# RF TEST REPORT

Report No.: 15071019-FCC-R1

Supersede Report No.: N/A

| | |
|---|---|
| Applicant | Sun Cupid Technology (HK) Ltd. |
| Product Name | LTE Moblie phone |
| Model No. | N4L |
| Serial No. | N/A |
| Test Standard | FCC Part 22(H):2014 ;FCC Part 24(E):2014; FCC Part 27:2014; ANSI/TIAC603 D: 2010 |
| Test Date | July 30 to August 13, 2015 |
| Issue Date | December 14, 2015 |
| Test Result | ☑ Pass ☐ Fail |
| Equipment complied with the specification | ☑ |
| Equipment did not comply with the specification | ☐ |

| | | |
|---|---|---|
| Winnie.Zhang | David Huang | |
| Winnie Zhang<br>Test Engineer | David Huang<br>Checked By | |

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Test result presented in this test report is applicable to the tested sample only


Issued by:

SIEMIC (SHENZHEN-CHINA) LABORATORIES

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# Laboratories Introduction

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## 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 |

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# 1. Report Revision History

| Report No. | Report Version | Description | Issue Date |
|---|---|---|---|
| 15071019-FCC-R1 | NONE | Original | November 05, 2015 |
| 15071019-FCC-R1 | V1 | Change test photos | December 14, 2015 |
| | | | |
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| | | | |

# 2. Customer information

| | |
|---|---|
| Applicant Name | Sun Cupid Technology (HK) Ltd. |
| Applicant Add | 16/F, CEO Tower, 77 Wing Hong St, Cheung Sha Wan, Kowloon |
| Manufacturer | SUNCUPID (SHENZHEN) ELECTRONIC LTD |
| Manufacturer Add | Baolong Industrial City, Longgang District, Shenzhen Hi-Tech Road, Building 1, A 7 |

# 3. Test site information

| | |
|---|---|
| Lab performing tests | SIEMIC (Shenzhen-China) LABORATORIES |
| Lab Address | Zone A, Floor 1, Building 2 Wan Ye Long Technology Park<br>South Side of Zhoushi Road, Bao' an District, Shenzhen, Guangdong China 518108 |
| FCC Test Site No. | 718246 |
| IC Test Site No. | 4842E-1 |
| Test Software | Radiated Emission Program-To Shenzhen v2.0 |

# 4. Equipment under Test (EUT) Information

| | |
|---|---|
| Description of EUT: | LTE Moblie phone |
| Main Model: | N4L |
| Serial Model: | N/A |
| Date EUT received: | July 29, 2015 |
| Test Date(s): | July 30 to August 13, 2015 |
| Equipment Category： | PCE |
| Antenna Gain: | GSM850: 0.08 dBi<br>PCS1900: 0.8 dBi<br>UMTS-FDD Band V: 0.08 dBi<br>UMTS-FDD Band IV: 0.73 dBi<br>UMTS-FDD Band II: 0.89 dBi<br>Bluetooth/BLE: 0.93 dBi<br>WIFI(2.4G): 0.93 dBi<br>WIFI(5G): 1.82 dB<br>LTE Band 2: 0.88 dBi<br>LTE Band 4: 0.75 dBi<br>LTE Band 5: 0.07 dBi<br>LTE Band 12: -1.73 dBi<br>LTE Band 17: -1.73 dBi<br>GPS:-0.32dBi |
| Type of Modulation: | GSM / GPRS: GMSK<br>EGPRS: GMSK, 8PSK<br>UMTS-FDD: QPSK, 16QAM<br>802.11a/b/g/n: DSSS, OFDM<br>Bluetooth: GFSK, π /4DQPSK, 8DPSK<br>BLE: GFSK<br>LTE Band: QPSK, 16QAM<br>GPS:BPSK |

| | |
|---|---|
| RF Operating Frequency (ies): | GSM850 TX: 824.2 ~ 848.8 MHz; RX: 869.2 ~ 893.8 MHz<br>PCS1900 TX: 1850.2 ~ 1909.8 MHz; RX: 1930.2 ~ 1989.8 MHz<br>UMTS-FDD Band V TX: 826.4 ~ 846.6 MHz; RX: 871.4 ~ 891.6 MHz<br>UMTS-FDD Band IV TX:1712.4 ~ 1752.6 MHz;<br>RX : 2112.4 ~ 2152.6 MHz<br>UMTS-FDD Band II TX:1852.4 ~ 1907.6 MHz;<br>RX: 1932.4 ~ 1987.6 MHz<br>WIFI:802.11b/g/n(20M): 2412-2462 MHz<br>WIFI:802.11n(40M): 2422-2452 MHz<br>WIFI:802.11a,n(20,40M): 5150-5250 MH<br>Bluetooth& BLE: 2402-2480 MHz<br>LTE Band 2 TX: 1852.5 ~ 1907.5 MHz; RX : 1932.5 ~ 1987.5 MHz<br>LTE Band 4 TX: 1712.5 ~ 1752.5 MHz; RX : 2112.5 ~ 2152.5 MHz<br>LTE Band 5 TX: 826.5 ~ 846.5 MHz; RX : 871.5 ~ 891.5 MHz<br>LTE Band 12 TX:699.7 ~ 715.3 MHz; RX : 729.7~ 745.3MHz<br>LTE Band 17 TX: 706.5 ~ 713.5 MHz; RX : 736.5 ~ 743.5 MHz<br>GPS RX:1575.42 MHz |
| Maximum Conducted AV Power to Antenna: | GSM850: 32.06 dBm<br>PCS1900: 29.63 dBm<br>UMTS-FDD Band V : 22.63 dBm<br>UMTS-FDD Band II : 22.80dBm<br>UMTS-FDD Band IV: 23.01dBm |
| ERP/EIRP: | GSM850: 25.54 dBm / ERP<br>PCS1900: 21.37 dBm / EIRP<br>UMTS-FDD Band V : 19.66 dBm / ERP<br>UMTS-FDD Band II : 18.52 dBm / EIRP<br>UMTS-FDD Band IV: 19.28 dBm/ EIRP |
| Number of Channels: | GSM 850: 124CH<br>PCS1900: 299CH<br>UMTS-FDD Band V : 102CH<br>UMTS-FDD Band IV: 202CH<br>UMTS-FDD Band II : 277CH<br>WIFI :802.11b/g/n(20M): 11CH<br>WIFI :802.11n(40M): 7CH<br>Bluetooth: 79CH<br>BLE: 40CH |

| | |
| --- | --- |
| | GPS:1CH |
| Port: | Power Port, Earphone Port, USB Port |
| | Battery:<br>Model:NUBN4<br>Spec: 3.8V,2150mAh,10.0Wh |
| Input Power: | Adapter:<br>Model:KNC005N-050100U<br>Input: AC100-240V; 50/60Hz; 0.2A Max<br>Output: DC 5.0V,1A |
| Trade Name : | NUU |
| GPRS/EGPRS Multi-slot class | 8/10/12 |
| FCC ID: | 2ADINNUUN4L |

## 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) ; § 27.50(d.4) | RF Output Power | Compliance |
| § 24.232 (d) ; § 27.50(d) | Peak-Average Ratio | Compliance |
| § 2.1047 | Modulation Characteristics | N/A |
| § 2.1049; § 22.905; § 22.917; § 24.238; § 27.53(a.5) | 99% & -26 dB Occupied Bandwidth | Compliance |
| § 2.1051; § 22.917(a); § 24.238(a); § 27.53(h) | Spurious Emissions at Antenna Terminal | Compliance |
| § 2.1053; § 22.917(a); § 24.238(a); § 27.53(h) | Field Strength of Spurious Radiation | Compliance |
| § 22.917(a); § 24.238(a); § 27.53(h) | Out of band emission, Band Edge | Compliance |
| § 2.1055; § 22.355; § 24.235; § 27.5(h); § 27.54 | Frequency stability vs. temperature<br>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

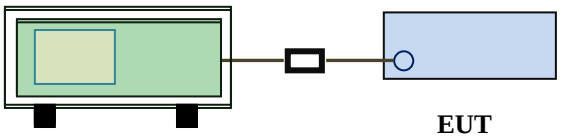
The EUT is a portable device, thus requires SAR evaluation;

Please refer to RF Exposure Evaluation Report: 15071019-FCC-H.

## 6.2 RF Output Power

| Temperature | 22℃ |
|---|---|
| Relative Humidity | 55% |
| Atmospheric Pressure | 1013mbar |
| Test date : | August 13, 2015 |
| Tested By : | Winnie Zhang |

**Requirement(s):**

| Spec | Item | Requirement | Applicable |
|---|---|---|---|
| §22.913 (a) | a) | ERP:38.45dBm | ☑ |
| §24.232 (c) | b) | EIRP:33dBm | ☑ |
| §27.50 (c) | c) | EIRP: 30dBm | ☑ |
| Test Setup |   Base Station | | |
| Test Procedure | For Conducted Power:<br>- The transmitter output port was connected to base station.<br>- Set EUT at maximum power through base station.<br>- Select lowest, middle, and highest channels for each band and different test mode.<br>For ERP/EIRP:<br>- The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.<br>- 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.<br>- The frequency range up to tenth harmonic of the fundamental frequency was investigated.<br>- 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.<br>- Spurious emissions in dB = 10 log (TX power in Watts/0.001) – the absolute level<br>- Spurious attenuation limit in dB = 43 + 10 Log10 (power out in Watts. |
| Remark | |
| Result | ☑ Pass ☐ 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 | **32.06** | 32.02 | 31.95 | 32±1 | 29.49 | 29.57 | **29.63** | 29±1 |
| GPRS Multi-Slot Class 8 (1 uplink),GMSK | 32.05 | 32.01 | 31.93 | 32±1 | 29.48 | 29.54 | 29.61 | 29±1 |
| GPRS Multi-Slot Class 10 (2 uplink) GMSK | 31.38 | 31.32 | 31.24 | 31±1 | 28.85 | 28.92 | 28.97 | 28±1 |
| GPRS Multi-Slot Class 12 (4 uplink) GMSK | 28.65 | 28.57 | 28.45 | 28±1 | 26.03 | 26.09 | 26.12 | 26±1 |
| EGPRS Multi-Slot Class 8 (1 uplink) GMSK MCS1 | 32.02 | 31.99 | 31.9 | 32±1 | 29.46 | 29.53 | 29.59 | 29±1 |
| EGPRS Multi-Slot Class 10 (2 uplink) GMSK MCS1 | 31.35 | 31.31 | 31.2 | 31±1 | 28.84 | 28.91 | 28.96 | 28±1 |
| EGPRS Multi-Slot Class 12 (4 uplink) GMSK MCS1 | 28.65 | 28.56 | 28.43 | 28±1 | 26.21 | 26.43 | 26.47 | 26±1 |
| EGPRS Multi-Slot Class 8 (1 uplink) GMSK MCS5 | 26.38 | 26.4 | 26.41 | 27±1 | 27.02 | 27.17 | 27.18 | 27±1 |
| EGPRS Multi-Slot Class 10 (2 uplink) GMSK MCS5 | 25.71 | 25.6 | 25.58 | 25±1 | 26.33 | 26.48 | 26.43 | 26±1 |
| EGPRS Multi-Slot Class 12 (4 uplink) GMSK MCS5 | 22.98 | 22.99 | 23.1 | 23±1 | 23.39 | 23.64 | 23.61 | 23±1 |

Remark :

GPRS, CS1 coding scheme.

EGPRS, MCS1 coding scheme.

EGPRS, MCS5 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 12 , Support Max 4 downlink, 4 uplink , 5 working link

**Note: Since GSM mode has higher power, so the test items below were not performed to GPRS and EGPRS mode.**

# UMTS Mode:

## UMTS-FDD Band V

| Band/ Time Slot configuration | Channel | Frequency | Average power (dBm) | Tune up Power tolerant |
|---|---|---|---|---|
| RMC 12.2kbps | 4132 | 826.4 | 22.62 | 22±1 |
| | 4175 | 835 | **22.63** | 22±1 |
| | 4233 | 846.6 | 22.51 | 22±1 |
| HSDPA Subtest1 | 4132 | 826.4 | 22.61 | 22±1 |
| | 4175 | 835 | 22.62 | 22±1 |
| | 4233 | 846.6 | 22.53 | 22±1 |
| HSDPA Subtest2 | 4132 | 826.4 | 22.63 | 22±1 |
| | 4175 | 835 | 22.63 | 22±1 |
| | 4233 | 846.6 | 22.56 | 22±1 |
| HSDPA Subtest3 | 4132 | 826.4 | 22.60 | 22±1 |
| | 4175 | 835 | 22.61 | 22±1 |
| | 4233 | 846.6 | 22.53 | 22±1 |
| HSDPA Subtest4 | 4132 | 826.4 | 22.61 | 22±1 |
| | 4175 | 835 | 22.69 | 22±1 |
| | 4233 | 846.6 | 22.60 | 22±1 |
| HSUPA Subtest1 | 4132 | 826.4 | 22.61 | 22±1 |
| | 4175 | 835 | 22.62 | 22±1 |
| | 4233 | 846.6 | 22.54 | 22±1 |
| HSUPA Subtest2 | 4132 | 826.4 | 22.61 | 22±1 |
| | 4175 | 835 | 22.60 | 22±1 |
| | 4233 | 846.6 | 22.61 | 22±1 |
| HSUPA Subtest3 | 4132 | 826.4 | 22.63 | 22±1 |
| | 4175 | 835 | 22.61 | 22±1 |
| | 4233 | 846.6 | 22.59 | 22±1 |
| HSUPA Subtest4 | 4132 | 826.4 | 22.62 | 22±1 |
| | 4175 | 835 | 22.62 | 22±1 |
| | 4233 | 846.6 | 22.61 | 22±1 |
| HSUPA Subtest5 | 4132 | 826.4 | 22.62 | 22±1 |
| | 4175 | 835 | 22.59 | 22±1 |
| | 4233 | 846.6 | 22.56 | 22±1 |

# UMTS-FDD Band II

| Band/ Time Slot configuration | Channel | Frequency | Average power (dBm) | Tune up Power tolerant |
| --- | --- | --- | --- | --- |
| RMC 12.2kbps | 9262 | 1852.4 | 22.37 | 22±1 |
| | 9400 | 1880 | 22.51 | 22±1 |
| | 9538 | 1907.6 | **22.80** | 22±1 |
| HSDPA Subtest1 | 9262 | 1852.4 | 22.46 | 22±1 |
| | 9400 | 1880 | 22.53 | 22±1 |
| | 9538 | 1907.6 | 22.65 | 22±1 |
| HSDPA Subtest2 | 9262 | 1852.4 | 22.41 | 22±1 |
| | 9400 | 1880 | 22.46 | 22±1 |
| | 9538 | 1907.6 | 22.51 | 22±1 |
| HSDPA Subtest3 | 9262 | 1852.4 | 22.44 | 22±1 |
| | 9400 | 1880 | 22.49 | 22±1 |
| | 9538 | 1907.6 | 22.56 | 22±1 |
| HSDPA Subtest4 | 9262 | 1852.4 | 22.47 | 22±1 |
| | 9400 | 1880 | 22.41 | 22±1 |
| | 9538 | 1907.6 | 22.39 | 22±1 |
| HSUPA Subtest1 | 9262 | 1852.4 | 22.52 | 22±1 |
| | 9400 | 1880 | 22.43 | 22±1 |
| | 9538 | 1907.6 | 22.46 | 22±1 |
| HSUPA Subtest2 | 9262 | 1852.4 | 22.39 | 22±1 |
| | 9400 | 1880 | 22.48 | 22±1 |
| | 9538 | 1907.6 | 22.40 | 22±1 |
| HSUPA Subtest3 | 9262 | 1852.4 | 22.47 | 22±1 |
| | 9400 | 1880 | 22.52 | 22±1 |
| | 9538 | 1907.6 | 22.51 | 22±1 |
| HSUPA Subtest4 | 9262 | 1852.4 | 22.53 | 22±1 |
| | 9400 | 1880 | 22.43 | 22±1 |
| | 9538 | 1907.6 | 22.46 | 22±1 |
| HSUPA Subtest5 | 9262 | 1852.4 | 22.45 | 22±1 |
| | 9400 | 1880 | 22.46 | 22±1 |
| | 9538 | 1907.6 | 22.47 | 22±1 |

