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1 Cover Page

RF TEST REPORT

Application No.:	SHEM1406001380RF
Applicant:	Medical Alarm Concepts Holdings Inc
FCC ID:	XWI-CS2992014
Equipment Under Test (EUT): **NOTE:** The following sample(s) submitted was/were identified on behalf of the client as	
Product Name:	iHelp
Model No.(EUT):	CS299B-A
Added Model No.	CS299BA-A, CS299BA-B, CS299BA-C, CS299BA-D, CS299EA-A, CS299EA-B, CS299EA-C, CS299EA-D, CS299B-B, CS299B-C, CS299B-D, CS299E-A, CS299E-B, CS299E-C, CS299E-D
Standards:	47 CFR Part 22 Subpart H: 2013 47 CFR Part 24 Subpart E: 2013
Date of Receipt:	June 12, 2014
Date of Test:	July 04, 2014 to July 09, 2014
Date of Issue:	October 10, 2013
Test Result:	**Pass***

* In the configuration tested, the EUT (Equipment under test) complied with the standards specified above.

Tony Wu

E&E Section Manager

SGS-CSTC (Shanghai) Co., Ltd.

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

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2 Version

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
00		October 15, 2014		Original

Authorized for issue by:				
Engineer		Eddy Zong **Print Name**		Eddy Zong
Clerk		Susie Liu **Print Name**		Susie Liu
Reviewer		Keny Xu **Print Name**		Keny.xu

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3 Test Summary

Test Item	FCC Requirement	Test method	Result
Output Power	Part 22.913(a)/24.232(c)	TIA-603-C Clause 2.2.1/2.2.17	PASS
Peak-to-Average Ratio	Part24.232(d)	KDB 971168 D01	PASS
Occupied Bandwidth	Part 2.1049(h)(i)	Part 22.917(b)/24.238(b)	PASS
Band Edge	Part 22.917(b)/24.238(b)	TIA-603-C Clause 2.2.12	PASS
Conducted Spurious Emission	Part 2.1057/22.917/ 24.238(b)	TIA-603-C Clause 2.2.13	PASS
Radiation Emission	Part 2.1051/22.917/24.238	TIA-603-C Clause 2.2.12	PASS
Frequency Stability	Part 2.1055/22.355/24.235	TIA-603-C Clause 2.2.2	PASS

Note: There are 16 models mentioned in the report. The electrical circuit design, PCB layout, electrical components used and internal wiring are identical, only differences are software vision and types of the speakers. The details please refer to the document “Declaration Letter about Identity of Products”

CS299B-A is tested model which can send or receive a calling and SMS, it send the data to service with GPRS and can set by computer

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5 General Information

5.1 Client Information

Applicant:	Medical Alarm Concepts Holdings Inc
Address of Applicant:	200 B West Church Road King of Prussia, PA 19406
Manufacturer:	Xi'an iHelp Wearable Electronic Co., Ltd
Address of Manufacturer:	#2 Innovate business apartment, Pioneering Development Park #69 Jinye Road, Xi'an Hi-Tech Deveopment Zone Xin'an Shanxi Province China
Factory:	Xi'an iHelp Wearable Electronic Co., Ltd
Address of Factory:	#2 Innovate business apartment, Pioneering Development Park #69 Jinye Road, Xi'an Hi-Tech Deveopment Zone Xin'an Shanxi Province China

5.2 General Description of EUT

Product Description:	Mobile Phone	
Software Version:	V 3.0	
Hardware Version:	V 2.03	
IMEI:	8660340200000024	
Battery:	Battery Type:	Li-on Rechargeable Battery
	Model No.:	BL-5C
	Technical Spec.:	DC 3.7V 1100mAh
	Remark: Supply the EUT with a fully charged battery during the testing.	
Adapter:	Model No.:	PL050060
	Rated Input:	AC 100V-250V 47-63Hz 400mA
	Rated Output:	DC5.0-5.3V 0.6A
	Cable length:	AC port: 2 wires
		DC port: 100 cm

5.3 Technical Specifications

Operation Frequency:	GSM 850:	Uplink:	824~849 MHz
		Downlink:	869~894 MHz
	DCS 1900:	Uplink:	1850~1915 MHz
		Downlink:	1930~1990 MHz
Modulation Technique:	GMSK		
GPRS Class:	10		
Release Vision	R99		
Antenna Type:	PCB Antenna		
Antenna Gain:	0 dBi		

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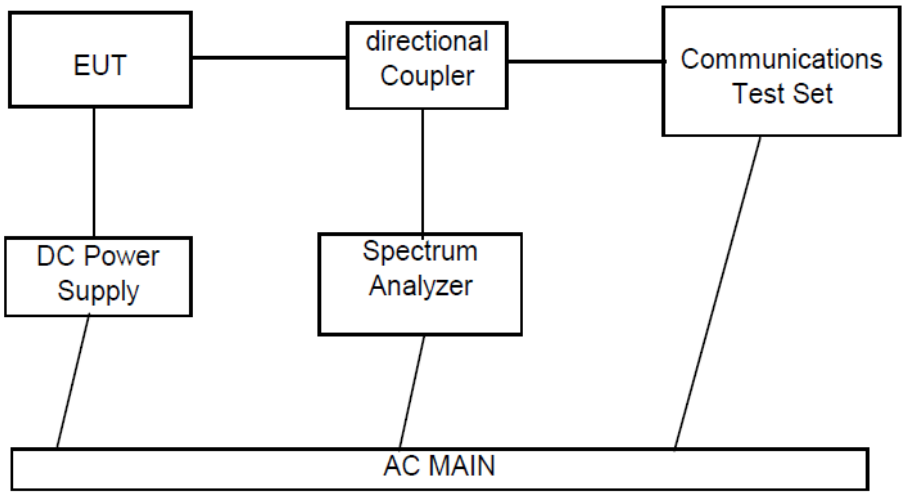
5.4 Test Mode

Test Mode	Description of Test Mode
GSM speech mode	The EUT is connected with CMU200. The EUT is commanded to operate at maximum transmitting power. A GSM talking link has been established.
GPRS data communication mode	The EUT is connected with CMU200. The EUT is commanded to operate at maximum transmitting power. A data communication link has been established.

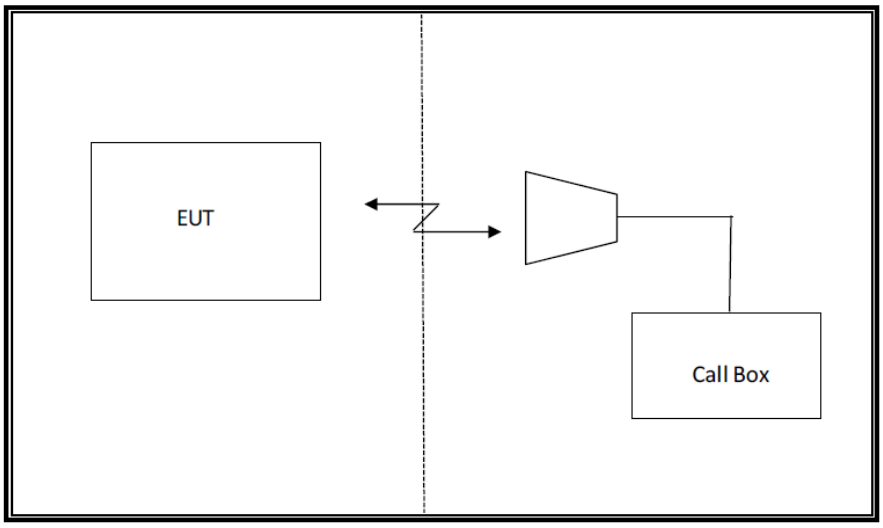
5.5 Description of Support Units

The EUT has been tested independently.

a. Setup Diagram for Conducted Tests:



b. Setup Diagram for Radiated Tests:



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5.6 E.U.T Operation Environment

Temperature Range: 20-25°C
Humidity Range: 30-60% RH
Atmospheric Pressure Range: 100-102kPa

5.7 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

No.588 West Jindu Road, Songjiang District, Shanghai, China.201612.

Tel: +86 21 6191 5666

Fax: +86 21 6191 5678

5.8 Test Facility

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

- **CNAS (No. CNAS L0599)**

  CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing. Date of expiry: 2014-07-26.

- **FCC – Registration No.: 402683**

  SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered and fully described in a report filed with the Federal Communications Commission (FCC). The acceptance letter from the FCC is maintained in our files. Registration No.: 402683, Expiry Date: 2015-02-22.

- **Industry Canada (IC) – IC Assigned Code: 8617A**

  The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A-1. Expiry Date: 2017-06-18.

- **VCCI (Member No.: 3061)**

  The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-3868 and C-4336 respectively. Date of Registration: 2012-05-29. Date of Expiry: 2015-05-28.

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5.9 Measurement Uncertainty

No.	Parameter	Measurement Uncertainty
1	Radio Frequency	< ±1 x 10^{-5}
2	Total RF power, conducted	< ±1.5 dB
3	RF power density, conducted	< ±3 dB
4	Spurious emissions, conducted	< ±3 dB
5	All emissions, radiated	< ±6 dB (30MHz – 1GHz) < ±6 dB (above 1GHz)
6	Temperature	< ±1°C
7	Humidity	< ±5 %
8	DC and low frequency voltages	< ±3 %

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6 Equipments Used during Test

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due date
1	EMI test receiver	Rohde & Schwarz	ESCS30	100086	2014-02-14	2015-02-13
2	Line impedance stabilization network	SCHWARZBECK	NSLK8127	8127-490	2014-02-14	2015-02-13
3	Line impedance stabilization network	ETS	3816/2	00034161	2014-02-14	2015-02-13
4	Spectrum Analyzer	Rohde & Schwarz	FSP-30	2705121009	2014-02-14	2015-02-13
5	EMI test receiver	Rohde & Schwarz	ESU40	100109	2014-02-14	2015-02-13
6	Active Loop Antenna (9kHz to 30MHz)	Rohde & Schwarz	FMZB 1519	1519-034	2014-03-19	2015-03-18
7	Broadband UHF-VHF ANTENNA (25MHz to 2GHz)	SCHWARZBECK	VULB9168	9168-313	2014-02-14	2015-02-13
8	Ultra broadband antenna (25MHz to3GHz)	Rohde & Schwarz	HL562	100227	2013-10-09	2014-10-08
9	Horn Antenna (1GHz to 18GHz)	Rohde & Schwarz	HF906	100284	2014-02-14	2015-02-13
10	Horn Antenna (1GHz to 18GHz)	SCHWARZBECK	BBHA9120D	9120D-679	2014-07-28	2015-07-27
11	Horn Antenna (14GHz to 40GHz)	SCHWARZBECK	BBHA 9170	BBHA9170373	2014-02-14	2015-02-13
12	Pre-amplifier (9KHz – 2GHz)	LNA6900	TESEQ	71033	2014-02-14	2015-02-13
13	Pre-amplifier (1GHz – 26.5GHz)	Rohde & Schwarz	SCU-F0118-G40-BZ4-CSS(F)	10001	2014-02-14	2015-02-13
14	Pre-amplifier (14GHz – 40GHz)	Rohde & Schwarz	SCU-F1840-G35-BZ3-CSS(F)	10001	2014-02-14	2015-02-13
15	Tunable Notch Filter	Wainwright instruments Gmbh	WRCT800.0/8 80.0-0.2/40-5SSK	9	2014-06-02	2015-06-01
16	High pass Filter	FSCW	HP 12/2800-5AA2	19A45-02	2014-06-02	2015-06-01
17	High-low temperature cabinet	Suzhou Zhihe	TL-40	50110050	2014-04-13	2015-04-12
18	AC power stabilizer	WOCEN	6100	51122	2014-06-02	2015-06-01
19	DC power	QJE	QJ30003SII	611145	2014-06-02	2015-06-01
20	UNIVERSAL RADIO COMMUNICATION TESTER	R&S	CMU 200	112012	2013-12-13	2014-12-12

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7 Test Results

7.1 Output Power (ERP/EIRP)

Limit:

Mode	GSM 850(ERP)	PCS1900(EIRP)
Frequency	824 – 849MHz	1850 – 1910MHz
Limit	38.45dBm(7W)	33.00dBm(2W)

Test Setup:

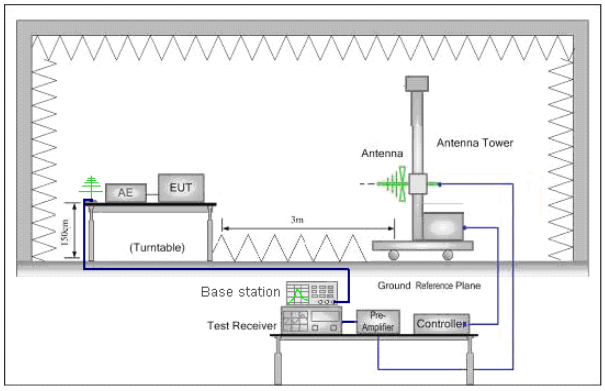

Figure 1. Pre-Calibration

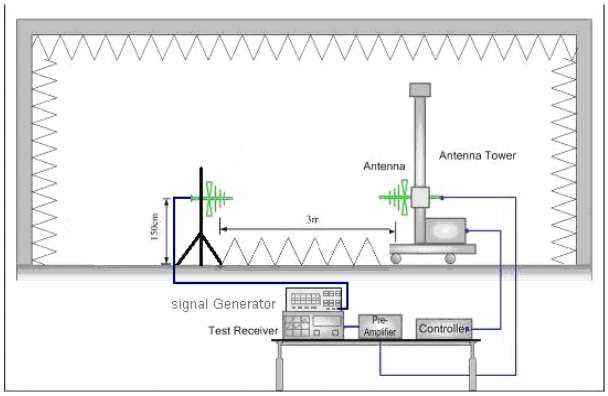

Figure 2.Final Test

Test Procedure:

1) EUT was placed on a 1.5meter high non – conductive table at a 3 meter test distance from the receive antenna. The height of receiving antenna is 1.5 m. The test setup refers to figure 1 above.
2) Detected emissions were maximized at each frequency by rotating the table 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.
3) The EUT is then put into continuously transmitting mode at its maximum power level during the test. And the maximum value of the receiver should be recorded.
4) The EUT shall be replaced by a substitution antenna the test setup refers to figure 2 above.
5) 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 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. The Power of signal source (P_g) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
6) The test results are attain as described below:

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Power(EIRP)=P_g – Cable loss + Antenna Gain

EIRP=ERP+2.15dB

7) The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning with AC/DC adapter which it is worse case, only the test worst case mode is recorded in the report.

8) Repeat above procedures until all frequencies measured was complete.

Receiver Setup: RBW=1MHz, VBW=3MHz

Test Result: Pass

Test Data:

Mode	Freq (MHz)	Channel	Antenna Pol.	S.G. output (dBm)	Antenna Gain (dBi)	Cable loss (dB)	ERP (dBm)	Limit (dBm)	Result
GSM 850	824.20	128	V	25.24	8.40	3.32	28.17	38.45	Pass
			H	24.73	8.40	3.32	27.66		Pass
	836.40	189	V	25.24	8.42	3.40	28.11		Pass
			H	23.78	8.42	3.40	26.65		Pass
	848.80	251	V	**25.63**	**8.47**	**3.43**	**28.52**		Pass
			H	24.89	8.47	3.43	27.78		Pass
GPRS 850	824.20	128	V	23.31	8.40	3.32	26.24		Pass
			H	22.83	8.40	3.32	25.76		Pass
	836.40	189	V	23.58	8.42	3.40	26.45		Pass
			H	22.94	8.42	3.40	25.81		Pass
	848.80	251	V	23.73	8.47	3.43	26.62		Pass
			H	22.94	8.47	3.43	25.83		Pass

Mode	Freq (MHz)	Channel	Antenna Pol.	S.G. output (dBm)	Antenna Gain (dBi)	Cable loss (dB)	EIRP (dBm)	Limit (dBm)	Result
PCS 1900	1850.20	512	V	22.36	9.15	4.15	27.36	33.00	Pass
			H	21.08	9.15	4.15	26.08		Pass
	1880.00	661	V	22.39	9.22	4.28	27.33		Pass
			H	21.86	9.22	4.28	26.80		Pass
	1908.80	810	V	**22.58**	**9.25**	**4.41**	**27.42**		Pass
			H	21.92	9.25	4.41	26.76		Pass
GPRS 1900	1850.20	512	V	22.16	9.15	4.15	27.16		Pass
			H	20.68	9.15	4.15	25.68		Pass
	1880.00	661	V	22.26	9.22	4.28	27.20		Pass
			H	21.32	9.22	4.28	26.26		Pass
	1909.80	810	V	22.48	9.25	4.41	27.32		Pass
			H	21.72	9.25	4.41	26.56		Pass

Remark: ERP=S.G. output + Antenna Gain - Cable loss-2.15
EIRP=S.G. output + Antenna Gain - Cable loss

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7.2 Peak-to-Average Ratio

Limit: <13dB

Test Results: Pass

Test Data:

Band	Frequency (MHz)	Channel	Test Mode	Peak-to-Average Ratio(dB)
GSM850	824.20	128	GSM Only	1.50
			GPRS	2.12
	836.40	189	GSM Only	2.34
			GPRS	1.42
	848.80	251	GSM Only	2.44
			GPRS	2.61
PCS 1900	1850.20	512	GSM Only	3.50
			GPRS	3.21
	1880.00	661	GSM Only	3.50
			GPRS	3.21
	1909.80	810	GSM Only	3.50
			GPRS	3.21

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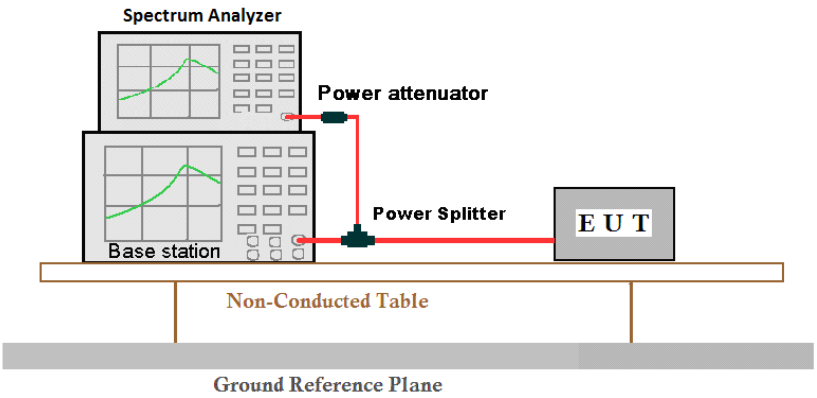
7.3 Occupied Bandwidth

Test Setup:



Test Procedure: The transmitter output was connected to a calibrated coaxial cable, attenuator and Spectrum analyser, the other end of which was connected to a Base Station Simulator. The Base Station Simulator was set to force the EUT to its maximum power setting. The tests were performed at three frequencies (low channel, middle channel and high channel).

