



# FCC REPORT

Report Reference No..... : TRE1407014701 R/C.....: 95418  
FCC ID..... : YPVITALCOMTIN  
Applicant's name..... : ITALCOM GROUP.  
Address..... : 1728 Coral Way,Coral Gables,Miami,Florida,United States  
Manufacturer..... : UTCOM TECHNOLOGY CO.,LIMITED.  
Address..... : C1105-1107,Tiley Central Plaza,No3 Haide Road,Nanshan District,Shenzhen 518054  
Test item description ..... : mobile phone  
Trade Mark ..... : NYX  
Model/Type reference..... : tin  
Listed Model(s) ..... : /  
Standard ..... : **FCC Part 22: PUBLIC MOBILE SERVICES**  
**FCC Part 24: PERSONAL COMMUNICATIONS SERVICES**  
Date of receipt of test sample..... : Jul 25, 2014  
Date of testing..... : Jul 26, 2014 ~ Aug 25, 2014  
Date of issue..... : Aug 24, 2014  
Result..... : **Pass**

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Testing Laboratory Name ..... : Shenzhen Huatongwei International Inspection Co., Ltd

Address..... : Keji Nan No.12 Road, Hi-tech Park, Shenzhen, China

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## 1. TEST STANDARDS AND TEST DESCRIPTION

### 1.1. Test Standards

The tests were performed according to following standards:

[FCC Part 22 \(10-1-13 Edition\)](#): PRIVATE LAND MOBILE RADIO SERVICES.

[FCC Part 24\(10-1-13 Edition\)](#): PUBLIC MOBILE SERVICES

[TIA/EIA 603 D June 2010](#): Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.

[47 CFR FCC Part 15 Subpart B](#): - Unintentional Radiators

[FCC Part 2](#): FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS

[KDB971168 D01:2013-06-07](#) Procedures for Compliance Measurement of the Fundamental Emission Power of Licensed Wideband (> 1 MHz) Digital Transmission Systems

[ANSI C63.4:2009](#) Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

### 1.2. Test Description

| Test Item                              | Section in CFR 47                                    | Result |
|----------------------------------------|------------------------------------------------------|--------|
| AC Power Conducted Emission            | Part 15.207                                          | Pass   |
| RF Output Power                        | Part 2.1046<br>Part 22.913 (a)(2)<br>Part 24.232 (c) | Pass   |
| Modulation Characteristics             | Part 2.1047                                          | Pass   |
| 99% & -26 dB Occupied Bandwidth        | Part 2.1049<br>Part 22.917<br>Part 24.238            | Pass   |
| Spurious Emissions at Antenna Terminal | Part 2.1051<br>Part 22.917 (a)<br>Part 24.238 (a)    | Pass   |
| Field Strength of Spurious Radiation   | Part 2.1053<br>Part 22.917 (a)<br>Part 24.238 (a)    | Pass   |
| Out of band emission, Band Edge        | Part 22.917 (a)<br>Part 24.238 (a)                   | Pass   |
| Frequency stability vs. temperature    | Part 2.1055(a)(1)(b)                                 | Pass   |
| Frequency stability vs. voltage        | Part 2.1055(d)(1)(2)                                 | Pass   |

Remark: The measurement uncertainty is not included in the test result.

## 2. SUMMARY

### 2.1. Client Information

|               |                                                                                |
|---------------|--------------------------------------------------------------------------------|
| Applicant:    | ITALCOM GROUP.                                                                 |
| Address:      | 1728 Coral Way,Coral Gables,Miami,Florida,United States                        |
| Manufacturer: | UTCOM TECHNOLOGY CO.,LIMITED.                                                  |
| Address:      | C1105-1107,Tiley Central Plaza,No3 Haide Road,Nanshan District,Shenzhen 518054 |

### 2.2. Product Description

|                           |                                                                                     |
|---------------------------|-------------------------------------------------------------------------------------|
| Name of EUT               | mobile phone                                                                        |
| Trade Mark:               | NYX                                                                                 |
| Model No.:                | tin                                                                                 |
| Listed Model(s):          | /                                                                                   |
| Power supply:             | DC 3.7V From Internal Battery                                                       |
| Adapter information:      | Model No.:nxy mobile<br>Input: AC 100~240V, 50/60Hz, 0.65A<br>Output: DC 5.0V 500mA |
| <b>2G:</b>                |                                                                                     |
| Support Network:          | GSM, GPRS, EGPRS                                                                    |
| Support Band:             | GSM850, DCS1900                                                                     |
| Modulation:               | GSM/GPRS: GMSK<br>EGPRS: GMSK                                                       |
| Transmit Frequency:       | GSM850: 824.20MHz-848.80MHz<br>PCS1900: 1850.20MHz-1909.80MHz                       |
| Receive Frequency:        | GSM850: 869.20MHz-893.80MHz<br>PCS1900: 1930.20MHz-1989.80MHz                       |
| GPRS Class:               | 12                                                                                  |
| EGPRS Class:              | 12                                                                                  |
| Antenna type:             | Intergal Antenna                                                                    |
| Antenna gain:             | -2.0dBi                                                                             |
| Hardware version:         | TIN_V001T                                                                           |
| Software version:         | TIN_AMXNYX_V001R                                                                    |
| <b>3G:</b>                |                                                                                     |
| Operation Band:           | FDD Band II and FDD Band V                                                          |
| Power Class:              | Power Class 3                                                                       |
| Modilation Type:          | QPSK for WCDMA/HSUPA/HSDPA                                                          |
| WCDMA Release Version:    | Release 6                                                                           |
| HSDPA Release Version:    | Category 8                                                                          |
| HSUPA Release Version:    | Category 5                                                                          |
| DC-HSUPA Release Version: | Not Supported                                                                       |
| Antenna type:             | Intergal Antenna                                                                    |
| Antenna gain:             | -2.0dBi                                                                             |
| Hardware version:         | TIN_V001T                                                                           |
| Software version:         | TIN_AMXNYX_V001R                                                                    |

Test Frequency:

| GSM 850 |                 | PCS1900 |                 |
|---------|-----------------|---------|-----------------|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 128     | 824.20          | 512     | 1850.20         |
| 190     | 836.60          | 661     | 1880.00         |
| 251     | 848.80          | 810     | 1909.80         |

| FDD Band II |                 | FDD Band V |                 |
|-------------|-----------------|------------|-----------------|
| Channel     | Frequency (MHz) | Channel    | Frequency (MHz) |
| 9262        | 1852.4          | 4132       | 826.40          |
| 9400        | 1880.0          | 4182       | 836.60          |
| 9538        | 1907.6          | 4233       | 846.60          |

### 2.3. EUT operation mode

The EUT has been tested under typical operating condition. The Applicant provides software to control the EUT for staying in continuous transmitting and receiving mode for testing.

### 2.4. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

- - supplied by the manufacturer
- - supplied by the lab

|                       |             |                |   |
|-----------------------|-------------|----------------|---|
| <input type="radio"/> | Power Cable | Length (m) :   | / |
| <input type="radio"/> |             | Shield :       | / |
| <input type="radio"/> |             | Detachable :   | / |
| <input type="radio"/> | Multimeter  | Manufacturer : | / |
| <input type="radio"/> |             | Model No. :    | / |

### 2.5. Modifications

No modifications were implemented to meet testing criteria.

### **3. TEST ENVIRONMENT**

#### **3.1. Address of the test laboratory**

Test Laboratory: Shenzhen Huatongwei International Inspection Co., Ltd  
Address: Keji Nan No.12 Road, Hi-tech Park, Shenzhen, China  
Phone: 86-755-26715686 Fax: 86-755-26748089

#### **3.2. Test Facility**

The test facility is recognized, certified, or accredited by the following organizations:

##### **CNAS-Lab Code: L1225**

Shenzhen Huatongwei International Inspection Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories, Date of Registration: Mar. 29, 2012. Valid time is until Feb. 28, 2015.

##### **A2LA-Lab Cert. No. 2243.01**

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing. Valid time is until Sept. 30, 2013.

##### **FCC-Registration No.: 662850**

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Registration 662850, Renewal date June. 01, 2012, valid time is until June. 01, 2015.

##### **IC-Registration No.: 5377A**

The 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 5377A on Jan. 25, 2011, valid time is until Jan. 24, 2014.

##### **ACA**

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our A2LA accreditation.

##### **VCCI**

The 3m Semi-anechoic chamber (12.2m×7.95m×6.7m) and Shielded Room (8m×4m×3m) of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-292. Date of Registration: Dec. 24, 2010. Valid time is until Dec. 23, 2013.

Main Ports Conducted Interference Measurement of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: C-2726. Date of Registration: Dec. 20, 2012. Valid time is until Dec. 19, 2015.

Telecommunication Ports Conducted Interference Measurement of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: T-1837. Date of Registration: May 07, 2013. Valid time is until May 06, 2016.

##### **DNV**

Shenzhen Huatongwei International Inspection Co., Ltd. has been found to comply with the requirements of DNV towards subcontractor of EMC and safety testing services in conjunction with the EMC and Low voltage Directives and in the voluntary field. The acceptance is based on a formal quality Audit and follow-ups according to relevant parts of ISO/IEC Guide 17025 (2005), in accordance with the requirements of the DNV Laboratory Quality Manual towards subcontractors. Valid time is until Aug. 24, 2016.

### 3.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

|                                       |              |
|---------------------------------------|--------------|
| Normal Temperature/T <sub>nor</sub> : | 15~35°C      |
| Relative Humidity                     | 30~60 %      |
| Air Pressure                          | 950-1050 hPa |

### 3.4. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report according to TR-100028-01 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 2" and is documented in the Shenzhen Huatongwei International Inspection Co., Ltd quality system according to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen Huatongwei laboratory is reported:

| Test Items                                 | Measurement Uncertainty | Notes |
|--------------------------------------------|-------------------------|-------|
| Frequency stability                        | 25 Hz                   | (1)   |
| Transmitter power conducted                | 0.57 dB                 | (1)   |
| Transmitter power Radiated                 | 2.20 dB                 | (1)   |
| Conducted spurious emission 9KHz-12.75 GHz | 1.60 dB                 | (1)   |
| Conducted Emission 9KHz-30MHz              | 3.39 dB                 | (1)   |
| Radiated Emission 30~1000MHz               | 4.24 dB                 | (1)   |
| Radiated Emission 1~18GHz                  | 5.16 dB                 | (1)   |
| Radiated Emission 18-40GHz                 | 5.54 dB                 | (1)   |
| Occupied Bandwidth                         | -----                   | (1)   |
| Emission Mask                              | -----                   | (1)   |
| Modulation Characteristic                  | -----                   | (1)   |
| Transmitter Frequency Behavior             | -----                   | (1)   |

- (1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

### 3.5. Equipments Used during the Test

| AC Power Conducted Emission |                               |               |             |            |            |
|-----------------------------|-------------------------------|---------------|-------------|------------|------------|
| No.                         | Equipment                     | Manufacturer  | Model No.   | Serial No. | Last Cal.  |
| 1                           | Artificial Mains              | Rohde&Schwarz | ESH2-Z5     | 100028     | 2013/10/26 |
| 2                           | EMI Test Receiver             | Rohde&Schwarz | ESCS 30     | 100038     | 2013/10/26 |
| 3                           | Pulse Limiter                 | Rohde&Schwarz | ESHSZ2      | 100044     | 2013/10/26 |
| 4                           | EMI Test Software             | Rohde&Schwarz | ES-K1 V1.71 | N/A        | N/         |
| 5                           | UNIVERSAL RADIO COMMUNICATION | Rohde&Schwarz | CMU200      | 112012     | 2013/10/26 |

| Output Power(Conducted) & Occupied Bandwidth & Emission Bandwidth & Band Edge Compliance & Conducted Spurious Emission |                               |               |           |            |            |
|------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------|-----------|------------|------------|
| No.                                                                                                                    | Equipment                     | Manufacturer  | Model No. | Serial No. | Last Cal.  |
| 1                                                                                                                      | UNIVERSAL RADIO COMMUNICATION | Rohde&Schwarz | CMU200    | 112012     | 2013/10/26 |
| 2                                                                                                                      | Spectrum Analyzer             | Rohde&Schwarz | FSU26     | 201141     | 2013/10/26 |
| 3                                                                                                                      | Splitter                      | Mini-Circuit  | ZAPD-4    | 400059     | 2013/10/26 |

| Frequency Stability |                               |               |           |            |            |
|---------------------|-------------------------------|---------------|-----------|------------|------------|
| No.                 | Equipment                     | Manufacturer  | Model No. | Serial No. | Last Cal.  |
| 1                   | UNIVERSAL RADIO COMMUNICATION | Rohde&Schwarz | CMU200    | 112012     | 2013/10/26 |
| 2                   | Spectrum Analyzer             | Rohde&Schwarz | FSU26     | 201141     | 2013/10/26 |
| 3                   | Climate Chamber               | ESPEC         | EL-10KA   | 05107008   | 2013/10/26 |
| 4                   | Splitter                      | Mini-Circuit  | ZAPD-4    | 400059     | 2013/10/26 |

| Output Power (Radiated) & Radiated Spurious Emission |                               |                              |           |              |            |
|------------------------------------------------------|-------------------------------|------------------------------|-----------|--------------|------------|
| No.                                                  | Equipment                     | Manufacturer                 | Model No. | Serial No.   | Last Cal.  |
| 1                                                    | UNIVERSAL RADIO COMMUNICATION | Rohde&Schwarz                | CMU200    | 112012       | 2013/10/26 |
| 2                                                    | Spectrum Analyzer             | Rohde&Schwarz                | FSU26     | 201141       | 2013/10/26 |
| 3                                                    | HORN ANTENNA                  | ShwarzBeck                   | 9120D     | 1012         | 2013/10/26 |
| 4                                                    | HORN ANTENNA                  | ShwarzBeck                   | 9120D     | 1011         | 2013/10/26 |
| 5                                                    | Ultra-Broadband Antenna       | ShwarzBeck                   | VULB9163  | 538          | 2013/10/26 |
| 6                                                    | Ultra-Broadband Antenna       | ShwarzBeck                   | VULB9163  | 539          | 2013/10/26 |
| 7                                                    | TURNTABLE                     | MATURO                       | TT2.0     | ----         | N/A        |
| 8                                                    | ANTENNA MAST                  | MATURO                       | TAM-4.0-P | ----         | N/A        |
| 9                                                    | EMI Test Software             | Audix                        | E3        | N/A          | N/A        |
| 10                                                   | EMI Test Receiver             | Rohde&Schwarz                | ESIB 26   | 100009       | 2013/10/26 |
| 11                                                   | RF Test Panel                 | Rohde&Schwarz                | TS / RSP  | 335015/ 0017 | N/A        |
| 12                                                   | High pass filter              | Compliance Direction systems | BSU-6     | 34202        | 2013/10/26 |
| 13                                                   | Splitter                      | Mini-Circuit                 | ZAPD-4    | 400059       | 2013/10/26 |
| 14                                                   | Horn Antenna                  | SCHWARZBECK                  | BBHA9170  | 25841        | 2013/10/26 |
| 15                                                   | Horn Antenna                  | SCHWARZBECK                  | BBHA9170  | 25842        | 2013/10/26 |
| 16                                                   | Preamplifier                  | ShwarzBeck                   | BBV 9718  | BBV 9718     | 2013/10/26 |
| 17                                                   | Broadband Preamplifier        | ShwarzBeck                   | BBV743    | 9743-0079    | 2013/10/26 |
| 18                                                   | Signal Generator              | Rohde&Schwarz                | SMF100A   | 101932       | 2013/10/26 |
| 19                                                   | Amplifier                     | Compliance Direction systems | PAP1-4060 | 120          | 2013/10/26 |
| 20                                                   | TURNTABLE                     | ETS                          | 2088      | 2149         | N/A        |
| 21                                                   | ANTENNA MAST                  | ETS                          | 2075      | 2346         | N/A        |
| 22                                                   | HORN ANTENNA                  | Rohde&Schwarz                | HF906     | 100068       | 2013/10/26 |
| 23                                                   | HORN ANTENNA                  | Rohde&Schwarz                | HF906     | 100039       | 2013/10/26 |

The calibration interval was one year.



## 4. TEST CONDITIONS AND RESULTS

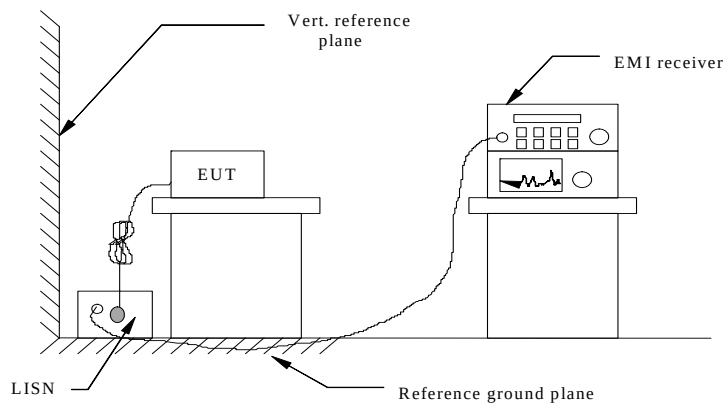
### 4.1. Conducted Emissions Test

#### LIMIT:

| Frequency of Emission (MHz) | Conducted Limit (dBuV) |            |
|-----------------------------|------------------------|------------|
|                             | Quasi-peak             | Average    |
| 0.15-0.5                    | 66 to 56 *             | 56 to 46 * |
| 0.5-5                       | 56                     | 46         |
| 5-30                        | 60                     | 50         |

\* Decreasing linearly with the logarithm of the frequency

#### TEST CONFIGURATION



#### TEST PROCEDURE

- 1 The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system; a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4-2009.
- 2 Support equipment, if needed, was placed as per ANSI C63.4-2009.
- 3 All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4-2009.
- 4 If a EUT received DC power from the adapter, the adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
- 5 All support equipments received AC power from a second LISN, if any.
- 6 The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7 Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
- 8 During the above scans, the emissions were maximized by cable manipulation.

