

Annex 4: Measurement diagrams  
to  
**TEST REPORT**  
No.: 6-0147-12-9-3

According to:  
**FCC Regulations**  
CFR47: Part 22, Part 24







**IC-Regulations**  
RSS-132, RSS-133, RSS-Gen

for

Cinterion Wireless Modules GmbH

EHS5-US Module

FCC-ID: QIPEHS5-US  
IC: 7830A-EHS5US

Laboratory Accreditation and Listings			
 <b>DAkkS</b> Deutsche Akkreditierungsstelle D-PL-12047-01-01	 FEDERAL COMMUNICATIONS COMMISSION USA Reg. No.: 736496 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-2665, R-2666 C-2914, T-1967, G-301
 <b>WiFi</b> ALLIANCE AUTHORIZED RF LABORATORY	 <b>CTIA Authorized Test Lab</b> LAB CODE 20011130-00		
accredited according to DIN EN ISO/IEC 17025			
<p><b>CETECOM GmbH</b></p> <p>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>			

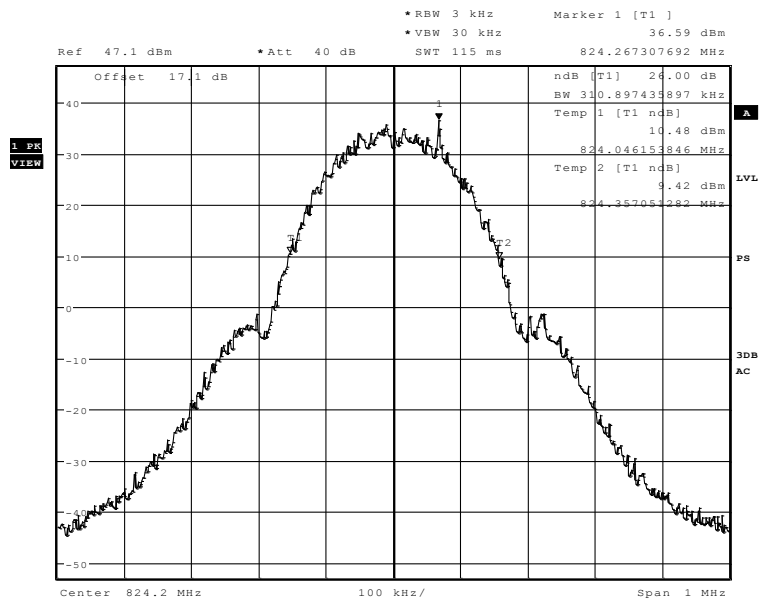
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## 1. Measurement diagrams

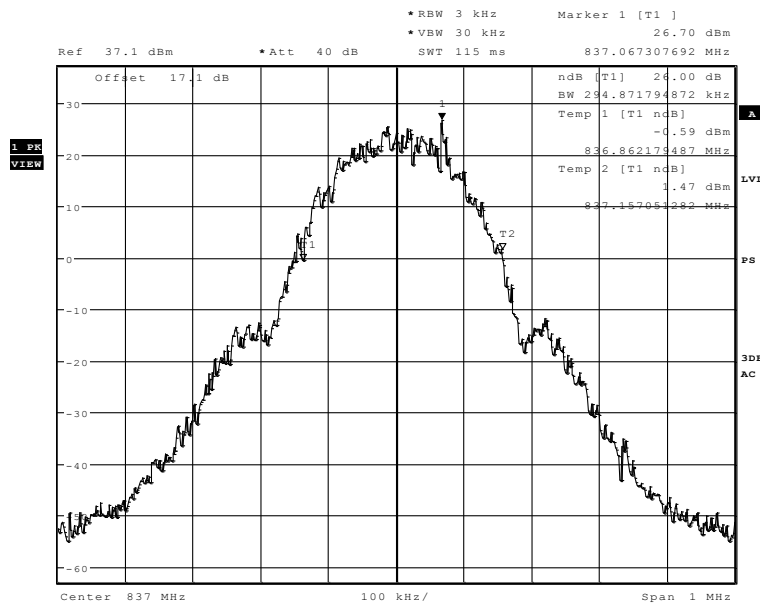
### 1.1. Emission bandwidth (26dBc Bandwidth)

#### 1.1.1. GSM 850 (GMSK Modulation)



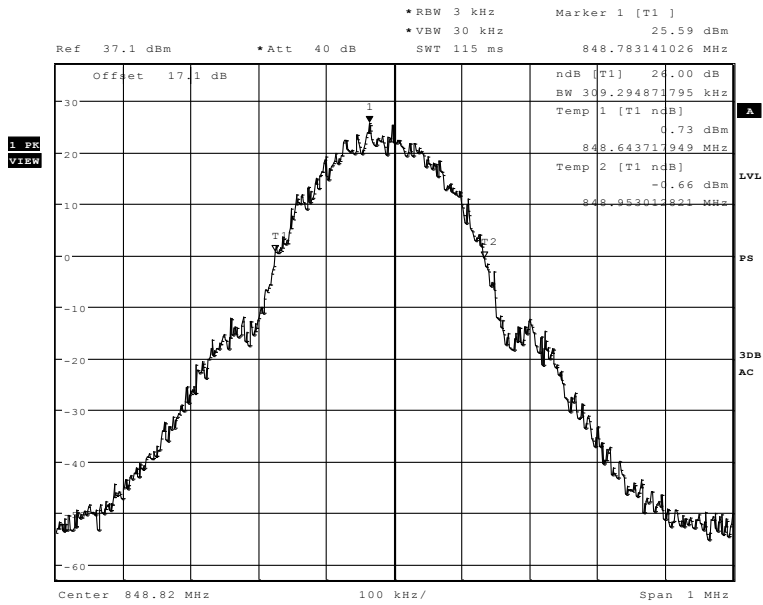
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Channel 128



Date: 18.SEP.2012 18:38:58

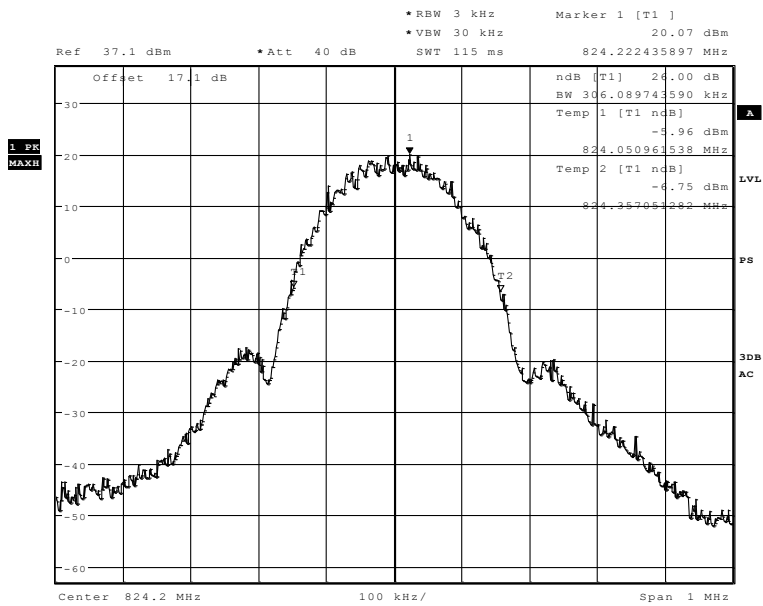
Channel 192



Date: 18.SEP.2012 19:19:44

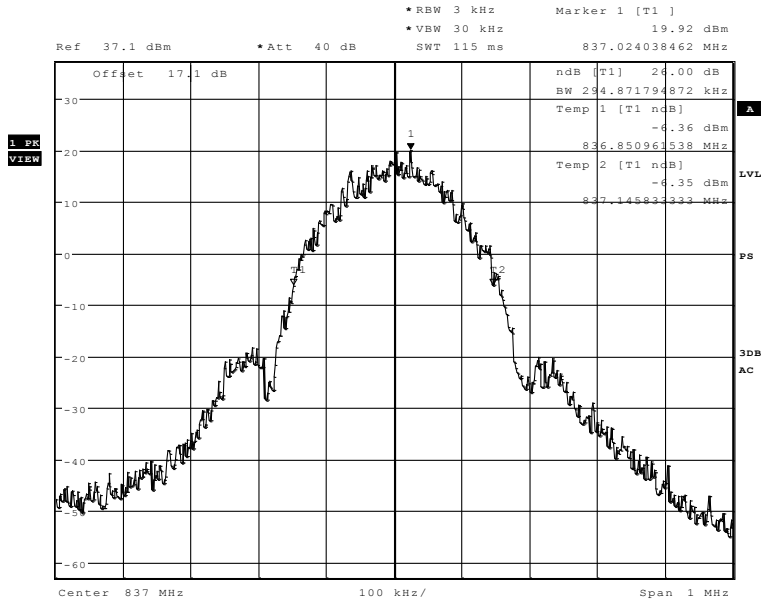
Channel 251

### 1.1.2. E-GPRS 850 (8-PSK Modulation)



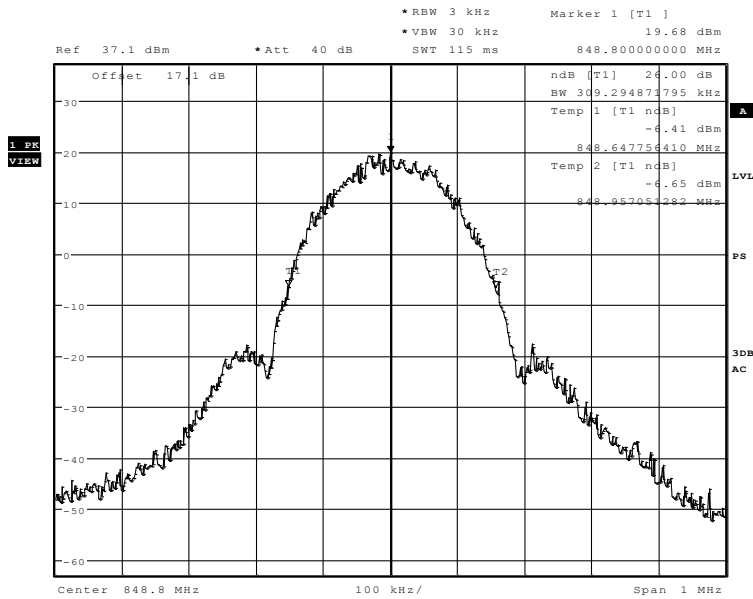
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Channel 128



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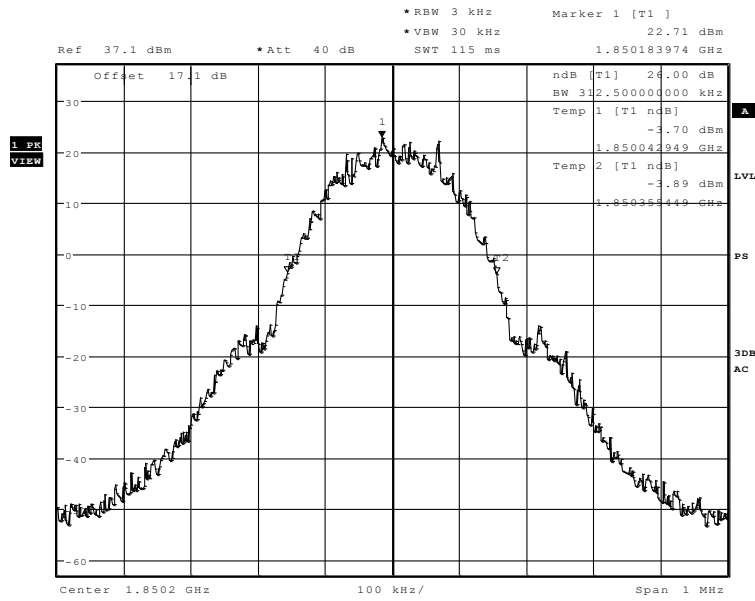
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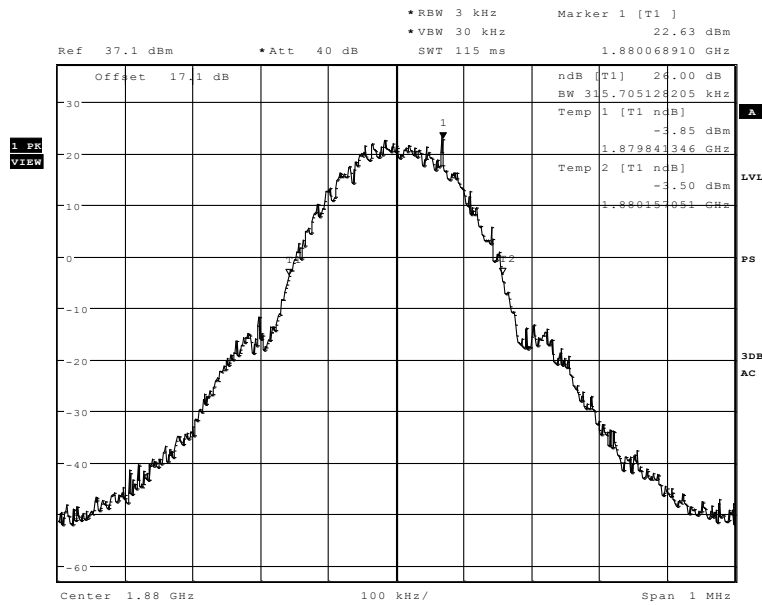
Channel 251

### 1.1.3. GSM 1900 (GMSK-Modulation)



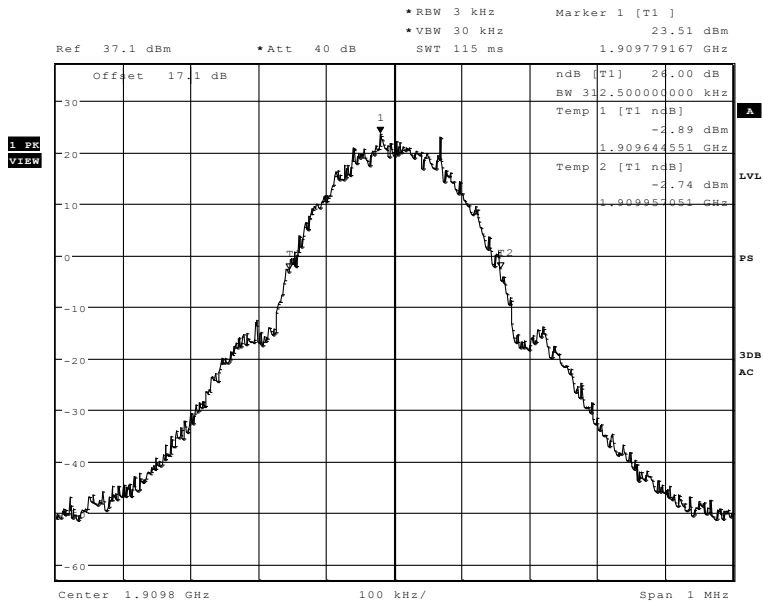
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#### Channel 512



Date: 20.SEP.2012 09:39:57

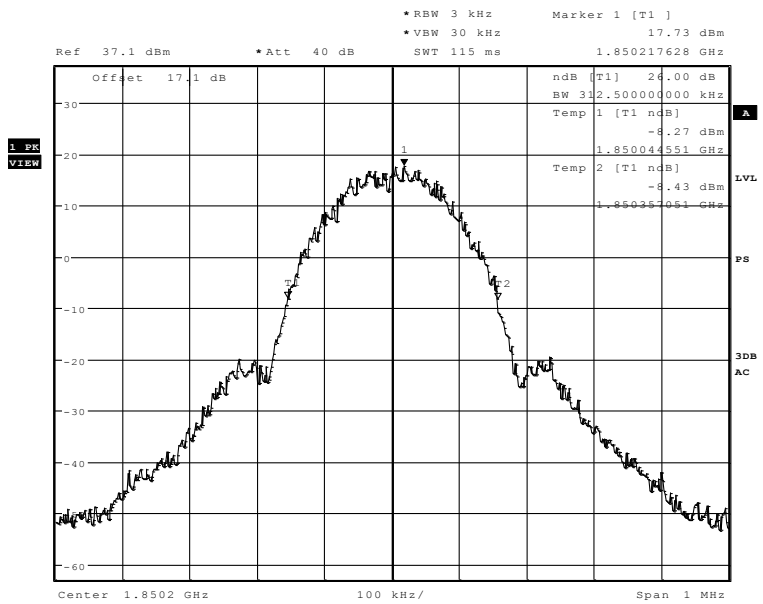
#### Channel 661



Date: 20.SEP.2012 09:55:22

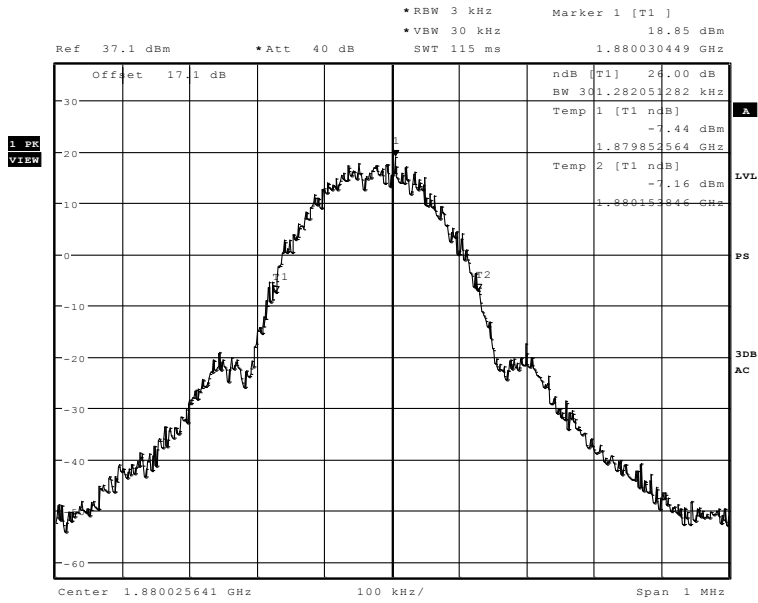
Channel 810

### 1.1.4. E-GPRS 1900 (8-PSK Modulation)



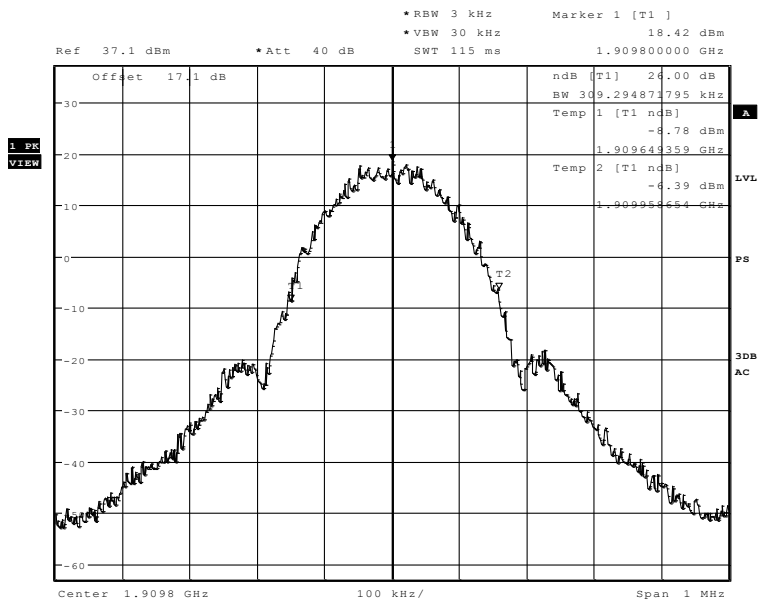
Date: 20.SEP.2012 09:59:50

Channel 512



Date: 20.SEP.2012 10:10:02

Channel 661



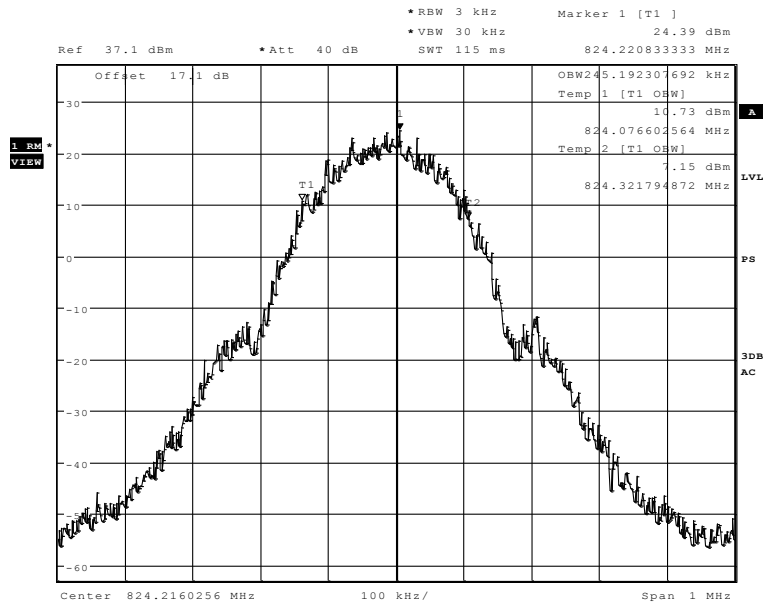
Date: 20.SEP.2012 10:11:58

Channel 810



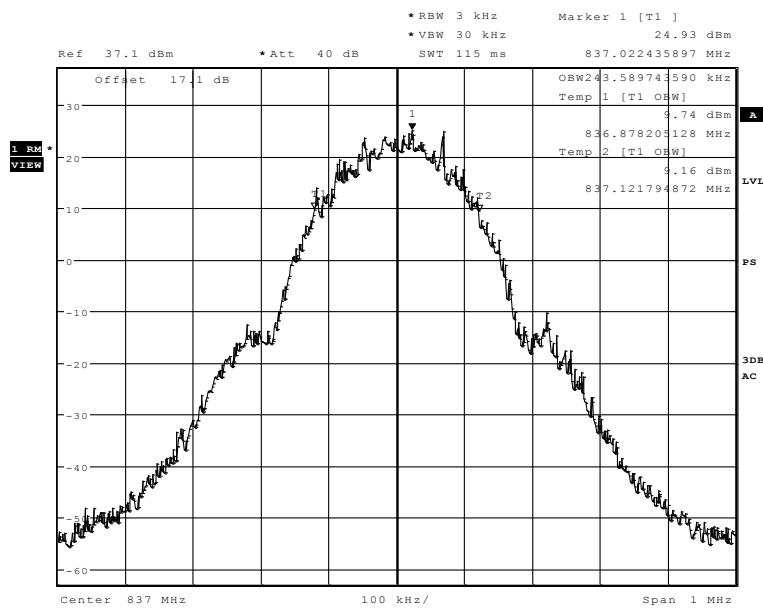
## 1.2. 99% Occupied bandwidth

### 1.2.1. GSM 850 (GMSK modulation)



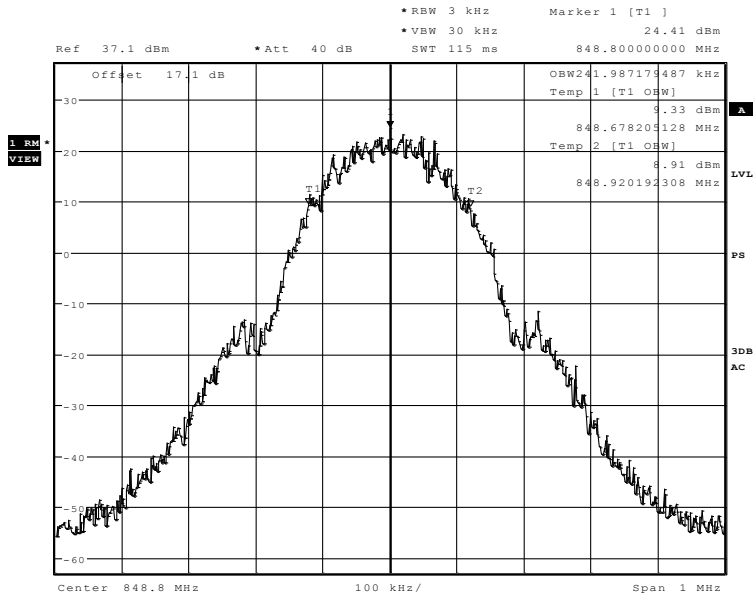
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#### Channel 128



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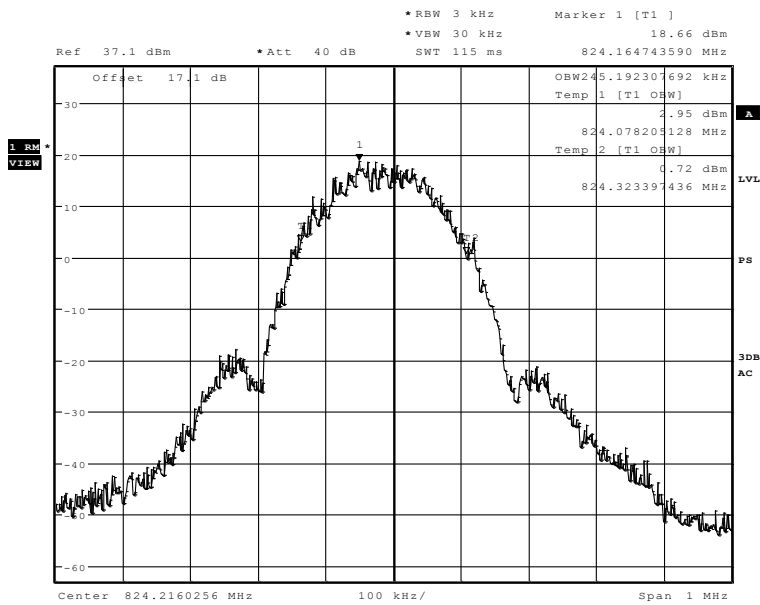
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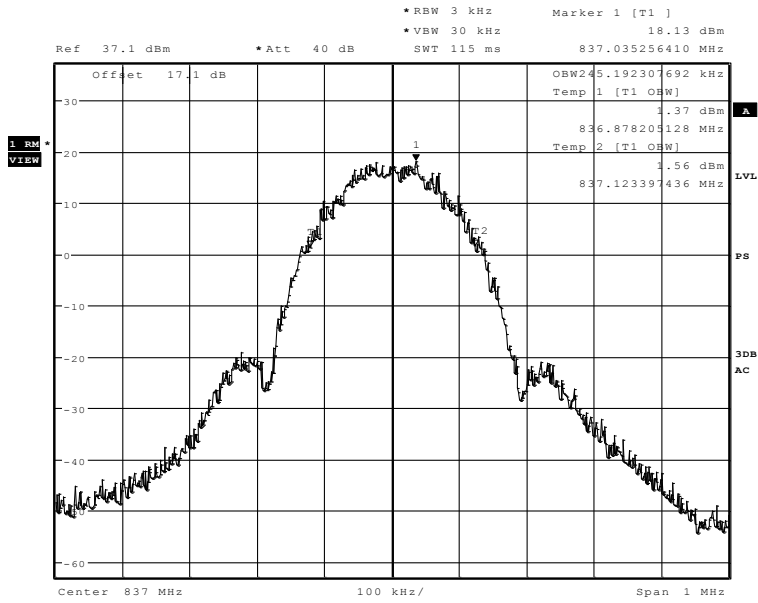
Channel 251

### 1.2.2. E-GPRS 850 (8PSK modulation)



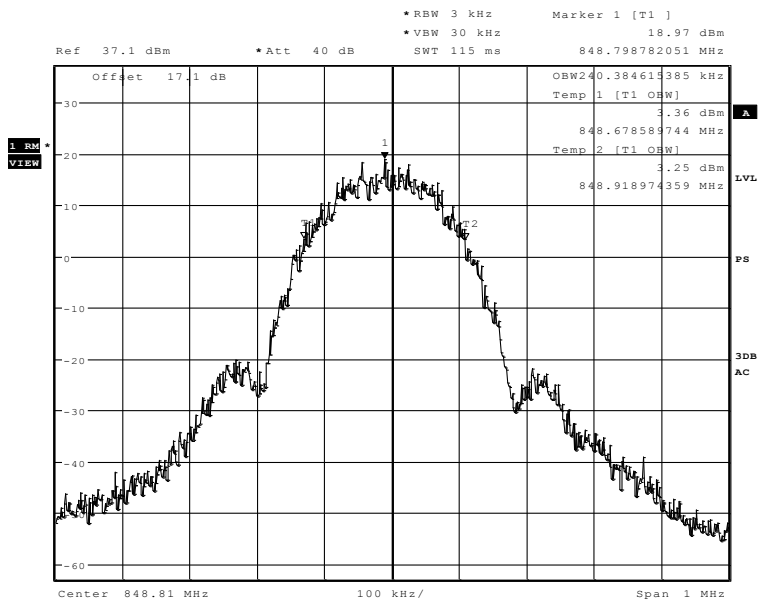
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Date: 18.SEP.2012 20:43:43

