



**MOTOROLA**

**MOBILE DEVICES BUSINESS**

**PRODUCT SAFETY AND COMPLIANCE  
EMC LABORATORY**

**EMC TEST REPORT - Addendum**

**Test Report Number** – 21532-1BT

**Report Date** – 14-02-2008

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: 2008-01-25 to 2008-01-28

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: 01-02-2008

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FCC Registration Number: 863448

IC Registration Number: 109AP-1

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



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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: Slider

Signaling Capability: Triple band 900/1800/1900 GSM with GPRS class 12, WCDMA 2100 with HSDPA 7.3 Mbps (Cat 7/8), Bluetooth class 2, sGPS

Serial Numbers: KEP0330135

FCC ID: IHDT6JG1

Project number: 21532-1

Testing Complete Date: 28-01-2008

## **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 36.8% +-5% 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 analysers	HP E7405A	US39440168	9 kHz – 26.5 GHz	19.04.07
	ESIB 26	100179	20 Hz – 26.5 GHz	15.05.07
	ESU 40	100040	20 Hz – 40 GHz	24.04.07
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	26.06.07
	Sonoma 310N	185680	9 kHz – 1 GHz	19.06.07
	AFS4-02001800-35-ULN (Mounted on EMCO 3115)	805815	2 GHz – 18 GHz	24.10.07
	JSA-18004000-30-5A (Mounted on EMCO 3116)	965195	18 GHz – 40 GHz	22.08.07
	JCA 2640-4000 (Mounted on EMCO 3116)	102	18 – 40 GHz	22.08.07
Radio com. Tester	CMU 200	112434	GSM 850/900/1800/1900 IS95, UMTS, CDMA, Bluetooth	01.05.07
High pass filter	K&L 3DH1-3000/T13000-0/0 (Mounted on EMCO 3115)	8	(2700 - 20000 MHz)	24.10.07
Attenuator	Weinschel 54A-6 (6dB) (Mounted on EMCO 3116)	T8887	DC – 40 GHz	22.08.07
	H&S 6603.19AA (3dB) (Mounted on EMCO 3115)	na	DC-18 GHz	24.10.07

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 21532-1 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 BK70 with model number SNN5823A**

**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 slider closed 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 Y orientation in horizontal polarity.

With the test sample slider open in was determined that the closed 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 slider open/closed and placed in orientation Y.

#### Open:

Title: FCC 15.247(c)  
 File: 21532 Z8m (8.53)(ESIB)FCC15.247 BT2400 Tch-mid\_Y 2008-01-25 Carrier-PK  
 Operator: ADR\_AAL EMC\_TL1\_hkr001  
 EUT Type: Z8m, FCC ID: IHDT6JG1, ESN: KEP0330135  
 EUT Condition: Board Rev: P3  
 Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.  
 BT channel 39 (2441 MHz) up/down in test mode. Orientation Y=V  
 HLP 3003C antenna (30MHz - 3 GHz). Peak detector used.

01/25/08 11:04:08  
 Sequence: Final Measurements

Z8m 21532 - Carrier Table

Freq (MHz)	Freq (Max) (MHz)	(PK) EMI (dBμV/m)	(1) Limit (dBμV/m)	(PK) Margin Limit (dB)	Tilt/Agl (deg)	Pol.
2441.00	2441.15	87.38	120.00	-22.84	216.20	H
2441.00	2440.78	83.74	120.00	-26.26	44.70	V

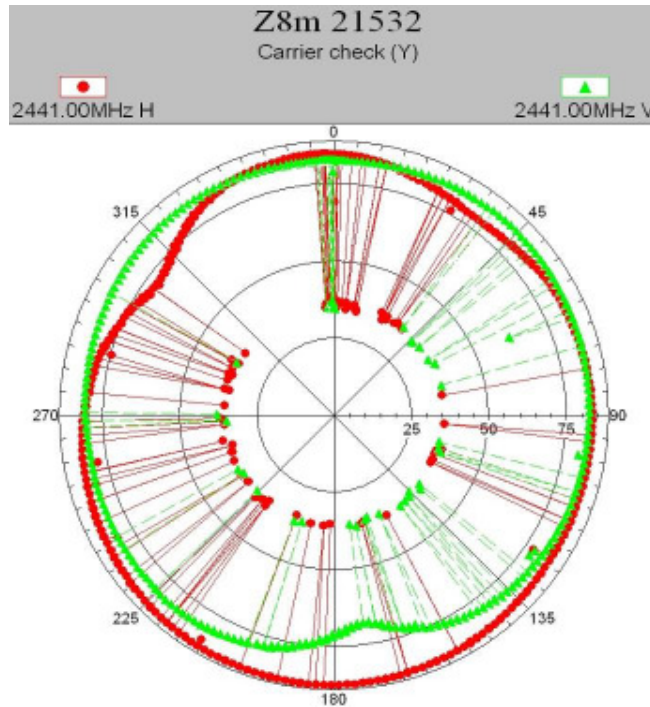
#### Closed:

Title: FCC 15.247(c)  
 File: 21532 Z8m (8.53)(ESIB)FCC15.247 BT2400 Tch-mid\_Y 2008-01-25 Carrier-PK -closed  
 Operator: ADR\_AAL EMC\_TL1\_hkr001  
 EUT Type: Z8m, FCC ID: IHDT6JG1, ESN: KEP0330135  
 EUT Condition: Board Rev: P3, Closed  
 Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.  
 BT channel 39 (2441 MHz) up/down in test mode. Orientation Y=V  
 HLP 3003C antenna (30MHz - 3 GHz). Peak detector used.

01/25/08 11:21:06  
 Sequence: Final Measurements

Z8m 21532 - Carrier Table

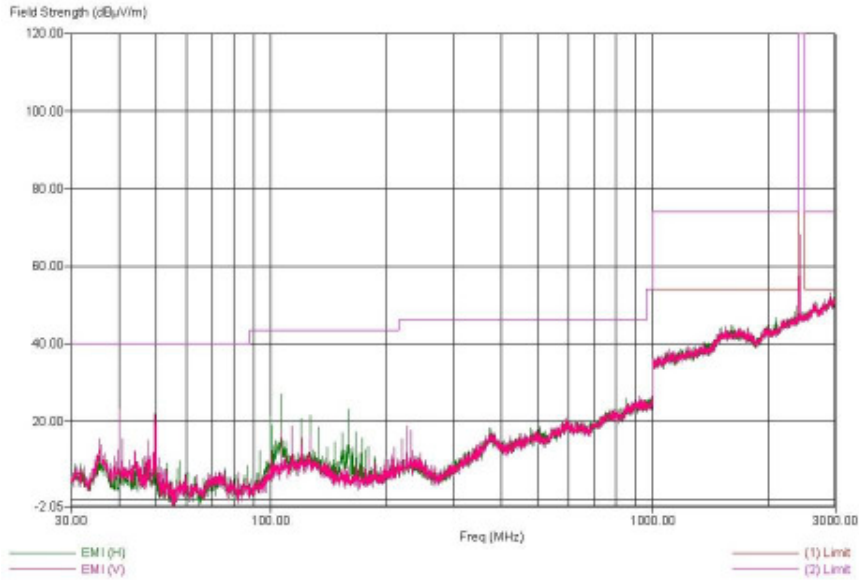
Freq (MHz)	Freq (Max) (MHz)	(PK) EMI (dBμV/m)	(1) Limit (dBμV/m)	(PK) Margin Limit (dB)	Tilt/Agl (deg)	Pol.
2441.00	2440.84	87.53	120.00	-22.47	178.90	H
2441.00	2440.77	83.85	120.00	-26.05	37.90	V



The Bluetooth radiated TX power is measured to 0.13 dBm on channel 39 with RBW = 1 MHz.

Title: FCC 15.247(c)  
File: Z8m 21532 (8.53) (ESIB) FCC15.247 BT2400 Tch-low\_X 2008-01-25 -3 Sequence: Preliminary Scan  
Operator: ADR AAL EMC TLI, hkr001  
EUT Type: Z8m, FCC ID: IHDT6JG1, ESN: KEP0330135  
EUT Condition: Board Rev: F3, Closed  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCM mode.  
BT channel 0 (2402 MHz) up/down in test mode. Orientation X=V  
MLP 3003C antenna (30MHz - 3 GHz). Peak detector used.

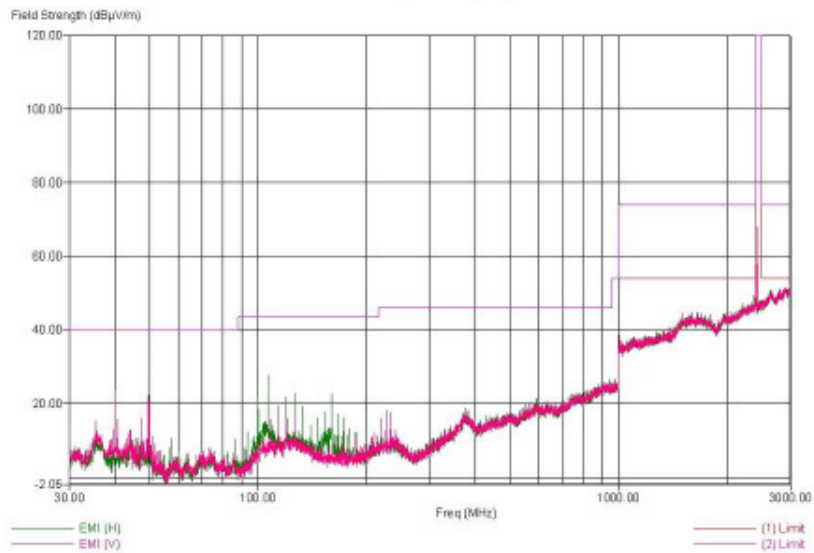
Z8m 21532 (30 MHz-3 GHz) - Open



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

Title: FCC 15.247(c)  
File: Z8m 21532 (8.53) (ESIB) FCC15.247 BT2400 Tch-low\_Y 2008-01-25 -3 Sequence: Preliminary Scan  
Operator: ADR AAL EMC TLI, hkr001  
EUT Type: Z8m, FCC ID: IHDT6JG1, ESN: KEP0330135  
EUT Condition: Board Rev: F3, Closed  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCM mode.  
BT channel 0 (2402 MHz) up/down in test mode. Orientation Y=V  
MLP 3003C antenna (30MHz - 3 GHz). Peak detector used.

