# TEST REPORT

## No. 2013TAR259

**for**

**TCT Mobile Limited**

**GSM/GPRS dual bands mobile phone**

**Model Name: MINI Q A**

**Marketing Name: OT-606A**

**FCC ID: RAD367**

**With**

**Hardware Version: Lot1**

**Software Version: 325-2**

**Issued Date: 2013-04-01**



**Test Laboratory:**

***DAR accreditation (DIN EN ISO/IEC 17025): No. D-PL-12123-01-01***

***FCC 2.948 Listed: No.733176***

***IC O.A.T.S listed: No.6629B***

TMC Beijing, Telecommunication Metrology Center of Ministry of Industry and Information Technology

3/F Shou Xiang Technology Building, No.51 Xueyuan Road, Hai Dian District, Beijing, P. R. China,100191.

Tel:+86(0)10-62304633-2604, Fax:+86(0)10-62304633, Email:welcome@emcite.com, web: www.emcite.com

# CONTENTS

# 1. Test Laboratory

## 1.1. Testing Location

| | |
|---|---|
| Company Name: | TMC Beijing, Telecommunication Metrology Center of MIIT |
| Address: | 3/F Shou Xiang Technology Building, No.51 Xueyuan Road, Hai Dian District, Beijing, P. R. China |
| Postal Code: | 100191 |
| Telephone: | 00861062304633 |
| Fax: | 00861062304793 |

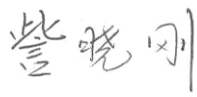
## 1.2. Testing Environment

| | |
|---|---|
| Normal Temperature: | 15-35℃ |
| Extreme Temperature: | -20/+55℃ |
| Relative Humidity: | 20-75% |

## 1.3. Project data

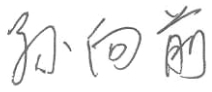
| | |
|---|---|
| Project Leader: | Zi Xiaogang |
| Testing Start Date: | 2013-03-13 |
| Testing End Date: | 2013-03-22 |

## 1.4. Signature



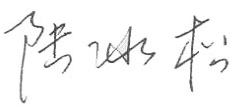
**Zi Xiaogang**

**(Prepared this test report)**



**Sun Xiangqian**

**(Reviewed this test report)**



**Lu Bingsong**

**Deputy Director of the laboratory**

**(Approved this test report)**

# 2. Client Information

## 2.1. Applicant Information

| | |
|---|---|
| Company Name: | TCT Mobile Limited |
| Address /Post: | 5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park, Pudong Area Shanghai, P.R. China. 201203 |
| Contact: | Gong Zhizhou |
| Email: | zhizhou.gong@jrdcom.com |
| Telephone: | 0086-21-61460890 |
| Fax: | 0086-21-61460602 |

## 2.2. Manufacturer Information

| | |
|---|---|
| Company Name: | TCT Mobile Limited |
| Address /Post: | 5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park, Pudong Area Shanghai, P.R. China. 201203 |
| Contact: | Gong Zhizhou |
| Email: | zhizhou.gong@jrdcom.com |
| Telephone: | 0086-21-61460890 |
| Fax: | 0086-21-61460602 |

# 3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

## 3.1. About EUT

| | |
|---|---|
| Description | GSM/GPRS dual bands mobile phone |
| Model Name | MINI Q A |
| Marketing Name | OT-606A |
| FCC ID | RAD367 |
| Frequency | GSM 850MHz; PCS 1900MHz |
| GPRS operation mode | Class B |
| GPRS Class | Class 12 |
| Antenna | Integrated |
| Power supply | Battery or Charger(AC Adaptor) |
| Output power | 30.60 dBm maximum ERP measured for GSM850 |
| Extreme vol. Limits | 3.6VDC to 4.2VDC (nominal: 3.8VDC) |
| Extreme temp. Tolerance | -30°C to +50°C |

Note: Components list, please refer to documents of the manufacturer; it is also included in the original test record of Telecommunication Metrology Center of MIIT of People's Republic of China.

## 3.2. Internal Identification of EUT used during the test

| EUT ID* | SN or IMEI | HW Version | SW Version |
|---|---|---|---|
| N07 | 013379003750349 | Lot1 | 325-2 |
| N08 | 013379003750299 | Lot1 | 325-2 |

*EUT ID: is used to identify the test sample in the lab internally.

## 3.3. Internal Identification of AE used during the test

| AE ID* | Description | SN |
|---|---|---|
| AE1 | Battery | CAB31C0000C1 BYD 670mAH |
| AE2 | Charger | CBA3120AG0C1 BYD Micro usb 1.2m |
| AE3 | Charger | CBA3120AG0C2 TENPAO Micro usb 1.2m |
| AE4 | Charger | CBA3170AG0C1 BYD Micro usb 1.5m |
| AE5 | Charger | CBA3170AG0C2 TENPAO Micro usb 1.5m |

*AE ID: is used to identify the test sample in the lab internally.

## 3.4. General Description

The Equipment Under Test (EUT) is a model of GSM/GPRS dual bands mobile phone with integrated antenna. It consists of normal options: lithium battery, charger

Manual and specifications of the EUT were provided to fulfil the test.

Samples undergoing test were selected by the Client.

# 4. Reference Documents

## 4.1. Reference Documents for testing

The following documents listed in this section are referred for testing.

| Reference | Title | Version |
|---|---|---|
| FCC Part 24 | PERSONAL COMMUNICATIONS SERVICES | V 10.1.12 |
| FCC Part 22 | PUBLIC MOBILE SERVICES | V 10.1.12 |
| ANSI/TIA-603-C | Land Mobile FM or PM Communications Equipment Measurement and Performance Standards | 2004 |
| ANSI C63.4 | Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz | 2003 |
| KDB971168 D01 | Procedures for Compliance Measurement of the Fundamental Emission Power of Licensed Wideband (> 1 MHz) Digital Transmission Systems | 2011 |

## 5. LABORATORY ENVIRONMENT

**Control room / conducted chamber** did not exceed following limits along the EMC testing:

| | |
|---|---|
| Temperature | Min. = 15 ˚C, Max. = 35 ˚C |
| Relative humidity | Min. =20 %, Max. = 80 % |
| Shielding effectiveness | > 110 dB |
| Electrical insulation | > 2 MΩ |
| Ground system resistance | < 0.5 Ω |

**Fully-anechoic chamber 2** (8.6 meters×6.1 meters×3.85 meters) did not exceed following limits along the EMC testing:

| | |
|---|---|
| Temperature | Min. = 15 ˚C, Max. = 30 ˚C |
| Relative humidity | Min. = 35 %, Max. = 60 % |
| Shielding effectiveness | > 110 dB |
| Electrical insulation | > 2 MΩ |
| Ground system resistance | < 1 Ω |
| Site voltage standing-wave ratio ($S_{VSWR}$) | Between 0 and 6 dB, from 1GHz to 18GHz |
| Uniformity of field strength | Between 0 and 6 dB, from 80 to 4000 MHz |

**Semi-anechoic chamber 2 / Fully-anechoic chamber 3** (10 meters×6.7 meters×6.15 meters) did not exceed following limits along the EMC testing:

| | |
|---|---|
| Temperature | Min. = 15 ˚C, Max. = 30 ˚C |
| Relative humidity | Min. = 35 %, Max. = 60 % |
| Shielding effectiveness | > 100 dB |
| Electrical insulation | > 2 MΩ |
| Ground system resistance | < 0.5 Ω |
| Normalised site attenuation (NSA) | < ±3.5 dB, 3 m distance |
| Site voltage standing-wave ratio ($S_{VSWR}$) | Between 0 and 6 dB, from 1GHz to 18GHz |
| Uniformity of field strength | Between 0 and 6 dB, from 80 to 3000 MHz |

## 6. SUMMARY OF TEST RESULTS

| Items | List | Clause in FCC rules | Verdict |
|---|---|---|---|
| 1 | Output Power | 22.913(a)/24.232(C) | P |
| 2 | Emission Limit | 2.1051/22.917/24.238 | P |
| 3 | Conducted Emission | 15.107/207 | P |
| 4 | Frequency Stability | 2.1055/24.235 | P |
| 5 | Occupied Bandwidth | 2.1049(h)(i) | P |
| 6 | Emission Bandwidth | 22.917(b)/24.238(b) | P |
| 7 | Band Edge Compliance | 22.917(b)/24.238(b) | P |
| 8 | Conducted Spurious Emission | 2.1057/22.917/24.238 | P |

## 7. Test Equipments Utilized

| NO. | Description | TYPE | SERIES NUMBER | MANUFACTURE | CAL DUE DATE |
|---|---|---|---|---|---|
| 1 | Test Receiver | ESCI | 100344 | R&S | 2014-03-27 |
| 3 | Test Receiver | ESU26 | 100376 | R&S | 2013-11-07 |
| 4 | EMI Antenna | VULB 9163 | 514 | Schwarzbeck | 2014-11-10 |
| 5 | EMI Antenna | 3117 | 00139065 | ETS-Lindgren | 2014-07-31 |
| 6 | LISN | ESH2-Z5 | 829991/012 | R&S | 2013-04-16 |
| 7 | Universal Radio Communication Tester | CMU200 | 102228 | R&S | 2013-07-07 |
| 8 | Universal Radio Communication Tester | E5515C | MY48361083 | Agilent | 2014-03-15 |
| 9 | Spectrum Analyzer | E4440A | MY48250642 | Agilent | 2014-03-04 |
| 10 | EMI Antenna | 9117 | 177 | Schwarzbeck | 2014-06-29 |
| 11 | EMI Antenna | VULB 9163 | 482 | Schwarzbeck | 2014-02-17 |
| 12 | EMI Antenna | 3117 | 00119024 | ETS-Lindgren | 2014-02-02 |
| 13 | EMI Antenna | 3117 | 00058889 | ETS-Lindgren | 2014-02-02 |
| 14 | Signal Generator | N5183A | MY49060052 | Agilent | 2014-03-18 |
| 15 | Climatic chamber | PL-2G | 343074 | ESPEC | 2013-05-12 |

# ANNEX A: MEASUREMENT RESULTS

## A.1 OUTPUT POWER

### A.1.1 Summary

During the process of testing, the EUT was controlled via Rhode & Schwarz Digital Radio Communication tester (CMU-200) to ensure max power transmission and proper modulation.
This result contains peak output power and EIRP measurements for the EUT.
In all cases, output power is within the specified limits.

### A.1.2 Conducted

#### A.1.2.1 Method of Measurements

The EUT was set up for the max output power with pseudo random data modulation.
The power was measured with Rhode & Schwarz Spectrum Analyzer FSU (peak)
These measurements were done at 3 frequencies, 1850.2 MHz, 1880.0MHz and 1909.8MHz for PCS1900 band;824.2MHz, 836.6MHz and 848.8MHz for GSM850 band. (bottom, middle and top of operational frequency range).

#### A.1.2.2 Test Condition

| RBW | VBW | Sweep Time | Span |
|---|---|---|---|
| 1MHz | 1MHz | 300ms | 10MHz |

**GSM850**

**Limit**

| | Power step | Nominal Peak output power (dBm) | Power &Multislot class | Operation class |
|---|---|---|---|---|
| GSM | 5 | 33dBm(2W) | 4 | / |
| GPRS | 3 | 33dBm(2W) | 12 | B |

**Measurement result**

**GSM**

| Frequency(MHz) | Power Step | Peak output power(dBm) |
|---|---|---|
| 824.2 | 5 | 31.99 |
| 836.6 | 5 | 32.01 |
| 848.8 | 5 | **32.03** |

**GPRS**

| Frequency(MHz) | Power Step | Peak output power(dBm) |
|---|---|---|
| 824.2 | 3 | 31.50 |
| 836.6 | 3 | 31.70 |
| 848.8 | 3 | **31.90** |

**PCS1900**

**Limit**

| | Power step | Nominal Peak output power (dBm) | Power &Multislot class | Operation class |
|---|---|---|---|---|
| GSM | 0 | 30dBm(1W) | 1 | / |
| GPRS | 3 | 30dBm(1W) | 12 | B |

**Measurement result**

**GSM**

| Frequency(MHz) | Power Step | Peak output power(dBm) |
|---|---|---|
| 1850.2 | 0 | 29.30 |
| 1880.0 | 0 | 29.30 |
| 1909.8 | 0 | **29.30** |

**GPRS**

| Frequency(MHz) | Power Step | Peak output power(dBm) |
|---|---|---|
| 1850.2 | 3 | **29.80** |
| 1880.0 | 3 | 28.90 |
| 1909.8 | 3 | 28.60 |

### A.1.3 Radiated

#### A.1.3.1 Description

This is the test for the maximum radiated power from the EUT.

Rule Part 24.232(b) specifies, "Mobile/portable stations are limited to 2 watts e.i.r.p. Peak power" and 24.232(c) specifies that "Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage."

Rule Part 22.913(a) specifies ”Maximum ERP. The effective radiated power (ERP) of base transmitters and cellular repeaters must not exceed 500 Watts. The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.”

#### A.1.3.2 Method of Measurement

The measurements procedures in TIA-603C-2004 are used.

1. 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.
2. 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 $A_{Rpl}$=Pin - Pr. The $A_{Rpl}$ 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(EIRP)=$P_{Mea}$-$A_{Rpl}$
3. The EUT is substituted for the dipole at the reference centre of the chamber and a scan is performed to obtain the radiation pattern.
4. From the radiation pattern, the co-ordinates where the maximum antenna gain occurs are identified.
5. The EUT is then put into continuously transmitting mode at its maximum power level.
6. 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.
7. 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).
8. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.15dBi.
9. The test system should be checked before test by a standard comb signal source. The signal source put on the position, instead of the EUT. The test result should be compared with the test result before. If the test result is similar with the initial one, then the test system can work stably.

**GSM 850-ERP 22.913(a)**

**Limits**

| | Power Step | Burst Peak ERP (dBm) |
|---|---|---|
| GSM | 5 | ≤38.45dBm (7W) |
| GPRS | 3 | ≤38.45dBm (7W) |

**Measurement result**

**GSM**

| Frequency(MHz) | $P_{Mea}$(dBm) | $P_{cl}$(dB) | $P_{Ag}$(dB) | $G_a$ Antenna Gain(dB) | Correction (dB) | ERP(dBm) | Polarization |
|---|---|---|---|---|---|---|---|
| 824.20 | -17.61 | 2.07 | -53.00 | 0.84 | 2.15 | 30.33 | H |
| 836.60 | -17.27 | 2.08 | -53.00 | 0.90 | 2.15 | **30.60** | H |
| 848.80 | -18.39 | 2.09 | -53.00 | 0.95 | 2.15 | 29.42 | H |

**GPRS**

| Frequency(MHz) | $P_{Mea}$(dBm) | $P_{cl}$(dB) | $P_{Ag}$(dB) | $G_a$ Antenna Gain(dB) | Correction (dB) | ERP(dBm) | Polarization |
|---|---|---|---|---|---|---|---|
| 824.20 | -17.52 | 2.07 | -53.00 | 0.84 | 2.15 | **30.42** | H |
| 836.60 | -17.85 | 2.08 | -53.00 | 0.90 | 2.15 | 30.02 | V |
| 848.80 | -17.87 | 2.09 | -53.00 | 0.95 | 2.15 | 29.94 | H |

Frequency**:** 836.60MHz

Peak ERP(dBm)=$P_{Mea}$(-17.27dBm) - $P_{cl}$(2.08dB) - $P_{Ag}$(-53.00dB) - $G_a$ (0.90dB)-2.15dB=30.60dBm

**ANALYZER SETTINGS: RBW = VBW = 3MHz**

**PCS1900-EIRP 24.232(b)**

**Limits**

| | Power Step | Burst Peak EIRP (dBm) |
|---|---|---|
| GSM | 0 | ≤33dBm (2W) |
| GPRS | 3 | ≤33dBm (2W) |

**Measurement result**

**GSM**

| Frequency(MHz) | $P_{Mea}$(dBm) | $P_{cl}$(dB) | $P_{Ag}$(dB) | $G_a$ Antenna Gain(dB) | EIRP(dBm) | Polarization |
|---|---|---|---|---|---|---|
| 1850.20 | -22.92 | 3.19 | -50.00 | -4.56 | 28.45 | H |
| 1880.00 | -21.09 | 3.11 | -50.00 | -4.43 | **30.23** | H |
| 1909.80 | -21.07 | 3.18 | -50.00 | -4.30 | 30.05 | H |

**GPRS**

| Frequency(MHz) | $P_{Mea}$(dBm) | $P_{cl}$(dB) | $P_{Ag}$(dB) | $G_a$ Antenna Gain(dB) | EIRP(dBm) | Polarization |
|---|---|---|---|---|---|---|
| 1850.20 | -22.96 | 3.19 | -50.00 | -4.56 | 28.41 | H |
| 1880.00 | -21.12 | 3.11 | -50.00 | -4.43 | **30.20** | H |
| 1909.80 | -21.17 | 3.18 | -50.00 | -4.30 | 29.95 | H |

Frequency**:** 1880.00MHz

Peak EIRP(dBm)= $P_{Mea}$(-21.09dBm) - $P_{cl}$(3.11dB) - $P_{Ag}$(-50.00dB) - $G_a$ (-4.43dB) =30.23dBm

**ANALYZER SETTINGS: RBW = VBW = 3MHz**

## A.2 EMISSION LIMT

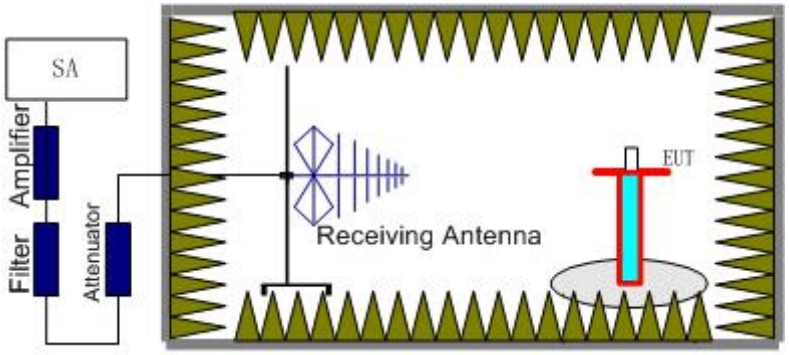
### A.2.1 Measurement Method

The measurement procedures in TIA-603C-2004 are used.

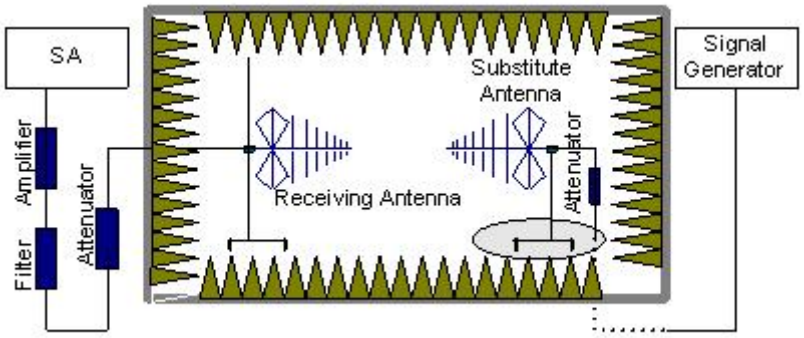
The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment, which is the transmitted carrier that can be as high as 1910 MHz. The resolution bandwidth is set as outlined in Part 24.238 and Part 22.917. The spectrum is scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of PCS1900 and GSM850.

**The procedure of radiated spurious emissions is as follows:**

1. EUT was placed on a 1.5 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 EUT for emission measurements. The height of receiving antenna is 1.5m. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the EUT through 360° 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.




2. The EUT is then put into continuously transmitting mode at its maximum power level during the test. And the maximum value of the receiver should be recorded as (Pr).
3. The EUT shall be replaced by a substitution antenna. The test setup refers to figure below.




In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power ($P_{Mea}$) is applied to the input of the

substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded ($P_r$). The power of signal source ($P_{Mea}$) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

4. The Path loss ($P_{pl}$) between the Signal Source with the Substitution Antenna and the Substitution Antenna Gain ($G_a$) should be recorded after test.
   A amplifier should be connected in for the test.
   The Path loss ($P_{pl}$) is the summation of the cable loss and the gain of the amplifier.
   The measurement results are obtained as described below:
   Power(EIRP)=$P_{Mea}$ - $P_{pl}$ - $G_a$
5. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.
6. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.15dBi.

**A.2.2 Measurement Limit**

Part 24.238 and Part 22.917 specify that the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

**A.2.3 Measurement Results**

Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the PCS1900 band (1850.2 MHz, 1880 MHz and 1909.8 MHz) and GSM850 band (824.2MHz, 836.6MHz, 848.8MHz) . 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 the PCS1900 ,GSM850 into any of the other blocks. The equipment must still, however, meet emissions requirements with the carrier at all frequencies over which it is capable of operating and it is the manufacturer's responsibility to verify this.

**A.2.4 Measurement Results Table**

| Frequency | Channel | Frequency Range | Result |
|---|---|---|---|
| GSM 850MHz | Low | 30MHz-10GHz | Pass |
| | Middle | 30MHz-10GHz | Pass |
| | High | 30MHz-10GHz | Pass |
| GSM 1900MHz | Low | 30MHz-20GHz | Pass |
| | Middle | 30MHz-20GHz | Pass |
| | High | 30MHz-20GHz | Pass |

**A.2.5 Sweep Table**

| Working Frequency | Subrange (GHz) | RBW | VBW | Sweep time (s) |
|---|---|---|---|---|
| 850MHz | 0.03~1 | 100KHz | 300KHz | 10 |
| | 1-2 | 1 MHz | 3 MHz | 2 |
| | 2~5 | 1 MHz | 3 MHz | 3 |
| | 5~8 | 1 MHz | 3 MHz | 3 |
| | 8~10 | 1 MHz | 3 MHz | 3 |
| 1900MHz | 0.03~1 | 100KHz | 300KHz | 10 |
| | 1-2 | 1 MHz | 3 MHz | 2 |
| | 2~5 | 1 MHz | 3 MHz | 3 |
| | 5~8 | 1 MHz | 3 MHz | 3 |
| | 8~11 | 1 MHz | 3 MHz | 3 |
| | 11~14 | 1 MHz | 3 MHz | 3 |
| | 14~18 | 1 MHz | 3 MHz | 3 |
| | 18~20 | 1 MHz | 3 MHz | 2 |

**GSM Mode Channel 128/824.2MHz**

| Frequency(MHz) | $P_{Mea}$(dBm) | Path Loss | Antenna Gain | Correction (dB) | Peak ERP(dBm) | Limit （dBm） | Polarization |
|---|---|---|---|---|---|---|---|
| 1649.67 | -60.51 | 2.91 | -5.44 | 2.15 | -60.13 | -13.00 | H |
| 2470.06 | -50.61 | 3.56 | -5.31 | 2.15 | -51.01 | -13.00 | H |
| 4116.03 | -63.41 | 4.67 | -8.57 | 2.15 | -61.66 | -13.00 | V |
| 5768.21 | -61.93 | 5.69 | -10.11 | 2.15 | -59.66 | -13.00 | H |
| 7416.22 | -60.49 | 6.40 | -11.35 | 2.15 | -57.69 | -13.00 | V |
| 9070.04 | -59.37 | 7.53 | -12.60 | 2.15 | -56.45 | -13.00 | V |

**GSM Mode Channel 190/836.6MHz**

| Frequency(MHz) | $P_{Mea}$(dBm) | Path Loss | Antenna Gain | Correction (dB) | Peak ERP(dBm) | Limit （dBm） | Polarization |
|---|---|---|---|---|---|---|---|
| 1673.32 | -54.91 | 2.97 | -5.34 | 2.15 | -54.69 | -13.00 | H |
| 2509.85 | -38.52 | 3.59 | -5.43 | 2.15 | -38.83 | -13.00 | H |
| 3076.36 | -62.64 | 3.98 | -6.88 | 2.15 | -61.89 | -13.00 | H |
| 4658.50 | -62.19 | 4.94 | -9.09 | 2.15 | -60.19 | -13.00 | V |
| 5856.06 | -52.01 | 5.68 | -10.14 | 2.15 | -49.70 | -13.00 | H |
| 7529.98 | -52.42 | 6.98 | -11.43 | 2.15 | -50.12 | -13.00 | V |

**GSM Mode Channel 251/848.8MHz**

| Frequency(MHz) | $P_{Mea}$(dBm) | Path Loss | Antenna Gain | Correction (dB) | Peak ERP(dBm) | Limit （dBm） | Polarization |
|---|---|---|---|---|---|---|---|
| 1701.61 | -60.66 | 2.96 | -5.21 | 2.15 | -60.56 | -13.00 | H |
| 2550.51 | -51.51 | 3.63 | -5.53 | 2.15 | -51.76 | -13.00 | V |
| 4248.24 | -62.24 | 4.78 | -8.65 | 2.15 | -60.52 | -13.00 | V |
| 5946.60 | -62.08 | 5.51 | -10.18 | 2.15 | -59.56 | -13.00 | H |
| 7639.58 | -61.48 | 6.72 | -11.54 | 2.15 | -58.81 | -13.00 | V |
| 8069.71 | -61.16 | 6.91 | -11.94 | 2.15 | -58.28 | -13.00 | V |

**GSM Mode Channel 512/1850.2MHz**

| Frequency(MHz) | $P_{Mea}$(dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit （dBm） | Polarization |
|---|---|---|---|---|---|---|
| 3700.53 | -44.73 | 4.44 | -8.14 | -41.03 | -13.00 | H |
| 5550.65 | -40.26 | 5.46 | -10.02 | -35.70 | -13.00 | H |
| 9250.75 | -44.87 | 7.65 | -12.60 | -39.92 | -13.00 | H |
| 11101.61 | -32.31 | 8.40 | -12.40 | -28.31 | -13.00 | H |
| 12951.54 | -42.60 | 8.86 | -13.24 | -38.22 | -13.00 | H |
| 14801.05 | -48.60 | 9.69 | -13.54 | -44.75 | -13.00 | H |

**GSM Mode Channel 661/1880.0MHz**

| Frequency(MHz) | $P_{Mea}$(dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit （dBm） | Polarization |
|---|---|---|---|---|---|---|
| 3760.24 | -44.59 | 4.52 | -8.21 | -40.90 | -13.00 | H |
| 5640.18 | -39.32 | 5.45 | -10.06 | -34.71 | -13.00 | H |
| 9399.82 | -44.19 | 7.45 | -12.60 | -39.04 | -13.00 | H |
| 11280.01 | -34.22 | 8.55 | -12.40 | -30.37 | -13.00 | H |
| 13160.19 | -42.28 | 9.14 | -13.46 | -37.96 | -13.00 | H |
| 15040.05 | -48.82 | 9.65 | -13.49 | -44.98 | -13.00 | H |

**GSM Mode Channel 810/1909.8MHz**

| Frequency(MHz) | $P_{Mea}$(dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit （dBm） | Polarization |
|---|---|---|---|---|---|---|
| 3819.75 | -45.77 | 4.50 | -8.28 | -41.99 | -13.00 | H |
| 5729.45 | -40.69 | 5.55 | -10.09 | -36.15 | -13.00 | V |
| 9548.66 | -45.04 | 7.79 | -12.58 | -40.25 | -13.00 | H |
| 11458.96 | -34.21 | 8.64 | -12.40 | -30.45 | -13.00 | H |
| 13369.24 | -41.69 | 9.07 | -13.67 | -37.09 | -13.00 | V |
| 15278.11 | -49.30 | 9.98 | -13.44 | -45.84 | -13.00 | V |

## A.3 CONDUCTED EMISSION

The measurement procedure in ANSI C63.4-2009 is used. Conducted Emission is measured with travel charger.

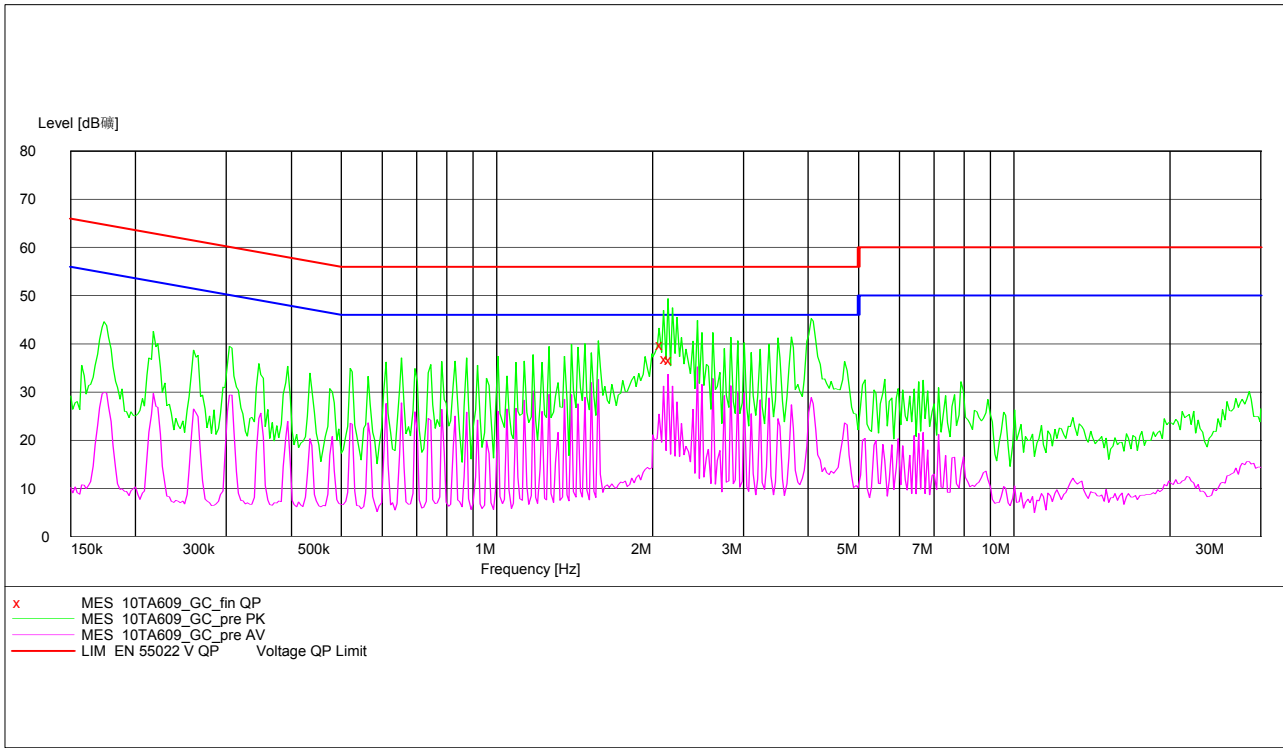
**A.3.1 Limit**

| Frequency of Emission (MHz) | Conducted Limit (dBμV) | |
|---|---|---|
| | Quasi -Peak | Average |
| 0.15 – 0.5 | 66 to 56* | 56 to 46* |
| 0.5 – 5 | 56 | 46 |
| 5 – 30 | 60 | 50 |
| * Decreases with logarithm of the frequency | | |

### A.3.2 Measurement result

**GSM850MHz**

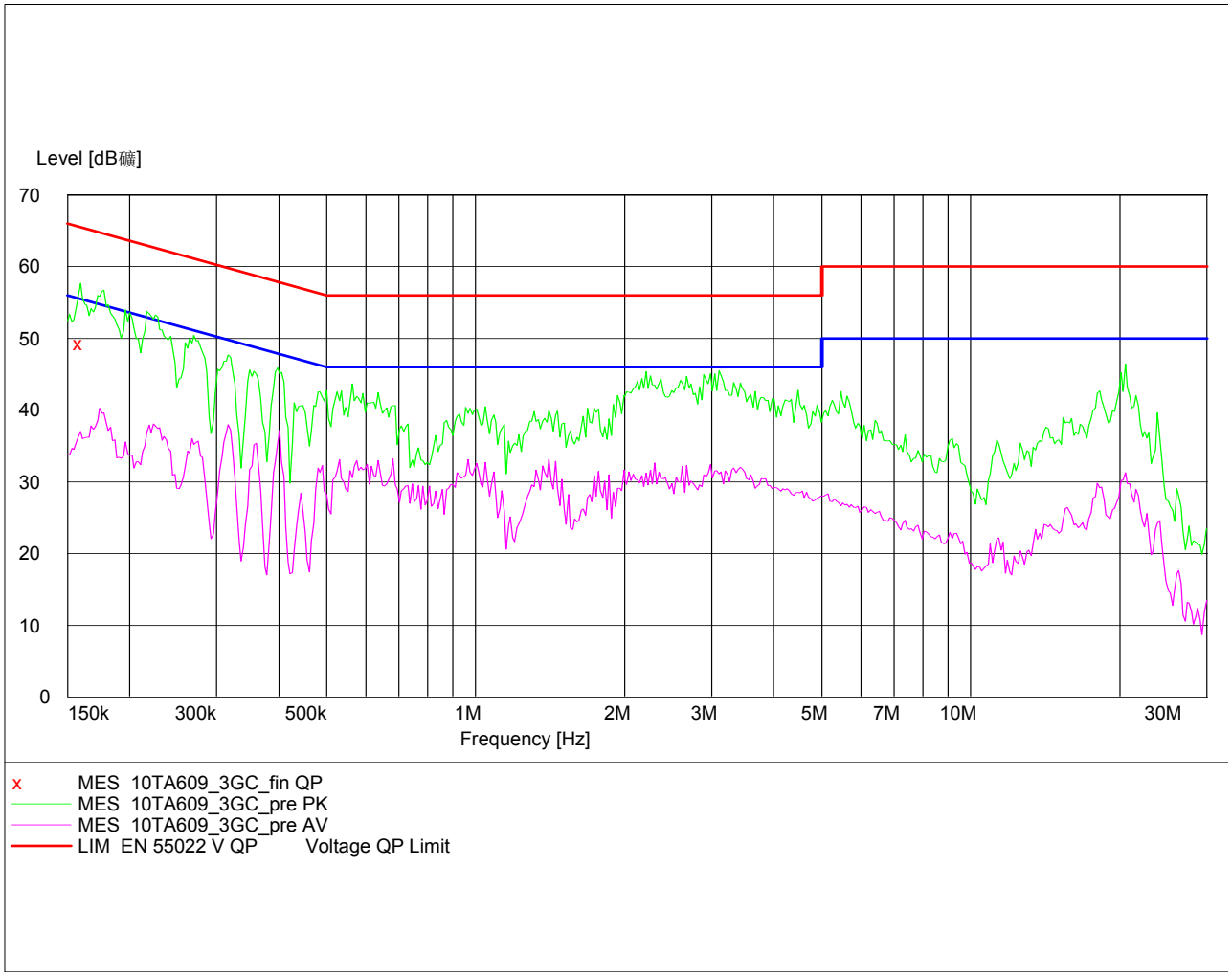
**AE2**




***MEASUREMENT RESULT: "10TA609_GC_fin QP"***

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Line | PE |
|---|---|---|---|---|---|---|
| 2.102020 | 39.80 | 10.1 | 56 | 16.2 | L1 | GND |
| 2.144271 | 36.90 | 10.1 | 56 | 19.1 | N | GND |
| 2.187371 | 36.70 | 10.1 | 56 | 19.3 | N | FLO |

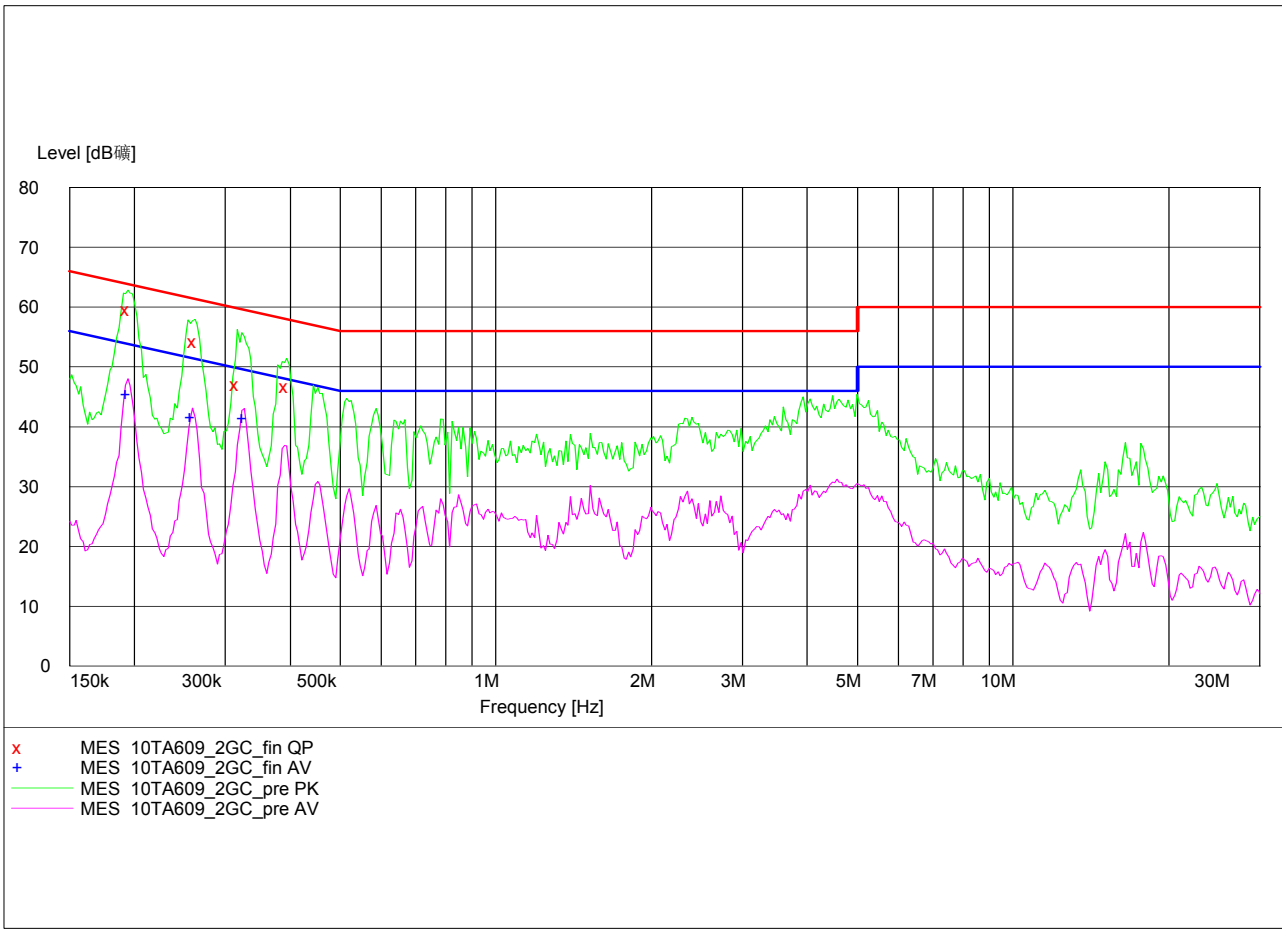
**AE3**




***MEASUREMENT RESULT: "10TA609_3GC_fin QP"***

| Frequency | Level | Transd | Limit | Margin | Line | PE |
|---|---|---|---|---|---|---|
| MHz | dBµV | dB | dBµV | dB | | |
| 0.159228 | 49.20 | 10.1 | 66 | 16.3 | L1 | GND |

