

**ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT****INTENTIONAL RADIATOR CERTIFICATION TO  
FCC PART 24 SUBPART E REQUIREMENT**

OF

**Applicant:** Sharp Corporation, Mobile Communication B.U.  
2-13-1, Hachihonmatsu-lida, Higashi-hiroshima-shi, Hiroshima, 739-0192, Japan

**Manufacturer:** Sharp Corporation  
1 Takumi-cho, Sakai-ku, Sakai City, Osaka 590-8522, Japan

**Product Name:** Cellular Phone

**Report Number:** ER/2018/C0120

**FCC ID:** APYHRO00269

**FCC Rule Part:** 2, & 24E

**Issue Date:** Jan. 17, 2019

**Date of Test:** Oct. 25, 2018 ~ Nov. 27, 2018

**Date of EUT Received:** Oct. 25, 2018

**We hereby certify that:**

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.26-2015 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits.

The test results of this report relate only to the tested sample identified in this report.

**Tested By:**

Marcus Tseng

**Marcus Tseng / Engineer****Approved By:**

Jazz Huang

**Jazz Huang / Asst. Supervisor**

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## Revision History

| Report Number | Revision | Description                  | Effected Page | Issue Date    | Revised By |
|---------------|----------|------------------------------|---------------|---------------|------------|
| ER/2018/C0120 | Rev.00   | Initial creation of document | All           | Dec. 25, 2018 | Elle Chang |
| ER/2018/C0120 | Rev.01   | Updated applied standard     | Page 6        | Jan. 17, 2019 | Elle Chang |

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## 1. GENERAL PRODUCT INFORMATION

### 1.1. Product Description

General:

|                   |                                       |
|-------------------|---------------------------------------|
| Product Name:     | Cellular Phone                        |
| Hardware Version: | DVT                                   |
| Software Version: | N/A                                   |
| Power Supply:     | 3.8V from Rechargeable Li-ion Battery |
| IMEI:             | 004401116646155 / 004401116643319     |

### 1.2. GSM / WCDMA: Cellular Phone Standards Frequency Range

| Operating Frequency (MHz) |        |          |
|---------------------------|--------|----------|
| GSM/GPRS 1900             | 1850.2 | - 1909.8 |

| Operating Frequency (MHz) |        |          |
|---------------------------|--------|----------|
| WCDMA / HSPA+ Band II     | 1852.4 | - 1907.6 |

| LTE Band | BW (MHz) | Operation Frequency (MHz) |
|----------|----------|---------------------------|
| 2        | 1.4      | 1850.7 - 1909.3           |
|          | 3        | 1851.5 - 1908.5           |
|          | 5        | 1852.5 - 1907.5           |
|          | 10       | 1855.0 - 1905.0           |
|          | 15       | 1857.5 - 1902.5           |
|          | 20       | 1860.0 - 1900.0           |

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### 1.3. Type of Emission & Max EIRP Power Measurement Result:

|           | EIRP (dBm) |      | (W)   | Type of Emission |
|-----------|------------|------|-------|------------------|
| GSM 1900  | 29.1       | EIRP | 0.813 | 246KGXW          |
| GPRS 1900 | 30.84      | EIRP | 1.213 | 246KGXW          |

|               | EIRP (dBm) |      | (W)   | Type of Emission |
|---------------|------------|------|-------|------------------|
| WCDMA Band II | 27.68      | EIRP | 0.586 | 4M13F9W          |
| HSDPA Band II | 26.99      | EIRP | 0.500 | 4M14F9W          |
| HSUPA Band II | 25.09      | EIRP | 0.323 | 4M14F9W          |

| LTE Band | BW (MHz) | Modulation | EIRP (dBm)   |      | (W)          | Type of Emission |
|----------|----------|------------|--------------|------|--------------|------------------|
| 2        | 1.4      | QPSK       | 27.21        | EIRP | 0.526        | 1M10G7D          |
|          | 1.4      | 16QAM      | 26.58        | EIRP | 0.455        | 1M10D7W          |
|          | 3        | QPSK       | <b>27.78</b> | EIRP | <b>0.600</b> | 2M71G7D          |
|          | 3        | 16QAM      | <b>27.1</b>  | EIRP | <b>0.513</b> | 2M70D7W          |
|          | 5        | QPSK       | 27.19        | EIRP | 0.524        | 4M51G7D          |
|          | 5        | 16QAM      | 26.74        | EIRP | 0.472        | 4M51D7W          |
|          | 10       | QPSK       | 26.06        | EIRP | 0.403        | 9M01G7D          |
|          | 10       | 16QAM      | 25.83        | EIRP | 0.383        | 8M96D7W          |
|          | 15       | QPSK       | 22.97        | EIRP | 0.198        | 13M5G7D          |
|          | 15       | 16QAM      | 23.23        | EIRP | 0.210        | 13M5D7W          |
|          | 20       | QPSK       | 25.49        | EIRP | 0.354        | 17M9G7D          |
|          | 20       | 16QAM      | 23.89        | EIRP | 0.245        | 18M0D7W          |

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#### 1.4. Test Methodology of Applied Standards

CC 47 CFR Part 2, 24.

ANSI C63.26-2015

KDB971168 D01 Power Meas license Digital System v03r01

KDB941225 D01 SAR test for 3G devices v03r01 (SAR Measurement Procedures for 3G Devices, WCDMA / HSPA) was used for EUT and Base station setting.

TS 151 010-1 is used to set, and measure the output power.

Note: All test items have been performed and record as per the above standards.

#### 1.5. Test Facility

SGS Taiwan Ltd. Electronics & Communication Laboratory No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803 code 0513)

FCC Registration Numbers are: 509634 / TW0001

#### 1.6. Special Accessories

No special accessories were used during testing.

#### 1.7. Equipment Modifications

There were no modifications incorporated into the EUT.

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## 2. SYSTEM TEST CONFIGURATION

### 2.1. EUT Configuration

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

### 2.2. EUT Exercise

The EUT (Transmitter) was operated in the continuous transmission mode employed with the simulator of the Base Station that fixates at test default channels to fix the Tx frequency which was for the purpose of the measurements.

### 2.3. Test Procedure

#### 2.3.1 Conducted Measurement at Antenna Port

According to measurement procured ANSI C63.26-2015, the EUT is placed on a turn table which is 0.8 m above ground plane. A low loss of RF cable was used to connect the antenna port of EUT to measurement equipment.

#### 2.3.2 Radiated Emissions (EIRP)

According to measurement procured ANSI C63.26-2015, The EUT is a placed on as turn table, for emission measurements below 1 GHz is 0.8 m above ground plane, for emission measurements above 1 GHz, the table height shall be 1.5 m. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both Horizontal and Vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna according to the requirements in Section 8 and 13.

### 2.4. Measurement Results Explanation Example

#### For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuation factor between EUT conducted port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly EUT RF output level.

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**Note:**

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Following shows an offset computation in physical test.

|                         | RF cable loss (dB) | Attenuation factor(dB) | offset(dB) |
|-------------------------|--------------------|------------------------|------------|
| Low Band (Below 1GHz)   | 0.2                | 10                     | 10.2       |
| High Band (Above 1 GHz) | 0.5                | 10                     | 10.5       |

## 2.5. Final Amplifier Voltage and Current Information:

| Test Mode  | DC voltage (V) | DC current (mA) |
|------------|----------------|-----------------|
| GSM 1900   | 3.8            | 167             |
| WCDMA B2   |                | 168             |
| LTE Band 2 |                | 167             |

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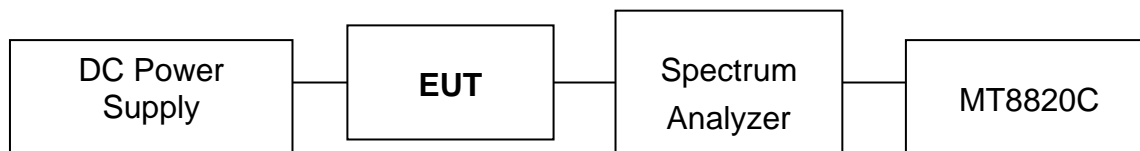
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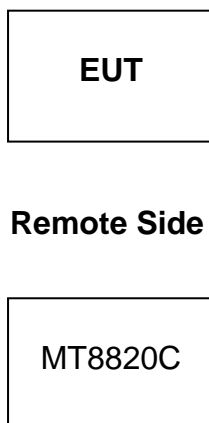


## 2.6. Configuration of Tested System

**Fig. 2-1 Configuration of Tested System (Fixed Channel-Conducted)**



**Fig. 2-2 Configuration of Tested System (Fixed Channel-Radiated)**



**Table 2-1 Equipment Used in**

| Item | Equipment                    | Mfr/Brand | Model/<br>Type No. | Series No. | Data Cable | Power Cord  |
|------|------------------------------|-----------|--------------------|------------|------------|-------------|
| 1.   | Radio Communication Analyzer | Anritsu   | MT8820C            | 6201465317 | shielded   | Un-shielded |

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### 3. SUMMARY OF TEST RESULTS

| FCC Rules                | Description Of Test   | Result    |
|--------------------------|---|-----------|
| §2.1046(a)               | RF Power Output   | Compliant |
| §2.1046(a)<br>§24.232(c) | EIRP measurement  | Compliant |
| §2.1049(h)               | 99% & 26dB Occupied Bandwidth   | Compliant |
| §2.1051<br>§24.238(a)    | Out of Band Emissions at Antenna<br>Terminals and Band Edge /<br>Emission mask requirements | Compliant |
| §2.1053<br>§24.238(a)    | Field Strength of Spurious Radiation  | Compliant |
| §24.232(d)               | Peak to Average Ratio   | Compliant |
| §2.1055(a)(1)<br>§24.235 | Frequency Stability   | Compliant |

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## 4. DESCRIPTION OF TEST MODES

### 4.1. The Worst Test Modes and Channel Details

1. The EUT has been tested under operating condition.
2. Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, X(E1)Y(E2)Z(H) axis and antenna ports. The worst case was found as listed below. Following channel(s) was (were) selected for the final test as listed below:

| BAND               | EIRP    | RADIATED EMISSION |
|--------------------|---------|-------------------|
| GSM/GPRS 1900      | E2-plan | E2-plan           |
| WCDMA/HSPA Band II | E2-plan | E2-plan           |
| LTE Band 2         | E2-plan | E2-plan           |

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# GSM/GPRS MODE

| TEST ITEM             | AVAILABLE CHANNEL | TESTED CHANNEL | MODE          |
|-----------------------|-------------------|----------------|---------------|
| EIRP                  | 512 to 810        | 512, 661, 810  | GSM/GPRS 1900 |
| FREQUENCY STABILITY   | 512 to 810        | 661            | GPRS 1900     |
| OCCUPIED BANDWIDTH    | 512 to 810        | 661            | GSM/GPRS 1900 |
| PEAK TO AVERAGE RATIO | 512 to 810        | 512, 661, 810  | GSM/GPRS 1900 |
| BAND EDGE             | 512 to 810        | 512, 810       | GSM/GPRS 1900 |
| CONDCUDED EMISSION    | 512 to 810        | 512, 661, 810  | GSM/GPRS 1900 |
| RADIATED EMISSION     | 512 to 810        | 512, 661, 810  | GPRS 1900     |

# WCDMA/HSPA MODE

| TEST ITEM             | AVAILABLE CHANNEL | TESTED CHANNEL   | MODE               |
|-----------------------|-------------------|------------------|--------------------|
| EIRP                  | 9262 to 9538      | 9262, 9400, 9583 | WCDMA/HSPA Band II |
| FREQUENCY STABILITY   | 1312 to 1513      | 1413             | WCDMA Band II      |
| OCCUPIED BANDWIDTH    | 1312 to 1513      | 1312, 1413, 1513 | WCDMA/HSPA Band II |
| PEAK TO AVERAGE RATIO | 1312 to 1513      | 1312, 1413, 1513 | WCDMA/HSPA Band II |
| BAND EDGE             | 1312 to 1513      | 1312, 1513       | WCDMA Band II      |
| CONDCUDED EMISSION    | 1312 to 1513      | 1312, 1413, 1513 | WCDMA Band II      |
| RADIATED EMISSION     | 1312 to 1513      | 1312, 1413, 1513 | WCDMA Band II      |

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## LTE Band 2 MODE

| TEST ITEM             | AVAILABLE CHANNEL | TESTED CHANNEL      | CHANNEL BANDWIDTH | MODULATION  | MODE                            |
|-----------------------|-------------------|---------------------|-------------------|-------------|---------------------------------|
| EIRP                  | 18607 to 19193    | 18607, 18900, 19193 | 1.4MHz            | QPSK, 16QAM | 1 RB/ 0,5 RB Offest             |
|                       | 18615 to 19185    | 18615, 18900, 19185 | 3MHz              | QPSK, 16QAM | 1 RB/ 0,14 RB Offest            |
|                       | 18625 to 19175    | 18625, 18900, 19175 | 5MHz              | QPSK, 16QAM | 1 RB/ 0,24 RB Offest            |
|                       | 18650 to 19150    | 18650, 18900, 19150 | 10MHz             | QPSK, 16QAM | 1 RB/ 0,49 RB Offest            |
|                       | 18675 to 19125    | 18675, 18900, 19125 | 15MHz             | QPSK, 16QAM | 1 RB/ 0,74 RB Offest            |
|                       | 18700 to 19100    | 18700, 18900, 19100 | 20MHz             | QPSK, 16QAM | 1 RB/ 0,99 RB Offest            |
| FREQUENCY STABILITY   | 18650 to 19150    | 18900               | 10MHz             | QPSK        | Full RB                         |
| OCCUPIED BAND-WIDTH   | 18607 to 19193    | 18607, 18900, 19193 | 1.4MHz            | QPSK, 16QAM | Full RB                         |
|                       | 18615 to 19185    | 18615, 18900, 19185 | 3MHz              | QPSK, 16QAM | Full RB                         |
|                       | 18625 to 19175    | 18625, 18900, 19175 | 5MHz              | QPSK, 16QAM | Full RB                         |
|                       | 18650 to 19150    | 18650, 18900, 19150 | 10MHz             | QPSK, 16QAM | Full RB                         |
|                       | 18675 to 19125    | 18675, 18900, 19125 | 15MHz             | QPSK, 16QAM | Full RB                         |
|                       | 18700 to 19100    | 18700, 18900, 19100 | 20MHz             | QPSK, 16QAM | Full RB                         |
| PEAK TO AVERAGE RATIO | 18607 to 19193    | 18607, 18900, 19193 | 1.4MHz            | 16QAM       | Full RB                         |
|                       | 18615 to 19185    | 18615, 18900, 19185 | 3MHz              | 16QAM       | Full RB                         |
|                       | 18625 to 19175    | 18625, 18900, 19175 | 5MHz              | 16QAM       | Full RB                         |
|                       | 18650 to 19150    | 18650, 18900, 19150 | 10MHz             | 16QAM       | Full RB                         |
|                       | 18675 to 19125    | 18675, 18900, 19125 | 15MHz             | 16QAM       | Full RB                         |
|                       | 18700 to 19100    | 18700, 18900, 19100 | 20MHz             | 16QAM       | Full RB                         |
| BAND EDGE             | 18607 to 19193    | 18607, 19193        | 1.4MHz            | QPSK        | 1 RB/ 0,5 RB Offes<br>Full RB   |
|                       | 18615 to 19185    | 18615, 19185        | 3MHz              | QPSK        | 1 RB/ 0,14 RB Offest<br>Full RB |
|                       | 18625 to 19175    | 18625, 19175        | 5MHz              | QPSK        | 1 RB/ 0,24 RB Offest<br>Full RB |
|                       | 18650 to 19150    | 18650, 19150        | 10MHz             | QPSK        | 1 RB/ 0,49 RB Offest<br>Full RB |
|                       | 18675 to 19125    | 18675, 19125        | 15MHz             | QPSK        | 1 RB/ 0,74 RB Offest<br>Full RB |
|                       | 18700 to 19100    | 18700, 19100        | 20MHz             | QPSK        | 1 RB/ 0,99 RB Offest<br>Full RB |
| CONDCUDED EMISSION    | 18607 to 19193    | 18607, 18900, 19193 | 1.4MHz            | QPSK        | 1 RB, 0 RB Offest               |
|                       | 18615 to 19185    | 18615, 18900, 19185 | 3MHz              | QPSK        | 1 RB, 0 RB Offest               |
|                       | 18625 to 19175    | 18625, 18900, 19175 | 5MHz              | QPSK        | 1 RB, 0 RB Offest               |
|                       | 18650 to 19150    | 18650, 18900, 19150 | 10MHz             | QPSK        | 1 RB, 0 RB Offest               |
|                       | 18675 to 19125    | 18675, 18900, 19125 | 15MHz             | QPSK        | 1 RB, 0 RB Offest               |
|                       | 18700 to 19100    | 18700, 18900, 19100 | 20MHz             | QPSK        | 1 RB, 0 RB Offest               |
| RADIATED EMISSION     | 18650 to 19150    | 18650, 18900, 19150 | 10MHz             | 16QAM       | 1 RB, 49 RB Offest              |

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## 5. MEASUREMENT UNCERTAINTY

| Test Items   | Uncertainty  |
|--|--|
| RF Power Output  | +/- 1.10 dB  |
| EIRP measurement   | Vertical Polarization = +/- 4.74dB<br>Horizontal Polarization = +/- 4.62dB |
| 99% Occupied Bandwidth                                   | +/- 5.19 Hz  |
| Out of Band Emissions at Antenna Terminals and Band Edge | +/- 0.70 dB  |
| Peak to Average Ratio                                    | +/- 0.70 dB  |
| Frequency Stability vs. Temperature                      | +/- 5.19 Hz  |
| Frequency Stability vs. Voltage                          | +/- 5.19 Hz  |
| Temperature  | +/- 0.65 °C  |
| Humidity   | +/- 4.6 %  |
| DC / AC Power Source                                     | DC= +/- 0.13%, AC= +/- 0.2%  |

### Radiated Spurious Emission:

|  |                            |
|--|----------------------------|
| Measurement uncertainty<br>(Polarization : <b>Vertical</b> ) | 9kHz – 30MHz: +/- 2.87 dB  |
|  | 30MHz - 180MHz: +/- 3.37dB |
|  | 180MHz -417MHz: +/- 3.19dB |
|  | 0.417GHz-1GHz: +/- 3.19dB  |
|  | 1GHz - 18GHz: +/- 4.04dB   |
|  | 18GHz - 40GHz: +/- 4.04dB  |

|  |                            |
|--|----------------------------|
| Measurement uncertainty<br>(Polarization : <b>Horizontal</b> ) | 9kHz – 30MHz: +/- 2.87 dB  |
|  | 30MHz - 167MHz: +/- 4.22dB |
|  | 167MHz -500MHz: +/- 3.44dB |
|  | 0.5GHz-1GHz: +/- 3.39dB    |
|  | 1GHz - 18GHz: +/- 4.08dB   |
|  | 18GHz - 40GHz: +/- 4.08dB  |

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

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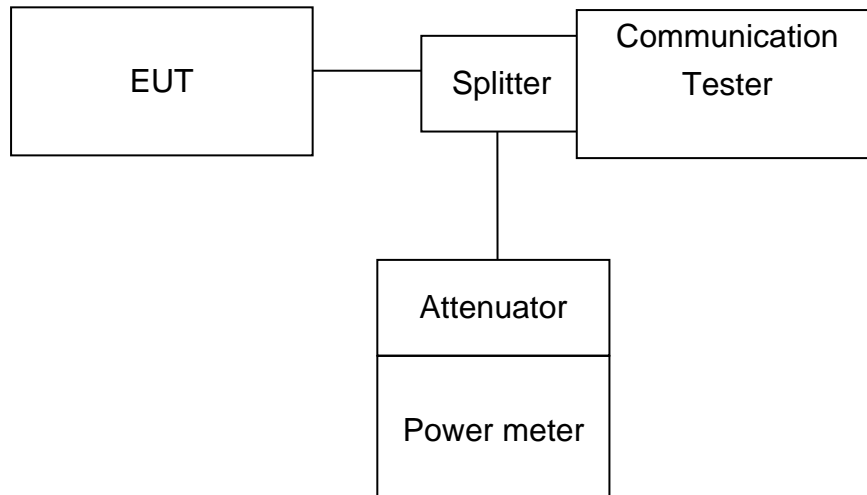
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## 6. RF CONDUCTED OUTPUT POWER MEASUREMENT

### 6.1. Standard Applicable

A base station simulator was used to establish communication with the EUT. Its parameters were set to transmit the maximum power on the EUT. The measured power in the radio frequency on the transmitter output terminals.

### 6.2. Test Set-up



**Note:** Measurement setup for testing on Antenna connector

### 6.3. Measurement Procedure

The transmitter output was connected to a calibrated attenuator, the other end of which was connected to a power meter. Transmitter output was read off the power meter in dBm. The power output at the transmitter antenna port was determined by adding the value of the attenuator to the power meter reading. TS 151 010-1 is reference to conduct the test measurement of output power.

The Procedure of KDB941225 (SAR Measurement Procedures for 3G devices, (WCDMA/HSPA) was used for EUT and Base station setting. RMC 12.2kps is used for this testing, and KDB 971168 D01 Power Meas License Digital System as the supplemental test methodology to adjust the proper setting obtaining the measurement results

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#### 6.4. Measurement Equipment Used

| EQUIPMENT TYPE               | MFR           | MODEL NUMBER | SERIAL NUMBER | LAST CAL.  | CAL DUE.   |
|------------------------------|---------------|--------------|---------------|------------|------------|
| Radio Communication Analyser | Anritsu       | MT8820C      | 6200995019    | 04/05/2018 | 04/04/2019 |
| DC Power Supply              | Agilent       | E3640A       | MY52410006    | 11/28/2017 | 11/27/2018 |
| Attenuator                   | Mini-Circuit  | BW-S10W2+    | 2             | 01/02/2018 | 01/01/2019 |
| DC Block                     | Mini-Circuits | BLK-18-S+    | 1             | 01/02/2018 | 01/01/2019 |

#### 6.5. Measurement Result

##### RF Conducted Output Power

##### GSM/GPRS/EDGE (GMSK; 8-PSK) Result:

| EUT Mode | Freq. (MHz) | CH  | Conducted Avg. Power (dBm) | Limit (dBm) | Margin (dB) |
|----------|-------------|-----|----------------------------|-------------|-------------|
| GSM 1900 | 1850.2      | 512 | 28.94                      | 33.00       | -4.06       |
|          | 1880.0      | 661 | 28.74                      | 33.00       | -4.26       |
|          | 1909.8      | 810 | 28.75                      | 33.00       | -4.25       |

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| EUT Mode  | Frequency (MHz) | CH  | Average Burst Power (1DN 1UP) Class 8 (dBm) | Average Burst Power (1DN 2UP) Class 10 (dBm) | Average Burst Power (1DN 3UP) Class 12 (dBm) | Average Burst Power (1DN 4UP) Class 12 (dBm) |
|-----------|-----------------|-----|---|--|--|--|
| GPRS 1900 | 1850.2          | 512 | 28.94                                       | 26.55  | 24.95  | 23.77  |
|           | 1880.0          | 661 | 28.74                                       | 26.72  | 25.01  | 23.83  |
|           | 1909.8          | 810 | 28.75                                       | 26.64  | 24.72  | 23.61  |

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## WCDMA MODE:

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 specification. The EUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7). RMC 12.2kps is used for this testing.

## Results:

### WCDMA/HSUPA/HSDPA Band II Result:

| EUT Mode | Freq. (MHz) | CH   | Conducted Avg. Power (dBm) |
|----------|-------------|------|----------------------------|
| WCDMA    | 1852.4      | 9262 | 22.29                      |
|          | 1880.0      | 9400 | 22.08                      |
|          | 1907.6      | 9538 | 21.70                      |
| HSDPA    | 1852.4      | 9262 | 21.20                      |
|          | 1880.0      | 9400 | 21.11                      |
|          | 1907.6      | 9538 | 20.81                      |
| HSUPA    | 1852.4      | 9262 | 21.05                      |
|          | 1880.0      | 9400 | 20.73                      |
|          | 1907.6      | 9538 | 20.75                      |

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**LTE Result:**  
**FDD Band 2**

| BW(MHz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) |       |
|---------|------------|---------|-----------|-----------------|---------|-----------------------|-------|
| 1.4     | QPSK       | 1 RB    | 0         | 1850.7          | 18607   | 22.19                 |       |
|         |            |         |           | 1880            | 18900   | 21.92                 |       |
|         |            |         |           | 1909.3          | 19193   | 21.95                 |       |
|         |            |         | 2         | 1850.7          | 18607   | 22.23                 |       |
|         |            |         |           | 1880            | 18900   | 21.99                 |       |
|         |            |         |           | 1909.3          | 19193   | 21.90                 |       |
|         |            |         | 5         | 1850.7          | 18607   | 22.15                 |       |
|         |            |         |           | 1880            | 18900   | 22.05                 |       |
|         |            |         |           | 1909.3          | 19193   | 21.83                 |       |
|         |            | 3 RB    | 0         | 1850.7          | 18607   | 22.16                 |       |
|         |            |         |           | 1880            | 18900   | 22.12                 |       |
|         |            |         |           | 1909.3          | 19193   | 22.07                 |       |
|         |            |         | 2         | 1850.7          | 18607   | 22.18                 |       |
|         |            |         |           | 1880            | 18900   | 22.16                 |       |
|         |            |         |           | 1909.3          | 19193   | 22.00                 |       |
|         |            |         | 3         | 1850.7          | 18607   | 22.12                 |       |
|         |            |         |           | 1880            | 18900   | 22.09                 |       |
|         |            |         |           | 1909.3          | 19193   | 21.97                 |       |
|         |            | 6RB     |           |                 | 1850.7  | 18607                 | 21.13 |
|         |            |         |           |                 | 1880    | 18900                 | 20.94 |
|         |            |         |           |                 | 1909.3  | 19193                 | 20.91 |
|         | 16-QAM     | 1 RB    | 0         | 1850.7          | 18607   | 21.04                 |       |
|         |            |         |           | 1880            | 18900   | 20.97                 |       |
|         |            |         |           | 1909.3          | 19193   | 21.00                 |       |
|         |            |         | 2         | 1850.7          | 18607   | 21.09                 |       |
|         |            |         |           | 1880            | 18900   | 21.03                 |       |
|         |            |         |           | 1909.3          | 19193   | 21.13                 |       |
|         |            |         | 5         | 1850.7          | 18607   | 21.25                 |       |
|         |            |         |           | 1880            | 18900   | 21.06                 |       |
|         |            |         |           | 1909.3          | 19193   | 20.47                 |       |
|         |            | 3 RB    | 0         | 1850.7          | 18607   | 21.24                 |       |
|         |            |         |           | 1880            | 18900   | 20.92                 |       |
|         |            |         |           | 1909.3          | 19193   | 20.65                 |       |
|         |            |         | 2         | 1850.7          | 18607   | 21.28                 |       |
|         |            |         |           | 1880            | 18900   | 20.98                 |       |
|         |            |         |           | 1909.3          | 19193   | 20.70                 |       |
|         |            |         | 3         | 1850.7          | 18607   | 21.05                 |       |
|         |            |         |           | 1880            | 18900   | 20.94                 |       |
|         |            |         |           | 1909.3          | 19193   | 20.67                 |       |
|         |            | 6RB     |           |                 | 1850.7  | 18607                 | 20.21 |
|         |            |         |           |                 | 1880    | 18900                 | 19.92 |
|         |            |         |           |                 | 1909.3  | 19193                 | 19.75 |

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| BW(MHz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) |       |
|---------|------------|---------|-----------|-----------------|---------|-----------------------|-------|
| 3       | QPSK       | 1 RB    | 0         | 1851.5          | 18615   | 21.99                 |       |
|         |            |         |           | 1880            | 18900   | 21.94                 |       |
|         |            |         |           | 1908.5          | 19185   | 21.70                 |       |
|         |            |         | 7         | 1851.5          | 18615   | 22.02                 |       |
|         |            |         |           | 1880            | 18900   | 22.03                 |       |
|         |            |         |           | 1908.5          | 19185   | 21.91                 |       |
|         |            |         | 14        | 1851.5          | 18615   | 21.96                 |       |
|         |            |         |           | 1880            | 18900   | 22.08                 |       |
|         |            |         |           | 1908.5          | 19185   | 21.82                 |       |
|         |            | 8 RB    | 0         | 1851.5          | 18615   | 21.23                 |       |
|         |            |         |           | 1880            | 18900   | 21.01                 |       |
|         |            |         |           | 1908.5          | 19185   | 21.08                 |       |
|         |            |         | 4         | 1851.5          | 18615   | 21.26                 |       |
|         |            |         |           | 1880            | 18900   | 21.00                 |       |
|         |            |         |           | 1908.5          | 19185   | 20.95                 |       |
|         |            |         | 7         | 1851.5          | 18615   | 21.22                 |       |
|         |            |         |           | 1880            | 18900   | 21.06                 |       |
|         |            |         |           | 1908.5          | 19185   | 20.91                 |       |
|         |            | 15RB    |           |                 | 1851.5  | 18615                 | 21.23 |
|         |            |         |           |                 | 1880    | 18900                 | 20.96 |
|         |            |         |           |                 | 1908.5  | 19185                 | 20.91 |
|         | 16-QAM     | 1 RB    | 0         | 1851.5          | 18615   | 21.21                 |       |
|         |            |         |           | 1880            | 18900   | 20.51                 |       |
|         |            |         |           | 1908.5          | 19185   | 20.82                 |       |
|         |            |         | 7         | 1851.5          | 18615   | 21.47                 |       |
|         |            |         |           | 1880            | 18900   | 20.92                 |       |
|         |            |         |           | 1908.5          | 19185   | 20.72                 |       |
|         |            |         | 14        | 1851.5          | 18615   | 21.39                 |       |
|         |            |         |           | 1880            | 18900   | 20.73                 |       |
|         |            |         |           | 1908.5          | 19185   | 20.49                 |       |
|         |            |         | 8 RB      | 0               | 1851.5  | 18615                 | 20.22 |
|         |            |         |           |                 | 1880    | 18900                 | 19.93 |
|         |            |         |           |                 | 1908.5  | 19185                 | 19.79 |
|         |            |         |           | 4               | 1851.5  | 18615                 | 20.25 |
|         |            |         |           |                 | 1880    | 18900                 | 19.99 |
|         |            |         |           |                 | 1908.5  | 19185                 | 19.60 |
|         |            | 7       |           | 1851.5          | 18615   | 20.30                 |       |
|         |            |         |           | 1880            | 18900   | 19.98                 |       |
|         |            |         |           | 1908.5          | 19185   | 19.57                 |       |
|         |            | 15RB    |           |                 | 1851.5  | 18615                 | 20.21 |
|         |            |         |           |                 | 1880    | 18900                 | 20.13 |
|         |            |         |           |                 | 1908.5  | 19185                 | 19.93 |

