RF TEST REPORT

Report No.: SET2015-03113

Product: Mobile phone

FCC ID: SG720150305G30

Model No.: G30

Applicant: Haier Telecom （Qingdao） Co.,Ltd.

Address: No.1 Haier Road, Hi-tech Zone, Qingdao, China

Issued by: CCIC-SET

Lab Location: Electronic Testing Building, Shahe Road，Xili, Nanshan District, Shenzhen, 518055, P. R. China

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Test Report

Product……....:	Mobile phone
Brand Name……:	Haier
Trade Name……....:	Haier
Applicant……:	Haier Telecom （Qingdao） Co.,Ltd.
Applicant Address……...:	No.1 Haier Road, Hi-tech Zone, Qingdao, China
Manufacturer……..:	Haier Telecom （Qingdao） Co.,Ltd.
Manufacturer Address….:	No.1 Haier Road, Hi-tech Zone, Qingdao, China
Test Standards……..…:	47 CFR Part 2(10-1-12 Edition) Frequency Allocations and Radio Treaty Matters; General Rules and Regulations 47 CFR Part 22(10-1-12 Edition) Public Mobile Services 47 CFR Part 24(10-1-12 Edition)Personal Communications Services
Test Result……..…:	PASS
Tested by……....:	Haigang He 2015.03.15 Haigang He，Test Engineer
Reviewed by……..…:	Zhu Qi 2015.03.15 Zhu Qi, Senior Egineer
Approved by……....:	Wu Li'an 2015.03.15 Wu Li'an，Manager

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Change History		
Issue	Date	Reason for change
1.0	2015.03.15	First edition

1. GENERAL INFORMATION

1.1 EUT Description

EUT Type	Mobile phone
Serial No.	568014
IMEI No.	353919025680145
Hardware Version	M11_V1.01_PCB
Software Version	HW-W816-H01-S006
EUT supports Radios application	GSM/GPRS/WCDMA/HSDPA/HSUPA
Frequency Range	GSM 850MHz: Tx: 824.2 - 848.8MHz (at intervals of 200kHz); Rx: 869.2 - 893.8MHz (at intervals of 200kHz) GSM 1900MHz: Tx: 1850.2 - 1909.8MHz (at intervals of 200kHz); Rx: 1930.2 - 1989.8MHz (at intervals of 200kHz) WCDMA 850MHz Tx: 826.4 - 846.6MHz (at intervals of 200kHz); Rx: 871.4 - 891.6MHz (at intervals of 200kHz) WCDMA 1900MHz Tx: 1852.4 - 1907.6MHz (at intervals of 200kHz); Rx: 1932.4 - 1987.6MHz (at intervals of 200kHz)
Multislot Class	GPRS: Multislot Class12,EGPRS: Multislot Class12
Maximum Output Power to Antenna	GSM850: 33.51dBm GSM1900: 30.78dBm WCDMA850: 23.32dBm WCDMA1900: 23.26dBm
Antenna Type	FPC Antenna
Type of Modulation	GMSK,8PSK,QPSK

1.2 Maximum ERP/EIRP Power, Frequency Tolerance, and Emission Designator

System	Emission Designator	Frequency Tolerance (ppm)	Maximum ERP/EIRP
GSM 850	252KGXW	0.07	2.118W
GSM 1900	248KGXW	0.03	1.084W
EDGE 850	248KG7W	0.05	2.084W
EDGE 1900	244KG7W	0.03	0.989W
WCDMA 850	4M18F9W	0.07	0.379W
WCDMA 1900	4M18F9W	0.03	0.366W

1.3 Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 2, Part 22, Part 24 for the EUT FCC ID Certification:

1. 47 CFR Part 2, 22(H), 24(E)
2. ANSI / TIA / EIA-603-C-2004
3. FCC KDB 971168 D01 Power Meas. License Digital Systems v02r01

Test detailed items/section required by FCC rules and results are as below:

No.	Section	Description	Limit	Result
1	2.1046	Conducted RF Output Power	Reporting Only	PASS
2	24.232(d)	Peak to Average Radio	＜13dBm	PASS
3	2.1049, 22.917(b) 24.238(b)	99% Occupied Bandwidth and 26dB Bandwidth	Reporting Only	PASS
4	2.1055, 22.355 24.235	Frequency Stability	＜2.5ppm	PASS
5	2.1051 22.917(a) 24.238(a)	Conducted Out of Band Emissions	< 43+10log10(P[Watts])	PASS
6	2.1051 22.917(a) 24.238(a)	Band Edge	< 43+10log10(P[Watts])	PASS

7	22.913(a)(2)	Effective Radiated Power	＜7Watts	PASS
	24.232(c)	Equivalent Isotropic Radiated Power	＜2Watts	PASS
8	2.1053 22.917(a) 24.238(a)	Field Strength of Spurious Radiation	< 43+10log10(P[Watts])	PASS

Remark：

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

1.4 Test Configuration of Equipment under Test

Antenna port conducted and radiated test items were performed according to KDB 971168 D01 Power Meas. License Digital Systems v02r01 with maximum output power.

Radiated measurements were performed with rotating EUT in different three orthogonal test planes to find the maximum emission.

Radiated emissions were investigated as following frequency range:

1. 30 MHz to 9000 MHz for GSM850 and WCDMA Band V.
2. 30 MHz to 20000 MHz for GSM1900 and WCDMA Band II.

All modes and data rates and positions were investigated.

Test modes are chosen to be reported as the worst case configuration below:

Test Modes		
Band	Radiated TCs	Conducted TCs
GSM 850	GSM Link EDGE Link	GSM Link EDGE Link
GSM 1900	GSM Link EDGE Link	GSM Link EDGE Link
WCDMA Band V	RMC 12.2Kbps Link	RMC 12.2Kbps Link
WCDMA Band II	RMC 12.2Kbps Link	RMC 12.2Kbps Link

Note: The maximum power levels are chosen to test as the worst case configuration as follows: GSM mode for GMSK modulation, EDGE multi-slot class 8 mode for 8PSK modulation, RMC 12.2Kbps mode for WCDMA band V, RMC 12.2Kbps mode for WCDMA band II, only these modes were used for all tests.

1.5 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between RF conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level will be exactly the RF output level.

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.
The following shows an offset computation example with RF cable loss 7 dB and a 10dB attenuator.
Example:
Offset (dB) = RF cable loss (dB) + attenuator factor (dB).
= 7 + 10 = 17 (dB)

1.6 Facilities and Accreditations

1.6.1 Test Facilities

CNAS-Lab Code: L1659

CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd. CCIC is a third party testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L1659. A 12.8*6.8*6.4 (m) fully anechoic chamber was used for the radiated spurious emissions test.

FCC-Registration No.: 406086

CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Registration 406086, valid time is until October 28, 2017.

IC-Registration No.: 11185A-1

CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd. EMC Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 11185A-1 on July. 15, 2013, valid time is until July. 15, 2016.

1.6.2 Test Environment Conditions

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

Temperature (℃):	15℃- 35℃
Relative Humidity (%):	30% -60%
Atmospheric Pressure (kPa):	86KPa-106KPa

2. 47 CFR PART 2, PART 22H & 24E REQUIREMENTS

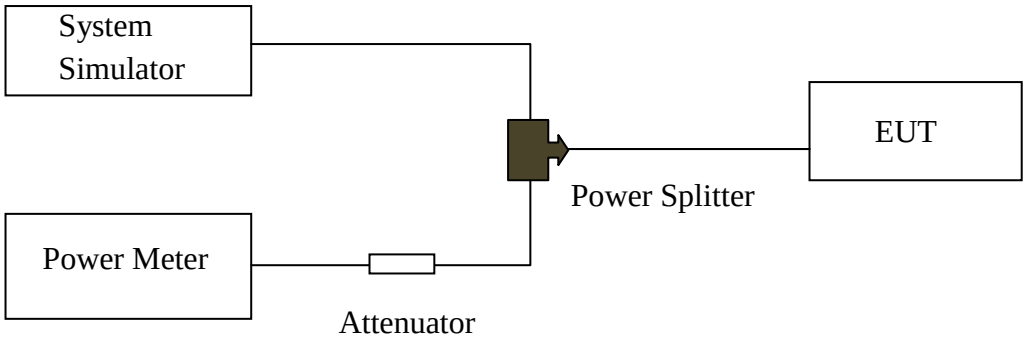
2.1 Conducted RF Output Power

2.1.1 Requirement

According to FCC section 2.1046(a), for transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in FCC section 2.1033(c)(8).

2.1.2 Test Description

1. Test Setup:



The EUT, which is powered by the Battery, is coupled to the Power meter and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power i.e. