MOTOROLA

MOBILE DEVICES BUSINESS

PRODUCT SAFETY AND COMPLIANCE EMC LABORATORY

EMC TEST REPORT - Addendum

Test Report Number – 22718-1 BT

Report Date – 2009-02-04

The test results contained herein relate only to the model(s) identified. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical characteristics.

Signature: Lei Yang Name: Lei Yang

Title: EMC Project Manager Test: 2009-01-23 to 2009-02-03

As the responsible test lab manager, I hereby declare that the model tested as specified in this report conforms to the requirements indicated.

Signature: Name: Yilin Zhao

Title: Test Lab Manager Date: 2009-02-04

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FCC Registration Number: 177885
IC Registration Number: 109AW-1

ADR Testing Service location ADR BJ
ISO/IEC-17025:2005 accredited by UKAS

UKAS TESTING
2404

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Test Report Details

Tests Performed By:	Motorola (China) Technologies Ltd. Asia Global Compliance Labs No.1 Wang Jing East Road Chao Yang District Beijing, 100102, P. R. China Phone: +86 10 8473 2610 FCC Registration Number: 177885 IC Registration Number: 109AW-1
Tests Requested By:	Motorola Inc. Mobile Devices business 600 North US Hwy 45 Libertyville, IL 60048
Product Type:	Cell phone with Bluetooth
Form Factor:	Slider
Signaling Capability:	WCDMA 850/2100, GSM 850/900/1800/1900, EDGE Class 12, Bluetooth Class I
IMEI:	356910020008934
Battery Type:	BQ50 with model number SNN5804B
FCC ID:	IHDT56KP2
Project number:	22718-1
Testing Complete Date:	02-03-2009

Applicable Standards

All tests and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47 Part 2, Sub-part J as well as the following parts:

__X__Part 15 Subpart C – Intentional Radiators
_____Part 22 Subpart H - Public Mobile Services
_____Part 24 - Personal Communications Services
_____Part 27 - Wireless Communications Service
_____ Part 90 - Private Land Mobile Radio Service

Applicable Standards: ANSI 63.4-2003, RSS-GEN, RSS-210 (Bluetooth).

The following tests were performed according to the regulations:

- The **spurious radiated emission** requirements of § **15.247(d) of CFR47 Part 15 2006**, specifically" radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

- Under this project only 30 to 1000 MHz, 1 to 26.5 GHz radiated emissions and radiated band-edge measurements were performed.

- For frequencies below 1 GHz a 100 kHz RBW (6 dB) is used and above 1 GHz a 1 MHz RBW (6 dB) is used.

Summary of Testing

Test	Test Name	Pass/Fail
1	Field Strength of Spurious Emissions	Pass
2	Band-edge Compliance of RF Radiated Emissions	Pass (*)

Test	Test Name	Results
1	Field Strength of Spurious Emissions	See plots
2	Band-edge Compliance of RF Radiated Emissions	See plots

The margin with respect to the limit is the minimum margin for all modes and bands. ( ) indicates the margin at which the product exceeds the limit.

(*) The rules found in CFR47, FCC part 15.247(d) handled in appendix were applied for the low band edge performance verification.

General and Special Conditions

The test sample was tested using a fully charged battery when applicable. Where a battery could not be used due to the need for a controlled variation of input voltage, an external power supply was utilized.

All testing was done in an indoor controlled environment with an average temperature of 21.7 º C ± 1 º C and relative humidity of 49.4 % ± 6 % over the dates used for testing.

Equipment and Cable Configurations

The test sample was tested in a stand-alone configuration that is representative of typical use.

Measuring Equipment and Calibration Information

Equipment related to the semi-anechoic chamber testing:

Equipment	Model/type	Serial number	Operational range	Date of calibration
EMI analyzers	ESU 40	100036	20 Hz – 40 GHz	12.11.2008
Pre Amplifiers	PA-02-0001:	2007343	(10 kHz – 3 GHz)	06.26.2008
	PA-02-218	2007344	3 GHz – 18 GHz	06.26.2008
	PA-02-5	2007345	18 GHz – 40 GHz	06.26.2008
Radio com. Tester	CMU 200	112790	GSM 850/900/1800/1900 IS95, UMTS, CDMA, Bluetooth	N/A
Band Reject Filter	WRCD	N/A	GSM 850/900/1800/1900 IS95, UMTS, CDMA	N/A
	4N45-24241/3/6	N/A	WLAN	N/A

The antennas used in the various tests are listed in the below table. The log-periodic antenna is used as communication and link establishment antenna for Bluetooth.

Antenna	Type	Serial number	Operational range	Date of calibration
Hybrid-log periodic	TDK HLP 3003C	130361	30 MHz – 3 GHz	11.07.08
Double ridged Horn	TDK HRN0118	130303	1 GHz – 18 GHz	03.26.08
Double ridged Horn	ETS HRN3116	00071938	18 GHz – 40 GHz	10.17.08
Double ridged Horn (link)	TDK HRN0118	130376	1 GHz – 18 GHz	N/A

All equipment is on a one-year calibration cycle except for link antennas

Description of Bluetooth (BT) Transmitter

The 22718-1 cell phone sample offers Bluetooth as a feature. The Bluetooth spread-spectrum, frequency hopping transceiver is designed to operate between 2400 and 2483.5 MHz. The Bluetooth antenna is mounted on the PCB inside of the EUT. The antenna installation is permanent. For a more thorough description of the functionality please refer to Exhibit 12 of this package.

As a Bluetooth transmitter, it is designed operate with other Bluetooth devices as defined by the industrial standard. In this application, the test sample is battery-operated.

Measurement Procedures and Data

FIELD STRENGTH OF SPURIOUS EMISSIONS

CFR Part 2.1053, 15.205, 15.209, 15.247

Measurement Procedure

The test sample is placed inside the semi-anechoic chamber on a polystyrene table at the turntable center. For each spurious frequency, the antenna mast is raised and lowered from 1 to 4 meters and the turntable is rotated 360 degrees to obtain a maximum reading on the spectrum analyzer. This is repeated for both horizontal and vertical polarizations of the receive antenna.

For 30 MHz – 18 GHz:
Field Strength (dBµV/m) = EMI Receiver Level (dBµV) + Cable Loss (dB) - Amplifier Gain (dB) + Filter loss (dB) + Antenna Correction Factor (3/m)

For 18 GHz – 26.5 GHz:
Field Strength (dBµV/m) = EMI Receiver Level (dBµV) + Cable Loss (dB) - Amplifier Gain (dB) + Filter loss (dB) + Antenna Correction Factor (1/m)

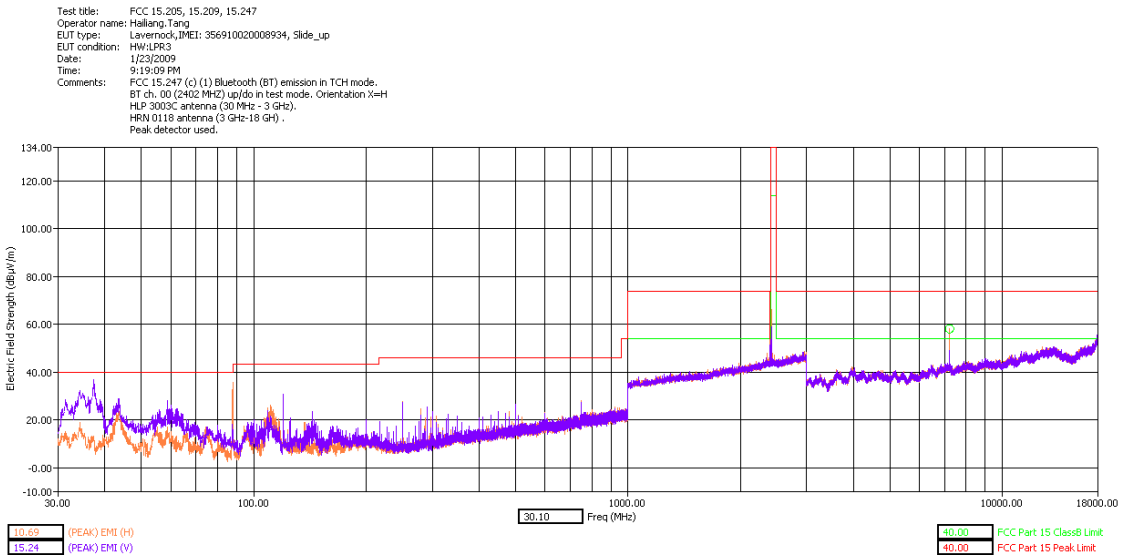
A fully charged battery was used for the supply voltage.

The test sample was operated during the measurements under the following conditions:

- Tests were performed at low, mid and high channels.
- Tests were performed in both horizontal and vertical polarity.

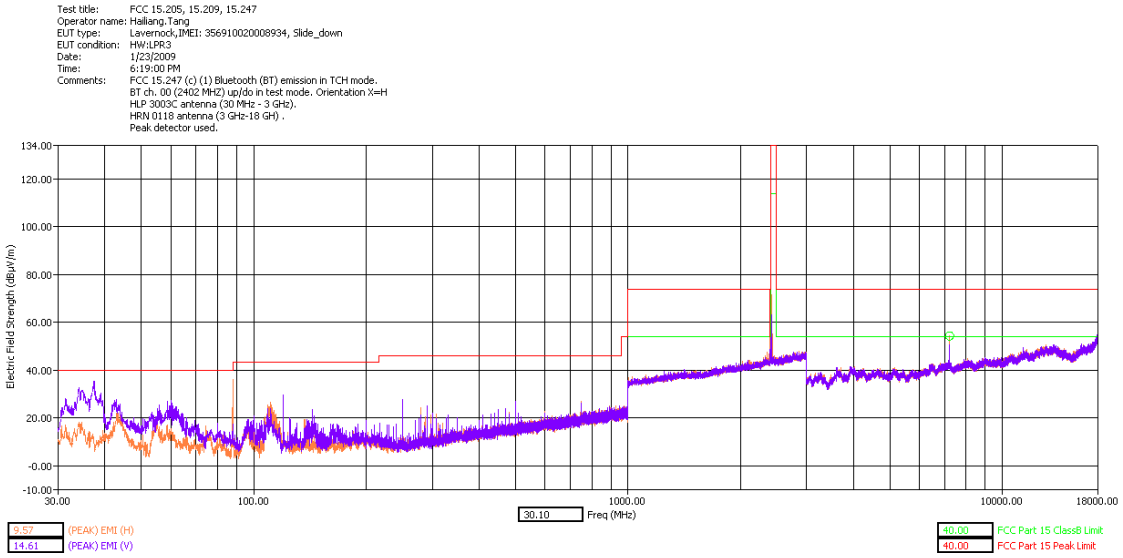
Measurement Results

For peak emissions detected above 1 GHz, only those emissions that are higher than the AVG limit line plus 8 dB are selected for final emission analysis.



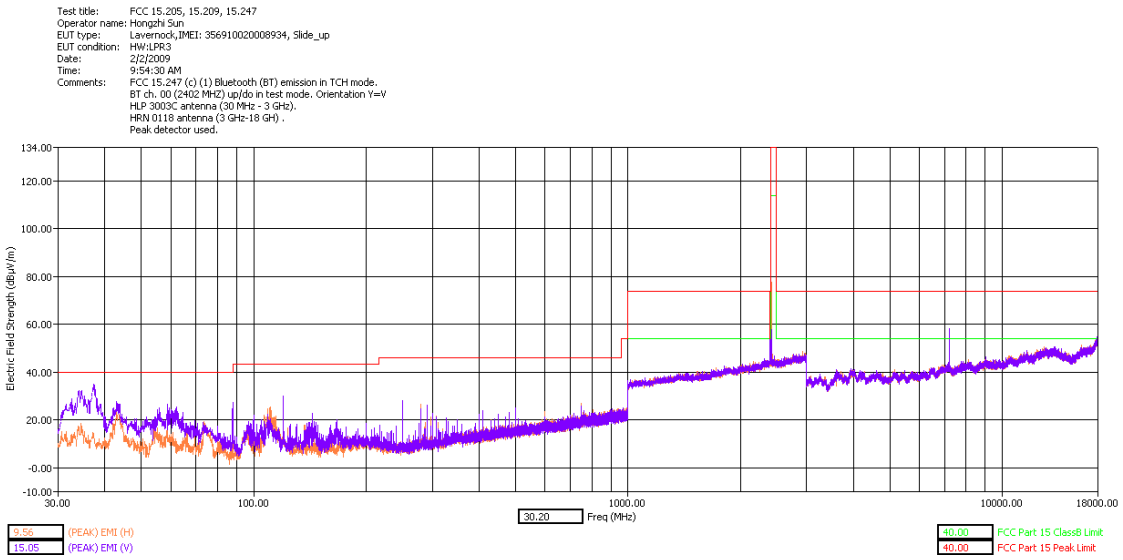
Freq (MHz)	Freq (Max) (MHz)	(AVG) EMI (dBµV/m)	(1) Limit (dBµV/m)	(AVG) Margin Lim1 (dB)	EUT Ttbl Agl (deg)	Pol
7206.50	7205.43	43.59	54.00	-10.41	315.00	H
7206.50	7205.53	48.42	54.00	-5.58	45.00	V

30 MHz – 18 GHz Low Channel Dual Polarization X – slider open



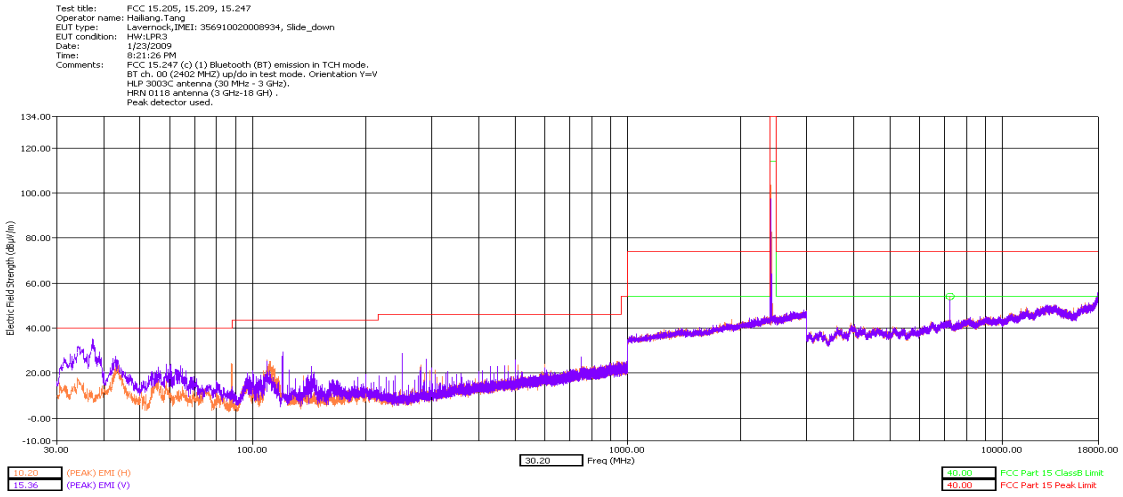
Freq (MHz)	Freq (Max) (MHz)	(AVG) EMI (dBµV/m)	(1) Limit (dBµV/m)	(AVG) Margin Lim1 (dB)	EUT Ttbl Agl (deg)	Pol
7206.00	7205.48	45.09	54.00	-8.91	157.10	H
7206.00	7205.53	39.57	54.00	-14.43	247.00	V