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| BW(MHz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) |       |
|---------|------------|---------|-----------|-----------------|---------|-----------------------|-------|
| 5       | QPSK       | 1 RB    | 0         | 1852.5          | 18625   | 22.04                 |       |
|         |            |         |           | 1880            | 18900   | 21.89                 |       |
|         |            |         |           | 1907.5          | 19175   | 21.81                 |       |
|         |            |         | 12        | 1852.5          | 18625   | 22.17                 |       |
|         |            |         |           | 1880            | 18900   | 22.00                 |       |
|         |            |         |           | 1907.5          | 19175   | 21.89                 |       |
|         |            |         | 24        | 1852.5          | 18625   | 22.04                 |       |
|         |            |         |           | 1880            | 18900   | 21.66                 |       |
|         |            |         |           | 1907.5          | 19175   | 21.62                 |       |
|         |            | 12 RB   | 0         | 1852.5          | 18625   | 21.23                 |       |
|         |            |         |           | 1880            | 18900   | 21.02                 |       |
|         |            |         |           | 1907.5          | 19175   | 20.98                 |       |
|         |            |         | 6         | 1852.5          | 18625   | 21.27                 |       |
|         |            |         |           | 1880            | 18900   | 21.02                 |       |
|         |            |         |           | 1907.5          | 19175   | 20.89                 |       |
|         |            |         | 13        | 1852.5          | 18625   | 21.21                 |       |
|         |            |         |           | 1880            | 18900   | 21.08                 |       |
|         |            |         |           | 1907.5          | 19175   | 20.82                 |       |
|         |            | 25RB    |           |                 | 1852.5  | 18625                 | 21.23 |
|         |            |         |           |                 | 1880    | 18900                 | 21.06 |
|         |            |         |           |                 | 1907.5  | 19175                 | 20.91 |
|         | 16-QAM     | 1 RB    | 0         | 1852.5          | 18625   | 21.27                 |       |
|         |            |         |           | 1880            | 18900   | 21.12                 |       |
|         |            |         |           | 1907.5          | 19175   | 20.44                 |       |
|         |            |         | 12        | 1852.5          | 18625   | 21.43                 |       |
|         |            |         |           | 1880            | 18900   | 21.16                 |       |
|         |            |         |           | 1907.5          | 19175   | 20.74                 |       |
|         |            |         | 24        | 1852.5          | 18625   | 21.18                 |       |
|         |            |         |           | 1880            | 18900   | 21.09                 |       |
|         |            |         |           | 1907.5          | 19175   | 20.54                 |       |
|         |            |         | 12 RB     | 0               | 1852.5  | 18625                 | 20.22 |
|         |            |         |           |                 | 1880    | 18900                 | 19.91 |
|         |            |         |           |                 | 1907.5  | 19175                 | 19.69 |
|         |            |         |           | 6               | 1852.5  | 18625                 | 20.35 |
|         |            |         |           |                 | 1880    | 18900                 | 19.99 |
|         |            |         |           |                 | 1907.5  | 19175                 | 19.71 |
|         |            |         |           | 13              | 1852.5  | 18625                 | 20.21 |
|         |            |         |           |                 | 1880    | 18900                 | 19.98 |
|         |            |         |           |                 | 1907.5  | 19175                 | 19.83 |
|         |            | 25RB    |           |                 | 1852.5  | 18625                 | 20.28 |
|         |            |         |           |                 | 1880    | 18900                 | 20.01 |
|         |            |         |           |                 | 1907.5  | 19175                 | 19.97 |

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| BW(MHz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) |       |
|---------|------------|---------|-----------|-----------------|---------|-----------------------|-------|
| 10      | QPSK       | 1 RB    | 0         | 1855            | 18650   | 21.96                 |       |
|         |            |         |           | 1880            | 18900   | 21.90                 |       |
|         |            |         |           | 1905            | 19150   | 21.69                 |       |
|         |            |         | 25        | 1855            | 18650   | 22.10                 |       |
|         |            |         |           | 1880            | 18900   | 22.04                 |       |
|         |            |         |           | 1905            | 19150   | 21.93                 |       |
|         |            |         | 49        | 1855            | 18650   | 22.05                 |       |
|         |            |         |           | 1880            | 18900   | 21.71                 |       |
|         |            |         |           | 1905            | 19150   | 21.74                 |       |
|         |            | 25 RB   | 0         | 1855            | 18650   | 21.25                 |       |
|         |            |         |           | 1880            | 18900   | 21.14                 |       |
|         |            |         |           | 1905            | 19150   | 20.87                 |       |
|         |            |         | 12        | 1855            | 18650   | 21.20                 |       |
|         |            |         |           | 1880            | 18900   | 21.13                 |       |
|         |            |         |           | 1905            | 19150   | 20.95                 |       |
|         |            |         | 25        | 1855            | 18650   | 21.13                 |       |
|         |            |         |           | 1880            | 18900   | 21.15                 |       |
|         |            |         |           | 1905            | 19150   | 20.77                 |       |
|         |            | 50RB    |           |                 | 1855    | 18650                 | 21.15 |
|         |            |         |           |                 | 1880    | 18900                 | 21.11 |
|         |            |         |           |                 | 1905    | 19150                 | 20.84 |
|         |            | 16-QAM  | 1 RB      | 0               | 1855    | 18650                 | 20.85 |
|         |            |         |           |                 | 1880    | 18900                 | 20.67 |
|         |            |         |           |                 | 1905    | 19150                 | 20.58 |
|         | 25         |         |           | 1855            | 18650   | 20.89                 |       |
|         |            |         |           | 1880            | 18900   | 21.09                 |       |
|         |            |         |           | 1905            | 19150   | 20.99                 |       |
|         | 49         |         |           | 1855            | 18650   | 20.57                 |       |
|         |            |         |           | 1880            | 18900   | 20.53                 |       |
|         |            |         |           | 1905            | 19150   | 20.51                 |       |
|         | 25 RB      |         |           | 0               | 1855    | 18650                 | 20.31 |
|         |            |         |           |                 | 1880    | 18900                 | 20.32 |
|         |            |         |           |                 | 1905    | 19150                 | 19.92 |
|         |            |         | 12        | 1855            | 18650   | 20.24                 |       |
|         |            |         |           | 1880            | 18900   | 20.18                 |       |
|         |            |         |           | 1905            | 19150   | 19.99                 |       |
|         |            |         | 25        | 1855            | 18650   | 20.36                 |       |
|         |            |         |           | 1880            | 18900   | 20.18                 |       |
|         |            |         |           | 1905            | 19150   | 19.73                 |       |
|         | 50RB       |         |           | 1855            | 18650   | 20.34                 |       |
|         |            |         |           | 1880            | 18900   | 20.11                 |       |
|         |            |         |           | 1905            | 19150   | 19.74                 |       |

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| BW(MHz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) |       |
|---------|------------|---------|-----------|-----------------|---------|-----------------------|-------|
| 15      | QPSK       | 1 RB    | 0         | 1857.5          | 18675   | 22.09                 |       |
|         |            |         |           | 1880            | 18900   | 21.96                 |       |
|         |            |         |           | 1902.5          | 19125   | 21.90                 |       |
|         |            |         | 36        | 1857.5          | 18675   | 22.10                 |       |
|         |            |         |           | 1880            | 18900   | 21.84                 |       |
|         |            |         |           | 1902.5          | 19125   | 21.88                 |       |
|         |            |         | 74        | 1857.5          | 18675   | 22.12                 |       |
|         |            |         |           | 1880            | 18900   | 21.84                 |       |
|         |            |         |           | 1902.5          | 19125   | 21.66                 |       |
|         |            | 36 RB   | 0         | 1857.5          | 18675   | 21.19                 |       |
|         |            |         |           | 1880            | 18900   | 21.14                 |       |
|         |            |         |           | 1902.5          | 19125   | 20.88                 |       |
|         |            |         | 18        | 1857.5          | 18675   | 21.27                 |       |
|         |            |         |           | 1880            | 18900   | 21.12                 |       |
|         |            |         |           | 1902.5          | 19125   | 20.95                 |       |
|         |            |         | 37        | 1857.5          | 18675   | 21.27                 |       |
|         |            |         |           | 1880            | 18900   | 21.05                 |       |
|         |            |         |           | 1902.5          | 19125   | 20.95                 |       |
|         |            | 75RB    |           |                 | 1857.5  | 18675                 | 21.08 |
|         |            |         |           |                 | 1880    | 18900                 | 21.09 |
|         |            |         |           |                 | 1902.5  | 19125                 | 20.87 |
|         | 16-QAM     | 1 RB    | 0         | 1857.5          | 18675   | 20.76                 |       |
|         |            |         |           | 1880            | 18900   | 20.73                 |       |
|         |            |         |           | 1902.5          | 19125   | 20.47                 |       |
|         |            |         | 36        | 1857.5          | 18675   | 21.37                 |       |
|         |            |         |           | 1880            | 18900   | 21.11                 |       |
|         |            |         |           | 1902.5          | 19125   | 21.11                 |       |
|         |            |         | 74        | 1857.5          | 18675   | 20.83                 |       |
|         |            |         |           | 1880            | 18900   | 20.39                 |       |
|         |            |         |           | 1902.5          | 19125   | 20.47                 |       |
|         |            | 36 RB   | 0         | 1857.5          | 18675   | 20.22                 |       |
|         |            |         |           | 1880            | 18900   | 20.07                 |       |
|         |            |         |           | 1902.5          | 19125   | 19.72                 |       |
|         |            |         | 18        | 1857.5          | 18675   | 20.29                 |       |
|         |            |         |           | 1880            | 18900   | 20.05                 |       |
|         |            |         |           | 1902.5          | 19125   | 19.77                 |       |
|         |            |         | 37        | 1857.5          | 18675   | 20.29                 |       |
|         |            |         |           | 1880            | 18900   | 20.07                 |       |
|         |            |         |           | 1902.5          | 19125   | 19.78                 |       |
|         |            | 75RB    |           |                 | 1857.5  | 18675                 | 20.14 |
|         |            |         |           |                 | 1880    | 18900                 | 20.05 |
|         |            |         |           |                 | 1902.5  | 19125                 | 19.84 |

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| BW(MHz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) |       |
|---------|------------|---------|-----------|-----------------|---------|-----------------------|-------|
| 20      | QPSK       | 1 RB    | 0         | 1860            | 18700   | 21.91                 |       |
|         |            |         |           | 1880            | 18900   | 21.83                 |       |
|         |            |         |           | 1900            | 19100   | 21.48                 |       |
|         |            |         | 50        | 1860            | 18700   | 22.34                 |       |
|         |            |         |           | 1880            | 18900   | 22.13                 |       |
|         |            |         |           | 1900            | 19100   | 21.92                 |       |
|         |            |         | 99        | 1860            | 18700   | 22.06                 |       |
|         |            |         |           | 1880            | 18900   | 21.61                 |       |
|         |            |         |           | 1900            | 19100   | 21.51                 |       |
|         |            | 50 RB   | 0         | 1860            | 18700   | 21.19                 |       |
|         |            |         |           | 1880            | 18900   | 21.15                 |       |
|         |            |         |           | 1900            | 19100   | 20.94                 |       |
|         |            |         | 25        | 1860            | 18700   | 21.24                 |       |
|         |            |         |           | 1880            | 18900   | 21.14                 |       |
|         |            |         |           | 1900            | 19100   | 20.96                 |       |
|         |            |         | 50        | 1860            | 18700   | 21.24                 |       |
|         |            |         |           | 1880            | 18900   | 21.00                 |       |
|         |            |         |           | 1900            | 19100   | 20.83                 |       |
|         |            | 100RB   |           |                 | 1860    | 18700                 | 21.23 |
|         |            |         |           |                 | 1880    | 18900                 | 21.17 |
|         |            |         |           |                 | 1900    | 19100                 | 20.84 |
|         | 16-QAM     | 1 RB    | 0         | 1860            | 18700   | 20.35                 |       |
|         |            |         |           | 1880            | 18900   | 20.67                 |       |
|         |            |         |           | 1900            | 19100   | 20.39                 |       |
|         |            |         | 50        | 1860            | 18700   | 21.55                 |       |
|         |            |         |           | 1880            | 18900   | 20.87                 |       |
|         |            |         |           | 1900            | 19100   | 21.01                 |       |
|         |            |         | 99        | 1860            | 18700   | 20.31                 |       |
|         |            |         |           | 1880            | 18900   | 20.34                 |       |
|         |            |         |           | 1900            | 19100   | 20.38                 |       |
|         |            | 50 RB   | 0         | 1860            | 18700   | 20.36                 |       |
|         |            |         |           | 1880            | 18900   | 20.21                 |       |
|         |            |         |           | 1900            | 19100   | 19.79                 |       |
|         |            |         | 25        | 1860            | 18700   | 20.42                 |       |
|         |            |         |           | 1880            | 18900   | 20.22                 |       |
|         |            |         |           | 1900            | 19100   | 19.83                 |       |
|         |            |         | 50        | 1860            | 18700   | 20.32                 |       |
|         |            |         |           | 1880            | 18900   | 20.07                 |       |
|         |            |         |           | 1900            | 19100   | 19.81                 |       |
|         |            | 100RB   |           |                 | 1860    | 18700                 | 20.30 |
|         |            |         |           |                 | 1880    | 18900                 | 20.24 |
|         |            |         |           |                 | 1900    | 19100                 | 19.71 |

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## HSDPA Release 6 MODE:

The following 4 Sub-Tests were completed according to the test requirements outlined in section 5.2A of the 3GPP TS34.121-1 specification. All TX RMS power requirements for Power Class 3 were met according to table 5.2AA.5 and 5.2B.5 All UE channels and power ratio's are set according to table C10.1.4 & C11.1.3 in the 3GPP TS34.121-1 RMC 12.2kps is used for this testing.

## HSDPA SUB-TEST Setting

Table C.10.1.4:  $\beta$  values for transmitter characteristics tests with HS-DPCCH(FOR HSDPA)

| Sub-test | $\beta_c$         | $\beta_d$         | $\beta_d$<br>(SF) | $\beta_c/\beta_d$ | $\beta_{HS}$<br>(Note 1,<br>Note 2) | CM (dB)<br>(Note 3) | MPR<br>(dB)<br>(Note 3) | RMC<br>(Kbps) |
|----------|-------------------|-------------------|-------------------|-------------------|-------------------------------------|---------------------|-------------------------|---------------|
| 1        | 2/15              | 15/15             | 64                | 2/15              | 4/15                                | 0.0                 | 0.0                     | 12.2          |
| 2        | 12/15<br>(Note 4) | 15/15<br>(Note 4) | 64                | 12/15<br>(Note 4) | 24/15                               | 1.0                 | 0.0                     | 12.2          |
| 3        | 15/15             | 8/15              | 64                | 15/8              | 30/15                               | 1.5                 | 0.5                     | 12.2          |
| 4        | 15/15             | 4/15              | 64                | 15/4              | 30/15                               | 1.5                 | 0.5                     | 12.2          |

**Note:** The recommended HSDPA MPRs are implemented as per following sub-tests.

## Results:

| Mode     | Sub test | Avg. Power (dBm) |         |         |
|----------|----------|------------------|---------|---------|
|          |          | Channel          |         |         |
|          |          | 9262.00          | 9400.00 | 9538.00 |
| HSDPA II | 1        | 21.20            | 21.11   | 20.81   |
|          | 2        | 20.75            | 20.57   | 20.28   |
|          | 3        | 20.78            | 20.61   | 20.29   |
|          | 4        | 20.78            | 20.62   | 20.29   |

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## HSPA (HSDPA & HSUPA) Release 6 MODE

The following 5 Sub-Tests were completed according to the test requirements outlined in section 5.2A of the 3GPP TS34.121-1 specification. All TX RMS power requirements for Power Class 3 were met according to table 5.2AA.5 and 5.2B.5 All UE channels and power ratio's are set according to table C11.1.3 in the 3GPP TS34.121-1 RMC 12.2kps is used for this testing

### HSPA SUB-TEST Setting

Table C.11.1.3:  $\beta$  values for transmitter characteristics tests with HS-DPCCH and E-DCH(FOR HSUPA)

| Sub-test | $\beta_c$      | $\beta_d$      | $\beta_d$ (SF) | $\beta_c/\beta_d$ | $\beta_{HS}$ | $\beta_{ec}$ | $\beta_{ed}$                                   | $\beta_{ed}$ (SF) | $\beta_{ed}$ (Code s) | CM (dB) | MPR (dB) | AG Index | E-TFCI | RMC (Kbps) |
|----------|----------------|----------------|----------------|-------------------|--------------|--------------|--|-------------------|-----------------------|---------|----------|----------|--------|------------|
| 1        | 11/15 (Note 3) | 15/15 (Note 3) | 64             | 11/15 (Note 3)    | 22/15        | 209/225      | 1309/225                                       | 4                 | 1                     | 1.0     | 0.0      | 20       | 75     | 12.2       |
| 2        | 6/15           | 15/15          | 64             | 6/15              | 12/15        | 12/15        | 94/75  | 4                 | 1                     | 3.0     | 2.0      | 12       | 67     | 12.2       |
| 3        | 15/15          | 9/15           | 64             | 15/9              | 30/15        | 30/15        | $\beta_{ed1}$ : 47/15<br>$\beta_{ed2}$ : 47/15 | 4<br>4            | 2                     | 2.0     | 1.0      | 15       | 92     | 12.2       |
| 4        | 2/15           | 15/15          | 64             | 2/15              | 4/15         | 2/15         | 56/75  | 4                 | 1                     | 3.0     | 2.0      | 17       | 71     | 12.2       |
| 5        | 15/15 (Note 4) | 15/15 (Note 4) | 64             | 15/15 (Note 4)    | 30/15        | 24/15        | 134/15   | 4                 | 1                     | 1.0     | 0.0      | 21       | 81     | 12.2       |

**Note: The recommended HSUPA MPRs are implemented as per following sub-tests.**

### Results:

| Mode     | Sub test | Avg. Power (dBm) |         |         |
|----------|----------|------------------|---------|---------|
|          |          | Channel          |         |         |
|          |          | 9262.00          | 9400.00 | 9538.00 |
| HSUPA II | 1        | 21.05            | 20.73   | 20.75   |
|          | 2        | 19.62            | 19.59   | 19.20   |
|          | 3        | 19.18            | 19.14   | 19.17   |
|          | 4        | 19.97            | 20.03   | 19.78   |
|          | 5        | 21.10            | 21.00   | 20.90   |

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## Minimum Communications Power Measurement

### PCS 1900 band

| PCL                | 0     | 1     | 2     | 3     | 4     | 5     | 6    | 7     | 8     |
|--------------------|-------|-------|-------|-------|-------|-------|------|-------|-------|
| Output power (dBm) | 28.56 | 26.69 | 25.09 | 23.11 | 21.16 | 19.28 | 17.2 | 15.07 | 13.12 |

| PCL                | 9     | 10   | 11   | 12   | 13   | 14   | 15    |
|--------------------|-------|------|------|------|------|------|-------|
| Output power (dBm) | 11.18 | 9.03 | 7.06 | 5.11 | 3.04 | 1.14 | -0.71 |

Note: The EUT output power was controlled by simulator. Set Communication Tester [MT8820C](#) PCL as above, and get the mobile phone output power reading.

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## 7. EQUIVALENT ISOTROPIC RADIATED POWER MEASUREMENT

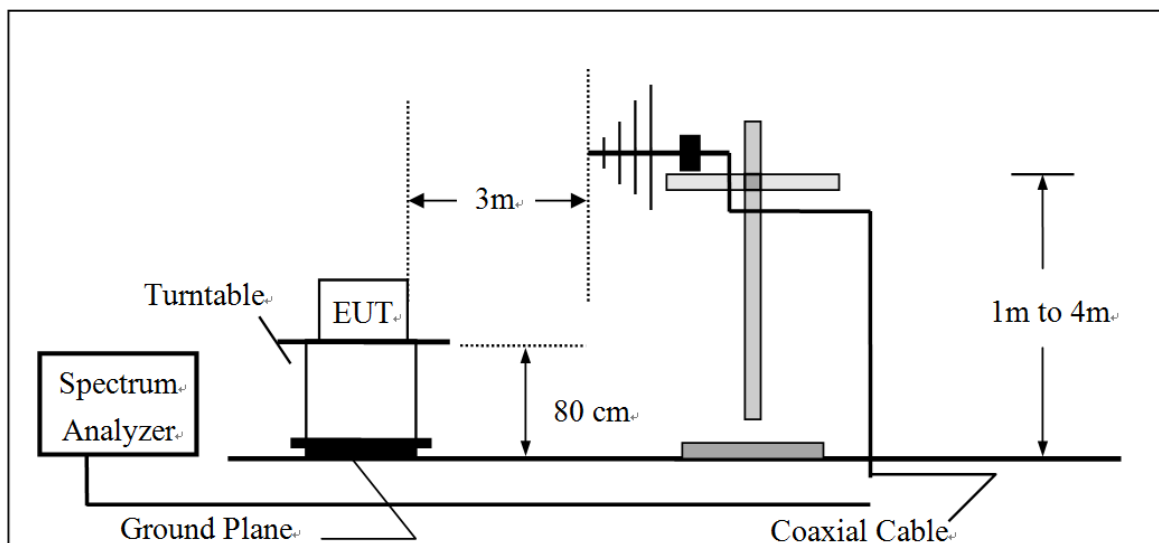
### 7.1. Standard Applicable

According to FCC §2.1046

FCC 24.232(b) Mobile and portable stations are limited to 2W EIRP.

### 7.2. Test SET-UP

(A) Radiated Power Test Set-Up, Frequency Below 1000MHz



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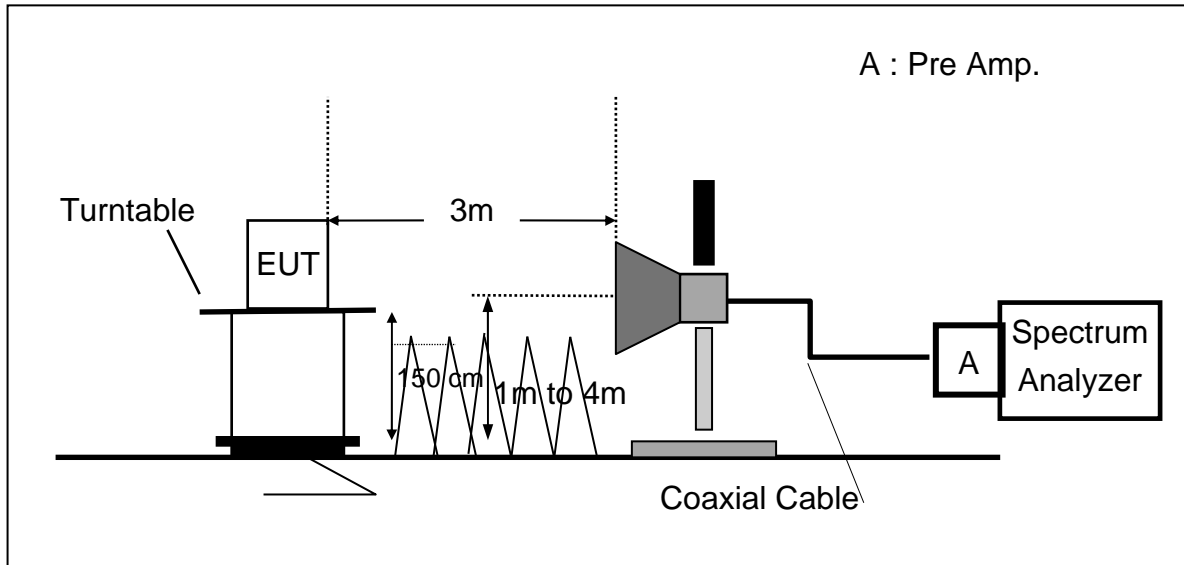
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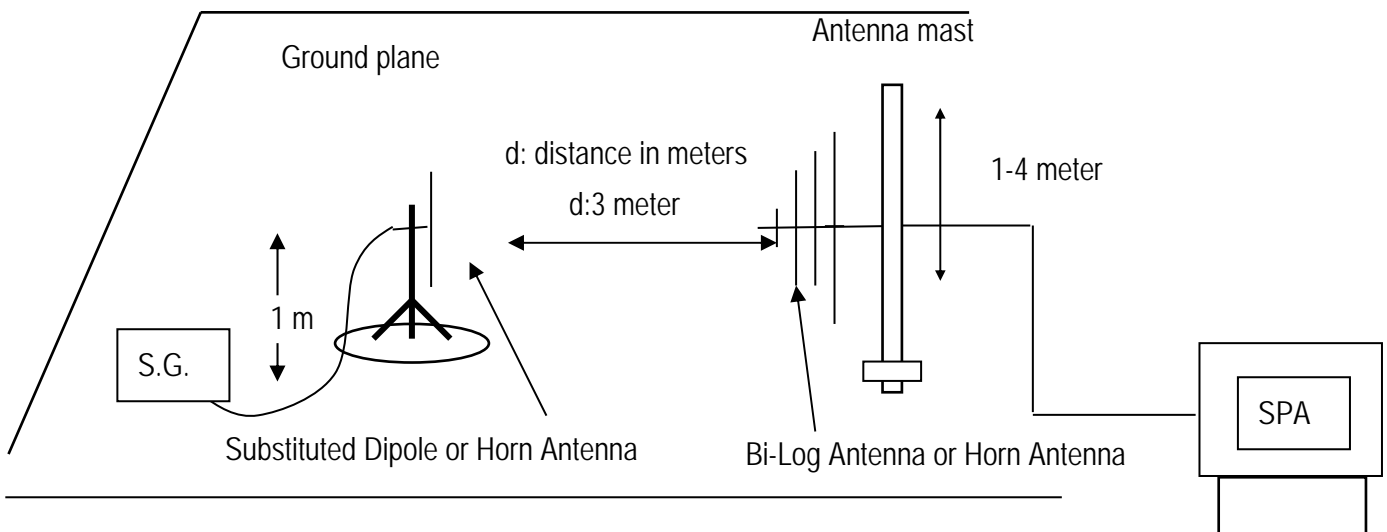
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## (B) Radiated Power Test Set-UP Frequency Over 1 GHz



## (C) Substituted Method Test Set-UP



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### 7.3. Measurement Procedure

1. The testing follows the Measurement Procedure of FCC KDB 971168 D01
2. The EUT was placed on a non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer.
3. During the measurement, the EUT was communication with the station. The highest emission was recorded with the rotation of the turntable and the lowering of the test antenna from 4m to 1m. The reading was recorded and the field strength (E in dBuV/m) was calculated
4. The testing follows the Measurement Procedure of FCC KDB 971168 D01
5. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a tx cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value" of step b. Record the power level of S.G.
6.  $EIRP = S.G. \text{ output (dBm)} + \text{Antenna Gain (dBi)} - \text{Cable Loss (dB)}$
7. Spectrum setting:
  - (1) Detector = Peak, marker the highest value of the detector by maximum hold, set RBW wide enough to capture the entire signal of emission, and  $VBW > 3 \times RBW$ .
  - (2) KDB 971168 D01 is adopted, and the procedure as lists under item 4, Measurement of the Average Power over the Fundamental Signal Bandwidth, is followed to set correspondingly for the acquisition of proper measurement data.Set frequency = nominal signal center frequency;  
Set span = 2 X occupied BW;  
Set RBW  $\approx$  1~5% of the span, not to exceed 1 MHz  
Set VBW = 3 x RBW;  
Select average power (RMS) detector  
Set sweep time and number of measurement points to achieve a minimum of 1 millisecond/pt integration time (ex. Point = 601points, then sweep time =  $601 \times 10^{-3} = 6s$ .)

Activate trace averaging routine over a minimum of 10 sweeps;

Activate marker/span pair and set span = signal or channel bandwidth;

Activate the band/interval power marker function;

Record the band power level;

Record adjusted value as the average signal power level. Then activate the occupied bandwidth measurement function.

The proper adjustment due to limitation of spectrum capability is given compensated to spectrum with conversion factor of  $10 \times \log (TBW/RBW)$ , where TBW is the transmission of UE exceeding the maximum BW UE can extends, and RBW is the resolution BW in UE.

