
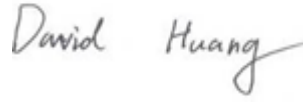


RF TEST REPORT



Report No.: Q191108S002-FCC-R1

Supersede Report No.: N/A

| | | |
|--|--|--|
| Applicant | Cedar Kingdom Corporation Limited | |
| Product Name | Mobile Phone | |
| Model No. | V205 | |
| Serial No. | N/A | |
| Test Standard | FCC Part 22(H) ;FCC Part 24(E); ANSI/TIA-603-E: 2016 | |
| Test Date | Nov. 15 to Dec. 03, 2019 | |
| Issue Date | Dec. 10, 2019 | |
| Test Result | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail | |
| Equipment complied with the specification | <input checked="" type="checkbox"/> | |
| Equipment did not comply with the specification | <input type="checkbox"/> | |
|  |  | |
| Aaron Liang Test Engineer | David Huang Checked By | |
| This test report may be reproduced in full only Test result presented in this test report is applicable to the tested sample only | | |

Issued by:

SIEMIC (SHENZHEN-CHINA) LABORATORIES

Zone A, Floor 1, Building 2 Wan Ye Long Technology Park

South Side of Zhoushi Road, Bao'an District, Shenzhen, Guangdong China 518108

Phone: +86 0755 2601 4629801 Email: China@siemic.com.cn

Laboratories Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.



In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

Accreditations for Conformity Assessment

| Country/Region | Scope |
|----------------|------------------------------------|
| USA | EMC, RF/Wireless, SAR, Telecom |
| Canada | EMC, RF/Wireless, SAR, Telecom |
| Taiwan | EMC, RF, Telecom, SAR, Safety |
| Hong Kong | RF/Wireless, SAR, Telecom |
| Australia | EMC, RF, Telecom, SAR, Safety |
| Korea | EMI, EMS, RF, SAR, Telecom, Safety |
| Japan | EMI, RF/Wireless, SAR, Telecom |
| Singapore | EMC, RF, SAR, Telecom |
| Europe | EMC, RF, SAR, Telecom, Safety |

| | |
|-----------------|--------------------|
| Test Report No. | Q191108S002-FCC-R1 |
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1. Report Revision History

| Report No. | Report Version | Description | Issue Date |
|--------------------|----------------|-------------|---------------|
| Q191108S002-FCC-R1 | NONE | Original | Dec. 10, 2019 |
| | | | |
| | | | |

2. Customer information

| | |
|------------------|--|
| Applicant Name | Cedar Kingdom Corporation Limited |
| Applicant Add | Flat/Rm 05, 14/F, Lucky Centre, 165-171 Wanchai Road, Wanchai, Hong Kong |
| Manufacturer | Cedar Kingdom Corporation Limited |
| Manufacturer Add | Flat/Rm 05, 14/F, Lucky Centre, 165-171 Wanchai Road, Wanchai, Hong Kong |

3. Test site information

| | |
|----------------------|---|
| Lab performing tests | SIEMIC (Shenzhen-China) LABORATORIES |
| Lab Address | Zone A, Floor 1, Building 2 Wan Ye Long Technology Park South Side of Zhoushi Road, Bao'an District, Shenzhen, Guangdong China 518108 |
| FCC Test Site No. | 535293 |
| IC Test Site No. | 4842E-1 |
| Test Software | Radiated Emission Program-To Shenzhen v2.0 |

4. Equipment under Test (EUT) Information

| | |
|----------------------|--|
| Description of EUT: | Mobile Phone |
| Main Model: | V205 |
| Serial Model: | N/A |
| Date EUT received: | Nov. 13, 2019 |
| Test Date(s): | Nov. 15 to Dec. 03, 2019 |
| Equipment Category : | PCE |
| Antenna Gain: | GSM850: -1.12dBi PCS1900: -1.45dBi Bluetooth: -2.06dBi |
| Antenna Type: | Fixed Internal Antenna |
| Type of Modulation: | GSM / GPRS: GMSK Bluetooth: GFSK, π /4DQPSK, 8DPSK GPS: BPSK |

RF Operating Frequency (ies): GSM850 TX: 824.2 ~ 848.8 MHz; RX: 869.2 ~ 893.8 MHz
 PCS1900 TX: 1850.2 ~ 1909.8 MHz; RX: 1930.2 ~ 1989.8 MHz
 Bluetooth& BLE: 2402-2480 MHz

Maximum Conducted GSM Voice:GSM850: 32.41 dBm
 PCS1900: 29.10 dBm
 AV Power to Antenna: GPRS:GSM850: 32.44 dBm
 PCS1900: 29.36 dBm

ERP/EIRP: GSM Voice:GSM850: 30.99 dBm / ERP
 PCS1900: 28.21 dBm / EIRP
 GPRS:GSM850: 30.71 dBm / ERP
 PCS1900: 28.31 dBm / EIRP

Number of Channels: GSM 850: 124CH
 PCS1900: 299CH
 Bluetooth: 79CH

Port: Please refer to the user's manual

Input Power: Adapter :
 Model: V205
 Input: AC100-240V~50/60Hz,.0.15A
 Output: DC 5.0V, 500mA

Battery :
 Model: BL-25BI
 Spec: 3.7V, 3000mAh/11.1Wh
 Limited charge voltage: 4.2V

Trade Name : VIRZO

GPRS Multi-slot class 13

FCC ID: 2AKQUVZCKV205

5. Test Summary

The product was tested in accordance with the following specifications.

All testing has been performed according to below product classification:

| FCC Rules | Description of Test | Result |
|---|--|------------|
| § 1.1307; § 2.1093 | RF Exposure (SAR) | Compliance |
| §2.1046; § 22.913(a); § 24.232(c); § 27.50(c.10) ; | RF Output Power | Compliance |
| § 24.232 (d) ; | Peak-Average Ratio | Compliance |
| § 2.1049; § 22.905; § 22.917; § 24.238; | 99% & -26 dB Occupied Bandwidth | Compliance |
| § 2.1051; § 22.917(a); § 24.238(a); | Spurious Emissions at Antenna Terminal | Compliance |
| § 2.1053; § 22.917(a); § 24.238(a); | Field Strength of Spurious Radiation | Compliance |
| § 22.917(a); § 24.238(a); | Out of band emission, Band Edge | Compliance |
| § 2.1055; § 22.355; § 24.235; | Frequency stability vs. temperature Frequency stability vs. voltage | Compliance |

Note: Testing was performed by configuring EUT to maximum output power status, the declared output power class for different

Measurement Uncertainty

| Emissions | | |
|--|---|---------------|
| Test Item | Description | Uncertainty |
| Band Edge and Radiated Spurious Emissions | Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m) | +5.6dB/-4.5dB |
| - | - | - |

6. MEASUREMENTS, EXAMINATION AND DERIVED RESULTS

6.1 RF Exposure (SAR)

Test Result: Pass

The EUT is a portable device, thus requires SAR evaluation;

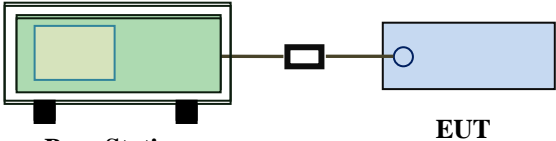
Please refer to RF Exposure Evaluation Report: Q191108S002-FCC-H2

6.2 RF Output Power

| | |
|----------------------|--------------|
| Temperature | 27°C |
| Relative Humidity | 35% |
| Atmospheric Pressure | 1013mbar |
| Test date : | Nov. 22,2019 |
| Tested By : | Aaron Liang |

Requirement(s):

| Spec | Item | Requirement | Applicable |
|-------------|------|--------------|-------------------------------------|
| §22.913 (a) | a) | ERP:38.45dBm | <input checked="" type="checkbox"/> |
| §24.232 (c) | b) | EIRP:33dBm | <input checked="" type="checkbox"/> |

| | |
|------------|--|
| Test Setup |  <p style="text-align: center;">Base Station EUT</p> |
|------------|--|

| | |
|----------------|---|
| Test Procedure | <p>For Conducted Power:</p> <ul style="list-style-type: none"> - The transmitter output port was connected to base station. - Set EUT at maximum power through base station. - Select lowest, middle, and highest channels for each band and different test mode. <p>For ERP/EIRP:</p> <p>According with KDB 971168 v02r02</p> <ul style="list-style-type: none"> - The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable. - The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis. - The frequency range up to tenth harmonic of the fundamental frequency was investigated. |
|----------------|---|

| | |
|--------|--|
| | <ul style="list-style-type: none"> - Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution. - Spurious emissions in dB = 10 log (TX power in Watts/0.001) – the absolute level - Spurious attenuation limit in dB = 43 + 10 Log10 (power out in Watts). |
| Remark | |
| Result | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail |

Test Data Yes N/A
 Test Plot Yes (See below) N/A

Conducted Power

GSM Mode:

| Burst Average Power (dBm); | | | | | | | | |
|--|--------|-------|-------|------------------------|---------|-------|--------|------------------------|
| Band | GSM850 | | | | PCS1900 | | | |
| Channel | 128 | 190 | 251 | Tune up Power tolerant | 512 | 661 | 810 | Tune up Power tolerant |
| Frequency (MHz) | 824.2 | 836.6 | 848.8 | / | 1850.2 | 1880 | 1909.8 | / |
| GSM Voice (1 uplink),GMSK | 32.39 | 32.31 | 32.41 | 32±1 | 29.07 | 29.1 | 29.06 | 29±1 |
| GPRS Multi-Slot Class 8 (1 uplink),GMSK | 32.31 | 32.41 | 32.44 | 32±1 | 29.02 | 29.11 | 29.36 | 29±1 |
| GPRS Multi-Slot Class 10 (2 uplink) GMSK | 30.95 | 31.06 | 31.05 | 30.5±1 | 27.42 | 27.41 | 27.73 | 27.5±1 |
| GPRS Multi-Slot Class 11 (3 uplink) GMSK | 29.25 | 29.32 | 29.42 | 29±1 | 26.09 | 26.01 | 26.31 | 26±1 |
| GPRS Multi-Slot Class 12 (4 uplink) GMSK | 27.63 | 27.69 | 27.67 | 27±1 | 24.26 | 24.15 | 24.45 | 24±1 |

Remark :

GPRS, CS1 coding scheme.

EGPRS, MCS1 coding scheme.

