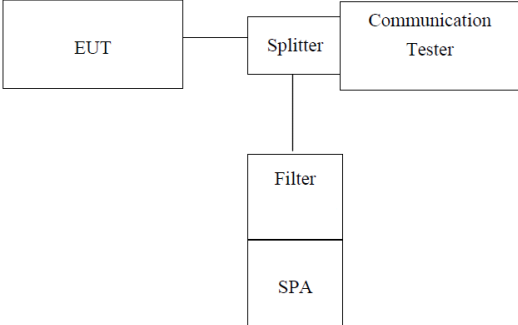


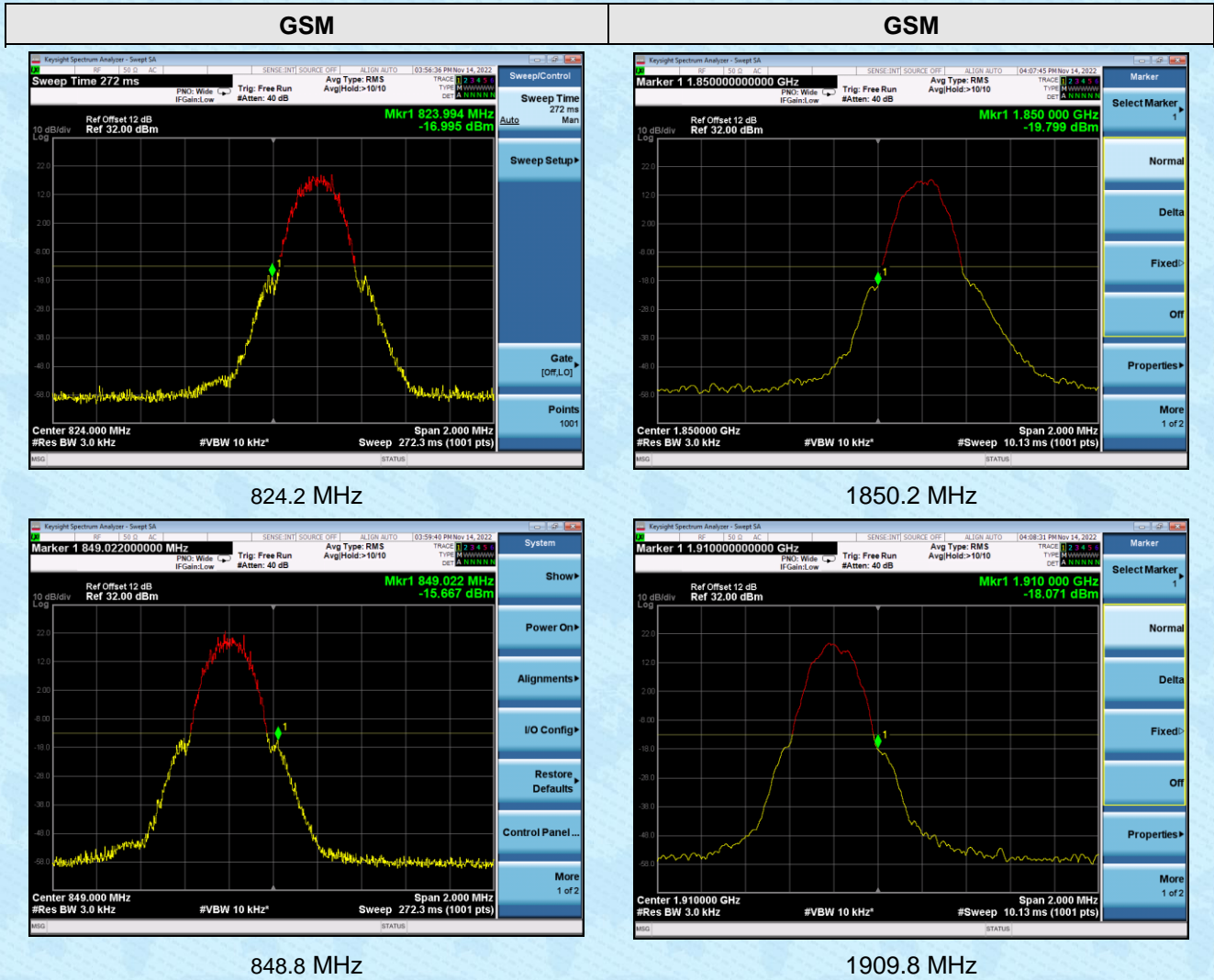
7.6 MODULATION CHARACTERISTIC

According to FCC § 2.1047(d), Part 22H & 24E there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

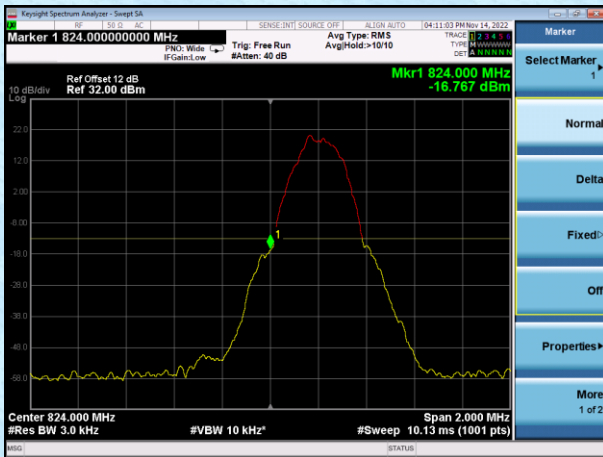
7.7 Out of band emission at antenna terminals

| | |
|-------------------|---|
| Test Requirement: | FCC part 22.917, part 24.238 |
| Test Method: | FCC part2.1051 |
| Limit: | -13dBm |
| Test setup: |  <p><i>Note: Measurement setup for testing on Antenna connector</i></p> |
| Test Procedure: | <ol style="list-style-type: none"> 1 The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. 2 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. 3 Band Edge Requirements: In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions. |
| Test Instruments: | Refer to section 5.0 for details |
| Test mode: | Refer to section 6.1 for details |
| Test results: | Pass |

Measurement Data:

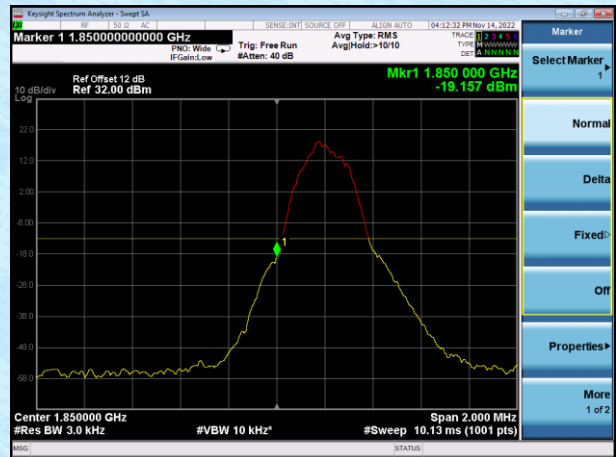


GPRS

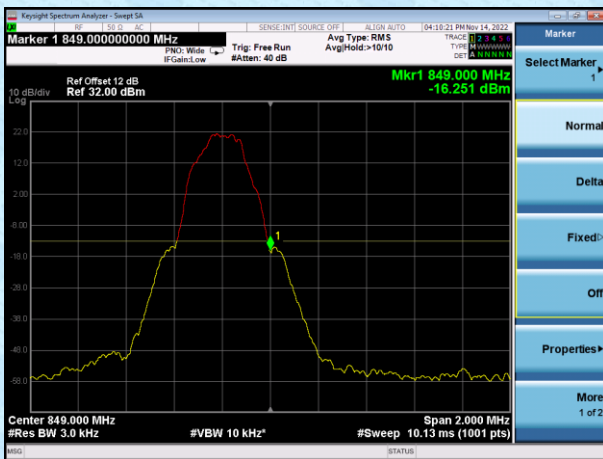


824.2 MHz

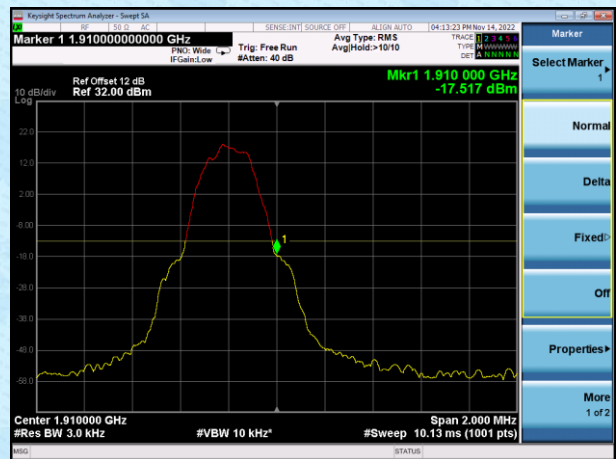
GPRS



1850.2 MHz



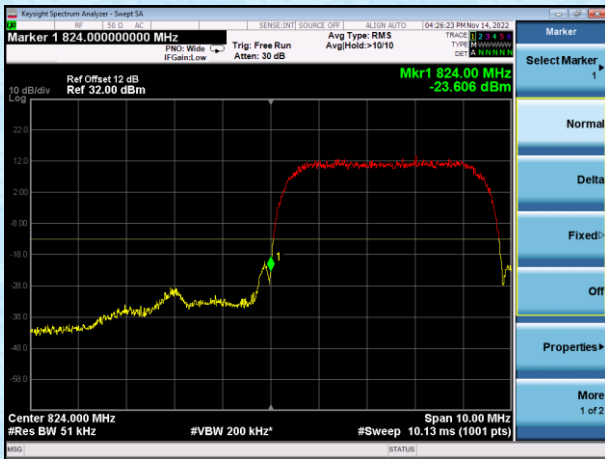
848.8 MHz



1909.8 MHz

WCDMA

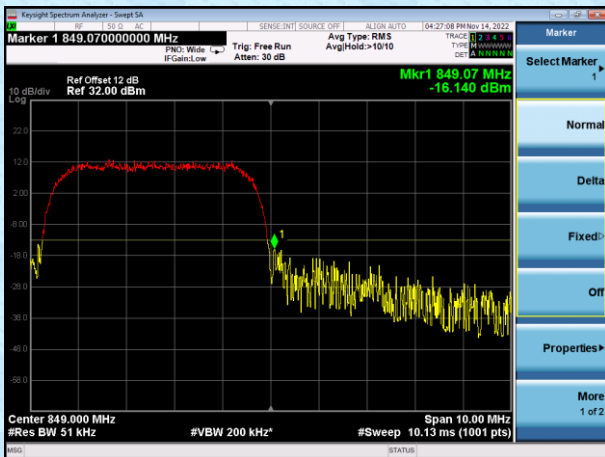
WCDMA



826.4 MHz



1852.4 MHz



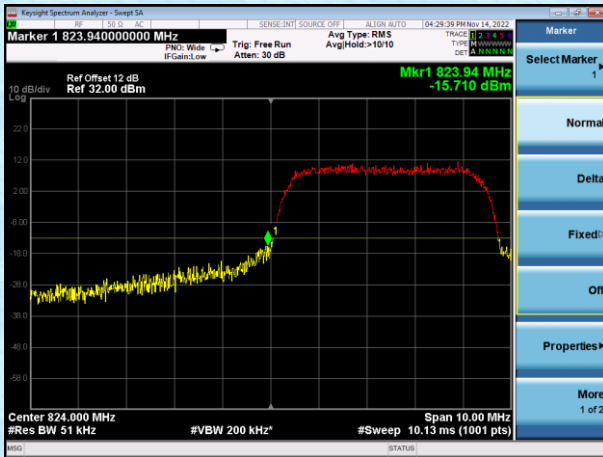
846.6 MHz



1907.6 MHz

HSDPA

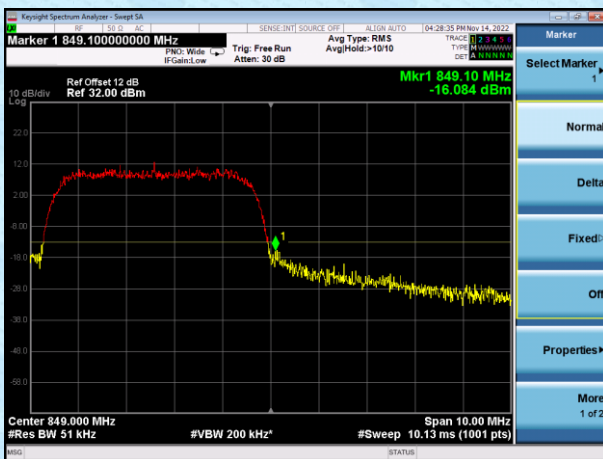
HSDPA



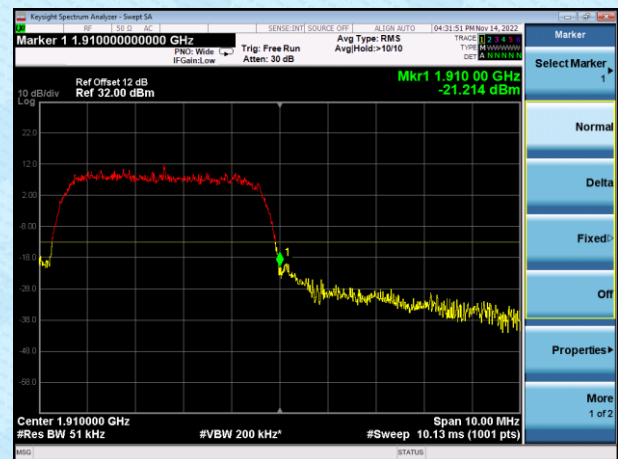
826.4 MHz



