TEST REPORT
No. I17Z61374-WMD01

for

Reliance Communications, LLC

GSM/CDMA/WCDMA/LTE mobile phone

Model Name: RC555L

FCC ID: 2AGBH-RC555L

with

Hardware Version: V2.0

Software Version: Orbic-RC555L-V1.6.3

Issued Date: 2017-10-16

TESTING
NVLAP LAB CODE 600118-0

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of CTTL.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S.Government.

Test Laboratory:

Test Firm Designation Number:CN5017

CTTL, Telecommunication Technology Labs, CAICT

No. 52, Huayuan North Road, Haidian District, Beijing, P. R. China 100191.

Tel:+86(0)10-62304633-2512, Fax:+86(0)10-62304633-2504

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I17Z61374-WMD01	Rev.0	1st edition	2017-09-26
I17Z61374-WMD01	Rev.1	Add FCC list No.	2017-10-16

CONTENTS

1. Test Laboratory

1.1. Testing Location

Location 1: CTTL(huayuan North Road)

Address: No. 52, Huayuan North Road, Haidian District, Beijing, P. R. China 100191

Location 2: CTTL(Shouxiang)

Address: No. 51 Shouxiang Science Building, Xueyuan Road, Haidian District, Beijing, P. R. China 100191

1.2. Testing Environment

Normal Temperature: 15-35℃
Relative Humidity: 20-75%

1.3. Project data

Testing Start Date: 2017-08-17
Testing End Date: 2017-09-26

1.4. Signature

Shen Yi
(Prepared this test report)

Zhou Yu
(Reviewed this test report)

Zhao Hui Lin
Deputy Director of the laboratory
(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name:	Reliance Communications, LLC
Address /Post:	555 Wireless BLVD, Hauppauge NY 11788
Contact:	Saqib Ghouri /Chandler Chen
Email:	saqib.ghouri@reliance.us/chandler.chen@reliance.us
Telephone:	+92-317-512-6111/+86 185-7557-6433
Fax:	\

2.2. Manufacturer Information

Company Name:	Unimaxcomm
Address /Post:	Room 602, Building-B, Shenzhen Software Park T3, Hi-Tech Park South, Nan Shan District, Shenzhen, China
Contact:	Chunli.He
Email:	hchunli@unimaxcomm.com
Telephone:	130 7785 5257
Fax:	\

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

3.1. About EUT

Description	GSM/CDMA/WCDMA/LTE mobile phone
Model Name	RC555L
FCC ID	2AGBH-RC555L
Antenna	Integrated
Extreme vol. Limits	3.6VDC to 4.3VDC (nominal: 3.8VDC)
Extremetemp. Tolerance	-10°C to 40°C

Note: Components list, please refer to documents of the manufacturer; it is also included in the original test record of CTTL, Telecommunication Technology Labs, Academy of Telecommunication Research, MIIT

3.2. Internal Identification of EUT used during the test

EUT ID*	IMEI	HW Version	SW Version	Date of receipt
UT08a	358924080002271	V2.0	Orbic-RC555L-V1.6.3	2017-08-17

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

3.3. Internal Identification of AE used during the test

AE ID*	Description	SN
AE1	Battery	/
AE2	Normal Charger	/

AE1

Model	RC555L
Manufacturer	Veken
Capacitance	3000mAh
Nominal Voltage	3.8V

AE2

Model	RC555L
Manufacturer	BLJ

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

3.4. Normal Accessory setting

Fully charged battery was used during the test.

3.5. General Description

The Equipment Under Test (EUT) is a model of GSM/CDMA/WCDMA/LTE mobile phone with integrated antenna. Manual and specifications of the EUT were provided to fulfil the test.

4. Reference Documents

4.1. Reference Documents for testing

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

Reference	Title	Version
FCC Part 24	PERSONAL COMMUNICATIONS SERVICES	10-1-16 Edition
FCC Part 22	PUBLIC MOBILE SERVICES	10-1-16 Edition
ANSI/TIA-603-D	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards	2010
ANSI C63.4	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2014
KDB 971168 D01	Measurement Guidance for Certification of Licensed Digital Transmitters	v02r02

5. SUMMARY OF TEST RESULTS

GSM850

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

PCS1900

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

6. Test Equipments Utilized

NO.	Description	TYPE	series number	MANUFACTURE	CAL DUE DATE	Calibration interval
1	Universal Radio Communication Tester	CMW500	159082	R&S	2017-12-06	1 year
2	Spectrum Analyzer	FSU26	200030	R&S	2018-06-20	1 year
3	Climate chamber	SH-241	92007454	ESPEC	2017-12-14	2 year

ANNEX A: MEASUREMENT RESULTS

A.1 OUTPUT POWER

A.1.1 Summary

During the process of testing, the EUT was controlled via Rhode & Schwarz Digital Radio Communication tester (CMU-200) to ensure max power transmission and proper modulation.

In all cases, output power is within the specified limits.

A.1.2 Conducted

A.1.2.1 Method of Measurements

The EUT was set up for the max output power with pseudo random data modulation.

These measurements were done at 3 frequencies, 1850.2 MHz, 1880.0MHz and 1909.8MHz for PCS1900 band; 824.4MHz, 836.6MHz and 848.8MHz for GSM850 band. (bottom, middle and top of operational frequency range).

GSM850

	Power step	Nominal Peak output power (dBm)
GSM	5	33dBm(2W)
GPRS	3	33dBm(2W)
EGPRS	6	33dBm(2W)

Measurement result
GSM(GMSK)

Frequency(MHz)	Power Step	Output power(dBm)
824.2	5	32.64
836.6	5	32.80
848.8	5	32.94

GPRS(GMSK,1Slot)

Frequency(MHz)	Power Step	Output power(dBm)
824.2	3	32.74
836.6	3	32.84
848.8	3	32.86

EGPRS(8PSK,1Slot)

Frequency(MHz)	Power Step	Output power(dBm)
824.2	6	25.95
836.6	6	25.89
848.8	6	25.97

PCS1900

	Power step	Nominal Peak output power (dBm)
GSM	0	30dBm(1W)
GPRS	3	30dBm(1W)
EGPRS	5	30dBm(1W)

Measurement result
GSM(GMSK)

Frequency(MHz)	Power Step	Output power(dBm)
1850.2	0	29.39
1880.0	0	29.32
1909.8	0	29.57

GPRS(GMSK,1Slot)

Frequency(MHz)	Power Step	Output power(dBm)
1850.2	3	29.47
1880.0	3	29.34
1909.8	3	29.62

EGPRS(8PSK,1Slot)

Frequency(MHz)	Power Step	Output power(dBm)
1850.2	5	25.25
1880.0	5	24.99
1909.8	5	24.93

A.2   FREQUENCY STABILITY

A.2.1 Method of Measurement

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

1.   Measure the carrier frequency at room temperature.

2.   Subject the EUT to overnight soak at -10℃.

3.   With the EUT, powered via nominal voltage, connected to the CMU200 and in a simulated call on   mid channel of PCS 1900 and GSM850, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.

4.   Repeat the above measurements at 10℃ increments from -10℃ to +40℃. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.

5.   Remeasure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1Volt increments remeasuring carrier frequency at each voltage. Pause at nominal voltage for 1 1/2 hours unpowered, to allow any self-heating to stabilize, before continuing.

6.   Subject the EUT to overnight soak at +40℃.

7.   With the EUT, powered via nominal voltage, connected to the CMU200 and in a simulated call on the centre channel, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.

8.   Repeat the above measurements at 10 C increments from +40℃ to -10℃. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.

9.   At all temperature levels hold the temperature to +/- 0.5℃ during the measurement procedure.

A.2.2 Measurement Limit

A.2.2.1 For Hand carried battery powered equipment

According to the JTC standard the frequency stability of the carrier shall be accurate to within 0.1 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 24.235, Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.   As this transceiver is considered "Hand carried, battery powered equipment" Section 2.1055(d)(2) applies. This requires that the lower voltage for frequency stability testing be specified by the manufacturer. This transceiver is specified to operate with an input voltage of between 3.6VDC and 4.3VDC, with a nominal voltage of 3.8VDC. Operation above or below these voltage limits is prohibited by transceiver software in order to prevent improper operation as well as to protect components from overstress. These voltages represent a tolerance of -10 % and +12.5 %. For the purposes of measuring frequency stability these voltage limits are to be used.

A.2.2.2 For equipment powered by primary supply voltage

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

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

A.2.3 Measurement results
GSM 850
Frequency Error vs Voltage

Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
3.6	14	0.017
3.8	34	0.040
4.3	10	0.012

Frequency Error vs Temperature

temperature(℃)	Frequency error(Hz)	Frequency error(ppm)
-10	30	0.036
0	13	0.016
10	11	0.013
20	10	0.012
30	7	0.008
40	15	0.018

EGPRS 850 - 8PSK
Frequency Error vs Voltage

Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
3.6	-58	0.069
3.8	-60	0.071
4.3	-60	0.072

Frequency Error vs Temperature

temperature(℃)	Frequency error(Hz)	Frequency error(ppm)
-10	-60	0.072
0	-57	0.068
10	-62	0.074
20	-62	0.074
30	-60	0.071
40	-59	0.070

PCS 1900

Frequency Error vs Voltage

Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
3.6	-10	0.005
3.8	6	0.003
4.3	-14	0.007

Frequency Error vs Temperature

temperature(℃)	Frequency error(Hz)	Frequency error(ppm)
-10	9	0.005
0	-9	0.005
10	-7	0.004
20	6	0.003
30	13	0.007
40	-9	0.005

EGPRS 1900 - 8PSK

Frequency Error vs Voltage

Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
3.6	-70	0.037
3.8	-60	0.032
4.3	-54	0.029

Frequency Error vs Temperature

temperature(℃)	Frequency error(Hz)	Frequency error(ppm)
-10	-54	0.029
0	-61	0.032
10	-59	0.032
20	-57	0.030
30	-55	0.029
40	-54	0.029

A.3 OCCUPIED BANDWIDTH

Reference

FCC: CFR Part 2.1049(h)(i)

A.3.1 Occupied Bandwidth Results

Occupied bandwidth measurements are only provided for selected frequencies in order to reduce the amount of submitted data. Data were taken at the extreme and mid frequencies of the US Cellular/PCS frequency bands. The table below lists the measured 99% BW. Spectrum analyzer plots are included on the following pages.

The measurement method is from KDB 971168:

a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be set wide enough to capture all modulation products including the emission skirts (i.e., two to five times the OBW).

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

c) Set the reference level of the instrument as required to keep the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope must be at least 10log (OBW / RBW) below the reference level.

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

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

GSM 850(99% BW)

Frequency(MHz)	Occupied Bandwidth (99% BW)(kHz)
824.2	244.391
836.6	243.590
848.8	242.788

GSM 850

Channel 128-Occupied Bandwidth (99% BW)


```
                                              * RBW  5 kHz      Marker 1 [T1 ]
                                              * VBW  20 kHz                27.29 dBm
        Ref  30 dBm        Att  35 dB   SWT 20 ms          824.209615385 MHz
        30                                           OBW244.391025641 kHz
                                                     Temp 1 [T1 OBW]
        20                                                      12.48 dBm     A
                                                              824.077403846 MHz
        10                                                   Temp 2 [T1 OBW]
                                                                 12.74 dBm
         0                                                  824.321794872 MHz   TDF

       -10                                                                      EXT

       -20                                                                      3DB

       -30

       -40

       -50

       -60

       -70
        Center  824.2 MHz          50 kHz/              Span  500 kHz
```
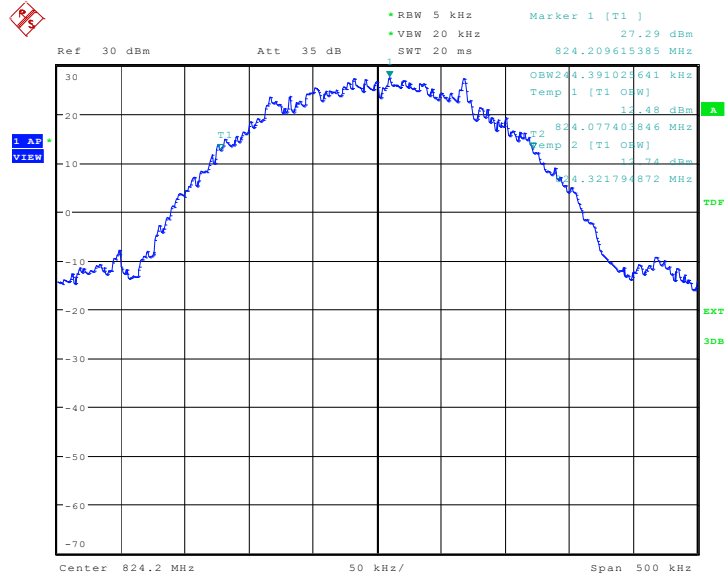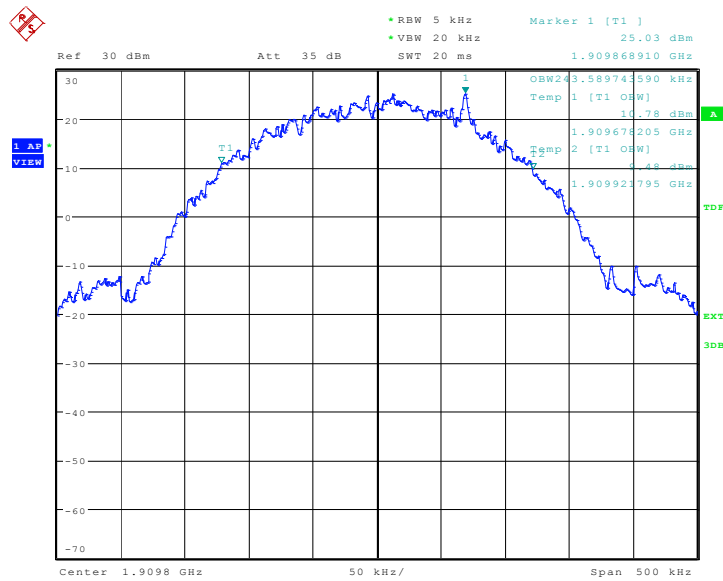
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Channel 190-Occupied Bandwidth (99% BW)
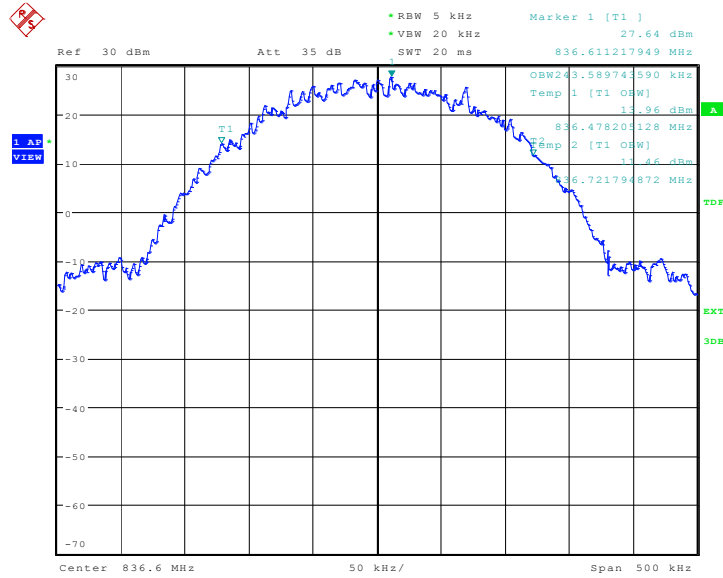
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Channel 251-Occupied Bandwidth (99% BW)
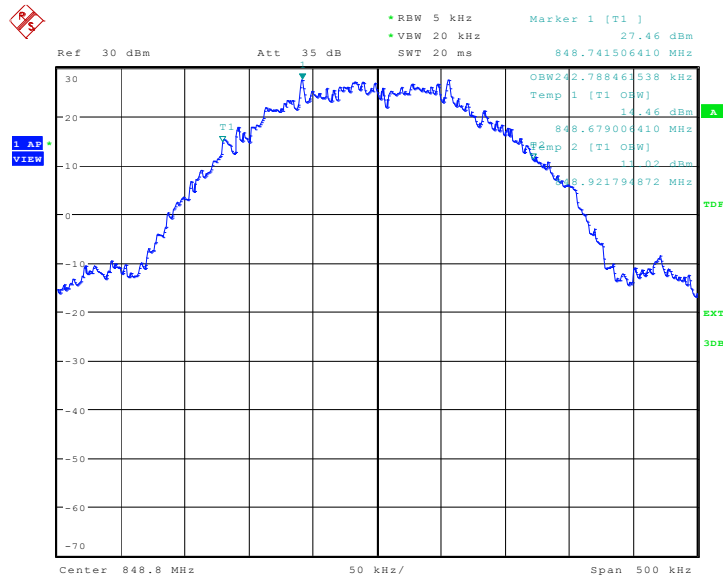
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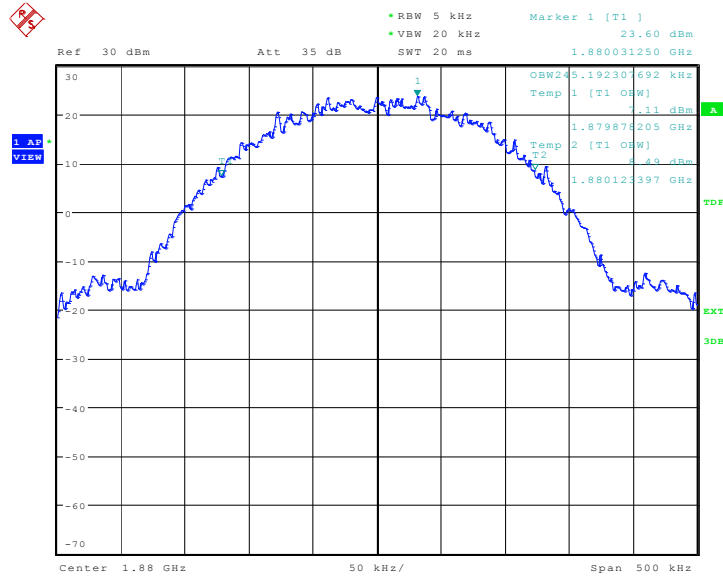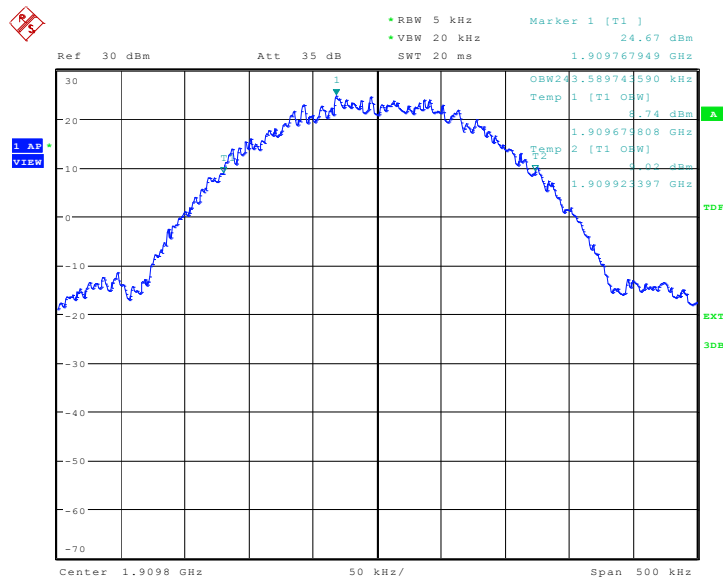
GPRS 850(99% BW)

