MOTOROLA

MOBILE DEVICES BUSINESS

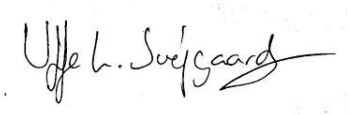
PRODUCT SAFETY AND COMPLIANCE EMC LABORATORY

EMC TEST REPORT - Addendum

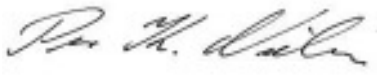
Test Report Number – 21653-1BT

Report Date – 2008-03-17

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.

Technician:  Name: Uffe Lund Svejgaard
Test: 2008-02-22 to 2008-03-05

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

Signature:  Name: Per K. Nielsen

Title: Sr. Staff Engineer Date: 2008-03-17

FCC Registration Number: 863448
IC Registration Number: 109AP-1

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

UKAS TESTING
2404

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Test Report Details

Tests Performed By:	Motorola A/S Product Safety and Compliance Group Lindholm Brygge 35 9400 Nr.Sundby Fax (45) 7219-5002 Phone: (45) 7219-5000 Motorola PCS FRN: 0016105769 FCC Registration Number: 863448 IC Registration Number: 109AP-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:	Bar
Signaling Capability:	Quadra band 850/900/1800/1900 GSM with GPRS class 12 and EDGE class 12, Bluetooth class 2, WiFi band b/g, FM radio.
Serial Numbers:	IMEI 352482020000489
FCC ID:	IHDT56JT1
Project number:	21653-1
Testing Complete Date:	05-03-2008

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).

DA 00-705, "Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems" published by the Federal Communications Commission was also used in the testing of this product.

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 1000MHz, 1 to 25GHz radiated emissions and radiated band-edge measurements were performed.

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

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 19.5º C +- 1 º C and relative humidity of 33.1% +-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	ESIB 26	100179	20 Hz – 26.5 GHz	15.05.2007
	ESU 40	100040	20 Hz – 40 GHz	07.02.2008
Pre Amplifiers	EA PA-02: (JCA12-300 JCA218-4003 JCA48-300 JCA1826-431 JCA1218-500)	800002	(1 – 26 GHz) 1 GHz – 2 GHz 2 GHz – 18 GHz 4 GHz – 8 GHz 18 GHz – 26 GHz 12 GHz – 18 GHz	26.06.2007
	Sonoma 310N	185680	9 kHz – 1 GHz	19.06.2007
	AFS4-02001800-35-ULN (Mounted on EMCO 3115)	805815	2 GHz – 18 GHz	24.10.2007
	JSA-18004000-30-5A (Mounted on EMCO 3116)	965195	18 GHz – 40 GHz	22.08.2007
	JCA 2640-4000 (Mounted on EMCO 3116)	102	18 – 40 GHz	22.08.2007
Radio com. Tester	CMU 200	112434	GSM 850/900/1800/1900 IS95, UMTS, CDMA, Bluetooth	20.02.2008
High pass filter	K&L 3DH1-3000/T13000-0/0 (Mounted on EMCO 3115)	8	(2700 - 20000 MHz)	24.10.2007
Attenuator	Weinschel 54A-6 (6dB) (Mounted on EMCO 3116)	T8887	DC – 40 GHz	22.08.2007
	H&S 6603.19AA (3dB) (Mounted on EMCO 3115)	na	DC-18 GHz	24.10.2007
Cable	C-ANT-FP1-4S (SMA)	na	30 MHz – 26 GHz	26.06.2007, 22.08.2007 and 24.10.2007

Equipment related to carrier spectrum testing:

Equipment	Model/type	Serial number	Operational range	Date of calibration
Spectrum analysers	FSEA	845097/004	20 Hz – 3.5 GHz	23.04.07
Radio com. Tester	CMU 200	834639/003	GSM 850/900/1800/1900 IS95, UMTS, Bluetooth	14.11.07

The antennas used in the various tests are listed in the below table. All the log-periodic antennas are used as communication and link establishment antennas for (GSM, UMTS, CDMA, FM and/or Bluetooth).

Antenna	Type	Serial number	Operational range	Date of calibration
Hybrid-log periodic	HLP 3003C	080200	30 MHz – 3 GHz	30.07.07
Log-periodic (link)	LPDA 8030	090200	800 MHz – 3 GHz	(na)
Log-periodic (link)	LPDA 8030	090100	800 MHz – 3 GHz	(na)
Log-periodic (link)	PLP 3003	021701	300 MHz – 3 GHz	(na)
Horn (link)	AT4002A	28548	800 MHz – 5 GHz	(na)
Horn (link)	AT4002A	28547	800 MHz – 5 GHz	(na)
Double ridged horn w. 3 GHz HP-filter + 1x 2-18 GHz pre-amp+3dB attenuator.	EMCO 3115	00071502	1 GHz – 18 GHz	07.05.07
Double rigid horn w. 2x 18-40 GHz pre-amp+6dB attenuator.	EMCO 3116	71564	18 GHz – 40 GHz	07.05.07

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

Description of Bluetooth (BT) Transmitter

The 21653-1 cell phone sample offers Bluetooth as a feature. The Bluetooth spread-spectrum, frequency hopping transceiver is designed to operate between 2400 and 2483 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.

There is a switch in the Bluetooth/WLAN (BT/WiFi) module that switches between BT and WiFi. They share the same antenna, and you are able to use a BT headset while in a WiFi VoIP call, however, they do not transmit and receive at the same time. There is a 20 ms delay (for switching between the two systems in time domain) using an intelligent multiplexing scheme. Even though they share the same antenna they are **NOT ON** at the same time. The BT is therefore tested as a standalone transmitter.

Measurement Procedures and Data

FIELD STRENGTH OF SPURIOUS EMISSIONS

CFR Part 2.1053, 15.247(d), 15.249

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.

Field Strength (dBµV/m) = EMI Receiver Level (dBµV) + Cable Loss (dB) - Amplifier Gain (dB) + Filter loss (dB) + Antenna Correction Factor (3/m)

A fully charged battery was used for the supply voltage.

The used standard battery type was BX50 with model number SNN5807A.

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.
- Investigation of maximum radiation orientation and position of the product sample to determine test orientations angles.
    - Tests were performed with the sample orientated along X, Y and Z orthogonal axis based on findings.
    - Tests were performed with the test sample placed in worst case position either open or closed based on form factor. Verification tests were performed for the other position.

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.

Attached results:

Maximum radiating position and orientation

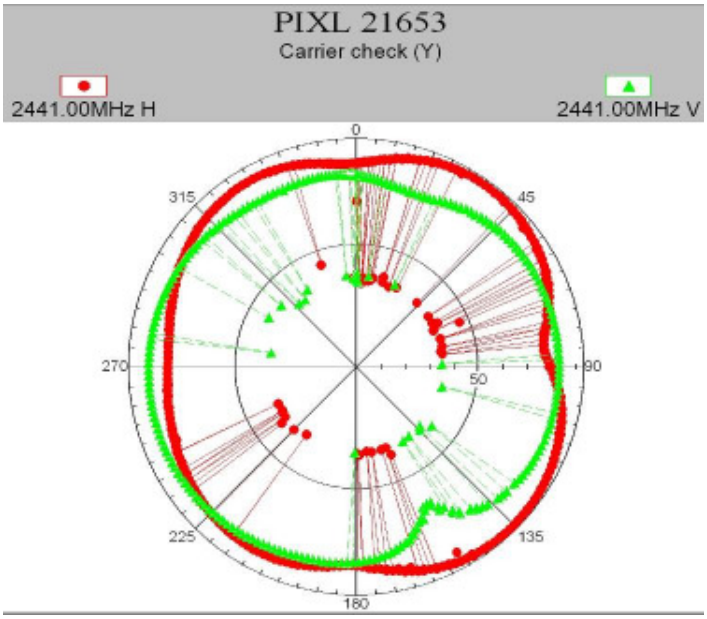
The test sample was placed on top of a none-conductive pedestal and a Bluetooth link towards the communication test set was established. The test sample was scanned with a log-periodic antenna connected to a spectrum analyzer over the whole sphere and the maximum radiation orientation was determined to be the Y orientation in horizontal polarity.

A check of carrier on the Bluetooth center channel 39 was performed to determine the expected maximum radiation of any Bluetooth harmonics for the test sample placed in orientation Y.

Title: FCC 15.247(c) 02/22/08 12:02:03
File: PIXL 21653 (8.53)(ESIB) FCC15.247 BT2400 Tch-mid_Y 2008-02-22 Carrier -PK Sequence: Final Measurements
Operator: ADR_AAL_EMC_TL1,kha001
EUT Type: PIXL (ZN5), FCC ID: IHDT56JT1, IMEI:352482020000489.
EUT Condition: Board Rev: P2.8, SW Rev: R6637_G_81.00.331
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.
BT channel 39 (2441 MHz) up/do in test mode. Orientation Y=H
HLP 3003C antenna (30MHz - 3 GHz). Peak detector used.

PIXL 21653 -Carrier (Y) -Table

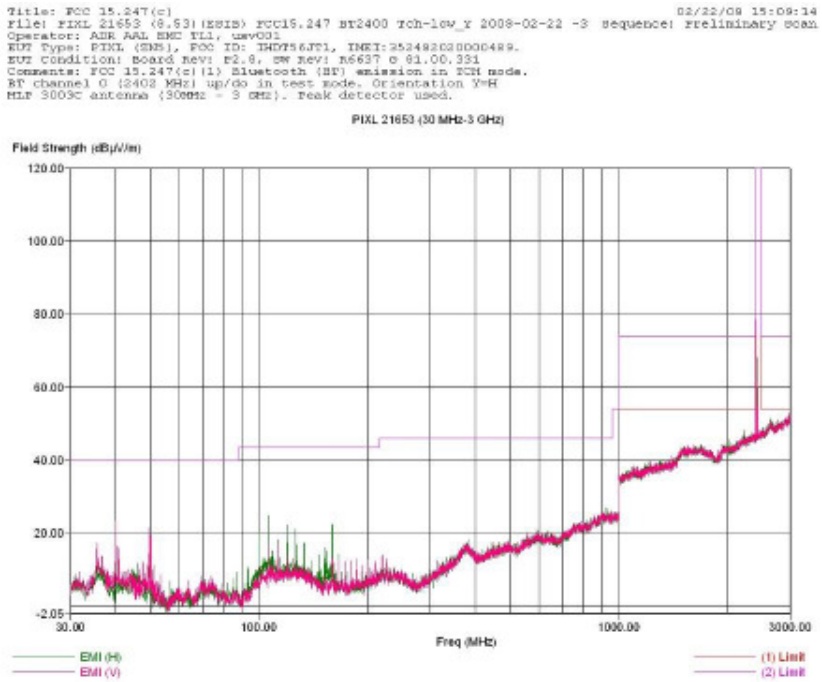
Freq (MHz)	Freq (Max) (MHz)	(PK) EMI (dBµV/m)	(1) Limit (dBµV/m)	(PK) Margin Lim1 (dB)	Ttbl Agl (deg)	Pol.
2441.00	2440.87	101.76	120.00	-18.24	133.30	H
2441.00	2440.85	95.29	120.00	-24.71	251.10	V



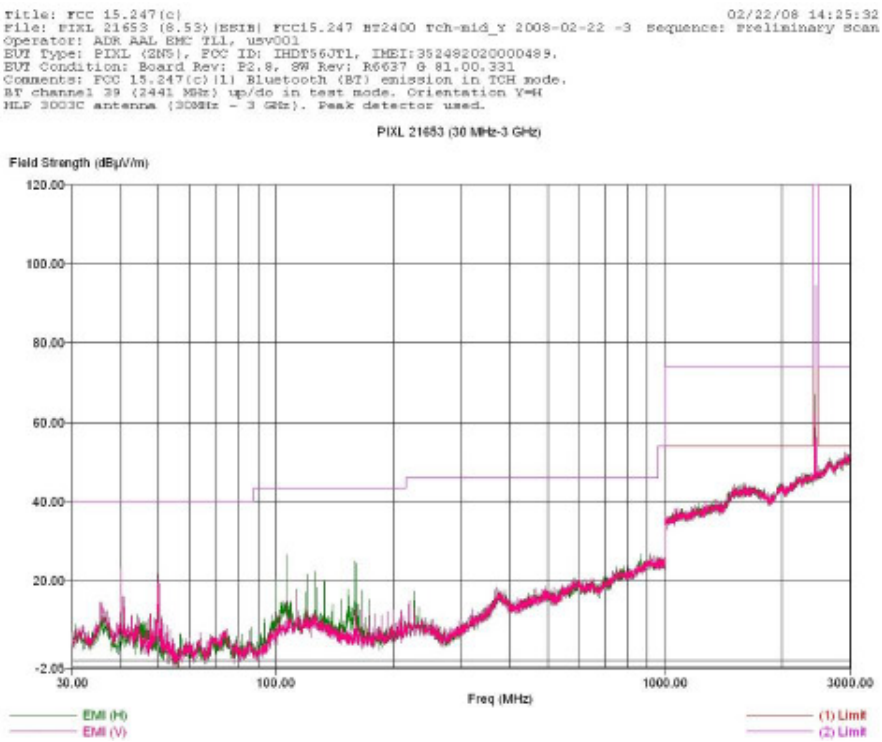
The Bluetooth radiated TX power is measured to be 4.36 dBm on channel 39 with RBW = 1 MHz.

There were no discernible emissions above the noise floor for 30-3000MHz for Low, Mid and High Channels and all polarizations in Bluetooth band

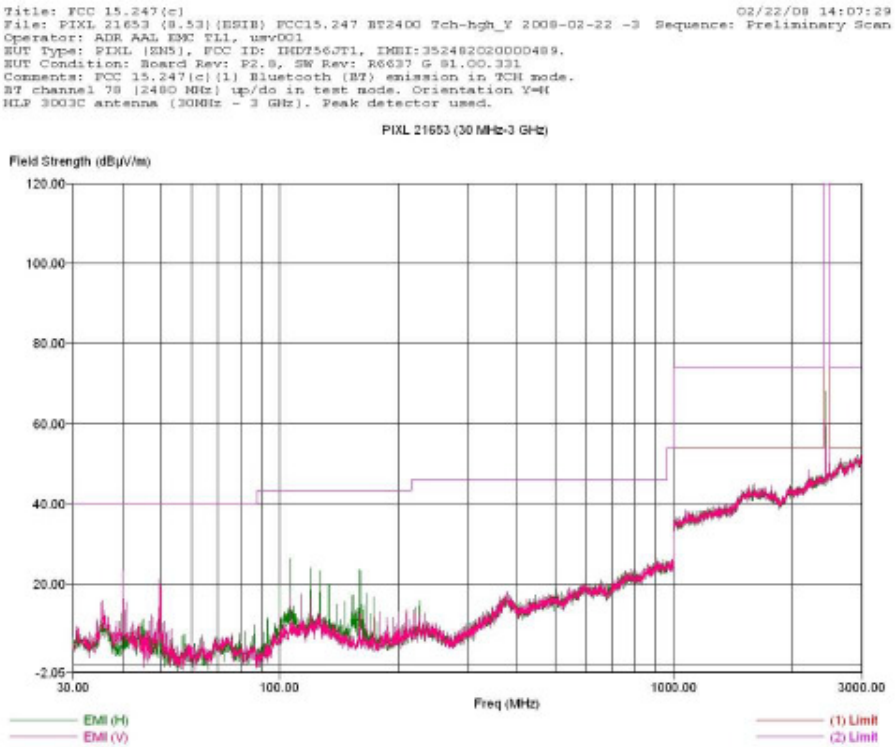
Only one worst case plot for each test frequency are shown in the below plots in the range from 30 MHz – 3000 MHz.



