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Report No.: GTI20161071F-3

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# TEST REPORT

**Product Name** .....: LTE/WCDMA/GSM(GPRS) Mutil-Mode Digital Mobile Phone

**Trademark** .....: /

**Model/Type reference** .....: ZTE BLADE V8 SE, ZTE BLADE V0820,  
ZTE BLADE V8 LITE, BLADE V8 SE

**FCC ID** .....: SRQ-BLADEV8SE

**Test Standards** .....: FCC CFR Title 47 Part 2  
FCC CFR Title 47 Part 22 Subpart H  
FCC CFR Title 47 Part 24 Subpart E

**Applicant**.....: ZTE CORPORATION

**Address of Applicant**.....: ZTE Plaza, #55 Keji Road South, Hi-Tech, Industrial Park,  
Nanshan District, Shenzhen, Guangdong, 518057, P.R.  
China Shenzhen

**Date of Receipt** .....: Dec. 26, 2016

**Date of Test Date** .....: Dec. 27, 2016 - Dec. 30, 2016

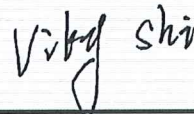
**Data of Issue.** .....: Jan. 02, 2017

|                    |               |
|--------------------|---------------|
| <b>Test result</b> | <b>Pass *</b> |
|--------------------|---------------|

\* In the configuration tested, the EUT complied with the standards specified above

| GENERAL DESCRIPTION OF EUT |                                                                                                                              |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Equipment:                 | LTE/WCDMA/GSM(GPRS) Mutil-Mode Digital Mobile Phone                                                                          |
| Model Name:                | ZTE BLADE V8 SE, ZTE BLADE V0820, ZTE BLADE V8 LITE, BLADE V8 SE                                                             |
| Model Difference           | All models are the Circuit Design identical, only different on model number, the test is performed on model: ZTE BLADE V8 SE |
| Manufacturer:              | ZTE CORPORATION                                                                                                              |
| Manufacturer Address:      | ZTE Plaza, #55 Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R. China Shenzhen |
| Power Rating:              | DC 3.85V form 2500mAh by Rechargeable Li-ion Battery                                                                         |
| Adapter:                   | Model: STC-A515A-Z<br>Input: AC 100-240V, 50Hz/60Hz, 300mA<br>Output: DC 5V, 1500mA                                          |

Compiled By:



(Viky Shi)

Reviewed By:



(Winner Zhang)

Approved By:



(Walter Chen)

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## 1. SUMMARY

### 1.1. Test Standards

[FCC Part 22 Subpart H](#): PRIVATE LAND MOBILE RADIO SERVICES.

[FCC Part 24 Subpart E](#): PUBLIC MOBILE SERVICES

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

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

[ANSI C63.4:2013](#): 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 |
|----------------------------------------|------------------------------------------------------|--------|
| RF Output Power                        | Part 2.1046<br>Part 22.913 (a)(2)<br>Part 24.232 (c) | Pass   |
| Peak-to-Average Ratio                  | Part 24.232 (d)                                      | 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                    | Part 2.1055(a)(1)(b)(d)(1)(2)                        | Pass   |

Note:

1. The measurement uncertainty is not included in the test result.

## 1.3. Test Facility

### 1.3.1 Address of the test laboratory

**Shenzhen General Testing & Inspection Technology Co., Ltd.**

Add: 1F, 2 Block, Jiaquan Building, Guanlan High-tech Park Baoan District, Shenzhen, Guangdong, China

### 1.3.2 Laboratory accreditation

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

#### IC Registration No.: 9783A

The 3m alternate test site of Shenzhen GTI Technology Co., Ltd. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 9783A on Aug, 2011.

#### FCC-Registration No.: 214666

Shenzhen GTI Technology 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 214666, Sep 19, 2011

## 1.4. 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 acc. to CISPR 16 - 4 Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements and is documented in the Shenzhen General Testing & Inspection Technology Co., Ltd quality system acc. 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 General Testing & Inspection 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.

## 2. GENERAL INFORMATION

### 2.1. Environmental conditions

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

|                     |         |
|---------------------|---------|
| Normal Temperature: | 25°C    |
| Relative Humidity:  | 55 %    |
| Air Pressure:       | 101 kPa |

### 2.2. General Description of EUT

|                       |                                                                                                |
|-----------------------|------------------------------------------------------------------------------------------------|
| Product Name:         | LTE/WCDMA/GSM(GPRS) Mutil-Mode Digital Mobile Phone                                            |
| Model/Type reference: | LeBHP401                                                                                       |
| Power supply:         | DC 3.85V form 2500mAh by Rechargeable Li-ion Battery                                           |
| Adapter:              | Model: STC-A515A-Z<br>Input: AC 100-240V, 50Hz/60Hz, 300mA<br>Output: DC 5V, 1500mA            |
| <b>GSM</b>            |                                                                                                |
| Operation Band:       | GSM850: UL: 824MHz~849MHz, DL: 869MHz~894MHz<br>PCS1900: UL: 1850MHz~1910, DL: 1930MHz~1990MHz |
| Supported Type:       | GSM/GPRS/EGPRS                                                                                 |
| Modulation Type:      | GMSK for GSM/GPRS, 8PSK for EGPRS                                                              |
| Antenna Type:         | Internal Antenna                                                                               |
| Antenna Gain:         | GSM 850: -3.3dBi<br>PCS 1900: -0.25dBi                                                         |
| <b>WCDMA</b>          |                                                                                                |
| Operation Band:       | Band II: UL: 824MHz~849MHz, DL: 869MHz~894MHz<br>Band V: UL: 1850MHz~1910, DL: 1930MHz~1990MHz |
| Modulation Type:      | QPSK for WCDMA/HSUPA/HSDPA                                                                     |
| Antenna Type:         | Internal Antenna                                                                               |
| Antenna Gain:         | WCDMA 850: -3.3dBi<br>WCDAM 1900: -0.25dBi                                                     |

## 2.3. Description of Test Modes and Test Frequency

The EUT has been tested under typical operating condition. The CUM200 used to control the EUT staying in continuous transmitting and receiving mode for testing.

### 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          |

## 2.4. Measurement Instruments List

| Output Power (Radiated) & Radiated Spurious Emission |                               |                              |             |            |                  |
|------------------------------------------------------|-------------------------------|------------------------------|-------------|------------|------------------|
| Item                                                 | Test Equipment                | Manufacturer                 | Model No.   | Serial No. | Calibrated until |
| 1                                                    | EMI Test Receiver             | R&S                          | ESCI        | 100967     | Jan. 07, 2017    |
| 2                                                    | High pass filter              | Compliance Direction systems | BSU-6       | 34202      | Jan. 07, 2017    |
| 3                                                    | Log-Bicon Antenna             | Schwarzbeck                  | CBL6141A    | 4180       | Jan. 07, 2017    |
| 4                                                    | Log-Bicon Antenna             | Schwarzbeck                  | CBL6141A    | 4181       | Jan. 07, 2017    |
| 5                                                    | Spectrum Analyzer             | HP                           | 8563E       | 02052      | Jan. 07, 2017    |
| 6                                                    | Horn Antenna                  | Schwarzbeck                  | BBHA 9120D  | 648        | Jan. 07, 2017    |
| 7                                                    | Horn Antenna                  | Schwarzbeck                  | BBHA 9120D  | 649        | Jan. 07, 2017    |
| 8                                                    | Ultra-Broadband Antenna       | ShwarzBeck                   | BBHA9170    | 25841      | Jan. 07, 2017    |
| 9                                                    | Ultra-Broadband Antenna       | ShwarzBeck                   | BBHA9170    | 25842      | Jan. 07, 2017    |
| 10                                                   | Pre-Amplifier                 | HP                           | 8447D       | 1937A03050 | Jan. 07, 2017    |
| 11                                                   | Pre-Amplifier                 | EMCI                         | EMC051835   | 980075     | Jan. 07, 2017    |
| 12                                                   | Splitter                      | Mini-Circuit                 | ZAPD-4      | 400059     | Jan. 07, 2017    |
| 13                                                   | Signal Generator              | Agilent                      | N5182A      | 1019356    | Jan. 07, 2017    |
| 14                                                   | UNIVERSAL RADIO COMMUNICATION | Rohde & Schwarz              | CMU200      | 114694     | Jan. 07, 2017    |
| 15                                                   | Antenna Mast                  | UC                           | UC3000      | N/A        | N/A              |
| 16                                                   | Antenna mast                  | MATURO                       | TAM-4.0-P   | N/A        | N/A              |
| 17                                                   | Turn Table                    | UC                           | UC3000      | N/A        | N/A              |
| 18                                                   | Cable Below 1GHz              | Schwarzbeck                  | AK9515E     | 33155      | Jan. 07,2017     |
| 19                                                   | Cable Above 1GHz              | Hubersuhner                  | SUCOFLEX102 | DA1580     | Jan. 07,2017     |

| Output Power(Conducted) & Occupied Bandwidth & Emission Bandwidth & Band Edge Compliance & Conducted Spurious Emission |                               |                 |           |            |                  |
|------------------------------------------------------------------------------------------------------------------------|-------------------------------|-----------------|-----------|------------|------------------|
| Item                                                                                                                   | Test Equipment                | Manufacturer    | Model No. | Serial No. | Calibrated until |
| 1                                                                                                                      | UNIVERSAL RADIO COMMUNICATION | Rohde & Schwarz | CMU200    | 114694     | Jan. 07, 2017    |
| 2                                                                                                                      | Spectrum Analyzer             | Rohde & Schwarz | FSU       | 100105     | Jan. 07, 2017    |
| 3                                                                                                                      | Splitter                      | Mini-Circuit    | ZAPD-4    | 400059     | Jan. 07, 2017    |

| Frequency Stability |                               |                 |           |            |                  |
|---------------------|-------------------------------|-----------------|-----------|------------|------------------|
| Item                | Test Equipment                | Manufacturer    | Model No. | Serial No. | Calibrated until |
| 1                   | UNIVERSAL RADIO COMMUNICATION | Rohde & Schwarz | CMU200    | 114694     | Jan. 07, 2017    |
| 2                   | Spectrum Analyzer             | Rohde & Schwarz | FSU       | 100105     | Jan. 07, 2017    |
| 3                   | Splitter                      | Mini-Circuit    | ZAPD-4    | 400059     | Jan. 07, 2017    |
| 4                   | Climate Chamber               | ESPEC           | EL-10KA   | 05107008   | Oct 25,2017      |

Note: 1. The Cal. Interval was one year.

2. The cable loss has calculated in test result which connection between each test instruments.

### 3. TEST ITEM AND RESULTS

#### 3.1. Conducted Output Power

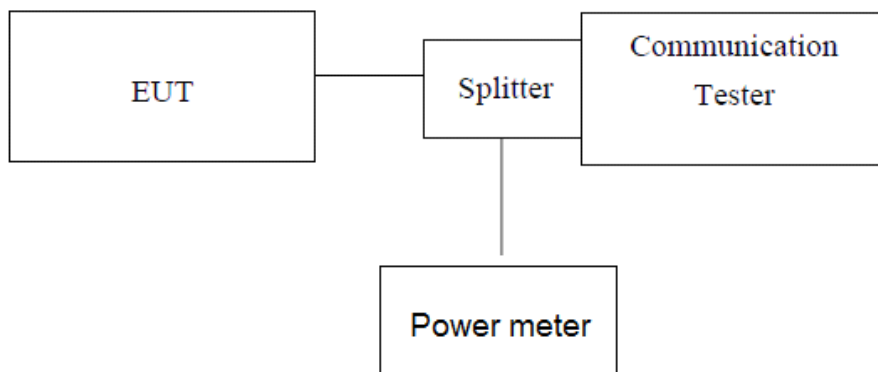
**LIMIT:**

GSM850/WCDMA Band V: 7W

PCS1900/WCDMA Band II: 2W

The Peak-to-Average Ratio (PAR) of the transmission may not exceed 13 dB.

**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 PK burst power and maximum Avg. burst power.

## TEST RESULTS

| EUT Mode               | Channel | Frequency (MHz) | Avg.Burst Power (dBm) | Peak-to-Average Ratio(dB) | Limit (dBm) | Result |
|------------------------|---------|-----------------|-----------------------|---------------------------|-------------|--------|
| GSM 850 (GMSK)         | 128     | 824.20          | 33.1                  | /                         | 38.45       | Pass   |
|                        | 190     | 836.60          | 33.1                  | /                         |             |        |
|                        | 251     | 848.80          | <b>33.2</b>           | /                         |             |        |
| GPRS850 (GMSK, 1Slot)  | 128     | 824.20          | 33.1                  | /                         | 38.45       | Pass   |
|                        | 190     | 836.60          | 33.1                  | /                         |             |        |
|                        | 251     | 848.80          | <b>33.2</b>           | /                         |             |        |
| GPRS850 (GMSK, 2Slot)  | 128     | 824.20          | 32.1                  | /                         | 38.45       | Pass   |
|                        | 190     | 836.60          | 32.1                  | /                         |             |        |
|                        | 251     | 848.80          | 32.2                  | /                         |             |        |
| GPRS850 (GMSK, 3Slot)  | 128     | 824.20          | 30.2                  | /                         | 38.45       | Pass   |
|                        | 190     | 836.60          | 30.2                  | /                         |             |        |
|                        | 251     | 848.80          | 30.1                  | /                         |             |        |
| GPRS850 (GMSK, 4Slot)  | 128     | 824.20          | 29.1                  | /                         | 38.45       | Pass   |
|                        | 190     | 836.60          | 29.0                  | /                         |             |        |
|                        | 251     | 848.80          | 29.0                  | /                         |             |        |
| EGPRS850 (8PSK,1Slot)  | 128     | 824.20          | 26.7                  | /                         | 38.45       | Pass   |
|                        | 190     | 836.60          | 26.7                  | /                         |             |        |
|                        | 251     | 848.80          | 26.5                  | /                         |             |        |
| EGPRS850 (8PSK, 2Slot) | 128     | 824.20          | 25.6                  | /                         | 38.45       | Pass   |
|                        | 190     | 836.60          | 25.7                  | /                         |             |        |
|                        | 251     | 848.80          | 25.4                  | /                         |             |        |
| EGPRS850 (8PSK, 3Slot) | 128     | 824.20          | 23.5                  | /                         | 38.45       | Pass   |
|                        | 190     | 836.60          | 23.5                  | /                         |             |        |
|                        | 251     | 848.80          | 23.3                  | /                         |             |        |
| EGPRS850 (8PSK, 4Slot) | 128     | 824.20          | 22.3                  | /                         | 38.45       | Pass   |
|                        | 190     | 836.60          | 22.3                  | /                         |             |        |
|                        | 251     | 848.80          | 22.2                  | /                         |             |        |

Note: 1. Peak-to-Average Ratio= maximum PK burst power-maximum Avg. burst power.

| EUT Mode                | Channel | Frequency (MHz) | Avg.Burst Power (dBm) | Peak-to-Average Ratio(dB) | Limit (dBm) | Result |
|-------------------------|---------|-----------------|-----------------------|---------------------------|-------------|--------|
| PCS1900 (GMSK)          | 512     | 1850.20         | 30.3                  | 0.11                      | 33.00       | Pass   |
|                         | 661     | 1880.00         | 30.3                  | 0.12                      |             |        |
|                         | 810     | 1909.80         | 30.4                  | 0.10                      |             |        |
| GPRS1900 (GMSK, 1Slot)  | 512     | 1850.20         | 30.3                  | 0.13                      | 33.00       | Pass   |
|                         | 661     | 1880.00         | 30.3                  | 0.12                      |             |        |
|                         | 810     | 1909.80         | 30.4                  | 0.12                      |             |        |
| GPRS1900 (GMSK, 2Slot)  | 512     | 1850.20         | 29.4                  | 0.11                      | 33.00       | Pass   |
|                         | 661     | 1880.00         | 29.4                  | 0.10                      |             |        |
|                         | 810     | 1909.80         | 29.6                  | 0.12                      |             |        |
| GPRS1900 (GMSK, 3Slot)  | 512     | 1850.20         | 27.3                  | 0.12                      | 33.00       | Pass   |
|                         | 661     | 1880.00         | 27.3                  | 0.11                      |             |        |
|                         | 810     | 1909.80         | 27.5                  | 0.13                      |             |        |
| GPRS1900 (GMSK, 4Slot)  | 512     | 1850.20         | 26.1                  | 0.10                      | 33.00       | Pass   |
|                         | 661     | 1880.00         | 26.1                  | 0.11                      |             |        |
|                         | 810     | 1909.80         | 26.3                  | 0.13                      |             |        |
| EGPRS1900 (8PSK, 1Slot) | 512     | 1850.20         | 26.0                  | 0.12                      | 33.00       | Pass   |
|                         | 661     | 1880.00         | 26.0                  | 0.12                      |             |        |
|                         | 810     | 1909.80         | 26.0                  | 0.11                      |             |        |
| EGPRS1900 (8PSK, 2Slot) | 512     | 1850.20         | 24.8                  | 0.14                      | 33.00       | Pass   |
|                         | 661     | 1880.00         | 24.9                  | 0.12                      |             |        |
|                         | 810     | 1909.80         | 24.8                  | 0.13                      |             |        |
| EGPRS1900 (8PSK, 3Slot) | 512     | 1850.20         | 22.6                  | 0.14                      | 33.00       | Pass   |
|                         | 661     | 1880.00         | 22.5                  | 0.12                      |             |        |
|                         | 810     | 1909.80         | 22.5                  | 0.13                      |             |        |
| EGPRS1900 (8PSK, 4Slot) | 512     | 1850.20         | 21.3                  | 0.13                      | 33.00       | Pass   |
|                         | 661     | 1880.00         | 21.4                  | 0.12                      |             |        |
|                         | 810     | 1909.80         | 21.3                  | 0.12                      |             |        |

