

Annex 1: Measurement diagrams to TEST REPORT No.: 16-1-0001901T21a

According to:
FCC Regulations
Part 22, Part 24

IC-Regulations
RSS-132 Issue 3, RSS-133 Issue 6,
RSS-Gen Issue 4

for

peiker acoustic GmbH

Telematic Device
ATM-02-US-R1

FCC: QWY-ATM2-R-11
ISED: 6588A-ATM2R11
PMN: ATM 02 Roof version
HVIN: ATM-02-US-R1

Laboratory Accreditation and Listings			
 Deutsche Akkreditierungsstelle D-PL-12047-01-01	 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-2666 C-2914, T-1967, G-301
 AUTHORIZED RF LABORATORY	 Authorized TM Test Lab 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			

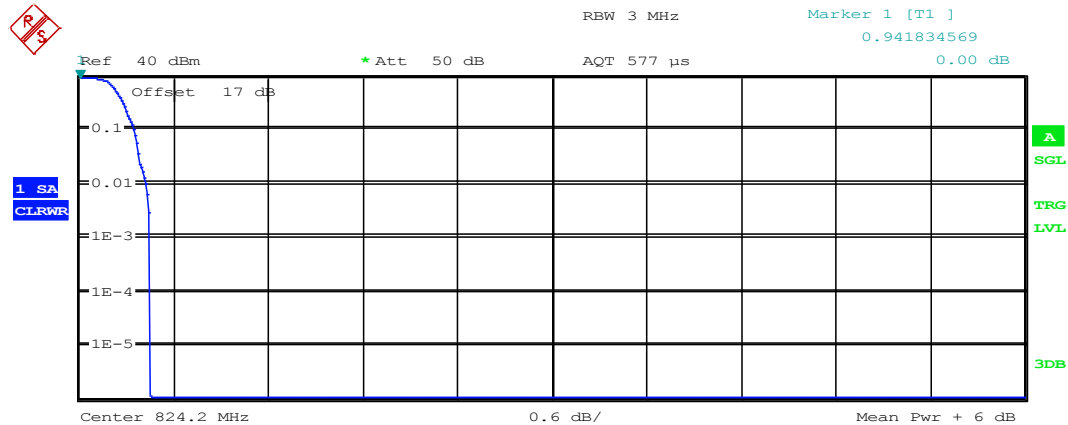
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1. Measurement diagrams

1.1. Power Measurements and PAPR-Value

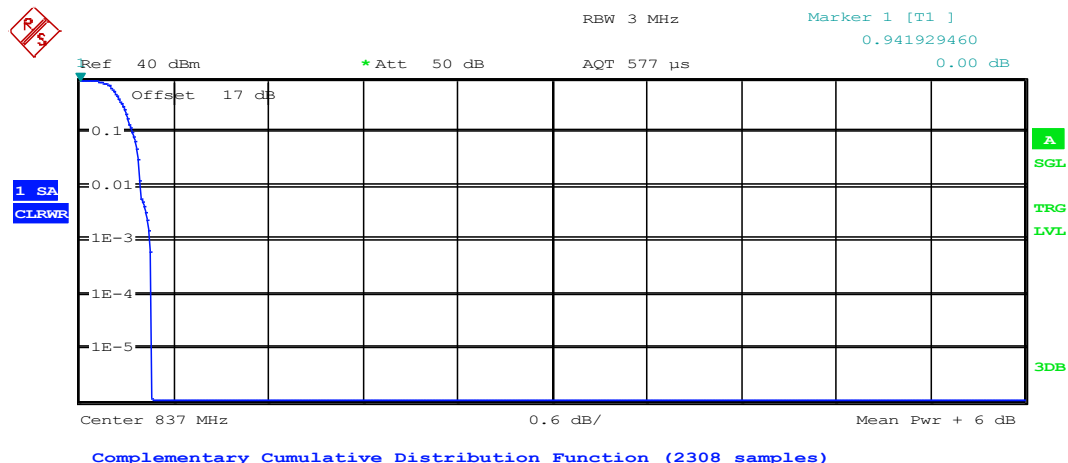
1.1.1. GSM 850 (GMSK Modulation)



Trace 1

Mean	31.31 dBm
Peak	31.76 dBm
Crest	0.45 dB
10 %	0.35 dB
1 %	0.42 dB
.1 %	0.45 dB
.01 %	0.45 dB

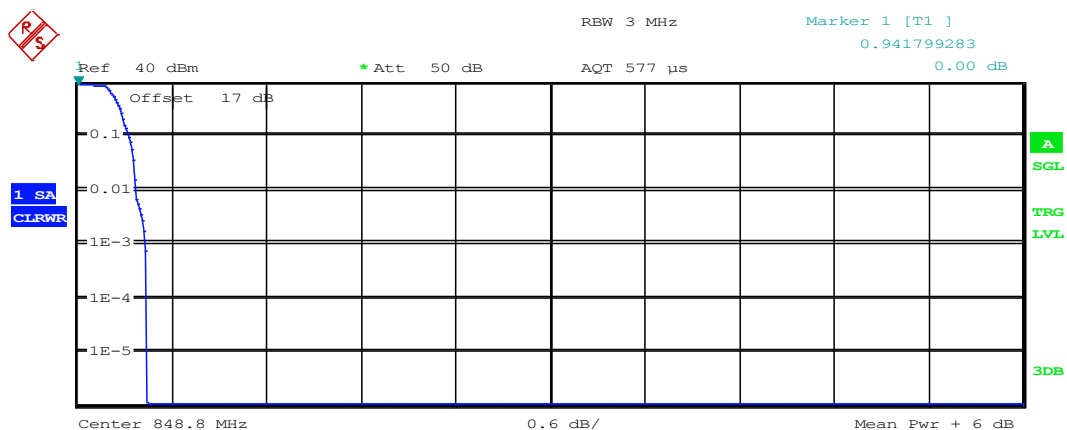
Diagram CCDF_128_GMSK



Trace 1

Mean	31.44 dBm
Peak	31.90 dBm
Crest	0.46 dB
10 %	0.34 dB
1 %	0.38 dB
.1 %	0.45 dB
.01 %	0.46 dB

Diagram CCDF_192_GMSK

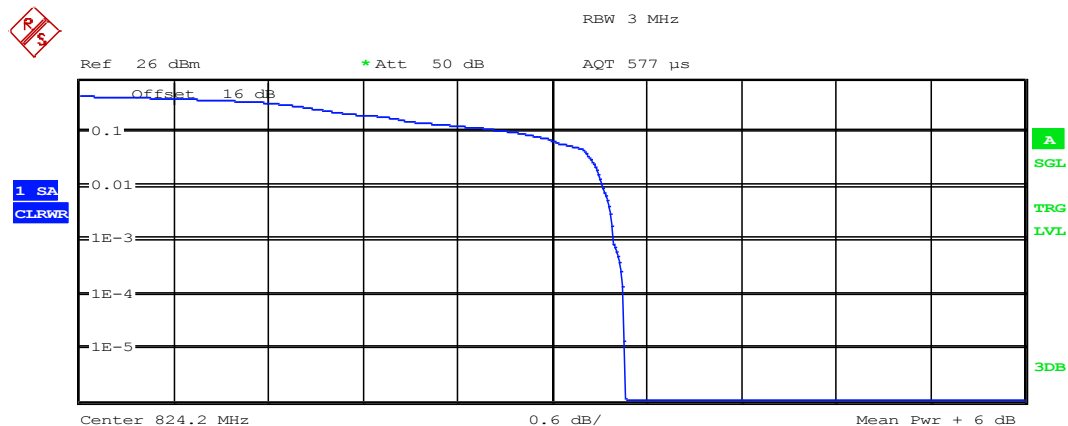


Complementary Cumulative Distribution Function (2308 samples)

Trace 1		
Mean	31.67	dBm
Peak	32.11	dBm
Crest	0.44	dB
10 %	0.33	dB
1 %	0.38	dB
.1 %	0.43	dB
.01 %	0.44	dB

Diagram CCDF_251_GMSK

1.1.2. GSM 850 (8-PSK Modulation)

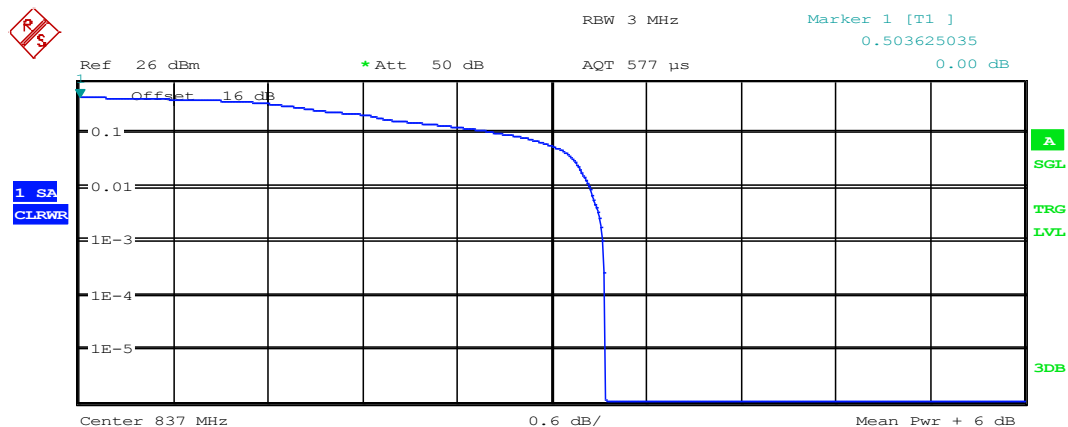


Complementary Cumulative Distribution Function (2308 samples)

Trace 1

Mean	23.52 dBm
Peak	26.97 dBm
Crest	3.46 dB
10 %	2.80 dB
1 %	3.32 dB
.1 %	3.39 dB
.01 %	3.45 dB

Diagram CCDF_128_8PSK

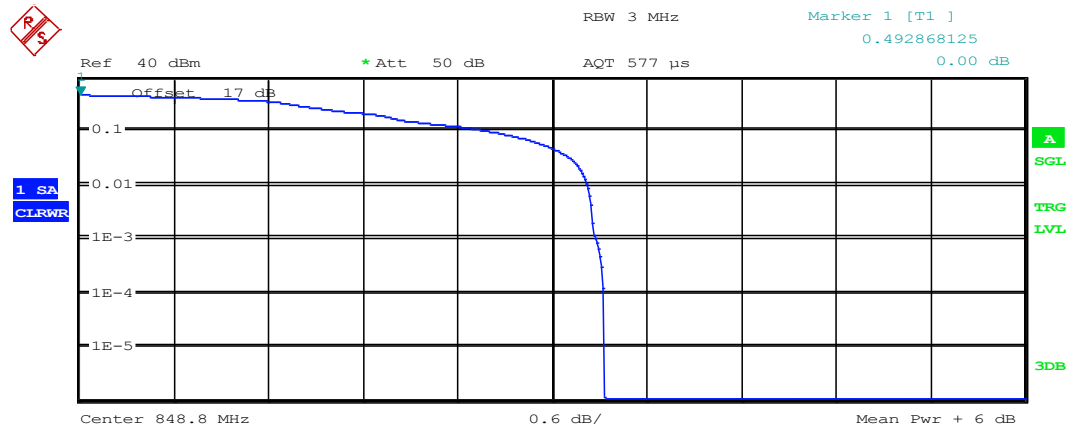


Complementary Cumulative Distribution Function (2308 samples)

Trace 1

Mean	23.71 dBm
Peak	27.04 dBm
Crest	3.33 dB
10 %	2.71 dB
1 %	3.24 dB
.1 %	3.33 dB
.01 %	3.35 dB

Diagram CCDF_192_8PSK



Complementary Cumulative Distribution Function (2308 samples)

Trace 1

Mean	24.83 dBm
Peak	28.16 dBm
Crest	3.33 dB
10 %	2.62 dB
1 %	3.22 dB
.1 %	3.28 dB
.01 %	3.33 dB

Diagram CCDF_251_8PSK

1.1.3. GSM 1900 (GMSK Modulation)

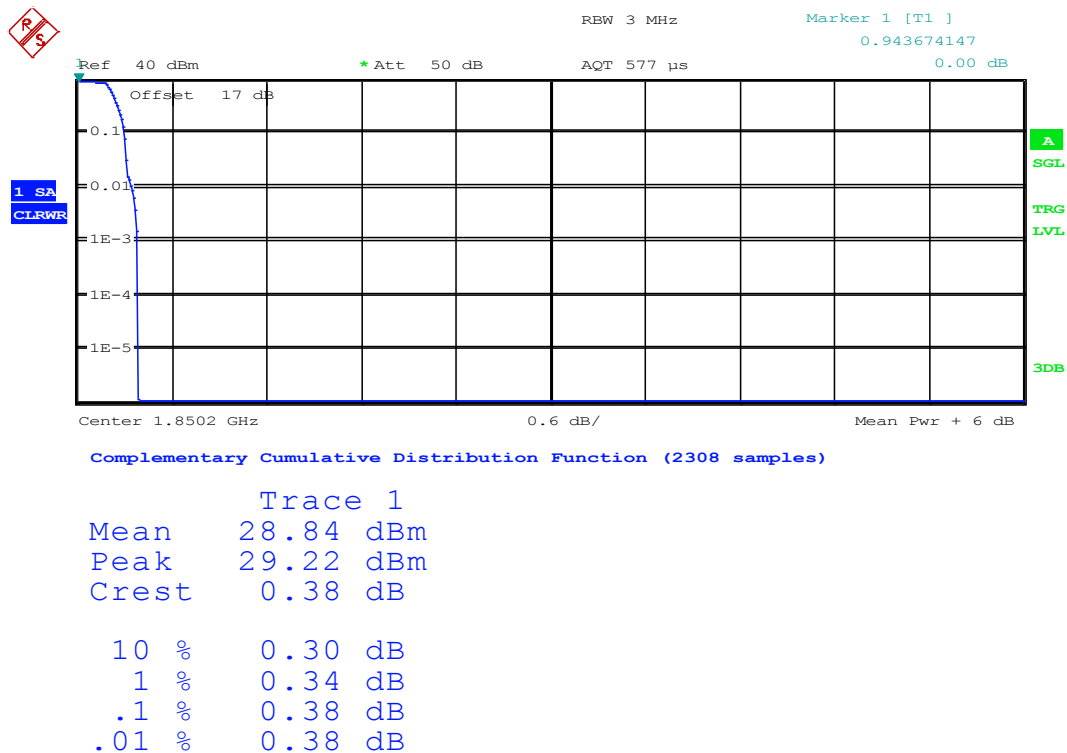


Diagram CCDF_512_GMSK

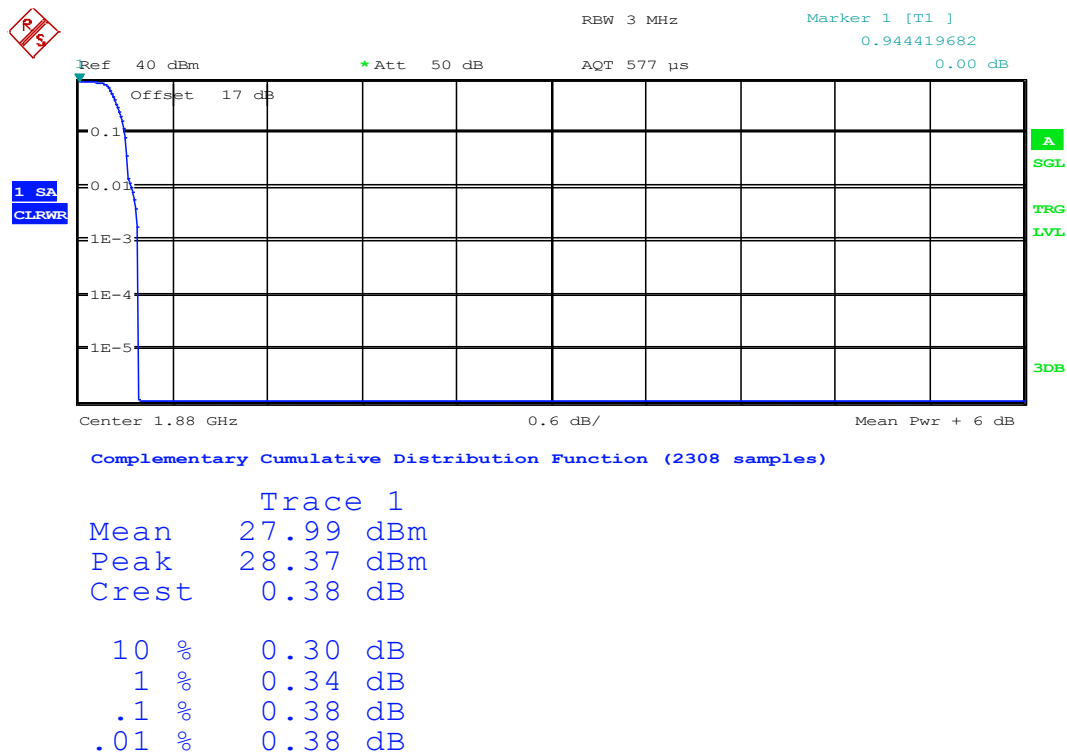
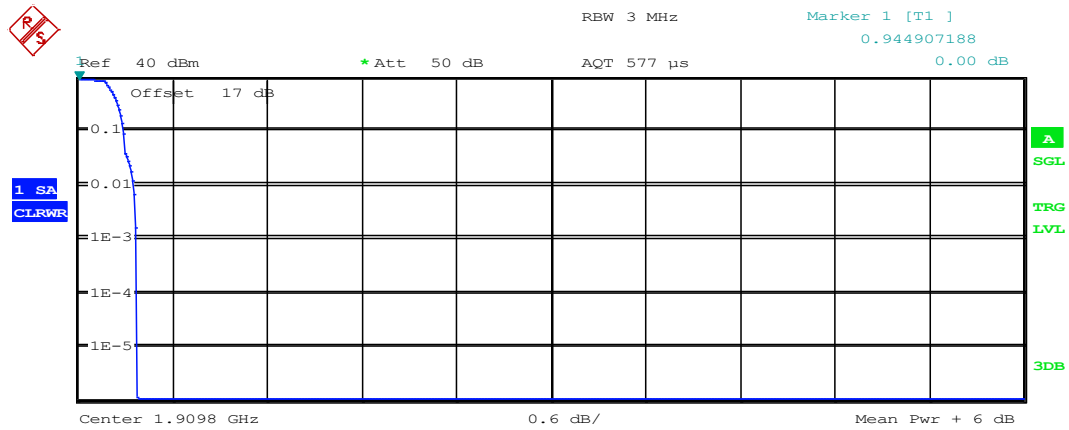


Diagram CCDF_661_GMSK



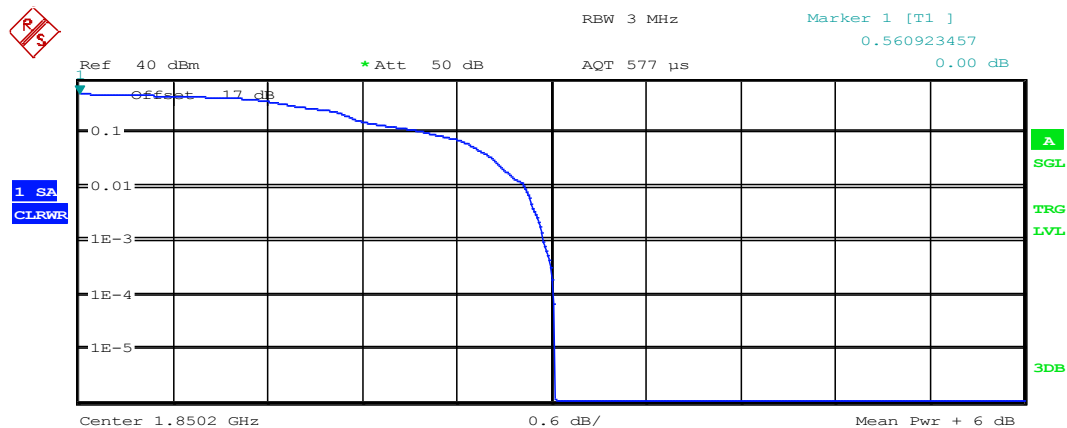
Complementary Cumulative Distribution Function (2308 samples)

Trace 1

Mean	28.22 dBm
Peak	28.58 dBm
Crest	0.37 dB
10 %	0.29 dB
1 %	0.35 dB
.1 %	0.37 dB
.01 %	0.38 dB

Diagram CCDF_810_GMSK

1.1.4. GSM 1900 (8-PSK Modulation)

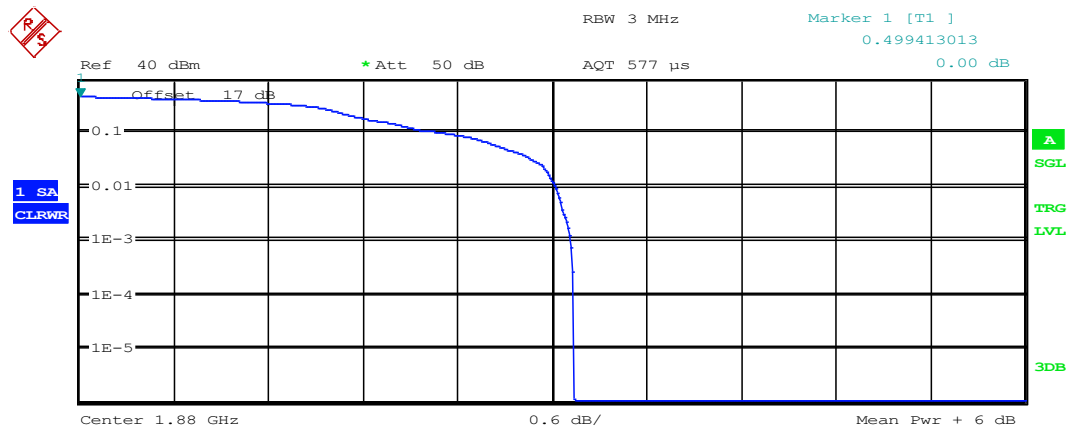


Complementary Cumulative Distribution Function (2308 samples)

Trace 1

Mean	25.28 dBm
Peak	28.30 dBm
Crest	3.02 dB
10 %	2.24 dB
1 %	2.83 dB
.1 %	2.95 dB
.01 %	3.02 dB

Diagram CCDF_512_8PSK

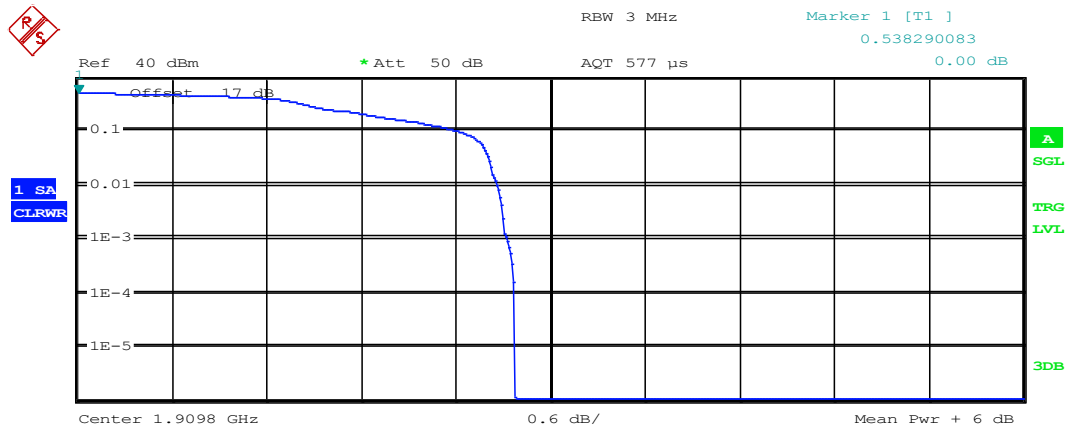


Complementary Cumulative Distribution Function (2308 samples)