#### TEST RESULTS

**Note:** We tested all modes and recorded the worst case at GSM900

**GSM850**

Test mode:

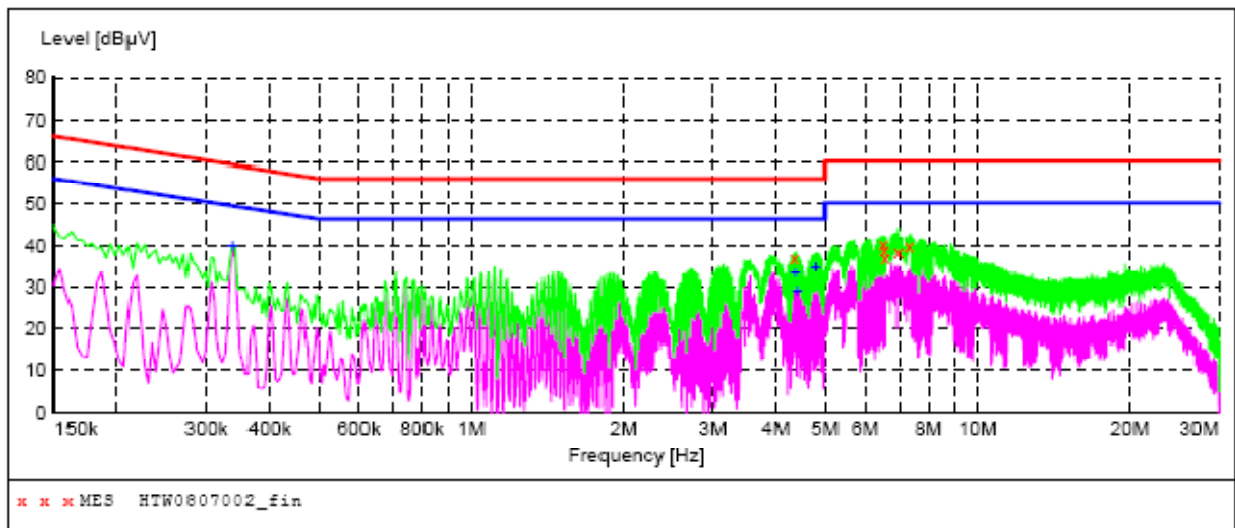
GSM850

Polarization

L

**SCAN TABLE: "Voltage (9K-30M) FIN"**

Short Description: 150K-30M Voltage

**MEASUREMENT RESULT: "HTW0807002\_fin"**

8/7/2014 10:31AM

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 4.334000         | 37.10         | 10.1         | 56            | 18.9         | QP       | L1   | GND |
| 6.522000         | 40.30         | 10.2         | 60            | 19.7         | QP       | L1   | GND |
| 6.554000         | 38.70         | 10.2         | 60            | 21.3         | QP       | L1   | GND |
| 6.570000         | 37.20         | 10.2         | 60            | 22.8         | QP       | L1   | GND |
| 6.978000         | 38.40         | 10.2         | 60            | 21.6         | QP       | L1   | GND |
| 7.318000         | 39.90         | 10.2         | 60            | 20.1         | QP       | L1   | GND |

**MEASUREMENT RESULT: "HTW0807002\_fin2"**

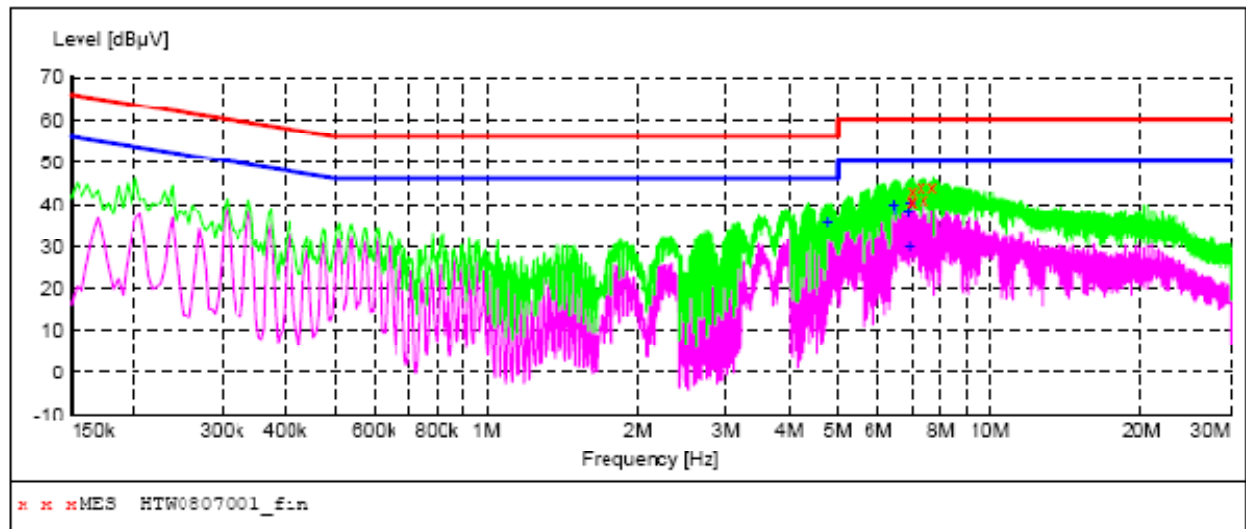
8/7/2014 10:31AM

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.338000         | 39.70         | 11.2         | 49            | 9.6          | AV       | L1   | GND |
| 4.366000         | 33.00         | 10.1         | 46            | 13.0         | AV       | L1   | GND |
| 4.402000         | 29.10         | 10.1         | 46            | 16.9         | AV       | L1   | GND |
| 4.798000         | 34.40         | 10.1         | 46            | 11.6         | AV       | L1   | GND |

|            |        |              |   |
|------------|--------|--------------|---|
| Test mode: | GSM850 | Polarization | N |
|------------|--------|--------------|---|

SCAN TABLE: "Voltage (9K-30M) FIN"

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "HTW0807001\_fin"

8/7/2014 10:27AM

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 6.970000         | 41.00         | 10.2         | 60            | 19.0         | QP       | N    | GND |
| 7.002000         | 43.00         | 10.2         | 60            | 17.0         | QP       | N    | GND |
| 7.010000         | 41.00         | 10.2         | 60            | 19.0         | QP       | N    | GND |
| 7.302000         | 44.00         | 10.2         | 60            | 16.0         | QP       | N    | GND |
| 7.402000         | 41.20         | 10.2         | 60            | 18.8         | QP       | N    | GND |
| 7.698000         | 43.90         | 10.3         | 60            | 16.1         | OP       | N    | GND |

MEASUREMENT RESULT: "HTW0807001\_fin2"

8/7/2014 10:27AM

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 4.778000         | 35.60         | 10.1         | 46            | 10.4         | AV       | N    | GND |
| 6.442000         | 39.90         | 10.2         | 50            | 10.1         | AV       | N    | GND |
| 6.474000         | 38.40         | 10.2         | 50            | 11.6         | AV       | N    | GND |
| 6.874000         | 38.10         | 10.2         | 50            | 11.9         | AV       | N    | GND |
| 6.918000         | 29.70         | 10.2         | 50            | 20.3         | AV       | N    | GND |
| 6.934000         | 40.20         | 10.2         | 50            | 9.8          | AV       | N    | GND |

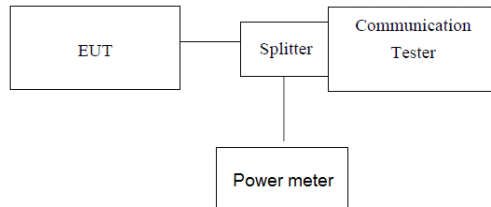
## 4.2. Conducted Peak Output Power

### LIMIT:

GSM850/WCDMA Band V: N/A

PCS1900/WCDMA Band II: N/A

### TEST CONFIGURATION



*Note: Measurement setup for testing on Antenna connector*

### TEST PROCEDURE

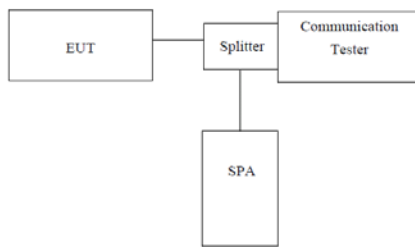
1. The transmitter output port was connected to base station.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator, the path loss was compensated to the results for each measurement.
3. Set EUT at maximum power through base station.
4. Select lowest, middle, and highest channels for each band and different modulation.
5. Measure the maximum burst average power.

### TEST RESULTS

| EUT Mode                  | Channel | Frequency (MHz) | Power (dBm) | Limit (dBm) | Result |
|---------------------------|---------|-----------------|-------------|-------------|--------|
| GSM 850<br>(GMSK)         | 128     | 824.20          | 32.97       | \           | Pass   |
|                           | 190     | 836.60          | 32.77       |             |        |
|                           | 251     | 848.80          | 32.38       |             |        |
| GPRS850<br>(GMSK,1Slot)   | 128     | 824.20          | 32.83       | \           | Pass   |
|                           | 190     | 836.60          | 32.74       |             |        |
|                           | 251     | 848.80          | 32.56       |             |        |
| EGPRS850<br>(GMSK,1Slot)  | 128     | 824.20          | 32.69       | \           | Pass   |
|                           | 190     | 836.60          | 32.36       |             |        |
|                           | 251     | 848.80          | 32.75       |             |        |
| PCS1900<br>(GMSK)         | 512     | 1850.20         | 30.21       | \           | Pass   |
|                           | 661     | 1880.00         | 30.15       |             |        |
|                           | 810     | 1909.80         | 30.08       |             |        |
| GPRS1900<br>(GMSK,1Slot)  | 512     | 1850.20         | 30.26       | \           | Pass   |
|                           | 661     | 1880.00         | 30.08       |             |        |
|                           | 810     | 1909.80         | 30.12       |             |        |
| EGPRS1900<br>(GMSK,1Slot) | 512     | 1850.20         | 30.36       | \           | Pass   |
|                           | 661     | 1880.00         | 30.25       |             |        |
|                           | 810     | 1909.80         | 30.18       |             |        |
| WCDMA Band II             | 9262    | 1852.40         | 23.34       | \           | Pass   |
|                           | 9400    | 1880.00         | 23.256      |             |        |
|                           | 9538    | 1907.60         | 23.78       |             |        |
| WCDMA Band V              | 4132    | 826.40          | 23.39       | \           | Pass   |
|                           | 4183    | 836.60          | 23.47       |             |        |
|                           | 4233    | 846.60          | 23.25       |             |        |

### 4.3. Occupy Bandwidth

#### TEST CONFIGURATION



*Note: Measurement setup for testing on Antenna connector*

#### TEST PROCEDURE

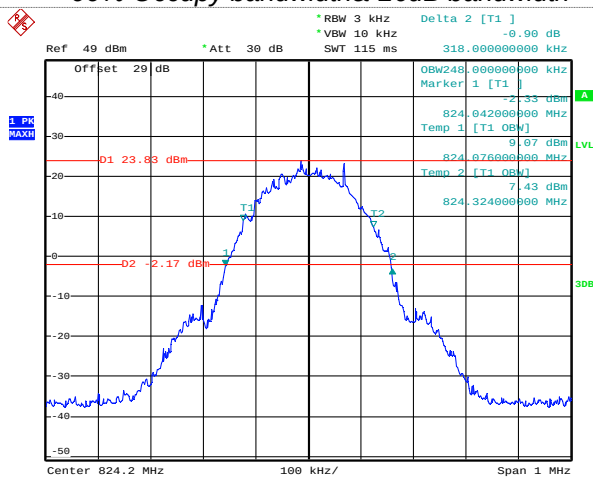
1. The EUT's output RF connector was connected with a short cable to the spectrum analyzer
2. RBW was set to about 1% of emission BW, VBW= 3 times RBW.
3. -26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.

#### TEST RESULTS

| EUT Mode               | Channel | Frequency (MHz) | 99% Occupy bandwidth (KHz) | -26dB bandwidth (KHz) |
|------------------------|---------|-----------------|----------------------------|-----------------------|
| GSM 850 (GMSK)         | 128     | 824.20          | 248.00                     | 318.00                |
|                        | 190     | 836.60          | 248.00                     | 316.00                |
|                        | 251     | 848.80          | 246.00                     | 316.00                |
| GPRS850 (GMSK,1Slot)   | 128     | 824.20          | 246.00                     | 318.00                |
|                        | 190     | 836.60          | 244.00                     | 318.00                |
|                        | 251     | 848.80          | 244.00                     | 320.00                |
| EGPRS850 (GMSK,1Slot)  | 128     | 824.20          | 248.00                     | 320.00                |
|                        | 190     | 836.60          | 244.00                     | 316.00                |
|                        | 251     | 848.80          | 248.00                     | 318.00                |
| PCS1900 (GMSK)         | 512     | 1850.20         | 246.00                     | 318.00                |
|                        | 661     | 1880.00         | 248.00                     | 316.00                |
|                        | 810     | 1909.80         | 246.00                     | 316.00                |
| GPRS1900 (GMSK,1Slot)  | 512     | 1850.20         | 246.00                     | 320.00                |
|                        | 661     | 1880.00         | 246.00                     | 316.00                |
|                        | 810     | 1909.80         | 248.00                     | 316.00                |
| EGPRS1900 (GMSK,1Slot) | 512     | 1850.20         | 244.00                     | 322.00                |
|                        | 661     | 1880.00         | 246.00                     | 316.00                |
|                        | 810     | 1909.80         | 248.00                     | 316.00                |
| WCDMA Band II          | 9262    | 1852.4          | 4180.00                    | 4660.00               |
|                        | 9400    | 1880.0          | 4180.00                    | 4660.00               |
|                        | 9538    | 1907.6          | 4200.00                    | 4680.00               |
| WCDMA Band V           | 4132    | 826.4           | 4200.00                    | 4760.00               |
|                        | 4183    | 836.6           | 4180.00                    | 4600.00               |
|                        | 4233    | 846.6           | 4170.00                    | 6020.00               |