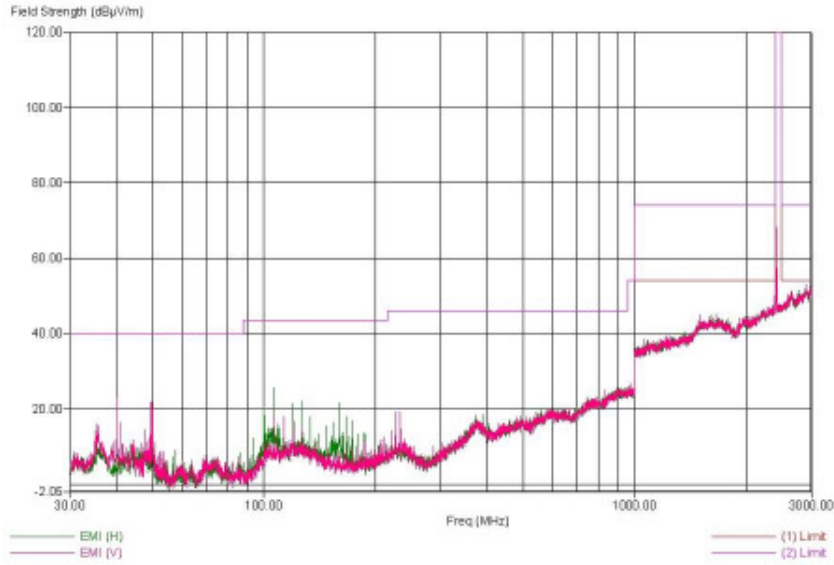
Z8m 21532 (30 MHz-3 GHz) - Open



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

Title: FCC 15.247(c)  
File: 28w 21532 (8.53) (ES18) FCC15.247 BT2400 Tch-low\_Z 2008-01-25 -3 Sequence: Preliminary Scan  
Operator: ADR AAL EMC TLI, hkr001  
EUT Type: 28w, FCC ID: IHDT6JG1, ESN: KEP0330135  
EUT Condition: Board Rev: F3, Closed  
Comments: FCC 15.247(c) (1) Bluetooth (BT) emission in TCH mode.  
BT channel 0 (2402 MHz) up/down in test mode. Orientation Z=V  
MLP 3003C antenna (30MHz - 3 GHz). Peak detector used.

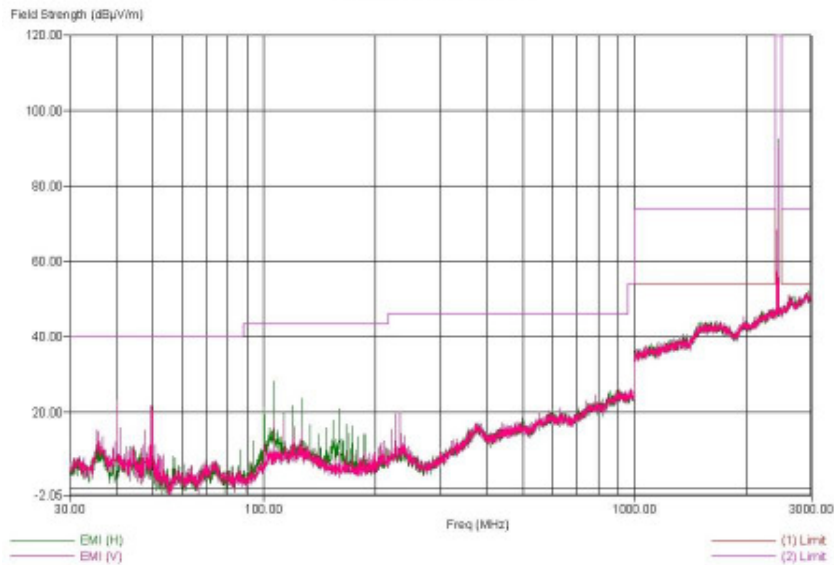
Z8m 21532 (30 MHz-3 GHz) - Open



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

Title: FCC 15.247(c)  
File: 28w 21532 (8.53) (ES18) FCC15.247 BT2400 Tch-mid\_X 2008-01-25 -3 Sequence: Preliminary Scan  
Operator: ADR AAL EMC TLI, hkr001  
EUT Type: 28w, FCC ID: IHDT6JG1, ESN: KEP0330135  
EUT Condition: Board Rev: F3, Closed  
Comments: FCC 15.247(c) (1) Bluetooth (BT) emission in TCH mode.  
BT channel 39 (2441 MHz) up/down in test mode. Orientation X=V  
MLP 3003C antenna (30MHz - 3 GHz). Peak detector used.

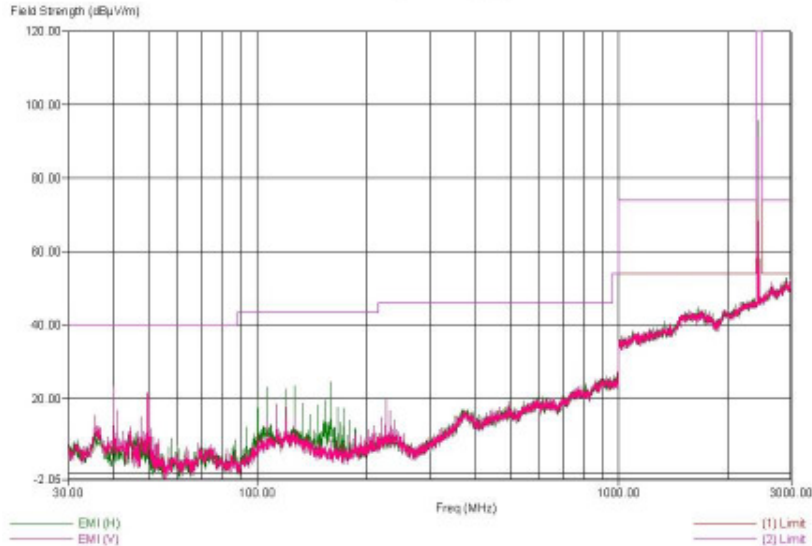
Z8m 21532 (30 MHz-3 GHz) - Open



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

Title: FCC 15.247(c)  
File: Z8m 21532 (0.53) (R21B) FCC15.247 BT2400 Tch-mid\_V 2008-01-25 -1 Sequence: Preliminary Scan  
Operator: ADR AAL EMC TLI, hkr001  
EUT Type: Z8m, FCC ID: IHDT6JG1, ESN: KEP0330135  
EUT Condition: Board Rev: P3, Closed  
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  
MLP 3003C antenna (30MHz - 3 GHz). Peak detector used.

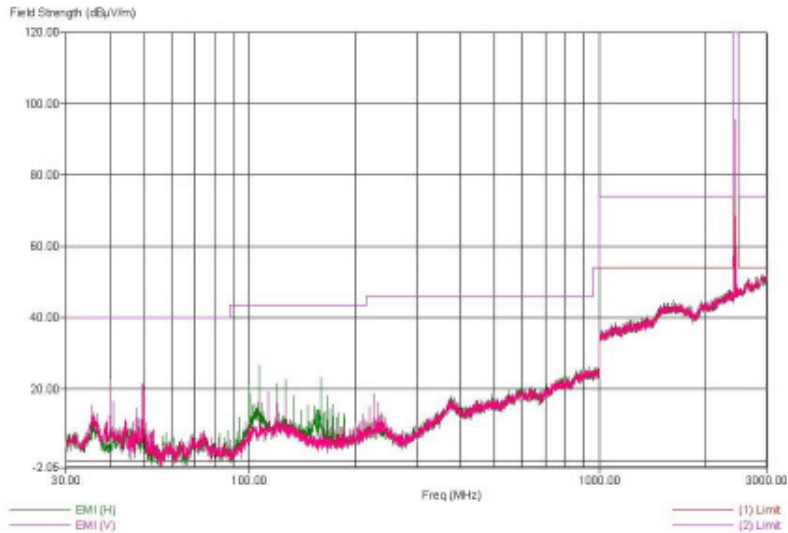
Z8m 21532 (30 MHz-3 GHz) - Open



**30-3000 MHz Middle Channel Dual Polarization Y**

Title: FCC 15.247(c)  
File: Z8m 21532 (0.53) (R21B) FCC15.247 BT2400 Tch-mid\_Z 2008-01-25 -2 Sequence: Preliminary Scan  
Operator: ADR AAL EMC TLI, hkr001  
EUT Type: Z8m, FCC ID: IHDT6JG1, ESN: KEP0330135  
EUT Condition: Board Rev: P3, Closed  
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  
MLP 3003C antenna (30MHz - 3 GHz). Peak detector used.

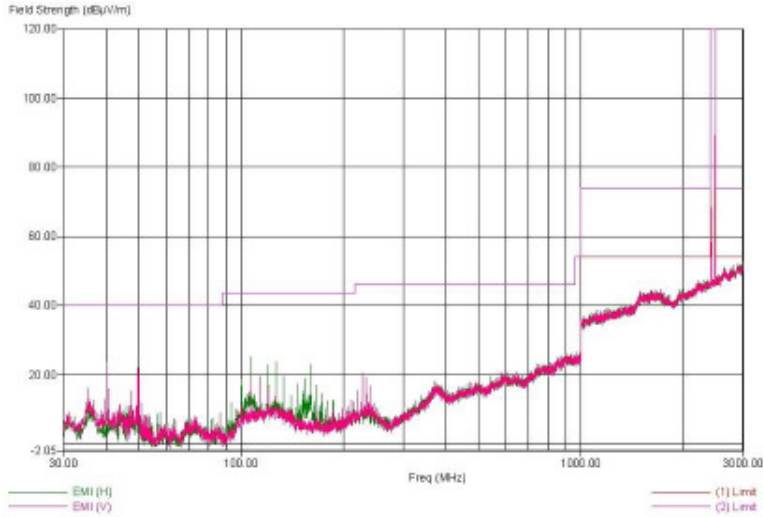
Z8m 21532 (30 MHz-3 GHz) - Open



**30-3000 MHz Middle Channel Dual Polarization Z**

Title: FCC 15.247(a)  
File: SR# 21532 (8.53) (KSR#) FCC15.247 RT2400 Tch-hgh\_X 2009-01-25 -3 Sequence: Preliminary Scan  
Operator: ADR AAL EMC TLI, hkr001  
EUT Type: SR#, FCC ID: IHDT6JG1, SR#: KEP0390135  
EUT Condition: Board Rev: 03, Closed  
Comments: FCC 15.247(e) (1) Bluetooth (BT) emission in TCM mode.  
BT channel 78 (2400 MHz) up/down in test mode. Orientation X=V  
MLP 3003C antenna (30MHz - 3 GHz). Peak detector used.

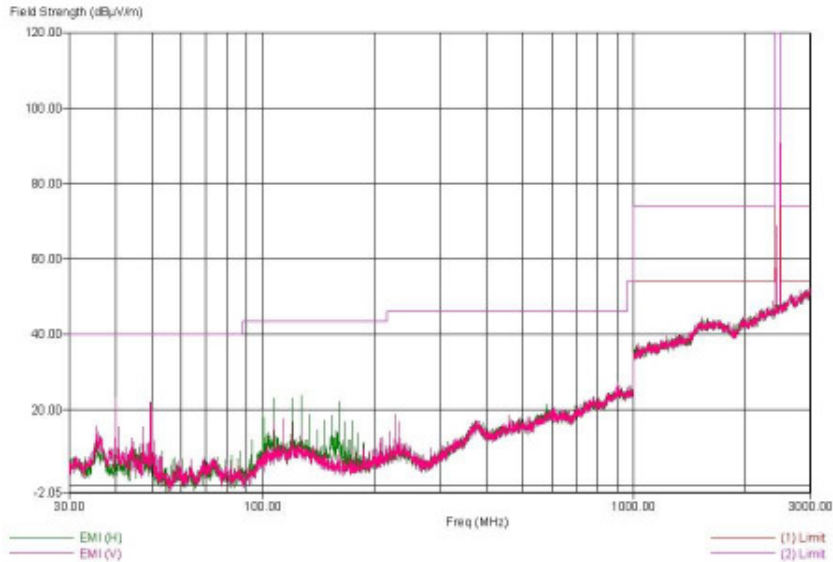
Z6m 21532 (30 MHz-3 GHz) - Open



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

Title: FCC 15.247(c)  
File: SR# 21532 (8.53) (KSR#) FCC15.247 RT2400 Tch-hgh\_Y 2009-01-25 -3 Sequence: Preliminary Scan  
Operator: ADR AAL EMC TLI, hkr001  
EUT Type: SR#, FCC ID: IHDT6JG1, SR#: KEP0390135  
EUT Condition: Board Rev: 03, Closed  
Comments: FCC 15.247(e) (1) Bluetooth (BT) emission in TCM mode.  
BT channel 78 (2400 MHz) up/down in test mode. Orientation Y=V  
MLP 3003C antenna (30MHz - 3 GHz). Peak detector used.

