# FCC RADIO TEST REPORT
# FCC ID: 2ACOP1020AGORA

| | |
|---|---|
| **Product：** | Smart Phone |
| **Trade Name：** | Agora |
| **Model Number：** | Agora Ring Pro |
| **Serial Model：** | N/A |
| **Report No.：** | BZT140614F01 |

## Prepared for

AGORA WHOLESALE SOCIEDAD ANONI

800M OESTE DE LOS JARDINES DEL RECUERDO Y 75 NORTE DEL AM-PM, BODEGAS LAGUNILLA BODEGA # 14,LAGUNILLA DE HEREDIA HEREDIA,COSTA RICA

## Prepared by

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# TEST RESULT CERTIFICATION

| | |
|---|---|
| **Applicant's name** ..... | AGORA WHOLESALE SOCIEDAD ANONI |
| Address ..... | 800M OESTE DE LOS JARDINES DEL RECUERDO Y 75 NORTE DEL AM-PM, BODEGAS LAGUNILLA BODEGA # 14,LAGUNILLA DE HEREDIA HEREDIA,COSTA RICA |
| **Manufacture's Name**. | Shenzhen Kaliho Technology Development Limited |
| Address ..... | Rm1901, Block A, The Stars Plaza, Huaqiang North Rd., Futian District,Shenzhen,China |
| Product name..... | Smart Phone |
| Band name ..... | Agora |
| Model and/or type reference ..... | Agora Ring Pro |
| **Standards**..... | FCC Part 22H and 24E |
| Test procedure ..... | ANSI C63.4-2003 |

This device described above has been tested by STS, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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| | |
|---|---|
| **Date of Test** ..... | |
| Date (s) of performance of tests ..... | June 11, 2014 ~ June 15, 2014 |
| Date of Issue ..... | June 16, 2014 |
| Test Result ..... | **Pass** |

Testing Engineer : Lynn Chen

(Lynn Chen)

Technical Manager : Carlen

(Carlen Liu)

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(Tommy zhang)

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# 1. GENERAL INFORMATION

## 1.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

| | |
|---|---|
| Product Designation: | Smart Phone |
| Hardware version: | -- |
| Software version: | -- |
| FCC ID: | **2ACOPJ1020AGORA** |
| Frequency Bands: | ☒GSM 850 ☒PCS 1900 (U.S. Bands)<br>☒GSM 900 ☒DCS 1800 (Non-U.S. Bands)<br>U.S. Bands:<br>☐UMTS FDD Band II ☒UMTS FDD Band V<br>Non-U.S. Bands:<br>☐UMTS FDD Band I ☐UMTS FDD Band VIII |
| Bluetooth | Frequency:2402 – 2480 MHz<br>Modulation: GFSK(1Mbps),π/4-DQPSK(2Mbps),8-DPSK(3Mbps) |
| Wifi | Frequency:2412 – 2462 MHz<br>Modulation: CCK/OFDM/DBPSK/DAPSK |
| Antenna: | Integrated Antenna |
| Antenna gain: | 1.0dBi |
| Power Supply: | DC 3.7V by battery or DC 5.0V supplied by adapter |
| Battery parameter: | DC 3.7V/1500mAh |
| Adapter Input: | AC100-240V, 50-60Hz |
| Adapter Output: | DC 5.0V, 500mA |
| GPRS/EDGE Class | Multi-Class12 |
| Extreme Vol. Limits: | DC3.4 V to 4.2 V (Nominal DC3.7 V) |
| Extreme Temp. Tolerance | -10℃ to +50℃ |
| ** Note: The High Voltage 4.2V and Low Voltage 3.4V was declared by manufacturer, The EUT couldn't be operate normally with higher or lower voltage. | |

## 1.2 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: 2ACOP1020AGORA** filing to comply with the FCC Part 22H&24E.

## 1.3 TEST METHODOLOGY

The radiated emission testing was performed according to the procedures of ANSI C 63.4: 2003; TIA/EIA 603 and FCC CFR 47 Rules of 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057.

## 1.4 TEST FACILITY

The test site used to collect the radiated data is located at:
BZT Testing Technology Co.,Ltd.
1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen P.R. China.
The test site is constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003.
FCC Registration No.: 701733

## 1.5 MEASUREMENT INSTRUMENTS

| NAME OF EQUIPMENT | MANUFACTURER | MODEL | SERIAL NUMBER | NEXT CAL. DATE |
|---|---|---|---|---|
| SPECTRUM ANALYZER | AGILENT | E4440A | US44300399 | 2014.6.26 |
| TEST RECEIVER | R&S | ESCI | A0304218 | 2014.6.26 |
| COMMUNICATION TESTER | AGILENT | 8960 | 3104A03367 | 2014.7.21 |
| COMMUNICATION TESTER | R&S | CMU200 | A0304247 | 2014.7.21 |
| TEST RECEIVER | R&S | FCKL1528 | A0304230 | 2014.6.26 |
| LISN | SCHWARZBECK | NSLK8127 | A0304233 | 2014.6.26 |
| CLIMATE CHAMBER | ALBATROSS | -- | -- | 2014.6.26 |
| Loop Antenna | Daze | ZN30900N | SEL0097 | 2014.6.26 |
| Bilogical Antenna | A.H. Systems Inc. | SAS-521-4 | N/A | 2015.4.26 |
| Horn Antenna | EM | EM-AH-10180 | N/A | 2015.4.26 |

## 1.6 SPECIAL ACCESSORIES

The battery and the charger, earphone supplied by the applicant were used as accessories and being tested with EUT intended for FCC grant together.

## 1.7 EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

# 2. SYSTEM TEST CONFIGURATION

## 2.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

## 2.2 EUT EXERCISE

The Transmitter was operated in the maximum output power mode through Communication Tester. The TX frequency was fixed which was for the purpose of the measurements.

## 2.3 GENERAL TECHNICAL REQUIREMENTS

| Item Number | Item Description | | FCC Rules |
|---|---|---|---|
| 1 | Output Power | Conducted output power | 22.913(a) / 24.232 (b) |
| | | Radiated output power | |
| 2 | Spurious Emission | Conducted spurious emission | 2.1051 / 22.917 / 24.238 |
| | | Radiated spurious emission | |
| 3 | Frequency Stability | | 2.1055 /24.235 |
| 4 | Occupied Bandwidth | | 2.1049 (h)(i) |
| 5 | Emission Bandwidth | | 22.917(b) / 24.238 (b) |
| 6 | Band Edge | | 22.917(b) / 24.238 (b) |

## 2.4 CONFIGURATION OF EUT SYSTEM

Fig. 2-1 Configuration of EUT System


Table 2-1 Equipment Used in EUT System

| Item | Equipment | Model No. | ID or Specification | Note |
|---|---|---|---|---|
| 1 | Smart Phone | Agora Ring Pro | FCC ID: 2ACOP1020AGORA | EUT |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

*Note: All the accessories have been used during the test.*
*the following "EUT" in setup diagram means EUT system.*

# 3. SUMMARY OF TEST RESULTS

| Item Number | Item Description | | FCC Rules | Result |
|---|---|---|---|---|
| 1 | Output Power | Conducted Output Power | 22.913(a) / 24.232 (b) | Pass |
| | | Radiated Output Power | | |
| 2 | Spurious Emission | Conducted Spurious Emission | 2.1051 / 22.917 / 24.238 | Pass |
| | | Radiated Spurious Emission | | |
| 3 | Mains Conducted Emission | | 15.107 / 15.207 | Pass |
| 4 | Frequency Stability | | 2.1055 /24.235 | Pass |
| 5 | Occupied Bandwidth | | 2.1049 (h)(i) | Pass |
| 6 | Emission Bandwidth | | 22.917(b) / 24.238 (b) | Pass |
| 7 | Band Edge | | 22.917(b) / 24.238 (b) | Pass |

# 4. DESCRIPTION OF TEST MODES

During the testing, the EUT was controlled via Rhode & Schwarz Digital Radio Communication Tester (CMU 200) to ensure max power transmission and proper modulation. Three channels (The top channel, the middle channel and the bottom channel) were chosen for testing on both GPRS850 and GPRS1900 frequency band.

**Note:** GSM/GPRS/EDGES850, GSM/GPRS/EDGE1900, HSDPA band V, HSUPA band V modes have been tested during the test.

the worst condition (GPRS/EDGE 850) be recorded in the test report if no other modes test data.

# 5. OUTPUT POWER

## 5.1 CONDUCTED OUTPUT POWER

### 5.1.1 MEASUREMENT METHOD

The EUT was setup for the max output power with pseudo random data modulation. Power was measured with Spectrum Analyzer. The measurements were performed on all modes(GPRS/EDGE850, GPRS/EDGE1900, HSDPA band V) at 3 typical channels(the Top Channel, the Middle Channel and the Bottom Channel) for each band.

### 5.1.2 MEASUREMENT RESULT

| Conducted Output Power Limits for GSM 850 MHZ | | |
|---|---|---|
| **Mode** | **Nominal Peak Power** | **Tolerance(dB)** |
| GSM850 | 32 dBm | +/- 1 |

| Conducted Output Power Limits for PCS 1900 MHZ | | |
|---|---|---|
| **Mode** | **Nominal Peak Power** | **Tolerance(dB)** |
| GSM1900 | 29 dBm | +/- 1 |

| Conducted Output Power Limits for WCDMA band V | | |
|---|---|---|
| **Mode** | **Nominal Peak Power** | **Tolerance(dB)** |
| WCDMA band V | 23.5 dBm | +/-0.5 |

**GSM 850:**

| Mode | Frequency (MHz) | Peak Power |
|---|---|---|
| GSM850 | 824.2 | 32.35 |
| | 836.6 | 32.19 |
| | 848.8 | 31.29 |
| GPRS850 (1 Slot) | 824.2 | 31.82 |
| | 836.6 | 31.48 |
| | 848.8 | 32.62 |
| GPRS850 (2 Slot) | 824.2 | 30.47 |
| | 836.6 | 30.34 |
| | 848.8 | 31.38 |
| GPRS850 (3 Slot) | 824.2 | 29.23 |
| | 836.6 | 29.98 |
| | 848.8 | 29.08 |
| GPRS850 (4 Slot) | 824.2 | 28.65 |
| | 836.6 | 28.83 |
| | 848.8 | 28.46 |

**PCS 1900:**

| Mode | Frequency (MHz) | Peak Power |
|---|---|---|
| GSM1900 | 1850.2 | 28.64 |
| | 1880 | 29.48 |
| | 1909.8 | 29.68 |
| GPRS1900 (1 Slot) | 1850.2 | 27.67 |
| | 1880 | 28.88 |
| | 1909.8 | 27.96 |
| GPRS1900 (2 Slot) | 1850.2 | 27.48 |
| | 1880 | 27.38 |
| | 1909.8 | 27.42 |
| GPRS1900 (3 Slot) | 1850.2 | 25.59 |
| | 1880 | 26.09 |
| | 1909.8 | 25.33 |
| GPRS1900 (4 Slot) | 1850.2 | 25.57 |
| | 1880 | 24.75 |
| | 1909.8 | 25.39 |

**EDGE 850:**

| Mode | Frequency (MHz) | Peak Power |
|---|---|---|
| EGPRS850 (1 Slot) | 824.2 | 32.32 |
| | 836.6 | 31.62 |
| | 848.8 | 31.79 |
| EGPRS850 (2 Slot) | 824.2 | 30.84 |
| | 836.6 | 30.42 |
| | 848.8 | 31.32 |
| EGPRS850 (3 Slot) | 824.2 | 29.58 |
| | 836.6 | 29.15 |
| | 848.8 | 29.65 |
| EGPRS850 (4 Slot) | 824.2 | 28.64 |
| | 836.6 | 28.37 |
| | 848.8 | 28.37 |

**EDGE 1900:**

| Mode | Frequency (MHz) | Peak Power |
|---|---|---|
| EGPRS1900 (1 Slot) | 1850.2 | 28.19 |
| | 1880 | 28.28 |
| | 1909.8 | 27.92 |
| EGPRS1900 (2 Slot) | 1850.2 | 27.28 |
| | 1880 | 27.18 |
| | 1909.8 | 27.13 |
| EGPRS1900 (3 Slot) | 1850.2 | 25.53 |
| | 1880 | 25.36 |
| | 1909.8 | 26.26 |
| EGPRS1900 (4 Slot) | 1850.2 | 25.32 |
| | 1880 | 25.17 |
| | 1909.8 | 25.19 |

**UMTS BAND V**

| Mode | Frequency (MHz) | Peak Power |
|---|---|---|
| WCDMA 850 RMC | 826.4 | 23.34 |
| | 836.6 | 23.53 |
| | 846.6 | 22.73 |
| HSDPA Subtest 1 | 826.4 | 22.63 |
| | 836.6 | 22.37 |
| | 846.6 | 22.62 |
| HSDPA Subtest 2 | 826.4 | 21.32 |
| | 836.6 | 21.45 |
| | 846.6 | 21.49 |
| HSDPA Subtest 3 | 826.4 | 20.59 |
| | 836.6 | 20.73 |
| | 846.6 | 20.23 |
| HSDPA Subtest 4 | 826.4 | 19.52 |
| | 836.6 | 18.83 |
| | 846.6 | 19.43 |
| HSUPA Subtest 1 | 826.4 | 21.49 |
| | 836.6 | 21.16 |
| | 846.6 | 21.41 |
| HSUPA Subtest 2 | 826.4 | 20.53 |
| | 836.6 | 20.62 |
| | 846.6 | 20.71 |
| HSUPA Subtest 3 | 826.4 | 20.39 |
| | 836.6 | 20.26 |
| | 846.6 | 19.78 |
| HSUPA Subtest 4 | 826.4 | 22.79 |
| | 835.6 | 22.94 |
| | 846.6 | 22.42 |
| HSUPA Subtest 5 | 826.4 | 21.47 |
| | 836.6 | 21.38 |
| | 846.6 | 21.62 |

According to 3GPP 25.101 sub-clause 6.2.2 , the maximum output power is allowed to be reduced by following the table.

Table 6.1aA: UE maximum output power with HS-DPCCH and E-DCH

| UE Transmit Channel Configuration | CM(db) | MPR(db) |
|---|---|---|
| For all combinations of ,DPDCH,DPCCH HS-DPDCH,E-DPDCH and E-DPCCH | 0≤ CM≤3.5 | MAX(CM-1,0) |
| Note: CM=1 for $\beta_c/\beta_d$=12/15, $\beta_{hs}/\beta_c$=24/15.For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference. | | |

The device supports MPR to solve linearity issues (ACLR or SEM) due to the higher peak-to average ratios (PAR) of the HSUPA signal. This prevents saturating the full range of the TX DAC inside of device and provides a reduced power output to the RF transceiver chip according to the Cubic Metric (a function of the combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH).

When E-DPDCH channels are present the beta gains on those channels are reduced firsts to try to get the power under the allowed limit. If the beta gains are lowered as far as possible, then a hard limiting is applied at the maximum allowed level.

The SW currently recalculates the cubic metric every time the beta gains on the E-DPDCH are reduced. The cubic metric will likely get lower each time this is done .However, there is no reported reduction of maximum output power in the HSUPA mode since the device also provides a compensate for the power back-off by increasing the gain of TX_AGC in the transceiver (PA) device.

The end effect is that the DUT output power is identical to the case where there is no MPR in the device.

# 5.2 RADIATED OUTPUT POWER

## 5.2.1 MEASUREMENT METHOD

The measurements procedures specified in TIA-603C-2004 were applied.

1 In an anechoic antenna test chamber, a half-wave dipole antenna for the frequency band of interest is placed at the reference centre of the chamber. An RF Signal source for the frequency band of interest is connected to the dipole with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A known (measured) power (Pin) is applied to the input of the dipole, and the power received (Pr) at the chamber's probe antenna is recorded.

2 The substitution method is used. Substitution values at each frequency are measured before and saved to the test software. A "reference path loss" is established as ARpl=Pin + 2.15 - Pr. The ARpl is the attenuation of “reference path loss”, and including the gain of receive antenna, the cable loss and the air loss. The measurement results are obtained as described below: Power=PMea+ARpl

3 The EUT is substituted for the dipole at the reference centre of the chamber and a scan is performed to obtain the radiation pattern.

4 From the radiation pattern, the co-ordinates where the maximum antenna gain occurs are identified.

5 The EUT is then put into continuously transmitting mode at its maximum power level.

6 Power mode measurements are performed with the receiving antenna placed at the coordinates determined in Step 3 to determine the output power as defined in Rule 24.232 (b) and (c). The "reference path loss" from Step1 is added to this result.

7 This value is EIRP since the measurement is calibrated using a half-wave dipole antenna of known gain (2.15 dBi) and known input power (Pin).

8 ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.15dBi..

9. Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

## 5.2.2 PROVISIONS APPLICABLE

This is the test for the maximum radiated power from the EUT. Rule Part 24.232(b) specifies, “Mobile/portable stations are limited to 2 watts e.i.r.p. Peak power” and 24.232(c) specifies that "Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage.” Rule Part 22.913(a) specifies “Maximum ERP. The effective radiated power (ERP) of base transmitters and cellular repeaters must not exceed 500 Watts. The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.”

| Mode | Nominal Peak Power |
|---|---|
| GSM 850 | <=38.45 dBm (7W) |
| PCS 1900 | <=33 dBm (2W) |
| UMTS BAND V | <=38.45 dBm (7W) |

### 5.2.3 MEASUREMENT RESULT

| Radiated Power (ERP) for GSM 850 MHZ | | | | | | |
|---|---|---|---|---|---|---|
| Mode | Frequency | Peak Reading (dBm) | Factor | Result | | Conclusion |
| | | | | Max. Peak ERP (dBm) | Polarization Of Max. ERP | |
| GSM850 | 824.2 | 15.65 | 14.50 | **30.15** | Horizontal | Pass |
| | 824.2 | 14.56 | 14.50 | 29.06 | Vertical | Pass |
| | 836.6 | 12.17 | 14.72 | 26.89 | Horizontal | Pass |
| | 836.6 | 13.33 | 14.72 | 28.05 | Vertical | Pass |
| | 848.8 | 14.15 | 15.23 | 29.38 | Horizontal | Pass |
| | 848.8 | 13.35 | 15.23 | 28.58 | Vertical | Pass |

| Radiated Power (ERP) for GPRS 850 MHZ | | | | | | |
|---|---|---|---|---|---|---|
| Mode | Frequency | Peak Reading (dBm) | Factor | Result | | Conclusion |
| | | | | Max. Peak ERP (dBm) | Polarization Of Max. ERP | |
| GPRS850 | 824.2 | 14.85 | 14.50 | **29.35** | Horizontal | Pass |
| | 824.2 | 13.39 | 14.50 | 27.89 | Vertical | Pass |
| | 836.6 | 13.14 | 14.72 | 27.86 | Horizontal | Pass |
| | 836.6 | 13.97 | 14.72 | 28.69 | Vertical | Pass |
| | 848.8 | 13.54 | 15.23 | 28.77 | Horizontal | Pass |
| | 848.8 | 11.42 | 15.23 | 26.65 | Vertical | Pass |

| Radiated Power (ERP) for EDGE 850 MHZ | | | | | | |
|---|---|---|---|---|---|---|
| Mode | Frequency | Peak Reading (dBm) | Factor | Result | | Conclusion |
| | | | | Max. Peak ERP (dBm) | Polarization Of Max. ERP | |
| EDGE850 | 824.2 | 13.88 | 14.50 | **28.38** | Horizontal | Pass |
| | 824.2 | 13.26 | 14.50 | 27.76 | Vertical | Pass |
| | 836.6 | 13.44 | 14.72 | 28.16 | Horizontal | Pass |
| | 836.6 | 11.81 | 14.72 | 26.53 | Vertical | Pass |
| | 848.8 | 12.25 | 15.23 | 27.48 | Horizontal | Pass |
| | 848.8 | 11.49 | 15.23 | 26.72 | Vertical | Pass |

| Radiated Power (E.I.R.P) for PCS 1900 MHZ | | | | | | |
|---|---|---|---|---|---|---|
| Mode | Frequency | Peak Reading (dBm) | Factor | Result | | Conclusion |
| | | | | Max. Peak E.I.R.P.(dBm) | Polarization Of Max. E.I.R.P. | |
| PCS1900 | 1850.2 | 16.33 | 9.24 | 25.57 | Horizontal | Pass |
| | 1850.2 | 17.11 | 9.24 | 26.35 | Vertical | Pass |
| | 1880.0 | 17.14 | 8.72 | 25.86 | Horizontal | Pass |
| | 1880.0 | 18.82 | 8.72 | **27.54** | Vertical | Pass |
| | 1909.8 | 17.04 | 8.61 | 25.65 | Horizontal | Pass |
| | 1909.8 | 19.04 | 8.61 | 27.65 | Vertical | Pass |

| Radiated Power (E.I.R.P) for GPRS 1900 MHZ | | | | | | |
|---|---|---|---|---|---|---|
| Mode | Frequency | Peak Reading (dBm) | Factor | Result | | Conclusion |
| | | | | Max. Peak E.I.R.P.(dBm) | Polarization Of Max. E.I.R.P. | |
| GPRS 1900 | 1850.2 | 16.21 | 9.24 | 25.45 | Horizontal | Pass |
| | 1850.2 | 17.43 | 9.24 | **26.67** | Vertical | Pass |
| | 1880.0 | 17.02 | 8.72 | 25.74 | Horizontal | Pass |
| | 1880.0 | 16.73 | 8.72 | 25.45 | Vertical | Pass |
| | 1909.8 | 16.38 | 8.61 | 24.99 | Horizontal | Pass |
| | 1909.8 | 17.55 | 8.61 | 26.16 | Vertical | Pass |

| Radiated Power (E.I.R.P) for EDGE 1900 MHZ | | | | | | |
|---|---|---|---|---|---|---|
| Mode | Frequency | Peak Reading (dBm) | Factor | Result | | Conclusion |
| | | | | Max. Peak E.I.R.P.(dBm) | Polarization Of Max. E.I.R.P. | |
| **EDGE 1900** | 1850.2 | 15.11 | 9.24 | 24.35 | Horizontal | Pass |
| | 1850.2 | 14.5 | 9.24 | 23.74 | Vertical | Pass |
| | 1880.0 | 15.74 | 8.72 | 24.46 | Horizontal | Pass |
| | 1880.0 | 14.93 | 8.72 | 23.65 | Vertical | Pass |
| | 1909.8 | 16.32 | 8.61 | 24.93 | Horizontal | Pass |
| | 1909.8 | 16.53 | 8.61 | **25.14** | Vertical | Pass |

| Radiated Power (E.I.R.P) for UMTS band V | | | | | | |
|---|---|---|---|---|---|---|
| Mode | Frequency | Peak Reading (dBm) | Factor | Result | | Conclusion |
| | | | | Max. Peak E.I.R.P.(dBm) | Polarization Of Max. E.I.R.P. | |
| RMC 12.2kbps | 826.4 | 6.15 | 14.59 | **20.74** | Horizontal | Pass |
| | 826.4 | 4.3 | 14.59 | 18.89 | Vertical | Pass |
| | 836.4 | 4.84 | 14.73 | 19.57 | Horizontal | Pass |
| | 836.4 | 5.92 | 14.73 | 20.65 | Vertical | Pass |
| | 846.6 | 4.49 | 15.19 | 19.68 | Horizontal | Pass |
| | 846.6 | 5.43 | 15.19 | 20.62 | Vertical | Pass |

NOTE 1: in the part, result the worst case GPRS 1slot for GSM 850 and PCS1900, and RMC 12.2kbps for band V.

# 6. SPURIOUS EMISSION

## 6.1 CONDUCTED SPURIOUS EMISSION

### 6.1.1 MEASUREMENT METHOD

The following steps outline the procedure used to measure the conducted emissions from the EUT.

1, Determine frequency range for measurements: From CFR 2.1057 the spectrum should be investigated from the lowest radio frequency generated in the equipment up to at least the 10th harmonic of the carrier frequency. For the equipment of PCS1900 band, this equates to a frequency range of 30 MHz to 19.1 GHz, data taken from 30 MHz to 20 GHz. For GSM850, data taken from 30 MHz to 9 GHz.

2, Determine EUT transmit frequencies: the following typical channels were chosen to conducted emissions testing.

| Typical Channels for testing of GSM/GPRS/EDGE 850 MHz | |
|---|---|
| Channel | Frequency (MHz) |
| 128 | 824.2 |
| 190 | 836.6 |
| 251 | 848.8 |

| Typical Channels for testing of PCS/ GPRS/EDGE 1900 MHz | |
|---|---|
| Channel | Frequency (MHz) |
| 512 | 1850.2 |
| 661 | 1880.0 |
| 810 | 1909.8 |

| Typical Channels for testing of UMTS band V | |
|---|---|
| Channel | Frequency (MHz) |
| 4132 | 826.4 |
| 4183 | 836.6 |
| 4233 | 846.6 |

### 6.1.2 PROVISIONS APPLICABLE

On any frequency outside frequency band of the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log(P) dB. For all power levels +30 dBm to 0 dBm, this becomes a constant specification limit of -13 dBm.

### 6.1.3 MEASUREMENT RESULT

**PLEASE REFER TO :** APPENDIX I TEST PLOTS FOR CONDUCTED SPURIOUS EMISSION

**Note:** 1. Below 30MHZ no Spurious found and The GSM modes is the worst condition.

2. As no emission found in standby or receive mode, no recording in this report.

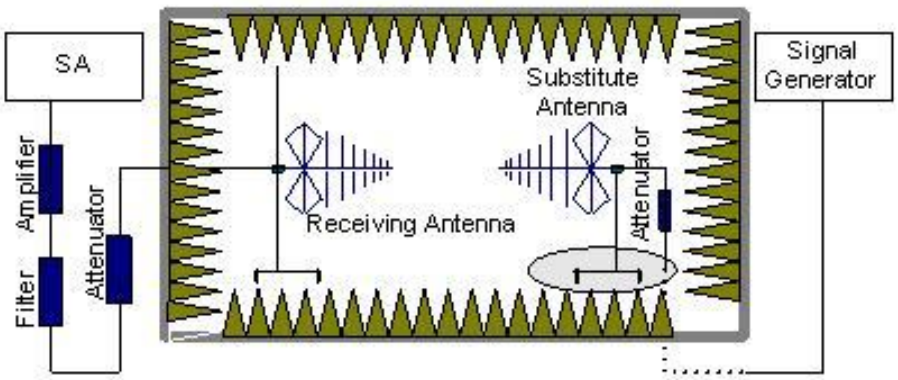
# 6.2 RADIATED SPURIOUS EMISSION

## 6.2.1 MEASUREMENT METHOD

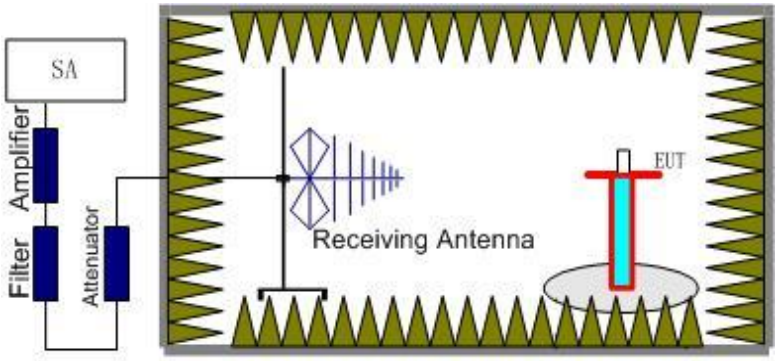
The measurements procedures specified in TIA-603C-2004 were used for testing. The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment. The resolution bandwidth is set 1MHz as outlined in Part 24.238. The measurements were performed on all modes(GPRS850, GPRS1900, HSDPA band V,) at 3 typical channels(the Top Channel, the Middle Channel and the Bottom Channel) for each band.

The procedure of radiated spurious emissions is as follows:

a) Pre-calibration With pre-calibration method, the Radiated Spurious Emissions(RSE) is calculated as, RSE=Rx（dBuV）+CL（dB）+SA（dB）+Gain（dBi）-107（dBuV to dBm）The SA is calibrated using following setup.




b) EUT was placed on a 0.8 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the test item for emission measurements. The height of receiving antenna is 0.8m. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the test item and adjusting the receiving antenna polarization. The radiated emission measurements of all non-harmonic and harmonics of the transmit frequency through the 10th harmonic were measured with peak detector and 1MHz bandwidth.




Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the PCS 1900 band (1850.2 MHz, 1880 MHz and 1909.8 MHz) ,GSM850 band (824.2MHz, 836.6MHz, 848.8MHz), UMTS band V (4132 (826.4MHz), 4183(835MHz) and 4233 (846.6MHz)). It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of any band into any of the other blocks.

