



**MOTOROLA**

**MOBILE DEVICES BUSINESS**

**PRODUCT SAFETY AND COMPLIANCE  
EMC LABORATORY**

**EMC TEST REPORT - Addendum**

**Test Report Number** – 22136-1BT

**Report Date** – 2008-07-03

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: 2008-06-19 to 2008-07-03

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: 2008-07-03

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-17025:2005 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: Bar

Signaling Capability: Triple band 800/1700 AWS/1900 CDMA 1x,  
Bluetooth Class 1 and sGPS.

Serial Numbers: A000000213232E4

FCC ID: IHDP56JS1

Project number: 22136-1

Testing Complete Date: 03-07-2009

## **Applicable Standards**

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

- 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 (6 dB) is used and above 1 GHz a 1 MHz RBW (6 dB) is used.

**Summary of Testing**

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

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

(\*) The Marker-Delta Method rule as per DA 00-705 handled in appendix-1 was applied.

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 21.7° C +- 1 ° C and relative humidity of 46.7% +-5% 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	26.05.2008
	ESU 40	100040	20 Hz – 40 GHz	07.02.2008
Pre Amplifiers	<del>EA PA 02</del> <del>JCA12 300</del> <del>JCA218 4003</del> <del>JCA48 300</del> <del>JCA1826 431</del> <del>JCA1218 500</del>	<del>800002</del>	<del>(1 – 26 GHz)</del> <del>1 GHz – 2 GHz</del> <del>2 GHz – 18 GHz</del> <del>4 GHz – 8 GHz</del> <del>18 GHz – 26 GHz</del> <del>12 GHz – 18 GHz</del>	<del>26.06.2007</del>
	Sonoma 310N	185680	9 kHz – 1 GHz	19.06.2007
	JCA218-4003	104	1 GHz – 18 GHz	19.05.2008
Antenna amplifiers	AFS4-02001800-35-ULN (Mounted on EMCO 3115)	805815	2 GHz – 18 GHz	13.03.2008
	JSA-18004000-30-5A (Mounted on EMCO 3116)	965195	18 GHz – 40 GHz	06.03.2008
	JCA 1840-400 (Mounted on EMCO 3116)	101	18 – 40 GHz	06.03.2008
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	3 GHz – 18 GHz	13.03.2008
Attenuator	Weinschel 54A-3 (3dB) (Mounted on EMCO 3116)	T8929	DC – 40 GHz	06.03.2008
	3 x H&S 6603.19AA (3dB) (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 –6 GHz 3 GHz – 18 GHz 18 GHz – 28 GHz	19.03.2008, 13.03.2008, 19.03.2008
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 (na)
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	060300	30 MHz – 3 GHz	07.12.07
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 + 2x 2-18 GHz pre-amp+3x 3dB attenuator.)	EMCO 3115	05896	1 GHz – 18 GHz	13.12.07
Double rigid horn (w. 2x 18-40 GHz pre-amp+6dB attenuator.)	EMCO 3116	2637	18 GHz – 40 GHz	20.12.07

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

## **Description of Bluetooth Transmitter**

The 22136-1 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 BQ50 with model number SNN5804A.

#### **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 X orientation in horizontal polarity.

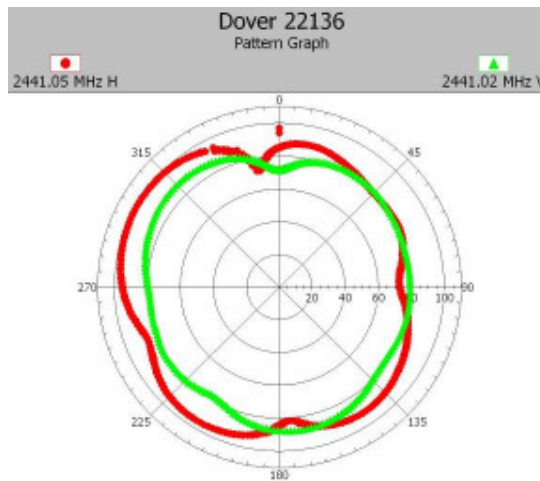
A check of carrier on the Bluetooth center channel 39 was performed to determine the expected maximum radiation of any Bluetooth harmonics for the test sample placed in orientation X.

Title: FCC 15.247(c)  
 File: Dover 22136 (5.31)(ESU) FCC15.247 BT2400 Tch-mid\_X 2008-06-19 Carrier -PK ok.set  
 Operator: ADR\_AAL EMC\_TL1, hkr001  
 EUT Type: Dover, FCC ID: IHDP56JS1, IMEI: A000000213232E4  
 EUT Condition: Board Rev: P3-1  
 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 3003C antenna (30MHz - 3 GHz). Peak detector used.

19-06-2008 15:37:38  
 Sequence: Final Measurements

Dover 22136 - Table

Freq (MHz)	Freq (Max) (MHz)	(PEAK) EMI (dBµV/m)	(1) Limit (dBµV/m)	(PEAK) Margin Lim1 (dB)	Ttbl Agl (deg)	Pol
2441.00	2441.05	99.06	114.00	-14.94	301.50	H
2441.00	2441.02	87.86	114.00	-26.14	173.90	V



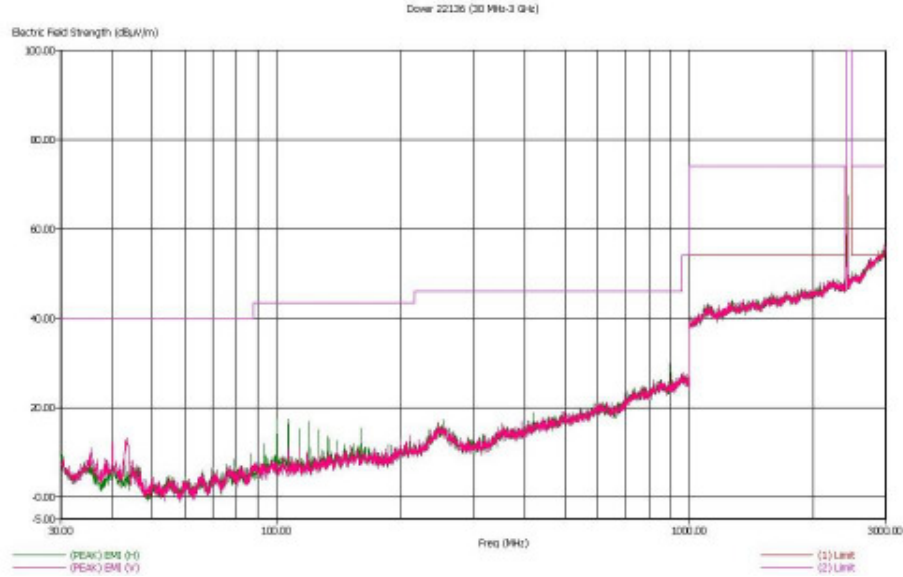
The Bluetooth radiated TX power is measured to 1.64 dBm on channel 39 with RBW=1 MHz (6 dB).

**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: Down 22136 (5.31)(ESD) FCC15.247 ET2400 Tch-low\_X 2008-06-19 -1.net  
Operator: ADR\_AAL\_EMC\_TL1\_kkr001  
EUT Type: Device, FCC ID: IHDP56JS1, IMEI: A00000212222E4  
EUT Condition: Board Rev: P3-1  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.  
BT channel 0 (2442 MHz) up/40 in test mode. Orientation X-H  
HLP 30E3C antenna (30MHz - 3 GHz).

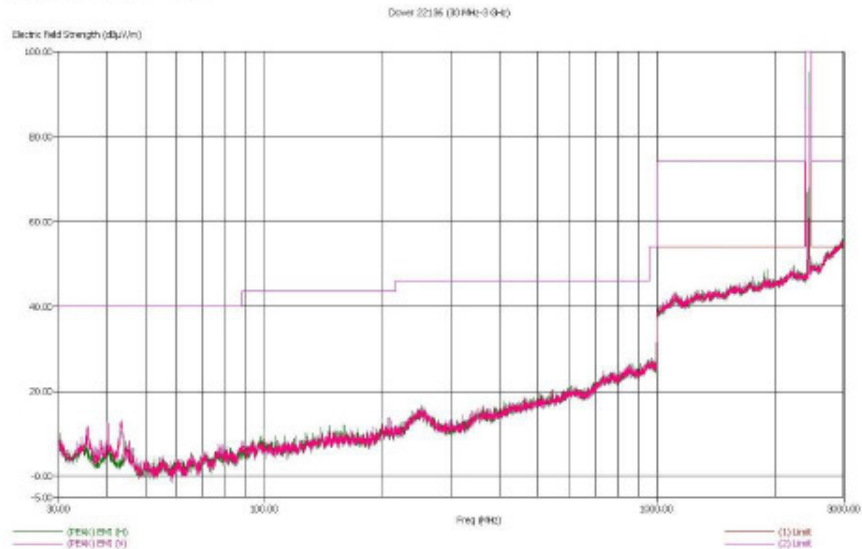
19-06-2008 16:23:41  
Sequence: Preliminary Scan



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

Title: FCC 15.247(c)  
File: Down 22136 (5.31)(ESD) FCC15.247 ET2400 Tch-mid\_X 2008-06-19 -1.net  
Operator: ADR\_AAL\_EMC\_TL1\_kkr001  
EUT Type: Device, FCC ID: IHDP56JS1, IMEI: A00000212222E4  
EUT Condition: Board Rev: P3-1  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.  
BT channel 19 (2441 MHz) up/40 in test mode. Orientation X-H  
HLP 30E3C antenna (30MHz - 3 GHz).