Trace 1

Mean	24.32 dBm
Peak	27.46 dBm
Crest	3.13 dB
10 %	2.35 dB
1 %	3.02 dB
.1 %	3.12 dB
.01 %	3.14 dB

Diagram CCDF_661_8PSK



Complementary Cumulative Distribution Function (2308 samples)

Trace 1	
Mean	25.11 dBm
Peak	27.88 dBm
Crest	2.77 dB
10 %	2.42 dB
1 %	2.66 dB
.1 %	2.72 dB
.01 %	2.77 dB

Diagram CCDF_810_8PSK

1.2. Magnetic field emissions radiated (850 MHz transmitting mode)

2.01_RSE_GPRS850_251

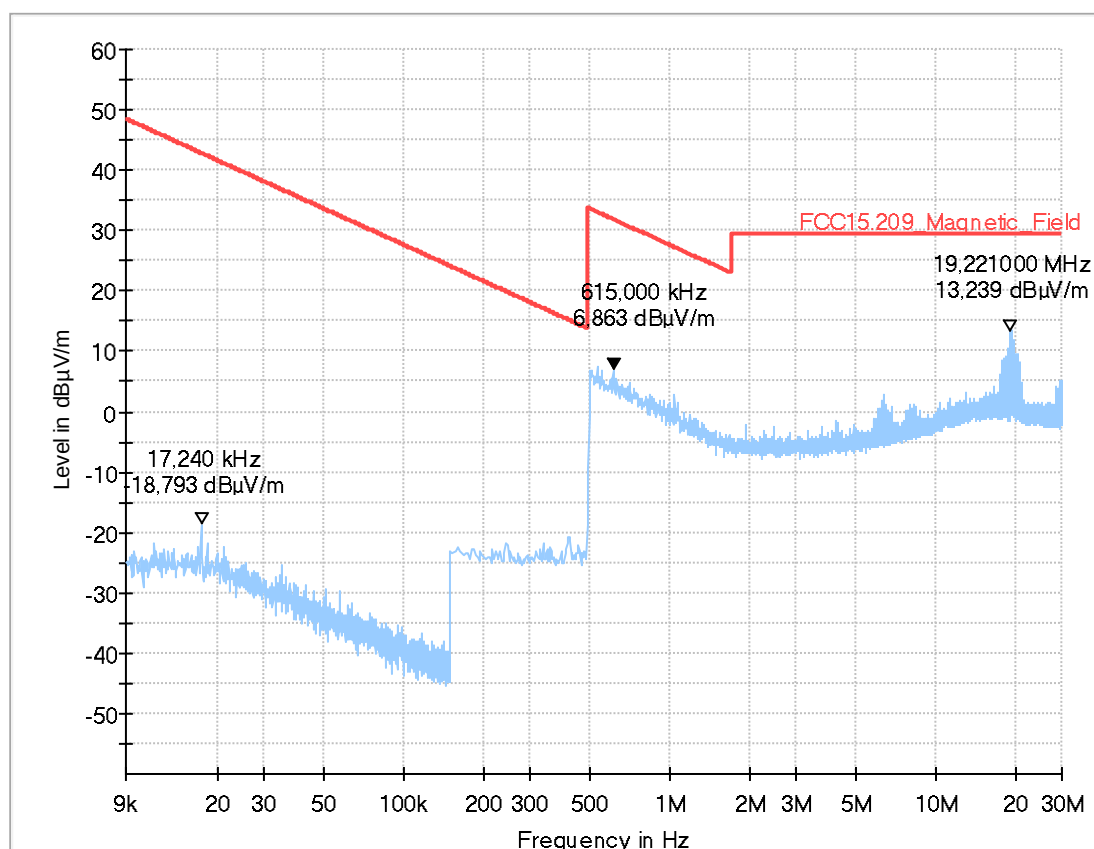
Common Information

Test Description:	Magnetic Field Strength Measurement related to 30/300m distance
Operating Conditions:	GPRS850_CH251
Operator Name:	Klv
Comment:	EUT Laying+Standing

EUT Information

Manufacturer:	peiker acoustic GmbH & Co. KG a valeo Brand
EUT:	ATM-02-US-R1 (Sample 1010)

HW version:	103.004.004
SW version:	001.009.015
Serial number:	4326
Connected Interfaces:	Antenna (65206826326-03) + EMC Control Unit
Power Supply:	12VDC
Comments:	-



1.2.1. Magnetic field emissions radiated (850 MHz transmitting mode)-Backup-Antenna

2.01a_RSE_GPRS850_128_standing

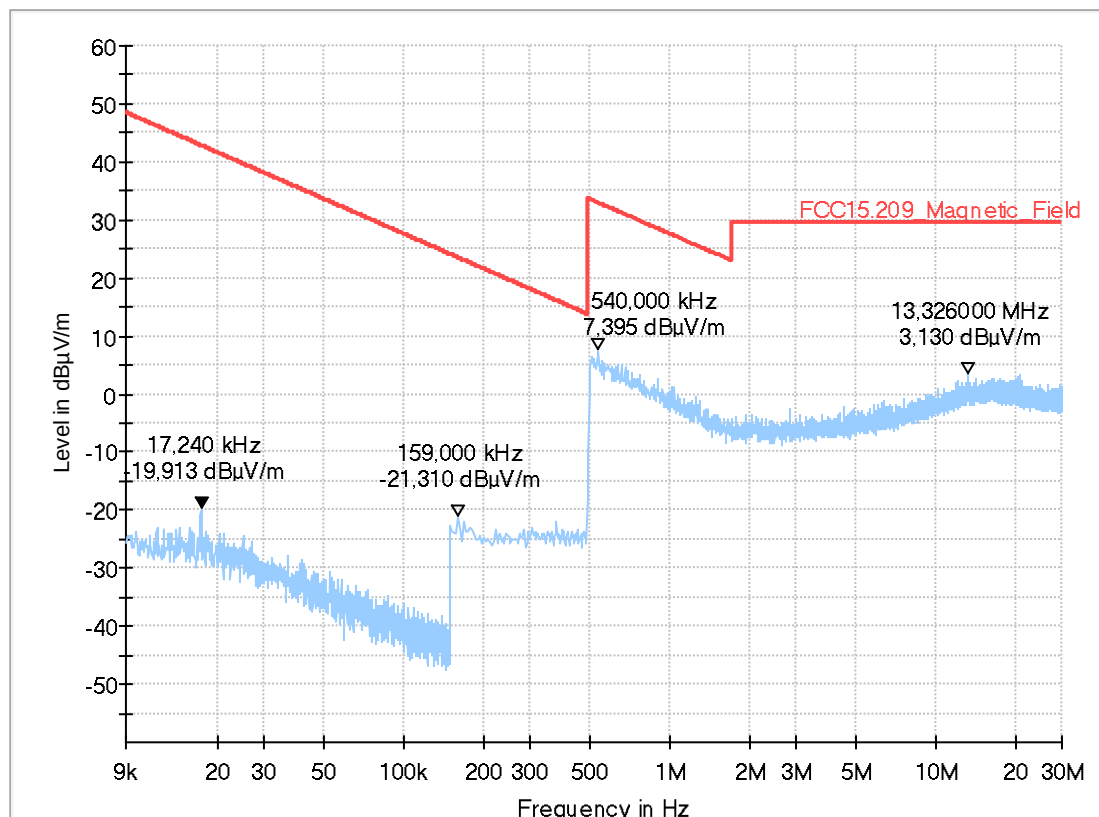
Common Information

Test Description:	Magnetic Field Strength Measurement related to 30/300m distance
Test site and distance	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Version of Testsoftware	EMC32 V9.25.0
Rec antenna	height 1.00m parallel and 90° to EUT polarisation
Used Filter	bypass
Test Specification	FCC 15.205 § 15.209; RSS-Gen: Issue 4
Operating Mode	GSM 850 CH128
Operating Conditions:	Humidity: 48%rH; Temperature: 21°C
Operator Name:	PMa
Comment:	STanding

EUT Information

Manufacturer:	peiker acustic GmbH & Co. KG a valeo Brand
EUT:	ATM-02-US-R1 (Sample 1010)
HW version:	103.004.004
SW version:	001.009.015
Serial number:	4326
Connected Interfaces:	Antenna (65206826326-03) + EMC Control Unit
Power Supply:	12VDC
Comments:	-

Full Spectrum



2.01b_RSE_GPRS850_128_laying

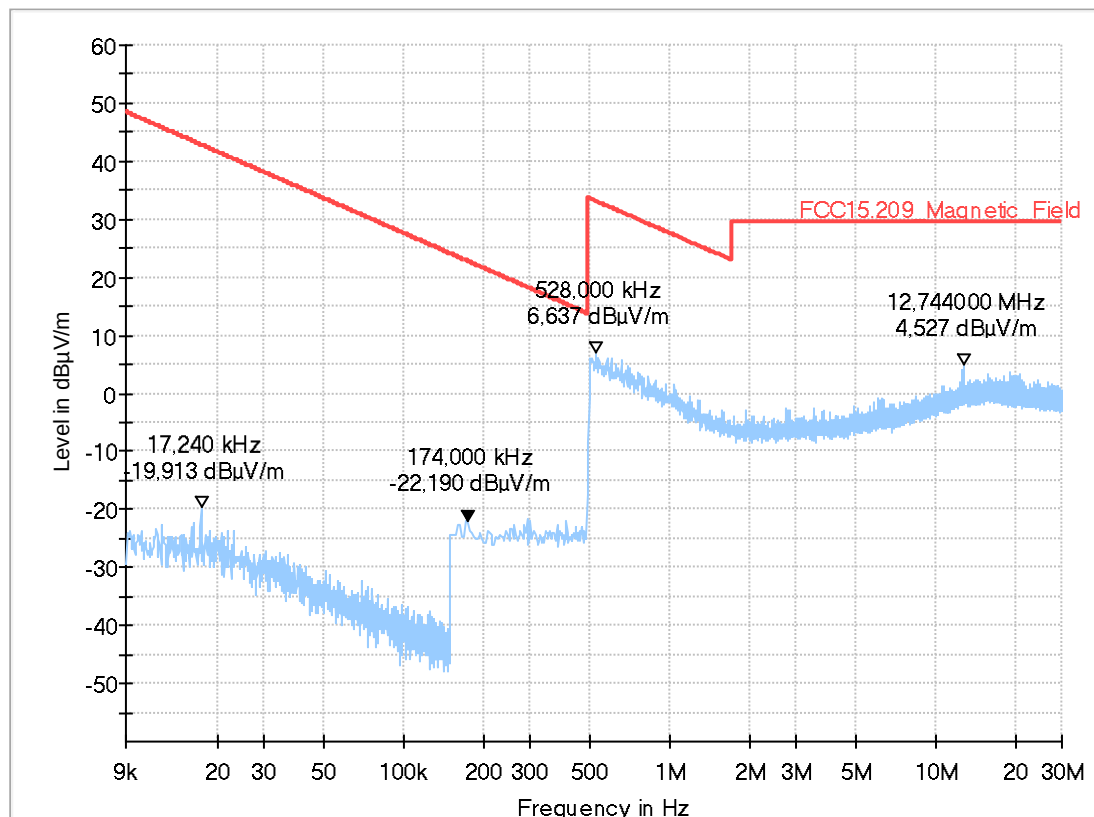
Common Information

Test Description:	Magnetic Field Strength Measurement related to 30/300m distance
Test site and distance	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Version of Testsoftware	EMC32 V9.25.0
Rec antenna	height 1.00m parallel and 90° to EUT polarisation
Used Filter	bypass
Test Specification	FCC 15.205 § 15.209; RSS-Gen: Issue 4
Operating Mode	GSM 850 CH128
Operating Conditions:	Humidity: 48%rH; Temperature: 21°C
Operator Name:	PMa
Comment:	Laying

