

Annex 1: Measurement diagrams
to
TEST REPORT
No.: 6-0082-11-1-2b

According to:
FCC-Regulations
Part 22 & Part 24
IC-Regulations
RSS-132 Issue 2, RSS-133 Issue 5 &
RSS-Gen, Issue 3

for
u-blox AG

RF Data-Module LISA-U200
FCC-ID: XPYLISAU200
IC-ID: 8595A-LISAU200

Laboratory Accreditation and Listings			
 Deutsche Akkreditierungsstelle D-PL-12047-01-01	 Reg. No.: 736496 MRA US-EU 0003	 Industry Canada Reg. No.: 3462D-1 Reg. No.: 3462D-2 Reg. No.: 3462D-3	 Voluntary Controls for Electromagnetic Emissions Reg. No.: R-2665, R-2666 C-2914, T-1967, G-301
 AUTHORIZED RF LABORATORY	 LAB CODE 20011130-00		
accredited according to DIN EN ISO/IEC 17025			
CETECOM GmbH Laboratory Radio Communications & Electromagnetic Compatibility Im Teelbruch 116 • 45219 Essen • Germany Registered in Essen, Germany, Reg. No.: HRB Essen 8984 Tel.: + 49 (0) 20 54 / 95 19-954 • Fax: + 49 (0) 20 54 / 95 19-964 E-mail: info@cetecom.com • Internet: www.cetecom.com			



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1. Measurement results

1.1. Conducted emissions on AC-Power lines

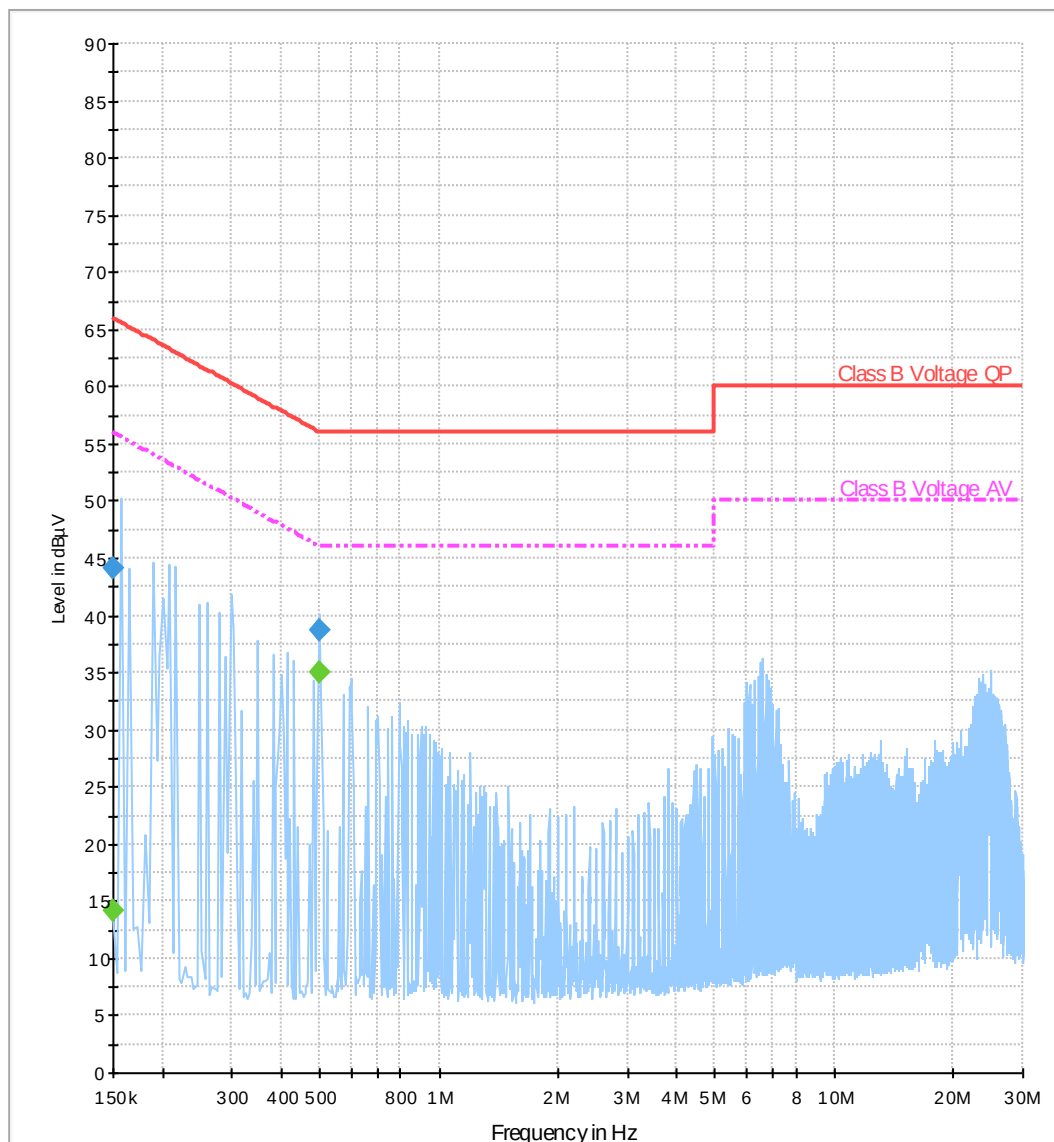
1.1.1 FDDII

Diagram No. b_1.1

Test Description:	Conducted Voltage Measurement Class B
Testspecification:	FCC 15.207
Technical Data:	Please see next page for detailed information
Diagram:	Shows the peak values as a sum of measured ports (N+L1) in maxhold
Operator name:	HLA
Report.- Nr.	6-0082-11-1-2b

EUT:	LISA-U200
Manufacturer:	U-blox
Operating mode:	RMC99 FDD II TX
Measured on line:	Mains AC L1 and N
Power during test:	110 V AC 60 Hz
Comment 1:	channel (9262)

01_Class B_Voltage_PK_QPAV_N_L1



Final Result 1

Frequency (MHz)	QuasiPeak (dB μ V)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.150000	44.1	15000.0	0.200	GND	N	0.0	21.9	66.0
0.500156	38.8	15000.0	9.000	GND	L1	0.0	17.2	56.0

Final Result 2

Frequency (MHz)	CAverage (dB μ V)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.150000	14.3	15000.0	9.000	GND	N	0.0	41.7	56.0
0.500156	35.0	15000.0	9.000	GND	L1	0.0	11.0	46.0

Diagram No. b_1.2

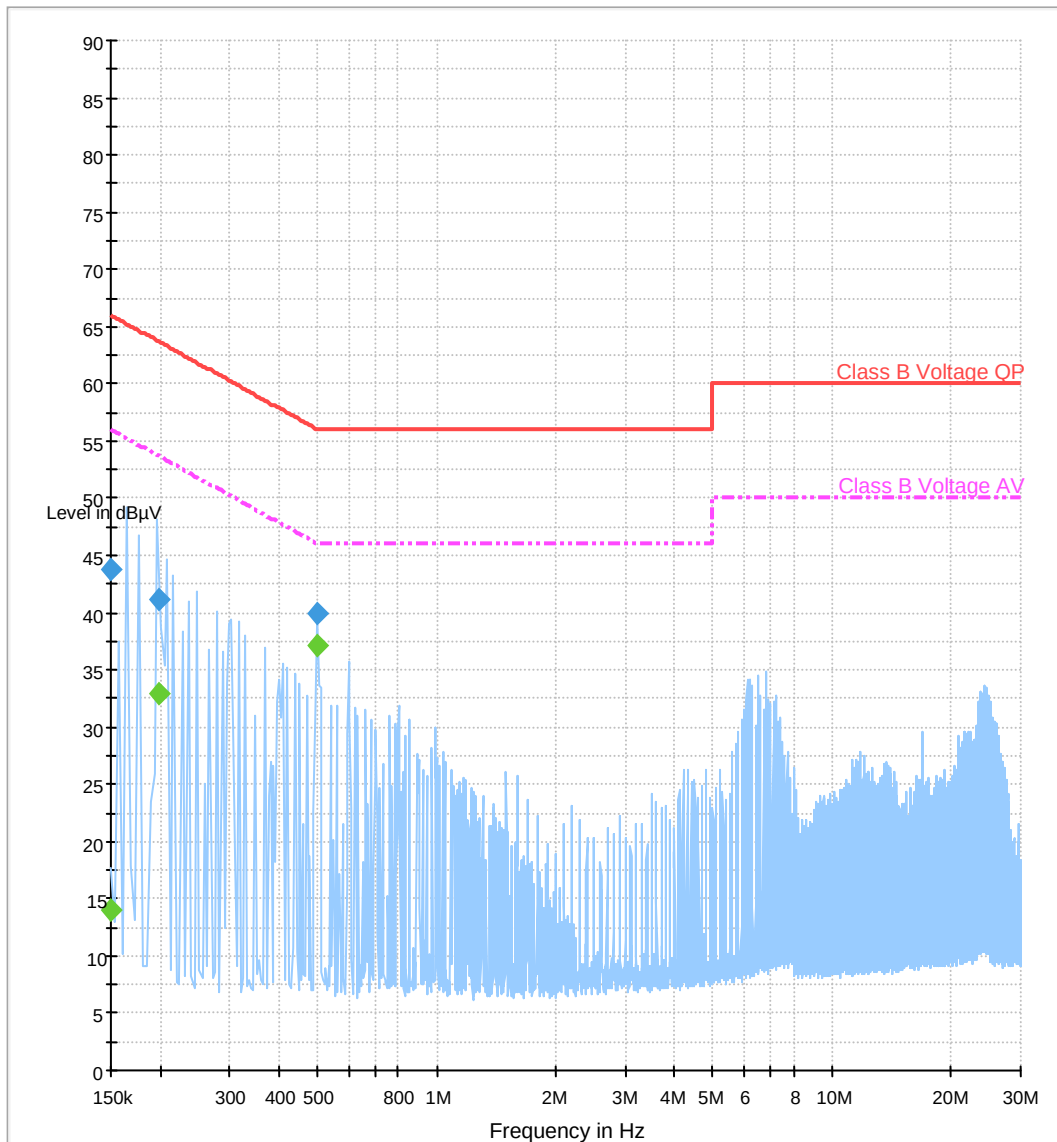
Test Description:
Testspezifikation:
Technical Data:
Diagram:
Operator name:
Report.- Nr.

Date: 10.11.2011 Page 1 of 3
Conducted Voltage Measurement Class B
FCC 15.207
Please see next page for detailed information
Shows the peak values as a sum of measured ports (N+L1) in maxhold mode
HLA
6-0082-11-1-2b
-

EUT:
Manufacturer:
Operating mode:
Measured on line:
Power during test:
Comment 1:

LISA -U200
U-blox
RMC99 FDD II TX
Mains AC L1 and N
110 V AC 60 Hz
channel (9400)

01_Class B_Voltage_PK_QPAV_N_L1



Final Result 1

Frequency (MHz)	QuasiPeak (dB μ V)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.150000	43.9	15000.0	0.200	GND	L1	0.0	22.2	66.0
0.199375	41.2	15000.0	9.000	GND	L1	0.0	22.5	63.6
0.500156	39.9	15000.0	9.000	GND	L1	0.0	16.1	56.0

Final Result 2

Frequency (MHz)	CAverage (dB μ V)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.150000	14.0	15000.0	9.000	GND	L1	0.0	42.0	56.0
0.199375	32.9	15000.0	9.000	GND	L1	0.0	20.8	53.6
0.500156	37.2	15000.0	9.000	GND	L1	0.0	8.8	46.0

Diagram No. b_1.3

Test Description:

Testspezifikation:

Technical Data:

Diagram:

Operator name:

Report.- Nr.

Date: 10.11.2011 Page 1 of 3

Conducted Voltage Measurement Class B

FCC 15.207

Please see next page for detailed information

Shows the peak values as a sum of measured ports (N+L1) in maxhold mode

HLA

6-0082-11-1-2b

EUT:

Manufacturer:

Operating mode:

Measured on line:

Power during test:

Comment 1:

LISA -U200

U-blox

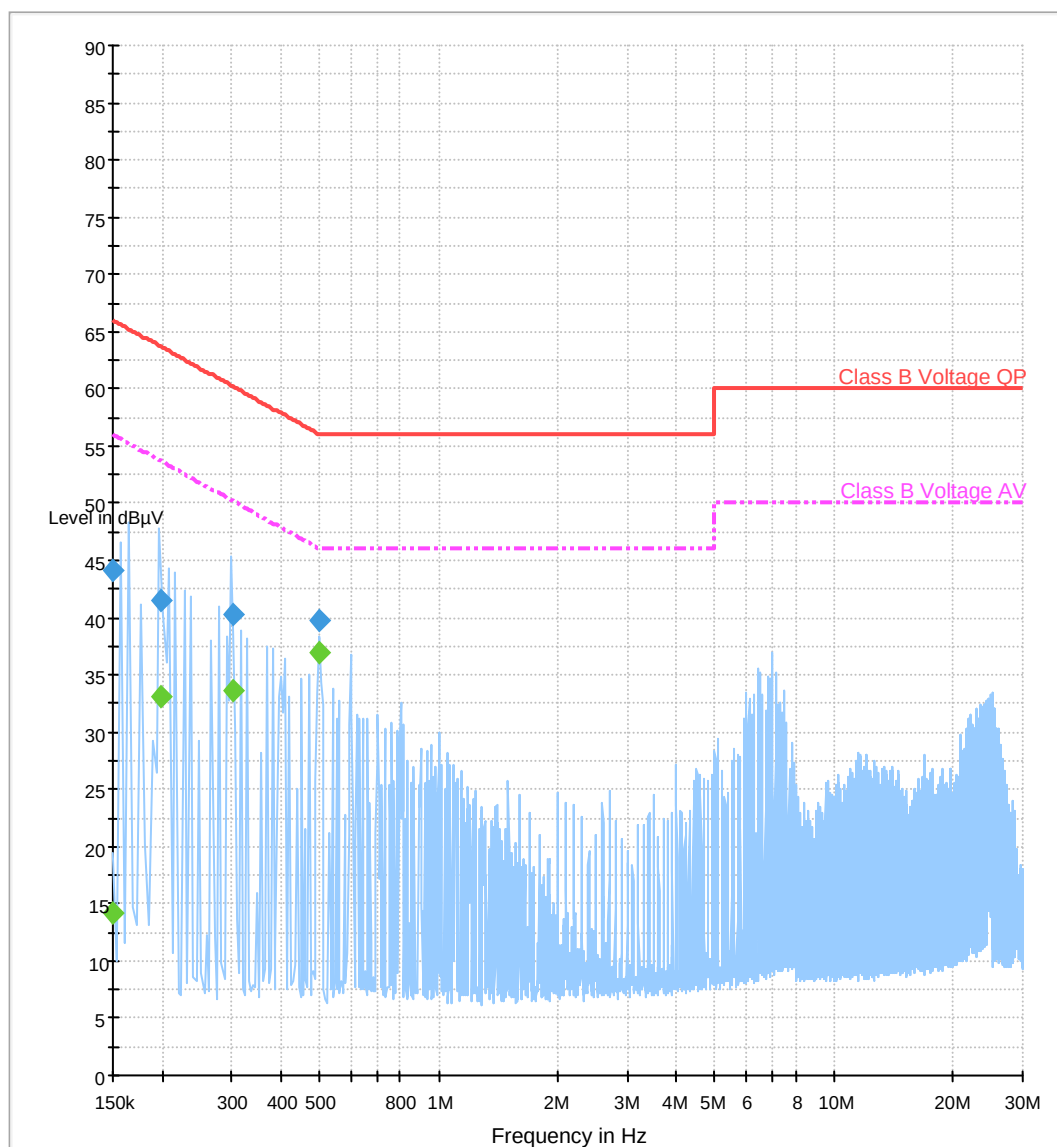
RMC99 FDD II TX

Mains AC L1 and N

110 V AC 60 Hz

channel (9538)

01_Class B_Voltage_PK_QPAV_N_L1



1.1.2.FDDV

1

Diagram No. b_1.4

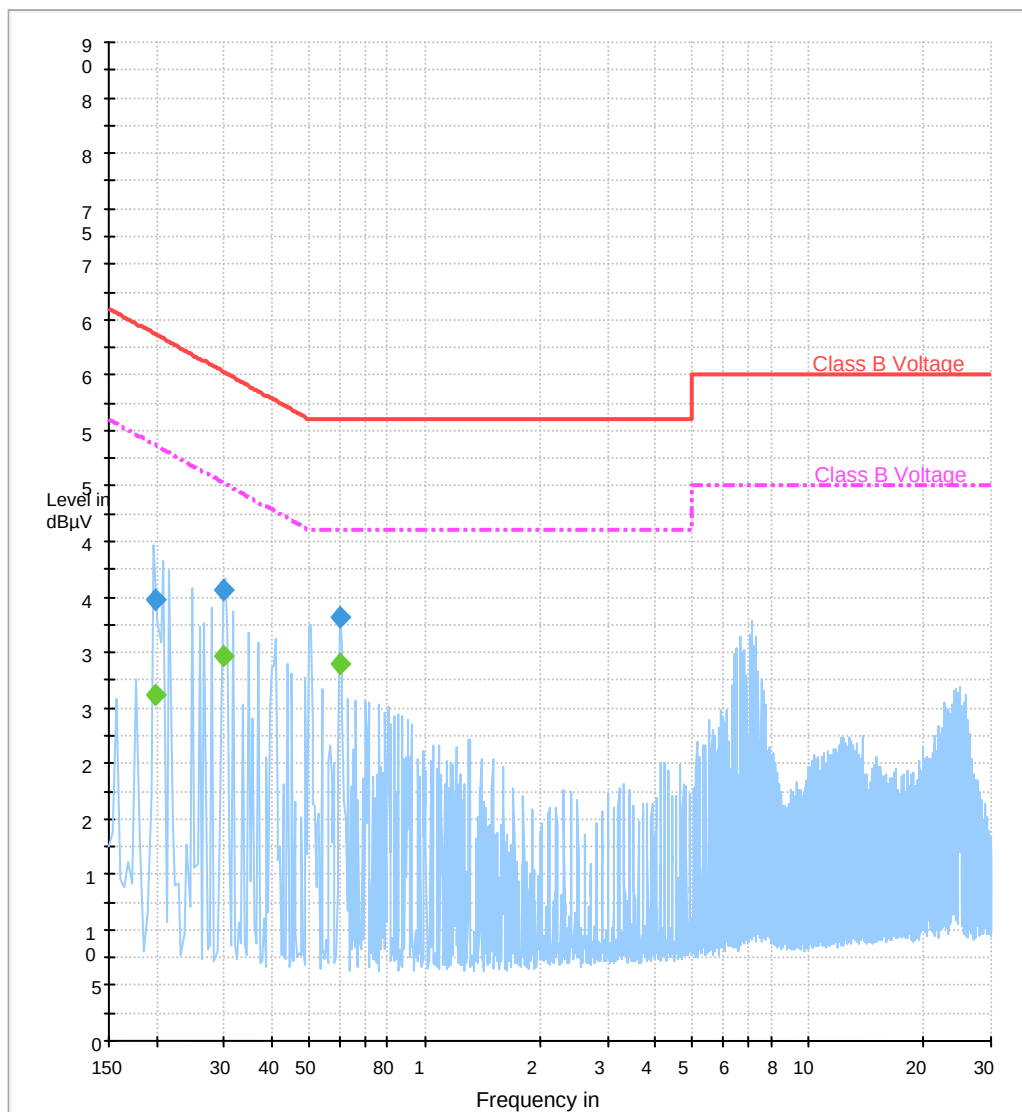
Test
 Testspezifikation
 Technical
 Diagram
 Operator
 Report - Nr

Conducted Voltage Measurement Class
 FCC
 Please see next page for detailed
 Shows the peak values as sum of measured ports (N+L1) in maxhold
 HL
 6-008 -1 -1-2

EUT
 Manufacturer
 Operating
 Measured on
 Power during
 Comment

LISA -U200
 U-blox
 RMC99 FDD V
 Mains AC L1 and
 110 V AC 60
 channel

01_Class



Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.199375	39.8	15000.0	9.000	GND	L1	0.0	23.9	63.6
0.299844	40.6	15000.0	9.000	GND	L1	0.0	19.6	60.2
0.601719	38.2	15000.0	9.000	GND	L1	0.0	17.8	56.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.199375	31.2	15000.0	9.000	GND	L1	0.0	22.5	53.6
0.299844	34.6	15000.0	9.000	GND	L1	0.0	15.6	50.2
0.601719	34.0	15000.0	9.000	GND	L1	0.0	12.0	46.0

Diagram No. b_1.5

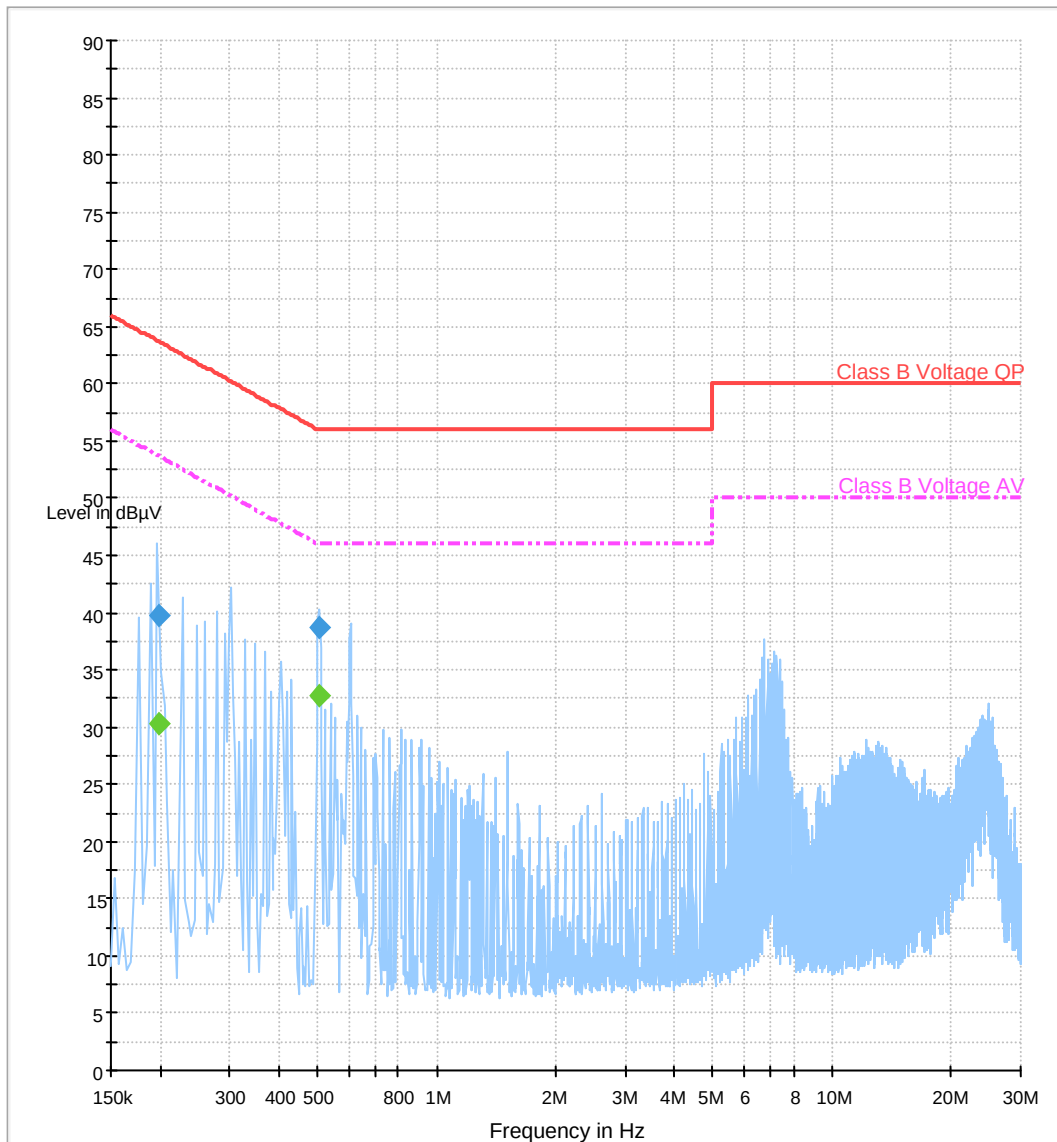
Test Description:
Testspezifikation:
Technical Data:
Diagram:
Operator name:
Report.- Nr.