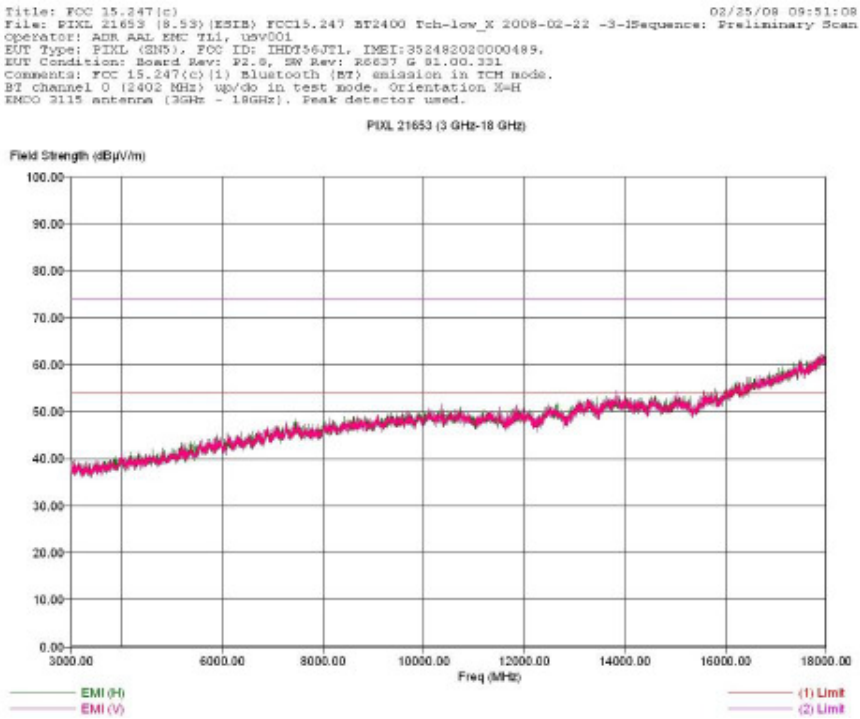
30-3000 MHz Low Channel Dual Polarization Y



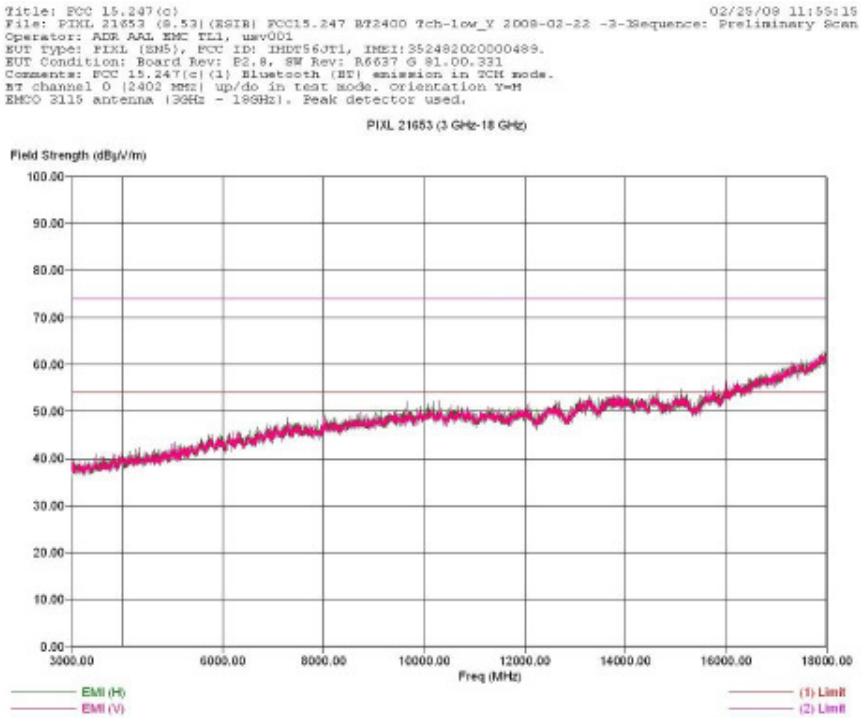
30-3000 MHz Middle Channel Dual Polarization Y



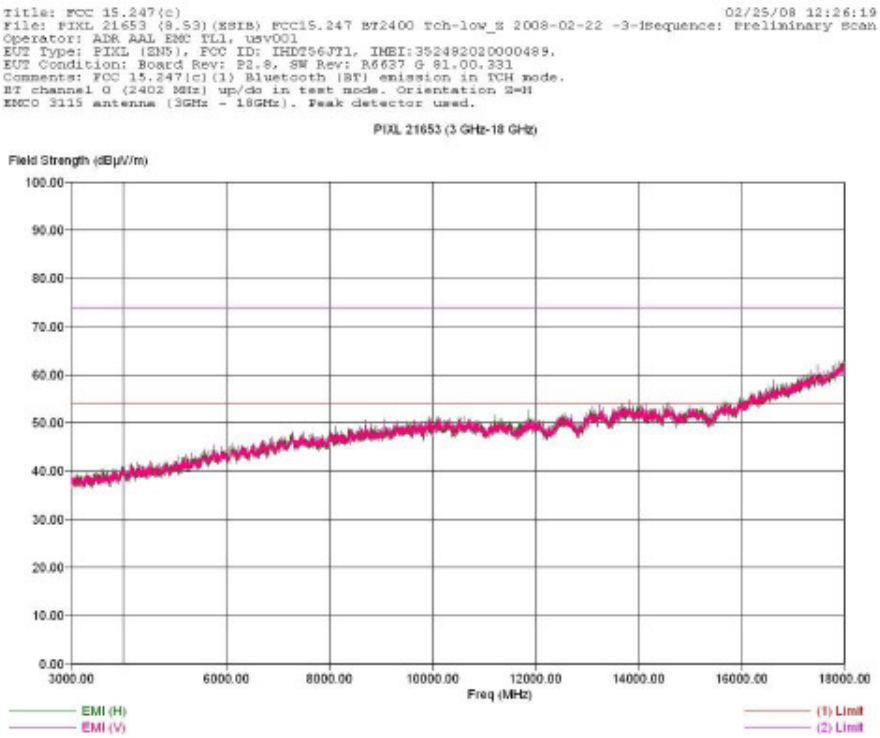
30-3000 MHz High Channel Dual Polarization Y



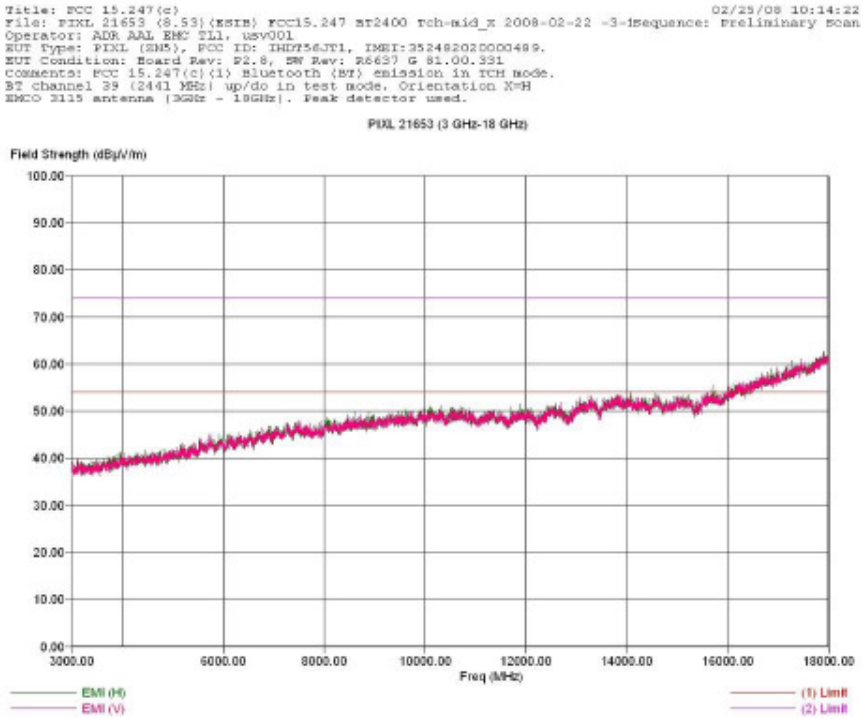
3-18 GHz Low Channel Dual Polarization X



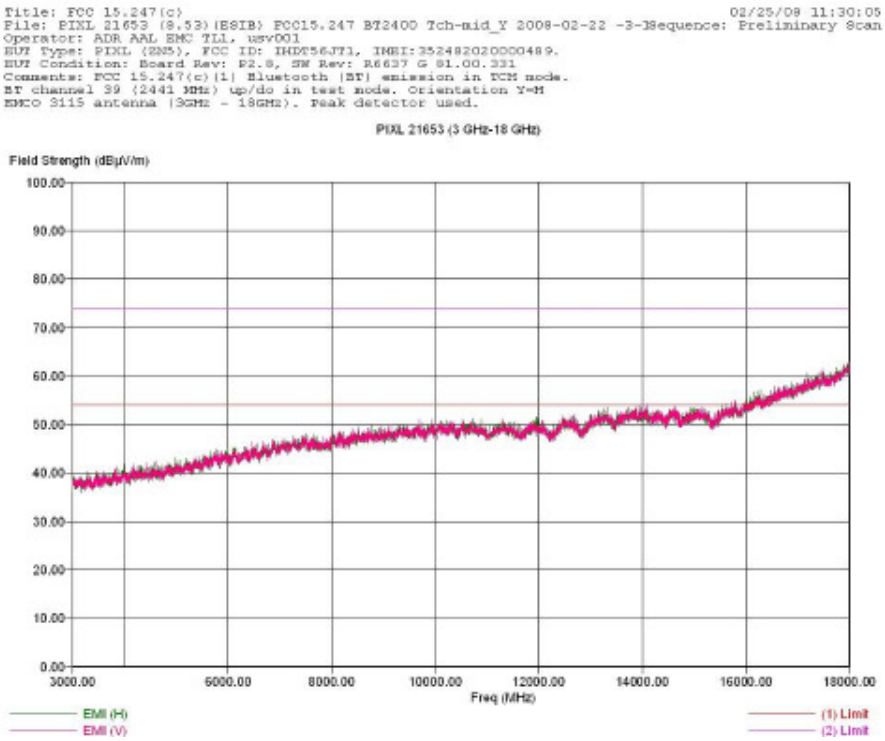
3-18 GHz Low Channel Dual Polarization Y



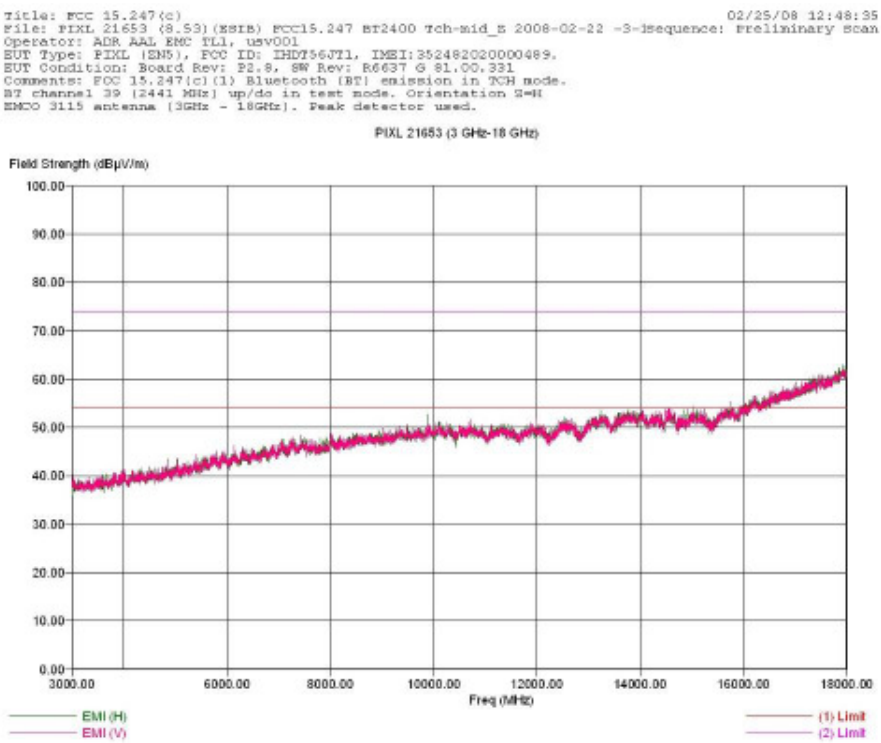
3-18 GHz Low Channel Dual Polarization Z



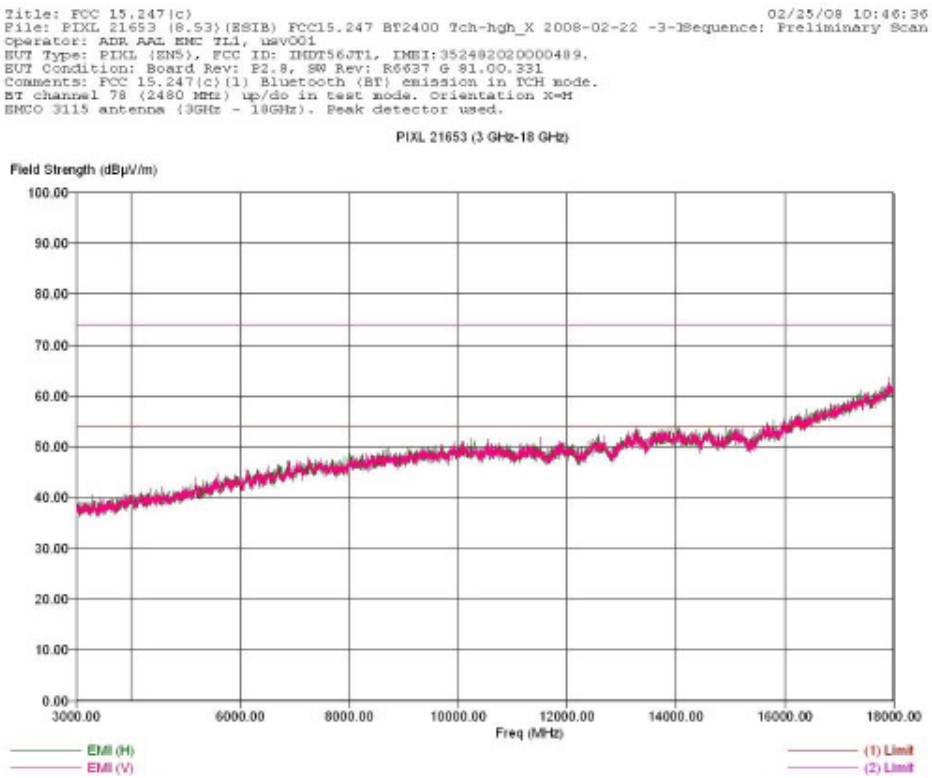
3-18 GHz Middle Channel Dual Polarization X