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#### 7.4. Measurement Equipment Used

| EQUIPMENT TYPE        | MFR              | MODEL NUMBER | SERIAL NUMBER | LAST CAL.  | CAL DUE.   |
|-----------------------|------------------|--------------|---------------|------------|------------|
| Bi-log Antenna        | SCHWAZBECK       | VULB9168     | 378           | 12/29/2017 | 12/28/2018 |
| Horn Antenna          | Schwarzbeck      | BBHA9120D    | 1441          | 08/16/2018 | 08/15/2019 |
| Horn Antenna          | Schwarzbeck      | BBHA9170     | 184           | 12/12/2017 | 12/11/2018 |
| Loop Antenna          | ETS.LINDGREN     | 6502         | 148045        | 10/08/2018 | 10/07/2019 |
| 3m Site NSA           | SGS              | 966 chamber  | N/A           | 01/02/2018 | 01/01/2019 |
| Spectrum Analyzer     | Agilent          | E4446A       | MY51100003    | 05/15/2018 | 05/14/2019 |
| EMI Test Receiver     | R&S              | ESCI7        | 100335        | 02/02/2018 | 02/01/2019 |
| Pre-Amplifier         | HP               | 8449B        | 3008A00578    | 01/02/2018 | 01/01/2019 |
| Pre-Amplifier         | HP               | 8447D        | 2944A07676    | 01/02/2018 | 01/01/2019 |
| Pre-Amplifier         | EMC Instru-ments | EMC184045B   | 980135        | 10/02/2018 | 10/01/2019 |
| Attenuator            | Mini-Circuit     | BW-S10W2+    | 2             | 01/02/2018 | 01/01/2019 |
| 2GHz High Pass Filter | Micro-Tronics    | HPM50110     | 36            | 01/02/2018 | 01/01/2019 |
| Filter 5150-5350 MHz  | Micro-Tronics    | BRM50703     | 1             | 01/02/2018 | 01/01/2019 |
| Low Loss Cable        | Huber Suhner     | 966_RX       | 9             | 01/02/2018 | 01/01/2019 |

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## 7.5. Measurement Result: (Peak) –using option of peak measurement

| EUT            |                       |     | Measurement  |             |              |            |              |       |
|----------------|-----------------------|-----|--------------|-------------|--------------|------------|--------------|-------|
| Operation Band | Fundamental Frequency | CH  | Antenna Pol. | S.G. Output | Antenna Gain | Cable Loss | EIRP         | Limit |
|                | MHz                   |     | V/H          | dBm         | dBi          | dB         | dBm          | dBm   |
| GSM 1900       | 1850.2                | 512 | V            | 19.95       | 9.77         | -4.66      | 25.05        | 33.00 |
|                |                       |     | H            | 23.58       | 9.77         | -4.66      | 28.68        | 33.00 |
|                | 1880.0                | 661 | V            | 13.12       | 9.86         | -4.7       | 18.28        | 33.00 |
|                |                       |     | H            | 23.94       | 9.86         | -4.7       | 29.1         | 33.00 |
|                | 1909.8                | 810 | V            | 14.71       | 9.94         | -4.72      | 19.93        | 33.00 |
|                |                       |     | H            | 21.36       | 9.94         | -4.72      | 26.59        | 33.00 |
| GPRS 1900      | 1850.2                | 512 | V            | 21.3        | 9.77         | -4.66      | 26.4         | 33.00 |
|                |                       |     | H            | 25.74       | 9.77         | -4.66      | <b>30.84</b> | 33.00 |
|                | 1880.0                | 661 | V            | 16.35       | 9.86         | -4.7       | 21.51        | 33.00 |
|                |                       |     | H            | 25.34       | 9.86         | -4.7       | 30.5         | 33.00 |
|                | 1909.8                | 810 | V            | 16.43       | 9.94         | -4.72      | 21.66        | 33.00 |
|                |                       |     | H            | 22.26       | 9.94         | -4.72      | 27.48        | 33.00 |

**Remark :** ( 1 )The RBW,VBW of SPA for frequency RBW=300 KHz, VBW=1MHz

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| EUT            |                       |      | Measurement  |             |              |            |              |       |
|----------------|-----------------------|------|--------------|-------------|--------------|------------|--------------|-------|
| Operation Band | Fundamental Frequency | CH   | Antenna Pol. | S.G. Output | Antenna Gain | Cable Loss | EIRP         | Limit |
|                | MHz                   |      | V/H          | dBm         | dBi          | dB         | dBm          | dBm   |
| WCDMA Band II  | 1852.4                | 9262 | V            | 16.57       | 9.77         | -4.67      | 21.68        | 33.00 |
|                |                       |      | H            | 21.21       | 9.77         | -4.67      | 26.31        | 33.00 |
|                | 1880.0                | 9400 | V            | 14.01       | 9.85         | -4.7       | 19.17        | 33.00 |
|                |                       |      | H            | 21.25       | 9.85         | -4.7       | 26.41        | 33.00 |
|                | 1907.6                | 9538 | V            | 14.15       | 9.94         | -4.72      | 19.37        | 33.00 |
|                |                       |      | H            | 22.47       | 9.94         | -4.72      | <b>27.68</b> | 33.00 |
| HSDPA Band II  | 1852.4                | 9262 | V            | 13.19       | 9.77         | -4.67      | 18.3         | 33.00 |
|                |                       |      | H            | 21.25       | 9.77         | -4.67      | 26.36        | 33.00 |
|                | 1880.0                | 9400 | V            | 12.57       | 9.85         | -4.7       | 17.73        | 33.00 |
|                |                       |      | H            | 21.83       | 9.86         | -4.7       | 26.99        | 33.00 |
|                | 1907.6                | 9538 | V            | 12.28       | 9.94         | -4.72      | 17.49        | 33.00 |
|                |                       |      | H            | 20.8        | 9.94         | -4.72      | 26.01        | 33.00 |
| HSUPA Band II  | 1852.4                | 9262 | V            | 12.22       | 9.77         | -4.67      | 17.33        | 33.00 |
|                |                       |      | H            | 18.21       | 9.77         | -4.67      | 23.31        | 33.00 |
|                | 1880.0                | 9400 | V            | 10.35       | 9.85         | -4.7       | 15.5         | 33.00 |
|                |                       |      | H            | 19.93       | 9.85         | -4.7       | 25.09        | 33.00 |
|                | 1907.6                | 9538 | V            | 13.57       | 9.94         | -4.72      | 18.79        | 33.00 |
|                |                       |      | H            | 19.69       | 9.94         | -4.72      | 24.9         | 33.00 |

**Remark :** ( 1 )The RBW,VBW of SPA for frequency RBW=300 KHz, VBW=1MHz

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| EUT  |                       |       | Measurement  |             |              |            |              |       |
|--|-----------------------|-------|--------------|-------------|--------------|------------|--------------|-------|
| Operation Band                             | Fundamental Frequency | CH    | Antenna Pol. | S.G. Output | Antenna Gain | Cable Loss | EIRP         | Limit |
|  | MHz                   |       | V/H          | dBm         | dBi          | dB         | dBm          | dBm   |
| LTE BAND 2<br>BW: 1.4M<br>QPSK<br>RB: 1,0  | 1850.7                | 18607 | V            | 17.22       | 9.77         | -4.67      | 22.33        | 33.01 |
|  |                       |       | H            | 21.72       | 9.77         | -4.67      | 26.83        | 33.01 |
|  | 1880.0                | 18900 | V            | 16.55       | 9.85         | -4.69      | 21.71        | 33.01 |
|  |                       |       | H            | 21.74       | 9.85         | -4.7       | 26.9         | 33.01 |
|  | 1909.3                | 19193 | V            | 14.61       | 9.94         | -4.72      | 19.82        | 33.01 |
|  |                       |       | H            | 19.59       | 9.94         | -4.72      | 24.8         | 33.01 |
| LTE BAND 2<br>BW: 1.4M<br>QPSK<br>RB: 1,5  | 1850.7                | 18607 | V            | 17.57       | 9.77         | -4.66      | 22.68        | 33.01 |
|  |                       |       | H            | 22.11       | 9.77         | -4.66      | <b>27.21</b> | 33.01 |
|  | 1880.0                | 18900 | V            | 16.41       | 9.85         | -4.7       | 21.56        | 33.01 |
|  |                       |       | H            | 21.48       | 9.85         | -4.7       | 26.64        | 33.01 |
|  | 1909.3                | 19193 | V            | 14.53       | 9.94         | -4.72      | 19.75        | 33.01 |
|  |                       |       | H            | 19.58       | 9.94         | -4.72      | 24.8         | 33.01 |
| LTE BAND 2<br>BW: 1.4M<br>16QAM<br>RB: 1,0 | 1850.7                | 18607 | V            | 16.99       | 9.77         | -4.67      | 22.1         | 33.01 |
|  |                       |       | H            | 21.47       | 9.77         | -4.67      | 26.58        | 33.01 |
|  | 1880.0                | 18900 | V            | 15.77       | 9.85         | -4.69      | 20.93        | 33.01 |
|  |                       |       | H            | 20.7        | 9.85         | -4.69      | 25.86        | 33.01 |
|  | 1909.3                | 19193 | V            | 14.54       | 9.94         | -4.72      | 19.75        | 33.01 |
|  |                       |       | H            | 19.6        | 9.94         | -4.72      | 24.81        | 33.01 |
| LTE BAND 2<br>BW: 1.4M<br>16QAM<br>RB: 1,5 | 1850.7                | 18607 | V            | 17.03       | 9.77         | -4.66      | 22.14        | 33.01 |
|  |                       |       | H            | 21.37       | 9.77         | -4.67      | 26.48        | 33.01 |
|  | 1880.0                | 18900 | V            | 15.66       | 9.85         | -4.7       | 20.82        | 33.01 |
|  |                       |       | H            | 21.31       | 9.85         | -4.7       | 26.47        | 33.01 |
|  | 1909.3                | 19193 | V            | 14.52       | 9.94         | -4.72      | 19.73        | 33.01 |
|  |                       |       | H            | 19.22       | 9.94         | -4.72      | 24.44        | 33.01 |

**Remark :** ( 1 )The RBW,VBW of SPA for frequency RBW= 8MHz , VBW= 8MHz

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| EUT                                       |                       |       | Measurement  |             |              |            |              |       |
|---|-----------------------|-------|--------------|-------------|--------------|------------|--------------|-------|
| Operation Band                            | Fundamental Frequency | CH    | Antenna Pol. | S.G. Output | Antenna Gain | Cable Loss | EIRP         | Limit |
|   | MHz                   |       | V/H          | dBm         | dBi          | dB         | dBm          | dBm   |
| LTE BAND 2<br>BW: 3M<br>QPSK<br>RB: 1,0   | 1851.5                | 18615 | V            | 17.54       | 9.77         | -4.67      | 22.64        | 33.01 |
|   |                       |       | H            | 22.35       | 9.77         | -4.67      | 27.46        | 33.01 |
|   | 1880.0                | 18900 | V            | 16.63       | 9.85         | -4.69      | 21.79        | 33.01 |
|   |                       |       | H            | 22.62       | 9.85         | -4.69      | <b>27.78</b> | 33.01 |
|   | 1908.5                | 19185 | V            | 21.34       | 9.93         | -4.72      | 26.55        | 33.01 |
|   |                       |       | H            | 19.77       | 9.94         | -4.72      | 24.99        | 33.01 |
| LTE BAND 2<br>BW: 3M<br>QPSK<br>RB: 1,14  | 1851.5                | 18615 | V            | 17.69       | 9.77         | -4.67      | 22.79        | 33.01 |
|   |                       |       | H            | 22.49       | 9.77         | -4.66      | 27.6         | 33.01 |
|   | 1880.0                | 18900 | V            | 16.38       | 9.85         | -4.7       | 21.54        | 33.01 |
|   |                       |       | H            | 22.06       | 9.85         | -4.7       | 27.22        | 33.01 |
|   | 1908.5                | 19185 | V            | 14.87       | 9.94         | -4.72      | 20.09        | 33.01 |
|   |                       |       | H            | 16.26       | 9.94         | -4.72      | 21.47        | 33.01 |
| LTE BAND 2<br>BW: 3M<br>16QAM<br>RB: 1,0  | 1851.5                | 18615 | V            | 17.02       | 9.77         | -4.67      | 22.13        | 33.01 |
|   |                       |       | H            | 21.92       | 9.77         | -4.67      | 27.03        | 33.01 |
|   | 1880.0                | 18900 | V            | 16.56       | 9.85         | -4.69      | 21.71        | 33.01 |
|   |                       |       | H            | 21.95       | 9.85         | -4.69      | 27.1         | 33.01 |
|   | 1908.5                | 19185 | V            | 14.69       | 9.93         | -4.72      | 19.9         | 33.01 |
|   |                       |       | H            | 20.09       | 9.93         | -4.72      | 25.3         | 33.01 |
| LTE BAND 2<br>BW: 3M<br>16QAM<br>RB: 1,14 | 1851.5                | 18615 | V            | 17.13       | 9.77         | -4.66      | 22.23        | 33.01 |
|   |                       |       | H            | 21.81       | 9.77         | -4.66      | 26.92        | 33.01 |
|   | 1880.0                | 18900 | V            | 16.24       | 9.85         | -4.7       | 21.4         | 33.01 |
|   |                       |       | H            | 21.24       | 9.85         | -4.7       | 26.4         | 33.01 |
|   | 1908.5                | 19185 | V            | 14.22       | 9.94         | -4.72      | 19.44        | 33.01 |
|   |                       |       | H            | 19.88       | 9.94         | -4.72      | 25.1         | 33.01 |

**Remark :** ( 1 )The RBW,VBW of SPA for frequency RBW= 8MHz , VBW= 8MHz

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| EUT                                       |                       |       | Measurement  |             |              |            |              |       |
|---|-----------------------|-------|--------------|-------------|--------------|------------|--------------|-------|
| Operation Band                            | Fundamental Frequency | CH    | Antenna Pol. | S.G. Output | Antenna Gain | Cable Loss | EIRP         | Limit |
|   | MHz                   |       | V/H          | dBm         | dBi          | dB         | dBm          | dBm   |
| LTE BAND 2<br>BW: 5M<br>QPSK<br>RB: 1,0   | 1852.5                | 18625 | V            | 17.69       | 9.77         | -4.67      | 22.8         | 33.01 |
|   |                       |       | H            | 21.96       | 9.77         | -4.67      | 27.07        | 33.01 |
|   | 1880.0                | 18900 | V            | 17.09       | 9.84         | -4.69      | 22.24        | 33.01 |
|   |                       |       | H            | 21.78       | 9.84         | -4.69      | 26.93        | 33.01 |
|   | 1907.5                | 19175 | V            | 15.48       | 9.93         | -4.72      | 20.68        | 33.01 |
|   |                       |       | H            | 20.29       | 9.93         | -4.72      | 25.5         | 33.01 |
| LTE BAND 2<br>BW: 5M<br>QPSK<br>RB: 1,24  | 1852.5                | 18625 | V            | 17.92       | 9.78         | -4.67      | 23.03        | 33.01 |
|   |                       |       | H            | 22.08       | 9.78         | -4.67      | <b>27.19</b> | 33.01 |
|   | 1880.0                | 18900 | V            | 16.45       | 9.86         | -4.7       | 21.61        | 33.01 |
|   |                       |       | H            | 21.62       | 9.86         | -4.7       | 26.78        | 33.01 |
|   | 1907.5                | 19175 | V            | 15.19       | 9.94         | -4.72      | 20.4         | 33.01 |
|   |                       |       | H            | 20.05       | 9.94         | -4.72      | 25.27        | 33.01 |
| LTE BAND 2<br>BW: 5M<br>16QAM<br>RB: 1,0  | 1852.5                | 18625 | V            | 17.39       | 9.77         | -4.67      | 22.5         | 33.01 |
|   |                       |       | H            | 21.59       | 9.77         | -4.67      | 26.7         | 33.01 |
|   | 1880.0                | 18900 | V            | 16.88       | 9.84         | -4.69      | 22.03        | 33.01 |
|   |                       |       | H            | 21.59       | 9.84         | -4.69      | 26.74        | 33.01 |
|   | 1907.5                | 19175 | V            | 15.28       | 9.93         | -4.72      | 20.49        | 33.01 |
|   |                       |       | H            | 20.08       | 9.93         | -4.72      | 25.29        | 33.01 |
| LTE BAND 2<br>BW: 5M<br>16QAM<br>RB: 1,24 | 1852.5                | 18625 | V            | 17.66       | 9.78         | -4.67      | 22.77        | 33.01 |
|   |                       |       | H            | 21.56       | 9.78         | -4.67      | 26.67        | 33.01 |
|   | 1880.0                | 18900 | V            | 16.26       | 9.86         | -4.7       | 21.42        | 33.01 |
|   |                       |       | H            | 21.12       | 9.87         | -4.7       | 26.28        | 33.01 |
|   | 1907.5                | 19175 | V            | 14.85       | 9.94         | -4.72      | 20.07        | 33.01 |
|   |                       |       | H            | 19.91       | 9.94         | -4.72      | 25.13        | 33.01 |

**Remark :** ( 1 )The RBW,VBW of SPA for frequency RBW= 8MHz , VBW= 8MHz

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| EUT  |                       |       | Measurement  |             |              |            |              |       |
|--|-----------------------|-------|--------------|-------------|--------------|------------|--------------|-------|
| Operation Band                             | Fundamental Frequency | CH    | Antenna Pol. | S.G. Output | Antenna Gain | Cable Loss | EIRP         | Limit |
|  | MHz                   |       | V/H          | dBm         | dBi          | dB         | dBm          | dBm   |
| LTE BAND 2<br>BW: 10M<br>QPSK<br>RB: 1,0   | 1855.0                | 18650 | V            | 1.23        | 9.77         | -4.67      | 6.34         | 33.01 |
|  |                       |       | H            | 20.22       | 9.77         | -4.67      | 25.33        | 33.01 |
|  | 1880.0                | 18900 | V            | 4.63        | 9.84         | -4.69      | 9.78         | 33.01 |
|  |                       |       | H            | 20.47       | 9.84         | -4.69      | 25.62        | 33.01 |
|  | 1905.0                | 19150 | V            | 12.07       | 9.91         | -4.72      | 17.27        | 33.01 |
|  |                       |       | H            | 17.88       | 9.93         | -4.72      | 23.1         | 33.01 |
| LTE BAND 2<br>BW: 10M<br>QPSK<br>RB: 1,49  | 1855.0                | 18650 | V            | 1.91        | 9.79         | -4.67      | 7.03         | 33.01 |
|  |                       |       | H            | 20.92       | 9.79         | -4.67      | 26.04        | 33.01 |
|  | 1880.0                | 18900 | V            | 4.64        | 9.86         | -4.7       | 9.81         | 33.01 |
|  |                       |       | H            | 20.89       | 9.87         | -4.7       | <b>26.06</b> | 33.01 |
|  | 1905.0                | 19150 | V            | 3.15        | 9.92         | -4.72      | 8.36         | 33.01 |
|  |                       |       | H            | 14.67       | 9.94         | -4.72      | 19.88        | 33.01 |
| LTE BAND 2<br>BW: 10M<br>16QAM<br>RB: 1,0  | 1855.0                | 18650 | V            | 1.01        | 9.77         | -4.67      | 6.12         | 33.01 |
|  |                       |       | H            | 19.68       | 9.77         | -4.67      | 24.79        | 33.01 |
|  | 1880.0                | 18900 | V            | 3.93        | 9.84         | -4.69      | 9.08         | 33.01 |
|  |                       |       | H            | 19.79       | 9.84         | -4.69      | 24.93        | 33.01 |
|  | 1905.0                | 19150 | V            | 3.71        | 9.92         | -4.72      | 8.92         | 33.01 |
|  |                       |       | H            | 20.62       | 9.92         | -4.72      | 25.83        | 33.01 |
| LTE BAND 2<br>BW: 10M<br>16QAM<br>RB: 1,49 | 1855.0                | 18650 | V            | 1.33        | 9.79         | -4.67      | 6.45         | 33.01 |
|  |                       |       | H            | 19.95       | 9.79         | -4.67      | 25.07        | 33.01 |
|  | 1880.0                | 18900 | V            | 3.75        | 9.86         | -4.7       | 8.92         | 33.01 |
|  |                       |       | H            | 20.15       | 9.86         | -4.7       | 25.31        | 33.01 |
|  | 1905.0                | 19150 | V            | 2.87        | 9.94         | -4.72      | 8.09         | 33.01 |
|  |                       |       | H            | 18.94       | 9.94         | -4.72      | 24.15        | 33.01 |

**Remark :** ( 1 )The RBW,VBW of SPA for frequency RBW= 8MHz , VBW= 8MHz

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| EUT  |                       |       | Measurement  |             |              |            |              |       |
|--|-----------------------|-------|--------------|-------------|--------------|------------|--------------|-------|
| Operation Band                             | Fundamental Frequency | CH    | Antenna Pol. | S.G. Output | Antenna Gain | Cable Loss | EIRP         | Limit |
|  | MHz                   |       | V/H          | dBm         | dBi          | dB         | dBm          | dBm   |
| LTE BAND 2<br>BW: 15M<br>QPSK<br>RB: 1,0   | 1857.5                | 18675 | V            | 14.96       | 9.77         | -4.67      | 20.07        | 33.01 |
|  |                       |       | H            | 17.1        | 9.77         | -4.67      | 22.21        | 33.01 |
|  | 1880.0                | 18900 | V            | 14.01       | 9.83         | -4.69      | 19.15        | 33.01 |
|  |                       |       | H            | 17.11       | 9.83         | -4.69      | 22.26        | 33.01 |
|  | 1902.5                | 19125 | V            | 13.57       | 9.9          | -4.71      | 18.76        | 33.01 |
|  |                       |       | H            | 17.62       | 9.9          | -4.71      | 22.81        | 33.01 |
| LTE BAND 2<br>BW: 15M<br>QPSK<br>RB: 1,74  | 1857.5                | 18675 | V            | 15.15       | 9.8          | -4.68      | 20.27        | 33.01 |
|  |                       |       | H            | 17.37       | 9.8          | -4.68      | 22.5         | 33.01 |
|  | 1880.0                | 18900 | V            | 13.6        | 9.87         | -4.7       | 18.77        | 33.01 |
|  |                       |       | H            | 17.8        | 9.87         | -4.7       | 22.97        | 33.01 |
|  | 1902.5                | 19125 | V            | 12.88       | 9.94         | -4.72      | 18.1         | 33.01 |
|  |                       |       | H            | 16.66       | 9.94         | -4.72      | 21.87        | 33.01 |
| LTE BAND 2<br>BW: 15M<br>16QAM<br>RB: 1,0  | 1857.5                | 18675 | V            | 14.5        | 9.77         | -4.66      | 19.6         | 33.01 |
|  |                       |       | H            | 17.06       | 9.77         | -4.67      | 22.17        | 33.01 |
|  | 1880.0                | 18900 | V            | 13.36       | 9.83         | -4.69      | 18.5         | 33.01 |
|  |                       |       | H            | 16.49       | 9.83         | -4.69      | 21.63        | 33.01 |
|  | 1902.5                | 19125 | V            | 13.05       | 9.9          | -4.71      | 18.23        | 33.01 |
|  |                       |       | H            | 17.69       | 9.9          | -4.71      | 22.87        | 33.01 |
| LTE BAND 2<br>BW: 15M<br>16QAM<br>RB: 1,74 | 1857.5                | 18675 | V            | 14.45       | 9.8          | -4.68      | 19.58        | 33.01 |
|  |                       |       | H            | 16.5        | 9.8          | -4.68      | 21.62        | 33.01 |
|  | 1880.0                | 18900 | V            | 12.51       | 9.87         | -4.7       | 17.68        | 33.01 |
|  |                       |       | H            | 17.28       | 9.87         | -4.7       | 22.45        | 33.01 |
|  | 1902.5                | 19125 | V            | 12.34       | 9.94         | -4.72      | 17.55        | 33.01 |
|  |                       |       | H            | 18.03       | 9.92         | -4.72      | <b>23.23</b> | 33.01 |

**Remark :** ( 1 ) The RBW,VBW of SPA for frequency RBW= 8MHz , VBW= 8MHz

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| EUT  |                       |       | Measurement  |             |              |            |              |       |
|--|-----------------------|-------|--------------|-------------|--------------|------------|--------------|-------|
| Operation Band                             | Fundamental Frequency | CH    | Antenna Pol. | S.G. Output | Antenna Gain | Cable Loss | EIRP         | Limit |
|  | MHz                   |       | V/H          | dBm         | dBi          | dB         | dBm          | dBm   |
| LTE BAND 2<br>BW: 20M<br>QPSK<br>RB: 1,0   | 1860.0                | 18700 | V            | 14.12       | 9.77         | -4.66      | 19.22        | 33.01 |
|  |                       |       | H            | 17.43       | 9.77         | -4.66      | 22.53        | 33.01 |
|  | 1880.0                | 18900 | V            | 12.9        | 9.83         | -4.69      | 18.04        | 33.01 |
|  |                       |       | H            | 17.34       | 9.83         | -4.69      | 22.48        | 33.01 |
|  | 1900.0                | 19100 | V            | 10.91       | 9.91         | -4.71      | 16.1         | 33.01 |
|  |                       |       | H            | 20.3        | 9.9          | -4.71      | <b>25.49</b> | 33.01 |
| LTE BAND 2<br>BW: 20M<br>QPSK<br>RB: 1,99  | 1860.0                | 18700 | V            | 13.28       | 9.82         | -4.68      | 18.41        | 33.01 |
|  |                       |       | H            | 17.62       | 9.82         | -4.68      | 22.76        | 33.01 |
|  | 1880.0                | 18900 | V            | 12.73       | 9.88         | -4.7       | 17.9         | 33.01 |
|  |                       |       | H            | 18.15       | 9.88         | -4.7       | 23.32        | 33.01 |
|  | 1900.0                | 19100 | V            | 15.6        | 9.91         | -4.72      | 20.79        | 33.01 |
|  |                       |       | H            | 13.47       | 9.93         | -4.72      | 18.68        | 33.01 |
| LTE BAND 2<br>BW: 20M<br>16QAM<br>RB: 1,0  | 1860.0                | 18700 | V            | 13.33       | 9.77         | -4.67      | 18.43        | 33.01 |
|  |                       |       | H            | 16.67       | 9.77         | -4.66      | 21.77        | 33.01 |
|  | 1880.0                | 18900 | V            | 12.35       | 9.83         | -4.69      | 17.49        | 33.01 |
|  |                       |       | H            | 16.87       | 9.83         | -4.69      | 22.01        | 33.01 |
|  | 1900.0                | 19100 | V            | 12.21       | 9.89         | -4.71      | 17.39        | 33.01 |
|  |                       |       | H            | 18.69       | 9.91         | -4.71      | 23.89        | 33.01 |
| LTE BAND 2<br>BW: 15M<br>16QAM<br>RB: 1,99 | 1860.0                | 18700 | V            | 12.54       | 9.82         | -4.68      | 17.68        | 33.01 |
|  |                       |       | H            | 16.85       | 9.82         | -4.68      | 21.99        | 33.01 |
|  | 1880.0                | 18900 | V            | 13.11       | 9.86         | -4.7       | 18.27        | 33.01 |
|  |                       |       | H            | 17.52       | 9.88         | -4.7       | 22.69        | 33.01 |
|  | 1900.0                | 19100 | V            | 11.34       | 9.94         | -4.72      | 16.56        | 33.01 |
|  |                       |       | H            | 16.27       | 9.94         | -4.72      | 21.48        | 33.01 |

**Remark :** ( 1 ) The RBW,VBW of SPA for frequency RBW= 8MHz , VBW= 8MHz

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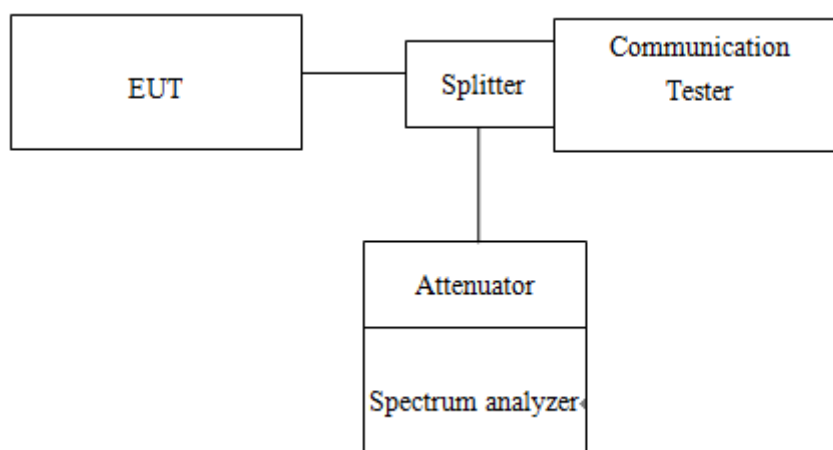


## 8. OCCUPIED BANDWIDTH MEASUREMENT

### 8.1. Standard Applicable

The occupied bandwidth 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.

### 8.2. Test Set-up



### 8.3. Measurement Procedure

#### **99% & 26dB Bandwidth with detector peak**

The EUT's output RF connector was connected with a short cable to the spectrum analyzer, RBW was set to about 1% of emission BW, VBW= 3 times RBW, -26dBc display line was placed on the screen (or 26dB bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace. Then set RBW to 99% bandwidth, RBW= 1%, VBW= 3 RBW, with span > 2 \* Signal BW, set % Power = 99%.

#### **99% Bandwidth with detector sample**

The EUT's output RF connector was connected with a short cable to the spectrum analyzer, RBW was set to about 1% ~ 5% of emission BW, VBW= 3 times RBW, -20dBc display line was placed on the screen (or 20dB bandwidth). Set RBW to 99% bandwidth, RBW= 1% ~ 5%, VBW= 3 RBW, with span > 2 \* Signal BW, set % Power = 99%.