# UMTS-FDD Band IV

| Band/ Time Slot configuration | Channel | Frequency | Average power (dBm) | Tune up Power tolerant |
|---|---|---|---|---|
| RMC 12.2kbps | 1313 | 1712.6 | **23.01** | 23±1 |
| | 1413 | 1732.6 | 22.73 | 23±1 |
| | 1512 | 1752.4 | 22.57 | 23±1 |
| HSDPA Subtest1 | 1313 | 1712.6 | 22.86 | 23±1 |
| | 1413 | 1732.6 | 22.75 | 23±1 |
| | 1512 | 1752.4 | 22.69 | 23±1 |
| HSDPA Subtest2 | 1313 | 1712.6 | 22.83 | 23±1 |
| | 1413 | 1732.6 | 22.73 | 23±1 |
| | 1512 | 1752.4 | 22.64 | 23±1 |
| HSDPA Subtest3 | 1313 | 1712.6 | 22.88 | 23±1 |
| | 1413 | 1732.6 | 22.75 | 23±1 |
| | 1512 | 1752.4 | 22.61 | 23±1 |
| HSDPA Subtest4 | 1313 | 1712.6 | 22.91 | 23±1 |
| | 1413 | 1732.6 | 22.72 | 23±1 |
| | 1512 | 1752.4 | 22.56 | 23±1 |
| HSUPA Subtest1 | 1313 | 1712.6 | 22.85 | 23±1 |
| | 1413 | 1732.6 | 22.79 | 23±1 |
| | 1512 | 1752.4 | 22.69 | 23±1 |
| HSUPA Subtest2 | 1313 | 1712.6 | 22.84 | 23±1 |
| | 1413 | 1732.6 | 22.78 | 23±1 |
| | 1512 | 1752.4 | 22.64 | 23±1 |
| HSUPA Subtest3 | 1313 | 1712.6 | 22.94 | 23±1 |
| | 1413 | 1732.6 | 22.75 | 23±1 |
| | 1512 | 1752.4 | 22.62 | 23±1 |
| HSUPA Subtest4 | 1313 | 1712.6 | 22.97 | 23±1 |
| | 1413 | 1732.6 | 22.75 | 23±1 |
| | 1512 | 1752.4 | 22.59 | 23±1 |
| HSUPA Subtest5 | 1313 | 1712.6 | 22.93 | 23±1 |
| | 1413 | 1732.6 | 22.81 | 23±1 |
| | 1512 | 1752.4 | 22.67 | 23±1 |

# ERP & EIRP

## ERP for Cellular Band (Part 22H)

| Frequency (MHz) | Substituted level (dBm) | Antenna Polarization | Antenna Gain correction (dBi) | Cable Loss (dB) | Absolute Level (dBm) | Limit (dBm) |
|---|---|---|---|---|---|---|
| 824.2 | 17.52 | V | 6.8 | 0.53 | 23.79 | 38.45 |
| 824.2 | 19.26 | H | 6.8 | 0.53 | 25.53 | 38.45 |
| 836.6 | 17.38 | V | 6.8 | 0.53 | 23.65 | 38.45 |
| 836.6 | 19.14 | H | 6.8 | 0.53 | 25.41 | 38.45 |
| 848.8 | 17.22 | V | 6.9 | 0.53 | 23.59 | 38.45 |
| 848.8 | 19.17 | H | 6.9 | 0.53 | **25.54** | 38.45 |

## EIRP for PCS Band (Part 24E)

| Frequency (MHz) | Substituted level (dBm) | Antenna Polarization | Antenna Gain correction (dBi) | Cable Loss (dB) | Absolute Level (dBm) | Limit (dBm) |
|---|---|---|---|---|---|---|
| 1850.2 | 14.27 | V | 7.88 | 0.85 | 21.30 | 33 |
| 1850.2 | 13.51 | H | 7.88 | 0.85 | 20.54 | 33 |
| 1880 | 14.34 | V | 7.88 | 0.85 | **21.37** | 33 |
| 1880 | 13.42 | H | 7.88 | 0.85 | 20.45 | 33 |
| 1909.8 | 14.26 | V | 7.86 | 0.85 | 21.27 | 33 |
| 1909.8 | 13.32 | H | 7.86 | 0.85 | 20.33 | 33 |

## ERP for UMTS-FDD Band V (Part 22H)

| Frequency (MHz) | Substituted level (dBm) | Antenna Polarization | Antenna Gain correction (dBi) | Cable Loss (dB) | Absolute Level (dBm) | Limit (dBm) |
|---|---|---|---|---|---|---|
| 826.4 | 12.38 | V | 6.8 | 0.53 | 18.65 | 38.45 |
| 826.4 | 13.15 | H | 6.8 | 0.53 | 19.42 | 38.45 |
| 835 | 12.17 | V | 6.8 | 0.53 | 18.44 | 38.45 |
| 835 | 13.02 | H | 6.8 | 0.53 | 19.29 | 38.45 |
| 846.6 | 12.14 | V | 6.9 | 0.53 | 18.51 | 38.45 |
| 846.6 | 13.29 | H | 6.9 | 0.53 | **19.66** | 38.45 |

## EIRP for UMTS-FDD Band II (Part 24E)

| Frequency (MHz) | Substituted level (dBm) | Antenna Polarization | Antenna Gain correction (dBi) | Cable Loss (dB) | Absolute Level (dBm) | Limit (dBm) |
|---|---|---|---|---|---|---|
| 1852.4 | 10.53 | V | 7.88 | 0.85 | 17.56 | 33 |
| 1852.4 | 11.28 | H | 7.88 | 0.85 | 18.31 | 33 |
| 1880 | 10.34 | V | 7.88 | 0.85 | 17.37 | 33 |
| 1880 | 11.49 | H | 7.88 | 0.85 | **18.52** | 33 |
| 1907.6 | 10.75 | V | 7.86 | 0.85 | 17.76 | 33 |
| 1907.6 | 11.13 | H | 7.86 | 0.85 | 18.14 | 33 |

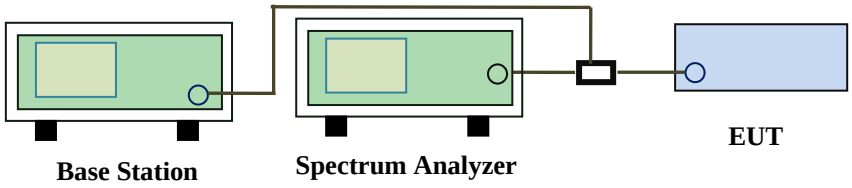
## EIRP for UMTS-FDD Band IV (Part 27H)

| Frequency (MHz) | Substituted level (dBm) | Antenna Polarization | Antenna Gain correction (dBi) | Cable Loss (dB) | Absolute Level (dBm) | Limit (dBm) |
|---|---|---|---|---|---|---|
| 1712.4 | 12.34 | V | 7.76 | 0.82 | **19.28** | 30 |
| 1712.4 | 11.58 | H | 7.76 | 0.82 | 18.52 | 30 |
| 1740 | 12.13 | V | 7.76 | 0.82 | 19.07 | 30 |
| 1740 | 11.49 | H | 7.76 | 0.82 | 18.43 | 30 |
| 1752.6 | 12.07 | V | 7.74 | 0.82 | 18.99 | 30 |
| 1752.6 | 11.22 | H | 7.74 | 0.82 | 18.14 | 30 |

## 6.3 Peak-Average Ratio

| | |
|---|---|
| Temperature | 22℃ |
| Relative Humidity | 57% |
| Atmospheric Pressure | 1005mbar |
| Test date : | August 05, 2015 |
| Tested By : | Winnie Zhang |

Requirement(s):

| Spec | Item | Requirement | Applicable |
|---|---|---|---|
| §24.232(d)<br>§ 27.50(d) | a) | The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB. | ☑ |
| Test Setup |  | | |
| Test Procedure | **According with KDB 971168**<br>1. The signal analyzer' s CCDF measurement profile is enabled<br>2. Frequency = carrier center frequency<br>3. Measurement BW > Emission bandwidth of signal<br>4. The signal analyzer was set to collect one million samples to generate the CCDF curve<br>5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal " RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the " on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power | | |
| Remark | | | |
| Result | ☑ Pass ☐ Fail | | |

**Test Data** ☑ Yes ☐ N/A

**Test Plot** ☐ Yes (See below) ☑ N/A

GSM 1900 PK-AV POWER(PART 24H)

| Frequency (MHz) | Conducted power(dBm) | | Peak-Average Ratio(PAR) |
|---|---|---|---|
| | Peak | Average | |
| 1850.2 | 31.05 | 29.49 | 1.56 |
| 1880 | 31.06 | 29.57 | 1.49 |
| 1909.8 | 30.98 | 29.63 | 1.35 |

UMTS-FDD BandII PK-AV POWER(PART 24E)

| Frequency (MHz) | Conducted power(dBm) | | Peak-Average Ratio(PAR) |
|---|---|---|---|
| | Peak | Average | |
| 1852.4 | 25.22 | 22.37 | 2.85 |
| 1880 | 25.28 | 22.51 | 2.77 |
| 1907.6 | 25.93 | 22.8 | 3.13 |

UMTS-FDD BandIV PK-AV POWER (PART 27)

| Frequency (MHz) | Conducted power(dBm) | | Peak-Average Ratio(PAR) |
|---|---|---|---|
| | Peak | Average | |
| 1712.6 | 25.84 | 23.01 | 2.83 |
| 1732.6 | 25.97 | 22.73 | 3.24 |
| 1752.4 | 25.46 | 22.57 | 2.89 |

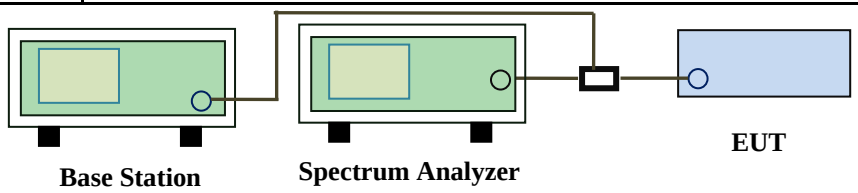
## 6.4 Modulation Characteristic

According to FCC § 2.1047(d), Part 22H, 24E& Part 27 there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

## 6.5 Occupied Bandwidth

| | |
|---|---|
| Temperature | 23℃ |
| Relative Humidity | 58% |
| Atmospheric Pressure | 1006mbar |
| Test date : | August 06, 2015 |
| Tested By : | Winnie Zhang |

**Requirement(s):**

| Spec | Item | Requirement | Applicable |
|---|---|---|---|
| §2.1049, §22.917, §22.905 §24.238 §27.53(a) | a) | 99% Occupied Bandwidth(kHz) | ☑ |
| | b) | 26 dB Bandwidth(kHz) | ☑ |
| Test Setup |   | | |
| Test Procedure | - The EUT was connected to Spectrum Analyzer and Base Station via power divider.<br>- The 99% and 26 dB occupied bandwidth (BW) of the middle channel for the highest RF powers. | | |
| Remark | | | |
| Result | ☑ Pass ☐ Fail | | |

**Test Data** ☑ Yes ☐ N/A

**Test Plot** ☑ Yes (See below) ☐ N/A

Cellular Band (Part 22H) result

| Channel | Frequency (MHz) | 99% Occupied Bandwidth (kHz) | 26 dB Bandwidth (kHz) |
|---|---|---|---|
| 128 | 824.2 | 248.6448 | 320.586 |
| 190 | 836.6 | 246.5602 | 307.523 |
| 251 | 848.8 | 243.1457 | 314.482 |

PCS Band (Part 24E) result

| Channel | Frequency (MHz) | 99% Occupied Bandwidth (kHz) | 26 dB Bandwidth (kHz) |
|---|---|---|---|
| 512 | 1850.2 | 246.9536 | 319.046 |
| 661 | 1880.0 | 247.8888 | 321.240 |
| 810 | 1909.8 | 246.2232 | 320.185 |

UMTS-FDD Band V (Part 22H)

| Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) | 26 dB Bandwidth (MHz) |
|---|---|---|---|
| 4132 | 826.4 | 4.2117 | 4.870 |
| 4175 | 835.0 | 4.2082 | 4.869 |
| 4233 | 846.6 | 4.2089 | 4.869 |

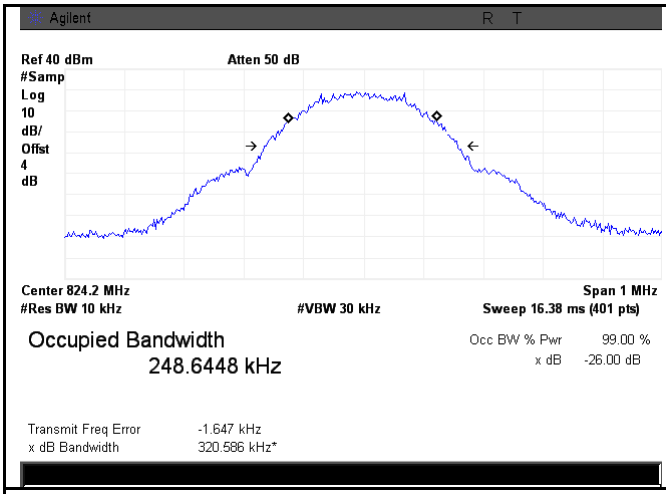
UMTS-FDD Band II (Part 24E)

| Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) | 26 dB Bandwidth (MHz) |
|---|---|---|---|
| 9262 | 1852.4 | 4.2126 | 4.859 |
| 9400 | 1880.0 | 4.2171 | 4.893 |
| 9538 | 1907.6 | 4.2243 | 4.869 |

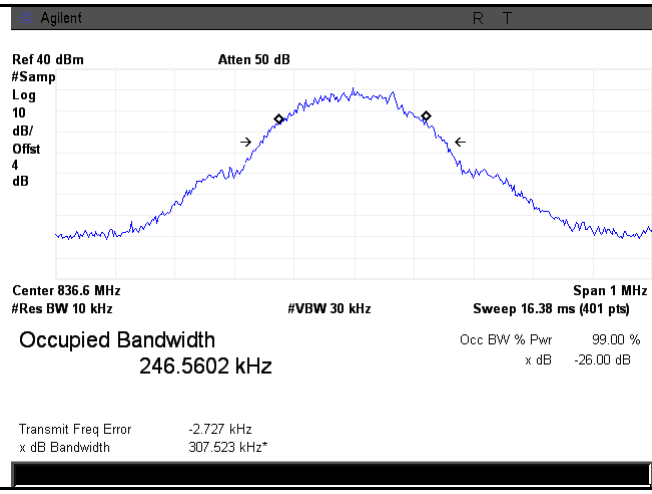
UMTS-FDD Band IV (Part 27E)

| Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) | 26 dB Bandwidth (MHz) |
|---|---|---|---|
| 9262 | 1852.4 | 4.2155 | 4.893 |
| 9400 | 1880.0 | 4.2245 | 4.931 |
| 9538 | 1907.6 | 4.2084 | 4.885 |

