

## Annex 1: Measurement diagrams 18-1-0097202T01a-A1

<b>Number of pages:</b>	35	<b>Date of Report:</b>	2021-May-31
<b>Testing company:</b>	CETECOM GmbH Im Teelbruch 116 45219 Essen Germany Tel. + 49 (0) 20 54 / 95 19-0 Fax: + 49 (0) 20 54 / 95 19-150	<b>Applicant:</b>	ACTIA Nordic AB
<b>Product:</b>	Telematics Device		
<b>Model:</b>	103360002		
<b>FCC ID:</b>	2AGKK103360002	<b>IC:</b>	20839-103360002

<b>Testing has been carried out in accordance with:</b>	Title 47 CFR, Chapter I FCC Regulations, Subchapter B Part 22, Part 24, Part 27  RSS-132, Issue 3; RSS-133, Issue 6; RSS-130, Issue 2; RSS-139, Issue 3 Deviations, modifications or clarifications (if any) to above mentioned documents are written in each section under "Test method and limit".
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# 1 Measurement diagrams

## 1.1 GSM+ Wifi 2.4GHz

### 8.01a\_simul\_GSM850\_WLAN2G4\_standing

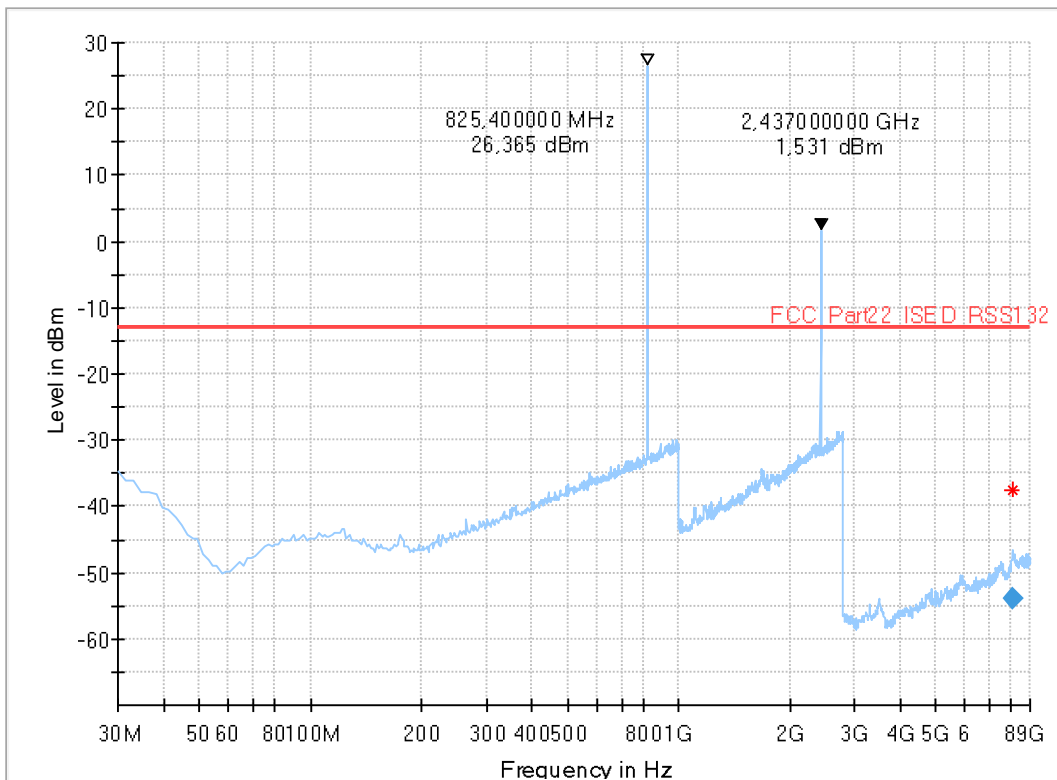
#### Common Information

Test Description:	Radiated emission related to 1m
Test Site:	Fully Anechoic Chamber (FAC1) - EMC32 V10.50.0
Test Standard:	FCC FCC Part 24.238 Broadband PCS
Antenna polarisation:	vertical / horizontal
Operating Mode:	WLAN ch6_2437GHz 6Mbps pwr_13 ext.Ant   GSM850 ch128_824,2MHz
Operator:	TFra
Environmental Conditions:	Humidity : 44%rH; Temperature: 20°C
EUT Setup:	1
Verdict:	Passed

#### EUT Information

PMT number:	18-1-00972S20_C02
Manufacturer:	ACTIA Nordic AB

Full Spectrum



Remark: Peak at 2437 MHz is the WLAN 2.4 GHz carrier and peak at 825 MHz is the GSM850 carrier

#### Final Result

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin	Meas. Time (ms)	Bandwidth (MHz)	Height	Pol	Azimuth (h)	Elevation (n)	Corr. (dB)
8092.291667	-53.90	-13.00	40.90	100.0	100.000	155.0	H	170.0	0.0	-80

# 8.01b\_simul\_GSM850\_WLAN2G4\_standing

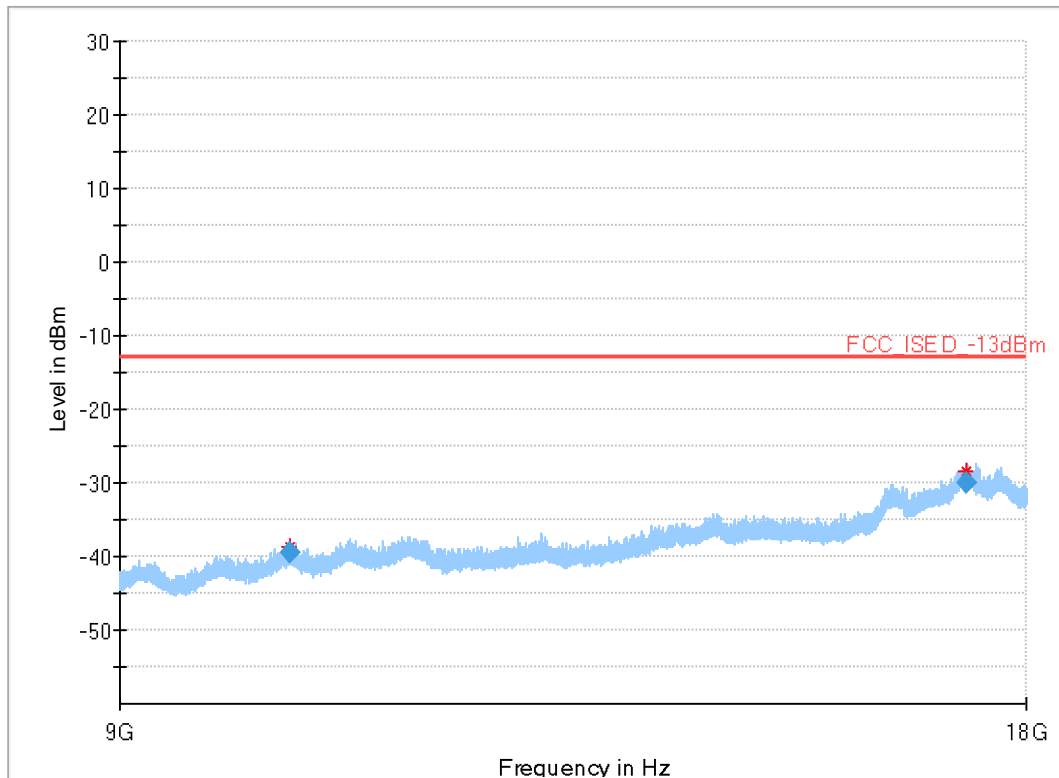
## Common Information

Test Description:	Radiated emission
Test Site:	Fully-Anechoic Chamber
Test Standard:	FCC FCC Part 27.53(h) AWS emission limits / RSS-139, Issue 3
Antenna polarisation:	vertical / horizontal
Measurement software version	EMC32 V10.50.0
Operating Mode:	WLAN ch6_2437GHz 6Mbps pwr_13 ext.Ant   GSM850 ch128
Operator:	TFra
Comment:	
EUT Setup:	1
Verdict:	Passed

## EUT Information

PMT number:	18-1-00972S20_C02
Manufacturer:	ACTIA Nordic AB

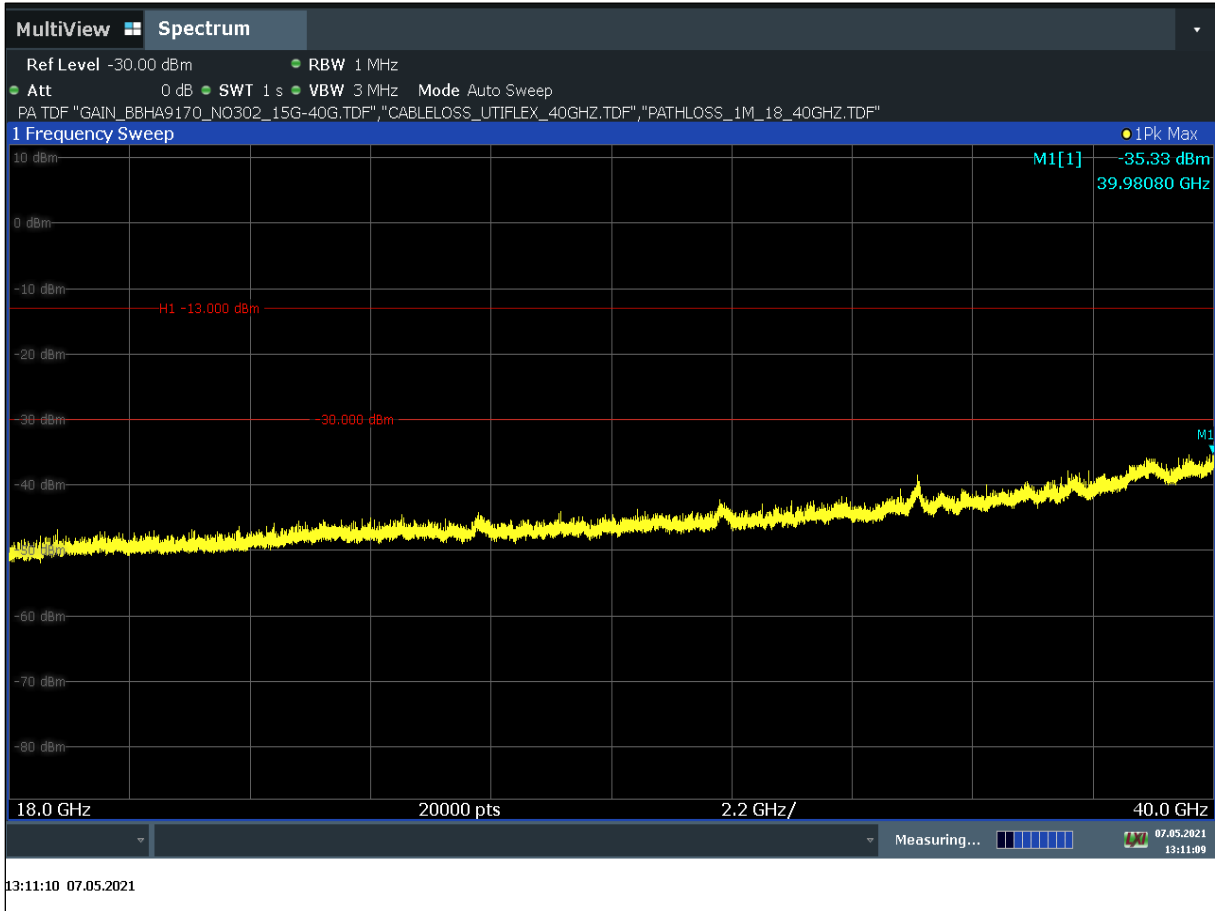
Full Spectrum



## Final Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin	Meas. Time (ms)	Bandwidth (Hz)	Height	Pol	Azimuth	Elevation	Corr. (dB)
10257.601667	-39.54	-13.00	26.54	100.0	1000.000	155.0	V	255.0	0.0	-76
17191.261667	-30.09	-13.00	17.09	100.0	1000.000	155.0	V	345.0	0.0	-65

### 8.01c\_simul\_GSM850\_WLAN2G4\_standing



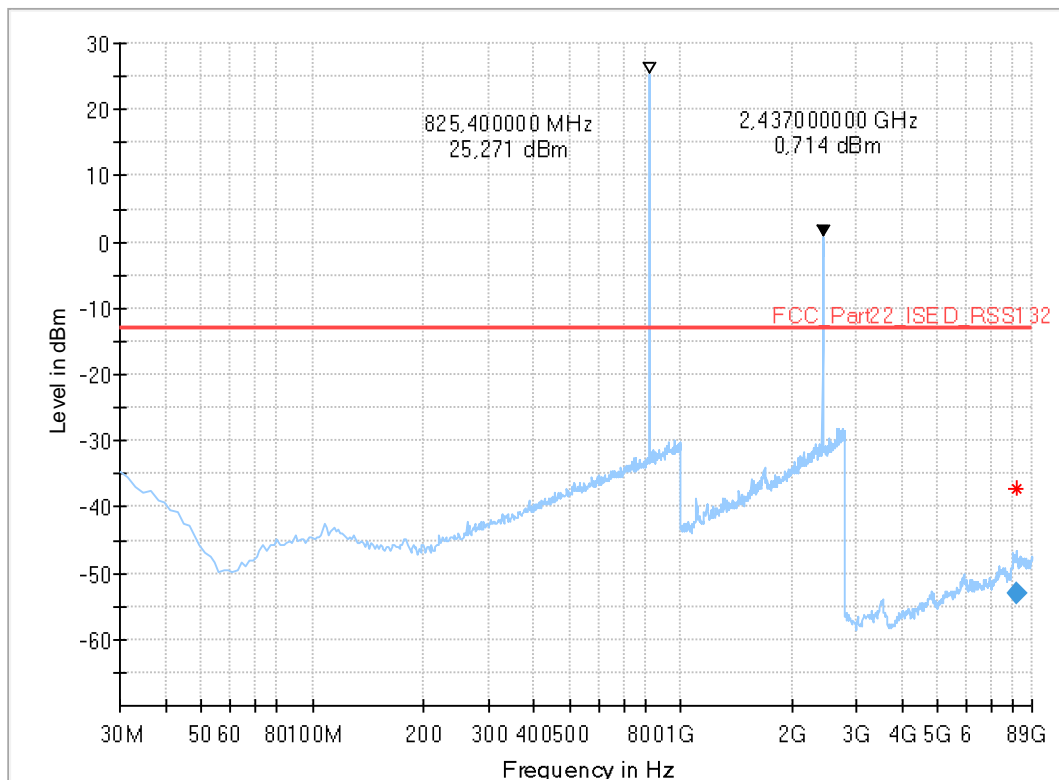
# 8.02a\_simul\_GSM850\_WLAN2G4\_laying

## Common Information

Test Description: Radiated emission related to 1m  
 Test Site: Fully Anechoic Chamber (FAC1) - EMC32 V10.50.0  
 Test Standard: FCC FCC Part 24.238 Broadband PCS  
 Antenna polarisation: vertical / horizontal  
  
