

Annex 1: Measurement diagrams  
to  
**TEST REPORT**  
No.: 6-0754-15-1-3a







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 & Co. KG  
**ATM-01 T1-US-4GW**  
Advanced Telecommunication Module

**FCC-ID: QWY-ATM-T-522**  
**IC: 6588A-ATMT522**  
PMN: ATM trunk version  
HVIN ATM-01 T1-US-4GW

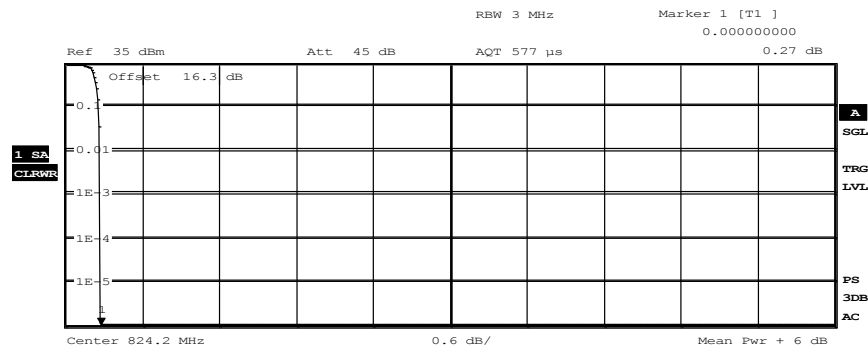
Laboratory Accreditation and Listings			
 <b>Deutsche Akkreditierungsstelle</b> D-PL-12047-01-01	 MRA US-EU 0003	 Industry Canada Reg. No.: 3462D-1 Reg. No.: 3462D-2 Reg. No.: 3462D-3	 Voluntary Controls for Electromagnetic Emissions Reg. No.: R-2666 C-2914, T-1967, G-301
 <b>AUTHORIZED RF LABORATORY</b>	 <b>LAB CODE 20011130-00</b>		
accredited according to DIN EN ISO/IEC 17025			
<p align="center"> <b>CETECOM GmbH</b>            Laboratory Radio Communications &amp; 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>			

## Table of contents

<b>1. MEASUREMENT DIAGRAMS MAIN ANTENNA .....</b>	<b>3</b>
1.1. PAPR-Value .....	3
1.2. Spurious emissions radiated (850 MHz transmitting mode).....	9
1.3. Spurious emissions radiated (1900 MHz transmitting mode).....	10
1.4. Radiated emissions on 850 MHz transmitting band-edge.....	11
1.5. Radiated emissions on 1900 MHz transmitting band-edge.....	13
<b>2. MEASUREMENT DIAGRAMS SECONDARY ANTENNA .....</b>	<b>15</b>
2.1. Spurious emissions radiated (850 MHz transmitting mode).....	15
2.2. Spurious emissions radiated (1900 MHz transmitting mode).....	16
2.3. Radiated emissions on 850 MHz transmitting band-edge.....	17
2.4. Radiated emissions on 1900 MHz transmitting band-edge.....	19

# 1. Measurement diagrams main antenna

## 1.1. PAPR-Value

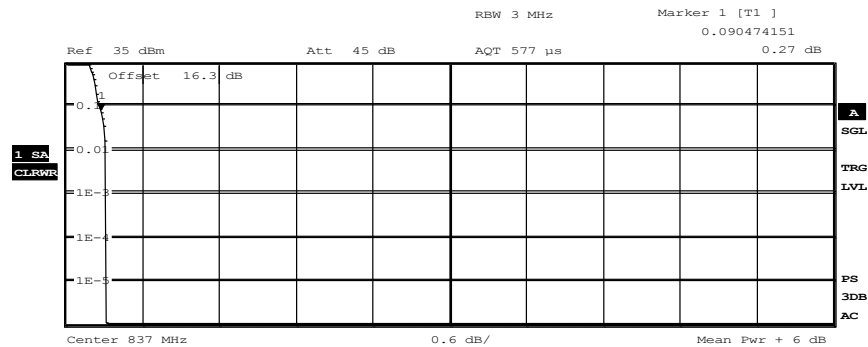


Complementary Cumulative Distribution Function  
NOF samples: 2308, Usable BW: 3.5MHz

Trace 1	
Mean	31.11 dBm
Peak	31.37 dBm
Crest	0.26 dB
10 %	0.25 dB
1 %	0.27 dB
.1 %	0.27 dB
.01 %	0.27 dB

Date: 30.SEP.2015 15:11:33

### Diagram Channel 128 (GMSK-modulation)

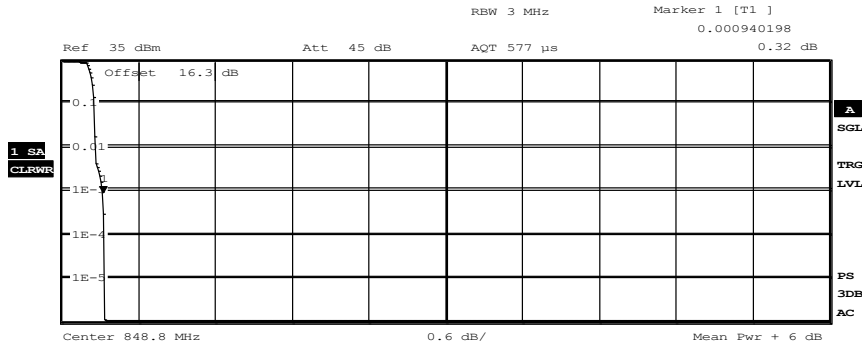


Complementary Cumulative Distribution Function  
NOF samples: 2308, Usable BW: 3.5MHz

Trace 1	
Mean	30.92 dBm
Peak	31.23 dBm
Crest	0.32 dB
10 %	0.26 dB
1 %	0.31 dB
.1 %	0.32 dB
.01 %	0.32 dB

Date: 30.SEP.2015 15:13:03

### Diagram Channel 192 (GMSK-modulation)

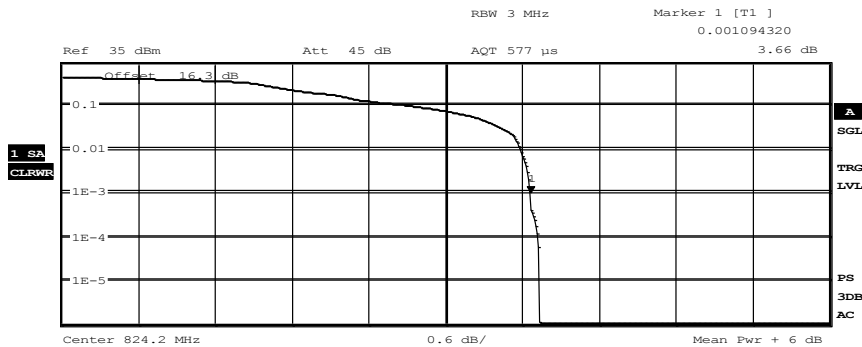


Complementary Cumulative Distribution Function  
 NOF samples: 2308, Usable BW: 3.5MHz

Trace 1	
Mean	30.55 dBm
Peak	30.88 dBm
Crest	0.33 dB
10 %	0.25 dB
1 %	0.27 dB
.1 %	0.32 dB
.01 %	0.34 dB

