



MOTOROLA

MOBILE DEVICES BUSINESS

**PRODUCT SAFETY AND COMPLIANCE
EMC LABORATORY**

EMC TEST REPORT - Addendum

Test Report Number – 22235-1BT

Report Date – 2008-07-29

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: 2008-07-21 to 2008-07-22

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: 2008-07-29

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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: Clamshell

Signaling Capability: Dual band 800/1900 CDMA 1x, Bluetooth Class 2.

Serial Numbers: A0000002E80B7CC

FCC ID: IHDP56JF1

Project number: 22235-1

Testing Complete Date: 22-07-2009

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 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 21.8° C +- 1 ° C and relative humidity of 47.0% +-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	EA PA 02 JCA12 300 JCA218 4003 JCA48 300 JCA1826 431 JCA1218 500)	800002	(1 – 26 GHz) 1 GHz – 2 GHz 2 GHz – 18 GHz 4 GHz – 8 GHz 18 GHz – 26 GHz 12 GHz – 18 GHz	26.06.2007
	Sonoma 310N	185680	9 kHz – 1 GHz	19.06.2007
	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	07.12.2007
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	71502	1 GHz – 18 GHz	21.05.2008
Double rigid horn (w. 2x 18-40 GHz pre-amp+6dB attenuator.)	EMCO 3116	2637	18 GHz – 40 GHz	20.12.2007

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

Description of Bluetooth Transmitter

The 22235-1 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 μ V/m) = EMI Receiver Level (dB μ 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 BK61 with model number SNN5815A.

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 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 Z orientation in horizontal polarity, see picture section.

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

A check of the carrier on the Bluetooth center channel 39 was performed to determine the expected maximum radiation of the Bluetooth carrier for the test sample with clamshell open and placed in orientation Z.

Open:

Title: FCC 15.247(c)
 File: Limerick 22235 (5.31)(ESIB) FCC15.247 BT2400 Tch-mid_Z 2008-07-21 Carrier -PK -open.set
 Operator: ADR_AAL EMC_TL1, hkr001
 EUT Type: Limerick, FCC ID: IHDP56JF1, IMEI: A0000002E80B7CC
 EUT Condition: SW rev: 02.00S2, Board Rev: DVT1, open
 Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.
 BT ch. 39 (2441 MHz) up/do in test mode. Orientation Z=H
 HLP 3003C antenna (30MHz - 3 GHz). Peak detector used.

21-07-2008 12:18:14
 Sequence: Final Measurements

Limerick 22235 - Table

Freq (MHz)	Freq (Max) (MHz)	(PEAK) EMI (dBµV/m)	(1) Limit (dBµV/m)	(PEAK) Margin Lim1 (dB)	Tilt Agl (deg)	Pol
2441.00	2441.16	98.00	114.00	-16.00	336.80	H
2441.00	2441.16	90.32	114.00	-23.68	100.10	V

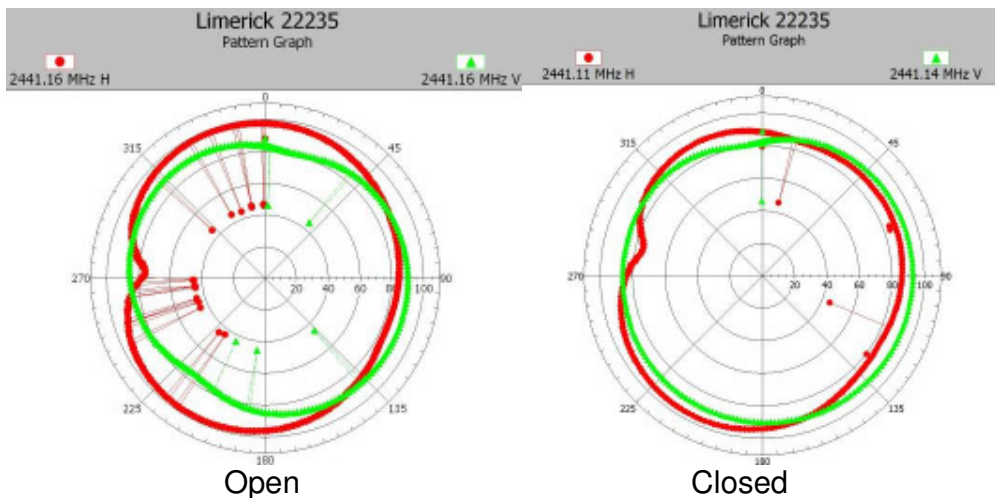
Closed:

Title: FCC 15.247(c)
 File: Limerick 22235 (5.31)(ESIB) FCC15.247 BT2400 Tch-mid_Z 2008-07-21 Carrier -PK -closed.set
 Operator: ADR_AAL EMC_TL1, hkr001
 EUT Type: Limerick, FCC ID: IHDP56JF1, IMEI: A0000002E80B7CC
 EUT Condition: SW rev: 02.00S2, Board Rev: DVT1, closed
 Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.
 BT ch. 39 (2441 MHz) up/do in test mode. Orientation Z=H
 HLP 3003C antenna (30MHz - 3 GHz). Peak detector used.

21-07-2008 12:49:25
 Sequence: Final Measurements

Limerick 22235 - Table

Freq (MHz)	Freq (Max) (MHz)	(PEAK) EMI (dBµV/m)	(1) Limit (dBµV/m)	(PEAK) Margin Lim1 (dB)	Tilt Agl (deg)	Pol
2441.00	2441.11	95.99	114.00	-18.01	201.60	H
2441.00	2441.14	92.75	114.00	-21.25	93.60	V



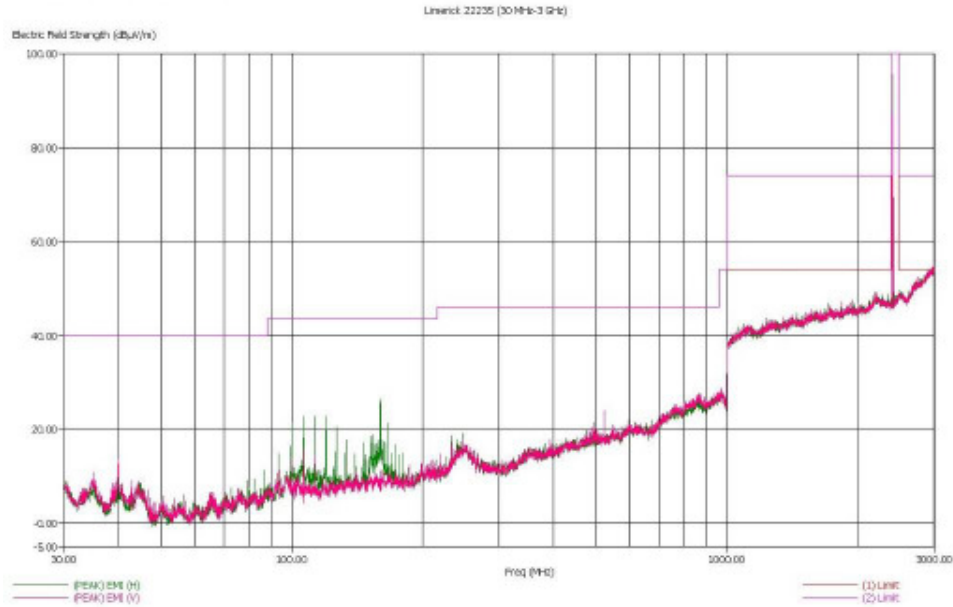
The Bluetooth radiated TX power is measured to 0.60 dBm on channel 39 with RBW=1 MHz (6 dB).

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(e)
File: Limerick 22235 (5.31)(E818) FCC15.247 BT2400 Teh-low_2 2008-07-21 -3.set
Operator: ADR_AAL_EMC_TL1.lkr001
EUT Type: Limerick, FCC ID: IHDP56JF1, IMEI: A000002E80870C
EUT Condition: SW rev: 02.0082, Board Rev: DVT1, open
Comments: FCC 15.247(e)(1) Bluetooth (BT) emission in TCH mode.
BT ch. 0 (2402 MHz) up/down in test mode. Orientation Z-H
MLP 3003C antenna (30MHz - 3 GHz). Peak detector used.