**AE4**



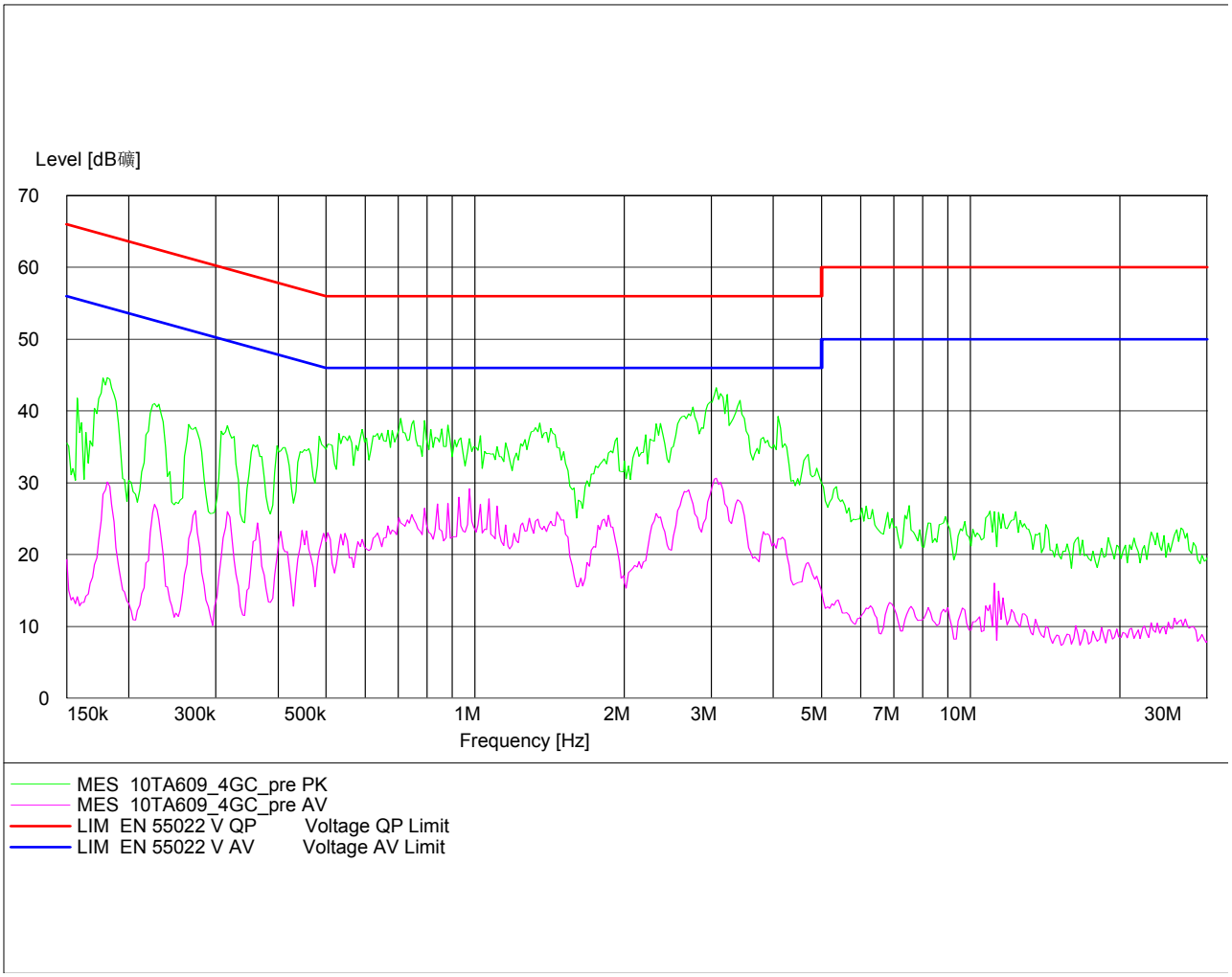

***MEASUREMENT RESULT: "10TA609_2GC_fin QP"***

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Line | PE |
|---|---|---|---|---|---|---|
| 0.194288 | 59.60 | 10.1 | 64 | 4.3 | L1 | GND |
| 0.261871 | 54.20 | 10.1 | 61 | 7.2 | L1 | GND |
| 0.316369 | 47.00 | 10.1 | 60 | 12.8 | N | FLO |
| 0.393790 | 46.70 | 10.1 | 58 | 11.3 | N | GND |

***MEASUREMENT RESULT: "10TA609_2GC_fin AV"***

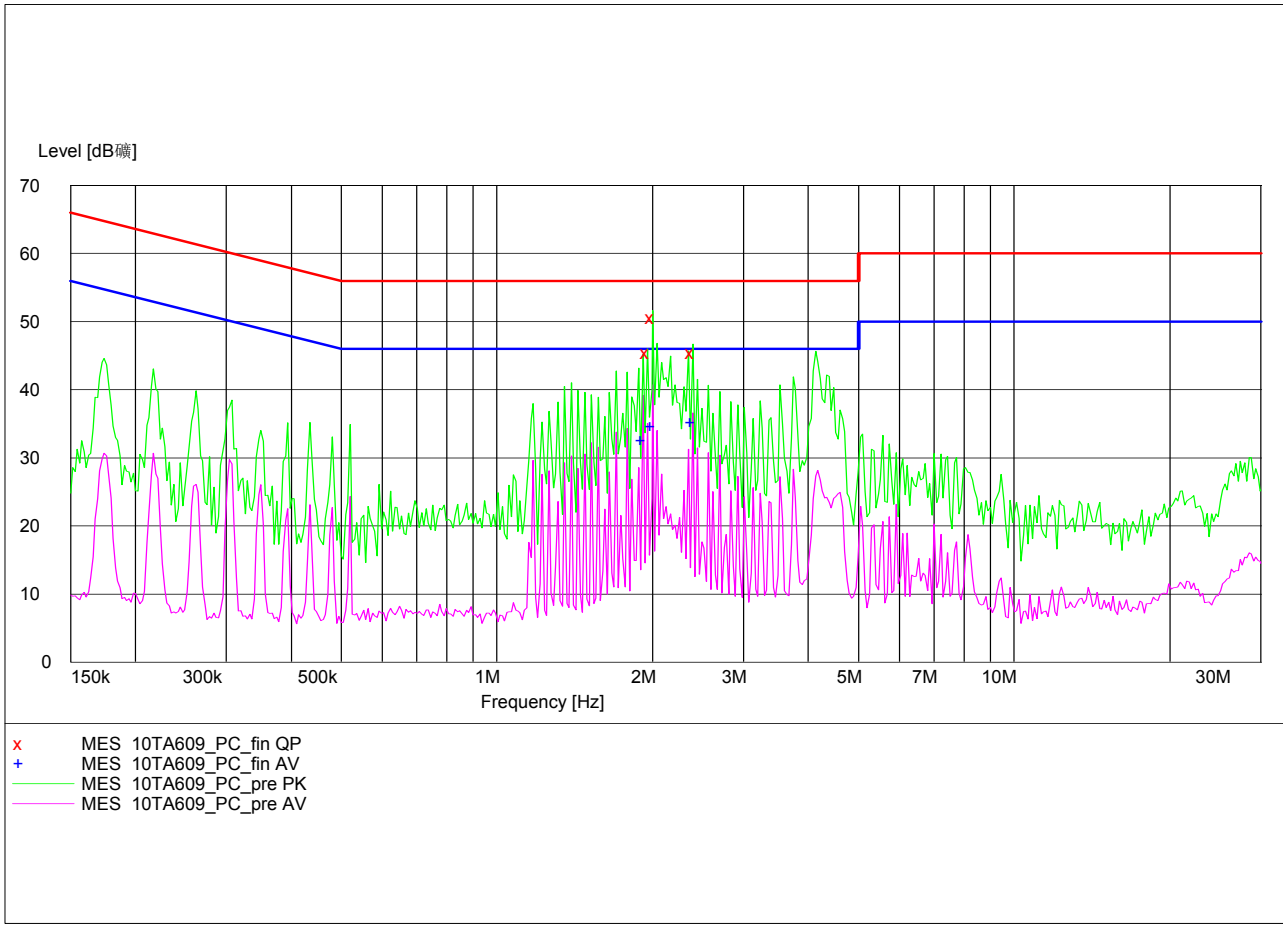
| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Line | PE |
|---|---|---|---|---|---|---|
| 0.194288 | 45.30 | 10.1 | 54 | 8.6 | N | GND |
| 0.259279 | 41.50 | 10.1 | 52 | 10.0 | L1 | FLO |
| 0.325956 | 41.30 | 10.1 | 50 | 8.3 | N | GND |

**AE5**


Level [dBμV]
70
60
50
40
30
20
10
0
150k
300k
500k
1M
2M
3M
5M
7M
10M
30M
Frequency [Hz]
MES 10TA609_4GC_pre PK
MES 10TA609_4GC_pre AV
LIM EN 55022 V QP Voltage QP Limit
LIM EN 55022 V AV Voltage AV Limit

**PCS1900MHz**

**AE2**



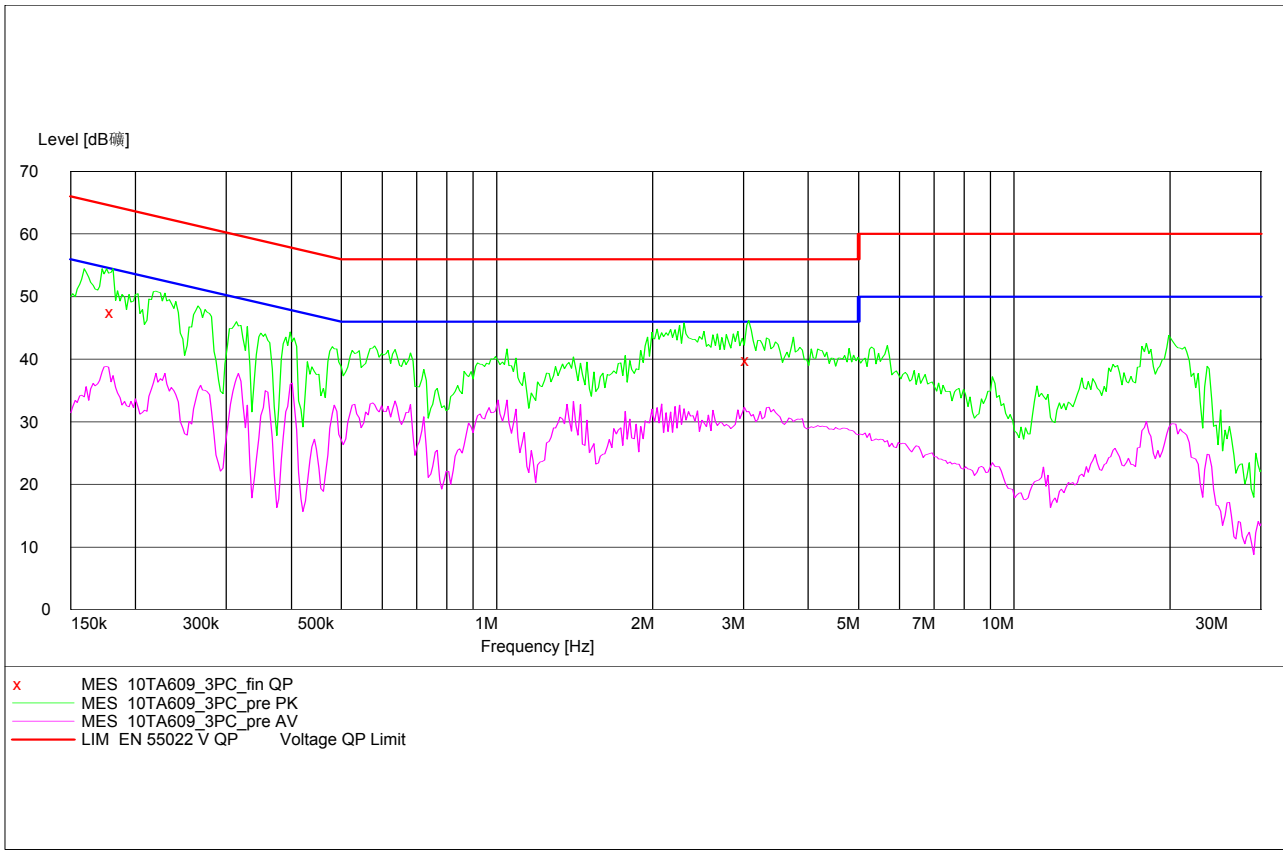

***MEASUREMENT RESULT: "10TA609_PC_fin QP"***

| Frequency | Level | Transd | Limit | Margin | Line | PE |
|---|---|---|---|---|---|---|
| MHz | dBµV | dB | dBµV | dB | | |
| 1.954365 | 45.50 | 10.1 | 56 | 10.5 | L1 | GND |
| 2.000000 | 50.50 | 10.1 | 56 | 5.5 | L1 | GND |
| 2.392295 | 45.40 | 10.1 | 56 | 10.6 | L1 | GND |

***MEASUREMENT RESULT: "10TA609_PC_fin AV"***

| Frequency | Level | Transd | Limit | Margin | Line | PE |
|---|---|---|---|---|---|---|
| MHz | dBµV | dB | dBµV | dB | | |
| 1.915856 | 32.50 | 10.1 | 46 | 13.5 | L1 | FLO |
| 2.000000 | 34.50 | 10.1 | 46 | 11.5 | L1 | GND |
| 2.392295 | 35.20 | 10.1 | 46 | 10.8 | L1 | GND |

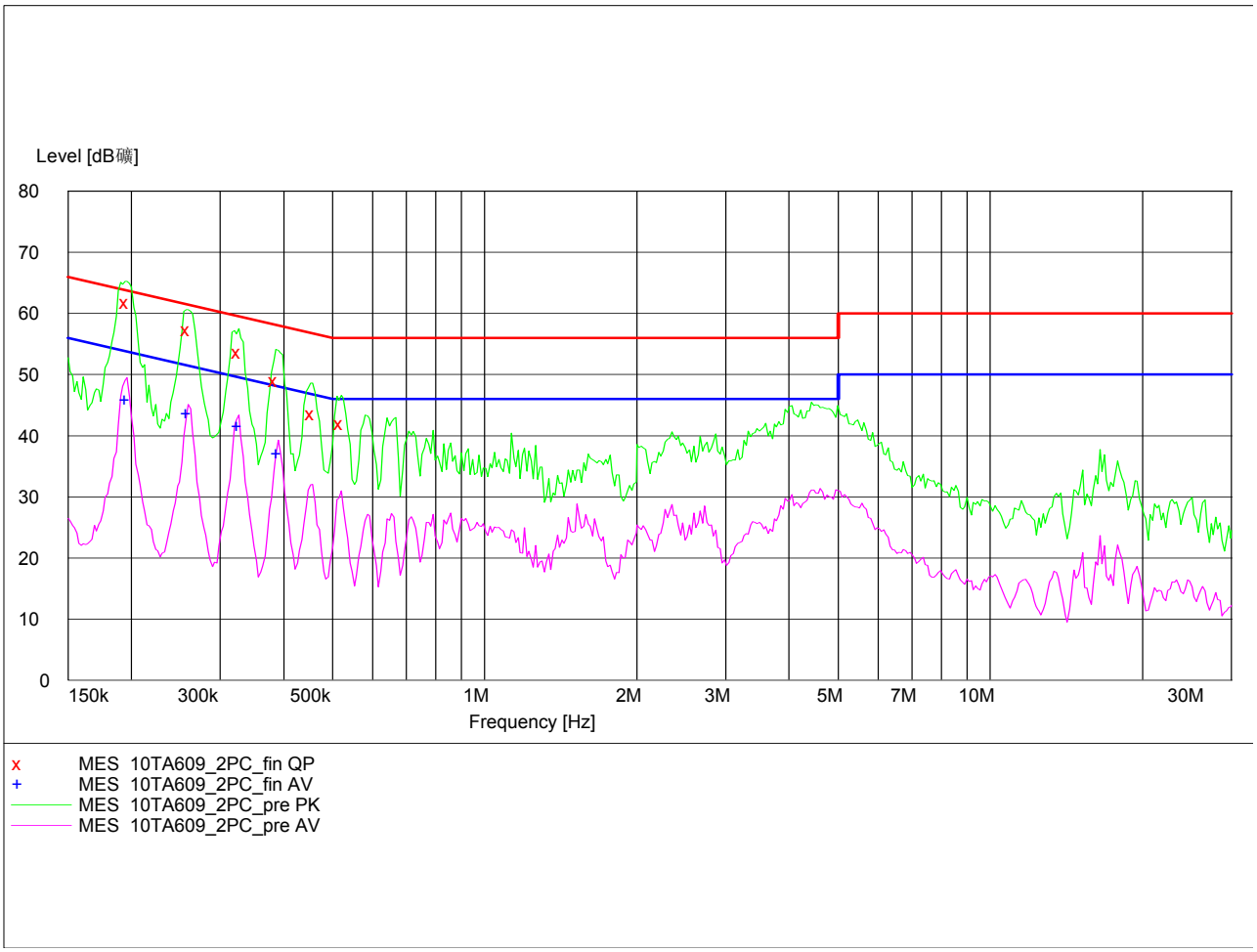
**AE3**




***MEASUREMENT RESULT: "10TA609_3PC_fin QP"***

| Frequency | Level | Transd | Limit | Margin | Line | PE |
|---|---|---|---|---|---|---|
| MHz | dBµV | dB | dBµV | dB | | |
| 0.181216 | 47.60 | 10.1 | 64 | 16.9 | L1 | GND |
| 3.067956 | 39.90 | 10.1 | 56 | 16.1 | N | FLO |