| Frequency(MHz)	Occupied Bandwidth (99% BW)(kHz)
824.2	247.596
836.6	242.788
848.8	245.192

GPRS 850

Channel 128-Occupied Bandwidth (99% BW)
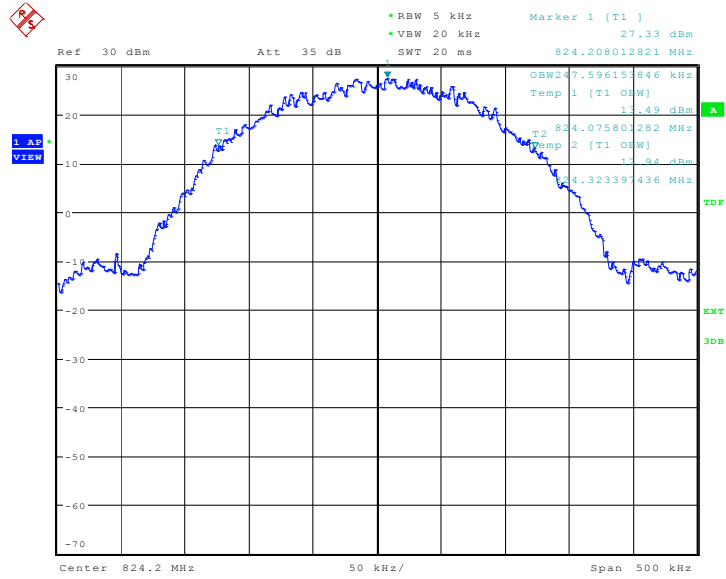
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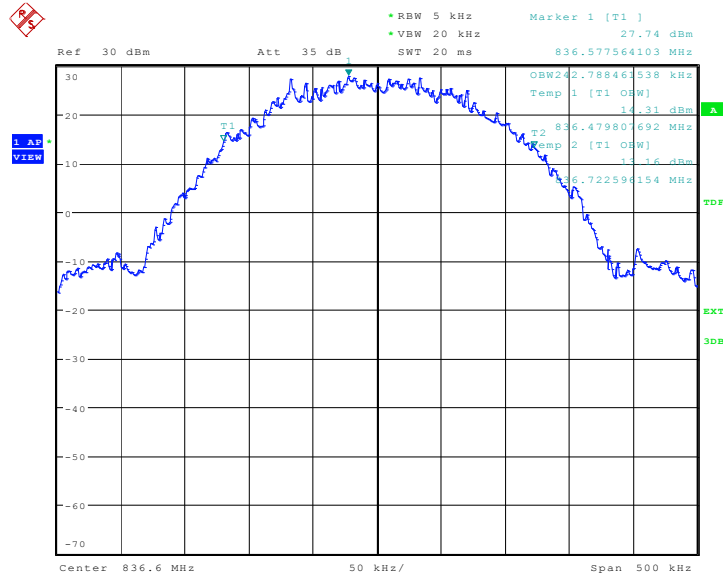
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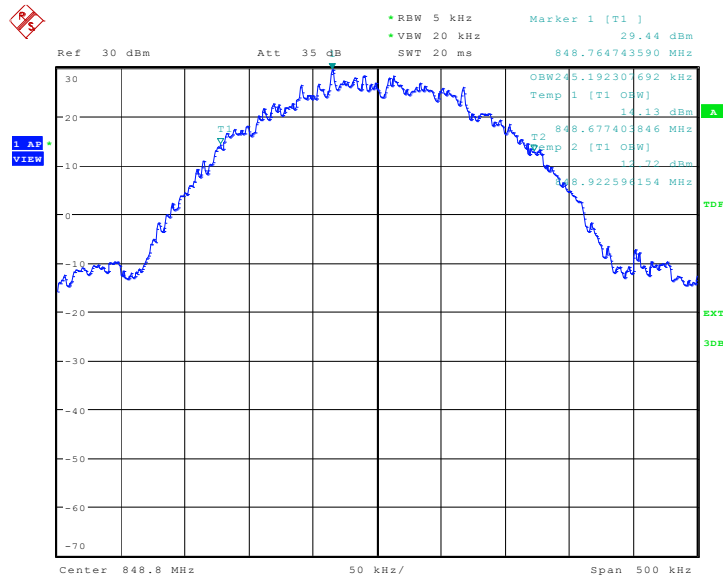
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EGPRS 850-8PSK(99% BW)

Frequency(MHz)	Occupied Bandwidth (99% BW)(kHz)
824.2	243.590
836.6	243.590
848.8	241.987

EGPRS 850-8PSK

Channel 128-Occupied Bandwidth (99% BW)
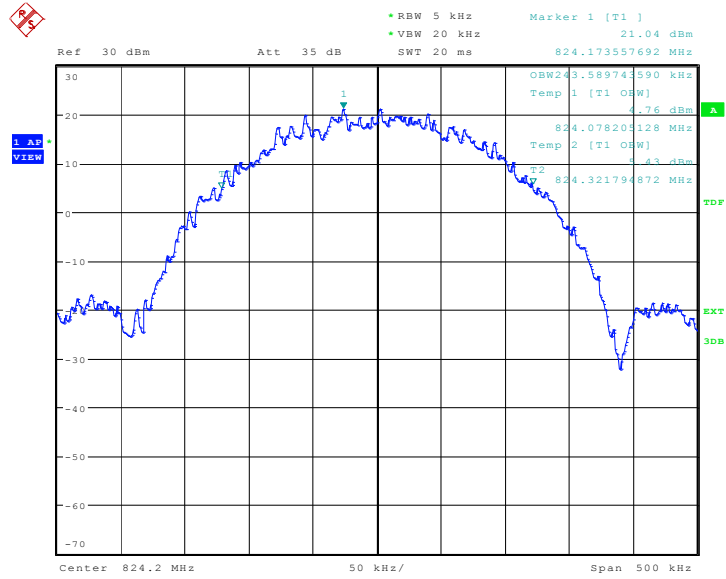
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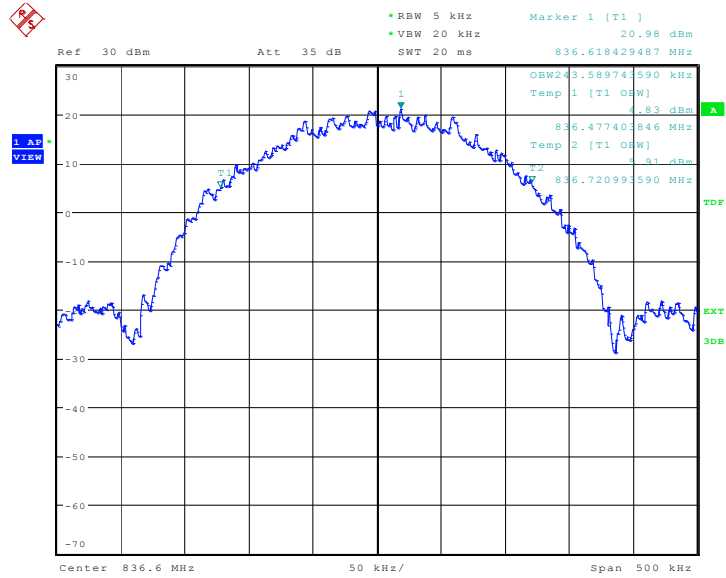
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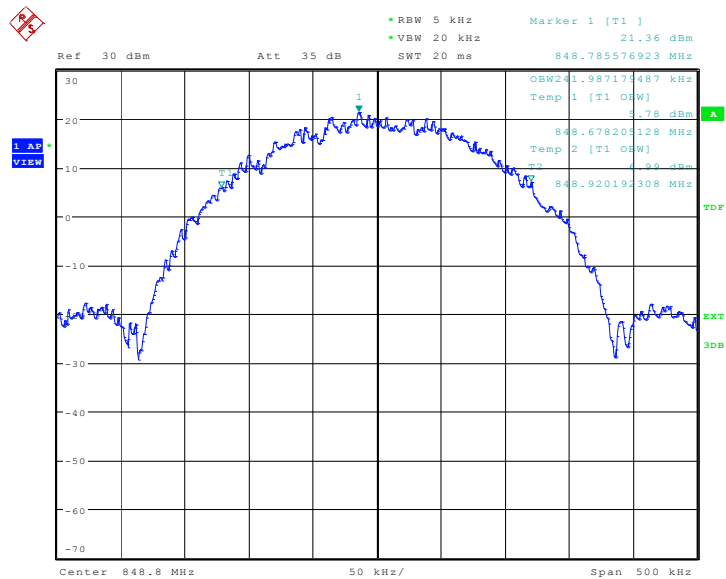
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PCS 1900(99% BW)

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

PCS 1900

Channel 512-Occupied Bandwidth (99% BW)
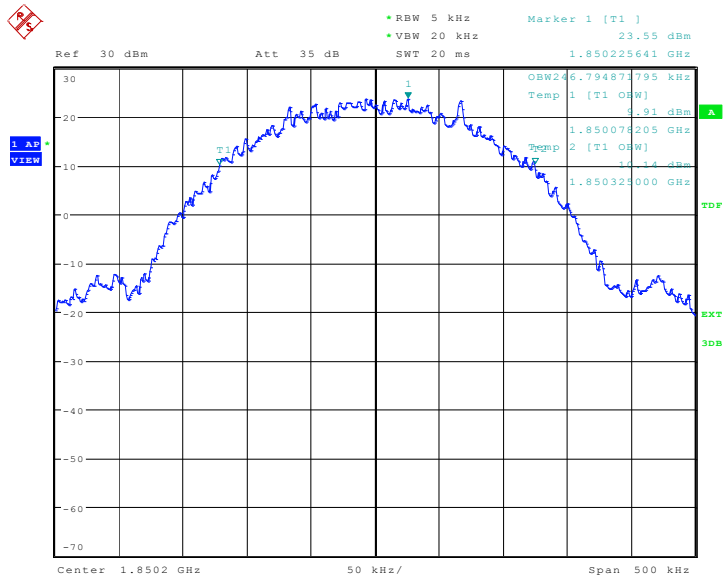
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Channel 661-Occupied Bandwidth (99% BW)
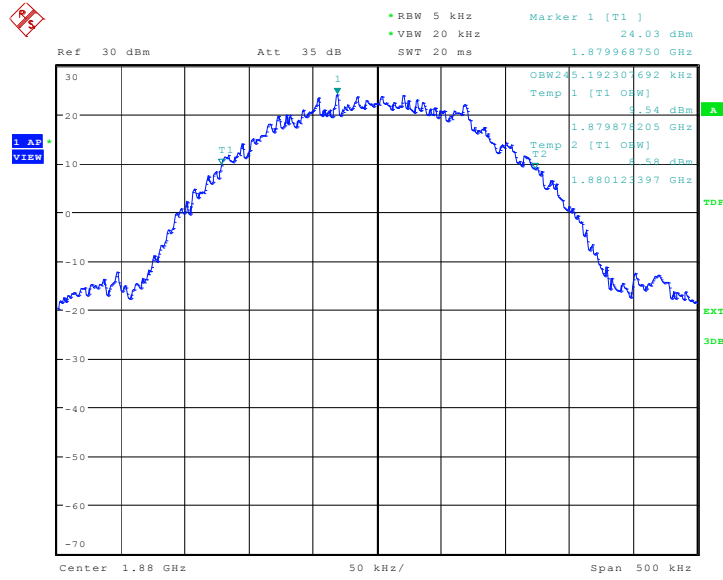
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Channel 810-Occupied Bandwidth (99% BW)

Date: 4.SEP.2017 10:18:52

GPRS 1900(99% BW)

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

GPRS 1900

Channel 512-Occupied Bandwidth (99% BW)
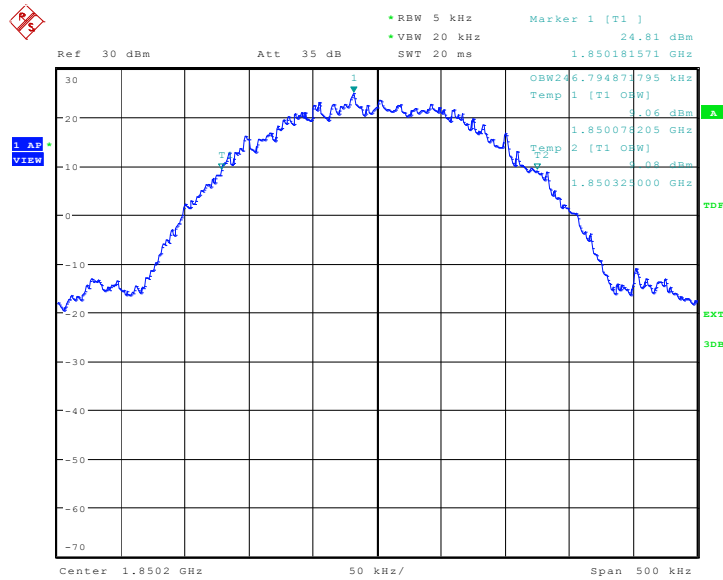
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Channel 661-Occupied Bandwidth (99% BW)

```
                                         • RBW  5 kHz          Marker 1 [T1 ]
                                         • VBW  20 kHz                    23.60 dBm
         Ref  30 dBm          Att  35 dB     SWT  20 ms         1.880031250 GHz
    30                                      1          OBW245.192301692 kHz
                                                       Temp 1 [T1 OBW]
    20                                                          7.11 dBm    A
                                                       1.879878205 GHz
    10                                                 Temp 2 [T1 OBW]
                                                       T2             6.49 dBm
     0                                                 1.880123397 GHz
                                                                            TDF
   -10
   -20                                                                      EXT
                                                                            3DB
   -30
   -40
   -50
   -60
   -70
         Center  1.88 GHz              50 kHz/              Span  500 kHz
```