 Operating Mode: WLAN ch6\_2437GHz 6Mbps pwr\_13 ext.Ant | GSM850 ch128  
 Operator: TFra  
 Environmental Conditions: Humidity : 44%rH; Temperature: 20°C  
 EUT Setup: 1  
 Verdict: PassedComment:

## EUT Information

PMT number: 18-1-00972S20\_C02  
 Manufacturer: ACTIA Nordic AB  
 Full Spectrum



Remark: Peak at 2437 MHz is the WLAN 2.4 GHz carrier and peak at 825 MHz is the GSM850 carrier

## Final Result

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin	Meas. Time (ms)	Bandwidth	Height	Pol	Azimuth	Elevation	Corr. (dB)
8138.275000	-53.08	-13.00	40.08	100.0	100.000	155.0	H	219.0	90.0	-80

## 8.02b\_simul\_GSM850\_WLAN2G4\_laying

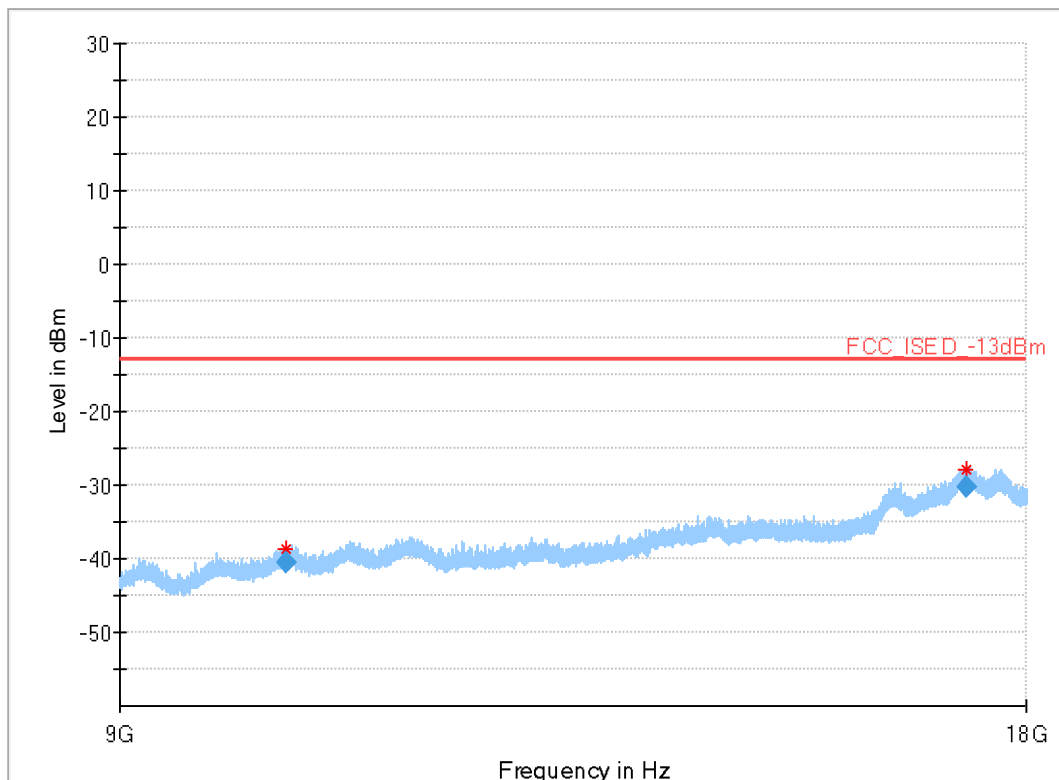
### Common Information

Test Description:	Radiated emission
Test Site:	Fully-Anechoic Chamber
Test Standard:	FCC FCC Part 27.53(h) AWS emission limits / RSS-139, Issue 3
Antenna polarisation:	vertical / horizontal
Measurement software version	EMC32 V10.50.0
Operating Mode:	WLAN ch6_2437GHz 6Mbps pwr_13 ext.Ant   GSM850 ch128
Operator:	TFra
Comment:	
EUT Setup:	1
Verdict:	Passed

### EUT Information

PMT number:	18-1-00972S20_C02
Manufacturer:	ACTIA Nordic AB

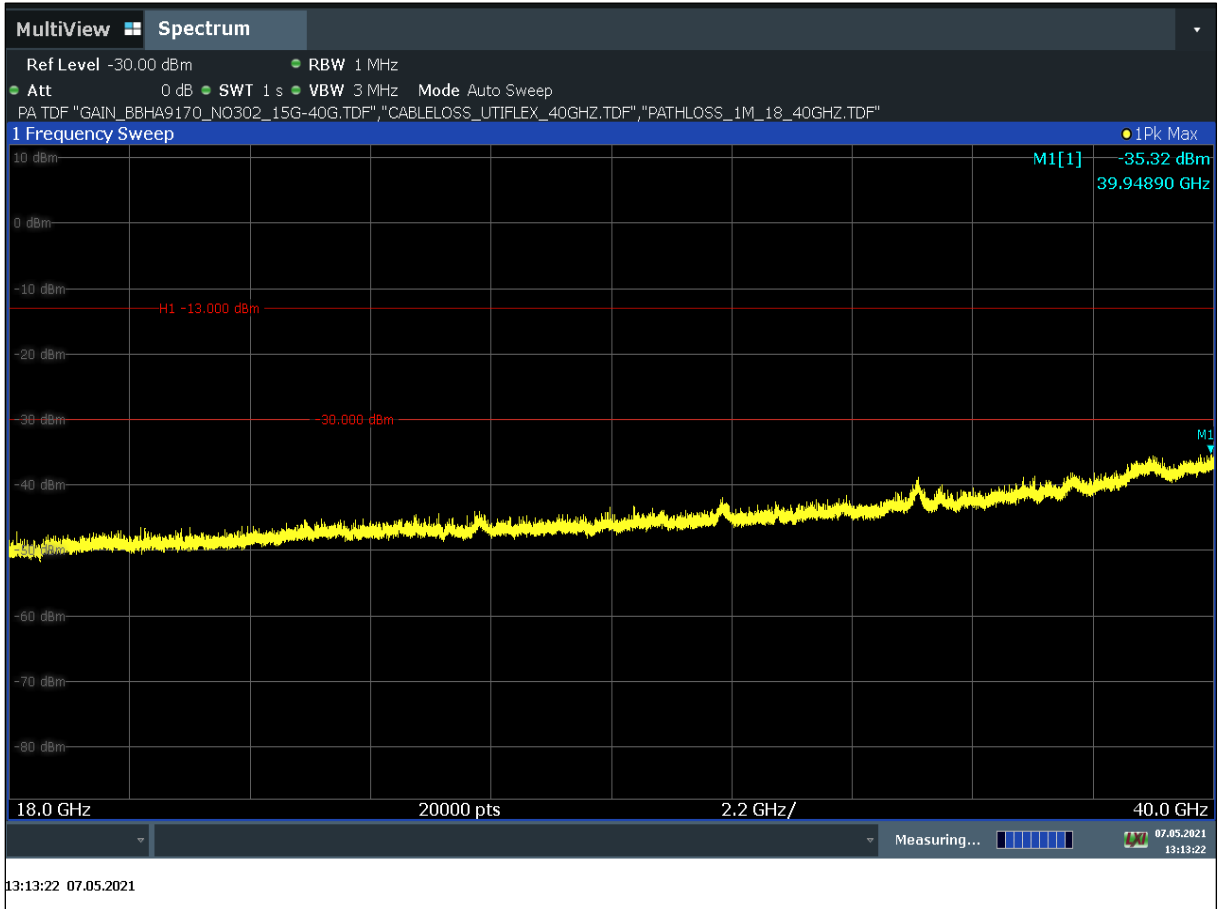
Full Spectrum



### Final Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin	Meas. Time (ms)	Bandwidth (MHz)	Height	Pol	Azimuth	Elevation	Corr. (dB)
10217.836667	-40.41	-13.00	27.41	100.0	1000.000	155.0	H	149.0	0.0	-76.1
17197.233333	-30.16	-13.00	17.16	100.0	1000.000	155.0	H	202.0	90.0	-64.8

### 8.02c\_simul\_GSM850\_WLAN2G4\_laying





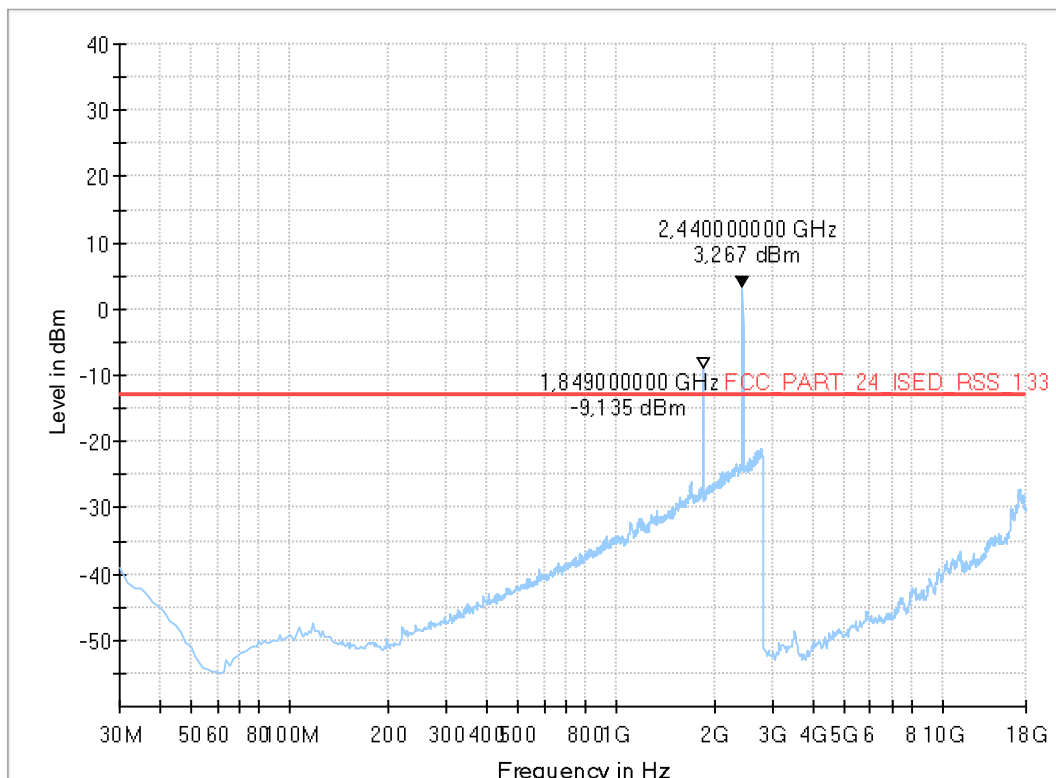
## 8.03a\_Simultaneous\_mode\_GSM1900\_WLAN 2G4\_Operation mode\_2

### Common Information

Test Description:	Radiated emission related to 1m
Test Site:	Fully Anechoic Chamber (FAC1) - EMC32 V10.50.0
Test Standard:	FCC FCC Part 24.238 Broadband PCS
Antenna polarisation:	vertical / horizontal
EUT:	
Manufacturer:	
Operating Mode:	GSM 1800_CH:810   Channel:(6), 2437 MHz, 1 Mbps, 20 MHz, b-mode, pwr=13 ext Ant
Operator:	HEI
Comment:	
Environmental Conditions::	Humidity : 38%rH; Temperature: 18°C
EUT Setup:	1
Verdict:	Passed

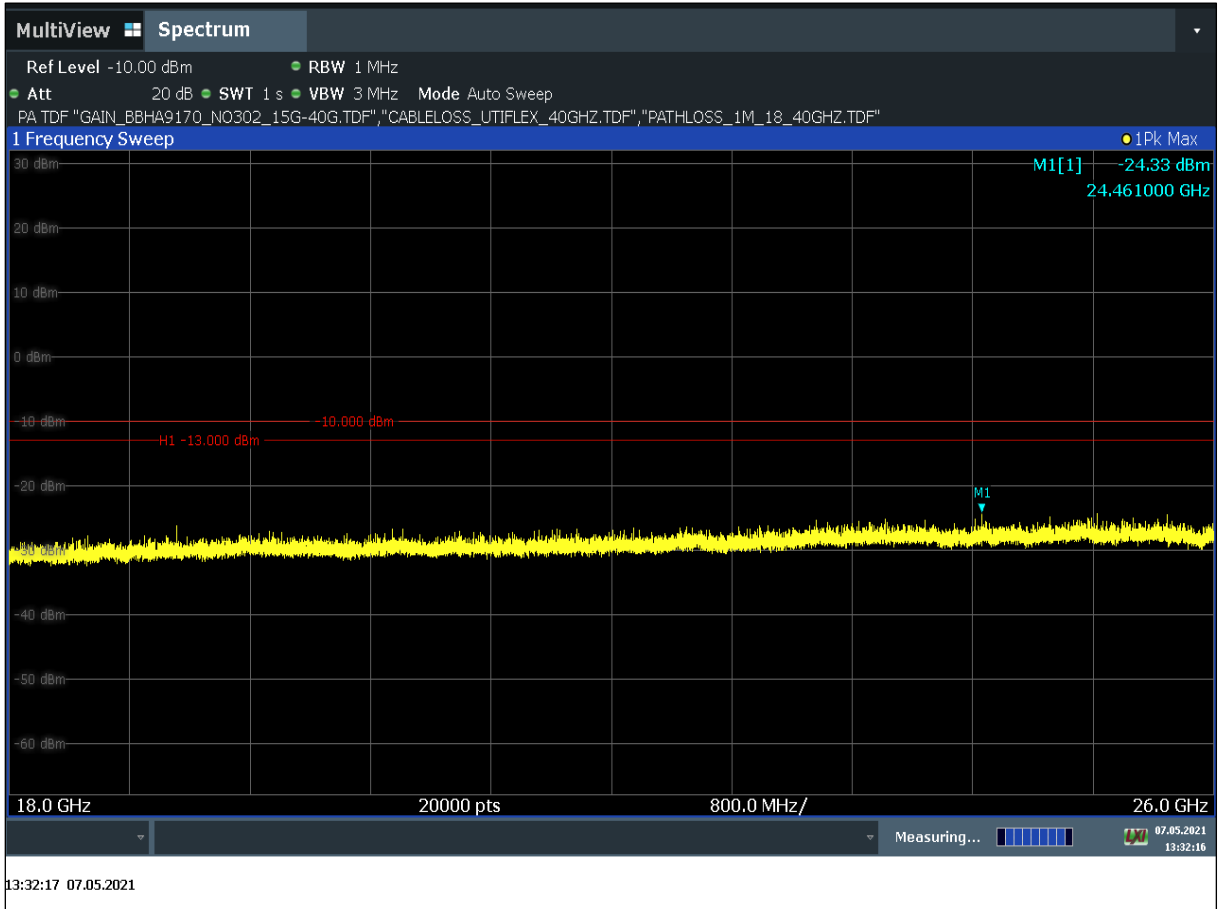
### EUT Information

PMT number:	18-1-00972S20_C02
Manufacturer:	ACTIA Nordic AB
	Full Spectrum



Remark: Peak at 2440 MHz is the WLAN 2.4 GHz carrier and peak at 1849 MHz is the GSM1900 carrier