Date: 30.SEP.2015 15:15:39

### Diagram Channel 251 (GMSK-modulation)

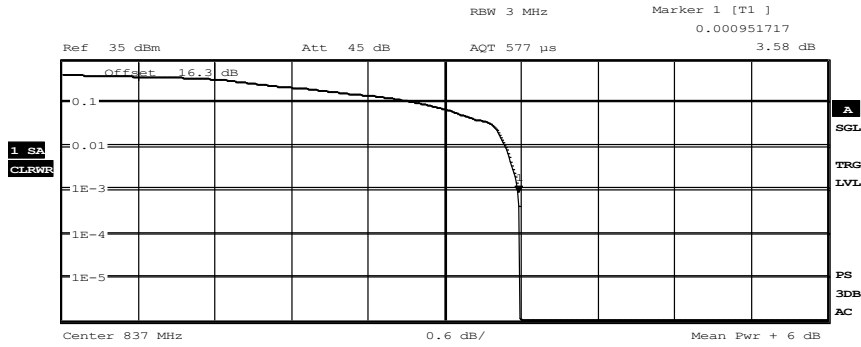


Complementary Cumulative Distribution Function  
 NOF samples: 2308, Usable BW: 3.5MHz

Trace 1	
Mean	24.39 dBm
Peak	28.13 dBm
Crest	3.73 dB
10 %	2.77 dB
1 %	3.59 dB
.1 %	3.66 dB
.01 %	3.72 dB

Date: 30.SEP.2015 15:22:46

### Diagram Channel 128 (8-PSK modulation)

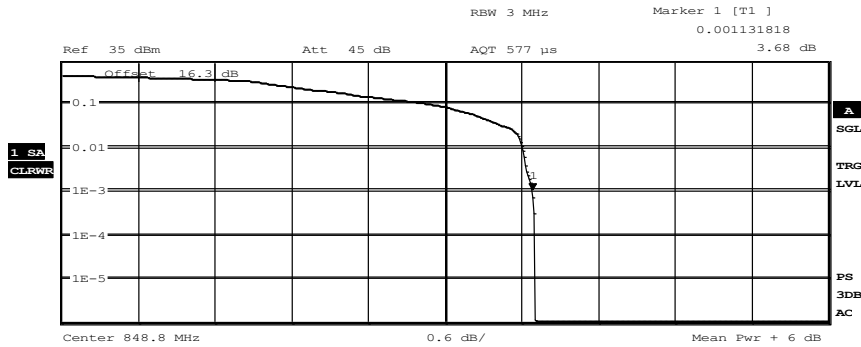


Complementary Cumulative Distribution Function  
 NOF samples: 2308, Usable BW: 3.5MHz

Trace 1	
Mean	24.54 dBm
Peak	28.13 dBm
Crest	3.59 dB
10 %	2.83 dB
1 %	3.48 dB
.1 %	3.58 dB
.01 %	3.60 dB

Date: 30.SEP.2015 15:22:03

**Diagram Channel 192 (8-PSK modulation)**

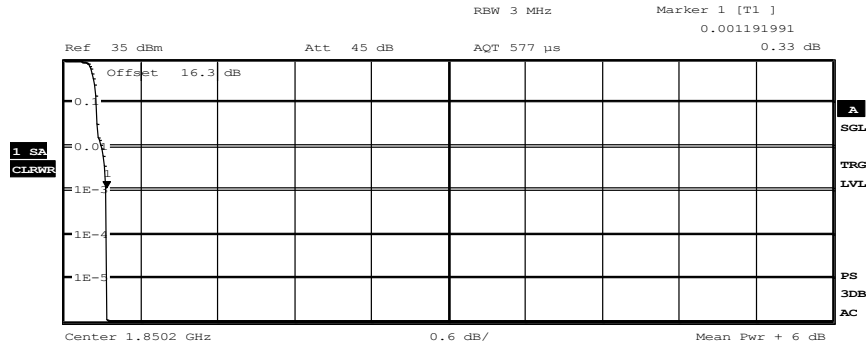


Complementary Cumulative Distribution Function  
 NOF samples: 2308, Usable BW: 3.5MHz

Trace 1	
Mean	25.55 dBm
Peak	29.26 dBm
Crest	3.70 dB
10 %	2.92 dB
1 %	3.61 dB
.1 %	3.68 dB
.01 %	3.71 dB

Date: 1.OCT.2015 10:13:09

**Diagram Channel 251 (8-PSK modulation)**



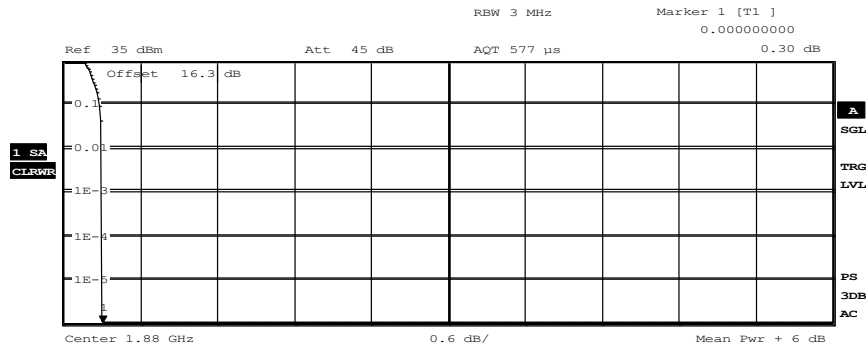
Complementary Cumulative Distribution Function  
 NOF samples: 2308, Usable BW: 3.5MHz

Trace 1  
 Mean 29.07 dBm  
 Peak 29.40 dBm  
 Crest 0.33 dB

10 % 0.25 dB  
 1 % 0.30 dB  
 .1 % 0.33 dB  
 .01 % 0.34 dB

Date: 30.SEP.2015 15:25:08

### Diagram Channel 512 (GMSK-modulation)



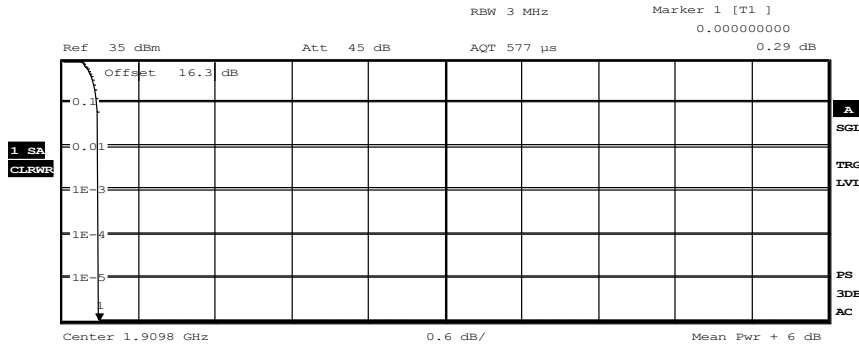
Complementary Cumulative Distribution Function  
 NOF samples: 2308, Usable BW: 3.5MHz

