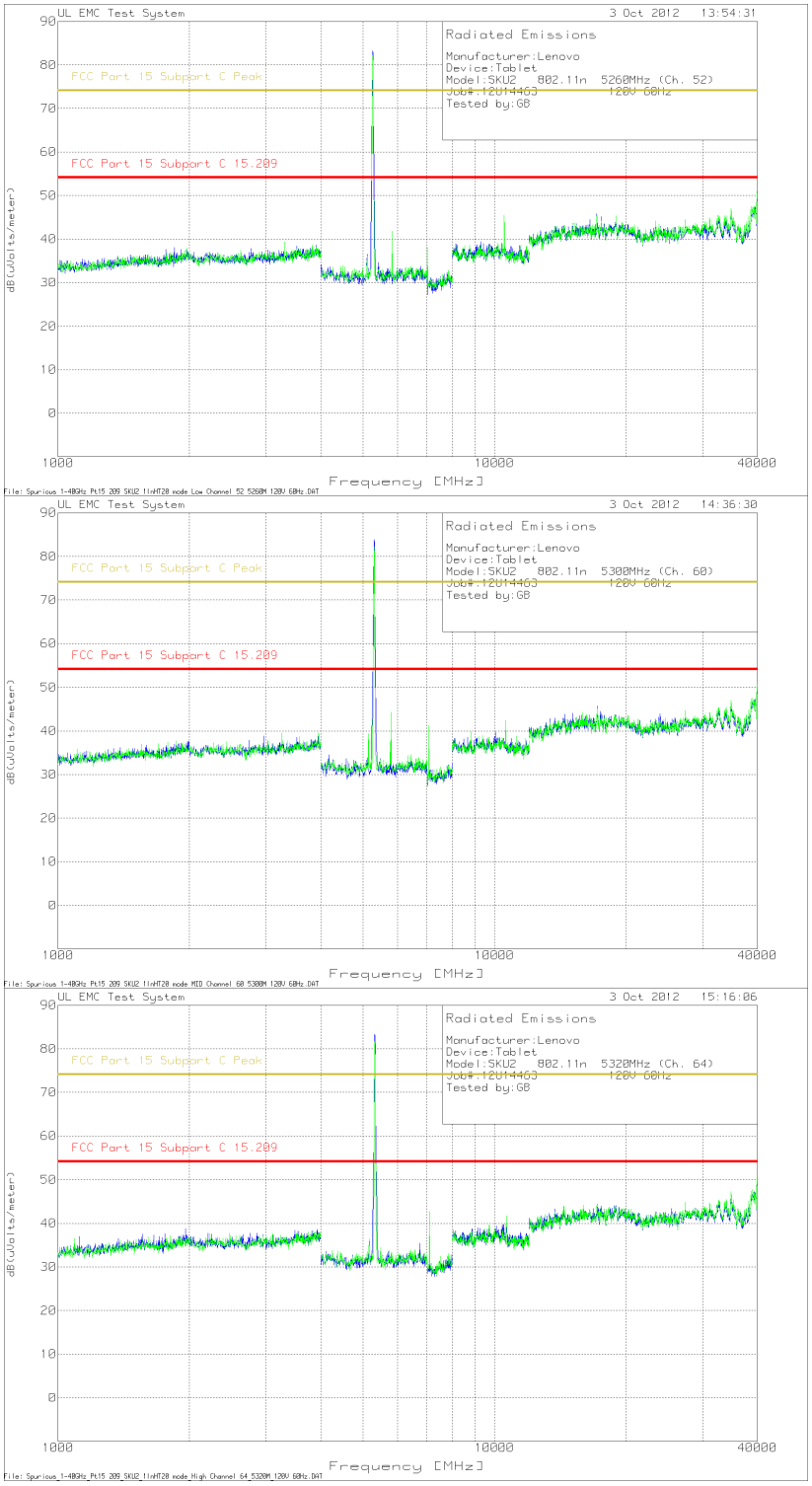
HIGH CHANNEL RESTRICTED, PEAK & AVG, HORIZ



RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



HARMONICS AND SPURIOUS EMISSIONS - PLOTS



HARMONICS AND SPURIOUS EMISSIONS - DATA

Manufacturer:Lenovo
Device:Tablet
Model:SKU2 802.11n Mode
Job#:12U14463 120V 60Hz
Tested by:GB

Low Channel - 5260MHz

Test Frequency	Meter Reading	Detector	AF-8933 [dB]	BOMS Factor [dB]	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
10520	70.07	PK	33.2	-49.25	54.02	54	0.02	74	-19.98	202	285	Vert
10520	54.69	LnAv	33.2	-49.25	38.64	54	-15.36	74	-35.36	202	285	Vert
10520	63.93	PK	33.2	-49.25	47.88	54	-6.12	74	-26.12	354	269	Horz

Mid Channel - 5300MHz

Test Frequency	Meter Reading	Detector	AF-8933 [dB]	BOMS Factor [dB]	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
10600	63.65	PK	33.2	-49.91	46.94	54	-7.06	74	-27.06	207	102	Horz
10600	68.95	PK	33.2	-49.91	52.24	54	-1.76	74	-21.76	238	220	Vert
15905.671	55.91	PK	37.3	-49.18	44.03	54	-9.97	74	-29.97	215	372	Vert
15896.653	55.36	PK	37.3	-49.24	43.42	54	-10.58	74	-30.58	360	366	Horz