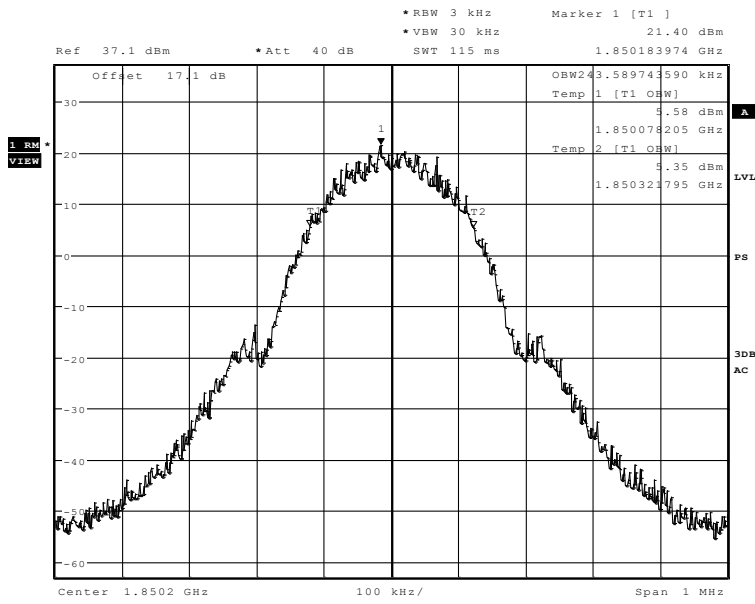
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Date: 18.SEP.2012 21:03:12

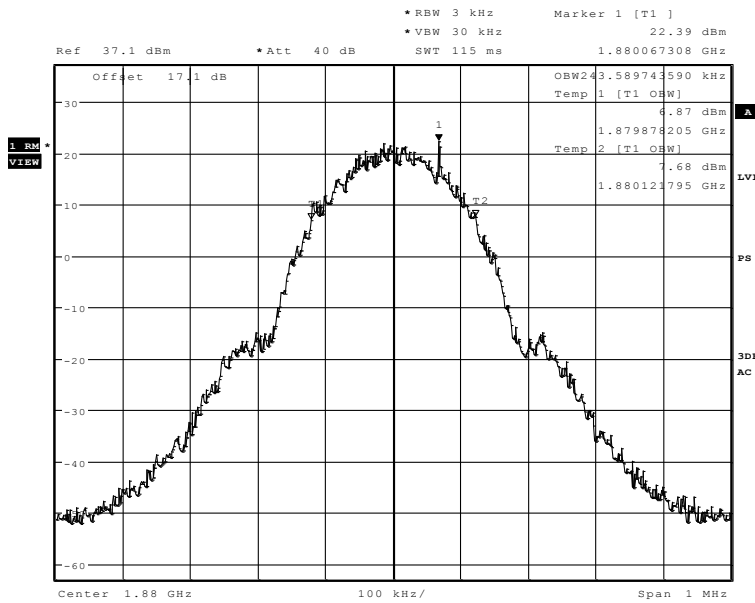
Channel 251

### 1.2.3. GSM 1900 (GMSK-Modulation)



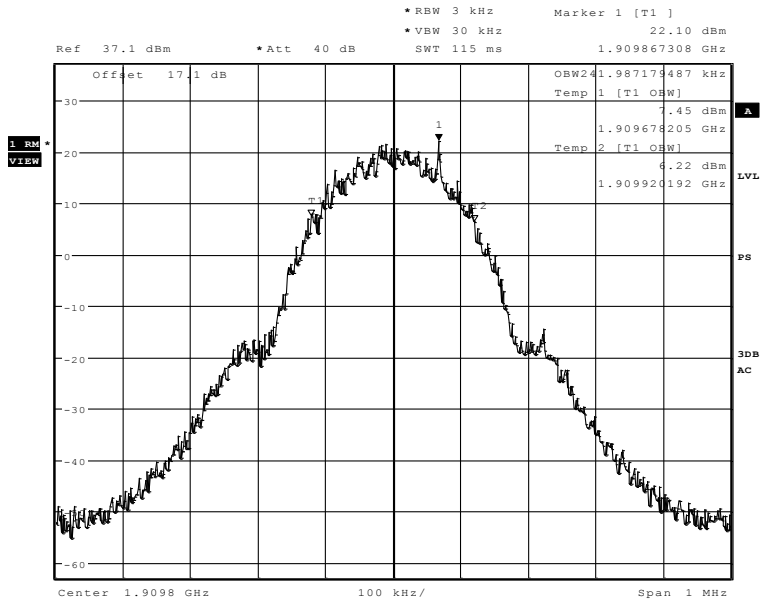
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Channel 512



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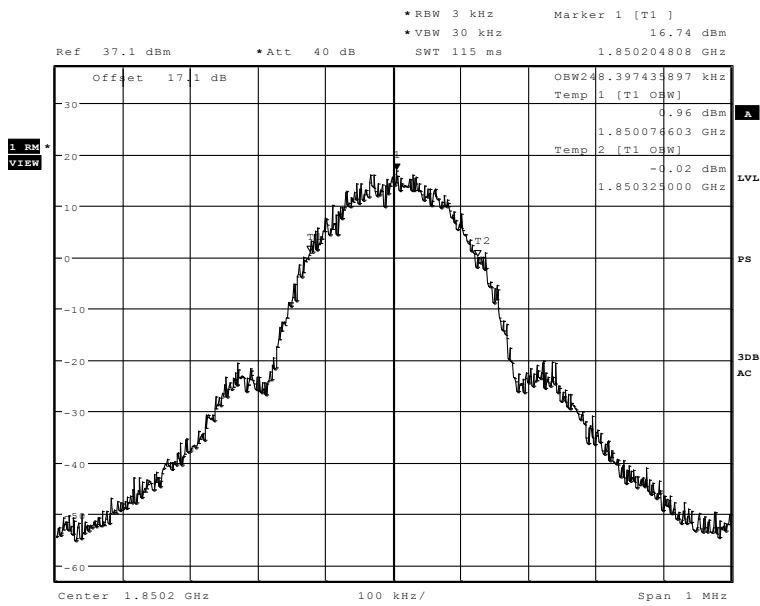
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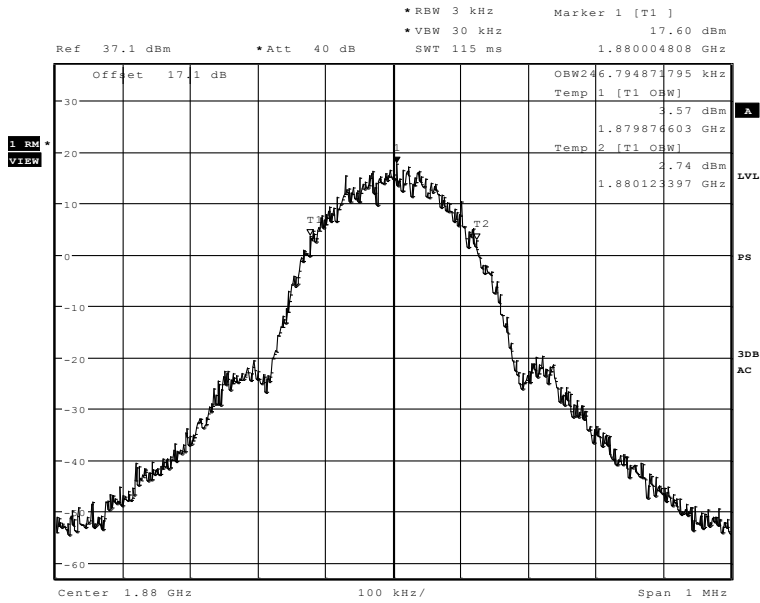
Channel 810

### 1.2.4. E-GPRS 1900 (8-PSK Modulation)



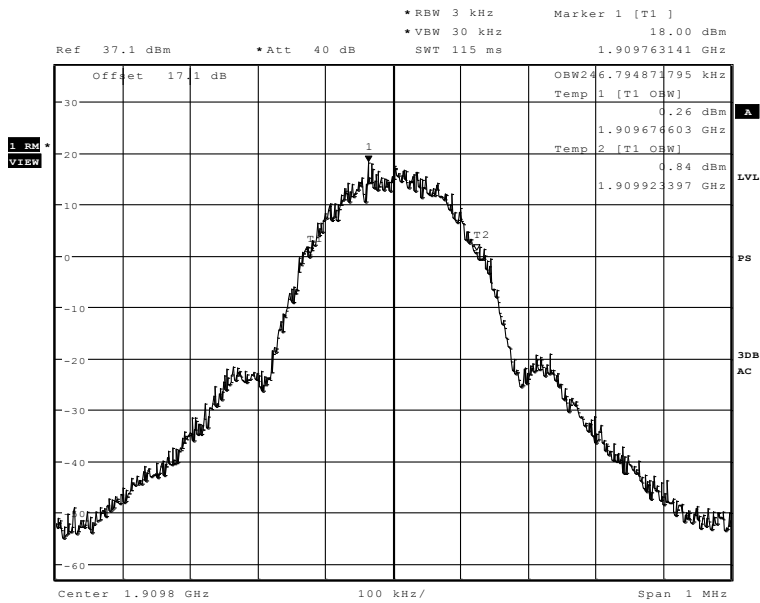
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Channel 512



Date: 20.SEP.2012 10:06:06

Channel 661



Date: 20.SEP.2012 10:13:49

Channel 810

### 1.3. Spurious emissions conducted

#### 1.3.1. Out-of-Band emissions - GSM 850 mode (GMSK-Modulation)

## Diagram No.: 12.01\_GSM\_RSE\_L\_Sweep1

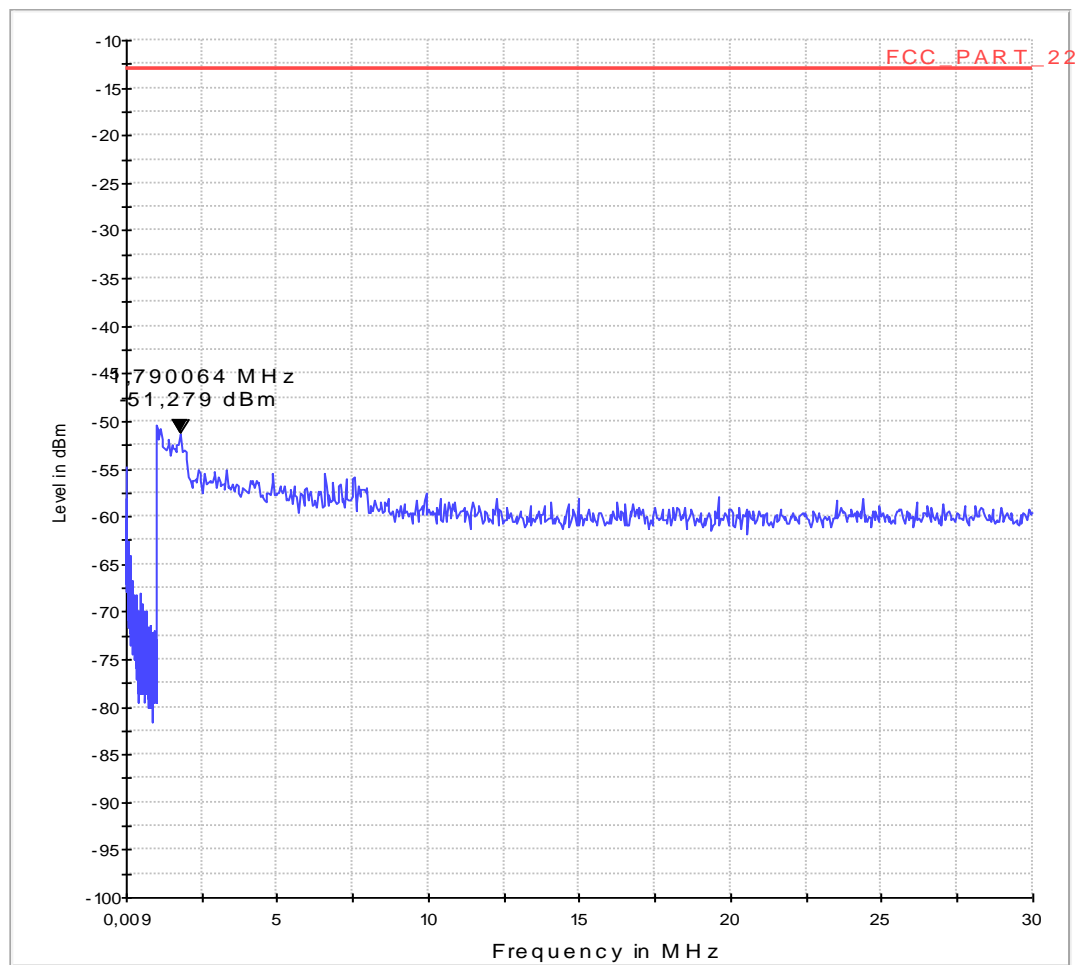
### Common Information

Test Description:	TX Spurious Emission conducted
Test Site:	Radio laboratory 1
Test Standard:	FCC Part 22, RSS-132
Operation mode:	TCH 850, CHANNEL 128
Operator Name:	Tas
Comment:	6-0147-12-9-3a

### EUT Information

EUT Name:	EHS5-US
Manufacturer:	Cinterion
Serial Number:	004401080756915
Hardware Rev:	B2 rev.3
Software Rev:	00.207
Comment:	Interface R232
Accessories:	Power supply (12V DC), Data/Voice transmission via RS232

Sweep\_1



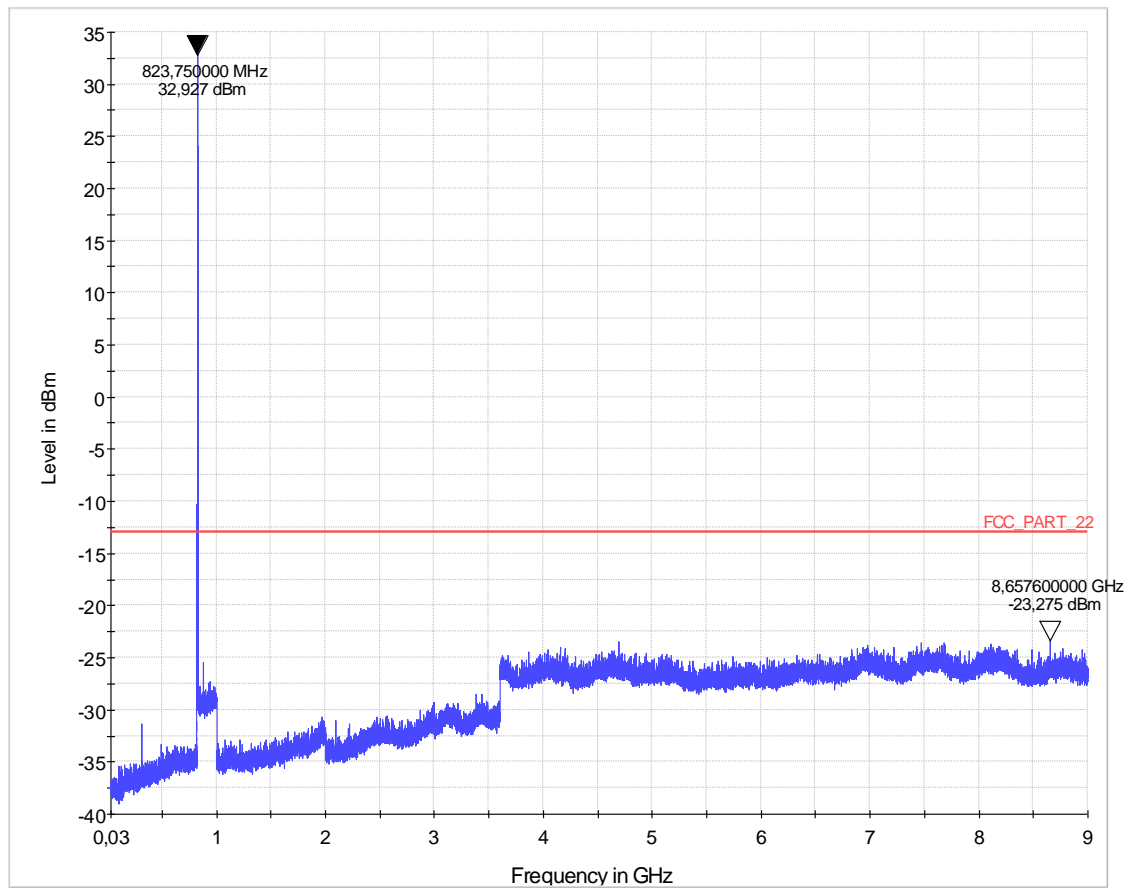
## Diagram No.: 12.01\_GSM\_RSE\_L\_Sweep2

### Common Information

Test Description:	TX Spurious Emission conducted
Test Site:	Radio laboratory 1
Test Standard:	FCC Part 22, RSS-132
Antenna polarisation:	vertical / horizontal
Operation mode:	TCH 850, CHANNEL 128
Operator Name:	sha
Comment:	6-0143-12-2-3a

### EUT Information

EUT Name:	EHS5-US
Manufacturer:	Cinterion
Serial Number:	004401080756915
Hardware Rev:	B2 rev.3
Software Rev:	00.207
Comment:	Interface R232
Accessories:	Power supply (12V DC), Data/Voice transmission via RS232





## Diagram No.: 12.02\_GSM\_RSE\_M\_Sweep1

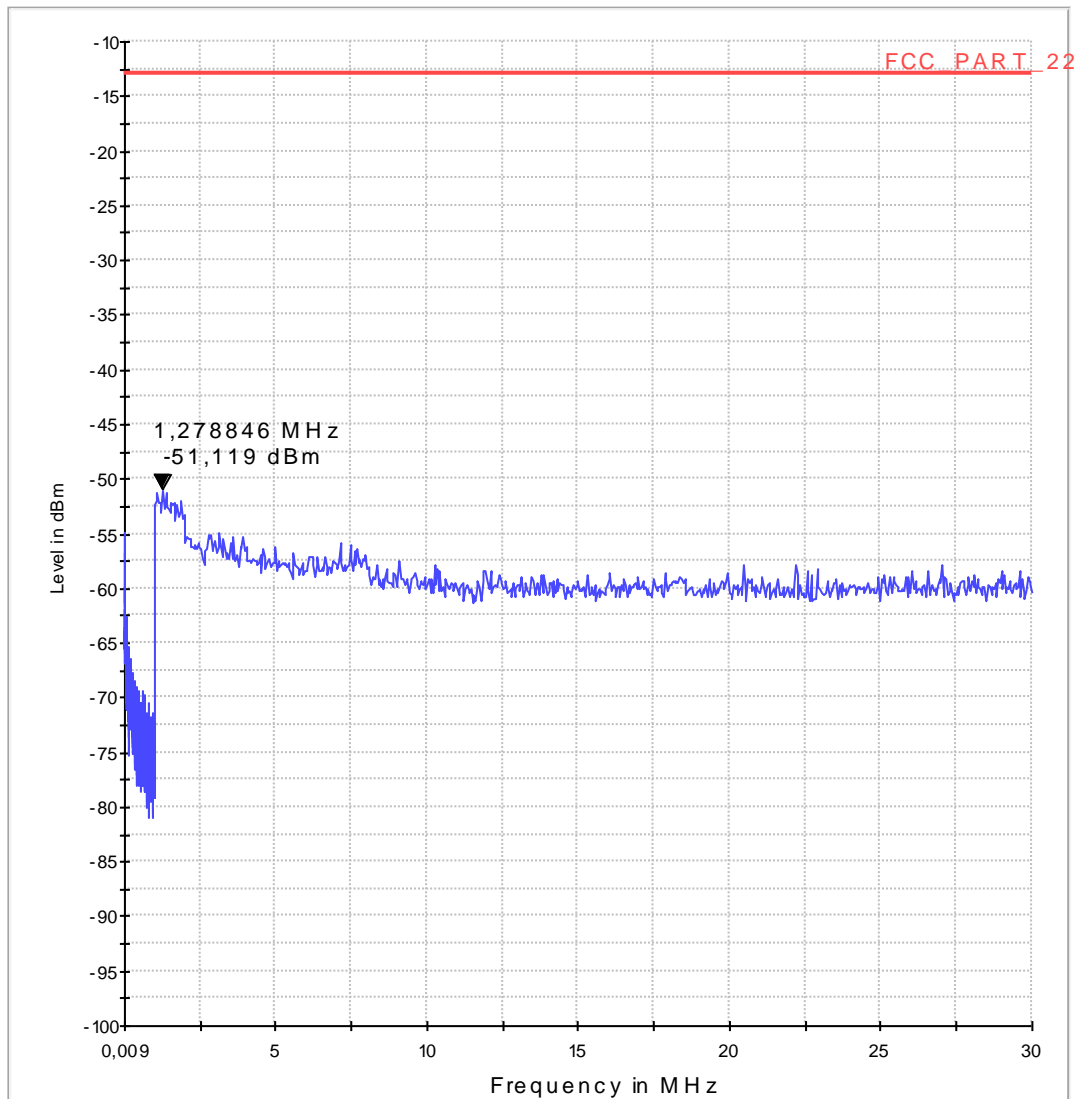
### Common Information

Test Description:	TX Spurious Emission conducted
Test Site:	Radio laboratory 1
Test Standard:	FCC Part 22, RSS-132
Operation mode:	TCH 850, CHANNEL 192
Operator Name:	sha
Comment:	6-0147-12-9-3a

### EUT Information

EUT Name:	EHS5-US
Manufacturer:	Cinterion
Serial Number:	004401080756915
Hardware Rev:	B2 rev.3
Software Rev:	00.207
Comment:	Interface R232
Accessories:	Power supply (12V DC), Data/Voice transmission via RS232

Sweep\_1



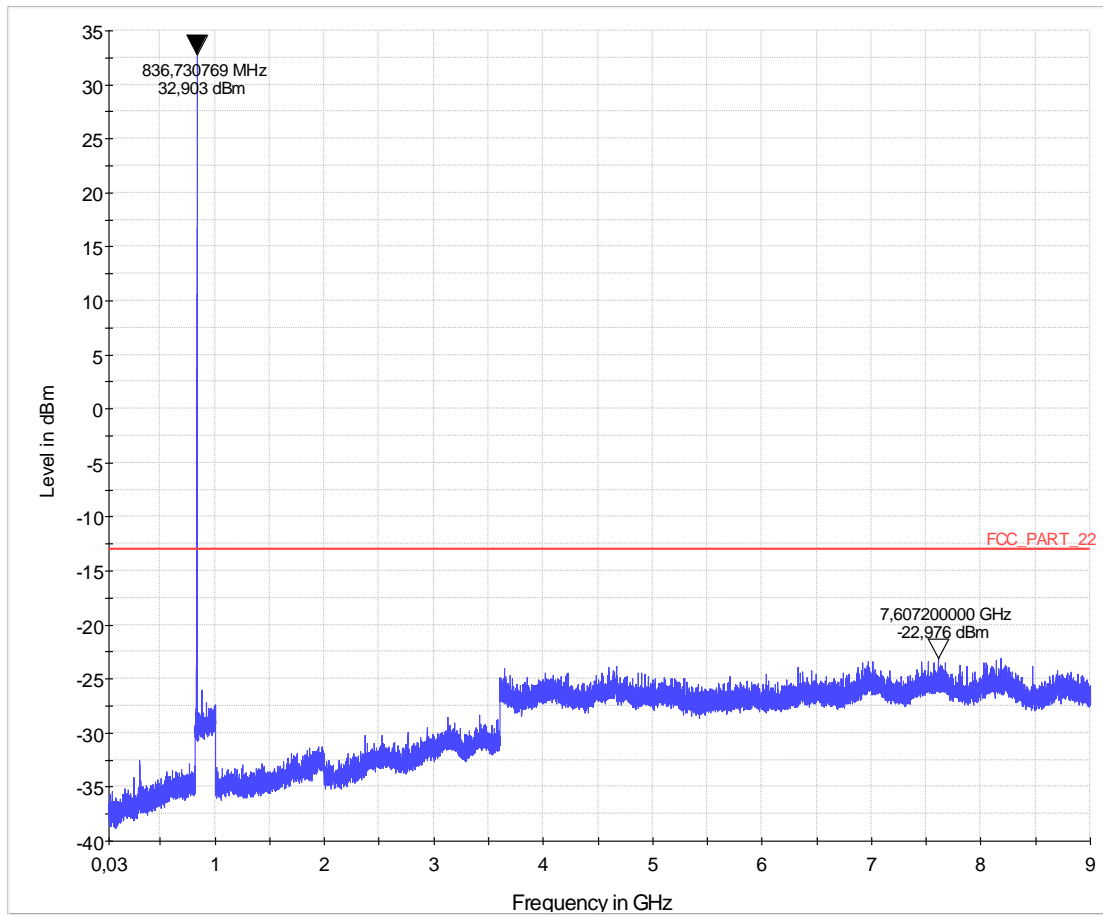
## Diagram No.: 12.02\_GSM\_RSE\_M\_Sweep2

### Common Information

Test Description:	TX Spurious Emission conducted
Test Site:	Radio laboratory 1
Test Standard:	FCC Part 22, RSS-132
Operation mode:	TCH 850, CHANNEL 192
Operator Name:	sha
Comment:	6-0147-12-9-3a

### EUT Information

EUT Name:	EHS5-US
Manufacturer:	Cinterion
Serial Number:	004401080756915
Hardware Rev:	B2 rev.3
Software Rev:	00.207
Comment:	Interface R232
Accessories:	Power supply (12V DC), Data/Voice transmission via RS232



## Diagram No.: 12.03\_GSM\_RSE\_L\_Sweep1

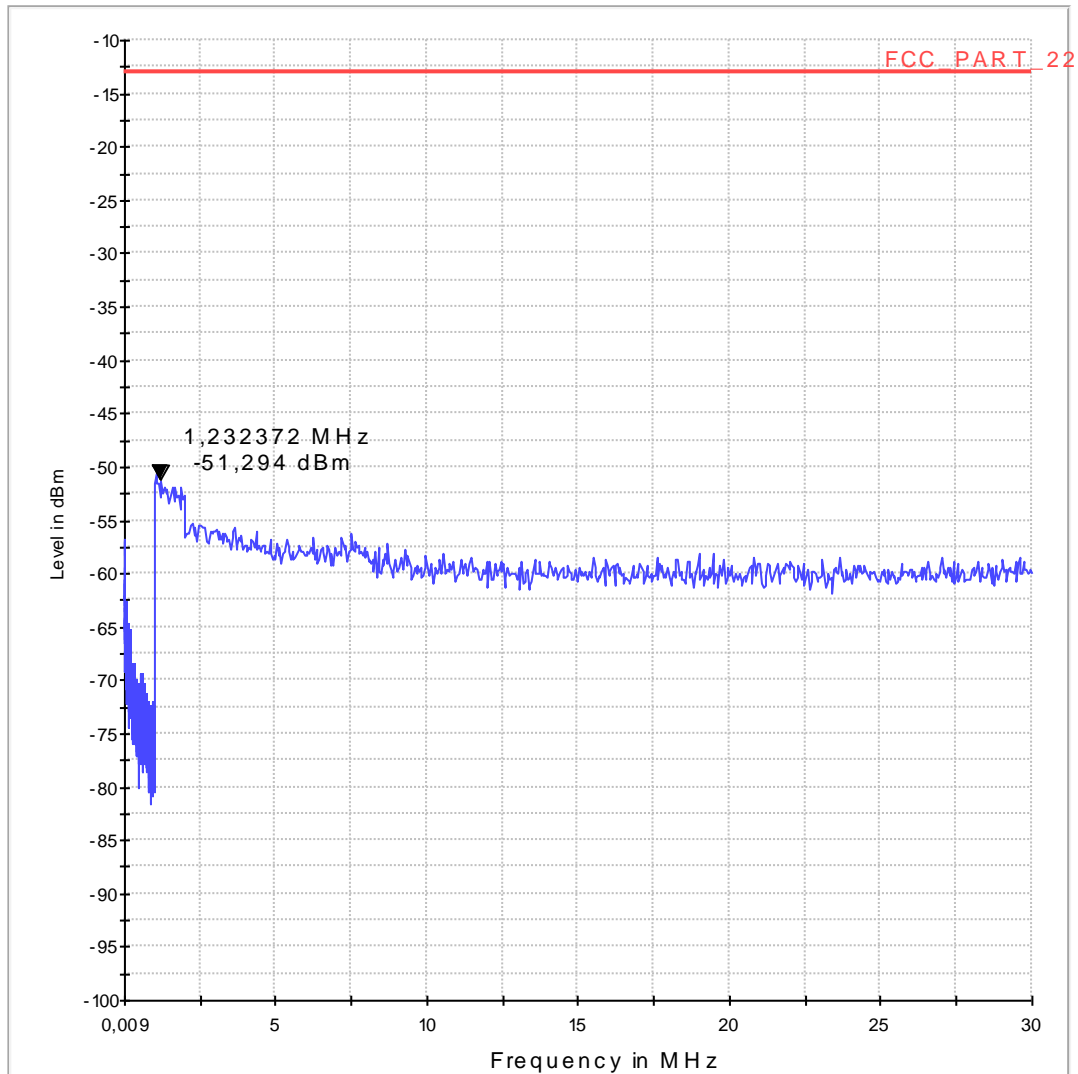
### Common Information

Test Description:	TX Spurious Emission conducted
Test Site:	Radio laboratory 1
Test Standard:	FCC Part 22, RSS-132
Operation mode:	TCH 850, CHANNEL 251
Operator Name:	sha
Comment:	6-0147-12-9-3a