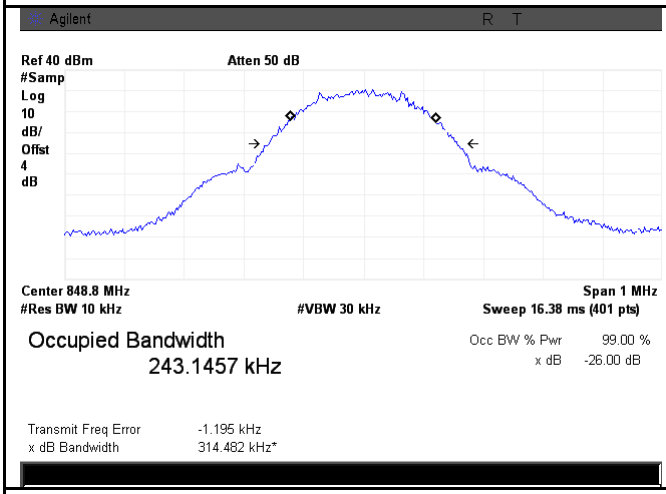
## Test Plots



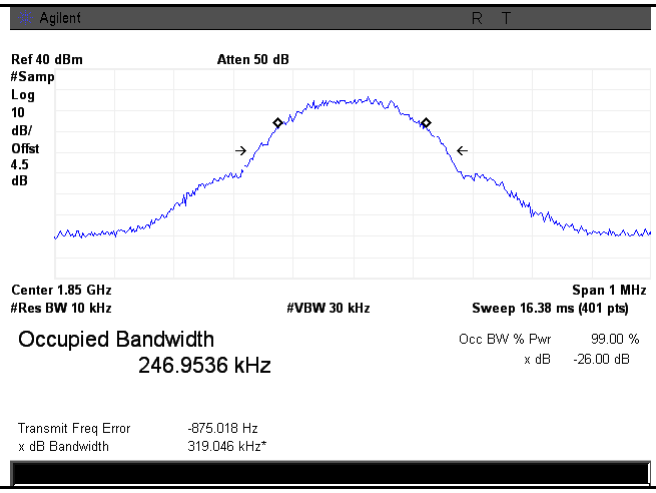

GSM 850 BW - Low CH 824.2MHz



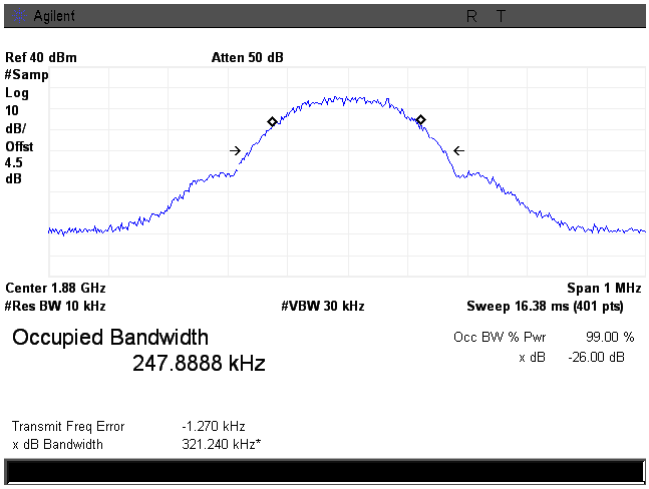

GSM 850 BW - Mid CH 836.6MHz



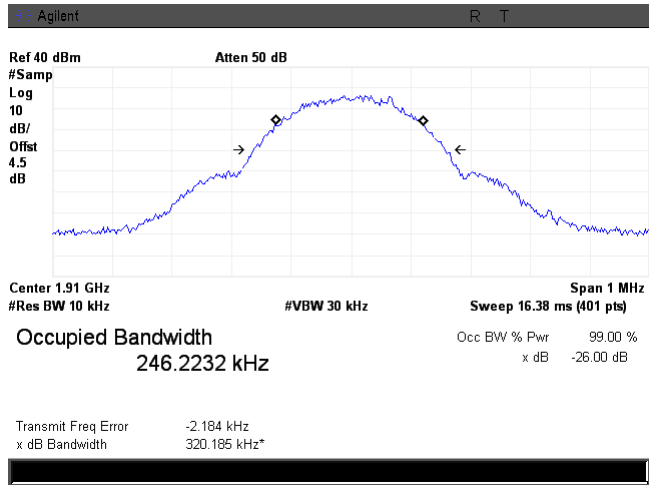

GSM 850 BW - High CH 848.8MHz



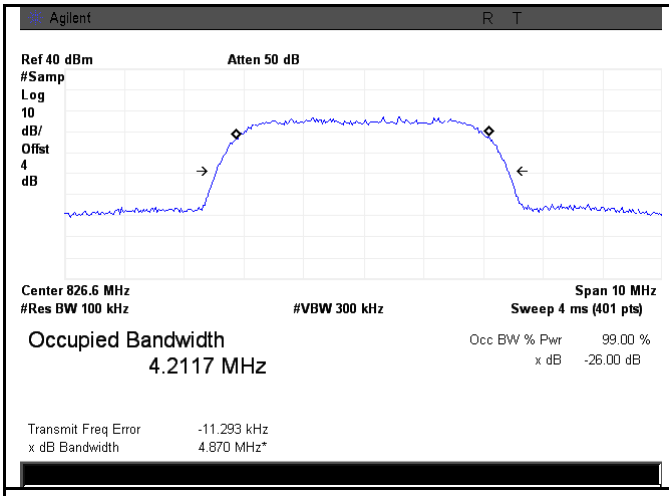

PCS 1900 BW - Low CH 1850.2MHz



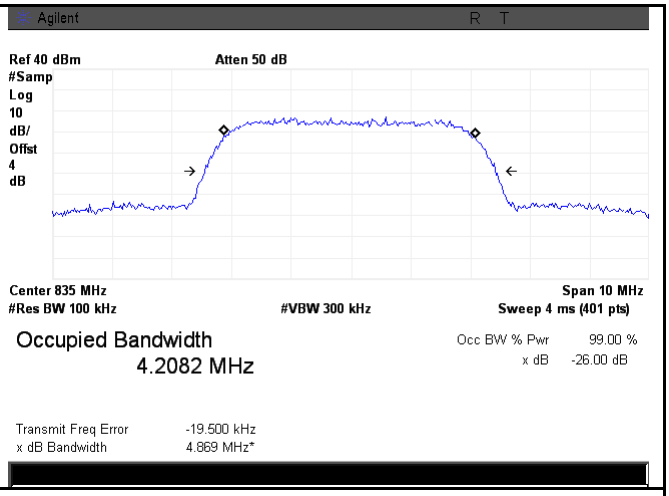

PCS 1900 BW - Mid CH 1880MHz



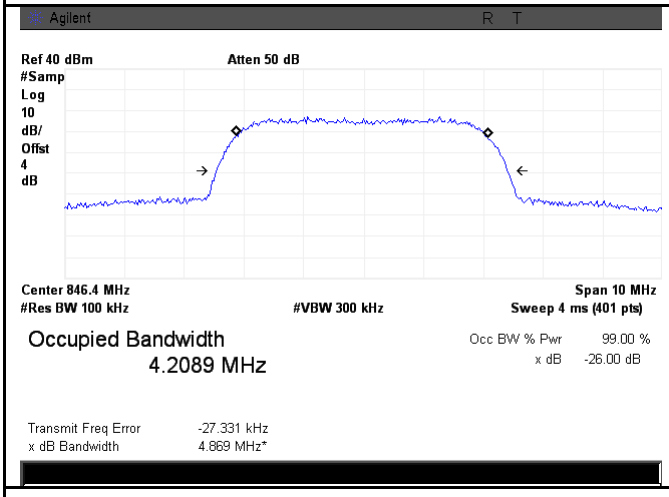

PCS 1900 BW - High CH 1909.8MHz



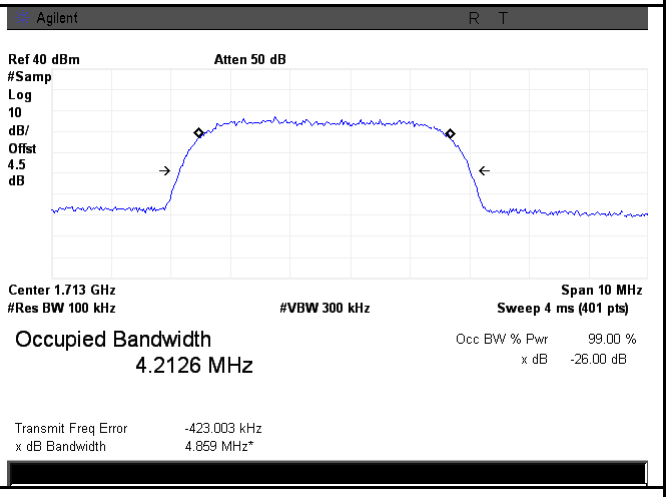

Band V BW - Low CH 826.6 MHz



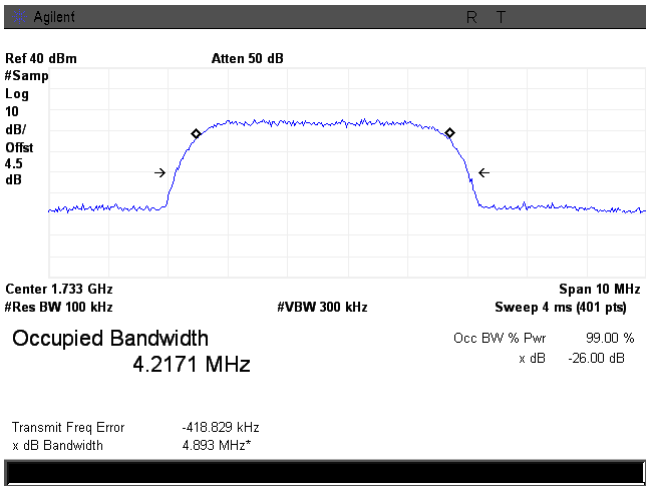

Band V BW - Mid CH 835.0 MHz



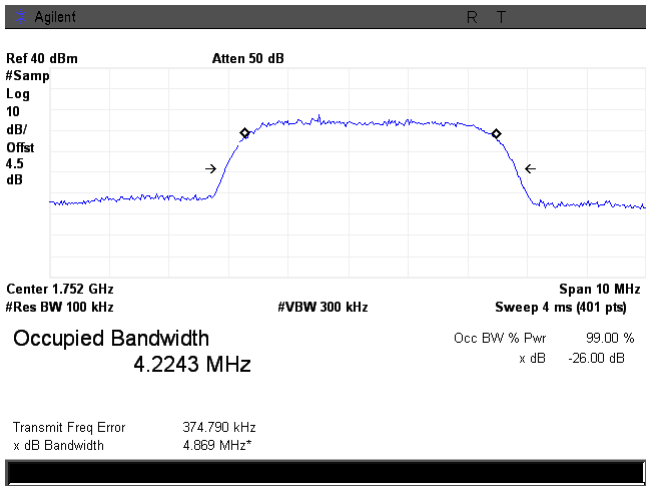

Band V BW - High CH 846.4 MHz



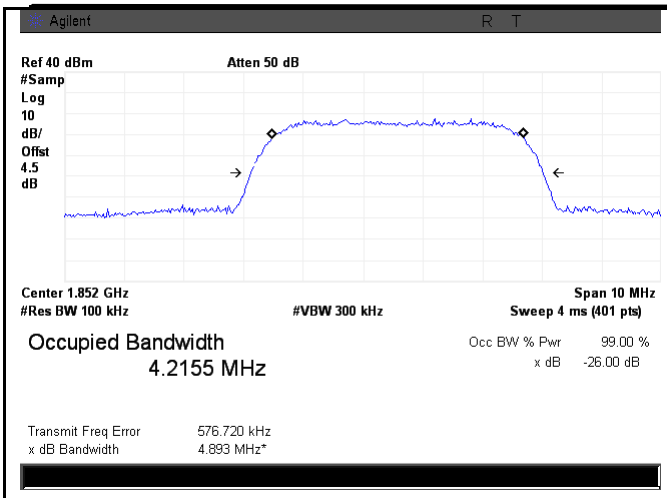

Band II BW - Low CH 1852.4MHz



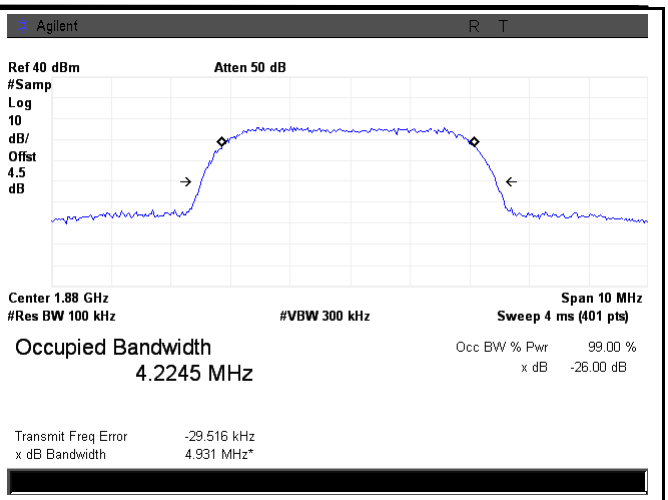

Band II BW - Mid CH 1880MHz



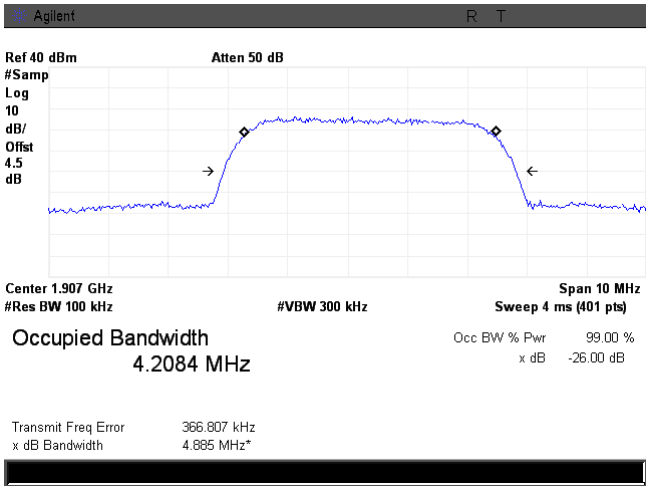

Band II BW - High CH 1907.6MHz




Band IV BW - Low CH 1852.4MHz




Band IVBW - Mid CH 1880MHz

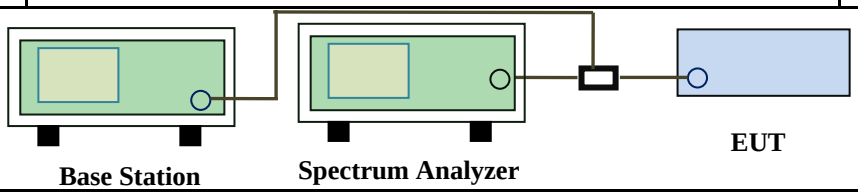



Band IV BW - High CH 1907.6MHz

## 6.6 Spurious Emissions at Antenna Terminals

| | |
|---|---|
| Temperature | 23℃ |
| Relative Humidity | 58% |
| Atmospheric Pressure | 1006mbar |
| Test date : | August 06, 2015 |
| Tested By : | Winnie Zhang |

**Requirement(s):**

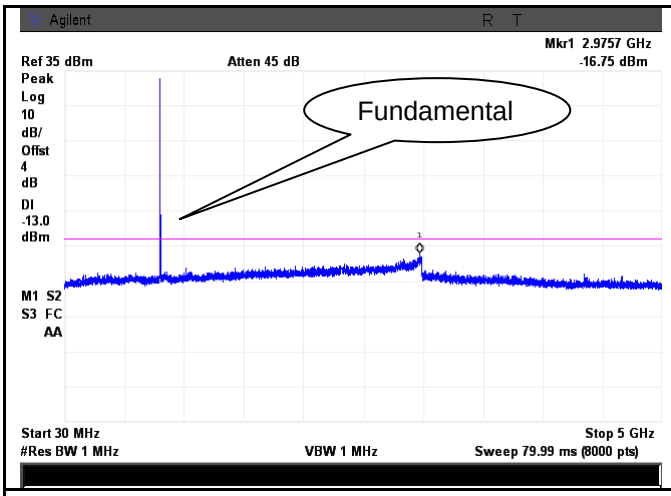
| Spec | Item | Requirement | Applicable |
|---|---|---|---|
| §2.1051, §22.917(a)& §24.238(a) § 27.53(h) | a) | The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 43 + 10 log (P) dB | ☑ |
| Test Setup |   | | |
| Test Procedure | - The EUT was connected to Spectrum Analyzer and Base Station via power divider.<br>- The Band Edges of low and high channels for the highest RF powers were measured.<br>- Setting RBW as roughly BW/100. | | |
| Remark | | | |
| Result | ☑ Pass ☐ Fail | | |