High Channel - 5320MHz

Test Frequency	Meter Reading	Detector	AF-8933 [dB]	BOMS Factor [dB]	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
10641.303	65.61	PK	33.2	-49.53	49.28	54	-4.72	74	-24.72	306	392	Horz
10641.303	64.01	PK	33.2	-49.53	47.68	54	-6.32	74	-26.32	48	178	Vert
15961.829	57.06	PK	37.3	-49.35	45.01	54	-8.99	74	-28.99	92	251	Vert
15960.446	55.92	PK	37.3	-49.39	43.83	54	-10.17	74	-30.17	357	322	Horz

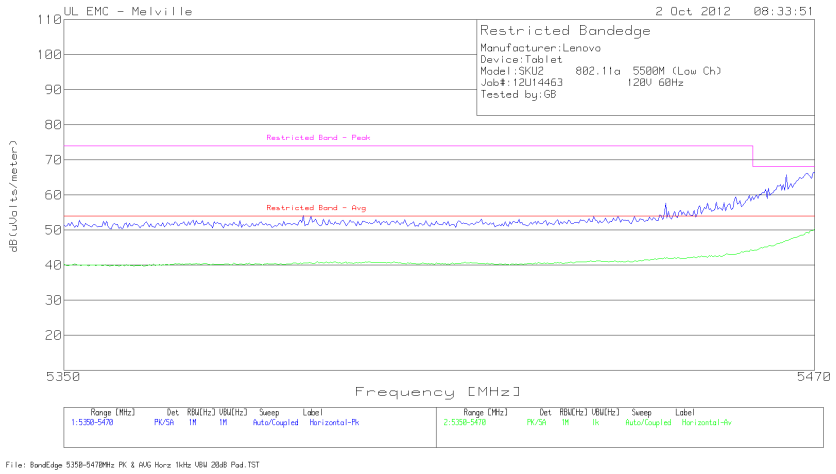
PK - Peak detector (Maximized)
LnAv - Linear Average

Note: No other emissions detected above the system noise floor

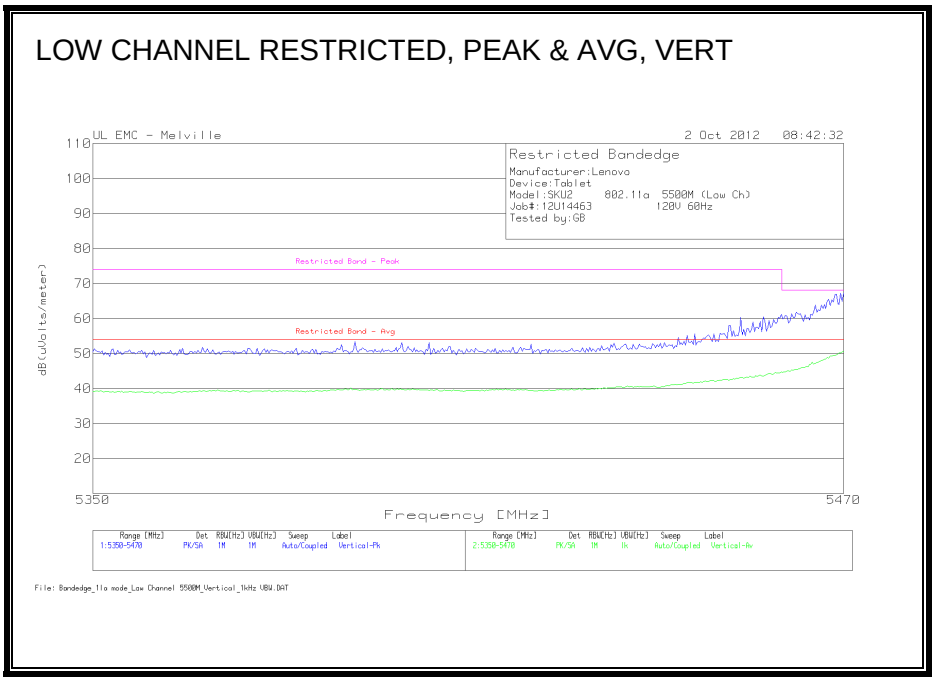
7.2.5. TX ABOVE 1 GHz FOR 802.11a MODE IN THE 5.6 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