### 8.03b\_Simultaneous\_mode\_GSM1900\_WLAN 2G4\_Operation mode\_2



## 8.04a\_Simultaneous\_mode\_GSM1900\_WLAN 2G4\_Operation mode\_2

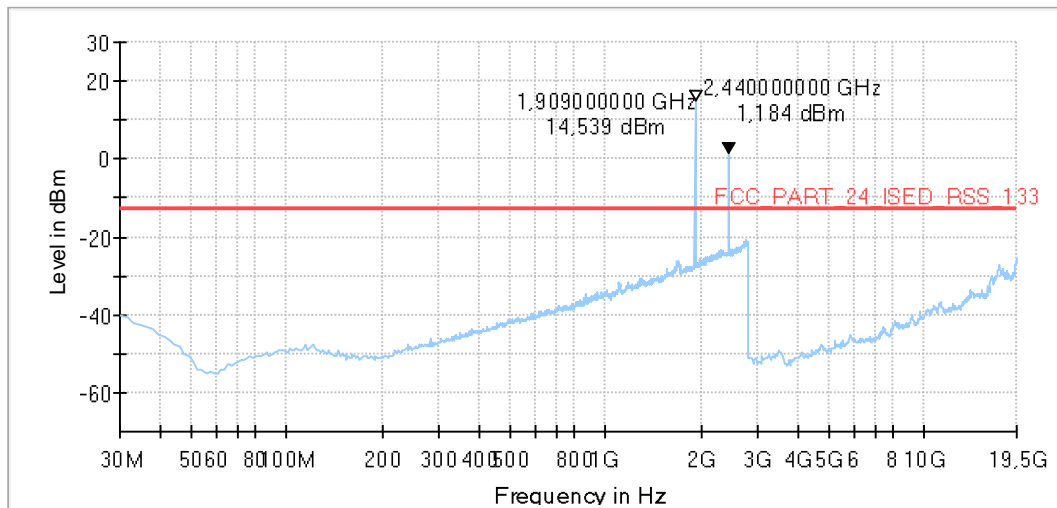
### Common Information

Test Description:	Radiated emission related to 3m
Test Site:	Fully Anechoic Chamber (FAC1) - EMC32 V10.50.0
Test Standard:	FCC FCC Part 24.238 Broadband PCS
Antenna polarisation:	vertical / horizontal
EUT:	
Manufacturer:	
Operating Mode:	GSM 1900_CH:810   Channel:Low(6), 2437 MHz, 1 Mbps, 20 MHz, b-mode, pwr=13
Operator:	WAbdellatif
Comment:	--
Environmental Conditions::	Humidity : 35%rH; Temperature: 19°C
EUT Setup:	1
Verdict:	Passed

### EUT Information

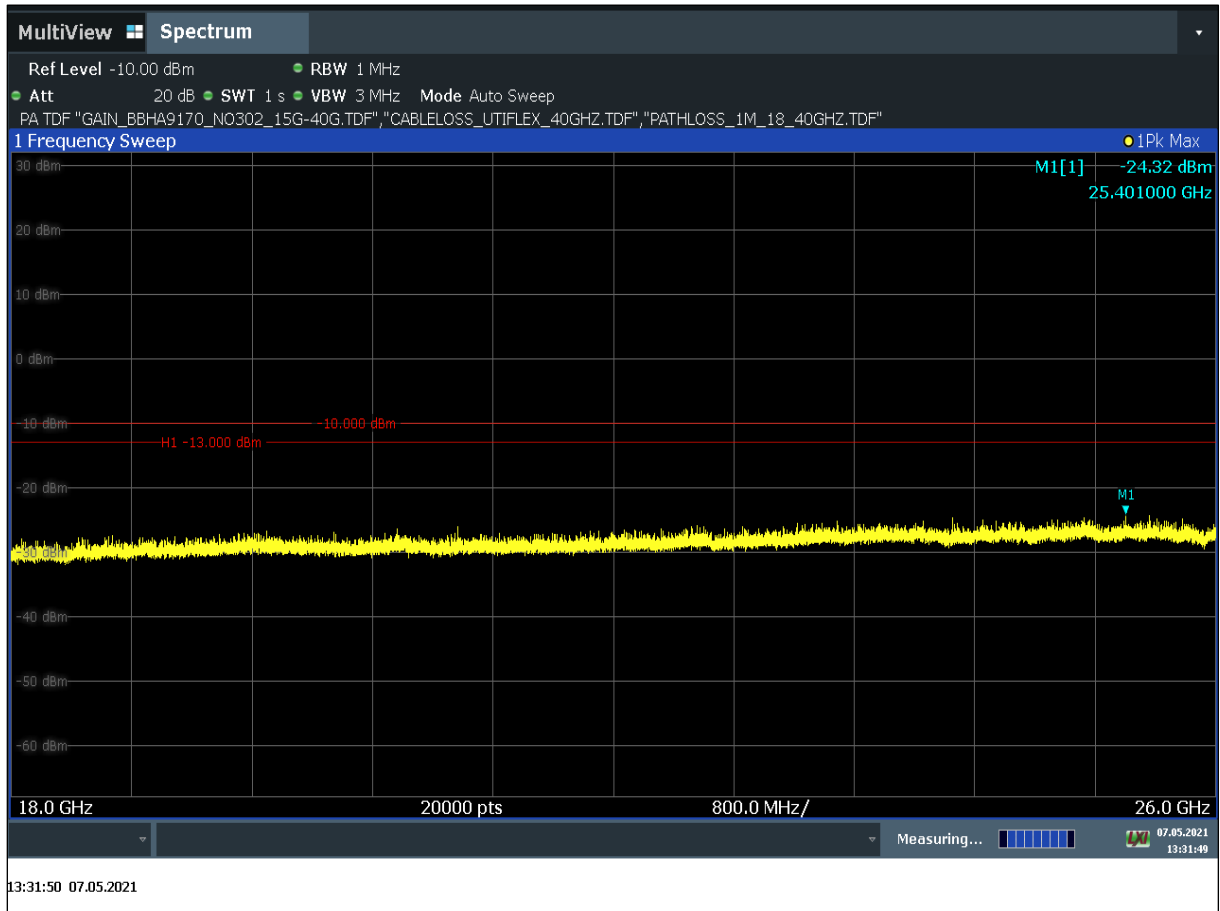
PMT number:	18-1-00972S20_C02
Manufacturer:	ACTIA Nordic AB

Full Spectrum



Remark: Peak at 2440 MHz is the WLAN 2.4 GHz carrier and peak at 1909 MHz is the GSM1900 carrier

### 8.04b\_Simultaneous\_mode\_GSM1900\_WLAN 2G4\_Operation mode\_2



## 1.2 WCDMA + Wifi 2.4GHz

# 8.05a\_Simultaneous\_mode\_UMTS\_FDDIV\_WLAN 2G4\_Operation mode\_3

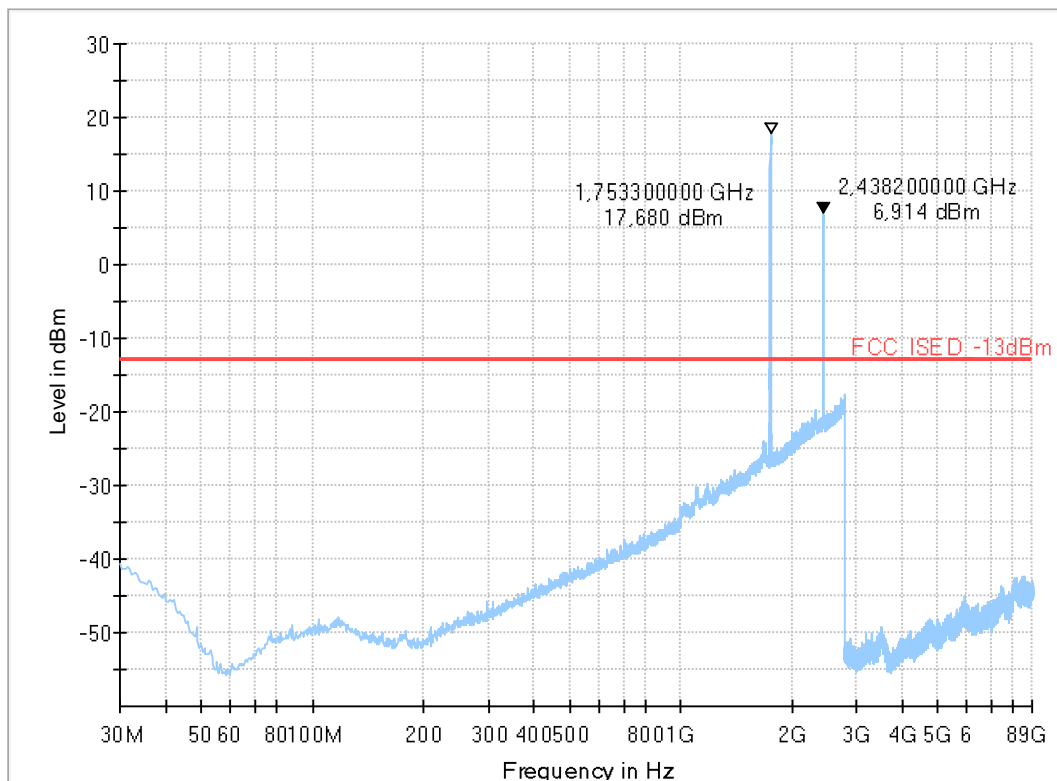
### Common Information

Test Description:	Radiated emission
Test Site:	Fully-Anechoic Chamber
Test Standard:	FCC FCC Part 27.53(h) AWS emission limits / RSS-139, Issue 3
Antenna polarisation:	vertical / horizontal
Measurement software version	EMC32 V10.50.0
Operating Mode:	UMTS_Band:4 \ Channel: low(6), 2437 MHz, 1 Mbps, 20 MHz, b-mode, pwr=13 ext Ant
Operator:	HEI
Comment:	Environmental Conditions:
EUT Setup:	
Verdict:	Passed

### EUT Information

PMT number:	18-1-00972S20_C02
Manufacturer:	ACTIA Nordic AB

Full Spectrum



Remark: Peak at 2438 MHz is the WLAN 2.4 GHz carrier and peak at 1753 MHz is the UMTS FDD IV carrier

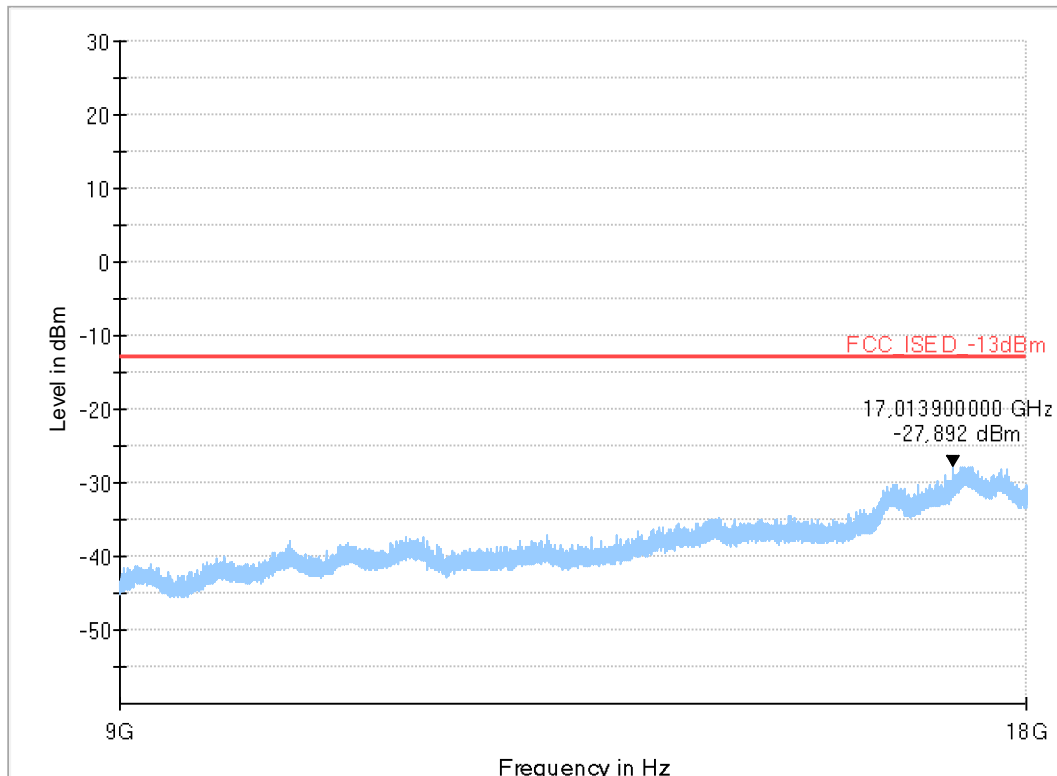
## 8.05b\_Simultaneous\_mode\_UMTS\_FDDIV\_WLAN 2G4\_Operation mode\_3