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#### 8.4. Measurement Equipment Used

| EQUIPMENT TYPE              | MFR           | MODEL NUM-BER   | SERIAL NUM-BER | LAST CAL.  | CAL DUE.   |
|-----------------------------|---------------|-----------------|----------------|------------|------------|
| EXA Spectrum Analyzer       | Agilent       | N9010A          | MY50420195     | 05/03/2018 | 05/02/2019 |
| Radio Communication Analyer | Anritsu       | MT8820C         | 6200995019     | 04/05/2018 | 04/04/2019 |
| DC Power Supply             | Agilent       | E3640A          | MY52410006     | 11/28/2017 | 11/27/2018 |
| Attenuator                  | Mini-Circuit  | BW-S10W2+       | 2              | 01/02/2018 | 01/01/2019 |
| DC Block                    | Mini-Circuits | BLK-18-S+       | 1              | 01/02/2018 | 01/01/2019 |
| 2WayDivider                 | Woken         | DSU7AMK1A1      | N/A            | 01/02/2018 | 01/01/2019 |
| Coaxial Cable               | Huber Suhner  | SUCOFLEX 102EPA | MY2616/2       | 01/02/2018 | 01/01/2019 |

#### 8.5. Measurement Result

| Freq. (MHz) | CH  | 99% BW (MHz) |           | 26 dB BW (MHz) |           |
|-------------|-----|--------------|-----------|----------------|-----------|
|             |     | GSM 1900     | GPRS 1900 | GSM 1900       | GPRS 1900 |
| 1850.2      | 512 | 0.24283      | 0.24384   | 0.318          | 0.323     |
| 1880.0      | 661 | 0.24051      | 0.24420   | 0.321          | 0.321     |
| 1909.8      | 810 | 0.24584      | 0.24641   | 0.318          | 0.316     |

| Freq. (MHz) | CH   | 99% BW (MHz) |          |          | 26 dB BW (MHz) |          |          |
|-------------|------|--------------|----------|----------|----------------|----------|----------|
|             |      | WCDMA II     | HSDPA II | HSUPA II | WCDMA II       | HSDPA II | HSUPA II |
| 1852.40     | 9262 | 4.12800      | 4.12340  | 4.13670  | 4.709          | 4.685    | 4.701    |
| 1880.00     | 9400 | 4.12430      | 4.13770  | 4.14330  | 4.715          | 4.702    | 4.695    |
| 1907.60     | 9538 | 4.13470      | 4.13140  | 4.13410  | 4.710          | 4.695    | 4.709    |

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| LTE BAND 2 Channel bandwidth: 1.4MHz |       |               |               |                |               |
|--------------------------------------|-------|---------------|---------------|----------------|---------------|
| Freq.<br>(MHz)                       | CH    | 99% BW (MHz)  |               | 26 dB BW (MHz) |               |
|                                      |       | QPSK          | 16QAM         | QPSK           | 16QAM         |
| 1850.7                               | 18607 | 1.0988        | 1.1033        | 1.284          | 1.299         |
| 1880.0                               | 18900 | 1.0977        | 1.1021        | 1.282          | 1.295         |
| 1909.3                               | 19193 | <b>1.0994</b> | <b>1.1039</b> | <b>1.286</b>   | <b>1.304</b>  |
| LTE BAND 2 Channel bandwidth: 5MHz   |       |               |               |                |               |
| Freq.<br>(MHz)                       | CH    | 99% BW (MHz)  |               | 26 dB BW (MHz) |               |
|                                      |       | QPSK          | 16QAM         | QPSK           | 16QAM         |
| 1852.5                               | 18625 | 4.5091        | 4.5114        | 5.039          | 5.022         |
| 1880.0                               | 18900 | 4.5105        | <b>4.5140</b> | 5.039          | 4.988         |
| 1907.5                               | 19175 | <b>4.5133</b> | 4.5123        | <b>5.057</b>   | <b>5.052</b>  |
| LTE BAND 2 Channel bandwidth: 15MHz  |       |               |               |                |               |
| Freq.<br>(MHz)                       | CH    | 99% BW (MHz)  |               | 26 dB BW (MHz) |               |
|                                      |       | QPSK          | 16QAM         | QPSK           | 16QAM         |
| 1857.5                               | 18675 | 13.482        | 13.446        | 14.722         | <b>14.740</b> |
| 1880.0                               | 18900 | 13.442        | 13.439        | 14.745         | 14.668        |
| 1902.5                               | 19125 | <b>13.483</b> | <b>13.456</b> | <b>14.763</b>  | 14.650        |
| LTE BAND 2 Channel bandwidth: 3MHz   |       |               |               |                |               |
| Freq.<br>(MHz)                       | CH    | 99% BW (MHz)  |               | 26 dB BW (MHz) |               |
|                                      |       | QPSK          | 16QAM         | QPSK           | 16QAM         |
| 1851.5                               | 18615 | 2.6977        | 2.7006        | 2.995          | 2.994         |
| 1880.0                               | 18900 | 2.7020        | <b>2.7052</b> | 3.001          | 2.994         |
| 1908.5                               | 19185 | <b>2.7052</b> | 2.7035        | <b>3.002</b>   | <b>3.008</b>  |
| LTE BAND 2 Channel bandwidth: 10MHz  |       |               |               |                |               |
| Freq.<br>(MHz)                       | CH    | 99% BW (MHz)  |               | 26 dB BW (MHz) |               |
|                                      |       | QPSK          | 16QAM         | QPSK           | 16QAM         |
| 1855.0                               | 18650 | 8.9941        | 8.9518        | 9.857          | <b>9.875</b>  |
| 1880.0                               | 18900 | <b>8.9969</b> | 8.9458        | 9.886          | 9.847         |
| 1905.0                               | 19150 | 8.9706        | <b>8.9570</b> | <b>9.910</b>   | 9.770         |
| LTE BAND 2 Channel bandwidth: 20MHz  |       |               |               |                |               |
| Freq.<br>(MHz)                       | CH    | 99% BW (MHz)  |               | 26 dB BW (MHz) |               |
|                                      |       | QPSK          | 16QAM         | QPSK           | 16QAM         |
| 1860.0                               | 18700 | 17.882        | 17.906        | <b>19.463</b>  | 19.450        |
| 1880.0                               | 18900 | 17.899        | 17.918        | 19.395         | 19.509        |
| 1900.0                               | 19100 | <b>17.934</b> | <b>17.965</b> | 19.425         | <b>19.519</b> |

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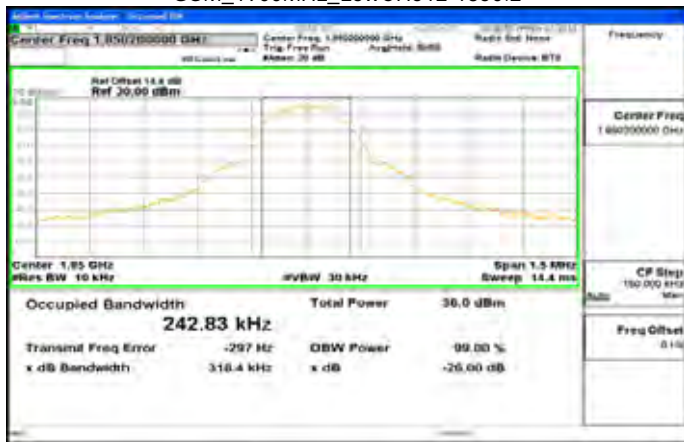
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GSM\_1900MHz\_LowCH512-1850.2



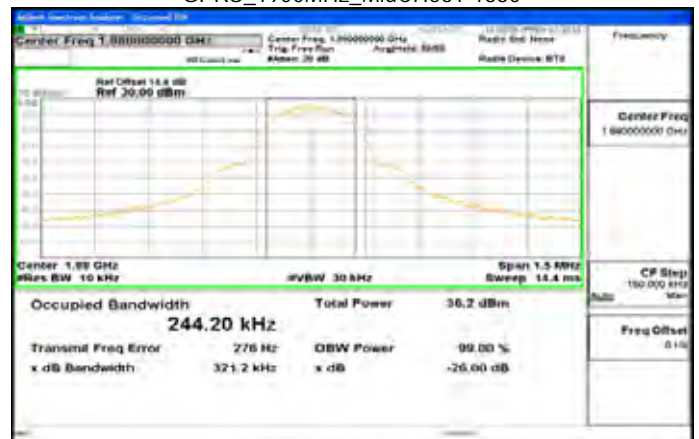
GPRS\_1900MHz\_LowCH512-1850.2



GSM\_1900MHz\_MidCH661-1880



GPRS\_1900MHz\_MidCH661-1880



GSM\_1900MHz\_HighCH810-1909.8



GPRS\_1900MHz\_HighCH810-1909.8



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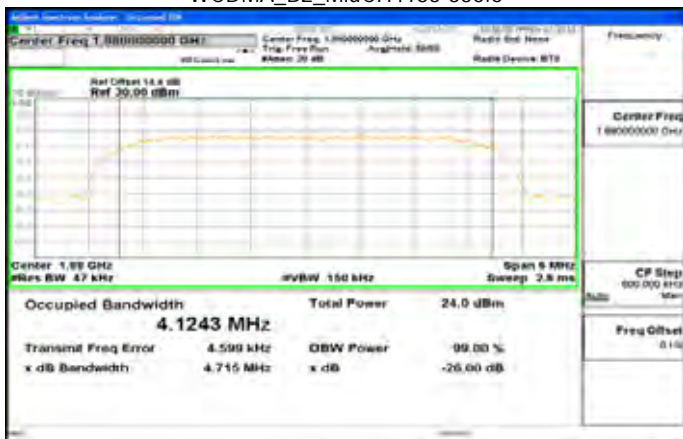
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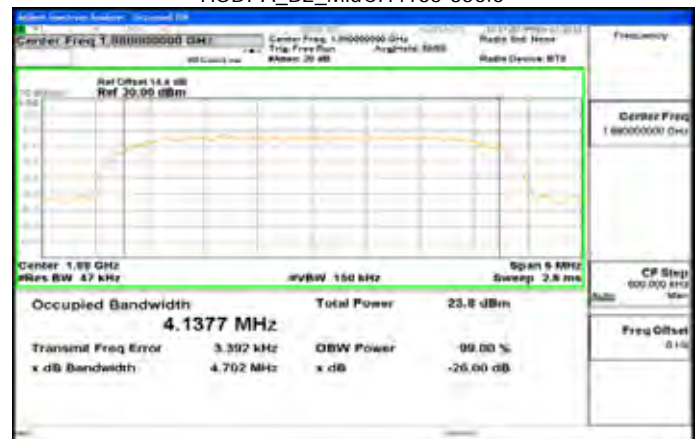
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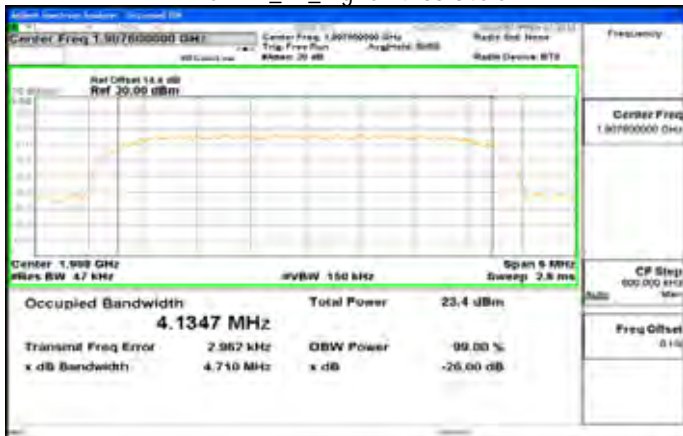
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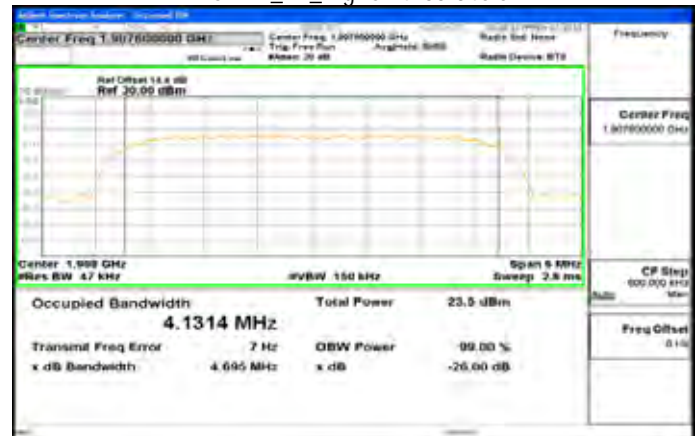
HSDPA\_B2\_MidCH4183-836.6



WCDMA\_B2\_HighCH4233-846.6



HSDPA\_B2\_HighCH4233-846.6



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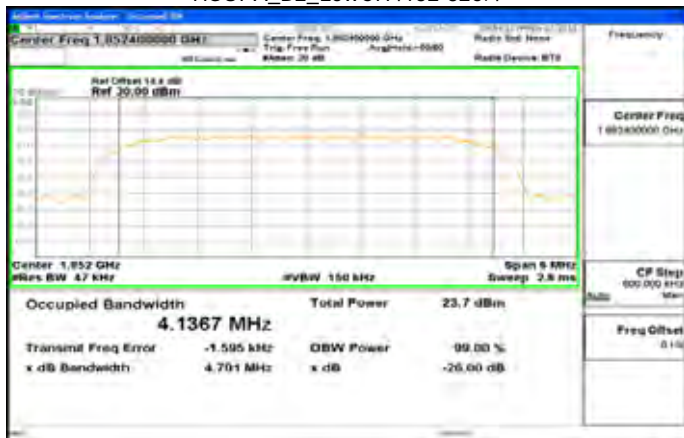
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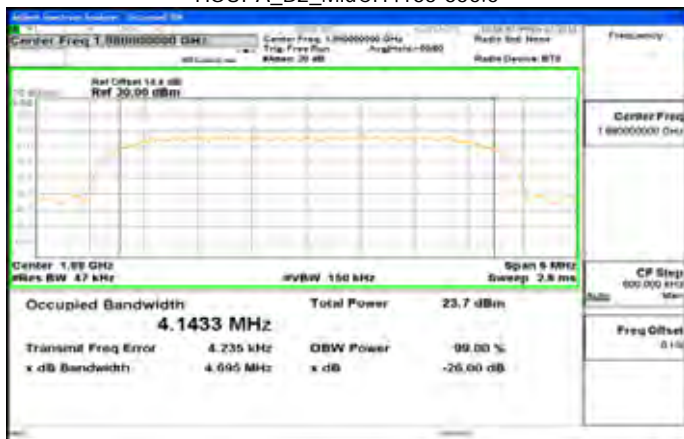
HSUPA\_B2\_LowCH4132-826.4



Band2\_1\_4MHz\_QPSK\_6\_0\_LowCH18607-1850.7



HSUPA\_B2\_MidCH4183-836.6



Band2\_1\_4MHz\_QPSK\_6\_0\_MidCH18900-1880



HSUPA\_B2\_HighCH4233-846.6



Band2\_1\_4MHz\_QPSK\_6\_0\_HighCH19193-1909.3



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Band2\_1\_4MHz\_16QAM\_6\_0\_LowCH18607-1850.7



Band2\_3MHz\_QPSK\_15\_0\_LowCH18615-1851.5



Band2\_1\_4MHz\_16QAM\_6\_0\_MidCH18900-1880



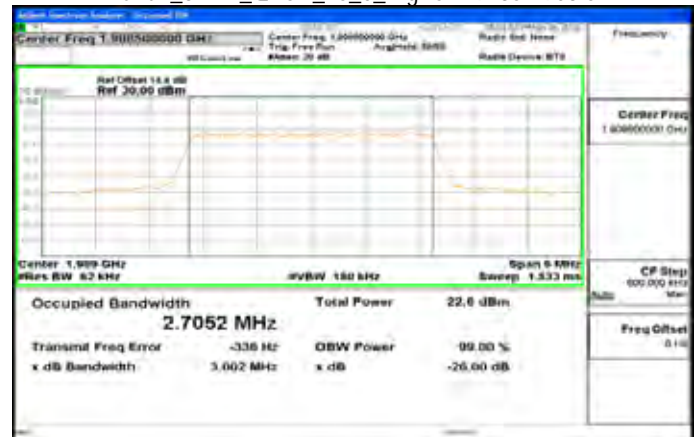
Band2\_3MHz\_QPSK\_15\_0\_MidCH18900-1880



Band2\_1\_4MHz\_16QAM\_6\_0\_HighCH19193-1909.3



Band2\_3MHz\_QPSK\_15\_0\_HighCH19185-1908.5



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Band2\_3MHz\_16QAM\_15\_0\_LowCH18615-1851.5



Band2\_5MHz\_QPSK\_25\_0\_LowCH18625-1852.5



Band2\_3MHz\_16QAM\_15\_0\_MidCH18900-1880



Band2\_5MHz\_QPSK\_25\_0\_MidCH18900-1880



Band2\_3MHz\_16QAM\_15\_0\_HighCH19185-1908.5



Band2\_5MHz\_QPSK\_25\_0\_HighCH19175-1907.5



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Band2\_5MHz\_16QAM\_25\_0\_LowCH18625-1852.5



Band2\_10MHz\_QPSK\_50\_0\_LowCH18650-1855



Band2\_5MHz\_16QAM\_25\_0\_MidCH18900-1880



Band2\_10MHz\_QPSK\_50\_0\_MidCH18900-1880



Band2\_5MHz\_16QAM\_25\_0\_HighCH19175-1907.5



Band2\_10MHz\_QPSK\_50\_0\_HighCH19150-1905



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Band2\_15MHz\_QPSK\_75\_0\_LowCH18675-1857.5



Band2\_10MHz\_16QAM\_50\_0\_MidCH18900-1880



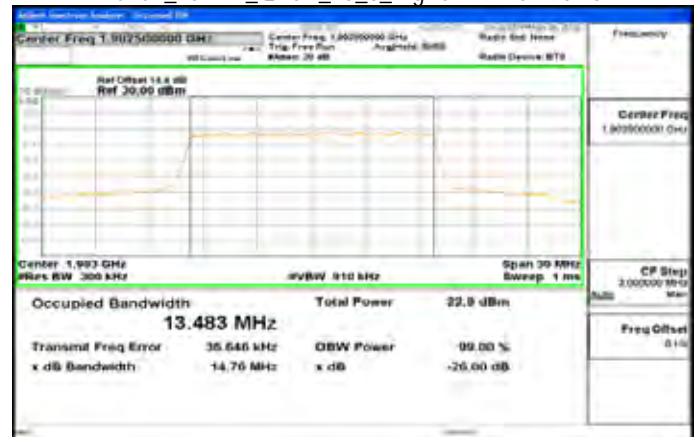
Band2\_15MHz\_QPSK\_75\_0\_MidCH18900-1880



Band2\_10MHz\_16QAM\_50\_0\_HighCH19150-1905



Band2\_15MHz\_QPSK\_75\_0\_HighCH19125-1902.5



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Band\_15MHz\_16QAM\_75\_0\_LowCH18675-1857.5



Band2\_20MHz\_QPSK\_100\_0\_LowCH18700-1860



Band2\_15MHz\_16QAM\_75\_0\_MidCH18900-1880



Band2\_20MHz\_QPSK\_100\_0\_MidCH18900-1880



Band2\_15MHz\_16QAM\_75\_0\_HighCH19125-1902.5



Band2\_20MHz\_QPSK\_100\_0\_HighCH19100-1900



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Band2\_20MHz\_16QAM\_100\_0\_LowCH18700-1860



Band2\_20MHz\_16QAM\_100\_0\_MidCH18900-1880



Band2\_20MHz\_16QAM\_100\_0\_HighCH19100-1900



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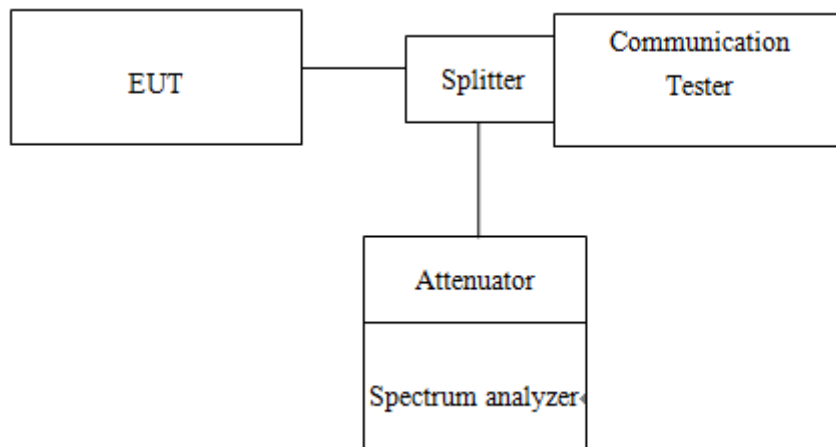
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## 9. OUT OF BAND EMISSION AT ANTENNA TERMINALS

### 9.1. Standard Applicable

FCC §24.238(a), Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB.

### 9.2. Test SET-UP



### 9.3. Measurement Procedure

#### Conducted Emission

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.

1. To connect Antenna Port of EUT to Spectrum.
2. Set RBW = 1MHz & VBW = 1MHz on Spectrum.
3. Allow trace to fully stabilize
4. Repeat above procedures until all default test channel measured were complete.

#### Band Edge

1. To connect Antenna Port of EUT to Spectrum.
2. The band edge of low and high channels for the highest RF powers was measured. Setting  $RBW \geq 1\% \text{ EBW}$ .
3. Allow trace to fully stabilize
4. Repeat above procedures until all default test channel measured were complete.

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#### 9.4. Measurement Equipment Used

| EQUIPMENT TYPE        | MFR             | MODEL NUMBER | SERIAL NUMBER | LAST CAL.  | CAL DUE.   |
|-----------------------|-----------------|--------------|---------------|------------|------------|
| Bi-log Antenna        | SCHWAZBECK      | VULB9168     | 378           | 12/29/2017 | 12/28/2018 |
| Horn Antenna          | Schwarzbeck     | BBHA9120D    | 1441          | 08/16/2018 | 08/15/2019 |
| Horn Antenna          | Schwarzbeck     | BBHA9170     | 184           | 12/12/2017 | 12/11/2018 |
| Loop Antenna          | ETS.LINDGREN    | 6502         | 148045        | 10/08/2018 | 10/07/2019 |
| 3m Site NSA           | SGS             | 966 chamber  | N/A           | 01/02/2018 | 01/01/2019 |
| Spectrum Analyzer     | Agilent         | E4446A       | MY51100003    | 05/15/2018 | 05/14/2019 |
| EMI Test Receiver     | R&S             | ESCI7        | 100335        | 02/02/2018 | 02/01/2019 |
| Pre-Amplifier         | HP              | 8449B        | 3008A00578    | 01/02/2018 | 01/01/2019 |
| Pre-Amplifier         | HP              | 8447D        | 2944A07676    | 01/02/2018 | 01/01/2019 |
| Pre-Amplifier         | EMC Instruments | EMC184045B   | 980135        | 10/02/2018 | 10/01/2019 |
| Attenuator            | Mini-Circuit    | BW-S10W2+    | 2             | 01/02/2018 | 01/01/2019 |
| 2GHz High Pass Filter | Micro-Tronics   | HPM50110     | 36            | 01/02/2018 | 01/01/2019 |
| Filter 5150-5350 MHz  | Micro-Tronics   | BRM50703     | 1             | 01/02/2018 | 01/01/2019 |
| Low Loss Cable        | Huber Suhner    | 966_RX       | 9             | 01/02/2018 | 01/01/2019 |

#### 9.5. Measurement Result:

Refer to next pages.

**NOTE: The occurrence of the spike on the conducted emission is the signal of the fundamental emission.**

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## Band Edge

GSM\_1900MHz\_LowCH512-1850.2



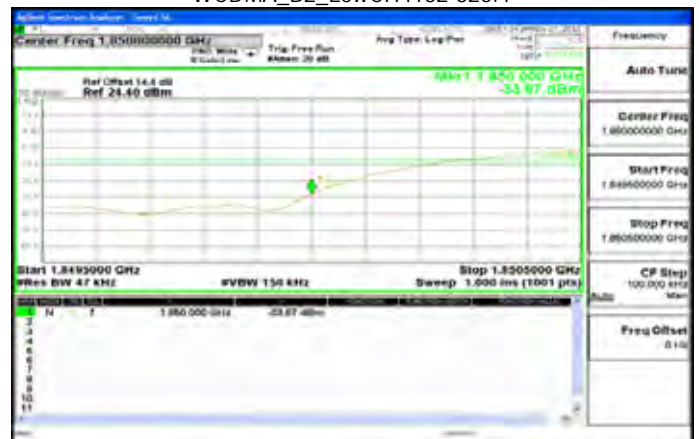
GPRS\_1900MHz\_HighCH810-1909.8



GSM\_1900MHz\_HighCH810-1909.8



WCDMA\_B2\_LowCH4132-826.4



GPRS\_1900MHz\_LowCH512-1850.2



WCDMA\_B2\_HighCH4233-846.6



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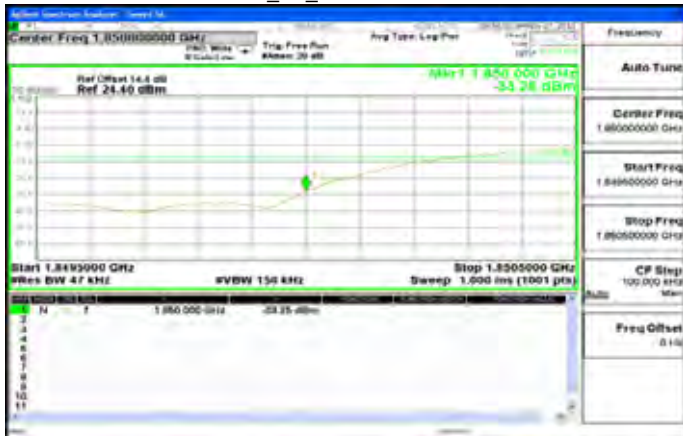
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HSDPA\_B2\_LowCH4132-826.4



HSUPA\_B2\_HighCH4233-846.6



HSDPA\_B2\_HighCH4233-846.6



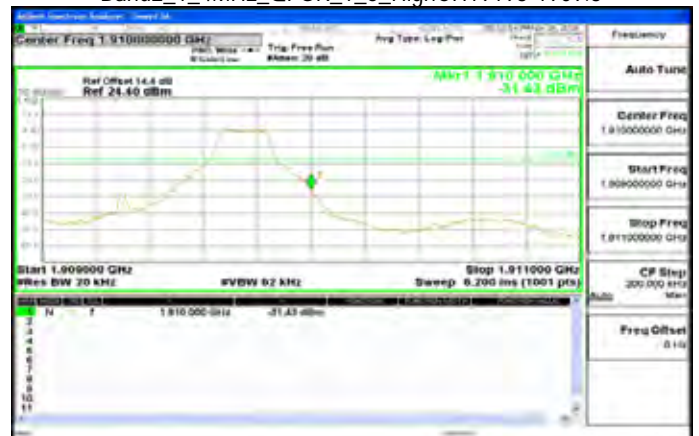
Band2\_1\_4MHz\_QPSK\_1\_0\_LowCH18607-1850.7



HSUPA\_B2\_LowCH4132-826.4



Band2\_1\_4MHz\_QPSK\_1\_5\_HighCH19193-1909.3



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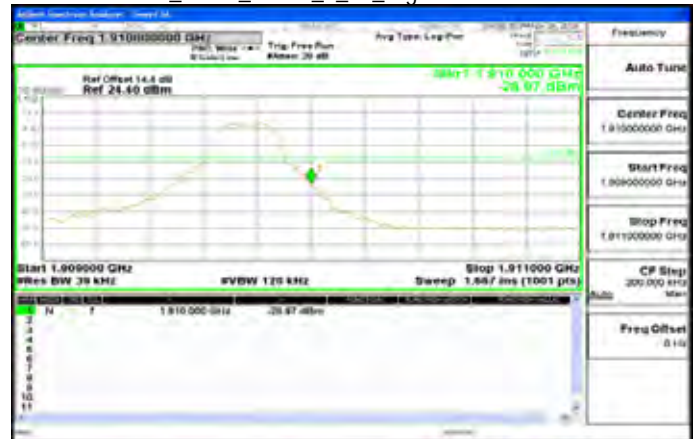
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Band2\_1\_4MHz\_QPSK\_6\_0\_LowCH18607-1850.7



Band2\_3MHz\_QPSK\_1\_14\_HighCH19185-1908.5



Band2\_1\_4MHz\_QPSK\_6\_0\_HighCH19193-1909.3



Band2\_3MHz\_QPSK\_15\_0\_LowCH18615-1851.5



Band2\_3MHz\_QPSK\_1\_0\_LowCH18615-1851.5



Band2\_3MHz\_QPSK\_15\_0\_HighCH19185-1908.5



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Band2\_5MHz\_QPSK\_1\_0\_LowCH18625-1852.5



Band2\_5MHz\_QPSK\_25\_0\_HighCH19175-1907.5



Band2\_5MHz\_QPSK\_1\_24\_HighCH19175-1907.5



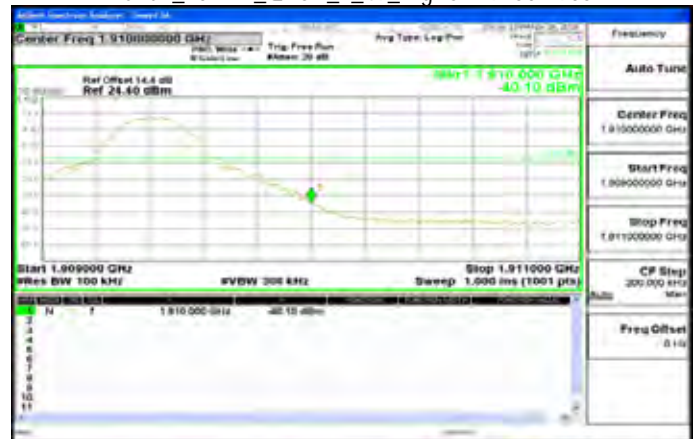
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Band2\_5MHz\_QPSK\_25\_0\_LowCH18625-1852.5



Band2\_10MHz\_QPSK\_1\_49\_HighCH19150-1905



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Band2\_10MHz\_QPSK\_50\_0\_LowCH18650-1855



Band2\_15MHz\_QPSK\_1\_74\_HighCH19125-1902.5



Band2\_10MHz\_QPSK\_50\_0\_HighCH19150-1905



Band2\_15MHz\_QPSK\_75\_0\_LowCH18675-1857.5



Band2\_15MHz\_QPSK\_1\_0\_LowCH18675-1857.5



Band2\_15MHz\_QPSK\_75\_0\_HighCH19125-1902.5



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Band2\_20MHz\_QPSK\_100\_0\_HighCH19100-1900



Band2\_20MHz\_QPSK\_1\_99\_HighCH19100-1900



Band2\_20MHz\_QPSK\_100\_0\_LowCH18700-1860



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## Out of Band Emission

30MHz-3GHz\_GSM\_1900MHz\_LowCH512-1850.2



3GHz-10GHz\_GSM\_1900MHz\_MidCH661-1880



3GHz-10GHz\_GSM\_1900MHz\_LowCH512-1850.2



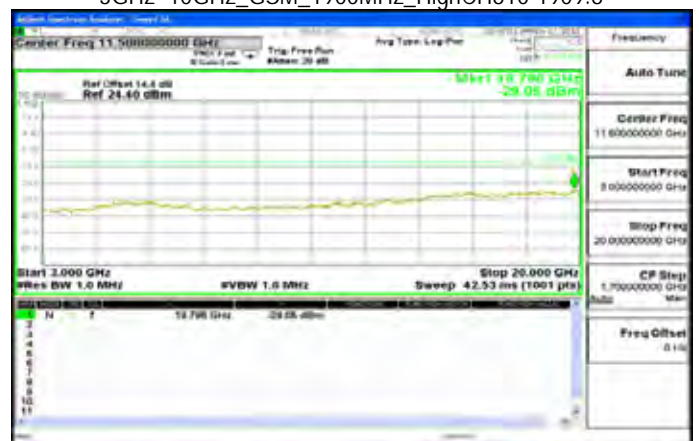
30MHz-3GHz\_GSM\_1900MHz\_HighCH810-1909.8



30MHz-3GHz\_GSM\_1900MHz\_MidCH661-1880



3GHz-10GHz\_GSM\_1900MHz\_HighCH810-1909.8



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30MHz~3GHz\_GPRS\_1900MHz\_LowCH512-1850.2



3GHz~10GHz\_GPRS\_1900MHz\_MidCH661-1880



3GHz~10GHz\_GPRS\_1900MHz\_LowCH512-1850.2



30MHz~3GHz\_GPRS\_1900MHz\_HighCH810-1909.8



30MHz~3GHz\_GPRS\_1900MHz\_MidCH661-1880



3GHz~10GHz\_GPRS\_1900MHz\_HighCH810-1909.8



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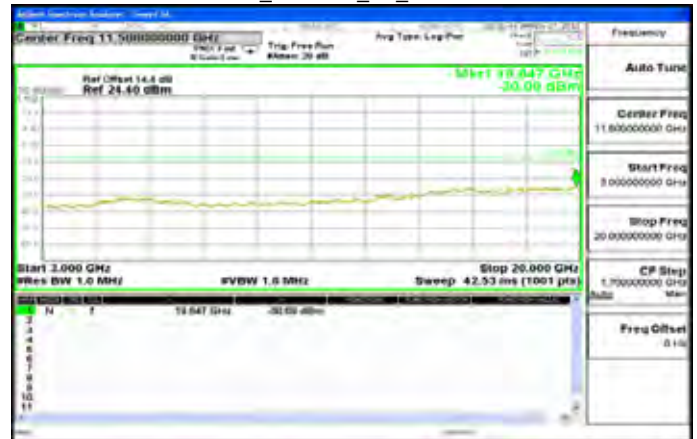
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30MHz~3GHz\_WCDMA\_B2\_LowCH9262-1852.4