LOW CHANNEL RESTRICTED, PEAK & AVG, HORIZ

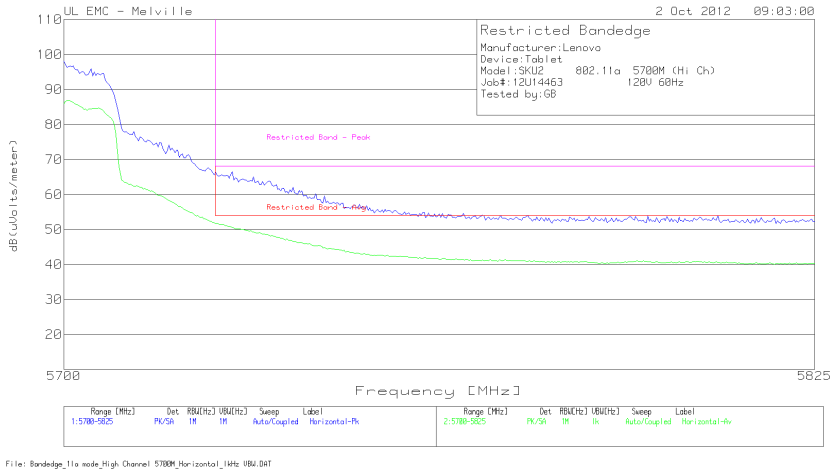


RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

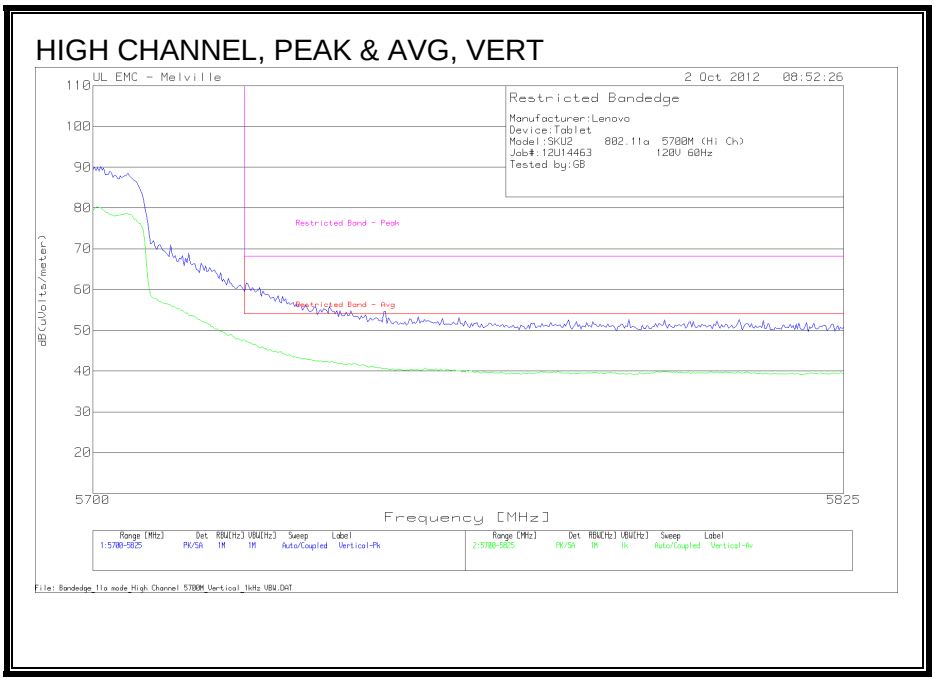


AUTHORIZED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

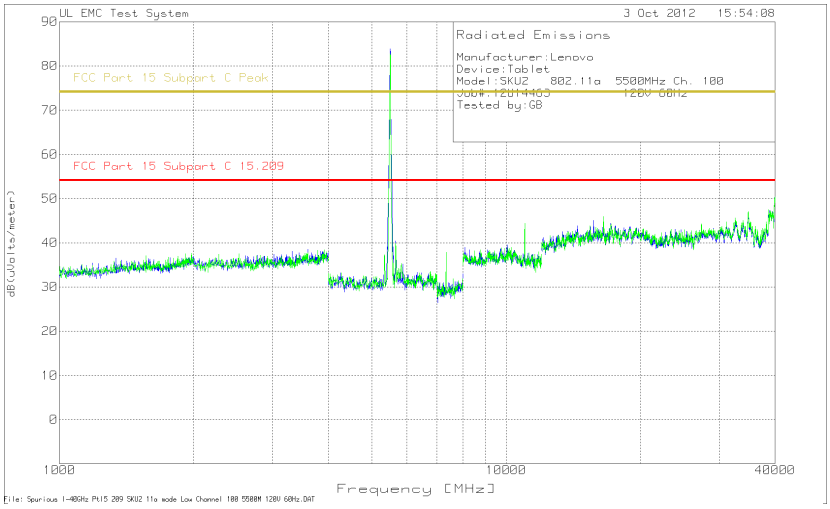
HIGH CHANNEL, PEAK & AVG, HORIZ

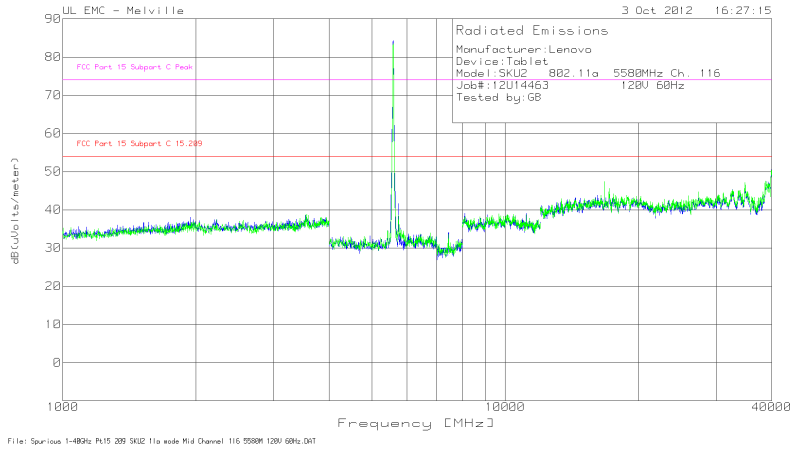


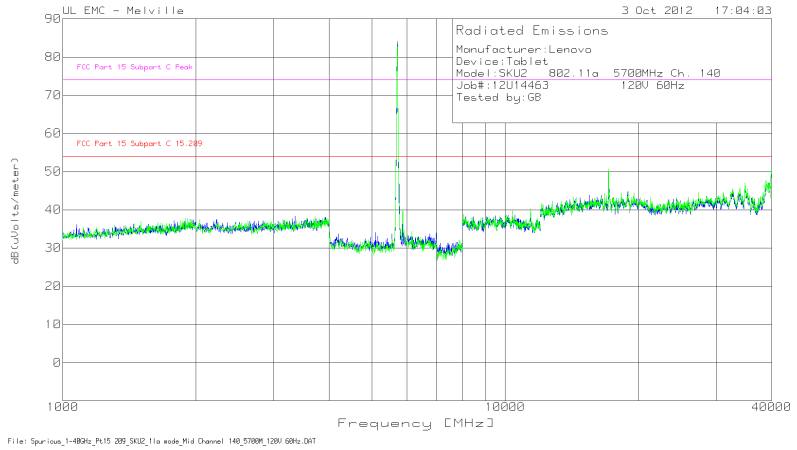
AUTHORIZED BANDEDGE (HIGH CHANNEL, VERTICAL)