The substitution method is used. Substitution values at each frequency are measured before and saved to the test software. A "reference path loss" is established and the $A_{Rpl}$ is the attenuation of “reference path loss”, and including the gain of receive antenna, the gain of the preamplifier, the cable loss and the air loss. The measurement results are obtained as described below: $Power=P_{Mea}+A_{Rpl}$

### 6.2.2 PROVISIONS APPLICABLE

(a) On any frequency outside a licensee’s frequency block (e.g. A, D, B, etc.) within the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log(P) dB. The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

**Note:** only result the worst condition of each test mode:

### 6.2.3 MEASUREMENT RESULT

GSM 850:

| The Worst Test Results Channel 128/824.2 MHz | | | | | |
|---|---|---|---|---|---|
| Frequency(MHz) | Power(dBm) | $A_{Rpl}$ (dBm) | $P_{Mea}$(dBm) | Limit（dBm） | Polarity |
| 1648.379 | -35.35 | -4.65 | -40 | -13.00 | Horizontal |
| 2471.322 | -36.57 | -2.1 | -38.67 | -13.00 | Horizontal |
| 4118.454 | -31.48 | 11.8 | -19.68 | -13.00 | Horizontal |
| 1648.379 | -38.68 | -4.65 | -43.33 | -13.00 | Vertical |
| 2471.322 | -41.24 | -2.1 | -43.34 | -13.00 | Vertical |
| 4118.454 | -40.58 | 11.8 | -28.78 | -13.00 | Vertical |
| **The Worst Test Results Channel 190/836.6 MHz** | | | | | |
| Frequency(MHz) | Power(dBm) | $A_{Rpl}$ (dBm) | $P_{Mea}$(dBm) | Limit（dBm） | Polarity |
| 1673.317 | -36.67 | -4.97 | -41.64 | -13.00 | Horizontal |
| 2506.234 | -42.28 | -2.1 | -44.38 | -13.00 | Horizontal |
| 3339.401 | -36.29 | 3.46 | -32.83 | -13.00 | Horizontal |
| 1673.317 | -37.68 | -4.97 | -42.65 | -13.00 | Vertical |
| 2506.234 | -32.48 | -2.1 | -34.58 | -13.00 | Vertical |
| 3339.401 | -36.29 | 3.46 | -32.83 | -13.00 | Vertical |
| **The Worst Test Results Channel 251/848.8 MHz** | | | | | |
| Frequency(MHz) | Power(dBm) | $A_{Rpl}$ (dBm) | $P_{Mea}$(dBm) | Limit（dBm） | Polarity |
| 1698.254 | -35.57 | -4.94 | -40.51 | -13.00 | Horizontal |
| 2541.147 | -43.46 | -2.02 | -45.48 | -13.00 | Horizontal |
| 3384.835 | -45.87 | 3.49 | -42.38 | -13.00 | Horizontal |
| 1698.254 | -35.42 | -4.94 | -40.36 | -13.00 | Vertical |
| 2541.147 | -41.52 | -2.02 | -43.54 | -13.00 | Vertical |
| 3384.835 | -37.12 | 3.49 | -33.63 | -13.00 | Vertical |

PCS 1900:

| The Worst Test Results for Channel 512/1850.2MHz | | | | | |
|---|---|---|---|---|---|
| Frequency(MHz) | Power(dBm) | $A_{Rpl}$ (dBm) | $P_{Mea}$(dBm) | Limit（dBm） | Polarity |
| 1793.017 | -36.69 | -3.54 | -40.23 | -13.00 | Horizontal |
| 3720.698 | -43.69 | 13.01 | -30.68 | -13.00 | Horizontal |
| 5543.641 | -42.79 | 14.7 | -28.09 | -13.00 | Horizontal |
| 1793.017 | -34.68 | -3.54 | -38.22 | -13.00 | Vertical |
| 3720.698 | -45.58 | 13.01 | -32.57 | -13.00 | Vertical |
| 5543.641 | -41.89 | 14.7 | -27.19 | -13.00 | Vertical |

| The Worst Test Results for Channel 661/1880.0MHz | | | | | |
|---|---|---|---|---|---|
| Frequency(MHz) | Power(dBm) | $A_{Rpl}$ (dBm) | $P_{Mea}$(dBm) | Limit（dBm） | Polarity |
| 1822.943 | -36.75 | -3.48 | -40.23 | -13.00 | Horizontal |
| 3763.092 | -52.23 | 13.8 | -38.43 | -13.00 | Horizontal |
| 5628.429 | -43.57 | 15.4 | -28.17 | -13.00 | Horizontal |
| 1822.943 | -31.59 | -3.48 | -35.07 | -13.00 | Vertical |
| 3763.092 | -43.06 | 13.8 | -29.26 | -13.00 | Vertical |
| 5628.429 | -33.59 | 15.4 | -18.19 | -13.00 | Vertical |

| The Worst Test Results for Channel 810/1909.8MHz | | | | | |
|---|---|---|---|---|---|
| Frequency(MHz) | Power(dBm) | $A_{Rpl}$ (dBm) | $P_{Mea}$(dBm) | Limit（dBm） | Polarity |
| 1967.581 | -32.79 | -3.26 | -36.05 | -13.00 | Horizontal |
| 3847.88 | -45.56 | 12.4 | -33.16 | -13.00 | Horizontal |
| 5713.217 | -37.29 | 15.75 | -21.54 | -13.00 | Horizontal |
| 1967.581 | -32.84 | -3.26 | -36.1 | -13.00 | Vertical |
| 3847.88 | -45.39 | 12.4 | -32.99 | -13.00 | Vertical |
| 5713.217 | -38.09 | 15.75 | -22.34 | -13.00 | Vertical |

UMTS band V

| Channel 4132/824.6MHz | | | | | |
|---|---|---|---|---|---|
| Frequency(MHz) | Power(dBm) | $A_{Rpl}$ (dBm) | $P_{Mea}$(dBm) | Limit（dBm） | Polarity |
| 1653.367 | -34.76 | -5.01 | -39.77 | -13.00 | Horizontal |
| 2481.297 | -35.58 | -2.08 | -37.66 | -13.00 | Horizontal |
| 1653.367 | -34.68 | -5.01 | -39.69 | -13.00 | Vertical |
| 2481.297 | -31.79 | -2.08 | -33.87 | -13.00 | Vertical |
| **Channel 4183/836.6MHz** | | | | | |
| Frequency(MHz) | Power(dBm) | $A_{Rpl}$ (dBm) | $P_{Mea}$(dBm) | Limit（dBm） | Polarity |
| 1675.329 | -31.69 | -4.97 | -36.66 | -13.00 | Horizontal |
| 2510.781 | -35.68 | -2.1 | -37.78 | -13.00 | Horizontal |
| 1675.329 | -27.49 | -4.97 | -32.46 | -13.00 | Vertical |
| 2510.781 | -35.58 | -2.1 | -37.68 | -13.00 | Vertical |
| **Channel 4233/846.6MHz** | | | | | |
| Frequency(MHz) | Power(dBm) | $A_{Rpl}$ (dBm) | $P_{Mea}$(dBm) | Limit（dBm） | Polarity |
| 1675.329 | -36.68 | -4.97 | -41.65 | -13.00 | Horizontal |
| 2510.781 | -38.69 | -2.1 | -40.79 | -13.00 | Horizontal |
| 1675.329 | -27.58 | -4.97 | -32.55 | -13.00 | Vertical |
| 2510.781 | -35.04 | -2.1 | -37.14 | -13.00 | Vertical |

:

**Note:** Below 30MHZ no Spurious found and The GPRS/EDGE modes is the worst condition.

# 7. FREQUENCY STABILITY

## 7.1 MEASUREMENT METHOD

In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the EUT in a “call mode”. This is accomplished with the use of R&S CMU200 DIGITAL RADIO COMMUNICATION TESTER.

1 . Measure the carrier frequency at room temperature.

2 .Subject the EUT to overnight soak at -10℃.

3 .With the EUT, powered via nominal voltage, connected to the CMU200 and in a simulated call on channel 661 for PCS 1900 band , channel 190 for GSM 850 band and channel 4183 for UMTS band V measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.

4 .Repeat the above measurements at 10℃ increments from -10℃ to +50℃. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.

5 .Re-measure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1Volt increments re-measuring carrier frequency at each voltage. Pause at nominal voltage for 1 1/2 hours unpowered, to allow any self-heating to stabilize, before continuing.

6 .Subject the EUT to overnight soak at +50℃.

7 , With the EUT, powered via nominal voltage, connected to the CMU200 and in a simulated call on the centre channel, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.

8 .Repeat the above measurements at 10℃ increments from +50℃ to -10℃. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.

9 .At all temperature levels hold the temperature to +/- 0.5℃ during the measurement procedure.

## 7.2 PROVISIONS APPLICABLE

### 7.2.1 For Hand carried battery powered equipment

According to the JTC standard the frequency stability of the carrier shall be accurate to within 0.1 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 24.235, Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. As this transceiver is considered "Hand carried, battery powered equipment" Section 2.1055(d)(2) applies. This requires that the lower voltage for frequency stability testing be specified by the manufacturer. This transceiver is specified to operate with an input voltage of between 3.4VDC and 4.2VDC, with a nominal voltage of 3.7VDC. Operation above or below these voltage limits is prohibited by transceiver software in order to prevent improper operation as well as to protect components from overstress. These voltages represent a tolerance of -10 % and +12.5 %. For the purposes of measuring frequency stability these voltage limits are to be used.

### 7.2.2 For equipment powered by primary supply voltage

According to the JTC standard the frequency stability of the carrier shall be accurate to within 0.1 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 24.235, Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. For this EUT section 2.1055(d)(1) applies. This requires varying primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment, the normal environment temperature is 20°C.

## 7.3 MEASUREMENT RESULT

| Frequency Error Against Voltage for GSM 850 band | | |
|---|---|---|
| Voltage(V) | Frequency error(Hz) | Frequency error(ppm) |
| 3.4 | 23 | 0.028 |
| 3.7 | 43 | 0.051 |
| 4.2 | 36 | 0.043 |

| Frequency Error Against Temperature for GSMS850 band | | |
|---|---|---|
| temperature(℃) | Frequency error(Hz) | Frequency error(ppm) |
| -10 | 23 | 0.028 |
| 0 | 32 | -0.038 |
| 10 | 25 | 0.030 |
| 20 | 13 | -0.016 |
| 30 | 18 | -0.022 |
| 40 | 10 | 0.012 |
| 50 | 26 | 0.031 |

| Frequency Error Against Voltage for GPRS850 band | | |
|---|---|---|
| Voltage(V) | Frequency error(Hz) | Frequency error(ppm) |
| 3.4 | 15 | 0.018 |
| 3.7 | 25 | 0.030 |
| 4.2 | 23 | -0.028 |

| Frequency Error Against Temperature for GPRS850 band | | |
|---|---|---|
| temperature(℃) | Frequency error(Hz) | Frequency error(ppm) |
| -10 | 36 | -0.043 |
| 0 | 19 | 0.023 |
| 10 | 8 | -0.010 |
| 20 | 17 | 0.020 |
| 30 | 23 | -0.028 |
| 40 | 35 | 0.042 |
| 50 | 31 | 0.037 |

| Frequency Error Against Voltage for EGPRS850 band | | |
|---|---|---|
| Voltage(V) | Frequency error(Hz) | Frequency error(ppm) |
| 3.4 | 32 | 0.038 |
| 3.7 | 26 | 0.031 |
| 4.2 | 35 | 0.042 |

| Frequency Error Against Temperature for EGPRS850 band | | |
|---|---|---|
| temperature(℃) | Frequency error(Hz) | Frequency error(ppm) |
| -10 | 35 | 0.042 |
| 0 | 25 | 0.030 |
| 10 | 23 | -0.028 |
| 20 | 29 | 0.035 |
| 30 | 26 | -0.031 |
| 40 | 28 | 0.033 |
| 50 | 22 | 0.026 |

Note: The EUT doesn't work below -10℃

| Frequency Error Against Voltage for GSM1900 band | | |
|---|---|---|
| Voltage(V) | Frequency error(Hz) | Frequency error(ppm) |
| 3.4 | 23 | 0.012 |
| 3.7 | 19 | -0.010 |
| 4.2 | 25 | -0.013 |

| Frequency Error Against Temperature for GSM1900 band | | |
|---|---|---|
| temperature(℃) | Frequency error(Hz) | Frequency error(ppm) |
| -10 | 27 | 0.014 |
| 0 | 9 | 0.005 |
| 10 | 25 | -0.013 |
| 20 | 19 | 0.010 |
| 30 | 32 | 0.017 |
| 40 | 9 | 0.005 |
| 50 | 23 | -0.012 |

| Frequency Error Against Voltage for GPRS1900 band | | |
|---|---|---|
| Voltage(V) | Frequency error(Hz) | Frequency error(ppm) |
| 3.4 | 23 | 0.012 |
| 3.7 | 17 | 0.009 |
| 4.2 | 34 | 0.018 |

| Frequency Error Against Temperature for GPRS1900 band | | |
|---|---|---|
| temperature(℃) | Frequency error(Hz) | Frequency error(ppm) |
| -10 | 27 | 0.014 |
| 0 | 14 | 0.007 |
| 10 | 32 | 0.017 |
| 20 | 19 | 0.010 |
| 30 | 27 | 0.014 |
| 40 | 32 | 0.017 |
| 50 | 26 | 0.014 |

| Frequency Error Against Voltage for EDGE1900 band | | |
|---|---|---|
| Voltage(V) | Frequency error(Hz) | Frequency error(ppm) |
| 3.4 | 34 | 0.018 |
| 3.7 | 26 | 0.014 |
| 4.2 | 38 | 0.020 |

| Frequency Error Against Temperature for EDGE1900 band | | |
|---|---|---|
| temperature(℃) | Frequency error(Hz) | Frequency error(ppm) |
| -10 | 25 | 0.013 |
| 0 | 19 | -0.010 |
| 10 | 17 | 0.009 |
| 20 | 14 | -0.007 |
| 30 | 26 | 0.014 |
| 40 | 21 | 0.011 |
| 50 | 42 | 0.022 |

**Note:** The EUT doesn't work below -10℃

| Frequency Error Against Voltage for UMTS band V | | |
|---|---|---|
| Voltage(V) | Frequency error(Hz) | Frequency error(ppm) |
| 3.4 | 31 | 0.037 |
| 3.7 | 26 | 0.031 |
| 4.2 | 18 | -0.022 |

| Frequency Error Against Temperature for UMTS band V | | |
|---|---|---|
| temperature(℃) | Frequency error(Hz) | Frequency error(ppm) |
| -10 | 34 | 0.041 |
| 0 | 7 | 0.008 |
| 10 | 26 | 0.031 |
| 20 | 28 | 0.034 |
| 30 | 18 | 0.022 |
| 40 | 22 | 0.026 |
| 50 | 14 | 0.017 |

**Note:** The EUT doesn't work below -10℃

# 8. OCCUPIED BANDWIDTH

## 8.1 MEASUREMENT METHOD

The test set up and general procedure is similar to conducted peak output power test. Only different for setting the measurement configuration of the measuring instrument of Spectrum Analyzer.

## 8.2 PROVISIONS APPLICABLE

The occupied bandwidth (99%) shall not exceed 300 KHz.

## 8.3 MEASUREMENT RESULT

| Occupied Bandwidth (99%) for GSM 850 band | | |
|---|---|---|
| Mode | Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |
| Low Channel | 824.2 | 257.78 |
| Middle Channel | 836.6 | 244.18 |
| High Channel | 848.8 | 239.81 |

| Occupied Bandwidth (99%) for GPRS 850 band | | |
|---|---|---|
| Mode | Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |
| Low Channel | 824.2 | 241.93 |
| Middle Channel | 836.6 | 243.68 |
| High Channel | 848.8 | 244.51 |

| Occupied Bandwidth (99%) for EGPRS 850 band | | |
|---|---|---|
| Mode | Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |
| Low Channel | 824.2 | 241.83 |
| Middle Channel | 836.6 | 243.57 |
| High Channel | 848.8 | 246.25 |

| Occupied Bandwidth (99%) for GSM1900 band | | |
|---|---|---|
| Mode | Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |
| Low Channel | 1850.2 | 244.89 |
| Middle Channel | 1880.0 | 248.15 |
| High Channel | 1909.8 | 245.63 |

| Occupied Bandwidth (99%) for GPRS1900 band | | |
|---|---|---|
| Mode | Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |
| Low Channel | 1850.2 | 250.41 |
| Middle Channel | 1880.0 | 248.54 |
| High Channel | 1909.8 | 245.03 |

| Occupied Bandwidth (99%) for EDGE1900 band | | |
|---|---|---|
| Mode | Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |
| Low Channel | 1850.2 | 249.81 |
| Middle Channel | 1880.0 | 242.41 |
| High Channel | 1909.8 | 243.54 |

| Occupied Bandwidth (99%) for UMTS band V | | |
|---|---|---|
| Mode | Frequency(MHz) | Occupied Bandwidth (99%)( MHz) |
| Low Channel | 826.4 | 4.17 |
| Middle Channel | 836.6 | 4.14 |
| High Channel | 846.6 | 4.15 |
| **Occupied Bandwidth (99%) for UMTS HSDPA band V** | | |
| Mode | Frequency(MHz) | Occupied Bandwidth (99%)( MHz) |
| Low Channel | 826.4 | 4.15 |
| Middle Channel | 836.6 | 4.13 |
| High Channel | 846.6 | 4.16 |
| **Occupied Bandwidth (99%) for UMTS HSUPA band V** | | |
| Mode | Frequency(MHz) | Occupied Bandwidth (99%)( MHz) |
| Low Channel | 826.4 | 4.17 |
| Middle Channel | 836.6 | 4.14 |
| High Channel | 846.6 | 4.15 |

# 9. EMISSION BANDWIDTH

## 9.1 MEASUREMENT METHOD

The test set up and general procedure is similar to conducted peak output power test. Only different for setting the measurement configuration of the measuring instrument of Spectrum Analyzer.

## 9.2 PROVISIONS APPLICABLE

The emission bandwidth is defined as two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power

## 9.3 MEASUREMENT RESULT

| Emission Bandwidth (-26dBc) for GSM850 band | | |
|---|---|---|
| Mode | Frequency(MHz) | Emission Bandwidth (-26dBc)( kHz) |
| Low Channel | 824.2 | 315.00 |
| Middle Channel | 836.6 | 318.30 |
| High Channel | 848.8 | 313.29 |

| Emission Bandwidth (-26dBc) for GPRS850 band | | |
|---|---|---|
| Mode | Frequency(MHz) | Emission Bandwidth (-26dBc)( kHz) |
| Low Channel | 824.2 | 311.54 |
| Middle Channel | 836.6 | 317.39 |
| High Channel | 848.8 | 313.95 |

| Emission Bandwidth (-26dBc) for EDGE850 band | | |
|---|---|---|
| Mode | Frequency(MHz) | Emission Bandwidth (-26dBc)( kHz) |
| Low Channel | 824.2 | 315.46 |
| Middle Channel | 836.6 | 302.84 |
| High Channel | 848.8 | 314.81 |

| Emission Bandwidth (-26dBc) for GSM1900 band | | |
|---|---|---|
| Mode | Frequency(MHz) | Emission Bandwidth (-26dBc)( kHz) |
| Low Channel | 1850.2 | 315.72 |
| Middle Channel | 1880.0 | 314.56 |
| High Channel | 1909.8 | 308.00 |

| Emission Bandwidth (-26dBc) for GPRS1900 band | | |
|---|---|---|
| Mode | Frequency(MHz) | Emission Bandwidth (-26dBc)( kHz) |
| Low Channel | 1850.2 | 312.24 |
| Middle Channel | 1880.0 | 313.95 |
| High Channel | 1909.8 | 305.28 |

| Emission Bandwidth (-26dBc) for EDGE1900 band | | |
|---|---|---|
| Mode | Frequency(MHz) | Emission Bandwidth (-26dBc)( kHz) |
| Low Channel | 1850.2 | 304.39 |
| Middle Channel | 1880.0 | 318.80 |
| High Channel | 1909.8 | 319.38 |

| Emission Bandwidth (-26dBc) for UMTS band V | | |
|---|---|---|
| Mode | Frequency(MHz) | Emission Bandwidth (-26dBc)( MHz) |
| Low Channel | 826.4 | 4.66 |
| Middle Channel | 836.6 | 4.67 |
| High Channel | 846.6 | 4.67 |
| **Emission Bandwidth (-26dBc) for UMTS HSDPA band V** | | |
| Mode | Frequency(MHz) | Emission Bandwidth (-26dBc)( MHz) |
| Low Channel | 826.4 | 4.68 |
| Middle Channel | 836.6 | 4.66 |
| High Channel | 846.6 | 4.66 |
| **Emission Bandwidth (-26dBc) for UMTS HSUPA band V** | | |
| Mode | Frequency(MHz) | Emission Bandwidth (-26dBc)( MHz) |
| Low Channel | 826.4 | 4.65 |
| Middle Channel | 836.6 | 4.65 |
| High Channel | 846.6 | 4.67 |

# 10. BAND EDGE

## 10.1 MEASUREMENT METHOD

The test set up and general procedure is similar to conducted peak output power test. Only different for setting the measurement configuration of the measuring instrument of Spectrum Analyzer.

## 10.2 PROVISIONS APPLICABLE

as Specified in FCC rules of 22.917(b) and 24.238(b)

## 10.3 MEASUREMENT RESULT

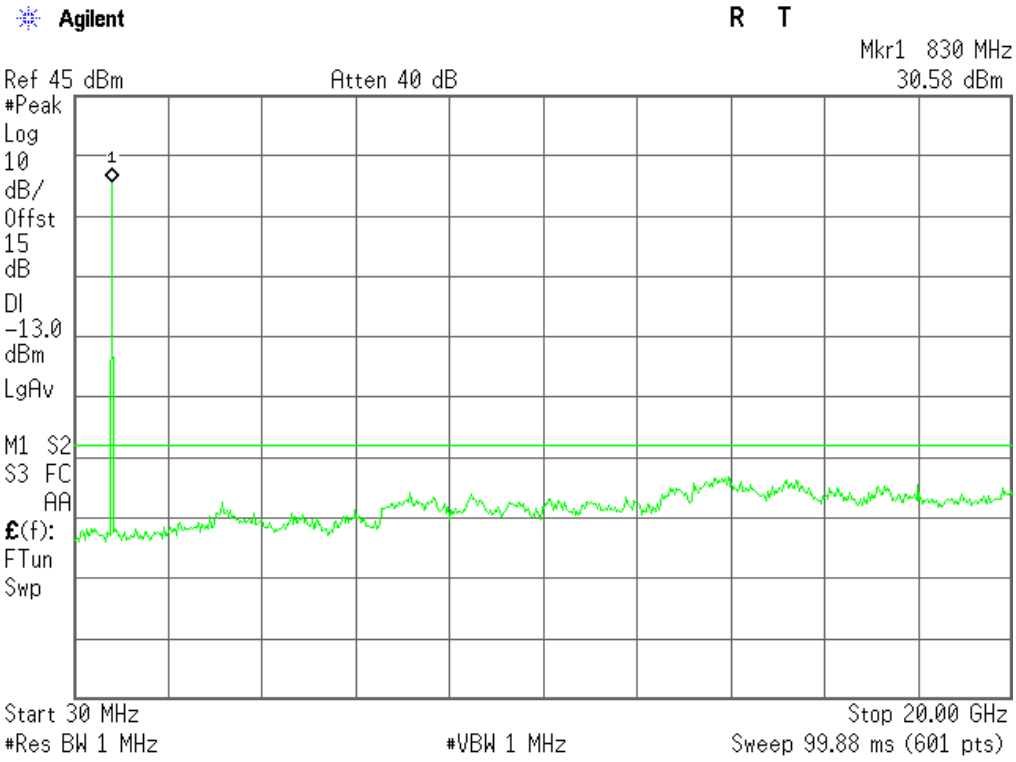
Please refers to Appendix III for compliance test plots for band edges

# APPENDIX I

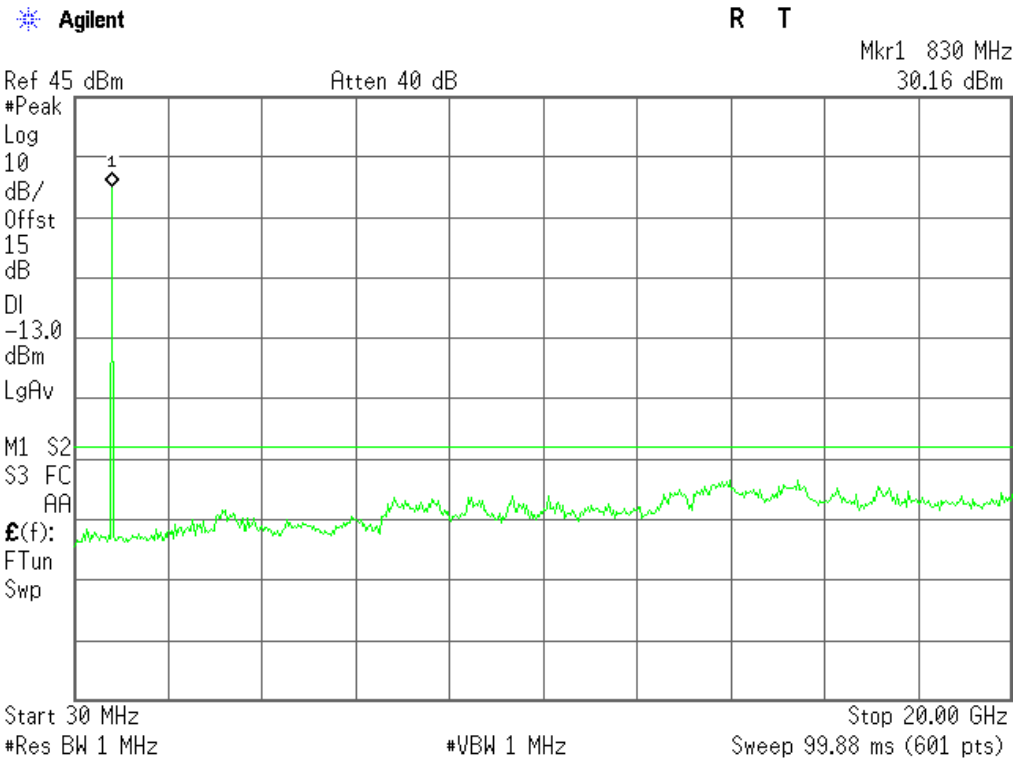
# TEST PLOTS FOR CONDUCTED SPURIOUS EMISSION

CONDUCTED EMISSION IN GSM 850 BAND

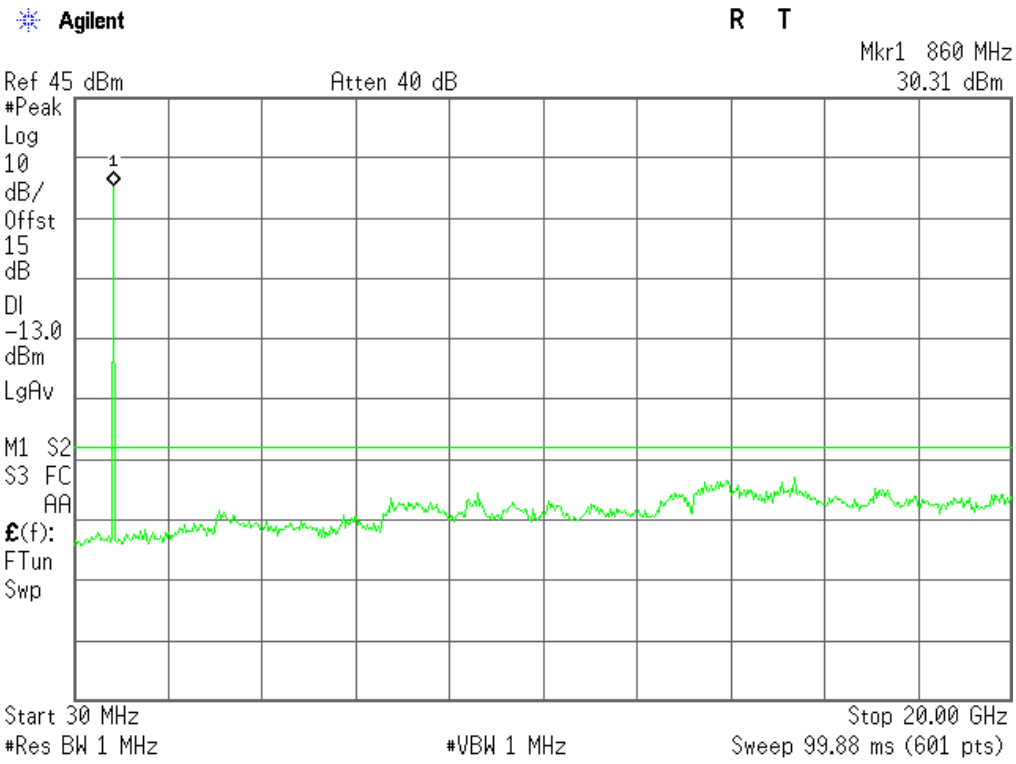
Conducted Emission Transmitting Mode CH 128 30MHz – 10GHz