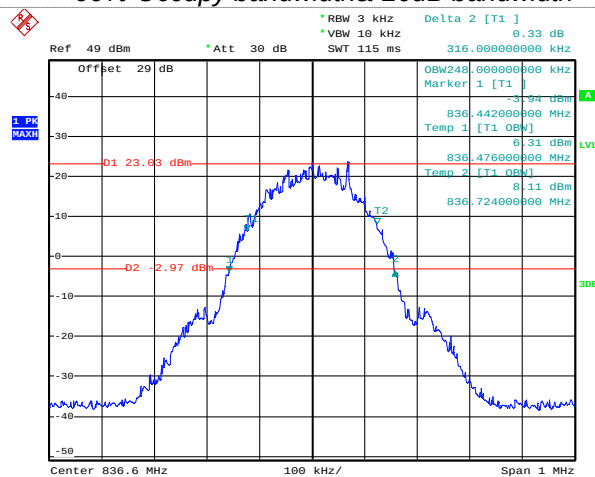
## GSM850 For GMSK Moudlation

99% Occupy bandwidth&amp;-26dB bandwidth



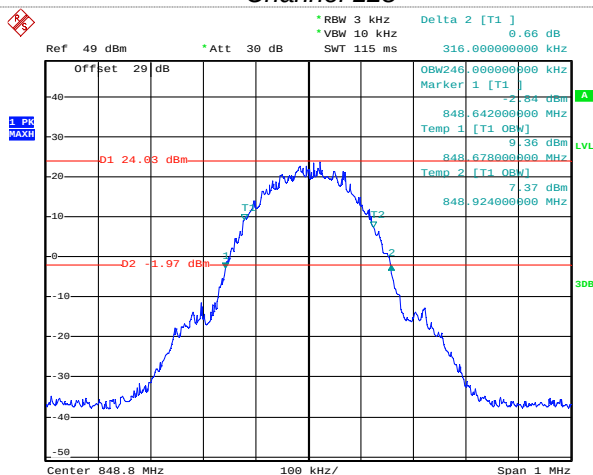
Date: 20.AUG.2014 14:08:06

99% Occupy bandwidth&amp;-26dB bandwidth



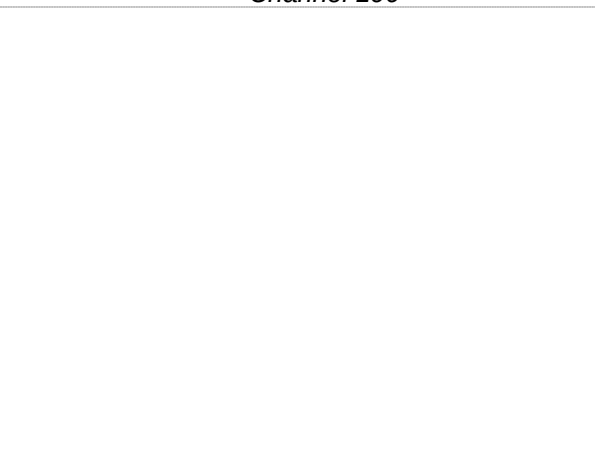
Date: 20.AUG.2014 14:17:32

## Channel 128



Date: 20.AUG.2014 14:15:34

## Channel 190

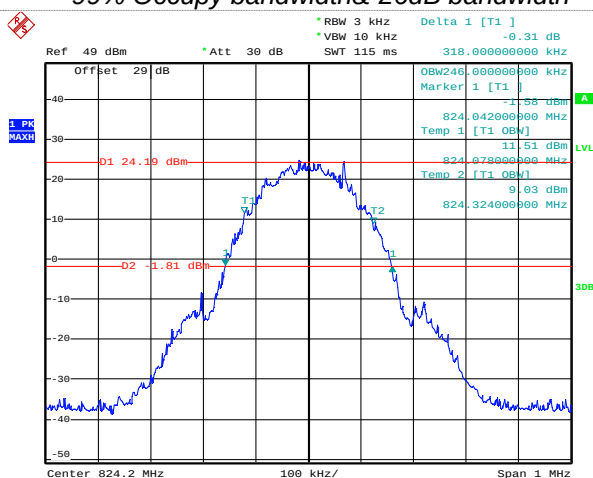


Date: 21.AUG.2014 09:18:06

## Channel 251

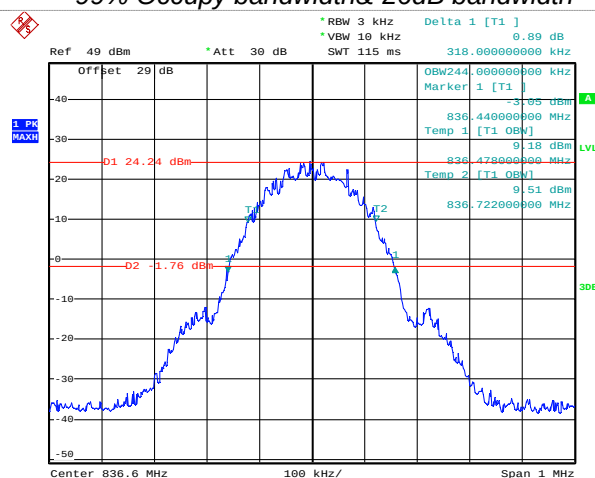
## GPRS850 For GMSK Moudlation

99% Occupy bandwidth&amp;-26dB bandwidth



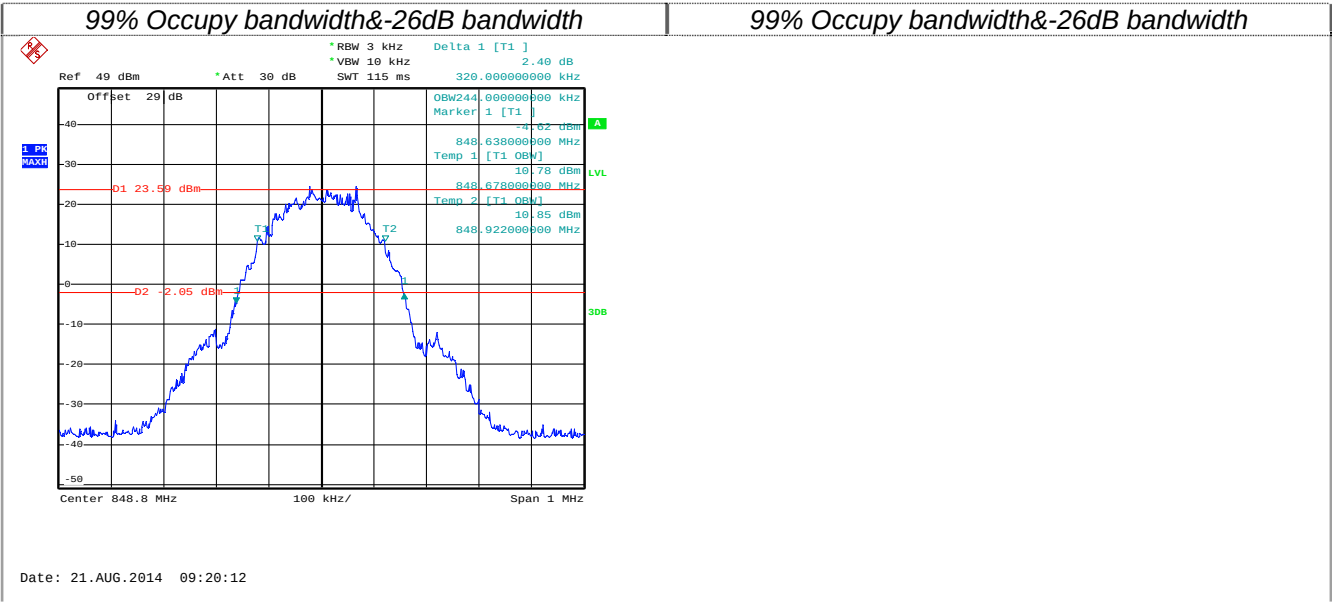
Date: 21.AUG.2014 09:14:51

99% Occupy bandwidth&amp;-26dB bandwidth



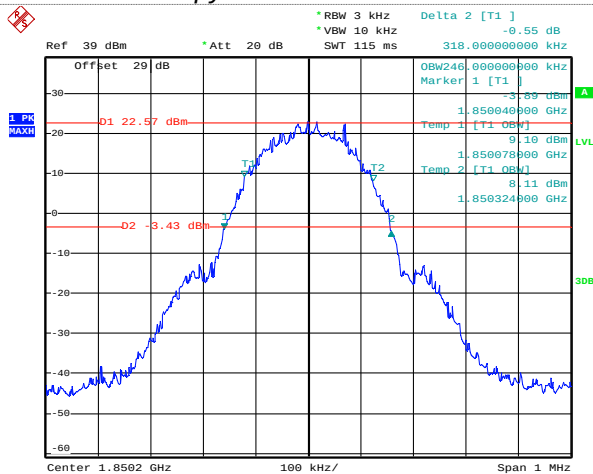
## Channel 128

## Channel 190



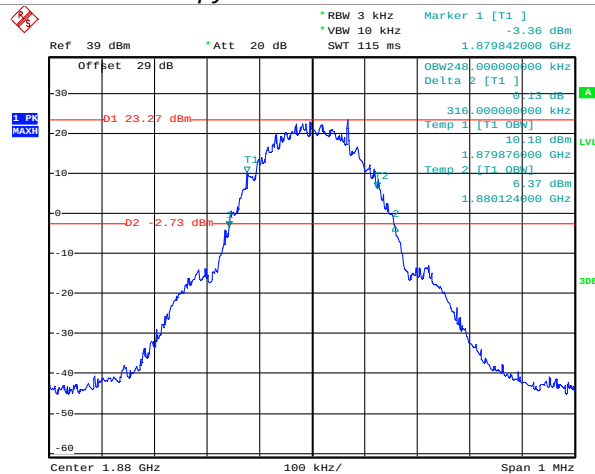
## PCS1900 For GMSK Moudlation

99% Occupy bandwidth&amp;-26dB bandwidth



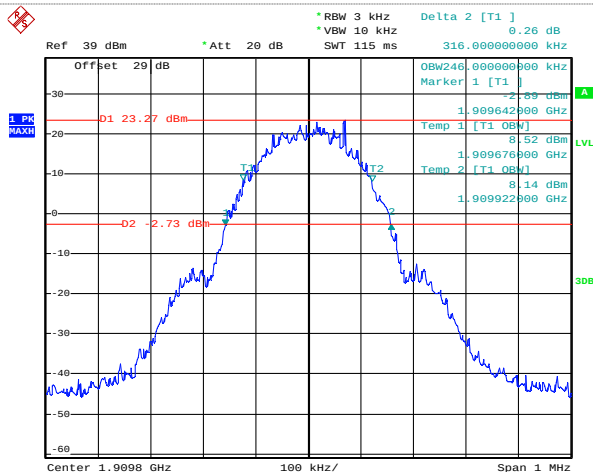
Date: 20.AUG.2014 16:12:29

99% Occupy bandwidth&amp;-26dB bandwidth



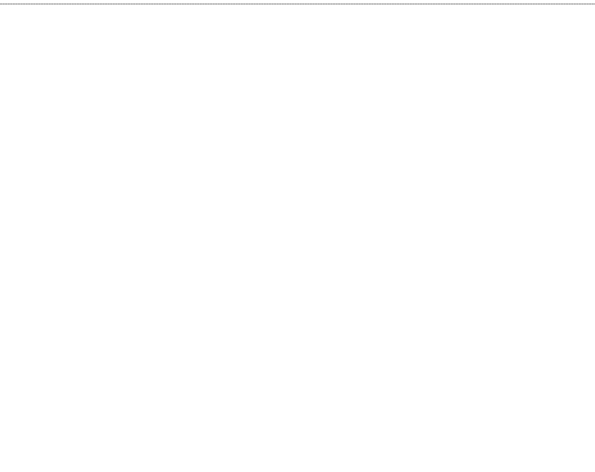
Date: 20.AUG.2014 16:14:43

## Channel 512



Date: 20.AUG.2014 16:16:01

## Channel 661

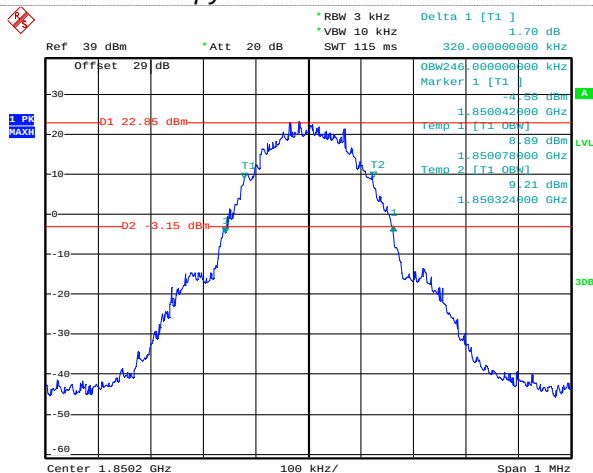


Date: 21.AUG.2014 09:51:42

## Channel 810

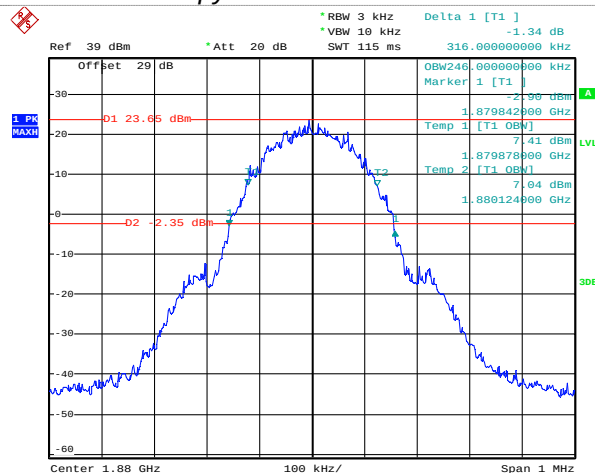
## GPRS1900 For GMSK Moudlation

99% Occupy bandwidth&amp;-26dB bandwidth



Date: 21.AUG.2014 09:49:24

99% Occupy bandwidth&amp;-26dB bandwidth

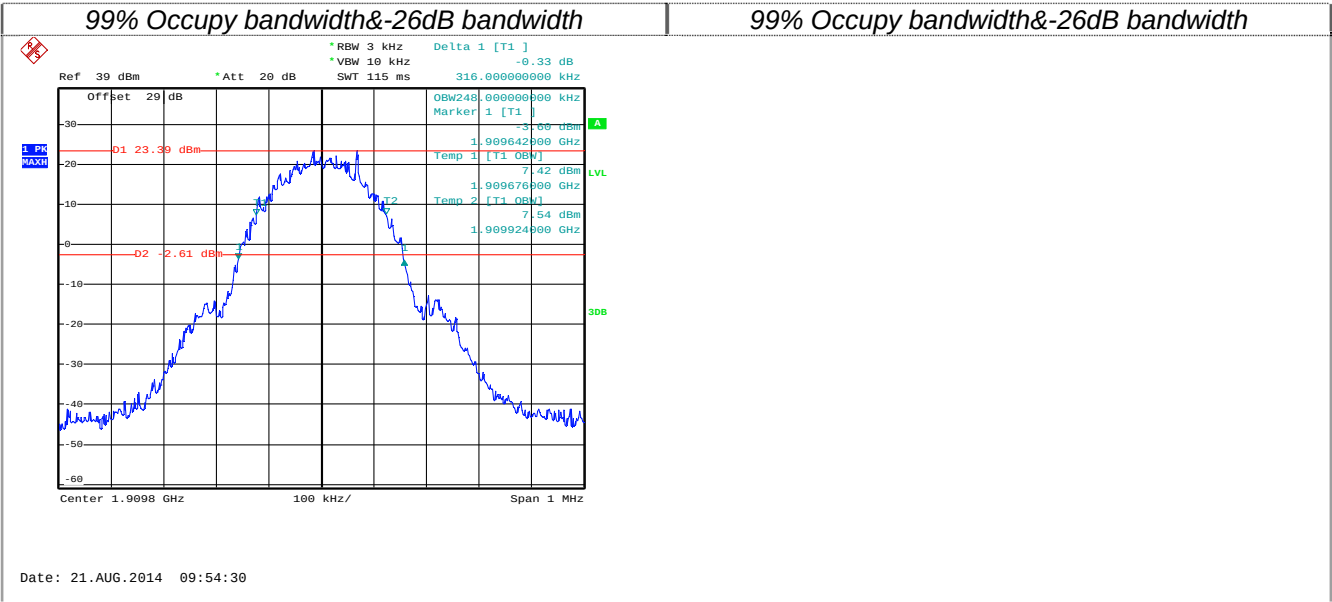


Date: 21.AUG.2014 09:51:42

## Channel 512

## Channel 661

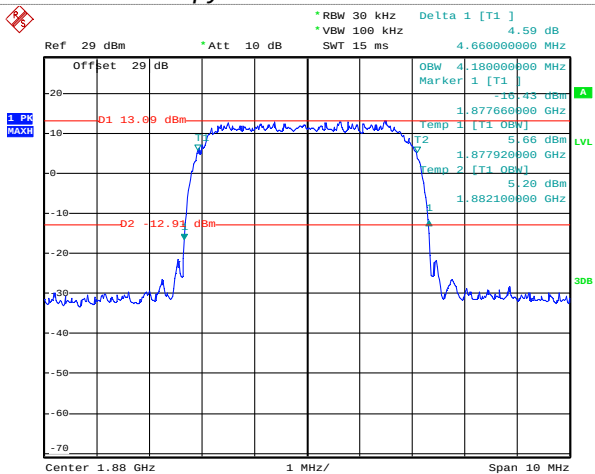
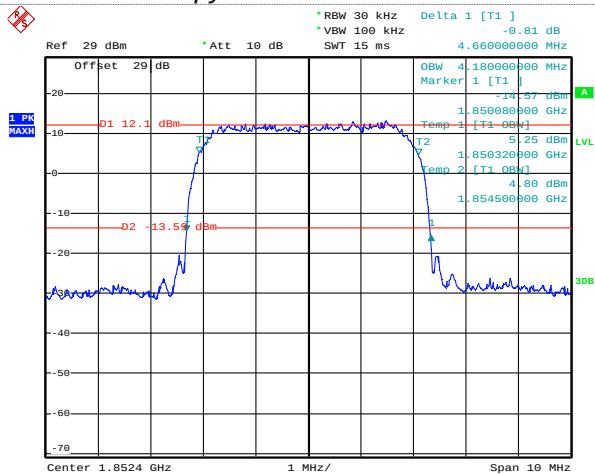




WCDMA Band II

99% Occupy bandwidth&-26dB bandwidth

99% Occupy bandwidth&-26dB bandwidth

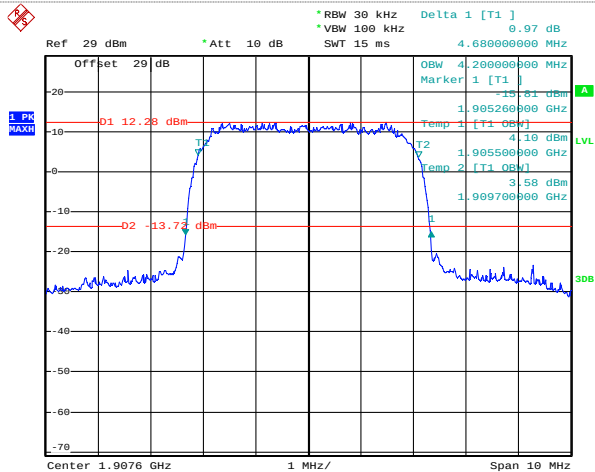


Date: 20.AUG.2014 21:51:01

Date: 20.AUG.2014 21:53:11

Channel 9262

Channel 9400



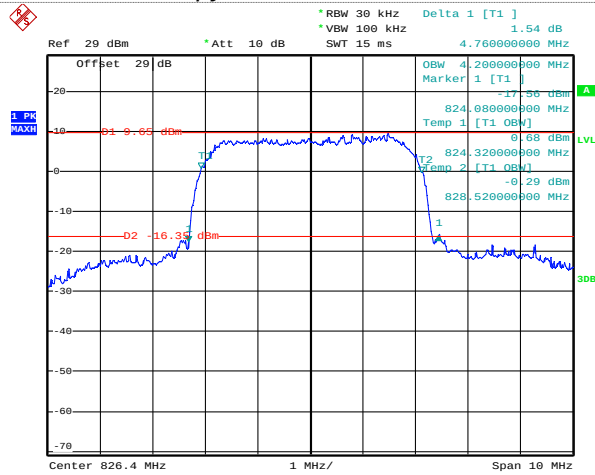
Date: 20.AUG.2014 21:54:37

Channel 9538

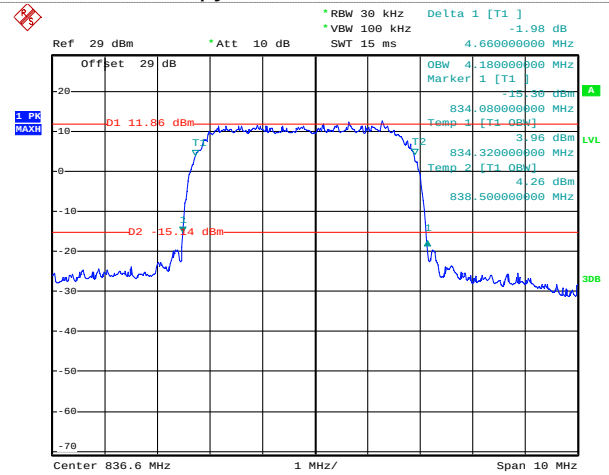
## WCDMA Band V

99% Occupy bandwidth & -26dB bandwidth

99% Occupy bandwidth & -26dB bandwidth

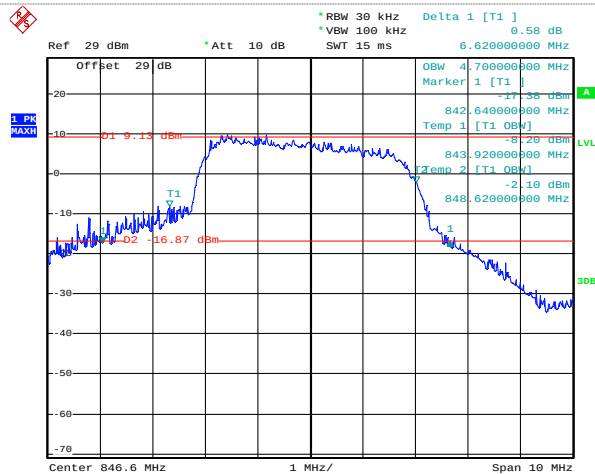


Date: 20.AUG.2014 21:14:45



Date: 20.AUG.2014 21:19:17

## Channel 4132



Date: 20.AUG.2014 21:24:58

## Channel 4183

Channel 4233

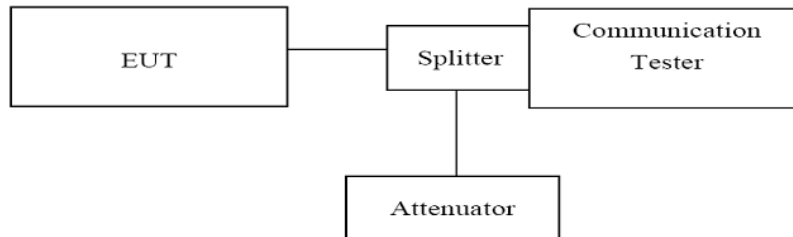
#### 4.4. Out of band emission at antenna terminals

##### 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.

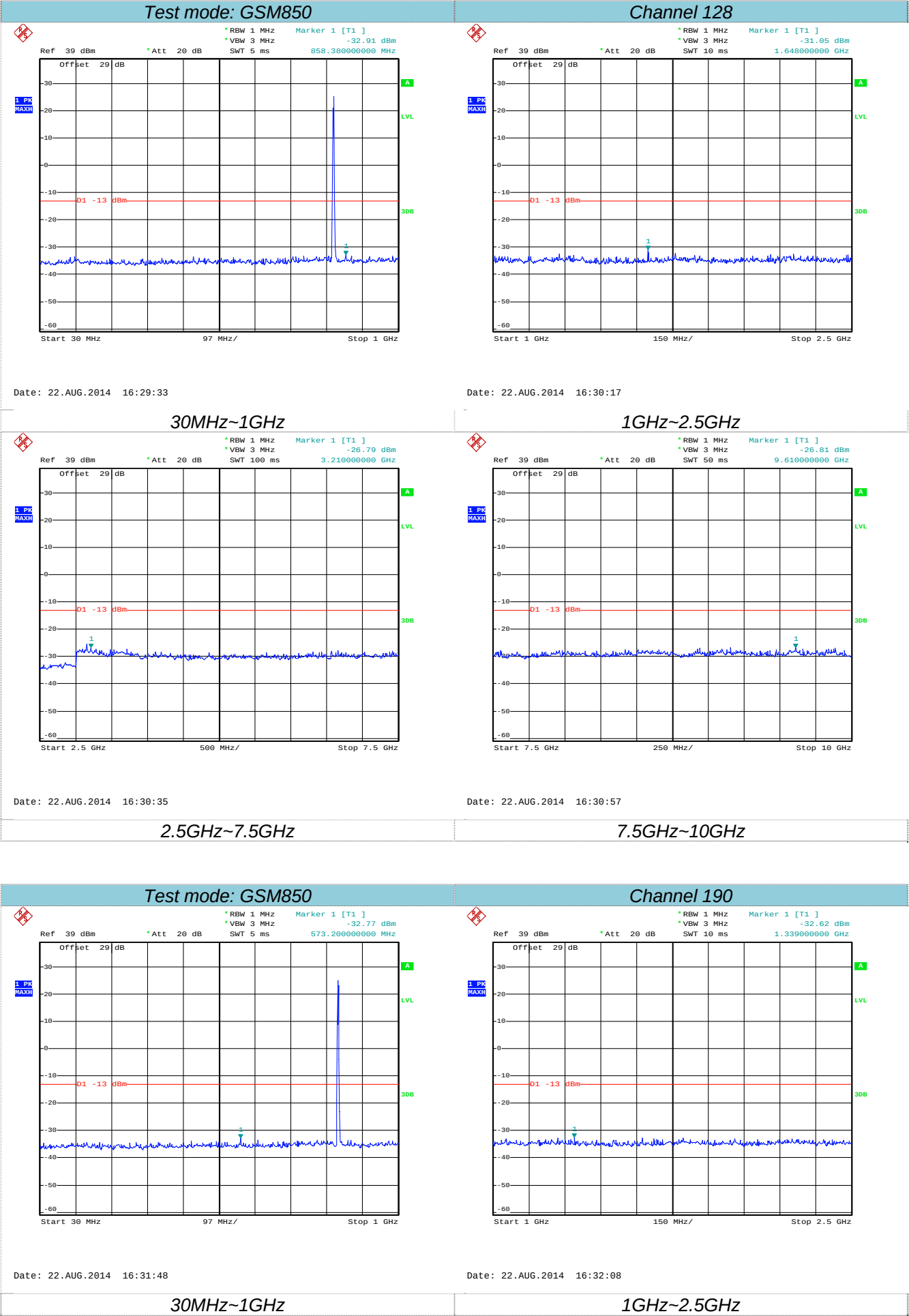
##### TEST CONFIGURATION

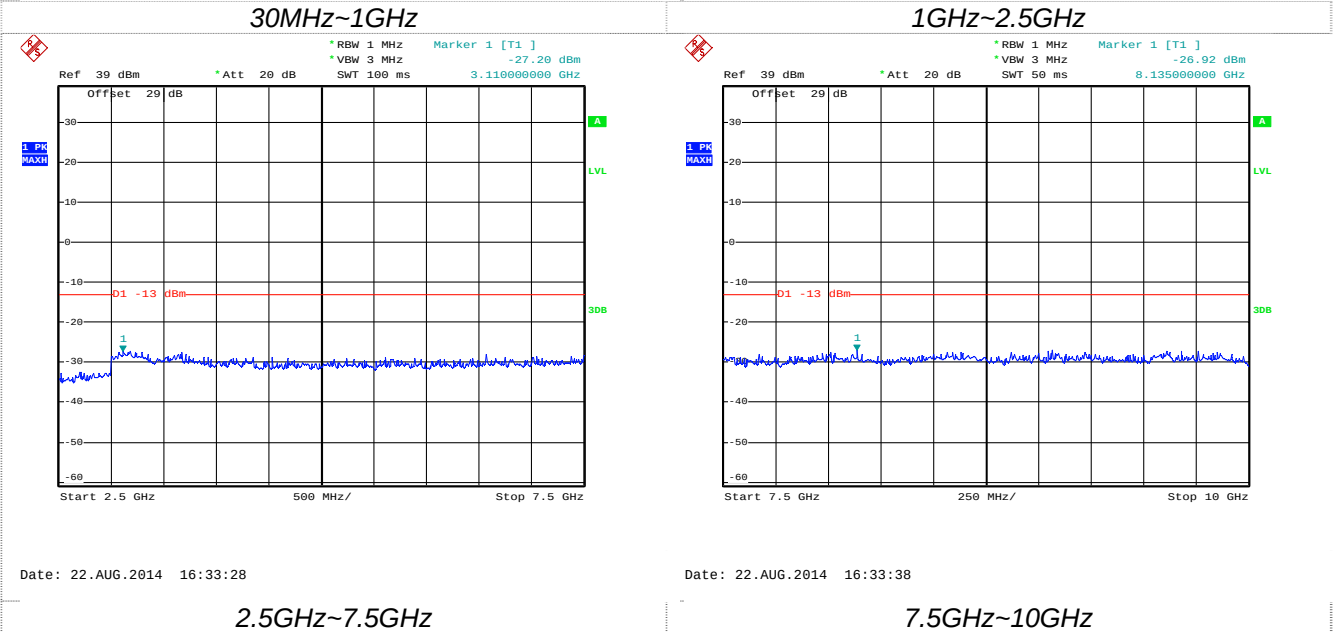
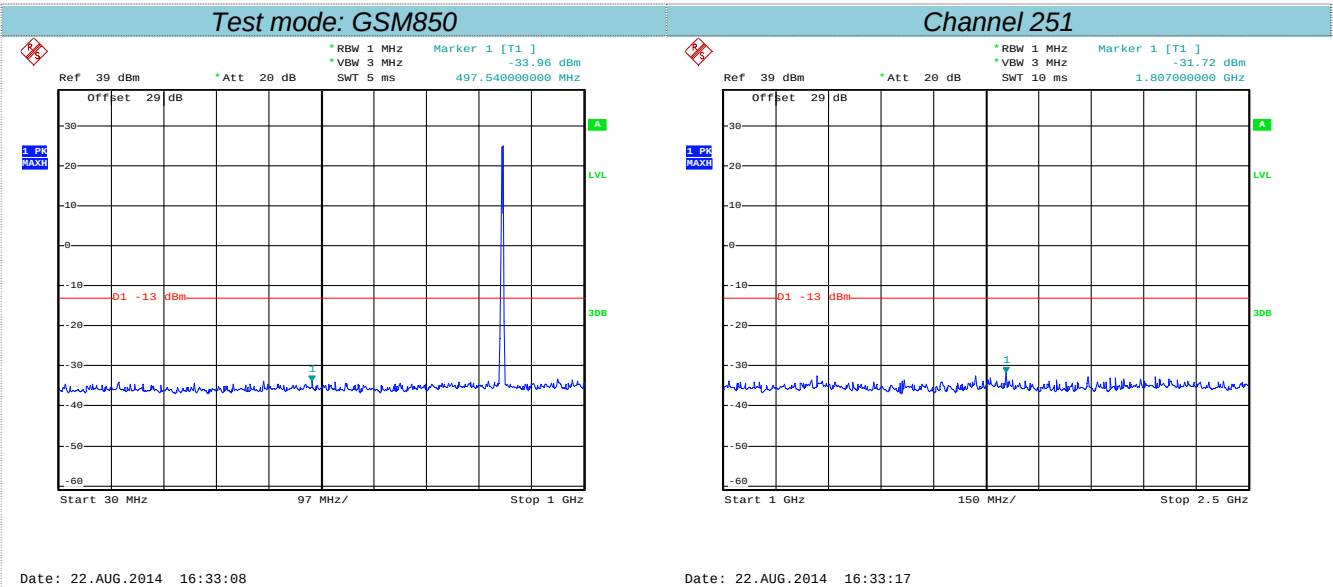
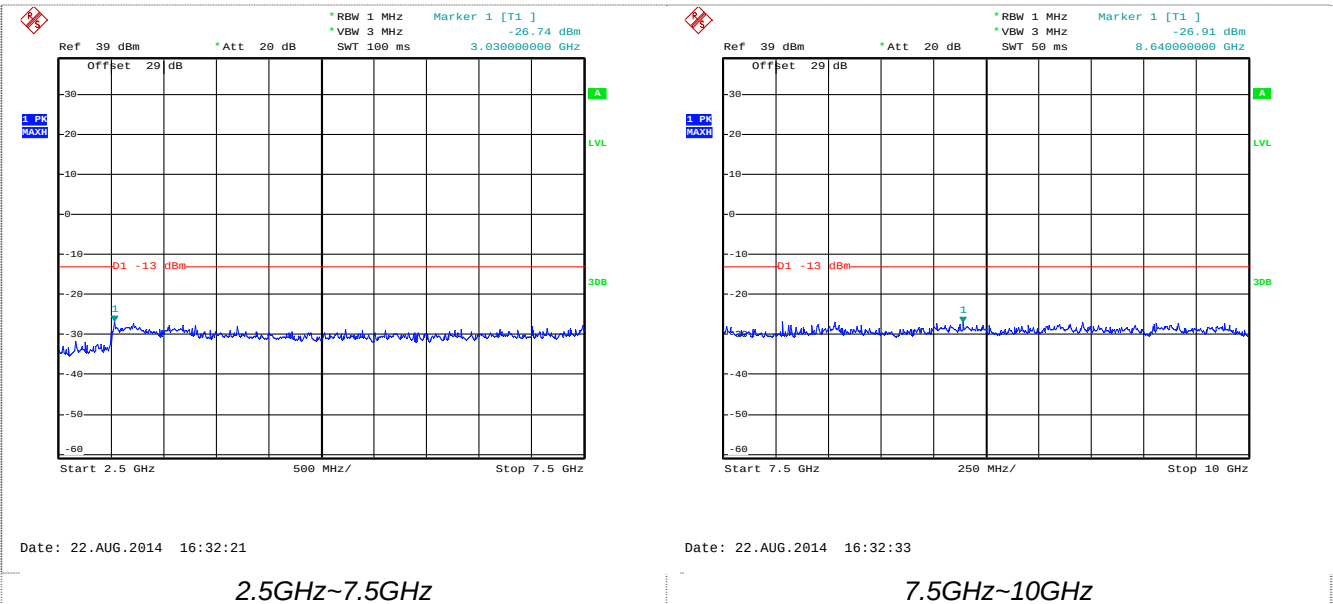


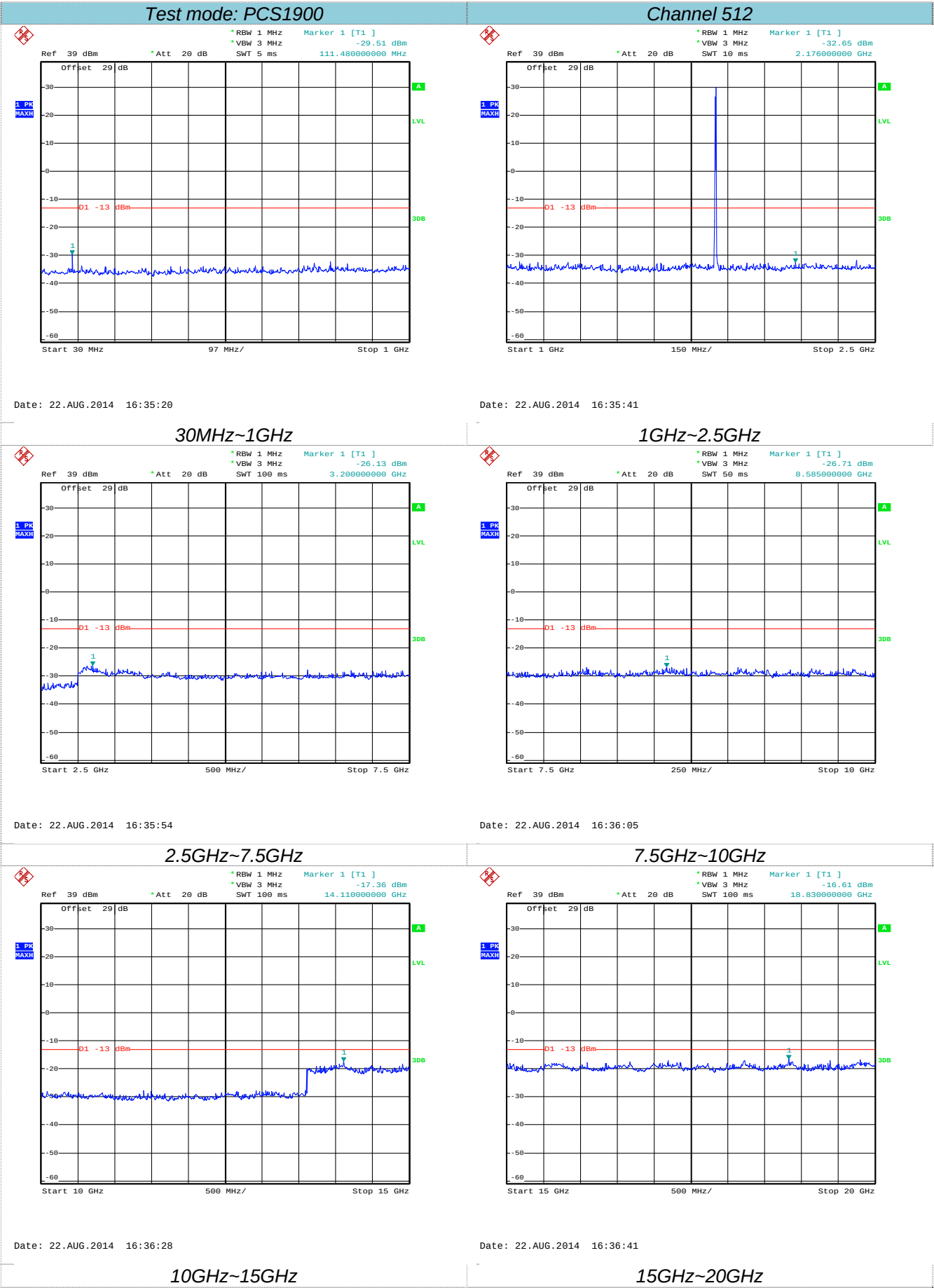
##### TEST PROCEDURE

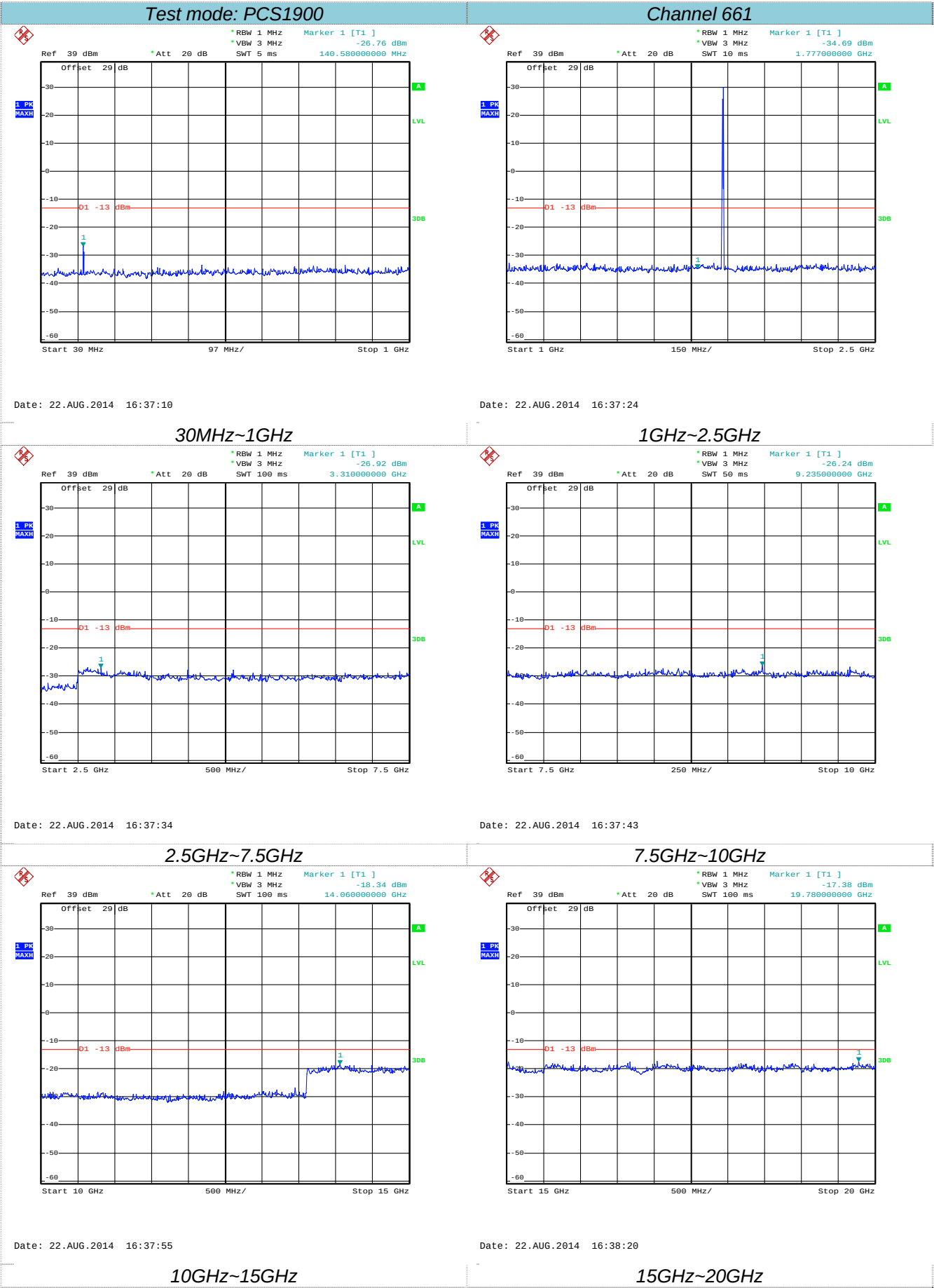
1. The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation.
2. The resolution bandwidth of the spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.
3. For the out of band: Set the RBW, VBW = 1MHz, Start=30MHz, Stop= 10th harmonic.

##### TEST RESULTS

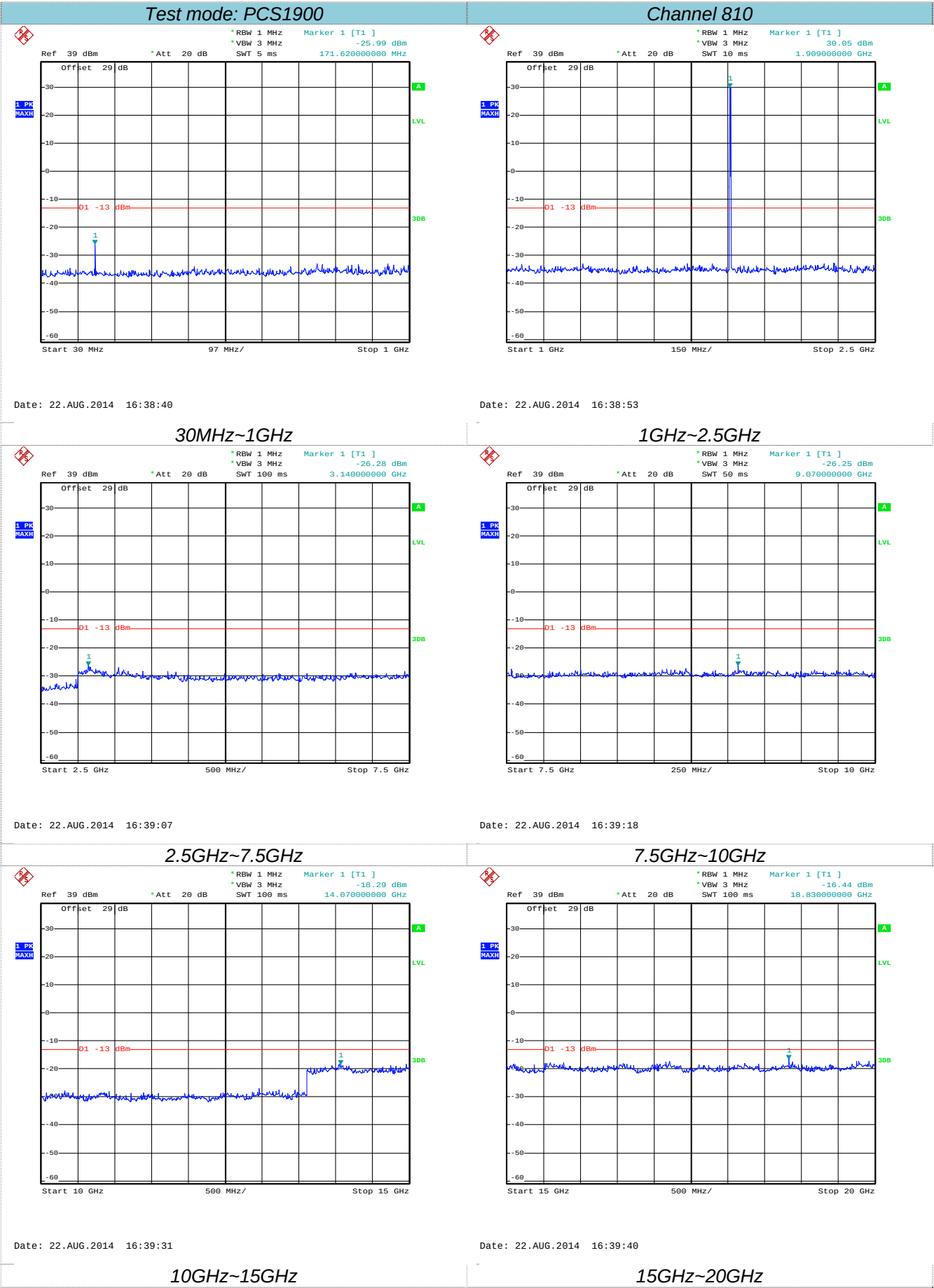


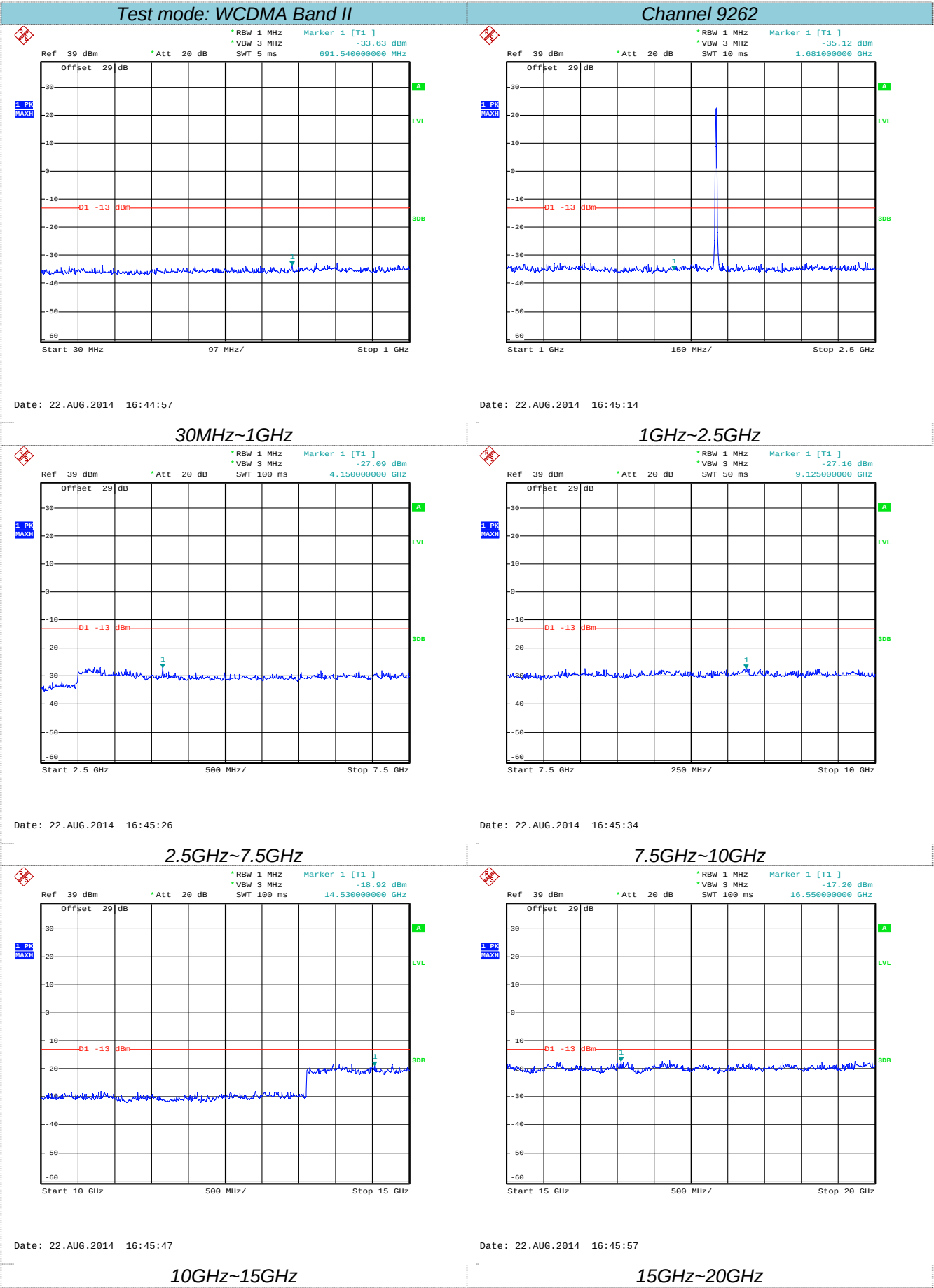


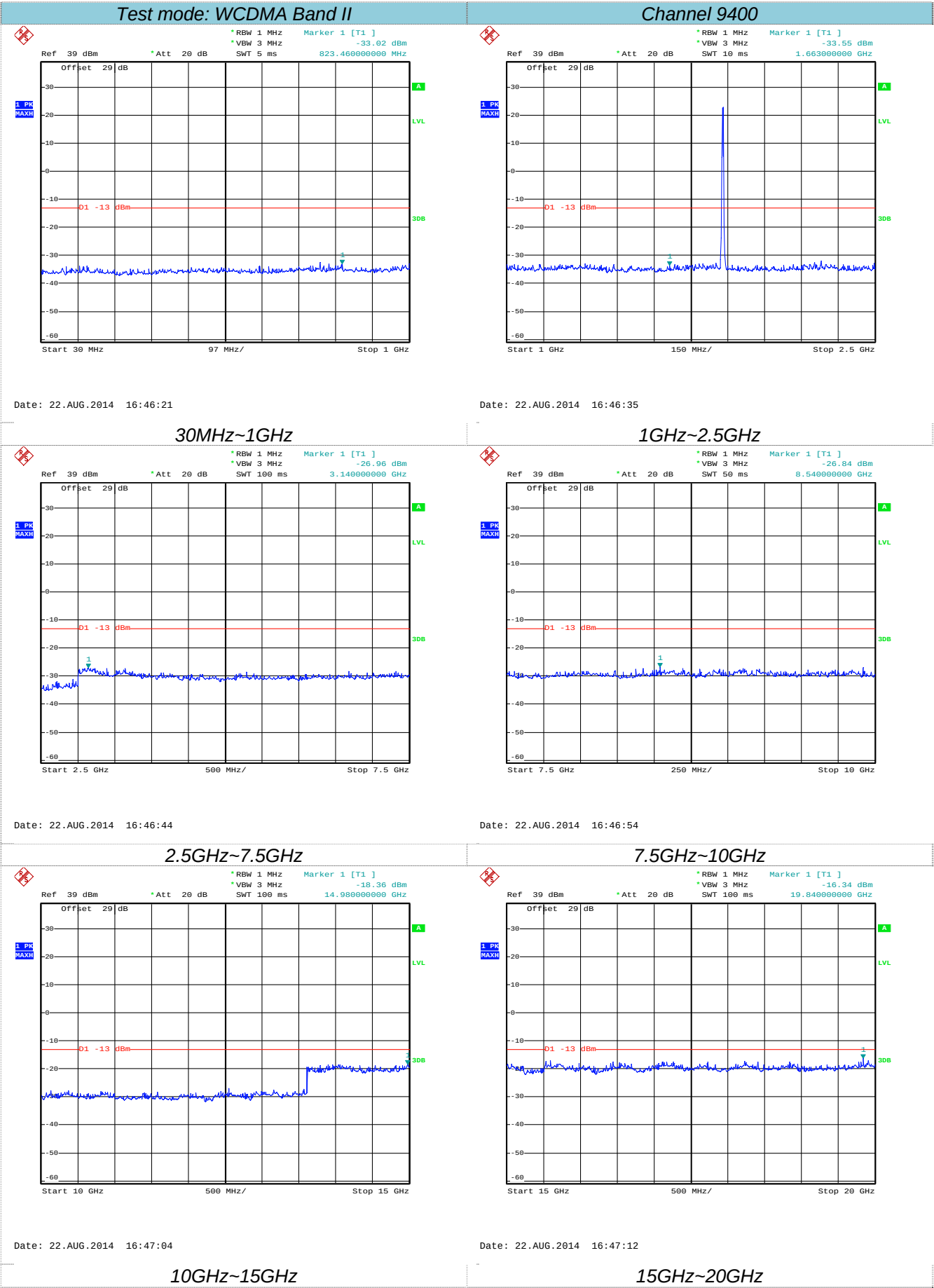












1GHz~2.5GHz

Ref 39 dBm

Att 20 dB

RBW 1 MHz

VBW 3 MHz

SWT 50 ms

Marker 1 [T1]

-26.84 dBm

8.540000000 GHz

Offset 29 dB

30

20

10

0

-10

-20

-30

-40

-50

-60

1 PK

MAXH

7.5 GHz

250 MHz/

10 GHz

30dB

LVL

Date: 22.AUG.2014 16:46:54

2.5GHz~7.5GHz

Ref 39 dBm

Att 20 dB

RBW 1 MHz

VBW 3 MHz

SWT 100 ms

Marker 1 [T1]

-10.36 dBm

14.980000000 GHz

Offset 29 dB

30

20

10

0

-10

-20

-30

-40

-50

-60

1 PK

MAXH

10 GHz

500 MHz/

15 GHz

30dB

LVL

Date: 22.AUG.2014 16:47:04

7.5GHz~10GHz

Ref 39 dBm

Att 20 dB

RBW 1 MHz

VBW 3 MHz

SWT 100 ms

Marker 1 [T1]

-10.34 dBm

19.840000000 GHz

Offset 29 dB

30

20

10

0

-10

-20

-30

-40

-50

-60

1 PK

MAXH

15 GHz

500 MHz/

20 GHz

30dB

LVL

Date: 22.AUG.2014 16:47:12

10GHz~15GHz

Ref 39 dBm

Att 20 dB

RBW 1 MHz

VBW 3 MHz

SWT 100 ms

Marker 1 [T1]

-10.34 dBm

19.840000000 GHz

Offset 29 dB

30

20

10

0

-10

-20

-30

-40

-50

-60

1 PK

MAXH

15 GHz

500 MHz/

20 GHz

30dB

LVL

Date: 22.AUG.2014 16:47:12

15GHz~20GHz

Ref 39 dBm

Att 20 dB

RBW 1 MHz

VBW 3 MHz

SWT 100 ms

Marker 1 [T1]

-10.34 dBm

19.840000000 GHz

Offset 29 dB

30

20

10

0

-10

-20

-30

-40

-50

-60

1 PK

MAXH

15 GHz

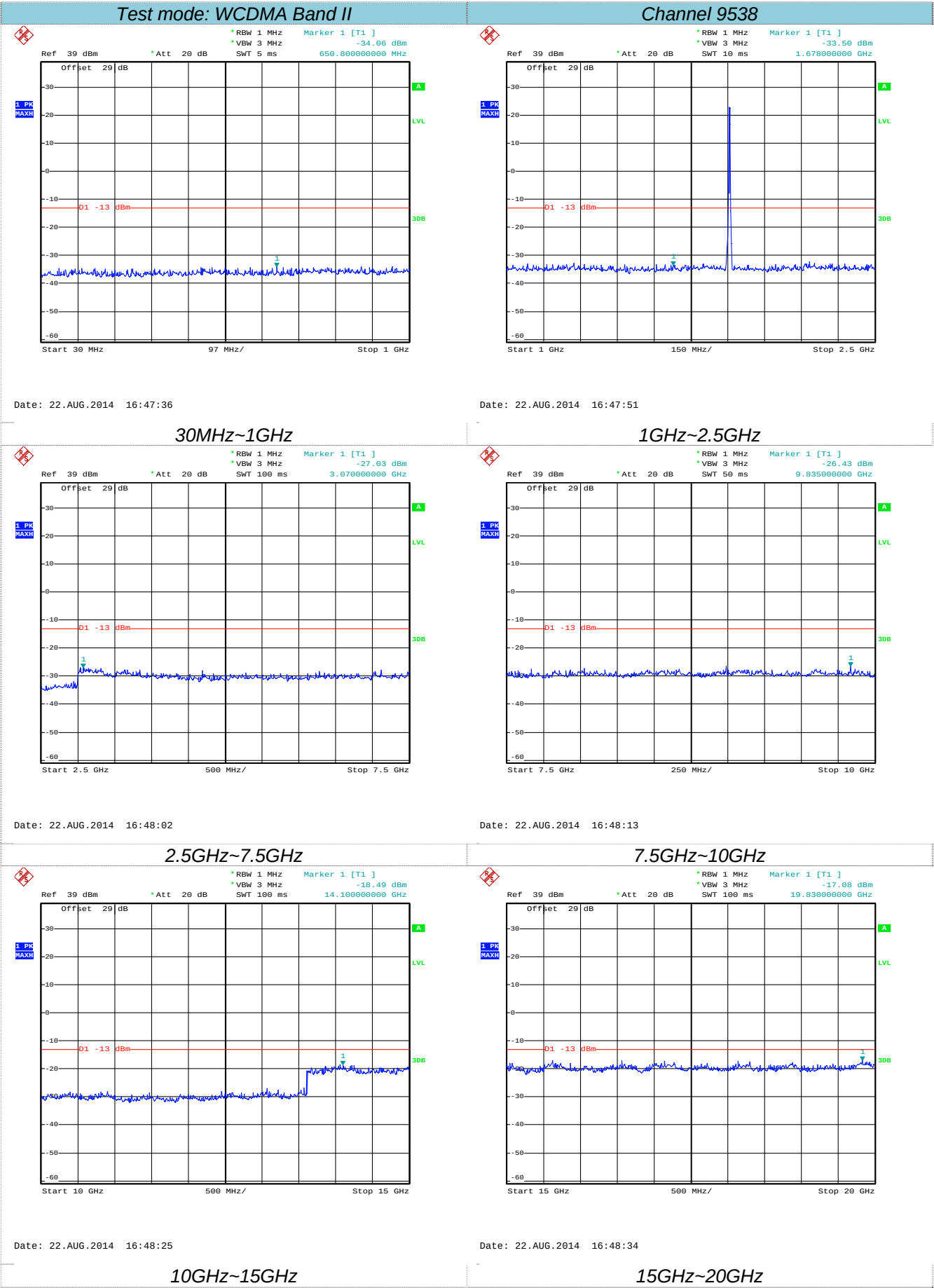
500 MHz/

20 GHz

30dB

LVL

Date: 22.AUG.2014 16:47:12



2.5GHz~7.5GHz

7.5GHz~10GHz

Ref 39 dBm

Att 20 dB

RBW 1 MHz

VBW 3 MHz

SWT 100 ms

Marker 1 [T1]

-18.49 dBm

14.100000000 GHz

Offset 29 dB

1 PK

MAXH

30

20

10

0

-10

-20

-30

-40

-50

-60

30dB

LVL

Start 10 GHz

500 MHz/

Stop 15 GHz

Ref 39 dBm

Att 20 dB

RBW 1 MHz

VBW 3 MHz

SWT 100 ms

Marker 1 [T1]

-17.08 dBm

19.830000000 GHz

Offset 29 dB

1 PK

MAXH

30

20

10

0

-10

-20

-30

-40

-50

-60

30dB

LVL

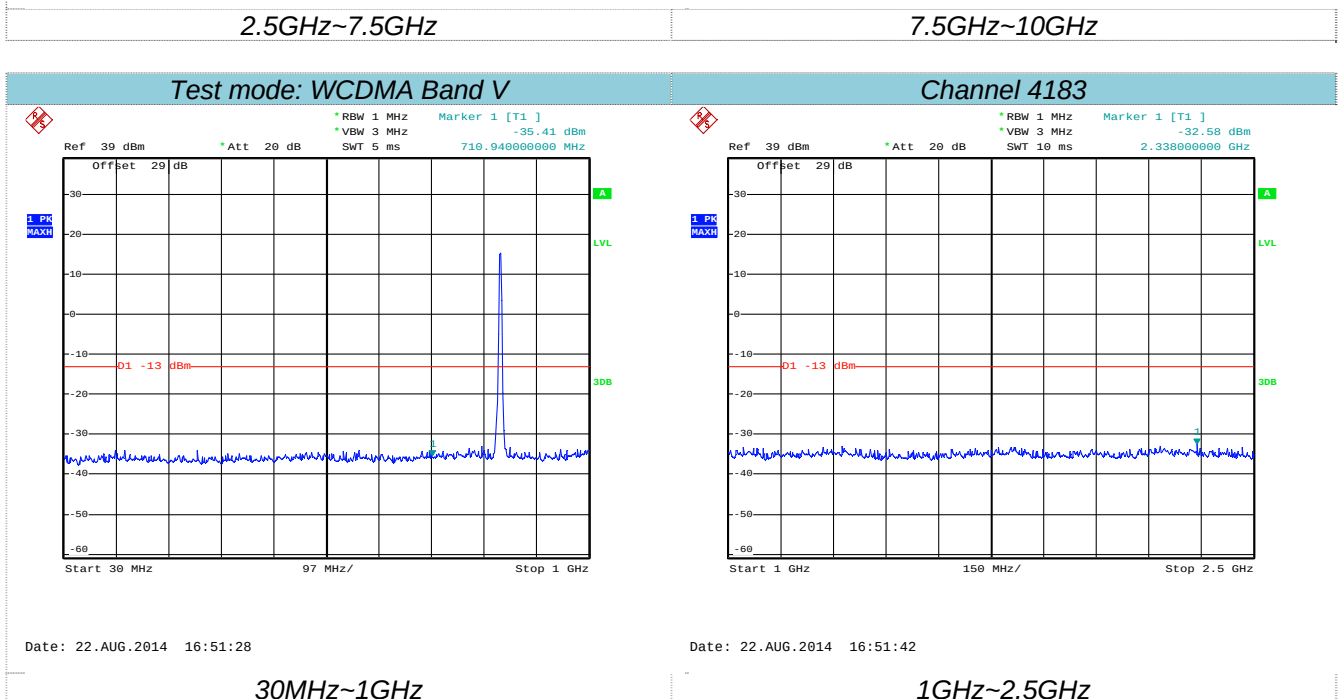
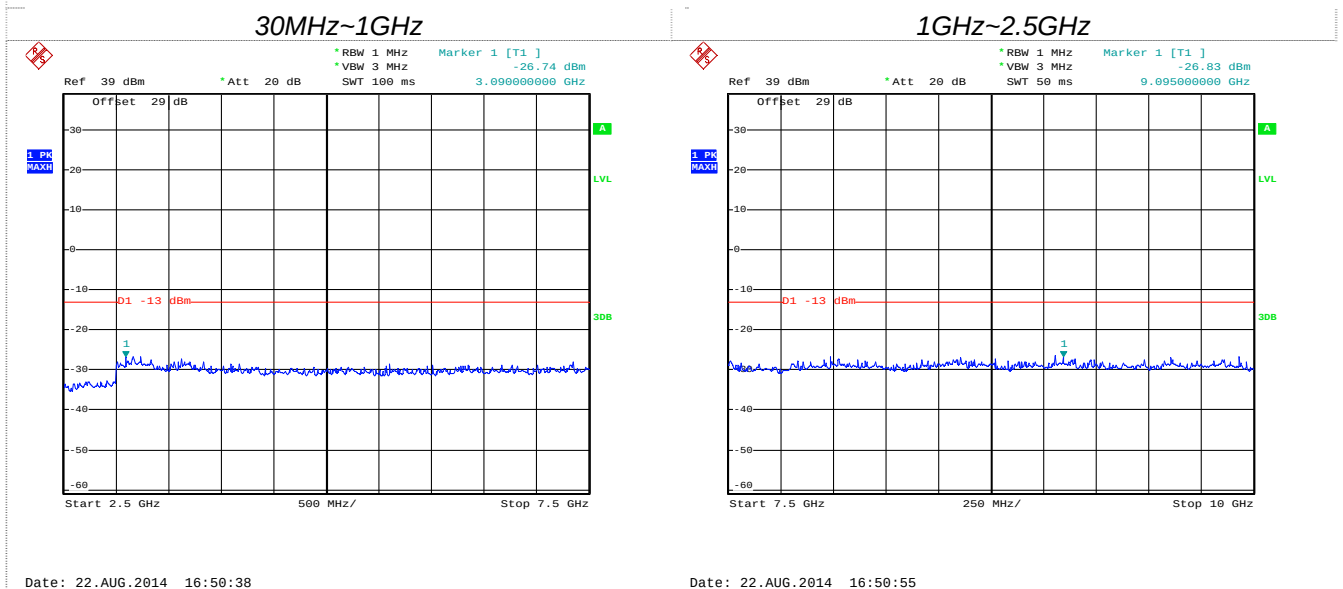
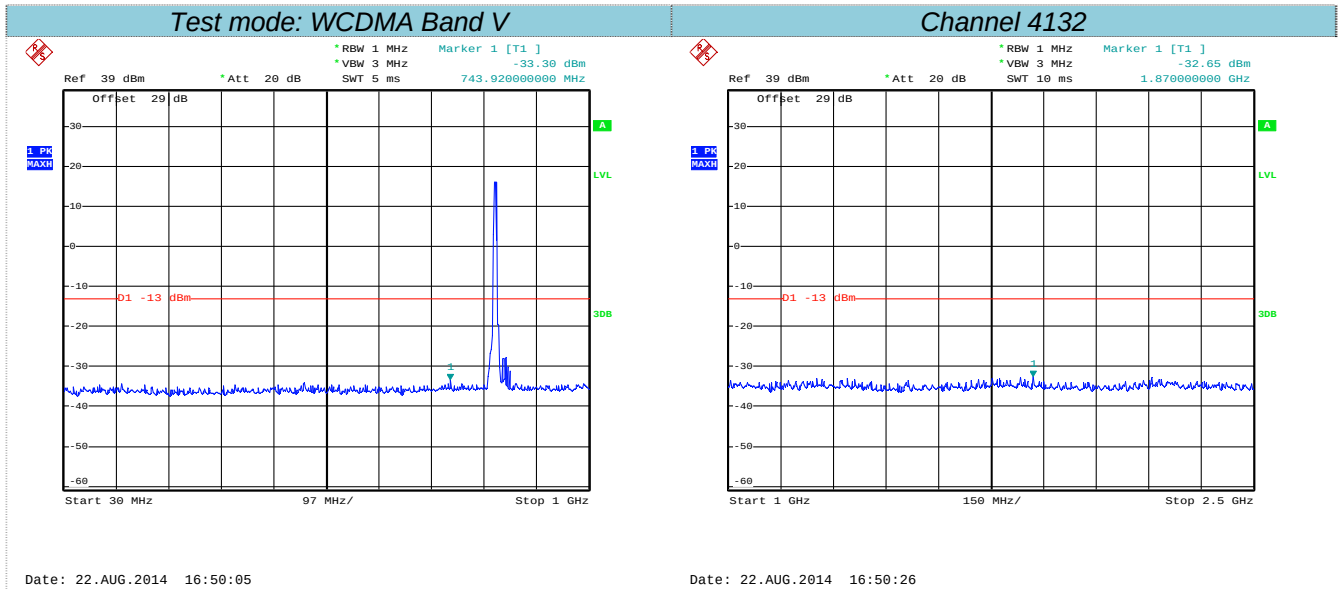
Start 15 GHz

