

Annex 1: Measurement diagrams

23-1-0035501T003a-A1-C01

Number of pages:	14	Date of Report:	2024-Sep-03
Testing company:	cetecom advanced GmbH Untertuerkheimer Str. 6-10 66117 Saarbruecken GERMANY	Applicant:	Schmitz Cargobull AG
Product: Model:	Telematic Device CTU-Pro		
FCC ID:	2BBVQ-CTUPRO	IC:	N/A
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		

1 Radiated field strength emissions < 30 MHz

2.850_H_field_GSM_850_CH_251

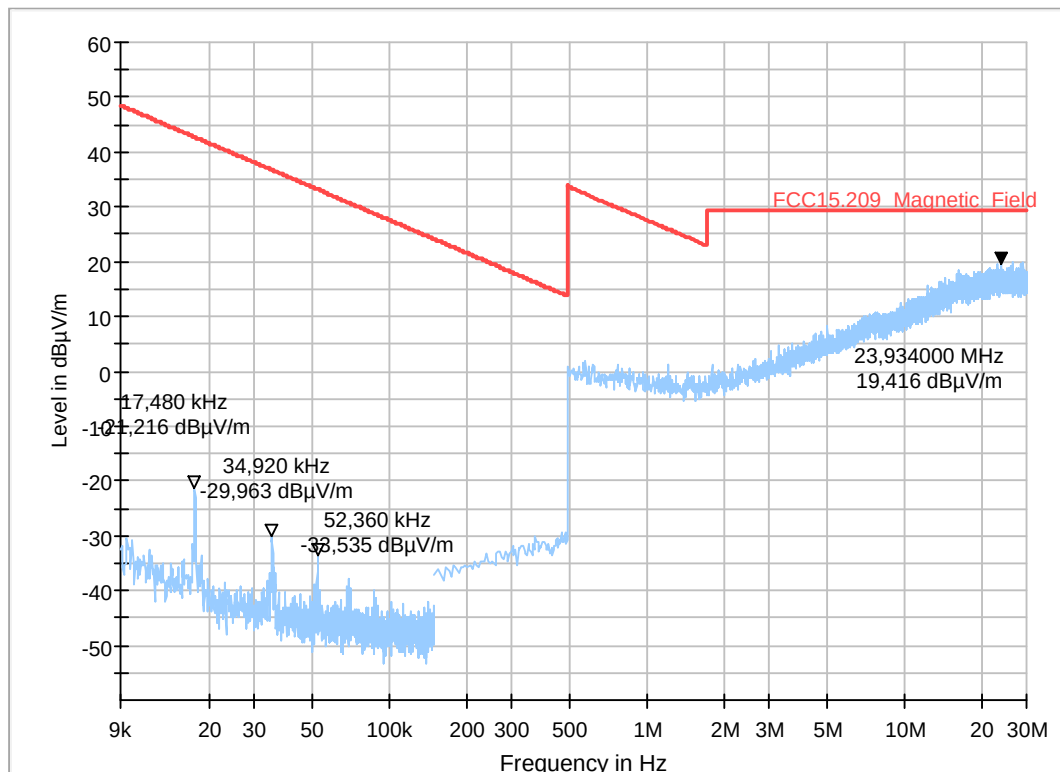
Common Information

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:	ASa-Dma
Operating Mode:	GSM850 ch251
Environmental Conditions:	Humidity : 40% rH; Temperature: 20 °C
EUT Setup:	EUT Laying position
Verdict:	Passed

EUT Information

PMT number:	23-1-00355S04_C01
Power supply:	12 V DC

Full Spectrum



Remark: Emission in the lower frequency range are caused by an electrical antenna mast inside the chamber and are not caused by the EUT