Use the Occupied Bandwidth function of SA to measure the 99% bandwidth and 26dBc bandwidth.

Receiver Setup: RBW=10KHz, VBW=30KHz, Span=1MHz, Detector=Peak, Sweep time=Auto

Test Data:

Mode	Test channel	Frequency (MHz)	26dB OBW (kHz)	99% OBW (kHz)
GSM 850	128	824.20	314	244
	189	836.40	322	246
	251	848.80	318	242
GPRS 850	128	824.20	318	240
	189	836.40	322	244
	251	848.80	316	242
PCS 1900	512	1850.20	324	240
	661	1880.00	318	242
	810	1909.80	314	244
GPRS 1900	512	1850.20	328	242
	661	1880.00	316	244
	810	1909.80	322	248

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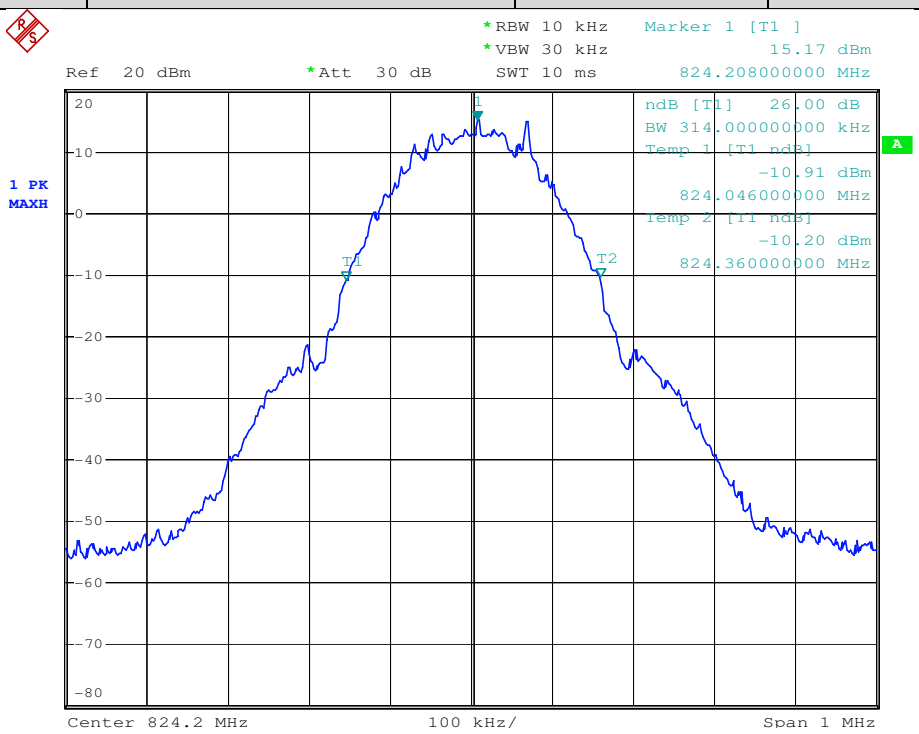
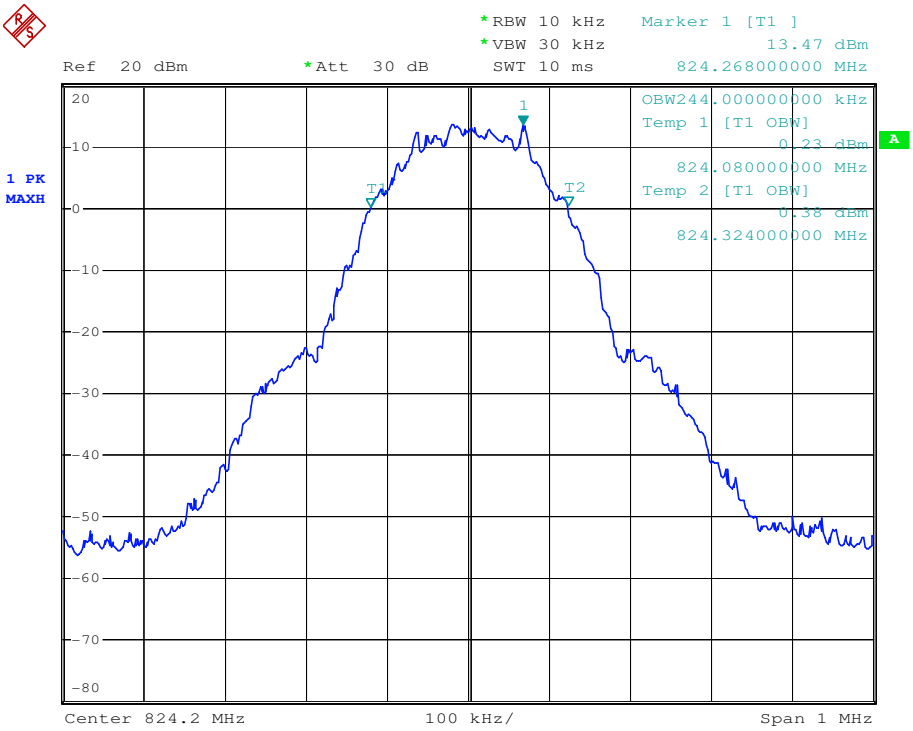
Test plot as follows:

Test Mode:	GSM 850	Test channel	Lowest/128





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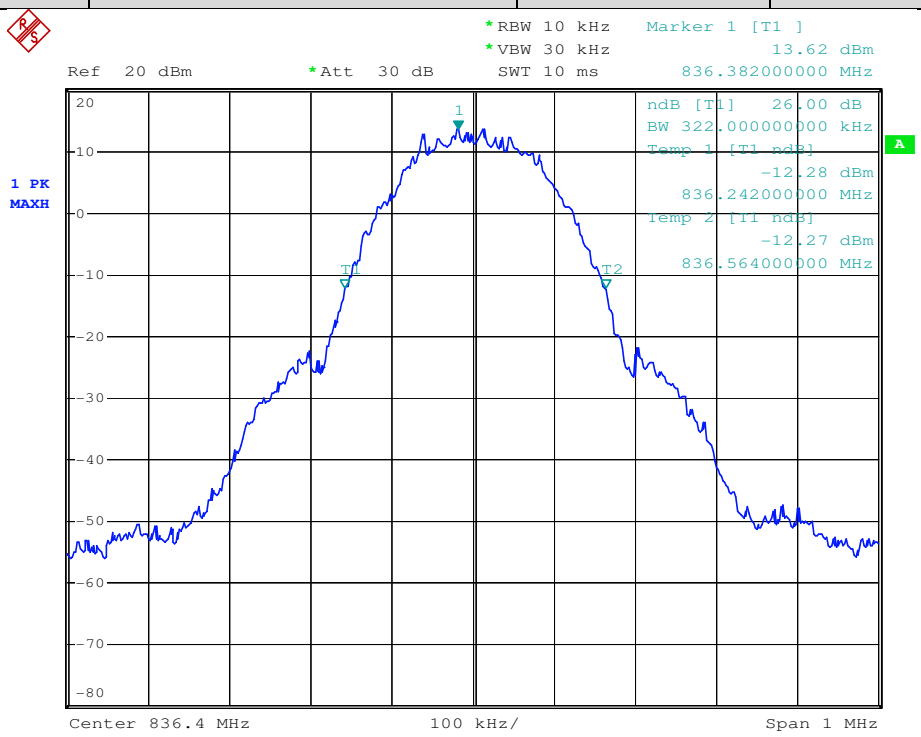
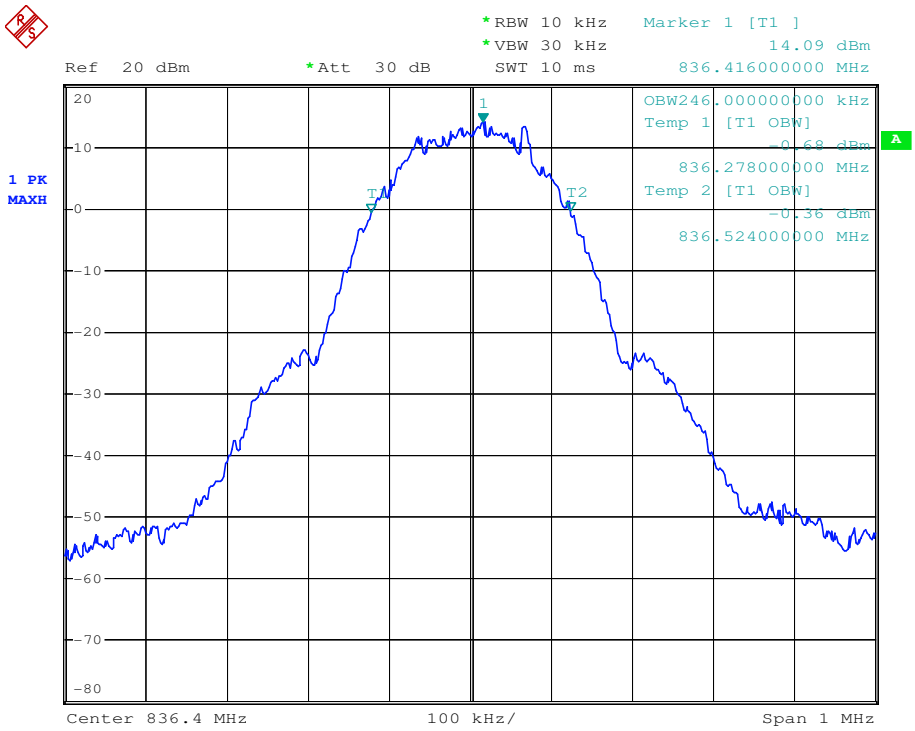
Test Mode:	GSM 850	Test channel	Middle/189





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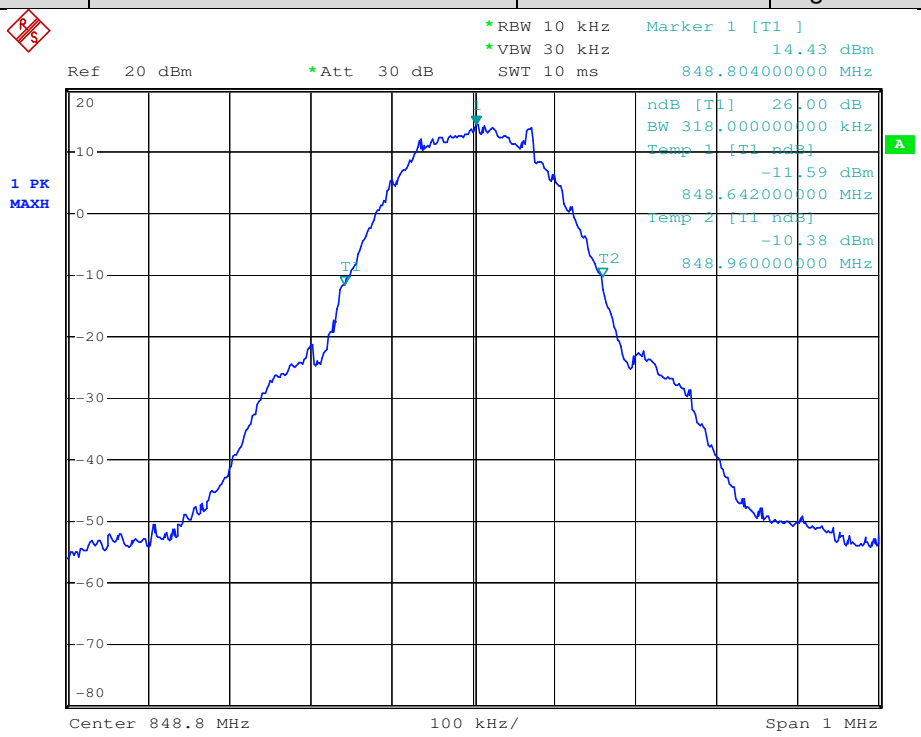
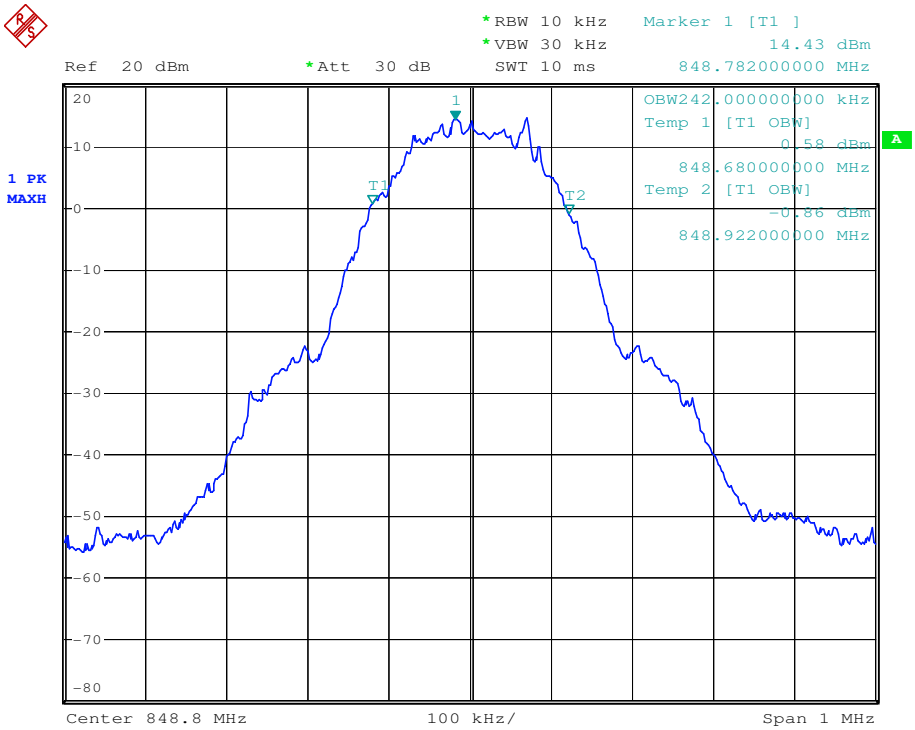
Test Mode:	GSM 850	Test channel	Highest/251





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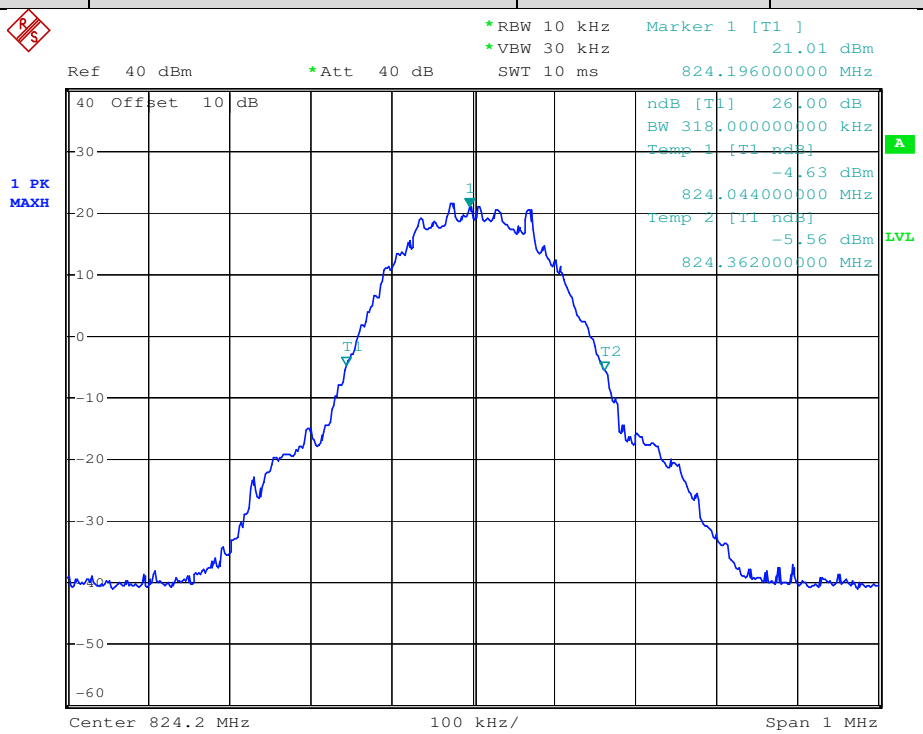
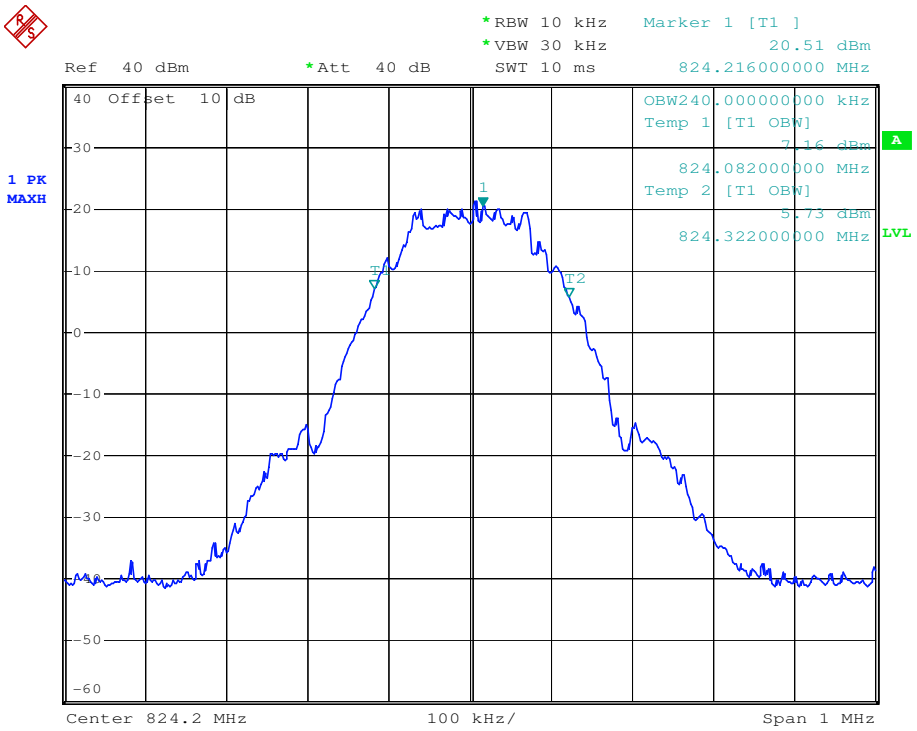
Test Mode:	GPRS 850	Test channel	Lowest/128