### EUT Information

EUT Name:	EHS5-US
Manufacturer:	Cinterion
Serial Number:	004401080756915
Hardware Rev:	B2 rev.3
Software Rev:	00.207
Comment:	Interface R232
Accessories:	Power supply (12V DC), Data/Voice transmission via RS232

Sweep\_1



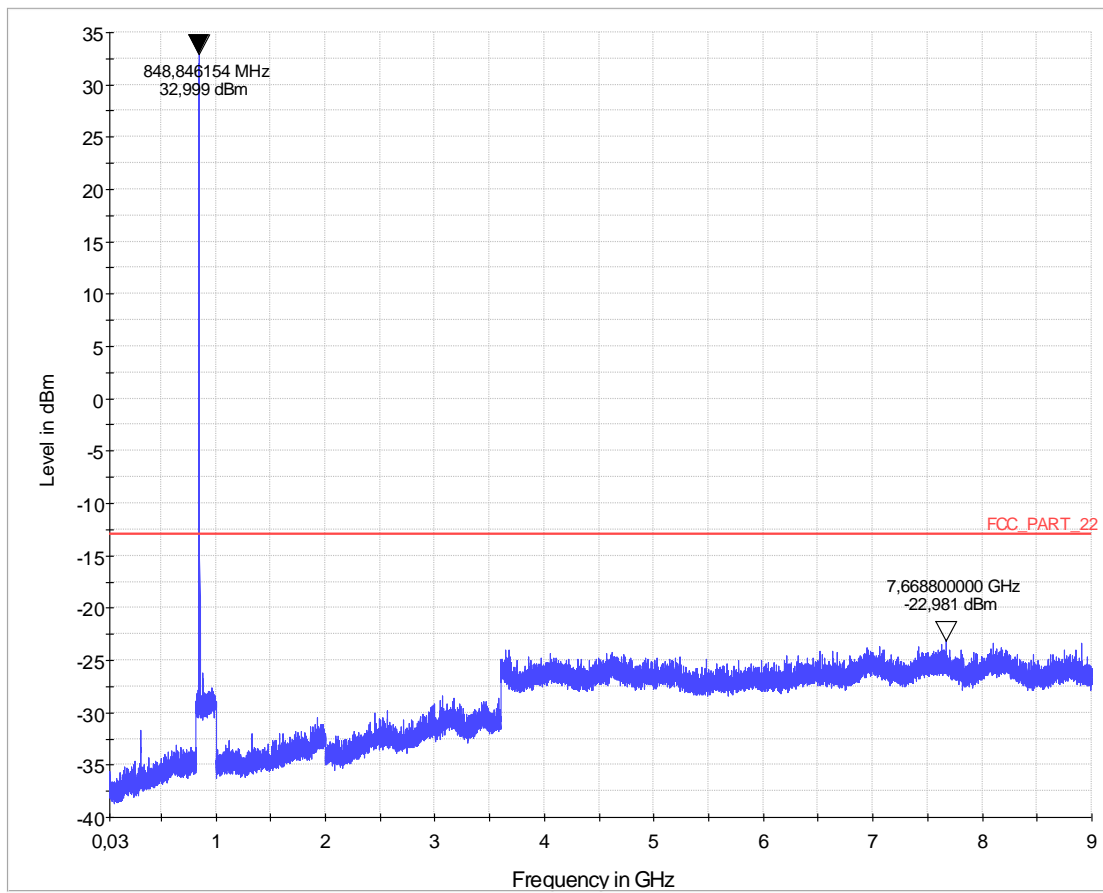
## Diagram No.: 12.03\_GSM\_RSE\_L\_Sweep2

### Common Information

Test Description:	TX Spurious Emission conducted
Test Site:	Radio laboratory 1
Test Standard:	FCC Part 22, RSS-132
Operation mode:	TCH 850, CHANNEL 251
Operator Name:	sha
Comment:	6-0147-12-9-3a

### EUT Information

EUT Name:	EHS5-US
Manufacturer:	Cinterion
Serial Number:	004401080756915
Hardware Rev:	B2 rev.3
Software Rev:	00.207
Comment:	Interface R232
Accessories:	Power supply (12V DC), Data/Voice transmission via RS232



1.3.2. Band-Edge compliance GSM-850 (GMSK-Modulation)

**Diagram no: 14.01**

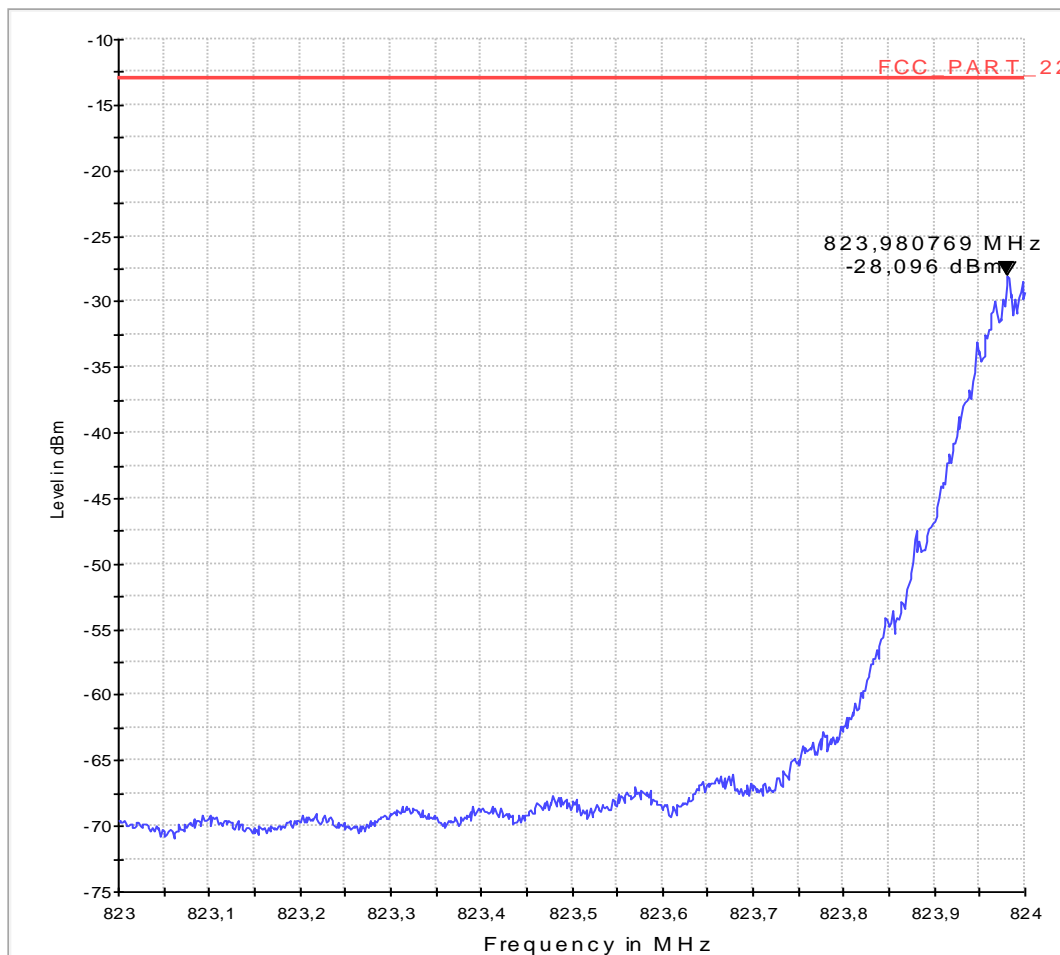
**Common Information**

Test Description:	Transmitter unwanted emissions (Band-Edge)/ FCC requirements
Operating Conditions:	Radio laboratory 1
Operator Name:	FCC Part 22, RSS-132
	22.5°C 39%
	TX - 850 (RMC), low channel on ARFCN 128
	Tas
	6-0147-12-9-3b

**EUT Information**

EUT Name:	EHS5-US
Manufacturer:	Cinterion
Serial Number:	00440108075600
Hardware Rev:	B2 rev.3
Software Rev:	00.260
Comment:	Interface R232
Accessories:	Power supply (12V DC), Data/Voice transmission via RS232 cable

Sweep\_3b\_Band\_Edge\_Channel\_128\_AV



## Diagram No.: 14.02

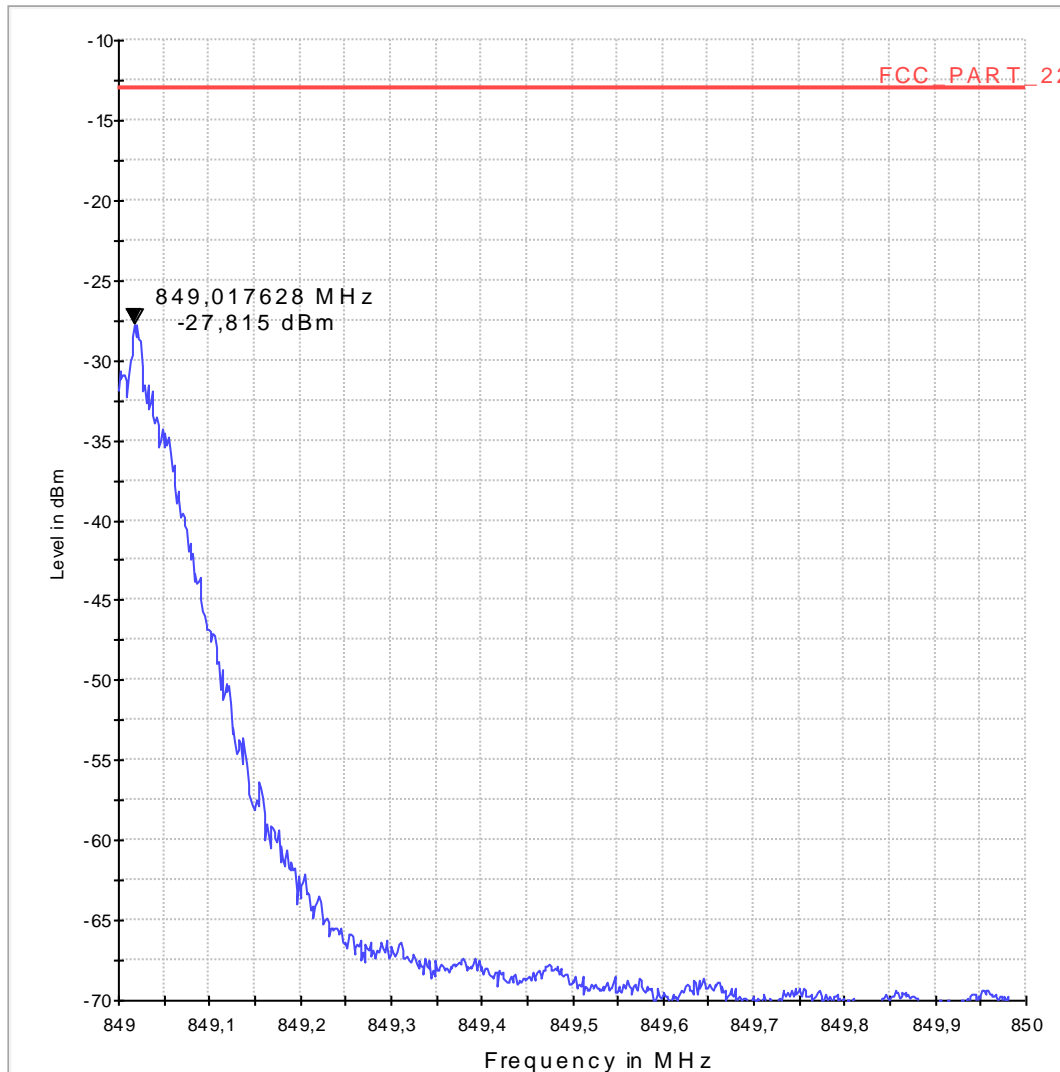
### Common Information

Test Description:	TX Spurious Emission conducted
Test Site:	Radio laboratory 1
Test Standard:	FCC Part 22, RSS-132
Operation mode:	TCH 850, CHANNEL 251
Operator Name:	sha
Comment:	6-0147-12-9-3a

### EUT Information

EUT Name:	EHS5-US
Manufacturer:	Cinterion
Serial Number:	004401080756915
Hardware Rev:	B2 rev.3
Software Rev:	00.207
Comment:	Interface R232
Accessories:	Power supply (12V DC), Data/Voice transmission via RS232

Sweep\_4b\_Band\_Edge\_Channel\_251\_AV



### 1.3.3. Out-of-Band emissions - GSM 850 mode (8PSK-Modulation)

### Diagram No.: 12.04\_EGPRS\_850\_RSE\_L\_Sweep1

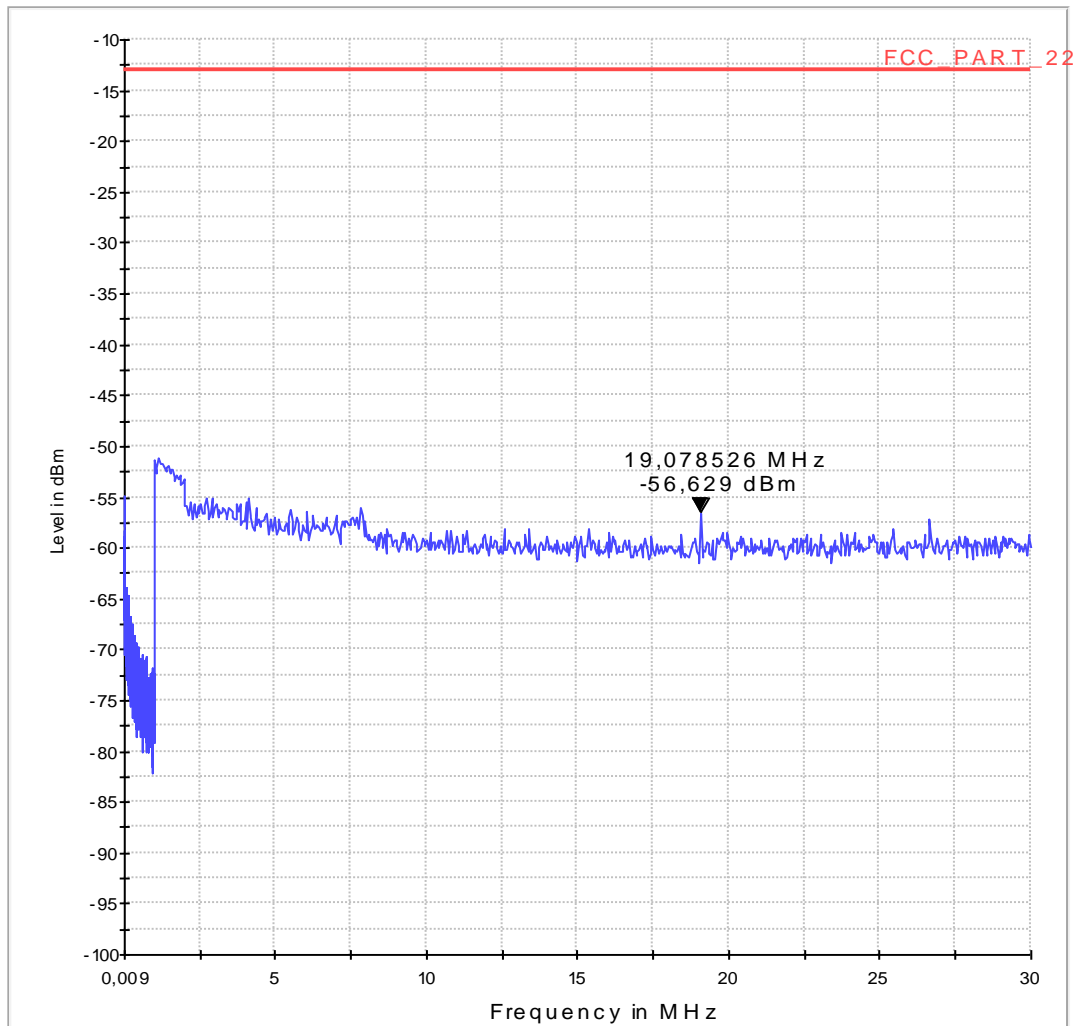
#### Common Information

Test Description:	TX Spurious Emission conducted
Test Site:	Radio laboratory 1
Test Standard:	FCC Part 22, RSS-132
Operation mode:	TCH 850, CHANNEL 128
Operator Name:	sha
Comment:	6-0147-12-9-3a

#### EUT Information

EUT Name:	EHS5-US
Manufacturer:	Cinterion
Serial Number:	004401080756915
Hardware Rev:	B2 rev.3
Software Rev:	00.207
Comment:	Interface R232
Accessories:	Power supply (12V DC), Data/Voice transmission via RS232

Sweep\_1



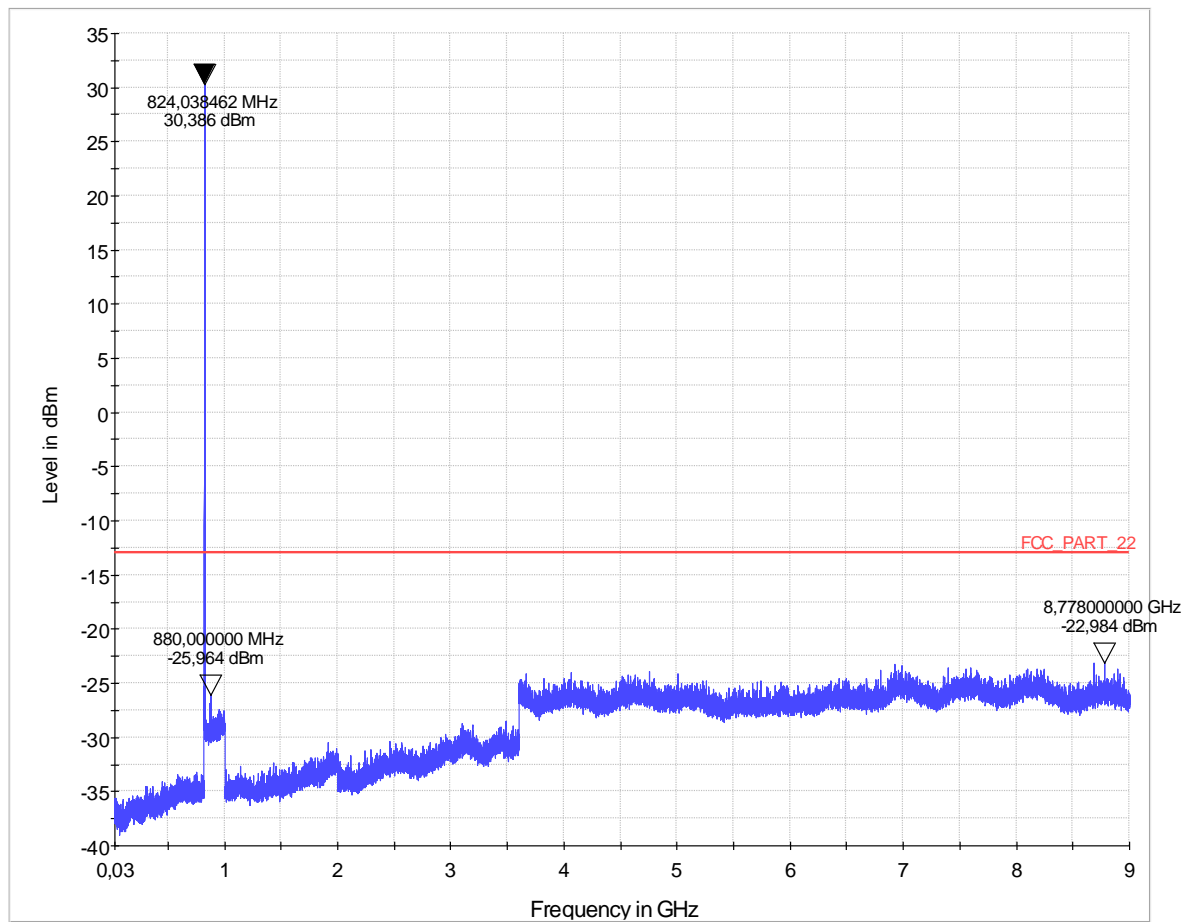
## Diagram No.: 12.04\_EGPRS\_850\_RSE\_L\_Sweep2

### Common Information

Test Description:	TX Spurious Emission conducted
Test Site:	Radio laboratory 1
Test Standard:	FCC Part 22, RSS-132
Operation mode:	TCH 850, CHANNEL 128
Operator Name:	sha
Comment:	6-0147-12-9-3a

### EUT Information

EUT Name:	EHS5-US
Manufacturer:	Cinterion
Serial Number:	004401080756915
Hardware Rev:	B2 rev.3
Software Rev:	00.207
Comment:	Interface R232
Accessories:	Power supply (12V DC), Data/Voice transmission via RS232





### Diagram No.: 12.05\_EGPRS\_850\_RSE\_M\_Sweep1

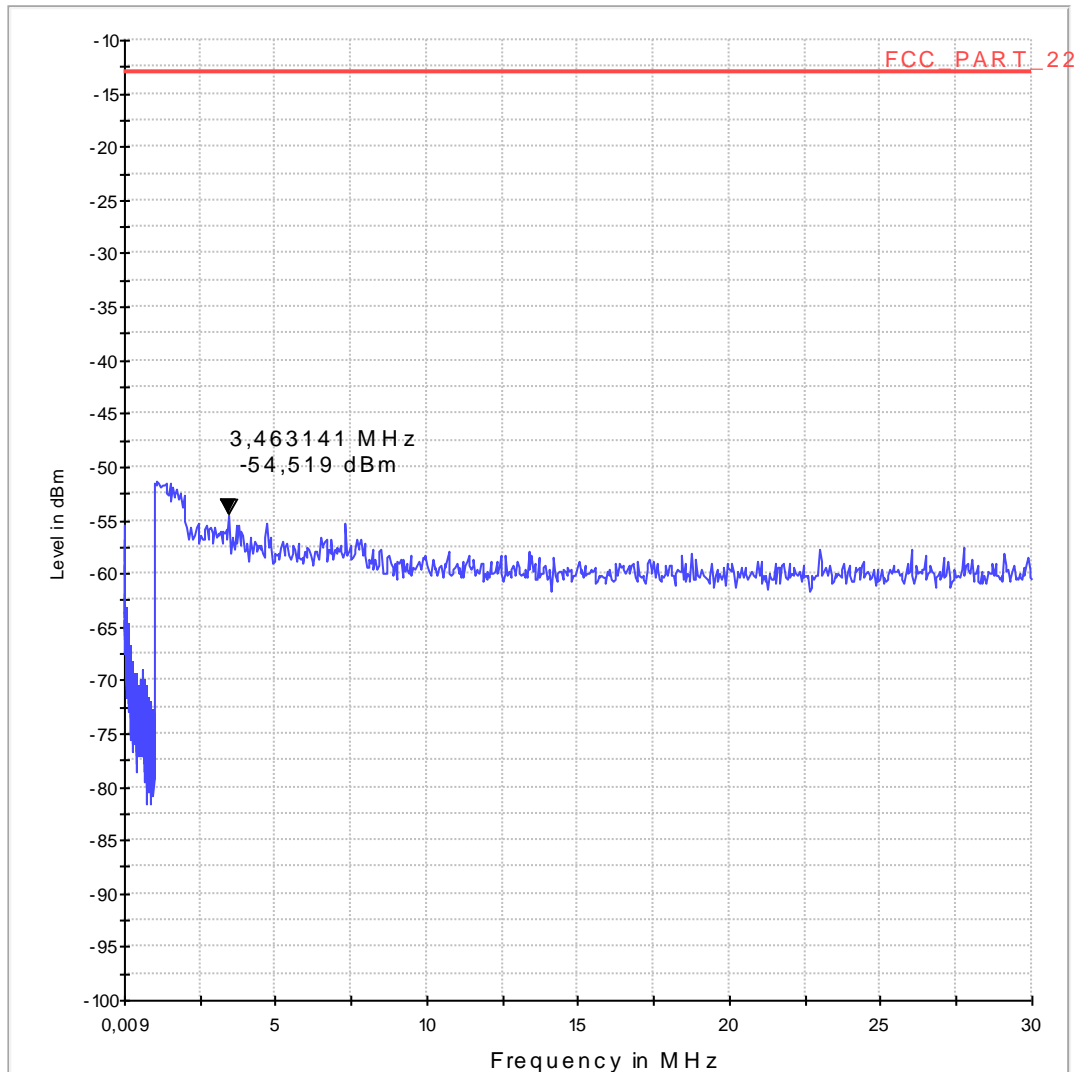
#### Common Information

Test Description:	TX Spurious Emission conducted
Test Site:	Radio laboratory 1
Test Standard:	FCC Part 22, RSS-132
Operation mode:	TCH 850, CHANNEL 192
Operator Name:	sha
Comment:	6-0147-12-9-3a

#### EUT Information

EUT Name:	EHS5-US
Manufacturer:	Cinterion
Serial Number:	004401080756915
Hardware Rev:	B2 rev.3
Software Rev:	00.207
Comment:	Interface R232
Accessories:	Power supply (12V DC), Data/Voice transmission via RS232