Date: 4.SEP.2017 11:13:28

Channel 810-Occupied Bandwidth (99% BW)

```
                                         • RBW  5 kHz          Marker 1 [T1 ]
                                         • VBW  20 kHz                    24.67 dBm
         Ref  30 dBm          Att  35 dB     SWT  20 ms         1.909767949 GHz
    30                                    1            OBW243.589743590 kHz
                                                       Temp 1 [T1 OBW]
    20                                                          8.74 dBm    A
                                                       1.909679808 GHz
    10                                                 Temp 2 [T1 OBW]
                                                       T2             8.02 dBm
     0                                                 1.909923397 GHz
                                                                            TDF
   -10
   -20                                                                      EXT
                                                                            3DB
   -30
   -40
   -50
   -60
   -70
         Center  1.9098 GHz            50 kHz/              Span  500 kHz
```

Date: 4.SEP.2017 11:14:00

EGPRS 1900-8PSK(99% BW)

Frequency(MHz)	Occupied Bandwidth (99% BW)(kHz)
1850.2	238.782
1880.0	242.788
1909.8	244.391

EGPRS 1900-8PSK

Channel 512-Occupied Bandwidth (99% BW)
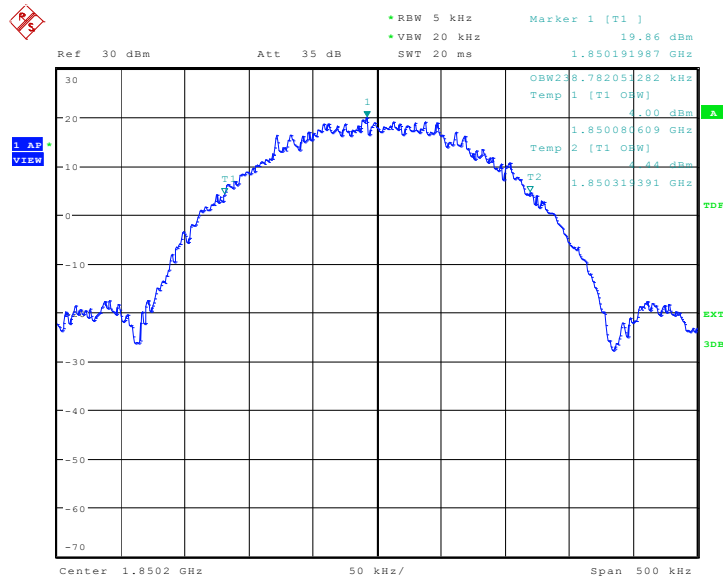
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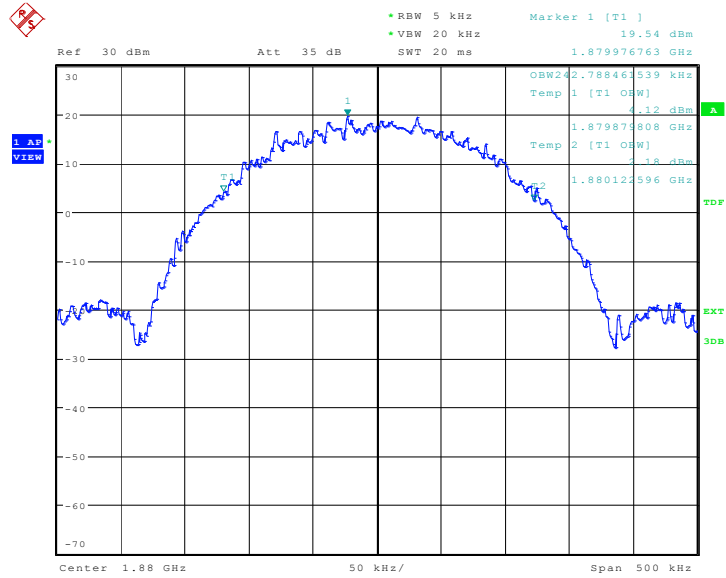
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Channel 810-Occupied Bandwidth (99% BW)
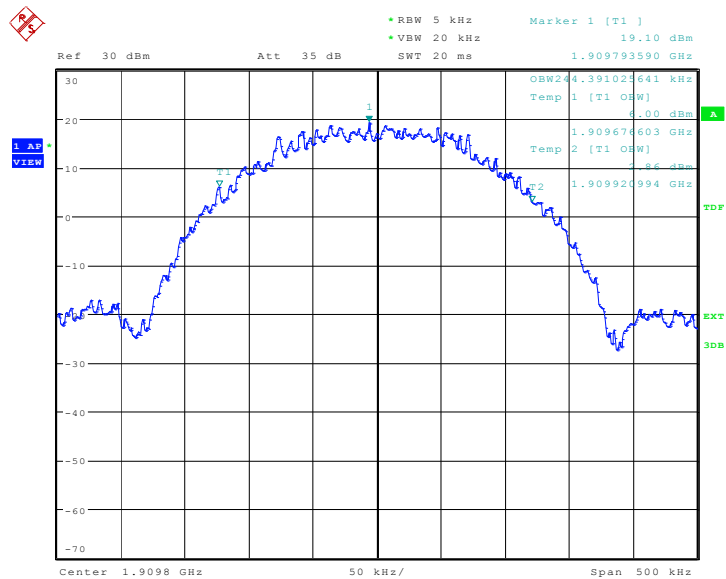
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A.4 EMISSION BANDWIDTH

Reference
FCC: CFR Part 22.917(b), 24.238(a)

A.4.1Emission Bandwidth Results

The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

GSM 850

Frequency(MHz)	Emission Bandwidth (kHz)
824.2	315.71
836.6	314.90
848.8	316.51

GSM 850
Channel 128-Emission Bandwidth
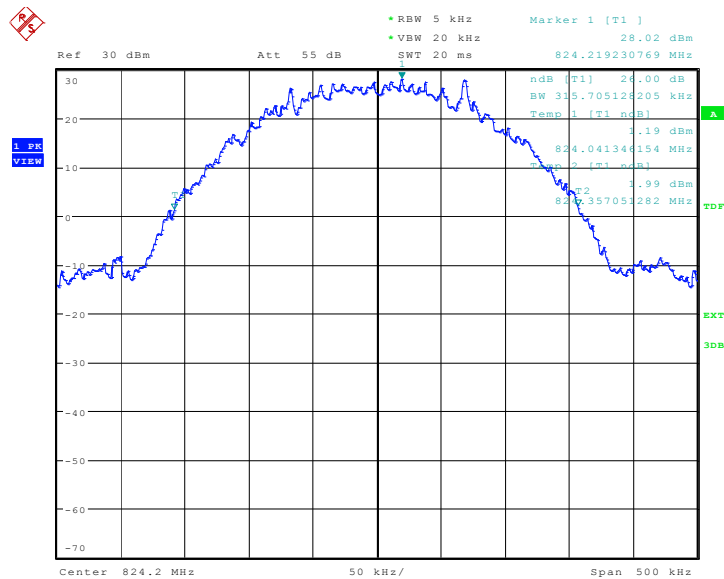
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Channel 190-Emission Bandwidth
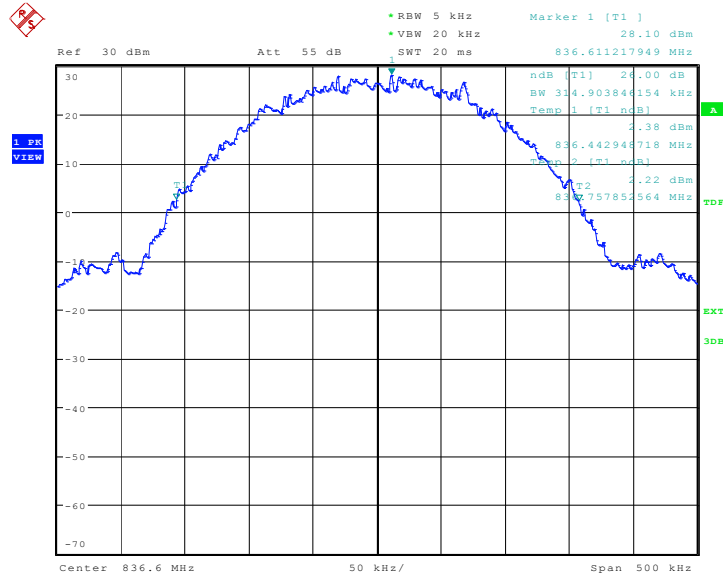
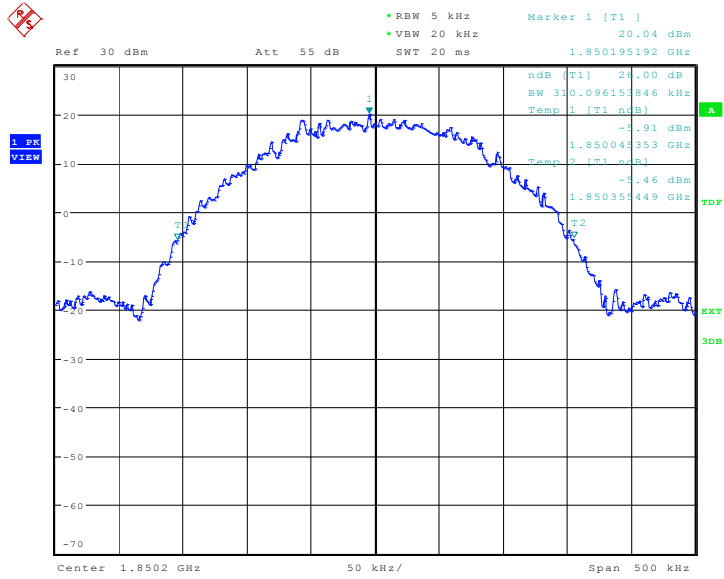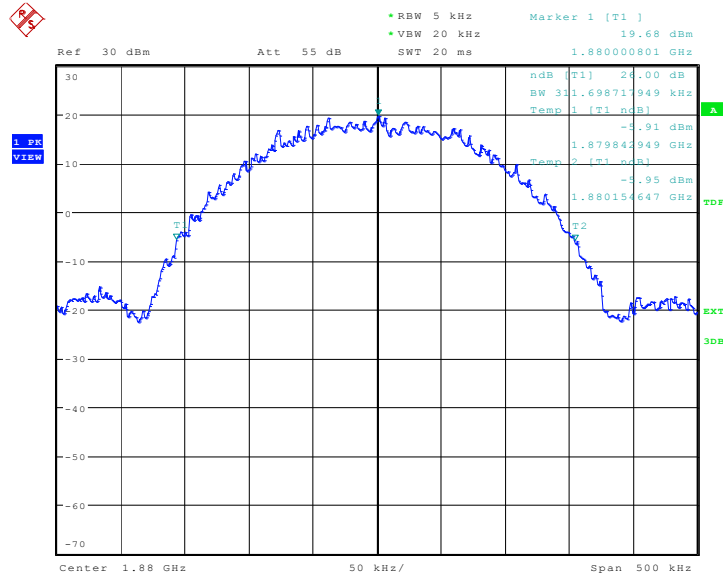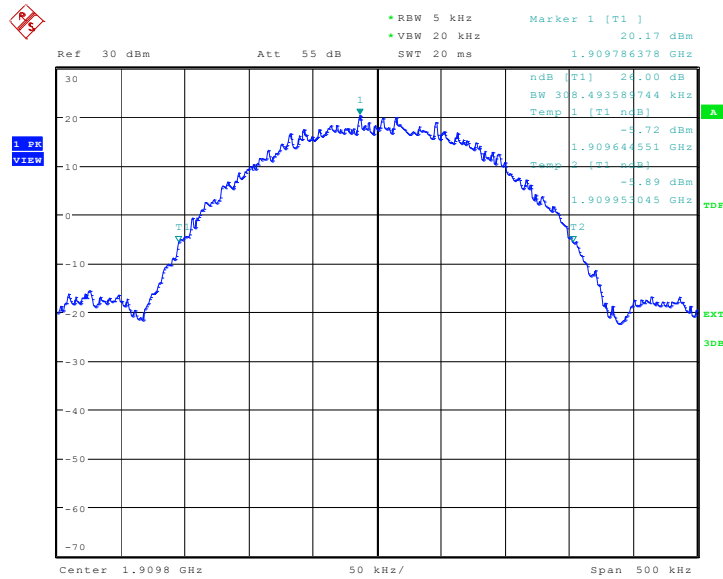Date: 4.SEP.2017 09:34:16

Channel 251-Emission Bandwidth
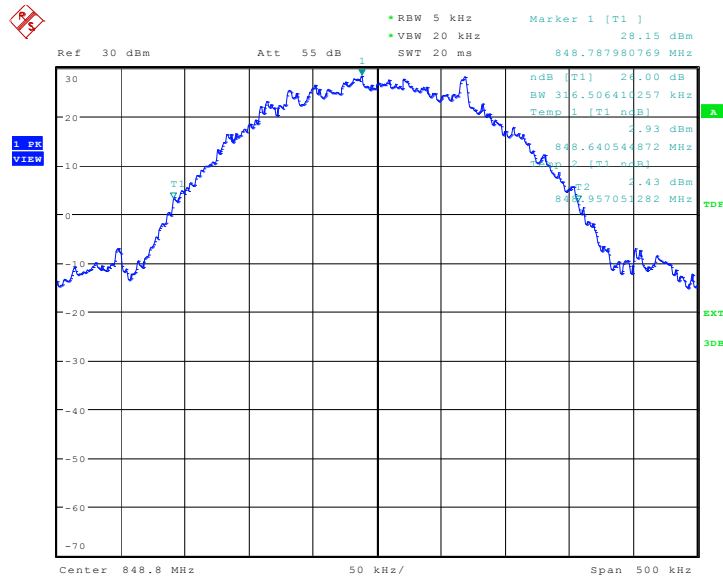
Date: 4.SEP.2017 09:35:24

GPRS 850

Frequency(MHz)	Emission Bandwidth (kHz)
824.2	312.50
836.6	316.51
848.8	314.10

GPRS 850

Channel 128-Emission Bandwidth
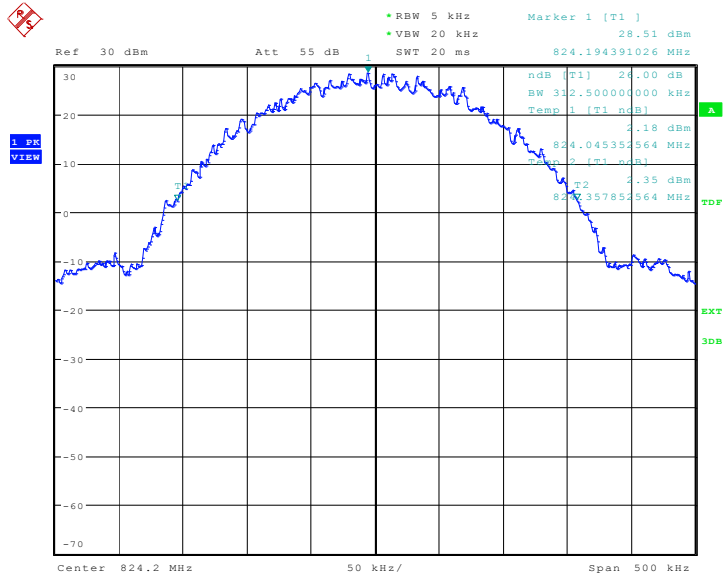
Date: 4.SEP.2017 11:03:30

Channel 190-Emission Bandwidth
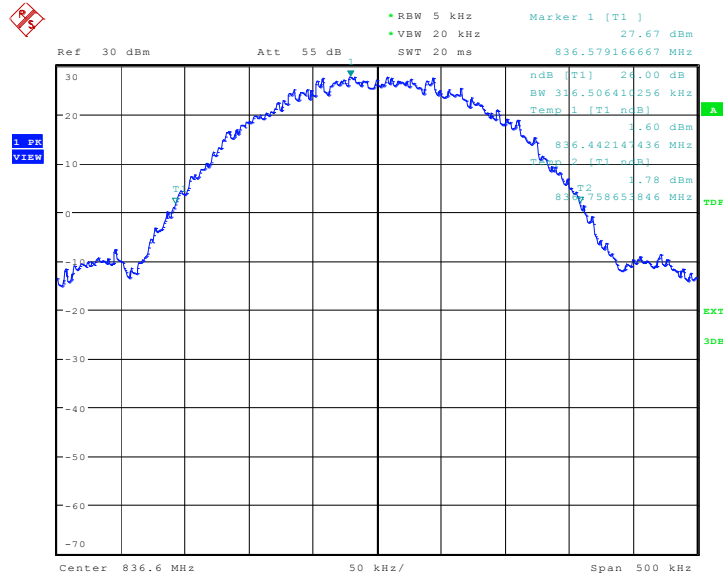
Date: 4.SEP.2017 11:04:37