1852.4 MHz



846.6 MHz



1907.6 MHz

HSUPA

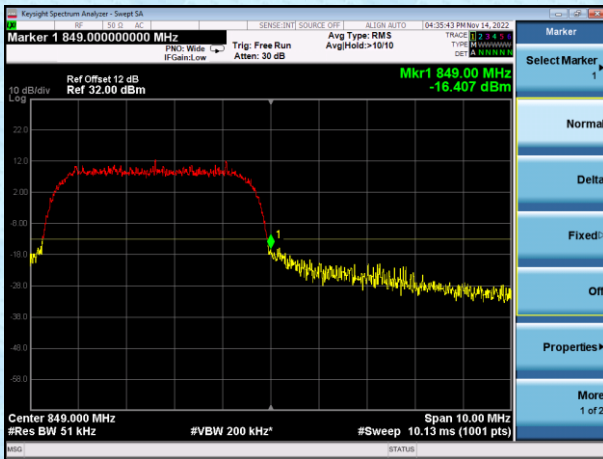
HSUPA



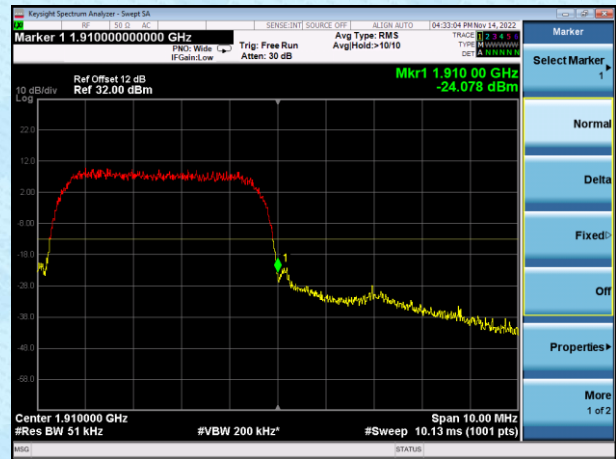
826.4 MHz



1852.4 MHz



846.6 MHz

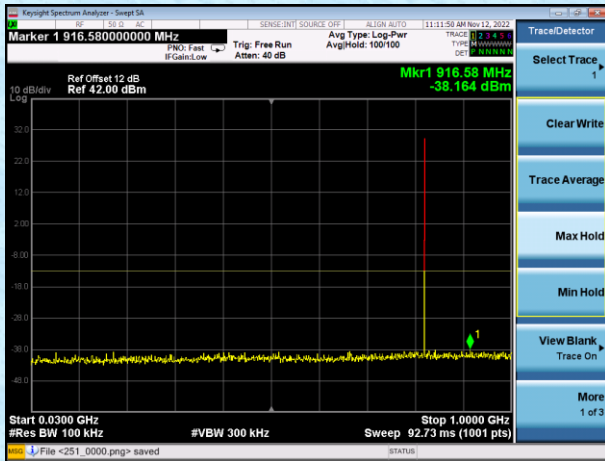


1907.6 MHz

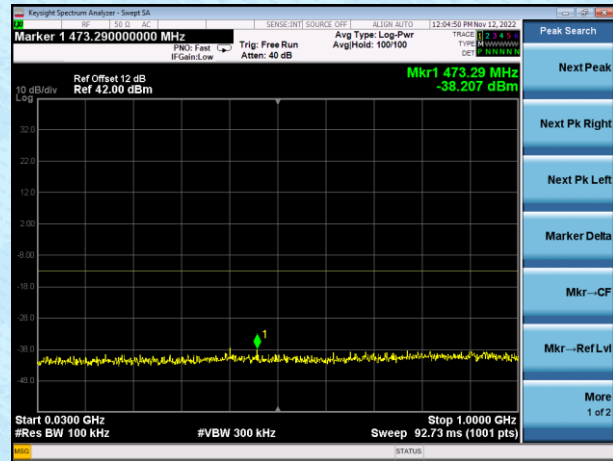
Measurement Data Below 1GHz:

We test all test mode and record the worst case test mode in the report

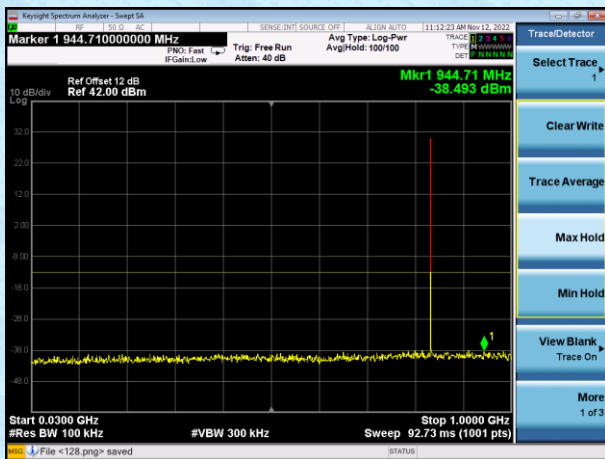
| | |
|------------|------------|
| GSM | GSM |
|------------|------------|