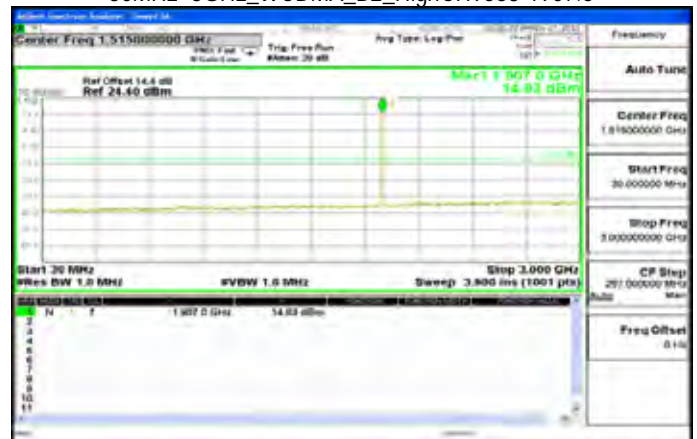
3GHz~10GHz\_WCDMA\_B2\_MidCH9400-1880



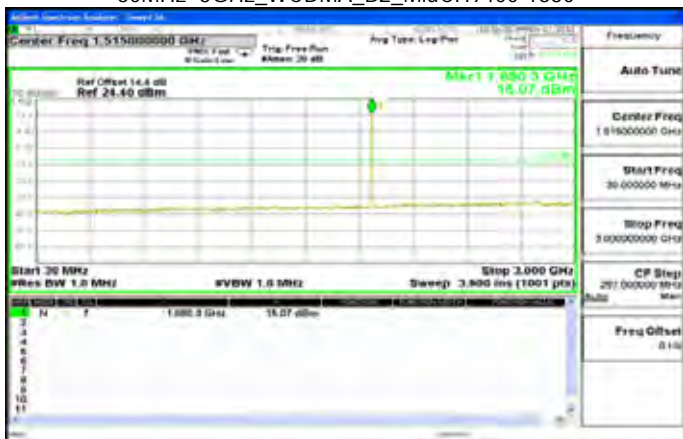
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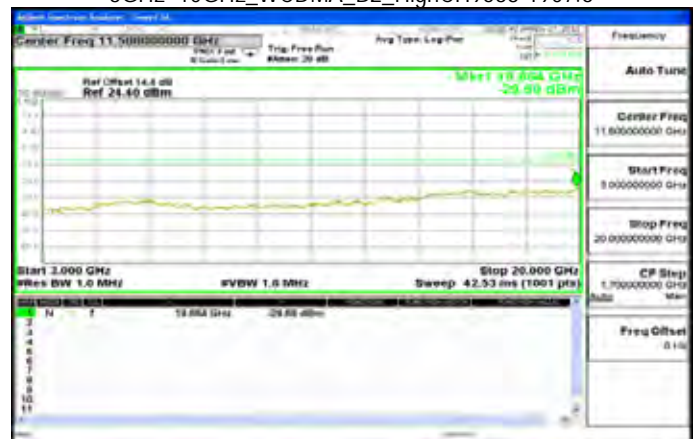
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30MHz~3GHz\_WCDMA\_B2\_MidCH9400-1880



3GHz~10GHz\_WCDMA\_B2\_HighCH9538-1907.6



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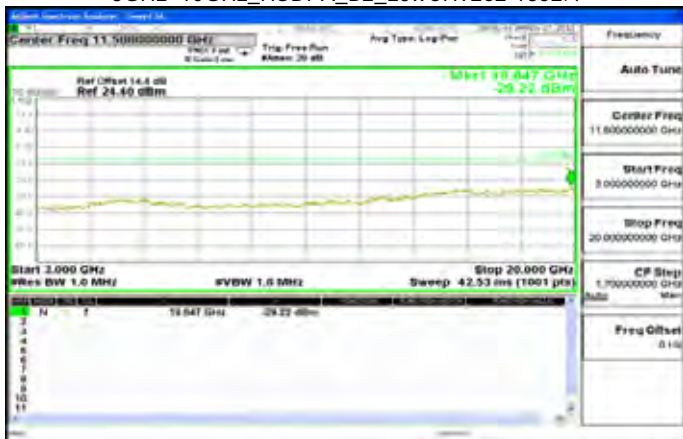
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3GHz-10GHz\_HSDPA\_B2\_MidCH9400-1880



3GHz-10GHz\_HSDPA\_B2\_LowCH9262-1852.4



30MHz-3GHz\_HSDPA\_B2\_HighCH9538-1907.6



30MHz-3GHz\_HSDPA\_B2\_MidCH9400-1880



3GHz-10GHz\_HSDPA\_B2\_HighCH9538-1907.6



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30MHz-3GHz\_HSUPA\_B2\_LowCH9262-1852.4



3GHz-10GHz\_HSUPA\_B2\_MidCH9400-1880



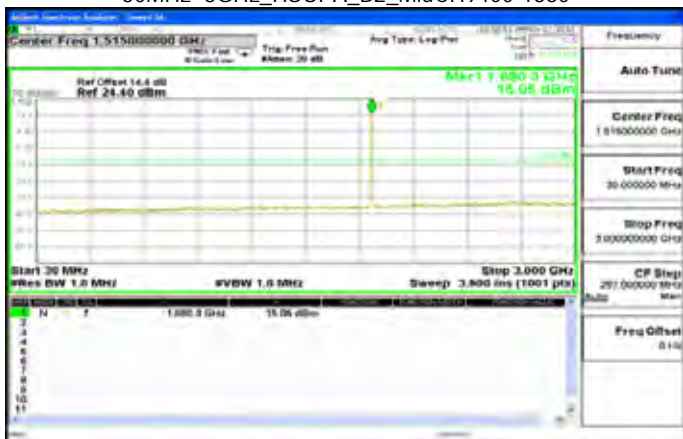
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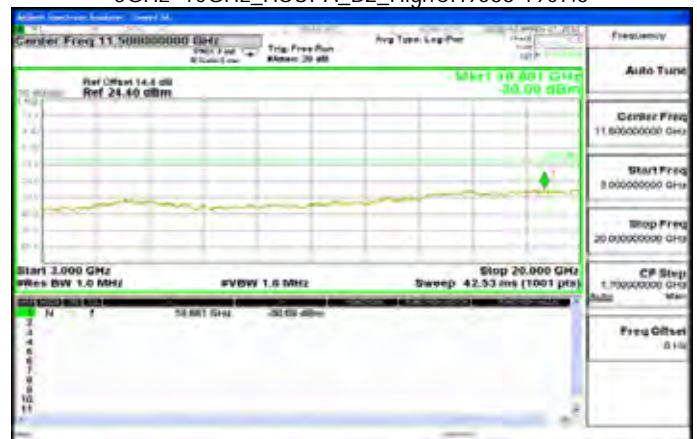
30MHz-3GHz\_HSUPA\_B2\_HighCH9538-1907.6



30MHz-3GHz\_HSUPA\_B2\_MidCH9400-1880



3GHz-10GHz\_HSUPA\_B2\_HighCH9538-1907.6



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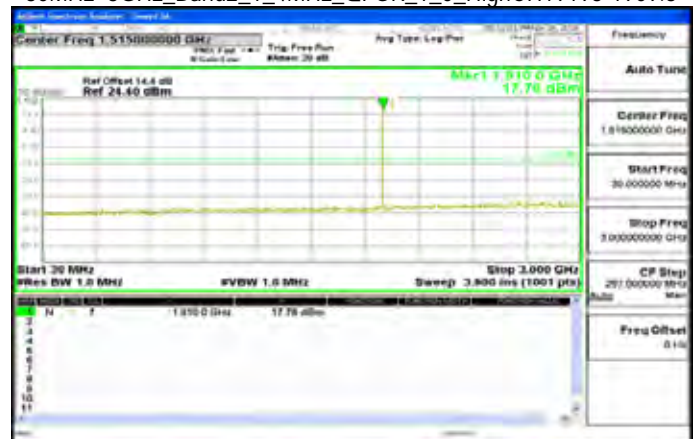
3GHz~10GHz\_Band2\_1\_4MHz\_QPSK\_1\_0\_MidCH18900-1880



3GHz~10GHz\_Band2\_1\_4MHz\_QPSK\_1\_0\_LowCH18607-1850.7



30MHz~3GHz\_Band2\_1\_4MHz\_QPSK\_1\_0\_HighCH19193-1909.3



30MHz~3GHz\_Band2\_1\_4MHz\_QPSK\_1\_0\_MidCH18900-1880



3GHz~10GHz\_Band2\_1\_4MHz\_QPSK\_1\_0\_HighCH19193-1909.3



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30MHz~3GHz\_Band2\_3MHz\_QPSK\_1\_0\_LowCH18615-1851.5



3GHz~10GHz\_Band2\_3MHz\_QPSK\_1\_0\_MidCH18900-1880



3GHz~10GHz\_Band2\_3MHz\_QPSK\_1\_0\_LowCH18615-1851.5



30MHz~3GHz\_Band2\_3MHz\_QPSK\_1\_0\_HighCH19185-1908.5



30MHz~3GHz\_Band2\_3MHz\_QPSK\_1\_0\_MidCH18900-1880



3GHz~10GHz\_Band2\_3MHz\_QPSK\_1\_0\_HighCH19185-1908.5



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30MHz~3GHz\_Band2\_5MHz\_QPSK\_1\_0\_LowCH18625-1852.5



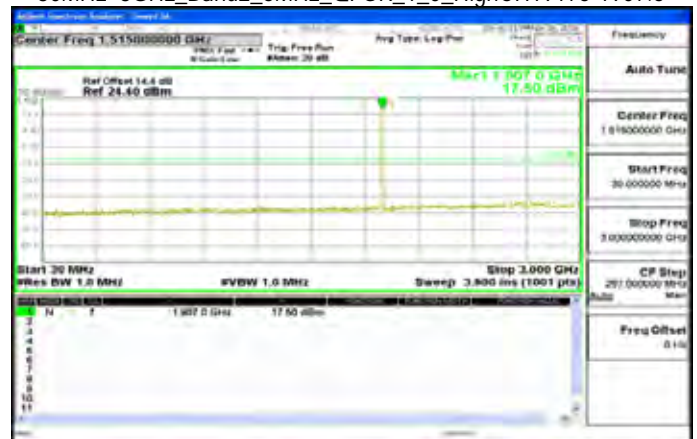
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3GHz~10GHz\_Band2\_5MHz\_QPSK\_1\_0\_LowCH18625-1852.5



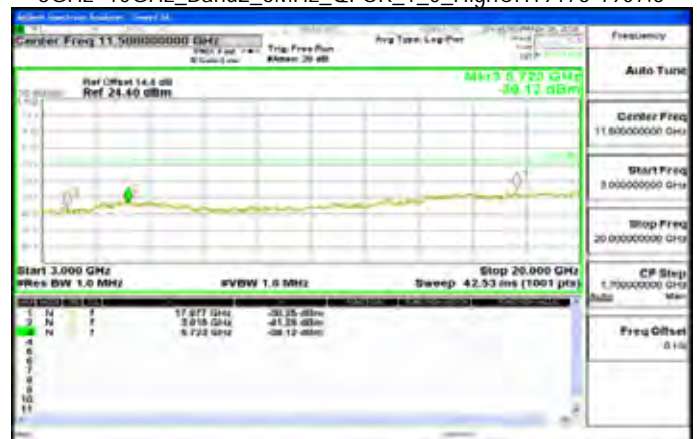
30MHz~3GHz\_Band2\_5MHz\_QPSK\_1\_0\_HighCH19175-1907.5



30MHz~3GHz\_Band2\_5MHz\_QPSK\_1\_0\_MidCH18900-1880



3GHz~10GHz\_Band2\_5MHz\_QPSK\_1\_0\_HighCH19175-1907.5



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30MHz-3GHz\_Band2\_10MHz\_QPSK\_1\_0\_LowCH18650-1855



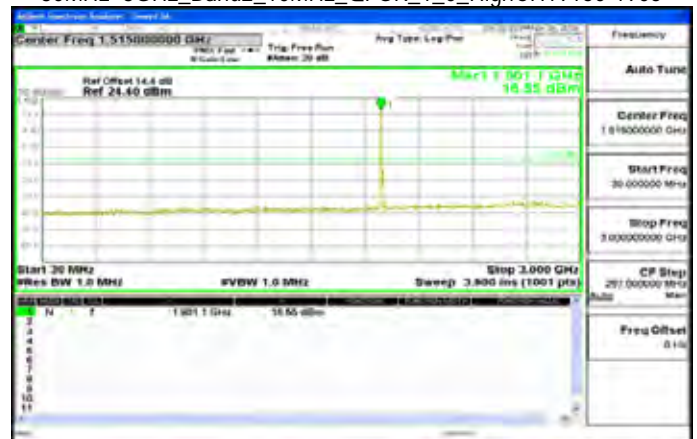
3GHz-10GHz\_Band2\_10MHz\_QPSK\_1\_0\_MidCH18900-1880



3GHz-10GHz\_Band2\_10MHz\_QPSK\_1\_0\_LowCH18650-1855



30MHz-3GHz\_Band2\_10MHz\_QPSK\_1\_0\_HighCH19150-1905



30MHz-3GHz\_Band2\_10MHz\_QPSK\_1\_0\_MidCH18900-1880



3GHz-10GHz\_Band2\_10MHz\_QPSK\_1\_0\_HighCH19150-1905



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30MHz-3GHz\_Band2\_15MHz\_QPSK\_1\_0\_LowCH18675-1857.5



3GHz-10GHz\_Band2\_15MHz\_QPSK\_1\_0\_MidCH18900-1880



3GHz-10GHz\_Band2\_15MHz\_QPSK\_1\_0\_LowCH18675-1857.5



30MHz-3GHz\_Band2\_15MHz\_QPSK\_1\_0\_HighCH19125-1902.5



30MHz-3GHz\_Band2\_15MHz\_QPSK\_1\_0\_MidCH18900-1880



3GHz-10GHz\_Band2\_15MHz\_QPSK\_1\_0\_HighCH19125-1902.5



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30MHz-3GHz\_Band2\_20MHz\_QPSK\_1\_0\_LowCH18700-1860



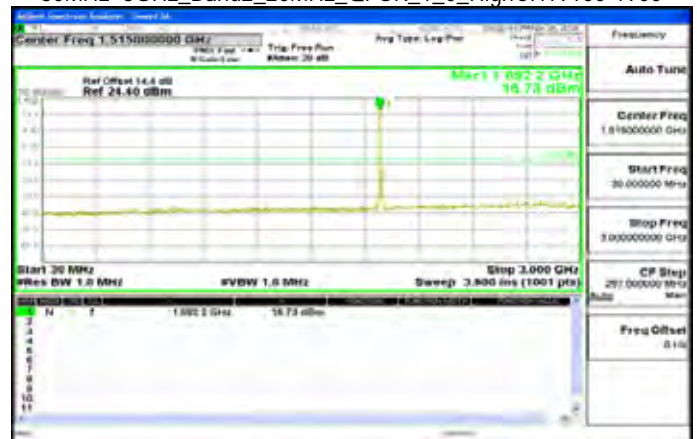
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3GHz-10GHz\_Band2\_20MHz\_QPSK\_1\_0\_LowCH18700-1860



30MHz-3GHz\_Band2\_20MHz\_QPSK\_1\_0\_HighCH19100-1900



30MHz-3GHz\_Band2\_20MHz\_QPSK\_1\_0\_MidCH18900-1880



3GHz-10GHz\_Band2\_20MHz\_QPSK\_1\_0\_HighCH19100-1900



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## 10. FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT

### 10.1. Standard Applicable

According to FCC §2.1053,

FCC §24.238(a), the magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under the conditions specified in the instruction manual and/ or alignment procedure, shall not be less than  $43 + 10 \log$  (mean output power in watts) dBc below the mean power output outside a license's frequency block (-13dBm).

**Table 2 — Unwanted Emissions for Mobile, Portable and Low-Power Fixed Subscriber Equipment**

| Frequency (MHz) | Attenuation (dB)                     |
|-----------------|--------------------------------------|
| <2200           | $43 + 10 \log_{10}(p)$               |
| 2200 - 2288     | $70 + 10 \log_{10}(p)$               |
| 2288 - 2292     | $67 + 10 \log_{10}(p)$               |
| 2292 - 2296     | $61 + 10 \log_{10}(p)$               |
| 2296 - 2300     | $55 + 10 \log_{10}(p)$               |
| 2300 - 2305     | $43 + 10 \log_{10}(p)$               |
| 2305 - 2320     | $43 + 10 \log_{10}(p)^{\text{Note}}$ |
| 2320 - 2324     | $55 + 10 \log_{10}(p)$               |
| 2324 - 2328     | $61 + 10 \log_{10}(p)$               |
| 2328 - 2337     | $67 + 10 \log_{10}(p)$               |
| 2337 - 2341     | $61 + 10 \log_{10}(p)$               |
| 2341 - 2345     | $55 + 10 \log_{10}(p)$               |
| 2345 - 2360     | $43 + 10 \log_{10}(p)^{\text{Note}}$ |
| 2360 - 2365     | $43 + 10 \log_{10}(p)$               |
| 2365 - 2395     | $70 + 10 \log_{10}(p)$               |
| >2395           | $43 + 10 \log_{10}(p)$               |

**Note:** Measured at the edges of the highest and lowest frequency range(s) in which the equipment is designed to operate. See Section 1.2 for the permitted frequency ranges for various equipment types.

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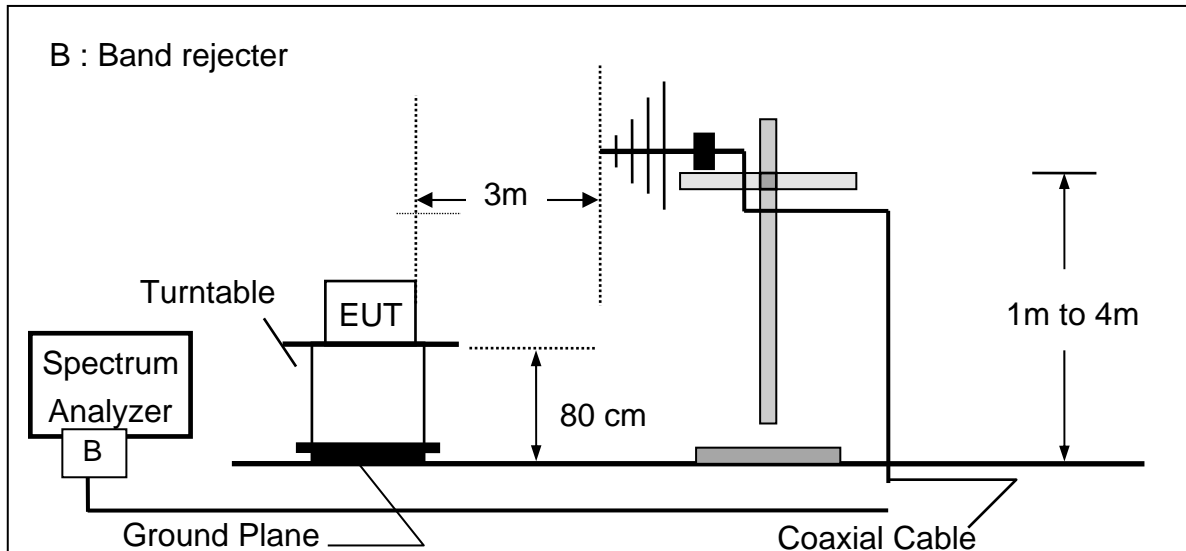
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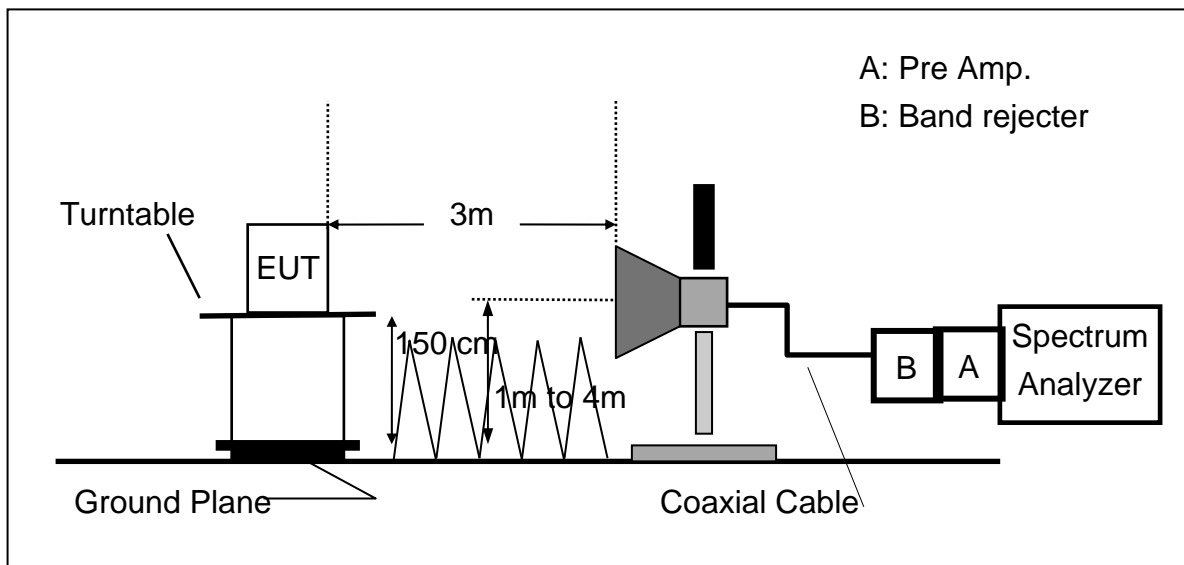
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## 10.2. EUT Setup

### Radiated Emission Test Set-Up, Frequency Below 1000MHz



### Radiated Emission Test Set-UP Frequency Over 1 GHz



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### 10.3. Measurement Procedure:

The EUT was placed on a non-conductive; the measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

The frequency range up to tenth harmonic was investigated for each of three fundamental frequencies (low, middle and high channels). Once spurious emission was identified, the power of the emission was determined using the substitution method.

The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency.

$EIRP\ (dBm) = SG\ Level(dBm) + Antenna\ Gain(dBi) + Cable\ Loss(dB)$

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.  
“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.  
“---” : denotes Noise Floor.

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#### 10.4. Measurement Equipment Used:

| EQUIPMENT TYPE        | MFR             | MODEL NUMBER | SERIAL NUMBER | LAST CAL.  | CAL DUE.   |
|-----------------------|-----------------|--------------|---------------|------------|------------|
| Bi-log Antenna        | SCHWAZBECK      | VULB9168     | 378           | 12/29/2017 | 12/28/2018 |
| Horn Antenna          | Schwarzbeck     | BBHA9120D    | 1441          | 08/16/2018 | 08/15/2019 |
| Horn Antenna          | Schwarzbeck     | BBHA9170     | 184           | 12/12/2017 | 12/11/2018 |
| Loop Antenna          | ETS.LINDGREN    | 6502         | 148045        | 10/08/2018 | 10/07/2019 |
| 3m Site NSA           | SGS             | 966 chamber  | N/A           | 01/02/2018 | 01/01/2019 |
| Spectrum Analyzer     | Agilent         | E4446A       | MY51100003    | 05/15/2018 | 05/14/2019 |
| EMI Test Receiver     | R&S             | ESCI7        | 100335        | 02/02/2018 | 02/01/2019 |
| Pre-Amplifier         | HP              | 8449B        | 3008A00578    | 01/02/2018 | 01/01/2019 |
| Pre-Amplifier         | HP              | 8447D        | 2944A07676    | 01/02/2018 | 01/01/2019 |
| Pre-Amplifier         | EMC Instruments | EMC184045B   | 980135        | 10/02/2018 | 10/01/2019 |
| Attenuator            | Mini-Circuit    | BW-S10W2+    | 2             | 01/02/2018 | 01/01/2019 |
| 2GHz High Pass Filter | Micro-Tronics   | HPM50110     | 36            | 01/02/2018 | 01/01/2019 |
| Filter 5150-5350 MHz  | Micro-Tronics   | BRM50703     | 1             | 01/02/2018 | 01/01/2019 |
| Low Loss Cable        | Huber Suhner    | 966_RX       | 9             | 01/02/2018 | 01/01/2019 |

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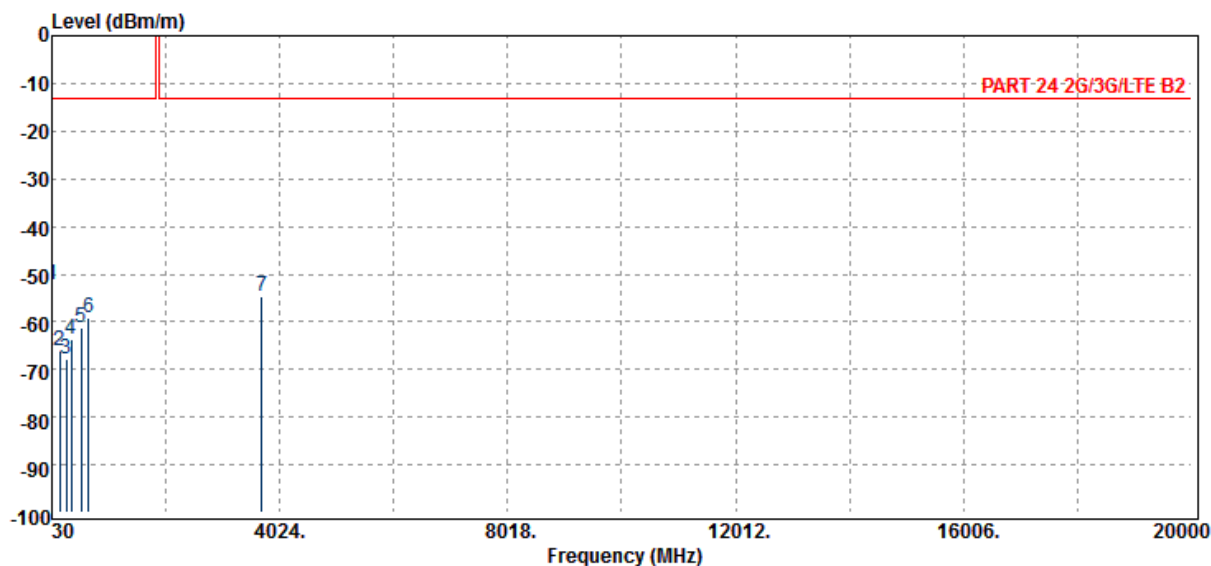
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## 10.5. Measurement Result:

### Radiated Spurious Emission Measurement Result: GPRS 1900 Mode

|                       |             |                          |                   |
|-----------------------|-------------|--------------------------|-------------------|
| Operation Band        | :GPRS 1900  | Temp./Humi.              | :22 deg_C / 61 RH |
| Fundamental Frequency | :1850.2 MHz | Engineer                 | :Tin              |
| Operation Mode        | :Tx CH LOW  |                          |                   |
| EUT Pol.              | :E2 Plane   | Measurement Antenna Pol. | :VERTICAL         |



| Freq.<br>MHz | ERP/EIRP<br>dBm | SG<br>Output Level<br>dBm | Antenna<br>Gain<br>dBd/dBi | Cable<br>Loss<br>dB | Limit<br>dBm | Margin<br>dB |
|--------------|-----------------|---------------------------|----------------------------|---------------------|--------------|--------------|
| 30.00        | -52.08          | -39.07                    | -12.43                     | -0.58               | -13.00       | -39.08       |
| 162.89       | -66.24          | -66.02                    | 1.09                       | -1.31               | -13.00       | -53.24       |
| 289.96       | -67.74          | -71.53                    | 5.57                       | -1.78               | -13.00       | -54.74       |
| 364.65       | -63.76          | -67.65                    | 5.96                       | -2.07               | -13.00       | -50.76       |
| 541.19       | -61.21          | -65.44                    | 6.14                       | -1.91               | -13.00       | -48.21       |
| 670.20       | -59.03          | -62.64                    | 5.92                       | -2.31               | -13.00       | -46.03       |
| 3700.40      | -54.52          | -60.18                    | 12.57                      | -6.91               | -13.00       | -41.52       |

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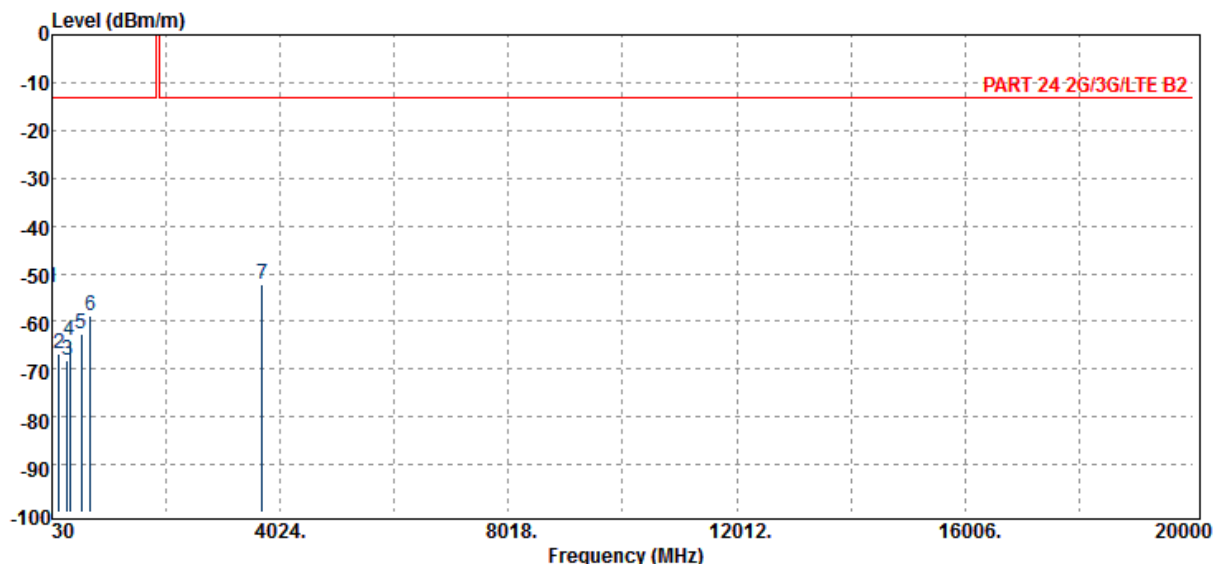
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Operation Band :GPRS 1900  
Fundamental Frequency :1850.2 MHz  
Operation Mode :Tx CH LOW  
EUT Pol. :E2 Plane

Temp./Humi. :22 deg\_C / 61 RH  
Engineer :Tin

Measurement Antenna Pol. :HORIZONTAL



| Freq.<br>MHz | ERP/EIRP<br>dBm | SG<br>Output Level<br>dBm | Antenna<br>Gain<br>dBd/dBi | Cable<br>Loss<br>dB | Limit<br>dBm | Margin<br>dB |
|--------------|-----------------|---------------------------|----------------------------|---------------------|--------------|--------------|
| 30.00        | -52.78          | -39.77                    | -12.43                     | -0.58               | -13.00       | -39.78       |
| 148.34       | -66.64          | -65.62                    | 0.26                       | -1.29               | -13.00       | -53.64       |
| 296.75       | -68.19          | -72.08                    | 5.70                       | -1.81               | -13.00       | -55.19       |
| 342.34       | -64.08          | -68.06                    | 5.97                       | -1.99               | -13.00       | -51.08       |
| 537.31       | -62.55          | -66.63                    | 6.15                       | -2.07               | -13.00       | -49.55       |
| 700.27       | -58.81          | -62.47                    | 5.82                       | -2.16               | -13.00       | -45.81       |
| 3700.40      | -52.35          | -58.00                    | 12.57                      | -6.91               | -13.00       | -39.35       |