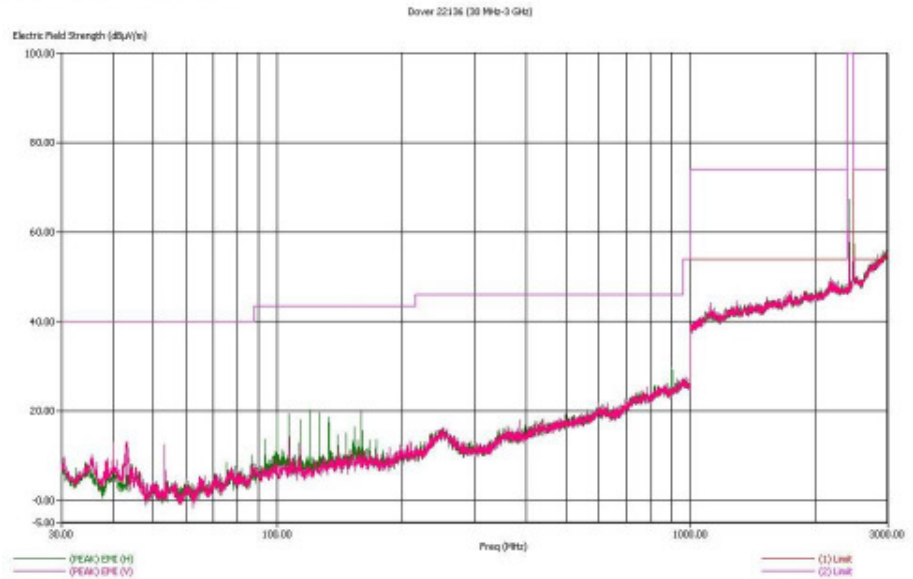
19-06-2008 15:53:52  
Sequence: Preliminary Scan



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

Title: FCC 15.247(c)  
File: Dover 22136 (5.31)(ESU) FCC15.247 BT2400 Tch-high\_X 2008-06-19 -3.set  
Operator: ADR\_MAR\_EMC\_TTL\_829001  
EUT Type: Dower, FCC ID: IHDP56JS1, IMEI: A000000213232E4  
EUT Condition: Board Rev: P3-1  
Comments: FCC 15.247(e)(1) Bluetooth (BT) emission in TCR mode.  
BT channel 78 (2480 MHz) up'dr in test mode. Orientation X=H  
HLP 3003C antenna (30MHz - 3 GHz).

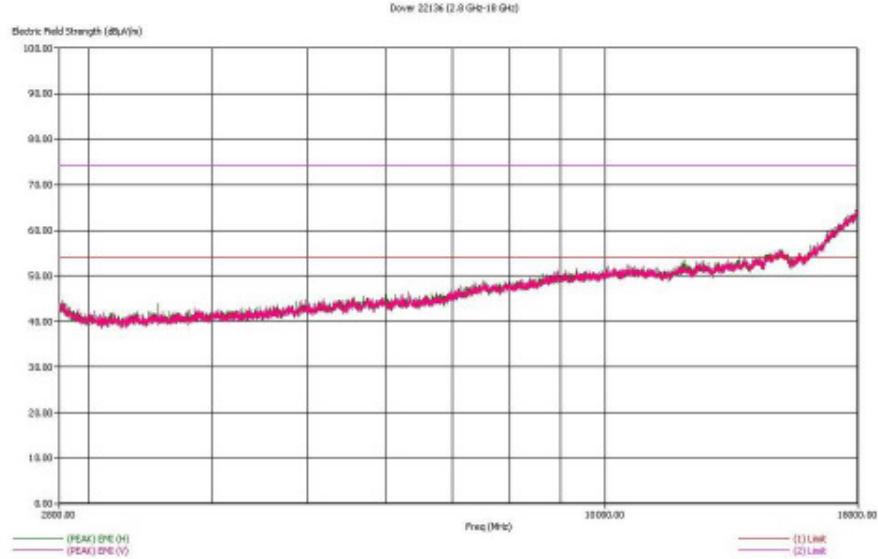
19-06-2008 16:35:45  
Sequence: Preliminary Scan



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

Title: FCC 15.247(c)  
File: Dover 22136 (S 31)(ES18) FCC15.247 BT2400 Tch-low\_X 2008-06-20 - 3-18.set  
Operator: ADR\_AAL\_EMC\_TL1\_hkr001  
EUT Type: Dover, FCC ID: IHDP56JS1, IMEI: 4000000213232E4  
EUT Condition: Board Rev: P3-1  
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  
EMCO 3115 antenna (3GHz - 18GHz).

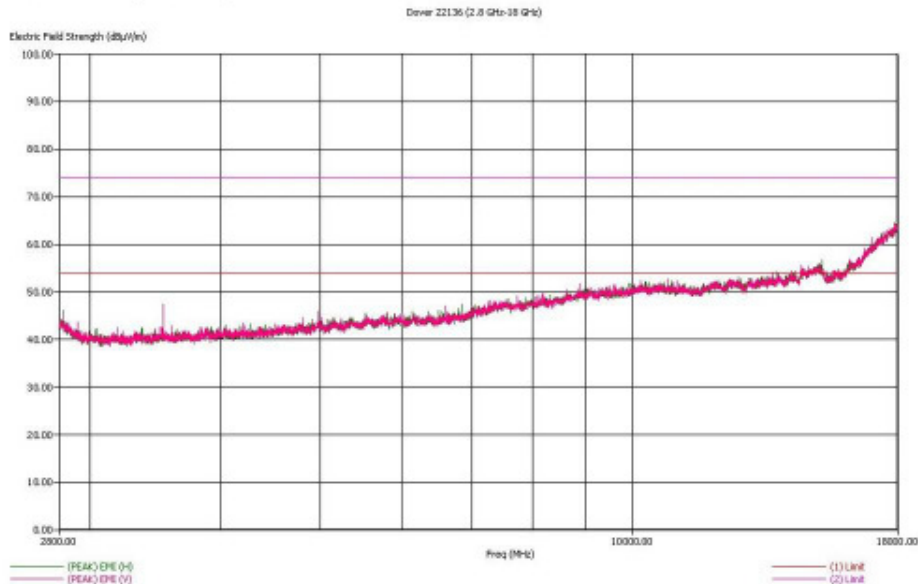
20-06-2008 14:37:28  
Sequence: Preliminary Scan



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

Title: FCC 15.247(c)  
File: Dover 22136 (S 31)(ES18) FCC15.247 BT2400 Tch-low\_Y 2008-06-20 - 3-18.set  
Operator: ADR\_AAL\_EMC\_TL1\_hkr001  
EUT Type: Dover, FCC ID: IHDP56JS1, IMEI: 4000000213232E4  
EUT Condition: Board Rev: P3-1  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.  
BT channel 0 (2402 MHz) up/down in test mode. Orientation Y-H  
EMCO 3115 antenna (3GHz - 18GHz).

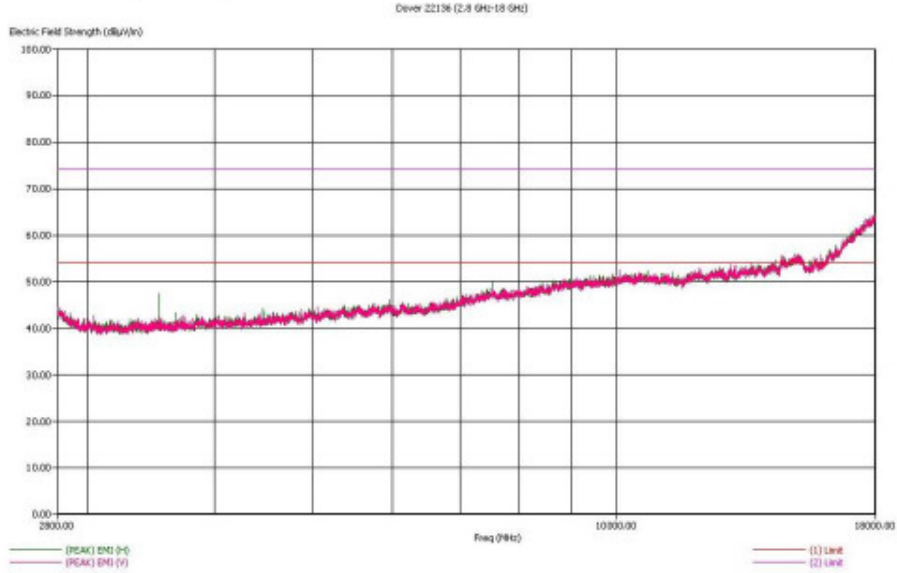
20-06-2008 13:20:26  
Sequence: Preliminary Scan



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

Title: FCC 15.247(c)  
File: Dover 22136 (5.31)(ESIB) FCC15.247 BT2400 Tch-low\_X 2008-06-20 - 3-18.set  
Operator: ADR\_AAL\_ENC\_TII\_hkr001  
EUT Type: Dover, FCC ID: IHDP56JS1, IMEI: A08000213232E4  
EUT Condition: Board Rev: P3-1  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCF mode.  
BT channel # (2402 MHz) up/go in test mode. Orientation Z-H  
EMCO 3115 antenna (3GHz - 18GHz).