Trace 1  
 Mean 29.10 dBm  
 Peak 29.40 dBm  
 Crest 0.30 dB

10 % 0.28 dB  
 1 % 0.30 dB  
 .1 % 0.30 dB  
 .01 % 0.30 dB

Date: 30.SEP.2015 15:27:13

### Diagram Channel 661 (GMSK-modulation)

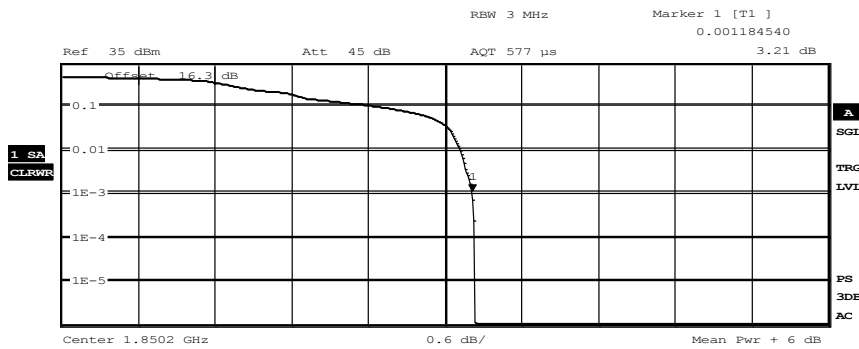


Complementary Cumulative Distribution Function  
NOF samples: 2308, Usable BW: 3.5MHz

Trace 1	
Mean	29.74 dBm
Peak	30.03 dBm
Crest	0.29 dB
10 %	0.27 dB
1 %	0.29 dB
.1 %	0.29 dB
.01 %	0.29 dB

Date: 1.OCT.2015 09:17:59

**Diagram Channel 810 (GMSK-modulation)**

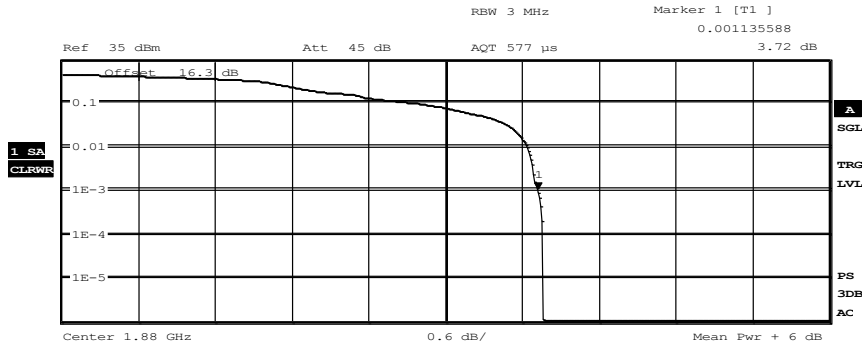


Complementary Cumulative Distribution Function  
NOF samples: 2308, Usable BW: 3.5MHz

Trace 1	
Mean	25.11 dBm
Peak	28.34 dBm
Crest	3.23 dB
10 %	2.52 dB
1 %	3.13 dB
.1 %	3.21 dB
.01 %	3.24 dB

Date: 1.OCT.2015 09:50:48

**Diagram Channel 512 (8-PSK modulation)**

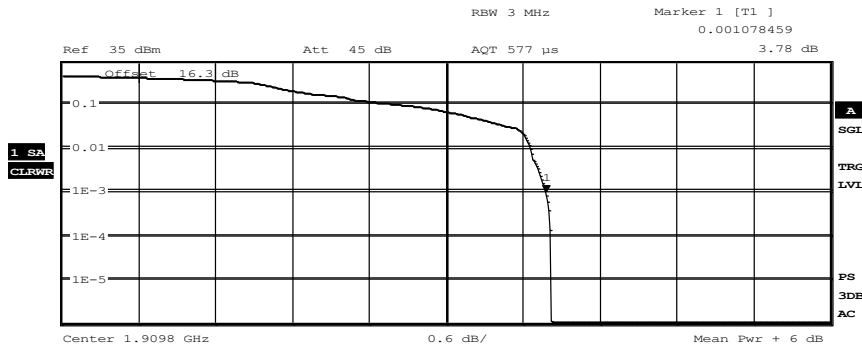


Complementary Cumulative Distribution Function  
NOF samples: 2308, Usable BW: 3.5MHz

Trace 1	
Mean	25.49 dBm
Peak	29.26 dBm
Crest	3.76 dB
10 %	2.81 dB
1 %	3.64 dB
.1 %	3.73 dB
.01 %	3.76 dB

Date: 1.OCT.2015 09:54:27

**Diagram Channel 661 (8-PSK modulation)**



Complementary Cumulative Distribution Function  
NOF samples: 2308, Usable BW: 3.5MHz

Trace 1	
Mean	24.95 dBm
Peak	28.76 dBm
Crest	3.82 dB
10 %	2.70 dB
1 %	3.66 dB
.1 %	3.78 dB
.01 %	3.82 dB

Date: 1.OCT.2015 09:57:54

**Diagram Channel 810 (8-PSK modulation)**



## 1.2. Spurious emissions radiated (850 MHz transmitting mode)

### 8.04\_RSE\_R\_CH128\_GPRS

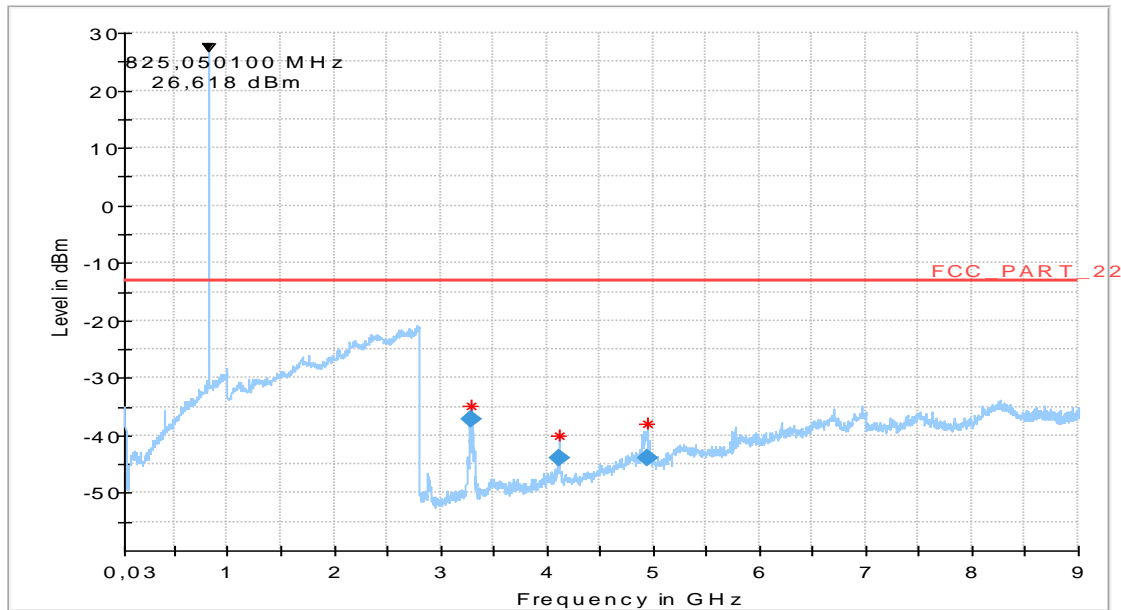
#### Common Information

Test Description:	Radiated Emissions GSM850
Test Site Location:	CETECOM GmbH Essen
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part 22.917 / RSS-132, Issue 3
Test Case:	-
Operating Mode:	MS allocated UL channel 128
Exclusionband:	824 - 849MHz
Environmental Conditions:	Humidity: 56%rH; Temperature: 21,8°C
Operator:	Lor