Note: 1.Peak-to-Average Ratio= maximum PK burst power-maximum Avg. burst power.

| EUT Mode            |           | Channel | Frequency (MHz) | Avg.Burst Power (dBm) | Peak-to-Average Ratio(dB) | Limit (dBm) | Result |
|---------------------|-----------|---------|-----------------|-----------------------|---------------------------|-------------|--------|
| WCDMA Band II HSDPA | Subtest 1 | 9262    | 1852.40         | 22.70                 | 2.84                      | 33.00       | Pass   |
|                     |           | 9400    | 1880.00         | 22.74                 | 2.83                      |             |        |
|                     |           | 9538    | 1907.60         | 22.63                 | 2.84                      |             |        |
|                     | Subtest 2 | 9262    | 1852.40         | 22.68                 | 2.83                      | 33.00       | Pass   |
|                     |           | 9400    | 1880.00         | 22.75                 | 2.85                      |             |        |
|                     |           | 9538    | 1907.60         | 22.62                 | 2.81                      |             |        |
|                     | Subtest 3 | 9262    | 1852.40         | 22.68                 | 2.86                      | 33.00       | Pass   |
|                     |           | 9400    | 1880.00         | 22.74                 | 2.82                      |             |        |
|                     |           | 9538    | 1907.60         | 22.63                 | 2.84                      |             |        |
|                     | Subtest 4 | 9262    | 1852.40         | 22.71                 | 2.85                      | 33.00       | Pass   |
|                     |           | 9400    | 1880.00         | 22.76                 | 2.83                      |             |        |
|                     |           | 9538    | 1907.60         | 22.65                 | 2.83                      |             |        |
| WCDMA Band II HSUPA | Subtest 1 | 9262    | 1852.40         | 22.68                 | 2.82                      | 33.00       | Pass   |
|                     |           | 9400    | 1880.00         | 22.73                 | 2.84                      |             |        |
|                     |           | 9538    | 1907.60         | 22.62                 | 2.83                      |             |        |
|                     | Subtest 2 | 9262    | 1852.40         | 22.67                 | 2.84                      | 33.00       | Pass   |
|                     |           | 9400    | 1880.00         | 22.74                 | 2.83                      |             |        |
|                     |           | 9538    | 1907.60         | 22.66                 | 2.81                      |             |        |
|                     | Subtest 3 | 9262    | 1852.40         | 22.70                 | 2.83                      | 33.00       | Pass   |
|                     |           | 9400    | 1880.00         | 22.73                 | 2.81                      |             |        |
|                     |           | 9538    | 1907.60         | 22.62                 | 2.83                      |             |        |
|                     | Subtest 4 | 9262    | 1852.40         | 22.70                 | 2.84                      | 33.00       | Pass   |
|                     |           | 9400    | 1880.00         | 22.76                 | 2.83                      |             |        |
|                     |           | 9538    | 1907.60         | 22.64                 | 2.81                      |             |        |
|                     | Subtest 5 | 9262    | 1852.40         | 22.69                 | 2.81                      | 33.00       | Pass   |
|                     |           | 9400    | 1880.00         | 22.72                 | 2.83                      |             |        |
|                     |           | 9538    | 1907.60         | 22.65                 | 2.84                      |             |        |
| WCDMA Band II RMC   | 12.2kbps  | 9262    | 1852.40         | 23.72                 | 2.83                      | 33.00       | Pass   |
|                     |           | 9400    | 1880.00         | 23.87                 | 2.83                      |             |        |
|                     |           | 9538    | 1907.60         | 23.84                 | 2.81                      |             |        |

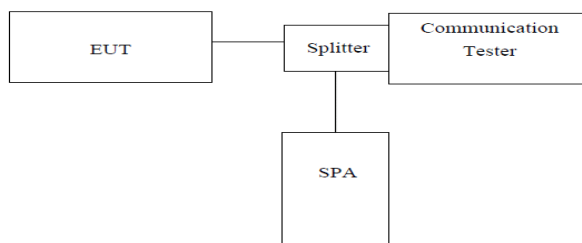
Note: 1.Peak-to-Average Ratio= maximum PK burst power-maximum Avg. burst power.

| EUT Mode           |           | Channel | Frequency (MHz) | Avg.Burst Power (dBm) | Peak-to-Average Ratio(dB) | Limit (dBm) | Result |
|--------------------|-----------|---------|-----------------|-----------------------|---------------------------|-------------|--------|
| WCDMA Band V HSDPA | Subtest 1 | 4132    | 826.40          | 22.97                 | /                         | 38.45       | Pass   |
|                    |           | 4183    | 836.60          | 22.86                 | /                         |             |        |
|                    |           | 4233    | 846.60          | 22.89                 | /                         |             |        |
|                    | Subtest 2 | 4132    | 826.40          | 22.96                 | /                         | 38.45       | Pass   |
|                    |           | 4183    | 836.60          | 22.85                 | /                         |             |        |
|                    |           | 4233    | 846.60          | 22.87                 | /                         |             |        |
|                    | Subtest 3 | 4132    | 826.40          | 22.97                 | /                         | 38.45       | Pass   |
|                    |           | 4183    | 836.60          | 22.87                 | /                         |             |        |
|                    |           | 4233    | 846.60          | 22.88                 | /                         |             |        |
|                    | Subtest 4 | 4132    | 826.40          | 23.01                 | /                         | 38.45       | Pass   |
|                    |           | 4183    | 836.60          | 22.89                 | /                         |             |        |
|                    |           | 4233    | 846.60          | 22.87                 | /                         |             |        |
| WCDMA Band V HSUPA | Subtest 1 | 4132    | 826.40          | 22.98                 | /                         | 38.45       | Pass   |
|                    |           | 4183    | 836.60          | 22.85                 | /                         |             |        |
|                    |           | 4233    | 846.60          | 22.86                 | /                         |             |        |
|                    | Subtest 2 | 4132    | 826.40          | 22.96                 | /                         | 38.45       | Pass   |
|                    |           | 4183    | 836.60          | 22.84                 | /                         |             |        |
|                    |           | 4233    | 846.60          | 22.87                 | /                         |             |        |
|                    | Subtest 3 | 4132    | 826.40          | 22.97                 | /                         | 38.45       | Pass   |
|                    |           | 4183    | 836.60          | 22.85                 | /                         |             |        |
|                    |           | 4233    | 846.60          | 22.86                 | /                         |             |        |
|                    | Subtest 4 | 4132    | 826.40          | 22.95                 | /                         | 38.45       | Pass   |
|                    |           | 4183    | 836.60          | 22.86                 | /                         |             |        |
|                    |           | 4233    | 846.60          | 22.87                 | /                         |             |        |
|                    | Subtest 5 | 4132    | 826.40          | 22.96                 | /                         | 38.45       | Pass   |
|                    |           | 4183    | 836.60          | 22.85                 | /                         |             |        |
|                    |           | 4233    | 846.60          | 22.87                 | /                         |             |        |
| WCDMA Band V RMC   | 12.2kbps  | 4132    | 826.40          | 23.96                 | /                         | 38.45       | Pass   |
|                    |           | 4183    | 836.60          | 23.87                 | /                         |             |        |
|                    |           | 4233    | 846.60          | 23.98                 | /                         |             |        |

Note: 1.Peak-to-Average Ratio= maximum PK burst power-maximum Avg. burst power.

## 3.2. Occupy Bandwidth

### TEST CONFIGURATION



*Note: Measurement setup for testing on Antenna connector*

### TEST PROCEDURE

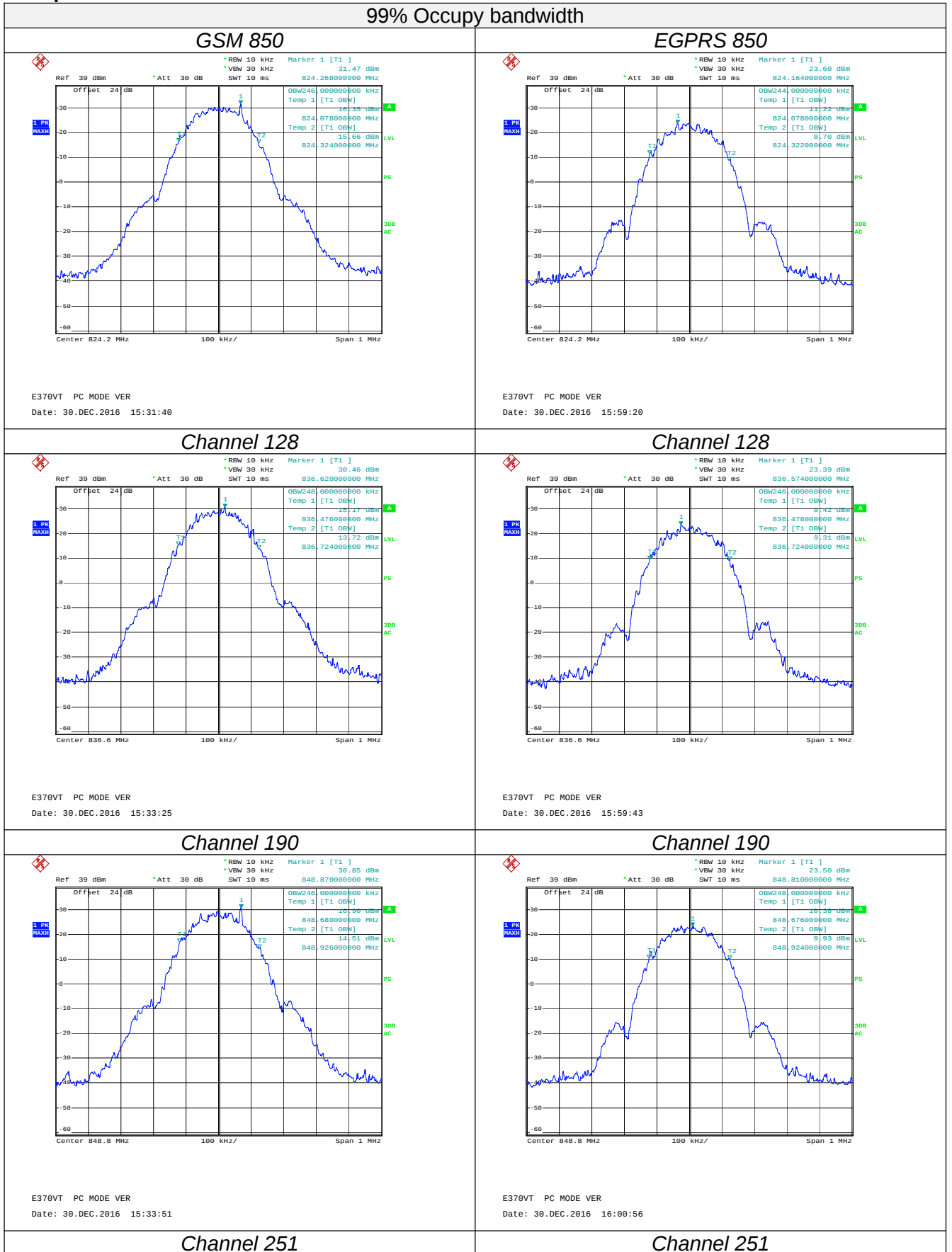
1. The EUT's output RF connector was connected with a short cable to the spectrum analyzer
2. RBW was set to about 1% of emission BW,  $VBW \geq 3$  times RBW.
3. -26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where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

## TEST RESULTS

| EUT Mode               | Channel | Frequency (MHz) | 99% Occupy bandwidth (KHz) | -26dBc bandwidth (KHz) |
|------------------------|---------|-----------------|----------------------------|------------------------|
| GSM 850 (GMSK)         | 128     | 824.20          | 246.00                     | 318.00                 |
|                        | 190     | 836.60          | 248.00                     | 322.00                 |
|                        | 251     | 848.80          | 246.00                     | 316.00                 |
| EGPRS850 (8PSK,1Slot)  | 128     | 824.20          | 244.00                     | 310.00                 |
|                        | 190     | 836.60          | 246.00                     | 310.00                 |
|                        | 251     | 848.80          | 248.00                     | 308.00                 |
| PCS1900 (GMSK)         | 512     | 1850.20         | 246.00                     | 320.00                 |
|                        | 661     | 1880.00         | 246.00                     | 322.00                 |
|                        | 810     | 1909.80         | 244.00                     | 322.00                 |
| EGPRS1900 (GMSK,1Slot) | 512     | 1850.20         | 244.00                     | 312.00                 |
|                        | 661     | 1880.00         | 250.00                     | 320.00                 |
|                        | 810     | 1909.80         | 248.00                     | 314.00                 |
| WCDMA Band II (QPSK)   | 9262    | 1852.4          | 4180.00                    | 4680.00                |
|                        | 9400    | 1880.0          | 4200.00                    | 4720.00                |
|                        | 9538    | 1907.6          | 4180.00                    | 4740.00                |
| WCDMA Band V (QPSK)    | 4132    | 826.4           | 4160.00                    | 4700.00                |
|                        | 4183    | 836.6           | 4180.00                    | 4760.00                |
|                        | 4233    | 846.6           | 4180.00                    | 4700.00                |

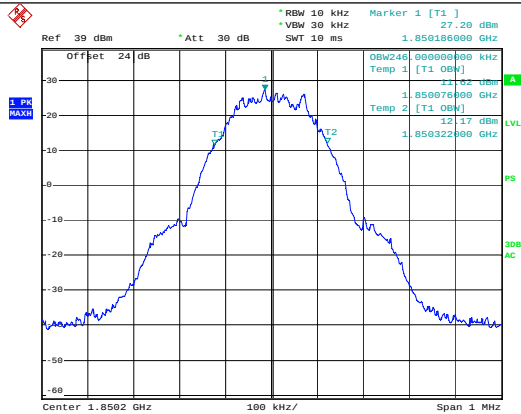
Note: GSM&GPRS use the same modulation technical(GMSK), and with the same channels, so the 99% OBW and the -26dB of GPRS not performed.

