

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			
 Deutsche Akkreditierungsstelle D-PL-12047-01-01	 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
 AUTHORIZED RF LABORATORY	 LAB CODE 20011130-00		
accredited according to DIN EN ISO/IEC 17025			
<p>CETECOM GmbH</p> 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			

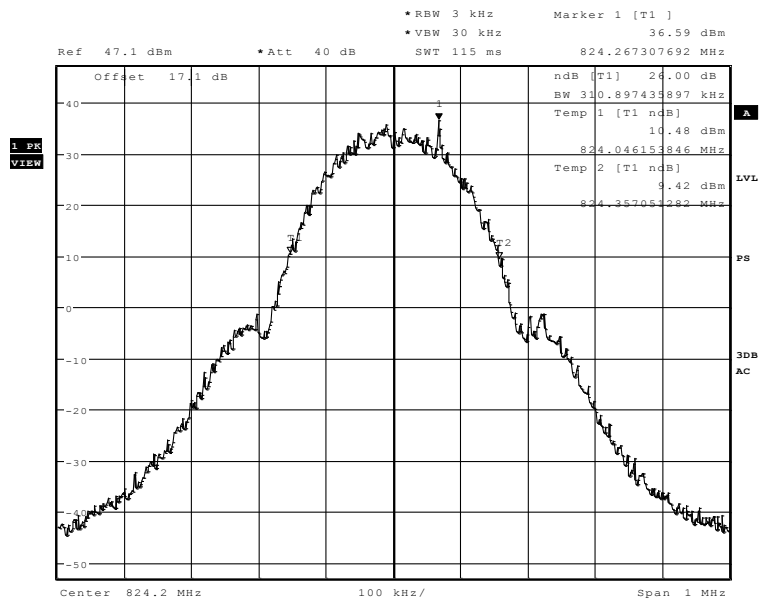
Table of contents

1. MEASUREMENT DIAGRAMS.....	3
1.1. <i>Emission bandwidth (26dBc Bandwidth).....</i>	<i>3</i>
1.1.1. <i>GSM 850 (GMSK Modulation).....</i>	<i>3</i>
1.1.2. <i>E-GPRS 850 (8-PSK Modulation).....</i>	<i>4</i>
1.1.3. <i>GSM 1900 (GMSK-Modulation).....</i>	<i>6</i>
1.1.4. <i>E-GPRS 1900 (8-PSK Modulation).....</i>	<i>7</i>
1.2. <i>99% Occupied bandwidth.....</i>	<i>9</i>
1.2.1. <i>GSM 850 (GMSK modulation).....</i>	<i>9</i>
1.2.2. <i>E-GPRS 850 (8PSK modulation).....</i>	<i>10</i>
1.2.3. <i>GSM 1900 (GMSK-Modulation).....</i>	<i>12</i>
1.2.4. <i>E-GPRS 1900 (8-PSK Modulation).....</i>	<i>13</i>
1.3. <i>Spurious emissions conducted</i>	<i>15</i>
1.3.1. <i>Out-of-Band emissions - GSM 850 mode (GMSK-Modulation).....</i>	<i>15</i>
1.3.2. <i>Band-Edge compliance GSM-850 (GMSK-Modulation).....</i>	<i>21</i>
1.3.3. <i>Out-of-Band emissions - GSM 850 mode (8PSK-Modulation).....</i>	<i>22</i>
1.3.4. <i>Band-Edge compliance (8-PSK Modulation).....</i>	<i>29</i>
1.3.5. <i>Out-of-Band emissions - GSM 1900 mode (GMSK-Modulation).....</i>	<i>31</i>
1.3.6. <i>Band-Edge compliance: GSM1900 – Mode (GMSK –Modulation).....</i>	<i>37</i>
1.3.7. <i>Out-of-Band emissions E-GSM 1900 mode (8-PSK-Modulation).....</i>	<i>38</i>
1.3.8. <i>Band-Edge compliance: E-GSM1900 (8-PSK Modulation).....</i>	<i>45</i>
1.4. <i>Spurious emissions radiated (30 MHz < f < 18 GHz)</i>	<i>47</i>
1.4.1. <i>GSM850 mode (GMSK-Modulation).....</i>	<i>47</i>
1.4.2. <i>Band-Edge GSM850 mode (GMSK-Modulation).....</i>	<i>50</i>
1.4.3. <i>Band-Edge GSM850 mode (8-PSK Modulation).....</i>	<i>52</i>
1.4.4. <i>GSM1900 mode (8PSK-Modulation).....</i>	<i>54</i>
1.4.5. <i>Band-Edge GSM1900 mode (GMSK Modulation).....</i>	<i>56</i>
1.4.6. <i>Band-Edge GSM1900 mode (8-PSK Modulation).....</i>	<i>59</i>

1. Measurement diagrams

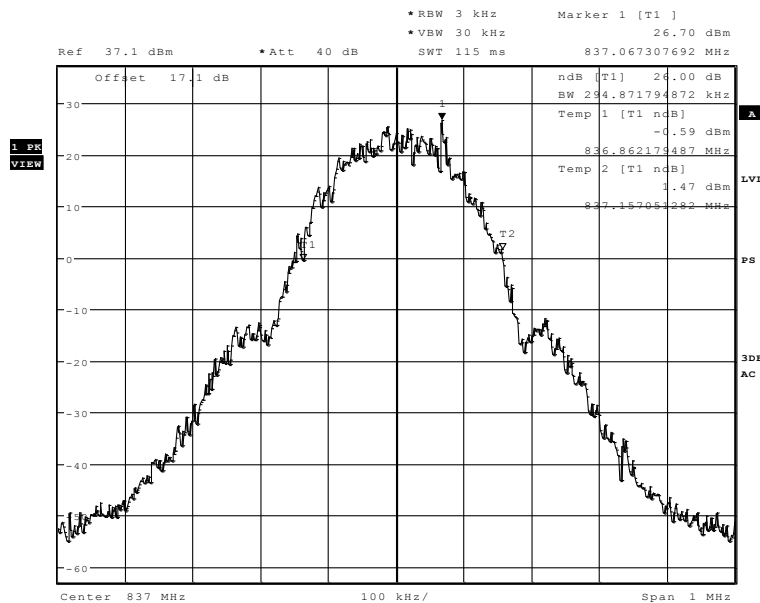
1.1. Emission bandwidth (26dBc Bandwidth)