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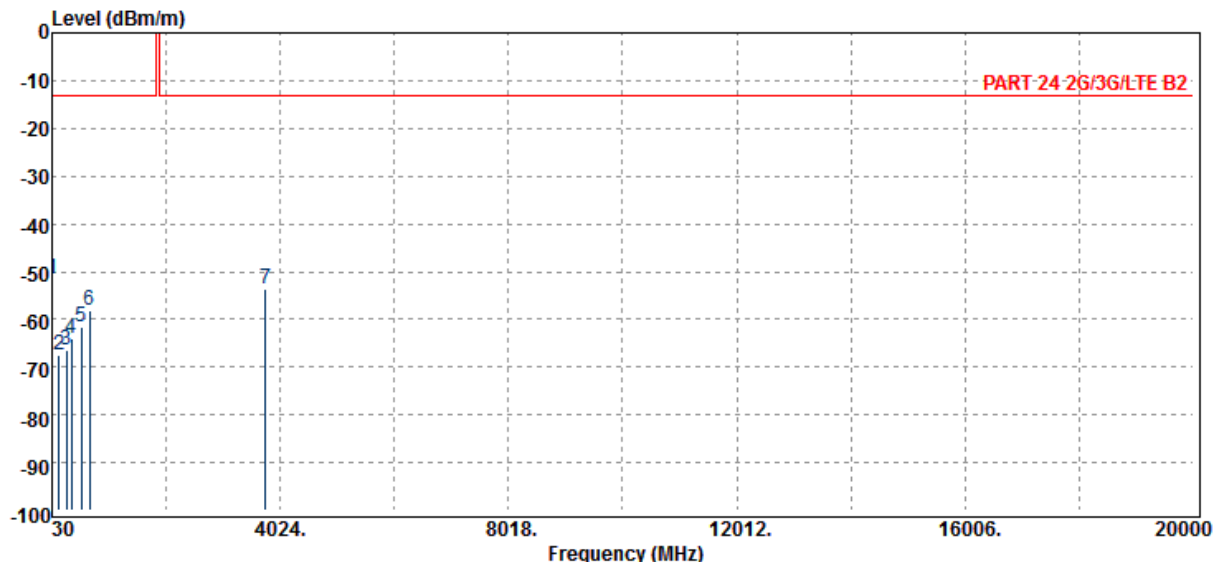
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Operation Band :GPRS 1900  
Fundamental Frequency :1880 MHz  
Operation Mode :Tx CH MID  
EUT Pol. :E2 Plane

Temp./Humi. :22 deg\_C / 61 RH  
Engineer :Tin

Measurement Antenna Pol. :VERTICAL



| Freq.<br>MHz | ERP/EIRP<br>dBm | SG<br>Output Level<br>dBm | Antenna<br>Gain<br>dBd/dBi | Cable<br>Loss<br>dB | Limit<br>dBm | Margin<br>dB |
|--------------|-----------------|---------------------------|----------------------------|---------------------|--------------|--------------|
| 30.00        | -51.73          | -38.72                    | -12.43                     | -0.58               | -13.00       | -38.73       |
| 146.40       | -67.41          | -66.29                    | 0.17                       | -1.29               | -13.00       | -54.41       |
| 288.99       | -66.31          | -70.10                    | 5.57                       | -1.78               | -13.00       | -53.31       |
| 362.71       | -63.99          | -67.89                    | 5.97                       | -2.07               | -13.00       | -50.99       |
| 541.19       | -61.66          | -65.90                    | 6.14                       | -1.91               | -13.00       | -48.66       |
| 694.45       | -57.99          | -61.23                    | 5.84                       | -2.61               | -13.00       | -44.99       |
| 3760.00      | -53.70          | -59.43                    | 12.61                      | -6.89               | -13.00       | -40.70       |

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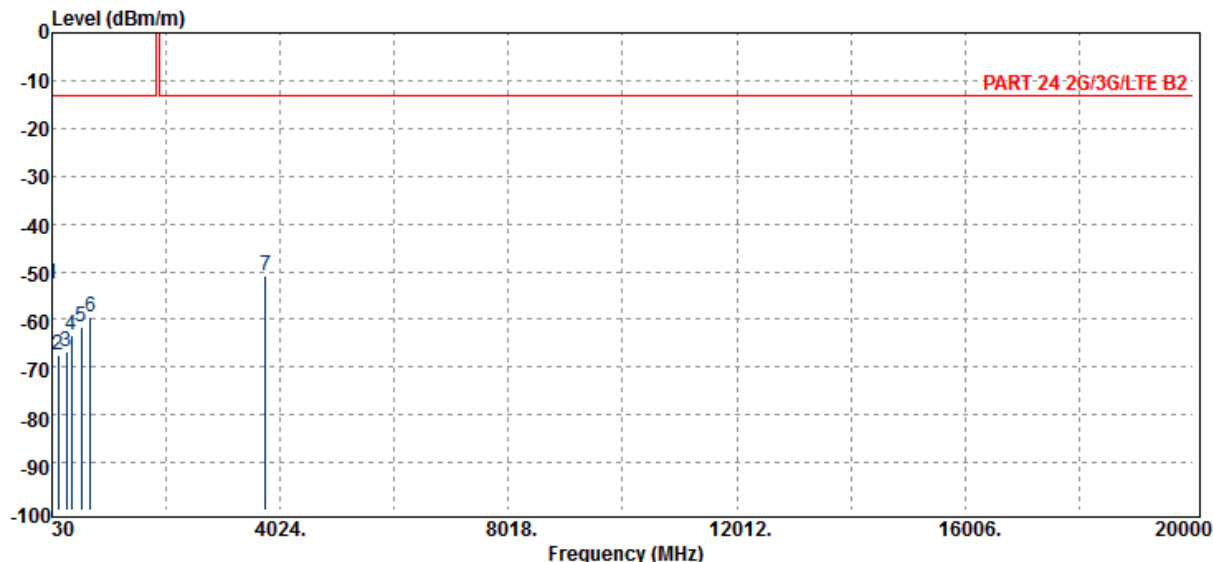
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Operation Band :GPRS 1900  
Fundamental Frequency :1880 MHz  
Operation Mode :Tx CH MID  
EUT Pol. :E2 Plane

Temp./Humi. :22 deg\_C / 61 RH  
Engineer :Tin

Measurement Antenna Pol. :HORIZONTAL



| Freq.<br>MHz | ERP/EIRP<br>dBm | SG<br>Output Level<br>dBm | Antenna<br>Gain<br>dBd/dBi | Cable<br>Loss<br>dB | Limit<br>dBm | Margin<br>dB |
|--------------|-----------------|---------------------------|----------------------------|---------------------|--------------|--------------|
| 30.00        | -52.69          | -39.68                    | -12.43                     | -0.58               | -13.00       | -39.69       |
| 139.61       | -67.63          | -66.23                    | -0.14                      | -1.26               | -13.00       | -54.63       |
| 284.14       | -66.83          | -70.64                    | 5.57                       | -1.76               | -13.00       | -53.83       |
| 362.71       | -63.31          | -67.21                    | 5.97                       | -2.07               | -13.00       | -50.31       |
| 544.10       | -61.59          | -65.94                    | 6.14                       | -1.79               | -13.00       | -48.59       |
| 699.30       | -59.43          | -63.02                    | 5.83                       | -2.24               | -13.00       | -46.43       |
| 3760.00      | -50.77          | -56.50                    | 12.61                      | -6.89               | -13.00       | -37.77       |

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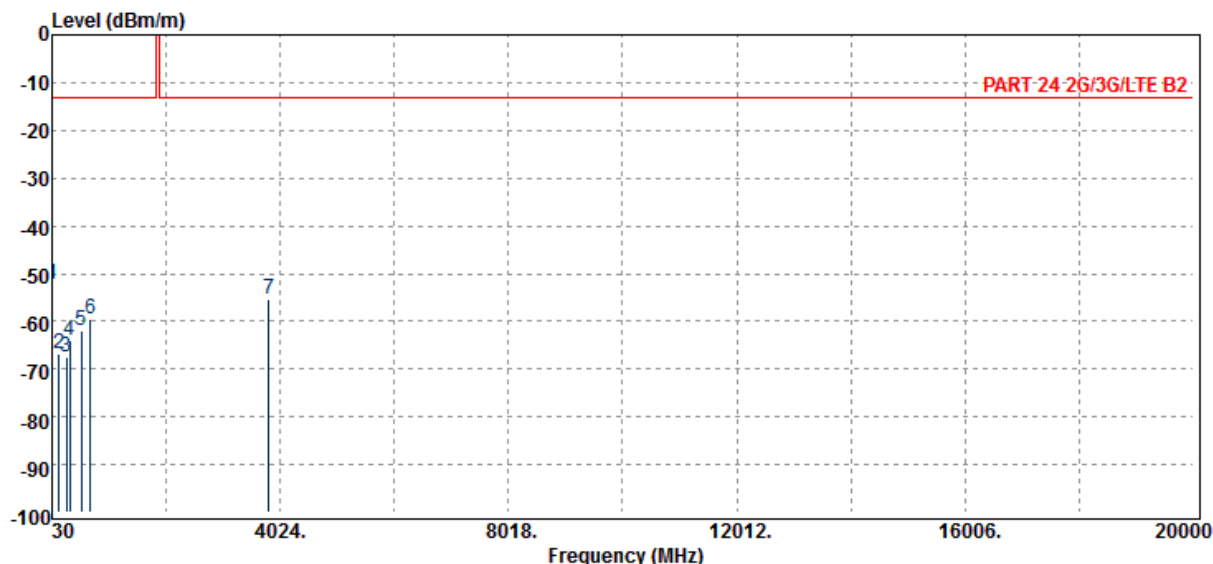
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|                       |             |                          |                   |
|-----------------------|-------------|--------------------------|-------------------|
| Operation Band        | :GPRS 1900  | Temp./Humi.              | :22 deg_C / 61 RH |
| Fundamental Frequency | :1909.8 MHz | Engineer                 | :Tin              |
| Operation Mode        | :Tx CH HIGH |                          |                   |
| EUT Pol.              | :E2 Plane   | Measurement Antenna Pol. | :VERTICAL         |



| Freq.<br>MHz | ERP/EIRP<br>dBm | SG<br>Output Level<br>dBm | Antenna<br>Gain<br>dBd/dBi | Cable<br>Loss<br>dB | Limit<br>dBm | Margin<br>dB |
|--------------|-----------------|---------------------------|----------------------------|---------------------|--------------|--------------|
| 30.00        | -52.42          | -39.41                    | -12.43                     | -0.58               | -13.00       | -39.42       |
| 149.31       | -66.70          | -65.72                    | 0.31                       | -1.29               | -13.00       | -53.70       |
| 289.96       | -67.64          | -71.43                    | 5.57                       | -1.78               | -13.00       | -54.64       |
| 343.31       | -64.04          | -68.01                    | 5.97                       | -2.00               | -13.00       | -51.04       |
| 548.95       | -62.07          | -66.23                    | 6.13                       | -1.97               | -13.00       | -49.07       |
| 696.39       | -59.44          | -62.81                    | 5.84                       | -2.46               | -13.00       | -46.44       |
| 3819.60      | -55.31          | -60.95                    | 12.66                      | -7.02               | -13.00       | -42.31       |

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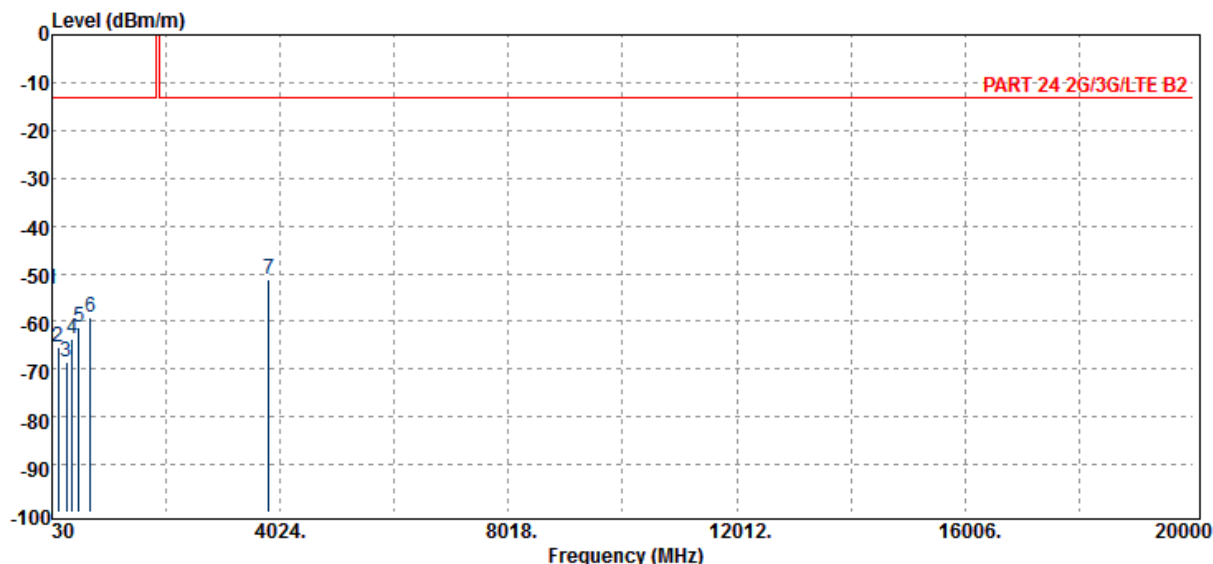
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|                       |             |                          |                   |
|-----------------------|-------------|--------------------------|-------------------|
| Operation Band        | :GPRS 1900  | Temp./Humi.              | :22 deg_C / 61 RH |
| Fundamental Frequency | :1909.8 MHz | Engineer                 | :Tin              |
| Operation Mode        | :Tx CH HIGH |                          |                   |
| EUT Pol.              | :E2 Plane   | Measurement Antenna Pol. | :HORIZONTAL       |



| Freq.<br>MHz | ERP/EIRP<br>dBm | SG<br>Output Level<br>dBm | Antenna<br>Gain<br>dBd/dBi | Cable<br>Loss<br>dB | Limit<br>dBm | Margin<br>dB |
|--------------|-----------------|---------------------------|----------------------------|---------------------|--------------|--------------|
| 30.00        | -53.44          | -40.43                    | -12.43                     | -0.58               | -13.00       | -40.44       |
| 144.46       | -65.41          | -64.20                    | 0.07                       | -1.28               | -13.00       | -52.41       |
| 288.99       | -68.57          | -72.36                    | 5.57                       | -1.78               | -13.00       | -55.57       |
| 386.96       | -63.70          | -67.57                    | 5.90                       | -2.02               | -13.00       | -50.70       |
| 495.60       | -61.25          | -65.32                    | 6.16                       | -2.09               | -13.00       | -48.25       |
| 696.39       | -59.23          | -62.61                    | 5.84                       | -2.46               | -13.00       | -46.23       |
| 3819.60      | -51.36          | -57.00                    | 12.66                      | -7.02               | -13.00       | -38.36       |

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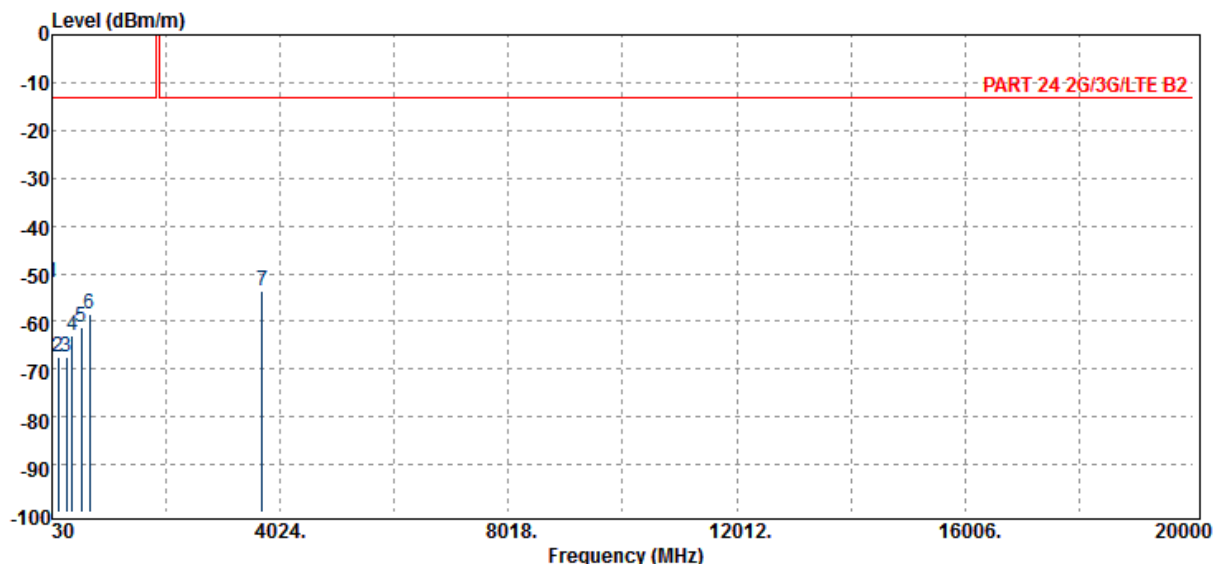
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## Radiated Spurious Emission Measurement Result: WCDMA Band II Mode

Operation Band :WCDMA B2      Temp./Humi. :22 deg\_C / 61 RH  
Fundamental Frequency :1852.4 MHz      Engineer :Tin  
Operation Mode :Tx CH LOW  
EUT Pol. :E2 Plane      Measurement Antenna Pol. :VERTICAL



| Freq.<br>MHz | ERP/EIRP<br>dBm | SG<br>Output Level<br>dBm | Antenna<br>Gain<br>dBd/dBi | Cable<br>Loss<br>dB | Limit<br>dBm | Margin<br>dB |
|--------------|-----------------|---------------------------|----------------------------|---------------------|--------------|--------------|
| 30.00        | -51.85          | -38.85                    | -12.43                     | -0.58               | -13.00       | -38.85       |
| 143.49       | -67.44          | -66.18                    | 0.02                       | -1.28               | -13.00       | -54.44       |
| 282.20       | -67.40          | -71.21                    | 5.57                       | -1.75               | -13.00       | -54.40       |
| 379.20       | -62.82          | -66.72                    | 5.92                       | -2.03               | -13.00       | -49.82       |
| 549.92       | -61.41          | -65.51                    | 6.13                       | -2.02               | -13.00       | -48.41       |
| 694.45       | -58.62          | -61.86                    | 5.84                       | -2.61               | -13.00       | -45.62       |
| 3704.80      | -53.51          | -59.18                    | 12.57                      | -6.90               | -13.00       | -40.51       |

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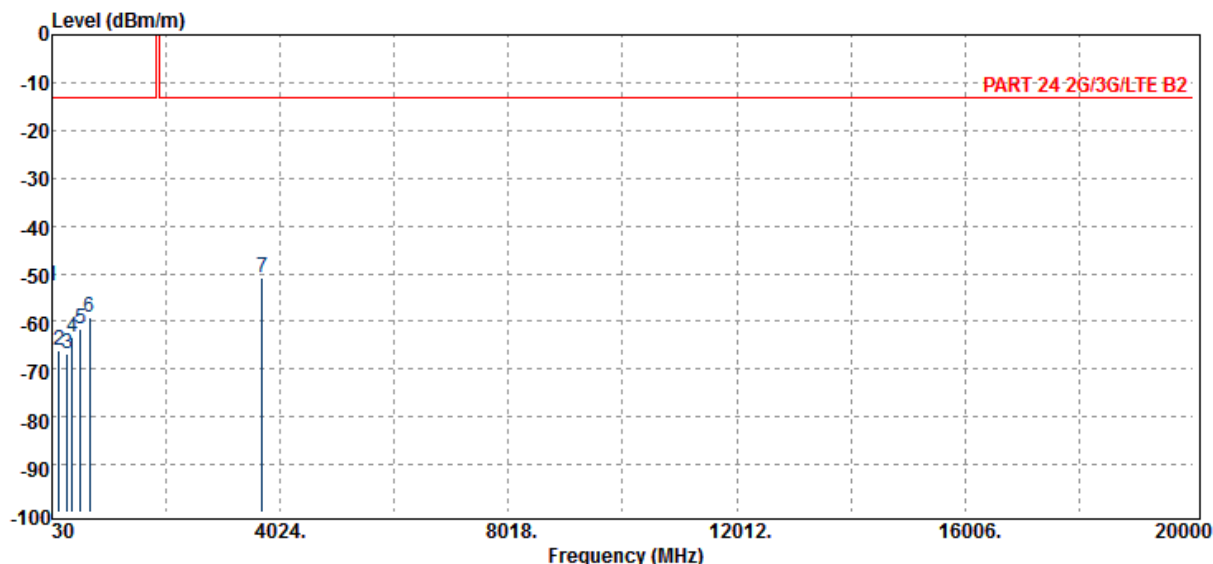
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Operation Band :WCDMA B2  
Fundamental Frequency :1852.4 MHz  
Operation Mode :Tx CH LOW  
EUT Pol. :E2 Plane

Temp./Humi. :22 deg\_C / 61 RH  
Engineer :Tin

Measurement Antenna Pol. :HORIZONTAL



| Freq.<br>MHz | ERP/EIRP<br>dBm | SG<br>Output Level<br>dBm | Antenna<br>Gain<br>dBd/dBi | Cable<br>Loss<br>dB | Limit<br>dBm | Margin<br>dB |
|--------------|-----------------|---------------------------|----------------------------|---------------------|--------------|--------------|
| 30.00        | -52.76          | -39.75                    | -12.43                     | -0.58               | -13.00       | -39.76       |
| 149.31       | -66.16          | -65.18                    | 0.31                       | -1.29               | -13.00       | -53.16       |
| 299.66       | -66.91          | -70.85                    | 5.76                       | -1.82               | -13.00       | -53.91       |
| 385.99       | -63.35          | -67.24                    | 5.90                       | -2.01               | -13.00       | -50.35       |
| 531.49       | -61.62          | -65.47                    | 6.16                       | -2.31               | -13.00       | -48.62       |
| 692.51       | -59.26          | -62.35                    | 5.85                       | -2.76               | -13.00       | -46.26       |
| 3704.80      | -50.81          | -56.48                    | 12.57                      | -6.90               | -13.00       | -37.81       |

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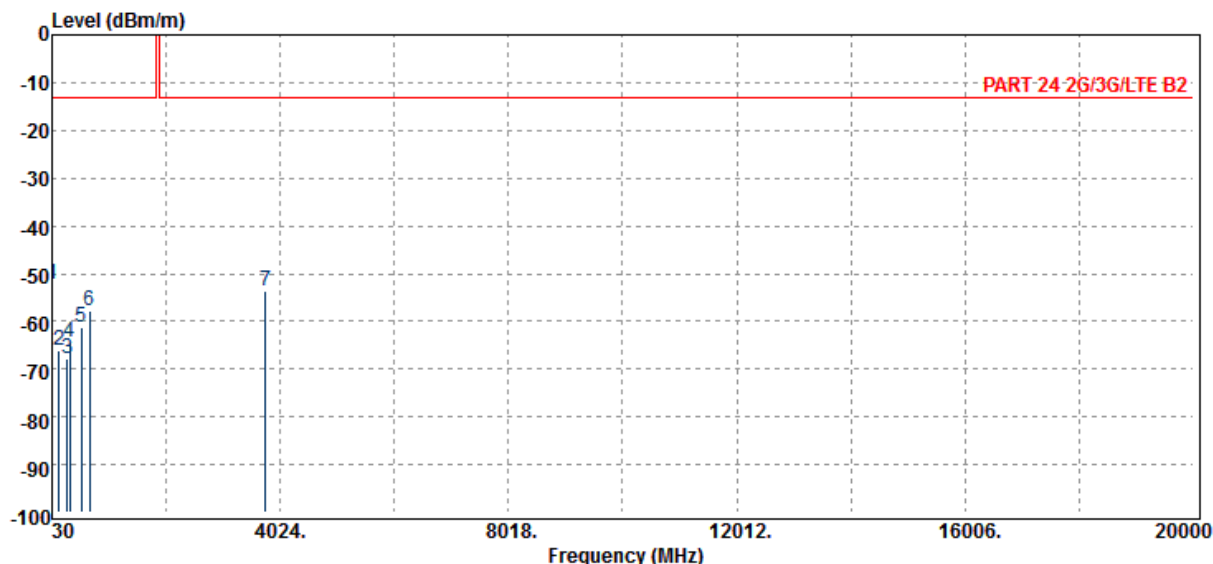
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Operation Band :WCDMA B2  
Fundamental Frequency :1880 MHz  
Operation Mode :Tx CH MID  
EUT Pol. :E2 Plane

Temp./Humi. :22 deg\_C / 61 RH  
Engineer :Tin

Measurement Antenna Pol. :VERTICAL



| Freq.<br>MHz | ERP/EIRP<br>dBm | SG<br>Output Level<br>dBm | Antenna<br>Gain<br>dBd/dBi | Cable<br>Loss<br>dB | Limit<br>dBm | Margin<br>dB |
|--------------|-----------------|---------------------------|----------------------------|---------------------|--------------|--------------|
| 30.00        | -52.22          | -39.21                    | -12.43                     | -0.58               | -13.00       | -39.22       |
| 156.10       | -66.12          | -65.51                    | 0.69                       | -1.30               | -13.00       | -53.12       |
| 296.75       | -67.98          | -71.88                    | 5.70                       | -1.81               | -13.00       | -54.98       |
| 347.19       | -64.34          | -68.32                    | 5.99                       | -2.02               | -13.00       | -51.34       |
| 539.25       | -61.35          | -65.51                    | 6.15                       | -1.99               | -13.00       | -48.35       |
| 692.51       | -57.63          | -60.72                    | 5.85                       | -2.76               | -13.00       | -44.63       |
| 3760.00      | -53.55          | -59.28                    | 12.61                      | -6.89               | -13.00       | -40.55       |

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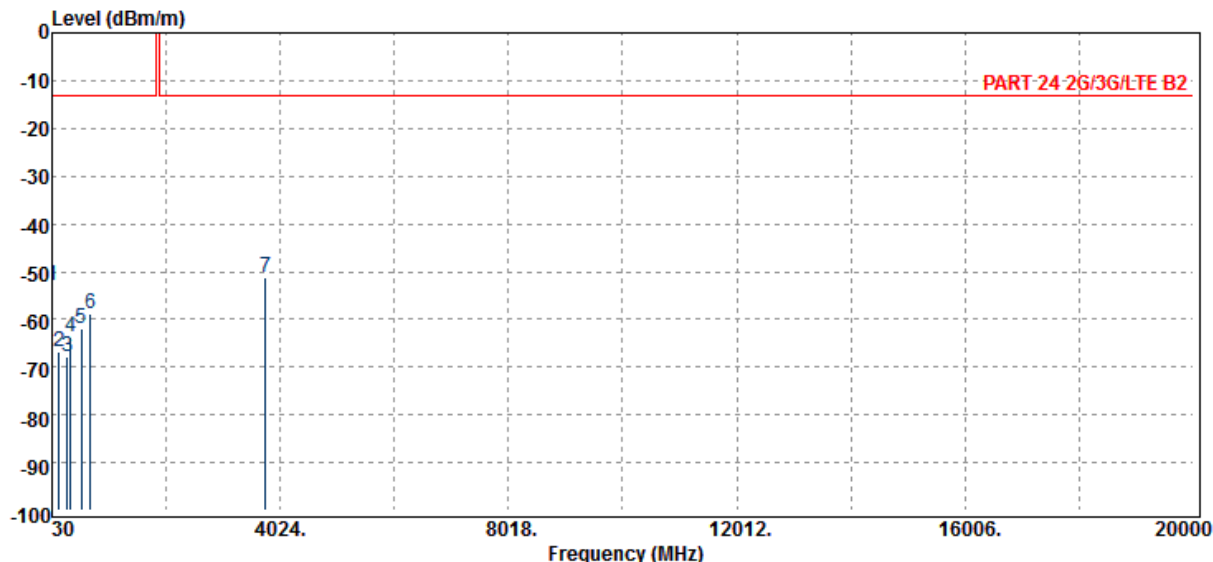
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Operation Band :WCDMA B2  
Fundamental Frequency :1880 MHz  
Operation Mode :Tx CH MID  
EUT Pol. :E2 Plane

Temp./Humi. :22 deg\_C / 61 RH  
Engineer :Tin

Measurement Antenna Pol. :HORIZONTAL



| Freq.<br>MHz | ERP/EIRP<br>dBm | SG<br>Output Level<br>dBm | Antenna<br>Gain<br>dBd/dBi | Cable<br>Loss<br>dB | Limit<br>dBm | Margin<br>dB |
|--------------|-----------------|---------------------------|----------------------------|---------------------|--------------|--------------|
| 30.00        | -52.85          | -39.84                    | -12.43                     | -0.58               | -13.00       | -39.85       |
| 146.40       | -66.78          | -65.66                    | 0.17                       | -1.29               | -13.00       | -53.78       |
| 291.90       | -67.82          | -71.64                    | 5.61                       | -1.79               | -13.00       | -54.82       |
| 352.04       | -63.65          | -67.61                    | 6.00                       | -2.03               | -13.00       | -50.65       |
| 541.19       | -61.93          | -66.17                    | 6.14                       | -1.91               | -13.00       | -48.93       |
| 696.39       | -58.68          | -62.06                    | 5.84                       | -2.46               | -13.00       | -45.68       |
| 3760.00      | -51.15          | -56.88                    | 12.61                      | -6.89               | -13.00       | -38.15       |

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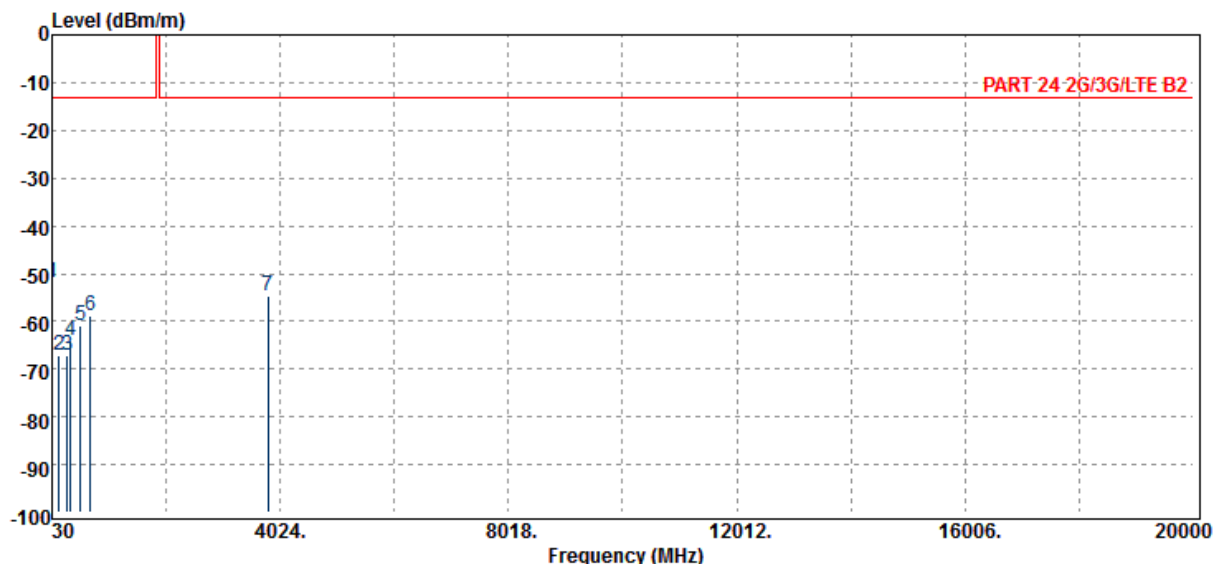
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Operation Band :WCDMA B2  
Fundamental Frequency :1907.6 MHz  
Operation Mode :Tx CH HIGH  
EUT Pol. :E2 Plane