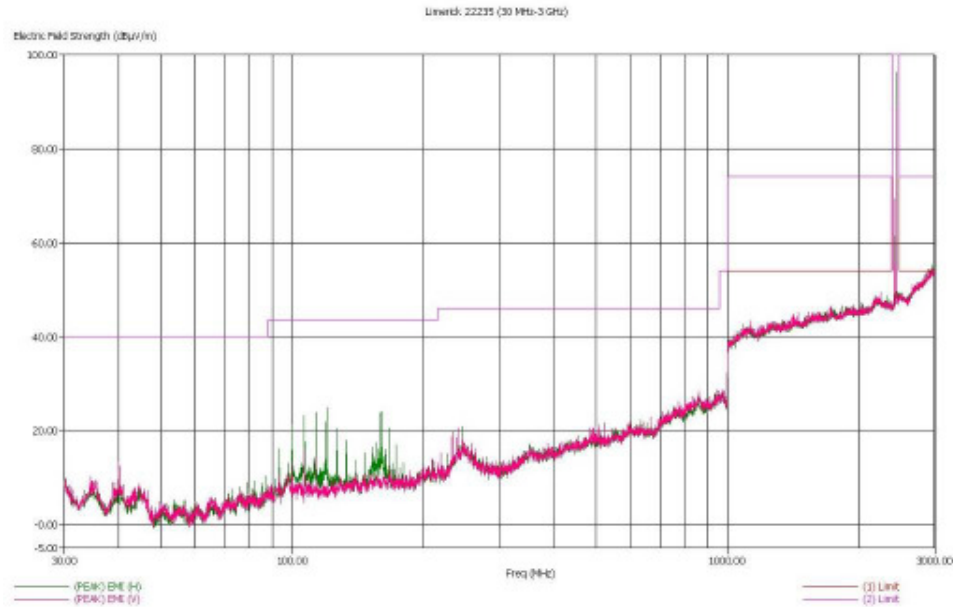
21-07-2008 14:06:09
Sequence: Preliminary Scan



30-3000 MHz Low Channel Dual Polarization Z

Title: FCC 15.247(e)
File: Limerick 22235 (5.31)(E818) FCC15.247 BT2400 Teh-mid_2 2008-07-21 -3.set
Operator: ADR_AAL_EMC_TL1.lkr001
EUT Type: Limerick, FCC ID: IHDP56JF1, IMEI: A000002E80870C
EUT Condition: SW rev: 02.0082, Board Rev: DVT1, open
Comments: FCC 15.247(e)(1) Bluetooth (BT) emission in TCH mode.
BT ch. 39 (2441 MHz) up/down in test mode. Orientation Z-H
MLP 3003C antenna (30MHz - 3 GHz). Peak detector used.

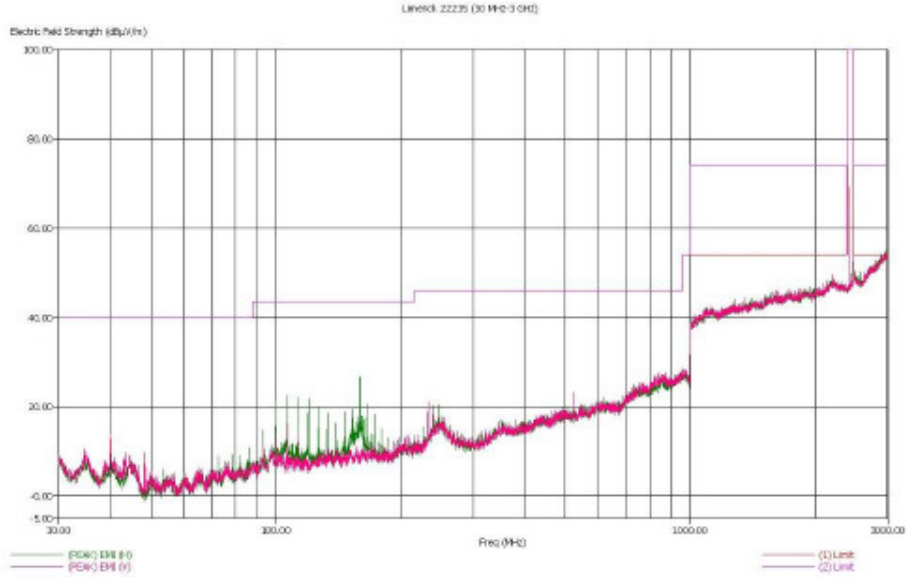
21-07-2008 14:09:11
Sequence: Preliminary Scan



30-3000 MHz Middle Channel Dual Polarization Z

Title: FCC 15.247(e)
File: Limerick 22235 [5.33] [SITE] FCC15.247 BT2400 Tck-hgh_Z 1008-07-21 -3.set
Operator: ADR_AAL_EMC_TLI_Akr001
SUT Type: Limerick, FCC ID: IHDP56JF1, DMEI: A0000102E80B70C
SUT Condition: SW rev: 02.0052, Board Rev: 0701, open
Comments: FCC 15.247(e)(1) Bluetooth [BT] emission in TCH mode.
BT ch. 78 [2400 MHz] up/down is test mode. Orientation Z=H
HLP 3013C antenna [30MHz - 3 GHz]. Peak detector used.

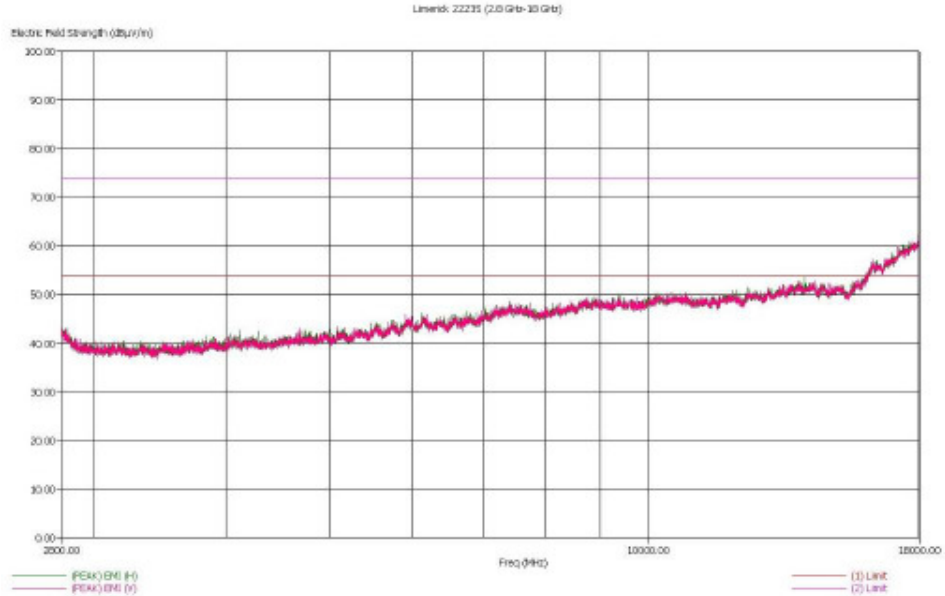
21-07-2008 14:37:44
Sequence: Preliminary Scan



30-3000 MHz High Channel Dual Polarization Z

Title: FCC 15.247(e)
File: Limerick 22235 (5.31)(E818) FCC15.247 ET2400 Tech-low_X 2008-07-21 -3-18.set
Operator: ADR_AAL_EMC_TL1_bkr001
EUT Type: Limerick, FCC ID: IHDP56JF1, IMEI: A0000002808700
EUT Condition: SW rev: 02.0032, Board Rev: DVT1, open
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TX mode.
BT ch: 0 (2402 MHz) up/down in test mode. Orientation X=H
EMC 3115 antenna (30Hz - 10GHz). Peak detector used.