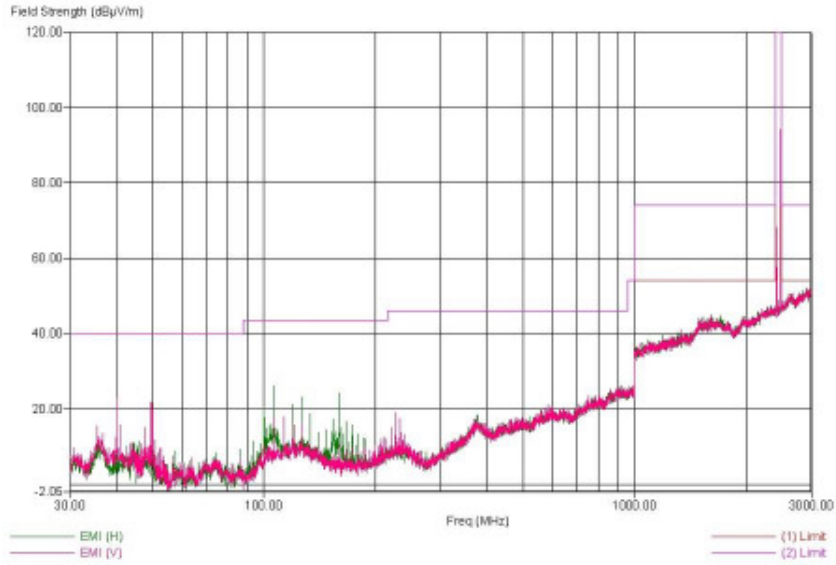
Z6m 21532 (30 MHz-3 GHz) - Open



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

Title: FCC 15.247(a)  
File: Z8n 21532 (8.53) (ES15) FCC15.247 ST2400 Tech-high\_Z 2008-01-25 -3 Sequence: Preliminary Scan  
Operator: ADR AAL SMC TLI, hkr001  
EUT Type: Z8n, FCC ID: IHDT6JG1, ESN: KE90330135  
EUT Condition: Board Rev1 F3, Closed  
Comments: FCC 15.247(c) (1) Bluetooth (BT) emission in TCM mode.  
BT channel 78 (2480 MHz) up/down in test mode. Orientation Z=V  
HLE 3003C antenna (30MHz - 3 GHz). Peak detector used.

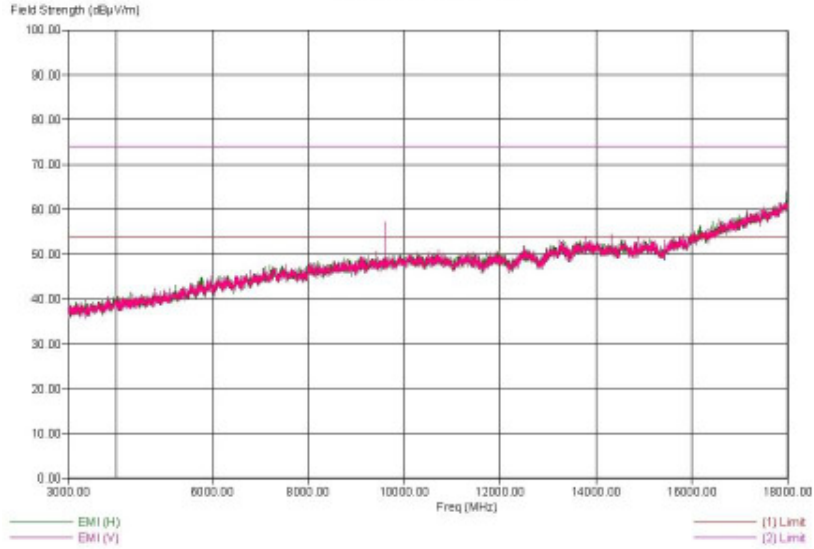
Z8n21532 (30 MHz-3 GHz) - Open



**30-3000 MHz High Channel Dual Polarization Z**

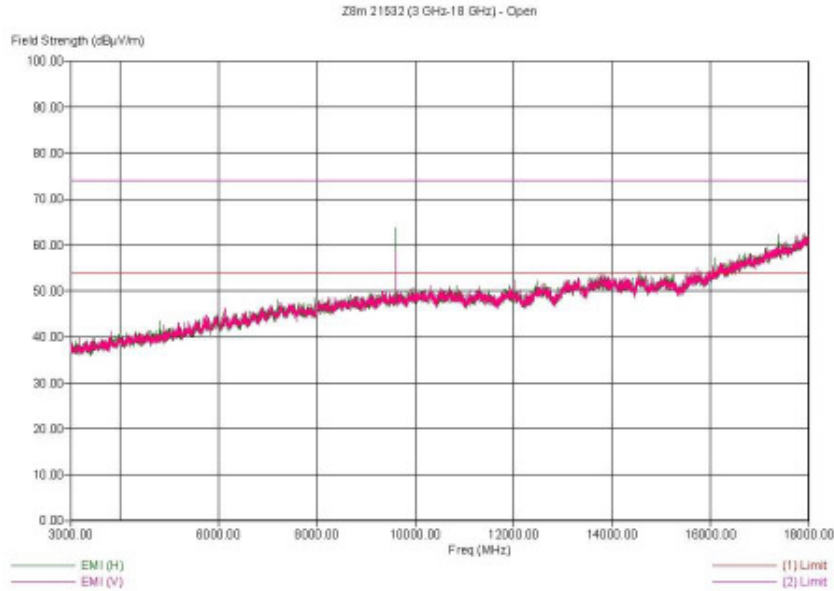
Title: FCC 15.247 (c) 01/28/08 10:36:48  
File: Z8m 21532 (8.53) (ESSE) FCC15.247 BT2400 Teh-low\_X 2008-01-25 -3-15Sequence: Preliminary Scan  
Operator: ADR AAL EMC TL1, hkr001  
EUT Type: Z8m, FCC ID: IHDT6JG1, ESN: K9P0320125  
EUT Condition: Board Rev: B3, Closed  
Comments: FCC 15.247(c) (1) Bluetooth (BT) emission in TCH mode.  
BT channel 0 (2402 MHz) up/down in test mode. Orientation X=V  
EMCO 1115 antenna (2GHz - 19GHz). Peak detector used.

Z8m 21532 (3 GHz-18 GHz) - Open

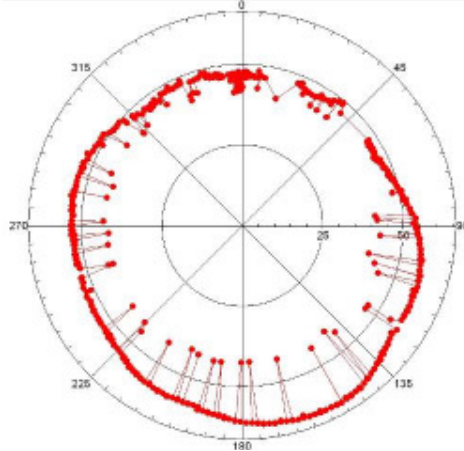


**3-18 GHz Low Channel Dual Polarization X**

Title: FCC 15.247(a)  
 File: Z8m 21532 (8.53)(ESB) FCC15.247 BT2400 Tch-low\_Y 2008-01-25 -3-18Sequence: Preliminary Scan  
 Operator: ADR\_AAL EMC TL1\_hkr001  
 EUT Type: Z8m, FCC ID: IHDT6JG1, ESN: KEP0330135  
 EUT Condition: Board Rev: P3, Closed  
 Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.  
 BT channel 0 (2402 MHz) up/down in test mode. Orientation Y-Y  
 EMC0 3115 antenna (3GHz - 18GHz). Peak detector used.



Z8m 21532  
 Final scan - AV



Title: FCC 15.247(c)  
 File: Z8m 21532 (8.53)(ESB) FCC15.247 BT2400 Tch-low\_Y 2008-01-25 -AV  
 Operator: ADR\_AAL EMC TL1\_hkr001  
 EUT Type: Z8m, FCC ID: IHDT6JG1, ESN: KEP0330135  
 EUT Condition: Board Rev: P3, Closed  
 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  
 EMC0 3115 ant (3GHz - 18GHz).

01/28/08 13:16:13  
 Sequence: Final Measurements

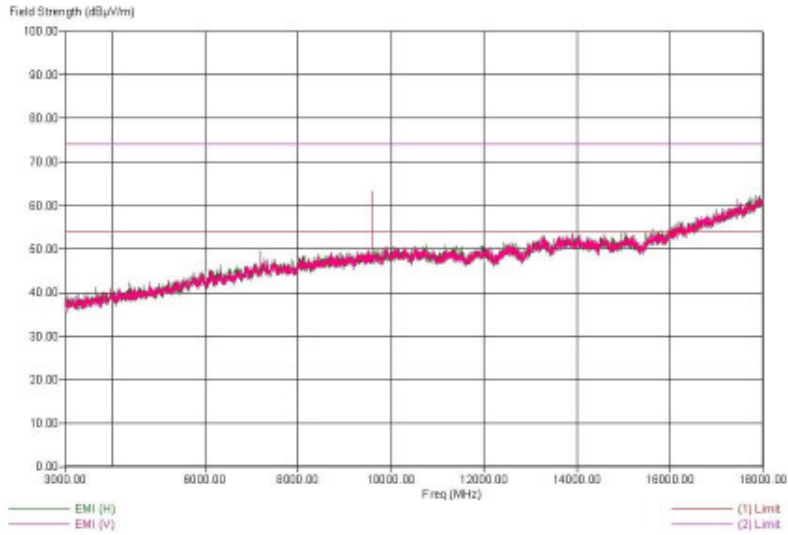
Z8m 21532 Table

Freq (MHz)	Freq (Max) (MHz)	(AVG) EMI (dBµV/m)	(1) Limit (dBµV/m)	(AVG) Margin Lim1 (dB)	TbtAgl (deg)	Pol.
9608.50	9808.67	49.44	54.00	-4.56	150.80	H

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

Title: FCC 15.247 (c)  
File: Z8m 21532 (8.33) (ES18) FCC15.247 BT2400 Tch-low\_2 2008-01-25 -3-18sequence: Preliminary Scan 01/28/08 10:13:47  
Operator: ADR AAL EMC TL1, hkr001  
EUT Type: Z8m, FCC ID: IHDT6JG1, ESN: KEP0330135  
EUT Condition: Board Rev: F3, Closed  
Comments: FCC 15.247 (c) (1) Bluetooth (BT) emission in TCH mode.  
BT channel 0 (2402 MHz) up/dc in test mode. Orientation Z=V  
EMCO 3115 antenna (3GHz - 18GHz). Peak detector used.

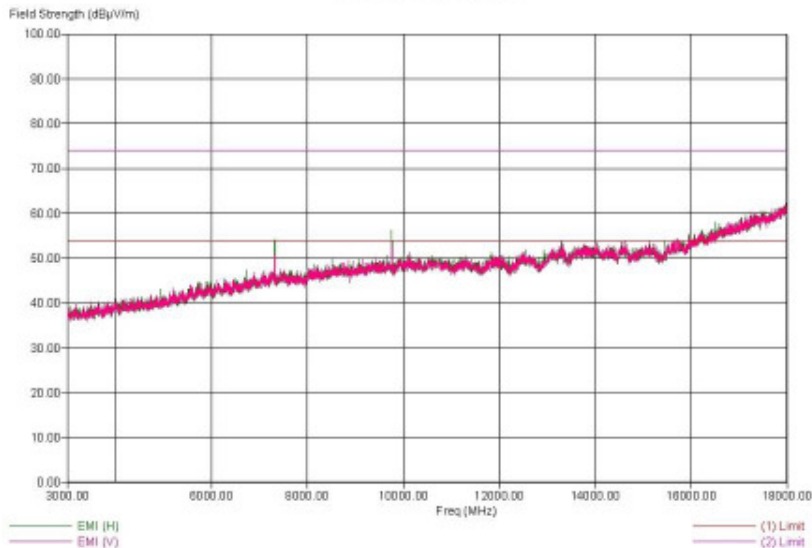
Z8m 21532 (3 GHz-18 GHz) - Open



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

Title: FCC 15.247 (c)  
File: Z8m 21532 (8.53) (ES18) FCC15.247 BT2400 Tch-mid\_X 2008-01-25 -3-18sequence: Preliminary Scan 01/28/08 10:50:04  
Operator: ADR AAL EMC TL1, hkr001  
EUT Type: Z8m, FCC ID: IHDT6JG1, ESN: KEP0330135  
EUT Condition: Board Rev: F3, Closed  
Comments: FCC 15.247 (c) (1) Bluetooth (BT) emission in TCH mode.  
BT channel 39 (2441 MHz) up/dc in test mode. Orientation X=V  
EMCO 3115 antenna (3GHz - 18GHz). Peak detector used.

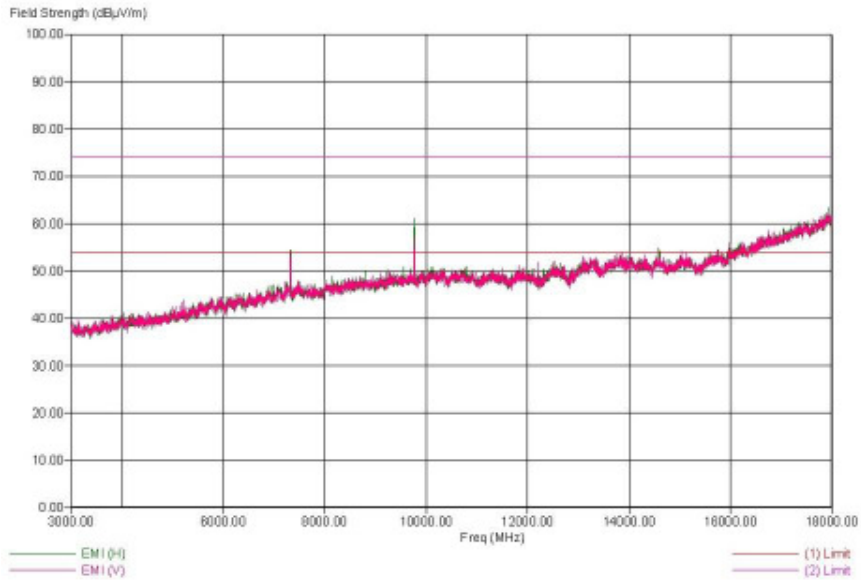
Z8m 21532 (3 GHz-18 GHz) - Open



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

Title: FCC 15.247 (e) 01/28/08 12:14:33  
File: Z8m 21532 (8.53) (ESIB) FCC15.247 BT2400 Tch-mid\_Y 2008-01-25 -3-18Sequence: Preliminary Scan  
Operator: ADR AAL EMC TLI, hkr001  
EUT Type: Z8m, FCC ID: IHDT6JG1, ESN: KEP0330135  
EUT Condition: Board Rev: F3, Closed  
Comments: FCC 15.247 (e) (1) Bluetooth (BT) emission in TCH mode.  
BT channel 39 (2441 MHz) up/down in test mode. Orientation Y=V  
EMCO 3115 antenna (3GHz - 18GHz). Peak detector used.

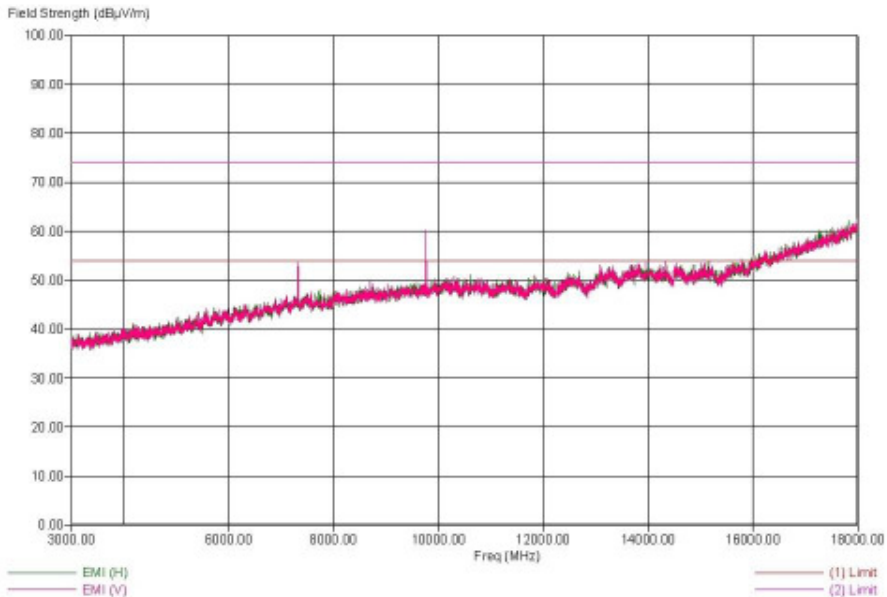
Z8m 21532 (3 GHz-18 GHz) - Open



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

Title: FCC 15.247 (e) 01/28/08 09:44:05  
File: Z8m 21532 (8.53) (ESIB) FCC15.247 BT2400 Tch-mid\_Z 2008-01-25 -3-18Sequence: Preliminary Scan  
Operator: ADR AAL EMC TLI, hkr001  
EUT Type: Z8m, FCC ID: IHDT6JG1, ESN: KEP0330135  
EUT Condition: Board Rev: F3, Closed  
Comments: FCC 15.247 (e) (1) Bluetooth (BT) emission in TCH mode.  
BT channel 39 (2441 MHz) up/down in test mode. Orientation Z=V  
EMCO 3115 antenna (3GHz - 18GHz). Peak detector used.

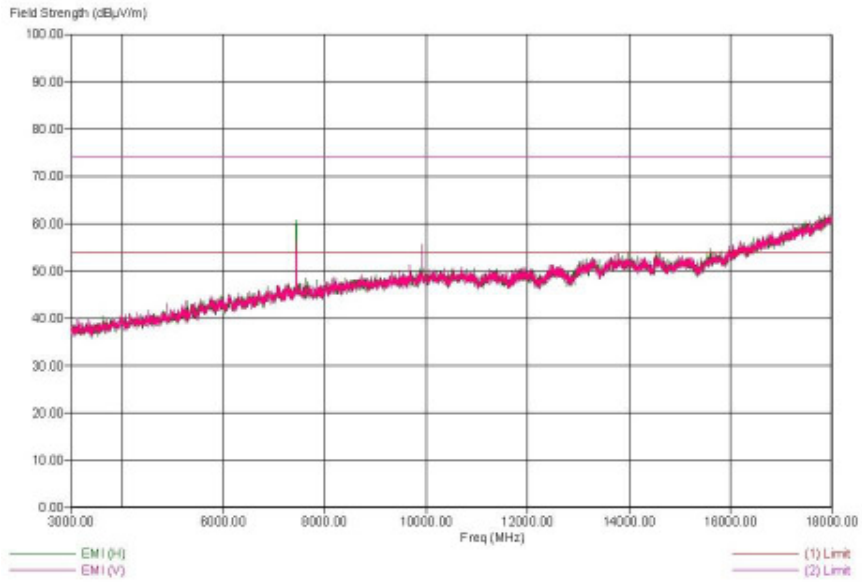
Z8m 21532 (3 GHz-18 GHz) - Open



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

Title: FCC 15.247 (e) 01/28/08 11:20:23  
File: Z8m 21532 (8.53) (ES18) FCC15.247 BT2400 Tch=hgh\_X 2008-01-25 -3-18Sequence: Preliminary Scan  
Operator: ADR AAL EMC TL1, hkr001  
EUT Type: Z8m, FCC ID: IHDT6JG1, S/N: KE0330135  
EUT Condition: Board Rev: P3, Closed  
Comments: FCC 15.247 (e) (1) Bluetooth (BT) emission in PCH mode.  
BT channel 78 (2480 MHz) up/down in test mode. Orientation X-Y  
EMCO 3115 antenna (3GHz - 18GHz). Peak detector used.

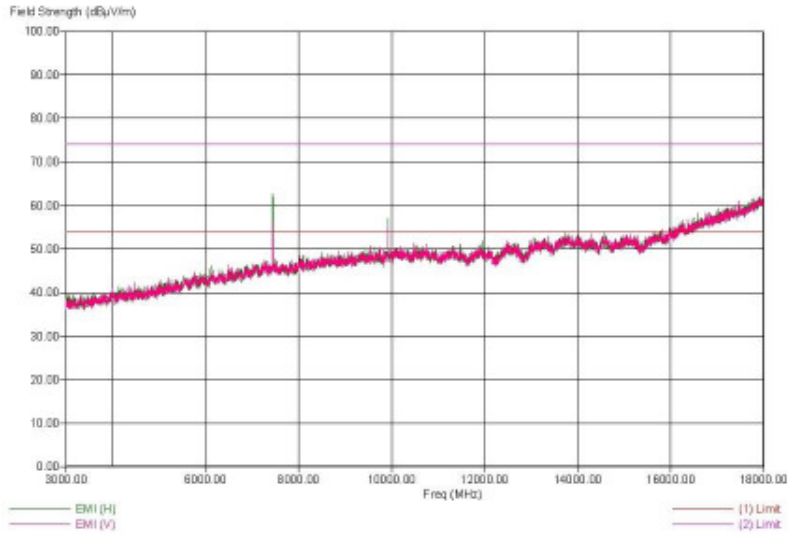
Z8m 21532 (3 GHz-18 GHz) - Open



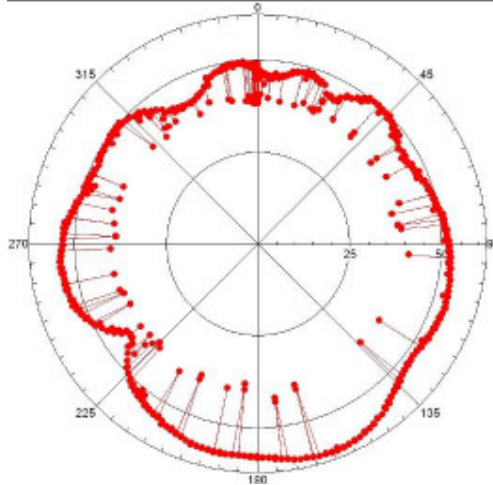
### 3-18 GHz High Channel Dual Polarization X

Title: FCC 15.247(c)  
 File: Z8m 21532 (8.53)(ESIB) FCC15.247 BT2400 Tch-hgh\_Y 2008-01-25 -2-16 Sequence: Preliminary Scan  
 Operator: ADR AAL EMC TL1, hkr001  
 EUT Type: Z8m, FCC ID: IHDT6JG1, ESN: KEP0330135  
 EUT Condition: Board Rev: P3, Closed  
 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  
 ENCO 3115 antenna (3GHz - 18GHz). Peak detector used.

Z8m 21532 (3 GHz-18 GHz)-Open



Z8m 21532  
 Final scan - AV



Title: FCC 15.247(c)  
 File: Z8m 21532 (8.53)(ESIB) FCC15.247 BT2400 Tch-hgh\_Y 2008-01-25 -AV  
 Operator: ADR AAL EMC TL1, hkr001  
 EUT Type: Z8m, FCC ID: IHDT6JG1, ESN: KEP0330135  
 EUT Condition: Board Rev: P3, Closed  
 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  
 ENCO 3115 ant (3GHz - 18GHz).

01/28/08 13:21:07  
 Sequence: Final Measurements

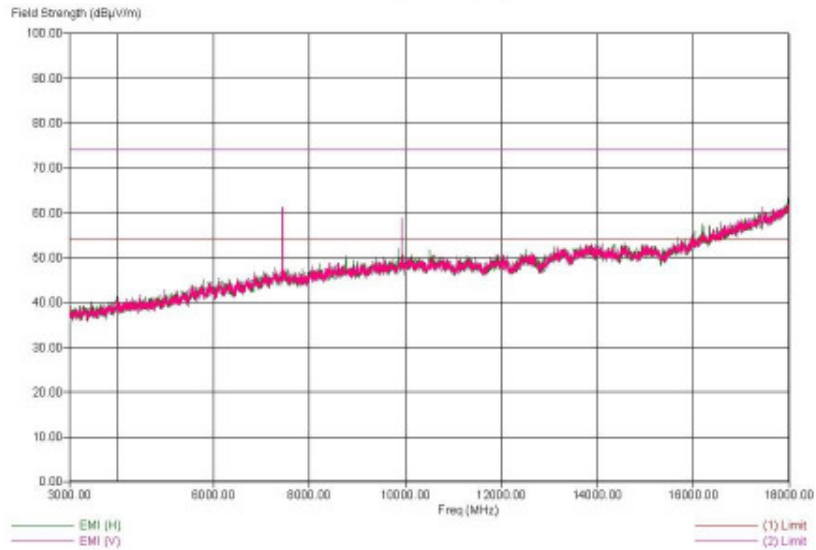
Z8m 21532 Table

Freq (MHz)	Freq (Max) (MHz)	(AVG) EMI (dBuV/m)	(1) Limit (dBuV/m)	(AVG) Margin Lim1 (dB)	Tilt Angl (deg)	Pol.
7440.50	7440.45	49.19	54.00	-4.81	158.80	H

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

Title: FCC 15.247 (c) 01/28/08 09:20:32  
File: ZM 21532 (0.33) (ESIB) FCC15.247 B72400 Tch-high\_2 2008-01-25 -3-10Sequence: Preliminary Scan  
Operator: ADM RAD EMC TEL hkr001  
EUT Type: ZM, FCC ID: IHDT6JG1, ESN: KEP0330135  
EUT Condition: Board Rev: P2, Closed  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.  
BT channel 7S (2450 MHz) up/down in test mode. Orientation Z=V  
EMCO 3115 antenna (3GHz - 18GHz). Peak detector used.

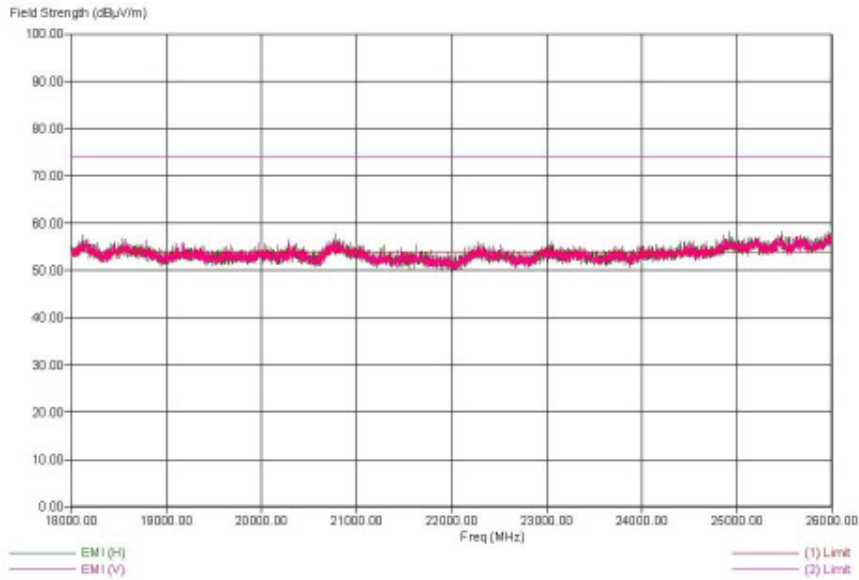
ZM 21532 (3 GHz-18 GHz) - Open



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

Title: FCC 15.247 (a) 01/28/08 15:33:16  
File: Z8m 21532 (8.53) (ES18) FCC15.247 BT2400 Tch-low\_X 2008-01-25 -18-2Sequence: Preliminary Scan  
Operator: ADR AAL EMC TL1, hkr001  
EUT Type: Z8m, FCC ID: IHDT6JG1, ESN: KEP0330135  
EUT Condition: Board Rev: P3, Closed  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.  
BT channel 0 (2402 MHz) up/down in test mode. Orientation X/Y  
EMCO 3116 antenna (18GHz - 25GHz). Peak detector used.

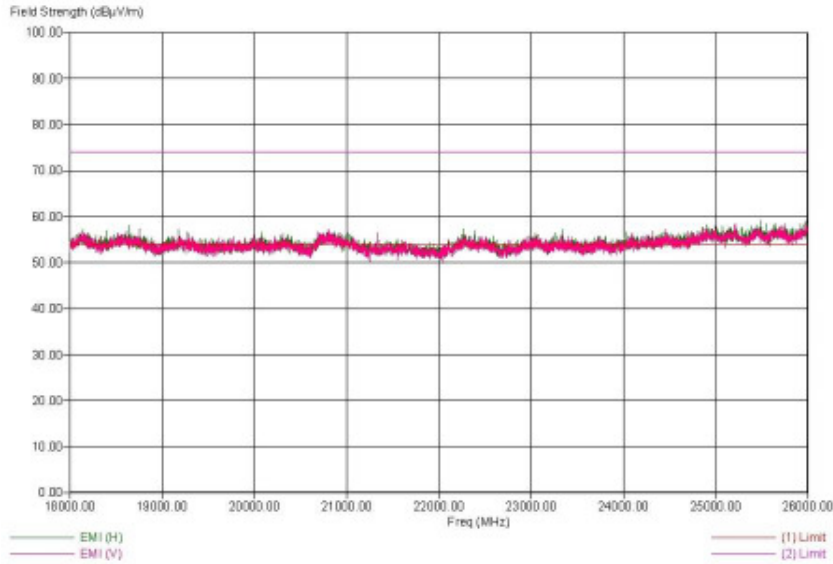
Z8m 21532 (18 GHz-25 GHz) - Open



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

Title: FCC 15.247 (a) 01/28/08 12:59:04  
File: Z8m 21532 (8.53) (ES18) FCC15.247 BT2400 Tch-low\_Y 2008-01-25 -18-2Sequence: Preliminary Scan  
Operator: ADR AAL EMC TL1, hkr001  
EUT Type: Z8m, FCC ID: IHDT6JG1, ESN: KEP0330135  
EUT Condition: Board Rev: P3, Closed  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.  
BT channel 0 (2402 MHz) up/down in test mode. Orientation Y/Y  
EMCO 3116 antenna (18GHz - 25GHz). Peak detector used.

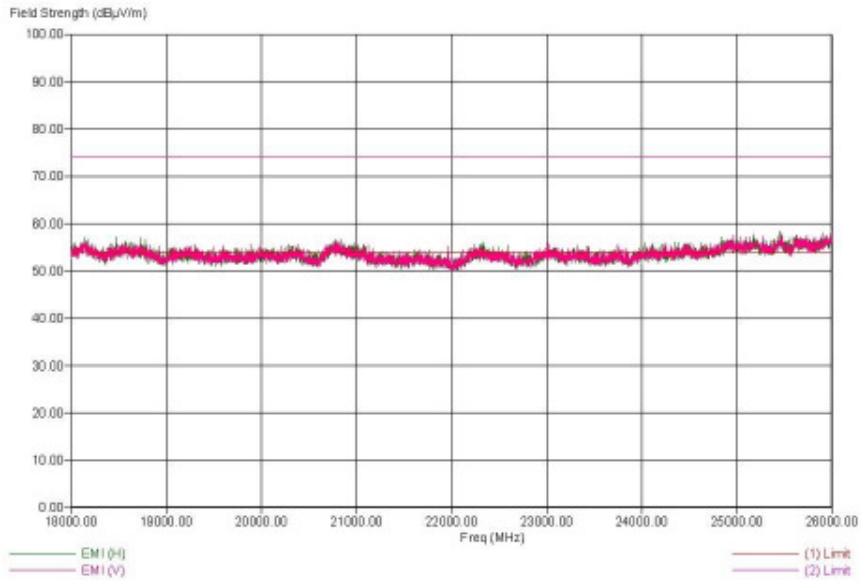
Z8m 21532 (18 GHz-25 GHz) - Open



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

Title: FCC 15.247(c) 01/29/08 15:19:11  
File: Z8m 21532 (8.53) (ES18) FCC15.247 BT2400 Tch-low\_X 2008-01-25 -18-25sequence: Preliminary Scan  
Operator: ADR AAL EMC TLI, hkr001  
EUT Type: Z8m, FCC ID: IHDT6JG1, ESN: KEF0330135  
EUT Condition: Board Rev: F3, Closed  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.  
BT channel 0 (2402 MHz) up/down in test mode. Orientation Z=V  
EMCO 3116 antenna (18GHz - 25GHz). Peak detector used.