2.851_H_field_GSM_850_CH_251

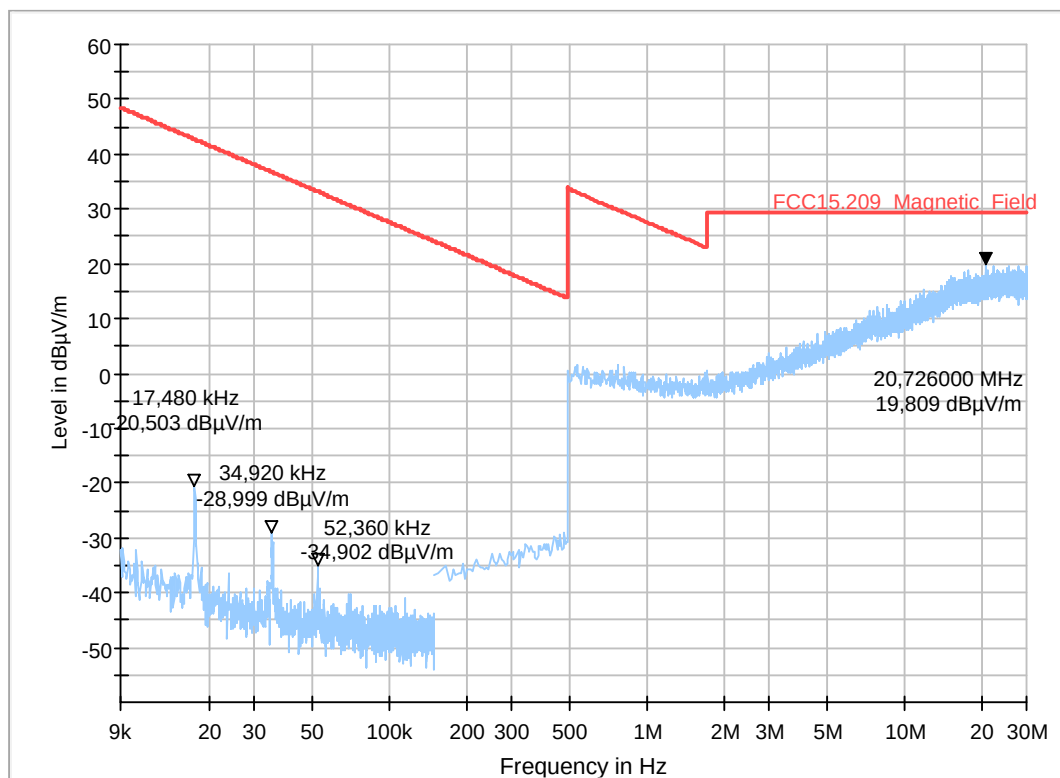
Common Information

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:	ASa-Dma
Operating Mode:	GSM850 ch251
Environmental Conditions:	Humidity : 40% rH; Temperature: 20 °C
EUT Setup:	EUT Standing position
Verdict:	Passed

EUT Information

PMT number:	23-1-00355S04_C01
Power supply:	12 V DC

Full Spectrum



Remark: Emission in the lower frequency range are caused by an electrical antenna mast inside the chamber and are not caused by the EUT

2.1901_H_field_GSM_1900

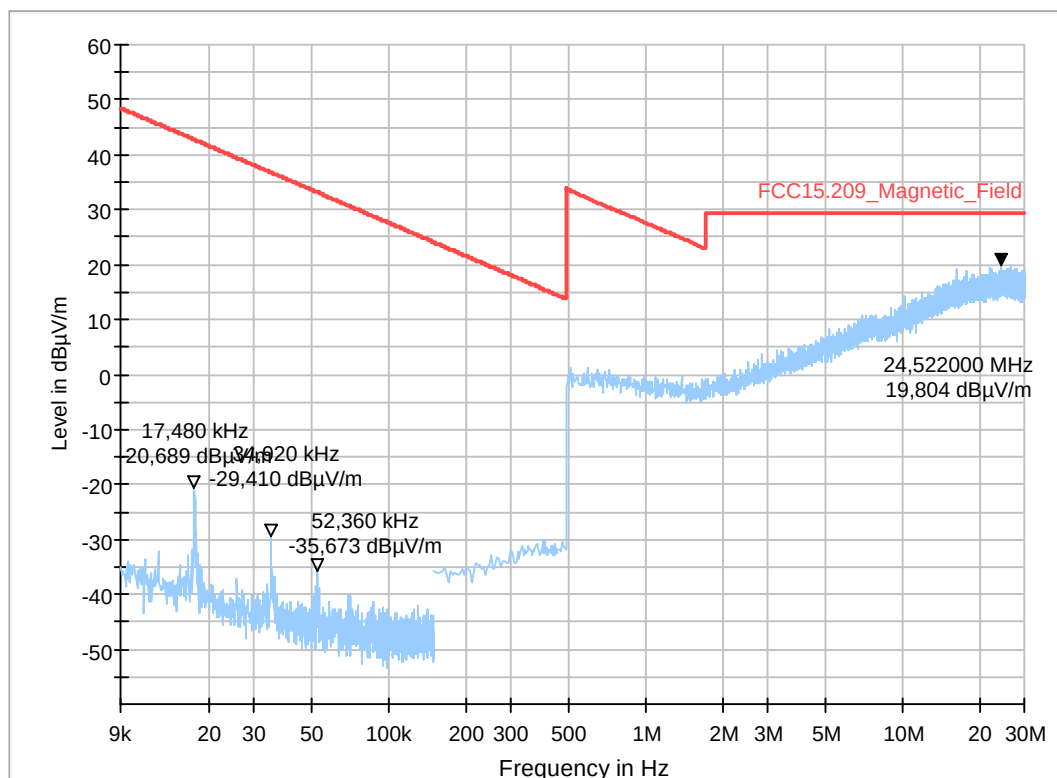
Common Information

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:	ASa-Dma
Operating Mode:	GSM1900 ch810
Environmental Conditions:	Humidity : 40% rH; Temperature: 20 °C
EUT Setup:	EUT Laying position
Verdict:	Passed

EUT Information

PMT number:	23-1-00355S04_C01
Power supply:	12 V DC

Full Spectrum



Remark: Emission in the lower frequency range are caused by an electrical antenna mast inside the chamber and are not caused by the EUT

