

Annex 1: Measurement diagrams 22-1-0030601T044a-A1

Number of pages:	27	Date of Report:	2023-Feb-06
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:	Continental Automotive Technologies GmbH
Product: Model:	Telematic Control Unit BSRF_EA_RW0		
FCC ID:	KR5-BSRFEARW0	IC:	--
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 Part 27, Subpart C Miscellaneous Wireless Communications Services ISED-Regulations, Radio Standards Specification RSS-Gen, Issue 5 General Requirements for Compliance of Radio Apparatus RSS-132, Issue 3 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 RSS-139, Issue 3 Advanced Wireless Services (AWS) Equipment Operating in the Bands 1710-1780 MHz and 2110-2180 MHz		

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1 Measurement diagrams

2.201_H_field_UMTS_FDD_B02_CH_9400

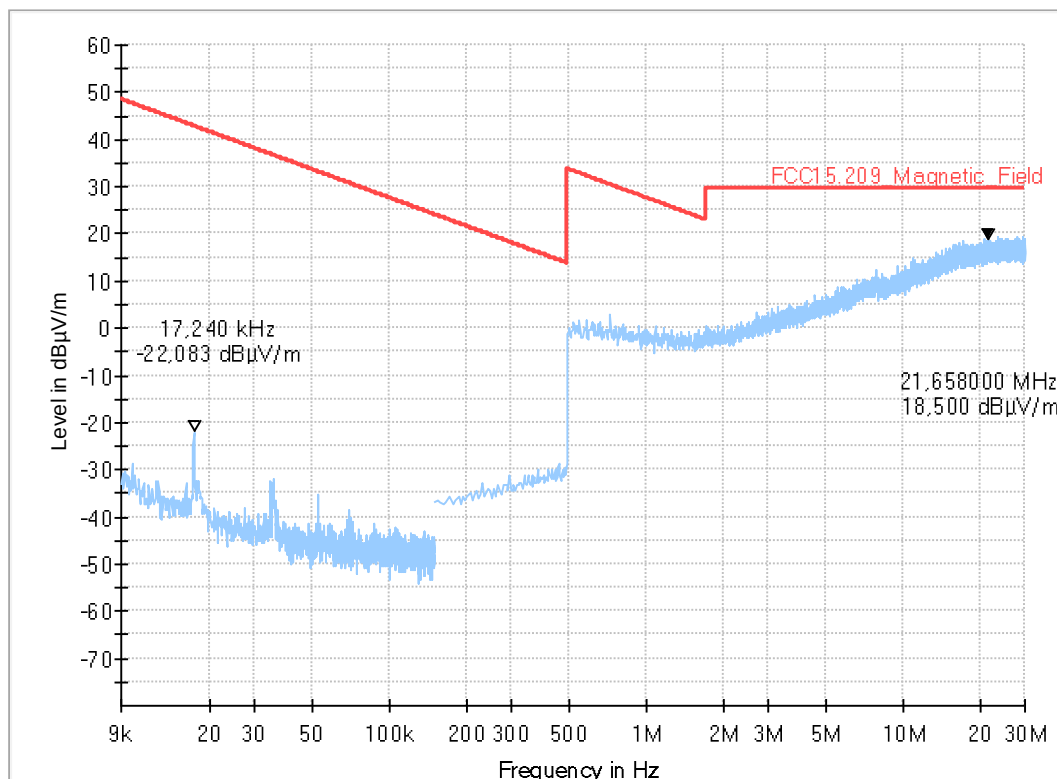
Common Information

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 4
Operator:	npe
Operating Mode:	UMTS FDDII, ch9400
Environmental Conditions:	Humidity : 50% rH; Temperature: 21 °C
EUT Setup:	1
Verdict:	Passed

EUT Information

PMT number 22-1-00306S58_C01

Full Spectrum



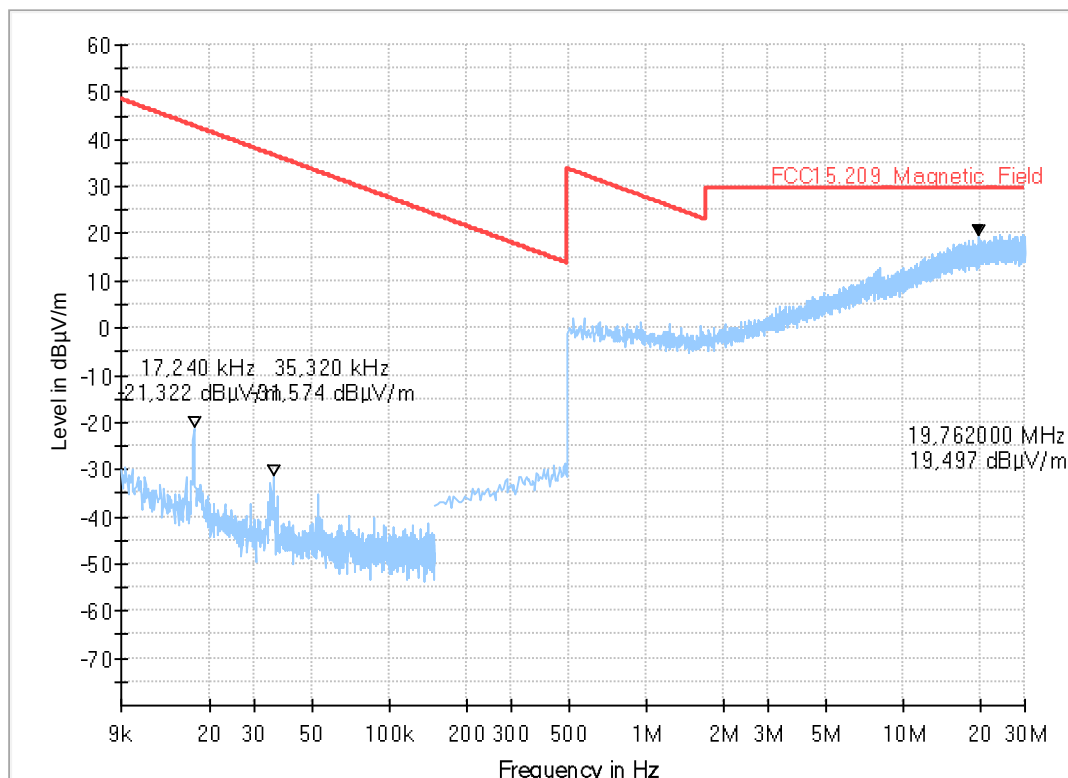
2.401_H_field_UMTS_FDD_B04_CH_1513

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 4
Operator:	npe
Operating Mode:	UMTS FDDIV, ch1513
Environmental Conditions:	Humidity : 50% rH; Temperature: 21 °C
EUT Setup:	1
Verdict:	Passed

EUT Information

PMT number	22-1-00306558_C01
	Full Spectrum



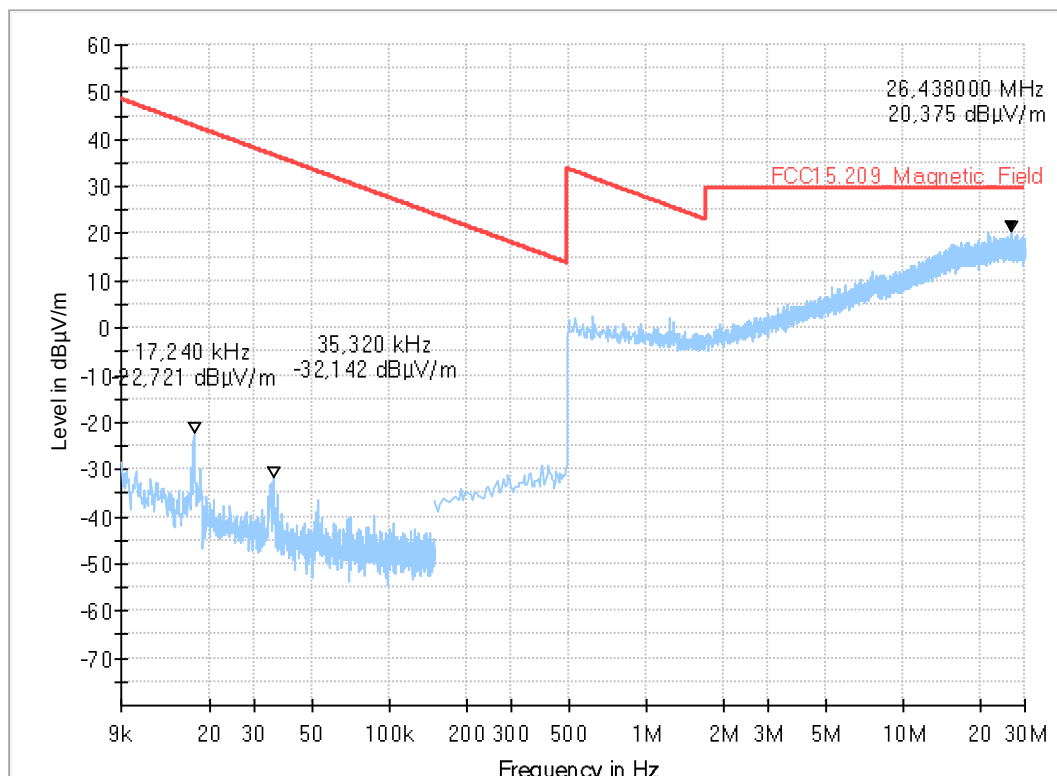
2.501_H_field_UMTS_FDD_B05_CH_4233

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 4
Operator:	npe
Operating Mode:	UMTS FDDV, ch4233
Environmental Conditions:	Humidity : 50% rH; Temperature: 21 °C
EUT Setup:	1
Verdict:	Passed