**Test Data** ☑ Yes ☐ N/A

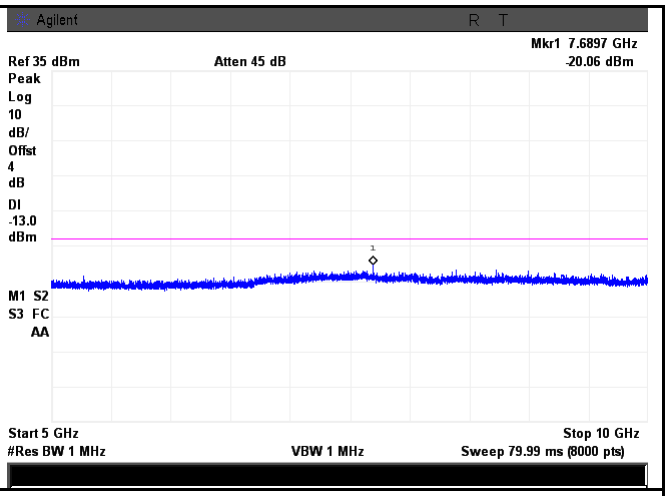
**Test Plot** ☑ Yes (See below) ☐ N/A

## Test Plots

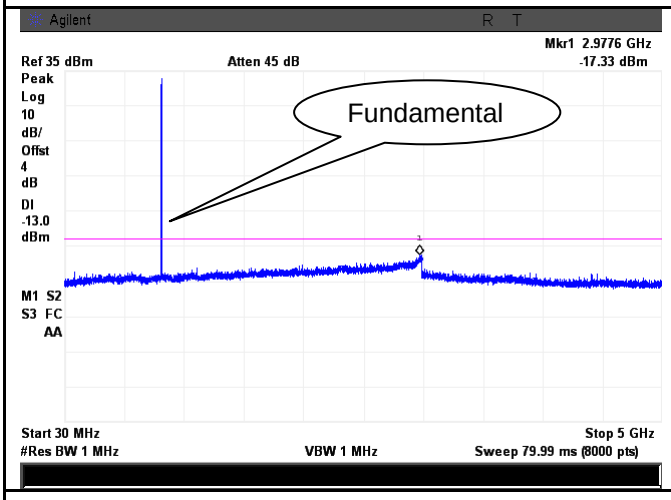
### Cellular Band (Part 22H) result



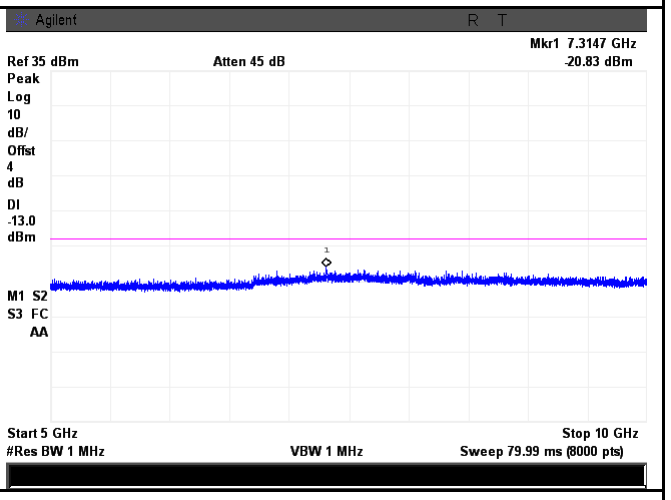

GSM 850 - Low Channel-1



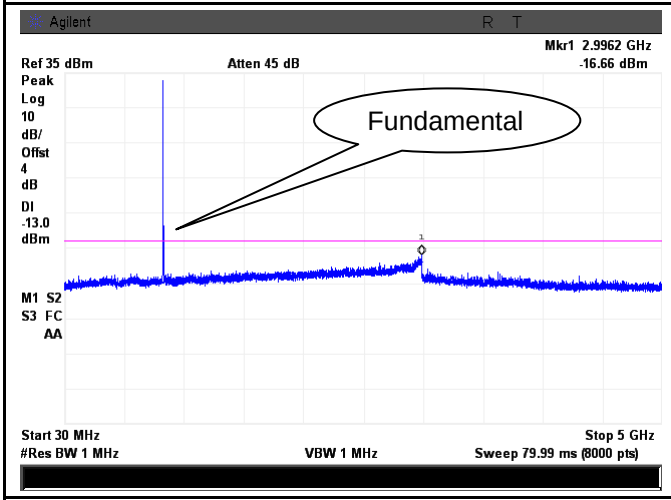

GSM 850 - Low Channel-2



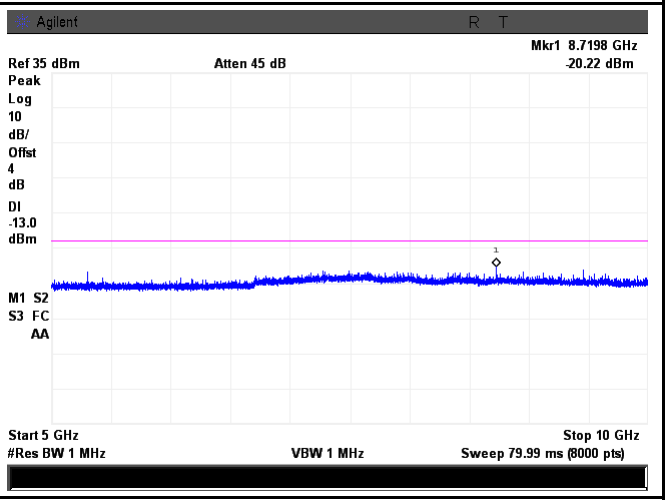

GSM 850 Middle Channel-1




GSM 850 Middle Channel-2

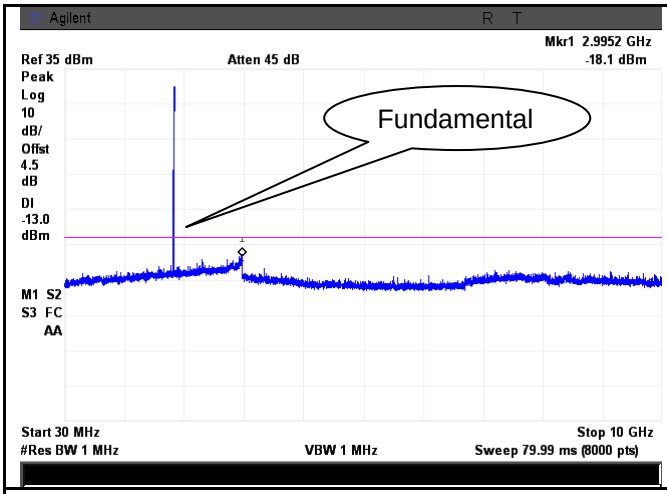



GSM 850 - High Channel-1

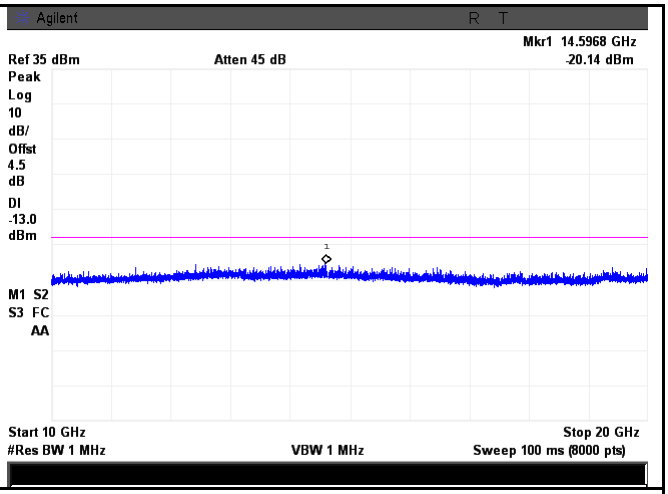



GSM 850 - High Channel-2

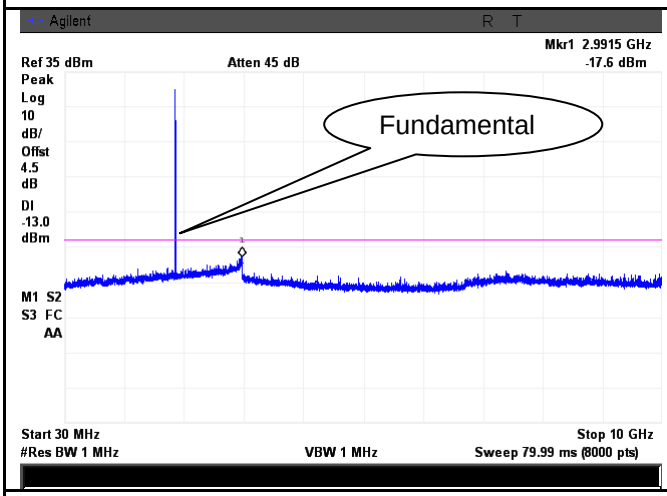
## PCS Band (Part24E) result



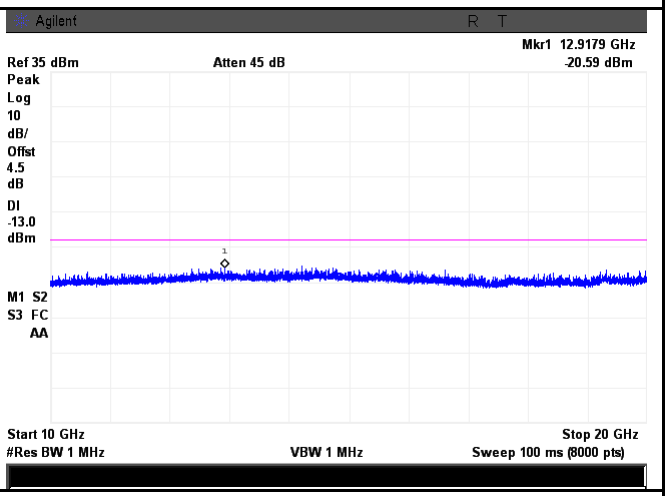

PCS1900 - Low Channel-1



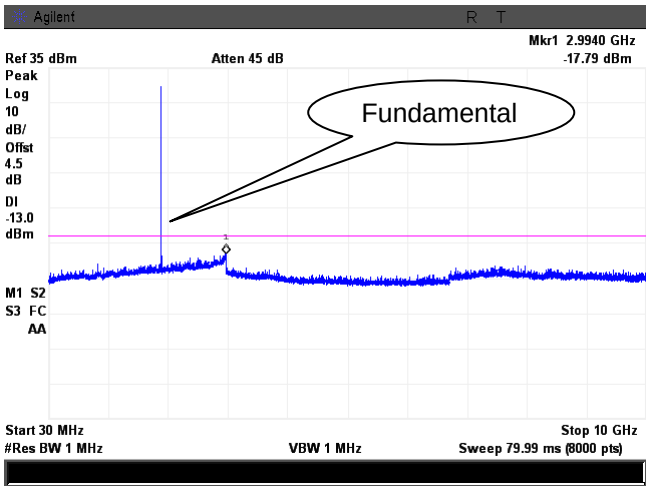

PCS 1900 - Low Channel-2



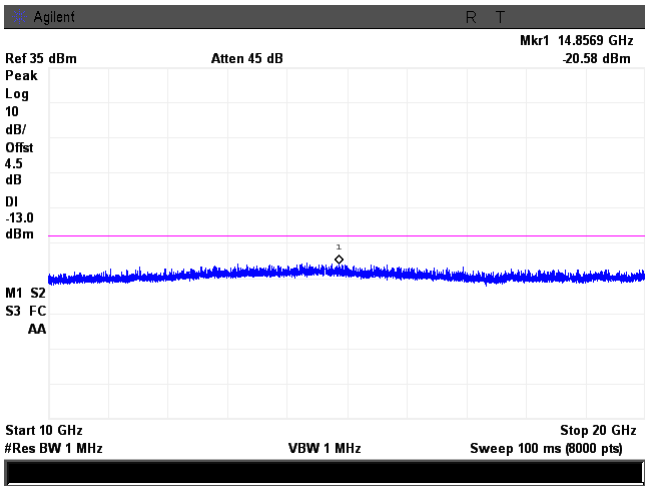

PCS1900 - Middle Channel-1




PCS 1900 - Middle Channel-2

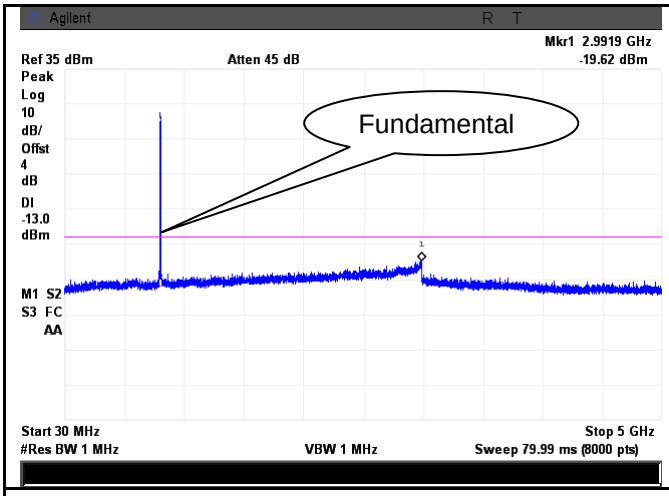



PCS1900 - High Channel-1

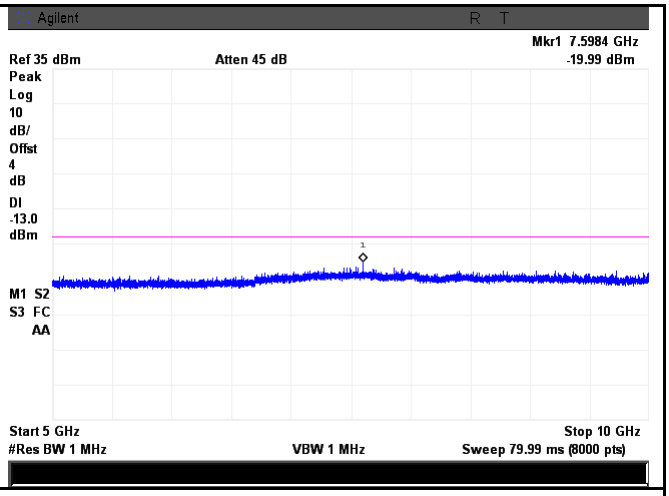



PCS 1900 - High Channel-2

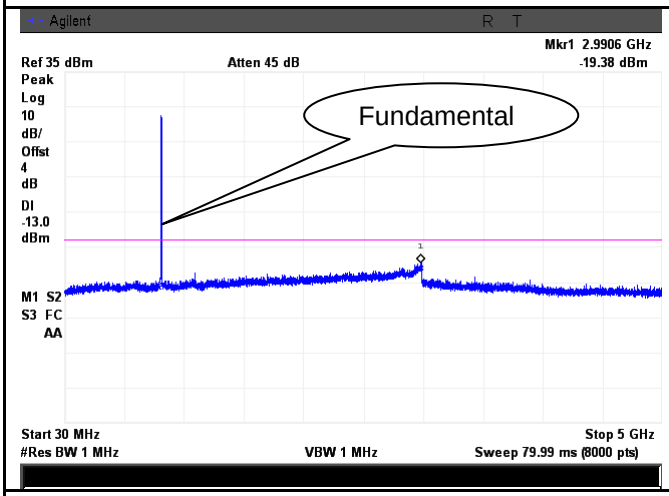
## UMTS-FDD Band V (Part 22H)