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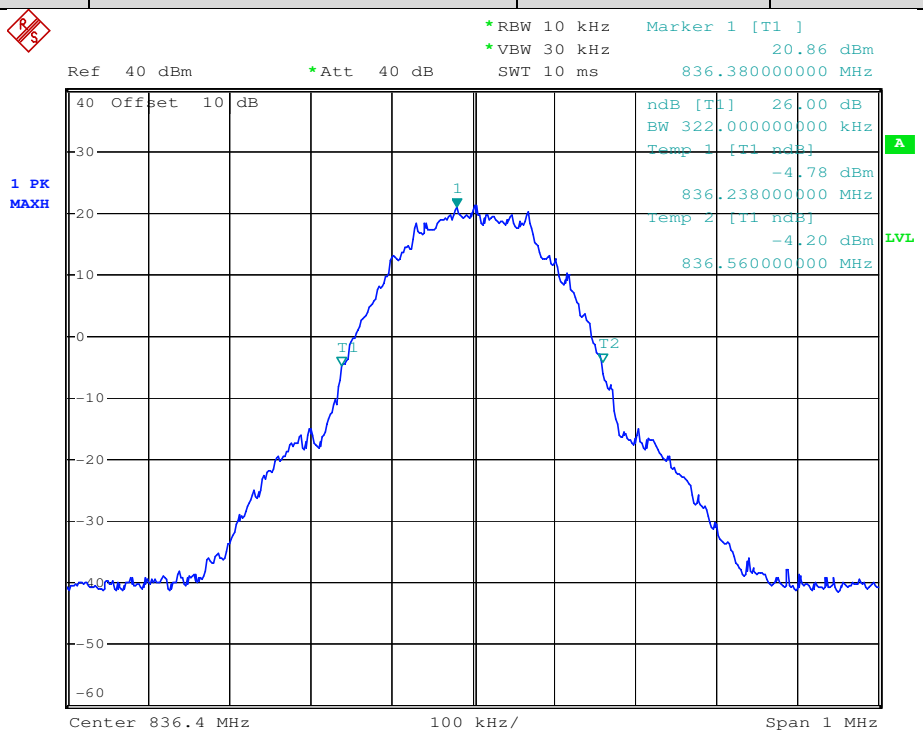
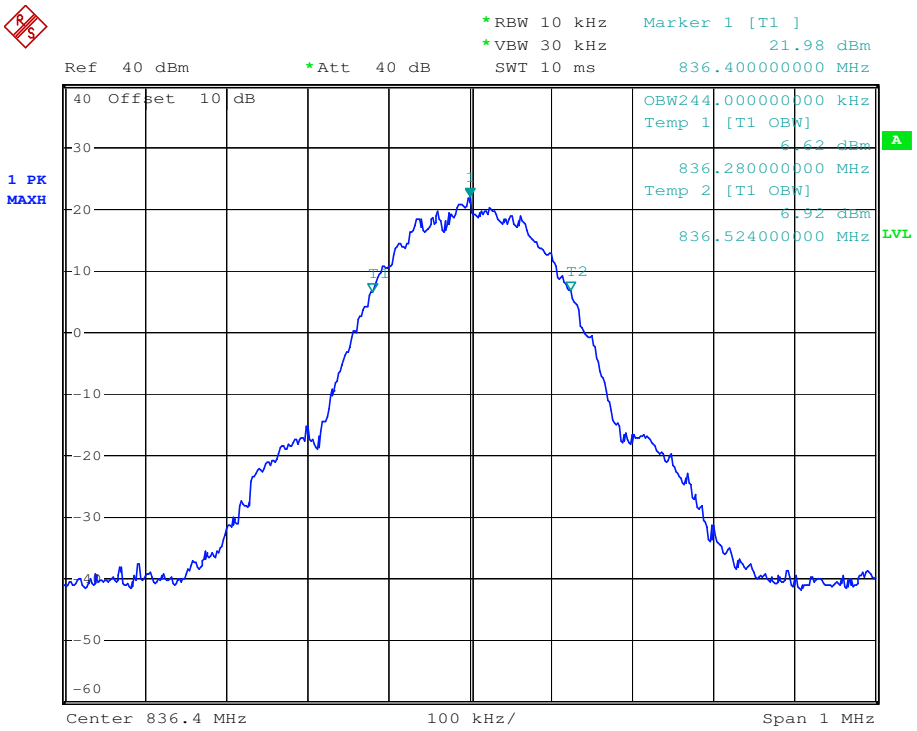
Test Mode:	GPRS 850	Test channel	Middle/189





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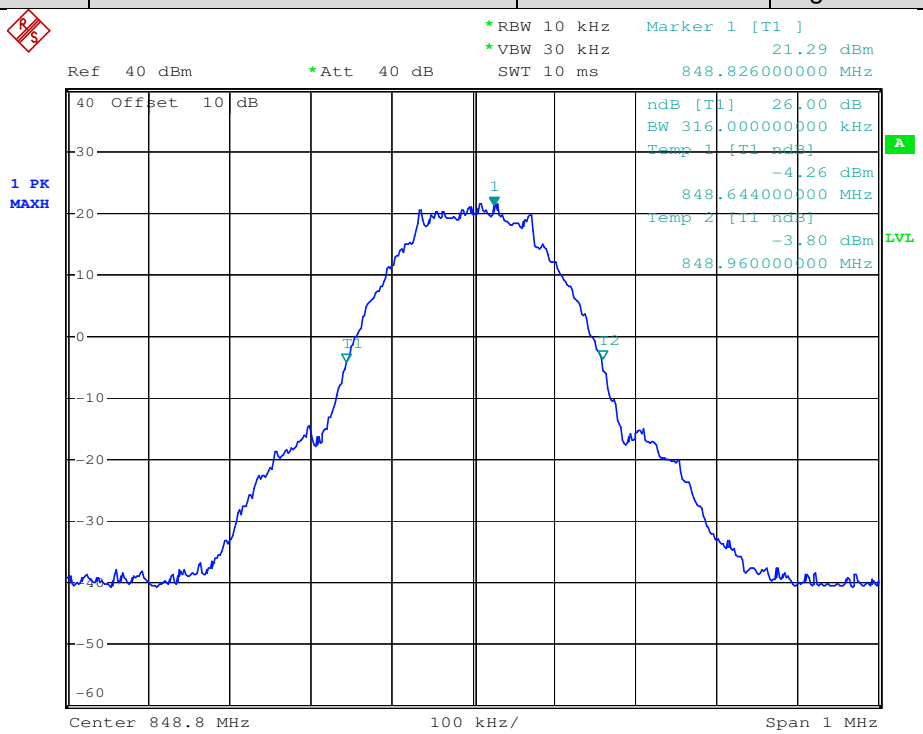
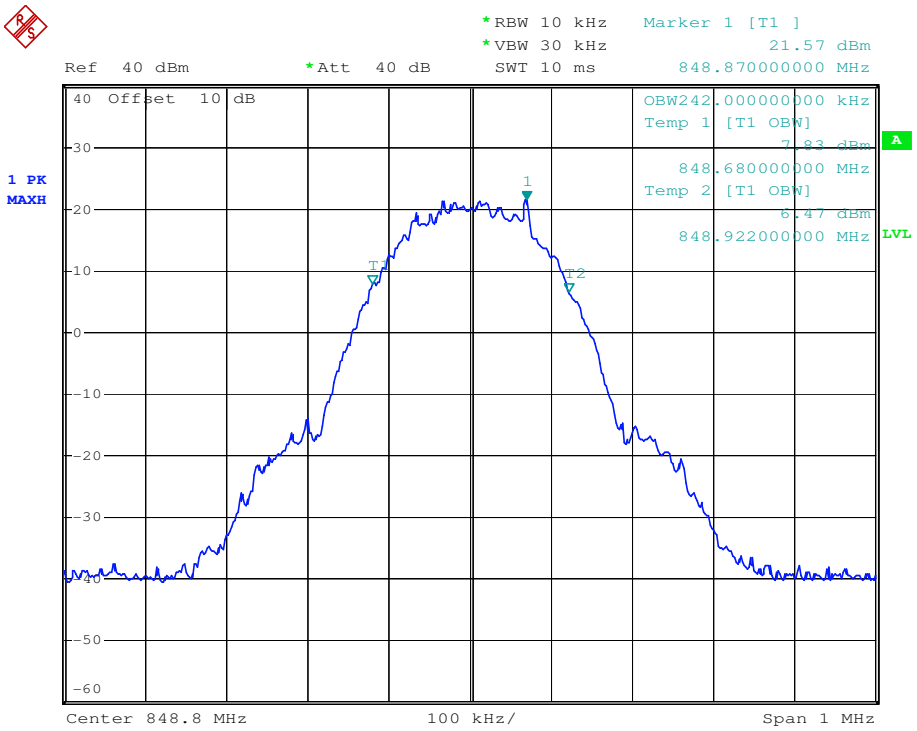
Test Mode:	GPRS 850	Test channel	Highest/251





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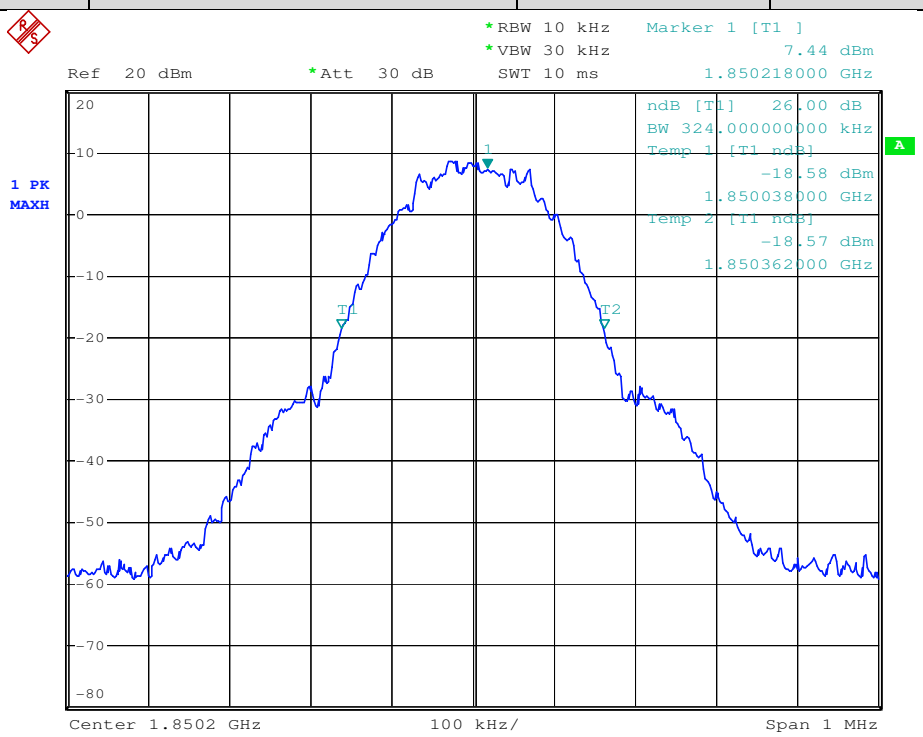
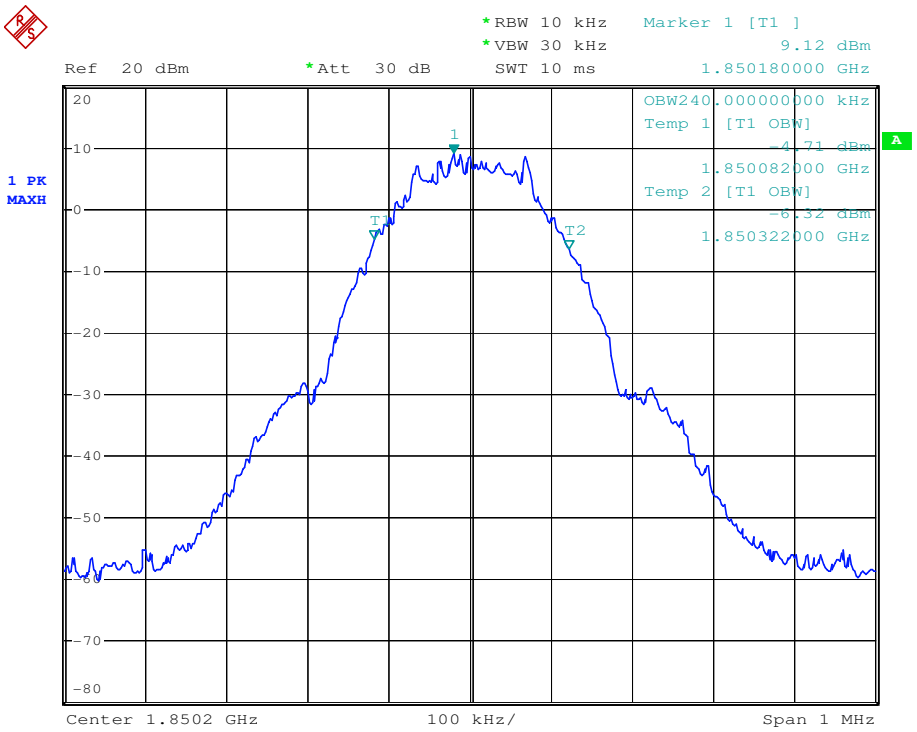
Test mode:	PCS 1900	Test channel:	Lowest/512





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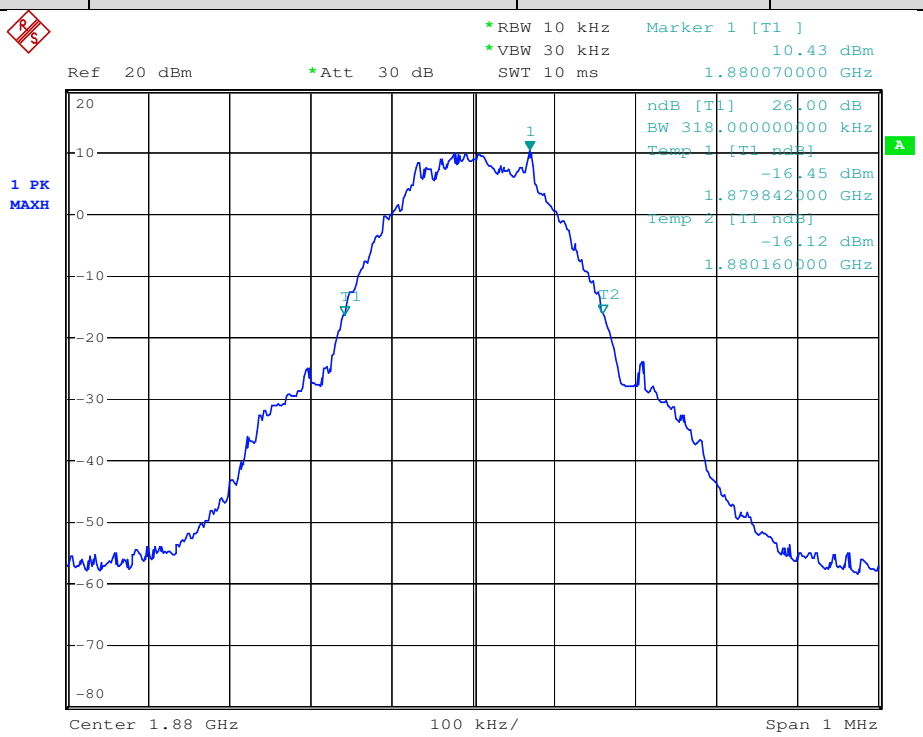
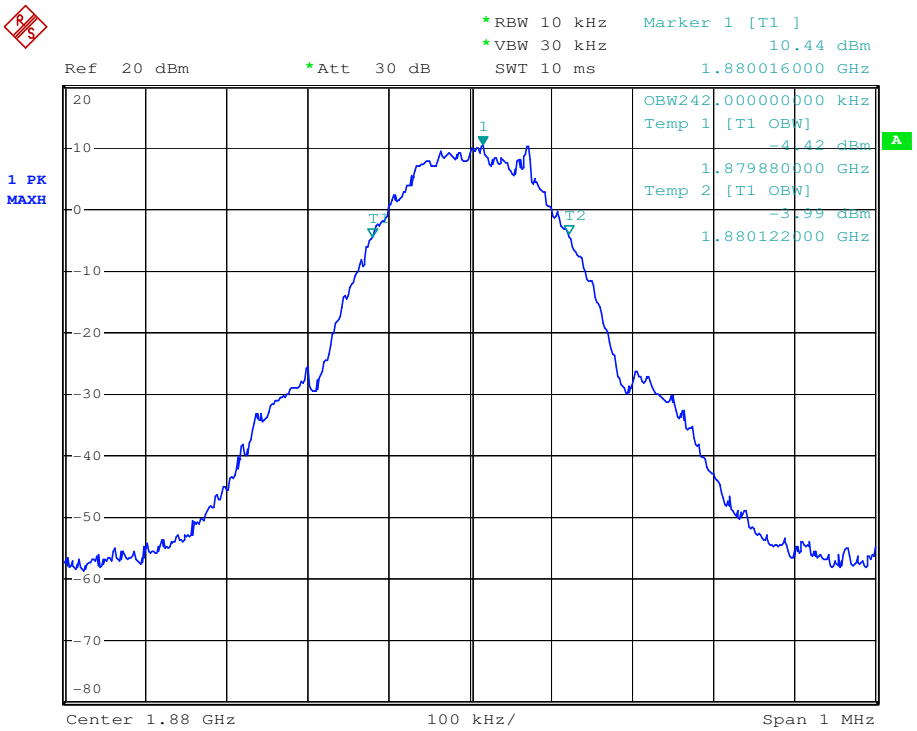
Test mode:	PCS 1900	Test channel:	Middle/661