1.1.1. GSM 850 (GMSK Modulation)



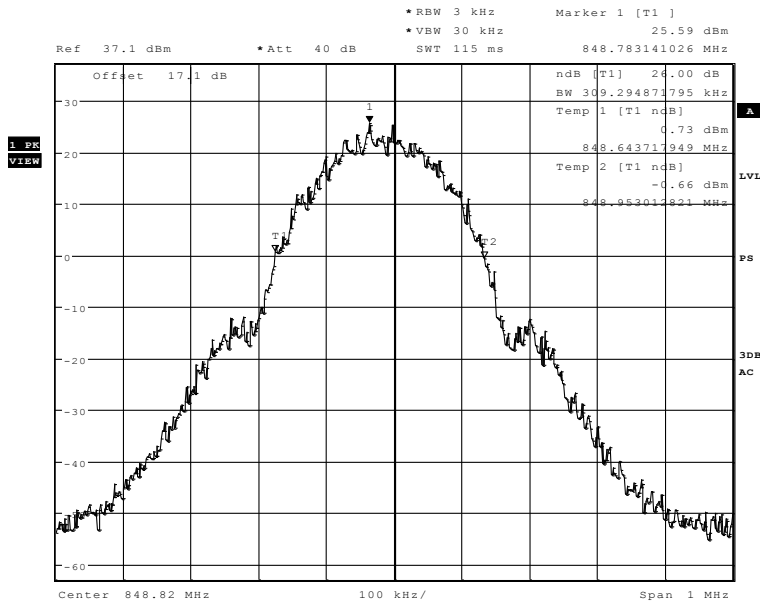
Date: 25.OCT.2012 13:27:34

Channel 128



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

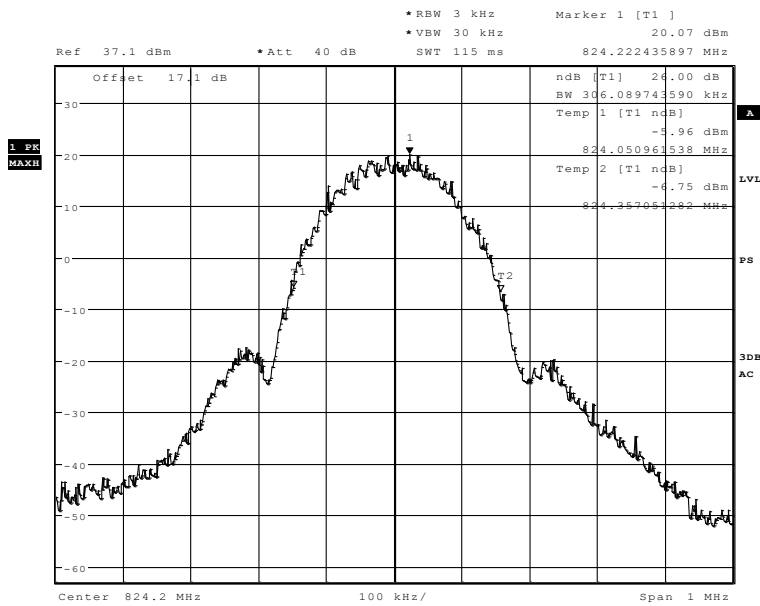
Channel 192



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

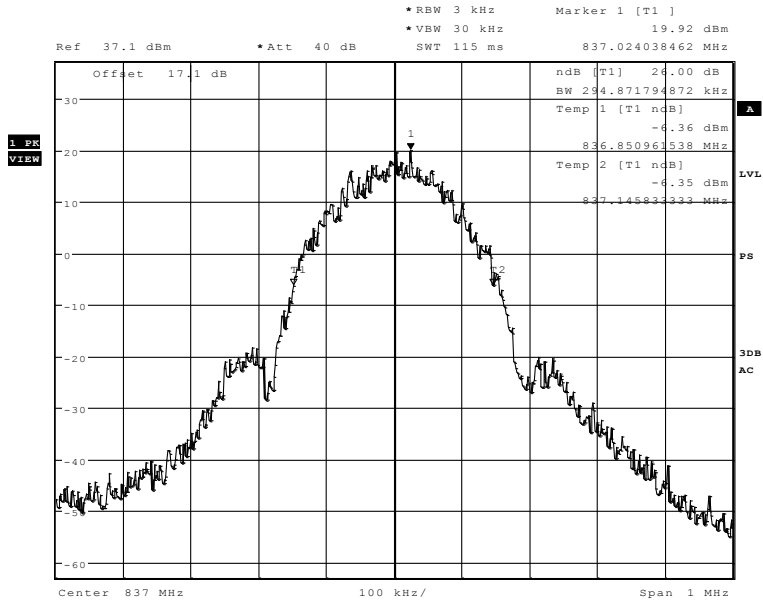
Channel 251

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



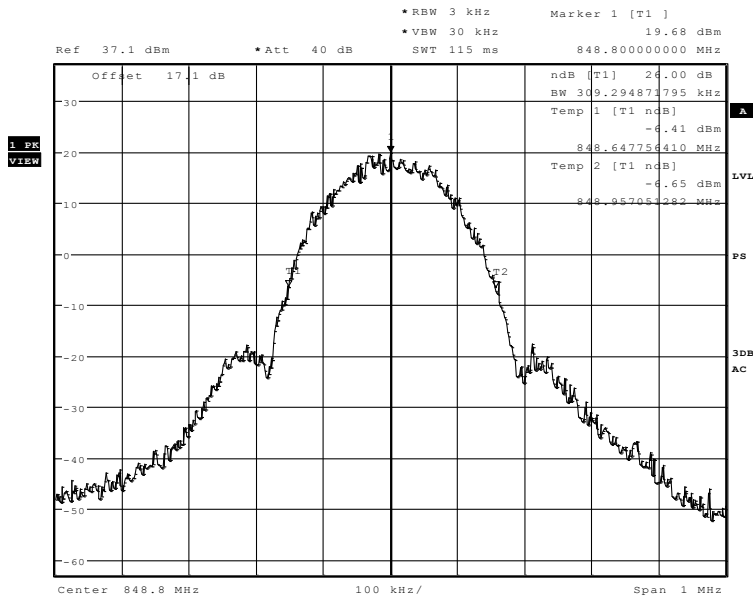
Date: 18.SEP.2012 19:54:37

Channel 128



Date: 18.SEP.2012 20:40:38

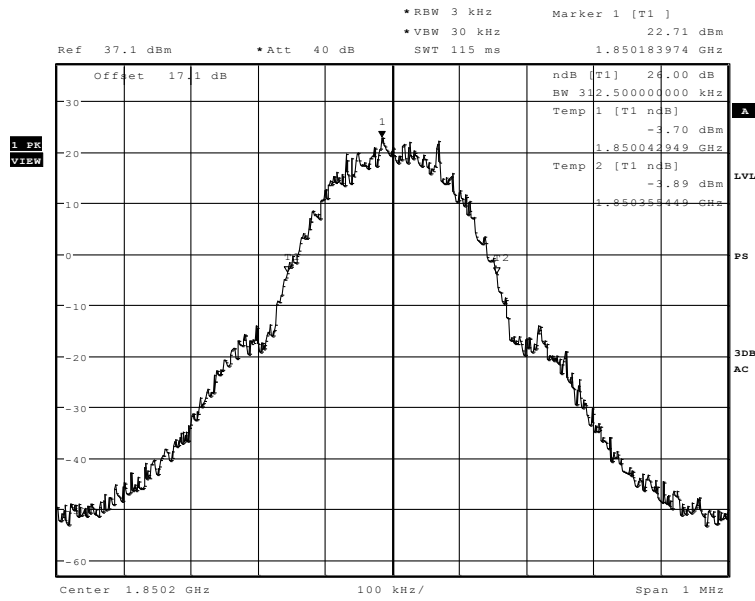
Channel 192



Date: 18.SEP.2012 21:00:17

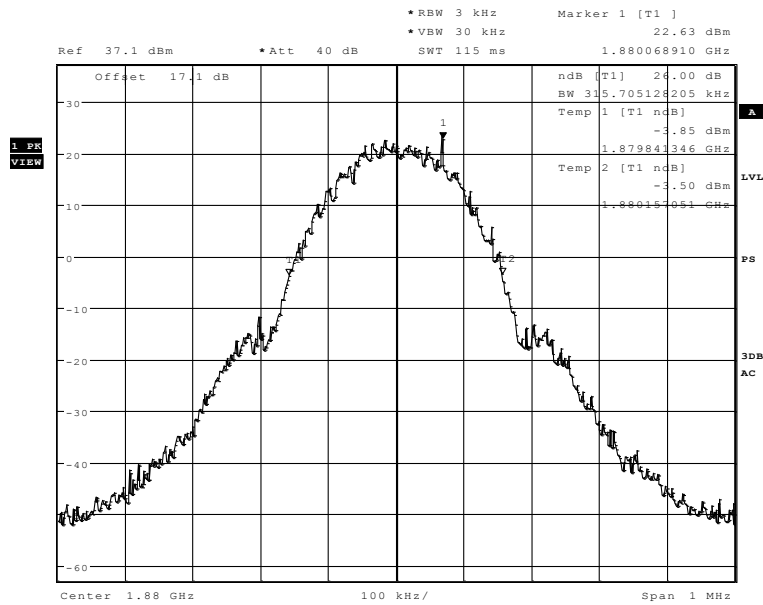
Channel 251

1.1.3. GSM 1900 (GMSK-Modulation)



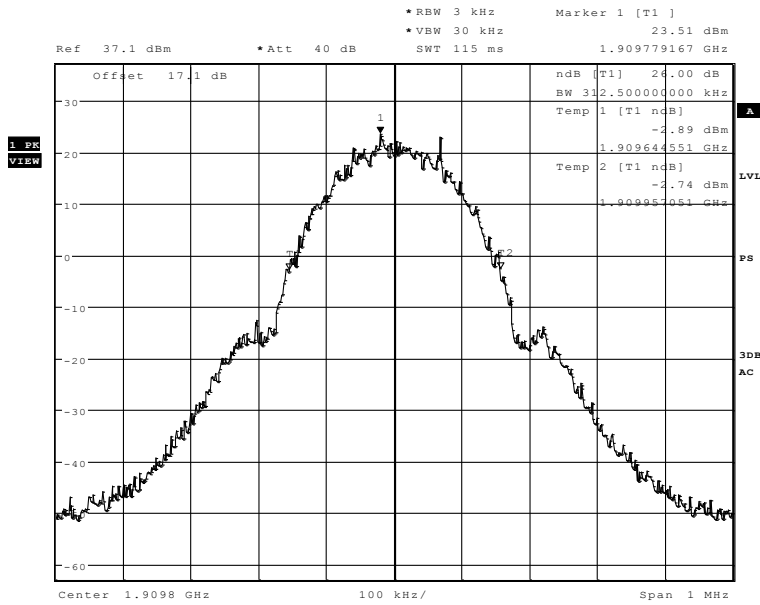
Date: 20.SEP.2012 09:36:43

Channel 512



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

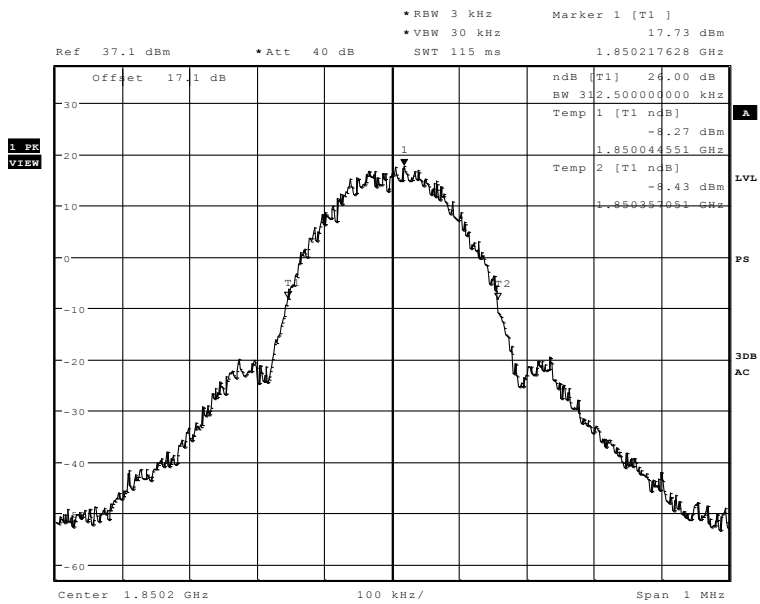
Channel 661



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

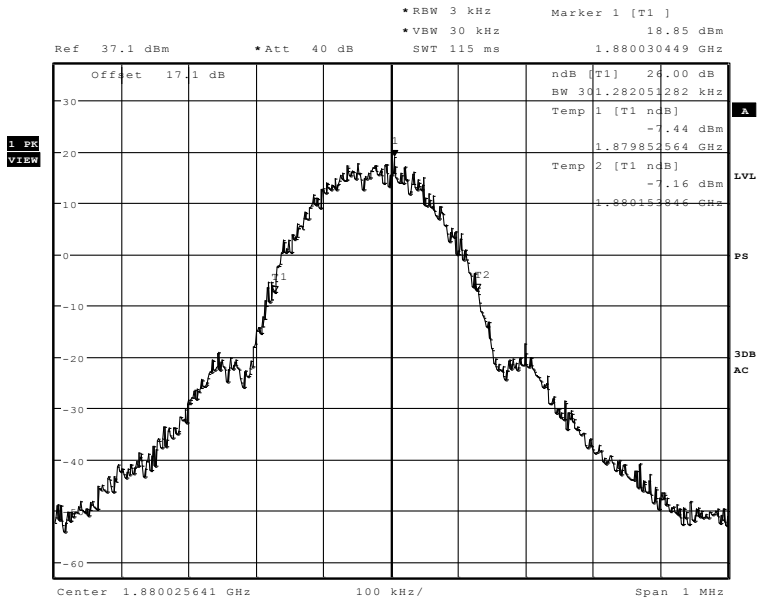
Channel 810

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



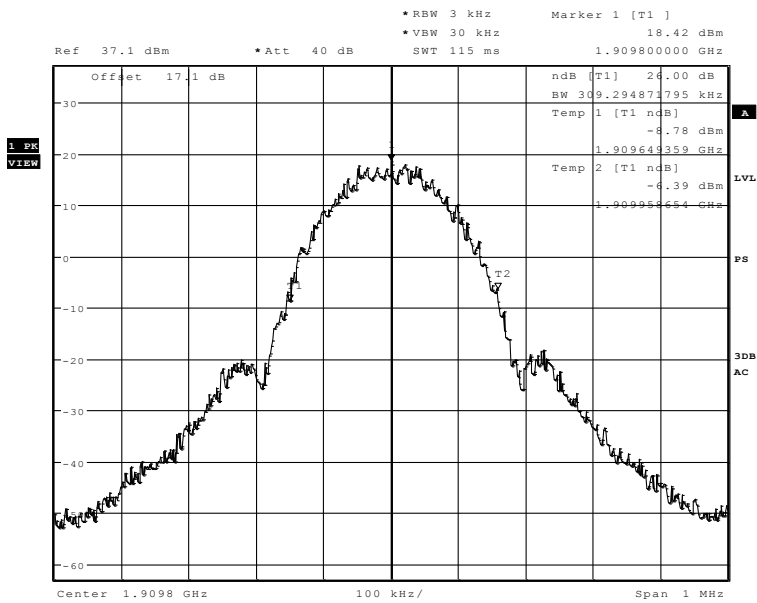
Date: 20.SEP.2012 09:59:50

Channel 512



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

Channel 661

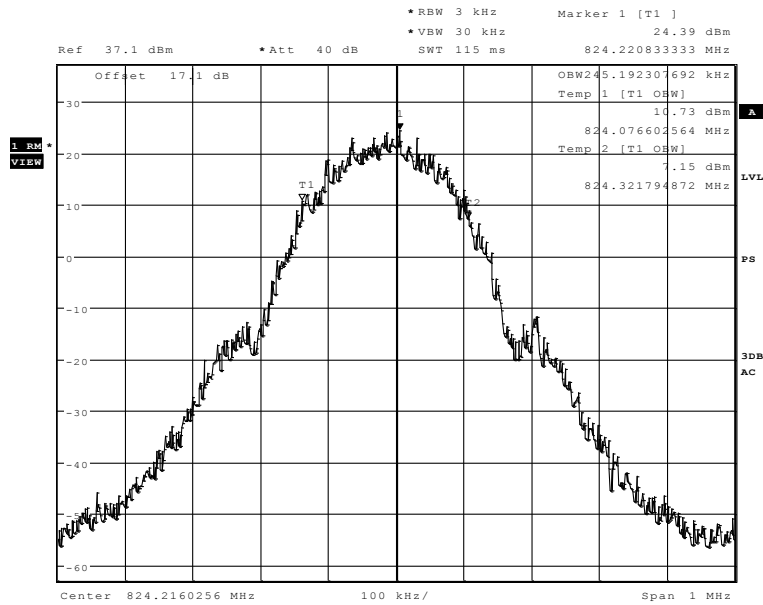


Date: 20.SEP.2012 10:11:58

Channel 810

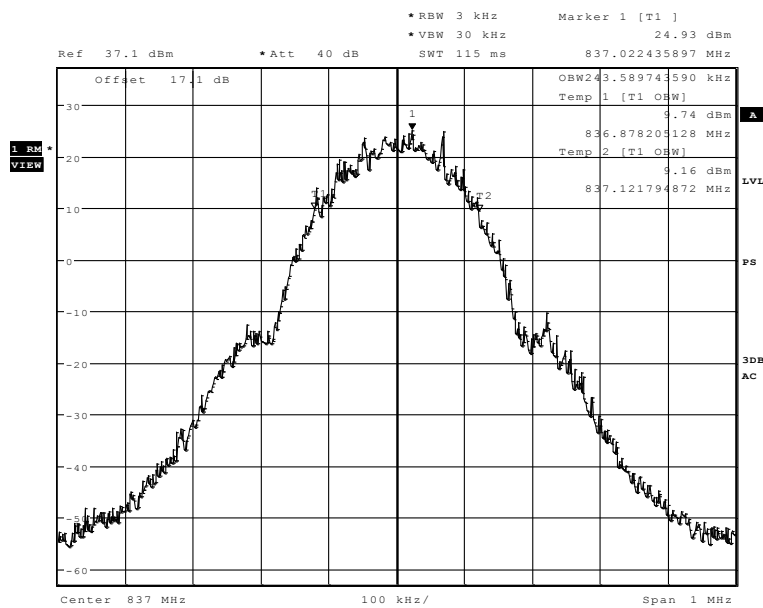
1.2. 99% Occupied bandwidth

1.2.1. GSM 850 (GMSK modulation)



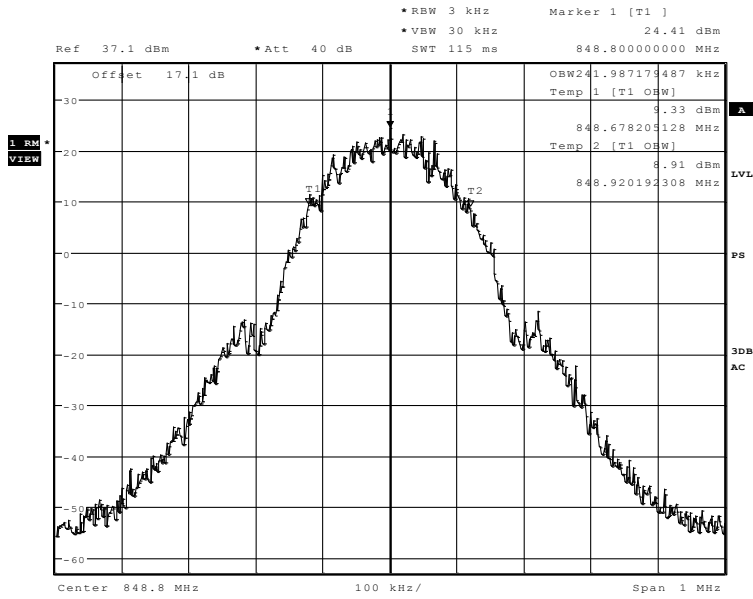
Date: 18.SEP.2012 18:16:23

Channel 128



Date: 18.SEP.2012 18:43:53

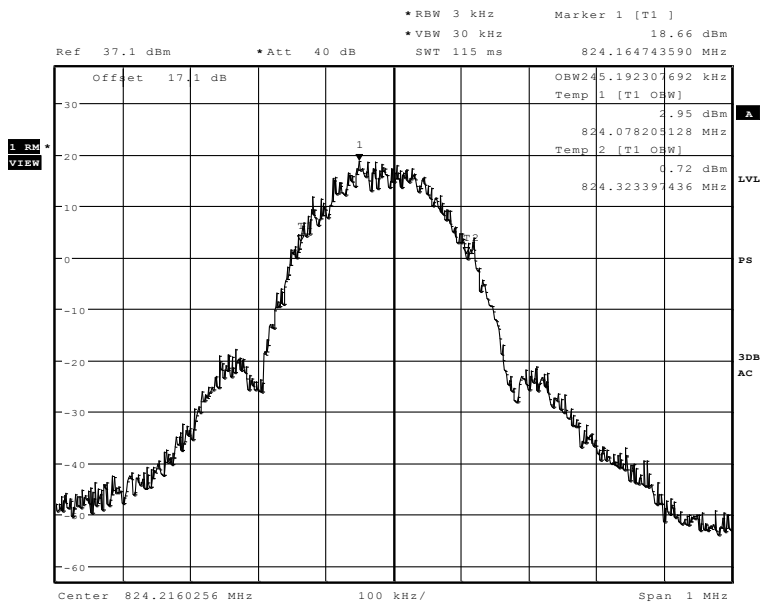
Channel 192



Date: 18.SEP.2012 19:23:47

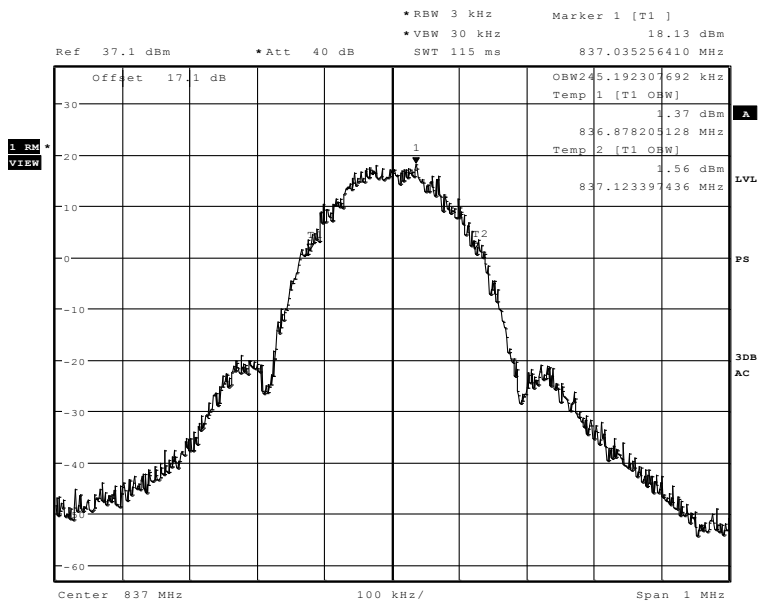
Channel 251

1.2.2. E-GPRS 850 (8PSK modulation)



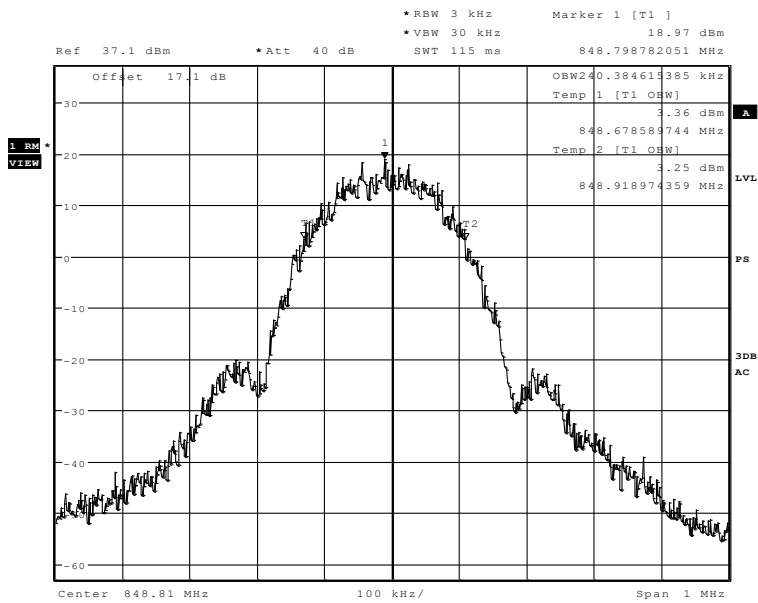