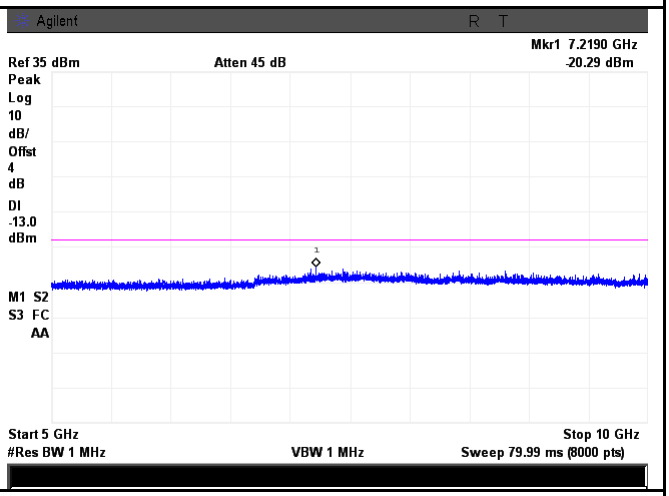

Band V - Low Channel-1



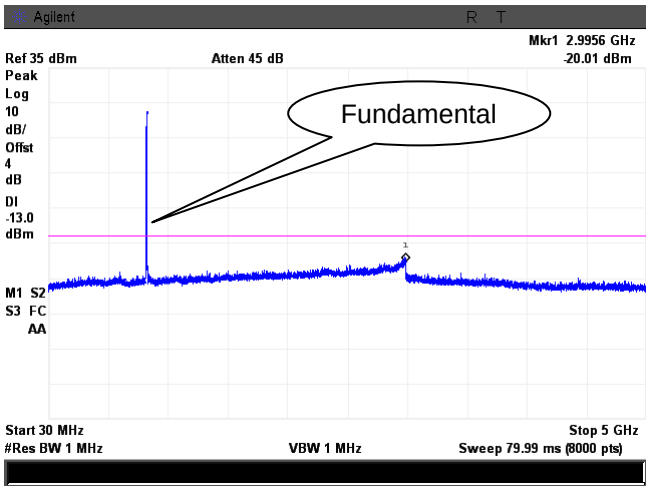

Band V - Low Channel-2



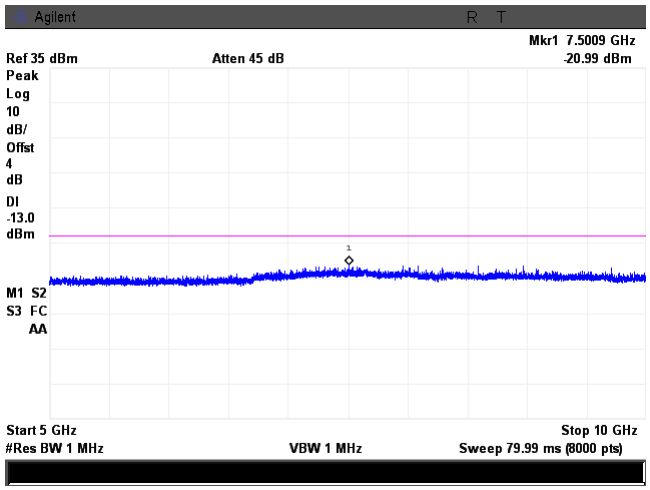

Band V - Middle Channel-1




Band V - Middle Channel-2

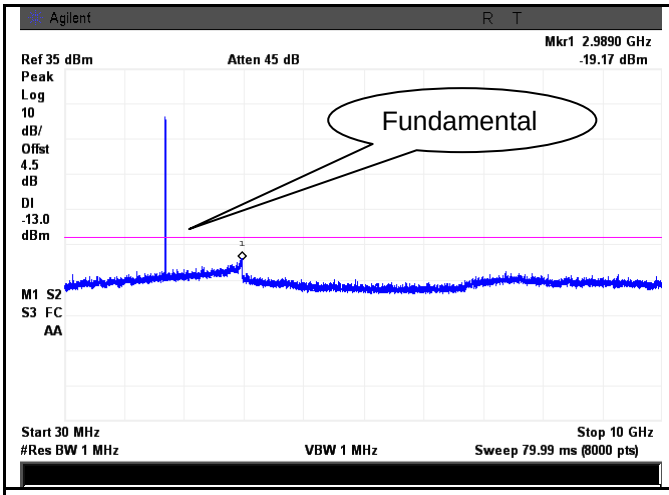



Band V - High Channel-1

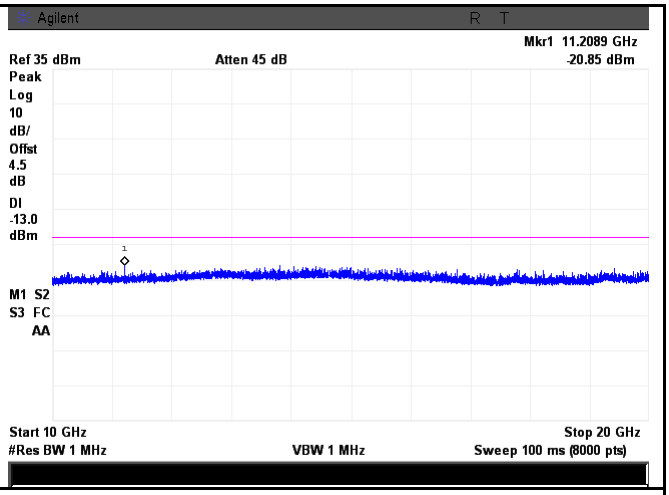



Band V - High Channel-2

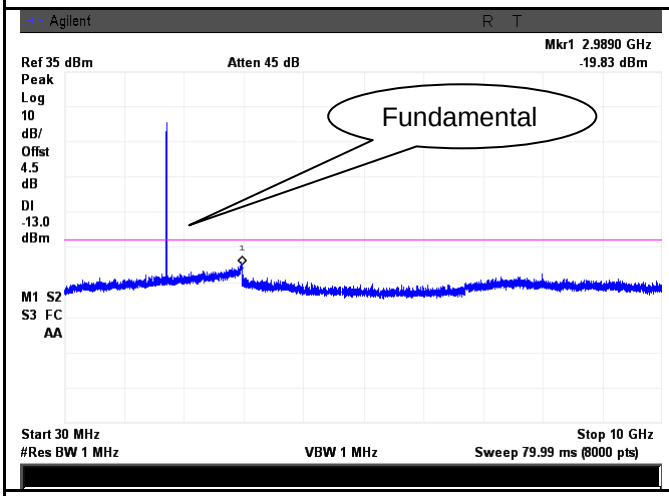
## UMTS-FDD Band II (Part 24E)



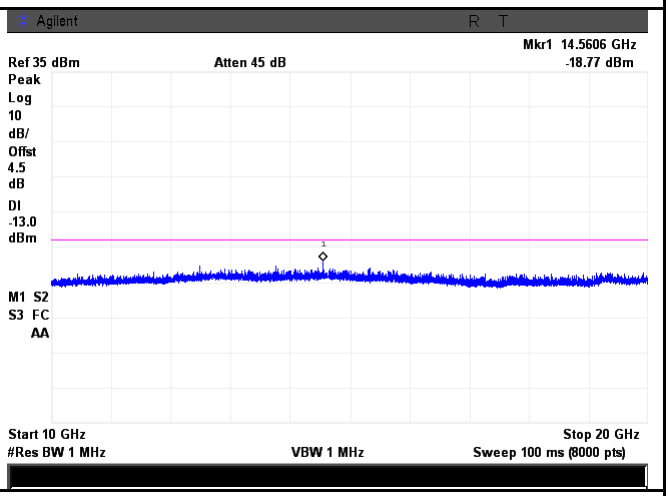

Band II - Low Channel-1



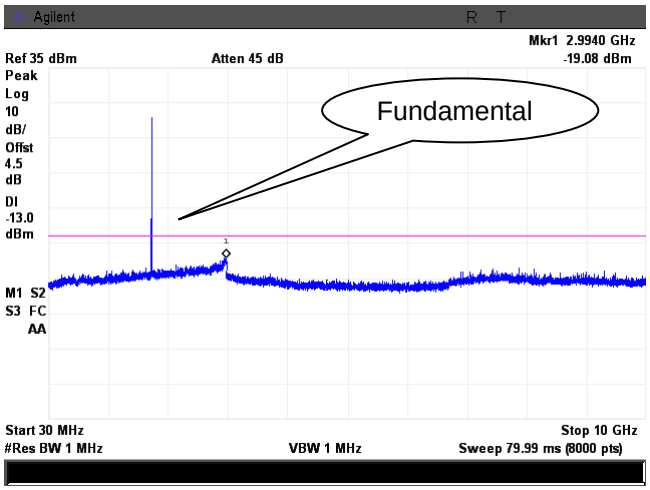

Band II - Low Channel-2



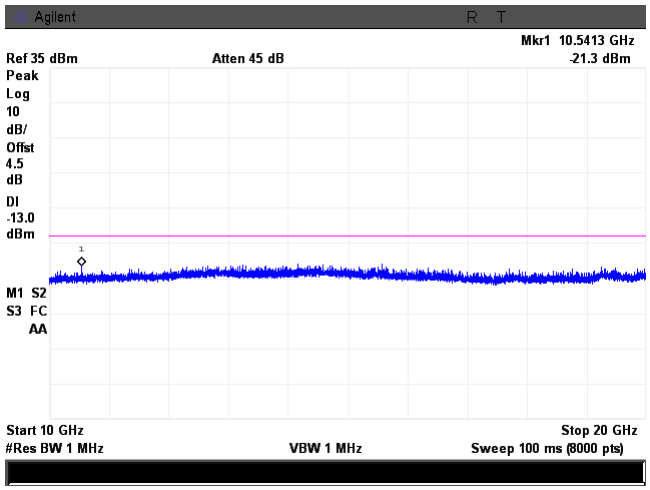

Band II - Middle Channel-1




Band II - Middle Channel-2

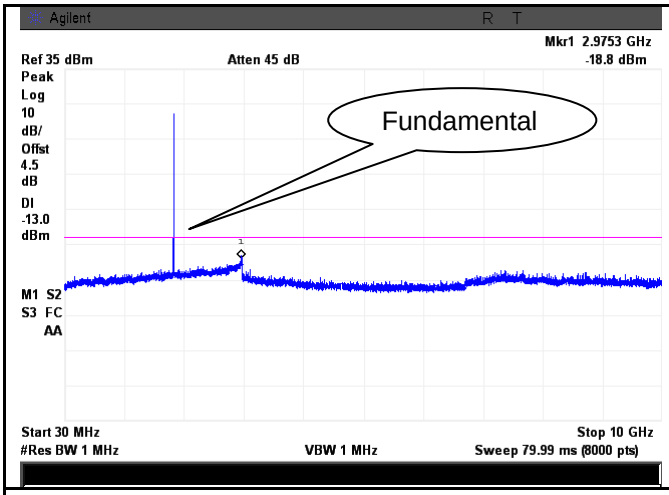



Band II - High Channel-1

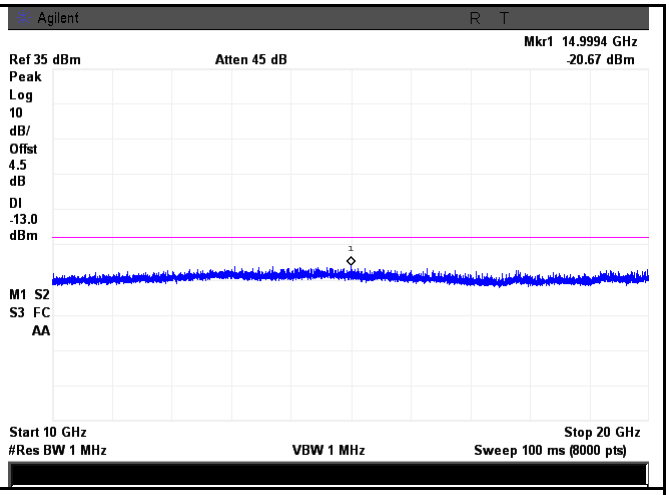



Band II - High Channel-2

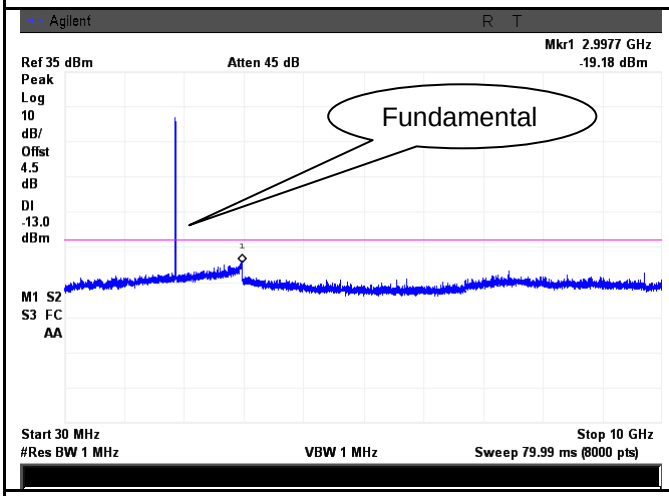
## UMTS-FDD Band IV (Part 27)



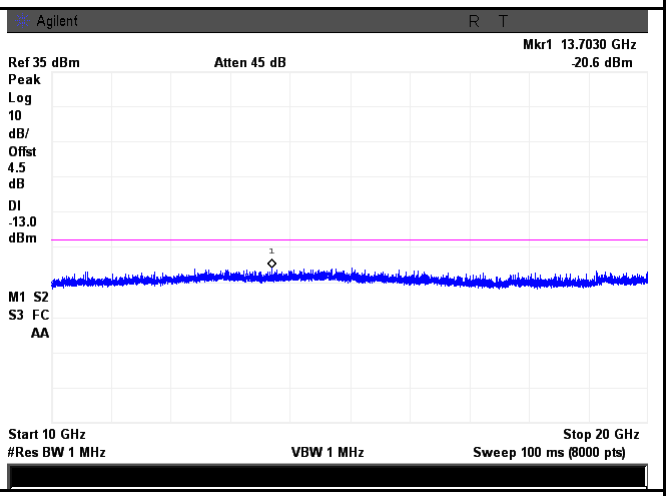

Band IV - Low Channel-1



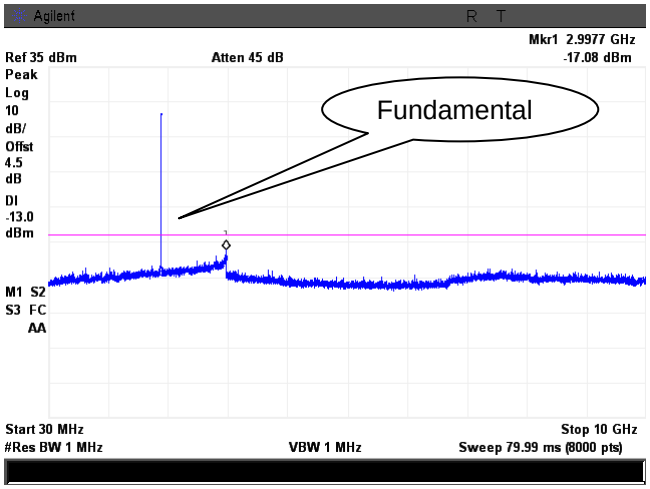

Band IV - Low Channel-2



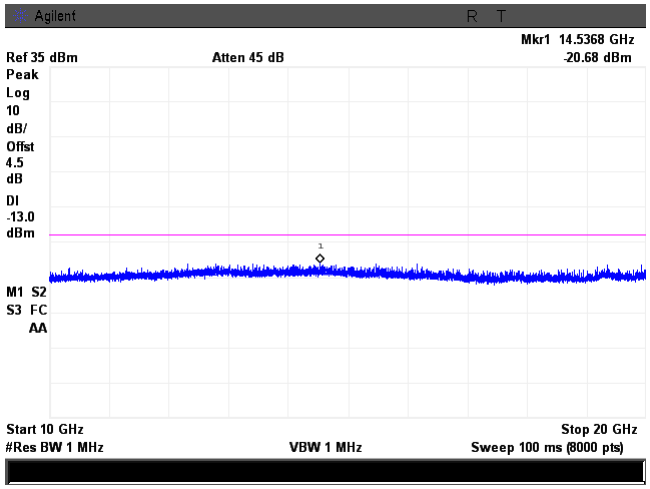

Band IV - Middle Channel-1




Band IV - Middle Channel-2




Band IV - High Channel-1

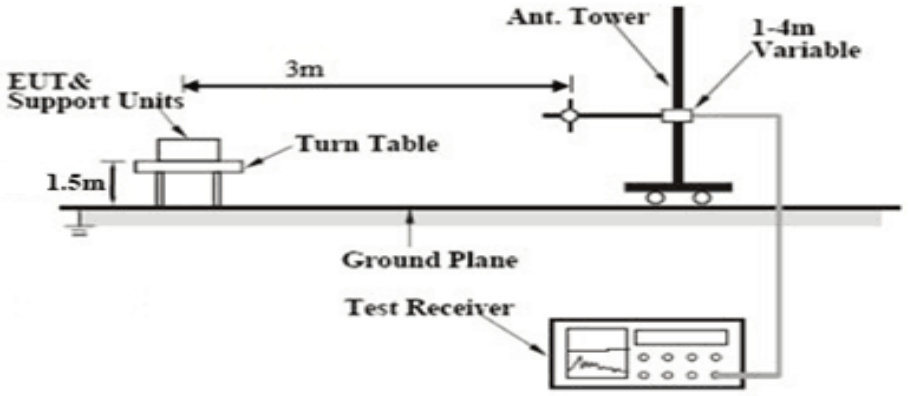



Band IV - High Channel-2

## 6.7 Spurious Radiated Emissions

| | |
|---|---|
| Temperature | 24℃ |
| Relative Humidity | 53% |
| Atmospheric Pressure | 1011mbar |
| Test date : | August 11, 2015 |
| Tested By : | Winnie Zhang |

**Requirement(s):**

| Spec | Item | Requirement | Applicable |
|---|---|---|---|
| §2.1053, §22.917 & §24.238 § 27.53(h) | 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. | ☑ |
| Test setup |  | | |
| Test Procedure | 1. The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.<br>2. 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.<br>3. 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.<br>Sample Calculation:<br>EUT Field Strength = Raw Amplitude (dBμV/m) – Amplifier Gain (dB) + Antenna Factor (dB) + Cable Loss (dB) + Filter Attenuation (dB, if used) | | |
| Remark | | | |

| Result | ☑ Pass | ☐ Fail |
|---|---|---|

Test Data ☑ Yes ☐ N/A

Test Plot ☐ Yes (See below) ☑ N/A

## Cellular Band (Part 22H) result

### Low channel

| Frequency (MHz) | Substituted level (dBm) | Polarity (H/V) | Antenna Gain Correction (dB) | Cable Loss (dB) | Corrected Reading (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| 1648.4 | -42.61 | V | 7.95 | 0.78 | -35.44 | -13 | -22.44 |
| 1648.4 | -43.79 | H | 7.95 | 0.78 | -36.62 | -13 | -23.62 |
| 361.1 | -50.26 | V | 6.7 | 0.28 | -43.84 | -13 | -30.84 |
| 741.5 | -51.83 | H | 7.1 | 0.42 | -45.15 | -13 | -32.15 |

### Middle channel

| Frequency (MHz) | Substituted level (dBm) | Polarity (H/V) | Antenna Gain Correction (dB) | Cable Loss (dB) | Corrected Reading (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| 1673.2 | -42.55 | V | 7.95 | 0.78 | -35.38 | -13 | -22.38 |
| 1673.2 | -44.07 | H | 7.95 | 0.78 | -36.9 | -13 | -23.90 |
| 361.5 | -51.34 | V | 6.7 | 0.28 | -44.92 | -13 | -31.92 |
| 741.3 | -53.29 | H | 7.1 | 0.42 | -46.61 | -13 | -33.61 |

### High channel

| Frequency (MHz) | Substituted level (dBm) | Polarity (H/V) | Antenna Gain Correction (dB) | Cable Loss (dB) | Corrected Reading (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| 1697.6 | -42.85 | V | 7.95 | 0.78 | -35.68 | -13 | -22.68 |
| 1697.6 | -43.11 | H | 7.95 | 0.78 | -35.94 | -13 | -22.94 |
| 361.3 | -50.62 | V | 6.7 | 0.28 | -44.2 | -13 | -31.20 |
| 741.6 | -53.49 | H | 7.1 | 0.42 | -46.81 | -13 | -33.81 |