## Test plots as follow:



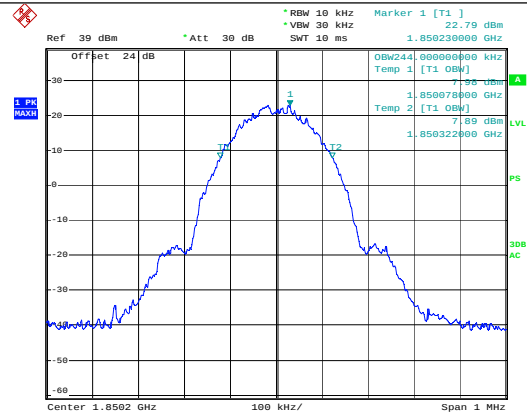
## 99% Occupy bandwidth

## PCS 1900



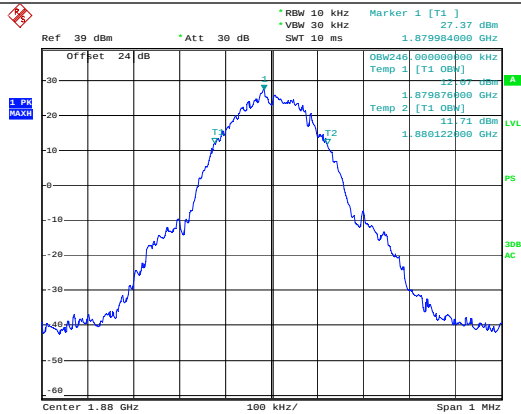
E370VT PC MODE VER  
 Date: 30.DEC.2016 15:37:31

## EGPRS 1900



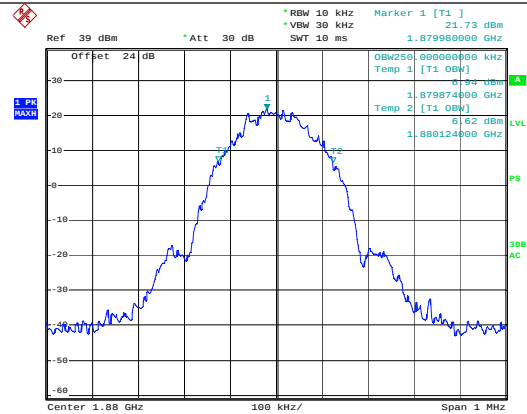
E370VT PC MODE VER  
 Date: 30.DEC.2016 15:54:50

## Channel 512



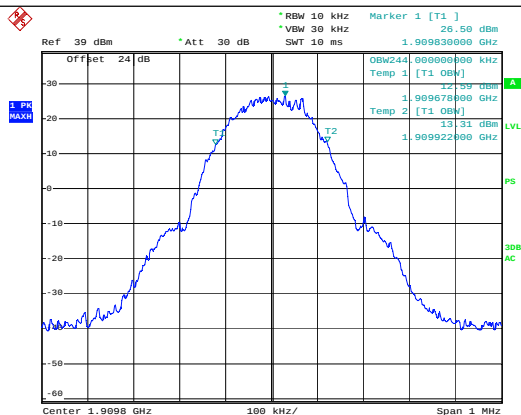
E370VT PC MODE VER  
 Date: 30.DEC.2016 15:37:57

## Channel 512



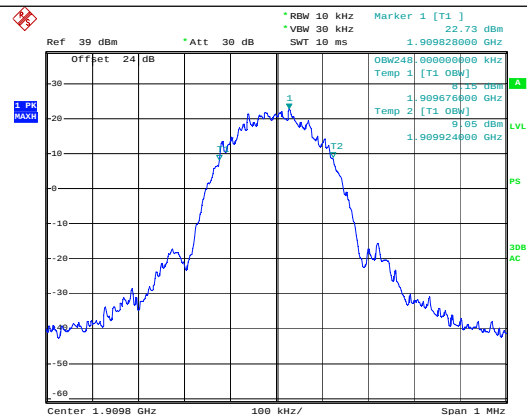
E370VT PC MODE VER  
 Date: 30.DEC.2016 15:55:17

## Channel 661



E370VT PC MODE VER  
 Date: 30.DEC.2016 15:41:55

## Channel 661



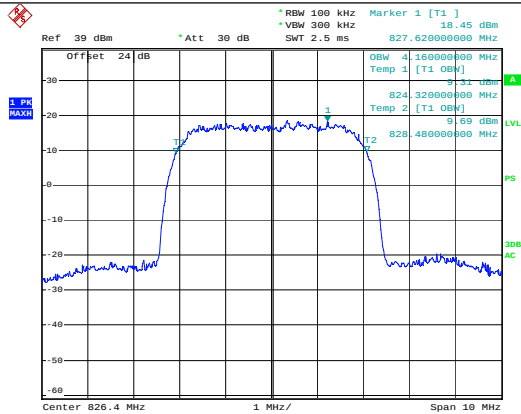
E370VT PC MODE VER  
 Date: 30.DEC.2016 16:03:09

## Channel 810

## Channel 810

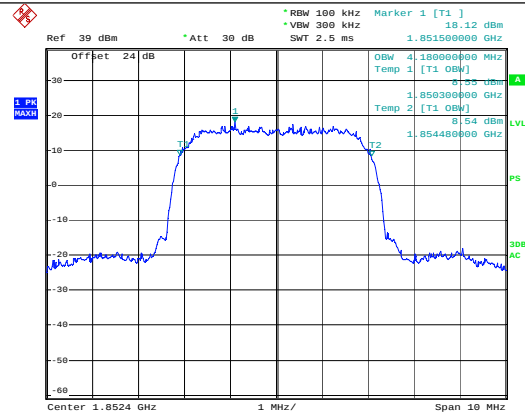
## 99% Occupancy bandwidth

## WCDMA 850



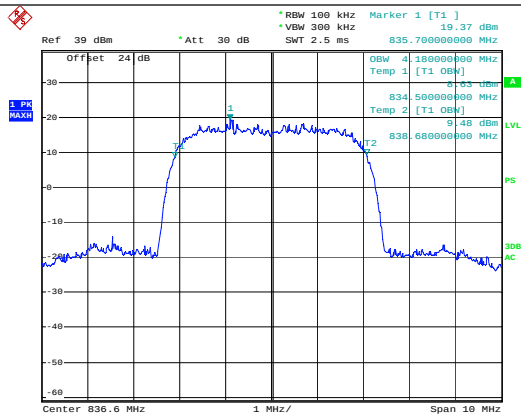
E370VT PC MODE VER  
Date: 30.DEC.2016 16:04:35

## WCDMA 1900



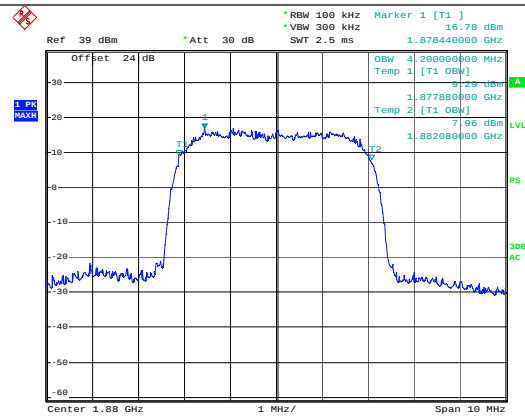
E370VT PC MODE VER  
Date: 30.DEC.2016 16:09:50

## Channel 4132



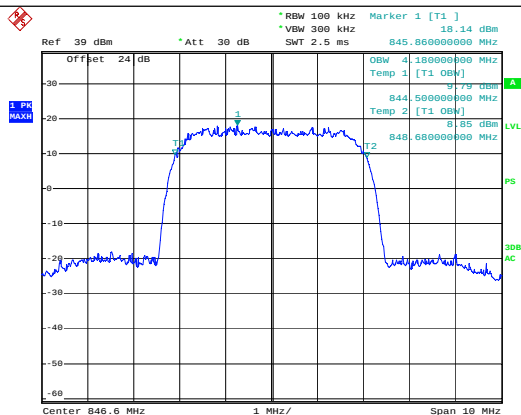
E370VT PC MODE VER  
Date: 30.DEC.2016 16:05:06

## Channel 9262



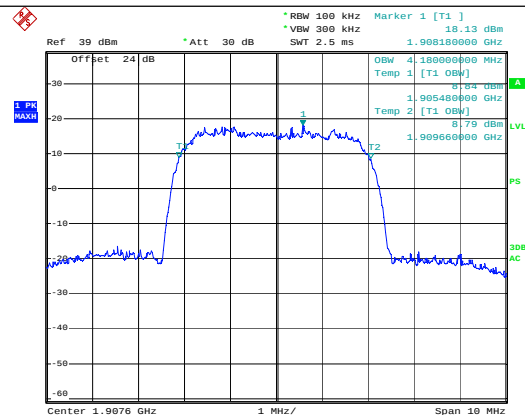
E370VT PC MODE VER  
Date: 30.DEC.2016 16:10:32

## Channel 4183



E370VT PC MODE VER  
Date: 30.DEC.2016 16:06:18

## Channel 9400



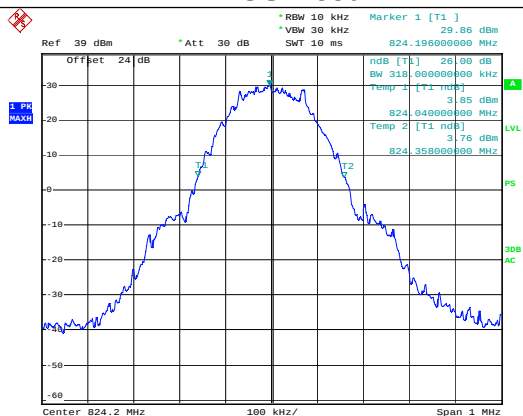
E370VT PC MODE VER  
Date: 30.DEC.2016 16:11:02

## Channel 4233

## Channel 9538

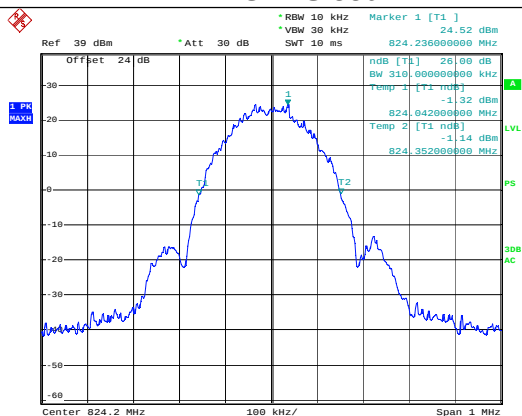
## -26dBc bandwidth

## GSM 850



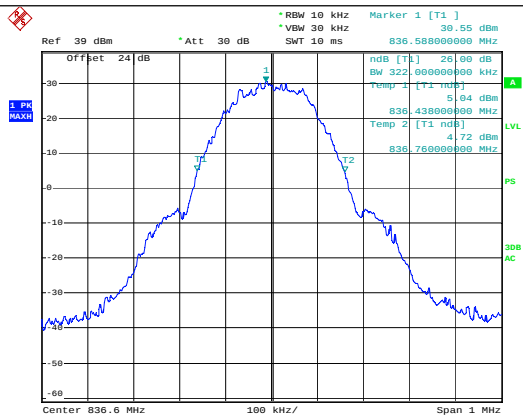
E370VT PC MODE VER  
Date: 30.DEC.2016 15:32:09

## EGPRS 850



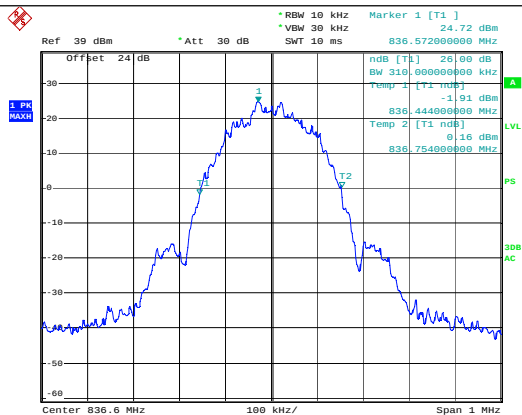
E370VT PC MODE VER  
Date: 30.DEC.2016 15:58:59

## Channel 128



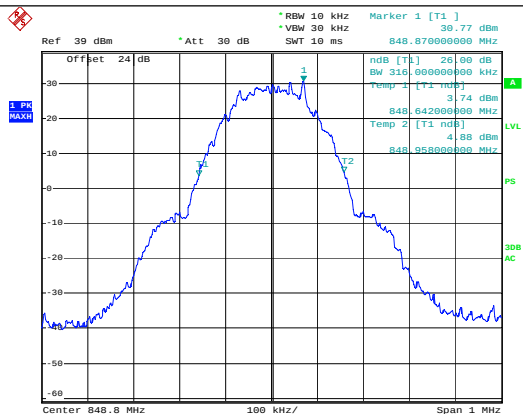
E370VT PC MODE VER  
Date: 30.DEC.2016 15:33:11

## Channel 128



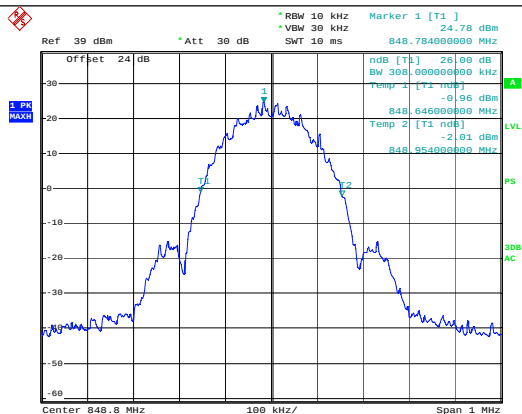
E370VT PC MODE VER  
Date: 30.DEC.2016 15:59:59

## Channel 190



E370VT PC MODE VER  
Date: 30.DEC.2016 15:34:17

## Channel 190



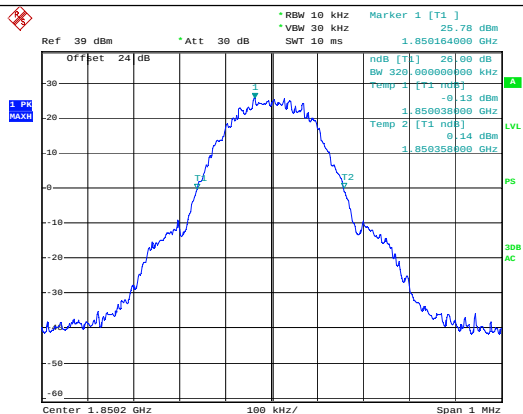
E370VT PC MODE VER  
Date: 30.DEC.2016 16:00:24

## Channel 251

## Channel 251

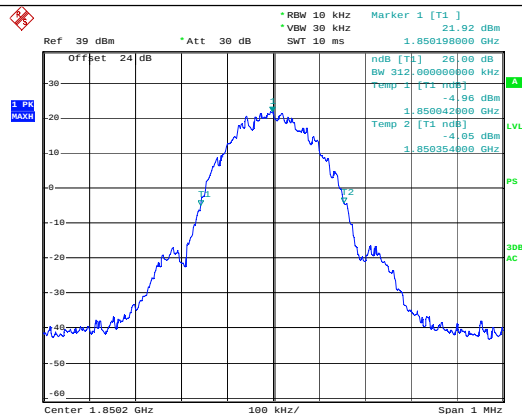
-26dBc bandwidth

PCS 1900



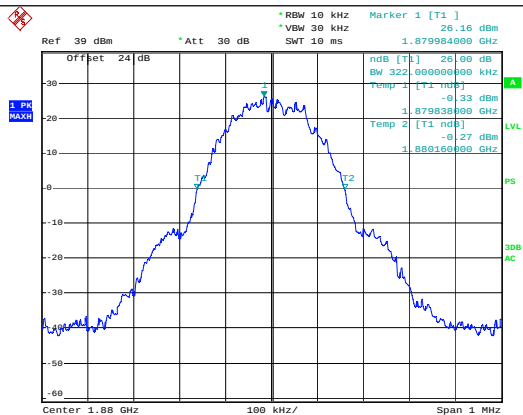
E370VT PC MODE VER  
Date: 30.DEC.2016 15:36:48

EGPRS 1900



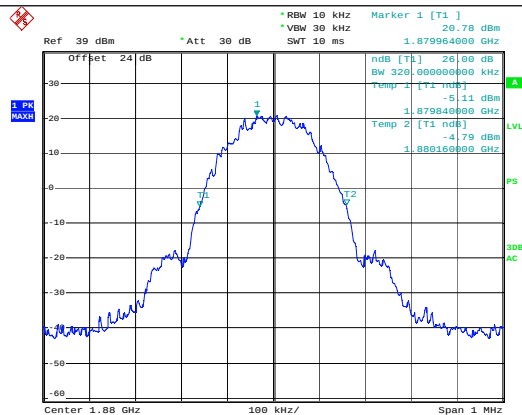
E370VT PC MODE VER  
Date: 30.DEC.2016 15:56:00

Channel 512



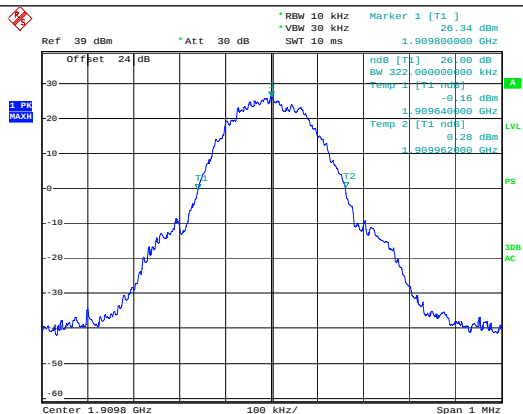
E370VT PC MODE VER  
Date: 30.DEC.2016 15:38:10

Channel 512



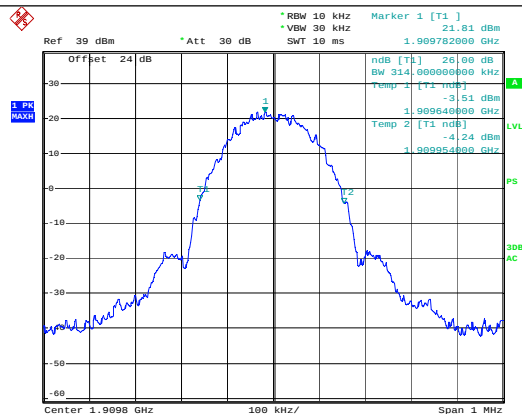
E370VT PC MODE VER  
Date: 30.DEC.2016 15:55:33