### Common Information

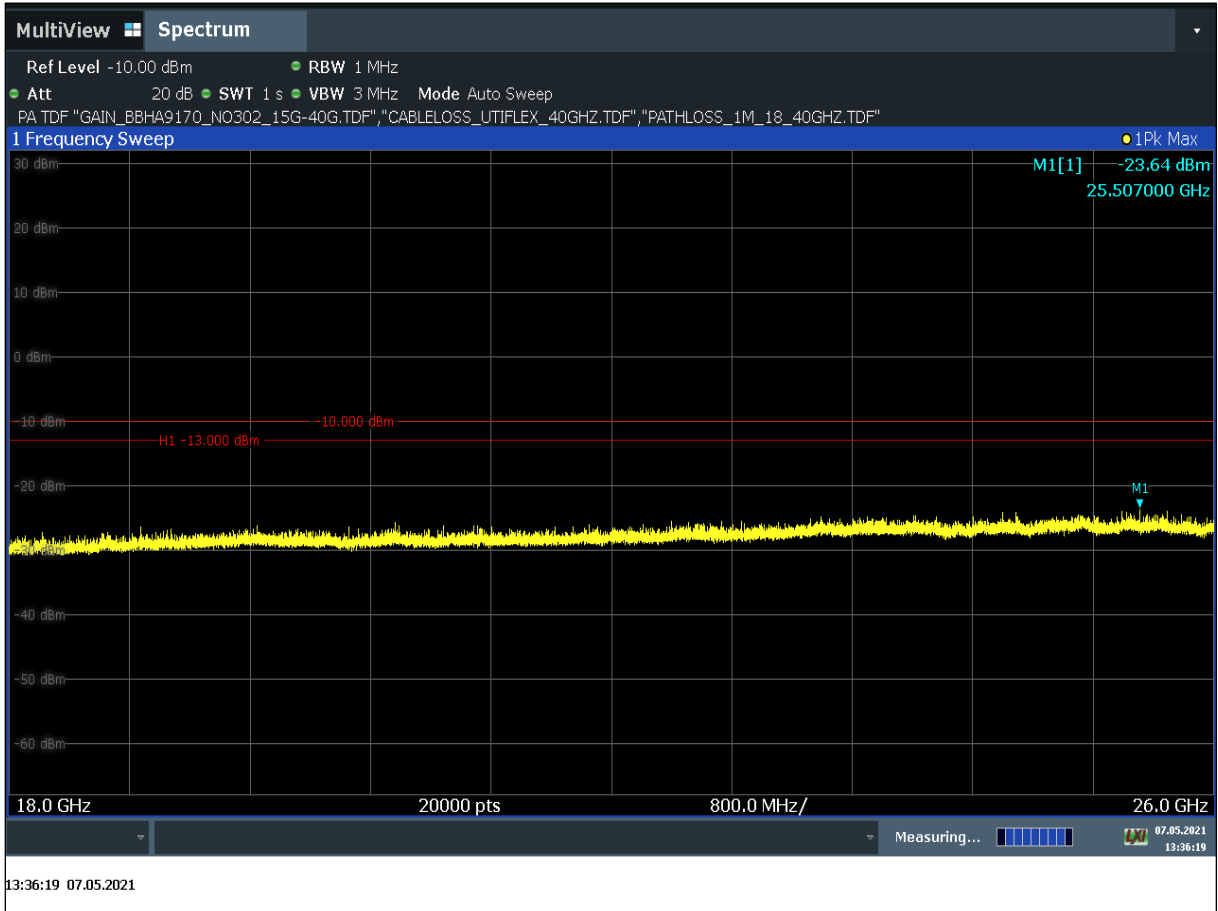
Test Description:	Radiated emission
Test Site:	Fully-Anechoic Chamber
Test Standard:	FCC FCC Part 27.53(h) AWS emission limits / RSS-139, Issue 3
Antenna polarisation:	vertical / horizontal
Measurement software version	EMC32 V10.50.0
Operating Mode:	UMTS FDD4 ch 1512   Channel:(6), 2437 MHz, 1 Mbps, 20 MHz, b-mode, pwr=13 ext Ant
Operator:	HEI
Comment:	Environmental Conditions:
EUT Setup:	1
Verdict:	Passed

### EUT Information

PMT number:	18-1-00972S20_C02
Manufacturer:	ACTIA Nordic AB
	Full Spectrum



### 8.05c\_Simultaneous\_mode\_UMTS\_FDDIV\_WLAN 2G4\_Operation mode\_3



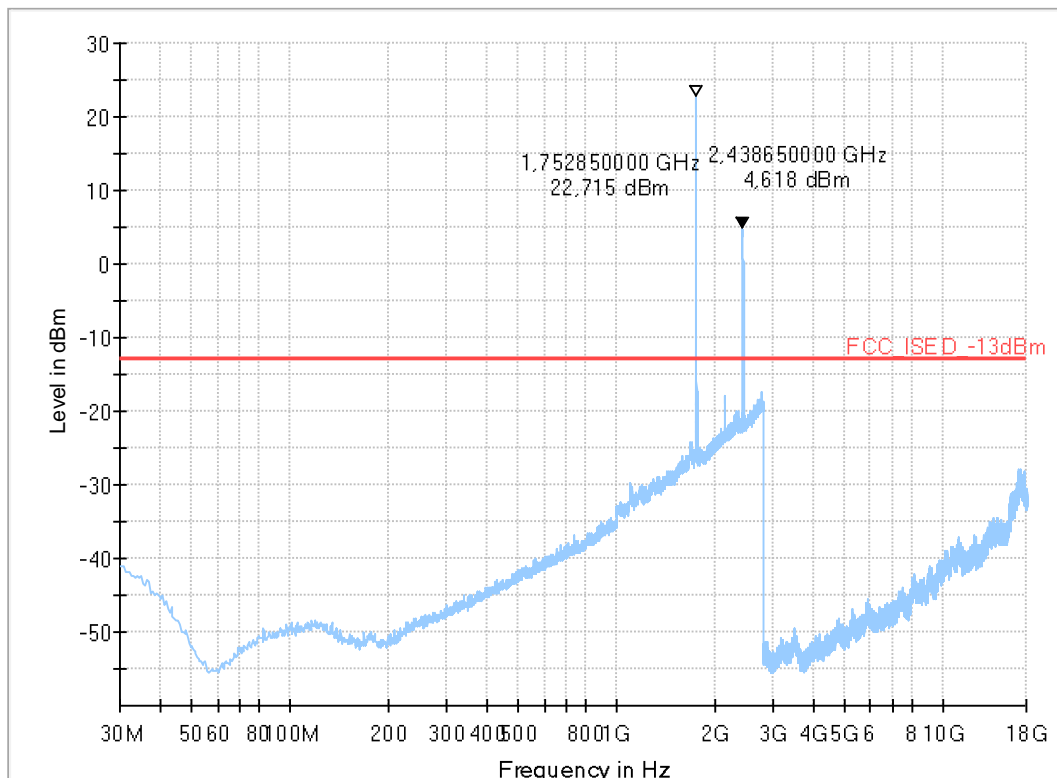
## 8.06a\_Simultaneous\_mode\_UMTS\_FDDIV\_WLAN 2G4\_Operation mode\_3

### Common Information

Test Description:	Radiated emission
Test Site:	Fully-Anechoic Chamber
Test Standard:	FCC FCC Part 27.53(h) AWS emission limits / RSS-139, Issue 3
Antenna polarisation:	vertical / horizontal
Measurement software version	EMC32 V10.50.0
Operating Mode:	UMTS_FDDIV_CH:1512   Channel:Low(6), 2437 MHz, 1 Mbps, 20 MHz, b-mode, pwr=13
Operator:	WAbdellatif
Comment:	Environmental Conditions:
EUT Setup:	1
Verdict:	Passed

### EUT Information

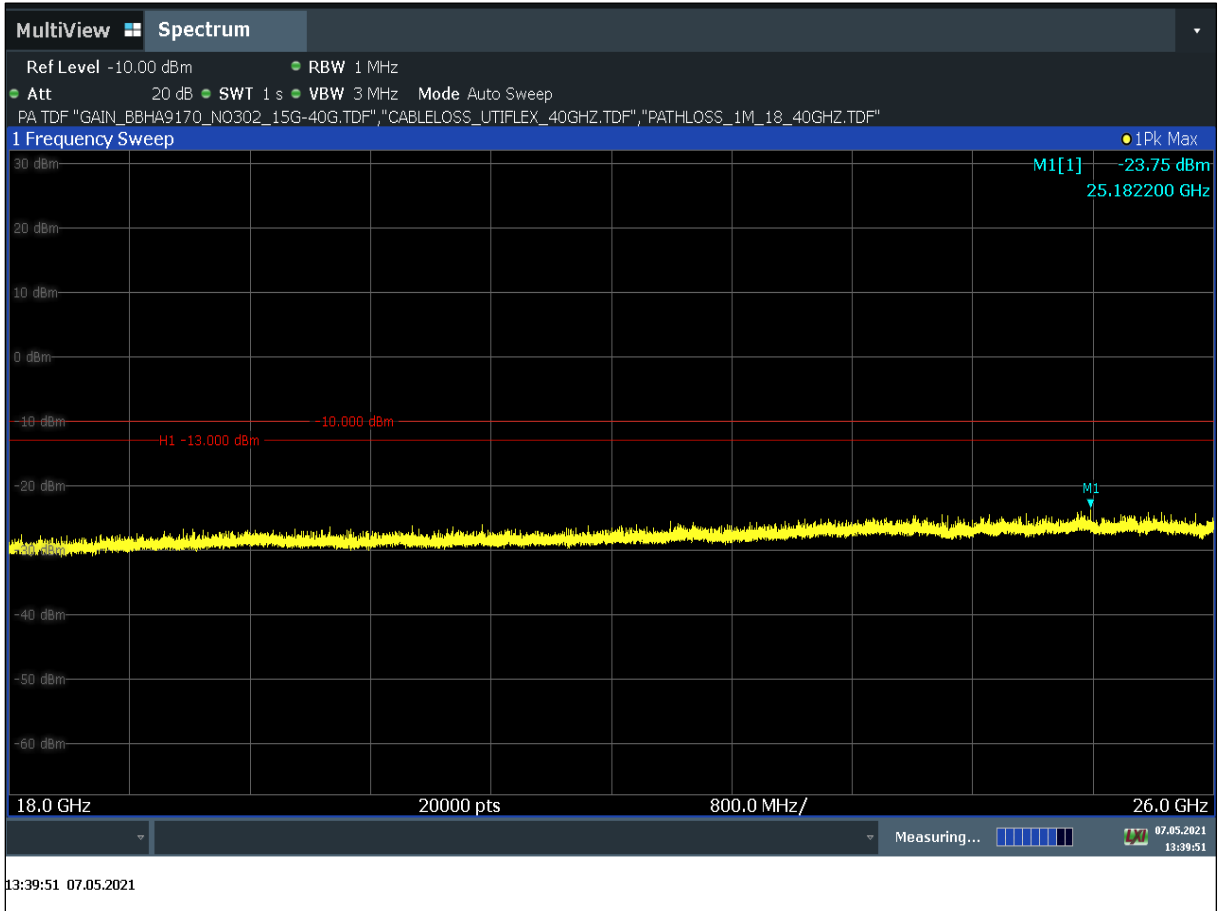
PMT number:	18-1-00972S20_C02
Manufacturer:	ACTIA Nordic AB
	Full Spectrum



Remark: Peak at 2439 MHz is the WLAN 2.4 GHz carrier and peak at 1753 MHz is the UMTS FDD IV carrier



### 8.06b\_Simultaneous\_mode\_UMTS\_FDDIV\_WLAN 2G4\_Operation mode\_3



1.3 LTE Wifi 2.4GHz

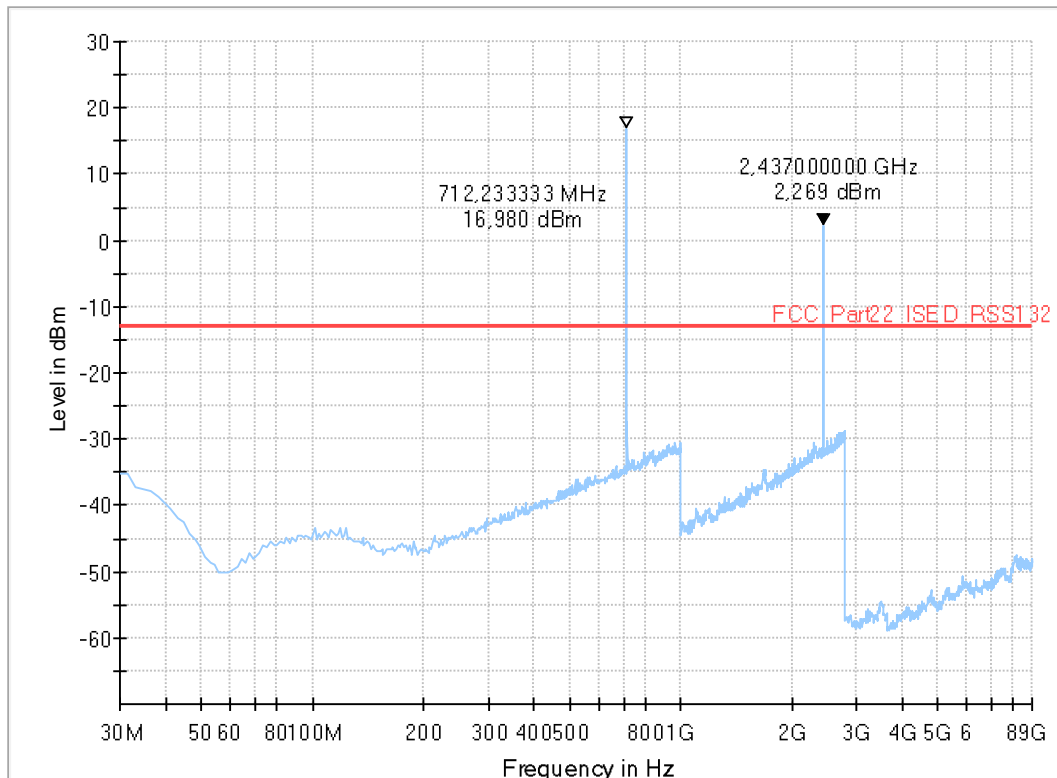
# 8.07a\_Simultaneous\_mode\_LTE\_FDD\_Band 12\_WLAN 2G4\_Operation mode\_4

**Common Information**

Test Description:	Radiated emission related to 1m
Test Site:	Fully Anechoic Chamber (FAC1) - EMC32 V10.50.0
Test Standard:	FCC FCC Part 24.238 Broadband PCS
Antenna polarisation:	vertical / horizontal
EUT:	
Manufacturer:	
Operating Mode:	LTE FDD12 ch23155   Channel:(6), 2437 MHz, 1 Mbps, 20 MHz, b-mode, pwr=13 ext Ant
Operator:	HEI
Comment:	
Environmental Conditions::	Humidity : 38%rH; Temperature: 18°C
EUT Setup:	1
Verdict:	Passed

**EUT Information**

PMT number:	18-1-00972S20_C02
Manufacturer:	ACTIA Nordic AB
	Full Spectrum



Remark: Peak at 2437 MHz is the WLAN 2.4 GHz carrier and peak at 712 MHz is the LTE FDD 12 carrier