Conducted Emission Transmitting Mode CH 190 30MHz – 10GHz

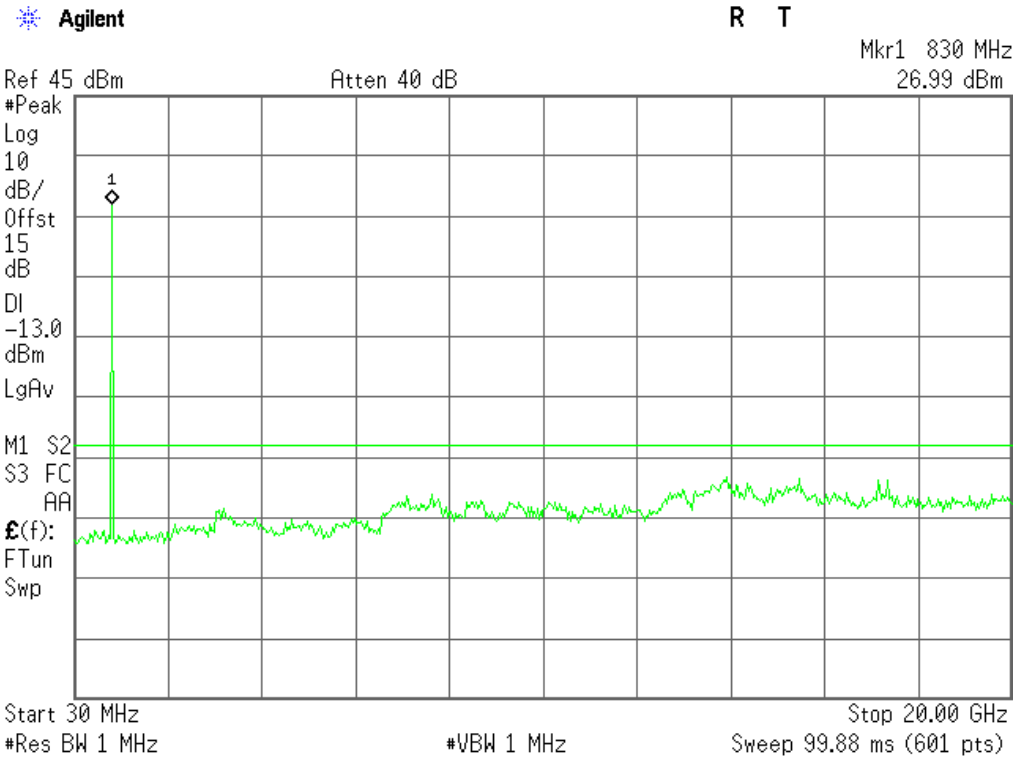


Conducted Emission Transmitting Mode CH 251 30MHz – 10GHz

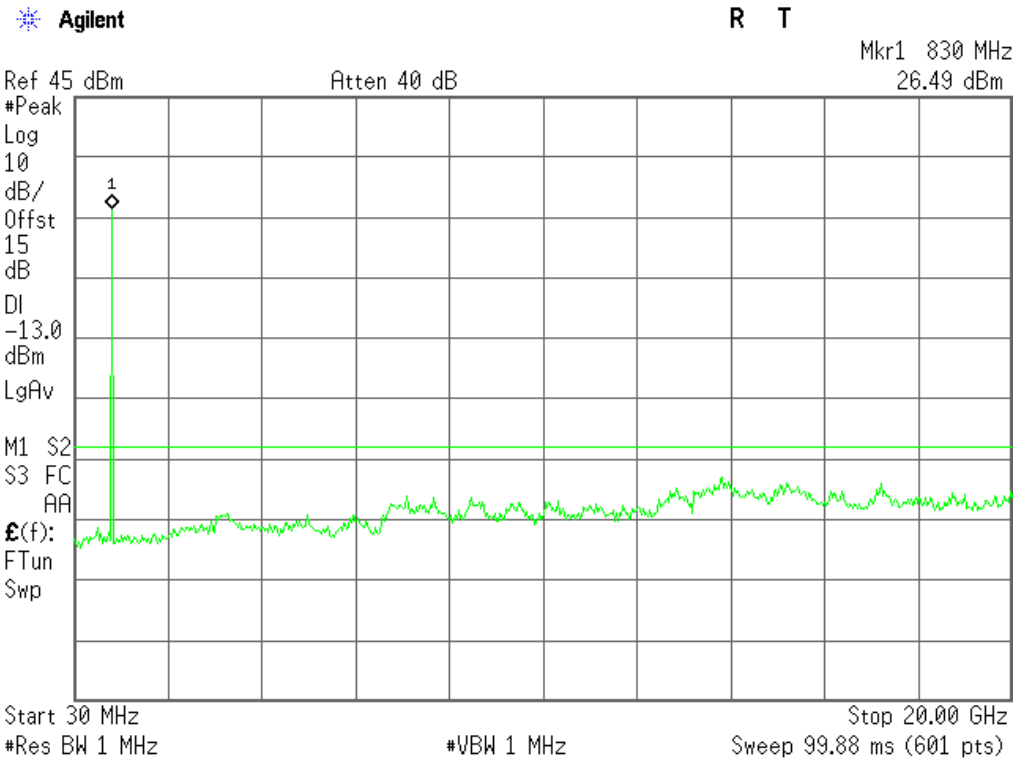


CONDUCTED EMISSION IN GPRS 850 BAND

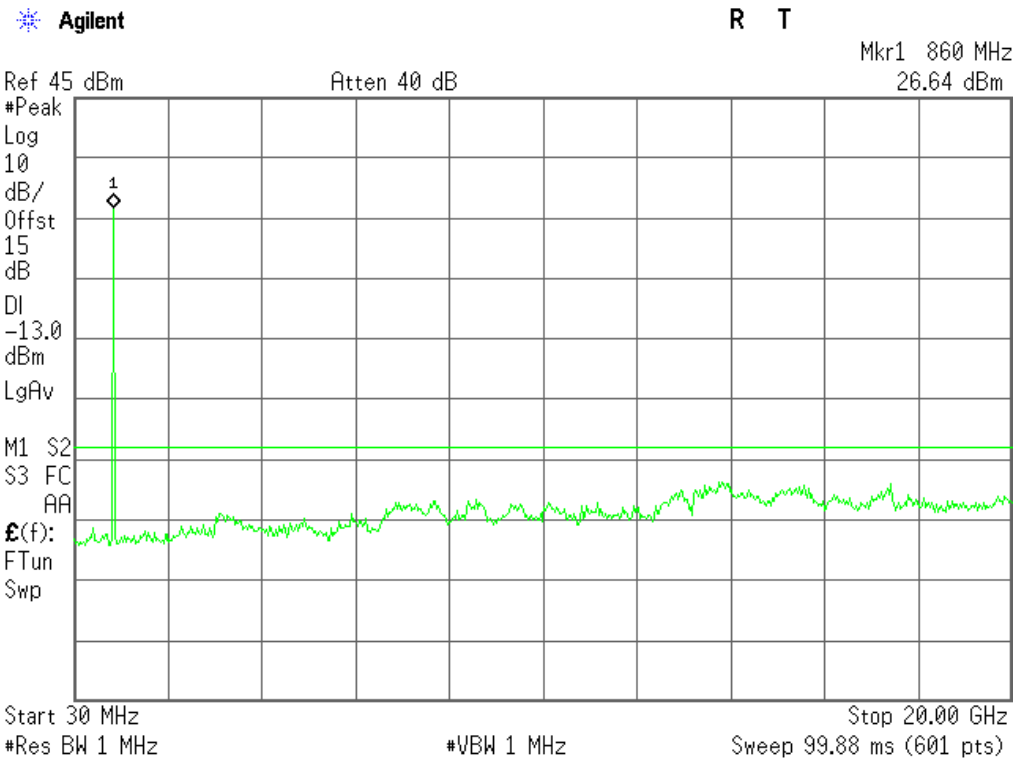
Conducted Emission Transmitting Mode CH 128 30MHz – 10GHz




Conducted Emission Transmitting Mode CH 190 30MHz – 10GHz

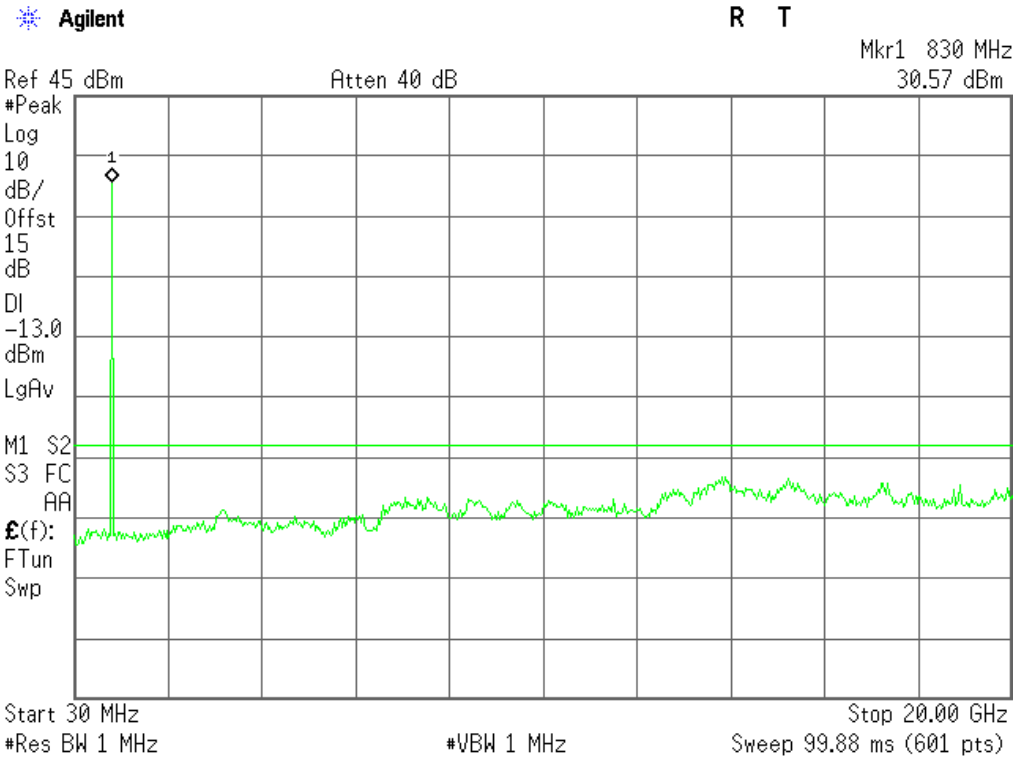


Conducted Emission Transmitting Mode CH 251 30MHz – 10GHz

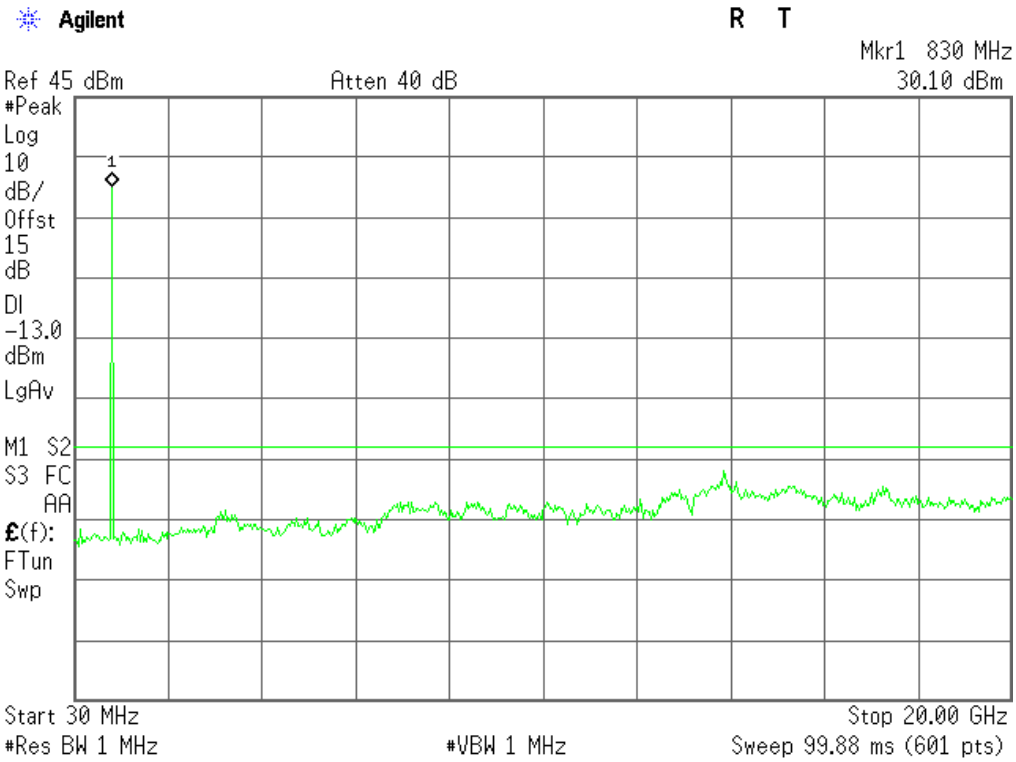


CONDUCTED EMISSION IN EGPRS 850 BAND

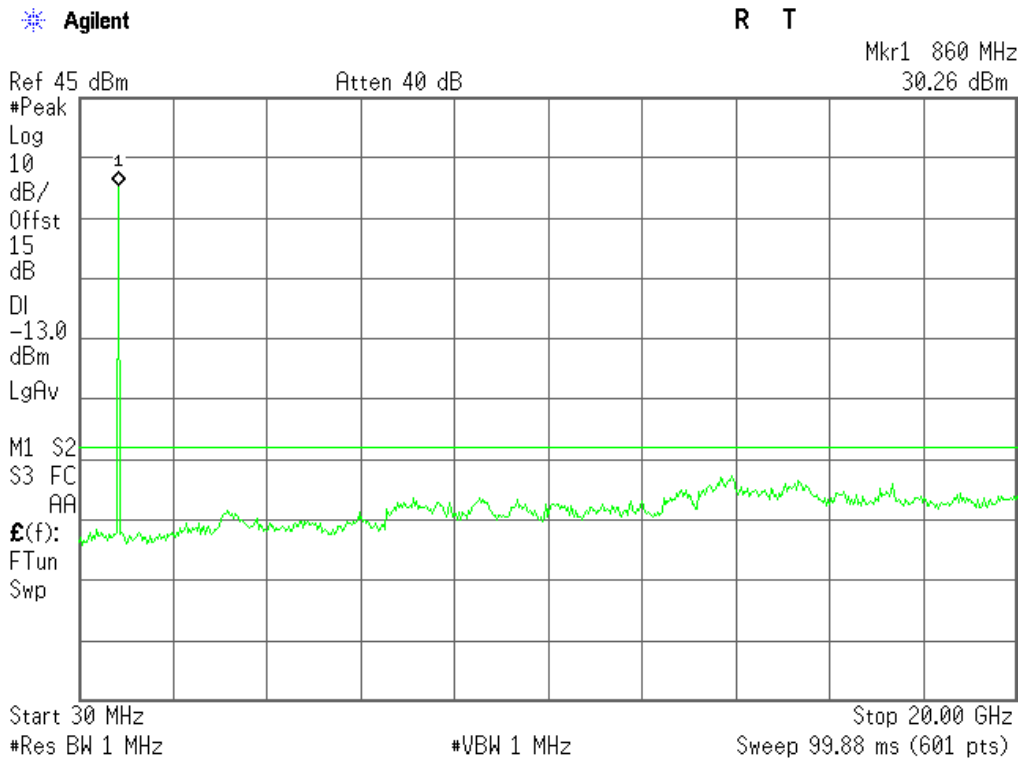
Conducted Emission Transmitting Mode CH 128 30MHz – 10GHz




Conducted Emission Transmitting Mode CH 190 30MHz – 10GHz

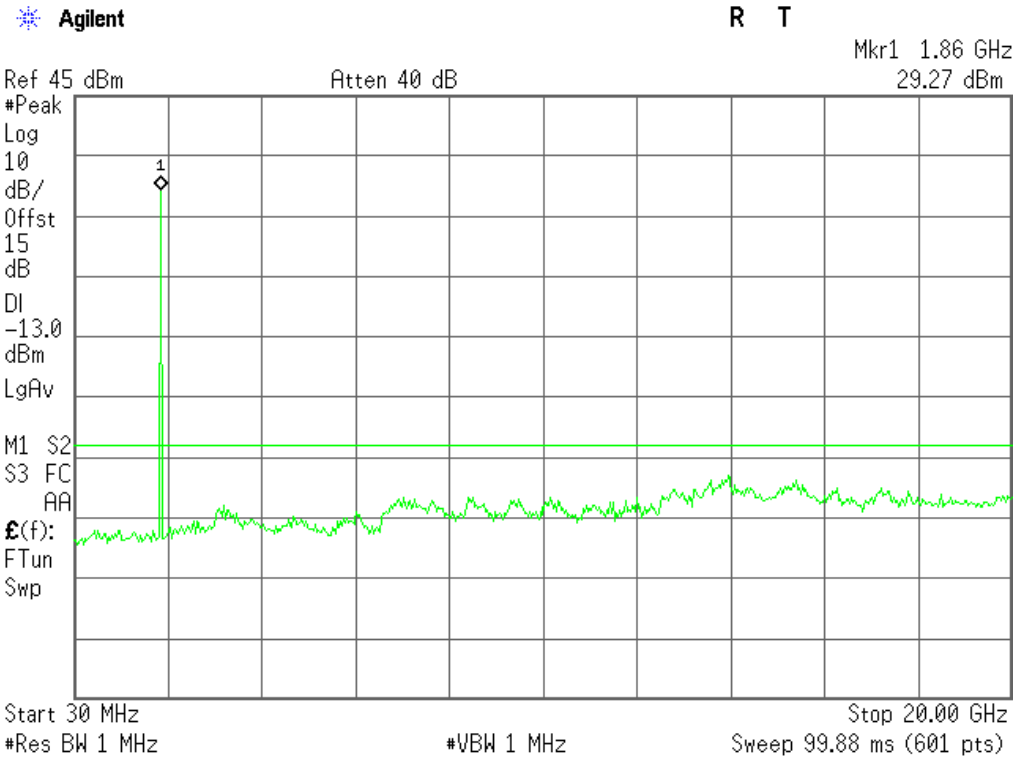


Conducted Emission Transmitting Mode CH 251 30MHz – 10GHz

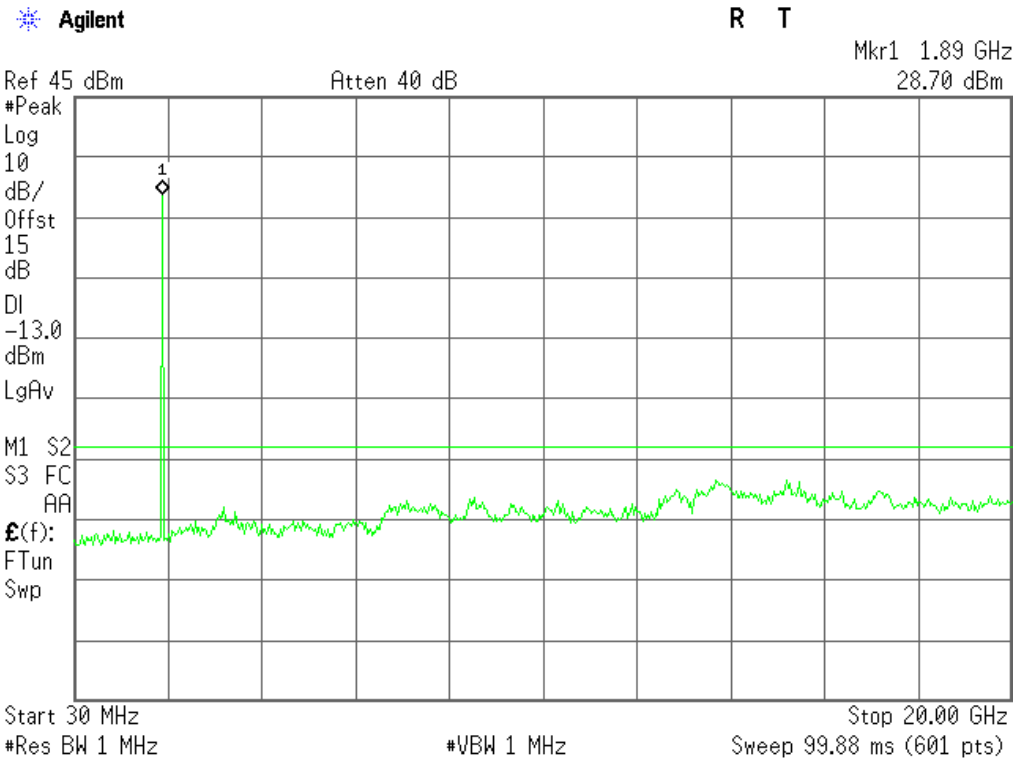


CONDUCTED EMISSION IN GSM1900 BAND

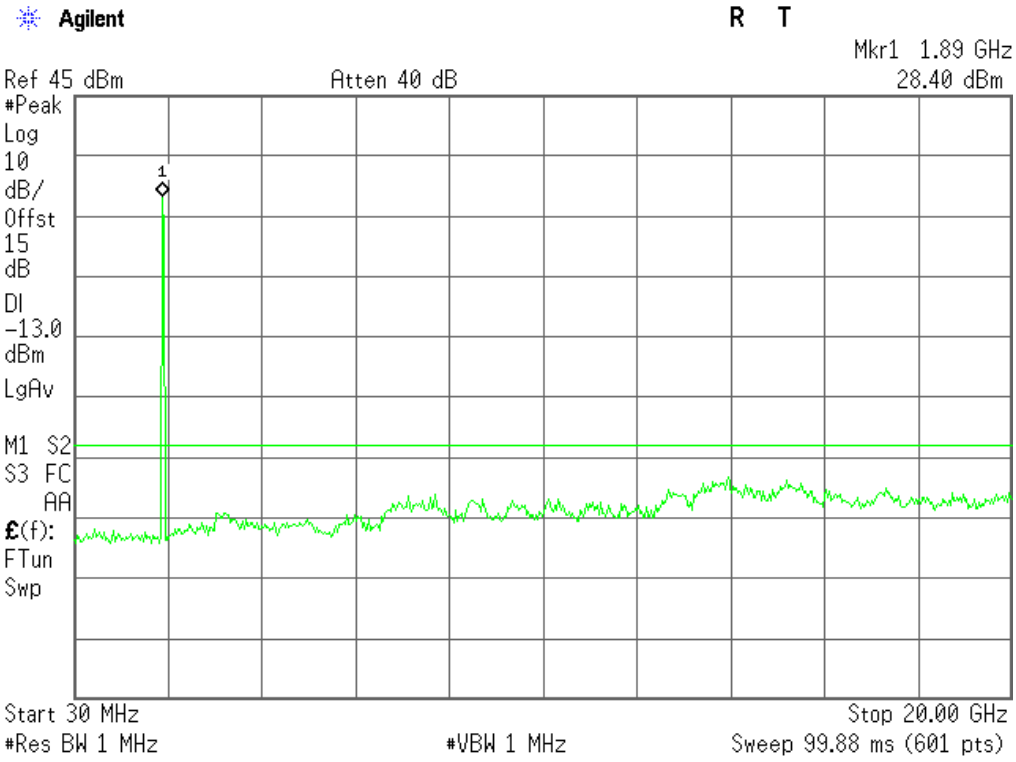
Conducted Emission Transmitting Mode CH 512 30MHz – 20GHz




Conducted Emission Transmitting Mode CH 661 30MHz – 20GHz

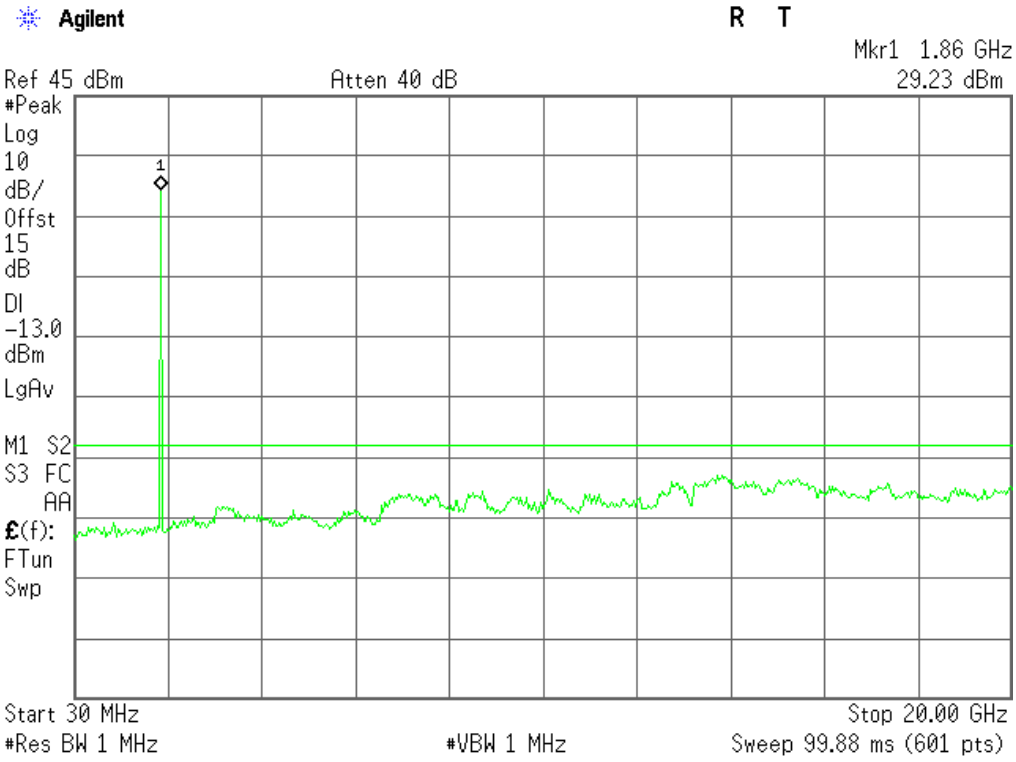


Conducted Emission Transmitting Mode CH 810 30MHz – 20GHz

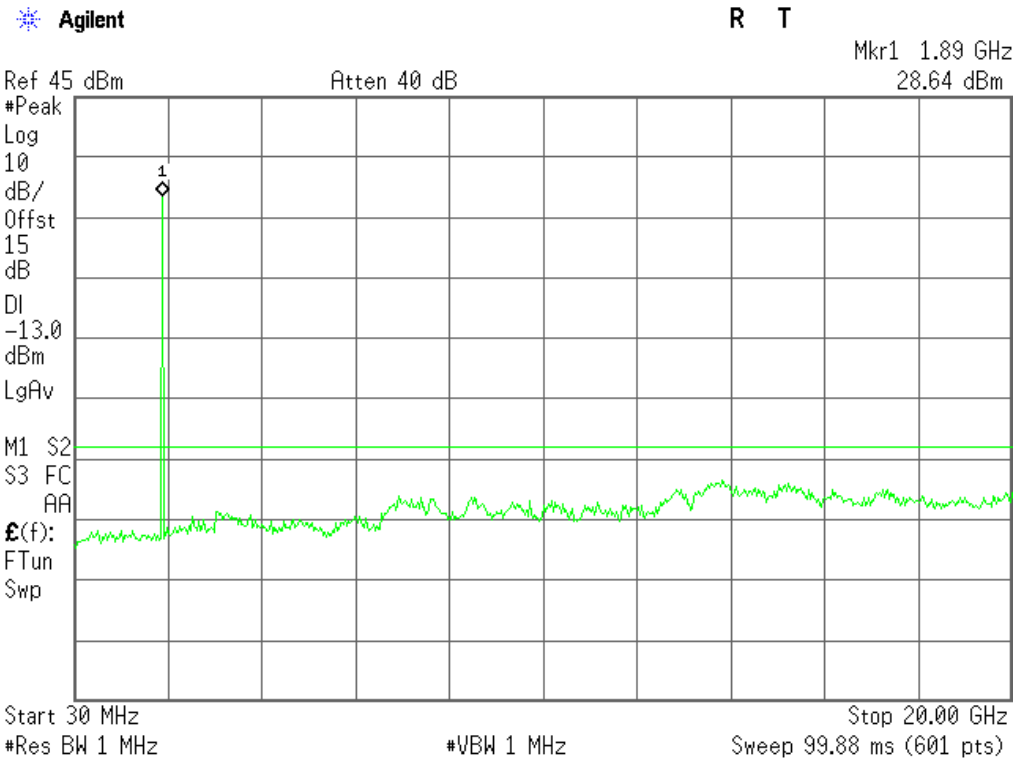


ONDUCTED EMISSION IN GPRS1900 BAND

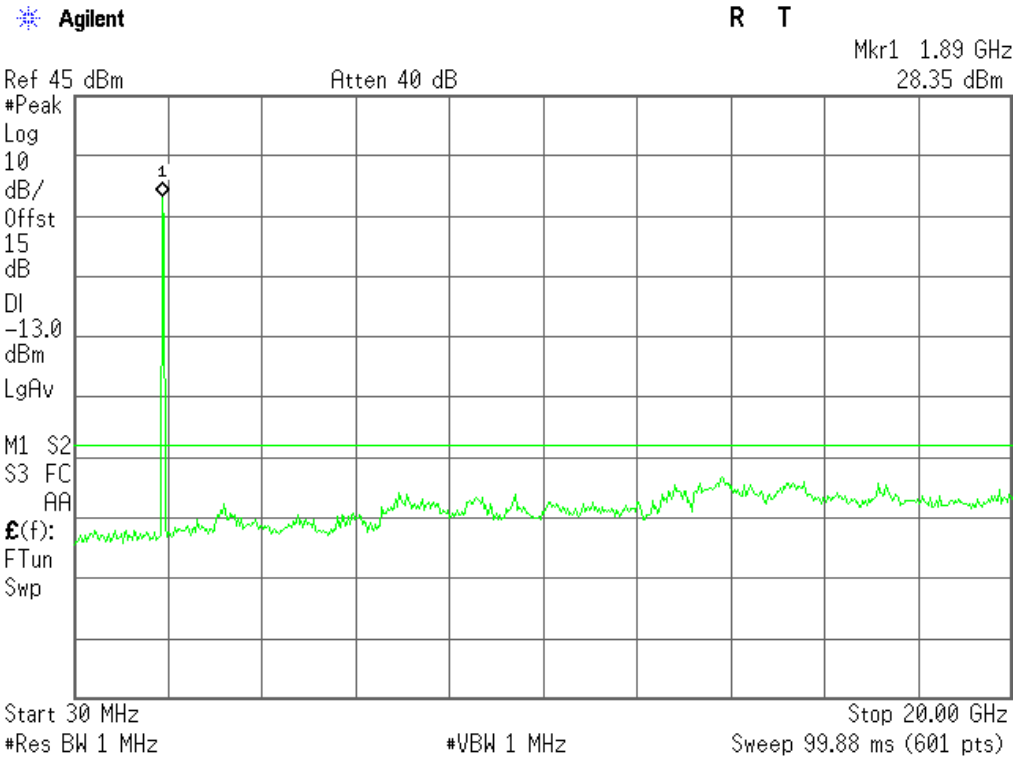
Conducted Emission Transmitting Mode CH 512 30MHz – 20GHz