Channel 661



E370VT PC MODE VER  
Date: 30.DEC.2016 15:38:42

Channel 661



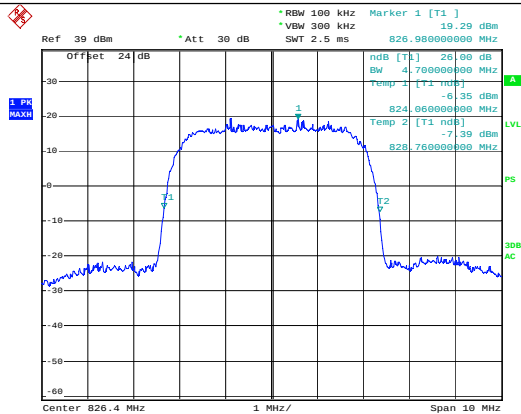
E370VT PC MODE VER  
Date: 30.DEC.2016 15:56:29

Channel 810

Channel 810

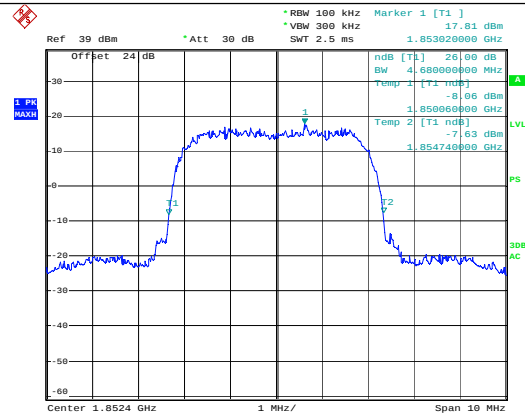
## -26dBc bandwidth

## WCDMA 850



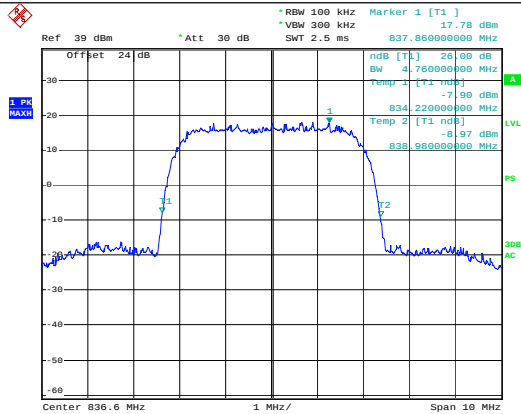
E370VT PC MODE VER  
Date: 30.DEC.2016 16:05:44

## WCDMA 1900



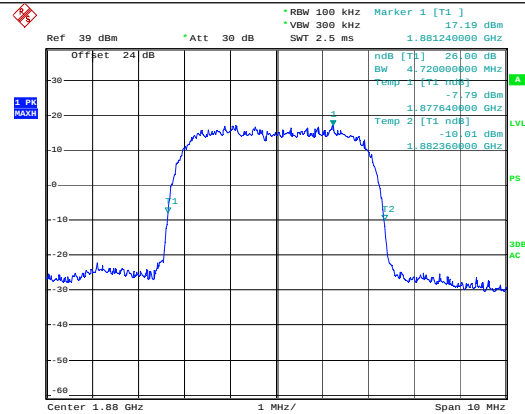
E370VT PC MODE VER  
Date: 30.DEC.2016 16:09:59

## Channel 4132



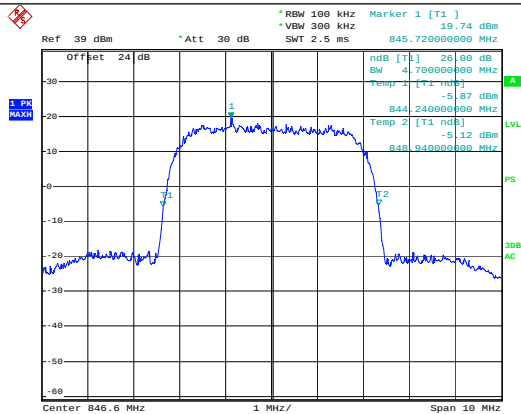
E370VT PC MODE VER  
Date: 30.DEC.2016 16:05:17

## Channel 9262



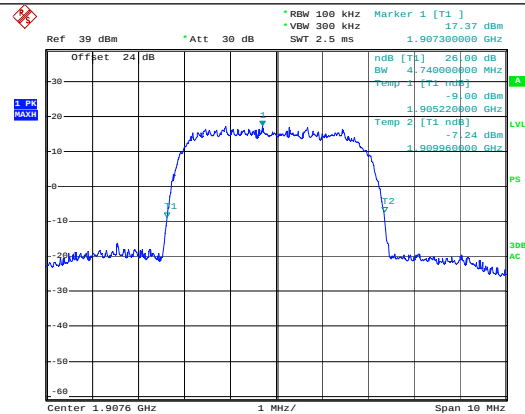
E370VT PC MODE VER  
Date: 30.DEC.2016 16:10:20

## Channel 4183



E370VT PC MODE VER  
Date: 30.DEC.2016 16:06:06

## Channel 9400



E370VT PC MODE VER  
Date: 30.DEC.2016 16:11:16

## Channel 4233

## Channel 9538

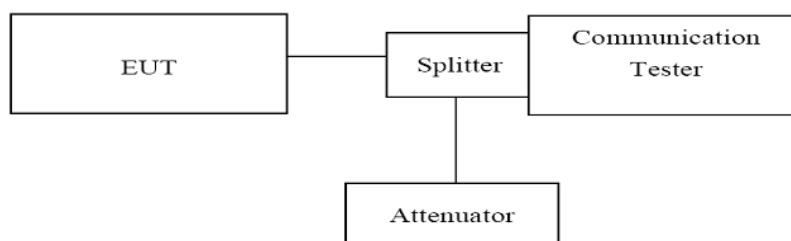
### 3.3. Out of band emission at antenna terminals

#### 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

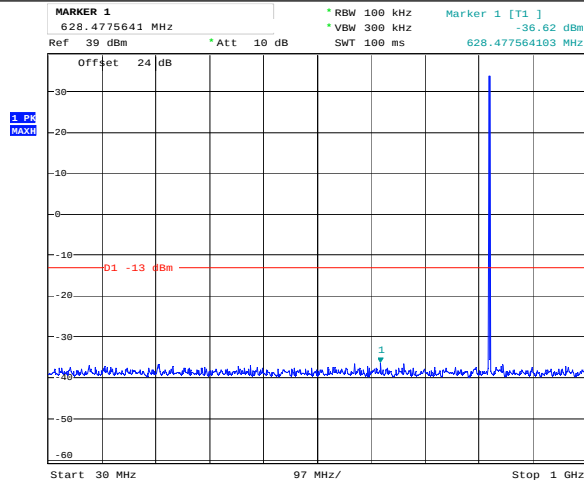
1. The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation.
2. The resolution bandwidth of the spectrum analyzer was set at 1MHz; sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.
3. For the out of band: Set the RBW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

#### TEST RESULTS

Remark: we test all modulation type and record worst case at Voice mode.