**AE4**



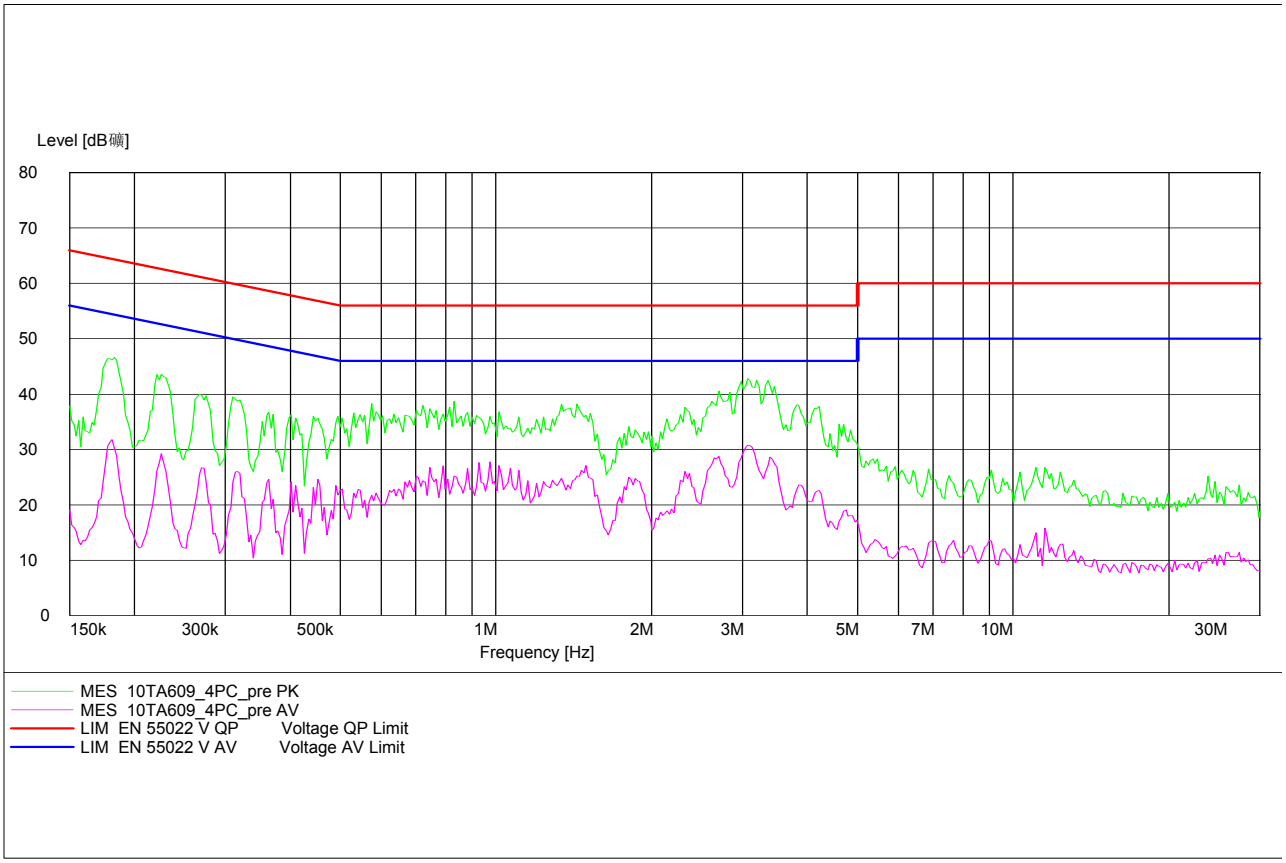

***MEASUREMENT RESULT: "10TA609_2PC_fin QP"***

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Line | PE |
|---|---|---|---|---|---|---|
| 0.196231 | 61.90 | 10.1 | 64 | 1.8 | L1 | GND |
| 0.259279 | 57.40 | 10.1 | 62 | 4.1 | L1 | FLO |
| 0.325956 | 53.70 | 10.1 | 60 | 5.9 | N | GND |
| 0.386031 | 49.10 | 10.1 | 58 | 9.1 | N | GND |
| 0.457178 | 43.60 | 10.1 | 57 | 13.1 | N | GND |
| 0.520311 | 42.00 | 10.1 | 56 | 14.0 | L1 | FLO |

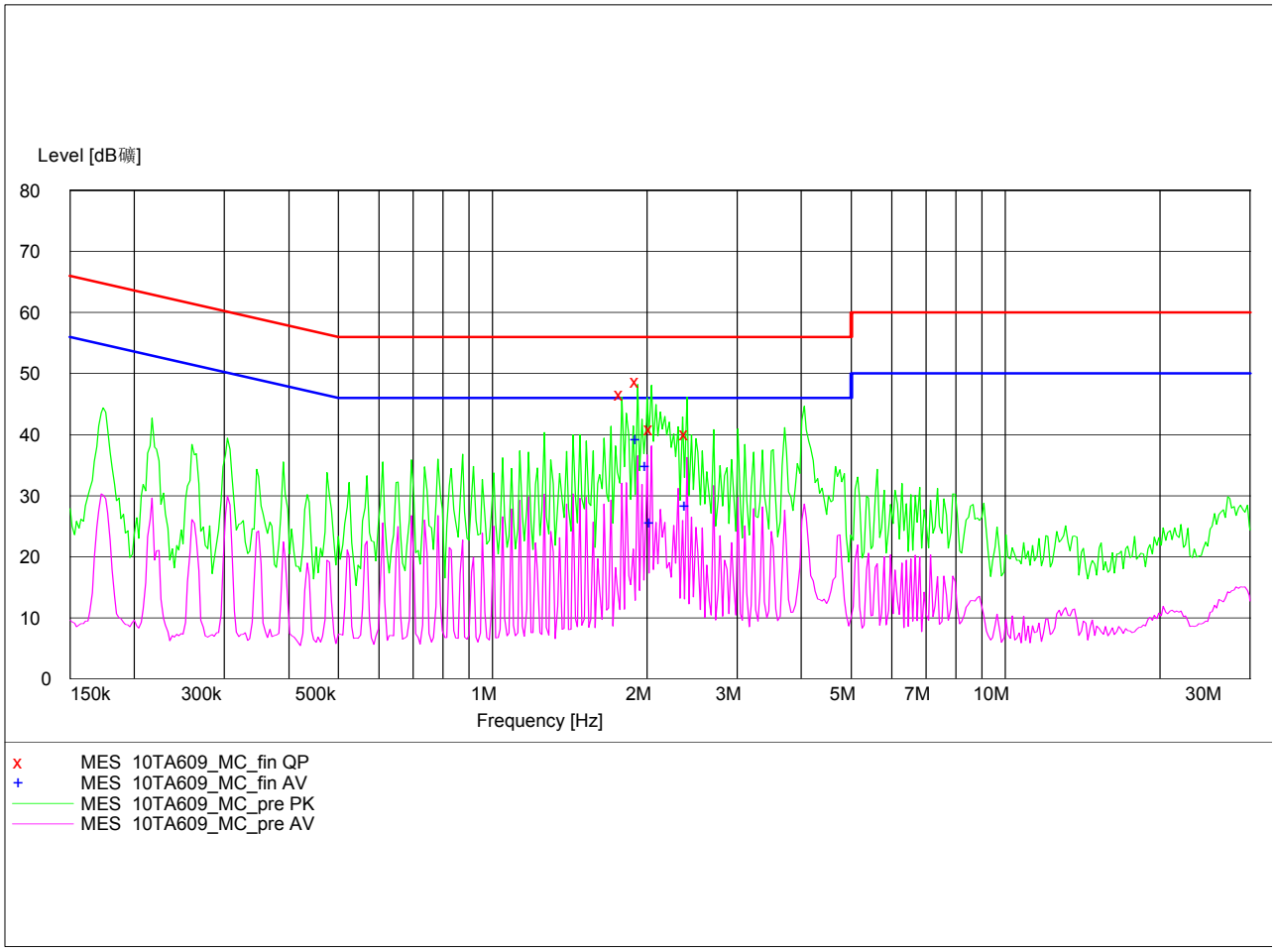
***MEASUREMENT RESULT: "10TA609_2PC_fin AV"***

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Line | PE |
|---|---|---|---|---|---|---|
| 0.196231 | 45.90 | 10.1 | 54 | 7.8 | N | GND |
| 0.259279 | 43.50 | 10.1 | 52 | 7.9 | N | GND |
| 0.325956 | 41.50 | 10.1 | 50 | 8.0 | N | FLO |
| 0.389891 | 37.00 | 10.1 | 48 | 11.0 | L1 | FLO |

**AE5**


Level [dBμV]
80
70
60
50
40
30
20
10
0
150k
300k
500k
1M
2M
3M
5M
7M
10M
30M
Frequency [Hz]
MES 10TA609_4PC_pre PK
MES 10TA609_4PC_pre AV
LIM EN 55022 V QP Voltage QP Limit
LIM EN 55022 V AV Voltage AV Limit

**MP3**



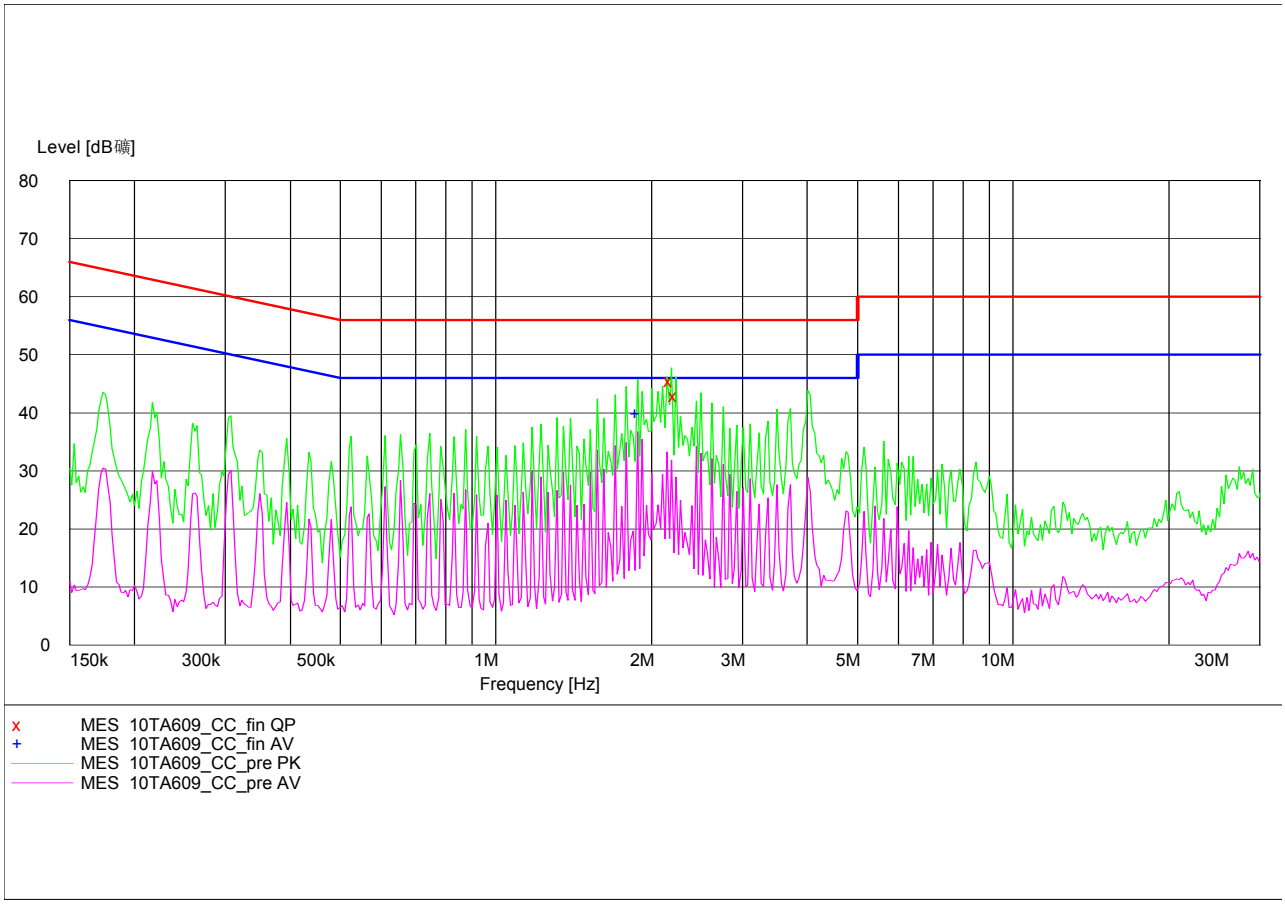

***MEASUREMENT RESULT: "10TA609_MC_fin QP"***

| Frequency | Level | Transd | Limit | Margin | Line | PE |
|---|---|---|---|---|---|---|
| MHz | dBµV | dB | dBµV | dB | | |
| 1.786954 | 46.70 | 10.1 | 56 | 9.3 | L1 | GND |
| 1.915856 | 48.70 | 10.1 | 56 | 7.3 | L1 | FLO |
| 2.040200 | 41.00 | 10.1 | 56 | 15.0 | L1 | FLO |
| 2.392295 | 40.10 | 10.1 | 56 | 15.9 | L1 | FLO |

***MEASUREMENT RESULT: "10TA609_MC_fin AV"***

| Frequency | Level | Transd | Limit | Margin | Line | PE |
|---|---|---|---|---|---|---|
| MHz | dBµV | dB | dBµV | dB | | |
| 1.915856 | 39.20 | 10.1 | 46 | 6.8 | L1 | FLO |
| 2.000000 | 34.90 | 10.1 | 46 | 11.1 | L1 | GND |
| 2.040200 | 25.50 | 10.1 | 46 | 20.5 | L1 | GND |
| 2.392295 | 28.20 | 10.1 | 46 | 17.8 | L1 | GND |

**Camera**




***MEASUREMENT RESULT: "10TA609_CC_fin QP"***

| Frequency | Level | Transd | Limit | Margin | Line | PE |
|---|---|---|---|---|---|---|
| MHz | dBµV | dB | dBµV | dB | | |
| 2.187371 | 45.50 | 10.1 | 56 | 10.5 | L1 | GND |
| 2.231337 | 42.90 | 10.1 | 56 | 13.1 | L1 | FLO |

***MEASUREMENT RESULT: "10TA609_CC_fin AV"***

| Frequency | Level | Transd | Limit | Margin | Line | PE |
|---|---|---|---|---|---|---|
| MHz | dBµV | dB | dBµV | dB | | |
| 1.878106 | 39.90 | 10.1 | 46 | 6.1 | L1 | GND |

## A.4 FREQUENCY STABILITY

### A.4.1 Method of Measurement

In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the EUT in a “call mode”. This is accomplished with the use of R&S CMU200 DIGITAL RADIO COMMUNICATION TESTER.

1. Measure the carrier frequency at room temperature.
2. Subject the EUT to overnight soak at -30℃.
3. With the EUT, powered via nominal voltage, connected to the CMU200 and in a simulated call on channel 661 for PCS 1900, channel 190 for GSM850 measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
4. Repeat the above measurements at 10℃ increments from -30℃ to +50℃. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.
5. Remeasure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1Volt increments remeasuring carrier frequency at each voltage. Pause at nominal voltage for 1 1/2 hours unpowered, to allow any self-heating to stabilize, before continuing.
6. Subject the EUT to overnight soak at +50℃.
7. With the EUT, powered via nominal voltage, connected to the CMU200 and in a simulated call on the centre channel, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
8. Repeat the above measurements at 10 C increments from +50℃ to -30℃. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.
9. At all temperature levels hold the temperature to +/- 0.5℃ during the measurement procedure.

### A.4.2 Measurement Limit

#### A.4.2.1 For Hand carried battery powered equipment

According to the JTC standard the frequency stability of the carrier shall be accurate to within 0.1 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 24.235, Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. As this transceiver is considered "Hand carried, battery powered equipment" Section 2.1055(d)(2) applies. This requires that the lower voltage for frequency stability testing be specified by the manufacturer. This transceiver is specified to operate with an input voltage of between 3.5VDC and 4.2VDC, with a nominal voltage of 3.8VDC. Operation above or below these voltage limits is prohibited by transceiver software in order to prevent improper operation as well as to protect components from overstress. These voltages represent a tolerance of -10 % and +12.5 %. For the purposes of measuring frequency stability these voltage limits are to be used.

#### A.4.2.2 For equipment powered by primary supply voltage

According to the JTC standard the frequency stability of the carrier shall be accurate to within 0.1 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 24.235, Frequency Stability. The frequency stability shall be sufficient to ensure that the

fundamental emission stays within the authorized frequency block. For this EUT section 2.1055(d)(1) applies. This requires varying primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

### A.4.3 Measurement results

**GSM 850**

**Frequency Error vs Voltage**

| Voltage(V) | Frequency error(Hz) | Frequency error(ppm) |
|---|---|---|
| 3.5 | -23 | 0.025 |
| 3.8 | -20 | 0.022 |
| 4.2 | -22 | 0.024 |

**Frequency Error vs Temperature**

| temperature(℃) | Frequency error(Hz) | Frequency error(ppm) |
|---|---|---|
| -30 | -35 | 0.038 |
| -20 | -33 | 0.036 |
| -10 | -30 | 0.032 |
| 0 | -30 | 0.032 |
| 10 | -20 | 0.022 |
| 20 | -20 | 0.022 |
| 30 | -20 | 0.022 |
| 40 | -25 | 0.027 |
| 50 | -35 | 0.038 |

**PCS 1900**

**Frequency Error vs Voltage**

| Voltage(V) | Frequency error(Hz) | Frequency error(ppm) |
|---|---|---|
| 3.5 | -36 | 0.019 |
| 3.8 | -34 | 0.018 |
| 4.2 | -37 | 0.019 |

**Frequency Error vs Temperature**

| temperature(℃) | Frequency error(Hz) | Frequency error(ppm) |
|---|---|---|
| -30 | -55 | 0.029 |
| -20 | -49 | 0.026 |
| -10 | -50 | 0.026 |
| 0 | -40 | 0.021 |
| 10 | -34 | 0.018 |
| 20 | -34 | 0.018 |
| 30 | -38 | 0.020 |
| 40 | -40 | 0.021 |
| 50 | -45 | 0.023 |

## A.5 OCCUPIED BANDWIDTH

### A.5.1 Occupied Bandwidth Results

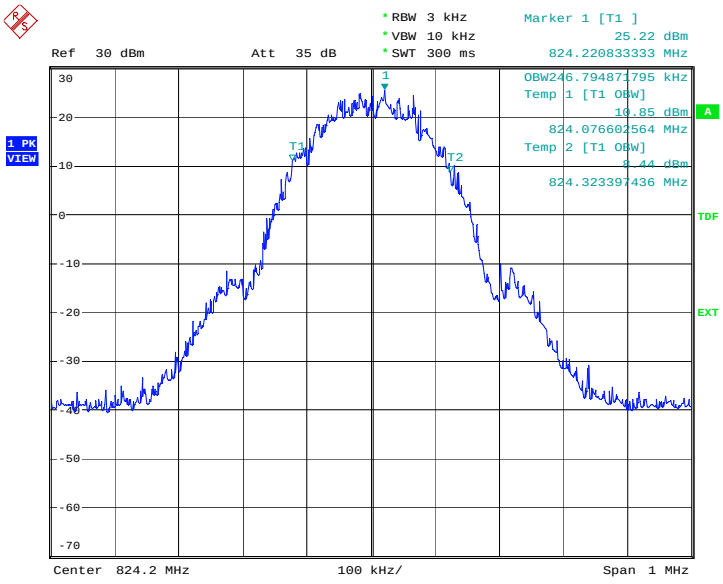
Similar to conducted emissions; occupied bandwidth measurements are only provided for selected frequencies in order to reduce the amount of submitted data. Data were taken at the extreme and mid frequencies of the USPCS frequency band. The table below lists the measured -20dBc BW (99%). Spectrum analyzer plots are included on the following pages.