## PCS Band (Part24E) result

### Low channel

| Frequency (MHz) | Substituted level (dBm) | Polarity (H/V) | Antenna Gain Correction (dB) | Cable Loss (dB) | Corrected Reading (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| 3700.4 | -49.23 | V | 10.25 | 2.73 | -41.71 | -13 | -28.71 |
| 3700.4 | -50.47 | H | 10.25 | 2.73 | -42.95 | -13 | -29.95 |
| 362.5 | -52.81 | V | 6.7 | 0.28 | -46.39 | -13 | -33.39 |
| 743.1 | -54.06 | H | 7.1 | 0.42 | -47.38 | -13 | -34.38 |

### Middle channel

| Frequency (MHz) | Substituted level (dBm) | Polarity (H/V) | Antenna Gain Correction (dB) | Cable Loss (dB) | Corrected Reading (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| 3760 | -49.62 | V | 10.25 | 2.73 | -42.1 | -13 | -29.1 |
| 3760 | -50.27 | H | 10.25 | 2.73 | -42.75 | -13 | -29.75 |
| 362.3 | -52.19 | V | 6.7 | 0.28 | -45.77 | -13 | -32.77 |
| 742.8 | -50.33 | H | 7.1 | 0.42 | -43.65 | -13 | -30.65 |

### High channel

| Frequency (MHz) | Substituted level (dBm) | Polarity (H/V) | Antenna Gain Correction (dB) | Cable Loss (dB) | Corrected Reading (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| 3819.6 | -45.67 | V | 10.36 | 2.73 | -38.04 | -13 | -25.04 |
| 3819.6 | -43.05 | H | 10.36 | 2.73 | -35.42 | -13 | -22.42 |
| 398.8 | -52.34 | V | 6.5 | 0.29 | -46.13 | -13 | -33.13 |
| 923.9 | -54.84 | H | 7.1 | 0.46 | -48.2 | -13 | -35.20 |

## UMTS-FDD Band V (Part 22H)

### Low channel

| Frequency (MHz) | Substituted level (dBm) | Polarity (H/V) | Antenna Gain Correction (dB) | Cable Loss (dB) | Corrected Reading (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| 1652.8 | -45.83 | V | 7.95 | 0.78 | -38.66 | -13 | -25.66 |
| 1652.8 | -46.35 | H | 7.95 | 0.78 | -39.18 | -13 | -26.18 |
| 361.9 | -53.11 | V | 6.7 | 0.28 | -46.69 | -13 | -33.69 |
| 741.4 | -55.03 | H | 7.1 | 0.42 | -48.35 | -13 | -35.35 |

### Middle channel

| Frequency (MHz) | Substituted level (dBm) | Polarity (H/V) | Antenna Gain Correction (dB) | Cable Loss (dB) | Corrected Reading (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| 1670 | -45.62 | V | 7.95 | 0.78 | -38.45 | -13 | -25.45 |
| 1670 | -46.74 | H | 7.95 | 0.78 | -39.57 | -13 | -26.57 |
| 361.2 | -52.95 | V | 6.7 | 0.28 | -46.53 | -13 | -33.53 |
| 741.8 | -54.77 | H | 7.1 | 0.42 | -48.09 | -13 | -35.09 |

### High channel

| Frequency (MHz) | Substituted level (dBm) | Polarity (H/V) | Antenna Gain Correction (dB) | Cable Loss (dB) | Corrected Reading (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| 1693.2 | -45.49 | V | 7.95 | 0.78 | -38.32 | -13 | -25.32 |
| 1693.2 | -46.35 | H | 7.95 | 0.78 | -39.18 | -13 | -26.18 |
| 361.7 | -52.78 | V | 6.7 | 0.28 | -46.36 | -13 | -33.36 |
| 741.6 | -54.62 | H | 7.1 | 0.42 | -47.94 | -13 | -34.94 |

## UMTS-FDD Band II (Part 24E)

### Low channel

| Frequency (MHz) | Substituted level (dBm) | Polarity (H/V) | Antenna Gain Correction (dB) | Cable Loss (dB) | Corrected Reading (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| 3704.8 | -45.43 | V | 10.25 | 2.73 | -37.91 | -13 | -24.91 |
| 3704.8 | -46.18 | H | 10.25 | 2.73 | -38.66 | -13 | -25.66 |
| 362.5 | -52.59 | V | 6.7 | 0.28 | -46.17 | -13 | -33.17 |
| 743.1 | -54.33 | H | 7.1 | 0.42 | -47.65 | -13 | -34.65 |

### Middle channel

| Frequency (MHz) | Substituted level (dBm) | Polarity (H/V) | Antenna Gain Correction (dB) | Cable Loss (dB) | Corrected Reading (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| 3760 | -45.62 | V | 10.25 | 2.73 | -38.1 | -13 | -25.10 |
| 3760 | -46.05 | H | 10.25 | 2.73 | -38.53 | -13 | -25.53 |
| 362.9 | -52.37 | V | 6.7 | 0.28 | -45.95 | -13 | -32.95 |
| 743.4 | -54.01 | H | 7.1 | 0.42 | -47.33 | -13 | -34.33 |

### High channel

| Frequency (MHz) | Substituted level (dBm) | Polarity (H/V) | Antenna Gain Correction (dB) | Cable Loss (dB) | Corrected Reading (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| 3815.2 | -45.32 | V | 10.36 | 2.73 | -37.69 | -13 | -24.69 |
| 3815.2 | -45.95 | H | 6.7 | 0.28 | -39.53 | -13 | -26.53 |
| 362.7 | -52.18 | V | 6.7 | 0.28 | -45.76 | -13 | -32.76 |
| 743.8 | -54.82 | H | 7.1 | 0.42 | -48.14 | -13 | -35.14 |

## UMTS-FDD Band IV (Part 27)

### Low channel

| Frequency (MHz) | Substituted level (dBm) | Polarity (H/V) | Antenna Gain Correction (dB) | Cable Loss (dB) | Corrected Reading (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| 3424.8 | -44.37 | V | 10.07 | 2.52 | -36.82 | -13 | -23.82 |
| 3424.8 | -47.82 | H | 10.07 | 2.52 | -40.27 | -13 | -27.27 |
| 361.3 | -50.44 | V | 6.7 | 0.28 | -44.02 | -13 | -31.02 |
| 741.5 | -53.06 | H | 7.1 | 0.42 | -46.38 | -13 | -33.38 |

### Middle channel

| Frequency (MHz) | Substituted level (dBm) | Polarity (H/V) | Antenna Gain Correction (dB) | Cable Loss (dB) | Corrected Reading (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| 3480 | -44.45 | V | 10.09 | 2.52 | -36.88 | -13 | -23.88 |
| 3480 | -47.61 | H | 10.09 | 2.52 | -40.04 | -13 | -27.04 |
| 361.6 | -50.37 | V | 6.7 | 0.28 | -43.95 | -13 | -30.95 |
| 741.9 | -53.15 | H | 7.1 | 0.42 | -46.47 | -13 | -33.47 |

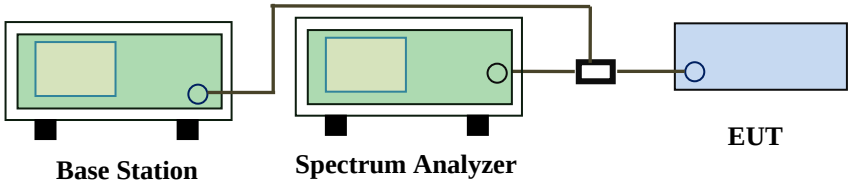
### High channel

| Frequency (MHz) | Substituted level (dBm) | Polarity (H/V) | Antenna Gain Correction (dB) | Cable Loss (dB) | Corrected Reading (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| 3505.2 | -44.73 | V | 10.09 | 2.52 | -37.16 | -13 | -24.16 |
| 3505.2 | -47.58 | H | 10.09 | 2.52 | -40.01 | -13 | -27.01 |
| 362.1 | -50.86 | V | 6.7 | 0.28 | -44.44 | -13 | -31.44 |
| 741.8 | -53.22 | H | 7.1 | 0.42 | -46.54 | -13 | -33.54 |

## 6.8 Band Edge

| Temperature | 23℃ |
|---|---|
| Relative Humidity | 58% |
| Atmospheric Pressure | 1006mbar |
| Test date : | August 06, 2015 |
| Tested By : | Winnie Zhang |

**Requirement(s):**

| Spec | Item | Requirement | Applicable |
|---|---|---|---|
| §22.917(a)<br>§24.238(a)<br>§ 27.53(h) | 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. | ☑ |
| Test setup |  | | |
| Procedure | - The EUT was connected to Spectrum Analyzer and Base Station via power divider.<br>- The Band Edges of low and high channels for the highest RF powers were measured. Setting RBW as roughly BW/100. | | |
| Remark | | | |
| Result | ☑ Pass ☐ Fail | | |

**Test Data** ☑ Yes ☐ N/A

**Test Plot** ☑ Yes (See below) ☐ N/A

## Cellular Band (Part 22H) result

| Frequency (MHz) | Emission (dBm) | Limit (dBm) |
|---|---|---|
| 823.9950 | -13.57 | -13 |
| 849.0175 | -14.06 | -13 |

## PCS Band (Part24E) result

| Frequency (MHz) | Emission (dBm) | Limit (dBm) |
|---|---|---|
| 1849.9950 | -14.91 | -13 |
| 1910.0175 | -14.36 | -13 |

## UMTS-FDD Band V (Part 22H)

| Frequency (MHz) | Emission (dBm) | Limit (dBm) |
|---|---|---|
| 823.9000 | -29.83 | -13 |
| 849.2000 | -26.37 | -13 |

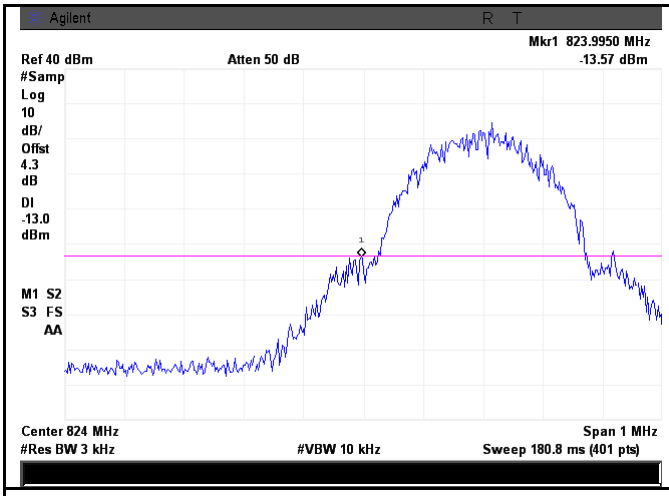
## UMTS-FDD Band IV (Part 27)

| Frequency (MHz) | Emission (dBm) | Limit (dBm) |
|---|---|---|
| 1849.8500 | -30.05 | -13 |
| 1910.0500 | -28.11 | -13 |

## UMTS-FDD Band II (Part 24E)

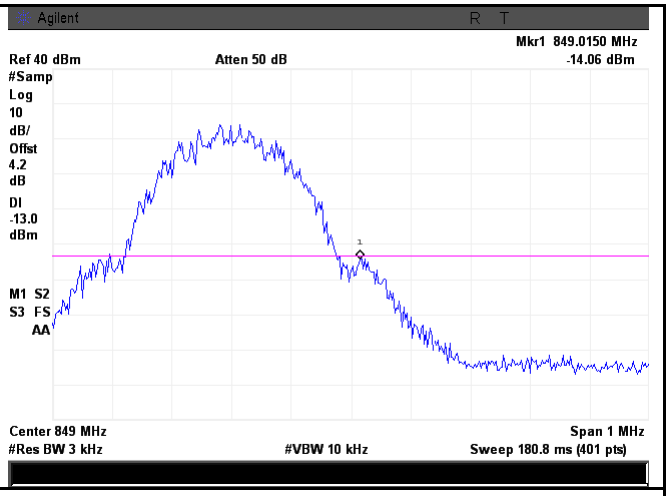
| Frequency (MHz) | Emission (dBm) | Limit (dBm) |
|---|---|---|
| 1849.8500 | -28.83 | -13 |
| 1910.0500 | -27.40 | -13 |