30 MHz – 18 GHz Low Channel Dual Polarization X – slider closed



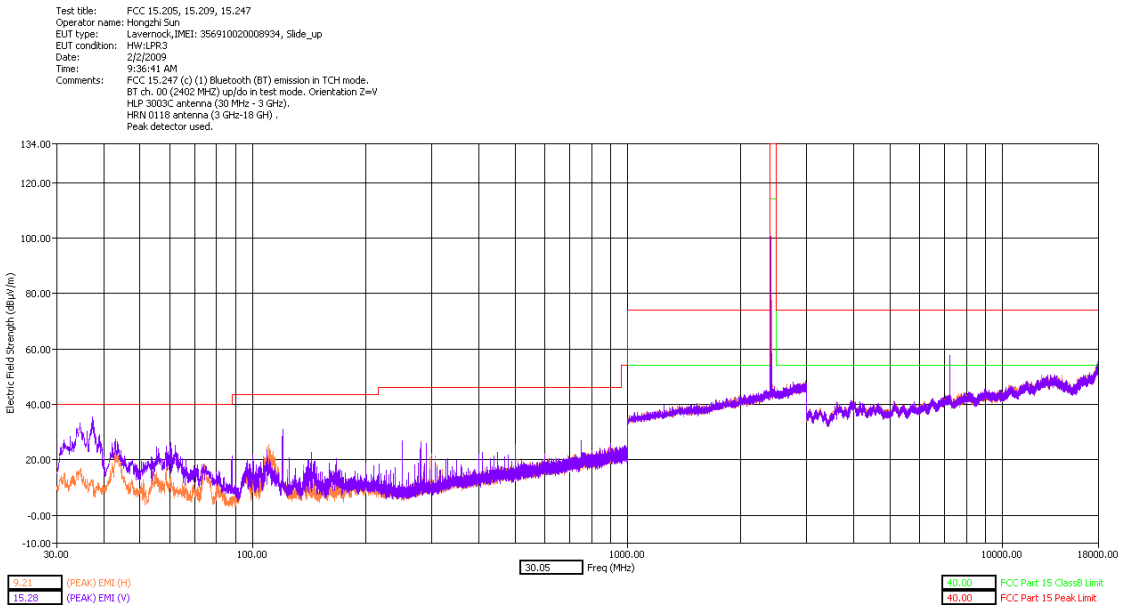
Freq (MHz)	Freq (Max) (MHz)	(AVG) EMI (dBµV/m)	(1) Limit (dBµV/m)	(AVG) Margin Lim1 (dB)	Pol	Ttbl Agl (deg)
7206.00	7205.43	42.94	54.00	-11.06	H	22.10
7206.00	7205.60	45.02	54.00	-8.98	V	180.00

30 MHz – 18 GHz Low Channel Dual Polarization Y – slider open



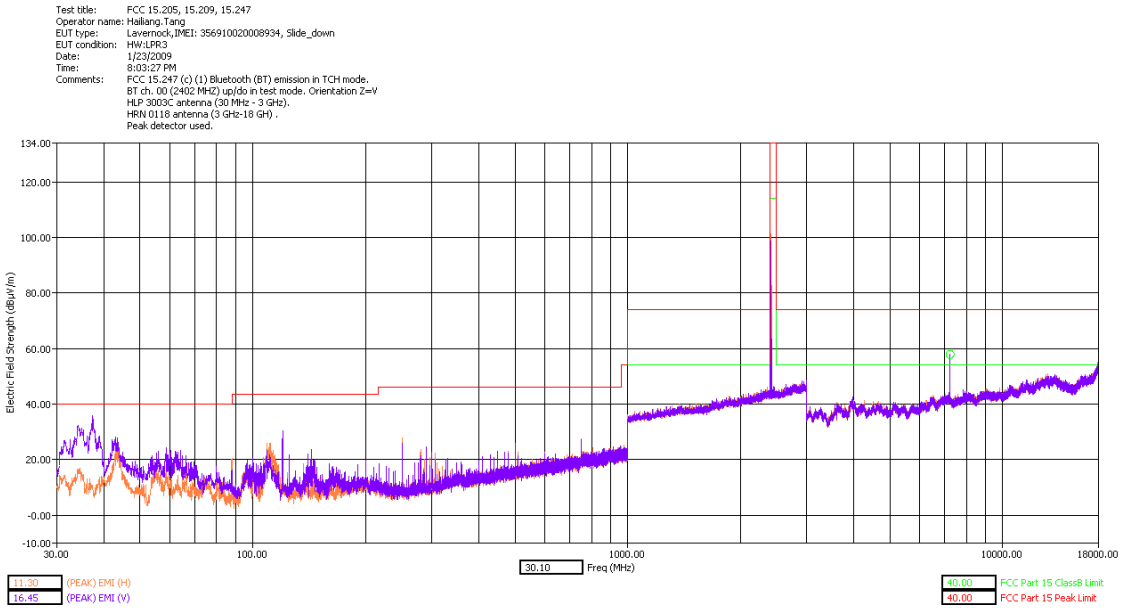
Freq (MHz)	Freq (Max) (MHz)	(AVG) EMI (dBµV/m)	(1) Limit (dBµV/m)	(AVG) Margin Lim1 (dB)	Pol	Ttbl Agl (deg)
7205.50	7206.42	41.76	54.00	-12.24	V	135.10
7206.50	7205.56	43.74	54.00	-10.26	H	112.00

30 MHz – 18 GHz Low Channel Dual Polarization Y – slider closed



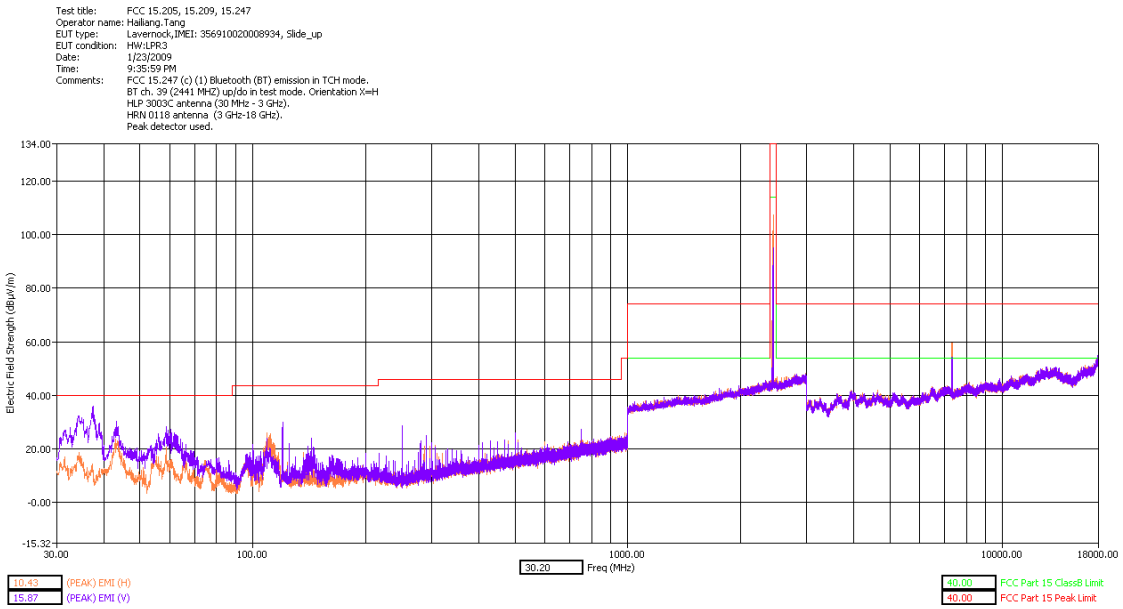
Freq (MHz)	Freq (Max) (MHz)	(AVG) EMI (dBµV/m)	(1) Limit (dBµV/m)	(AVG) Margin Lim1 (dB)	EUT Ttbl Agl (deg)	Pol
7205.50	7205.50	44.13	54.00	-9.87	180.10	H
7205.50	7205.51	47.37	54.00	-6.63	246.90	V

30 MHz – 18 GHz Low Channel Dual Polarization Z – slider open



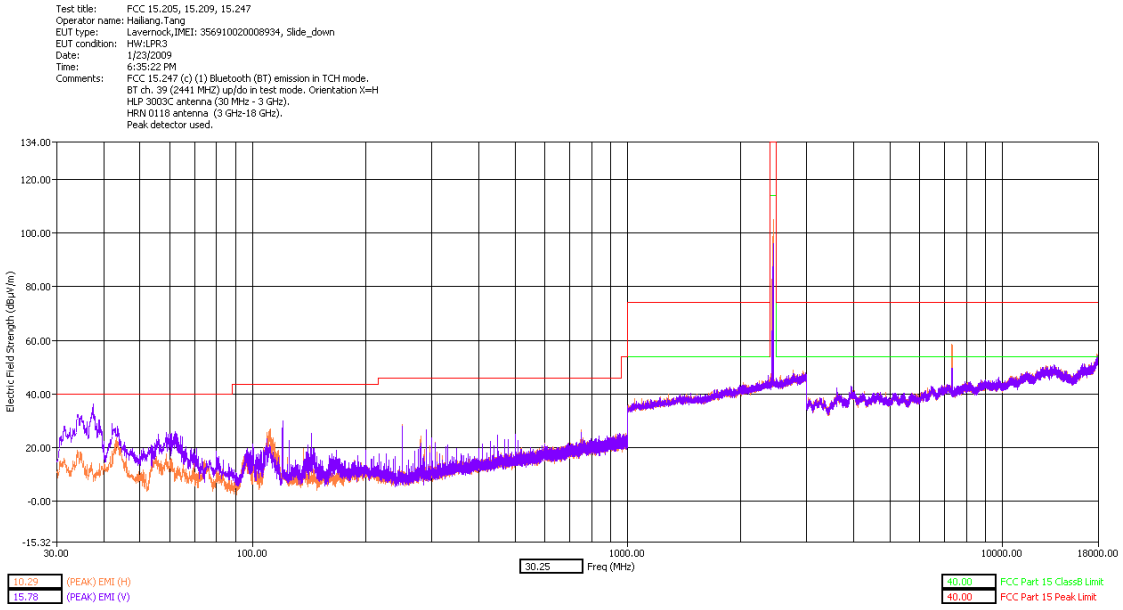
Freq (MHz)	Freq (Max) (MHz)	(AVG) EMI (dBµV/m)	(1) Limit (dBµV/m)	(AVG) Margin Lim1 (dB)	Ttbl Agl (deg)	EUT Ttbl Agl (deg)	Pol
7205.50	7205.48	39.90	54.00	-14.10	180.10	180.10	H
7205.50	7205.35	42.78	54.00	-11.22	180.00	180.00	V

30 MHz – 18 GHz Low Channel Dual Polarization Z – slider closed



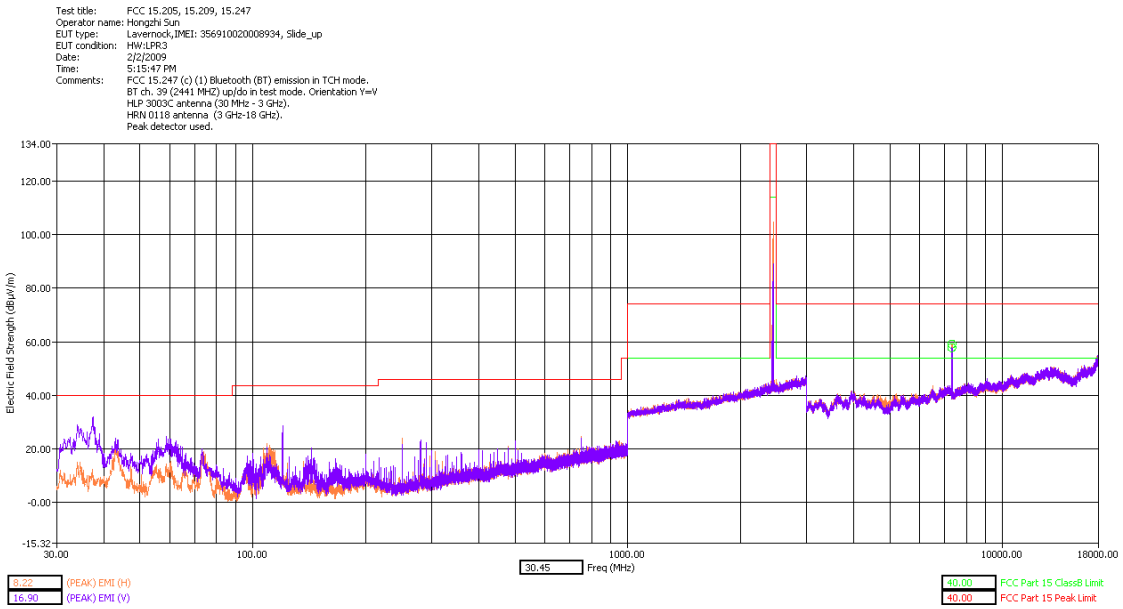
Freq (MHz)	Freq (Max) (MHz)	(AVG) EMI (dBµV/m)	(1) Limit (dBµV/m)	(AVG) Margin Lim1 (dB)	Ttbl Agl (deg)	Pol
7323.00	7322.48	41.61	54.00	-12.39	22.00	H
7323.00	7322.54	41.05	54.00	-12.95	315.00	V

30 MHz – 18 GHz Middle Channel Dual Polarization X – slider open



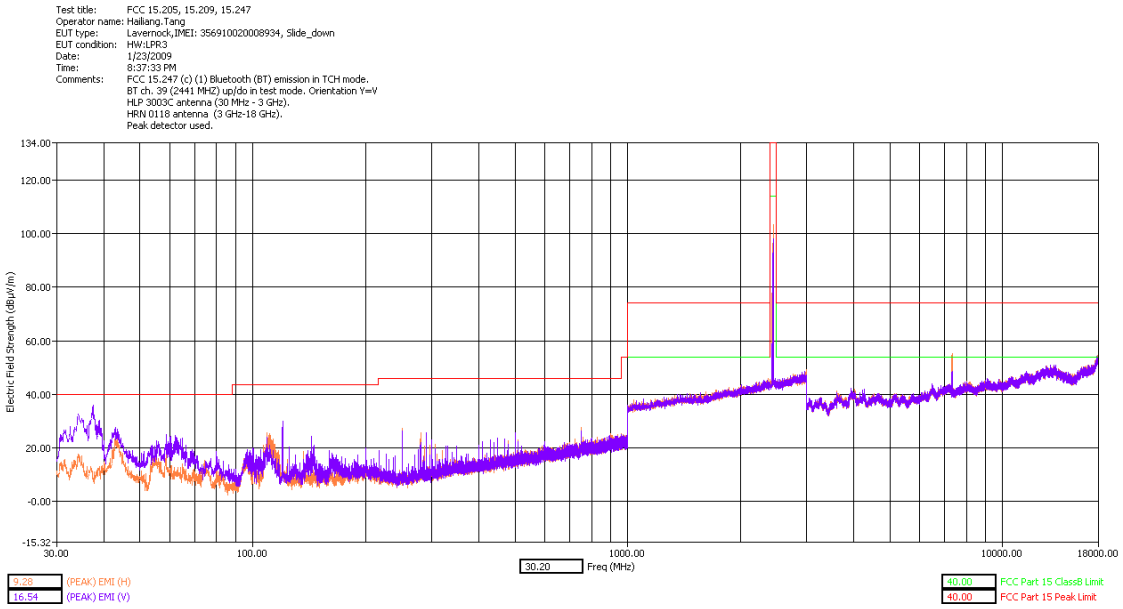
Freq (MHz)	Freq (Max) (MHz)	(AVG) EMI (dBµV/m)	(1) Limit (dBµV/m)	(AVG) Margin Lim1 (dB)	Pol	Ttbl Agl (deg)
7322.50	7322.32	44.80	54.00	-9.20	H	22.10
7322.50	7323.50	37.92	54.00	-16.08	V	180.00