Multi-Slot Class 8 , Support Max 4 downlink, 1 uplink , 5 working link

Multi-Slot Class 10 , Support Max 4 downlink, 2 uplink , 5 working link

Multi-Slot Class 11 , Support Max 4 downlink, 2 uplink , 5 working link

Multi-Slot Class 12 , Support Max 4 downlink, 4 uplink , 5 working link

ERP & EIRP

GSM Voice

ERP for Cellular Band (Part 22H)

| Frequency (MHz) | Antenna Polarization (H/V) | Absolute Level (dBm) | Limit (dBm) | Margin (dB) |
|--------------------|----------------------------------|-------------------------|----------------|----------------|
| 824.2 | V | 30.59 | 38.45 | -7.86 |
| 824.2 | H | 30.21 | 38.45 | -8.24 |
| 836.6 | V | 30.95 | 38.45 | -7.5 |
| 836.6 | H | 30.44 | 38.45 | -8.01 |
| 848.8 | V | 30.58 | 38.45 | -7.87 |
| 848.8 | H | 30.99 | 38.45 | -7.46 |

EIRP for PCS Band (Part 24E)

| Frequency (MHz) | Antenna Polarization (H/V) | Absolute Level (dBm) | Limit (dBm) | Margin (dB) |
|--------------------|----------------------------------|-------------------------|----------------|----------------|
| 1850.2 | V | 28.1 | 33 | -10.35 |
| 1850.2 | H | 28.06 | 33 | -10.39 |
| 1880 | V | 28.09 | 33 | -10.36 |
| 1880 | H | 27.99 | 33 | -10.46 |
| 1909.8 | V | 28.15 | 33 | -10.3 |
| 1909.8 | H | 28.21 | 33 | -10.24 |

GPRS:

ERP for Cellular Band (Part 22H)

| Frequency (MHz) | Antenna Polarization (H/V) | Absolute Level (dBm) | Limit (dBm) | Margin (dB) |
|--------------------|----------------------------------|-------------------------|----------------|----------------|
| 824.2 | V | 30.48 | 38.45 | -7.97 |
| 824.2 | H | 30.71 | 38.45 | -7.74 |
| 836.6 | V | 30.62 | 38.45 | -7.83 |
| 836.6 | H | 30.55 | 38.45 | -7.9 |
| 848.8 | V | 30.42 | 38.45 | -8.03 |
| 848.8 | H | 30.39 | 38.45 | -8.06 |

EIRP for PCS Band (Part 24E)

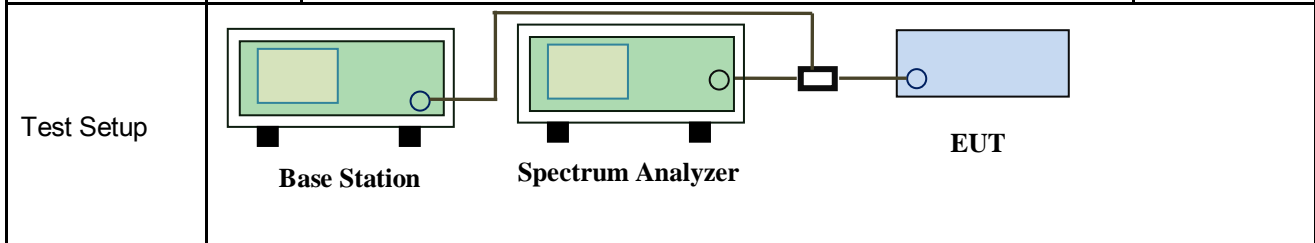
| Frequency (MHz) | Antenna Polarization (H/V) | Absolute Level (dBm) | Limit (dBm) | Margin (dB) |
|--------------------|----------------------------------|-------------------------|----------------|----------------|
| 1850.2 | V | 28.05 | 33 | -10.4 |
| 1850.2 | H | 28.31 | 33 | -10.14 |
| 1880 | V | 28.19 | 33 | -10.26 |
| 1880 | H | 28.06 | 33 | -10.39 |
| 1909.8 | V | 28.31 | 33 | -10.14 |
| 1909.8 | H | 28.22 | 33 | -10.23 |

6.3 Peak-Average Ratio

| | |
|----------------------|--------------|
| Temperature | 27°C |
| Relative Humidity | 35% |
| Atmospheric Pressure | 1013mbar |
| Test date : | Nov. 22,2019 |
| Tested By : | Aaron Liang |

Requirement(s):

| Spec | Item | Requirement | Applicable |
|------------|------|--|-------------------------------------|
| §24.232(d) | a) | The peak-to-average ratio (PAR) of the transmission may not exceed 13dB. | <input checked="" type="checkbox"/> |



| | |
|----------------|---|
| Test Procedure | <p>According with KDB 971168 v02r02</p> <p>5.7.2 Alternate procedure for PAPR</p> <p>5.1.2 Peak power measurements with a peak power meter</p> <p>The total peak output power may be measured using a broadband peak RF power meter. The power meter must have a video bandwidth that is greater than or equal to the emission bandwidth and utilize a fast-responding diode detector.</p> <p>5.2.3 Average power measurement with average power meter</p> <p>As an alternative to the use of a spectrum/signal analyzer or EMI receiver to perform a measurement of the total in-band average output power, a wideband RF average power meter with a thermocouple detector or equivalent can be used under certain conditions</p> <p>If the EUT can be configured to transmit continuously (i.e., the burst duty cycle $\geq 98\%$) and at all times the EUT is transmitting at its maximum output power level, then a conventional wide-band RF power meter can be used.</p> |
|----------------|---|

| | |
|-----------------|--------------------|
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| | |
|--------|---|
| | <p>If the EUT cannot be configured to transmit continuously (i.e., the burst duty cycle < 98%), then there are two options for the use of an average power meter. First, a gated average power meter can be used to perform the measurement if the gating parameters can be adjusted such that the power is measured only over active transmission bursts at maximum output power levels. A conventional average power meter can also be used if the measured burst duty cycle is constant (i.e., duty cycle variations are less than ± 2 percent) by performing the measurement over the on/off burst cycles and then correcting (increasing) the measured level by a factor equal to $10\log(1/\text{duty cycle})$</p> |
| Remark | |
| Result | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail |

Test Data Yes N/A
Test Plot Yes (See below) N/A

GSM : GSM 1900 PK-AV POWER (PART 24E)

| Frequency (MHz) | Conducted power(dBm) | | Peak-Average Ratio(PAR) |
|--------------------|----------------------|---------|----------------------------|
| | Peak | Average | |
| 1850.2 | 30.07 | 29.07 | 1.00 |
| 1880 | 29.95 | 29.1 | 0.85 |
| 1909.8 | 29.76 | 29.06 | 0.70 |

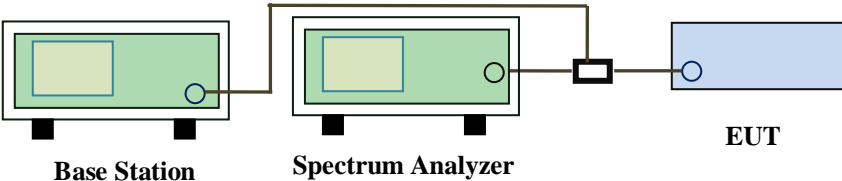
GPRS 1900 PK-AV POWER (PART 24E)

| Frequency (MHz) | Conducted power(dBm) | | Peak-Average Ratio(PAR) |
|--------------------|----------------------|---------|----------------------------|
| | Peak | Average | |
| 1850.2 | 30.02 | 29.02 | 1.00 |
| 1880 | 30.08 | 29.11 | 0.97 |
| 1909.8 | 30.36 | 29.36 | 1.00 |

6.4 Occupied Bandwidth

| | |
|----------------------|--------------|
| Temperature | 27°C |
| Relative Humidity | 35% |
| Atmospheric Pressure | 1013mbar |
| Test date : | Nov. 22,2019 |
| Tested By : | Aaron Liang |

Requirement(s):

| Spec | Item | Requirement | Applicable |
|--|--|-----------------------------|-------------------------------------|
| §2.1049, §22.917, §22.905 §24.238 | a) | 99% Occupied Bandwidth(kHz) | <input checked="" type="checkbox"/> |
| | b) | 26 dB Bandwidth(kHz) | <input checked="" type="checkbox"/> |
| Test Setup |  <p style="text-align: center;">Base Station Spectrum Analyzer EUT</p> | | |
| Test Procedure | <ul style="list-style-type: none"> - The EUT was connected to Spectrum Analyzer and Base Station via power divider. - The 99% and 26 dB occupied bandwidth (BW) of the middle channel for the highest RF powers. | | |
| Remark | | | |
| Result | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail | | |

Test Data Yes N/A

Test Plot Yes (See below) N/A

GSM Voice:

Cellular Band (Part 22H) result

| Channel | Frequency (MHz) | 99% Occupied Bandwidth (kHz) | 26 dB Bandwidth (kHz) |
|---------|-----------------|------------------------------|-----------------------|
| 128 | 824.2 | 243.19 | 316.7 |
| 190 | 836.6 | 244.16 | 312.8 |
| 251 | 848.8 | 244.64 | 312.3 |

PCS Band (Part 24E) result

| Channel | Frequency (MHz) | 99% Occupied Bandwidth (kHz) | 26 dB Bandwidth (kHz) |
|---------|-----------------|------------------------------|-----------------------|
| 512 | 1850.2 | 240.55 | 302.2 |
| 661 | 1880 | 242.51 | 317.2 |
| 810 | 1909.8 | 245.48 | 314.6 |

GPRS:

Cellular Band (Part 22H) result

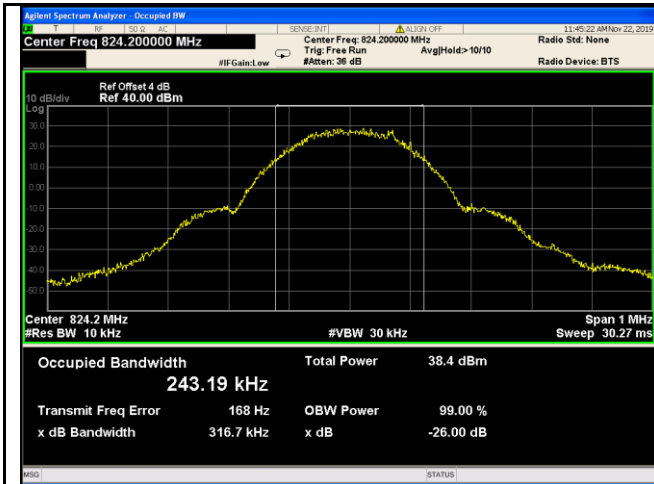
| Channel | Frequency (MHz) | 99% Occupied Bandwidth (kHz) | 26 dB Bandwidth (kHz) |
|---------|-----------------|------------------------------|-----------------------|
| 128 | 824.2 | 245.11 | 312.9 |
| 190 | 836.6 | 243.29 | 311.4 |
| 251 | 848.8 | 247.11 | 310.2 |