Date: 18.SEP.2012 20:05:31

Channel 128



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

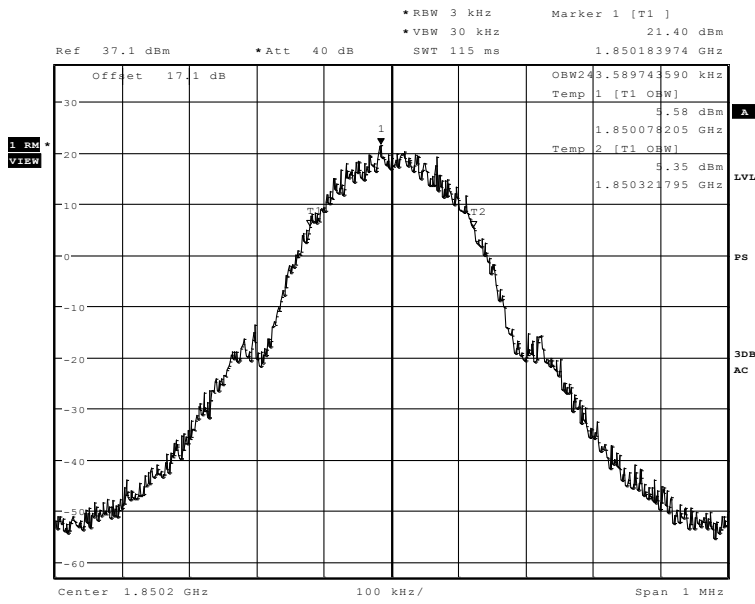
Channel 192



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

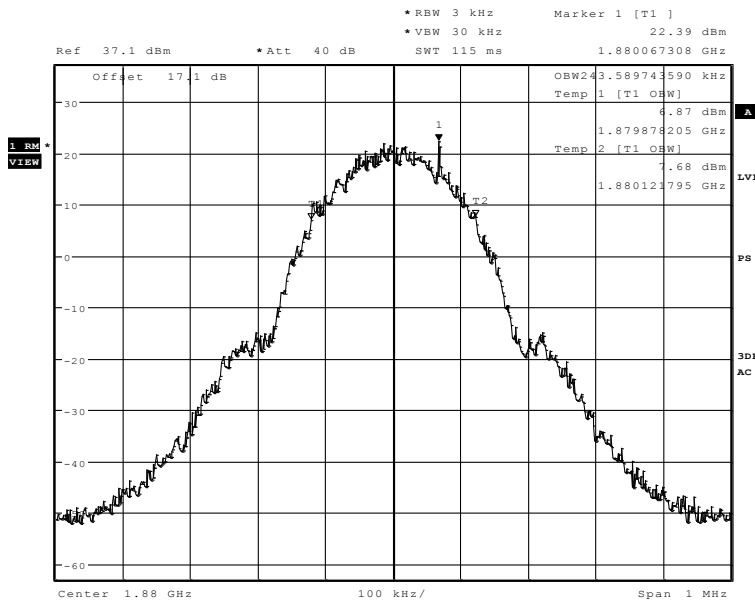
Channel 251

1.2.3. GSM 1900 (GMSK-Modulation)



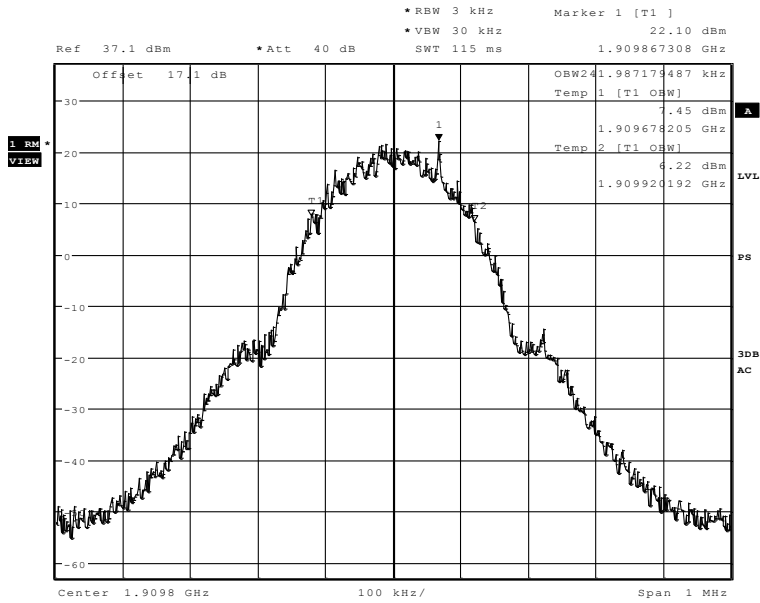
Date: 20.SEP.2012 09:01:26

Channel 512



Date: 20.SEP.2012 09:51:09

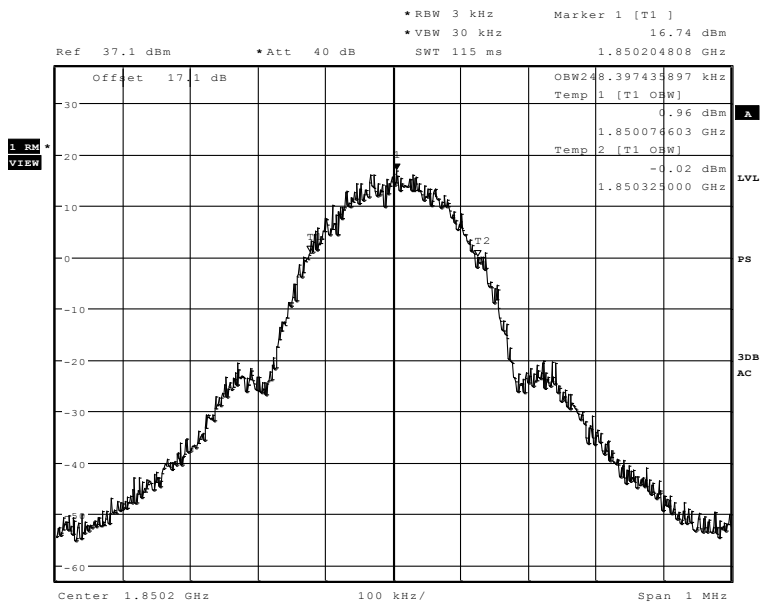
Channel 661



Date: 20.SEP.2012 09:53:02

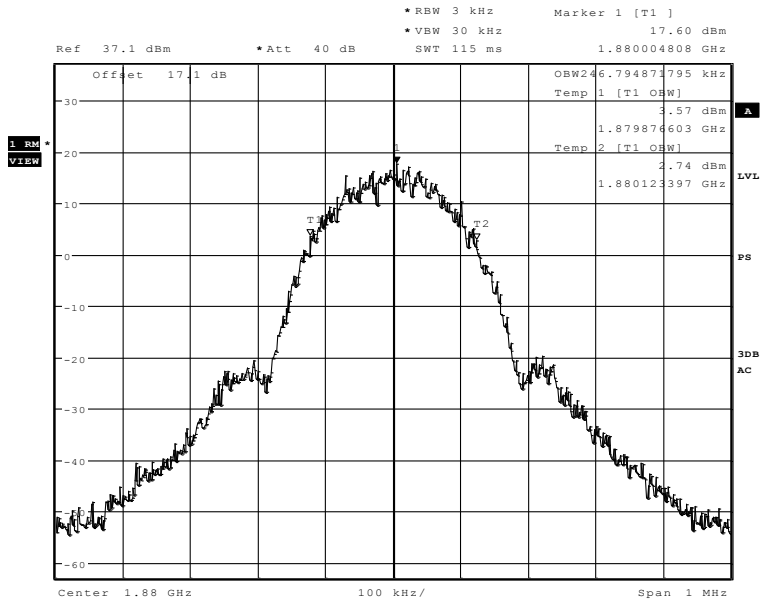
Channel 810

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



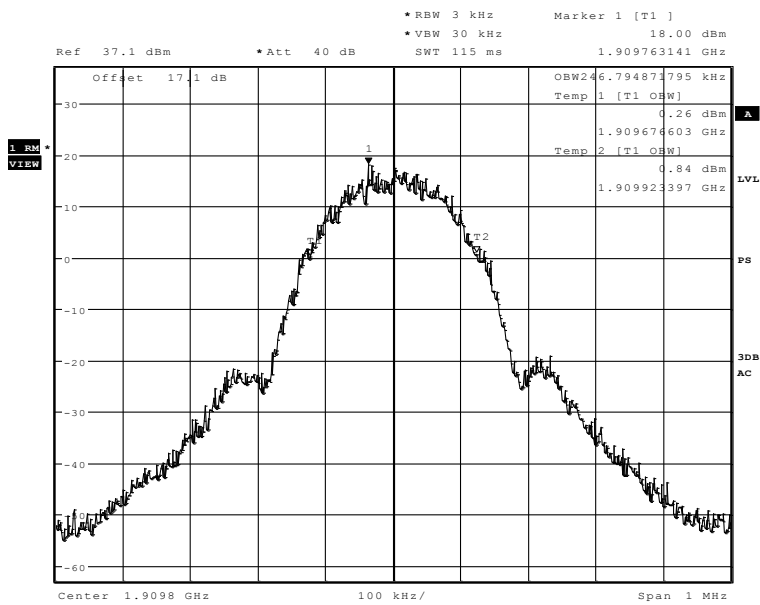
Date: 20.SEP.2012 10:04:22

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

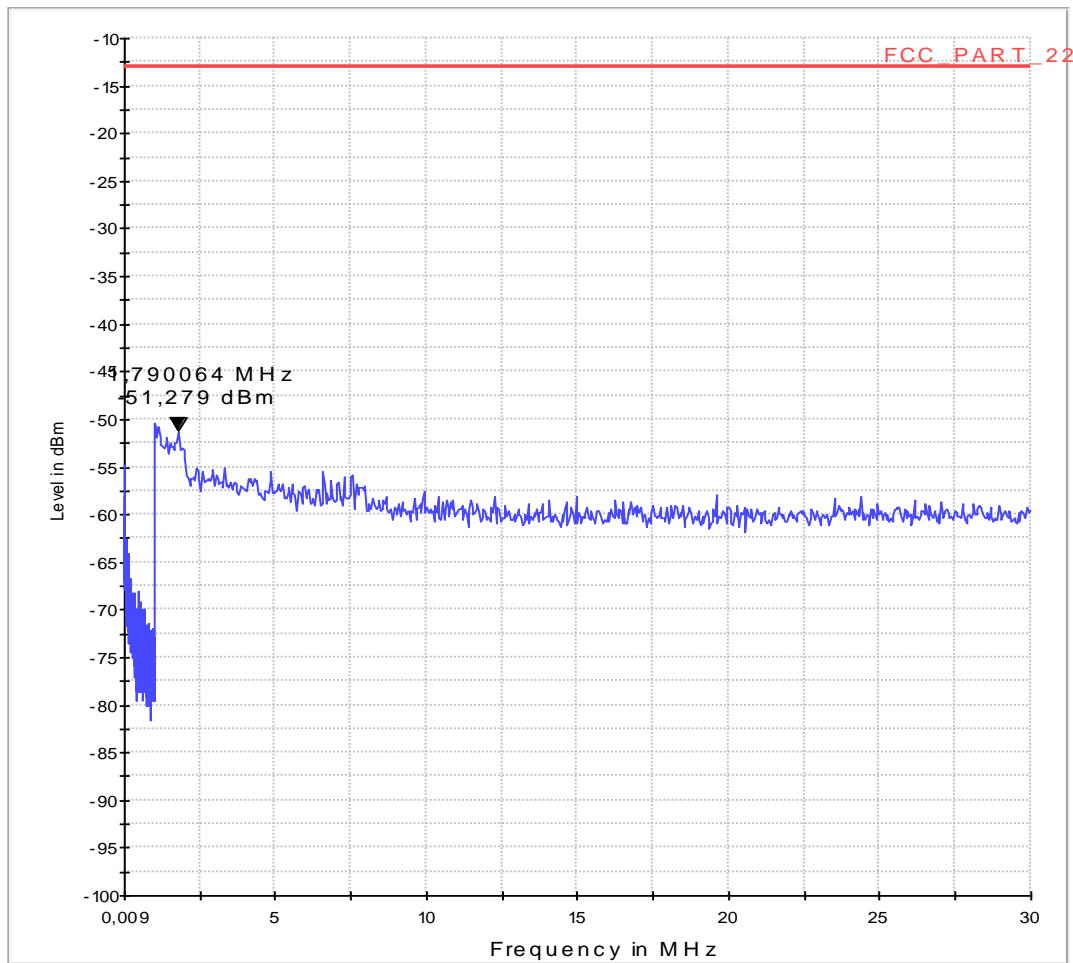


Diagram No.: 12.01_GSM_RSE_L_Sweep2

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

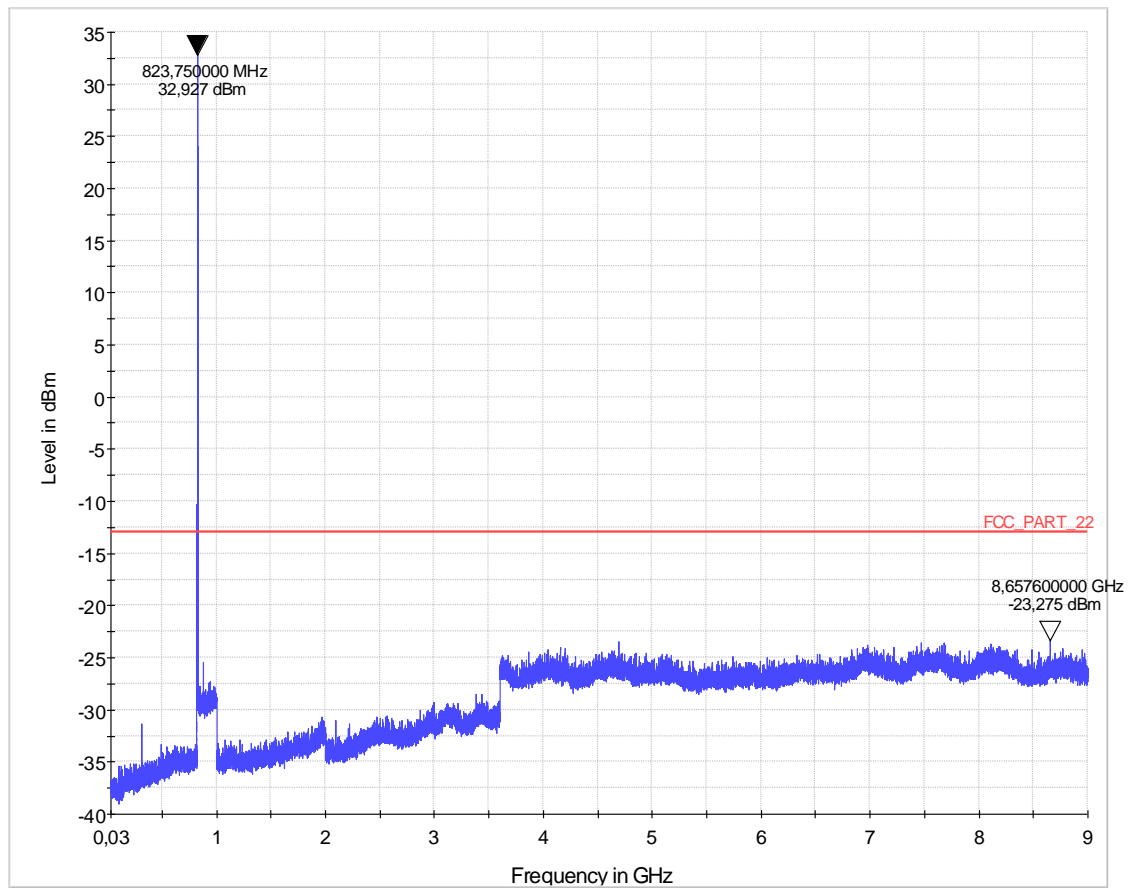


Diagram No.: 12.02_GSM_RSE_M_Sweep1

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

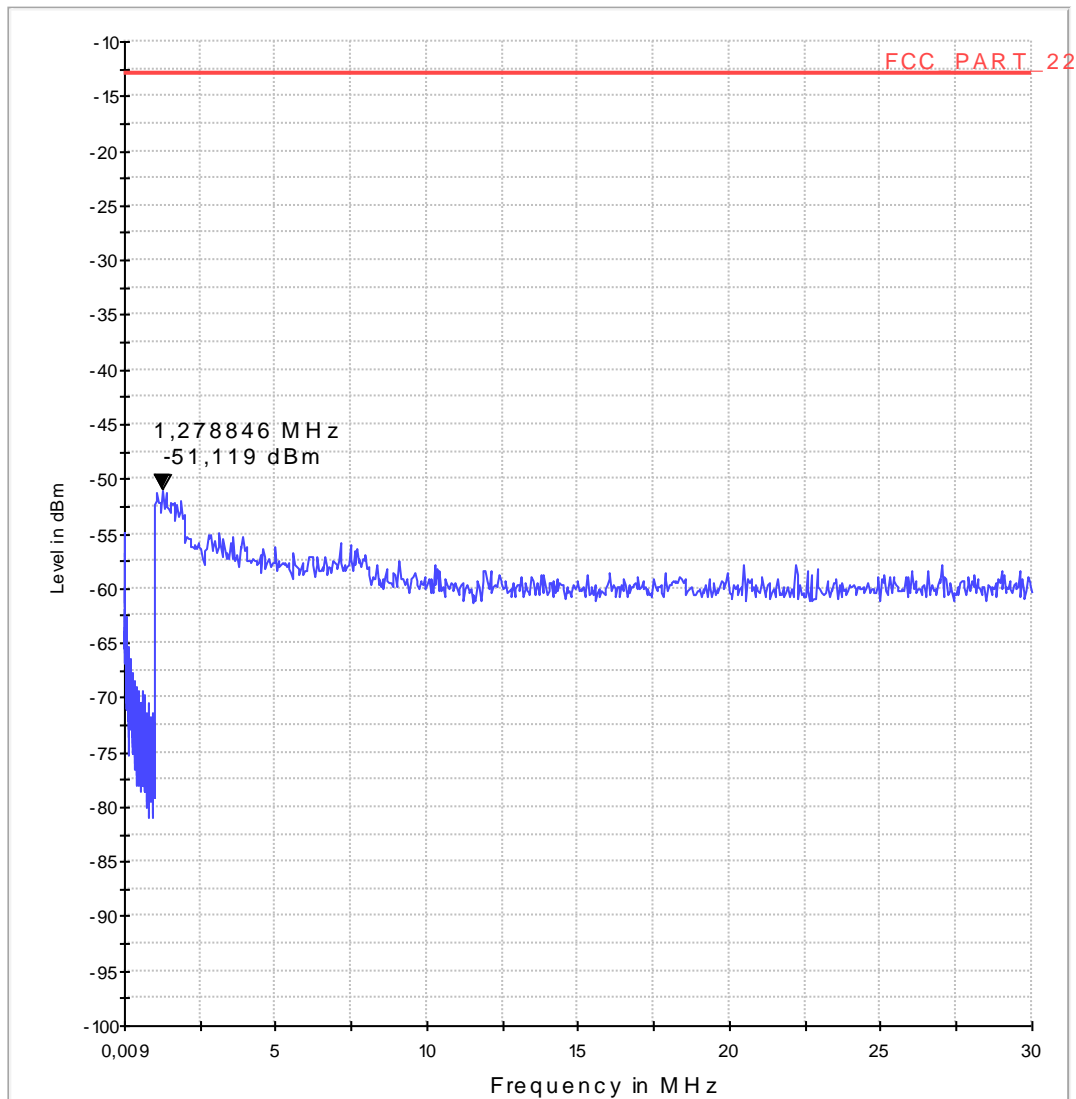


Diagram No.: 12.02_GSM_RSE_M_Sweep2

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

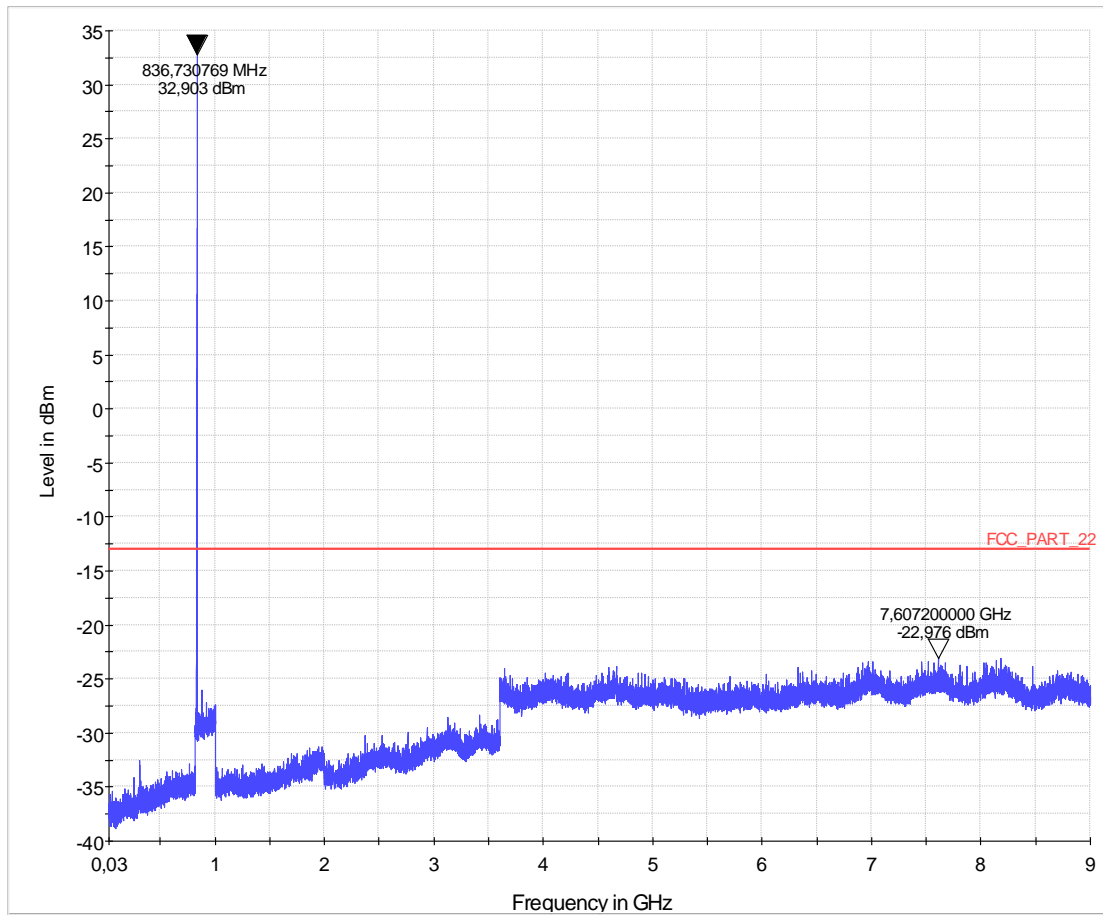


Diagram No.: 12.03_GSM_RSE_L_Sweep1

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

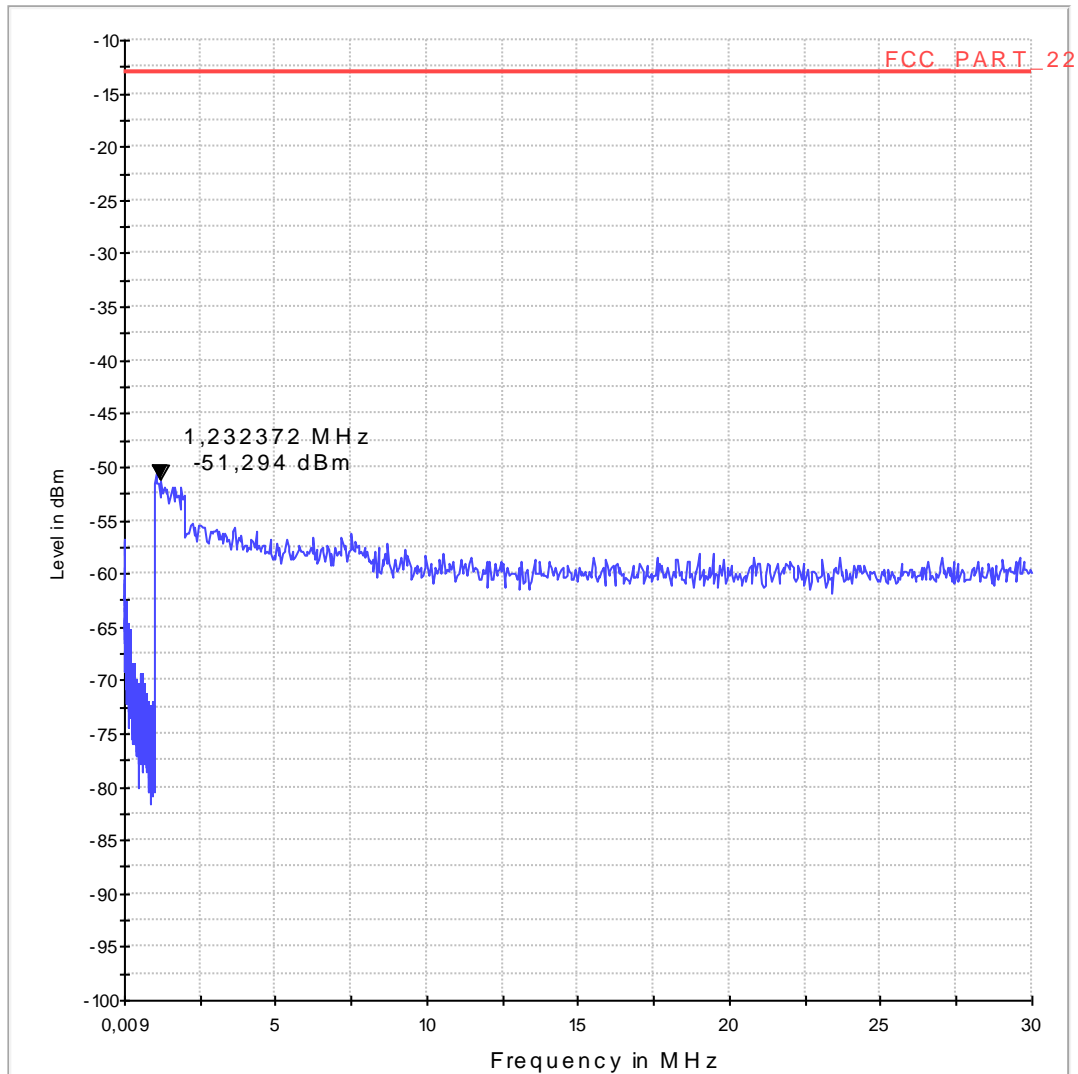


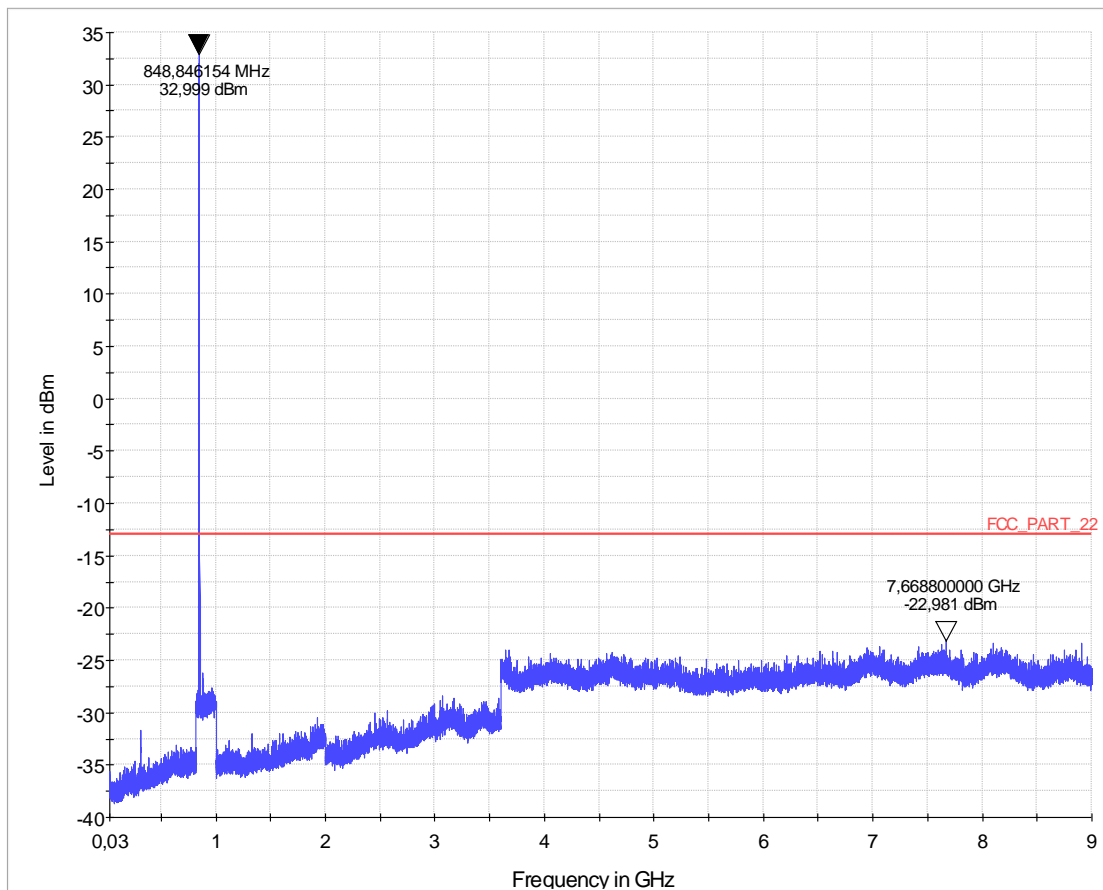
Diagram No.: 12.03_GSM_RSE_L_Sweep2

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

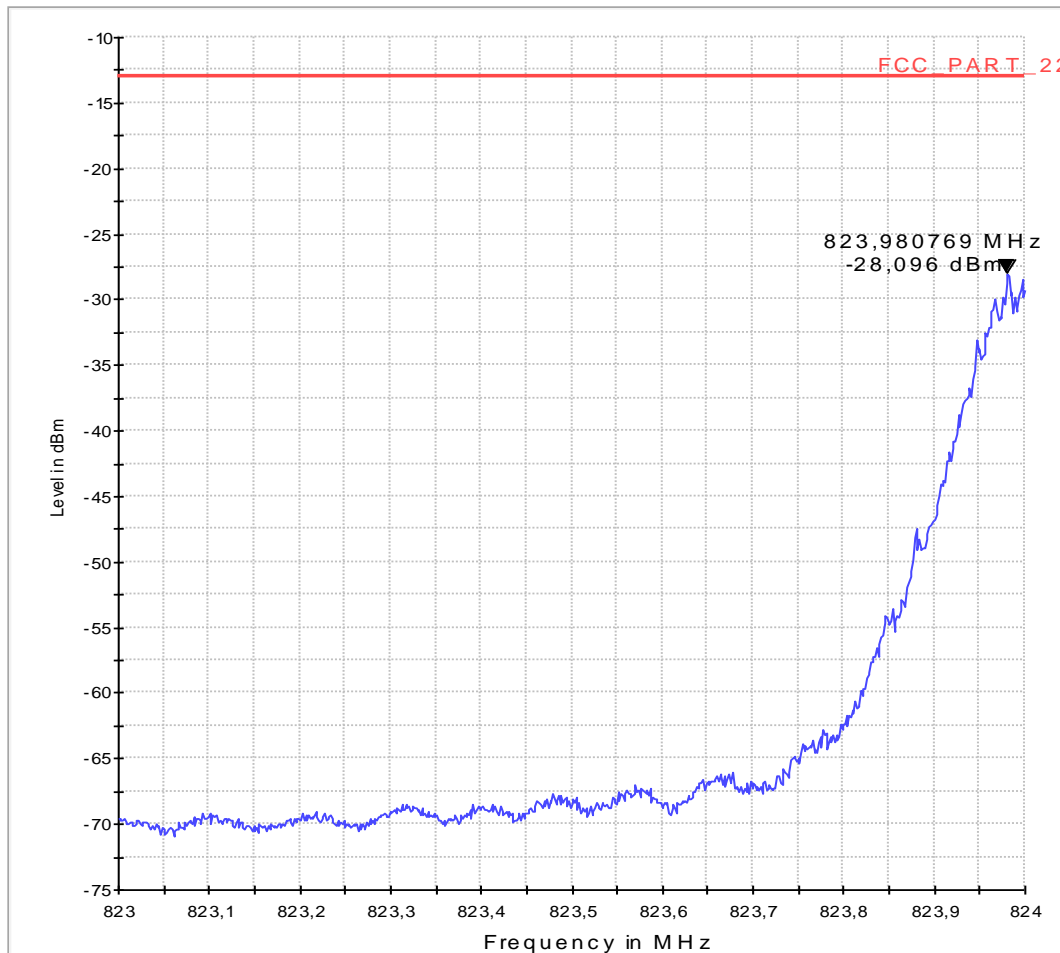


Diagram No.: 14.02**Common Information**

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

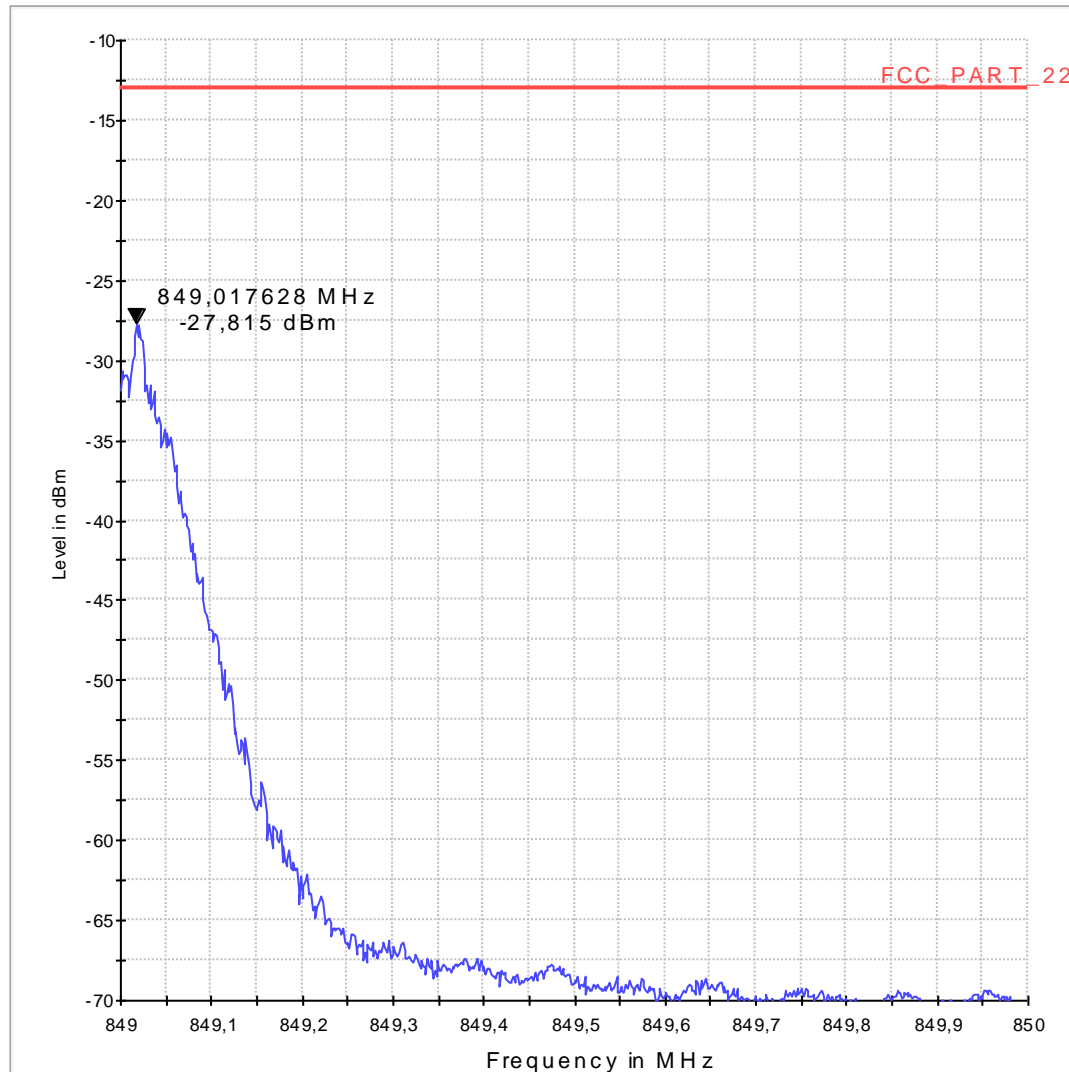
**1.3.3. Out-of-Band emissions - GSM 850 mode (8PSK-Modulation)**