## Test Plots



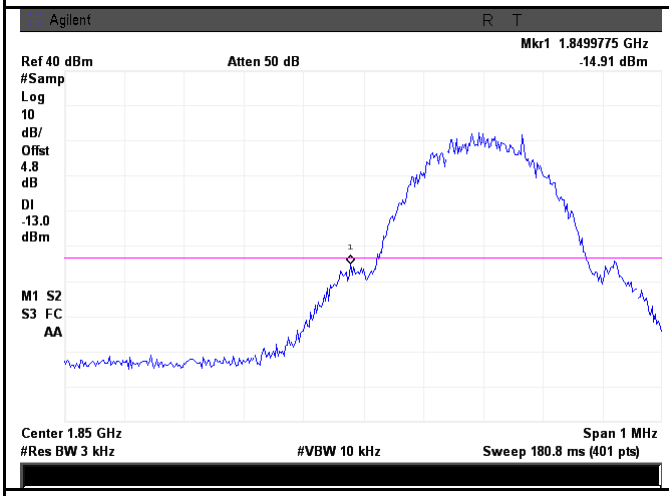

Cellular Band - Low Channel

Note: Offset=Cable loss (4.0) + 10log (3.20/3)=4.0+0.3=4.3dB



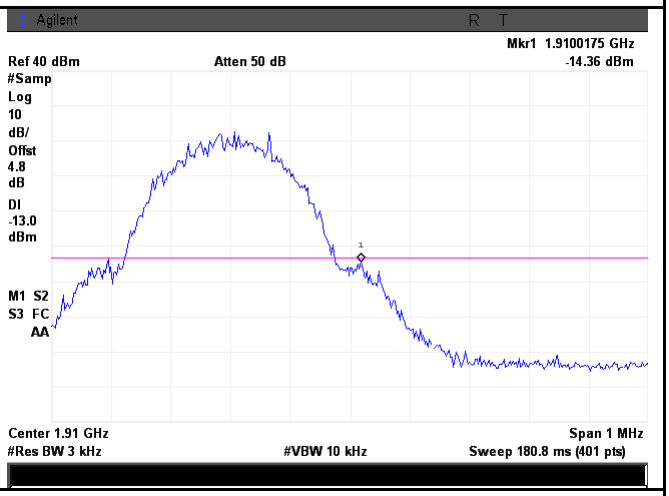

Cellular Band - High Channel

Note: Offset=Cable loss (4.0) + 10log (3.14/3)=4.0+0.2=4.2dB



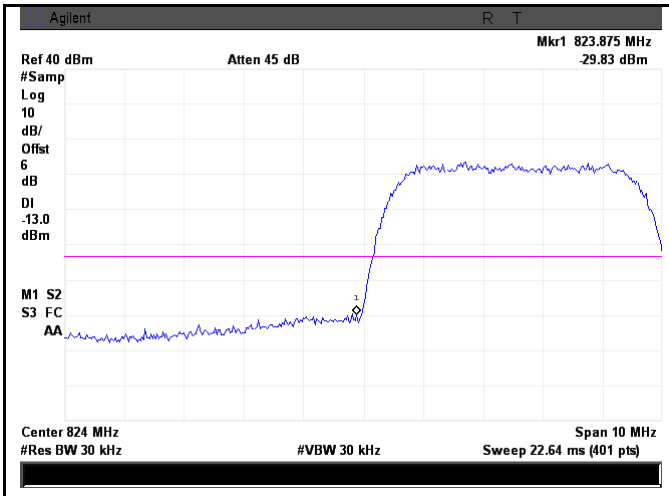

PCS Band - Low Channel

Note: Offset=Cable loss (4.5) + 10log (3.19/3)=4.5+0.3=4.8dB



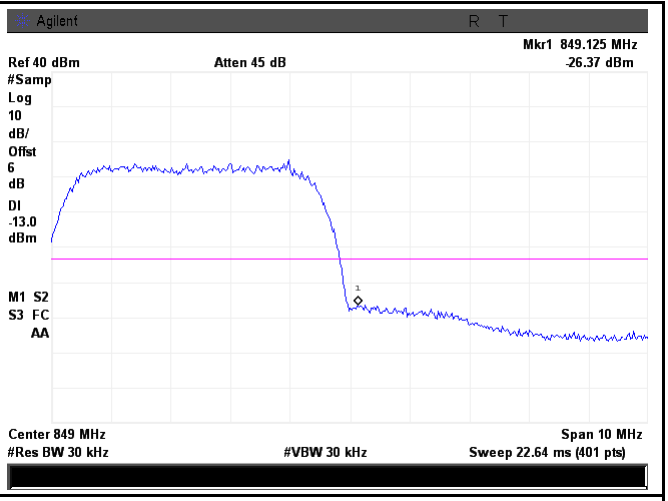

PCS Band - High Channel

Note: Offset=Cable loss (4.5) + 10log (3.20/3)=4.5+0.3=4.8dB



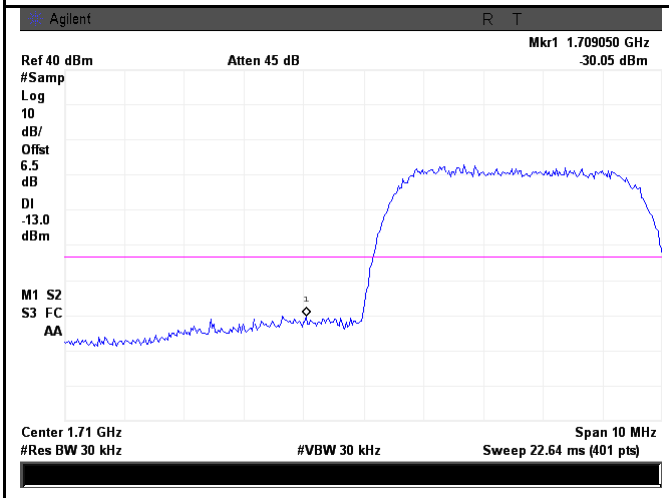

UMTS-FDD Band V - Low Channel

Note: Offset=Cable loss (4.0) + 10log (48.70/30)=4.0+2.0=6.0 dB



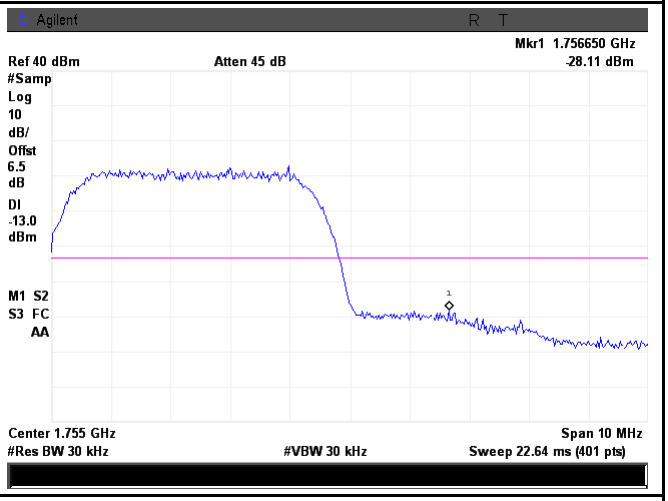

UMTS-FDD Band V - High Channel

Note: Offset=Cable loss (4.0) + 10log (48.69/30)=4.0+2.0=6.0 dB



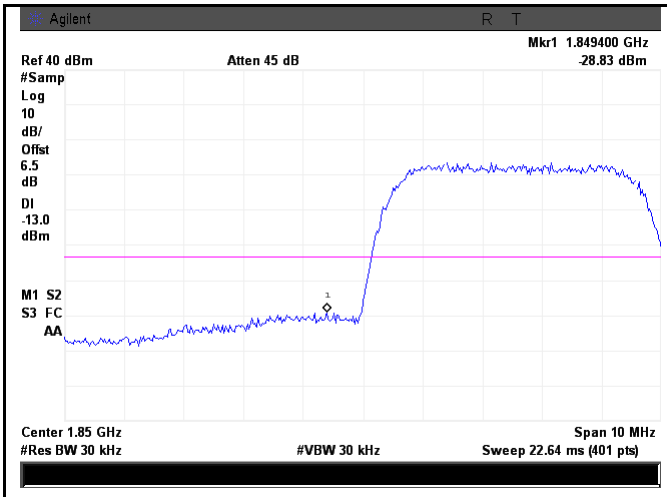

UMTS-FDD Band II - Low Channel

Note: Offset=Cable loss (4.5) + 10log (48.59/30)=4.5+2.0=6.5 dB



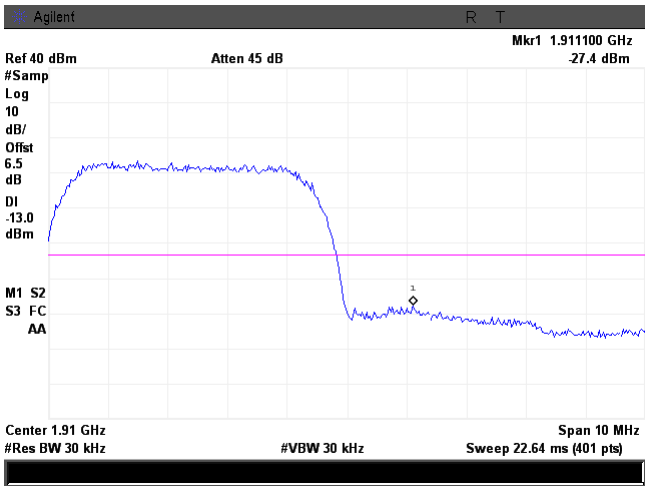

UMTS-FDD Band II - High Channel

Note: Offset=Cable loss (4.5) + 10log (48.69/30)=4.5+2.0=6.5 dB




UMTS-FDD Band IV - Low Channel

Note: Offset=Cable loss (4.5) + 10log (48.93/30)=4.5+2.0=6.0 dB




UMTS-FDD Band IV - High Channel

Note: Offset=Cable loss (4.5) + 10log (48.85/30)=4.5+2.0=6.5 dB

## 6.9 Frequency Stability

| | |
|---|---|
| Temperature | 23℃ |
| Relative Humidity | 58% |
| Atmospheric Pressure | 1006mbar |
| Test date : | August 06, 2015 |
| Tested By : | Winnie Zhang |

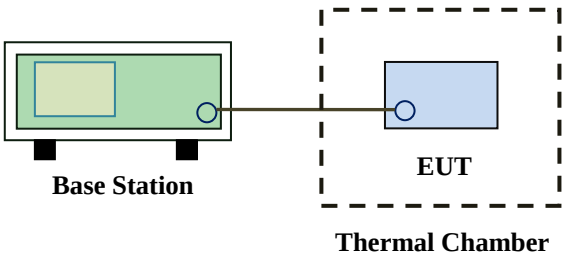
**Requirement(s):**

| Spec | Item | Requirement | Applicable |
|---|---|---|---|
| §2.1055, §22.355 & §24.235 § 27.5(h); § 27.54 | a) | 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:<br>Frequency Tolerance for Transmitters in the Public Mobile Services | ☑ |

| 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 | .0 |
| 821 to 896 | 1.5 | 2.5 | 2.5 |
| 928 to 29. | 5.0 | N/A | N/A |
| 929 to 960. | 1.5 | N/A | N/A |
| 2110 to 2220 | 10.0 | N/A | N/A |

According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized frequency block.

Test setup



| | |
|---|---|
| Procedure | 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.<br>Limit: The frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5ppm) of the center frequency. |
| Remark | |
| Result | ☑ Pass ☐ Fail |

**Test Data** ☑ Yes ☐ N/A

**Test Plot** ☐ Yes (See below) ☑ N/A

## Cellular Band (Part 22H) result

| Middle Channel, $f_o$ = 836.6 MHz | | | | |
|---|---|---|---|---|
| Temperature (℃) | Power Supplied ($V_{DC}$) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| -10 | 3.7 | 26 | 0.0311 | 2.5 |
| 0 | | 24 | 0.0287 | 2.5 |
| 10 | | 23 | 0.0275 | 2.5 |
| 20 | | 11 | 0.0131 | 2.5 |
| 30 | | 16 | 0.0191 | 2.5 |
| 40 | | 23 | 0.0275 | 2.5 |
| 50 | | 15 | 0.0179 | 2.5 |
| 55 | | 29 | 0.0347 | 2.5 |
| 25 | 4.2 | 18 | 0.0215 | 2.5 |
| | 3.5 | 24 | 0.0287 | 2.5 |

## PCS Band (Part 24E) result

| Middle Channel, $f_o$ = 1880 MHz | | | | |
|---|---|---|---|---|
| Temperature (℃) | Power Supplied ($V_{DC}$) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| -10 | 3.7 | 24 | 0.0128 | 2.5 |
| 0 | | 21 | 0.0112 | 2.5 |
| 10 | | 15 | 0.0080 | 2.5 |
| 20 | | 13 | 0.0069 | 2.5 |
| 30 | | 12 | 0.0064 | 2.5 |
| 40 | | 21 | 0.0112 | 2.5 |
| 50 | | 21 | 0.0112 | 2.5 |
| 55 | | 26 | 0.0138 | 2.5 |
| 25 | 4.2 | 22 | 0.0117 | 2.5 |
| | 3.5 | 25 | 0.0133 | 2.5 |

UMTS-FDD Band V (Part 22H)

| Middle Channel, $f_o$ = 835 MHz | | | | |
|---|---|---|---|---|
| Temperature (℃) | Power Supplied ($V_{DC}$) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| -10 | 3.7 | 20 | 0.0240 | 2.5 |
| 0 | | 17 | 0.0204 | 2.5 |
| 10 | | 11 | 0.0132 | 2.5 |
| 20 | | 11 | 0.0132 | 2.5 |
| 30 | | 12 | 0.0144 | 2.5 |
| 40 | | 18 | 0.0216 | 2.5 |
| 50 | | 15 | 0.0180 | 2.5 |
| 55 | | 20 | 0.0240 | 2.5 |
| 25 | 4.2 | 21 | 0.0251 | 2.5 |
| | 3.5 | 19 | 0.0228 | 2.5 |

UMTS-FDD Band II (Part 24E)

| Middle Channel, $f_o$ = 1880 MHz | | | | |
|---|---|---|---|---|
| Temperature (℃) | Power Supplied ($V_{DC}$) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| -10 | 3.7 | 17 | 0.0090 | 2.5 |
| 0 | | 16 | 0.0085 | 2.5 |
| 10 | | 9 | 0.0048 | 2.5 |
| 20 | | 10 | 0.0053 | 2.5 |
| 30 | | 6 | 0.0032 | 2.5 |
| 40 | | 14 | 0.0074 | 2.5 |
| 50 | | 15 | 0.0080 | 2.5 |
| 55 | | 21 | 0.0112 | 2.5 |
| 25 | 4.2 | 11 | 0.0059 | 2.5 |
| | 3.5 | 11 | 0.0059 | 2.5 |

UMTS-FDD Band IV (Part 27)

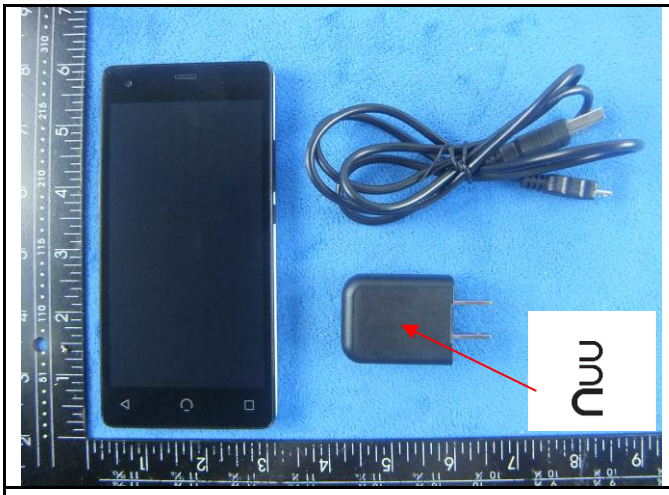
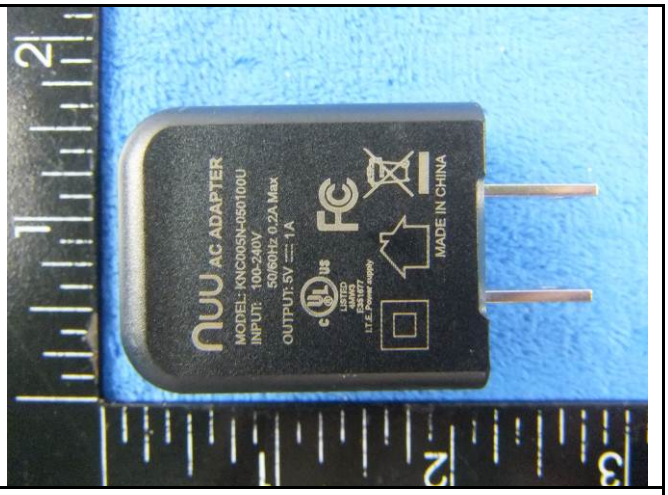
| Middle Channel, $f_o$ = 1880 MHz | | | | |
|---|---|---|---|---|
| Temperature (℃) | Power Supplied ($V_{DC}$) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| -10 | 3.7 | 16 | 0.0085 | 2.5 |
| 0 | | 16 | 0.0085 | 2.5 |
| 10 | | 10 | 0.0053 | 2.5 |
| 20 | | 11 | 0.0059 | 2.5 |
| 30 | | 7 | 0.0037 | 2.5 |
| 40 | | 13 | 0.0069 | 2.5 |
| 50 | | 15 | 0.0080 | 2.5 |
| 55 | | 20 | 0.0106 | 2.5 |
| 25 | 4.2 | 12 | 0.0064 | 2.5 |
| | 3.5 | 12 | 0.0064 | 2.5 |

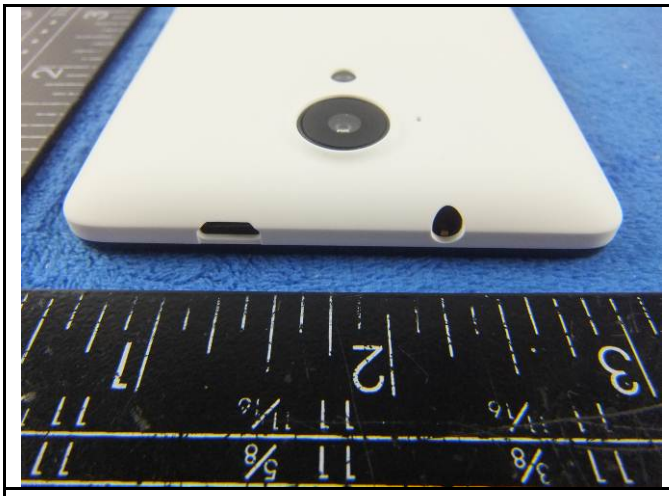
# Annex A. TEST INSTRUMENT

| Instrument | Model | Serial # | Cal Date | Cal Due | In use |
|---|---|---|---|---|---|
| **RF Conducted Test** | | | | | |
| Agilent ESA-E SERIES SPECTRUM ANALYZER | E4407B | MY45108319 | 09/17/2014 | 09/16/2015 | ☑ |
| Power Splitter | 1# | 1# | 09/02/2014 | 09/01/2015 | ☑ |
| Universal Radio Communication Tester | CMU200 | 121393 | 09/26/2014 | 09/25/2015 | ☑ |
| Temperature/Humidity Chamber | UHL-270 | 001 | 10/10/2014 | 10/09/2015 | ☑ |
| DC Power Supply | E3640A | MY40004013 | 09/18/2014 | 09/17/2015 | ☑ |
| **Radiated Emissions** | | | | | |
| EMI test receiver | ESL6 | 100262 | 09/18/2014 | 09/17/2015 | ☑ |
| OPT 010 AMPLIFIER (0.1-1300MHz) | 8447E | 2727A02430 | 09/02/2014 | 09/01/2015 | ☑ |
| Microwave Preamplifier (1 ~ 26.5GHz) | 8449B | 3008A02402 | 03/25/2015 | 03/24/2016 | ☑ |
| Bilog Antenna (30MHz~6GHz) | JB6 | A110712 | 09/22/2014 | 09/21/2015 | ☑ |
| Bilog Antenna (30MHz~2GHz) | JB1 | A112017 | 09/22/2014 | 09/21/2015 | ☑ |
| Double Ridge Horn Antenna (1 ~18GHz) | AH-118 | 71259 | 09/25/2014 | 09/24/2015 | ☑ |
| Double Ridge Horn Antenna (1 ~18GHz) | AH-118 | 71283 | 09/25/2014 | 09/24/2015 | ☑ |
| SYNTHESIZED SIGNAL GENERATOR | 8665B | 3744A01293 | 09/18/2014 | 09/17/2015 | ☑ |
| Tunable Notch Filter | 3NF-800/1000-S | AA4 | 09/02/2014 | 09/01/2015 | ☑ |
| Tunable Notch Filter | 3NF-1000/2000-S | AM 4 | 09/02/2014 | 09/01/2015 | ☑ |

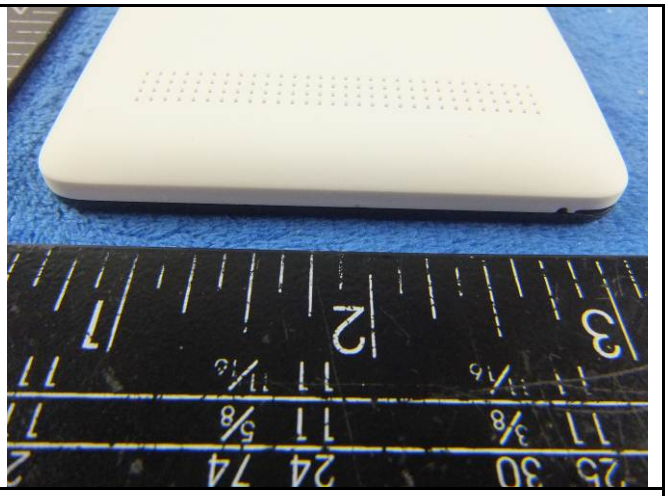
# Annex B. EUT And Test Setup Photographs