**GSM 850(99%)**

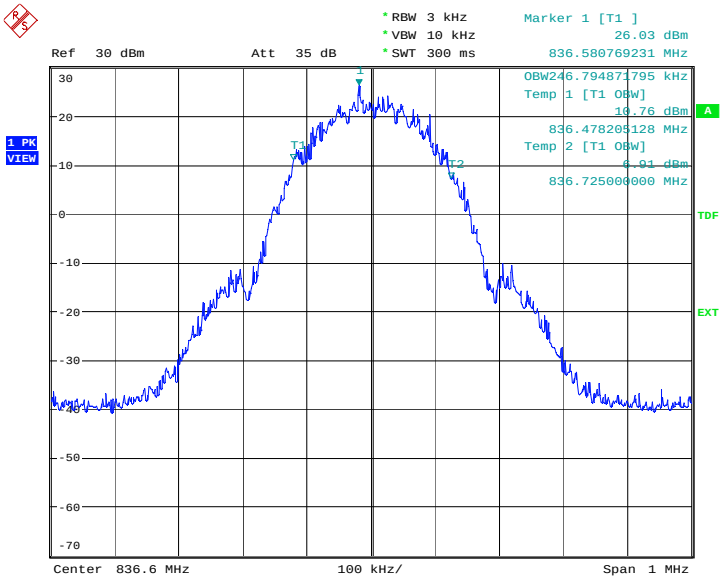
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |
|---|---|
| 824.2 | 246.795 |
| 836.6 | 246.795 |
| 848.8 | 245.192 |

**GSM 850**

**Channel 128-Occupied Bandwidth (99%)**

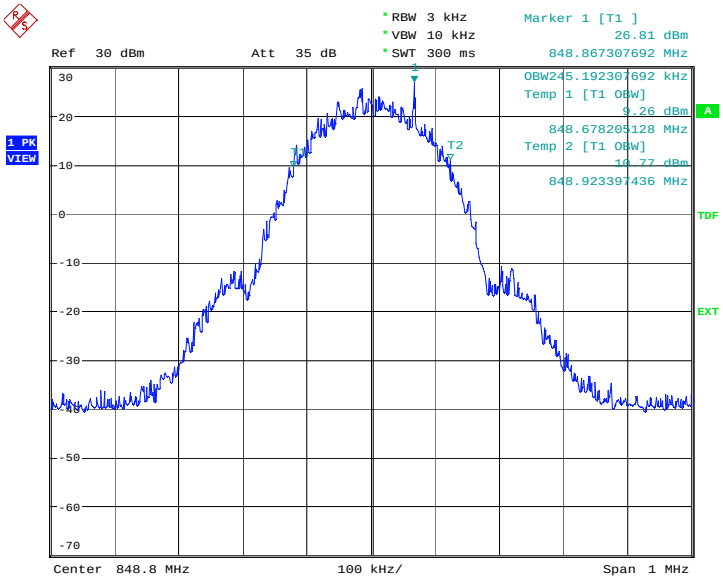


## Channel 190-Occupied Bandwidth (99%)




Date: 7.JUN.2010 02:34:48

## Channel 251-Occupied Bandwidth (99%)



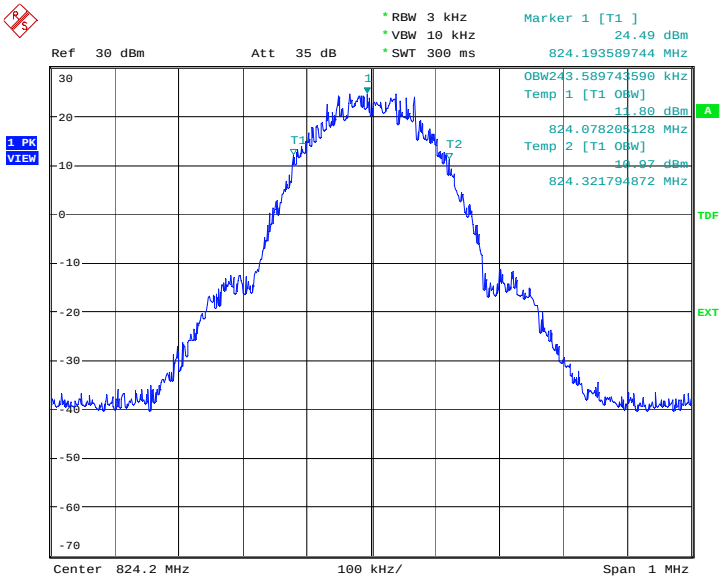

Date: 7.JUN.2010 02:35:15

**GPRS 850(99%)**

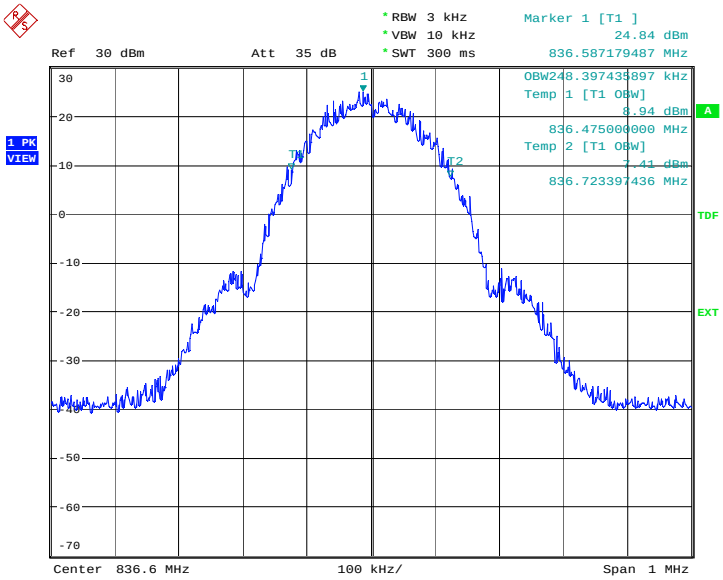
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |
|---|---|
| 824.2 | 243.590 |
| 836.6 | 248.397 |
| 848.8 | 246.795 |

**GPRS 850**

**Channel 128-Occupied Bandwidth (99%)**

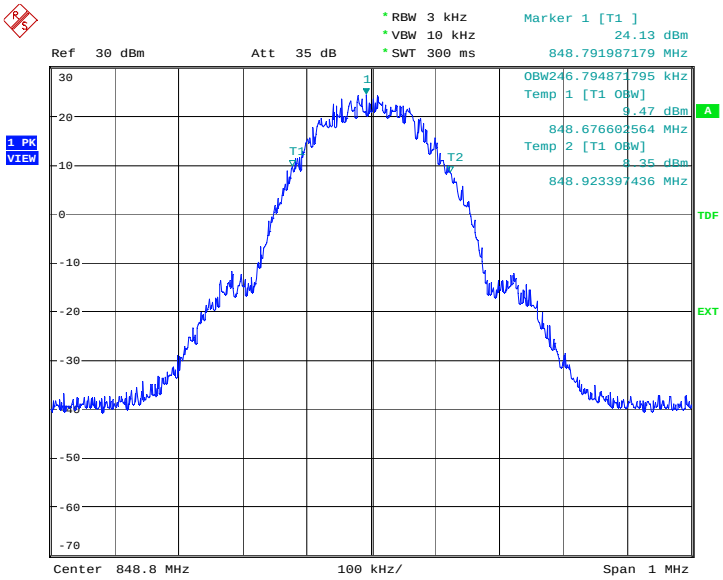


## Channel 190-Occupied Bandwidth (99%)




Date: 7.JUN.2010 03:08:06

## Channel 251-Occupied Bandwidth (99%)



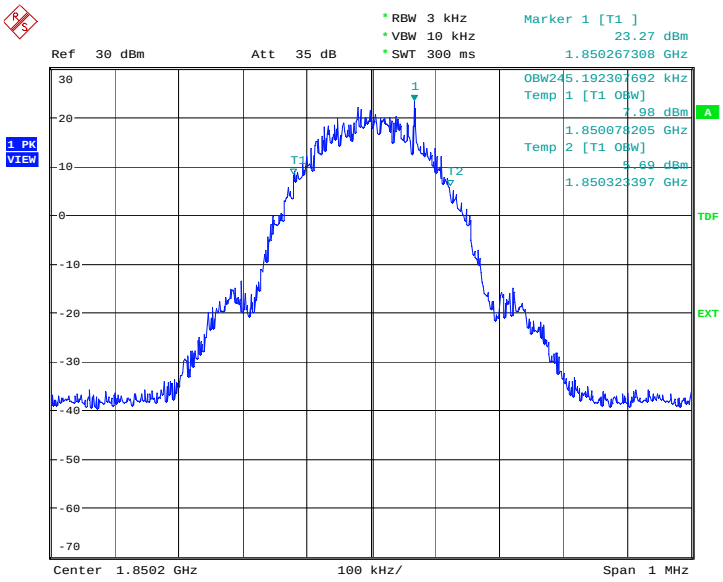

Date: 7.JUN.2010 03:08:33

**PCS 1900(99%)**

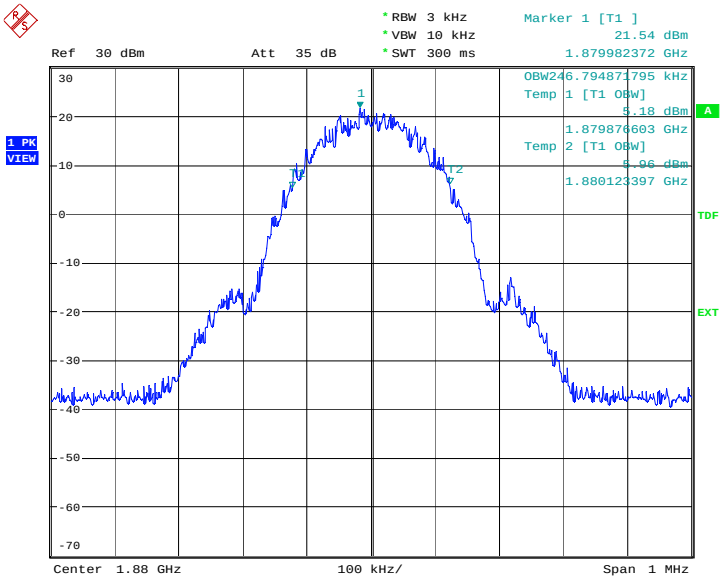
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |
|---|---|
| 1850.2 | 245.192 |
| 1880.0 | 246.795 |
| 1909.8 | 243.590 |

**PCS 1900**

**Channel 512-Occupied Bandwidth (99%)**

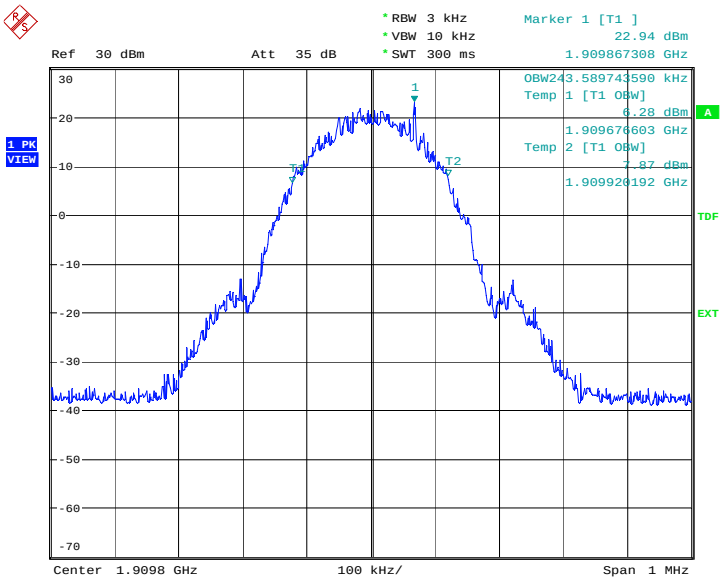


## Channel 661-Occupied Bandwidth (99%)




Date: 7.JUN.2010 02:54:25

## Channel 810-Occupied Bandwidth (99%)



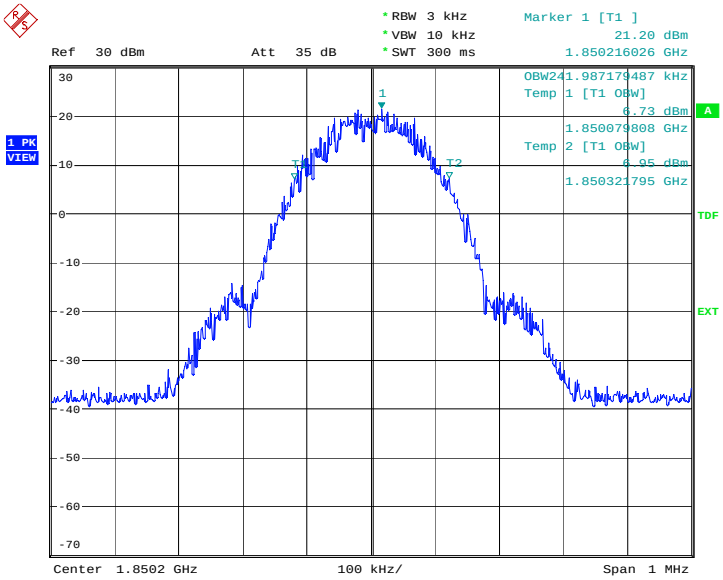

Date: 7.JUN.2010 02:54:52

**GPRS 1900(99%)**

| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |
|---|---|
| 1850.2 | 241.987 |
| 1880.0 | 245.192 |
| 1909.8 | 245.192 |

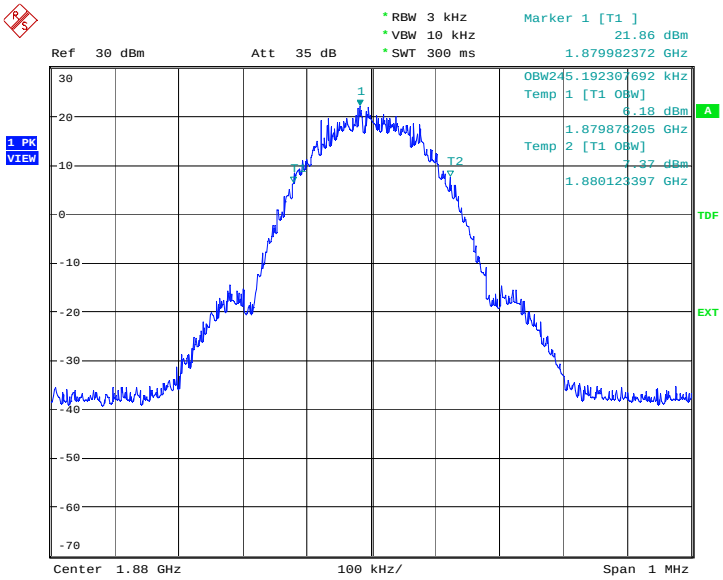
**GPRS 1900**

**Channel 512-Occupied Bandwidth (99%)**



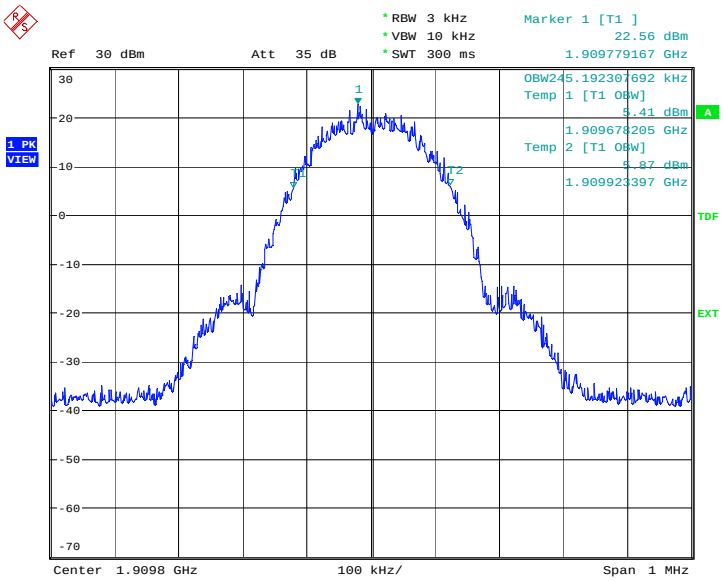

Date: 7.JUN.2010 03:21:25

## Channel 661-Occupied Bandwidth (99%)




Date: 7.JUN.2010 03:21:52

## Channel 810-Occupied Bandwidth (99%)




Date: 7.JUN.2010 03:22:19

## A.6 EMISSION BANDWIDTH

### A.6.1Emission Bandwidth Results

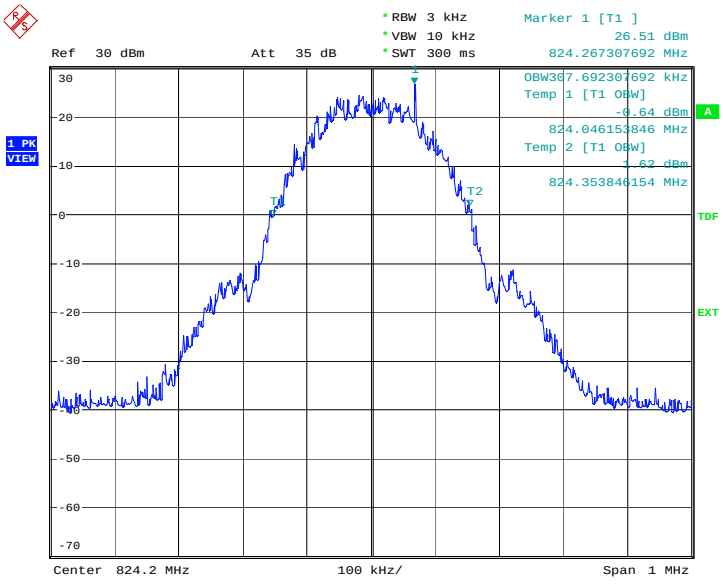
Similar to conducted emissions; Emission bandwidth measurements are only provided for selected frequencies in order to reduce the amount of submitted data. Data were taken at the extreme and mid frequencies of the PCS1900 band and GSM850 band. Table below lists the measured -26dBc BW. Spectrum analyzer plots are included on the following pages.

