



FCC RADIO TEST REPORT

FCC ID:2AHHN-BW17X629T

Product: Smart Watch

Trade Name: Brightwrist

Model No.: BW09PRO

Serial Model: BW09PLUS, BW09ULTRA,
BW09LITE, BW09AVNC

Report No.: NTEK- 2016NT0309467F2

Issue Date: 24 Mar. 2016

Prepared for

PARADIGM HOLDINGS, LLC
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Prepared by

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1 TEST RESULT CERTIFICATION

| | |
|-----------------------------------|---|
| Applicant's name | PARADIGM HOLDINGS, LLC |
| Address | 10 21st STREET BROOKLYN, NEW YORK 11232,United States |
| Manufacture's Name | PARADIGM HOLDINGS, LLC |
| Address | 10 21st STREET BROOKLYN, NEW YORK 11232,United States |
| | |
| Product description | |
| Product name | Smart Watch |
| Model and/or type reference | BW09PRO |
| Serial Model | BW09PLUS, BW09ULTRA, BW09LITE, BW09AVNC |

Measurement Procedure Used:

| APPLICABLE STANDARDS | |
|--|-------------|
| APPLICABLE STANDARD/ TEST PROCEDURE | TEST RESULT |
| 47 CFR Part 2, Part 22H, Part 24E ANSI/ TIA/ EIA-603-D-2010 | Complied |
| FCC KDB 971168 D01 Power Meas. License Digital Systems v02v02 | |

This device described above has been tested by NTEK Testing Technology Co., Ltd., and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

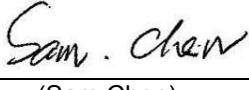
This report shall not be reproduced except in full, without the written approval of NTEK Testing Technology Co., Ltd., this document may be altered or revised by NTEK Testing Technology Co., Ltd., personnel only, and shall be noted in the revision of the document.

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

Date of Test : 09 Mar. 2016 ~ 24 Mar. 2016

Testing Engineer : 
(Allen Liu)

Technical Manager : 
(Jason Chen)

Authorized Signatory : 
(Sam Chen)

2 SUMMARY OF TEST RESULTS**FCC Part22, Subpart H/ FCC Part24, Subpart E**

| FCC Rule | Test Item | Verdict | Remark |
|----------------------------------|---|---------|--------|
| 2.1046 | Conducted Output Power | PASS | |
| 24.232(d) | Peak-to-Average Ratio | PASS | |
| 2.1049 22.917(b) 24.238(b) | Occupied Bandwidth | PASS | |
| 2.1051 22.917(a) 24.238(a) | Band Edge | PASS | |
| 22.913(a)(2) | Effective Radiated Power | PASS | |
| 24.232(c) | Equivalent Isotropic Radiated Power | PASS | |
| 2.1053 22.917(a) 24.238(a) | Field Strength of Spurious Radiation | PASS | |
| 2.1055 22.355 24.235 | Frequency Stability for Temperature & Voltage | PASS | |
| 2.1051 22.917(a) 24.238(a) | Conducted Emission | PASS | |

Remark:

1. "N/A" denotes test is not applicable in this Test Report.
2. All test items were verified and recorded according to the standards and without any deviation during the test.
3. No modifications are made to the EUT during all test items.
4. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

3 FACILITIES AND ACCREDITATIONS

3.1 FACILITIES

All measurement facilities used to collect the measurement data are located at 1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen P.R. China.

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 and CISPR Publication 22.

3.2 LABORATORY ACCREDITATIONS AND LISTINGS

Site Description

EMC Lab. : Accredited by CNAS, 2014.09.04
The certificate is valid until 2017.09.03
The Laboratory has been assessed and proved to be in compliance with
CNAS-CL01:2006 (identical to ISO/IEC 17025:2005)
The Certificate Registration Number is L5516.

Accredited by Industry Canada, August 29, 2012
The Certificate Registration Number is 9270A-1.

Name of Firm

： NTEK Testing Technology Co., Ltd

Site Location

: 1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen P.R. China.

3.3 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

4 GENERAL DESCRIPTION OF EUT

| Product Feature and Specification | |
|-----------------------------------|--|
| Equipment | Smart Watch |
| Trade Name | Brightwrist |
| FCC ID | 2AHNH-BW17X629T |
| Model No. | BW09PRO |
| Serial Model | BW09PLUS, BW09ULTRA, BW09LITE, BW09AVNC |
| Model Difference | All the model are the same circuit and RF module, except the model name and colour. |
| Operating Frequency | <input checked="" type="checkbox"/> GSM850: TX824.2MHz~848.8MHz /RX869.2MHz~893.8MHz; <input checked="" type="checkbox"/> PCS1900: TX1850.2MHz~1909.8MHz /RX1930.2MHz~1989.8MHz; |
| Modulation | <input checked="" type="checkbox"/> GMSK for GSM/GPRS; |
| Number of Channels | <input checked="" type="checkbox"/> 124 Channels for GSM850; <input checked="" type="checkbox"/> 299 Channels for PCS1900; |
| GPRS Class | <input checked="" type="checkbox"/> Multi-Class12 <input checked="" type="checkbox"/> Only 4 timeslots are used for GPRS |
| SIM CARD | The Smart Watch one SIM Card sockets <input checked="" type="checkbox"/> IMEI Code: 35408206250271 |
| Antenna Type | FPCB Antenna |
| Antenna Gain | 1 dBi |
| Power supply | <input checked="" type="checkbox"/> DC supply: DC 3.7/380mAh from Li-ion Battery or DC 5V from USB Port. <input type="checkbox"/> Adapter supply: Model: Input: Output: |
| HW Version | N/A |
| SW Version | N/A |

Note: Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual. The High Voltage 4.2V and Low Voltage 3.2V was declared by manufacturer, The EUT couldn't be operate normally with higher or lower voltage.

Revision History

5 DESCRIPTION OF TEST MODES

During the testing, the EUT was controlled via Rhode & Schwarz Digital Radio Communication Tester(CMU 200) to ensure max power transmission and proper modulation. Three channels (The low channel, the middle channel and the high channel) were chosen for testing on both GPRS850 and GPRS1900 frequency band.

Note: GSM/GPRS 850, GSM/GPRS 1900, HSDPA band II, HSUPA band II, HSDPA band V, HSUPA band V modes have been tested during the test. the worst condition (GSM850, GSM1900 RMC 12.2k) be recorded in the test report if no other modes test data.

Antenna port conducted and radiated test items were performed according to KDB 971168 D01 Power Meas. License Digital Systems v02r02 with maximum output power.

Radiated measurements were performed with rotating EUT in different three orthogonal test planes to find the maximum emission.

Radiated emissions were investigated as following frequency range:

1. 30 MHz to 10th harmonic for GSM850/UMTS FDD Band V.
2. 30 MHz to 10th harmonic for GSM1900/UMTS FDD Band II.

All modes and data rates and positions were investigated.

Test modes are chosen to be reported as the worst case configuration below:

| Test Modes | | |
|------------|--------------------------|-------------------------|
| Band | For Conducted Test Cases | For Radiated Test Cases |
| GSM 850 | GSM Link | GSM Link |
| GSM 1900 | GSM Link | GSM Link |

Test Frequency and Channels:

| Frequency Band | ☒ GSM 850 | | ☒ GSM 1900 | |
|----------------|-----------|-----------------|------------|-----------------|
| | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| CH_H | 251 | 848.8 | 810 | 1909.8 |
| CH_M | 189 | 836.4 | 661 | 1880.0 |
| CH_L | 128 | 824.2 | 512 | 1850.2 |

6 SETUP OF EQUIPMENT UNDER TEST

6.1 BLOCK DIAGRAM CONFIGURATION OF TEST SYSTEM

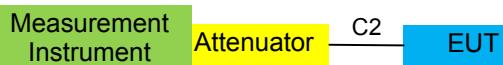
For AC Conducted Emission Mode



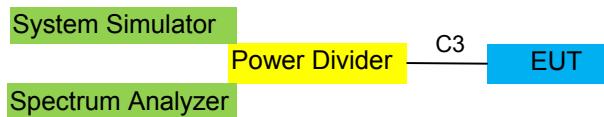
For Radiated Test Cases



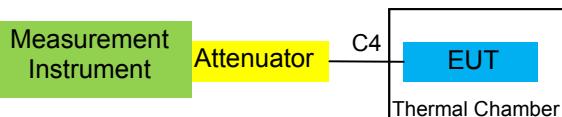
For Conducted Output Power



For Peak-to Average Ratio, Occupied Bandwidth, Conducted Band edge and Conducted Spurious Emission



For Frequency Stability



6.2 SUPPORT EQUIPMENT

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| Item | Equipment | Mfr/Brand | Model/Type No. | FCC ID | Note |
|------|-------------|-------------|----------------|-----------------|---------------------|
| E-1 | Smart Watch | Brightwrist | BW09PRO | 2AHHN-BW17X629T | EUT |
| 2. | Adapter | N/A | N/A | N/A | Peripherals |
| 3. | iPhone5s | Apple | A1518 | N/A | Peripherals |
| 4. | N/A | N/A | N/A | N/A | Auxiliary equipment |
| | | | | | |

| Item | Cable Type | Shielded Type | Ferrite Core | Length |
|------|------------|---------------|--------------|--------|
| C-1 | USB Cable | NO | NO | 1.0m |
| C-2 | RF Cable | NO | NO | 0.5m |
| C-3 | RF Cable | NO | NO | 0.5m |
| C-4 | RF Cable | NO | NO | 0.5m |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Notes:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (3) "YES" is means "shielded" "with core"; "NO" is means "unshielded" "without core".

6.3 EQUIPMENTS LIST FOR ALL TEST ITEMS

| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Last calibration | Calibrated until | Calibration period |
|------|-----------------------|--------------|-------------|--------------|------------------|------------------|--------------------|
| 1 | Spectrum Analyzer | Agilent | E4407B | MY45108040 | 2015.07.06 | 2016.07.05 | 1 year |
| 2 | Test Receiver | R&S | ESPI | 101318 | 2015.06.07 | 2016.06.06 | 1 year |
| 3 | Bilog Antenna | TESEQ | CBL6111D | 31216 | 2015.07.06 | 2016.07.05 | 1 year |
| 4 | 50Ω Coaxial Switch | Anritsu | MP59B | 6200264416 | 2015.06.07 | 2016.06.06 | 1 year |
| 5 | Spectrum Analyzer | ADVANTEST | R3132 | 150900201 | 2015.06.07 | 2016.06.06 | 1 year |
| 6 | Horn Antenna | EM | EM-AH-10180 | 2011071402 | 2015.07.06 | 2016.07.05 | 1 year |
| 7 | Horn Ant | Schwarzbeck | BBHA 9170 | 9170-181 | 2015.07.06 | 2016.07.05 | 1 year |
| 8 | Amplifier | EM | EM-30180 | 060538 | 2015.07.06 | 2016.07.05 | 1 year |
| 9 | Loop Antenna | ARA | PLA-1030/B | 1029 | 2015.06.08 | 2016.06.07 | 1 year |
| 10 | Power Meter | R&S | NRVS | 100696 | 2015.07.06 | 2016.07.05 | 1 year |
| 11 | Power Sensor | R&S | URV5-Z4 | 0395.1619.05 | 2015.07.06 | 2016.07.05 | 1 year |
| 12 | Test Cable | N/A | R-01 | N/A | 2015.07.06 | 2016.07.05 | 1 year |
| 13 | Test Cable | N/A | R-02 | N/A | 2015.07.06 | 2016.07.05 | 1 year |
| 14 | Test Receiver | R&S | ESCI | 101160 | 2015.06.06 | 2016.06.05 | 1 year |
| 15 | LISN | R&S | ENV216 | 101313 | 2015.08.24 | 2016.08.23 | 1 year |
| 16 | LISN | EMCO | 3816/2 | 00042990 | 2015.08.24 | 2016.08.23 | 1 year |
| 17 | 50Ω Coaxial Switch | Anritsu | MP59B | 6200264417 | 2015.06.07 | 2016.06.06 | 1 year |
| 18 | Passive Voltage Probe | R&S | ESH2-Z3 | 100196 | 2015.06.07 | 2016.06.06 | 1 year |
| 19 | Absorbing clamp | R&S | MOS-21 | 100423 | 2015.06.08 | 2016.06.07 | 1 year |
| 20 | Test Cable | N/A | C01 | N/A | 2015.06.08 | 2016.06.07 | 1 year |
| 21 | Test Cable | N/A | C02 | N/A | 2015.06.08 | 2016.06.07 | 1 year |
| 22 | Test Cable | N/A | C03 | N/A | 2015.06.08 | 2016.06.07 | 1 year |
| 23 | Attenuation | MCE | 24-10-34 | BN9258 | 2015.06.08 | 2016.06.07 | 1 year |
| 24 | Spectrum Analyzer | agilent | e4440a | us44300399 | 2015.06.08 | 2016.06.07 | 1 year |
| 25 | test receiver | R&S | esCI | a0304218 | 2015.06.08 | 2016.06.07 | 1 year |
| 26 | Communication Tester | R&S | CMU200 | A0304247 | 2015.06.08 | 2016.06.07 | 1 year |
| 27 | Thermal Chamber | Ten Billion | TTC-B3C | TBN-960502 | 2015.06.08 | 2016.06.07 | 1 year |

Note: Each piece of equipment is scheduled for calibration once a year.

7 TEST REQUIREMENTS

7.1 CONDUCTED EMISSIONS TEST

7.1.1 Applicable Standard

According to FCC KDB 971168 D01 v02r02 Section 6.0

7.1.2 Conformance Limit

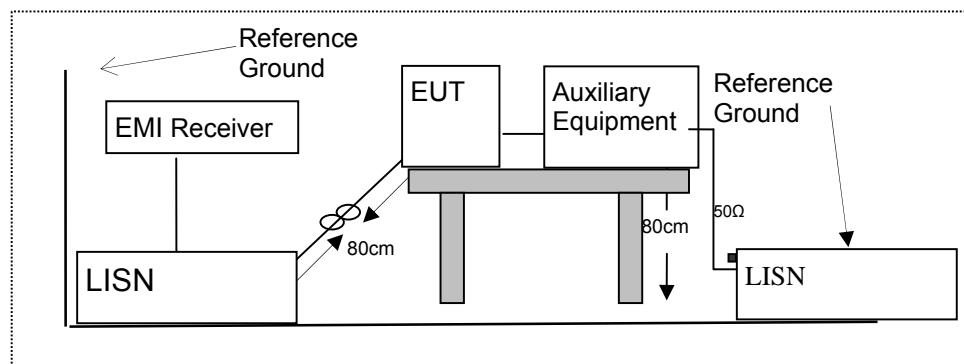
| Frequency(MHz) | Conducted Emission Limit | |
|----------------|--------------------------|---------|
| | Quasi-peak | Average |
| 0.15-0.5 | 66-56* | 56-46* |
| 0.5-5.0 | 56 | 46 |
| 5.0-30.0 | 60 | 50 |

Note: 1. *Decreases with the logarithm of the frequency
 2. The lower limit shall apply at the transition frequencies
 3. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

7.1.3 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

7.1.4 Test Configuration

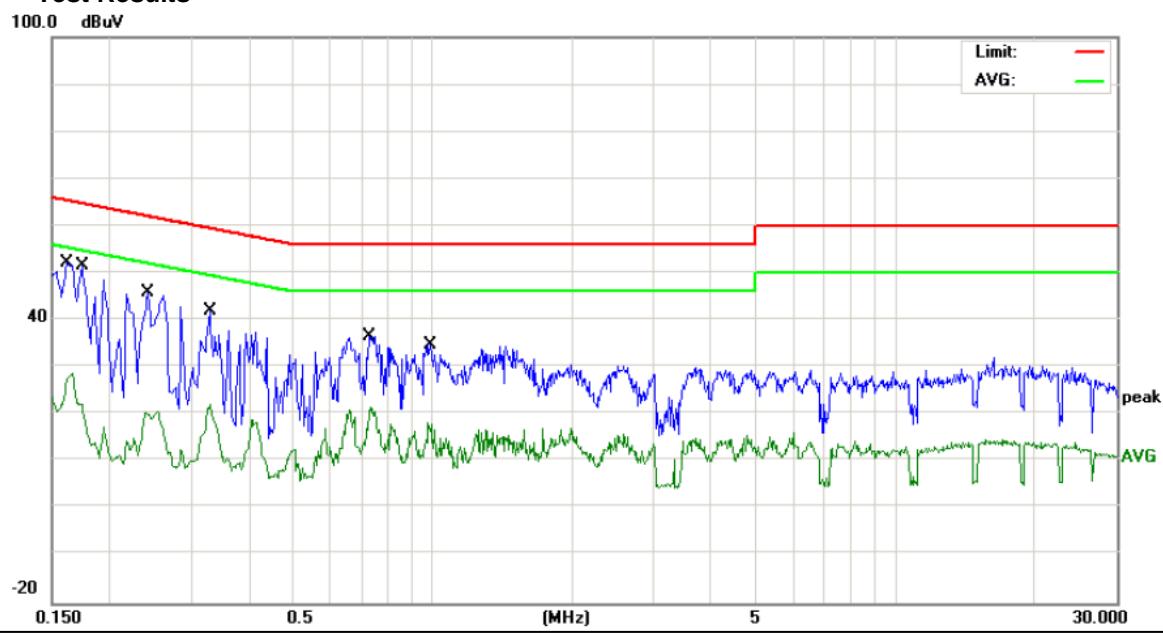


7.1.5 Test Procedure

According to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 Conducted emissions the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode.

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room.
2. The EUT was placed on a table which is 0.8m above ground plane.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
4. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40cm long.
5. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
6. LISN at least 80 cm from nearest part of EUT chassis.
7. The frequency range from 150KHz to 30MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth(IF bandwidth=9KHz) with Maximum Hold Mode
9. For the actual test configuration, please refer to the related Item –EUT Test Photos.

7.1.6 Test Results



Site Conduction #1

Phase: **L1**

Temperature: 22

Limit: (CE)FCC PART 15 class B_QP

Power: AC 120V/60Hz

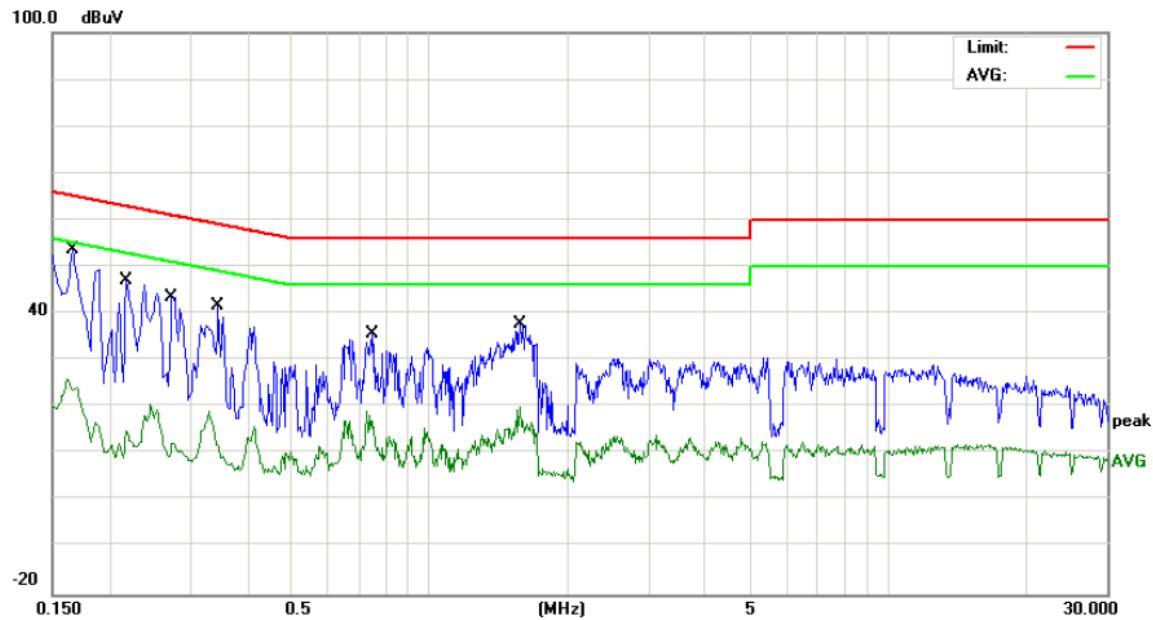
Humidity: 50 %

Mode: ON

Note:

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure- ment | Limit | Over | |
|-----|-----|--------|---------------|----------------|------------------|-------|----------|---------|
| | | MHz | dBuV | dB | dBuV | dB | Detector | Comment |
| 1 | | 0.1620 | 41.97 | 10.07 | 52.04 | 65.36 | -13.32 | QP |
| 2 | | 0.1620 | 22.26 | 10.07 | 32.33 | 55.36 | -23.03 | AVG |
| 3 | * | 0.1737 | 41.49 | 10.05 | 51.54 | 64.78 | -13.24 | QP |
| 4 | | 0.1737 | 25.64 | 10.05 | 35.69 | 54.78 | -19.09 | AVG |
| 5 | | 0.2419 | 35.90 | 10.07 | 45.97 | 62.03 | -16.06 | QP |
| 6 | | 0.2419 | 15.51 | 10.07 | 25.58 | 52.03 | -26.45 | AVG |
| 7 | | 0.3300 | 31.80 | 10.11 | 41.91 | 59.45 | -17.54 | QP |
| 8 | | 0.3300 | 14.58 | 10.11 | 24.69 | 49.45 | -24.76 | AVG |
| 9 | | 0.7298 | 26.82 | 9.82 | 36.64 | 56.00 | -19.36 | QP |
| 10 | | 0.7298 | 12.96 | 9.82 | 22.78 | 46.00 | -23.22 | AVG |
| 11 | | 0.9858 | 24.98 | 9.87 | 34.85 | 56.00 | -21.15 | QP |
| 12 | | 0.9858 | 15.24 | 9.87 | 25.11 | 46.00 | -20.89 | AVG |

*:Maximum data x:Over limit !:over margin



Site Conduction #1

Phase: **N**

Temperature: 22

Limit: (CE)FCC PART 15 class B_QP

Power: AC 120V/60Hz

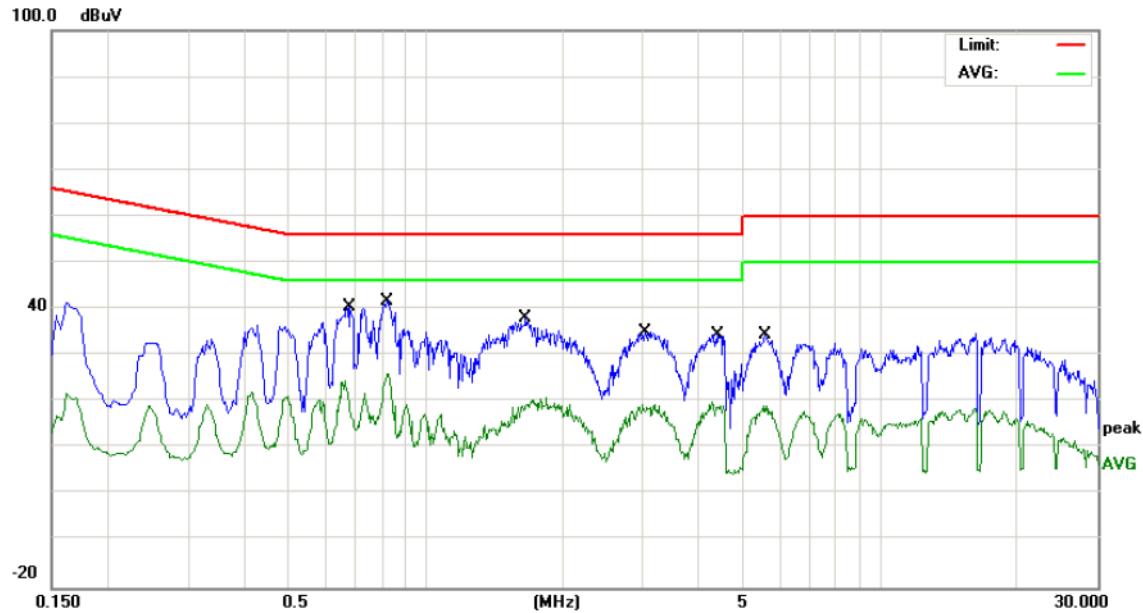
Humidity: 50 %

Mode: ON

Note:

| No. | Mk. | Freq. | Reading | Correct | Measure- | Limit | Over | Detector | Comment |
|-----|-----|--------|---------|---------|----------|-------|--------|----------|---------|
| | | | Level | Factor | ment | | | | |
| | | MHz | dBuV | dB | dBuV | dBuV | dB | | |
| 1 | * | 0.1660 | 43.48 | 10.06 | 53.54 | 65.15 | -11.61 | QP | |
| 2 | | 0.1660 | 28.57 | 10.06 | 38.63 | 55.15 | -16.52 | AVG | |
| 3 | | 0.2179 | 37.05 | 10.04 | 47.09 | 62.89 | -15.80 | QP | |
| 4 | | 0.2179 | 16.61 | 10.04 | 26.65 | 52.89 | -26.24 | AVG | |
| 5 | | 0.2740 | 33.33 | 10.10 | 43.43 | 60.99 | -17.56 | QP | |
| 6 | | 0.2740 | 15.23 | 10.10 | 25.33 | 50.99 | -25.66 | AVG | |
| 7 | | 0.3458 | 31.52 | 10.09 | 41.61 | 59.06 | -17.45 | QP | |
| 8 | | 0.3458 | 16.93 | 10.09 | 27.02 | 49.06 | -22.04 | AVG | |
| 9 | | 0.7500 | 25.90 | 9.82 | 35.72 | 56.00 | -20.28 | QP | |
| 10 | | 0.7500 | 14.54 | 9.82 | 24.36 | 46.00 | -21.64 | AVG | |
| 11 | | 1.5740 | 28.09 | 9.80 | 37.89 | 56.00 | -18.11 | QP | |
| 12 | | 1.5740 | 14.42 | 9.80 | 24.22 | 46.00 | -21.78 | AVG | |

*:Maximum data x:Over limit !:over margin



Site Conduction #1

Phase: **L1**

Temperature: 22

Limit: (CE)FCC PART 15 class B_QP

Power: AC 240V/50Hz

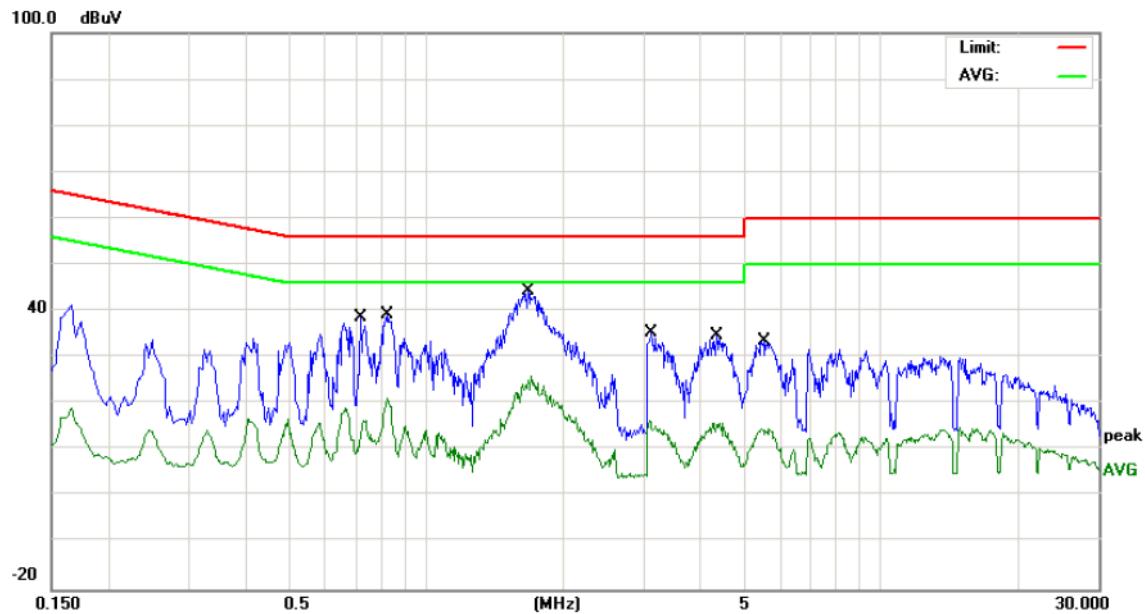
Humidity: 50 %

Mode: ON

Note:

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|-----|-----|--------|---------------|----------------|--------------|-------|--------|----------|
| | | MHz | dBuV | dB | dBuV | dBuV | dB | Detector |
| 1 | | 0.6820 | 30.68 | 9.78 | 40.46 | 56.00 | -15.54 | QP |
| 2 | | 0.6820 | 15.24 | 9.78 | 25.02 | 46.00 | -20.98 | AVG |
| 3 | * | 0.8217 | 31.93 | 9.81 | 41.74 | 56.00 | -14.26 | QP |
| 4 | | 0.8217 | 12.84 | 9.81 | 22.65 | 46.00 | -23.35 | AVG |
| 5 | | 1.6577 | 28.25 | 9.77 | 38.02 | 56.00 | -17.98 | QP |
| 6 | | 1.6577 | 14.25 | 9.77 | 24.02 | 46.00 | -21.98 | AVG |
| 7 | | 3.0379 | 25.43 | 9.74 | 35.17 | 56.00 | -20.83 | QP |
| 8 | | 3.0379 | 11.58 | 9.74 | 21.32 | 46.00 | -24.68 | AVG |
| 9 | | 4.3778 | 24.82 | 9.75 | 34.57 | 56.00 | -21.43 | QP |
| 10 | | 4.3778 | 13.61 | 9.75 | 23.36 | 46.00 | -22.64 | AVG |
| 11 | | 5.5658 | 24.60 | 9.76 | 34.36 | 60.00 | -25.64 | QP |
| 12 | | 5.5658 | 12.26 | 9.76 | 22.02 | 50.00 | -27.98 | AVG |

*:Maximum data x:Over limit !:over margin



Site Conduction #1

Phase: **N**

Temperature: 22

Limit: (CE)FCC PART 15 class B_QP

Power: AC 240V/50Hz

Humidity: 50 %

Mode: ON

Note:

| No. | Mk. | Freq. | Reading | Correct | Measure- | Limit | Over | Detector | Comment |
|-----|-----|--------|---------|---------|----------|-------|--------|----------|---------|
| | | | Level | Factor | ment | | | | |
| | | MHz | dBuV | dB | dBuV | dB | | | |
| 1 | | 0.7177 | 28.71 | 9.81 | 38.52 | 56.00 | -17.48 | QP | |
| 2 | | 0.7177 | 13.85 | 9.81 | 23.66 | 46.00 | -22.34 | AVG | |
| 3 | | 0.8257 | 29.38 | 9.84 | 39.22 | 56.00 | -16.78 | QP | |
| 4 | | 0.8257 | 15.28 | 9.84 | 25.12 | 46.00 | -20.88 | AVG | |
| 5 | * | 1.6777 | 34.70 | 9.79 | 44.49 | 56.00 | -11.51 | QP | |
| 6 | | 1.6777 | 14.57 | 9.79 | 24.36 | 46.00 | -21.64 | AVG | |
| 7 | | 3.1379 | 25.64 | 9.73 | 35.37 | 56.00 | -20.63 | QP | |
| 8 | | 3.1379 | 11.52 | 9.73 | 21.25 | 46.00 | -24.75 | AVG | |
| 9 | | 4.3498 | 25.12 | 9.72 | 34.84 | 56.00 | -21.16 | QP | |
| 10 | | 4.3498 | 14.30 | 9.72 | 24.02 | 46.00 | -21.98 | AVG | |
| 11 | | 5.5137 | 23.82 | 9.73 | 33.55 | 60.00 | -26.45 | QP | |
| 12 | | 5.5137 | 13.63 | 9.73 | 23.36 | 50.00 | -26.64 | AVG | |

*:Maximum data x:Over limit !:over margin

7.2 FIELD STRENGTH OF SPURIOUS RADIATION

7.2.1 Applicable Standard

According to FCC KDB 971168 D01 v02r02 Section 5.8 and ANSI/ TIA-603-D-2010 Section 2.2.12

7.2.2 Conformance Limit

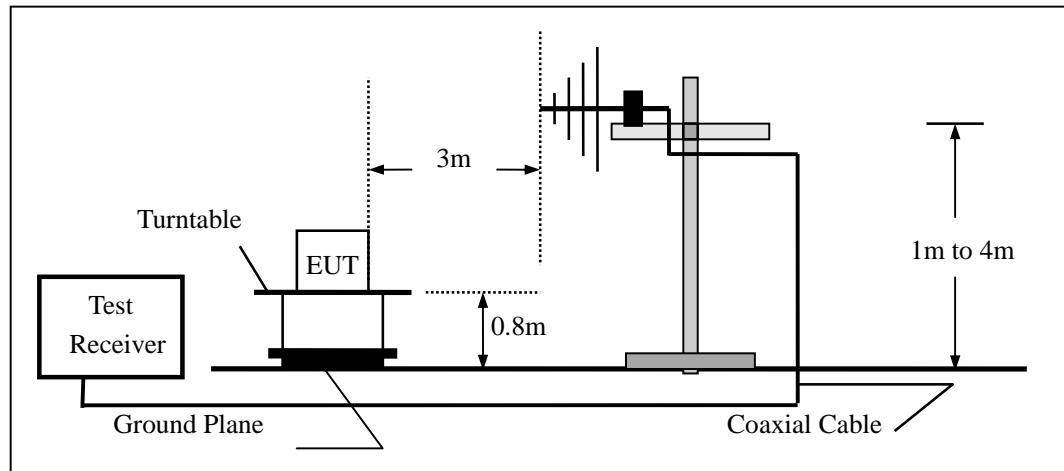
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

7.2.3 Measuring Instruments

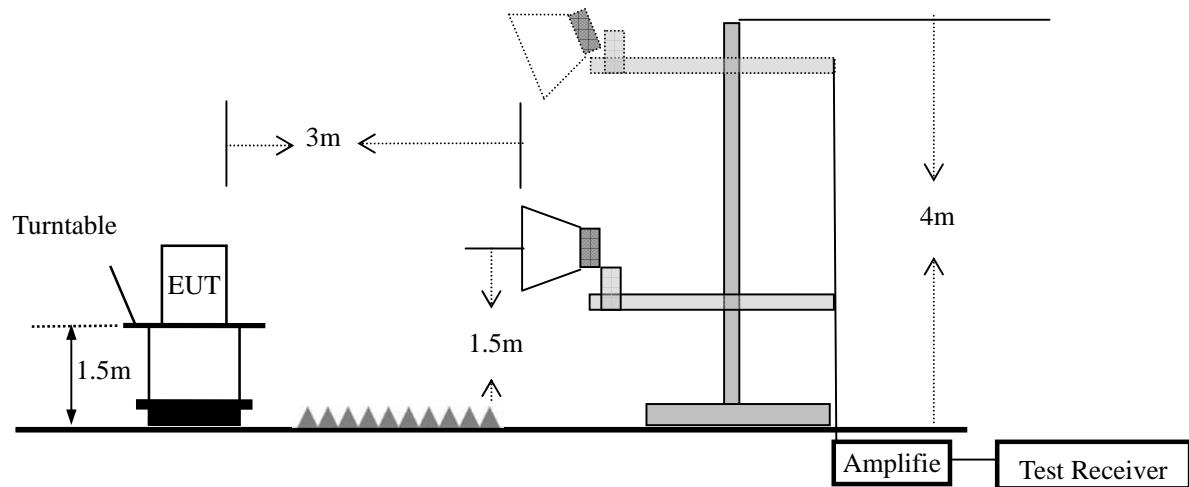
The Measuring equipment is listed in the section 6.3 of this test report.

7.2.4 Test Configuration

(a) For radiated emissions from 30MHz to 1000MHz



(b) For radiated emissions above 1000MHz



7.2.5 Test Procedure

The measurements procedures specified in TIA-603-D-2010 were used for testing. The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment. The resolution bandwidth is set 1MHz as outlined in Part 24.238. The measurements were performed on all modes(GPRS850, GPRS1900, HSDPA band V) at 3 typical channels(the Top Channel, the Middle Channel and the Bottom Channel) for each band.Only shown the worst data.

The procedure of radiated spurious emissions is as follows:

- a) Pre-calibration With pre-calibration method, the Radiated Spurious Emissions(RSE) is calculated as, $RSE = Rx(dBuV) + CL(dB) + SA(dB) + Gain(dBi) - 107(dBuV \text{ to } dBm)$ The SA is calibrated using following setup.
- b) EUT was placed on a 0.8 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the test item for emission measurements. The height of receiving antenna is 0.8m. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the test item and adjusting the receiving antenna polarization. The radiated emission measurements of all non-harmonic and harmonics of the transmit frequency through the 10th harmonic were measured with peak detector and 1MHz bandwidth.

Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the PCS 1900 band (1850.2 MHz, 1880 MHz and 1909.8 MHz), GSM850 band (824.2MHz, 836.6MHz, 848.8MHz), UMTS band II(1852.4MHz, 1880MHz, 1907.6MHz), UMTS band V(826.4MHz, 835.0MHz, 846.6MHz) . It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of any band into any of the other blocks.

The substitution method is used. Substitution values at each frequency are measured before and saved to the test software. A "reference path loss" is established and the ARpl is the attenuation of "reference path loss", and including the gain of receive antenna, the gain of the preamplifier, the cable loss and the air loss. The measurement results are obtained as described below: Power=PMea+ARpl

7.2.6 Test Results

| | | | |
|--------------|----------------|--------------------|-----------|
| EUT: | Smart Watch | Model No.: | BW09PRO |
| Temperature: | 20 °C | Relative Humidity: | 48% |
| Test Mode: | GSM850/GSM1900 | Test By: | Allen Liu |

■ Radiated Spurious Emission

| GSM850 | | | | | | |
|--|----------------|---------------|---------------|----------------|---------------------|------------|
| Frequency (MHz) | Power (dBm) | ARpl (dBm) | PMea (dBm) | Limit (dBm) | Over Limit (dBm) | Polarity |
| Test Results for Channel 128/824.2 MHz | | | | | | |
| 1648.4 | -30.38 | 7.8 | -22.58 | -13.00 | -9.58 | Vertical |
| 1648.4 | -30.33 | 7.8 | -22.53 | -13.00 | -9.53 | Horizontal |
| 2472.6 | -30.14 | 11 | -19.14 | -13.00 | -6.14 | Vertical |
| 2472.6 | -30.3 | 11 | -19.3 | -13.00 | -6.30 | Horizontal |
| 3296.8 | -30.02 | 12.3 | -17.72 | -13.00 | -4.72 | Vertical |
| 3296.8 | -30.19 | 12.3 | -17.89 | -13.00 | -4.89 | Horizontal |
| Test Results for Channel 190/836.6 MHz | | | | | | |
| 1673.2 | -31.92 | 8 | -23.92 | -13.00 | -10.92 | Vertical |
| 1673.2 | -31.81 | 8 | -23.81 | -13.00 | -10.81 | Horizontal |
| 2509.8 | -30.34 | 11.2 | -19.14 | -13.00 | -6.14 | Vertical |
| 2509.8 | -30.45 | 11.2 | -19.25 | -13.00 | -6.25 | Horizontal |
| 3346.4 | -31.43 | 12.6 | -18.83 | -13.00 | -5.83 | Vertical |
| 3346.4 | -31.65 | 12.6 | -19.05 | -13.00 | -6.05 | Horizontal |
| Test Results for Channel 251/848.8 MHz | | | | | | |
| 1697.6 | -30.1 | 8.1 | -22 | -13.00 | -9.00 | Vertical |
| 1697.6 | -29.12 | 8.1 | -21.02 | -13.00 | -8.02 | Horizontal |
| 2546.4 | -29.75 | 11.69 | -18.06 | -13.00 | -5.06 | Vertical |
| 2546.4 | -29 | 11.69 | -17.31 | -13.00 | -4.31 | Horizontal |
| 3395.2 | -30.33 | 12.92 | -17.41 | -13.00 | -4.41 | Vertical |
| 3395.2 | -30.55 | 12.92 | -17.63 | -13.00 | -4.63 | Horizontal |

| GPRS850 | | | | | | |
|--|----------------|---------------|---------------|----------------|---------------------|------------|
| Frequency (MHz) | Power (dBm) | ARpl (dBm) | PMea (dBm) | Limit (dBm) | Over Limit (dBm) | Polarity |
| Test Results for Channel 128/824.2 MHz | | | | | | |
| 1648.4 | -29.22 | 7.80 | -21.42 | -13.00 | -8.42 | Vertical |
| 1648.4 | -31.49 | 7.80 | -23.69 | -13.00 | -10.69 | Horizontal |
| 2472.6 | -29.98 | 11.00 | -18.98 | -13.00 | -5.98 | Vertical |
| 2472.6 | -30.24 | 11.00 | -19.24 | -13.00 | -6.24 | Horizontal |
| 3296.8 | -29.86 | 12.30 | -17.56 | -13.00 | -4.56 | Vertical |
| 3296.8 | -30.03 | 12.30 | -17.73 | -13.00 | -4.73 | Horizontal |
| Test Results for Channel 190/836.6 MHz | | | | | | |
| 1673.2 | -30.76 | 8.00 | -22.76 | -13.00 | -9.76 | Vertical |
| 1673.2 | -32.97 | 8.00 | -24.97 | -13.00 | -11.97 | Horizontal |
| 2509.8 | -30.18 | 11.20 | -18.98 | -13.00 | -5.98 | Vertical |
| 2509.8 | -30.39 | 11.20 | -19.19 | -13.00 | -6.19 | Horizontal |
| 3346.4 | -31.27 | 12.60 | -18.67 | -13.00 | -5.67 | Vertical |
| 3346.4 | -31.49 | 12.60 | -18.89 | -13.00 | -5.89 | Horizontal |
| Test Results for Channel 251/848.8 MHz | | | | | | |
| 1697.6 | -28.94 | 8.10 | -20.84 | -13.00 | -7.84 | Vertical |
| 1697.6 | -30.28 | 8.10 | -22.18 | -13.00 | -9.18 | Horizontal |
| 2546.4 | -29.59 | 11.69 | -17.90 | -13.00 | -4.90 | Vertical |
| 2546.4 | -28.94 | 11.69 | -17.25 | -13.00 | -4.25 | Horizontal |
| 3395.2 | -30.17 | 12.92 | -17.25 | -13.00 | -4.25 | Vertical |
| 3395.2 | -30.39 | 12.92 | -17.47 | -13.00 | -4.47 | Horizontal |

