



**MOTOROLA**

**MOBILE DEVICES BUSINESS**

**PRODUCT SAFETY AND COMPLIANCE  
EMC LABORATORY**

**EMC TEST REPORT - Addendum**

**Test Report Number** – 21699-1BT

**Report Date** – 2008-03-19

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:

*Hans K.*

Name: Hans Kristian Kristensen  
Test: 2008-03-17 to 2008-03-18

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

Signature:

*Per K. Nielsen*

Name: Per K. Nielsen

Title: Sr. Staff Engineer

Date: 2008-03-19

This report must not be reproduced, except in full, without written approval from this laboratory.

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

ADR Testing Service location ADR AL  
ISO/IEC-1725:2005 accredited by UKAS



**Table of Contents**

Test Report Details ..... 4

Applicable Standards ..... 5

Summary of Testing..... 6

General and Special Conditions..... 6

Equipment and Cable Configurations ..... 7

Measuring Equipment and Calibration Information ..... 7

Description of Bluetooth Transmitter ..... 9

Measurement Procedures and Data..... 10

**FIELD STRENGTH OF SPURIOUS EMISSIONS**..... 10

        Measurement Procedure..... 10

        Measurement Results ..... 10

            Maximum radiating position and orientation ..... 11

            30-3000 MHz Low Channel Dual Polarization X ..... 13

            30-3000 MHz Middle Channel Dual Polarization X ..... 13

            30-3000 MHz High Channel Dual Polarization X..... 14

            3-18 GHz Low Channel Dual Polarization X ..... 15

            3-18 GHz Low Channel Dual Polarization Y ..... 15

            3-18 GHz Low Channel Dual Polarization Z ..... 16

            3-18 GHz Middle Channel Dual Polarization X..... 16

            3-18 GHz Middle Channel Dual Polarization Y ..... 17

            3-18 GHz Middle Channel Dual Polarization Z ..... 17

            3-18 GHz High Channel Dual Polarization X ..... 18

            3-18 GHz High Channel Dual Polarization Y ..... 18

            3-18 GHz High Channel Dual Polarization Z..... 19

            18-25 GHz Low Channel Dual Polarization X ..... 20

            18-25 GHz Middle Channel Dual Polarization X..... 20

            18-25 GHz High Channel Dual Polarization X ..... 21

**BAND-EDGE COMPLIANCE OF RF RADIATED EMISSIONS**..... 22

        Measurement Procedure..... 22

        Measurement Results ..... 22

            Authorized Band Emissions Low Channel Dual Polarization X ..... 23

            Authorized Band Emissions Low Channel Dual Polarization Y ..... 24

            Authorized Band Emissions Low Channel Dual Polarization Z ..... 25

            Authorized Band Emissions High Channel Dual Polarization X ..... 26

            Authorized Band Emissions High Channel Dual Polarization Y ..... 26

            Authorized Band Emissions High Channel Dual Polarization Z..... 27

**PICTURES**..... 27

APPLICANT: MOTOROLA INC

FCC ID: IHDT56JF1

## **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: Flip

Signaling Capability: Triple band 850/1800/1900 GSM with GPRS class 10, Single band 800 CDMA with CDMA 1x, Bluetooth class 2, sGPS.

Serial Numbers: 351788020003849

FCC ID: IHDT56JF1

Project number: 21699-1

Testing Complete Date: 19-03-2008

## **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:

- 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 20.1° C +- 1 ° C and relative humidity of 34.3% +-4% over the days of 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:<br>(JCA12-300<br>JCA218-4003<br>JCA48-300<br>JCA1826-431<br>JCA1218-500) | 800002        | (1 – 26 GHz)<br>1 GHz – 2 GHz<br>2 GHz – 18 GHz<br>4 GHz – 8 GHz<br>18 GHz – 26 GHz<br>12 GHz – 18 GHz | 26.06.2007                   |
|                    | Sonoma 310N  | 185680        | 9 kHz – 1 GHz  | 19.06.2007                   |
| Antenna amplifiers | AFS4-02001800-35-ULN<br>(Mounted on EMCO 3115)                                     | 805815        | 2 GHz – 18 GHz   | 13.03.2008                   |
|                    | JSA-18004000-30-5A<br>(Mounted on EMCO 3116)                                       | 965195        | 18 GHz – 40 GHz  | 06.03.2008                   |
|                    | JCA 1840-400<br>(Mounted on EMCO 3116)   | 101           | 18 – 40 GHz  | 06.03.2008                   |
| Radio com. Tester  | CMU 200  | 112434        | GSM<br>850/900/1800/1900<br>IS95,<br>UMTS, CDMA,<br>Bluetooth  | 20.02.2008                   |
| High pass filter   | K&L 3DH1-3000/T13000-0/0<br>(Mounted on EMCO 3115)                                 | 8             | 3 GHz – 18 GHz   | 13.03.2008                   |
| Attenuator         | Weinschel 54A-3 (3dB)<br>(Mounted on EMCO 3116)                                    | T8929         | DC – 40 GHz  | 06.03.2008                   |
|                    | 3 x H&S 6603.19AA (3dB)<br>(Mounted on EMCO 3115)                                  | na            | DC-18 GHz  | 13.03.2008                   |
| Cable              | C-ANT-FP1-10S (SK)   | na            | 18 GHz – 40 GHz  | 06.03.2008                   |
|                    | C-ANT-FP1-4S (SMA)   | na            | 30 MHz – 18 GHz  | 26.06.2007 and<br>13.03.2008 |
| Filter             | F-3S-2S (SK-Bypass)  | na            | 30 MHz – 40 GHz  | 06.03.2008                   |

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<br>850/900/1800/1900<br>IS95,<br>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<br>(w. 3 GHz HP-filter + 2x 2-18 GHz pre-amp+3x 3dB attenuator.) | EMCO 3115 | 00071502      | 1 GHz – 18 GHz    | 07.05.07            |
| Double rigid horn<br>(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 Transmitter**

The 21699-1 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.

## **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 (dB $\mu$ V/m) = EMI Receiver Level (dB $\mu$ V) + 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 BC70 with model number SNN5769B

#### **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 in clamshell lid open position 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 X orientation in horizontal polarity.

With the test sample clamshell lid closed in was determined that the open position caused maximum radiation in the Bluetooth band.

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 with clamshell lid open and placed in orientation X.

#### Open:

Title: FCC 15.247(c)  
 File: Greatwall 21699 (8.53)(ESIB) FCC15.247 BT2400 Tch-mid\_X 2008-03-17 Carrier-PK  
 Operator: ADR\_AAL\_EMIC\_TL1.hkr001  
 EUT Type: Greatwall, FCC ID: IHDT56JF1, IMEI:351788020003849.  
 EUT Condition: Board Rev:P2.  
 Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.  
 BT channel 39 (2441 MHz) up/do in test mode. Orientation X=H  
 HLP 3003 C antenna (30MHz - 3 GHz). Peak detector used.

03/17/08 11:00:23  
 Sequence: Final Measurements

Greatwall 21699 - Carrier (X) -Table

| Freq (MHz) | Freq (Max) (MHz) | (PK) EMI (dBµV/m) | (1) Limit (dBµV/m) | (PK) Margin Lim1 (dB) | Ttbt Agl (deg) | Pol. |
|------------|------------------|-------------------|--------------------|-----------------------|----------------|------|
| 2441.00    | 2440.87          | 96.65             | 120.00             | -23.35                | 231.10         | H    |
| 2441.00    | 2440.88          | 88.21             | 120.00             | -31.79                | 142.70         | V    |

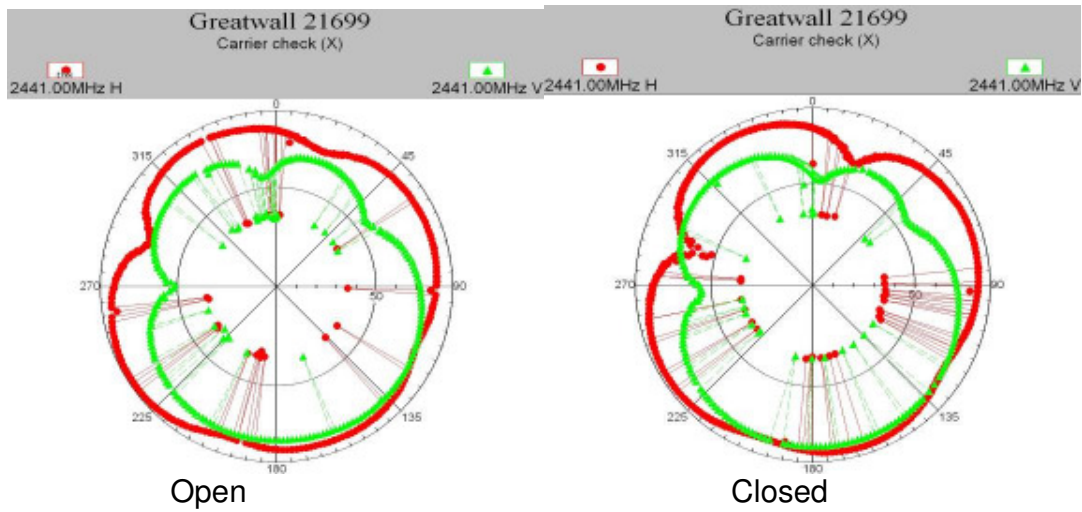
#### Closed:

Title: FCC 15.247(c)  
 File: Greatwall 21699 (8.53)(ESIB) FCC15.247 BT2400 Tch-mid\_X 2008-03-17 Carrier-PK -closed  
 Operator: ADR\_AAL\_EMIC\_TL1.hkr001  
 EUT Type: Greatwall, FCC ID: IHDT56JF1, IMEI:351788020003849.  
 EUT Condition: Board Rev:P2. Closed  
 Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.  
 BT channel 39 (2441 MHz) up/do in test mode. Orientation X=H  
 HLP 3003 C antenna (30MHz - 3 GHz). Peak detector used.

03/17/08 11:40:44  
 Sequence: Final Measurements

Greatwall 21699 - Carrier (X) -Table

| Freq (MHz) | Freq (Max) (MHz) | (PK) EMI (dBµV/m) | (1) Limit (dBµV/m) | (PK) Margin Lim1 (dB) | Ttbt Agl (deg) | Pol. |
|------------|------------------|-------------------|--------------------|-----------------------|----------------|------|
| 2441.00    | 2440.85          | 94.35             | 120.00             | -25.65                | 231.70         | H    |
| 2441.00    | 2441.21          | 89.20             | 120.00             | -30.80                | 172.40         | V    |



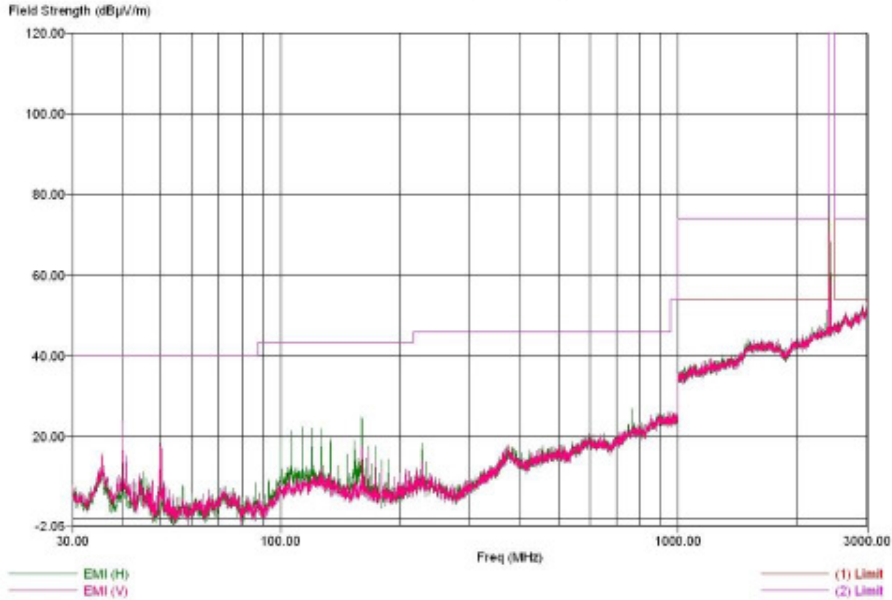
The Maximum Bluetooth radiated TX power is measured to -0.75 dBm on channel 39 with RBW=1 MHz.

**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.

Title: FCC 15.247(c)  
File: Greatwall 21699 (8.53)(ESIB) FCC15.247 BT2400 Tch-Low\_X 2008-03-17Sequence: Preliminary Scan  
Operator: ADR AAL EMC TLI, hkr001  
EUT Type: Greatwall, FCC ID: IHDT56JF1, IMEI:351788020003849.  
EUT Condition: Board Rev: P2.  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.  
BT channel 0 (2402 MHz) up/down in test mode. Orientation X=H  
HLP 3003C antenna (30MHz - 3 GHz). Peak detector used.

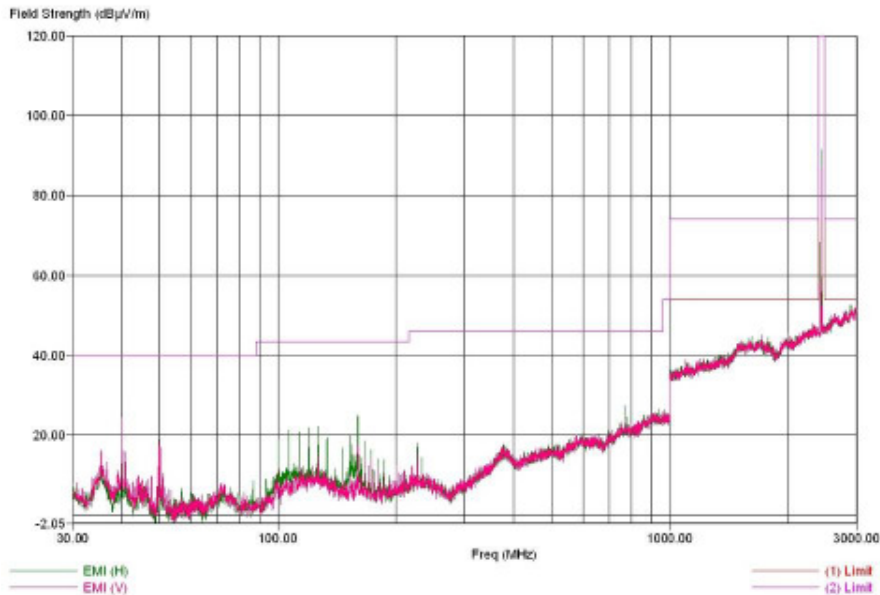
Greatwall 21699 (30 MHz-3 GHz)



### 30-3000 MHz Low Channel Dual Polarization X

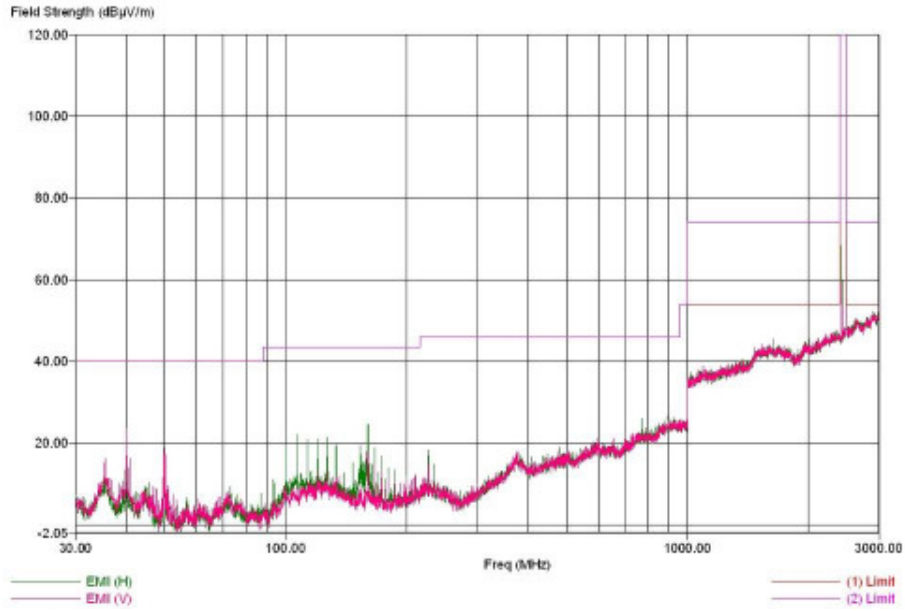
Title: FCC 15.247(c)  
File: Greatwall 21699 (8.53)(ESIB) FCC15.247 BT2400 Tch-mid\_X 2008-03-17Sequence: Preliminary Scan  
Operator: ADR AAL EMC TLI, hkr001  
EUT Type: Greatwall, FCC ID: IHDT56JF1, IMEI:351788020003849.  
EUT Condition: Board Rev: P2.  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.  
BT channel 39 (2441 MHz) up/down in test mode. Orientation X=H  
HLP 3003C antenna (30MHz - 3 GHz). Peak detector used.