**GSM 850(-26dBc)**

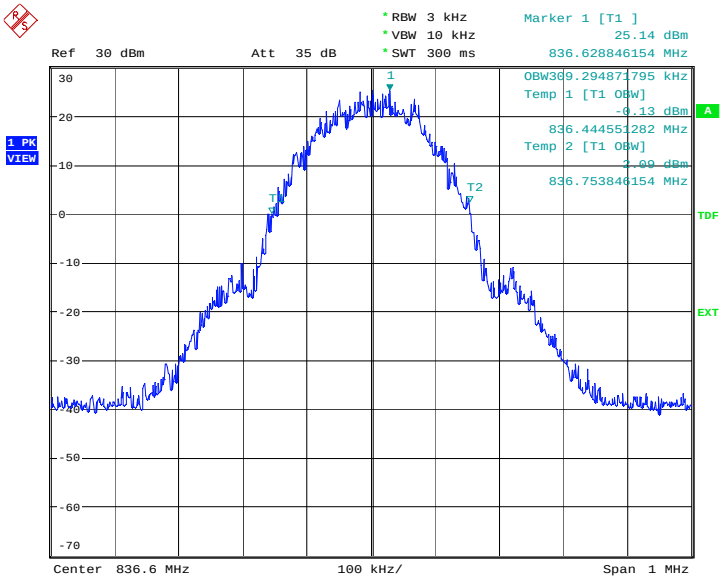
| Frequency(MHz) | Occupied Bandwidth (–26dBc BW)( kHz) |
|---|---|
| 824.2 | 307.692 |
| 836.6 | 309.295 |
| 848.8 | 307.692 |

**GSM 850**

**Channel 128-Occupied Bandwidth (-26dBc BW)**

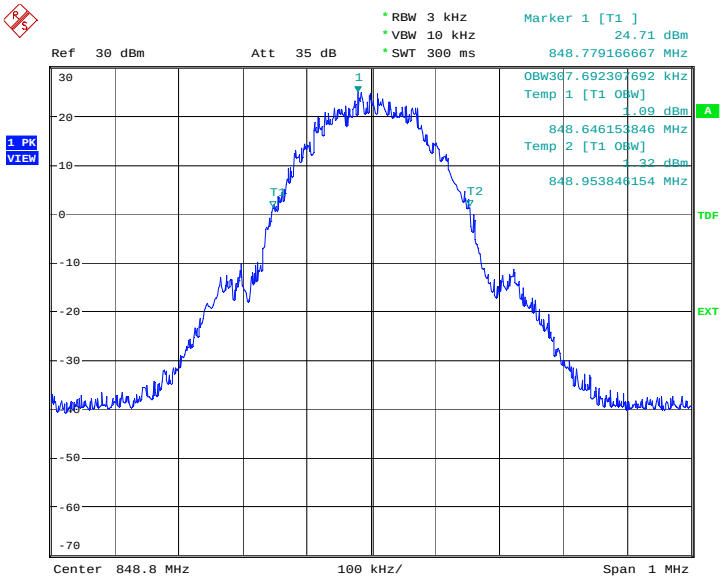


## Channel 190-Occupied Bandwidth (-26dBc BW)




Date: 7.JUN.2010 02:36:10

## Channel 251-Occupied Bandwidth (-26dBc BW)



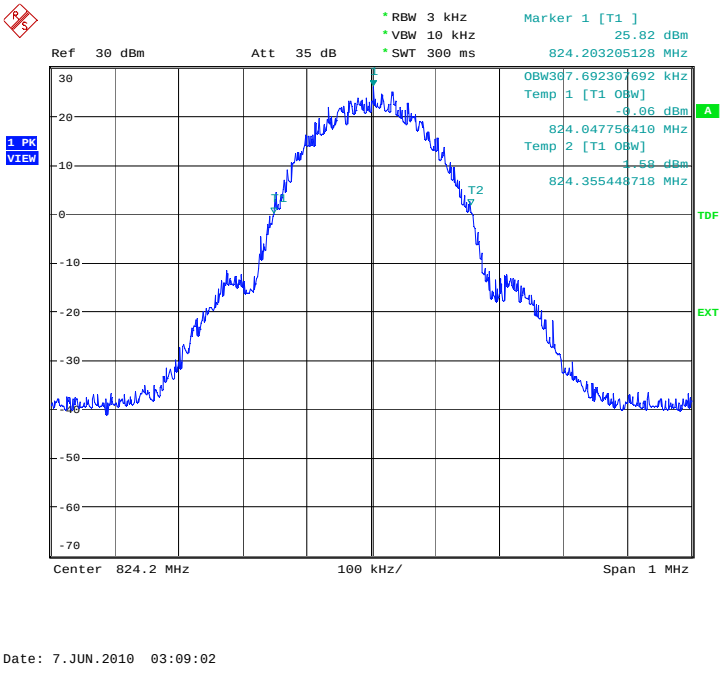

Date: 7.JUN.2010 02:36:37

**GPRS 850(-26dBc)**

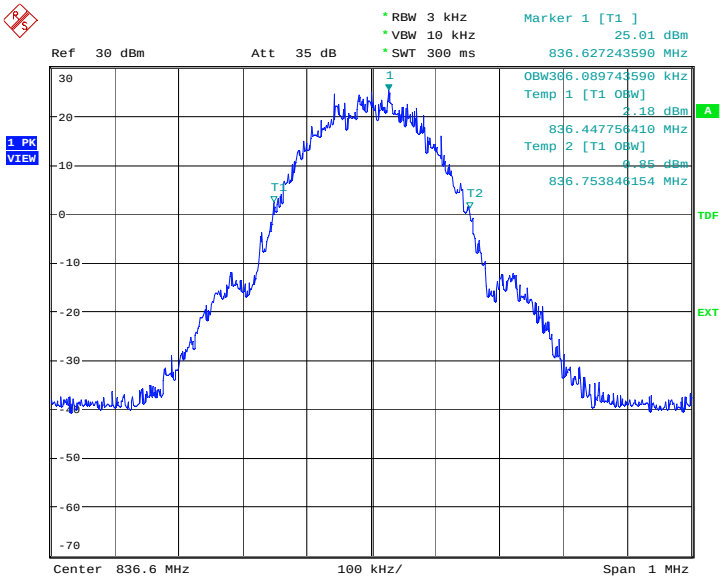
| Frequency(MHz) | Occupied Bandwidth (–26dBc BW)( kHz) |
|---|---|
| 824.2 | 307.692 |
| 836.6 | 306.090 |
| 848.8 | 307.692 |

**GPRS 850**

**Channel 128-Occupied Bandwidth (-26dBc BW)**

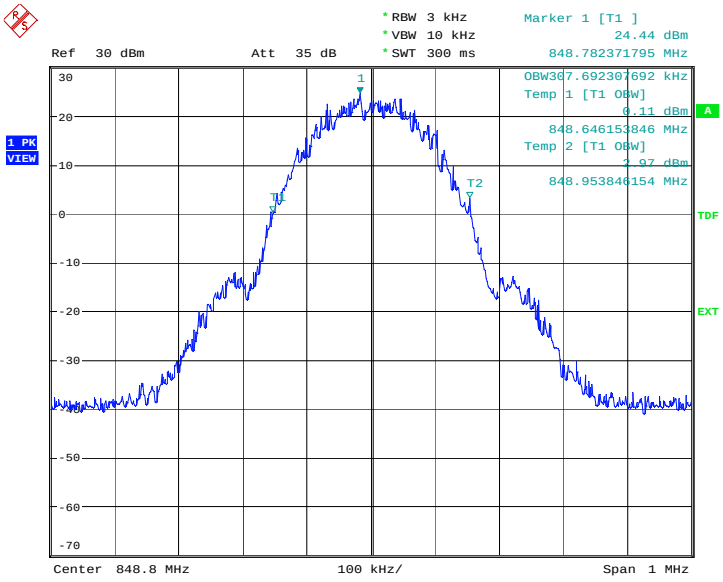


## Channel 190-Occupied Bandwidth (-26dBc BW)




Date: 7.JUN.2010 03:09:29

## Channel 251-Occupied Bandwidth (-26dBc BW)



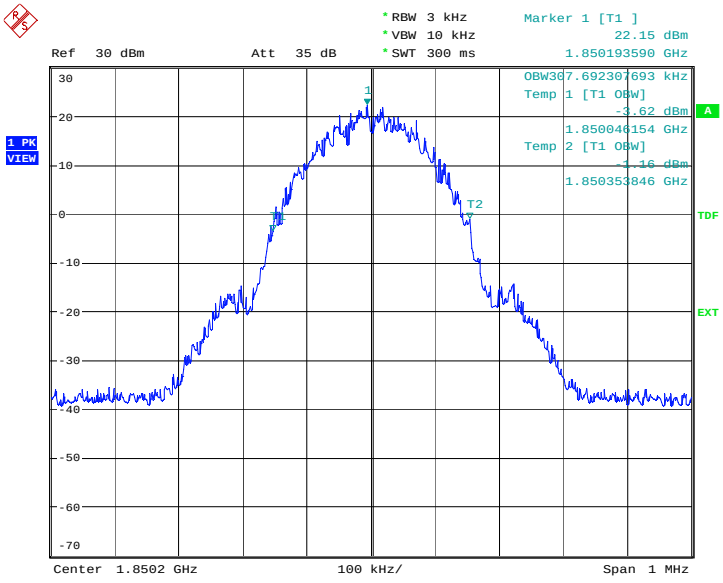

Date: 7.JUN.2010 03:09:56

**PCS 1900(-26dBc)**

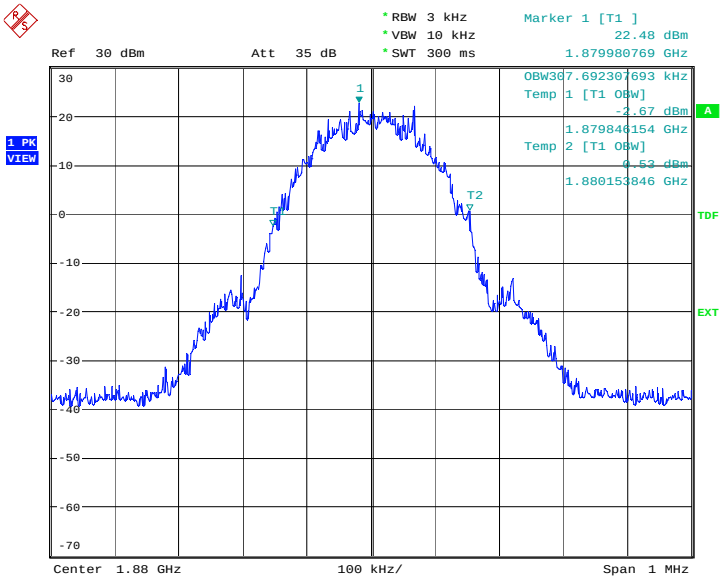
| Frequency(MHz) | Occupied Bandwidth (–26dBc BW)( kHz) |
|---|---|
| 1850.2 | 307.692 |
| 1880.0 | 307.692 |
| 1909.8 | 312.500 |

**PCS 1900**

**Channel 512-Occupied Bandwidth (-26dBc BW)**

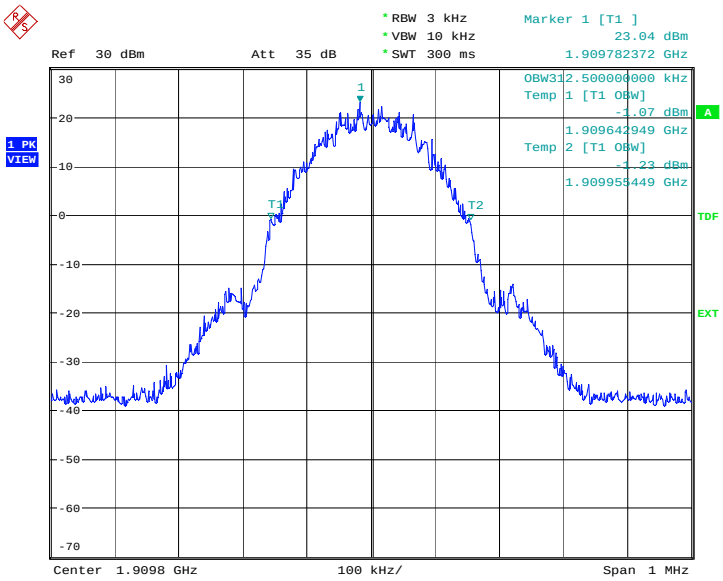


## Channel 661-Occupied Bandwidth (-26dBc BW)




Date: 7.JUN.2010 02:55:49

## Channel 810-Occupied Bandwidth (-26dBc BW)



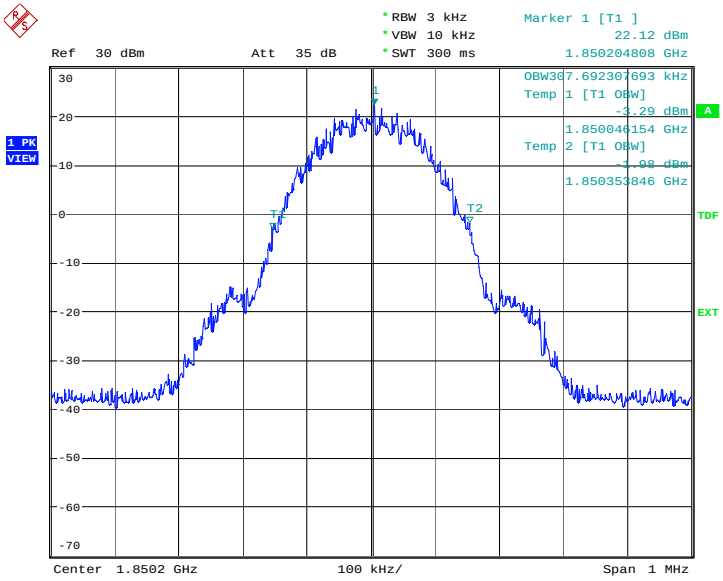

Date: 7.JUN.2010 02:56:16

**GPRS 1900(-26dBc)**

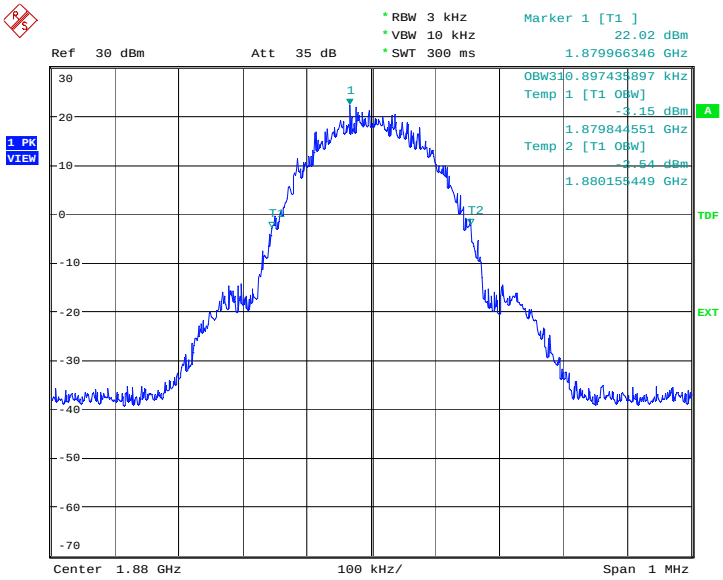
| Frequency(MHz) | Occupied Bandwidth (–26dBc BW)( kHz) |
|---|---|
| 1850.2 | 307.692 |
| 1880.0 | 310.897 |
| 1909.8 | 309.295 |