Conducted Emission Transmitting Mode CH 661 30MHz – 20GHz

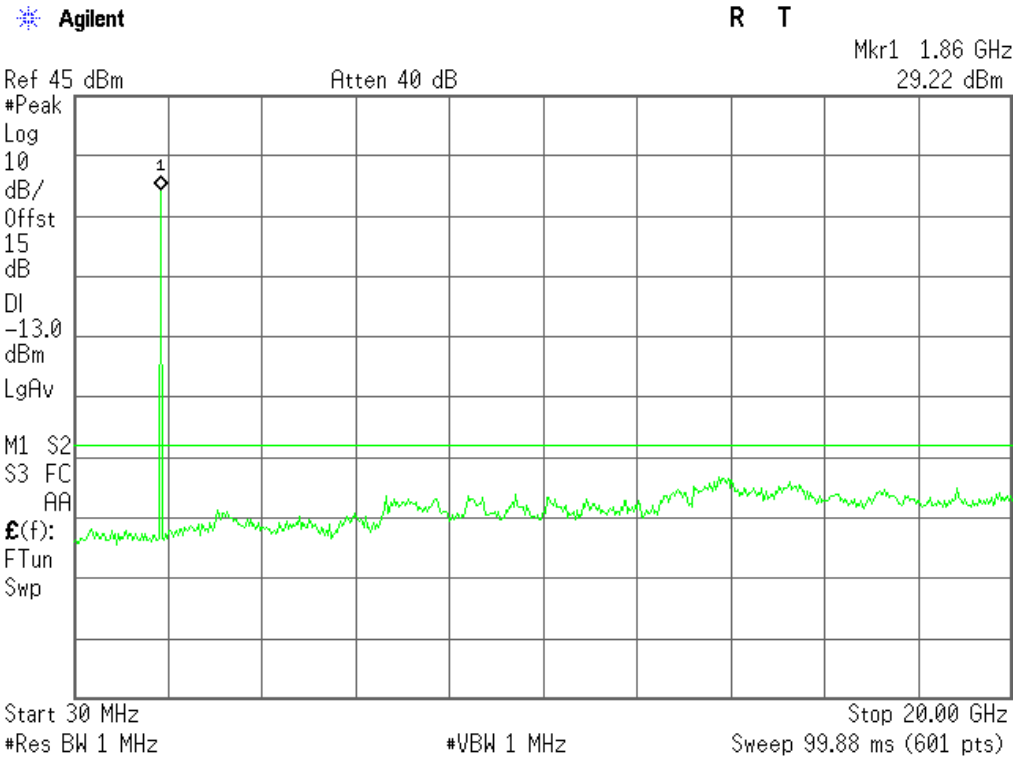


Conducted Emission Transmitting Mode CH 810 30MHz – 20GHz

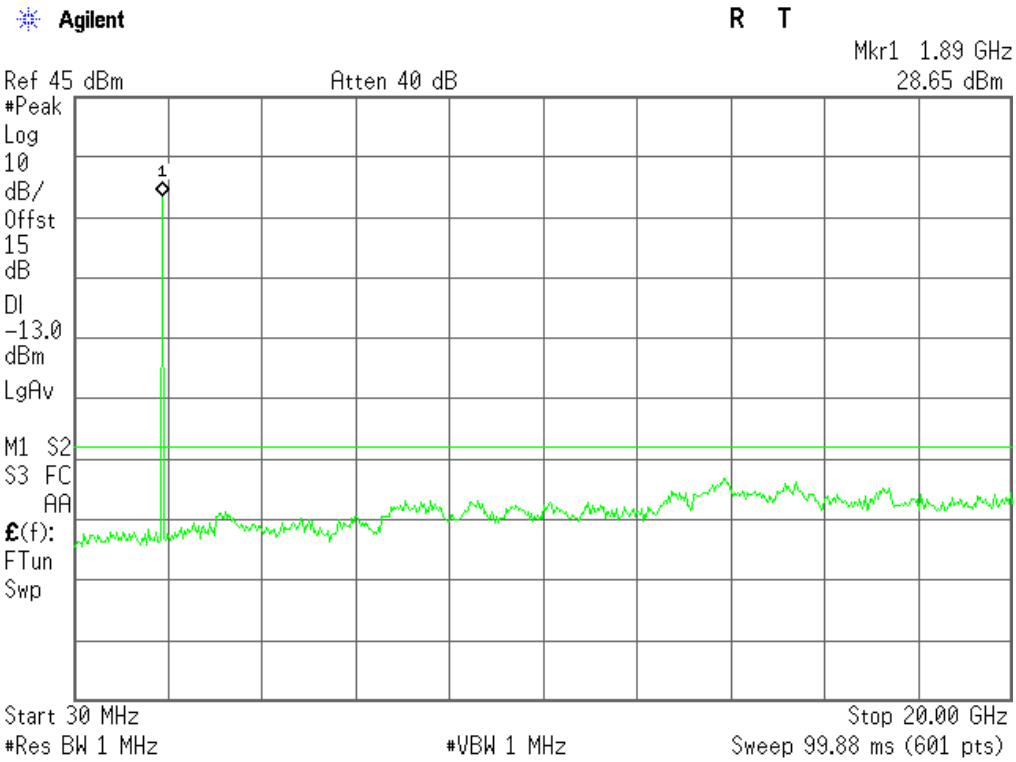


ONDUCTED EMISSION IN EGPRS1900 BAND

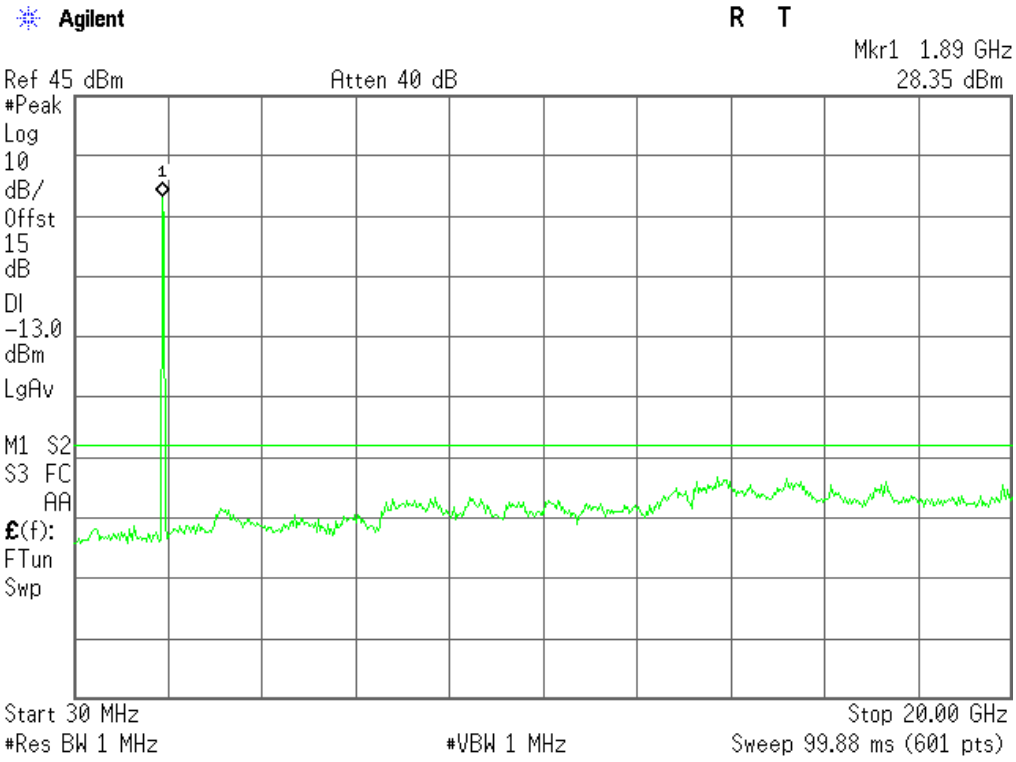
Conducted Emission Transmitting Mode CH 512 30MHz – 20GHz




Conducted Emission Transmitting Mode CH 661 30MHz – 20GHz

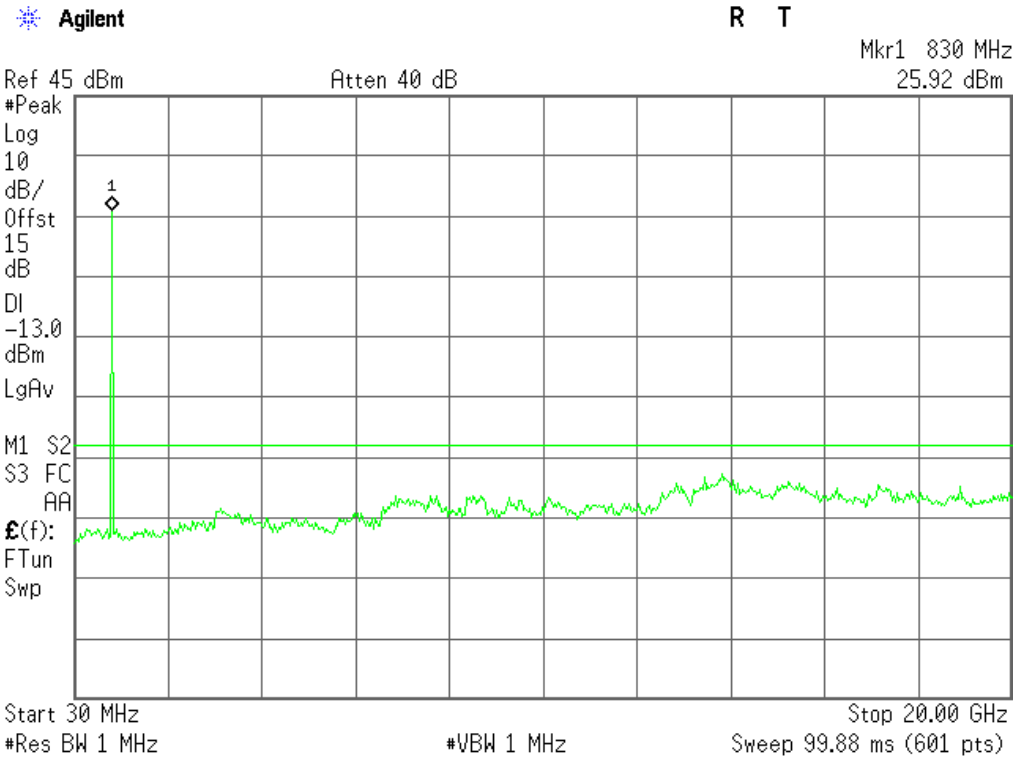


Conducted Emission Transmitting Mode CH 810 30MHz – 20GHz

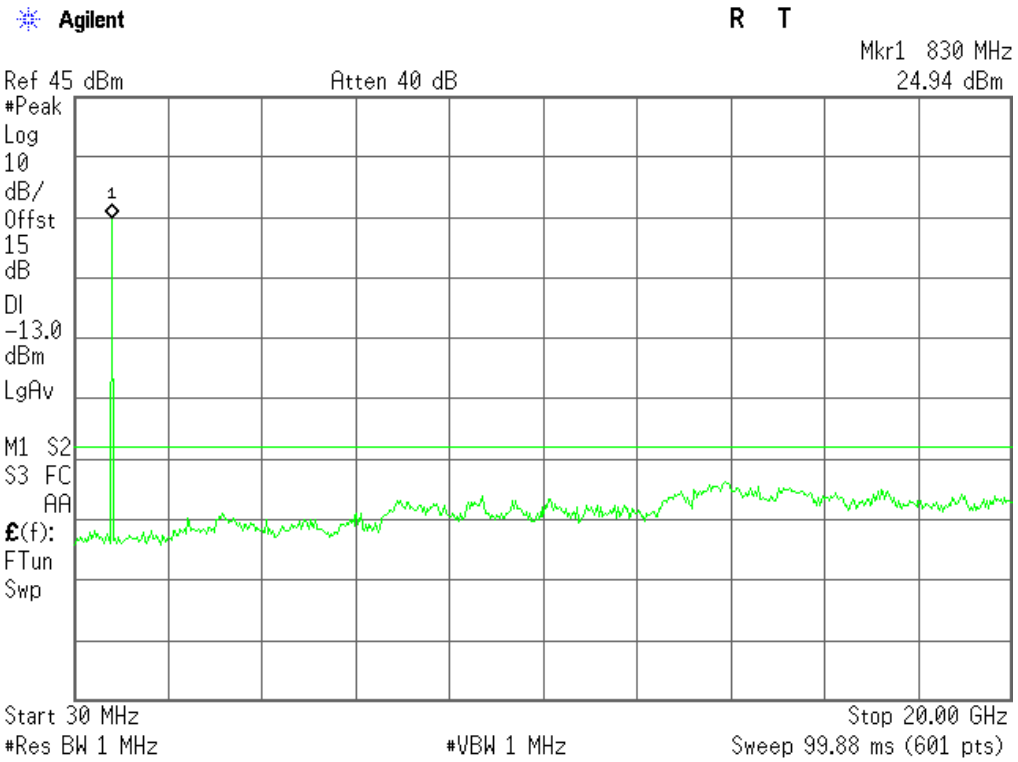


CONDUCTED EMISSION IN UMTS band V

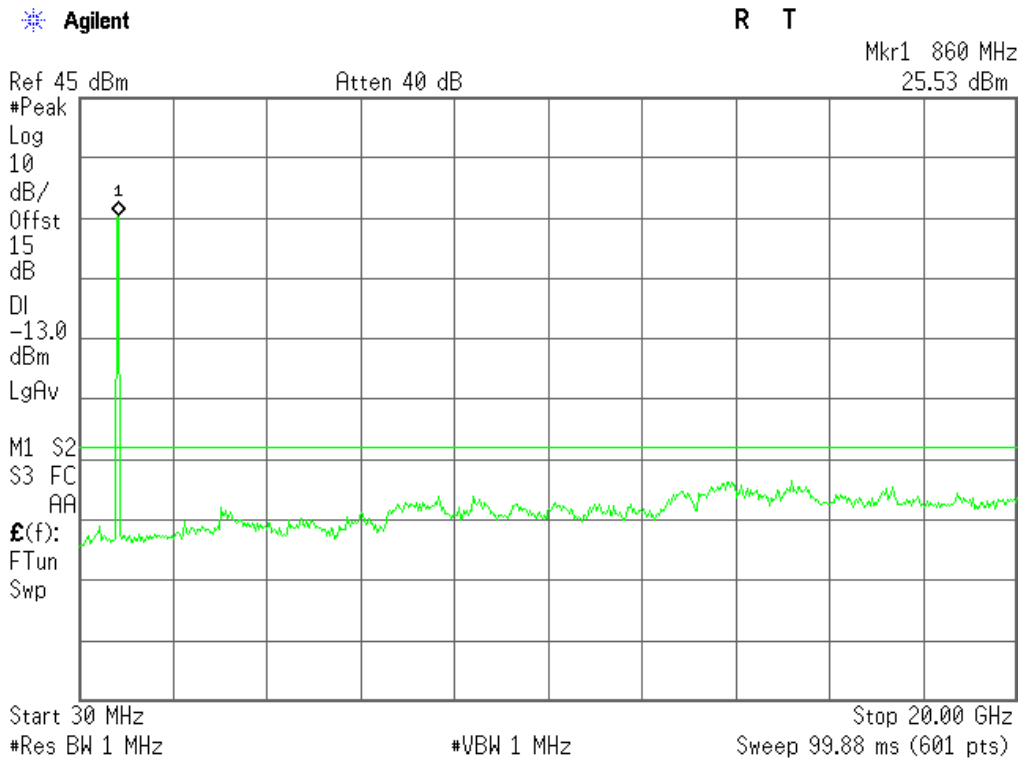
Conducted Emission Transmitting Mode 4132 30MHz – 20GHz




Conducted Emission Transmitting Mode CH 4183 30MHz – 20GHz

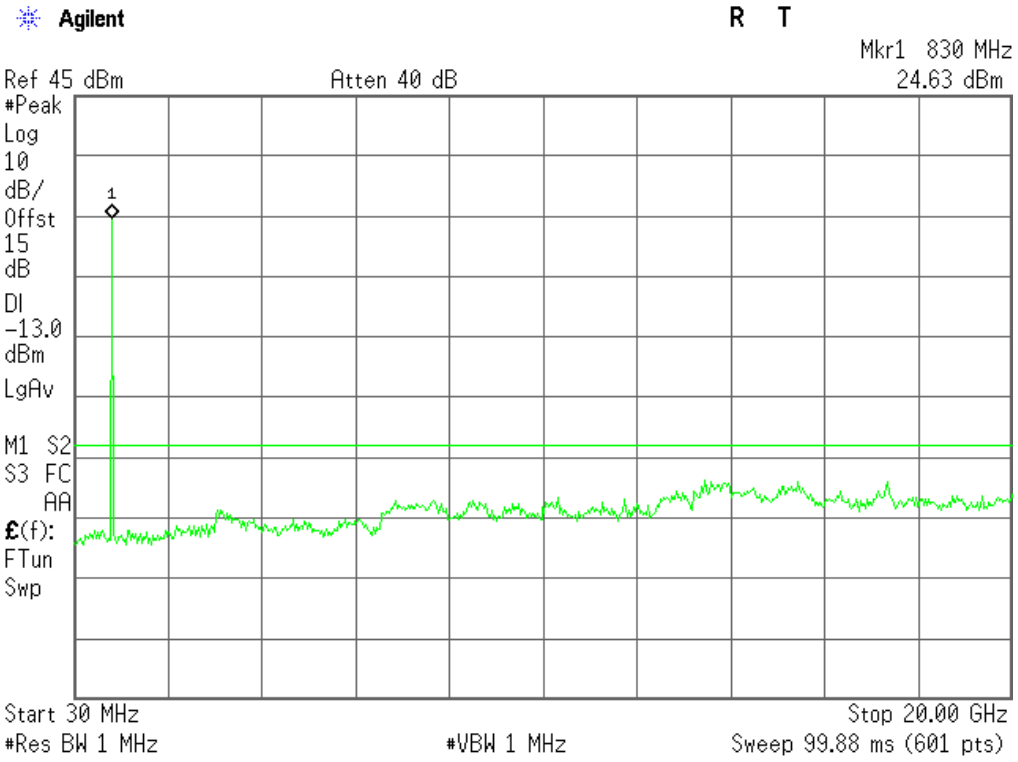


Conducted Emission Transmitting Mode CH 4233 30MHz – 20GHz

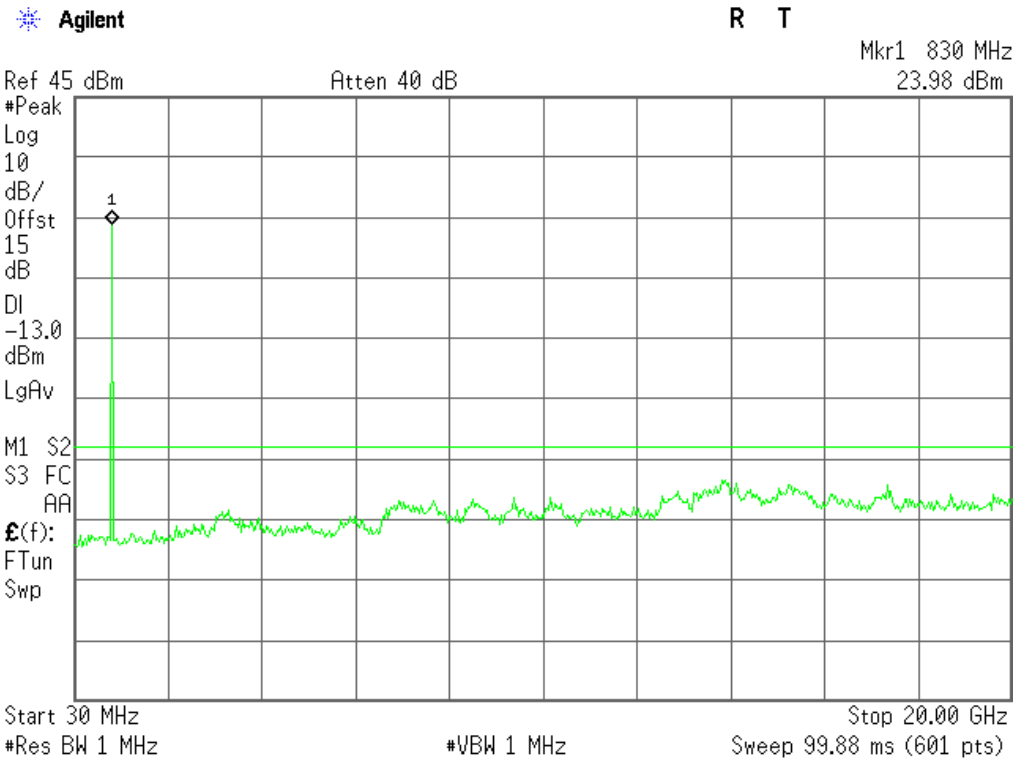


CONDUCTED EMISSION IN UMTS HSDPA band V

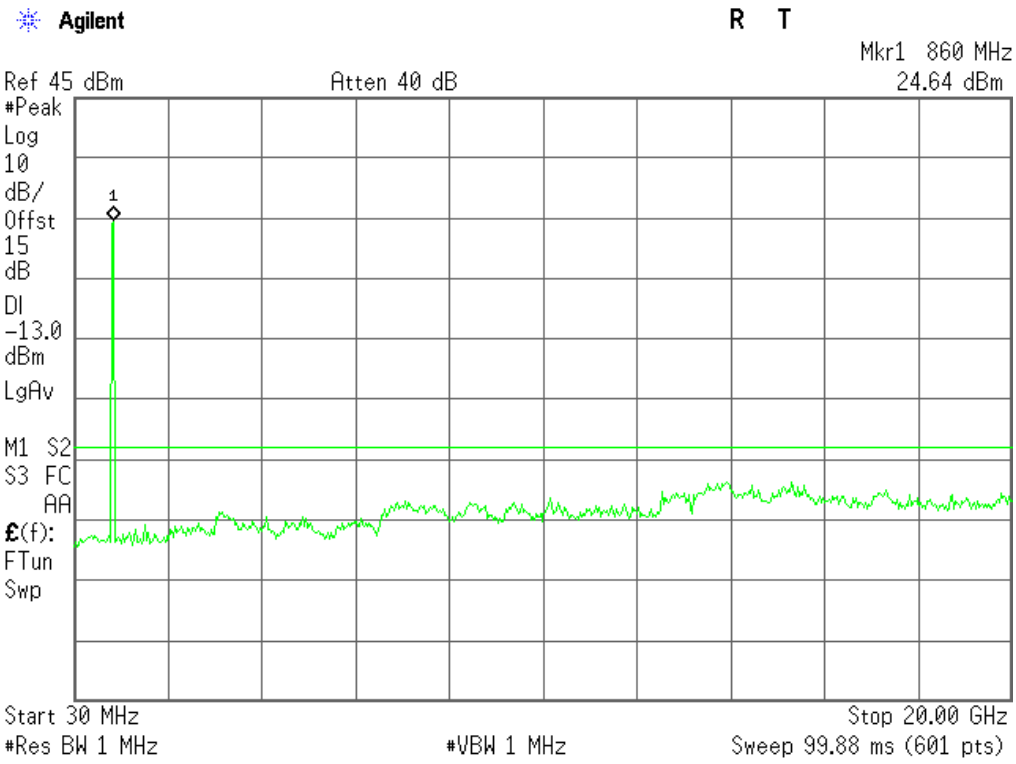
Conducted Emission Transmitting Mode 4132 30MHz – 20GHz