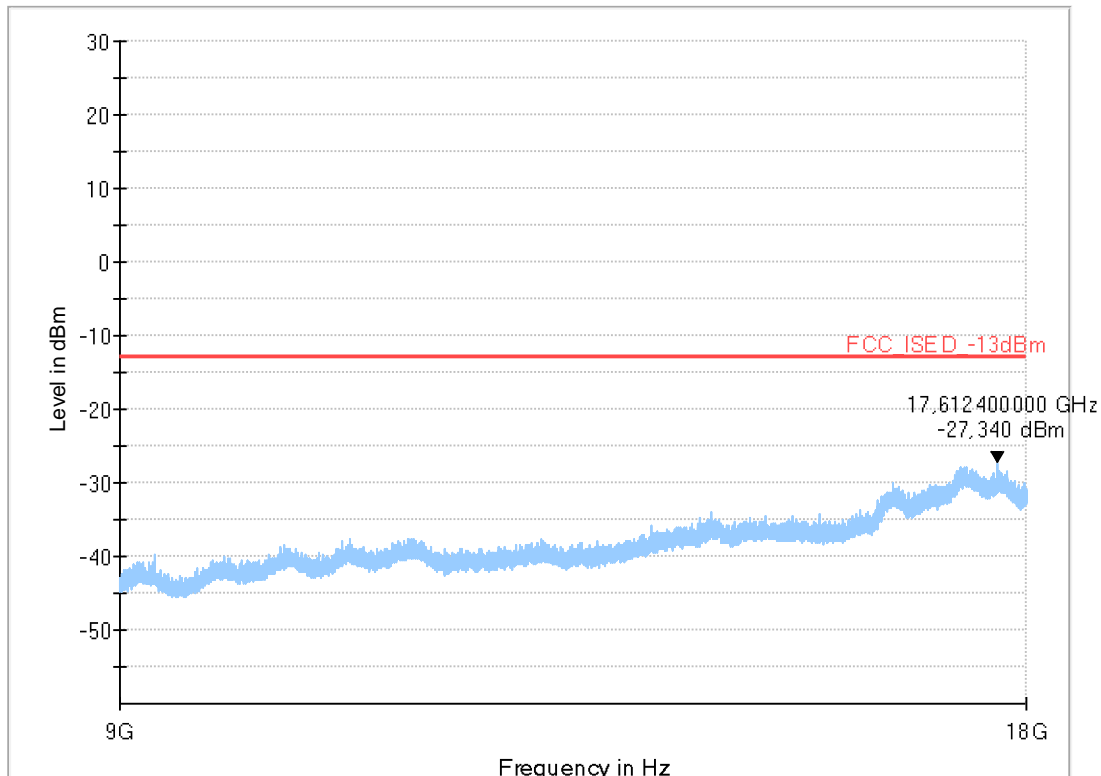
## 8.07b\_Simultaneous\_mode\_LTE\_FDD\_Band 12\_WLAN 2G4\_Operation mode\_4

### Common Information

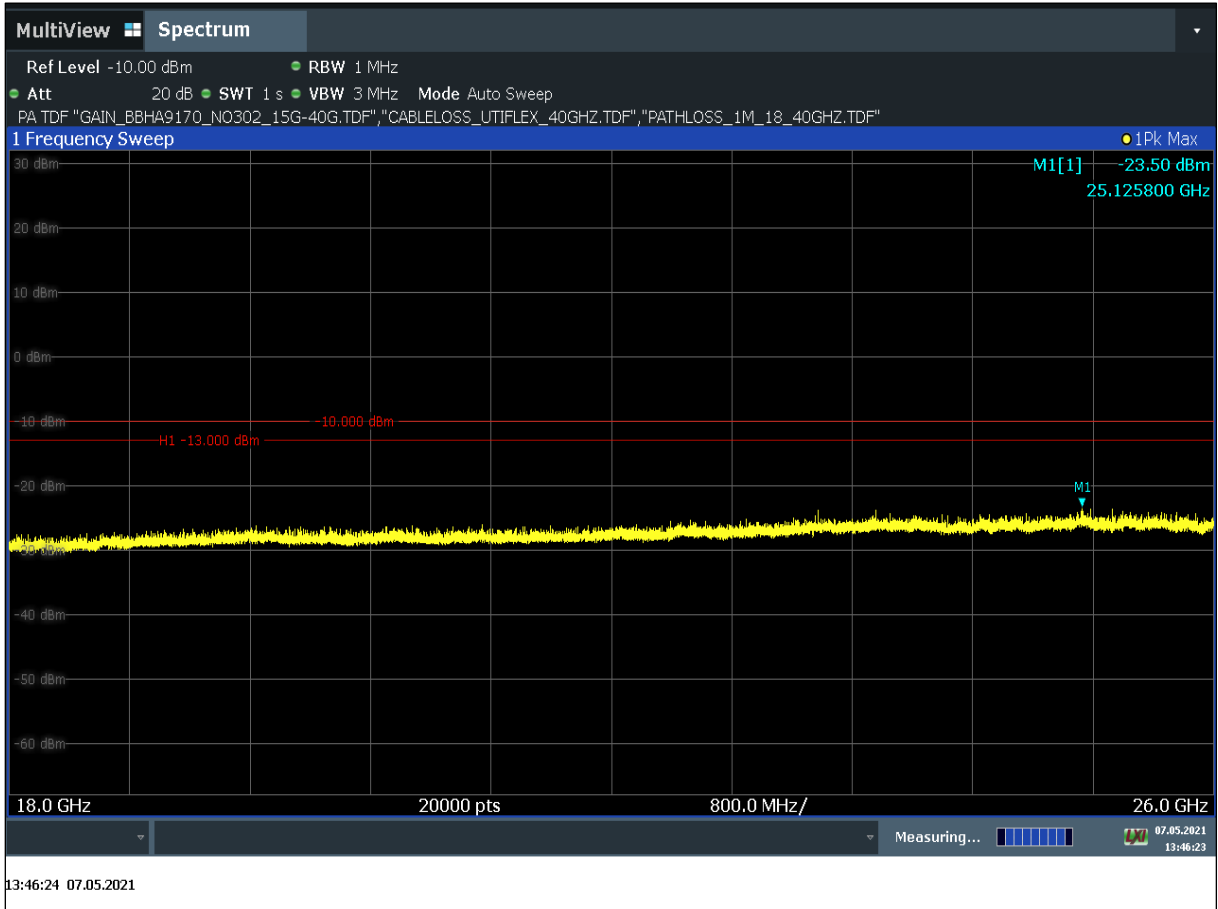
Test Description:	Radiated emission
Test Site:	Fully-Anechoic Chamber
Test Standard:	FCC FCC Part 27.53(h) AWS emission limits / RSS-139, Issue 3
Antenna polarisation:	vertical / horizontal
Measurement software version	EMC32 V10.50.0
Operating Mode:	LTE FDD12 ch23155   Channel:(6), 2437 MHz, 1 Mbps, 20 MHz, b-mode, pwr=13 ext Ant
Operator:	HEI
Comment:	Environmental Conditions:
EUT Setup:	1
Verdict:	Passed

### EUT Information

PMT number:	18-1-00972S20_C02
Manufacturer:	ACTIA Nordic AB
	Full Spectrum



### 8.07c\_Simultaneous\_mode\_LTE\_FDD\_Band 12\_WLAN 2G4\_Operation mode\_4



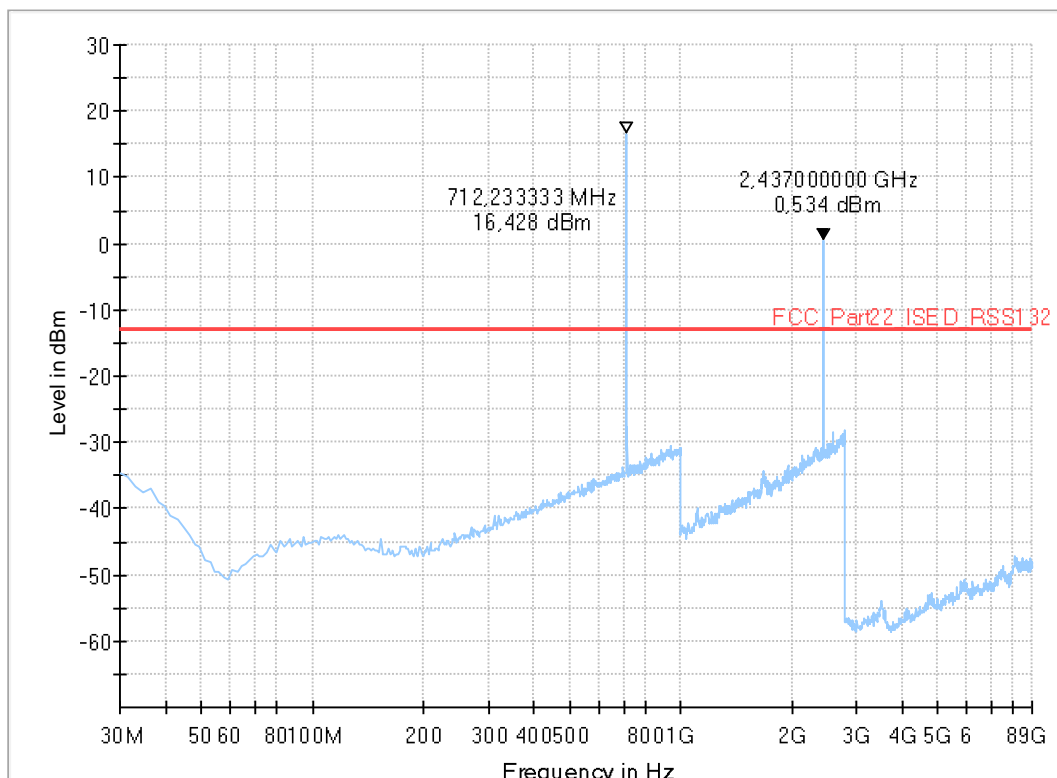
## 8.08a\_Simultaneous\_mode\_LTE\_FDD\_Band 12\_WLAN 2G4\_Operation mode\_4

### Common Information

Test Description:	Radiated emission related to 1m
Test Site:	Fully Anechoic Chamber (FAC1) - EMC32 V10.50.0
Test Standard:	FCC FCC Part 24.238 Broadband PCS
Antenna polarisation:	vertical / horizontal
Manufacturer:	
Operating Mode:	LTE FDD12_Ch:23155_BW.5MHz   Channel:Low(6), 2437 MHz, 1 Mbps, 20 MHz, b-mode, pwr=13
Operator:	HEI
Comment:	
Environmental Conditions:	Humidity : 40%rH; Temperature: 20°C
EUT Setup:	1
Verdict:	Passed

### EUT Information

PMT number:	18-1-00972S20_C02
Manufacturer:	ACTIA Nordic AB
	Full Spectrum



Remark: Peak at 2437 MHz is the WLAN 2.4 GHz carrier and peak at 712 MHz is the LTE FDD 12 carrier

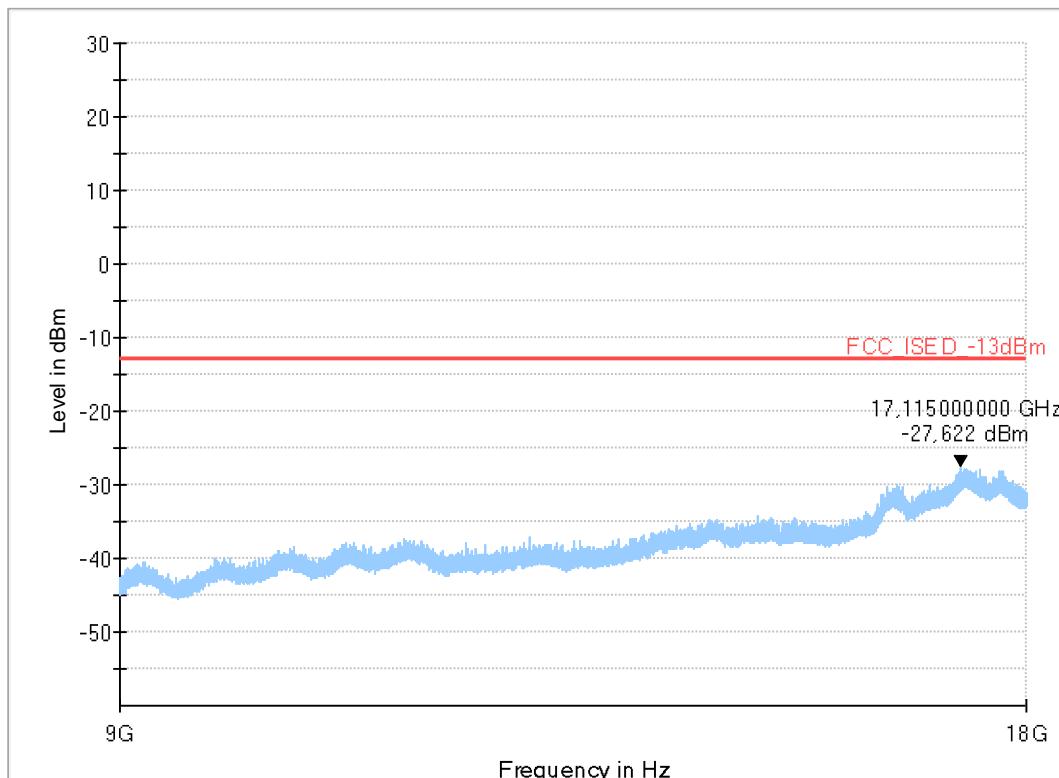
## 8.08b\_Simultaneous\_mode\_LTE\_FDD\_Band 12\_WLAN 2G4\_Operation mode\_4