EUT Information

PMT number	22-1-00306558_C01
	Full Spectrum



8.02a_Traffic_mode_UMTS_FDD_B02_CH_9400_laying

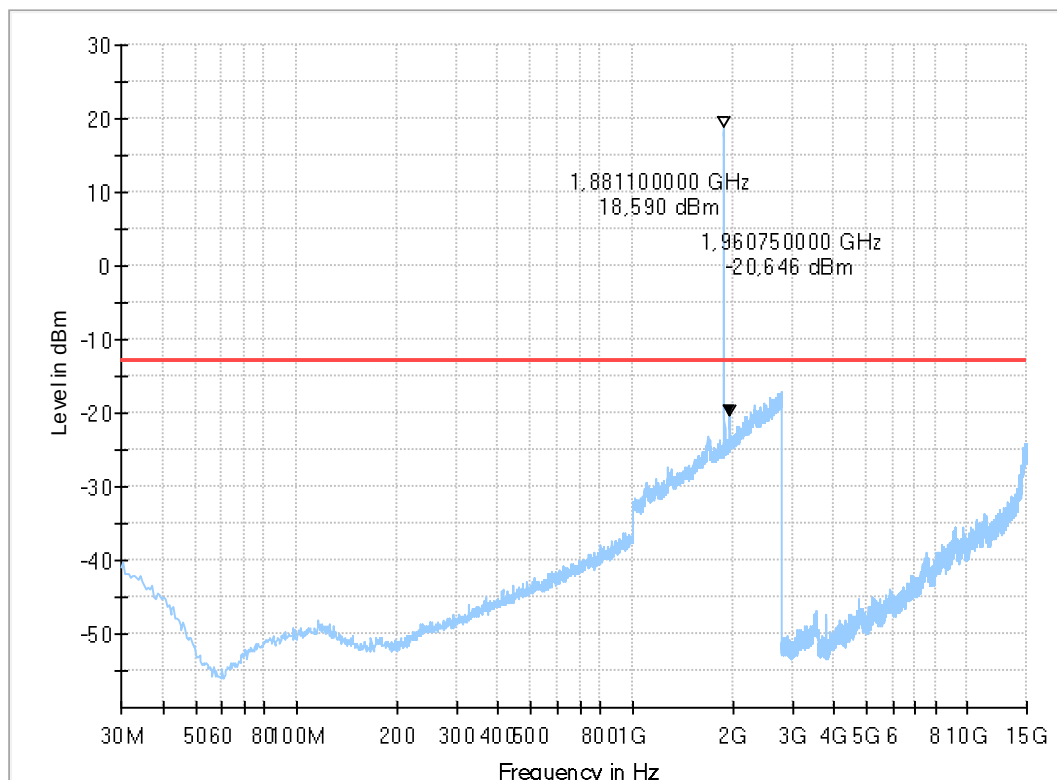
Common Information

Test Description:	Radiated emission
Test Site:	Fully-Anechoic Chamber
Test Standard:	FCC FCC Part 27.53(h) AWS emission limits / RSS-139, Issue 3
Antenna polarisation:	vertical / horizontal
Measurement software version	EMC32 V10.60.20
Operating Mode:	UMTS_FDD_B02_CH_9400
Environmental Conditions:	Humidity: 45% rH; Temperature: 21 °C
Operator:	SOz
Comment:	Laying
EUT Setup:	1
Verdict:	Passed

EUT Information

PMT number: 22-1-00306S58_C01

Full Spectrum



Remark: Emission at 1.88 GHz is uplink frequency of UMTS FDD 2 and not related to result.

8.02b_Traffic_mode_UMTS_FDD_B02_CH_9400_standing

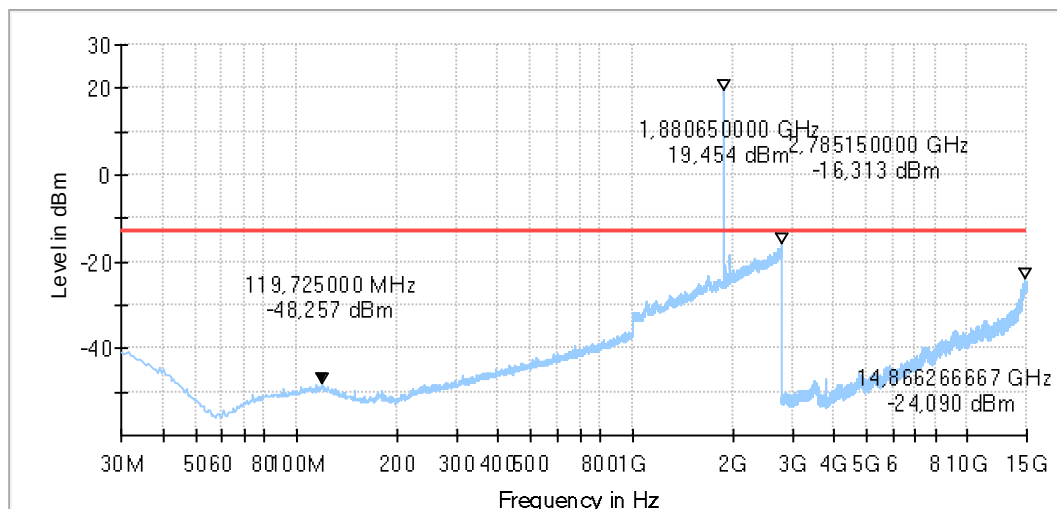
Common Information

Test Description:	Radiated emission
Test Site:	Fully-Anechoic Chamber
Test Standard:	FCC FCC Part 27.53(h) AWS emission limits / RSS-139, Issue 3
Antenna polarisation:	vertical / horizontal
Measurement software version	EMC32 V10.60.20
Operating Mode:	UMTS_FDD_B02_CH_9400
Environmental Conditions:	Humidity: 45% rH; Temperature: 21 °C
Operator:	TFra
Comment:	Environmental Conditions:
EUT Setup:	1
Verdict:	Passed

EUT Information

PMT number:	22-1-00306S58_C01
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Full Spectrum



Remark: Emission at 1.88 GHz is uplink frequency of UMTS FDD 2 and not related to result.

8.03a_Traffic_mode_UMTS_FDD_B02_CH_9400

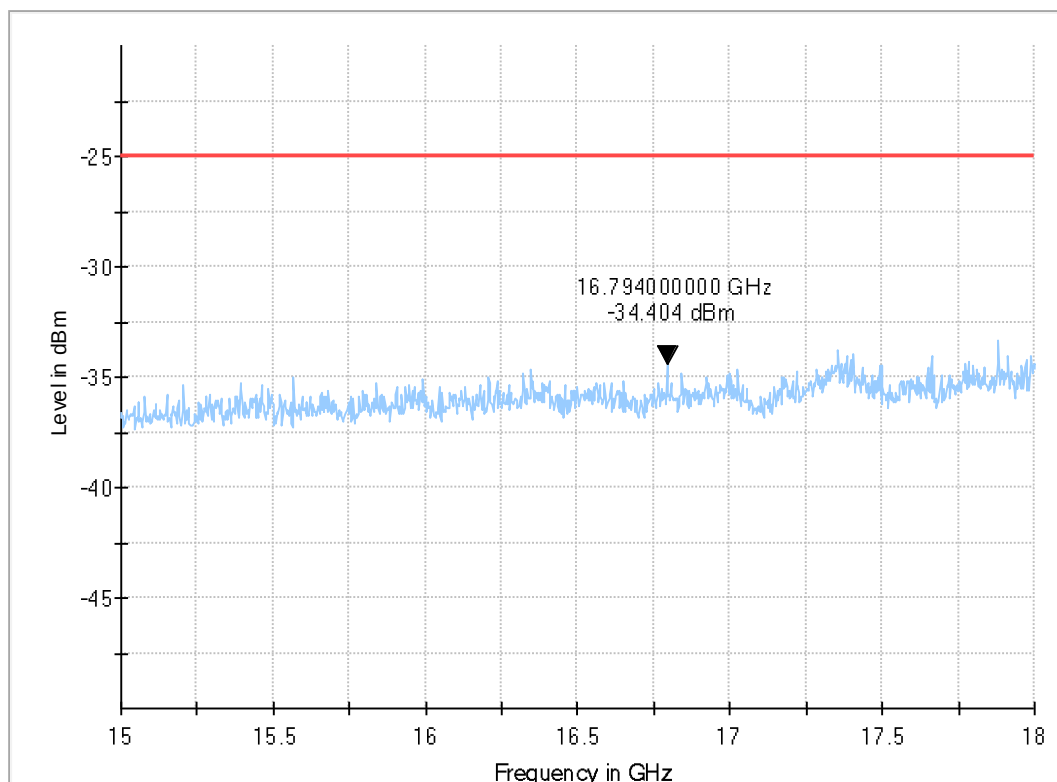
Common Information

Test Description:	Radiated Field Strength Emission
Test Site Location:	CETECOM GmbH Essen
Test Site:	Fully Anechoic Room (FAR2)
Test Standard:	FCC Part 24
Comm. Link:	WCDMA FDDII
Operating Mode:	MS allocated channel 9400
Exclusionband:	--
Environmental Conditions:	Humidity: 45% rH; Temperature: 21 °C
Operator:	npe
Set-up:	EUT laying, Ant hor
Verdict:	Passed