Conducted Emission Transmitting Mode CH 4183 30MHz – 20GHz

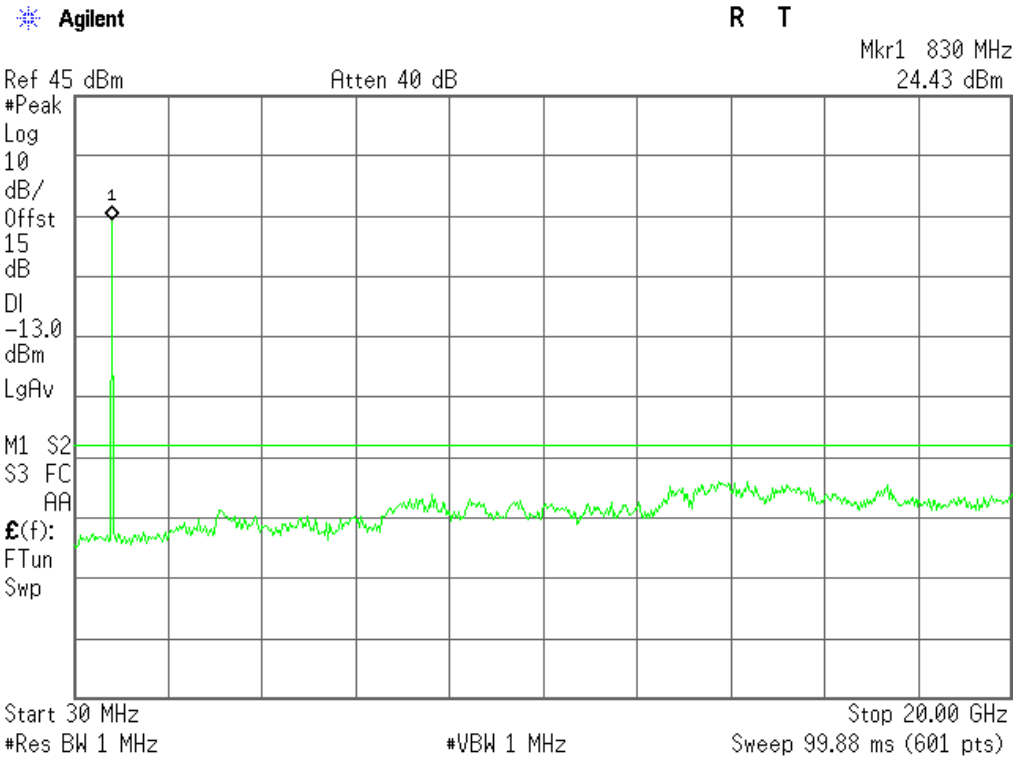


Conducted Emission Transmitting Mode CH 4233 30MHz – 20GHz

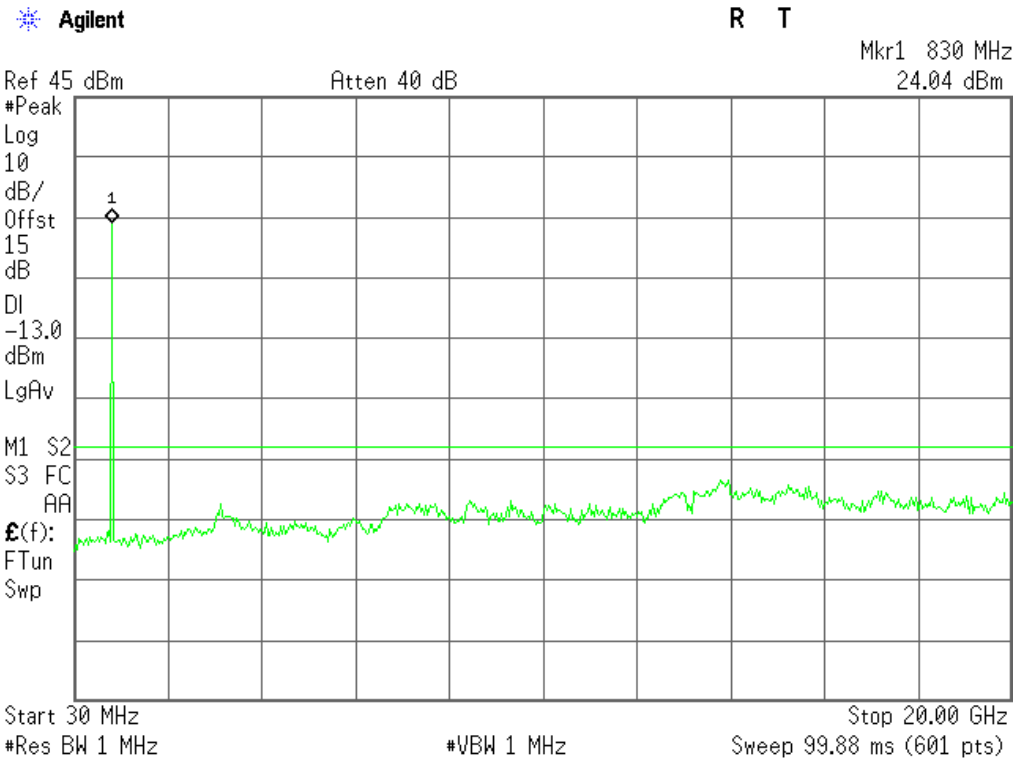


CONDUCTED EMISSION IN UMTS HSUPA band V

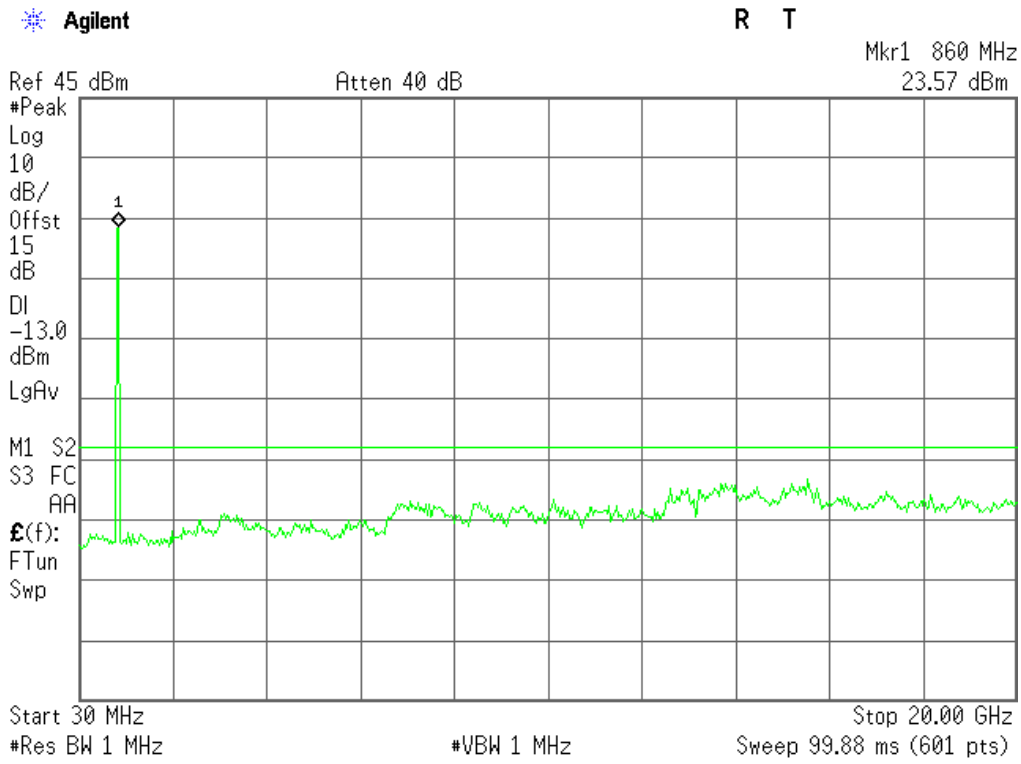
Conducted Emission Transmitting Mode 4132 30MHz – 20GHz




Conducted Emission Transmitting Mode CH 4183 30MHz – 20GHz



Conducted Emission Transmitting Mode CH 4233 30MHz – 20GHz

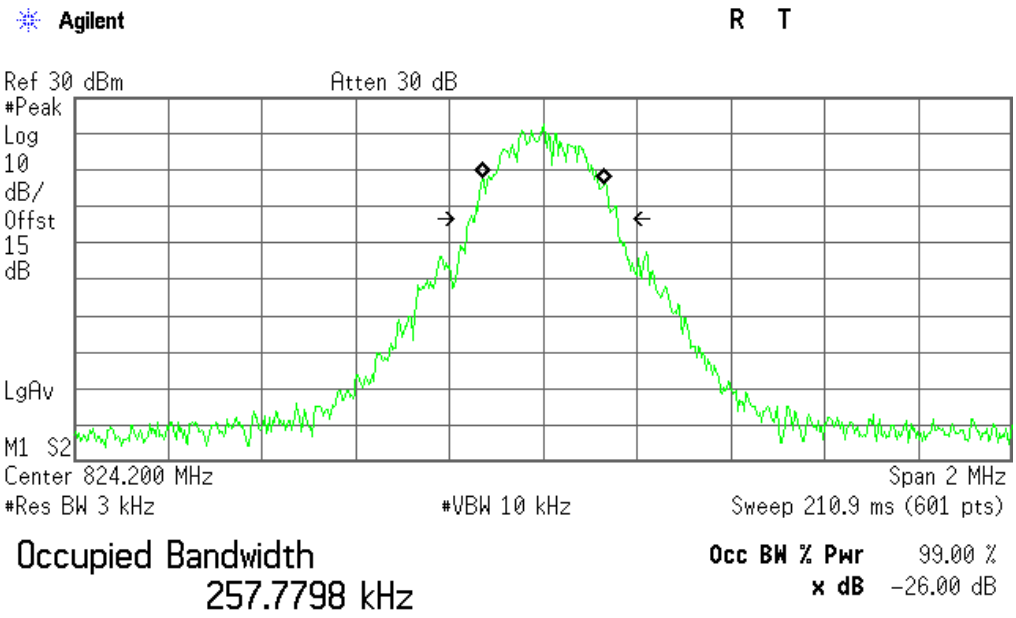


# APPENDIX II

# TEST PLOTS FOR OCCUPIED BANDWIDTH (99%)

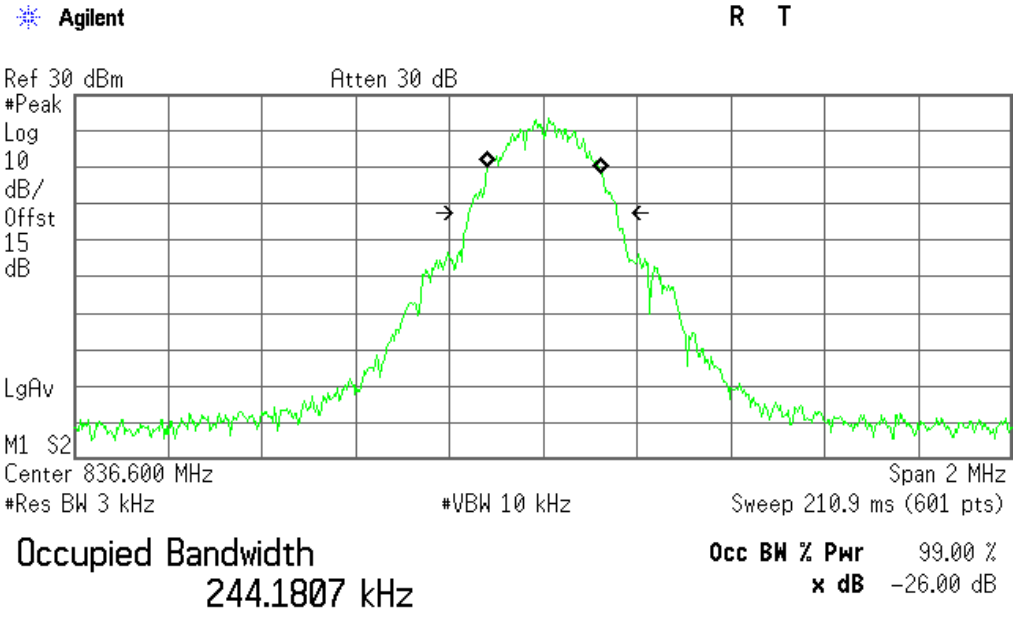
# EMISSION BANDWIDTH (-26dBC)

Occupied Bandwidth (99%) GSM 850 BAND CH 128



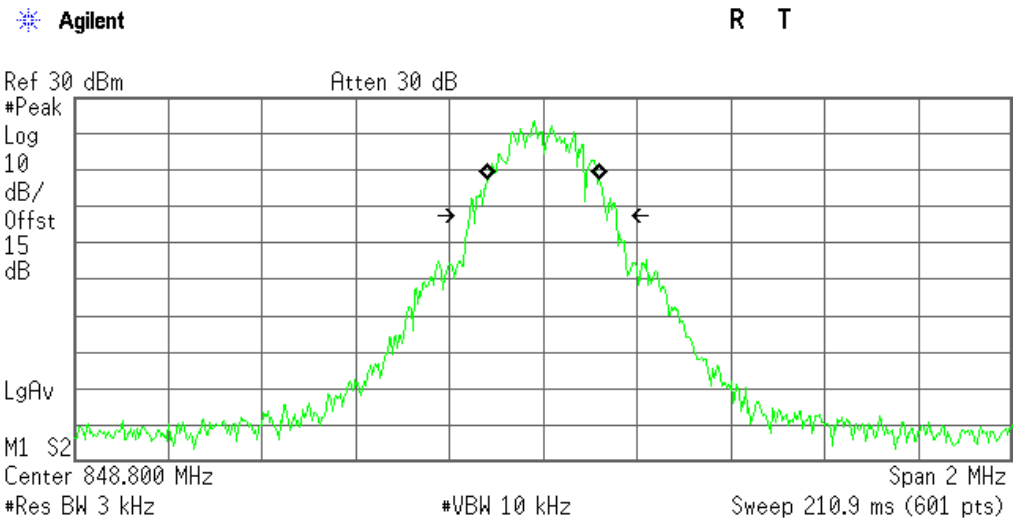

**Transmit Freq Error** 238.217 Hz
**x dB Bandwidth** 315.003 kHz

Occupied Bandwidth (99%) GSM 850 BAND CH 190




**Transmit Freq Error** 1.902 kHz
**x dB Bandwidth** 318.296 kHz

Occupied Bandwidth (99%) GSM 850 BAND CH 251

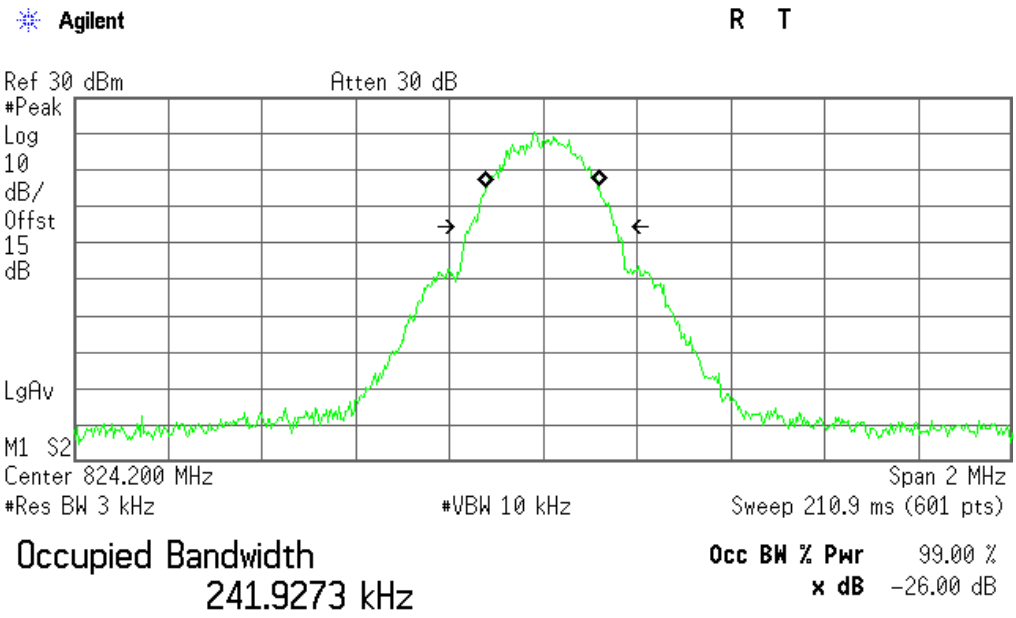



Occupied Bandwidth
239.8119 kHz

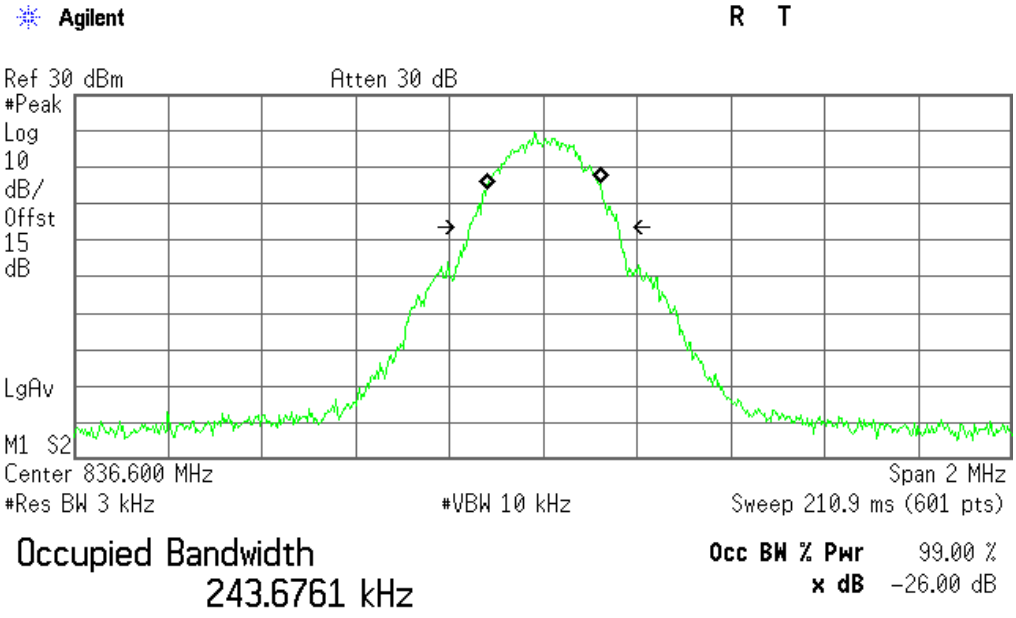
**Occ BW % Pwr** 99.00 %
**x dB** -26.00 dB

**Transmit Freq Error** -941.991 Hz
**x dB Bandwidth** 313.292 kHz

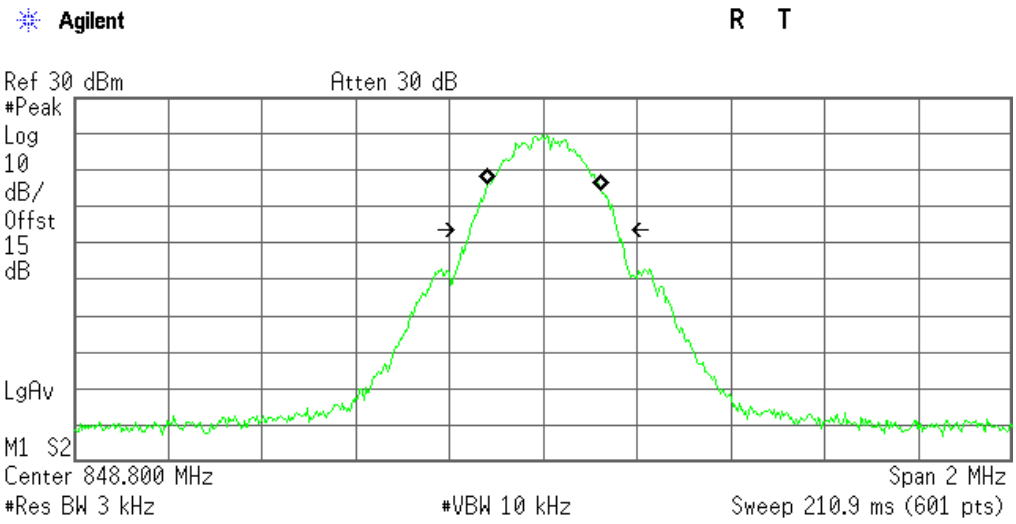
Occupied Bandwidth (99%) GRPS 850 BAND CH 128




Occupied Bandwidth (99%) GRPS 850 BAND CH 190



Occupied Bandwidth (99%) GRPS 850 BAND CH 251

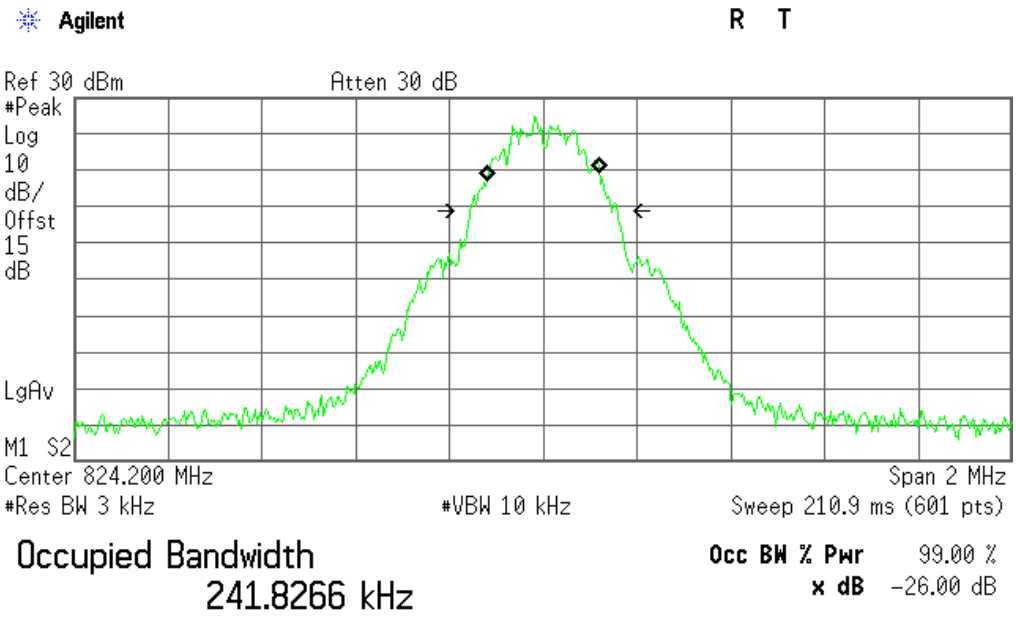



Occupied Bandwidth
244.5103 kHz

**Occ BW % Pwr** 99.00 %
**x dB** -26.00 dB

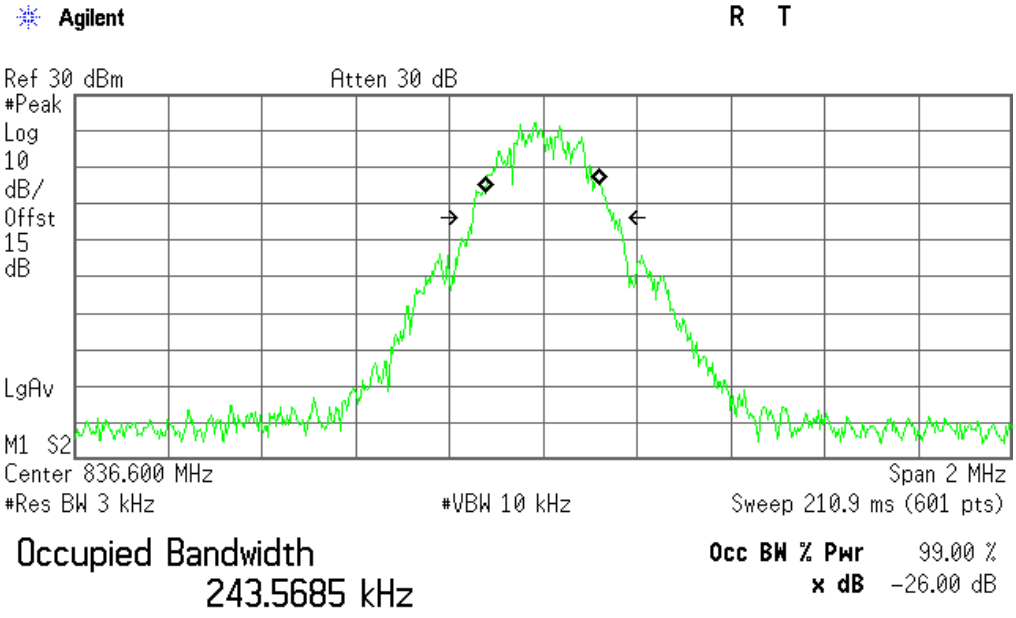
**Transmit Freq Error** 2.413 kHz
**x dB Bandwidth** 313.945 kHz

Occupied Bandwidth (99%) EGPRS 850 BAND CH 128



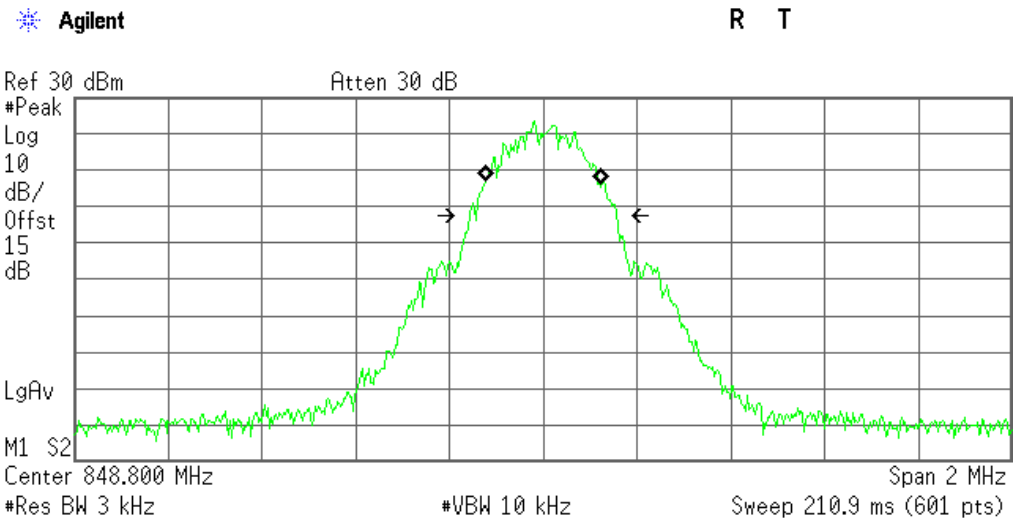

**Transmit Freq Error** -19.329 Hz
**x dB Bandwidth** 315.463 kHz

Occupied Bandwidth (99%) EGPRS 850 BAND CH 190




**Transmit Freq Error** -1.882 kHz
**x dB Bandwidth** 302.836 kHz

Occupied Bandwidth (99%) EGPRS 850 BAND CH 251

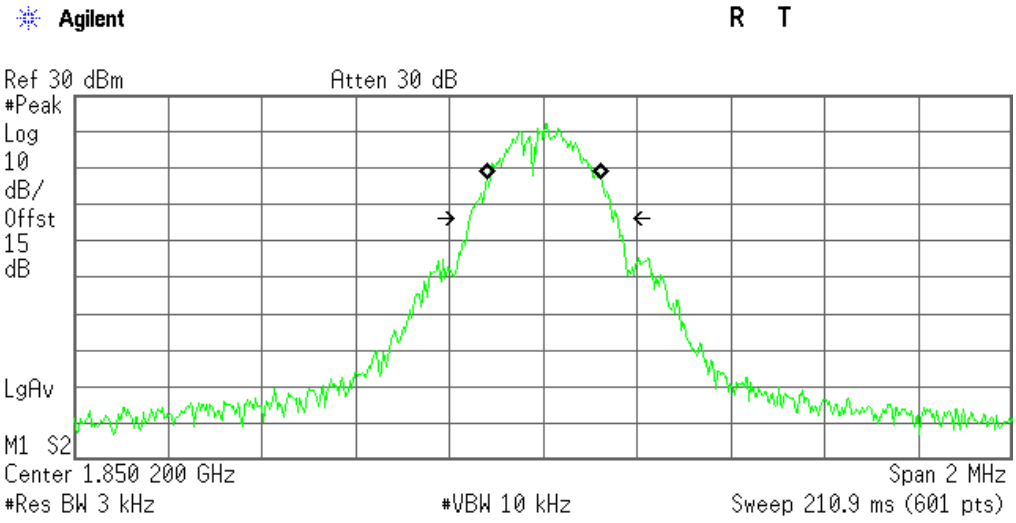



Occupied Bandwidth
246.2480 kHz

**Occ BW % Pwr** 99.00 %
**x dB** -26.00 dB

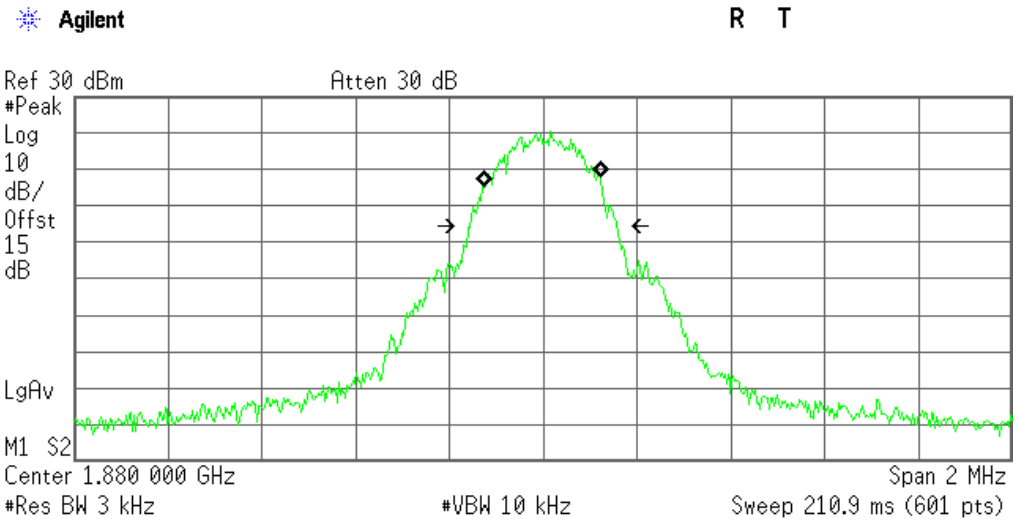
**Transmit Freq Error** 1.408 kHz
**x dB Bandwidth** 314.814 kHz