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

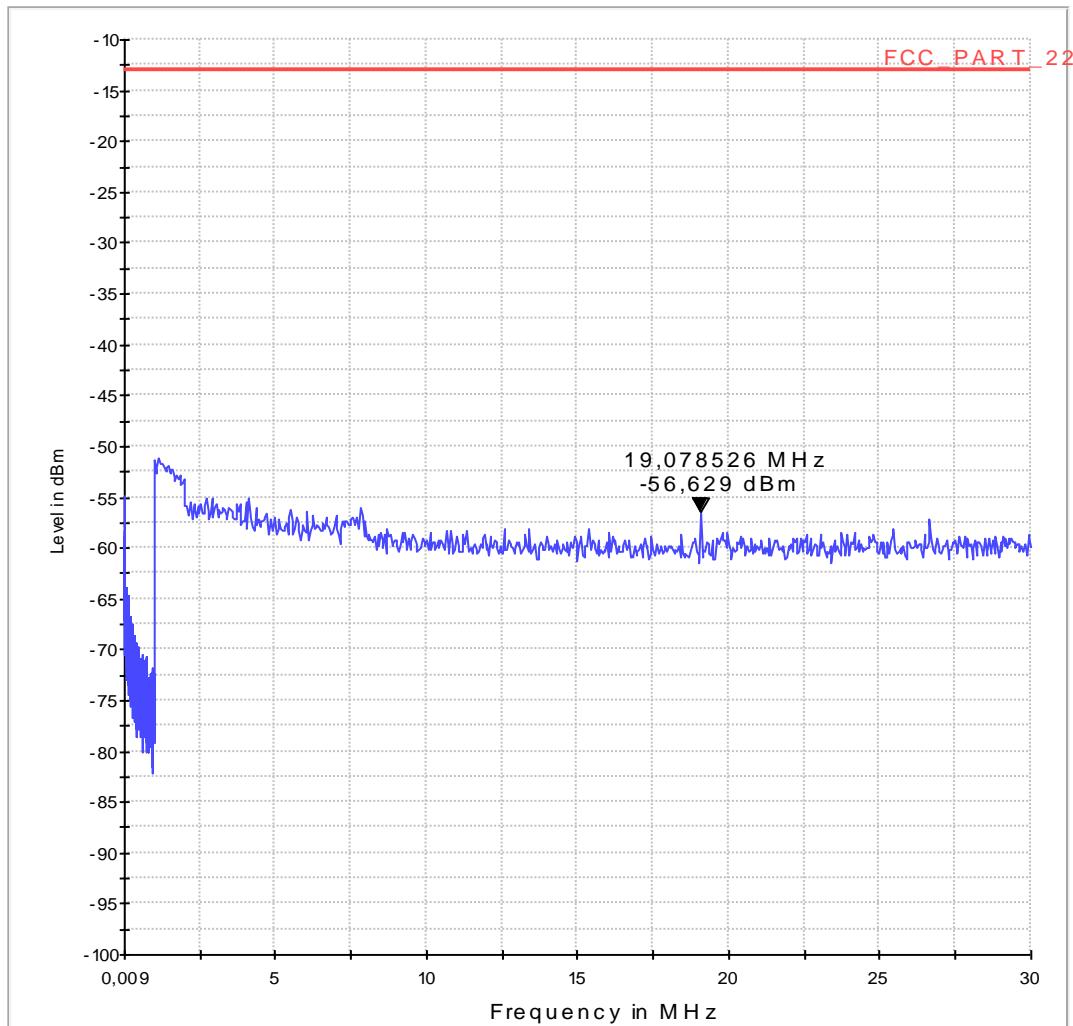


Diagram No.: 12.04_EGPRS_850_RSE_L_Sweep2

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

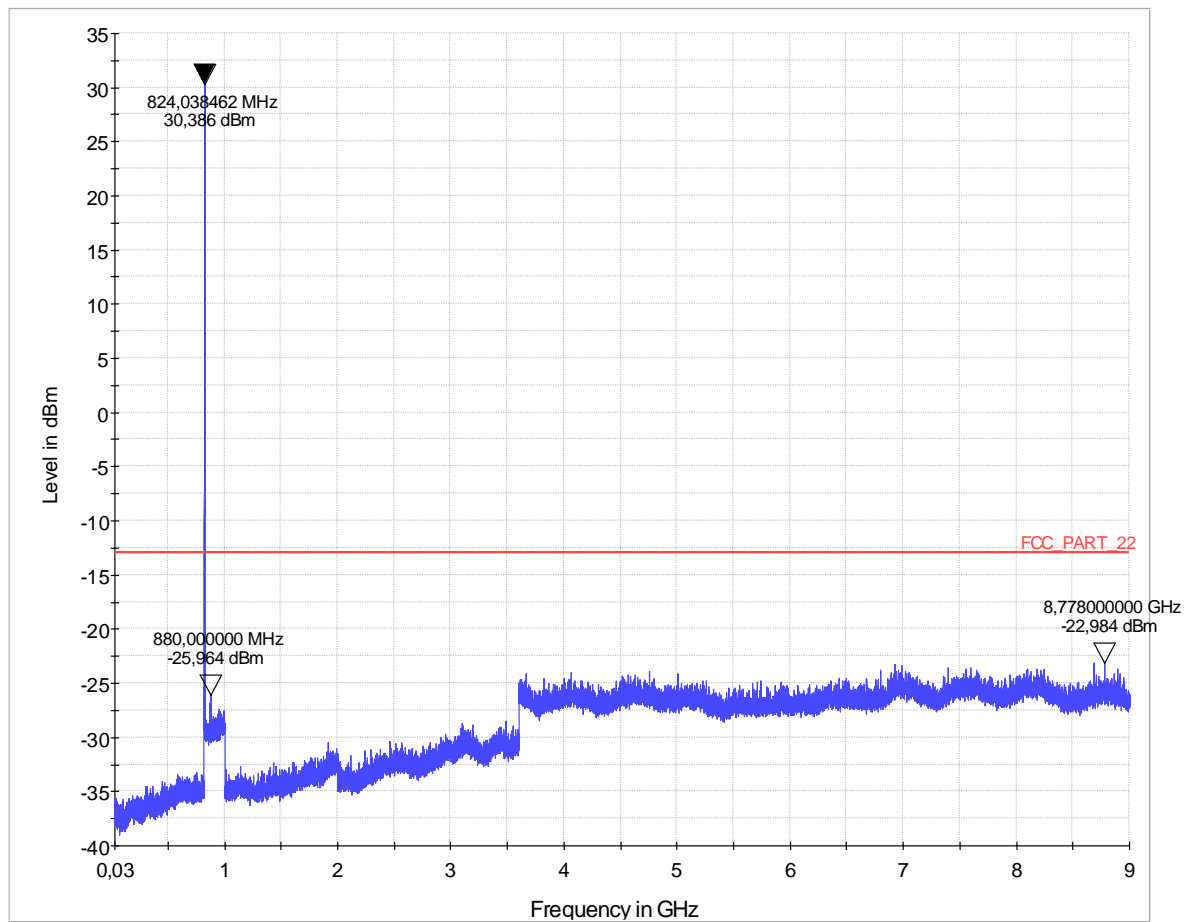


Diagram No.: 12.05_EGPRS_850_RSE_M_Sweep1

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

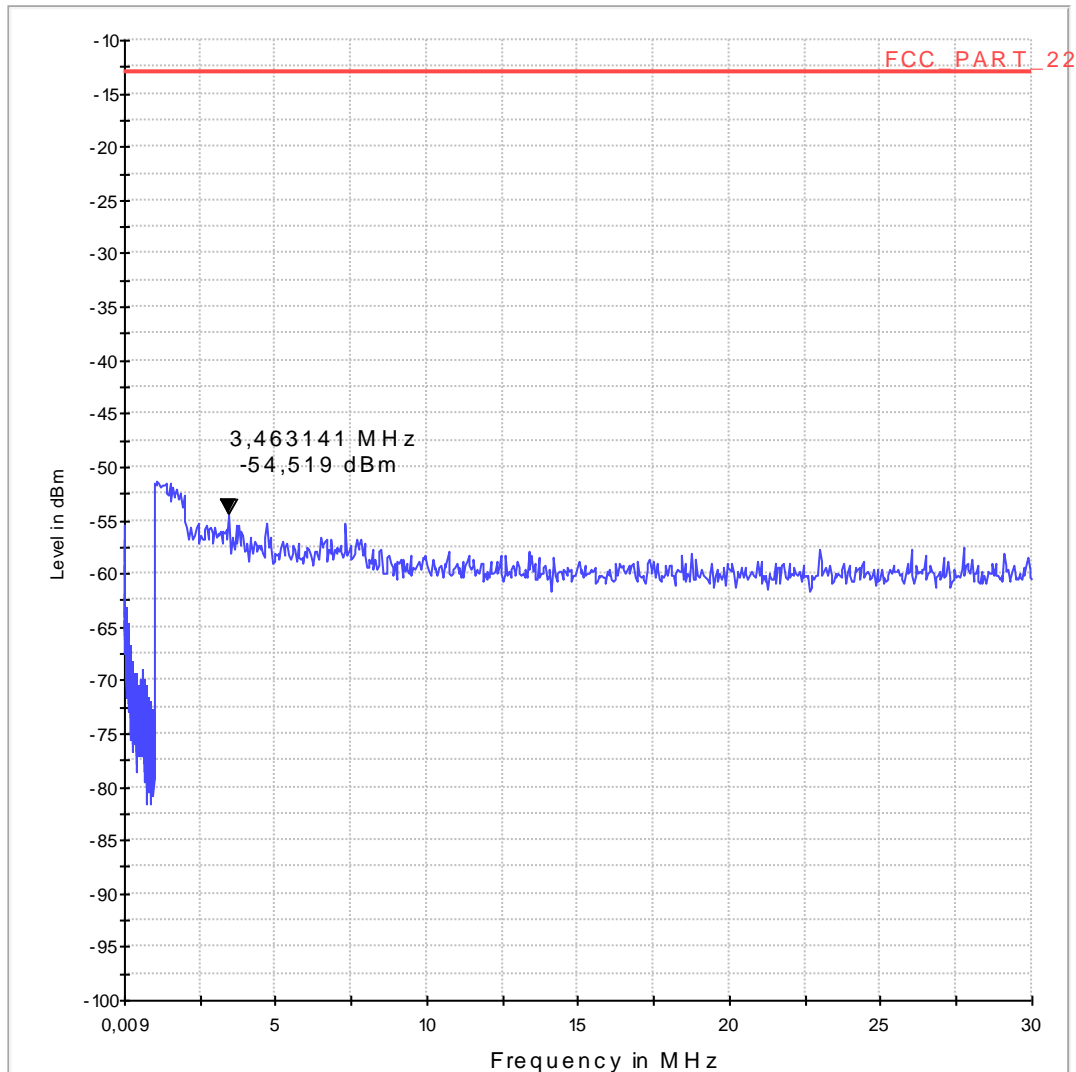


Diagram No.: 12.05_EGPRS_850_RSE_M_Sweep2

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

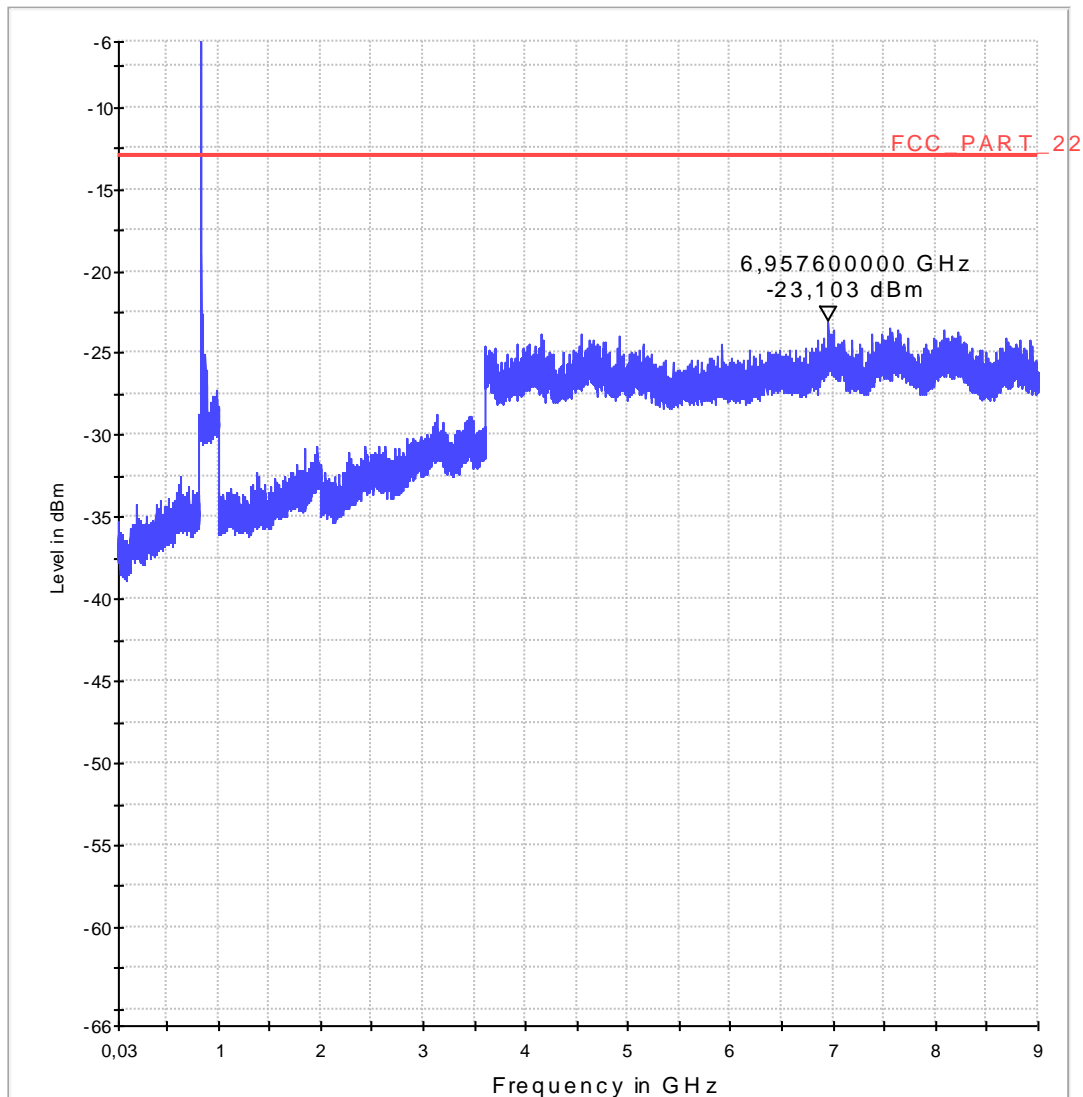


Diagram No.: 12.06_EGPRS_850_RSE_H_Sweep1

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

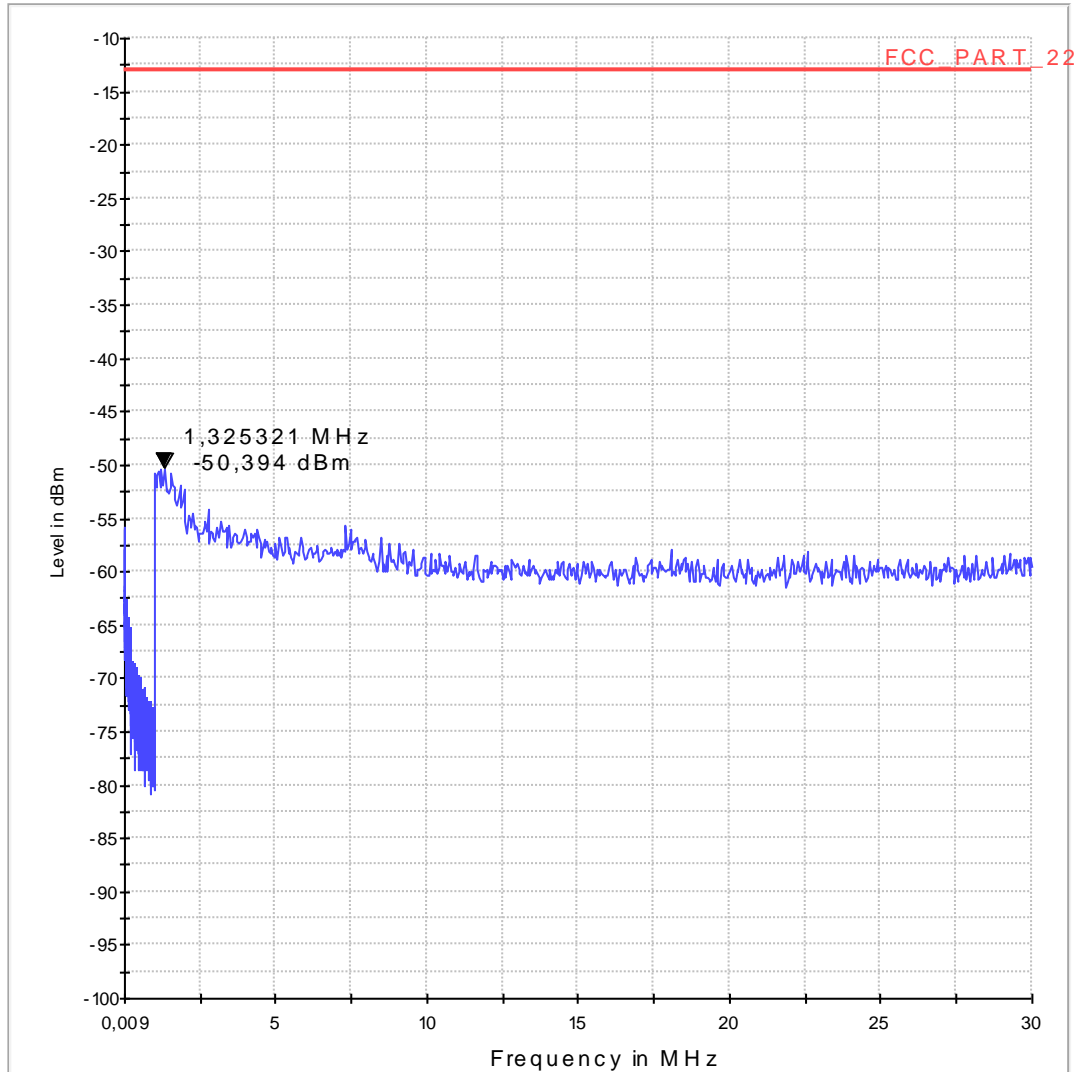


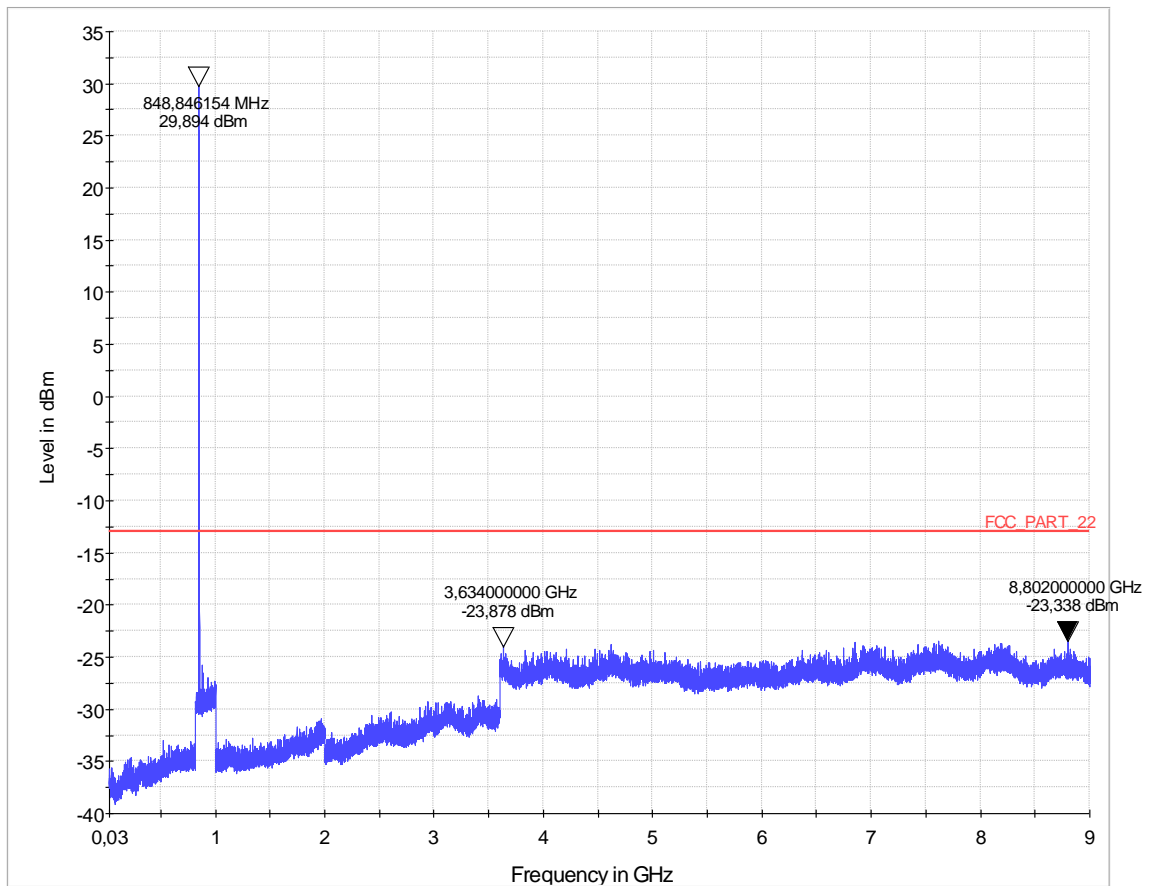
Diagram No.: 12.06_EGPRS_850_RSE_H_Sweep2