EUT Information

PMT Sample Nr. 22-1-00306S58_C01

Full Spectrum



8.03b_Traffic_mode_UMTS_FDD_B02_CH_9400

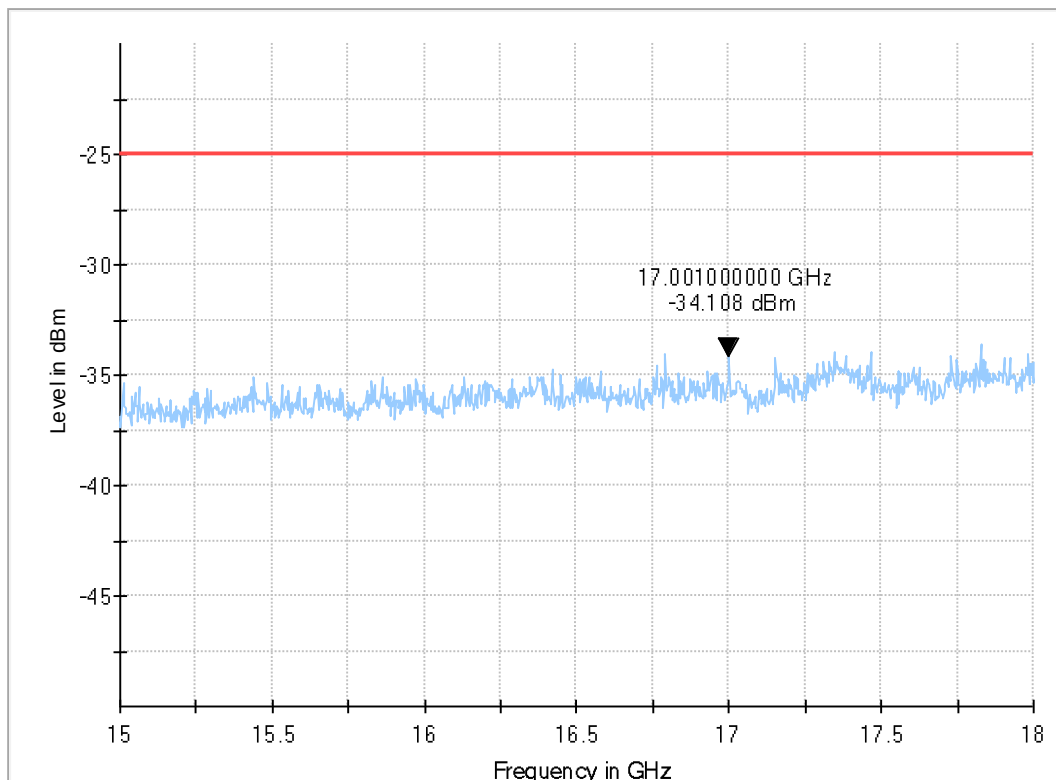
Common Information

Test Description:	Radiated Field Strength Emission
Test Site Location:	CETECOM GmbH Essen
Test Site:	Fully Anechoic Room (FAR2)
Test Standard:	FCC Part 24
Comm. Link:	WCDMA FDDII
Operating Mode:	MS allocated channel 9400
Exclusionband:	--
Environmental Conditions:	Humidity: 45% rH; Temperature: 21 °C
Operator:	npe
Set-up:	EUT standing, Ant hor
Verdict:	Passed

EUT Information

PMT Sample Nr. 22-1-00306S58_C01

Full Spectrum



8.03c_Traffic_mode_UMTS_FDD_B02_CH_9400

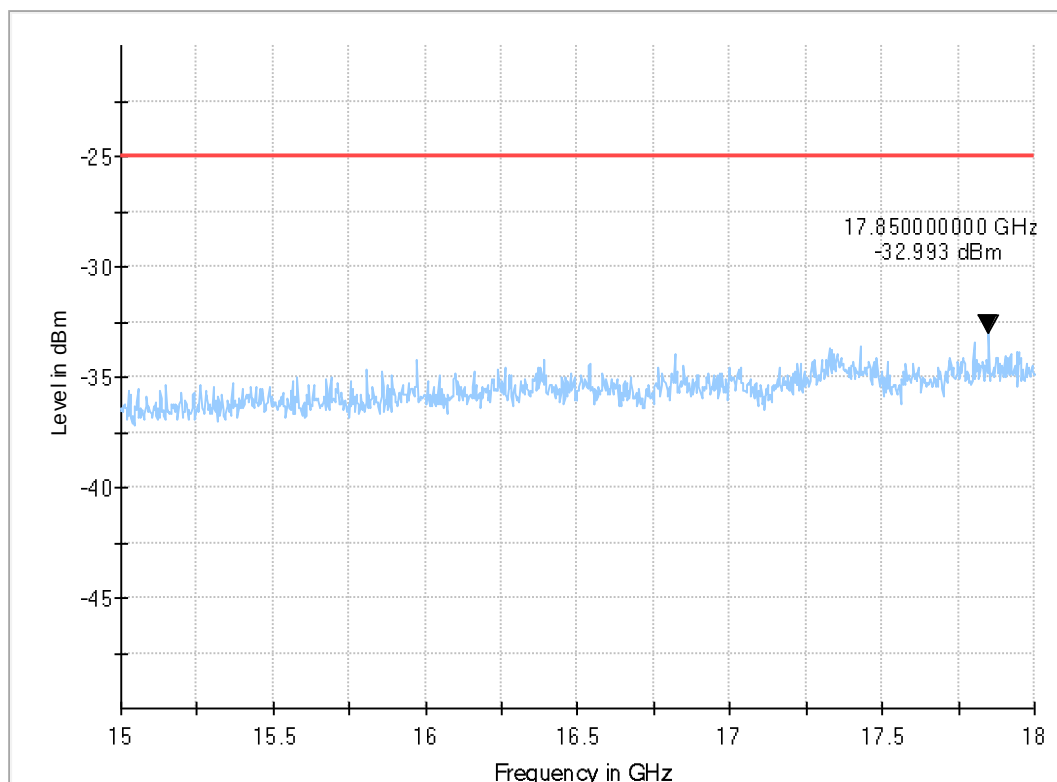
Common Information

Test Description:	Radiated Field Strength Emission
Test Site Location:	CETECOM GmbH Essen
Test Site:	Fully Anechoic Room (FAR2)
Test Standard:	FCC Part 24
Comm. Link:	WCDMA FDDII
Operating Mode:	MS allocated channel 9400
Exclusionband:	--
Environmental Conditions:	Humidity: 45% rH; Temperature: 21 °C
Operator:	npe
Set-up:	EUT laying, Ant ver
Verdict:	Passed

EUT Information

PMT Sample Nr. 22-1-00306S58_C01

Full Spectrum



8.03d_Traffic_mode_UMTS_FDD_B02_CH_9400

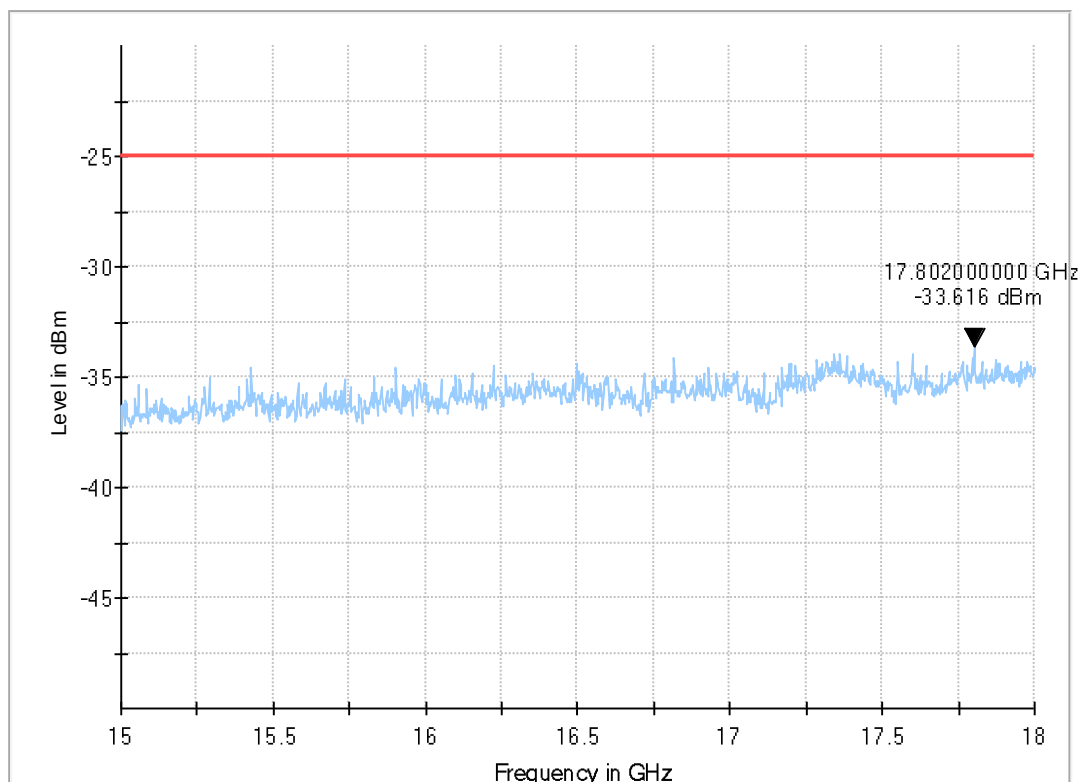
Common Information

Test Description:	Radiated Field Strength Emission
Test Site Location:	CETECOM GmbH Essen
Test Site:	Fully Anechoic Room (FAR2)
Test Standard:	FCC Part 24
Comm. Link:	WCDMA FDDII
Operating Mode:	MS allocated channel 9400
Exclusionband:	--
Environmental Conditions:	Humidity: 45% rH; Temperature: 21 °C
Operator:	npe
Set-up:	EUT standing, Ant ver
Verdict:	Passed

EUT Information

PMT Sample Nr. 22-1-00306S58_C01

Full Spectrum



8.04a_c_Traffic_mode_UMTS_FDD_B02_CH_9400_EUT_laying

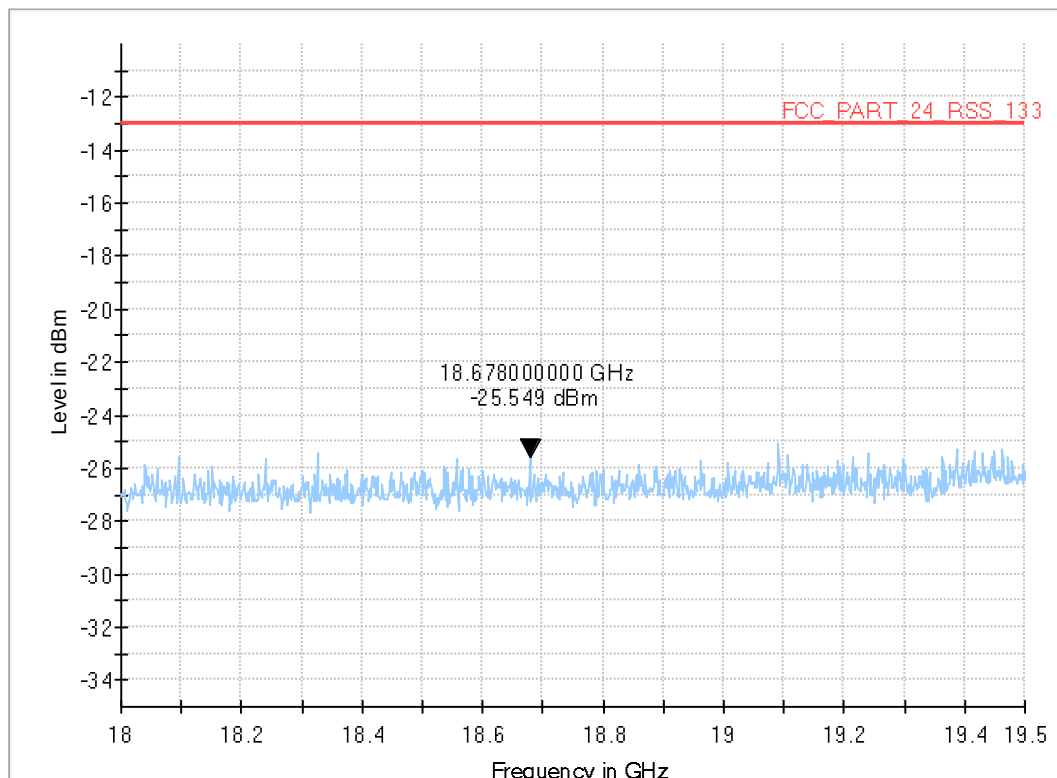
Common Information

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:	WCDMA FDDII
Operating Mode:	MS allocated channel 9400
Exclusionband:	1850- 1910MHz
Environmental Conditions:	Humidity: 45% rH; Temperature: 22.1 °C
Operator:	Lor
EUT Setup:	EUT laying, Ant hor/ver, main antenna
Verdict:	Passed

EUT Information

PMT Sample Nr. 22-1-00306S58_C01

Full Spectrum



8.04b_d_Traffic_mode_UMTS_FDD_B02_CH_9400_EUT _standing

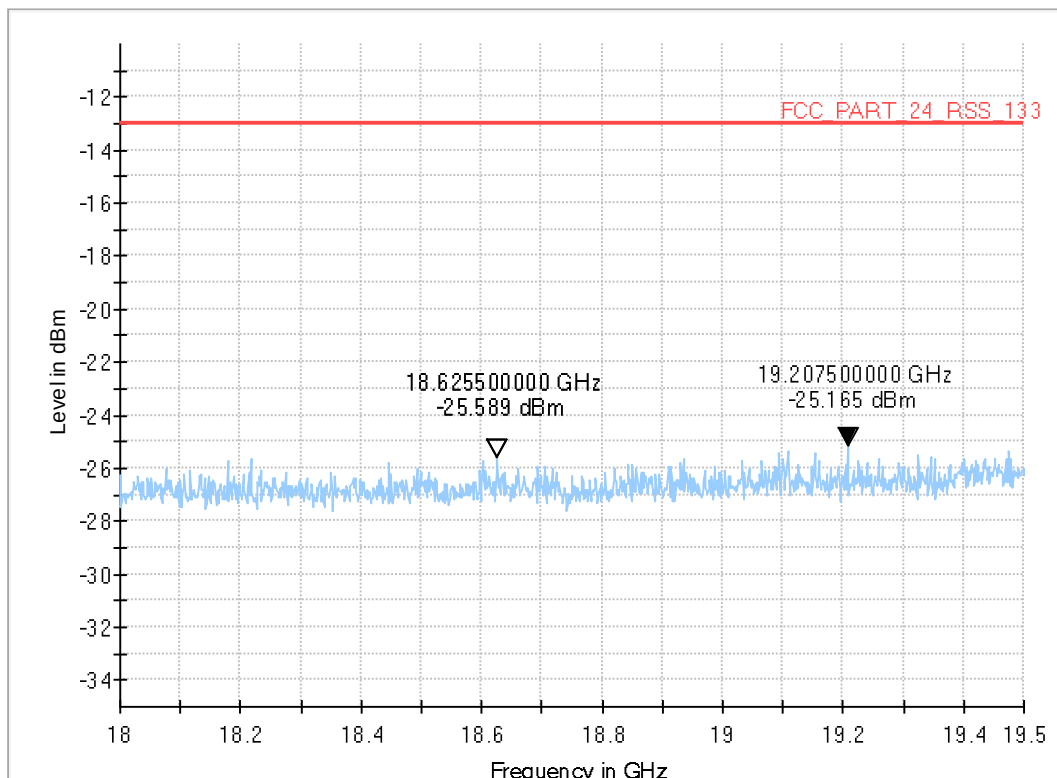
Common Information

Test Description:	Radiated Spurious Emissions W-CDMA II
Test Site Location:	CETECOM GmbH Essen
Test Site:	Fully Anechoic Room (FAR2)
Test Standard:	FCC Part 24.238 / RSS-133
Comm. Link:	WCDMA FDDII
Operating Mode:	MS allocated channel 9400
Exclusionband:	1850- 1910MHz
Environmental Conditions:	Humidity: 45% rH; Temperature: 22.1 °C
Operator:	Lor
EUT Setup:	EUT standing, Ant hor/ver, main antenna
Verdict:	Passed

EUT Information

PMT Sample Nr. 22-1-00306S58_C01

Full Spectrum



8.05a_Traffic_mode_UMTS_FDD_B04_CH_1513_laying

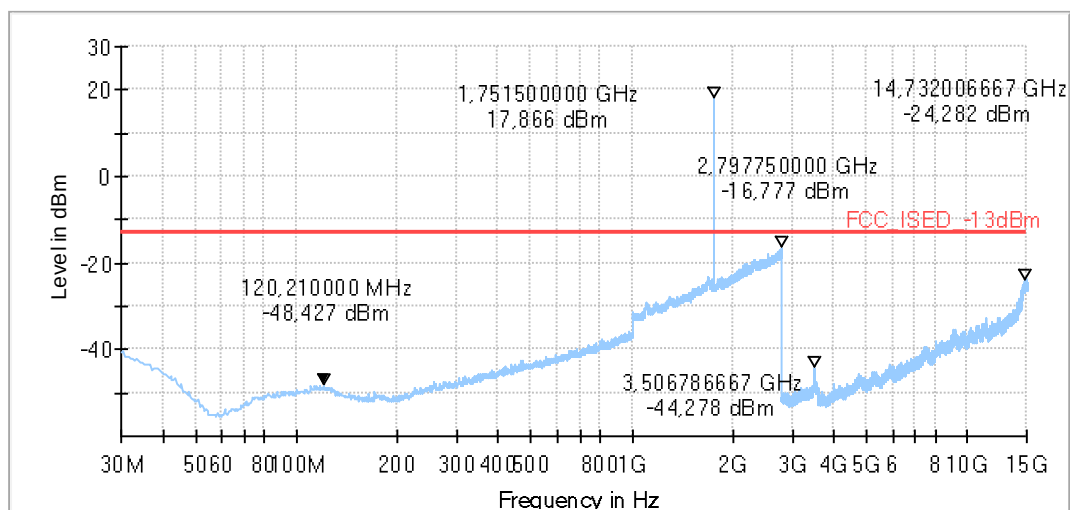
Common Information

Test Description:	Radiated emission
Test Site:	Fully-Anechoic Chamber
Test Standard:	FCC FCC Part 27.53(h) AWS emission limits / RSS-139, Issue 3
Antenna polarisation:	vertical / horizontal
Measurement software version	EMC32 V10.60.20
Operating Mode:	UMTS_FDD_B04_CH_1513
Environmental Conditions:	Humidity: 45% rH; Temperature: 21 °C
Operator:	SOz
Comment:	laying
EUT Setup:	1
Verdict:	Passed