Occupied Bandwidth (99%) PCS 1900 BAND CH 512



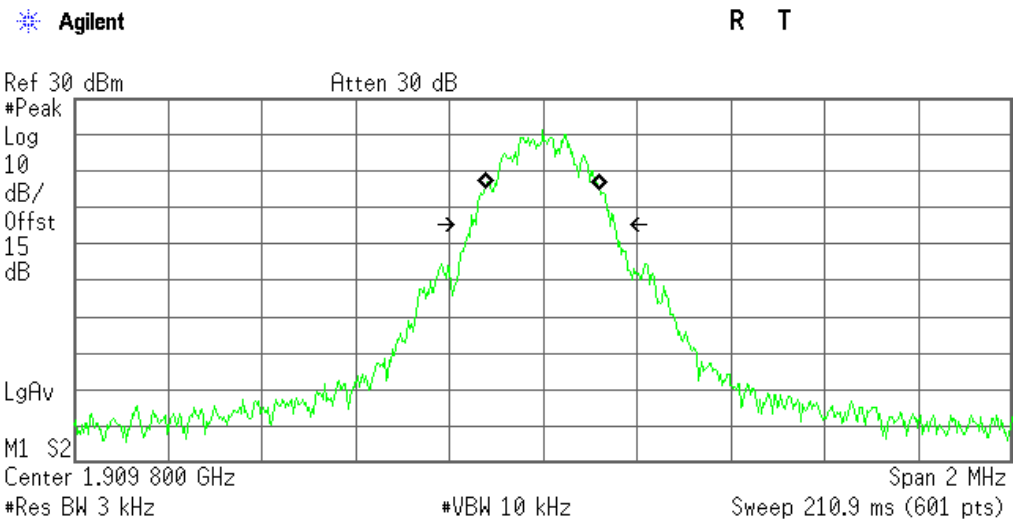

**Transmit Freq Error** 1.607 kHz
**x dB Bandwidth** 315.718 kHz

Occupied Bandwidth (99%) PCS 1900 BAND CH 661




**Transmit Freq Error** -1.864 kHz
**x dB Bandwidth** 314.561 kHz

Occupied Bandwidth (99%) PCS 1900 BAND CH 810

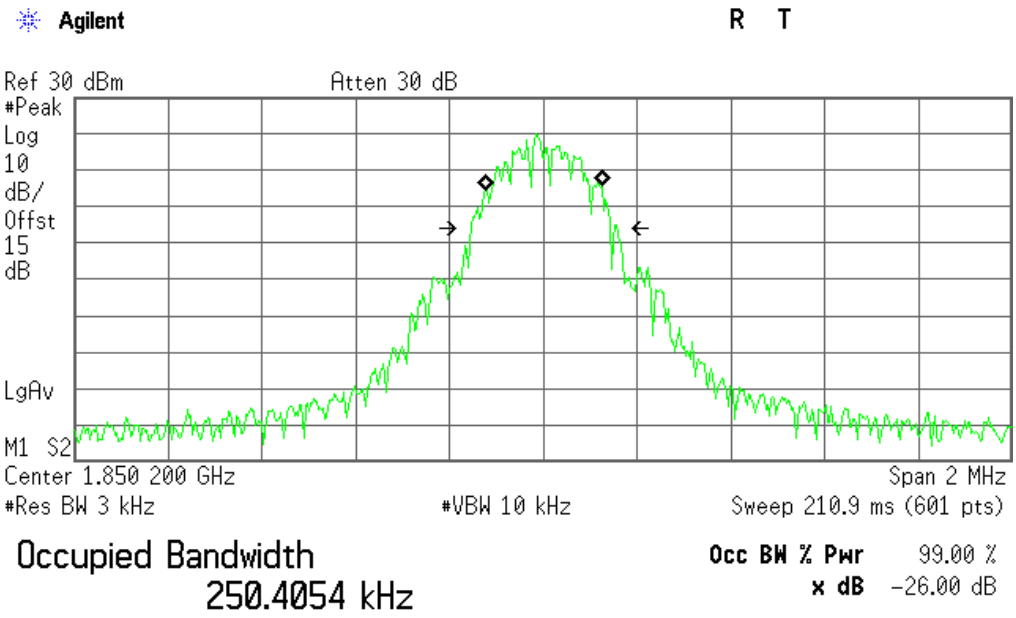



Occupied Bandwidth
245.6324 kHz

**Occ BW % Pwr** 99.00 %
**x dB** -26.00 dB

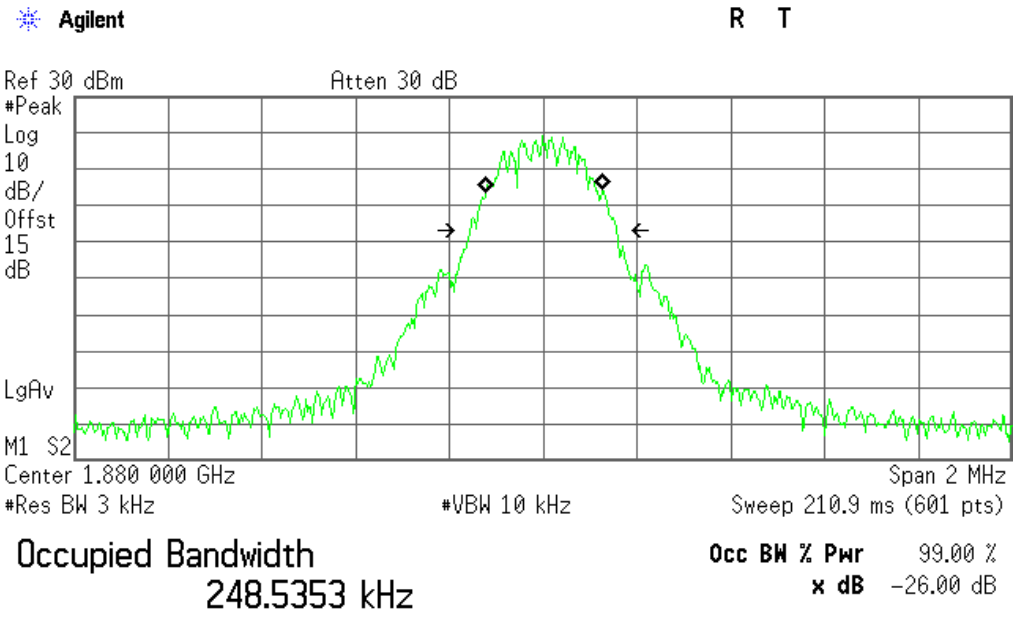
**Transmit Freq Error** -1.603 kHz
**x dB Bandwidth** 307.998 kHz

Occupied Bandwidth (99%) GPRS 1900 BAND CH 512



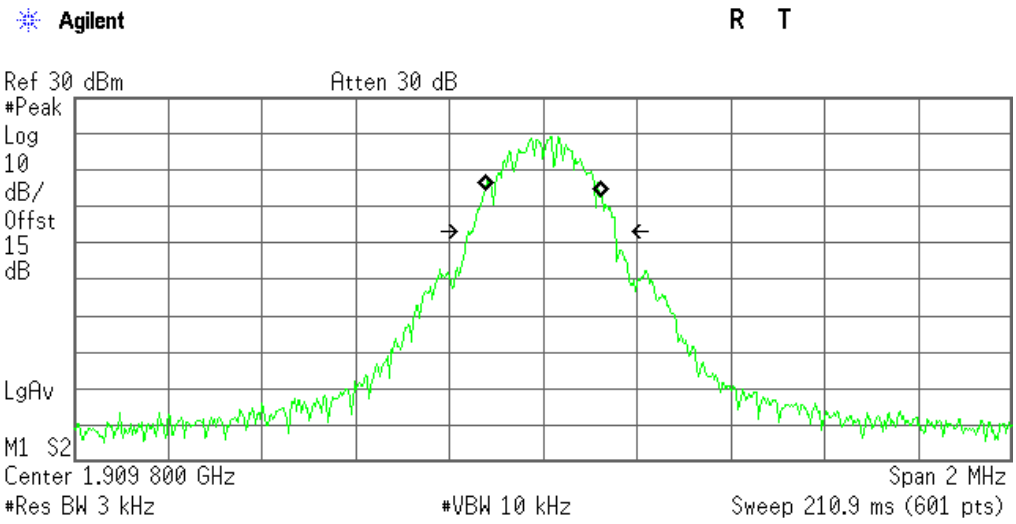

**Transmit Freq Error** 681.837 Hz
**x dB Bandwidth** 312.237 kHz

Occupied Bandwidth (99%) GPRS 1900 BAND CH 661




**Transmit Freq Error** 2.121 kHz
**x dB Bandwidth** 313.954 kHz

Occupied Bandwidth (99%) GPRS 1900 BAND CH 810

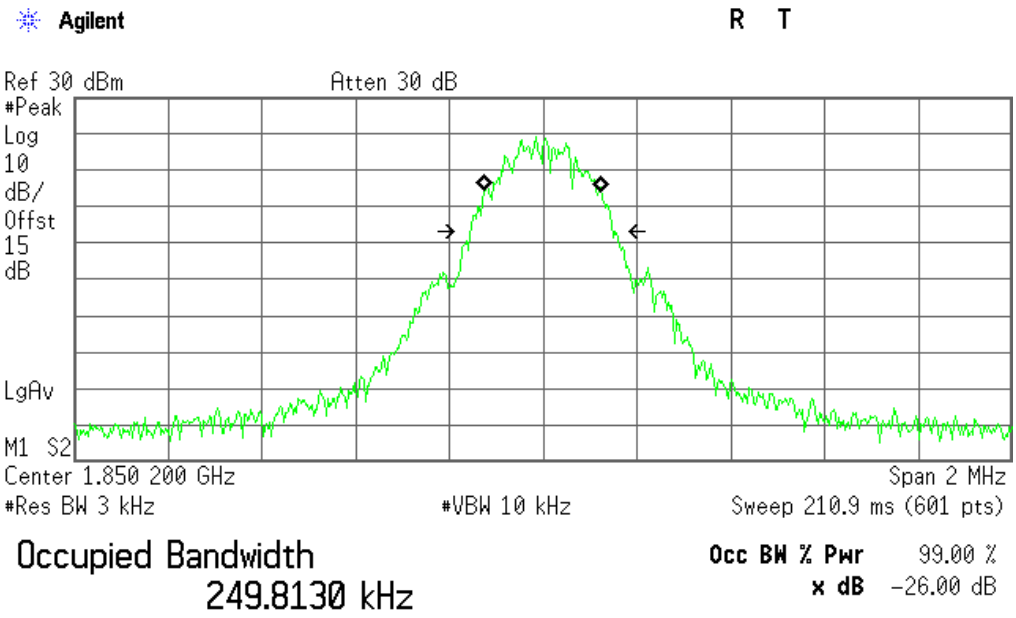



Occupied Bandwidth
245.0267 kHz

**Occ BW % Pwr** 99.00 %
**x dB** -26.00 dB

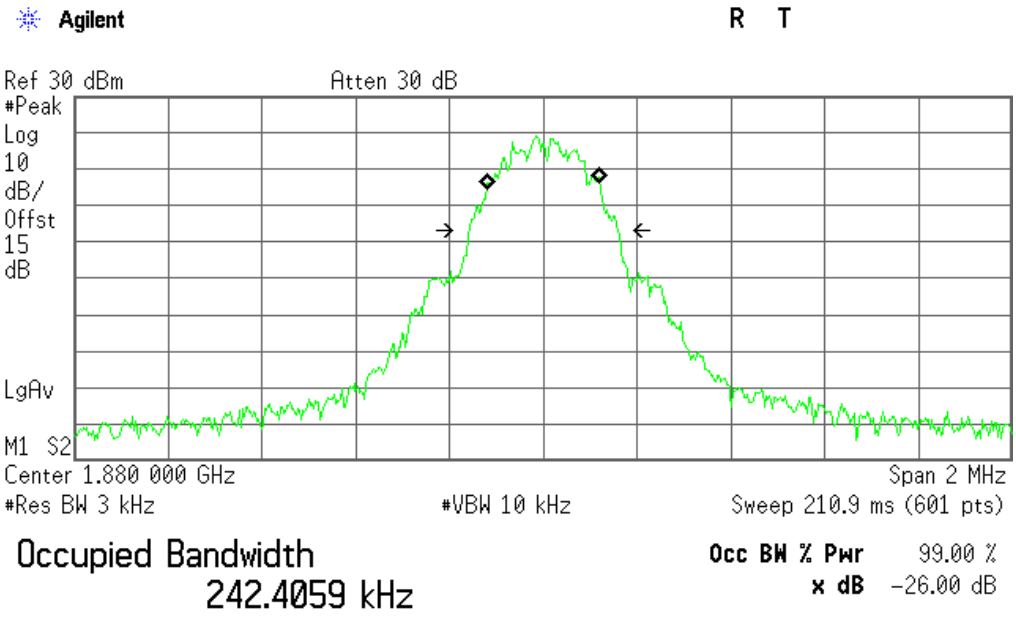
**Transmit Freq Error** -743.362 Hz
**x dB Bandwidth** 305.277 kHz

Occupied Bandwidth (99%) EGPRS 1900 BAND CH 512



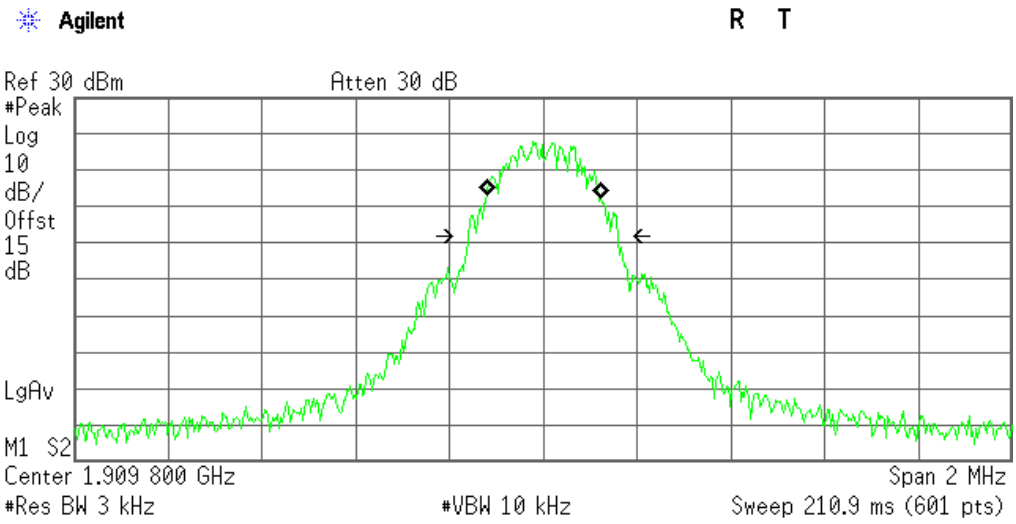

**Transmit Freq Error** -711.670 Hz
**x dB Bandwidth** 304.389 kHz

Occupied Bandwidth (99%) EGPRS 1900 BAND CH 661




**Transmit Freq Error** -96.001 Hz
**x dB Bandwidth** 318.795 kHz

Occupied Bandwidth (99%) EGPRS 1900 BAND CH 810

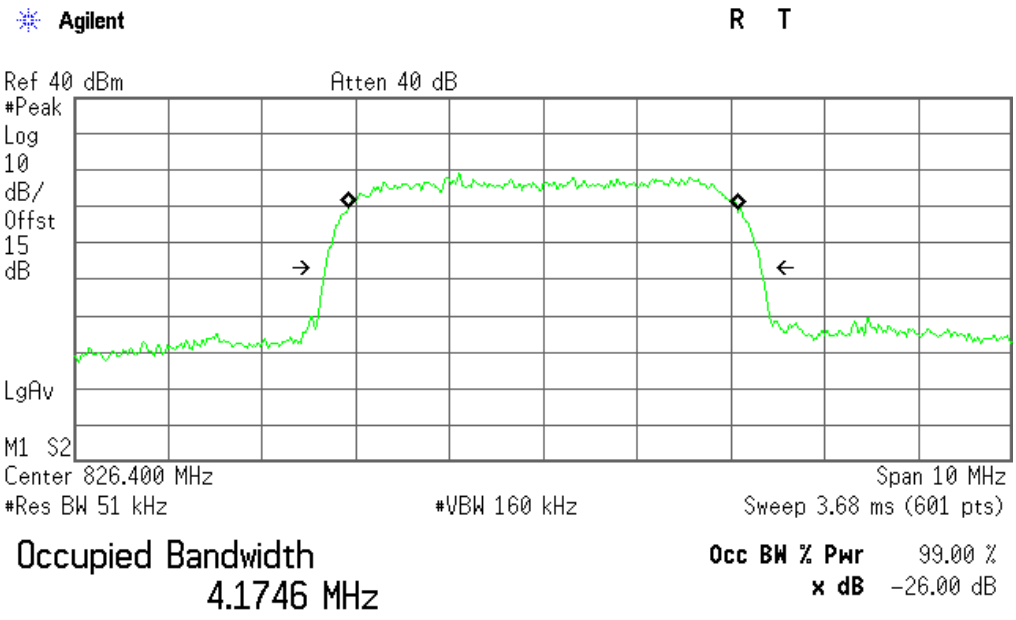



Occupied Bandwidth
243.5360 kHz

**Occ BW % Pwr** 99.00 %
**x dB** -26.00 dB

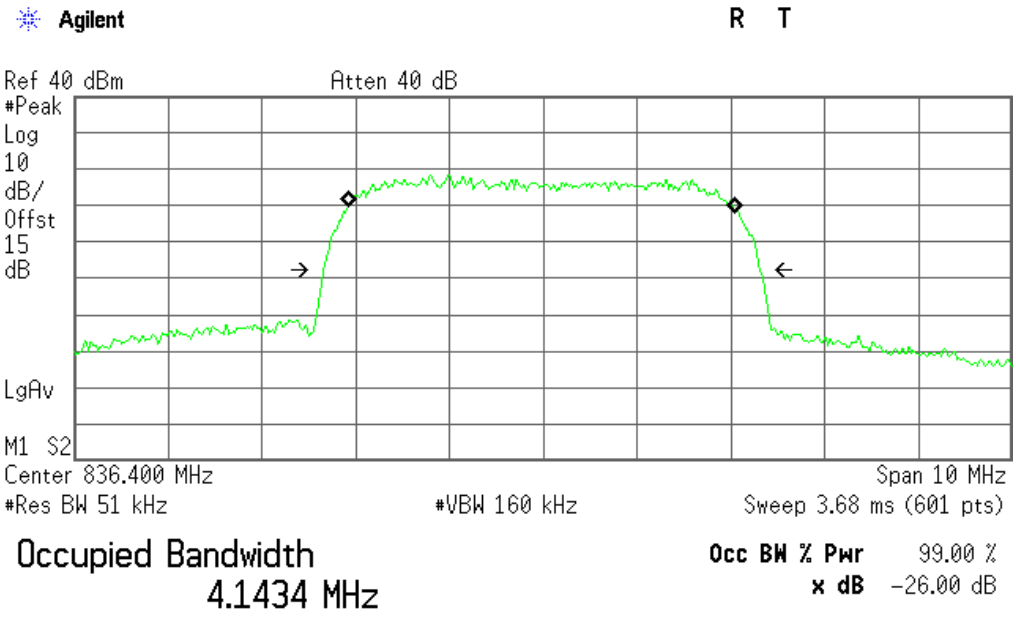
**Transmit Freq Error** 895.686 Hz
**x dB Bandwidth** 319.377 kHz

Occupied Bandwidth (99%) UMTS BAND V CH 4132



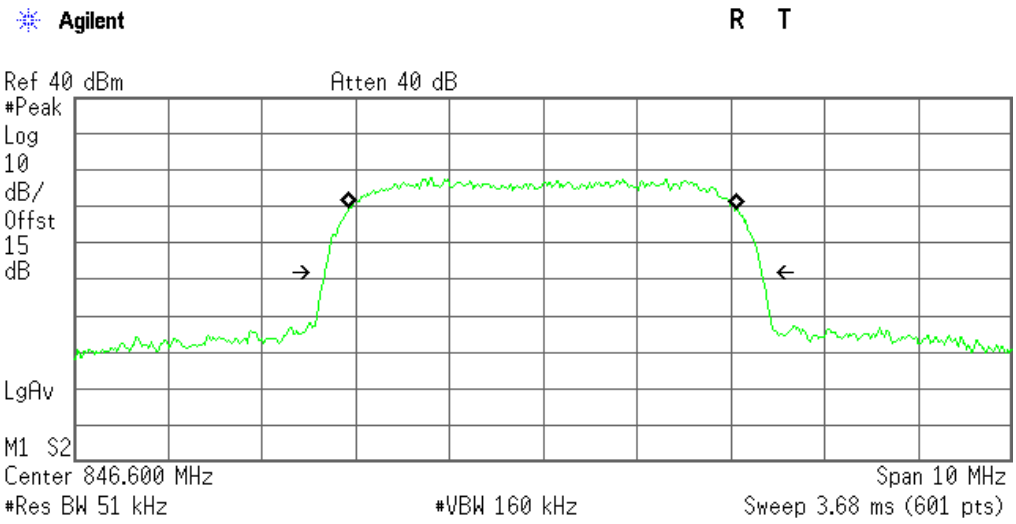

**Transmit Freq Error** 1.971 kHz
**x dB Bandwidth** 4.655 MHz

Occupied Bandwidth (99%) UMTS BAND V CH 4183




**Transmit Freq Error** -19.951 kHz
**x dB Bandwidth** 4.668 MHz

Occupied Bandwidth (99%) UMTS BAND V CH 4233

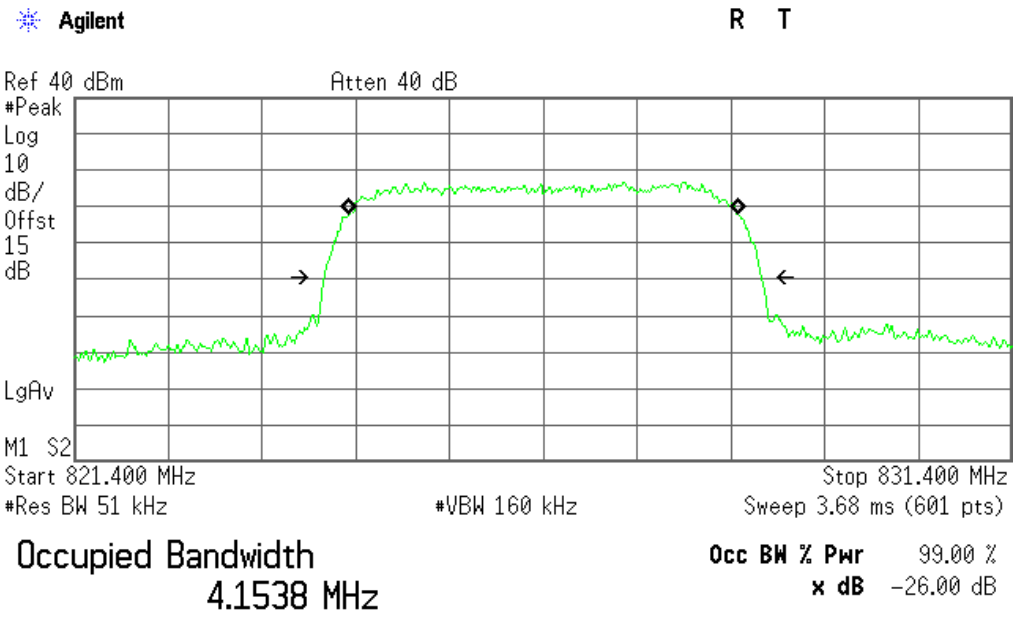



Occupied Bandwidth
4.1485 MHz

**Occ BW % Pwr** 99.00 %
**x dB** -26.00 dB

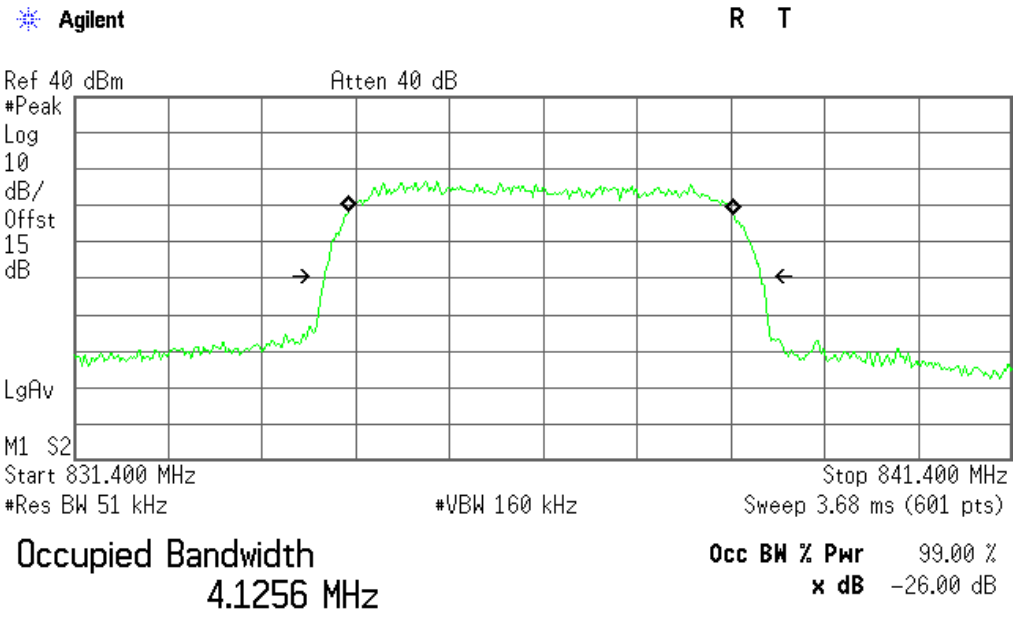
**Transmit Freq Error** -2.175 kHz
**x dB Bandwidth** 4.666 MHz