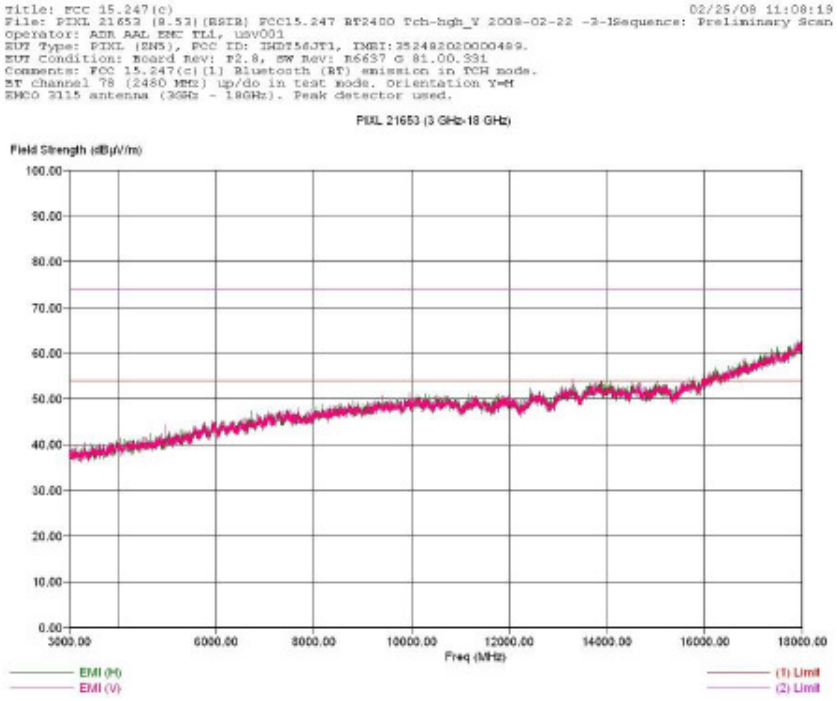
3-18 GHz Middle Channel Dual Polarization Y



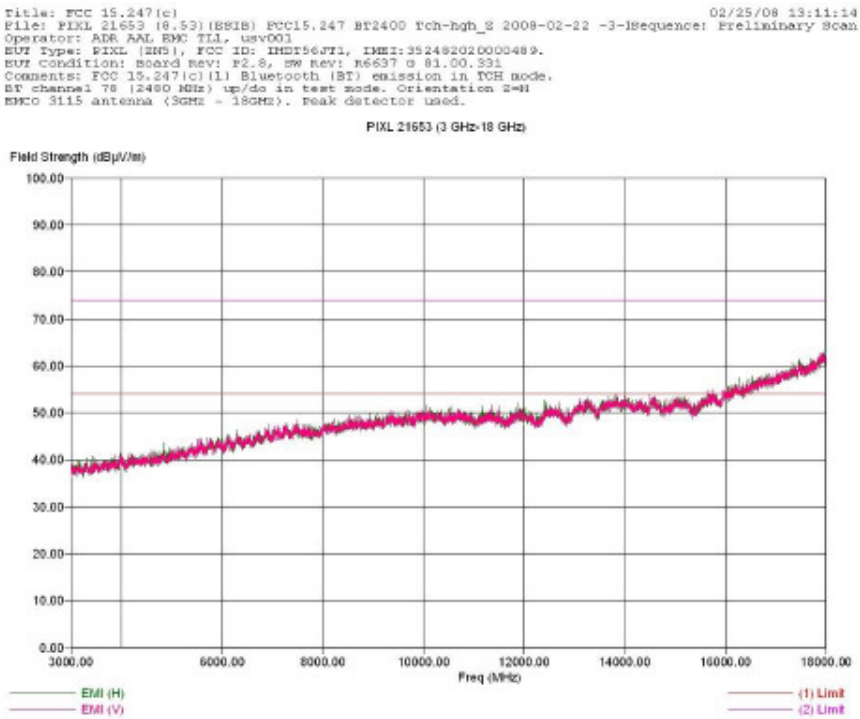
3-18 GHz Middle Channel Dual Polarization Z



3-18 GHz High Channel Dual Polarization X



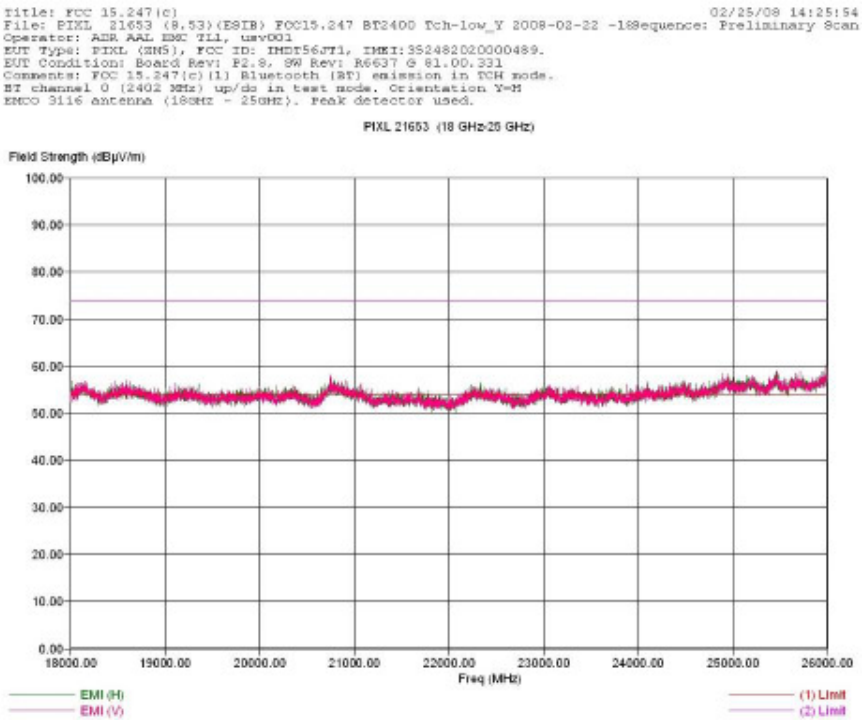
3-18 GHz High Channel Dual Polarization Y