2.1902_H_field_GSM_1900

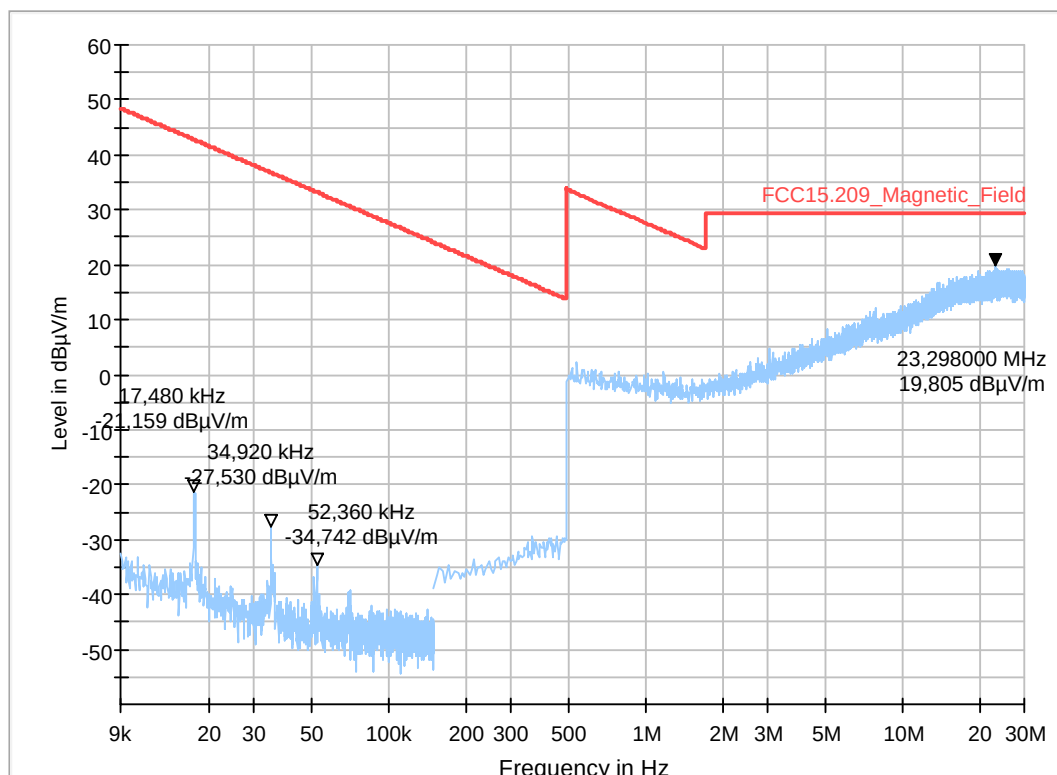
Common Information

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:	ASa-Dma
Operating Mode:	GSM1900 ch810
Environmental Conditions:	Humidity : 40% rH; Temperature: 20 °C
EUT Setup:	EUT Standing position
Verdict:	Passed

EUT Information

PMT number:	23-1-00355S04_C01
Power supply:	12 V DC

Full Spectrum



Remark: Emission in the lower frequency range are caused by an electrical antenna mast inside the chamber and are not caused by the EUT

2 Radiated spurious emissions > 30 MHz

8.01_Traffic_mode_GSM_850_CH_251

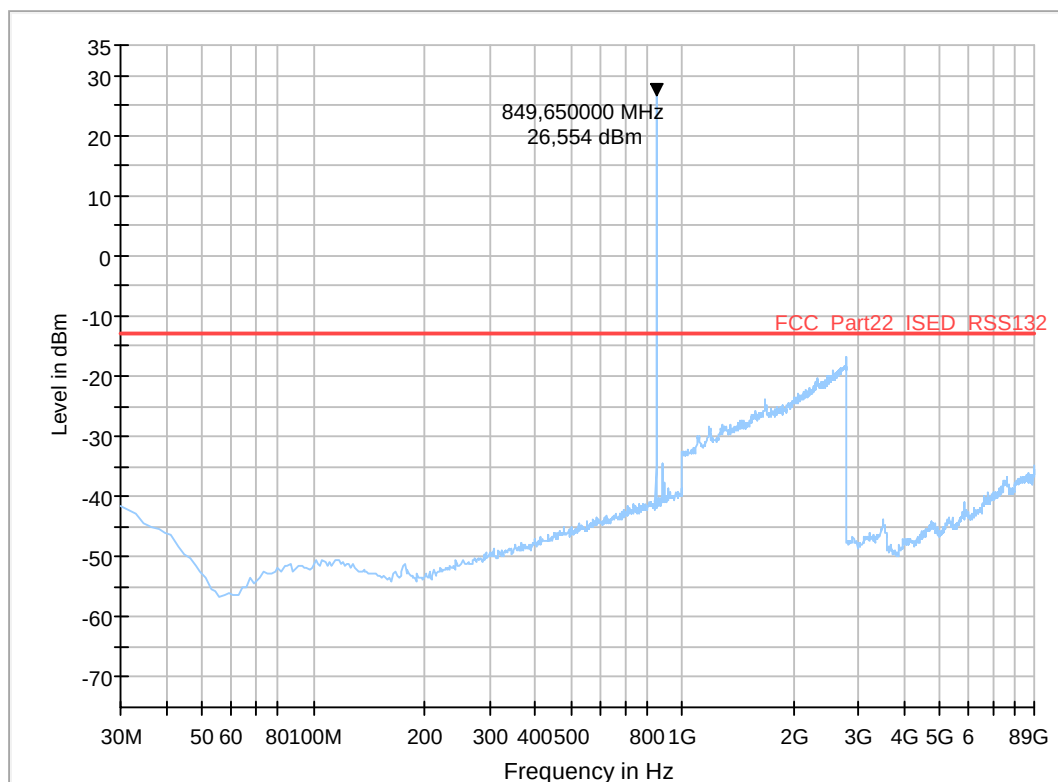
Common Information

Test Description:	Radiated Spurious Emissions
Test Site:	Fully Anechoic Chamber (FAC1) - EMC32 V10.60.20
Test Standard:	FCC Part 22
Antenna polarisation:	vertical / horizontal
Operating Mode:	GSM850 ch251
Operator:	Maa
Environmental Conditions:	Humidity : 40% rH; Temperature: 20 °C
EUT Setup:	1
Verdict:	Passed

EUT Information

PMT number:	23-1-00355S04_C01
Power Supply:	12 V DC

Full Spectrum



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

8.02_RSE_TX_GSM1900

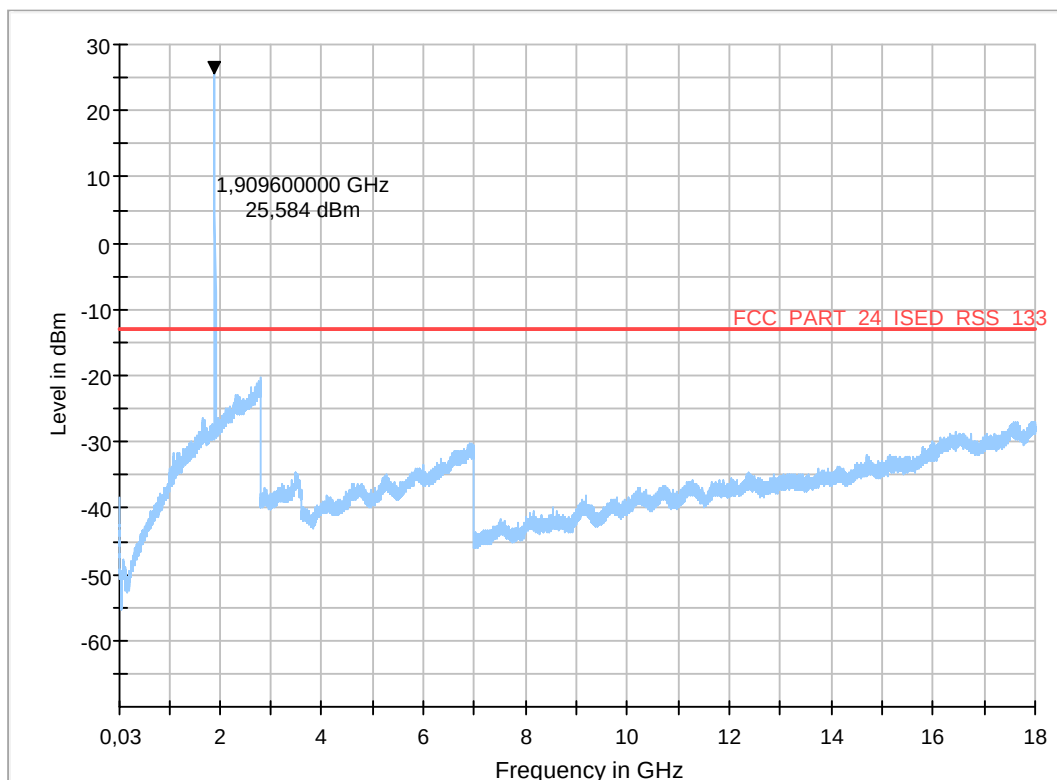
Common Information

Test Description:	Radiated Spurious Emissions
Test Site:	Fully Anechoic Chamber (FAC1) - EMC32 V10.60.20
Test Standard:	FCC Part 24
Antenna polarisation:	vertical / horizontal
Operating Mode:	GSM1900 ch810
Operator:	Maa
Environmental Conditions:	Humidity : 40% rH; Temperature: 20 °C
EUT Setup:	1
Verdict:	Passed

EUT Information

PMT number:	23-1-00355S04_C01
Power Supply:	12 V DC

Full Spectrum



Remark: Emission at 1909.6 MHz is uplink frequency of GSM 1900 and not related to spurious emission results.