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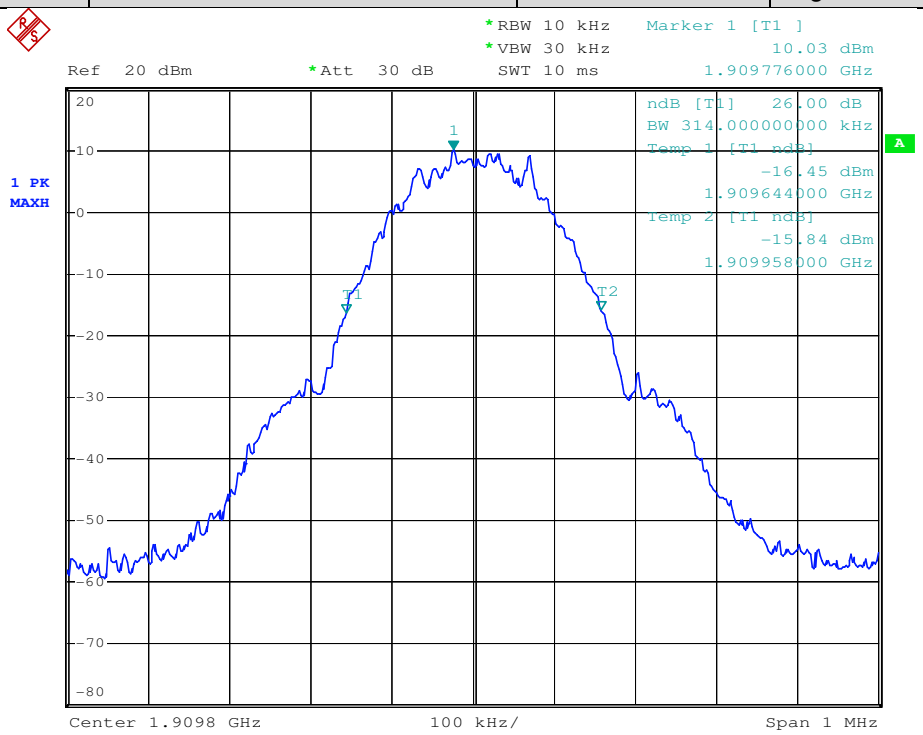
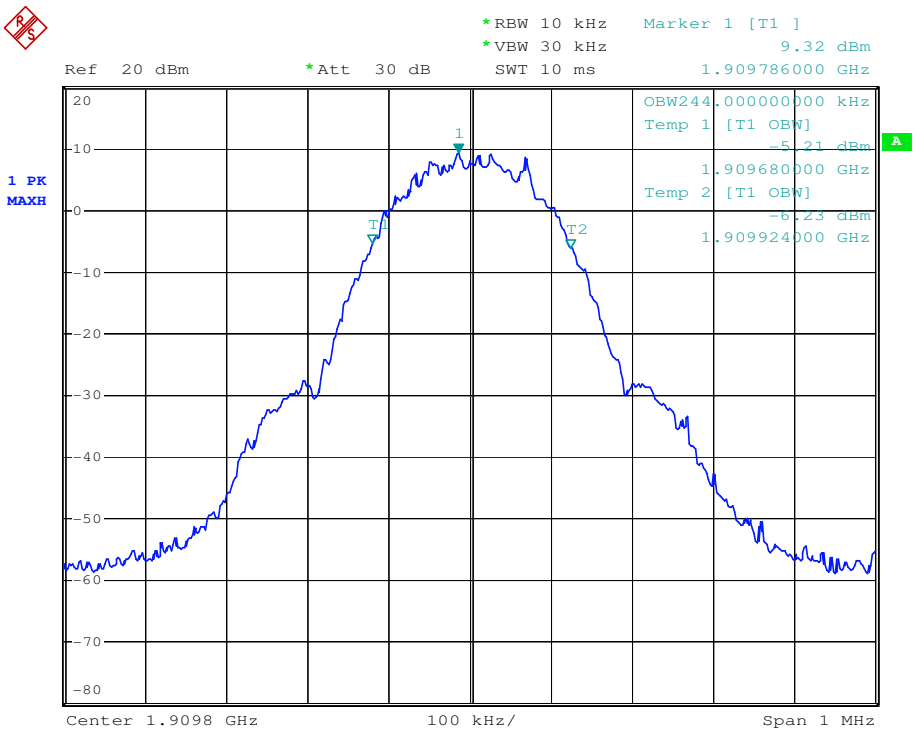
Test Mode:	PCS 1900	Test channel:	Highest/810





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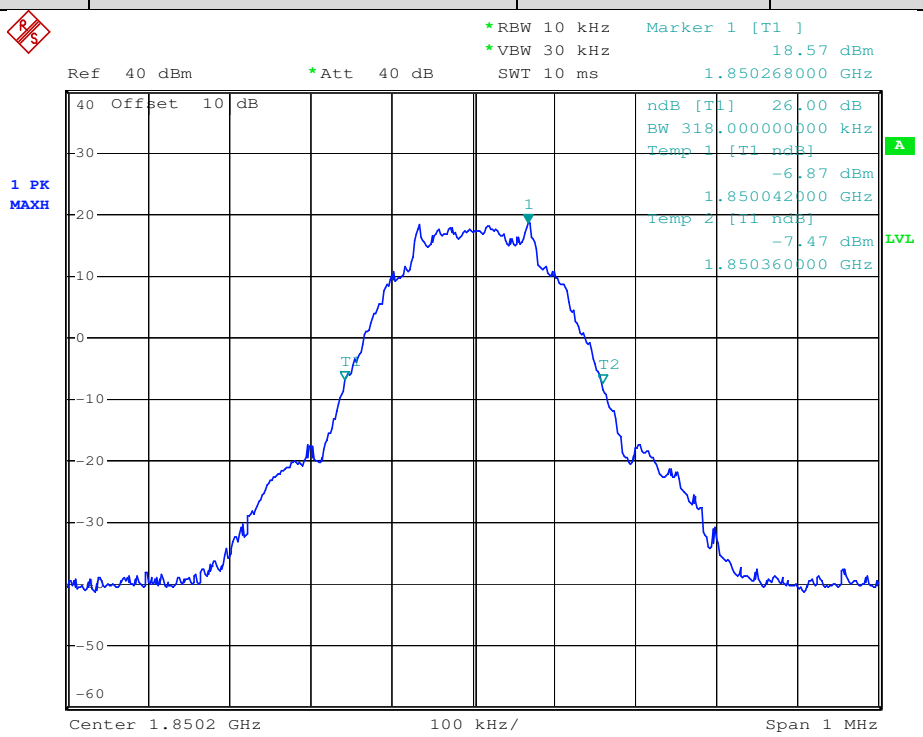
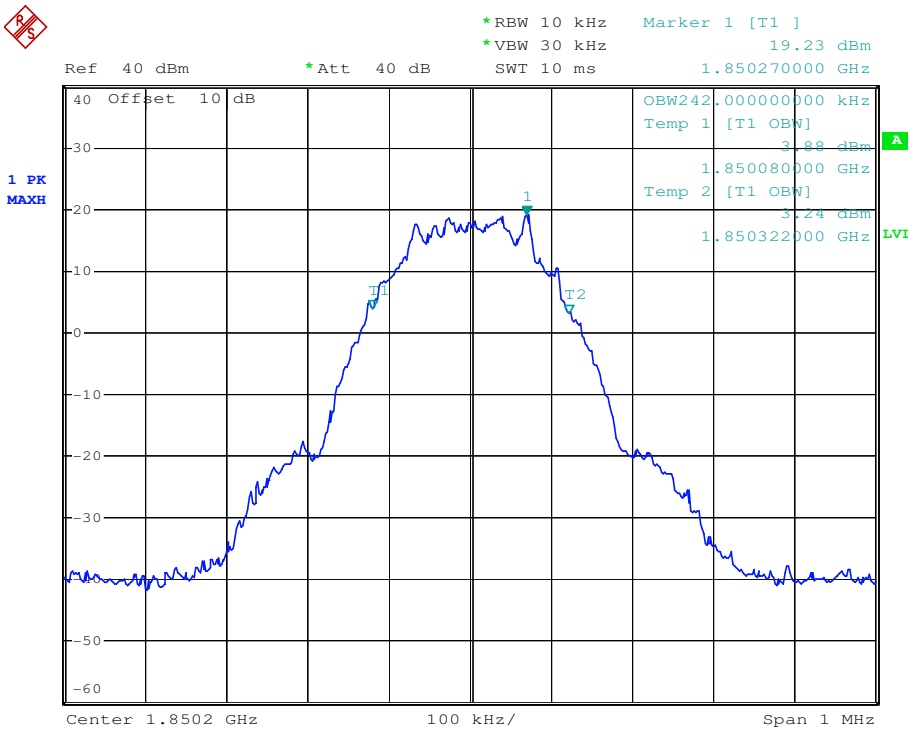
Test mode:	GPRS 1900	Test channel:	Lowest/512





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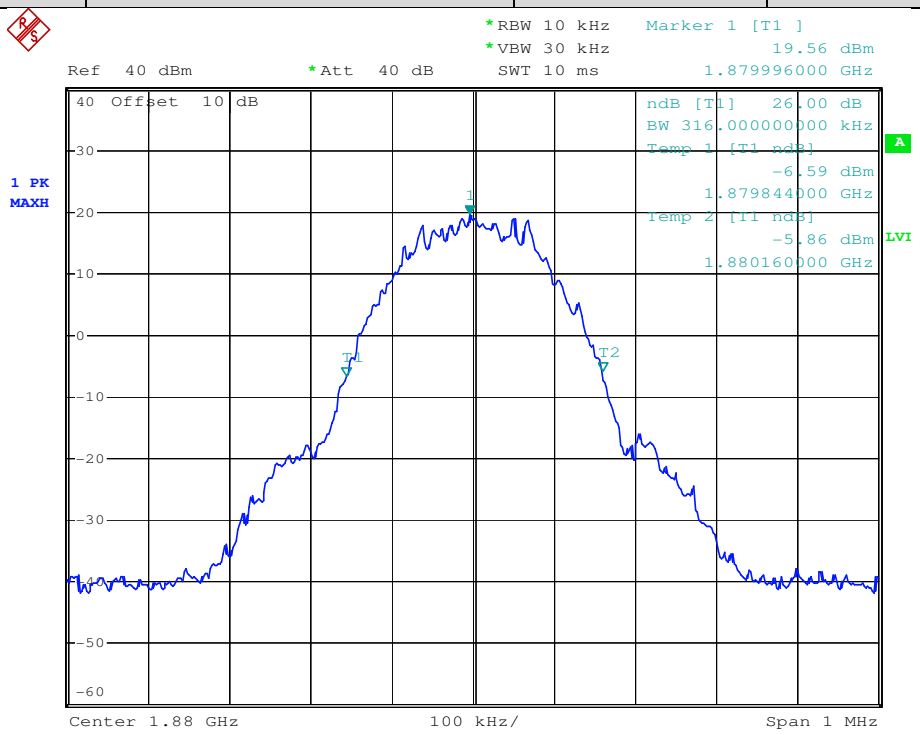
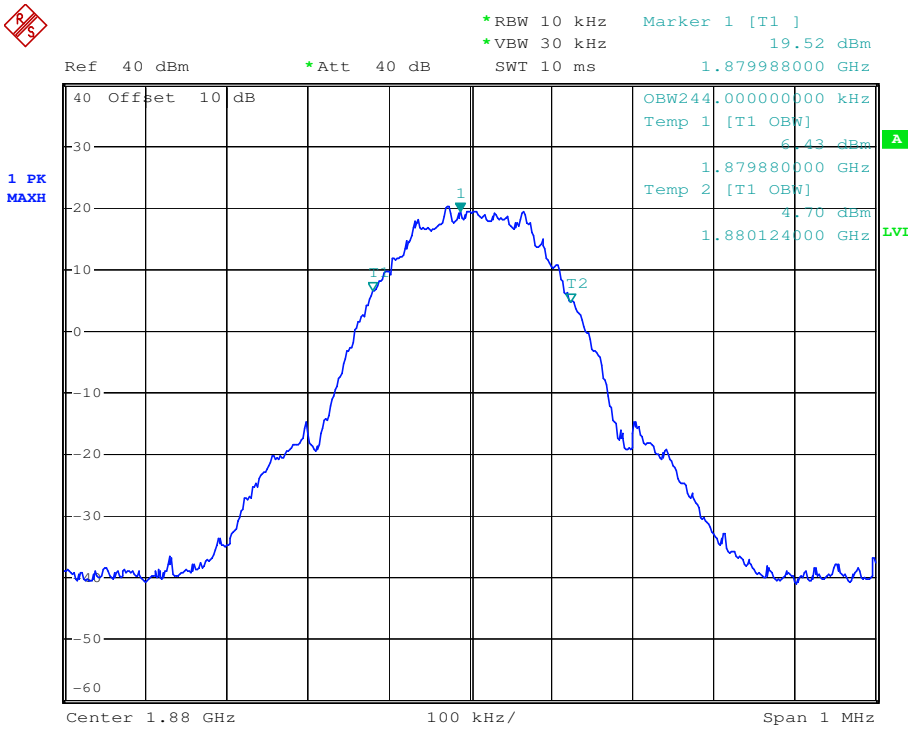
Test mode:	GPRS 1900	Test channel:	Middle/661





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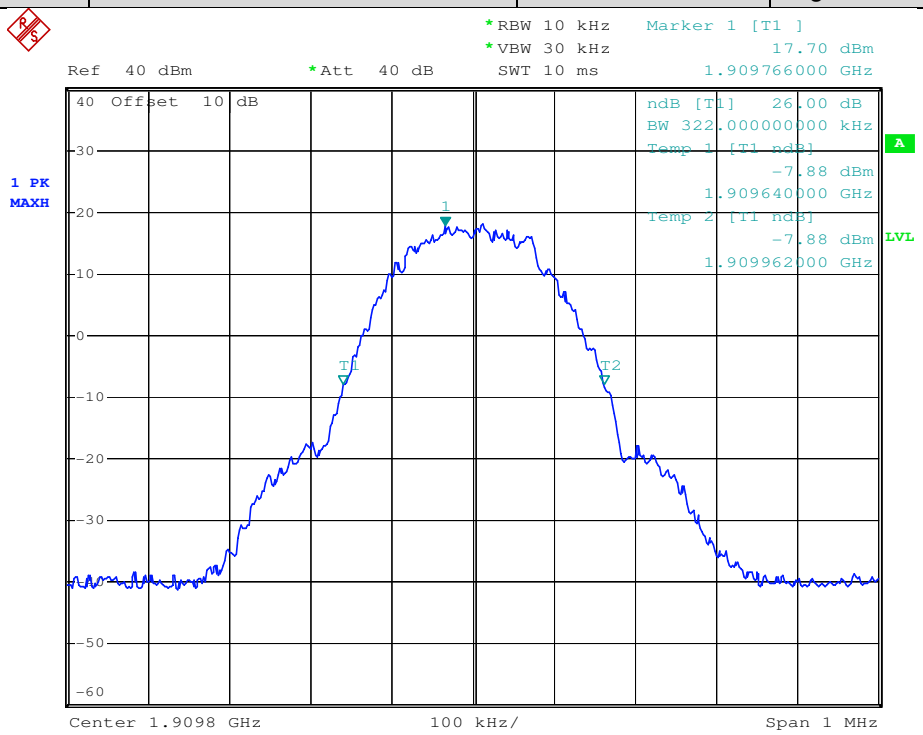
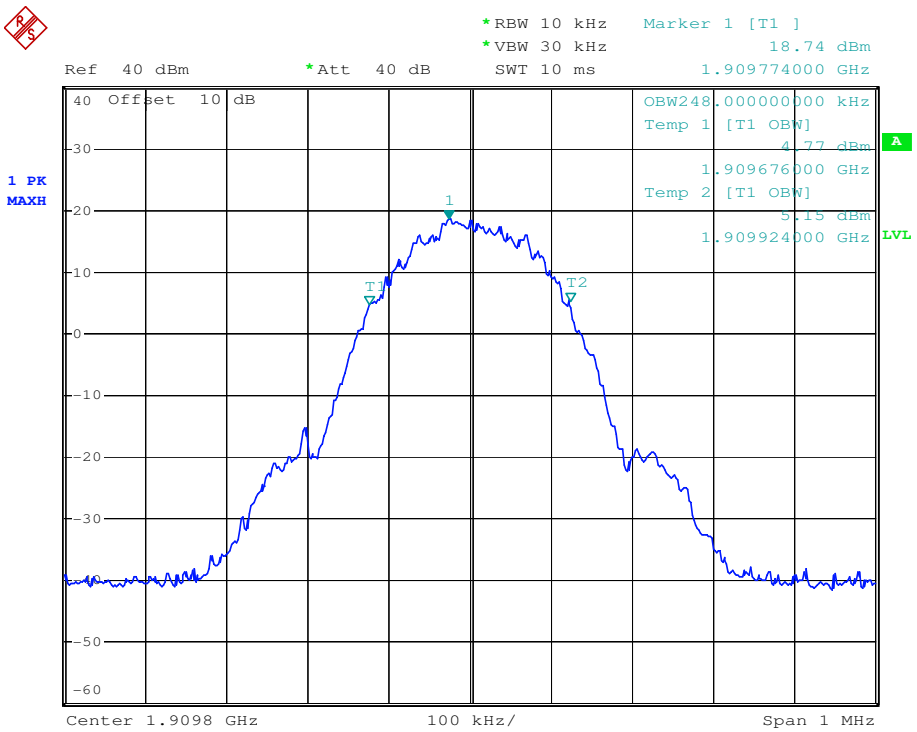
Test Mode:	GPRS 1900	Test channel:	Highest/810