Date: 10.11.2011 Page 1 of 3
Conducted Voltage Measurement Class B
FCC 15.207
Please see next page for detailed information
Shows the peak values as a sum of measured ports (N+L1) in maxhold mode
HLA
6-0082-11-1-2b

EUT:
Manufacturer:
Operating mode:
Measured on line:
Power during test:
Comment 1:

LISA -U200
U-blox
RMC99 FDD V TX
Mains AC L1 and N
110 V AC 60 Hz
channel (4182)

01_Class B_Voltage_PK_QPAV_N_L1



Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.199375	39.8	15000.0	9.000	GND	L1	0.0	23.8	63.6
0.502969	38.7	15000.0	9.000	GND	N	0.0	17.3	56.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.199375	30.3	15000.0	9.000	GND	L1	0.0	23.4	53.6
0.502969	32.8	15000.0	9.000	GND	N	0.0	13.2	46.0

Diagram No. b_1.6

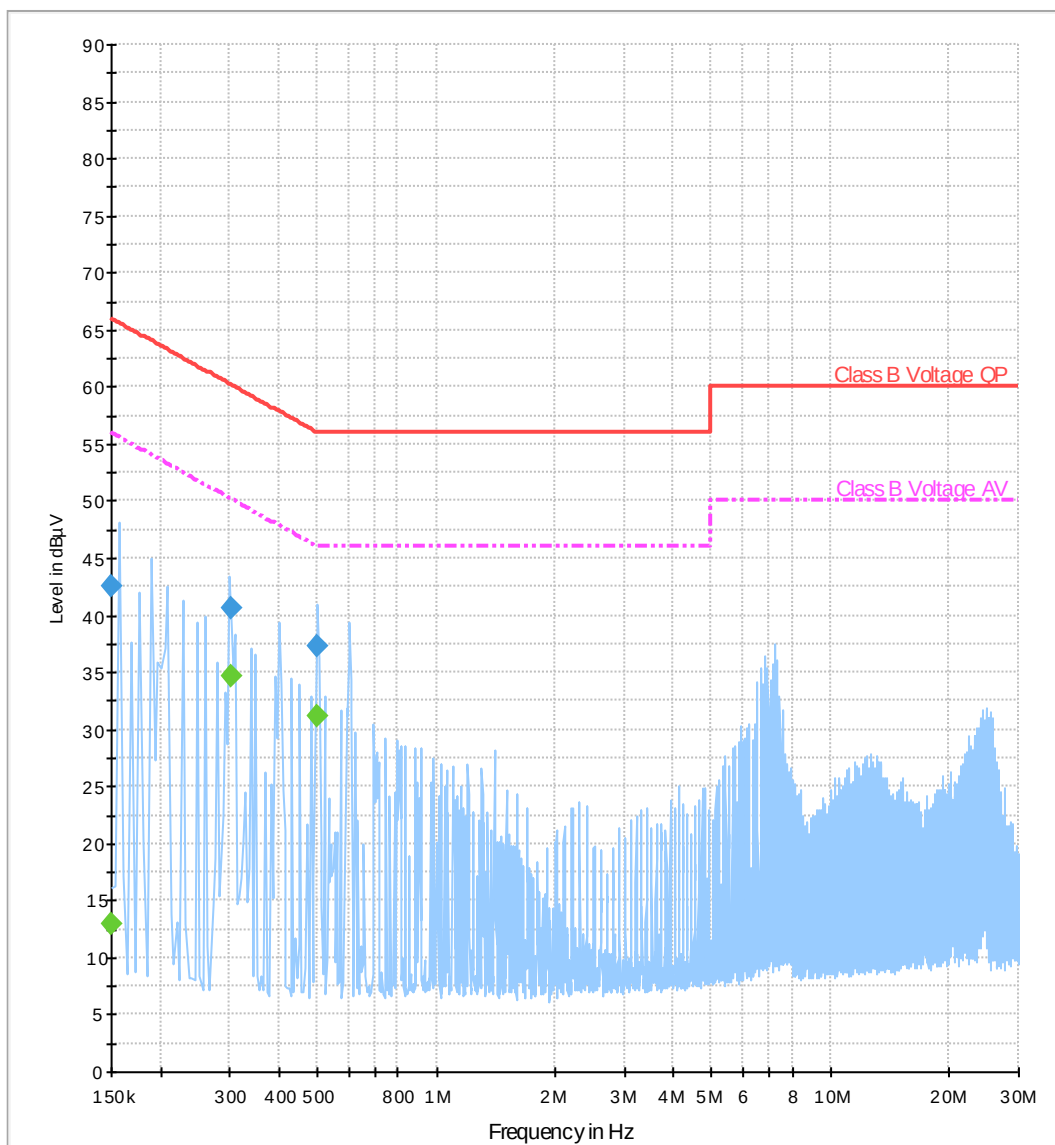
Test Description:
Testspezifikation:
Technical Data:
Diagram:
Operator name:
Report.- Nr.

Date: 10.11.2011 Page 1 of 3
Conducted Voltage Measurement Class B
FCC 15.207
Please see next page for detailed information
Shows the peak values as a sum of measured ports (N+L1) in maxhold mode
HLA
6-0082-11-1-2b

EUT:
Manufacturer:
Operating mode:
Measured on line:
Power during test:
Comment 1:

LISA-U200
U-blox
RMC99 FDD V TX
Mains AC L1 and N
110 V AC 60 Hz
channel (4233)

01_Class B_Voltage_PK_QPAV_N_L1



Final Result 1

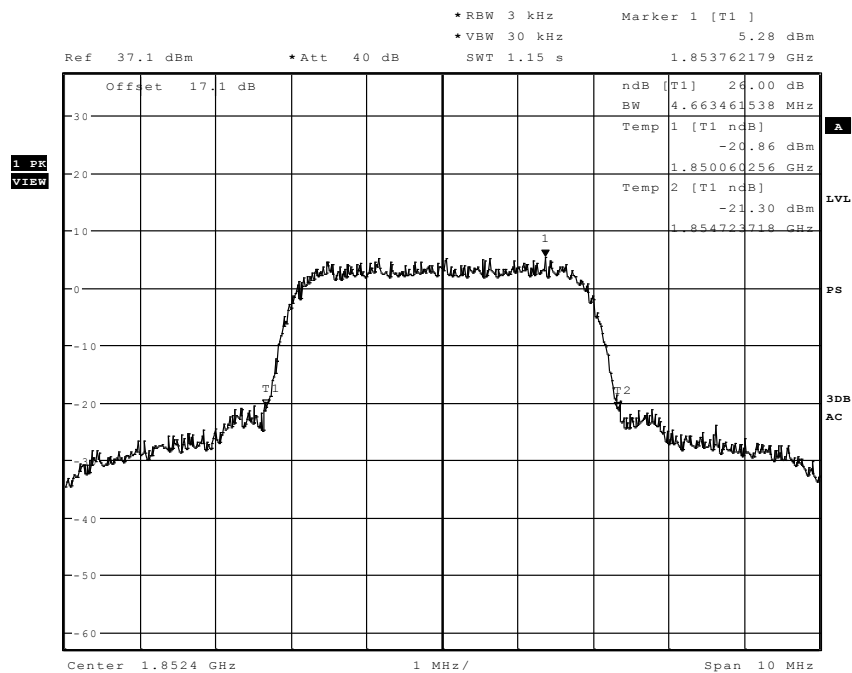
Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	42.6	15000.0	0.200	GND	N	0.0	23.4	66.0
0.300938	40.7	15000.0	9.000	GND	L1	0.0	19.5	60.2
0.499063	37.3	15000.0	9.000	GND	N	0.0	18.7	56.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	13.0	15000.0	9.000	GND	N	0.0	43.0	56.0
0.300938	34.7	15000.0	9.000	GND	L1	0.0	15.5	50.2
0.499063	31.2	15000.0	9.000	GND	N	0.0	14.8	46.0

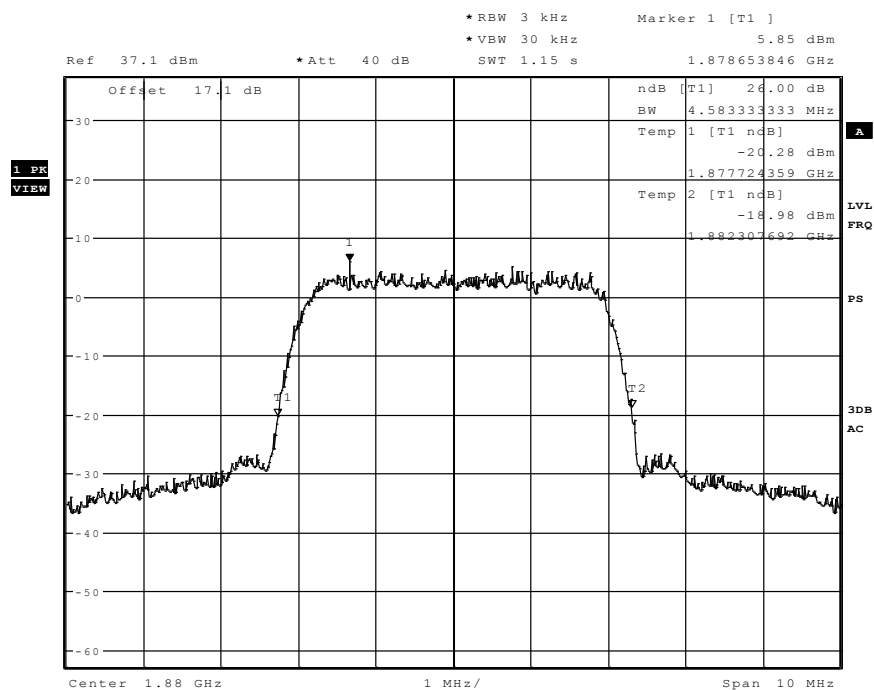
1.2. 26dBc Emission bandwidth

1.2.1. FDD Band II – RMC99 Mode



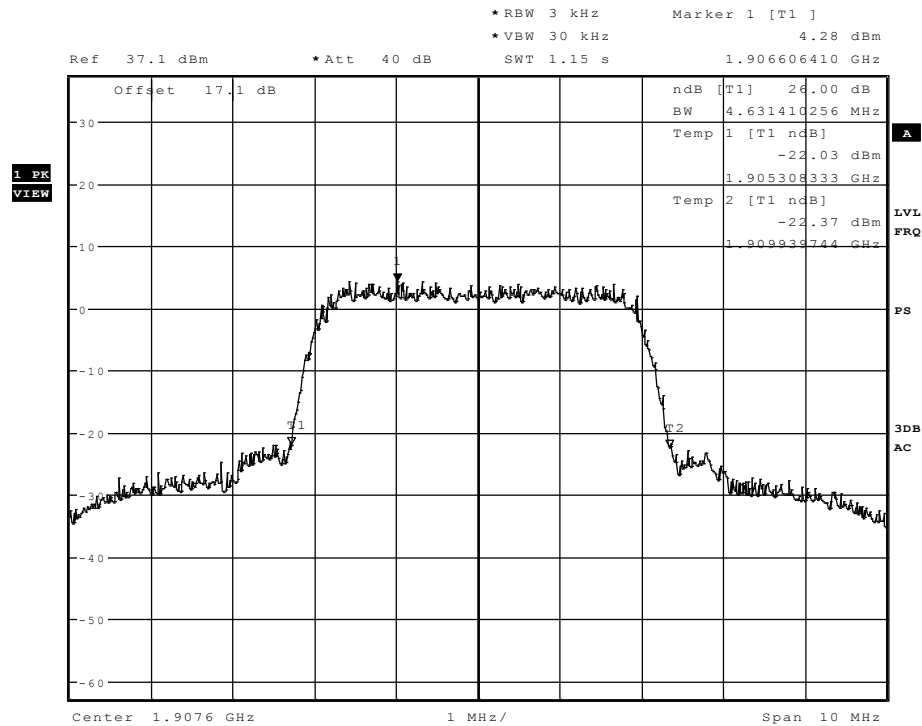
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Channel 9262