### Common Information

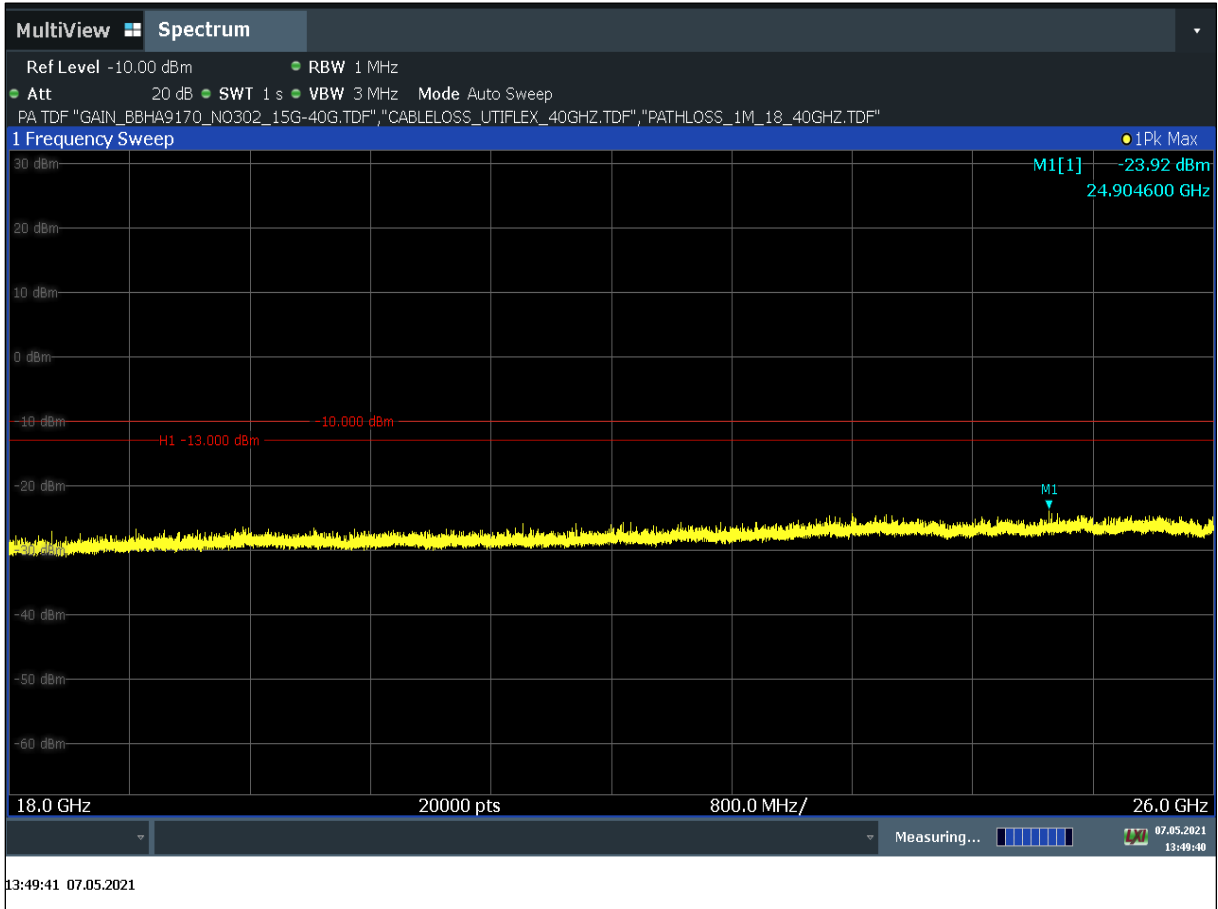
Test Description:	Radiated emission
Test Site:	Fully-Anechoic Chamber
Test Standard:	FCC FCC Part 27.53(h) AWS emission limits / RSS-139, Issue 3
Antenna polarisation:	vertical / horizontal
Measurement software version	EMC32 V10.50.0
Operating Mode:	LTE FDD12_Ch:23155_BW.5MHz   Channel:Low(6), 2437 MHz, 1 Mbps, 20 MHz, b-mode, pwr=13
Operator:	HEI
Comment:	Environmental Conditions:
EUT Setup:	1
Verdict:	Passed

### EUT Information

PMT number:	18-1-00972S20_C02
Manufacturer:	ACTIA Nordic AB
	Full Spectrum



### 8.08c\_Simultaneous\_mode\_LTE\_FDD\_Band 12\_WLAN 2G4\_Operation mode\_4



**1.4 GSM+ Wifi 5GHz**

**8.09a\_simul\_GSM850\_WLAN5G\_standing**

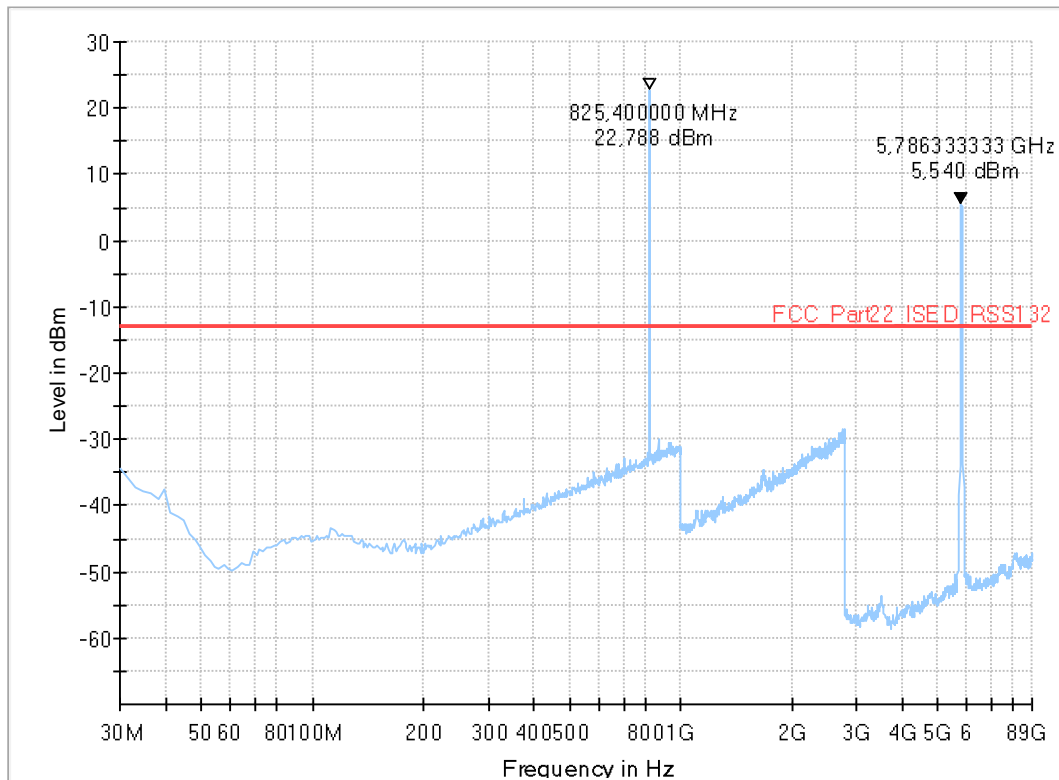
**Common Information**

Test Description:	Radiated emission related to 1m
Test Site:	Fully Anechoic Chamber (FAC1) - EMC32 V10.50.0
Test Standard:	FCC FCC Part 24.238 Broadband PCS
Antenna polarisation:	vertical / horizontal
Operating Mode:	GSM 850_CH:128\ WLAN 5GHz_CH:159_BW:40_MCS0_PWR:17
Operator:	HEI
Comment:	
Environmental Conditions::	Humidity : 38%rH; Temperature: 18°C
EUT Setup:	1
Verdict:	Passed

**EUT Information**

PMT number:	18-1-00972S20_C02
Manufacturer:	ACTIA Nordic AB

Full Spectrum



Remark: Peak at 5786 MHz is the WLAN 5 GHz carrier and peak at 825 MHz is the GSM850 carrier



## 8.09b\_simul\_GSM850\_WLAN5G\_standing

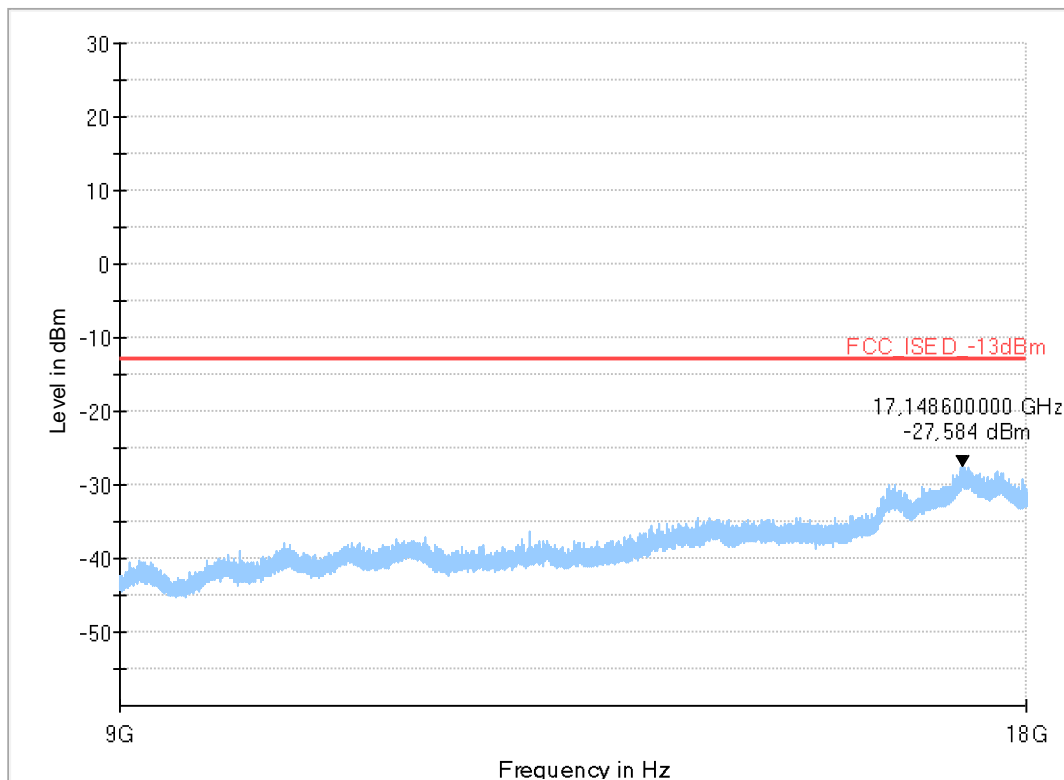
### Common Information

Test Description:	Radiated emission
Test Site:	Fully-Anechoic Chamber
Test Standard:	FCC FCC Part 27.53(h) AWS emission limits / RSS-139, Issue 3
Antenna polarisation:	vertical / horizontal
Measurement software version	EMC32 V10.50.0
Operating Mode:	GSM 850_CH:128_BT classic_CH:39
Operator:	HEI
Comment:	Environmental Conditions:
EUT Setup:	1
Verdict:	Inconclusive

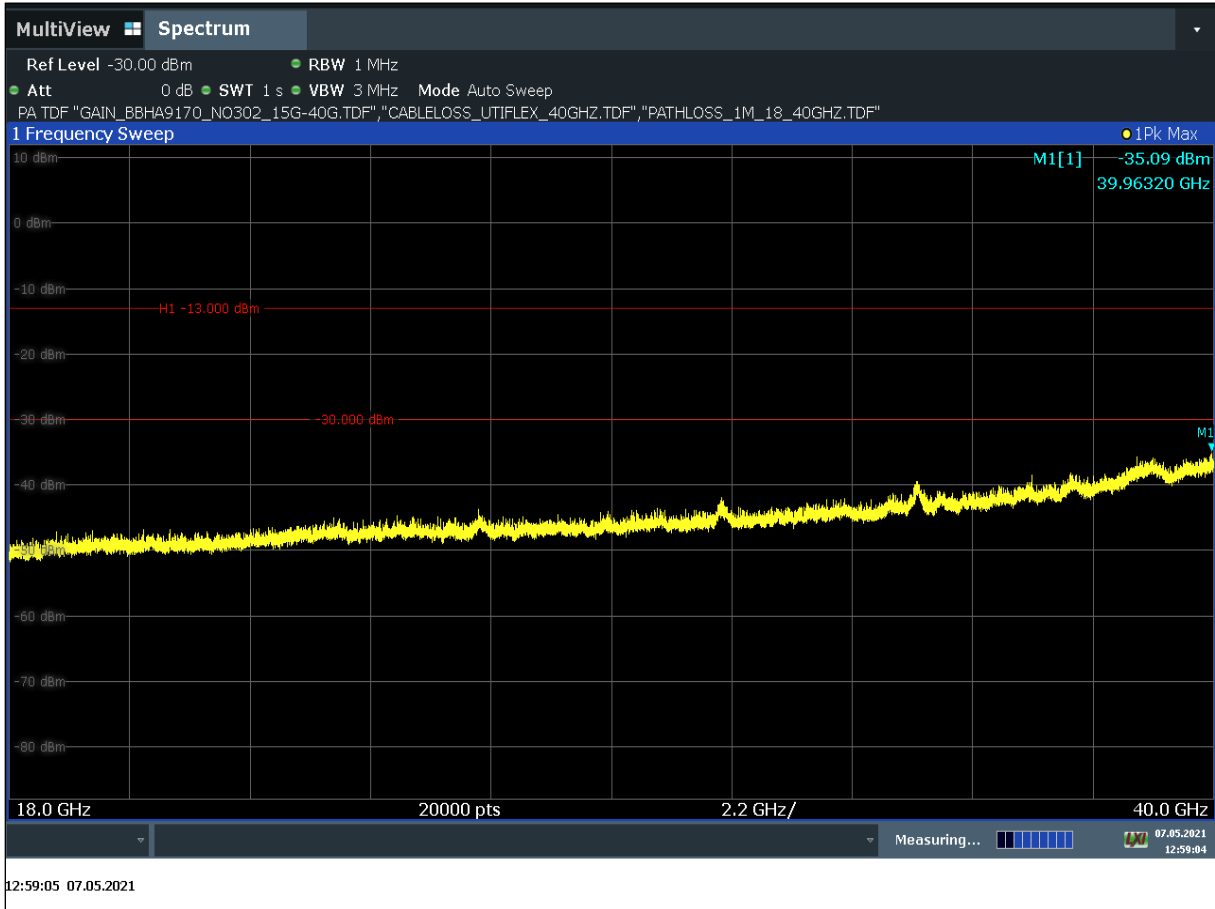
### EUT Information

PMT number:	18-1-00972S20_C02
Manufacturer:	ACTIA Nordic AB

Full Spectrum



### 8.09c\_simul\_GSM850\_WLAN5G\_standing



## 8.10a\_simul\_GSM850\_WLAN5G\_laying

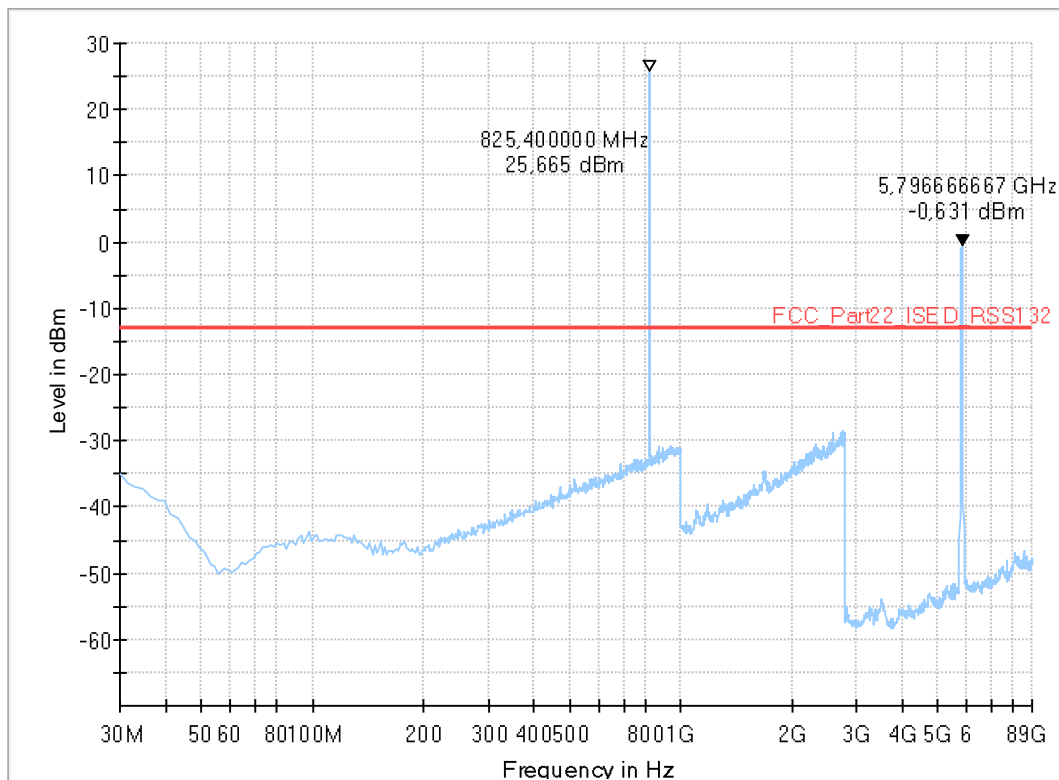
### Common Information

Test Description:	Radiated emission related to 1m
Test Site:	Fully Anechoic Chamber (FAC1) - EMC32 V10.50.0
Test Standard:	FCC FCC Part 24.238 Broadband PCS
Antenna polarisation:	vertical / horizontal
Operating Mode:	GSM 850_CH:128\ WLAN 5GHz_CH:159_BW:40_MCS0_PWR:17
Operator:	HEI
Comment:	
Environmental Conditions:	Humidity : 38%rH; Temperature: 18°C
EUT Setup:	1
Verdict:	Passed