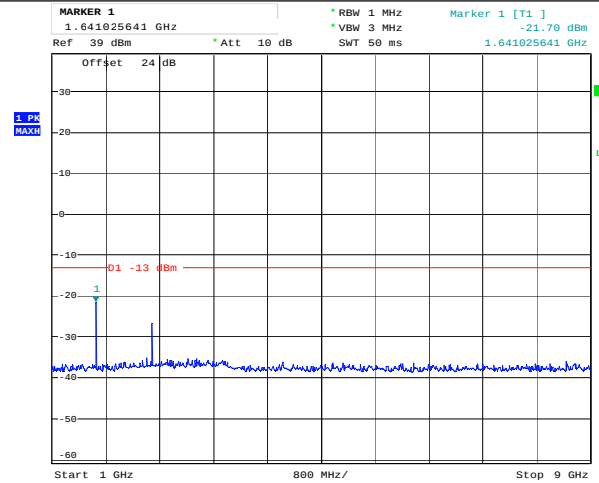
## GSM 850

### Lowest channel



Date: 28.DEC.2016 11:46:53

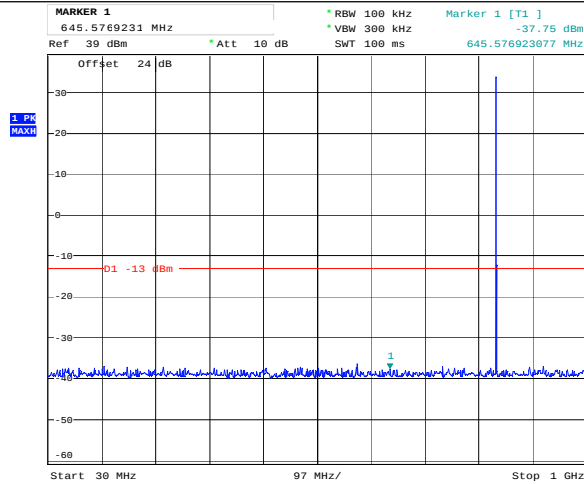
30MHz~1GHz



Date: 28.DEC.2016 11:49:39

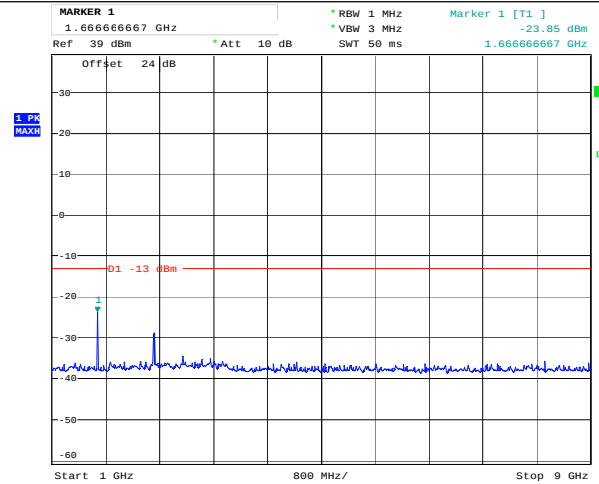
1GHz~9GHz

### Middle channel



Date: 28.DEC.2016 11:47:29

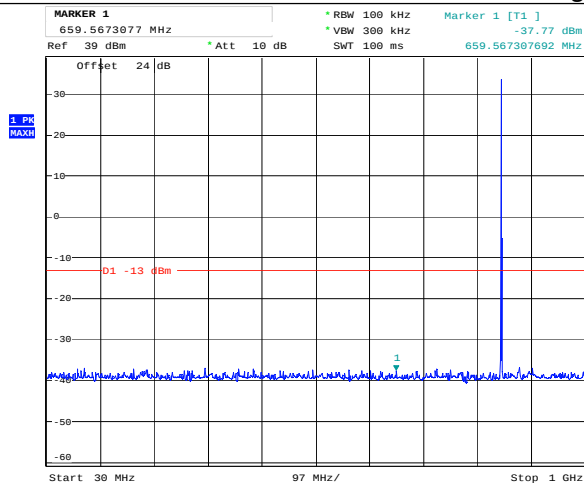
30MHz~1GHz



Date: 28.DEC.2016 11:49:09

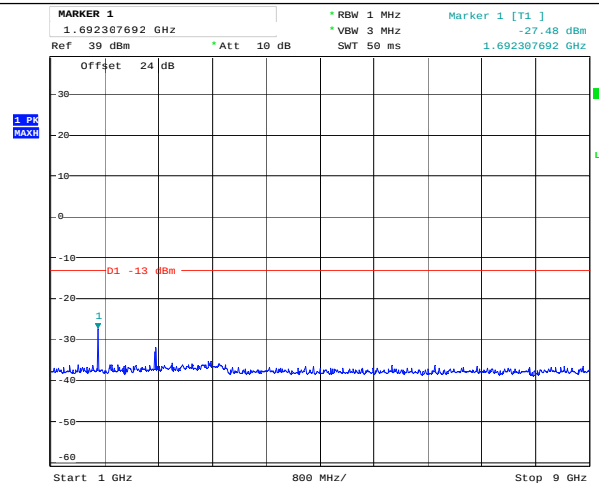
1GHz~9GHz

### Highest channel



Date: 28.DEC.2016 11:48:00

30MHz~1GHz

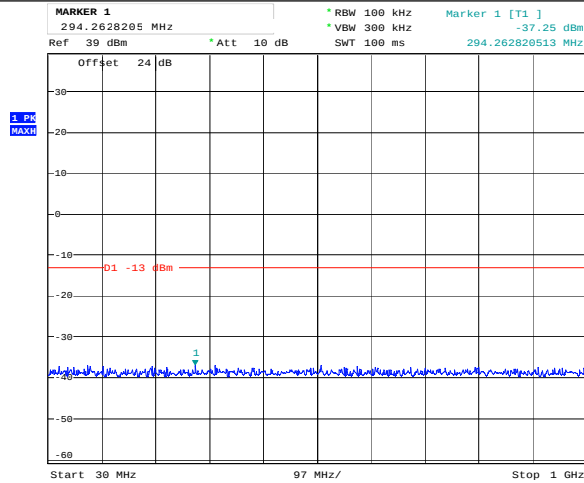


Date: 28.DEC.2016 11:48:36

1GHz~9GHz

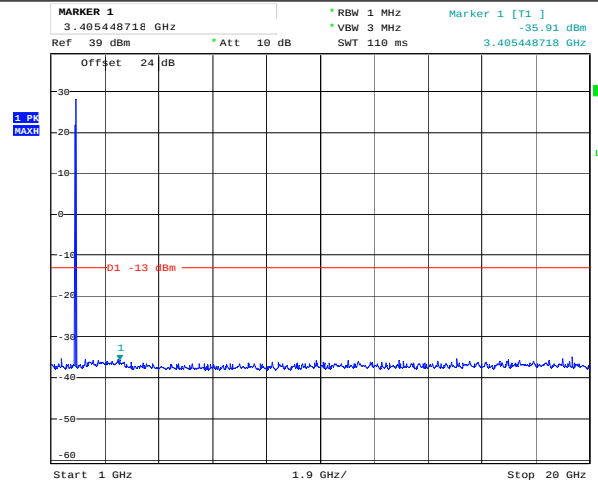
## PCS 1900

### Lowest channel



Date: 28.DEC.2016 11:39:49

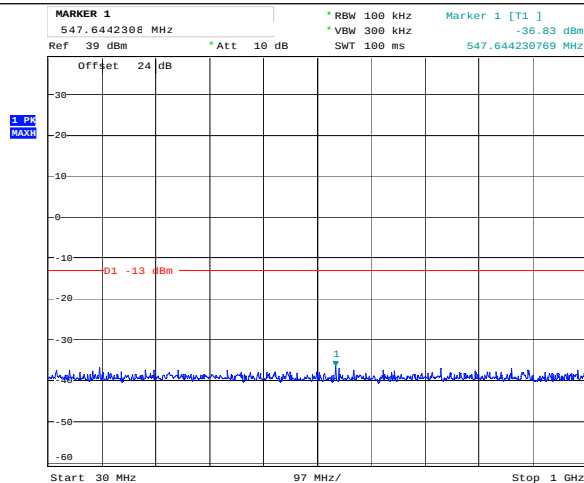
30MHz~1GHz



Date: 28.DEC.2016 11:42:57

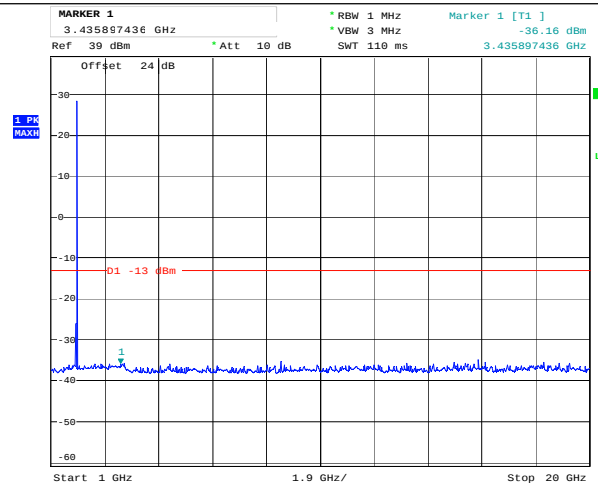
1GHz~20GHz

### Middle channel



Date: 28.DEC.2016 11:40:24

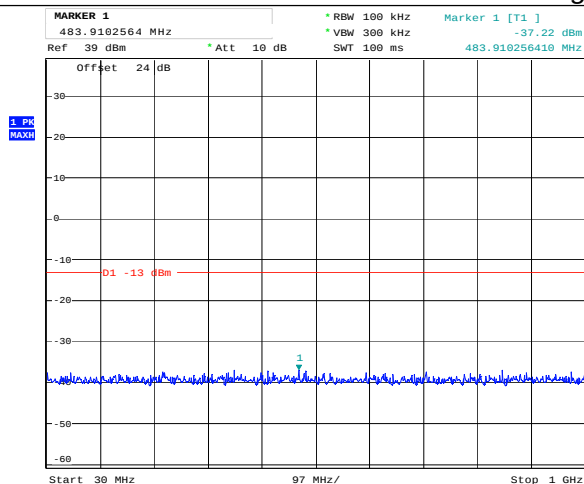
30MHz~1GHz



Date: 28.DEC.2016 11:42:15

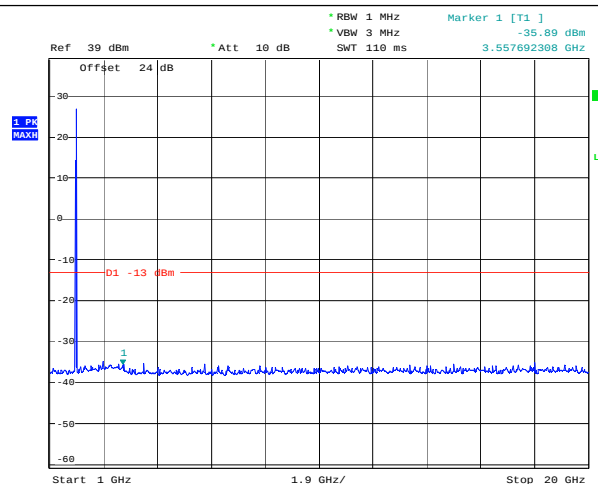
1GHz~20GHz

### Highest channel



Date: 28.DEC.2016 11:40:51

30MHz~1GHz

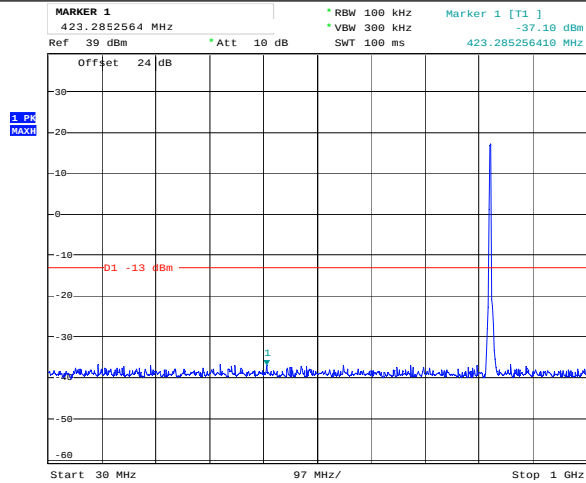


Date: 28.DEC.2016 11:41:41

1GHz~20GHz

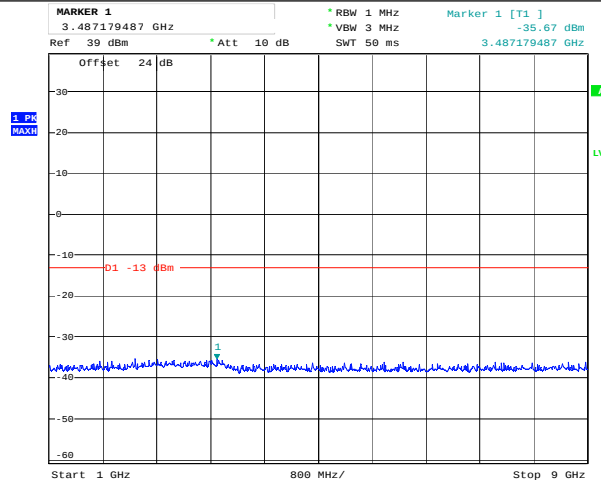
# WCDMA 850

## Lowest channel



Date: 28.DEC.2016 11:53:01

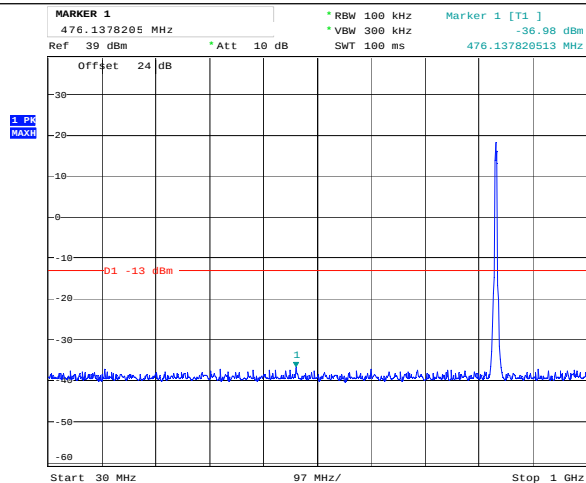
30MHz~1GHz



Date: 28.DEC.2016 11:56:18

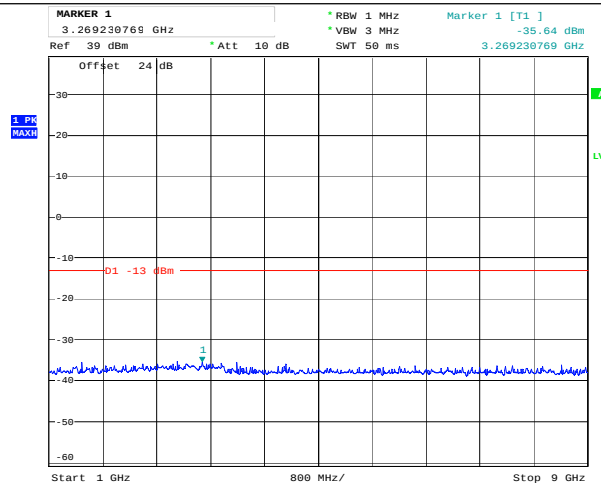
1GHz~9GHz

## Middle channel



Date: 28.DEC.2016 11:53:41

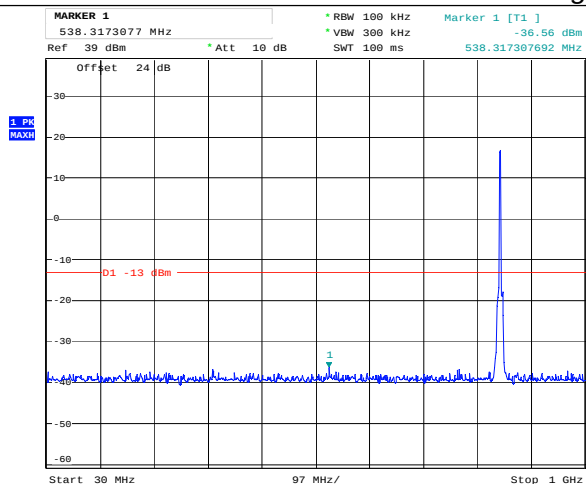