EUT Information

Manufacturer:	peiker acoustic GmbH & Co. KG a valeo Brand
EUT:	ATM-02-US-R1 (Sample 1010)
HW version:	103.004.004
SW version:	001.009.015
Serial number:	4326
Connected Interfaces:	Antenna (65206826326-03) + EMC Control Unit
Power Supply:	12VDC
Comments:	-

Full Spectrum



1.3. Magnetic field emissions radiated (1900 MHz transmitting mode)

2.02b_RSE_GPRS1900_512_standing

Common Information

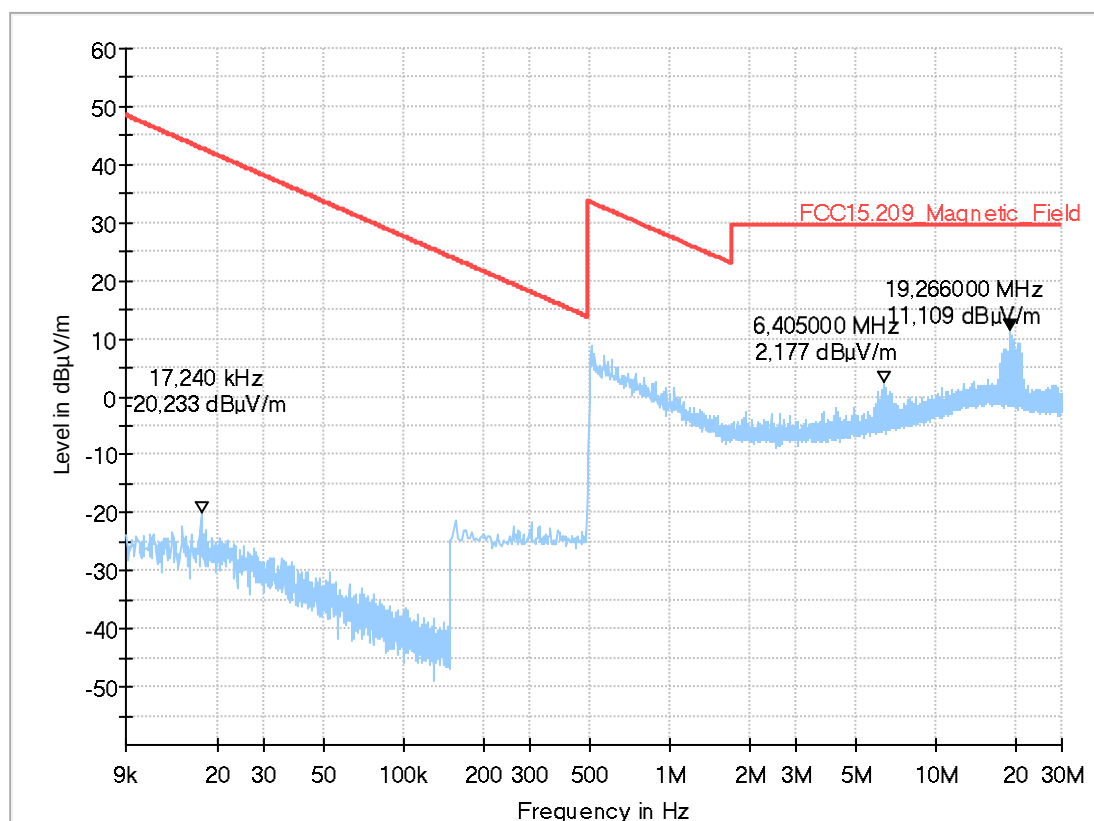
Test Description:	Magnetic Field Strength Measurement related to 30/300m distance
Operating Conditions:	GPRS1900_CH512
Operator Name:	HEI
Comment:	EUT Standing

EUT Information

Manufacturer:	peiker acoustic GmbH & Co. KG a valeo Brand
EUT:	ATM-02-US-R1 (Sample 1010)

HW version:	103.004.004
SW version:	001.009.015
Serial number:	4326
Connected Interfaces:	Antenna (65206826326-03) + EMC Control Unit
Power Supply:	12VDC
Comments:	-

Full Spectrum



2.02a_RSE_GPRS1900_512_laying

Common Information

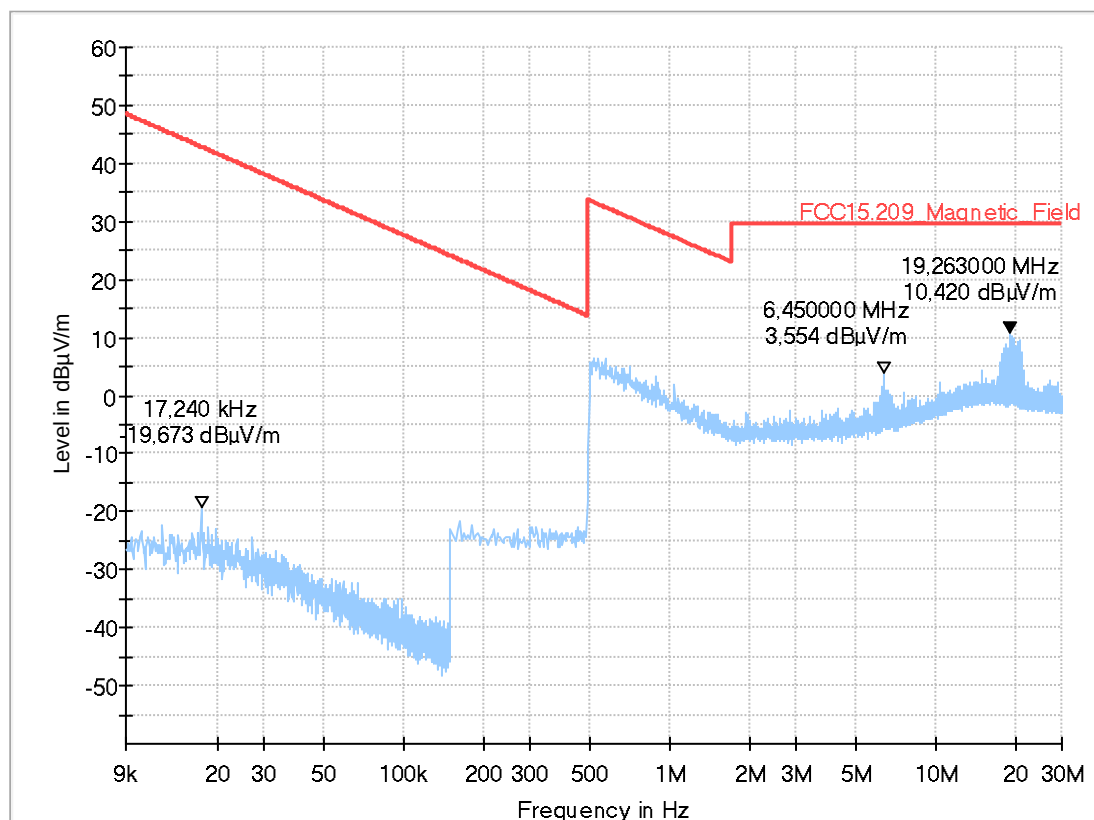
Test Description:	Magnetic Field Strength Measurement related to 30/300m distance
Operating Conditions:	GPRS1900_CH512
Operator Name:	HEI
Comment:	EUT Laying

EUT Information

Manufacturer:	peiker acoustic GmbH & Co. KG a valeo Brand
EUT:	ATM-02-US-R1 (Sample 1010)

HW version:	103.004.004
SW version:	001.009.015
Serial number:	4326
Connected Interfaces:	Antenna (65206826326-03) + EMC Control Unit
Power Supply:	12VDC
Comments:	-

Full Spectrum



1.3.1. Magnetic field emissions radiated (1900 MHz transmitting mode)-Backup-Antenna

2.02a_RSE_GPRS1900_810_standing

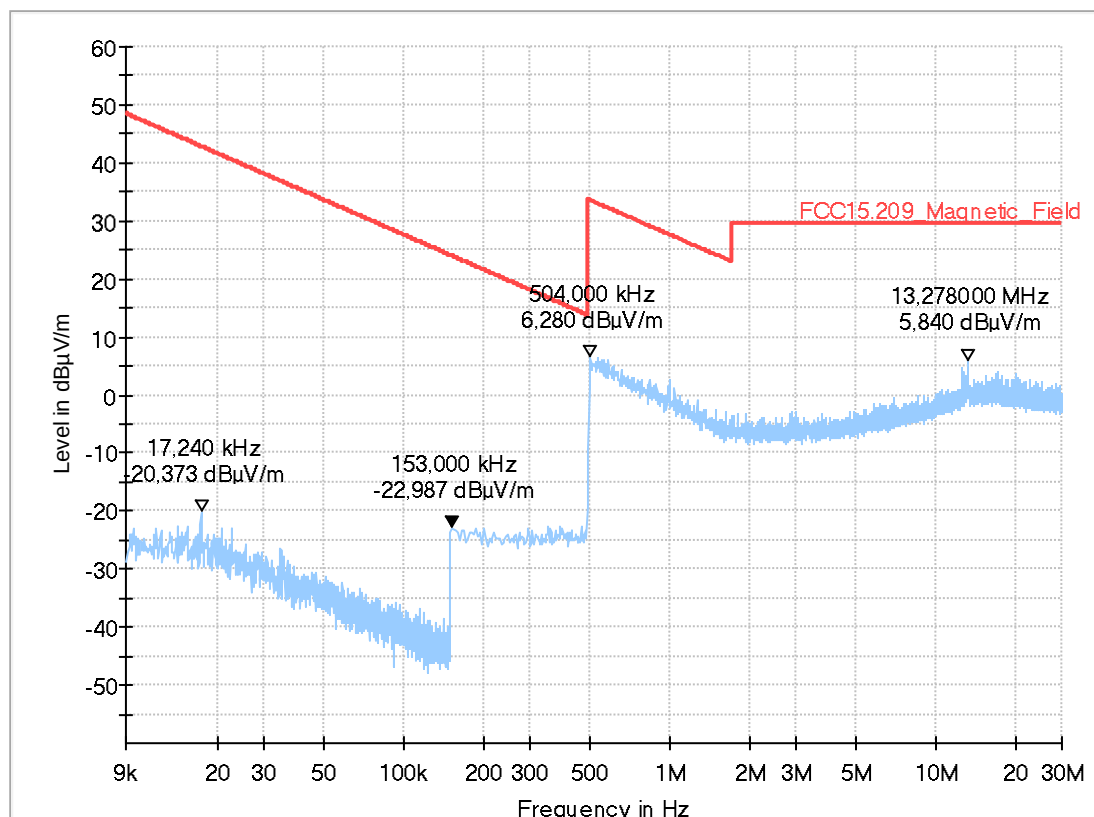
Common Information

Test Description:	Magnetic Field Strength Measurement related to 30/300m distance
Test site and distance	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Version of Testsoftware	EMC32 V9.25.0
Rec antenna	height 1.00m parallel and 90° to EUT polarisation
Used Filter	bypass
Test Specification	FCC 15.205 § 15.209; RSS-Gen: Issue 4
Operating Mode	GSM 1900 CH810
Operating Conditions:	Humidity: 48%rH; Temperature: 21°C
Operator Name:	PMa
Comment:	Standing