#### EUT Information

Manufacturer:	peiker acustic GmbH & Co. KG
EuT:	ATM-01 T1-US-4GW
-----	
HW Version:	212.007.007
SW Version:	001.018.103
Serial Number:	0000595569
Connected Interfaces:	Microphone, loudspeaker, GPS, Diversity RX
Power Supply:	14 VDC
Comments:	--

Full Spectrum



#### Final Result

Frequency (MHz)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
3296.102205	-	24.11	5000.0	V	225.0	0.0	-95.7
4121.713427	-	30.99	5000.0	V	192.0	0.0	-93.3
4939.509018	-	30.90	5000.0	V	176.0	0.0	-90.9

### 1.3. Spurious emissions radiated (1900 MHz transmitting mode)

#### 8.11\_RSE\_R\_CH661\_GSM

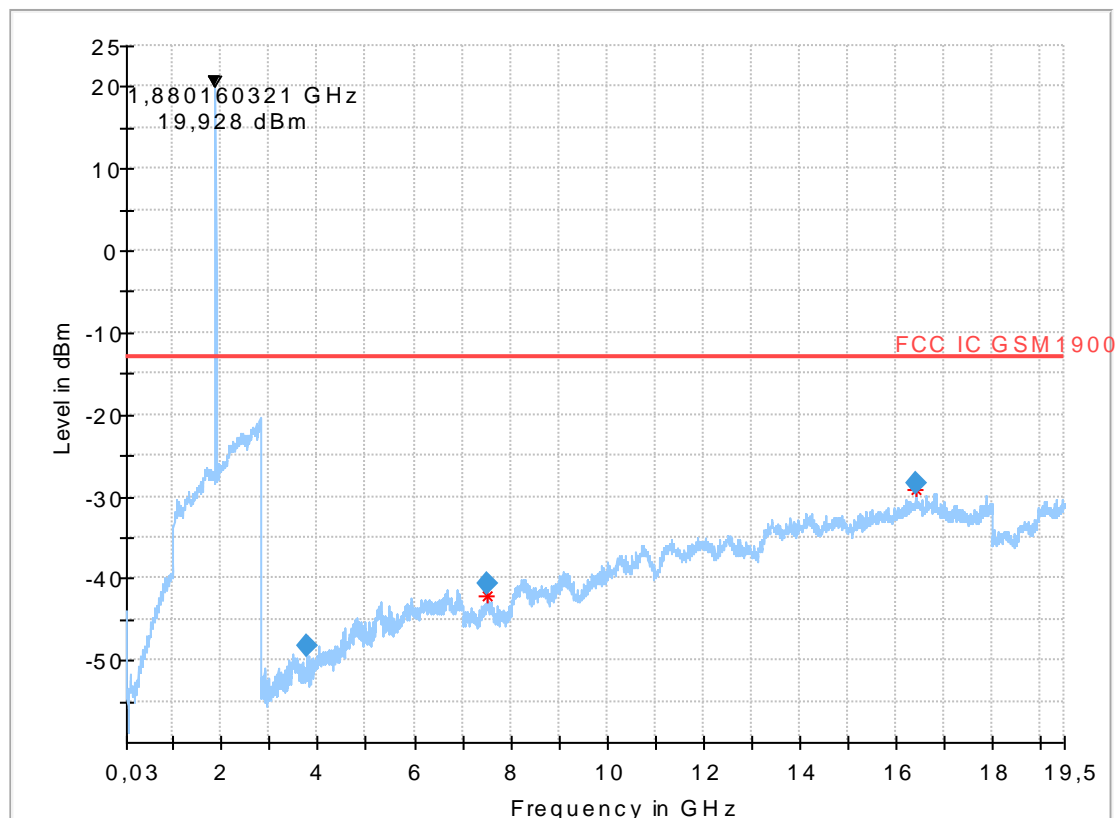
##### Common Information

Test Description:	Radiated Spurious Emissions GSM1900
Test Site Location:	CETECOM GmbH Essen
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part 24.238 / RSS-133, Issue 6
Comm. Link:	GSM1900, Voice
Operating Mode:	MS allocated channel 512 (UL = 1850.2MHz),661(UL = 1880.0MHz),810 (UL = 1909.8MHz)
Exclusionband:	1850- 1910MHz
Environmental Conditions:	Humidity: 56%rH; Temperature: 21,8°C
Operator:	

##### EUT Information

Manufacturer:	peiker acoustic GmbH & Co. KG
EuT:	ATM-01 T1-US-4GW
-----	-----
HW Version:	212.007.007
SW Version:	001.018.103
Serial Number:	0000595569
Connected Interfaces:	
Power Supply:	14 VDC
Comments:	

Full Spectrum



##### Final Result

Frequency (MHz)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
3760.115231	-	35.22	1000.0	V	-8.0	90.0	-95.1
7517.650300	-	27.73	1000.0	V	-27.0	90.0	-83.3
16424.904809	-	15.32	1000.0	H	164.0	90.0	-69.6

## 1.4. Radiated emissions on 850 MHz transmitting band-edge

### 9.01\_BE\_R\_CH128\_GSM

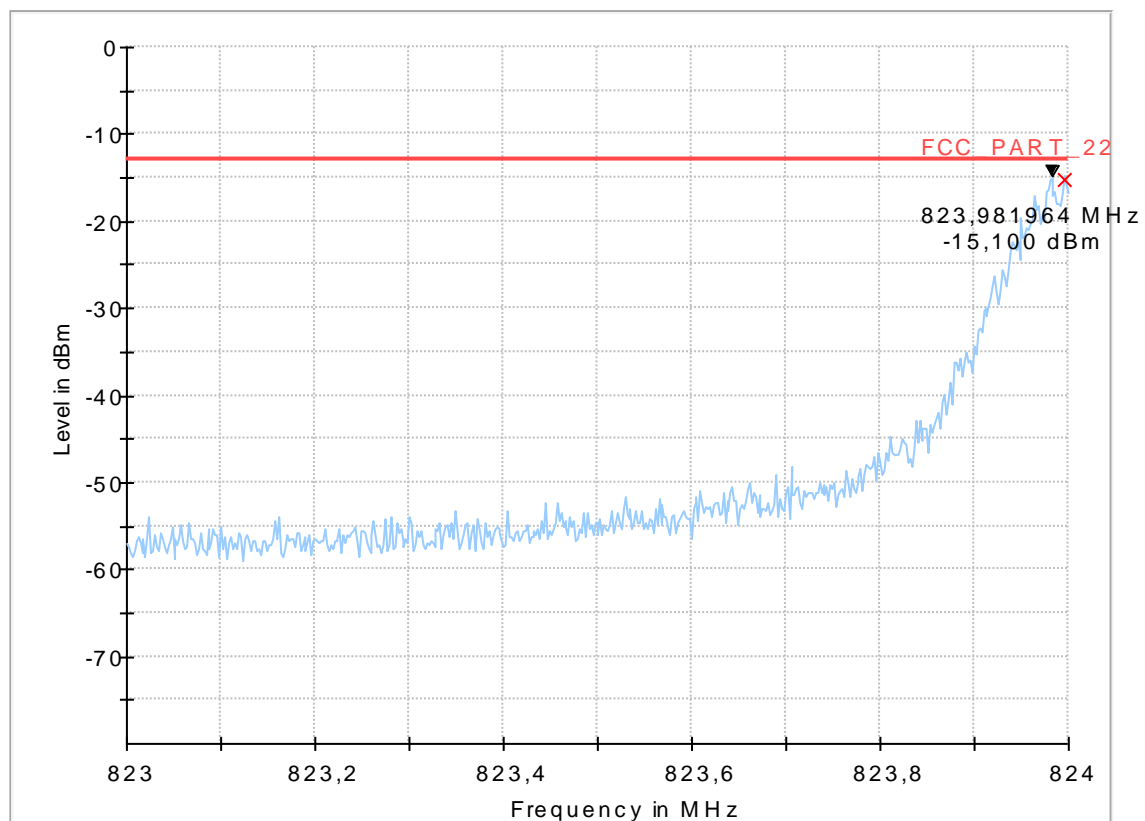
#### Common Information

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 / RSS-132
Operating Mode:	MS allocated channel 128 (fc = 824.2MHz), Voice, PCL5 (+33dBm)
Exclusionband:	824 - 849MHz
Environmental Conditions:	Humidity: 53%rH; Temperature: 22°C
Operator:	MRa