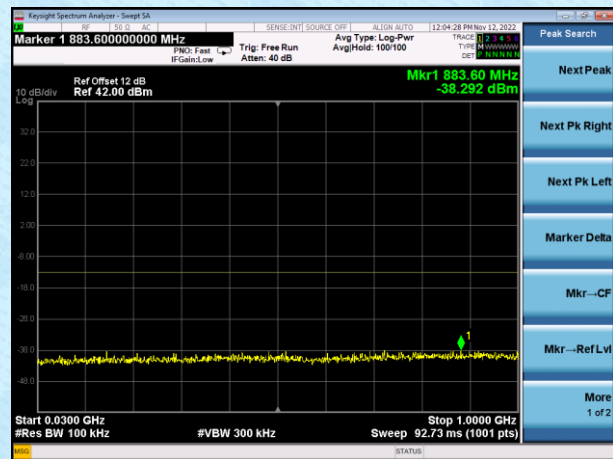
824.2 MHz



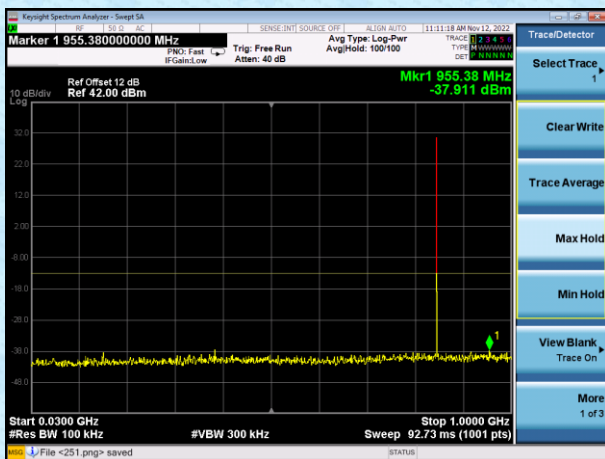
1850.2 MHz



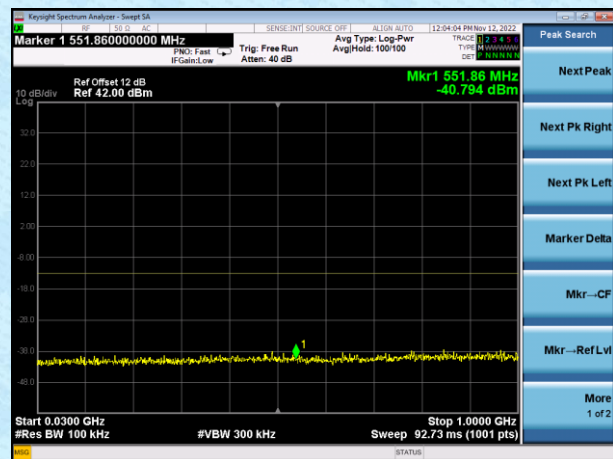
836.6 MHz



1880 MHz



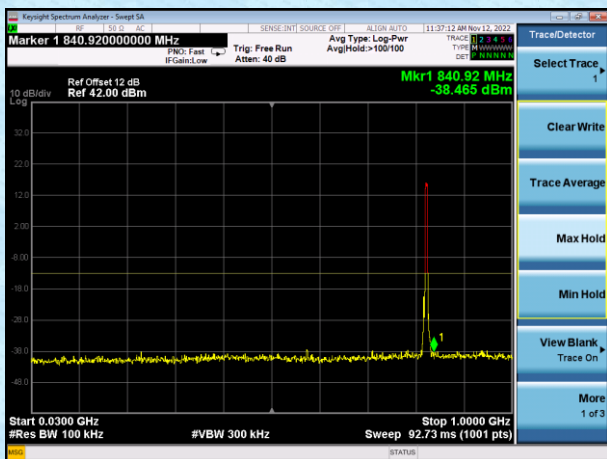
848.8 MHz



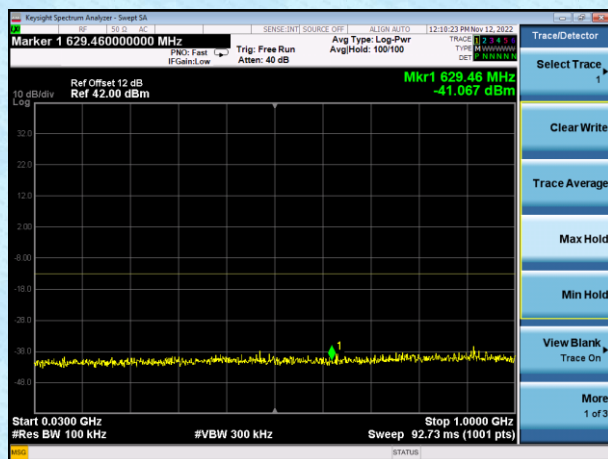
1909.8 MHz

WCDMA

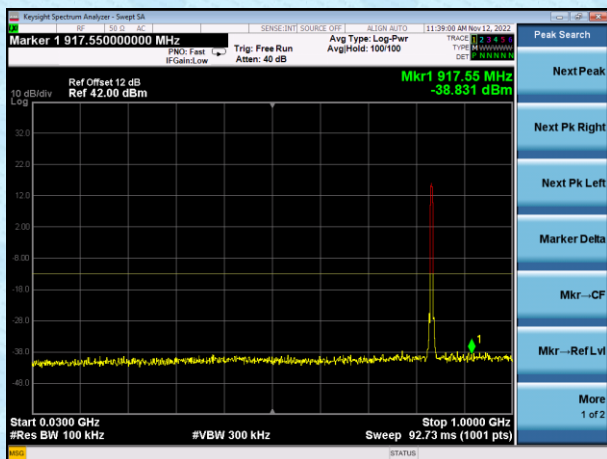
WCDMA



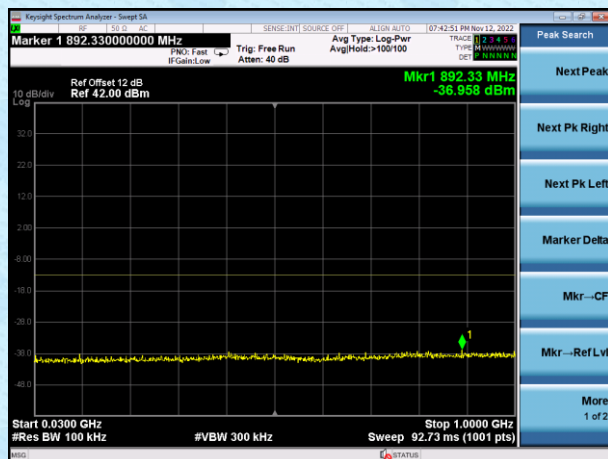
826.4 MHz



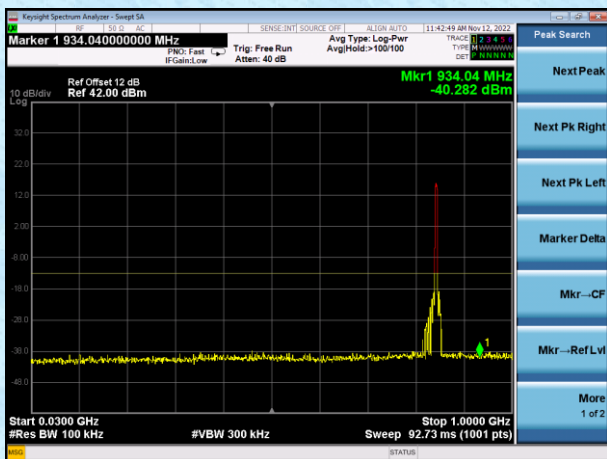
1852.4 MHz



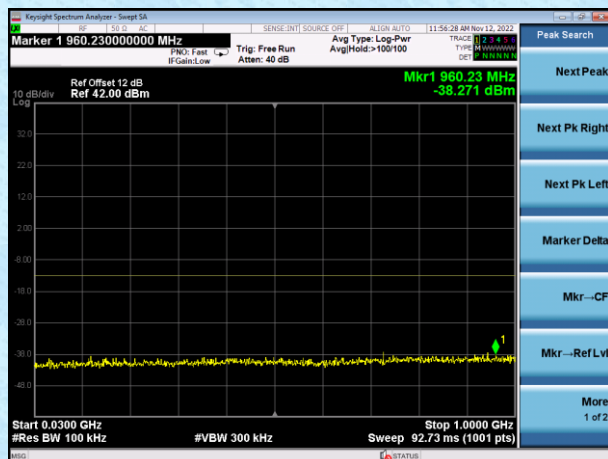
836.6 MHz



1880 MHz

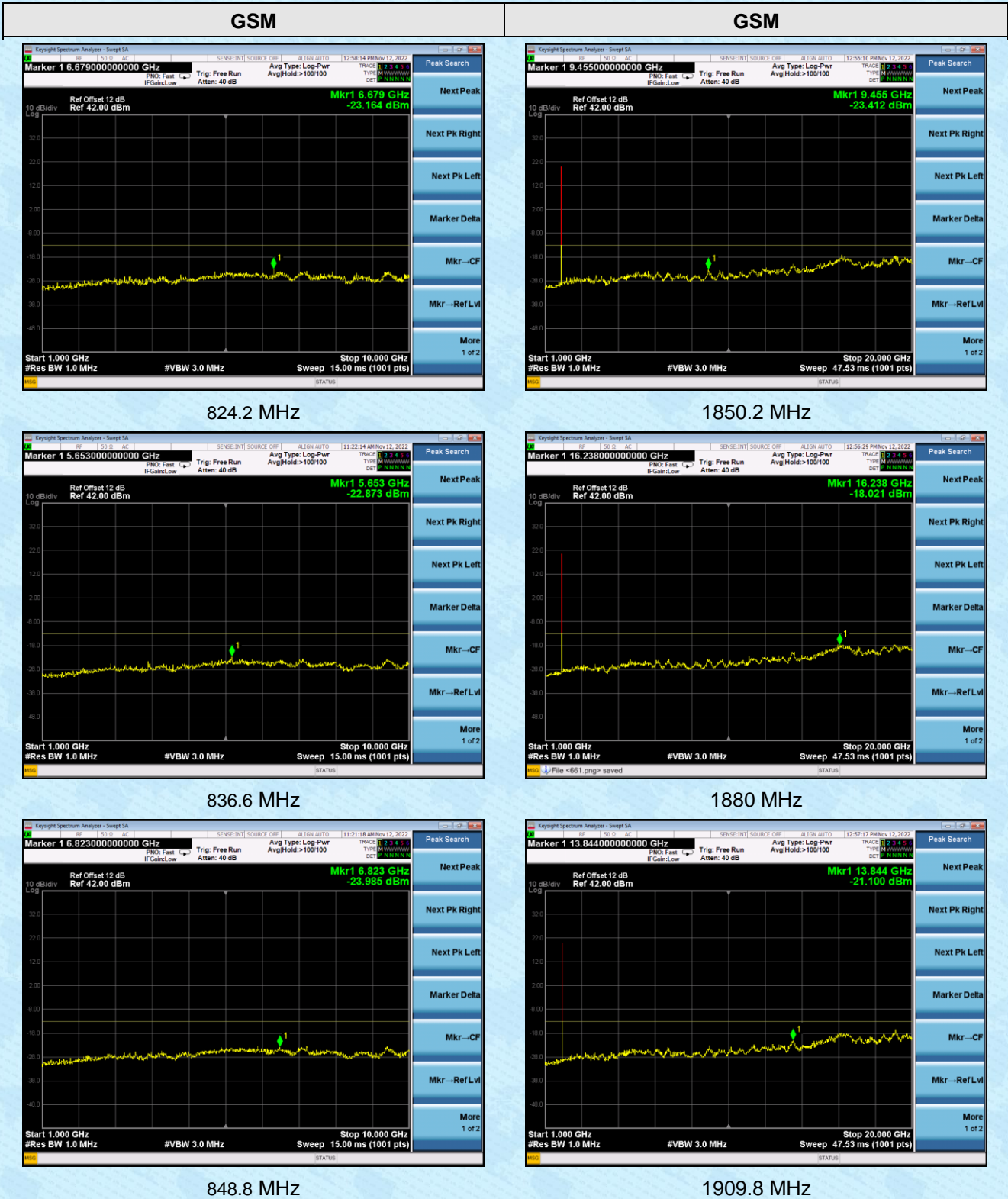


846.6 MHz



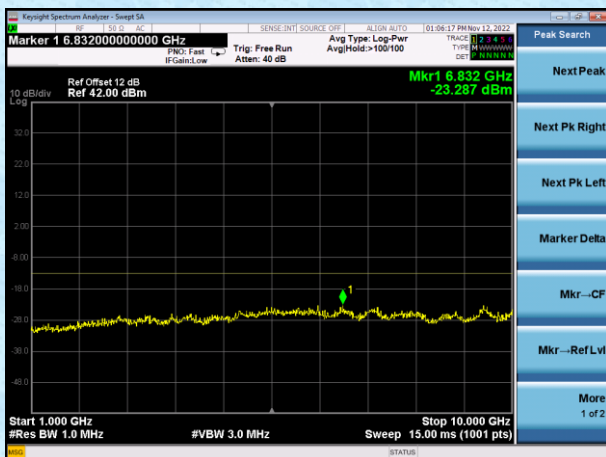
1907.6 MHz

Measurement Data Above 1GHz:



WCDMA

WCDMA



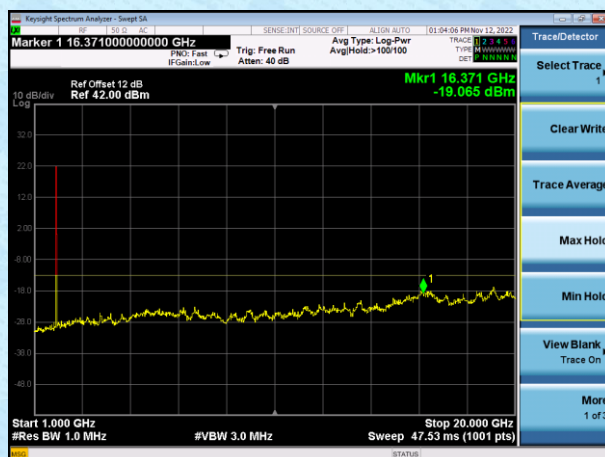
826.4 MHz



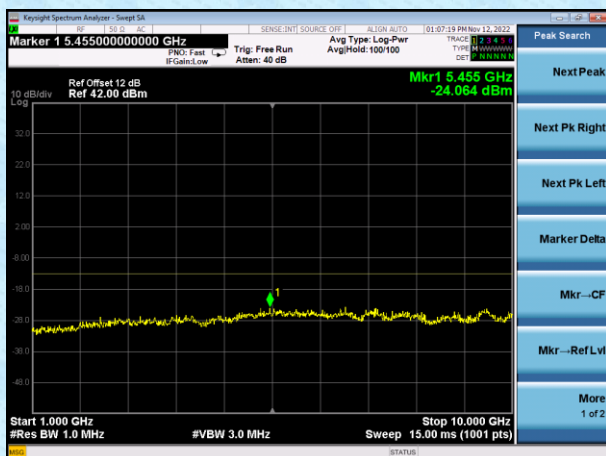
1852.4 MHz



836.6 MHz



1880 MHz

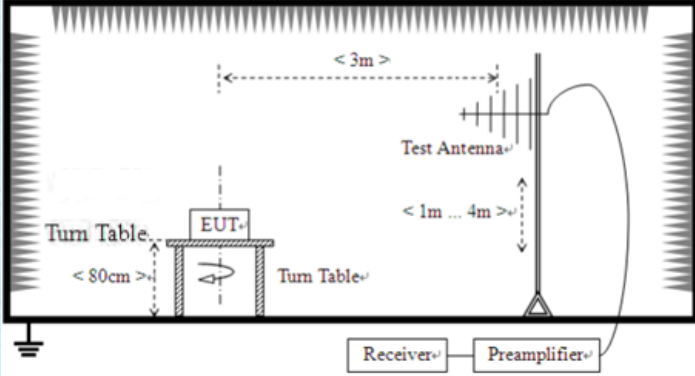
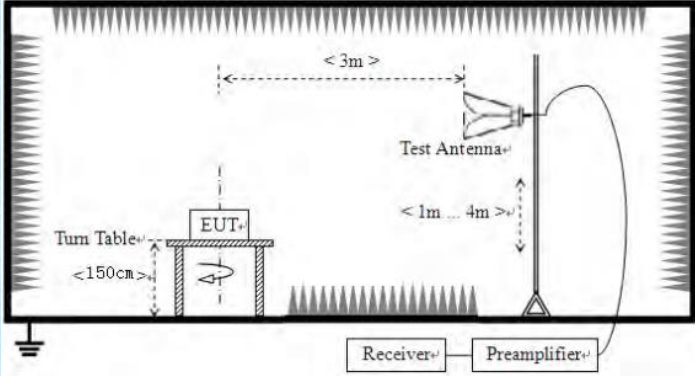
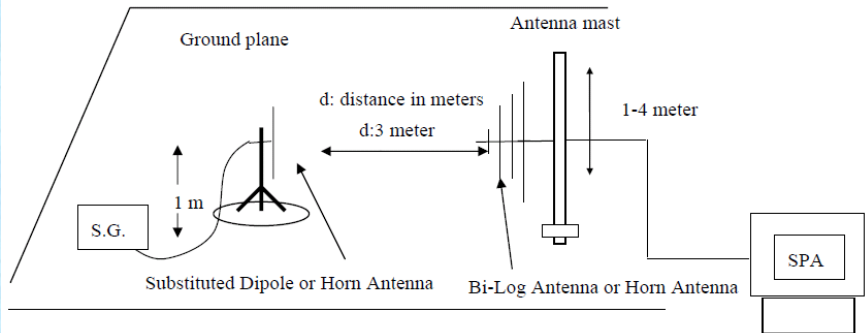


846.6 MHz



1907.6 MHz

7.8 Field strength of spurious radiation measurement

| | |
|-------------------|---|
| Test Requirement: | FCC part 22.917, part 24.238 |
| Test Method: | FCC part 2.1053 and ANSI C63.26:2015 |
| Limit: | -13dBm |
| Test setup: | <p>Below 1GHz</p>  <p>Above 1GHz</p>  <p>Substituted method:</p>  |

| | |
|--------------------------|---|
| <p>Test Procedure:</p> | <ol style="list-style-type: none"> 1. 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. 2. 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. 3. The frequency range up to tenth harmonic was investigated for each of three fundamental frequency (low, middle and high channels). Once spurious emission was identified, the power of the emission was determined using the substitution method. 4. The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency. <ul style="list-style-type: none"> EIRP = S.G. output (dBm) + Antenna Gain(dB/dBi) – Cable Loss (dB) ERP=EIRP-2.15 |
| <p>Test Instruments:</p> | <p>Refer to section 5.0 for details</p> |
| <p>Test mode:</p> | <p>Refer to section 6.1 for details</p> |
| <p>Test results:</p> | <p>Pass</p> |

Measurement Data:

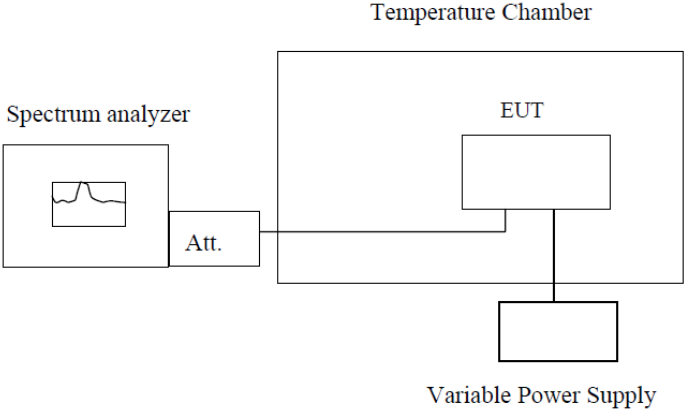
Worst case record in the report

| Frequency (MHz) | Read Level (dBm) | polarization | Factor (dB) | Level (dBm) | Limit Line (dBm) | Margin (dB) | Detector |
|------------------------|------------------|--------------|-------------|-------------|------------------|-------------|----------|
| GSM850 Low Channel | | | | | | | |
| 150.0108 | -87.67 | H | 23.1 | -64.57 | -13 | 51.57 | peak |
| 30.4238 | -90.89 | V | 29.55 | -61.34 | -13 | 48.34 | peak |
| 2472.6 | -58.19 | H | 1.01 | -57.18 | -13 | 44.18 | peak |
| 2472.6 | -55.42 | V | 1.01 | -54.41 | -13 | 41.41 | peak |
| GSM850 Middle Channel | | | | | | | |
| 150.0108 | -87.9 | H | 23.1 | -64.8 | -13 | 51.8 | peak |
| 30.4238 | -91.03 | V | 29.55 | -61.48 | -13 | 48.48 | peak |
| 2509.5 | -58.19 | H | 0.93 | -57.26 | -13 | 44.26 | peak |
| 2509.5 | -56.29 | V | 0.93 | -55.36 | -13 | 42.36 | peak |
| GSM850 High Channel | | | | | | | |
| 150.0108 | -88.59 | H | 23.1 | -65.49 | -13 | 52.49 | peak |
| 30.4238 | -91.51 | V | 29.55 | -61.96 | -13 | 48.96 | peak |
| 2546.4 | -59.03 | H | 0.86 | -58.17 | -13 | 45.17 | peak |
| 2546.4 | -55.31 | V | 0.86 | -54.45 | -13 | 41.45 | peak |
| PCS1900 Low Channel | | | | | | | |
| 150.0108 | -88.8 | H | 23.1 | -65.7 | -13 | 52.7 | peak |
| 30.4238 | -91.55 | V | 29.55 | -62 | -13 | 49 | peak |
| 3700.4 | -62.96 | H | 5.85 | -57.11 | -13 | 44.11 | peak |
| 3700.4 | -60.94 | V | 5.85 | -55.09 | -13 | 42.09 | peak |
| PCS1900 Middle Channel | | | | | | | |
| 150.0108 | -88.37 | H | 23.1 | -65.27 | -13 | 52.27 | peak |
| 30.4238 | -91.89 | V | 29.55 | -62.34 | -13 | 49.34 | peak |
| 3760 | -63.84 | H | 6.21 | -57.63 | -13 | 44.63 | peak |
| 3760 | -60.7 | V | 6.21 | -54.49 | -13 | 41.49 | peak |
| PCS1900 High Channel | | | | | | | |
| 150.0108 | -88.85 | H | 23.1 | -65.75 | -13 | 52.75 | peak |
| 30.4238 | -91.41 | V | 29.55 | -61.86 | -13 | 48.86 | peak |
| 3819.6 | -63.09 | H | 6.47 | -56.62 | -13 | 43.62 | peak |
| 3819.6 | -61.22 | V | 6.47 | -54.75 | -13 | 41.75 | peak |