30 MHz – 18 GHz Middle Channel Dual Polarization X- slider closed



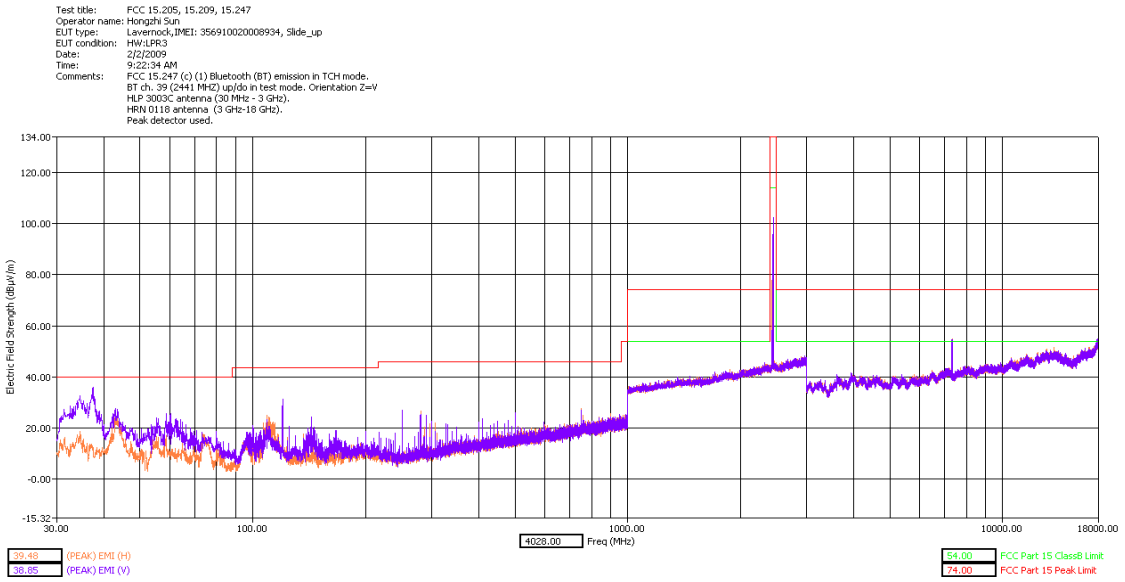
Freq (MHz)	Freq (Max) (MHz)	(AVG) EMI (dBµV/m)	(1) Limit (dBµV/m)	(AVG) Margin Lim1 (dB)	Pol	Ttbl Agl (deg)
7322.50	7323.15	46.04	54.00	-7.96	H	90.00
7322.50	7322.92	41.15	54.00	-12.85	V	247.00

30 MHz – 18 GHz Middle Channel Dual Polarization Y – slider open



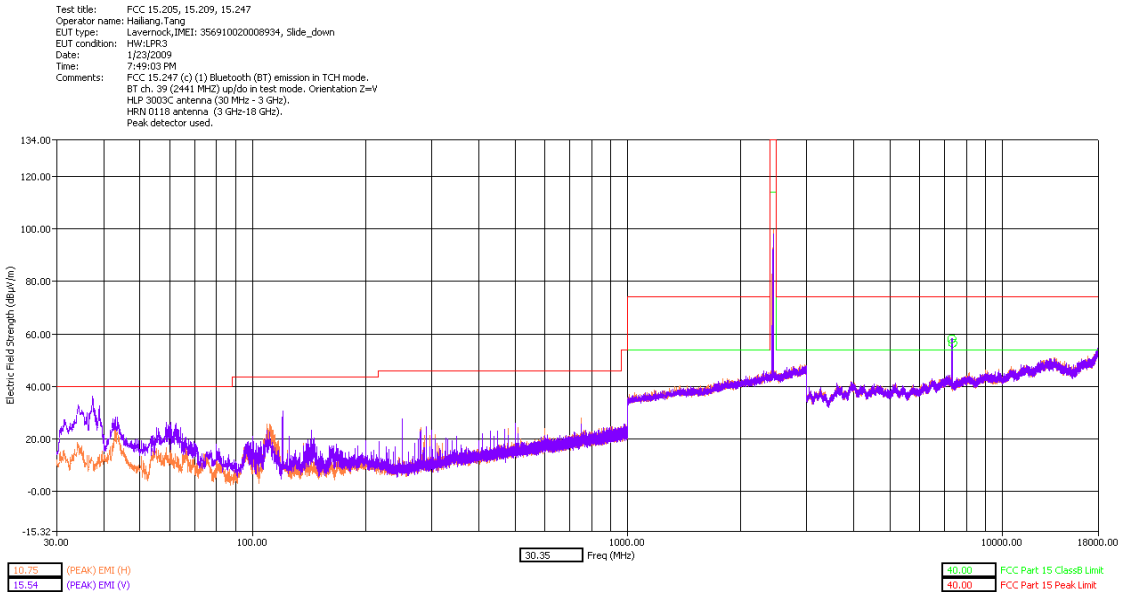
Freq (MHz)	Freq (Max) (MHz)	(AVG) EMI (dBµV/m)	(1) Limit (dBµV/m)	(AVG) Margin Lim1 (dB)	Pol	Ttbl Agl (deg)
7323.00	7322.92	46.03	54.00	-7.97	H	270.00
7323.00	7322.85	38.43	54.00	-15.57	V	21.90

30 MHz – 18 GHz Middle Channel Dual Polarization Y – slider closed



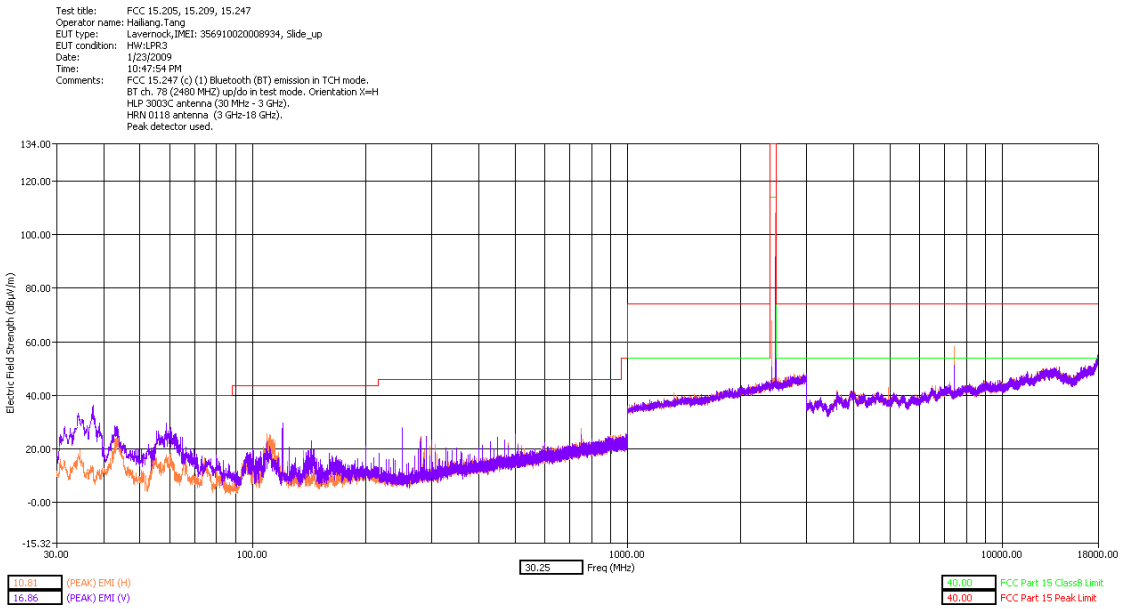
Freq (MHz)	Freq (Max) (MHz)	(AVG) EMI (dBµV/m)	(1) Limit (dBµV/m)	(AVG) Margin Lim1 (dB)	Pol	Ttbl Agl (deg)
7323.00	7322.44	43.64	54.00	-10.36	H	315.00
7323.00	7322.72	41.36	54.00	-12.64	V	45.00

30 MHz – 18 GHz Middle Channel Dual Polarization Z – slider open



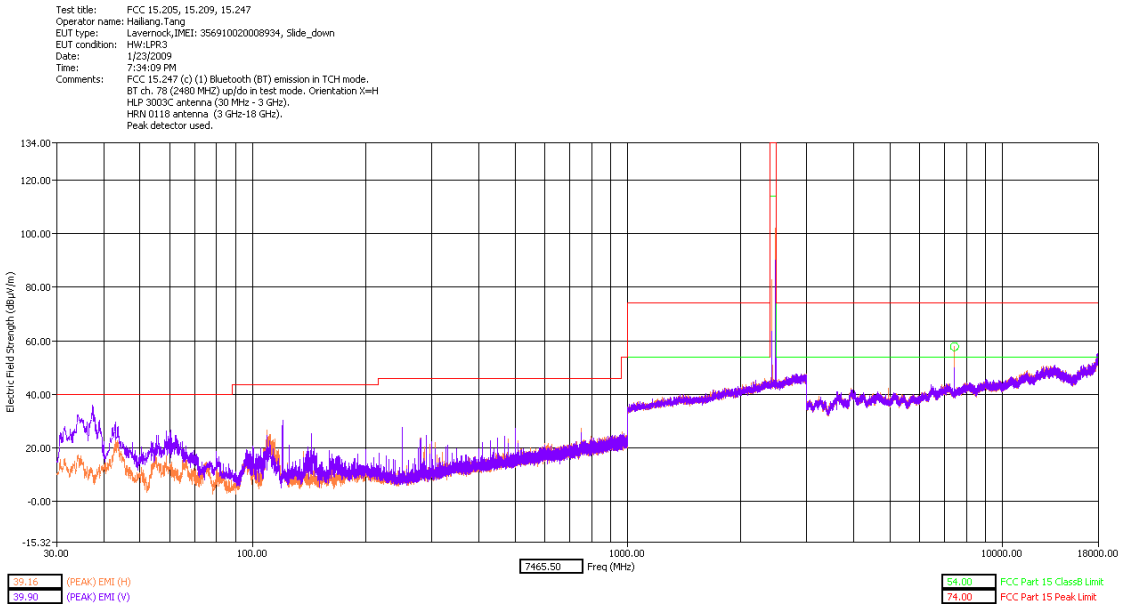
Freq (MHz)	Freq (Max) (MHz)	(AVG) EMI (dBµV/m)	(1) Limit (dBµV/m)	(AVG) Margin Lim1 (dB)	Pol	Ttbl Agl (deg)
7322.50	7322.71	39.62	54.00	-14.38	V	180.10
7322.50	7322.35	44.98	54.00	-9.02	H	22.00
7323.00	7322.46	45.79	54.00	-8.21	H	22.00
7323.00	7323.40	38.46	54.00	-15.54	V	180.00

30 MHz – 18 GHz Middle Channel Dual Polarization Z – slider closed



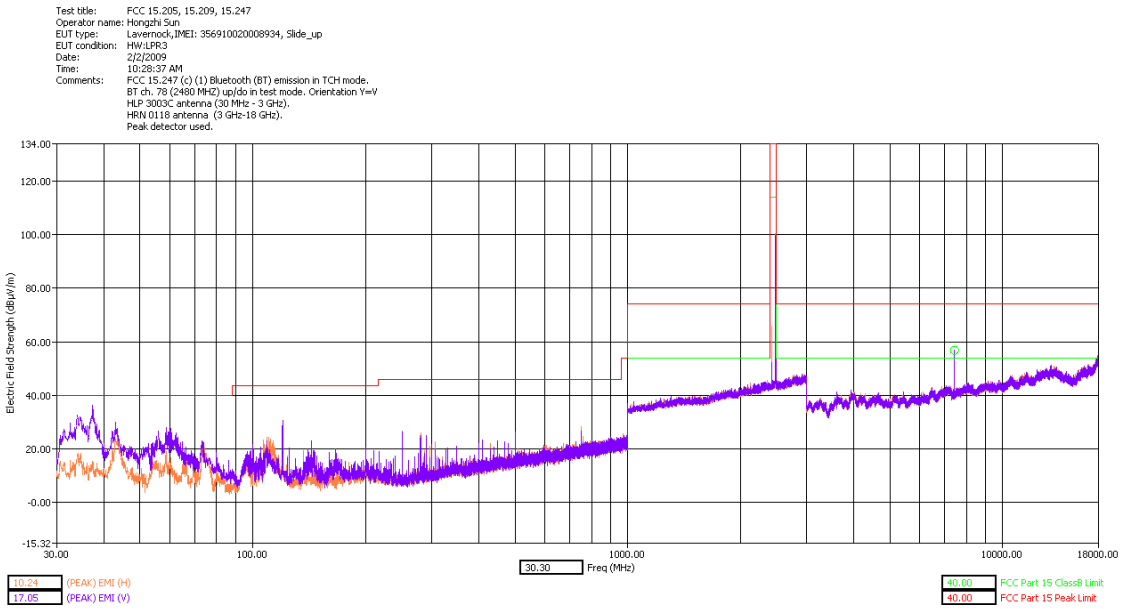
Freq (MHz)	Freq (Max) (MHz)	(AVG) EMI (dBµV/m)	(1) Limit (dBµV/m)	(AVG) Margin Lim1 (dB)	Pol	Ttbl Agl (deg)
7439.50	7439.36	44.86	54.00	-9.14	H	157.10
7439.50	7439.67	40.82	54.00	-13.18	V	247.10

30 MHz – 18 GHz High Channel Dual Polarization X – slider open



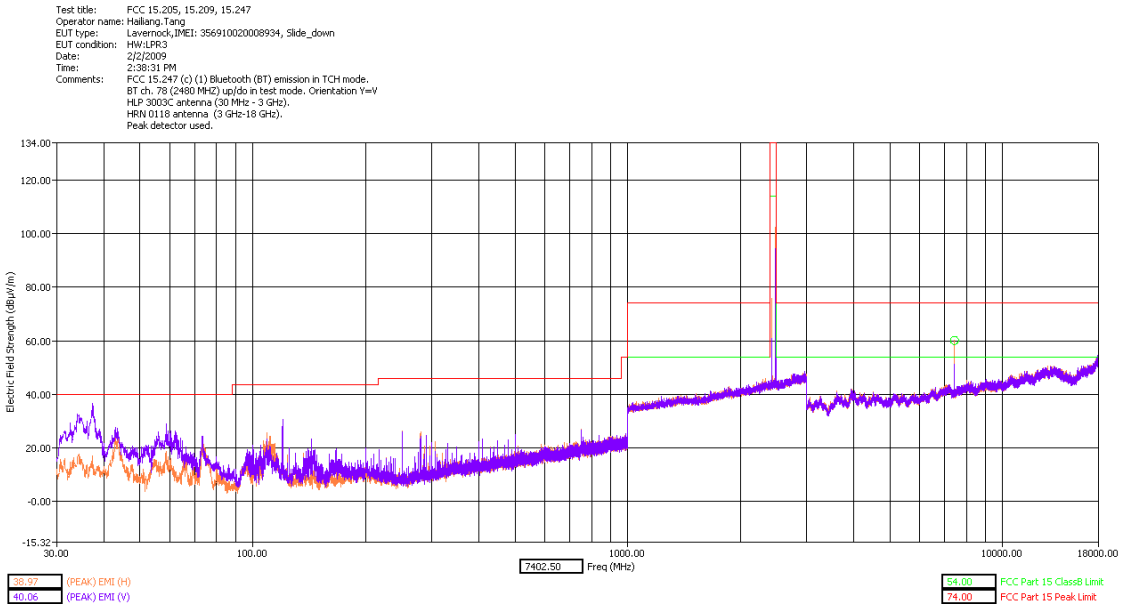
Freq (MHz)	Freq (Max) (MHz)	(AVG) EMI (dBµV/m)	(1) Limit (dBµV/m)	(AVG) Margin Lim1 (dB)	Pol	Ttbl Agl (deg)
7439.50	7440.56	40.76	54.00	-13.24	H	112.00
7439.50	7439.74	42.24	54.00	-11.76	V	180.10

