

# TEST REPORT



**DT&C Co., Ltd.**

42, Yurim-ro, 154Beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea, 17042  
Tel : 031-321-2664, Fax : 031-321-1664

1. Report No : DRTFCC1909-0242(1)
2. Customer
  - Name : LG Electronics USA, Inc.
  - Address : 1000 Sylvan Ave. Englewood Cliffs, New Jersey, United States 07632
3. Use of Report : FCC Original Grant
4. Product Name / Model Name : Mobile Phone / LM-G850EMW  
FCC ID : ZNFG850EMW
5. Test Method Used : KDB971168 D01v03, ANSI/TIA-603-E-2016, ANSI C63.26-2015  
Test Specification : §2, §22(H), §24(E), §27
6. Date of Test : 2019.08.16 ~ 2019.09.16
7. Testing Environment : Refer to appended test report.
8. Test Result : Refer to attached test result.

|             |                                                                                                      |                                                                                                                     |
|-------------|------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| Affirmation | Tested by                                                                                            | Reviewed by                                                                                                         |
|             | Name : InHee Bae  | Name : GeunKi Son  (Signature) |

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2019 . 09 . 30 .

**DT&C Co., Ltd.**

If this report is required to confirmation of authenticity, please contact to [report@dtnc.net](mailto:report@dtnc.net)

## Test Report Version

| Test Report No.    | Date          | Description                          |
|--------------------|---------------|--------------------------------------|
| DRTFCC1909-0242    | Sep. 24, 2019 | Initial issue                        |
| DRTFCC1909-0242(1) | Sep. 30, 2019 | Revised the section 7.5, 7.6 and 7.7 |
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## 1. GENERAL INFORMATION

**Applicant Name** : LG Electronics USA, Inc.  
**Address** : 1000 Sylvan Ave. Englewood Cliffs, New Jersey, United States 07632  
**FCC ID** : ZNFG850EMW  
**FCC Classification** : PCS Licensed Transmitter held to ear (PCE)  
**EUT** : Mobile Phone  
**Model Name** : LM-G850EMW  
**Add Model Name** : LMG850EMW, G850EMW, LM-G850EM, LMG850EM, G850EM, LM-G850EMWX, LMG850EMWX, G850EMWX, LM-G850EMX, LMG850EMX, G850EMX  
**Supplying power** : DC 3.87 V  
**Antenna Type** : PIFA Antenna

| Mode      | Tx Frequency (MHz) | Emission Designator | ERP (Max. Power) |       | EIRP (Max. Power) |       |
|-----------|--------------------|---------------------|------------------|-------|-------------------|-------|
|           |                    |                     | dBm              | W     | dBm               | W     |
| GSM850    | 824.2 ~ 848.8      | 247KGXW             | 28.83            | 0.764 | -                 | -     |
| EDGE850   | 824.2 ~ 848.8      | 236KG7W             | 22.17            | 0.165 | -                 | -     |
| WCDMA850  | 826.4 ~ 846.6      | 4M15F9W             | 20.36            | 0.109 | -                 | -     |
| HSUPA850  | 826.4 ~ 846.6      | 4M16F9W             | 18.04            | 0.064 | -                 | -     |
| WCDMA1700 | 1712.4 ~ 1752.6    | 4M16F9W             | -                | -     | 21.95             | 0.157 |
| HSUPA1700 | 1712.4 ~ 1752.6    | 4M15F9W             | -                | -     | 20.97             | 0.125 |
| GSM1900   | 1850.2 ~ 1909.8    | 245KGXW             | -                | -     | 32.82             | 1.914 |
| EDGE1900  | 1850.2 ~ 1909.8    | 243KG7W             | -                | -     | 27.53             | 0.566 |
| WCDMA1900 | 1852.4 ~ 1907.6    | 4M15F9W             | -                | -     | 23.37             | 0.217 |
| HSUPA1900 | 1852.4 ~ 1907.6    | 4M16F9W             | -                | -     | 22.33             | 0.171 |

## 2. INTRODUCTION

### 2.1. EUT DESCRIPTION

The Equipment Under Test (EUT) supports GSM/WCDMA/LTE Phone with Bluetooth, WLAN, NFC, WPC.

### 2.2. EUT CAPABILITIES

This EUT contains the following capabilities:

850/1900 GSM/WCDMA, 850/1700/1900 WCDMA/HSUPA, Multi-band LTE, 802.11b/g/n/ac WLAN(2.4GHz)  
802.11a/n/ac WLAN(5GHz), Bluetooth(BDR, EDR, LE), NFC, WPC.

### 2.3. TESTING ENVIRONMENT

| Ambient Condition   |                 |
|---------------------|-----------------|
| ▪ Temperature       | +21 °C ~ +25 °C |
| ▪ Relative Humidity | 41 % ~ 47 %     |

### 2.4. MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

### 2.5. MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with requirements of ANSI C63.4-2014. All measurement uncertainty values are shown with a coverage factor of  $k = 2$  to indicate a 95 % level of confidence.

| Parameter                                | Measurement uncertainty                               |
|------------------------------------------|-------------------------------------------------------|
| Radiated Disturbance<br>(Below 1 GHz)    | 5.1 dB (The confidence level is about 95 %, $k = 2$ ) |
| Radiated Disturbance<br>(1 GHz ~ 18 GHz) | 5.4 dB (The confidence level is about 95 %, $k = 2$ ) |
| Radiated Disturbance<br>(Above 18 GHz)   | 5.3 dB (The confidence level is about 95 %, $k = 2$ ) |

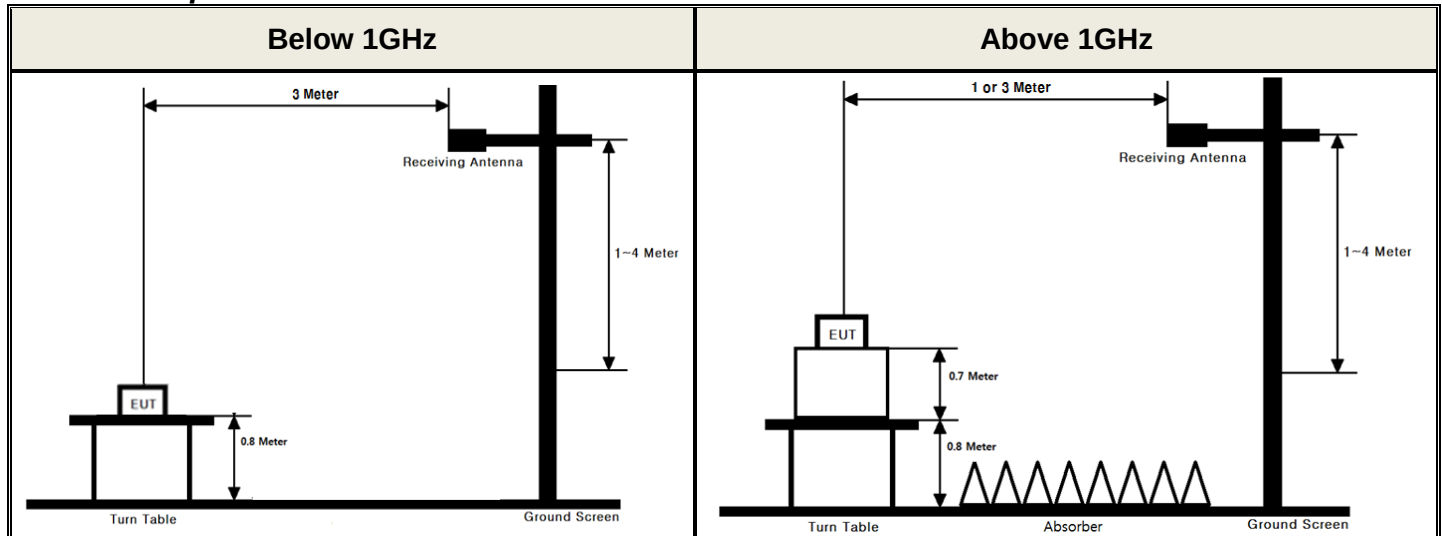
### 2.6. TEST FACILITY

|                                                                                                                                                                                                                                                                               |   |                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|------------------|
| <b>DT&amp;C Co., Ltd.</b>                                                                                                                                                                                                                                                     |   |                  |
| The 3 m test site and conducted measurement facility used to collect the radiated data are located at the 42, Yurim-ro, 154beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea 17042.<br>The test site complies with the requirements of § 2.948 according to ANSI C63.4-2014. |   |                  |
| <b>- FCC MRA Accredited Test Firm No. : KR0034</b>                                                                                                                                                                                                                            |   |                  |
| <a href="http://www.dtc.net">www.dtc.net</a>                                                                                                                                                                                                                                  |   |                  |
| Telephone                                                                                                                                                                                                                                                                     | : | + 82-31-321-2664 |
| FAX                                                                                                                                                                                                                                                                           | : | + 82-31-321-1664 |

### 3. DESCRIPTION OF TESTS

#### 3.1 ERP & EIRP (Effective Radiated Power & Equivalent Isotropic Radiated Power)

##### Test Set-up



These measurements were performed at 3 m test site. The equipment under test is placed on a non-conductive table 1.5 meters above a turntable which is flush with the ground plane and 3 meters from the receive antenna. For measurements above 1 GHz absorbers are placed on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1 GHz, the absorbers are removed.

##### Test Procedure

- ANSI/TIA-603-E-2016 - Section 2.2.17
- KDB971168 D01v03 - Section 5.2.2
- ANSI 63.26-2015 – Section 5.2.4.4.1

##### Test setting

1. Set span to 2 x to 3 x the OBW.
2. Set RBW = 1% to 5% of the OBW.
3. Set VBW  $\geq$  3 x RBW.
4. Set number of points in sweep  $\geq$  2 x span / RBW.
5. Sweep time:
  - 1) Set = auto-couple, or
  - 2) Set  $\geq$   $[10 \times (\text{number of points in sweep}) \times (\text{transmission period})]$  for single sweep (automation-compatible) measurement. Transmission period is the on and off time of the transmitter.
6. Detector = power averaging (rms).
7. If the EUT can be configured to transmit continuously, then set the trigger to free run.
8. If the EUT cannot be configured to transmit continuously, then use a sweep trigger with the level set to enable triggering only on full power bursts and configure the EUT to transmit at full power for the entire duration of each sweep. Verify that the sweep time is less than or equal to the transmission burst duration. Time gating can also be used under similar constraints (i.e., configured such that measurement data is collected only during active full-power transmissions).
9. Trace average at least 100 traces in power averaging (rms) mode if sweep is set to auto-couple. To accurately determine the average power over multiple symbols, it can be necessary to increase the number of traces to be averaged above 100 or, if using a manually configured sweep time, increase the sweep time.

10. Compute the power by integrating the spectrum across the OBW of the signal using the instrument's band or channel power measurement function, with the band/channel limits set equal to the OBW band edges. If the instrument does not have a band or channel power function, then sum the spectrum levels (in linear power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.

The receiver antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer.

A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminal of the substitute antenna is measured.

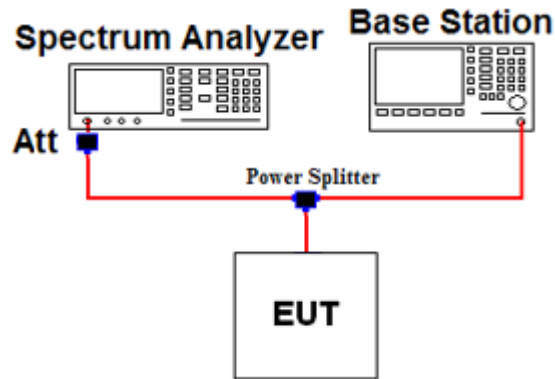
The ERP/EIRP is calculated using the following formula:

**ERP/EIRP = The conducted power at the substitute antenna's terminal [dBm] + Substitute Antenna gain [dBd for ERP, dBi for EIRP]**

For readings above 1 GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn antenna and an isotropic antenna are taken into consideration.

## 3.2 PEAK TO AVERAGE RATIO

### Test set-up



### Test Procedure

- KDB971168 D01v03 - Section 5.7.2
- ANSI C63.26-2015 – Section 5.2.3.4

A peak to average ratio measurement is performed at the conducted port of the EUT.

The spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The present of time the signal spends at or above the level defines the probability for that particular power level.

### Test setting

The spectrum Analyzer's CCDF measurement function is enabled.

1. Set resolution/measurement bandwidth  $\geq$  OBW or specified reference bandwidth.
2. Set the number of counts to a value that stabilizes the measured CCDF curve.
3. Set the measurement interval as follows:
  - 1) For continuous transmissions, set to the greater of  $[10 \times (\text{number of points in sweep}) \times (\text{transmission symbol period})]$  or 1 ms.
  - 2) For burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize. Set the measurement interval to a time that is less than or equal to the burst duration.
  - 3) If there are several carriers in a single antenna port, the peak power shall be determined for each individual carrier (by disabling the other carriers while measuring the required carrier) and the total peak power calculated from the sum of the individual carrier peak powers.
4. Record the maximum PAPR level associated with a probability of 0.1%.
5. The peak power level is calculated from the sum of the PAPR value from step d) to the measured average power.

## ■ Alternate Procedure

- KDB971168 D01v03 - Section 5.7.3
- ANSI C63.26-2015 – Section 5.2.6

Use one of the measurement procedures of the peak power and record as  $P_{Pk}$ .

Use one of the measurement procedures of the average power and record as  $P_{Avg}$ .

Both the peak and average power levels must be expressed in the same logarithmic units (e.g., dBm). Determine the PAPR from:

$$PAPR \text{ (dB)} = P_{Pk} \text{ (dBm or dBW)} - P_{Avg} \text{ (dBm or dBW)}.$$

Where,

PAPR peak-to-average power ratio, in dB

$P_{Pk}$  measured peak power or peak PSD level, in dBm or dBW

$P_{Avg}$  measured average power or average PSD level, in dBm or dBW

### - Peak Power Measurement

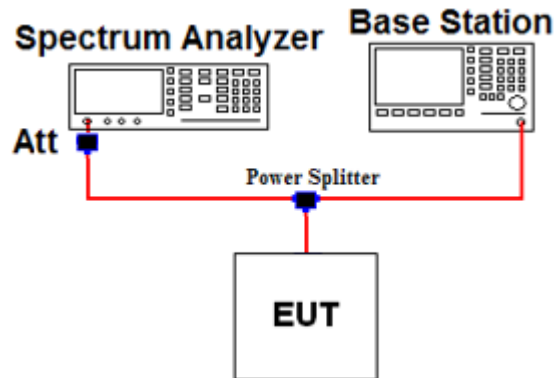
1. Set the RBW  $\geq$  OBW
2. Set VBW  $\geq 3 \times$  RBW
3. Set span  $\geq 2 \times$  RBW
4. Sweep time  $\geq 10 \times$  (number of points in sweep)  $\times$  (transmission symbol period).
5. Detector = peak
6. Trace mode = max hold
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the peak amplitude level.

### - Average Power Measurement

1. Set span to  $2 \times$  to  $3 \times$  the OBW.
2. Set RBW = 1% to 5% of the OBW.
3. Set VBW  $\geq 3 \times$  RBW.
4. Set number of measurement points in sweep  $\geq 2 \times$  span / RBW..
5. Sweep time = 1 ) auto-couple, or  
2 ) set  $\geq [10 \times (\text{number of points in sweep}) \times (\text{transmission period})]$  for single sweep (automation-compatible ) measurement. Transmission period is the on and off time of the transmitter.
6. Detector = power averaging (RMS).
7. If the EUT can be configured to transmit continuously, then set the trigger to free run.
8. If the EUT cannot be configured to transmit continuously, then use a sweep trigger with the level set to enable Triggering only on full power bursts and configure the EUT to transmit at full power for the entire duration of each Sweep. Verify that the sweep time is less than or equal to the transmission burst duration. Time gating can also be used under similar constraints (i.e., configured such that measurement data is collected only during active full-Power transmissions)
9. Trace average at least 100 traces in power averaging (rms) mode if sweep is set to auto-couple. To accurately determine the average power over multiple symbols, it can be necessary to increase the number of traces to be averaged above 100 or, if using a manually configured sweep time, increase the sweep time.
10. Compute the power by integrating the spectrum across the OBW of the signal using the instrument's band or channel power measurement function, with the band/channel limits set equal to the OBW band edges. If the instrument does not have a band or channel power function, then sum the spectrum levels (in linear power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.

### 3.3 OCCUPIED BANDWIDTH (99 % Bandwidth)

#### Test set-up



#### Offset value information

| Frequency (MHz) | Offset Value (dB) | Frequency (MHz) | Offset Value (dB) |
|-----------------|-------------------|-----------------|-------------------|
| 824.2           | 6.60              | 1850.2          | 6.91              |
| 826.4           | 6.59              | 1852.4          | 6.90              |
| 836.6           | 6.57              | 1880            | 6.93              |
| 846.6           | 6.67              | 1907.6          | 6.93              |
| 848.8           | 6.69              | 1909.8          | 6.93              |
| 1712.4          | 6.87              | -               | -                 |
| 1732.4          | 6.87              | -               | -                 |
| 1752.6          | 6.92              | -               | -                 |

Note. 1: The offset values from EUT to Spectrum analyzer were measured and used for test.

#### Test Procedure

- KDB971168 D01v03 - Section 4.3
- ANSI C63.26-2015 – Section 5.4.4

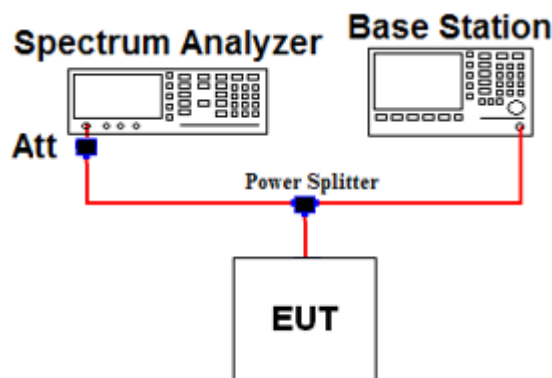
The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power of a given emission.

#### Test setting

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99 % occupied bandwidth and the 26 dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2.  $RBW = 1 \sim 5 \%$  of the expected OBW &  $VBW \geq 3 \times RBW$
3. Detector = Peak
4. Trance mode = Max hold
5. Sweep = Auto couple
6. The trace was allowed to stabilize
7. If necessary, step 2 ~ 6 were repeated after changing the RBW such that it would be within 1 ~ 5 % of the 99 % occupied bandwidth observed in step 6.

### 3.4 SPURIOUS EMISSIONS AT ANTENNA TERMINAL

#### Test set-up



#### Offset value information

| Frequency (MHz) | Offset Value (dB) | Frequency (MHz) | Offset Value (dB) |
|-----------------|-------------------|-----------------|-------------------|
| 10000           | 8.45              | 20000           | 13.15             |
| -               | -                 | -               | -                 |

Note. 1: The offset value from EUT to Spectrum analyzer was measured and used for test.

#### Test Procedure

- KDB971168 D01v03 - Section 6
- ANSI C63.26-2015 - Section 5.7

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The EUT was setup to maximum output power at its low, middle, high channel with all bandwidths. The spectrum is scanned from 9 kHz up to a frequency including its 10<sup>th</sup> harmonic.

The power of any spurious emission shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB, where P is the transmitter power in Watts.

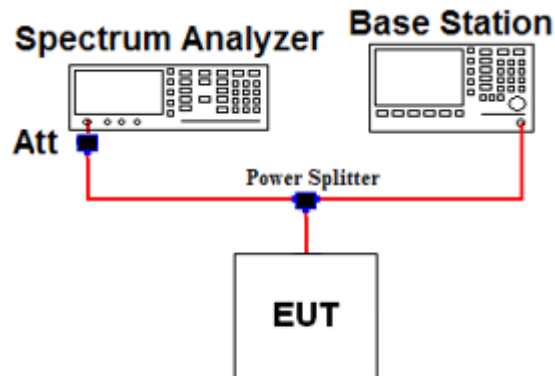
#### Test setting

1. RBW = 100 kHz(Below 1 GHz) or 1 MHz(Above 1 GHz) & VBW  $\geq 3 \times$  RBW ( Refer to Note 1)
2. Detector = RMS & Trace mode = Max hold
3. Sweep time = Auto couple
4. Number of sweep point  $\geq 2 \times$  span / RBW
5. The trace was allowed to stabilize

Note 1: Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater for Part 22 and 1 MHz or greater for Part 24, 27

### 3.5 BAND EDGE EMISSIONS AT ANTENNA TERMINAL

#### Test set-up



#### Offset value information

| Frequency (MHz) | Offset Value (dB) | Frequency (MHz) | Offset Value (dB) |
|-----------------|-------------------|-----------------|-------------------|
| 819-824         | 6.60              | 1755-1764       | 6.92              |
| 849-854         | 6.69              | 1845-1850       | 6.91              |
| 1701-1710       | 6.93              | 1905-1915       | 6.93              |
| -               | -                 | -               | -                 |

Note. 1: The offset value from EUT to Spectrum analyzer was measured and used for test.

#### Test Procedure

- KDB971168 D01v03 - Section 6
- ANSI C63.26-2015 - Section 5.7

All out of band emissions are measured by means of a calibrated spectrum analyzer. The EUT was setup to maximum output power at its lowest and highest channel with all modulations.

The power of any spurious emission shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB, where P is the transmitter power in Watts.

#### Test setting

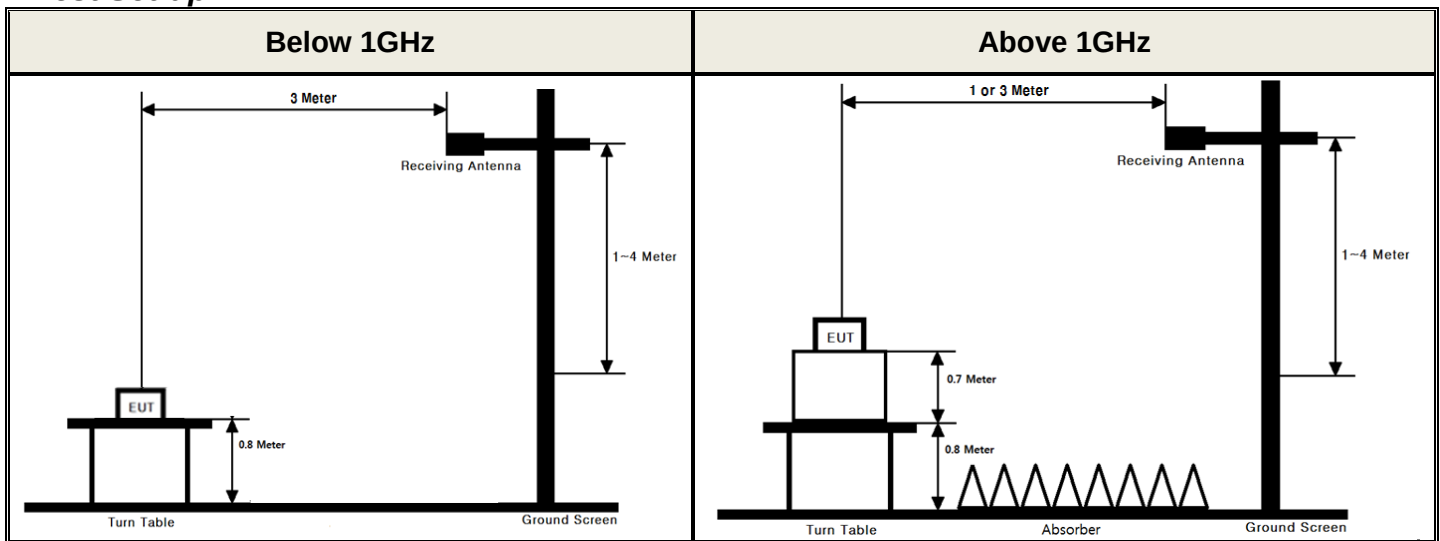
1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW  $\geq 1$  % of the emission
4. VBW  $\geq 3 \times$  RBW
5. Detector = RMS & Trace mode = Max hold
6. Sweep time = Auto couple or 1 s for band edge
7. Number of sweep point  $\geq 2 \times$  span / RBW
8. The trace was allowed to stabilize

Note 1: In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of **at least one percent** of the emission bandwidth of the fundamental emission of the transmitter may be employed to demonstrate compliance with the out-of-band emissions limit.

