

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			
<p>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</p>			

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1. Measurement results

1.1. Conducted emissions on AC-Power lines

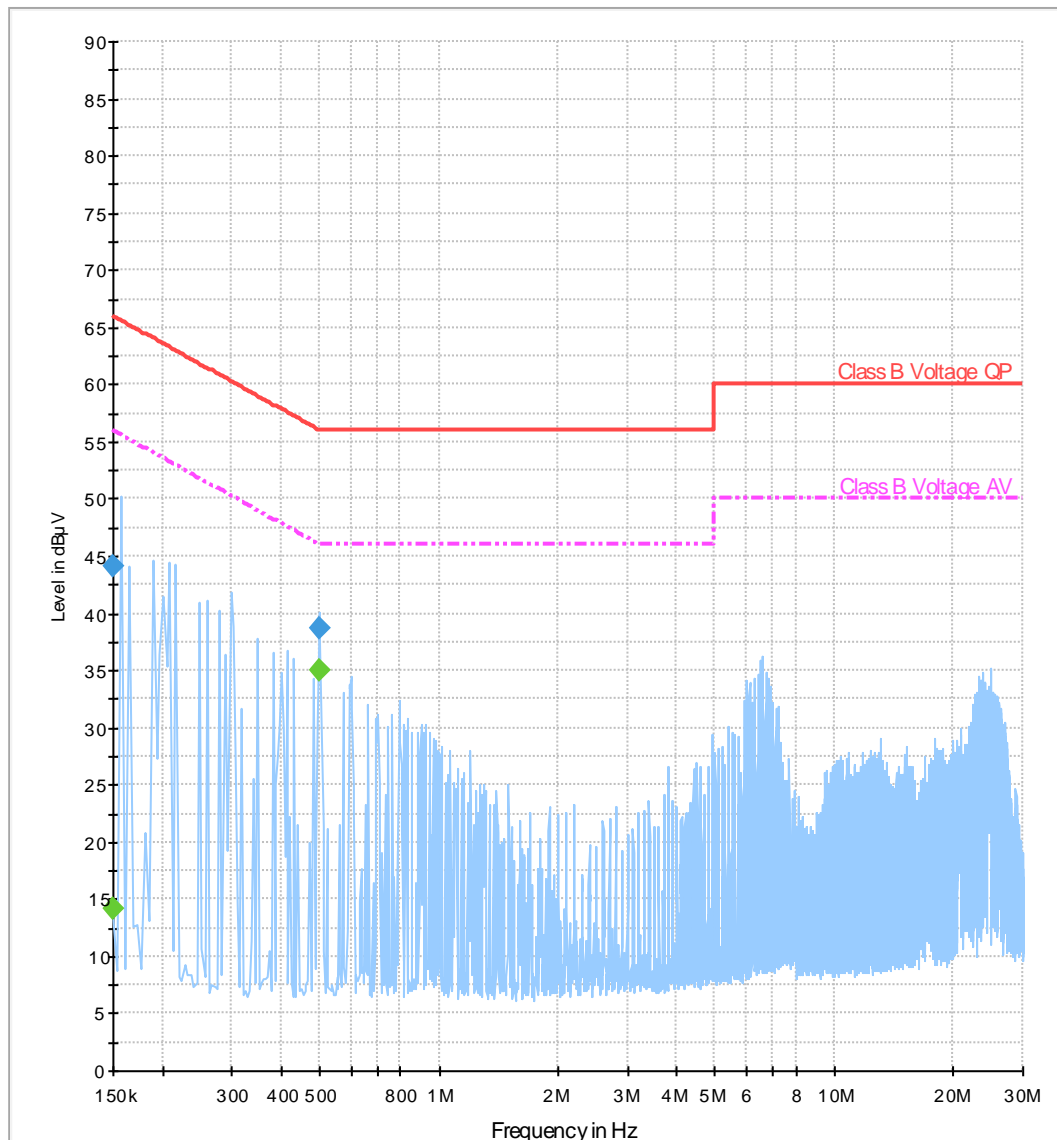
1.1.1 FDDII

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

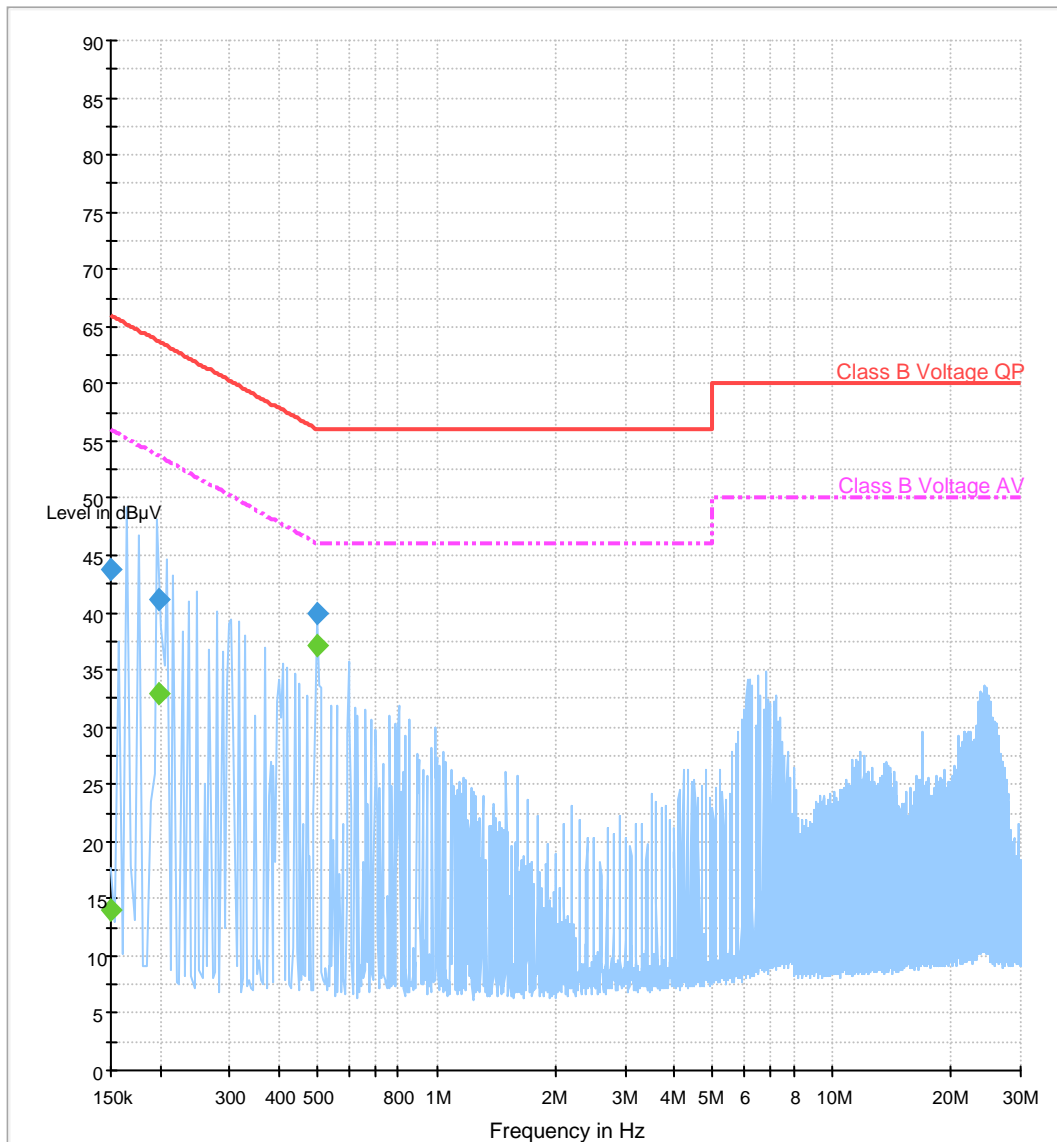
Final Result 2

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:	Date: 10.11.2011 Page 1 of 3
Testspezifikation:	Conducted Voltage Measurement Class B
Technical Data:	FCC 15.207
Diagram:	Please see next page for detailed information
Operator name:	HLA
Report.- Nr.	6-0082-11-1-2b
EUT:	-
Manufacturer:	LISA -U200
Operating mode:	U-blox
Measured on line:	RMC99 FDD II TX
Power during test:	Mains AC L1 and N
Comment 1:	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

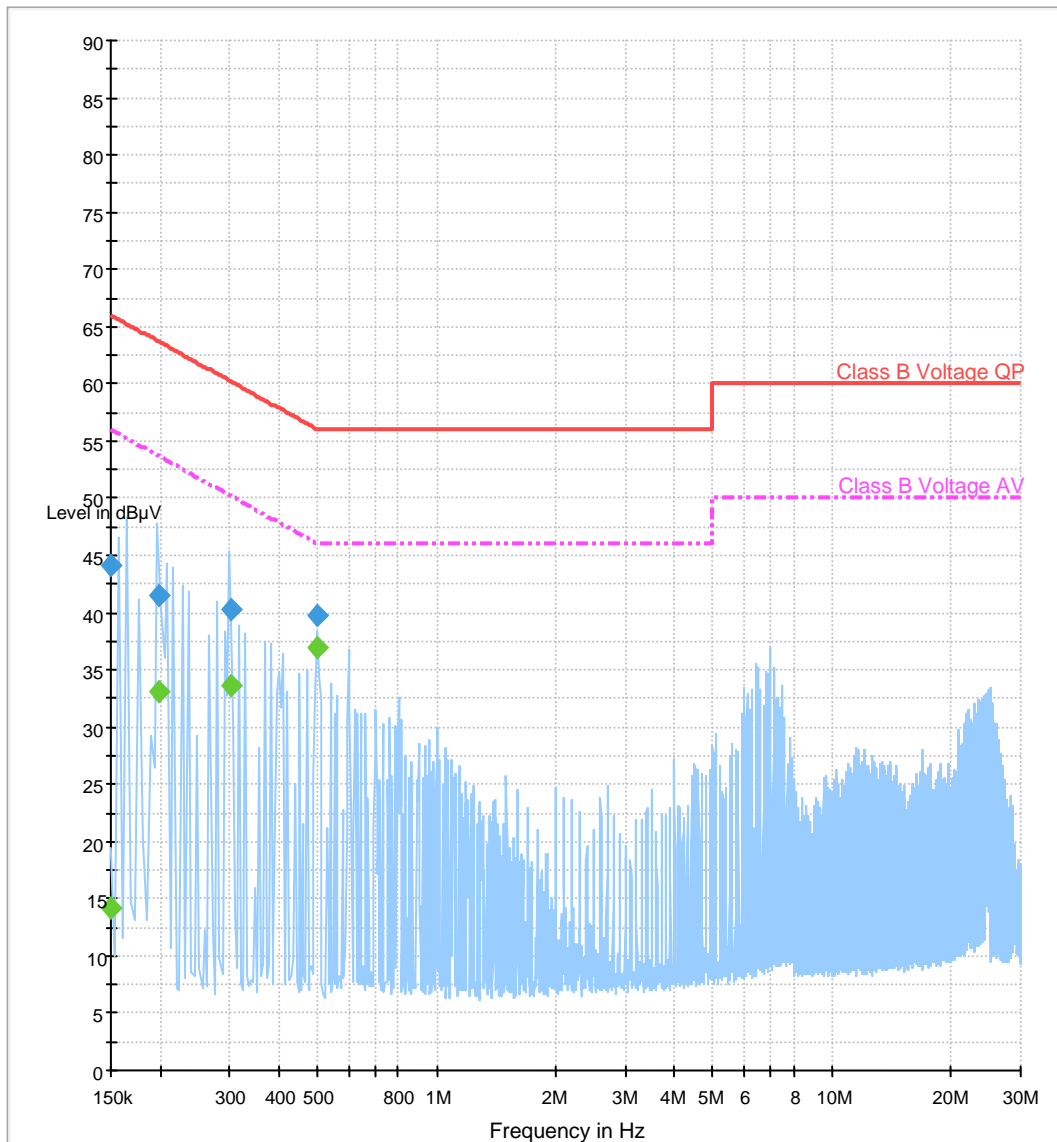
Test Description:
Testspezifikation:
Technical Data:
Diagram:
Operator name:
Report.- Nr.

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



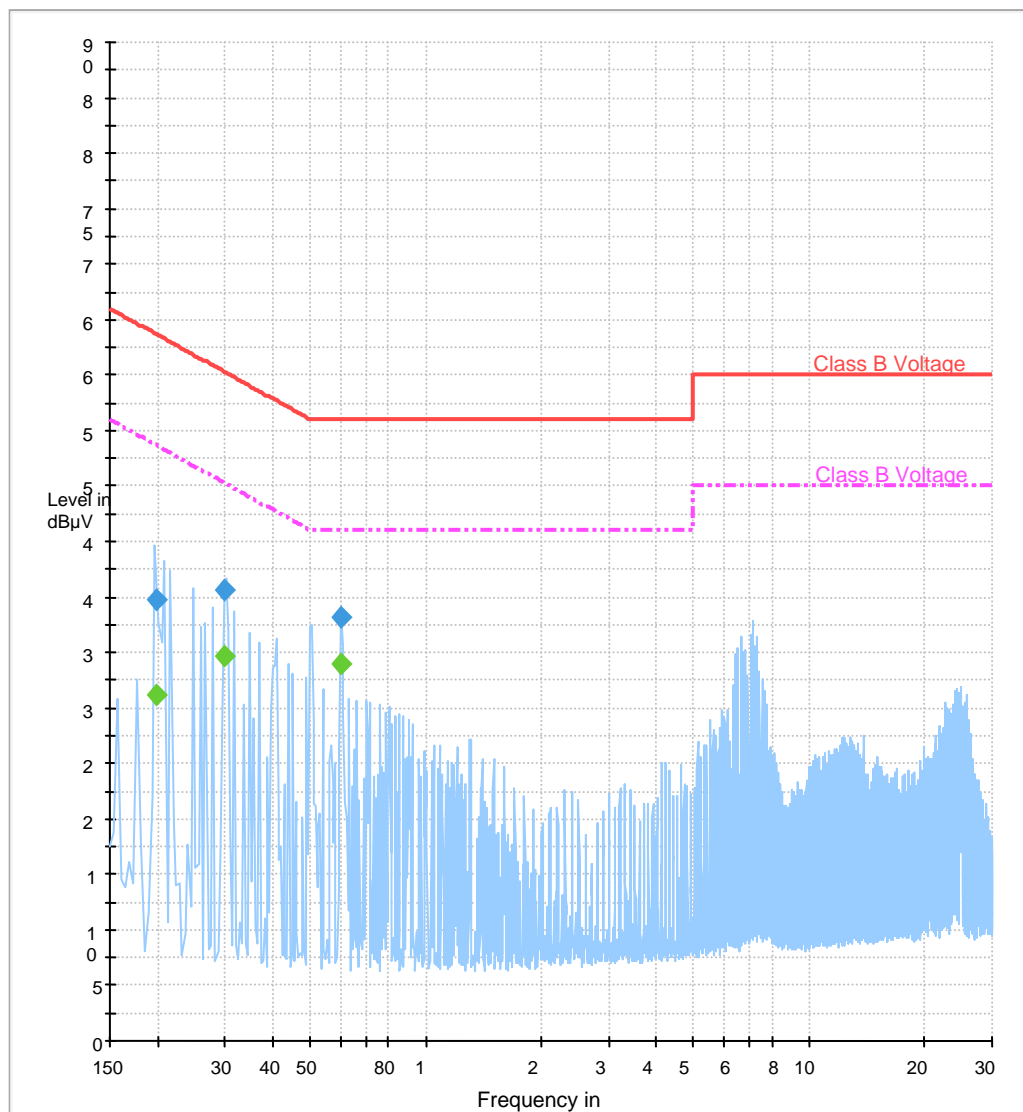
1.1.2.FDDV

1

Diagram No. b_1.4

Test	Conducted Voltage Measurement Class
Testspecification	FCC
Technical	Please see next page for detailed
Diagram	Shows the peak values as sum of measured ports (N+L1) in maxhold
Operator	HL
Report - Nr	6-008 -1 -1-2
EUT	LISA -U200
Manufacturer	U-blox
Operating	RMC99 FDD V
Measured on	Mains AC L1 and
Power during	110 V AC 60
Comment	channel

01_Class



Final Result 1

Frequency (MHz)	QuasiPeak (dB μ V)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.199375	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 (dB μ V)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
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

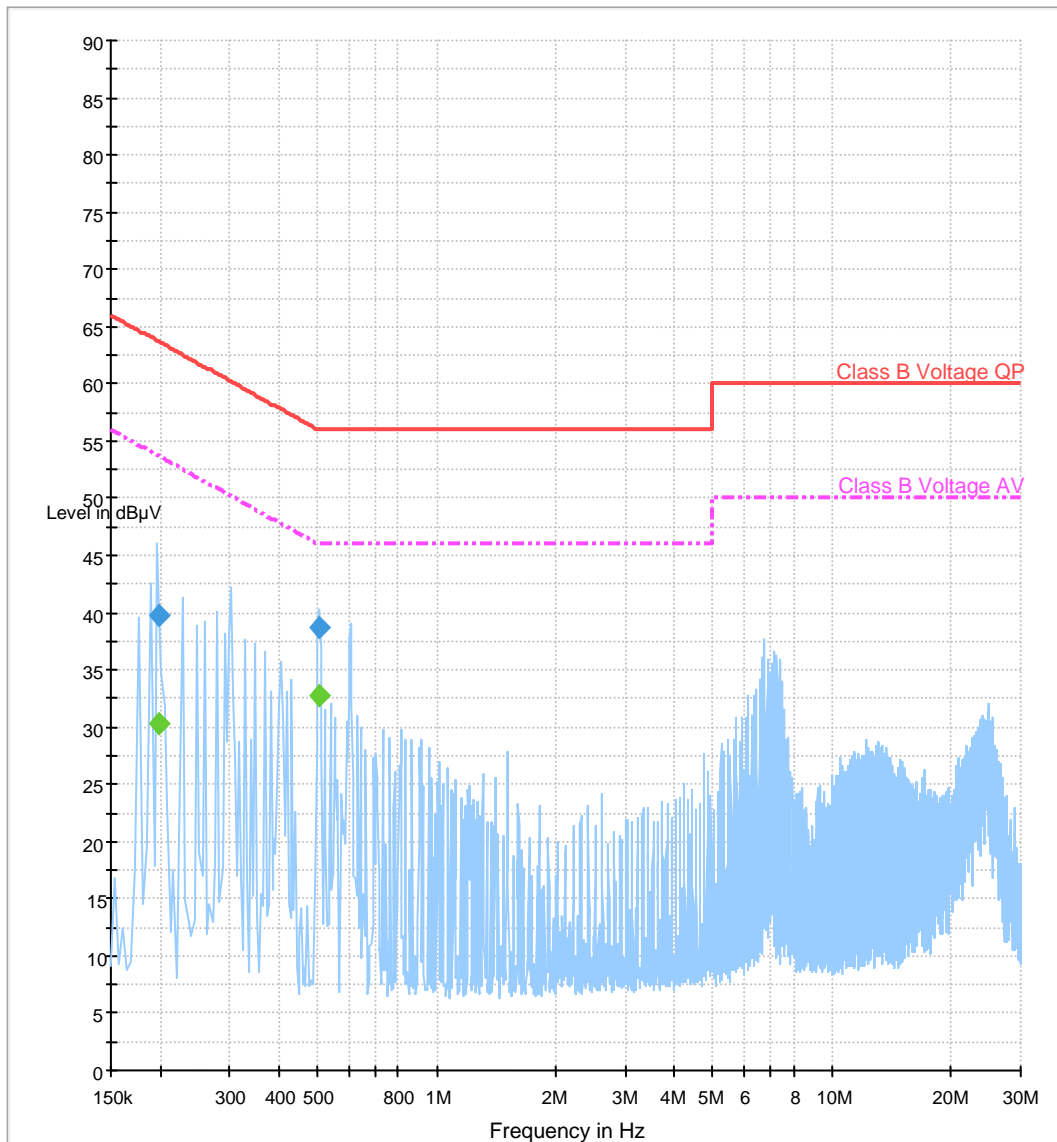
Test Description:
Testspezifikation:
Technical Data:
Diagram:
Operator name:
Report.- Nr.