Sweep\_1



## Diagram No.: 12.05\_EGPRS\_850\_RSE\_M\_Sweep2

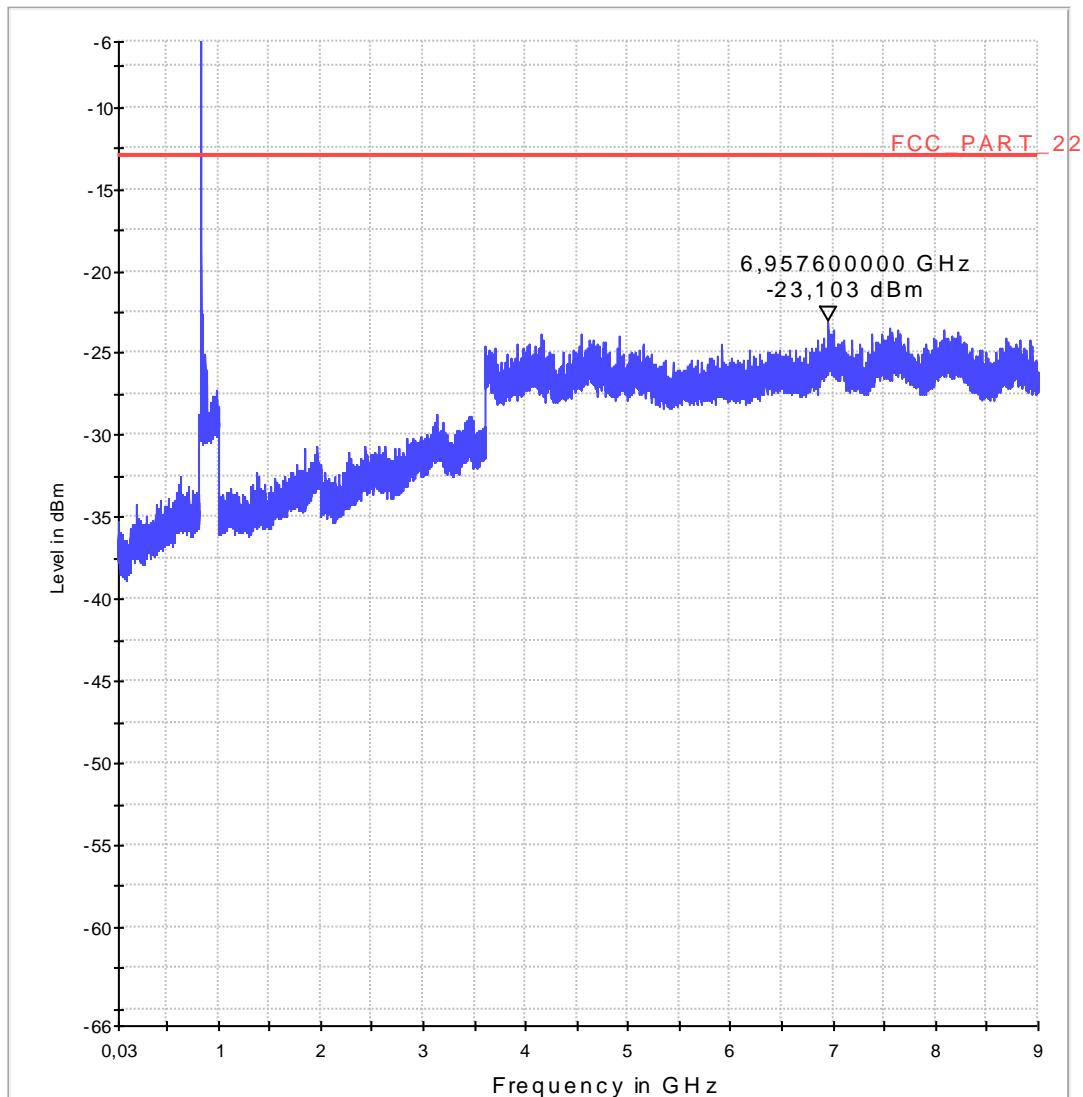
### Common Information

Test Description:	TX Spurious Emission conducted
Test Site:	Radio laboratory 1
Test Standard:	FCC Part 22, RSS-132
Operation mode:	TCH 850, CHANNEL 192
Operator Name:	sha
Comment:	6-0147-12-9-3a

### EUT Information

EUT:	Multi RF Module
Manufacturer:	SMA Technology AG
Comment:	KNX technology
Voltage:	low 4.5 V DC
Op. Mode:	TX cont. mode
S/N:	33

Sweep\_2 30M till 9 G



### Diagram No.: 12.06\_EGPRS\_850\_RSE\_H\_Sweep1

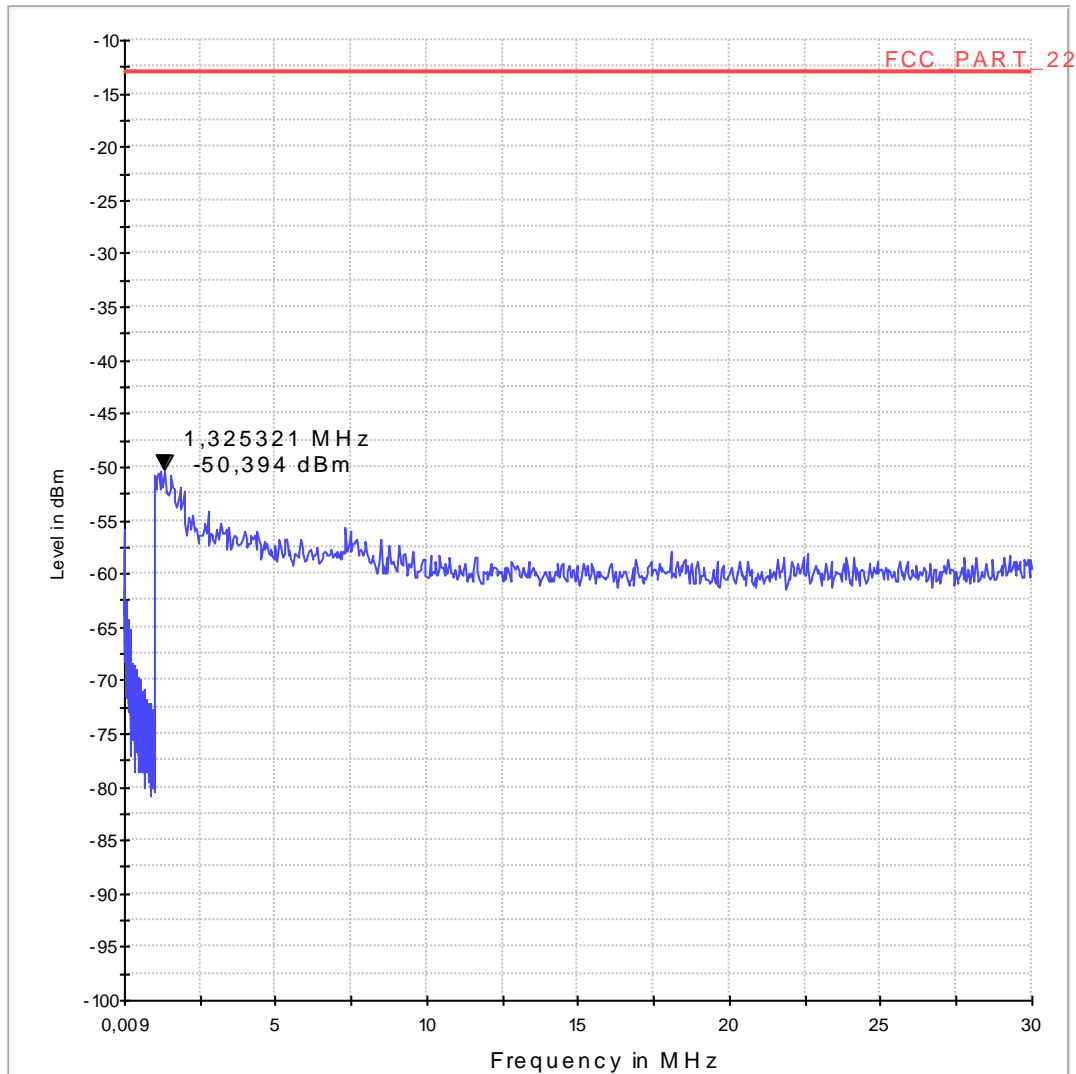
#### Common Information

Test Description:	TX Spurious Emission conducted
Test Site:	Radio laboratory 1
Test Standard:	FCC Part 22, RSS-132
Operation mode:	TCH 850, CHANNEL 251
Operator Name:	sha
Comment:	6-0147-12-9-3a

#### EUT Information

EUT Name:	EHS5-US
Manufacturer:	Cinterion
Serial Number:	004401080756915
Hardware Rev:	B2 rev.3
Software Rev:	00.207
Comment:	Interface R232
Accessories:	Power supply (12V DC), Data/Voice transmission via RS232

Sweep\_1



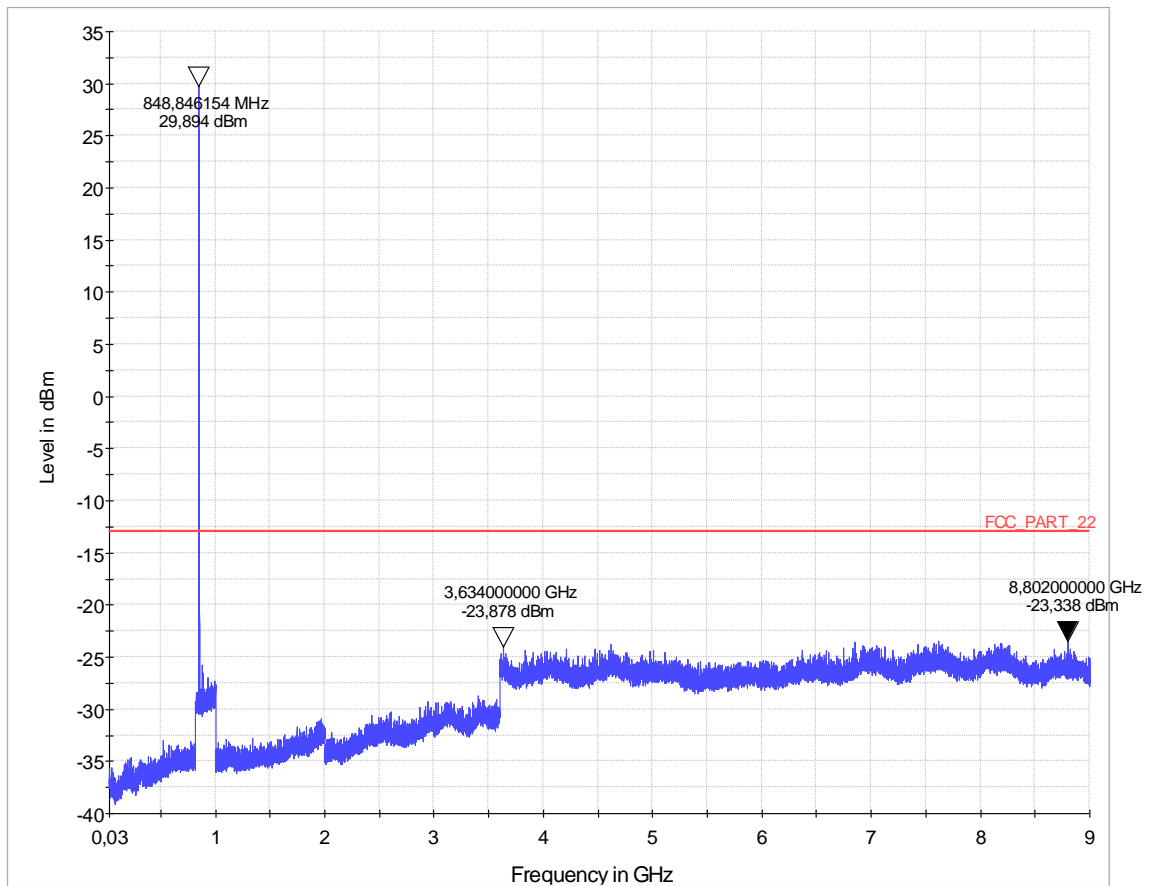
## Diagram No.: 12.06\_EGPRS\_850\_RSE\_H\_Sweep2

### Common Information

Test Description:	TX Spurious Emission conducted
Test Site:	Radio laboratory 1
Test Standard:	FCC Part 22, RSS-132
Operation mode:	TCH 850, CHANNEL 251
Operator Name:	sha
Comment:	6-0147-12-9-3a

### EUT Information

EUT Name:	EHS5-US
Manufacturer:	Cinterion
Serial Number:	004401080756915
Hardware Rev:	B2 rev.3
Software Rev:	00.207
Comment:	Interface R232
Accessories:	Power supply (12V DC), Data/Voice transmission via RS232



1.3.4. Band-Edge compliance (8-PSK Modulation)

### Diagram No. 14.03

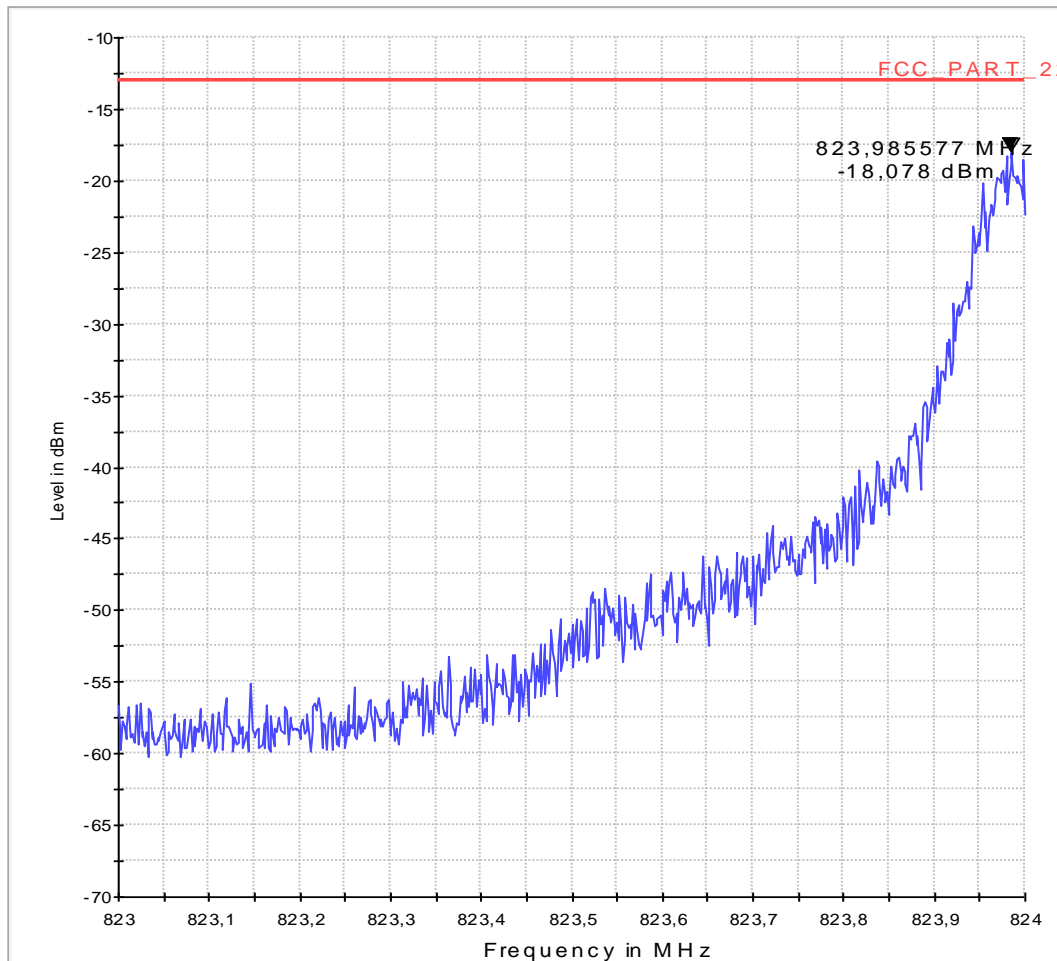
**Common Information**

Test Description:	Transmitter unwanted emissions (Band-Edge)/ FCC requirements
Test Site:	Radio laboratory 1
Test Standard:	FCC Part 22, RSS-132
Environment Conditions:	22.5°C 39%
Operator Name:	Tas
Operating mode:	E-GPRS-TX_low channel on ARFCN 128 6-0147-12-9-3b

**EUT Information**

EUT Name:	EHS5-US
Manufacturer:	Cinterion
Serial Number:	00440108075600
Hardware Rev:	B2 rev.3
Software Rev:	00.260
Comment:	Interface R232
Accessories:	Power supply (12V DC), Data/Voice transmission via RS232 cable

Sweep\_3a\_Band\_Edge\_Channel\_128\_PK



## Diagram No. 14.04

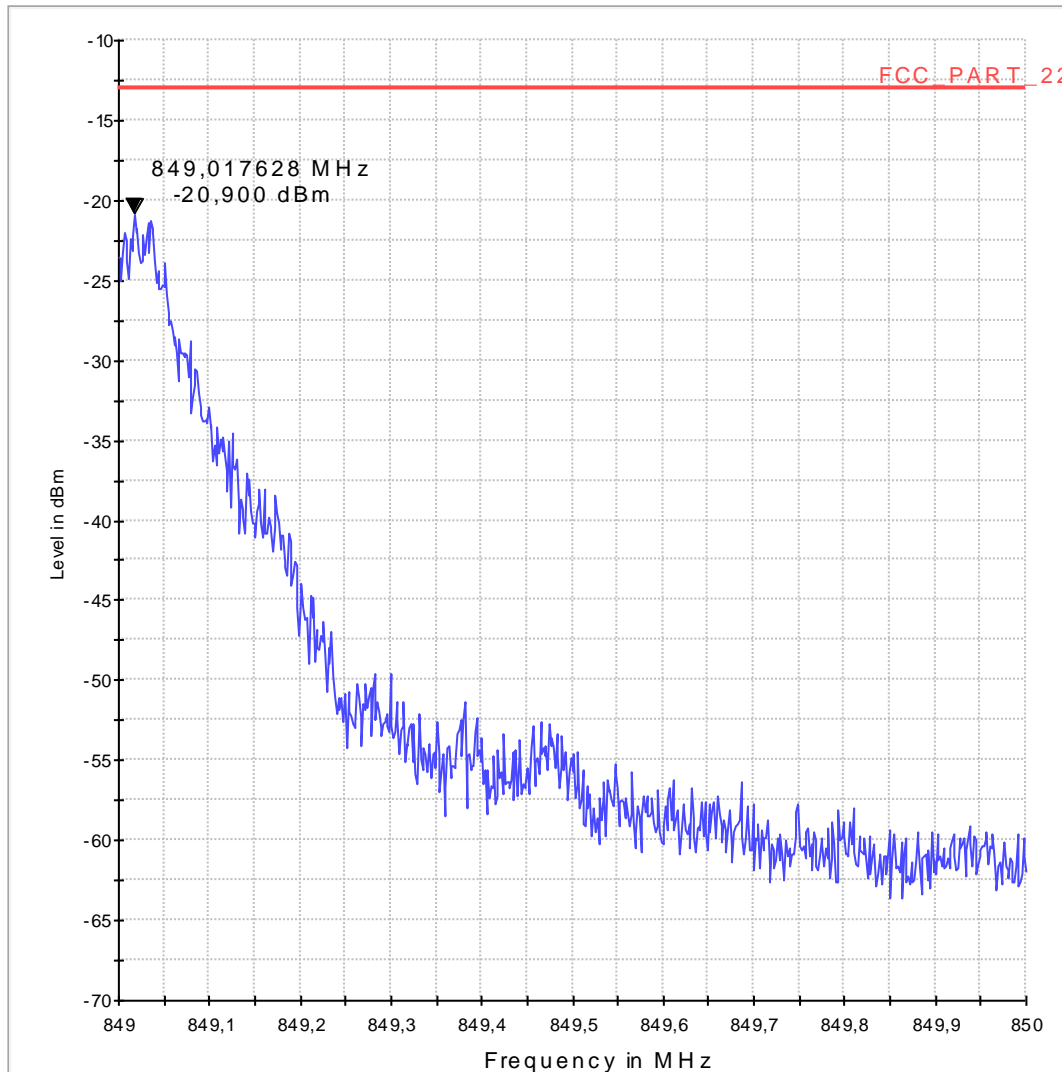
### Common Information

Test Description:	Transmitter unwanted emissions (Band-Edge)/ FCC requirements
Test Site:	Radio laboratory 1
Test Standard:	FCC Part 22, RSS-132
Environment Conditions:	22.5°C 39%
Operator Name:	Tas
Operating mode:	E-GPRS-TX_high channel on ARFCN 251 6-0147-12-9-3b

### EUT Information

EUT Name:	EHS5-US
Manufacturer:	Cinterion
Serial Number:	00440108075600
Hardware Rev:	B2 rev.3
Software Rev:	00.260
Comment:	Interface R232
Accessories:	Power supply (12V DC), Data/Voice transmission via RS232 cable

Sweep\_4a\_Band\_Edge\_Channel\_251\_PK



### 1.3.5. Out-of-Band emissions - GSM 1900 mode (GMSK-Modulation)

## Diagram No.: 10\_Sweep 1

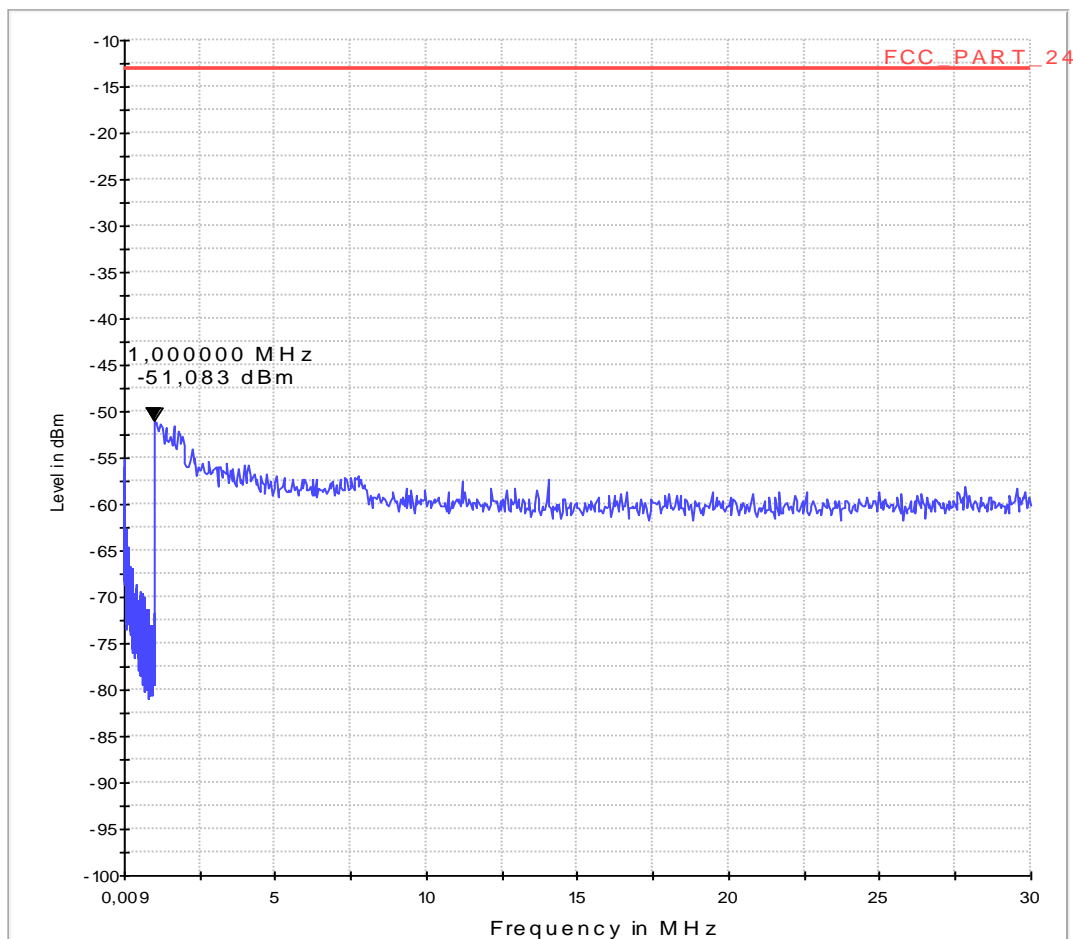
#### Common Information

Test Description:	TX Spurious Emission conducted
Test Site:	Radio laboratory 1
Test Standard:	FCC Part 24.238 RSS-133
Operation mode:	TCH 1900, CHANNEL 512
Operator Name:	Tas
Comment:	6-0147-12-9-3a

#### EUT Information

EUT Name:	EHS5-US
Manufacturer:	Cinterion
Serial Number:	004401080756915
Hardware Rev:	B2 rev.3
Software Rev:	00.207
Comment:	Interface R232
Accessories:	Power supply (12V DC), Data/Voice transmission via RS232 , Mounting Ant. 1140.26 SMA, Handset HH-SI30.3/v3.0/0

Sweep\_1



## Diagram No.: 10\_PCS\_RSE\_19G

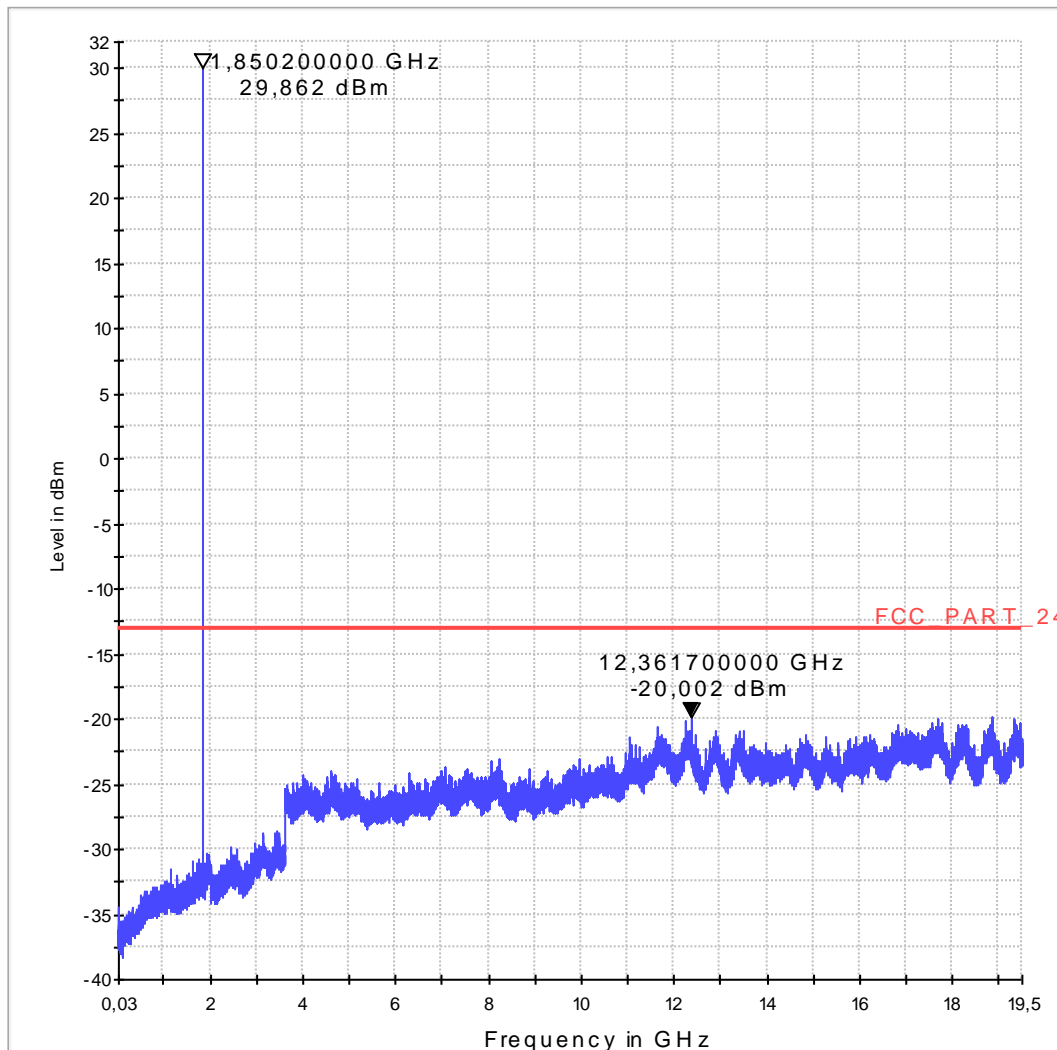
### Common Information

Test Description:	TX Spurious Emission conducted
Test Site:	Radio laboratory 1
Test Standard:	FCC Part 24.238 RSS-133
Operation mode:	TCH 1900, CHANNEL 512
Operator Name:	Tas/Ach
Comment:	6-0147-12-9-3a

### EUT Information

EUT Name:	EHS5-US
Manufacturer:	Cinterion
Serial Number:	004401080756915
Hardware Rev:	B2 rev.3
Software Rev:	00.207
Comment:	Interface R232
Accessories:	Power supply (12V DC), Data/Voice transmission via RS232 , Mounting Ant. 1140.26 SMA, Handset HH-SI30.3/v3.0/0