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

### 3.6 RADIATED SPURIOUS EMISSIONS

#### Test Set-up



These measurements were performed at 3 m test site. The equipment under test is placed on a non-conductive table 1.5-meters above a turntable which is flush with the ground plane and 3 meters from the receive antenna. For measurements above 1 GHz absorbers are placed on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1 GHz, the absorbers are removed.

#### Test Procedure

- ANSI/TIA-603-E-2016 - Section 2.2.12
- KDB971168 D01v03 - Section 5.8
- ANSI C63.26-2015 - Section 5.5

#### Test setting

1. RBW = 100 kHz for below 1 GHz and 1 MHz for above 1 GHz / VBW  $\geq 3 \times$  RBW
2. Detector = RMS & Trace mode = Max hold
3. Sweep time = Auto couple
4. Number of sweep point  $\geq 2 \times$  span / RBW
5. The trace was allowed to stabilize

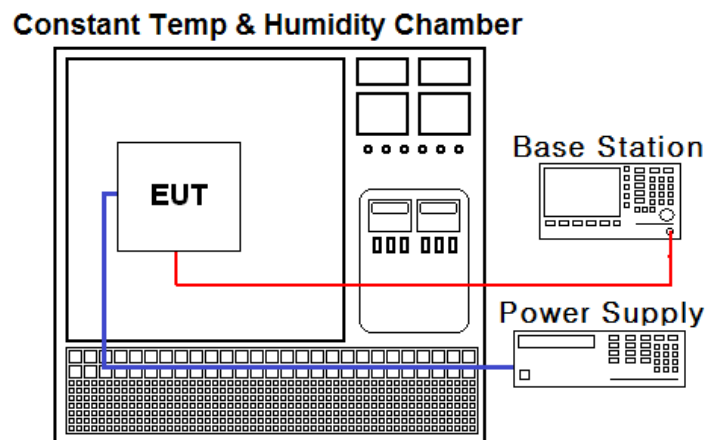
The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer.

For radiated spurious emission measurements below 1 GHz, a half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading.

For radiated spurious emission measurements above 1 GHz, a Horn antenna was substituted in place of the EUT. This Horn antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading. The difference between the gain of the horn and an isotropic antenna are taken into consideration.

### 3.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

#### Test Set-up



#### Test Procedure

- ANSI/TIA-603-E-2016
- KDB971168 D01v03 - Section 9

The frequency stability of the transmitter is measured by:

- a.) **Temperature:**  
The temperature is varied from - 30 °C to + 50 °C in 10 °C increments using an environmental chamber.
- b.) **Primary Supply Voltage:**  
The primary supply voltage is varied from 85 % to 115 % of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

#### Specification:

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block for Part 24, 27. The frequency stability of the transmitter shall be maintained within  $\pm 0.00025\%$  ( $\pm 2.5$  ppm) of the center frequency for Part 22.

#### Time Period and Procedure:

1. The carrier frequency of the transmitter is measured at room temperature.  
(20 °C to provide a reference)
2. The equipment is turned on in a "standby" condition for one minute before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
3. Frequency measurements are made at 10 °C intervals ranging from -30 °C to +50 °C.  
A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

## 4. LIST OF TEST EQUIPMENT

| Type                         | Manufacturer         | Model                       | Cal.Date<br>(yy/mm/dd) | Next.Cal. Date<br>(yy/mm/dd) | S/N        |
|------------------------------|----------------------|-----------------------------|------------------------|------------------------------|------------|
| Spectrum Analyzer            | Agilent Technologies | N9020A                      | 19/06/26               | 20/06/26                     | MY46471251 |
| Spectrum Analyzer            | Agilent Technologies | N9020A                      | 19/06/26               | 20/06/26                     | MY50410163 |
| DC power supply              | Agilent Technologies | 66332A                      | 19/06/25               | 20/06/25                     | MY43000394 |
| Multimeter                   | FLUKE                | 17B                         | 18/12/18               | 19/12/18                     | 26030065WS |
| Power Splitter               | Anritsu              | K241B                       | 18/12/19               | 19/12/19                     | 016681     |
| Temp & Humi                  | MG Indus             | THP31R1                     | 19/07/04               | 20/07/04                     | 20131002-1 |
| Radio Communication Analyzer | Agilent Technologies | E5515C                      | 19/06/28               | 20/06/28                     | GB41321164 |
| Thermohygrometer             | BODYCOM              | BJ5478                      | 18/12/27               | 19/12/27                     | 120612-2   |
| Thermohygrometer             | BODYCOM              | BJ5478                      | 18/12/27               | 19/12/27                     | 120612-1   |
| Signal Generator             | Rohde Schwarz        | SMBV100A                    | 18/12/19               | 19/12/19                     | 255571     |
| Signal Generator             | ANRITSU              | MG3695C                     | 18/12/20               | 19/12/20                     | 173501     |
| Loop Antenna                 | ETS                  | 6502                        | 19/03/21               | 21/03/21                     | 3471       |
| Bilog Antenna                | Schwarzbeck          | VULB 9160                   | 18/07/13               | 20/07/13                     | 3359       |
| Dipole Antenna               | Schwarzbeck          | VHA9103                     | 19/02/28               | 21/02/28                     | 2116       |
| Dipole Antenna               | Schwarzbeck          | VHA9103                     | 18/04/13               | 20/04/13                     | 2117       |
| Dipole Antenna               | Schwarzbeck          | UHA9105                     | 19/02/28               | 21/02/28                     | 2261       |
| Dipole Antenna               | Schwarzbeck          | UHA9105                     | 18/04/13               | 20/04/13                     | 2262       |
| HORN ANT                     | ETS                  | 3117                        | 18/05/10               | 20/05/10                     | 00140394   |
| HORN ANT                     | ETS                  | 3117                        | 18/03/26               | 20/03/26                     | 00152145   |
| HORN ANT                     | A.H.Systems          | SAS-574                     | 19/04/23               | 21/04/23                     | 154        |
| HORN ANT                     | A.H.Systems          | SAS-574                     | 19/07/03               | 21/07/03                     | 155        |
| Amplifier                    | EMPOWER              | BBS3Q7ELU                   | 19/06/24               | 20/06/24                     | 1020       |
| PreAmplifier                 | H.P                  | 8447D                       | 18/12/18               | 19/12/18                     | 2944A07774 |
| PreAmplifier                 | Agilent              | 8449B                       | 19/06/27               | 20/06/27                     | 3008A02108 |
| High-pass filter             | Wainwright           | WHKX12-935-1000-15000-40SS  | 19/06/24               | 20/06/24                     | 7          |
| High-pass filter             | Wainwright           | WHKX12-2580-3000-18000-80SS | 19/06/24               | 20/06/24                     | 3          |
| High-pass filter             | Wainwright           | WHNX8.5/26.5G-6SS           | 19/06/24               | 20/06/24                     | 1          |
| Cable                        | DTNC                 | Cable                       | 19/01/16               | 20/01/16                     | M-01       |
| Cable                        | DTNC                 | Cable                       | 19/01/16               | 20/01/16                     | M-04       |
| Cable                        | Junkosha             | MWX315                      | 19/01/16               | 20/01/16                     | M-05       |
| Cable                        | Junkosha             | MWX221                      | 19/01/16               | 20/01/16                     | M-06       |
| Cable                        | DTNC                 | Cable                       | 19/01/16               | 20/01/16                     | RF-73      |
| Cable                        | Radiall              | Cable                       | 19/01/16               | 20/01/16                     | RF-84      |

Note1: The measurement antennas were calibrated in accordance to the requirements of ANSI C63.5-2017.

Note2: The cable is not a regular calibration item, so it has been calibrated by DT & C itself.

## 5. SUMMARY OF TEST RESULTS

| FCC Part Section(s)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Parameter                                                                         | Status<br>Note 1   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------------|
| 2.1046                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Conducted Output Power                                                            | C <sup>Note2</sup> |
| 22.913(a)<br>24.232(c)<br>27.50(d.4)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Effective Radiated Power<br>Equivalent Isotropic Radiated Power                   | C                  |
| 2.1049                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Occupied Bandwidth                                                                | C                  |
| 2.1051<br>22.917(a)<br>24.238(a)<br>27.53(h)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Band Edge Emissions at Antenna Terminal<br>Spurious Emissions at Antenna Terminal | C                  |
| 24.232(d)<br>27.50(d.5)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Peak to Average Ratio                                                             | C                  |
| 2.1053<br>22.917(a)<br>24.238(a)<br>27.53(h)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Radiated Spurious and Harmonic Emissions                                          | C                  |
| 2.1055<br>22.355<br>24.235<br>27.54                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Frequency Stability                                                               | C                  |
| <p>Note 1: C=Comply NC=Not Comply NT=Not Tested NA=Not Applicable</p> <p>Note 2: Refer to RF exposure report.</p> <p>Note 3: This device supports wireless charging capability &amp; Can use Dual Display.<br/>So per KDB648474 D03v01r04, the radiated test items were performed all not charging, charging and Dual Display conditions. For wireless charging condition, the handset is placed on the representative charging pad under normal conditions and in a simulated call configuration.<br/>And the worst case data was reported.</p> |                                                                                   |                    |

## 6. EMISSION DESIGNATOR AND SAMPLE CALCULATION

### A. Emission Designator

#### GSM850 Emission Designator

Emission Designator = **247KGXW**  
GSM OBW = 246.50 kHz  
(Measured at the 99.75 % power bandwidth)  
G = Phase Modulation  
X = Cases not otherwise covered  
W = Combination (Audio/Data)

#### EDGE850 Emission Designator

Emission Designator = **236KG7W**  
EDGE OBW = 236.38 kHz  
(Measured at the 99.75 % power bandwidth)  
G = Phase Modulation  
7 = Cases not otherwise covered  
W = Combination (Audio/Data)

#### WCDMA850 Emission Designator

Emission Designator = **4M15F9W**  
WCDMA OBW = 4.1512 MHz  
(Measured at the 99.75 % power bandwidth)  
F = Frequency Modulation  
9 = Composite Digital Information  
W = Combination (Audio/Data)

#### WCDMA1700 Emission Designator

Emission Designator = **4M16F9W**  
WCDMA OBW = 4.1590 MHz  
(Measured at the 99.75 % power bandwidth)  
F = Frequency Modulation  
9 = Composite Digital Information  
W = Combination (Audio/Data)

#### HSUPA1700 Emission Designator

Emission Designator = **4M15F9W**  
HSUPA OBW = 4.1462 MHz  
(Measured at the 99.75 % power bandwidth)  
F = Frequency Modulation  
9 = Composite Digital Information  
W = Combination (Audio/Data)

#### GSM1900 Emission Designator

Emission Designator = **245KGXW**  
GSM OBW = 244.69 kHz  
(Measured at the 99.75 % power bandwidth)  
G = Phase Modulation  
X = Cases not otherwise covered  
W = Combination (Audio/Data)

#### EDGE1900 Emission Designator

Emission Designator = **243KG7W**  
EDGE OBW = 242.90 kHz  
(Measured at the 99.75 % power bandwidth)  
G = Phase Modulation  
7 = Cases not otherwise covered  
W = Combination (Audio/Data)

#### HSUPA850 Emission Designator

Emission Designator = **4M16F9W**  
HSUPA OBW = 4.1596 MHz  
(Measured at the 99.75 % power bandwidth)  
F = Frequency Modulation  
9 = Composite Digital Information  
W = Combination (Audio/Data)

#### WCDMA1900 Emission Designator

Emission Designator = **4M15F9W**  
WCDMA OBW = 4.1525 MHz  
(Measured at the 99.75 % power bandwidth)  
F = Frequency Modulation  
9 = Composite Digital Information  
W = Combination (Audio/Data)

#### HSUPA1900 Emission Designator

Emission Designator = **4M16F9W**  
HSUPA OBW = 4.1601 MHz  
(Measured at the 99.75 % power bandwidth)  
F = Frequency Modulation  
9 = Composite Digital Information  
W = Combination (Audio/Data)

## B. For substitution method

### EIRP for GSM1900

| MODE    | Channel | Freq.(MHz) | Spectrum Reading Value (dBm) | Ant Pol (H/V) | Generator Output (dBm) | T.F (dB) <sup>Note1</sup> | Level (dBm) @ Ant Terminal | TX Ant Gain (dBi) | Result |       |
|---------|---------|------------|------------------------------|---------------|------------------------|---------------------------|----------------------------|-------------------|--------|-------|
|         |         |            |                              |               |                        |                           |                            |                   | (dBm)  | (W)   |
| GSM1900 | 512     | 1850.2     | -16.42                       | V             | -10.06                 | 37.92                     | 27.86                      | 4.96              | 32.82  | 1.914 |

Level (dBm) @ ant Terminal = Generator output(dBm) + Gain or Loss of equipments

**ERP or EIRP = Level @ Ant Terminal Level(dBm) + Tx Ant. Gain**

- 1) The EUT mounted on a non-conductive turntable is 0.8 meter above test site ground level.
- 2) During the test, the turn table is rotated until the maximum signal is found.
- 3) Record the field strength meter's level.
- 4) Replace the EUT with dipole/Horn antenna that is connected to a calibrated signal generator.
- 5) Increase the signal generator output till the field strength meter's level is equal to the item (3).
- 6) The signal generator output level with substituted antenna gain is the rating of ERP, EIRP or Radiated spurious emission.

Note 1: For the radiated output power was used power amplifier and cable. (T.F= power amplifier gain[dB] + cable loss[dB])

For the radiated spurious emission was used cable only. (T.F= cable loss[dB])

## 7. TEST DATA

### 7.1 PEAK TO AVERAGE RATIO

- Plots of the EUT's Peak- to- Average Ratio are shown in Clause 8.1

### 7.2 OCCUPIED BANDWIDTH (99 % Bandwidth)

| Mode      | Channel     | Frequency(MHz) | Test Result (kHz) |
|-----------|-------------|----------------|-------------------|
| GSM850    | 128         | 824.2          | 242.49            |
|           | 190         | 836.6          | 243.39            |
|           | <b>251</b>  | <b>848.8</b>   | <b>246.50</b>     |
| EDGE850   | 128         | 824.2          | 235.04            |
|           | 190         | 836.6          | 232.95            |
|           | <b>251</b>  | <b>848.8</b>   | <b>236.38</b>     |
| GSM1900   | <b>512</b>  | <b>1850.2</b>  | <b>244.69</b>     |
|           | 661         | 1880.0         | 242.22            |
|           | 810         | 1909.8         | 242.40            |
| EDGE1900  | 512         | 1850.2         | 239.21            |
|           | 661         | 1880.0         | 241.32            |
|           | <b>810</b>  | <b>1909.8</b>  | <b>242.90</b>     |
| WCDMA850  | <b>4132</b> | <b>826.4</b>   | <b>4151.20</b>    |
|           | 4183        | 836.6          | 4147.70           |
|           | 4233        | 846.6          | 4133.30           |
| HSUPA850  | 4132        | 826.4          | 4148.60           |
|           | <b>4183</b> | <b>836.6</b>   | <b>4159.60</b>    |
|           | 4233        | 846.6          | 4122.80           |
| WCDMA1700 | 1312        | 1712.4         | 4152.90           |
|           | 1412        | 1732.4         | 4152.70           |
|           | <b>1513</b> | <b>1752.6</b>  | <b>4159.00</b>    |
| HSUPA1700 | 1312        | 1712.4         | 4141.30           |
|           | 1412        | 1732.4         | 4140.30           |
|           | <b>1513</b> | <b>1752.6</b>  | <b>4146.20</b>    |
| WCDMA1900 | 9262        | 1852.4         | 4122.90           |
|           | 9400        | 1880.0         | 4146.30           |
|           | <b>9538</b> | <b>1907.6</b>  | <b>4152.50</b>    |
| HSUPA1900 | 9262        | 1852.4         | 4146.70           |
|           | 9400        | 1880.0         | 4152.10           |
|           | <b>9538</b> | <b>1907.6</b>  | <b>4160.10</b>    |

### **7.3 SPURIOUS EMISSIONS AT ANTENNA TERMINAL**

- Plots of the EUT's Conducted Spurious Emissions are shown in Clause 8.3

### **7.4 BAND EDGE EMISSIONS AT ANTENNA TERMINAL**

- Plots of the EUT's Band Edge are shown in Clause 8.4

## 7.5 EFFECTIVE RADIATED POWER

### - GSM850 data

| Mode           | CH         | Frequency (MHz) | Ant. Pol. (H/V) | LEVEL@ TX ANTENNA TERMINAL (dBm) | Antenna Gain (dBd) | ERP (dBm)    | ERP (W)      | Note.                          |
|----------------|------------|-----------------|-----------------|----------------------------------|--------------------|--------------|--------------|--------------------------------|
| GSM850         | 128        | 824.2           | H               | 26.36                            | 1.23               | 27.59        | 0.574        | -                              |
| <b>GSM850</b>  | <b>128</b> | <b>824.2</b>    | <b>H</b>        | <b>27.60</b>                     | <b>1.23</b>        | <b>28.83</b> | <b>0.764</b> | With WCP                       |
| GSM850         | 128        | 824.2           | H               | 26.02                            | 1.23               | 27.25        | 0.531        | With Dual Display (180°)       |
| GSM850         | 128        | 824.2           | H               | 26.99                            | 1.23               | 28.22        | 0.664        | With WPC & Dual Display (180°) |
| GSM850         | 190        | 836.6           | H               | 25.90                            | 1.22               | 27.12        | 0.515        | -                              |
| GSM850         | 251        | 848.8           | H               | 26.37                            | 1.21               | 27.58        | 0.573        | -                              |
| <b>EDGE850</b> | <b>128</b> | <b>824.2</b>    | <b>H</b>        | <b>20.94</b>                     | <b>1.23</b>        | <b>22.17</b> | <b>0.165</b> | -                              |

Note1: With Dual Display mode was tested at 0, 90 180 and 360 degrees and the worst case data was reported.

Note2: With WPC & Dual Display mode was tested at 0, 90, 180 degrees which are possible to wireless charge and the worst case data was reported.

### - WCDMA850 data

| Mode            | CH          | Frequency (MHz) | Ant. Pol. (H/V) | LEVEL@ TX ANTENNA TERMINAL (dBm) | Antenna Gain (dBd) | ERP (dBm)    | ERP (W)      | Note.                          |
|-----------------|-------------|-----------------|-----------------|----------------------------------|--------------------|--------------|--------------|--------------------------------|
| WCDMA850        | 4132        | 826.4           | H               | 17.86                            | 1.23               | 19.09        | 0.081        | -                              |
| WCDMA850        | 4132        | 826.4           | H               | 18.12                            | 1.23               | 19.35        | 0.086        | With WCP                       |
| WCDMA850        | 4132        | 826.4           | H               | 17.76                            | 1.23               | 18.99        | 0.079        | With Dual Display (180°)       |
| <b>WCDMA850</b> | <b>4132</b> | <b>826.4</b>    | <b>H</b>        | <b>19.13</b>                     | <b>1.23</b>        | <b>20.36</b> | <b>0.109</b> | With WPC & Dual Display (180°) |
| WCDMA850        | 4183        | 836.6           | H               | 16.95                            | 1.22               | 18.17        | 0.066        | -                              |
| WCDMA850        | 4233        | 846.6           | H               | 17.38                            | 1.21               | 18.59        | 0.072        | -                              |

Note1: With Dual Display mode was tested at 0, 90 180 and 360 degrees and the worst case data was reported.

Note2: With WPC & Dual Display mode was tested at 0, 90, 180 degrees which are possible to wireless charge and the worst case data was reported.

### - HSPA850 data

| Mode           | CH          | Frequency (MHz) | Ant. Pol. (H/V) | LEVEL@ TX ANTENNA TERMINAL (dBm) | Antenna Gain (dBd) | ERP (dBm)    | ERP (W)      | Note. |
|----------------|-------------|-----------------|-----------------|----------------------------------|--------------------|--------------|--------------|-------|
| <b>HSPA850</b> | <b>4132</b> | <b>826.4</b>    | <b>H</b>        | <b>16.81</b>                     | <b>1.23</b>        | <b>18.04</b> | <b>0.064</b> | -     |

#### NOTES:

This EUT was tested under all configurations and the highest power is reported in GSM mode and WCDMA mode with HSDPA inactive at 12.2 kbps RMC and TPC bits set to "1" and in GSM mode using a Power Control Level of "0" in PCS Band and "5" in the Cellular Band. This EUT was tested with the fully charged battery. Also, we have done x, y, z planes in EUT and horizontal and vertical polarization of detecting antenna.

The worst case data is reported.

## 7.6 EQUIVALENT ISOTROPIC RADIATED POWER

### - WCDMA1700 data

| Mode             | CH          | Frequency (MHz) | Ant. Pol. (H/V) | LEVEL@ TX ANTENNA TERMINAL (dBm) | Antenna Gain (dBi) | EIRP (dBm)   | EIRP (W)     | Note.                        |
|------------------|-------------|-----------------|-----------------|----------------------------------|--------------------|--------------|--------------|------------------------------|
| WCDMA1700        | 1312        | 1712.4          | V               | 15.21                            | 6.17               | 21.38        | 0.137        | -                            |
| <b>WCDMA1700</b> | <b>1412</b> | <b>1732.4</b>   | <b>V</b>        | <b>16.04</b>                     | <b>5.91</b>        | <b>21.95</b> | <b>0.157</b> | -                            |
| WCDMA1700        | 1412        | 1732.4          | H               | 14.20                            | 5.91               | 20.11        | 0.103        | With WCP                     |
| WCDMA1700        | 1412        | 1732.4          | V               | 15.05                            | 5.91               | 20.96        | 0.125        | With Dual Display (360°)     |
| WCDMA1700        | 1412        | 1732.4          | H               | 14.06                            | 5.91               | 19.97        | 0.099        | With WPC & Dual Display (0°) |
| WCDMA1700        | 1513        | 1752.6          | V               | 15.28                            | 5.65               | 20.93        | 0.124        | -                            |

Note1: With Dual Display mode was tested at 0, 90 180 and 360 degrees and the worst case data was reported.

Note2: With WPC & Dual Display mode was tested at 0, 90, 180 degrees which are possible to wireless charge and the worst case data was reported.

### - HSUPA1700 data

| Mode             | CH          | Frequency (MHz) | Ant. Pol. (H/V) | LEVEL@ TX ANTENNA TERMINAL (dBm) | Antenna Gain (dBi) | EIRP (dBm)   | EIRP (W)     | Note. |
|------------------|-------------|-----------------|-----------------|----------------------------------|--------------------|--------------|--------------|-------|
| <b>HSUPA1700</b> | <b>1412</b> | <b>1732.4</b>   | <b>H</b>        | <b>15.06</b>                     | <b>5.91</b>        | <b>20.97</b> | <b>0.125</b> | -     |

### - GSM1900 data

| Mode            | CH         | Frequency (MHz) | Ant. Pol. (H/V) | LEVEL@ TX ANTENNA TERMINAL (dBm) | Antenna Gain (dBi) | EIRP (dBm)   | EIRP (W)     | Note.                          |
|-----------------|------------|-----------------|-----------------|----------------------------------|--------------------|--------------|--------------|--------------------------------|
| GSM1900         | 512        | 1850.2          | V               | 26.74                            | 4.96               | 31.70        | 1.479        | -                              |
| GSM1900         | 512        | 1850.2          | H               | 26.18                            | 4.96               | 31.14        | 1.300        | With WCP                       |
| <b>GSM1900</b>  | <b>512</b> | <b>1850.2</b>   | <b>V</b>        | <b>27.86</b>                     | <b>4.96</b>        | <b>32.82</b> | <b>1.914</b> | With Dual Display (360°)       |
| GSM1900         | 512        | 1850.2          | H               | 26.30                            | 4.96               | 31.26        | 1.337        | With WPC & Dual Display (180°) |
| GSM1900         | 661        | 1880.0          | V               | 26.78                            | 4.80               | 31.58        | 1.439        | -                              |
| GSM1900         | 810        | 1909.8          | V               | 26.56                            | 4.16               | 30.72        | 1.180        | -                              |
| <b>EDGE1900</b> | <b>810</b> | <b>1850.2</b>   | <b>V</b>        | <b>22.57</b>                     | <b>4.96</b>        | <b>27.53</b> | <b>0.566</b> | -                              |

Note1: With Dual Display mode was tested at 0, 90 180 and 360 degrees and the worst case data was reported.