### EUT Information

PMT number:	18-1-00972S20_C02
Manufacturer:	ACTIA Nordic AB

Full Spectrum



Remark: Peak at 5797 MHz is the WLAN 5 GHz carrier and peak at 825 MHz is the GSM850 carrier

## 8.10b\_simul\_GSM850\_WLAN5G\_laying

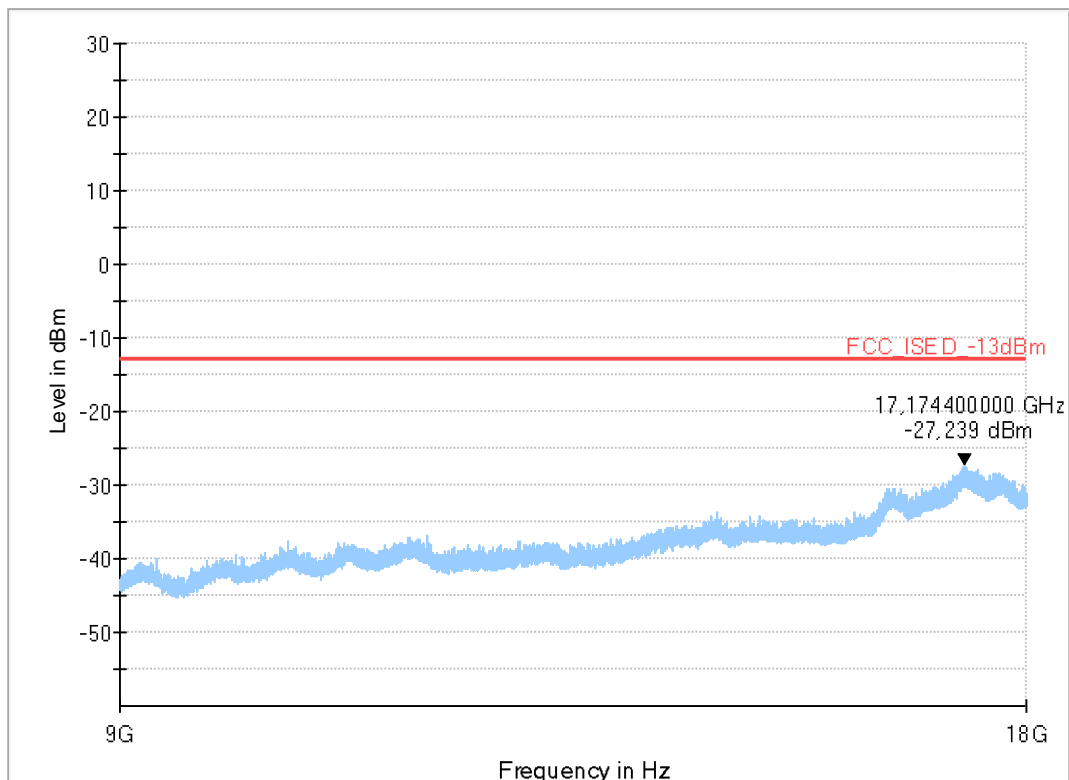
### Common Information

Test Description:	Radiated emission
Test Site:	Fully-Anechoic Chamber
Test Standard:	FCC FCC Part 27.53(h) AWS emission limits / RSS-139, Issue 3
Antenna polarisation:	vertical / horizontal
Measurement software version	EMC32 V10.50.0
Operating Mode:	GSM 850_CH:128\ WLAN 5GHz_CH:159_BW:40_MCS0_PWR:17
Operator:	HEI
Comment:	Environmental Conditions:
EUT Setup:	1
Verdict:	Passed

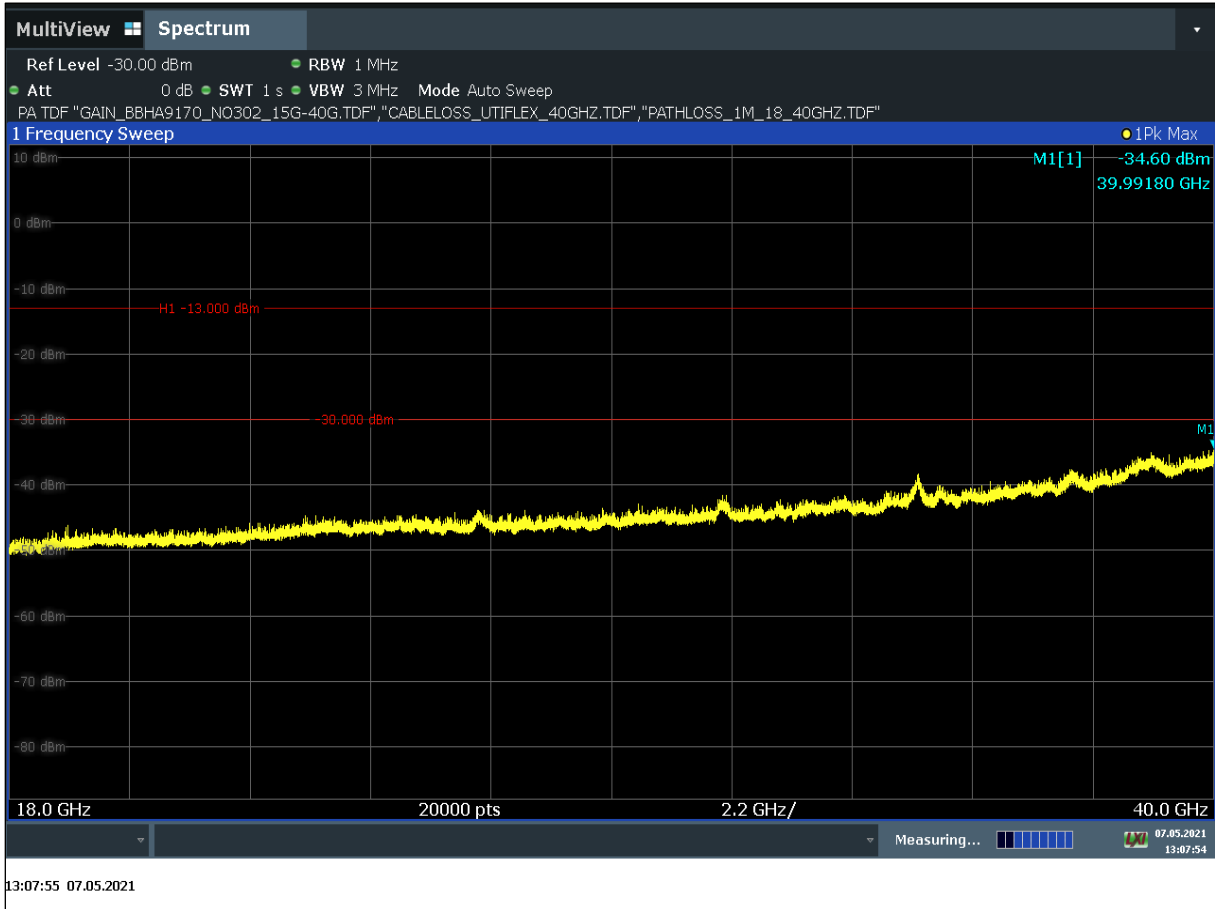
### EUT Information

PMT number:	18-1-00972S20_C02
Manufacturer:	ACTIA Nordic AB

Full Spectrum



### 8.10c\_simul\_GSM850\_WLAN5G\_laying



1.5 GSM + BT

## 8.11a\_simul\_GSM850\_BT\_standing

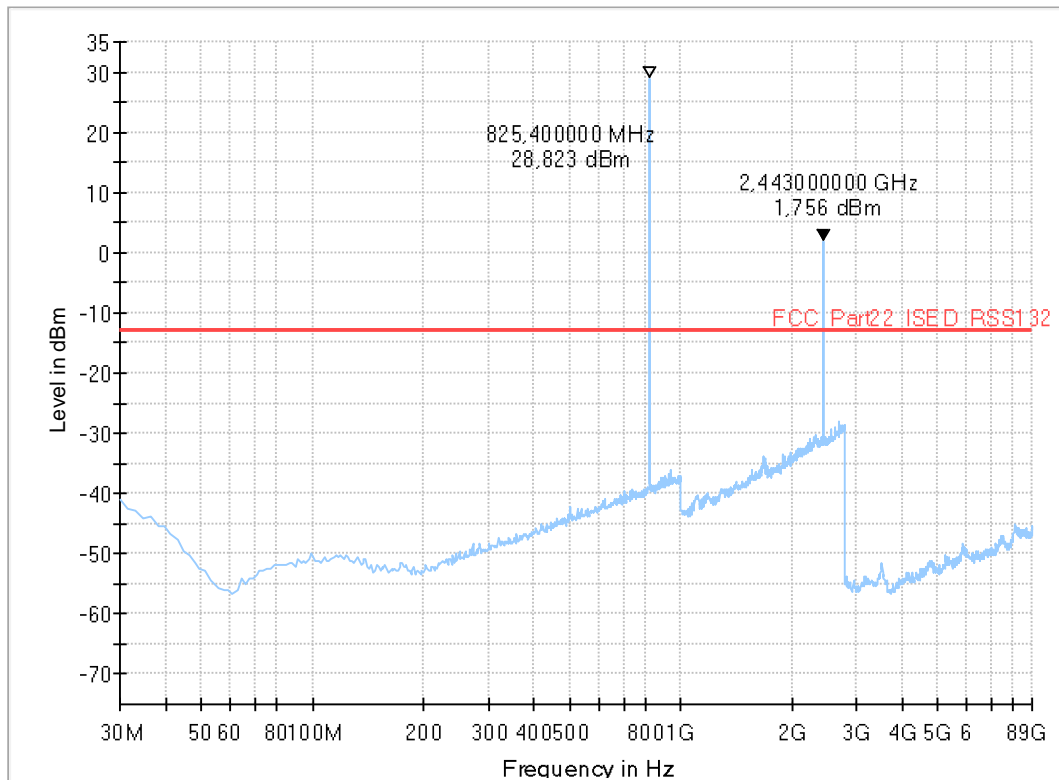
### Common Information

Test Description:	Radiated emission related to 1m
Test Site:	Fully Anechoic Chamber (FAC1) - EMC32 V10.50.0
Test Standard:	FCC FCC Part 24.238 Broadband PCS
Antenna polarisation:	vertical / horizontal
Operating Mode:	GSM 850_BT_classic
Operator:	HEI
Comment:	
Environmental Conditions::	Humidity : 28%rH; Temperature: 18°C
EUT Setup:	1
Verdict:	Passed

### EUT Information

PMT number:	18-1-00972S20_C02
Manufacturer:	ACTIA Nordic AB

Full Spectrum



Remark: Peak at 2443 MHz is the BT carrier and peak at 825 MHz is the GSM850 carrier

## 8.11b\_simul\_GSM850\_BT\_standing

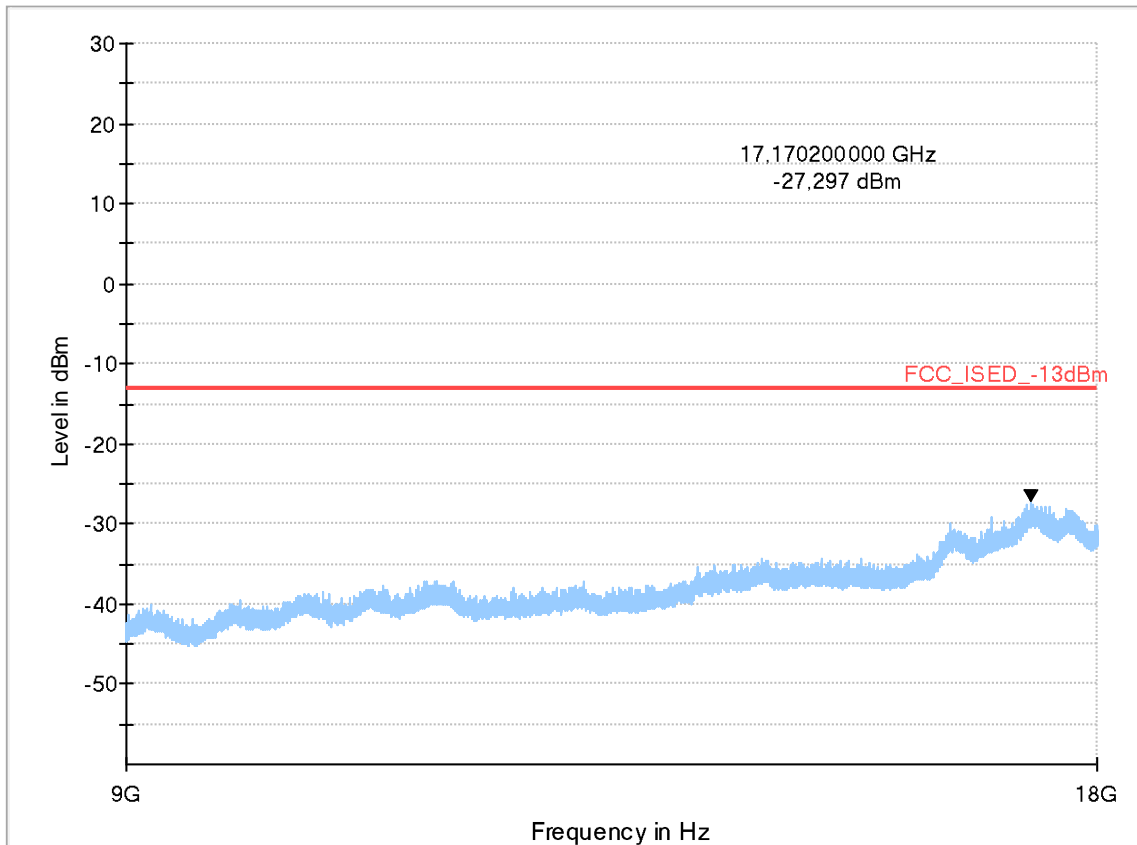
### Common Information

Test Description:	Radiated emission
Test Site:	Fully-Anechoic Chamber
Test Standard:	FCC FCC Part 27.53(h) AWS emission limits / RSS-139, Issue 3
Antenna polarisation:	vertical / horizontal
Measurement software version	EMC32 V10.50.0
Operating Mode:	GSM 850_CH:128_BT classic_CH:39
Operator:	HEI
Environmental Conditions::	Humidity : 28%rH; Temperature: 18°C
EUT Setup:	1
Verdict:	Passed