30MHz~1GHz



Date: 28.DEC.2016 11:55:41

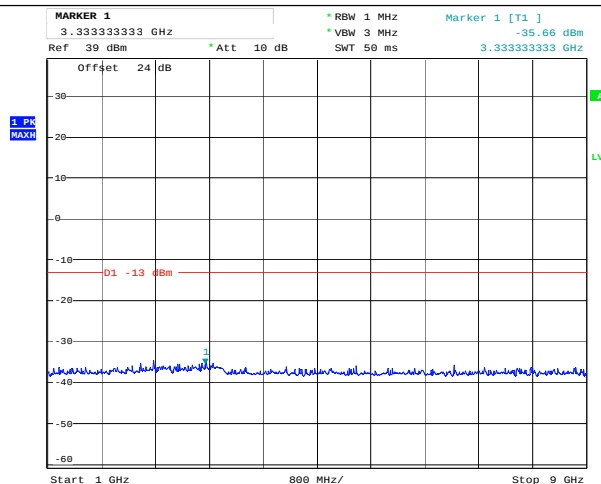
1GHz~9GHz

## Highest channel



Date: 28.DEC.2016 11:54:19

30MHz~1GHz

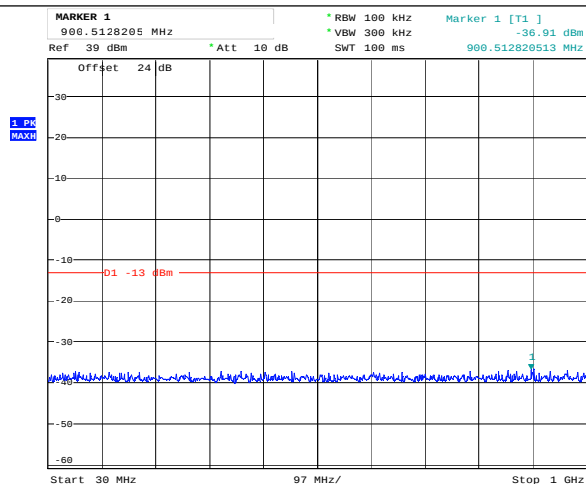


Date: 28.DEC.2016 11:55:00

1GHz~9GHz

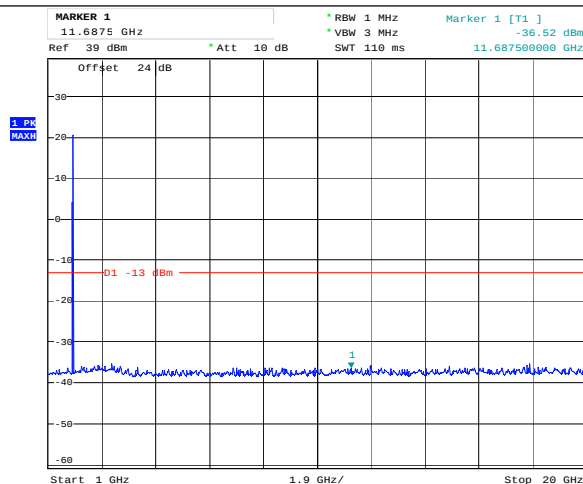
# WCDMA 1900

## Lowest channel



Date: 28.DEC.2016 11:59:19

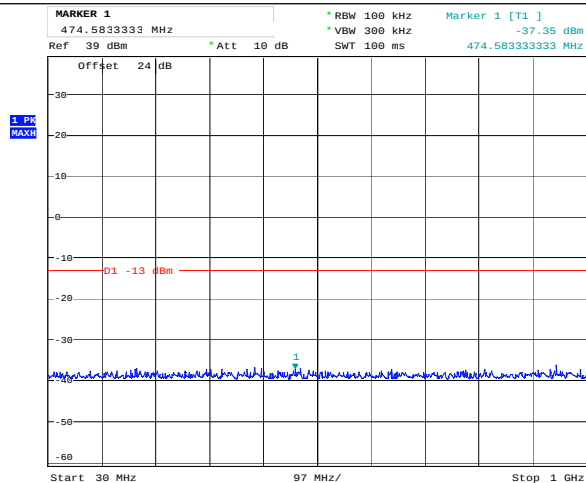
30MHz~1GHz



Date: 28.DEC.2016 12:02:31

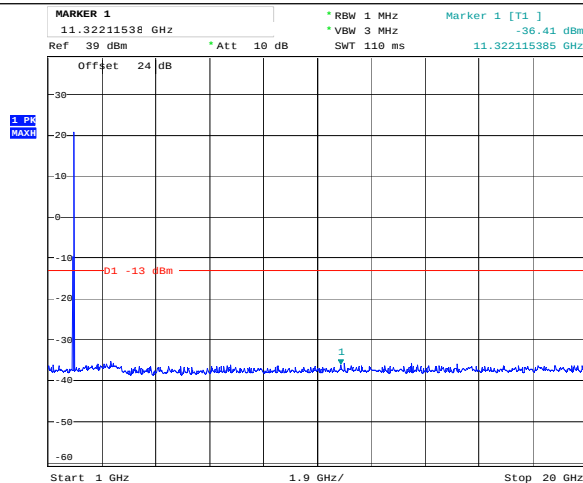
1GHz~20GHz

## Middle channel



Date: 28.DEC.2016 12:00:10

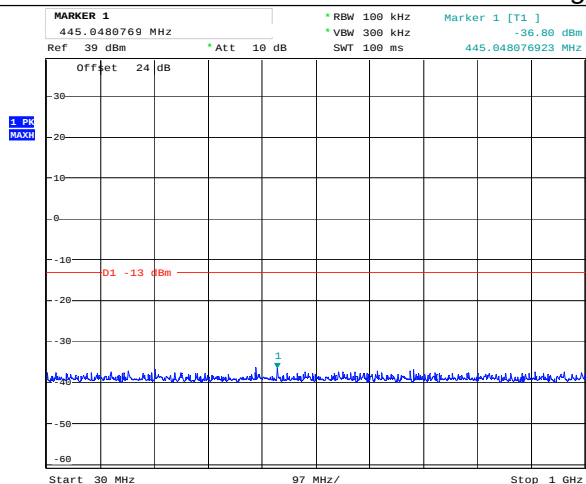
30MHz~1GHz



Date: 28.DEC.2016 12:02:05

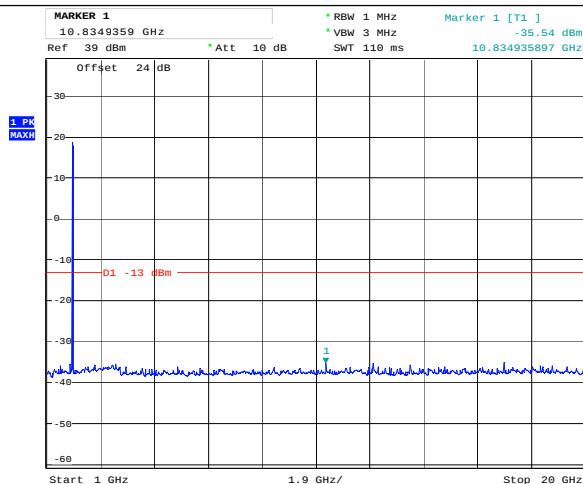
1GHz~20GHz

## Highest channel



Date: 28.DEC.2016 12:00:50

30MHz~1GHz



Date: 28.DEC.2016 12:01:26

1GHz~20GHz

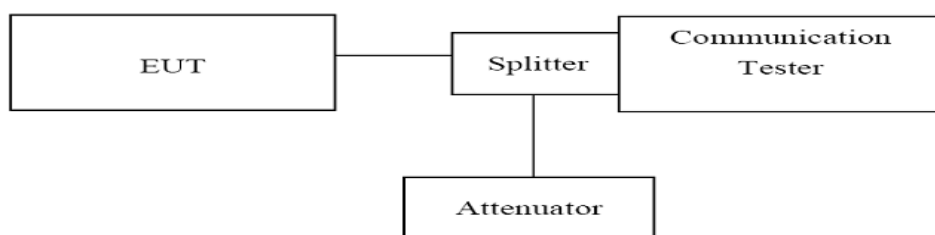
### 3.4. Band Edge compliance

#### 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.

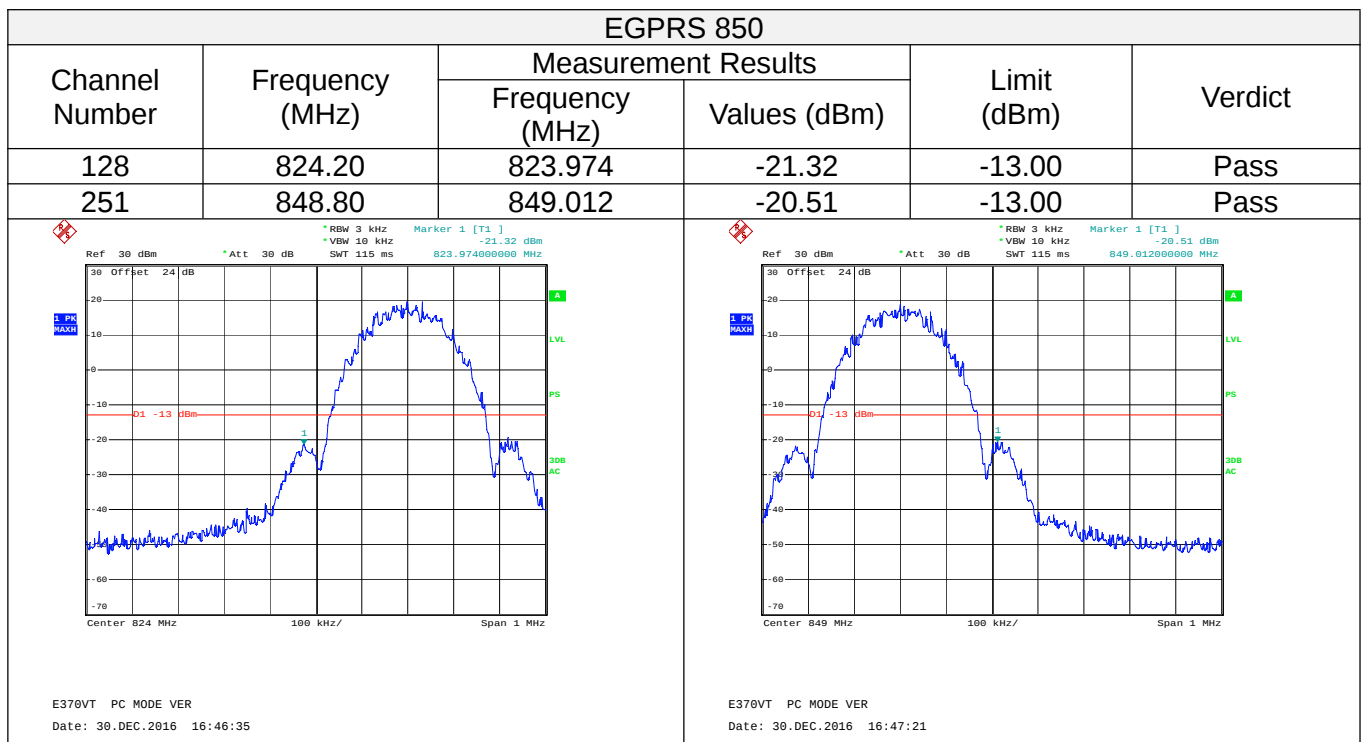
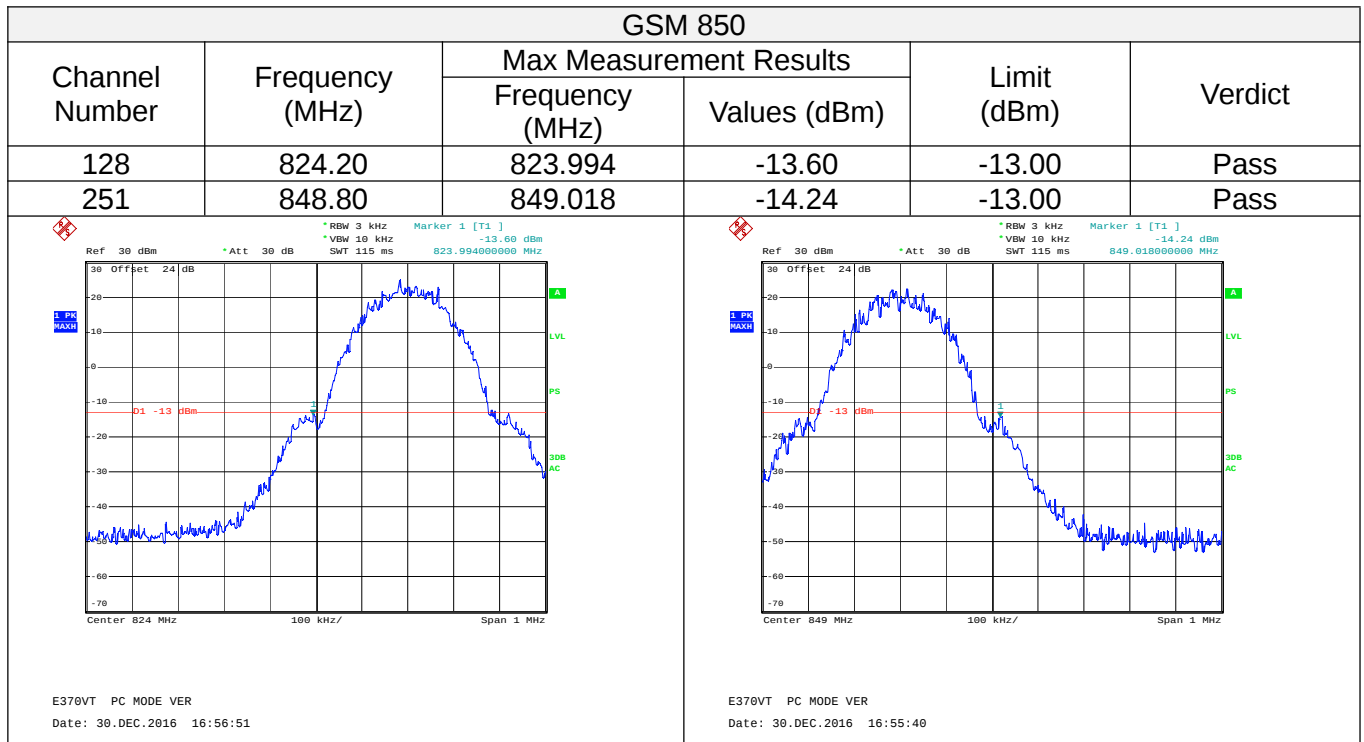
#### TEST CONFIGURATION

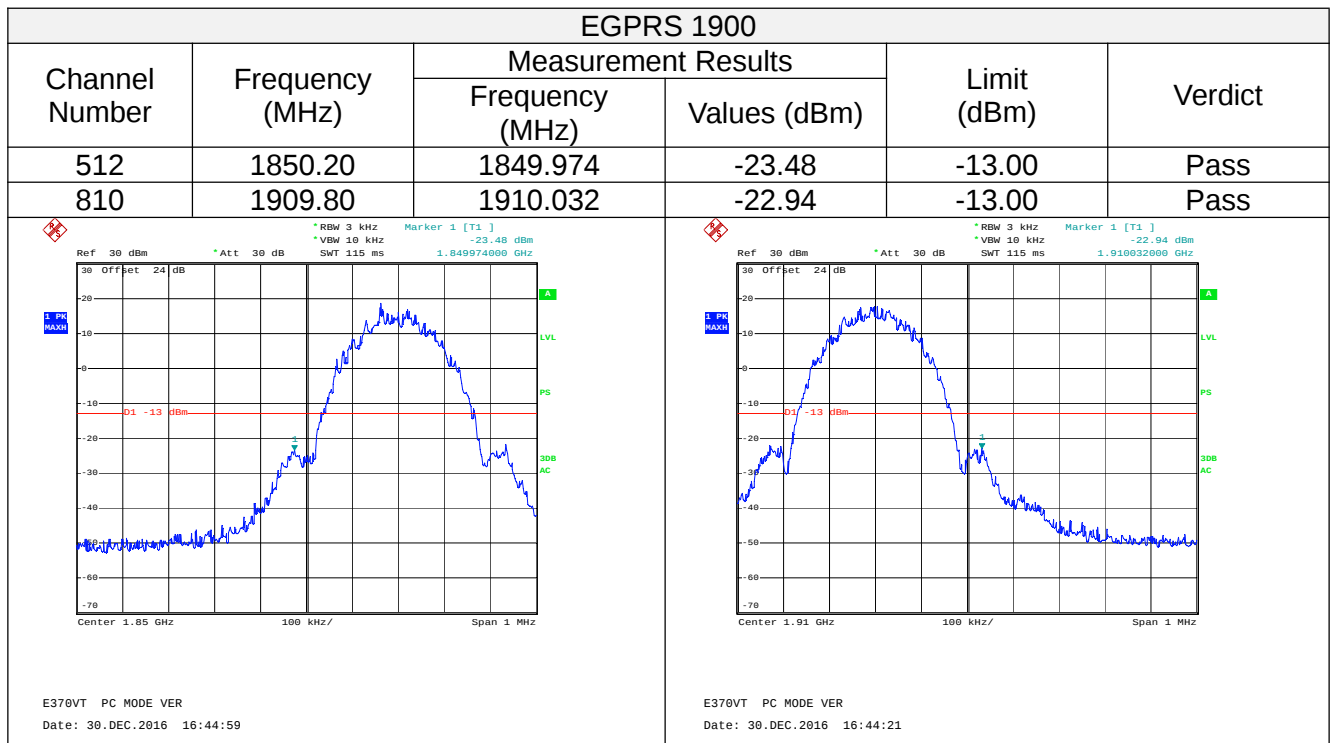
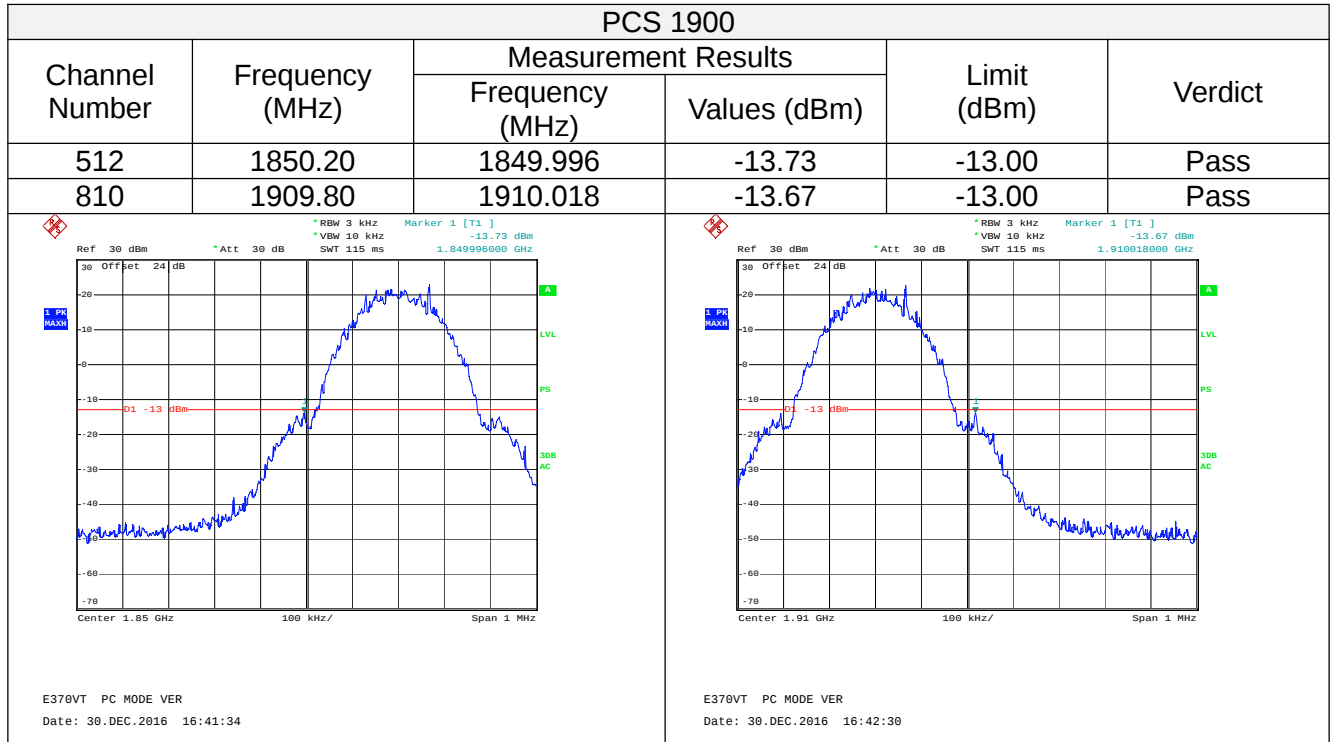


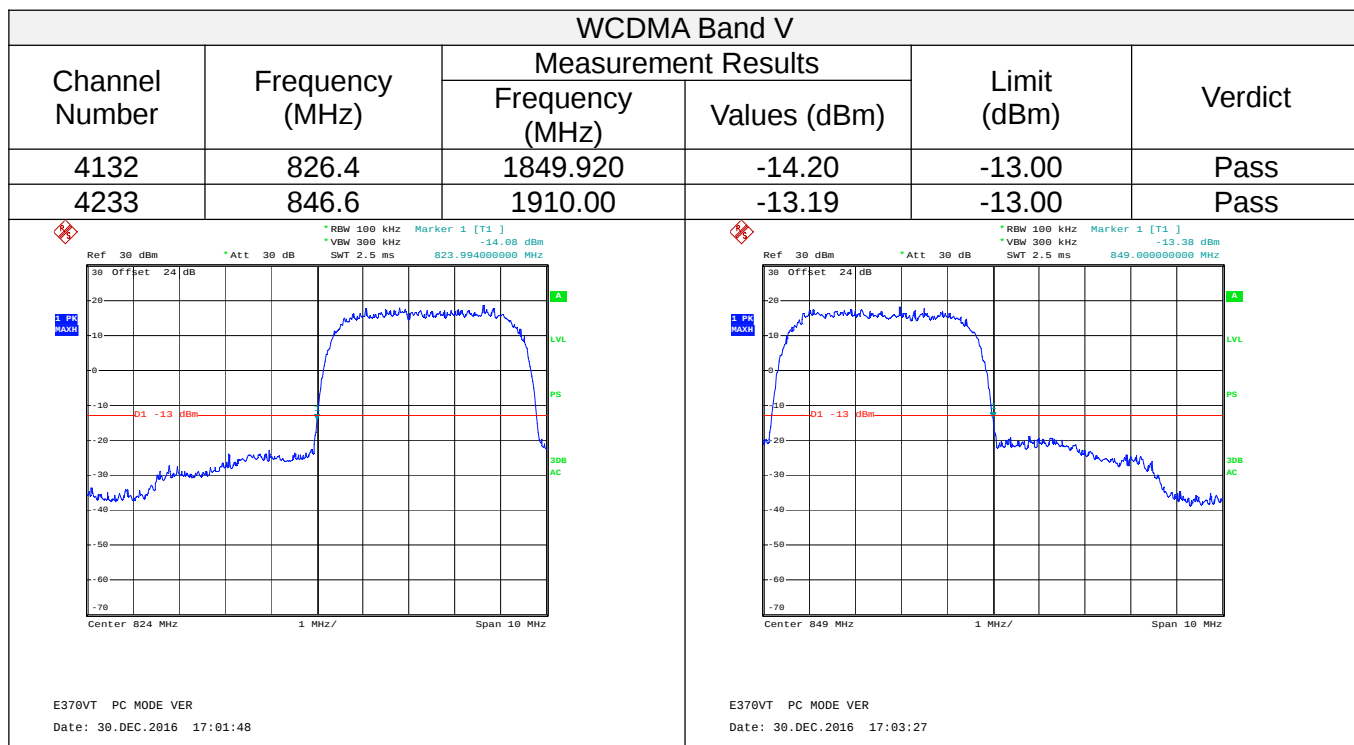
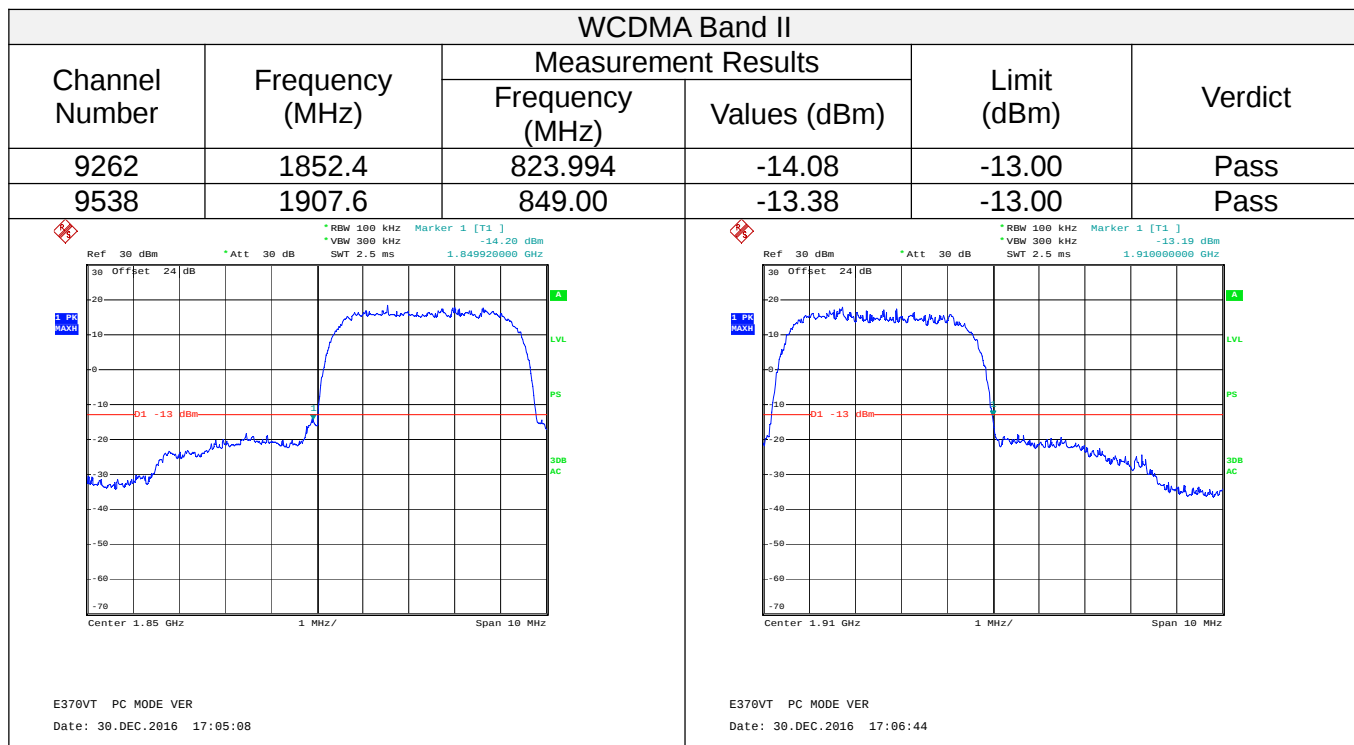
#### TEST PROCEDURE

1. The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation.
2. Set the RBW=5 KHz, VBW = 50KHz, Span=1MHz Sweep time= Auto for 2G system measurement.
3. Set the RBW=50 KHz, VBW = 300KHz, Span=1MHz Sweep time= Auto for 3G system measurement.