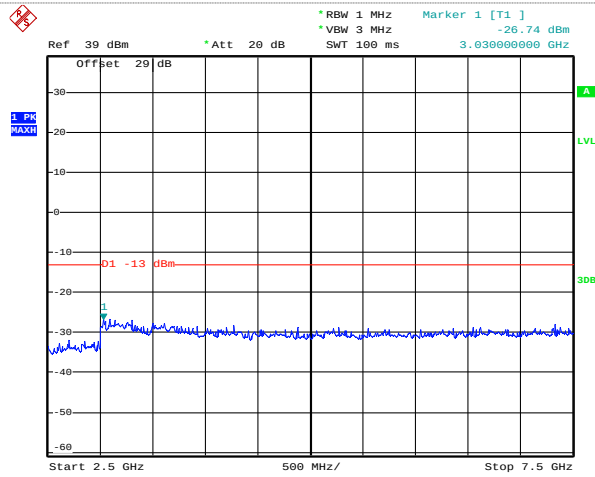
500 MHz/

Stop 20 GHz

10GHz~15GHz

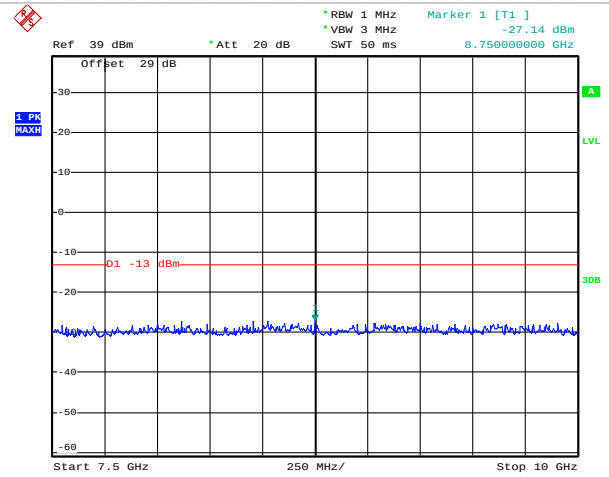
15GHz~20GHz





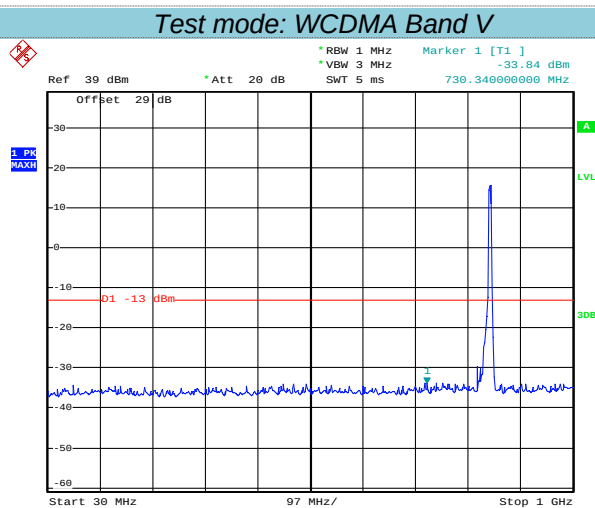
Date: 22.AUG.2014 16:51:57

2.5GHz~7.5GHz



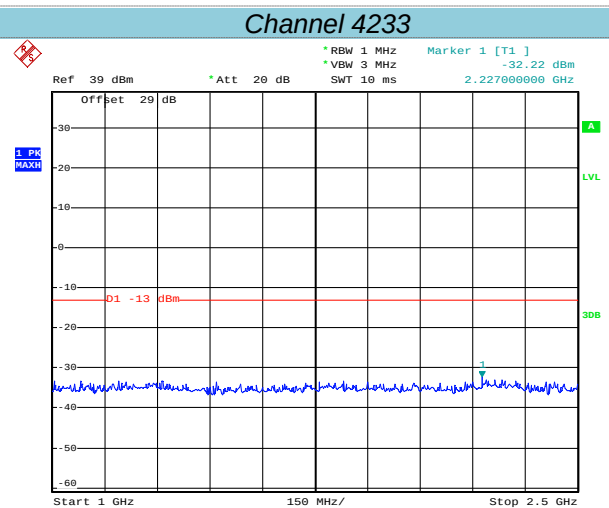
Date: 22.AUG.2014 16:52:09

7.5GHz~10GHz



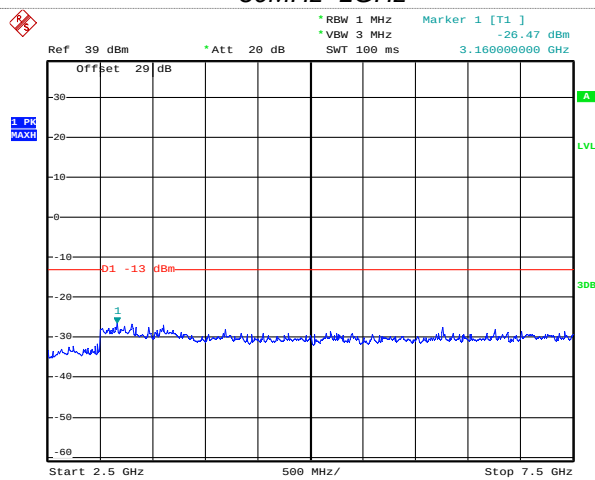
Date: 22.AUG.2014 16:52:43

30MHz~1GHz



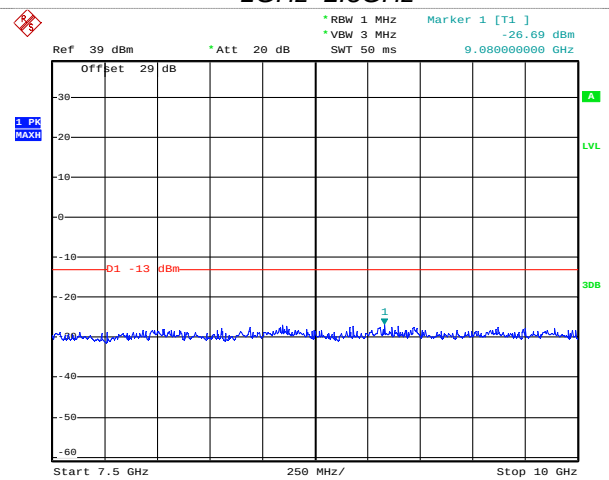
Date: 22.AUG.2014 16:52:54

1GHz~2.5GHz



Date: 22.AUG.2014 16:53:15

2.5GHz~7.5GHz



Date: 22.AUG.2014 16:53:24

7.5GHz~10GHz

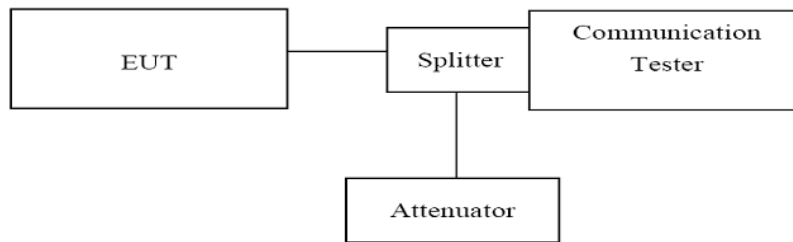
## 4.5. Band Edge compliance

### 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.

### TEST CONFIGURATION



### TEST PROCEDURE

1. The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation.
2. For the bandedge: 2G: Set the RBW=10KHz, VBW = 30KHz, Sweep time= Auto  
3G: Set the RBW=100KHz, VBW = 300KHz, Sweep time= Auto

### TEST RESULTS

| GSM850         |                 |                     |              |             |         |
|----------------|-----------------|---------------------|--------------|-------------|---------|
| Channel Number | Frequency (MHz) | Measurement Results |              | Limit (dBm) | Verdict |
|                |                 | Frequency (MHz)     | Values (dBm) |             |         |
| 128            | 824.20          | 823.98              | -15.93       | -13.00      | Pass    |
| 251            | 848.80          | 849.00              | -15.46       | -13.00      | Pass    |

| GPRS850        |                 |                     |              |             |         |
|----------------|-----------------|---------------------|--------------|-------------|---------|
| Channel Number | Frequency (MHz) | Measurement Results |              | Limit (dBm) | Verdict |
|                |                 | Frequency (MHz)     | Values (dBm) |             |         |
| 128            | 824.20          | 824.00              | -16.60       | -13.00      | Pass    |
| 251            | 848.80          | 849.00              | -15.89       | -13.00      | Pass    |

| EGPRS850       |                 |                     |              |             |         |
|----------------|-----------------|---------------------|--------------|-------------|---------|
| Channel Number | Frequency (MHz) | Measurement Results |              | Limit (dBm) | Verdict |
|                |                 | Frequency (MHz)     | Values (dBm) |             |         |
| 128            | 824.20          | 824.00              | -17.05       | -13.00      | Pass    |
| 251            | 848.80          | 849.00              | -15.89       | -13.00      | Pass    |

| PCS1900        |                 |                     |              |             |         |
|----------------|-----------------|---------------------|--------------|-------------|---------|
| Channel Number | Frequency (MHz) | Measurement Results |              | Limit (dBm) | Verdict |
|                |                 | Frequency (MHz)     | Values (dBm) |             |         |
| 512            | 1850.20         | 1850.00             | -15.39       | -13.00      | Pass    |
| 810            | 1909.80         | 1910.00             | -14.71       | -13.00      | Pass    |

| GPRS1900       |                 |                     |              |             |         |
|----------------|-----------------|---------------------|--------------|-------------|---------|
| Channel Number | Frequency (MHz) | Measurement Results |              | Limit (dBm) | Verdict |
|                |                 | Frequency (MHz)     | Values (dBm) |             |         |
| 512            | 1850.20         | 1850.00             | -14.94       | -13.00      | Pass    |
| 810            | 1909.80         | 1910.00             | -14.69       | -13.00      | Pass    |

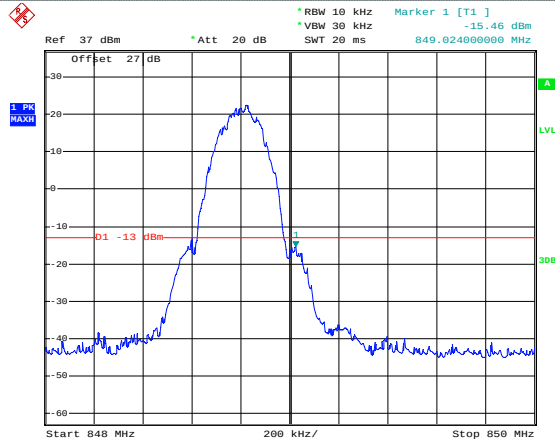
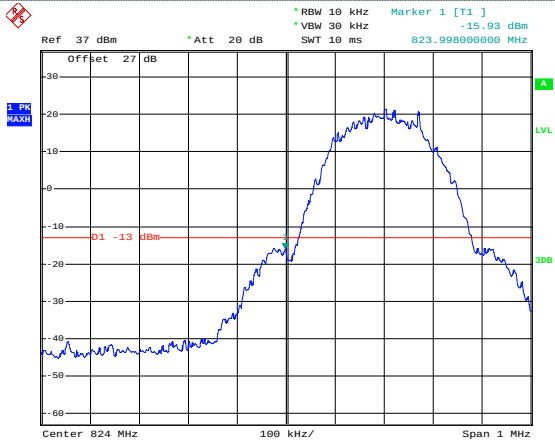
| EGPRS1900      |                 |                     |              |             |         |
|----------------|-----------------|---------------------|--------------|-------------|---------|
| Channel Number | Frequency (MHz) | Measurement Results |              | Limit (dBm) | Verdict |
|                |                 | Frequency (MHz)     | Values (dBm) |             |         |
| 512            | 1850.20         | 1850.00             | -15.65       | -13.00      | Pass    |
| 810            | 1909.80         | 1910.00             | -14.78       | -13.00      | Pass    |

| WCDMA Band II  |                 |                     |              |             |         |
|----------------|-----------------|---------------------|--------------|-------------|---------|
| Channel Number | Frequency (MHz) | Measurement Results |              | Limit (dBm) | Verdict |
|                |                 | Frequency (MHz)     | Values (dBm) |             |         |
| 9262           | 1852.4          | 1850.00             | -14.22       | -13.00      | Pass    |
| 9538           | 1907.6          | 1910.69             | -19.46       | -13.00      | Pass    |

| WCDMA Band V   |                 |                     |              |             |         |
|----------------|-----------------|---------------------|--------------|-------------|---------|
| Channel Number | Frequency (MHz) | Measurement Results |              | Limit (dBm) | Verdict |
|                |                 | Frequency (MHz)     | Values (dBm) |             |         |
| 4132           | 826.4           | 824.00              | -18.06       | -13.00      | Pass    |
| 4233           | 846.6           | 849.09              | -15.87       | -13.00      | Pass    |



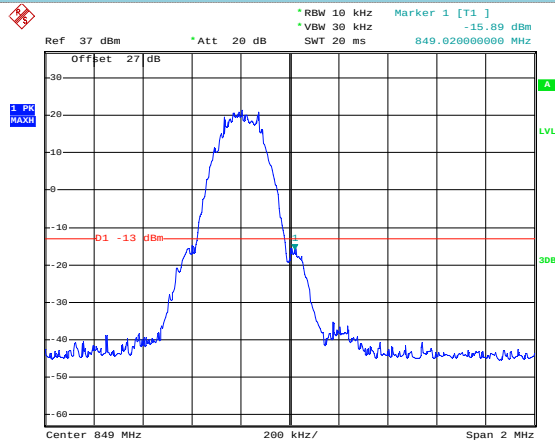
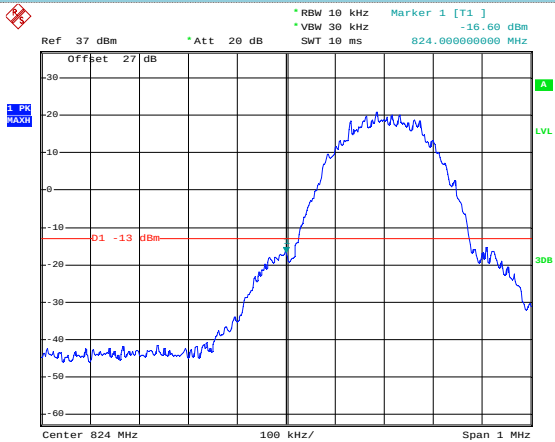
GSM850 For GMSK Moudlation



Channel 128

Channel 251

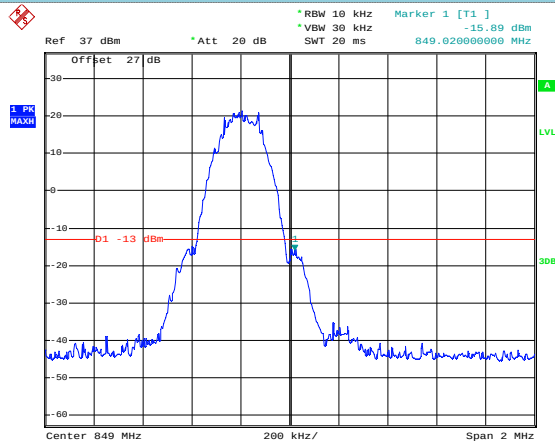
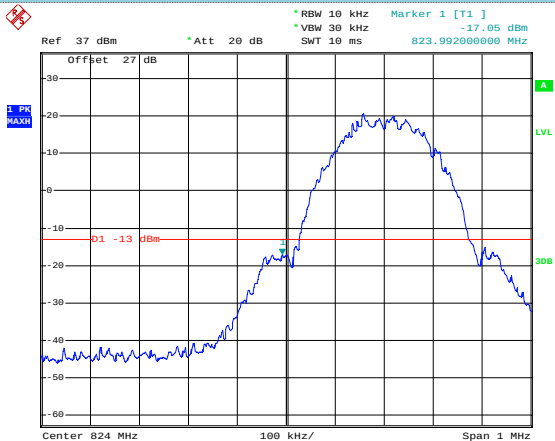
GPRS850 For GMSK Moudlation