## Annex B.i. Photograph: EUT External Photo

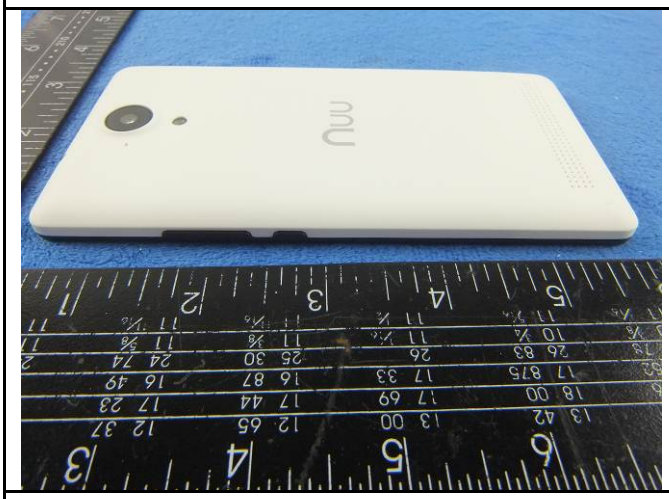
<table>
<tr><td>  </td><td> 
</td></tr>
<tr><td>Whole Package - Top View</td><td>Adapter - Front View</td></tr>
<tr><td>  </td><td> 
</td></tr>
<tr><td>EUT - Front View</td><td>EUT - Rear View</td></tr>
</table>



EUT - Top View



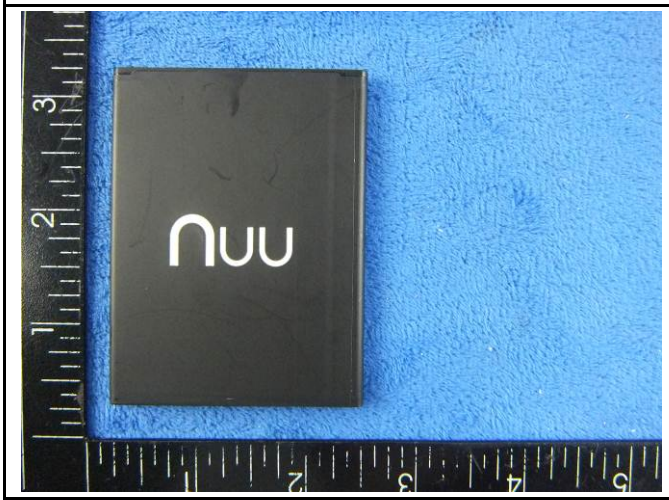
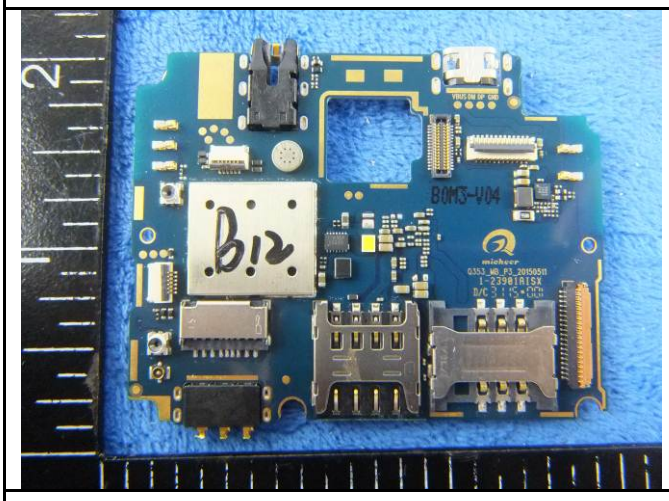
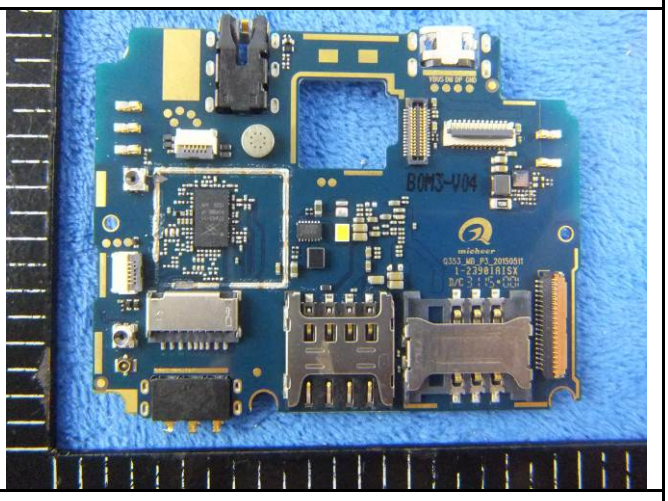
EUT - Bottom View

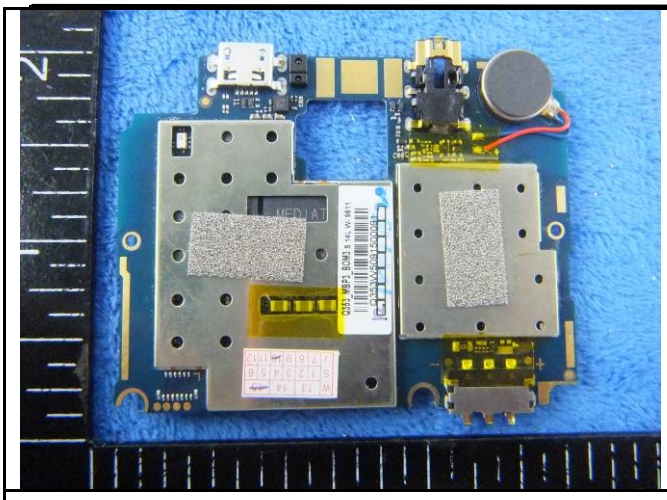


EUT - Left View

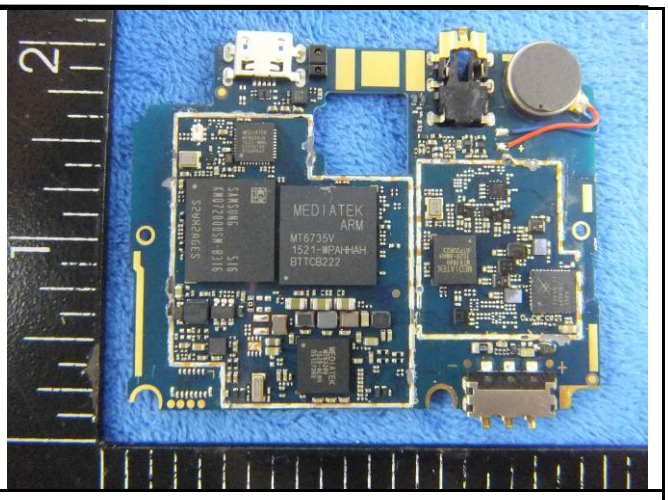
EUT - Right View

## Annex B.ii. Photograph: EUT Internal Photo

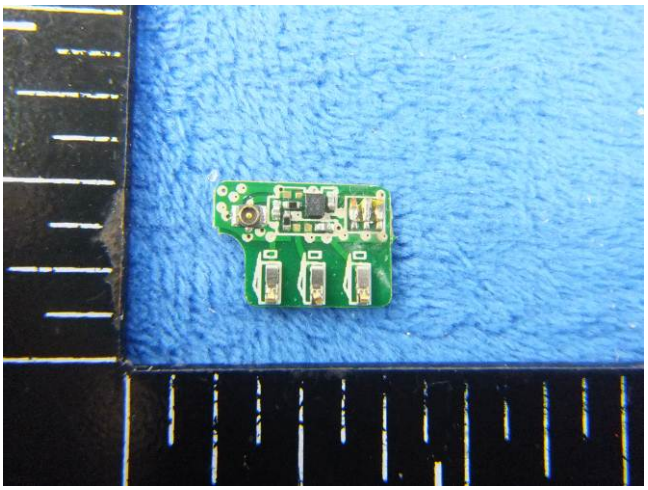
<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>Cover Off - Top View 1</td><td>Cover Off - Top View 2</td></tr>
<tr><td>  </td><td> 
</td></tr>
<tr><td>Battery – Front View</td><td>Battery - Rear View</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Mainbard with Shielding - Front View</td><td>Mainboard without shielding - Front View</td></tr>
</table>



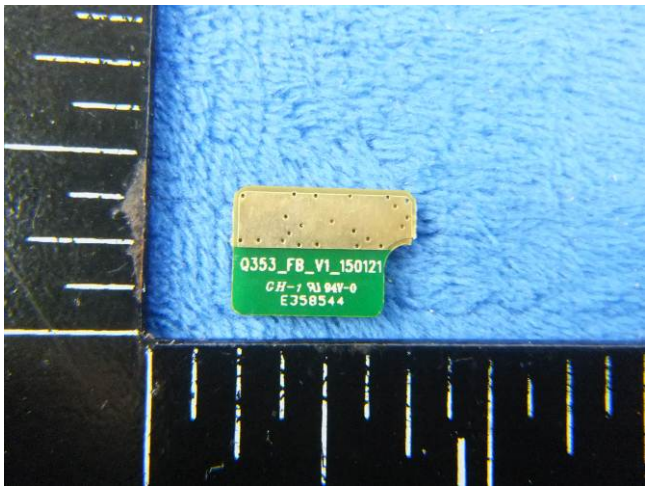
Mainbard with Shielding - Rear View




Mainbard without Shielding - Rear View



Mini Mainboard - Front View



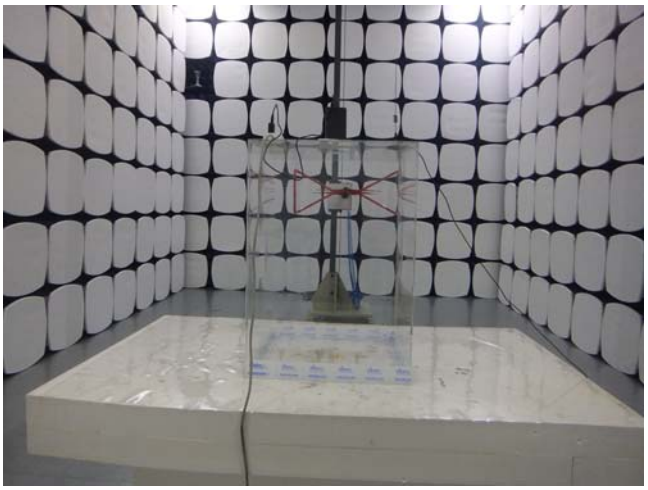
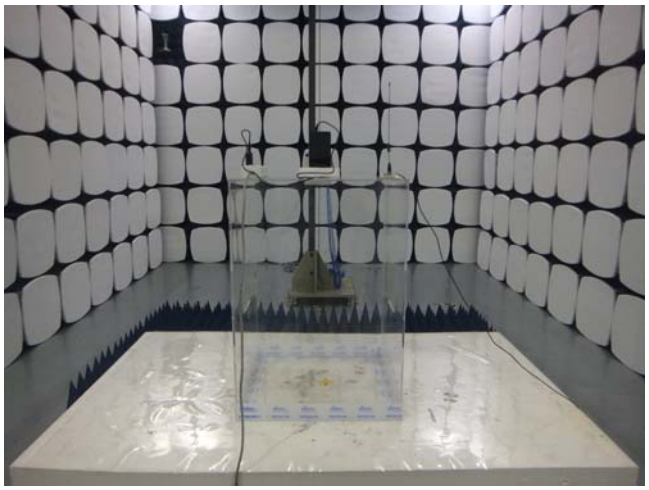

Mini Mainboard - Rear View

LCD – Front View

LCD – Rear View

| | |
|---|---|
|  |  |
| GSM/PCS/UMTS-FDD/LTE Antenna View | WIFI/BT/BLE - Antenna View |
|  | |
| GPS - Antenna View | |

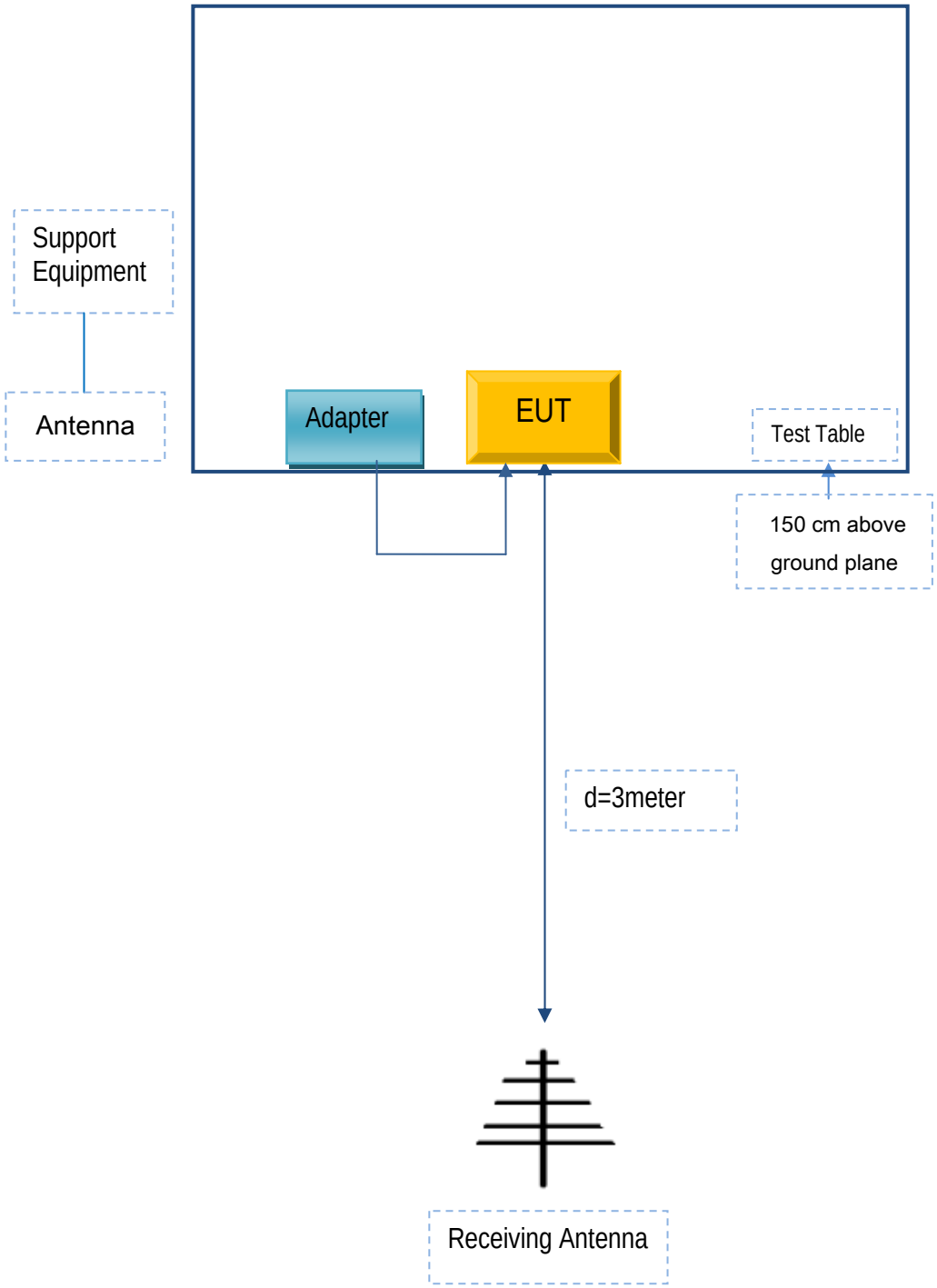
## Annex B.iii. Photograph: Test Setup Photo

| | |
| --- | --- |
|  |  |
| Radiated Spurious Emissions Test Setup Below 1GHz | Radiated Spurious Emissions Test Setup Above 1GHz |

# Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

## Annex C.ii. TEST SET UP BLOCK

### Block Configuration Diagram for Radiated Emissions



## Annex C. il. SUPPORTING EQUIPMENT DESCRIPTION

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

| Manufacturer | Equipment Description | Model | Calibration Date | Calibration Due Date |
|---|---|---|---|---|
| N/A | N/A | N/A | N/A | N/A |

# Annex C.ii. EUT OPERATING CONKITIONS

N/A

# Annex D. User Manual / Block Diagram / Schematics / Partlist

Please see attachment

# Annex E. DECLARATION OF SIMILARITY

N/A