

Annex 1: Measurement diagrams 21-1-0178701T020a-C02-A1

Number of pages:	17	Date of Report:	2023-Jun-13
Testing company:	cetecom advanced GmbH Im Teelbruch 116 45219 Essen Germany Tel. + 49 (0) 20 54 / 95 19-0 Fax: + 49 (0) 20 54 / 95 19-150	Applicant:	Actia Nordic AB
Product:	Telematic Device		
Model:	104760201		
FCC ID:	2AGKK104760201	IC:	20839-104760201

Testing has been carried out in accordance with:

FCC Regulations

Title 47 CFR, Chapter I, Subchapter A

Part 15, Subpart C Intentional Radiators

§ 15.209 Radiated emission limits; general requirements

Title 47 CFR, Chapter I, Subchapter B

Part 22, Subpart H Cellular Radiotelephone Service

Part 24, Subpart E Paging and Radiotelephone Service

ISED-Regulations

Radio Standards Specification

RSS-Gen, Issue 5

General Requirements for Compliance of Radio Apparatus

RSS-132, Issue 4

Cellular Telephone Systems Operating in the Bands 824-849 MHz and 869-894 MHz

RSS-133, Issue 6, Amendment 1

2 GHz Personal Communications Services

Table of Contents

1	Measurement diagrams.....	3
---	---------------------------	---

1 Measurement diagrams

2.1901_H_field_GSM_1900_CH_810_laying

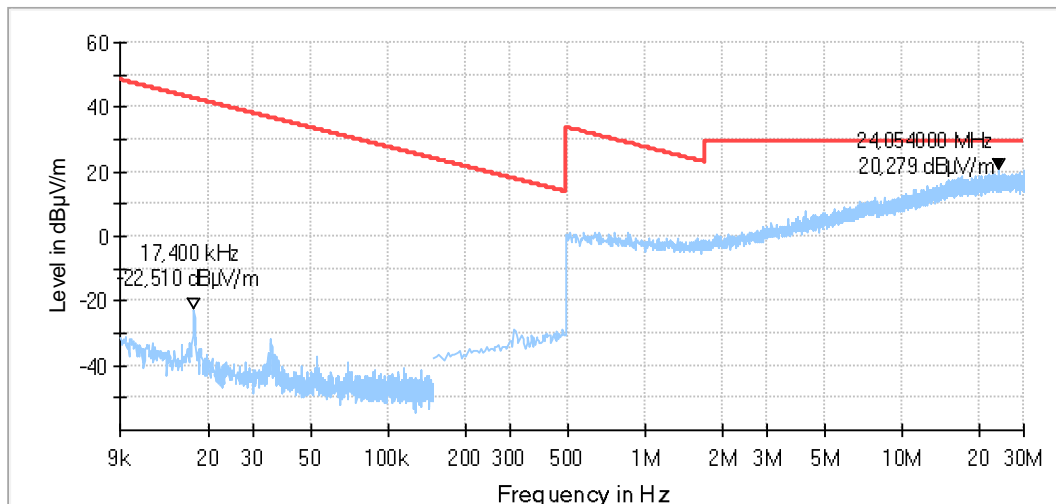
Common Information

Test description:	Magnetic Field Strength Measurement related to 30/300 m distance
Test Site Location:	Ref.-Nr. 441 Semi Anechoic Chamber (SAC1) with 3 m measurement distance
Version of Testsoftware:	EMC32 V10.50.0
Distance correction:	used accord. table, pls. see test report
Technical Data:	Please see page 2 for detailed data of measurement setup
Rec. antenna (pre-scan):	height 1.00 m, parallel and 90° to EUT polarisation
Used filter:	bypass
Test Standard:	FCC 15.205 § 15.209; RSS-Gen: Issue 5
Operator:	HLa
Operating Mode:	GSM_1900_CH_810
Power during tests:	12 V DC
Verdict:	Passed

EUT Information

PMT number	21-1-01787S50_C01
------------	-------------------

Full Spectrum



2.1902_H_field_GSM_1900_CH_810_standing

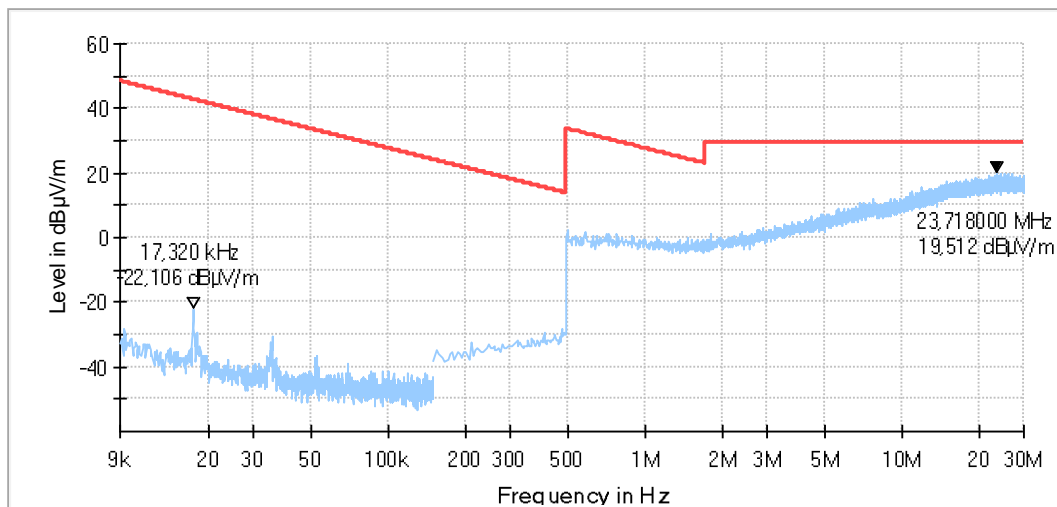
Common Information

Test description:	Magnetic Field Strength Measurement related to 30/300 m distance
Test Site Location:	Ref.-Nr. 441 Semi Anechoic Chamber (SAC1) with 3 m measurement distance
Version of Testsoftware:	EMC32 V10.50.0
Distance correction:	used accord. table, pls. see test report
Technical Data:	Please see page 2 for detailed data of measurement setup
Rec. antenna (pre-scan):	height 1.00 m, parallel and 90° to EUT polarisation
Used filter:	bypass
Test Standard:	FCC 15.205 § 15.209; RSS-Gen: Issue 5
Operator:	HLA
Operating Mode:	GSM_1900_CH_810
Power during tests:	12 V DC
Verdict:	Passed