PCS Band (Part 24E) result

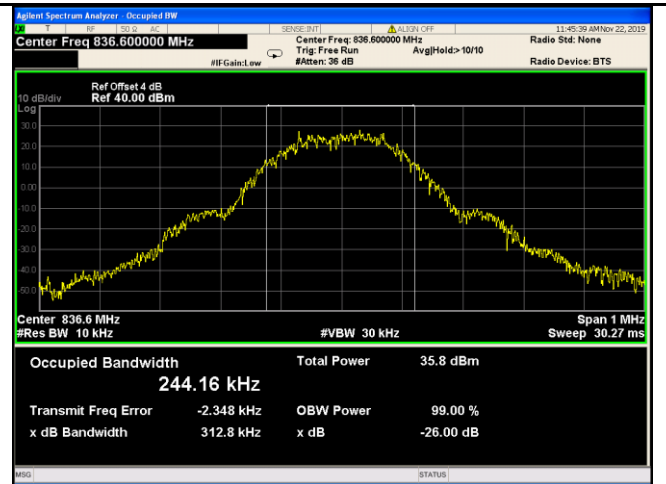
| Channel | Frequency (MHz) | 99% Occupied Bandwidth (kHz) | 26 dB Bandwidth (kHz) |
|---------|-----------------|------------------------------|-----------------------|
| 512 | 1850.2 | 241.84 | 306.9 |
| 661 | 1880 | 246.02 | 317.5 |
| 810 | 1909.8 | 244.25 | 314.3 |

Test Plots

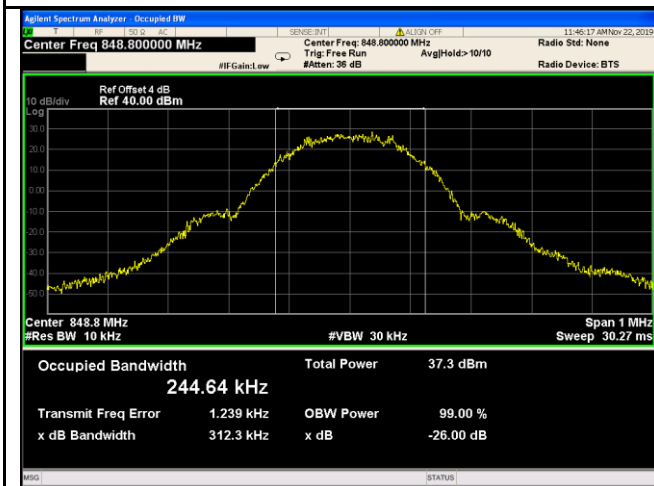
GSM Voice:



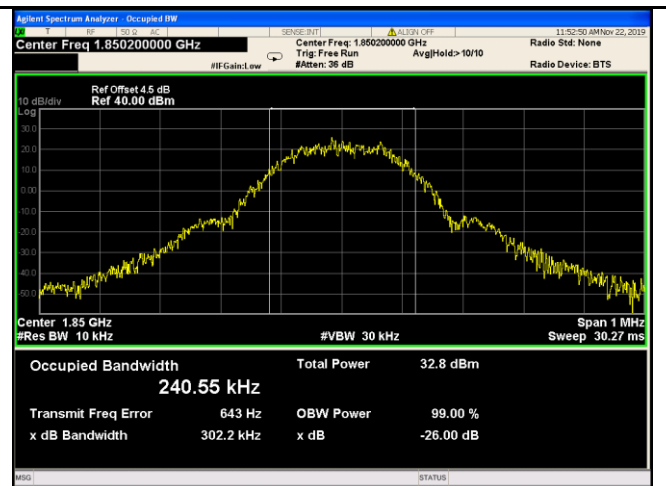
GSM 850 BW - Low CH 824.2MHz



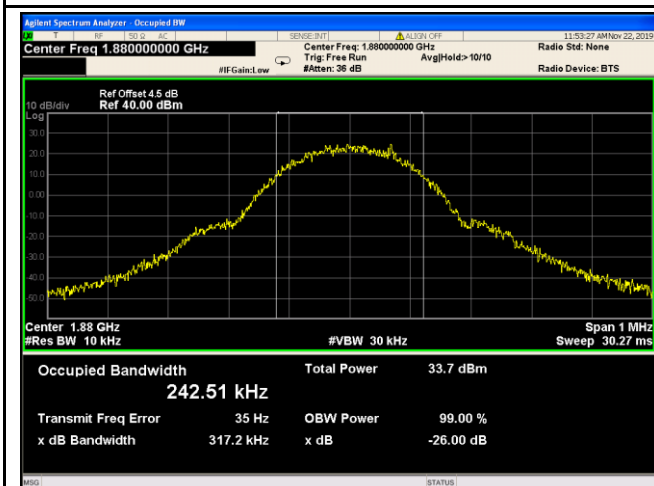
GSM 850 BW - Mid CH 836.6MHz



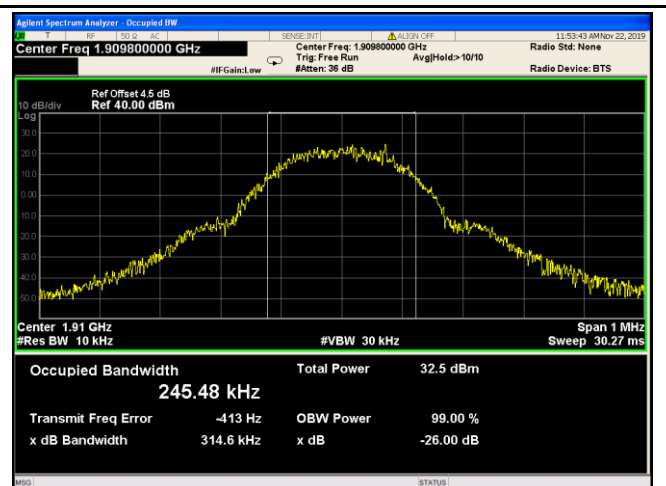
GSM 850 BW - High CH 848.8MHz



PCS 1900 BW - Low CH 1850MHz

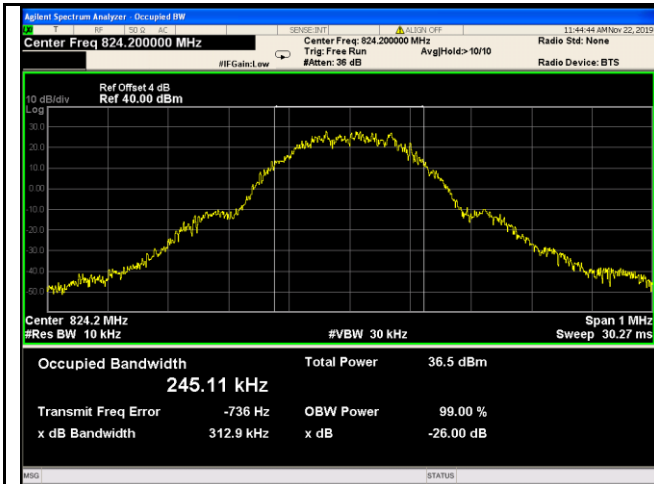


PCS 1900 BW - Mid CH 1880MHz

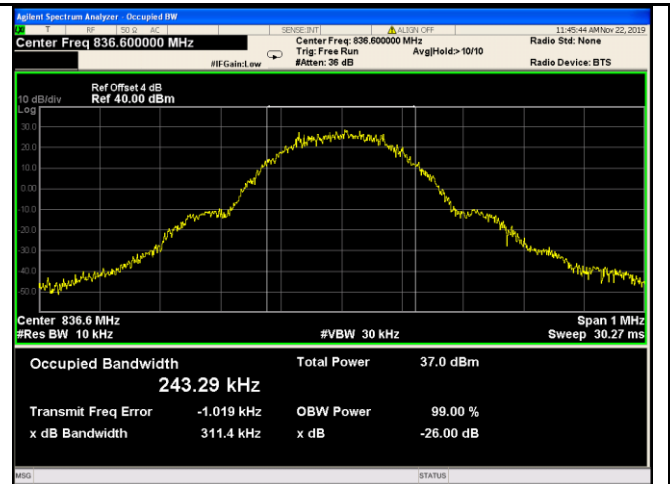


PCS 1900 BW - High CH 1910MHz

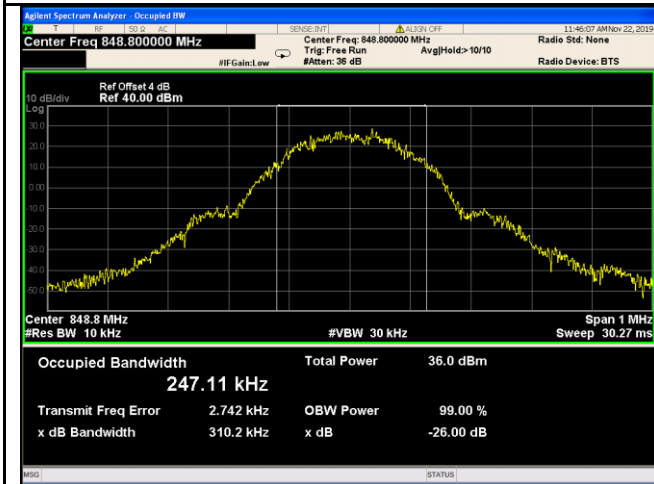
GPRS:



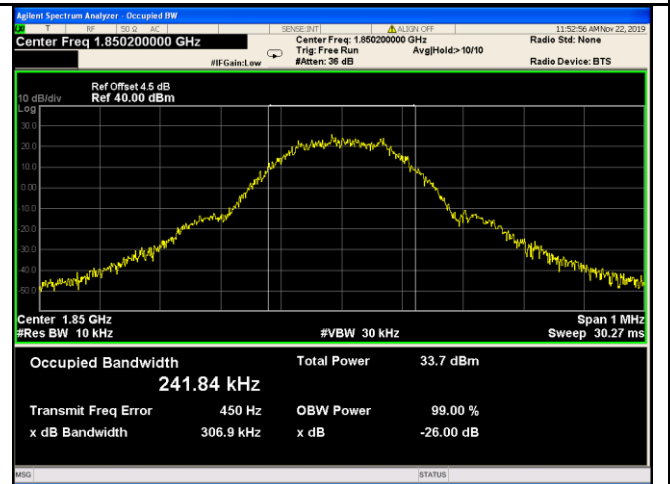
GSM 850 BW - Low CH 824.2MHz



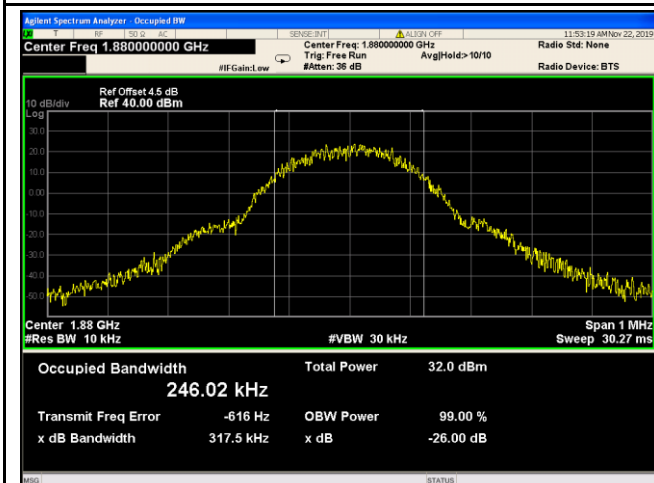
GSM 850 BW - Mid CH 836.6MHz



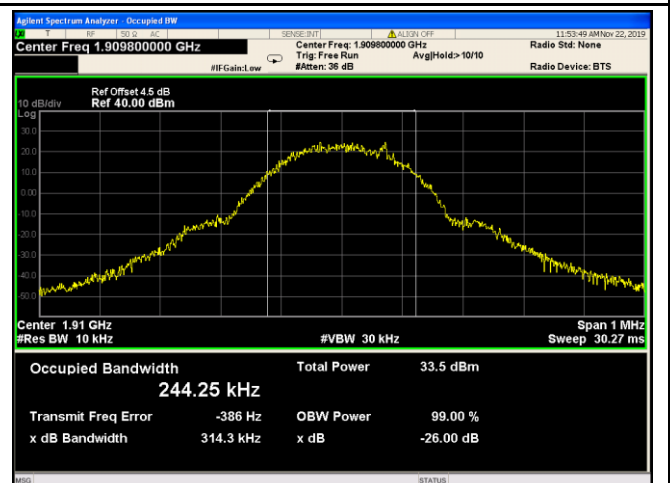
GSM 850 BW - High CH 848.8MHz



PCS 1900 BW - Low CH 1850MHz



PCS 1900 BW - Mid CH 1880MHz

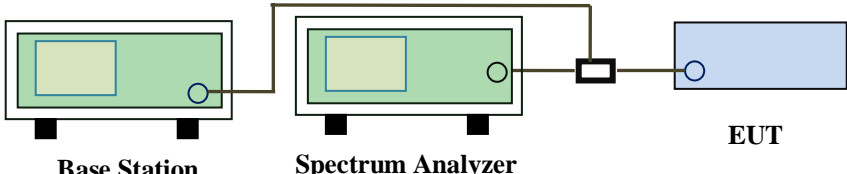


PCS 1900 BW - High CH 1910MHz

6.5 Spurious Emissions at Antenna Terminals

| | |
|----------------------|--------------|
| Temperature | 27°C |
| Relative Humidity | 35% |
| Atmospheric Pressure | 1013mbar |
| Test date : | Nov. 22,2019 |
| Tested By : | Aaron Liang |

Requirement(s):

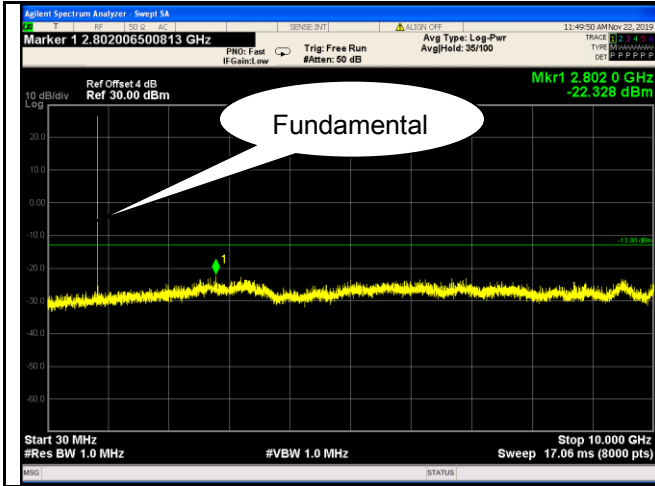
| Spec | Item | Requirement | Applicable |
|---------------------------------------|--|--|-------------------------------------|
| §2.1051, §22.917(a)& §24.238(a) | a) | The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least $43 + 10 \log(P)$ dB | <input checked="" type="checkbox"/> |
| Test Setup |  <p style="text-align: center;">Base Station Spectrum Analyzer EUT</p> | | |
| Test Procedure | <ul style="list-style-type: none"> - The EUT was connected to Spectrum Analyzer and Base Station via power divider. - The Band Edges of low and high channels for the highest RF powers were measured. - Setting RBW as roughly BW/100. | | |
| Remark | | | |
| Result | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail | | |

Test Data Yes N/A
 Test Plot Yes (See below) N/A

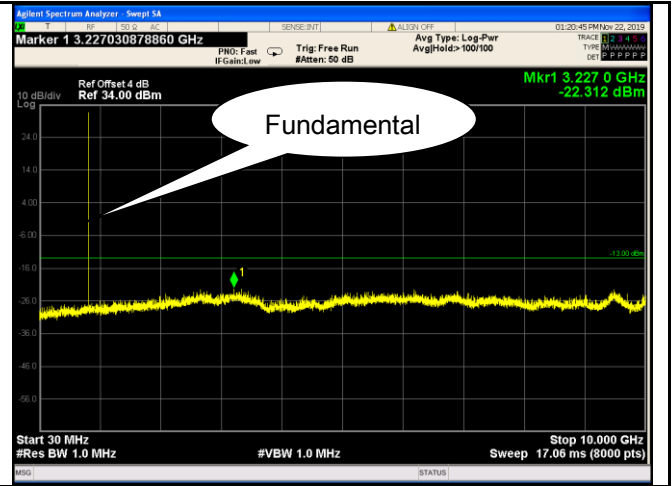
Test Plots

GSM Voice:

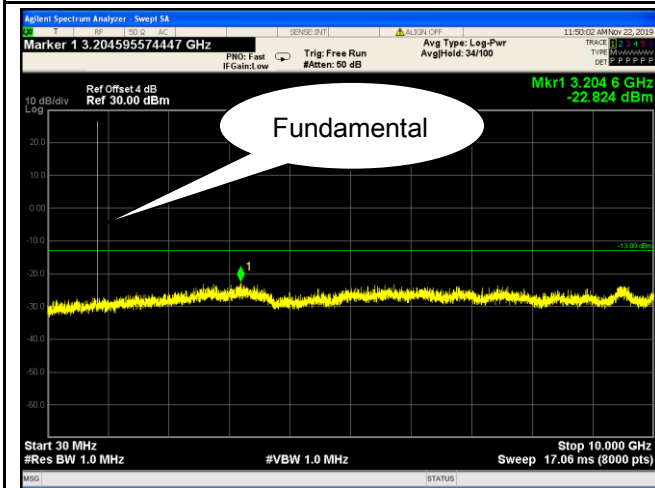
Cellular Band (Part 22H) result



GSM 850 - Low Channel

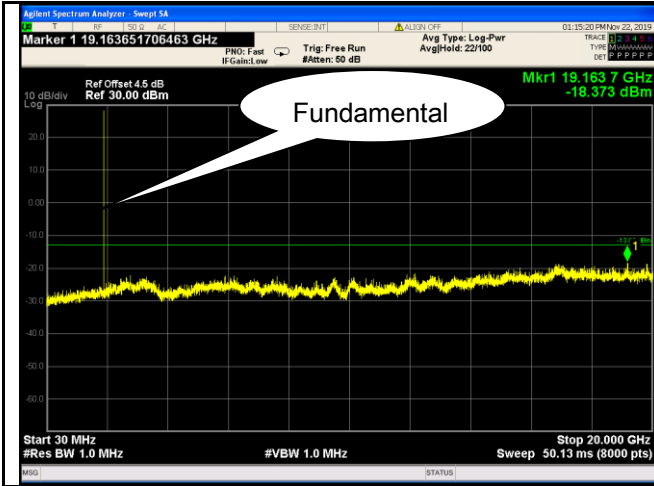


GSM 850 Middle Channel

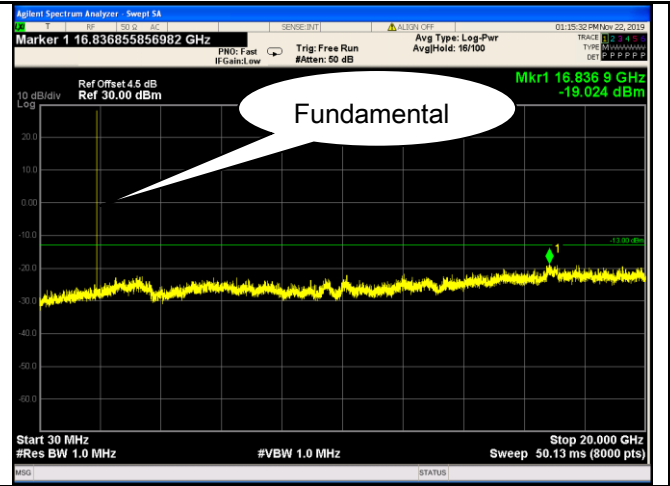


GSM 850 - High Channel

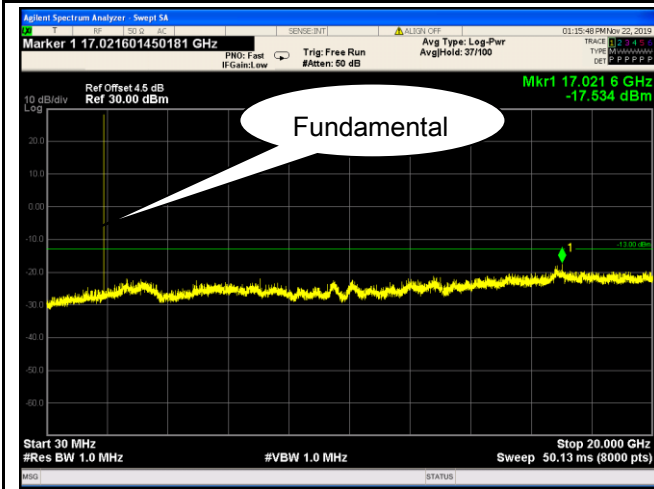
PCS Band (Part24E) result



PCS1900 - Low Channel



PCS1900 - Middle Channel

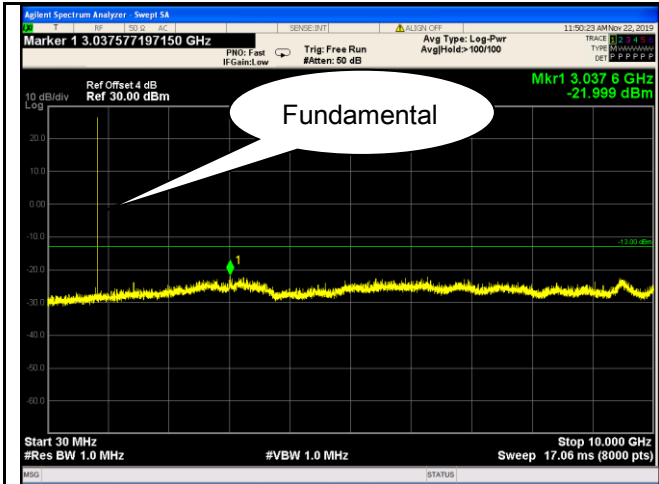


PCS1900 - High Channel

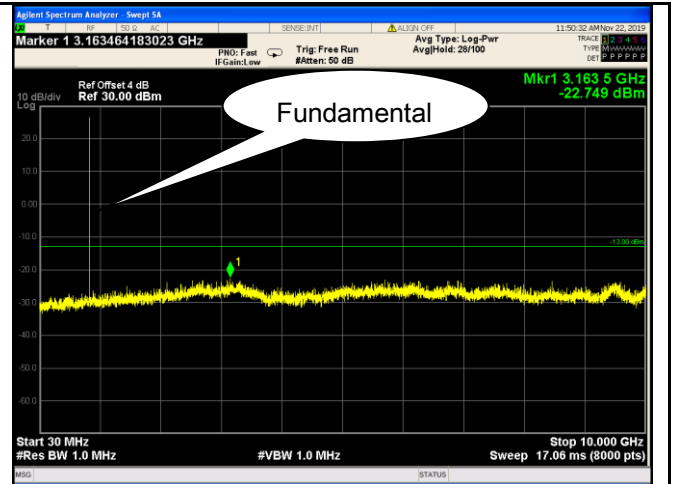


GPRS:

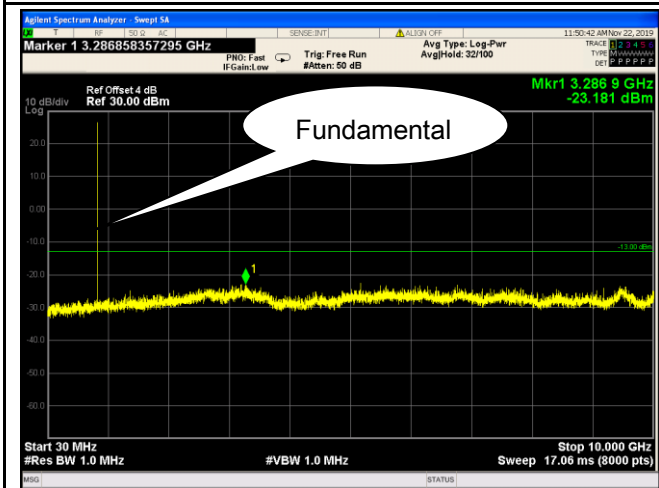
Cellular Band (Part 22H) result



GSM 850 - Low Channel

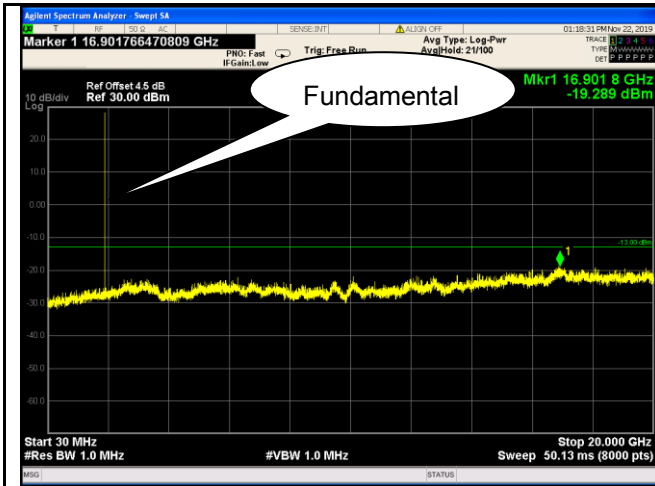


GSM 850 Middle Channel

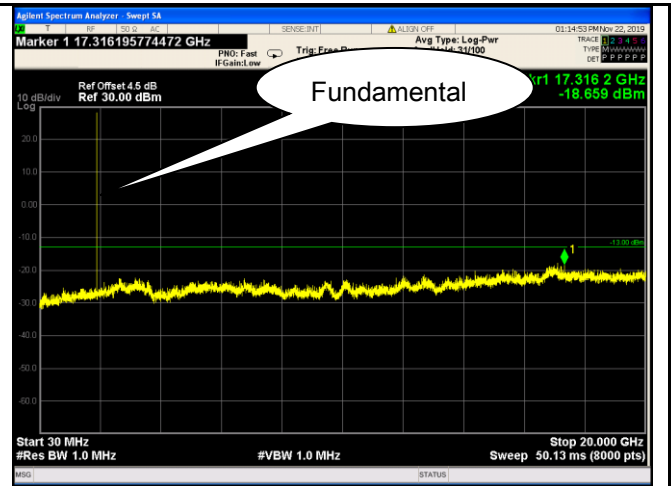


GSM 850 - High Channel

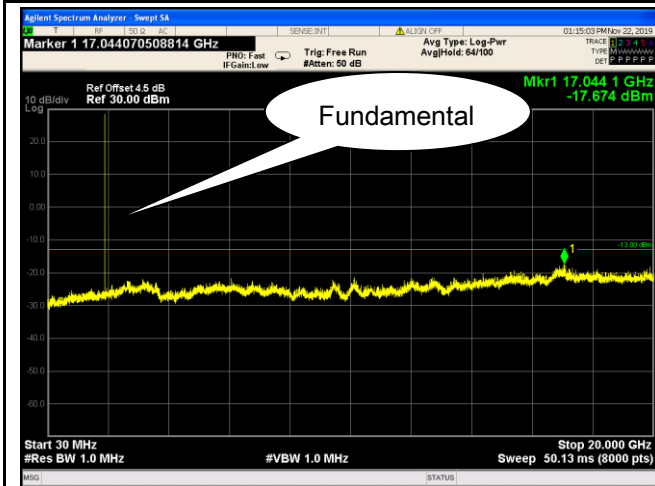
PCS Band (Part24E) result



PCS1900 - Low Channel



PCS1900 - Middle Channel



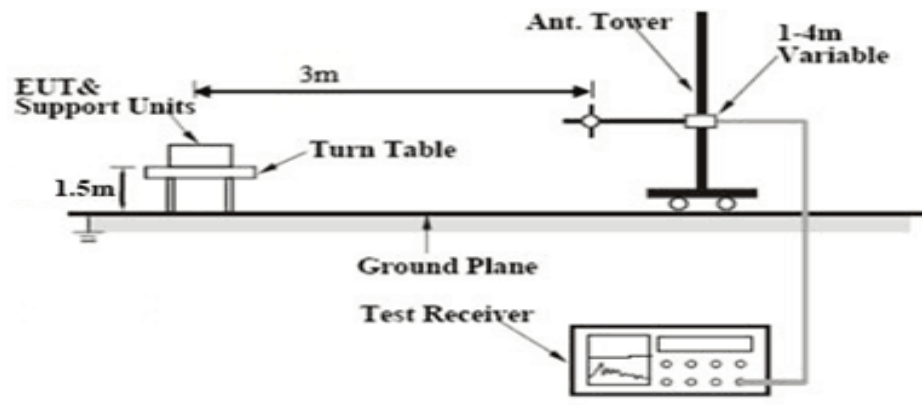
PCS1900 - High Channel

6.6 Spurious Radiated Emissions

| | |
|----------------------|--------------|
| Temperature | 27°C |
| Relative Humidity | 35% |
| Atmospheric Pressure | 1013mbar |
| Test date : | Nov. 22,2019 |
| Tested By : | Aaron Liang |

Requirement(s):

| Spec | Item | Requirement | Applicable |
|----------------------------------|------|---|-------------------------------------|
| §2.1053, §22.917 & §24.238 | a) | The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic. | <input checked="" type="checkbox"/> |

| | |
|------------|--|
| Test setup |  |
|------------|--|

| | |
|----------------|---|
| Test Procedure | <ol style="list-style-type: none"> The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution. Sample Calculation: EUT Field Strength = Raw Amplitude (dBµV/m) – Amplifier Gain (dB) + Antenna Factor (dB) + Cable Loss (dB) + Filter Attenuation (dB, if used) |
|----------------|---|

| | |
|--------|--|
| Remark | |
| Result | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail |

Test Data Yes N/A
Test Plot Yes (See below) N/A

Cellular Band (Part 22H) result

Low channel

| Frequency (MHz) | Antenna Polarization (H/V) | Corrected Reading (dBm) | Limit (dBm) | Margin (dB) |
|--------------------|----------------------------------|-------------------------------|----------------|----------------|
| 1648.4 | V | -38.54 | -13 | -25.54 |
| 1648.4 | H | -42.56 | -13 | -29.56 |
| 2472.6 | V | -33.16 | -13 | -20.16 |
| 2472.6 | H | -29.54 | -13 | -16.54 |
| 224.1 | V | -44.78 | -13 | -31.78 |
| 351.7 | H | -45.81 | -13 | -32.81 |