Date: 4.NOV.2011 21:20:49

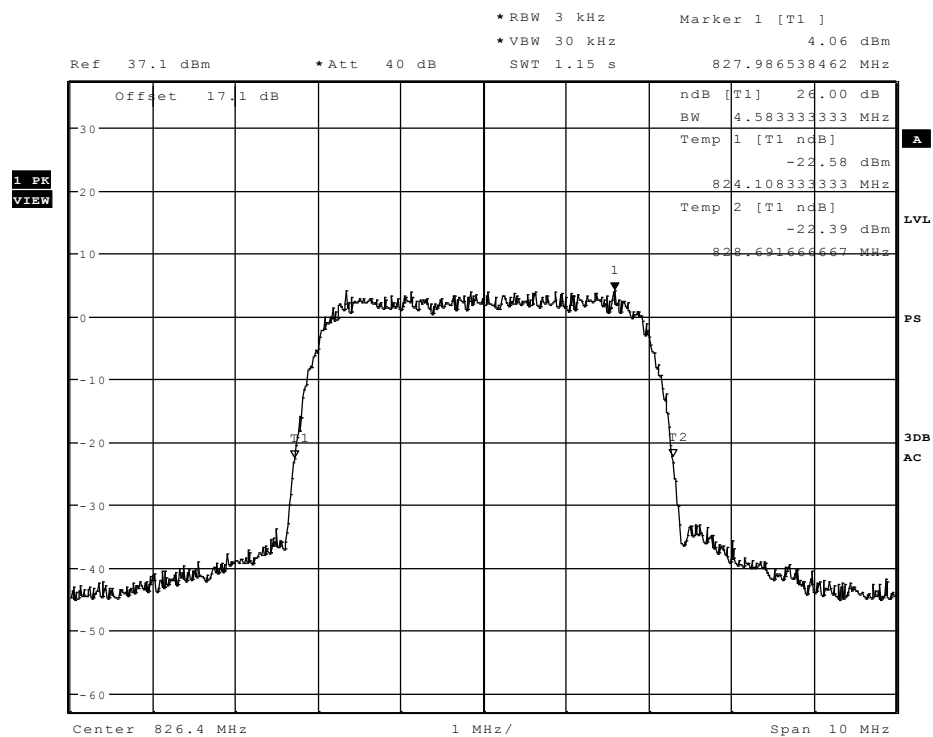
Channel 9400



Date: 4.NOV.2011 21:24:08

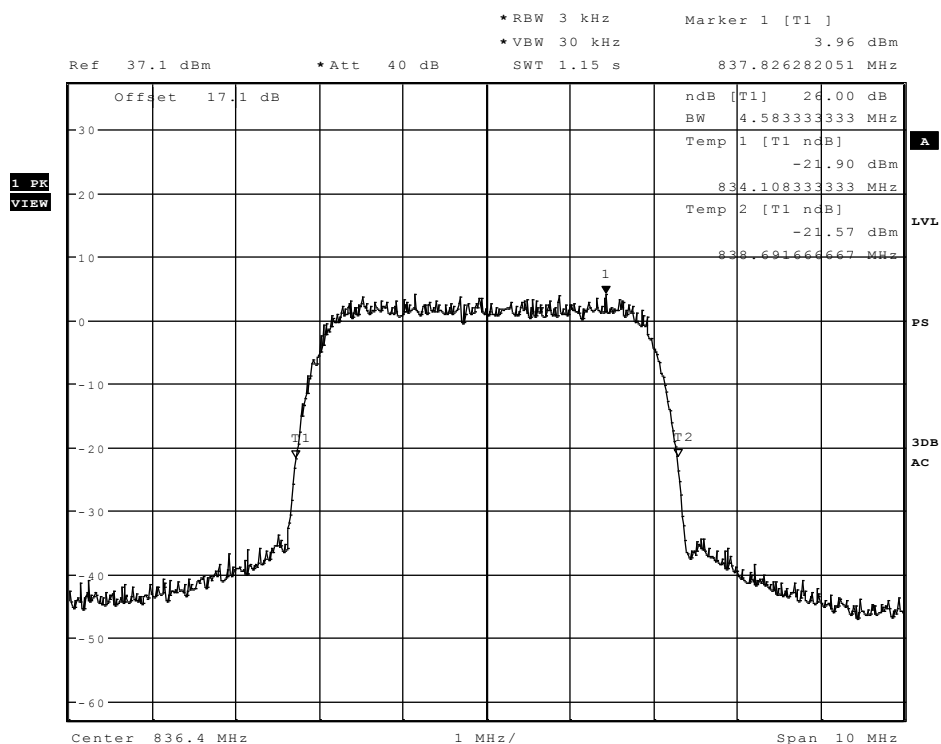
Channel 9538

1.2.2. FDD Band V – RMC99 Mode



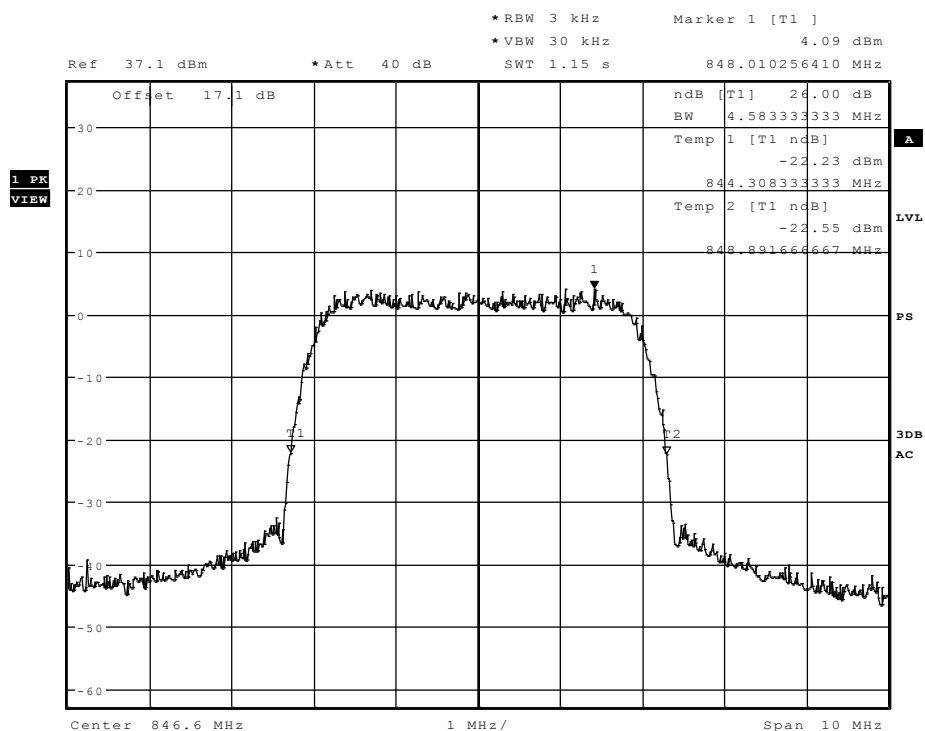
Date: 4.NOV.2011 21:47:42

Channel 4132



Date: 4.NOV.2011 21:50:20

Channel 4182

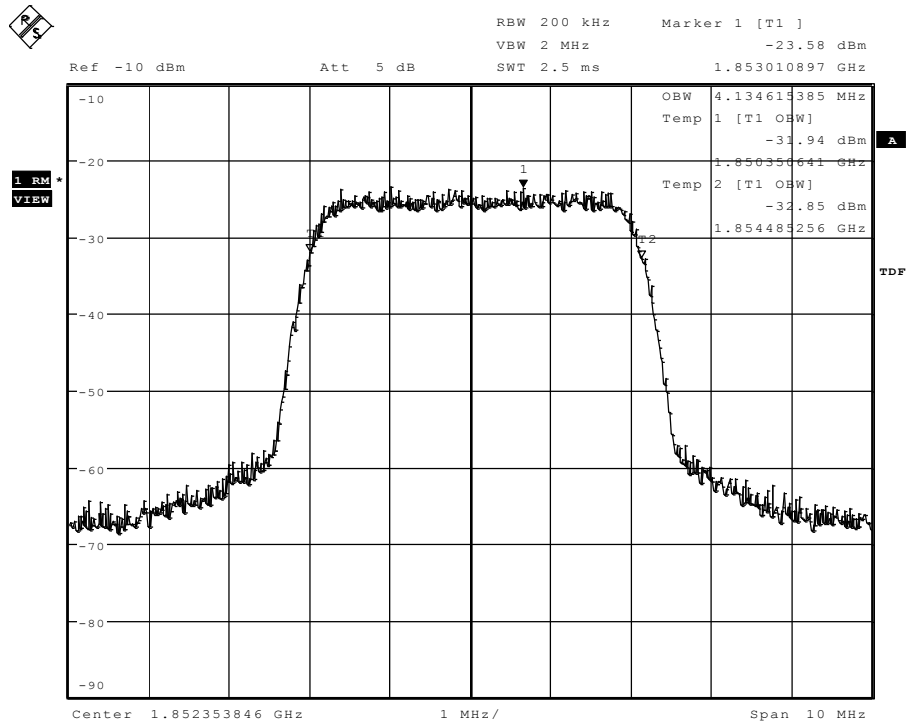


Date: 4.NOV.2011 21:52:39

Channel 4233

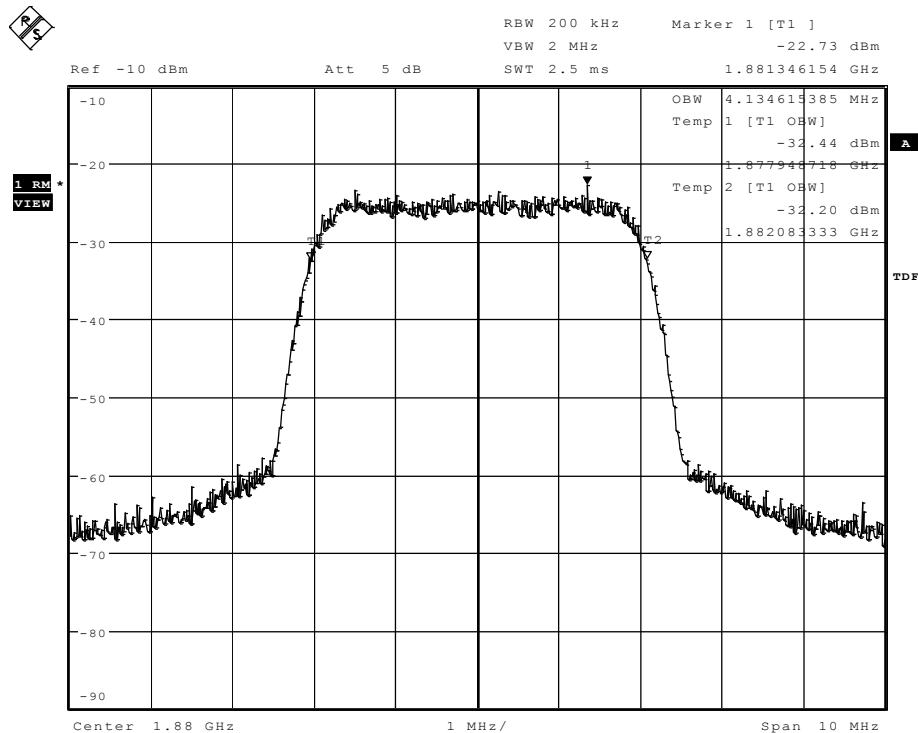
1.3. 99% Occupied bandwidth

1.3.1. FDD Band II – RMC99 Mode



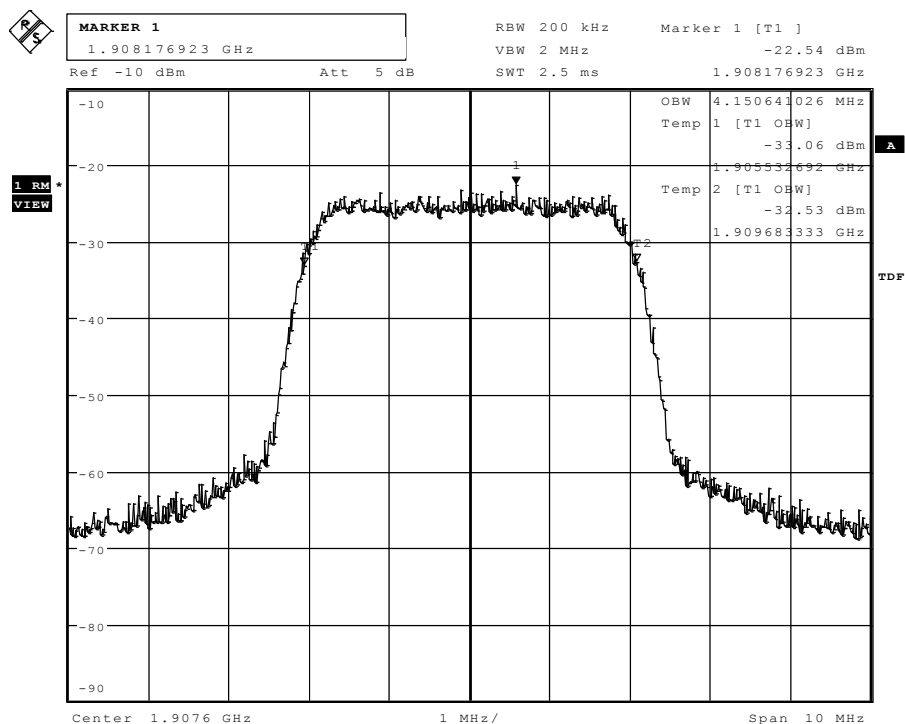
Date: 29.NOV.2011 08:41:23

Channel 9262



Date: 29.NOV.2011 08:44:58

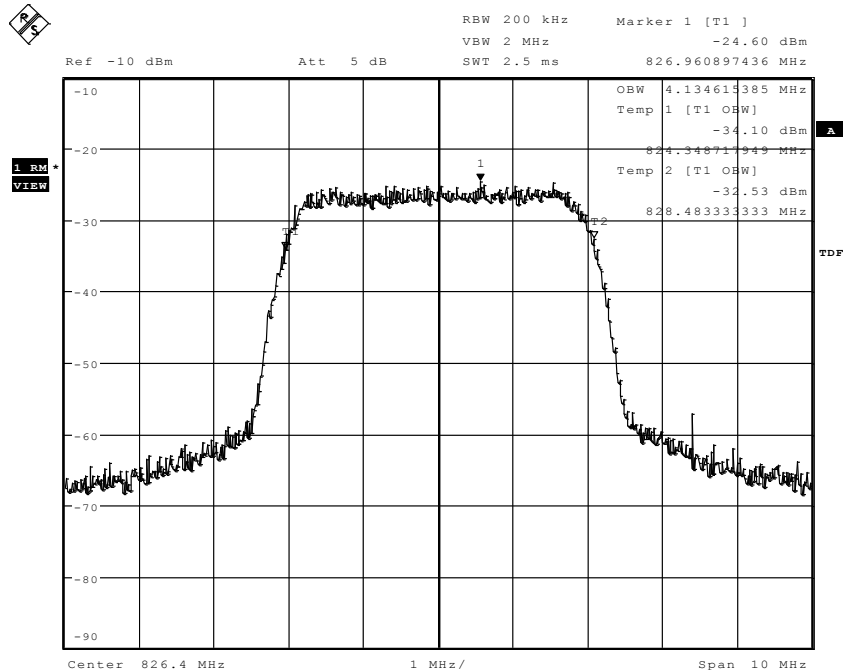
Channel 9400



Date: 29.NOV.2011 08:47:20

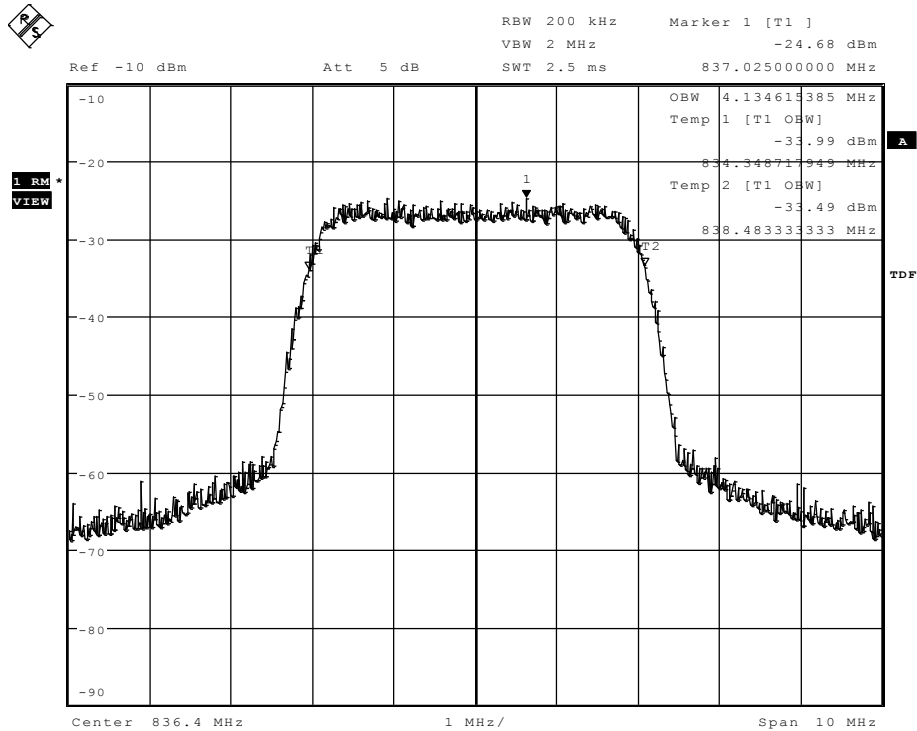
Channel 9538

1.3.2. FDD Band V – RMC99 Mode



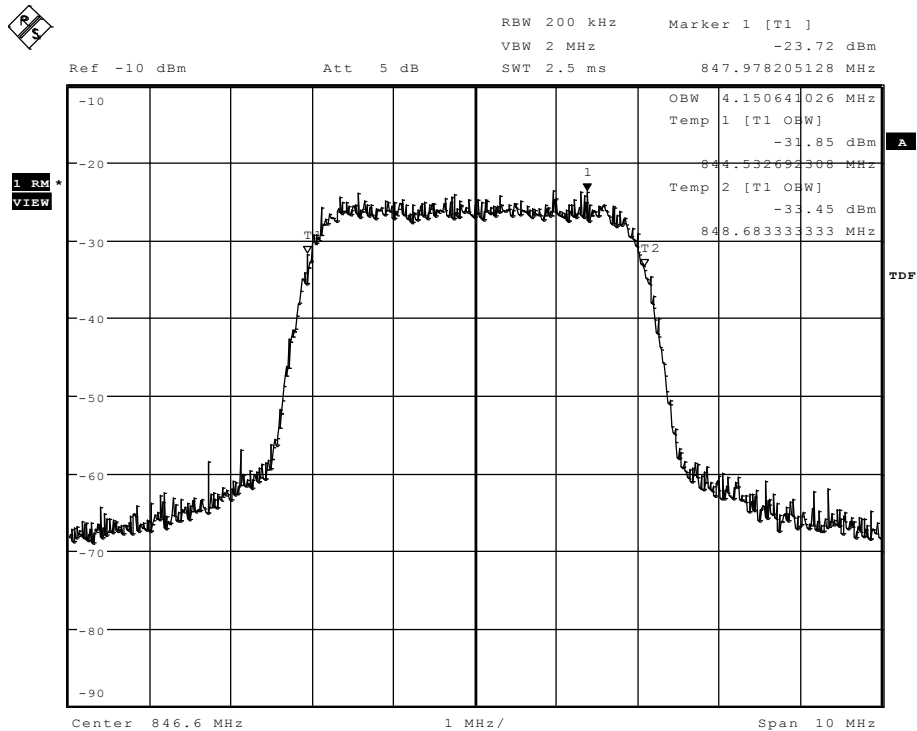
Date: 29.NOV.2011 08:49:44

Channel 4132



Date: 29.NOV.2011 08:51:22

Channel 4182



Date: 29.NOV.2011 08:52:47

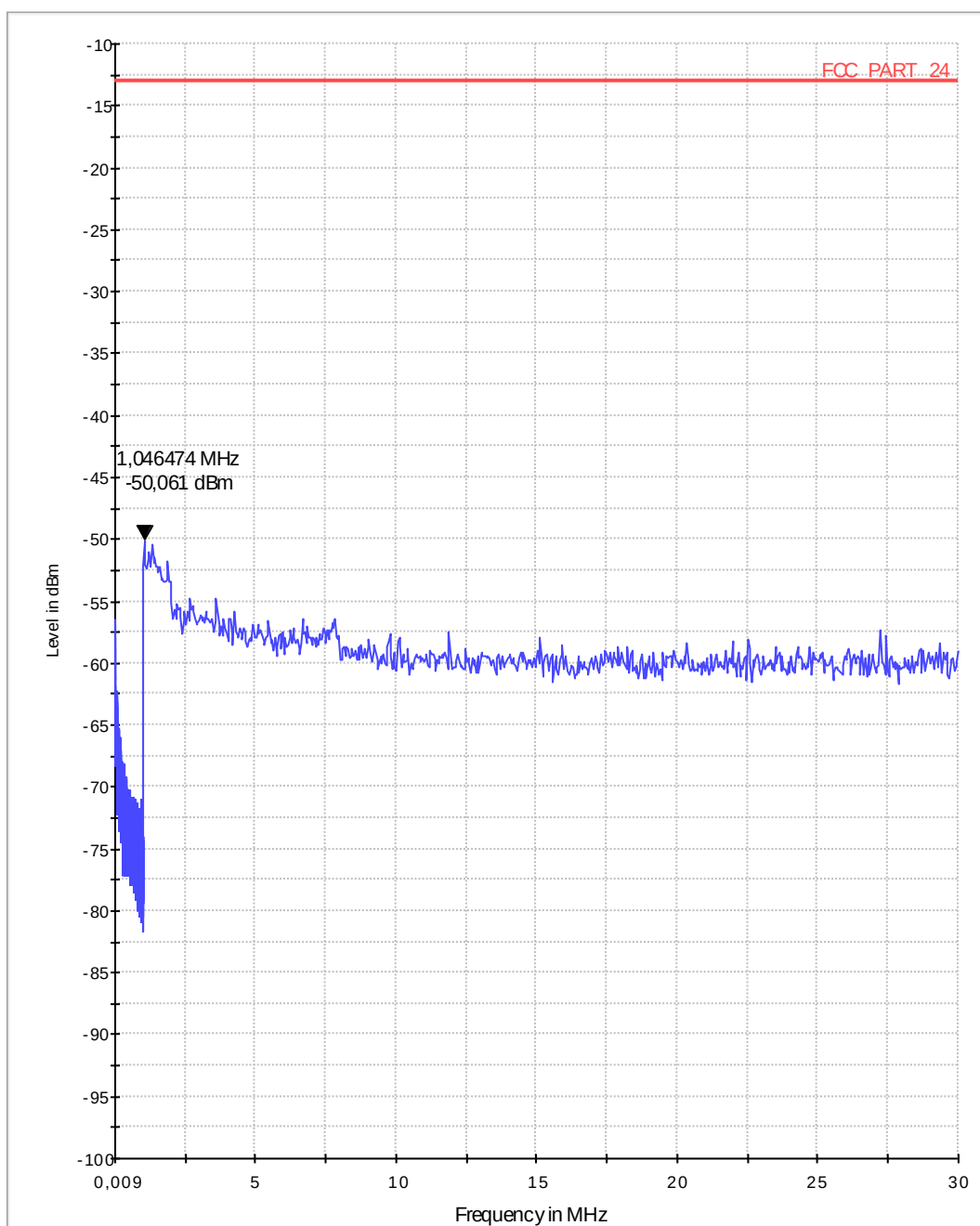
Channel 4233

1.4. Spurious emissions conducted – FDD Band V Mode b_4.09

Common Information

Test Description:	TX Spurious Emission conducted
Test Site:	Radio laboratory
Test Standard:	FCC Part 22, RSS-132
Test condition:	23°C 41%
Operation mode:	FDDV-HSUPA (UARFCN 4132 low)
Operator Name:	dpa

Sweep_1

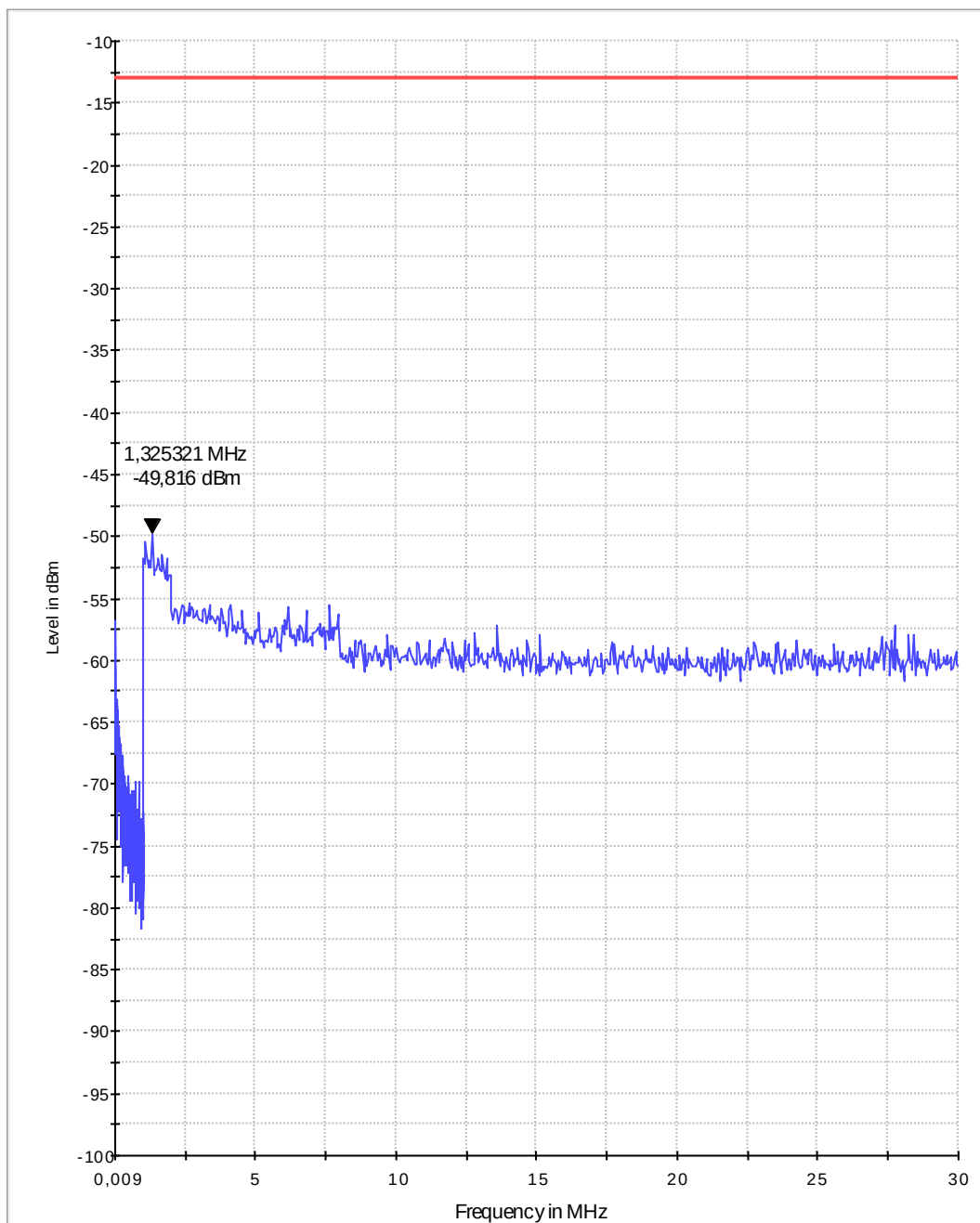


b_4.10**Common Information**

Test Description: TX Spurious Emission conducted
Test Site: Radio laboratory
Test Standard: FCC Part 22, RSS-132
Test condition: 23°C 41%

Operation mode: FDDV-HSUPA (UARFCN 4182 middle)
Operator Name: dpa

Sweep_1

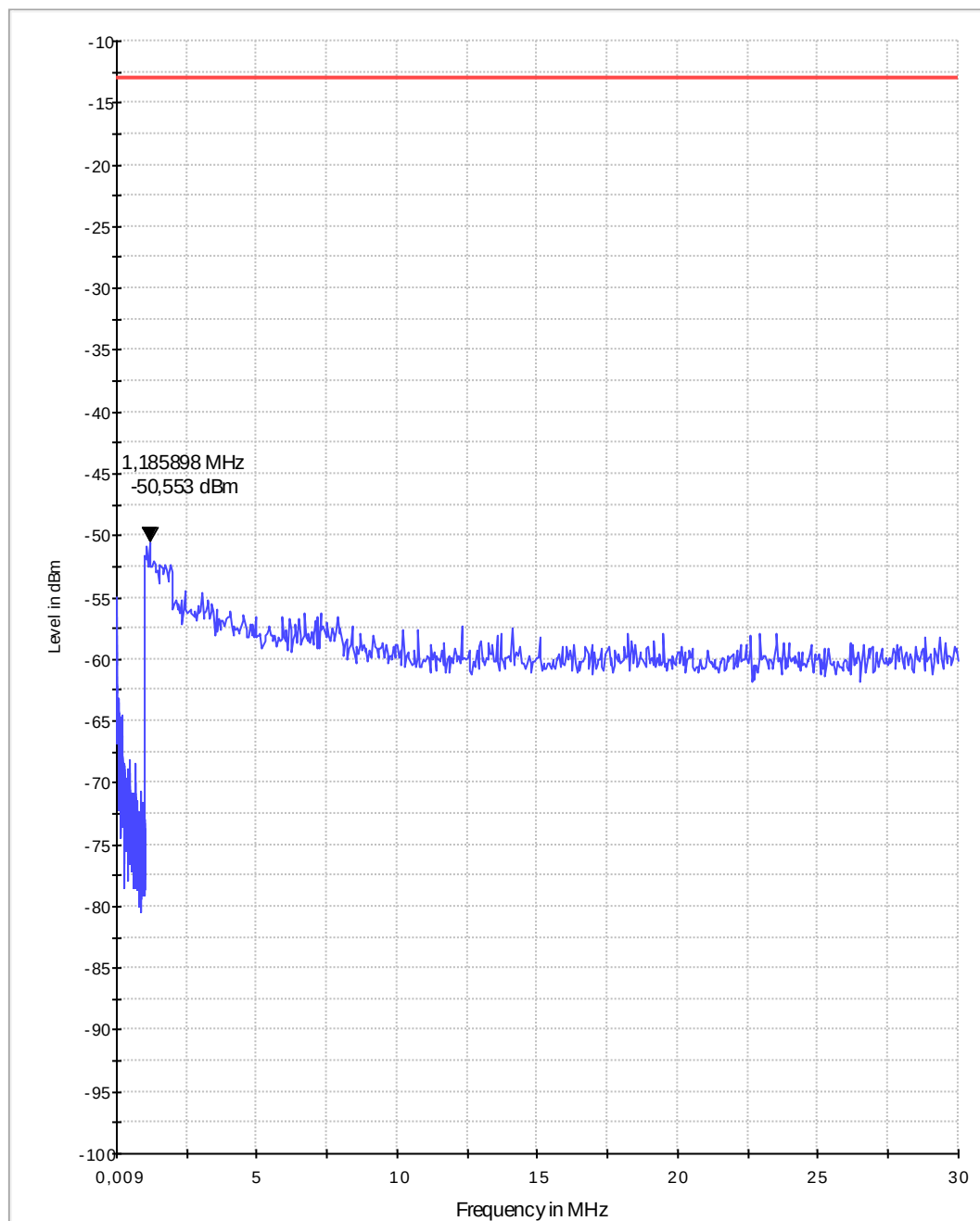


b_4.11**Common Information**

Test Description: TX Spurious Emission conducted
Test Site: Radio laboratory
Test Standard: FCC Part 22, RSS-132
Test condition: 23°C 41%