**GPRS 1900**

**Channel 512-Occupied Bandwidth (-26dBc BW)**

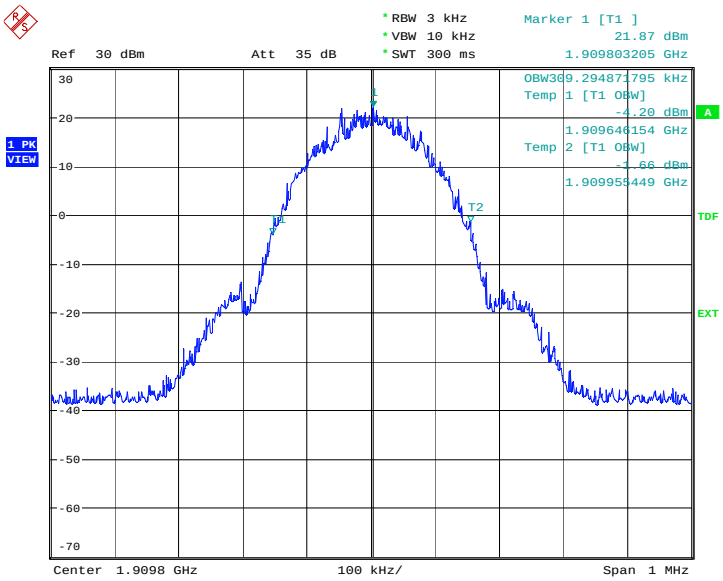


## Channel 661-Occupied Bandwidth (-26dBc BW)




Date: 7.JUN.2010 03:23:14

## Channel 810-Occupied Bandwidth (-26dBc BW)

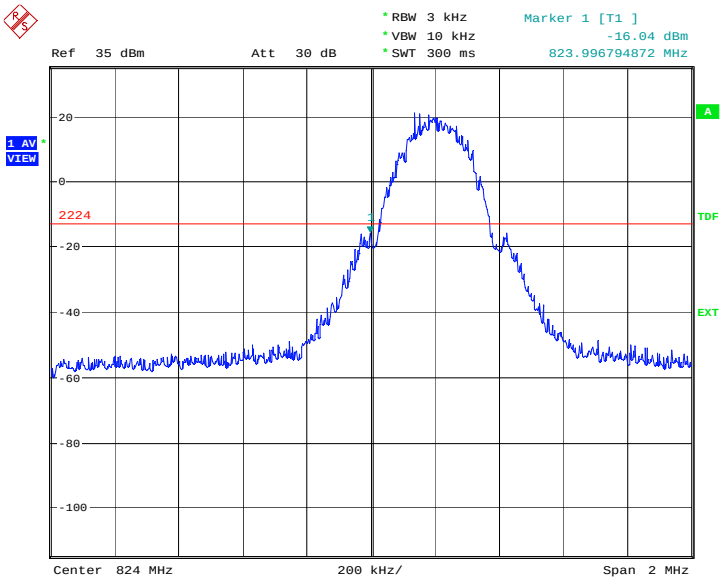



Date: 7.JUN.2010 03:23:41

## A.7 BAND EDGE COMPLIANCE (§22.917(b)/§24.238(b))

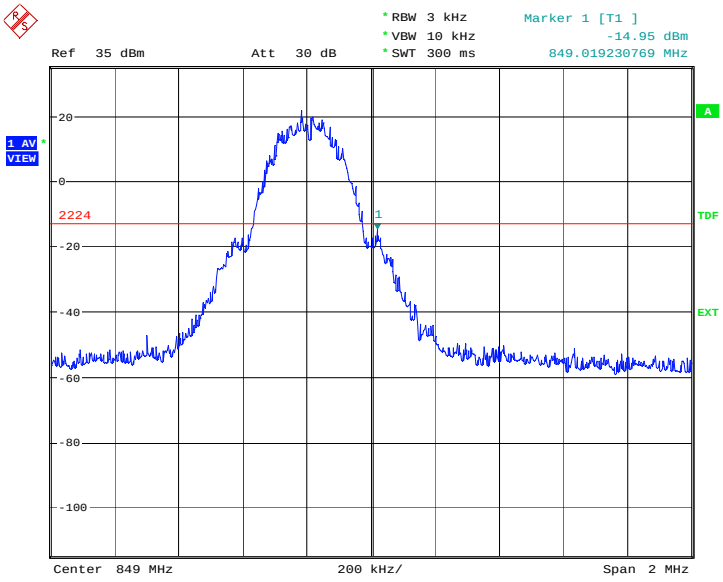
### GSM 850

### LOW BAND EDGE BLOCK-A (GSM850)-Channel 128




Date: 7.JUN.2010 03:36:55

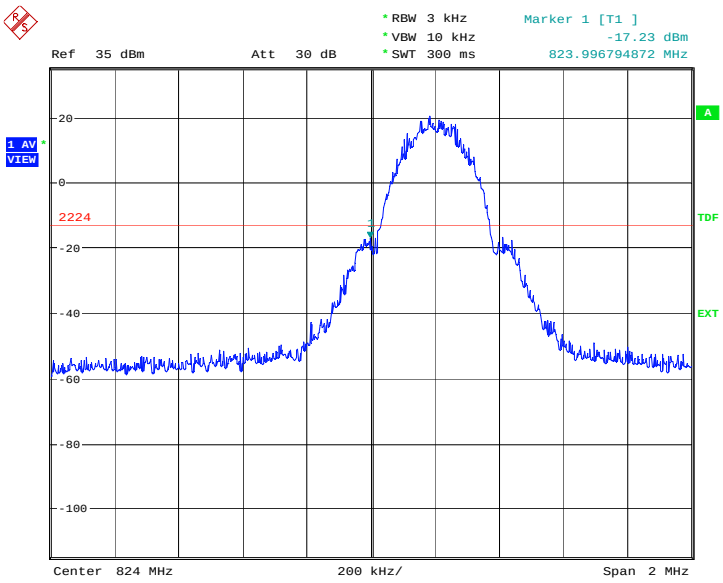
### HIGH BAND EDGE BLOCK-C (GSM850) –Channel 251




Date: 7.JUN.2010 02:40:20

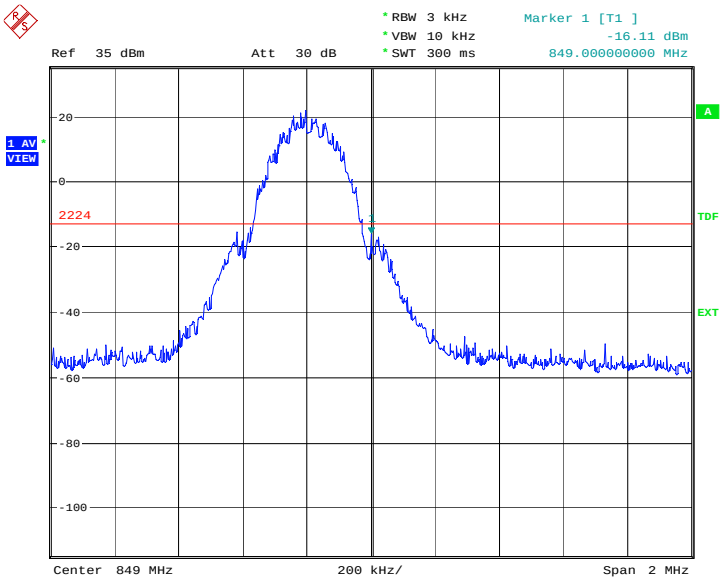
## GPRS 850

## LOW BAND EDGE BLOCK-A (GSM850)-Channel 128




Date: 7.JUN.2010 03:13:12

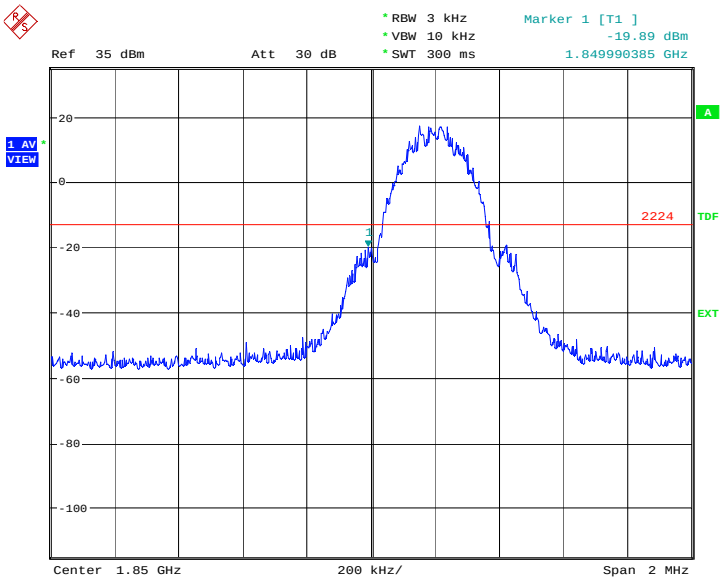
## HIGH BAND EDGE BLOCK-C (GSM850) –Channel 251




Date: 7.JUN.2010 03:13:40

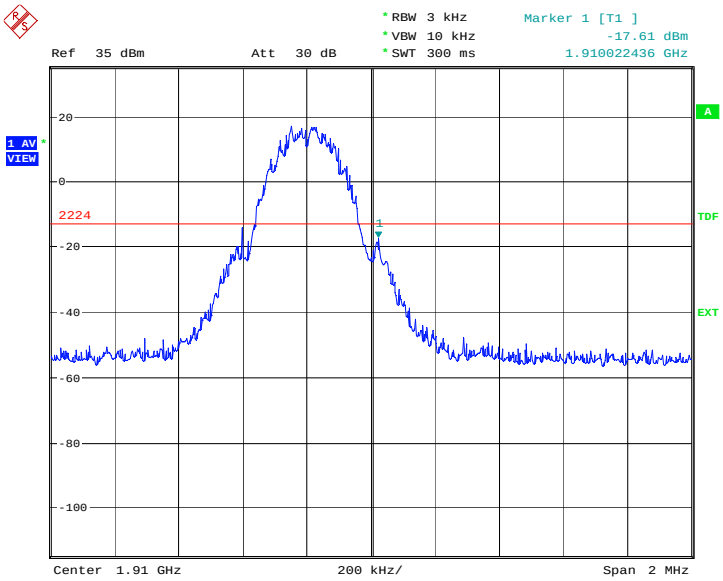
## PCS 1900

## LOW BAND EDGE BLOCK-A (PCS-1900)-Channel 512




Date: 7.JUN.2010 02:59:30

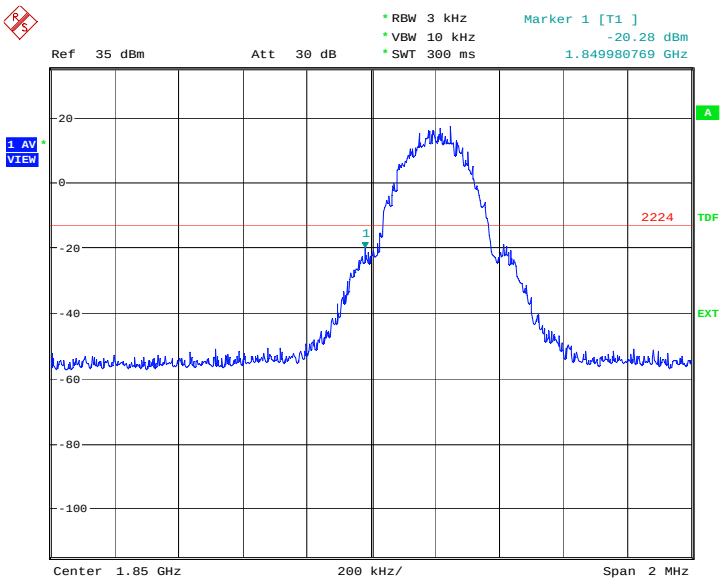
## HIGH BAND EDGE BLOCK-C (PCS-1900) –Channel 810




Date: 7.JUN.2010 02:59:59

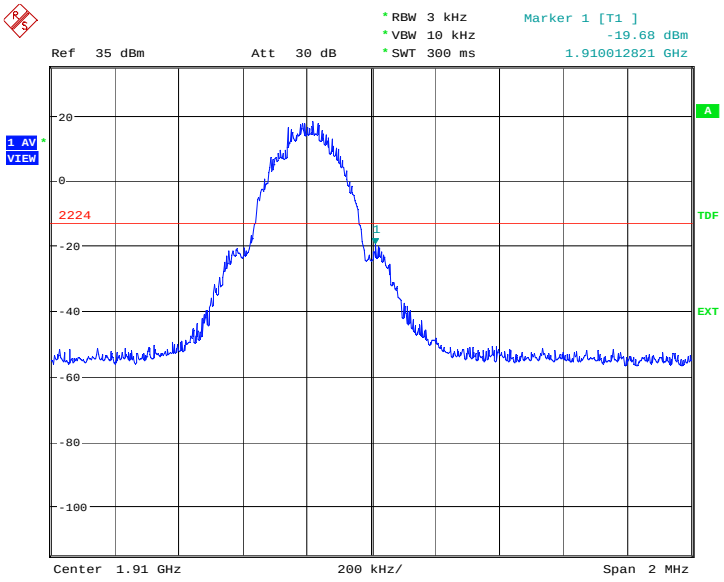
## GPRS 1900

## LOW BAND EDGE BLOCK-A (PCS-1900)-Channel 512




Date: 7.JUN.2010 03:26:56

## HIGH BAND EDGE BLOCK-C (PCS-1900) –Channel 810




Date: 7.JUN.2010 03:27:24

## A.8 CONDUCTED SPURIOUS EMISSION

### A.8.1 Measurement Method

The following steps outline the procedure used to measure the conducted emissions from the EUT.

1. Determine frequency range for measurements: From CFR 2.1057 the spectrum should be investigated from the lowest radio frequency generated in the equipment up to at least the 10th harmonic of the carrier frequency. For the equipment of PCS1900 band, this equates to a frequency range of 30 MHz to 19.1 GHz, data taken from 30 MHz to 20 GHz. For GSM850, data taken from 30 MHz to 9 GHz.
2. Determine EUT transmit frequencies: below outlines the band edge frequencies pertinent to conducted emissions testing.

**GSM850 Transmitter**

| Channel | Frequency (MHz) |
|---|---|
| 128 | 824.2 |
| 190 | 836.6 |
| 251 | 848.8 |

**PCS1900 Transmitter**

| Channel | Frequency (MHz) |
|---|---|
| 512 | 1850.2 |
| 661 | 1880.0 |
| 810 | 1909.8 |

### A. 8.2 Measurement Limit

Sec. 24.238 Emission Limits.

(a) On any frequency outside frequency band of the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log(P) dB. For all power levels +30 dBm to 0 dBm, this becomes a constant specification limit of -13 dBm.

**A. 8.3 Measurement result**

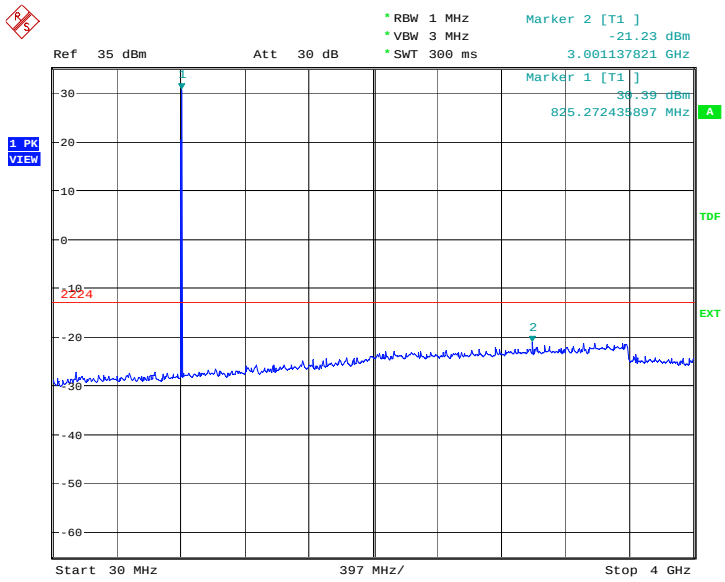
**GSM850**

| Harmonic | Tx ch. 128 Freq. (MHz) | Level (dBm) | Tx ch. 190 Freq. (MHz) | Level (dBm) | Tx ch. Freq. (MHz) 251 | Level (dBm) |
|---|---|---|---|---|---|---|
| 2 | 1648.4 | nf | 1673.2 | nf | 1697.6 | nf |
| 3 | 2472.6 | nf | 2509.8 | nf | 2546.4 | nf |
| 4 | 3296.8 | nf | 3346.4 | nf | 3395.2 | nf |
| 5 | 4121 | nf | 4183 | nf | 4244 | nf |
| 6 | 4945.2 | nf | 5019.6 | nf | 5092.8 | nf |
| 7 | 5769.4 | nf | 5856.2 | nf | 5941.6 | nf |
| 8 | 6593.6 | nf | 6692.8 | nf | 6790.4 | nf |
| 9 | 7417.8 | nf | 7529.4 | nf | 7639.2 | nf |
| 10 | 8242 | nf | 8366 | nf | 8488 | nf |
| nf: Noise floor | | | | | | |

**A.8.3.1 Channel 128: 30MHz – 4GHz**

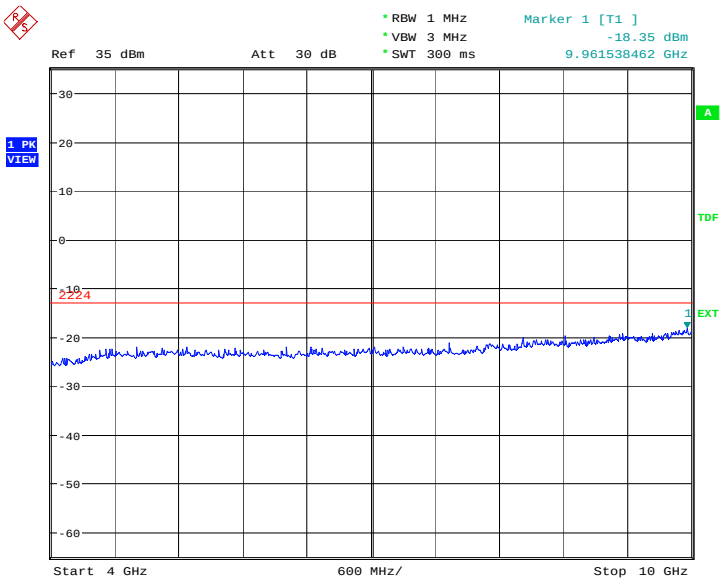
Spurious emission limit –13dBm.

**NOTE: peak above the limit line is the carrier frequency.**



### A.8.3.2 Channel 128: 4GHz – 10GHz

Spurious emission limit –13dBm.

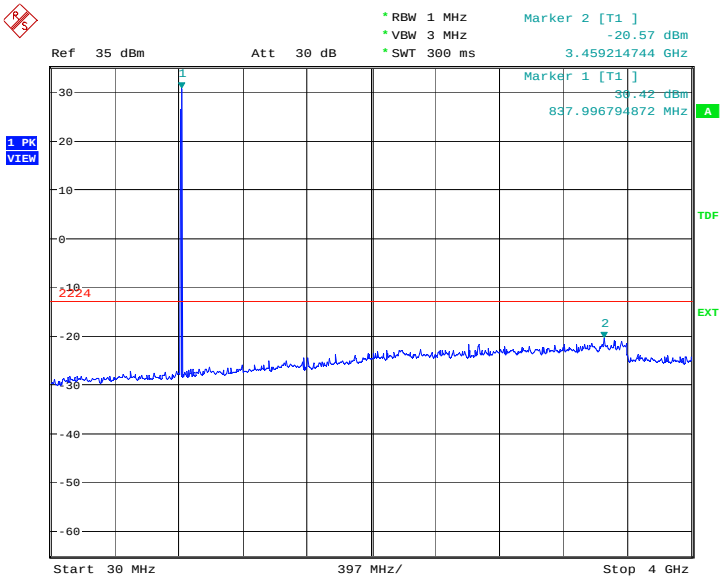



Date: 7.JUN.2010 02:41:17

### A.8.3.3 Channel 190: 30MHz – 4GHz

Spurious emission limit –13dBm

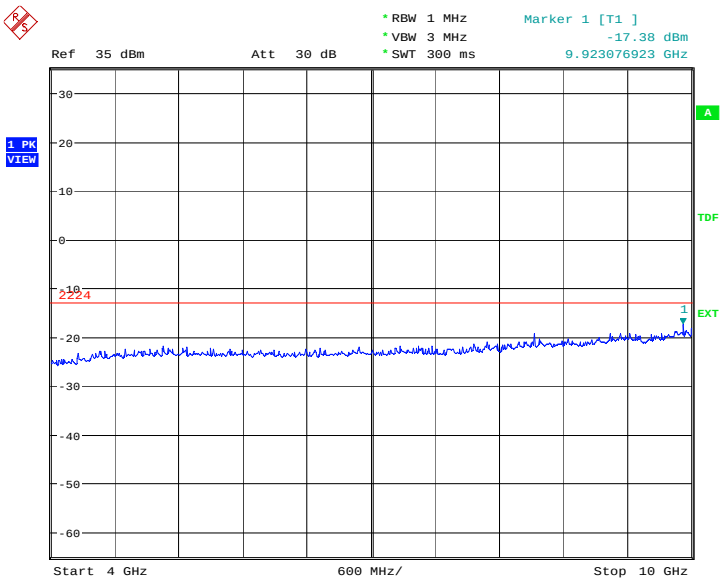
**NOTE: peak above the limit line is the carrier frequency.**




Date: 7.JUN.2010 02:41:46

### A.8.3.4 Channel 190: 4GHz –10GHz

Spurious emission limit –13dBm

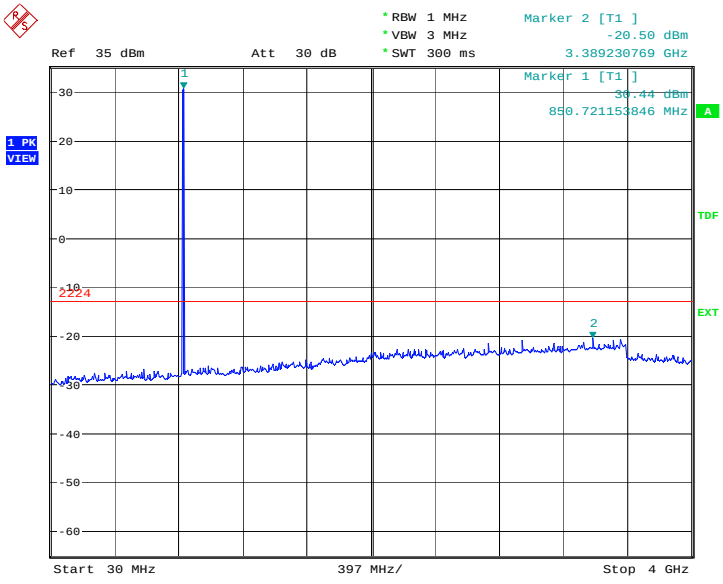



Date: 7.JUN.2010 02:42:14

### A.8.3.5 Channel 251: 30MHz – 4GHz

Spurious emission limit –13dBm.