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

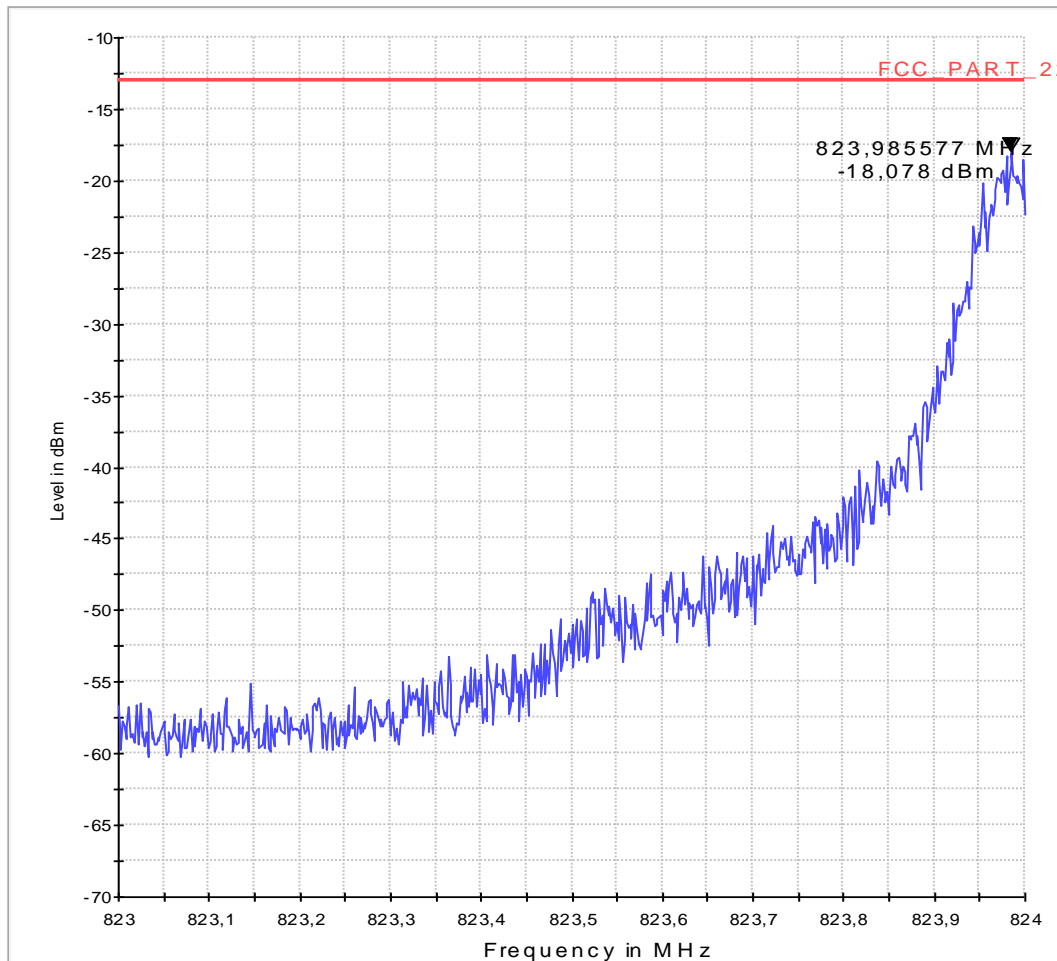


Diagram No. 14.04

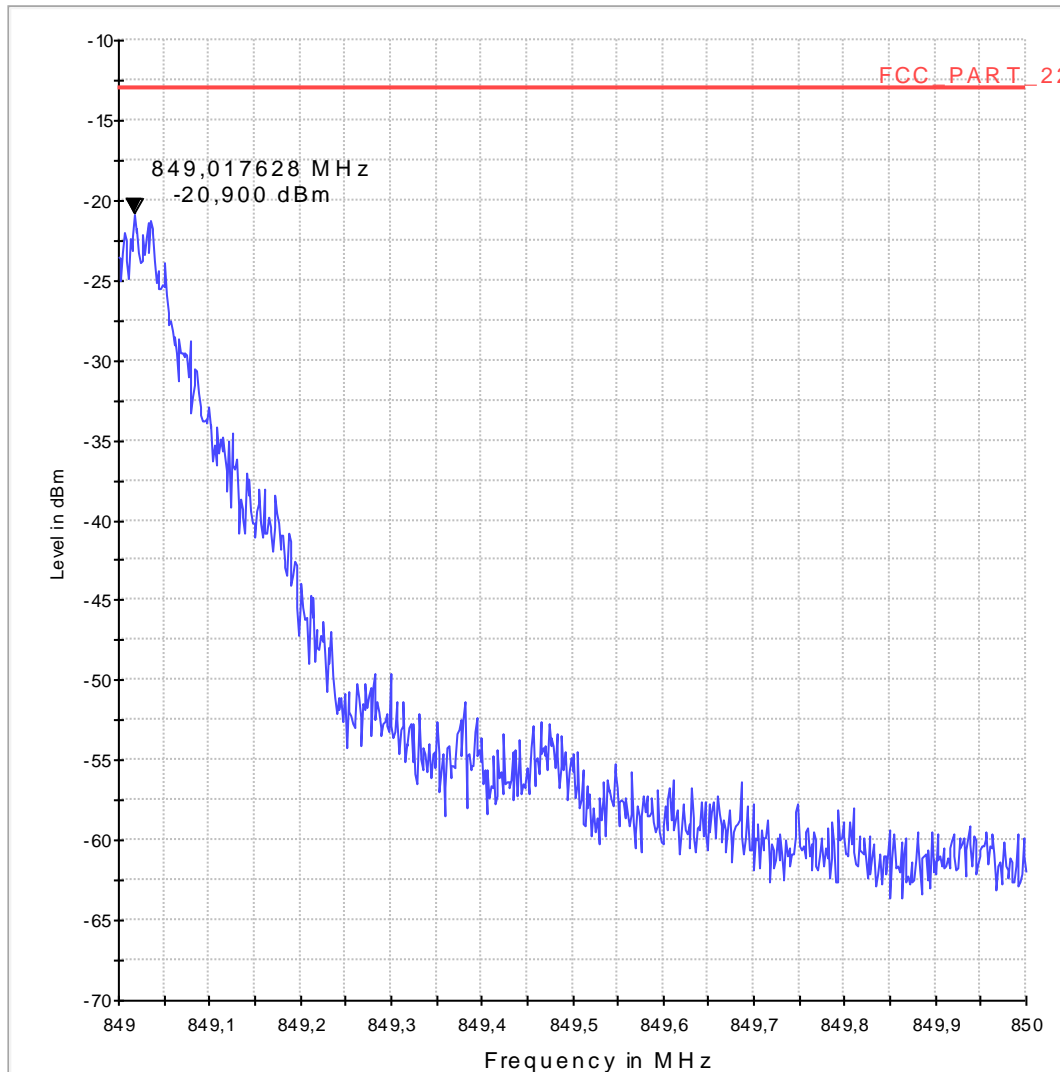
Common Information

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

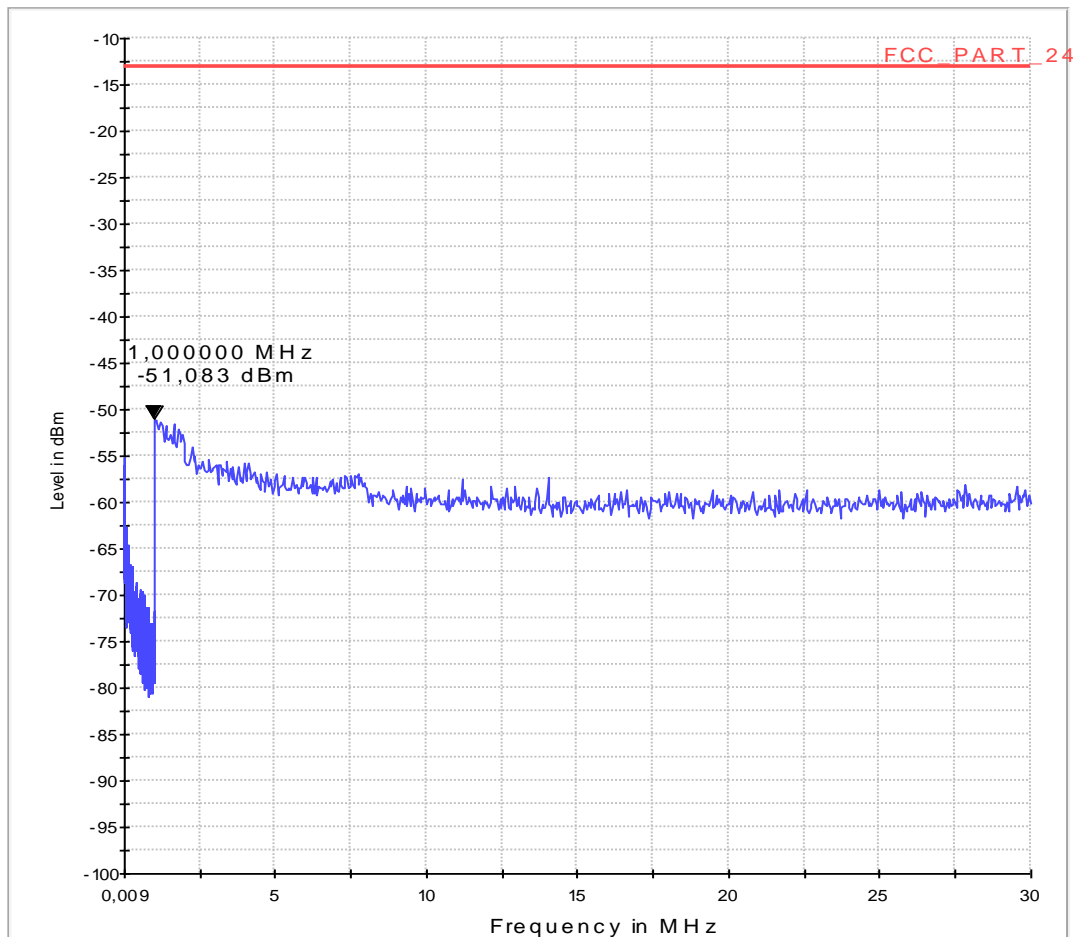


Diagram No.: 10_PCS_RSE_19G

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

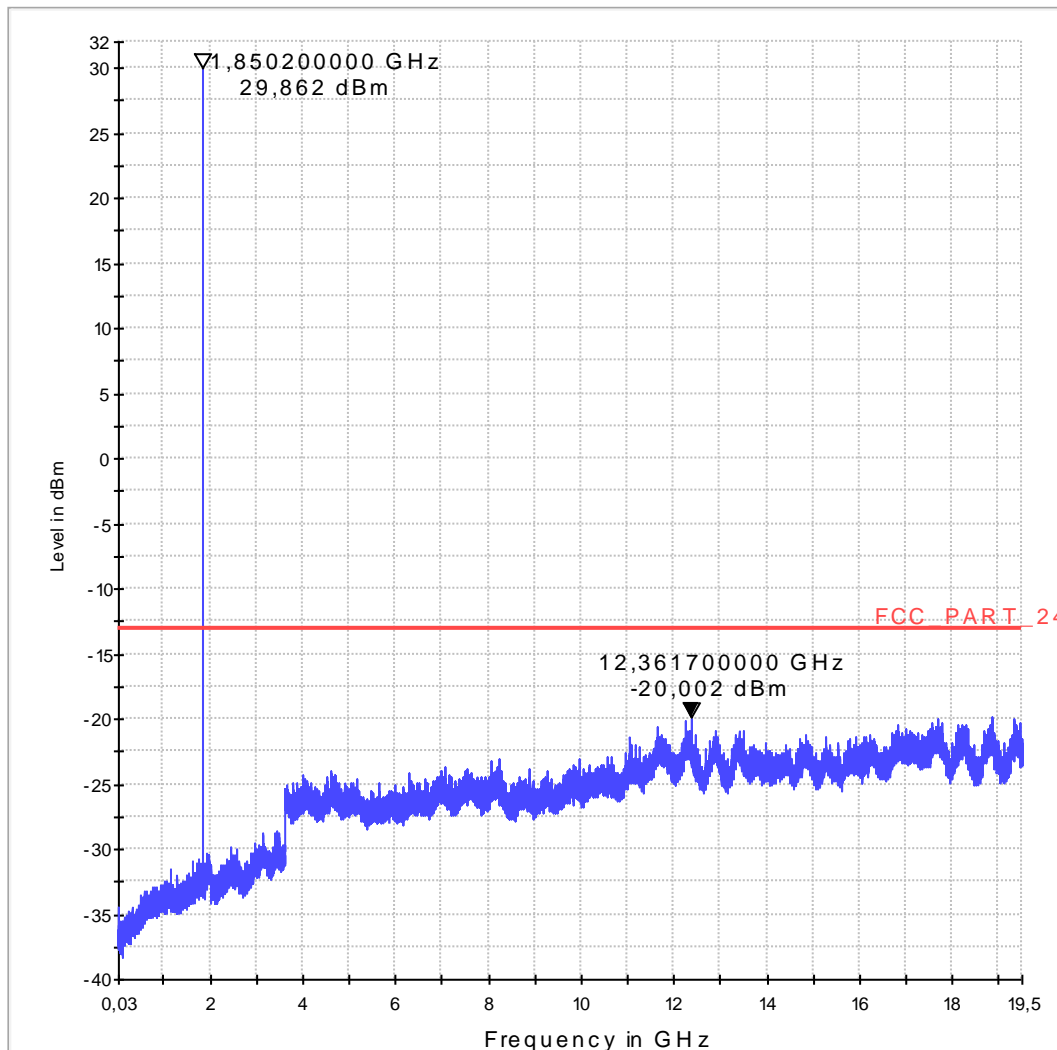


Diagram No.: 10_Sweep 1

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

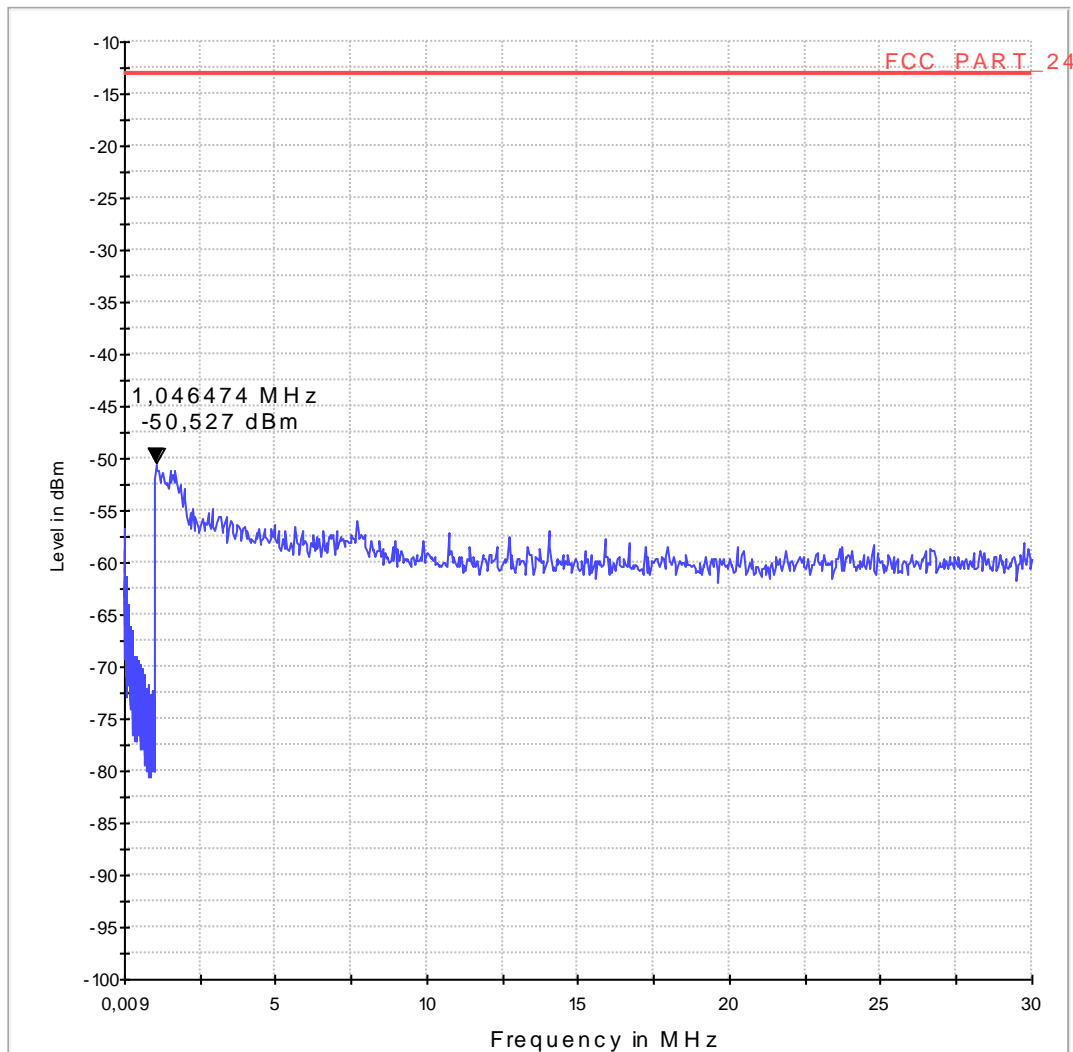


Diagram No.: 10_PCS_RSE_19G_M

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

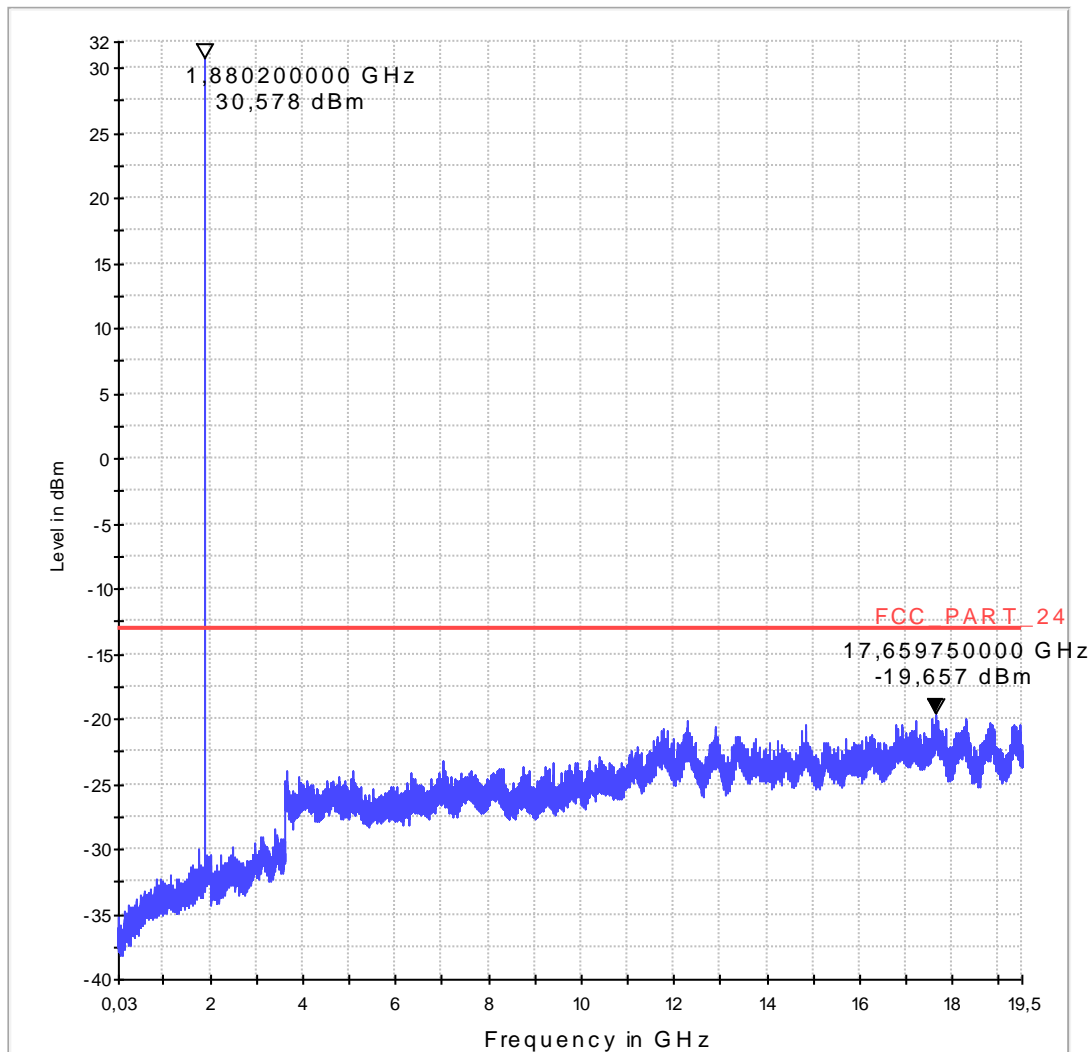


Diagram No.: 10_PCS_RSE_30M_H

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

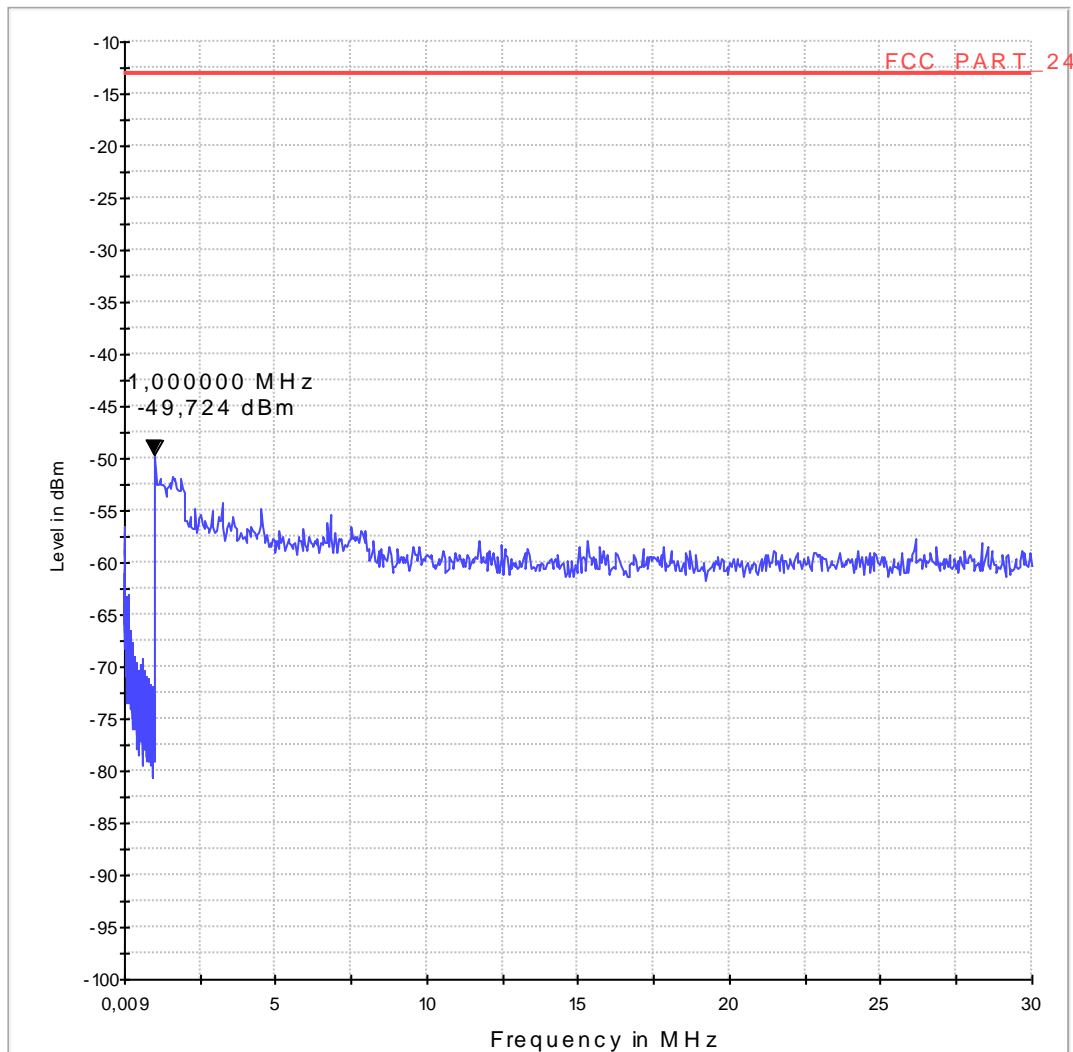


Diagram No.: 10_PCS_RSE_19G_H

Common Information

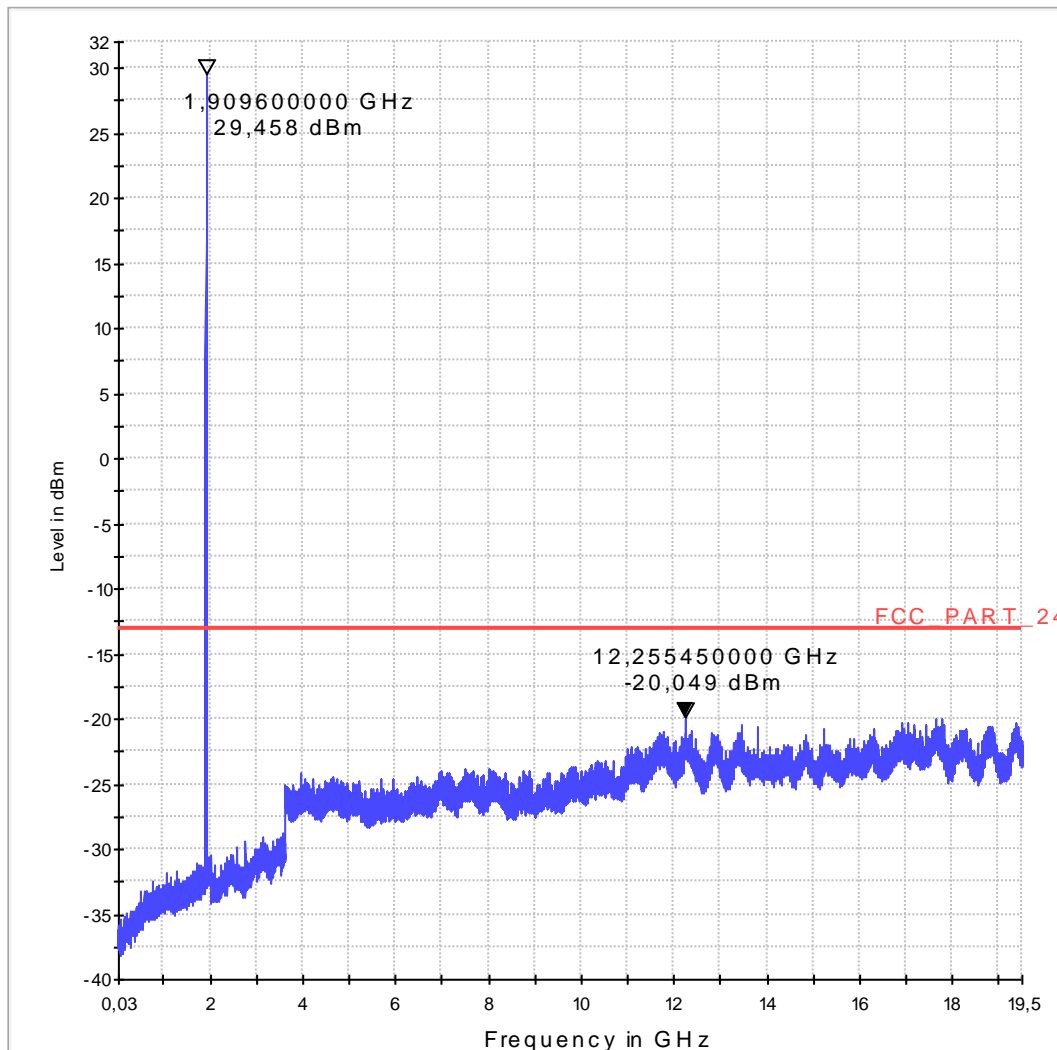
Test Description: TX Spurious Emission conducted
Test Site: Radio laboratory 1
Test Standard: FCC Part 24.238 RSS-133