Note2: With WPC & Dual Display mode was tested at 0, 90, 180 degrees which are possible to wireless charge and the worst case data was reported.

#### NOTES:

This EUT was tested under all configurations and the highest power is reported in GSM mode and WCDMA mode with HSDPA inactive at 12.2 kbps RMC and TPC bits set to "1" and in GSM mode using a Power Control Level of "0" in PCS Band and "5" in the Cellular Band. This EUT was tested with the fully charged battery. Also, we have done x, y, z planes in EUT and horizontal and vertical polarization of detecting antenna.

The worst case data is reported.

#### - WCDMA1900 data

| Mode             | CH          | Frequency (MHz) | Ant. Pol. (H/V) | LEVEL@ TX ANTENNA TERMINAL (dBm) | Antenna Gain (dBi) | EIRP (dBm)   | EIRP (W)     | Note.                        |
|------------------|-------------|-----------------|-----------------|----------------------------------|--------------------|--------------|--------------|------------------------------|
| WCDMA1900        | 9262        | 1852.4          | V               | 18.31                            | 4.95               | 23.26        | 0.212        | -                            |
| WCDMA1900        | 9400        | 1880.0          | V               | 18.57                            | 4.80               | 23.37        | 0.217        | -                            |
| WCDMA1900        | 9400        | 1880.0          | H               | 16.51                            | 4.80               | 21.31        | 0.135        | With WCP                     |
| <b>WCDMA1900</b> | <b>9400</b> | <b>1880.0</b>   | <b>V</b>        | <b>17.95</b>                     | <b>4.80</b>        | <b>22.75</b> | <b>0.188</b> | With Dual Display (360°)     |
| WCDMA1900        | 9400        | 1880.0          | H               | 15.75                            | 4.80               | 20.55        | 0.114        | With WPC & Dual Display (0°) |
| WCDMA1900        | 9538        | 1907.6          | V               | 17.86                            | 4.15               | 22.01        | 0.159        | -                            |

Note1: With Dual Display mode was tested at 0, 90 180 and 360 degrees and the worst case data was reported.

Note2: With WPC & Dual Display mode was tested at 0, 90, 180 degrees which are possible to wireless charge and the worst case data was reported.

#### - HSUPA1900 data

| Mode             | CH          | Frequency (MHz) | Ant. Pol. (H/V) | LEVEL@ TX ANTENNA TERMINAL (dBm) | Antenna Gain (dBi) | EIRP (dBm)   | EIRP (W)     | Note. |
|------------------|-------------|-----------------|-----------------|----------------------------------|--------------------|--------------|--------------|-------|
| <b>HSUPA1900</b> | <b>9400</b> | <b>1880.0</b>   | <b>V</b>        | <b>17.53</b>                     | <b>4.80</b>        | <b>22.33</b> | <b>0.171</b> | -     |

#### NOTES:

This EUT was tested under all configurations and the highest power is reported in GSM mode and WCDMA mode with HSDPA inactive at 12.2 kbps RMC and TPC bits set to "1" and in GSM mode using a Power Control Level of "0" in PCS Band and "5" in the Cellular Band. This EUT was tested with the fully charged battery. Also, we have done x, y, z planes in EUT and horizontal and vertical polarization of detecting antenna.

The worst case data is reported.

## 7.7 RADIATED SPURIOUS EMISSIONS

### - GSM850 data

| Channel (ERP) | Tx Freq. (MHz) | Freq. (MHz) | POL (H/V) | LEVEL@ ANTENNA TERMINAL (dBm) | Substitute Antenna Gain (dBd) | Correct Generator Level (dBm) | Result (dBc) | Limit (dBc) | Note                    |
|---------------|----------------|-------------|-----------|-------------------------------|-------------------------------|-------------------------------|--------------|-------------|-------------------------|
| 128 (0.574 W) | 824.2          | 1648.49     | V         | -56.23                        | 3.82                          | -52.41                        | 80.00        | 40.59       | -                       |
|               |                | 2472.64     | V         | -41.63                        | 3.79                          | -37.84                        | 65.43        |             | -                       |
|               |                | 3296.53     | H         | -53.32                        | 5.52                          | -47.80                        | 75.39        |             | -                       |
| 190 (0.515 W) | 836.6          | 1673.36     | V         | -53.81                        | 3.89                          | -49.92                        | 77.04        | 40.12       | -                       |
|               |                | 2509.79     | V         | -39.09                        | 3.64                          | -35.45                        | 62.57        |             | -                       |
|               |                | 3345.94     | H         | -53.07                        | 5.66                          | -47.41                        | 74.53        |             | -                       |
|               |                | 2509.70     | V         | -46.42                        | 3.64                          | -42.78                        | 69.90        |             | With Dual Display(180°) |
| 251 (0.573 W) | 848.8          | 1697.44     | V         | -54.82                        | 3.97                          | -50.85                        | 78.43        | 40.58       | -                       |
|               |                | 2546.66     | V         | -40.31                        | 3.70                          | -36.61                        | 64.19        |             | -                       |
|               |                | 3395.28     | H         | -53.63                        | 5.79                          | -47.84                        | 75.42        |             | -                       |

- Limit Calculation=  $43 + 10 \log_{10}(\text{ERP [W]})$  [dBc]

- No other spurious and harmonic emissions were reported greater than listed emissions above table.

Note: With Dual Display mode was tested at 0, 90 180 and 360 degrees and the worst case data was reported.

### - GSM850 data (With WCP)

| Channel (ERP) | Tx Freq. (MHz) | Freq. (MHz) | POL (H/V) | LEVEL@ ANTENNA TERMINAL (dBm) | Substitute Antenna Gain (dBd) | Correct Generator Level (dBm) | Result (dBc) | Limit (dBc) | Note                     |
|---------------|----------------|-------------|-----------|-------------------------------|-------------------------------|-------------------------------|--------------|-------------|--------------------------|
| 190 (0.515 W) | 836.6          | 2509.76     | X         | -45.25                        | 3.64                          | -41.61                        | 68.73        | 40.12       | -                        |
|               |                | 2509.87     | X         | -49.12                        | 3.64                          | -45.48                        | 72.60        |             | With Dual Display (180°) |

- Limit Calculation=  $43 + 10 \log_{10}(\text{ERP [W]})$  [dBc]

- No other spurious and harmonic emissions were reported greater than listed emissions above table.

Note: With WPC & Dual Display mode was tested at 0, 90, 180 degrees which are possible to wireless charge and the worst case data was reported.

### NOTES:

This EUT was tested under all configurations and the highest power is reported in GSM mode and WCDMA mode with HSDPA inactive at 12.2 kbps RMC and TPC bits set to "1" and in GSM mode using a Power Control Level of "0" in PCS Band and "5" in the Cellular Band. This EUT was tested with the fully charged battery. Also, we have done x, y, z planes in EUT and horizontal and vertical polarization of detecting antenna. The worst case data is reported.

### - WCDMA850 data

| Channel (ERP)  | Tx Freq. (MHz) | Freq. (MHz) | POL (H/V) | LEVEL@ ANTENNA TERMINAL (dBm) | Substitute Antenna Gain (dBd) | Correct Generator Level (dBm) | Result (dBc) | Limit (dBc) | Note                     |
|----------------|----------------|-------------|-----------|-------------------------------|-------------------------------|-------------------------------|--------------|-------------|--------------------------|
| 4132 (0.081 W) | 826.4          | 1654.66     | V         | -56.69                        | 3.83                          | -52.86                        | 71.95        | 32.09       | -                        |
|                |                | 1652.89     | V         | -55.60                        | 3.83                          | -51.77                        | 70.86        |             | With Dual Display (180°) |
| 4183 (0.066 W) | 836.6          | 1672.45     | V         | -57.26                        | 3.89                          | -53.37                        | 71.54        | 31.17       | -                        |
| 4233 (0.072 W) | 846.6          | 1692.48     | V         | -58.11                        | 3.96                          | -54.15                        | 72.74        | 31.59       | -                        |

- Limit Calculation=  $43 + 10 \log_{10}(\text{ERP [W]})$  [dBc]

- No other spurious and harmonic emissions were reported greater than listed emissions above table.

Note: With Dual Display mode was tested at 0, 90 180 and 360 degrees and the worst case data was reported.

### - WCDMA850 data (With WCP)

| Channel (ERP)  | Tx Freq. (MHz) | Freq. (MHz) | POL (H/V) | LEVEL@ ANTENNA TERMINAL (dBm) | Substitute Antenna Gain (dBd) | Correct Generator Level (dBm) | Result (dBc) | Limit (dBc) | Note                     |
|----------------|----------------|-------------|-----------|-------------------------------|-------------------------------|-------------------------------|--------------|-------------|--------------------------|
| 4132 (0.081 W) | 826.4          | 1653.74     | V         | -56.13                        | 3.83                          | -52.30                        | 71.39        | 32.09       | -                        |
|                |                | 1652.30     | V         | -55.65                        | 3.83                          | -51.82                        | 70.91        |             | With Dual Display (180°) |

- Limit Calculation=  $43 + 10 \log_{10}(\text{ERP [W]})$  [dBc]

- No other spurious and harmonic emissions were reported greater than listed emissions above table.

Note: With WPC & Dual Display mode was tested at 0, 90, 180 degrees which are possible to wireless charge and the worst case data was reported.

### - HSUPA850 data

| Channel (ERP)  | Tx Freq. (MHz) | Freq. (MHz) | POL (H/V) | LEVEL@ ANTENNA TERMINAL (dBm) | Substitute Antenna Gain (dBd) | Correct Generator Level (dBm) | Result (dBc) | Limit (dBc) | Note |
|----------------|----------------|-------------|-----------|-------------------------------|-------------------------------|-------------------------------|--------------|-------------|------|
| 4132 (0.064 W) | 826.4          | 1654.40     | X         | -57.71                        | 3.83                          | -53.88                        | 71.92        | 31.04       | -    |

- Limit Calculation=  $43 + 10 \log_{10}(\text{ERP [W]})$  [dBc]

- No other spurious and harmonic emissions were reported greater than listed emissions above table.

### NOTES:

This EUT was tested under all configurations and the highest power is reported in GSM mode and WCDMA mode with HSDPA inactive at 12.2 kbps RMC and TPC bits set to "1" and in GSM mode using a Power Control Level of "0" in PCS Band and "5" in the Cellular Band. This EUT was tested with the fully charged battery. Also, we have done x, y, z planes in EUT and horizontal and vertical polarization of detecting antenna.

The worst case data is reported.

### - WCDMA1700 data

| Channel (EIRP) | Tx Freq. (MHz) | Freq. (MHz) | POL (H/V) | LEVEL@ ANTENNA TERMINAL (dBm) | Substitute Antenna Gain (dBi) | Correct Generator Level (dBm) | Result (dBc) | Limit (dBc) | Note                     |
|----------------|----------------|-------------|-----------|-------------------------------|-------------------------------|-------------------------------|--------------|-------------|--------------------------|
| 1312 (0.134 W) | 1712.4         | 3425.19     | V         | -53.72                        | 8.02                          | -45.70                        | 67.08        | 34.38       | -                        |
| 1412 (0.157 W) | 1732.4         | 3461.20     | V         | -53.10                        | 8.11                          | -44.99                        | 66.94        | 34.95       | -                        |
|                |                | 3463.81     | V         | -53.65                        | 8.11                          | -45.54                        | 67.49        |             | With Dual Display (360°) |
| 1513 (0.139 W) | 1752.6         | 3505.39     | V         | -54.38                        | 8.29                          | -46.09                        | 66.14        | 33.93       |                          |

- Limit Calculation=  $43 + 10 \log_{10}(\text{EIRP [W]})$  [dBc]

- No other spurious and harmonic emissions were reported greater than listed emissions above table.

Note: With Dual Display mode was tested at 0, 90 180 and 360 degrees and the worst case data was reported.

### - WCDMA1700 data (With WCP)

| Channel (EIRP) | Tx Freq. (MHz) | Freq. (MHz) | POL (H/V) | LEVEL@ ANTENNA TERMINAL (dBm) | Substitute Antenna Gain (dBi) | Correct Generator Level (dBm) | Result (dBc) | Limit (dBc) | Note                   |
|----------------|----------------|-------------|-----------|-------------------------------|-------------------------------|-------------------------------|--------------|-------------|------------------------|
| 1412 (0.157 W) | 1732.4         | 3464.98     | V         | -54.09                        | 8.12                          | -45.97                        | 67.92        | 34.95       | -                      |
|                |                | 3464.42     | V         | -54.24                        | 8.11                          | -46.13                        | 68.08        |             | With Dual Display (0°) |

- Limit Calculation=  $43 + 10 \log_{10}(\text{EIRP [W]})$  [dBc]

- No other spurious and harmonic emissions were reported greater than listed emissions above table.

Note: With WPC & Dual Display mode was tested at 0, 90, 180 degrees which are possible to wireless charge and the worst case data was reported.

### - HSUPA1700 data

| Channel (EIRP) | Tx Freq. (MHz) | Freq. (MHz) | POL (H/V) | LEVEL@ ANTENNA TERMINAL (dBm) | Substitute Antenna Gain (dBi) | Correct Generator Level (dBm) | Result (dBc) | Limit (dBc) | Note |
|----------------|----------------|-------------|-----------|-------------------------------|-------------------------------|-------------------------------|--------------|-------------|------|
| 1513 (0.125 W) | 1732.4         | 3465.58     | V         | -53.97                        | 8.12                          | -45.85                        | 66.82        | 33.97       | -    |

- Limit Calculation=  $43 + 10 \log_{10}(\text{EIRP [W]})$  [dBc]

- No other spurious and harmonic emissions were reported greater than listed emissions above table.

#### NOTES:

This EUT was tested under all configurations and the highest power is reported in GSM mode and WCDMA mode with HSDPA inactive at 12.2 kbps RMC and TPC bits set to "1" and in GSM mode using a Power Control Level of "0" in PCS Band and "5" in the Cellular Band. This EUT was tested with the fully charged battery. Also, we have done x, y, z planes in EUT and horizontal and vertical polarization of detecting antenna.

The worst case data is reported.

### - GSM1900 data

| Channel (EIRP) | Tx Freq. (MHz) | Freq. (MHz) | POL (H/V) | LEVEL@ ANTENNA TERMINAL (dBm) | Substitute Antenna Gain (dBi) | Correct Generator Level (dBm) | Result (dBc) | Limit (dBc) | Note                     |
|----------------|----------------|-------------|-----------|-------------------------------|-------------------------------|-------------------------------|--------------|-------------|--------------------------|
| 512 (1.479 W)  | 1850.2         | 3700.54     | H         | -51.84                        | 8.58                          | -43.26                        | 74.96        | 44.70       | -                        |
|                |                | 5550.44     | H         | -33.88                        | 10.41                         | -23.47                        | 55.17        |             | -                        |
| 661 (1.439 W)  | 1880.0         | 3759.89     | H         | -53.22                        | 8.36                          | -44.86                        | 76.44        | 44.58       | -                        |
|                |                | 5639.90     | H         | -33.91                        | 10.64                         | -23.27                        | 54.85        |             | -                        |
|                |                | 5640.05     | H         | -32.87                        | 10.64                         | -22.23                        | 53.81        |             | With Dual Display (360°) |
| 810 (1.180 W)  | 1909.8         | 3819.54     | H         | -54.73                        | 8.22                          | -46.51                        | 77.23        | 43.72       | -                        |
|                |                | 5729.29     | H         | -37.10                        | 10.68                         | -26.42                        | 57.14        |             | -                        |

- Limit Calculation=  $43 + 10 \log_{10}(\text{EIRP [W]})$  [dBc]

- No other spurious and harmonic emissions were reported greater than listed emissions above table.

Note: With Dual Display mode was tested at 0, 90 180 and 360 degrees and the worst case data was reported.

### - GSM1900 data (With WCP)

| Channel (EIRP) | Tx Freq. (MHz) | Freq. (MHz) | POL (H/V) | LEVEL@ ANTENNA TERMINAL (dBm) | Substitute Antenna Gain (dBi) | Correct Generator Level (dBm) | Result (dBc) | Limit (dBc) | Note                     |
|----------------|----------------|-------------|-----------|-------------------------------|-------------------------------|-------------------------------|--------------|-------------|--------------------------|
| 661 (1.439 W)  | 1880.0         | 5640.15     | V         | -39.29                        | 10.64                         | -28.65                        | 60.23        | 44.58       | -                        |
|                |                | 5640.10     | V         | -49.75                        | 10.64                         | -39.11                        | 70.69        |             | With Dual Display (180°) |

- Limit Calculation=  $43 + 10 \log_{10}(\text{EIRP [W]})$  [dBc]

- No other spurious and harmonic emissions were reported greater than listed emissions above table.

Note: With WPC & Dual Display mode was tested at 0, 90, 180 degrees which are possible to wireless charge and the worst case data was reported.

#### NOTES:

This EUT was tested under all configurations and the highest power is reported in GSM mode and WCDMA mode with HSDPA inactive at 12.2 kbps RMC and TPC bits set to "1" and in GSM mode using a Power Control Level of "0" in PCS Band and "5" in the Cellular Band. This EUT was tested with the fully charged battery. Also, we have done x, y, z planes in EUT and horizontal and vertical polarization of detecting antenna. The worst case data is reported.

### - WCDMA1900 data

| Channel (EIRP) | Tx Freq. (MHz) | Freq. (MHz) | POL (H/V) | LEVEL@ ANTENNA TERMINAL (dBm) | Substitute Antenna Gain (dBi) | Correct Generator Level (dBm) | Result (dBc) | Limit (dBc) | Note                     |
|----------------|----------------|-------------|-----------|-------------------------------|-------------------------------|-------------------------------|--------------|-------------|--------------------------|
| 9262 (0.212 W) | 1852.4         | 3705.15     | V         | -53.77                        | 8.56                          | -45.21                        | 68.47        | 36.26       | -                        |
| 9400 (0.217 W) | 1880.0         | 3761.74     | V         | -52.84                        | 8.36                          | -44.48                        | 67.85        | 36.37       | -                        |
|                |                | 3758.51     | V         | -53.14                        | 8.37                          | -44.77                        | 68.14        |             | With Dual Display (360°) |
| 9538 (0.159 W) | 1907.6         | 3815.02     | V         | -53.49                        | 8.22                          | -45.27                        | 67.28        | 35.01       | -                        |

- Limit Calculation=  $43 + 10 \log_{10}(\text{EIRP [W]})$  [dBc]

- No other spurious and harmonic emissions were reported greater than listed emissions above table.

Note: With Dual Display mode was tested at 0, 90 180 and 360 degrees and the worst case data was reported.

### - WCDMA1900 data (With WCP)

| Channel (EIRP) | Tx Freq. (MHz) | Freq. (MHz) | POL (H/V) | LEVEL@ ANTENNA TERMINAL (dBm) | Substitute Antenna Gain (dBi) | Correct Generator Level (dBm) | Result (dBc) | Limit (dBc) | Note                   |
|----------------|----------------|-------------|-----------|-------------------------------|-------------------------------|-------------------------------|--------------|-------------|------------------------|
| 9400 (0.217 W) | 1880.0         | 3758.88     | V         | -53.25                        | 8.37                          | -44.88                        | 68.25        | 36.37       | -                      |
|                |                | 3758.63     | V         | -53.77                        | 8.37                          | -45.40                        | 68.77        |             | With Dual Display (0°) |

- Limit Calculation=  $43 + 10 \log_{10}(\text{EIRP [W]})$  [dBc]

- No other spurious and harmonic emissions were reported greater than listed emissions above table.

Note: With WPC & Dual Display mode was tested at 0, 90, 180 degrees which are possible to wireless charge and the worst case data was reported.

### - HSUPA1900 data

| Channel (EIRP) | Tx Freq. (MHz) | Freq. (MHz) | POL (H/V) | LEVEL@ ANTENNA TERMINAL (dBm) | Substitute Antenna Gain (dBi) | Correct Generator Level (dBm) | Result (dBc) | Limit (dBc) | Note |
|----------------|----------------|-------------|-----------|-------------------------------|-------------------------------|-------------------------------|--------------|-------------|------|
| 9400 (0.171 W) | 1880           | 3759.50     | V         | -53.20                        | 8.37                          | -44.83                        | 67.16        | 35.33       | -    |

- Limit Calculation=  $43 + 10 \log_{10}(\text{EIRP [W]})$  [dBc]

- No other spurious and harmonic emissions were reported greater than listed emissions above table.

#### NOTES:

This EUT was tested under all configurations and the highest power is reported in GSM mode and WCDMA mode with HSDPA inactive at 12.2 kbps RMC and TPC bits set to "1" and in GSM mode using a Power Control Level of "0" in PCS Band and "5" in the Cellular Band. This EUT was tested with the fully charged battery. Also, we have done x, y, z planes in EUT and horizontal and vertical polarization of detecting antenna.

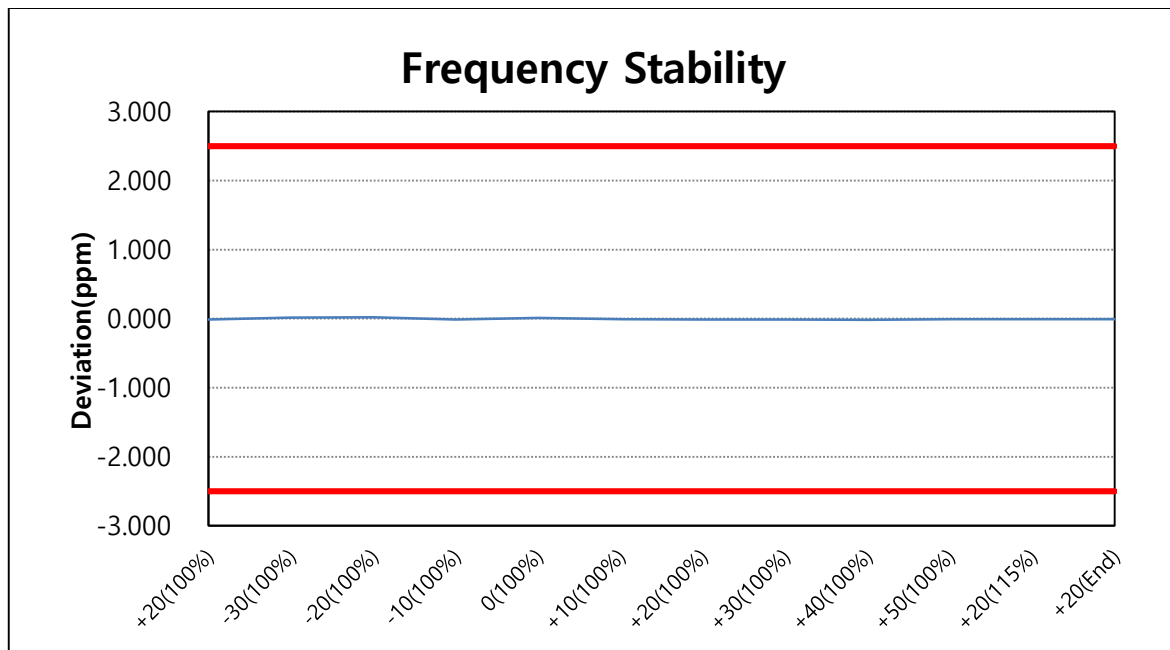
The worst case data is reported.