Greatwall 21699 (30 MHz-3 GHz)



### 30-3000 MHz Middle Channel Dual Polarization X

Title: FCC 15.247(c)  
File: Greatwall 21699 (8.53)(ESIB) FCC15.247 BT2400 Ech-hgh\_X 2008-03-17:sequence: Preliminary Scan  
Operator: ADA AAL RME TLL, hkr001  
EUT Type: Greatwall, FCC ID: IHDT56JF1, IMEI:351788020003849.  
EUT Condition: Board Rev: F2.  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCM mode.  
BT channel 78 (2480 MHz) up/down in test mode. Orientation X=H  
HLP 3003C antenna (30MHz - 3 GHz). Peak detector used.  
Greatwall 21699 (30 MHz-3 GHz)

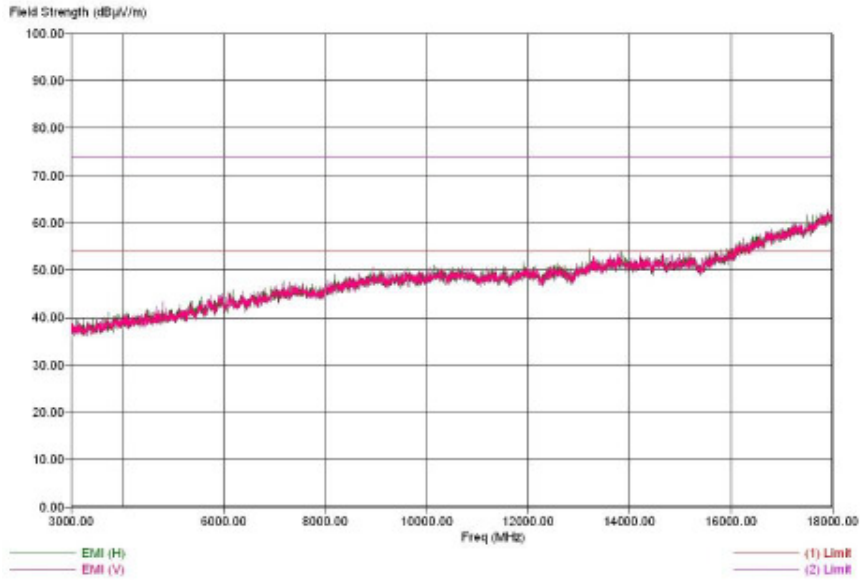


### 30-3000 MHz High Channel Dual Polarization X

Title: FCC 15.247(c)  
File: Greatwall 21699 (8.53)(ES1B) FCC15.247 BT2400 Tch-Low\_X 2008-02-22Sequence: Preliminary Scan  
Operator: ADR AAL EMC TLL, hkr001  
EUT Type: Greatwall, FCC ID: IHDT56JF1, IMEI:351788020003849.  
EUT Condition: Board Rev: F2  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.  
BT channel 0 (2402 MHz) up/down in test mode. Orientation X=H  
EMC 3115 antenna (3GHz - 18GHz). Peak detector used.

03/18/08 11:51:05

Greatwall 21699 (3 GHz-18 GHz)

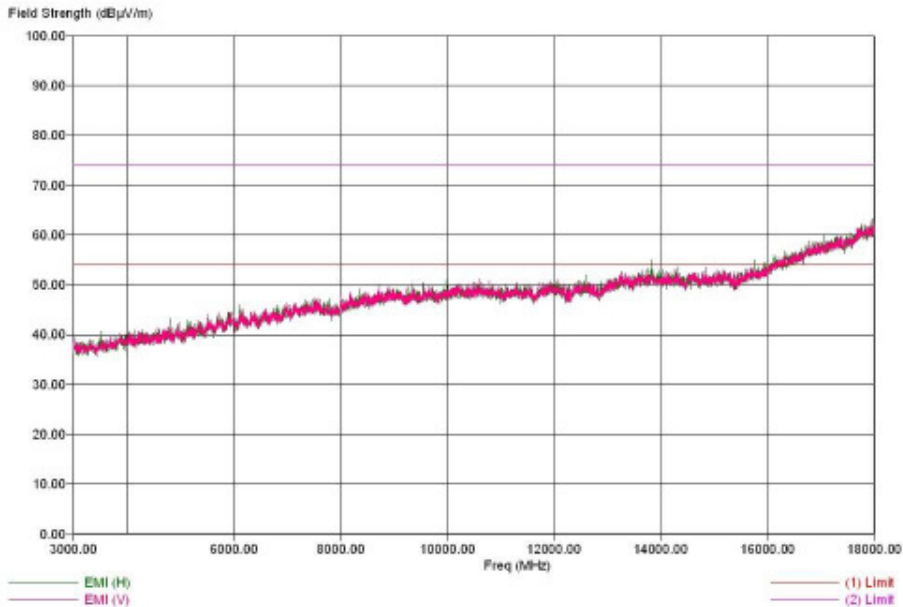


### 3-18 GHz Low Channel Dual Polarization X

Title: FCC 15.247(c)  
File: Greatwall 21699 (8.53)(ES1B) FCC15.247 BT2400 Tch-Low\_Y 2008-02-22Sequence: Preliminary Scan  
Operator: ADR AAL EMC TLL, hkr001  
EUT Type: Greatwall, FCC ID: IHDT56JF1, IMEI:351788020003849.  
EUT Condition: Board Rev: F2  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.  
BT channel 0 (2402 MHz) up/down in test mode. Orientation Y=V  
EMC 3115 antenna (3GHz - 18GHz). Peak detector used.

03/18/08 09:16:17

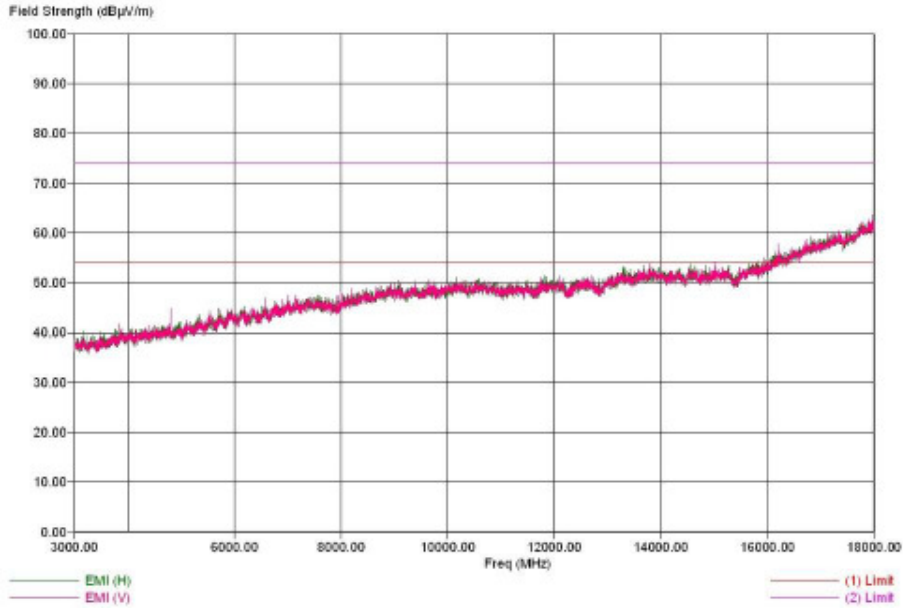
Greatwall 21699 (3 GHz-18 GHz)



### 3-18 GHz Low Channel Dual Polarization Y

Title: FCC 15.247(c)  
File: Greatwall 21699 (8.53)(RSTR) FCC15.247 BT2400 Tch-low\_E 2008-02-22Sequence: Preliminary Scan  
Operator: ADR AAL EMC TIL, hkr001  
EUT Type: Greatwall, FCC ID: IHDT56JF1, IMEI:351789020003849,  
EUT Condition: Board Rev: P2  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.  
BT channel 0 (2402 MHz) up/down in test mode. Orientation E=V  
EMCO 3115 antenna (3GHz - 18GHz). Peak detector used.