| GSM1900 | | | | | | |
|--|----------------|---------------|---------------|----------------|---------------------|------------|
| Frequency (MHz) | Power (dBm) | ARpl (dBm) | PMea (dBm) | Limit (dBm) | Over Limit (dBm) | Polarity |
| Test Results for Channel 512/1850.2MHz | | | | | | |
| 3700.4 | -32.88 | 13.42 | -19.46 | -13 | -6.46 | Vertical |
| 3700.4 | -34.12 | 13.42 | -20.7 | -13 | -7.7 | Horizontal |
| 5550.6 | -33.82 | 17.12 | -16.7 | -13 | -3.7 | Vertical |
| 5550.6 | -33.43 | 17.12 | -16.31 | -13 | -3.31 | Horizontal |
| 7400.8 | -35.71 | 19.26 | -16.45 | -13 | -3.45 | Vertical |
| 7400.8 | -35.34 | 19.26 | -16.08 | -13 | -3.08 | Horizontal |
| Test Results for Channel 661/1880.0MHz | | | | | | |
| 3760 | -35.81 | 13.76 | -22.05 | -13.00 | -9.05 | Vertical |
| 3760 | -33.6 | 13.76 | -19.84 | -13.00 | -6.84 | Horizontal |
| 5640 | -34.12 | 17.56 | -16.56 | -13.00 | -3.56 | Vertical |
| 5640 | -38.84 | 17.56 | -21.28 | -13.00 | -8.28 | Horizontal |
| 7520 | -37.83 | 19.6 | -18.23 | -13.00 | -5.23 | Vertical |
| 7520 | -38.27 | 19.6 | -18.67 | -13.00 | -5.67 | Horizontal |
| Test Results for Channel 810/1909.8MHz | | | | | | |
| 3819.6 | -34.81 | 13.87 | -20.94 | -13.00 | -7.94 | Vertical |
| 3819.6 | -30.34 | 13.87 | -16.47 | -13.00 | -3.47 | Horizontal |
| 5729.4 | -35.45 | 17.66 | -17.79 | -13.00 | -4.79 | Vertical |
| 5729.4 | -34.42 | 17.66 | -16.76 | -13 | -3.76 | Horizontal |
| 7639.2 | -39 | 19.75 | -19.25 | -13.00 | -6.25 | Vertical |
| 7639.2 | -38.83 | 19.75 | -19.08 | -13.00 | -6.08 | Horizontal |

| GPRS1900 | | | | | | |
|--|----------------|---------------|---------------|----------------|---------------------|------------|
| Frequency (MHz) | Power (dBm) | ARpl (dBm) | PMea (dBm) | Limit (dBm) | Over Limit (dBm) | Polarity |
| Test Results for Channel 512/1850.2MHz | | | | | | |
| 3700.4 | -31.72 | 13.42 | -18.30 | -13.00 | -5.30 | Vertical |
| 3700.4 | -35.28 | 13.42 | -21.86 | -13.00 | -8.86 | Horizontal |
| 5550.6 | -33.66 | 17.12 | -16.54 | -13.00 | -3.54 | Vertical |
| 5550.6 | -33.37 | 17.12 | -16.25 | -13.00 | -3.25 | Horizontal |
| 7400.8 | -35.55 | 19.26 | -16.29 | -13.00 | -3.29 | Vertical |
| 7400.8 | -35.50 | 19.26 | -16.24 | -13.00 | -3.24 | Horizontal |
| Test Results for Channel 661/1880.0MHz | | | | | | |
| 3760 | -34.65 | 13.76 | -20.89 | -13.00 | -7.89 | Vertical |
| 3760 | -34.76 | 13.76 | -21.00 | -13.00 | -8.00 | Horizontal |
| 5640 | -33.96 | 17.56 | -16.40 | -13.00 | -3.40 | Vertical |
| 5640 | -38.78 | 17.56 | -21.22 | -13.00 | -8.22 | Horizontal |
| 7520 | -37.67 | 19.60 | -18.07 | -13.00 | -5.07 | Vertical |
| 7520 | -38.43 | 19.60 | -18.83 | -13.00 | -5.83 | Horizontal |
| Test Results for Channel 810/1909.8MHz | | | | | | |
| 3819.6 | -33.65 | 13.87 | -19.78 | -13.00 | -6.78 | Vertical |
| 3819.6 | -31.50 | 13.87 | -17.63 | -13.00 | -4.63 | Horizontal |
| 5729.4 | -35.29 | 17.66 | -17.63 | -13.00 | -4.63 | Vertical |
| 5729.4 | -34.36 | 17.66 | -16.70 | -13.00 | -3.70 | Horizontal |
| 7639.2 | -38.84 | 19.75 | -19.09 | -13.00 | -6.09 | Vertical |
| 7639.2 | -38.99 | 19.75 | -19.24 | -13.00 | -6.24 | Horizontal |

7.3 EFFECTIVE RADIATED POWER AND EFFECTIVE ISOTROPIC RADIATED POWER

7.3.1 Applicable Standard

According to FCC KDB 971168 D01 v02r02 Section 5.2.1/ Section 5.2.2.2 and ANSI/ TIA-603-D-2010 Section 2.2.17

7.3.2 Conformance Limit

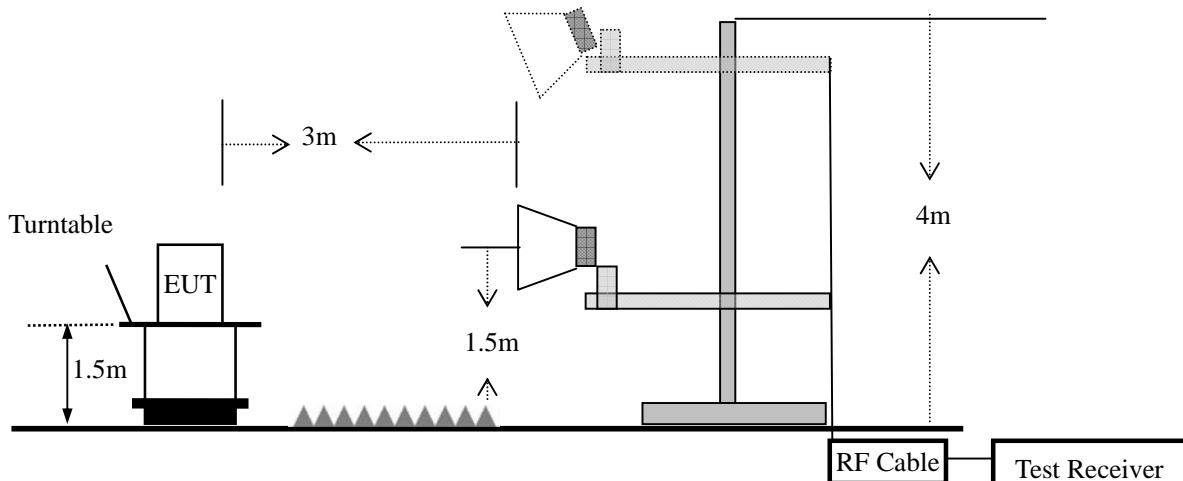
The substitution method, in ANSI / TIA / EIA-603-D-2010, was used for ERP/EIRP measurement, and the spectrum analyzer configuration follows KDB 971168 D01 Power Meas. License Digital Systems v02r02. The ERP of mobile transmitters must not exceed 7 Watts (Cellular Band) and the EIRP of mobile transmitters are limited to 2 Watts (PCS Band).

7.3.3 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

7.3.4 Test Configuration

(a) For E.R.P and E.I.R.P Measurements



7.3.5 Test Procedure

The measurements procedures specified in TIA-603-D-2010 were applied.

In an anechoic antenna test chamber, a half-wave dipole antenna for the frequency band of interest is placed at the reference centre of the chamber. An RF Signal source for the frequency band of interest is connected to the dipole with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A known (measured) power (P_{in}) is applied to the input of the dipole, and the power received (P_{r}) at the chamber's probe antenna is recorded.

The substitution method is used. Substitution values at each frequency are measured before and saved to the test software. A "reference path loss" is established as $AR_{pl} = P_{in} + 2.15 - P_r$. The AR_{pl} is the attenuation of "reference path loss", and including the gain of receive antenna, the cable loss and the air loss. The measurement results are obtained as described below: $Power = PM_{ea} + AR_{pl}$

The EUT is substituted for the dipole at the reference centre of the chamber and a scan is performed to obtain the radiation pattern.

From the radiation pattern, the co-ordinates where the maximum antenna gain occurs are identified.

The EUT is then put into continuously transmitting mode at its maximum power level.

Power mode measurements are performed with the receiving antenna placed at the coordinates determined in Step 3 to determine the output power as defined in Rule 24.232 (b) and (c). The "reference path loss" from Step1 is added to this result.

This value is EIRP since the measurement is calibrated using a half-wave dipole antenna of known gain (2.15 dBi) and known input power (Pin).

ERP can be calculated from EIRP by subtracting the gain of the dipole, $ERP = EIRP - 2.15\text{dBi}$.

Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

Substitution antenna and Receiving Antenna:

| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Character | Note |
|------|-------------------|--------------|-------------|------------|------------|----------------------|
| 1 | Bilog Antenna | TESEQ | CBL6111D | 31216 | 30MHz~2GHz | Receiving Antenna |
| 2 | Horn Antenna | EM | EM-AH-10180 | 2011071402 | 1GHz~18GHz | Receiving Antenna |
| 3 | Bilog Antenna | TESEQ | CBL6111D | 31216 | 30MHz~2GHz | Substitution antenna |
| 4 | Horn Antenna | EM | EM-AH-10180 | 2011071402 | 1GHz~18GHz | Substitution antenna |

Use the following spectrum analyzer settings:

| | | |
|--------------|----------------|-----------|
| | GSM/GPRS/EGPRS | UMTS band |
| Span | 500KHz | 10MHz |
| RBW | 10KHz | 300KHz |
| VBW | 30KHz | 1MHz |
| Detector | RMS | RMS |
| Trace | Average | Average |
| Average Type | Power | Power |
| Sweep Count | 100 | 100 |

7.3.6 Test Results

| | | | |
|--------------|----------------|--------------------|-----------|
| EUT: | Smart Watch | Model No.: | BW09PRO |
| Temperature: | 20 °C | Relative Humidity: | 48% |
| Test Mode: | GSM850/GSM1900 | Test By: | Allen Liu |

■ Effective Radiated Power

| Radiated Power (ERP) for GSM850 | | | | | | | |
|---------------------------------|------------|----------|----------|----------------------|-----------------|-----------|---------|
| Horizontal Polarization | | | | | | | |
| Frequency (MHz) | PMea (dBm) | Pcl (dB) | PAg (dB) | Ga Antenna Gain (dB) | Correction (dB) | ERP (dBm) | ERP (W) |
| 824.2 | -17.22 | 2.11 | -52.73 | 0.87 | 2.15 | 30.38 | 1.0914 |
| 836.6 | -17.01 | 2.13 | -52.73 | 0.93 | 2.15 | 30.51 | 1.1246 |
| 848.8 | -17.31 | 2.13 | -52.73 | 0.97 | 2.15 | 30.17 | 1.0399 |
| Vertical Polarization | | | | | | | |
| Frequency (MHz) | PMea (dBm) | Pcl (dB) | PAg (dB) | Ga Antenna Gain (dB) | Correction (dB) | ERP (dBm) | ERP (W) |
| 824.2 | -19.84 | 2.11 | -52.73 | 0.87 | 2.15 | 27.76 | 0.5970 |
| 836.6 | -20.11 | 2.13 | -52.73 | 0.93 | 2.15 | 27.41 | 0.5508 |
| 848.8 | -20.49 | 2.13 | -52.73 | 0.97 | 2.15 | 26.99 | 0.5000 |

| Radiated Power (ERP) for GPRS850 | | | | | | | |
|----------------------------------|------------|----------|----------|----------------------|-----------------|-----------|---------|
| Horizontal Polarization | | | | | | | |
| Frequency (MHz) | PMea (dBm) | Pcl (dB) | PAg (dB) | Ga Antenna Gain (dB) | Correction (dB) | ERP (dBm) | ERP (W) |
| 824.2 | -19.47 | 2.11 | -52.73 | 0.87 | 2.15 | 28.13 | 0.6501 |
| 836.6 | -19.81 | 2.13 | -52.73 | 0.93 | 2.15 | 27.71 | 0.5902 |
| 848.8 | -19.98 | 2.13 | -52.73 | 0.97 | 2.15 | 27.50 | 0.5623 |
| Vertical Polarization | | | | | | | |
| Frequency (MHz) | PMea (dBm) | Pcl (dB) | PAg (dB) | Ga Antenna Gain (dB) | Correction (dB) | ERP (dBm) | ERP (W) |
| 824.2 | -21.26 | 2.11 | -52.73 | 0.87 | 2.15 | 26.34 | 0.4305 |
| 836.6 | -21.08 | 2.13 | -52.73 | 0.93 | 2.15 | 26.44 | 0.4406 |
| 848.8 | -21.38 | 2.13 | -52.73 | 0.97 | 2.15 | 26.10 | 0.4074 |

■ Effective Isotropic Radiated Power

| Radiated Power (E.I.R.P) for GSM 1900 MHZ | | | | | | |
|--|------------|----------|----------|----------------------|------------|----------|
| Horizontal Polarization | | | | | | |
| Frequency (MHz) | PMea (dBm) | Pcl (dB) | PAg (dB) | Ga Antenna Gain (dB) | EIRP (dBm) | EIRP (W) |
| 1850.2 | -21.28 | 3.76 | -48.53 | -4.72 | 28.21 | 0.6622 |
| 1880 | -22.27 | 3.91 | -50.53 | -4.59 | 28.94 | 0.7834 |
| 1909.8 | -22.77 | 3.93 | -50.53 | -4.38 | 28.21 | 0.6622 |
| Vertical Polarization | | | | | | |
| Frequency (MHz) | PMea (dBm) | Pcl (dB) | PAg (dB) | Ga Antenna Gain (dB) | EIRP (dBm) | EIRP (W) |
| 1850.2 | -23.76 | 3.76 | -48.53 | -4.72 | 25.73 | 0.3741 |
| 1880 | -25.29 | 3.91 | -50.53 | -4.59 | 25.92 | 0.3908 |
| 1909.8 | -25.57 | 3.93 | -50.53 | -4.38 | 25.41 | 0.3475 |
| Radiated Power (E.I.R.P) for GPRS 1900 MHZ | | | | | | |
| Horizontal Polarization | | | | | | |
| Frequency (MHz) | PMea (dBm) | Pcl (dB) | PAg (dB) | Ga Antenna Gain (dB) | EIRP (dBm) | EIRP (W) |
| 1850.2 | -23.54 | 3.76 | -48.53 | -4.72 | 25.95 | 0.3936 |
| 1880 | -25.59 | 3.91 | -50.53 | -4.59 | 25.62 | 0.3648 |
| 1909.8 | -25.84 | 3.93 | -50.53 | -4.38 | 25.14 | 0.3266 |
| Vertical Polarization | | | | | | |
| Frequency (MHz) | PMea (dBm) | Pcl (dB) | PAg (dB) | Ga Antenna Gain (dB) | EIRP (dBm) | EIRP (W) |
| 1850.2 | -25.88 | 3.76 | -48.53 | -4.72 | 23.61 | 0.2296 |
| 1880 | -27.54 | 3.91 | -50.53 | -4.59 | 23.67 | 0.2328 |
| 1909.8 | -27.82 | 3.93 | -50.53 | -4.38 | 23.16 | 0.2070 |

7.4 CONDUCTED OUTPUT POWER

7.4.1 Applicable Standard

According to FCC Part 2.1046 and FCC Part 22.913(a)(2) and FCC Part 24.232(c) and FCC KDB 971168 D01 v02r02 Section 5.2

7.4.2 Conformance Limit

Extend coverage on a secondary basis into cellular unserved areas, as those areas are defined in §22.949, the ERP of base transmitters and cellular repeaters of such systems must not exceed 1000 Watts. The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts(38.5dBm).

Mobile and portable stations are limited to 2 watts (33dBm)EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications..

7.4.3 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

7.4.4 Test Setup

Please refer to Section 6.1 of this test report.

7.4.5 Test Procedure

Connect the EUT to Universal Radio Communication Tester CMU200 or CMU500 via the antenna connector. A call is set up by the SS according to the generic call set up procedure on a channel with ARFCN in the ARFCN range, power control level set to Max power. The frequency band is set as selected frequency, The RF output of the transmitter was connected to base station simulator.

Set EUT at maximum average power by base station simulator.

Set RBW = 1-5% of the OBW, not to exceed 1 MHz.

Set VBW \geq 3 \times RBW.

Number of points in sweep \geq 2 \times span / RBW. (This gives bin-to-bin spacing \leq RBW/2, so that narrowband signals are not lost between frequency bins.)

Sweep time = auto.

Detector = RMS (power averaging).

Set sweep trigger to "free run".

Trace average at least 100 traces in power averaging (i.e., RMS) mode; however, the number of traces to be averaged shall be increased above 100 as needed such that the average accurately represents the true average over the on and off periods of the transmitter.

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

Add $10 \log (1/x)$, where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission). For example, add $10 \log (1/0.25) = 6$ dB if the duty cycle is a constant 25%.

Measure lowest, middle, and highest channels for each bandwidth and different modulation.

Measure and record the results in the test report.

7.4.6 Test Results

| | | | |
|--------------|----------------|--------------------|-----------|
| EUT: | Smart Watch | Model No.: | BW09PRO |
| Temperature: | 20 °C | Relative Humidity: | 48% |
| Test Mode: | GSM850/GSM1900 | Test By: | Allen Liu |

Output Power for GSM850

| Mode | Frequency(MHz) | Maximum Burst-Average Output Power |
|-----------------|----------------|------------------------------------|
| GSM850 | 824.2 | 32.25 |
| | 836.6 | 32.13 |
| | 848.8 | 32.09 |
| GPRS850(1 Slot) | 824.2 | 32.28 |
| | 836.6 | 32.17 |
| | 848.8 | 32.25 |
| GPRS850(2 Slot) | 824.2 | 31.26 |
| | 836.6 | 31.41 |
| | 848.8 | 31.22 |
| GPRS850(3 Slot) | 824.2 | 29.45 |
| | 836.6 | 30.05 |
| | 848.8 | 30.12 |
| GPRS850(4 Slot) | 824.2 | 29.15 |
| | 836.6 | 29.09 |
| | 848.8 | 29.11 |
| | 848.8 | 22.96 |

Output Power for PCS1900

| Mode | Frequency(MHz) | Maximum Burst-Average Output Power |
|------------------|----------------|------------------------------------|
| GSM1900 | 1850.2 | 29.23 |
| | 1880 | 29.58 |
| | 1909.8 | 29.34 |
| GPRS1900(1 Slot) | 1850.2 | 29.21 |
| | 1880 | 29.18 |
| | 1909.8 | 29.29 |
| GPRS1900(2 Slot) | 1850.2 | 28.26 |
| | 1880 | 28.36 |
| | 1909.8 | 28.45 |
| GPRS1900(3 Slot) | 1850.2 | 26.24 |
| | 1880 | 26.75 |
| | 1909.8 | 26.44 |
| GPRS1900(4 Slot) | 1850.2 | 25.54 |
| | 1880 | 25.71 |
| | 1909.8 | 25.46 |

7.5 FREQUENCY STABILITY

7.5.1 Applicable Standard

According to FCC Part 2.1055 and FCC Part 22.355 and FCC Part 24.235 and FCC KDB 971168 D01 Section 9.0

7.5.2 Conformance Limit

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ ($\pm 2.5\text{ppm}$) of the center frequency.

7.5.3 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

7.5.4 Test Setup

Please refer to Section 6.1 of this test report.

7.5.5 Test Procedure

Connect the EUT to Universal Radio Communication Tester CMU200 or CMU500 via the antenna connector. A call is set up by the SS according to the generic call set up procedure on a channel with ARFCN in the ARFCN range, power control level set to Max power. MS TXPWR_MAX_CCH is set to the maximum value supported by the Power Class of the Mobile under test.