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 (dB μ V)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
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

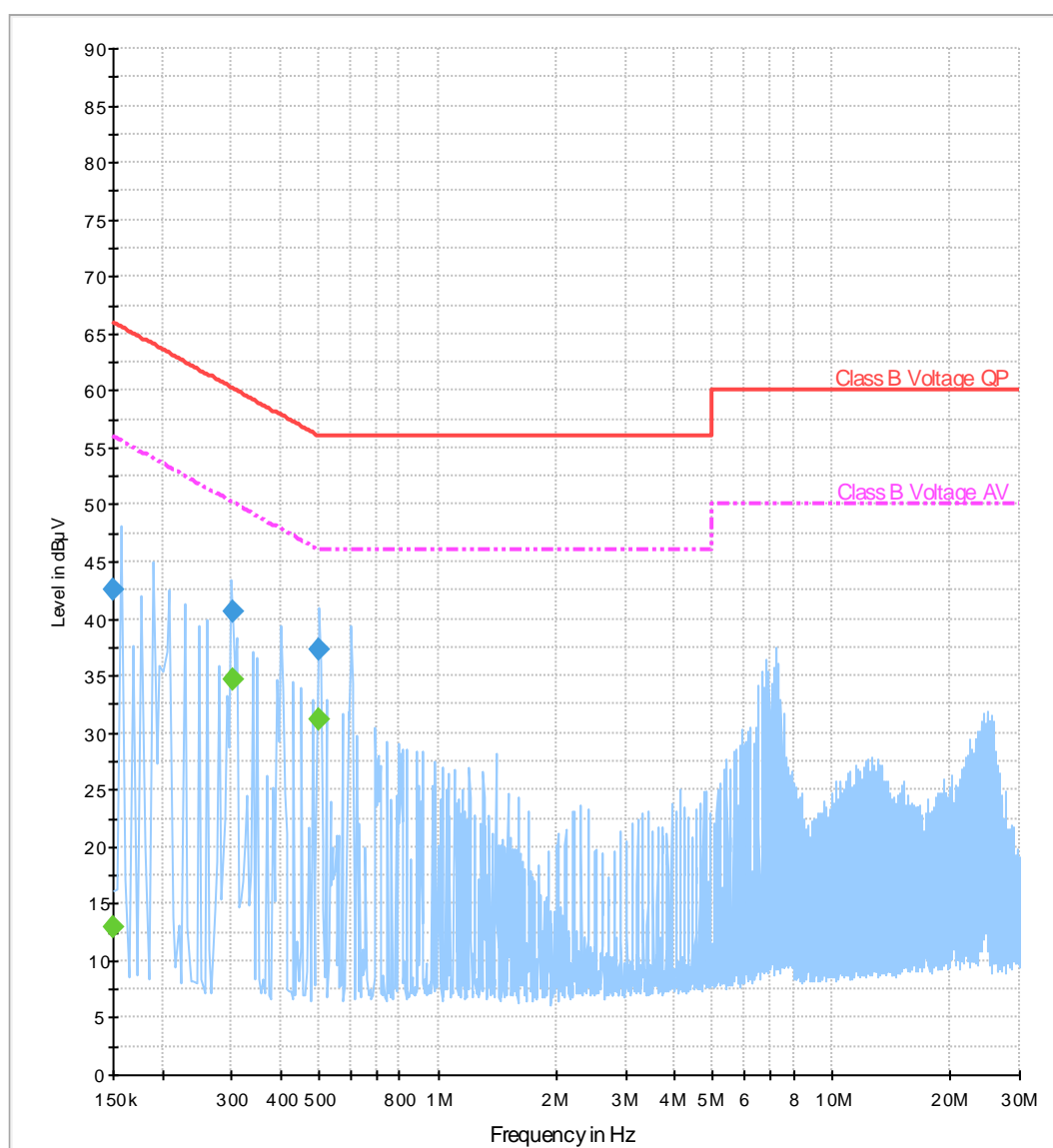
Final Result 2

Frequency (MHz)	CAverage (dB μ V)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
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:	Date: 10.11.2011 Page 1 of 3
Testspezifikation:	Conducted Voltage Measurement Class B
Technical Data:	FCC 15.207
Diagram:	Please see next page for detailed information
Operator name:	Shows the peak values as a sum of measured ports (N+L1) in maxhold mode
Report.- Nr.	HLA 6-0082-11-1-2b
EUT:	LISA-U200
Manufacturer:	U-blox
Operating mode:	RMC99 FDD V TX
Measured on line:	Mains AC L1 and N
Power during test:	110 V AC 60 Hz
Comment 1:	channel (4233)

01_Class B_Voltage_PK_QPAV_N_L1



Final Result 1

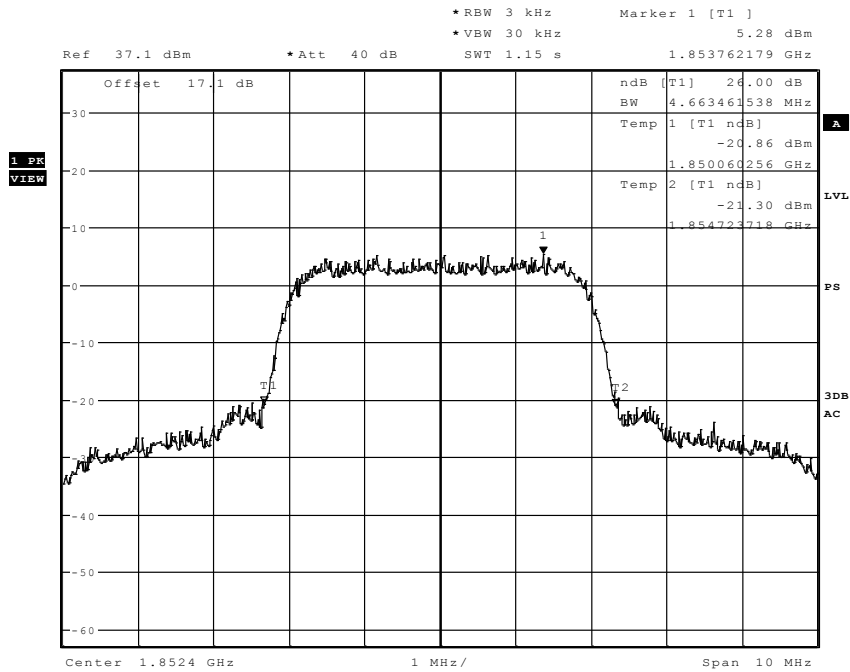
Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	42.6	15000.0	0.200	GND	N	0.0	23.4	66.0
0.300938	40.7	15000.0	9.000	GND	L1	0.0	19.5	60.2
0.499063	37.3	15000.0	9.000	GND	N	0.0	18.7	56.0

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

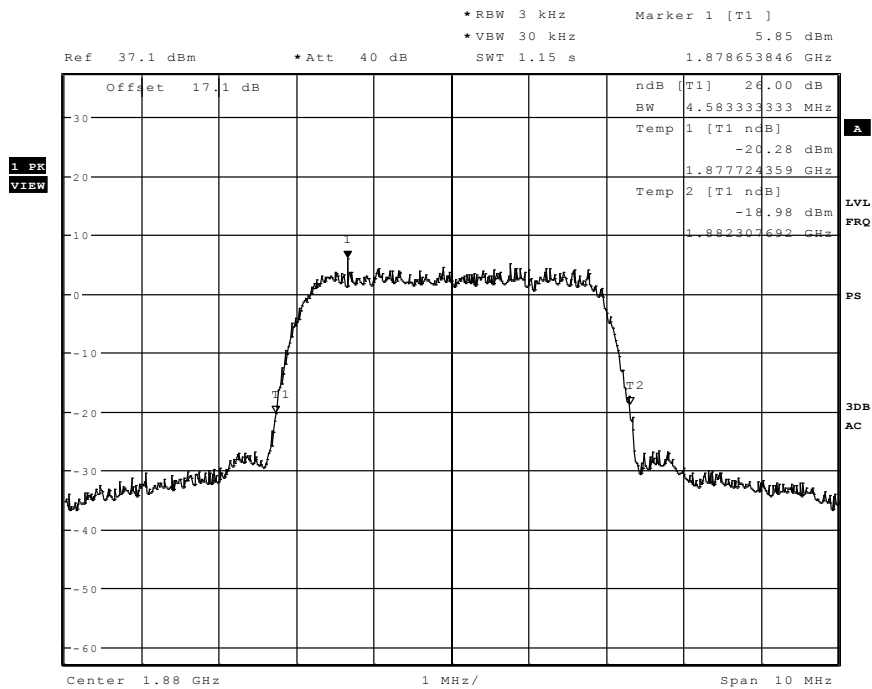
1.2. 26dBc Emission bandwidth

1.2.1. FDD Band II – RMC99 Mode



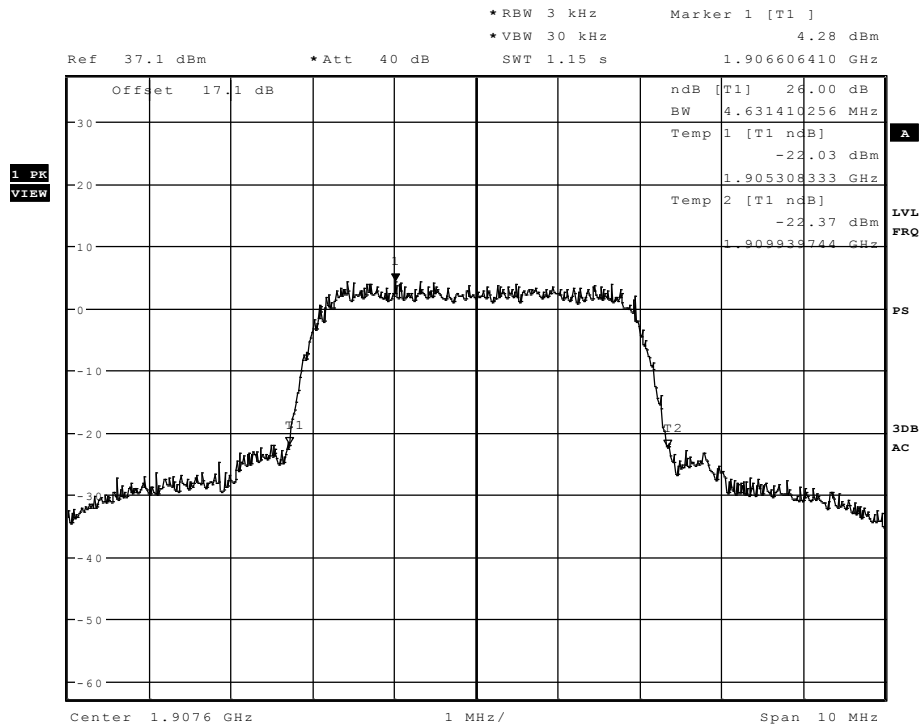
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Channel 9262



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

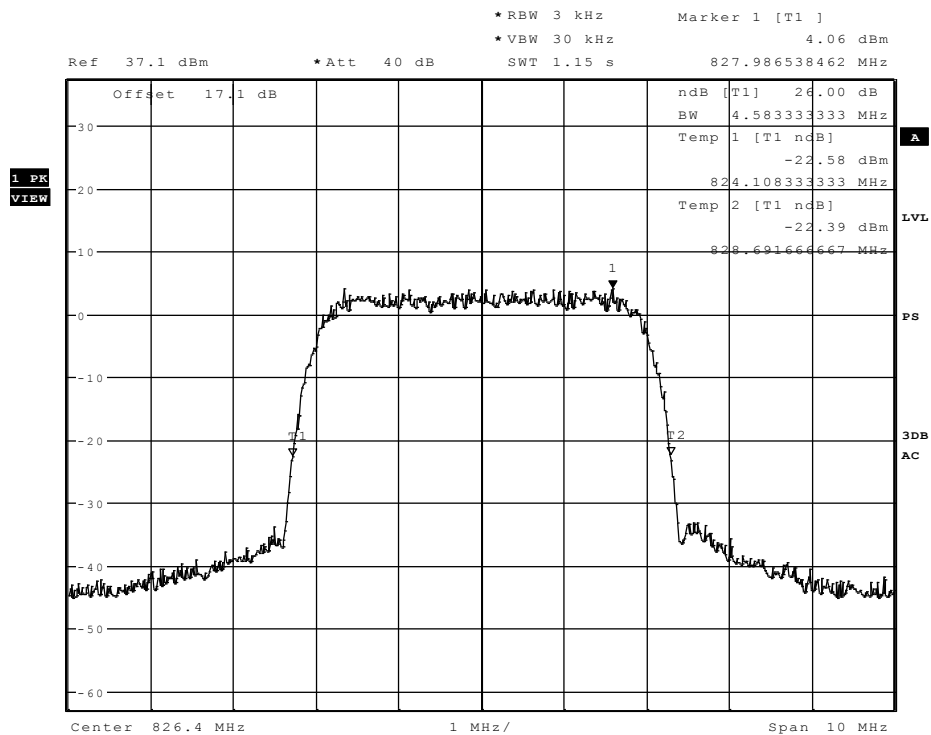
Channel 9400



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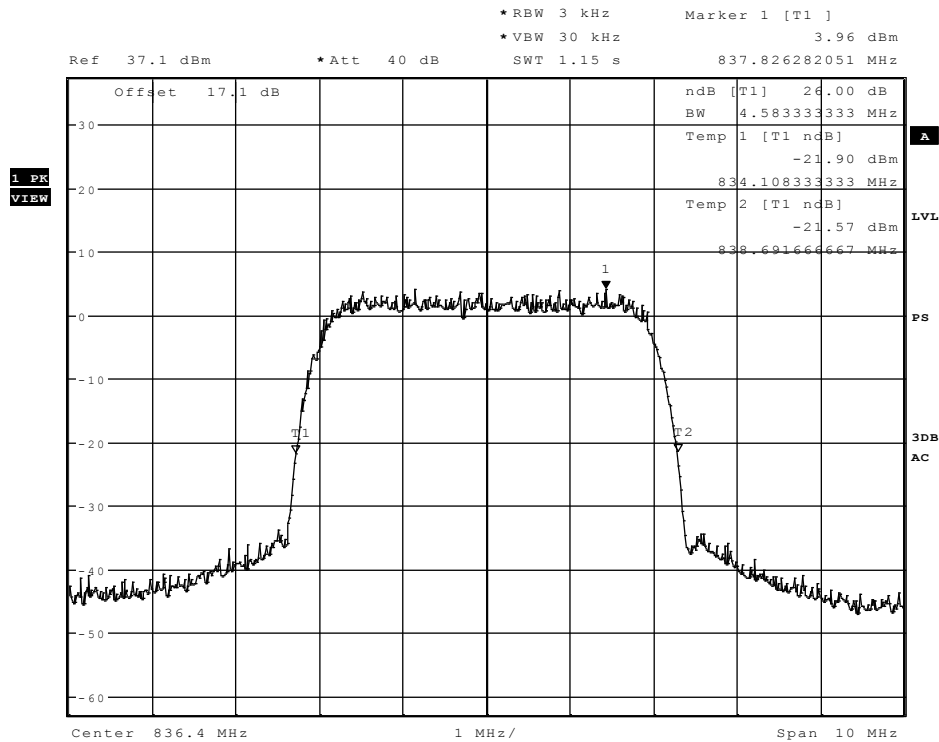
Channel 9538

1.2.2. FDD Band V – RMC99 Mode



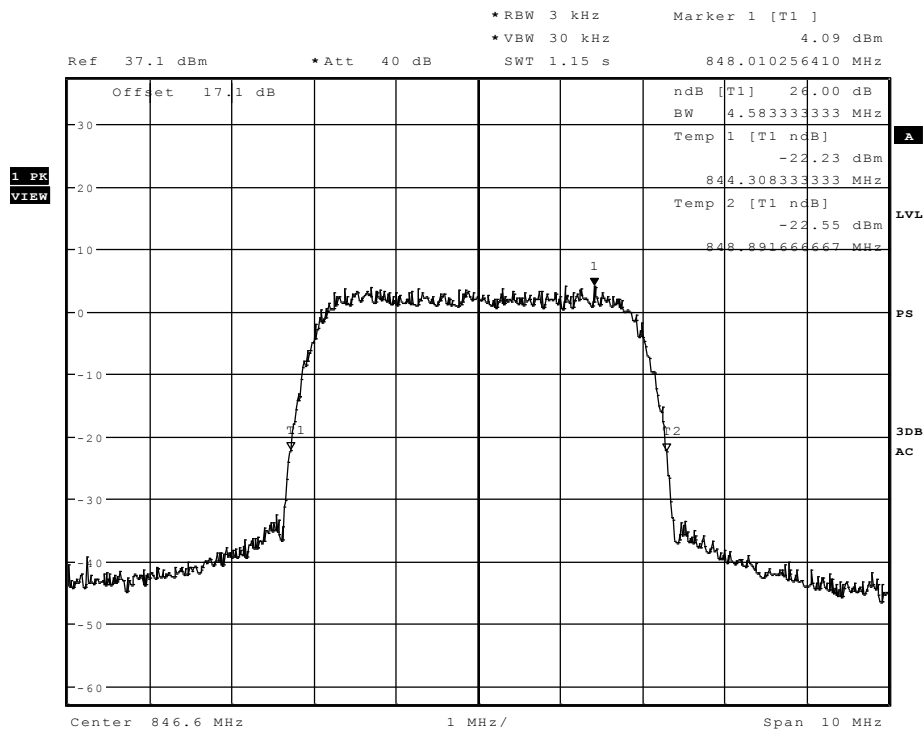
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Channel 4132