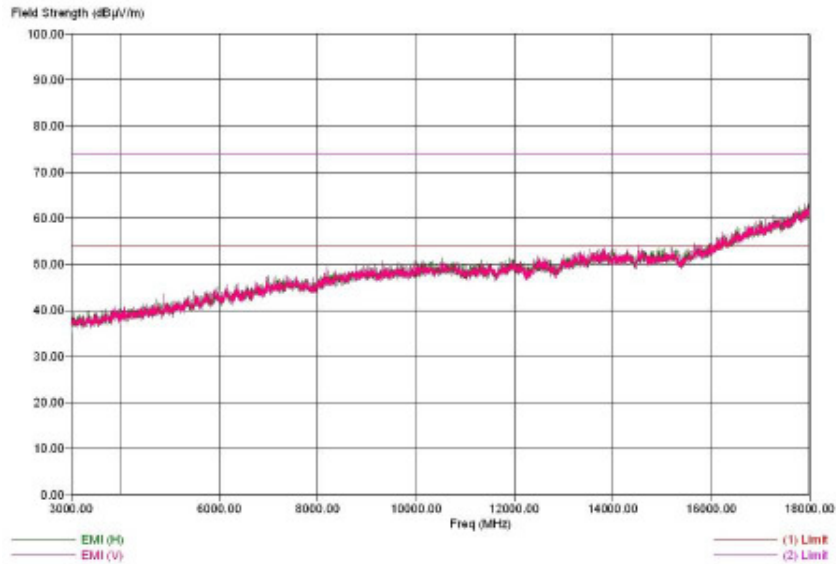
Greatwall 21699 (3 GHz-18 GHz)



### 3-18 GHz Low Channel Dual Polarization Z

Title: FCC 15.247(c)  
File: Greatwall 21699 (8.53)(RSTR) FCC15.247 RFR400 Tch-mid\_X 2008-02-22Sequence: Preliminary Scan  
Operator: ADR AAL EMC TIL, hkr001  
EUT Type: Greatwall, FCC ID: IHDT56JF1, IMEI:351789020003849,  
EUT Condition: Board Rev: P2  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.  
BT channel 39 (2441 MHz) up/down in test mode. Orientation X=H  
EMCO 3115 antenna (3GHz - 18GHz). Peak detector used.

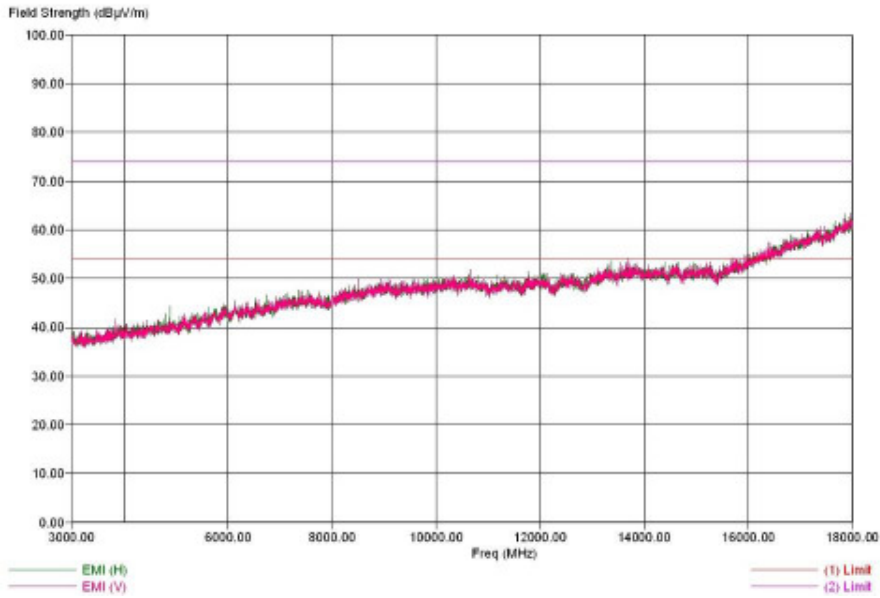
Greatwall 21699 (3 GHz-18 GHz)



### 3-18 GHz Middle Channel Dual Polarization X

Title: FCC 15.247(c)  
File: Greatwall 21699 (8.53)(ES18) FCC15.247 BT2400 Tech-mid\_Y 2008-02-22 Sequence: Preliminary Scan  
Operator: ADR AAL EMC TLL, hkr001  
EUT Type: Greatwall, FCC ID: IHDT56JF1, IMEI:351789020003849.  
EUT Condition: Board Rev: P2  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCM mode.  
BT channel 39 (2441 MHz) up/down in test mode. Orientation Y=V  
EMCO 3115 antenna (3GHz - 18GHz). Peak detector used.

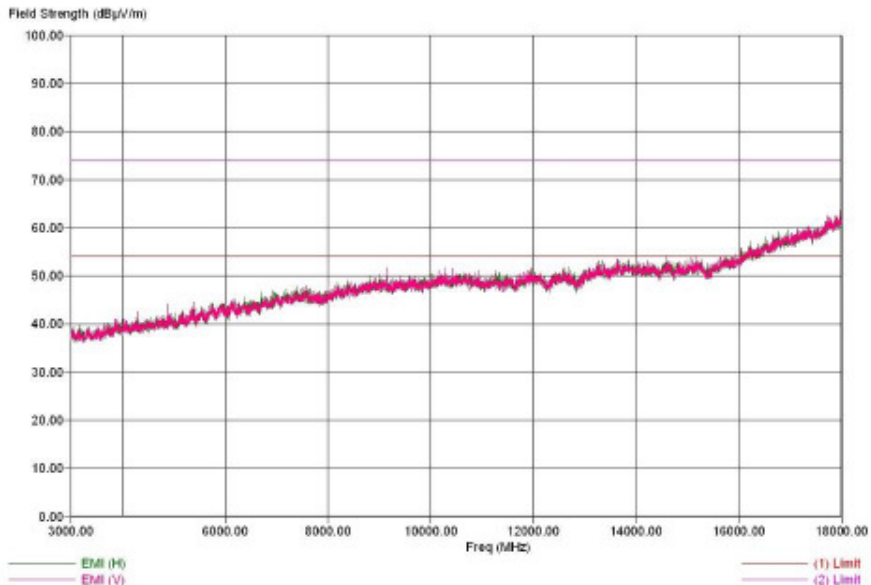
Greatwall 21699 (3 GHz-18 GHz)



### 3-18 GHz Middle Channel Dual Polarization Y

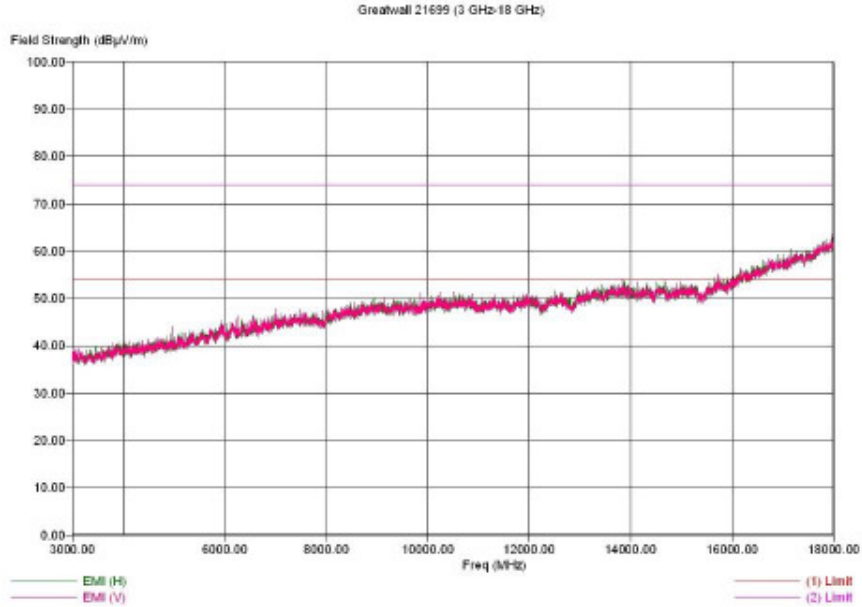
Title: FCC 15.247(c)  
File: Greatwall 21699 (8.53)(ES18) FCC15.247 BT2400 Tech-mid\_Z 2008-02-22 Sequence: Preliminary Scan  
Operator: ADR AAL EMC TLL, hkr001  
EUT Type: Greatwall, FCC ID: IHDT56JF1, IMEI:351789020003849.  
EUT Condition: Board Rev: P2  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCM mode.  
BT channel 39 (2441 MHz) up/down in test mode. Orientation Z=V  
EMCO 3115 antenna (3GHz - 18GHz). Peak detector used.