30 MHz – 18 GHz High Channel Dual Polarization X – slider closed



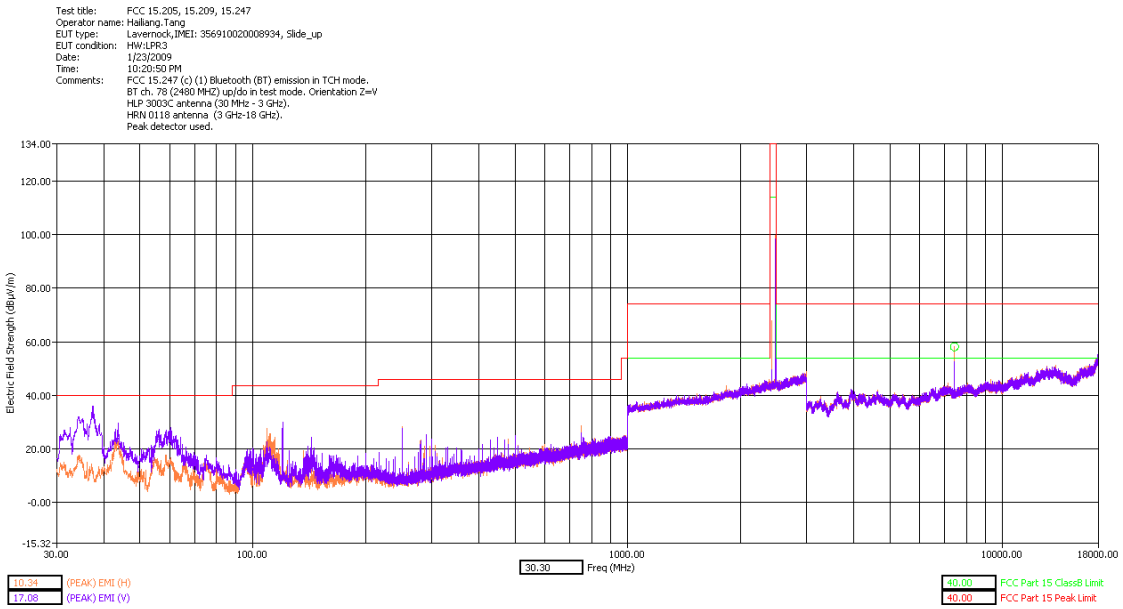
Freq (MHz)	Freq (Max) (MHz)	(AVG) EMI (dBµV/m)	(1) Limit (dBµV/m)	(AVG) Margin Lim1 (dB)	Pol	Ttbl Agl (deg)
7440.50	7439.38	41.38	54.00	-12.62	V	247.10
7440.50	7439.87	47.35	54.00	-6.65	H	90.00

30 MHz – 18 GHz High Channel Dual Polarization Y – slider open



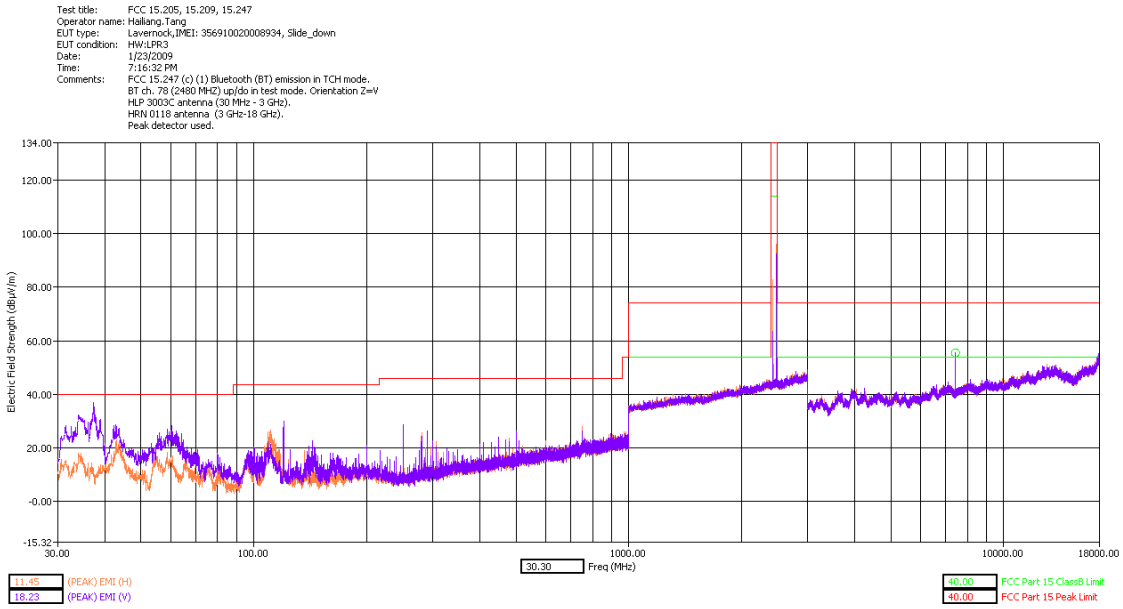
Freq (MHz)	Freq (Max) (MHz)	(AVG) EMI (dBµV/m)	(1) Limit (dBµV/m)	(AVG) Margin Lim1 (dB)	Pol	Ttbl Agl (deg)
7439.50	7440.38	46.20	54.00	-7.80	H	270.00
7439.50	7439.30	38.79	54.00	-15.21	V	135.00

30 MHz – 18 GHz High Channel Dual Polarization Y – slider closed



Freq (MHz)	Freq (Max) (MHz)	(AVG) EMI (dBµV/m)	(1) Limit (dBµV/m)	(AVG) Margin Lim1 (dB)	Pol	Ttbl Agl (deg)
7440.00	7440.52	44.49	54.00	-9.51	H	180.00
7440.00	7440.24	44.50	54.00	-9.50	V	247.10

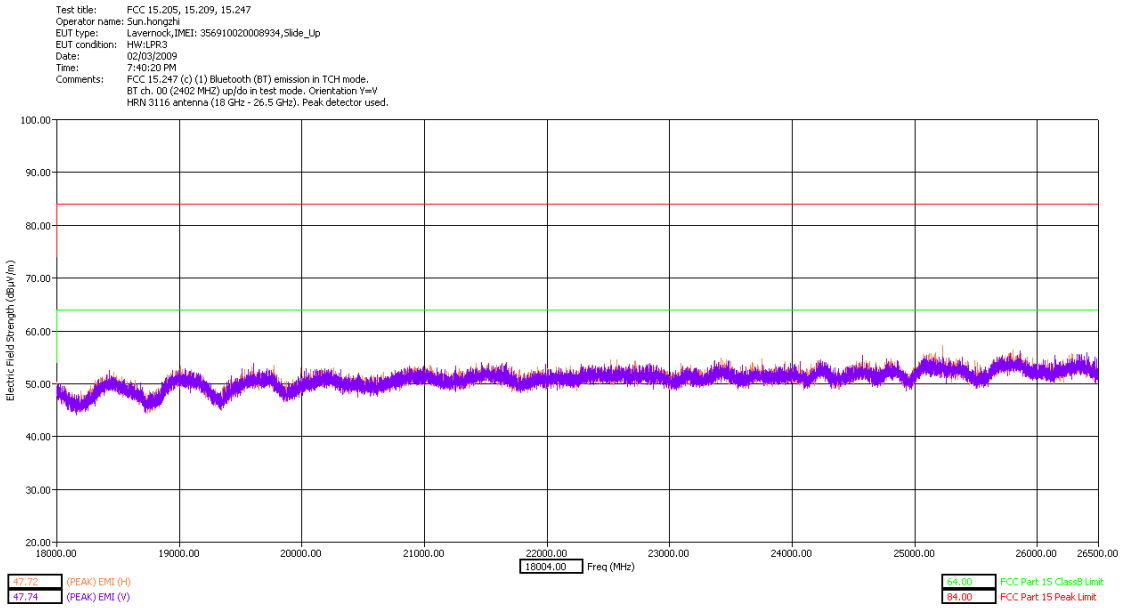
30 MHz – 18 GHz High Channel Dual Polarization Z – slider open



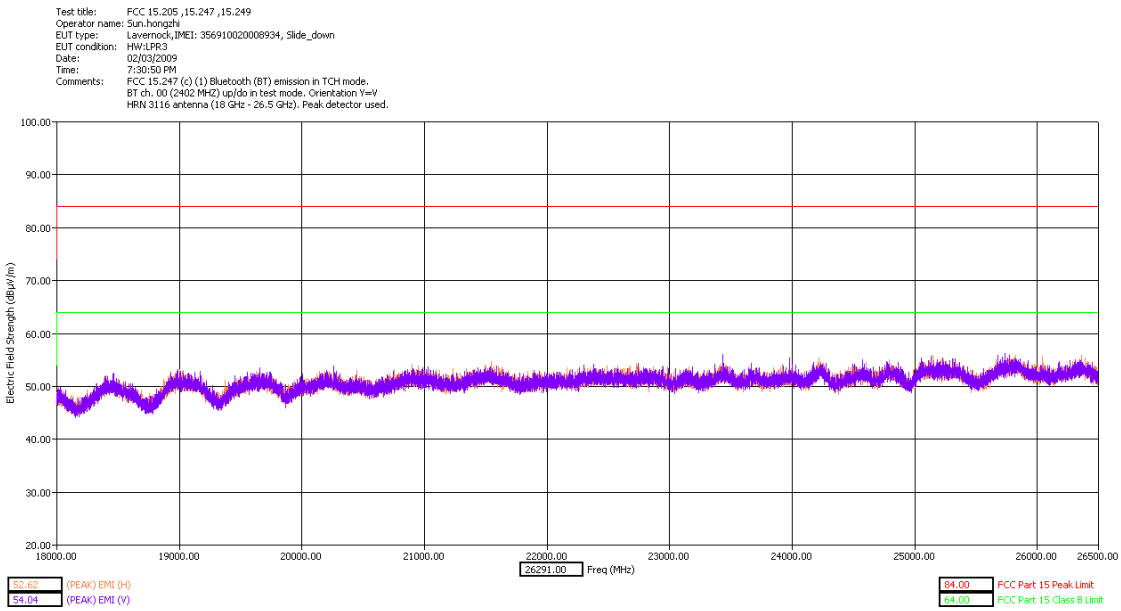
Freq (MHz)	Freq (Max) (MHz)	(AVG) EMI (dBµV/m)	(1) Limit (dBµV/m)	(AVG) Margin Lim1 (dB)	Pol	Ttbl Agl (deg)
7440.50	7440.39	41.95	54.00	-12.05	H	112.00
7440.50	7439.59	41.72	54.00	-12.28	V	157.00

30 MHz – 18 GHz High Channel Dual Polarization Z – slider closed

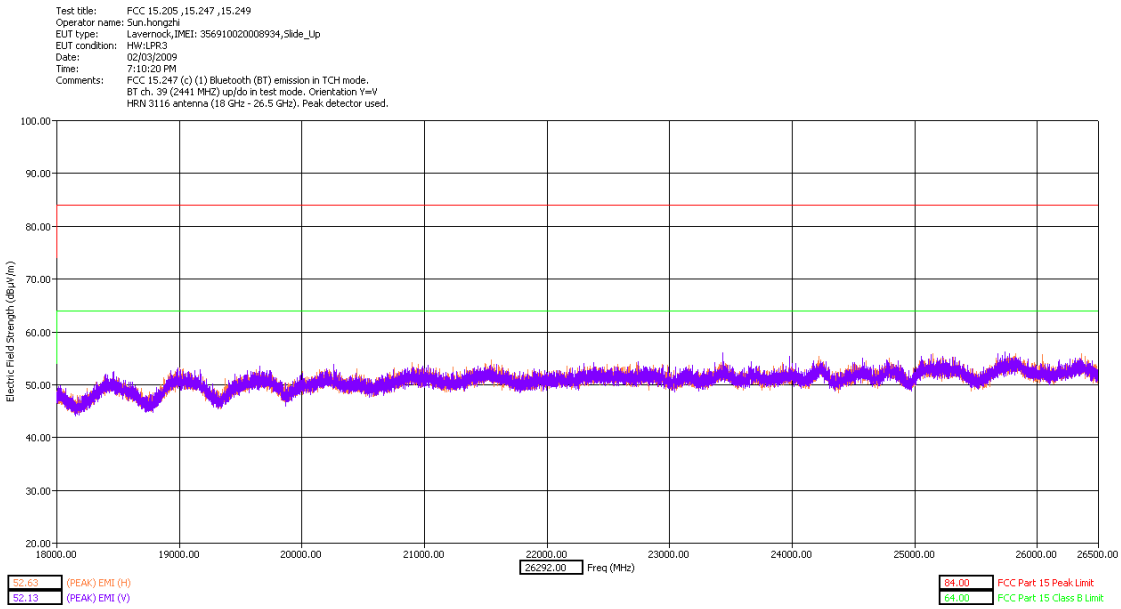
There were no discernible emissions above the noise floor for 18 - 26.5 GHz for Low, Mid and High Channels and all polarizations in Bluetooth band.
Only polarization Y results is showed here



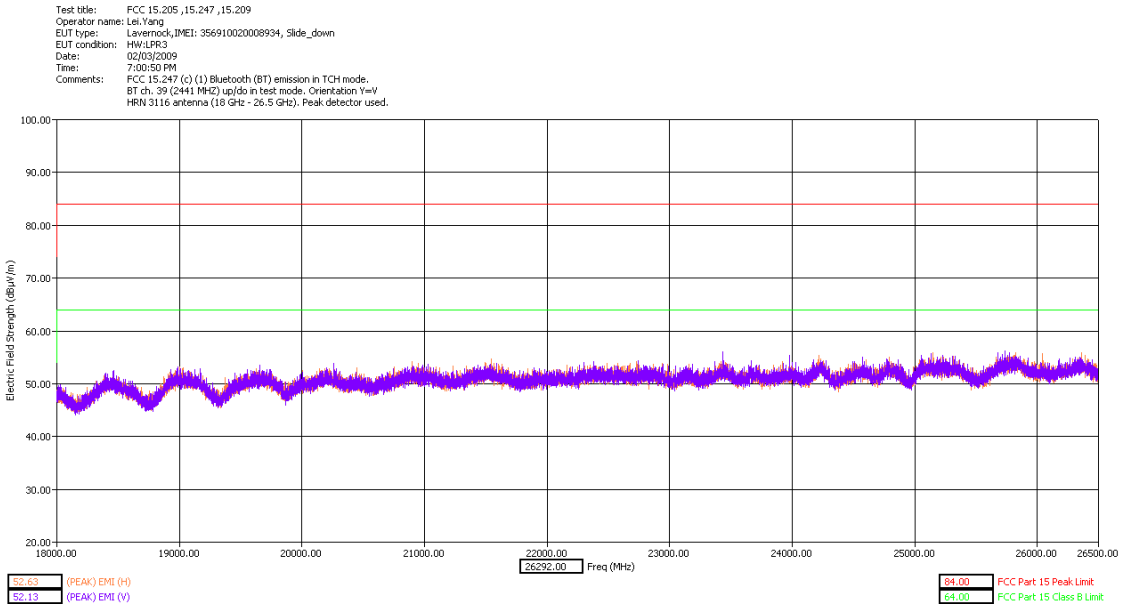
18-26.5 GHz Low Channel Dual Polarization Y – slider open