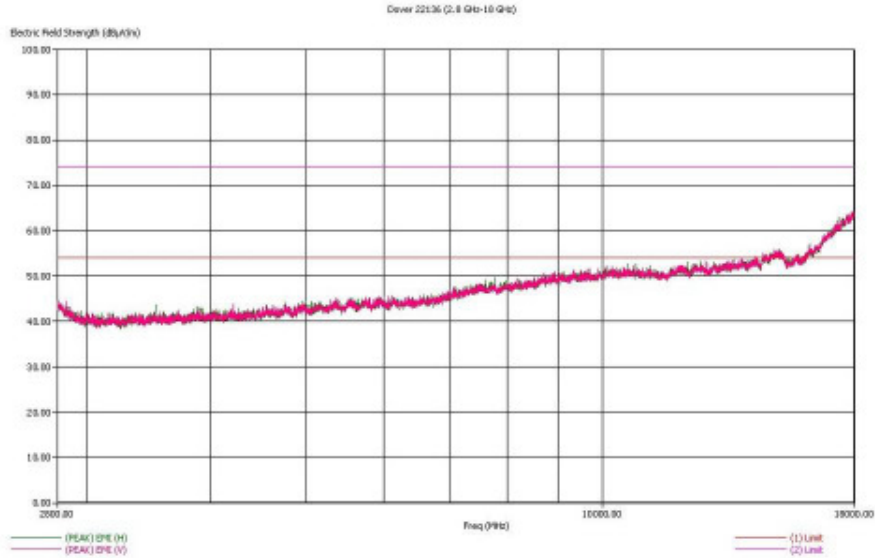
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Sequence: Preliminary Scan



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

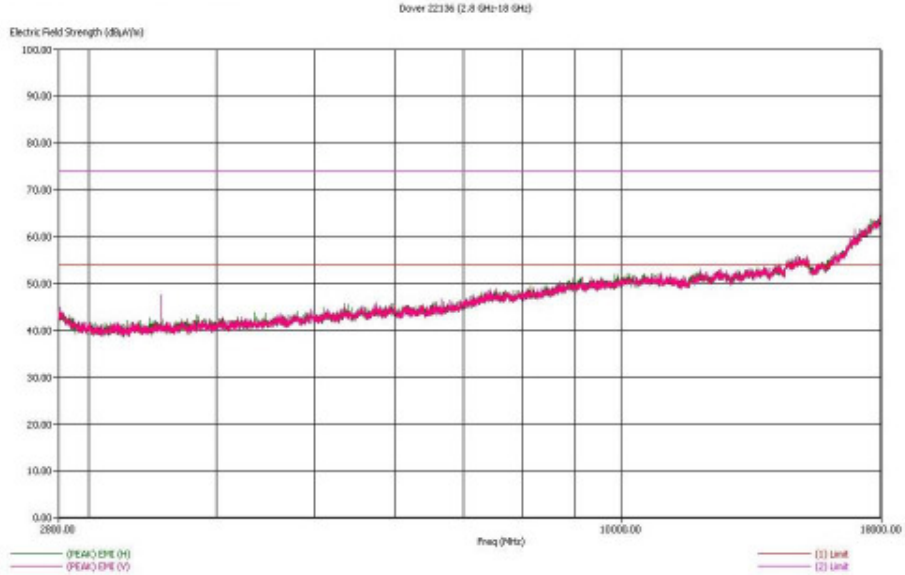
Title: FCC 15.247(c)  
File: Dover 22136 (5.31)(ESIB) FCC15.247 BT2400 Tch-mid\_X 2008-06-20 - 3-18.set  
Operator: ADR\_AAL\_ENC\_TII\_hkr001  
EUT Type: Dover, FCC ID: IHDP56JS1, IMEI: A08000213232E4  
EUT Condition: Board Rev: P3-1  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCF mode.  
BT channel #9 (2441 MHz) up/go in test mode. Orientation X-H  
EMCO 3115 antenna (3GHz - 18GHz).

20-06-2008 14:39:20  
Sequence: Preliminary Scan



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

Title: FCC 15.247(c)  
 File: Dover 22136 (5.31)(ESIB) FCC15.247 BT2400 Tch-mid\_Y 2008-06-20 - 3-18.net  
 Operator: ADR\_AAL EMC\_TL1, 3br001  
 EUT Type: Dover, FCC ID: IHDP56JS1, IMEI: A000000213232E4  
 EUT Condition: Board Rev: P3-1  
 Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.  
 BT channel 39 (2441 MHz) up/down in test mode. Orientation Y=H  
 ENCO 3115 antenna (3GHz - 18GHz).  
 20-06-2008 13:04:18  
 Sequence: Preliminary Scan



Title: FCC 15.247(c)  
 File: Dover 22136 (5.31)(ESIB) FCC15.247 BT2400 Tch-mid\_Y 2008-06-20 -AV V.set  
 Operator: ADR\_AAL EMC\_TL1, usv001  
 EUT Type: Halc, FCC ID: IHDP56JV1, IMEI: A0000002C65066  
 EUT Condition: Board Rev: P3, Open  
 Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.  
 BT ch. 78 (2480 MHz) up/down in test mode. Orientation Y=H/V  
 ENCO 3115 antenna (3GHz - 18GHz). AV detector used.  
 20-06-2008 14:01:16  
 Sequence: Final Measurements

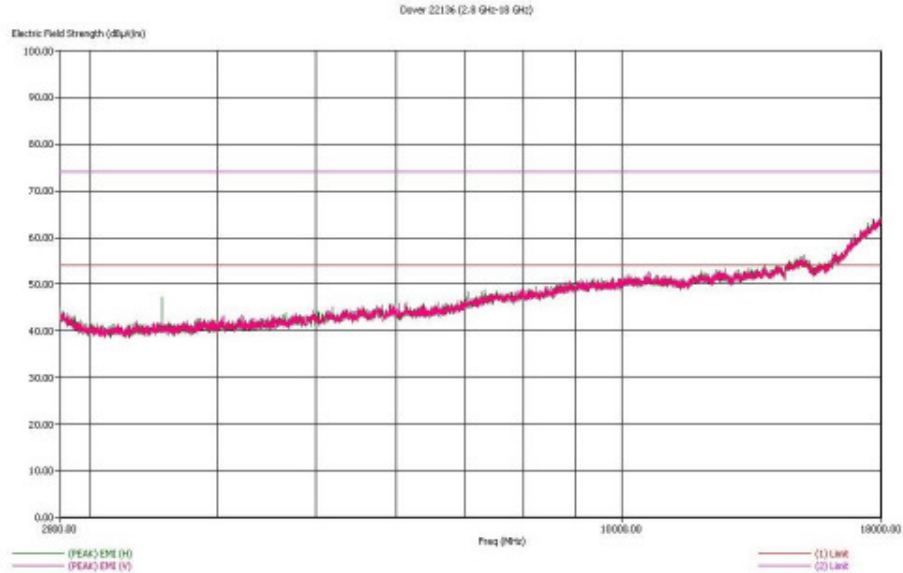
Dover 22136. hgh\_Y - Table

Freq (MHz)	Freq (Max) (MHz)	(AVG) EMI (dBµV/m)	(1) limit (dBµV/m)	(AVG) Margin limit (dB)	Totl Agl (deg)	Pol
3527.00	3528.00	44.06	54.00	-9.94	164.50	V

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

Title: FCC 15.247(c)  
File: Dover 22136 (5.31)(ESIB) FCC15.247 NT2400 Tch-aid\_Z 2008-06-20 - 3-18.asst  
Operator: AIR\_AAL\_EMC\_TLI\_hkr001  
EUT Type: Dover, FCC ID: IHDP56JS1, INEI: A000000213232E4  
EUT Condition: Board Rev: P3-1  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.  
BT channel 39 (2441 MHz) up/down in test mode. Orientation Z=H  
EMCO 3115 antenna (3GHz - 19GHz).

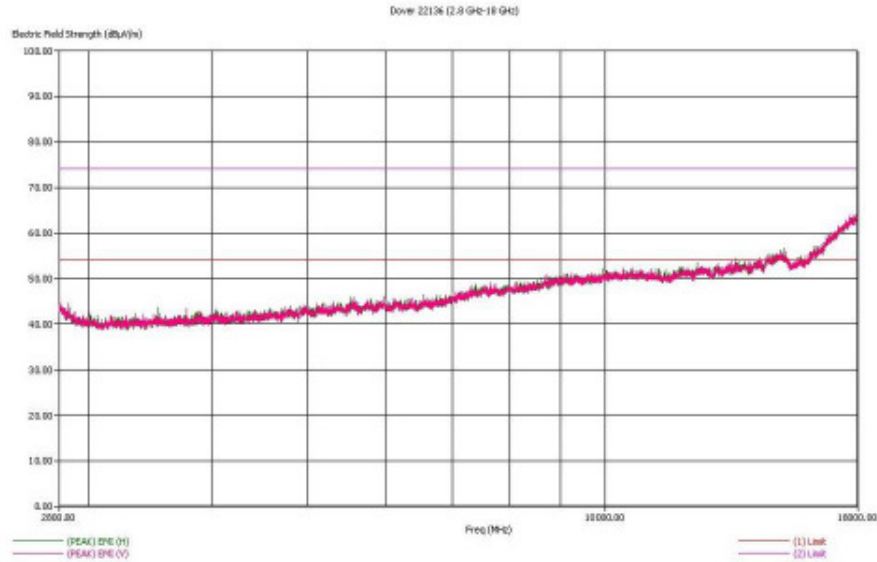
20-06-2008 15:31:53  
Sequence: Preliminary Scan



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

Title: FCC 15.247(c)  
File: Dover 22136 (5.31)(ESIB) FCC15.247 NT2400 Tch-high\_X 2008-06-20 - 3-18.asst  
Operator: AIR\_AAL\_EMC\_TLI\_hkr001  
EUT Type: Dover, FCC ID: IHDP56JS1, INEI: A000000213232E4  
EUT Condition: Board Rev: P3-1  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.  
BT channel 79 (2480 MHz) up/down in test mode. Orientation X=H  
EMCO 3115 antenna (3GHz - 19GHz).