EUT Information

PMT number	21-1-01787550_C01
------------	-------------------

Full Spectrum



2.850_H_field_GSM_850_CH_251_laying

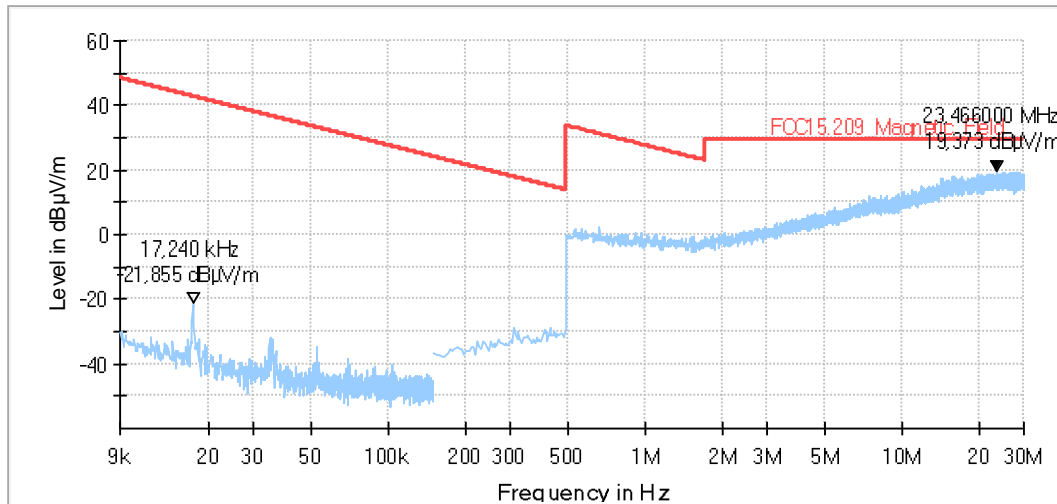
Common Information

Test description:	Magnetic Field Strength Measurement related to 30/300 m distance
Test Site Location:	Ref.-Nr. 441 Semi Anechoic Chamber (SAC1) with 3 m measurement distance
Version of Testsoftware:	EMC32 V10.50.0
Distance correction:	used accord. table, pls. see test report
Technical Data:	Please see page 2 for detailed data of measurement setup
Rec. antenna (pre-scan):	height 1.00 m, parallel and 90° to EUT polarisation
Used filter:	bypass
Test Standard:	FCC 15.205 § 15.209; RSS-Gen: Issue 5
Operator:	HLa
Operating Mode:	GSM_850_CH_251
Power during tests:	12 V DC
Verdict:	Passed

EUT Information

PMT number	21-1-01787550_C01
------------	-------------------

Full Spectrum



2.851_H_field_GSM_850_CH_251_laying

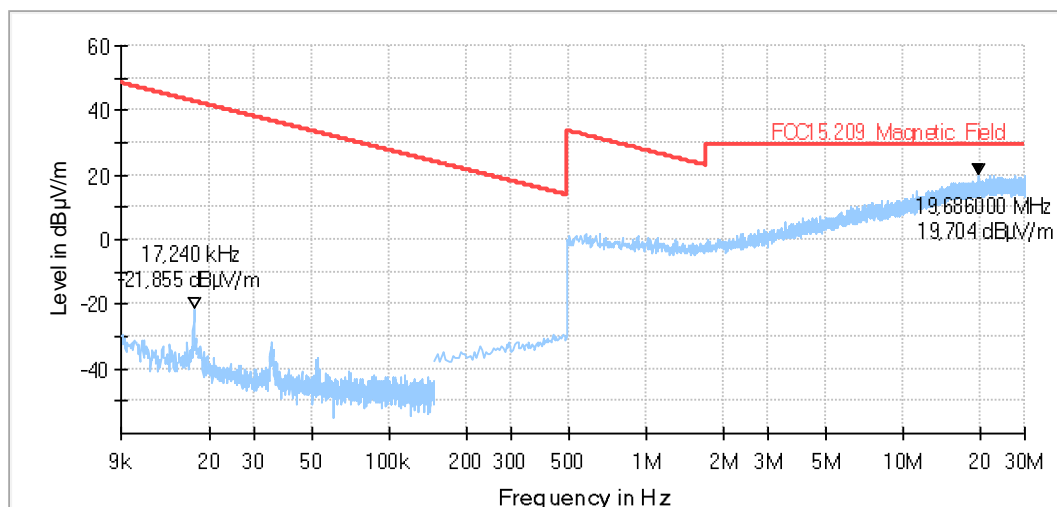
Common Information

Test description:	Magnetic Field Strength Measurement related to 30/300 m distance
Test Site Location:	Ref.-Nr. 441 Semi Anechoic Chamber (SAC1) with 3 m measurement distance
Version of Testsoftware:	EMC32 V10.50.0
Distance correction:	used accord. table, pls. see test report
Technical Data:	Please see page 2 for detailed data of measurement setup
Rec. antenna (pre-scan):	height 1.00 m, parallel and 90° to EUT polarisation
Used filter:	bypass
Test Standard:	FCC 15.205 § 15.209; RSS-Gen: Issue 5
Operator:	HLa
Operating Mode:	GSM_850_CH_251
Power during tests:	12 V DC
Verdict:	Passed