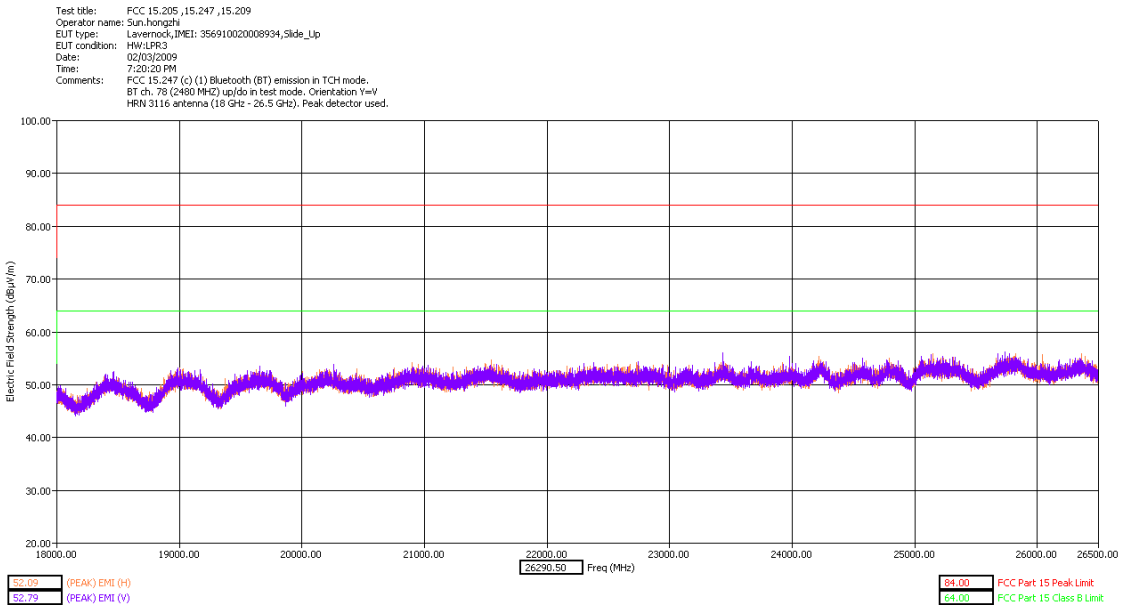
18-26.5 GHz Low Channel Dual Polarization Y- slider closed



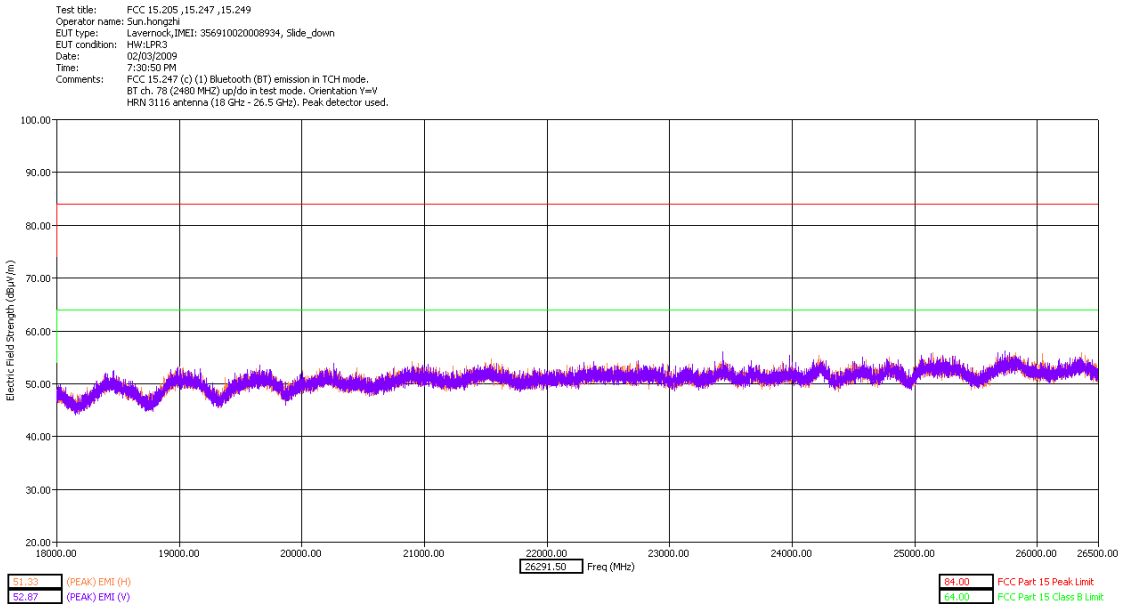
18-26.5 GHz Middle Channel Dual Polarization Y- slider open



18-26.5 GHz Middle Channel Dual Polarization Y – slider closed



18-26.5 GHz High Channel Dual Polarization Y- slider open



18-26.5 GHz High Channel Dual Polarization Y – slider closed

BAND-EDGE COMPLIANCE OF RF RADIATED EMISSIONS

CFR Part 15.247

Measurement Procedure

The test sample is placed inside the semi-anechoic chamber on a polystyrene table at the turntable center. Test is repeated for both horizontal and vertical polarizations of the receive antenna.

For 30 MHz – 18 GHz:
Field Strength (dBµV/m) = EMI Receiver Level (dBµV) + Cable Loss (dB) - Amplifier Gain (dB) + Filter loss (dB) + Antenna Correction Factor (3/m)

For 18 GHz – 26.5 GHz:
Field Strength (dBµV/m) = EMI Receiver Level (dBµV) + Cable Loss (dB) - Amplifier Gain (dB) + Filter loss (dB) + Antenna Correction Factor (1/m)

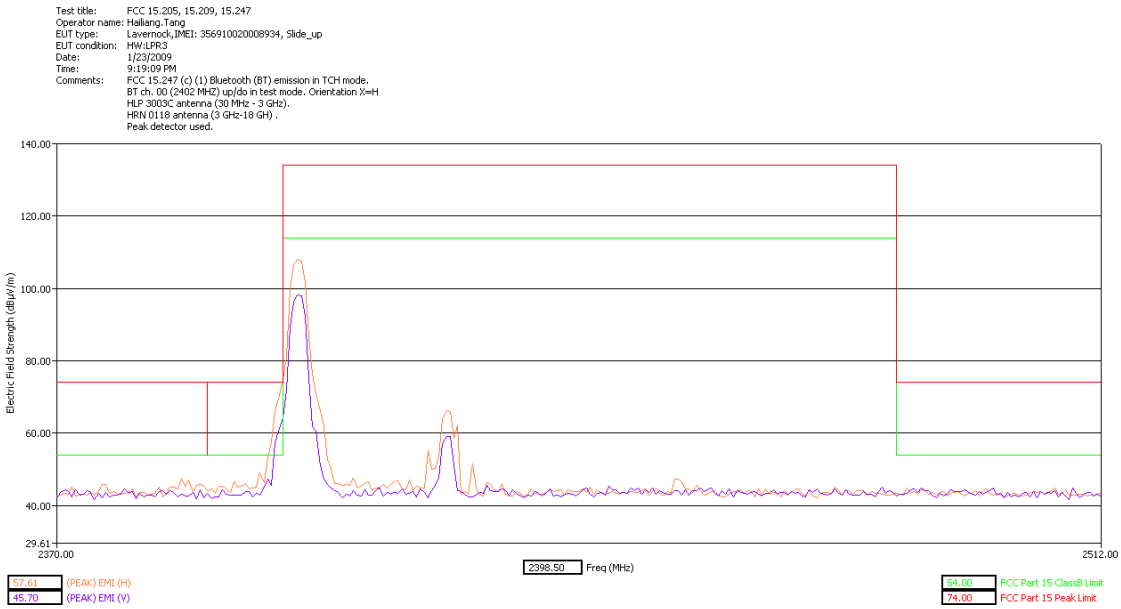
The test sample was operated in Bluetooth single channel test mode. A fully charged battery was used for the supply voltage.

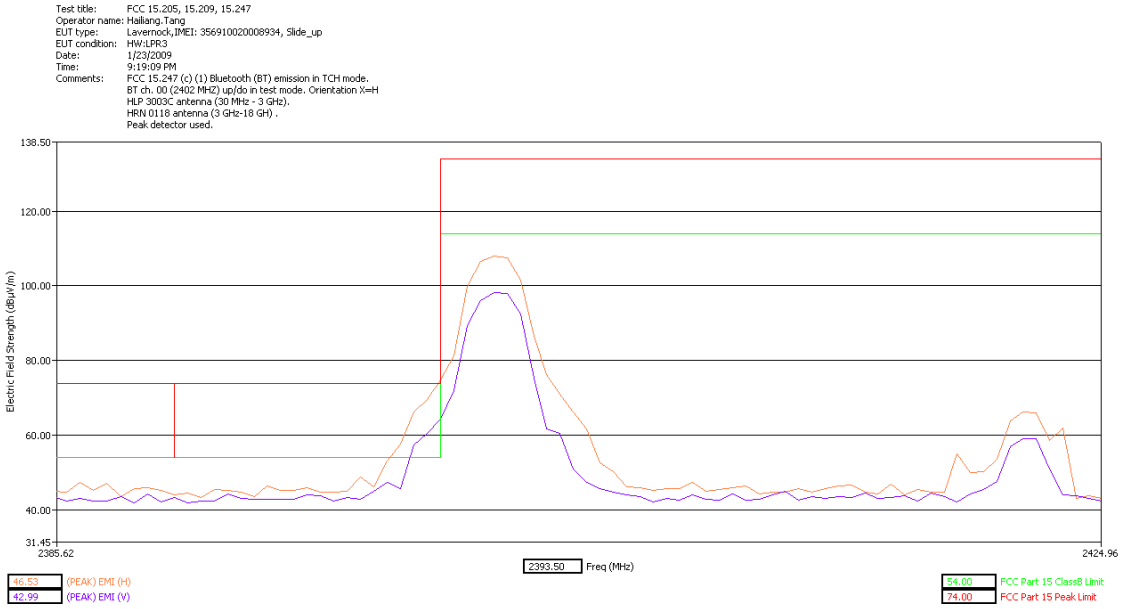
Measurement Results

Comments:
The band edge measurements crossing the corner for the low/high channel with respect to the average limit line is acceptable when applying the FCC rule specified in CFR 47 part 15.35(b) for the use of peak detector above 1 GHz. The peak detector limit line has been added to the graphical plots.

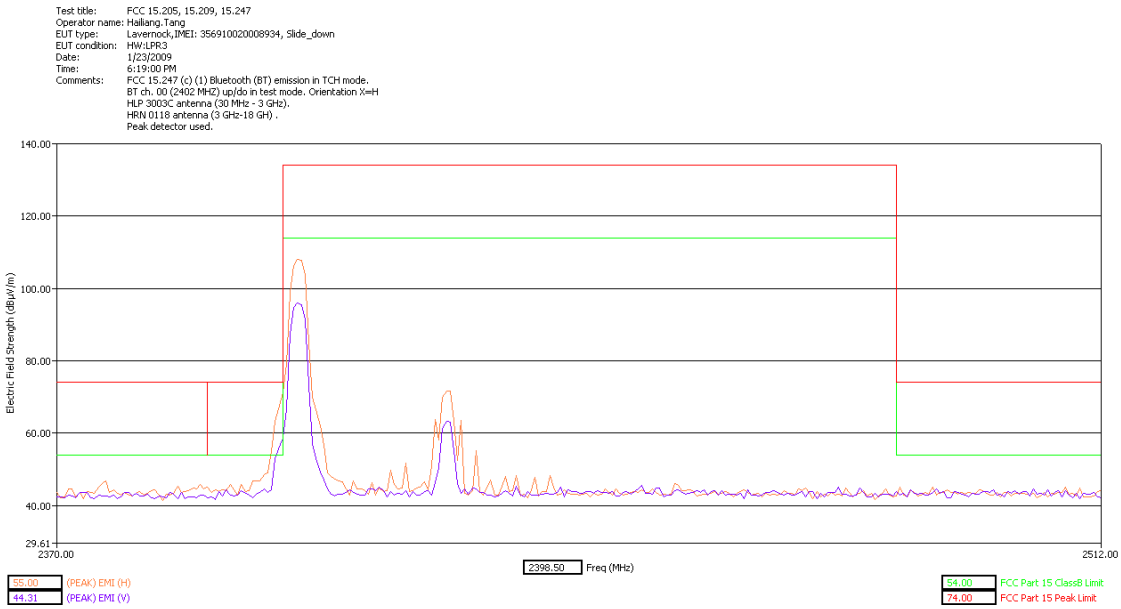
The peak detector limit line has been added to the graphical plots.

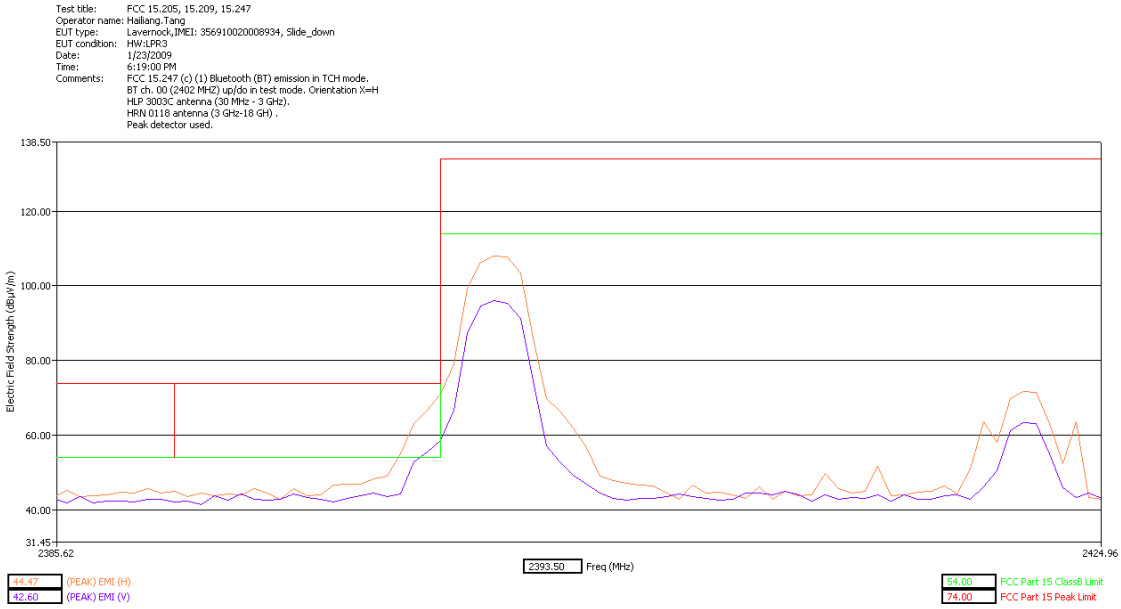
See Attached:



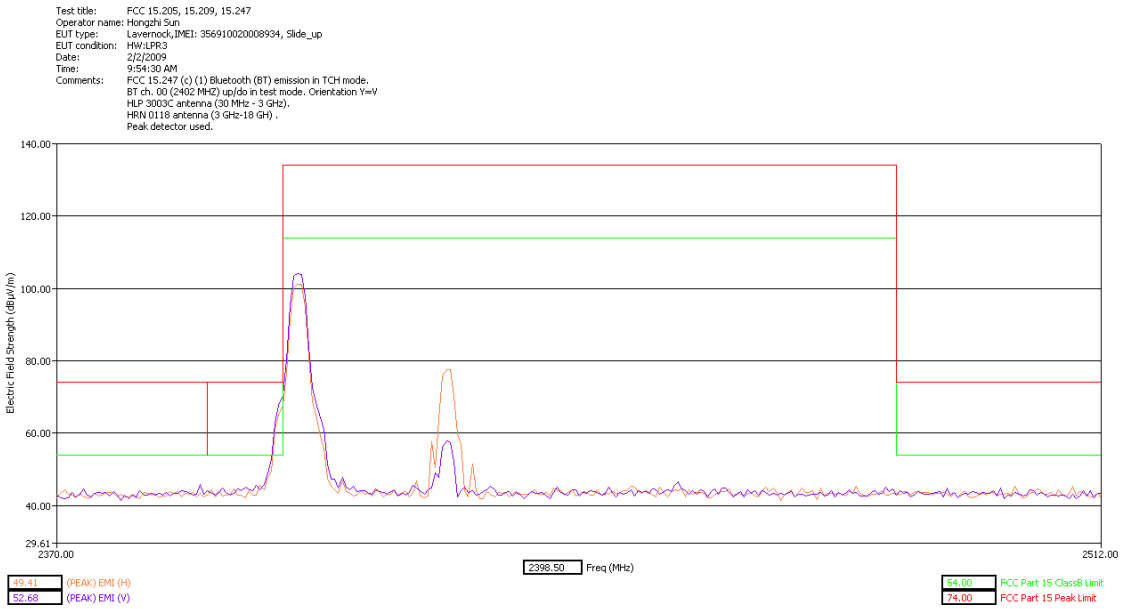


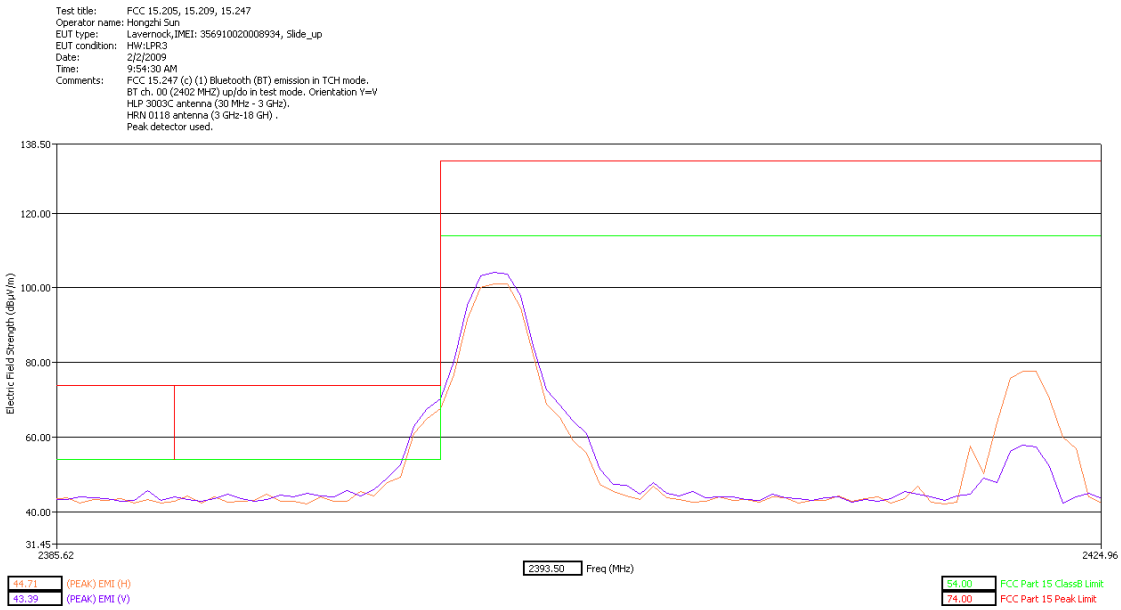
Authorized Band Emissions Low Channel Dual Polarization X – slider open



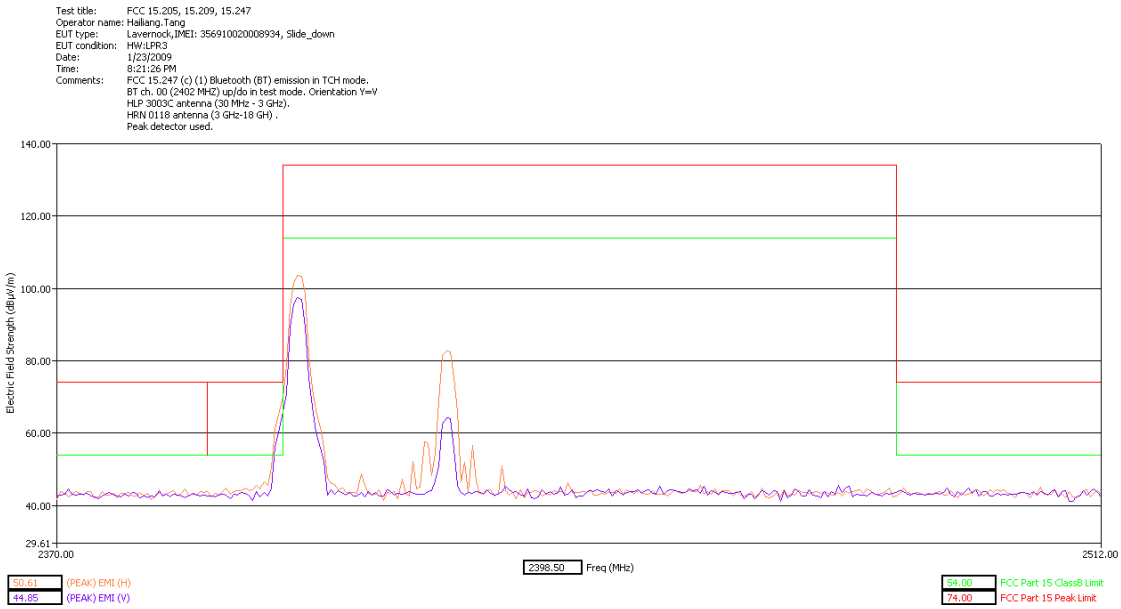


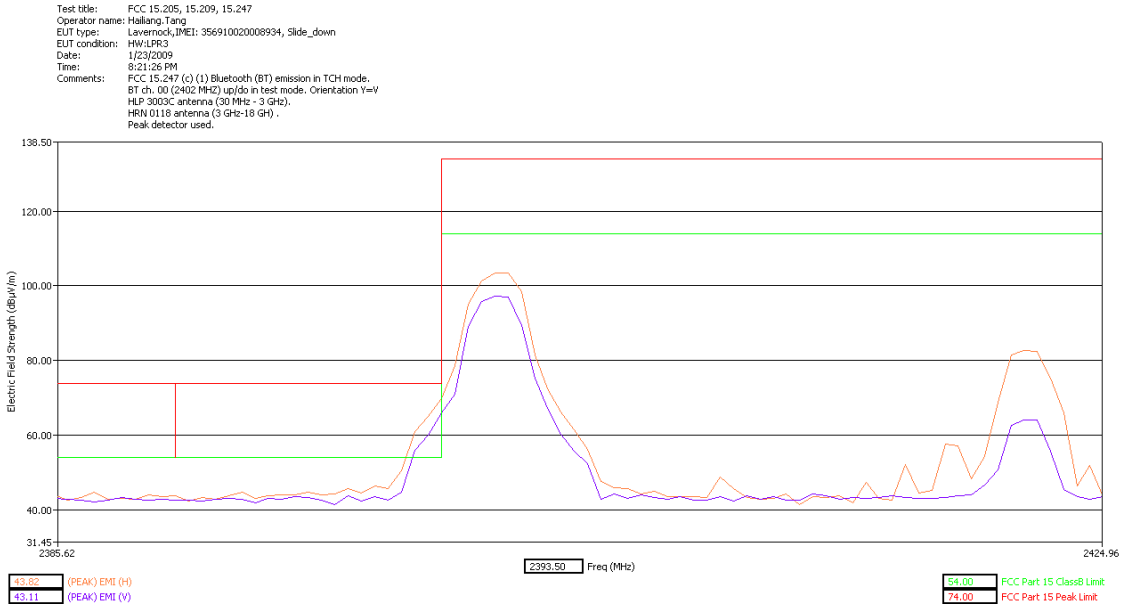
Authorized Band Emissions Low Channel Dual Polarization X – slider closed



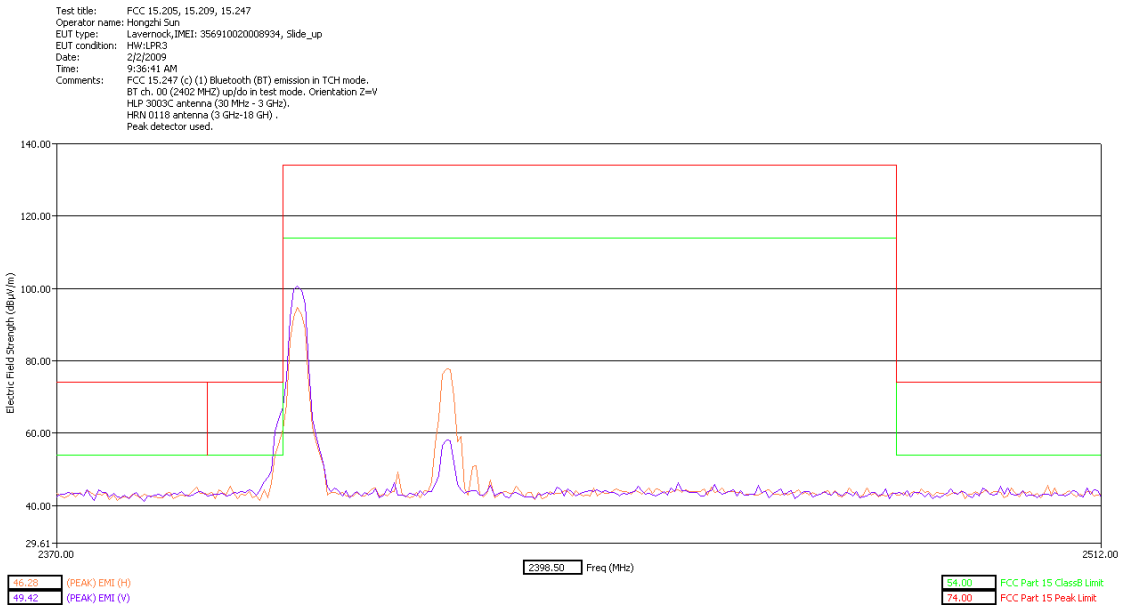


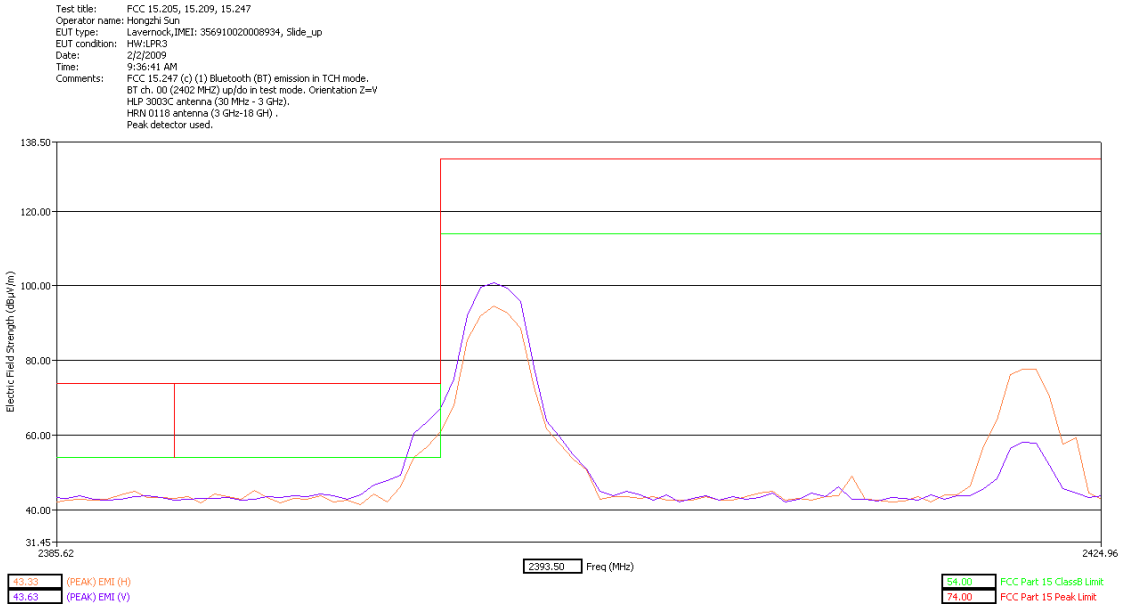
Authorized Band Emissions Low Channel Dual Polarization Y – slider open