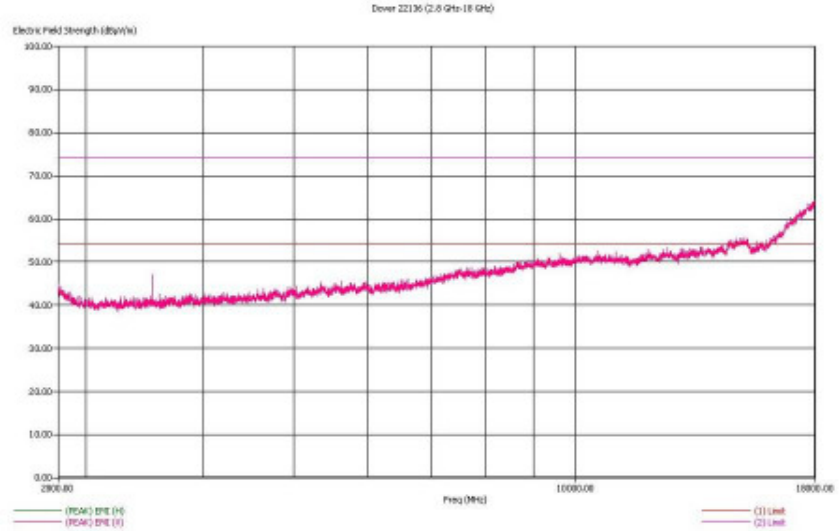
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Sequence: Preliminary Scan



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

Title: FCC 15.247(c)  
File: Dover 22136 [5.21](ES18) FCC15.247 BT1480 Tch-hgh\_Y 2008-06-20 - 3-18 Y.set  
Operator: ADR\_AAL EMC\_TLI\_hkr001  
EIT Type: Dover, FCC ID: IHDP56JS1, IMEI: A808080213232E4  
EIT Conditions: Board Rev: F3-1  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.  
BT channel 78 (2480 MHz) up/down in test mode. Orientation Y=H  
EMCO 3115 antenna (3GHz - 18GHz).

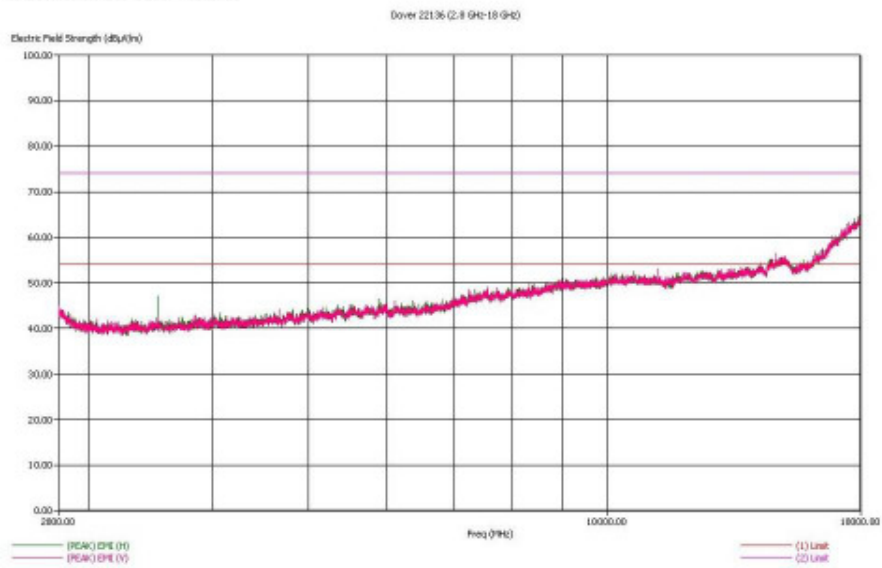
20-06-2008 13:36:58  
Sequence: Preliminary Scan



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

Title: FCC 15.247(c)  
File: Dover 22136 [5.31](ES18) FCC15.247 BT1480 Tch-hgh\_Z 2008-06-20 - 3-18.set  
Operator: ADR\_AAL EMC\_TLI\_hkr001  
EIT Type: Dover, FCC ID: IHDP56JS1, IMEI: A808080213232E4  
EIT Conditions: Board Rev: F3-1  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.  
BT channel 78 (2480 MHz) up/down in test mode. Orientation Z=H  
EMCO 3115 antenna (3GHz - 18GHz).

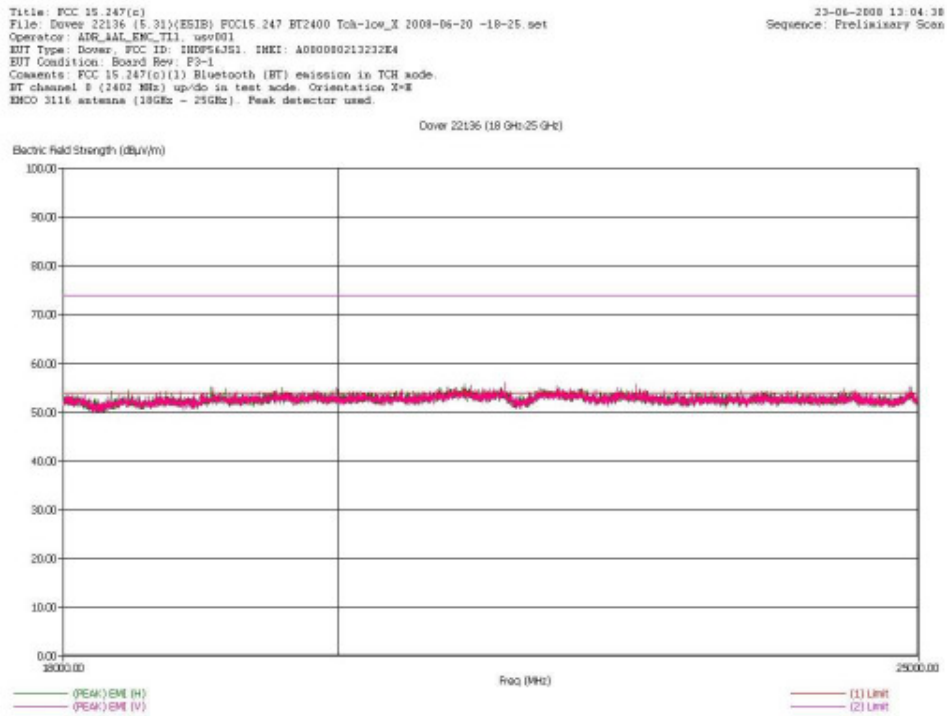
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Sequence: Preliminary Scan



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

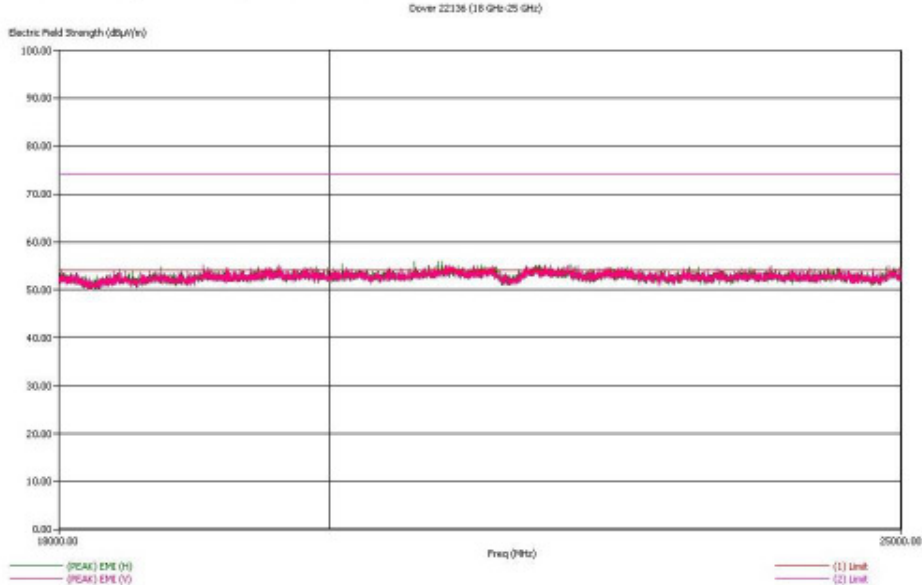
**There were no discernible emissions above the noise floor for 18-26 GHz for Low, Mid and High Channels and all polarizations in Bluetooth band**

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)  
File: Dower 22136 (5.31)(ES1B) FCC15.247 BT2400 Tch-mid\_X 2008-06-20 -10-25.mst  
Operator: ADR\_AAL\_EMC\_TEL\_usw001  
EUT Type: Dower, FCC ID: IHDP56JS1, IMEI: A000000213232E4  
EUT Condition: Board Rev: P3-1  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.  
BT channel 39 (2441 MHz) up/down in test mode. Orientation X+Z  
EMCO 3116 antenna (18GHz - 25GHz). Peak detector used.