Channel 251-Emission Bandwidth
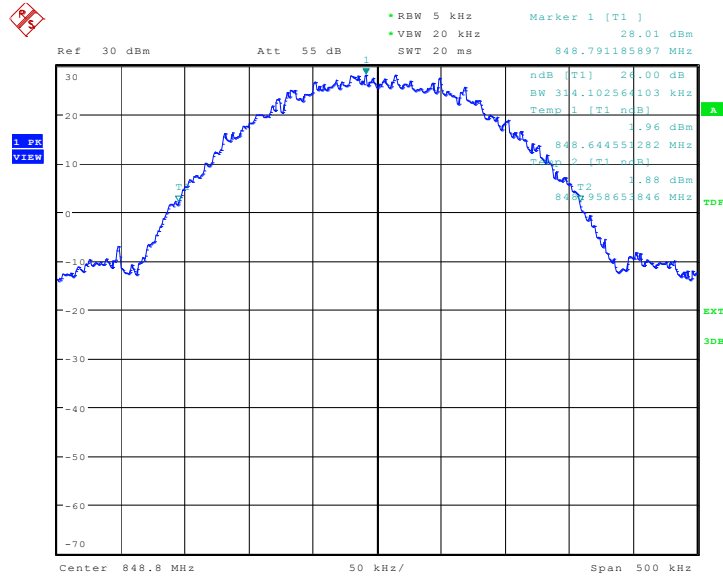
Date: 4.SEP.2017 11:05:45

EGPRS 850-8PSK

Frequency(MHz)	Emission Bandwidth (kHz)
824.2	307.69
836.6	311.70
848.8	311.70

EGPRS 850-8PSK

Channel 128-Emission Bandwidth
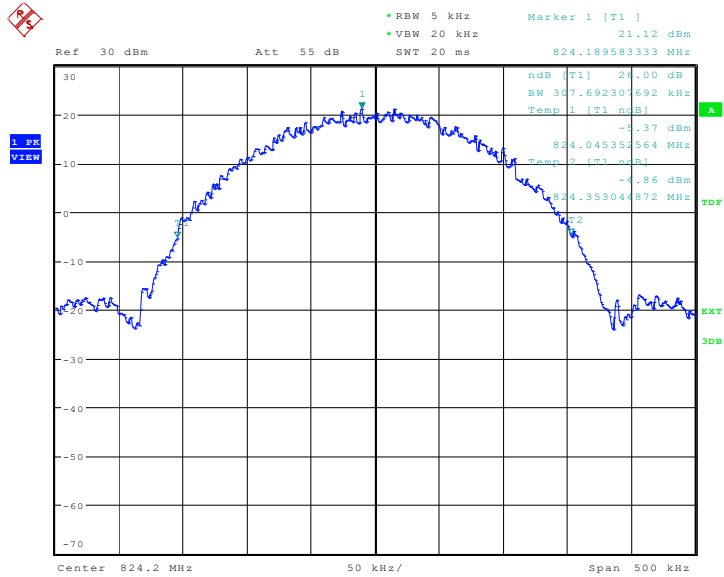
Date: 4.SEP.2017 11:49:12

Channel 190-Emission Bandwidth
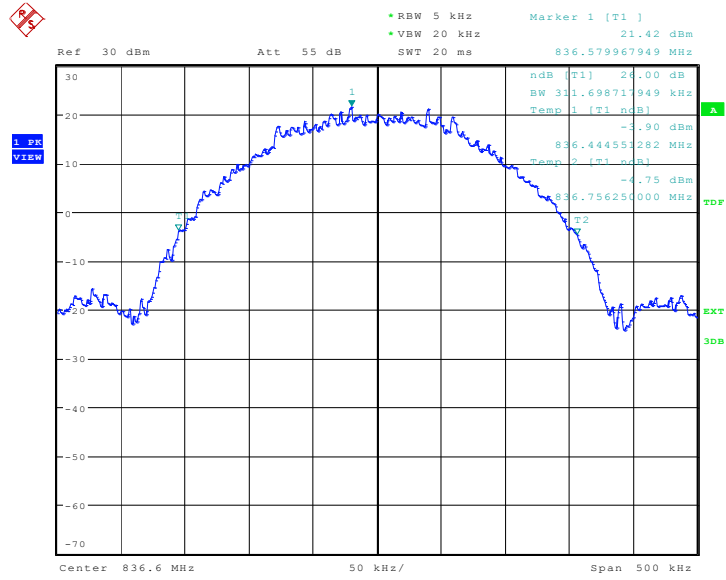
Date: 4.SEP.2017 11:50:19

Channel 251-Emission Bandwidth
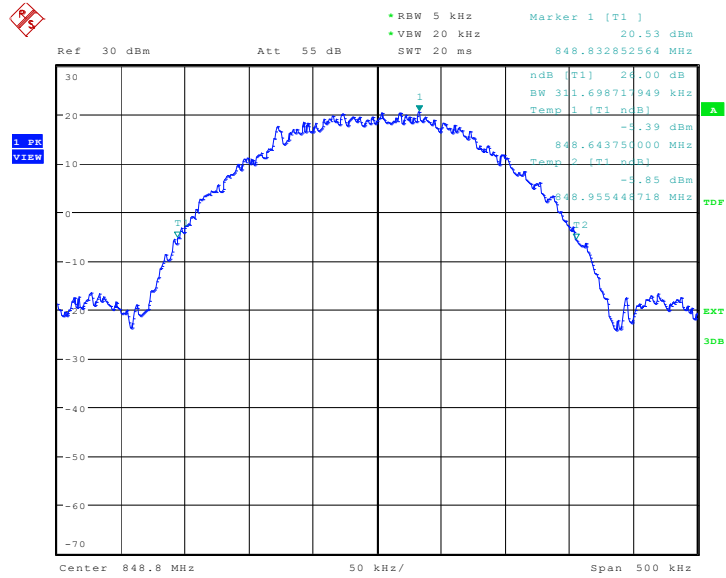
Date: 4.SEP.2017 11:51:27

PCS 1900

Frequency(MHz)	Emission Bandwidth (kHz)
1850.2	314.10
1880.0	310.10
1909.8	314.10

PCS 1900

Channel 512-Emission Bandwidth
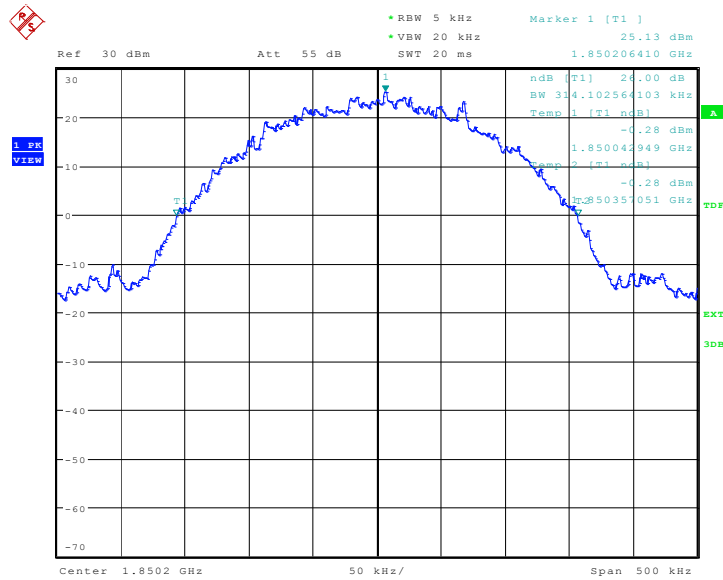
Date: 4.SEP.2017 10:20:01

Channel 661-Emission Bandwidth
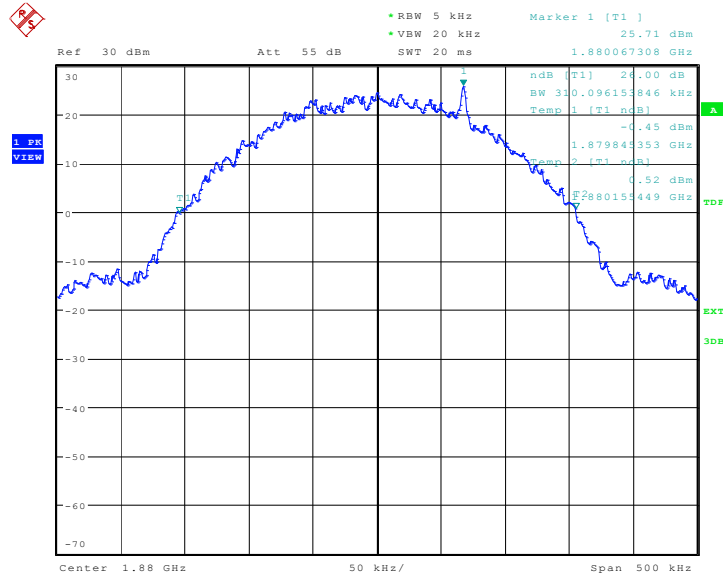
Date: 4.SEP.2017 10:21:08

Channel 810-Emission Bandwidth
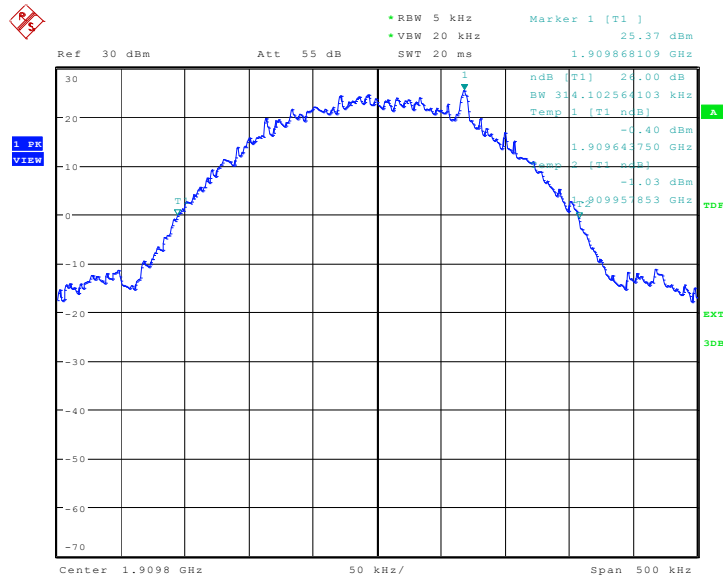
Date: 4.SEP.2017 10:22:15

GPRS 1900

Frequency(MHz)	Emission Bandwidth (kHz)
1850.2	314.90
1880.0	311.70
1909.8	318.11

GPRS 1900

Channel 512-Emission Bandwidth
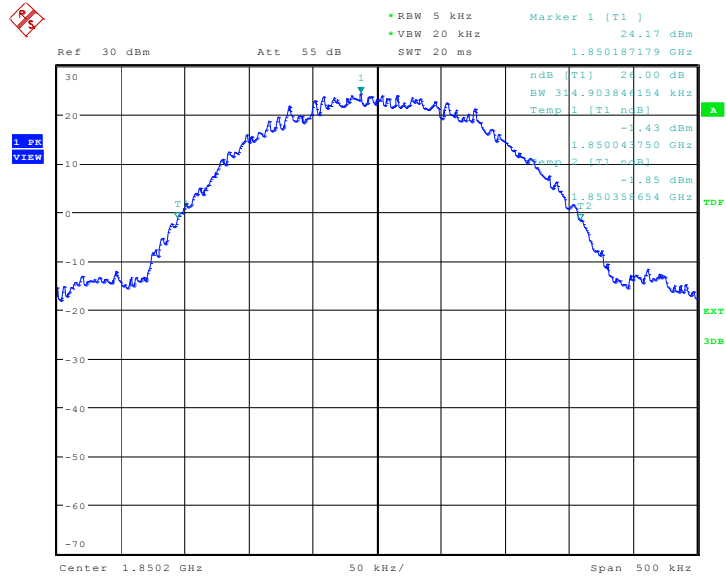
Date: 4.SEP.2017 11:15:09

Channel 661-Emission Bandwidth
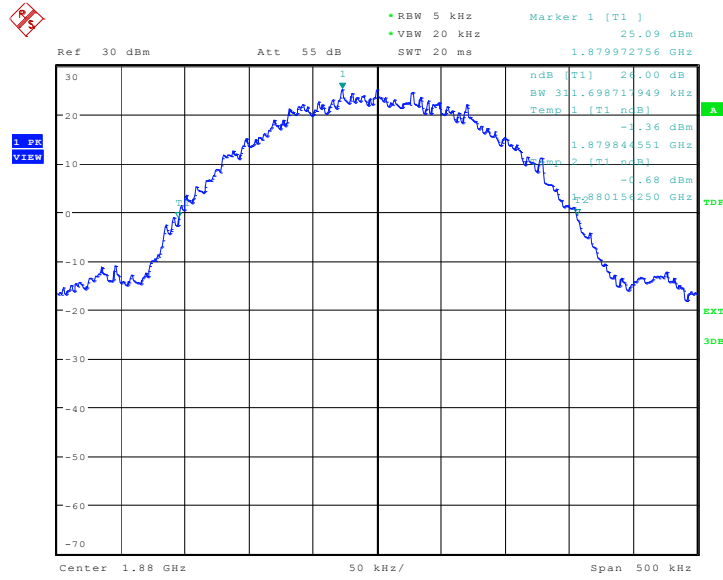
Date: 4.SEP.2017 11:16:16

Channel 810-Emission Bandwidth
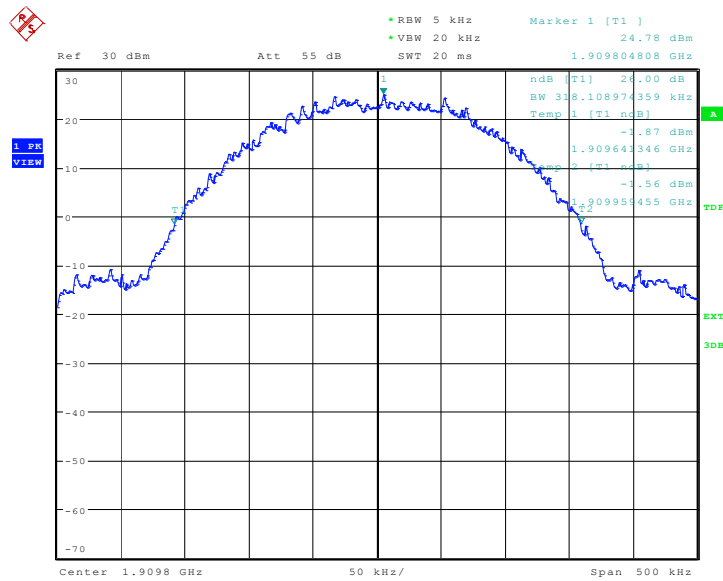
Date: 4.SEP.2017 11:17:23

EGPRS 1900-8PSK

Frequency(MHz)	Emission Bandwidth(kHz)
1850.2	310.10
1880.0	311.70
1909.8	308.49

EGPRS 1900-8PSK

Channel 512-Emission Bandwidth

Date: 4.SEP.2017 12:30:25

Channel 661-Emission Bandwidth

Date: 4.SEP.2017 12:31:32

Channel 810-Emission Bandwidth

Date: 4.SEP.2017 12:32:39

A.5 BAND EDGE COMPLIANCE

Reference
FCC: CFR Part 22.917(b), 24.238(a)

Measurement limit
On any frequency outside frequency band of the US Cellular/PCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log (P) dB.

According to KDB 971168, a relaxation of the reference bandwidth is often provided for measurements within a specified frequency range at the edge of the authorized frequency block/band. This is often implemented by permitting the use of a narrower RBW (typically limited to a minimum RBW of 1% of the OBW) for measuring the out-of-band emissions without a requirement to integrate the result over the full reference bandwidth.