HARMONICS AND SPURIOUS EMISSIONS - PLOTS







HARMONICS AND SPURIOUS EMISSIONS - DATA

Manufacturer:Lenovo
Device:Tablet
Model:SKU2 802.11a Mode
Job#:12U14463 120V 60Hz
Tested by:GB

Low Channel - 5500MHz

Test Frequency	Meter Reading	Detector	AF-8933 [dB]	BOMS Factor [dB]	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
11000	62.83	PK	33.4	-48.91	47.32	54	-6.68	74	-26.68	201	147	Horz
11000	66.62	PK	33.4	-48.91	51.11	54	-2.89	74	-22.89	2	254	Vert

Mid Channel - 5580MHz

Test Frequency	Meter Reading	Detector	AF-8933 [dB]	BOMS Factor [dB]	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
11162.204	62.95	PK	33.2	-49.34	46.81	54	-7.19	74	-27.19	195	181	Horz
11155.271	63.41	PK	33.2	-49.66	46.95	54	-7.05	74	-27.05	347	150	Vert
16743.808	62.78	PK	37.4	-49.09	51.09	54	-2.91	74	-22.91	34	243	Vert
16740.481	62.98	PK	37.4	-48.93	51.45	54	-2.55	74	-22.55	284	396	Horz

High Channel - 5700MHz

Test Frequency	Meter Reading	Detector	AF-8933 [dB]	BOMS Factor [dB]	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
11407.665	60.07	PK	33.3	-49.81	43.56	54	-10.44	74	-30.44	192	103	Horz
11395.691	60.53	PK	33.3	-49.63	44.2	54	-9.8	74	-29.8	185	236	Vert
17100.752	71.04	PK	37.4	-49.63	58.81	54	4.81	74	-15.19	44	260	Vert
17100.752	57.84	LnAv	37.4	-49.63	45.61	54	-8.39	74	-28.39	44	260	Vert
17101.503	67.67	PK	37.4	-49.54	55.53	54	1.53	74	-18.47	291	257	Horz
17101.503	54.27	LnAv	37.4	-49.54	42.13	54	-11.87	74	-31.87	291	257	Horz

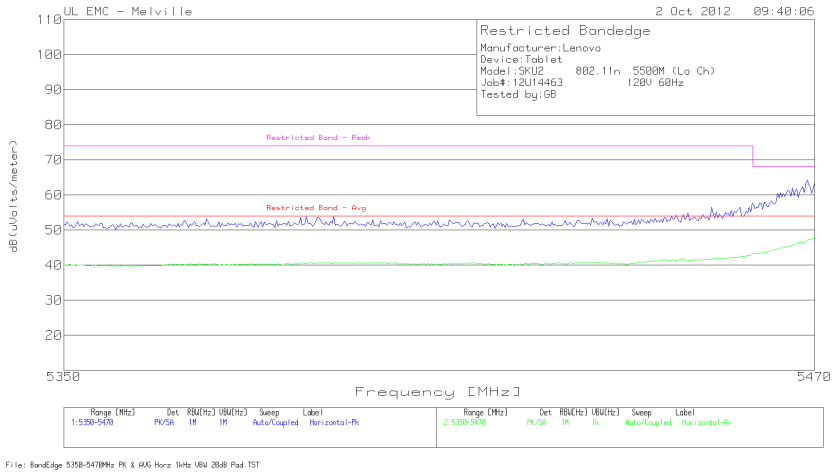
PK - Peak detector
LnAv - Linear Average

Note: No other emissions detected above the system noise floor.

7.2.6. TX ABOVE 1 GHz FOR 802.11n HT20 MODE IN THE 5.6 GHz BAND

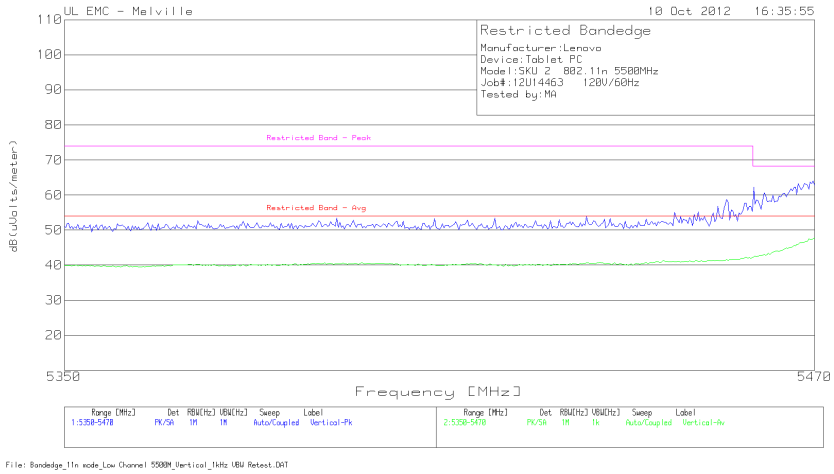
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