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

Channel 4182

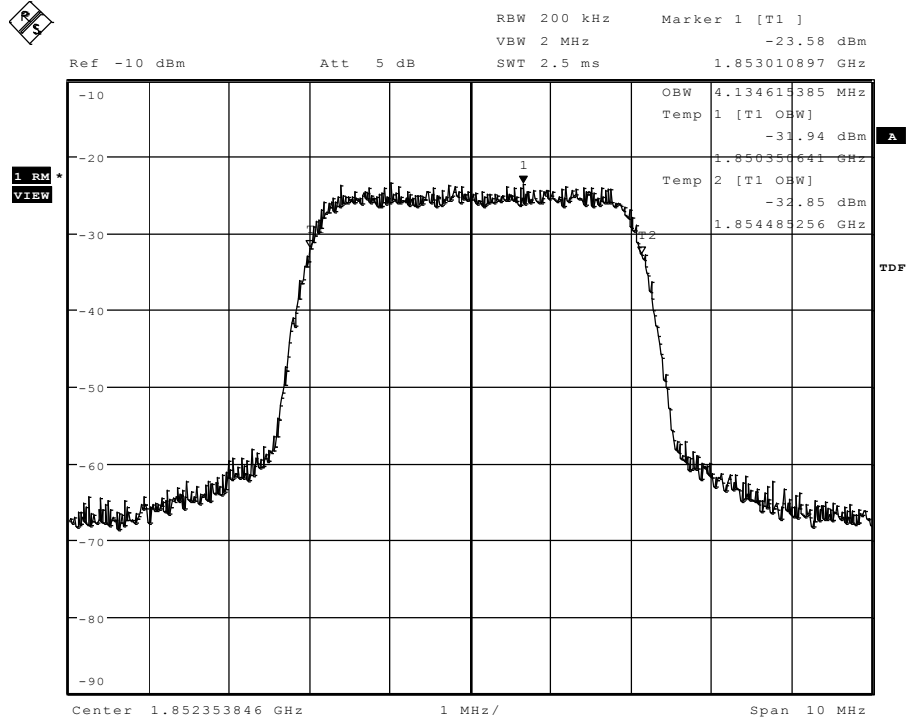


Date: 4.NOV.2011 21:52:39

Channel 4233

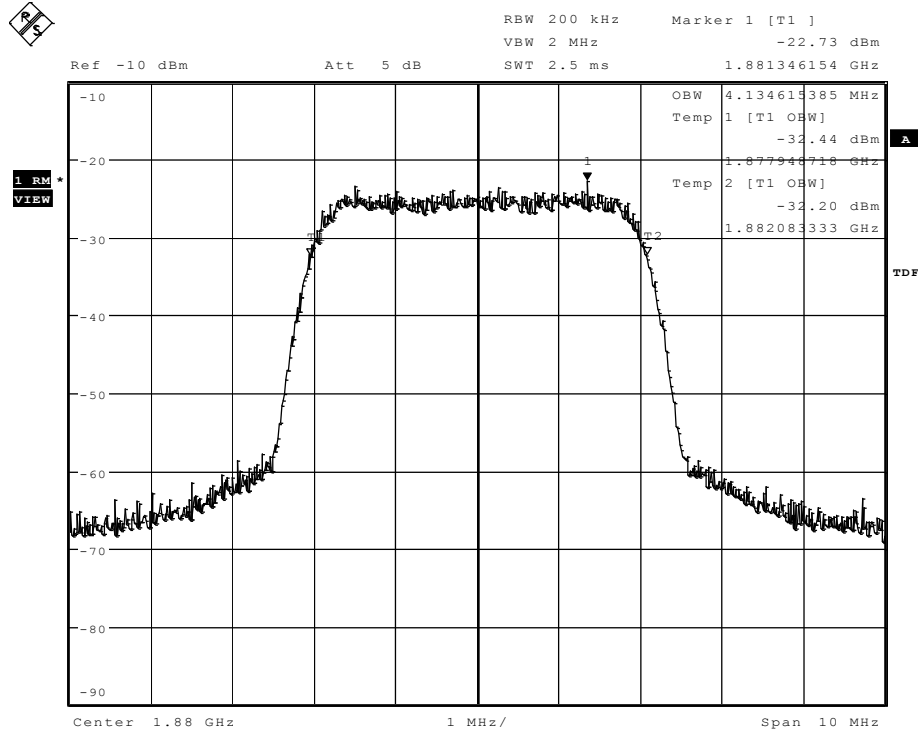
1.3. 99% Occupied bandwidth

1.3.1. FDD Band II – RMC99 Mode



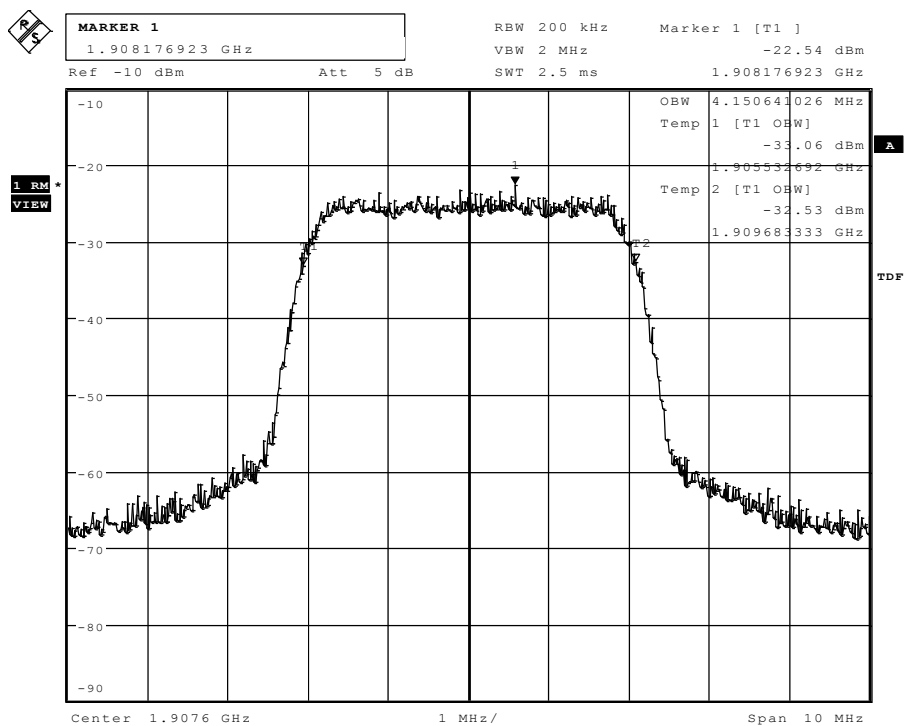
Date: 29.NOV.2011 08:41:23

Channel 9262



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

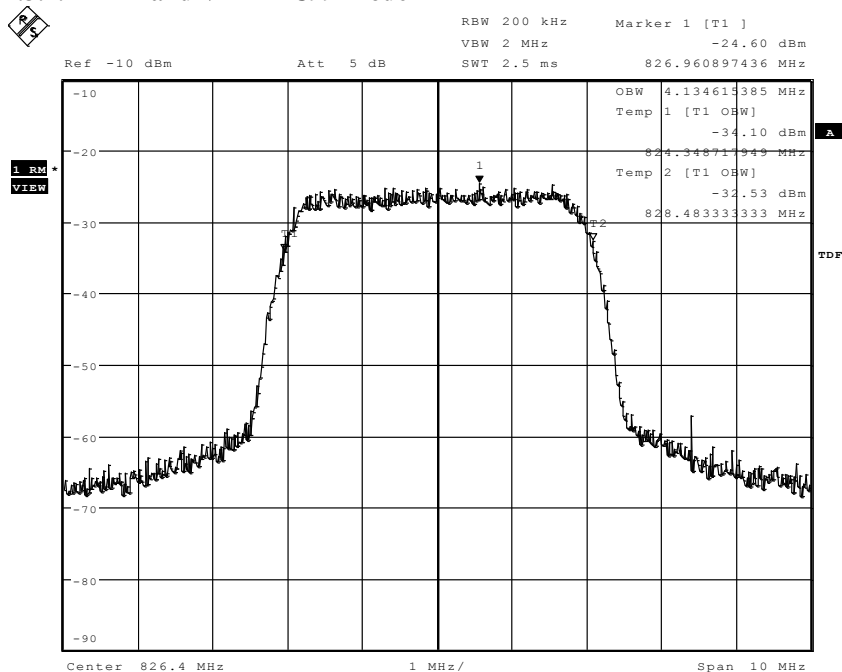
Channel 9400



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

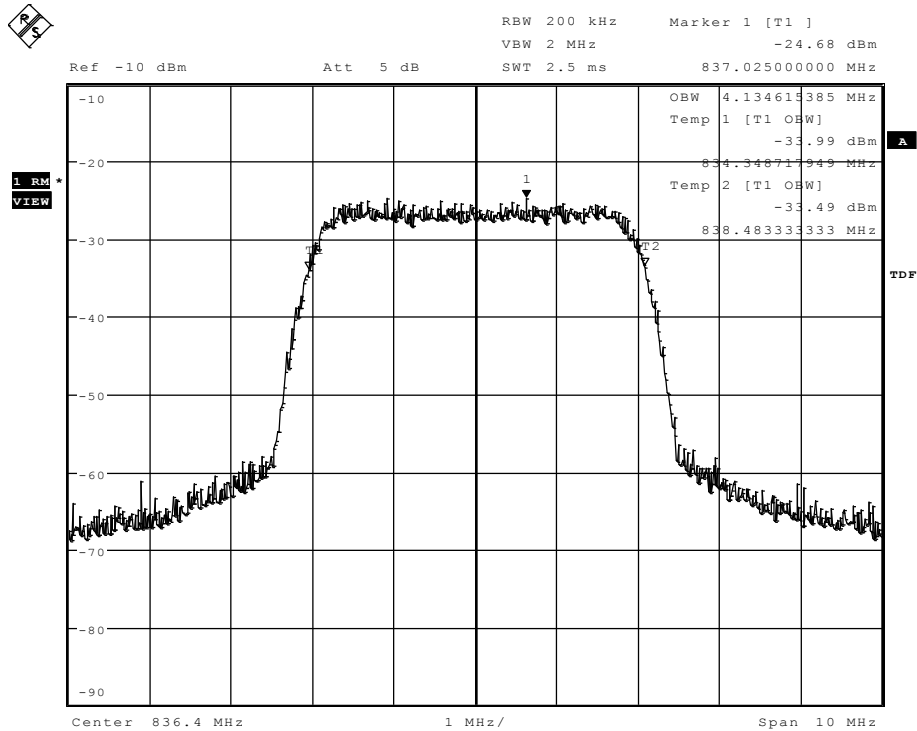
Channel 9538

1.3.2. FDD Band V – RMC99 Mode



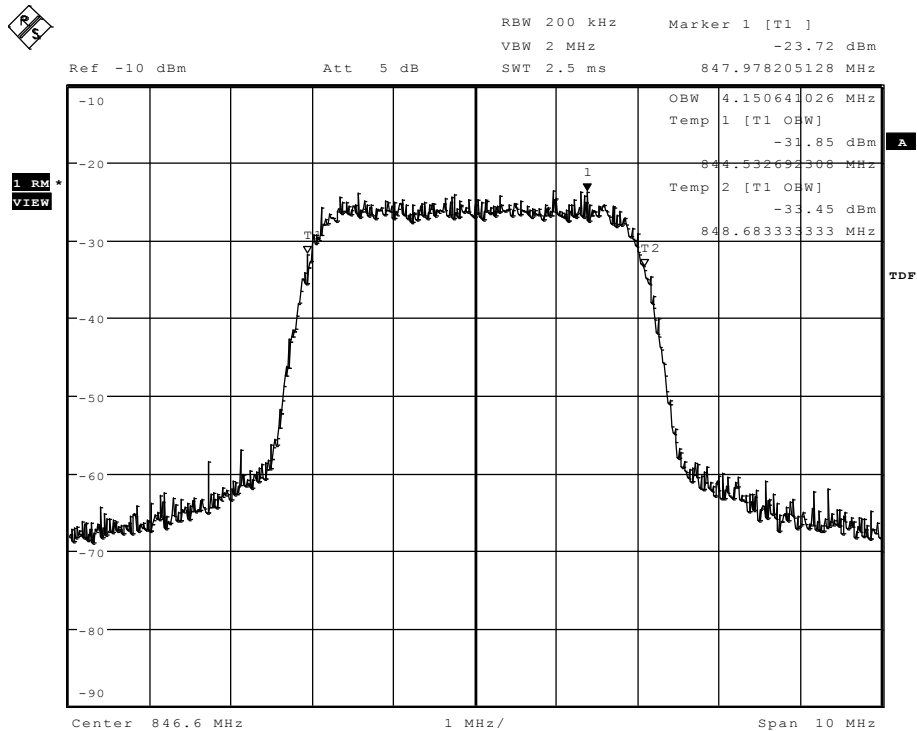
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Channel 4132