Occupied Bandwidth (99%) UMTS HSDPA BAND V CH 4132



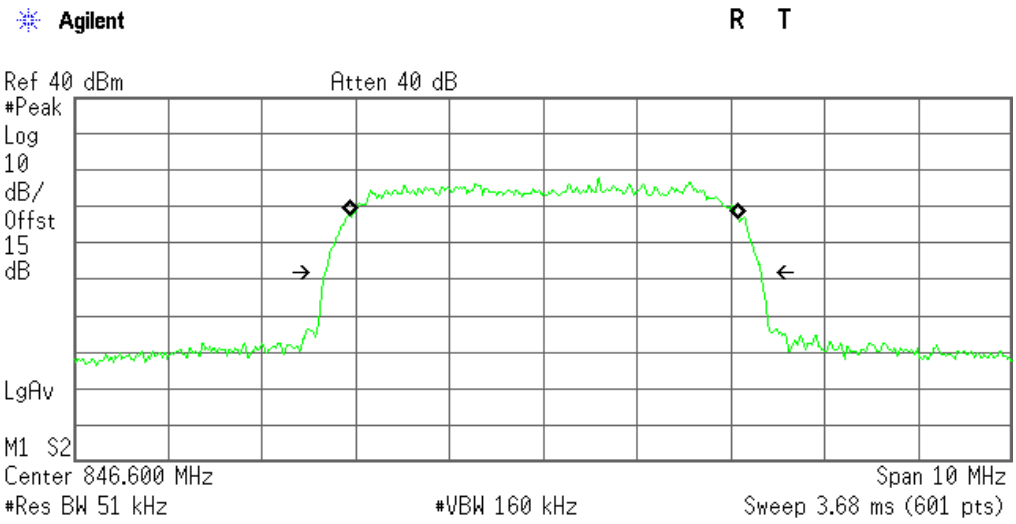

**Transmit Freq Error** -1.722 kHz
**x dB Bandwidth** 4.675 MHz

Occupied Bandwidth (99%) UMTS HSDPA BAND V CH 4183




**Transmit Freq Error** -25.305 kHz
**x dB Bandwidth** 4.660 MHz

Occupied Bandwidth (99%) UMTS HSDPA BAND V CH 4233

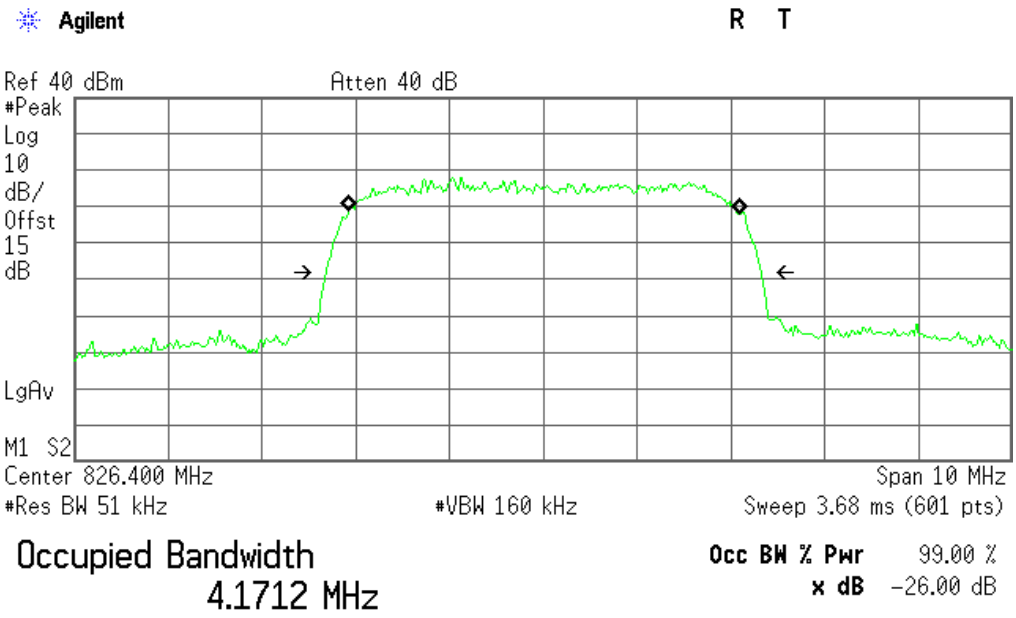



Occupied Bandwidth
4.1557 MHz

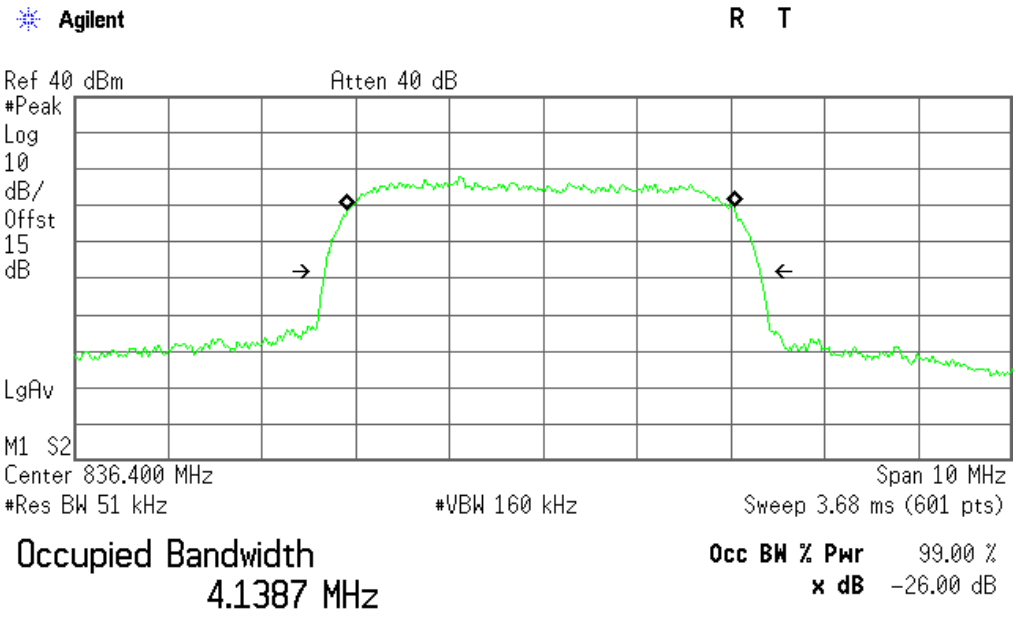
**Occ BW % Pwr** 99.00 %
**x dB** -26.00 dB

**Transmit Freq Error** 4.530 kHz
**x dB Bandwidth** 4.659 MHz

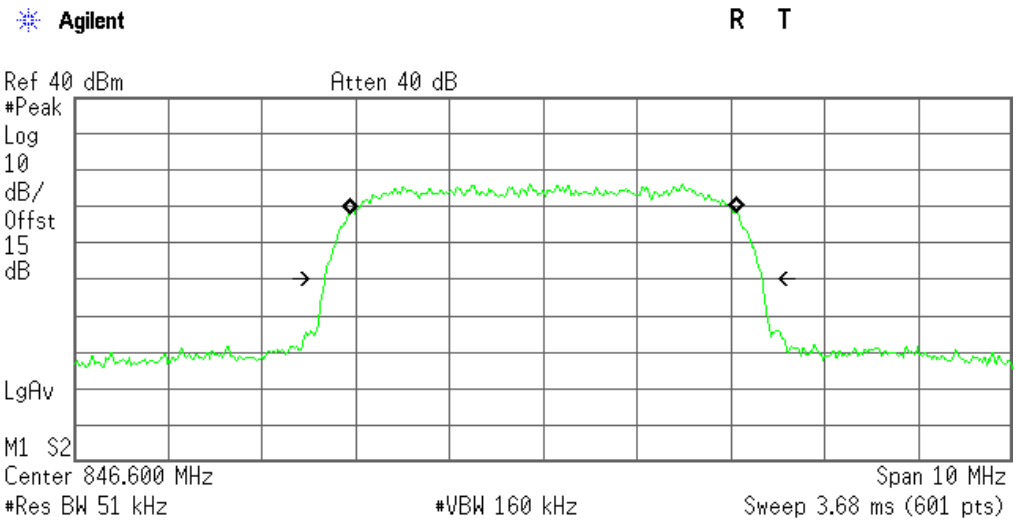
Occupied Bandwidth (99%) UMTS HUDPA BAND V CH 4132




Occupied Bandwidth (99%) UMTS HUDPA BAND V CH 4183



Occupied Bandwidth (99%) UMTS HUDPA BAND V CH 4233




Occupied Bandwidth
4.1472 MHz

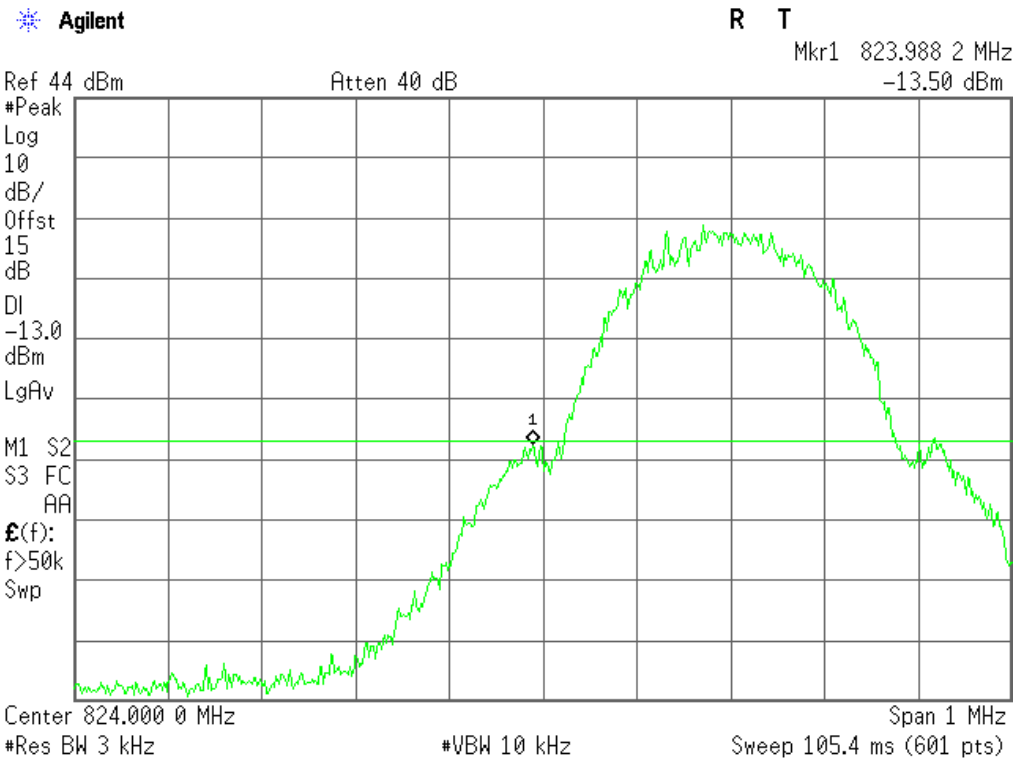
**Occ BW % Pwr** 99.00 %
**x dB** -26.00 dB