GSM 850
LOW BAND EDGE BLOCK-A (GSM850)-Channel 128
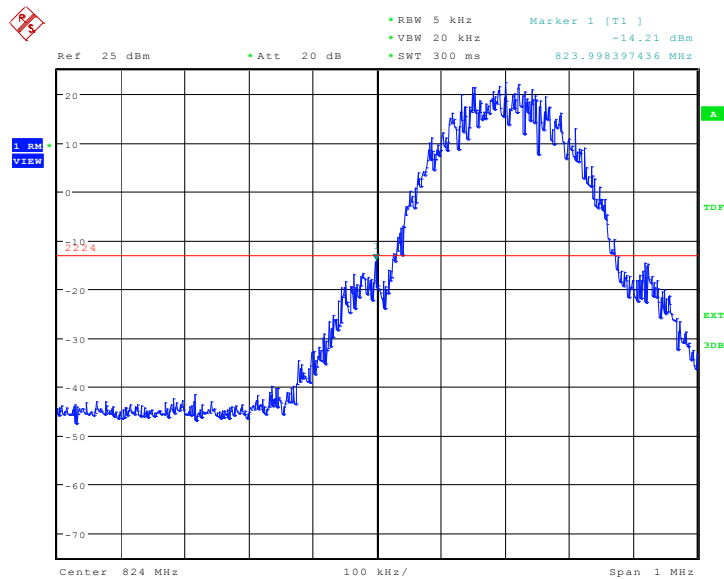
Date: 4.SEP.2017 10:12:29
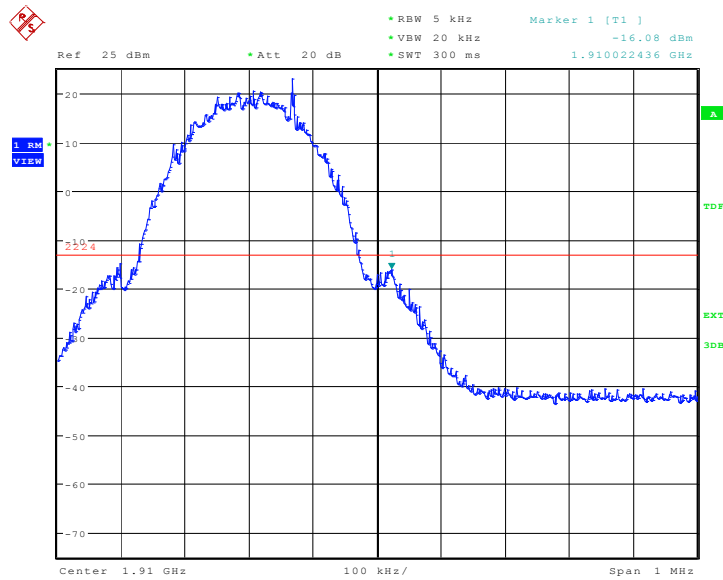
HIGH BAND EDGE BLOCK-C (GSM850) –Channel 251

```
                                       • RBW  5 kHz      Marker 1 [T1 ]
                                       • VBW  20 kHz              -13.30 dBm
        Ref   25 dBm      • Att  20 dB  • SWT 300 ms      849.020833333 MHz
```

```
Center  849 MHz           100 kHz/                    Span  1 MHz
```
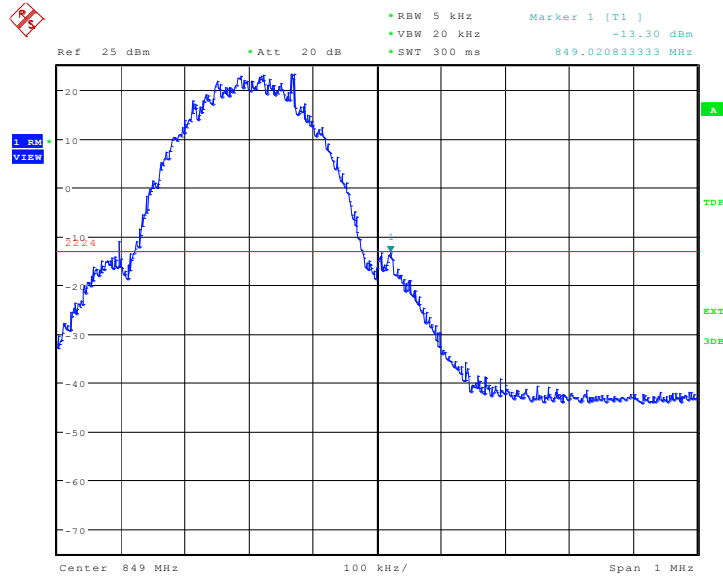
Date: 4.SEP.2017 10:14:33

GPRS 850

LOW BAND EDGE BLOCK-A (GSM850)-Channel 128
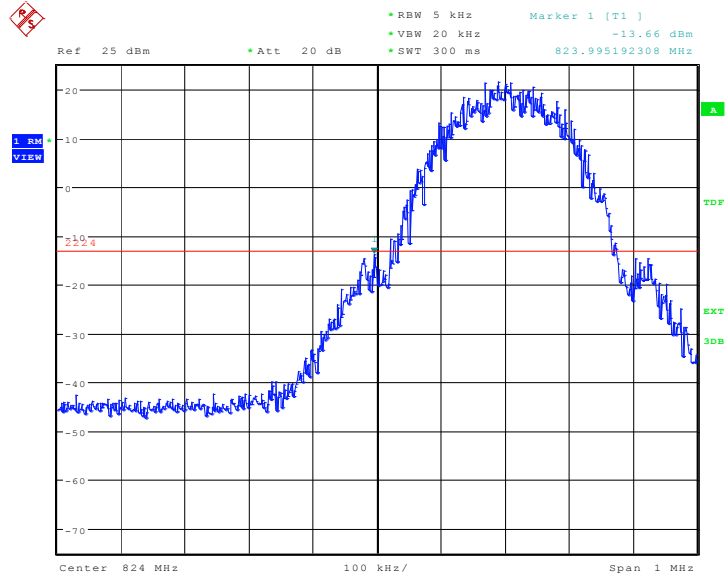
Date: 4.SEP.2017 11:05:54

HIGH BAND EDGE BLOCK-C (GSM850) –Channel 251
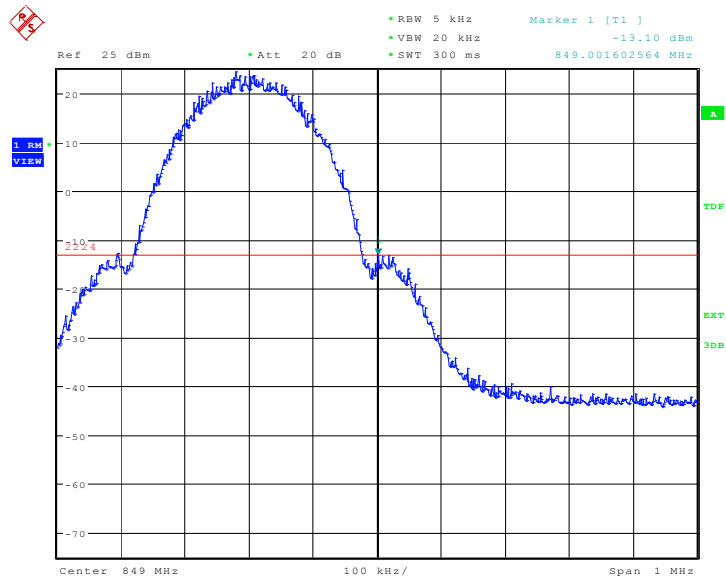
Date: 4.SEP.2017 11:07:58

EGPRS 850-8PSK

LOW BAND EDGE BLOCK-A (GSM850)-Channel 128
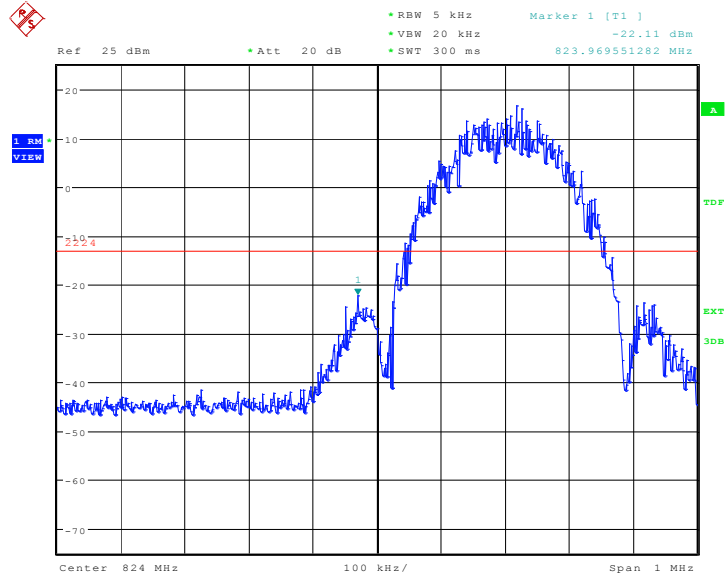
Date: 4.SEP.2017 11:51:36

HIGH BAND EDGE BLOCK-C (GSM850) –Channel 251
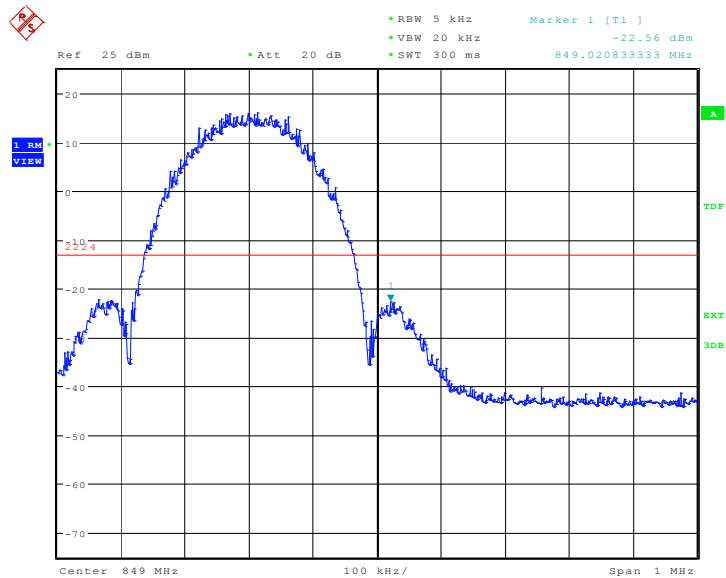
Date: 4.SEP.2017 11:53:39

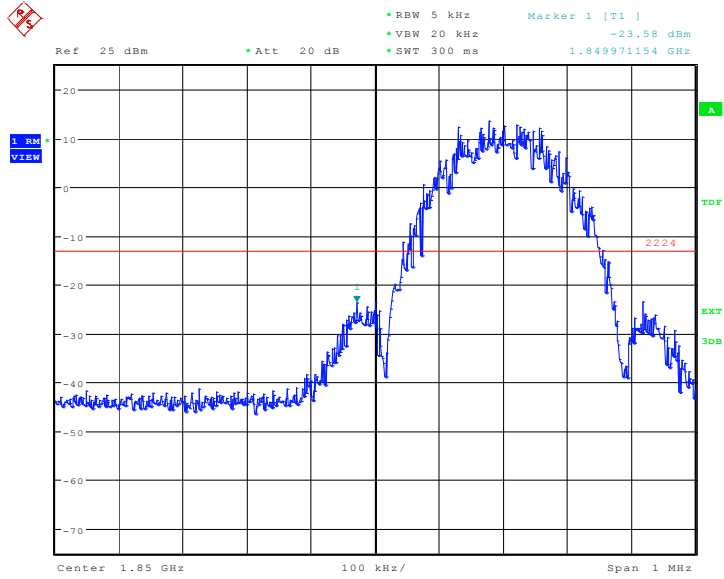**PCS 1900**
LOW BAND EDGE BLOCK-A (PCS-1900)-Channel 512
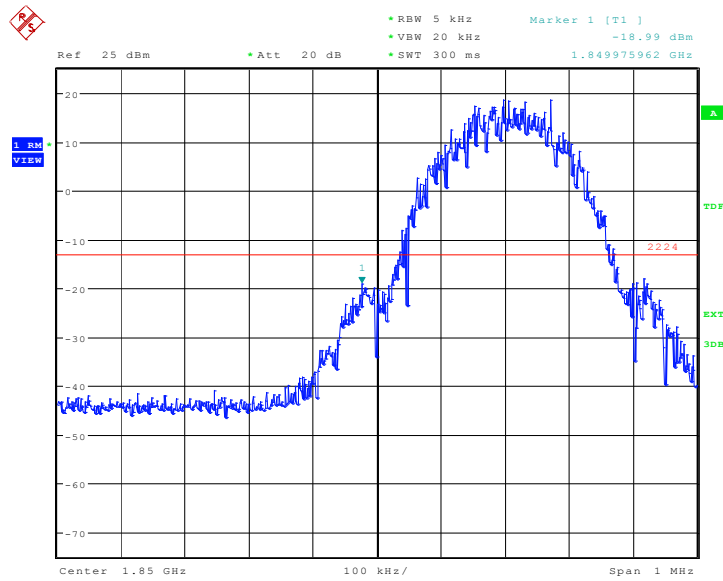
Date: 4.SEP.2017 10:22:25

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

Date: 4.SEP.2017 10:24:28

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


```
                                    * RBW  5 kHz      Marker 1 [T1 ]
                                    * VBW  20 kHz           -17.92 dBm
Ref   25 dBm      * Att  20 dB      * SWT 300 ms      1.849980769 GHz
```
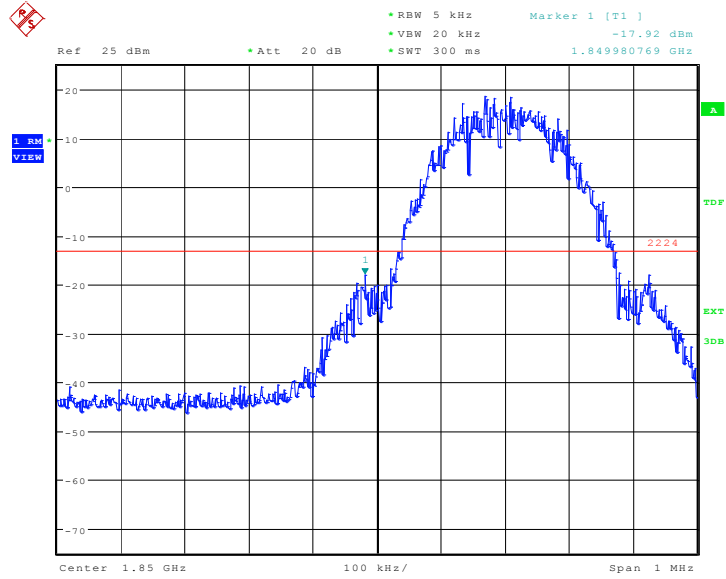
Date: 4.SEP.2017 11:17:33

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


```
                                    * RBW  5 kHz      Marker 1 [T1 ]
                                    * VBW  20 kHz           -16.62 dBm
Ref   25 dBm      * Att  20 dB      * SWT 300 ms      1.910001603 GHz
```
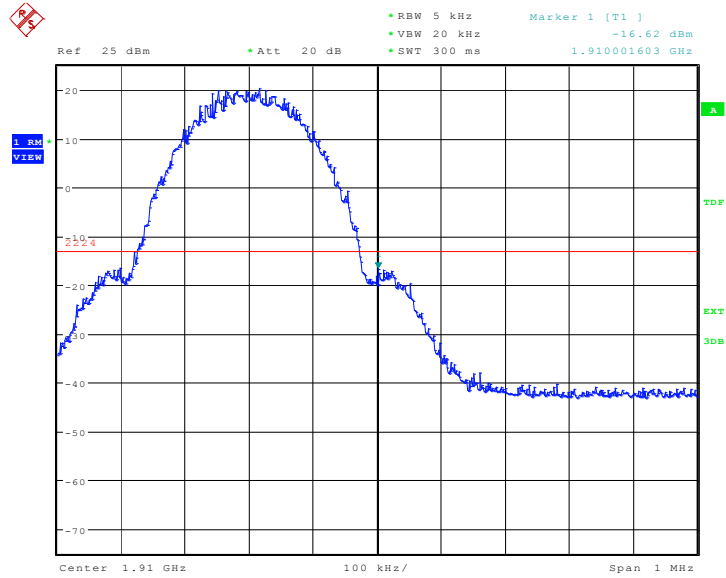
Date: 4.SEP.2017 11:19:36

EGPRS 1900-8PSK

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


```
                                    * RBW  5 kHz      Marker 1 [T1 ]
                                    * VBW  20 kHz           -23.58 dBm
   Ref   25 dBm    * Att  20 dB     * SWT 300 ms       1.849971154 GHz
```

Date: 4.SEP.2017 12:32:48

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


```
                                    * RBW  5 kHz      Marker 1 [T1 ]
                                    * VBW  20 kHz           -20.52 dBm
   Ref   25 dBm    * Att  20 dB     * SWT 300 ms       1.910012821 GHz
```
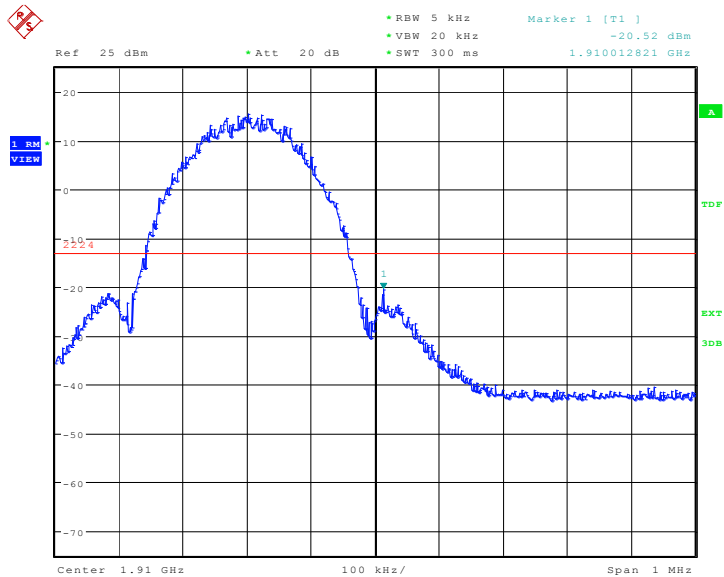
Date: 4.SEP.2017 12:34:52

A.6 CONDUCTED SPURIOUS EMISSION

Reference

FCC: CFR Part 2.1057, 22.917, 24.238.