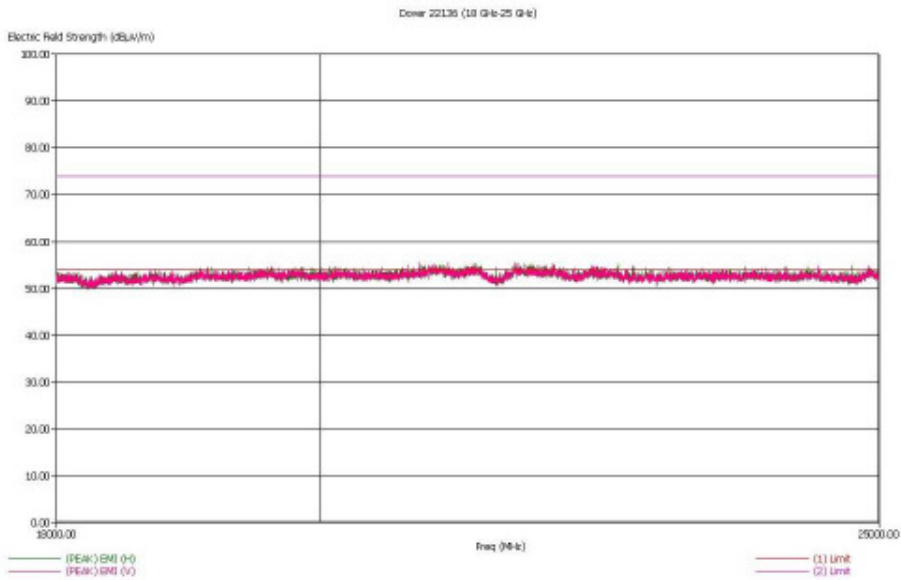
23-06-2008 13:41:04  
Sequence: Preliminary Scan



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

Title: FCC 15.247(c)  
File: Dower 22136 (5.31)(ES1B) FCC15.247 BT2400 Tch-hgh\_X 2008-06-20 -10-25.mst  
Operator: ADR\_AAL\_EMC\_TEL\_usw001  
EUT Type: Dower, FCC ID: IHDP56JS1, IMEI: A000000213232E4  
EUT Condition: Board Rev: P3-1  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.  
BT channel 78 (2489 MHz) up/down in test mode. Orientation X+H  
EMCO 3116 antenna (18GHz - 25GHz). Peak detector used.

23-06-2008 13:58:37  
Sequence: Preliminary Scan



### 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.

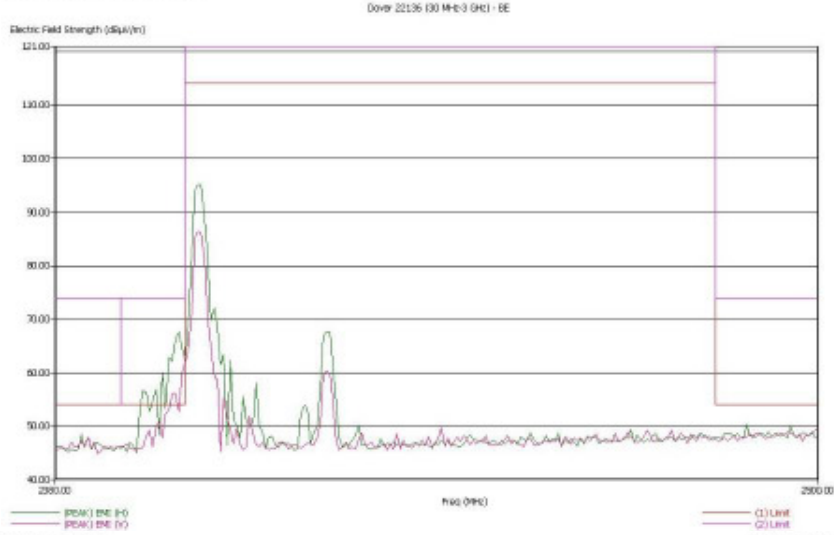
The test was performed in 22.5 degree angular step size when the band edge crossing is measured to be +6 dB above the AVG limit line.

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

See Attached:

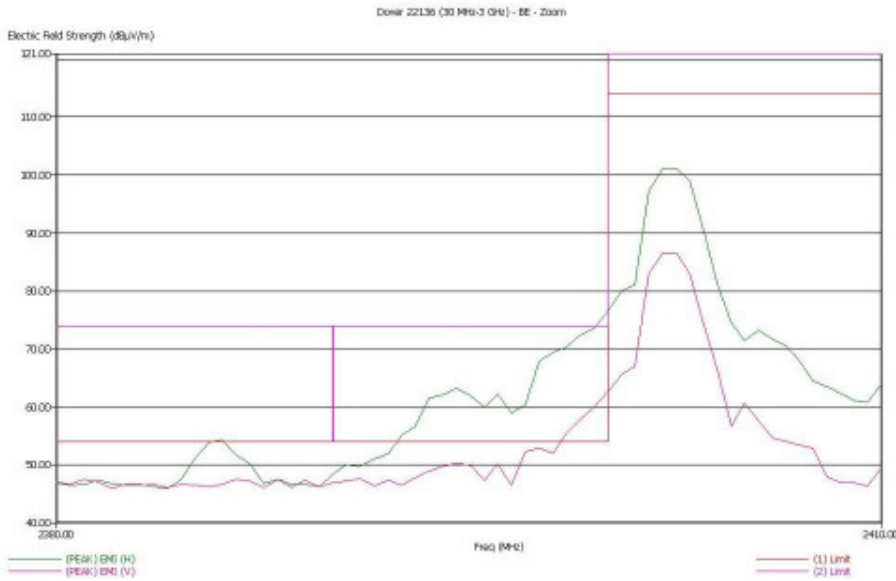
Title: FCC 15.247(c)  
File: D:\emc\22136\_05\_1311(ESD)\FCC15.247 BT2400 Tck-Low\_I 2008-06-19 -3.set  
Operator: ADR\_AAL\_ENC\_TLI\_Mkr001  
EUT Type: Device, FCC ID: IHDP56JS1, IMEI: A400080213232E4  
EUT Condition: Board Rev: PS-1  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCK mode.  
BT channel 0 (2402 MHz) up/down in test mode. Orientation I-H  
MLP 3003C antenna (30MHz - 3 GHz).

15-06-2008 16:23:41  
Sequence: Preliminary Scan



Title: FCC 15.247(c)  
File: D:\emc\22136\_05\_1311(ESD)\FCC15.247 BT2400 Tck-Low\_I 2008-06-19 -3 -22\_Spreader.set  
Operator: ADR\_AAL\_ENC\_TLI\_Mkr001  
EUT Type: Device, FCC ID: IHDP56JS1, IMEI: A400080213232E4  
EUT Condition: Board Rev: PS-1  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCK mode.  
BT channel 0 (2402 MHz) up/down in test mode. Orientation X-H  
MLP 3003C antenna (30MHz - 3 GHz).

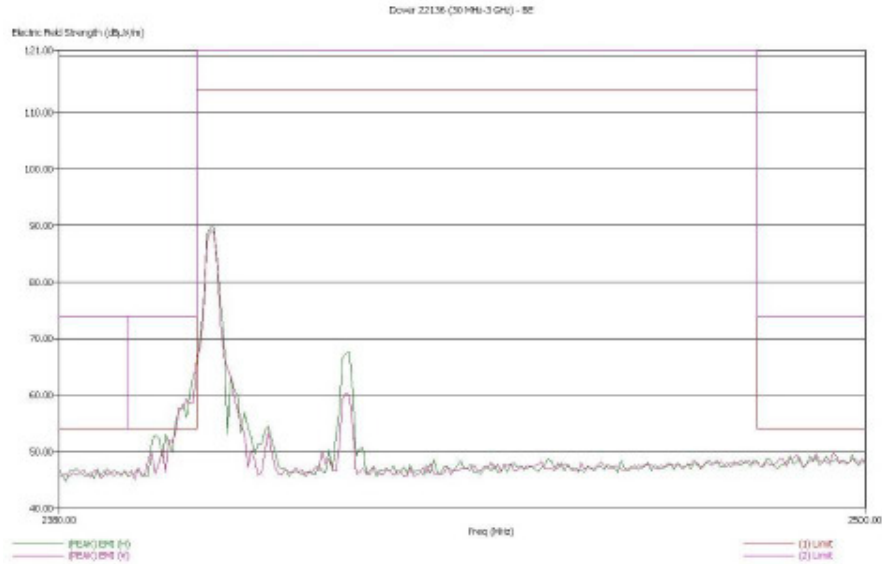
26-06-2008 09:08:11  
Sequence: Preliminary Scan