EUT Information

PMT number	21-1-01787550_C01
------------	-------------------

Full Spectrum



8.01_Traffic_mode_GSM_850_CH_251

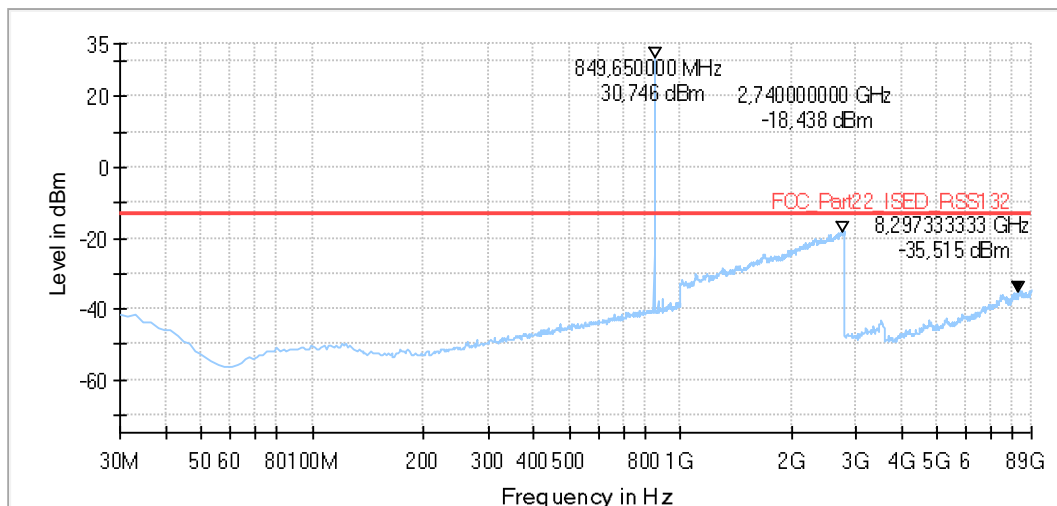
Common Information

Test Description:	Radiated emission related to 1m
Test Site:	Fully Anechoic Chamber (FAC1) - EMC32 V10.60.20
Test Standard:	FCC FCC Part 24.238 Broadband PCS
Antenna polarisation:	vertical / horizontal
Operating Mode:	GPRS850
Operator:	Lor
Comment:	External Antenna
Environmental Conditions::	Humidity : 44% rH; Temperature: 20 °C
EUT Setup:	1
Verdict:	Passed

EUT Information

PMT number:	21-1-01787S52_C01
-------------	-------------------

Full Spectrum



Remark: Emission at 849.65 MHz is uplink frequency of GSM 850 and not related to spurious emission results.

8.02a_RSE_TX_Ch810_GMSK_1TXSlot_ExtAntenna

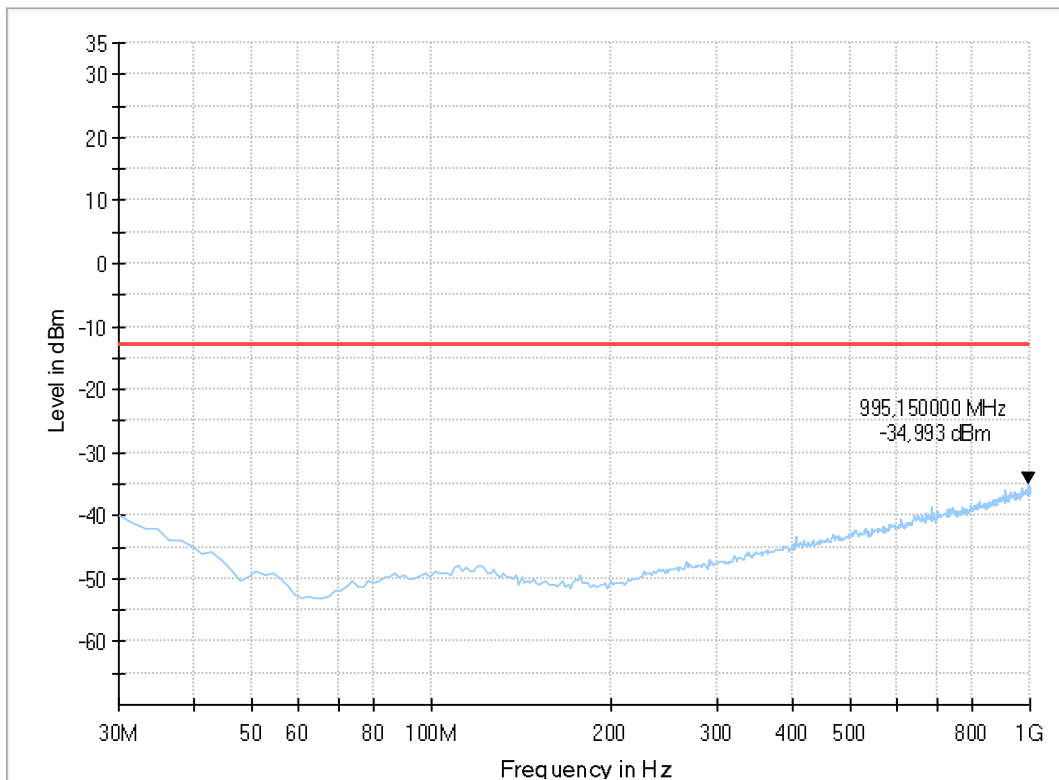
Common Information

Test Description:	Radiated emission related to 1m
Test Site:	Fully Anechoic Chamber (FAC1) - EMC32 V10.60.20
Test Standard:	FCC FCC Part 24.238 Broadband PCS
Antenna polarisation:	vertical / horizontal
Operating Mode:	TCH 1900, Ch810
Operator:	Lor
Comment:	EUT standing
Environmental Conditions:	Tnom,Vnom
EUT Setup:	External Antenna
Verdict:	Passed