Greatwall 21699 (3 GHz-18 GHz)



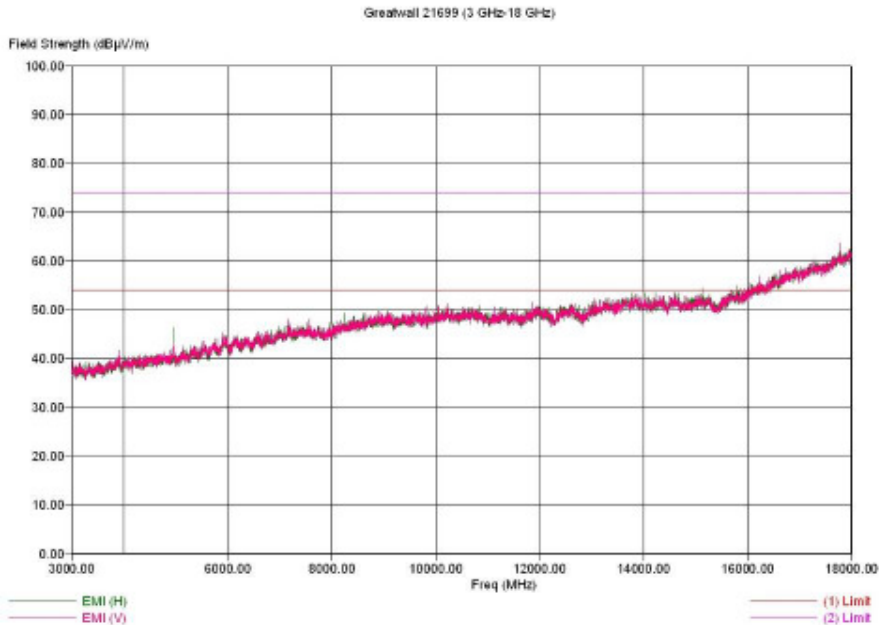
### 3-18 GHz Middle Channel Dual Polarization Z

Title: FCC 15.247(c)  
File: Greatwall 21699 (8.53)(ESIB) FCC15.247 BT2400 Tch-hgh\_X 2008-02-22Sequence: Preliminary Scan  
Operator: ADR AAL EMC TLL, hkr001  
EUT Type: Greatwall, FCC ID: IHDT56JF1, IMEI:351789020003849.  
EUT Condition: Board Rev: F2  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.  
BT channel 78 (2480 MHz) up/down in test mode. Orientation X=H  
EMCO 3115 antenna (3GHz - 18GHz). Peak detector used.



### 3-18 GHz High Channel Dual Polarization X

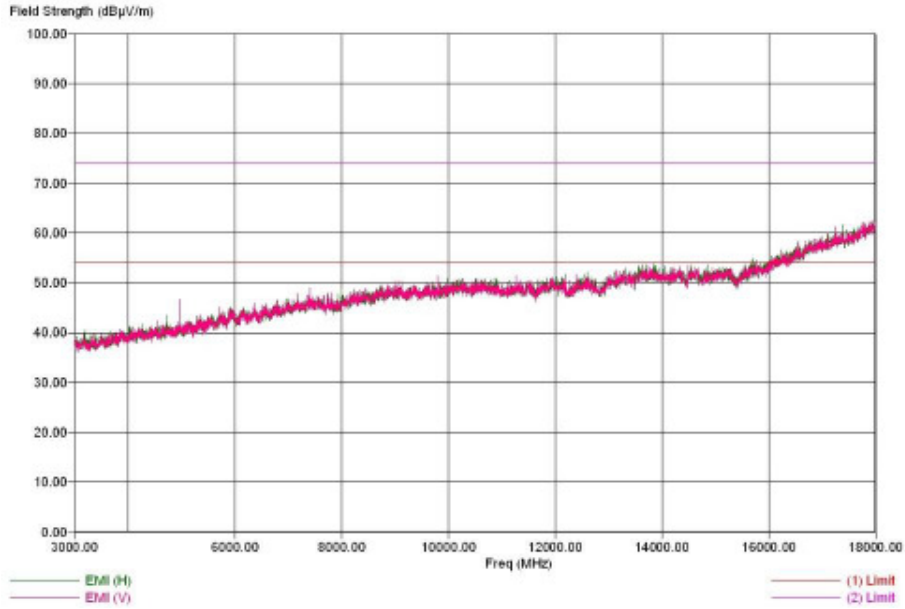
Title: FCC 15.247(c)  
File: Greatwall 21699 (8.53)(ESIB) FCC15.247 BT2400 Tch-hgh\_Y 2008-02-22Sequence: Preliminary Scan  
Operator: ADR AAL EMC TLL, hkr001  
EUT Type: Greatwall, FCC ID: IHDT56JF1, IMEI:351789020003849.  
EUT Condition: Board Rev: F2  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.  
BT channel 78 (2480 MHz) up/down in test mode. Orientation Y=V  
EMCO 3115 antenna (3GHz - 18GHz). Peak detector used.



### 3-18 GHz High Channel Dual Polarization Y

Title: FCC 15.247(c)  
File: Greatwall 21699 [8.53](BSIB) FCC15.247 BT2400 Tch-hgh\_S 2008-02-22Sequence: Preliminary Scan  
Operator: ADR AAL EMC TLL, hkrDC1  
SUT Type: Greatwall, FCC ID: IHDT56JF1, IMEI:351788020003849.  
SUT Condition: Board Rev: F2  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.  
BT channel 78 (2480 MHz) up/do in test mode. orientation E-V  
EMCO 3115 antenna (3GHz - 18GHz). Peak detector used.

Greatwall 21699 (3 GHz-18 GHz)



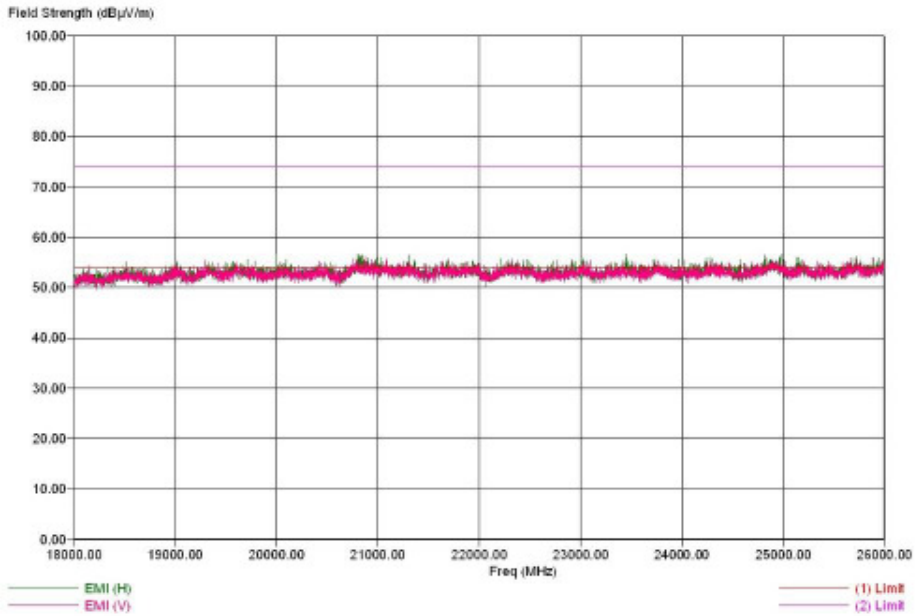
**3-18 GHz High Channel Dual Polarization Z**

**There were no discernible emissions above the noise floor for 18-26 GHz 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 18 GHz – 26 GHz.

Title: FCC 15.247(c) 03/16/08 12:22:25  
File: Greatwall 21699 (8.53)(ESIB) FCC15.247 BT2400 Tch-low\_X 2008-03-22Sequence: Preliminary Scan  
Operator: ADR AAL EMC TLI, hkr001  
EUT Type: Greatwall, FCC ID: IHDT56JF1, IMEI:351789020003849.  
EUT Condition: Board Rev: P2  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.  
BT channel 0 (2402 MHz) up/do in test mode. Orientation X=H  
EMCO 3116 antenna (18GHz - 25GHz). Peak detector used.