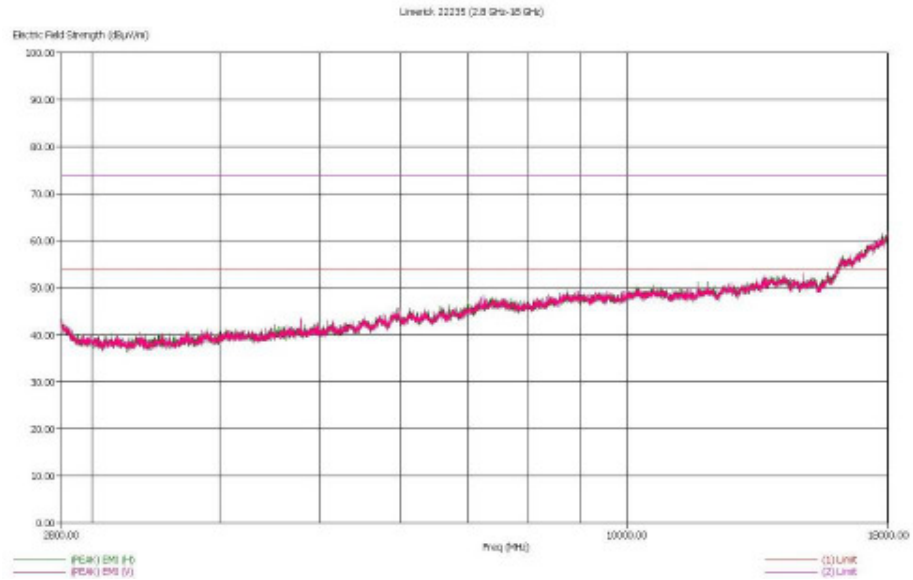
22-07-2008 10:20:46
Sequence: Preliminary Scan



3-18 GHz Low Channel Dual Polarization X

Title: FCC 15.247(e)
File: Limerick 22235 (5.31)(E818) FCC15.247 ET2400 Tech-low_Y 2008-07-21 -3-18.set
Operator: ADR_AAL_EMC_TL1_bkr001
EUT Type: Limerick, FCC ID: IHDP56JF1, IMEI: A0000002808700
EUT Condition: SW rev: 02.0032, Board Rev: DVT1, open
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TX mode.
BT ch: 0 (2402 MHz) up/down in test mode. Orientation Y=V
EMC 3115 antenna (30Hz - 10GHz). Peak detector used.

22-07-2008 11:51:34
Sequence: Preliminary Scan

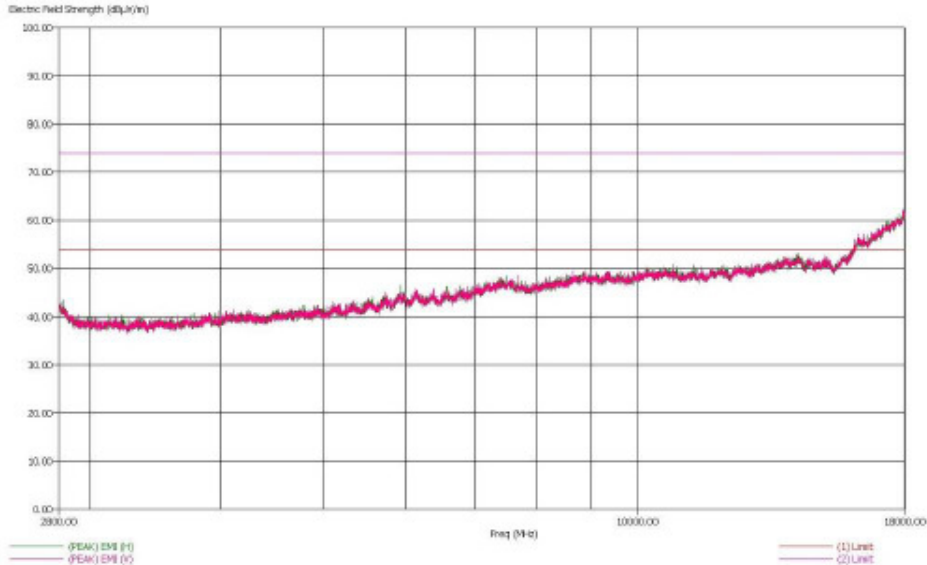


3-18 GHz Low Channel Dual Polarization Y

Title: FCC 15.247(c)
File: Limerick 22235 (5.31)(E818) FCC15.247 ET2400 Tck-low_2 2008-07-21 -3-18.net
Operator: AML_AAL_EMC_TLI. hkr001
EUT Type: Limerick, FCC ID: [IHDP56JF1, IMEI: A00100102E808700
EUT Condition: SW rev: 02.0052, Board Rev: DVT1, open
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.
BT ch. 0 (2402 MHz) up/down in test mode, Orientation 2-H
EMC 3115 antenna (30Hz - 180Hz), Peak detector used.

22-07-2008 12:15:00
Sequence: Preliminary Scan

Limerick 22235 (2.8 GHz-18 GHz)

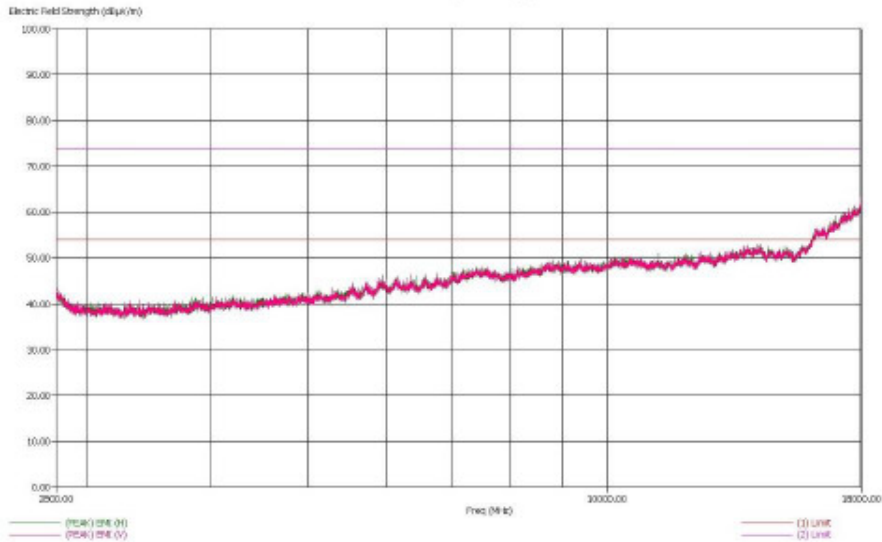


3-18 GHz Low Channel Dual Polarization Z

Title: FCC 15.247(c)
File: Limerick 22235 (9.31)(E818) FCC15.247 ET2400 Tck-mid_X 2008-07-21 -3-18.net
Operator: AML_AAL_EMC_TLI. hkr001
EUT Type: Limerick, FCC ID: [IHDP56JF1, IMEI: A00100102E808700
EUT Condition: SW rev: 02.0052, Board Rev: DVT1, open
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.
BT ch. 38 (2441 MHz) up/down in test mode, Orientation X-H
EMC 3115 antenna (30Hz - 180Hz), Peak detector used.

22-07-2008 10:36:47
Sequence: Preliminary Scan

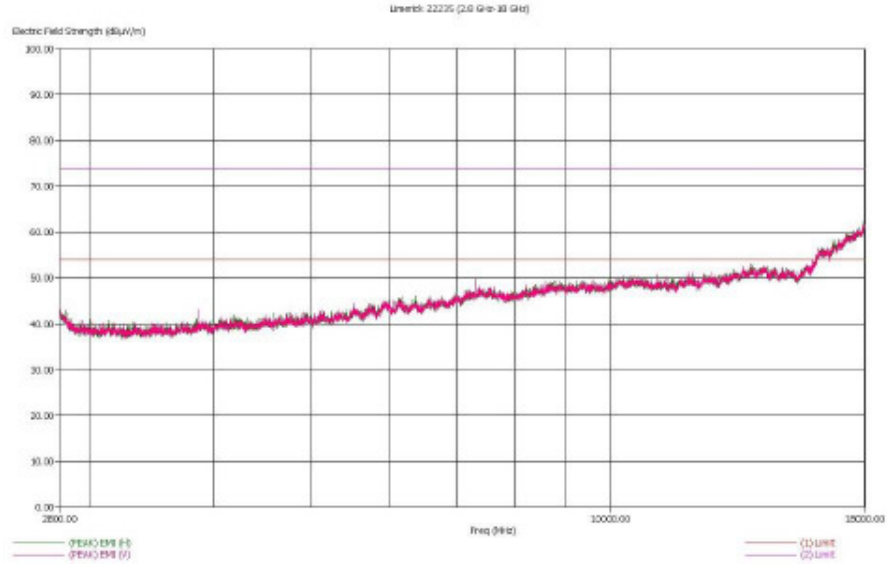
Limerick 22235 (2.8 GHz-18 GHz)



3-18 GHz Middle Channel Dual Polarization X

Title: FCC 15.247(c)
File: Limerick 22235 (5.31)(ES1B) FCC15.247 ET2403 Tch-mid_Y 2008-07-21 -3-18.wpt
Operator: AIR_AAL_EMP_TL1_kkr001
EUT Type: Limerick, FCC ID: IHDP56JF1, DNI: A10031021E00700
EUT Condition: SW rev: 02.0022, Board Rev: DVT1, open
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCM mode.
ET ch. 39 (2441 MHz) up/down in test mode. Orientation Y-H
EMC 3115 antenna (30Hz - 10GHz). Peak detector used.