EUT was placed at temperature chamber and connected to an external power supply.

Temperature and voltage condition shall be tested to confirm frequency stability.

For Temperature Variation

1. The testing follows FCC KDB 971168 D01 v02r02 Section 9.0.
2. The EUT was set up in the thermal chamber and connected with the system simulator.
3. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
4. With power OFF, the temperature was raised in 10°C steps up to 50°C . The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

For Voltage Variation

1. The testing follows FCC KDB 971168 D01 v02r02 Section 9.0.
2. The EUT was placed in a temperature chamber at $25\pm 5^\circ\text{C}$ and connected with the system simulator.
3. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.
4. The variation in frequency was measured for the worst case.

7.5.6 Test Results

| | | | |
|---------------|--------------------|--------------------|-----------|
| EUT: | Smart Watch | Model No.: | BW09PRO |
| Temperature: | 20°C | Relative Humidity: | 48% |
| Test Mode: | Mode1/Mode2 | Test By: | Allen Liu |
| Results: PASS | | | |

| Frequency Error Against Voltage for GSM 850 band | | |
|--|----------------------|-----------------------|
| Voltage (V) | Frequency Error (Hz) | Frequency Error (ppm) |
| 3.5 | 24 | 0.029 |
| 3.7 | 30 | 0.036 |
| 4.2 | 15 | 0.018 |

| Frequency Error Against Temperature for GSM 850 band | | |
|--|----------------------|-----------------------|
| Temperature (°C) | Frequency Error (Hz) | Frequency Error (ppm) |
| -10 | 31 | 0.037 |
| 0 | 25 | 0.030 |
| 10 | 21 | 0.025 |
| 20 | 28 | 0.033 |
| 30 | 16 | 0.019 |
| 40 | 15 | 0.018 |
| 50 | 27 | 0.032 |

| Frequency Error Against Voltage for GPRS850 band | | |
|--|----------------------|-----------------------|
| Voltage (V) | Frequency Error (Hz) | Frequency Error (ppm) |
| 3.5 | 27 | 0.0323 |
| 3.7 | 24 | 0.0287 |
| 4.2 | 22 | 0.0263 |

| Frequency Error Against Temperature for GPRS850 band | | |
|--|----------------------|-----------------------|
| Temperature (°C) | Frequency Error (Hz) | Frequency Error (ppm) |
| -10 | 29 | 0.0347 |
| 0 | 26 | 0.0311 |
| 10 | 24 | 0.0287 |
| 20 | 24 | 0.0287 |
| 30 | 15 | 0.0179 |
| 40 | 12 | 0.0143 |
| 50 | 3 | 0.0036 |

Note:

1. Normal Voltage = 3.7V; Battery End Point (BEP) = 3.2V; Maximum Voltage = 4.2V
2. The frequency fundamental emissions stay within the authorized frequency block based on the frequency deviation measured is small.

| Frequency Error Against Voltage for PCS 1900 band | | |
|---|----------------------|-----------------------|
| Voltage (V) | Frequency Error (Hz) | Frequency Error (ppm) |
| 3.5 | 28 | 0.015 |
| 3.7 | 33 | 0.018 |
| 4.2 | 26 | 0.014 |

| Frequency Error Against Temperature for PCS 1900 band | | |
|---|----------------------|-----------------------|
| Temperature (°C) | Frequency Error (Hz) | Frequency Error (ppm) |
| -10 | 15 | 0.008 |
| 0 | 21 | 0.011 |
| 10 | 28 | 0.015 |
| 20 | 35 | 0.019 |
| 30 | 16 | 0.009 |
| 40 | 25 | 0.013 |
| 50 | 20 | 0.011 |

| Frequency Error Against Voltage for GPRS1900 band | | |
|---|----------------------|-----------------------|
| Voltage (V) | Frequency Error (Hz) | Frequency Error (ppm) |
| 3.5 | 24 | 0.0128 |
| 3.7 | 20 | 0.0106 |
| 4.2 | 11 | 0.0059 |

| Frequency Error Against Temperature for GPRS1900 band | | |
|---|----------------------|-----------------------|
| Temperature (°C) | Frequency Error (Hz) | Frequency Error (ppm) |
| -10 | 30 | 0.0160 |
| 0 | 30 | 0.0160 |
| 10 | 25 | 0.0133 |
| 20 | 24 | 0.0128 |
| 30 | 24 | 0.0128 |
| 40 | 13 | 0.0069 |
| 50 | 8 | 0.0043 |

Note:

1. Normal Voltage = 3.7V; Battery End Point (BEP) = 3.2V; Maximum Voltage = 4.2V
2. The frequency fundamental emissions stay within the authorized frequency block based on the frequency deviation measured is small.

7.6 PEAK-TO-AVERAGE RATIO

7.6.1 Applicable Standard

According to FCC 22.913 and FCC 24.232(d) and FCC KDB 971168 D01 Section 5.7.1

7.6.2 Conformance Limit

The peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB. The PAPR measurements should be made using either an instrument with complementary cumulative distribution function (CCDF) capabilities to determine that PAPR will not exceed 13 dB for more than 0.1 percent of the time or other Commission approved procedure. The measurement must be performed using a signal corresponding to the highest PAPR expected during periods of continuous transmission.

7.6.3 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

7.6.4 Test Setup

Please refer to Section 6.1 of this test report.

7.6.5 Test Procedure

The EUT was connected to Spectrum Analyzer and Base Station via power divider.

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.

Set the number of counts to a value that stabilizes the measured CCDF curve.

Set the measurement interval to 1 ms.

Record the maximum PAPR level associated with a probability of 0.1%.

a) Refer to instrument's analyzer instruction manual for details on how to use the power statistics/CCDF function;

b) Set resolution/measurement bandwidth \geq signal's occupied bandwidth;

c) Set the number of counts to a value that stabilizes the measured CCDF curve;

d) Set the measurement interval as follows:

1) for continuous transmissions, set to 1 ms,

2) for burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize and set the measurement interval to a time that is less than or equal to the burst duration.

e) Record the maximum PAPR level associated with a probability of 0.1%.

7.6.6 Test Results

| | | | |
|---------------|-------------|--------------------|-----------|
| EUT: | Smart Watch | Model No.: | BW09PRO |
| Temperature: | 20 °C | Relative Humidity: | 48% |
| Test Mode: | Mode1/Mode2 | Test By: | Allen Liu |
| Results: PASS | | | |

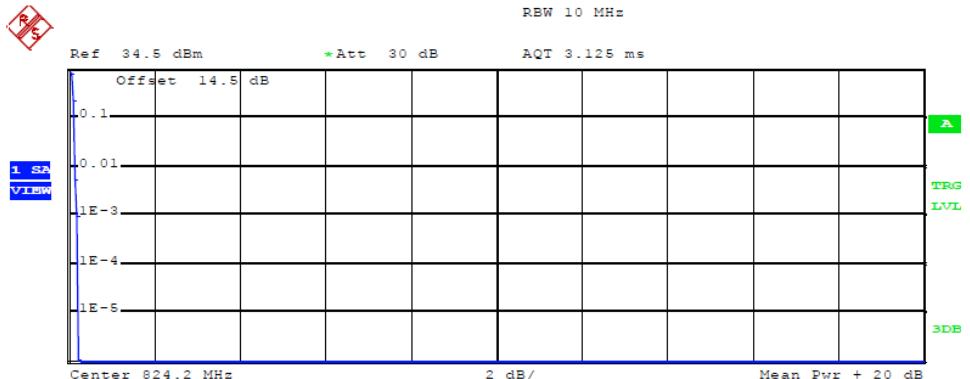
| Cellular Band | | | | | | |
|----------------------------------|--------------|--------------|---------------|--------------|--------------|---------------|
| Modes | GSM850 | | | GSM1900 | | |
| Channel | 128 (Low) | 190 (Mid) | 251 (High) | 512 (Low) | 661 (Mid) | 810 (High) |
| Frequency(MHz) | 824.2 | 836.6 | 848.8 | 1850.2 | 1880 | 1909.8 |
| Peak-to-Average Ratio (dB) | 0.20 | 0.20 | 0.16 | 2.96 | 3.04 | 2.92 |

| Cellular Band | | | | | | |
|----------------------------------|--------------|--------------|---------------|--------------|--------------|---------------|
| Modes | GPRS850 | | | GPRS1900 | | |
| Channel | 128 (Low) | 190 (Mid) | 251 (High) | 512 (Low) | 661 (Mid) | 810 (High) |
| Frequency(MHz) | 824.2 | 836.6 | 848.8 | 1850.2 | 1880 | 1909.8 |
| Peak-to-Average Ratio (dB) | 0.20 | 0.20 | 0.20 | 2.64 | 2.72 | 2.56 |

All the modulation modes and Channels have been tested, the data of the worst mode (GSM) are recorded in the following pages.

Peak-to-average power ratio plot on channel 128

GSM850



Complementary Cumulative Distribution Function (100000 samples)

Trace 1

Mean 30.85 dBm

Peak 31.06 dBm

Crest 0.21 dB

10 % 0.16 dB

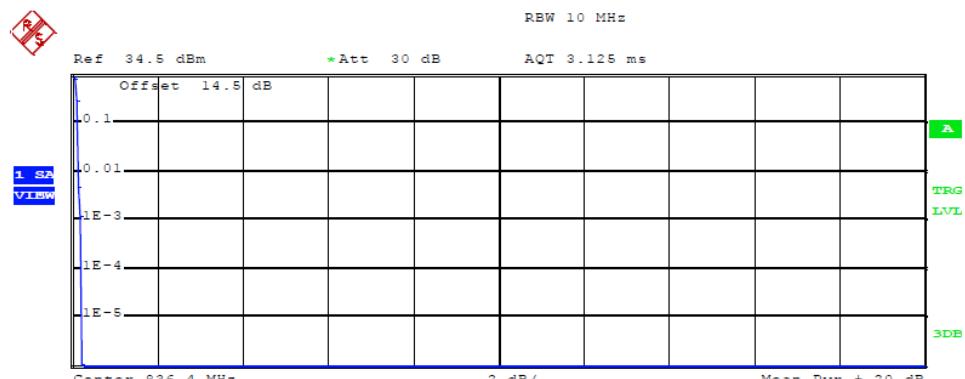
1 % 0.16 dB

.1 % 0.20 dB

.01 % 0.24 dB

Peak-to-average power ratio plot on channel 190

GSM850



Complementary Cumulative Distribution Function (100000 samples)