8.03a_RSE_TX_GSM1900_EUT_Laying

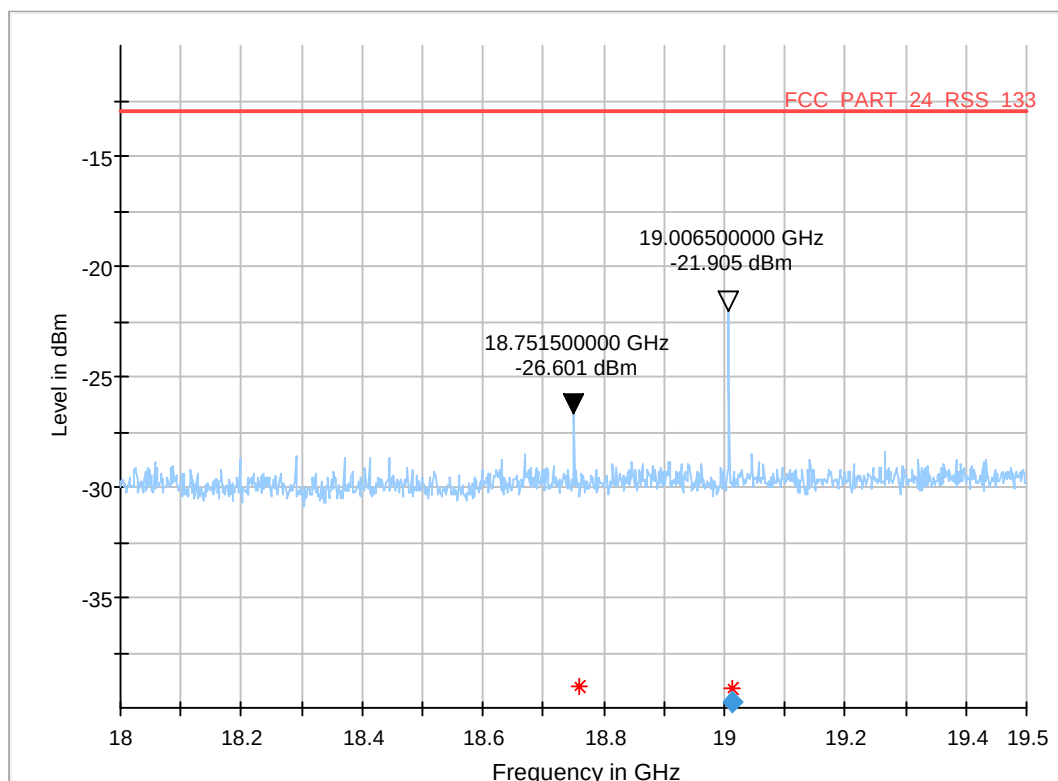
Common Information

Test Description:	Radiated Spurious Emissions
Test Site:	Fully Anechoic Room (FAR2)
Test Standard:	FCC Part 24
Operating Mode:	GSM1900 ch810
Environmental Conditions:	Humidity: 19.6% rH; Temperature: 63 °C
Operator:	Lor
Verdict:	Passed

EUT Information

PMT number:	23-1-00355S04_C01
Power Supply:	12 V DC

Full Spectrum



Final Result

Frequency (MHz)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Trd Corr. (dB)
18760.020000	-13.00	27.14	500.0	155.0	V	110.0	0.0	-122.4
19013.340000	-13.00	26.70	500.0	155.0	H	5.0	0.0	-122.5

Remark: manual check and retest of emission at 19.013 GHz in diagram No. 8.03c

8.03b_RSE_TX_GSM1900_EUT_Standing

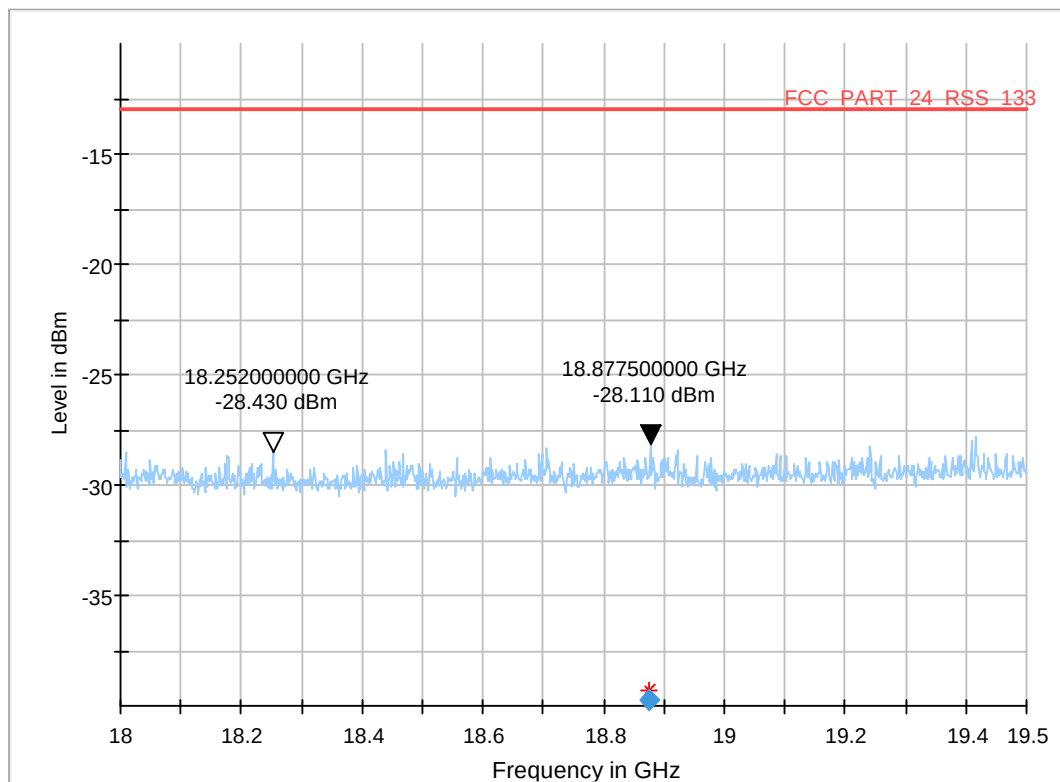
Common Information

Test Description:	Radiated Spurious Emissions
Test Site:	Fully Anechoic Room (FAR2)
Test Standard:	FCC Part 24
Operating Mode:	GSM1900 ch810
Environmental Conditions:	Humidity: 19.6% rH; Temperature: 63 °C
Operator:	Lor
Verdict:	Passed