Sweep\_2





### Diagram No.: 10\_Sweep 1

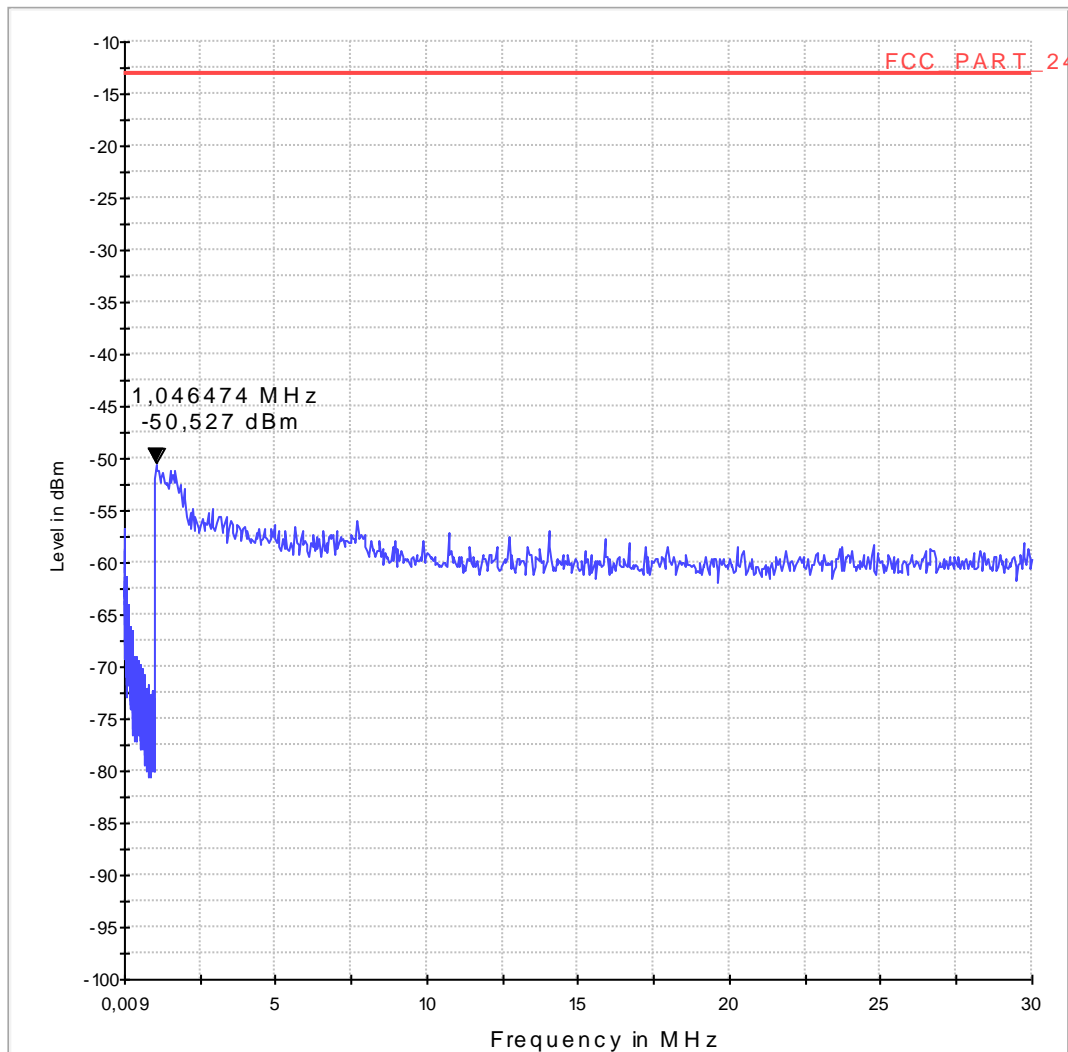
#### Common Information

Test Description:	TX Spurious Emission conducted
Test Site:	Radio laboratory 1
Test Standard:	FCC Part 24.238 RSS-133
Operation mode:	TCH 1900, CHANNEL 661
Operator Name:	Tas
Comment:	6-0147-12-9-3a

#### EUT Information

EUT Name:	EHS5-US
Manufacturer:	Cinterion
Serial Number:	004401080756915
Hardware Rev:	B2 rev.3
Software Rev:	00.207
Comment:	Interface R232
Accessories:	Power supply (12V DC), Data/Voice transmission via RS232 , Mounting Ant. 1140.26 SMA, Handset HH-SI30.3/v3.0/0

Sweep\_1



### Diagram No.: 10\_PCS\_RSE\_19G\_M

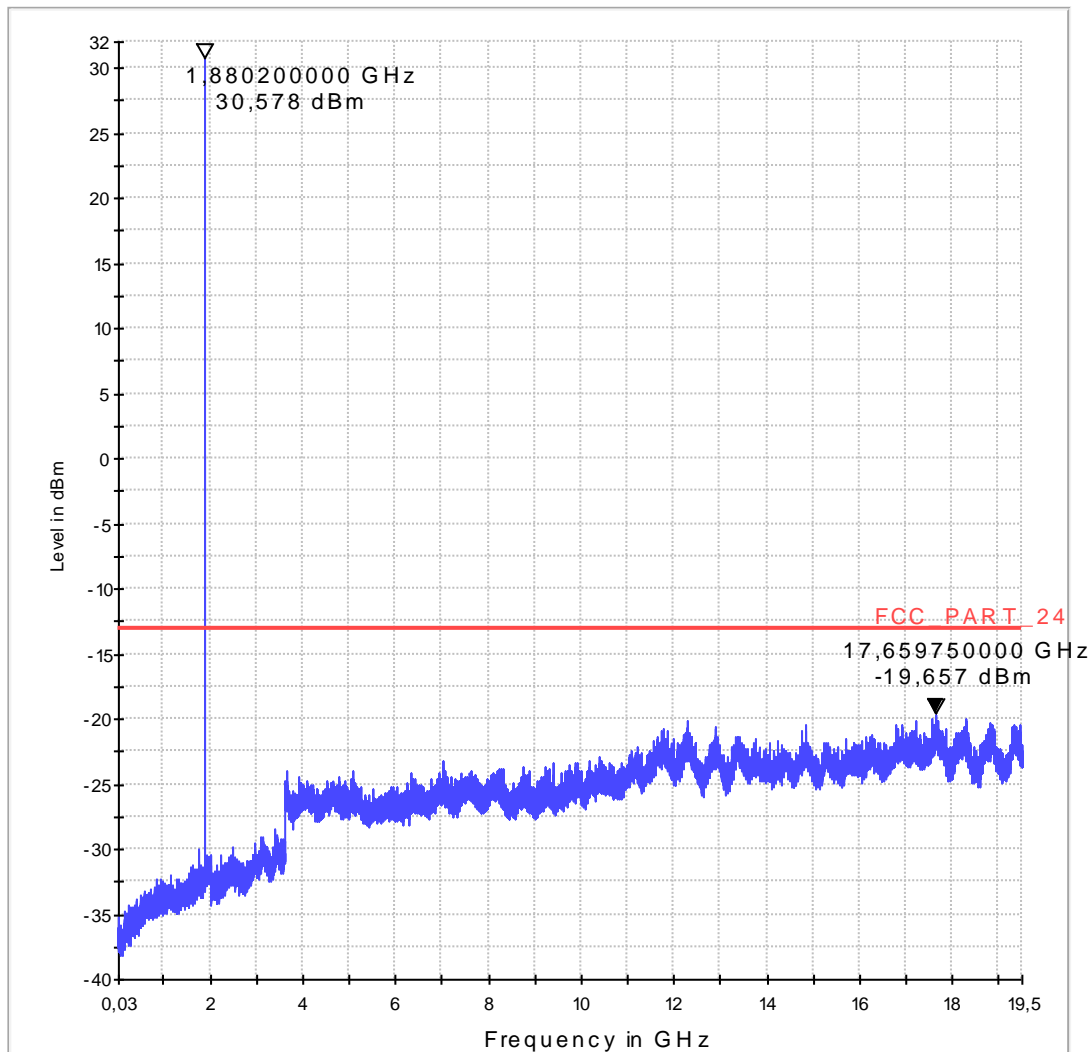
#### Common Information

Test Description: TX Spurious Emission conducted  
Test Site: Radio laboratory 1  
Test Standard: FCC Part 24.238 RSS-133  
  
Operation mode: TCH 1900, CHANNEL 661  
Operator Name: Tas/Ach  
Comment: 6-0147-12-9-3a

#### EUT Information

EUT Name: EHS5-US  
Manufacturer: Cinterion  
Serial Number: 004401080756915  
Hardware Rev: B2 rev.3  
Software Rev: 00.207  
Comment: Interface R232  
Accessories: Power supply (12V DC), Data/Voice transmission via RS232 , Mounting Ant. 1140.26 SMA, Handset HH-SI30.3/v3.0/0

Sweep\_2



### Diagram No.: 10\_PCS\_RSE\_30M\_H

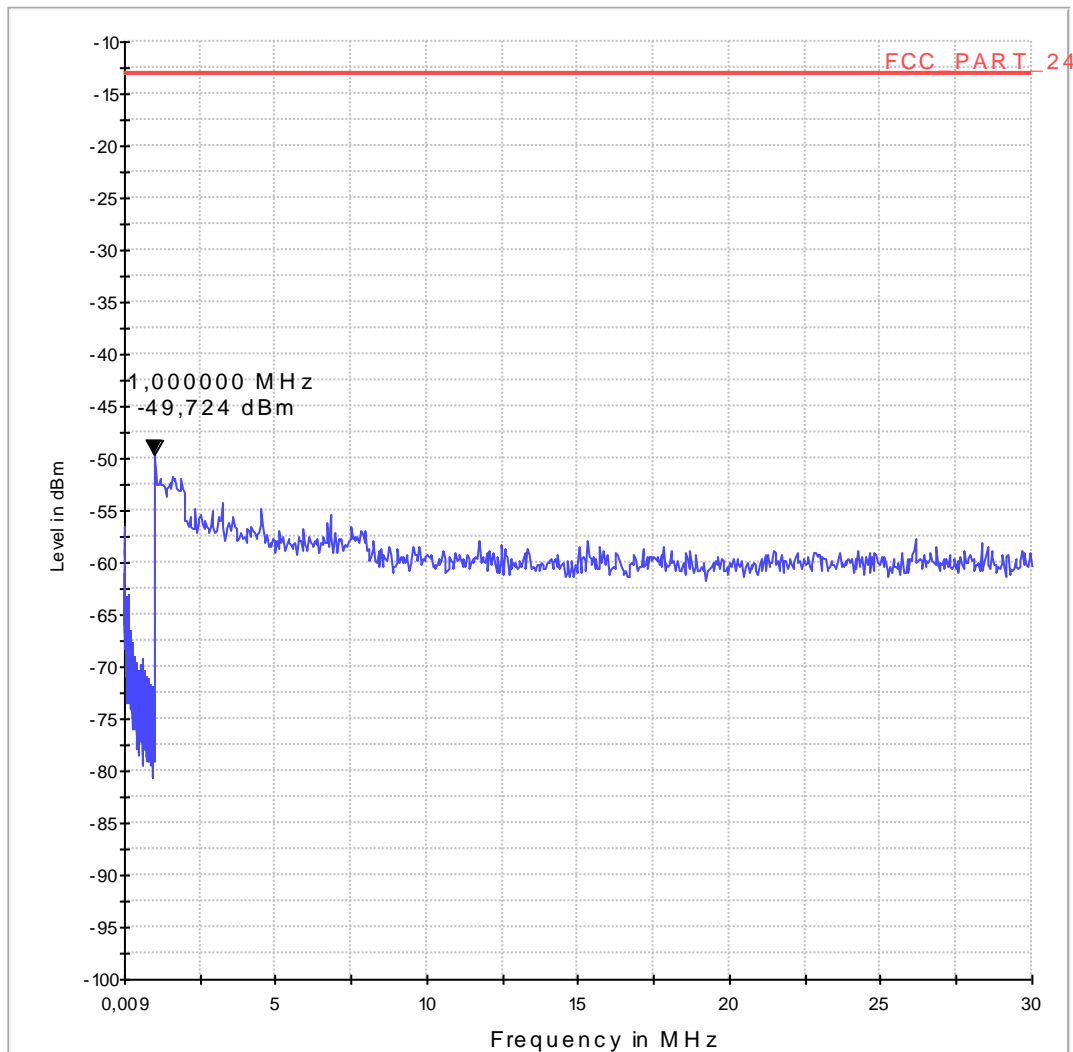
#### Common Information

Test Description: TX Spurious Emission conducted  
Test Site: Radio laboratory 1  
Test Standard: FCC Part 24.238 RSS-133  
  
Operation mode: TCH 1900, CHANNEL 810  
Operator Name: Tas/Ach  
Comment: 6-0147-12-9-3a

#### EUT Information

EUT Name: EHS5-US  
Manufacturer: Cinterion  
Serial Number: 004401080756915  
Hardware Rev: B2 rev.3  
Software Rev: 00.207  
Comment: Interface R232  
Accessories: Power supply (12V DC), Data/Voice transmission via RS232 , Mounting Ant. 1140.26 SMA, Handset HH-SI30.3/v3.0/0

Sweep\_1



### Diagram No.: 10\_PCS\_RSE\_19G\_H

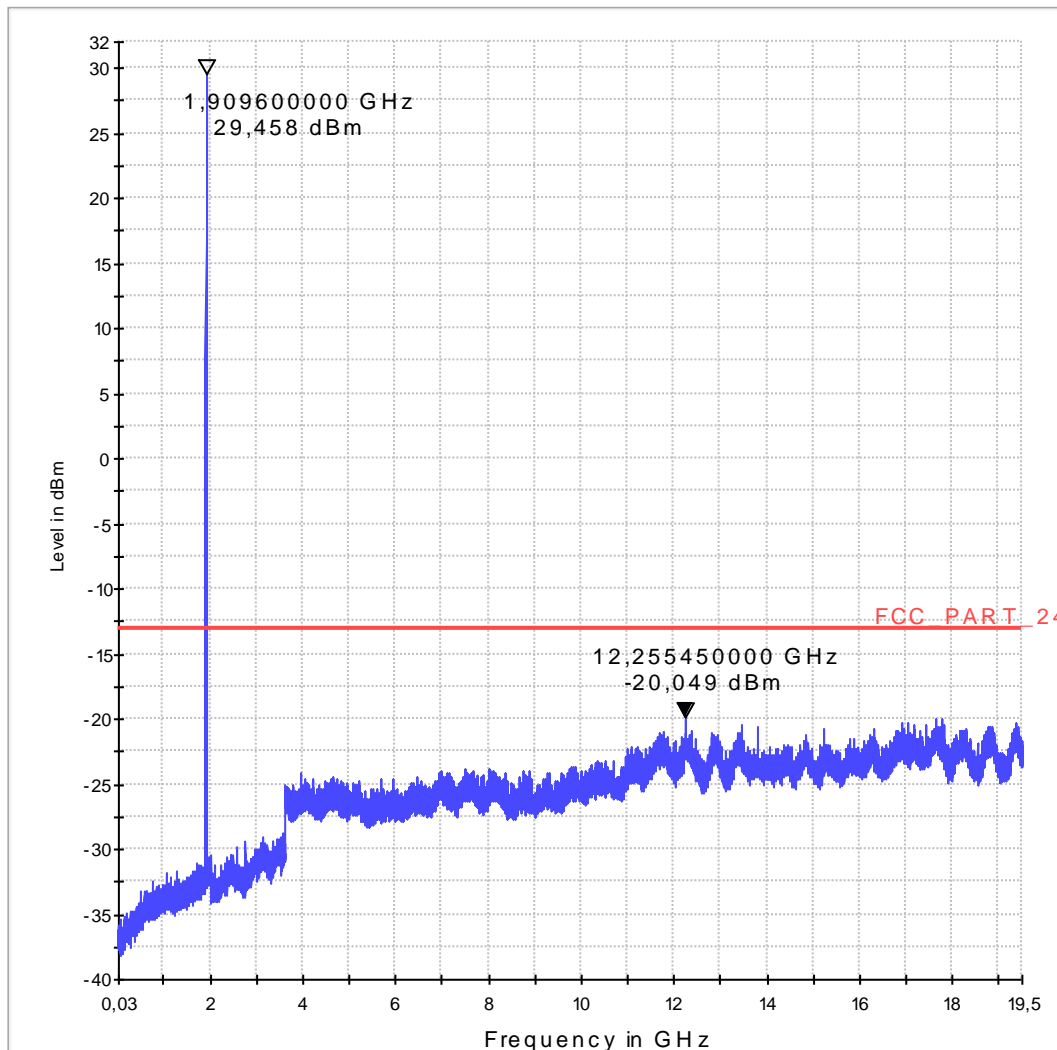
#### Common Information

Test Description: TX Spurious Emission conducted  
Test Site: Radio laboratory 1  
Test Standard: FCC Part 24.238 RSS-133  
  
Operation mode: TCH 1900, CHANNEL 810  
Operator Name: Tas/Ach  
Comment: 6-0147-12-9-3a

#### EUT Information

EUT Name: EHS5-US  
Manufacturer: Cinterion  
Serial Number: 004401080756915  
Hardware Rev: B2 rev.3  
Software Rev: 00.207  
Comment: Interface R232  
Accessories: Power supply (12V DC), Data/Voice transmission via RS232 , Mounting Ant. 1140.26 SMA, Handset HH-SI30.3/v3.0/0

Sweep\_2



1.3.6. Band-Edge compliance: GSM1900 – Mode (GMSK –Modulation)

### Diagram No.: 14.05\_PCS\_BE\_PK\_L

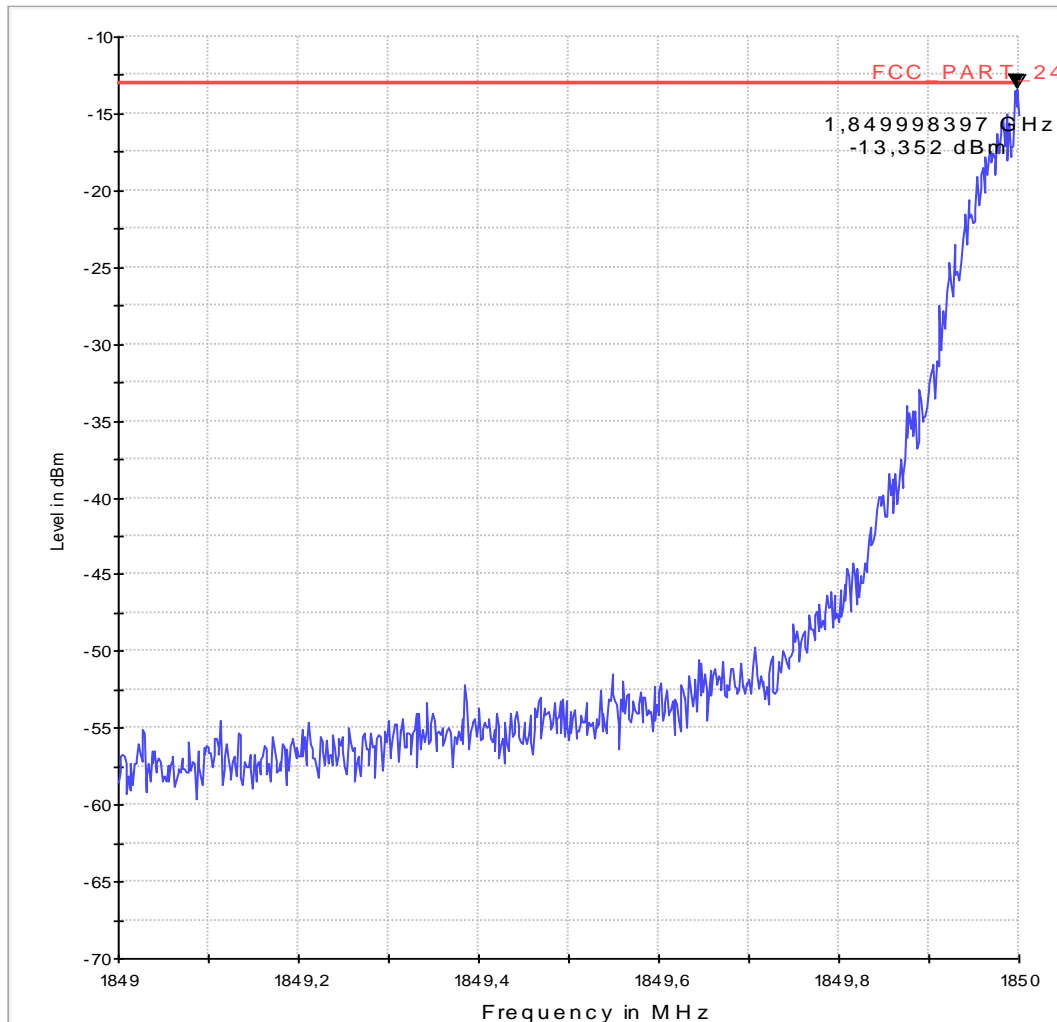
#### Common Information

Test Description:	Transmitter unwanted emissions (Band-Edge)/ FCC requirements
Operating Conditions:	Radio laboratory 1
Op-mode	PCS 1900 ARFCN 512
Operator Name:	ach

#### EUT Information

EUT Name:	EHS5-US
Manufacturer:	Cinterion
Serial Number:	004401080756915
Hardware Rev:	B2 rev.3
Software Rev:	00.207
Comment:	Interface R232
Accessories:	Power supply (12V DC), Data/Voice transmission via RS232

Sweep\_3a\_Band\_Edge\_Channel\_512\_PK



## Diagram No. 14.06\_PCS\_BE\_AV\_H

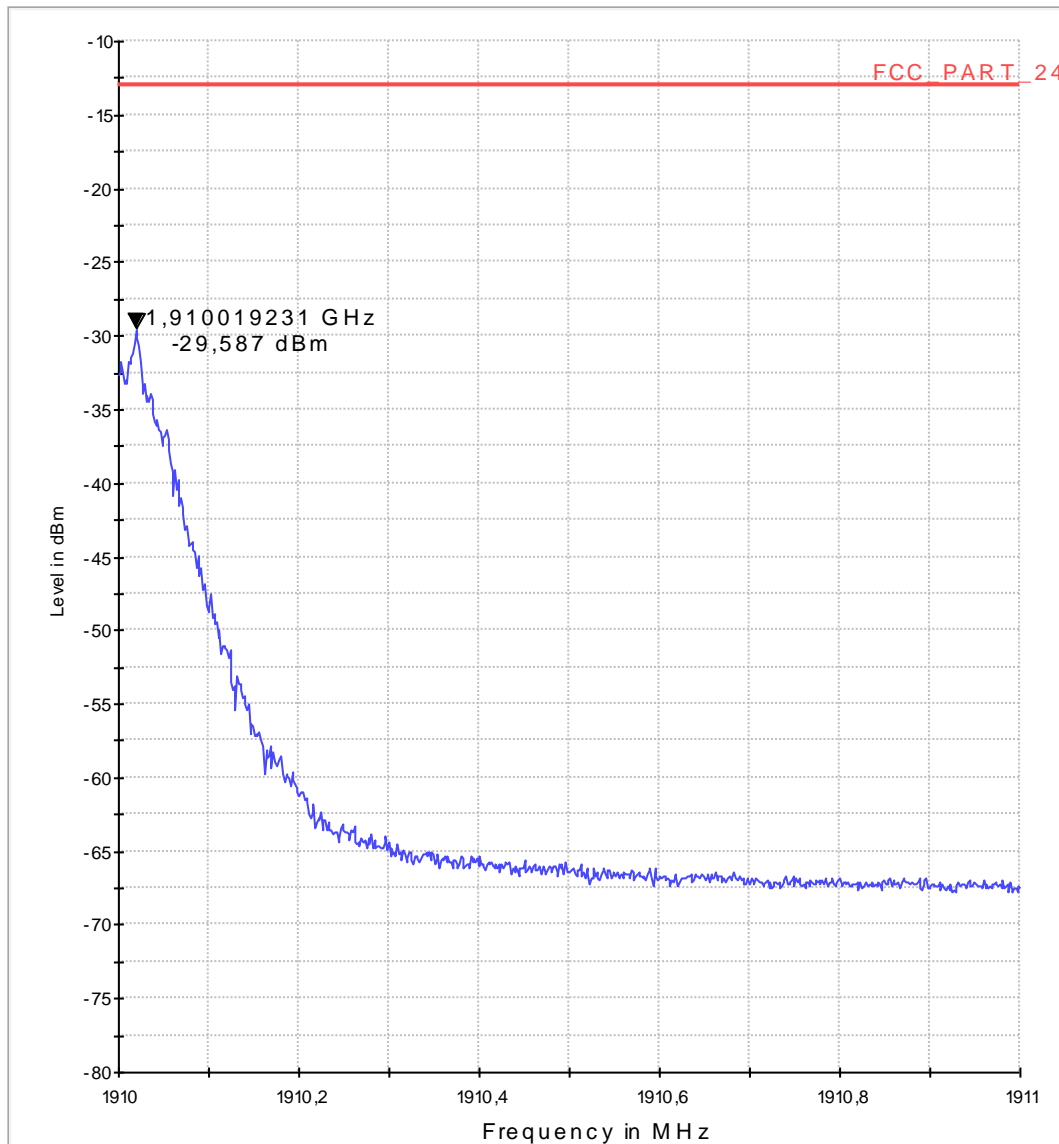
### Common Information

Test Description:	Transmitter unwanted emissions (Band-Edge)/ FCC requirements
Test Site:	Radio laboratory 1
Op-mode:	PCS1900 ARFCN: 810
Operator Name:	TAS/Ach

### EUT Information

EUT Name:	EHS5-US
Manufacturer:	Cinterion
Serial Number:	004401080756915
Hardware Rev:	B2 rev.3
Software Rev:	00.207
Comment:	Interface R232
Accessories:	Power supply (12V DC), Data/Voice transmission via RS232

Sweep\_4b\_Band\_Edge\_Channel\_810\_AV



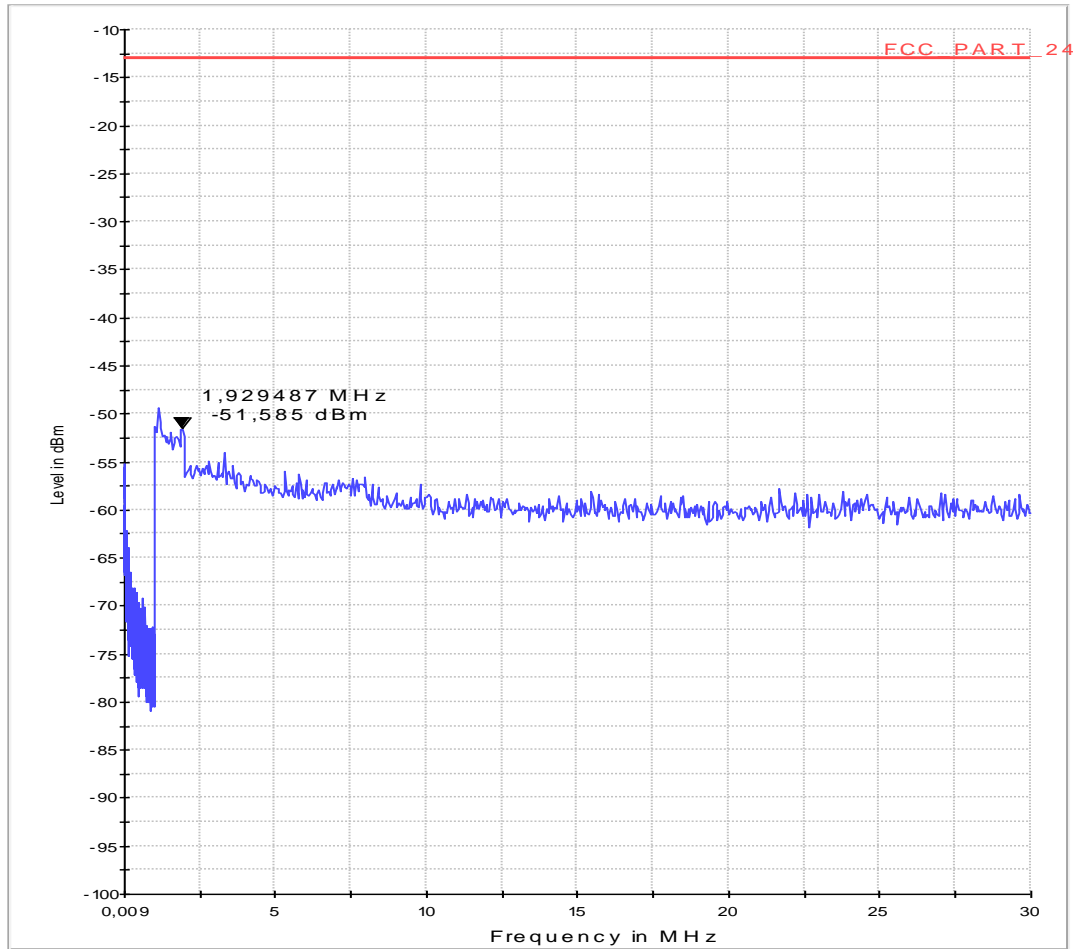
### 1.3.7. Out-of-Band emissions E-GSM 1900 mode (8-PSK-Modulation)