EUT Information

PMT Sample Nr.	21-1-01787552_C01
Set-up:	External Antenna

Full Spectrum



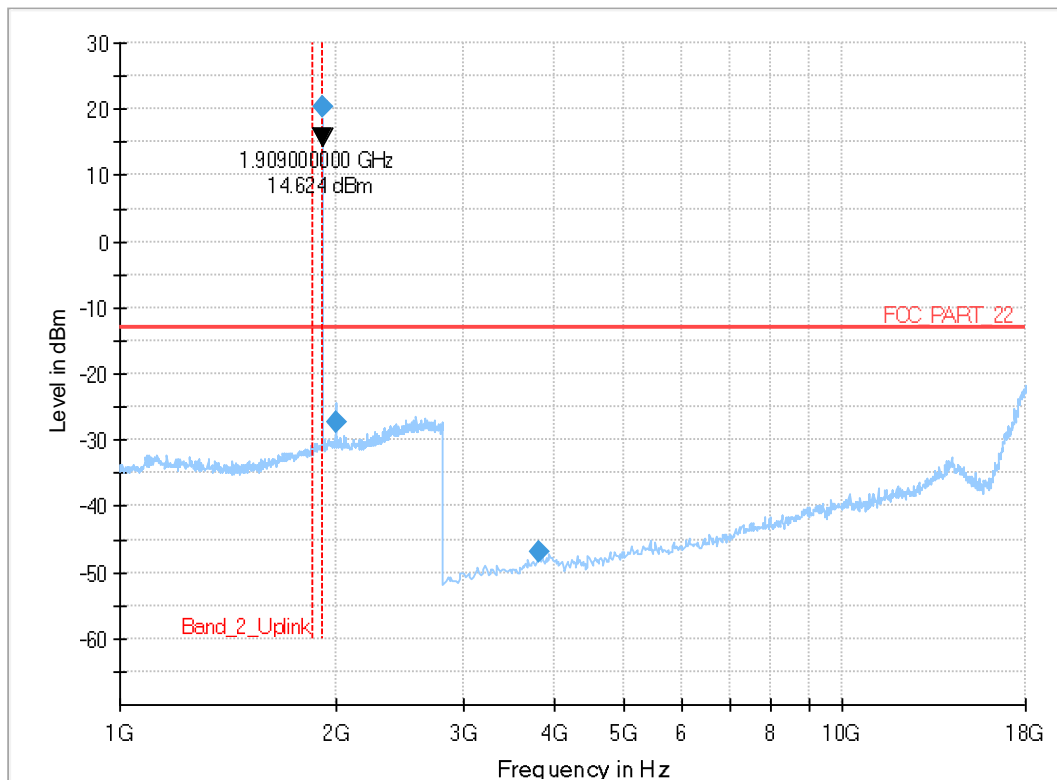
8.02b_RSE_TX_Ch810_GMSK_1TXSlot_ExtAntenna_EUT_standing

Common Information

Test Description:	Radiated emission related to 1m
Test Site:	FAR
Test Standard:	FCC FCC Part 24.238 Broadband PCS
Antenna polarisation:	vertical / horizontal
Operating Mode:	TCH 1900, Ch810
Operator:	Lor
Comment:	EUT standing
Environmental Conditions:	Tnom,Vnom
EUT Setup:	External Antenna
Verdict:	Passed

EUT Information

PMT Sample Nr.	21-1-01787552_C01
Set-up:	External Antenna
	Full Spectrum



Remark: Emission at 1909.0 MHz is uplink frequency of GSM 1900 and not related to spurious emission results.

Final Result

Frequency (MHz)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Sig Path (dB)	Preamp (dB)	Trd Corr. (dB)
1909.860000	-13.00	-33.27	50.0	150.0	V	333.0	-62.2	5.3	47.6	-115.1
1989.939000	-13.00	14.46	50.0	150.0	V	103.0	-62.0	5.4	48.0	-115.3
3819.685000	-13.00	34.00	50.0	150.0	V	342.0	-97.8	-35.1	53.6	-116.3

(continuation of the "Final_Result" table from column 19 ...)

Frequency (MHz)	Raw Rec (dB μ V)	Comment
1909.860000	82.5	11:23:06 AM - 11/21/2022
1989.939000	34.5	11:21:22 AM - 11/21/2022
3819.685000	50.8	11:31:34 AM - 11/21/2022

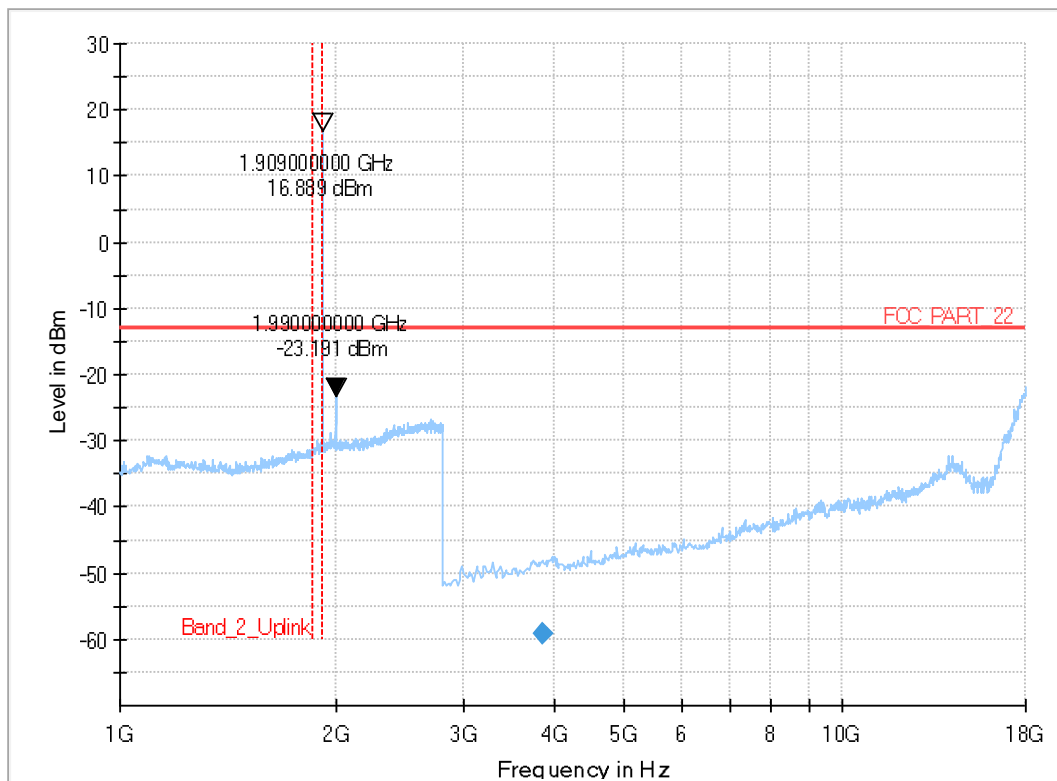
8.02c_RSE_TX_Ch810_GMSK_1TXSlot_ExtAntenna_ EUT_laying