## 7.8 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

### 7.8.1 FREQUENCY STABILITY (GSM850)

OPERATING FREQUENCY : 836,600,000\_Hz  
 CHANNEL : 190(Mid)  
 REFERENCE VOLTAGE : 3.87 V DC  
 DEVIATION LIMIT :  $\pm 0.00025\%$  or 2.5 ppm

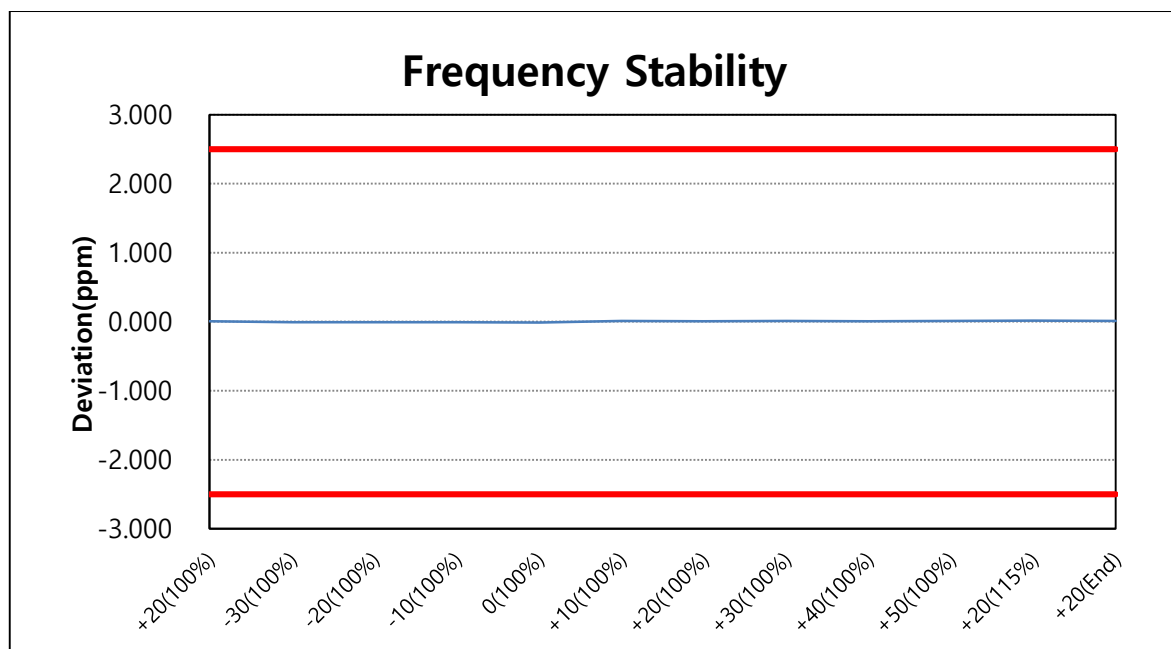
| VOLTAGE<br>(%) | POWER<br>(V DC) | TEMP<br>(°C) | FREQ<br>(Hz) | Deviation |             |
|----------------|-----------------|--------------|--------------|-----------|-------------|
|                |                 |              |              | (ppm)     | (%)         |
| 100%           | 3.87            | +20(Ref)     | 836,599,992  | -0.010    | -0.00000096 |
| 100%           |                 | -30          | 836,600,007  | 0.008     | 0.00000084  |
| 100%           |                 | -20          | 836,600,007  | 0.008     | 0.00000084  |
| 100%           |                 | -10          | 836,600,009  | 0.011     | 0.00000108  |
| 100%           |                 | 0            | 836,600,005  | 0.006     | 0.00000060  |
| 100%           |                 | +10          | 836,600,006  | 0.007     | 0.00000072  |
| 100%           |                 | +20          | 836,599,992  | -0.010    | -0.00000096 |
| 100%           |                 | +30          | 836,600,008  | 0.010     | 0.00000096  |
| 100%           |                 | +40          | 836,600,004  | 0.005     | 0.00000048  |
| 100%           |                 | +50          | 836,599,994  | -0.007    | -0.00000072 |
| 115%           | 4.45            | +20          | 836,600,006  | 0.007     | 0.00000072  |
| BATT.ENDPOINT  | 2.40            | +20          | 836,599,995  | -0.006    | -0.00000060 |



## 7.8.2 FREQUENCY STABILITY (WCDMA850)

OPERATING FREQUENCY : 836,600,000 Hz  
 CHANNEL : 4183(Mid)  
 REFERENCE VOLTAGE : 3.87 V DC  
 DEVIATION LIMIT :  $\pm 0.00025$  % or 2.5 ppm

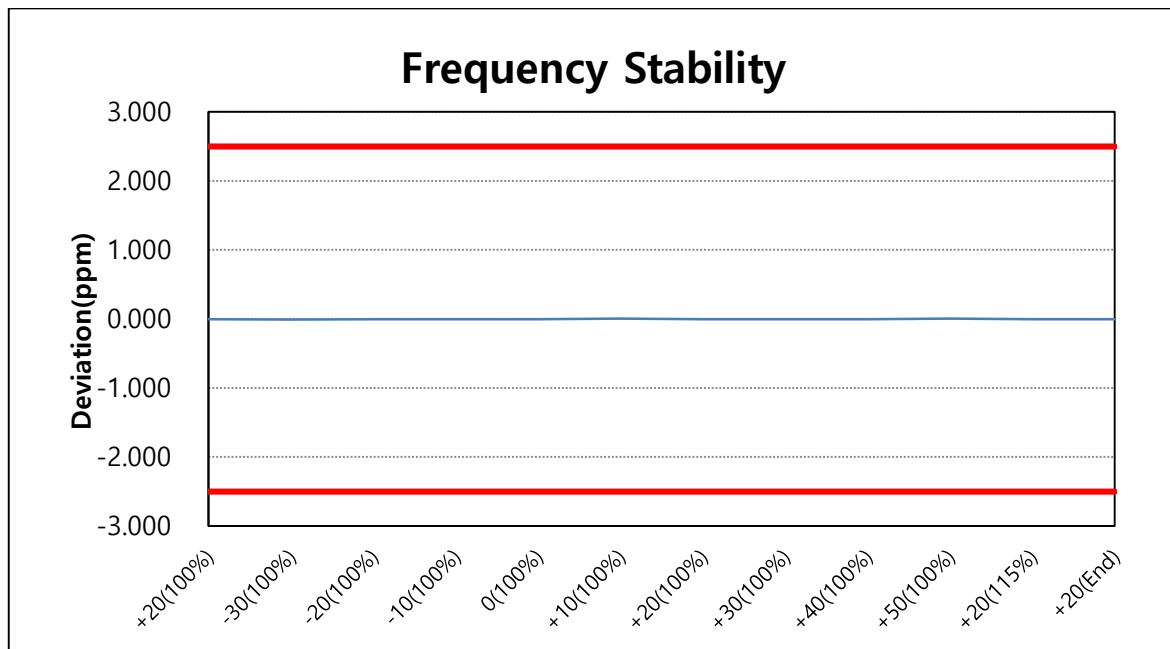
| VOLTAGE (%)   | POWER (V DC) | TEMP (°C) | FREQ (Hz)   | Deviation |             |
|---------------|--------------|-----------|-------------|-----------|-------------|
|               |              |           |             | (ppm)     | (%)         |
| 100%          | 3.87         | +20(Ref)  | 836,599,994 | -0.007    | -0.00000072 |
| 100%          |              | -30       | 836,600,007 | 0.008     | 0.00000084  |
| 100%          |              | -20       | 836,600,009 | 0.011     | 0.00000108  |
| 100%          |              | -10       | 836,600,005 | 0.006     | 0.00000060  |
| 100%          |              | 0         | 836,600,004 | 0.005     | 0.00000048  |
| 100%          |              | +10       | 836,599,995 | -0.006    | -0.00000060 |
| 100%          |              | +20       | 836,599,994 | -0.007    | -0.00000072 |
| 100%          |              | +30       | 836,599,992 | -0.010    | -0.00000096 |
| 100%          |              | +40       | 836,600,006 | 0.007     | 0.00000072  |
| 100%          |              | +50       | 836,599,991 | -0.011    | -0.00000108 |
| 115%          | 4.45         | +20       | 836,600,011 | 0.013     | 0.00000131  |
| BATT.ENDPOINT | 2.40         | +20       | 836,599,996 | -0.005    | -0.00000048 |



### 7.8.3 FREQUENCY STABILITY (WCDMA1700)

OPERATING FREQUENCY : 1,732,400,000 Hz  
 CHANNEL : 1412(Mid)  
 REFERENCE VOLTAGE : 3.87 V DC  
 LIMIT : The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

| VOLTAGE (%)   | POWER (V DC) | TEMP (°C) | FREQ (Hz)     | Deviation |             |
|---------------|--------------|-----------|---------------|-----------|-------------|
|               |              |           |               | (ppm)     | (%)         |
| 100%          | 3.87         | +20(Ref)  | 1,880,000,006 | 0.003     | 0.00000032  |
| 100%          |              | -30       | 1,879,999,995 | -0.003    | -0.00000027 |
| 100%          |              | -20       | 1,879,999,996 | -0.002    | -0.00000021 |
| 100%          |              | -10       | 1,880,000,004 | 0.002     | 0.00000021  |
| 100%          |              | 0         | 1,880,000,007 | 0.004     | 0.00000037  |
| 100%          |              | +10       | 1,880,000,006 | 0.003     | 0.00000032  |
| 100%          |              | +20       | 1,880,000,006 | 0.003     | 0.00000032  |
| 100%          |              | +30       | 1,879,999,995 | -0.003    | -0.00000027 |
| 100%          |              | +40       | 1,880,000,006 | 0.003     | 0.00000032  |
| 100%          |              | +50       | 1,880,000,004 | 0.002     | 0.00000021  |
| 115%          | 4.45         | +20       | 1,880,000,007 | 0.004     | 0.00000037  |
| BATT.ENDPOINT | 2.40         | +20       | 1,879,999,995 | -0.003    | -0.00000027 |

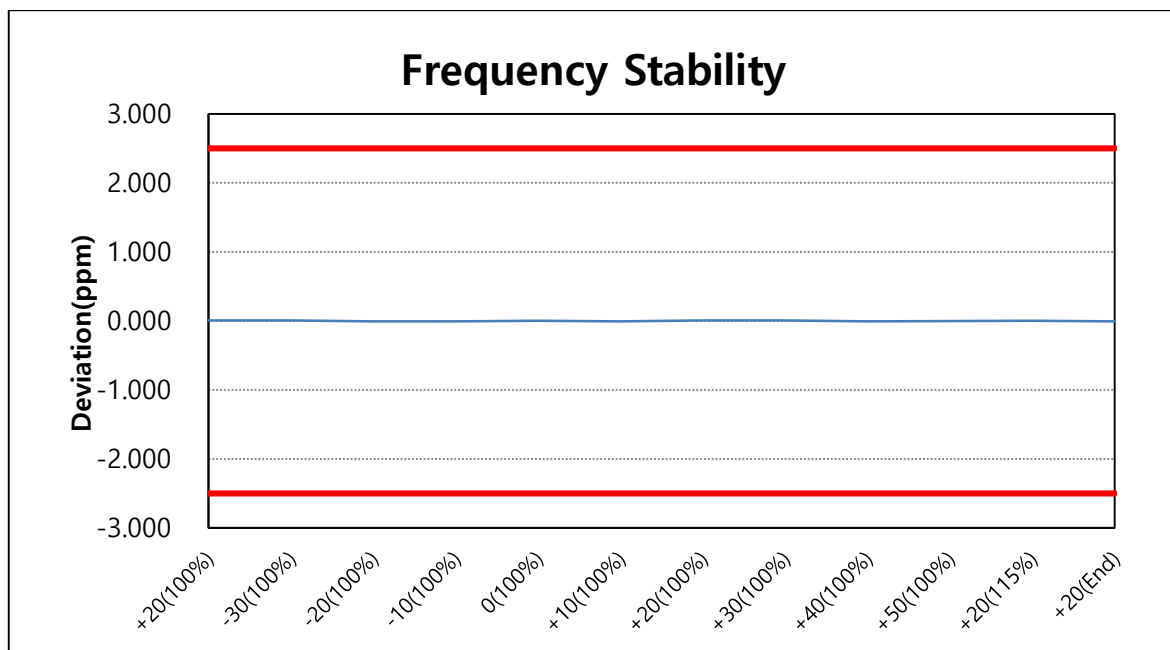


**Note.** Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain inband when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

## 7.8.4 FREQUENCY STABILITY (GSM1900)

OPERATING FREQUENCY : 1,880,000,000 Hz  
 CHANNEL : 661(Mid)  
 REFERENCE VOLTAGE : 3.87 V DC  
 LIMIT : The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

| VOLTAGE (%)   | POWER (V DC) | TEMP (°C) | FREQ (Hz)     | Deviation |             |
|---------------|--------------|-----------|---------------|-----------|-------------|
|               |              |           |               | (ppm)     | (%)         |
| 100%          | 3.87         | +20(Ref)  | 1,880,000,010 | 0.005     | 0.00000053  |
| 100%          |              | -30       | 1,879,999,989 | -0.006    | -0.00000059 |
| 100%          |              | -20       | 1,880,000,008 | 0.004     | 0.00000043  |
| 100%          |              | -10       | 1,880,000,007 | 0.004     | 0.00000037  |
| 100%          |              | 0         | 1,879,999,990 | -0.005    | -0.00000053 |
| 100%          |              | +10       | 1,879,999,992 | -0.004    | -0.00000043 |
| 100%          |              | +20       | 1,880,000,010 | 0.005     | 0.00000053  |
| 100%          |              | +30       | 1,879,999,994 | -0.003    | -0.00000032 |
| 100%          |              | +40       | 1,879,999,992 | -0.004    | -0.00000043 |
| 100%          |              | +50       | 1,879,999,993 | -0.004    | -0.00000037 |
| 115%          | 4.45         | +20       | 1,880,000,005 | 0.003     | 0.00000027  |
| BATT.ENDPOINT | 2.40         | +20       | 1,880,000,008 | 0.004     | 0.00000043  |

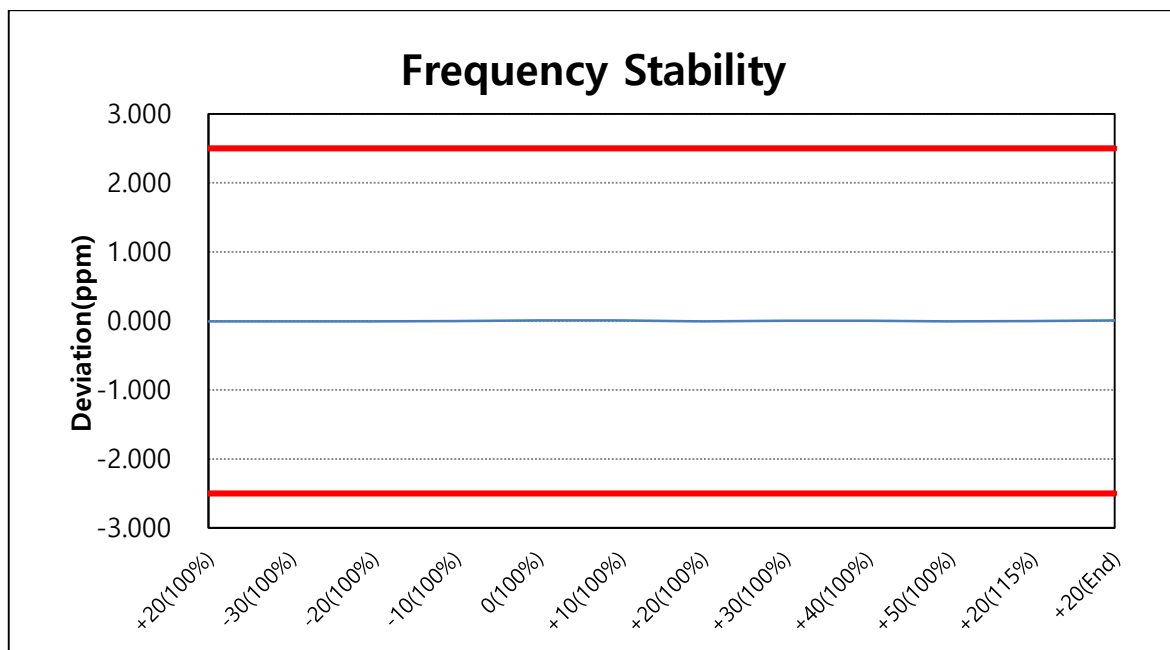


**Note.** Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain inband when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

### 7.8.5 FREQUENCY STABILITY (WCDMA1900)

OPERATING FREQUENCY : 1,880,000,000 Hz  
 CHANNEL : 9400(Mid)  
 REFERENCE VOLTAGE : 3.87 V DC  
 LIMIT : The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

| VOLTAGE (%)   | POWER (V DC) | TEMP (°C) | FREQ (Hz)     | Deviation |             |
|---------------|--------------|-----------|---------------|-----------|-------------|
|               |              |           |               | (ppm)     | (%)         |
| 100%          | 3.87         | +20(Ref)  | 1,880,000,009 | 0.005     | 0.00000048  |
| 100%          |              | -30       | 1,879,999,993 | -0.004    | -0.00000037 |
| 100%          |              | -20       | 1,880,000,006 | 0.003     | 0.00000032  |
| 100%          |              | -10       | 1,880,000,008 | 0.004     | 0.00000043  |
| 100%          |              | 0         | 1,880,000,008 | 0.004     | 0.00000043  |
| 100%          |              | +10       | 1,879,999,994 | -0.003    | -0.00000032 |
| 100%          |              | +20       | 1,880,000,009 | 0.005     | 0.00000048  |
| 100%          |              | +30       | 1,880,000,005 | 0.003     | 0.00000027  |
| 100%          |              | +40       | 1,879,999,993 | -0.004    | -0.00000037 |
| 100%          |              | +50       | 1,879,999,992 | -0.004    | -0.00000043 |
| 115%          | 4.45         | +20       | 1,880,000,006 | 0.003     | 0.00000032  |
| BATT.ENDPOINT | 2.40         | +20       | 1,880,000,010 | 0.005     | 0.00000053  |

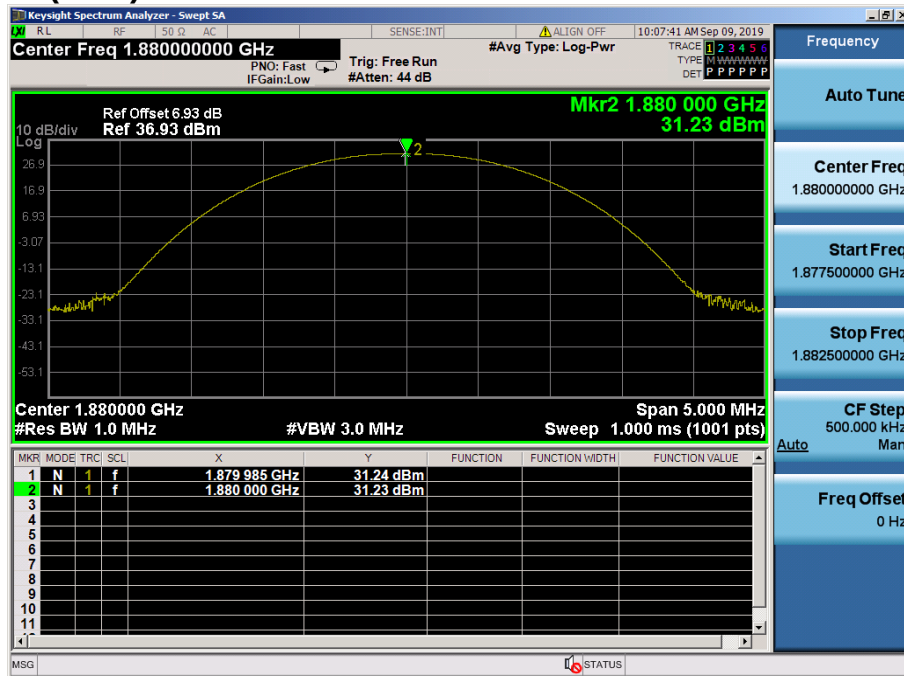


**Note.** Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain inband when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

## 8. TEST PLOTS

### 8.1 PEAK TO AVERAGE RATIO

-P<sub>pk</sub> (dBm) GSM1900 & Channel: 661

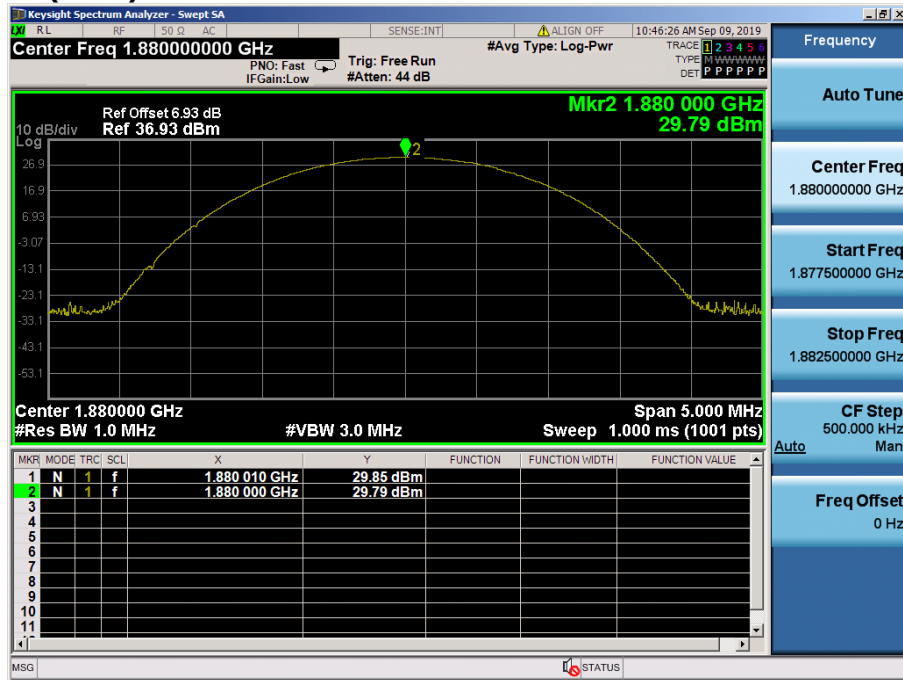


-P<sub>avg</sub> (dBm) GSM1900 & Channel: 661

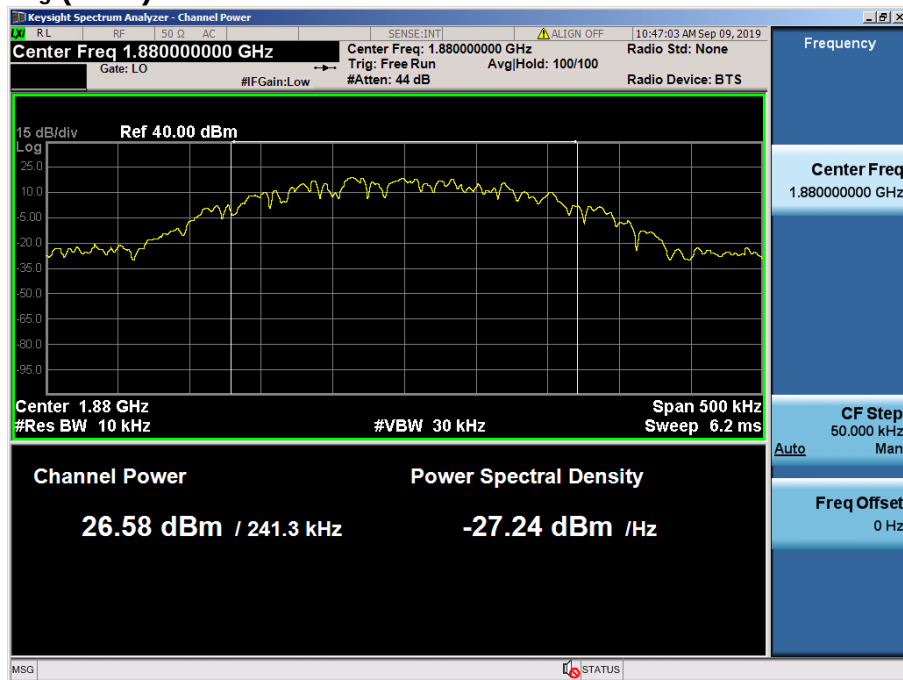


$$\text{PAPR (dB)} = P_{pk} \text{ (dBm)} - P_{avg} \text{ (dBm)} = 31.23 \text{ dBm} - 30.75 \text{ dBm} = 0.48 \text{ dB}$$