EUT Information

PMT number:	23-1-00355S04_C01
Power Supply:	12 V DC

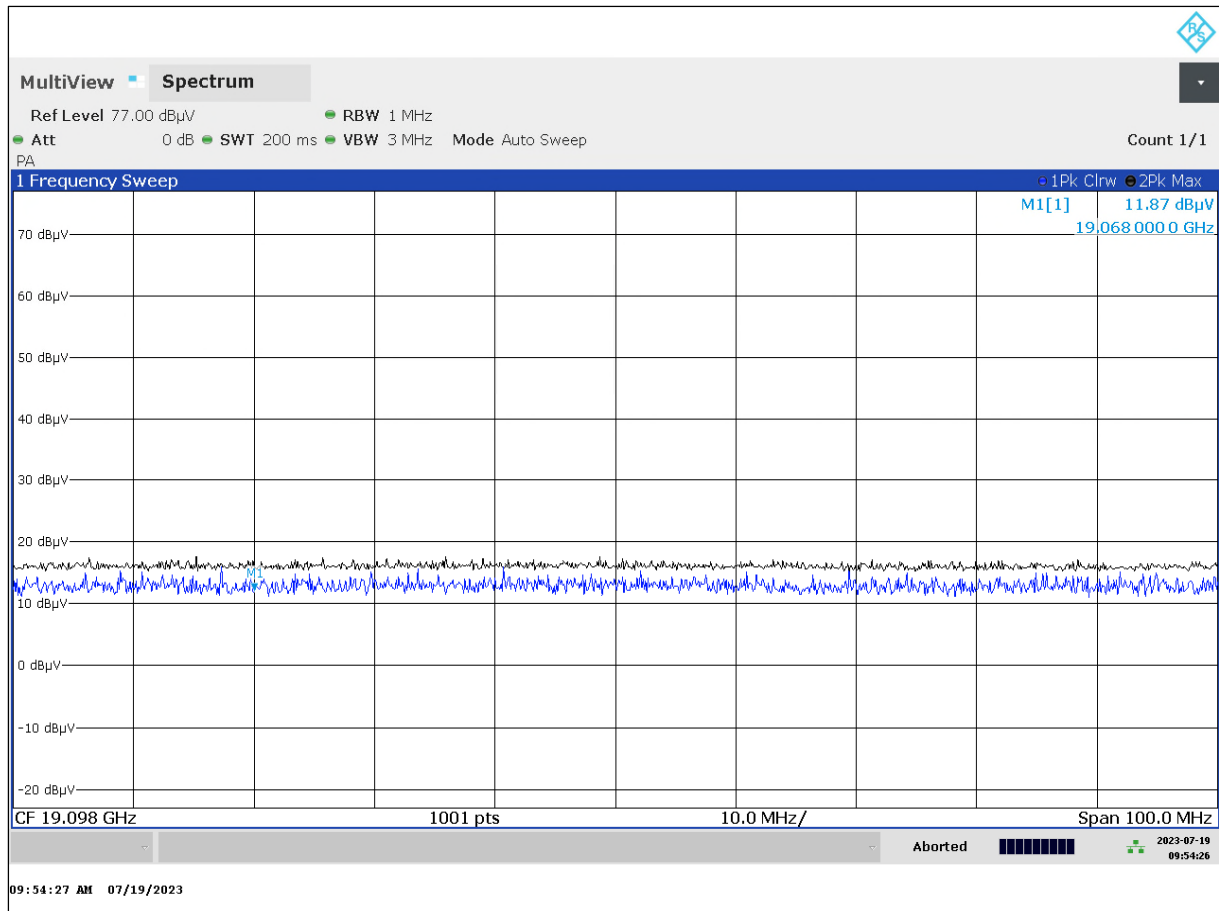
Full Spectrum



Final Result

Frequency (MHz)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)	Trd Corr. (dB)
18873.540000	-13.00	26.76	500.0	155.0	H	230.0	90.0	-56.1	-122.4