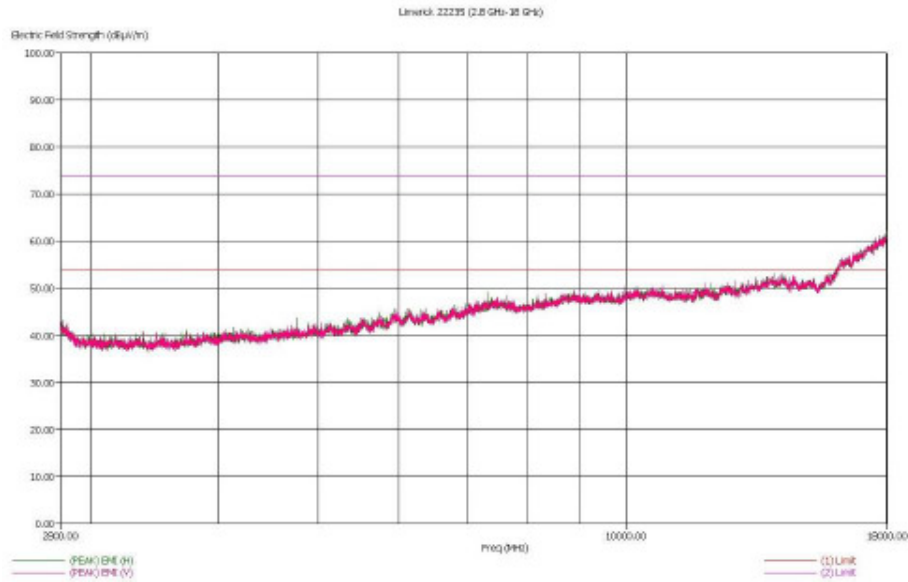
22-07-2008 11:38:17
Sequence: Preliminary Scan



3-18 GHz Middle Channel Dual Polarization Y

Title: FCC 15.247(c)
File: Limerick 22235 (5.31)(ES1B) FCC15.247 ET2403 Tch-mid_Z 2008-07-21 -3-18.wpt
Operator: AIR_AAL_EMP_TL1_kkr001
EUT Type: Limerick, FCC ID: IHDP56JF1, DNI: A10031021E00700
EUT Condition: SW rev: 02.0022, Board Rev: DVT1, open
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCM mode.
ET ch. 39 (2441 MHz) up/down in test mode. Orientation Z-H
EMC 3115 antenna (30Hz - 10GHz). Peak detector used.

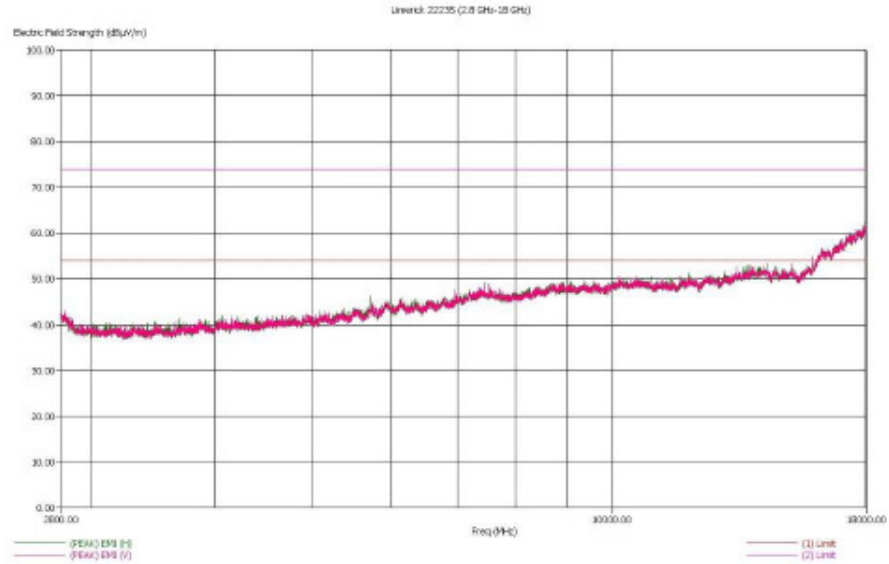
22-07-2008 12:28:12
Sequence: Preliminary Scan



3-18 GHz Middle Channel Dual Polarization Z

Title: FCC 15.247(c)
File: Limerick 22235 (5.31)(ES18) FCC15.247 RT2400 Test-kgk_X 2008-07-21 -3-18.net
Operator: ARL_AAL_EMC_TL1_hkr001
EUT Type: Limerick, FCC ID: IHDP56JF1, DMI: A0000102E80870C
EUT Condition: SW rev: 02.0002, Board Rev: EVT1, open
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.
ET ck. 78 (2400 MHz) up/0 in test mode. Orientation X-H
EMC 3115 antenna (30Hz - 100Hz). Peak detector used.

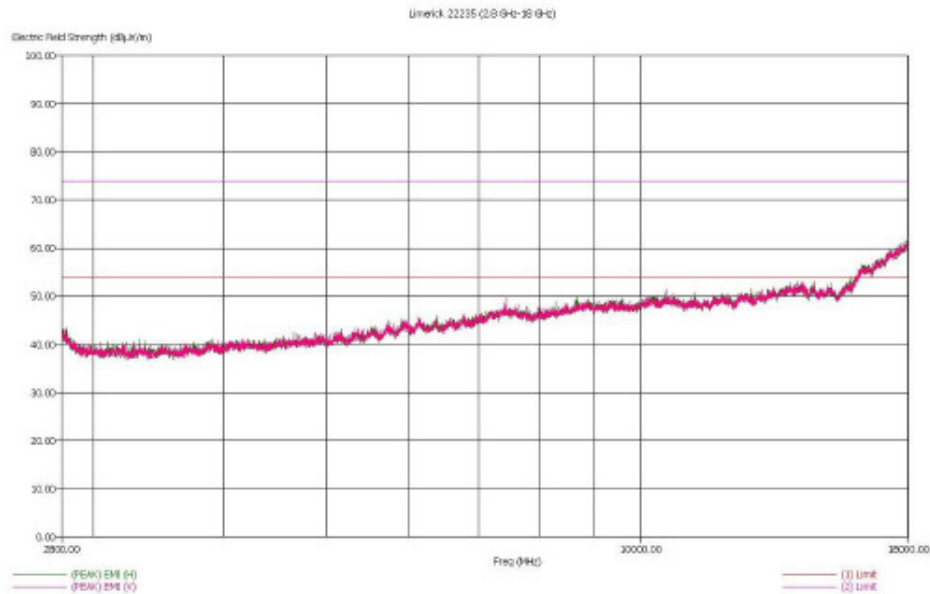
22-07-2008 10:52:58
Sequence: Preliminary Scan



3-18 GHz High Channel Dual Polarization X

Title: FCC 15.247(c)
File: Limerick 22235 (5.31)(ES18) FCC15.247 RT2400 Test-kgk_Y 2008-07-21 -3-18.net
Operator: ARL_AAL_EMC_TL1_hkr001
EUT Type: Limerick, FCC ID: IHDP56JF1, DMI: A0000102E80870C
EUT Condition: SW rev: 02.0002, Board Rev: EVT1, open
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.
BT ck. 78 (2400 MHz) up/0 in test mode. Orientation Y-H
EMC 3115 antenna (30Hz - 100Hz). Peak detector used.