| Frequency (MHz) | Read Level (dBm) | polarization | Factor (dB) | Level (dBm) | Limit Line (dBm) | Margin (dB) | Detector |
|-------------------------|------------------|--------------|-------------|-------------|------------------|-------------|----------|
| 3G BAND2, Low Channel | | | | | | | |
| 150.0108 | -88.75 | H | 23.1 | -65.65 | -13 | 52.65 | peak |
| 30.4238 | -90.59 | V | 29.55 | -61.04 | -13 | 48.04 | peak |
| 3704.8 | -63.36 | H | 5.91 | -57.45 | -13 | 44.45 | peak |
| 3704.8 | -59.83 | V | 5.91 | -53.92 | -13 | 40.92 | peak |
| 3G BAND2 Middle Channel | | | | | | | |
| 150.0108 | -88.3 | H | 23.1 | -65.2 | -13 | 52.2 | peak |
| 30.4238 | -90.82 | V | 29.55 | -61.27 | -13 | 48.27 | peak |
| 3760 | -62.49 | H | 6.21 | -56.28 | -13 | 43.28 | peak |
| 3760 | -60.64 | V | 6.21 | -54.43 | -13 | 41.43 | peak |
| 3G BAND2 High Channel | | | | | | | |
| 150.0108 | -88.68 | H | 23.1 | -65.58 | -13 | 52.58 | peak |
| 30.4238 | -91.12 | V | 29.55 | -61.57 | -13 | 48.57 | peak |
| 3815.2 | -62.28 | H | 6.46 | -55.82 | -13 | 42.82 | peak |
| 3815.2 | -60.59 | V | 6.46 | -54.13 | -13 | 41.13 | peak |
| 3G BAND5 Low Channel | | | | | | | |
| 150.0108 | -88.04 | H | 23.1 | -64.94 | -13 | 51.94 | peak |
| 30.4238 | -89.83 | V | 29.55 | -60.28 | -13 | 47.28 | peak |
| 1652.8 | -54.26 | H | -2.29 | -56.55 | -13 | 43.55 | peak |
| 1652.8 | -50.8 | V | -2.29 | -53.09 | -13 | 40.09 | peak |
| 3G BAND5 Middle Channel | | | | | | | |
| 150.0108 | -88.51 | H | 23.1 | -65.41 | -13 | 52.41 | peak |
| 30.4238 | -90.87 | V | 29.55 | -61.32 | -13 | 48.32 | peak |
| 1673.2 | -53.51 | H | -1.63 | -55.14 | -13 | 42.14 | peak |
| 1673.2 | -51.94 | V | -1.63 | -53.57 | -13 | 40.57 | peak |
| 3G BAND5 High Channel | | | | | | | |
| 150.0108 | -87.47 | H | 23.1 | -64.37 | -13 | 51.37 | peak |
| 30.4238 | -89.1 | V | 29.55 | -59.55 | -13 | 46.55 | peak |
| 1693.2 | -55.06 | H | -0.99 | -56.05 | -13 | 43.05 | peak |
| 1693.2 | -52.08 | V | -0.99 | -53.07 | -13 | 40.07 | peak |

Note: Level = Reading Level + Factor
Margin = Limit - Level

7.9 Frequency stability V.S. Temperature measurement

| | |
|-------------------|--|
| Test Requirement: | FCC part 22.355, part 24.235 |
| Test Method: | FCC Part2.1055(a)(1)(b) |
| Limit: | $\pm 2.5\text{ppm}$ |
| Test setup: |  <p>Note : Measurement setup for testing on Antenna connector</p> |
| Test procedure: | <ol style="list-style-type: none"> 1. The equipment under test was connected to an external DC power supply and input rated voltage. 2. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. 3. The EUT was placed inside the temperature chamber. 4. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25°C operating frequency as reference frequency. 5. Turn EUT off and set the chamber temperature to -20°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. 6. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached. |
| Test Instruments: | Refer to section 5.0 for details |
| Test mode: | Refer to section 6.1 for details |
| Test results: | Pass |

Measurement Data:

Worst case record in the report

| GSM Mode Middle Channel 836.6MHz | | | | |
|----------------------------------|-------------------------------------|----------------------|-----------------------|-------------|
| Temperature (°C) | Voltage Supplied (V _{DC}) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| -30 | 9 | 3 | 0.0036 | 2.5 |
| -20 | | -2 | -0.0024 | 2.5 |
| -10 | | 1 | 0.0012 | 2.5 |
| 0 | | 2 | 0.0024 | 2.5 |
| 10 | | 3 | 0.0036 | 2.5 |
| 20 | | -1 | -0.0012 | 2.5 |
| 30 | | 5 | 0.0060 | 2.5 |
| 40 | | 3 | 0.0036 | 2.5 |
| 50 | | 2 | 0.0024 | 2.5 |

| GSM Mode Middle Channel 1880 MHz | | | | |
|----------------------------------|-------------------------------------|----------------------|-----------------------|-------------|
| Temperature (°C) | Voltage Supplied (V _{DC}) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| -30 | 9 | 9 | 0.0108 | 2.5 |
| -20 | | -5 | -0.0060 | 2.5 |
| -10 | | 3 | 0.0036 | 2.5 |
| 0 | | 3 | 0.0036 | 2.5 |
| 10 | | 2 | 0.0024 | 2.5 |
| 20 | | 8 | 0.0096 | 2.5 |
| 30 | | -1 | -0.0012 | 2.5 |
| 40 | | 4 | 0.0048 | 2.5 |
| 50 | | 2 | 0.0024 | 2.5 |