Common Information

Test Description: Radiated emission related to 1m
 Test Site: FAC2
 Test Standard: FCC Part 24.238 Broadband PCS / RSS-133
 Antenna polarisation: vertical / horizontal
 Operating Mode: TCH 1900, Ch810
 Operator: Lor
 Comment: EUT laying
 Environmental Conditions: Tnom,Vnom
 EUT Setup: External Antenna
 Verdict: Passed

EUT Information

PMT Sample Nr. 21-1-01787552_C01
 Full Spectrum



Remark: Emission at 1909.0 MHz is uplink frequency of GSM 1900 and not related to spurious emission results.

Final Result

Frequency (MHz)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Sig Path (dB)	Preamp (dB)	Trd Corr. (dB)
3849.035000	-13.00	46.11	50.0	150.0	V	18.0	-97.7	-35.0	53.7	-116.3

(continuation of the "Final Result" table from column 19 ...)

Frequency (MHz)	Raw Rec (dBμV)	Comment
3849.035000	38.6	11:52:27 AM - 11/21/2022

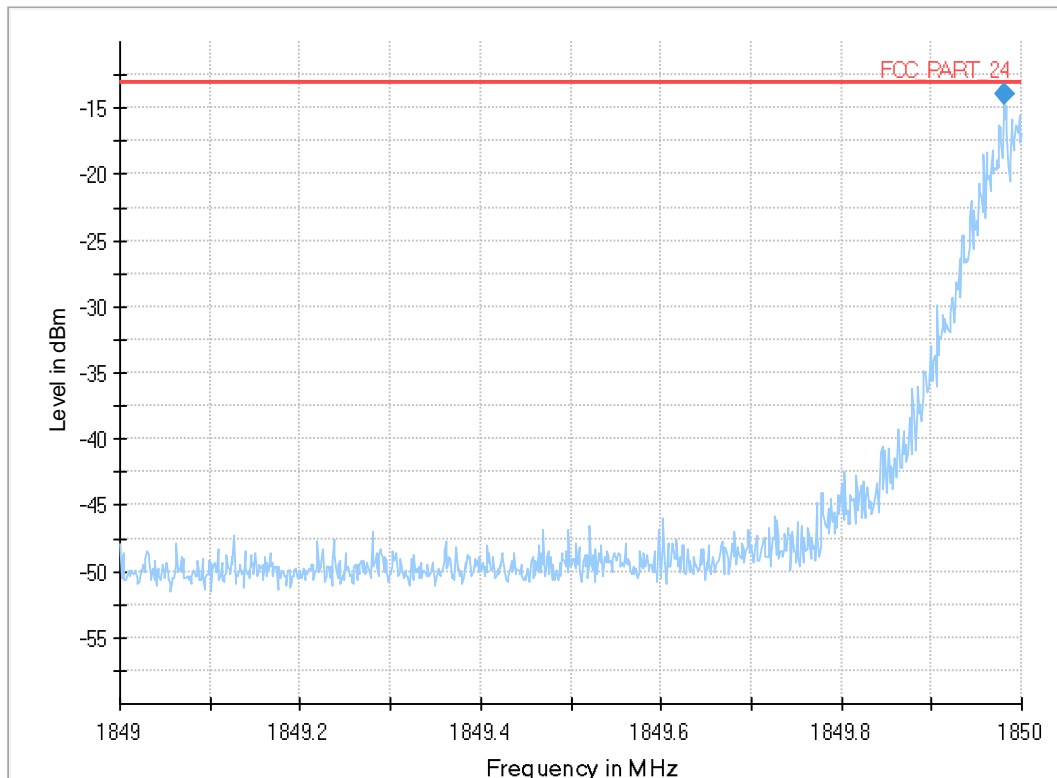
9.01a_BE_Ch512_GMSK_1TXSlot_ExtAntenna_EUT_standing

Common Information

Test Description: Radiated Spurious Emissions at band-edge low for GSM1900
 Test Site Location: CETECOM GmbH Essen
 Test Site: Fully Anechoic Room (FAR2)
 Test Standard: FCC Part 24.238 / RSS-133
 Comm. Link: GSM1900, Voice/EDGE
 Operating Mode: MS allocated channel 512 (UL = 1850.2MHz)
 Environmental Conditions: Humidity: 44% rH; Temperature: 19.5 °C
 Operator: Lor
 EUT Setup: External Antenna
 Verdict: Passed

EUT Information

PMT Sample Nr. 21-1-01787552_C01
 Full Spectrum



Final Result

Frequency (MHz)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Sig Path (dB)	Preamp (dB)	Trd Corr. (dB)
1849.980000	-13.00	1.00	1000.0	150.0	V	5.0	-63.0	5.4	47.3	-115.7

(continuation of the "Final Result" table from column 19 ...)