**-P<sub>pk</sub> (dBm)** EDGE1900 & Channel: 661

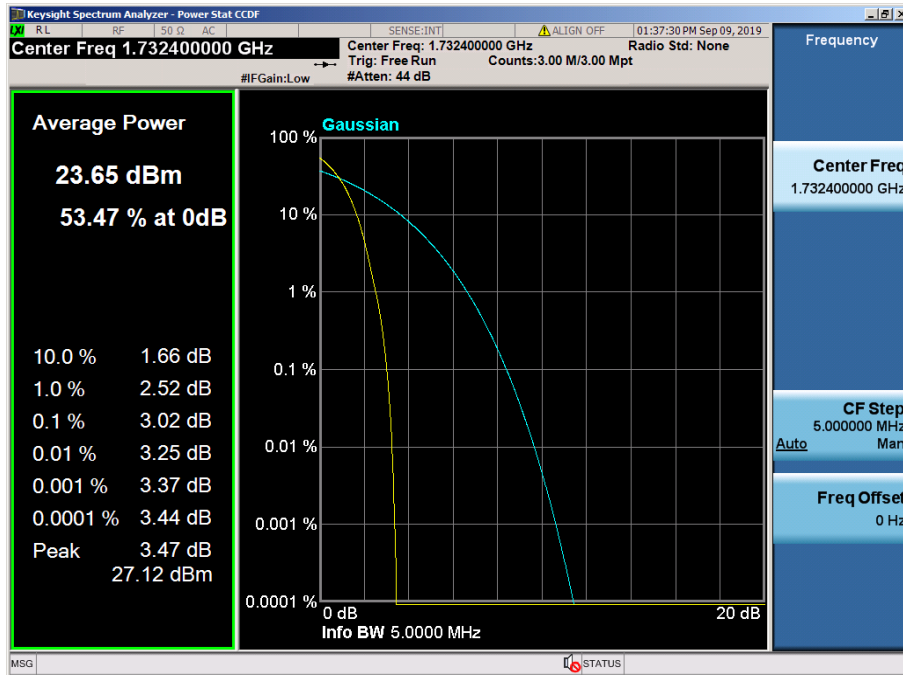


**-P<sub>avg</sub> (dBm)** EDGE1900 & Channel: 661

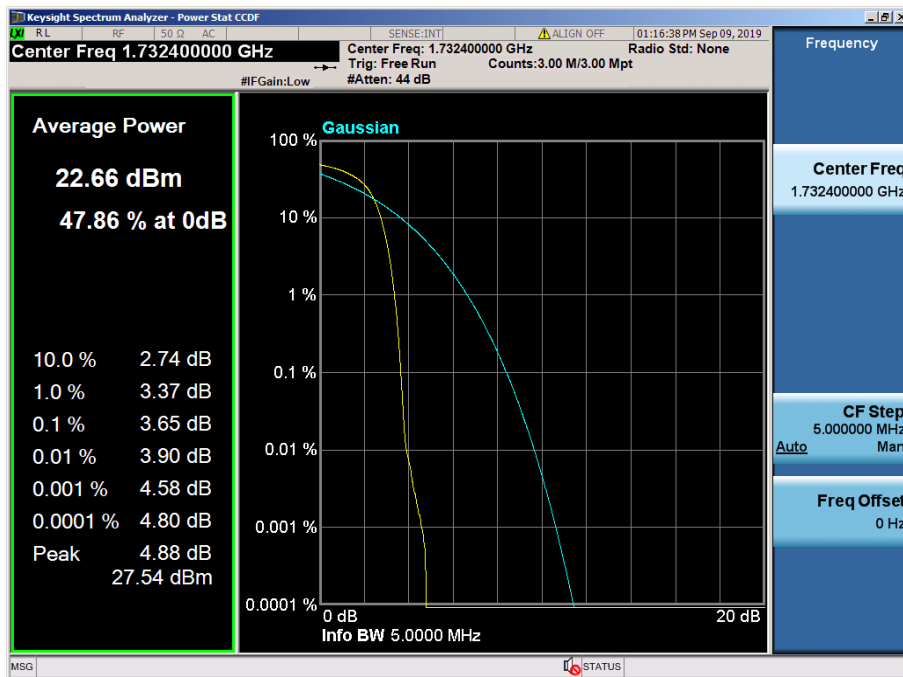


$$\text{PAPR (dB)} = P_{pk} \text{ (dBm)} - P_{avg} \text{ (dBm)} = 29.79 \text{ dBm} - 26.58 \text{ dBm} = 3.27 \text{ dB}$$