Trace 1

Mean 30.84 dBm

Peak 31.06 dBm

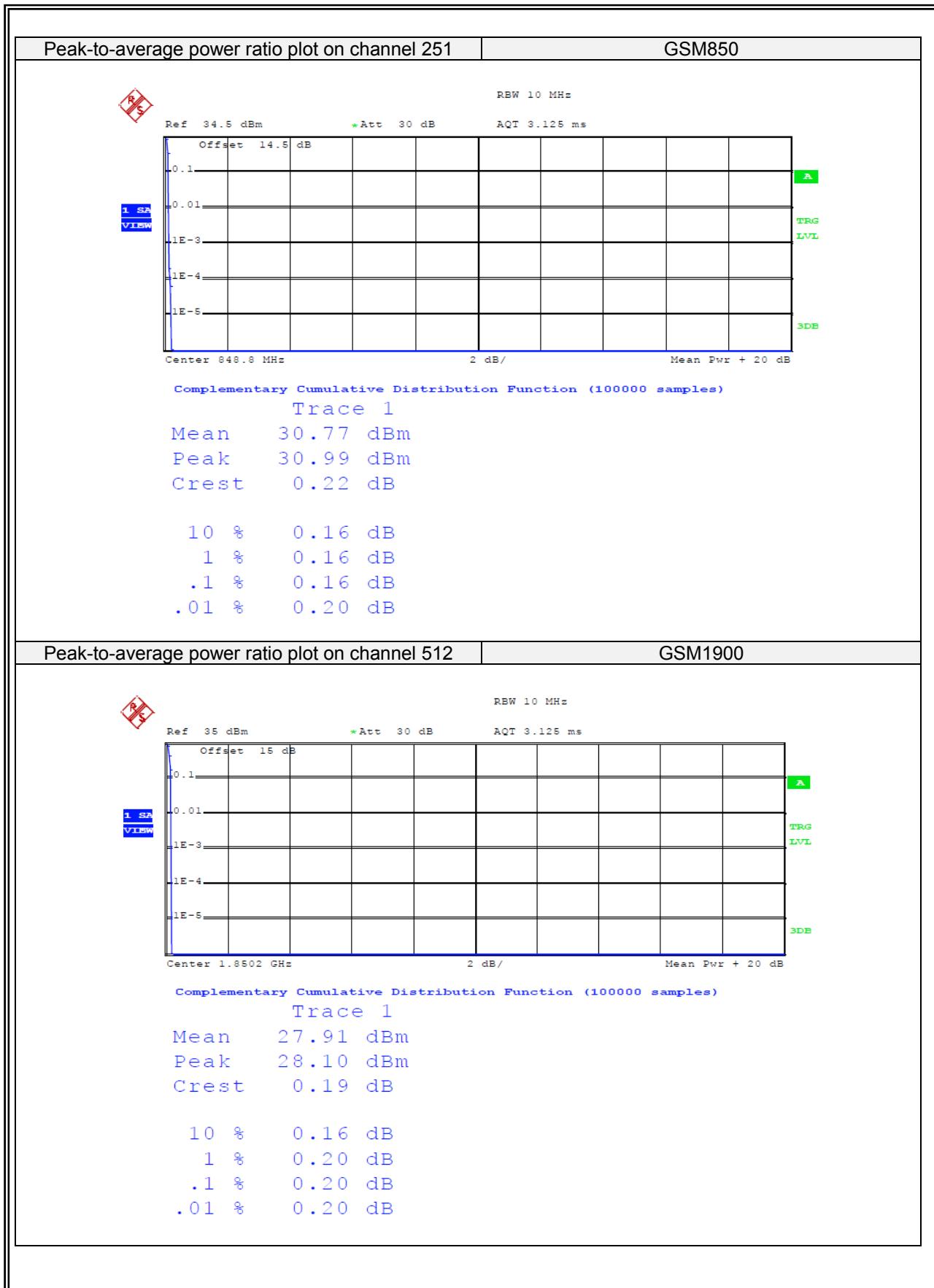
Crest 0.21 dB

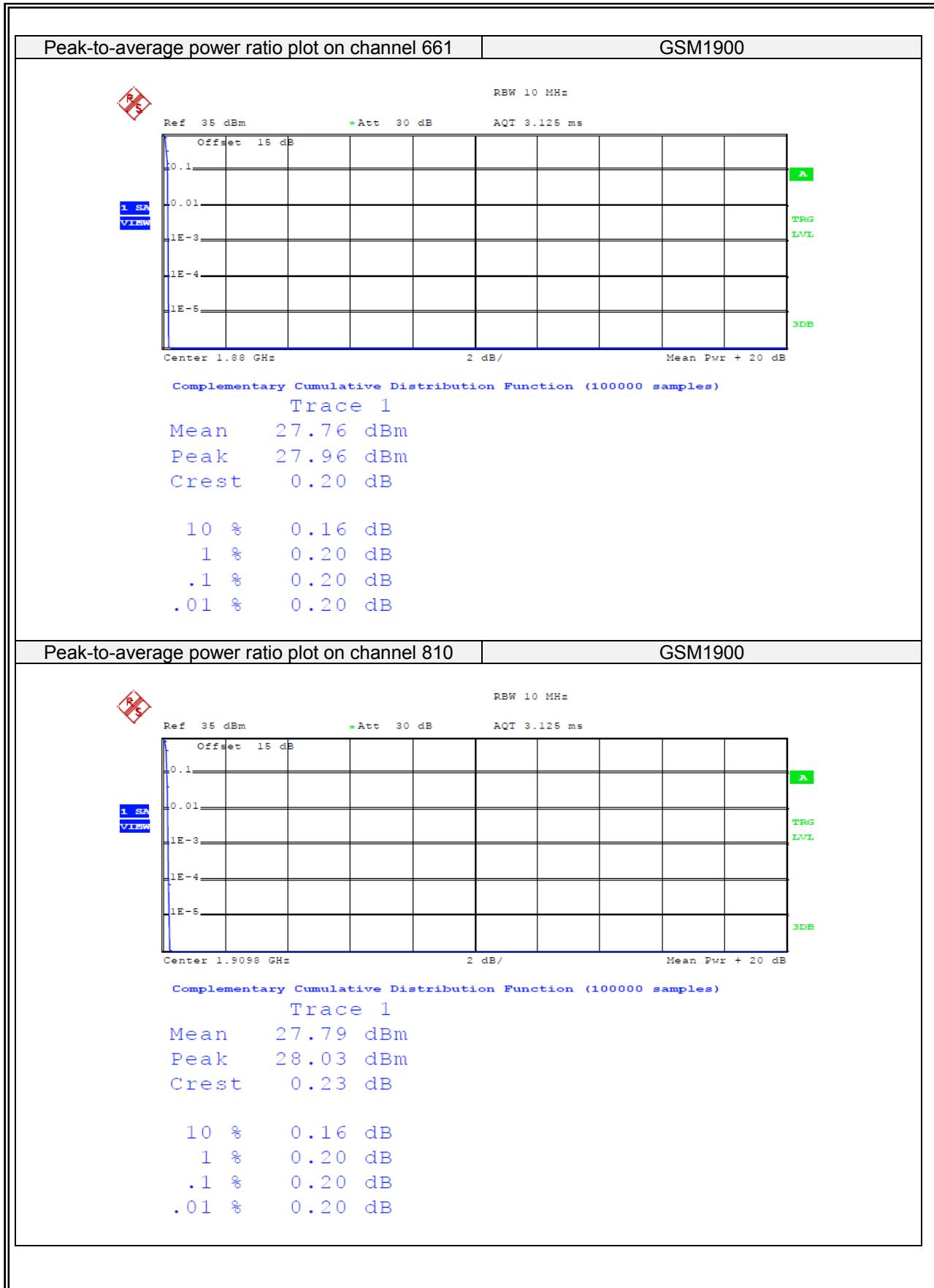
10 % 0.16 dB

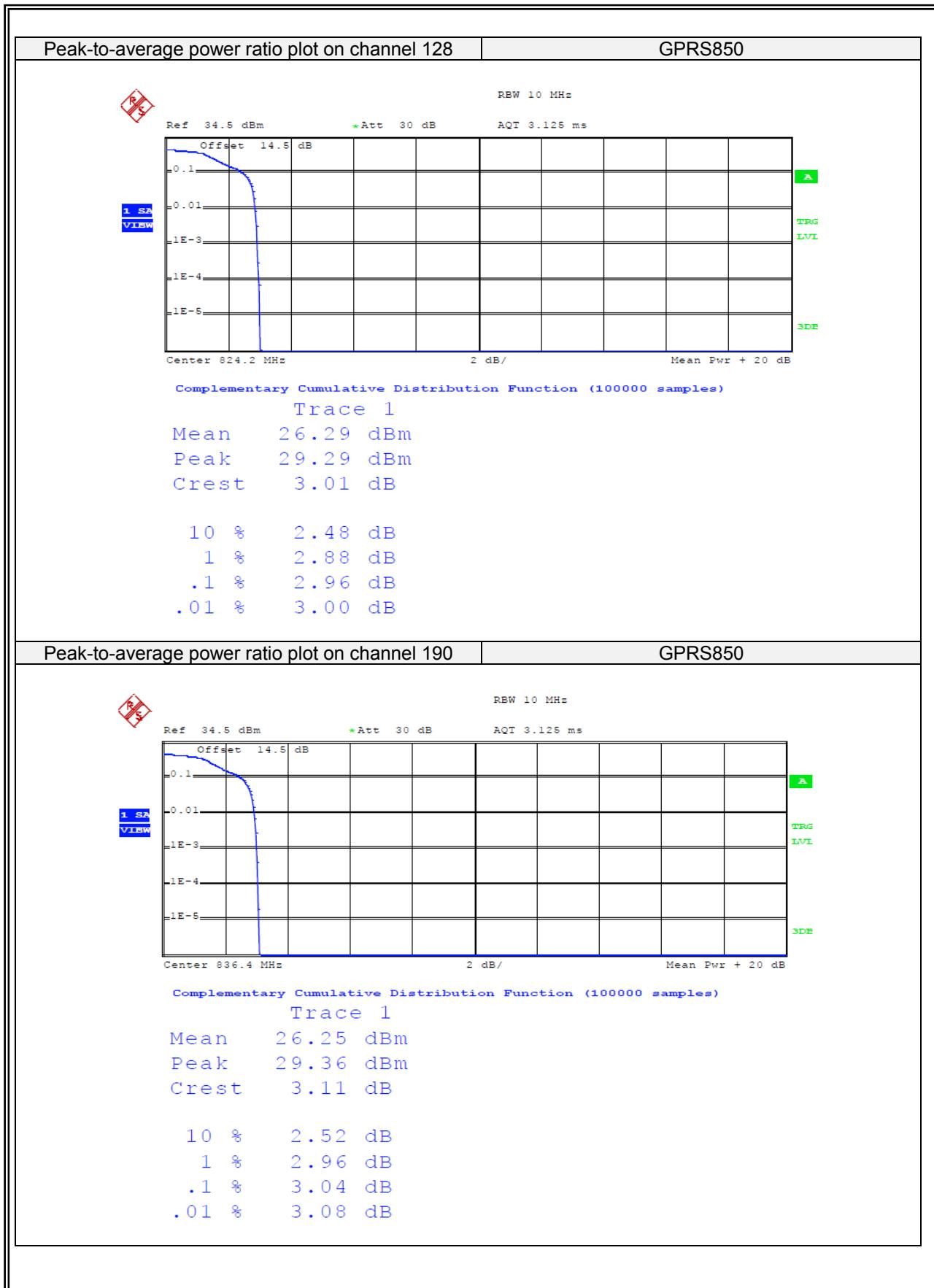
1 % 0.16 dB

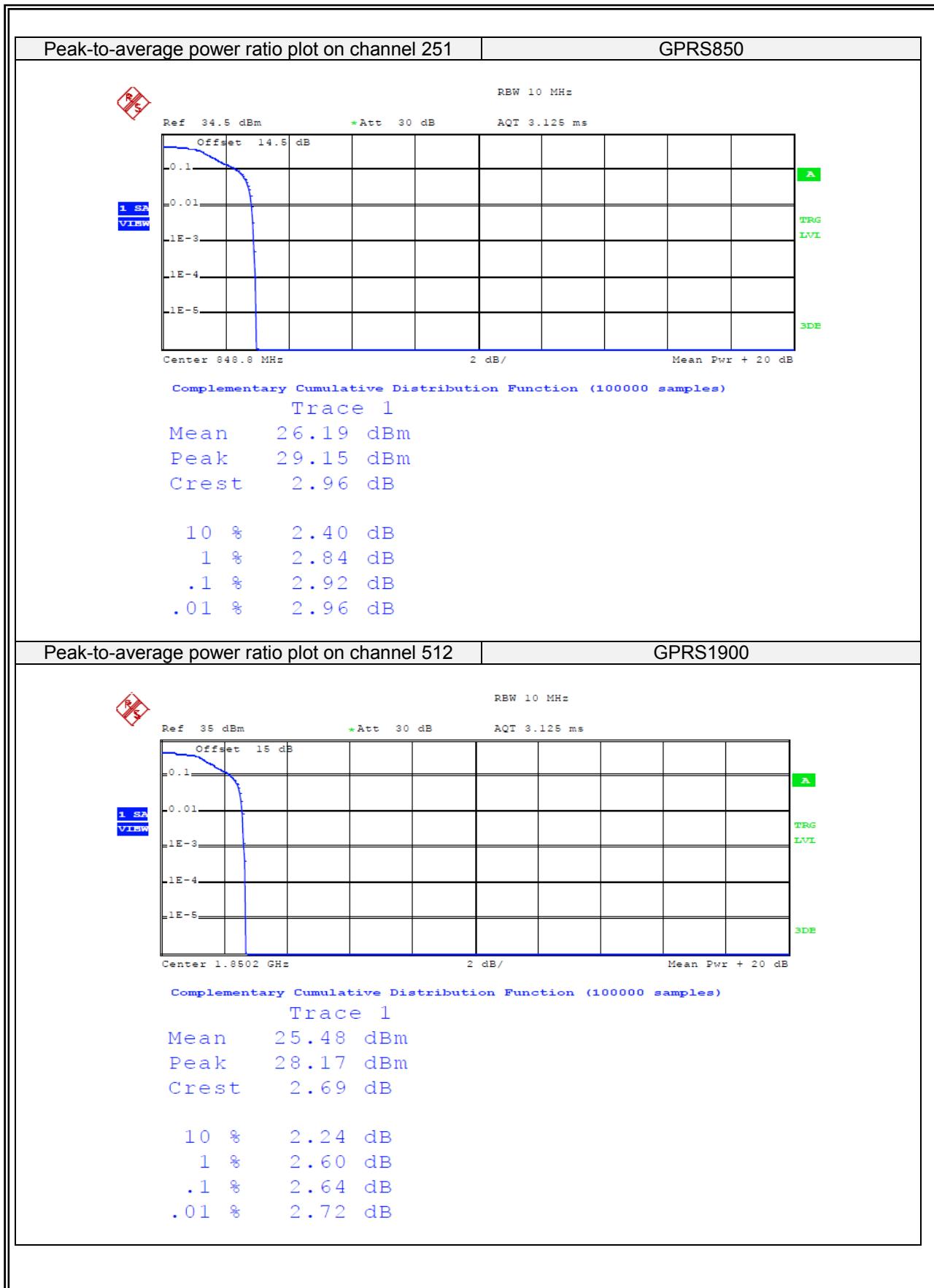
.1 % 0.20 dB

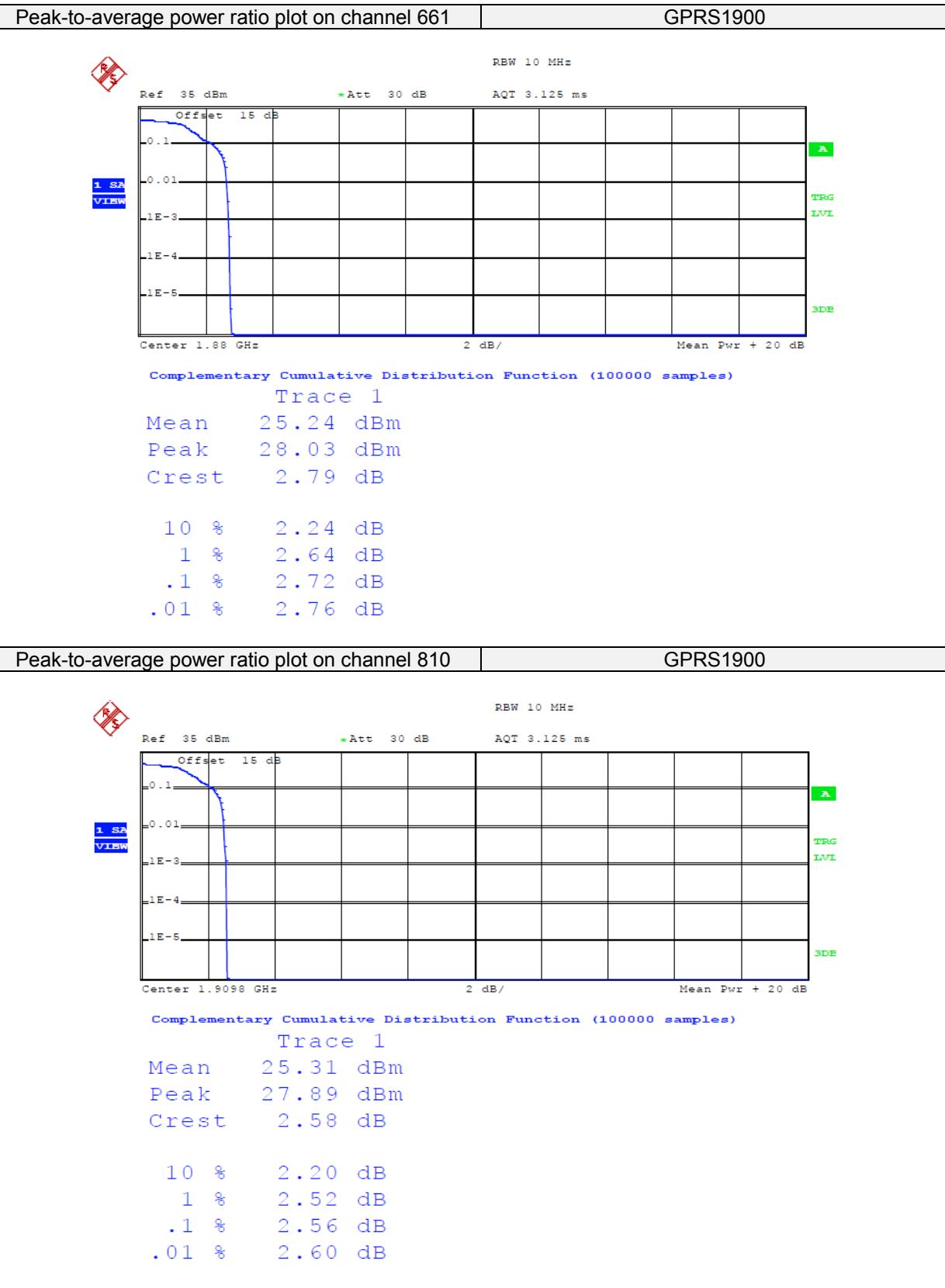
.01 % 0.24 dB











7.7 26DB BANDWIDTH AND 99% OCCUPIED BANDWIDTH

7.7.1 Applicable Standard

According to FCC Part 2.1049 and FCC Part 22H and FCC Part 24E and FCC KDB 971168 D01 Section 4.0

7.7.2 Conformance Limit

The occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean transmitted power.

The 26 dB emission bandwidth is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated 26 dB below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth equal to approximately 1.0% of the emission bandwidth.

7.7.3 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

7.7.4 Test Setup

Please refer to Section 6.1 of this test report.

7.7.5 Test Procedure

The testing follows FCC KDB 971168 v02r02 Section 4.0.

The EUT was connected to Spectrum Analyzer and Base Station via power divider.

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.

The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be between two and five times the anticipated OBW.

The nominal resolution bandwidth (RBW) shall be in the range of 1 to 5 % of the anticipated OBW, and the VBW shall be at least 3 times the RBW.

Set the detection mode to peak, and the trace mode to max hold.

Determine the reference value: Set the EUT to transmit a modulated signal. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace.

(this is the reference value)

Determine the “-26 dB down amplitude” as equal to (Reference Value – X).

Place two markers, one at the lowest and the other at the highest frequency of the envelope of the spectral display such that each marker is at or slightly below the “-X dB down amplitude” determined in step 6. If a marker is below this “-X dB down amplitude” value it shall be placed as close as possible to this value. The OBW is the positive frequency difference between the two markers.

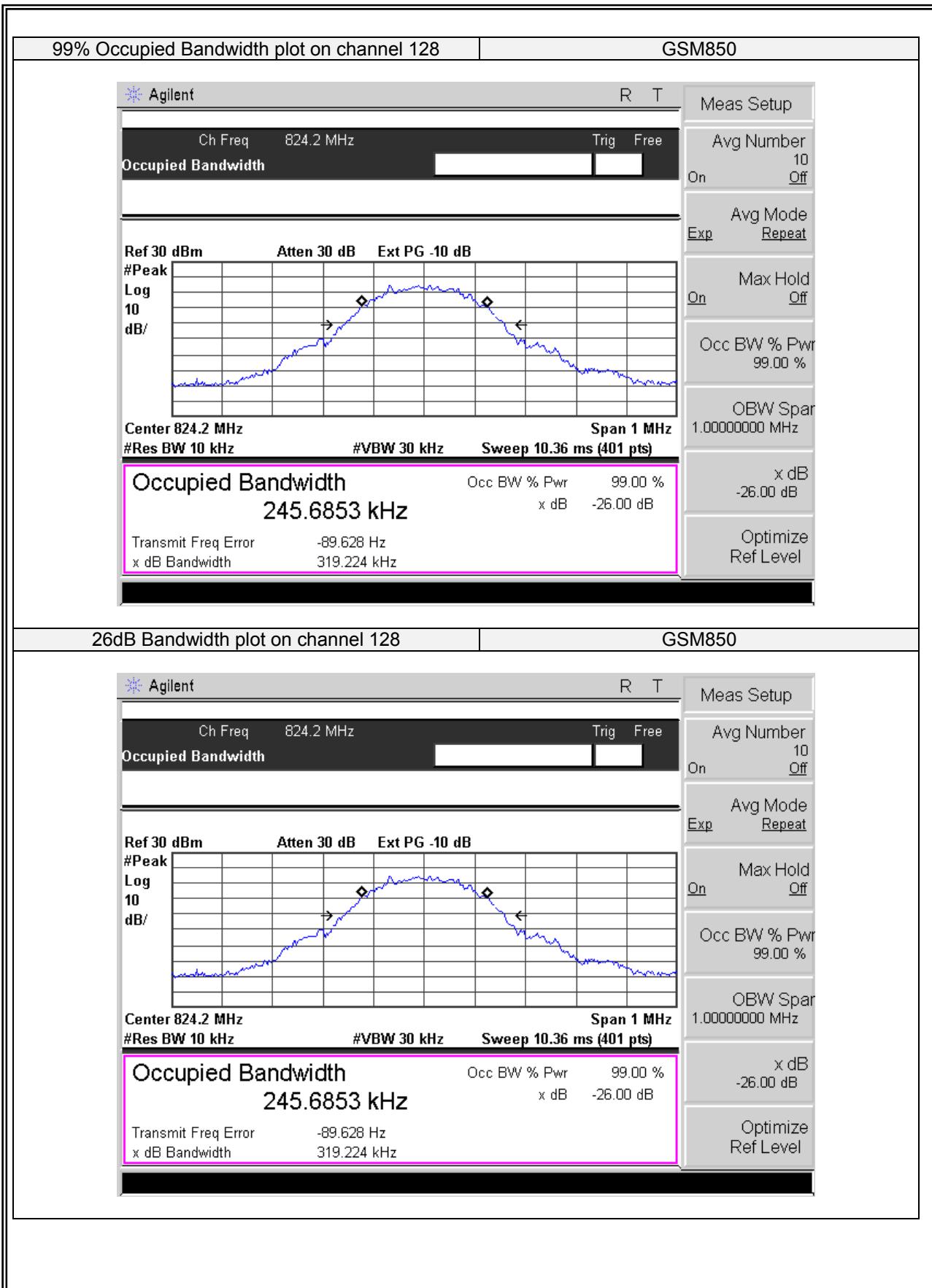
Use the 99 % power bandwidth function of the spectrum analyzer and report the measured bandwidth.

7.7.6 Test Results

| | | | |
|---------------|-------------|--------------------|-----------|
| EUT: | Smart Watch | Model No.: | BW09PRO |
| Temperature: | 20 °C | Relative Humidity: | 48% |
| Test Mode: | Mode1/Mode2 | Test By: | Allen Liu |
| Results: PASS | | | |

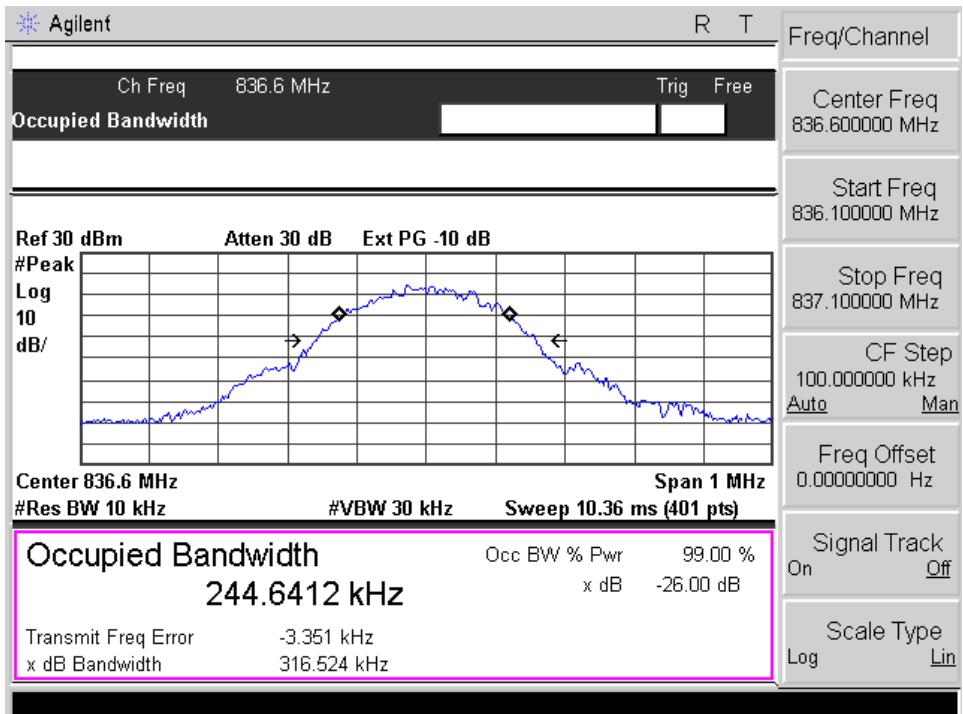
| Operation Mode | Channel Number | Channel Frequency (MHz) | 26dB Bandwidth (kHz) | 99% Occupied Bandwidth (kHz) | Limit (kHz) | Verdict |
|----------------|----------------|-------------------------|----------------------|------------------------------|-------------|---------|
| GSM850 | 128 | 824.2 | 319.224 | 245.685 | N/A | PASS |
| | 189 | 836.4 | 316.524 | 244.641 | N/A | PASS |
| | 251 | 848.8 | 316.674 | 245.879 | N/A | PASS |
| GSM1900 | 512 | 1850.2 | 321.281 | 246.630 | N/A | PASS |
| | 661 | 1880.0 | 318.757 | 246.010 | N/A | PASS |
| | 810 | 1909.8 | 330.389 | 245.025 | N/A | PASS |
| GPRS850 | 128 | 824.2 | 315.962 | 243.341 | N/A | PASS |
| | 189 | 836.4 | 315.172 | 247.324 | N/A | PASS |
| | 251 | 848.8 | 319.377 | 245.617 | N/A | PASS |
| GPRS1900 | 512 | 1850.2 | 317.672 | 243.135 | N/A | PASS |
| | 661 | 1880.0 | 320.322 | 245.665 | N/A | PASS |
| | 810 | 1909.8 | 321.412 | 249.592 | N/A | PASS |

All the modulation modes and Channels have been tested, the data of the worst mode (GSM) are recorded in the following pages.