Frequency (MHz)	Raw Rec (dBμV)	Comment
1849.980000	49.0	1:26:36 PM - 11/21/2022

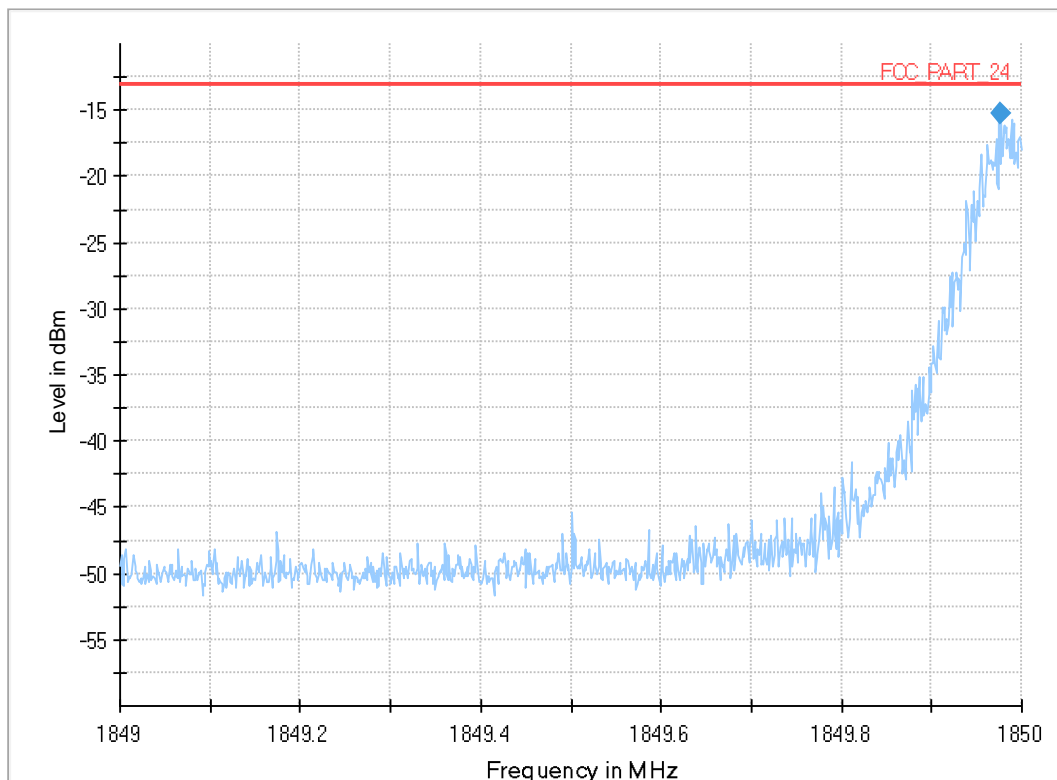
9.01b_BE_Ch512_GMSK_1TXSlot_ExtAntenna_EUT_laying

Common Information

Test Description: Radiated Spurious Emissions at band-edge low for GSM1900
 Test Site Location: CETECOM GmbH Essen
 Test Site: Fully Anechoic Room (FAR2)
 Test Standard: FCC Part 24.238 / RSS-133
 Comm. Link: GSM1900, Voice/EDGE
 Operating Mode: MS allocated channel 512 (UL = 1850.2MHz)
 Environmental Conditions: Humidity: 44% rH; Temperature: 19.5 °C
 Operator: Lor
 EUT Setup: External Antenna
 Verdict: Passed

EUT Information

PMT Sample Nr. 21-1-01787552_C01
 Full Spectrum



Final Result

Frequency (MHz)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Sig Path (dB)	Preamp (dB)	Trd Corr. (dB)
1849.977500	-13.00	2.20	1000.0	150.0	V	180.0	-63.0	5.4	47.3	-115.7

(continuation of the "Final Result" table from column 19 ...)

Frequency (MHz)	Raw Rec (dBμV)	Comment
1849.977500	47.8	1:12:48 PM - 11/21/2022

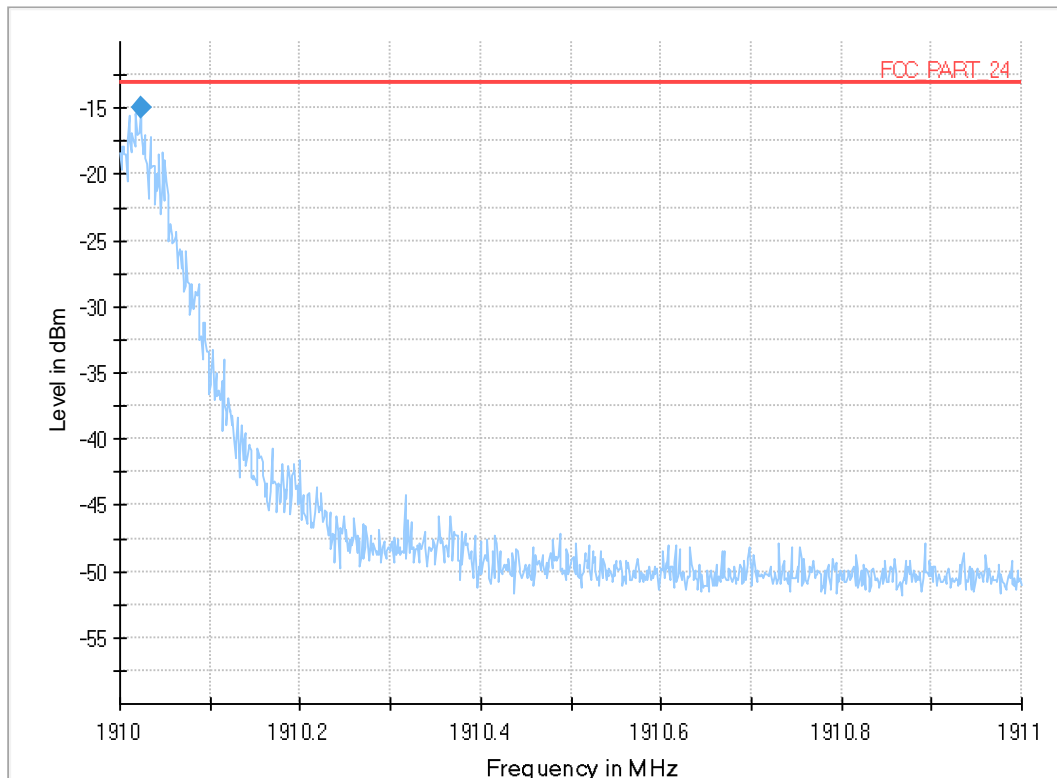
9.02a_BE_Ch810_GMSK_1TXSlot_ExtAntenna_ EUT_standing