Operation mode: FDDV-HSUPA (UARFCN 4233 high)
Operator Name: dpa

Sweep_1



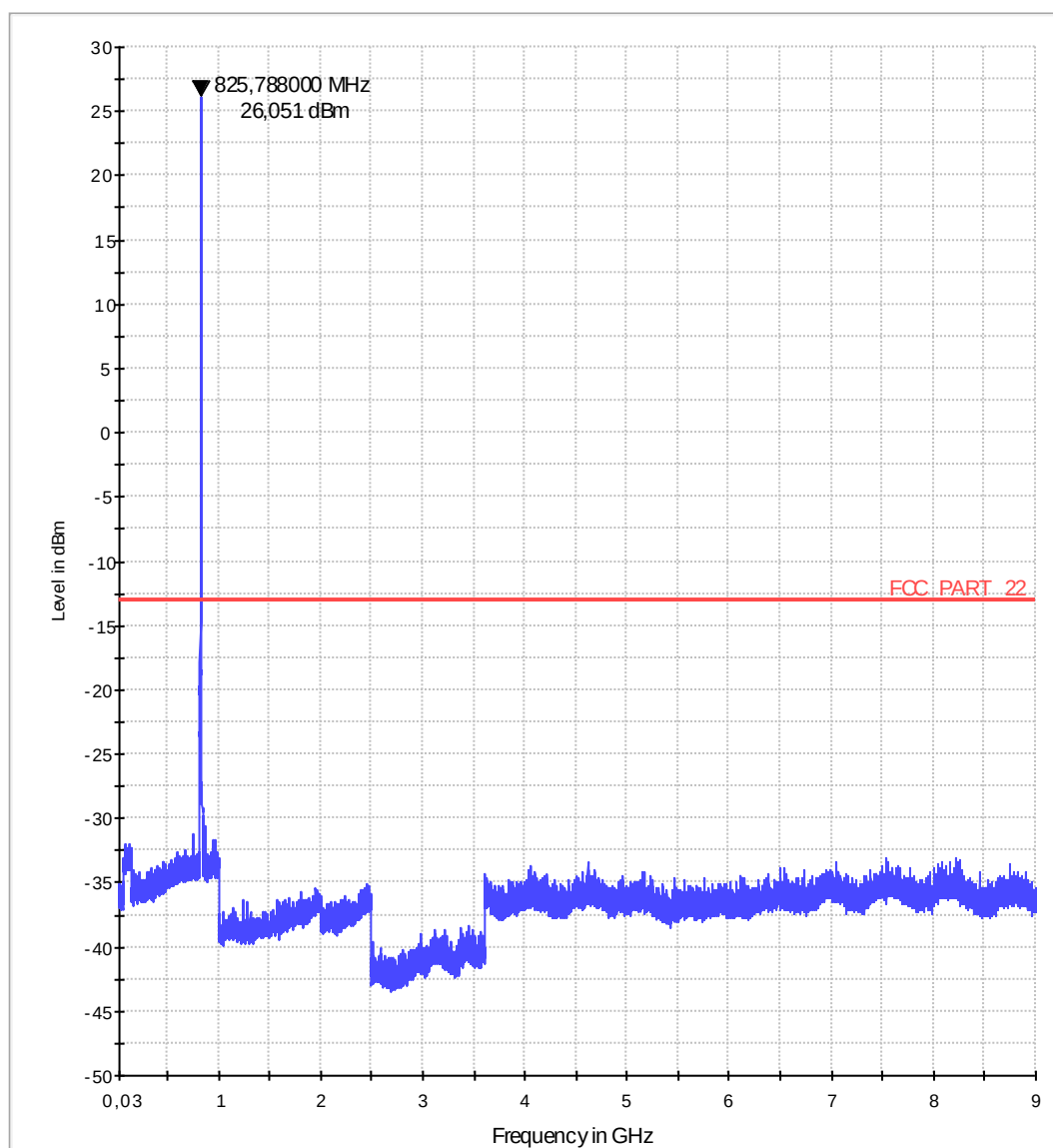
b_4.14**Common Information**

Test Description:	TX Spurious Emission conducted
Test Site:	Radio laboratory
Test Standard:	FCC Part 22, RSS-132
Test condition:	23°C 41%
Operation mode:	FDDV-HSUPA (UARFCN 4132 low)

EUT Information

EUT Name:	LISA-U200
Manufacturer:	u-blox AG
Serial Number:	358901040001353
Hardware Rev:	21.03
Voltage:	3,8 VDC

Sweep_2



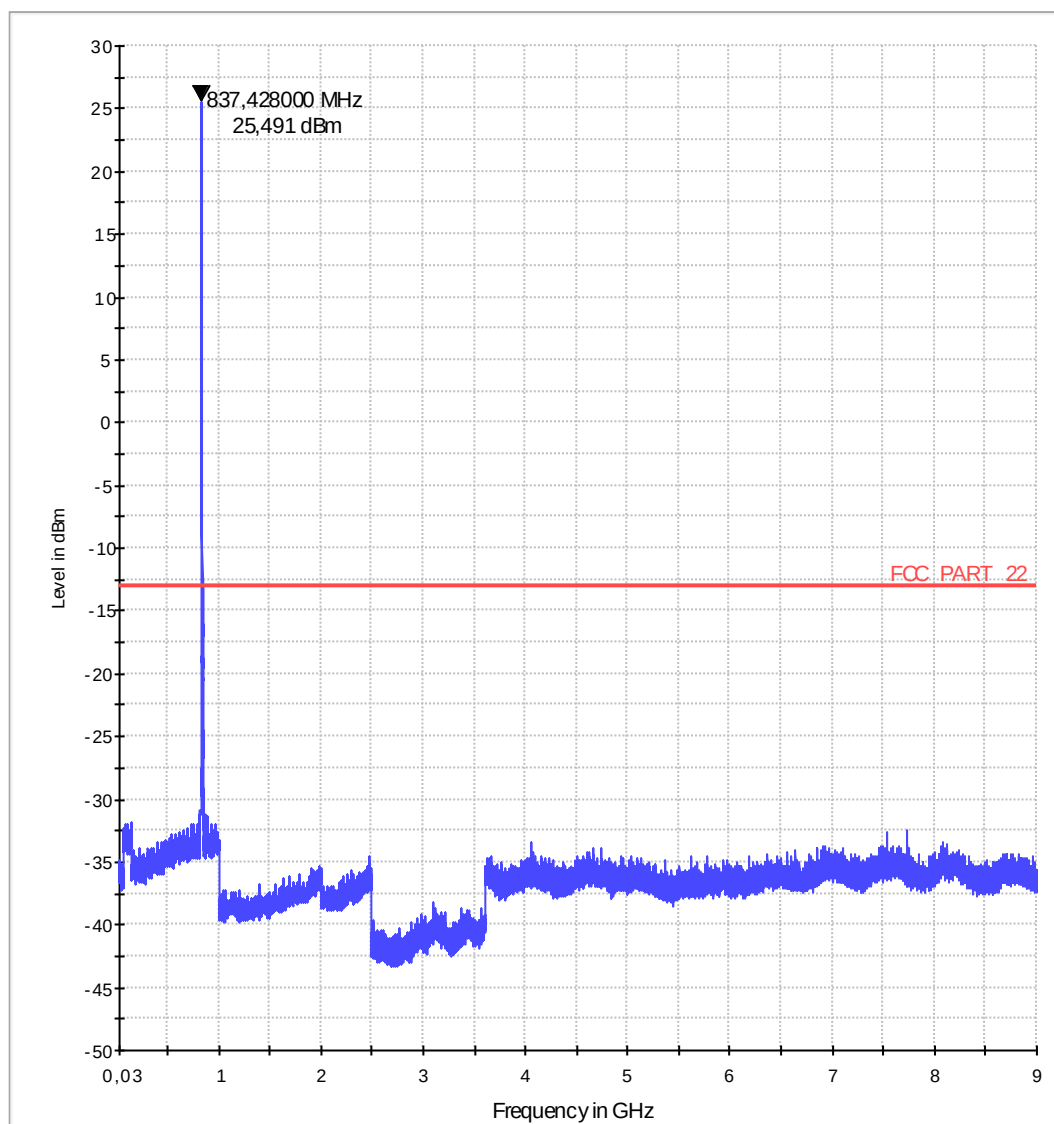
b_4.15**Common Information**

Test Description:	TX Spurious Emission conducted
Test Site:	Radio laboratory
Test Standard:	FCC Part 22, RSS-132
Test condition:	23°C 41%
Operation mode:	FDDV-HSUPA (UARFCN 4182 middle)
Operator:	dpa

EUT Information

EUT Name:	LISA-U200
Manufacturer:	u-blox AG
Serial Number:	358901040001353
Hardware Rev:	21.03
Voltage:	3,8 VDC

Sweep_2



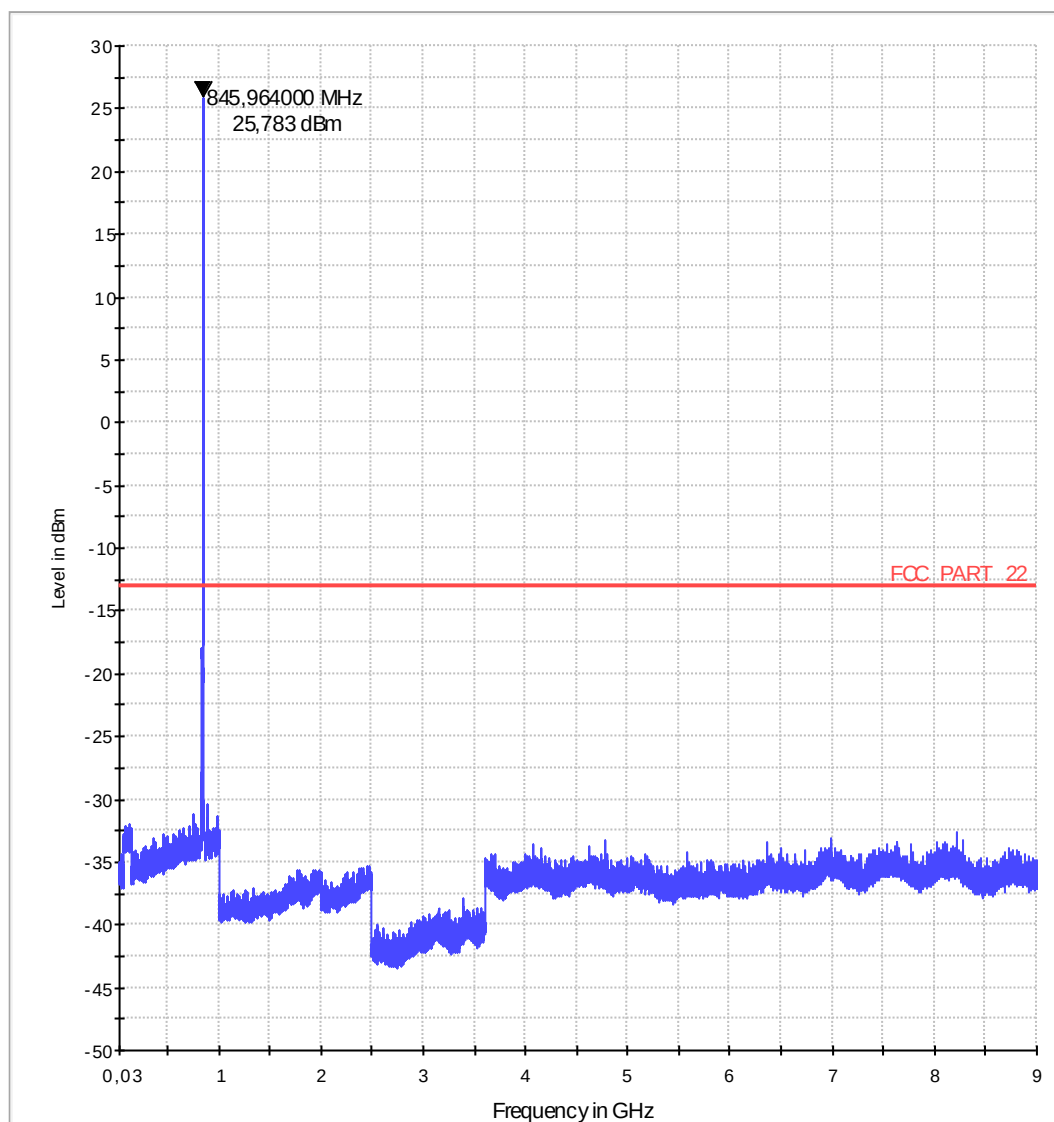
b_4.16**Common Information**

Test Description:	TX Spurious Emission conducted
Test Site:	Radio laboratory
Test Standard:	FCC Part 22, RSS-132
Test condition:	23°C 41%
Operation mode:	FDDV-HSUPA (UARFCN 4233 high)
Operator:	dpa

EUT Information

EUT Name:	LISA-U200
Manufacturer:	u-blox AG
Serial Number:	358901040001353
Hardware Rev:	21.03
Voltage:	3,8 VDC

Sweep_2



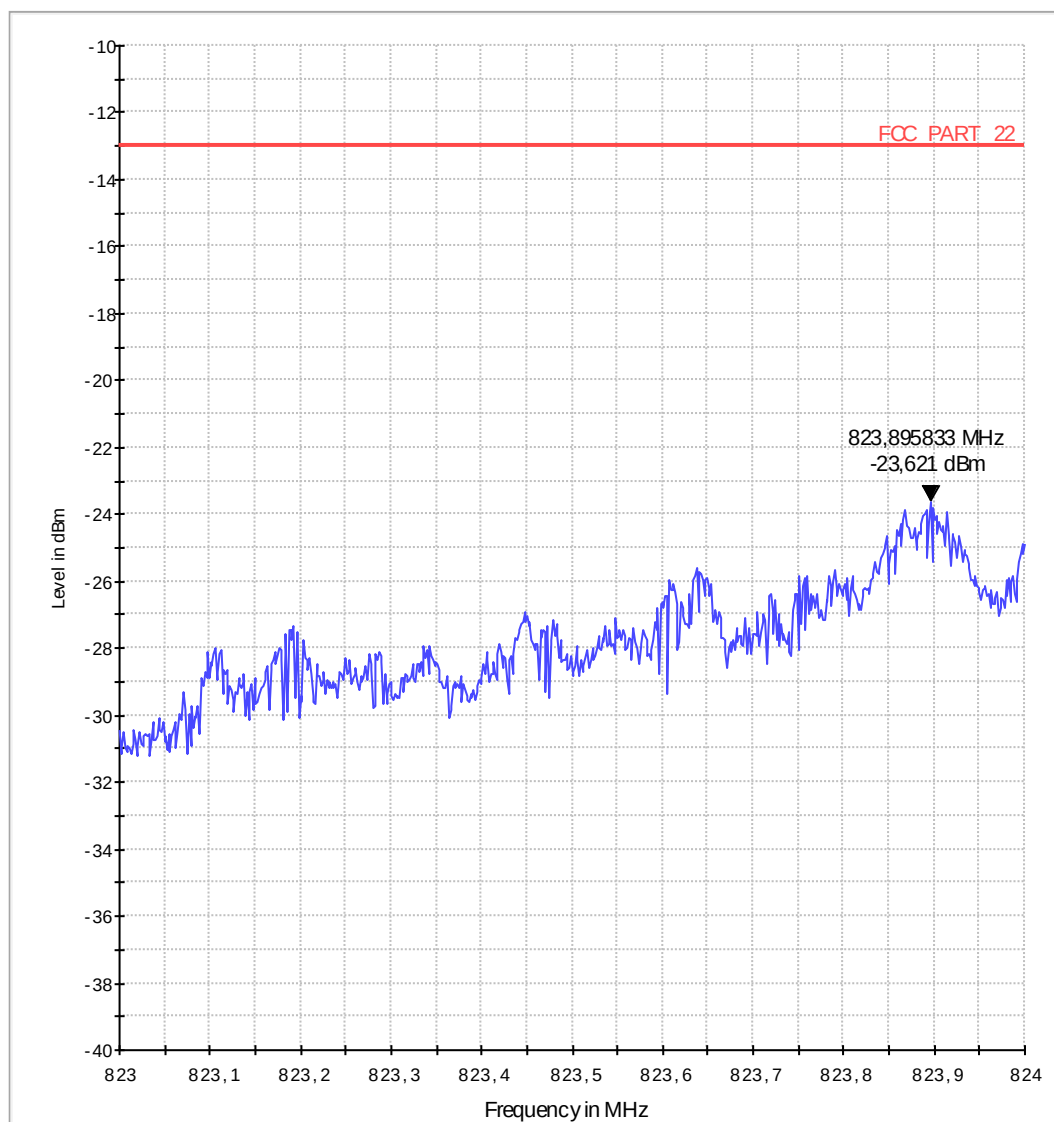
1.4.1. Band-Edge compliance conducted**b_4.12****Common Information**

Test Description:	Band Edge
Test Site:	Radio laboratory
Test Standard:	FCC Part 22, RSS-132
Test condition:	23°C 41%
Operation mode:	FDDV-HSUPA (UARFCN 4132 low)
Operator:	dpa

EUT Information

EUT Name:	LISA-U200
Manufacturer:	u-blox AG
Serial Number:	358901040001353
Hardware Rev:	21.03
Voltage:	3,8 VDC

Sweep_3a_Band_Edge_Channel_4132_PK



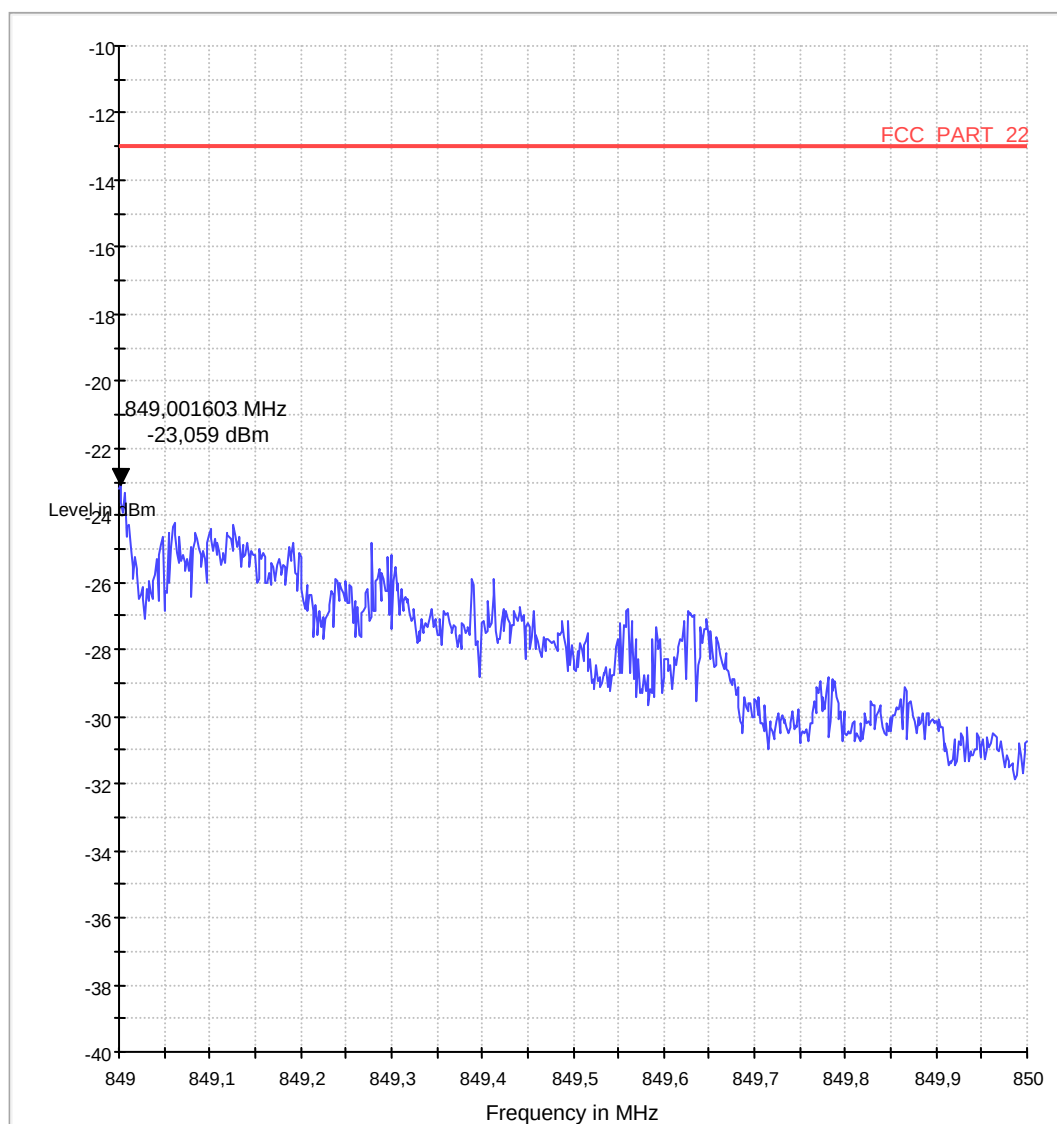
b_4.13**Common Information**

Test Description:	Band Edge
Test Site:	Radio laboratory
Test Standard:	FCC Part 22, RSS-132
Test condition:	23°C 41%
Operation mode:	FDDV-HSUPA (UARFCN 4233 high)
Operator:	dpa

EUT Information

EUT Name:	LISA-U200
Manufacturer:	u-blox AG
Serial Number:	358901040001353
Hardware Rev:	21.03
Voltage:	3,8 VDC