#### EUT Information

Manufacturer:	peiker acustic GmbH & Co. KG
EuT:	ATM-01 T1-US-4GW
-----	-----
HW Version:	212.007.007
SW Version:	001.018.103
Serial Number:	0000595569
Connected Interfaces:	
Power Supply:	14 VDC
Comments:	

Full Spectrum



## 9.02\_BE\_R\_CH251\_GSM

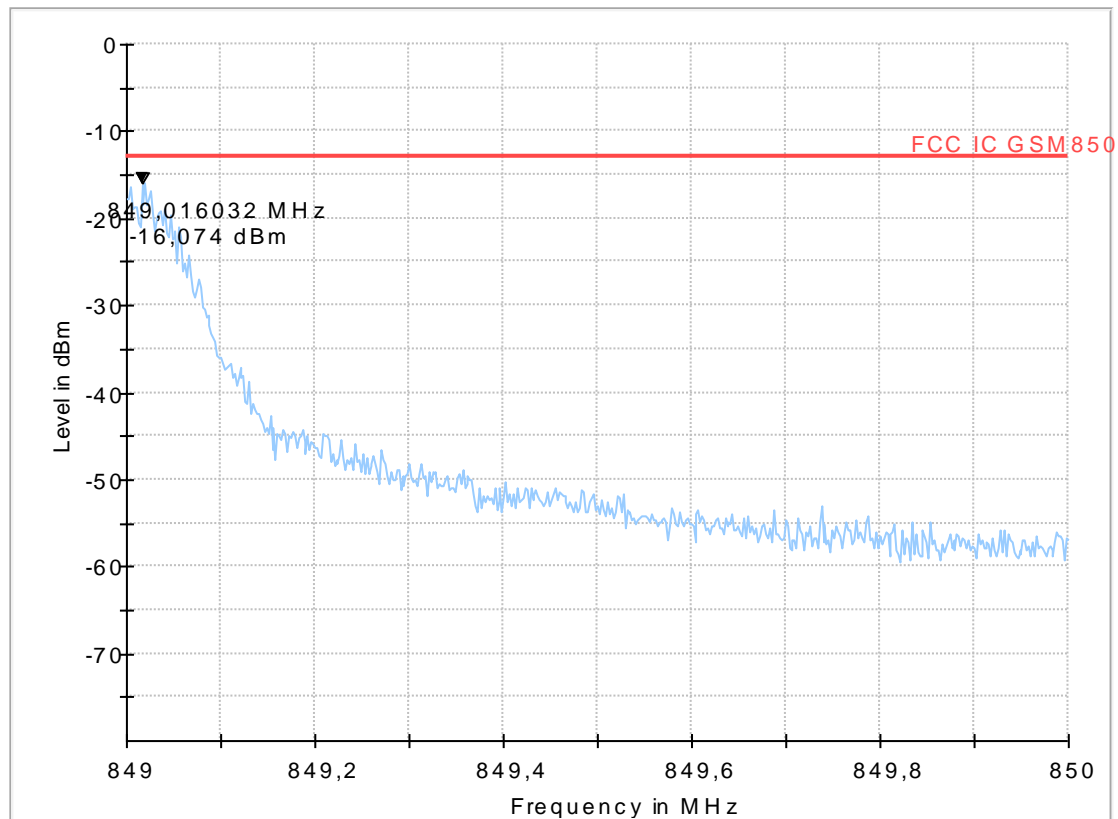
### Common Information

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 / RSS-132
Operating Mode:	MS allocated channel 251 (fc = 848.8MHz), Voice, PCL0 (+33dBm)
Exclusionband:	824 - 849MHz
Environmental Conditions:	Humidity: 53%rH; Temperature: 22°C
Operator:	MRa

### EUT Information

Manufacturer:	peiker acustic GmbH & Co. KG
EuT:	ATM-01 T1-US-4GW
-----	
HW Version:	212.007.007
SW Version:	001.018.103
Serial Number:	0000595569
Connected Interfaces:	
Power Supply:	14 VDC
Comments:	

Full Spectrum



## 1.5. Radiated emissions on 1900 MHz transmitting band-edge

### 9.07\_BE\_R\_Ch512\_GSM

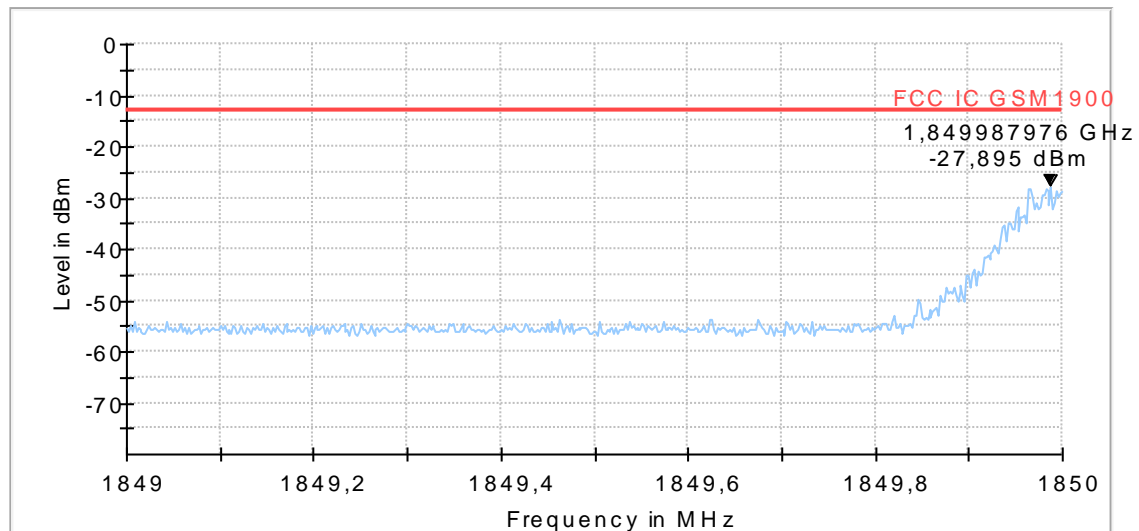
#### Common Information

Test Description:	Radiated Spurious Emissions GSM1900
Test Site Location:	CETECOM GmbH Essen
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part 24.238 / RSS-133, Issue 6
Comm. Link:	GSM1900, Voice
Operating Mode:	MS allocated channel 512 (UL = 1850.2MHz)
Exclusionband:	1850- 1910MHz
Environmental Conditions:	Humidity: 55%rH; Temperature: 21,5°C
Operator:	Mra