Temp./Humi. :22 deg\_C / 61 RH  
Engineer :Tin

Measurement Antenna Pol. :VERTICAL



| Freq.<br>MHz | ERP/EIRP<br>dBm | SG<br>Output Level<br>dBm | Antenna<br>Gain<br>dBd/dBi | Cable<br>Loss<br>dB | Limit<br>dBm | Margin<br>dB |
|--------------|-----------------|---------------------------|----------------------------|---------------------|--------------|--------------|
| 30.00        | -52.06          | -39.05                    | -12.43                     | -0.58               | -13.00       | -39.06       |
| 149.31       | -67.25          | -66.27                    | 0.31                       | -1.29               | -13.00       | -54.25       |
| 298.69       | -67.13          | -71.05                    | 5.74                       | -1.82               | -13.00       | -54.13       |
| 352.04       | -63.94          | -67.91                    | 6.00                       | -2.03               | -13.00       | -50.94       |
| 527.61       | -60.83          | -64.52                    | 6.16                       | -2.47               | -13.00       | -47.83       |
| 696.39       | -58.96          | -62.33                    | 5.84                       | -2.46               | -13.00       | -45.96       |
| 3815.20      | -54.81          | -60.46                    | 12.66                      | -7.00               | -13.00       | -41.81       |

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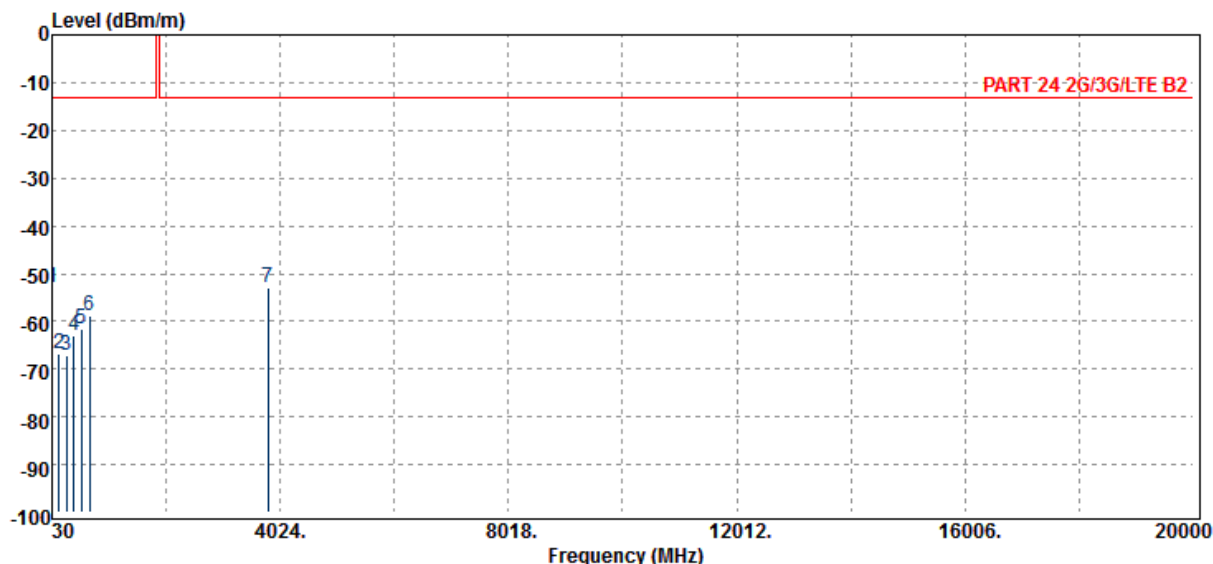
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|                       |             |                          |                   |
|-----------------------|-------------|--------------------------|-------------------|
| Operation Band        | :WCDMA B2   | Temp./Humi.              | :22 deg_C / 61 RH |
| Fundamental Frequency | :1907.6 MHz | Engineer                 | :Tin              |
| Operation Mode        | :Tx CH HIGH |                          |                   |
| EUT Pol.              | :E2 Plane   | Measurement Antenna Pol. | :HORIZONTAL       |



| Freq.<br>MHz | ERP/EIRP<br>dBm | SG<br>Output Level<br>dBm | Antenna<br>Gain<br>dBd/dBi | Cable<br>Loss<br>dB | Limit<br>dBm | Margin<br>dB |
|--------------|-----------------|---------------------------|----------------------------|---------------------|--------------|--------------|
| 30.00        | -52.79          | -39.78                    | -12.43                     | -0.58               | -13.00       | -39.79       |
| 146.40       | -66.79          | -65.67                    | 0.17                       | -1.29               | -13.00       | -53.79       |
| 289.96       | -67.17          | -70.96                    | 5.57                       | -1.78               | -13.00       | -54.17       |
| 415.09       | -62.98          | -66.67                    | 5.81                       | -2.12               | -13.00       | -49.98       |
| 544.10       | -61.70          | -66.05                    | 6.14                       | -1.79               | -13.00       | -48.70       |
| 691.54       | -58.69          | -61.70                    | 5.85                       | -2.83               | -13.00       | -45.69       |
| 3815.20      | -52.95          | -58.61                    | 12.66                      | -7.00               | -13.00       | -39.95       |

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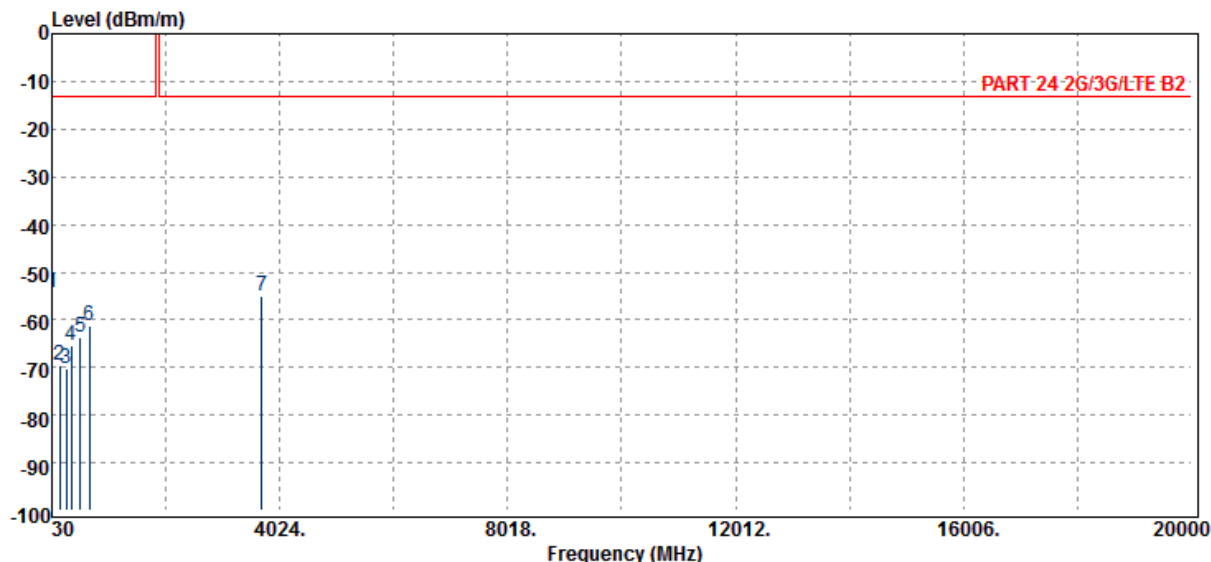
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## Radiated Spurious Emission Measurement Result: LTE Band 2 Mode

|                       |             |                          |                     |
|-----------------------|-------------|--------------------------|---------------------|
| Operation Band        | :LTE B2     | Temp./Humi.              | :24.1 deg_C / 65 RH |
| Fundamental Frequency | :1851.5 MHz | Engineer                 | :Tin                |
| Operation Mode        | :Tx CH LOW  |                          |                     |
| EUT Pol.              | :E2 Plane   | Measurement Antenna Pol. | :VERTICAL           |



| Freq.<br>MHz | ERP/EIRP<br>dBm | SG<br>Output Level<br>dBm | Antenna<br>Gain<br>dBd/dBi | Cable<br>Loss<br>dB | Limit<br>dBm | Margin<br>dB |
|--------------|-----------------|---------------------------|----------------------------|---------------------|--------------|--------------|
| 30.00        | -54.40          | -39.24                    | -14.58                     | -0.58               | -13.00       | -41.40       |
| 162.89       | -69.51          | -67.15                    | -1.06                      | -1.31               | -13.00       | -56.51       |
| 289.96       | -70.15          | -71.79                    | 3.42                       | -1.78               | -13.00       | -57.15       |
| 364.65       | -65.51          | -67.25                    | 3.81                       | -2.07               | -13.00       | -52.51       |
| 531.49       | -63.68          | -65.37                    | 4.01                       | -2.31               | -13.00       | -50.68       |
| 692.51       | -61.30          | -62.24                    | 3.70                       | -2.76               | -13.00       | -48.30       |
| 3703.00      | -55.07          | -60.73                    | 12.57                      | -6.91               | -13.00       | -42.07       |

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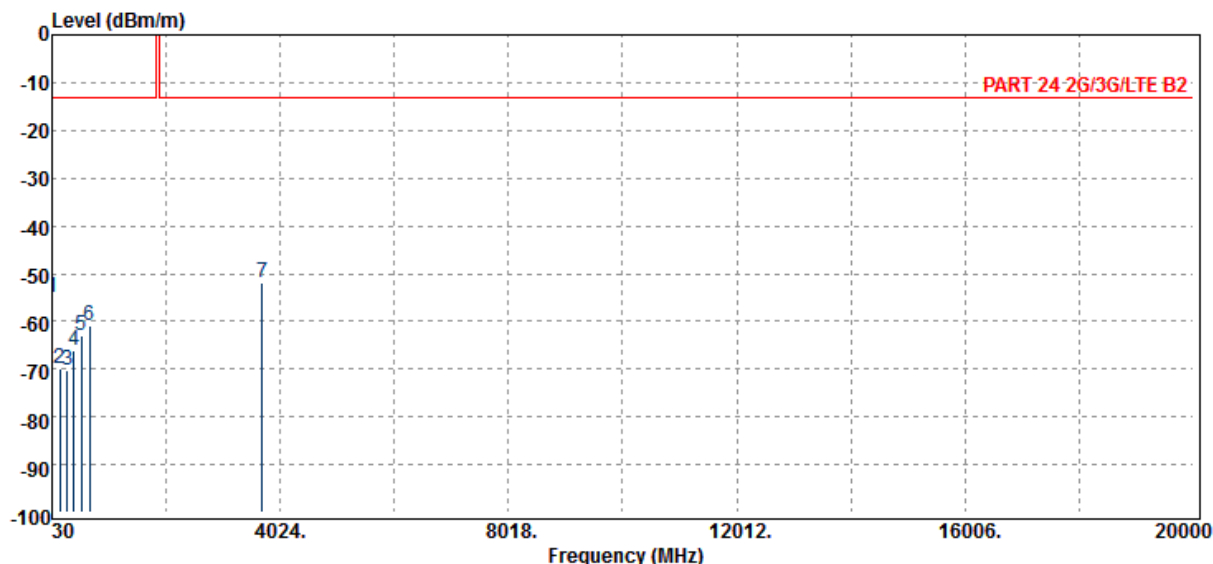
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|                       |             |                          |                     |
|-----------------------|-------------|--------------------------|---------------------|
| Operation Band        | :LTE B2     | Temp./Humi.              | :24.1 deg_C / 65 RH |
| Fundamental Frequency | :1851.5 MHz | Engineer                 | :Tin                |
| Operation Mode        | :Tx CH LOW  |                          |                     |
| EUT Pol.              | :E2 Plane   | Measurement Antenna Pol. | :HORIZONTAL         |



| Freq.<br>MHz | ERP/EIRP<br>dBm | SG<br>Output Level<br>dBm | Antenna<br>Gain<br>dBd/dBi | Cable<br>Loss<br>dB | Limit<br>dBm | Margin<br>dB |
|--------------|-----------------|---------------------------|----------------------------|---------------------|--------------|--------------|
| 30.00        | -55.09          | -39.93                    | -14.58                     | -0.58               | -13.00       | -42.09       |
| 168.71       | -69.78          | -67.75                    | -0.70                      | -1.33               | -13.00       | -56.78       |
| 299.66       | -70.18          | -71.97                    | 3.61                       | -1.82               | -13.00       | -57.18       |
| 406.36       | -65.93          | -67.48                    | 3.69                       | -2.15               | -13.00       | -52.93       |
| 541.19       | -62.89          | -64.98                    | 3.99                       | -1.91               | -13.00       | -49.89       |
| 692.51       | -60.92          | -61.86                    | 3.70                       | -2.76               | -13.00       | -47.92       |
| 3703.00      | -51.83          | -57.49                    | 12.57                      | -6.91               | -13.00       | -38.83       |

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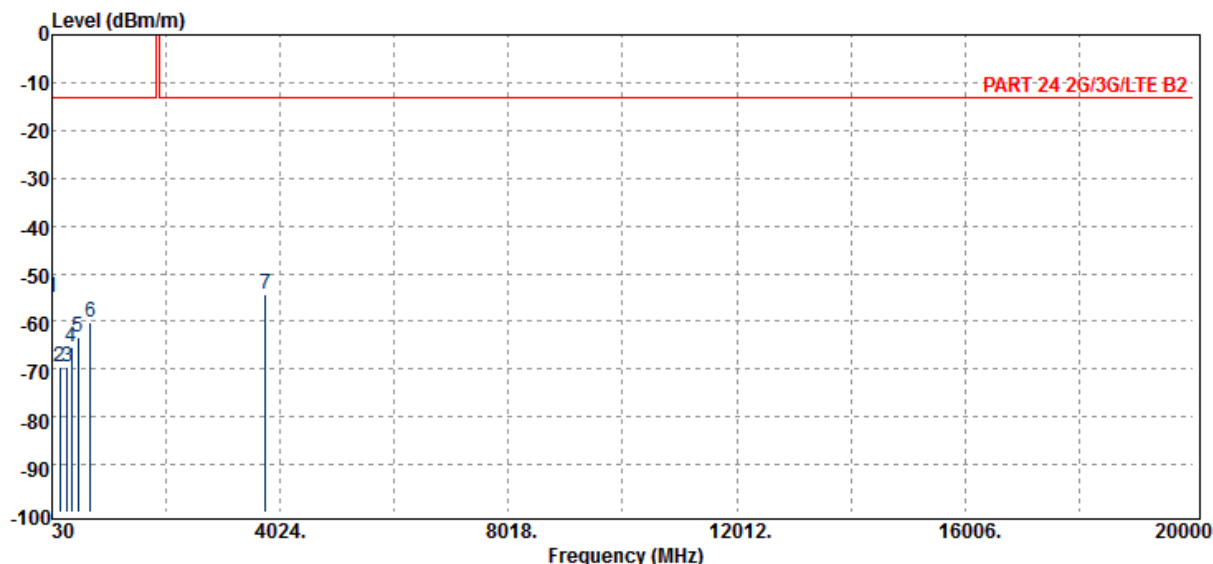
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|                       |            |                          |                     |
|-----------------------|------------|--------------------------|---------------------|
| Operation Band        | :LTE B2    | Temp./Humi.              | :24.1 deg_C / 65 RH |
| Fundamental Frequency | :1880 MHz  | Engineer                 | :Tin                |
| Operation Mode        | :Tx CH MID |                          |                     |
| EUT Pol.              | :E2 Plane  | Measurement Antenna Pol. | :VERTICAL           |



| Freq.<br>MHz | ERP/EIRP<br>dBm | SG<br>Output Level<br>dBm | Antenna<br>Gain<br>dBd/dBi | Cable<br>Loss<br>dB | Limit<br>dBm | Margin<br>dB |
|--------------|-----------------|---------------------------|----------------------------|---------------------|--------------|--------------|
| 30.00        | -54.94          | -39.78                    | -14.58                     | -0.58               | -13.00       | -41.94       |
| 170.65       | -69.64          | -67.79                    | -0.51                      | -1.33               | -13.00       | -56.64       |
| 298.69       | -69.55          | -71.32                    | 3.59                       | -1.82               | -13.00       | -56.55       |
| 369.50       | -65.43          | -67.17                    | 3.80                       | -2.06               | -13.00       | -52.43       |
| 487.84       | -63.24          | -65.29                    | 3.93                       | -1.89               | -13.00       | -50.24       |
| 696.39       | -60.32          | -61.55                    | 3.69                       | -2.46               | -13.00       | -47.32       |
| 3760.00      | -54.38          | -60.11                    | 12.61                      | -6.89               | -13.00       | -41.38       |

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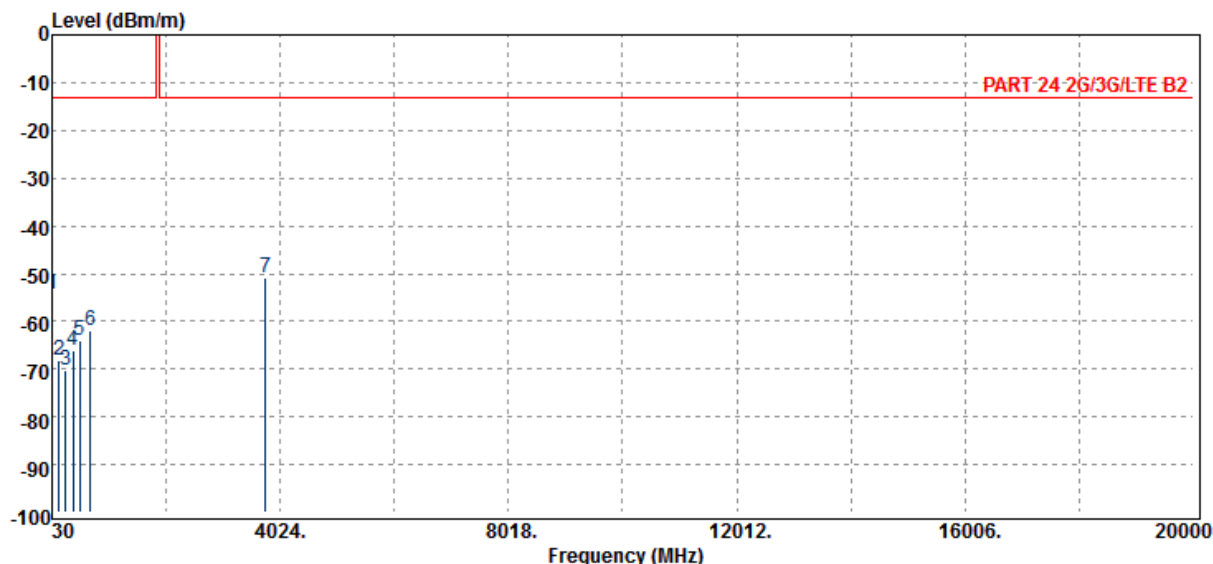
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|                       |            |                          |                     |
|-----------------------|------------|--------------------------|---------------------|
| Operation Band        | :LTE B2    | Temp./Humi.              | :24.1 deg_C / 65 RH |
| Fundamental Frequency | :1880 MHz  | Engineer                 | :Tin                |
| Operation Mode        | :Tx CH MID |                          |                     |
| EUT Pol.              | :E2 Plane  | Measurement Antenna Pol. | :HORIZONTAL         |



| Freq.<br>MHz | ERP/EIRP<br>dBm | SG<br>Output Level<br>dBm | Antenna<br>Gain<br>dBd/dBi | Cable<br>Loss<br>dB | Limit<br>dBm | Margin<br>dB |
|--------------|-----------------|---------------------------|----------------------------|---------------------|--------------|--------------|
| 30.00        | -54.23          | -39.07                    | -14.58                     | -0.58               | -13.00       | -41.23       |
| 154.16       | -68.14          | -65.27                    | -1.57                      | -1.30               | -13.00       | -55.14       |
| 274.44       | -70.36          | -72.09                    | 3.46                       | -1.73               | -13.00       | -57.36       |
| 401.51       | -66.03          | -67.61                    | 3.71                       | -2.13               | -13.00       | -53.03       |
| 516.94       | -64.06          | -65.61                    | 4.03                       | -2.48               | -13.00       | -51.06       |
| 697.36       | -61.85          | -63.15                    | 3.68                       | -2.38               | -13.00       | -48.85       |
| 3760.00      | -50.94          | -56.67                    | 12.61                      | -6.89               | -13.00       | -37.94       |

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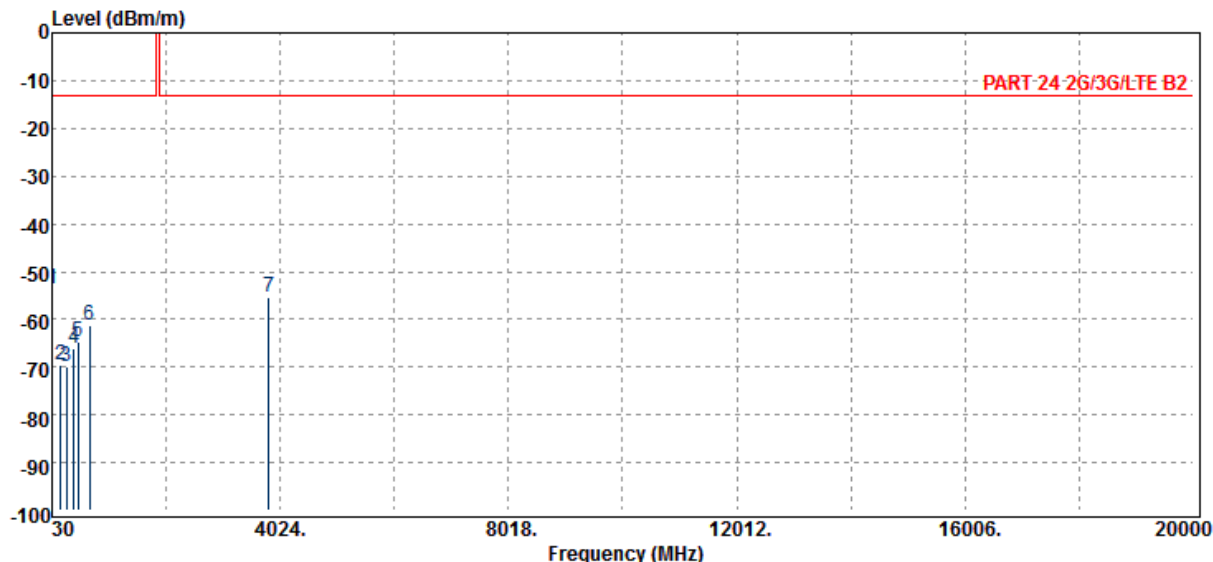
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|                       |             |                          |                     |
|-----------------------|-------------|--------------------------|---------------------|
| Operation Band        | :LTE B2     | Temp./Humi.              | :24.1 deg_C / 65 RH |
| Fundamental Frequency | :1908.5 MHz | Engineer                 | :Tin                |
| Operation Mode        | :Tx CH HIGH |                          |                     |
| EUT Pol.              | :E2 Plane   | Measurement Antenna Pol. | :VERTICAL           |



| Freq.<br>MHz | ERP/EIRP<br>dBm | SG<br>Output Level<br>dBm | Antenna<br>Gain<br>dBd/dBi | Cable<br>Loss<br>dB | Limit<br>dBm | Margin<br>dB |
|--------------|-----------------|---------------------------|----------------------------|---------------------|--------------|--------------|
| 30.00        | -53.80          | -38.64                    | -14.58                     | -0.58               | -13.00       | -40.80       |
| 175.50       | -69.57          | -68.49                    | 0.27                       | -1.36               | -13.00       | -56.57       |
| 285.11       | -69.80          | -71.46                    | 3.42                       | -1.76               | -13.00       | -56.80       |
| 418.00       | -66.09          | -67.62                    | 3.65                       | -2.11               | -13.00       | -53.09       |
| 490.75       | -64.77          | -66.76                    | 3.96                       | -1.96               | -13.00       | -51.77       |
| 689.60       | -61.13          | -61.85                    | 3.71                       | -2.98               | -13.00       | -48.13       |
| 3817.00      | -55.52          | -61.17                    | 12.66                      | -7.01               | -13.00       | -42.52       |

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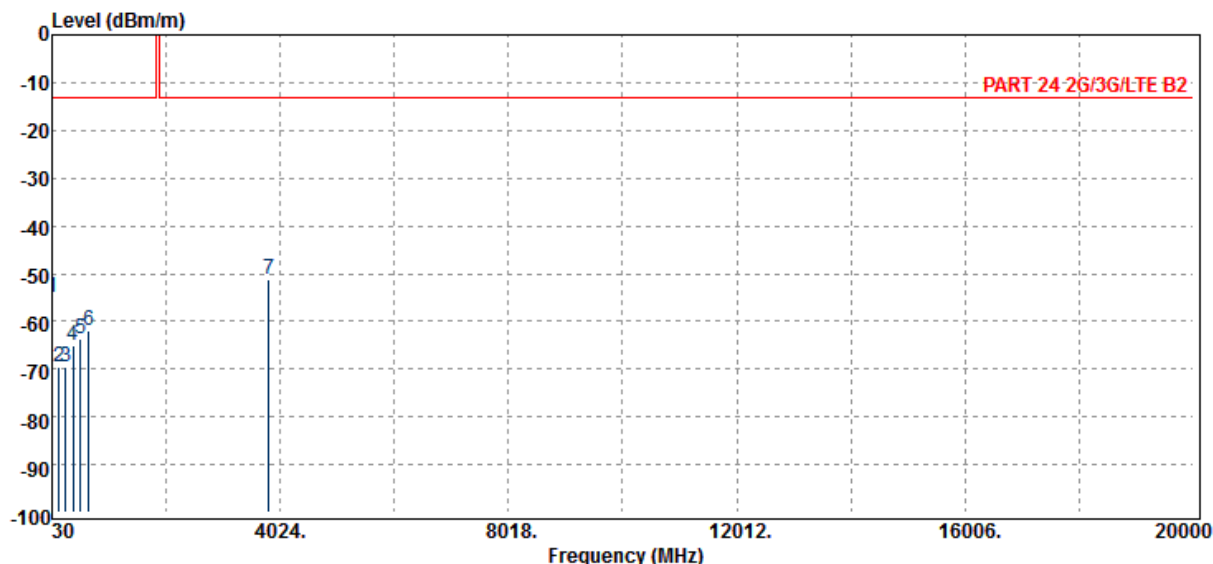
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|                       |             |                          |                     |
|-----------------------|-------------|--------------------------|---------------------|
| Operation Band        | :LTE B2     | Temp./Humi.              | :24.1 deg_C / 65 RH |
| Fundamental Frequency | :1908.5 MHz | Engineer                 | :Tin                |
| Operation Mode        | :Tx CH HIGH |                          |                     |
| EUT Pol.              | :E2 Plane   | Measurement Antenna Pol. | :HORIZONTAL         |



| Freq.<br>MHz | ERP/EIRP<br>dBm | SG<br>Output Level<br>dBm | Antenna<br>Gain<br>dBd/dBi | Cable<br>Loss<br>dB | Limit<br>dBm | Margin<br>dB |
|--------------|-----------------|---------------------------|----------------------------|---------------------|--------------|--------------|
| 30.00        | -55.08          | -39.92                    | -14.58                     | -0.58               | -13.00       | -42.08       |
| 154.16       | -69.63          | -66.77                    | -1.57                      | -1.30               | -13.00       | -56.63       |
| 272.50       | -69.48          | -71.23                    | 3.48                       | -1.73               | -13.00       | -56.48       |
| 403.45       | -65.02          | -66.58                    | 3.70                       | -2.14               | -13.00       | -52.02       |
| 532.46       | -63.75          | -65.49                    | 4.01                       | -2.27               | -13.00       | -50.75       |
| 675.05       | -61.83          | -62.93                    | 3.75                       | -2.65               | -13.00       | -48.83       |
| 3817.00      | -51.32          | -56.96                    | 12.66                      | -7.01               | -13.00       | -38.32       |

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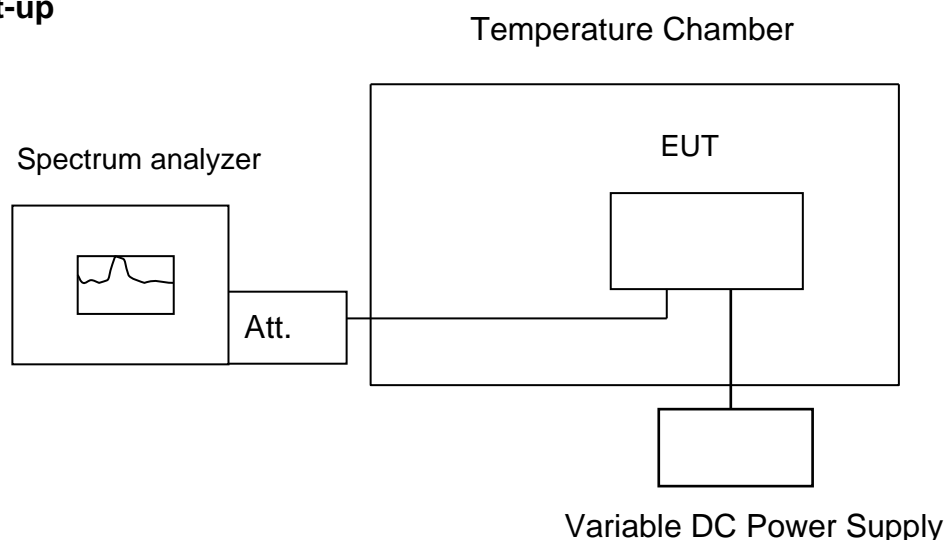
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## 11. FREQUENCY STABILITY MEASUREMENT

### 11.1. Standard Applicable

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

### 11.2. Test Set-up



**Note:** Measurement setup for testing on Antenna connector

### 11.3. Measurement Procedure

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.

Set chamber temperature to 25 . Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the input voltage to specify extreme voltage variation (+/- 15%) and endpoint as declared by the manufacturer, record the maximum frequency change.