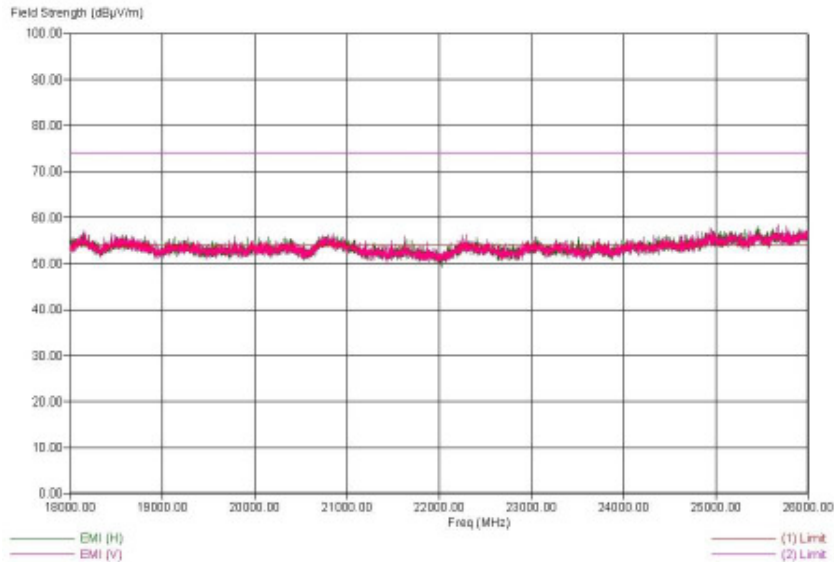
Z8m 21532 (18 GHz-25 GHz) - Open



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

Title: FCC 15.247(c) 01/29/08 15:44:42  
File: Z8m 21532 (8.53) (ES18) FCC15.247 BT2400 Tch-mid\_X 2008-01-25 -18-25sequence: Preliminary Scan  
Operator: ADR AAL EMC TLI, hkr001  
EUT Type: Z8m, FCC ID: IHDT6JG1, ESN: KEF0330135  
EUT Condition: Board Rev: F3, Closed  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.  
BT channel 39 (2441 MHz) up/down in test mode. Orientation X=V  
EMCO 3116 antenna (18GHz - 25GHz). Peak detector used.

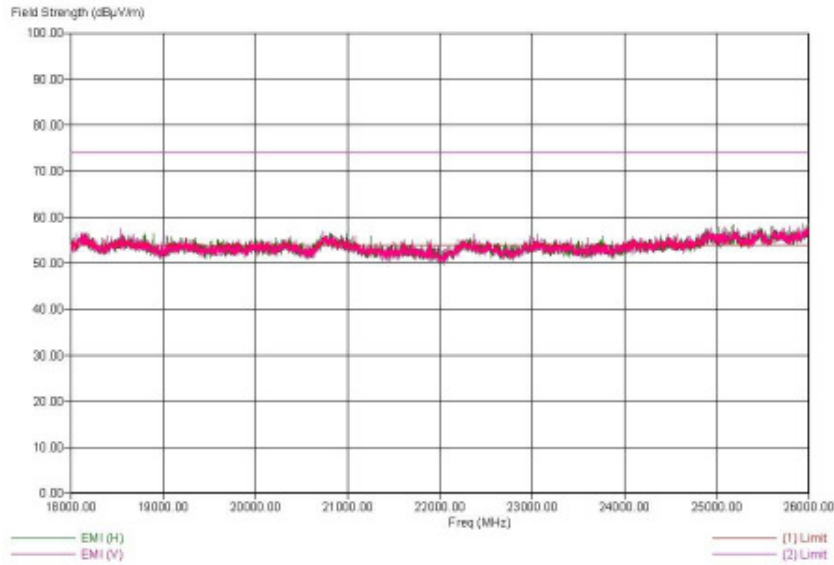
Z8m 21532 (18 GHz-25 GHz) - Open



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

Title: FCC 15.247(c)  
File: 28a 21532 (8.53) (ESIB) FCC15.247 BT2400 Tch-mid\_Y 2008-01-25 -18-25sequence: Preliminary Scan  
Operator: ADR AAL EMC TLI, hkr001  
EUT Type: 28a, FCC ID: IHDT6JG1, ESN: KEP0330135  
EUT Condition: Board Rev: P3, Closed  
Comments: FCC 15.247(c) (1) Bluetooth (BT) emission in TCH mode.  
BT channel 39 (2441 MHz) up/down in test mode. Orientation Y=V  
EMCO 3116 antenna (18GHz - 25GHz). Peak detector used.

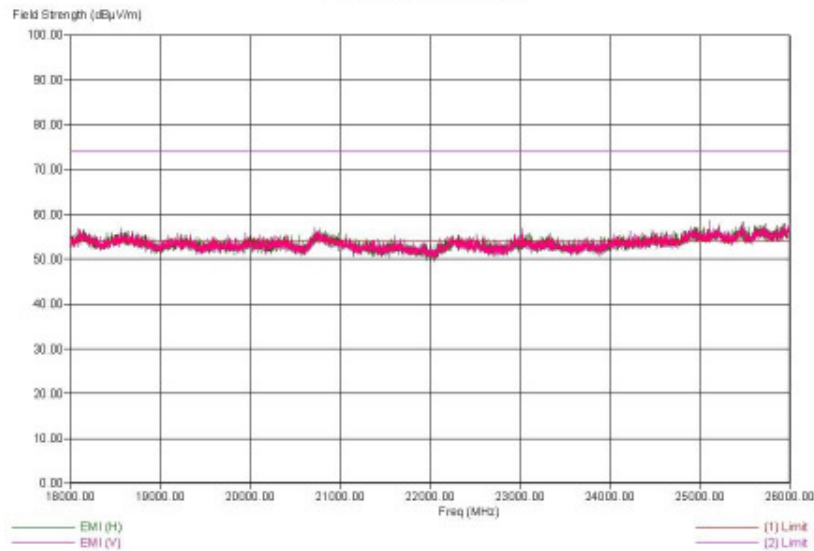
Z8m 21532 (18 GHz-25 GHz) - Open



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

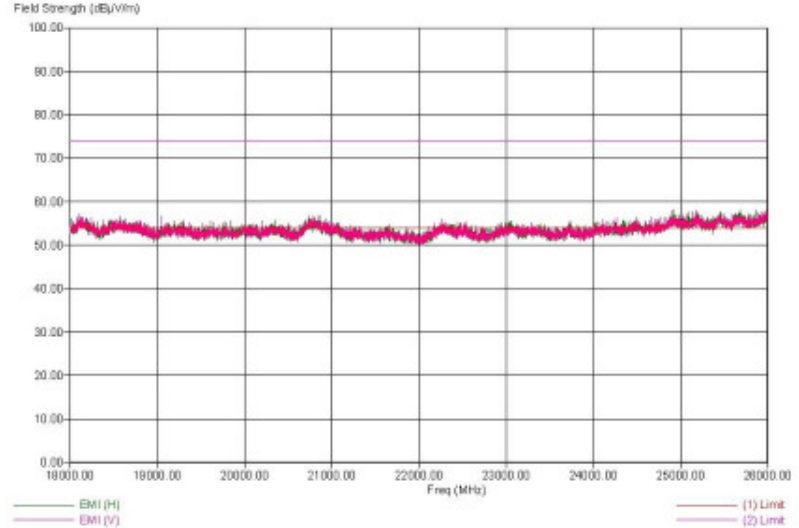
Title: FCC 15.247(c)  
File: 28a 21532 (8.53) (ESIB) FCC15.247 BT2400 Tch-mid\_Z 2008-01-25 -18-25sequence: Preliminary Scan  
Operator: ADR AAL EMC TLI, hkr001  
EUT Type: 28a, FCC ID: IHDT6JG1, ESN: KEP0330135  
EUT Condition: Board Rev: P3, Closed  
Comments: FCC 15.247(c) (1) Bluetooth (BT) emission in TCH mode.  
BT channel 39 (2441 MHz) up/down in test mode. Orientation Z=V  
EMCO 3116 antenna (18GHz - 25GHz). Peak detector used.

Z8m 21532 (18 GHz-25 GHz) - Open



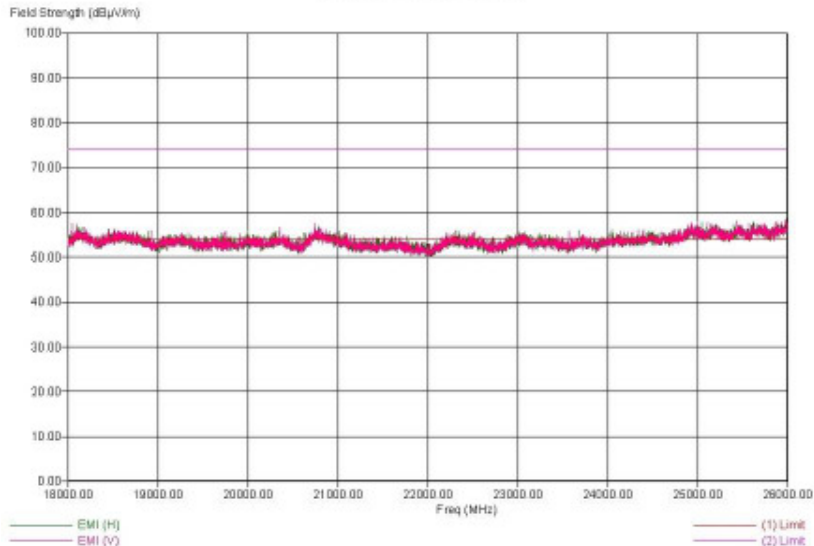
### 18-25 GHz Middle Channel Dual Polarization Z

Title: FCC 15.247 (c) 01/28/08 15:55:54  
File: Z8m 21532 (8.53) (ES1B) FCC15.247 BT2400 Tch-hgh\_X 2008-01-25 -18-25sequence: Preliminary Scan  
Operator: ADR AAL EMC TLI, hkr001  
EUT Type: Z8m, FCC ID: IHDT6JG1, ESN: KEP0330135  
EUT Condition: Board Rev: P2, Closed  
Comments: FCC 15.247 (c) (1) Bluetooth (BT) emission in TCH mode.  
BT channel 78 (2480 MHz) up/down in test mode. Orientation X\*Y  
EMCO 3116 antenna (18GHz - 25GHz). Peak detector used.  
Z8m 21532 (18 GHz-25 GHz) - Open



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

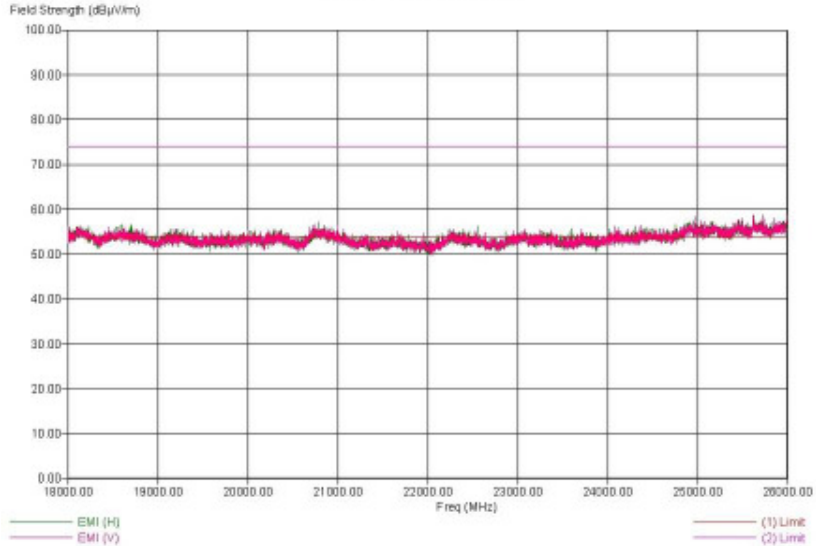
Title: FCC 15.247 (c) 01/28/08 14:34:47  
File: Z8m 21532 (8.33) (ES1B) FCC15.247 BT2400 Tch-hgh\_Y 2008-01-25 -18-25sequence: Preliminary Scan  
Operator: ADR AAL EMC TLI, hkr001  
EUT Type: Z8m, FCC ID: IHDT6JG1, ESN: KEP0330135  
EUT Condition: Board Rev: P2, Closed  
Comments: FCC 15.247 (c) (1) Bluetooth (BT) emission in TCH mode.  
BT channel 78 (2480 MHz) up/down in test mode. Orientation Y\*Y  
EMCO 3116 antenna (18GHz - 25GHz). Peak detector used.  
Z8m 21532 (18 GHz-25 GHz) - Open