Common Information

Test Description:	Radiated Spurious Emissions at band-edge high for GSM1900
Test Site Location:	CETECOM GmbH Essen
Test Site:	Fully Anechoic Room (FAR2)
Test Standard:	FCC Part 24.238 / RSS-133
Comm. Link:	GSM1900, Voice/EDGE
Operating Mode:	MS allocated channel 810 (UL = 1909.8MHz)
Environmental Conditions:	Humidity: 44% rH; Temperature: 19.5 °C
Operator:	Lor
EUT Setup:	External Antenna
Verdict:	Passed

EUT Information

PMT Sample Nr. 21-1-01787552_C01
Full Spectrum



Final_Result

Frequency (MHz)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Sig Path (dB)	Preamp (dB)	Trd Corr. (dB)
1910.022500	-13.00	1.93	1000.0	150.0	V	179.0	-62.2	5.3	47.6	-115.1

(continuation of the "Final_Result" table from column 19 ...)

Frequency (MHz)	Raw Rec (dBμV)	Comment
1910.022500	47.3	1:33:38 PM - 11/21/2022

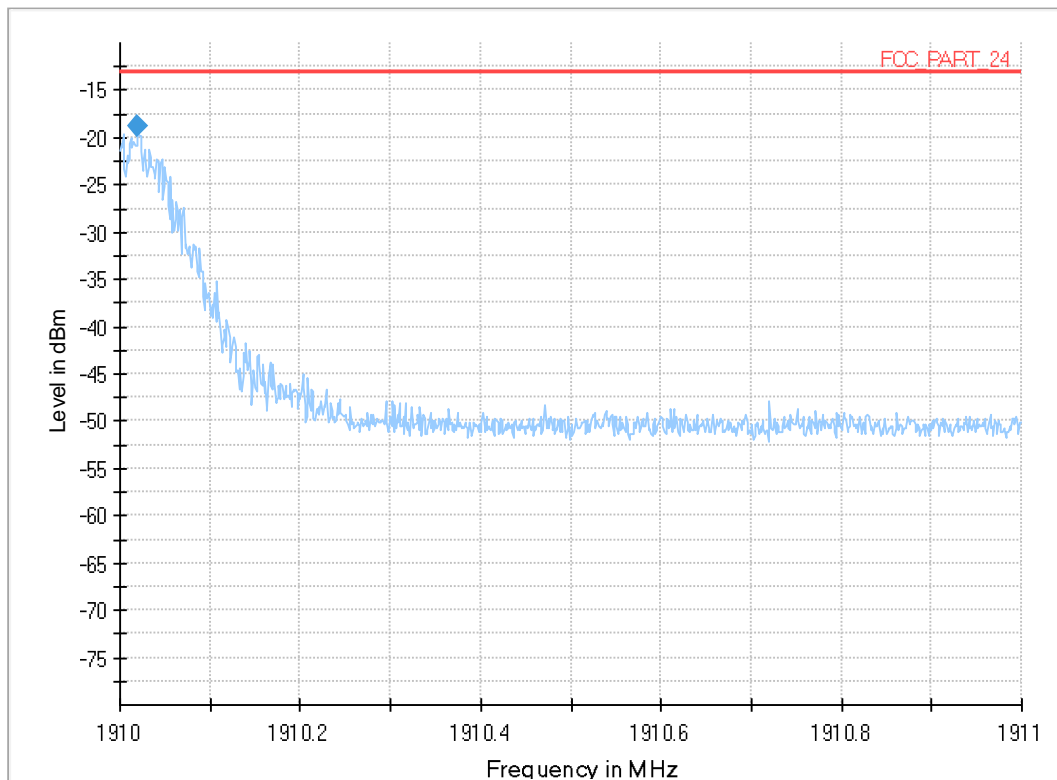
9.02b_BE_Ch810_GMSK_1TXSlot_ExtAntenna_EUT_laying

Common Information

Test Description: Radiated Spurious Emissions GSM1900
 Test Site Location: CETECOM GmbH Essen
 Test Site: Fully Anechoic Room (FAR2)
 Test Standard: FCC Part 24.238 / RSS-133
 Comm. Link: GSMK1900
 Operating Mode: MS allocated channel 810 (UL = 1909.8MHz)
 Exclusionband: 1850- 1910MHz
 Environmental Conditions: Humidity: 44% rH; Temperature: 19.4 °C
 Operator: Lor
 EUT Setup: External Antenna
 Verdict: Passed

EUT Information

PMT Sample Nr. 21-1-01787552_C01
 Full Spectrum



Final Result

Frequency (MHz)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Sig Path (dB)	Preamp (dB)	Trd Corr. (dB)
1910.020000	-13.00	5.71	1000.0	150.0	H	141.0	-62.2	5.3	47.6	-115.1

(continuation of the "Final Result" table from column 19 ...)