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#### 11.4. Measurement Equipment Used

| EQUIPMENT TYPE               | MFR           | MODEL NUMBER    | SERIAL NUMBER | LAST CAL.  | CAL DUE.   |
|------------------------------|---------------|-----------------|---------------|------------|------------|
| EXA Spectrum Analyzer        | Agilent       | N9010A          | MY50420195    | 05/03/2018 | 05/02/2019 |
| Radio Communication Analyzer | Anritsu       | MT8820C         | 6200995019    | 04/05/2018 | 04/04/2019 |
| DC Power Supply              | Agilent       | E3640A          | MY52410006    | 11/28/2017 | 11/27/2018 |
| Attenuator                   | Mini-Circuit  | BW-S10W2+       | 2             | 01/02/2018 | 01/01/2019 |
| DC Block                     | Mini-Circuits | BLK-18-S+       | 1             | 01/02/2018 | 01/01/2019 |
| 2WayDivider                  | Woken         | DSU7AMK1A1      | N/A           | 01/02/2018 | 01/01/2019 |
| Coaxial Cable                | Huber Su-hner | SUCOFLEX 102EPA | MY2616/2      | 01/02/2018 | 01/01/2019 |

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## 11.5. Measurement Result

### FREQUENCY ERROR vs. VOLTAGE

| GPRS 1900 Mid Channel 1880 MHz |           |             |            |            |
|--------------------------------|-----------|-------------|------------|------------|
| Limit: +/- 2.5 ppm             |           |             |            |            |
| Vdc                            | Temp. ( ) | Freq. (MHz) | Delta (Hz) | Limit (Hz) |
| FREQUENCY ERROR vs. VOLTAGE    |           |             |            |            |
| 4.37                           | 20        | 1880.00237  | 2370       | 4700       |
| 3.8                            | 20        | 1879.99863  | -1370      | 4700       |
| 3.23                           | 20        | 1879.99871  | -1290      | 4700       |
| 3.1 (End point)                | 20        | 1879.99842  | -1580      | 4700       |

### FREQUENCY ERROR vs. TEMPERATURE

| FREQUENCY ERROR vs. Temp. |     |            |       |      |
|---------------------------|-----|------------|-------|------|
| 3.8                       | 50  | 1879.99807 | -1930 | 4700 |
| 3.8                       | 40  | 1880.00227 | 2270  | 4700 |
| 3.8                       | 30  | 1879.9988  | -1200 | 4700 |
| 3.8                       | 20  | 1879.99863 | -1370 | 4700 |
| 3.8                       | 10  | 1880.00118 | 1180  | 4700 |
| 3.8                       | 0   | 1879.99779 | -2210 | 4700 |
| 3.8                       | -10 | 1880.00169 | 1690  | 4700 |
| 3.8                       | -20 | 1880.00174 | 1740  | 4700 |
| 3.8                       | -30 | 1879.99735 | -2650 | 4700 |

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## FREQUENCY ERROR vs. VOLTAGE

| WCDMA II Mid Channel 1880 MHz |           |             |            |            |
|-------------------------------|-----------|-------------|------------|------------|
| Limit: +/- 2.5 ppm            |           |             |            |            |
| Vdc                           | Temp. ( ) | Freq. (MHz) | Delta (Hz) | Limit (Hz) |
| FREQUENCY ERROR vs. VOLTAGE   |           |             |            |            |
| 4.37                          | 20        | 1880.00144  | 1440       | 4700       |
| 3.8                           | 20        | 1879.99898  | -1020      | 4700       |
| 3.23                          | 20        | 1879.99902  | -980       | 4700       |
| 3.1 (End point)               | 20        | 1879.99734  | -2660      | 4700       |

## FREQUENCY ERROR vs. TEMPERATURE

| FREQUENCY ERROR vs. Temp. |     |            |       |      |
|---------------------------|-----|------------|-------|------|
| 3.8                       | 50  | 1880.00218 | 2180  | 4700 |
| 3.8                       | 40  | 1879.99891 | -1090 | 4700 |
| 3.8                       | 30  | 1880.00252 | 2520  | 4700 |
| 3.8                       | 20  | 1879.99898 | -1020 | 4700 |
| 3.8                       | 10  | 1880.00242 | 2420  | 4700 |
| 3.8                       | 0   | 1879.99974 | -260  | 4700 |
| 3.8                       | -10 | 1879.99763 | -2370 | 4700 |
| 3.8                       | -20 | 1879.99844 | -1560 | 4700 |
| 3.8                       | -30 | 1879.99929 | -710  | 4700 |

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|                         |           |                    |            |                          |                   |
|-------------------------|-----------|--------------------|------------|--------------------------|-------------------|
| Reference Freq.:        |           | LTE B2 Mid Channel |            | 1880 MHz                 | 20M QPSK CH 18900 |
| Power Supply Vdc        | Temp. ( ) | Freq. (MHz)        | Delta (Hz) | Limit = +/- 2.5 ppm (Hz) |                   |
| Freq. ERROR vs. VOLTAGE |           |                    |            |                          |                   |
| 4.37                    | 25        | 1880.000020        | 19.9999999 | 4700                     |                   |
| 3.8                     | 25        | 1879.999985        | -15        | 4700                     |                   |
| 3.23                    | 25        | 1880.000006        | 5.99999998 | 4700                     |                   |
| 3.1<br>(End Point)      | 25        | 1879.999985        | -15        | 4700                     |                   |
| Freq. ERROR vs. Temp.   |           |                    |            |                          |                   |
| 3.8                     | -30       | 1880.000012        | 12         | 4700                     |                   |
| 3.8                     | -20       | 1880.000018        | 18         | 4700                     |                   |
| 3.8                     | -10       | 1880.000030        | 29.9999999 | 4700                     |                   |
| 3.8                     | 0         | 1879.999975        | -25        | 4700                     |                   |
| 3.8                     | 10        | 1880.000019        | 19.0000001 | 4700                     |                   |
| 3.8                     | 20        | 1879.999986        | -14        | 4700                     |                   |
| 3.8                     | 30        | 1879.999982        | -18        | 4700                     |                   |
| 3.8                     | 40        | 1879.999984        | -16        | 4700                     |                   |
| 3.8                     | 50        | 1880.000020        | 19.9999999 | 4700                     |                   |

**Note: The battery is rated 3.8V dc.**

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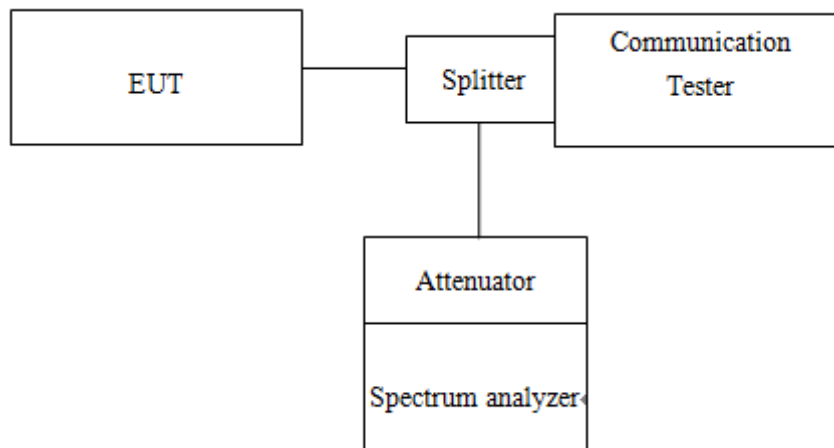
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## 12. PEAK TO AVERAGE RATIO

### 12.1. Standard Applicable

The peak-to-average ratio (PAR) of the transmission may not exceed 13dB.

### 12.2. Test SET-UP



### 12.3. Measurement Procedure

1. KDB 971168 D01 is employed as the following procedure is proper adjusted accordingly:
2. Set resolution/measurement bandwidth  $\geq$  signal's occupied bandwidth; & internal =1ms
3. Set the number of counts to a value that stabilizes the measured CCDF curve.

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## 12.4. Measurement Equipment Used

| EQUIPMENT TYPE               | MFR           | MODEL NUMBER    | SERIAL NUMBER | LAST CAL.  | CAL DUE.   |
|------------------------------|---------------|-----------------|---------------|------------|------------|
| EXA Spectrum Analyzer        | Agilent       | N9010A          | MY50420195    | 05/03/2018 | 05/02/2019 |
| Radio Communication Analyser | Anritsu       | MT8820C         | 6200995019    | 04/05/2018 | 04/04/2019 |
| DC Power Supply              | Agilent       | E3640A          | MY52410006    | 11/28/2017 | 11/27/2018 |
| Attenuator                   | Mini-Circuit  | BW-S10W2+       | 2             | 01/02/2018 | 01/01/2019 |
| DC Block                     | Mini-Circuits | BLK-18-S+       | 1             | 01/02/2018 | 01/01/2019 |
| 2WayDivider                  | Woken         | DSU7AMK1A1      | N/A           | 01/02/2018 | 01/01/2019 |
| Coaxial Cable                | Huber Su-hner | SUCOFLEX 102EPA | MY2616/2      | 01/02/2018 | 01/01/2019 |

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## 12.5. Measurement Result

### Tabular Results:

| Freq.<br>(MHz) | CH  | Peak-to-Average Ratio (dB) |              |
|----------------|-----|----------------------------|--------------|
|                |     | GSM<br>1900                | GPRS<br>1900 |
| 1850.2         | 512 | 9                          | 8.98         |
| 1880           | 661 | 8.89                       | 9.94         |
| 1909.8         | 810 | 9.04                       | 9.13         |

| Freq.<br>(MHz) | CH   | Peak-to-Average Ratio (dB) |             |             |
|----------------|------|----------------------------|-------------|-------------|
|                |      | WCDMA<br>II                | HSDPA<br>II | HSUPA<br>II |
| 1852.4         | 9262 | 3.30                       | 3.31        | 3.19        |
| 1880           | 9400 | 3.24                       | 3.36        | 3.38        |
| 1907.6         | 9538 | 3.31                       | 3.28        | 3.29        |

| LTE BAND 2                |       |           |       |                         |       |           |       |
|---------------------------|-------|-----------|-------|-------------------------|-------|-----------|-------|
| Channel bandwidth: 1.4MHz |       |           |       | Channel bandwidth: 3MHz |       |           |       |
| Freq.<br>(MHz)            | CH    | PAPR (dB) |       | Freq.<br>(MHz)          | CH    | PAPR (dB) |       |
|                           |       | 16QAM     | Limit |                         |       | 16QAM     | Limit |
| 1850.7                    | 18607 | 5.77      | 13    | 1851.5                  | 18615 | 5.70      | 13    |
| 1880.0                    | 18900 | 5.52      | 13    | 1880.0                  | 18900 | 5.87      | 13    |
| 1909.3                    | 19193 | 5.38      | 13    | 1908.5                  | 19185 | 5.77      | 13    |

| LTE BAND 2              |       |           |       |                          |       |           |       |
|-------------------------|-------|-----------|-------|--------------------------|-------|-----------|-------|
| Channel bandwidth: 5MHz |       |           |       | Channel bandwidth: 10MHz |       |           |       |
| Freq.<br>(MHz)          | CH    | PAPR (dB) |       | Freq.<br>(MHz)           | CH    | PAPR (dB) |       |
|                         |       | 16QAM     | Limit |                          |       | 16QAM     | Limit |
| 1852.5                  | 18625 | 5.58      | 13    | 1855.0                   | 18650 | 5.71      | 13    |
| 1880.0                  | 18900 | 5.69      | 13    | 1880.0                   | 18900 | 5.79      | 13    |
| 1907.5                  | 19175 | 5.57      | 13    | 1905.0                   | 19150 | 5.98      | 13    |

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| LTE BAND 2               |       |           |       |                          |       |           |       |
|--------------------------|-------|-----------|-------|--------------------------|-------|-----------|-------|
| Channel bandwidth: 15MHz |       |           |       | Channel bandwidth: 20MHz |       |           |       |
| Freq.<br>(MHz)           | CH    | PAPR (dB) |       | Freq.<br>(MHz)           | CH    | PAPR (dB) |       |
|                          |       | 16QAM     | Limit |                          |       | 16QAM     | Limit |
| 1857.5                   | 18675 | 5.99      | 13    | 1860.0                   | 18700 | 6.49      | 13    |
| 1880.0                   | 18900 | 6.03      | 13    | 1880.0                   | 18900 | 6.53      | 13    |
| 1902.5                   | 19125 | 6.01      | 13    | 1900.0                   | 19100 | 6.56      | 13    |

## Measurement Results:

Please refer to next page.

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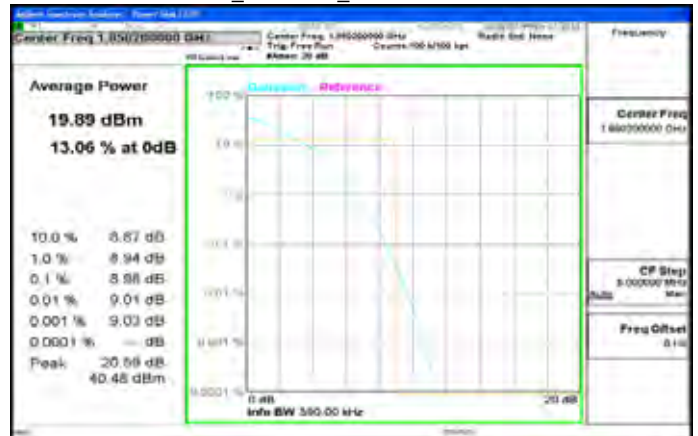
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GSM\_1900MHz\_LowCH512-1850.2



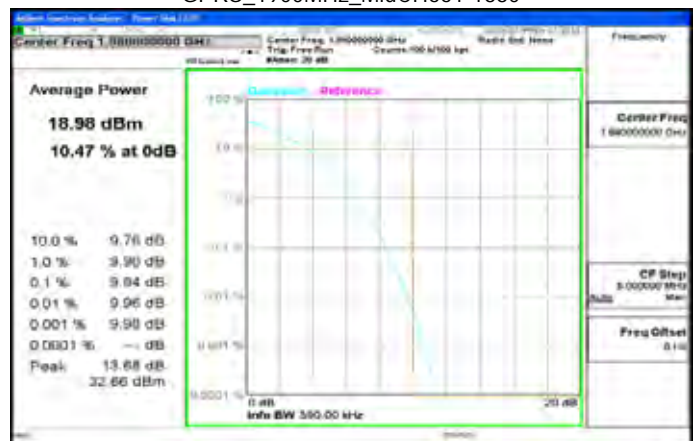
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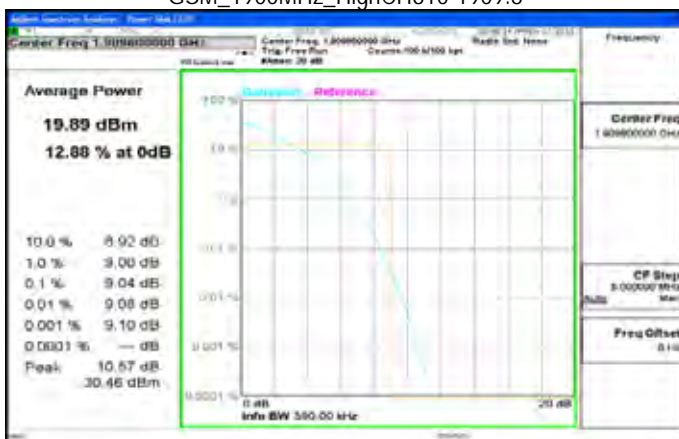
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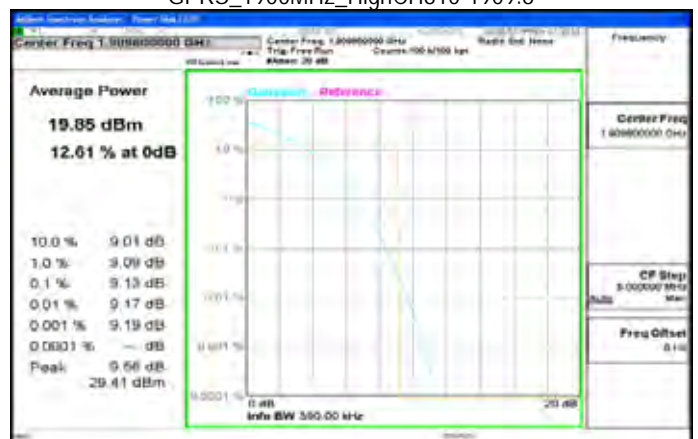
GRPS\_1900MHz\_MidCH661-1880



GSM\_1900MHz\_HighCH810-1909.8



GRPS\_1900MHz\_HighCH810-1909.8



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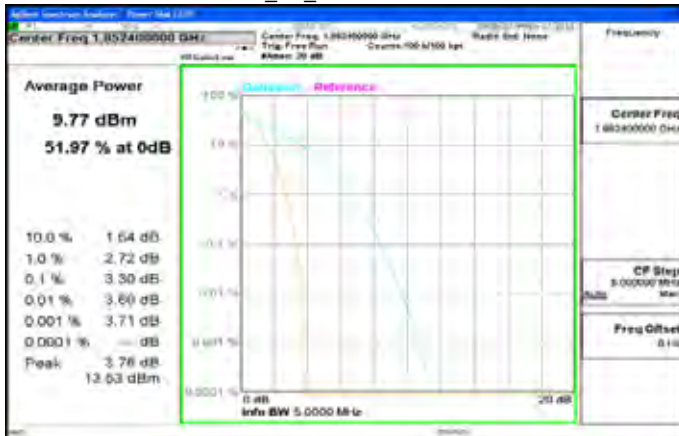
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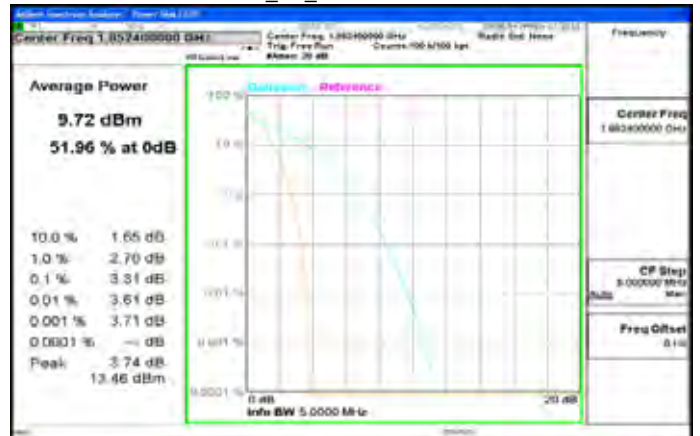
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HSDPA\_B2\_LowCH9262-1852.4



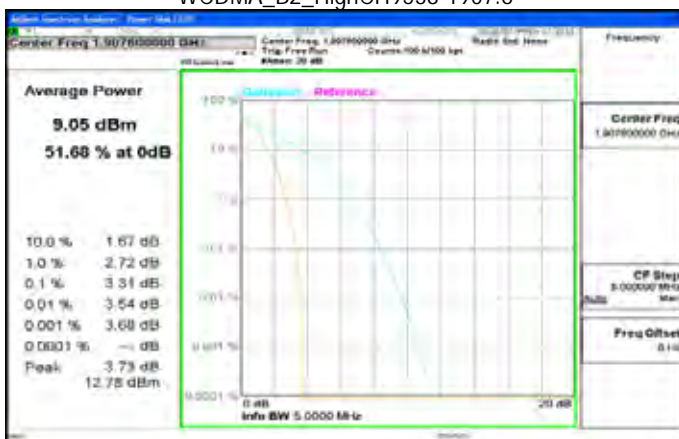
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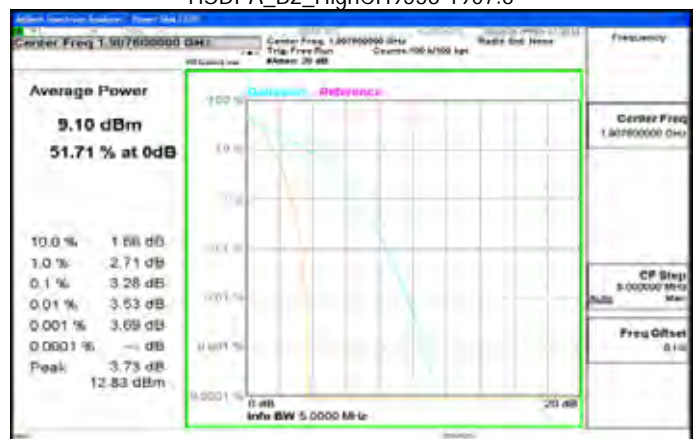
HSDPA\_B2\_MidCH9400-1880



WCDMA\_B2\_HighCH9538-1907.6



HSDPA\_B2\_HighCH9538-1907.6



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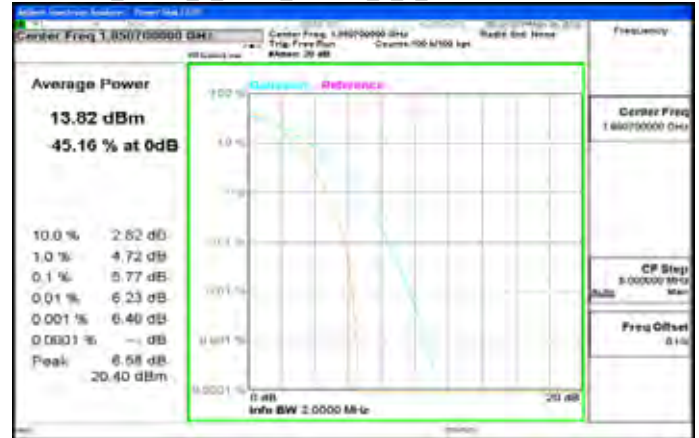
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HSUPA\_B2\_LowCH9262-1852.4



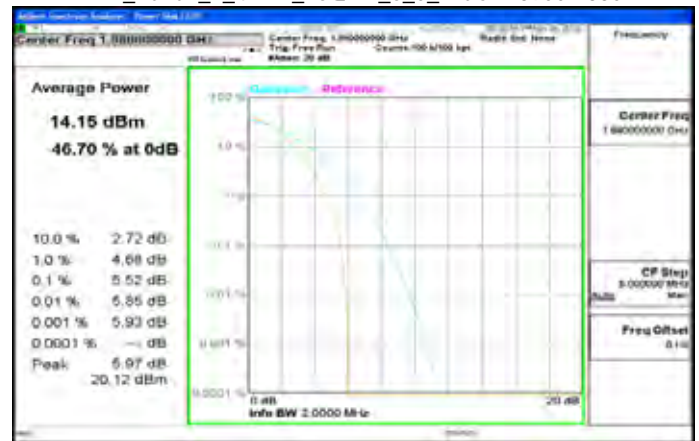
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HSUPA\_B2\_MidCH9400-1880



LTE\_Band2\_1\_4MHz\_16QAM\_6\_0\_MidCH18900-1880



HSUPA\_B2\_HighCH9538-1907.6



LTE\_Band2\_1\_4MHz\_16QAM\_6\_0\_HighCH19193-1909.3



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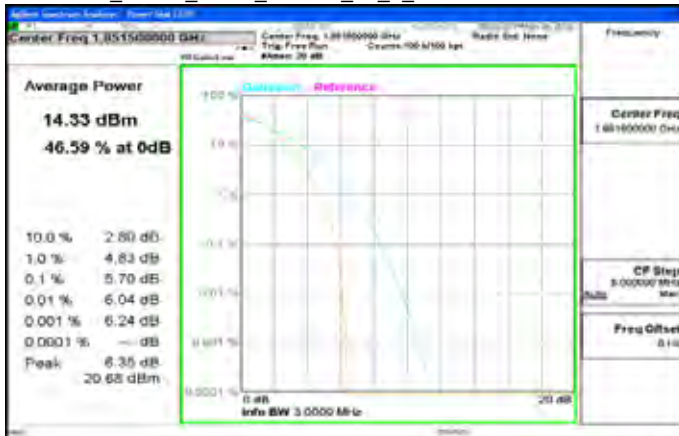
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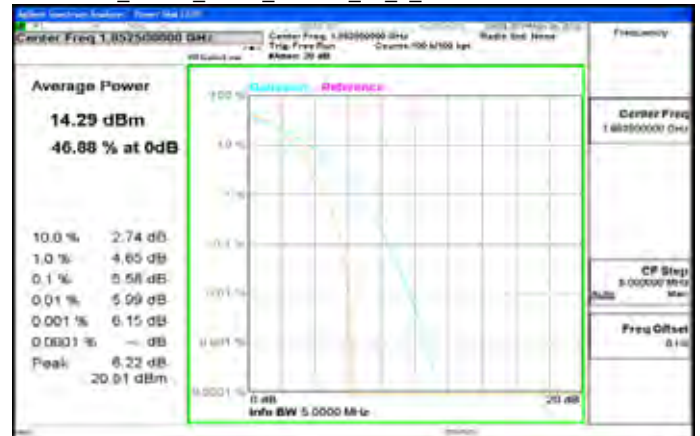
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LTE\_Band2\_3MHz\_16QAM\_15\_0\_LowCH18615-1851.5



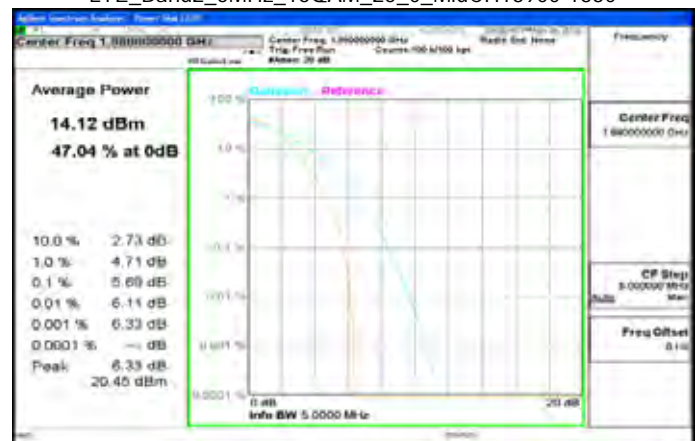
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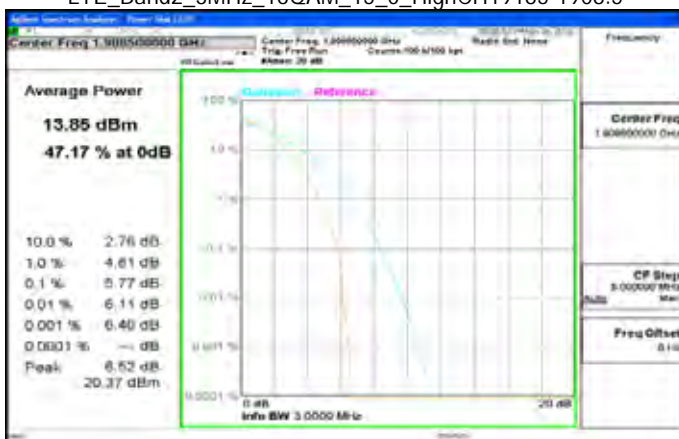
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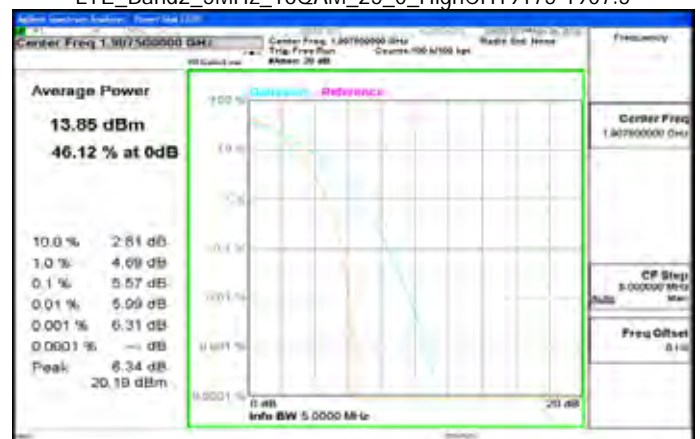
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LTE\_Band2\_3MHz\_16QAM\_15\_0\_HighCH19185-1908.5



LTE\_Band2\_5MHz\_16QAM\_25\_0\_HighCH19175-1907.5



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LTE\_Band2\_10MHz\_16QAM\_50\_0\_LowCH18650-1855



LTE\_Band2\_15MHz\_16QAM\_75\_0\_LowCH18675-1857.5



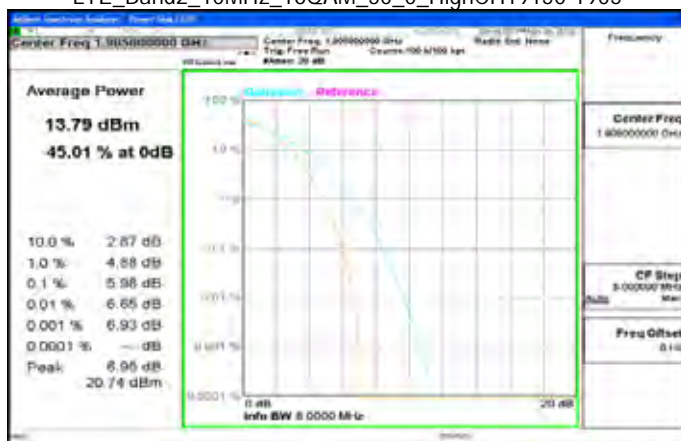
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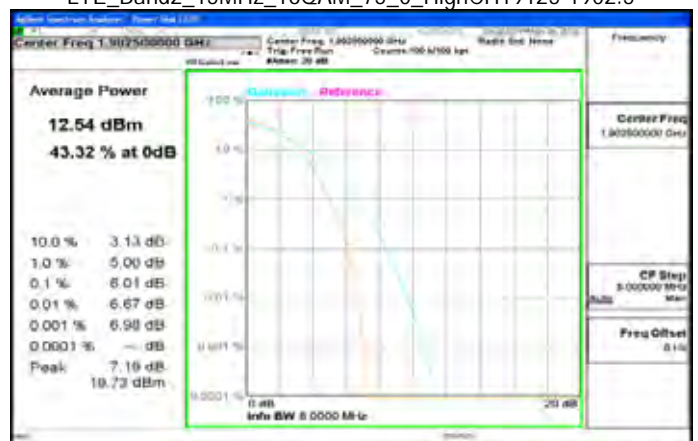
LTE\_Band2\_15MHz\_16QAM\_75\_0\_MidCH18900-1880



LTE\_Band2\_10MHz\_16QAM\_50\_0\_HighCH19150-1905



LTE\_Band2\_15MHz\_16QAM\_75\_0\_HighCH19125-1902.5



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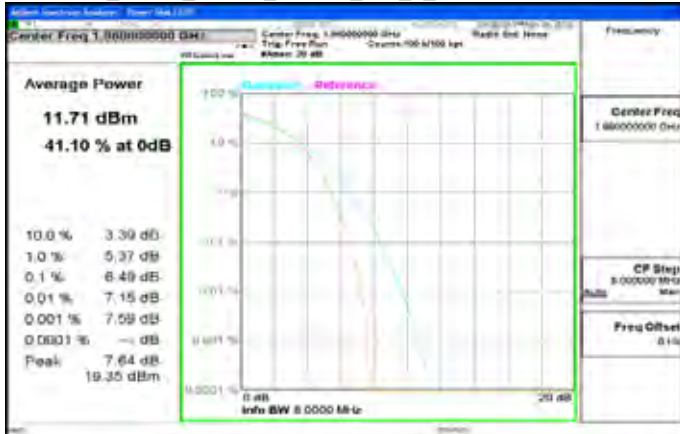
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LTE\_Band2\_20MHz\_16QAM\_100\_0\_LowCH18700-1860



LTE\_Band2\_20MHz\_16QAM\_100\_0\_HighCH19100-1900



LTE\_Band2\_20MHz\_16QAM\_100\_0\_MidCH18900-1880



~ End of Report ~

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