#### EUT Information

Manufacturer:	peiker acustic GmbH & Co. KG
EuT:	ATM-01 T1-US-4GW
-----	-----
HW Version:	212.007.007
SW Version:	001.018.103
Serial Number:	0000595569
Connected Interfaces:	
Power Supply:	14 VDC
Comments:	

Full Spectrum



## 9.08\_BE\_R\_Ch810\_GSM

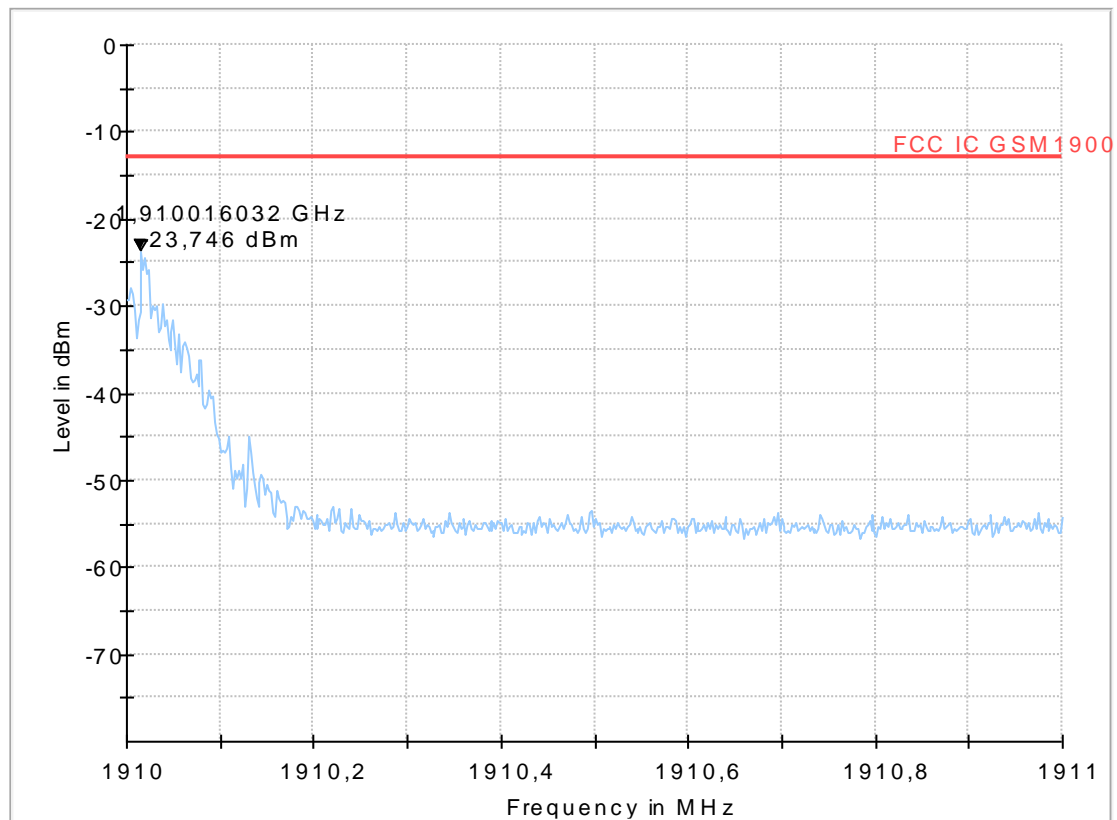
### Common Information

Test Description:	Radiated Spurious Emissions GSM1900
Test Site Location:	CETECOM GmbH Essen
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part 24.238 / RSS-133, Issue 6
Comm. Link:	GSM1900, Voice/EDGE
Operating Mode:	MS allocated channel 810 (UL = 1909.8MHz)
Exclusionband:	1850- 1910MHz
Environmental Conditions:	Humidity: 55%rH; Temperature: 21,5°C
Operator:	MRa

### EUT Information

Manufacturer:	peiker acustic GmbH & Co. KG
EuT:	ATM-01 T1-US-4GW
-----	
HW Version:	212.007.007
SW Version:	001.018.103
Serial Number:	0000595569
Connected Interfaces:	
Power Supply:	14 VDC
Comments:	

Full Spectrum



## 2. Measurement diagrams secondary antenna

### 2.1. Spurious emissions radiated (850 MHz transmitting mode)

#### 8.04\_Backup\_RSE\_R\_Ch128\_GPRS

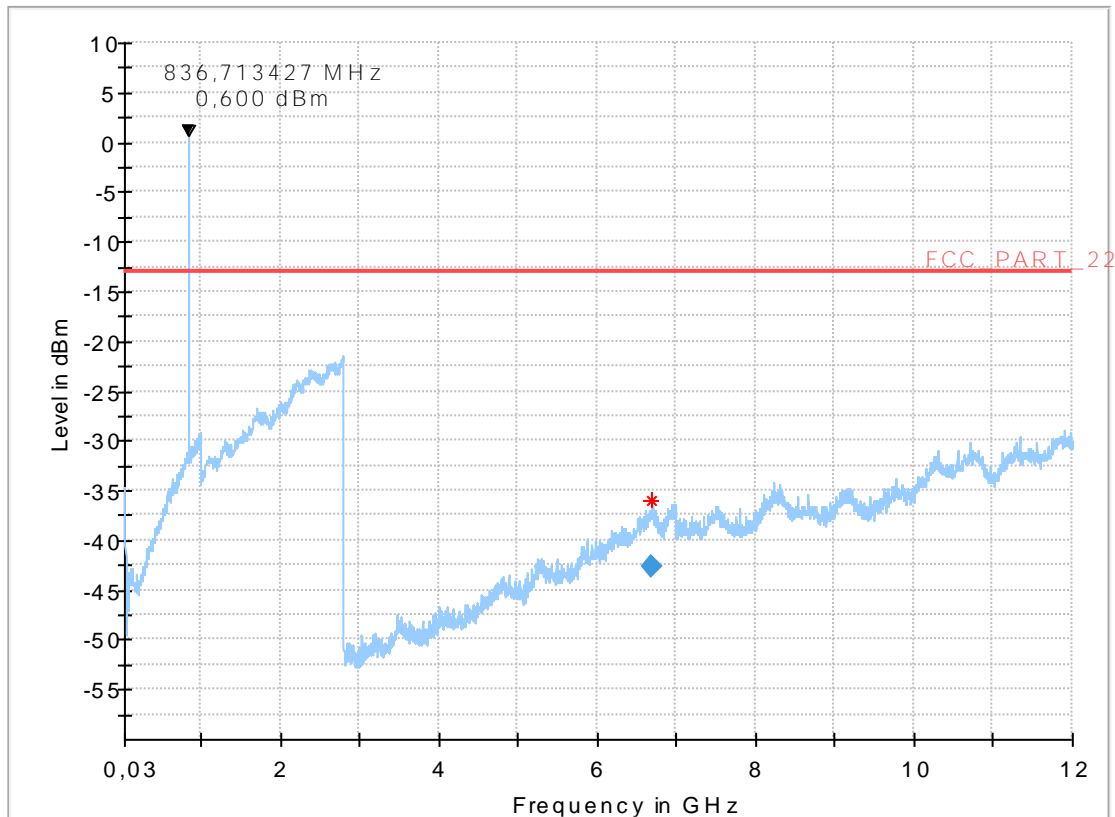
##### Common Information

Test Description:	Radiated Emissions GSM850
Test Site Location:	CETECOM GmbH Essen
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part22.917 / RSS-132
Test Case:	-
Operating Mode:	MS allocated UL channel 128
Exclusionband:	824 - 849MHz
Environmental Conditions:	Humidity: 55%rH; Temperature: 21,5°C
Operator:	MFr