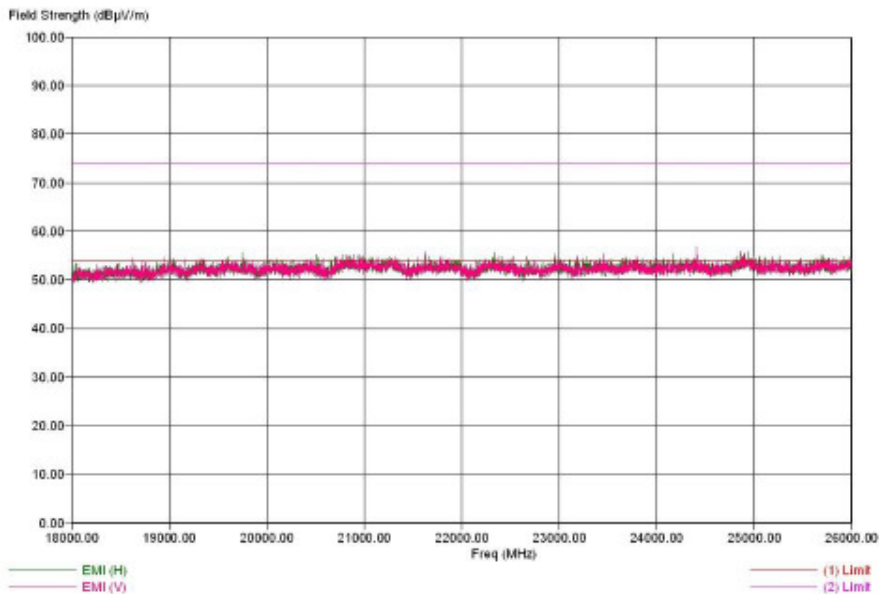
Greatwall 21699 (18 GHz-25 GHz)



### 18-25 GHz Low Channel Dual Polarization X

Title: FCC 15.247(c) 03/18/08 12:51:03  
File: Greatwall 21699 (8.53)(ESIB) FCC15.247 BT2400 Tch-mid\_x 2008-03-22Sequence: Preliminary Scan  
Operator: ADR AAL EMC TLI, hkr001  
EUT Type: Greatwall, FCC ID: IHDT56JF1, IMEI:351789020003849.  
EUT Condition: Board Rev: P2  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.  
BT channel 39 (2441 MHz) up/do in test mode. Orientation X=H  
EMCO 3116 antenna (18GHz - 25GHz). Peak detector used.

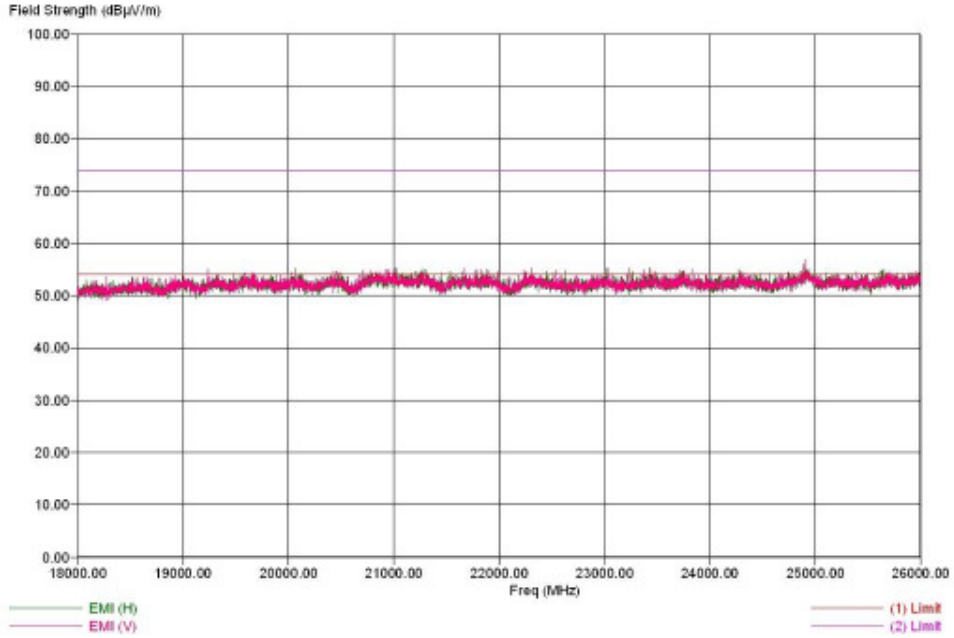
Greatwall 21699 (18 GHz-25 GHz)



### 18-25 GHz Middle Channel Dual Polarization X

Title: FCC 15.247(c)  
File: Greatwall 21699 (8.53)(ESIB) FCC15.247 BT2400 Ech-hgh\_X 2008-03-22Sequence: Preliminary Scan  
Operator: ADR PAL EMC TLL, hkr001  
EUT Type: Greatwall, FCC ID: IHDT56JF1, IMEI:351788020003849.  
EUT Condition: Board Rev: P2  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.  
BT channel 70 (2400 MHz) up/down in test mode. Orientation X=H  
EMCO 3116 antenna (18GHz - 25GHz). Peak detector used.

Greatwall 21699 (18 GHz-25 GHz)



**18-25 GHz High Channel Dual Polarization X**

## **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 (dB $\mu$ V/m) = EMI Receiver Level (dB $\mu$ V) + 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**

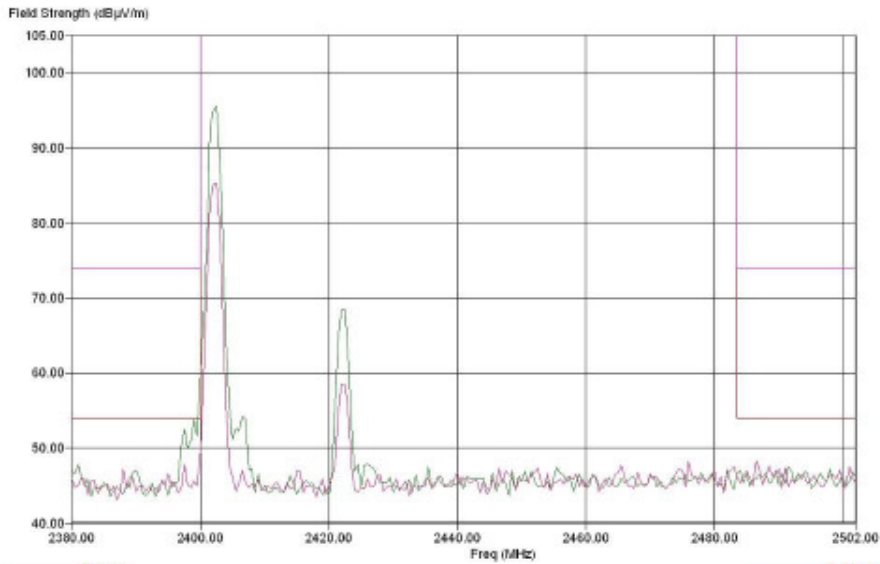
Comments:

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:

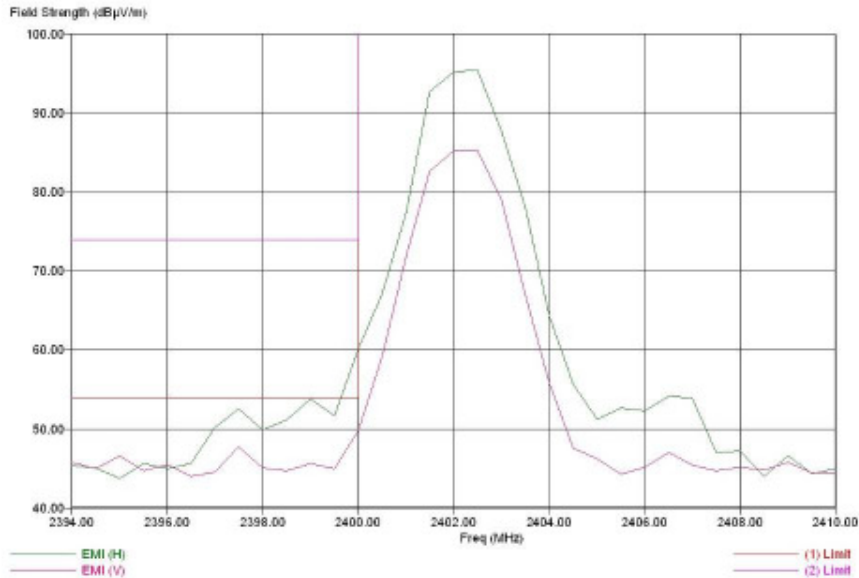
Title: FCC 15.247(c)  
File: Greatwall 21699 (8.53)(ESIB) FCC15.247 B7240G Tch-low\_X 2008-03-17Sequence: Preliminary Scan  
Operator: ADR AAL EMC TLL, hkr001  
EUT Type: Greatwall, FCC ID: IHDT56JF1, IMEI:351788020003849.  
EUT Condition: Board Rev: P2.  
Comments: FCC 15.247(c) (1) Bluetooth (BT) emission in TCM mode.  
BT channel 0 (2402 MHz) up/down in test mode. Orientation X-H  
HLP 3003C antenna (30MHz - 3 GHz). Peak detector used.