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

Channel 4182



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

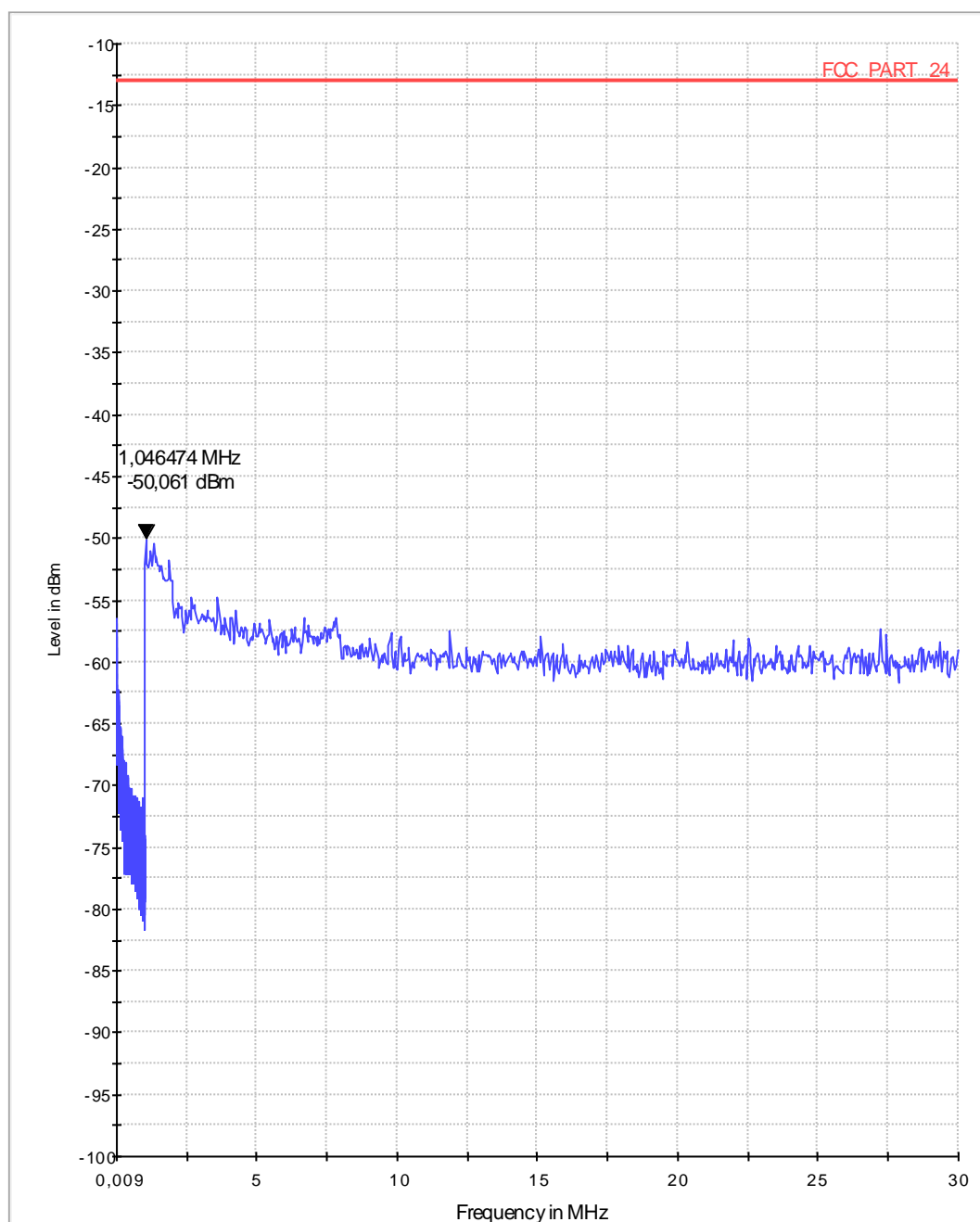
Channel 4233

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

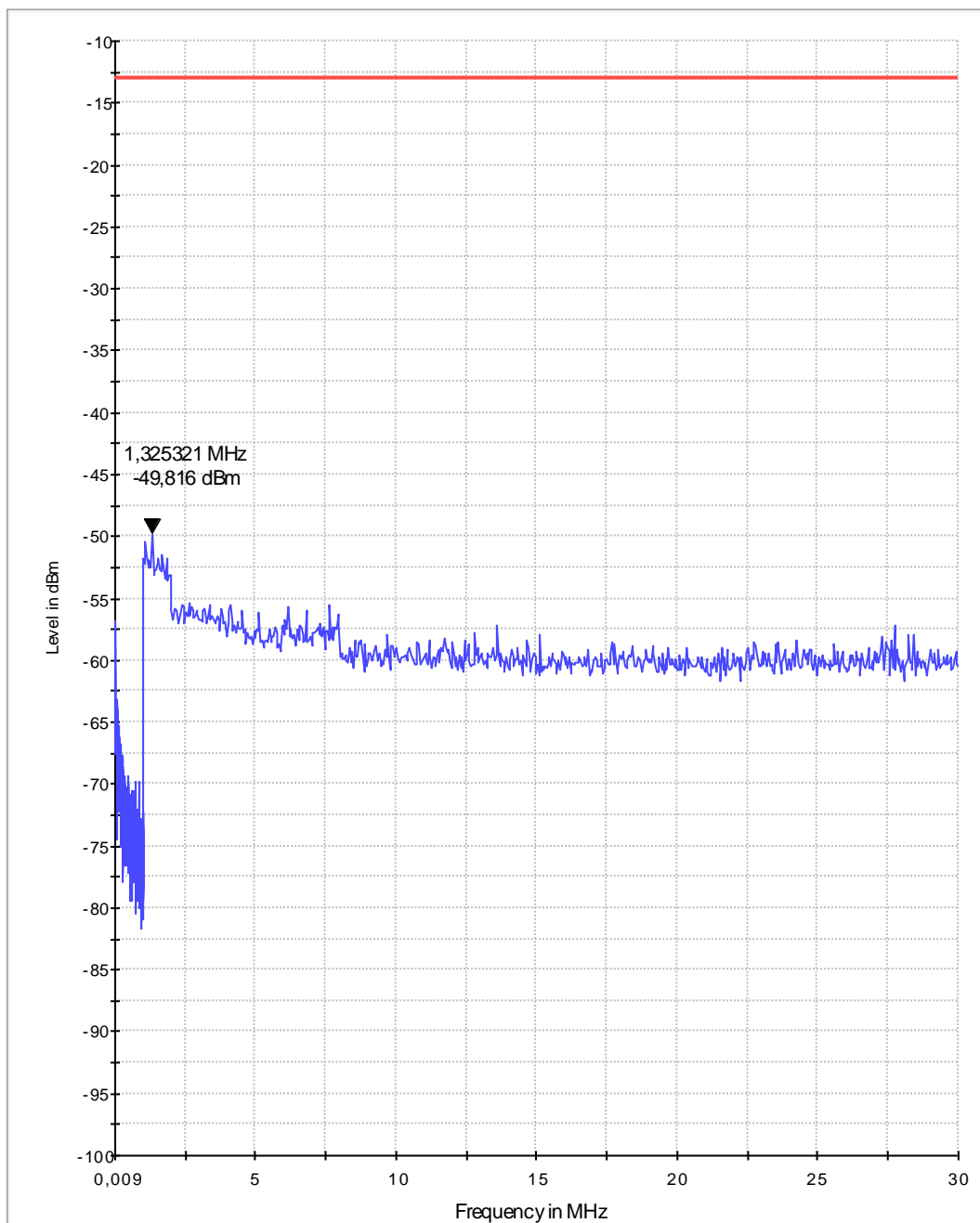


b_4.10**Common Information**

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

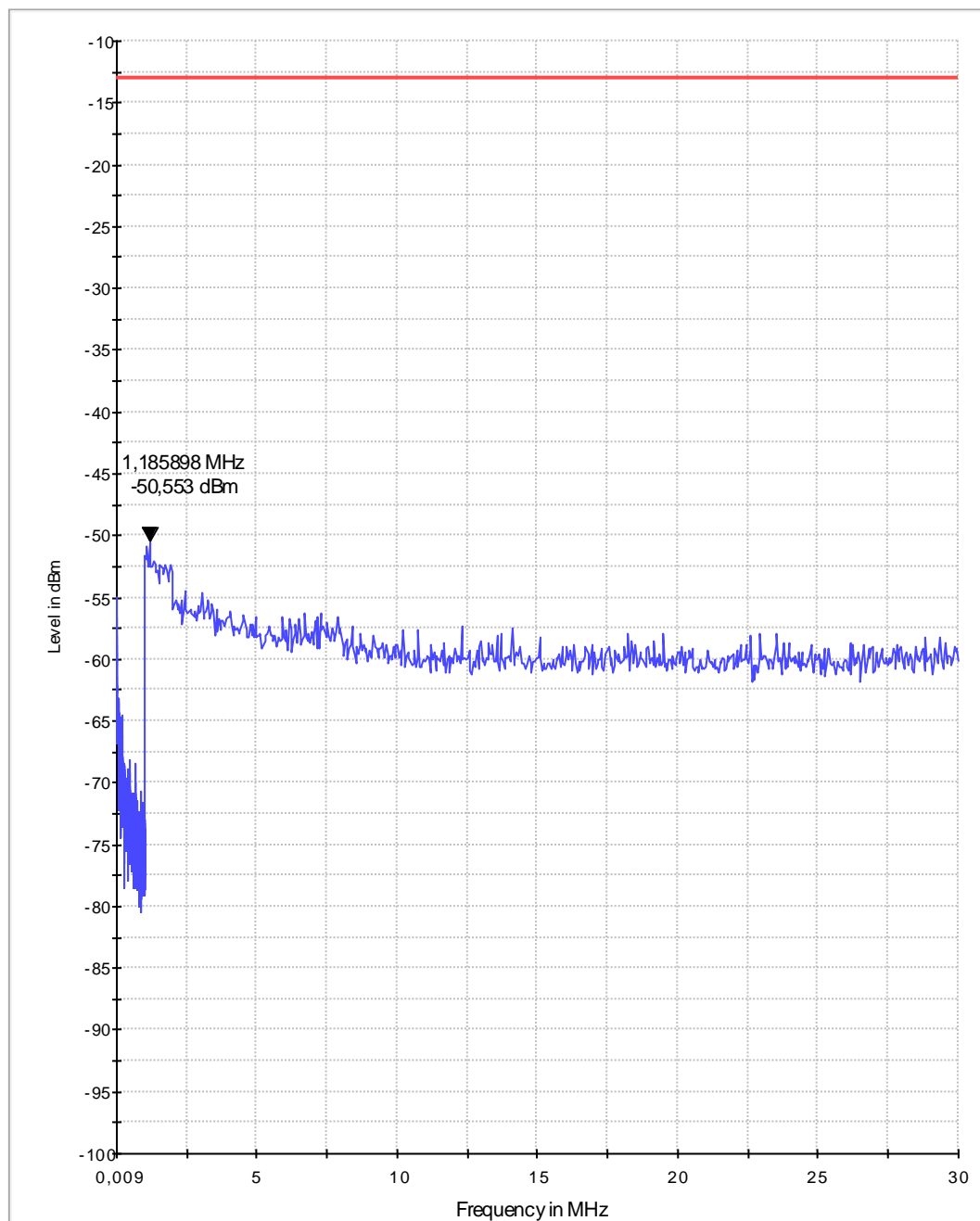
Sweep_1



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



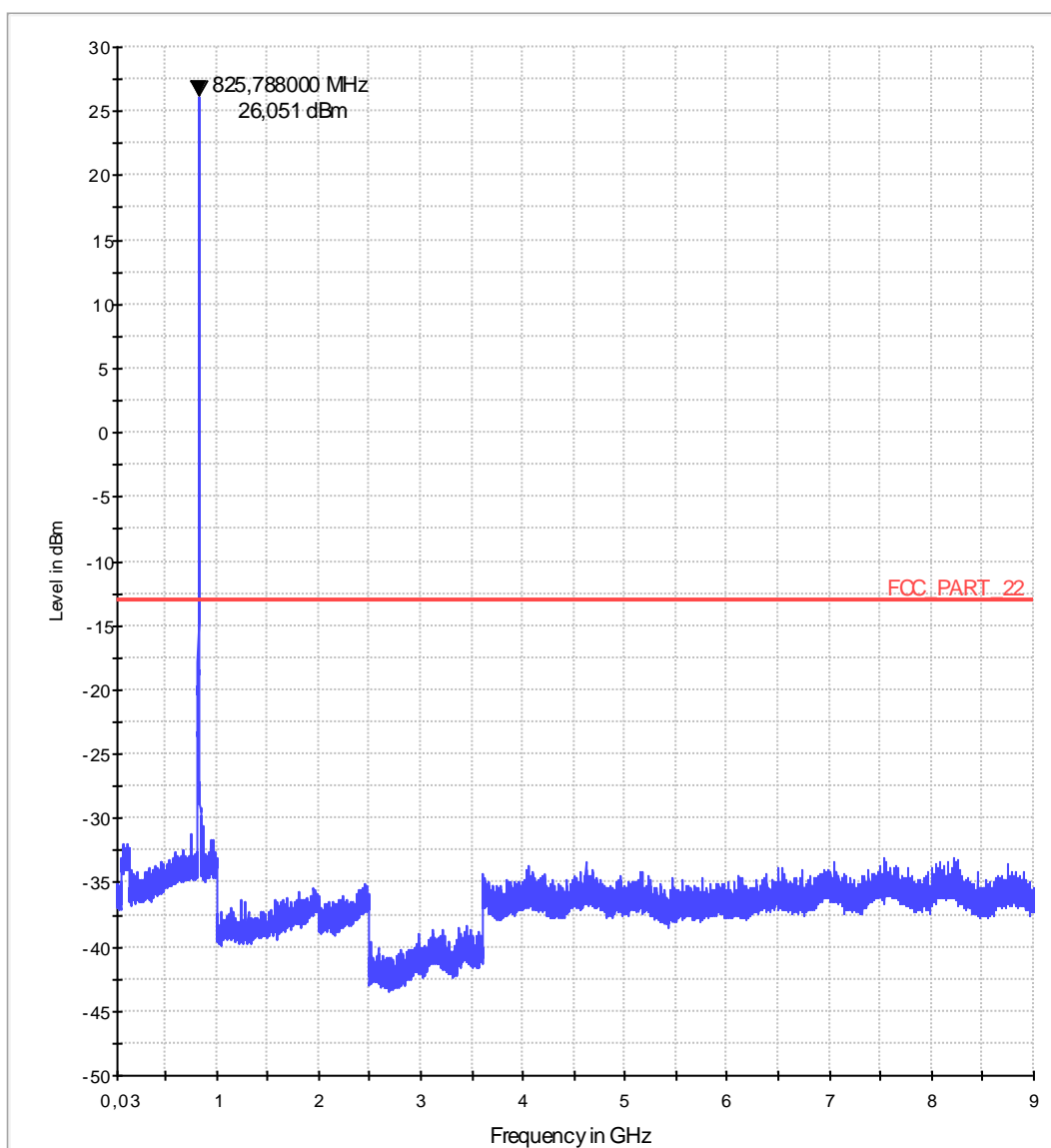
b_4.14**Common Information**

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



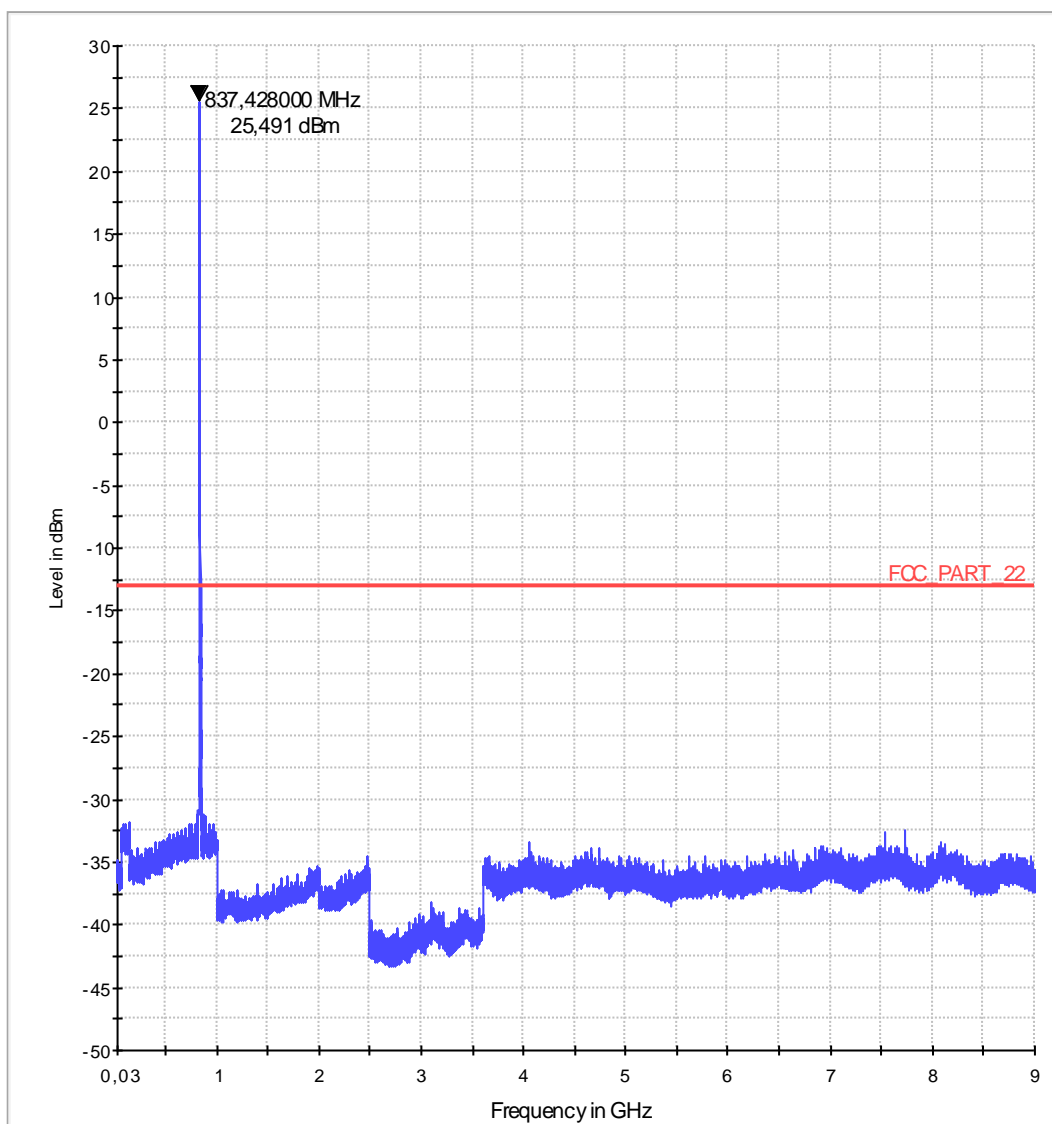
b_4.15**Common Information**

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



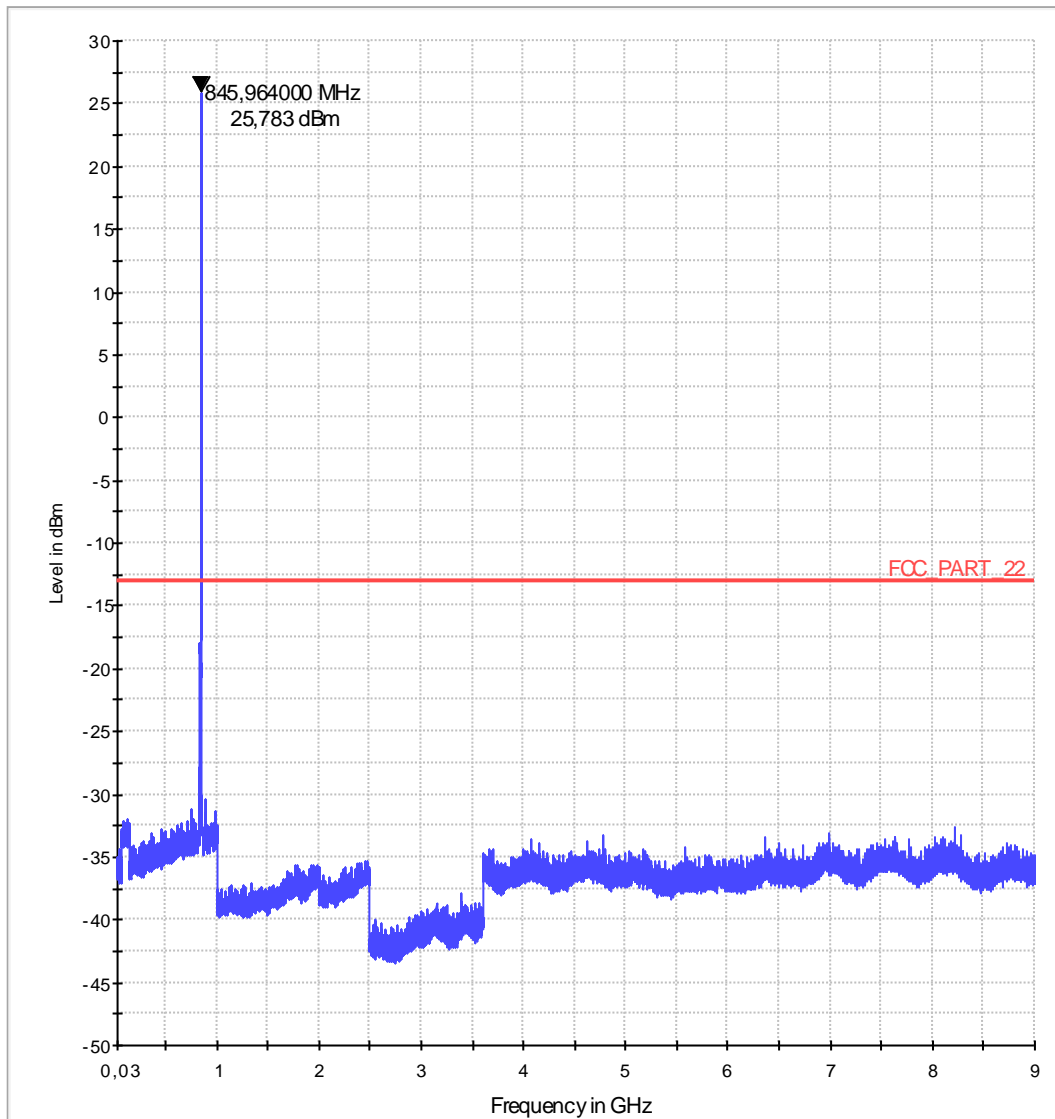
b_4.16**Common Information**

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



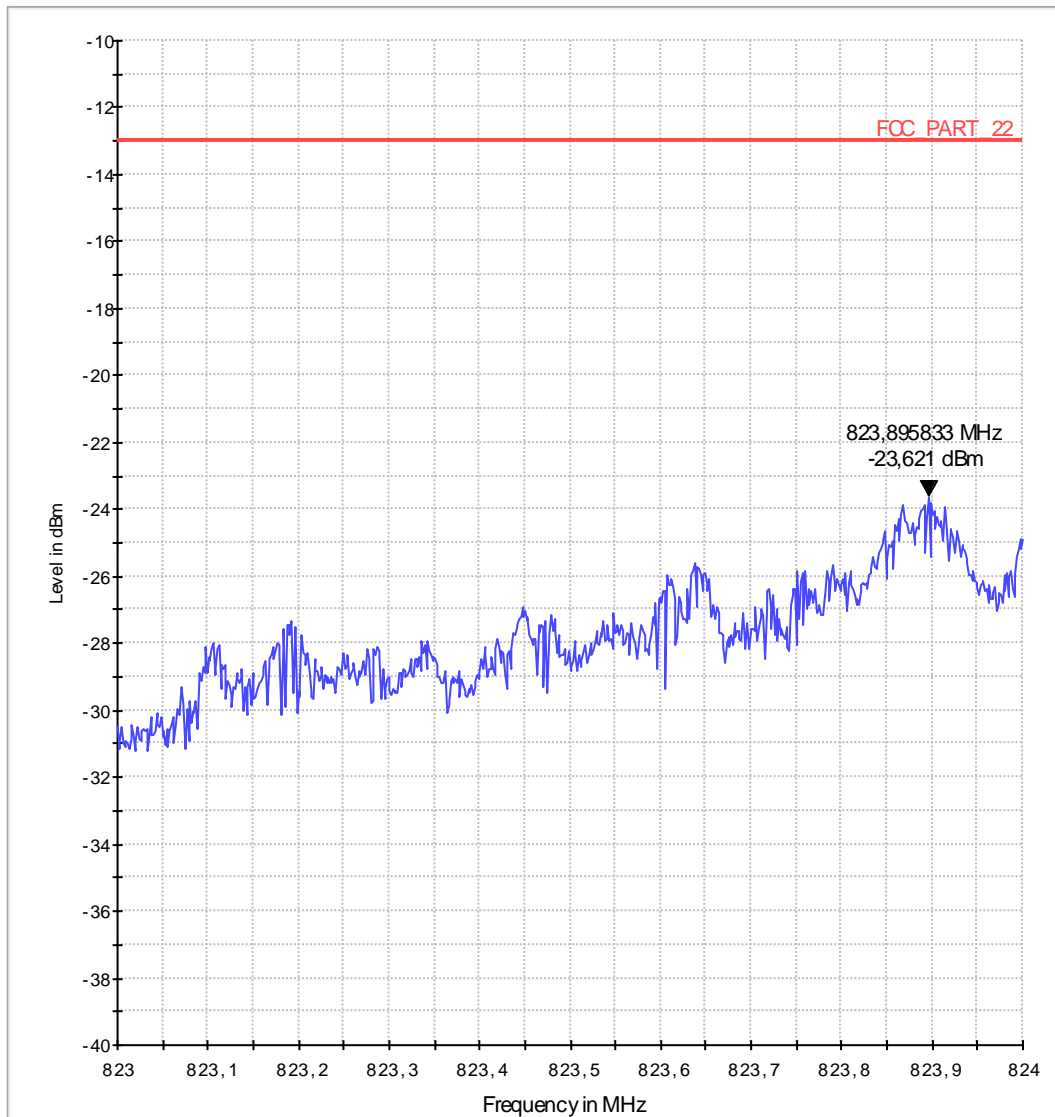
1.4.1. Band-Edge compliance conducted**b_4.12****Common Information**

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



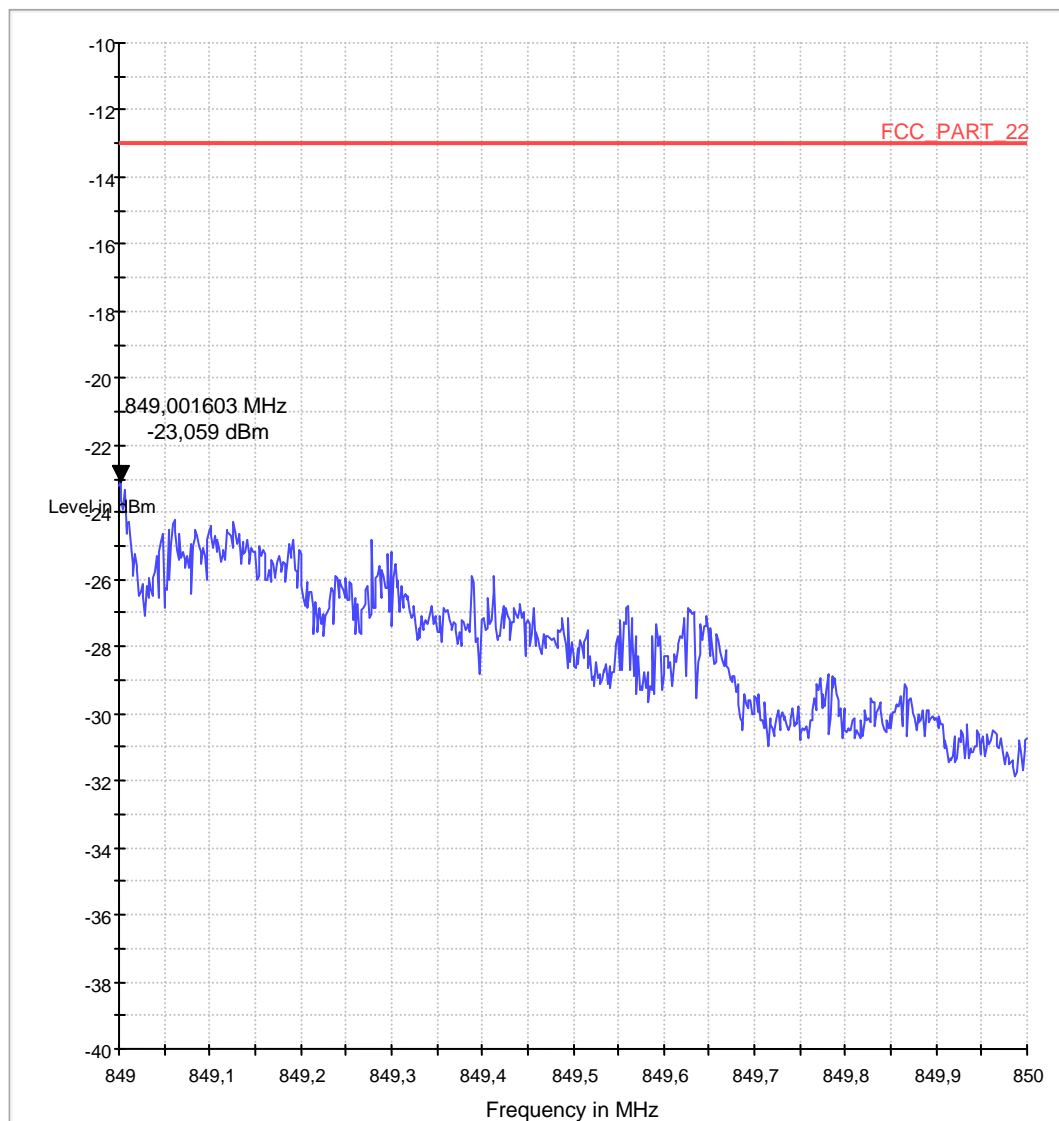
b_4.13**Common Information**

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

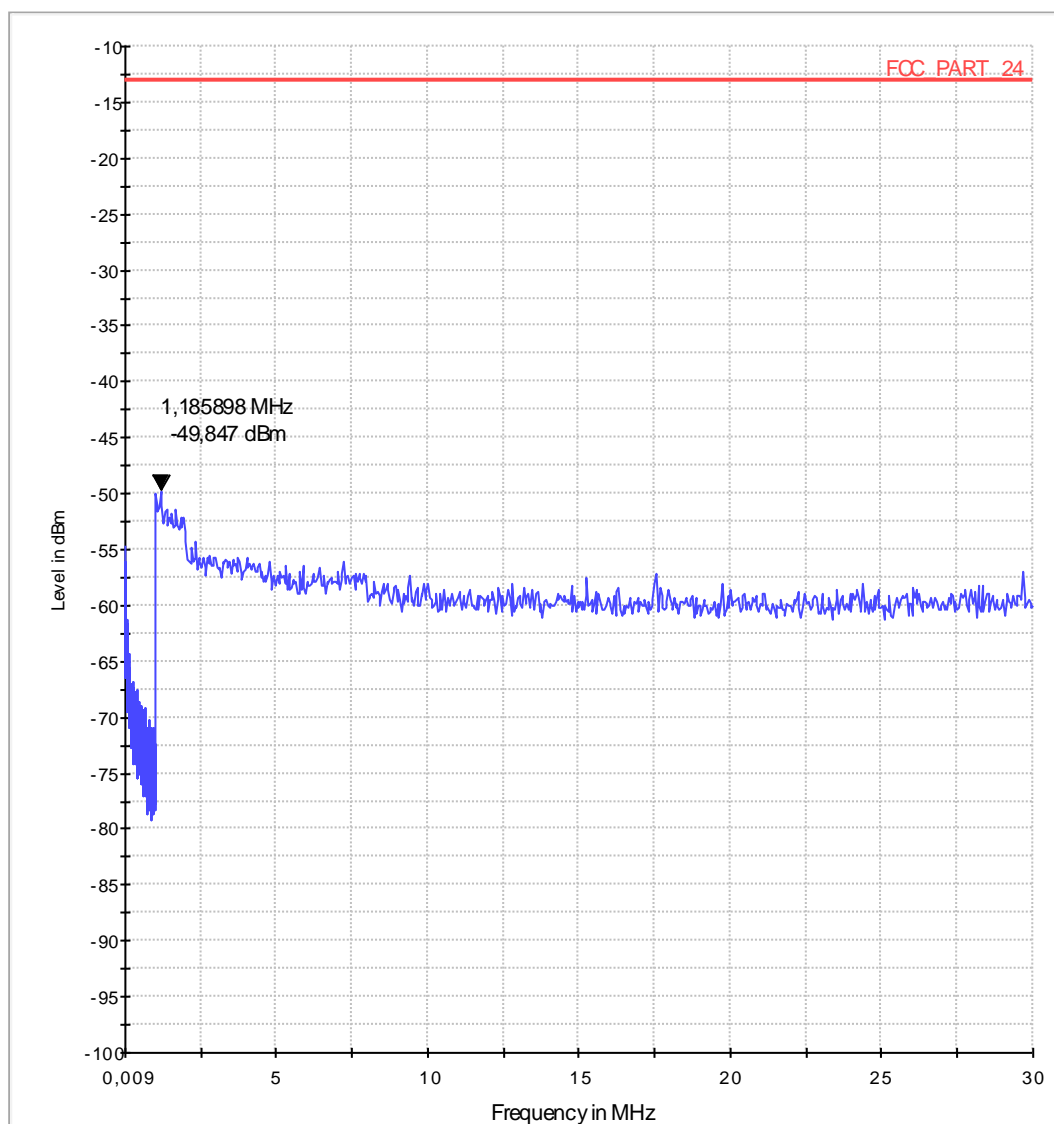
Common Information

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



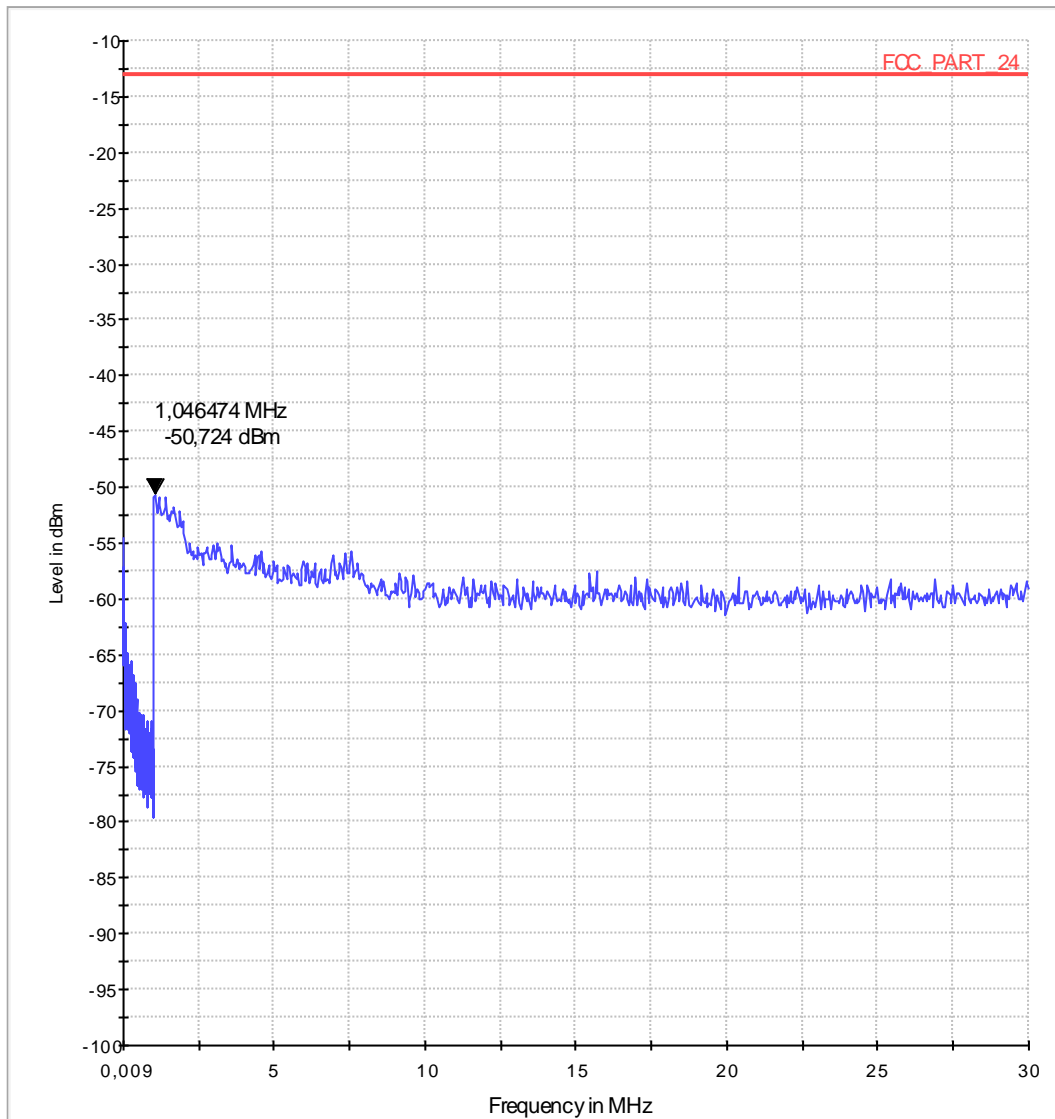
b_4.20**Common Information**

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



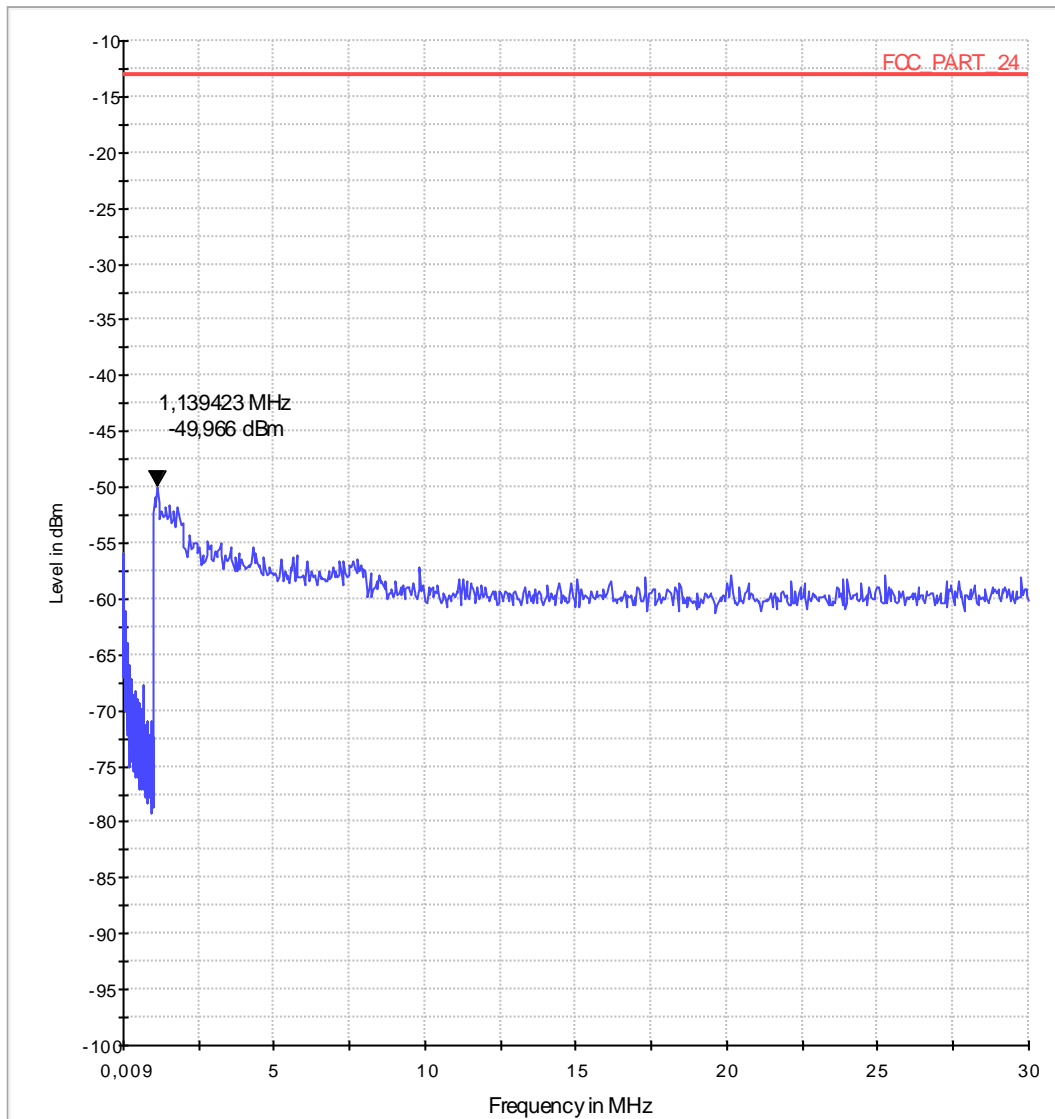
b_4.21**Common Information**

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**

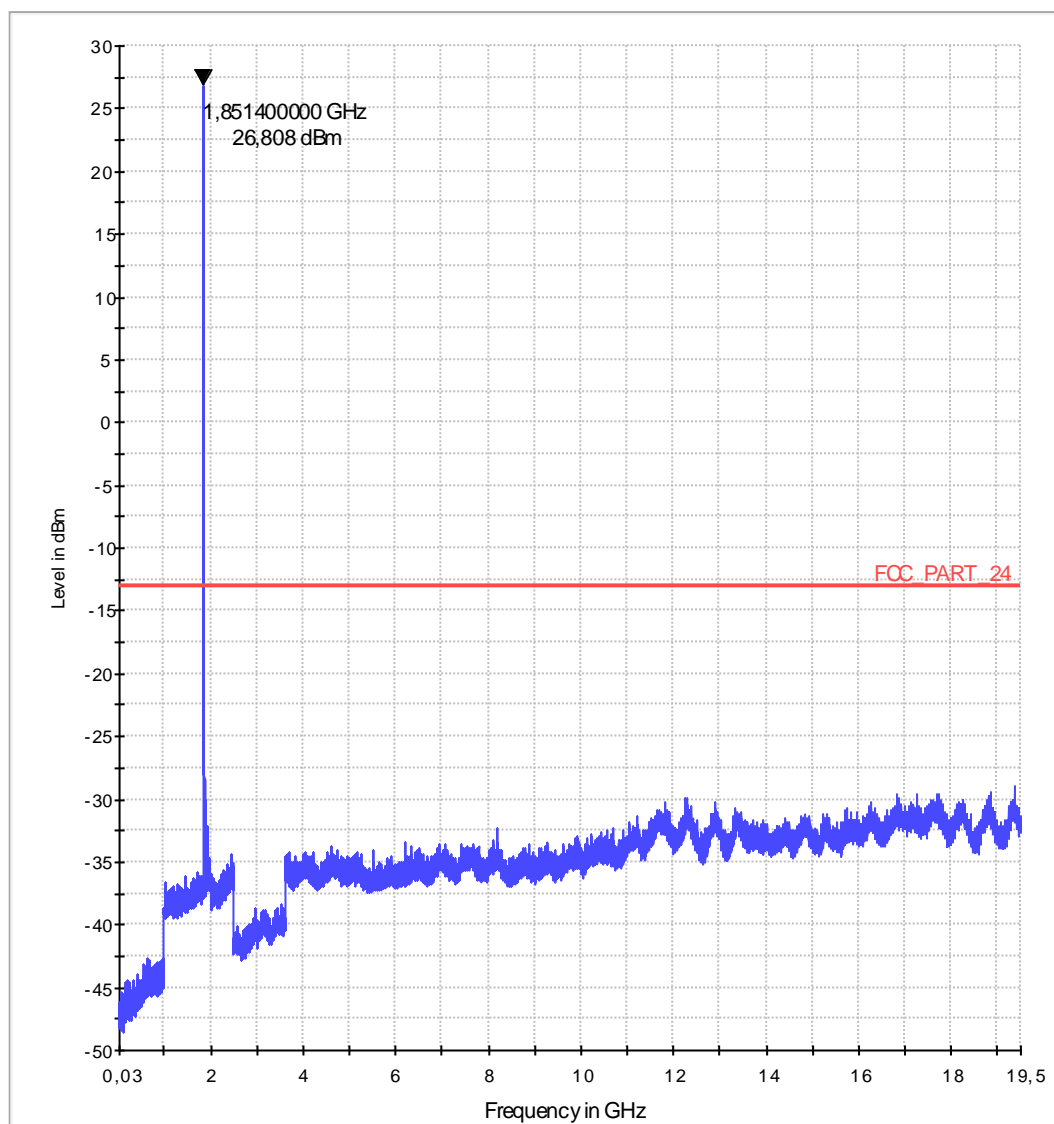
Test Description: TX Spurious Emission conducted
Test Site: Radio laboratory
Test Standard: FCC Part 24.238, RSS-133
Test condition: 23°C 41%