##### EUT Information

Manufacturer:	peiker acustic GmbH & Co. KG
EuT:	ATM-01 T1-US-4GW
-----	
HW Version:	212.007.007
SW Version:	001.018.103
Serial Number:	0000595569
Connected Interfaces:	
Power Supply:	14 VDC
Comments:	

Full Spectrum



##### Final Result

Frequency (MHz)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
6694.258517	-	29.61	5000.0	V	259.0	0.0	-85.3

## 2.2. Spurious emissions radiated (1900 MHz transmitting mode)

### 8.11\_Backup\_RSE\_R\_Ch661\_GSM1900

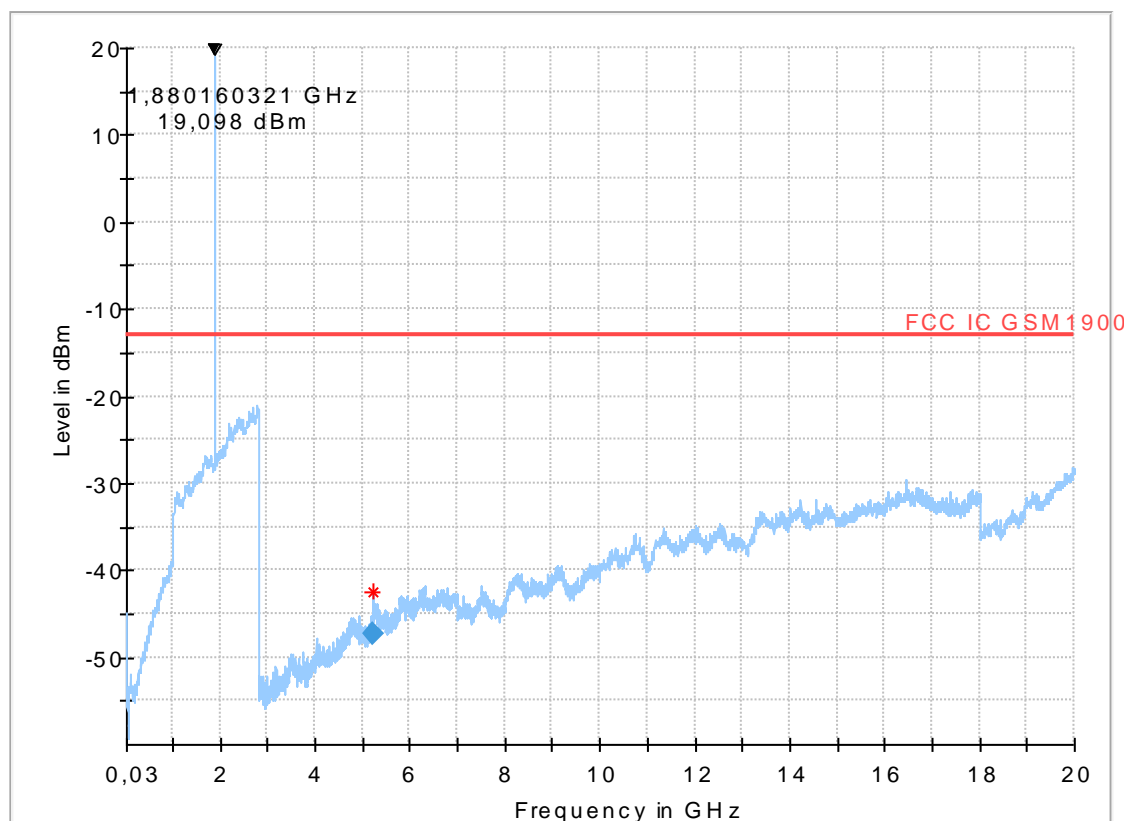
#### Common Information

Test Description:	Radiated Spurious Emissions GSM1900
Test Site Location:	CETECOM GmbH Essen
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part 24.238 // RSS-133, Issue 6
Comm. Link:	GSM1900, Voice
Operating Mode:	MS allocated channel 661(UL = 1880.0MHz)
Exclusionband:	1850- 1910MHz
Environmental Conditions:	Humidity: 55%rH; Temperature: 21,5°C
Operator:	MFr

#### EUT Information

Manufacturer:	peiker acustic GmbH & Co. KG
EuT:	ATM-01 T1-US-4GW
-----	
HW Version:	212.007.007
SW Version:	001.018.103
Serial Number:	0000595569
Connected Interfaces:	
Power Supply:	14 VDC
Comments:	

Full Spectrum



#### Final Result

Frequency (MHz)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
5228.712425	-	34.29	1000.0	V	126.0	0.0	-88.7



## 2.3. Radiated emissions on 850 MHz transmitting band-edge

### 9.01\_Backup\_BE\_R\_Ch128\_GPR850

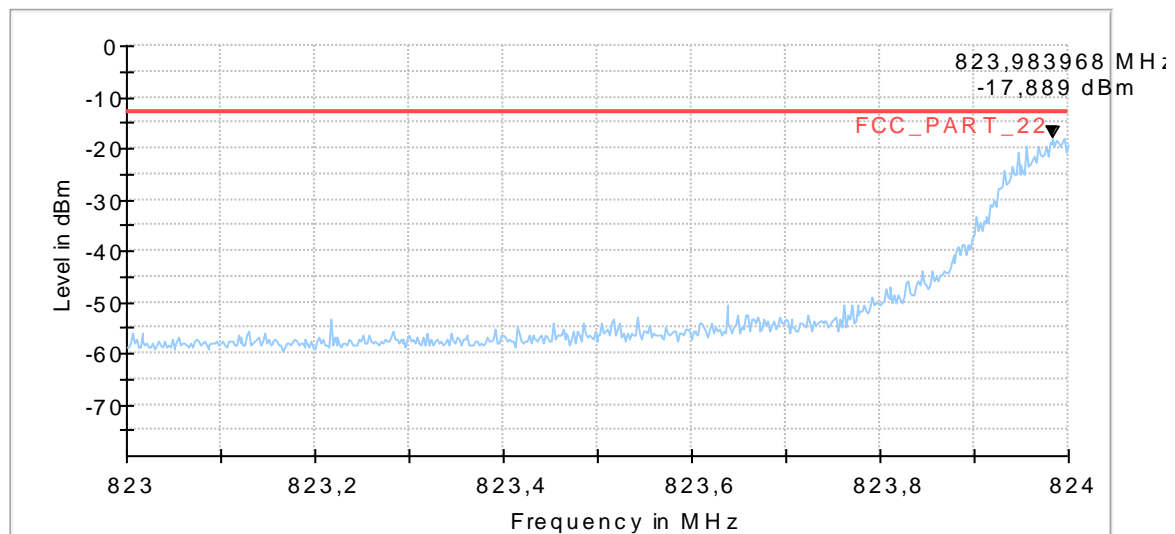
#### Common Information

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 / RSS-132, Issue 3
Operating Mode:	MS allocated channel 128 (fc = 824.2MHz), Voice, PCL5 (+33dBm)
Exclusionband:	824 - 849MHz
Environmental Conditions:	Humidity: 53%rH; Temperature: 22°C
Operator:	MFr