EUT Information

PMT number:	22-1-00306S58_C01
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Full Spectrum



Remark: Emission at 1.75 GHz is uplink frequency of UMTS FDD 4 and not related to result.

8.05b_Traffic_mode_UMTS_FDD_B04_CH_1513_standing

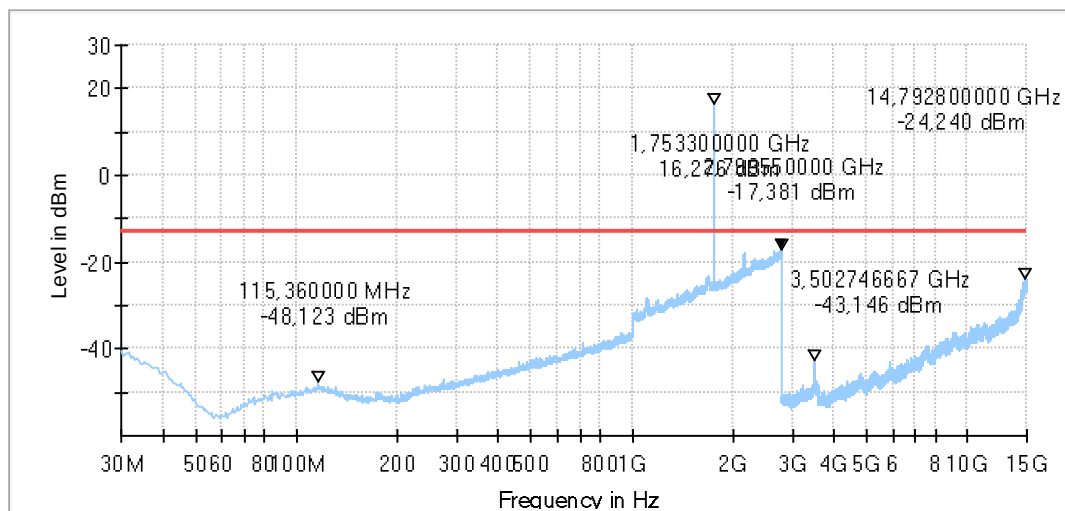
Common Information

Test Description:	Radiated emission
Test Site:	Fully-Anechoic Chamber
Test Standard:	FCC FCC Part 27.53(h) AWS emission limits / RSS-139, Issue 3
Antenna polarisation:	vertical / horizontal
Measurement software version	EMC32 V10.60.20
Operating Mode:	UMTS_FDD_B04_CH_1513
Environmental Conditions:	Humidity: 45% rH; Temperature: 21 °C
Operator:	TFra
EUT Setup:	1
Verdict:	Passed

EUT Information

PMT number:	22-1-00306S58_C01
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Full Spectrum



Remark: Emission at 1.75 GHz is uplink frequency of UMTS FDD 4 and not related to result.

8.06a_Traffic_mode_UMTS_FDD_B04_CH_1513

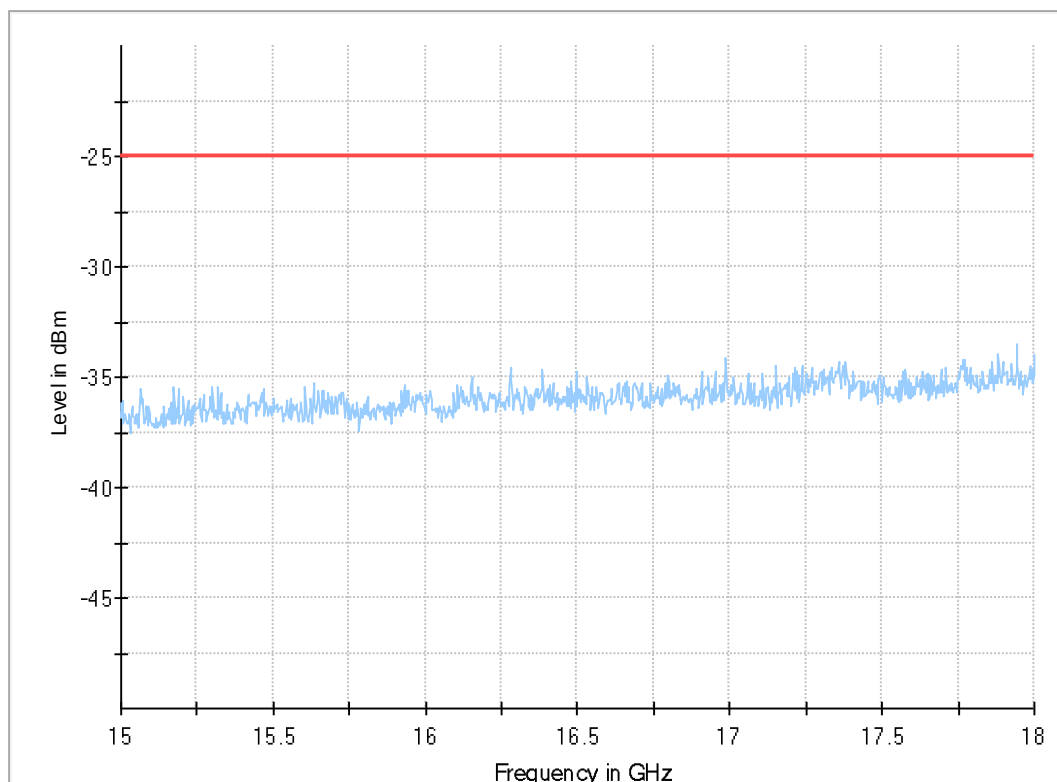
Common Information

Test Description:	Radiated Field Strength Emission
Test Site Location:	CETECOM GmbH Essen
Test Site:	Fully Anechoic Room (FAR2)
Test Standard:	FCC Part 27.53 (m)(4)/ RSS-139
Comm. Link:	WCDMA FDDIV
Operating Mode:	MS allocated channel 1513
Exclusionband:	--
Environmental Conditions:	Humidity: 45% rH; Temperature: 21 °C
Operator:	npe
Set-up:	EUT laying, Ant hor
Verdict:	Passed