EUT Information

Manufacturer:	peiker acustic GmbH & Co. KG a valeo Brand
EUT:	ATM-02-US-R1 (Sample 1010)
HW version:	103.004.004
SW version:	001.009.015
Serial number:	4326
Connected Interfaces:	Antenna (65206826326-03) + EMC Control Unit
Power Supply:	12VDC
Comments:	-

Full Spectrum



2.02b_RSE_GPRS1900_810_laying

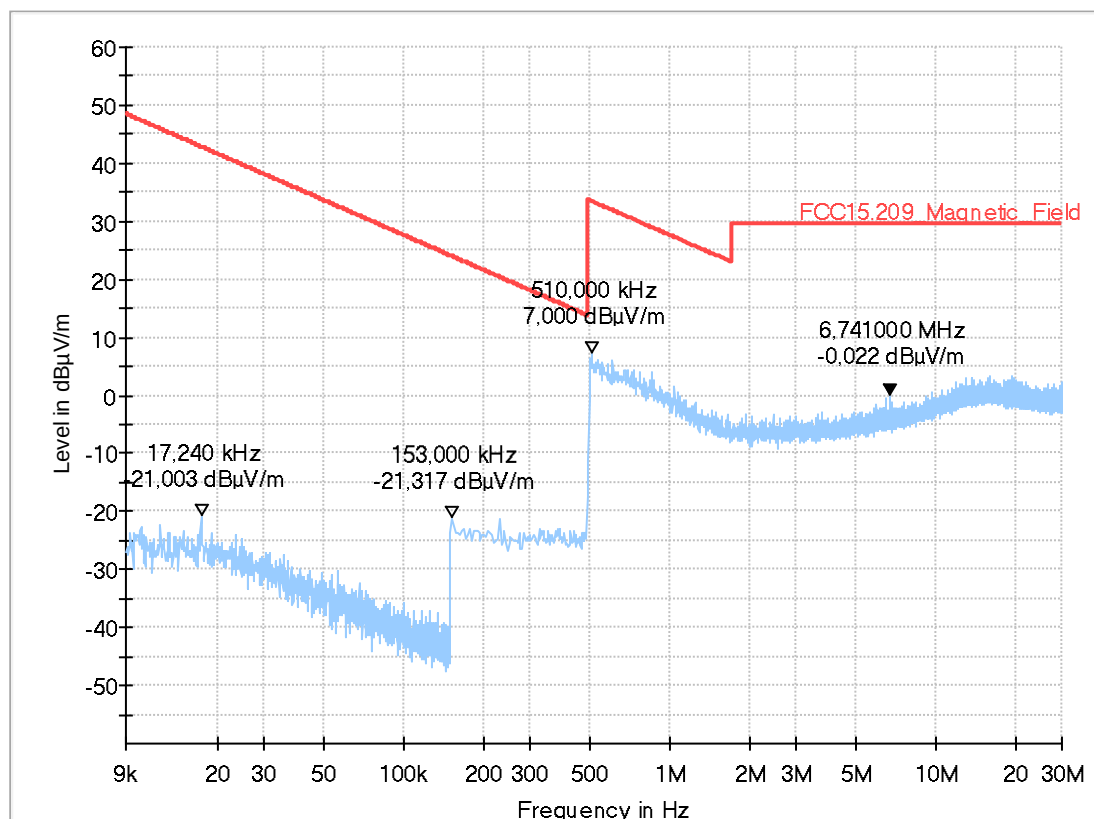
Common Information

Test Description:	Magnetic Field Strength Measurement related to 30/300m distance
Test site and distance	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Version of Testsoftware	EMC32 V9.25.0
Rec antenna	height 1.00m parallel and 90° to EUT polarisation
Used Filter	bypass
Test Specification	FCC 15.205 § 15.209; RSS-Gen: Issue 4
Operating Mode	GSM 1900 CH810
Operating Conditions:	Humidity: 48%rH; Temperature: 21°C
Operator Name:	PMa
Comment:	Laying

EUT Information

Manufacturer:	peiker acoustic GmbH & Co. KG a valeo Brand
EUT:	ATM-02-US-R1 (Sample 1010)
HW version:	103.004.004
SW version:	001.009.015
Serial number:	4326
Connected Interfaces:	Antenna (65206826326-03) + EMC Control Unit
Power Supply:	12VDC
Comments:	-

Full Spectrum



1.4. Spurious emissions radiated (850 MHz transmitting mode)

8.01_RSE_GPRS850_CH251

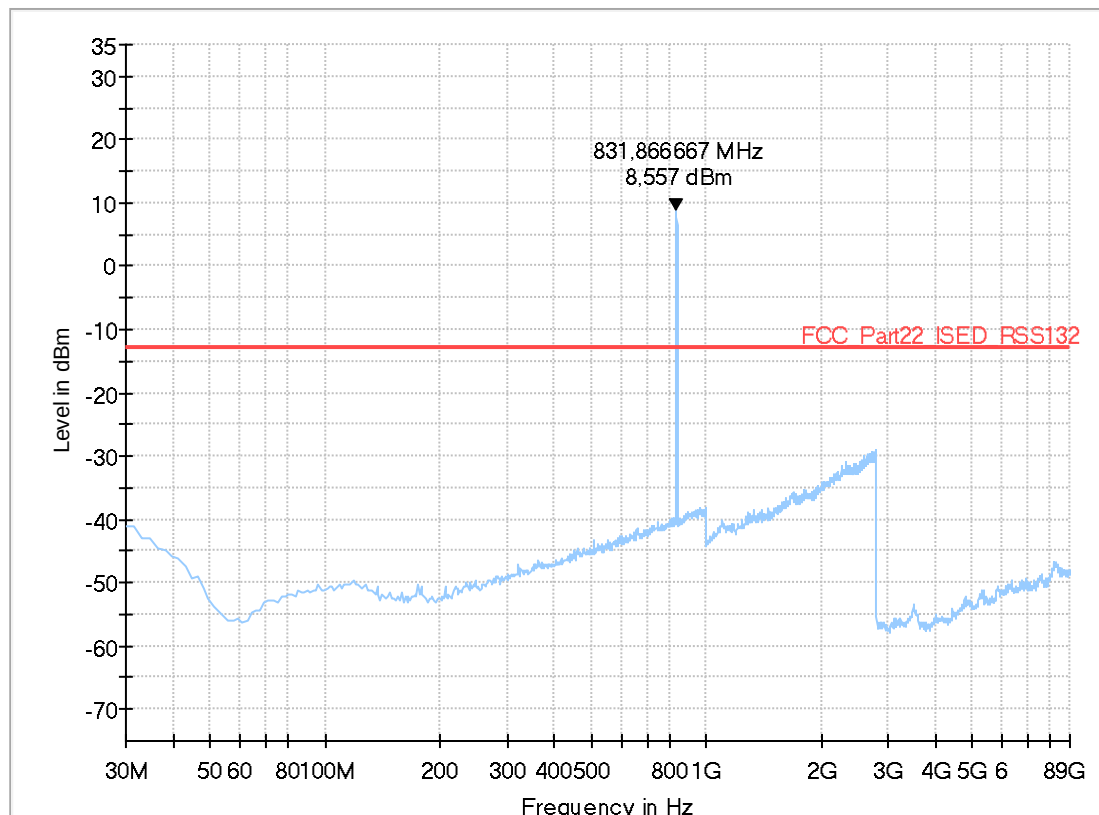
Common Information

Test Description:	Radiated emission related to 1m
Test Site:	FAR
Test Standard:	FCC FCC Part 24.238 Broadband PCS
Antenna polarisation:	vertical / horizontal
Operation mode:	TCH 1900, CHANNEL 512
Operator Name:	DLe
Comment:	

EUT Information

Manufacturer:	peiker acustic GmbH & Co. KG a valeo Brand
EUT:	ATM-02-US-R1 (Sample 1010)
HW version:	103.004.004
SW version:	001.009.015
Serial number:	4326
Connected Interfaces:	Antenna (65206826326-03) + EMC Control Unit
Power Supply:	12VDC
Comments:	-

Full Spectrum



1.4.1. Spurious emissions radiated (850 MHz transmitting mode)-Backup-Antenna

8.03_RSE_GPRS850_128

Common Information

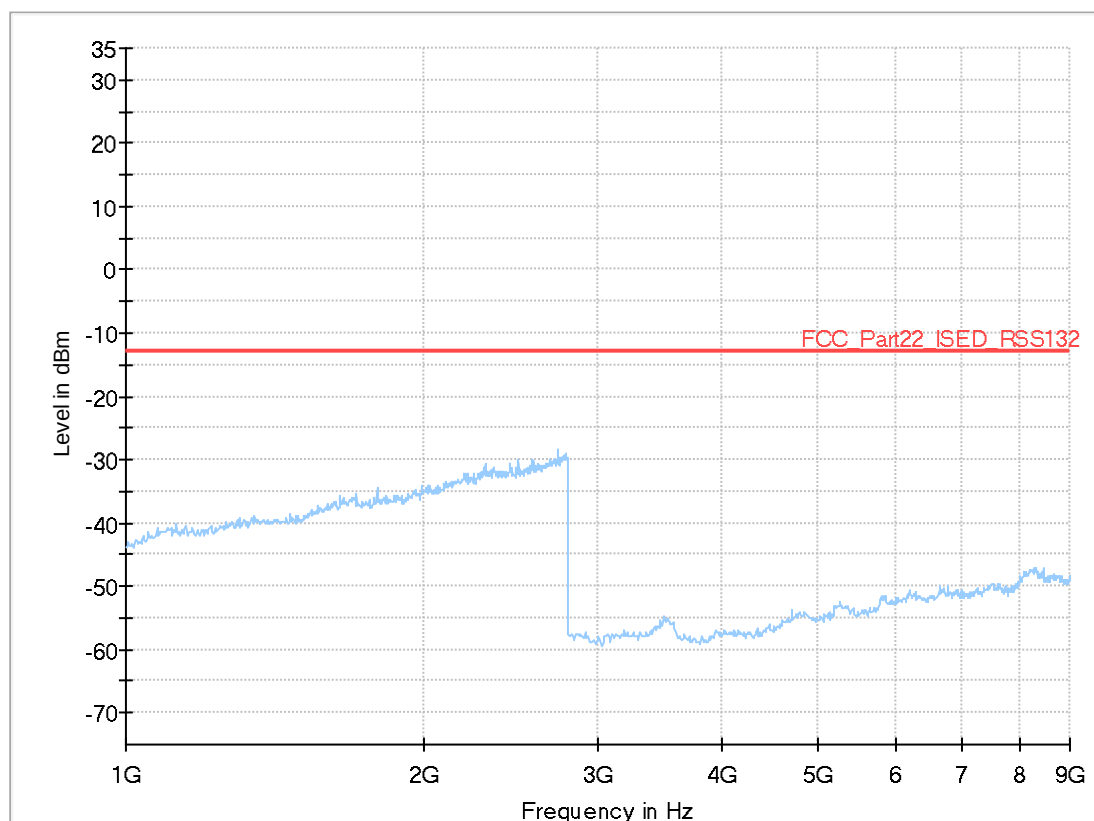
Test Description:	Radiated emission related to 1m
Test Site:	FAR
Test Standard:	FCC FCC Part 24.238 Broadband PCS
Antenna polarisation:	vertical / horizontal
Operation mode:	TX-Mode/GSM850/Ch182
Operator Name:	SLo

EUT Information

Manufacturer:	peiker acoustic GmbH & Co. KG a valeo Brand
EUT:	ATM-02-US-R1 (Sample 1010)