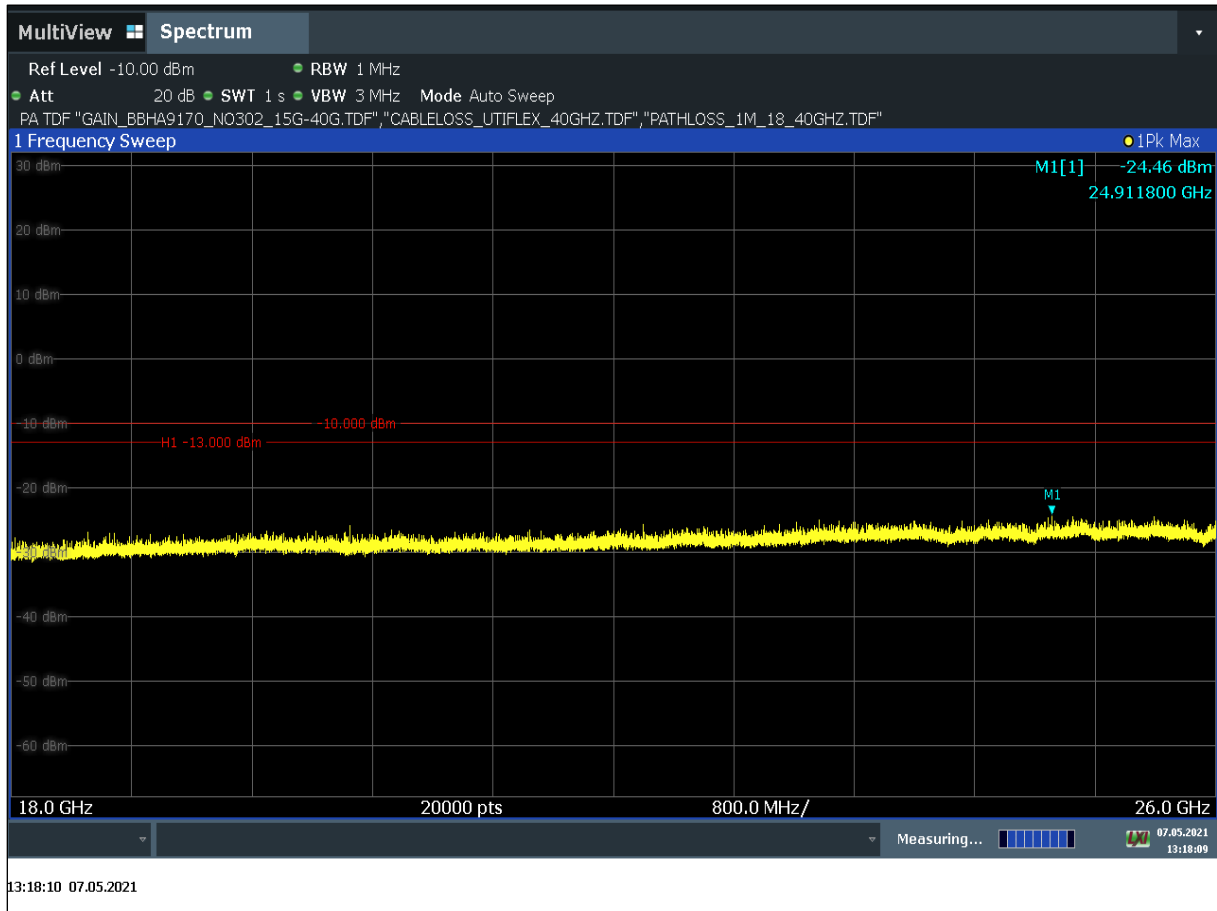
### EUT Information

PMT number:	18-1-00972S20_C02
Manufacturer:	ACTIA Nordic AB

Full Spectrum



### 8.11c\_simul\_GSM850\_BT\_standing





## 8.12a\_simul\_GSM850\_BT\_laying

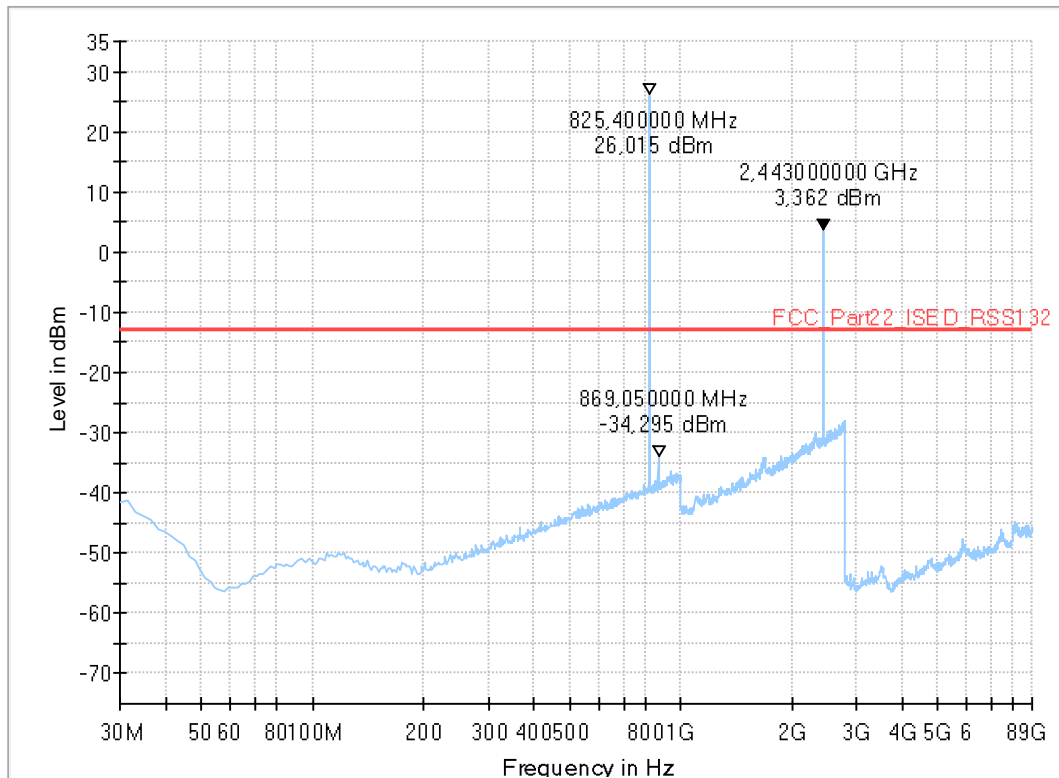
### Common Information

Test Description:	Radiated emission related to 1m
Test Site:	Fully Anechoic Chamber (FAC1) - EMC32 V10.50.0
Test Standard:	FCC FCC Part 24.238 Broadband PCS
Antenna polarisation:	vertical / horizontal
Operating Mode:	GSM 850_BT_classic
Operator:	HEI
Comment:	
Environmental Conditions:	Humidity : 38%rH; Temperature: 18°C
EUT Setup:	1
Verdict:	Passed

### EUT Information

PMT number:	18-1-00972S20_C02
Manufacturer:	ACTIA Nordic AB

Full Spectrum



Remark: Peak at 2443 MHz is the BT carrier and peak at 825 MHz is the GSM850 carrier

## 8.12b\_simul\_GSM850\_BT\_laying

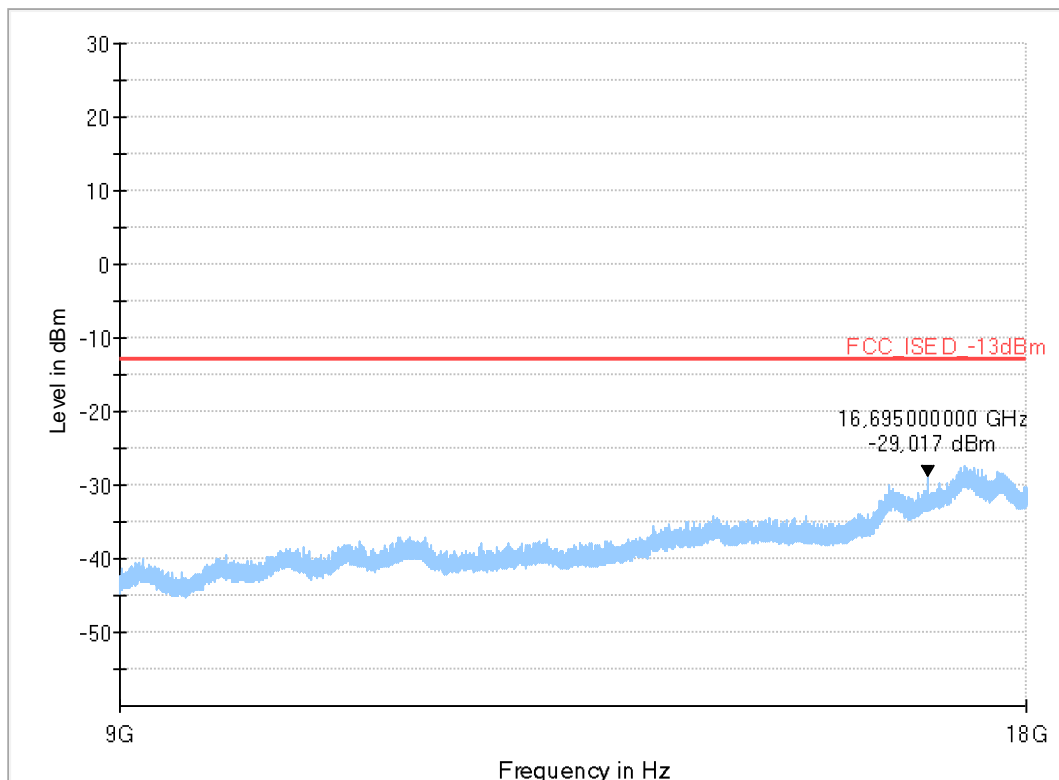
### Common Information

Test Description:	Radiated emission
Test Site:	Fully-Anechoic Chamber
Test Standard:	FCC FCC Part 27.53(h) AWS emission limits / RSS-139, Issue 3
Antenna polarisation:	vertical / horizontal
Measurement software version	EMC32 V10.50.0
Operating Mode:	GSM 850_CH:128_BT classic_CH:39
Operator:	HEI
Comment:	Environmental Conditions:
EUT Setup:	1
Verdict:	Passed

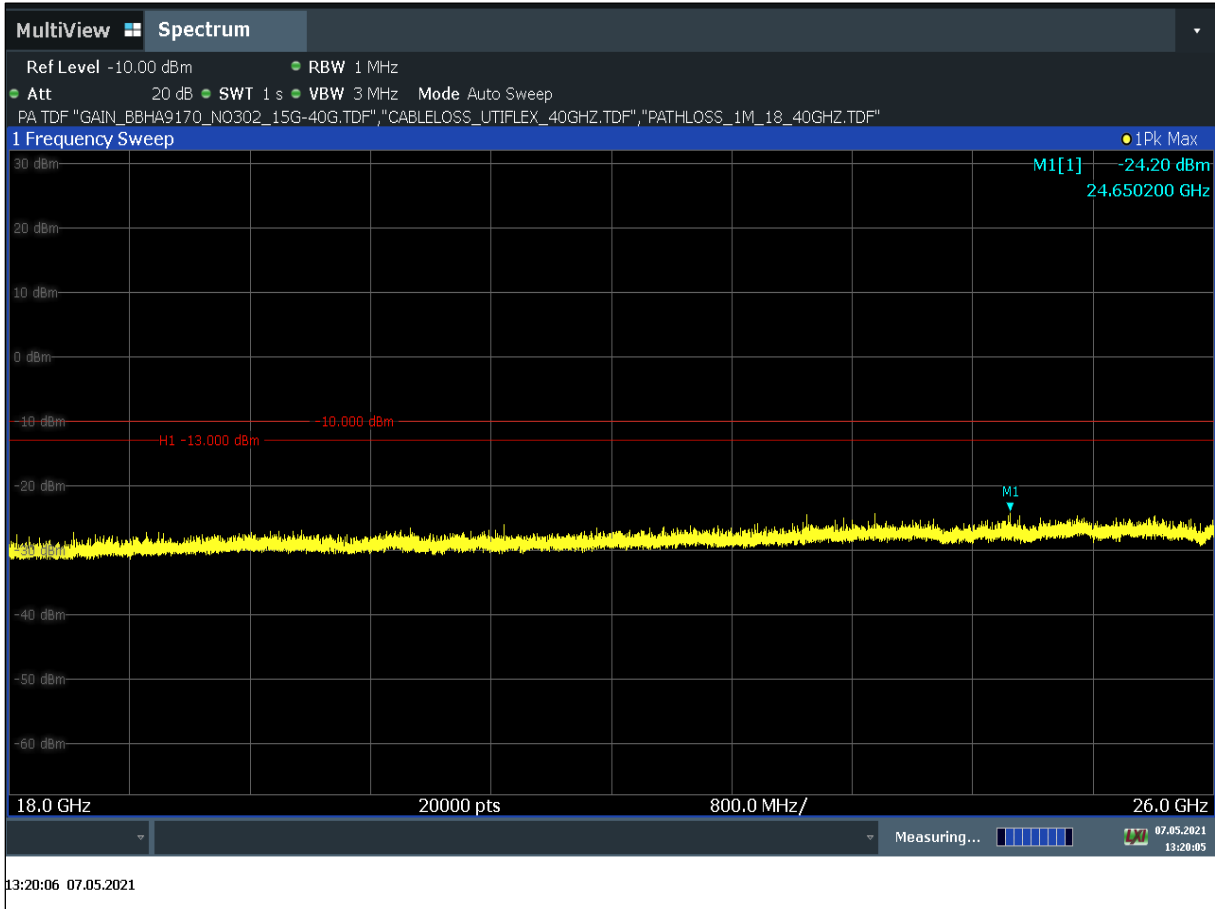
### EUT Information

PMT number:	18-1-00972S20_C02
Manufacturer:	ACTIA Nordic AB

Full Spectrum



### 8.12c\_simul\_GSM850\_BT\_laying



# End Of Annex 1