EUT Information

PMT Sample Nr. 22-1-00306S58_C01

Full Spectrum



8.06b_Traffic_mode_UMTS_FDD_B04_CH_1513

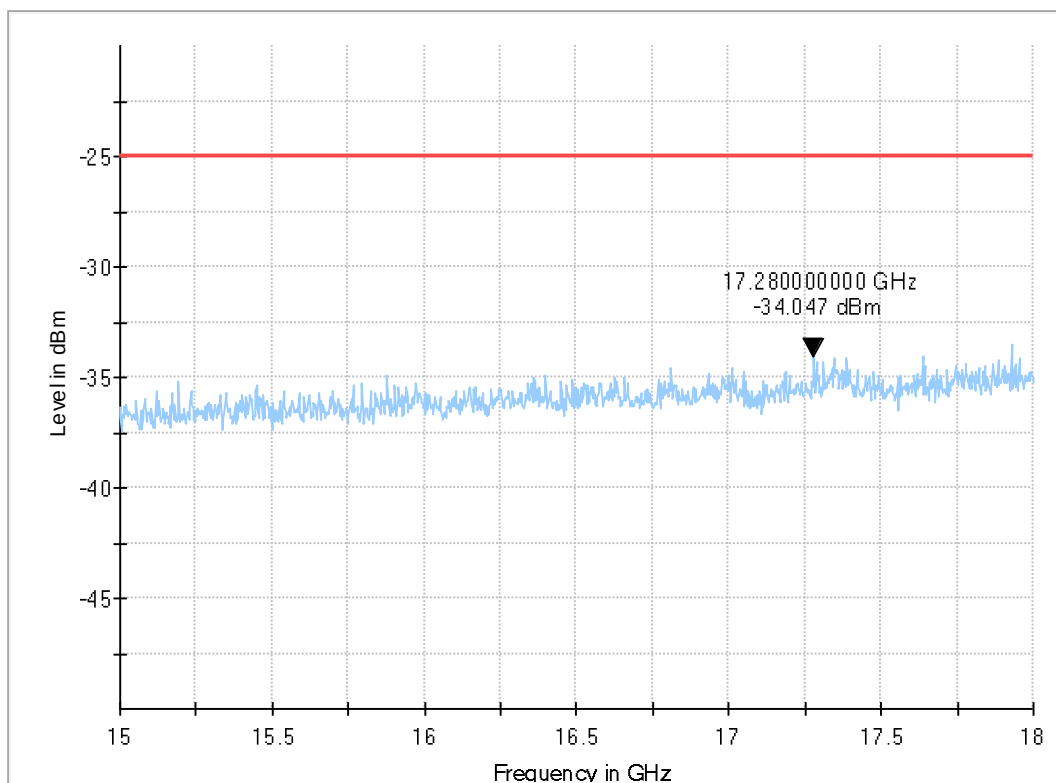
Common Information

Test Description:	Radiated Field Strength Emission
Test Site Location:	CETECOM GmbH Essen
Test Site:	Fully Anechoic Room (FAR2)
Test Standard:	FCC Part 27.53 (m)(4)/ RSS-139
Comm. Link:	WCDMA FDDIV
Operating Mode:	MS allocated channel 1513
Exclusionband:	--
Environmental Conditions:	Humidity: 45% rH; Temperature: 21 °C
Operator:	npe
Set-up:	EUT standing, Ant hor
Verdict:	Passed

EUT Information

PMT Sample Nr.	22-1-00306S58_C01
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Full Spectrum



8.06c_Traffic_mode_UMTS_FDD_B04_CH_1513

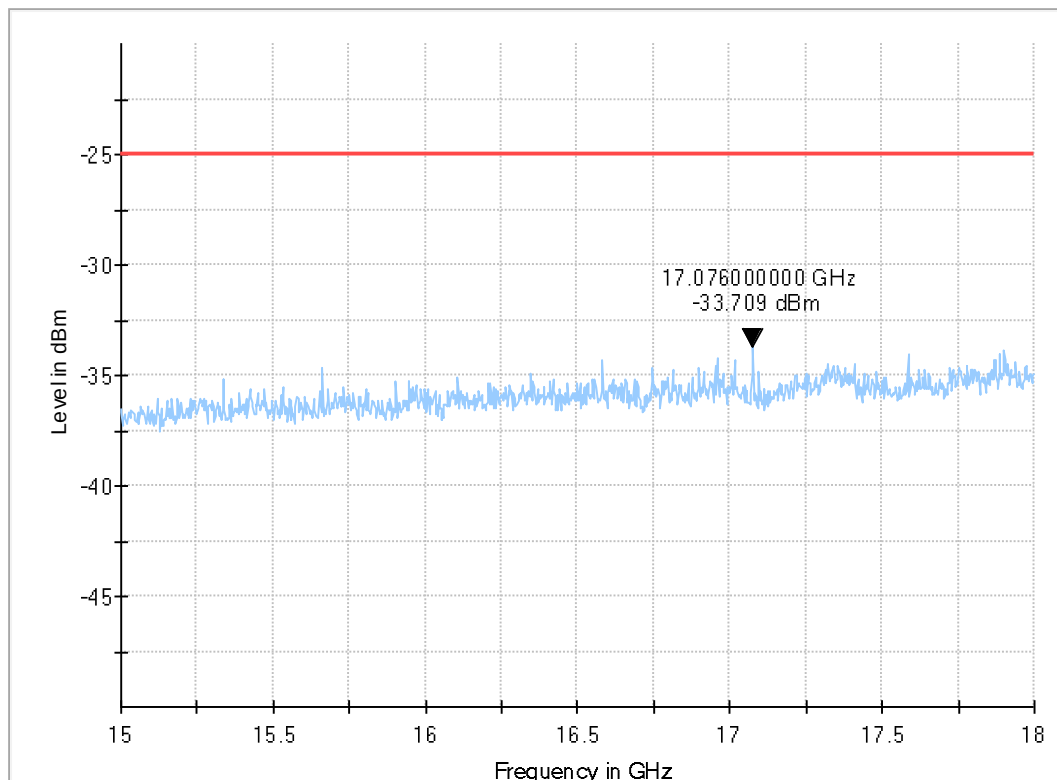
Common Information

Test Description:	Radiated Field Strength Emission
Test Site Location:	CETECOM GmbH Essen
Test Site:	Fully Anechoic Room (FAR2)
Test Standard:	FCC Part 27.53 (m)(4)/ RSS-139
Comm. Link:	WCDMA FDDIV
Operating Mode:	MS allocated channel 1513
Exclusionband:	--
Environmental Conditions:	Humidity: 45% rH; Temperature: 21 °C
Operator:	npe
Set-up:	EUT laying, Ant ver
Verdict:	Passed

EUT Information

PMT Sample Nr. 20-1-00397S18_C01

Full Spectrum



8.06d_Traffic_mode_UMTS_FDD_B04_CH_1513

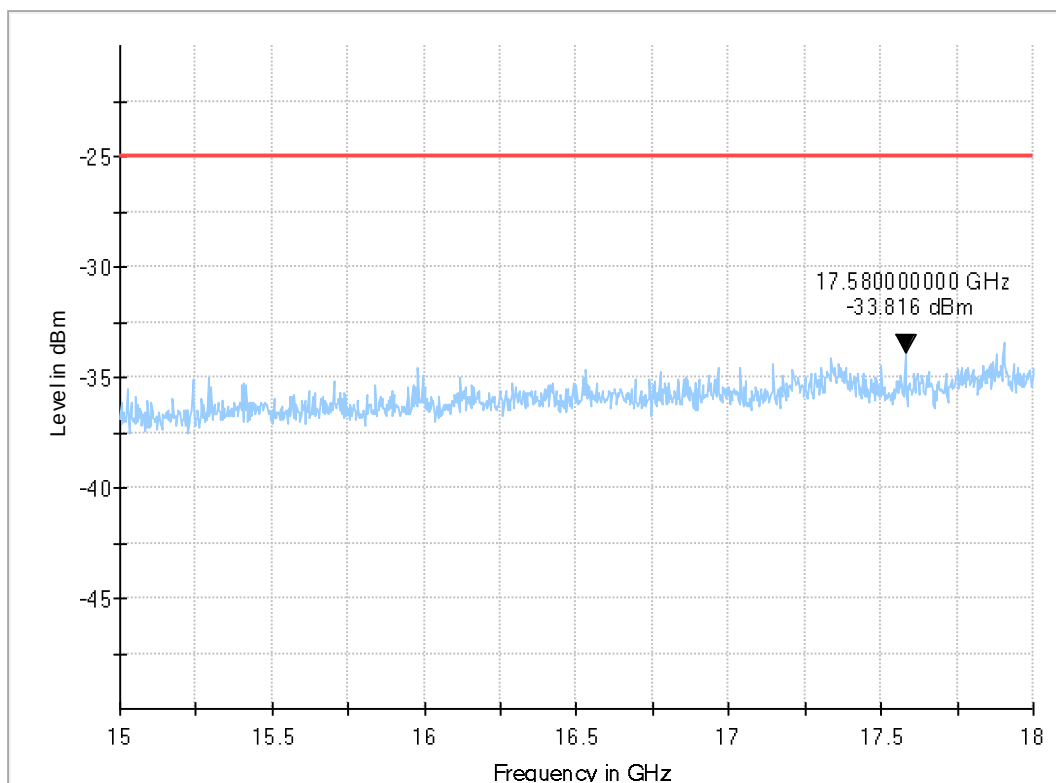
Common Information

Test Description:	Radiated Field Strength Emission
Test Site Location:	CETECOM GmbH Essen
Test Site:	Fully Anechoic Room (FAR2)
Test Standard:	FCC Part 27.53 (m)(4)/ RSS-139
Comm. Link:	WCDMA FDDIV
Operating Mode:	MS allocated channel 1513
Exclusionband:	--
Environmental Conditions:	Humidity: 45% rH; Temperature: 21 °C
Operator:	npe
Set-up:	EUT standing, Ant ver
Verdict:	Passed

EUT Information

PMT Sample Nr.	20-1-00397S18_C01
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Full Spectrum



8.07a_Traffic_mode_UMTS_FDD_B05_CH_4233_laying

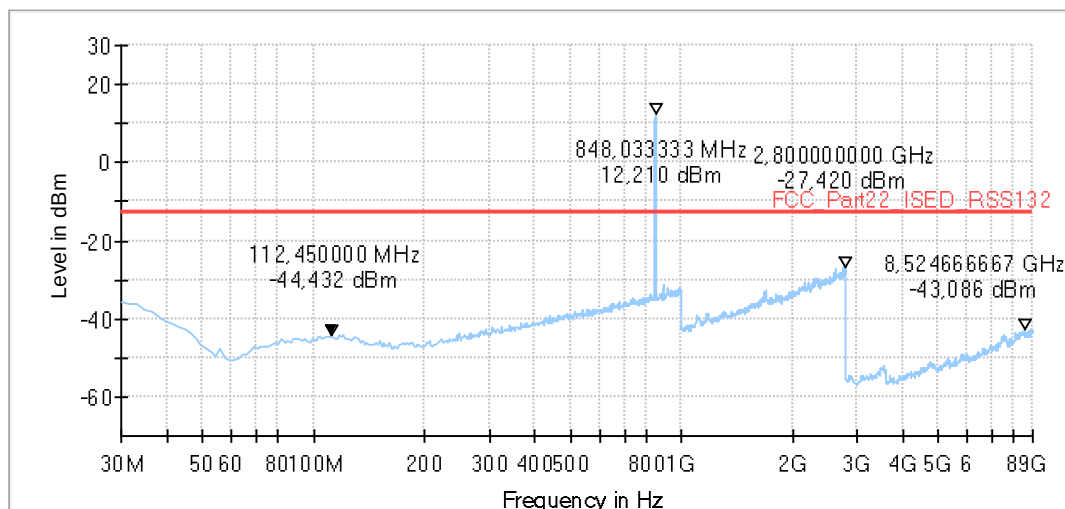
Common Information

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:	UMTS_FDD_B05_CH_4233
Operator:	TFra
Environmental Conditions::	Humidity : 54% rH; Temperature: 20 °C
EUT Setup:	1
Verdict:	Passed

EUT Information

PMT number: 22-1-00306S58_C01

Full Spectrum



Remark: Emission at 848.03 MHz is uplink frequency of UMTS FDD 5 and not related to result.