Middle channel

| Frequency (MHz) | Antenna Polarization (H/V) | Corrected Reading (dBm) | Limit (dBm) | Margin (dB) |
|--------------------|----------------------------------|-------------------------------|----------------|----------------|
| 1673.2 | V | -39.84 | -13 | -26.84 |
| 1673.2 | H | -43.7 | -13 | -30.7 |
| 2509.8 | V | -34.77 | -13 | -21.77 |
| 2509.8 | H | -30.13 | -13 | -17.13 |
| 511.7 | V | -45.21 | -13 | -32.21 |
| 337.8 | H | -46.77 | -13 | -33.77 |

High channel

| Frequency (MHz) | Antenna Polarization (H/V) | Corrected Reading (dBm) | Limit (dBm) | Margin (dB) |
|--------------------|----------------------------------|-------------------------------|----------------|----------------|
| 1697.6 | V | -38.24 | -13 | -25.24 |
| 1697.6 | H | -42.55 | -13 | -29.55 |
| 2546.4 | V | -33.19 | -13 | -20.19 |
| 2546.4 | H | -29.11 | -13 | -16.11 |
| 299.5 | V | -47.84 | -13 | -34.84 |
| 822.3 | H | -45.26 | -13 | -32.26 |

Note:

- 1, The testing has been conformed to $10 \times 848.8 \text{ MHz} = 8,488 \text{ MHz}$
- 2, All other emissions more than 30 dB below the limit
- 3, GSM voice , GPRS and EGPRS mode were investigated. The results above show only the worse cases
- 4, X-Axis, Y-Axis and Z-Axis were investigated. The results above show only the worst case.

PCS Band (Part24E) result

Low channel

| Frequency (MHz) | Antenna Polarization (H/V) | Corrected Reading (dBm) | Limit (dBm) | Margin (dB) |
|--------------------|----------------------------------|-------------------------------|----------------|----------------|
| 3700.4 | V | -33.69 | -13 | -20.69 |
| 3700.4 | H | -31.47 | -13 | -18.47 |
| 5550.6 | V | -28.52 | -13 | -15.52 |
| 5550.6 | H | -31.96 | -13 | -18.96 |
| 552.7 | V | -47.2 | -13 | -34.2 |
| 315.6 | H | -49.21 | -13 | -36.21 |

Middle channel

| Frequency (MHz) | Antenna Polarization (H/V) | Corrected Reading (dBm) | Limit (dBm) | Margin (dB) |
|--------------------|----------------------------------|-------------------------------|----------------|----------------|
| 3760 | V | -32.06 | -13 | -19.06 |
| 3760 | H | -30.49 | -13 | -17.49 |
| 5640 | V | -27.77 | -13 | -14.77 |
| 5640 | H | -31.02 | -13 | -18.02 |
| 294.7 | V | -46.85 | -13 | -33.85 |
| 521.6 | H | -48.21 | -13 | -35.21 |

High channel

| Frequency (MHz) | Antenna Polarization (H/V) | Corrected Reading (dBm) | Limit (dBm) | Margin (dB) |
|--------------------|----------------------------------|-------------------------------|----------------|----------------|
| 3819.6 | V | -33.14 | -13 | -20.14 |
| 3819.6 | H | -32.47 | -13 | -19.47 |
| 5729.4 | V | -28.44 | -13 | -15.44 |
| 5729.4 | H | -28.89 | -13 | -15.89 |
| 566.3 | V | -46.81 | -13 | -33.81 |
| 338.4 | H | -49.72 | -13 | -36.72 |

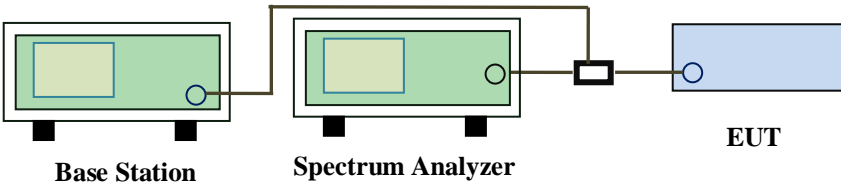
Note:

- 1, The testing has been conformed to $10 \times 1909.8 \text{ MHz} = 19,098 \text{ MHz}$
- 2, All other emissions more than 30 dB below the limit
- 3, GSM voice , GPRS and EGPRS mode were investigated. The results above show only the worse cases
- 4, X-Axis, Y-Axis and Z-Axis were investigated. The results above show only the worst case.

6.7 Band Edge

| | |
|----------------------|--------------|
| Temperature | 27°C |
| Relative Humidity | 35% |
| Atmospheric Pressure | 1013mbar |
| Test date : | Nov. 22,2019 |
| Tested By : | Aaron Liang |

Requirement(s):

| Spec | Item | Requirement | Applicable |
|--------------------------|--|--|-------------------------------------|
| §22.917(a) §24.238(a) | a) | The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB. | <input checked="" type="checkbox"/> |
| Test setup |  <p>The diagram shows a Base Station (green box) connected to a Spectrum Analyzer (green box) and an EUT (blue box) via a power divider (black box). The Base Station and Spectrum Analyzer are connected to each other, and the Spectrum Analyzer is connected to the power divider, which then splits the signal to the EUT.</p> | | |
| Procedure | <ul style="list-style-type: none"> - The EUT was connected to Spectrum Analyzer and Base Station via power divider. - The Band Edges of low and high channels for the highest RF powers were measured. Setting RBW as roughly BW/100. | | |
| Remark | | | |
| Result | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail | | |

Test Data Yes N/A

Test Plot Yes (See below) N/A

GSM Voice:

Cellular Band (Part 22H) result

| Frequency (MHz) | Emission (dBm) | Limit (dBm) |
|-----------------|----------------|-------------|
| 823.996 | -19.458 | -13 |
| 849.027 | -17.621 | -13 |

PCS Band (Part24E) result

| Frequency (MHz) | Emission (dBm) | Limit (dBm) |
|-----------------|----------------|-------------|
| 1849.98 | -16.459 | -13 |
| 1910.013 | -16.326 | -13 |

GPRS:

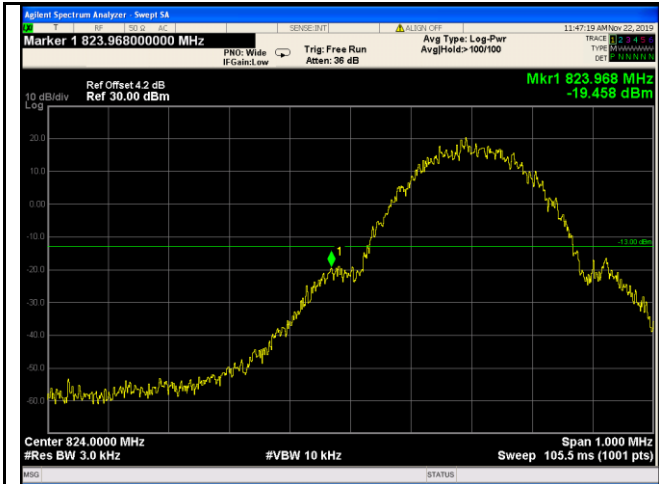
Cellular Band (Part 22H) result

| Frequency (MHz) | Emission (dBm) | Limit (dBm) |
|-----------------|----------------|-------------|
| 822.979 | -18.891 | -13 |
| 849.02 | -18.142 | -13 |

PCS Band (Part24E) result

| Frequency (MHz) | Emission (dBm) | Limit (dBm) |
|-----------------|----------------|-------------|
| 1849.979 | -16.207 | -13 |
| 1910.01 | -15.459 | -13 |