## TEST RESULTS







### 3.5. Radiated Power Measurement

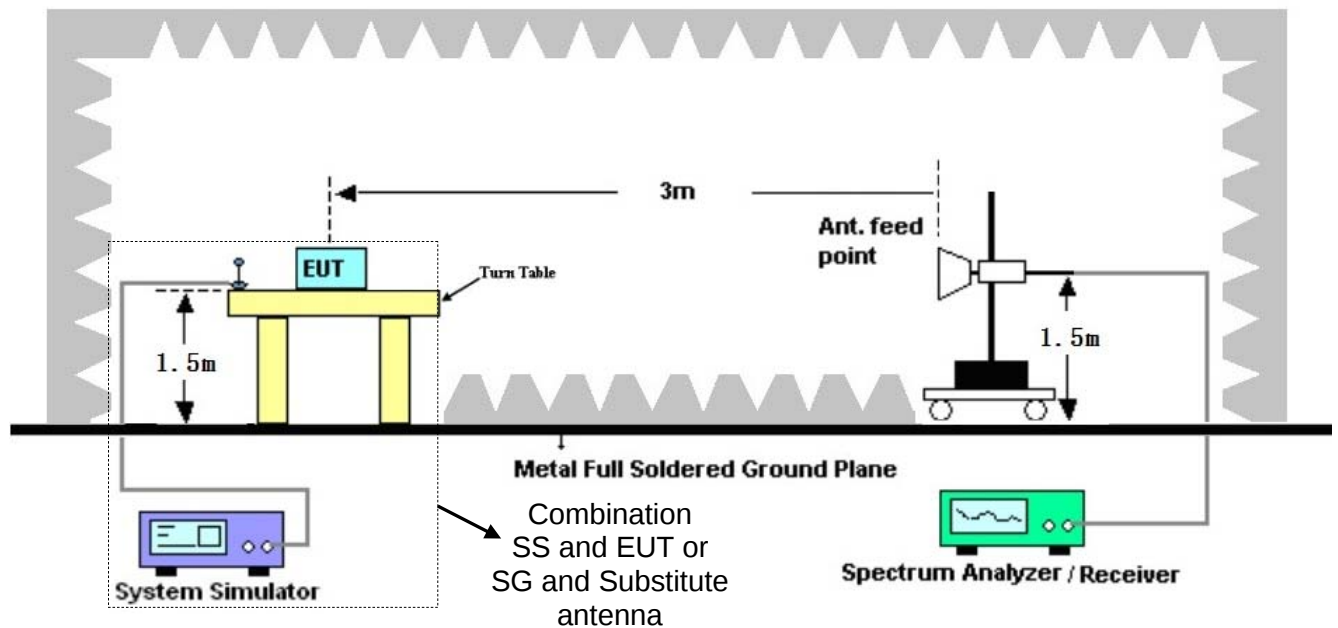
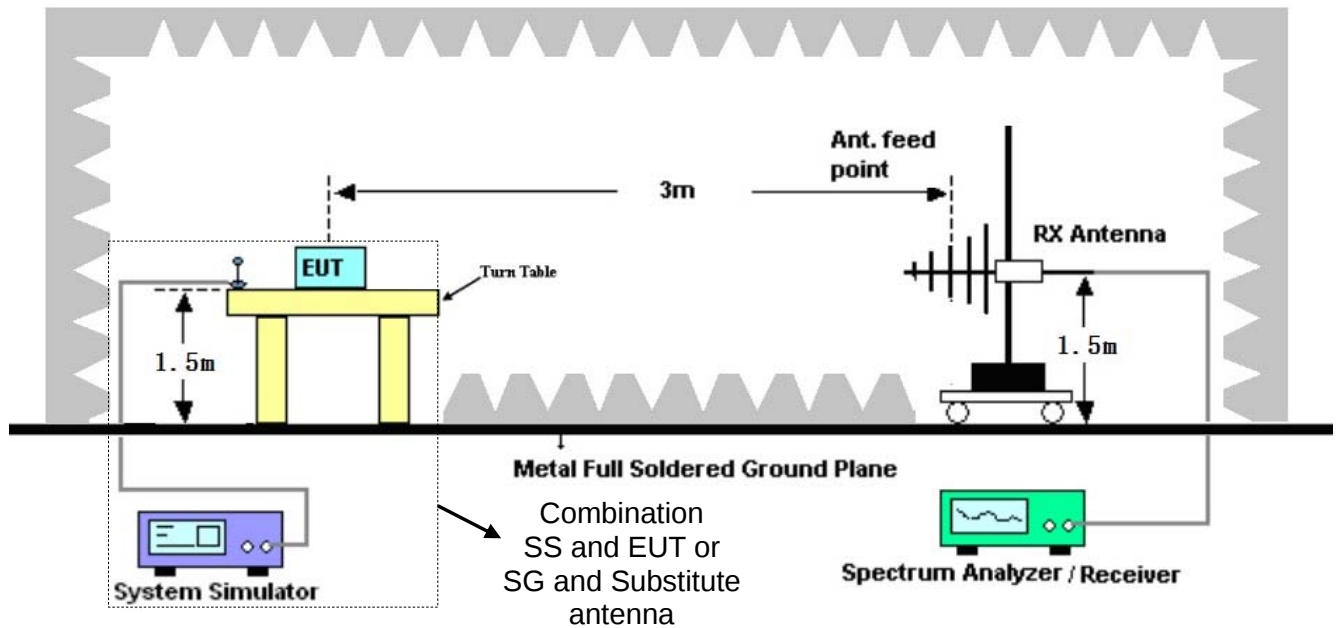
#### LIMIT

GSM850/WCDMA Band V: 7W ERP

PCS1900/WCDMA Band II: 2W EIRP

#### TEST CONFIGURATION

For the actual test configuration, please refer to the related Item –EUT Test Photos.



## **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 adjusts 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. An amplifier should be connected to the Signal Source output port. And the cable should be connecting 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 N5182A 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**

Remark:

1. By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that "Z axis" position was the worst, and test data recorded in this report.

**Measurement Data(worst case):**

| Mode                | Channel | Antenna Pol. | ERP   | Limit (dBm) | Result |
|---------------------|---------|--------------|-------|-------------|--------|
| GSM850<br>(GMSK)    | 128     | V            | 30.23 | 38.45       | Pass   |
|                     |         | H            | 28.67 |             |        |
|                     | 190     | V            | 30.31 |             |        |
|                     |         | H            | 28.70 |             |        |
|                     | 251     | V            | 30.47 |             |        |
|                     |         | H            | 28.78 |             |        |
| Mode                | Channel | Antenna Pol. | EIRP  | Limit (dBm) | Result |
| PCS1900<br>(GMSK)   | 512     | V            | 24.04 | 33.00       | Pass   |
|                     |         | H            | 25.64 |             |        |
|                     | 661     | V            | 24.14 |             |        |
|                     |         | H            | 25.71 |             |        |
|                     | 810     | V            | 24.20 |             |        |
|                     |         | H            | 25.77 |             |        |
| Mode                | Channel | Antenna Pol. | EIRP  | Limit (dBm) | Result |
| EGPRS850<br>(8PSK)  | 128     | V            | 30.10 | 38.45       | Pass   |
|                     |         | H            | 28.35 |             |        |
|                     | 190     | V            | 30.44 |             |        |
|                     |         | H            | 28.53 |             |        |
|                     | 251     | V            | 30.09 |             |        |
|                     |         | H            | 28.39 |             |        |
| Mode                | Channel | Antenna Pol. | EIRP  | Limit (dBm) | Result |
| EGPRS1900<br>(8PSK) | 512     | V            | 24.13 | 33.00       | Pass   |
|                     |         | H            | 25.50 |             |        |
|                     | 661     | V            | 24.25 |             |        |
|                     |         | H            | 25.65 |             |        |
|                     | 810     | V            | 24.32 |             |        |
|                     |         | H            | 25.59 |             |        |

| Mode                    | Channel | Antenna Pol. | EIRP  | Limit (dBm) | Result |
|-------------------------|---------|--------------|-------|-------------|--------|
| WCDMA Band II<br>(QPSK) | 9262    | V            | 18.64 | 33.00       | Pass   |
|                         |         | H            | 18.67 |             |        |
|                         | 9400    | V            | 18.70 |             |        |
|                         |         | H            | 18.71 |             |        |
|                         | 9538    | V            | 18.76 |             |        |
|                         |         | H            | 18.78 |             |        |
| Mode                    | Channel | Antenna Pol. | ERP   | Limit (dBm) | Result |
| WCDMA Band V<br>(QPSK)  | 4132    | V            | 21.27 | 38.45       | Pass   |
|                         |         | H            | 20.10 |             |        |
|                         | 4182    | V            | 21.32 |             |        |
|                         |         | H            | 20.14 |             |        |
|                         | 4233    | V            | 21.38 |             |        |
|                         |         | H            | 20.19 |             |        |

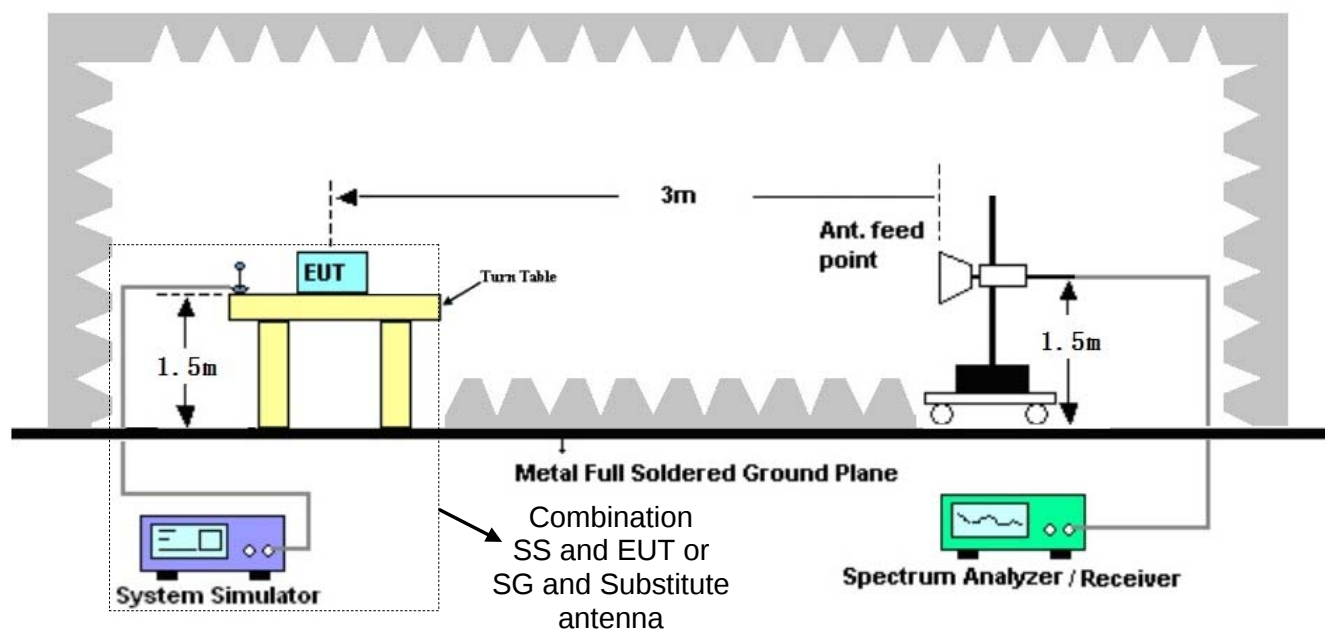
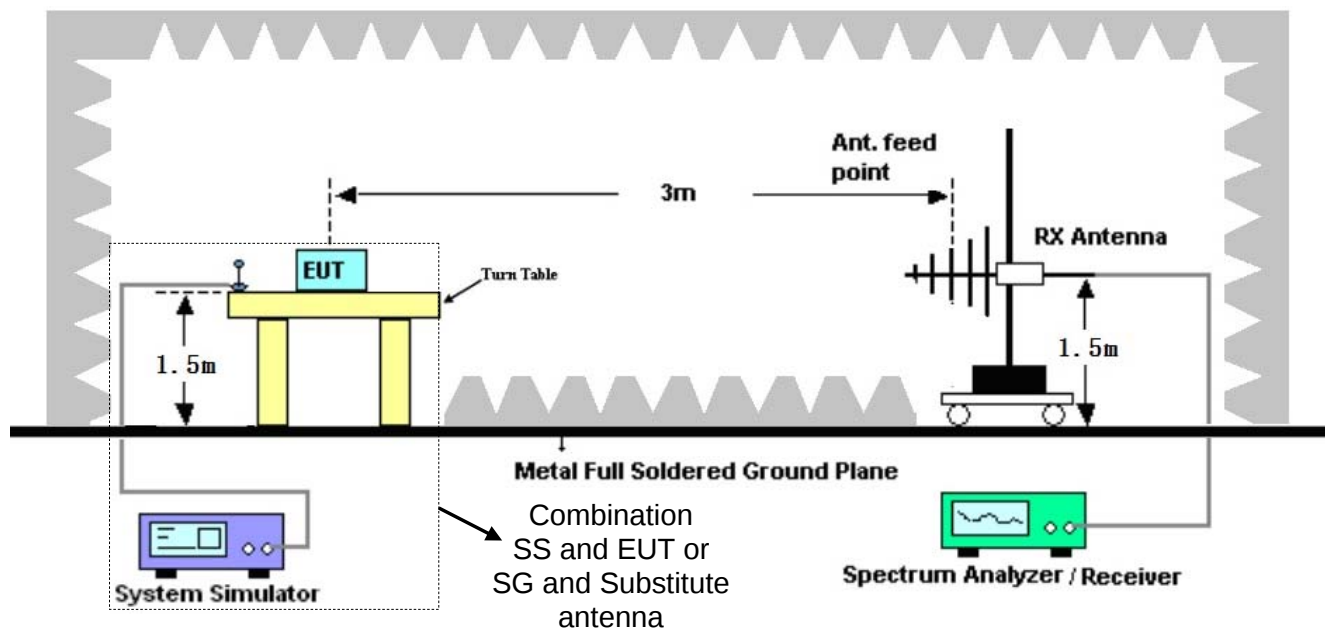
### 3.6. Radiated Spurious Emission

#### LIMIT

-13dBm

#### TEST CONFIGURATION

For the actual test configuration, please refer to the related Item –EUT Test Photos.



## **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 adjusts 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. An amplifier should be connected to the Signal Source output port. And the cable should be connecting 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,  $\text{ERP} = \text{EIRP} - 2.15\text{dBi}$ .
8. Test frequency range should extend to 10<sup>th</sup> harmonic of highest fundamental frequency.

## **TEST RESULTS**

Remark:

1. By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that "Z axis" position was the worst, and test data recorded in this report.
2. We test all modulation type and record worst case at Voice mode.