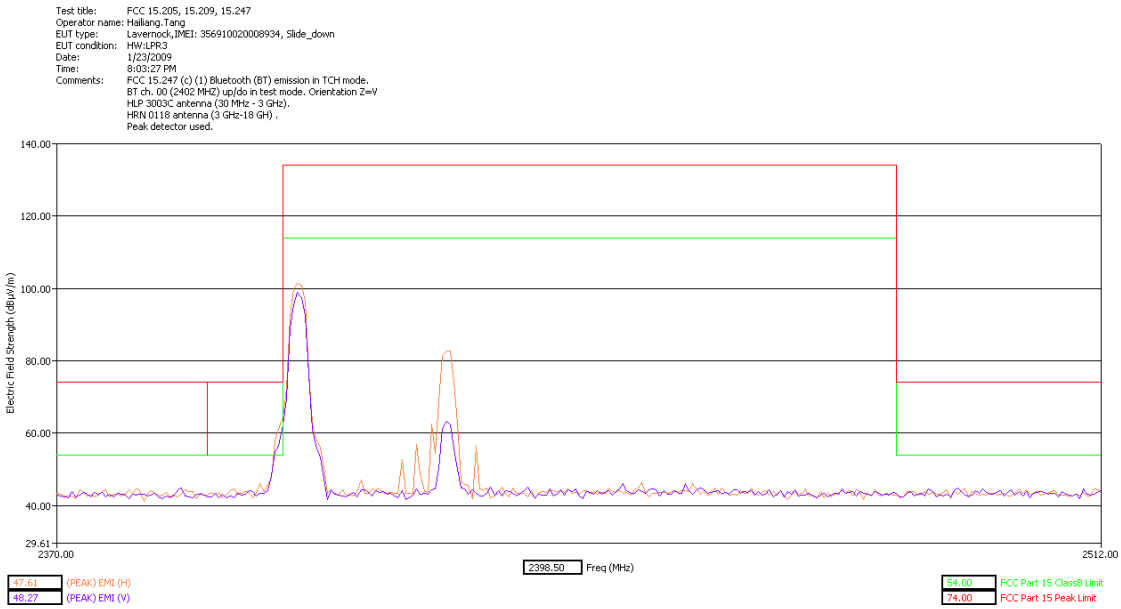


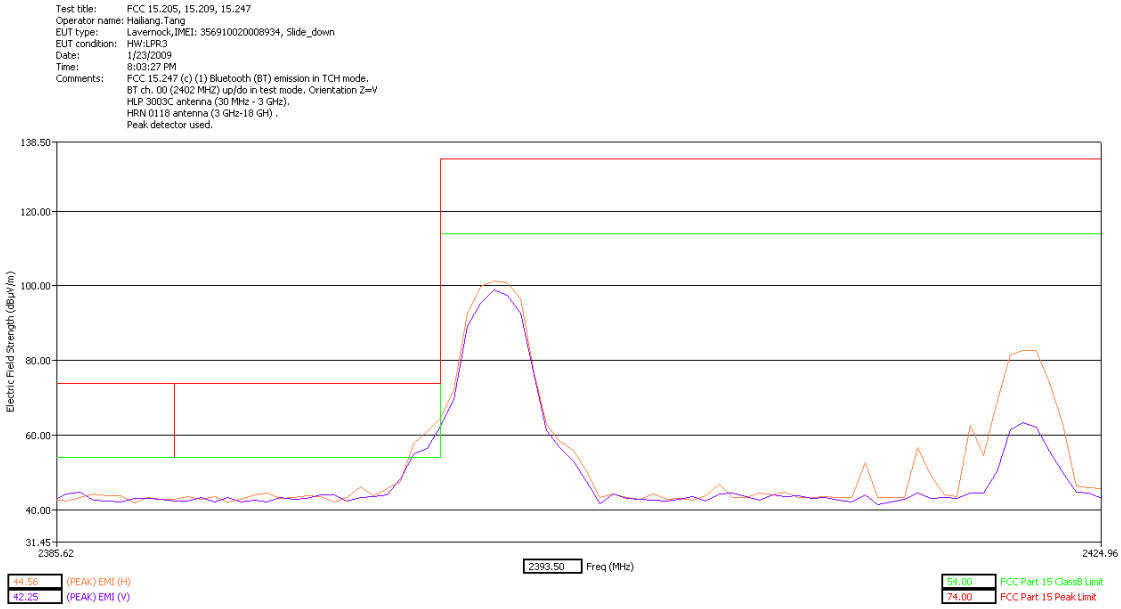
Authorized Band Emissions Low Channel Dual Polarization Y – slider closed



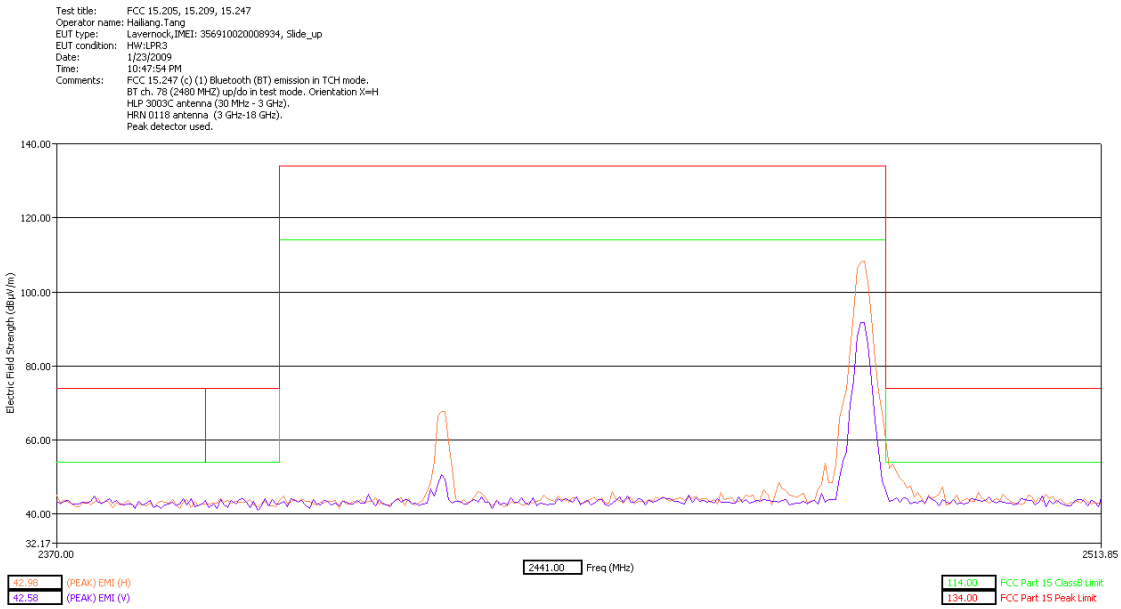


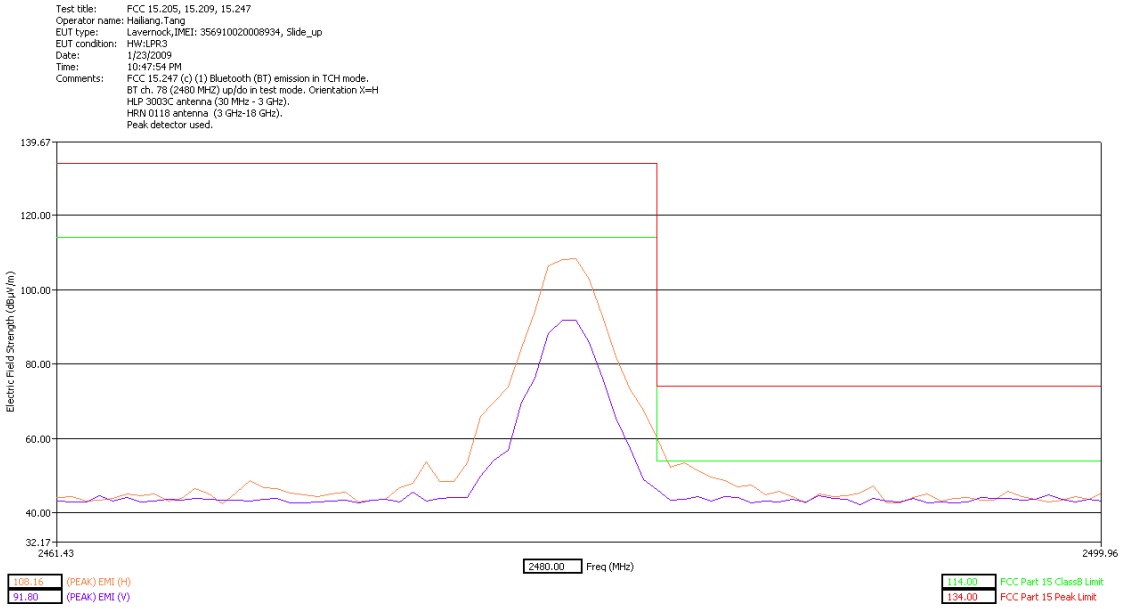
Authorized Band Emissions Low Channel Dual Polarization Z – slider open



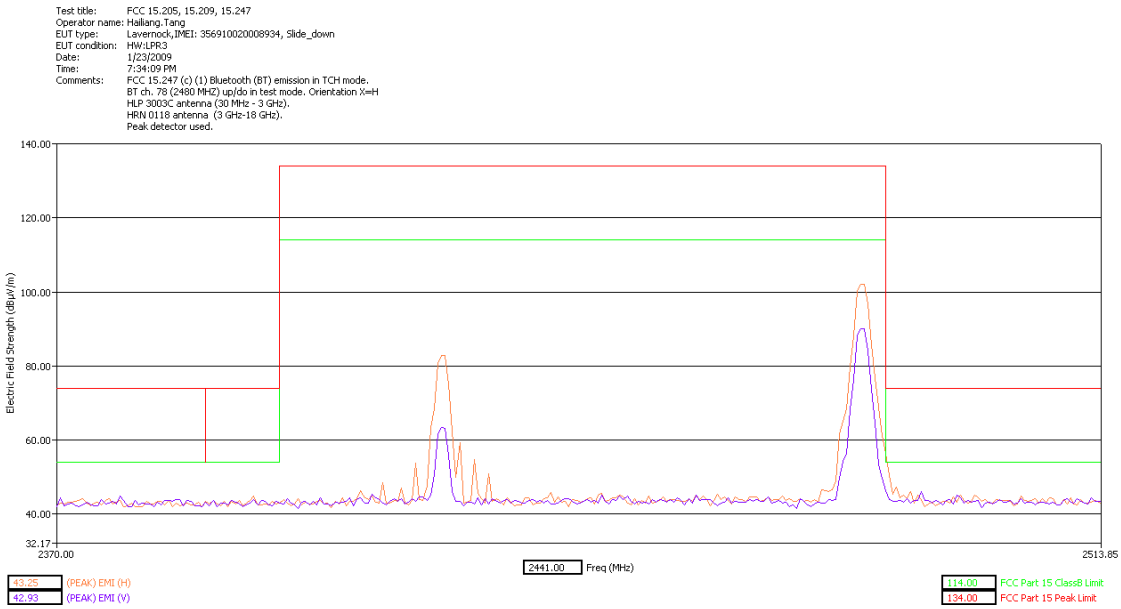


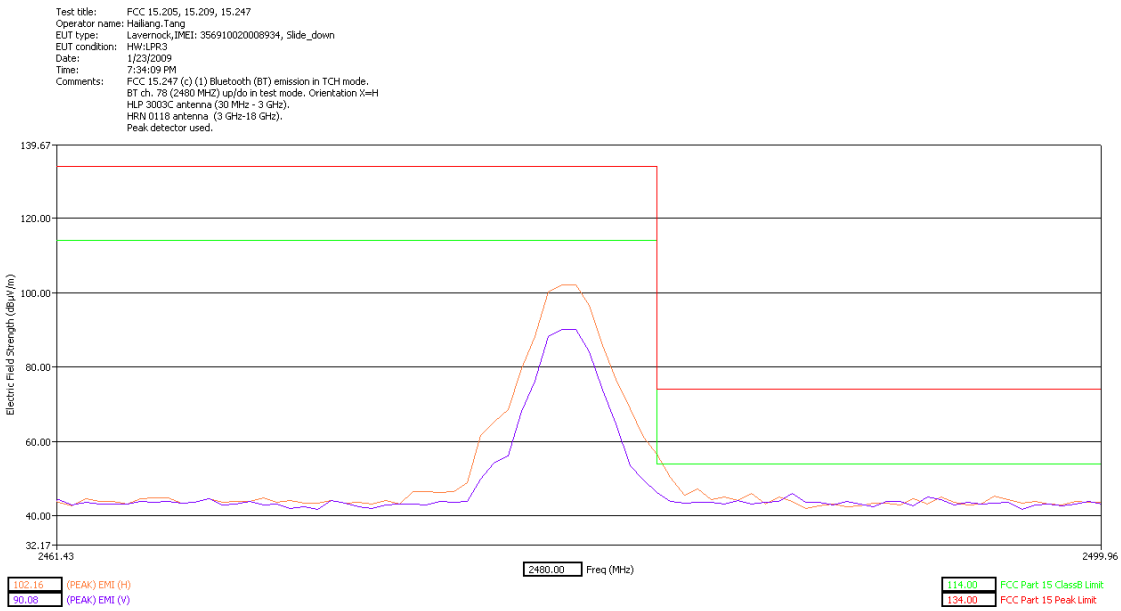
Authorized Band Emissions Low Channel Dual Polarization Z – slider closed



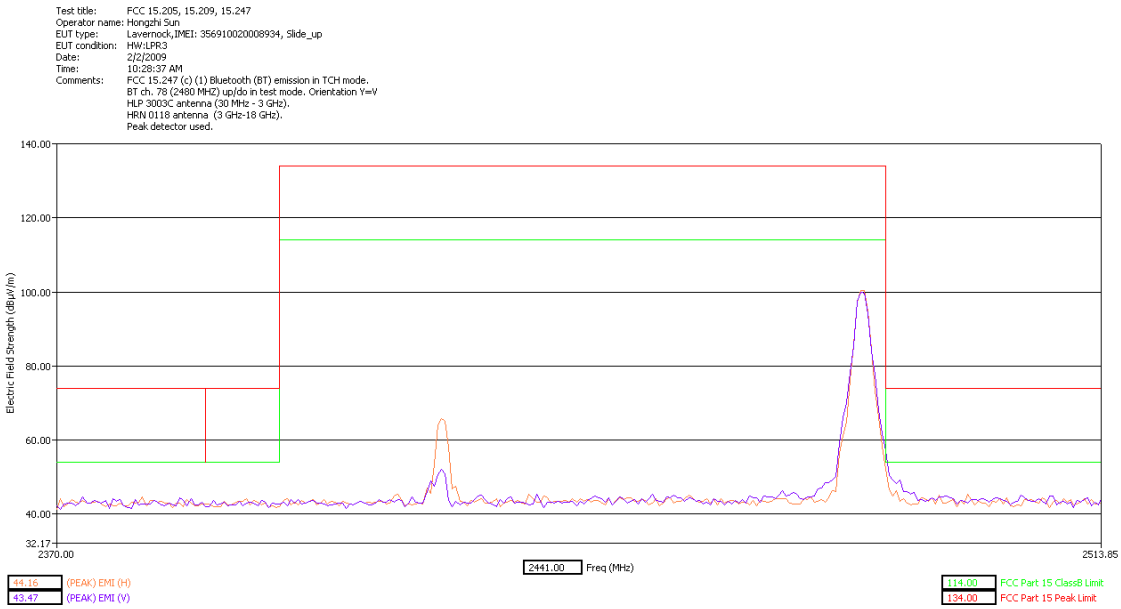


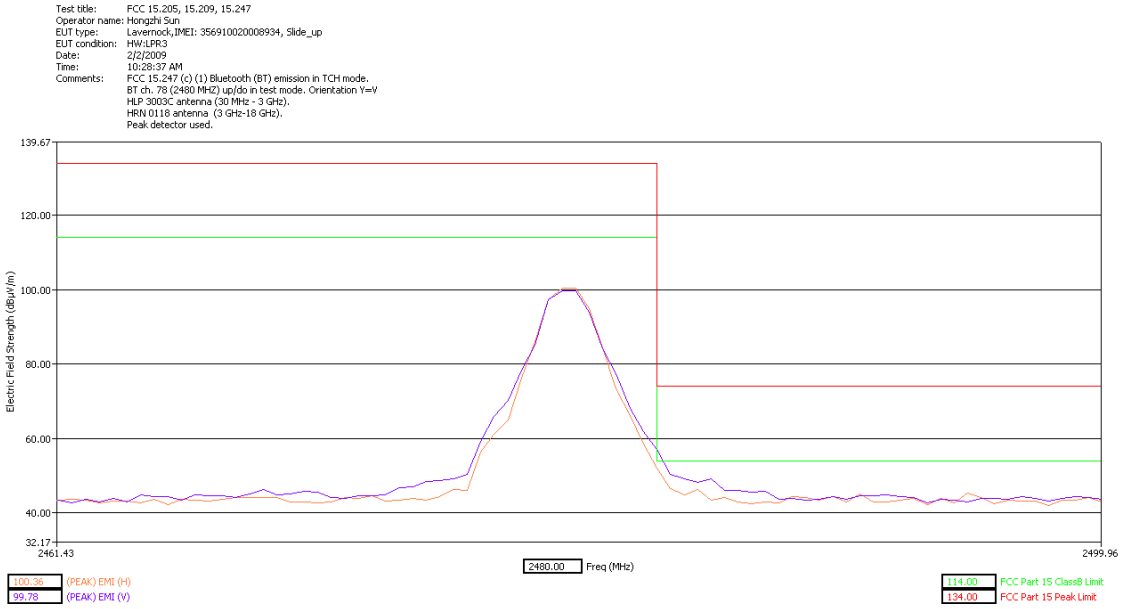
Authorized Band Emissions High Channel Dual Polarization X – slider open