HW version:	103.004.004
SW version:	001.009.015
Serial number:	4326
Connected Interfaces:	Antenna (65206826326-03) + EMC Control Unit
Power Supply:	12VDC
Comments:	-

Full Spectrum



1.5. Spurious emissions radiated (1900 MHz transmitting mode)

1.5.1. Spurious emissions radiated (1900 MHz transmitting mode)-Main-Antenna

8.02_RSE_GPRS1900_512

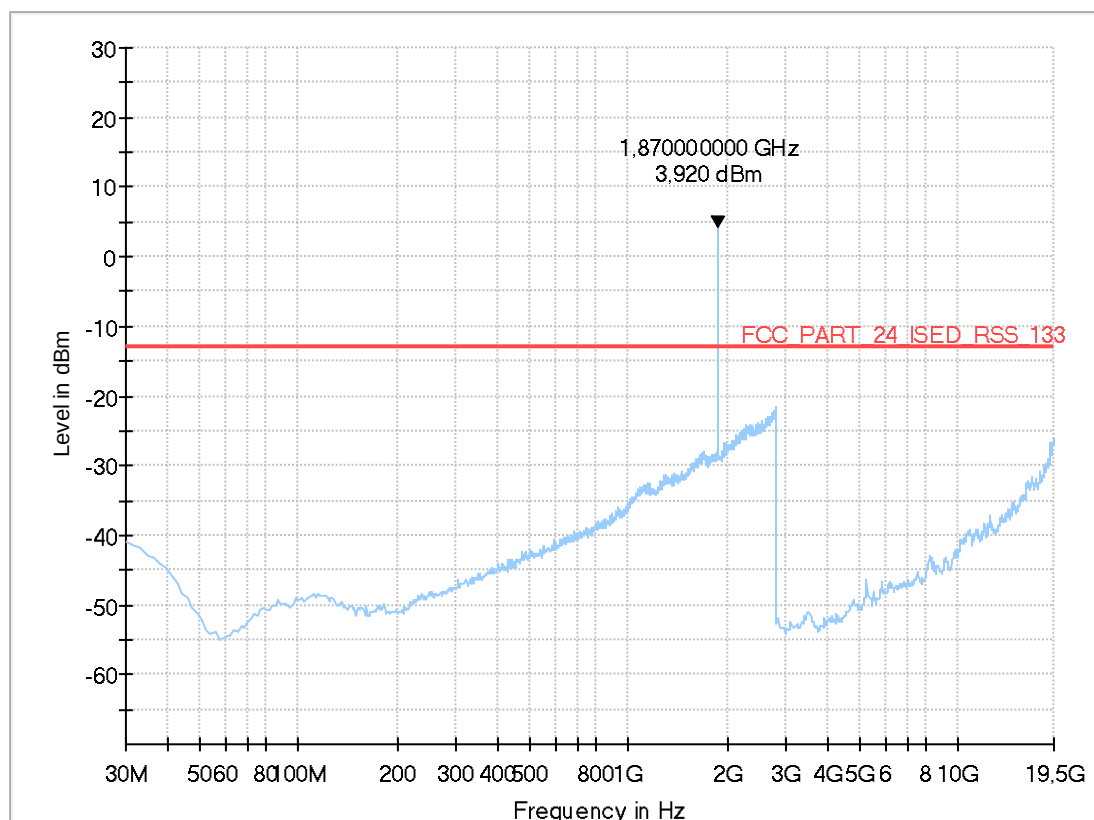
Common Information

Test Description:	Radiated emission related to 1m
Test Site:	FAR
Test Standard:	FCC FCC Part 24.238 Broadband PCS
Antenna polarisation:	vertical / horizontal
Operation mode:	TCH 1900, CHANNEL 512
Operator Name:	DLe
Comment:	

EUT Information

Manufacturer:	peiker acustic GmbH & Co. KG a valeo Brand
EUT:	ATM-02-US-R1 (Sample 1010)
HW version:	103.004.004
SW version:	001.009.015
Serial number:	4326
Connected Interfaces:	Antenna (65206826326-03) + EMC Control Unit
Power Supply:	12VDC
Comments:	-

Full Spectrum



1.5.2. Spurious emissions radiated (1900 MHz transmitting mode)-Backup-Antenna

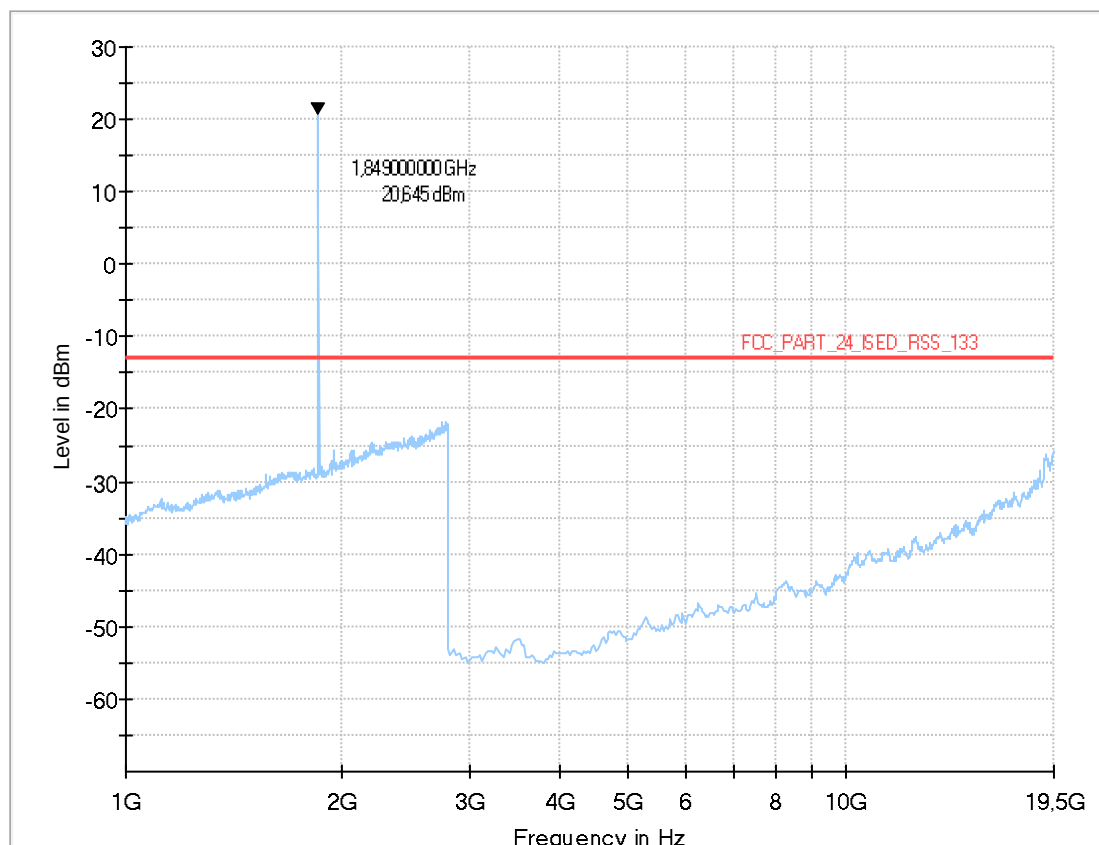
8.04_RSE_GPRS_1900_CH810

Common Information

Test Description:	Radiated Band Edge Compliance GSM1900
Test Site Location:	CETECOM GmbH Essen
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part 22.917
Operating Mode:	MS allocated channel 810
Environmental Conditions:	Humidity: 50%rH; Temperature: 20°C
Operator:	Klv

EUT Information

Manufacturer:	peiker acustic GmbH & Co. KG a valeo Brand
EUT:	ATM-02-US-R1 (Sample 1010)
-----	-----
HW version:	103.004.004
SW version:	001.009.015
Serial number:	4326
Connected Interfaces:	Antenna (65206826326-03) + EMC Control Unit
Power Supply:	12VDC
Comments:	-



1.6. Radiated emissions on 850 MHz transmitting band-edge

1.6.1. Spurious emissions radiated (850 MHz transmitting mode)-Main-Antenna

9.01a_BE_GPRS_850_CH128

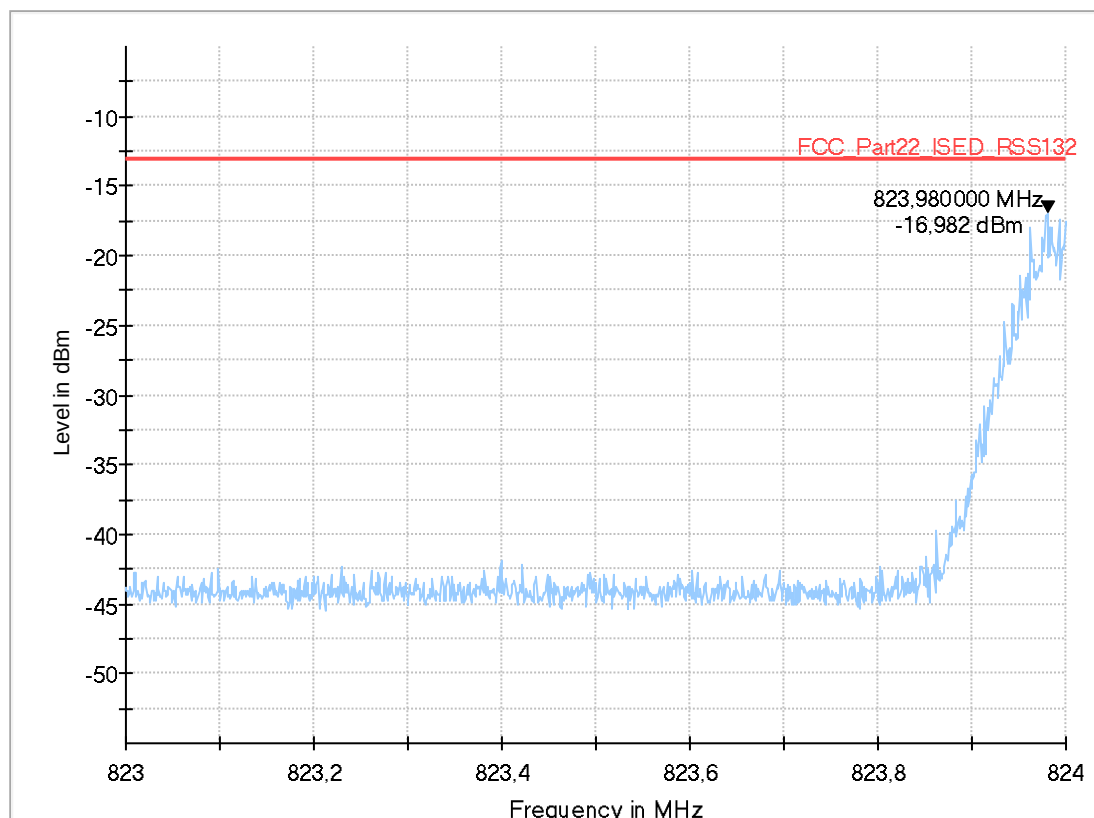
Common Information

Test Description:	Radiated emission related to 1m
Test Site:	FAR
Test Standard:	FCC FCC Part 24.238 Broadband PCS
Antenna polarisation:	vertical / horizontal
Operation mode:	TCH 850, CHANNEL 128
Operator Name:	TFra

EUT Information

Manufacturer:	peiker acoustic GmbH & Co. KG a valeo Brand
EUT:	ATM-02-US-R1 (Sample 1010)
HW version:	103.004.004
SW version:	001.009.015
Serial number:	4326
Connected Interfaces:	Antenna (65206826326-03) + EMC Control Unit
Power Supply:	12VDC
Comments:	-