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



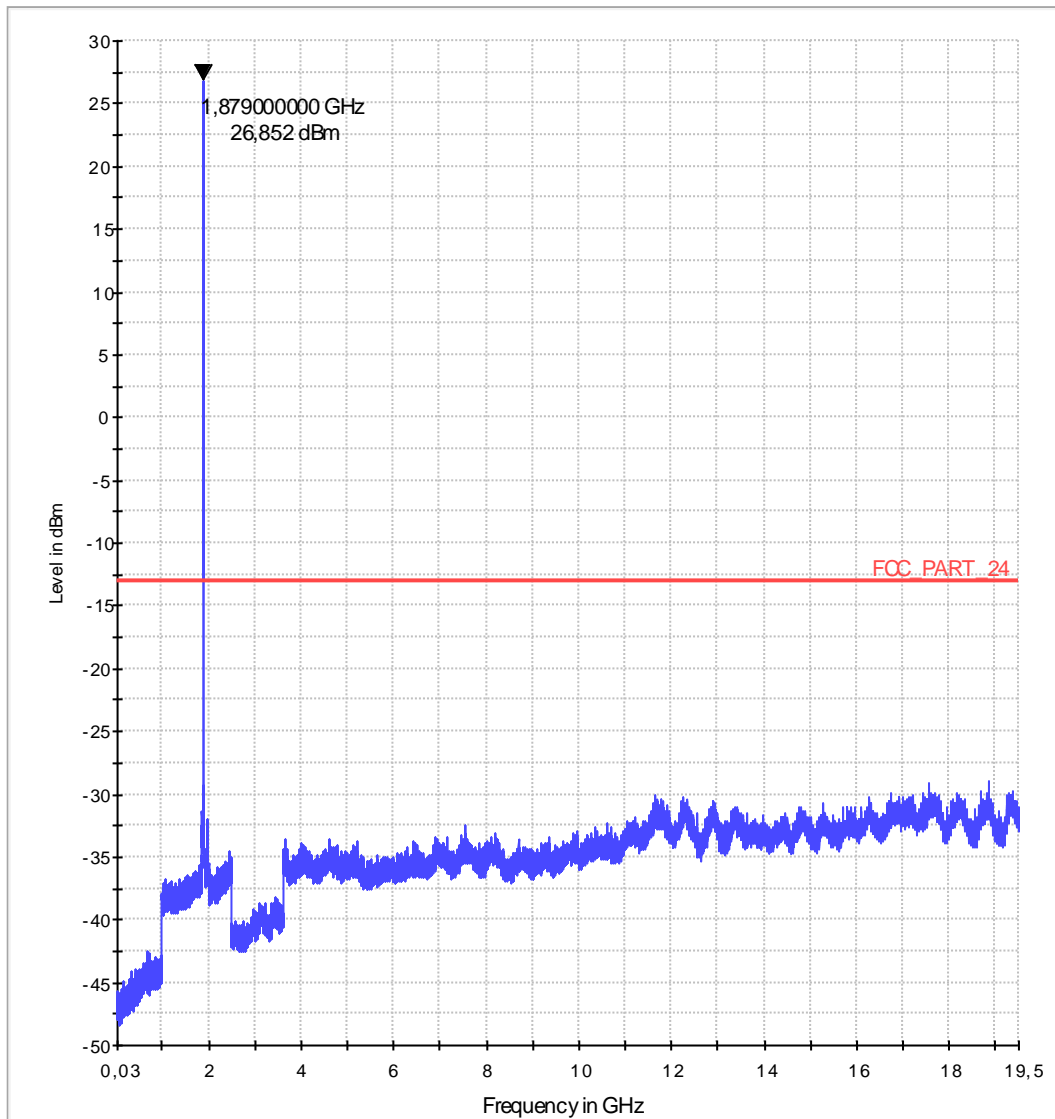
b_4.23**Common Information**

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

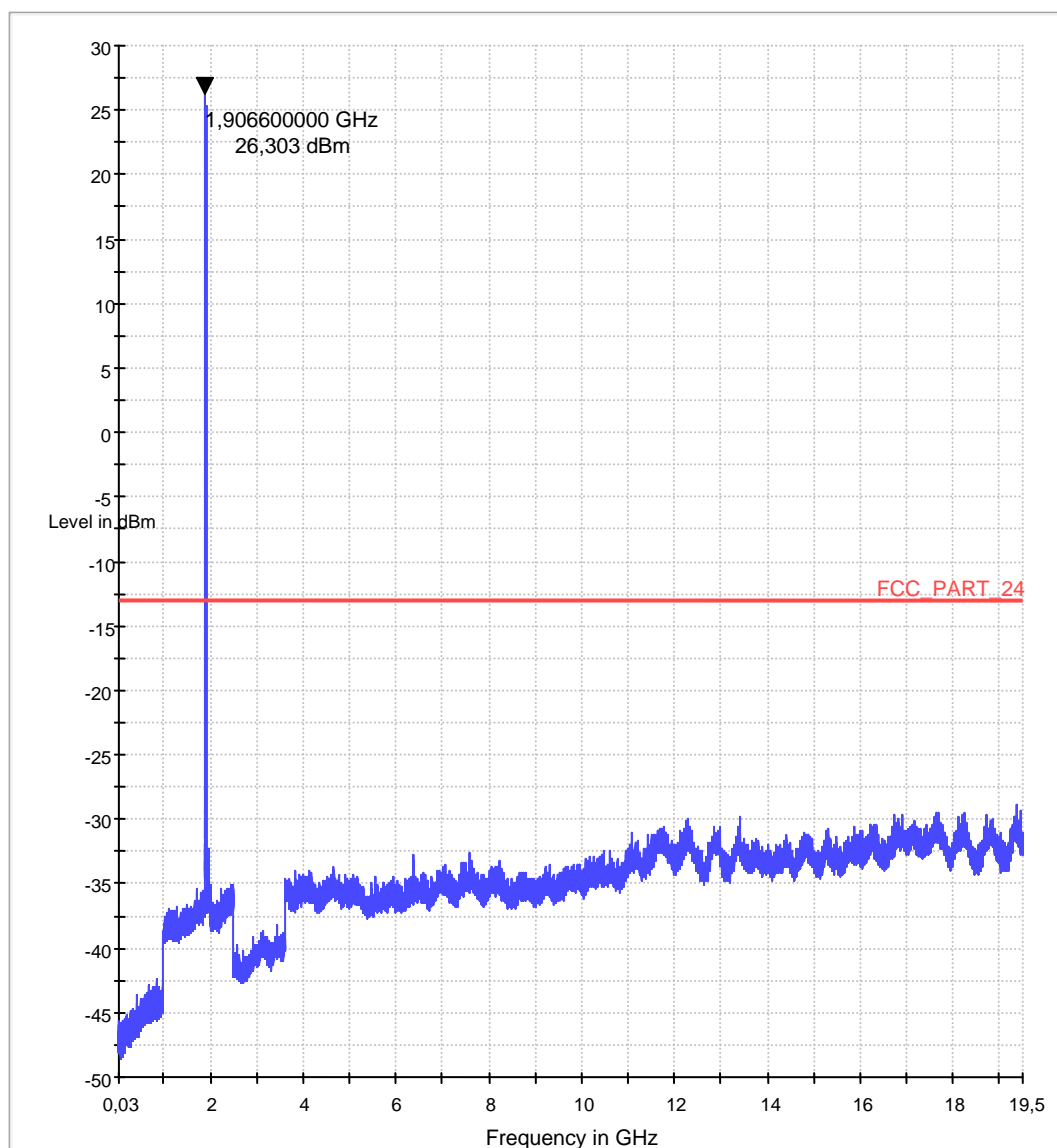
b_4.24**Common Information**

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



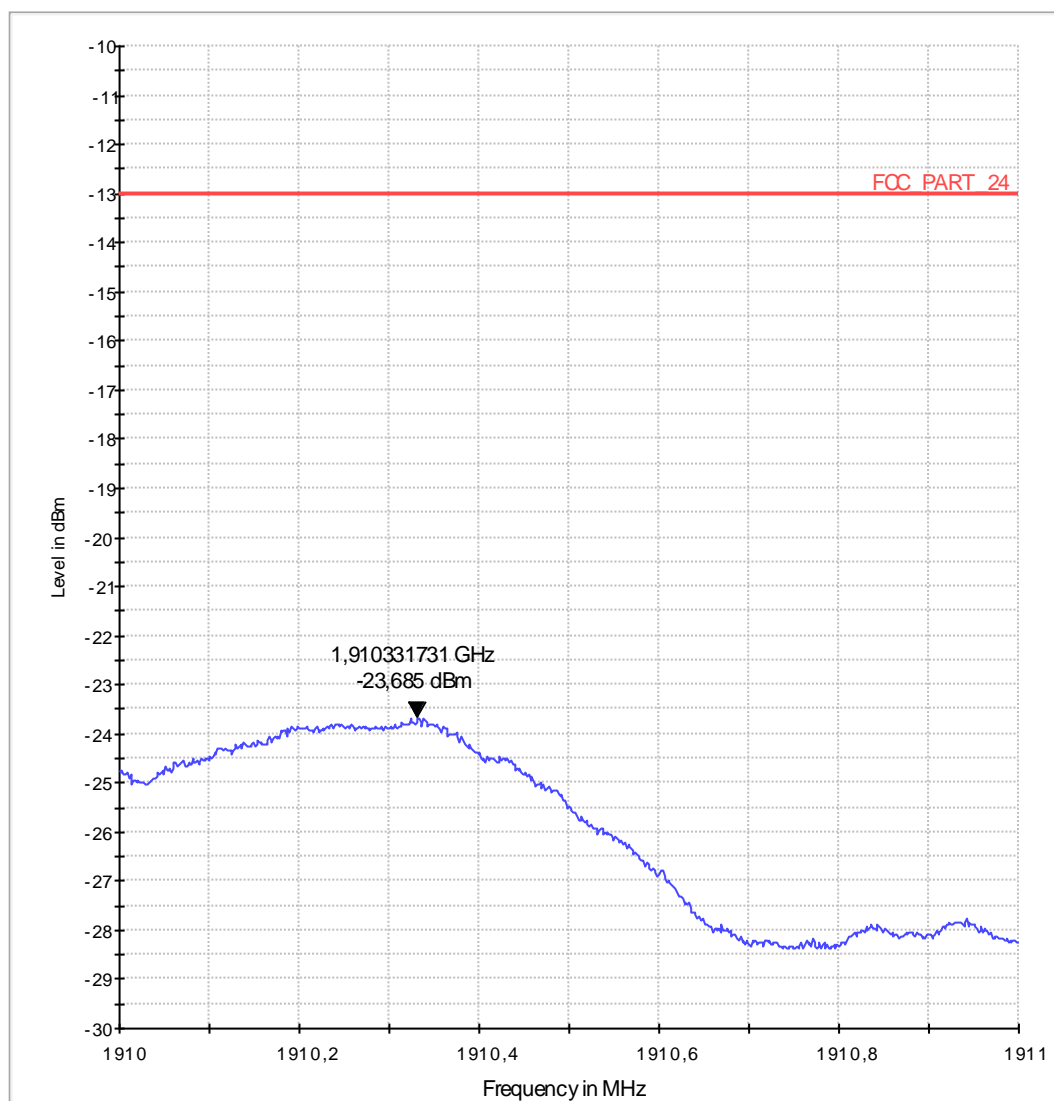
1.5.1. Band-Edge compliance conducted**b_4.27****Common Information**

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**

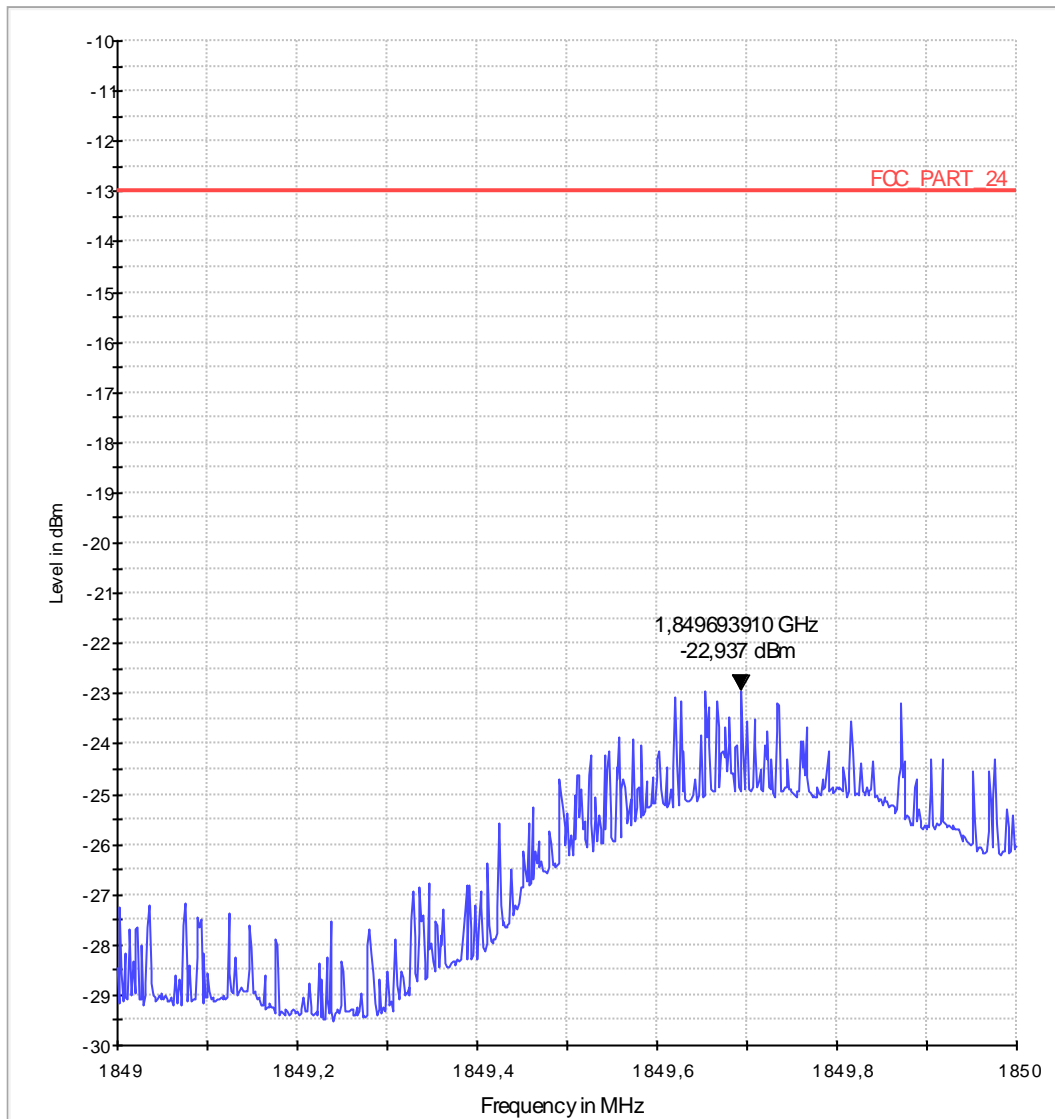
Test Description:	Band Edge
Test Site:	Radio laboratory
Test Standard:	FCC Part 24.238, RSS-133
Test condition:	23°C 41%