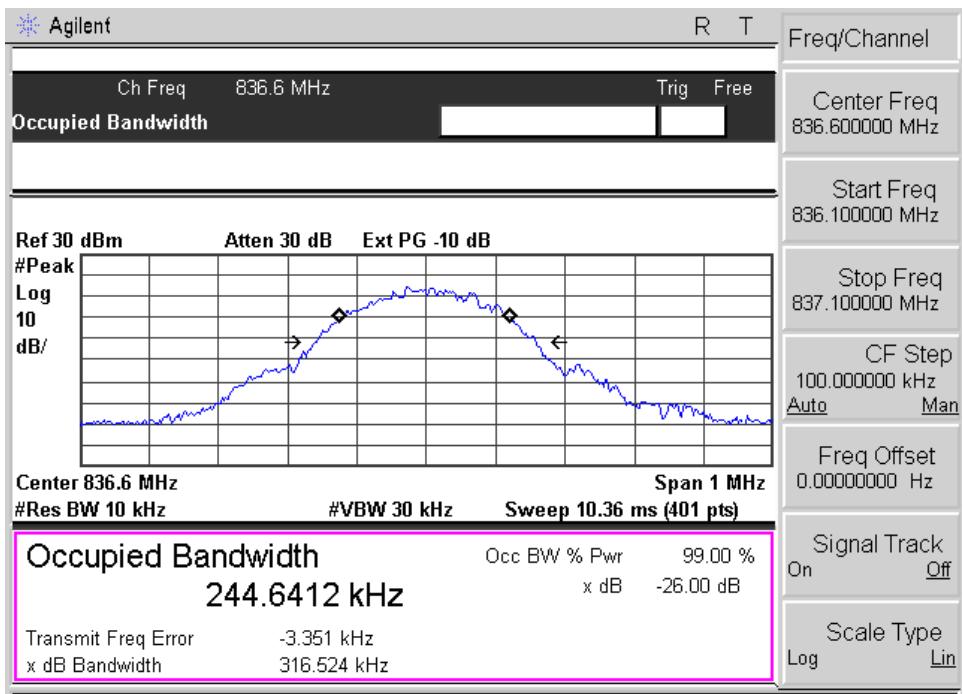
99% Occupied Bandwidth plot on channel 190

GSM850



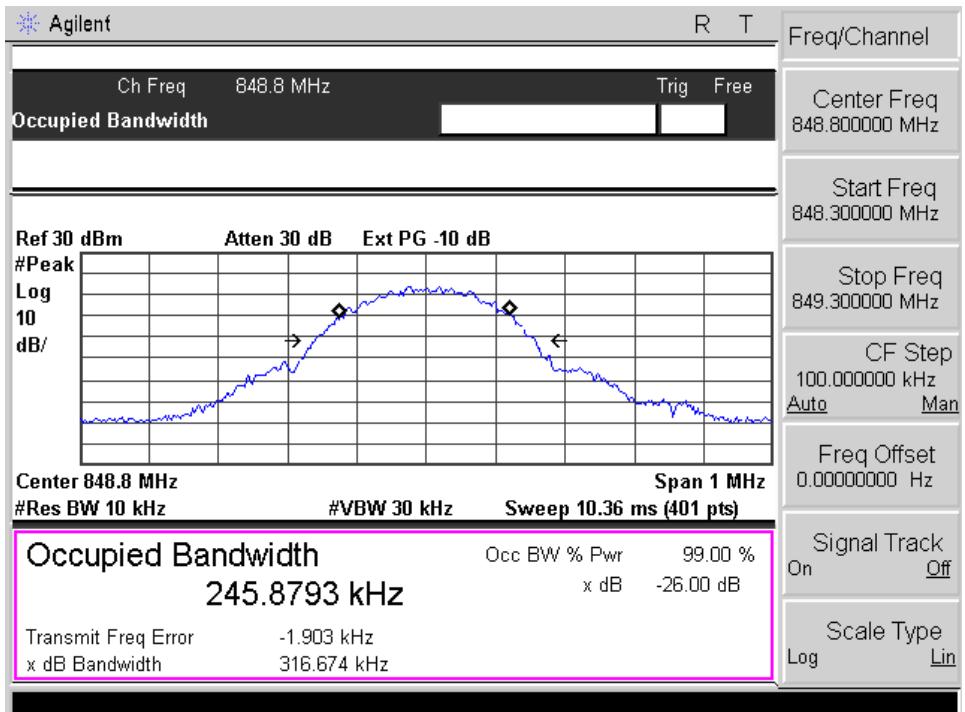
26dB Bandwidth plot on channel 190

GSM850



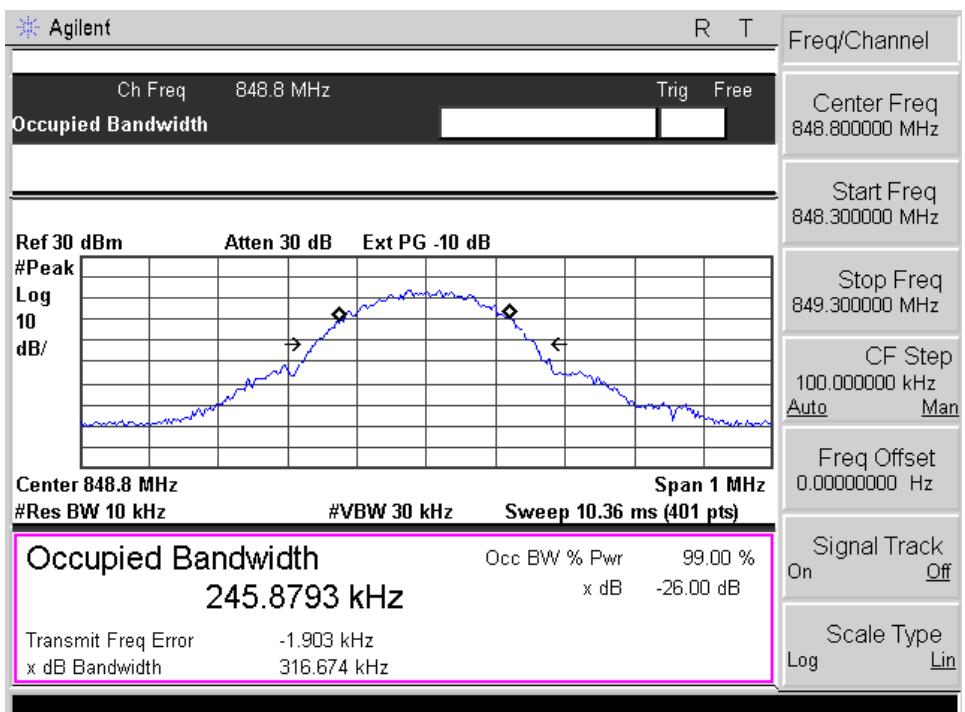
99% Occupied Bandwidth plot on channel 251

GSM850



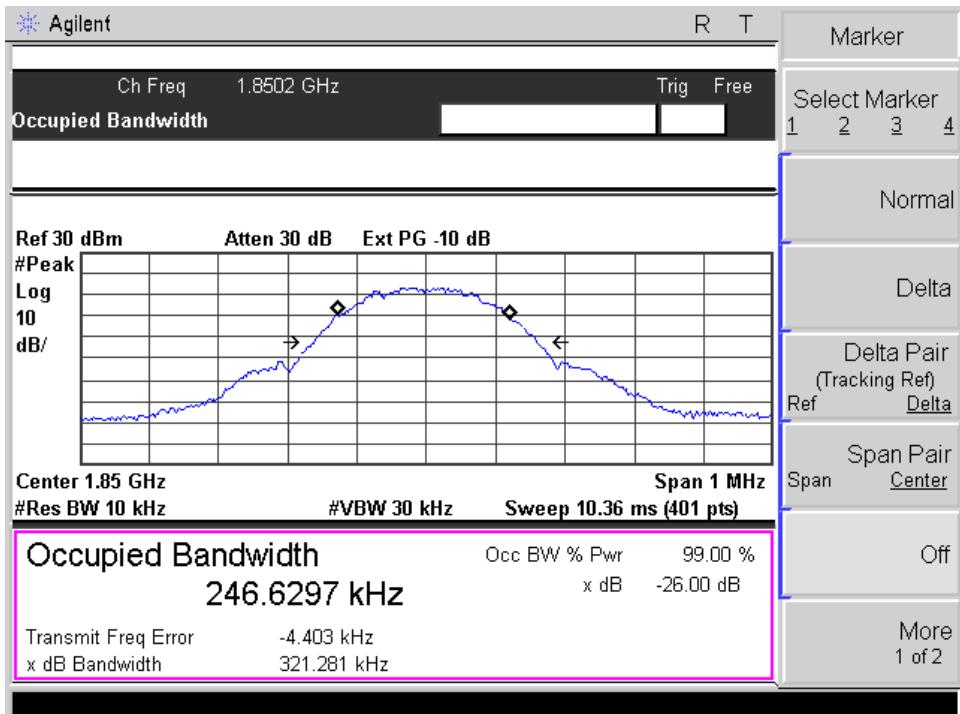
26dB Bandwidth plot on channel 251

GSM850



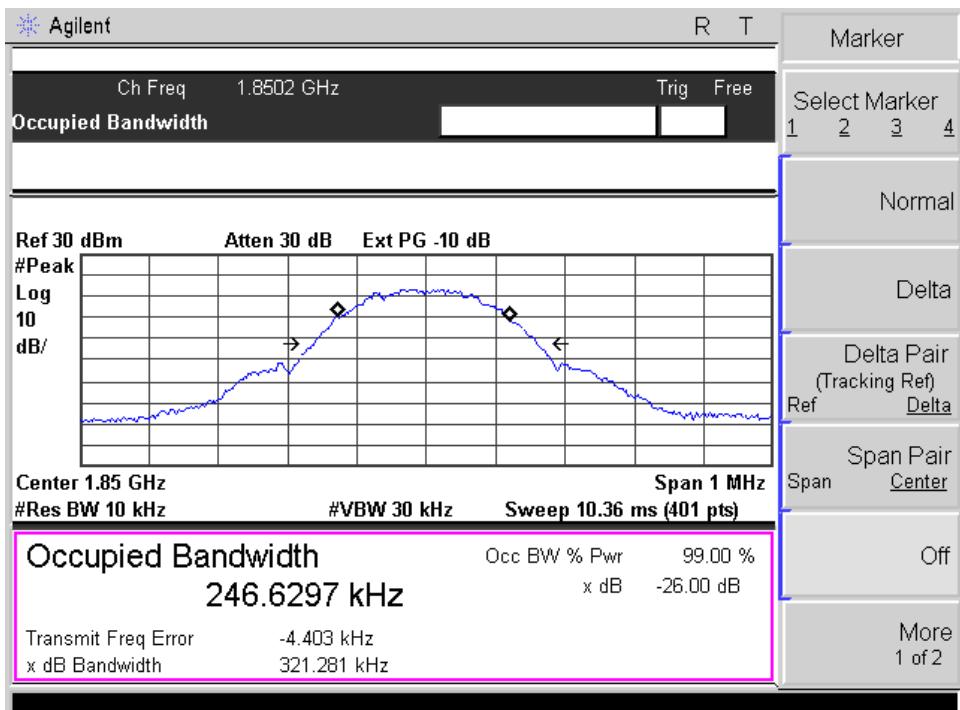
99% Occupied Bandwidth plot on channel 512

GSM1900



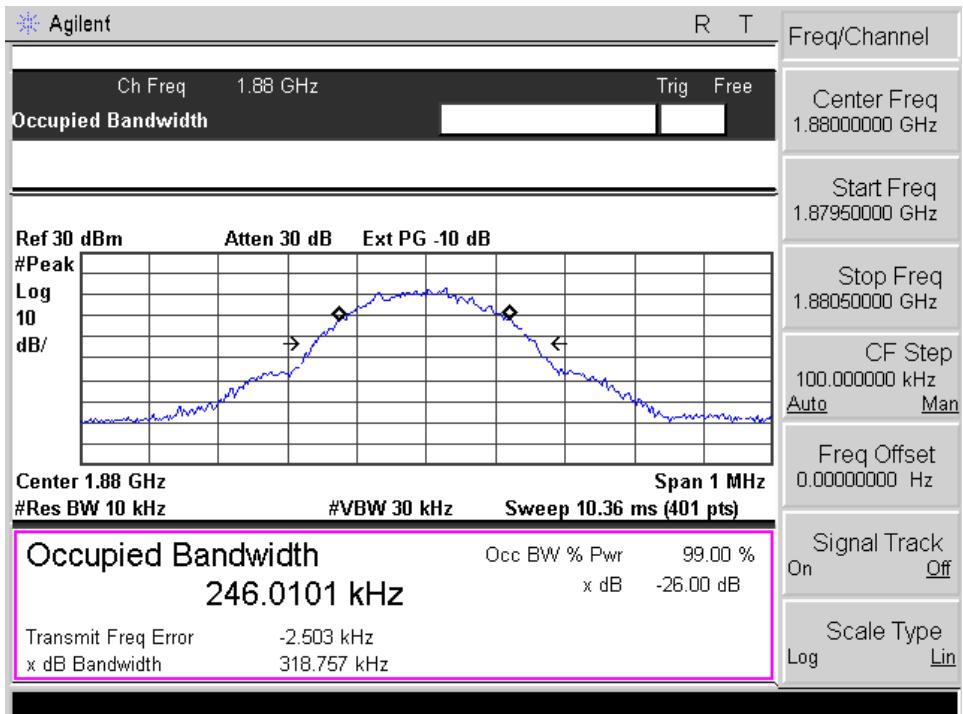
26dB Bandwidth plot on channel 512

GSM1900



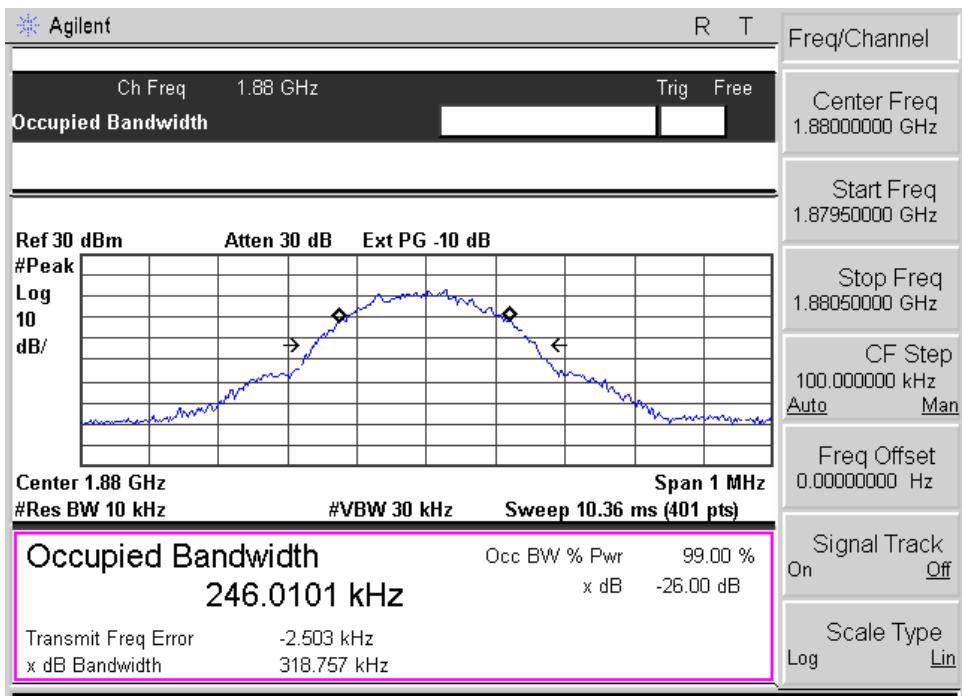
99% Occupied Bandwidth plot on channel 661

GSM1900



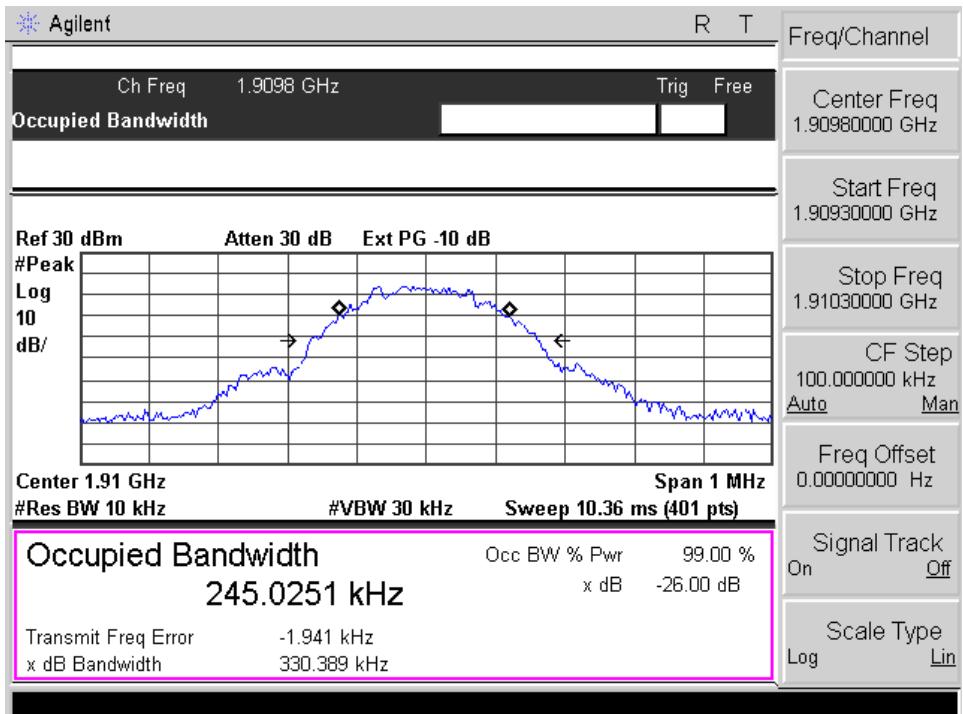
26dB Bandwidth plot on channel 661

GSM1900



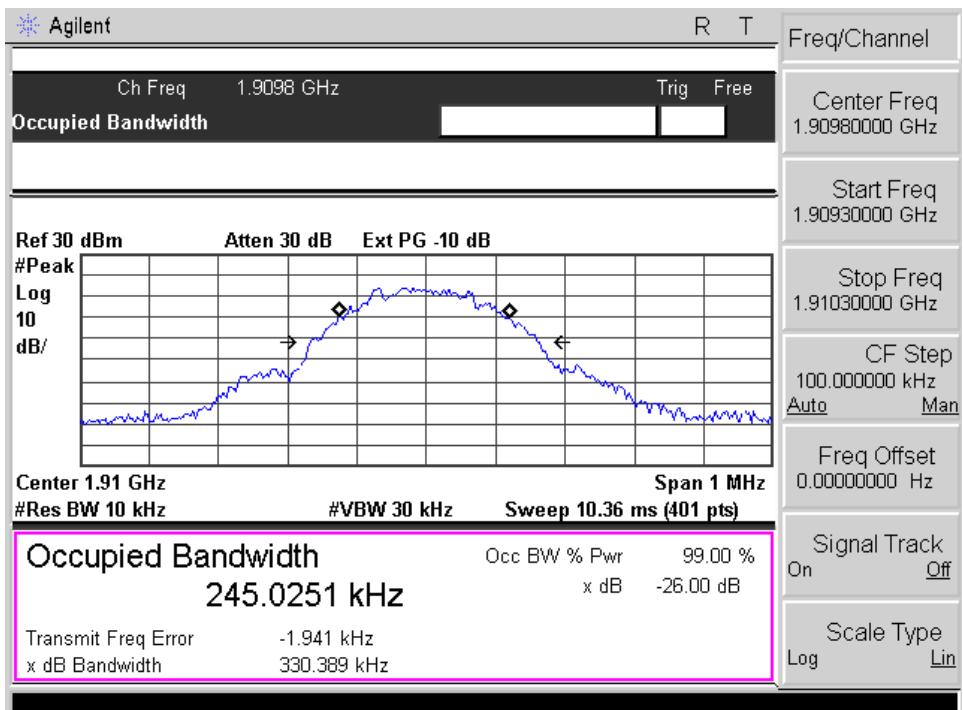
99% Occupied Bandwidth plot on channel 810

GSM1900



26dB Bandwidth plot on channel 810

GSM1900



7.8 CONDUCTED BAND EDGE

7.8.1 Applicable Standard

According to FCC Part 2.1051 and FCC Part 22.917(a) and 24.238(a) and FCC KDB 971168 D01 Section6.0

7.8.2 Conformance Limit

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.

7.8.3 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

7.8.4 Test Setup

Please refer to Section 6.1 of this test report.

7.8.5 Test Procedure

The testing follows FCC KDB 971168 v02r02 Section 6.0.

The EUT was connected to Spectrum Analyzer and Base Station via power divider.

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.

The path loss was compensated to the results for each measurement.

The band edges of low and high channels for the highest RF powers were measured.

The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)

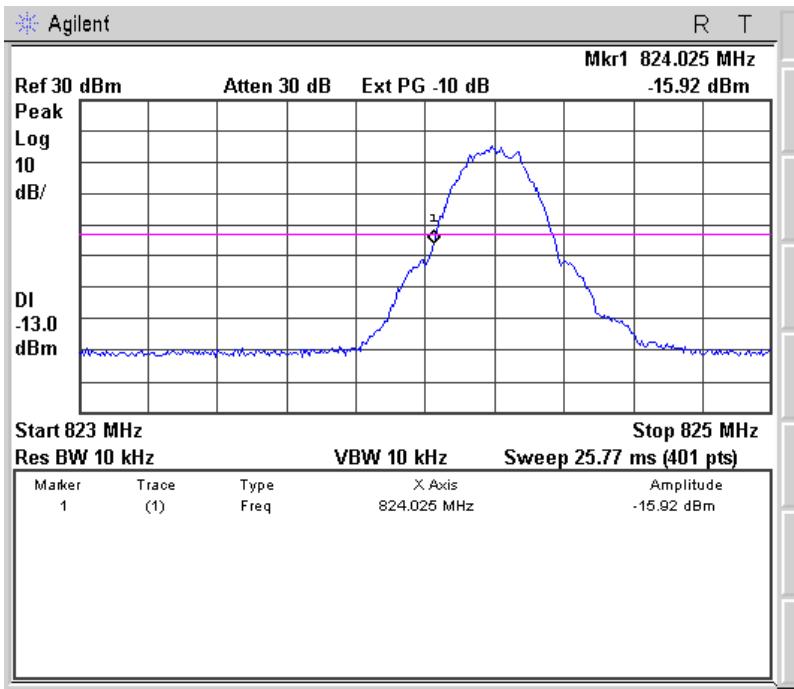
$$\begin{aligned} &= P(W) - [43 + 10\log(P)] \text{ (dB)} \\ &= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)} \\ &= -13 \text{ dBm.} \end{aligned}$$

7.8.6 Test Results

| | | | |
|---------------|-------------|--------------------|-----------|
| EUT: | Smart Watch | Model No.: | BW09PRO |
| Temperature: | 20 °C | Relative Humidity: | 48% |
| Test Mode: | Mode1/Mode2 | Test By: | Allen Liu |
| Results: PASS | | | |

Conducted Band Edge plot on channel 128

GSM850



Peak Search

Meas Tools ▾

Next Peak

Next Pk Right

Next Pk Left

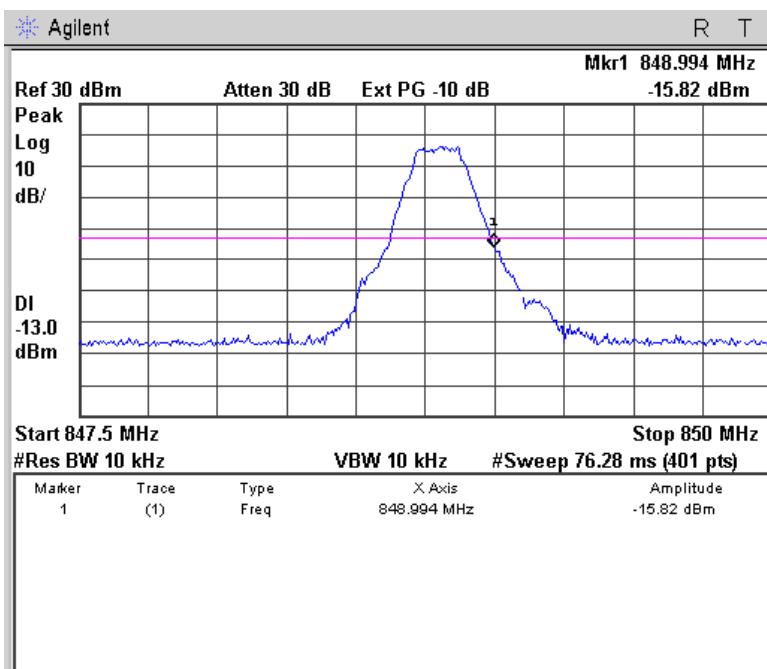
Min Search

Pk-Pk Search

More
1 of 2

Conducted Band Edge plot on channel 251

GSM850



Peak Search

Meas Tools ▾

Next Peak

Next Pk Right

Next Pk Left

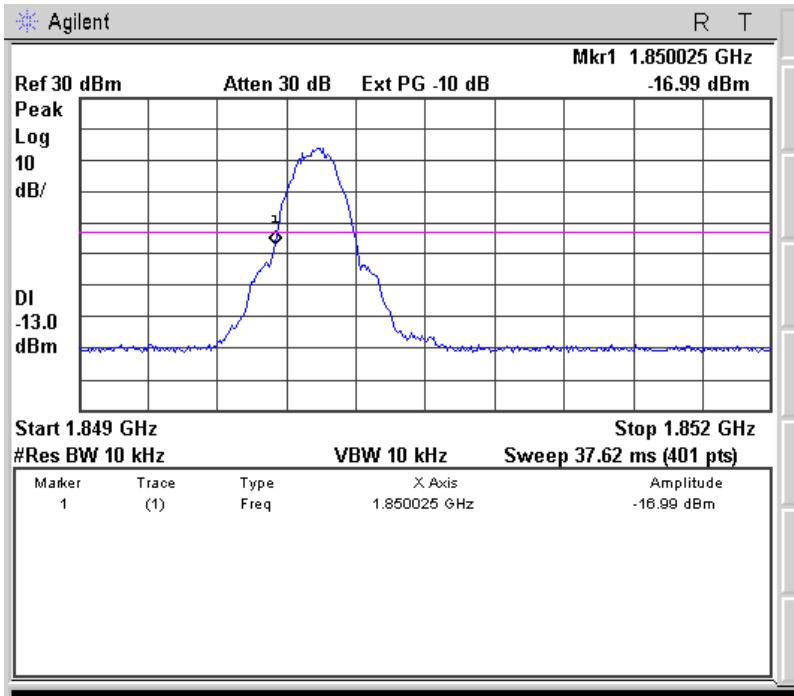
Min Search

Pk-Pk Search

More
1 of 2

Conducted Band Edge plot on channel 512

GSM1900



Peak Search

Meas Tools ▾

Next Peak

Next Pk Right

Next Pk Left

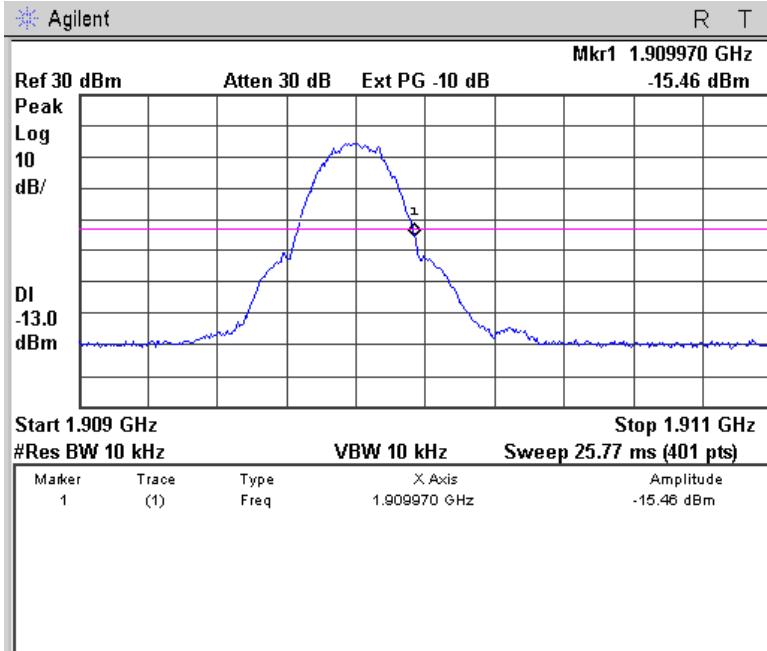
Min Search

Pk-Pk Search

More
1 of 2

Conducted Band Edge plot on channel 810

GSM1900



Peak Search

Meas Tools ▾

Next Peak

Next Pk Right

Next Pk Left

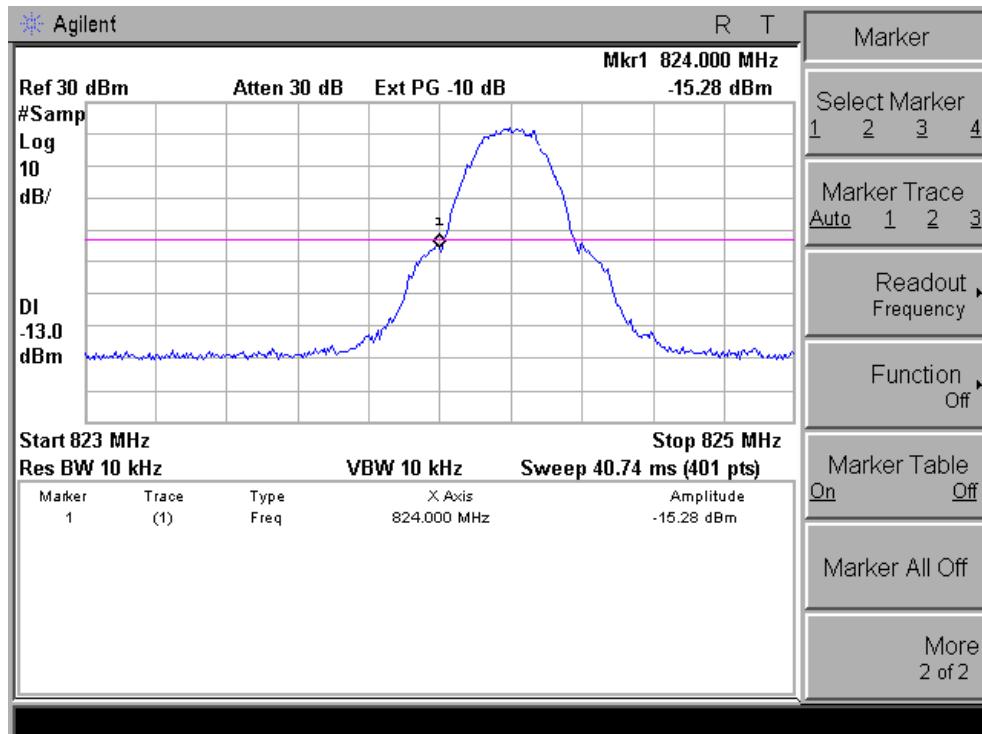
Min Search

Pk-Pk Search

More
1 of 2

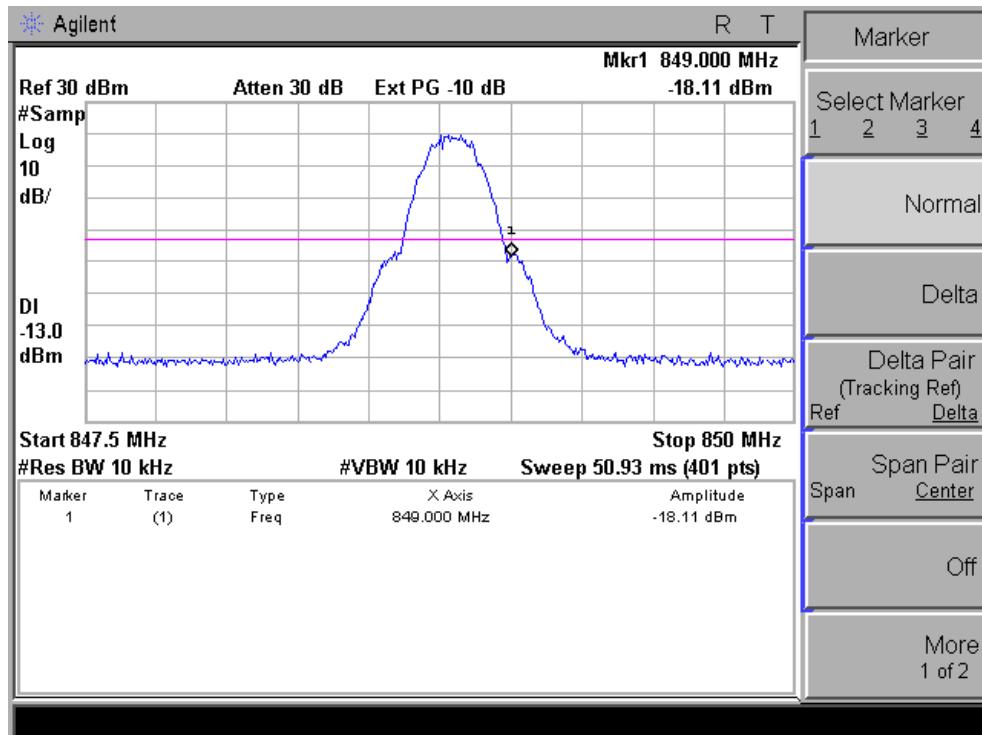
Conducted Band Edge plot on channel 128

GPRS850



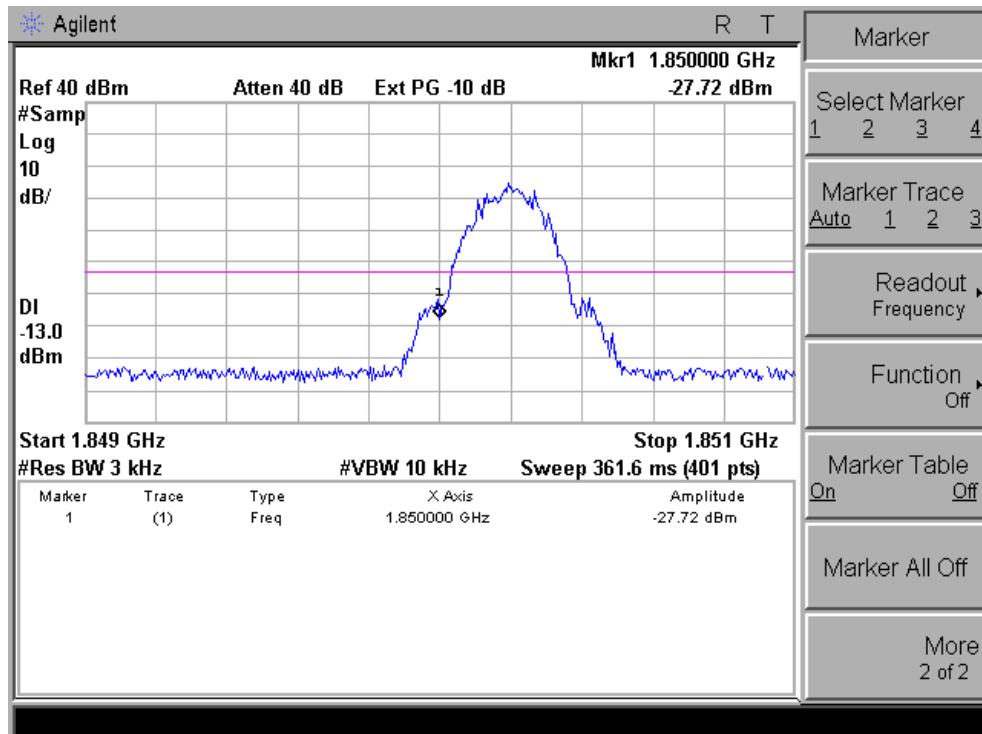
Conducted Band Edge plot on channel 251

GPRS850



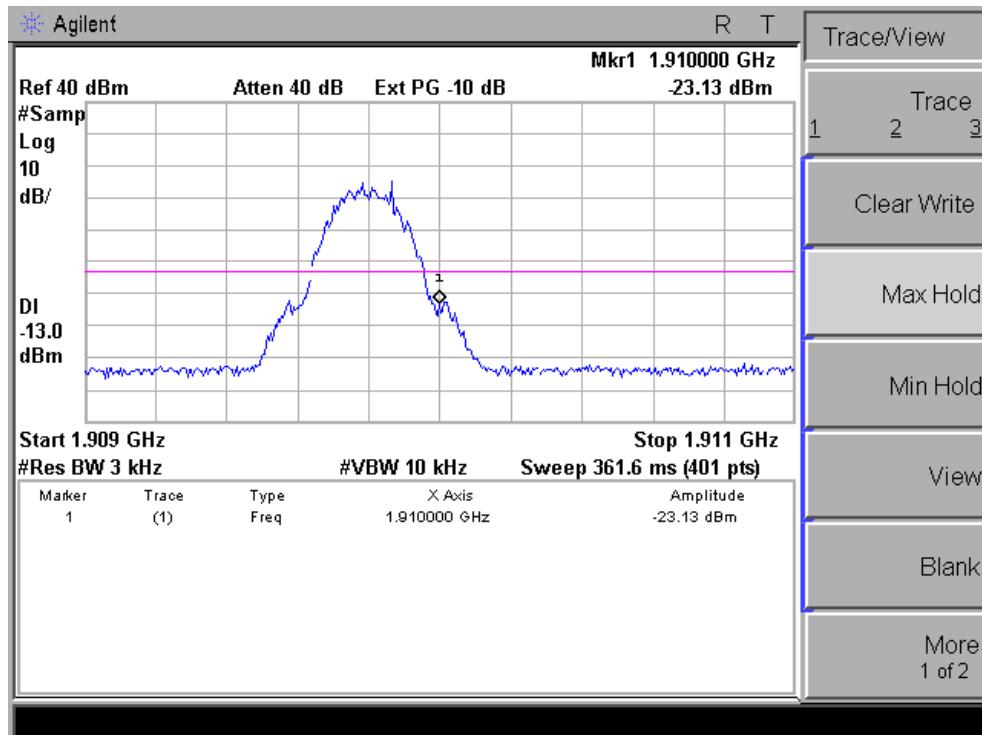
Conducted Band Edge plot on channel 512

GPRS1900



Conducted Band Edge plot on channel 810

GPRS1900



7.9 CONDUCTED SPURIOUS EMISSION AT ANTENNA TERMINAL

7.9.1 Applicable Standard

According to FCC Part 2.1051 and FCC Part 22.917(a) and Part 24.238(a) and FCC KDB 971168 D01 Section6.0

7.9.2 Conformance Limit

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.

It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th harmonic.

7.9.3 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

7.9.4 Test Setup

Please refer to Section 6.1 of this test report.

7.9.5 Test Procedure

The testing follows FCC KDB 971168 v02r02 Section 6.0.

The EUT was connected to Spectrum Analyzer and Base Station via power divider.

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.

The path loss was compensated to the results for each measurement.

The middle channel for the highest RF power within the transmitting frequency was measured.

The conducted spurious emission for the whole frequency range was taken.

The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)

$$= P(W) - [43 + 10\log(P)] \text{ (dB)}$$

$$= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$$

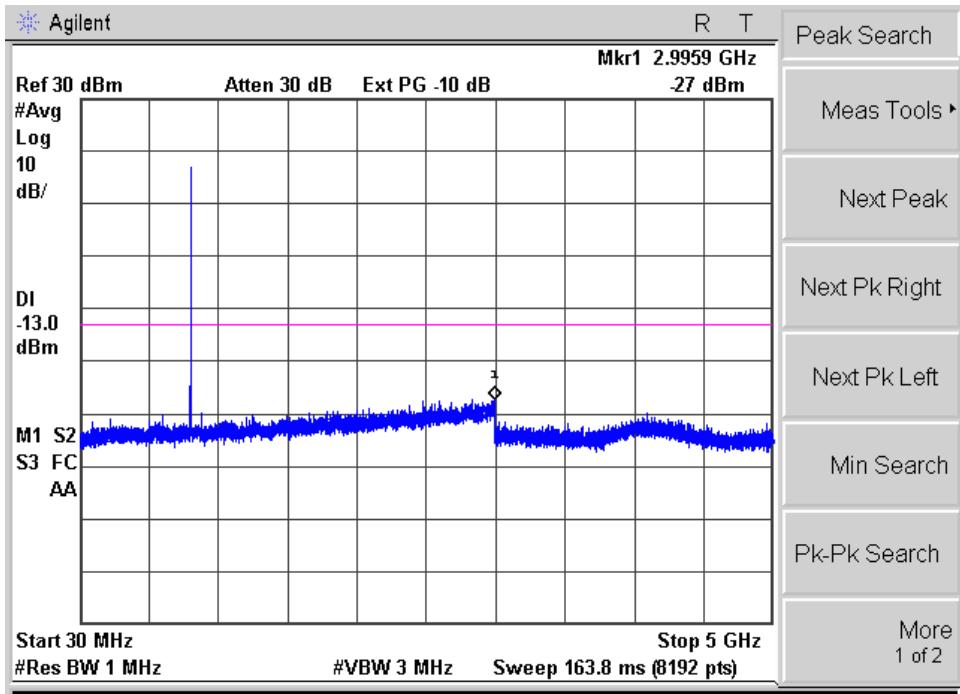
$$= -13 \text{ dBm.}$$

7.9.6 Test Results

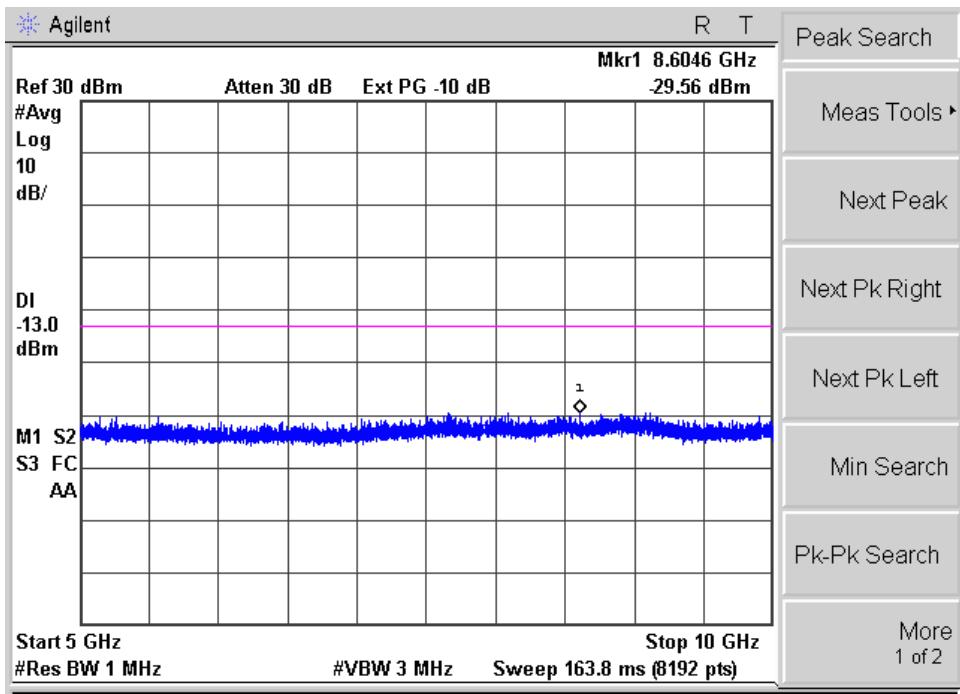
| | | | |
|---------------|-------------|--------------------|-----------|
| EUT: | Smart Watch | Model No.: | BW09PRO |
| Temperature: | 20 °C | Relative Humidity: | 48% |
| Test Mode: | Mode1/Mode2 | Test By: | Allen Liu |
| Results: PASS | | | |

All the modulation modes and Channels have been tested, the data of the worst mode (GSM) are recorded in the following pages.

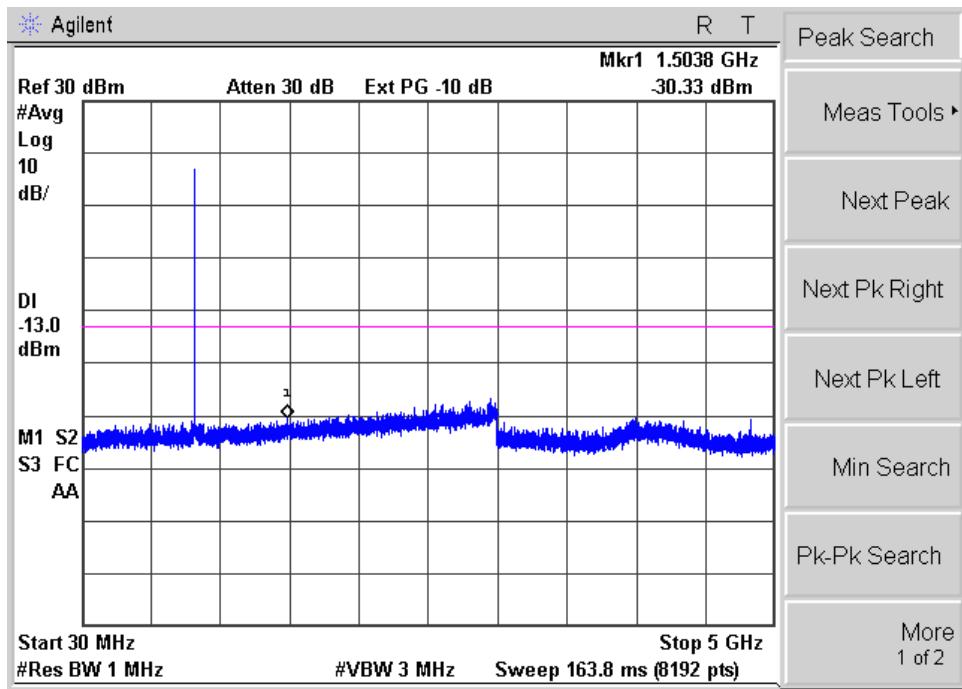
Conducted Emission Transmitting Mode CH 128 30MHz – 5GHz



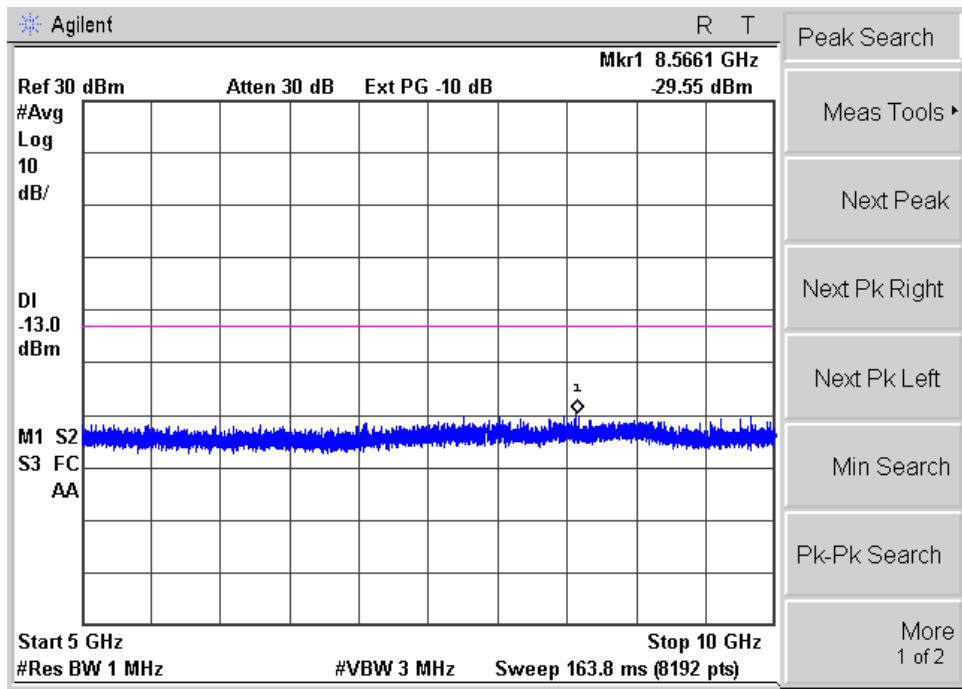
Conducted Emission Transmitting Mode CH 128 5GHz – 10GHz



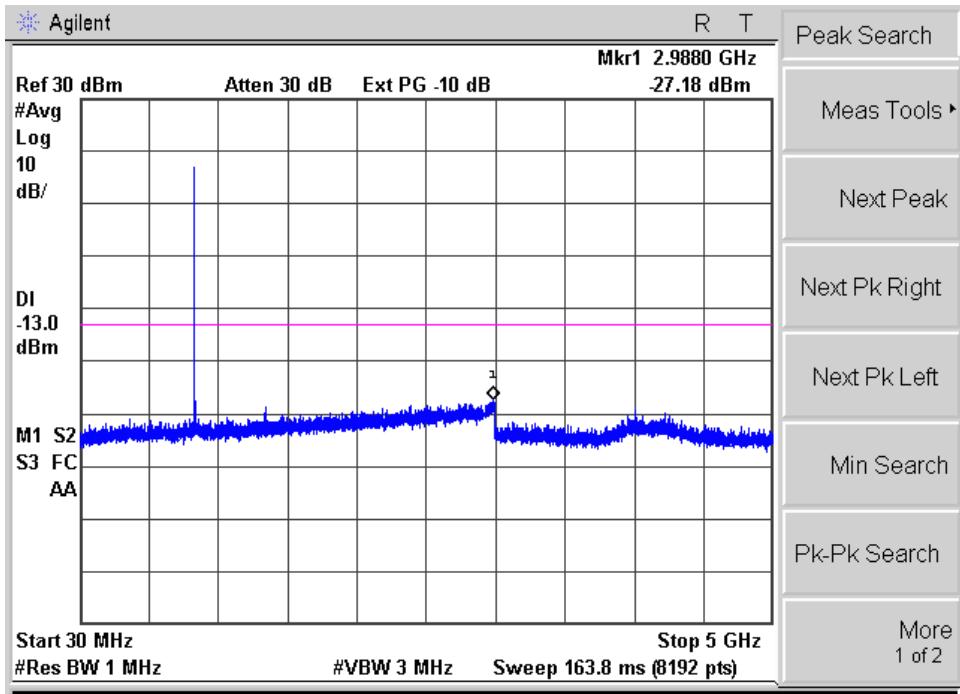
Conducted Emission Transmitting Mode CH 190 30MHz – 5GHz



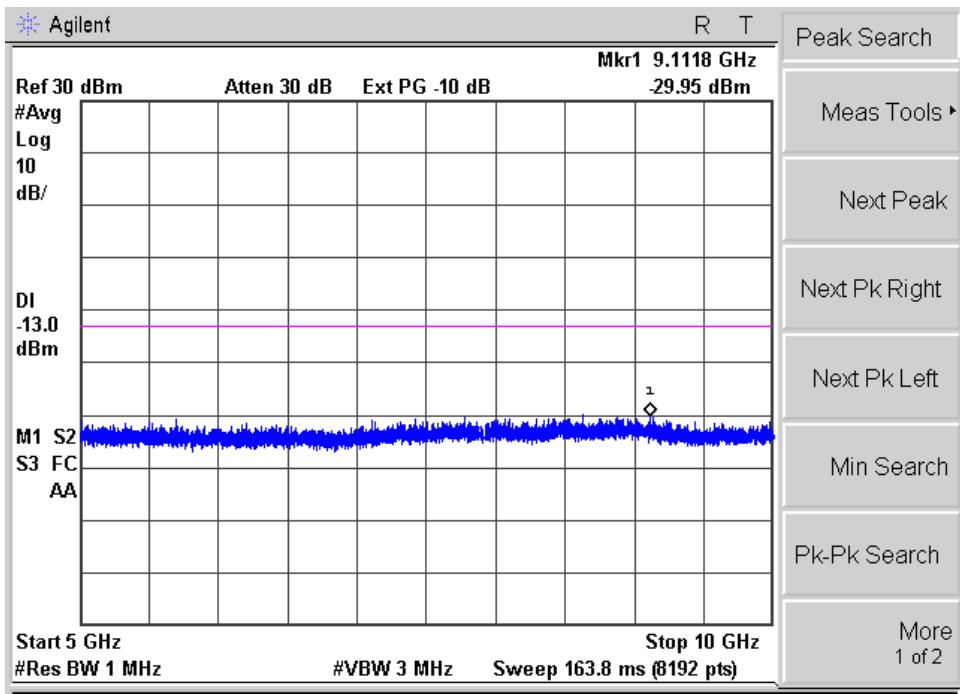
Conducted Emission Transmitting Mode CH 190 5GHz – 10GHz



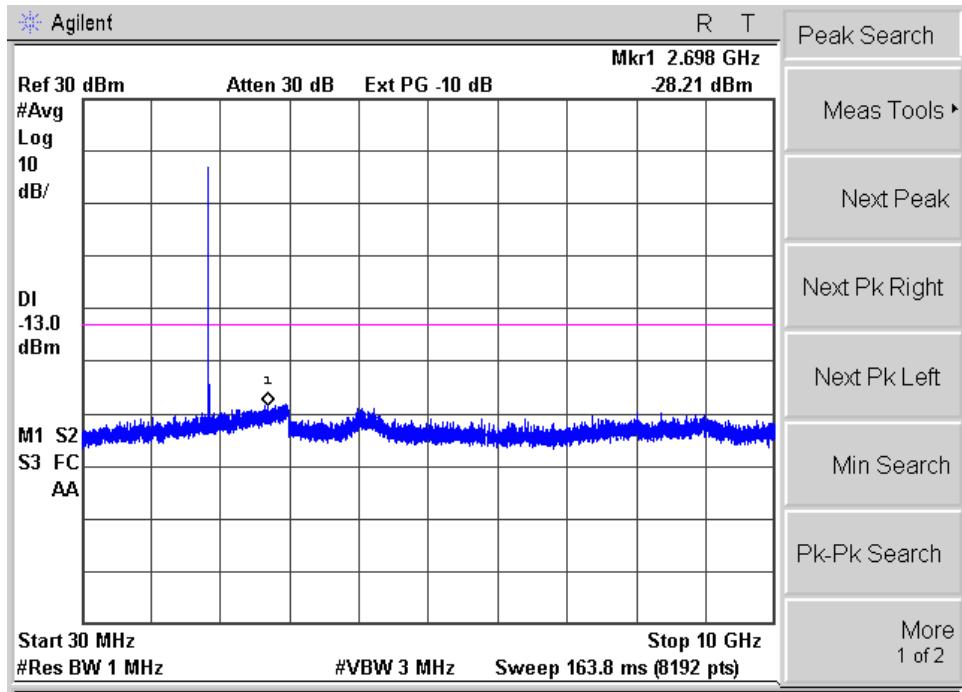
Conducted Emission Transmitting Mode CH 251 30MHz – 5GHz



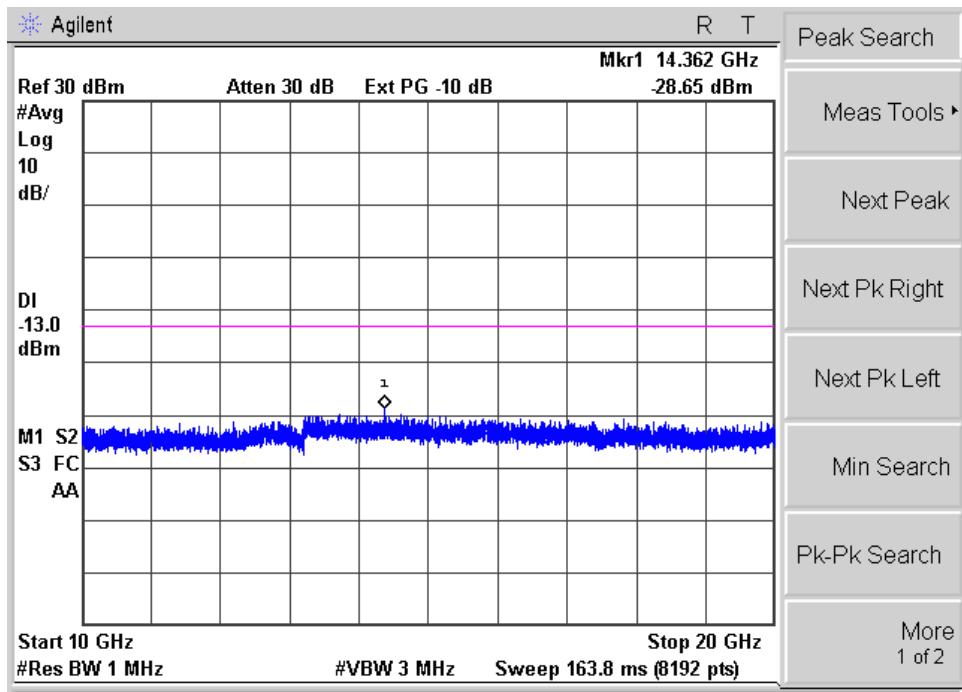
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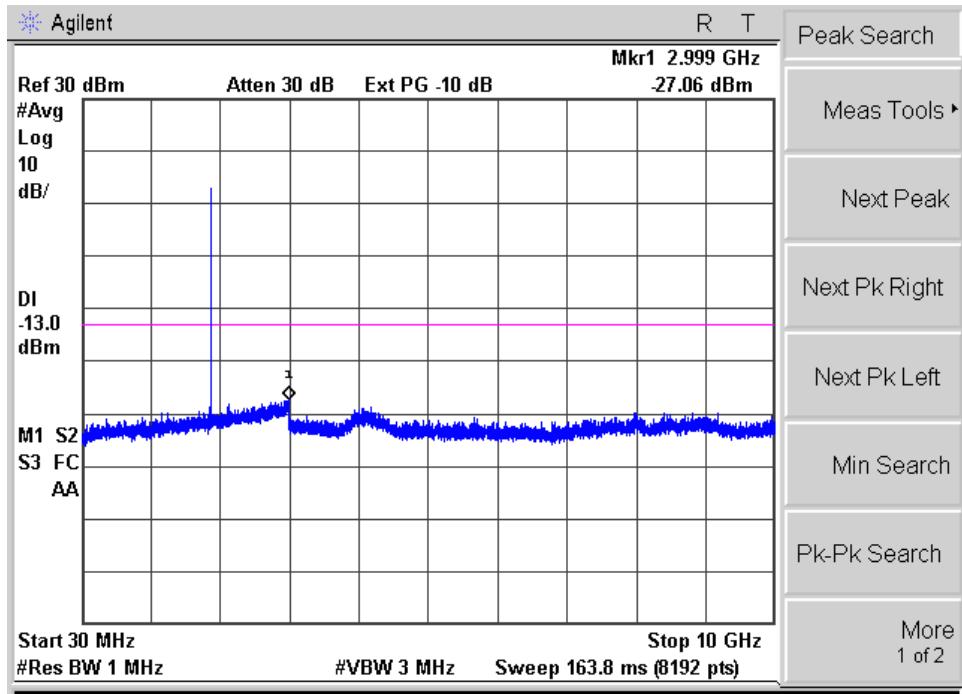
Conducted Emission Transmitting Mode CH 512 30MHz – 10GHz



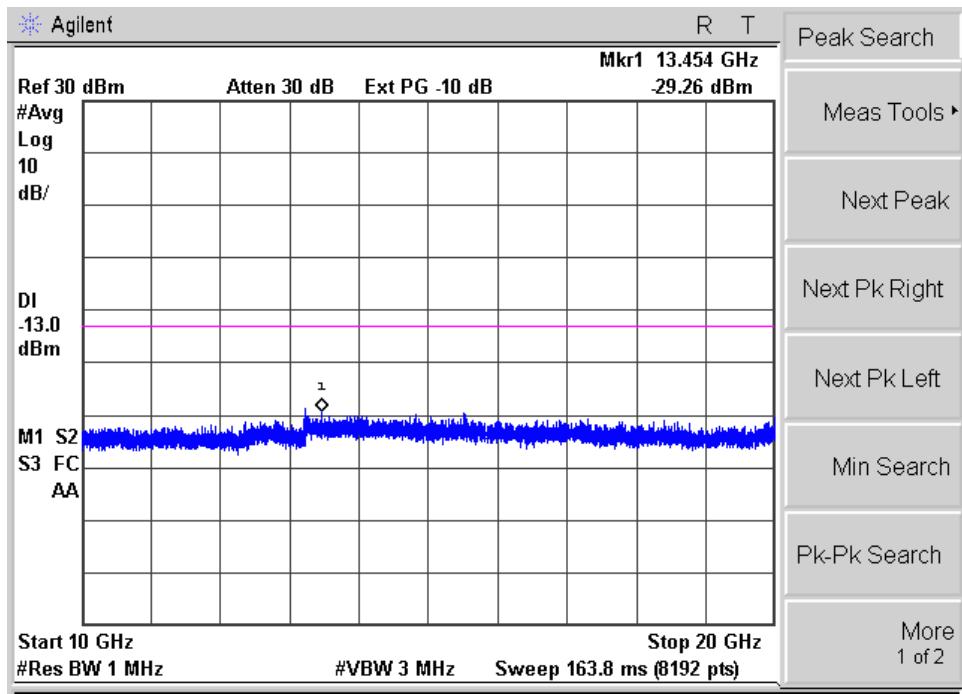
Conducted Emission Transmitting Mode CH 512 10GHz – 20GHz



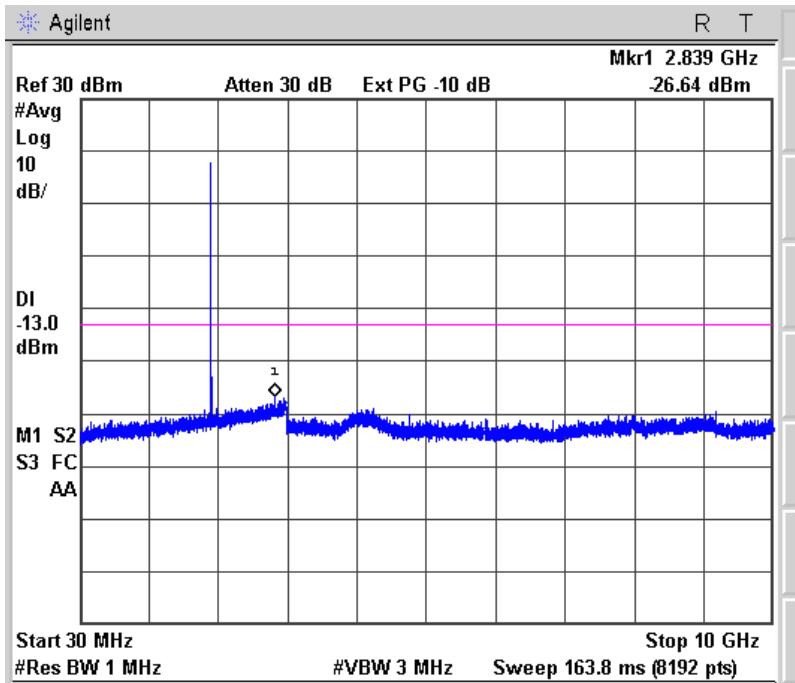
Conducted Emission Transmitting Mode CH 661 30MHz – 10GHz



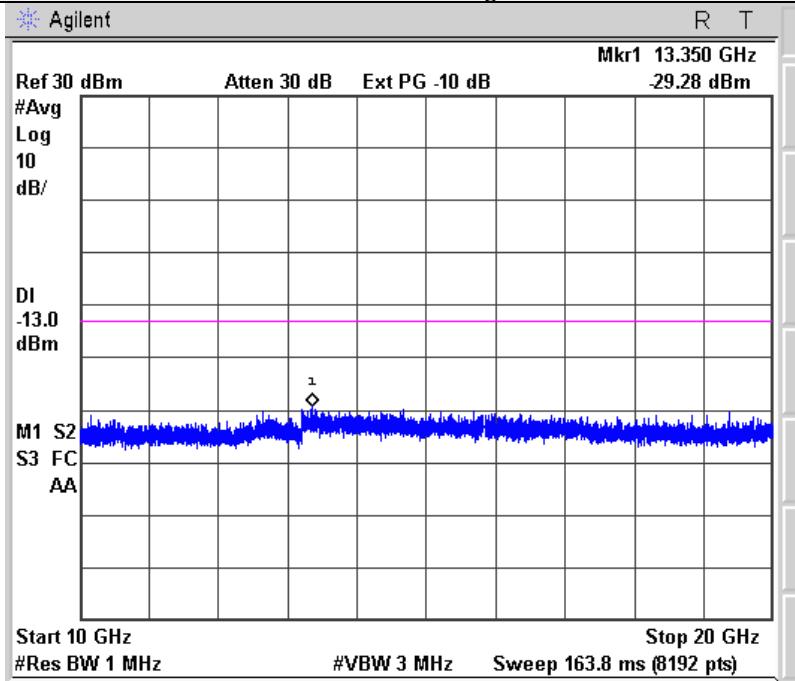
Conducted Emission Transmitting Mode CH 661 10GHz – 20GHz



Conducted Emission Transmitting Mode CH 810 30MHz – 10GHz



Conducted Emission Transmitting Mode CH 810 10GHz – 20GHz



END OF REPORT