LOW CHANNEL RESTRICTED, PEAK & AVG, HORIZ

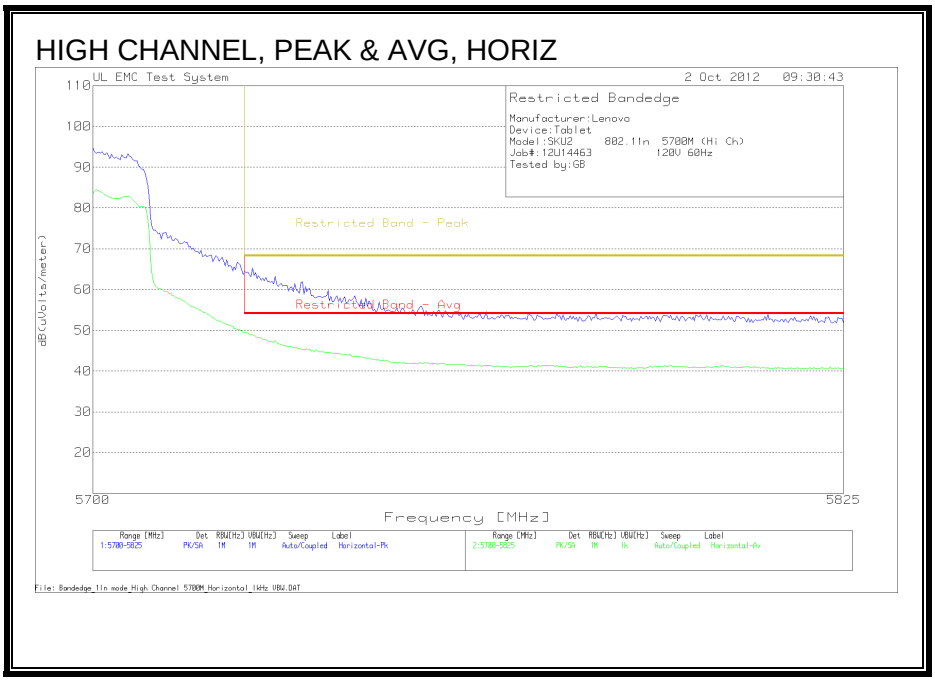


RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

LOW CHANNEL RESTRICTED, PEAK & AVG, VERT

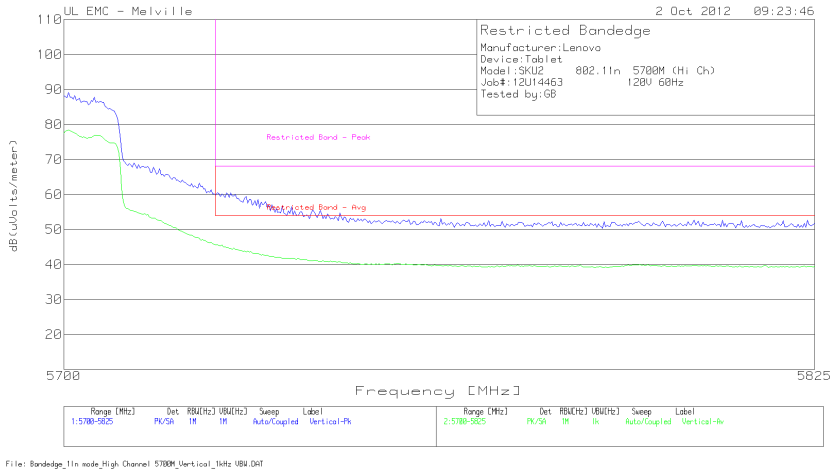


AUTHORIZED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

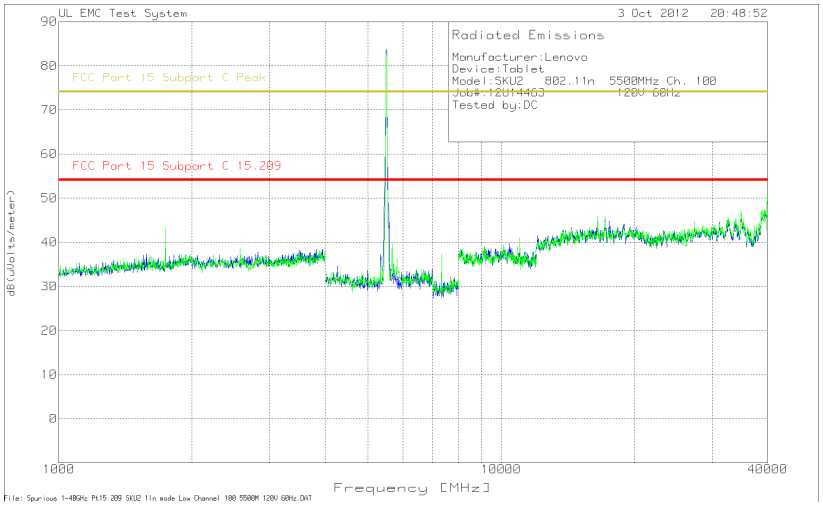


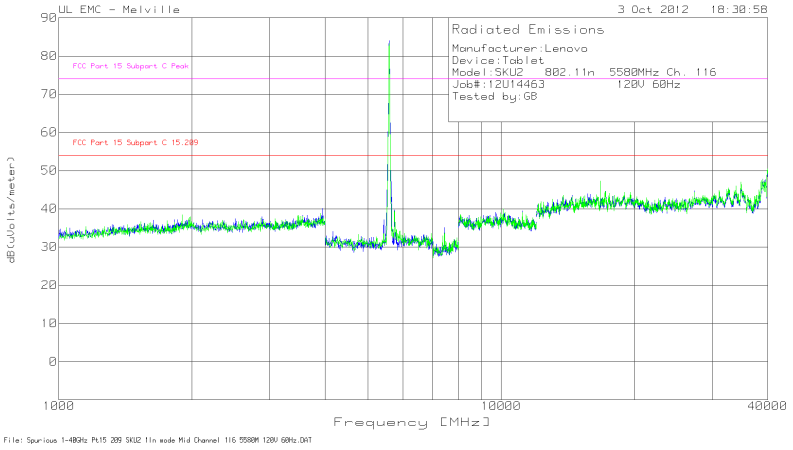
AUTHORIZED BANDEDGE (HIGH CHANNEL, VERTICAL)