A.6.1 Measurement Method

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

1. Determine frequency range for measurements: From CFR 2.1057 the spectrum should be investigated from the lowest radio frequency generated in the equipment up to at least the 10th harmonic of the carrier frequency. For the mobile station equipment tested, this equates to a frequency range of 13 MHz to 9 GHz, data taken from 10 MHz to 25 GHz.
2. Determine EUT transmit frequencies: below outlines the band edge frequencies pertinent to conducted emissions testing.
3. According to KDB 971168, the applicable rule part specifies the reference bandwidth for measuring unwanted emission levels (typically, 100 kHz if the authorized frequency band/block is at or below 1 GHz and 1 MHz if the authorized frequency band/block is above 1 GHz)

GSM850 Transmitter

Channel	Frequency (MHz)
128	824.2
190	836.6
251	848.8

PCS1900 Transmitter

Channel	Frequency (MHz)
512	1850.2
661	1880.0
810	1909.8

A. 6.2 Measurement Limit

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

The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.
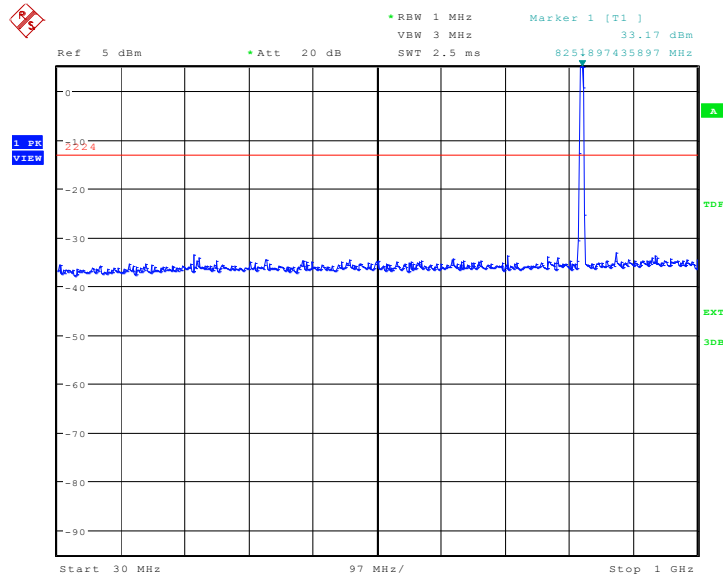
A.6.3 Measurement result

GSM850

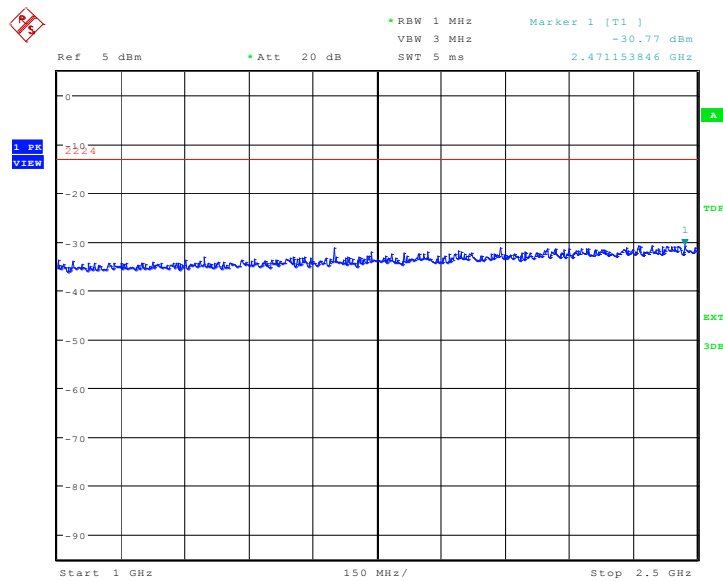**Channel 128: 30MHz – 1GHz**

Spurious emission limit –13dBm.

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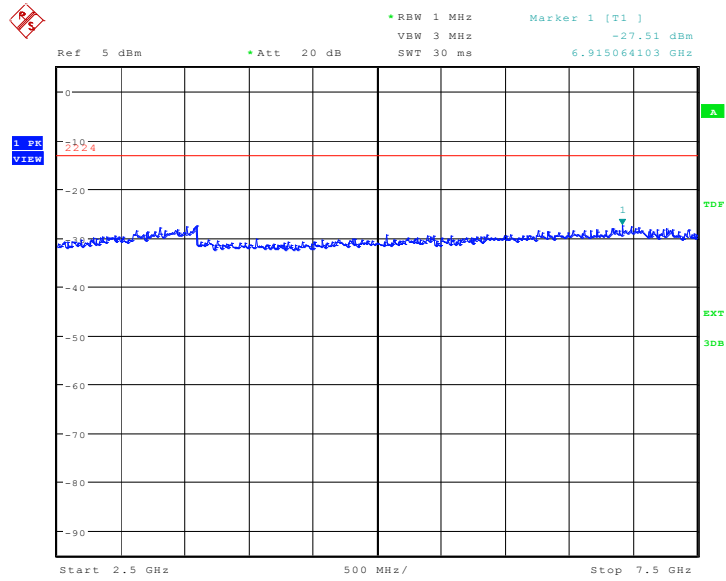

Date: 4.SEP.2017 09:40:05

Channel 128: 1GHz – 2.5GHz

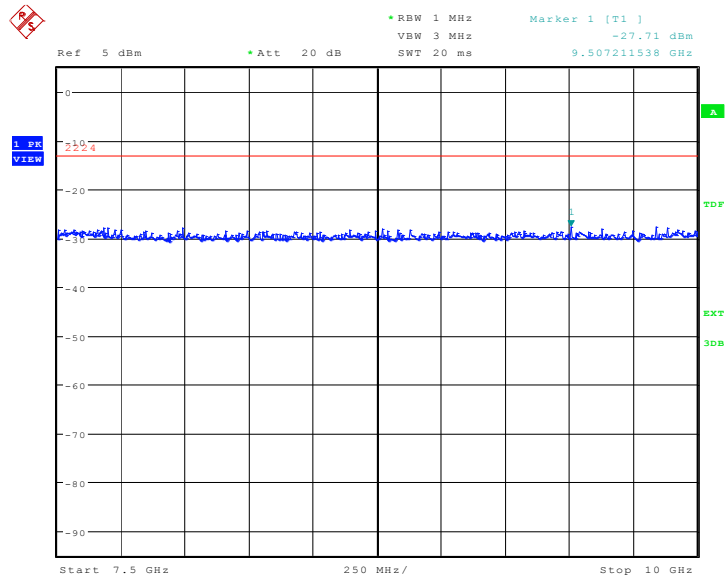Spurious emission limit –13dBm.

Date: 4.SEP.2017 09:40:33

Channel 128: 2.5GHz – 7.5GHz

Spurious emission limit –13dBm.

Date: 4.SEP.2017 09:41:01

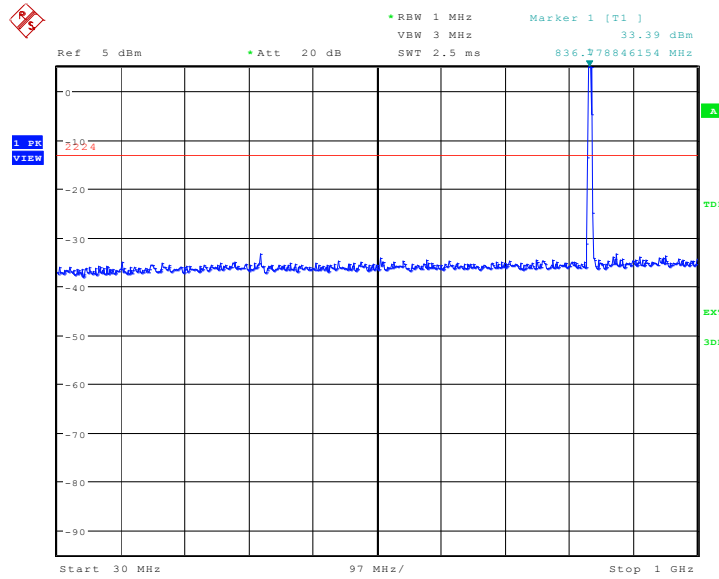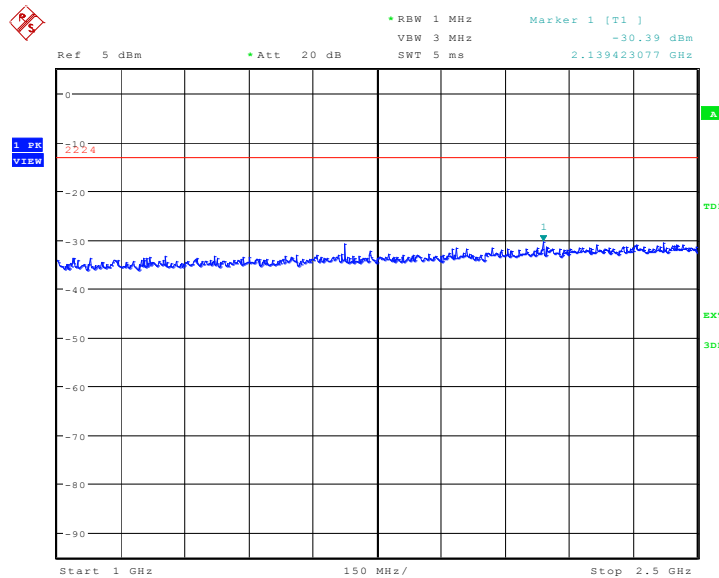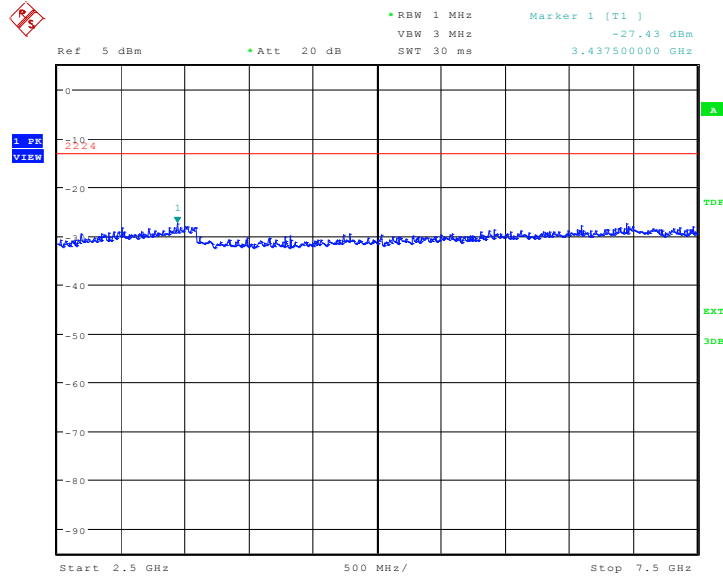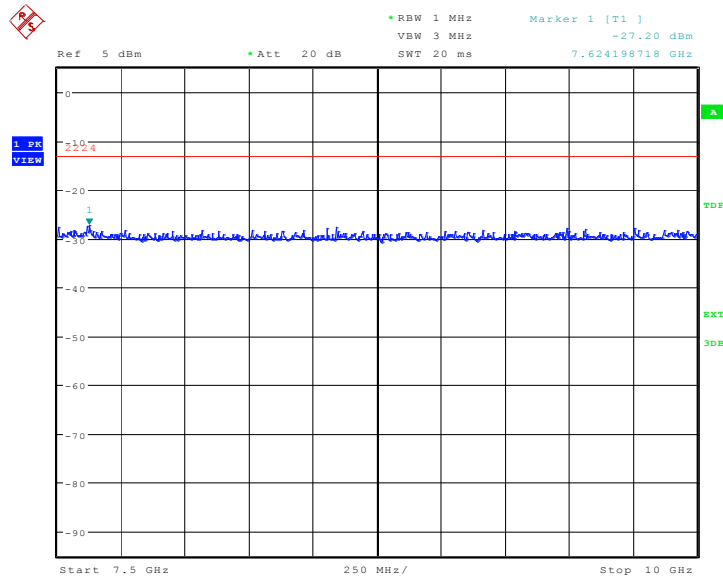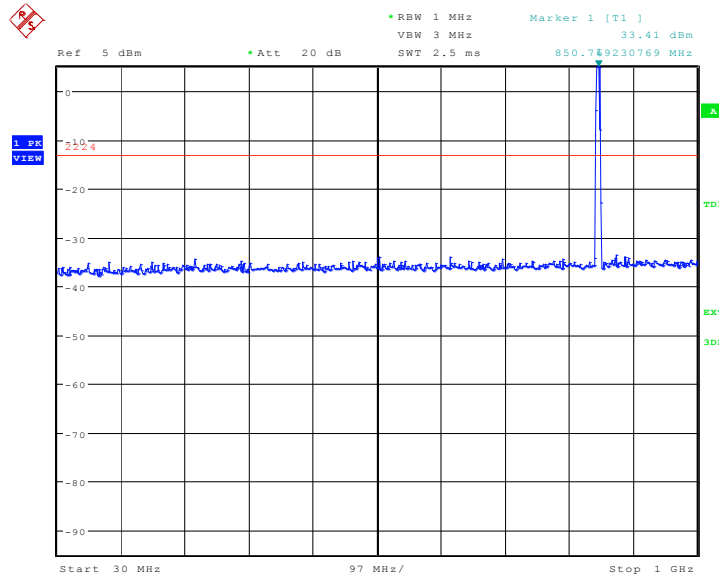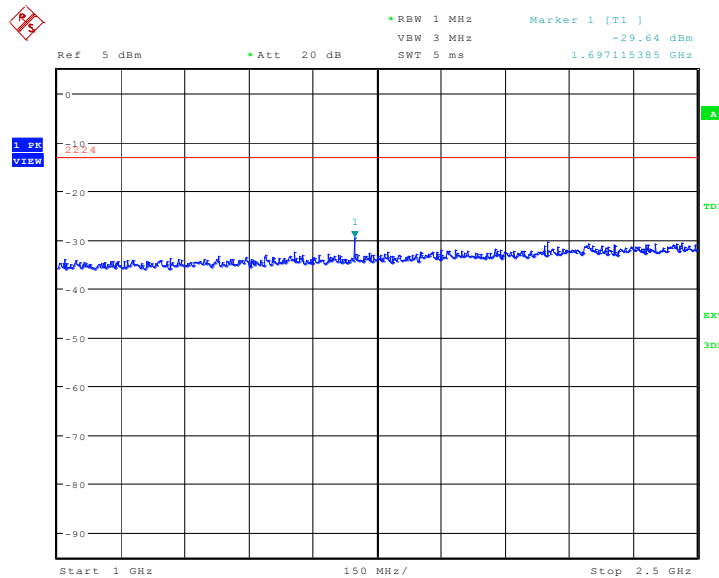## Channel 128: 7.5GHz –10GHz

Spurious emission limit –13dBm.