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

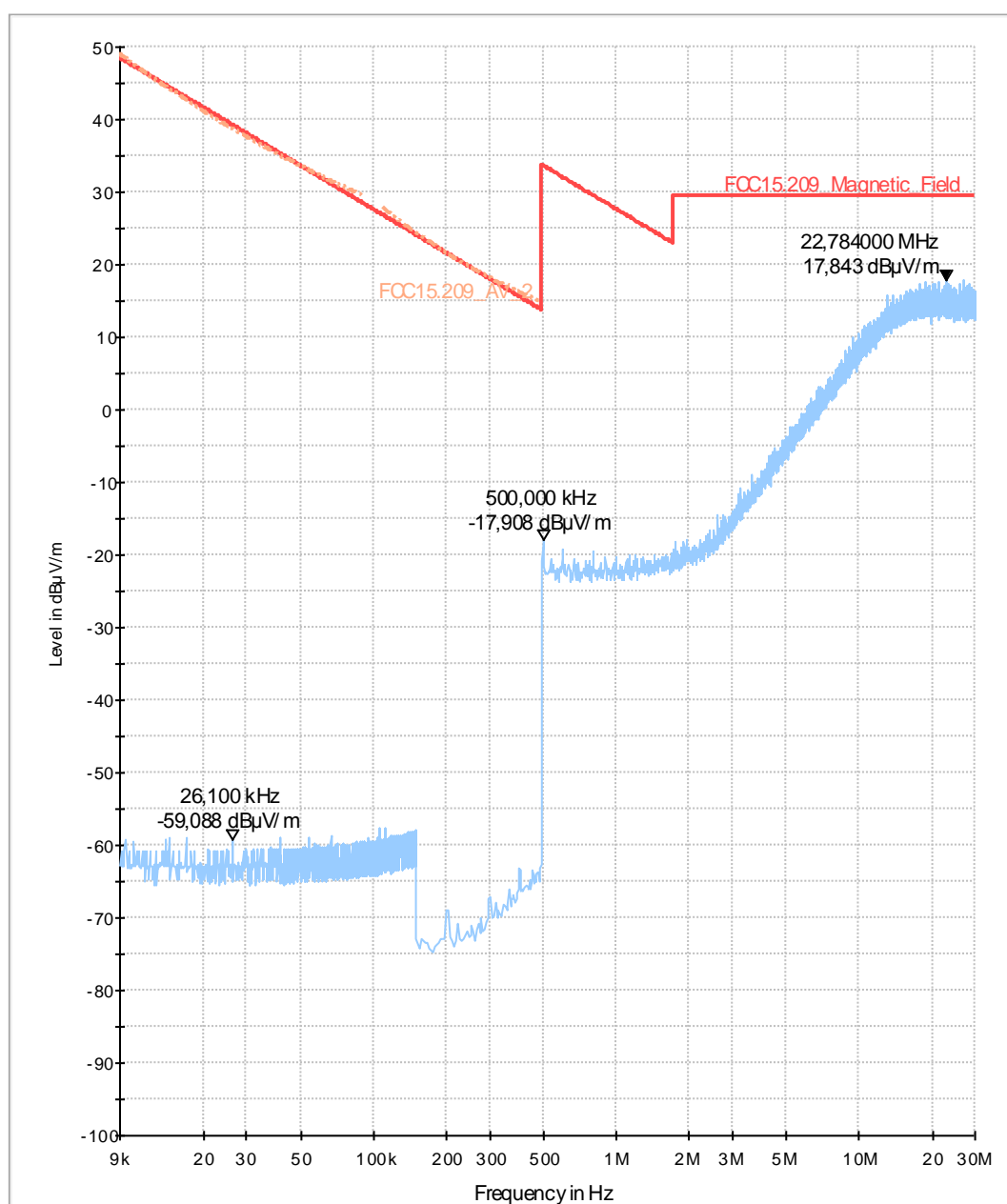


Diagram No. b_3.02

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

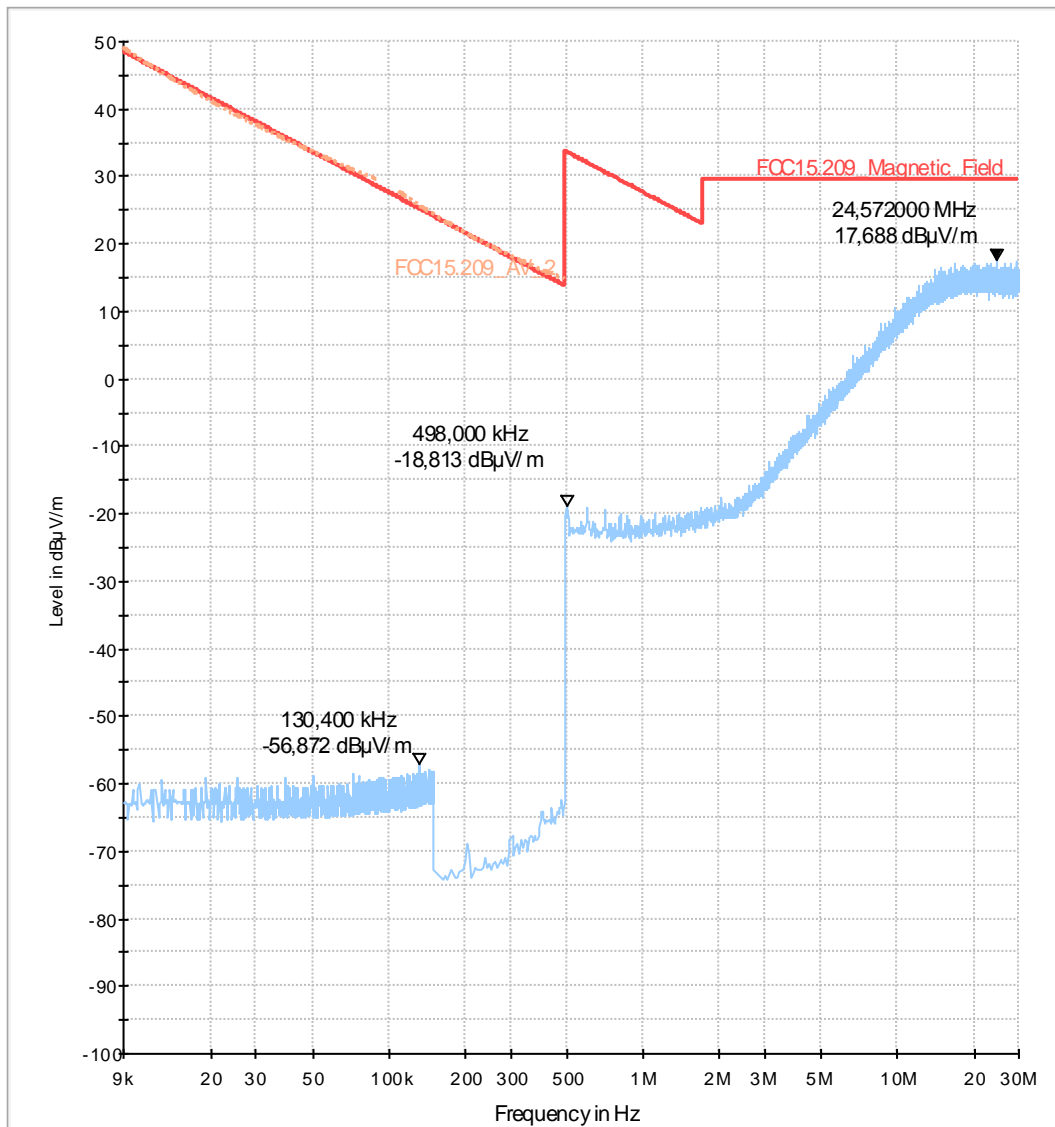


Diagram No. b_3.03

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

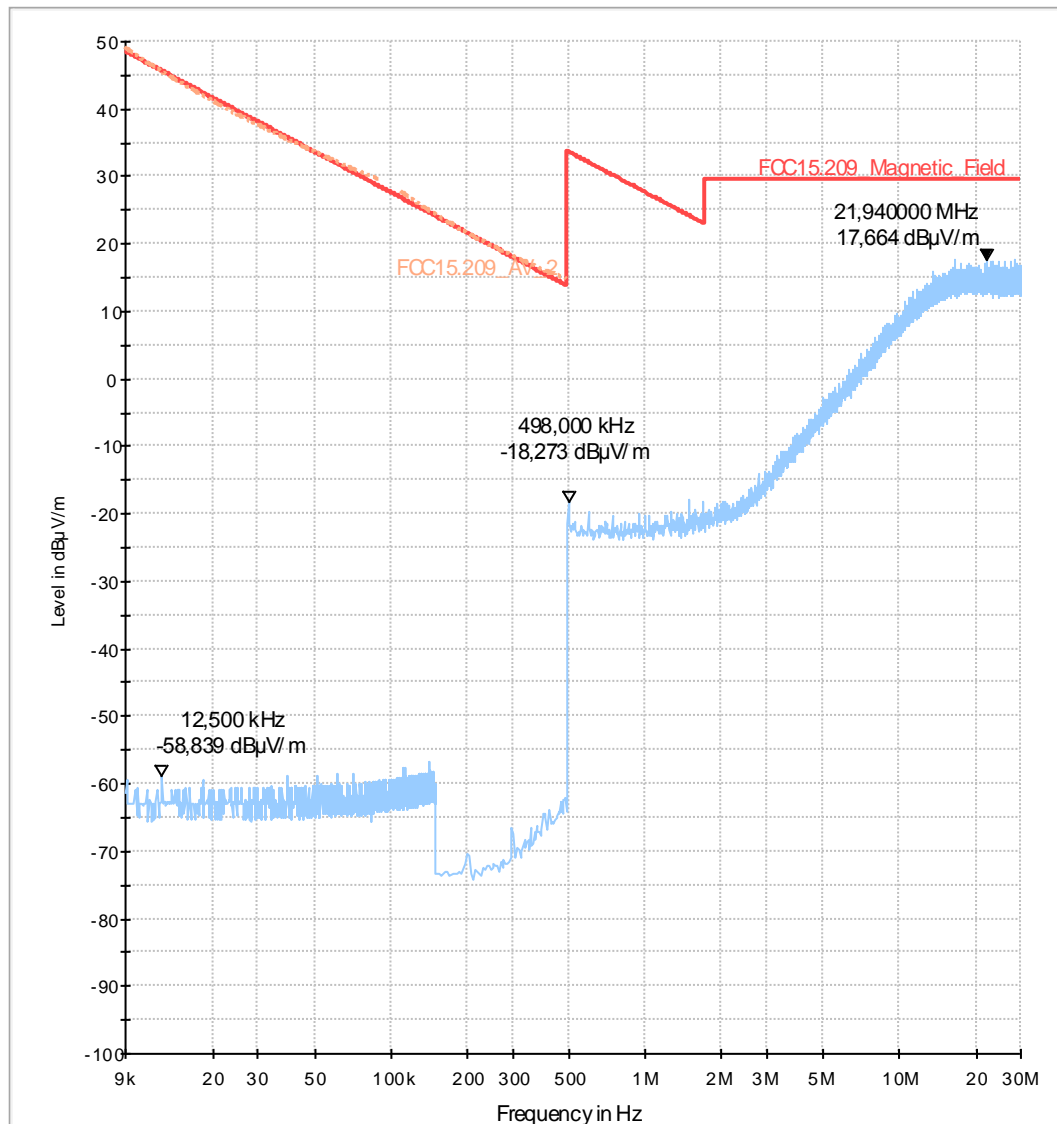
IMEI:

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:

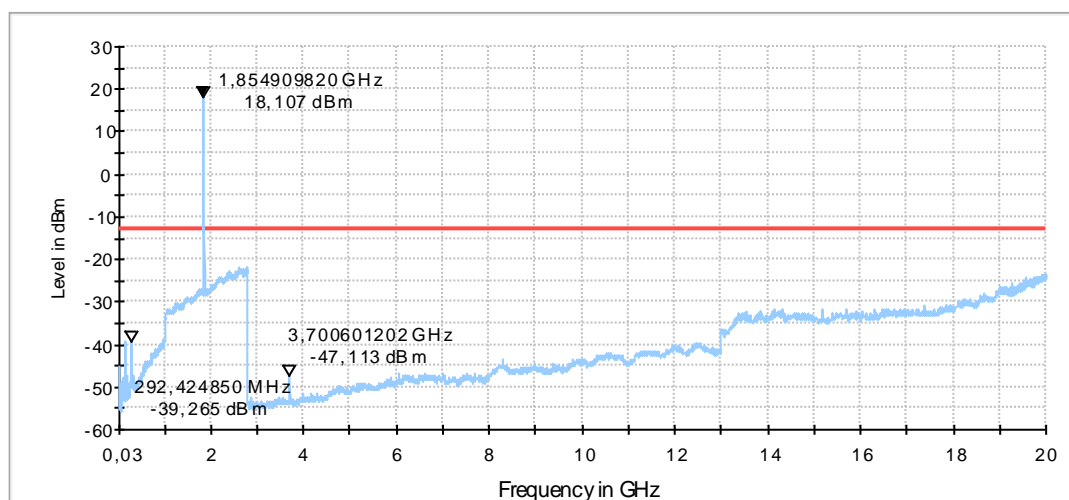
Serial number:

Connected Interfaces:

Power Supply:

Comments:

030414_FCC_Part24_UMTS-FDDII_TX_all_channels_30M-25G



b_5.14_BE**Common Information**

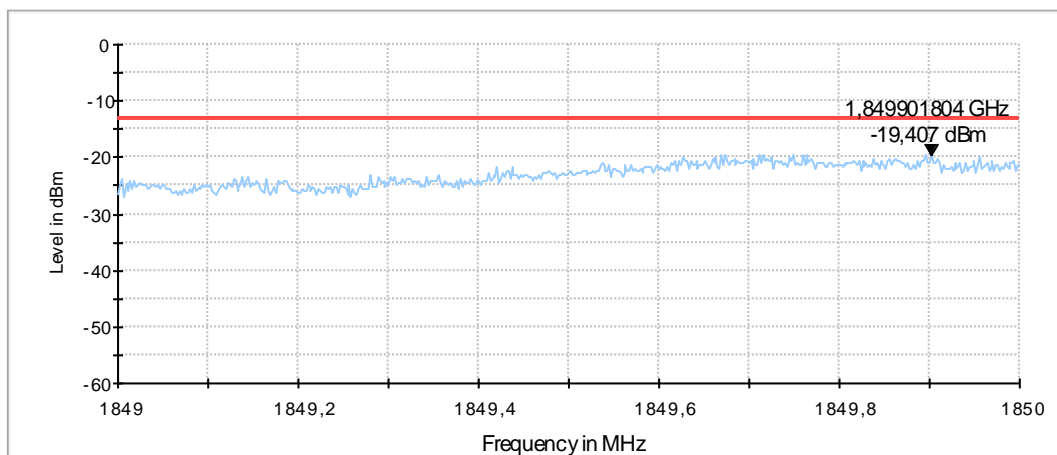
Test Description:	Band-Edge Radiated FDDII
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part24
Operation mode:	UMTS FDDII, HSUPA, Channel 9262 (UL 1852,4MHz)
Environmental Conditions:	Humidity: 58%rH; Temperature: 19°C
Operator Name:	YZH

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

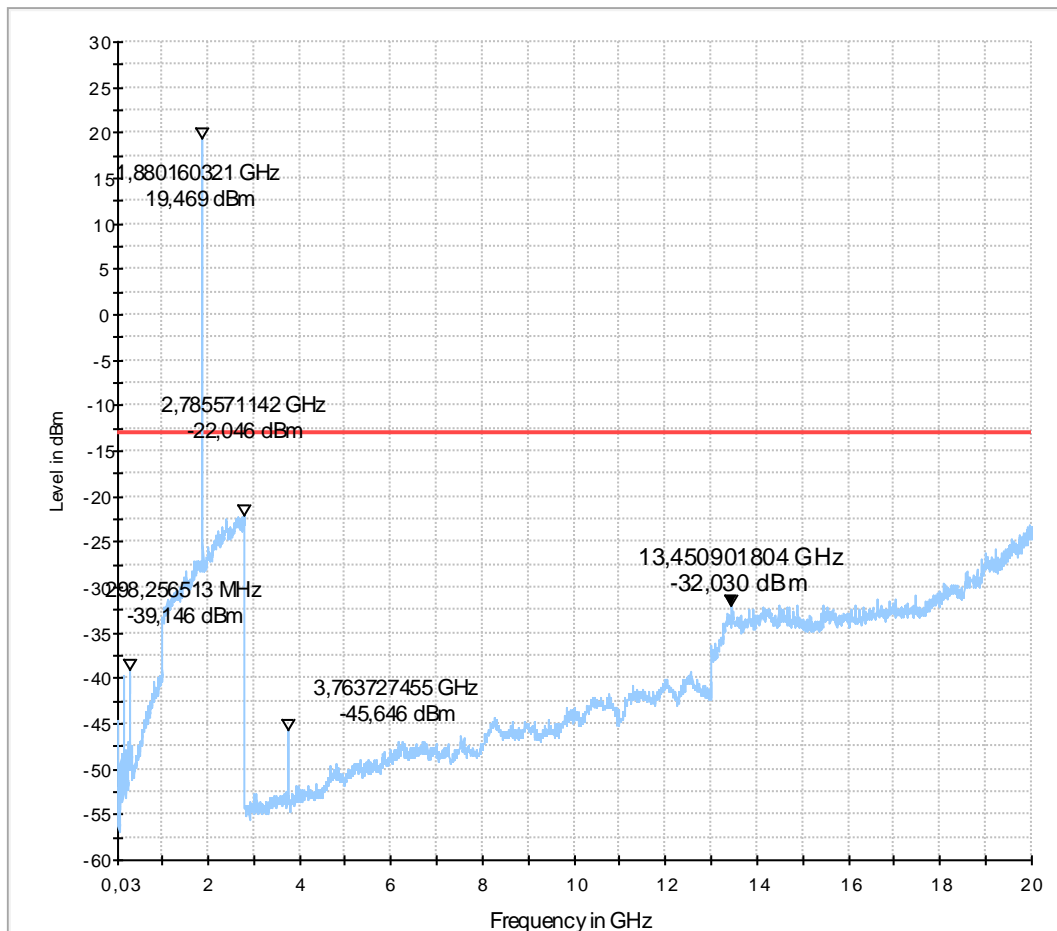
Test Description:	Radiated Spurious Emissions UMTS FDD II
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part24
Operation Mode:	UMTS FDDII, HSUPA, Channel 9400 (UL 1880,0MHz)
Environmental Conditions:	Humidity: 58%rH; Temperature: 19°C
Operator Name:	YZH

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

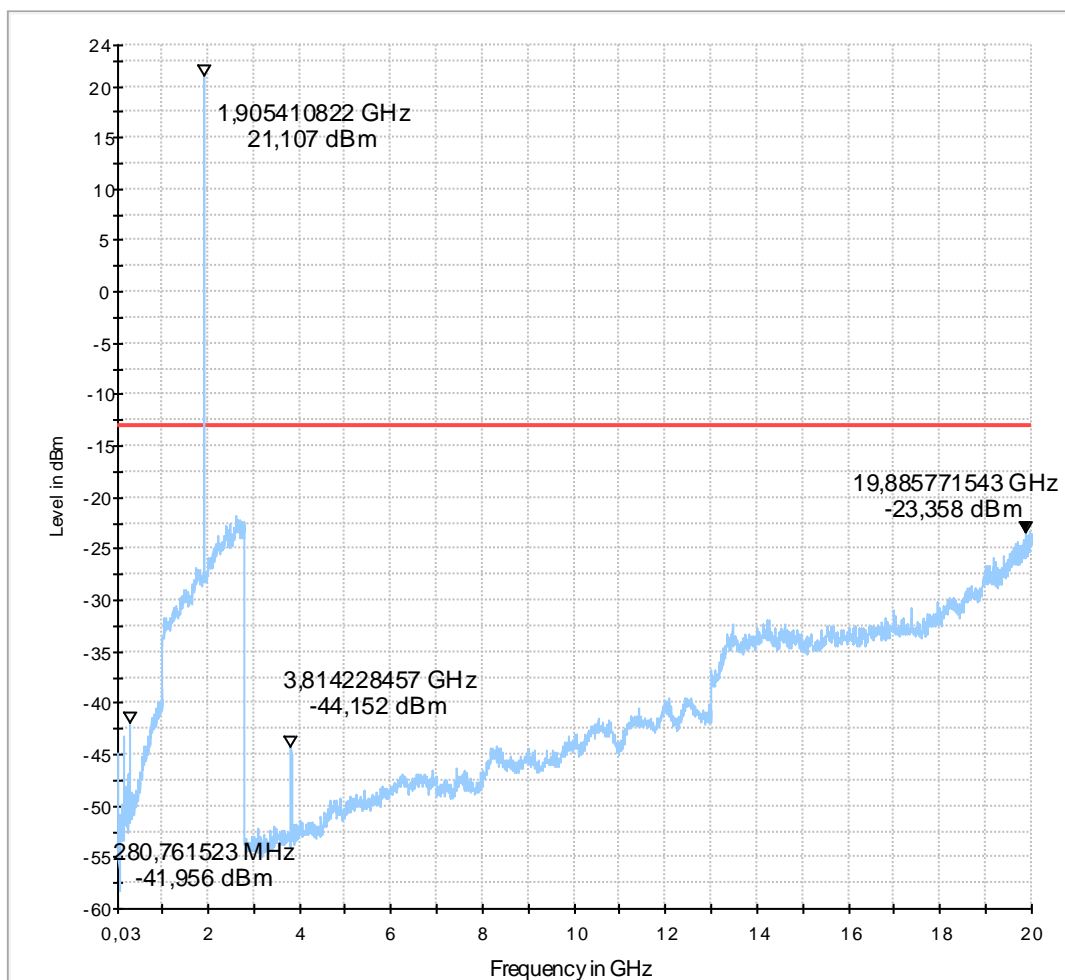
Test Description:	Radiated Spurious Emissions UMTS FDD II (FCC Part 24)
Operating Conditions:	Fully Anechoic Room (FAR)
Operator Name:	Tas
Project no.:	6-0082-11-1-2b
Operating mode	UMTS FDD II, HSUPA, TX-Channel UARFCN 9538 High

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

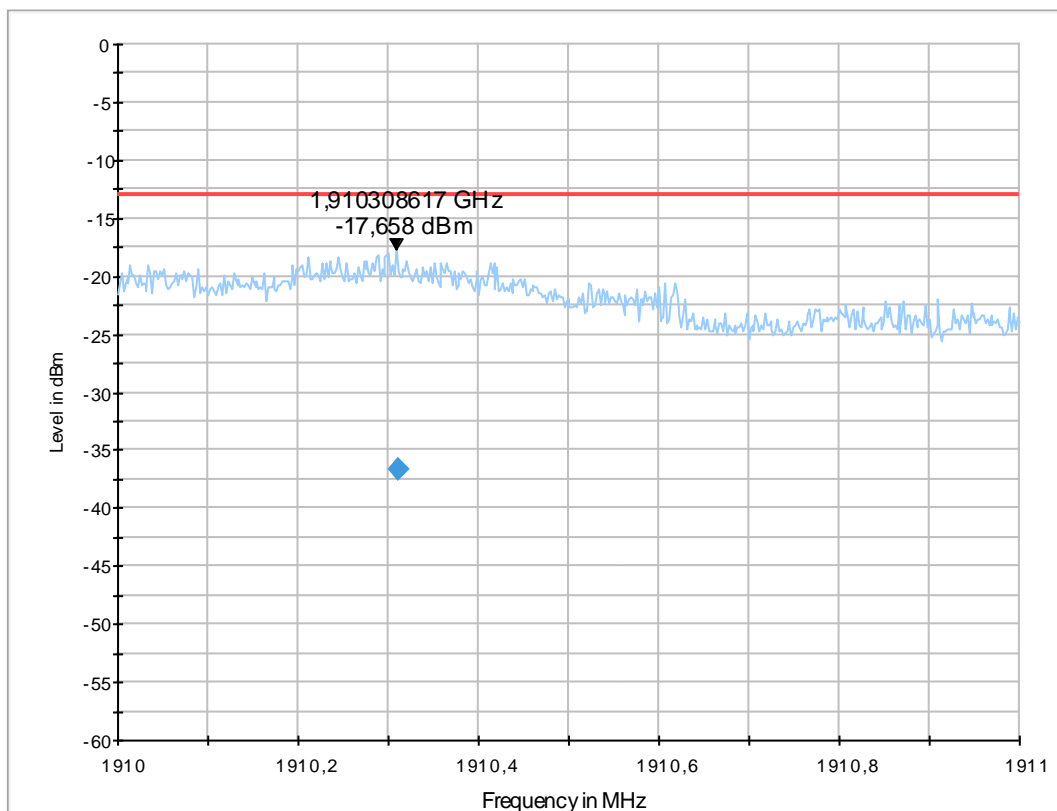
Manufacturer: u-blox
 Model: LISA-U200
 Type: GSM/WCDMA Module

 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: H1.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