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

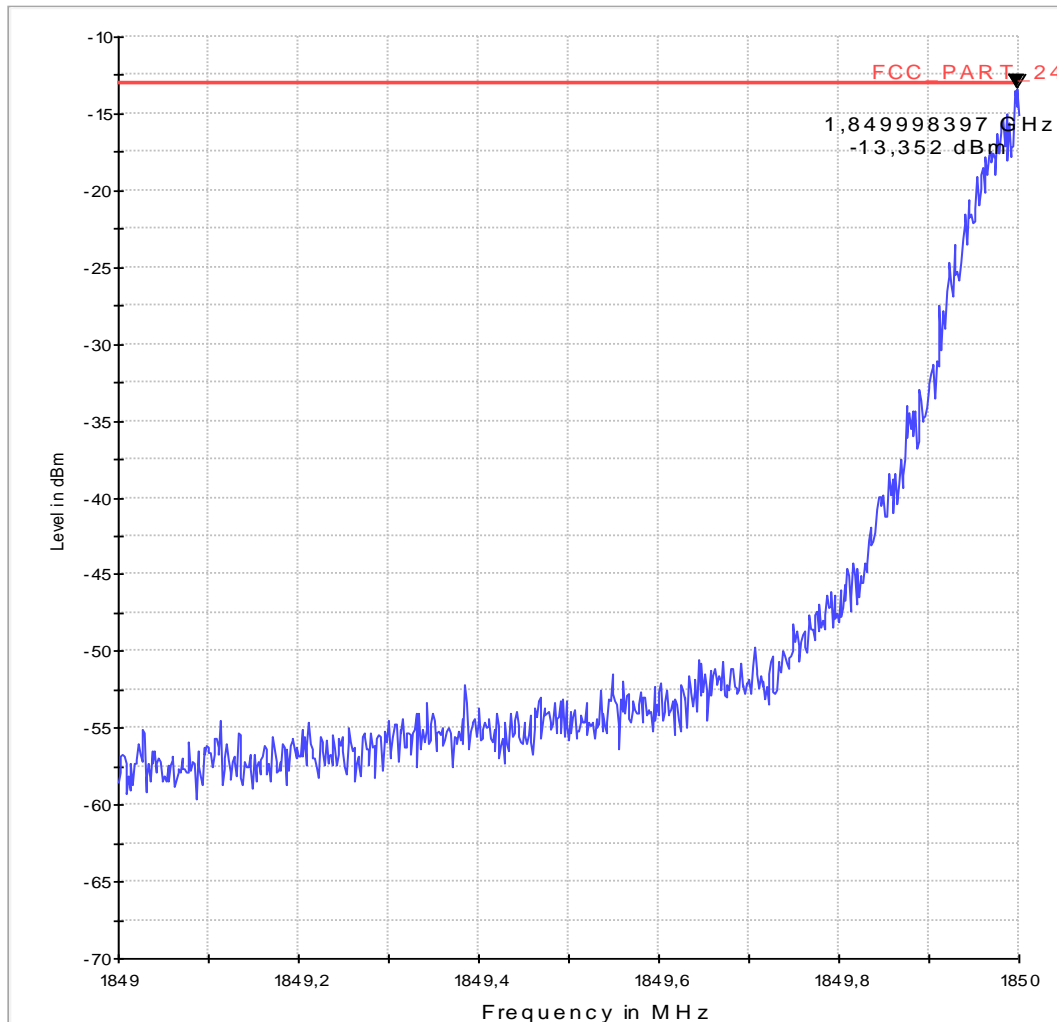


Diagram No. 14.06_PCS_BE_AV_H

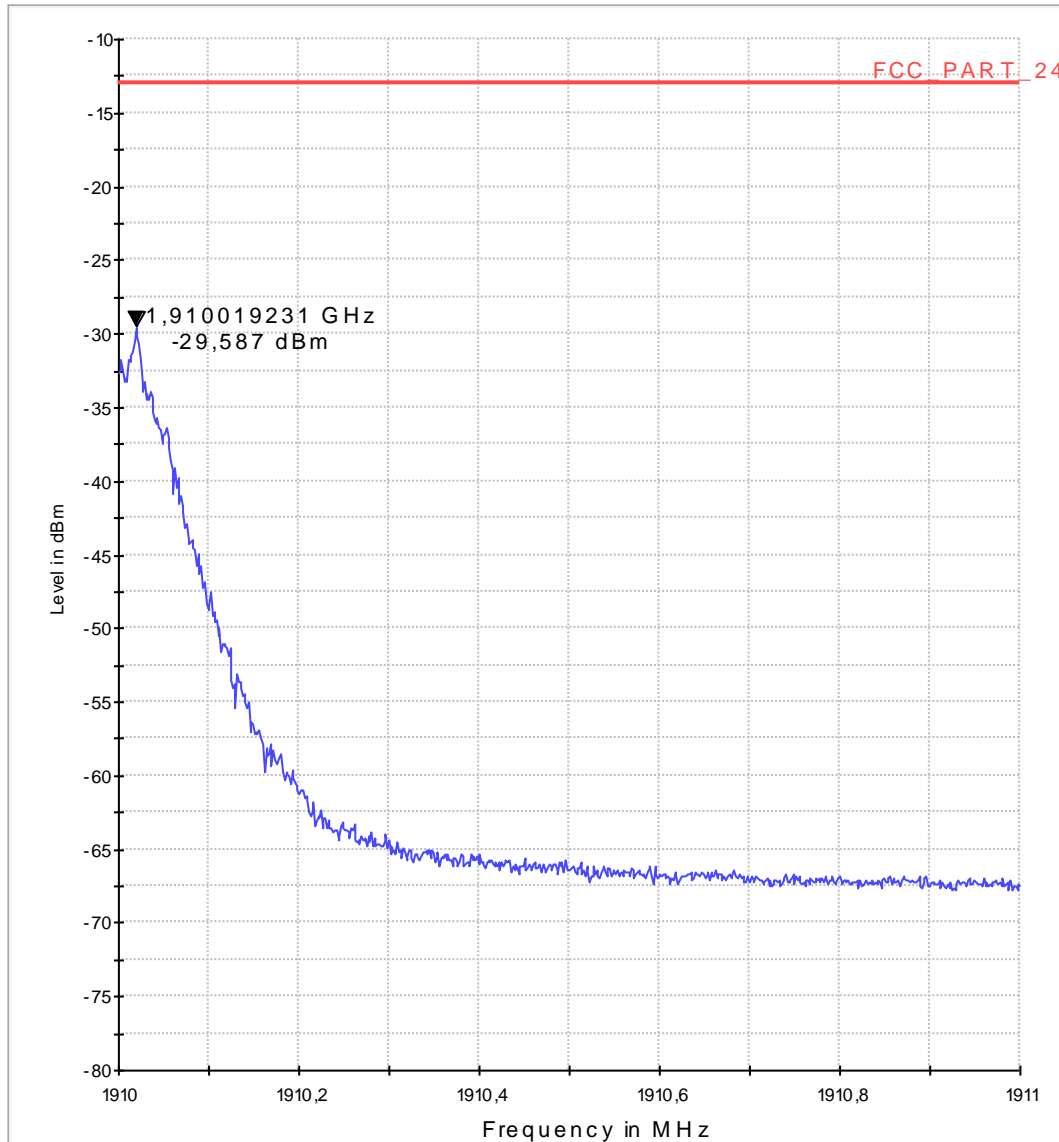
Common Information

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

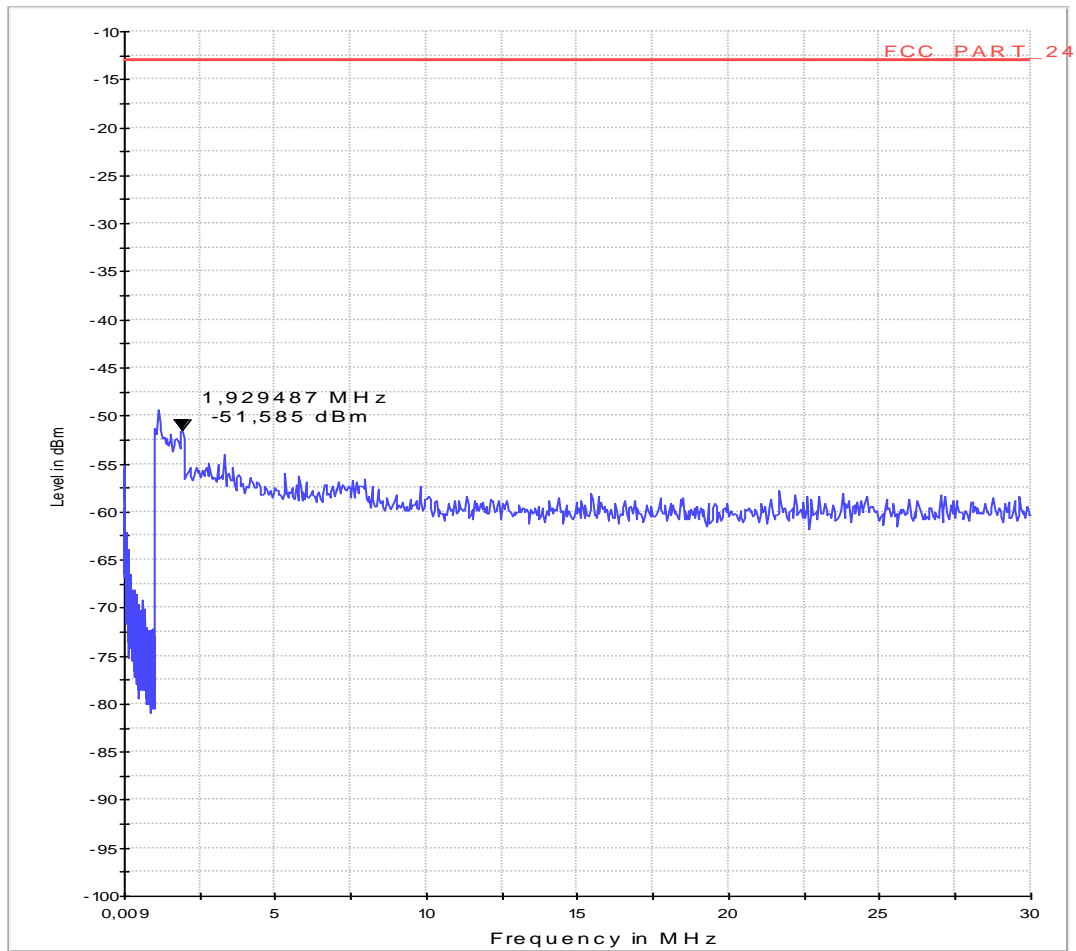


Diagram No.: 12.10_Sweep2

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

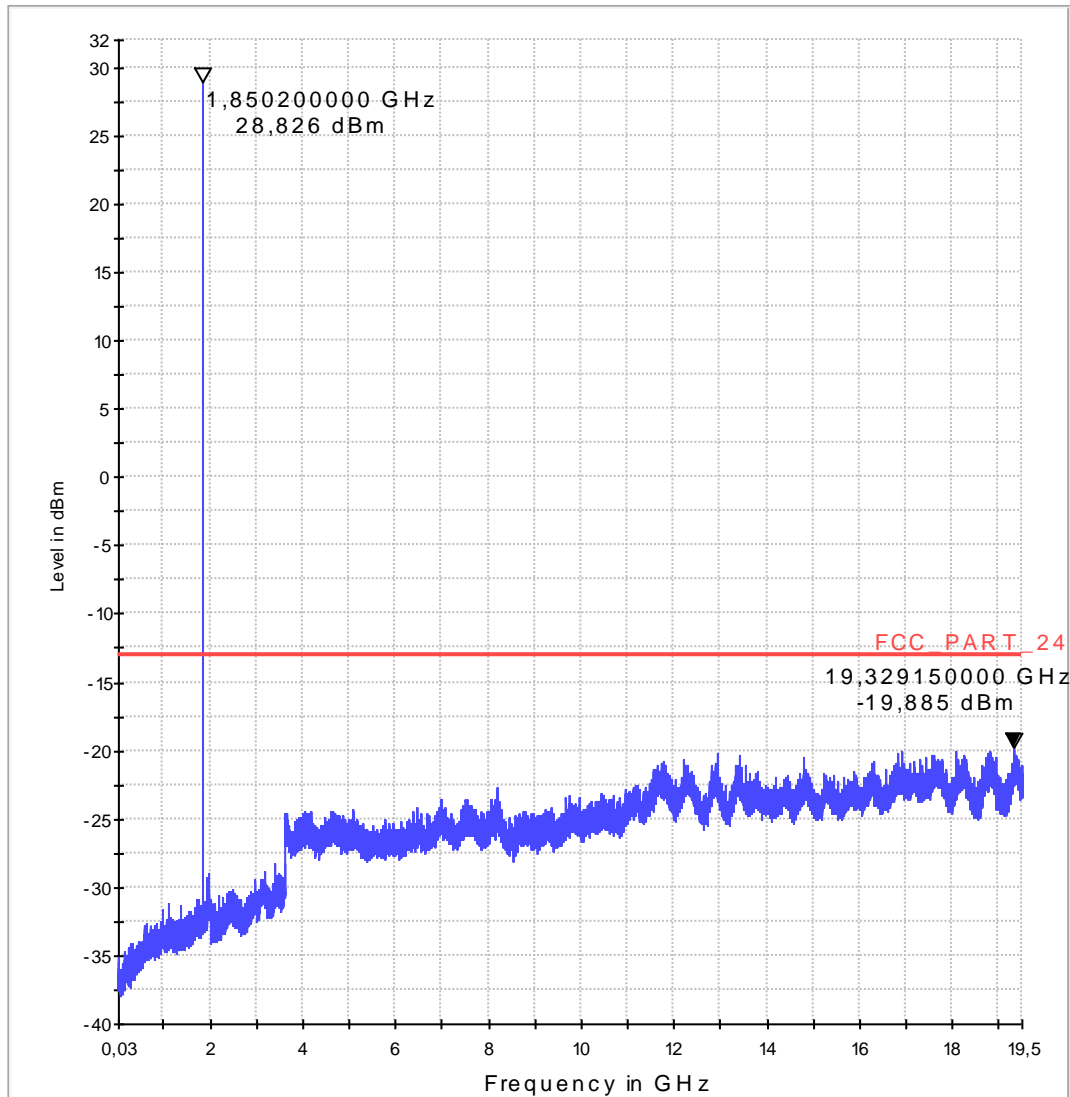


Diagram No.: 12.11_Sweep1

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

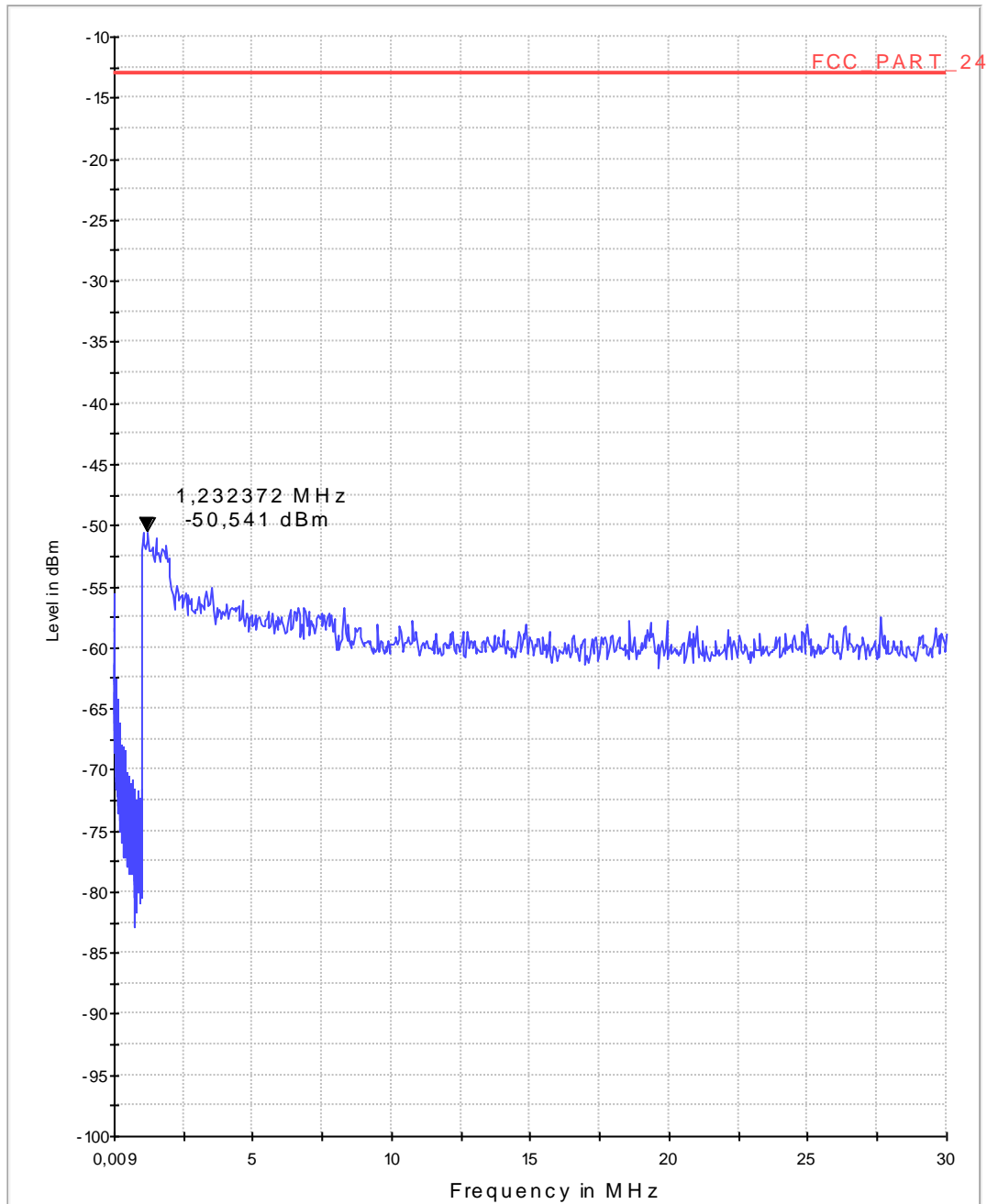


Diagram No.:12.11_Sweep2

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

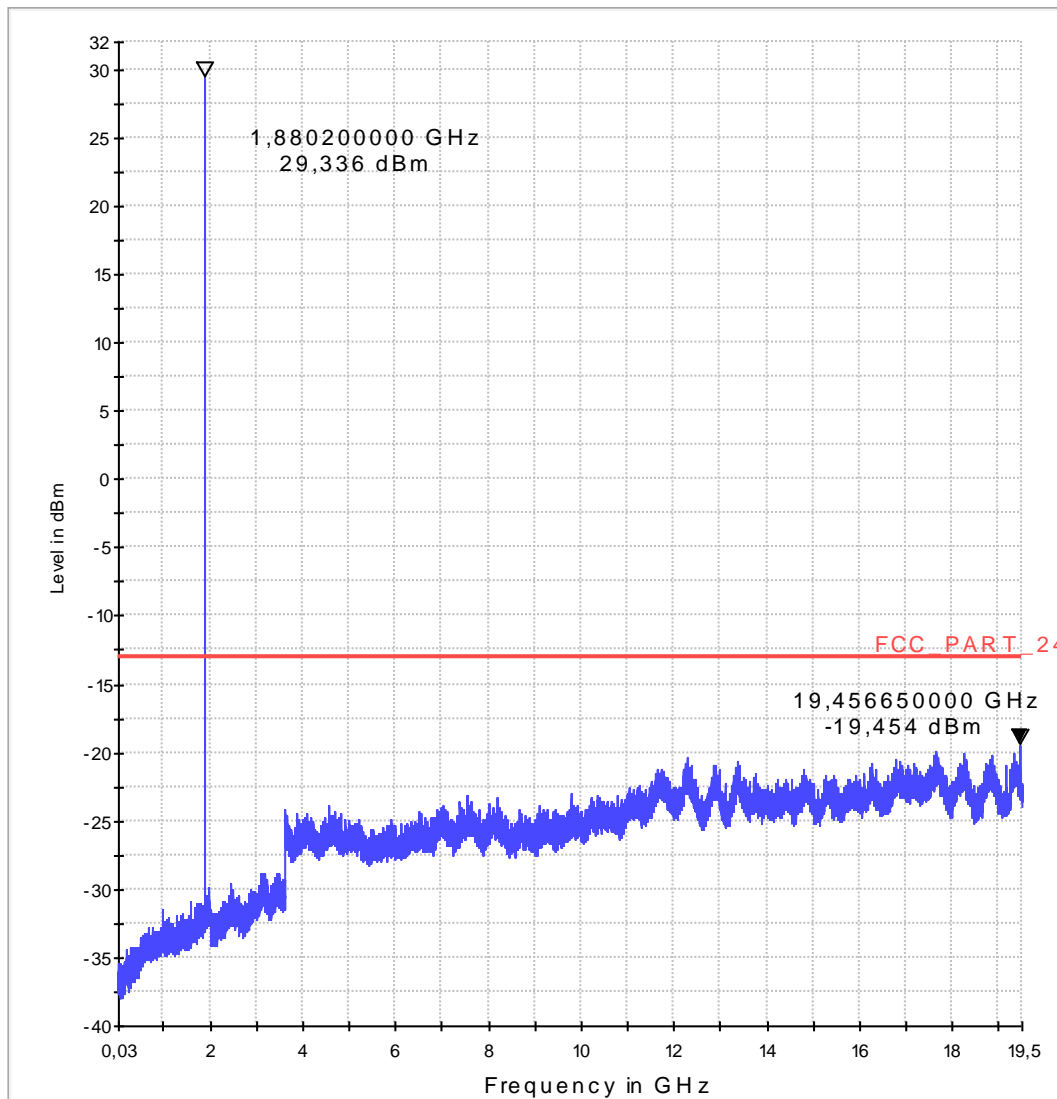


Diagram No.: 12.12_Sweep1

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

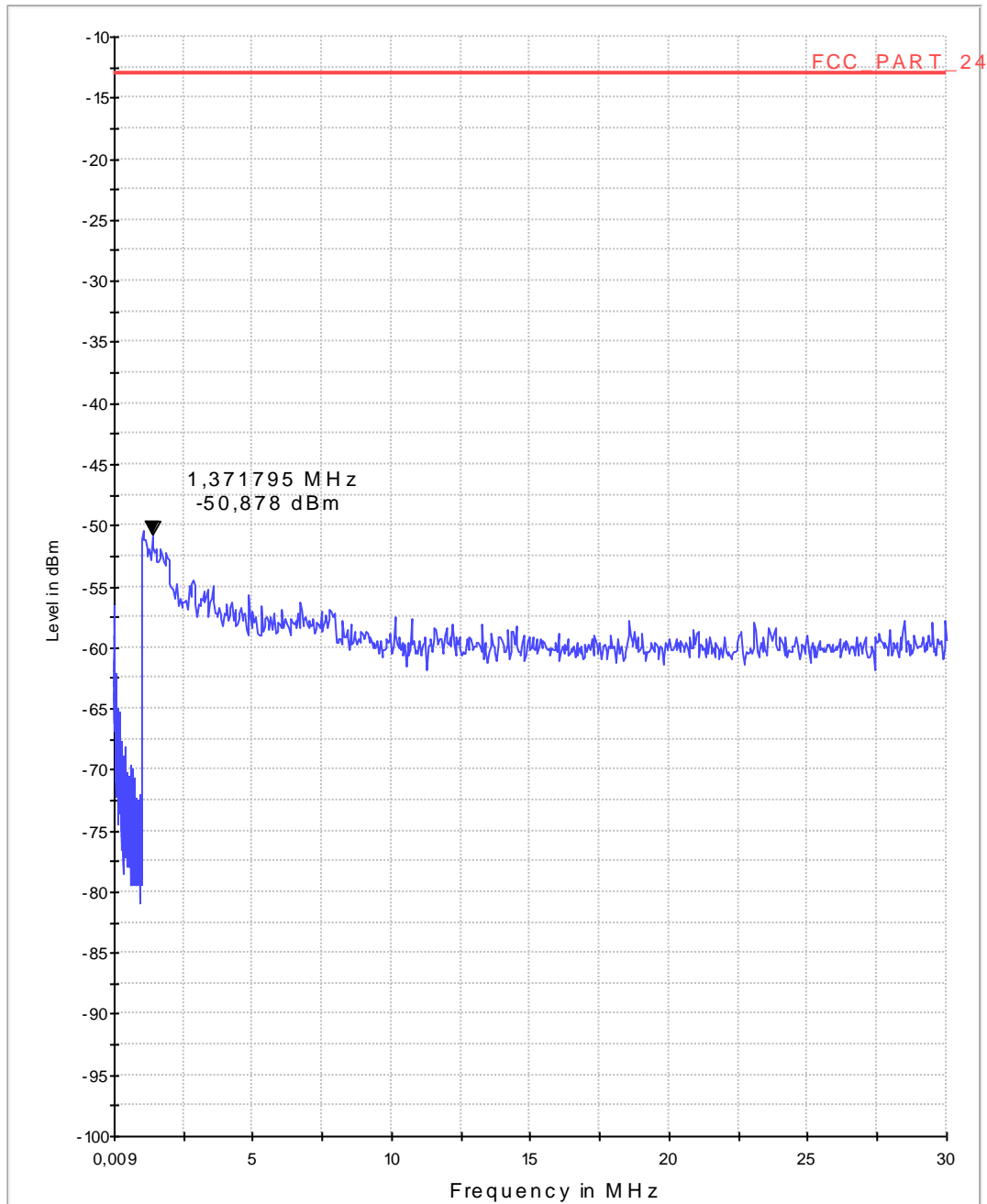
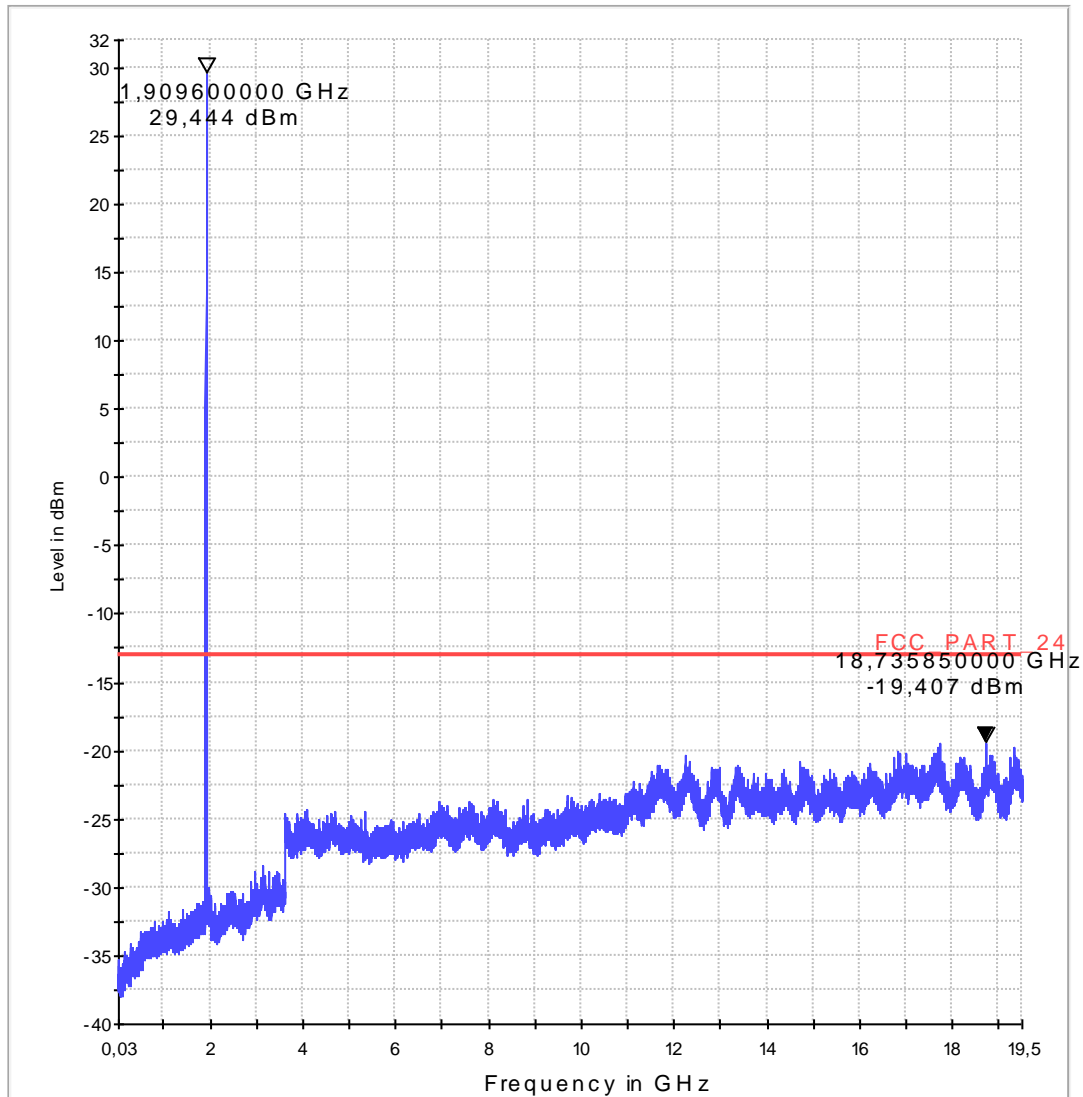