Full Spectrum



9.01b_BE_GPRS_850_CH251

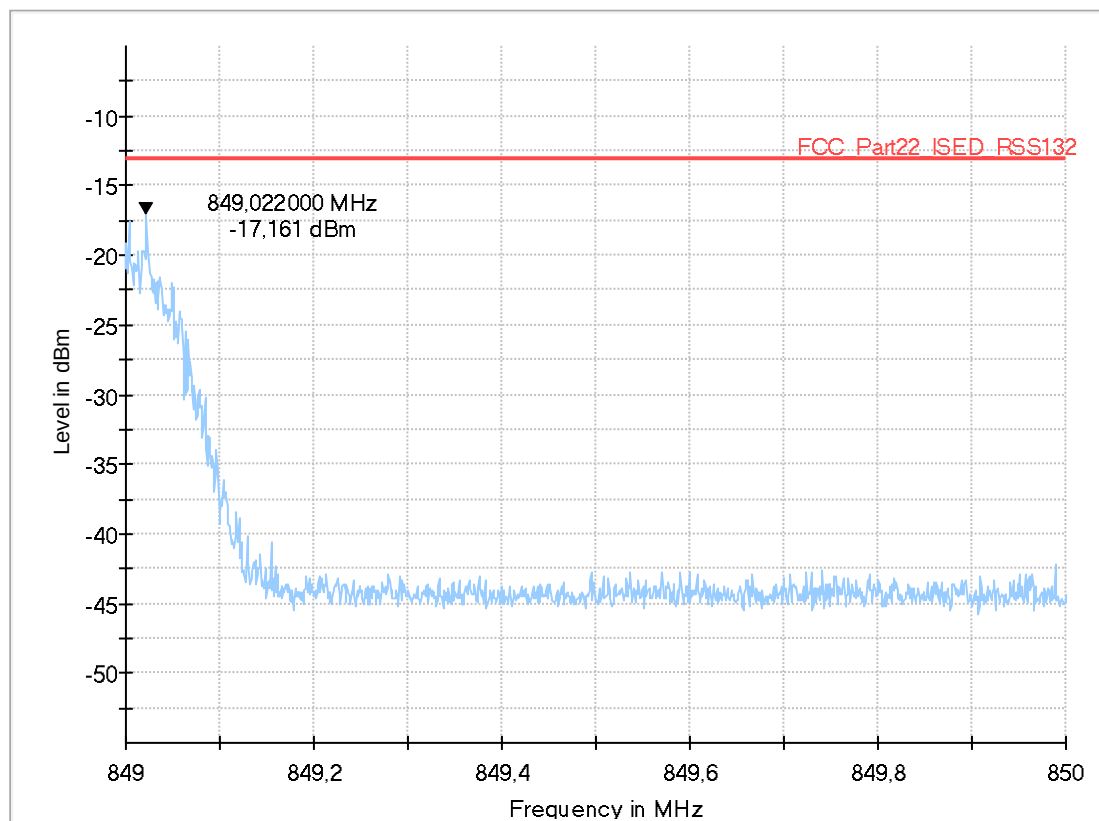
Common Information

Test Description:	Band-Edge: Radiated Field Strength Emissions Emissions in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.247&15.209 Intentional Radiator / RSS-Gen, Issue 4
Antenna polarisation:	horizontal/vertical
Operator Name:	TFra

EUT Information

Manufacturer:	peiker acoustic GmbH & Co. KG a valeo Brand
EUT:	ATM-02-US-R1 (Sample 1010)
-----	-----
HW version:	103.004.004
SW version:	001.009.015
Serial number:	4326
Connected Interfaces:	Antenna (65206826326-03) + EMC Control Unit
Power Supply:	12VDC
Comments:	-

Full Spectrum



1.6.2. Radiated emissions on 850 MHz transmitting band-edge-Backup-Antenna

1.6.3. Spurious emissions radiated (1900 MHz transmitting mode)-Backup-Antenna

9.03a_RSE_GPRS_850_CH128

Common Information

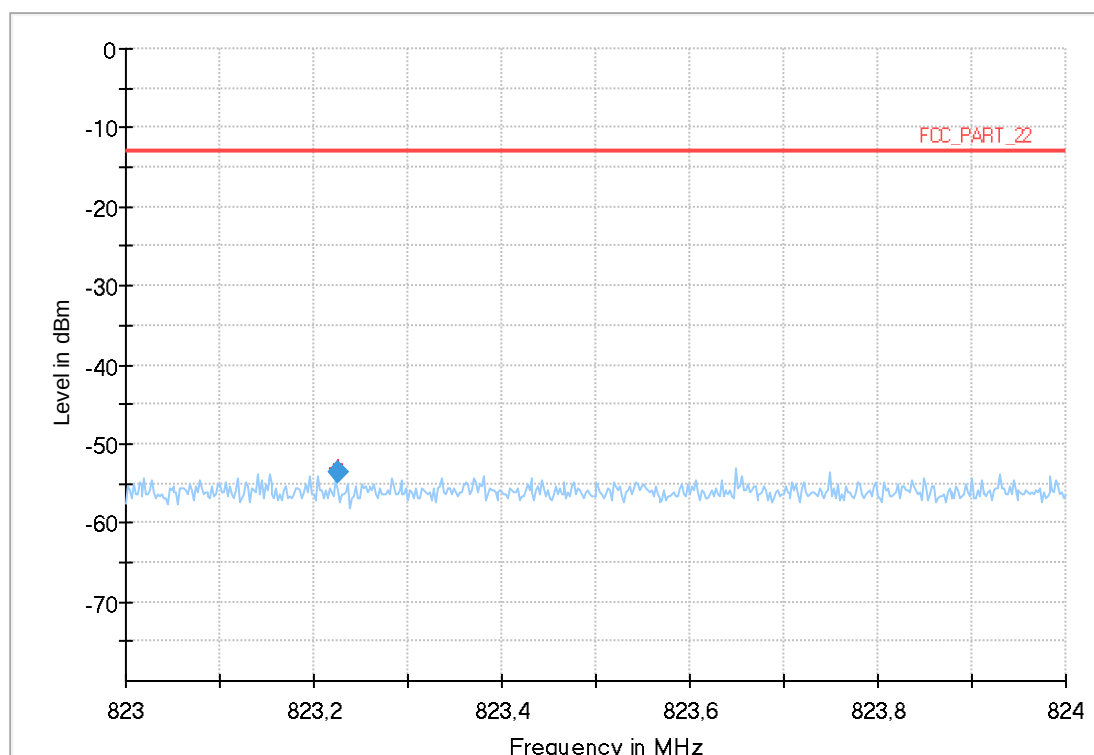
Test Description:	Radiated Band Edge Compliance GSM850
Test Site Location:	CETECOM GmbH Essen
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part 22.917
Operating Mode:	MS allocated channel 128 (fc = 824.2MHz), Voice, PCL5 (+33dBm)
Exclusionband:	824 - 849MHz
Environmental Conditions:	Humidity: 50%rH; Temperature: 20°C
Operator:	SLo

EUT Information

Manufacturer:	peiker acoustic GmbH & Co. KG a valeo Brand
EUT:	ATM-02-US-R1 (Sample 1010)

HW version:	103.004.004
SW version:	001.009.015
Serial number:	4326
Connected Interfaces:	Antenna (65206826326-03) + EMC Control Unit
Power Supply:	12VDC
Comments:	-

Full Spectrum



— Preview Result 1-PK+	* Critical_Freqs PK+
— FCC_PART_22	◆ Final_Result PK+

Final Result

Frequency (MHz)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
823.226453	-13.00	40.50	10000.0	3.000	155.0	H	258.0	0.0	-75.8

9.03b_RSE_GPRS_850_CH251

Common Information

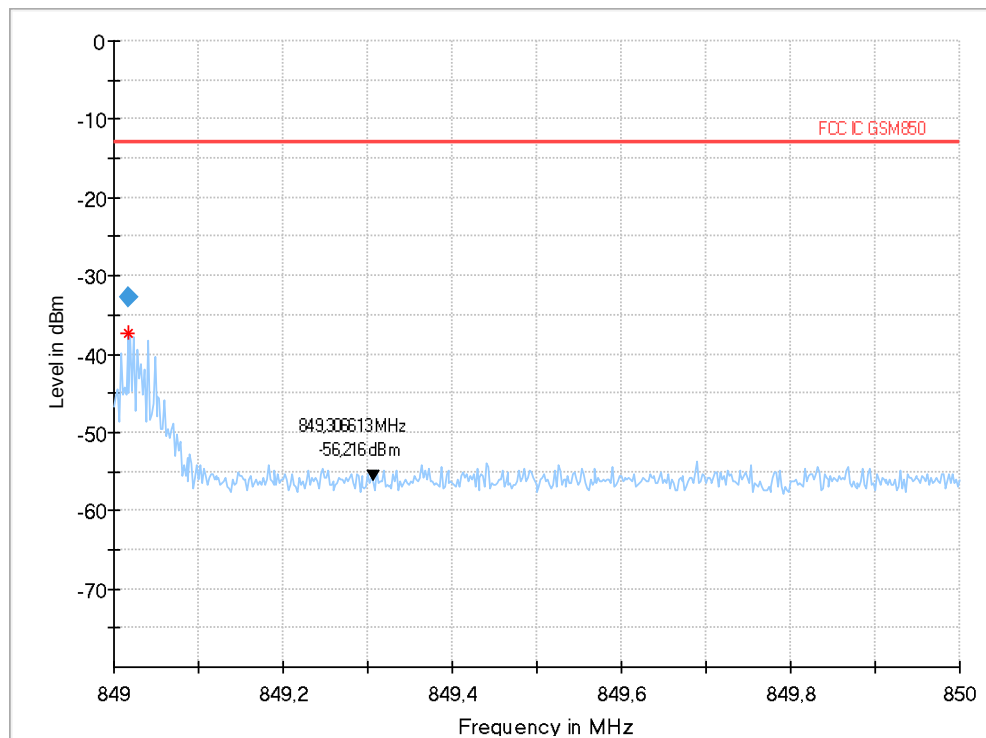
Test Description:	Radiated Band Edge Compliance GSM850
Test Site Location:	CETECOM GmbH Essen
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part 22.917
Operating Mode:	MS allocated channel 251 (fc = 848.8MHz), Voice, PCL0 (+33dBm)
Exclusionband:	824 - 849MHz
Environmental Conditions:	Humidity: 50%rH; Temperature: 19.8°C
Operator:	SLo

EUT Information

Manufacturer:	peiker acoustic GmbH & Co. KG a valeo Brand
EUT:	ATM-02-US-R1 (Sample 1010)

HW version:	103.004.004
SW version:	001.009.015
Serial number:	4326
Connected Interfaces:	Antenna (65206826326-03) + EMC Control Unit
Power Supply:	12VDC
Comments:	-

Full Spectrum



Final Result

Frequency (MHz)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
849.018036	13.00	19.70	10000.0	3.000	155.0	H	187.0	90.0	-76.0

(continuation of the "Final_Result" table from column 17 ...)