**Measurement Data(worst case):**

Measurement Data (Test Case)

| GSM850  |                 |                   |             |             |        |
|---------|-----------------|-------------------|-------------|-------------|--------|
| Channel | Frequency (MHz) | Spurious Emission |             | Limit (dBm) | Result |
|         |                 | Polarization      | Level (dBm) |             |        |
| 128     | 1648.40         | Vertical          | -44.98      | -13.00      | Pass   |
|         | 2472.60         | Vertical          | -40.57      |             |        |
|         | 1648.40         | Horizontal        | -43.92      |             |        |
|         | 2472.60         | Horizontal        | -40.76      |             |        |
| 190     | 1673.20         | Vertical          | -44.25      |             |        |
|         | 2509.80         | Vertical          | -40.21      |             |        |
|         | 1673.20         | Vertical          | -43.65      |             |        |
|         | 2509.80         | Horizontal        | -40.69      |             |        |
| 251     | 1697.60         | Vertical          | -42.87      |             |        |
|         | 2546.40         | Vertical          | -39.18      |             |        |
|         | 1697.60         | Horizontal        | -41.31      |             |        |
|         | 2546.40         | Horizontal        | -39.14      |             |        |

Remark :

- The emission levels of below 1 GHz are very lower than the limit above 10dB and not show in test report.

| PCS1900 |                    |                   |             |             |        |        |      |        |      |
|---------|--------------------|-------------------|-------------|-------------|--------|--------|------|--------|------|
| Channel | Frequency<br>(MHz) | Spurious Emission |             | Limit (dBm) | Result |        |      |        |      |
|         |                    | Polarization      | Level (dBm) |             |        |        |      |        |      |
| 512     | 3700.40            | Vertical          | -51.98      | -13.00      | Pass   |        |      |        |      |
|         | 5550.60            | Vertical          | -47.73      |             |        |        |      |        |      |
|         | 3700.40            | Horizontal        | -51.84      |             |        |        |      |        |      |
|         | 5550.60            | Horizontal        | -47.67      |             |        |        |      |        |      |
| 661     | 3760.00            | Vertical          | -51.63      |             |        | -13.00 | Pass |        |      |
|         | 5640.00            | Vertical          | -47.49      |             |        |        |      |        |      |
|         | 3760.00            | Horizontal        | -51.63      |             |        |        |      |        |      |
|         | 5640.00            | Horizontal        | -47.49      |             |        |        |      |        |      |
| 810     | 3819.60            | Vertical          | -48.96      |             |        |        |      | -13.00 | Pass |
|         | 5729.40            | Vertical          | -45.20      |             |        |        |      |        |      |
|         | 3819.60            | Horizontal        | -50.25      |             |        |        |      |        |      |
|         | 5729.40            | Horizontal        | -46.42      |             |        |        |      |        |      |

Remark :

- The emission levels of below 1 GHz are very lower than the limit above 10dB and not show in test report.

| WCDMA Band II |                 |                   |             |             |        |        |      |        |      |
|---------------|-----------------|-------------------|-------------|-------------|--------|--------|------|--------|------|
| Channel       | Frequency (MHz) | Spurious Emission |             | Limit (dBm) | Result |        |      |        |      |
|               |                 | Polarization      | Level (dBm) |             |        |        |      |        |      |
| 9262          | 3704.80         | Vertical          | -56.74      | -13.00      | Pass   |        |      |        |      |
|               | 5557.20         | Vertical          | -53.41      |             |        |        |      |        |      |
|               | 3704.80         | Horizontal        | -57.63      |             |        |        |      |        |      |
|               | 5557.20         | Horizontal        | -53.39      |             |        |        |      |        |      |
| 9400          | 3760.00         | Vertical          | -56.46      |             |        | -13.00 | Pass |        |      |
|               | 5640.00         | Vertical          | -53.20      |             |        |        |      |        |      |
|               | 3760.00         | Horizontal        | -56.32      |             |        |        |      |        |      |
|               | 5640.00         | Horizontal        | -53.25      |             |        |        |      |        |      |
| 9538          | 3815.20         | Vertical          | -56.30      |             |        |        |      | -13.00 | Pass |
|               | 5722.80         | Vertical          | -53.20      |             |        |        |      |        |      |
|               | 3815.20         | Horizontal        | -56.17      |             |        |        |      |        |      |
|               | 5722.80         | Horizontal        | -53.13      |             |        |        |      |        |      |

Remark :

- The emission levels of below 1 GHz are very lower than the limit above 10dB and not show in test report.

| WCDMA Band V |                 |                   |             |             |        |        |      |        |      |
|--------------|-----------------|-------------------|-------------|-------------|--------|--------|------|--------|------|
| Channel      | Frequency (MHz) | Spurious Emission |             | Limit (dBm) | Result |        |      |        |      |
|              |                 | Polarization      | Level (dBm) |             |        |        |      |        |      |
| 4132         | 1652.80         | Vertical          | -53.74      | -13.00      | Pass   |        |      |        |      |
|              | 2479.20         | Vertical          | -51.69      |             |        |        |      |        |      |
|              | 1652.80         | Horizontal        | -53.54      |             |        |        |      |        |      |
|              | 2479.20         | Horizontal        | -51.26      |             |        |        |      |        |      |
| 4182         | 1673.20         | Vertical          | -53.12      |             |        | -13.00 | Pass |        |      |
|              | 2509.80         | Vertical          | -51.15      |             |        |        |      |        |      |
|              | 1673.20         | Horizontal        | -53.23      |             |        |        |      |        |      |
|              | 2509.80         | Horizontal        | -51.04      |             |        |        |      |        |      |
| 4233         | 1693.20         | Vertical          | -52.98      |             |        |        |      | -13.00 | Pass |
|              | 2539.80         | Vertical          | -51.06      |             |        |        |      |        |      |
|              | 1693.20         | Horizontal        | -52.14      |             |        |        |      |        |      |
|              | 2539.80         | Horizontal        | -50.94      |             |        |        |      |        |      |

Remark :

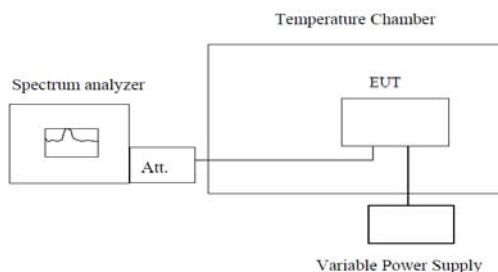
- The emission levels of below 1 GHz are very lower than the limit above 10dB and not show in test report.

### 3.7. Frequency stability

#### LIMIT

Cellular Band:  $\pm 2.5\text{ppm}$  PCS Band: Within the authorized frequency block

#### 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.
7. Reduce the input voltage to specified extreme voltage variation (+/- 15%) and endpoint, record the maximum frequency change.

## TEST RESULTS

Remark: we test all modulation type and record worst case at Voice mode

### 1. Temperature measurement:

2. Temperature measurement:

| Reference Frequency: GSM850 Middle channel=190 channel=836.6MHz |                       |                 |          |                |        |
|-----------------------------------------------------------------|-----------------------|-----------------|----------|----------------|--------|
| Voltage<br>( V )                                                | Temperature<br>( °C ) | Frequency error |          | Limit<br>(ppm) | Result |
|                                                                 |                       | Hz              | ppm      |                |        |
| 3.85                                                            | -30                   | 182             | 0.217547 | 2.5            | Pass   |
|                                                                 | -20                   | 173             | 0.206789 |                |        |
|                                                                 | -10                   | 170             | 0.203203 |                |        |
|                                                                 | 0                     | 169             | 0.202008 |                |        |
|                                                                 | 10                    | 167             | 0.199617 |                |        |
|                                                                 | 20                    | 172             | 0.205594 |                |        |
|                                                                 | 30                    | 168             | 0.200813 |                |        |
|                                                                 | 40                    | 163             | 0.194836 |                |        |
|                                                                 | 50                    | 167             | 0.199617 |                |        |
| Reference Frequency: PCS1900 Middle channel=661 channel=1880MHz |                       |                 |          |                |        |
| Voltage<br>( V )                                                | Temperature<br>( °C ) | Frequency error |          | Limit<br>(ppm) | Result |
|                                                                 |                       | Hz              | ppm      |                |        |
| 3.85                                                            | -30                   | 176             | 0.093617 | 2.5            | Pass   |
|                                                                 | -20                   | 176             | 0.093617 |                |        |
|                                                                 | -10                   | 182             | 0.096809 |                |        |
|                                                                 | 0                     | 169             | 0.089894 |                |        |
|                                                                 | 10                    | 176             | 0.093617 |                |        |
|                                                                 | 20                    | 184             | 0.097872 |                |        |
|                                                                 | 30                    | 167             | 0.088830 |                |        |
|                                                                 | 40                    | 171             | 0.090957 |                |        |
|                                                                 | 50                    | 185             | 0.098404 |                |        |

| Reference Frequency: EGPRS850 Middle channel=190 channel=836.6MHz |                    |                 |          |                |        |
|-------------------------------------------------------------------|--------------------|-----------------|----------|----------------|--------|
| Voltage<br>( V )                                                  | Temperature<br>(℃) | Frequency error |          | Limit<br>(ppm) | Result |
|                                                                   |                    | Hz              | ppm      |                |        |
| 3.85                                                              | -30                | 186             | 0.222328 | 2.5            | Pass   |
|                                                                   | -20                | 177             | 0.211571 |                |        |
|                                                                   | -10                | 172             | 0.205594 |                |        |
|                                                                   | 0                  | 172             | 0.205594 |                |        |
|                                                                   | 10                 | 168             | 0.200813 |                |        |
|                                                                   | 20                 | 175             | 0.20918  |                |        |
|                                                                   | 30                 | 180             | 0.215157 |                |        |
|                                                                   | 40                 | 170             | 0.203203 |                |        |
|                                                                   | 50                 | 165             | 0.197227 |                |        |
| Reference Frequency: EGPRS1900 Middle channel=661 channel=1880MHz |                    |                 |          |                |        |
| Voltage<br>( V )                                                  | Temperature<br>(℃) | Frequency error |          | Limit<br>(ppm) | Result |
|                                                                   |                    | Hz              | ppm      |                |        |
| 3.85                                                              | -30                | 180             | 0.095745 | 2.5            | Pass   |
|                                                                   | -20                | 178             | 0.094681 |                |        |
|                                                                   | -10                | 178             | 0.094681 |                |        |
|                                                                   | 0                  | 182             | 0.096809 |                |        |
|                                                                   | 10                 | 169             | 0.089894 |                |        |
|                                                                   | 20                 | 166             | 0.088298 |                |        |
|                                                                   | 30                 | 172             | 0.091489 |                |        |
|                                                                   | 40                 | 173             | 0.092021 |                |        |
|                                                                   | 50                 | 181             | 0.096277 |                |        |

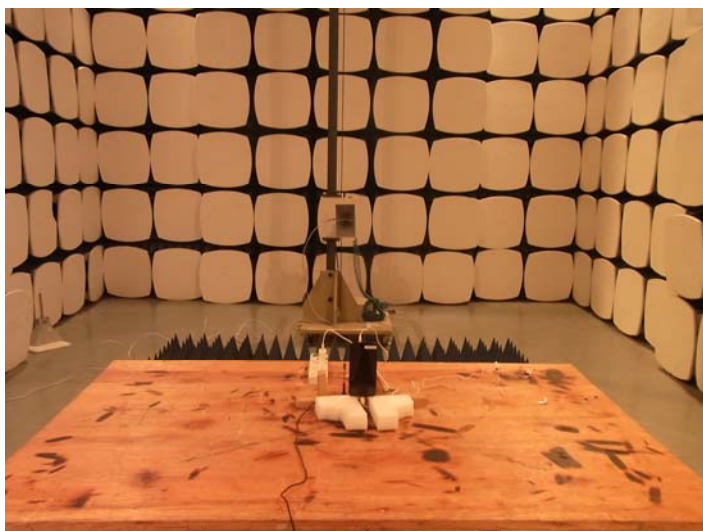
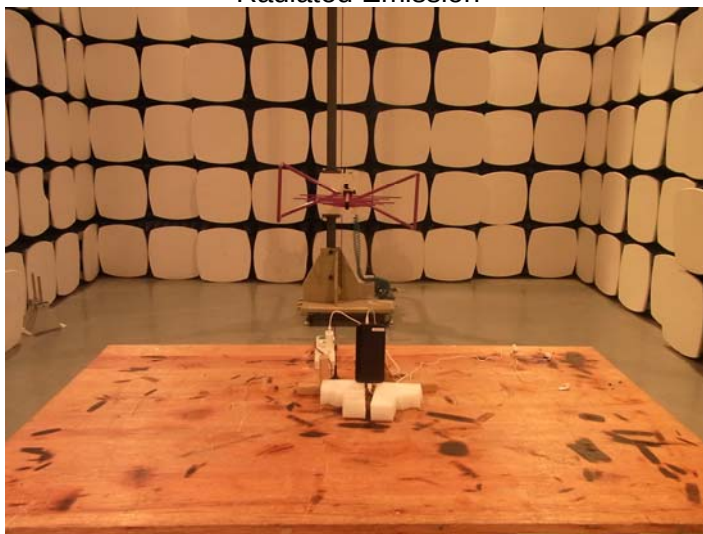
| Reference Frequency: WCDMA Band II Middle channel=9400 channel=1880MHz |                    |                 |          |                |        |
|------------------------------------------------------------------------|--------------------|-----------------|----------|----------------|--------|
| Voltage<br>( V )                                                       | Temperature<br>(℃) | Frequency error |          | Limit<br>(ppm) | Result |
|                                                                        |                    | Hz              | ppm      |                |        |
| 3.85                                                                   | -30                | 182             | 0.096809 | 2.5            | Pass   |
|                                                                        | -20                | 176             | 0.093617 |                |        |
|                                                                        | -10                | 175             | 0.093085 |                |        |
|                                                                        | 0                  | 168             | 0.089362 |                |        |
|                                                                        | 10                 | 180             | 0.095745 |                |        |
|                                                                        | 20                 | 176             | 0.093617 |                |        |
|                                                                        | 30                 | 174             | 0.092553 |                |        |
|                                                                        | 40                 | 188             | 0.100000 |                |        |
|                                                                        | 50                 | 179             | 0.095213 |                |        |
| Reference Frequency: WCDMA Band V Middle channel=4182 channel=836.6MHz |                    |                 |          |                |        |
| Voltage<br>( V )                                                       | Temperature<br>(℃) | Frequency error |          | Limit<br>(ppm) | Result |
|                                                                        |                    | Hz              | ppm      |                |        |
| 3.85                                                                   | -30                | 172             | 0.205594 | 2.5            | Pass   |
|                                                                        | -20                | 179             | 0.213961 |                |        |
|                                                                        | -10                | 182             | 0.217547 |                |        |
|                                                                        | 0                  | 169             | 0.202008 |                |        |
|                                                                        | 10                 | 164             | 0.196032 |                |        |
|                                                                        | 20                 | 174             | 0.207985 |                |        |
|                                                                        | 30                 | 164             | 0.196032 |                |        |
|                                                                        | 40                 | 189             | 0.225914 |                |        |
|                                                                        | 50                 | 170             | 0.203203 |                |        |

## 2. Voltage measurement:

| Reference Frequency: GSM850 Middle channel=190 channel=836.6MHz        |               |                 |          |             |        |
|------------------------------------------------------------------------|---------------|-----------------|----------|-------------|--------|
| Temperature (°C)                                                       | Voltage ( V ) | Frequency error |          | Limit (ppm) | Result |
|                                                                        |               | Hz              | ppm      |             |        |
| 25                                                                     | 4.40          | 186             | 0.222328 | 2.5         | Pass   |
|                                                                        | 3.85          | 164             | 0.196032 |             |        |
|                                                                        | 3.60          | 173             | 0.206789 |             |        |
| Reference Frequency: PCS1900 Middle channel=661 channel=1880MHz        |               |                 |          |             |        |
| Temperature (°C)                                                       | Voltage ( V ) | Frequency error |          | Limit (ppm) | Result |
|                                                                        |               | Hz              | ppm      |             |        |
| 25                                                                     | 4.40          | 172             | 0.091489 | 2.5         | Pass   |
|                                                                        | 3.85          | 164             | 0.087234 |             |        |
|                                                                        | 3.60          | 170             | 0.090426 |             |        |
| Reference Frequency: EGPRS850 Middle channel=190 channel=836.6MHz      |               |                 |          |             |        |
| Temperature (°C)                                                       | Voltage ( V ) | Frequency error |          | Limit (ppm) | Result |
|                                                                        |               | Hz              | ppm      |             |        |
| 25                                                                     | 4.40          | 178             | 0.212766 | 2.5         | Pass   |
|                                                                        | 3.85          | 182             | 0.217547 |             |        |
|                                                                        | 3.60          | 169             | 0.202008 |             |        |
| Reference Frequency: EGPRS1900 Middle channel=661 channel=1880MHz      |               |                 |          |             |        |
| Temperature (°C)                                                       | Voltage ( V ) | Frequency error |          | Limit (ppm) | Result |
|                                                                        |               | Hz              | ppm      |             |        |
| 25                                                                     | 4.40          | 172             | 0.091489 | 2.5         | Pass   |
|                                                                        | 3.85          | 173             | 0.092021 |             |        |
|                                                                        | 3.60          | 181             | 0.096277 |             |        |
| Reference Frequency: WCDMA Band II Middle channel=9400 channel=1880MHz |               |                 |          |             |        |
| Temperature (°C)                                                       | Voltage ( V ) | Frequency error |          | Limit (ppm) | Result |
|                                                                        |               | Hz              | ppm      |             |        |
| 25                                                                     | 4.40          | 160             | 0.085106 | 2.5         | Pass   |
|                                                                        | 3.85          | 176             | 0.093617 |             |        |
|                                                                        | 3.60          | 183             | 0.097340 |             |        |
| Reference Frequency: WCDMA Band V Middle channel=4182 channel=836.6MHz |               |                 |          |             |        |
| Temperature (°C)                                                       | Voltage ( V ) | Frequency error |          | Limit (ppm) | Result |
|                                                                        |               | Hz              | ppm      |             |        |
| 25                                                                     | 4.40          | 168             | 0.200813 | 2.5         | Pass   |
|                                                                        | 3.85          | 176             | 0.210375 |             |        |
|                                                                        | 3.60          | 171             | 0.204399 |             |        |

## 4. EUT TEST PHOTOS

Radiated Emission





## 5. PHOTOGRAPHS OF EUT CONSTRUCTIONAL

Please reference to the test report No.: GTI20161071F-1

\*\*\*\*\*THE END\*\*\*\*\*