### 18-25 GHz High Channel Dual Polarization Y

Title: FCC 15.247 (a) 01/28/08 14:54:18  
File: Z8m 21532 (8.53) (ES18) FCC15.247 BT2400 Teh-high\_x 2008-01-25 -18-Sequence: Preliminary Scan  
Operator: ADR AAL EMC TL1, hkr001  
EUT Type: Z8m, FCC ID: IHDT6JG1, ESN: KEP0220125  
EUT Condition: Board Rev: F3, Closed  
Comments: FCC 15.247 (a) (1) Bluetooth (BT) emission in TCH mode.  
BT channel 78 (2480 MHz) up/down in test mode. Orientation Z=V  
EMCO 211C antenna (18GHz - 25GHz). Peak detector used.

Z8m 21532 (18 GHz-25 GHz)- Open



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

## **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.

$$\text{Field Strength (dBuV/m)} = \text{EMI Receiver Level (dBuV)} + \text{Cable Loss (dB)} + \text{Filter Loss (dB)} - \text{Amplifier Gain (dB)} + \text{Antenna Correction Factor (3/m)}$$

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

### **Measurement Results**

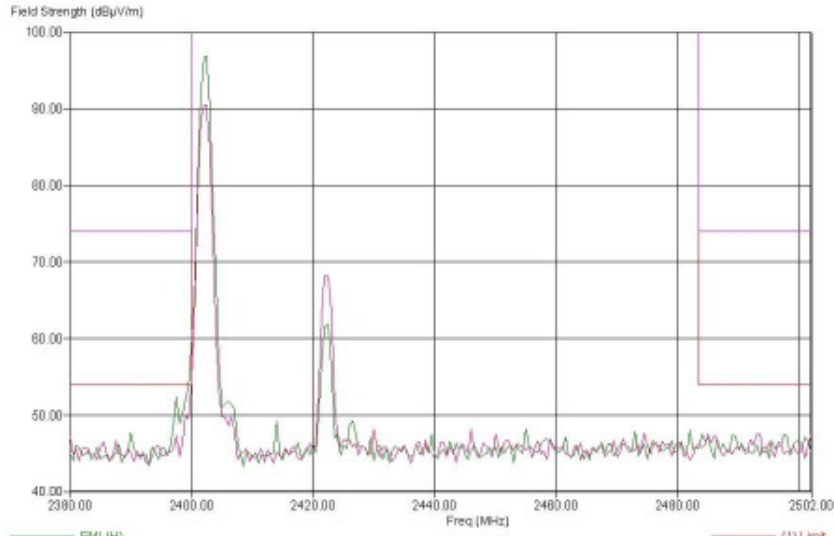
Comments:

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:

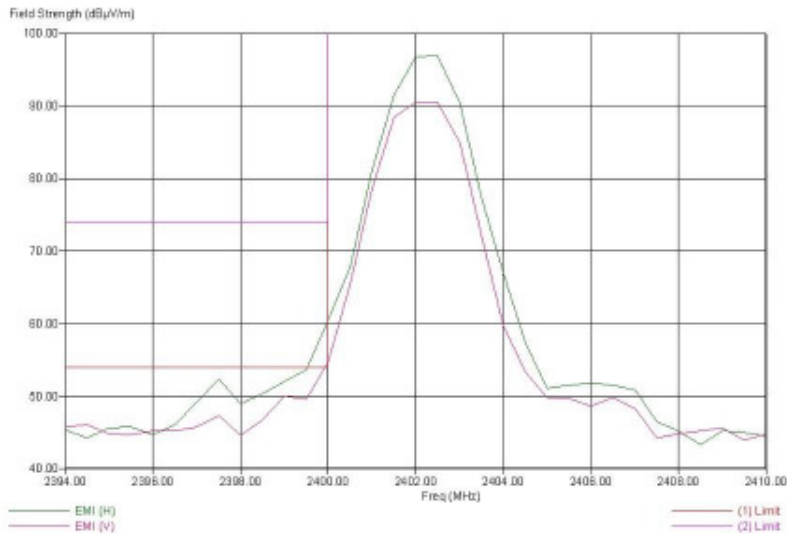
Title: FCC 15.247(c)  
File: Z8m 21532 (8.53) (ES18) FCC15.247 BT2400 Teh-low\_X 2008-01-25 -3 Sequence: Preliminary Scan  
Operator: ADR AAL SMC TLI, hkr001  
EUT Type: Z8m, FCC ID: IHDT6JG1, ESN: KEP0330135  
EUT Condition: Board Rev: F3, Closed  
Comments: FCC 15.247(c) (1) Bluetooth (BT) emission in TCM mode.  
BT channel 0 (2402 MHz) up/down in test mode. Orientation X=Y  
HLP 3003C antenna (30MHz - 3 GHz). Peak detector used.

Z8m 21532 (30 MHz-3 GHz) - Open - Zoom1



Title: FCC 15.247(c)  
File: Z8m 21532 (8.53) (ES18) FCC15.247 BT2400 Teh-low\_X 2008-01-25 -3 Sequence: Preliminary Scan  
Operator: ADR AAL SMC TLI, hkr001  
EUT Type: Z8m, FCC ID: IHDT6JG1, ESN: KEP0330135  
EUT Condition: Board Rev: F3, Closed  
Comments: FCC 15.247(c) (1) Bluetooth (BT) emission in TCM mode.  
BT channel 0 (2402 MHz) up/down in test mode. Orientation X=Y  
HLP 3003C antenna (30MHz - 3 GHz). Peak detector used.

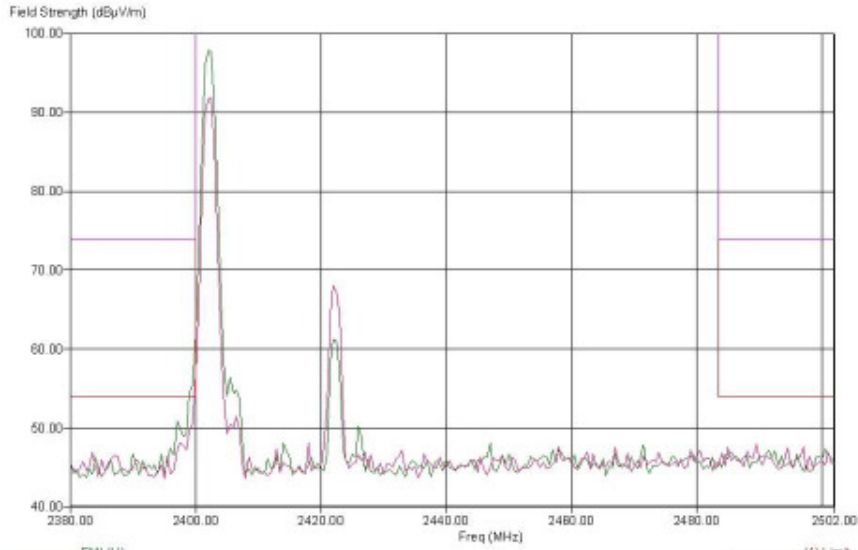
Z8m 21532 (30 MHz-3 GHz) - Open - Zoom1.1



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

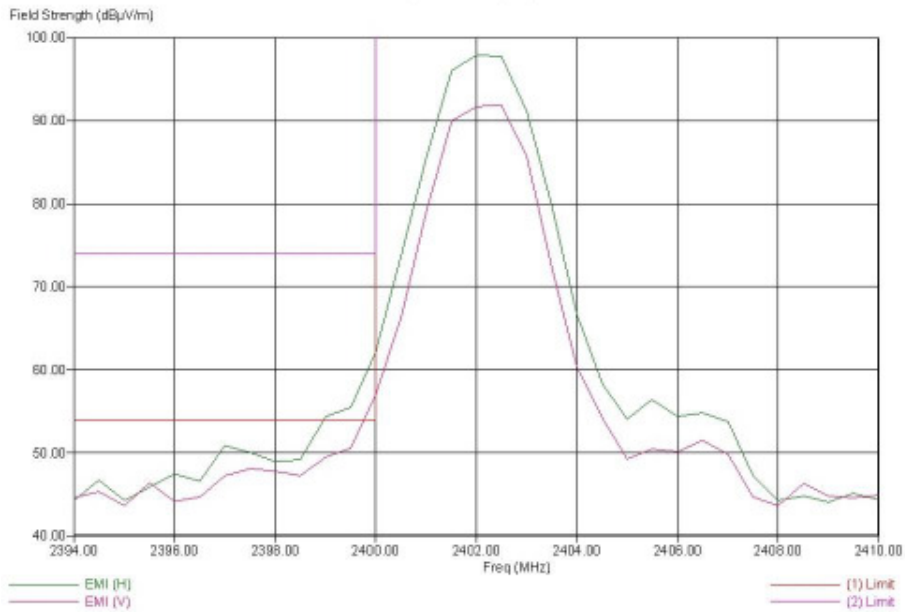
Title: FCC 15.247(c)  
File: Z8m 21532 (8.53) (ESIB) FCC15.247 BT2400 Tch-low\_Y 2008-01-25 -3 Sequence: Preliminary Scan  
Operator: ADR AAL EMC TLL, hkr001  
EUT Type: Z8m, FCC ID: IHDT6JG1, ESN: KEP0330135  
EUT Condition: Board Rev: P3, Closed  
Comments: FCC 15.247(c) (1) Bluetooth (BT) emission in TCM mode.  
BT channel 0 (2402 MHz) up/down in test mode. Orientation Y=V  
HLP 3003C antenna (30MHz - 3 GHz). Peak detector used.

Z8m 21532 (30 MHz-3 GHz) - Open - Zoom1



Title: FCC 15.247(c)  
File: Z8m 21532 (8.53) (ESIB) FCC15.247 BT2400 Tch-low\_Y 2008-01-25 -3 Sequence: Preliminary Scan  
Operator: ADR AAL EMC TLL, hkr001  
EUT Type: Z8m, FCC ID: IHDT6JG1, ESN: KEP0330135  
EUT Condition: Board Rev: P3, Closed  
Comments: FCC 15.247(c) (1) Bluetooth (BT) emission in TCM mode.  
BT channel 0 (2402 MHz) up/down in test mode. Orientation Y=V  
HLP 3003C antenna (30MHz - 3 GHz). Peak detector used.