Greatwall 21699 (30 MHz-3 GHz) - Zoom1



EMI (H) (1) Limit  
EMI (V) (2) Limit  
Title: FCC 15.247(c)  
File: Greatwall 21699 (8.53)(ESIB) FCC15.247 B7240G Tch-low\_X 2008-03-17Sequence: Preliminary Scan  
Operator: ADR AAL EMC TLL, hkr001  
EUT Type: Greatwall, FCC ID: IHDT56JF1, IMEI:351788020003849.  
EUT Condition: Board Rev: P2.  
Comments: FCC 15.247(c) (1) Bluetooth (BT) emission in TCM mode.  
BT channel 0 (2402 MHz) up/down in test mode. Orientation X-H  
HLP 3003C antenna (30MHz - 3 GHz). Peak detector used.

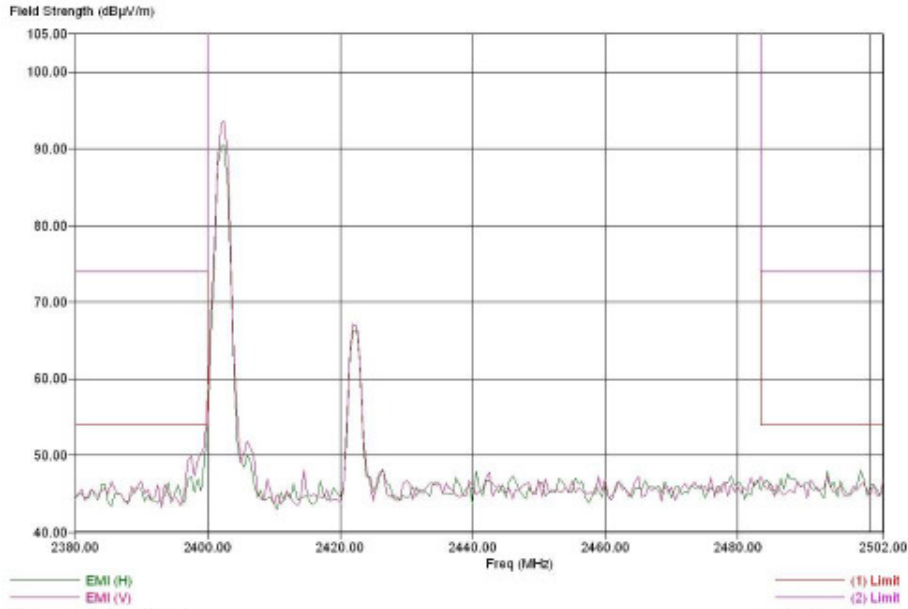
Greatwall 21699 (30 MHz-3 GHz) - Zoom1.1



**Authorized Band Emissions Low Channel Dual Polarization X**

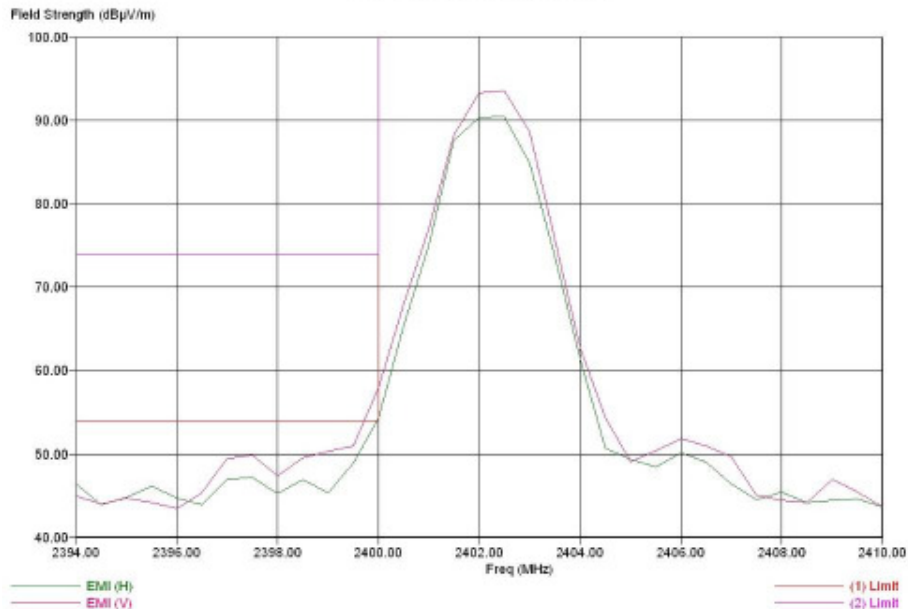
Title: FCC 15.247(c)  
File: Greatwall 21699 (8.53)(ESIB) FCC15.247 BT2400 Tch-low\_Y 2008-03-17Sequence: Preliminary Scan  
Operator: ADR AAL EME TLL, hkr001  
EUT Type: Greatwall, FCC ID: IHDT56JF1, IMEI:351788020003849.  
EUT Condition: Board Rev: F2.  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.  
BT channel 0 (2402MHz) up/do in test mode. Orientation Y=V  
HLP 3003C antenna (30MHz - 3 GHz). Peak detector used.

Greatwall 21699 (30 MHz-3 GHz) - Zoom1



Title: FCC 15.247(c)  
File: Greatwall 21699 (8.53)(ESIB) FCC15.247 BT2400 Tch-low\_Y 2008-03-17Sequence: Preliminary Scan  
Operator: ADR AAL EME TLL, hkr001  
EUT Type: Greatwall, FCC ID: IHDT56JF1, IMEI:351788020003849.  
EUT Condition: Board Rev: F2.  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.  
BT channel 0 (2402MHz) up/do in test mode. Orientation Y=V  
HLP 3003C antenna (30MHz - 3 GHz). Peak detector used.

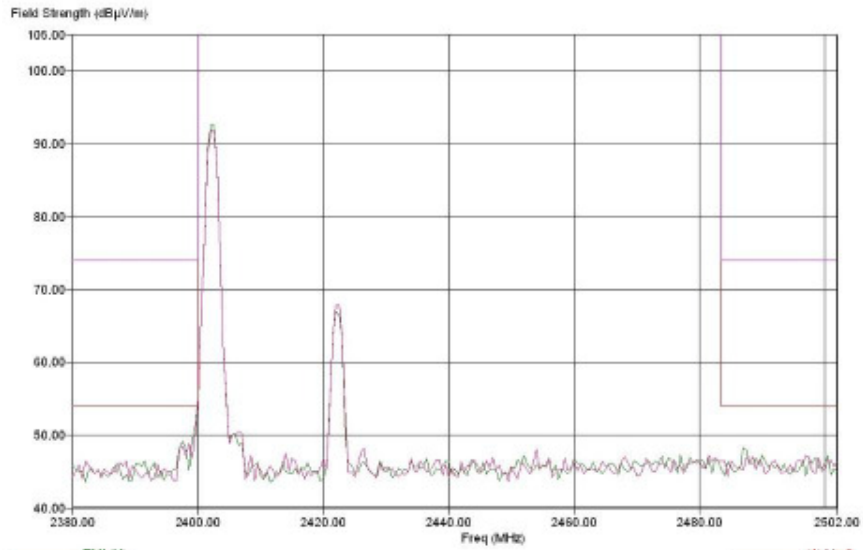
Greatwall 21699 (30 MHz-3 GHz) - Zoom1.1



**Authorized Band Emissions Low Channel Dual Polarization Y**

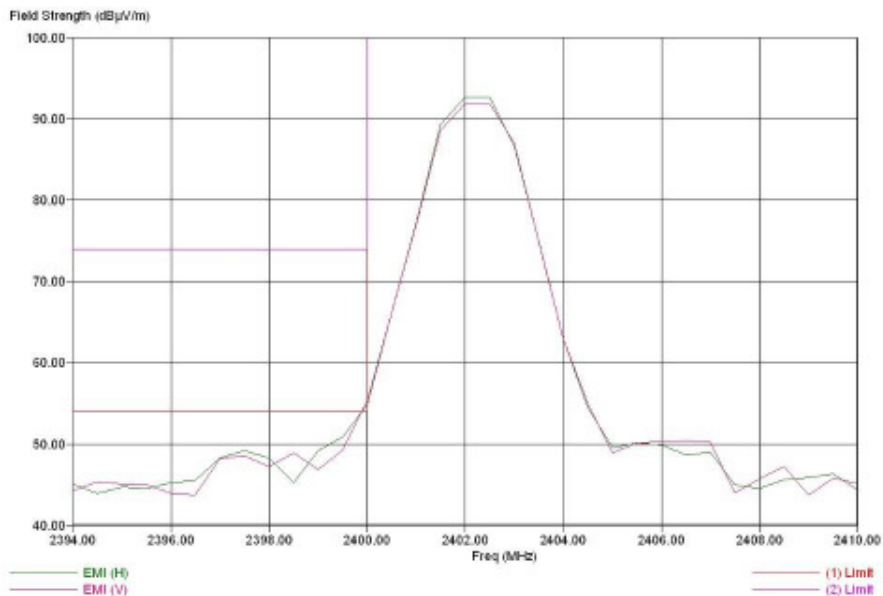
Title: FCC 15.247(c)  
File: Greatwall 21699 (8.53)(ESIB) FCC15.247 BT2400 Tch-low\_Z 2008-03-17 Sequence: Preliminary Scan  
Operator: ADM AAL EMC TLI, hkr001  
EUT Type: Greatwall, FCC ID: IHDT56JF1, IMEI:351788020003849.  
EUT Condition: Board Rev: P2.  
Comments: FCC 15.247(c) (1) Bluetooth (BT) emission in TCH mode.  
BT channel 0 (2402MHz) up/down in test mode. Orientation Z=V  
HLP 3003C antenna (30MHz - 3 GHz). Peak detector used.