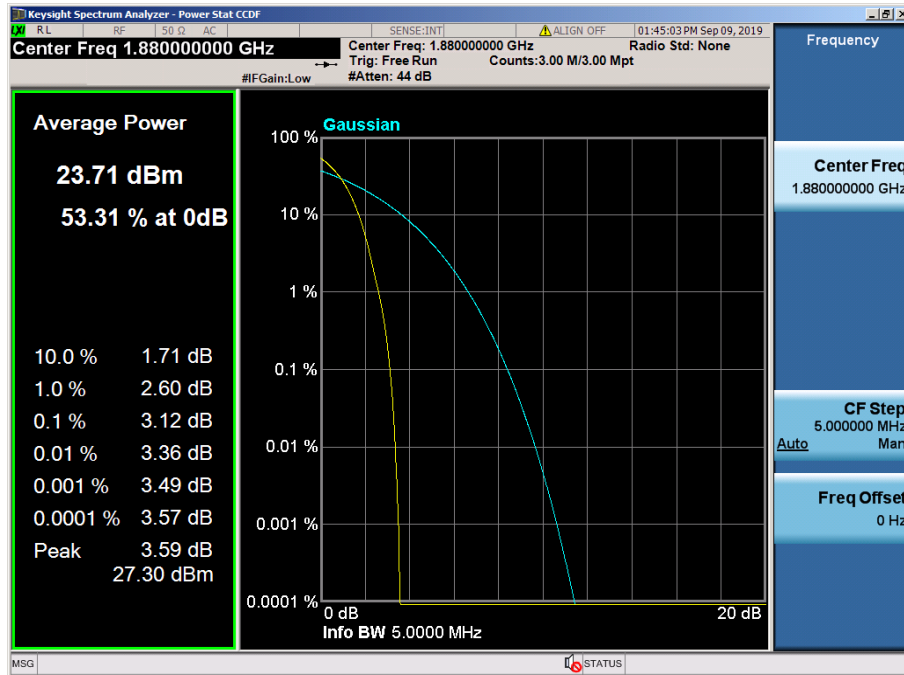
## WCDMA1700 & Channel: 1412



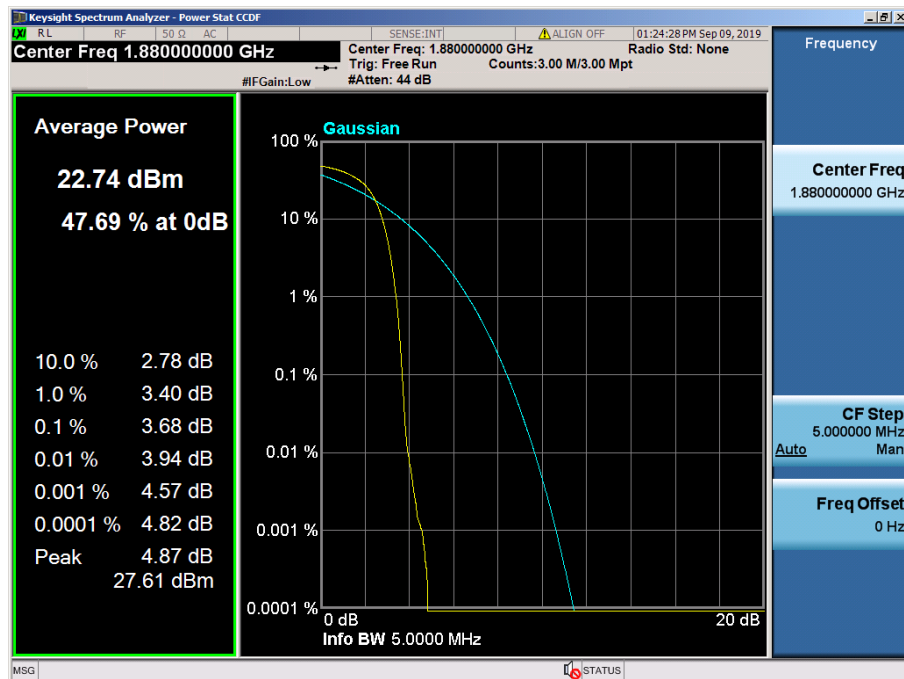
## HSUPA1700 & Channel: 1412



## WCDMA1900 & Channel: 9400

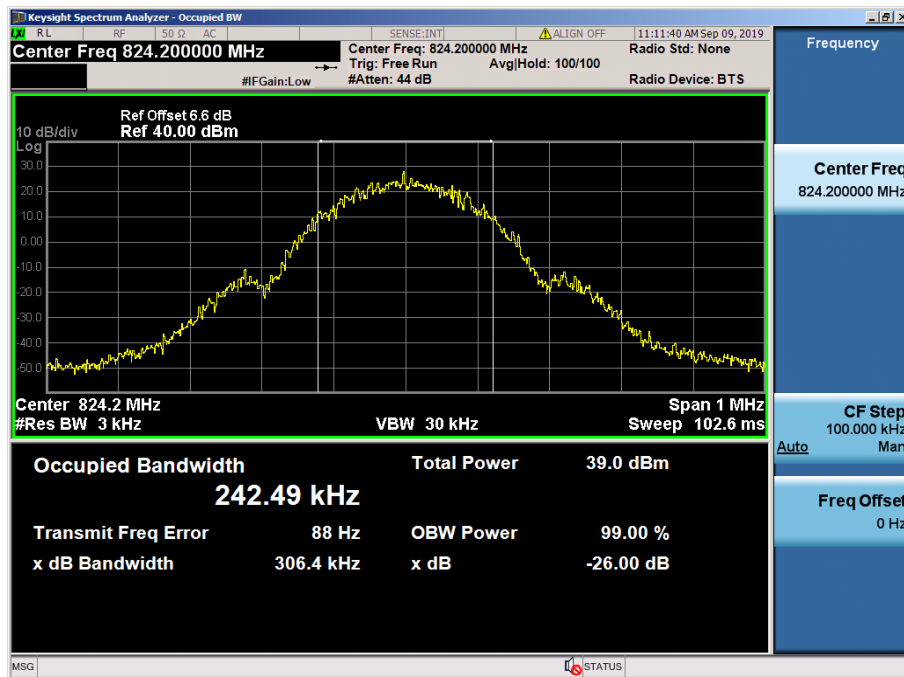


## HSUPA1900 & Channel: 9400

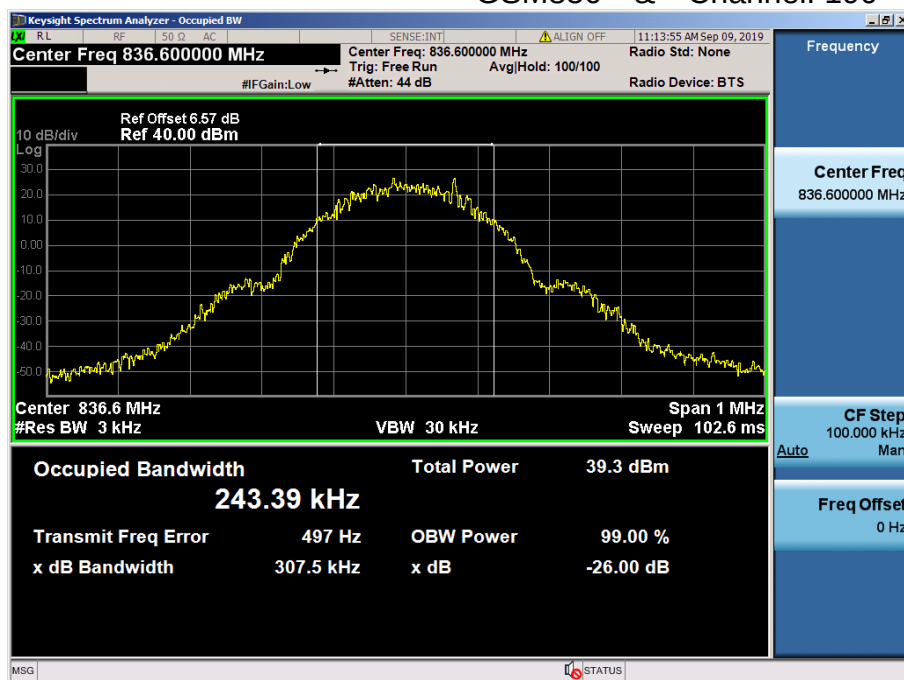


## 8.2 OCCUPIED BANDWIDTH (99 % Bandwidth)

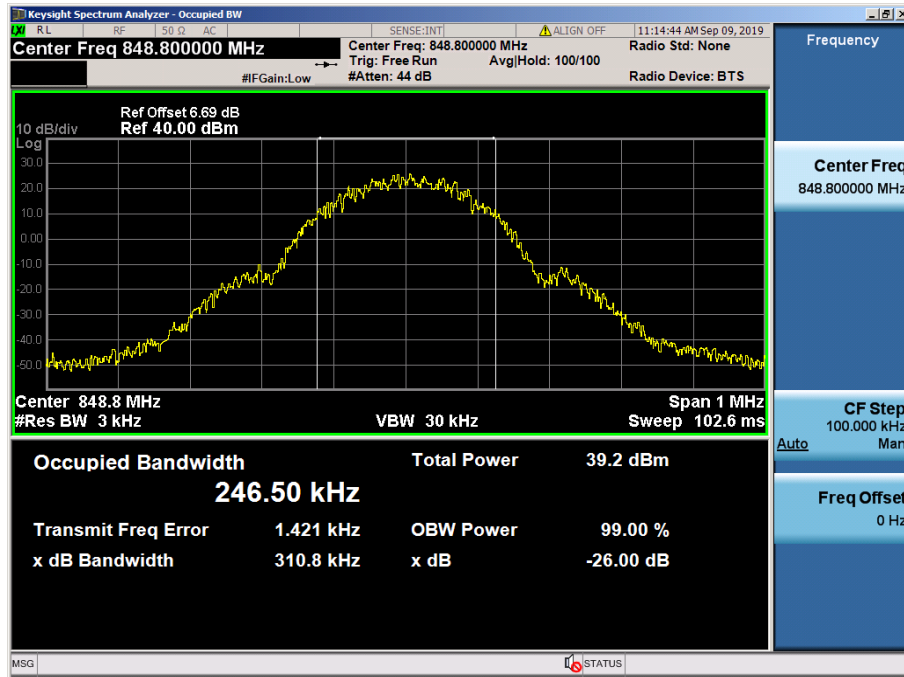
### GSM850 & Channel: 128



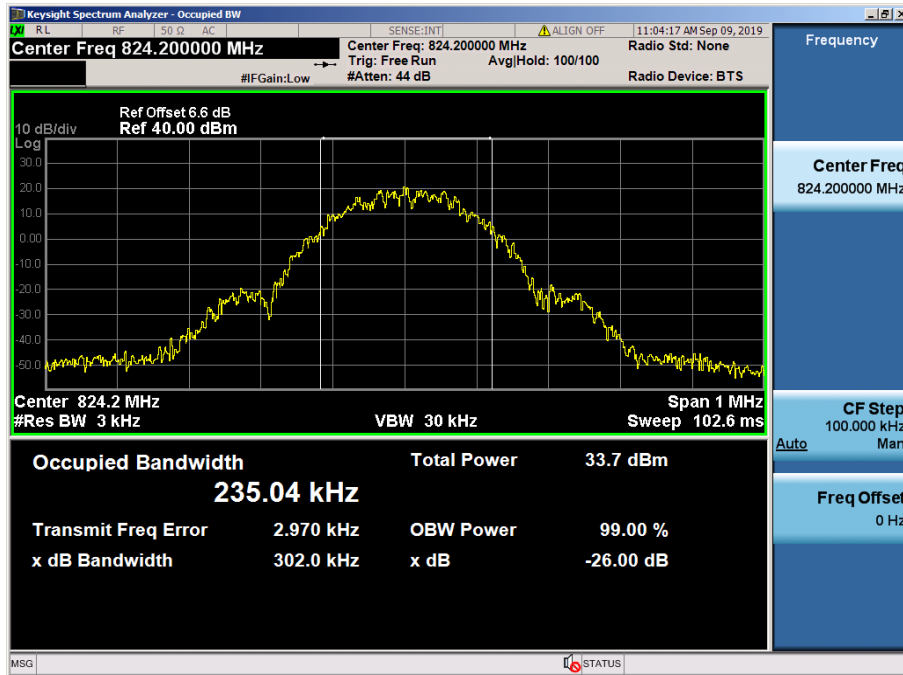
### GSM850 & Channel: 190



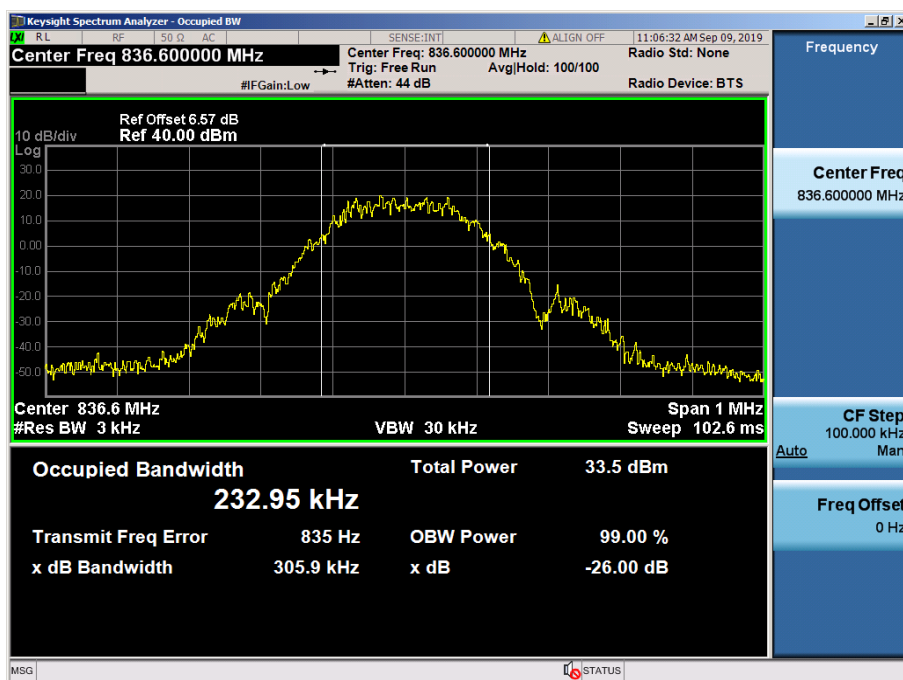
# GSM850 & Channel: 251



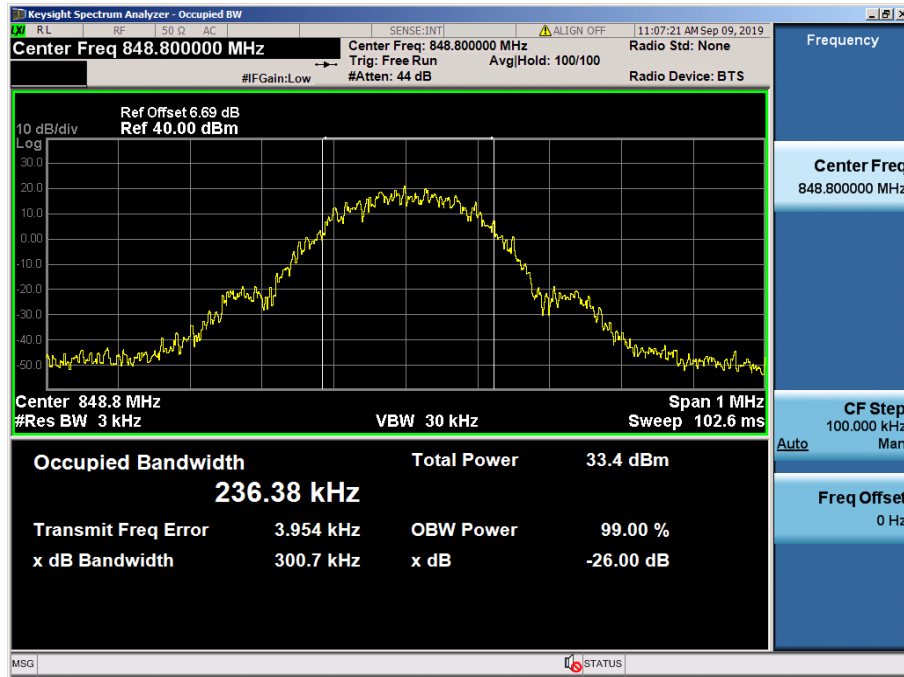
## EDGE850 & Channel: 128



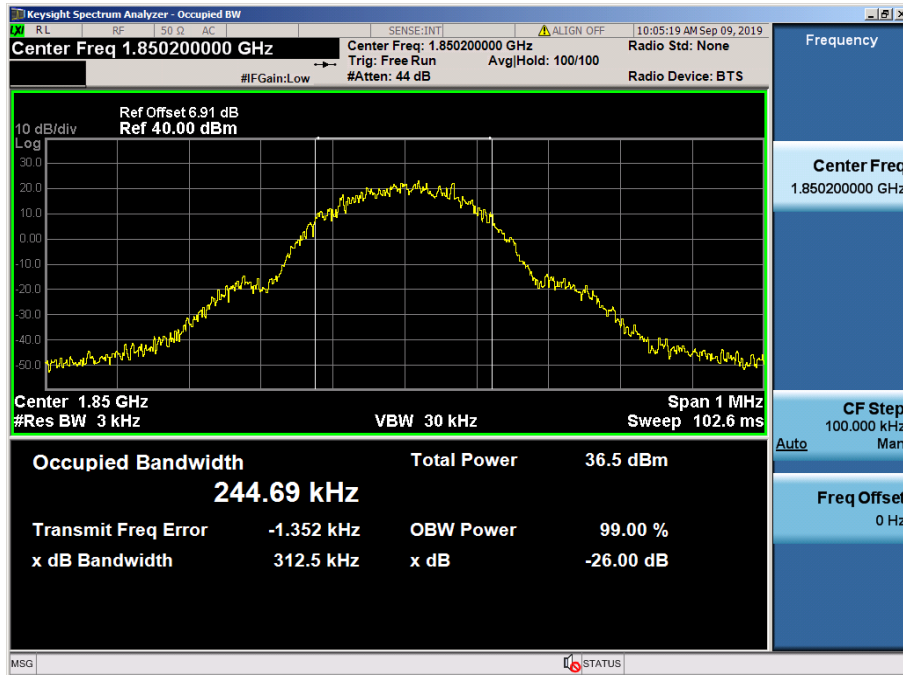
## EDGE850 & Channel: 190



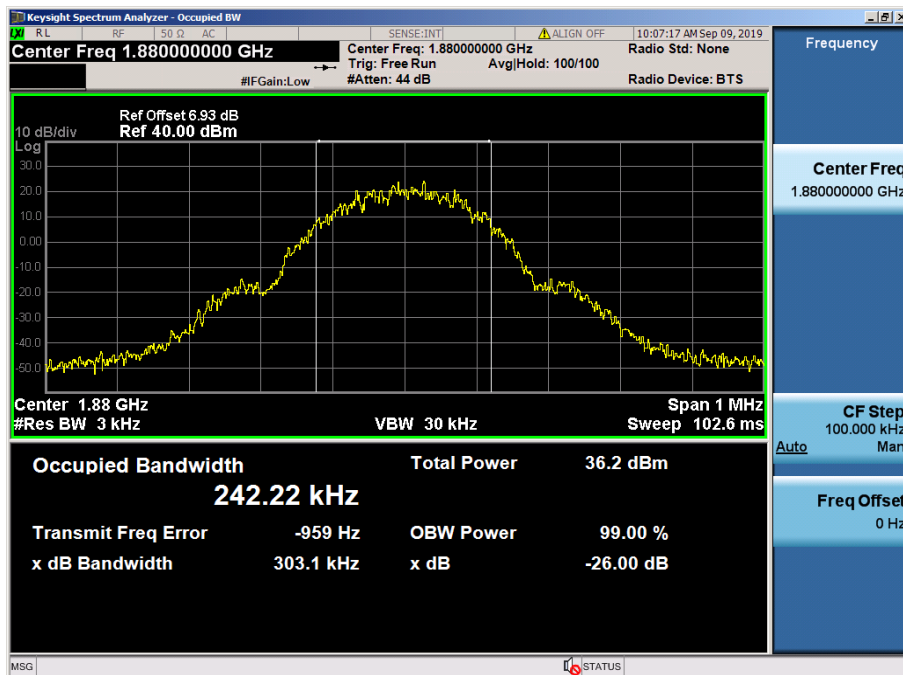
# EDGE850 & Channel: 251



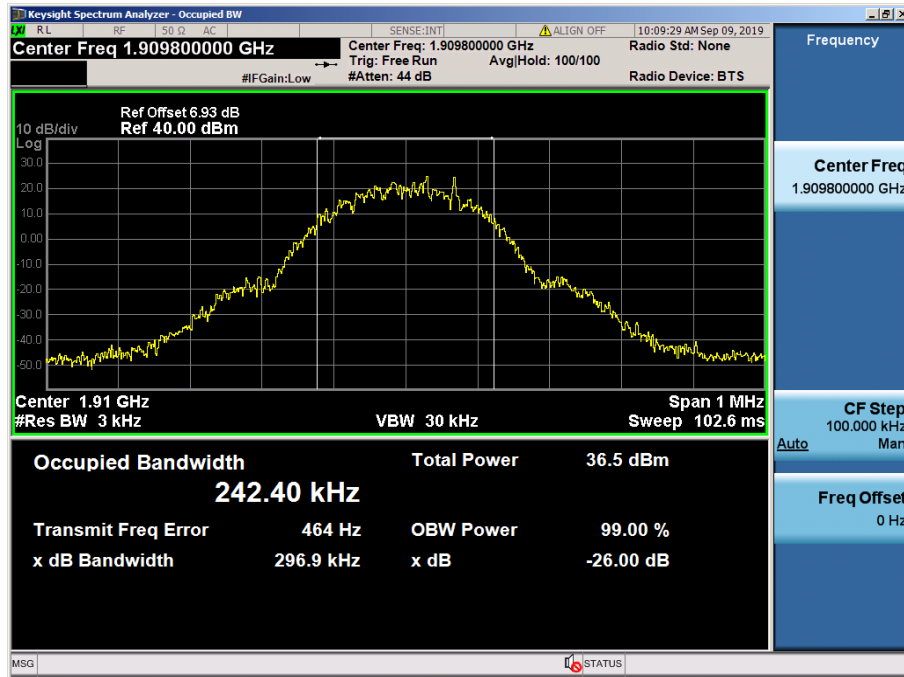
## GSM1900 & Channel: 512



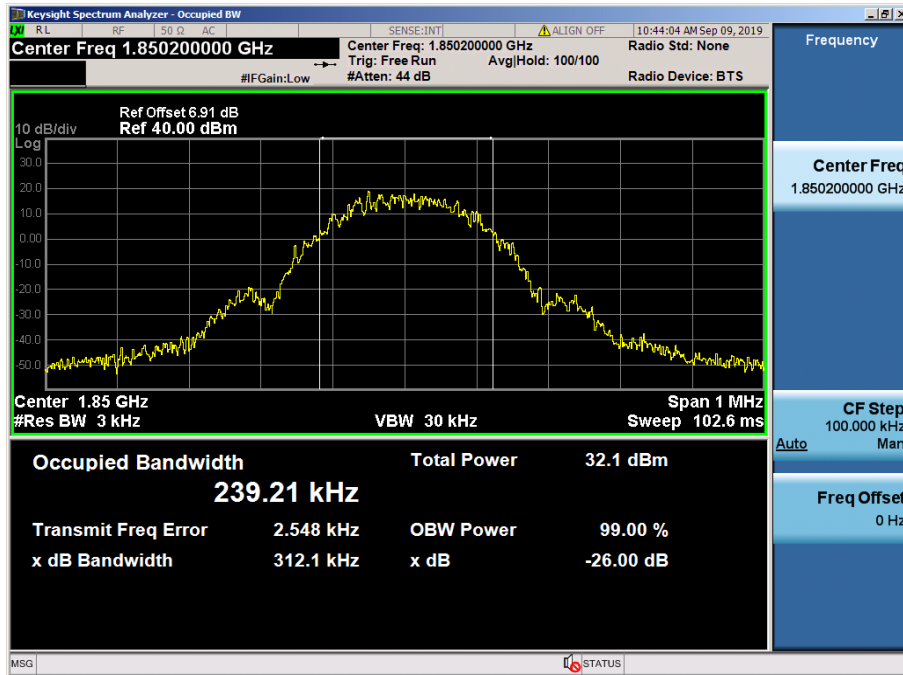
## GSM1900 & Channel: 661



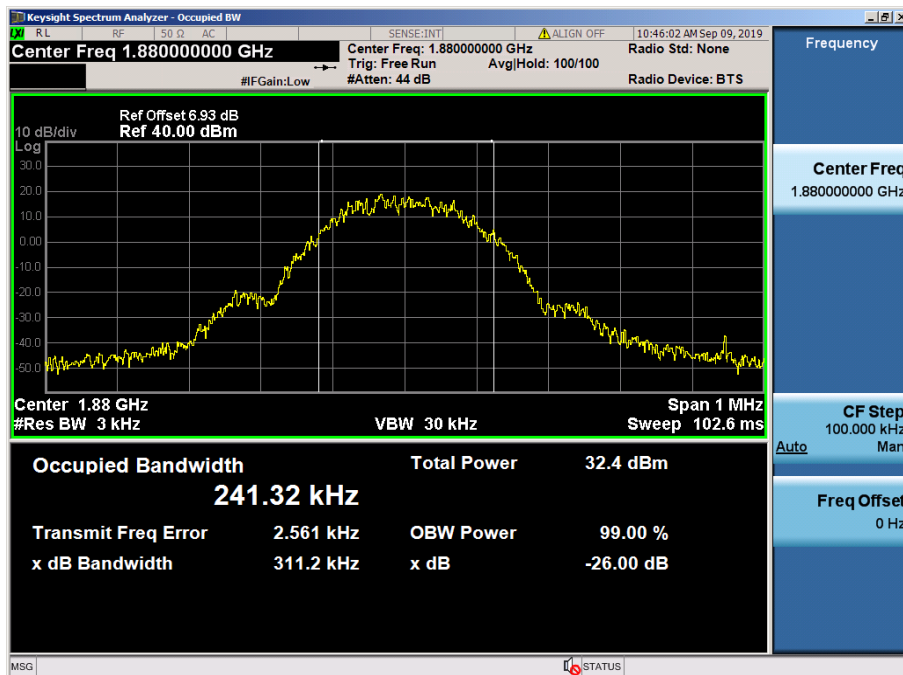
# GSM1900 & Channel: 810



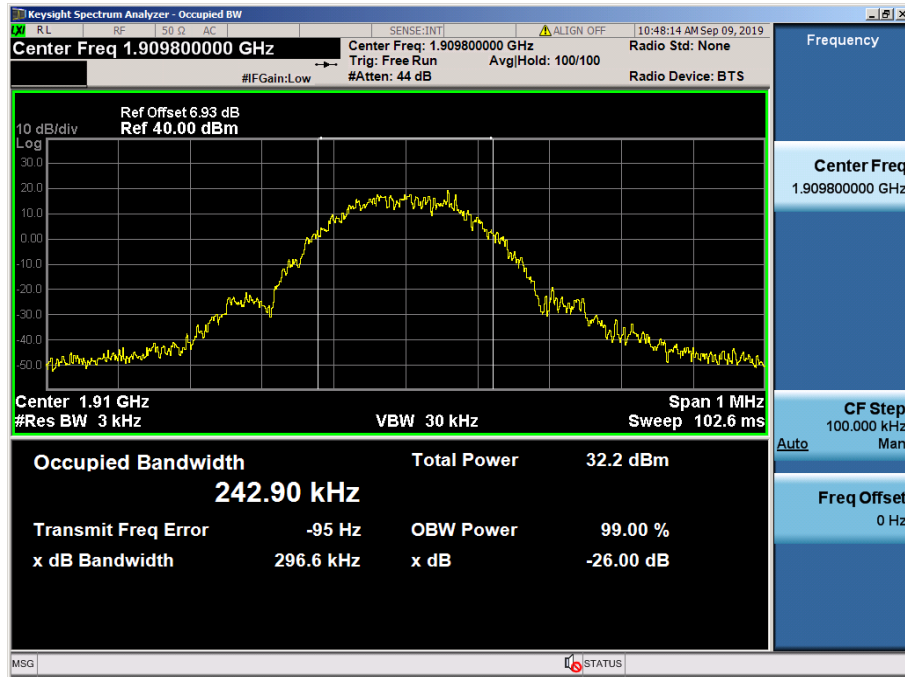
## EDGE1900 & Channel: 512



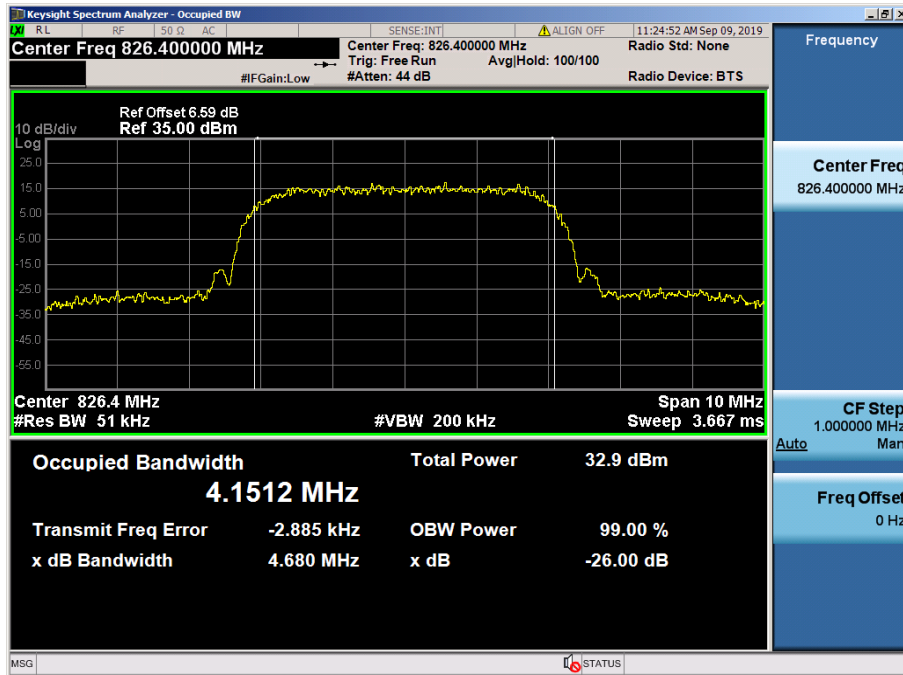
## EDGE1900 & Channel: 661



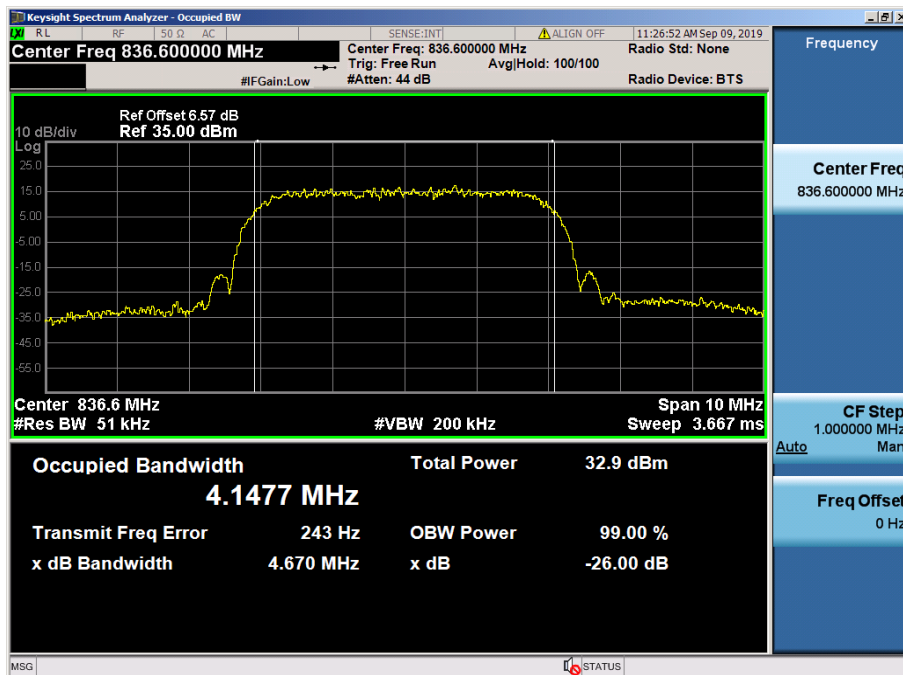
# EDGE1900 & Channel: 810



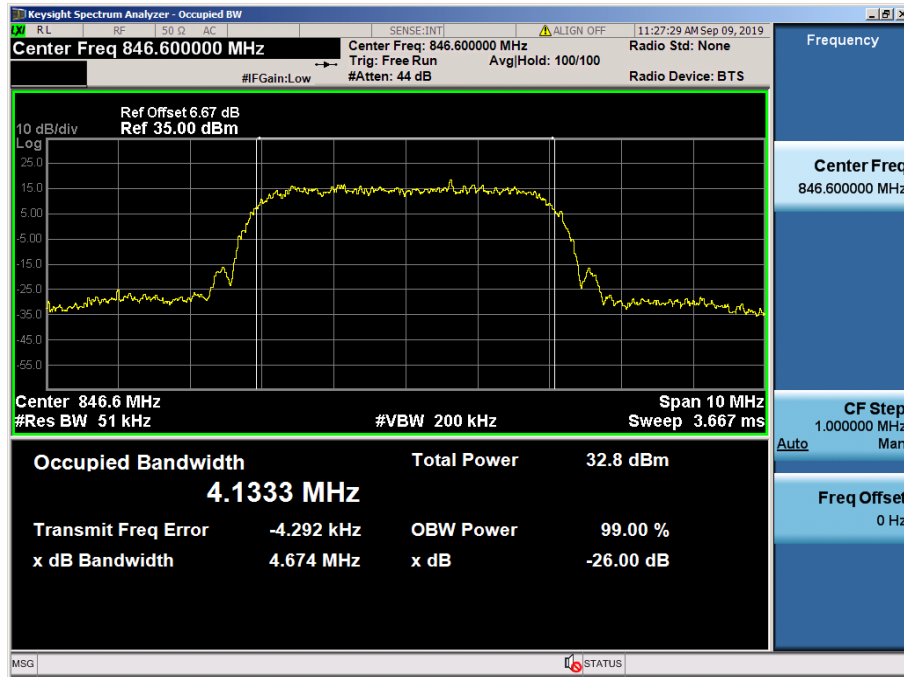
## WCDMA850 & Channel: 4132



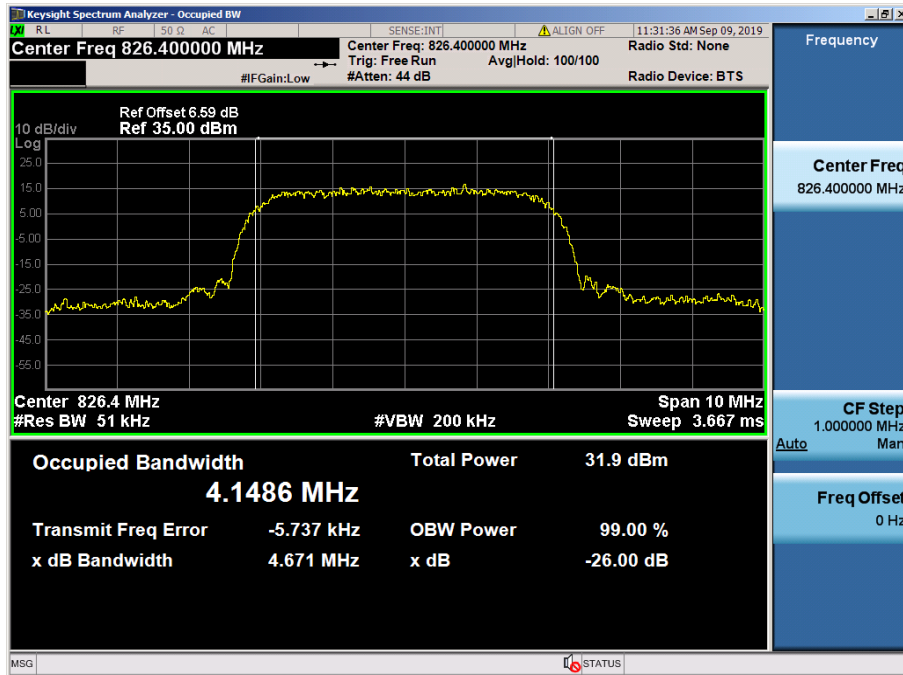
## WCDMA850 & Channel: 4183



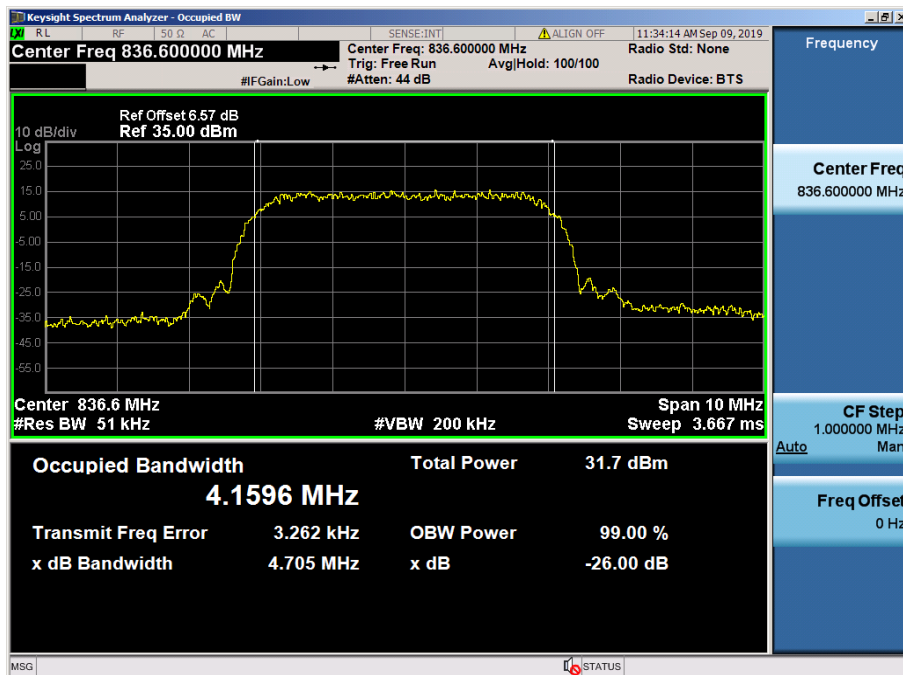
WCDMA850 & Channel: 4233



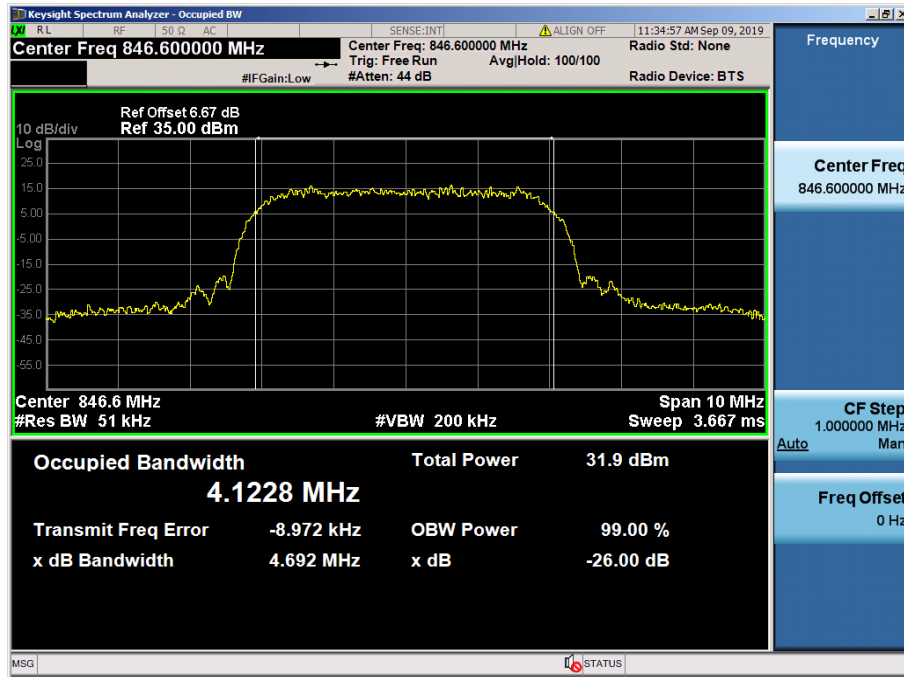
## HSUPA850 & Channel: 4132



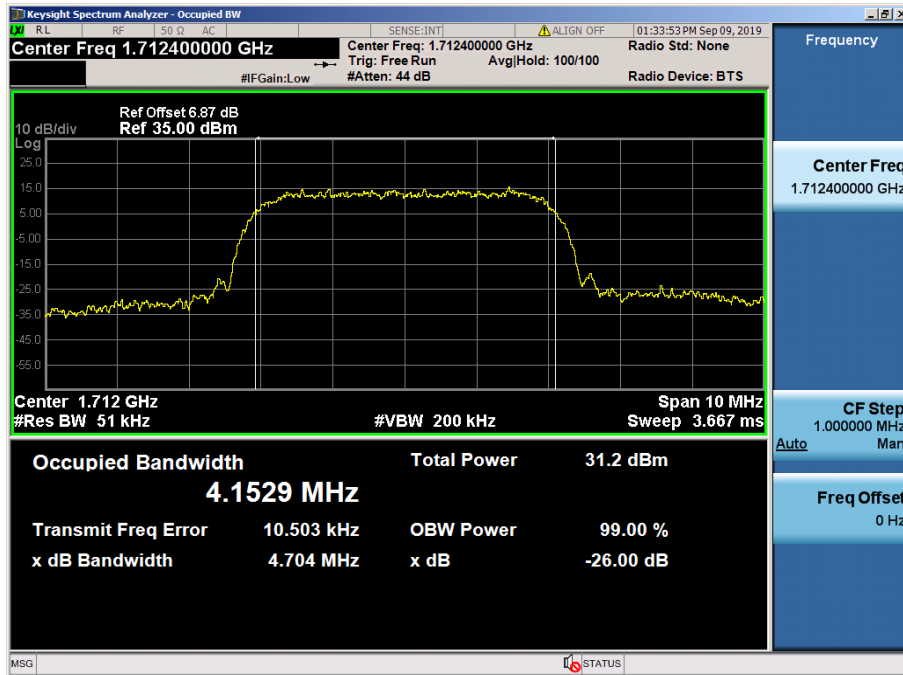
## HSUPA850 & Channel: 4183



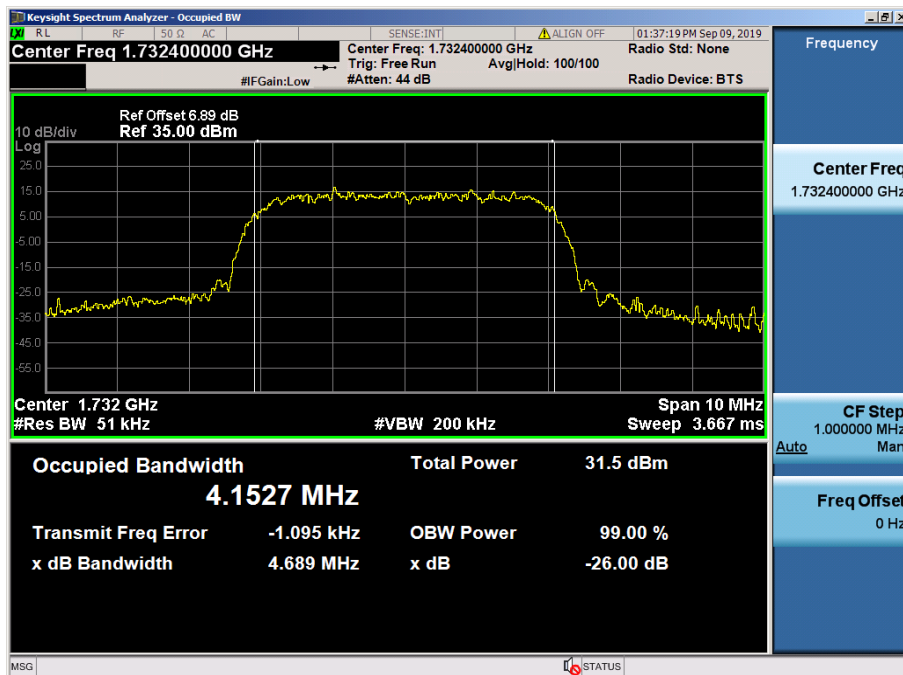
# HSUPA850 & Channel: 4233



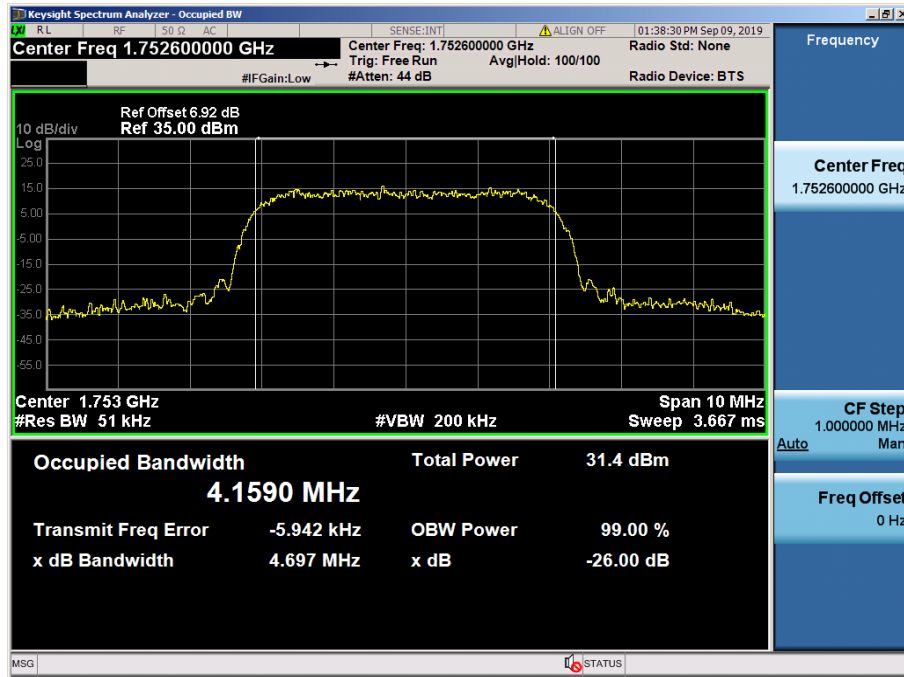
## WCDMA1700 & Channel: 1312



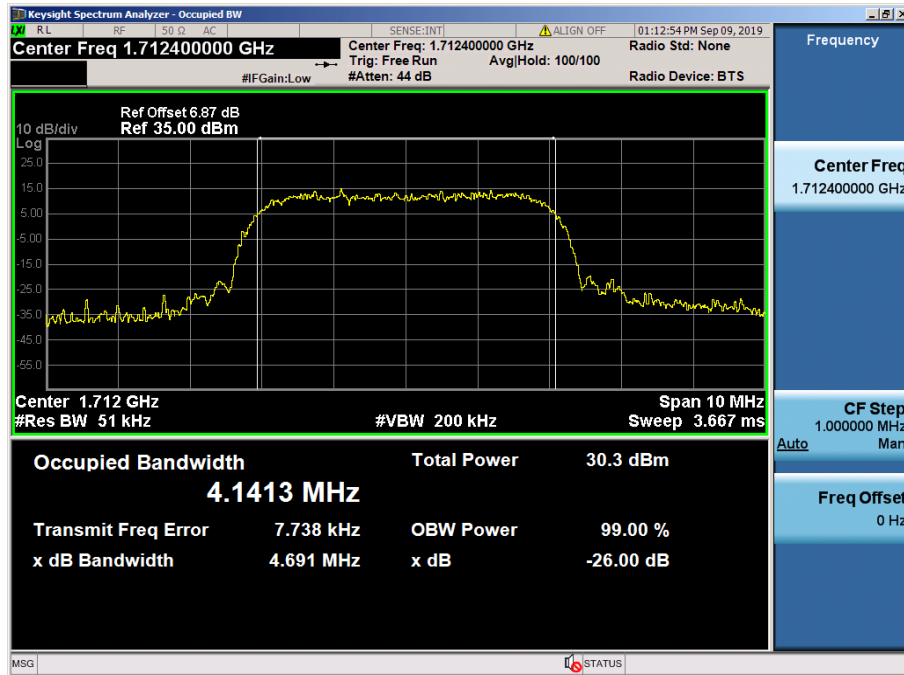
## WCDMA1700 & Channel: 1412



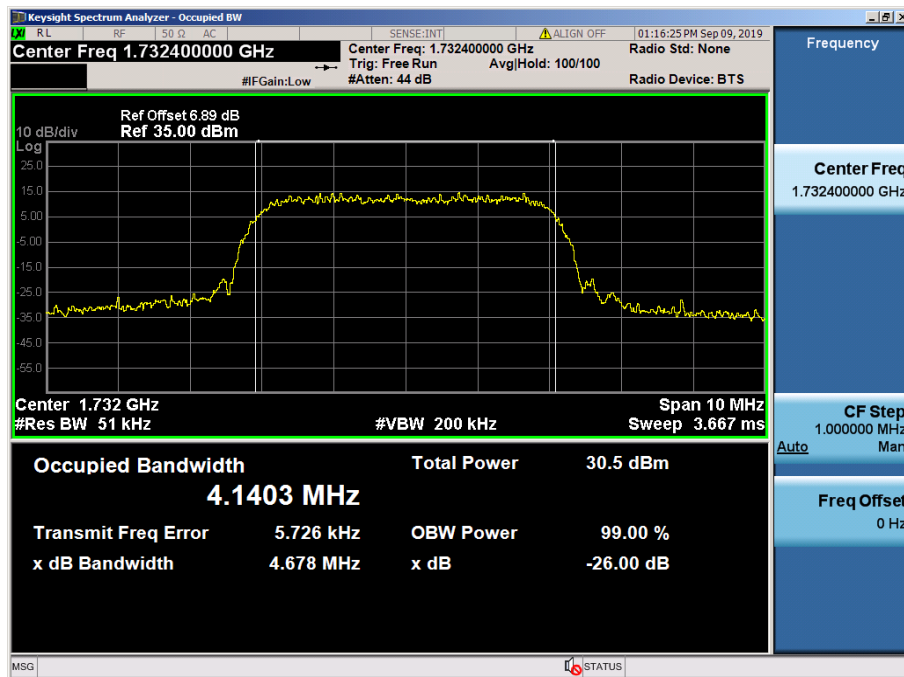
# WCDMA1700 & Channel: 1513



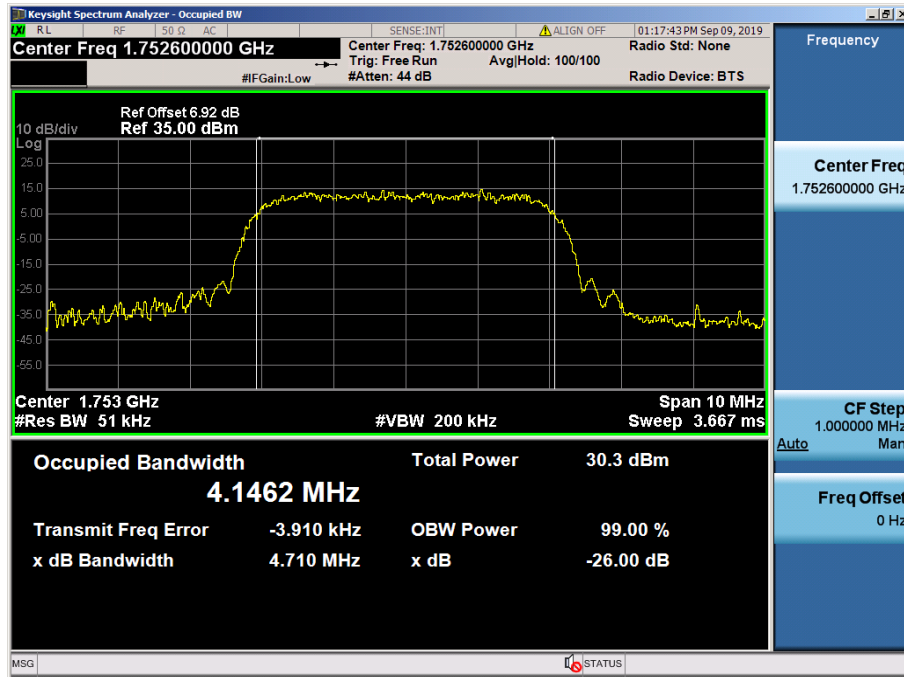
## HSUPA1700 & Channel: 1312



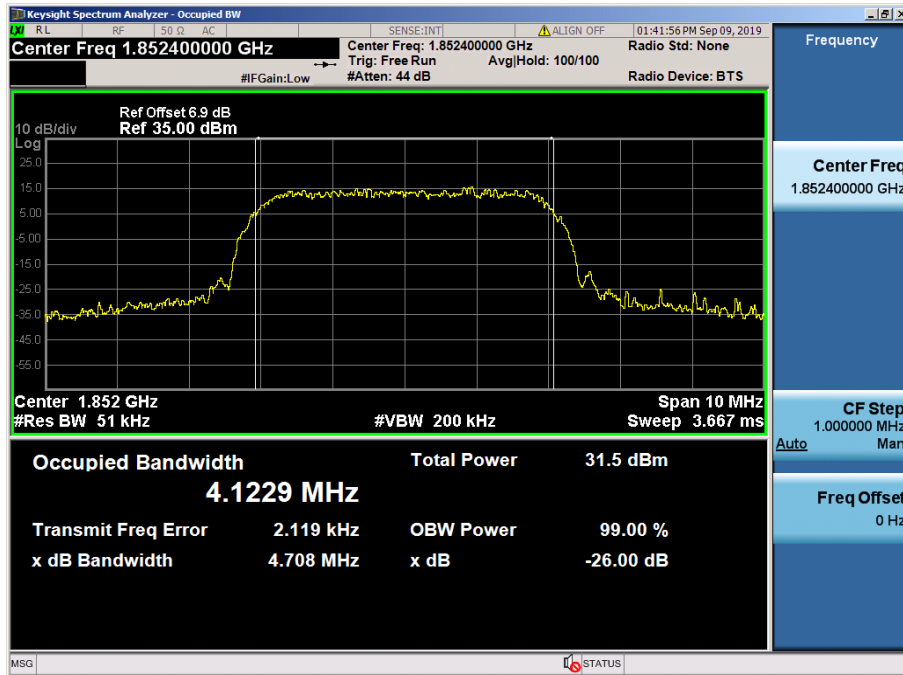
## HSUPA1700 & Channel: 1412



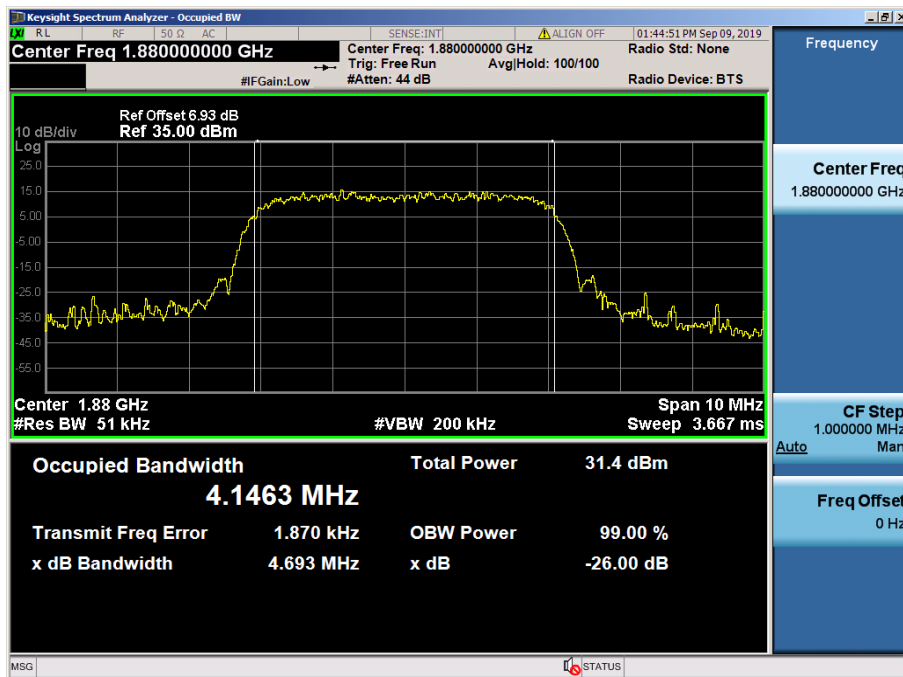
# HSUPA1700 & Channel: 1513



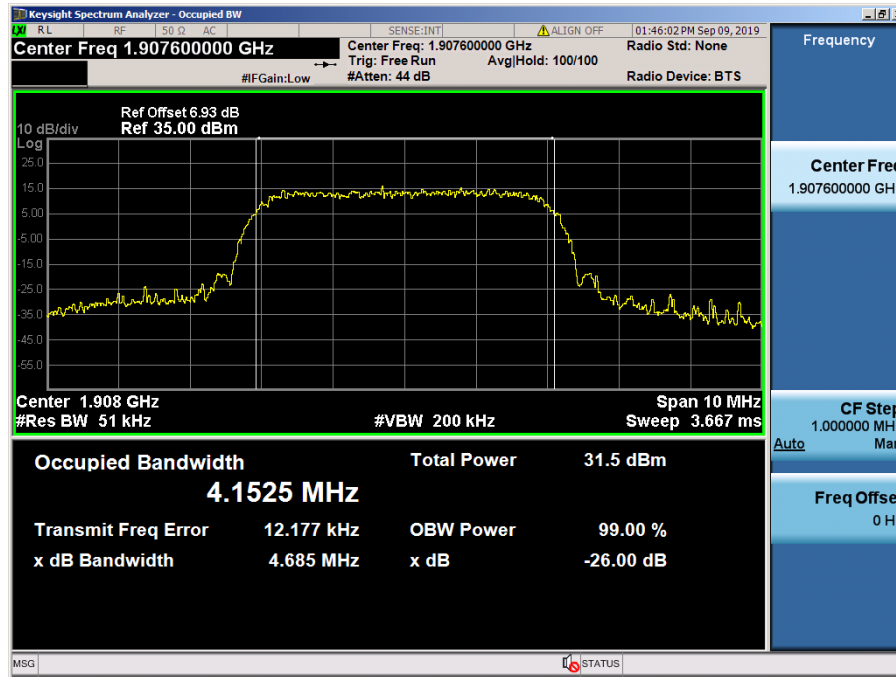
## WCDMA1900 & Channel: 9262



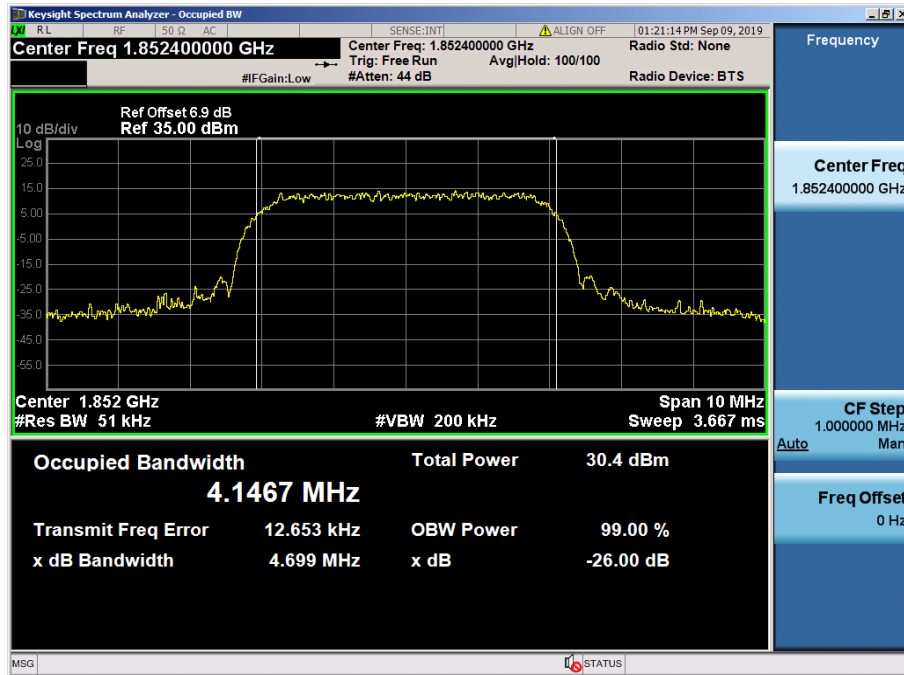
## WCDMA1900 & Channel: 9400



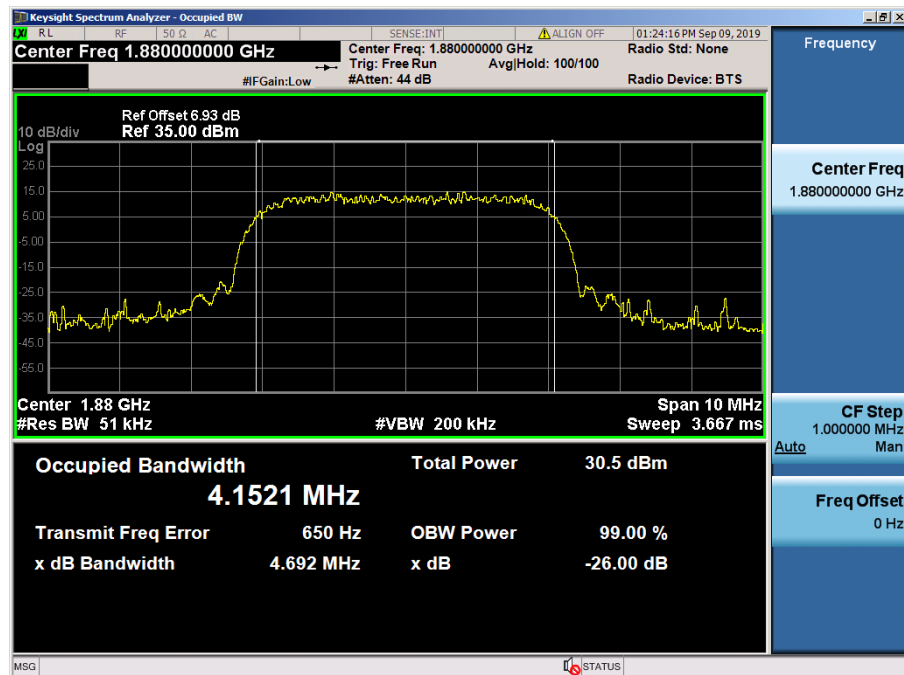
# WCDMA1900 & Channel: 9538



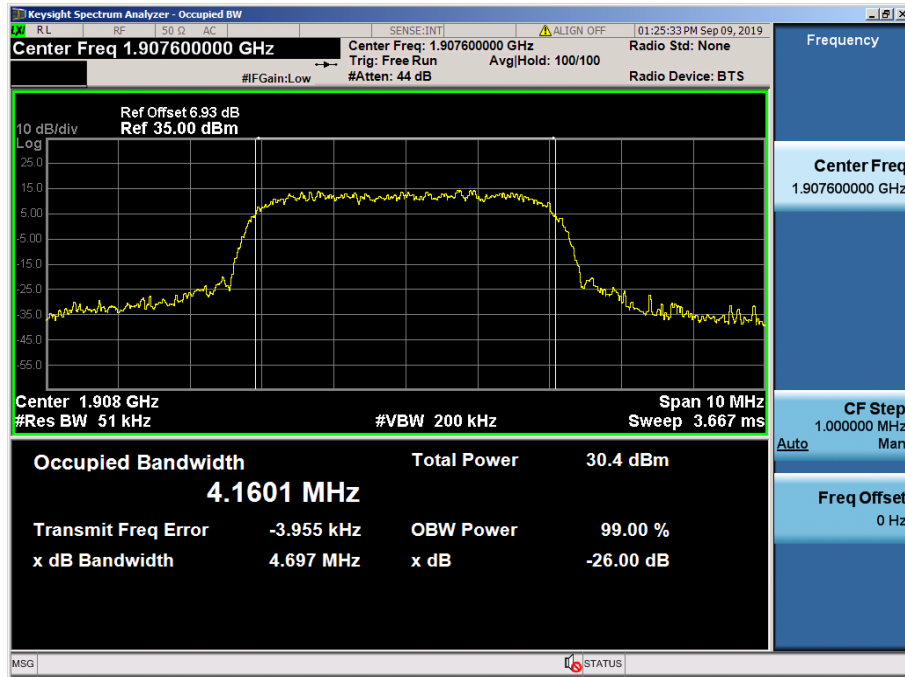