**Transmit Freq Error** -1.096 kHz
**x dB Bandwidth** 4.674 MHz

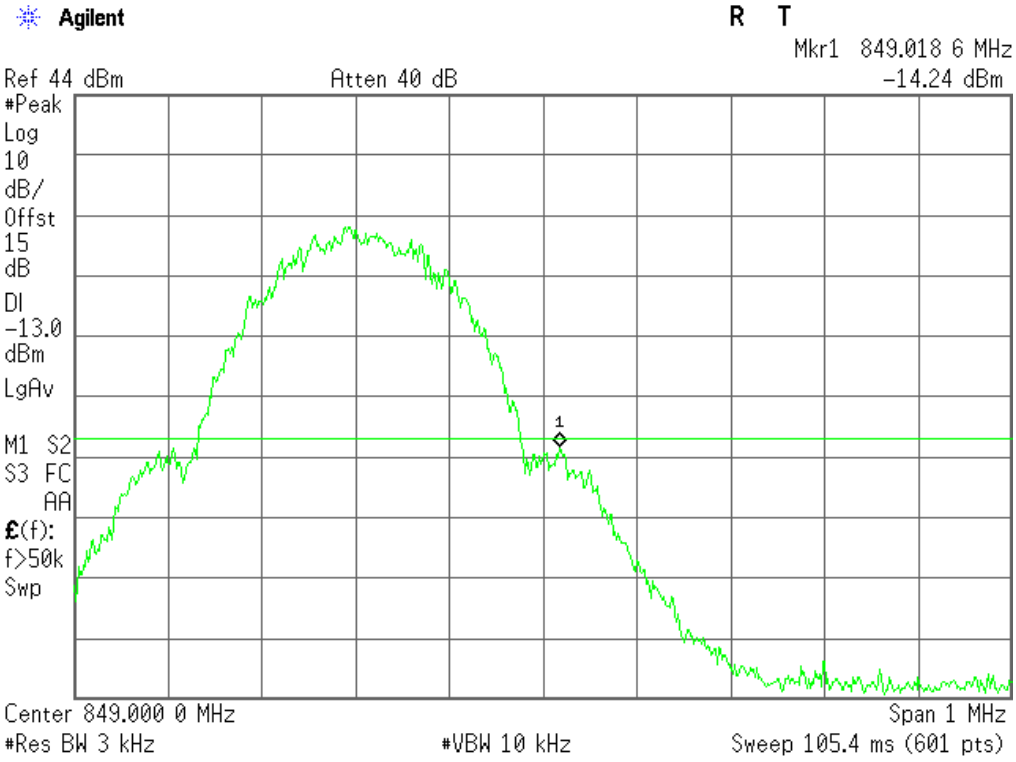
# APPENDIX III

# TEST PLOTS FOR BAND EDGES

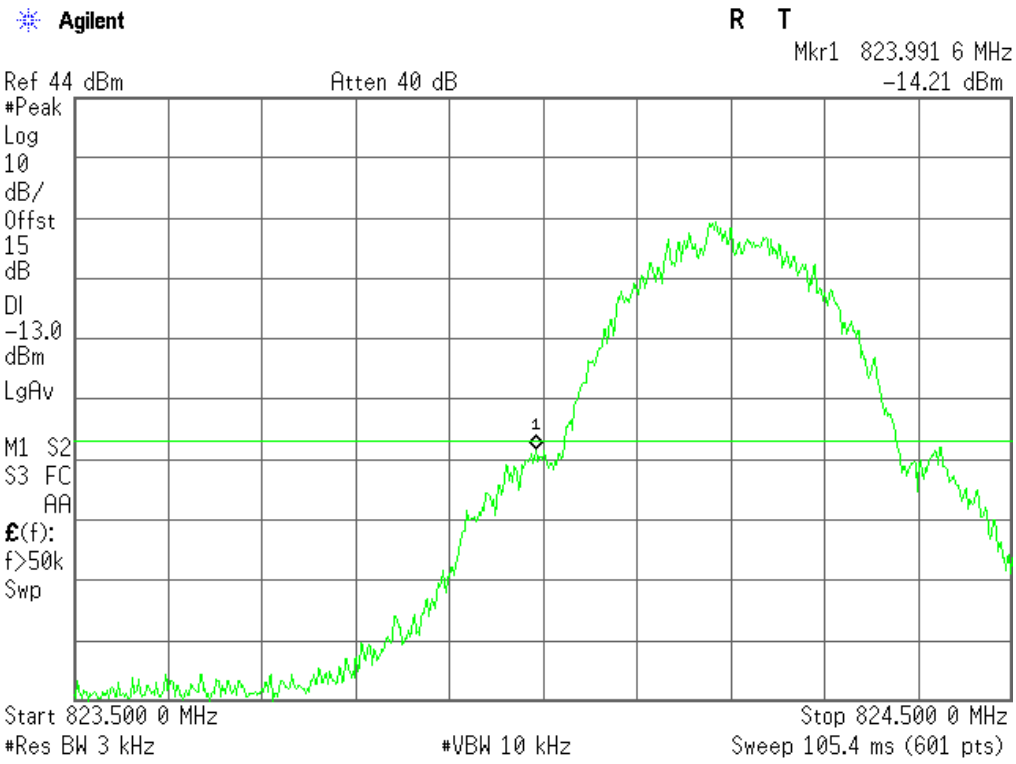
Low Band Edge GSM 850 BAND CH 128



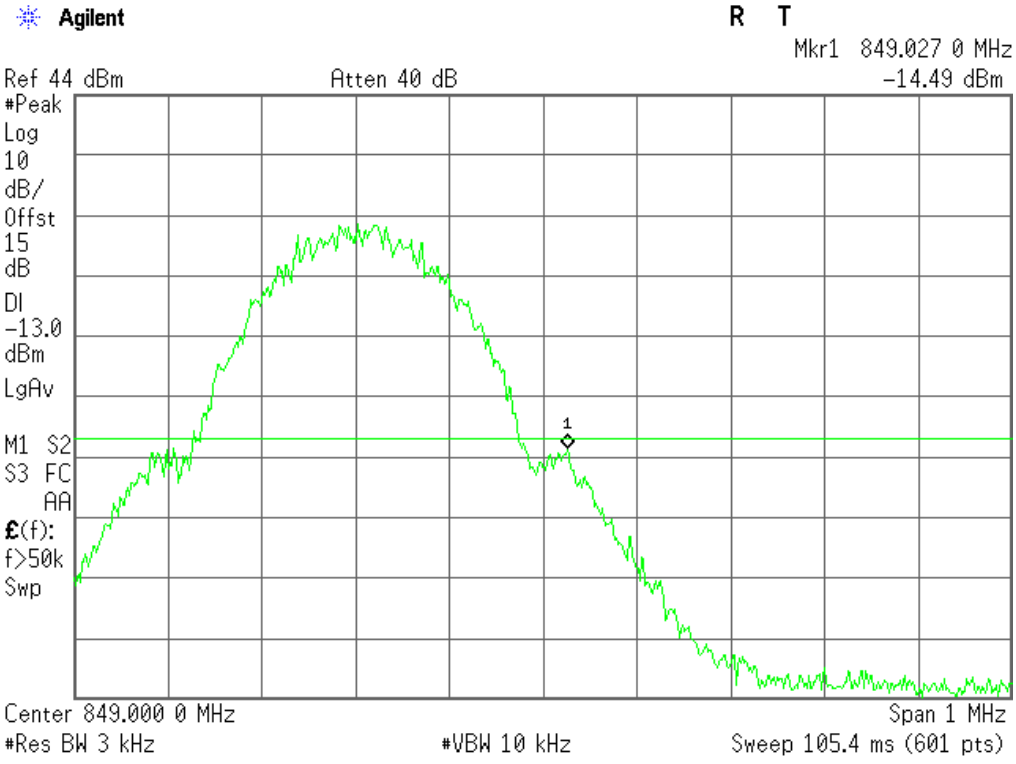

High Band Edge GSM 850 BAND CH 251



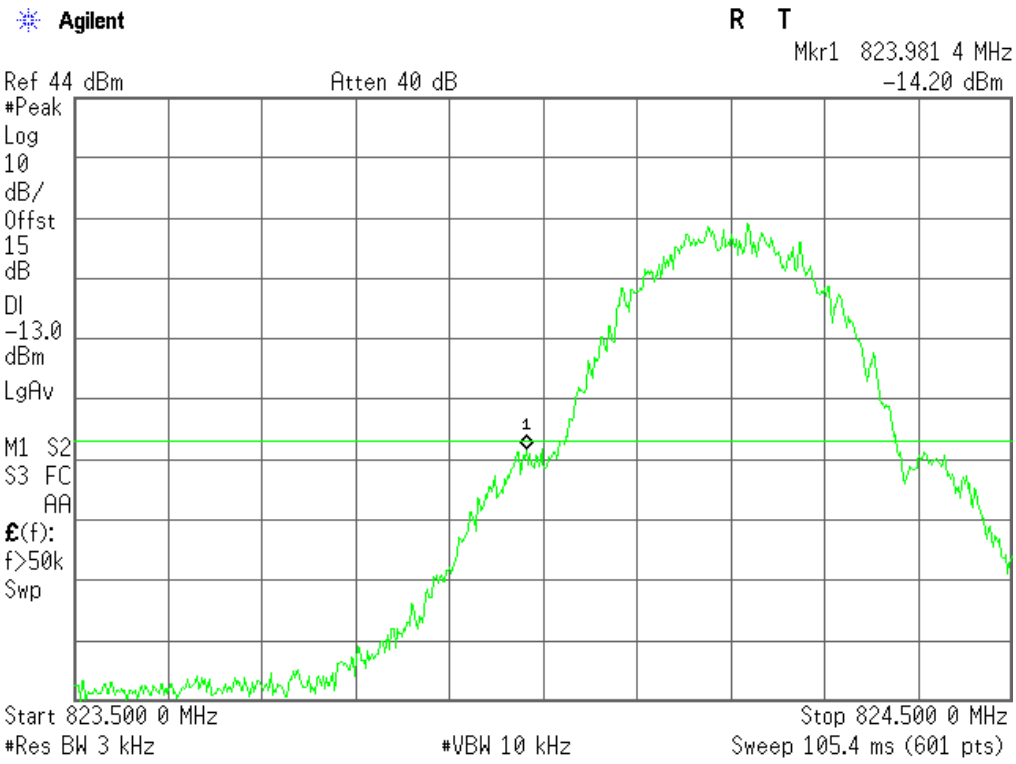
Low Band Edge GPRS 850 BAND CH 128



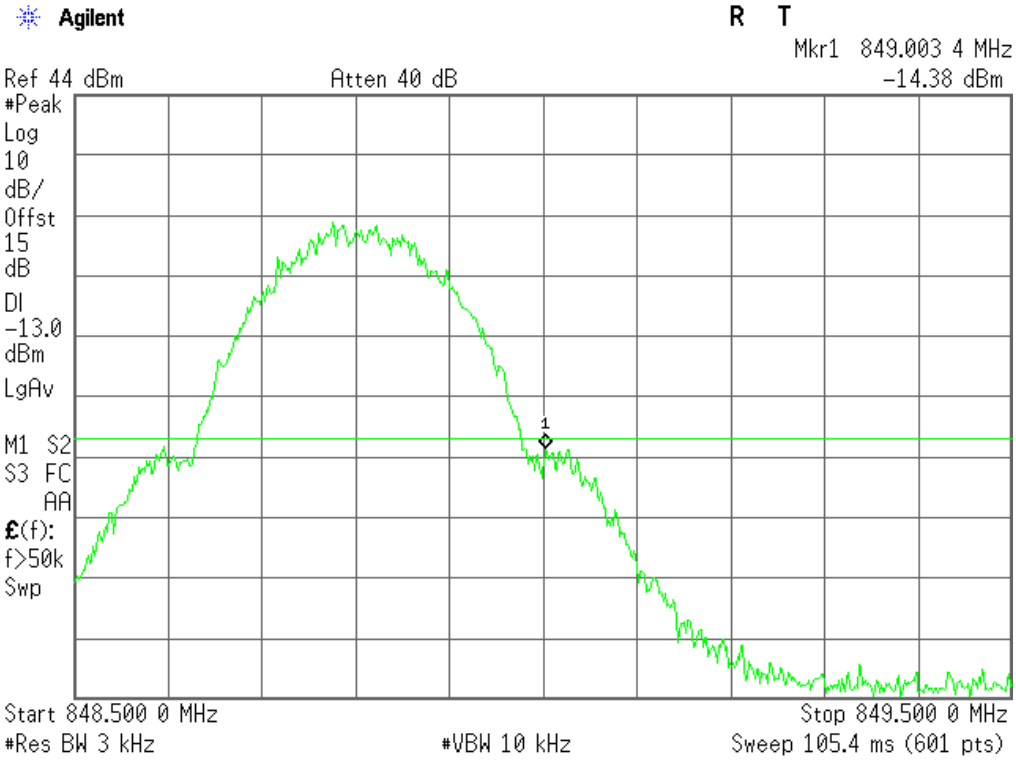

High Band Edge GPRS 850 BAND CH 251



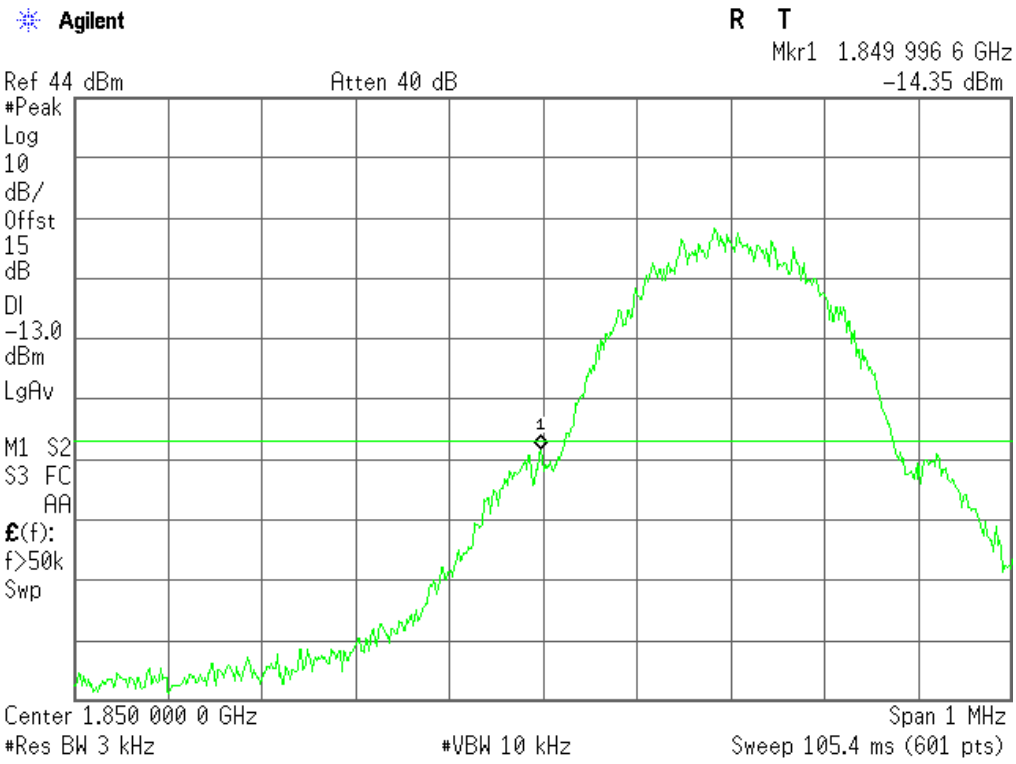
Low Band Edge EGPRS 850 BAND CH 128



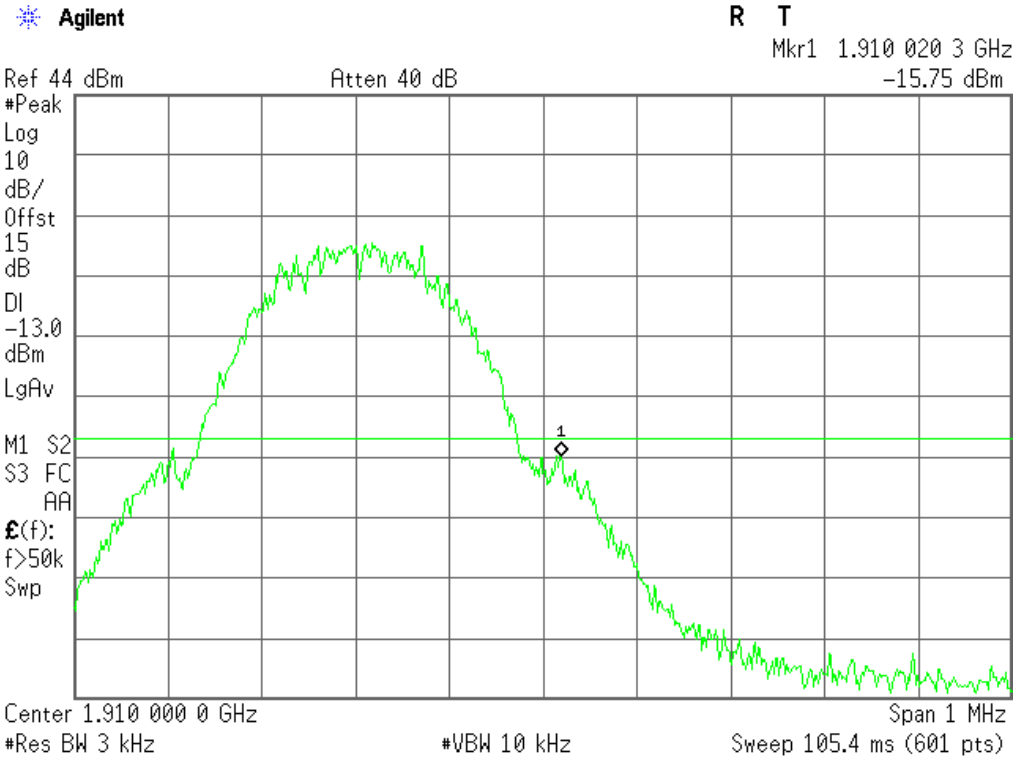

High Band Edge EGPRS 850 BAND CH 251



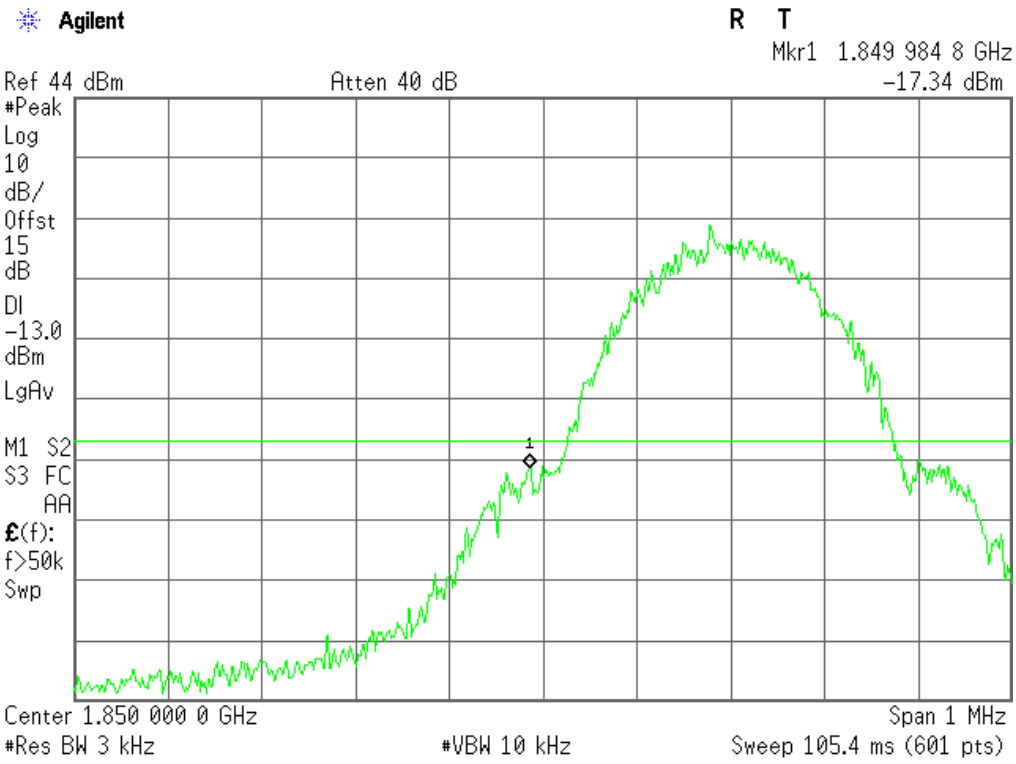
Low Band Edge PCS 1900 BAND CH 512



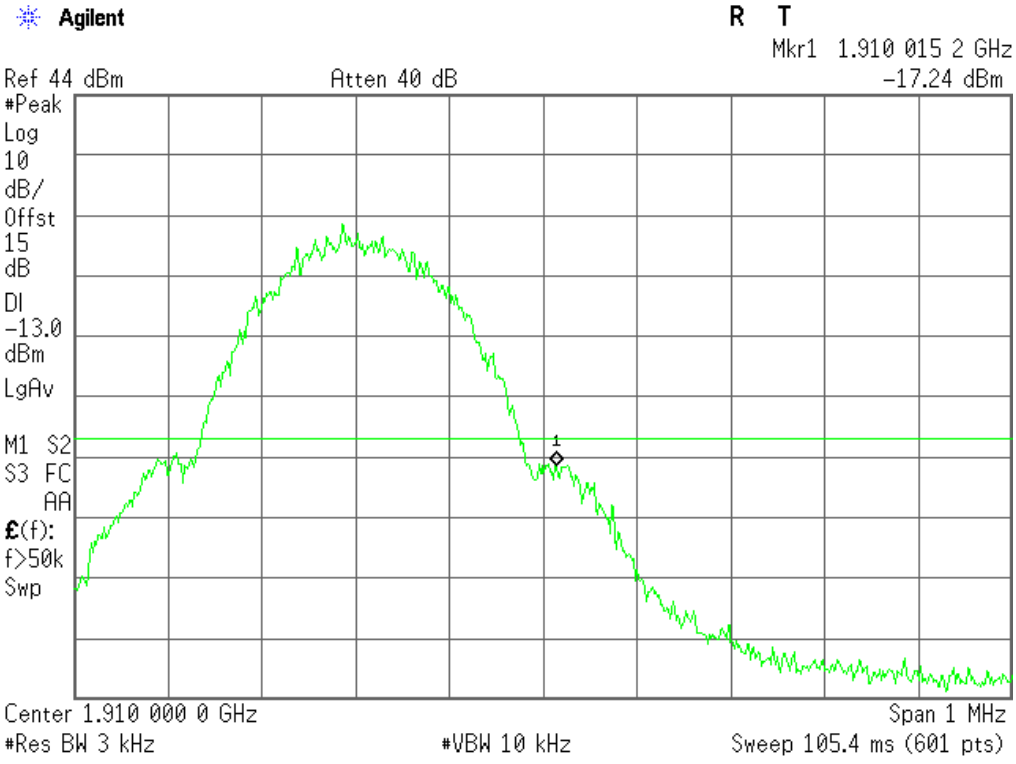

High Band Edge PCS 1900 BAND CH 810



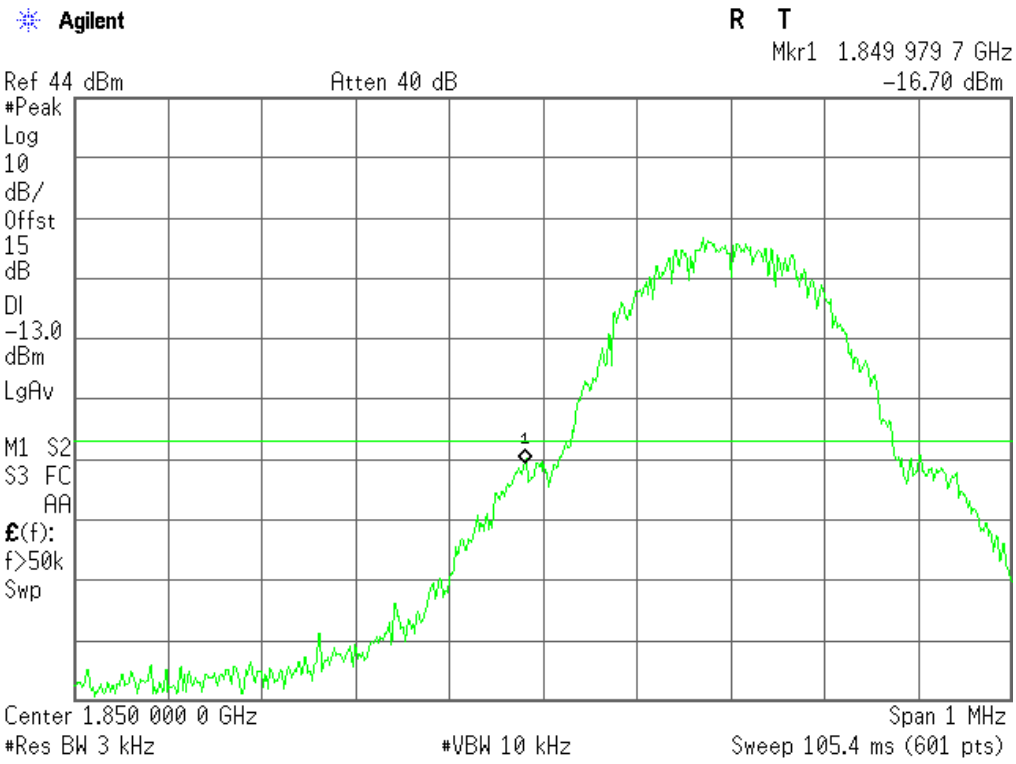
Low Band Edge GPRS 1900 BAND CH 512



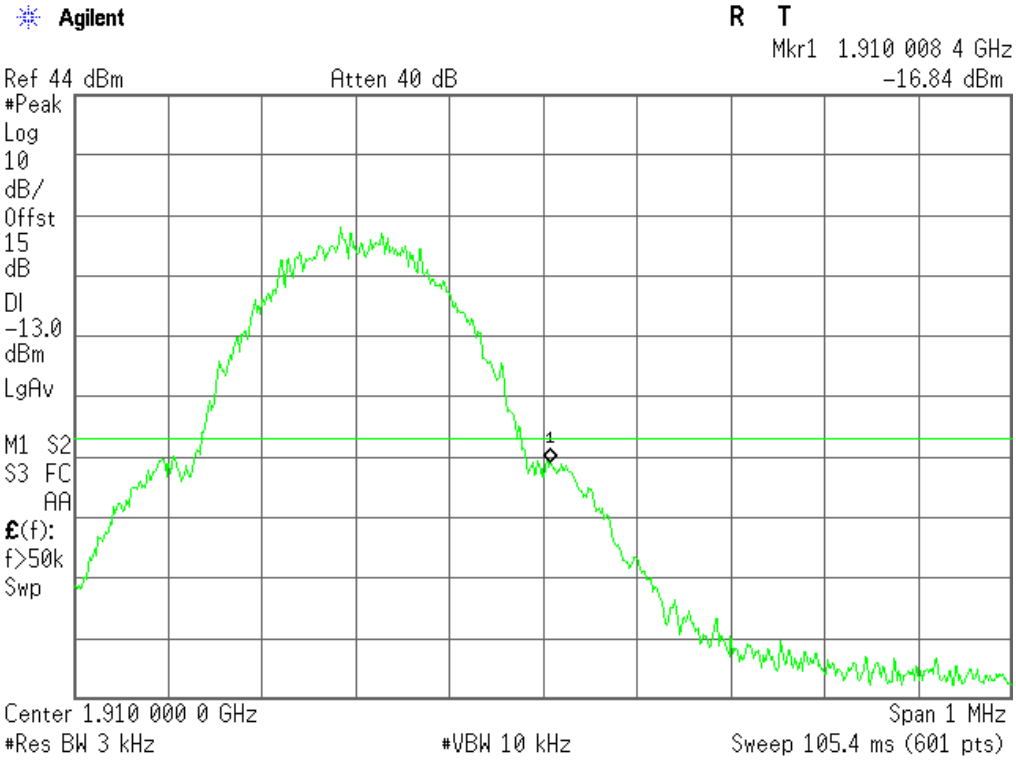

High Band Edge GPRS 1900 BAND CH 810



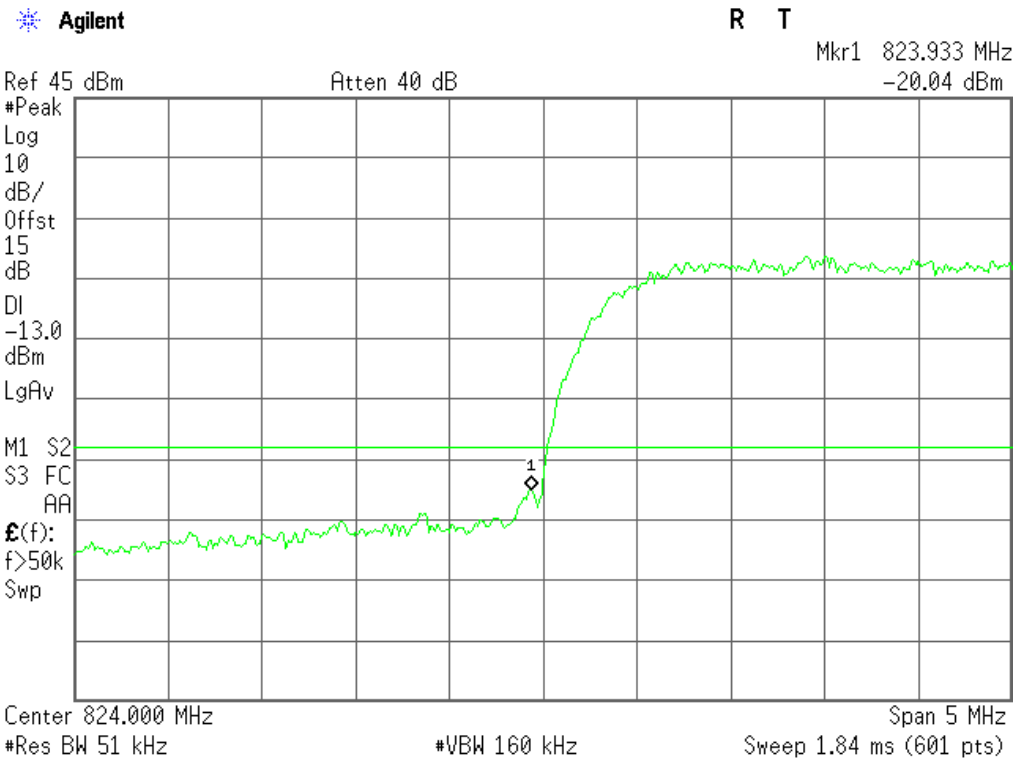
Low Band Edge EGPRS 1900 BAND CH 512



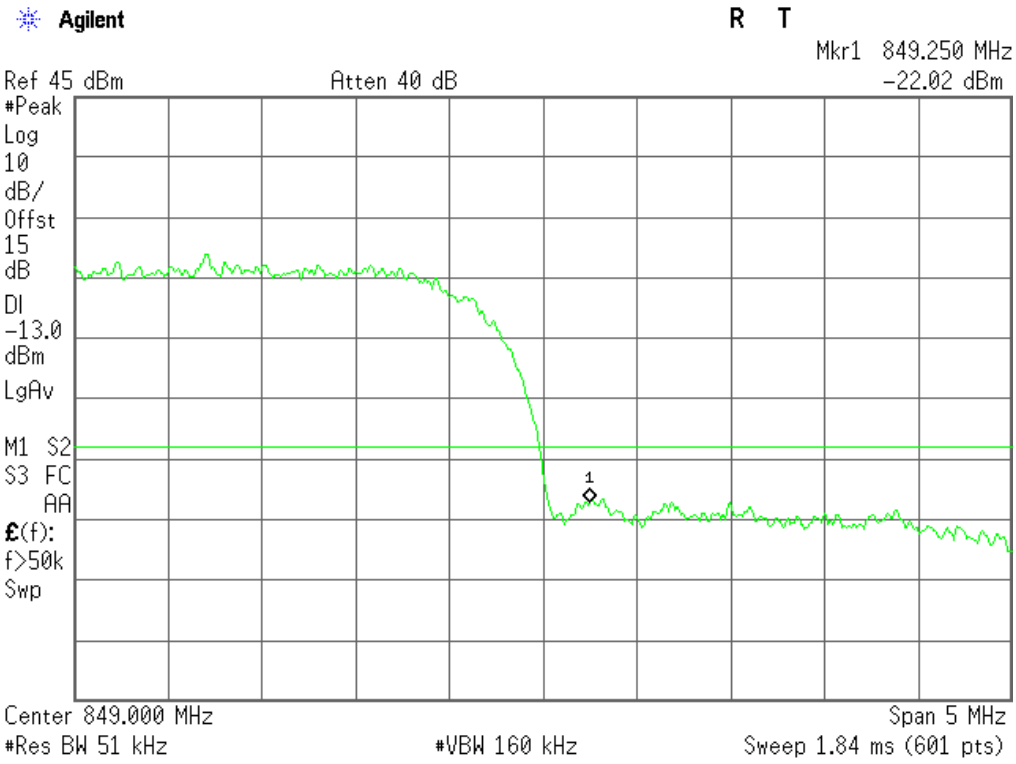

High Band Edge EGPRS 1900 BAND CH 810



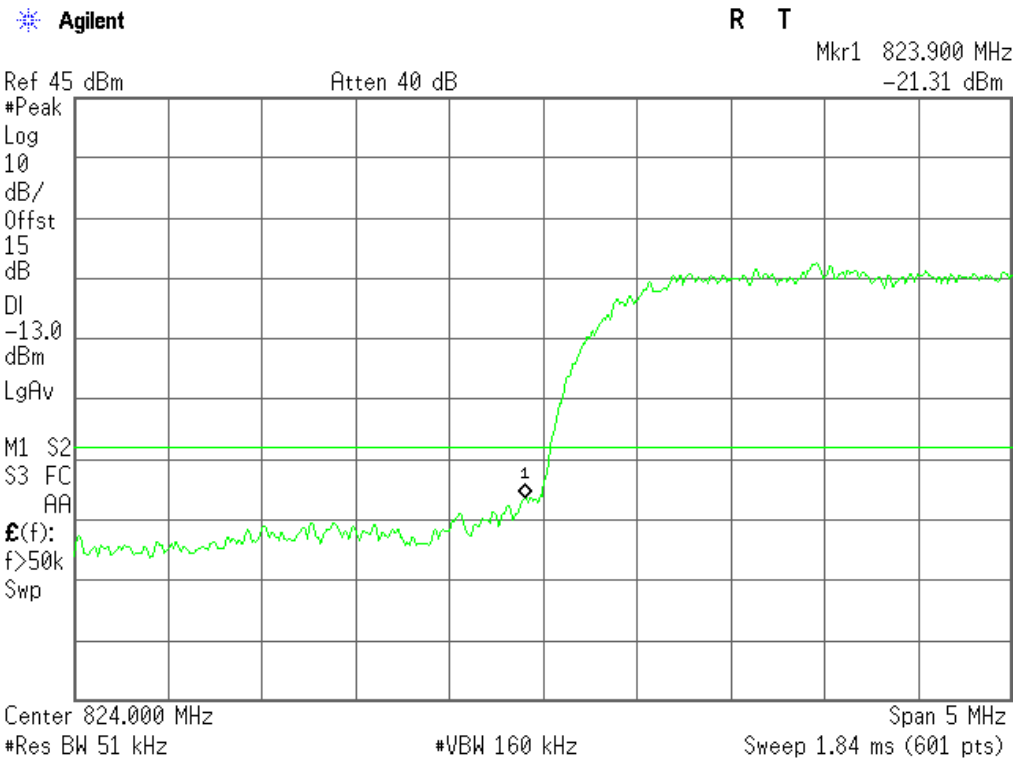
Low Band Edge UMTS BAND V CH 4132



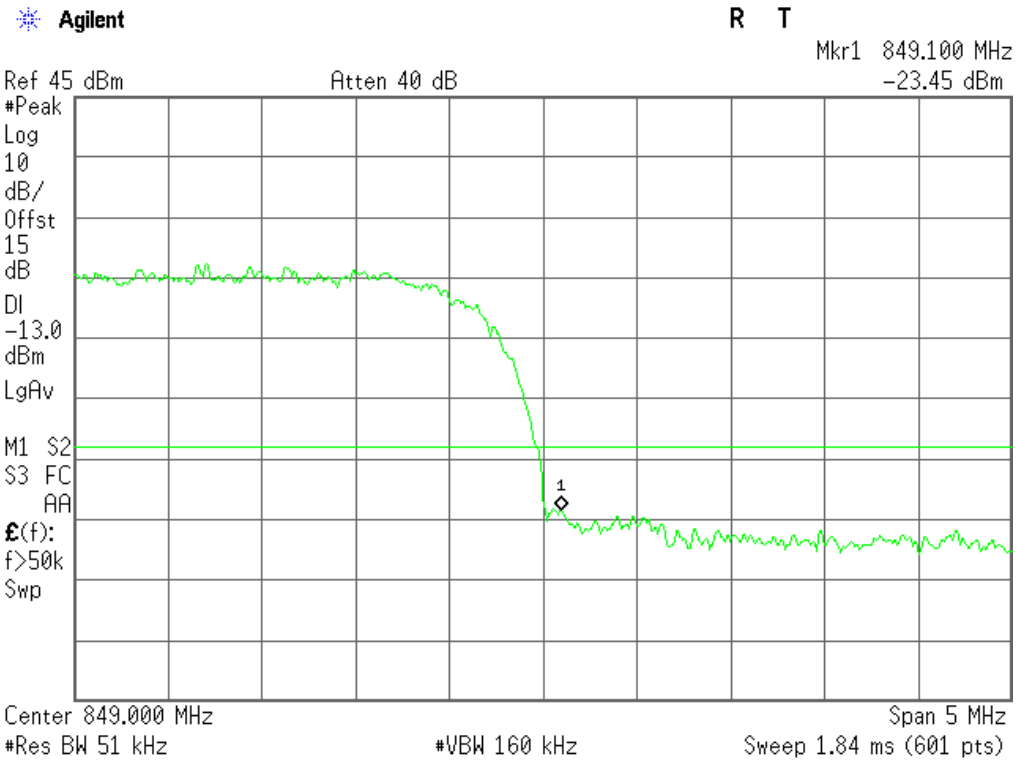

High Band Edge UMTS BAND V CH 4233



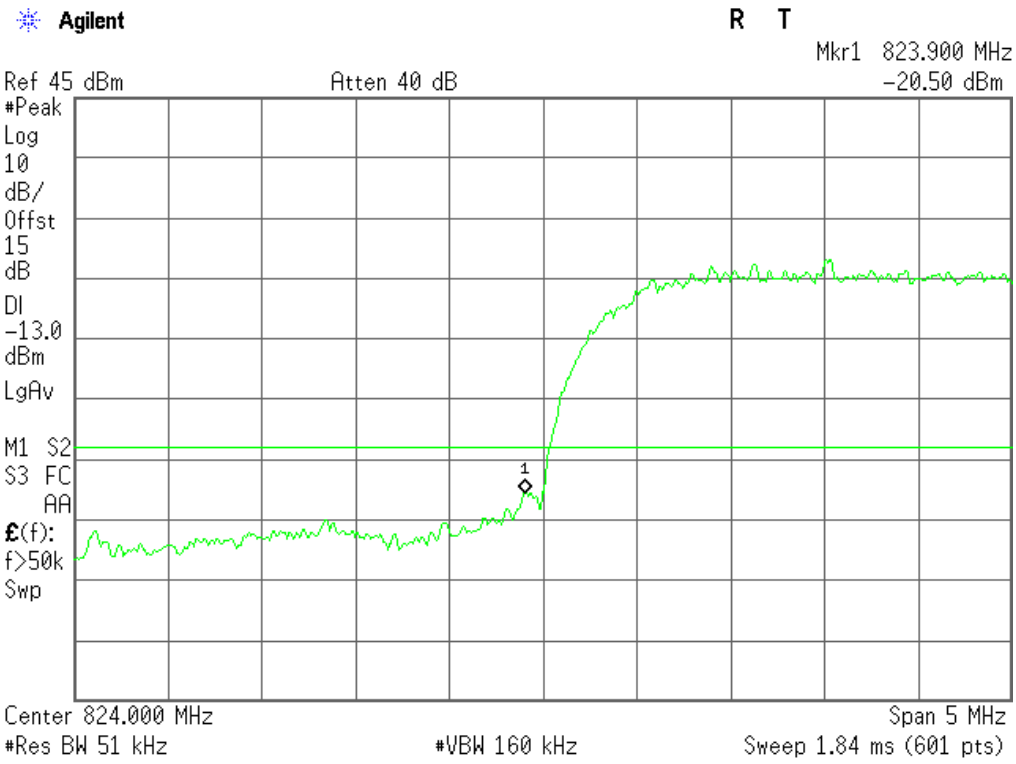
Low Band Edge HSDPA BAND V CH 4132



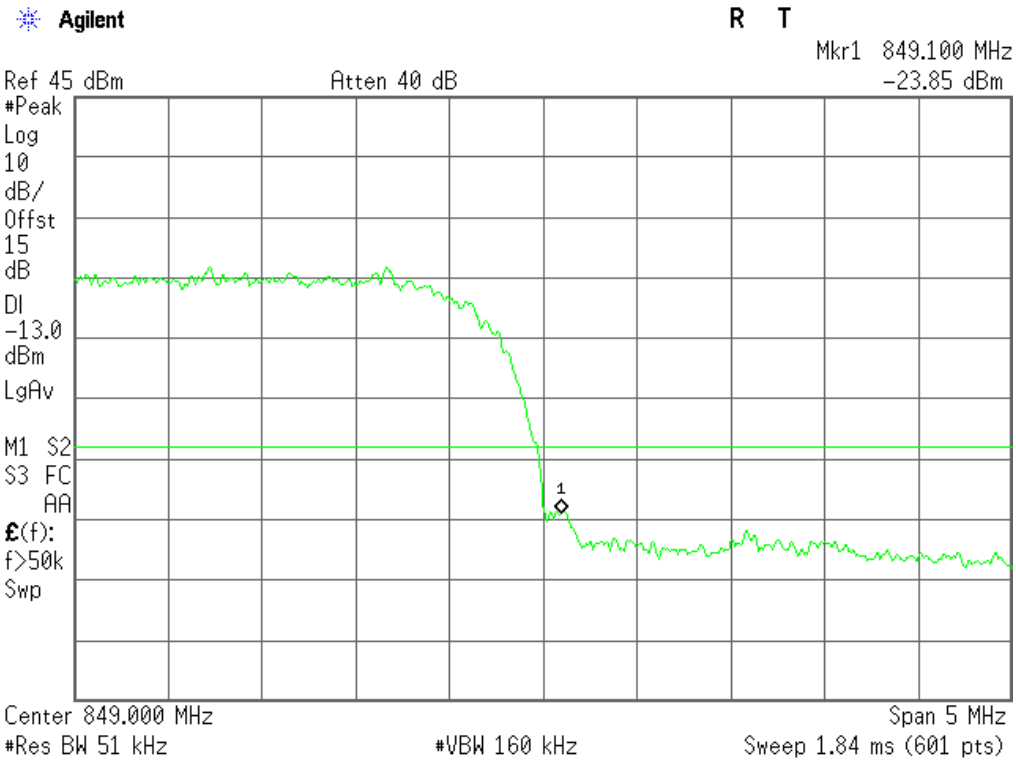

High Band Edge HSDPA BAND V CH 4233



Low Band Edge HSUPA BAND V CH 4132



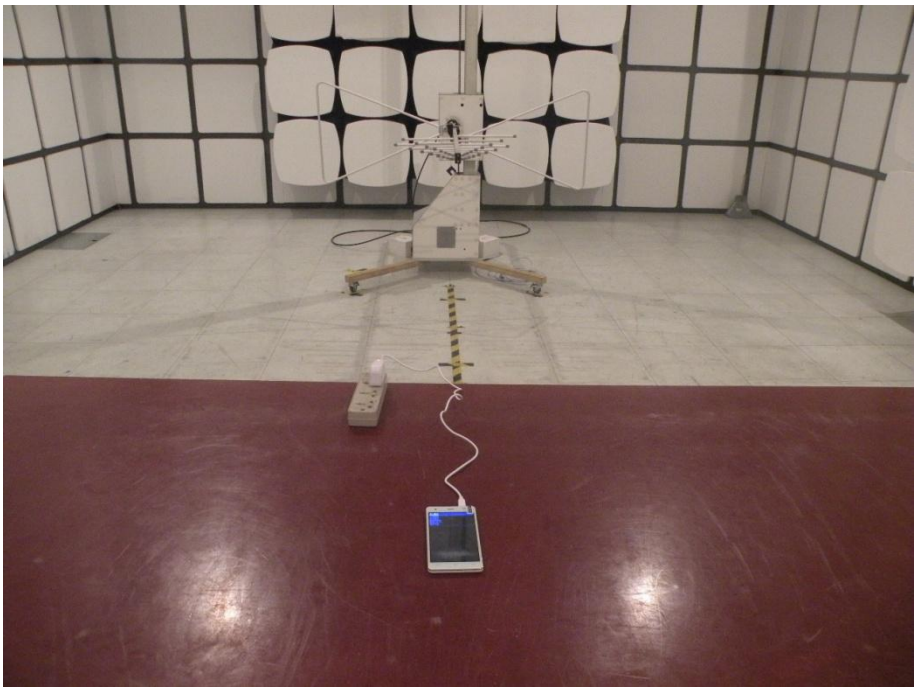

High Band Edge HSUPA BAND V CH 4233

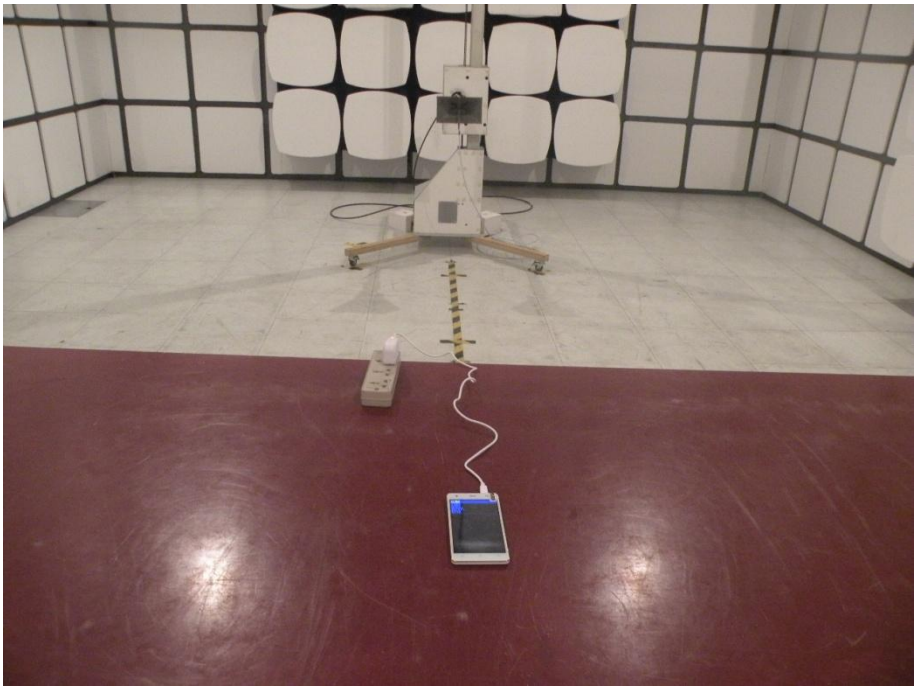


# APPENDIX IV

# PHOTOGRAPHS OF TEST SETUP

RADIATED SPURIOUS EMISSION





**----END OF REPORT----**