Diagram No.: 12.12_Sweep2

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

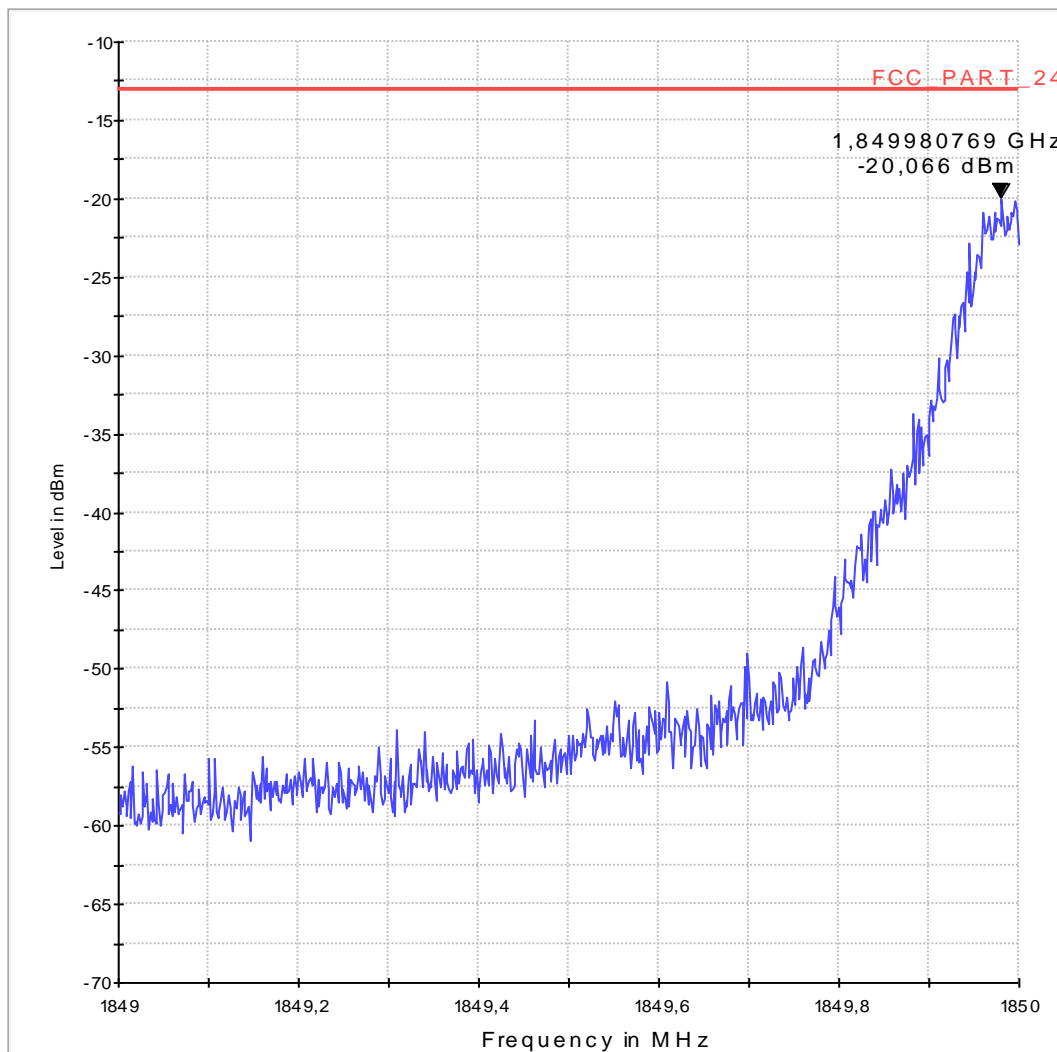


Diagram No. 14.08

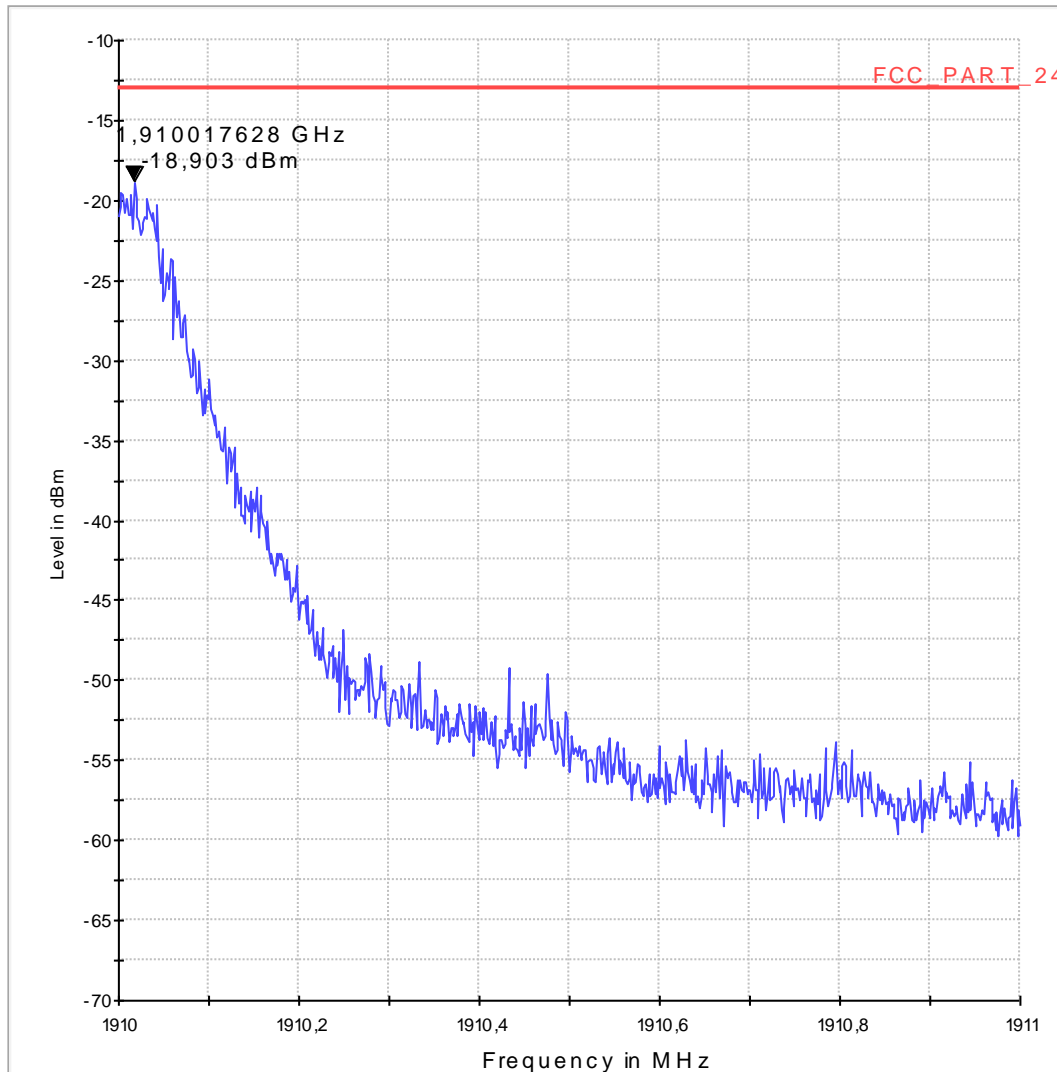
Common Information

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

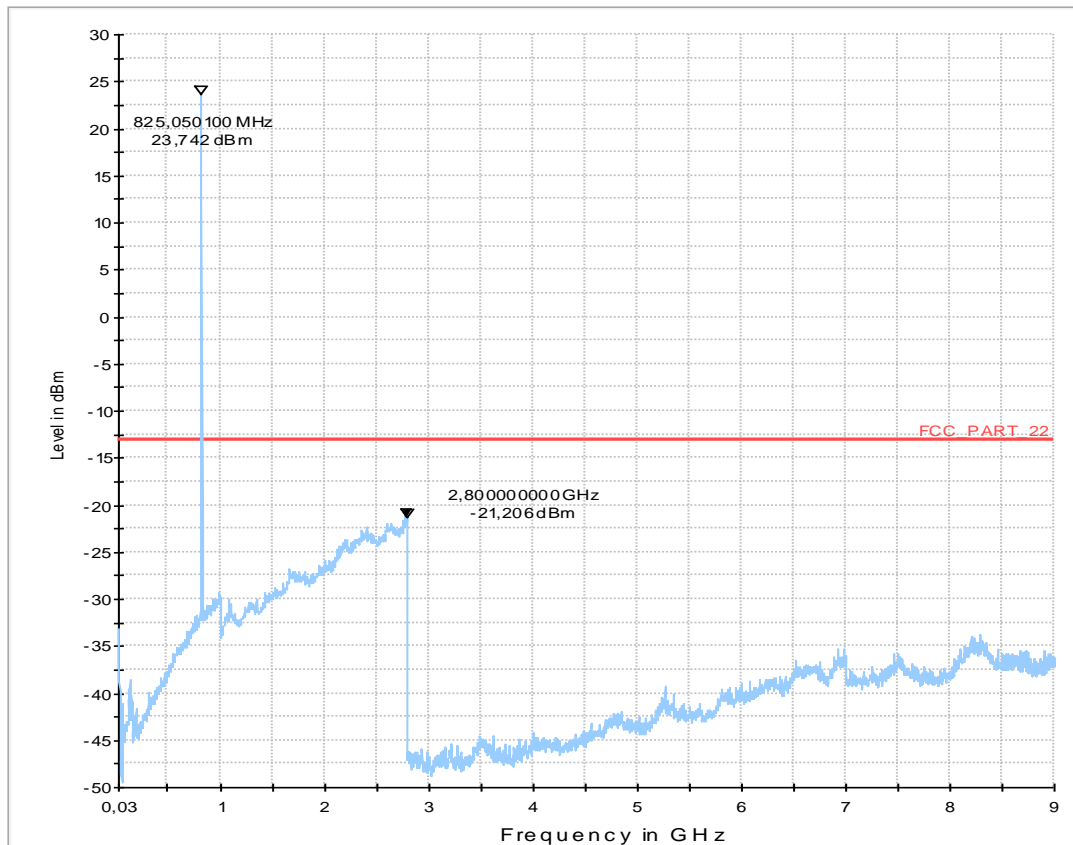


Diagram 8.02_RSE

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

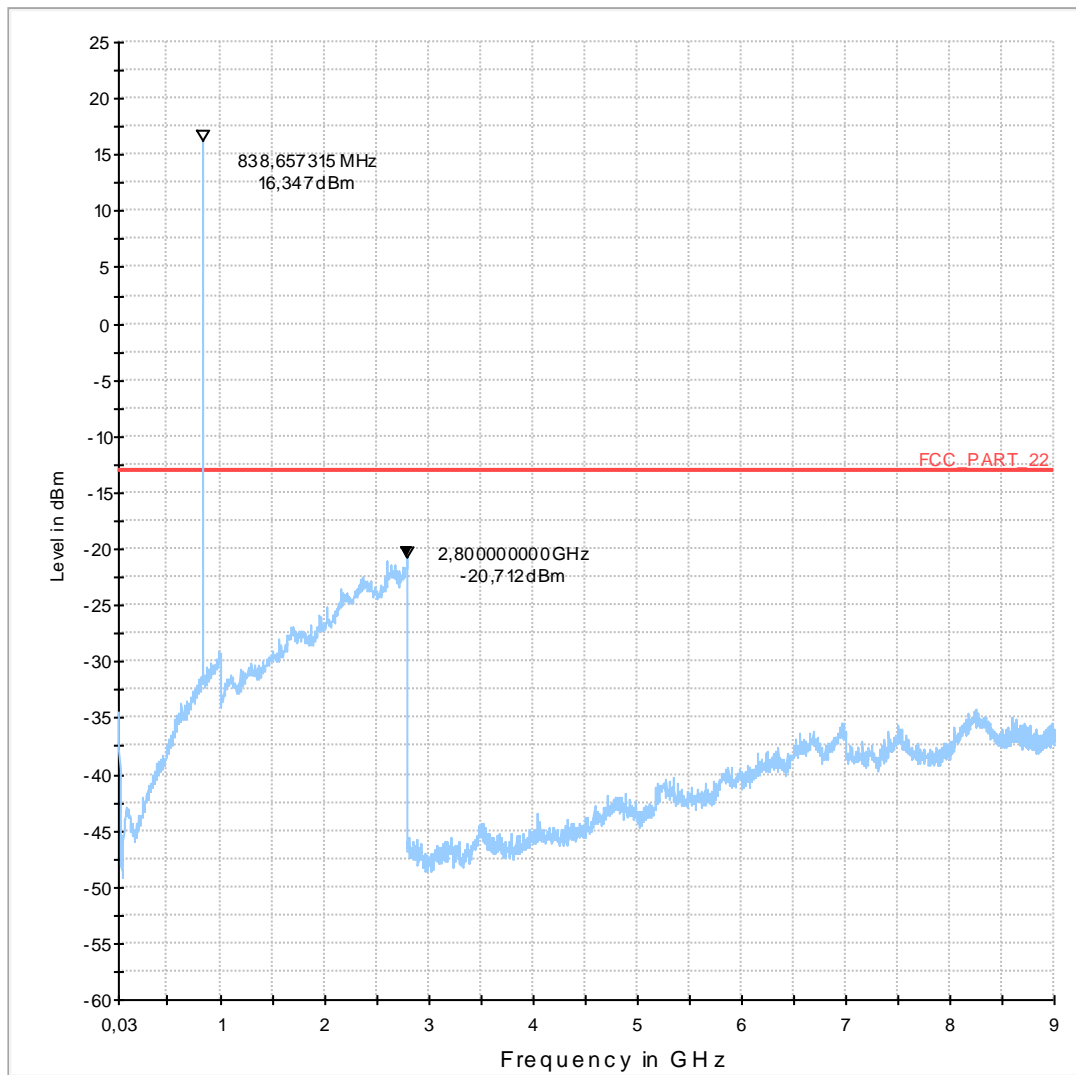


Diagram 8.03_RSE_Voice

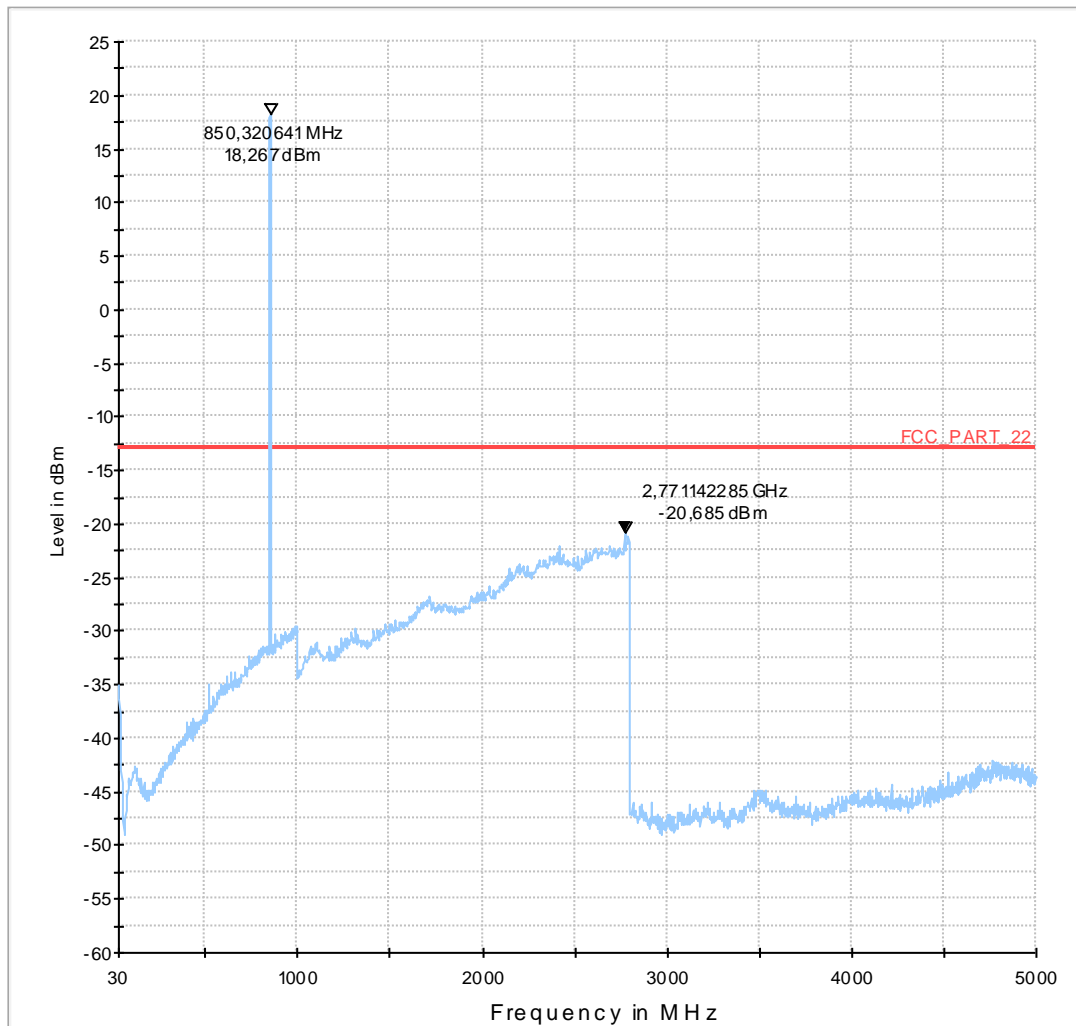
Common Information

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

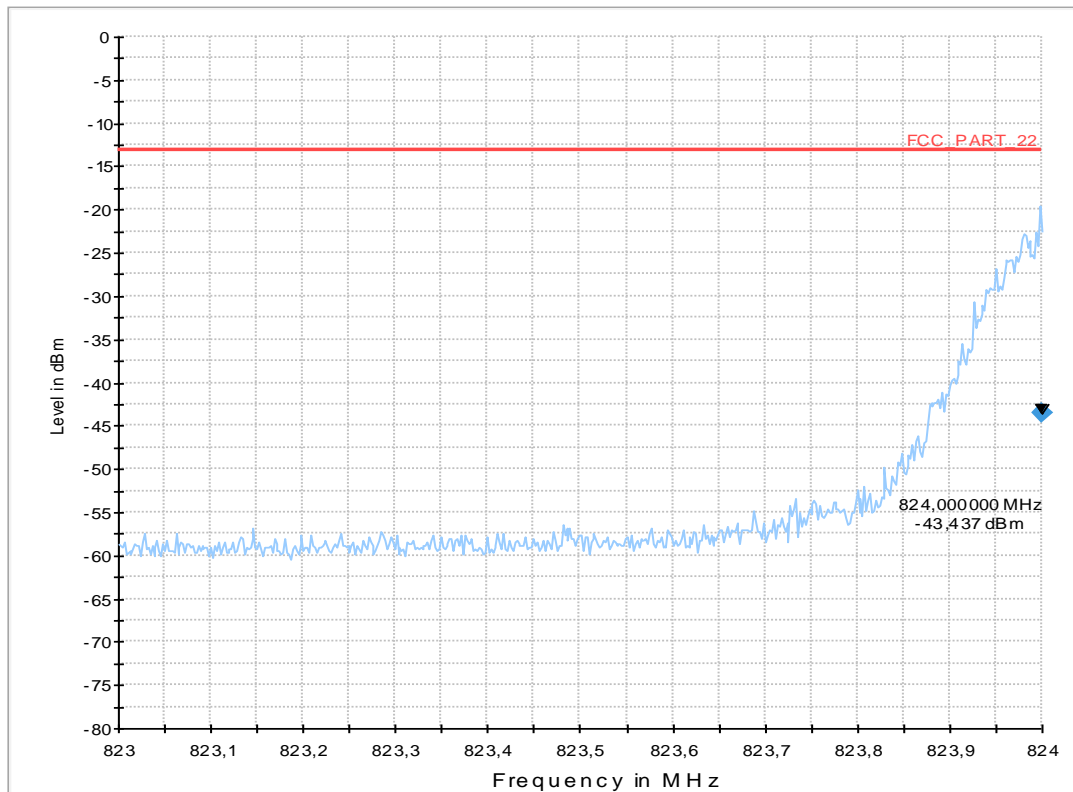


Diagram 8.03_BE_VOICE

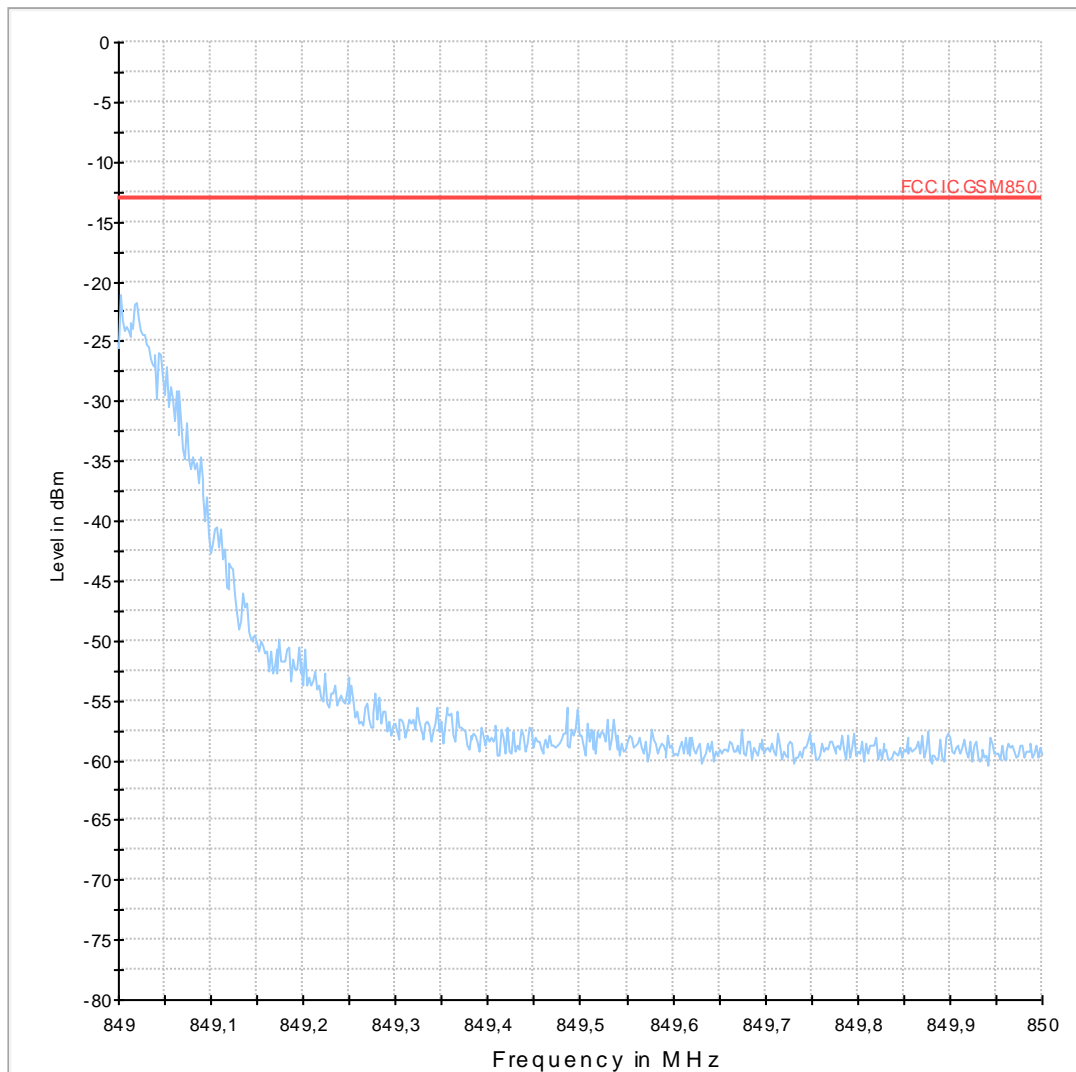
Common Information

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

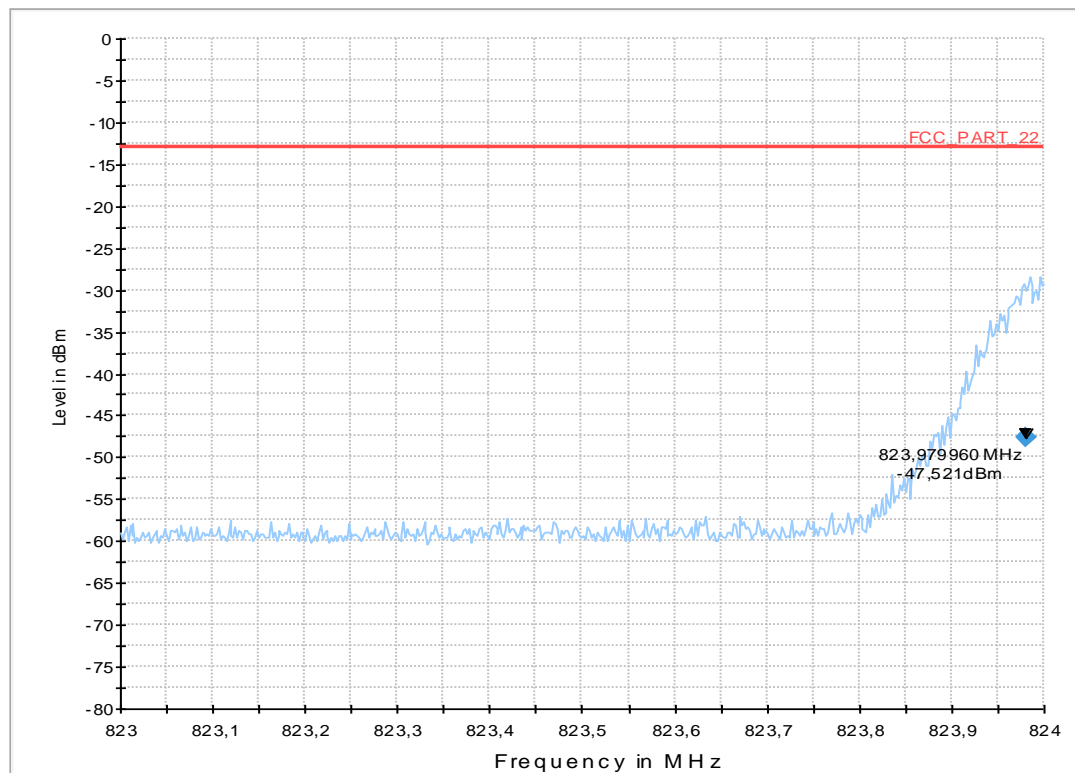