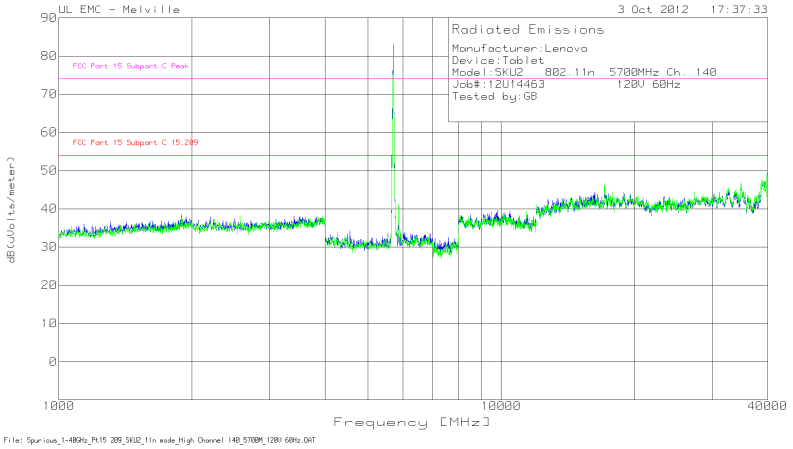
HIGH CHANNEL, PEAK & AVG, VERT



HARMONICS AND SPURIOUS EMISSIONS - PLOTS







HARMONICS AND SPURIOUS EMISSIONS - DATA

Manufacturer:Lenovo
Device:Tablet
Model:SKU2 802.11n Mode
Job#:12U14463 120V 60Hz
Tested by:GB

Low Channel - 5500MHz

Test Frequency	Meter Reading	Detector	AF-8933 [dB]	BOMS Factor [dB]	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
11000.19	62.32	PK	33.4	-49.79	45.93	54	-8.07	74	-28.07	192	300	Vert
11000.19	64.49	PK	33.4	-49.79	48.1	54	-5.9	74	-25.9	31	302	Horz
27499.584	53.88	PK	43.9	-44.07	53.71	54	-0.29	74	-20.29	174	386	Vert
27499.584	54.7	PK	43.9	-44.07	54.53	54	0.53	74	-19.47	146	185	Horz
27499.584	42.44	LnAv	43.9	-44.07	42.27	54	-11.73	74	-31.73	146	185	Horz

Mid Channel - 5580MHz

Test Frequency	Meter Reading	Detector	AF-8933 [dB]	BOMS Factor [dB]	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
11160.942	63.72	PK	33.2	-49.37	47.55	54	-6.45	74	-26.45	344	360	Vert
11160.221	58.7	PK	33.2	-49.39	42.51	54	-11.49	74	-31.49	344	360	Horz
16739.9	66.29	PK	37.4	-48.91	54.78	54	0.78	74	-19.22	226	114	Vert
16739.9	53.93	LnAv	37.4	-48.91	42.42	54	-11.58	74	-31.58	226	114	Vert
16739.9	63.39	PK	37.4	-48.91	51.88	54	-2.12	74	-22.12	285	352	Horz

High Channel - 5700MHz

Test Frequency	Meter Reading	Detector	AF-8933 [dB]	BOMS Factor [dB]	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
11397.044	57.92	PK	33.3	-49.63	41.59	54	-12.41	74	-32.41	185	155	Horz
11408.216	61.1	PK	33.3	-49.76	44.64	54	-9.36	74	-29.36	333	254	Vert
17106.463	67.57	PK	37.4	-48.91	56.06	54	2.06	74	-17.94	59	270	Vert
17106.463	54.1	LnAv	37.4	-48.91	42.59	54	-11.41	74	-31.41	59	270	Vert
17102.605	66.63	PK	37.4	-49.4	54.63	54	0.63	74	-19.37	291	267	Horz
17102.605	53.62	LnAv	37.4	-49.4	41.62	54	-12.38	74	-32.38	291	267	Horz