**Authorized Band Emissions Low Channel Dual Polarization X**  
(See appendix 1)

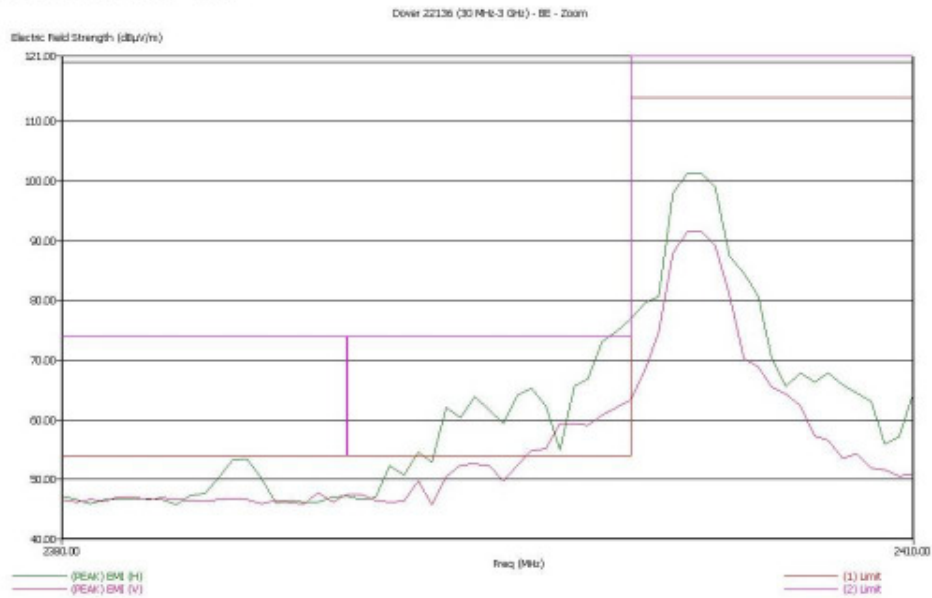
Title: FCC 15.247(c)  
File: Dover 22136 (5.31)(ESU) FCC15.247 BT2400 Tok-low\_Y 2008-06-19 -3.ser  
Operator: ADM\_AAL\_EMC\_TL1\_hkr011  
EUT Type: Dover, FCC ID: IHDP56JS1, IMEI: A00000213232E4  
EUT Condition: Board Rev: P3-1  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.  
BT channel 0 (2402 MHz) sp'ds in test mode. Orientation Y-H  
HLP 30E3C antenna (30MHz - 3 GHz).

19-06-2008 17:25:41  
Sequence: Preliminary Scan



Title: FCC 15.247(c)  
File: Dover 22136 (5.31)(ESU) FCC15.247 BT2400 Tok-low\_Y 2008-06-19 -2 -22.5raddev set  
Operator: ADM\_AAL\_EMC\_TL1\_hkr001  
EUT Type: Dover, FCC ID: IHDP56JS1, IMEI: A00000213232E4  
EUT Condition: Board Rev: P3-1  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.  
BT channel 0 (2402 MHz) sp'ds in test mode. Orientation Y-H  
HLP 30E3C antenna (30MHz - 3 GHz).

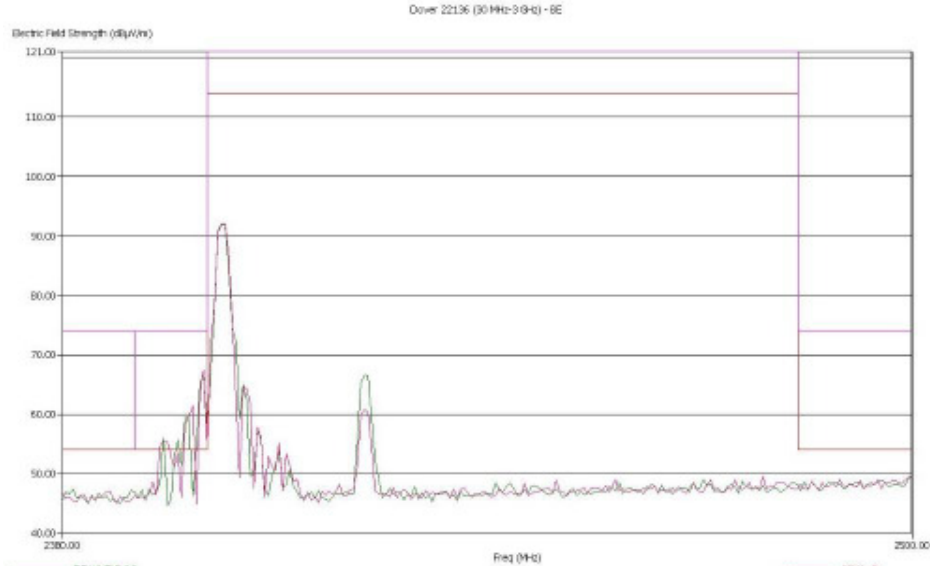
19-06-2008 17:45:04  
Sequence: Preliminary Scan



**Authorized Band Emissions Low Channel Dual Polarization Y**  
(See appendix 1)

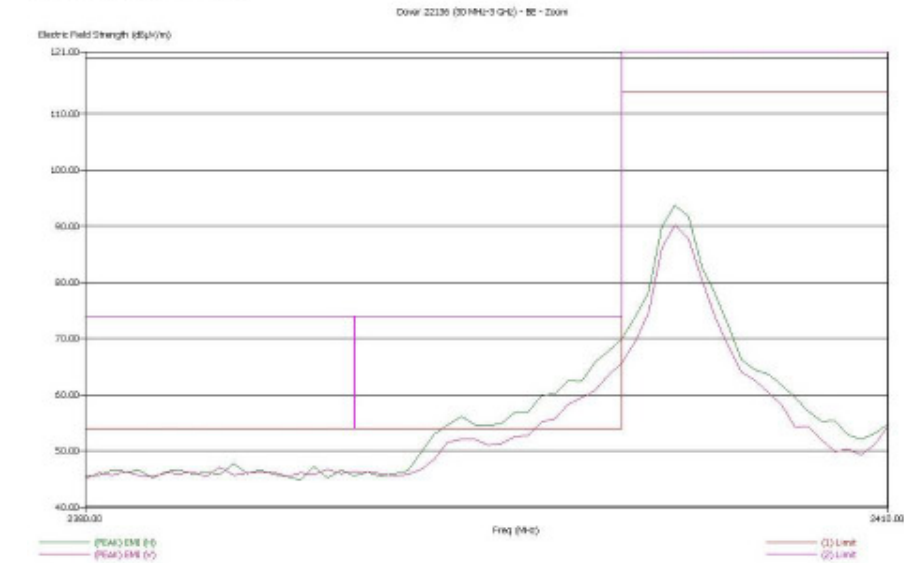
Title: FCC 15.247(e)  
File: Dover 22136 (5.31)(EIR) FCC15.247 BT2400 Tch-low\_Z 2008-06-19 -3.set  
Operator: ADR\_AAL\_EMC\_TLI\_hkr001  
EUT Type: Dover, FCC ID: IHDP56JS1, IMEI: A000010213232E4  
EUT Condition: Board Rev: P3-1  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.  
BT channel 0 (2402 MHz) up/down in test mode. Orientation Z-H  
HLP 3003C antenna (30MHz - 3 GHz).

20-06-2008 09:22:53  
Sequence: Preliminary Scan



Title: FCC 15.247(e)  
File: Dover 22136 (5.31)(EIR) FCC15.247 BT2400 Tch-low\_Z 2008-06-19 -3 -22.5grader.set  
Operator: ADR\_AAL\_EMC\_TLI\_hkr001  
EUT Type: Dover, FCC ID: IHDP56JS1, IMEI: A000010213232E4  
EUT Condition: Board Rev: P3-1  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.  
BT channel 0 (2402 MHz) up/down in test mode. Orientation Z-Y  
HLP 3003C antenna (30MHz - 3 GHz).

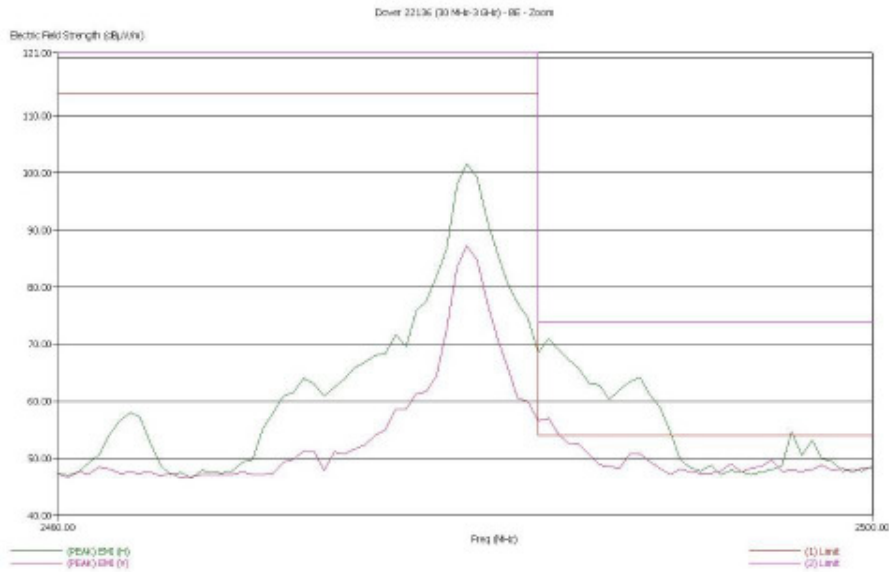
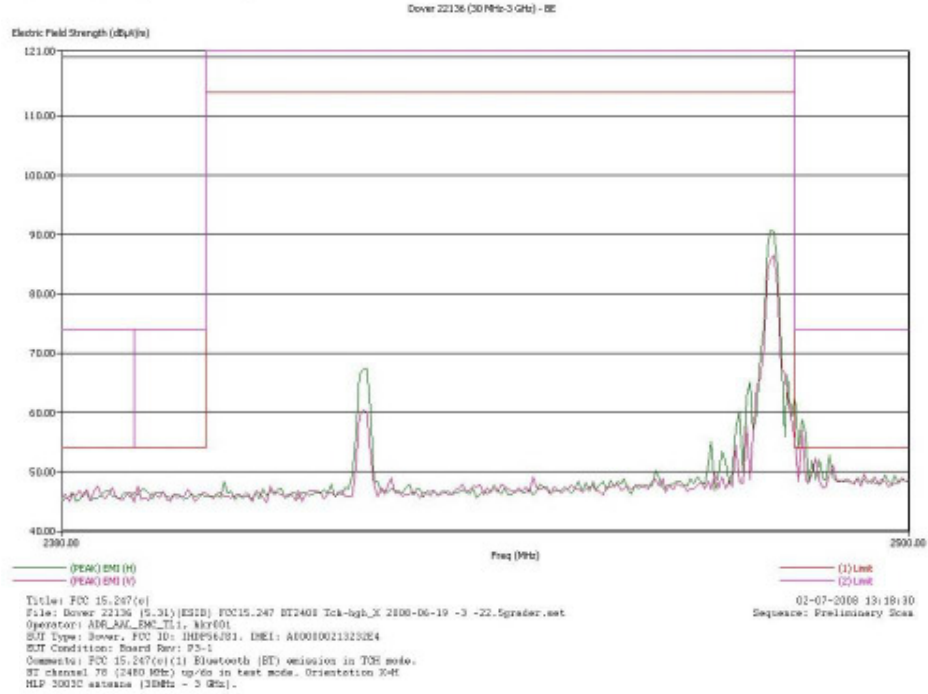
02-07-2008 11:49:57  
Sequence: Preliminary Scan