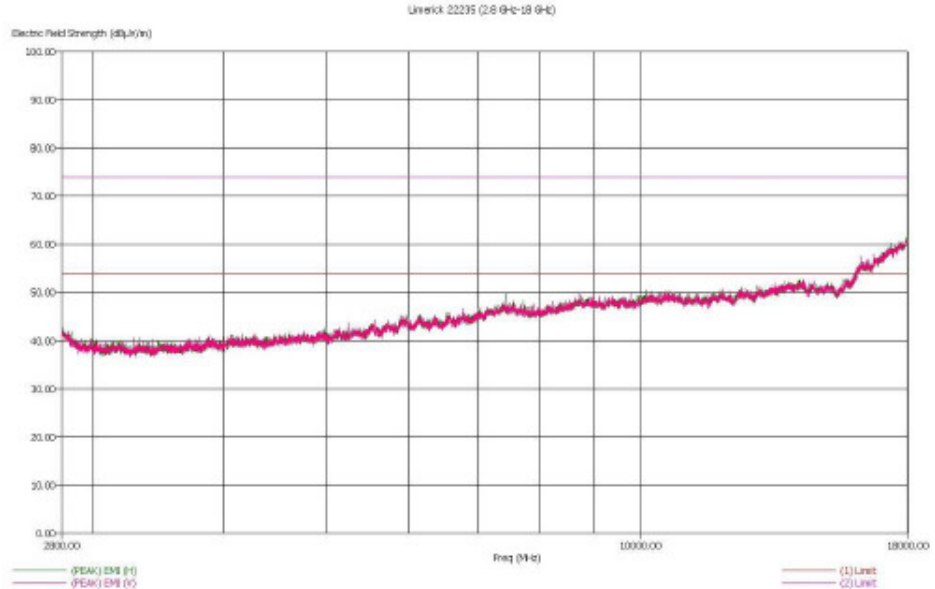
22-07-2008 11:25:00
Sequence: Preliminary Scan



3-18 GHz High Channel Dual Polarization Y

Title: FCC 15.247(e)
File: Lineick 22235 (5.31)(EIR) FCC15.247 RT2480 Tok-kgk_2 2008-07-21 -3-18.net
Operator: AML_AAI_EMC_IL1_bkr001
EUT Type: Lineick, FCC ID: [IHDP56JF1, DNI]: A000002E80670C
EUT Condition: SW rev: 02.0052, Board Rev: DV11, open
Comments: FCC 15.247(e)(1) Bluetooth (BT) emission in TCH mode.
BT ch. 7B (2400 MHz) updo in test mode. Orientation Z-4
EMC 3115 antenna (30Hz - 180Hz). Peak detector used.

22-07-2008 13:08:10
Sequence: Preliminary Scan



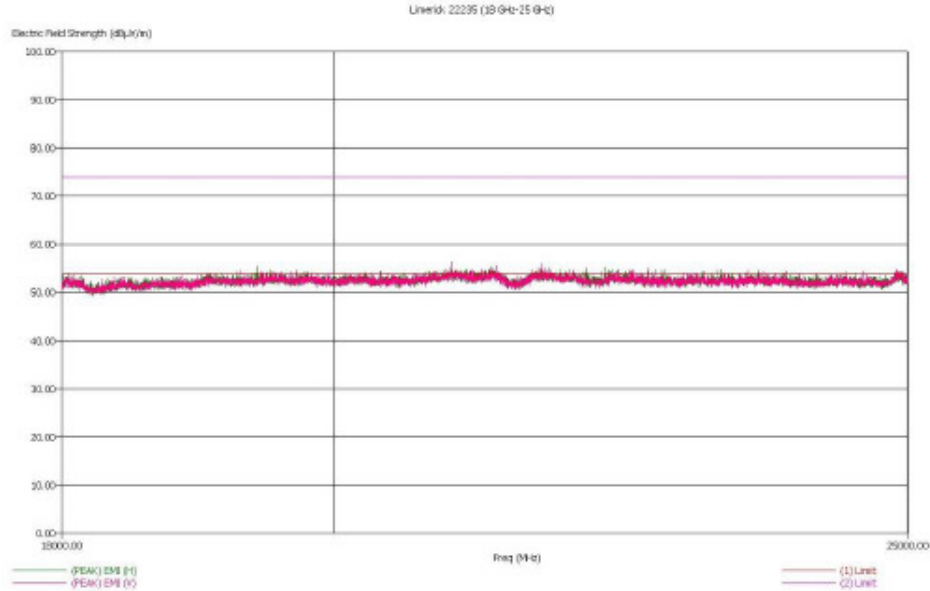
3-18 GHz High Channel Dual Polarization Z

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: Limerick 22235 (5.31)(ESIB) FCC15.247 RT2400 Tch-low_Z 2008-07-21 -18-25.net
Operator: ARL_AAL_EMC_TL1. hkr001
EUT Type: Limerick, FCC ID: IHDP56JF1, IMEI: A000002E808700
EUT Condition: SW rev: 02.0052, Board Rev: DVT1, open
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.
BT ch. 0 (2402 MHz) up/down in test mode, Orientation Z-H
EMC 3118 antenna (180Hz - 250Hz), Peak detector used.

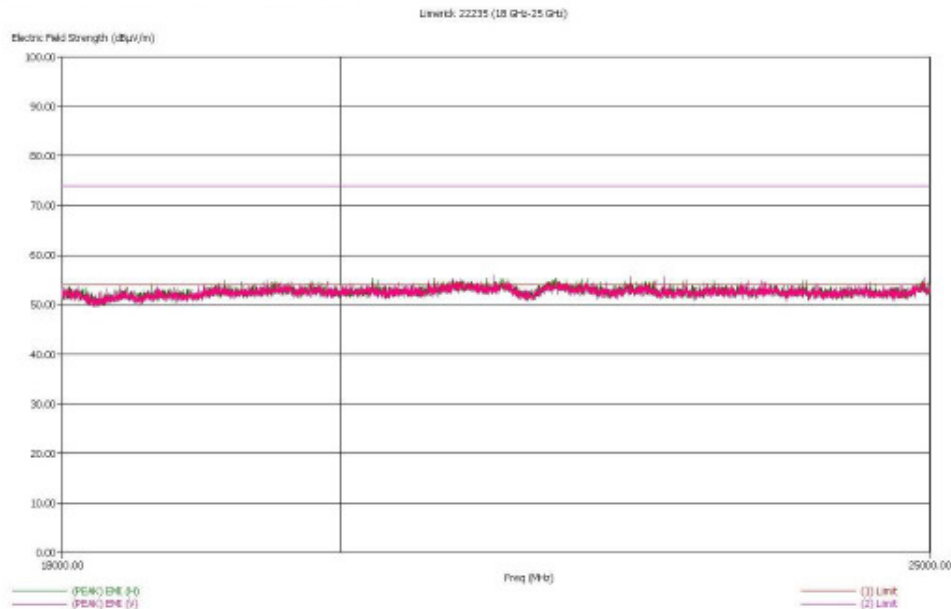
22-07-2008 13:58:25
Sequence: Preliminary Scan



18-25 GHz Low Channel Dual Polarization Z

Title: FCC 15.247(c)
File: Limerick 22235 (5.31)(ESIB) FCC15.247 RT2400 Tch-mid_Z 2008-07-21 -18-25.net
Operator: ARL_AAL_EMC_TL1. hkr001
EUT Type: Limerick, FCC ID: IHDP56JF1, IMEI: A000002E808700
EUT Condition: SW rev: 02.0052, Board Rev: DVT1, open
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.
BT ch. 39 (2441 MHz) up/down in test mode, Orientation Z-H
EMC 3118 antenna (180Hz - 250Hz), Peak detector used.