Channel 128

Channel 251

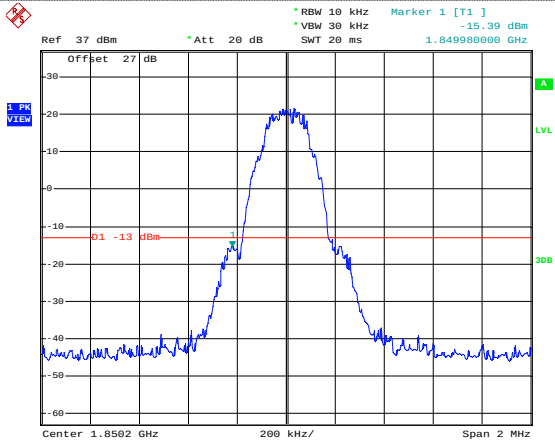
EGPRS850 For GMSK Moudlation



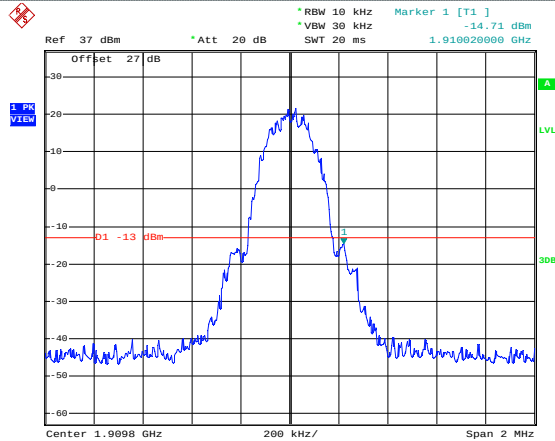
Channel 128

Channel 251

PCS1900 For GMSK Moudlation

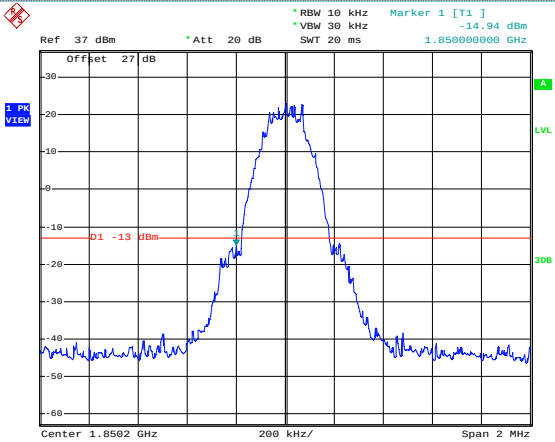


Channel 512

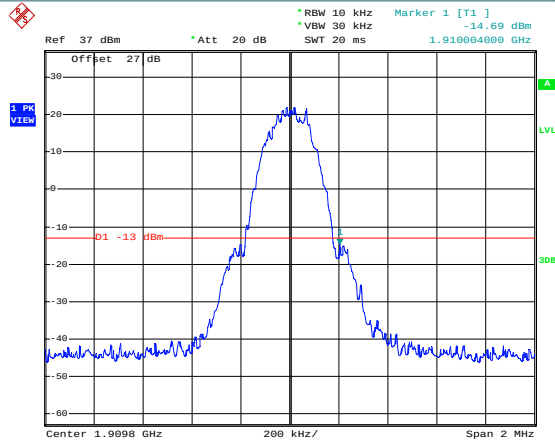


Channel 810

GPRS1900 For GMSK Moudlation

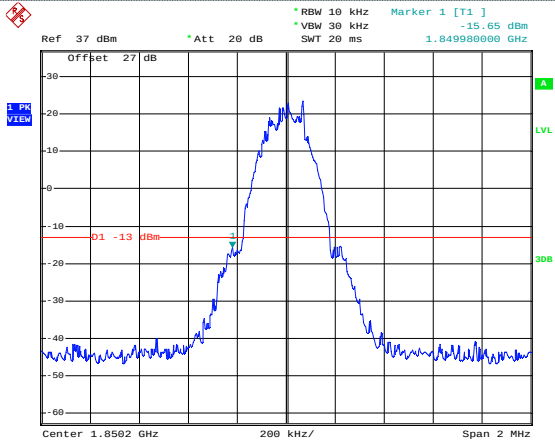


Channel 512

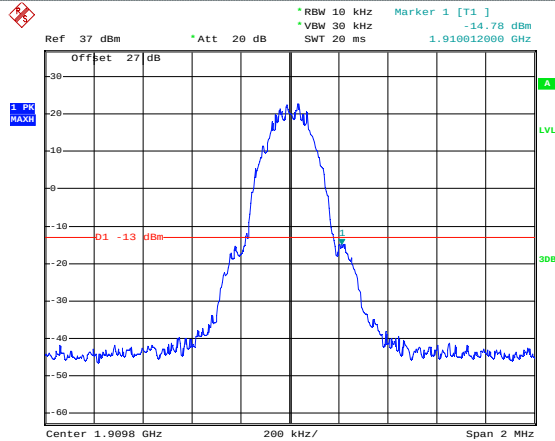


Channel 810

EGPRS1900 For GMSK Moudlation

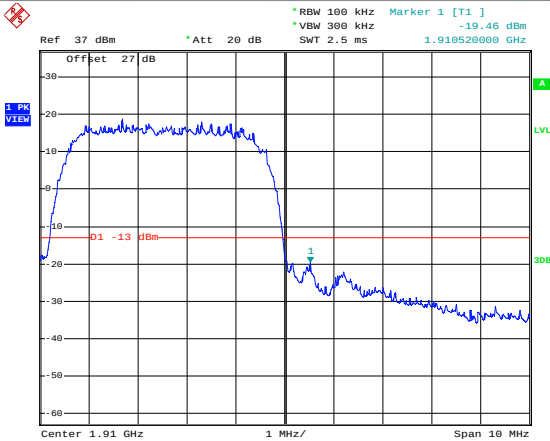
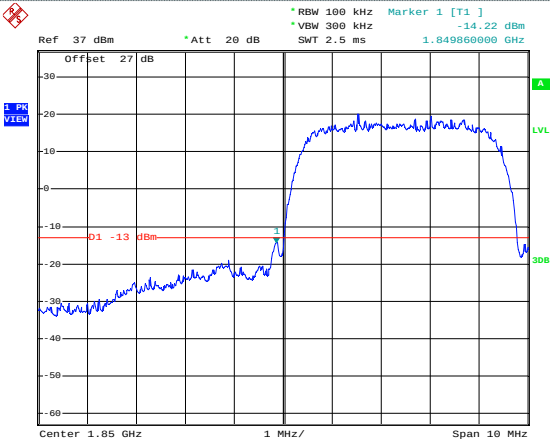


Channel 512



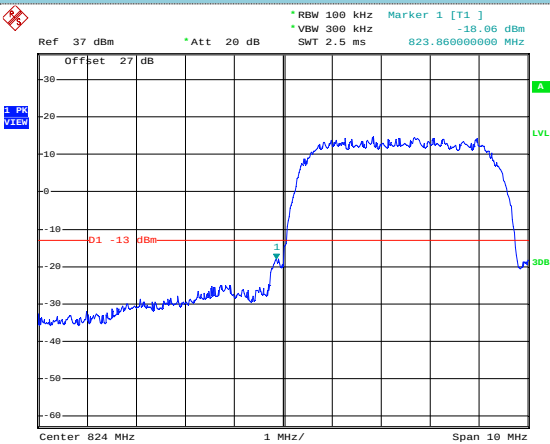
Channel 810

WCDMA Band II

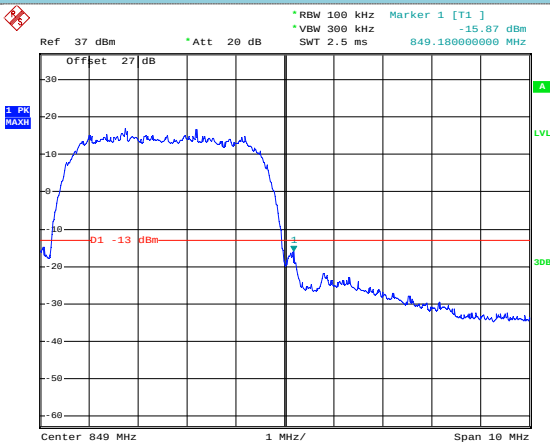


Channel 9262

WCDMA Band V



Channel 9538



Channel 4132

Channel 4233

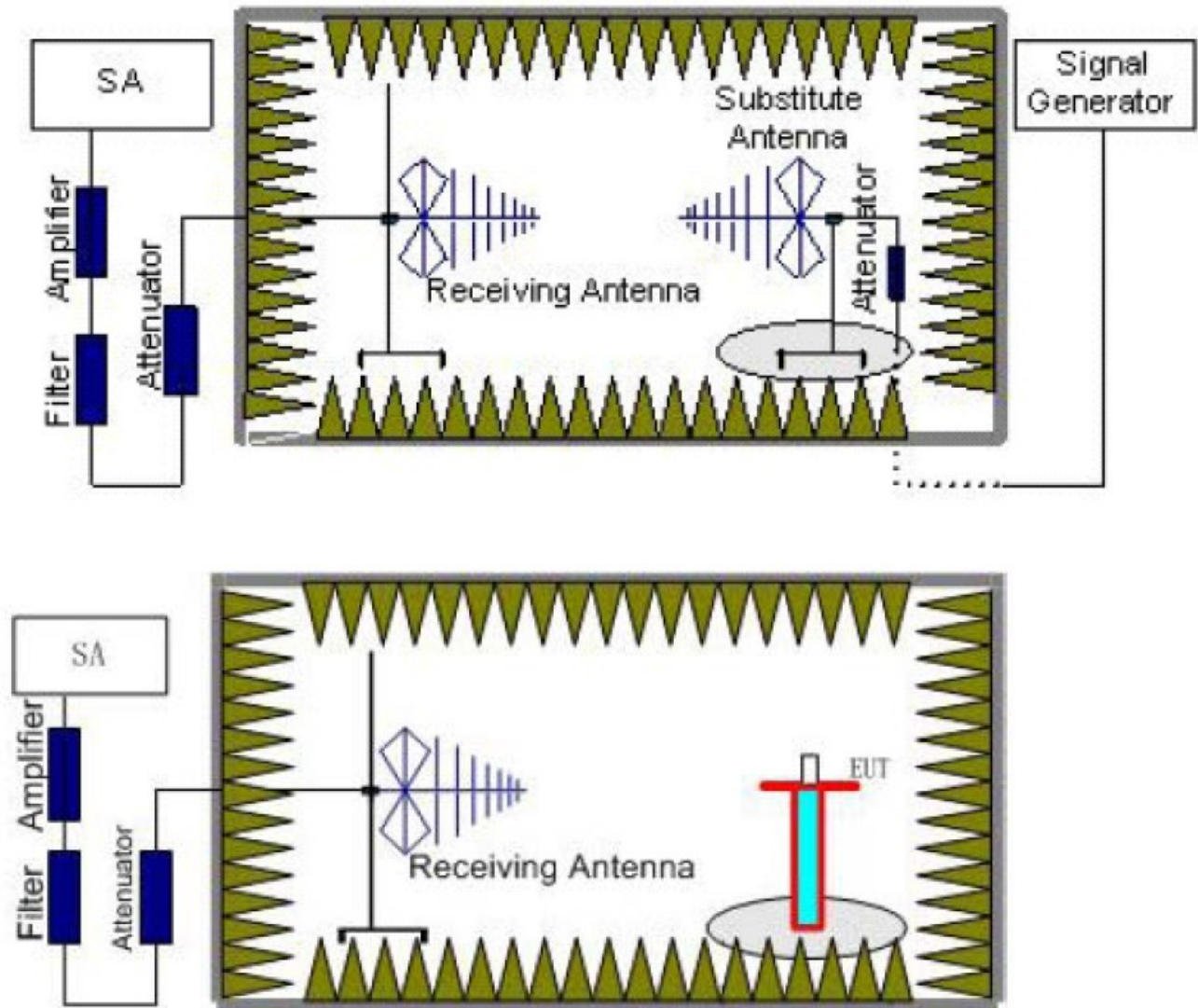
## 4.6. Radiated Power Measurement

### LIMIT

GSM850/WCDMA Band V: 7W ERP

PCS1900/WCDMA Band II: 2W EIRP

### TEST CONFIGURATION



### TEST PROCEDURE

1. EUT was placed on a 1.50 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 1.50m. 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 transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.
2. A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
3. The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=1MHz, VBW=3MHz, And the maximum value of the receiver should be recorded as (Pr).

4. The EUT shall be replaced by a substitution antenna. 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 (PMea) 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 (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
5. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (Pcl) ,the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test.
6. The measurement results are obtained as described below:  
 $\text{Power(EIRP)} = \text{PMea} - \text{PAg} - \text{Pcl} + \text{Ga}$   
 We used SMF100A microwave signal generator which signal level can up to 33dBm,so we not used power Amplifier for substitution test; The measurement results are amend as described below:  
 $\text{Power(EIRP)} = \text{PMea} - \text{Pcl} + \text{Ga}$
7. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.  
 ERP can be calculated from EIRP by subtracting the gain of the dipole,  $\text{ERP} = \text{EIRP} - 2.15\text{dBi}$ .

### **TEST RESULTS**

GSM:

| Mode     | Channel | Antenna Pol. | ERP   | Limit (dBm) | Result |
|----------|---------|--------------|-------|-------------|--------|
| GSM850   | 128     | V            | 31.35 | 38.45       | Pass   |
|          |         | H            | 28.46 |             |        |
|          | 190     | V            | 31.78 |             |        |
|          |         | H            | 28.36 |             |        |
|          | 251     | V            | 31.78 |             |        |
|          |         | H            | 27.68 |             |        |
| GPRS850  | 128     | V            | 31.74 | 38.45       | Pass   |
|          |         | H            | 28.63 |             |        |
|          | 190     | V            | 31.48 |             |        |
|          |         | H            | 28.67 |             |        |
|          | 251     | V            | 31.78 |             |        |
|          |         | H            | 28.76 |             |        |
| EGPRS850 | 128     | V            | 31.49 | 38.45       | Pass   |
|          |         | H            | 27.36 |             |        |
|          | 190     | V            | 31.39 |             |        |
|          |         | H            | 28.79 |             |        |
|          | 251     | V            | 31.69 |             |        |
|          |         | H            | 27.36 |             |        |

| Mode       | Channel | Antenna Pol. | EIRP  | Limit (dBm) | Result |
|------------|---------|--------------|-------|-------------|--------|
| PCS1900    | 512     | V            | 28.65 | 33.01       | Pass   |
|            |         | H            | 24.78 |             |        |
|            | 661     | V            | 28.94 |             |        |
|            |         | H            | 25.69 |             |        |
|            | 810     | V            | 28.52 |             |        |
|            |         | H            | 24.69 |             |        |
| GPRS1900   | 512     | V            | 28.79 | 33.01       | Pass   |
|            |         | H            | 25.74 |             |        |
|            | 661     | V            | 28.25 |             |        |
|            |         | H            | 25.74 |             |        |
|            | 810     | V            | 28.52 |             |        |
|            |         | H            | 24.95 |             |        |
| EGPRS 1900 | 512     | V            | 29.67 | 33.01       | Pass   |
|            |         | H            | 25.84 |             |        |
|            | 661     | V            | 28.76 |             |        |
|            |         | H            | 24.69 |             |        |
|            | 810     | V            | 28.52 |             |        |
|            |         | H            | 24.76 |             |        |

## WCDMA:

| Mode          | Channel | Antenna Pol. | EIRP  | Limit (dBm) | Result |
|---------------|---------|--------------|-------|-------------|--------|
| WCDMA Band II | 9262    | V            | 22.36 | 33.01       | Pass   |
|               |         | H            | 17.63 |             |        |
|               | 9400    | V            | 22.64 |             |        |
|               |         | H            | 17.63 |             |        |
|               | 9538    | V            | 22.64 |             |        |
|               |         | H            | 17.84 |             |        |

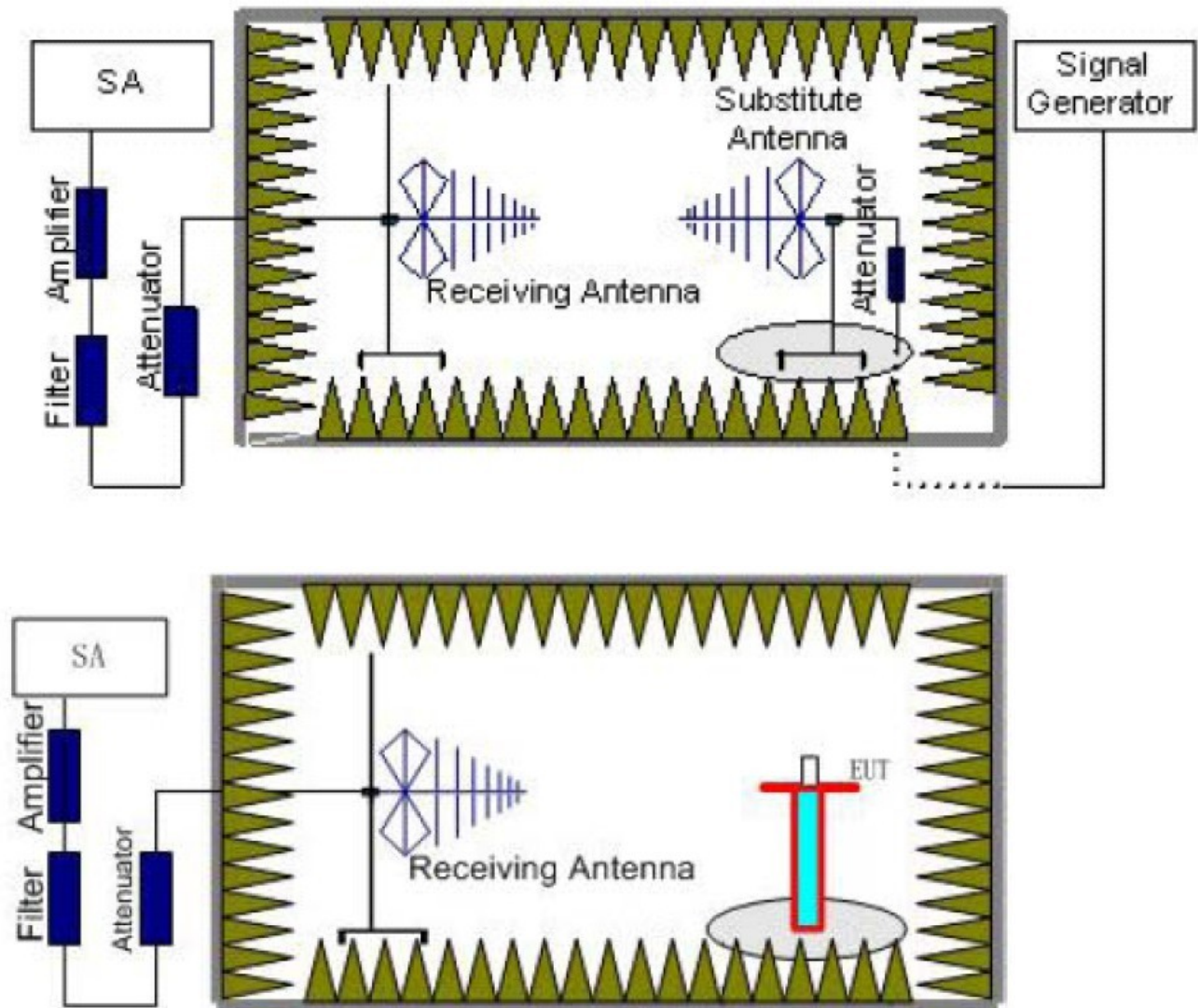
| Mode         | Channel | Antenna Pol. | ERP   | Limit (dBm) | Result |
|--------------|---------|--------------|-------|-------------|--------|
| WCDMA Band V | 4132    | V            | 21.09 | 38.45       | Pass   |
|              |         | H            | 15.68 |             |        |
|              | 4182    | V            | 21.25 |             |        |
|              |         | H            | 16.36 |             |        |
|              | 4233    | V            | 20.52 |             |        |
|              |         | H            | 15.78 |             |        |

## 4.7. Radiated Spurious Emission

### LIMIT

-13dBm

### TEST CONFIGURATION



### TEST RESULTS

1. EUT was placed on a 1.50 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 1.50m. 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 transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.
2. A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
3. The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=1MHz, VBW=3MHz, And the maximum value of the receiver should be recorded as (Pr).