**GSM Voice:
Test Plots**



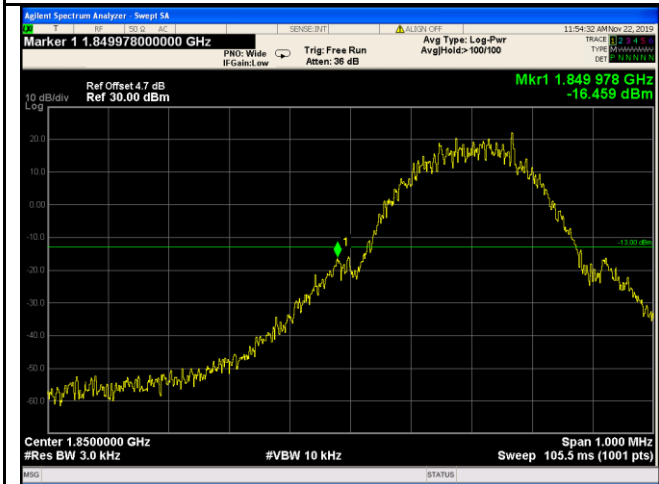
Cellular Band - Low Channel

Note: Offset=Cable loss (4.0) + 10log
(3.167/3)=4.0+0.2=4.2dB



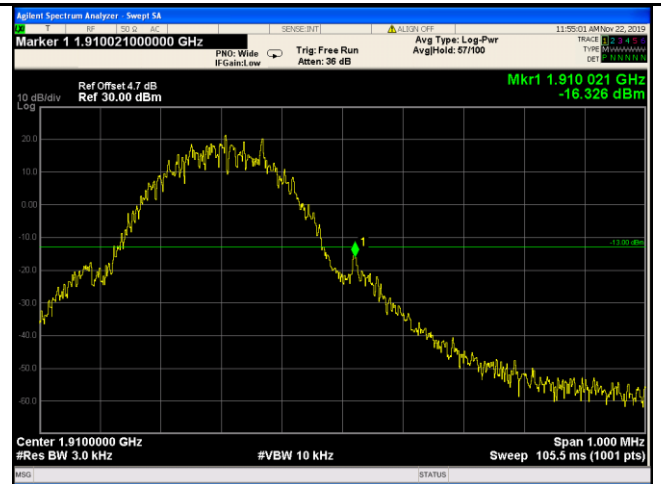
Cellular Band - High Channel

Note: Offset=Cable loss (4.0) + 10log
(3.123/3)=4.0+0.2=4.2dB



PCS Band - Low Channel

Note: Offset=Cable loss (4.5) + 10log
(3.129/3)=4.5+0.2=4.7dB

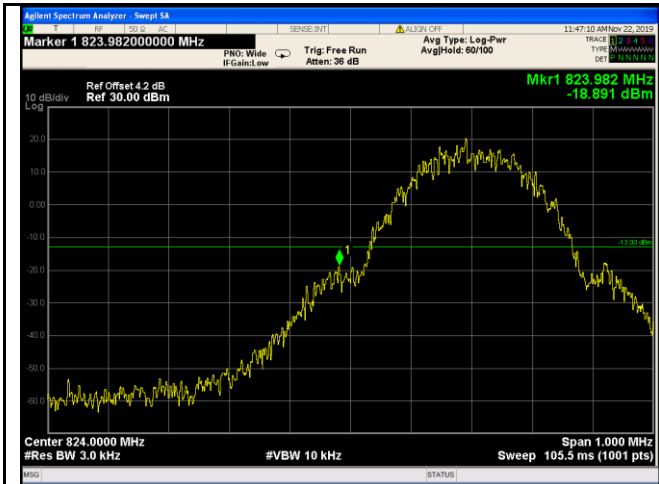


PCS Band - High Channel

Note: Offset=Cable loss (4.5) + 10log
(3.102/3)=4.5+0.2=4.7dB

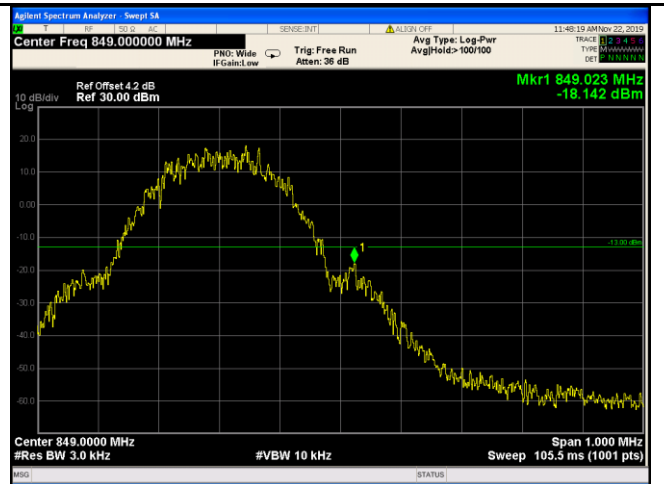
GPRS:

Test Plots



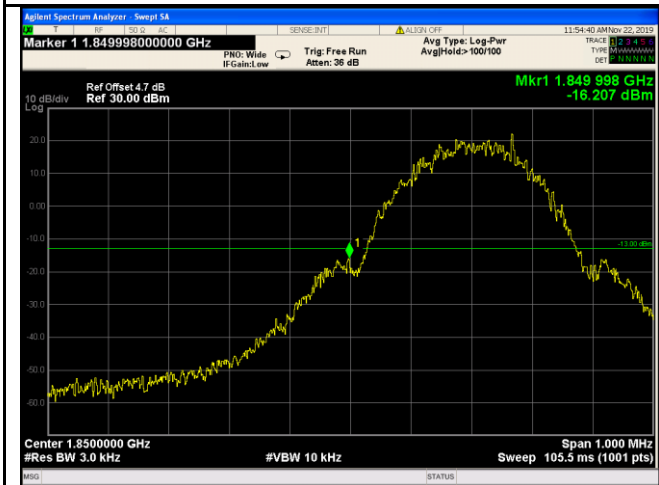
Cellular Band - Low Channel

Note: Offset=Cable loss (4.0) + 10log
(3.022/3)=4.0+0.2=4.2dB



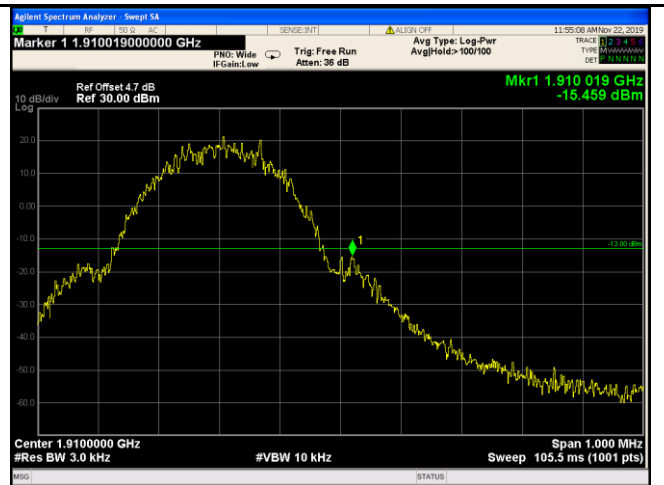
Cellular Band - High Channel

Note: Offset=Cable loss (4.0) + 10log
(3.146/3)=4.0+0.2=4.2dB



PCS Band - Low Channel

Note: Offset=Cable loss (4.5) + 10log
(3.069/3)=4.5+0.2=4.7dB



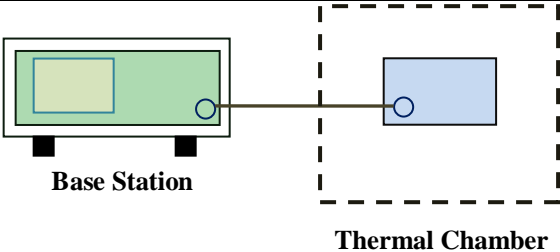
PCS Band - High Channel

Note: Offset=Cable loss (4.5) + 10log
(3.143/3)=4.5+0.2=4.7dB

6.8 Frequency Stability

| | |
|----------------------|--------------|
| Temperature | 27°C |
| Relative Humidity | 35% |
| Atmospheric Pressure | 1013mbar |
| Test date : | Nov. 22,2019 |
| Tested By : | Aaron Liang |

Requirement(s):

| Spec | Item | Requirement | Applicable | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------------------------|---|---|-----------------------|-------------------------|-------------------------|------------------------|----------|------|------|------|-----------|-----|-----|------|-----------|-----|-----|-----|------------|-----|-----|-----|------------|-----|-----|-----|-------------|-----|-----|-----|--------------|------|-----|-----|-------------------------------------|
| §2.1055, §22.355 & §24.235 | a) | <p>According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table below:</p> <p>Frequency Tolerance for Transmitters in the Public Mobile Services</p> <table border="1"> <thead> <tr> <th>Frequency Range (MHz)</th> <th>Base, fixed (ppm)</th> <th>Mobile ≥ 3 watts (ppm)</th> <th>Mobile ≤ 3 watts (ppm)</th> </tr> </thead> <tbody> <tr> <td>25 to 50</td> <td>20.0</td> <td>20.0</td> <td>50.0</td> </tr> <tr> <td>50 to 450</td> <td>5.0</td> <td>5.0</td> <td>50.0</td> </tr> <tr> <td>45 to 512</td> <td>2.5</td> <td>5.0</td> <td>5.0</td> </tr> <tr> <td>821 to 896</td> <td>1.5</td> <td>2.5</td> <td>2.5</td> </tr> <tr> <td>928 to 929</td> <td>5.0</td> <td>N/A</td> <td>N/A</td> </tr> <tr> <td>929 to 960.</td> <td>1.5</td> <td>N/A</td> <td>N/A</td> </tr> <tr> <td>2110 to 2220</td> <td>10.0</td> <td>N/A</td> <td>N/A</td> </tr> </tbody> </table> <p>According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized frequency block.</p> | Frequency Range (MHz) | Base, fixed (ppm) | Mobile ≥ 3 watts (ppm) | Mobile ≤ 3 watts (ppm) | 25 to 50 | 20.0 | 20.0 | 50.0 | 50 to 450 | 5.0 | 5.0 | 50.0 | 45 to 512 | 2.5 | 5.0 | 5.0 | 821 to 896 | 1.5 | 2.5 | 2.5 | 928 to 929 | 5.0 | N/A | N/A | 929 to 960. | 1.5 | N/A | N/A | 2110 to 2220 | 10.0 | N/A | N/A | <input checked="" type="checkbox"/> |
| | | Frequency Range (MHz) | Base, fixed (ppm) | Mobile ≥ 3 watts (ppm) | Mobile ≤ 3 watts (ppm) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 25 to 50 | 20.0 | 20.0 | 50.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 50 to 450 | 5.0 | 5.0 | 50.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 45 to 512 | 2.5 | 5.0 | 5.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 821 to 896 | 1.5 | 2.5 | 2.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 928 to 929 | 5.0 | N/A | N/A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 929 to 960. | 1.5 | N/A | N/A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2110 to 2220 | 10.0 | N/A | N/A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Test setup |  <p style="text-align: center;">Base Station Thermal Chamber</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| | |
|-----------|---|
| Procedure | <p>A communication link was established between EUT and base station. The frequency error was monitored and measured by base station under variation of ambient temperature and variation of primary supply voltage.</p> <p>Limit: The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ ($\pm 2.5\text{ppm}$) of the center frequency.</p> |
| Remark | |
| Result | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail |

Test Data Yes N/A

Test Plot Yes (See below) N/A

GSM Voice:

Cellular Band (Part 22H) result

| Middle Channel, $f_0 = 836.6$ MHz | | | | |
|-----------------------------------|-----------------------------------|----------------------|-----------------------|-------------|
| Temperature (°C) | Power Supplied (V _{DC}) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| -10 | 3.7 | 12 | 0.0128 | 2.5 |
| 0 | | 12 | 0.0128 | 2.5 |
| 10 | | 19 | 0.0203 | 2.5 |
| 20 | | 13 | 0.0139 | 2.5 |
| 30 | | 18 | 0.0193 | 2.5 |
| 40 | | 10 | 0.0107 | 2.5 |
| 50 | | 13 | 0.0139 | 2.5 |
| 55 | | 19 | 0.0203 | 2.5 |
| 25 | 4.2 | 10 | 0.0107 | 2.5 |
| | 3.5 | 14 | 0.0150 | 2.5 |

PCS Band (Part 24E) result

| Middle Channel, $f_0 = 1880$ MHz | | | | |
|----------------------------------|-----------------------------------|----------------------|-----------------------|-------------|
| Temperature (°C) | Power Supplied (V _{DC}) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| -10 | 3.7 | 15 | 0.0160 | 2.5 |
| 0 | | 16 | 0.0171 | 2.5 |
| 10 | | 17 | 0.0182 | 2.5 |
| 20 | | 13 | 0.0139 | 2.5 |
| 30 | | 18 | 0.0193 | 2.5 |
| 40 | | 12 | 0.0128 | 2.5 |
| 50 | | 11 | 0.0118 | 2.5 |
| 55 | | 12 | 0.0128 | 2.5 |
| 25 | 4.2 | 13 | 0.0139 | 2.5 |
| | 3.5 | 12 | 0.0128 | 2.5 |