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

Title: FCC 15.247(e)  
File: Dover 22136 [5\_31](ESU) FCC15.247 BT2400 Tch-hgh\_X 2008-06-19 -3.mat  
Operator: ADR\_AAI\_EMC\_TL1\_hlr001  
EUT Type: Dover; FCC ID: IHDP56JS1; IMEI: A000000213232E4  
EUT Condition: Board Rev: P3-1  
Comments: FCC 15.247(e)(1) Bluetooth (BT) emission in TCH mode.  
BT channel 78 (2480 MHz) up/down in test mode. Orientation X=Z  
NLP 3002C antenna (30MHz - 3 GHz).

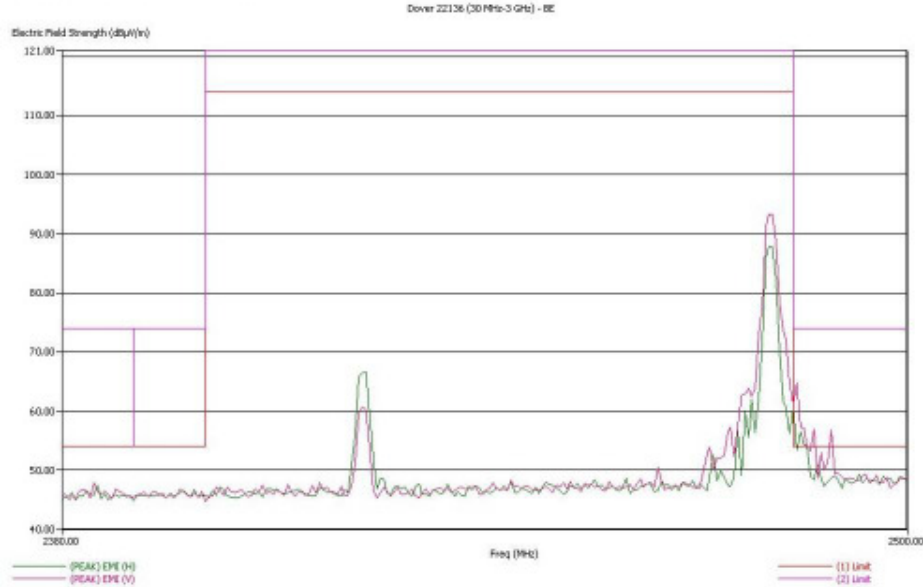
19-06-2008 16:35:45  
Sequence: Preliminary Scan



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

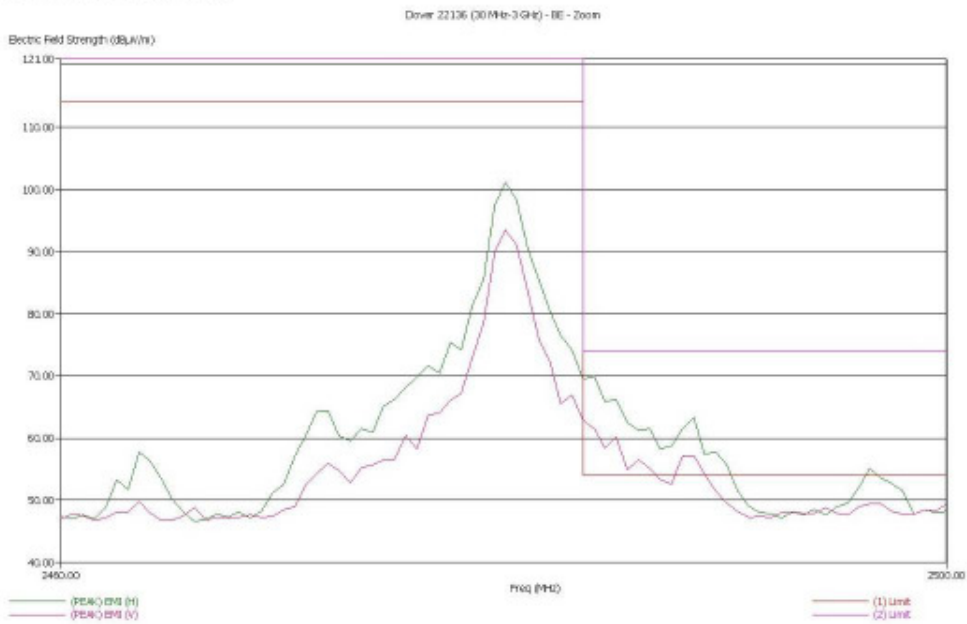
Title: FCC 15.247(e)  
File: Dover 22136 (5.31)(ESB) FCC15.247 BT2400 Tch-hgh\_V 2008-06-19 -3 .net  
Operator: ADR\_AAL\_EMC\_TL1\_hkr001  
EUT Type: Dover, FCC ID: IHDP56JS1, IMEI: A000000213232E4  
EUT Condition: Board Rev: P3-1  
Comments: FCC 15.247(e)(1) Bluetooth (BT) emission in TCH mode.  
BT channel 78 (2480 MHz) up/down in test mode. Orientation Y-Z  
HLP 3003C antenna (30MHz - 3 GHz).

19-06-2008 16:53:27  
Sequence: Preliminary Scan



Title: FCC 15.247(e)  
File: Dover 22136 (5.31)(ESB) FCC15.247 BT2400 Tch-hgh\_V 2008-06-19 -3 -22.5gzaider.net  
Operator: ADR\_AAL\_EMC\_TL1\_hkr001  
EUT Type: Dover, FCC ID: IHDP56JS1, IMEI: A000000213232E4  
EUT Condition: Board Rev: P3-1  
Comments: FCC 15.247(e)(1) Bluetooth (BT) emission in TCH mode.  
BT channel 78 (2480 MHz) up/down in test mode. Orientation Y-Z  
HLP 3003C antenna (30MHz - 3 GHz).

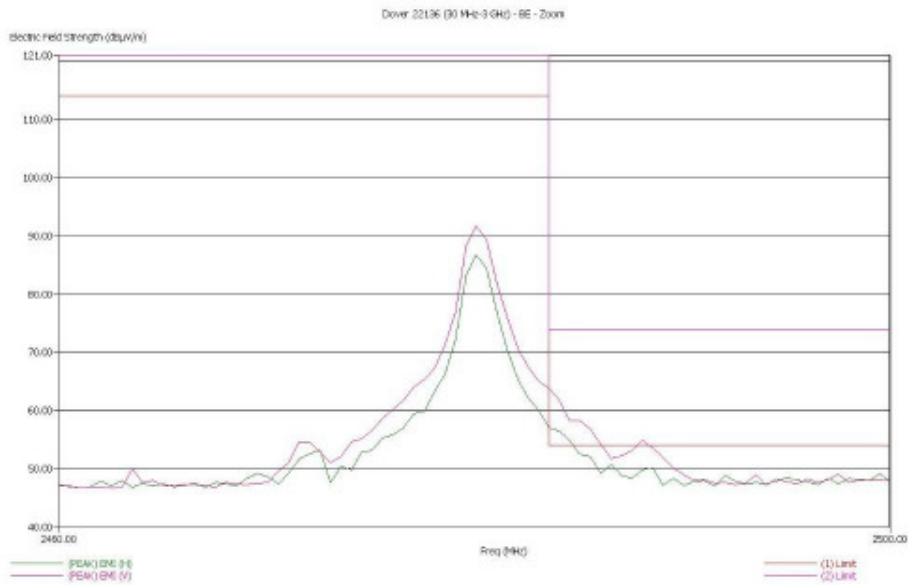
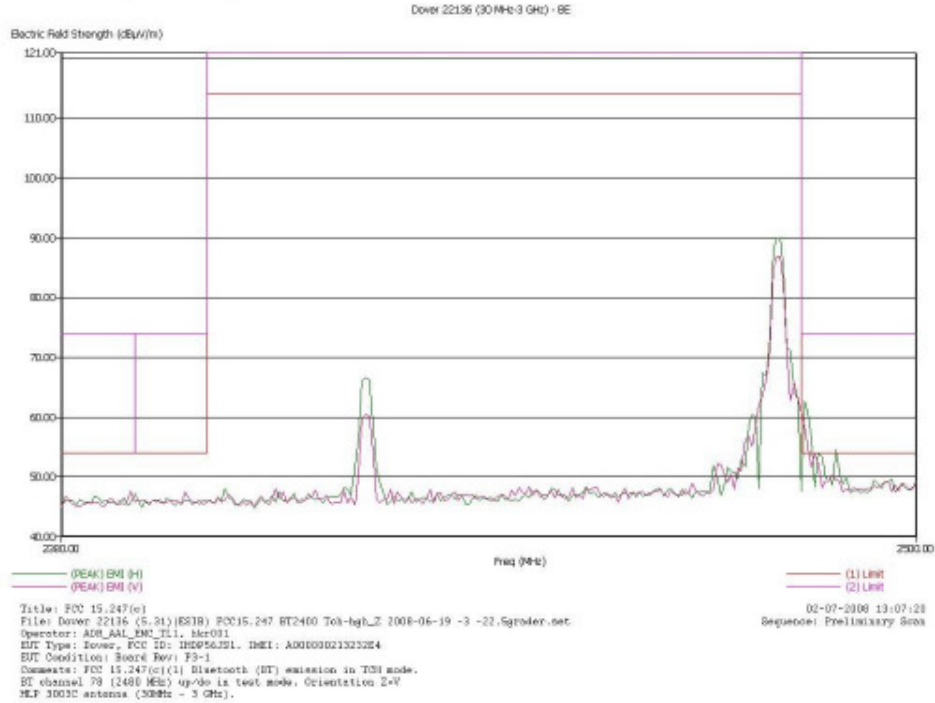
02-07-2008 13:29:13  
Sequence: Preliminary Scan