22-07-2008 13:48:56
Sequence: Preliminary Scan

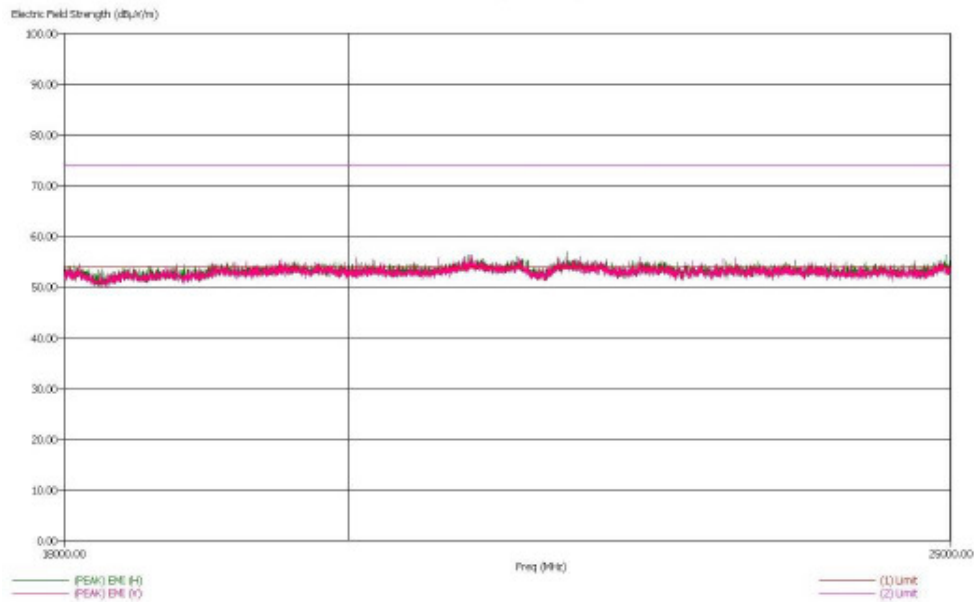


18-25 GHz Middle Channel Dual Polarization Z

Title: FCC 15.247(c)
File: Limerick 22235 (S.31)(E218) FCC15.247 BT2400 Tech-hgh_2 2008-07-21 -18-25.net
Operator: SAR_AAL_BAP_IL1, hkr001
EUT Type: Limerick, FCC ID: IHDP56JF1, IMEI: A000002E9087CC
EUT Condition: SW rev: 02.0082, Board Rev: DVT1, open
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.
ET ch: 78 (2480 MHz) up-no in test mode, Orientation Z-H
EMC 3116 antenna (193Hz - 253Hz), Peak detector used.

22-07-2008 13:35:24
Sequence: Preliminary Scan

Limerick 22235 (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.

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

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.

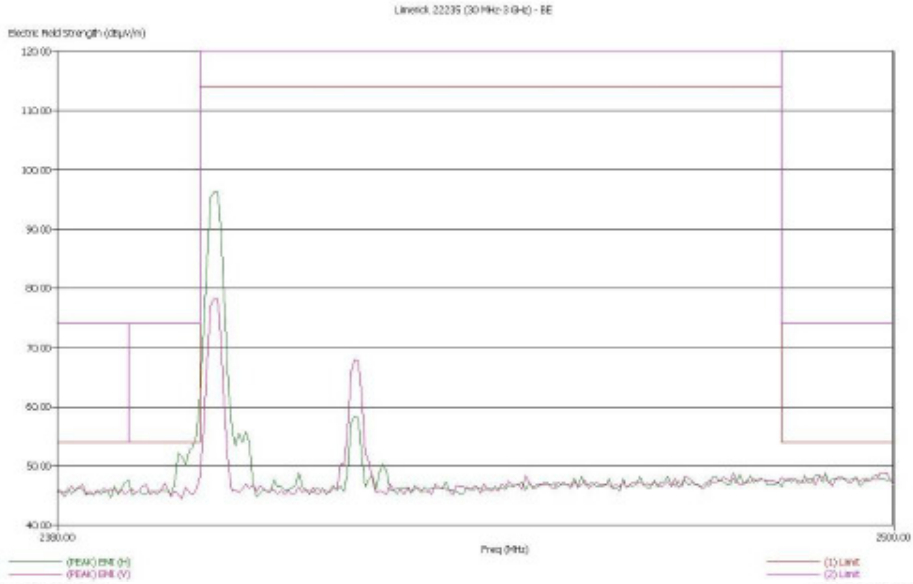
The test was performed in 22.5 degree angular step size when the band edge crossing is measured to be +6 dB above the AVG limit line.

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

See Attached:

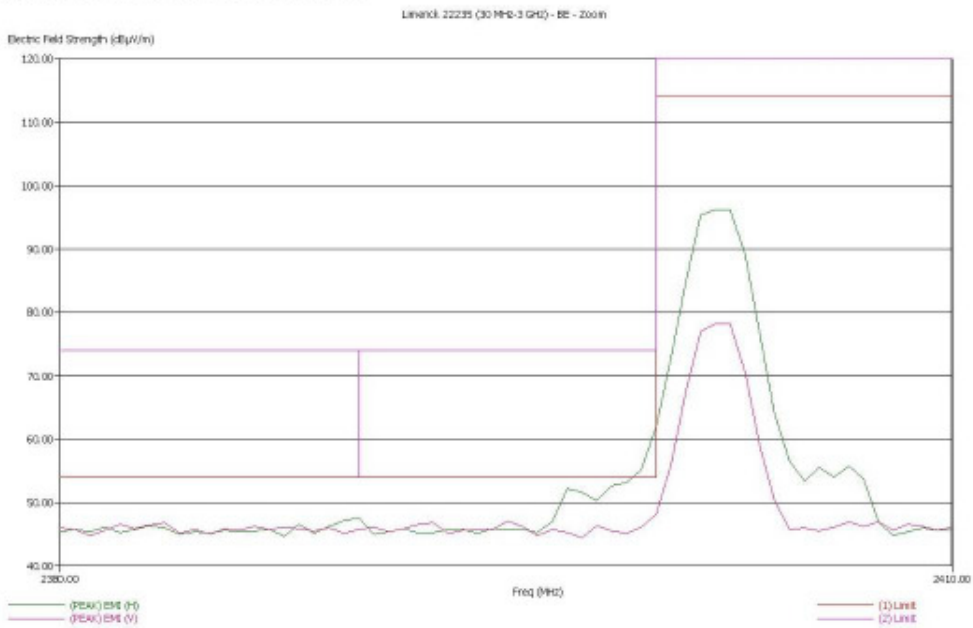
Title: FCC 15.247(c)
File: Limerick 22235 (5.31)(ES18) FCC15.247 BT2400 Tch-low_X 2008-07-21 -3.net
Operator: ADR_JAL_SMC_TL1_Akr001
EUT Type: Limerick, FCC ID: IHDP56JF1, IMEI: A0000028908700
EUT Condition: SW rev: 02.0052, Board Rev: DV11, open
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.
BT ch. 0 (2402 MHz) up/down test mode, Orientation X-H
HLP 3003C antenna (30MHz - 3 GHz), Peak detector used.

21-07-2008 15:21:07
Sequence: Preliminary Scan



Title: FCC 15.247(c)
File: Limerick 22235 (5.31)(ES18) FCC15.247 BT2400 Tch-low_X 2008-07-21 -3.net
Operator: ADR_JAL_SMC_TL1_Akr001
EUT Type: Limerick, FCC ID: IHDP56JF1, IMEI: A0000028908700
EUT Condition: SW rev: 02.0052, Board Rev: DV11, open
Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.
BT ch. 0 (2402 MHz) up/down test mode, Orientation X-H
HLP 3003C antenna (30MHz - 3 GHz), Peak detector used.