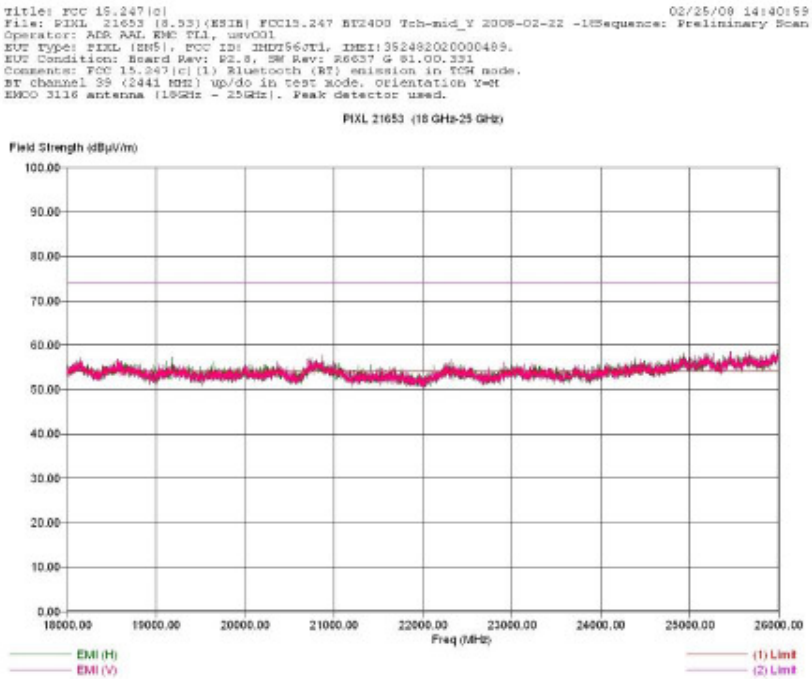
3-18 GHz High Channel Dual Polarization Z

There were no discernible emissions above the noise floor for 18000-25000MHz for Low, Mid and High Channels and all polarizations in Bluetooth band

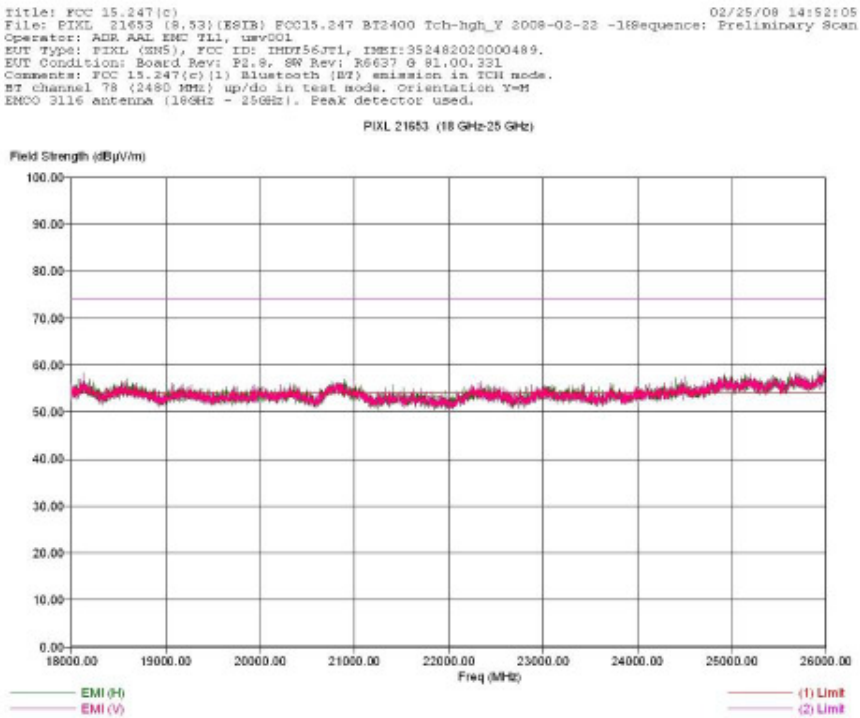
Only one worst case plot for each test frequency are shown in the below plots in the range from 18000 MHz – 26000 MHz.



18-25 GHz Low Channel Dual Polarization Y



18-25 GHz Middle Channel Dual Polarization Y



18-25 GHz High Channel Dual Polarization Y

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.

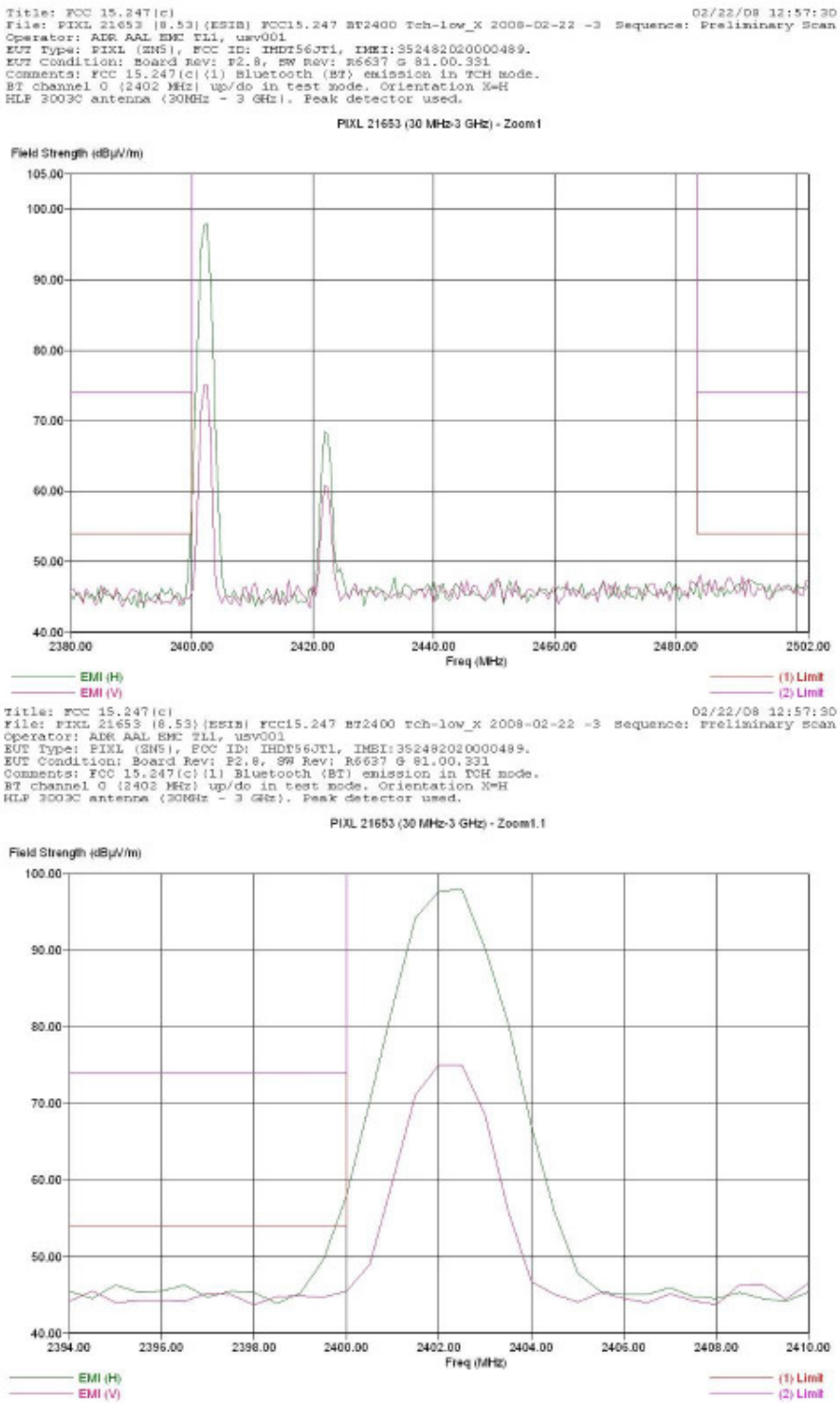
Field Strength (dBµV/m) = EMI Receiver Level (dBµV) + Cable Loss (dB) + Filter Loss (dB) - Amplifier Gain (dB) + Antenna Correction Factor (3/m)