Greatwall 21699 (30 MHz-3 GHz) - Zoom1



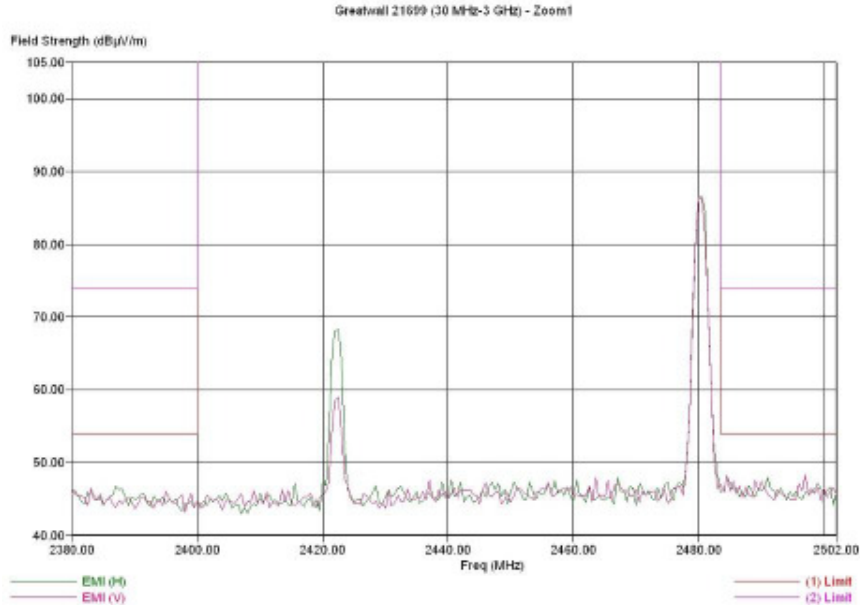
Title: FCC 15.247(c)  
File: Greatwall 21699 (8.53)(ESIB) FCC15.247 BT2400 Tch-low\_Z 2008-03-17 Sequence: Preliminary Scan  
Operator: ADM AAL EMC TLI, hkr001  
EUT Type: Greatwall, FCC ID: IHDT56JF1, IMEI:351788020003849.  
EUT Condition: Board Rev: P2.  
Comments: FCC 15.247(c) (1) Bluetooth (BT) emission in TCH mode.  
BT channel 0 (2402MHz) up/down in test mode. Orientation Z=V  
HLP 3003C antenna (30MHz - 3 GHz). Peak detector used.

Greatwall 21699 (30 MHz-3 GHz) - Zoom1.1



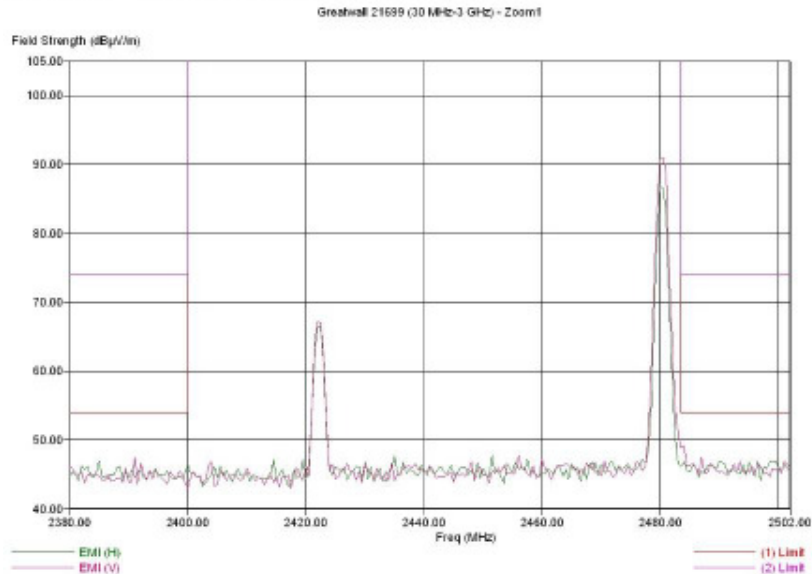
**Authorized Band Emissions Low Channel Dual Polarization Z**

Title: FCC 15.247(c) 03/17/08 13:04:27  
File: Greatwall 21699 (8.53)(ES18) FCC15.247 BT2400 Tch-hgh\_X 2008-03-17 Sequence: Preliminary Scan  
Operator: ADR AAL EMC TLL hkr001  
EUT Type: Greatwall, FCC ID: IHDT56JF1, IMEI:351789020003849.  
EUT Condition: Board Rev: F2.  
Comments: FCC 15.247(c) (1) Bluetooth (BT) emission in TCH mode.  
BT channel 78 (2480 MHz) up/do in test mode. Orientation X=H  
HLP 3003C antenna (30MHz - 3 GHz). Peak detector used.



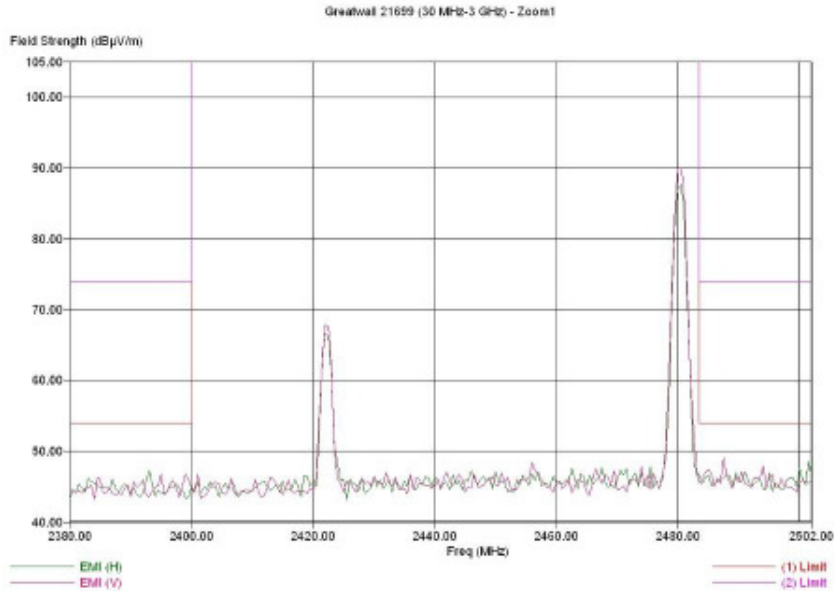
**Authorized Band Emissions High Channel Dual Polarization X**

Title: FCC 15.247(c) 03/17/08 13:24:29  
File: Greatwall 21699 (8.53)(ES18) FCC15.247 BT2400 Tch-hgh\_Y 2008-03-17 Sequence: Preliminary Scan  
Operator: ADR AAL EMC TLL hkr001  
EUT Type: Greatwall, FCC ID: IHDT56JF1, IMEI:351789020003849.  
EUT Condition: Board Rev: F2.  
Comments: FCC 15.247(c) (1) Bluetooth (BT) emission in TCH mode.  
BT channel 78 (2480 MHz) up/do in test mode. Orientation Y=V  
HLP 3003C antenna (30MHz - 3 GHz). Peak detector used.



**Authorized Band Emissions High Channel Dual Polarization Y**

Title: FCC 15.247(c)  
File: Greatwall 21699 (8.59)(ES18) FCC15.247 RT2400 Tch-bgh\_Z 2008-03-17Sequence: Preliminary Scan 03/17/08 15:22:57  
Operator: AER AAL EME TLL, hkr001  
EUC Type: Greatwall, FCC ID: IHDT56JF1, IMEI:351788020003849.  
EUT Condition: Board Rev: F2.  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.  
BT channel 78 (2480MHz) up/down in test mode. Orientation E-W  
HLP 3003C antenna (30MHz - 3 GHz). Peak detector used.



**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**