Diagram 8.09_BE_EDGE

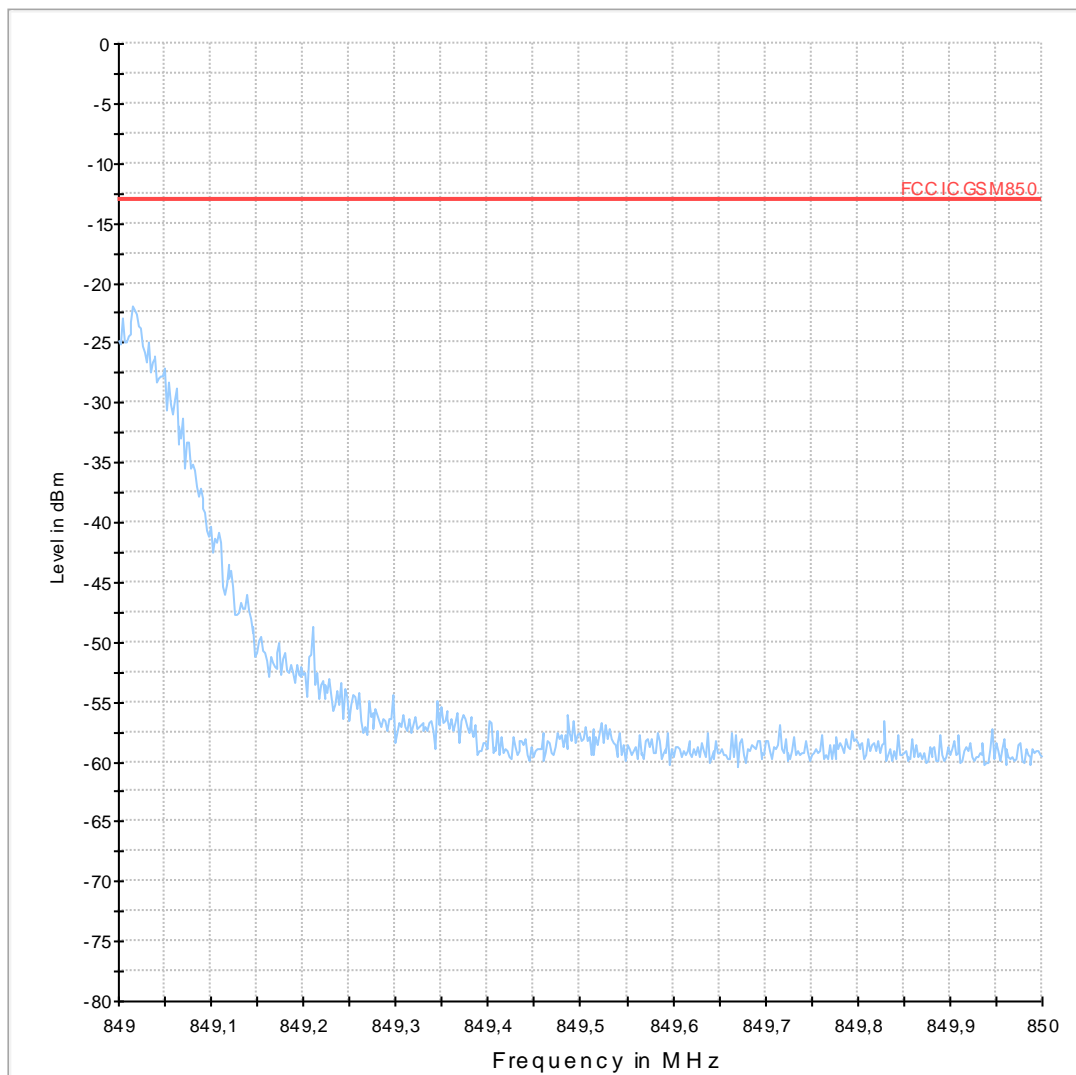
Common Information

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

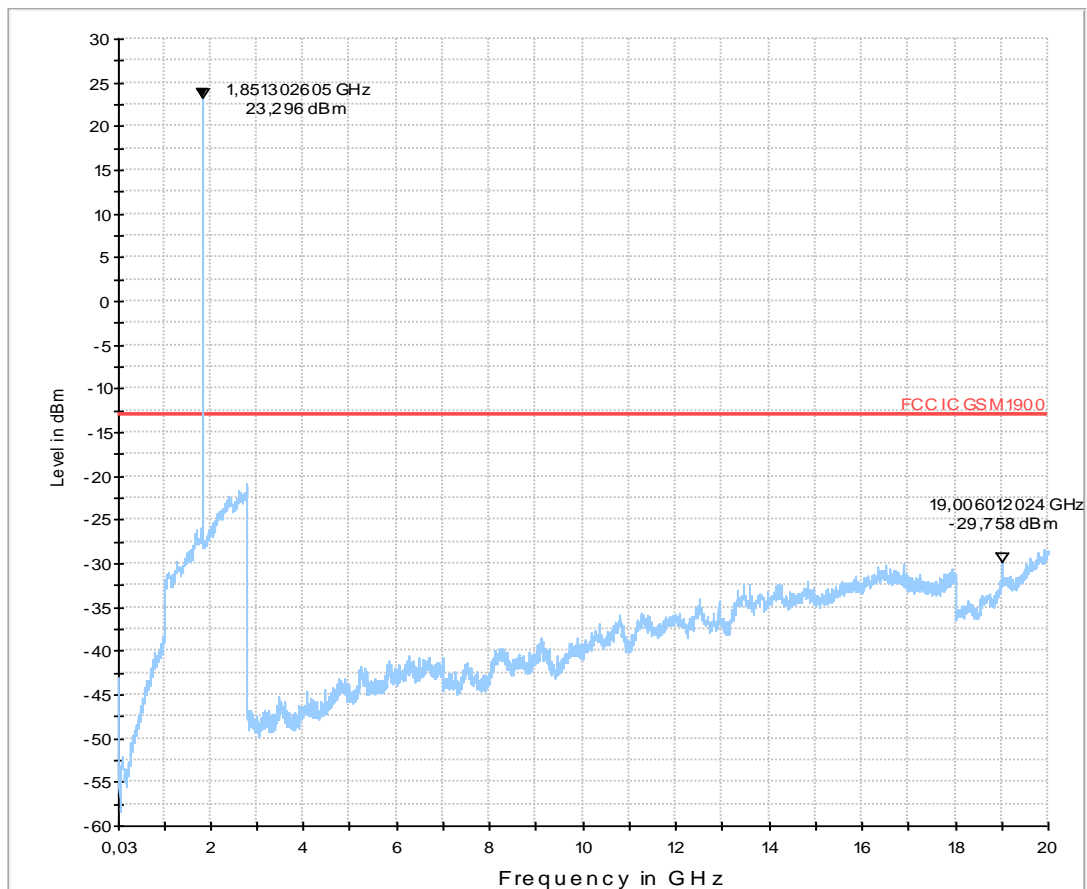


Diagram 8.08_RSE_EDGE

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

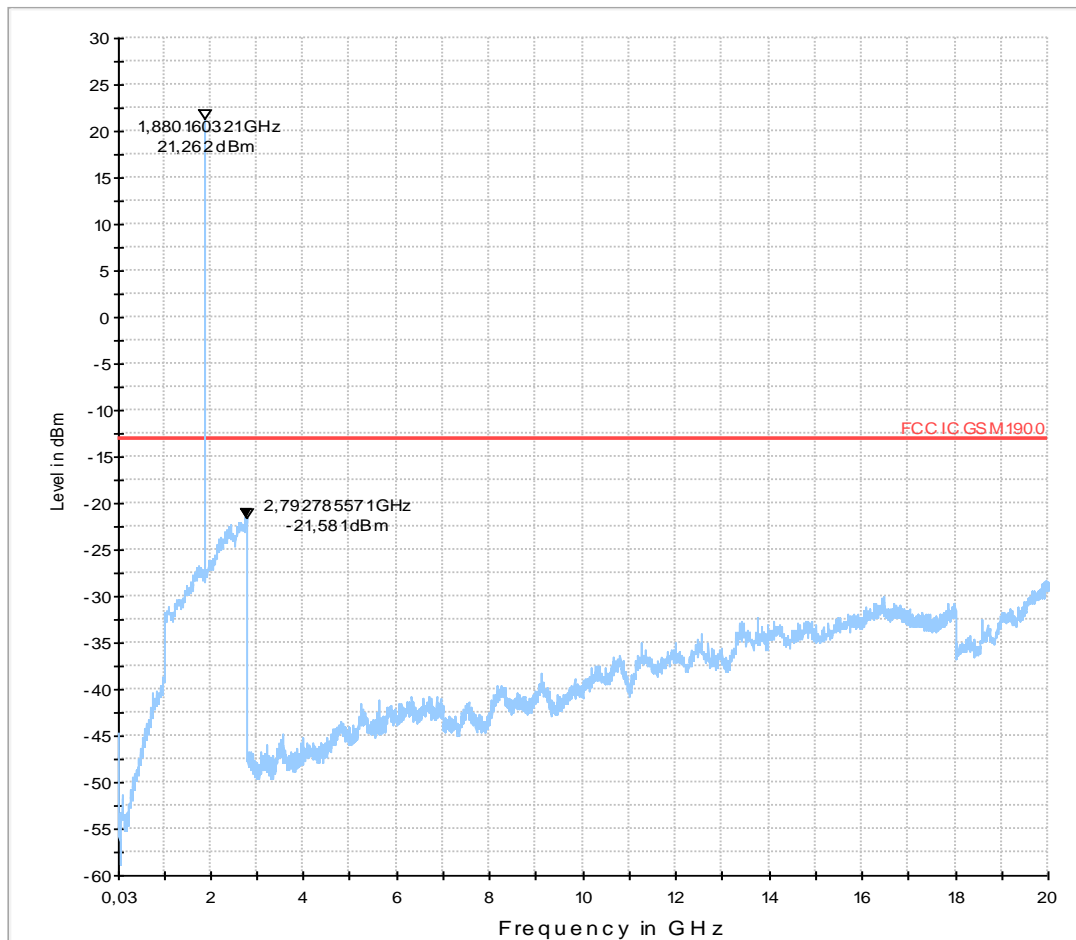


Diagram 8.09_RSE_EDGE

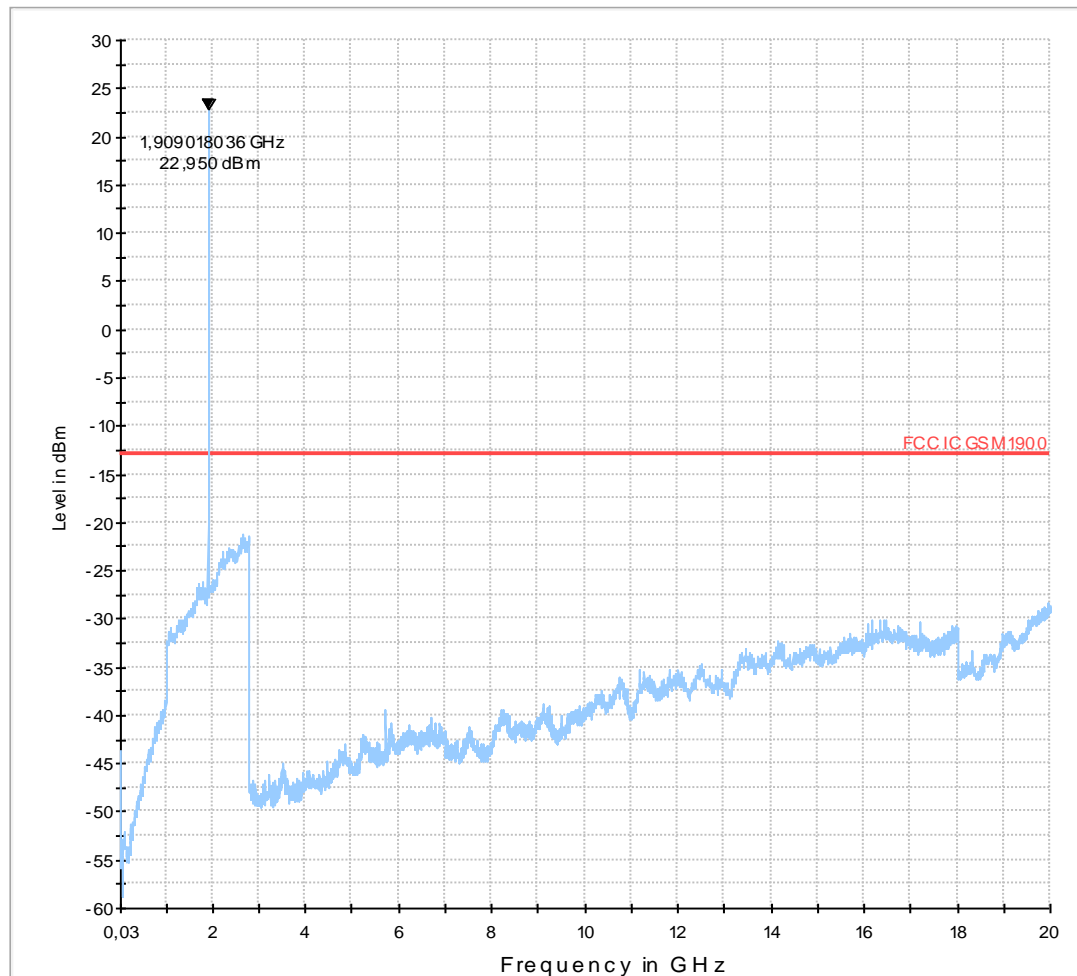
Common Information

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

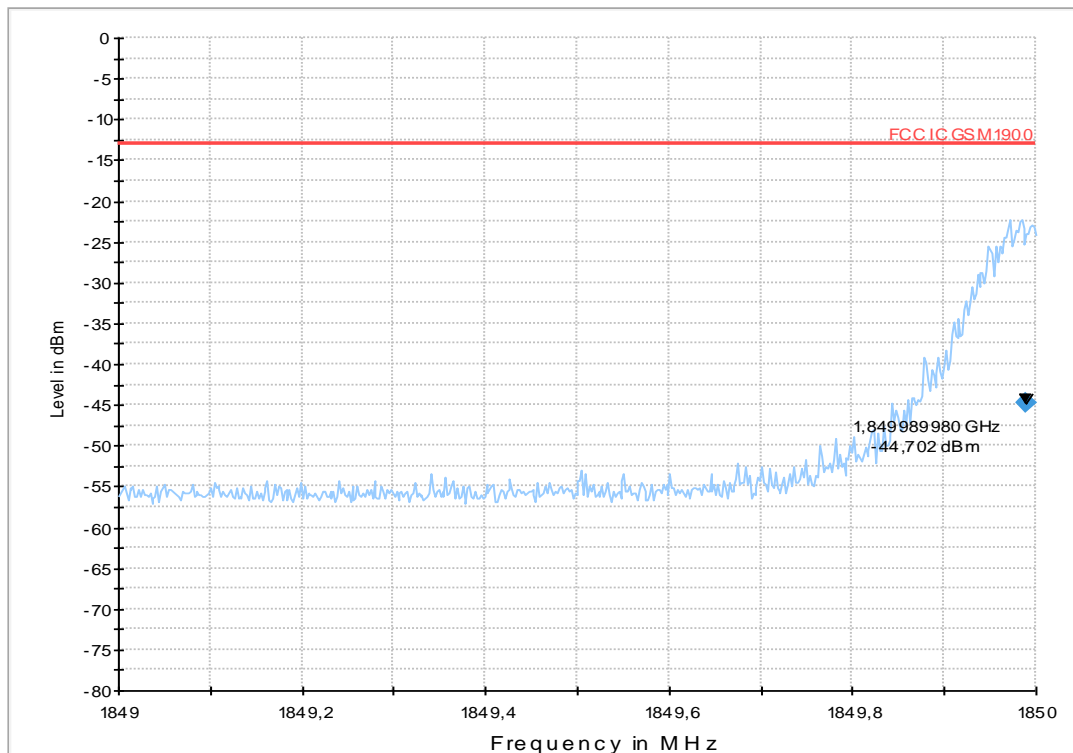


Diagram 8.03_BE_Voice

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

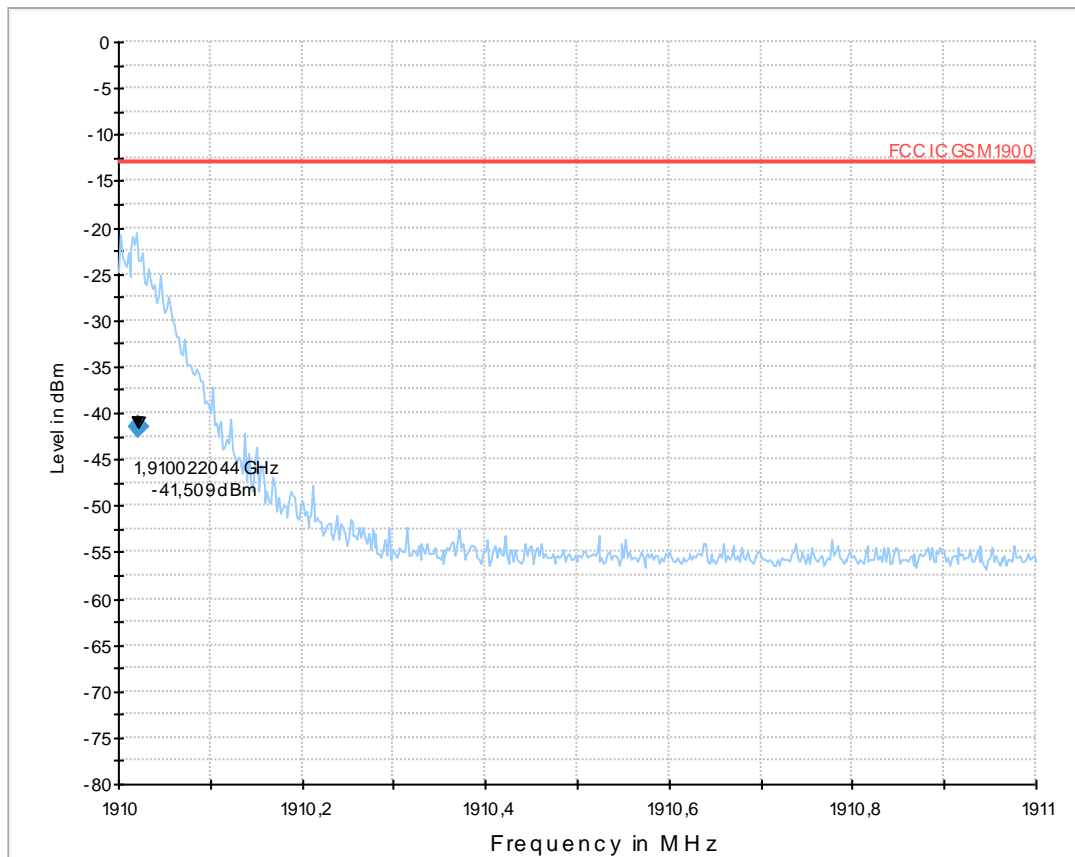
EUT Information

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

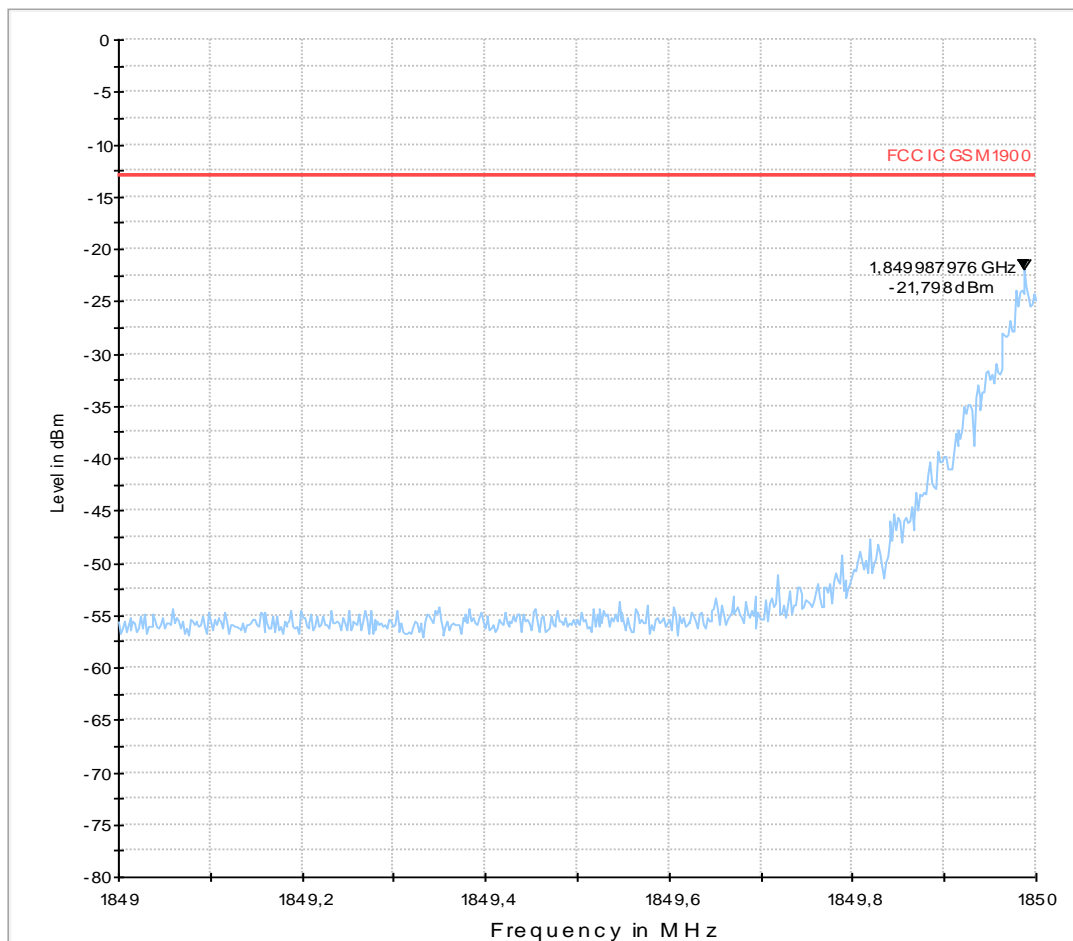


Diagram 8.09_BE_EDGE

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