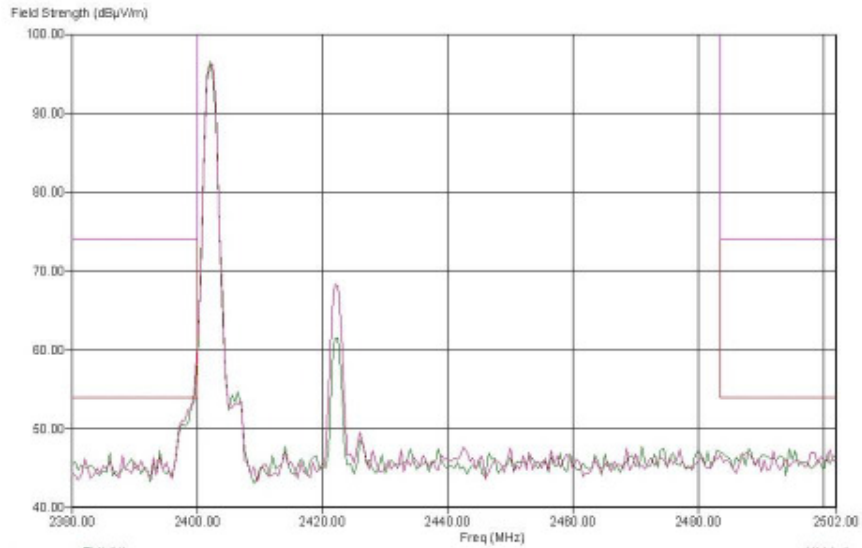
Z8m 21532 (30 MHz-3 GHz) - Open - Zoom1.1



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

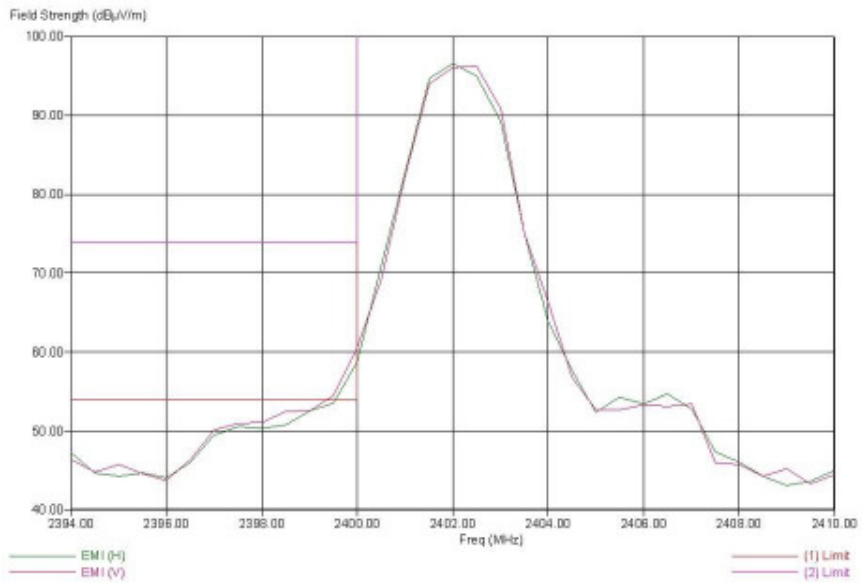
Title: FCC 15.247(c)  
File: Z8m 21532 (8.53) (ES1B) FCC15.247 BT2400 Teh-low\_Z 2008-01-25 -3 Sequence: Preliminary Scan  
Operator: ADR AAL EMC TL1, hkr001  
EUT Type: Z8m, FCC ID: IHDT6JG1, ESN: KEP0330135  
EUT Condition: Board Rev: F3, Closed  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCM mode.  
BT channel 0 (2402 MHz) up/down in test mode. Orientation Z-V  
MLP 3003C antenna (30MHz - 3 GHz). Peak detector used.

Z8m 21532 (30 MHz-3 GHz) - Open - Zoom 1



Title: FCC 15.247(c)  
File: Z8m 21532 (8.53) (ES1B) FCC15.247 BT2400 Teh-low\_Z 2008-01-25 -3 Sequence: Preliminary Scan  
Operator: ADR AAL EMC TL1, hkr001  
EUT Type: Z8m, FCC ID: IHDT6JG1, ESN: KEP0330135  
EUT Condition: Board Rev: F3, Closed  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCM mode.  
BT channel 0 (2402 MHz) up/down in test mode. Orientation Z-V  
MLP 3003C antenna (30MHz - 3 GHz). Peak detector used.

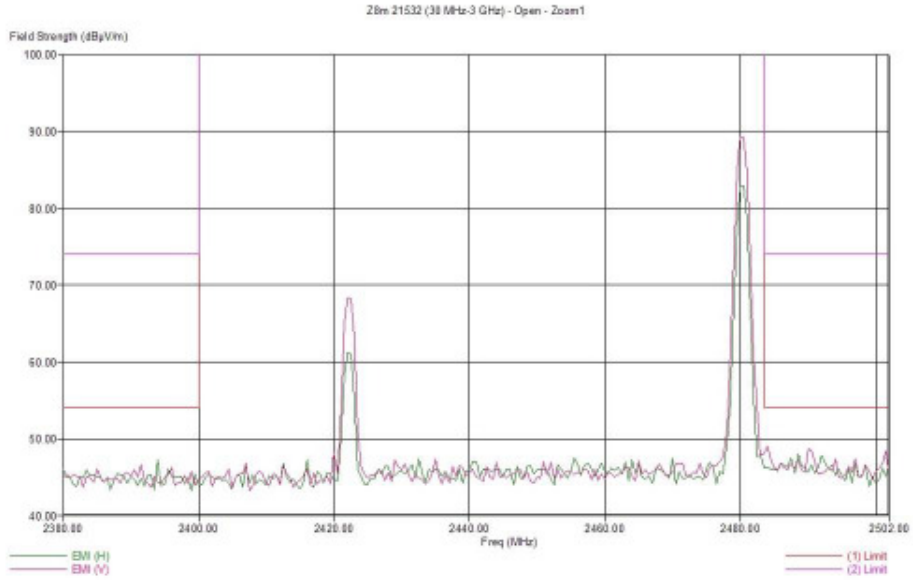
Z8m 21532 (30 MHz-3 GHz) - Open - Zoom 1.1



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

Title: FCC 15.247(c)  
File: Z8m 21532 (8.53)(ESIB) FCC15.247 BT2400 Tch-hgh\_X 2008-01-25 -3.set  
Operator: ADR\_AAL\_KMC\_T11 ksz001  
EST Type: Z8m, FCC ID: IHDT6JG1, ESN: KEP0330135  
EST Condition: Board Rev: P1, Closed  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.  
BT channel 78 (2480 MHz) up/down in test mode. Orientation X-V  
NIP 3003C antenna (30MHz - 3 GHz). Peak detector used.

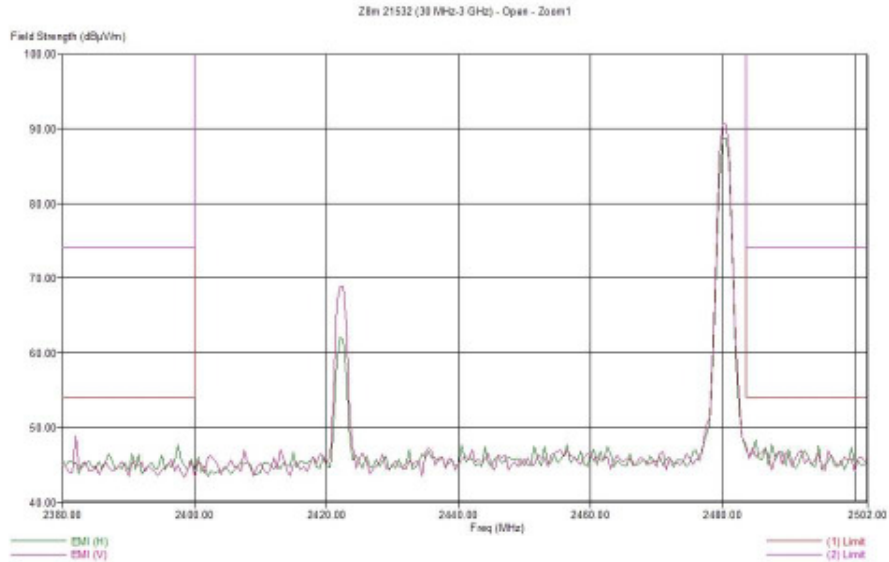
01/25/08 13:22:17  
Sequence: Preliminary Scan



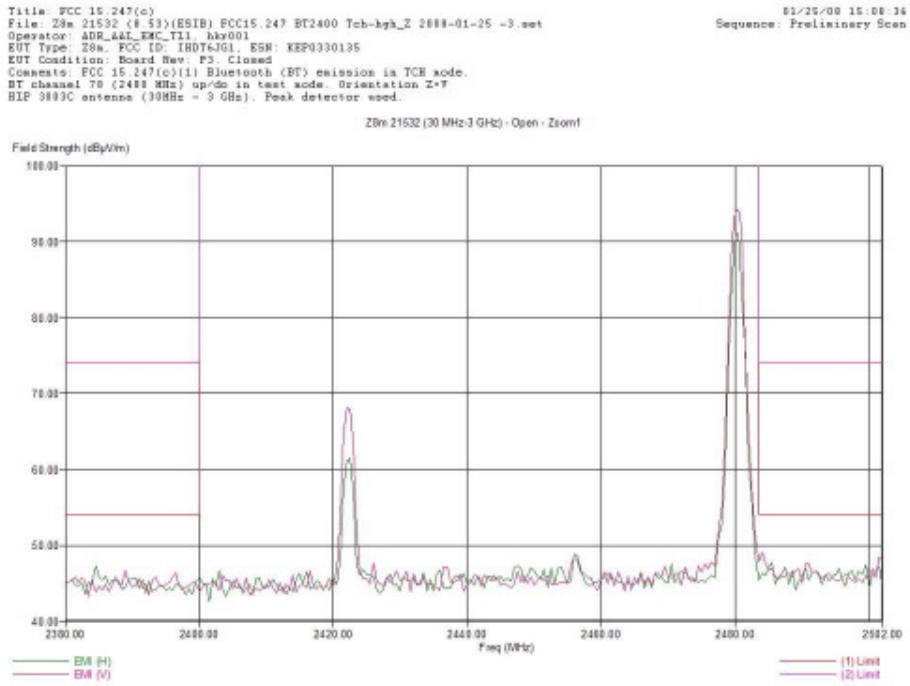
### Authorized Band Emissions High Channel Dual Polarization X

Title: FCC 15.247(c)  
File: Z8m 21532 (8.53)(ESIB) FCC15.247 BT2400 Tch-hgh\_Y 2008-01-25 -3.set  
Operator: ADR\_AAL\_KMC\_T11 ksz001  
EST Type: Z8m, FCC ID: IHDT6JG1, ESN: KEP0330135  
EST Condition: Board Rev: P1, Closed  
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  
NIP 3003C antenna (30MHz - 3 GHz). Peak detector used.

01/25/08 12:57:01  
Sequence: Preliminary Scan



### 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**