Frequency (MHz)	Comment
849.018036	21:53:57 - 24.01.2018

1.6.4. Radiated emissions on 1900 MHz transmitting band-edge-Main-Antenna

9.02a_RSE_GPRS_1900_512

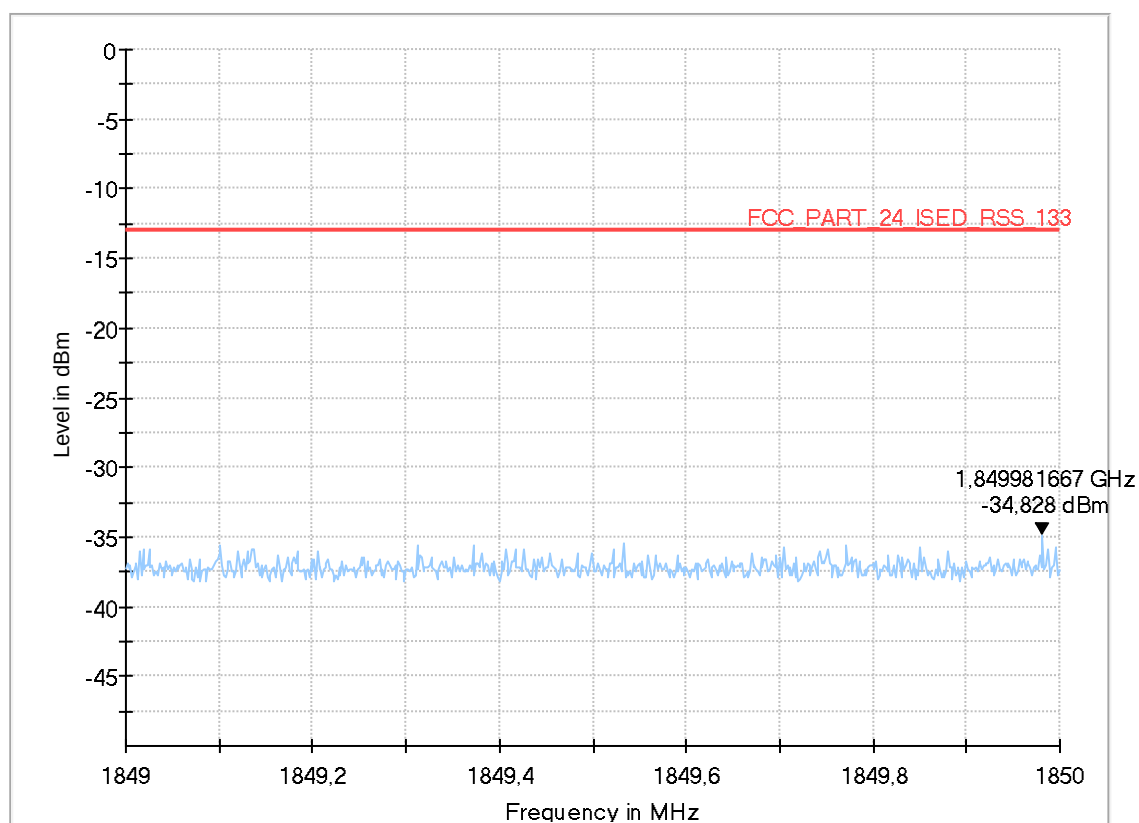
Common Information

Test Description:	Band-Edge: Radiated Field Strength Emissions Emissions in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.247&15.209 Intentional Radiator / RSS-Gen, Issue 4
Antenna polarisation:	horizontal/vertical
Operator Name:	TFra

EUT Information

Manufacturer:	peiker acoustic GmbH & Co. KG a valeo Brand
EUT:	ATM-02-US-R1 (Sample 1010)
HW version:	103.004.004
SW version:	001.009.015
Serial number:	4326
Connected Interfaces:	Antenna (65206826326-03) + EMC Control Unit
Power Supply:	12VDC
Comments:	-

Full Spectrum



9.02b_RSE_GPRS_1900_810

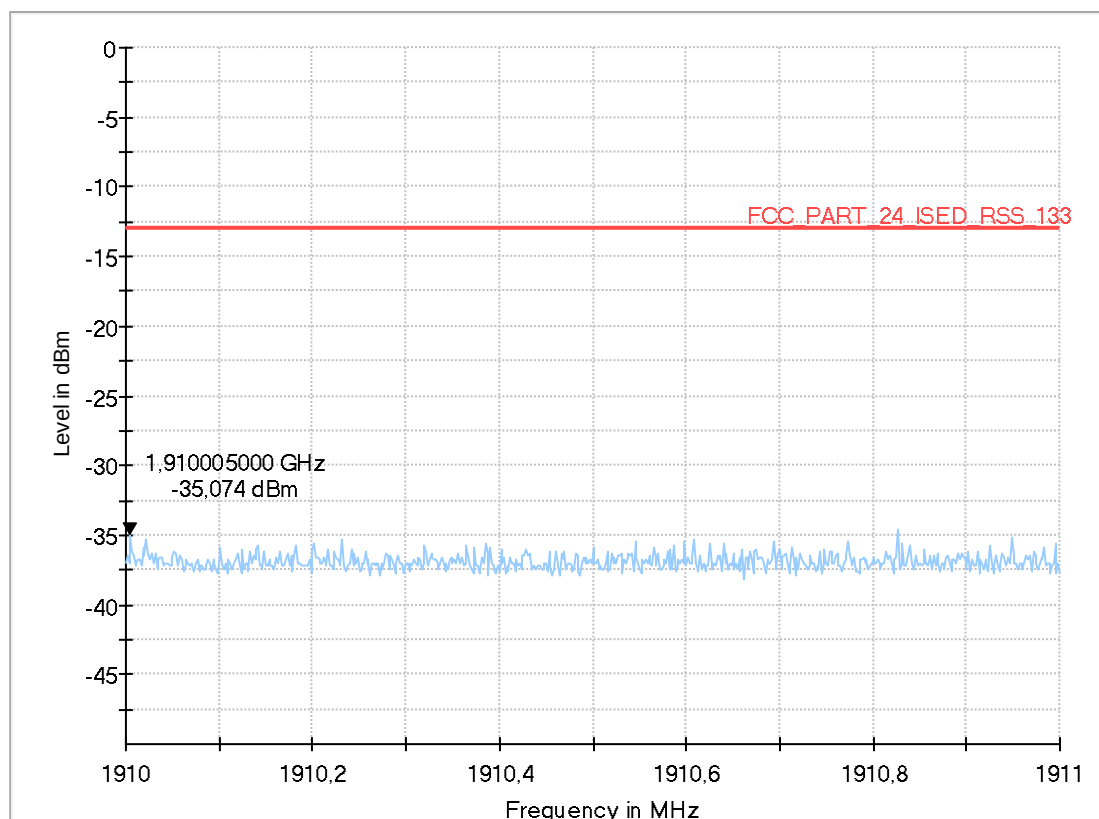
Common Information

Test Description:	Radiated Emissions GSM1900
Test Site Location:	CETECOM GmbH Essen
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part24.238
Operating Mode:	MS allocated UL channel 810
Exclusionband:	1850 - 1910MHz
Environmental Conditions:	Humidity: 40%rH; Temperature: 20°C
Operator:	TFra

EUT Information

Manufacturer:	peiker acoustic GmbH & Co. KG a valeo Brand
EUT:	ATM-02-US-R1 (Sample 1010)
-----	-----
HW version:	103.004.004
SW version:	001.009.015
Serial number:	4326
Connected Interfaces:	Antenna (65206826326-03) + EMC Control Unit
Power Supply:	12VDC
Comments:	-

Full Spectrum



1.6.5. Radiated emissions on 1900 MHz transmitting band-edge-Backup-Antenna

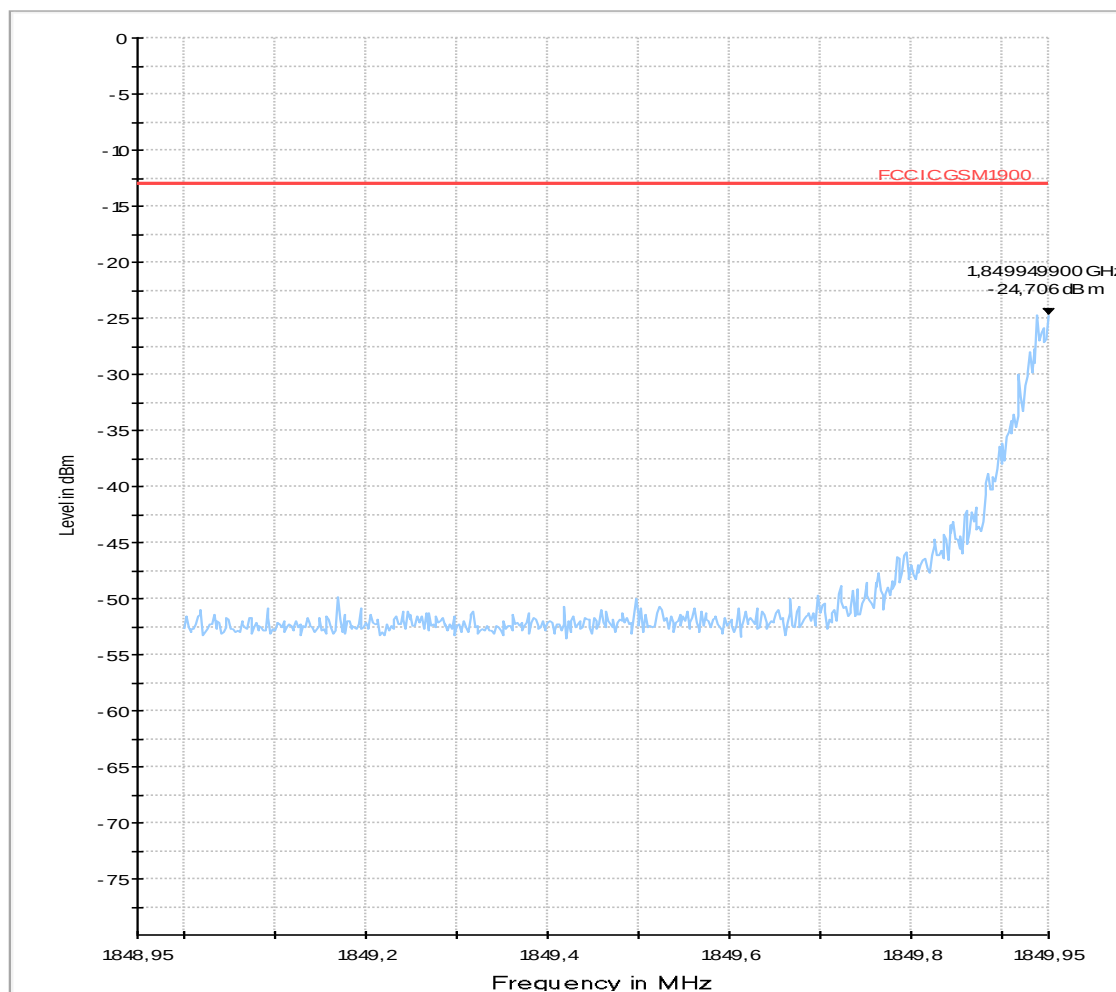
9.04a_RSE_GPRS_1900_512

Common Information

Test Description:	Band-Edge: Radiated Field Strength Emissions Emissions in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.247&15.209 Intentional Radiator / RSS-Gen, Issue 4
Antenna polarisation:	horizontal/vertical
Operator Name:	TFra

EUT Information

Manufacturer:	peiker acustic GmbH & Co. KG a valeo Brand
EUT:	ATM-02-US-R1 (Sample 1010)
HW version:	103.004.004
SW version:	001.009.015
Serial number:	4326
Connected Interfaces:	Antenna (65206826326-03) + EMC Control Unit
Power Supply:	12VDC
Comments:	-



9.04b_RSE_GPRS_1900_810

Common Information

Test Description:	Band-Edge: Radiated Field Strength Emissions Emissions in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.247&15.209 Intentional Radiator / RSS-Gen, Issue 4
Antenna polarisation:	horizontal/vertical
Operator Name:	TFra

EUT Information

Manufacturer:	peiker acoustic GmbH & Co. KG a valeo Brand
EUT:	ATM-02-US-R1 (Sample 1010)
-----	-----
HW version:	103.004.004
SW version:	001.009.015
Serial number:	4326
Connected Interfaces:	Antenna (65206826326-03) + EMC Control Unit
Power Supply:	12VDC
Comments:	-