Sweep_3a_Band_Edge_Channel_4233_PK



1.5. Spurious emissions conducted – FDD Band II Mode

b_4.19

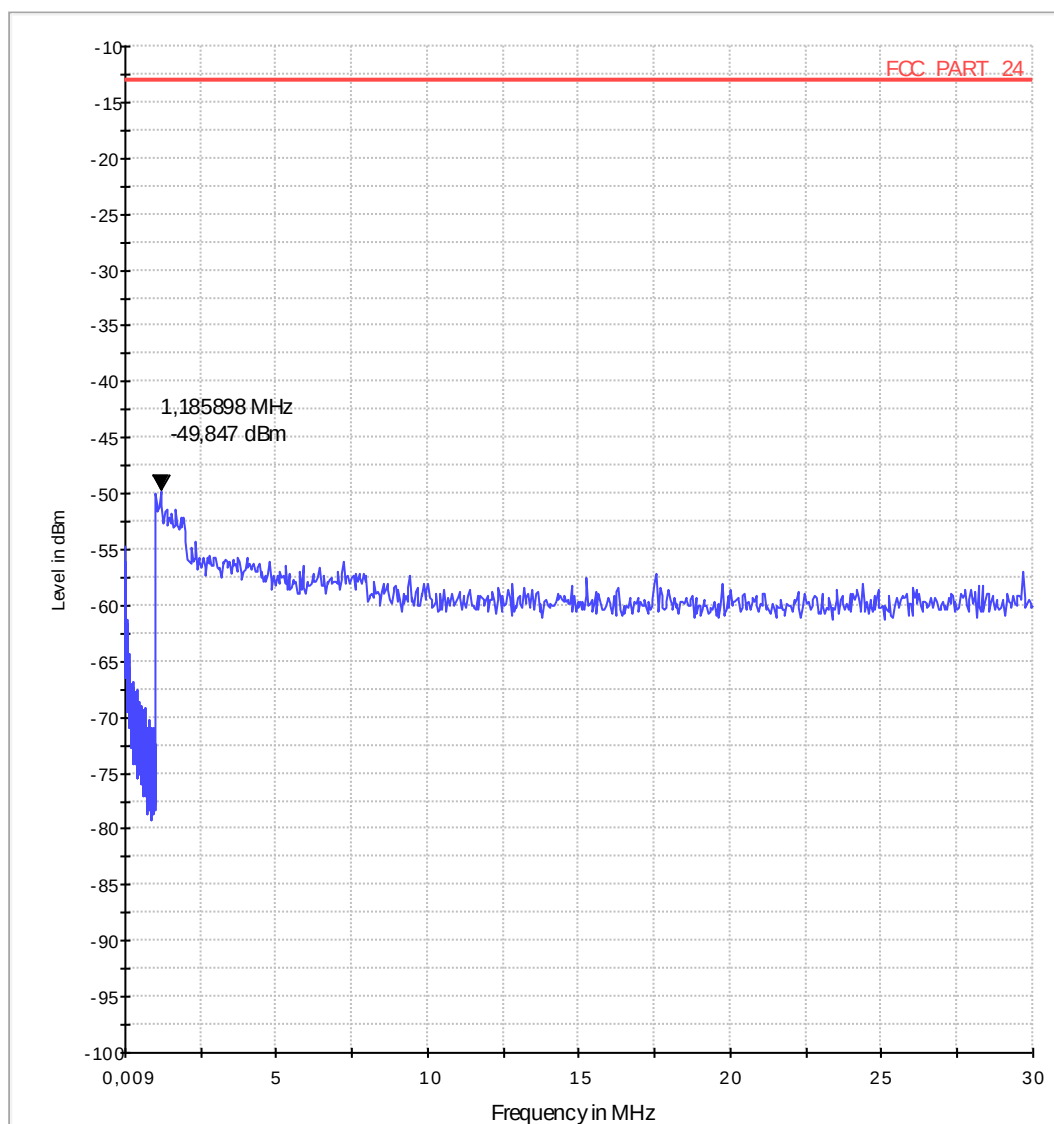
Common Information

Test Description:	TX Spurious Emission conducted
Test Site:	Radio laboratory
Test Standard:	FCC Part 24.238, RSS-133
Test Conditions:	23°C 41%
Operation mode:	FDDII-HSUPA (UARFCN 9262 low)
Operator Name:	dpa

EUT Information

EUT Name:	LISA-U200
Manufacturer:	u-blox AG
Serial Number:	358901040001353
Hardware Rev:	21.03
Voltage:	3,8 VDC

Sweep_1



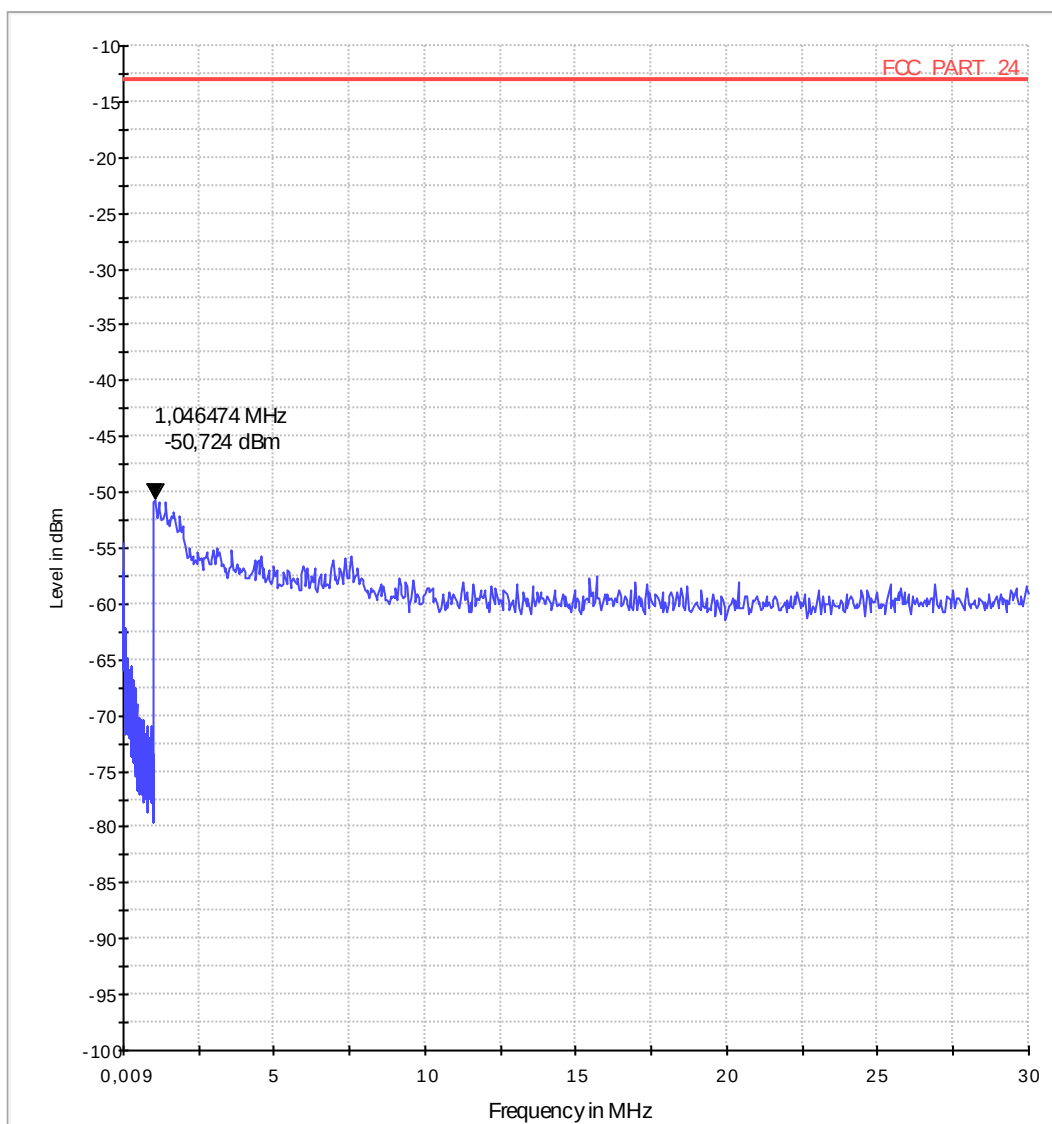
b_4.20**Common Information**

Test Description:	TX Spurious Emission conducted
Test Site:	Radio laboratory
Test Standard:	FCC Part 24.238, RSS-133
Test Conditions:	23°C 41%
Operation mode:	FDDII-HSUPA (UARFCN 9400 middle)
Operator Name:	dpa
Comment:	

EUT Information

EUT Name:	LISA-U200
Manufacturer:	u-blox AG
Serial Number:	358901040001353
Hardware Rev:	21.03
Voltage:	3,8 VDC

Sweep_1



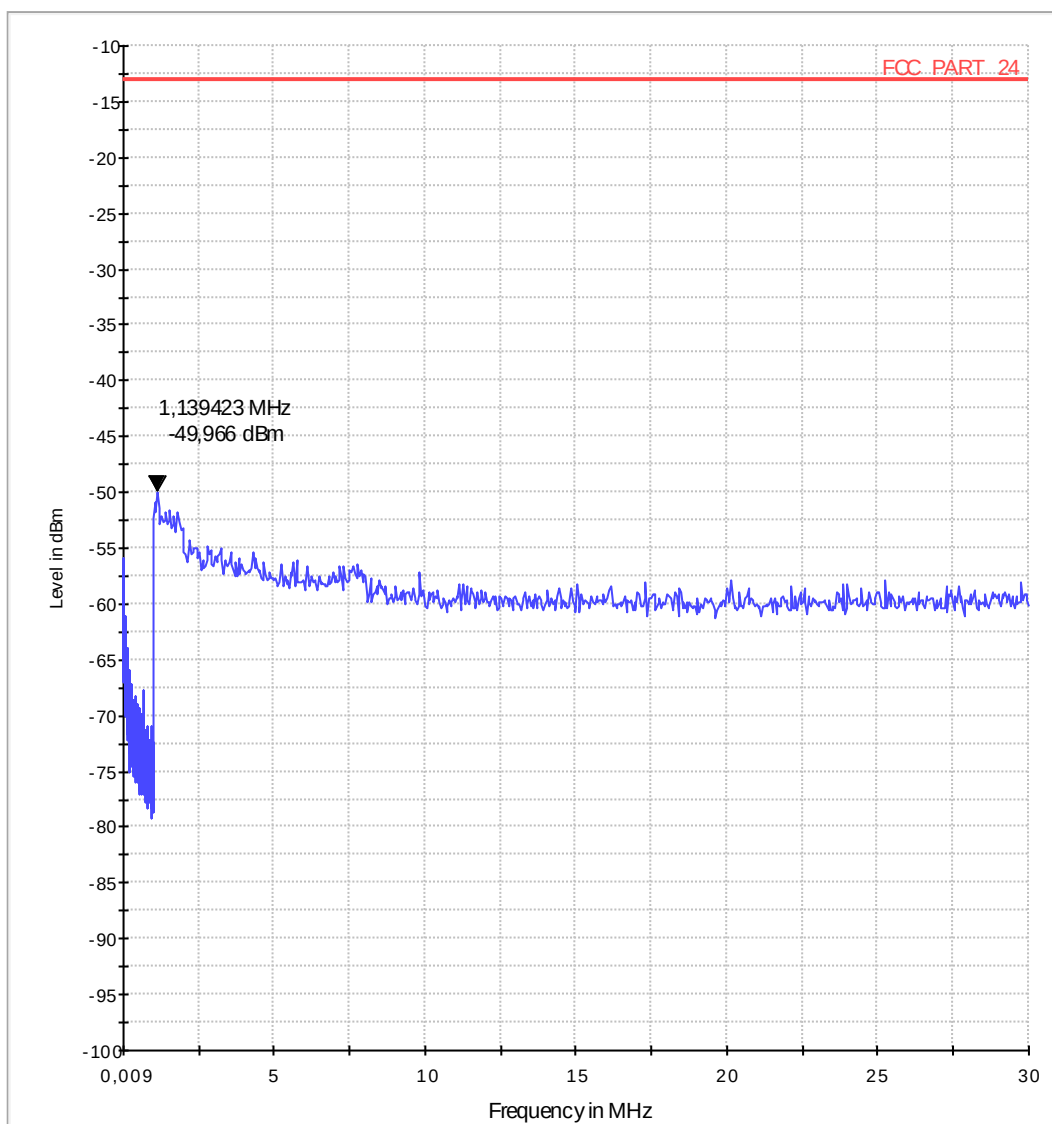
b_4.21**Common Information**

Test Description:	TX Spurious Emission conducted
Test Site:	Radio laboratory
Test Standard:	FCC Part 24.238, RSS-133
Test Conditions:	23°C 41%
Operation mode:	FDDII-HSUPA (UARFCN 9538 high)
Operator Name:	dpa
Comment:	

EUT Information

EUT Name:	LISA-U200
Manufacturer:	u-blox AG
Serial Number:	358901040001353
Hardware Rev:	21.03
Voltage:	3,8 VDC

Sweep_1



b_4.22**Common Information**

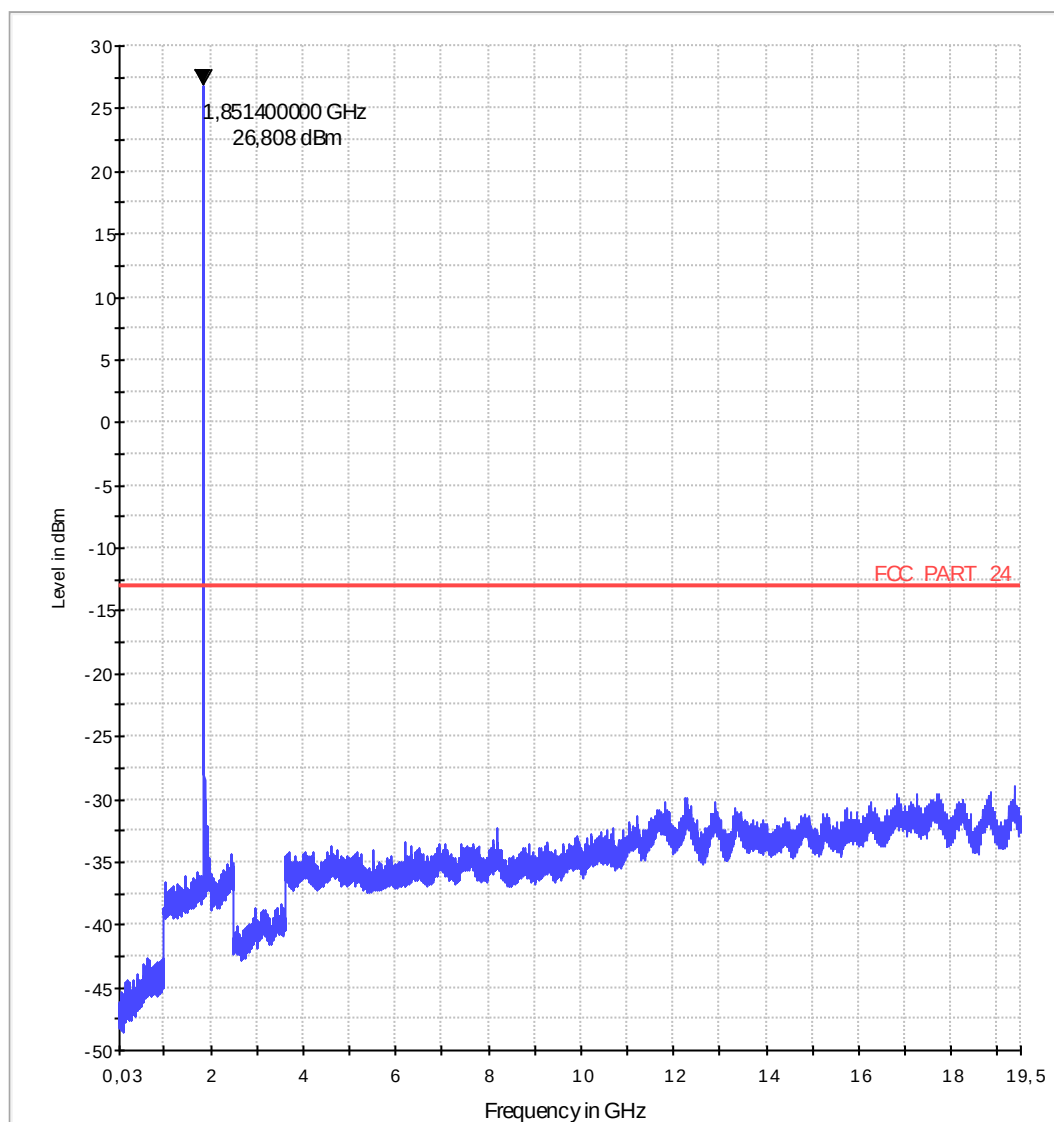
Test Description: TX Spurious Emission conducted
Test Site: Radio laboratory
Test Standard: FCC Part 24.238, RSS-133
Test condition: 23°C 41%

Operation mode: FDDII-HSUPA (UARFCN 9262 low)
Operator: dpa

EUT Information

EUT Name: LISA-U200
Manufacturer: u-blox AG
Serial Number: 358901040001353
Hardware Rev: 21.03
Voltage: 3,8 VDC

Sweep_2



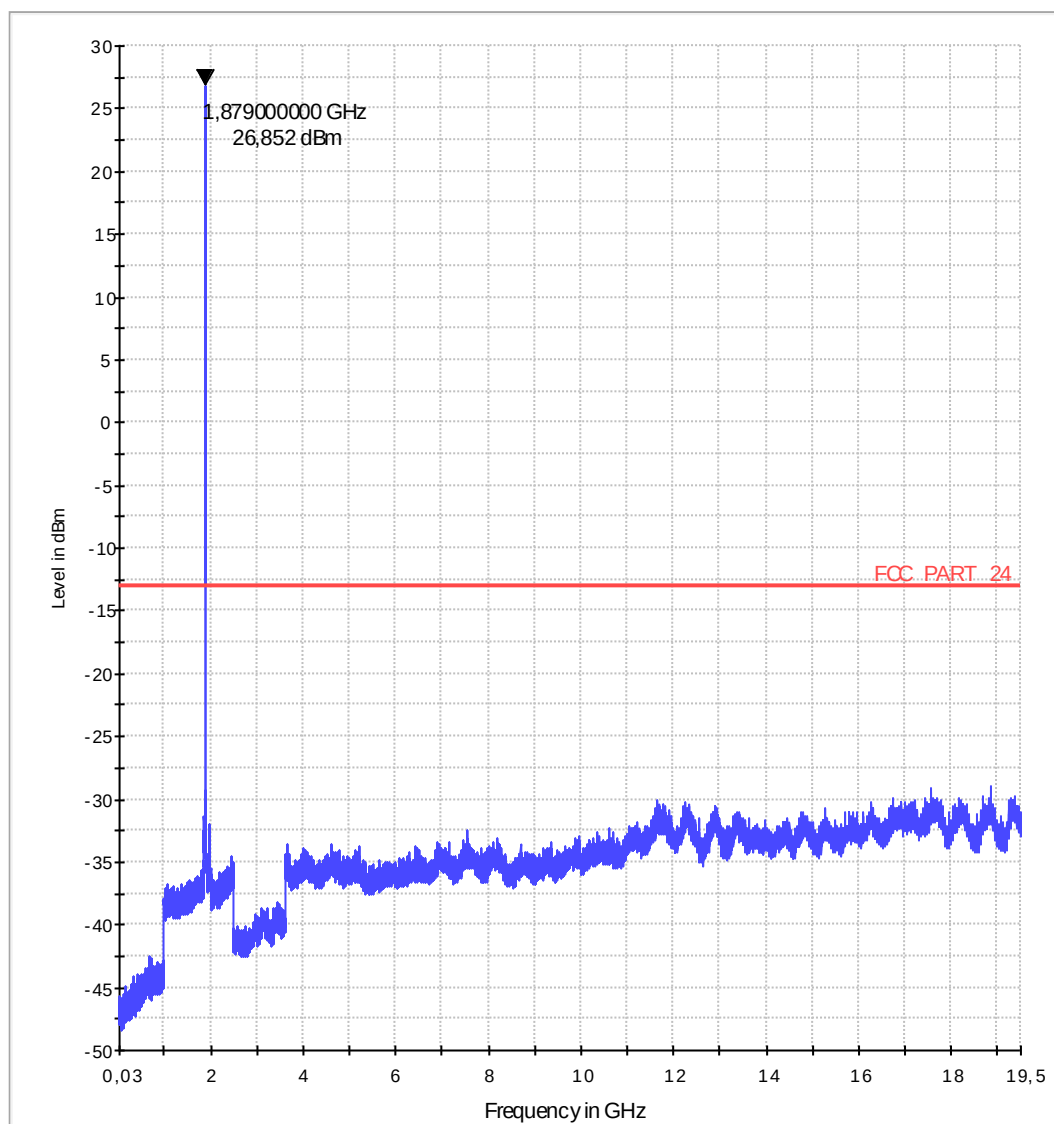
b_4.23**Common Information**

Test Description:	TX Spurious Emission conducted
Test Site:	Radio laboratory
Test Standard:	FCC Part 24.238, RSS-133
Test condition:	23°C 41%
Operation mode:	FDDII-HSUPA (UARFCN 9400 middle)
Operator:	dpa

EUT Information

EUT Name:	LISA-U200
Manufacturer:	u-blox AG
Serial Number:	358901040001353
Hardware Rev:	21.03
Voltage:	3,8 VDC