#### EUT Information

Manufacturer:	peiker acustic GmbH & Co. KG
EuT:	ATM-01 T1-US-4GW
-----	-----
HW Version:	212.007.007
SW Version:	001.018.103
Serial Number:	0000595569
Connected Interfaces:	
Power Supply:	14 VDC
Comments:	

Full Spectrum



## 9.02\_Backup\_BE\_R\_Ch251\_GPR850

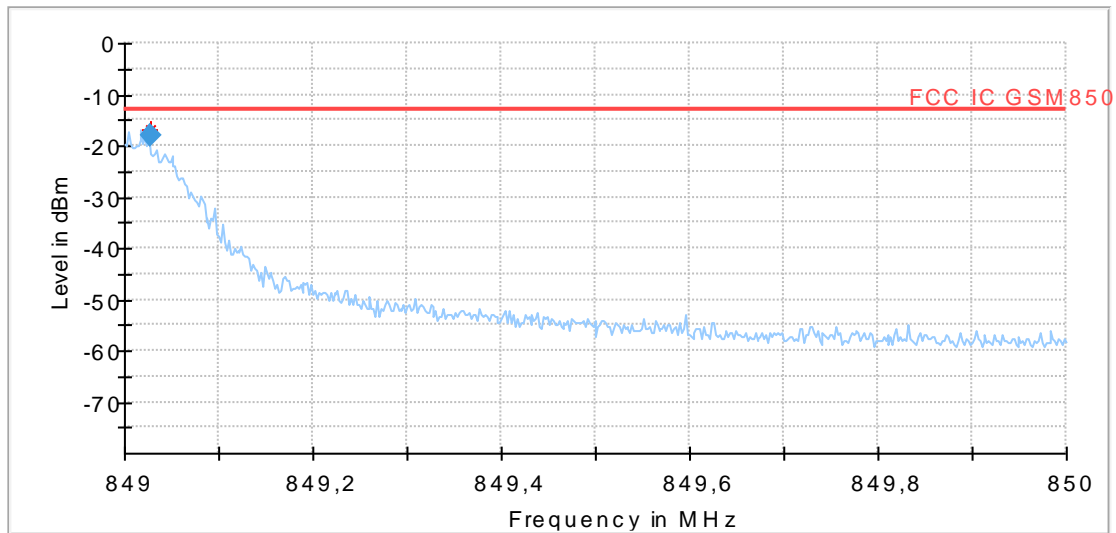
### Common Information

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 / RSS-132, Issue 3
Operating Mode:	MS allocated channel 251 (fc = 848.8MHz), Voice, PCL0 (+33dBm)
Exclusionband:	824 - 849MHz
Environmental Conditions:	Humidity: 53%RH; Temperature: 22°C
Operator:	MFr

### EUT Information

Manufacturer:	peiker acustic GmbH & Co. KG
EuT:	ATM-01 T1-US-4GW
-----	-----
HW Version:	212.007.007
SW Version:	001.018.103
Serial Number:	0000595569
Connected Interfaces:	
Power Supply:	14 VDC
Comments:	

Full Spectrum



## 2.4. Radiated emissions on 1900 MHz transmitting band-edge

### 9.07\_Backup\_BE\_R\_Ch512\_GPRS1900

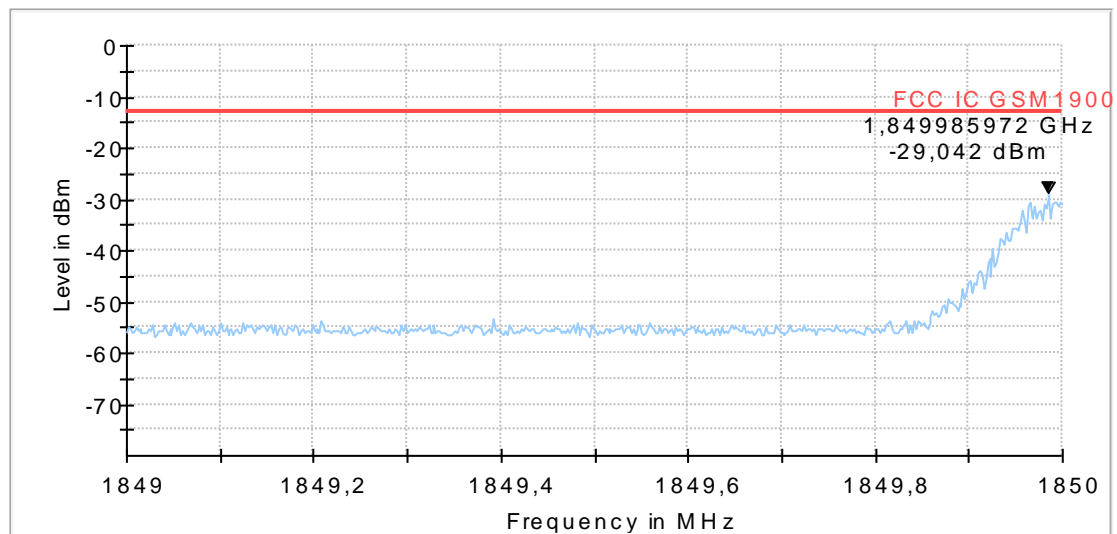
#### Common Information

Test Description:	Radiated Spurious Emissions GSM1900
Test Site Location:	CETECOM GmbH Essen
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part 24.238 / RSS-133, Issue 6
Comm. Link:	GSM1900, Voice/EDGE
Operating Mode:	MS allocated channel 512 (UL = 1850.2MHz),661(UL = 1880.0MHz),810 (UL = 1909.8MHz)
Exclusionband:	1850- 1910MHz
Environmental Conditions:	Humidity: 53%rH; Temperature: 24.6°C
Operator:	MFr

#### EUT Information

Manufacturer:	peiker acustic GmbH & Co. KG
EuT:	ATM-01 T1-US-4GW
-----	-----
HW Version:	212.007.007
SW Version:	001.018.103
Serial Number:	0000595569
Connected Interfaces:	
Power Supply:	14 VDC
Comments:	

Full Spectrum



## 9.08\_Backup\_BE\_R\_Ch810\_GPRS1900

### Common Information

Test Description:	Radiated Spurious Emissions GSM1900
Test Site Location:	CETECOM GmbH Essen
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part 24.238 / RSS-133, Issue 6
Comm. Link:	GSM1900, Voice/EDGE
Operating Mode:	MS allocated channel 512 (UL = 1850.2MHz),661(UL = 1880.0MHz),810 (UL = 1909.8MHz)
Exclusionband:	1850- 1910MHz
Environmental Conditions:	Humidity: 53%rH; Temperature: 24.6°C
Operator:	MFr

### EUT Information

Manufacturer:	peiker acustic GmbH & Co. KG
EuT:	ATM-01 T1-US-4GW
-----	
HW Version:	212.007.007
SW Version:	001.018.103
Serial Number:	0000595569
Connected Interfaces:	
Power Supply:	14 VDC
Comments:	

Full Spectrum