Date: 4.SEP.2017 09:41:30

Channel 190: 30MHz – 1GHz

Spurious emission limit –13dBm

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


```
R&S                                    * RBW 1 MHz        Marker 1 [T1 ]
                                         VBW 3 MHz                33.39 dBm
              Ref  5 dBm    * Att  20 dB  SWT 2.5 ms      836.178846154 MHz
```

Date: 4.SEP.2017 09:41:59

Channel 190: 1GHz –2.5GHz

Spurious emission limit –13dBm


```
R&S                                    * RBW 1 MHz        Marker 1 [T1 ]
                                         VBW 3 MHz                -30.39 dBm
              Ref  5 dBm    * Att  20 dB  SWT 5 ms        2.139423077 GHz
```

Date: 4.SEP.2017 09:42:27

Channel 190: 2.5GHz –7.5GHz

Spurious emission limit –13dBm

Date: 4.SEP.2017 09:42:55

Channel 190: 7.5GHz –10GHz

Spurious emission limit –13dBm

Date: 4.SEP.2017 09:43:24

Channel 251: 30MHz – 1GHz

Spurious emission limit –13dBm.

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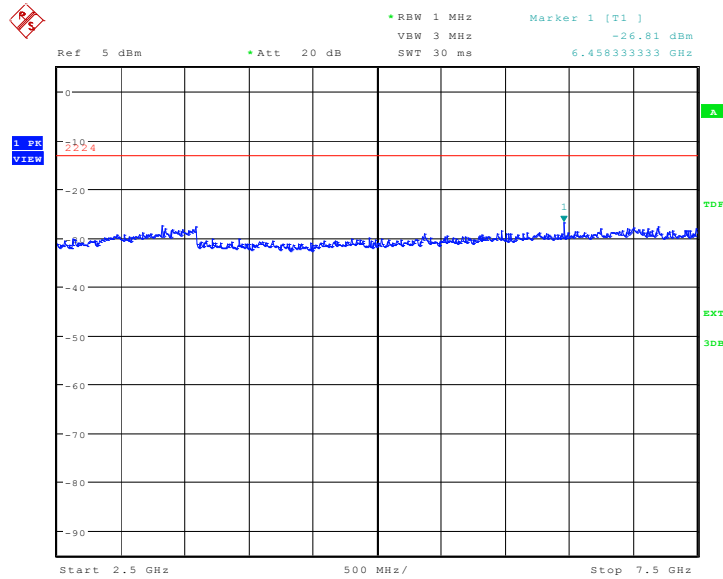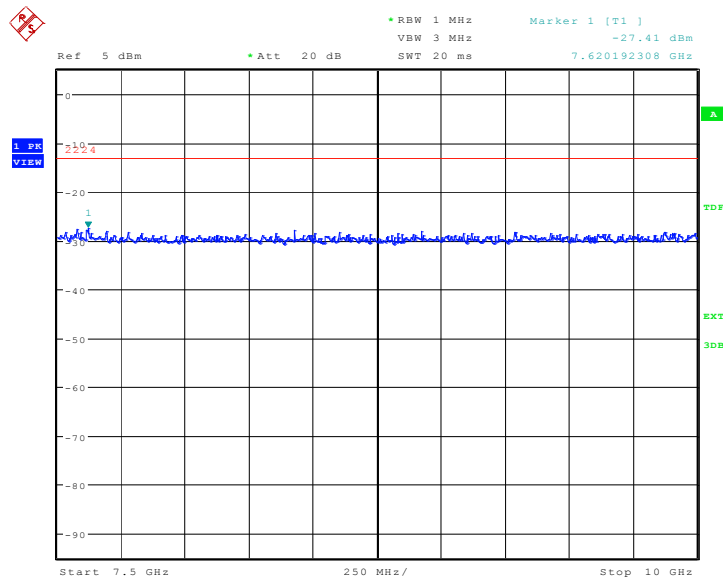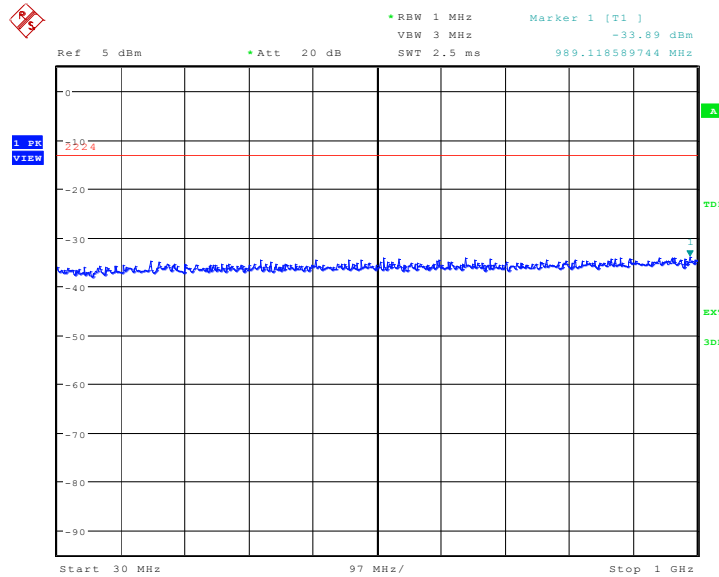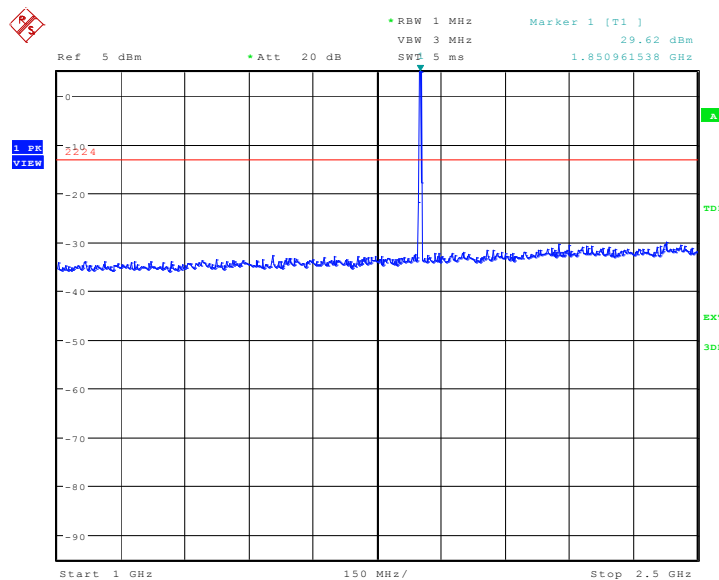

Date: 4.SEP.2017 09:43:53

Channel 251: 1GHz – 2.5GHz

Spurious emission limit –13dBm.

Date: 4.SEP.2017 09:44:21

Channel 251:2.5GHz – 7.5GHz

Spurious emission limit –13dBm.

Date: 4.SEP.2017 09:44:49

Channel 251: 7.5GHz – 10GHz

Spurious emission limit –13dBm.

Date: 4.SEP.2017 09:45:17

PCS1900

Channel 512: 30MHz – 1GHz

Spurious emission limit –13dBm.

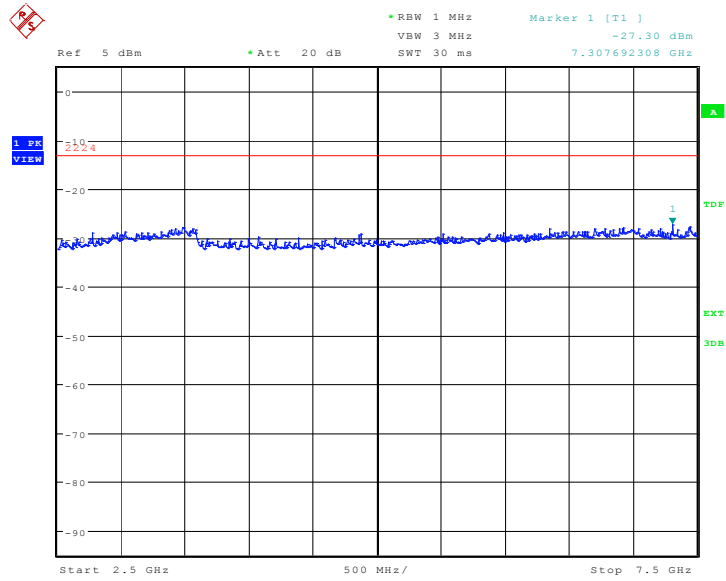Date: 4.SEP.2017 10:26:55

Channel 512: 1GHz – 2.5GHz

Spurious emission limit –13dBm.

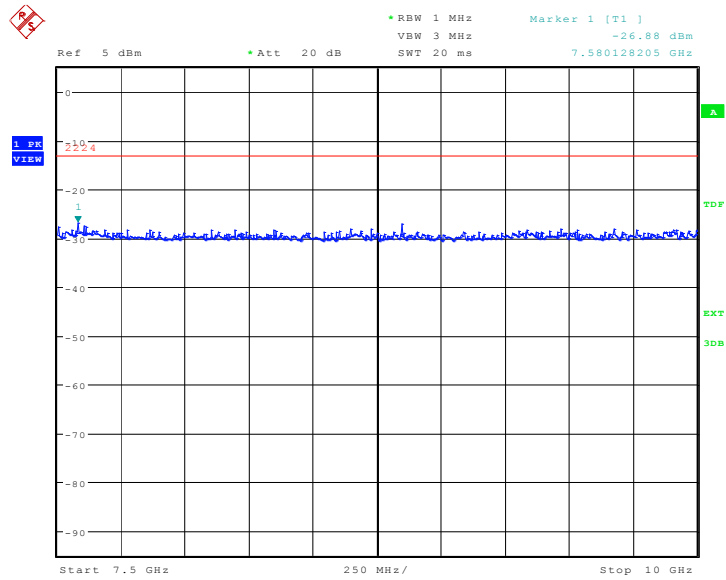**NOTE: peak above the limit line is the carrier frequency.**

Date: 4.SEP.2017 10:27:23

Channel 512: 2.5GHz – 7.5GHz
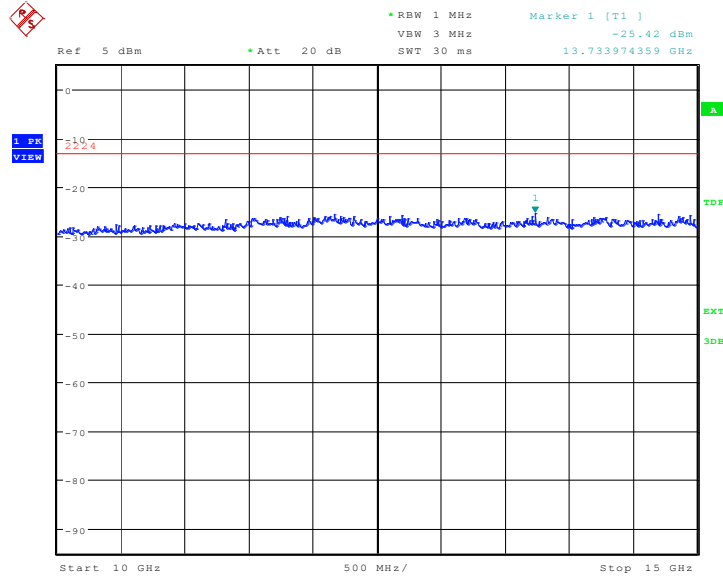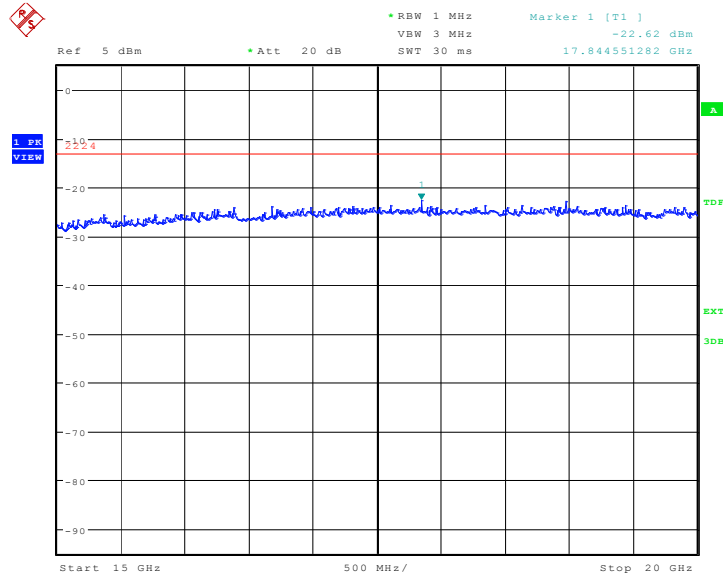
Spurious emission limit –13dBm.

```
                                    *RBW  1 MHz        Marker 1 [T1 ]
                                     VBW  3 MHz            -27.30 dBm
          Ref  5 dBm      *Att  20 dB    SWT 30 ms       7.307692308 GHz
```



```
Date: 4.SEP.2017  10:27:51
```

Channel 512: 7.5GHz –10GHz

Spurious emission limit –13dBm.

```
                                    *RBW  1 MHz        Marker 1 [T1 ]
                                     VBW  3 MHz            -26.88 dBm
          Ref  5 dBm      *Att  20 dB    SWT 20 ms       7.580128205 GHz
```



```
Date: 4.SEP.2017  10:28:19
```

Channel 512: 10GHz –15GHz

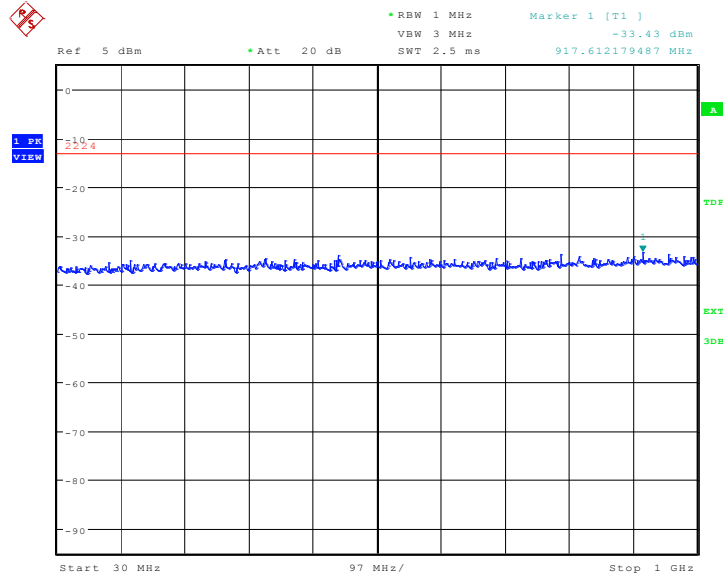Spurious emission limit –13dBm.

Date: 4.SEP.2017 10:28:47

Channel 512: 15GHz –20GHz

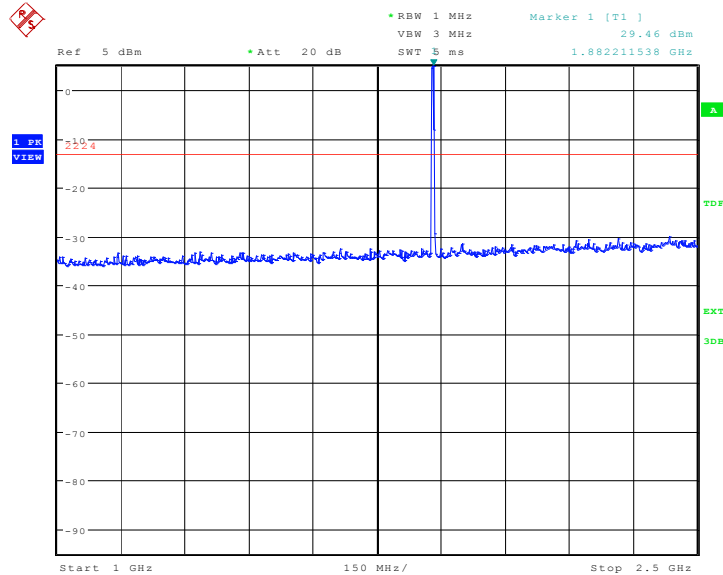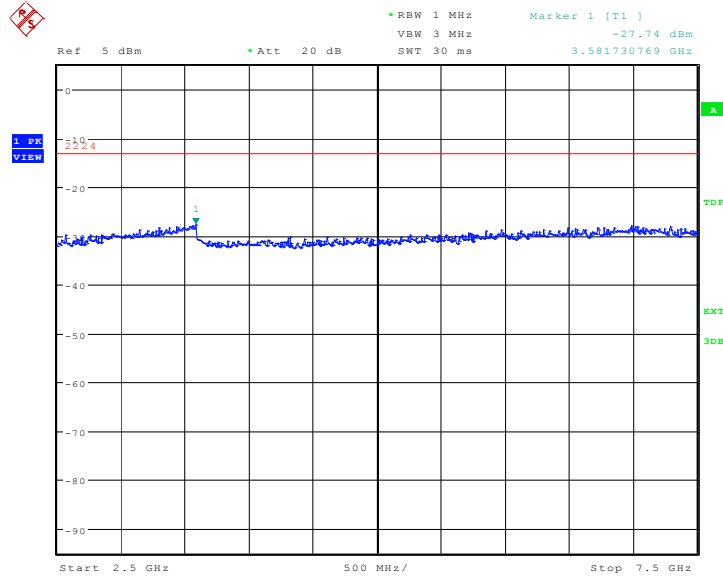Spurious emission limit –13dBm.