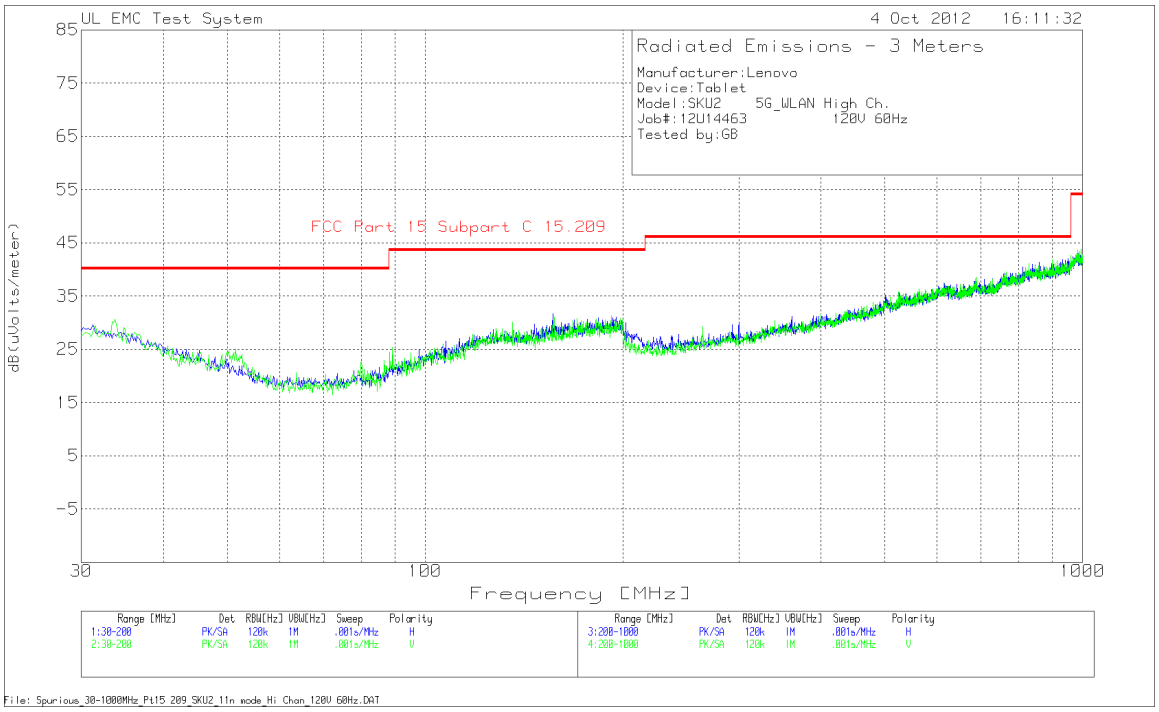
PK - Peak detector (Maximized)
LnAv - Linear Average

Note: No other emissions detected above the system noise floor

7.3. WORST-CASE BELOW 1 GHz

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION)

HORIZONTAL & VERTICAL PLOT



HORIZONTAL & VERTICAL DATA

Manufacturer:Lenovo											
Device:Tablet											
Model:SKU2 5G_WLAN High Ch.											
Job#:12U14463 120V 60Hz											
Tested by:GB											
Horizontal 30 - 200MHz											
Marker No.	Test Frequency	Meter Reading	Detector	AF-54 (dB)	GL-3M (dB)	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin	Azimuth [Degs]	Height [cm]	Polarity
2	156.4364	15.71	PK	14.7	1.3	31.71	43.5	-11.79	44	200	Horz
Vertical 30 - 200MHz											
Marker No.	Test Frequency	Meter Reading	Detector	AF-54 (dB)	GL-3M (dB)	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin	Azimuth [Degs]	Height [cm]	Polarity
1	89.2192	15.64	PK	8.7	1	25.34	43.5	-18.16	175	100	Vert
3	33.4034	13.19	PK	16.4	0.6	30.19	40	-9.81	12	100	Vert
4	51.4414	15.26	PK	9	0.7	24.96	40	-15.04	281	100	Vert
5	135.8458	14.82	PK	14.1	1.2	30.12	43.5	-13.38	147	100	Vert
Horizontal 200 - 1000MHz											
Marker No.	Test Frequency	Meter Reading	Detector	AF-44067 (dB)	GL-3M (dB)	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin	Azimuth [Degs]	Height [cm]	Polarity
6	616.6083	14.41	PK	20.2	2.8	37.41	46	-8.59	183	300	Horz
PK - Peak detector											

8. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.4.

The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

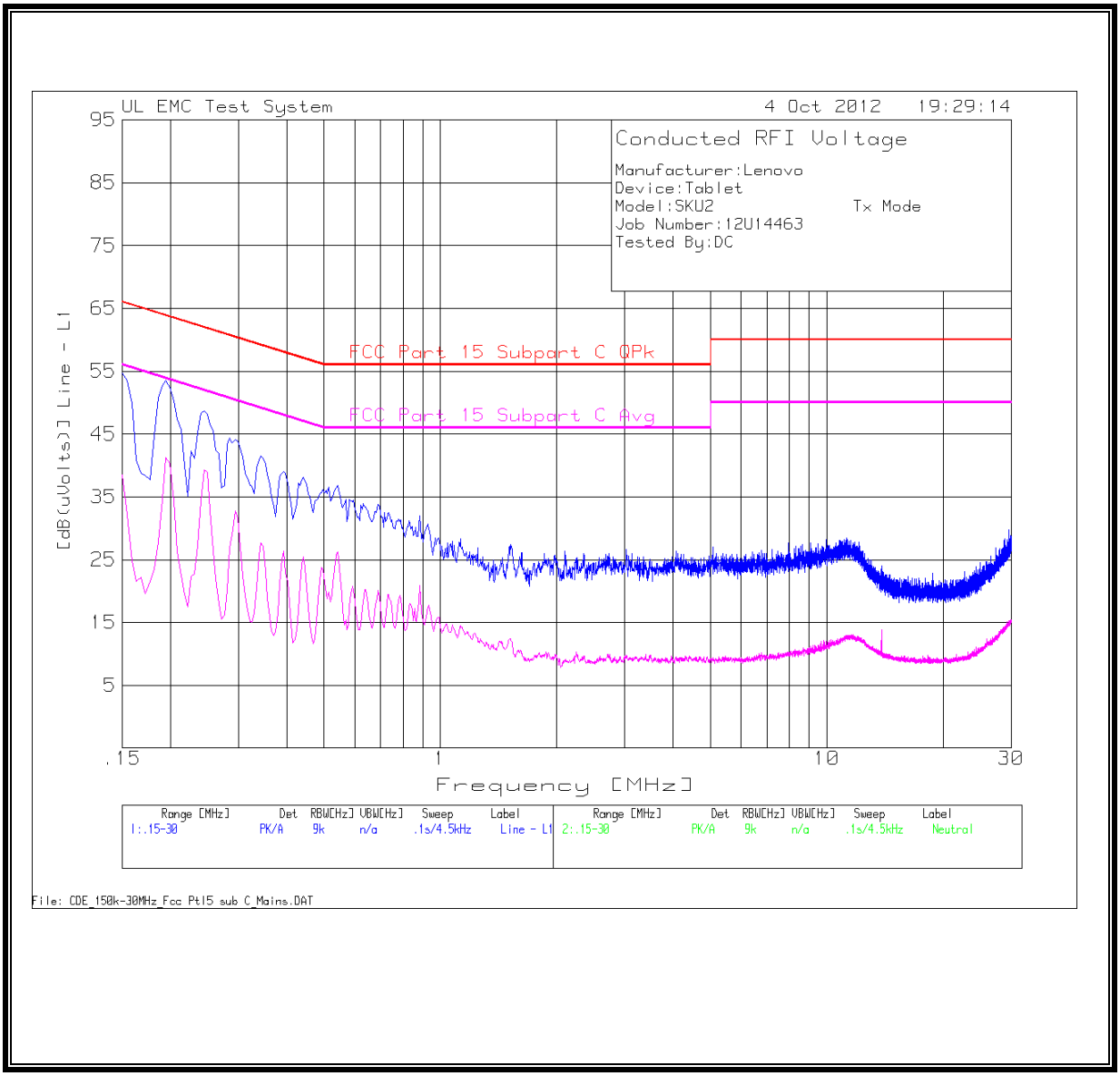
Line conducted data is recorded for both NEUTRAL and HOT lines.