4. The EUT shall be replaced by a substitution antenna. 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 (PMea) 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 (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
5. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (Pcl) ,the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test.
6. The measurement results are obtained as described below:  
Power(EIRP)=PMea- PAg - Pcl + Ga  
We used SMF100A micowave signal generator which signal level can up to 33dBm,so we not used power Amplifier for substitution test; The measurement results are amend as described below:  
Power(EIRP)=PMea- Pcl + Ga
7. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.  
ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP-2.15dBi.

## **TEST RESULTS**



| GSM850  |                 |                   |             |             |        |
|---------|-----------------|-------------------|-------------|-------------|--------|
| Channel | Frequency (MHz) | Spurious Emission |             | Limit (dBm) | Result |
|         |                 | Polarization      | Level (dBm) |             |        |
| 128     | 1648.40         | Vertical          | -32.38      | -13.00      | Pass   |
|         | 2472.60         | V                 | -34.65      |             |        |
|         | 3296.80         | V                 | -31.58      |             |        |
|         | 4121.00         | V                 | -38.67      |             |        |
|         | 4945.20         | V                 | ---         |             |        |
|         | 1648.40         | Horizontal        | -38.42      | -13.00      | Pass   |
|         | 2472.60         | H                 | -42.98      |             |        |
|         | 3296.80         | H                 | -43.56      |             |        |
|         | 4121.00         | H                 | -48.69      |             |        |
|         | 4945.20         | H                 | ---         |             |        |
| 190     | 1673.20         | Vertical          | -36.78      | -13.00      | Pass   |
|         | 2509.80         | V                 | -39.59      |             |        |
|         | 3346.40         | V                 | -37.64      |             |        |
|         | 4183.00         | V                 | -42.59      |             |        |
|         | 5019.60         | V                 | ---         |             |        |
|         | 1673.20         | Horizontal        | -41.87      | -13.00      | Pass   |
|         | 2509.80         | H                 | -45.69      |             |        |
|         | 3346.40         | H                 | -46.74      |             |        |
|         | 4183.00         | H                 | -49.98      |             |        |
|         | 5019.60         | H                 | ---         |             |        |
| 251     | 1697.60         | Vertical          | -41.58      | -13.00      | Pass   |
|         | 2546.40         | V                 | -45.89      |             |        |
|         | 3395.20         | V                 | -41.74      |             |        |
|         | 4244.00         | V                 | -47.85      |             |        |
|         | 5092.80         | V                 | ---         |             |        |
|         | 1697.60         | Horizontal        | -37.69      | -13.00      | Pass   |
|         | 2546.40         | H                 | -43.64      |             |        |
|         | 3395.20         | H                 | -42.68      |             |        |
|         | 4244.00         | H                 | -46.58      |             |        |
|         | 5092.80         | H                 | ---         |             |        |

Remark :

1. The emission behaviour belongs to narrowband spurious emission.
2. Remark"---" means that the emission level is too low to be measured
3. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

| PCS1900 |                 |                   |             |             |        |
|---------|-----------------|-------------------|-------------|-------------|--------|
| Channel | Frequency (MHz) | Spurious Emission |             | Limit (dBm) | Result |
|         |                 | Polarization      | Level (dBm) |             |        |
| 512     | 3700.40         | Vertical          | -32.59      | -13.00      | Pass   |
|         | 5550.60         | V                 | -36.78      |             |        |
|         | 7400.80         | V                 | -38.74      |             |        |
|         | 9251.00         | V                 | -42.58      |             |        |
|         | 11101.20        | V                 | ---         |             |        |
|         | 3700.40         | Horizontal        | -38.69      | -13.00      | Pass   |
|         | 5550.60         | H                 | -41.78      |             |        |
|         | 7400.80         | H                 | -43.16      |             |        |
|         | 9251.00         | H                 | -46.84      |             |        |
|         | 11101.20        | H                 | ---         |             |        |
| 661     | 3760.00         | Vertical          | -33.64      | -13.00      | Pass   |
|         | 5640.00         | V                 | -37.85      |             |        |
|         | 7520.00         | V                 | -38.94      |             |        |
|         | 9400.00         | V                 | -42.63      |             |        |
|         | 11280.00        | V                 | ---         |             |        |
|         | 3760.00         | Horizontal        | -36.89      | -13.00      | Pass   |
|         | 5640.00         | H                 | -40.64      |             |        |
|         | 7520.00         | H                 | -40.89      |             |        |
|         | 9400.00         | H                 | -42.67      |             |        |
|         | 11280.00        | H                 | ---         |             |        |
| 810     | 3819.60         | Vertical          | -34.97      | -13.00      | Pass   |
|         | 5729.40         | V                 | -37.26      |             |        |
|         | 7639.20         | V                 | -37.59      |             |        |
|         | 9549.00         | V                 | -40.64      |             |        |
|         | 11458.80        | V                 | ---         |             |        |
|         | 3819.60         | Horizontal        | -37.58      | -13.00      | Pass   |
|         | 5729.40         | H                 | -42.63      |             |        |
|         | 7639.20         | H                 | -44.84      |             |        |
|         | 9549.00         | H                 | -47.45      |             |        |
|         | 11458.80        | H                 | ---         |             |        |

Remark :

1. The emission behaviour belongs to narrowband spurious emission.
2. Remark"---" means that the emission level is too low to be measured
3. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

| WCDMA Band II |                 |                   |             |             |        |
|---------------|-----------------|-------------------|-------------|-------------|--------|
| Channel       | Frequency (MHz) | Spurious Emission |             | Limit (dBm) | Result |
|               |                 | Polarization      | Level (dBm) |             |        |
| 9262          | 3704.80         | Vertical          | -33.74      | -13.00      | Pass   |
|               | 5557.20         | V                 | -40.25      |             |        |
|               | 5557.20         | V                 | -37.63      |             |        |
|               | 7409.60         | V                 | -45.78      |             |        |
|               | 9262.00         | V                 | ---         |             |        |
|               | 3704.80         | Horizontal        | -38.64      | -13.00      | Pass   |
|               | 5557.20         | H                 | -43.87      |             |        |
|               | 5557.20         | H                 | -43.74      |             |        |
|               | 7409.60         | H                 | -49.32      |             |        |
|               | 9262.00         | H                 | ---         |             |        |
| 9400          | 3760.00         | Vertical          | -35.71      | -13.00      | Pass   |
|               | 5640.00         | V                 | -42.07      |             |        |
|               | 5640.00         | V                 | -38.85      |             |        |
|               | 7520.00         | V                 | -43.67      |             |        |
|               | 9400.00         | V                 | ---         |             |        |
|               | 3760.00         | Horizontal        | -44.52      | -13.00      | Pass   |
|               | 5640.00         | H                 | -45.89      |             |        |
|               | 5640.00         | H                 | -45.78      |             |        |
|               | 7520.00         | H                 | -49.87      |             |        |
|               | 9400.00         | H                 | ---         |             |        |
| 9538          | 3815.20         | Vertical          | -41.85      | -13.00      | Pass   |
|               | 5722.80         | V                 | -47.38      |             |        |
|               | 5722.80         | V                 | -44.52      |             |        |
|               | 7630.40         | V                 | -46.84      |             |        |
|               | 9538.00         | V                 | ---         |             |        |
|               | 3815.20         | Horizontal        | -45.38      | -13.00      | Pass   |
|               | 5722.80         | H                 | -47.56      |             |        |
|               | 5722.80         | H                 | -43.67      |             |        |
|               | 7630.40         | H                 | -46.58      |             |        |
|               | 9538.00         | H                 | ---         |             |        |

Remark :

4. The emission behaviour belongs to narrowband spurious emission.
5. Remark"---" means that the emission level is too low to be measured
6. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

| WCDMA Band V |                 |                   |             |             |        |
|--------------|-----------------|-------------------|-------------|-------------|--------|
| Channel      | Frequency (MHz) | Spurious Emission |             | Limit (dBm) | Result |
|              |                 | Polarization      | Level (dBm) |             |        |
| 4132         | 1652.80         | Vertical          | -34.92      | -13.00      | Pass   |
|              | 2479.20         | V                 | -37.28      |             |        |
|              | 2479.20         | V                 | -39.23      |             |        |
|              | 3305.60         | V                 | -41.12      |             |        |
|              | 4132.00         | V                 | ---         |             |        |
|              | 1652.80         | Horizontal        | -39.46      | -13.00      | Pass   |
|              | 2479.20         | H                 | -42.81      |             |        |
|              | 2479.20         | H                 | -44.14      |             |        |
|              | 3305.60         | H                 | -46.48      |             |        |
|              | 4132.00         | H                 | ---         |             |        |
| 4182         | 1673.20         | Vertical          | -32.88      | -13.00      | Pass   |
|              | 2509.80         | V                 | -35.31      |             |        |
|              | 2509.80         | V                 | -37.31      |             |        |
|              | 3346.40         | V                 | -39.27      |             |        |
|              | 4183.00         | V                 | ---         |             |        |
|              | 1673.20         | Horizontal        | -37.56      | -13.00      | Pass   |
|              | 2509.80         | H                 | -41.00      |             |        |
|              | 2509.80         | H                 | -42.38      |             |        |
|              | 3346.40         | H                 | -44.79      |             |        |
|              | 4183.00         | H                 | ---         |             |        |
| 4233         | 1693.20         | Vertical          | -33.93      | -13.00      | Pass   |
|              | 2539.80         | V                 | -36.29      |             |        |
|              | 2539.80         | V                 | -38.24      |             |        |
|              | 3386.40         | V                 | -40.13      |             |        |
|              | 4233.00         | V                 | ---         |             |        |
|              | 1693.20         | Horizontal        | -38.47      | -13.00      | Pass   |
|              | 2539.80         | H                 | -41.82      |             |        |
|              | 2539.80         | H                 | -43.15      |             |        |
|              | 3386.40         | H                 | -45.49      |             |        |
|              | 4233.00         | H                 | ---         |             |        |

Remark :

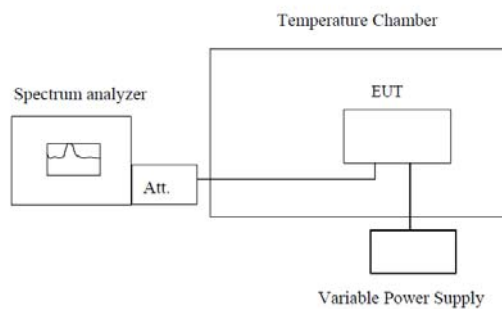
4. The emission behaviour belongs to narrowband spurious emission.
5. Remark"---" means that the emission level is too low to be measured
6. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

#### 4.8. Frequency stability V.S. Temperature measurement

##### LIMIT

2.5ppm

##### TEST CONFIGURATION



Note : Measurement setup for testing on Antenna connector

##### TEST PROCEDURE

1. The equipment under test was connected to an external DC power supply and input rated voltage.
2. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators.
3. The EUT was placed inside the temperature chamber.
4. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25°C operating frequency as reference frequency.
5. Turn EUT off and set the chamber temperature to -30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency.
6. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.

##### TEST RESULTS

| Reference Frequency: GSM850 Middle channel=190 channel=836.6MHz |                  |                 |       |             |        |
|-----------------------------------------------------------------|------------------|-----------------|-------|-------------|--------|
| Power supplied (Vdc)                                            | Temperature (°C) | Frequency error |       | Limit (ppm) | Result |
|                                                                 |                  | Hz              | ppm   |             |        |
| 3.70                                                            | -30              | 38              | 0.045 | 2.5         | Pass   |
|                                                                 | -20              | 37              | 0.044 |             |        |
|                                                                 | -10              | 44              | 0.053 |             |        |
|                                                                 | 0                | 32              | 0.038 |             |        |
|                                                                 | 10               | 35              | 0.042 |             |        |
|                                                                 | 20               | 32              | 0.038 |             |        |
|                                                                 | 30               | 36              | 0.043 |             |        |
|                                                                 | 40               | 34              | 0.041 |             |        |
|                                                                 | 50               | 35              | 0.042 |             |        |
| Reference Frequency: PCS1900 Middle channel=661 channel=1880MHz |                  |                 |       |             |        |
| Power supplied (Vdc)                                            | Temperature (°C) | Frequency error |       | Limit (ppm) | Result |
|                                                                 |                  | Hz              | ppm   |             |        |
| 3.70                                                            | -30              | 35              | 0.019 | 2.5         | Pass   |
|                                                                 | -20              | 34              | 0.018 |             |        |
|                                                                 | -10              | 32              | 0.017 |             |        |
|                                                                 | 0                | 37              | 0.020 |             |        |
|                                                                 | 10               | 36              | 0.019 |             |        |
|                                                                 | 20               | 35              | 0.019 |             |        |
|                                                                 | 30               | 28              | 0.015 |             |        |
|                                                                 | 40               | 34              | 0.018 |             |        |
|                                                                 | 50               | 35              | 0.019 |             |        |

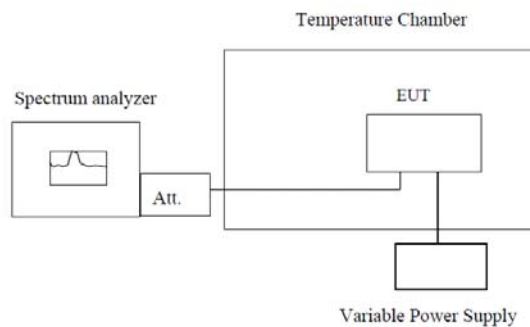
| Reference Frequency: WCDMA Band II Middle channel=9400 channel=1880MHz |                  |                 |       |             |        |
|------------------------------------------------------------------------|------------------|-----------------|-------|-------------|--------|
| Power supplied (Vdc)                                                   | Temperature (°C) | Frequency error |       | Limit (ppm) | Result |
|                                                                        |                  | Hz              | ppm   |             |        |
| 3.70                                                                   | -30              | 34              | 0.018 | 2.5         | Pass   |
|                                                                        | -20              | 37              | 0.020 |             |        |
|                                                                        | -10              | 34              | 0.018 |             |        |
|                                                                        | 0                | 36              | 0.019 |             |        |
|                                                                        | 10               | 34              | 0.018 |             |        |
|                                                                        | 20               | 32              | 0.017 |             |        |
|                                                                        | 30               | 36              | 0.019 |             |        |
|                                                                        | 40               | 35              | 0.019 |             |        |
|                                                                        | 50               | 34              | 0.018 |             |        |
| Reference Frequency: WCDMA Band V Middle channel=4182 channel=836.6MHz |                  |                 |       |             |        |
| Power supplied (Vdc)                                                   | Temperature (°C) | Frequency error |       | Limit (ppm) | Result |
|                                                                        |                  | Hz              | ppm   |             |        |
| 3.70                                                                   | -30              | 36              | 0.043 | 2.5         | Pass   |
|                                                                        | -20              | 35              | 0.042 |             |        |
|                                                                        | -10              | 37              | 0.044 |             |        |
|                                                                        | 0                | 32              | 0.038 |             |        |
|                                                                        | 10               | 36              | 0.043 |             |        |
|                                                                        | 20               | 34              | 0.041 |             |        |
|                                                                        | 30               | 35              | 0.042 |             |        |
|                                                                        | 40               | 32              | 0.038 |             |        |
|                                                                        | 50               | 36              | 0.043 |             |        |

#### 4.9. Frequency stability V.S. Temperature measurement

##### LIMIT

2.5ppm

##### TEST CONFIGURATION



Note : Measurement setup for testing on Antenna connector

##### TEST PROCEDURE

1. Set chamber temperature to 25°C. Use a variable DC power source to power the EUT and set the voltage to rated voltage.
2. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.
3. Reduce the input voltage to specified extreme voltage variation (+/- 15%) and endpoint, record the maximum frequency change.

##### TEST RESULTS

| Reference Frequency: GSM850 (GSM link) Middle channel=190 channel=836.6MHz |                      |                 |       |             |        |
|----------------------------------------------------------------------------|----------------------|-----------------|-------|-------------|--------|
| Temperature (°C)                                                           | Power supplied (Vdc) | Frequency error |       | Limit (ppm) | Result |
|                                                                            |                      | Hz              | ppm   |             |        |
| 25                                                                         | 4.25                 | 31              | 0.037 | 2.5         | Pass   |
|                                                                            | 3.70                 | 34              | 0.041 |             |        |
|                                                                            | 3.40                 | 33              | 0.039 |             |        |
| Reference Frequency: PCS1900 (GSM link) Middle channel=661 channel=1880MHz |                      |                 |       |             |        |
| Temperature (°C)                                                           | Power supplied (Vdc) | Frequency error |       | Limit (ppm) | Result |
|                                                                            |                      | Hz              | ppm   |             |        |
| 25                                                                         | 4.25                 | 42              | 0.022 | 2.5         | Pass   |
|                                                                            | 3.70                 | 38              | 0.020 |             |        |
|                                                                            | 3.40                 | 49              | 0.026 |             |        |
| Reference Frequency: WCDMA Band II Middle channel=9400 channel=1880MHz     |                      |                 |       |             |        |
| Temperature (°C)                                                           | Power supplied (Vdc) | Frequency error |       | Limit (ppm) | Result |
|                                                                            |                      | Hz              | ppm   |             |        |
| 25                                                                         | 4.25                 | 39              | 0.021 | 2.5         | Pass   |
|                                                                            | 3.70                 | 42              | 0.022 |             |        |
|                                                                            | 3.40                 | 33              | 0.018 |             |        |
| Reference Frequency: WCDMA Band V Middle channel=4182 channel=836.6MHz     |                      |                 |       |             |        |
| Temperature (°C)                                                           | Power supplied (Vdc) | Frequency error |       | Limit (ppm) | Result |
|                                                                            |                      | Hz              | ppm   |             |        |
| 25                                                                         | 4.25                 | 38              | 0.045 | 2.5         | Pass   |
|                                                                            | 3.70                 | 33              | 0.039 |             |        |
|                                                                            | 3.40                 | 37              | 0.044 |             |        |

.....End of Report.....