Date: 4.SEP.2017 10:29:16

Channel 661: 30MHz – 1GHz

Spurious emission limit –13dBm

Channel 661: 1GHz –2.5GHz

Spurious emission limit –13dBm
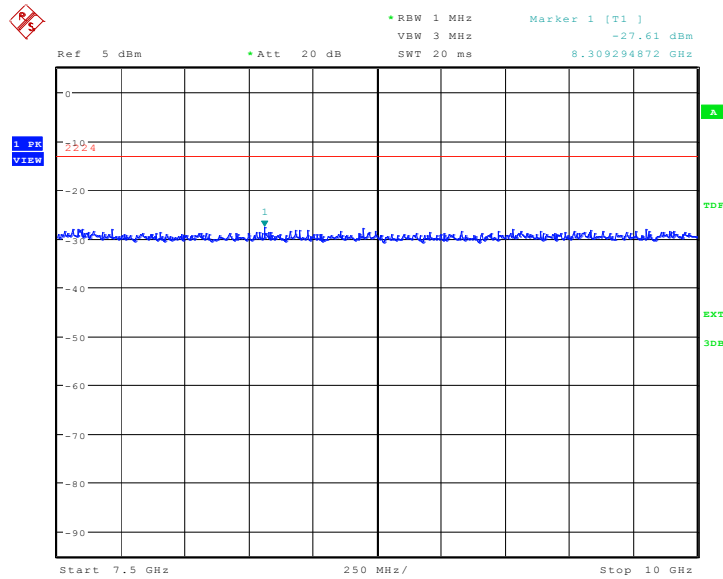
NOTE: peak above the limit line is the carrier frequency.

Channel 661: 2.5GHz –7.5GHz
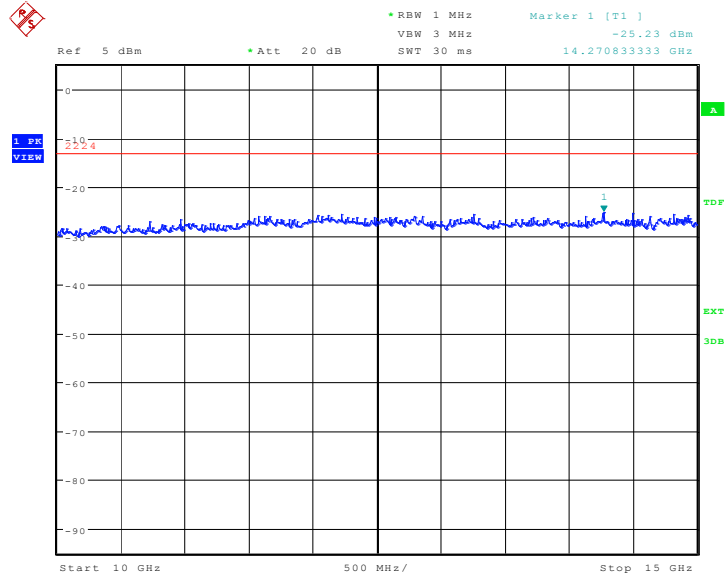
Spurious emission limit –13dBm

Date: 4.SEP.2017 10:30:40

Channel 661: 7.5GHz –10GHz
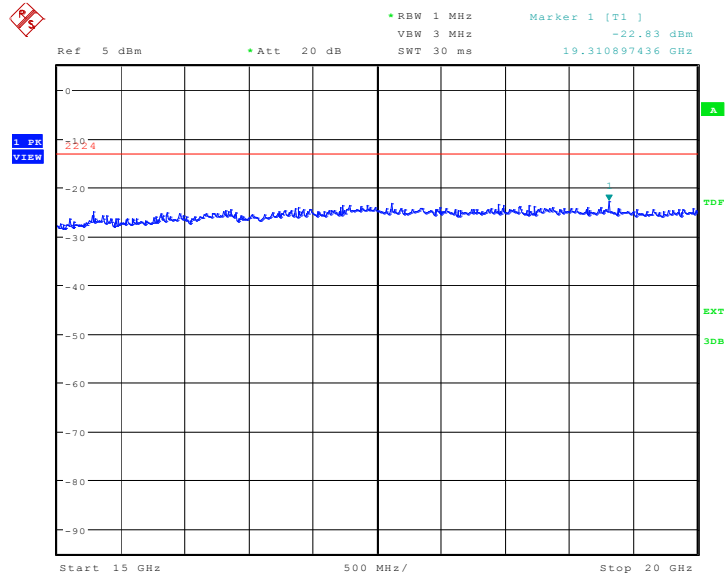
Spurious emission limit –13dBm

Date: 4.SEP.2017 10:31:08

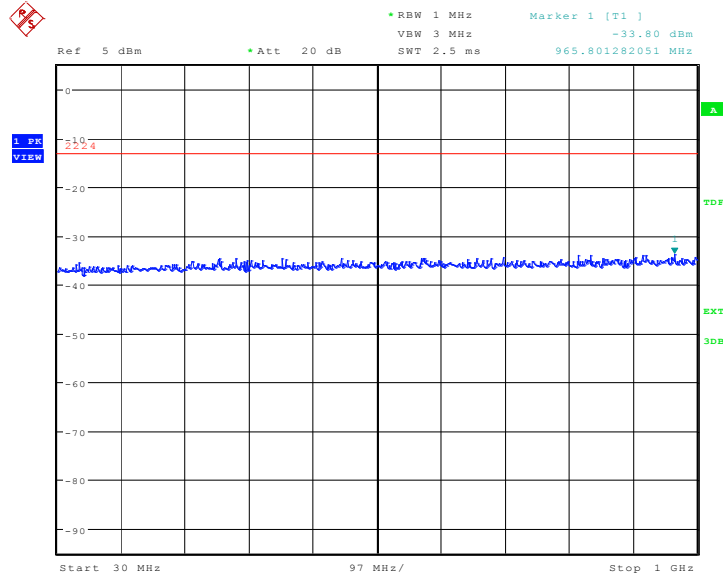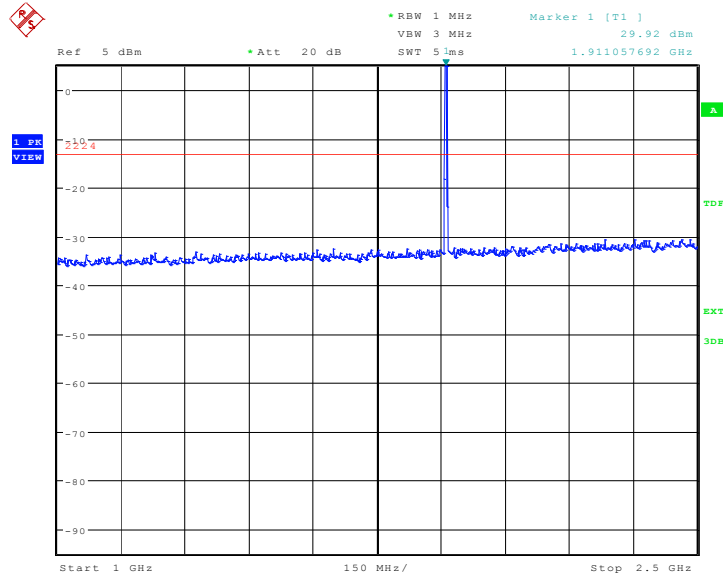## Channel 661: 10GHz –15GHz

Spurious emission limit –13dBm.


```
                                         *RBW  1 MHz      Marker 1 [T1 ]
                                          VBW  3 MHz            -25.23 dBm
        Ref   5 dBm        *Att  20 dB    SWT  30 ms       14.270833333 GHz
```

Date: 4.SEP.2017 10:31:37

Channel 661: 15GHz –20GHz

Spurious emission limit –13dBm.


```
                                         *RBW  1 MHz      Marker 1 [T1 ]
                                          VBW  3 MHz            -22.83 dBm
        Ref   5 dBm        *Att  20 dB    SWT  30 ms       19.310897436 GHz
```

Date: 4.SEP.2017 10:32:05

Channel 810: 30MHz – 1GHz

Spurious emission limit –13dBm.

```
                                          *RBW  1 MHz        Marker 1 [T1 ]
                                           VBW  3 MHz            -33.80 dBm
         Ref   5 dBm        *Att  20 dB    SWT  2.5 ms       965.801282051 MHz
```

```
   0

  -10
  2224

  -20

  -30

  -40

  -50

  -60

  -70

  -80

  -90

 Start  30 MHz              97 MHz/               Stop  1 GHz
```

Date: 4.SEP.2017 10:32:33

Channel 810: 1GHz – 2.5GHz

Spurious emission limit –13dBm.

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

```
                                          *RBW  1 MHz        Marker 1 [T1 ]
                                           VBW  3 MHz             29.92 dBm
         Ref   5 dBm        *Att  20 dB    SWT  5 ms        1.911057692 GHz
```

```
   0

  -10
  2224

  -20

  -30

  -40

  -50

  -60

  -70

  -80

  -90

 Start  1 GHz               150 MHz/              Stop  2.5 GHz
```

Date: 4.SEP.2017 10:33:01

Channel 810:2.5GHz – 7.5GHz

Spurious emission limit –13dBm.

Date: 4.SEP.2017 10:33:30

Channel 810: 7.5GHz – 10GHz
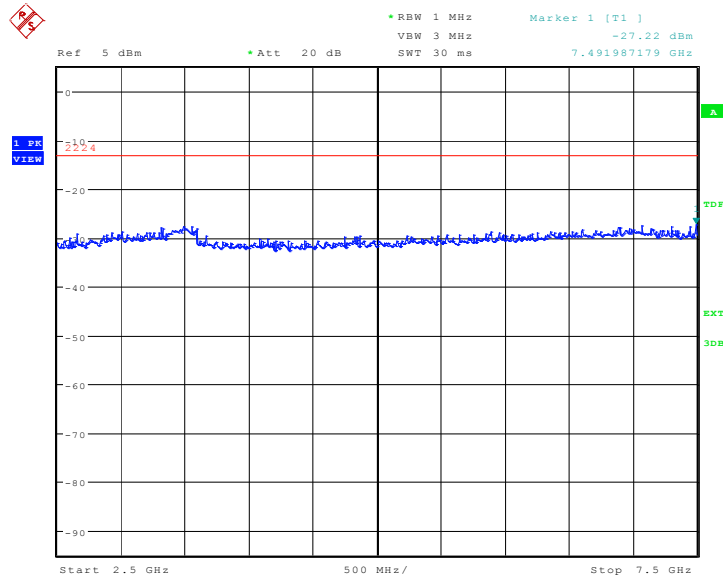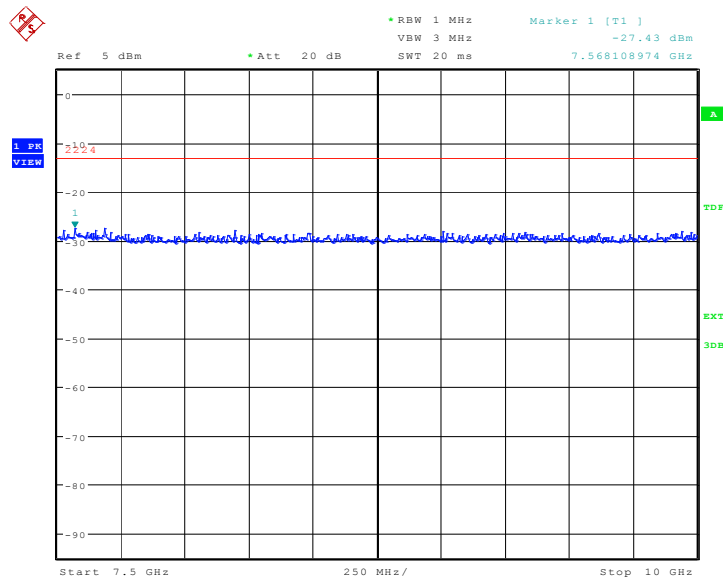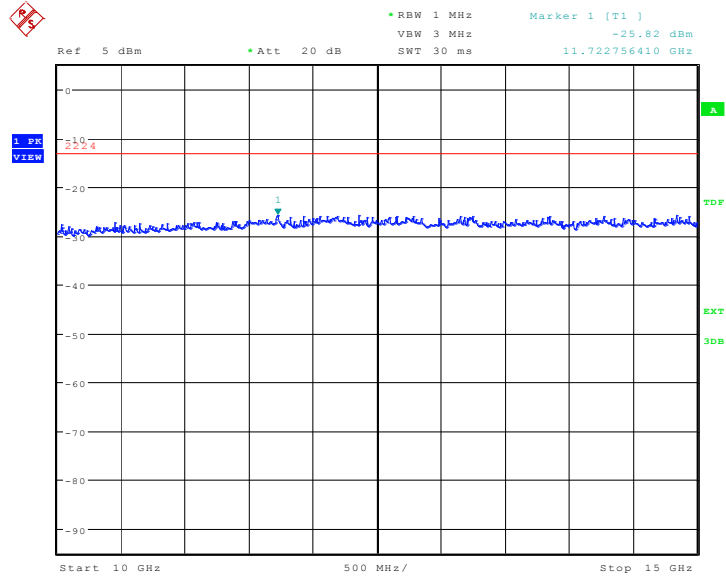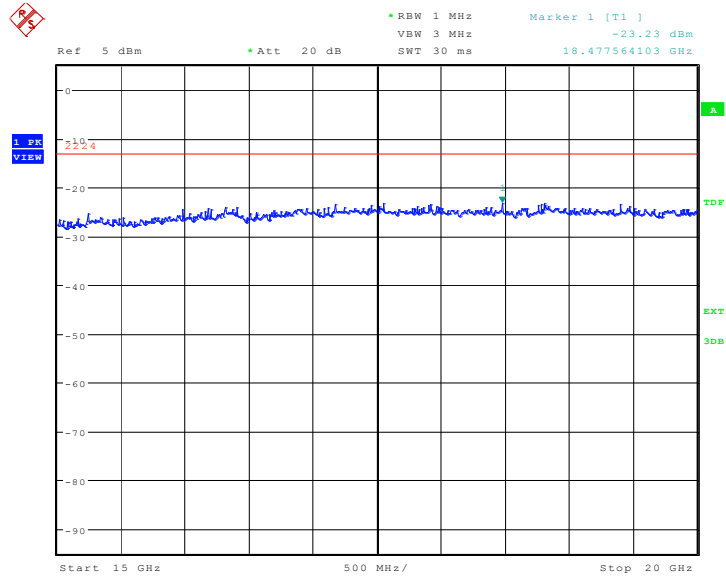
Spurious emission limit –13dBm.

Date: 4.SEP.2017 10:33:58

Channel 810: 10GHz –15GHz

Spurious emission limit –13dBm.

Date: 4.SEP.2017 10:34:26

Channel 810: 15GHz –20GHz

Spurious emission limit –13dBm.

Date: 4.SEP.2017 10:34:54

ANNEX B: Accreditation Certificate

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 600118-0

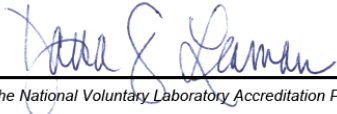### Telecommunication Technology Labs, CAICT
Beijing
China

is accredited by the National Voluntary Laboratory Accreditation Program for specific services,
listed on the Scope of Accreditation, for:

Electromagnetic Compatibility & Telecommunications

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005.
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality
management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).

2016-09-29 through 2017-09-30
Effective Dates

For the National Voluntary Laboratory Accreditation Program

END OF REPORT