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

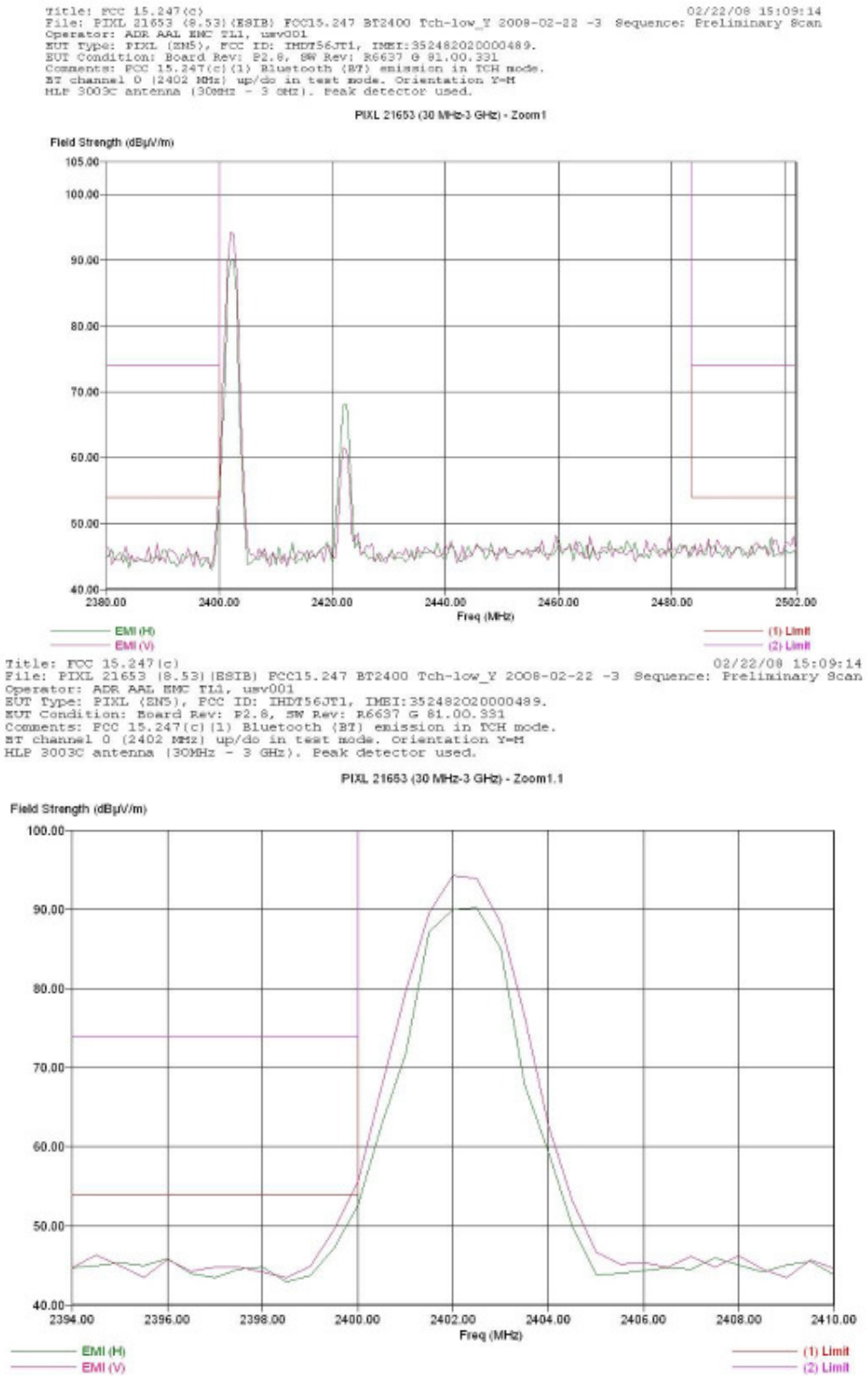
Measurement Results

Comments:
The band edge measurements crossing the corner for the low 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.

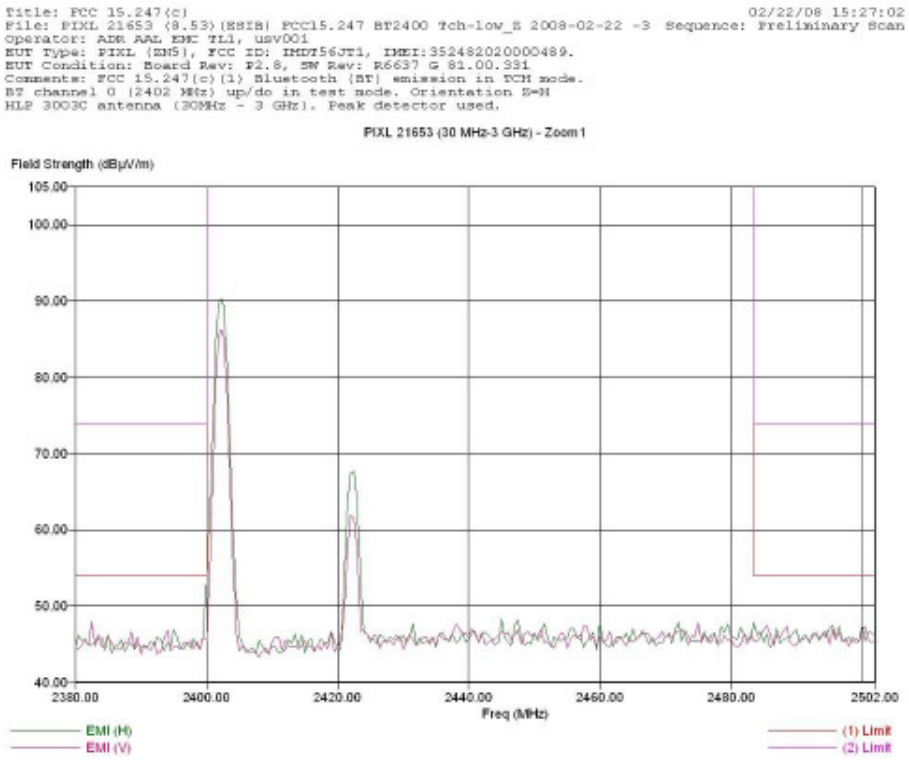
See Attached:

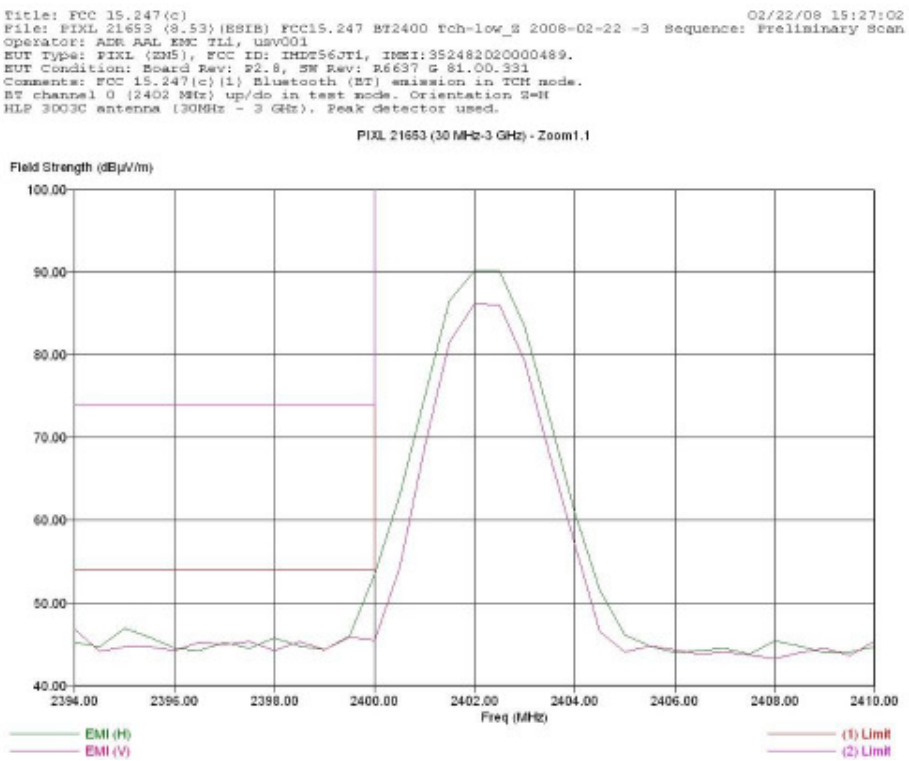


Authorized Band Emissions Low Channel Dual Polarization X

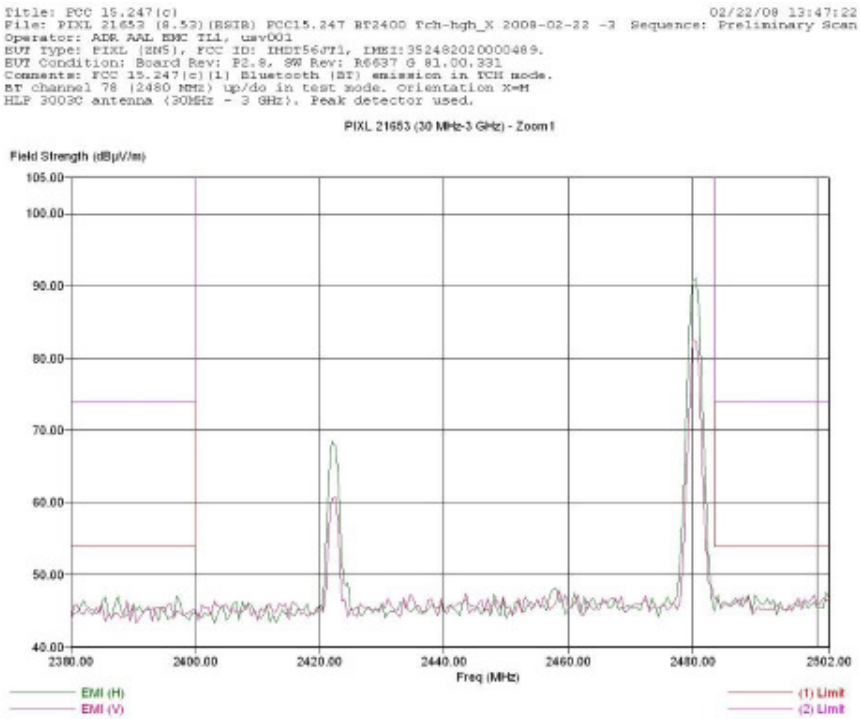


Authorized Band Emissions Low Channel Dual Polarization Y

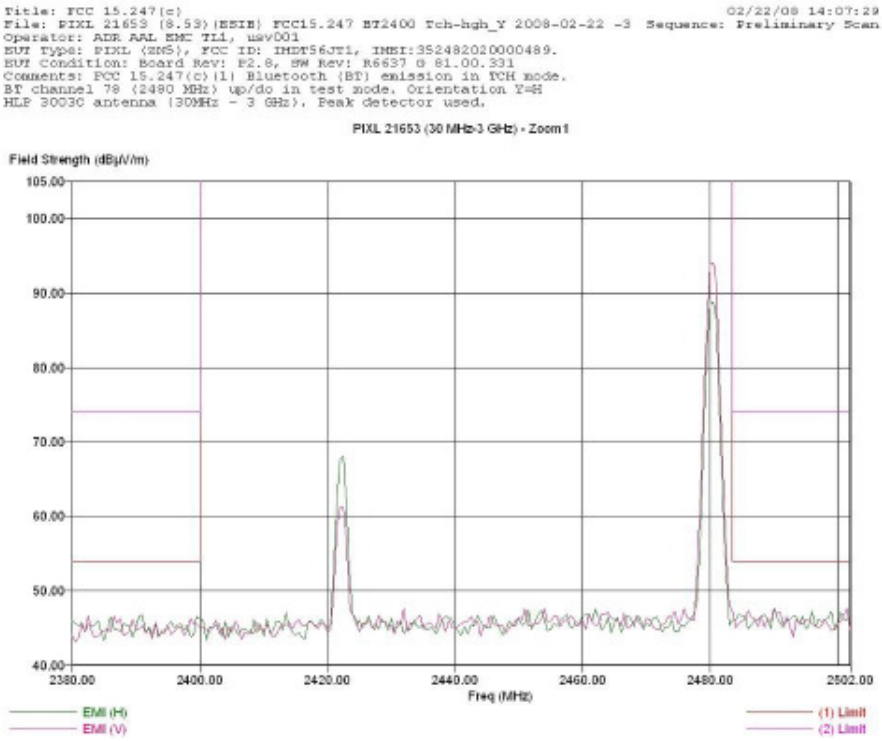




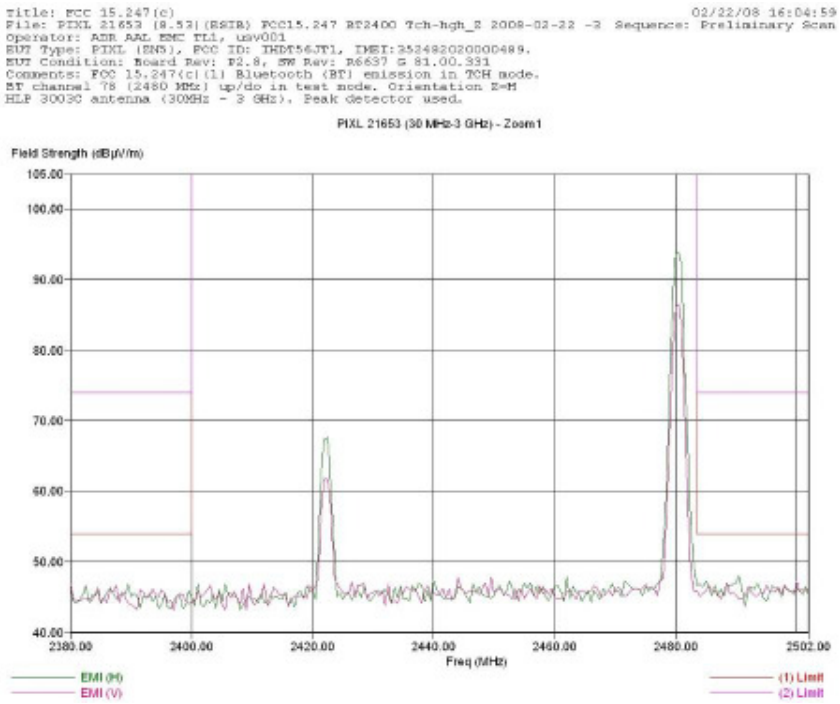
Authorized Band Emissions Low Channel Dual Polarization Z



Authorized Band Emissions High Channel Dual Polarization X



Authorized Band Emissions High Channel Dual Polarization Y



Authorized Band Emissions High Channel Dual Polarization Z

PICTURES

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

End of Test Report