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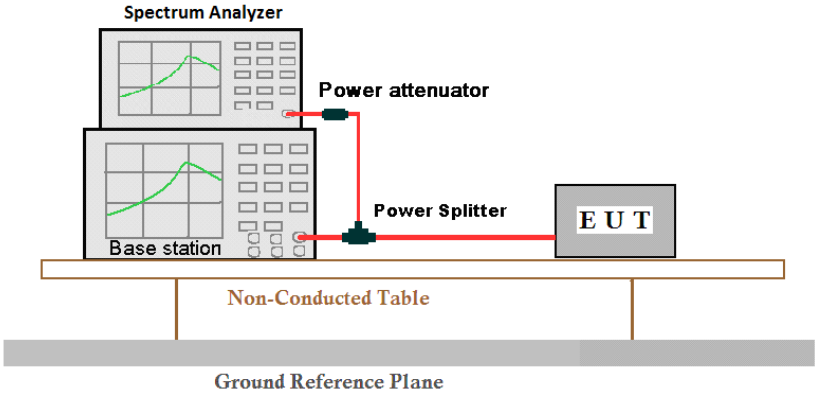
7.4 Band Edge

Limit:

Operation Band	Frequency Range (MHz)	Limit
GSM 850	Below 824 and above 849	Attenuated at least 43+10log(P)
PCS1900	Below 1850 and above 1910	Attenuated at least 43+10log(P)
Note: 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 Setup:



Test Procedure: The transmitter output was connected to a calibrated coaxial cable, attenuator and Spectrum analyser, the other end of which was connected to a Base Station Simulator. The Base Station Simulator was set to force the EUT to its maximum power setting.

Receiver Setup: RBW=10KHz, VBW=30KHz, Span=1MHz, Detector=AV, Sweep time=Auto

Test Results: Pass

The data of conducted output power for reference:

Band	Channel	Frequency	Conducted Output Power (dBm)	
			GSM	GPRS 10
GSM850	128	824.2	33.60	31.40
	189	836.4	32.80	31.00
	251	848.8	32.50	30.70
PCS1900	512	1850.2	29.80	29.80
	661	1880.0	30.20	29.90
	810	1909.8	30.20	30.10

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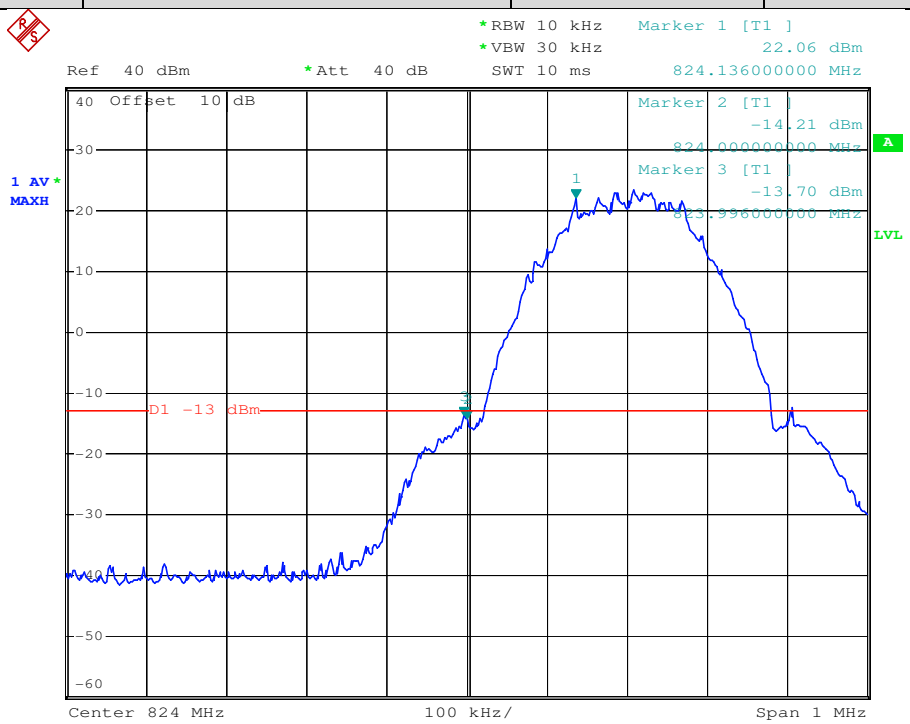
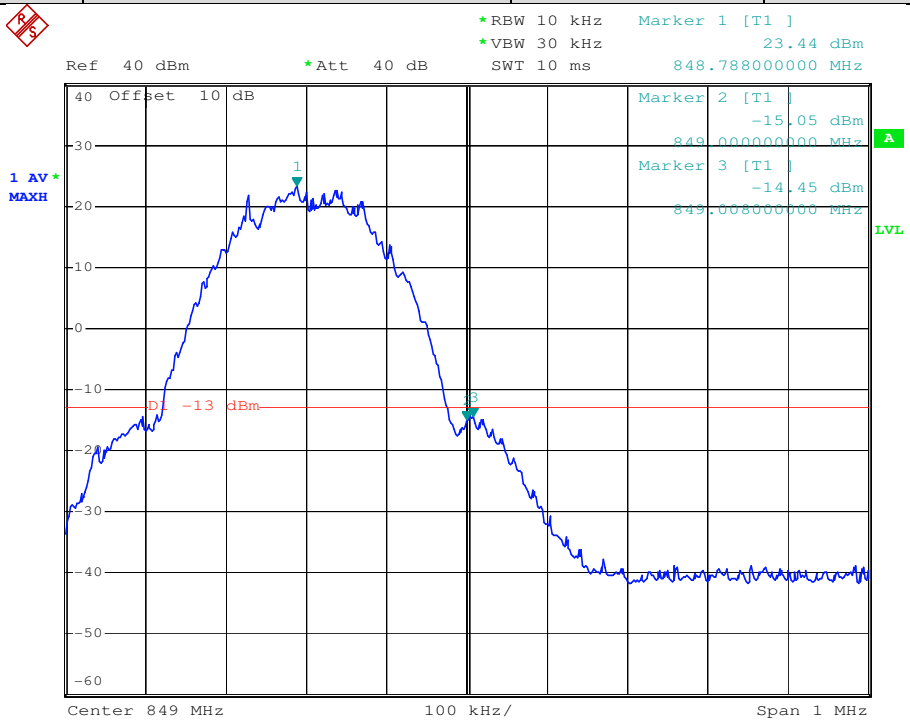
Test Mode:	GSM 850	Test channel	Lowest/128



Test Mode:	GSM 850	Test channel	Highest/251



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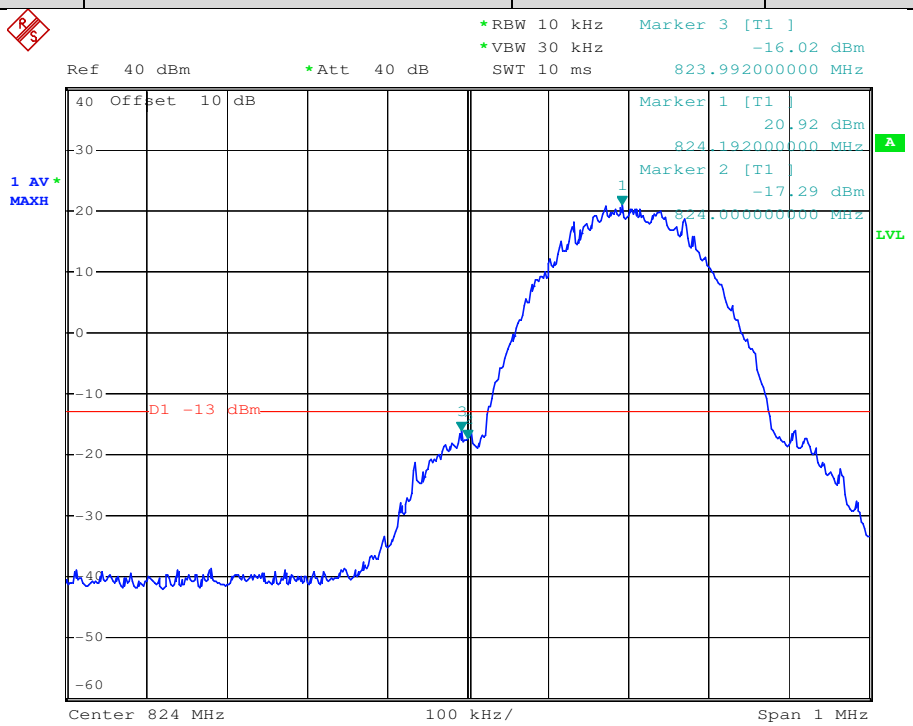
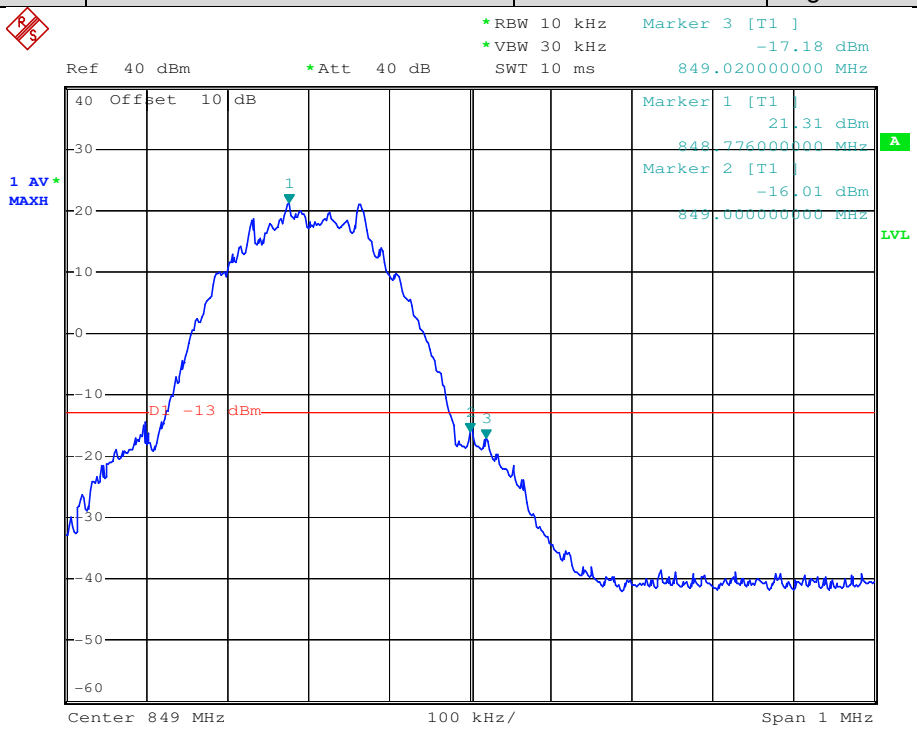
Test Mode:	GPRS 850	Test channel	Lowest/128



Test Mode:	GPRS 850	Test channel	Highest/251



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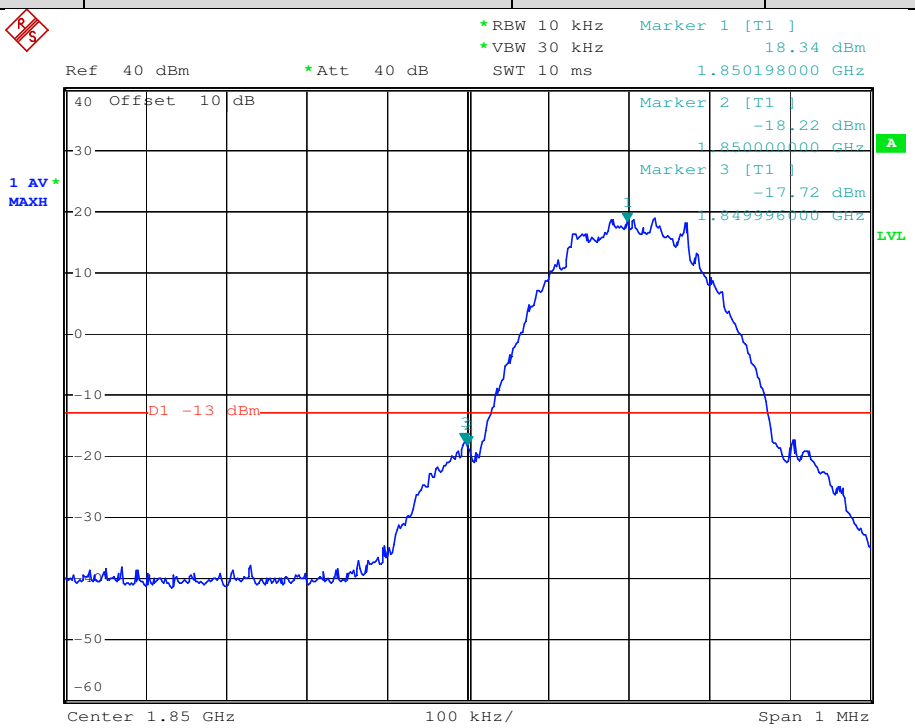
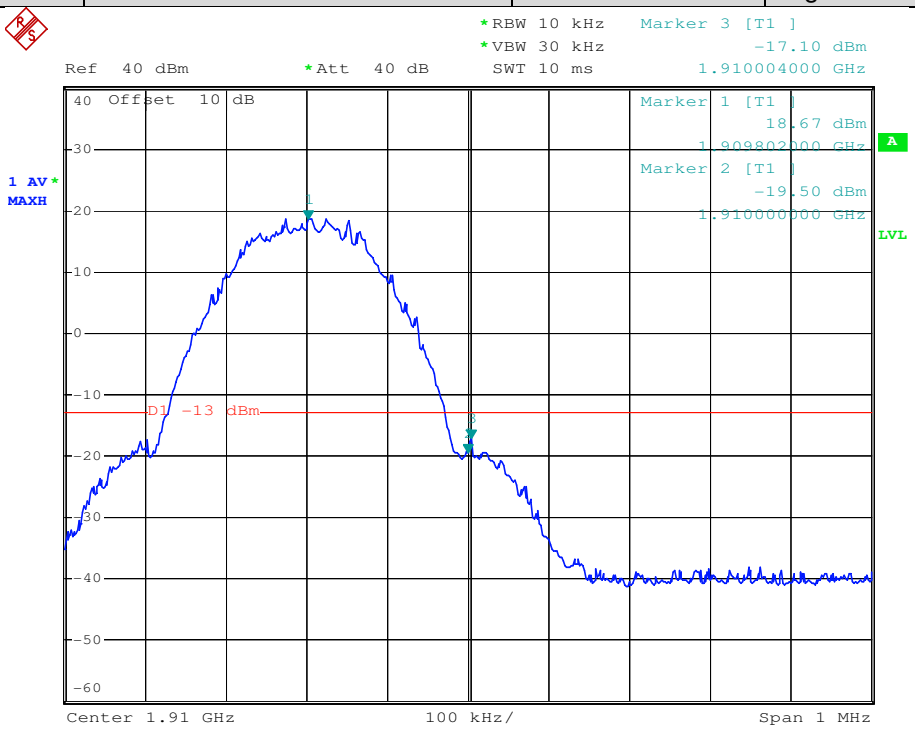
Test Mode:	PCS1900	Test channel	Lowest/512



Test Mode:	PCS1900	Test channel	Highest/810



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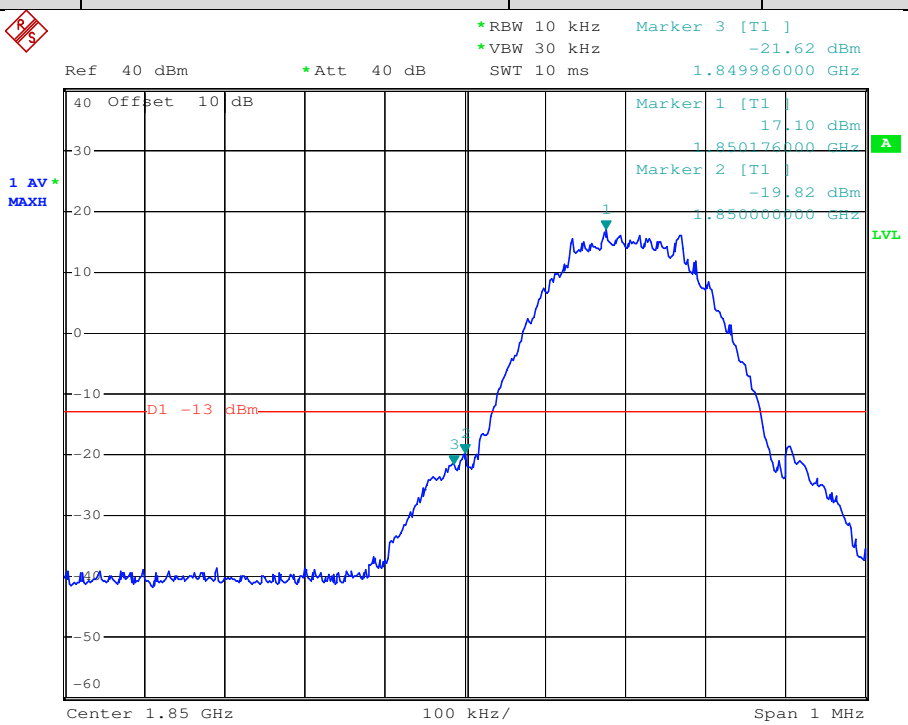
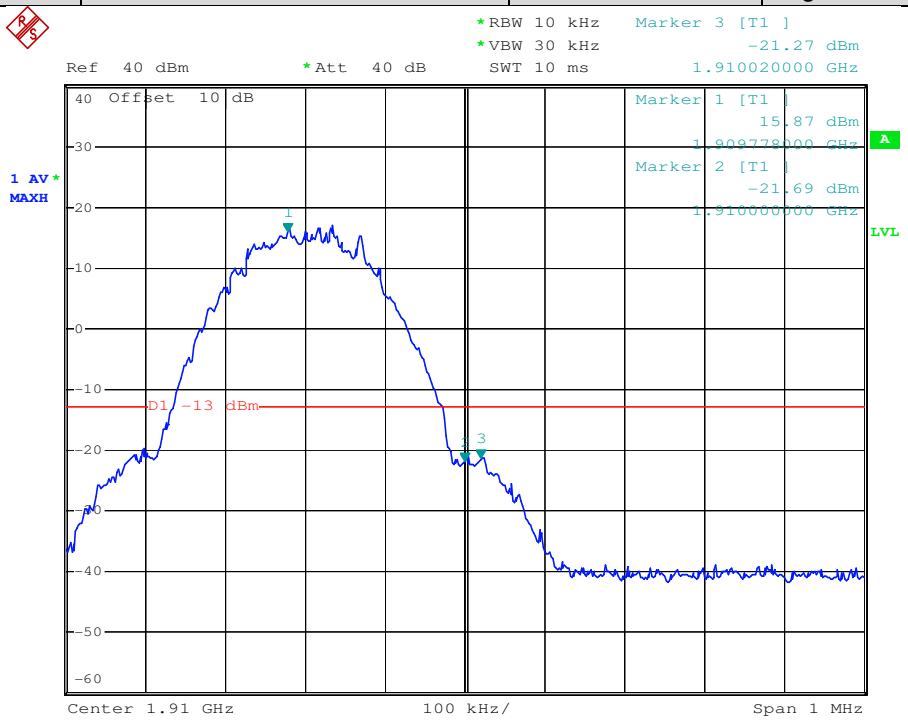
Test Mode:	GPRS 1900	Test channel	Lowest/512



Test Mode:	GPRS 1900	Test channel	Highest/810



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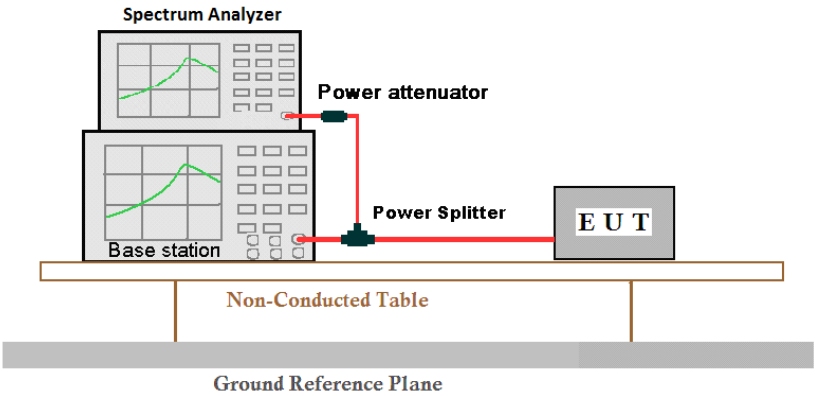
7.5 Conducted Spurious Emission

Limit:

Attenuated at least 43+10log(P)

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 Setup:



Procedure:

The transmitter output was connected to a calibrated coaxial cable, attenuator and Spectrum analyzer, the other end of which was connected to a Base Station Simulator. The Base Station Simulator was set to force the EUT to its maximum power setting. The tests were performed at three frequencies (low channel and high channel).the equipment operates below 10GHz: to the tenth harmonic of the highest fundamental frequency or to 40GHz.whichever is lower, the resolution bandwidth of the spectrum analyzer was set at 100kHz for spurious emissions below 1 GHz, and 1 MHz for spurious emissions above 1GHz.the video bandwidth of the spectrum analyzer was set at thrice the resolution bandwidth. Detector Mode was set to mean or average power.

Pretest under all modes; choose the worst case mode (Speech mode) record on the report. Please see the below test results.

Test Results: Pass

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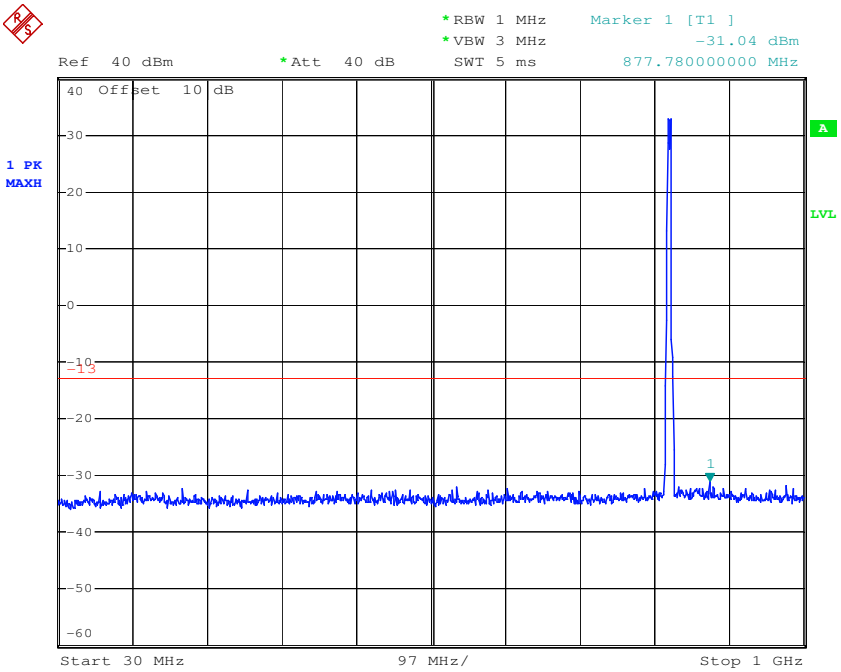
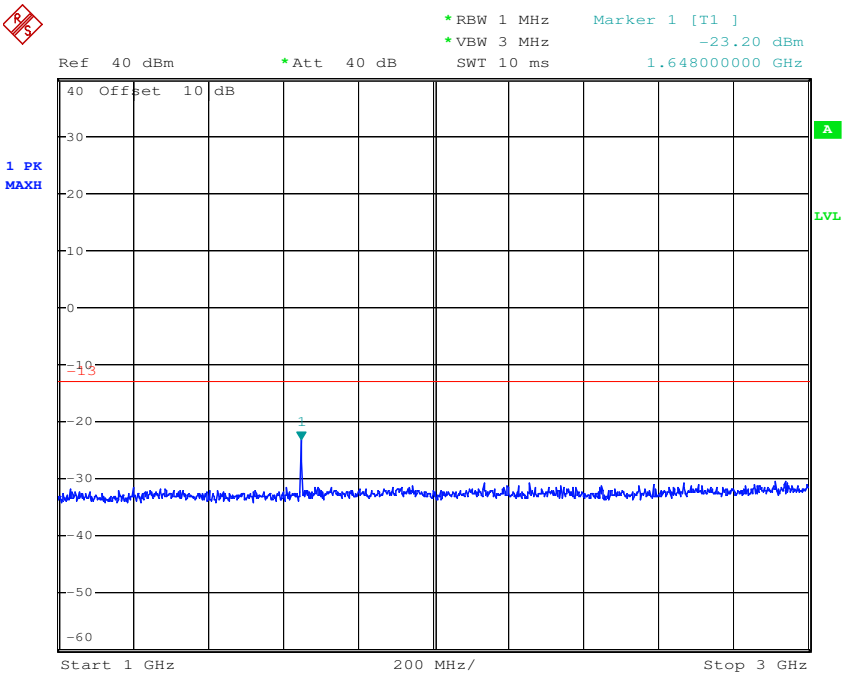
Test plot as follows:

Test mode:	GSM 850	Test channel:	Lowest/128	Operation Frequency	824.20MHz

30MHz-1GHz:



1GHz-3GHz:



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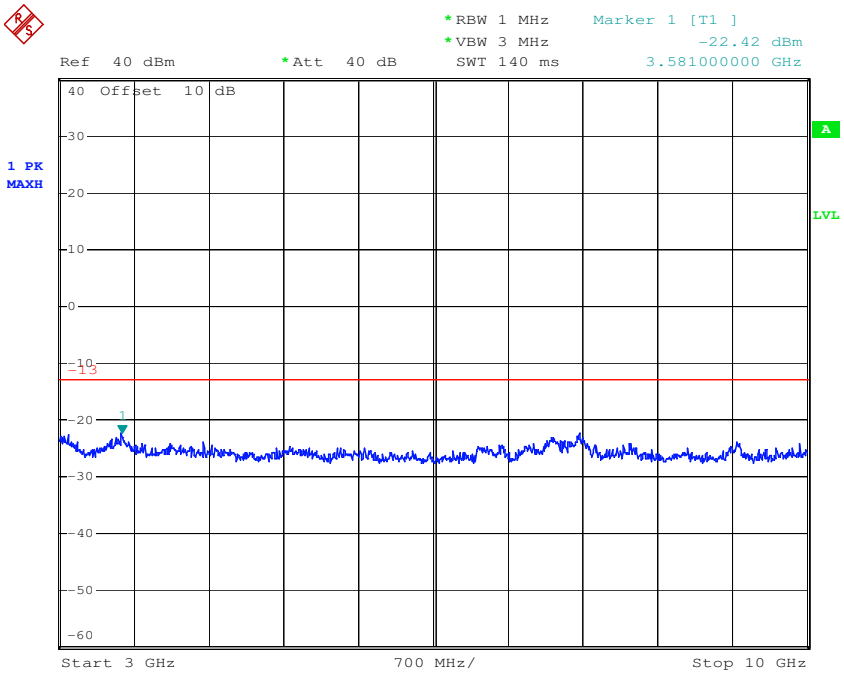
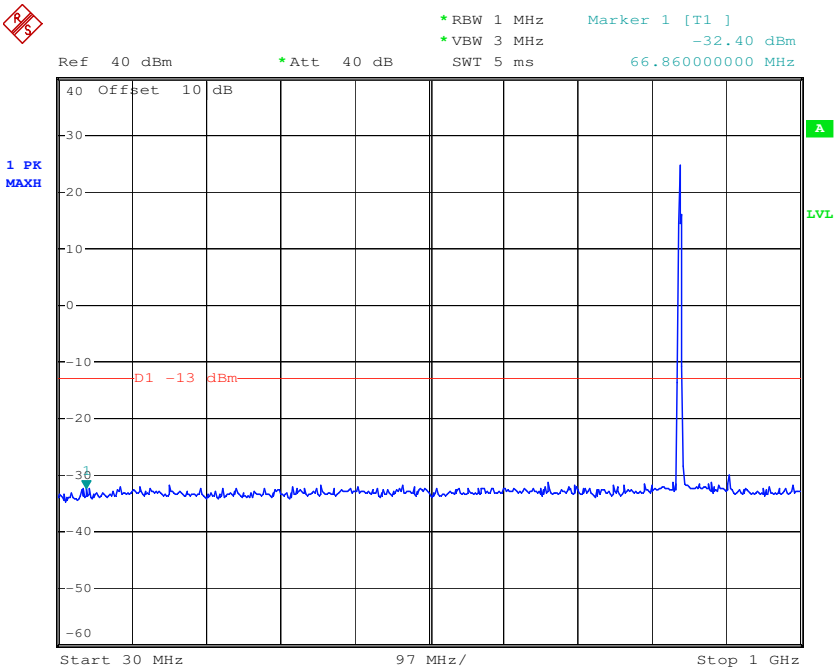
3GHz10GHz:



Test mode:	GSM 850	Test channel:	Middle/189	Operation Frequency	836.40MHz

30MHz-1GHz:



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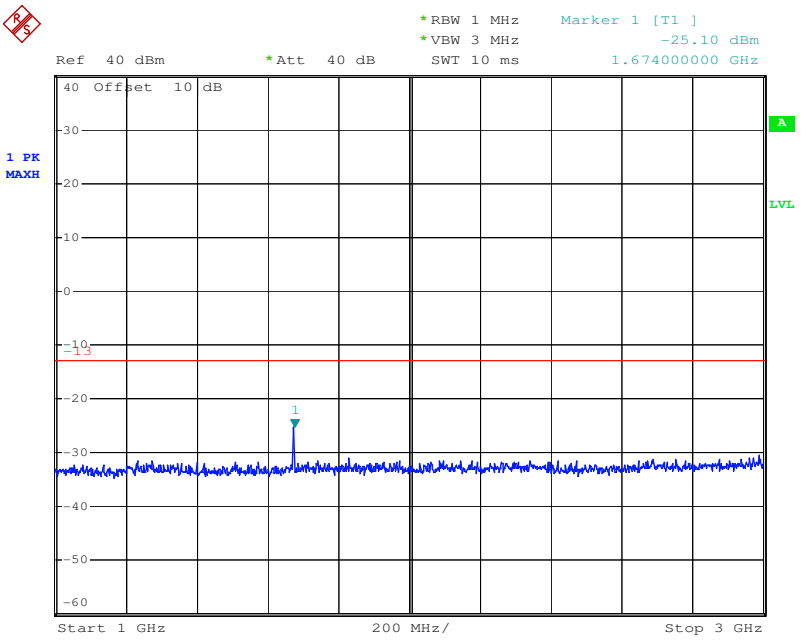
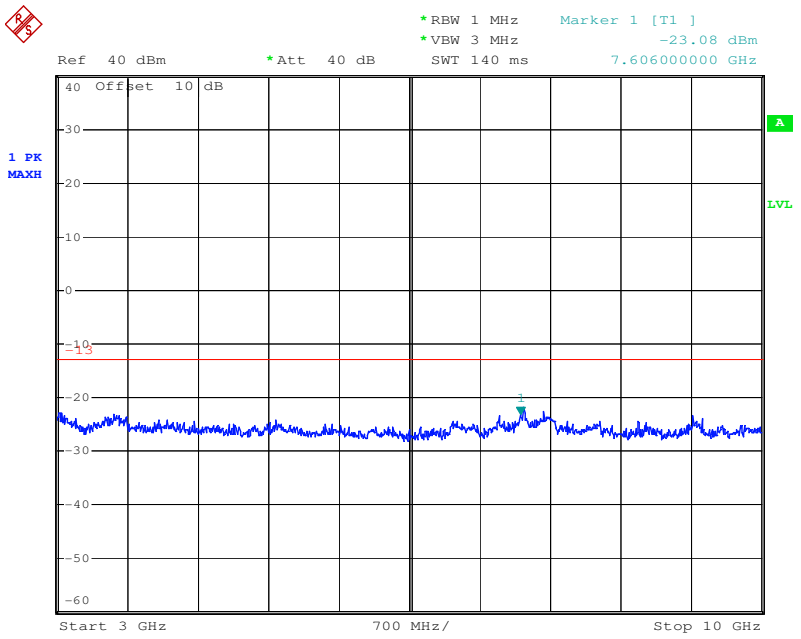
1GHz-3GHz:



3GHz-10GHz:



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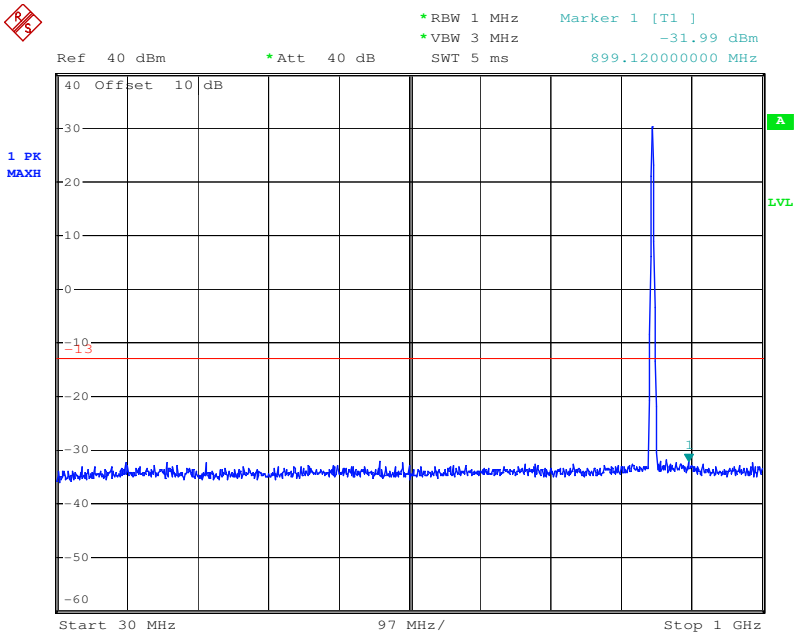
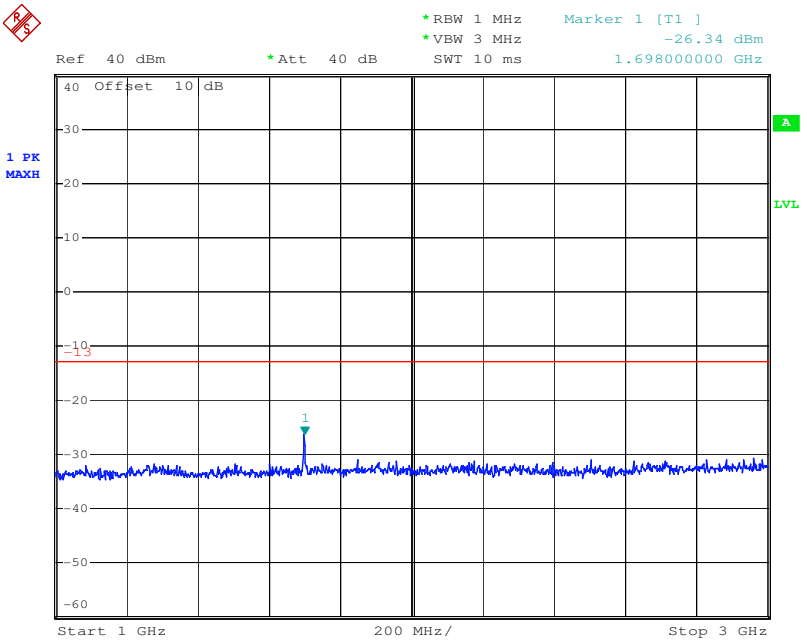
Test mode:	GSM 850	Test channel:	High/251	Operation Frequency	848.80MHz

30MHz-1GHz:



1GHz-3GHz:



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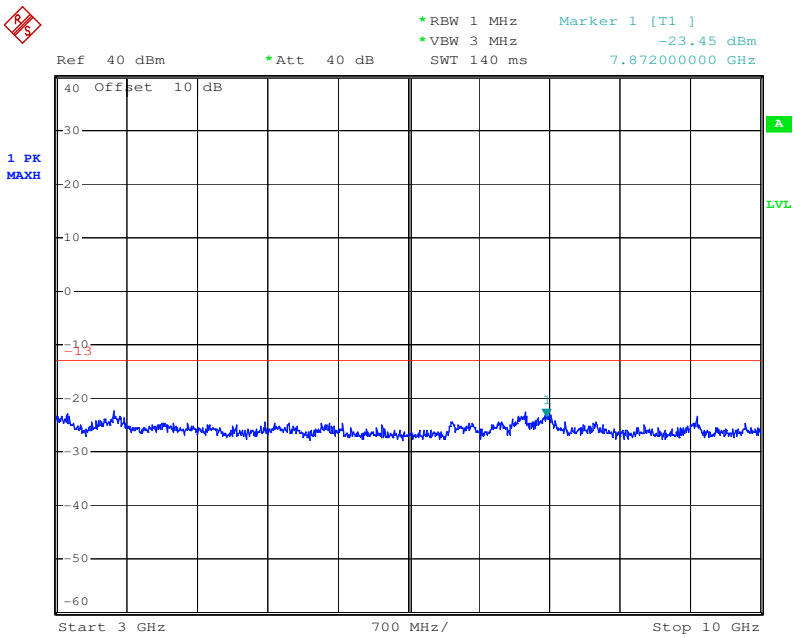
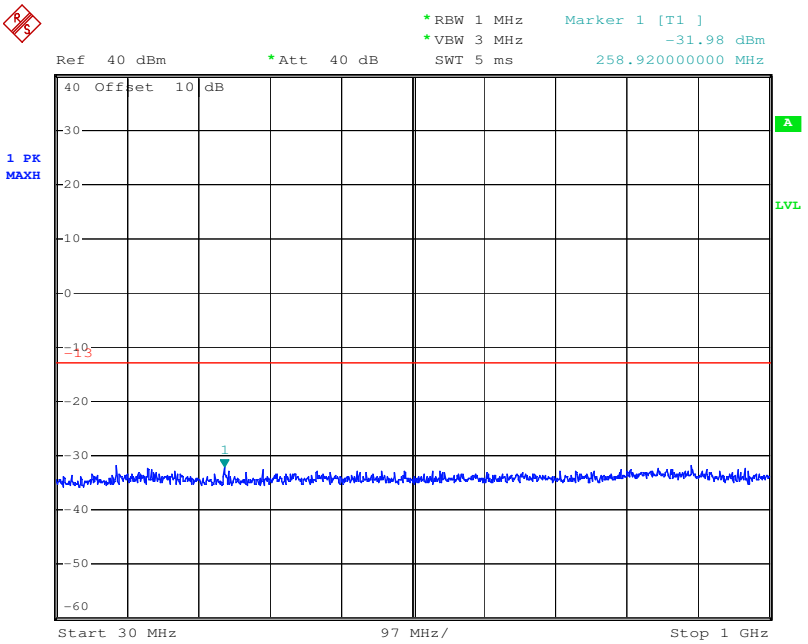
3GHz-10GHz:



Test mode:	PCS 1900	Test channel:	Lowest/512	Operation Frequency	1850.20MHz

30MHz-1GHz:



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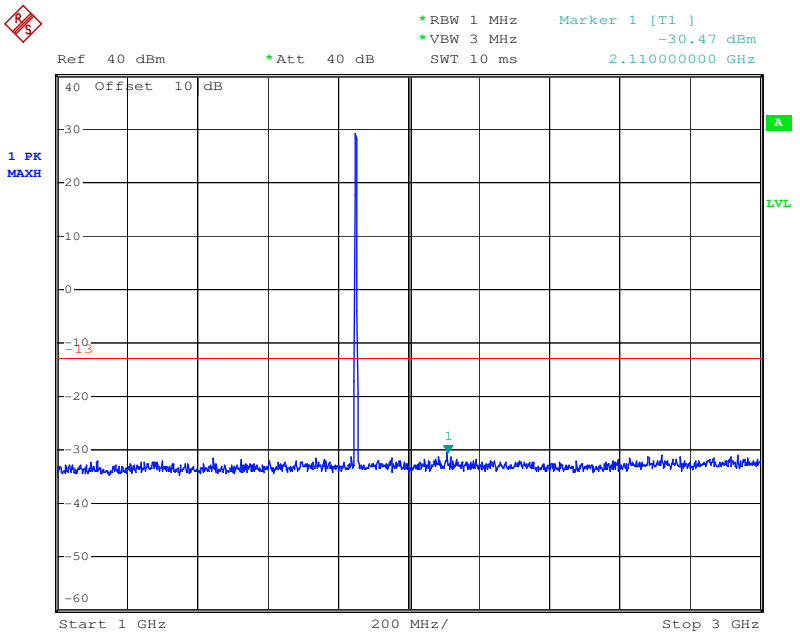
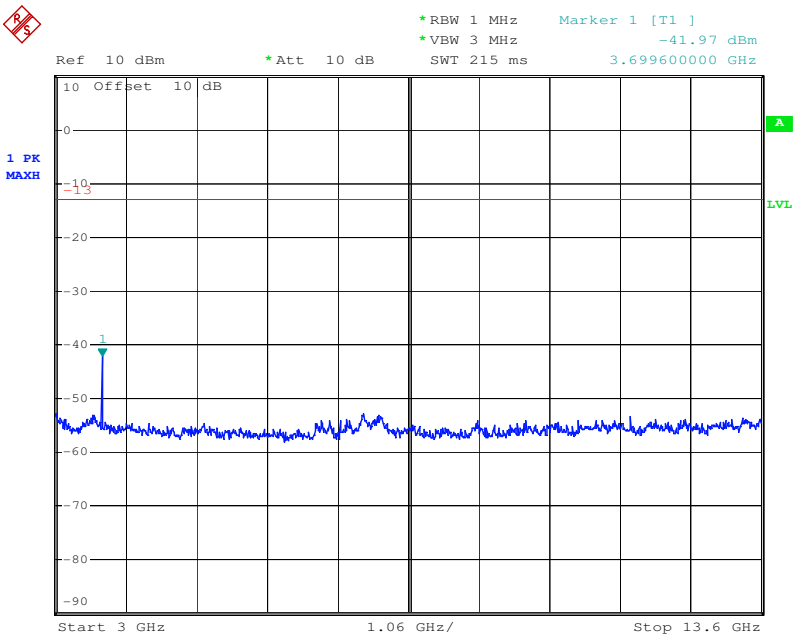
1GHz-3GHz:



3GHz-13.6GHz:



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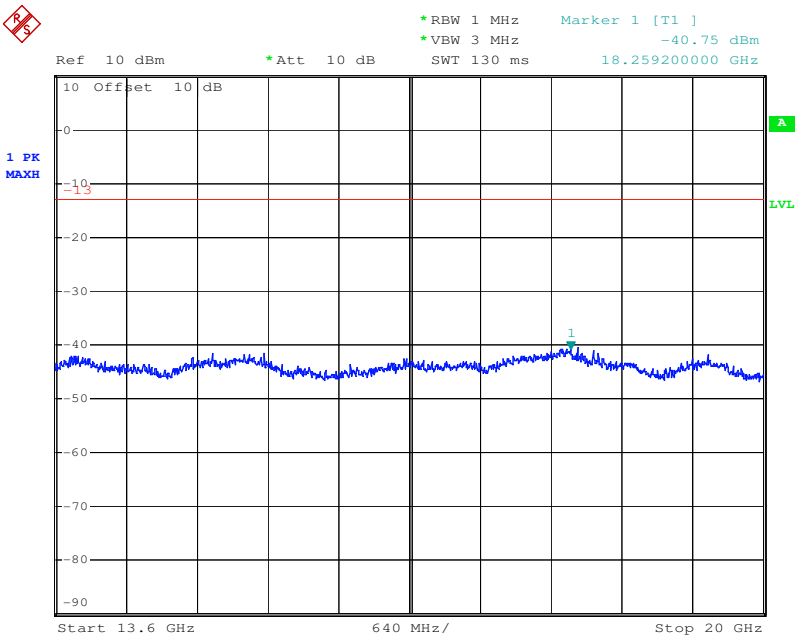
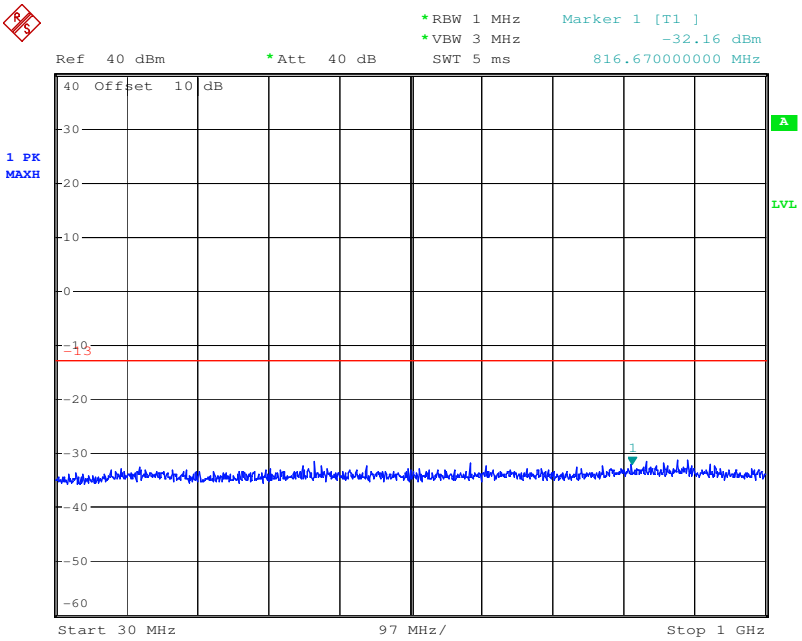
13.6GHz-20GHz:



Test mode:	PCS 1900	Test channel:	Middle/661	Operation Frequency	1880.00MHz

30MHz-1GHz:



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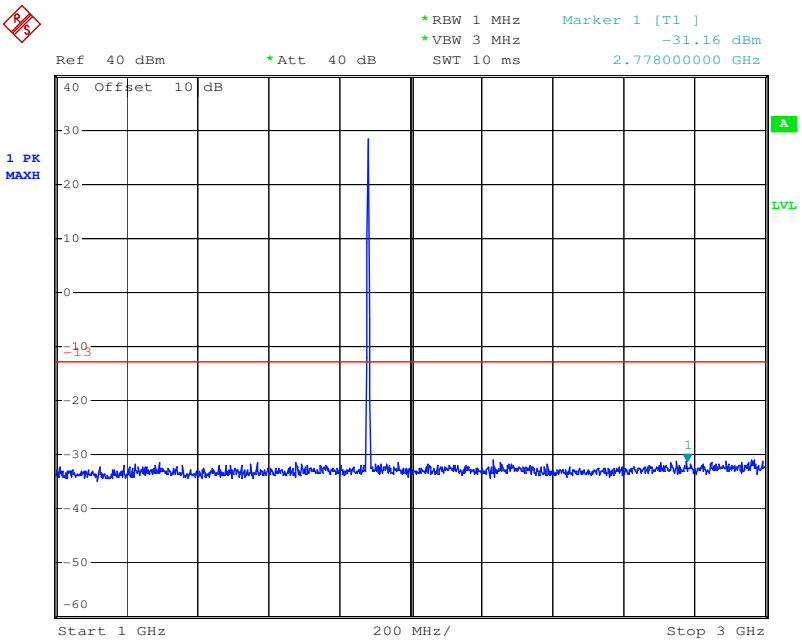
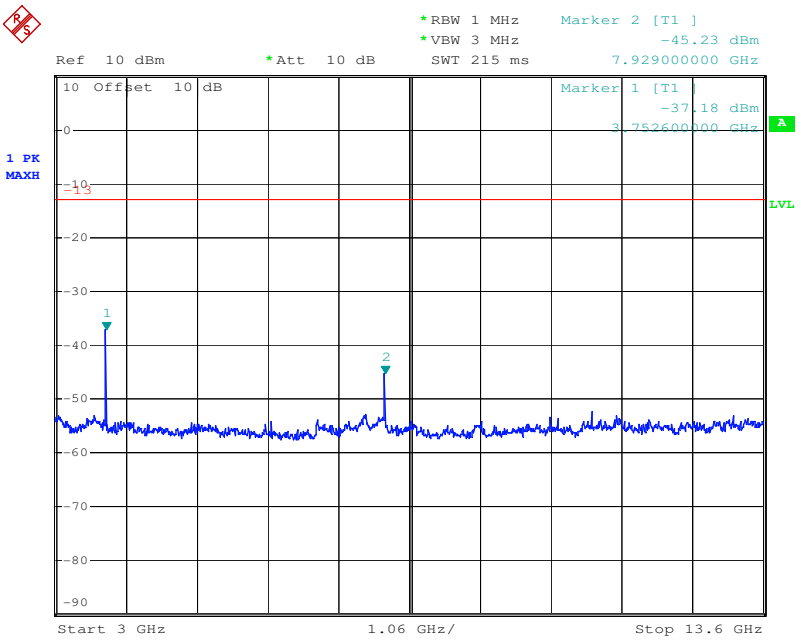
1GHz-3GHz:



3GHz-13.6GHz:



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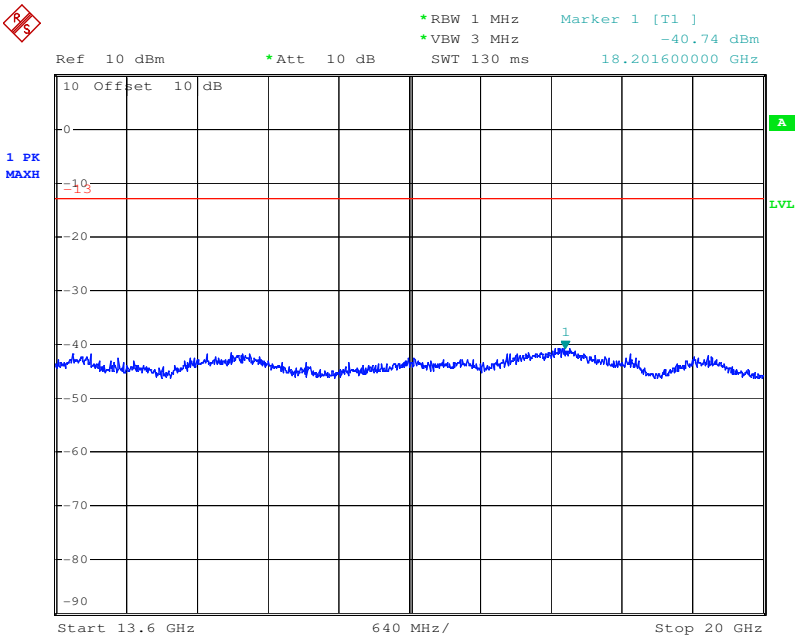
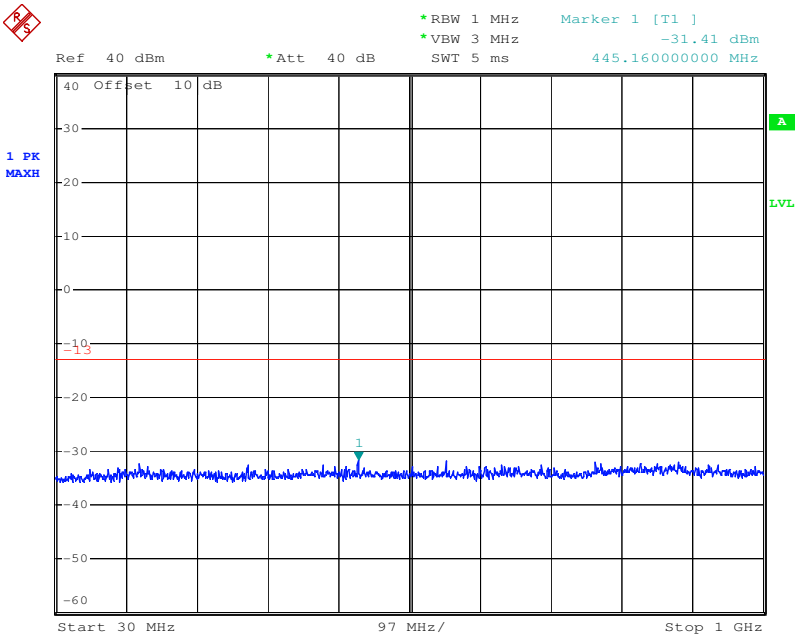
13.6GHz-20GHz:



Test mode:	PCS 1900	Test channel:	High/810	Operation Frequency	1909.80MHz

30MHz-1GHz:



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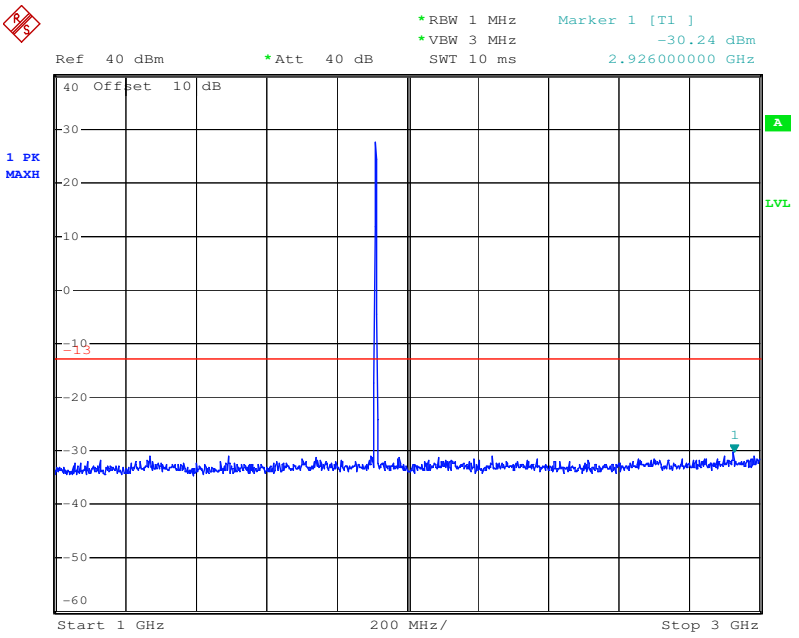
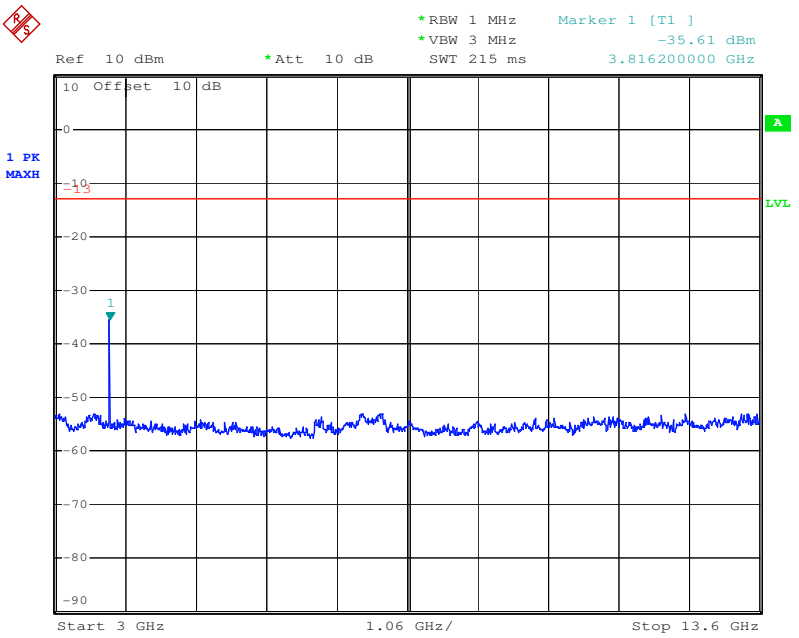
1GHz-3GHz:



3GHz-13.6GHz:



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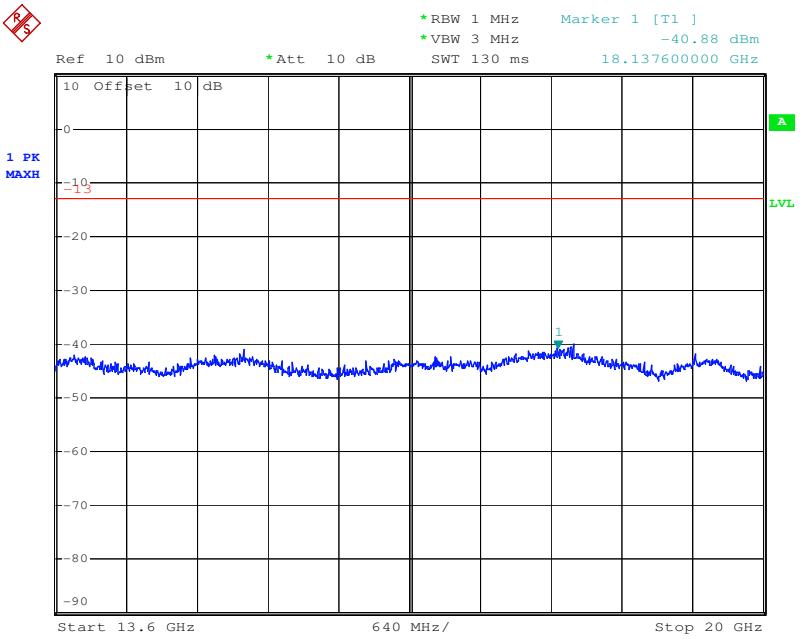
13.6GHz-20GHz:



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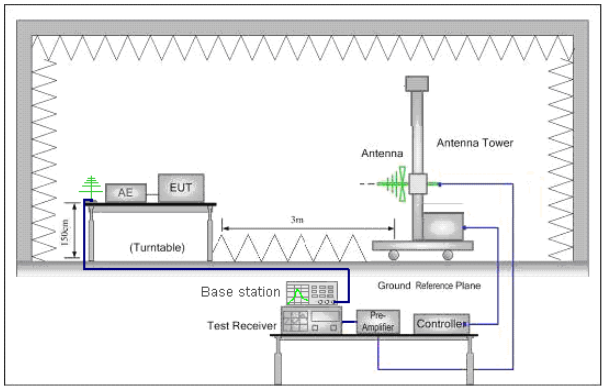
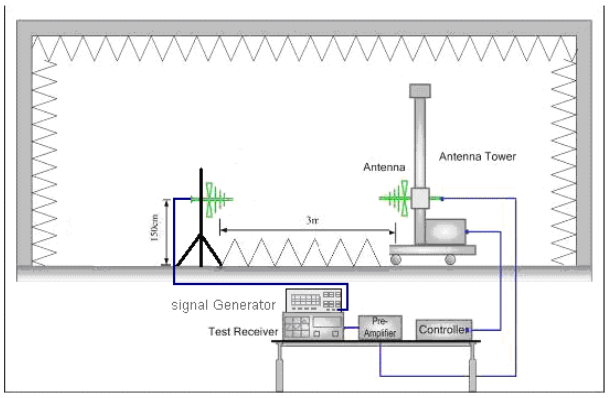
7.6 Radiated Emission

Limit: Attenuated at least 43+10log(P)

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 Setup:





Test Procedure:

1) EUT was placed on a 1.5meter high non – conductive table at a 3 meter test distance from the receive antenna. The height of receiving antenna is 1.5 m. The test setup refers to figure 1 above.
2) Detected emissions were maximized at each frequency by rotating the table 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.
3) The EUT is then put into continuously transmitting mode at its maximum power level during the test. And the maximum value of the receiver should be recorded.
4) The EUT shall be replaced by a substitution antenna the test setup refers to figure 2 above.
5) 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 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. The Power of signal source (P_g) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

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6) The test results are attain as described below:
   Power(EIRP)=P_g – Cable loss + Antenna Gain
   EIRP=ERP+2.15dB
7) This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15dBi)
8) The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning with AC/DC adapter which it is worse case, only the test worst case mode is recorded in the report.
9) Repeat above procedures until all frequencies measured was complete.

Pretest under all modes; choose the worst case mode (Speech mode) record on the report. Please see the below test results.

Receiver Setup:

Frequency	RBW	VBW
30MHz-1GHz	100 kHz	300kHz
Above 1GHz	1MHz	3MHz

Test Results: Pass

Test Data:

Test mode: GSM 850 Test channel: Lowest/128 Operation Frequency 824.20MHz

Frequency (MHz)	Polarization	ERP (dBm)	Limit (dBm)	Margin (dB)
1648.00	H	-23.38	-13	10.38
3581.34	H	-33.92	-13	20.92
6506.00	H	-36.44	-13	23.44
1648.00	V	-26.94	-13	13.94
3631.31	V	-37.45	-13	24.45
5824.00	V	-40.33	-13	27.33

Test mode: GSM 850 Test channel: Middle/189 Operation Frequency 836.40MHz

Frequency (MHz)	Polarization	ERP (dBm)	Limit (dBm)	Margin (dB)
1674.00	H	-25.3	-13.	12.3
3340.00	H	-36.92	-13	23.92
5806.00	H	-34.44	-13	21.44
1674.00	V	-26.39	-13	13.39
3340.00	V	-32.23	-13	19.23
5635.00	V	-36.33	-13	23.33

Test mode: GSM 850 Test channel: High/251 Operation Frequency 848.80MHz

Frequency (MHz)	Polarization	ERP (dBm)	Limit (dBm)	Margin (dB)
1693.00	H	-34.92	-13.	21.92
5752.00	H	-43.94	-13	30.94
1693.00	V	-30.27	-13	17.27

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5815.00	V	-45.20	-13	32.20
1693.00	H	-34.92	-13.	21.92
5752.00	H	-43.94	-13	30.94

Test mode: PCS 1900 Test channel: Lowest/512 Operation Frequency 1850.20MHz

Frequency (MHz)	Polarization	EIRP (dBm)	Limit (dBm)	Margin (dB)
1867.36	H	-38.08	-13.	25.08
3699.71	H	-25.98	-13	12.98
15263.00	H	-34.20	-13	21.20
1882.00	V	-41.47	-13	28.47
3702.28	V	-28.21	-13	15.21
15025.00	V	-35.02	-13	22.02

Test mode: PCS 1900 Test channel: Middle/661 Operation Frequency 1880.00MHz

Frequency (MHz)	Polarization	EIRP (dBm)	Limit (dBm)	Margin (dB)
3752.42	H	-22.04	-13.	9.04
7929.48	H	-35.75	-13	22.75
13852.00	H	-33.99	-13	20.99
3754.75	V	-24.78	-13	11.78
7932.07	V	-37.92	-13	24.92
15399.00	V	-33.58	-13	20.58

Test mode: PCS 1900 Test channel: High/810 Operation Frequency 1909.80MHz

Frequency (MHz)	Polarization	EIRP (dBm)	Limit (dBm)	Margin (dB)
3816.31	H	-28.99	-13.	15.99
8046.58	H	-39.07	-13	26.07
13852.00	H	-35.64	-13	22.64
3821.65	V	-30.91	-13	17.91
8033.47	V	-40.95	-13	27.95
15025.00	V	-36.55	-13	23.55

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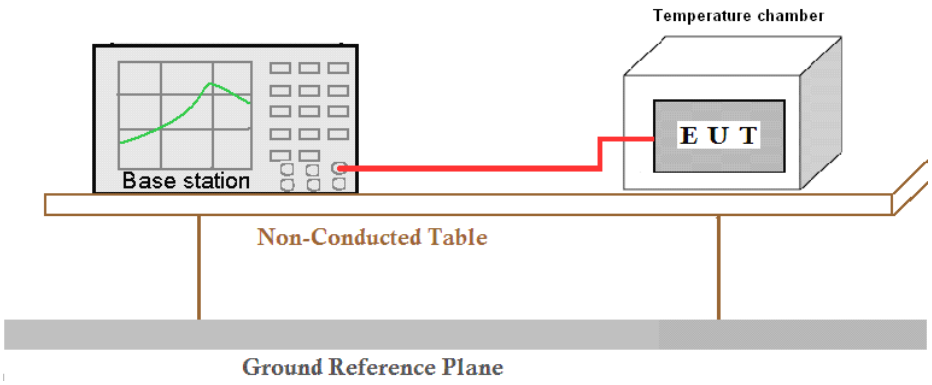
7.7 Frequency stability

Limit:

Operation Band	Frequency stability Limit(ppm)
GSM 850	±2.5ppm
PCS 1900	The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test Setup:



Test Procedure: The transmitter output was connected to a calibrated coaxial cable and a Base Station Simulator. The Base Station Simulator was set to force the EUT to its maximum power setting. The tests were performed at three frequencies (low channel and high channel).The EUT was place in the temperature chamber, the DC leads and RF output cable exited the chamber though an opening made for that purpose. After Operate the equipment in standby conditions for 15 minutes before proceeding. The temperature was varied from -20℃ to +50℃ at intervals of not more than 10℃ The frequency stability was read from the base station at 25℃ the input voltage was varied +/-15%, the frequency stability and input voltage was record.

Test Results: Pass

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GSM 850:

Condition		Test Channel		Frequency (Hz)		Dev (ppm)		Limit (ppm)	Result
Voltage (V)	Temp (℃)	CH No.	Freq (MHz)	GSM	GPRS	GSM	GPRS		
Normal(3.7)	Norma(25)	128	824.20	693	638	0.84	0.77	±2.5	Pass
		251	848.80	-336	-431	-0.40	-0.51		Pass
	Extreme(-30)	128	824.20	735	161	0.89	0.20		Pass
		251	848.80	1008	242	**1.19**	0.29		Pass
	Extreme(-20)	128	824.20	420	331	0.51	0.40		Pass
		251	848.80	315	588	0.37	0.69		Pass
	Extreme(-10)	128	824.20	-357	-213	-0.43	-0.26		Pass
		251	848.80	882	594	1.04	0.70		Pass
	Extreme(0)	128	824.20	378	416	0.46	0.50		Pass
		251	848.80	672	861	0.79	1.01		Pass
	Extreme(10)	128	824.20	231	293	0.28	0.36		Pass
		251	848.80	210	714	0.25	0.84		Pass
	Extreme(30)	128	824.20	-525	-567	-0.64	-0.69		Pass
		251	848.80	525	632	0.62	0.74		Pass
	Extreme(40)	128	824.20	336	433	0.41	0.53		Pass
		251	848.80	651	205	0.77	0.24		Pass
	Extreme(50)	128	824.20	861	845	1.04	1.03		Pass
		251	848.80	-630	-912	-0.74	**-1.07**		Pass
Extreme(3.4)	Norma(25)	128	824.20	252	573	0.31	0.70		Pass
		251	848.80	462	729	0.54	0.86		Pass
Extreme(4.1)		128	824.20	546	108	0.66	0.13		Pass
		251	848.80	504	714	0.59	0.84		Pass

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PCS1900:

Condition		Test Channel		Delta (Hz)		Freq (MHz)		Limit (ppm)	Result
Voltage (V)	Temp (℃)	CH No.	Freq (MHz)	GSM	GPRS	GSM	GPRS		
Normal(3.7)	Norma(25)	512	1850.20	777	752	1850.2008	1850.2008	Within frequency block	Pass
		810	1909.80	483	564	1909.8005	1909.8006		Pass
	Extreme(-30)	512	1850.20	-399	443	1850.1996	1850.2004		Pass
		810	1909.80	-735	-658	1909.7993	1909.7993		Pass
	Extreme(-20)	512	1850.20	546	549	1850.2005	1850.2005		Pass
		810	1909.80	-357	-324	1909.7996	1909.7997		Pass
	Extreme(-10)	512	1850.20	-924	-731	1850.1991	1850.1993		Pass
		810	1909.80	693	528	1909.8007	1909.8005		Pass
	Extreme(0)	512	1850.20	-567	578	1850.1994	1850.2006		Pass
		810	1909.80	1008	902	1909.8010	1909.8009		Pass
	Extreme(10)	512	1850.20	483	429	1850.2005	1850.2004		Pass
		810	1909.80	-861	835	1909.7991	1909.8008		Pass
	Extreme(30)	512	1850.20	693	765	1850.2007	1850.2008		Pass
		810	1909.80	546	479	1909.8005	1909.8005		Pass
	Extreme(40)	512	1850.20	378	358	1850.2004	1850.2004		Pass
		810	1909.80	903	867	1909.8009	1909.8009		Pass
	Extreme(50)	512	1850.20	-693	733	1850.1993	1850.2007		Pass
		810	1909.80	504	557	1909.8005	1909.8006		Pass
Extreme(3.4)	Norma(25)	512	1850.20	630	425	1850.2006	1850.2004		Pass
		810	1909.80	567	520	1909.8006	1909.8005		Pass
Extreme(4.1)		512	1850.20	630	469	1850.2006	1850.2005		Pass
		810	1909.80	567	582	1909.8006	1909.8006		Pass

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8 Test Setup Photographs

Refer to the < CS299B-A _Test Setup photos>.

9 EUT Constructional Details

Refer to the < CS299B-A _External Photos > & < CS299B-A _Internal Photos >.

--End of the Report--

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