### Diagram No.: 12.10\_Sweep1

#### Common Information

Test Description:	TX Spurious Emission conducted
Test Site:	Radio laboratory 1
Test Standard:	FCC Part 24
Operation mode:	TCH 1900, CHANNEL 512
Operator Name:	sha
Comment:	6-0147-12-9-3a

Sweep\_1

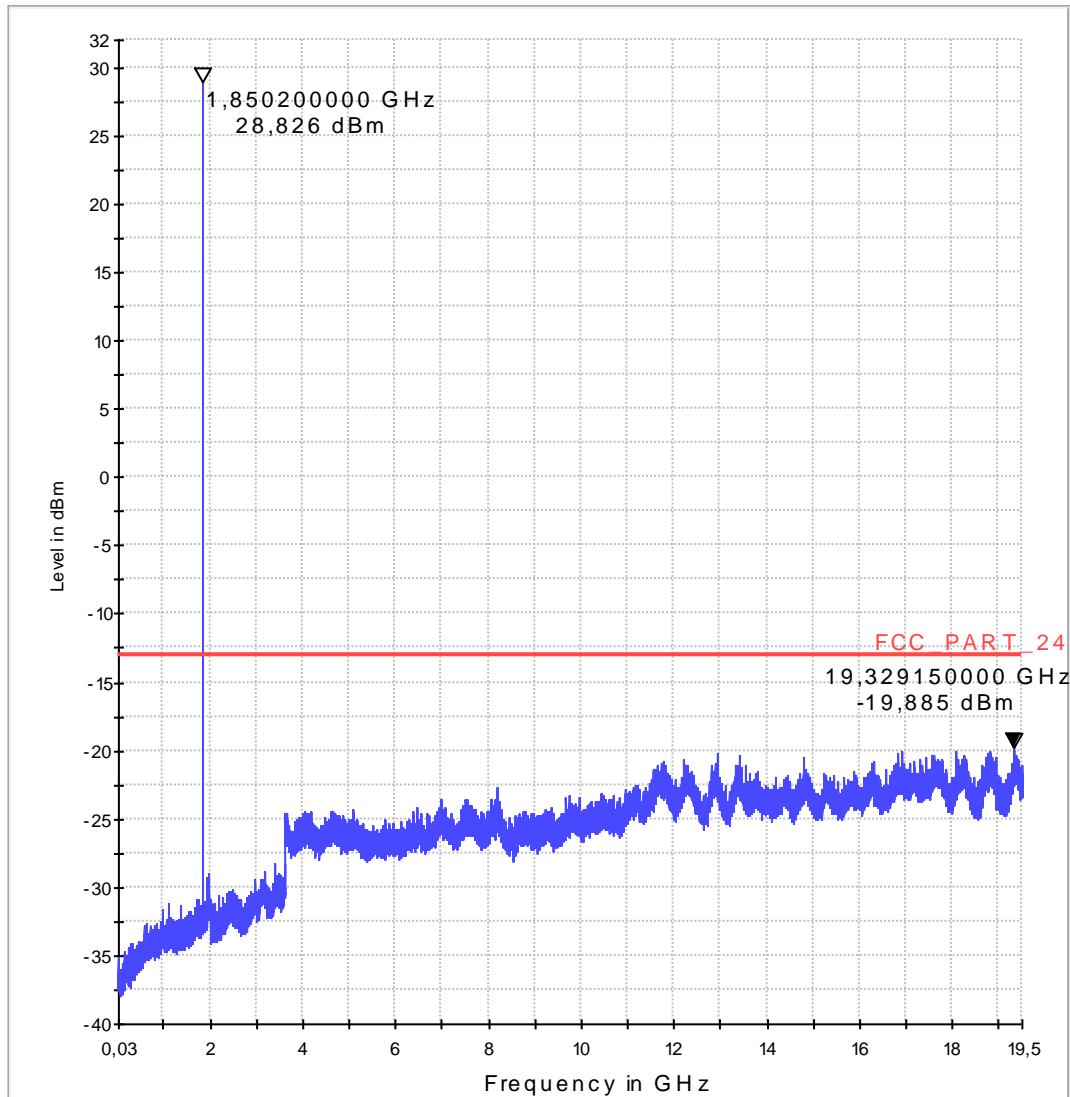


### Diagram No.: 12.10\_Sweep2

#### Common Information

Test Description:	TX Spurious Emission conducted
Test Site:	Radio laboratory 1
Test Standard:	FCC Part 24
Operation mode:	TCH 1900, CHANNEL 512
Operator Name:	sha
Comment:	6-0147-12-9-3a

Sweep\_2



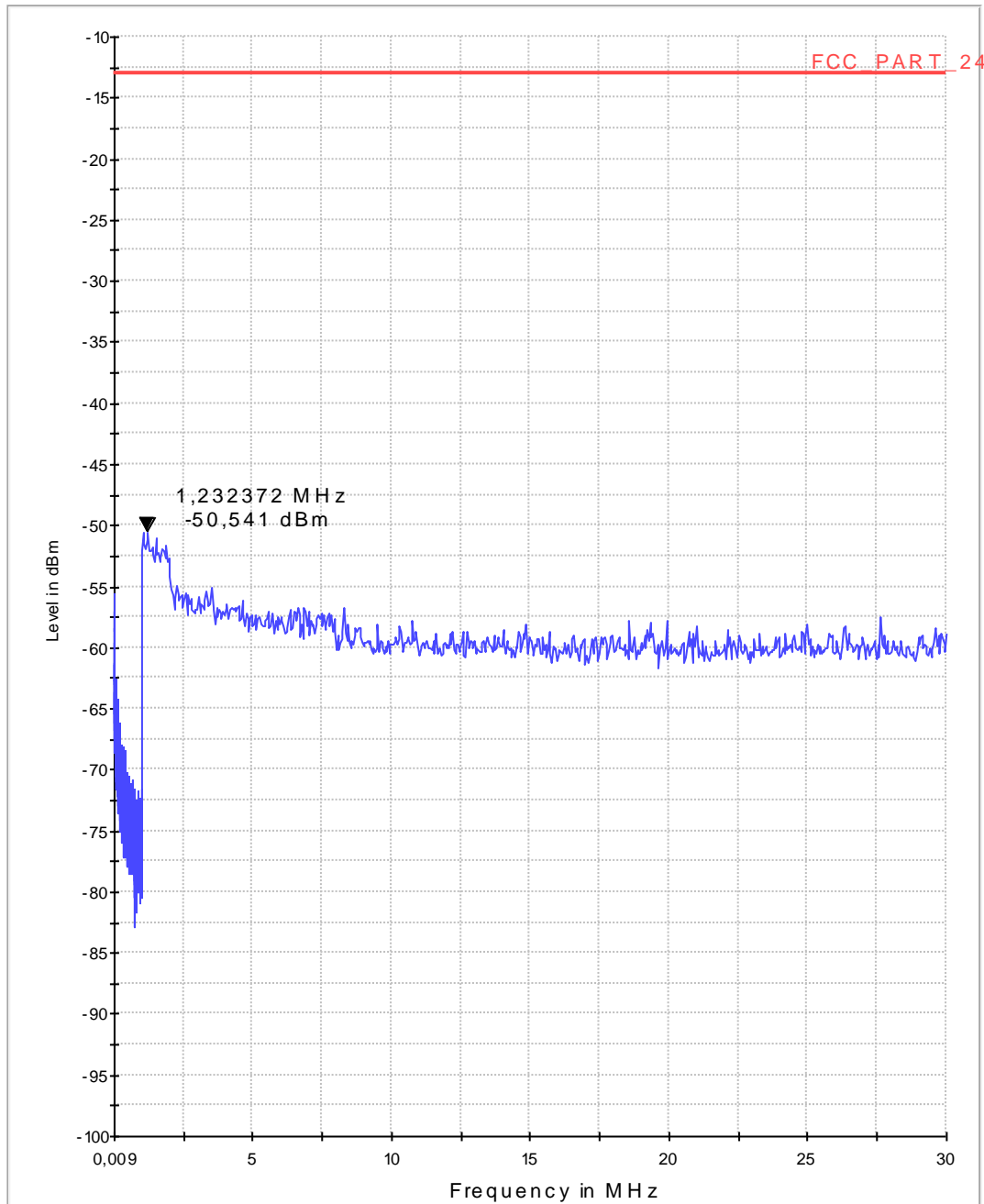


### Diagram No.: 12.11\_Sweep1

#### Common Information

Test Description:	TX Spurious Emission conducted
Test Site:	Radio laboratory 1
Test Standard:	FCC Part 24
Operation mode:	TCH 1900, CHANNEL 661
Operator Name:	sha
Comment:	6-0147-12-9-3a

Sweep\_1

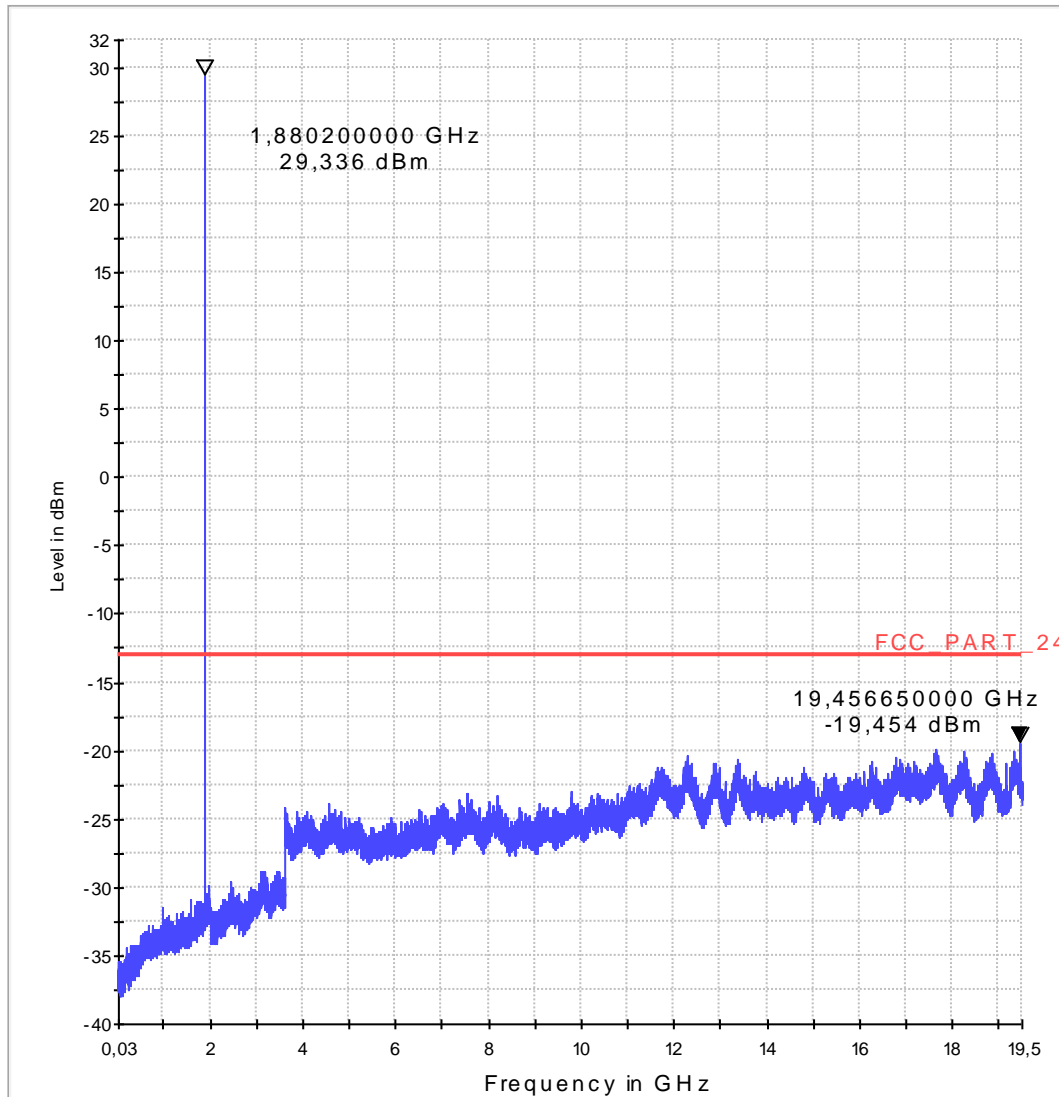


### Diagram No.:12.11\_Sweep2

#### Common Information

Test Description:	TX Spurious Emission conducted
Test Site:	Radio laboratory 1
Test Standard:	FCC Part 24
Operation mode:	TCH 1900, CHANNEL 661
Operator Name:	sha
Comment:	6-0147-12-9-3a

Sweep\_2

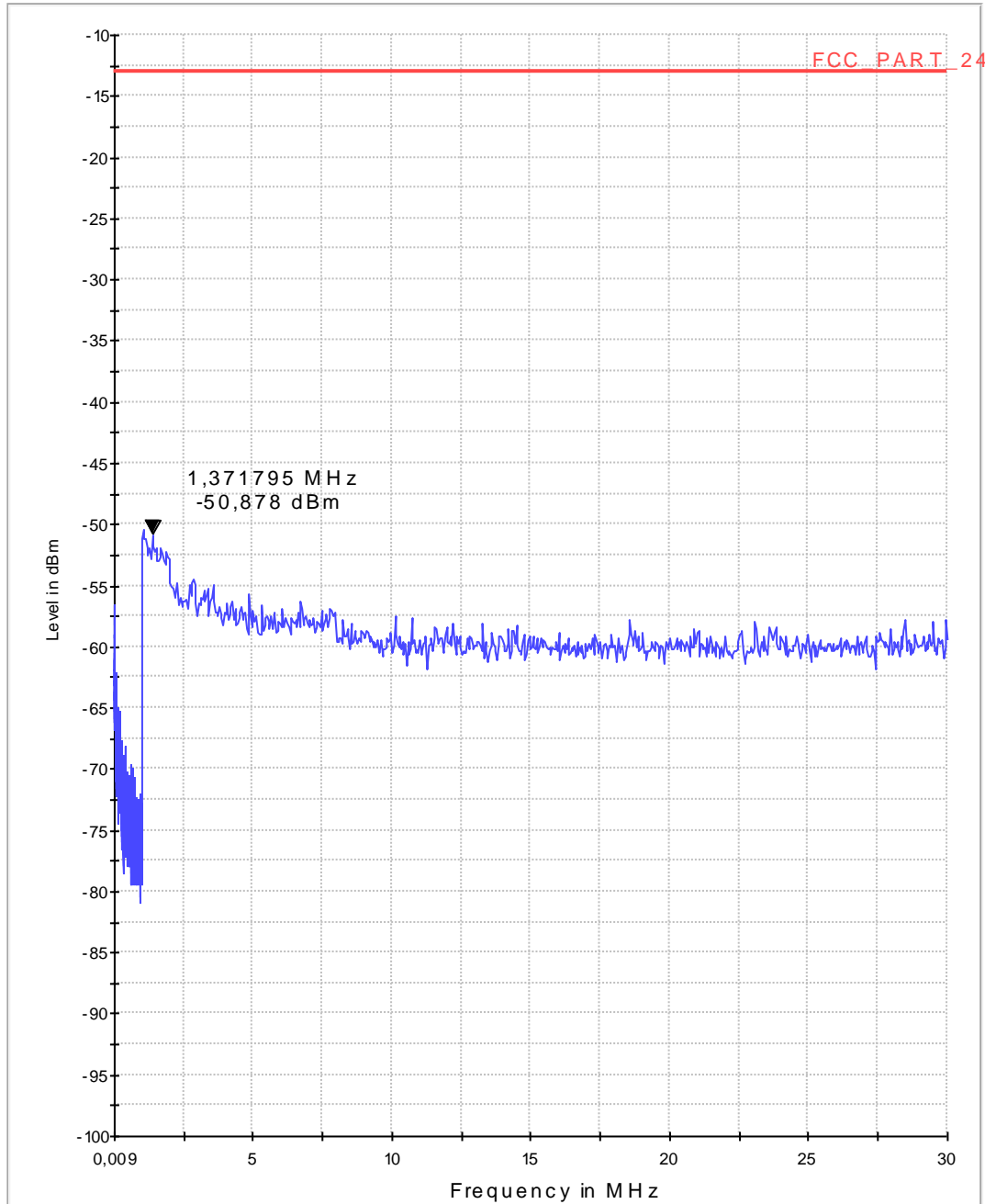


### Diagram No.: 12.12\_Sweep1

#### Common Information

Test Description:	TX Spurious Emission conducted
Test Site:	Radio laboratory 1
Test Standard:	FCC Part 24
Operation mode:	TCH 1900, CHANNEL 810
Operator Name:	sha
Comment:	6-0147-12-9-3a

Sweep\_1

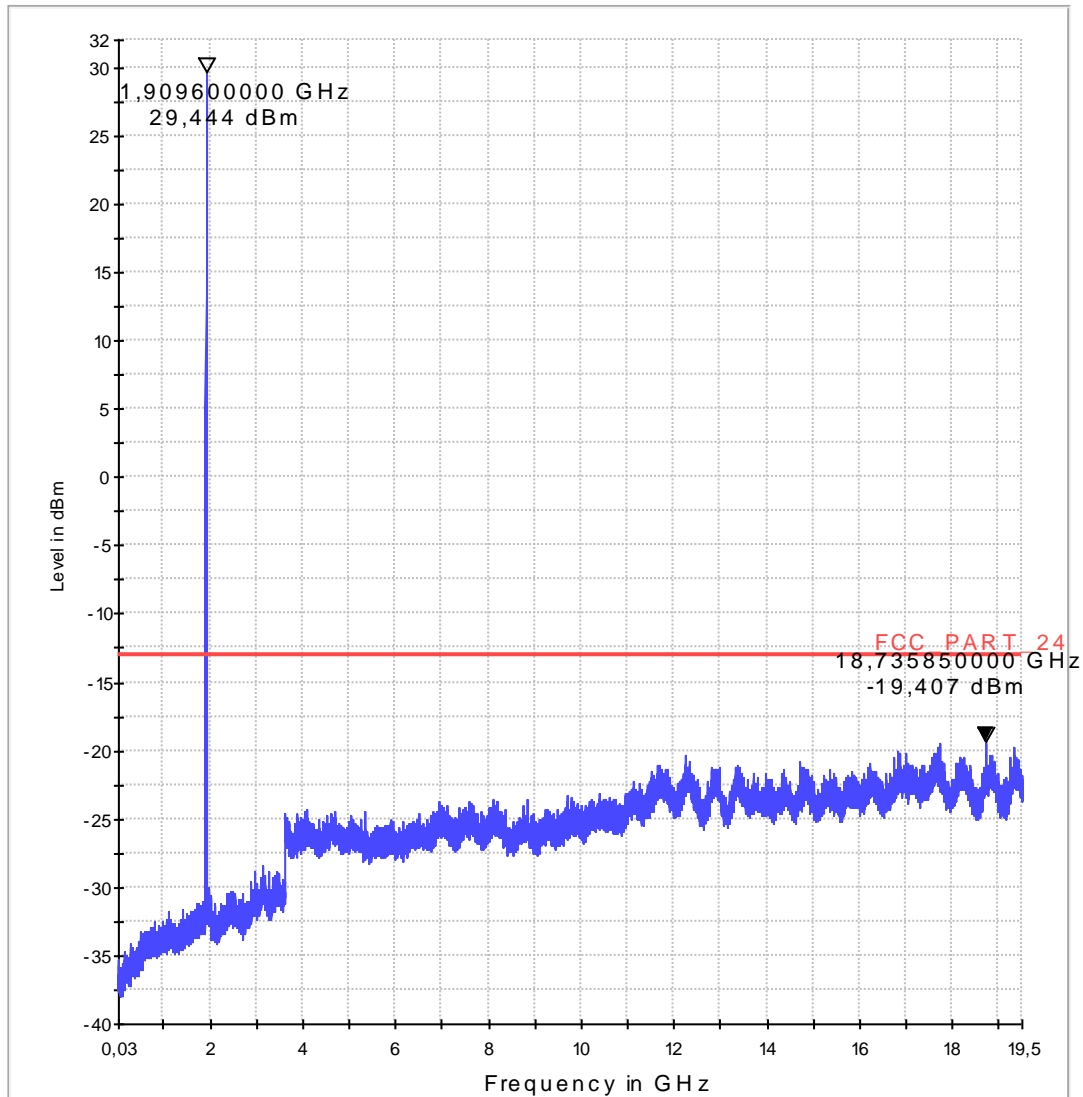


### Diagram No.: 12.12\_Sweep2

#### Common Information

Test Description:	TX Spurious Emission conducted
Test Site:	Radio laboratory 1
Test Standard:	FCC Part 24
Operation mode:	TCH 1900, CHANNEL 810
Operator Name:	sha
Comment:	6-0147-12-9-3a

Sweep\_2



1.3.8. Band-Edge compliance: E-GSM1900 (8-PSK Modulation)

### Diagram no: 14.07

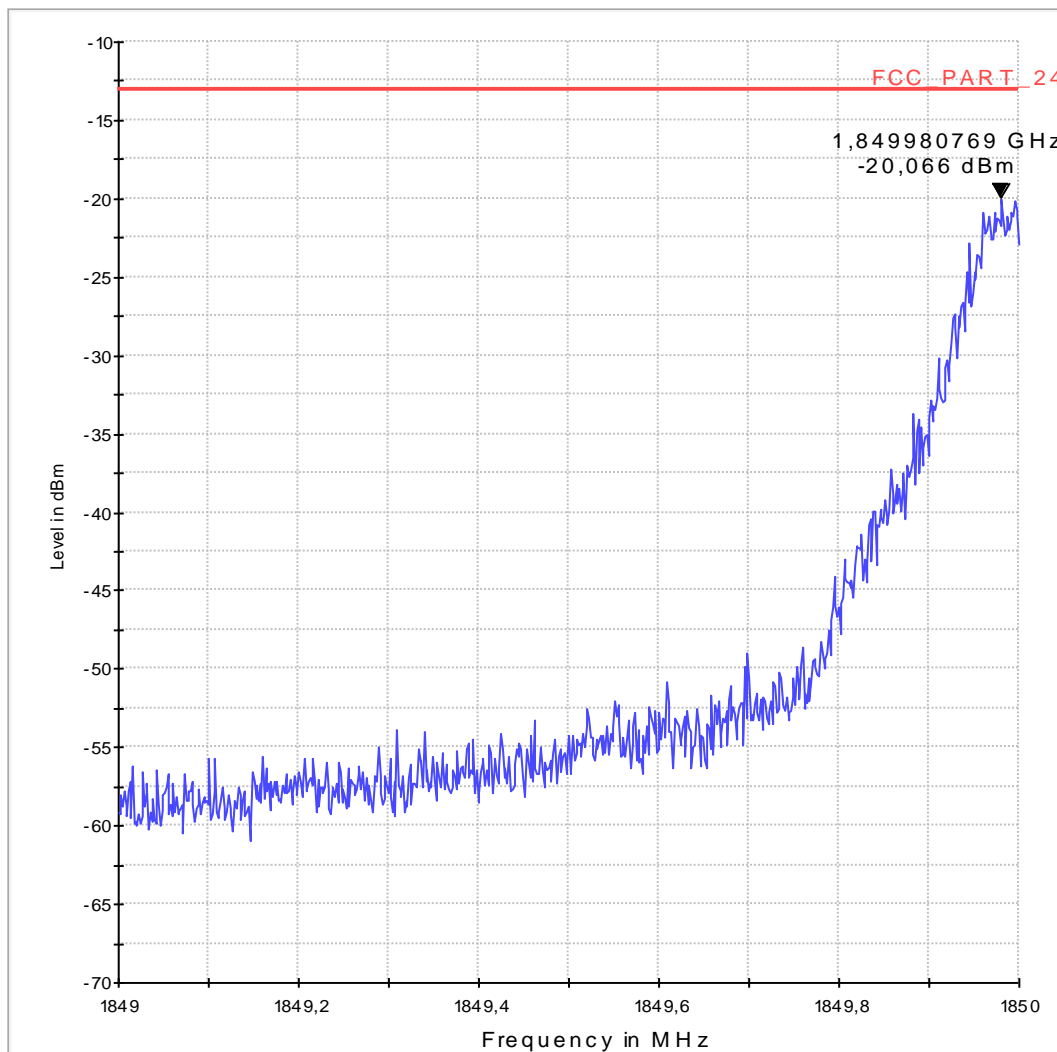
#### Common Information

Test Description:	Transmitter unwanted emissions (Band-Edge)/ FCC requirements
Test site	Radio laboratory 1
Test specification	FCC Part 24.238 (a,b) 21.6°C, 41% E-GPRS-TX_low channel on ARFCN 512 6-0147-12-9-3a

#### EUT Information

EUT Name:	EHS5-US
Manufacturer:	Cinterion
Serial Number:	00440108075600
Hardware Rev:	B2 rev.3
Software Rev:	00.260
Comment:	Interface R232
Accessories:	Power supply (12V DC), Data/Voice transmission via RS232 cable

Sweep\_3a\_Band\_Edge\_Channel\_512\_PK



## Diagram No. 14.08

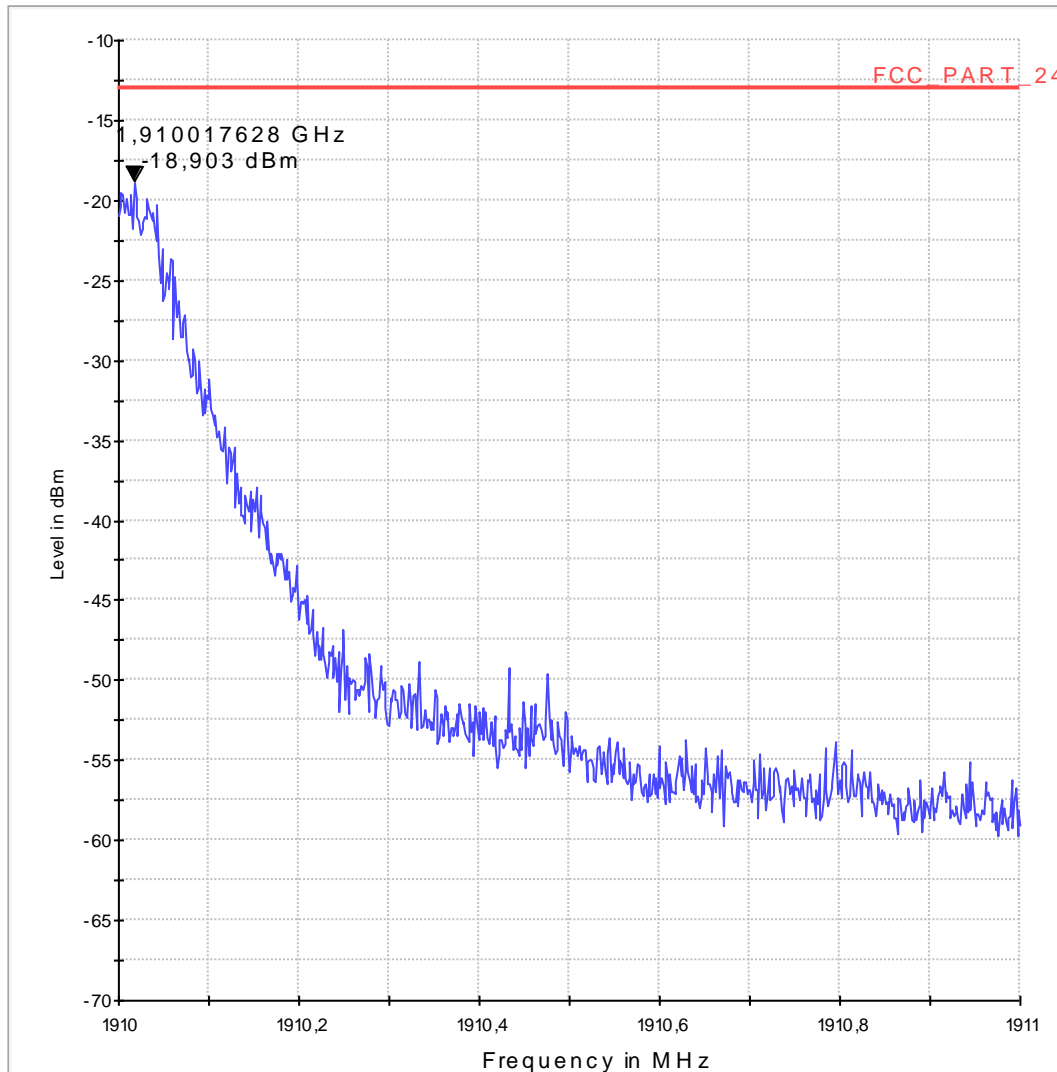
### Common Information

Test Description:	Transmitter unwanted emissions (Band-Edge)/ FCC requirements
Test Site:	Radio laboratory 1
Test Standard:	FCC Part 24.238 (a,b)
Environment Conditions:	21.6°C, 41%
Operator Name:	Tas
Operating mode:	E-GPRS-TX_high channel on ARFCN 810 6-0147-12-9-3a