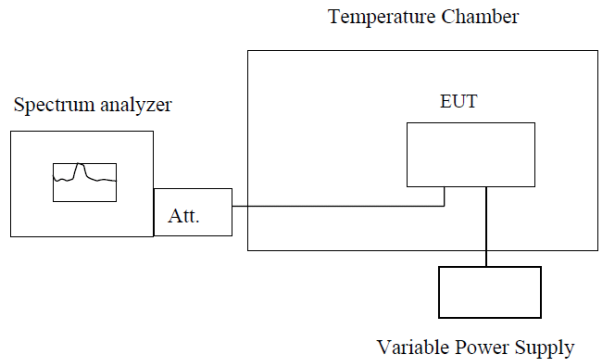
| GPRS Mode Middle Channel 836.6MHz | | | | |
|-----------------------------------|-------------------------------------|----------------------|-----------------------|-------------|
| Temperature (°C) | Voltage Supplied (V _{DC}) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| -30 | 9 | 2 | 0.0024 | 2.5 |
| -20 | | 10 | 0.0120 | 2.5 |
| -10 | | -2 | -0.0024 | 2.5 |
| 0 | | 1 | 0.0012 | 2.5 |
| 10 | | 5 | 0.0060 | 2.5 |
| 20 | | -3 | -0.0036 | 2.5 |
| 30 | | 6 | 0.0072 | 2.5 |
| 40 | | 4 | 0.0048 | 2.5 |
| 50 | | 2 | 0.0024 | 2.5 |

| GPRS Mode Middle Channel 1880 MHz | | | | |
|-----------------------------------|-------------------------------------|----------------------|-----------------------|-------------|
| Temperature (°C) | Voltage Supplied (V _{DC}) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| -30 | 9 | 3 | 0.0036 | 2.5 |
| -20 | | 4 | 0.0048 | 2.5 |
| -10 | | 2 | 0.0024 | 2.5 |
| 0 | | 3 | 0.0036 | 2.5 |
| 10 | | 8 | 0.0096 | 2.5 |
| 20 | | 9 | 0.0108 | 2.5 |
| 30 | | 2 | 0.0024 | 2.5 |
| 40 | | 4 | 0.0048 | 2.5 |
| 50 | | 5 | 0.0060 | 2.5 |

| WCDMA Mode Middle Channel 836.6MHz | | | | |
|------------------------------------|-------------------------------------|----------------------|-----------------------|-------------|
| Temperature (°C) | Voltage Supplied (V _{DC}) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| -30 | 9 | 10 | 0.0120 | 2.5 |
| -20 | | 3 | 0.0036 | 2.5 |
| -10 | | 9 | 0.0108 | 2.5 |
| 0 | | 8 | 0.0096 | 2.5 |
| 10 | | -6 | -0.0072 | 2.5 |
| 20 | | 4 | 0.0048 | 2.5 |
| 30 | | 2 | 0.0024 | 2.5 |
| 40 | | -5 | -0.0060 | 2.5 |
| 50 | | 2 | 0.0024 | 2.5 |

| WCDMA Mode Middle Channel 1880 MHz | | | | |
|------------------------------------|-------------------------------------|----------------------|-----------------------|-------------|
| Temperature (°C) | Voltage Supplied (V _{DC}) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| -30 | 9 | 1 | 0.0012 | 2.5 |
| -20 | | -6 | -0.0072 | 2.5 |
| -10 | | 3 | 0.0036 | 2.5 |
| 0 | | 8 | 0.0096 | 2.5 |
| 10 | | 7 | 0.0084 | 2.5 |
| 20 | | 5 | 0.0060 | 2.5 |
| 30 | | 2 | 0.0024 | 2.5 |
| 40 | | 1 | 0.0012 | 2.5 |
| 50 | | 6 | 0.0072 | 2.5 |

7.10 Frequency stability V.S. Voltage measurement

| | |
|-------------------|--|
| Test Requirement: | FCC part 22.355, part 24.235 |
| Test Method: | FCC Part2.1055(d)(1)(2) |
| Limit: | ±2.5ppm |
| Test setup: |  <p>Note : Measurement setup for testing on Antenna connector</p> |
| Test procedure: | <ol style="list-style-type: none"> 1. Set chamber temperature to 25°C. Use a variable DC power source to power the EUT and set the voltage to rated voltage. 2. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency. 3. Reduce the input voltage to specified extreme voltage variation (+/- 15%) and endpoint, record the maximum frequency change. |
| Test Instruments: | Refer to section 5.0 for details |
| Test mode: | Refer to section 6.1 for details |
| Test results: | Pass |

Measurement Data:

| GSM Mode Middle Channel 836.6MHz | | | | |
|----------------------------------|-------------------------------------|----------------------|-----------------------|-------------|
| Temperature (°C) | Voltage Supplied (V _{DC}) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 20 | V min.= 7.65 | 5 | 0.0060 | 2.5 |
| | V max.= 10.35 | 2 | 0.0024 | 2.5 |

| GSM Mode Middle Channel 1880MHz | | | | |
|---------------------------------|-------------------------------------|----------------------|-----------------------|-------------|
| Temperature (°C) | Voltage Supplied (V _{DC}) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 20 | V min.= 7.65 | 1 | 0.0012 | 2.5 |
| | V max.= 10.35 | 3 | 0.0036 | 2.5 |

| GPRS Mode Middle Channel 836.6MHz | | | | |
|-----------------------------------|-------------------------------------|----------------------|-----------------------|-------------|
| Temperature (°C) | Voltage Supplied (V _{DC}) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 20 | V min.= 7.65 | 6 | 0.0072 | 2.5 |
| | V max.= 10.35 | 2 | 0.0024 | 2.5 |

| GPRS Mode Middle Channel 1880MHz | | | | |
|----------------------------------|-------------------------------------|----------------------|-----------------------|-------------|
| Temperature (°C) | Voltage Supplied (V _{DC}) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 20 | V min.= 7.65 | 2 | 0.0024 | 2.5 |
| | V max.= 10.35 | 4 | 0.0048 | 2.5 |

| WCDMA Mode Middle Channel 836.6MHz | | | | |
|------------------------------------|-------------------------------------|----------------------|-----------------------|-------------|
| Temperature (°C) | Voltage Supplied (V _{DC}) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 20 | V min.= 7.65 | 10 | 0.0120 | 2.5 |
| | V max.= 10.35 | 5 | 0.0060 | 2.5 |

| WCDMA Mode Middle Channel 1880MHz | | | | |
|-----------------------------------|-------------------------------------|----------------------|-----------------------|-------------|
| Temperature (°C) | Voltage Supplied (V _{DC}) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 20 | V min.= 7.65 | 1 | 0.0012 | 2.5 |
| | V max.= 10.35 | 6 | 0.0072 | 2.5 |

8 Test Setup Photo

Reference to the **appendix I** for details.

9 EUT Constructional Details

Reference to the **appendix II** for details.

-----End-----