Sweep_2



CETECOM 6-0082-11-1-2b

1 / 1

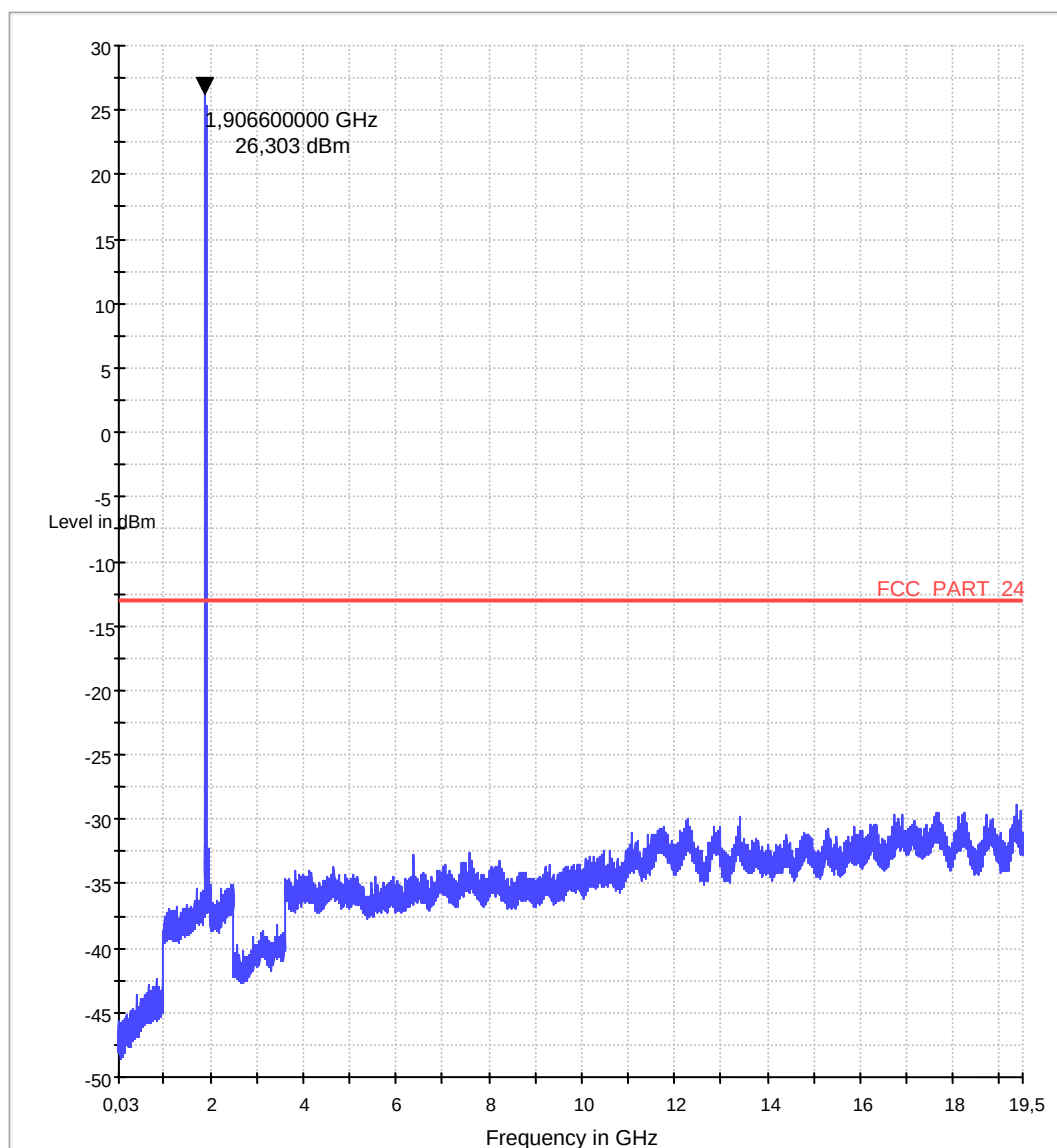
b_4.24**Common Information**

Test Description:	TX Spurious Emission conducted
Test Site:	Radio laboratory
Test Standard:	FCC Part 24.238, RSS-133
Test condition:	23°C 41%
Operation mode:	FDDII-HSUPA (UARFCN 9538 high)

EUT Information

EUT Name:	LISA-L200
Manufacturer:	u-blox AG
Serial Number:	358901040001353
Hardware Rev:	21.03
Voltage:	3,8 VDC

Sweep_2



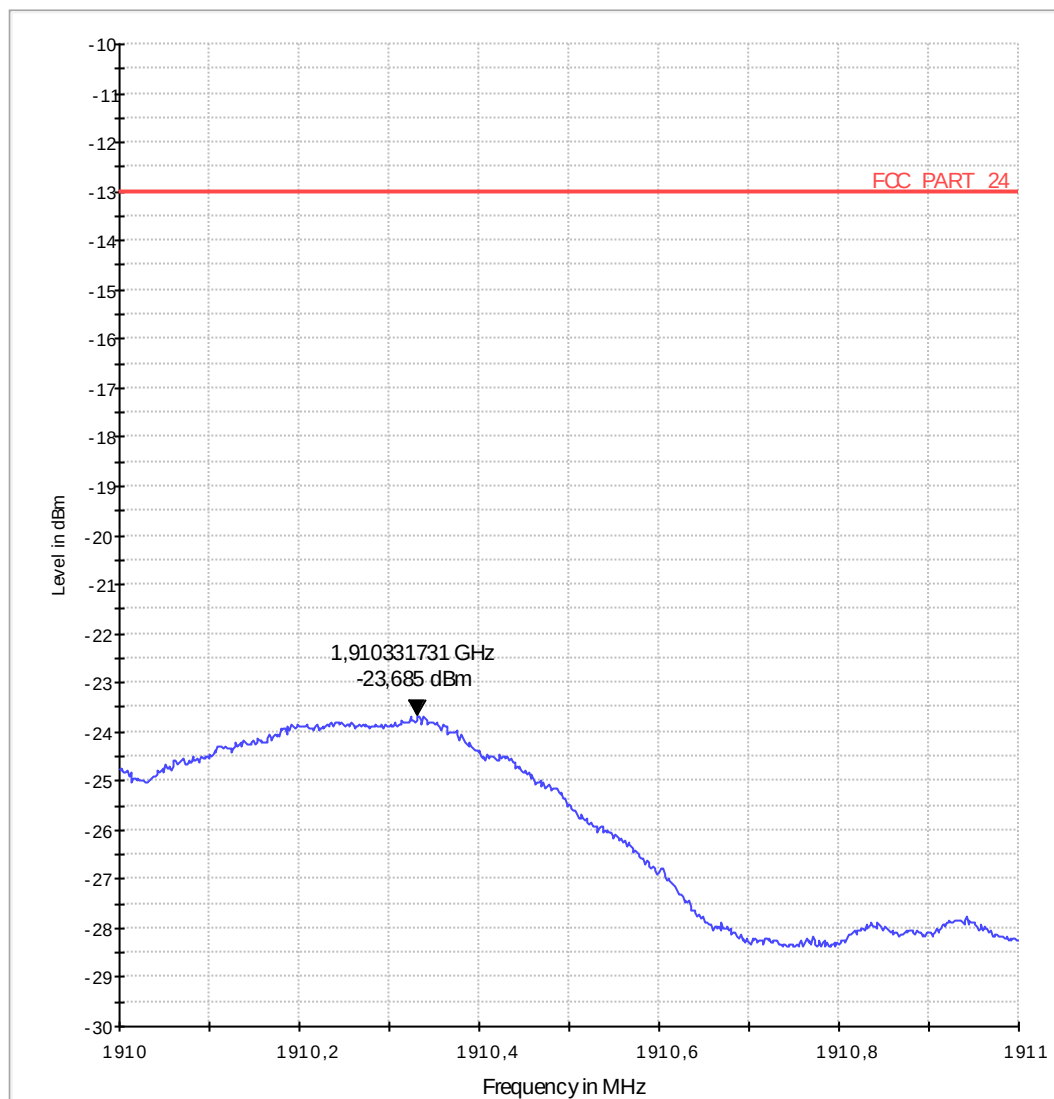
1.5.1. Band-Edge compliance conducted**b_4.27****Common Information**

Test Description:	Band Edge
Test Site:	Radio laboratory
Test Standard:	FCC Part 24.238, RSS-133
Test condition:	23°C 41%
Operation mode:	FDDII-HSUPA (UARFCN 9538 high)
Operator:	dpa
Comment:	

EUT Information

EUT Name:	LISA-U200
Manufacturer:	u-blox AG
Serial Number:	358901040001353
Hardware Rev:	21.03
Voltage:	3,8 VDC

Sweep_3b_Band_Edge_Channel_9538_AV



b_4.28**Common Information**

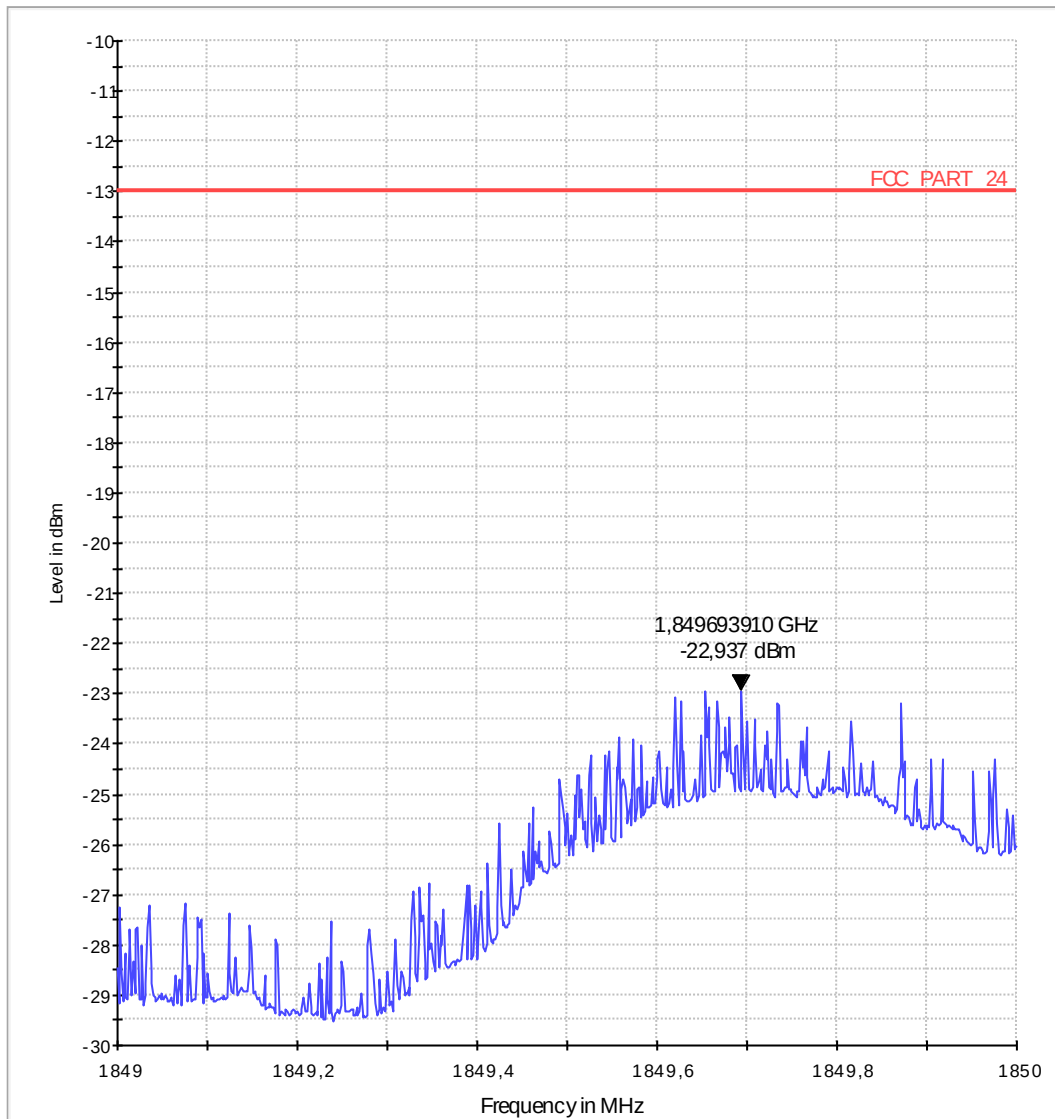
Test Description:	Band Edge
Test Site:	Radio laboratory
Test Standard:	FCC Part 24.238, RSS-133
Test condition:	23°C 41%

Operation mode:	FDDII-HSUPA (UARFCN 9262 low)
Operator:	dpa

EUT Information

EUT Name:	LISA-U200
Manufacturer:	u-blox AG
Serial Number:	358901040001353
Hardware Rev:	21.03
Voltage:	3,8 VDC

Sweep_3b_Band_Edge_Channel_9262_AV



1.6. Spurious emissions radiated – FDD Band II Mode

1.6.1. Spurious emissions magnetic-field <30MHz

Diagram No. b_3.01

Common Information

Test description:

Test site and distance:

Measured sides of EUT:

Rec. antenna (pre-scan):

Turntable step:

Used filter:

Test specification.:

Magnetic Fieldstrength Measurement related to 3 m distance

Semi Anechoic Room covered with absorbers (SAR) with 3 m measurement distance

front, right, rear, left

height 1.00 m, parallel and 90° to EUT polarisation

90° during pre-scan

bypass

FCC 15.205 § 15.209; RSS-Gen: Issue 3

Operator:

Operating conditions:

Power during tests:

Comment 1:

HLA

FDD II TX

110V/60Hz

Channel low (9262)

FCC15.209_magn hor+vert

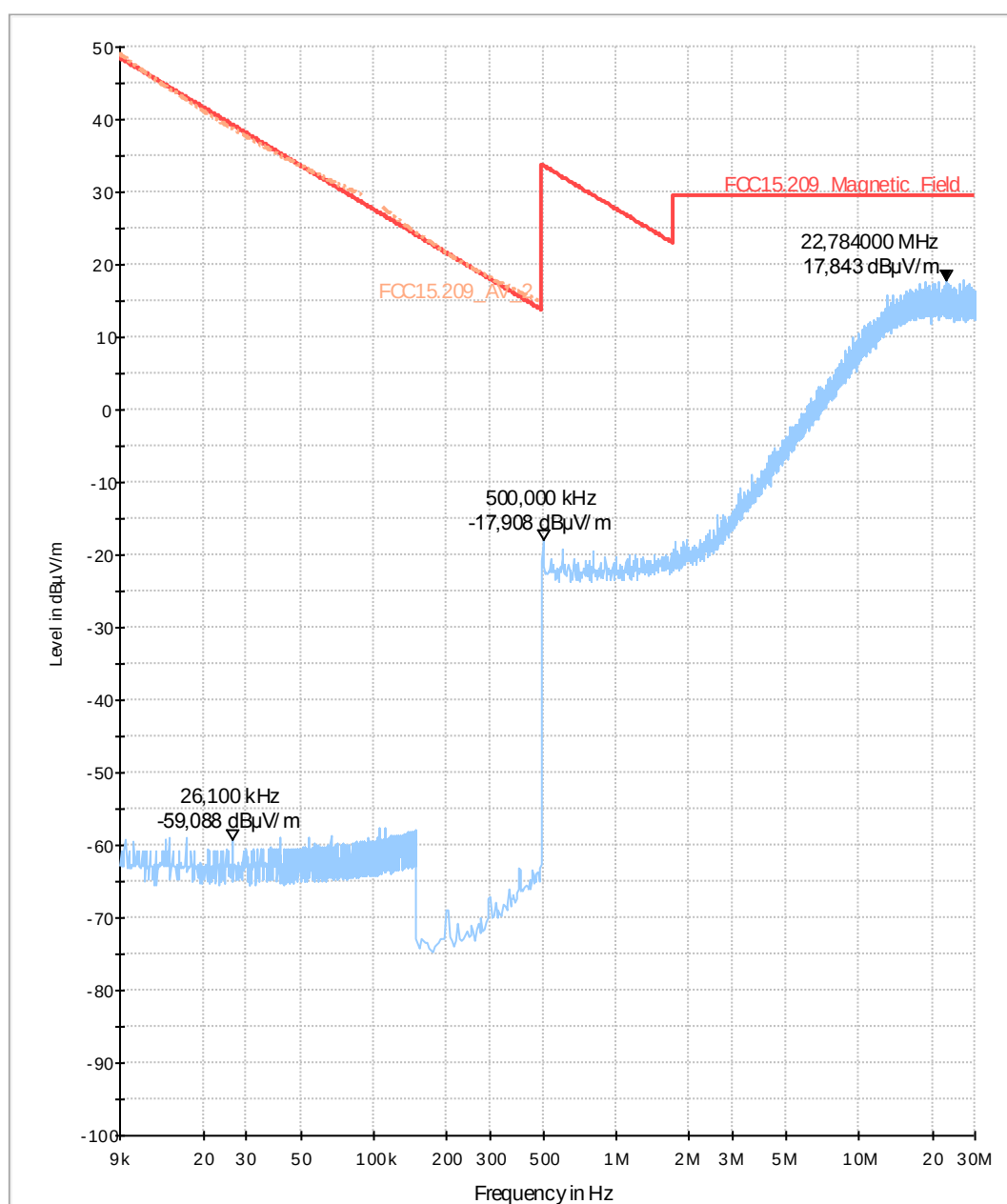


Diagram No. b_3.02

Common Information

Test description:	Magnetic Fieldstrength Measurement related to 3 m distance
Test site and distance:	Semi Anechoic Room (SAR) + mobile floor absorbers and 3m measurement distance
Measured sides of EUT:	front, right, rear, left
Rec. antenna (pre-scan):	height 1.00 m, parallel and 90° to EUT polarisation
Turntable step:	90° during pre-scan
Used filter:	lowpass 1200 MHz
Test specification.:	FCC 15.205 § 15.209; RSS-Gen: Issue 3
Operator:	HLA
Operating conditions:	HSUPA TX-on
Power during tests:	110V/60Hz
Comment 1:	Channel middle (9400) FDD II

EUT Information

EUT Name:	M/N LISA-U200
Manufacturer:	u-blox AG
IMEI:	358901040001734
FW:	21.03

FCC15.209_magn hor+vert

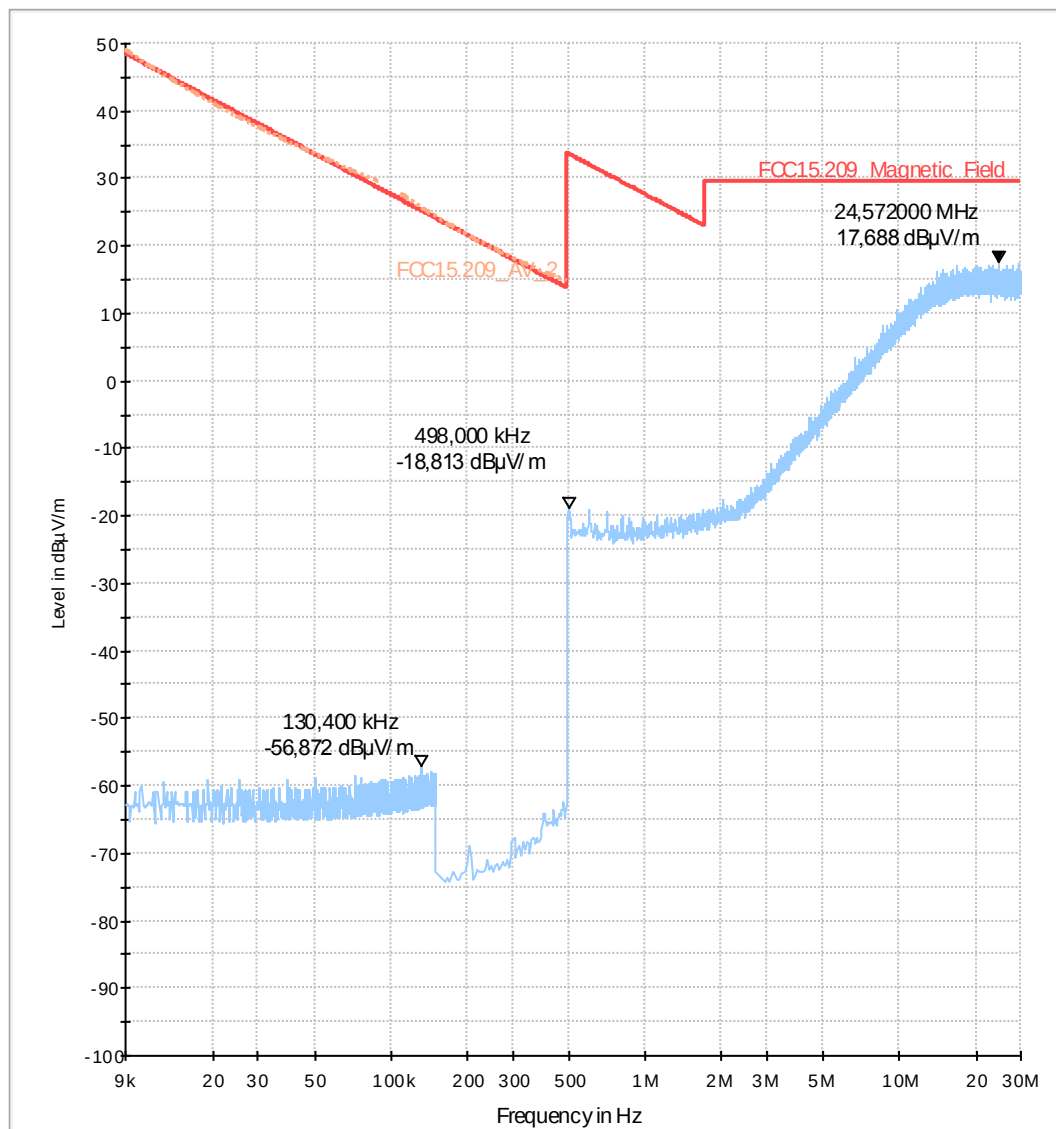


Diagram No. b_3.03

Common Information

Test description:

Test site and distance:

Measured sides of EUT:

Rec. antenna (pre-scan):

Turntable step:

Used filter:

Test specification.:

Magnetic Fieldstrength Measurement related to 3 m distance

Semi Anechoic Room (SAR) + mobile floor absorbers and 3m measurement distance

front, right, rear, left

height 1.00 m, parallel and 90° to EUT polarisation

90° during pre-scan

lowpass 1200 MHz

FCC 15.205 § 15.209; RSS-Gen: Issue 3

Operator:

HLA

Operating conditions:

FDD II TX

Power during tests:

110V/60Hz

Comment 1:

Channel high (9538) FDD II

EUT Information

EUT Name:

M/N LISA-U200

Manufacturer:

u-blox AG

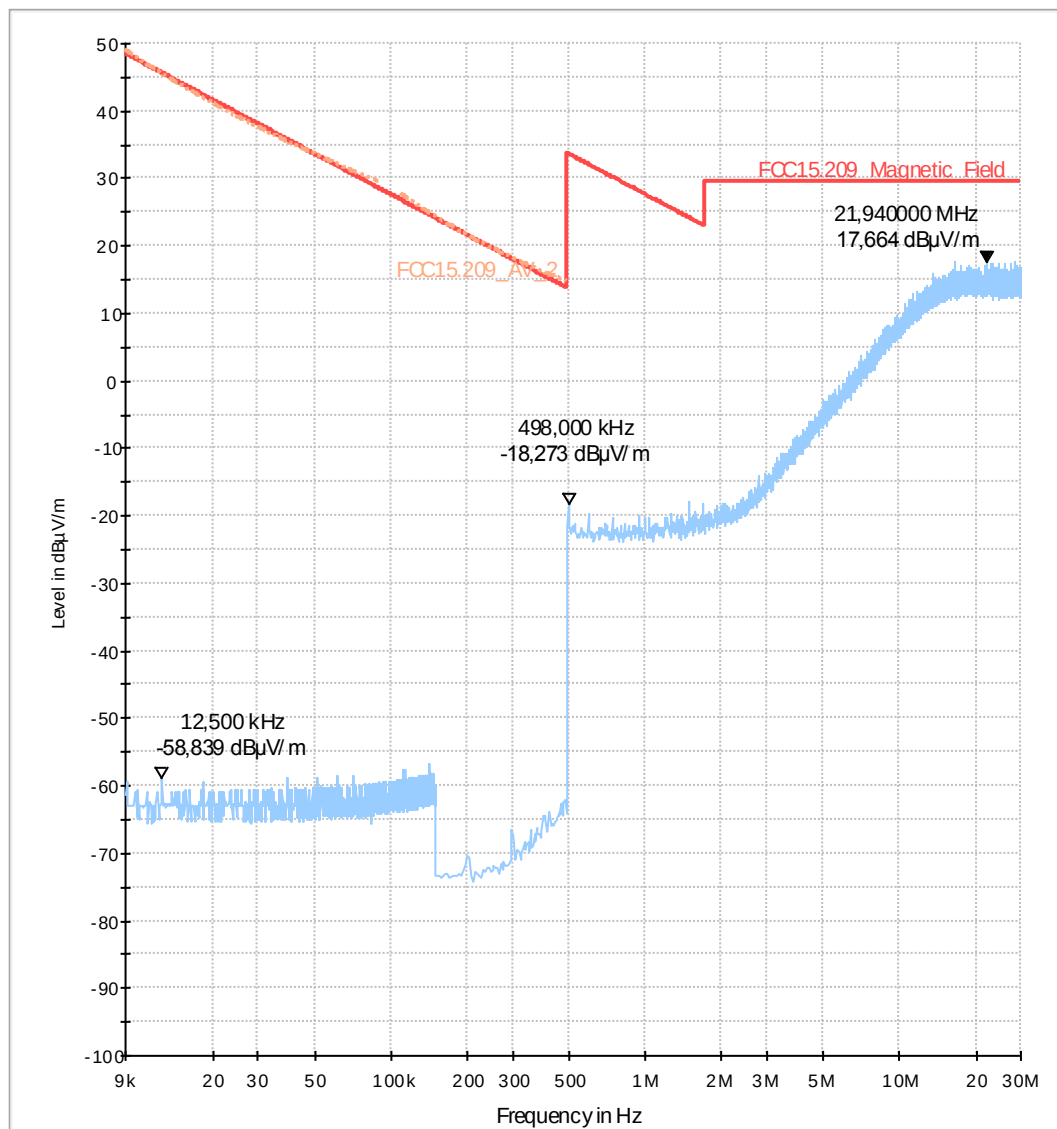
IMEI:

358901040001734

FW:

21.03

FCC15.209_magn hor+vert



1.6.2. Spurious emissions electric field-strength emission >30 MHz+ Block-Edge+ E.I.R.P.
b_5.14
Common Information

Test Description:	Radiated Spurious Emissions UMTS FDD II
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part24
Antenna polarisation:	UMTS FDDII, HSUPA, Channel 9262 (UL 1852,4MHz)
Environmental Conditions:	Humidity: 58%rH; Temperature: 19°C
Operator Name:	YZH

EUT Information

Manufacturer:	u-blox AG
Model:	LISA-U200
Type:	

EUT:

EUT additional information: -

HW version: -

SW version: -

Additional SW: -

Config: -

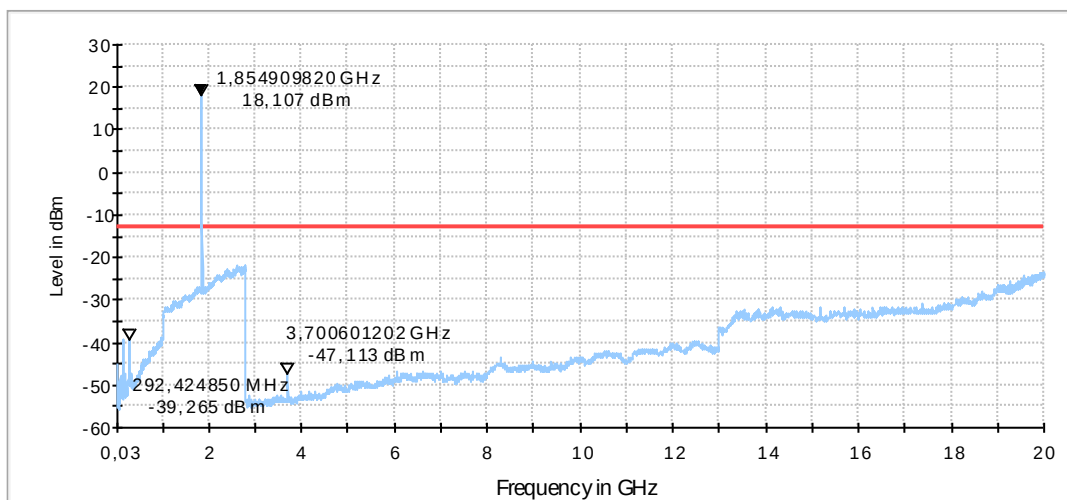
Serial number:

Connected Interfaces:

Power Supply:

Comments:

030414_FCC_Part24_UMTS-FDDII_TX_all_channels_30M-25G



b_5.14_BE**Common Information**

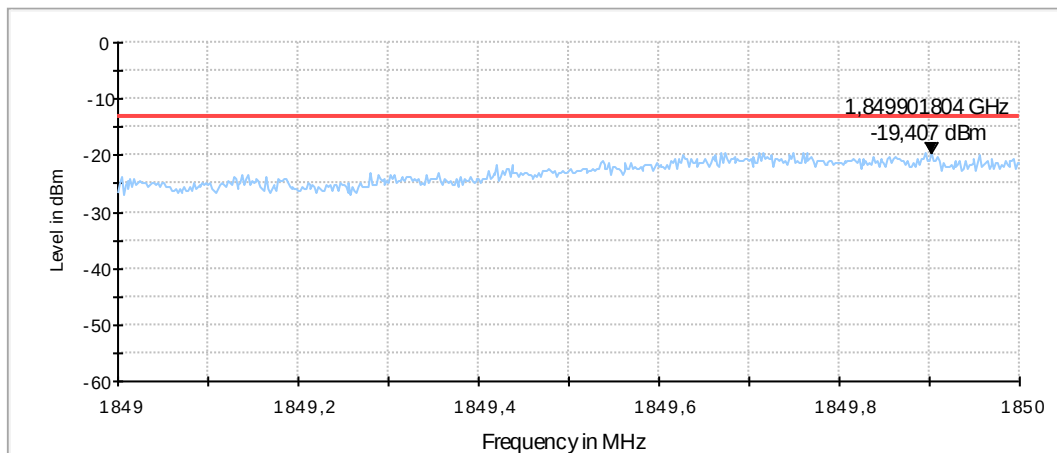
Test Description:	Band-Edge Radiated FDDII
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part24
Operation mode:	UMTS FDDII, HSUPA, Channel 9262 (UL 1852,4MHz)
Environmental Conditions:	Humidity: 58%rH; Temperature: 19°C
Operator Name:	YZH

EUT Information

Manufacturer:	u-blox
Model:	LISA-U200
Type:	GSM/WCDMA Module

EUT:	-
EUT additional information:	-
HW version:	-
SW version:	21.03
Additional SW:	-
Config:	-
Serial number:	358901040001353
Aux. Devices:	Magnet Antenna GA107, AC/DC 12V Charger
Power Supply:	AC Charger connected to 110 V / 60 Hz
Comments:	

030415_FCC_Part24_UMTS-FDDII_TX_low_channel_band_edge



b_5.15

Common Information

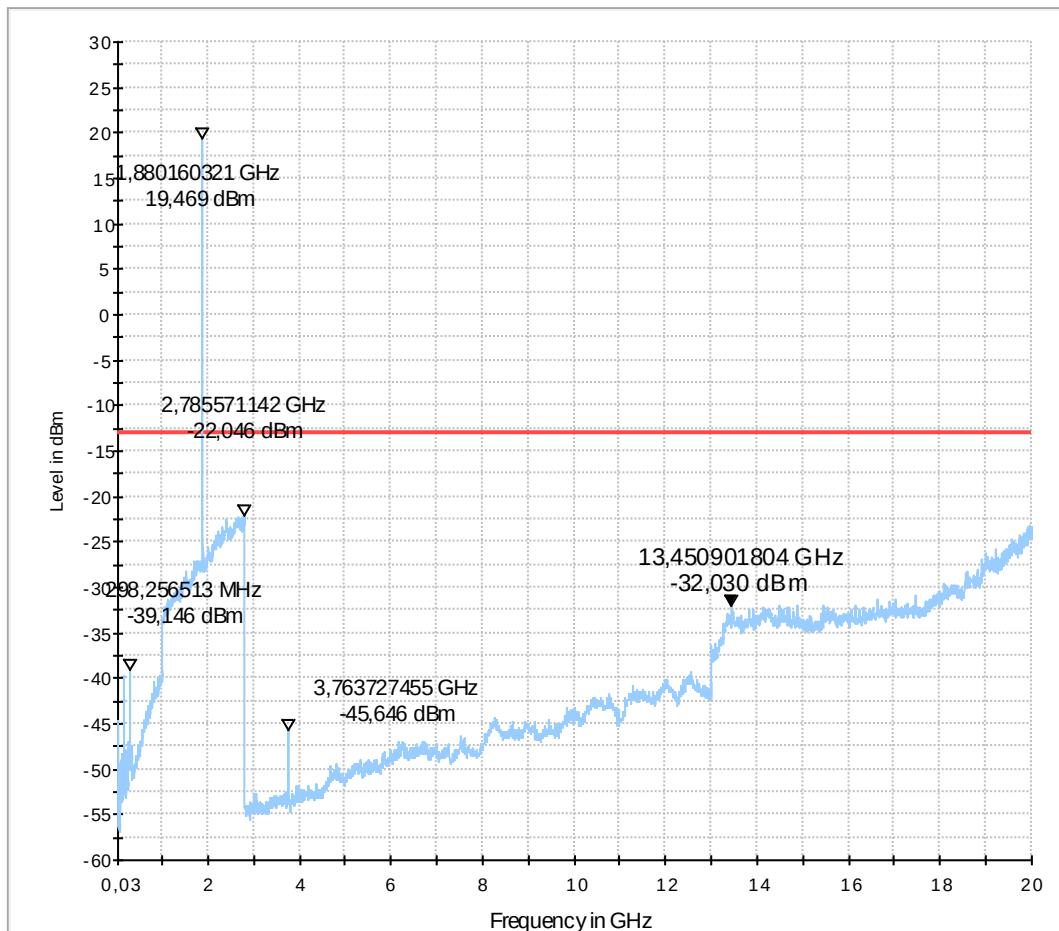
Test Description:	Radiated Spurious Emissions UMTS FDD II
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part24
Operation Mode:	UMTS FDDII, HSUPA, Channel 9400 (UL 1880,0MHz)
Environmental Conditions:	Humidity: 58%rH; Temperature: 19°C
Operator Name:	YZH

EUT Information

Manufacturer:	u-blox
Model:	LISA-U200
Type:	GSM/WCDMA Module

EUT:	-
EUT additional information:	-
HW version:	-
SW version:	21.03
Additional SW:	-
Config:	-
Serial number:	358901040001353
Aux. Devices:	Magnet Antenna GA107, AC/DC 12V Charger
Power Supply:	AC Charger connected to 110 V / 60 Hz
Comments:	

030414_FCC_Part24_UMTS-FDDII_TX_all_channels_30M-25G



b_5.16**Common Information**

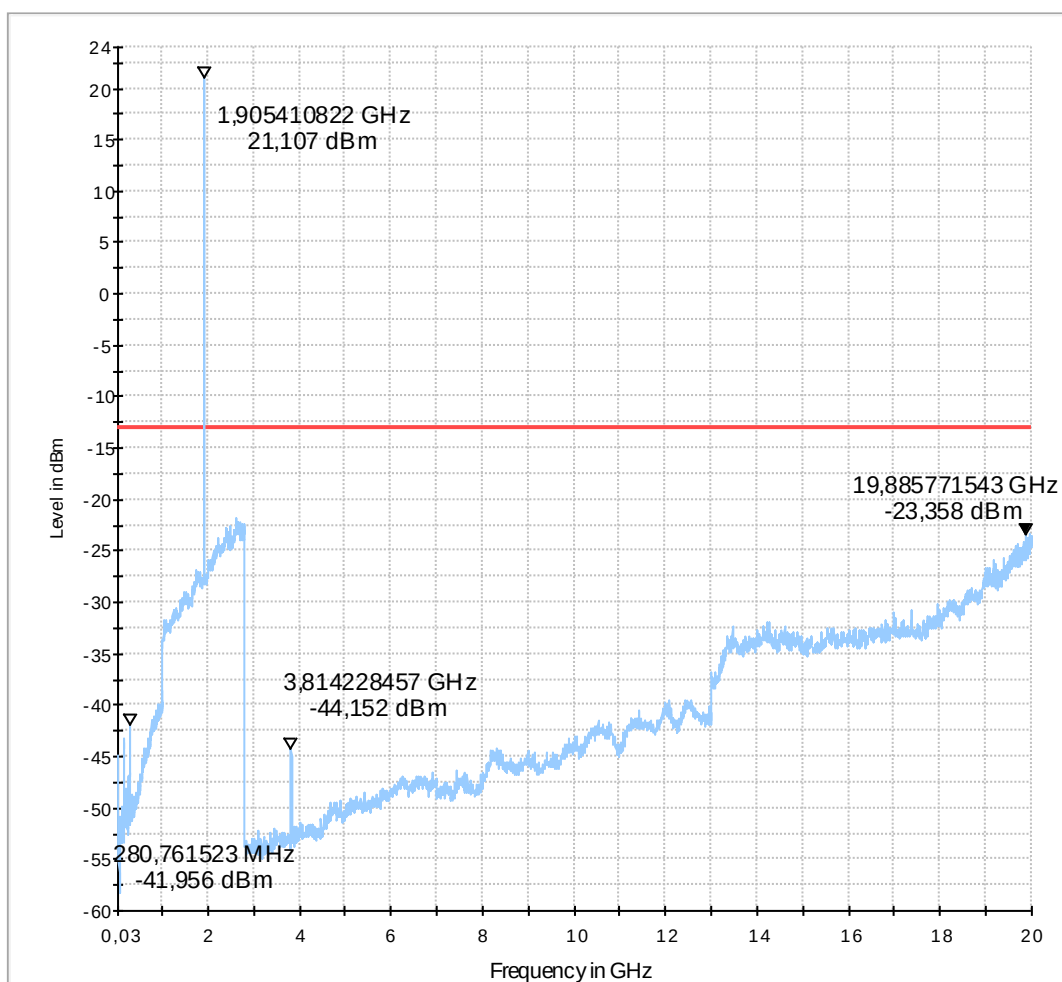
Test Description:	Radiated Spurious Emissions UMTS FDD II (FCC Part 24)
Operating Conditions:	Fully Anechoic Room (FAR)
Operator Name:	Tas
Project no.:	6-0082-11-1-2b
Operating mode	UMTS FDD II, HSUPA, TX-Channel UARFCN 9538 High

EUT Information

Manufacturer:	u-blox
Model:	LISA-U200
Type:	GSM/WCDMA Module

EUT:	-
EUT additional information:	-
HW version:	-
SW version:	21.03
Additional SW:	-
Config:	-
Serial number:	358901040001353
Aux. Devices:	Magnet Antenna GA107, AC/DC 12V Charger
Power Supply:	AC Charger connected to 110 V / 60 Hz
Comments:	

030414_FCC_Part24_UMTS-FDDII_TX_all_channels_30M-25G



b_5.16_BE

Common Information

Test Description: Radiated Spurious Emissions UMTS FDD II (FCC Part 24)
 Operating Conditions: Fully Anechoic Room (FAR)
 Operator Name: Tas
 Project no. 6-0082-11-1-2b
 Operating mode UMTS FDD II, HSUPA, TX-Channel UARFCN 9538 High

EUT Information

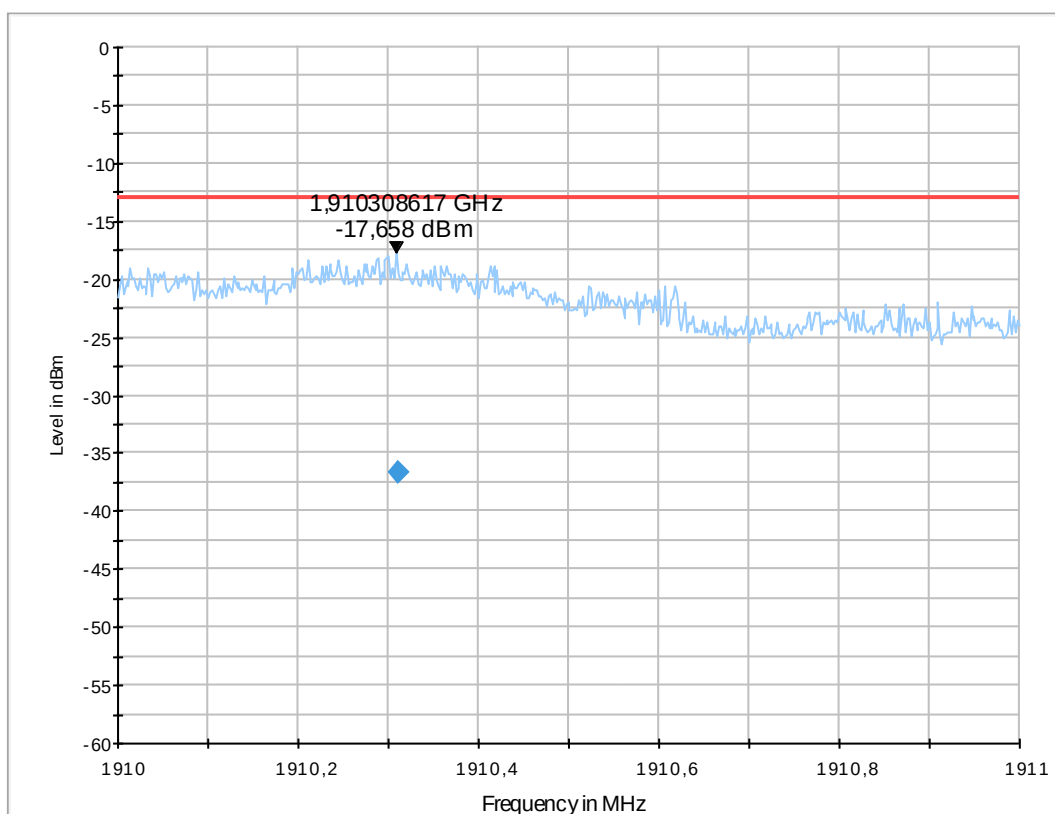
Manufacturer: u-blox
 Model: LISA-U200
 Type: GSM/WCDMA Module

 EUT: -
 EUT additional information: -
 HW version: -
 SW version: 21.03
 Additional SW: -
 Config: -
 Serial number: 358901040001353
 Aux. Devices: Magnet Antenna GA107, AC/DC 12V Charger
 Power Supply: AC Charger connected to 110 V / 60 Hz
 Comments:

Final Result 1

Frequency (MHz)	Average (dBm)	Meas. Time (ms)	Bandwidth (kHz)	Polarization	Azimuth (deg)	Elevation (deg)	Corr. (dB)	Margin (dB)	Limit (dBm)
1910.310621	-36.7	10000.0	5.000	V	12.0	90.0	-62.7	23.7	-13.0

030416_FCC_Part24_UMTS-FDDII_TX_high_channel_band_edge



1.7. Spurious emissions radiated – FDD Band V Mode

1.7.1. Spurious emissions magnetic field strength ($f < 30$ MHz)

Diagram No. b_3.04

Common Information

Test description: Magnetic Fieldstrength Measurement related to 3 m distance
 Test site and distance: Semi Anechoic Room (SAR) + mobile floor absorbers and 3m measurement
 Measured sides of EUT: front, right, rear, left
 Rec. antenna (pre-scan): height 1.00 m. parallel and 90° to EUT polarisation
 Turntable step: 90° during pre-scan
 Used filter: lowpass 1200 MHz
 Test specification: FCC 15.205 & 15.209: RSS-Gen: Issue 3

Operator: HT.a
 Operating conditions: HSUPA TX-on
 Power during tests: 110V/60Hz
 Comment 1: Channel low (4132) FDD V

EUT Information

EUT Name: M/N LISA-U200
 Manufacturer: u-blox AG
 IMEI: 358901040001734
 FW: 21.03

FCC15.209_magn hor+vert

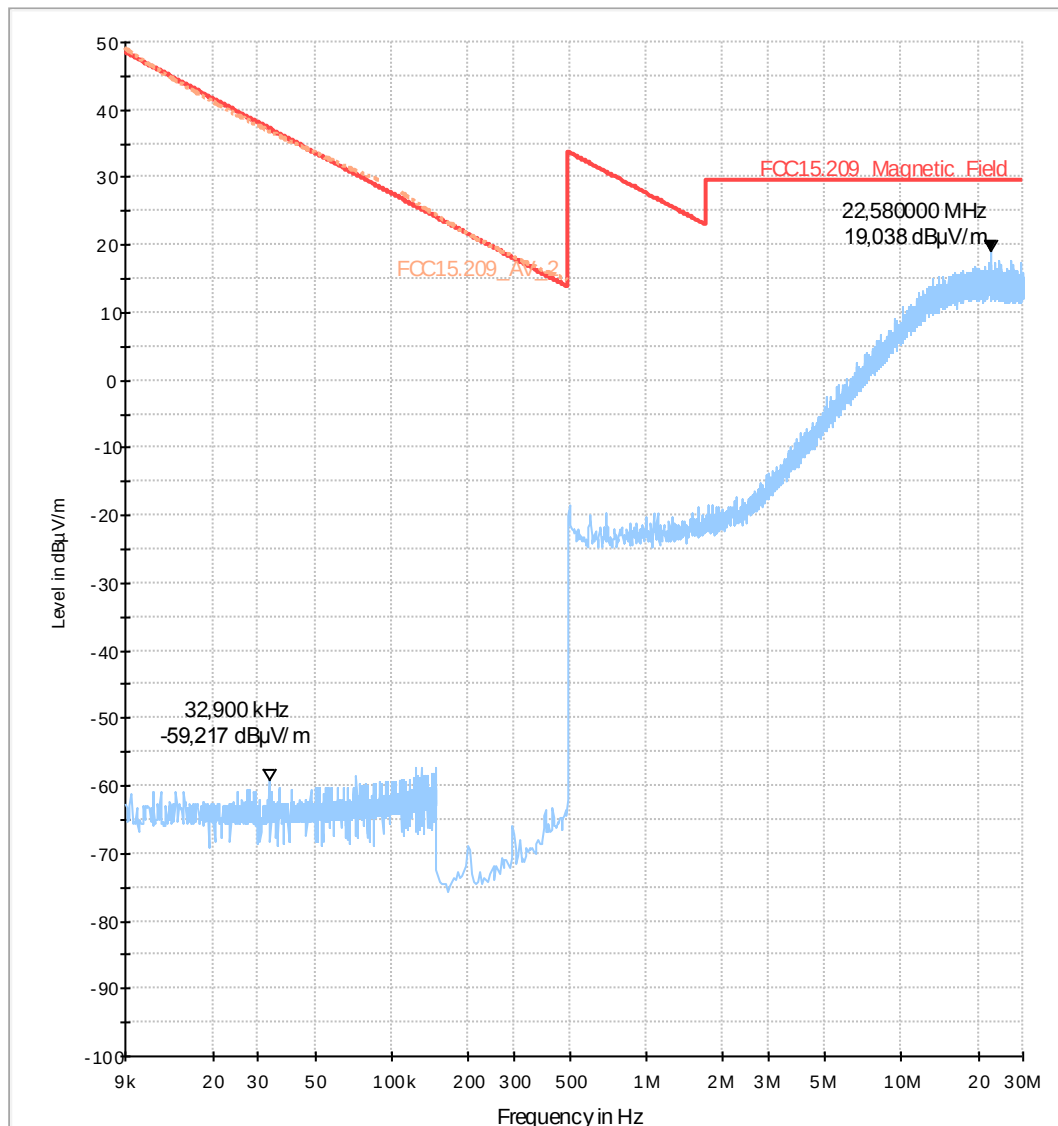


Diagram No. b_3.05

Common Information

Test description:

Test site and distance:

Measured sides of EUT:

Rec. antenna (pre-scan):

Turntable step:

Used filter:

Test specification:

Magnetic Fieldstrength Measurement related to 3 m distance

Semi Anechoic Room (SAR) + mobile floor absorbers and 3m measurement distance

front, right, rear, left

height 1.00 m, parallel and 90° to EUT polarisation

90° during pre-scan

lowpass 1200 MHz

FCC 15.205 § 15.209; RSS-Gen: Issue 3

Operator:

HLA

Operating conditions:

HSUPA TX-on

Power during tests:

110V/60Hz

Comment 1:

Channel middle (4182) FDD V

EUT Information

EUT Name:

M/N LISA-U200

Manufacturer:

u-blox AG

IMEI:

358901040001734

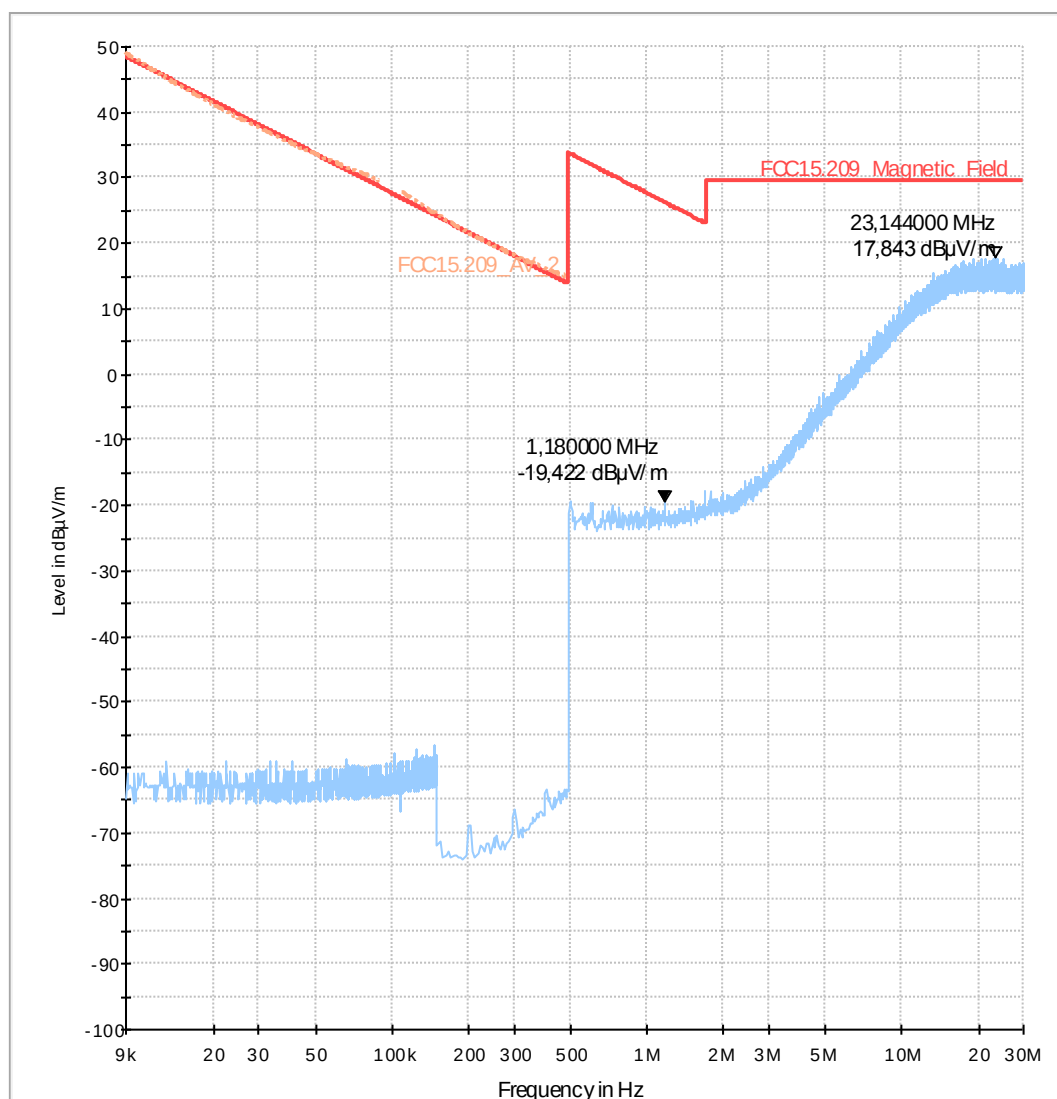
FW:

21.03

Accessories:

Two USB cable (1,8m) connected and one to the laptop +GSM ant U-07 + AC/DC adapter

FCC15.209_magn hor+vert



EMI Auto Test Template: FCC15.209_magn hor+vert

Diagram No. b_3.06

Common Information

Test description:

Test site and distance:

Measured sides of EUT:

Rec. antenna (pre-scan):

Turntable step:

Used filter:

Test specification.:

Magnetic Fieldstrength Measurement related to 3 m distance

Semi Anechoic Room (SAR) + mobile floor absorbers and 3m measurement distance

front, right, rear, left

height 1.00 m, parallel and 90° to EUT polarisation

90° during pre-scan

lowpass 1200 MHz

FCC 15.205 § 15.209; RSS-Gen: Issue 3

Operator:

HLA

Operating conditions:

HSUPA TX-on

Power during tests:

110V/60Hz

Comment 1:

Channel high (4233) FDD V

EUT Information

EUT Name:

M/N LISA-U200

Manufacturer:

u-blox AG

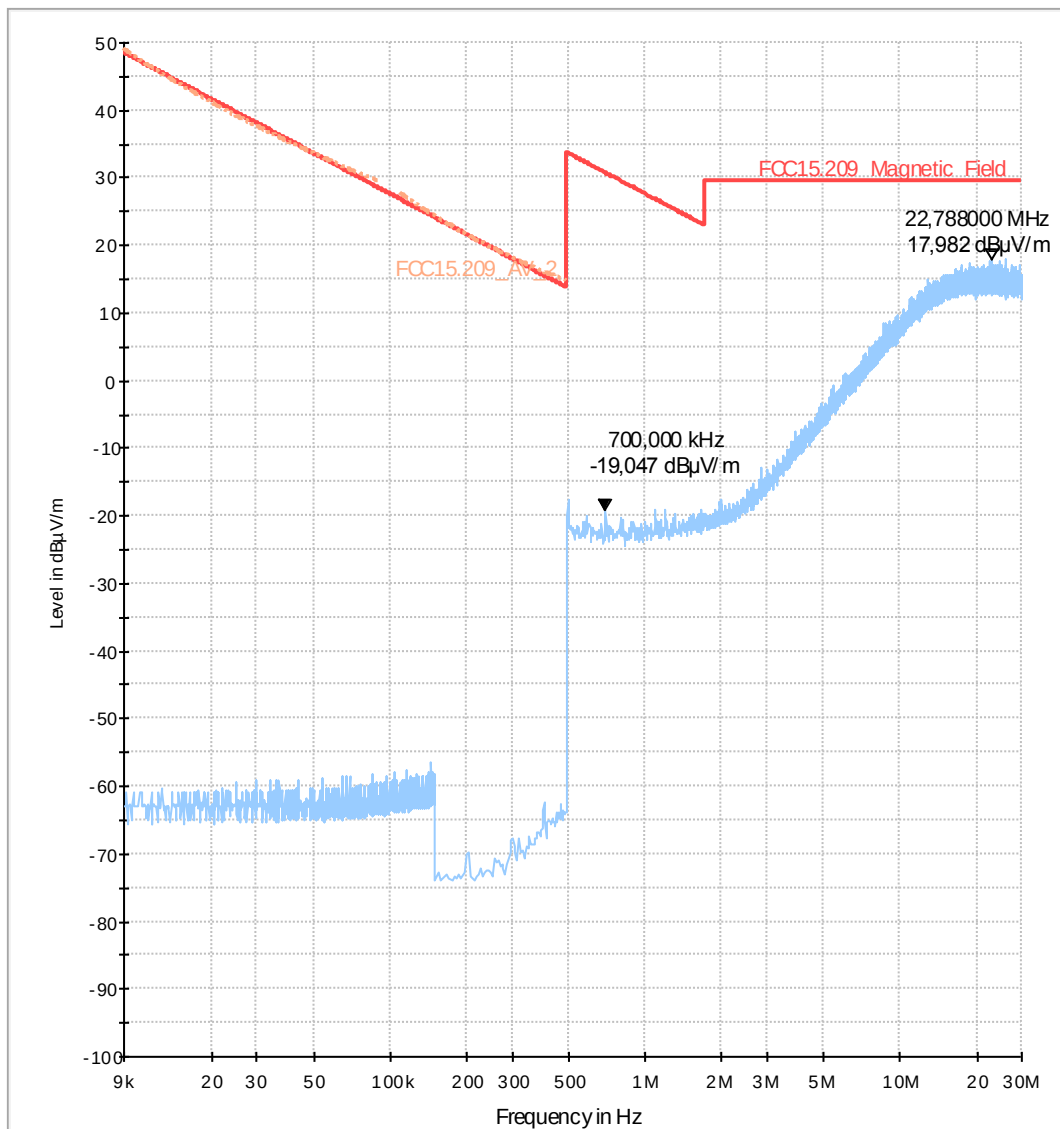
IMEI:

358901040001734

FW:

21.03

FCC15.209_magn hor+vert



EMI Auto Test Template: FCC15.209_magn hor+vert

1.7.2. Spurious emissions electric field-strength emission >30 MHz+ Block-Edge+ E.R.P.

CETECOM GmbH, 6-0082-11-1-2b

Diagram No.: b_5.11

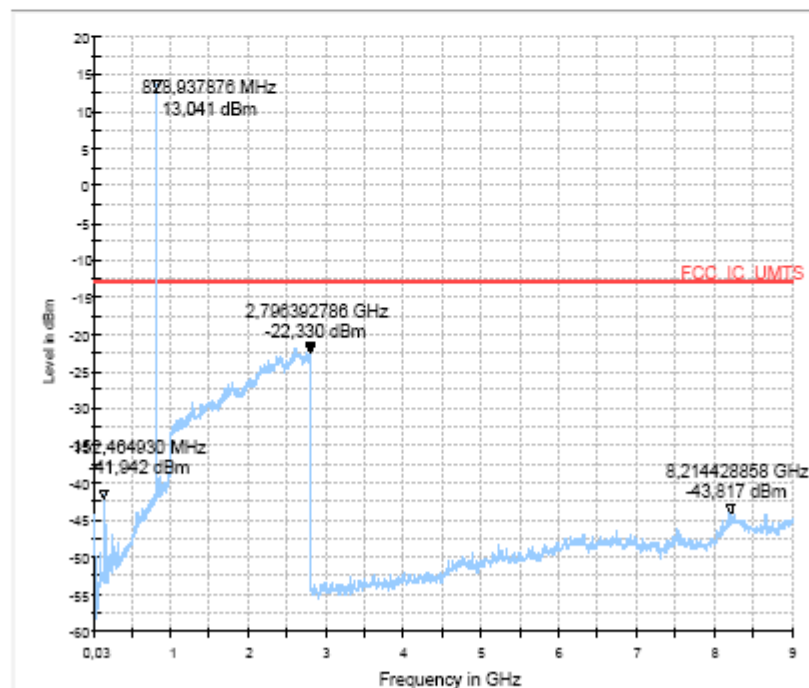
Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.109 Unintentional Radiator
Antenna polarisation:	horizontal/vertical
Operation mode:	Tx Mode FDD V (UL: UARFCN 4132 Low)
Operator Name:	Oou
Comment:	External Antenna of EUT used

EUT Information

Manufacturer:	u-blox
Model:	LISA-U200
Type:	GSM/WCDMA Module
EUT:	-
EUT additional information:	-
HW version:	-
SW version:	21.03
Additional SW:	-
Config:	-
Serial number:	358901040001353
Aux. Devices:	Magnet Antenna GA107, AC/DC 12V Charger
Power Supply:	AC Charger connected to 110 V / 60 Hz
Comments:	

030411_FCC_Part22_UMTS-FDDV_TX_all_channels_30M-12G



03.11.2011

10:53:24

b_5.11_BE**Common Information**

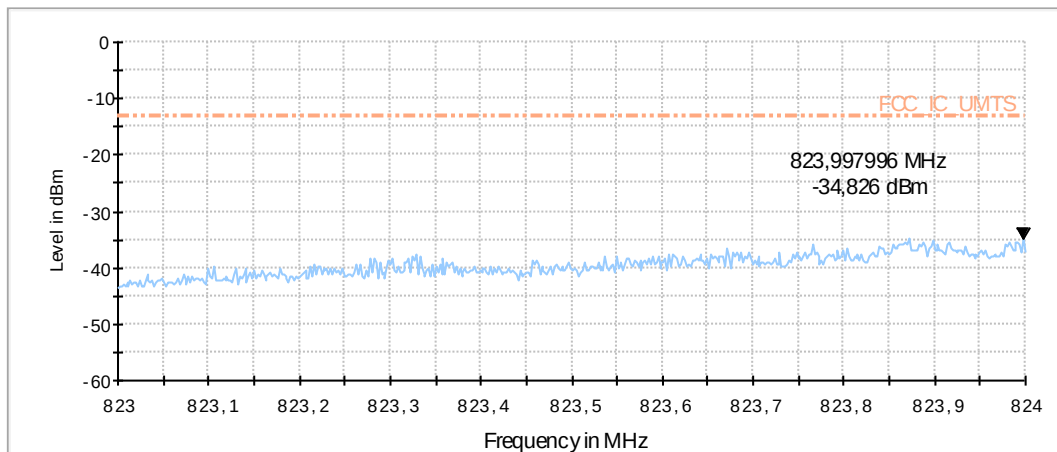
Test Description:	Band-Edge Radiated FDDV
Test Site Location:	CETECOM GmbH Essen
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part 22
Operating Mode:	UMTS FDDV, HSUPA, Channel 4132 (UL 826,4MHz)
Environmental Conditions:	Humidity: 58%rH; Temperature: 20°C
Operator Name:	YZH

EUT Information

Manufacturer:	u-blox
Model:	LISA-U200
Type:	GSM/WCDMA Module

EUT:	-
EUT additional information:	-
HW version:	-
SW version:	21.03
Additional SW:	-
Config:	-
Serial number:	358901040001353
Aux. Devices:	Magnet Antenna GA107, AC/DC 12V Charger
Power Supply:	AC Charger connected to 110 V / 60 Hz
Comments:	

030412_FCC_Part22_UMTS-FDDV_TX_low_channel_band_edge



b_5.12

Common Information

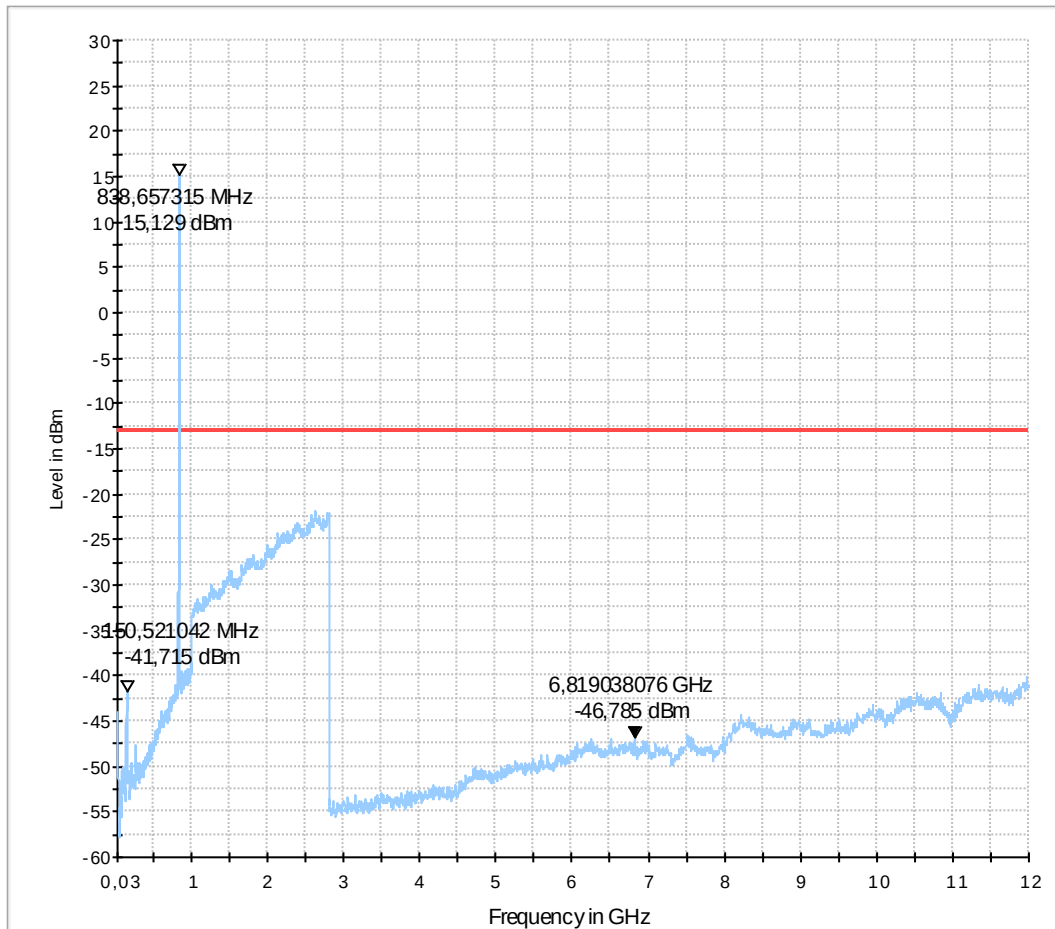
Test Description:	Radiated Spurious Emissions UMTS FDD V
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part 22
Operation mode:	UMTS FDDV, HSUPA (4182 middle)
Environmental Conditions:	Humidity: 44%rH; Temperature: 19°C
Operator Name:	YZH

EUT Information

Manufacturer:	u-blox
Model:	LISA-U200
Type:	GSM/WCDMA Module

EUT:	-
EUT additional information:	-
HW version:	-
SW version:	21.03
Additional SW:	-
Config:	-
Serial number:	358901040001353
Aux. Devices:	Magnet Antenna GA107, AC/DC 12V Charger
Power Supply:	AC Charger connected to 110 V / 60 Hz
Comments:	

030411_FCC_Part22_UMTS-FDDV_TX_all_channels_30M-12G



b_5.13**Common Information**

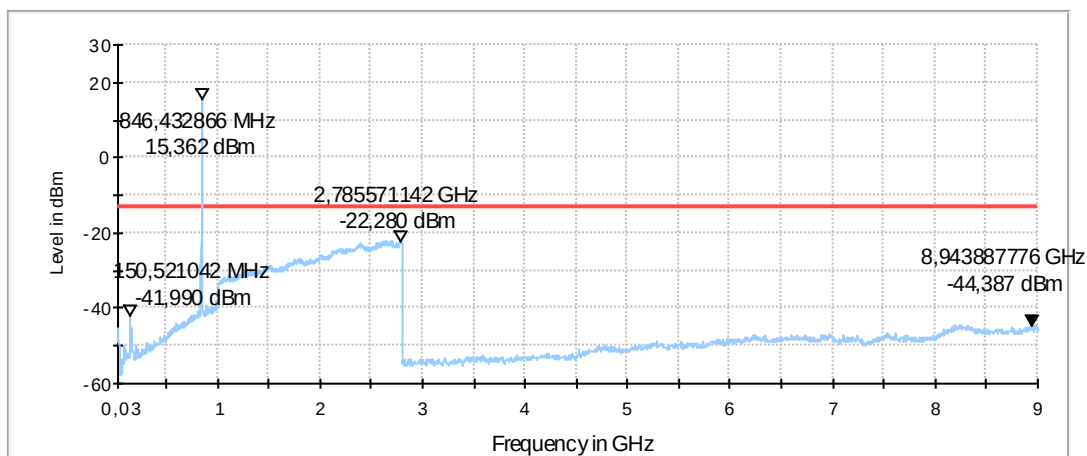
Test Description:	Radiated Spurious Emissions UMTS FDD V
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part 22
Operation mode:	UMTS FDDV, HSUPA, Channel 4233 (UL 846,6MHz)
Environmental Conditions:	Humidity: 58%rH; Temperature: 20°C
Operator Name:	YZH

EUT Information

Manufacturer:	u-blox
Model:	LISA-U200
Type:	GSM/WCDMA Module

EUT:	-
EUT additional information:	-
HW version:	-
SW version:	21.03
Additional SW:	-
Config:	-
Serial number:	358901040001353
Aux. Devices:	Magnet Antenna GA107, AC/DC 12V Charger
Power Supply:	AC Charger connected to 110 V / 60 Hz
Comments:	

030411_FCC_Part22_UMTSFDDV_TX_all_channels_30M-12G



b_5.13_BE**Common Information**

Test Description:	Band-Edge Radiated FDDV
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part 22
Operation mode:	UMTS FDDV, HSUPA, Channel 4233 (UL 846,6MHz)
Environmental Conditions:	Humidity: 58%rH; Temperature: 19°C
Operator Name:	YZH

EUT Information

Manufacturer:	u-blox
Model:	LISA-U200
Type:	GSM/WCDMA Module

EUT:	-
EUT additional information:	-
HW version:	-
SW version:	21.03
Additional SW:	-
Config:	-
Serial number:	358901040001353
Aux. Devices:	Magnet Antenna GA107, AC/DC 12V Charger
Power Supply:	AC Charger connected to 110 V / 60 Hz
Comments:	

030413_FCC_Part22_UMTS-FDDV_TX_high_channel_band_edge