### EUT Information

EUT Name:	EHS5-US
Manufacturer:	Cinterion
Serial Number:	00440108075600
Hardware Rev:	B2 rev.3
Software Rev:	00.260
Comment:	Interface R232
Accessories:	Power supply (12V DC), Data/Voice transmission via RS232 cable

Sweep\_4a\_Band\_Edge\_Channel\_810\_PK



**1.4. Spurious emissions radiated (30 MHz <math>< f < 18 GHz)</math>**

**1.4.1. GSM850 mode (GMSK-Modulation)**

**Diagram 8.01\_RSE\_Voice**

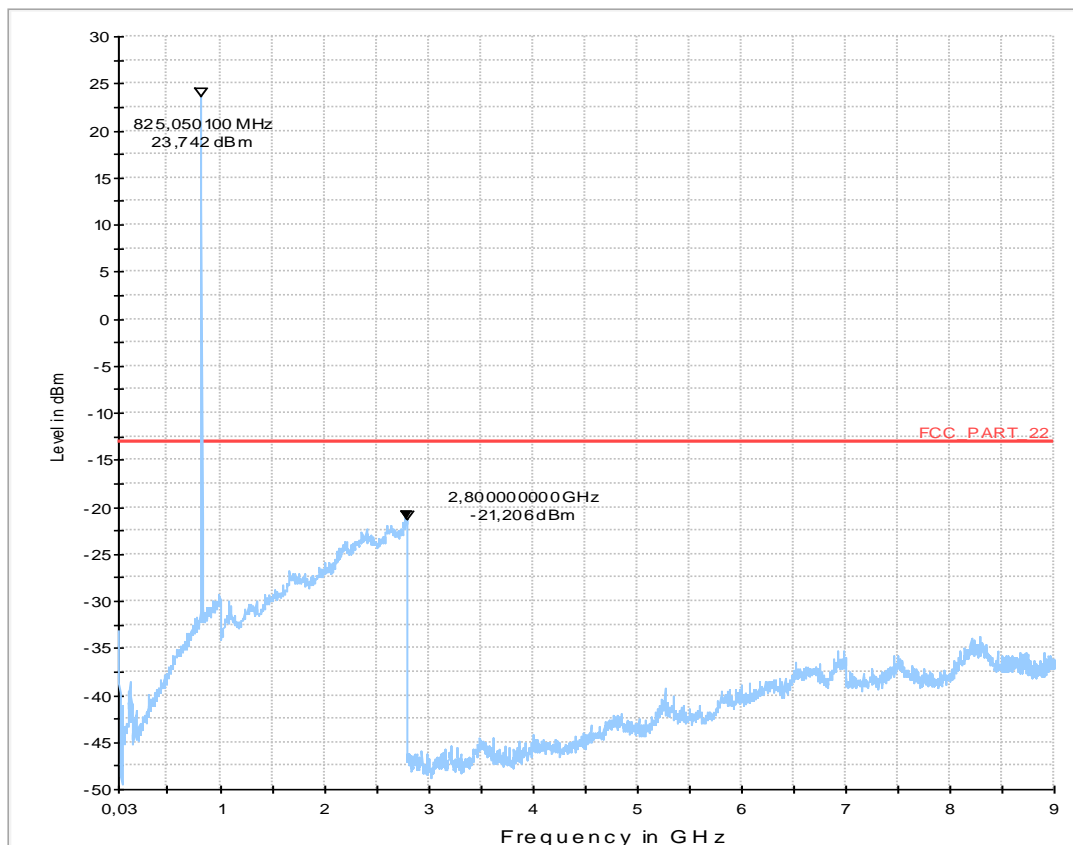
**Common Information**

Test Description:	Radiated Spurious Emissions GSM850
Test Site Location:	CETECOM GmbH Essen
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part22.917
Test Case:	MS allocated channel 128, Voice, PCL0 (+33dBm)
Operating Mode:	MS allocated UL channel 128
Exclusionband:	824 - 849MHz
Environmental Conditions:	Humidity: 48%rH; Temperature: 19,2°C
Operator:	dpa

**EUT Information**

EUT Name:	EHS5-US
Manufacturer:	Cinterion
Serial Number:	004401080756915
Hardware Rev:	B2 rev.3
Software Rev:	00.207
Comment:	Interface R232
Accessories:	Power supply (12V DC), Voice transmission via RS232 and connected to the CTC-Laptop#3, Mounting Ant. 1140.26 SMA, Siemens Handset HH-SI30.3/v3.0/0

030401\_FCC\_Part22\_GSM850\_TX\_all\_channels\_30M-12G



### Diagram 8.02\_RSE

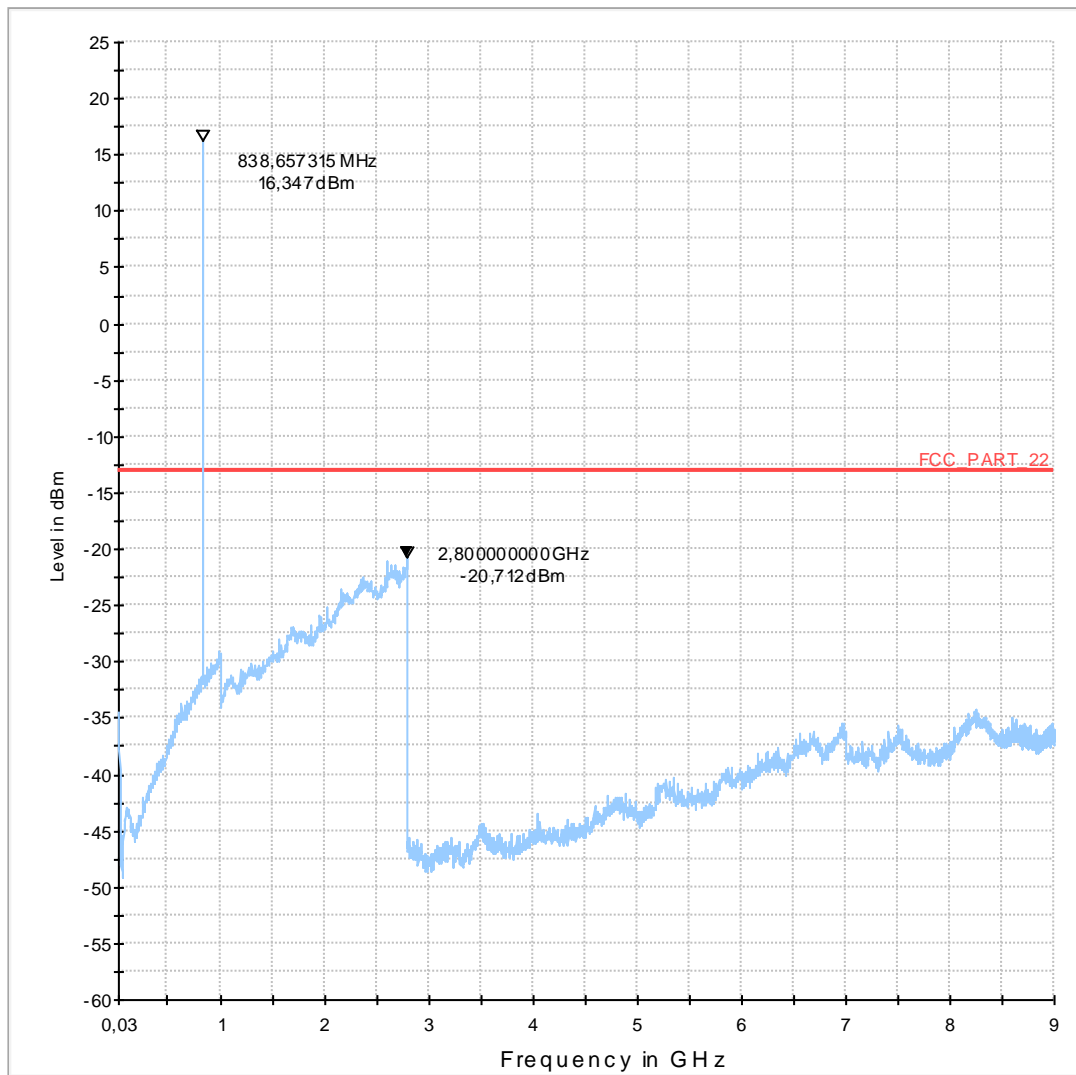
#### Common Information

Test Description:	Radiated Spurious Emissions GSM850
Test Site Location:	CETECOM GmbH Essen
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part22.917
Test Case:	GPRS, MS allocated middle channel 192 (UL = 837.0MHz)
Exclusionband:	824 - 849MHz
Environmental Conditions:	Humidity: 58%rH; Temperature: 23°C
Operator:	dpa

#### EUT Information

EUT Name:	EHS5-US
Manufacturer:	Cinterion
Serial Number:	004401080756915
Hardware Rev:	B2 rev.3
Software Rev:	00.207
Comment:	Interface R232
Accessories:	Power supply (12V DC), Voice transmission via RS232 and connected to the CTC-Laptop#3, Mounting Ant. 1140.26 SMA, Siemens Handset HH-SI30.3/v3.0/0

030401\_FCC\_Part22\_GSM850\_TX\_all\_channels\_30M-12G





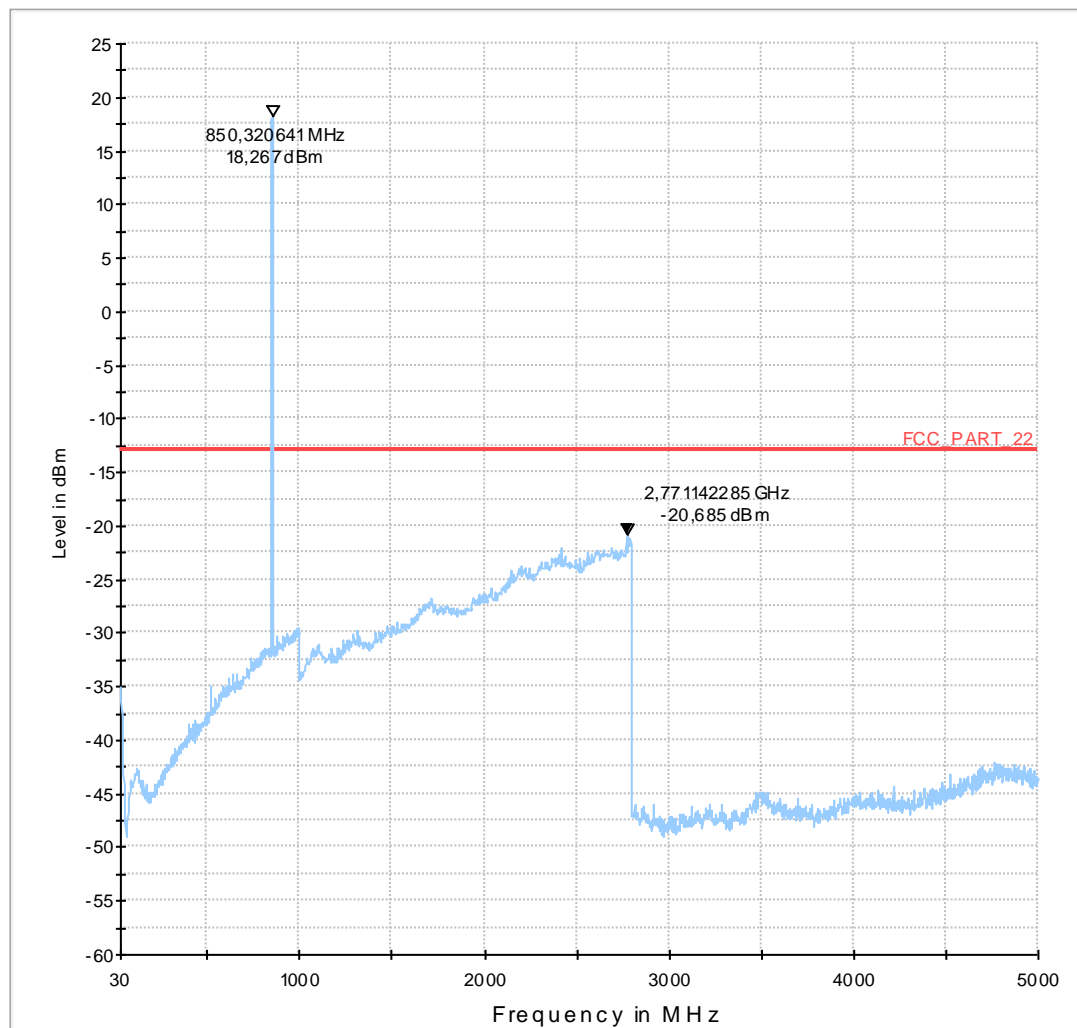
**Diagram 8.03\_RSE\_Voice****Common Information**

Test Description:	Radiated Emissions GSM850
Test Site Location:	CETECOM GmbH Essen
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part22.917
Test Case:	GSM1900, VOICE
Operating Mode:	MS allocated UL channel 251
Exclusionband:	824 - 849MHz
Environmental Conditions:	Humidity: 48%rH; Temperature: 19,2°C
Operator:	dpa 6-0147-12-9-3a

**EUT Information**

EUT Name:	EHS5-US
Manufacturer:	Cinterion
Serial Number:	004401080756915
Hardware Rev:	B2 rev.3
Software Rev:	00.207
Comment:	Interface R232
Accessories:	Power supply (12V DC), Data/Voice transmission via RS232 , Mounting Ant. 1140.26 SMA, Handset HH-SI30.3/v3.0/0

030401\_FCC\_Part22\_GSM850\_TX\_all\_channels\_30M-12G



1.4.2. Band-Edge GSM850 mode (GMSK-Modulation)

Diagram 8.01\_BE\_Voice

**Common Information**

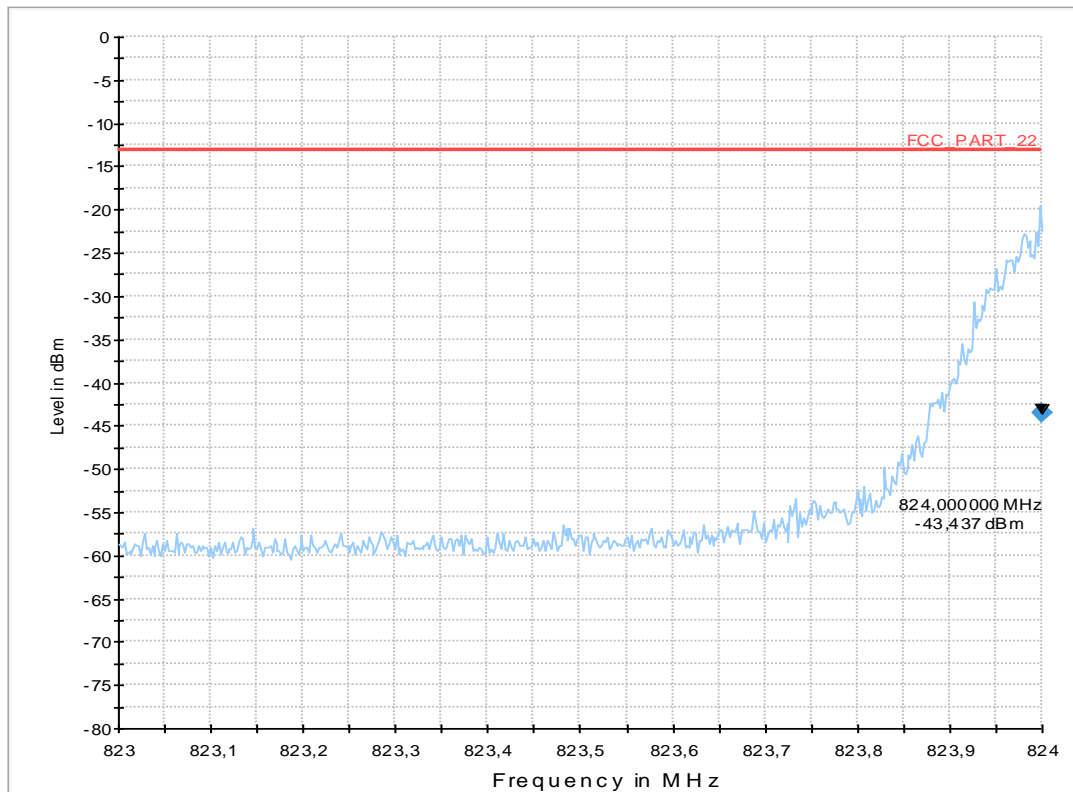
Test Description:	Band Edge Radiated - G850 band
Test Site Location:	CETECOM GmbH Essen
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part 22
Operating Mode:	MS allocated channel 128 (fc = 824.2MHz), Voice, PCL5 (+33dBm)
Exclusionband:	824 - 849MHz
Environmental Conditions:	Humidity: 49%rH; Temperature: 25°C
Operator:	Dpa 6-0147-12-9-3a

**EUT Information**

EUT Name:	EHS5-US
Manufacturer:	Cinterion
Serial Number:	004401080756915
Hardware Rev:	B2 rev.3
Software Rev:	00.207
Comment:	Interface R232
Accessories:	Power supply (12V DC), Voice transmission via RS232 and connected to the CTC-Laptop#3, Mounting Ant. 1140.26 SMA, Siemens Handset HH-SI30.3/v3.0/0

**Final Result 1**

Frequency (MHz)	Average (dBm)	Meas. Time	Bandwidth (kHz)	Polarization	Azimuth (deg)	Elevation (deg)	Corr. (dB)	Margin (dB)	Limit (dBm)
824.000000	-43.4	1000.00	3.000	V	189.0	90.0	-75.9	30.4	-13.0



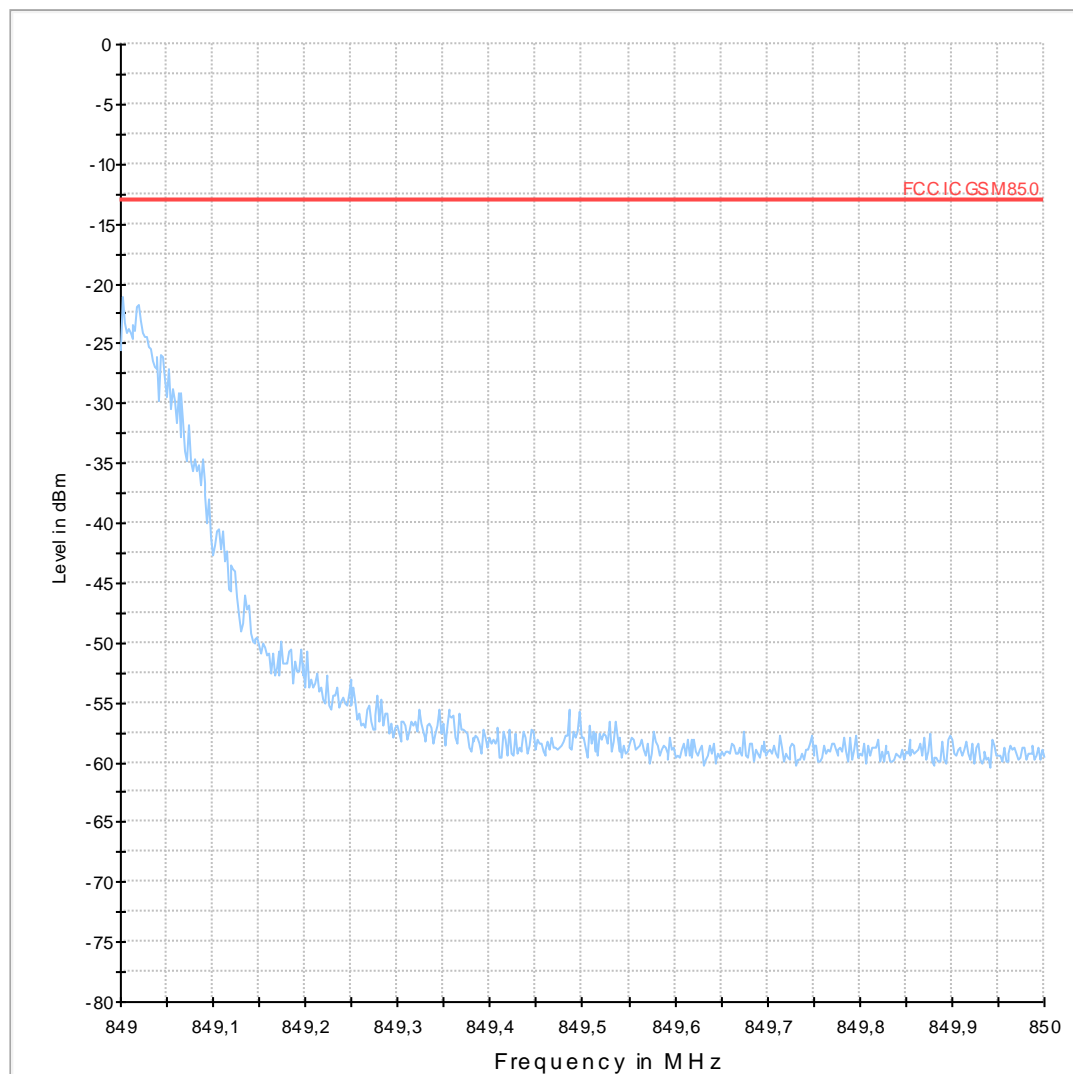
**Diagram 8.03\_BE\_VOICE****Common Information**

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: 49%rH; Temperature: 20°C
Operator:	Dpa

**EUT Information**

EUT Name:	EHS5-US
Manufacturer:	Cinterion
Serial Number:	004401080756915
Hardware Rev:	B2 rev.3
Software Rev:	00.207
Comment:	Interface R232
Accessories:	Power supply (12V DC), Data/Voice transmission via RS232 , Mounting Ant. 1140.26 SMA, Handset HH-SI30.3/v3.0/0

030403b\_FCC\_Part22\_GSM850\_TX\_high\_band\_edge\_CMU\_RF3\_RF4



### 1.4.3. Band-Edge GSM850 mode (8-PSK Modulation)

**Diagram 8.07\_BE\_EDGE**

#### Common Information

Test Description:	Band Edge Radiated - G850 band
Test Site Location:	CETECOM GmbH Essen
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part 22
Operating Mode:	MS allocated channel 128 (fc = 824.2MHz)
Exclusionband:	824 - 849MHz
Environmental Conditions:	Humidity: 49%rH; Temperature: 20°C
Operator:	HLA 6-0147-12-9-3a

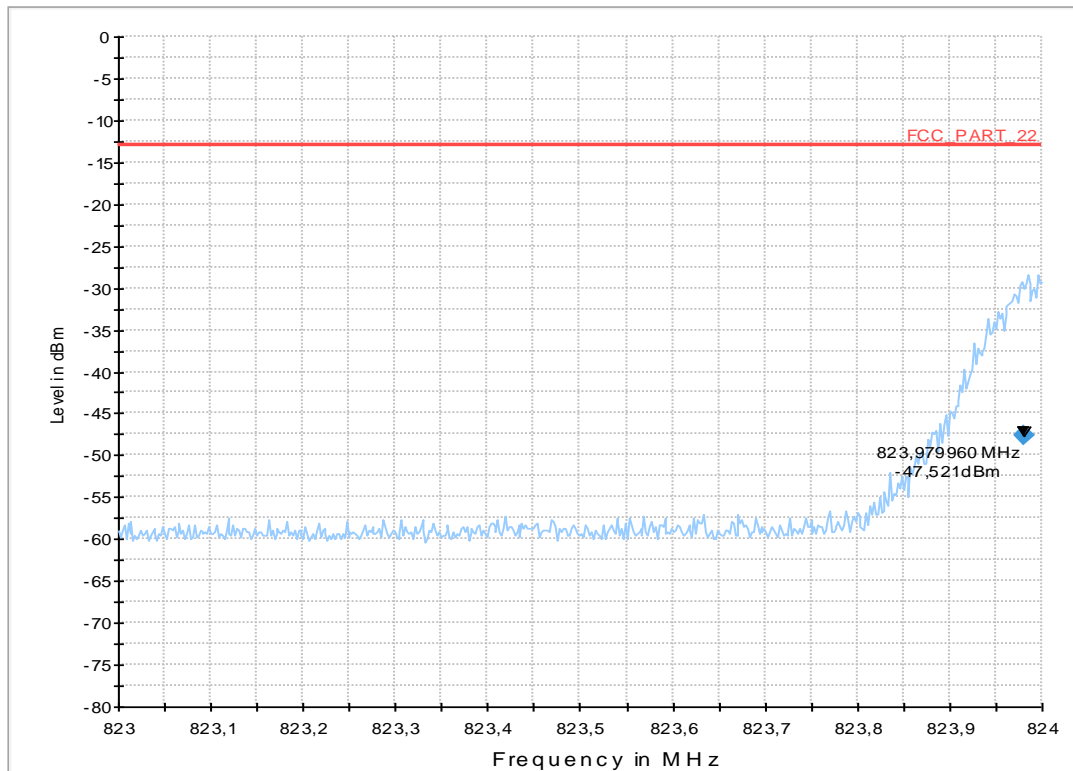
#### EUT Information

EUT Name:	EHS5-US
Manufacturer:	Cinterion
Serial Number:	004401080756915
Hardware Rev:	B2 rev.3
Software Rev:	00.207
Comment:	Interface R232
Accessories:	Power supply (12V DC), Data/Voice transmission via RS232 and connected to the CTC-Laptop#3, Mounting Ant. 1140.26 SMA, Siemens Handset HH-SI30.3/v3.0/0

#### Final Result 1

Frequency (MHz)	Average (dBm)	Meas. Time (ms)	Bandwidth (kHz)	Polarization	Azimuth (deg)	Elevation (deg)	Corr. (dB)	Margin (dB)	Limit (dBm)
823.979960	-47.5	10000.0	3.000	H	54.0	0.0	-75.9	34.5	-13.0

030402b\_FCC\_Part22\_GSM850\_TX\_low\_band\_edge\_CMU\_RF3\_RF4



### Diagram 8.09\_BE\_EDGE

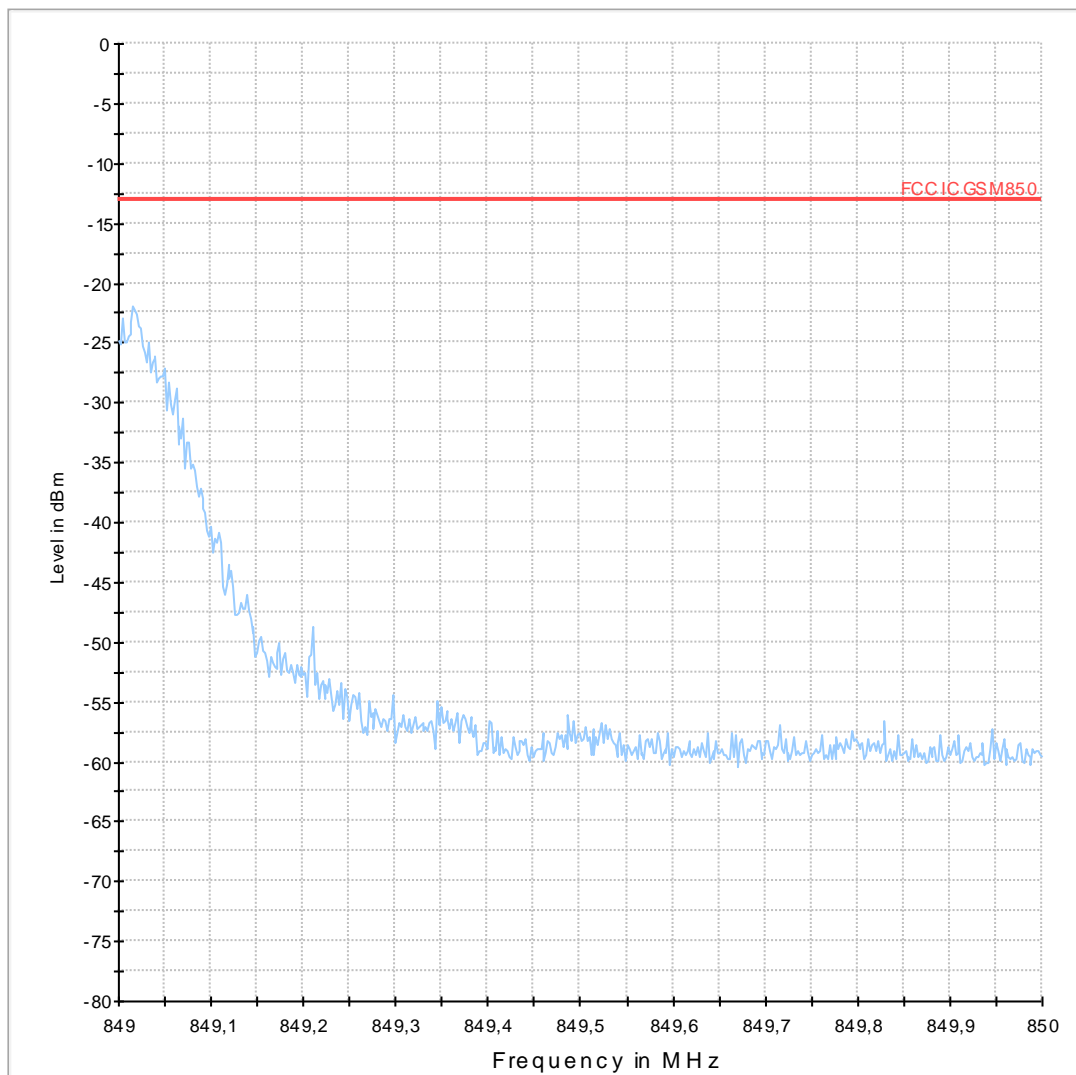
#### Common Information

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)
Exclusionband:	824 - 849MHz
Environmental Conditions:	Humidity: 49%RH; Temperature: 20°C
Operator:	HLA

#### EUT Information

EUT Name:	EHS5-US
Manufacturer:	Cinterion
Serial Number:	004401080756915
Hardware Rev:	B2 rev.3
Software Rev:	00.207
Comment:	Interface R232
Accessories:	Power supply (12V DC), Data/Voice transmission via RS232 and connected to the CTC-Laptop#3, Mounting Ant. 1140.26 SMA, Siemens Handset HH-SI30.3/v3.0/0

030403b\_FCC\_Part22\_GSM850\_TX\_high\_band\_edge\_CMU\_RF3\_RF4



## 1.4.4. GSM1900 mode (8PSK-Modulation)

## Diagram 8.07\_RSE\_EDGE

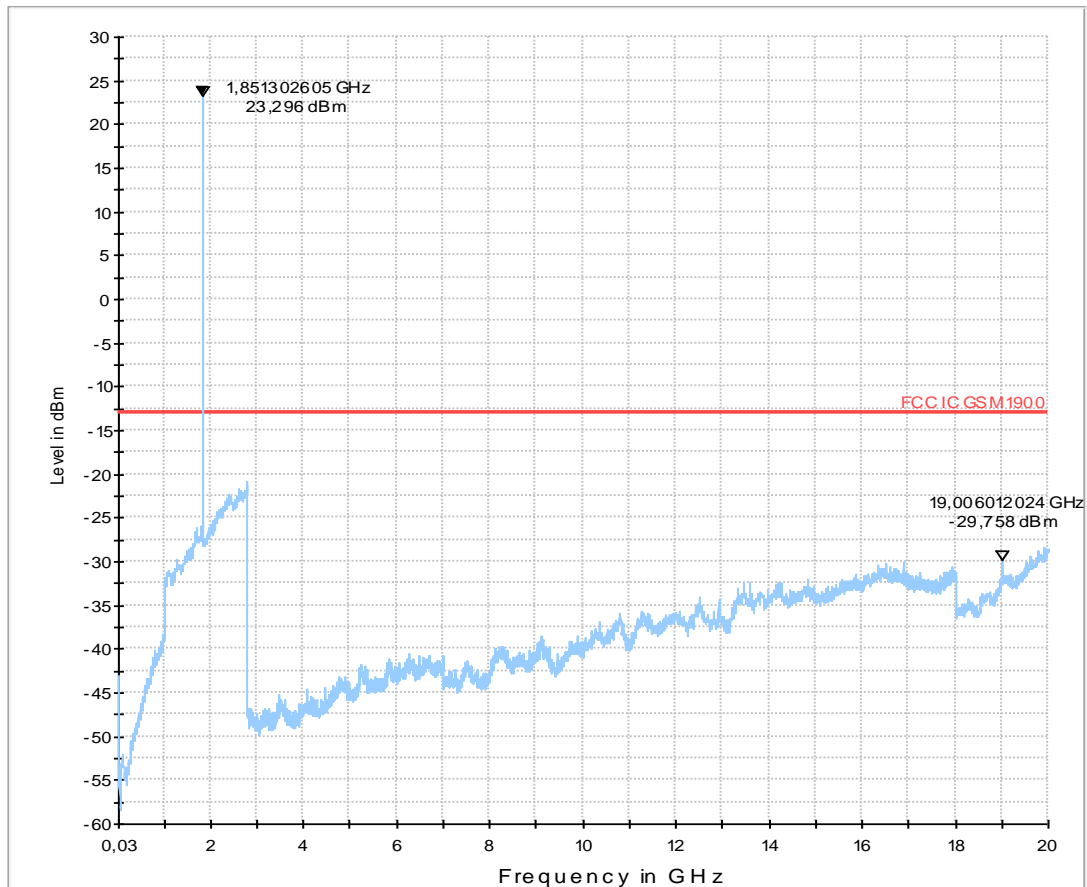
## Common Information

Test Description:	Radiated Spurious Emissions GSM1900
Test Site Location:	CETECOM GmbH Essen
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part 24
Comm. Link:	GSM1900, EDGE
Operating Mode:	MS allocated channel 512 (UL = 1850.2MHz)
Exclusionband:	1850- 1910MHz
Environmental Conditions:	Humidity: 48%rH; Temperature: 19,2°C
Operator:	dpa 6-0147-12-9-3a

## EUT Information

EUT Name:	EHS5-US
Manufacturer:	Cinterion
Serial Number:	004401080756915
Hardware Rev:	B2 rev.3
Software Rev:	00.207
Comment:	Interface R232
Accessories:	Power supply (12V DC), Data/Voice transmission via RS-232, Mounting Ant. 1140.26 SMA, Handset HH-SI30.3/v3.0/0

030404\_FCC\_Part24\_GSM1900\_TX\_all\_channels\_30M-20G



## Diagram 8.08\_RSE\_EDGE

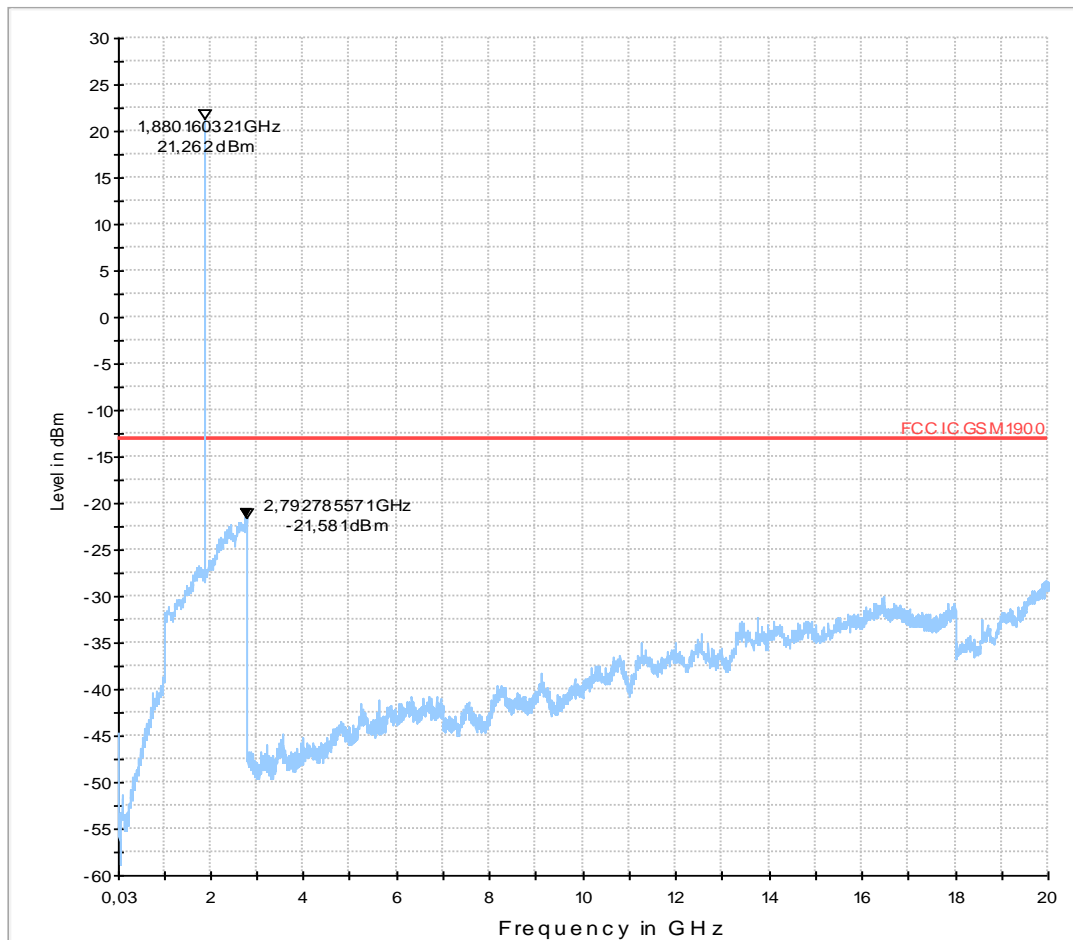
## Common Information

Test Description:	Radiated Spurious Emissions GSM1900
Test Site Location:	CETECOM GmbH Essen
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part 24
Comm. Link:	GSM1900, EDGE
Operating Mode:	661(UL = 1880.0MHz)
Exclusionband:	1850- 1910MHz
Environmental Conditions:	HLA
Operator:	6-0147-12-9-3a

**EUT Information**

EUT Name:	EHS5-US
Manufacturer:	Cinterion
Serial Number:	004401080756915
Hardware Rev:	B2 rev.3
Software Rev:	00.207
Comment:	Interface R232
Accessories:	Power supply (12V DC), Data/Voice transmission via RS232, Mounting Ant. 1140.26 SMA, Handset HH-SI30.3/v3.0/0

030404\_FCC\_Part24\_GSM1900\_TX\_all\_channels\_30M-20G



### Diagram 8.09\_RSE\_EDGE

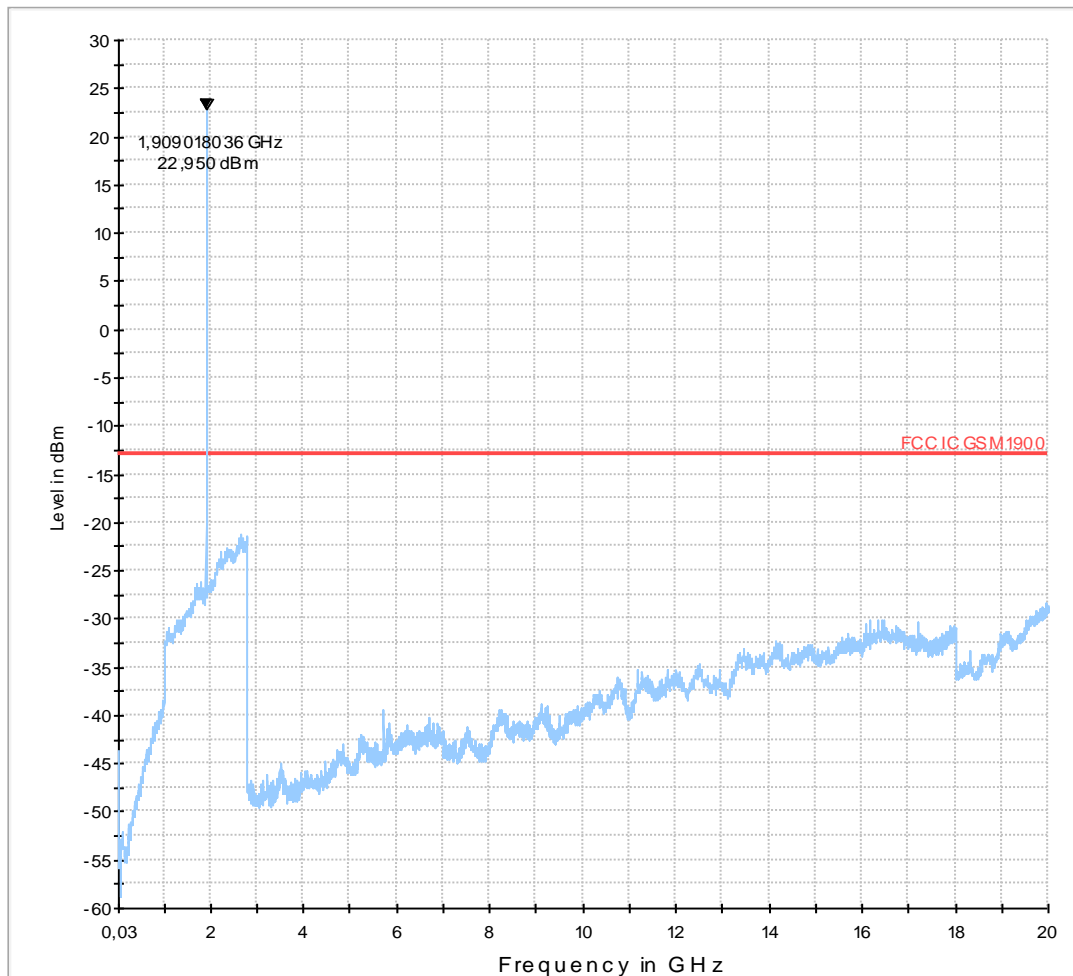
#### Common Information

Test Description:	Radiated Spurious Emissions GSM1900
Test Site Location:	CETECOM GmbH Essen
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part 24
Comm. Link:	GSM1900, EDGE
Operating Mode:	MS allocated channel 810 (UL = 1909.8MHz)
Exclusionband:	1850- 1910MHz
Environmental Conditions:	Humidity: 48%rH; Temperature: 19,2°C
Operator:	dpa 6-0147-12-9-3a

#### EUT Information

EUT Name:	EHS5-US
Manufacturer:	Cinterion
Serial Number:	004401080756915
Hardware Rev:	B2 rev.3
Software Rev:	00.207
Comment:	Interface R232
Accessories:	Power supply (12V DC), Data/Voice transmission via RS232 , Mounting Ant. 1140.26 SMA, Handset HH-SI30.3/v3.0/0

030404\_FCC\_Part24\_GSM1900\_TX\_all\_channels\_30M-20G



#### 1.4.5. Band-Edge GSM1900 mode (GMSK Modulation)



### Diagram 8.01\_BE\_Voice

#### 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
Comm. Link:	GSM1900, Voice/EDGE
Operating Mode:	MS allocated channel 512 (UL = 1850.2MHz)
Exclusionband:	1850- 1910MHz
Environmental Conditions:	Humidity: 48%rH; Temperature: 19,2°C
Operator:	HLA 6-0147-12-9-3a

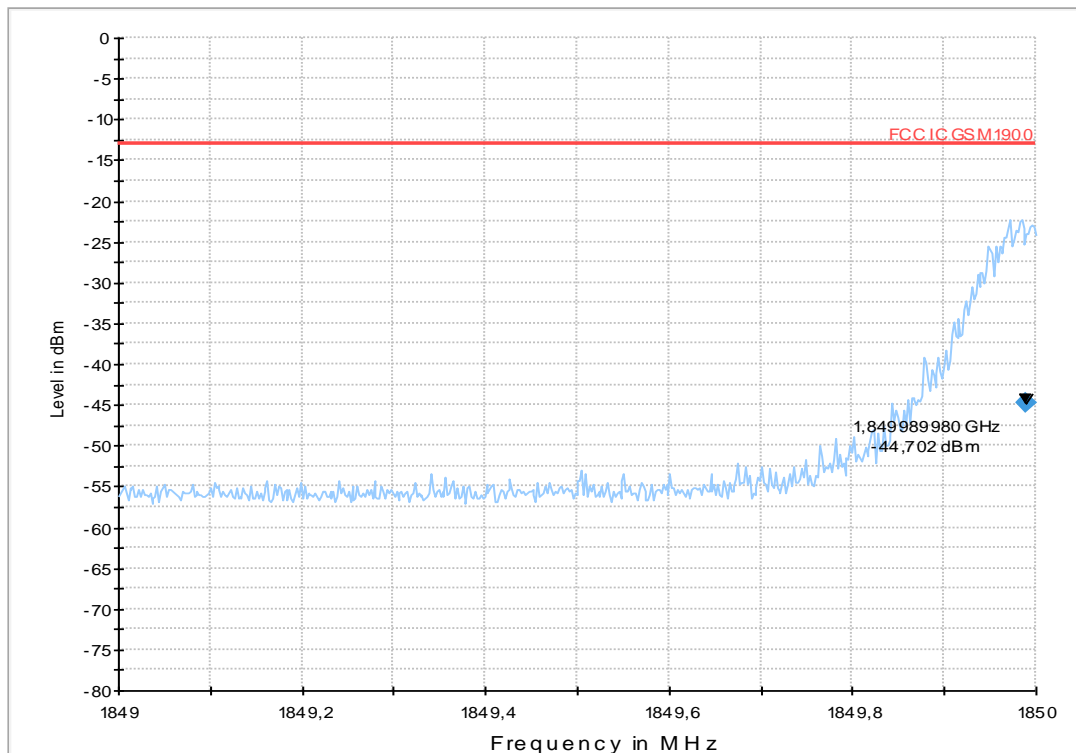
#### EUT Information

EUT Name:	EHS5-US
Manufacturer:	Cinterion
Serial Number:	004401080756915
Hardware Rev:	B2 rev.3
Software Rev:	00.207
Comment:	Interface R232
Accessories:	Power supply (12V DC), Data/Voice transmission via RS232 , Mounting Ant. 1140.26 SMA, Handset HH-SI30.3/v3.0/0

#### Final Result 1

Frequency (MHz)	Average (dBm)	Meas. Time (ms)	Bandwidth (kHz)	Polarization	Azimuth (deg)	Elevation (deg)	Corr. (dB)	Margin (dB)	Limit (dBm)
1849.989980	-44.7	10000.0	3.000	V	137.0	0.0	-63.1	31.7	-13.0

030405\_FCC\_Part24\_GSM1900\_TX\_low\_channel\_band\_edge



### Diagram 8.03\_BE\_Voice

#### 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
Comm. Link:	GSM1900, Voice
Operating Mode:	MS allocated channel 810 (UL = 1909.8MHz)
Exclusionband:	1850- 1910MHz
Environmental Conditions:	Humidity: 48%rH; Temperature: 19,2°C
Operator:	HLa 6-0147-12-9-3a

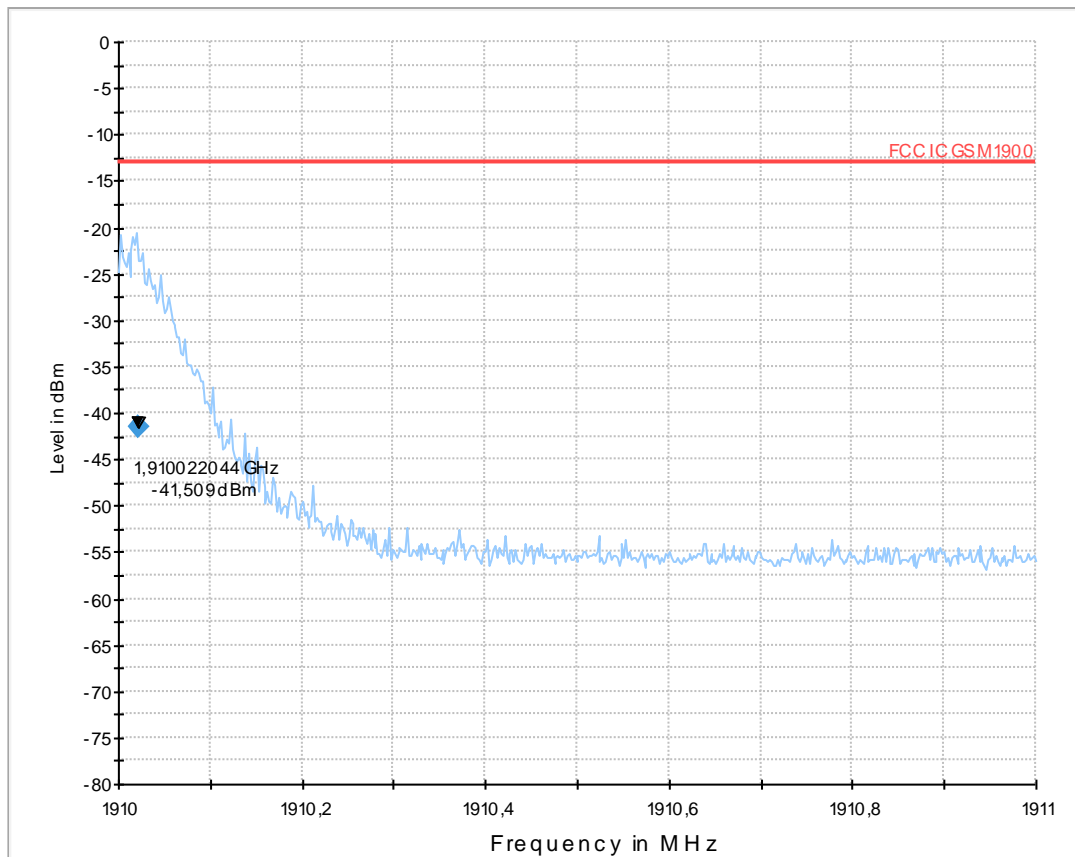
#### EUT Information

EUT Name:	EHS5-US
Manufacturer:	Cinterion
Serial Number:	004401080756915
Hardware Rev:	B2 rev.3
Software Rev:	00.207
Comment:	Interface R232
Accessories:	Power supply (12V DC), Data/Voice transmission via RS232 , Mounting Ant. 1140.26 SMA, Handset HH-SI30.3/v3.0/0

#### Final Result 1

Frequency (MHz)	Average (dBm)	Meas. Time (ms)	Bandwidth (kHz)	Polarization	Azimuth (deg)	Elevation (deg)	Corr. (dB)	Margin (dB)	Limit (dBm)
1910.022044	-41.5	10000.0	3.000	V	29.0	0.0	-62.8	28.5	-13.0

030406\_FCC\_Part24\_GSM1900\_TX\_high\_channel\_band\_edge



### 1.4.6. Band-Edge GSM1900 mode (8-PSK Modulation)

#### Diagram 8.07\_BE\_EDGE

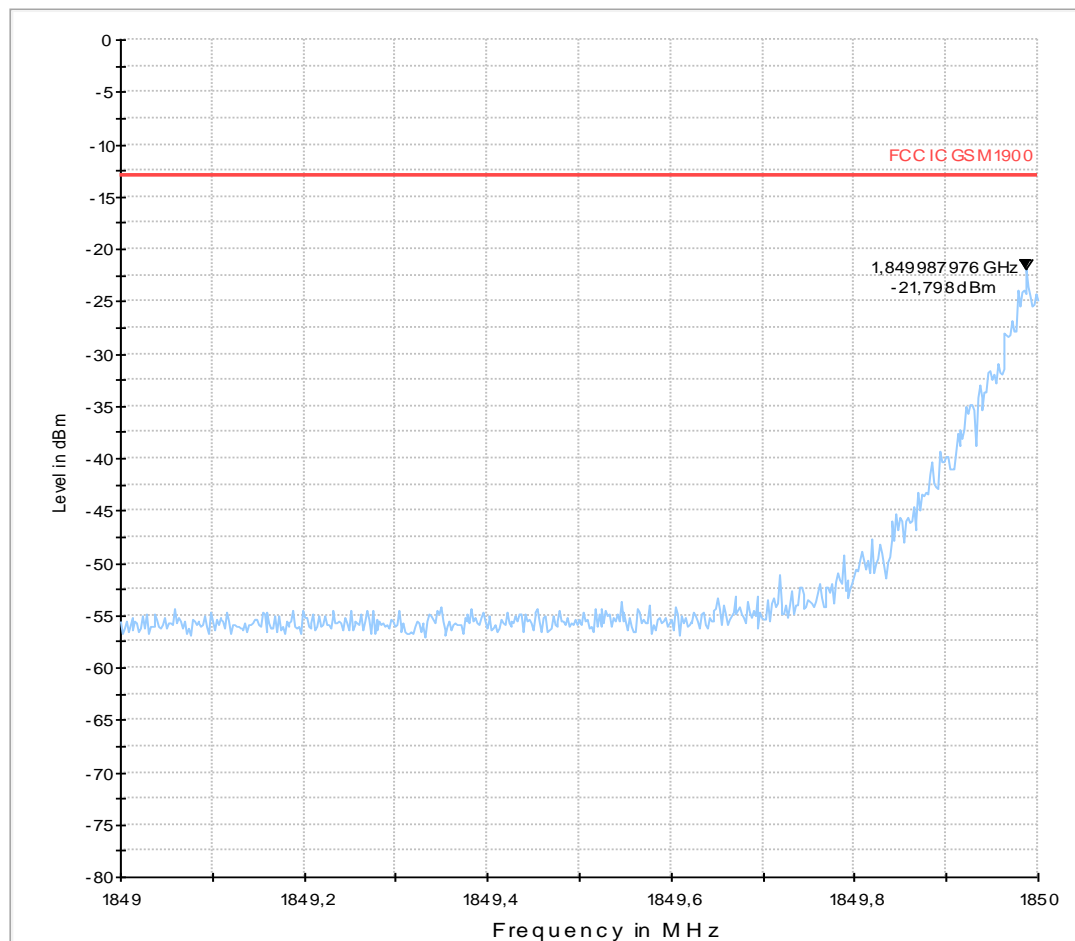
#### Common Information

Test Description:	Radiated Spurious Emissions GSM1900
Test Site Location:	CETECOM GmbH Essen
Test Site:	Fully Anechoic Room (FAR)
Test Standard:	FCC Part 24
Comm. Link:	GSM1900, EDGE
Operating Mode:	MS allocated channel 512 (UL = 1850.2MHz)
Exclusionband:	1850- 1910MHz
Environmental Conditions:	Humidity: 48%RH; Temperature: 19,2°C
Operator:	dpa

#### EUT Information

EUT Name:	EHS5-US
Manufacturer:	Cinterion
Serial Number:	004401080756915
Hardware Rev:	B2 rev.3
Software Rev:	00.207
Comment:	Interface R232
Accessories:	Power supply (12V DC), Data/Voice transmission via RS232, Mounting Ant. 1140.26 SMA, Handset HH-SI30.3/v3.0/0

030405\_FCC\_Part24\_GSM1900\_TX\_low\_channel\_band\_edge



### Diagram 8.09\_BE\_EDGE

#### 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
Comm. Link:	GSM1900, EDGE
Operating Mode:	MS allocated channel ,810 (UL = 1909.8MHz)
Exclusionband:	1850- 1910MHz
Environmental Conditions:	Humidity: 48%rH; Temperature: 19,2°C
Operator:	dpa

#### EUT Information

EUT Name:	EHS5-US
Manufacturer:	Cinterion
Serial Number:	004401080756915
Hardware Rev:	B2 rev.3
Software Rev:	00.207
Comment:	Interface R232
Accessories:	Power supply (12V DC), Data/Voice transmission via RS232 , Mounting Ant. 1140.26 SMA, Handset HH-SI30.3/v3.0/0

030406\_FCC\_Part24\_GSM1900\_TX\_high\_channel\_band\_edge