RESULTS

6 WORST EMISSIONS

Manufacturer:Lenovo								
Device:Tablet								
Model:SKU2	Tx Mode							
Job Number:12U14463								
Tested By:DC								
Line - L1 .15 - 30MHz								
Test Frequency	Meter Reading	Detector	LISN 5A636 L1 [dB]	[dB(uVolts)]	FCC Part 15 Subpart C QPk	Margin	FCC Part 15 Subpart C Avg	Margin
0.1545	43.42	PK	10.1	53.52	65.8	-12.28	55.8	-2.28
0.1545	22.07	Av	10.1	32.17	65.8	-33.63	55.8	-23.63
0.195	43.38	PK	10.1	53.48	63.8	-10.32	53.8	-0.32
0.195	31.13	Av	10.1	41.23	63.8	-22.57	53.8	-12.57
0.249	38.09	PK	10.1	48.19	61.8	-13.61	51.8	-3.61
0.249	28.73	Av	10.1	38.83	61.8	-22.97	51.8	-12.97
0.294	34.06	PK	10.1	44.16	60.4	-16.24	50.4	-6.24
0.294	22.69	Av	10.1	32.79	60.4	-27.61	50.4	-17.61
0.3435	31.48	PK	10	41.48	59.1	-17.62	49.1	-7.62
0.3435	17.73	Av	10	27.73	59.1	-31.37	49.1	-21.37
0.4425	28.01	PK	10.1	38.11	57	-18.89	47	-8.89
0.4425	15.4	Av	10.1	25.5	57	-31.5	47	-21.5
Neutral .15 - 30MHz								
Test Frequency	Meter Reading	Detector	LISN 5A636 L2 [dB]	[dB(uVolts)]	FCC Part 15 Subpart C QPk	Margin	FCC Part 15 Subpart C Avg	Margin
0.1725	52.14	PK	10.1	62.24	64.8	-2.56	54.8	7.44
0.1725	30.38	Av	10.1	40.48	64.8	-24.32	54.8	-14.32
0.1815	49.52	PK	10.1	59.62	64.4	-4.78	54.4	5.22
0.1815	23.09	Av	10.1	33.19	64.4	-31.21	54.4	-21.21
0.2355	45.9	PK	10.1	56	62.3	-6.3	52.3	3.7
0.2355	22.55	Av	10.1	32.65	62.3	-29.65	52.3	-19.65
0.267	42.49	PK	10.1	52.59	61.2	-8.61	51.2	1.39
0.267	21.69	Av	10.1	31.79	61.2	-29.41	51.2	-19.41
0.3345	38.59	PK	10.1	48.69	59.3	-10.61	49.3	-0.61
0.3345	18.83	Av	10.1	28.93	59.3	-30.37	49.3	-20.37
0.501	33.53	PK	10.1	43.63	56	-12.37	46	-2.37
0.501	17	Av	10.1	27.1	56	-28.9	46	-18.9
Neutral .15 - 30MHz								
Test Frequency	Meter Reading	Detector	LISN 5A636 L2 [dB]	[dB(uVolts)]	FCC Part 15 Subpart C QPk	Margin	FCC Part 15 Subpart C Avg	Margin
0.168	37.49	QP	10.1	47.59	65.06	-17.47	55.06	-7.47
0.186	24.36	QP	10.1	34.46	64.21	-29.75	54.21	-19.75
0.231	25.21	QP	10.1	35.31	62.41	-27.1	52.41	-17.1
PK - Peak detector								
QP - Quasi-Peak detector								
Av - Average detector								

LINE 1 RESULTS



LINE 2 RESULTS