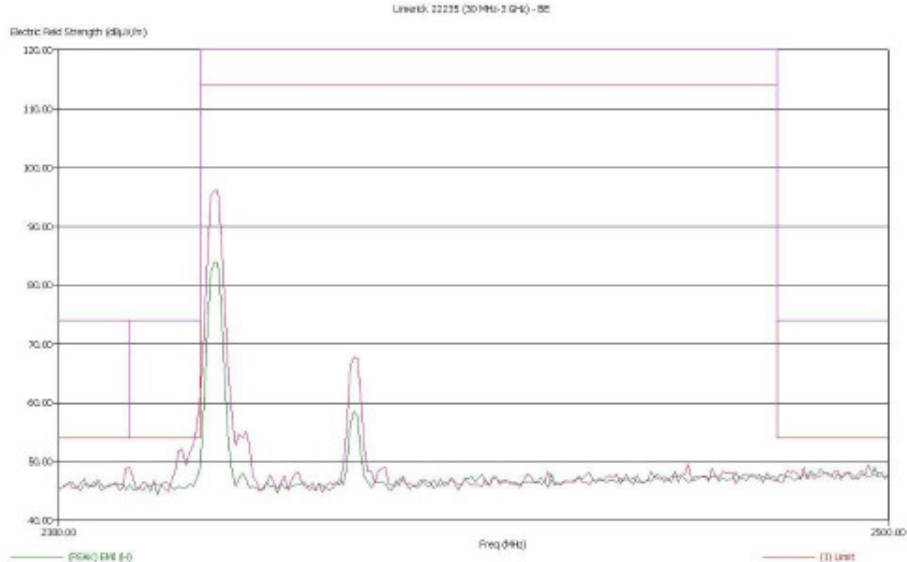
21-07-2008 15:21:07
Sequence: Preliminary Scan



Authorized Band Emissions Low Channel Dual Polarization X

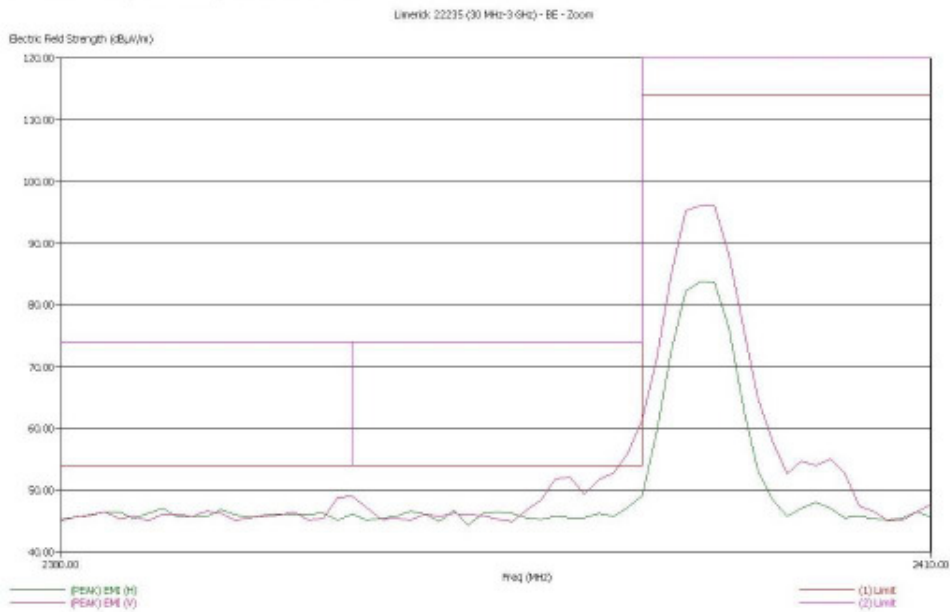
Title: FCC 15.247(e)
File: Limerick 22235 (5.31)(ES1B) FCC15.247 BT2400 Tch-low_Y 2008-07-21 -3.snr
Operator: ADR_AAL_EMC_TL1.kkr001
EUT Type: Limerick, FCC ID: IHDP56JF1, DMEI: A0000102E808700
EUT Condition: SW rev: 02.0052, Board Rev: D771, open
Comments: FCC 15.247(e)(1) Bluetooth (BT) emission in TCH mode.
BT ch. 0 (2402 MHz) up/down in test mode, Orientation Y-H
HLP 3013C antenna (30MHz - 3 GHz), Peak detector used.

21-07-2008 15:40:34
Sequence: Preliminary Scan



Title: FCC 15.247(e)
File: Limerick 22235 (5.31)(ES1B) FCC15.247 BT2400 Tch-low_Y 2008-07-21 -3.snr
Operator: ADR_AAL_EMC_TL1.kkr001
EUT Type: Limerick, FCC ID: IHDP56JF1, DMEI: A0000102E808700
EUT Condition: SW rev: 02.0052, Board Rev: D771, open
Comments: FCC 15.247(e)(1) Bluetooth (BT) emission in TCH mode.
BT ch. 0 (2402 MHz) up/down in test mode, Orientation Y-H
HLP 3013C antenna (30MHz - 3 GHz), Peak detector used.

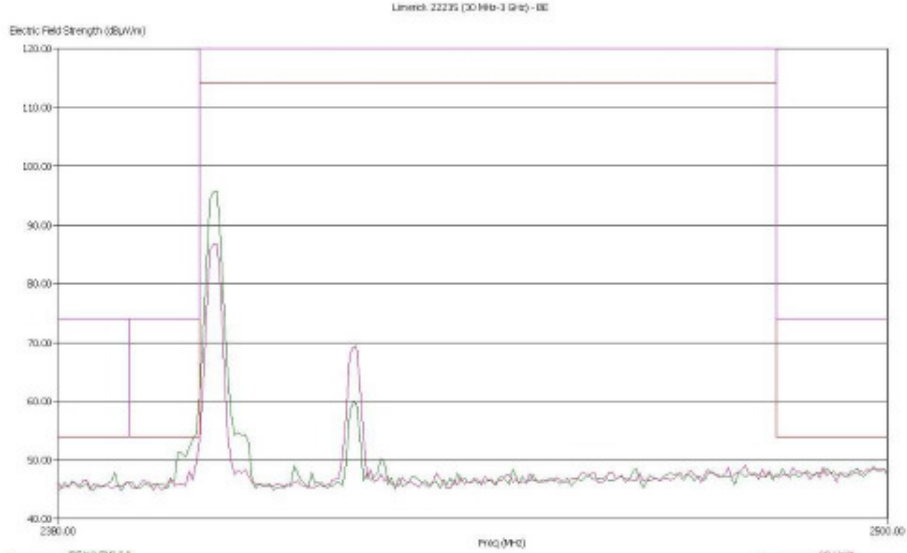
21-07-2008 15:40:34
Sequence: Preliminary Scan



Authorized Band Emissions Low Channel Dual Polarization Y

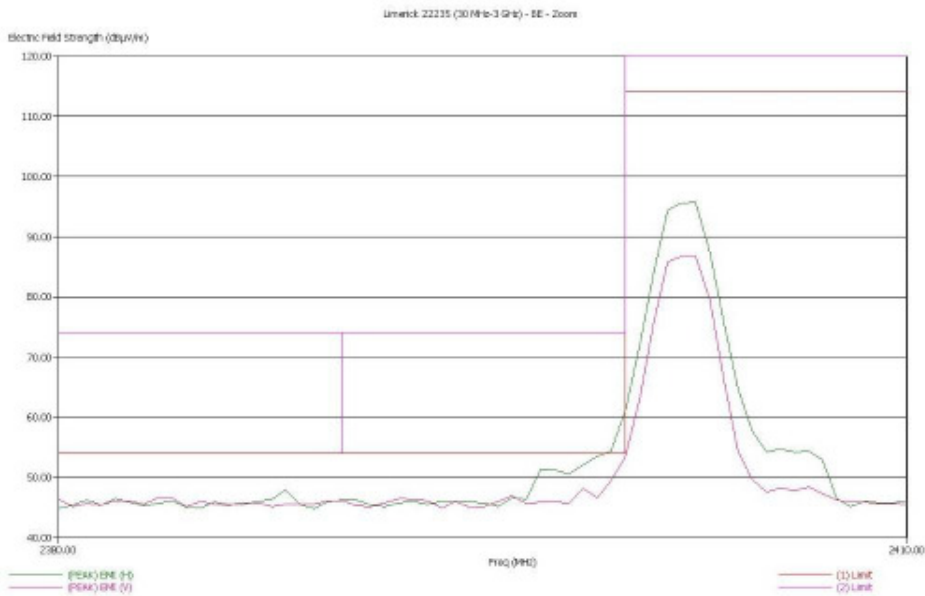
Title: FCC 15.247(c)
 File: Limerick 22235 (5.31)(ES18) FCC15.247 BT2400 Tch-low_Z 2008-07-21 -3.set
 Operator: ADR_AAL_EMC_TL1.kk001
 EUT Type: Limerick, FCC ID: IHDP56JF1, IMEI: A000002E80E70C
 EUT Condition: SW rev: 32.0002, Board Rev: DWT1, open
 Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.
 BT ch. 0 (2402 MHz) up/down in test mode. Orientation Z-H
 HLP 3003C antenna (30MHz - 3 GHz). Peak detector used.