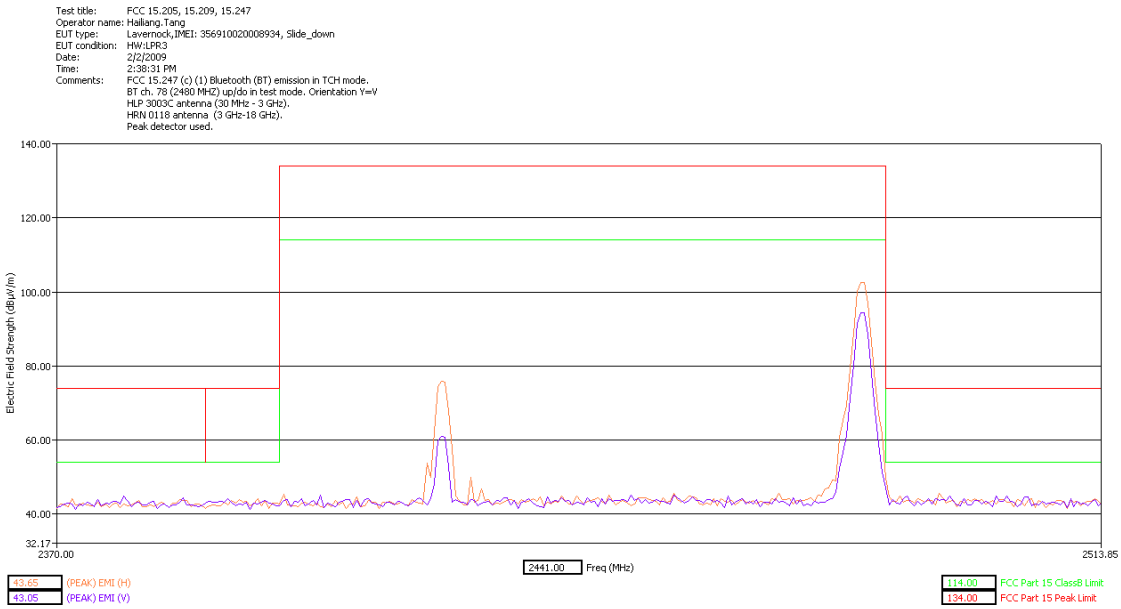


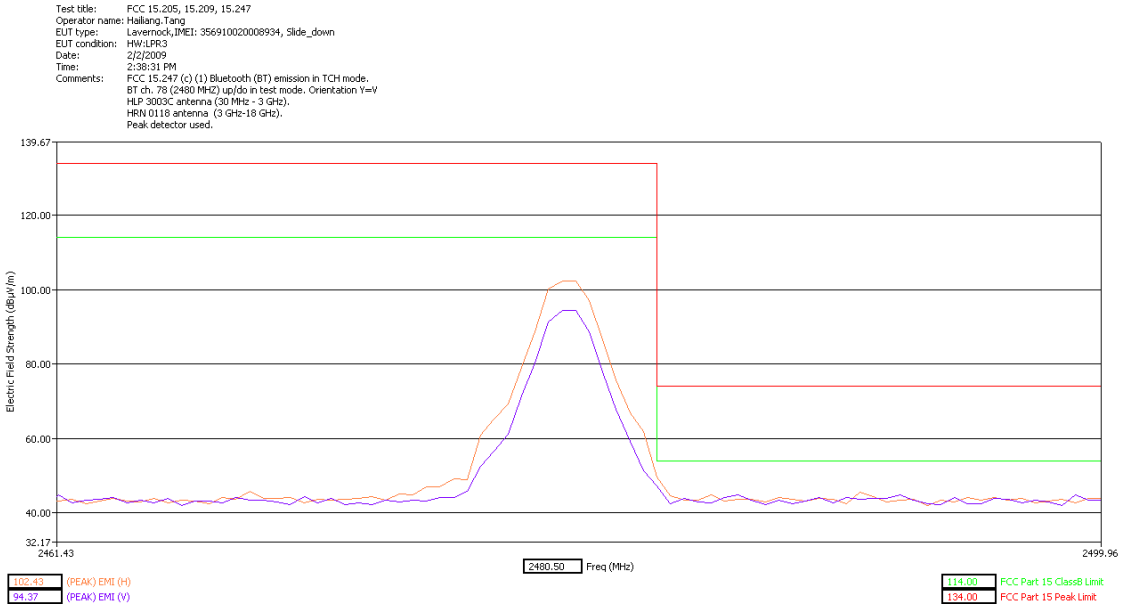
Authorized Band Emissions High Channel Dual Polarization X – slider closed



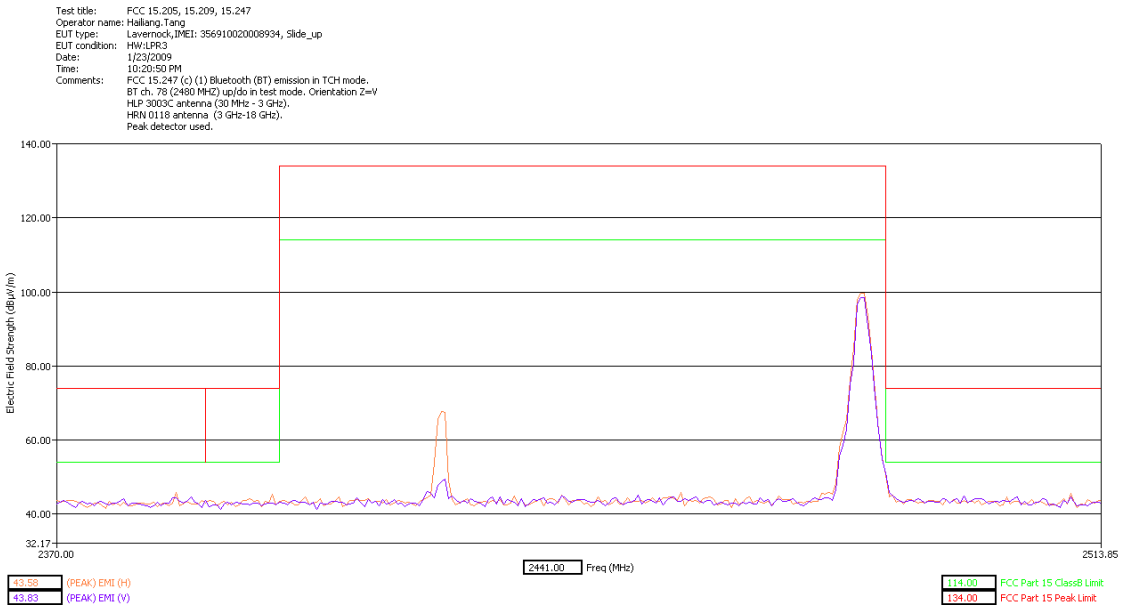


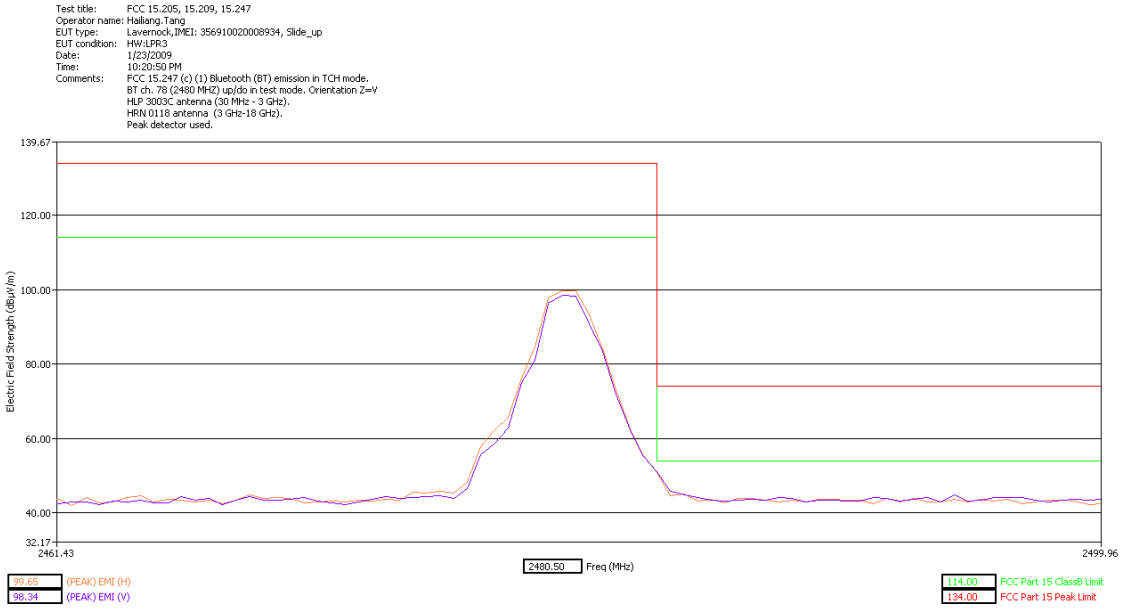
Authorized Band Emissions High Channel Dual Polarization Y – slider open



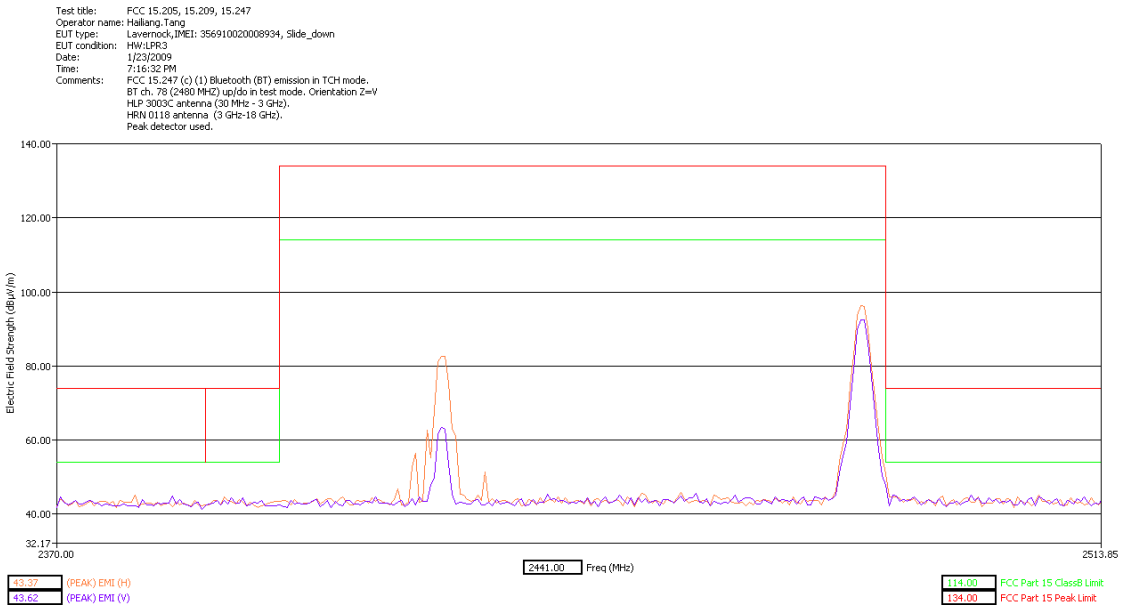


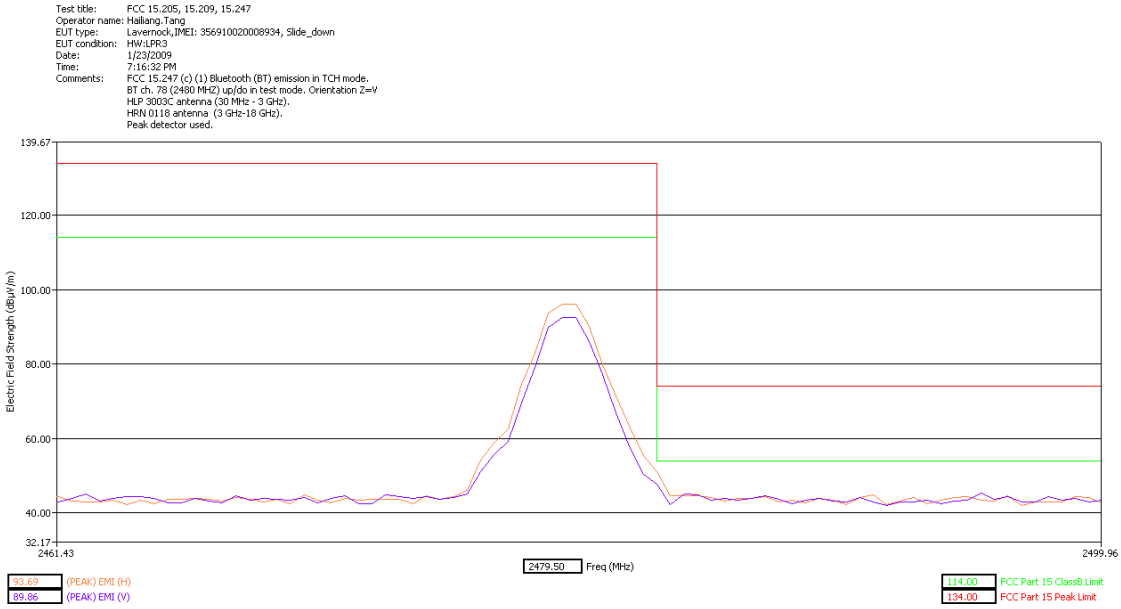
Authorized Band Emissions High Channel Dual Polarization Y – slider closed





Authorized Band Emissions High Channel Dual Polarization Z – slider open





Authorized Band Emissions High Channel Dual Polarization Z – slider closed

PICTURES

The pictures related to the above test results are placed in the associated report denoted as EXHIBIT 7A2.

APPENDIX

The Bluetooth low channel band edge performance is further evaluated using the described method in FCC part 15.247(d).

The carrier is measured using a 100 kHz RBW (6 dB) and the maximum power with the orientation Y is shown below.

Freq (MHz)	Freq (Max) (MHz)	(PEAK) EMI (dBµV/m)	Ttbl Agl (deg)	Pol
2402.00	2402.01	103.75	198.00	H
2402.00	2402.02	99.23	173.40	V

Carrier Low Channel, Y-Orientation, RBW = 100 kHz (6 dB)

The peak value of the carrier field strength is measured to: 103.75 dBµV/m

The new out of band emission limit line for emissions that does not fall inside and restricted band as defined in FCC part 15.205 and is limited to the frequency band 2390 MHz to 2400 MHz is:

103.75 dBuV/m – 20 dB = 83.75 dBµV/m

A test with this modified limit line included is performed.

Band Edge Low Channel, X-Orientation, RBW = 100 kHz (6 dB) - slider open

The band edge performance in the out of band emission frequency range from 2390 MHz to 2400 MHz is attenuated by more than 20 dB with respect to the carrier according to requirements specified in FCC part 15.247 (d).

End of Test Report