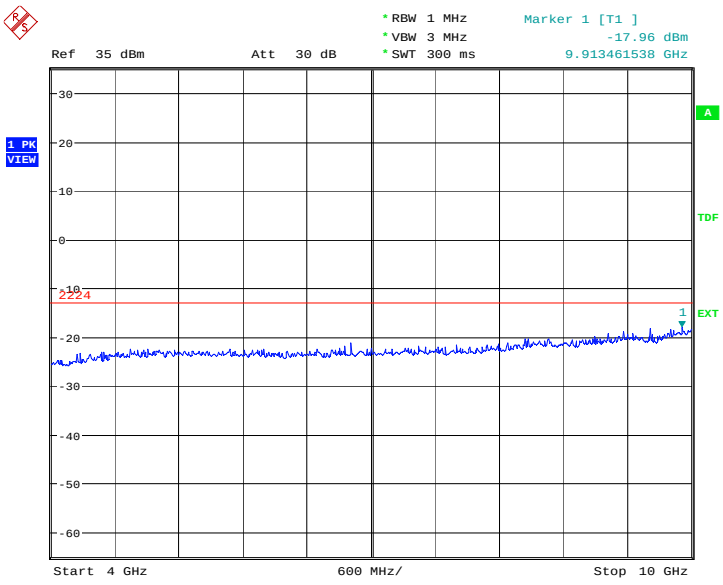
**NOTE: peak above the limit line is the carrier frequency.**




Date: 7.JUN.2010 02:42:42

### A.8.3.6 Channel 251: 4GHz – 10GHz

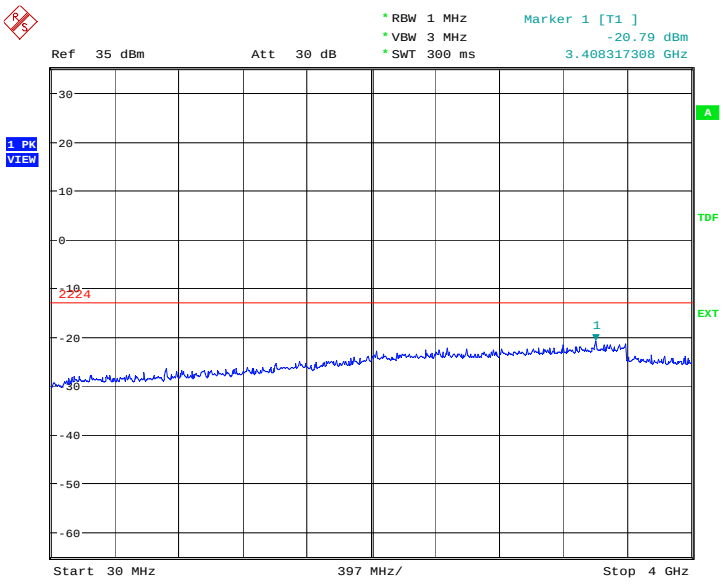
Spurious emission limit –13dBm.




Date: 7.JUN.2010 02:43:10

### A.8.3.7 Idle mode: 30MHz – 4GHz

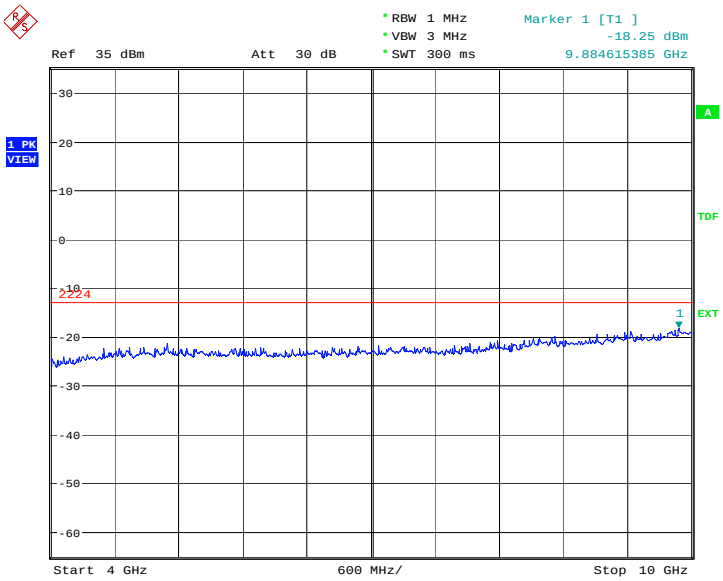
Spurious emission limit –13dBm.




Date: 7.JUN.2010 02:43:39

### A.8.3.8 Idle mode: 4GHz – 10GHz

Spurious emission limit –13dBm.



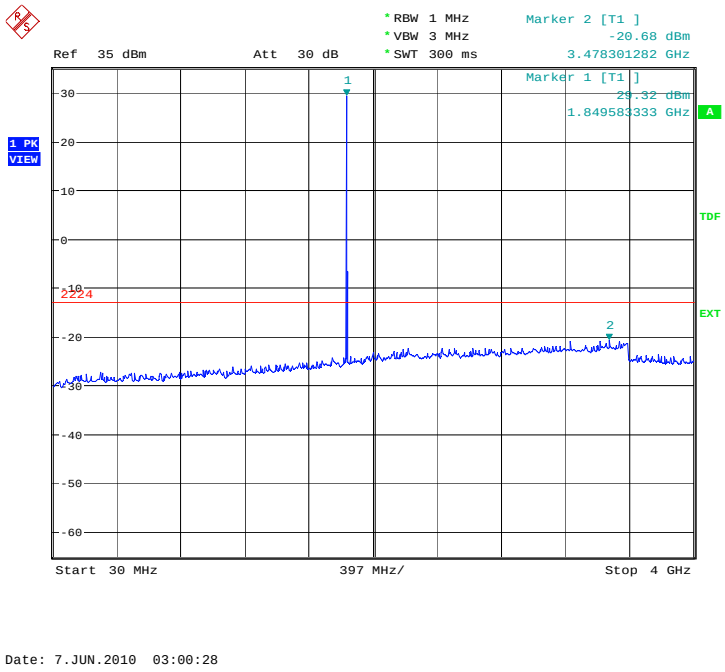
**PCS1900**

| Harmonic | Tx ch. 512 Freq. (MHz) | Level (dBm) | Tx ch. 661 Freq. (MHz) | Level (dBm) | Tx ch. 810 Freq. (MHz) | Level (dBm) |
|---|---|---|---|---|---|---|
| 2 | 3700.4 | nf | 3760 | nf | 3819.6 | nf |
| 3 | 5550.6 | nf | 5640 | nf | 5729.4 | nf |
| 4 | 7400.8 | nf | 7520 | nf | 7639.2 | nf |
| 5 | 9251.0 | nf | 9400 | nf | 9549.0 | nf |
| 6 | 11101.2 | nf | 11280 | nf | 11458.8 | nf |
| 7 | 12951.4 | nf | 13160 | nf | 13368.6 | nf |
| 8 | 14801.6 | nf | 15040 | nf | 15278.4 | nf |
| 9 | 16651.8 | nf | 16920 | nf | 17188.2 | nf |
| 10 | 18502.0 | nf | 18800 | nf | 19098.0 | nf |
| nf: Noise floor | | | | | | |

**A. 8.3.9 Channel 512: 30MHz – 4GHz**

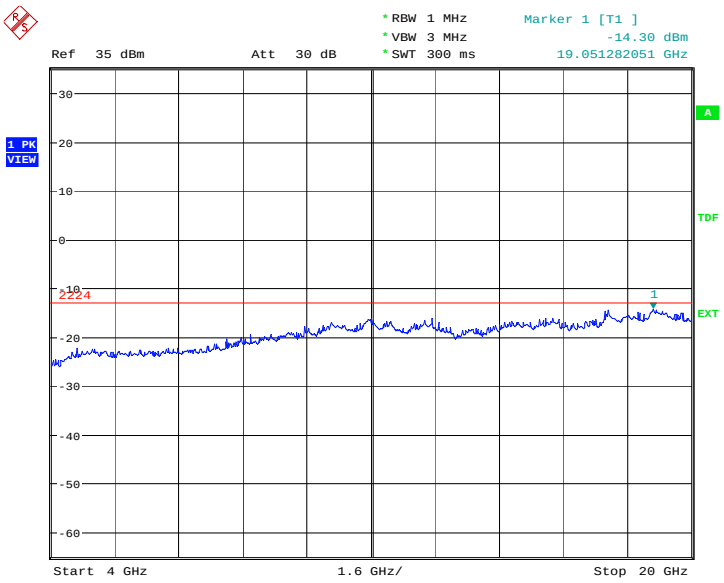
Spurious emission limit –13dBm.

**NOTE: peak above the limit line is the carrier frequency.**



### A. 8.3.10 Channel 512: 4GHz – 20GHz

Spurious emission limit –13dBm.

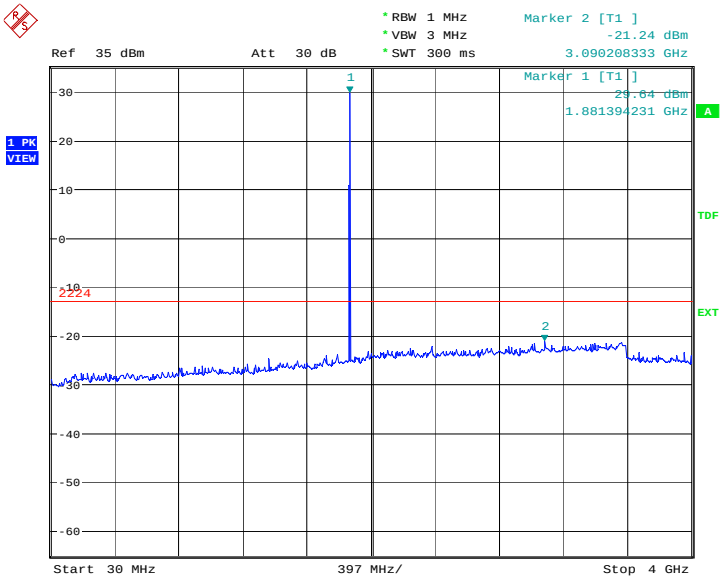



Date: 7.JUN.2010 03:00:56

### A. 8.3.11 Channel 661: 30MHz – 4GHz

Spurious emission limit –13dBm

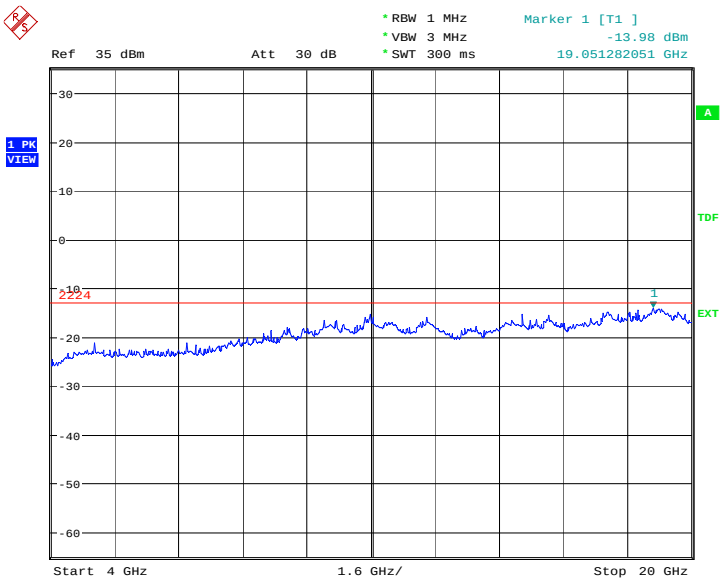
**NOTE: peak above the limit line is the carrier frequency.**




Date: 7.JUN.2010 03:01:25

### A. 8.3.12 Channel 661: 4GHz –20GHz

Spurious emission limit –13dBm

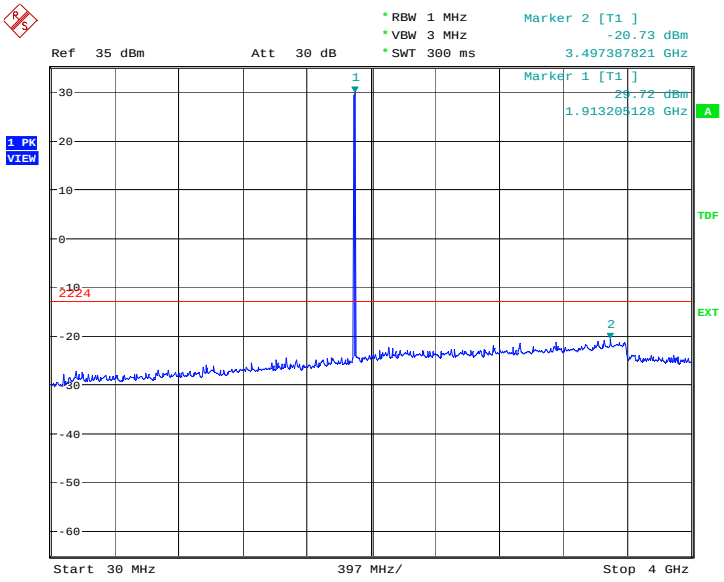



Date: 7.JUN.2010 03:01:53

### A. 8.3.13 Channel 810: 30MHz – 4GHz

Spurious emission limit –13dBm.

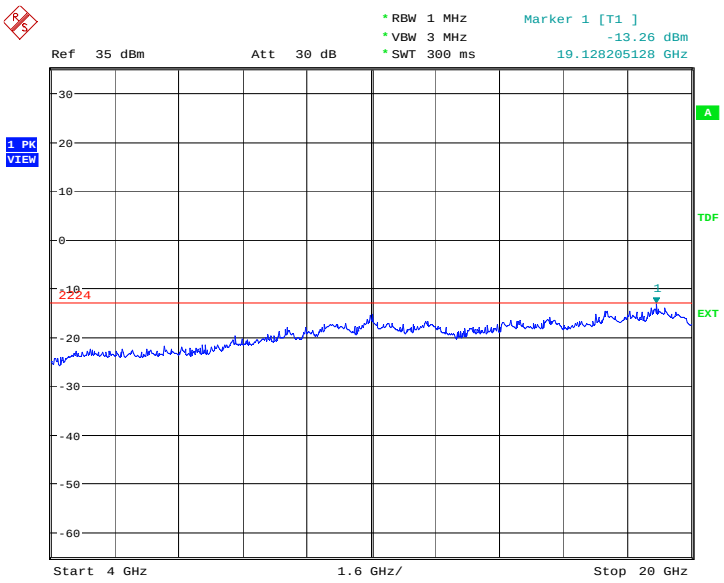
**NOTE: peak above the limit line is the carrier frequency.**




Date: 7.JUN.2010 03:02:22

### A. 8.3.14 Channel 810: 4GHz – 20GHz

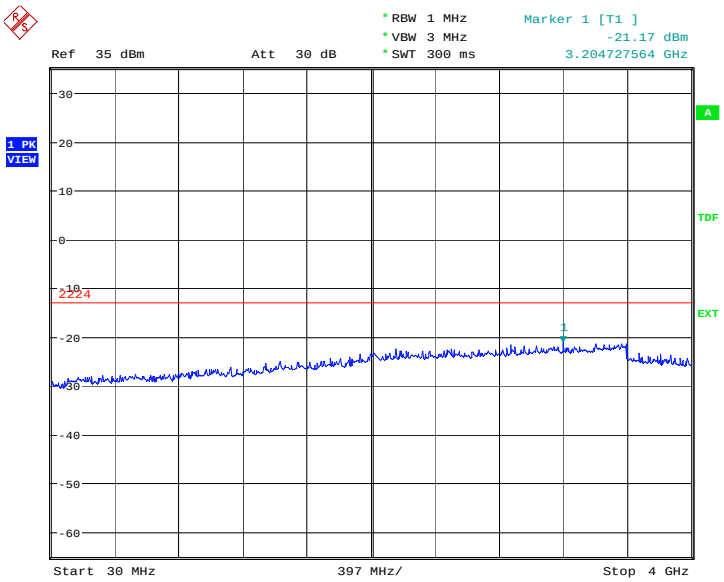
Spurious emission limit –13dBm.




Date: 7.JUN.2010 03:02:50

### A. 8.3.15 Idle mode: 30MHz – 4GHz

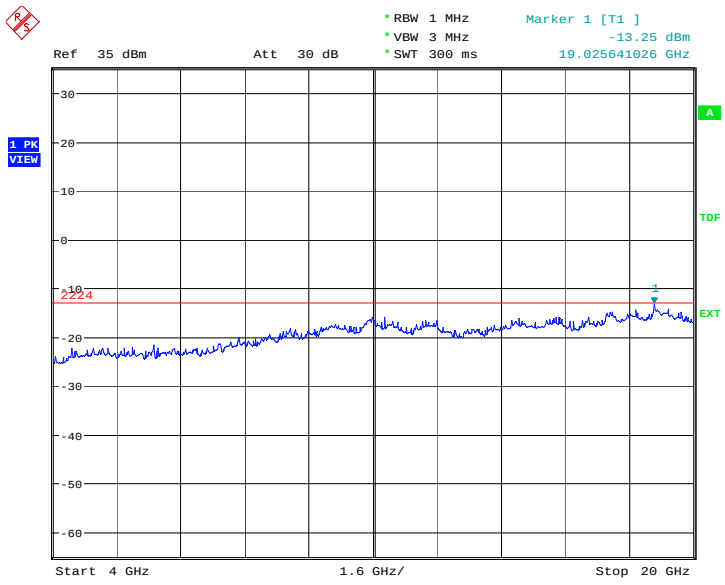
Spurious emission limit –13dBm.




Date: 7.JUN.2010 03:03:19

### A. 8.3.16 Idle mode: 4GHz – 20GHz

Spurious emission limit -13dBm.




*****END OF REPORT*****