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

Title: FCC 15.247(e)  
File: Dover 22136 (5,31)(ESB) FCC15.247 BT2400 Tch-hgh\_Z 2008-06-19 -3.net  
Operator: AD0\_AAL\_EMC\_TL1\_hkr001  
EUT Type: Dover, FCC ID: IHDP56JS1, IMEI: A001000213232E4  
EUT Condition: Board Rev: F3-1  
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.  
BT channel 79 (2480 MHz) up-do in test mode. Orientation Z-H  
EIP 3003C antenna (30MHz - 3 GHz).

20-06-2008 09:51:55  
Sequence: Preliminary Scan



**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

**APPENDIX**

**Appendix- 1 Marker-Delta Method**

The Bluetooth low channel band edge performance is further evaluated using the Marker-Delta Method described in FCC guideline DA 00-705.

The in-band field strength was measured as described in Step-1 using and RBW (6 dB)=VBW=1MHz – Peak detector and RBW(6 dB)=VBW=1MHz – Average detector.

```
Title: FCC 15.247(c)
File: Dover 22136 (5.31)(ESIB) FCC15.247 BT2400 Tch-low_Y 2008-06-19 Carrier -PK -RBW=VBW=1M.set
Operator: ADR_AAL_ENC_TL1, hkr001
EUT Type: Dover, FCC ID: IHDP56JS1, IMEI: A000000213232E4
EUT Condition: Board Rev: P3-1
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.
BT channel 0 (2402 MHz) up/do in test mode. Orientation Y=V
HLP 3003C antenna (30MHz - 3 GHz). Peak detector used.
```

02-07-2008 14:00:01

Sequence: Final Measurements

Dover 22136 - Table, RBW=1MHz, VBW=1MHz, PK

Freq (MHz)	Freq (Max) (MHz)	(PEAK) EMI (dBµV/m)	(Z) Limit (dBµV/m)	(PEAK) Margin Lim2 (dB)	Tilt Ang (deg)	Pol
2402.00	2402.06	98.36	134.00	-35.64	222.10	H
2402.00	2402.05	92.34	134.00	-41.66	223.70	V

**Carrier Y-Orientation-RBW(6 dB)=VBW=1MHz – PK detector**

```
Title: FCC 15.247(c)
File: Dover 22136 (5.31)(ESIB) FCC15.247 BT2400 Tch-low_Y 2008-06-19 Carrier -AV -RBW=VBW=1M.set
Operator: ADR_AAL_ENC_TL1, hkr001
EUT Type: Dover, FCC ID: IHDP56JS1, IMEI: A000000213232E4
EUT Condition: Board Rev: P3-1
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.
BT channel 0 (2402 MHz) up/do in test mode. Orientation Y=V
EMCO 3115 antenna (30Hz - 18GHz). AV detector used.
```

02-07-2008 14:06:33

Sequence: Final Measurements

Dover 22136 - Table, RBW=1MHz, VBW=1MHz, AV

Freq (MHz)	Freq (Max) (MHz)	(AVG) EMI (dBµV/m)	(1) Limit (dBµV/m)	(AVG) Margin Lim1 (dB)	Tilt Ang (deg)	Pol
2402.00	2402.04	86.08	114.00	-27.92	222.20	H
2402.00	2402.05	76.47	114.00	-37.53	360.00	V

**Carrier Y-Orientation-RBW(6 dB)=VBW=1MHz – AVG detector**

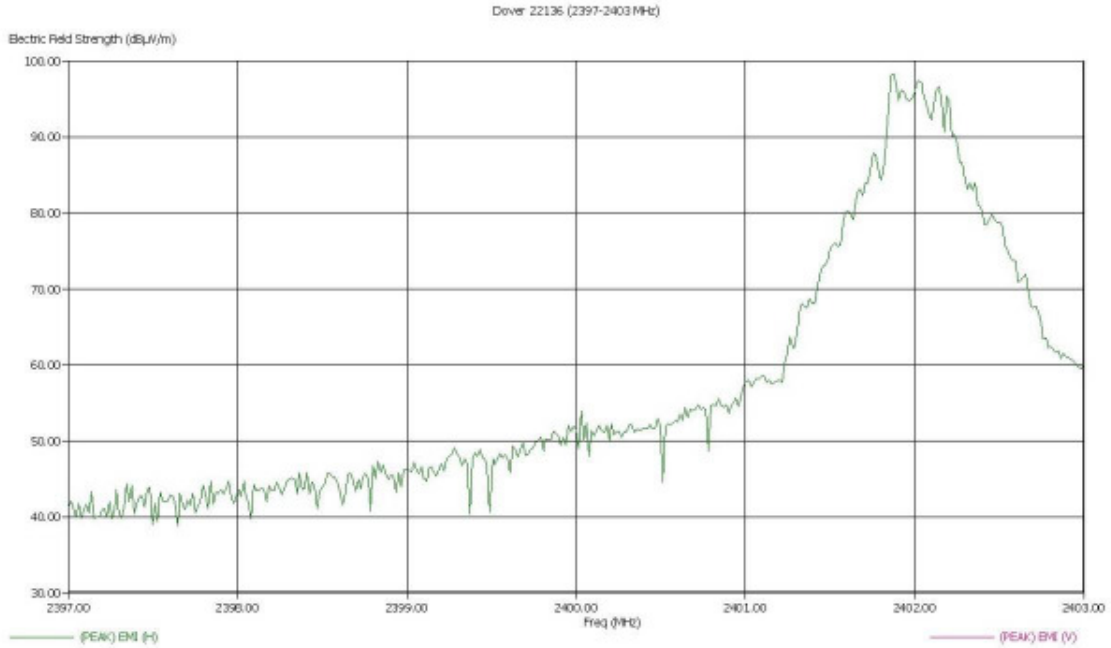
The frequency 2402.03 was selected as peak reference point in order to minimize the span of the Step-2 measurement.

In Step-2 the band edge is measured from 2397 MHz – 2403 MHz, using an RBW of 1% equals 60 kHz, so the RBW(6 dB)=50kHz, VBW=Auto were selected for the measurement.

The carrier peak was detected and the delta marker function was used to record the maximum peak in the frequency range from 2398 MHz to 2400 MHz.

Title: FCC 15.247(e)  
 File: Dover 22136 (5.31)(ESU) FCC15.247 ET2400 Tch-low\_Y 2008-06-19 -FK -RBW=50K -VBW=Auto -table.set  
 Operator: ADR\_AAL\_ENC\_TL1, hkr001  
 EUT Type: Dover, FCC ID: IHDP56JS1. IMEI: A000000213232E4  
 EUT Condition: Board Rev: P3-1  
 Comments: FCC 15.247(e)(1) Bluetooth (BT) emission in TCH mode.  
 ET channel 0 (2402 MHz) up/down is test mode. Orientation Y=H  
 HLP 3003C antenna (30MHz - 3 GHz).  
 Turntable fixed at 222 deg. & Transducer fixed at Horizontal  
 Carrier Fk: 2401.87 MHz=98.35 dBuV/m  
 Marker freq: 2399.96 MHz=52.02 dBuV/m => Delta=46.33 dB

02-07-2008 15:36:46  
 Sequence: Preliminary Scan



**Marker-Delta X-Orientation-RBW (6 dB)=50kHz, VBW=Auto – Max hold**

Reading the graph indicates the worst case value to -46.33 dBc in the frequency range from 2398 MHz – 2400 MHz.

The maximum peak field strength in the frequency band from 2398 MHz to 2400 MHz is then 98.36 dBµV/m – 46.33 dB = 52.03 dBµV/m.

**End of Test Report**