Annex A. TEST INSTRUMENT

RE& RSE

Frequency Range Below 1GHz

| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Next Cal. |
|---------------------------------|-------------------|-----------|---------------------------------|-------------|-------------|
| EMI Test Receiver | Rohde&Schwarz | ESL6 | 1300.5001K0 6-100262-eQ | Apr. 04, 19 | Apr. 03, 20 |
| Bilog Antenna | Sunol Sciences | JB6 | A110712 | Apr. 08, 19 | Apr. 07, 20 |
| Active Antenna | CMO-POWER | AL-130 | 121031 | Mar. 27, 19 | Mar. 26, 20 |
| Signal Amplifier | HP | 8447E | 443008 | Mar. 28, 19 | Mar. 27, 20 |
| 3m Semi-anechoic Chamber | SAEMC | 9m*6m*6m | N/A | Oct. 18,18 | Oct. 17,21 |
| Test Software | EZ-EMC | ICP-03A1 | N/A | N/A | N/A |
| Universal Radio Communication | ROHDE&SCHW ARZ | CMU200 | 112012 | Mar. 28,19 | Mar. 27,20 |
| Universal Radio Communication | ROHDE&SCHW ARZ | CMU200 | 121393 | Mar. 28,19 | Mar. 27,20 |
| Wireless Communication Test Set | ROHDE&SCHW ARZ | CMW500 | 1201.0002K5 00-155842- Gd | Aug. 06, 19 | Aug. 05, 20 |

RE& RSE

Frequency Range Above 1GHz

| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Next Cal. |
|---------------------|---------------------------|-----------|-------------|-------------|-------------|
| Spectrum | Agilent | E4446A | MY46180622 | May. 08,19 | Mar. 07, 20 |
| MXA signal analyzer | Agilent | N9020A | MY49100060 | Mar. 28, 19 | Mar. 27, 20 |
| Horn Antenna | COM-POWER | HAH-118 | 71259 | Mar. 22, 19 | Mar. 21, 20 |
| Horn Antenna | COM-POWER | HAH-118 | 71283 | Mar. 20, 19 | Mar. 19, 20 |
| SHF-EHF Horn | Schwarzbeck | BBHA9170 | BBHA9170147 | Jun. 30, 19 | Jun. 29, 20 |
| SHF-EHF Horn | Schwarzbeck | BBHA9170 | BBHA9170242 | Jun. 30, 19 | Jun. 29, 20 |
| AMPLIFIER | EM Electornic Corporation | EM01G26G | 60613 | Mar. 28, 19 | Mar. 27, 20 |

| | | | | | |
|---------------------------------|-----------------------------|-----------|-----------------------------|-------------|-------------|
| AMPLIFIER | Emc Instruments Corporation | Emc012645 | 980077 | Jan. 04, 19 | Jan. 03,20 |
| 3m Semi-anechoic Chamber | SAEMC | 9m*6m*6m | N/A | Oct. 18,18 | Oct. 17,21 |
| Test Software | EZ-EMC | ICP-03A1 | N/A | N/A | N/A |
| Universal Radio Communication | ROHDE&SCHW ARZ | CMU200 | 112012 | Mar. 28,19 | Mar. 27,20 |
| Universal Radio Communication | ROHDE&SCHW ARZ | CMU200 | 121393 | Mar. 28,19 | Mar. 27,20 |
| Wireless Communication Test Set | ROHDE&SCHW ARZ | CMW500 | 1201.0002K50 0-155842-Gd | Aug. 06, 19 | Aug. 05, 20 |

Antenna Port Conducted RF measurement

| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Next Cal. |
|-------------------------------------|---------------|--------------|--------------|-------------|-------------|
| Wireless Connectivity | R&S | CMW270 | 1201.0002K75 | Nov. 29, 18 | Nov. 28, 19 |
| MXA VEXTOR SIGNAL | Agilent | n5182a | MY50140530 | Mar. 28,19 | Mar. 27,20 |
| MXA signal analyzer | Agilent | n9020a | MY49100060 | Mar. 28,19 | Mar. 27,20 |
| RF Control Unit | Tonscend | JS0806-2 | 188060112 | Mar. 28,19 | Mar. 27,20 |
| Signal Generation | Agilent | E4421B | US40051152 | Nov. 29, 18 | Nov. 28, 19 |
| DC Power Supply | Agilent | E3640A | MY40004013 | Mar. 28,19 | Mar. 27,20 |
| Programmable Temperature & Humidity | Hongjin | HYC-TH-225DH | DG-180746 | Mar. 28,19 | Mar. 27,20 |
| Test System | Tonscend | JS 1120-3 | N/A | N/A | N/A |
| Power Splitter | Weinschel | 1580-1 | TL177 | Mar. 20,19 | Mar. 19,20 |
| Universal Radio Communication | ROHDE&SCHWARZ | CMU200 | 112012 | Mar. 28,19 | Mar. 27,20 |
| Universal Radio Communication | ROHDE&SCHWARZ | CMU200 | 121393 | Mar. 28,19 | Mar. 27,20 |



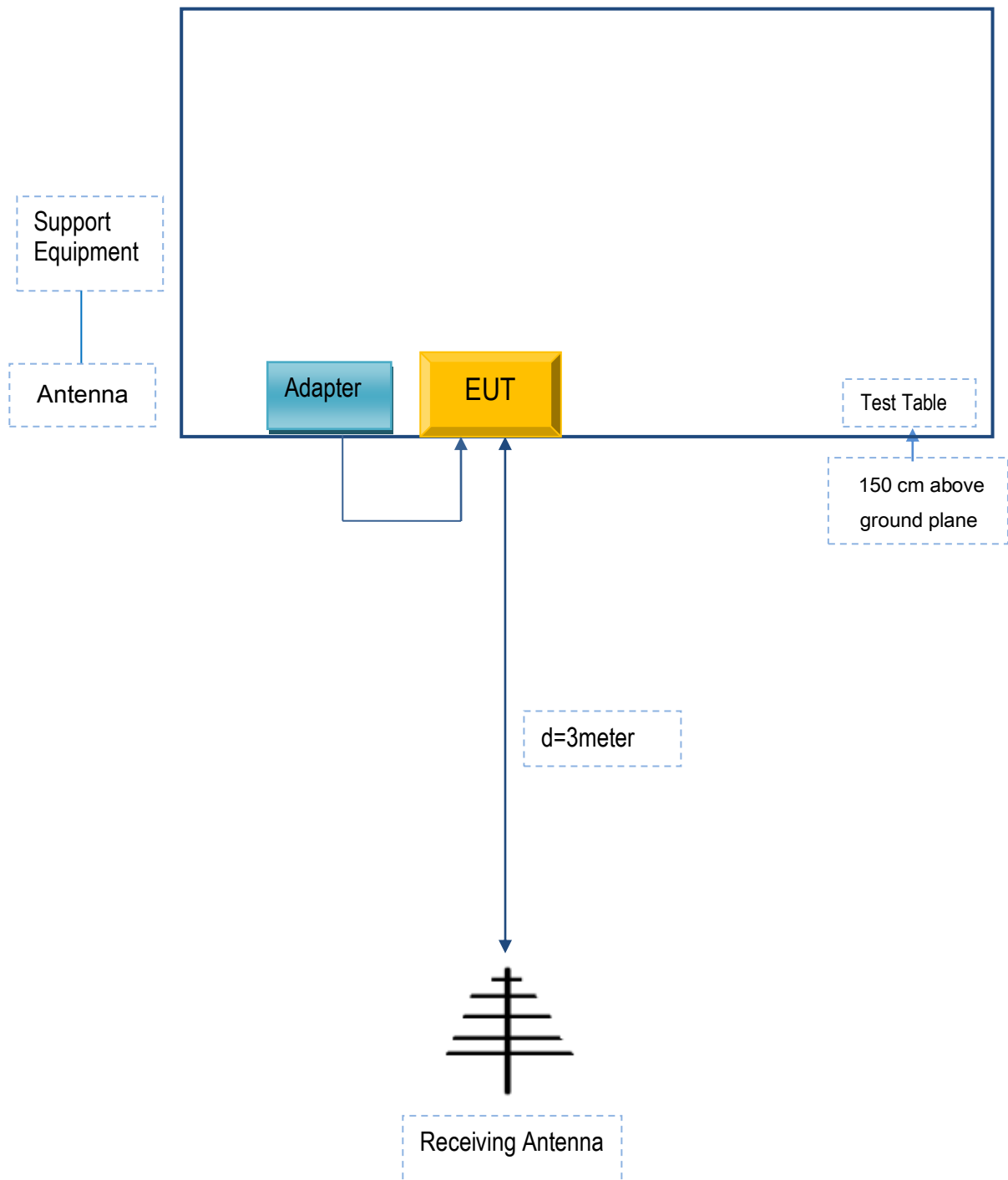
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|---------------------------------------|---------------|--------|-----------------------------|-------------|-------------|
| Wireless Communication Test Set | ROHDE&SCHWARZ | CMW500 | 1201.0002K50 0-155842-Gd | Aug. 06, 19 | Aug. 05, 20 |
|---------------------------------------|---------------|--------|-----------------------------|-------------|-------------|

Annex B. TEST SETUP AND SUPPORTING EQUIPMENT

Annex B.i. TEST SET UP BLOCK

Block Configuration Diagram for Radiated Emissions



Annex C. SUPPORTING EQUIPMENT DESCRIPTION

The following is a description of supporting equipment and details of cables used with the EUT.

Supporting Equipment:

| Manufacturer | Equipment Description | Model | Serial No |
|--------------|-----------------------|-------|-----------|
| N/A | N/A | N/A | N/A |

Supporting Cable:

| Cable type | Shield Type | Ferrite Core | Length | Serial No |
|------------|-------------|--------------|--------|-----------|
| N/A | N/A | N/A | N/A | N/A |

| | |
|-----------------|--------------------|
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**Annex C. User Manual / Block Diagram / Schematics / Partlist/
DECLARATION OF SIMILARITY**

Please see the attachment