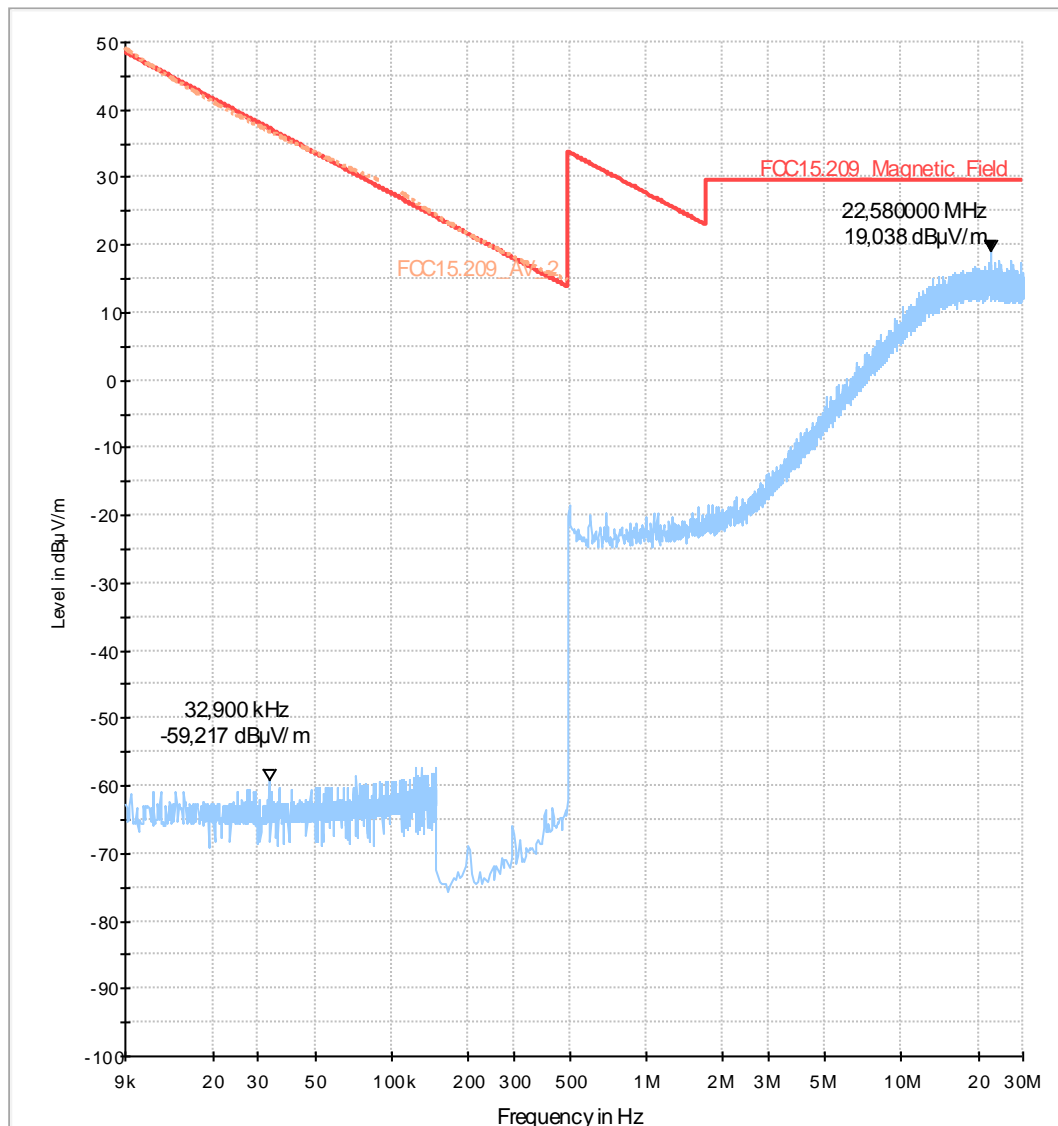


Diagram No. b_3.05

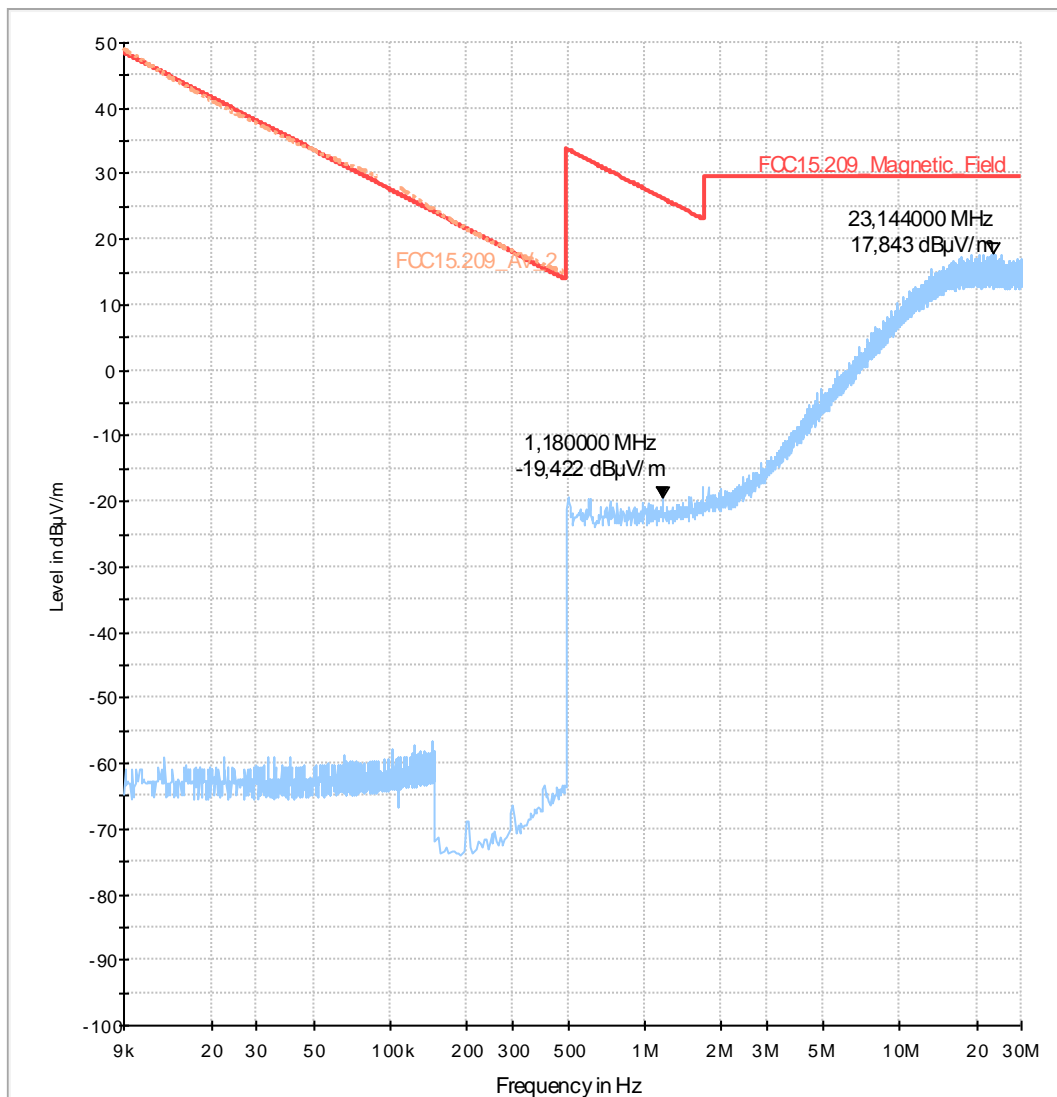
Common Information

Test description:	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 (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:
 Operating conditions:
 Power during tests:
 Comment 1:

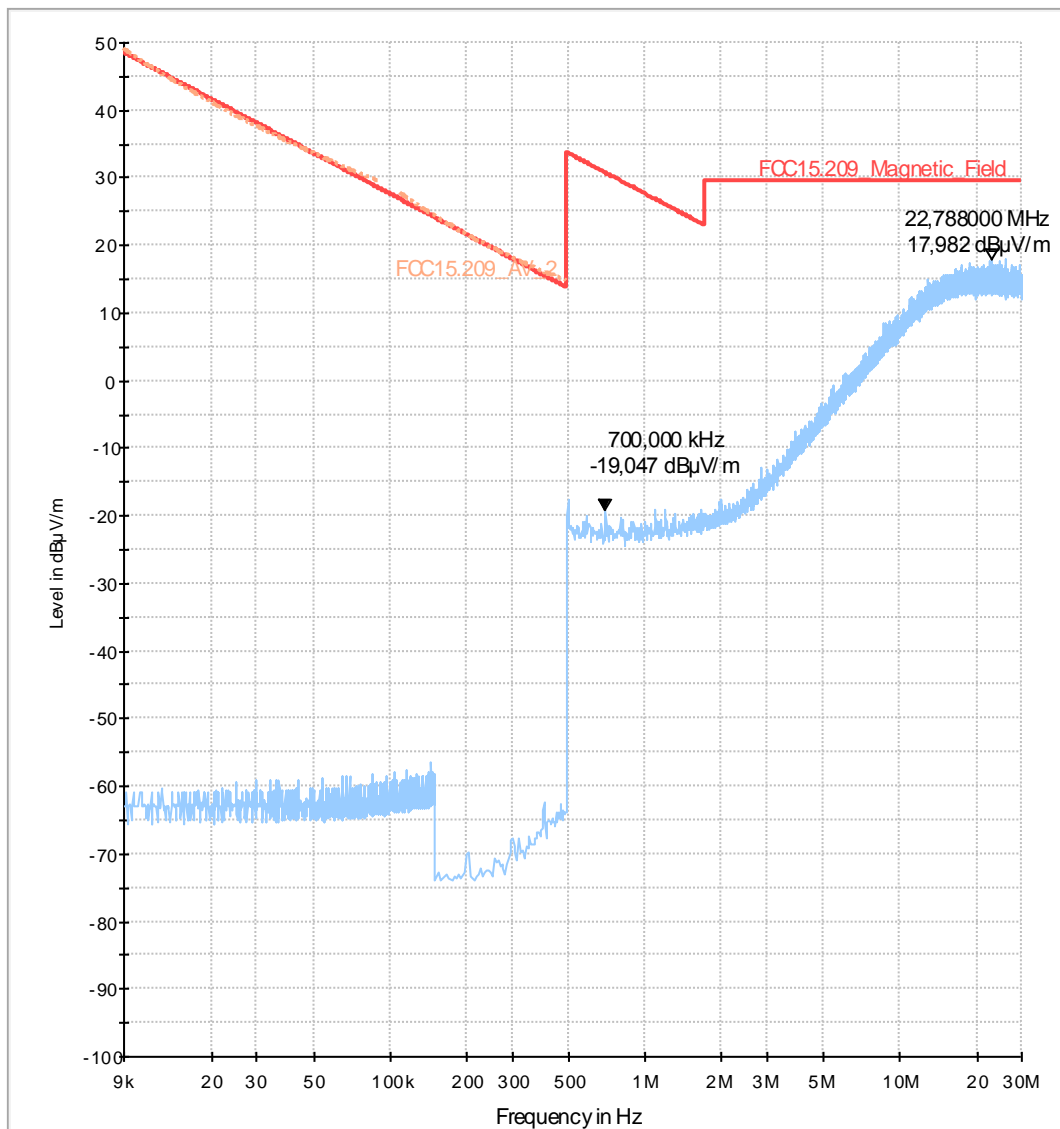
HLA
 HSUPA TX-on
 110V/60Hz
 Channel high (4233) FDD V

EUT Information

EUT Name:
 Manufacturer:
 IMEI:
 FW:

M/N LISA-U200
 u-blox AG
 358901040001734
 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

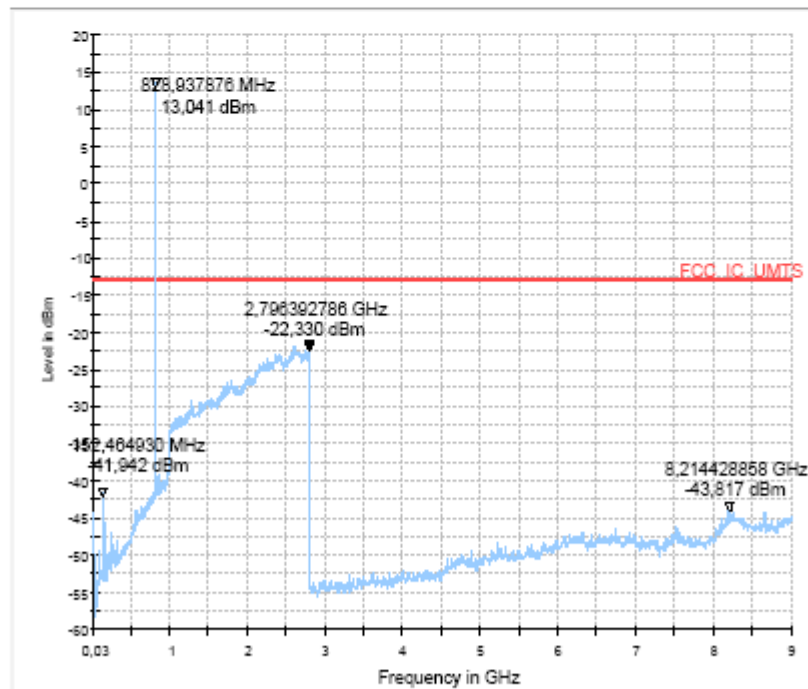
Diagram No.: b_5.11
Common Information

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**

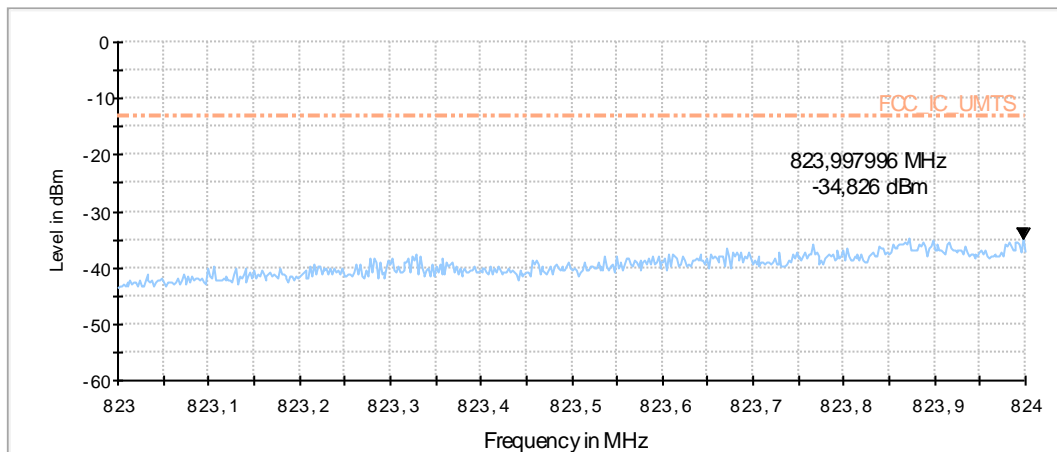
Test Description:	Band-Edge Radiated FDDV
Test Site Location:	CETECOM GmbH Essen
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part 22
Operating Mode:	UMTS FDDV, HSUPA, Channel 4132 (UL 826,4MHz)
Environmental Conditions:	Humidity: 58%rH; Temperature: 20°C
Operator Name:	YZH

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**

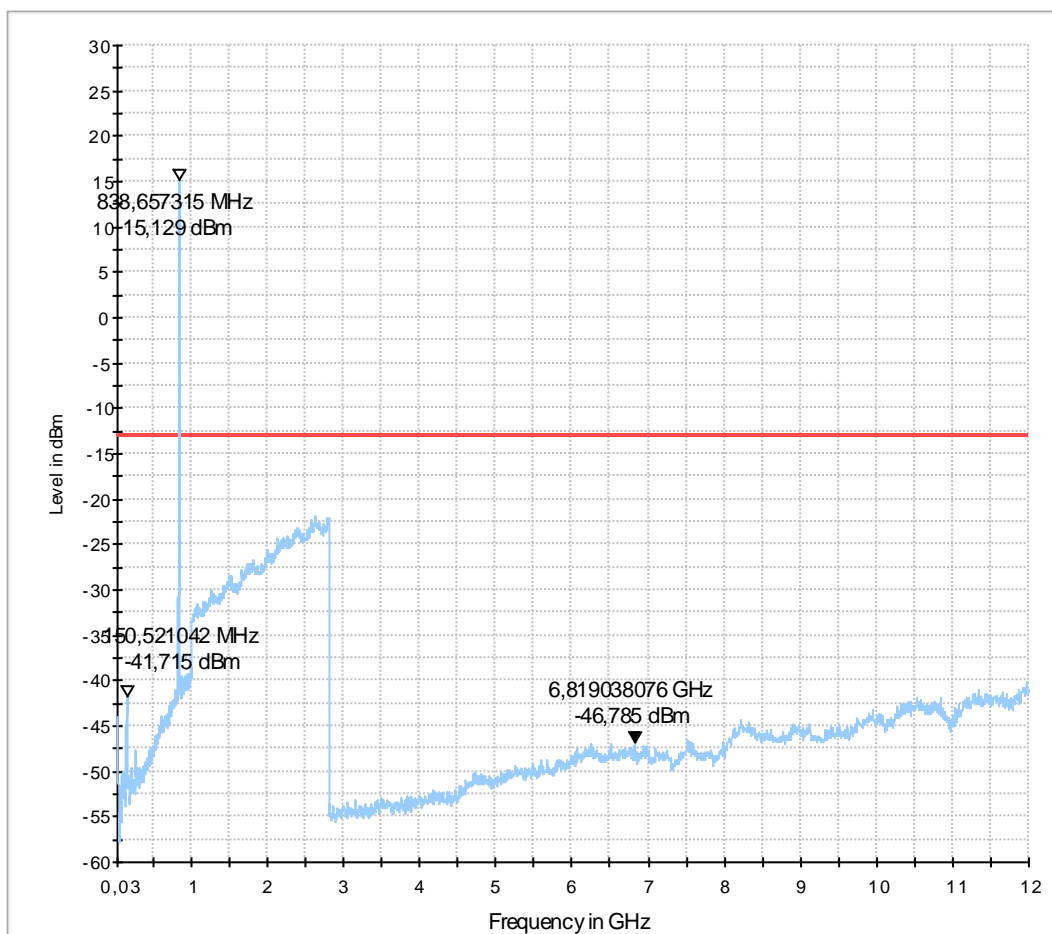
Test Description:	Radiated Spurious Emissions UMTS FDD V
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part 22
Operation mode:	UMTS FDDV, HSUPA (4182 middle)
Environmental Conditions:	Humidity: 44%rH; Temperature: 19°C
Operator Name:	YZH

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**

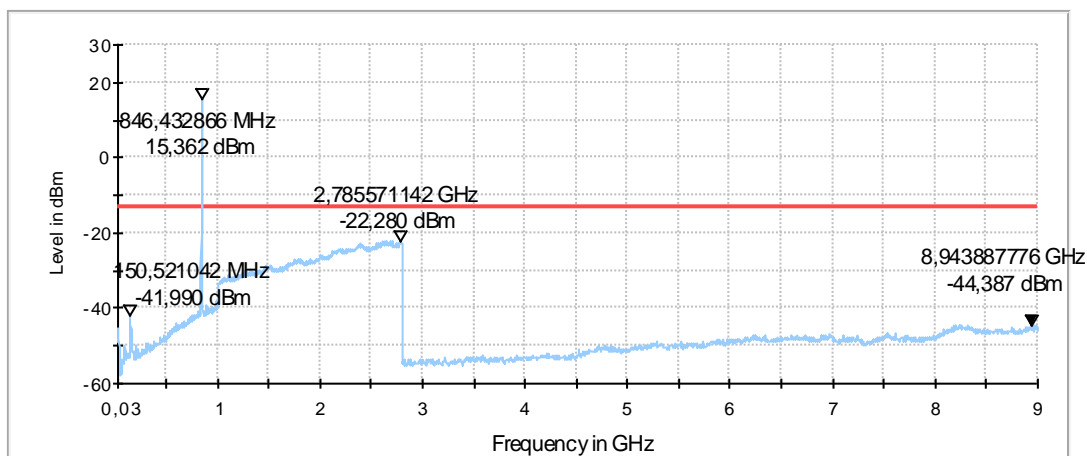
Test Description:	Radiated Spurious Emissions UMTS FDD V
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part 22
Operation mode:	UMTS FDDV, HSUPA, Channel 4233 (UL 846,6MHz)
Environmental Conditions:	Humidity: 58%rH; Temperature: 20°C
Operator Name:	YZH

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_UMTS-FDDV_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