Frequency (MHz)	Raw Rec (dBμV)	Comment
1910.020000	43.5	12:56:32 PM - 11/21/2022

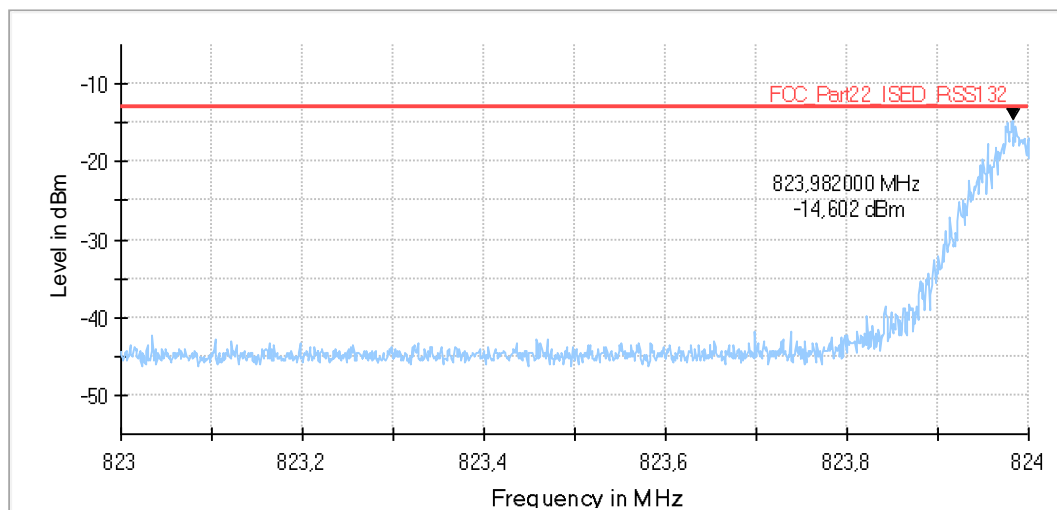
9.850_Bandedge_low_Channel_128_UL_824.2

Common Information

Test Description:	Radiated emission related to 1m
Test Site:	Fully Anechoic Chamber (FAC1) - EMC32 V10.60.20
Test Standard:	FCC FCC Part 24.238 Broadband PCS
Antenna polarisation:	vertical / horizontal
Operating Mode:	GPRS850
Operator:	Lor
Environmental Conditions::	Humidity: 50% rH, Temperature: 20 °C
EUT Setup:	2, External Antenna
Verdict:	Passed

EUT Information

PMT number:	21-1-01787S52_C01
	Full Spectrum



9.851_Bandedge_high_Channel_251_UL_848.8

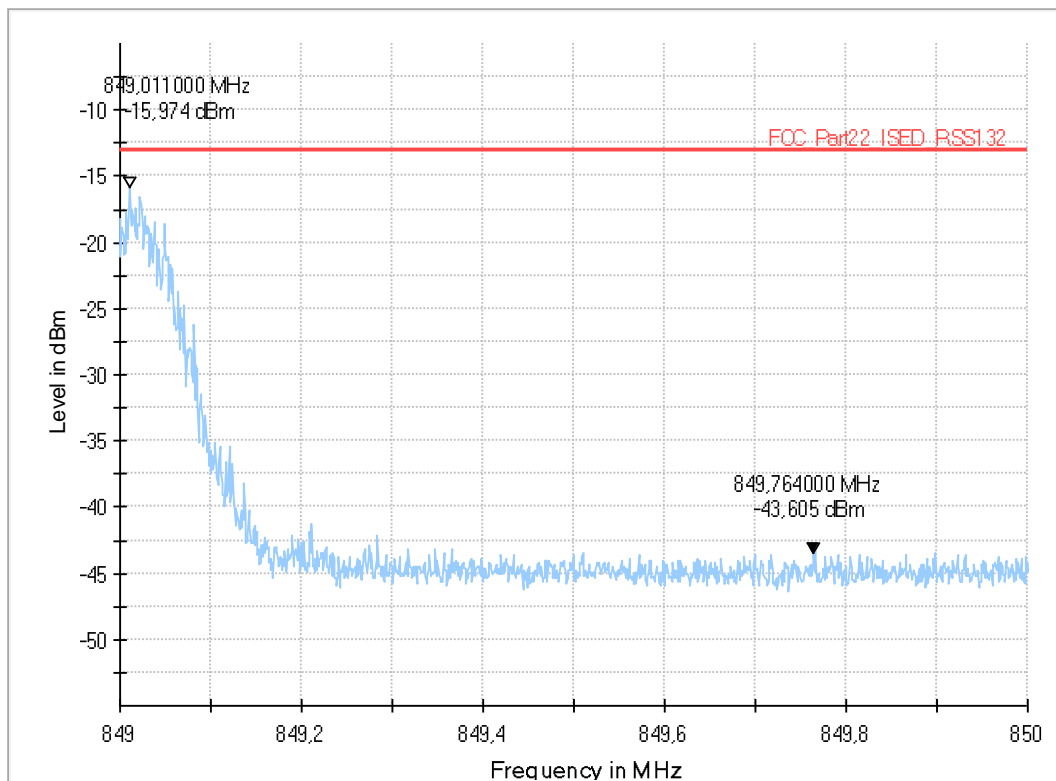
Common Information

Test Description:	Radiated emission related to 1m
Test Site:	Fully Anechoic Chamber (FAC1) - EMC32 V10.60.20
Test Standard:	FCC FCC Part 22
Antenna polarisation:	vertical / horizontal
Operating Mode:	TCH 850, CHANNEL 251
Operator:	npe
Comment:	External Antenna
Environmental Conditions:	Humidity: 50% rH, Temperature: 20 °C
EUT Setup:	2
Verdict:	Passed

EUT Information

PMT number:	21-1-01787552_C01
-------------	-------------------

Full Spectrum



End Of Annex 1