## HSUPA1900 & Channel: 9262



## HSUPA1900 & Channel: 9400

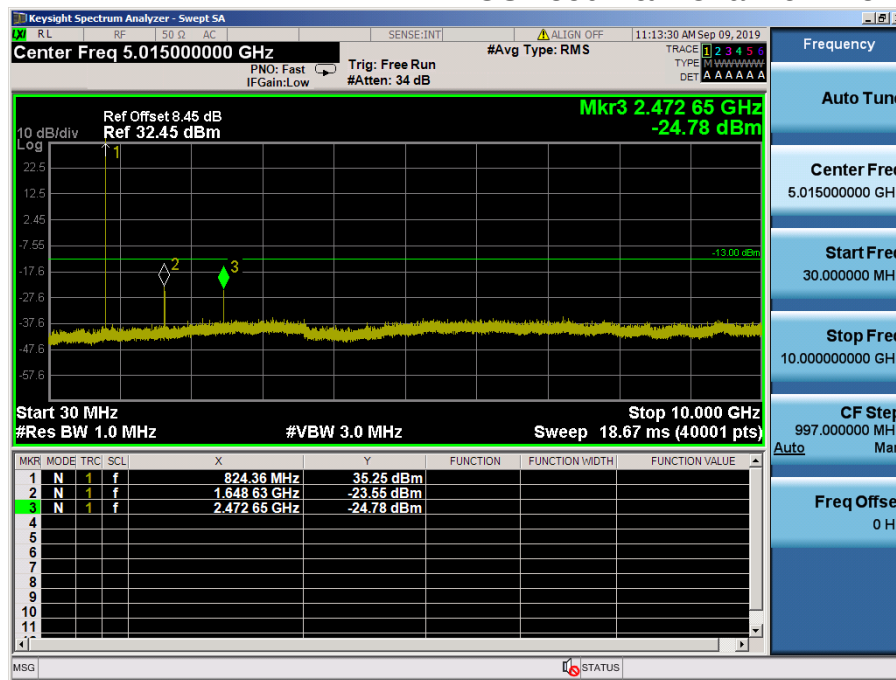


## HSUPA1900 &amp; Channel: 9538

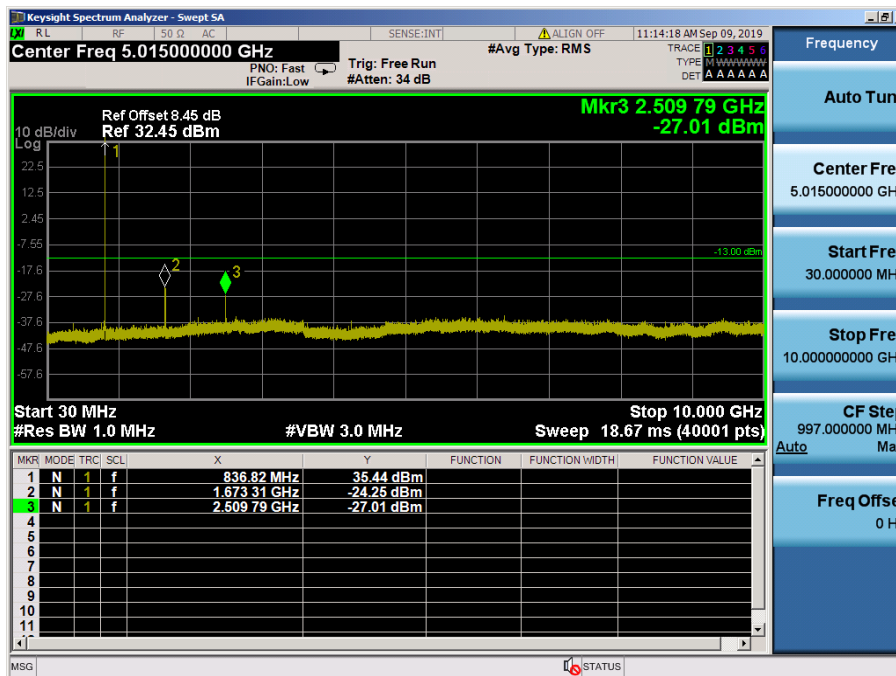


## 8.3 SPURIOUS EMISSIONS AT ANTENNA TERMINAL

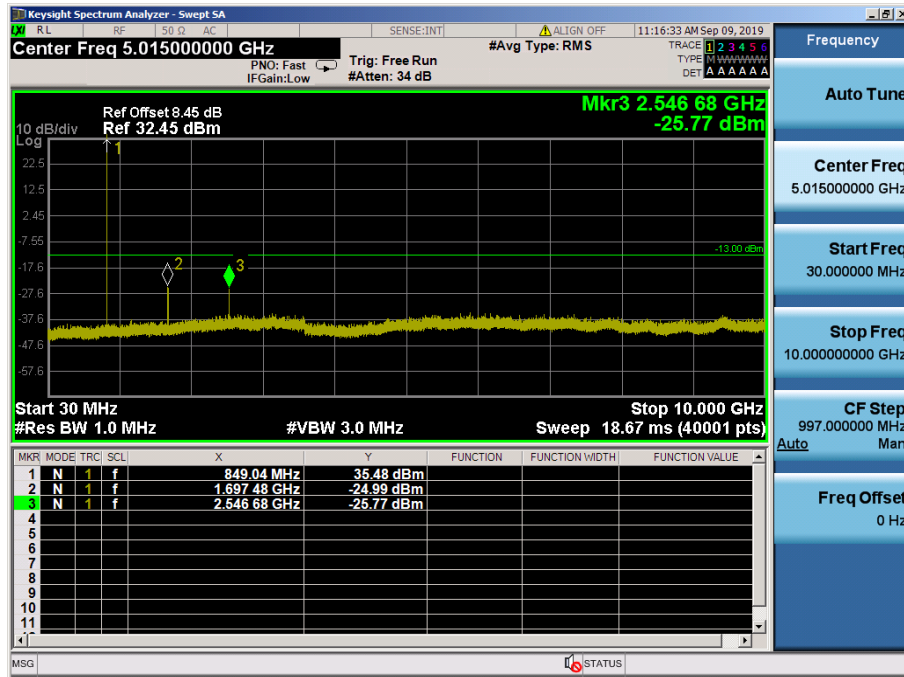
## GSM850 &amp; Channel: 128



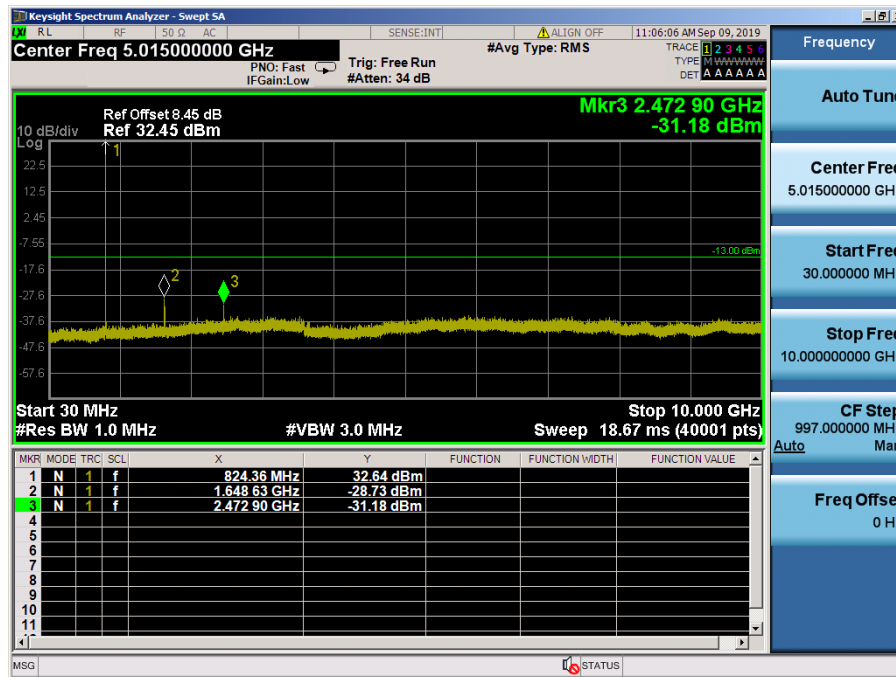
## GSM850 &amp; Channel: 190



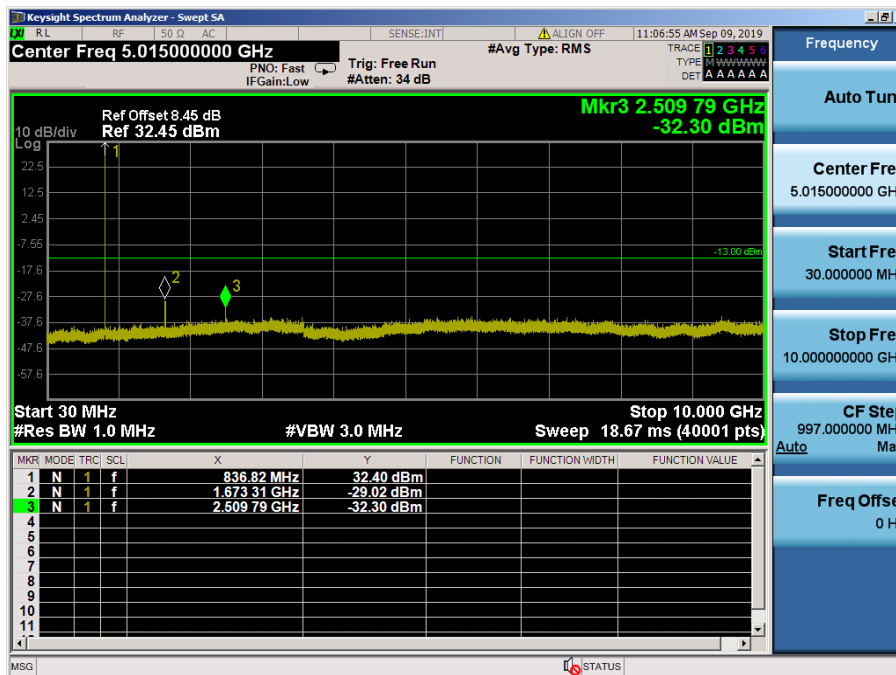
# GSM850 & Channel: 251



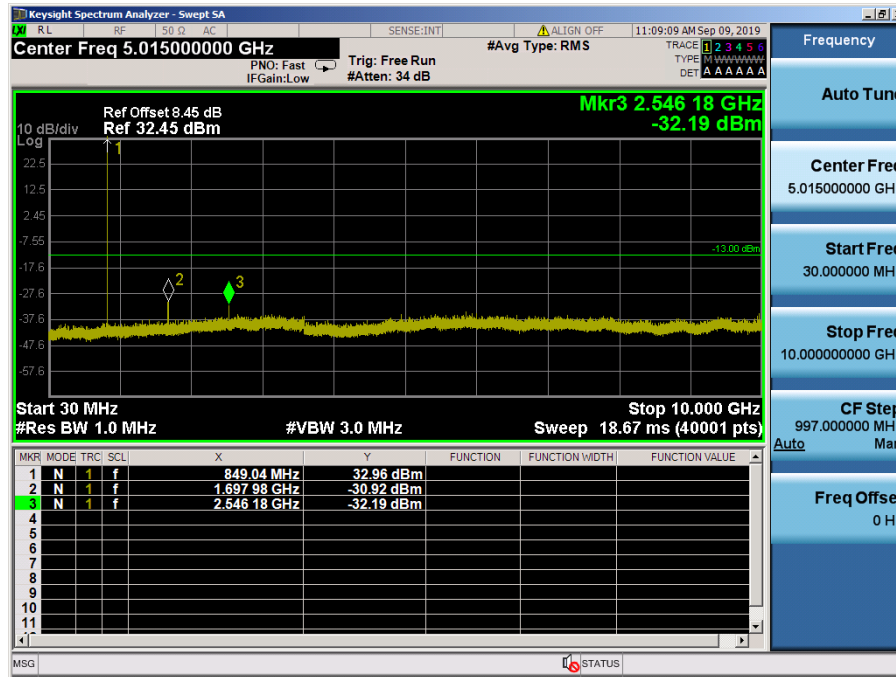
## EDGE850 &amp; Channel: 128



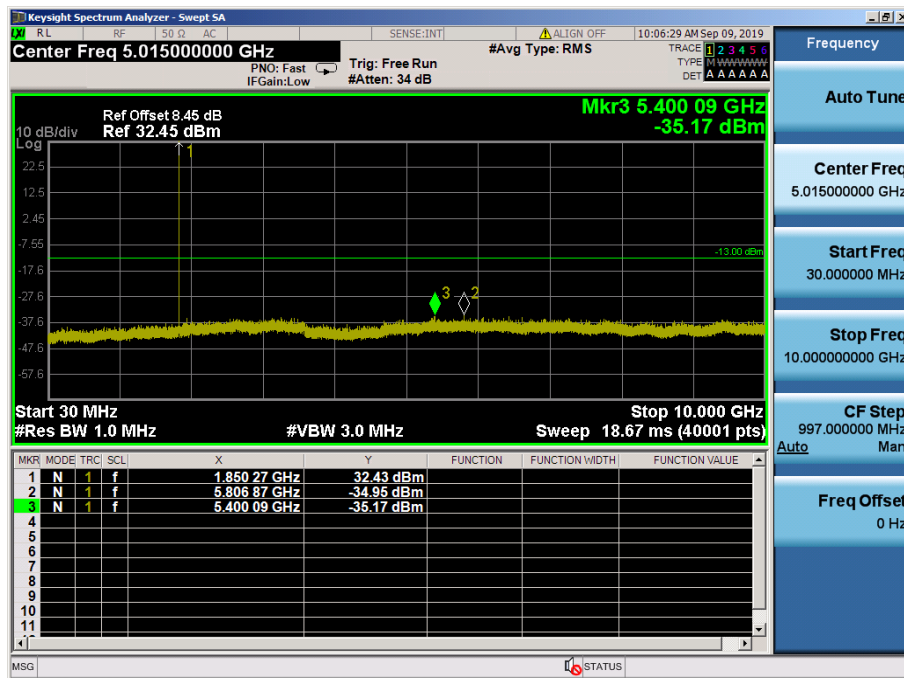
## EDGE850 &amp; Channel: 190



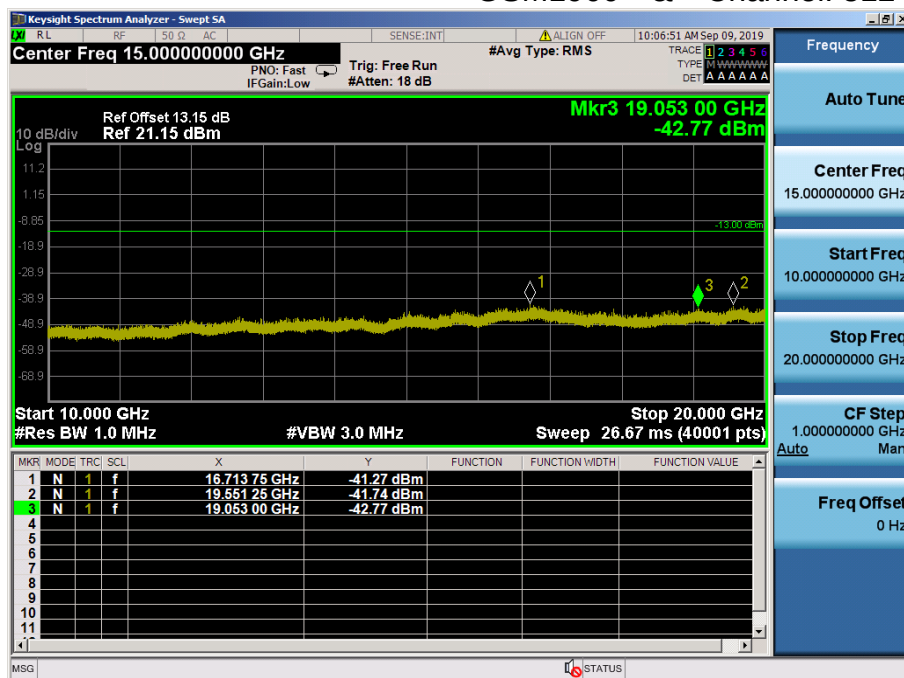
# EDGE850 & Channel: 251



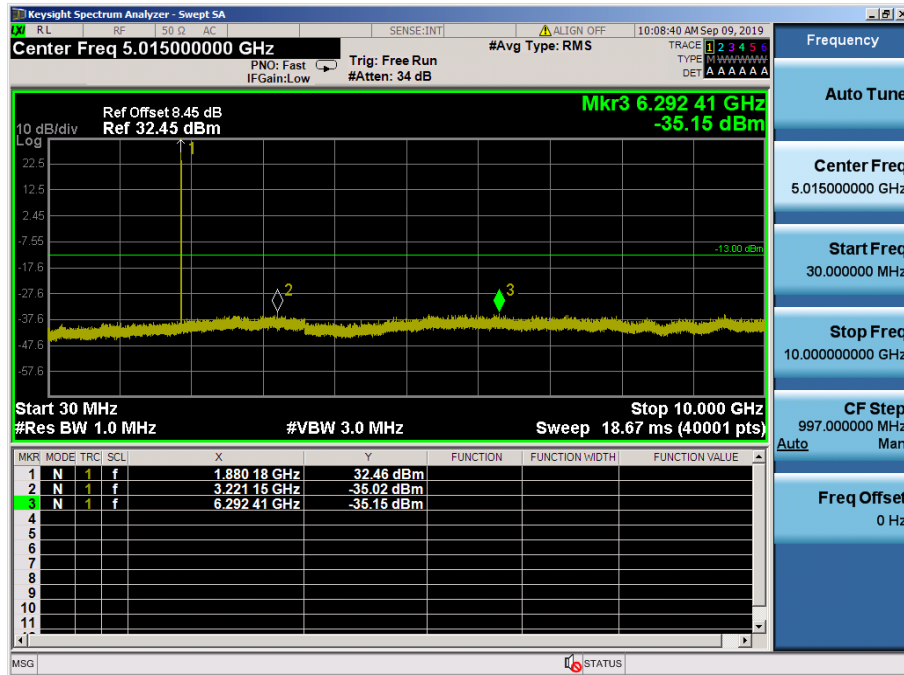
## GSM1900 &amp; Channel: 512



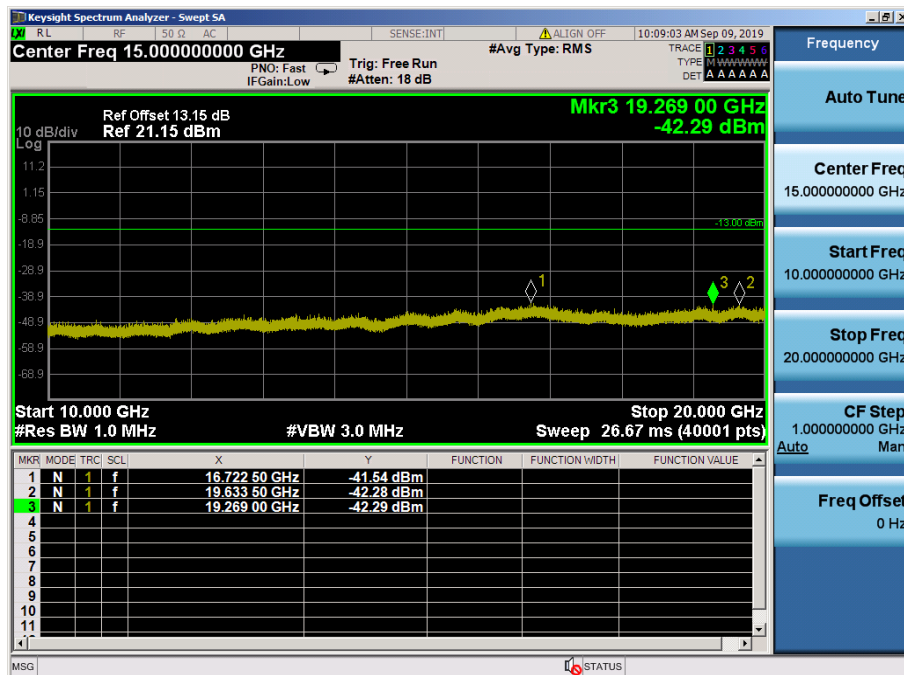
## GSM1900 &amp; Channel: 512



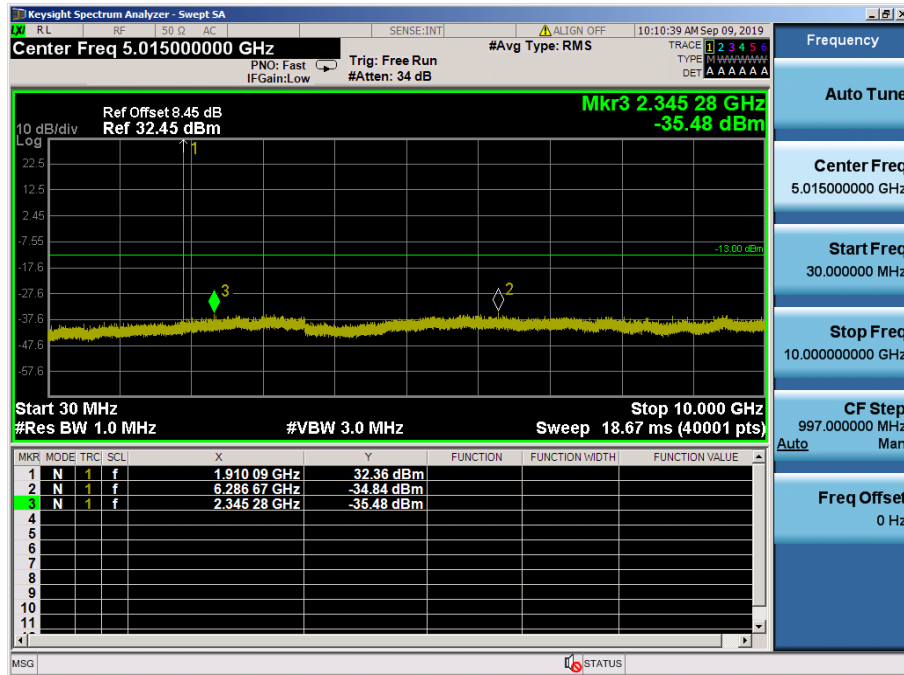
## GSM1900 & Channel: 661



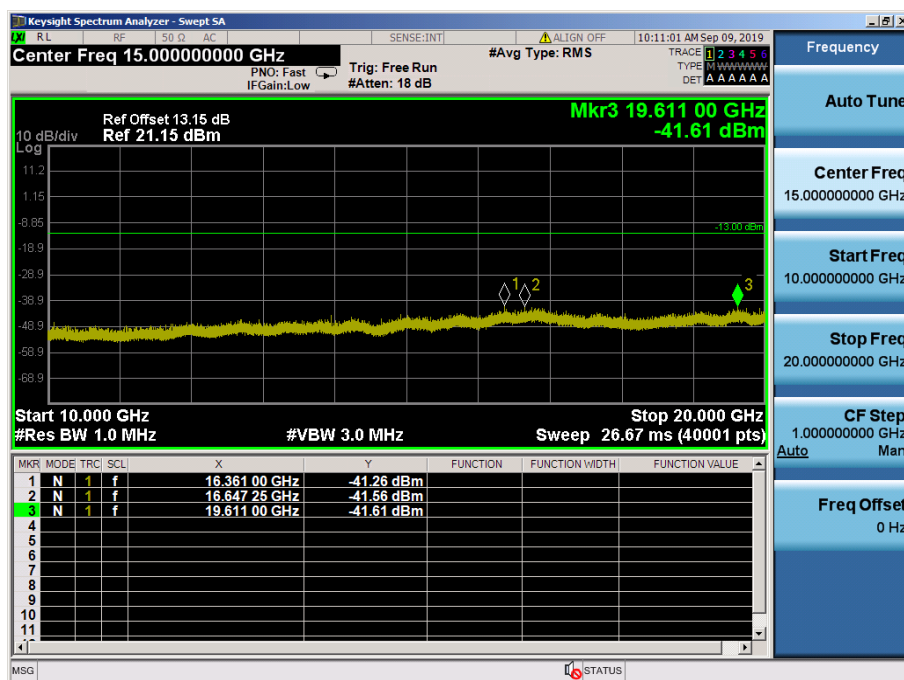
## GSM1900 & Channel: 661



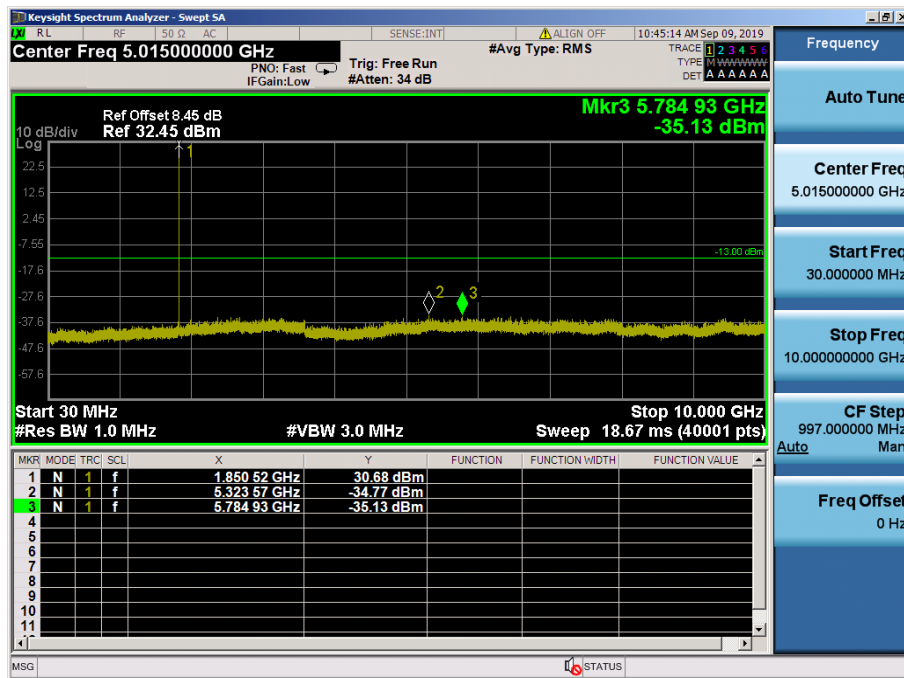
## GSM1900 & Channel: 810



## GSM1900 & Channel: 810



## EDGE1900 &amp; Channel: 512



## EDGE1900 &amp; Channel: 512