8.07b_Traffic_mode_UMTS_FDD_B05_CH_4233_standing

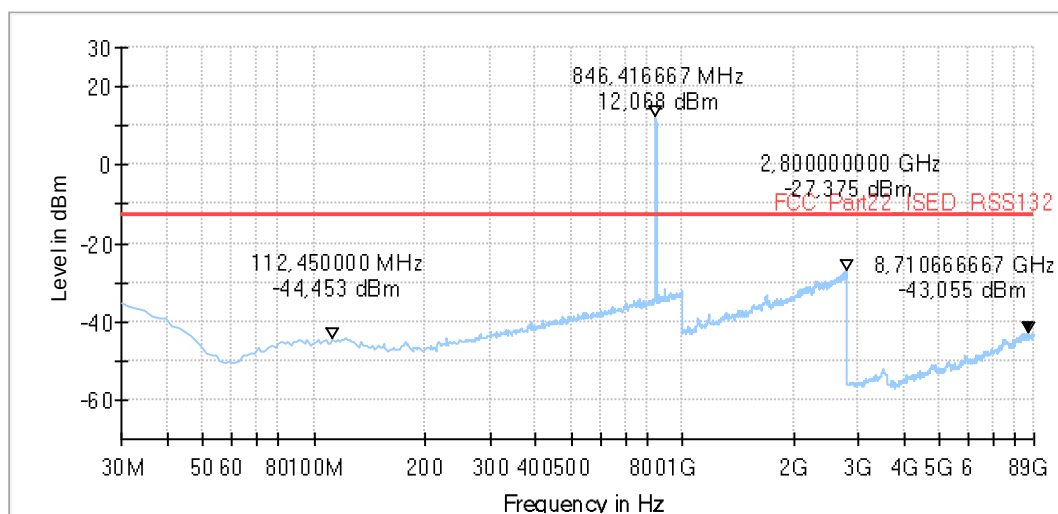
Common Information

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:	UMTS_FDD_B05_CH_4233
Operator:	TFra
Environmental Conditions:	Humidity : 54% rH; Temperature: 19 °C
EUT Setup:	1
Verdict:	Passed

EUT Information

PMT number:	22-1-00306S58_C01
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Full Spectrum



Remark: Emission at 846.42 MHz is uplink frequency of UMTS FDD 5 and not related to result.

9.201_Bandedge_low_Channel_9262_UL_1852.4

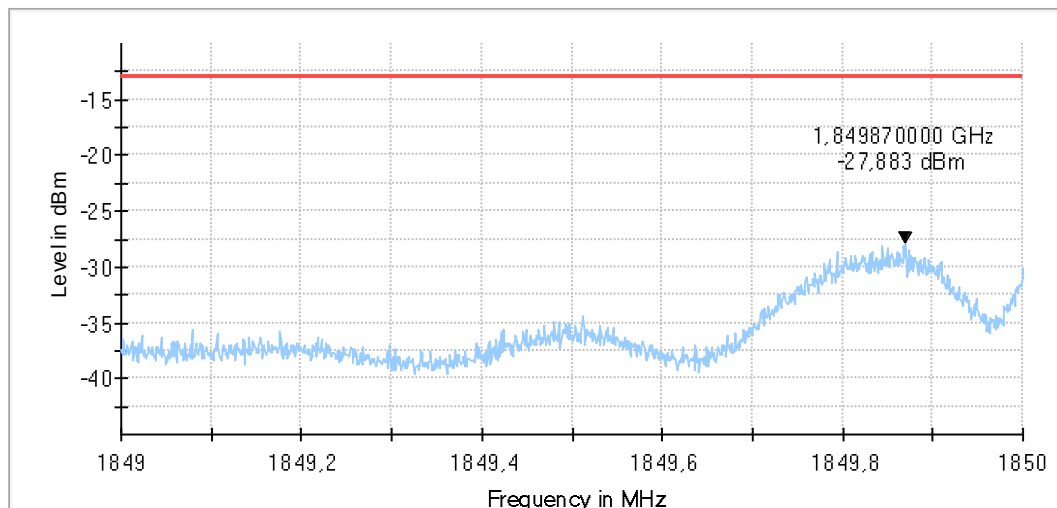
Common Information

Test Description:	-
Test Site Location:	CETECOM GmbH Essen
Test Site:	Fully Anechoic Chamber (FAC1) - EMC32 V10.60.20
Test Standard:	-
Test Case:	-
Operating Mode:	UMTS_FDD_B02_CH_9262
Environmental Conditions:	Humidity : 55% rH; Temperature: 20 °C
Operator:	TFra
EUT Setup:	1
Verdict:	Passed

EUT Information

PMT number:	22-1-00306S58_C01
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Full Spectrum



9.202_Bandedge_high_Channel_9538_UL_1907.6

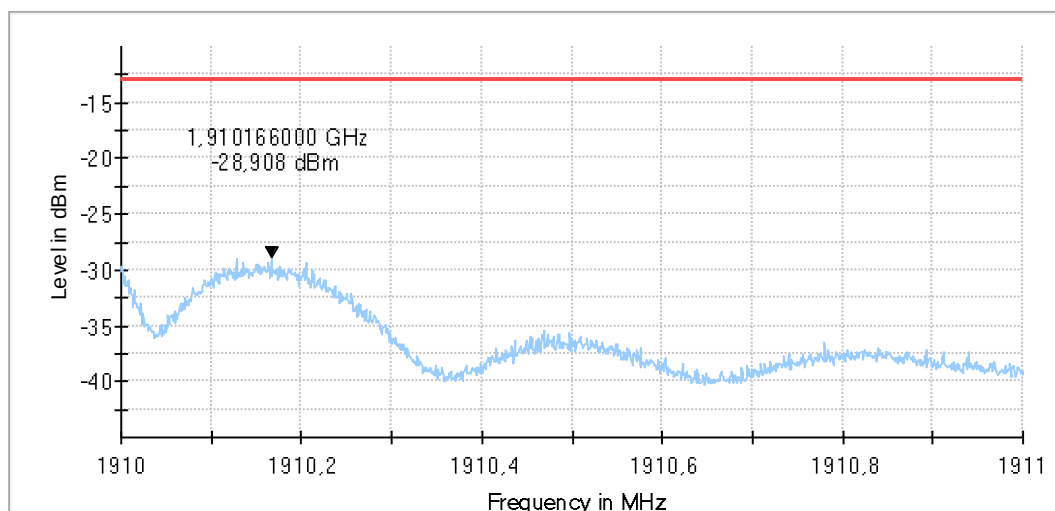
Common Information

Test Description:	-
Test Site Location:	CETECOM GmbH Essen
Test Site:	Fully Anechoic Chamber (FAC1) - EMC32 V10.60.20
Test Standard:	-
Test Case:	-
Operating Mode:	UMTS_FDD_B02_CH_9538
Environmental Conditions::	Humidity : 54% rH; Temperature: 19 °C
Operator:	TFra
EUT Setup:	1
Verdict:	Passed

EUT Information

PMT number:	22-1-00306S58_C01
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Full Spectrum



9.401_Bandedge_low_Channel_1312_UL_1712.6

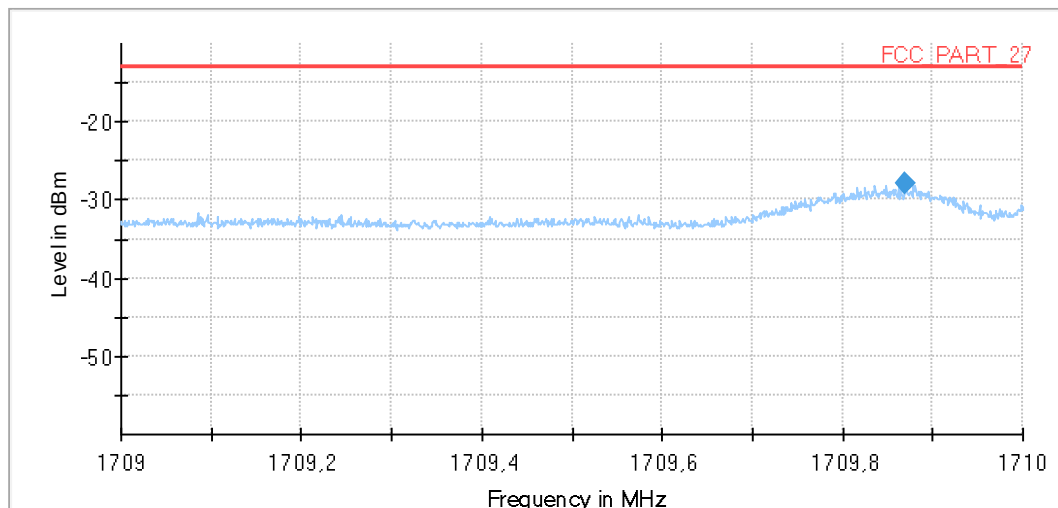
Common Information

Test Description: -
 Test Site Location: CETECOM GmbH Essen
 Test Site: Fully Anechoic Chamber (FAC1) - EMC32 V10.60.20
 Test Standard: -
 Test Case: -
 Operating Mode: UMTS_FDD_B04_CH_1312
 Environmental Conditions:: Humidity : 45% rH; Temperature: 20 °C
 Operator: TFra
 EUT Setup: 1
 Verdict: Passed

EUT Information

PMT number: 22-1-00306S58_C01

Full Spectrum



Final Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
1709.870000	-27.91	-13.00	14.91	700.0	50.000	H	306.0	0.0	-62

9.402_Bandedge_high_Channel_1513_UL_1752.4

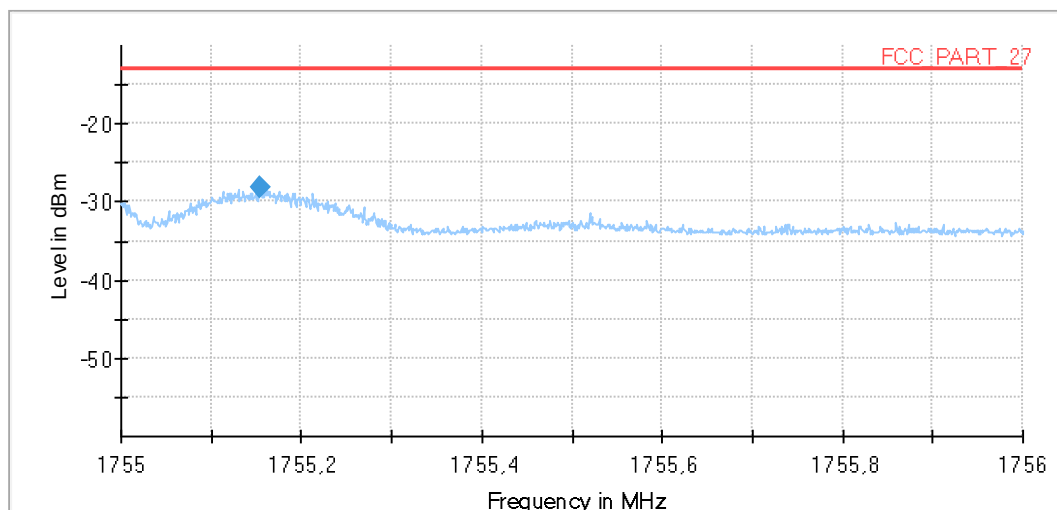
Common Information

Test Description: -
 Test Site Location: CETECOM GmbH Essen
 Test Site: Fully Anechoic Chamber (FAC1) - EMC32 V10.60.20
 Test Standard: -
 Test Case: -
 Operating Mode: UMTS_FDD_B04_CH_1513
 Environmental Conditions:: Humidity : 52% rH; Temperature: 20 °C
 Operator: TFra
 EUT Setup: 1
 Verdict: Passed

EUT Information

PMT number: 22-1-00306S58_C01

Full Spectrum



Final Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
1755.155000	-28.16	-13.00	15.16	700.0	50.000	H	310.0	0.0	-62

9.501_Bandedge_low_Channel_4132_UL_826.4

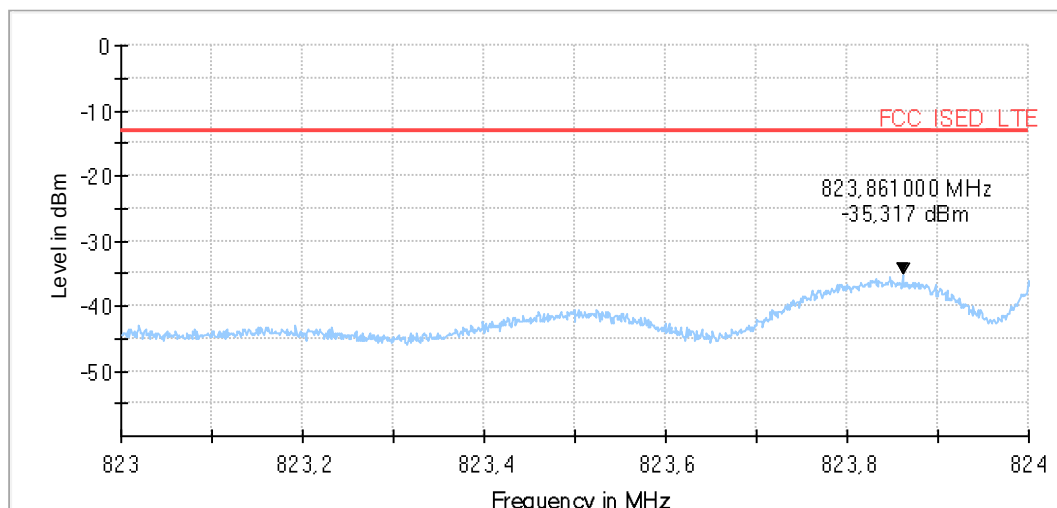
Common Information

Test Description:	Band-Edge low - Radiated Spurious Emissions LTE Band V
Test Site Location:	CETECOM GmbH Essen
Test Site:	Fully Anechoic Chamber (FAC1) - EMC32 V10.60.20
Test Standard:	FCC Part 22.917(a) / RSS-132
Operating Mode:	UMTS_FDD_B05_CH_4132
Environmental Conditions::	Humidity : 54% rH; Temperature: 20 °C
Test SW Version:	EMC32 V10.60.20
Operator:	TFra
Remarks:	EUT - laying/standing position
EUT Setup:	1
Verdict:	Passed

EUT Information

PMT number:	22-1-00306S58_C01
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Full Spectrum



9.502_Bandedge_high_Channel_4233_UL_846.6

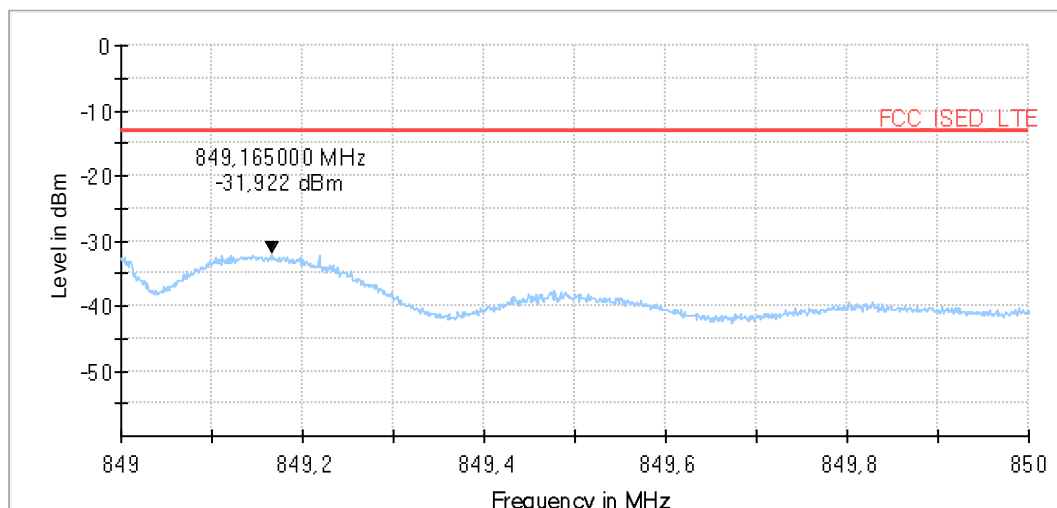
Common Information

Test Description:	Band-Edge low - Radiated Spurious Emissions LTE Band V
Test Site Location:	CETECOM GmbH Essen
Test Site:	Fully Anechoic Chamber (FAC1) - EMC32 V10.60.20
Test Standard:	FCC Part 22.917(a) / RSS-132
Operating Mode:	UMTS_FDD_B05_CH_4233
Environmental Conditions:	Humidity : 54% rH; Temperature: 20 °C
Test SW Version:	EMC32 V10.60.20
Operator:	TFra
Remarks:	EUT - laying/standing position
EUT Setup:	1
Verdict:	Passed

EUT Information

PMT number:	22-1-00306S58_C01
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Full Spectrum



End Of Annex 1