21-07-2008 14:06:09
 Sequence: Preliminary Scan



Title: FCC 15.247(c)
 File: Limerick 22235 (5.31)(ES18) FCC15.247 BT2400 Tch-low_Z 2008-07-21 -3.set
 Operator: ADR_AAL_EMC_TL1.kk001
 EUT Type: Limerick, FCC ID: IHDP56JF1, IMEI: A000002E80E70C
 EUT Condition: SW rev: 02.0002, Board Rev: DWT1, open
 Comments: FCC 15.247(c)(1) Bluetooth (BT) emission in TCH mode.
 BT ch. 0 (2402 MHz) up/down in test mode. Orientation Z-H
 HLP 3003C antenna (30MHz - 3 GHz). Peak detector used.

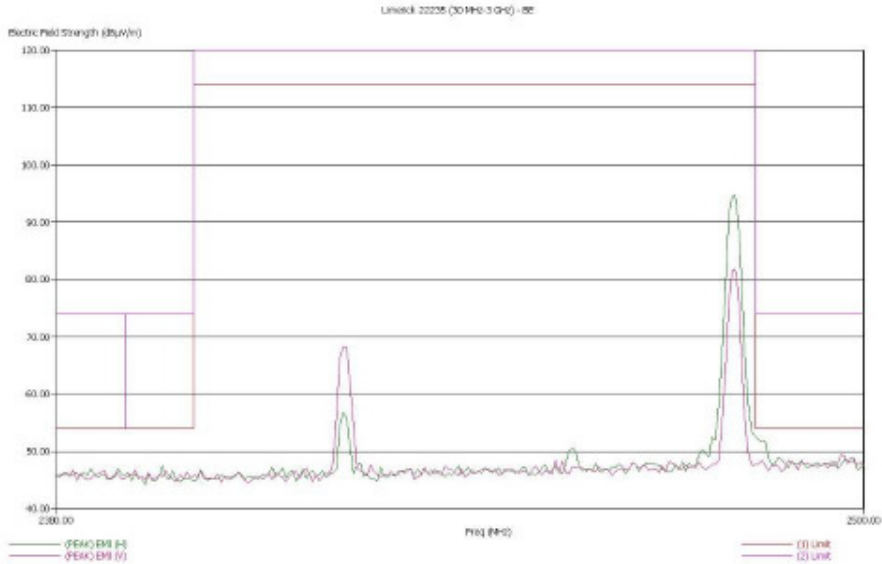
21-07-2008 14:06:09
 Sequence: Preliminary Scan



Authorized Band Emissions Low Channel Dual Polarization Z

Title: FCC 15.247(c)
File: Limerick 22235 (5.31)(8210) FCC15.247 RT2400 Tch-gh_X 2008-07-21 -3.sec
Operator: ARLAM_EMC_TL1.kkr001
EUT Type: Limerick, FCC ID: IHDP56JF1, IMEI: A30001022800700
EUT Condition: SW rev: 02.0052, Board Rev: DVT1, open
Comments: FCC 15.247(c)(1) Risetooth (RT) emission in TCH mode.
ET ch. 7B (2480 MHz) up/no in test mode, Orientation X-H
MLP 3003C antenna (30MHz - 3 GHz), Peak detector used.

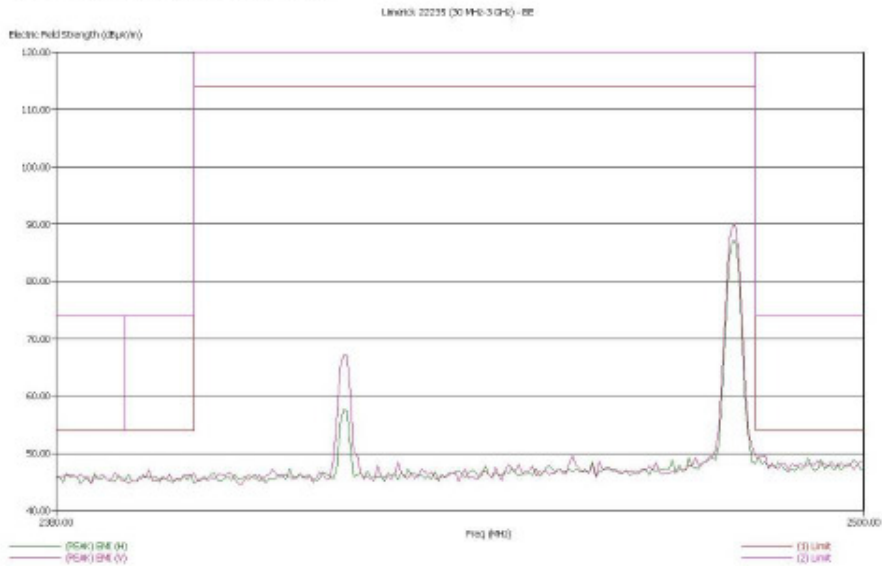
22-07-2008 15:29:18
Sequence: Preliminary Soak



Authorized Band Emissions High Channel Dual Polarization X

Title: FCC 15.247(c)
File: Limerick 22235 (5.31)(8210) FCC15.247 RT2400 Tch-gh_Y 2008-07-21 -3.sec
Operator: ARLAM_EMC_TL1.kkr001
EUT Type: Limerick, FCC ID: IHDP56JF1, IMEI: A30001022800700
EUT Condition: SW rev: 02.0052, Board Rev: DVT1, open
Comments: FCC 15.247(c)(1) Risetooth (RT) emission in TCH mode.
ET ch. 7B (2480 MHz) up/no in test mode, Orientation Y-H
MLP 3003C antenna (30MHz - 3 GHz), Peak detector used.

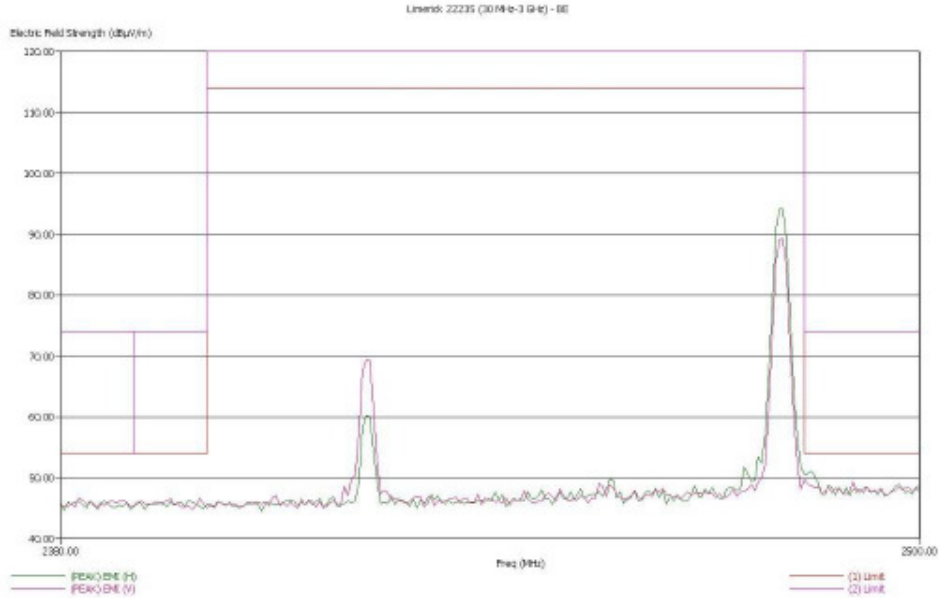
21-07-2008 16:11:34
Sequence: Preliminary Soak



Authorized Band Emissions High Channel Dual Polarization Y

Title: FCC 15.247(e)
File: Linsrick 22235 (5_31)(E1B) FCC15.247 BT2400 ToH-high_L2 2008-07-21 -3.doc
Operator: ADR_AAL_ENC_TL1,akr001
EUT Type: Linsrick, FCC ID: IHDP56JF1, IMEI: A0000002E008700
EUT Condition: SW rev: 02.0052, Board Rev: DVT1, open
Comments: FCC 15.247(e)(1) Bluetooth (BT) emission in TCH mode.
BT ch. 7B (2400 MHz) up/down in test mode. Orientation Z-H
HP-3000C antenna (3dBic - 3 GHz). Peak detector used.

21-07-2008 14:37:44
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

End of Test Report