8.03c_RSE_TX_GSM1900_EUT Laying_Manual_Retest_critical_frequency



9.01_Bandedge_low_Channel_128

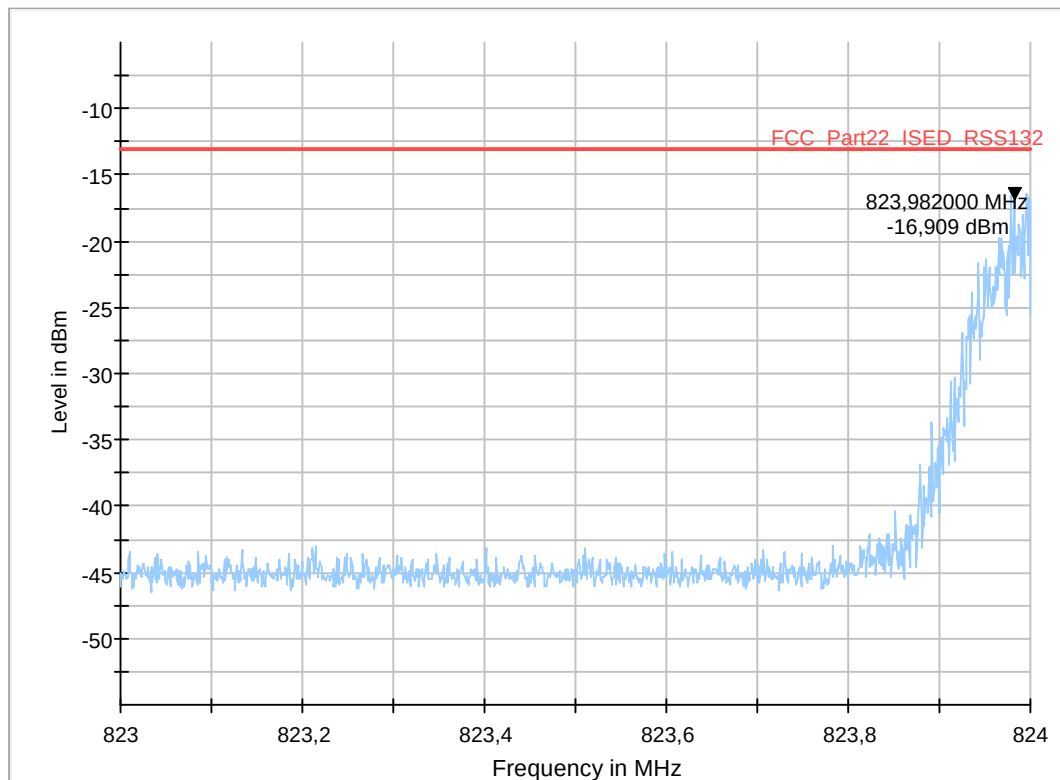
Common Information

Test Description:	Radiated emission
Test Site:	Fully Anechoic Chamber (FAC1) - EMC32 V10.60.20
Test Standard:	FCC Part 22
Antenna polarisation:	vertical / horizontal
Operating Mode:	GSM850 ch128
Operator:	ASa/Maa
Environmental Conditions:	Humidity : 40% rH; Temperature: 20 °C
EUT Setup:	1
Verdict:	Passed

EUT Information

PMT number:	23-1-00355S04_C01
Power Supply:	12 V DC

Full Spectrum



9.02_Bandedge_high_Channel_251

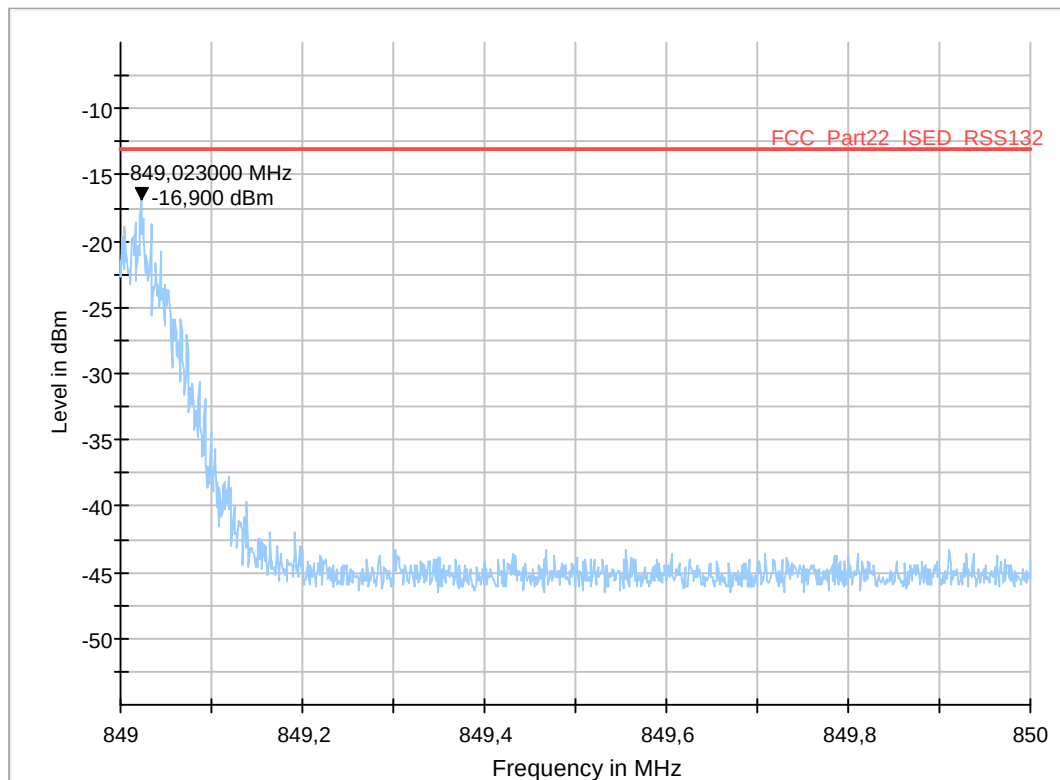
Common Information

Test Description:	Radiated emission
Test Site:	Fully Anechoic Chamber (FAC1) - EMC32 V10.60.20
Test Standard:	FCC Part 22
Antenna polarisation:	vertical / horizontal
Operating Mode:	GSM850 ch251
Operator:	ASa/Maa
Environmental Conditions:	Humidity : 40% rH; Temperature: 20 °C
EUT Setup:	1
Verdict:	Passed

EUT Information

PMT number:	23-1-00355S04_C01
Power Supply:	12 V DC

Full Spectrum



9.03_Bandedge_low_Channel_512

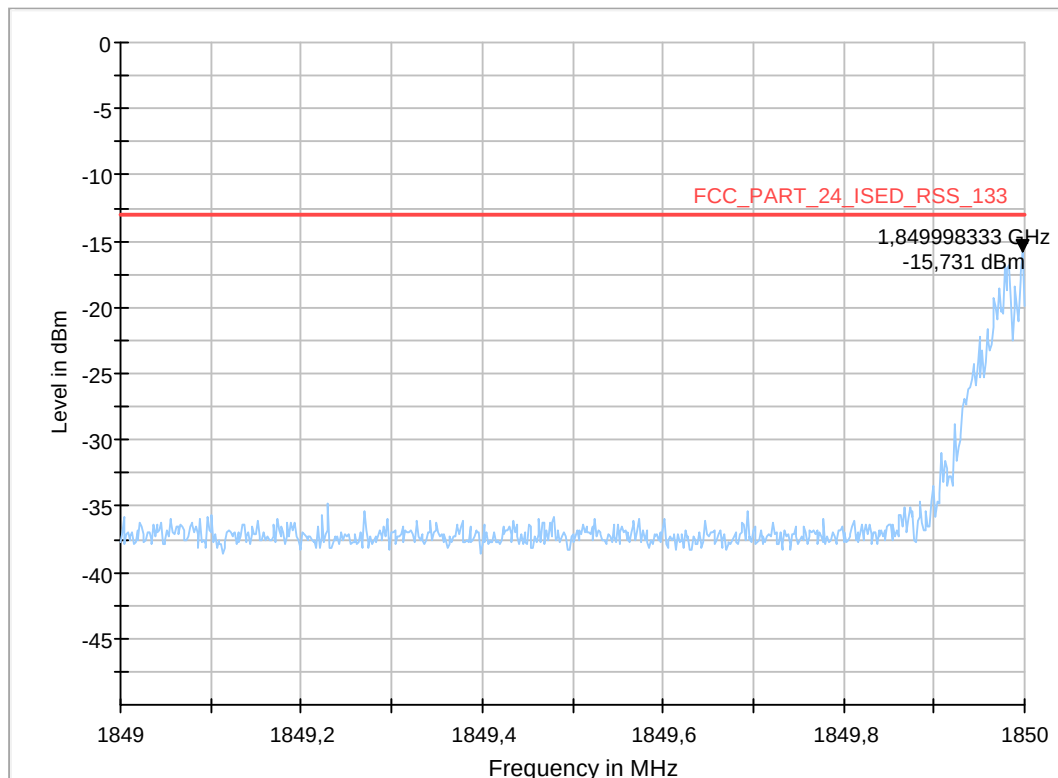
Common Information

Test Description:	Radiated emission
Test Site Location:	cetecom advanced GmbH Essen
Test Site:	Fully Anechoic Chamber (FAC1) - EMC32 V10.60.20
Test Standard:	FCC Part 24
Operating Mode:	GSM1900 ch512
Environmental Conditions:	Humidity : 40% rH; Temperature: 20 °C
Operator:	DMa-ASa
EUT Setup:	1
Verdict:	Passed

EUT Information

PMT number:	23-1-00355S04_C01
Power Supply:	12 V DC

Full Spectrum



9.04_Bandedge_high_Channel_810

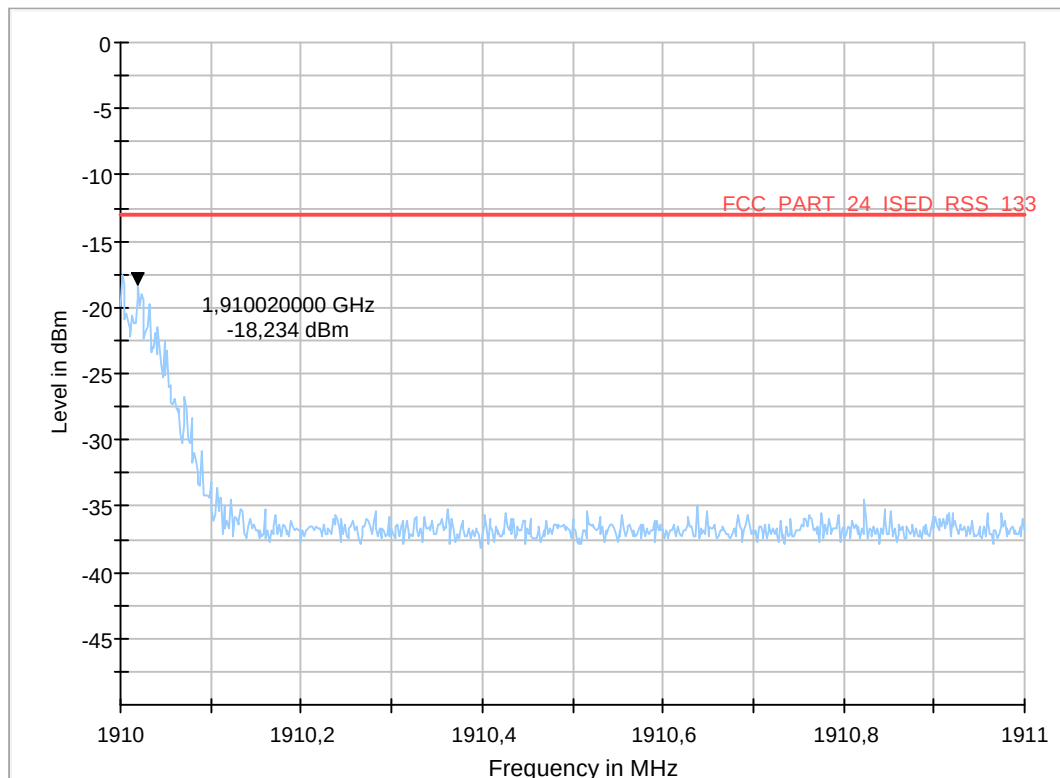
Common Information

Test Description:	Radiated emission
Test Site Location:	cetecom advanced GmbH Essen
Test Site:	Fully Anechoic Chamber (FAC1) - EMC32 V10.60.20
Test Standard:	FCC Part 24
Operating Mode:	GSM1900 ch810
Environmental Conditions:	Humidity : 40% rH; Temperature: 20 °C
Operator:	DMa-ASa
EUT Setup:	1
Verdict:	Passed

EUT Information

PMT number:	23-1-00355S04_C01
Power Supply:	12 V DC

Full Spectrum



End Of Annex 1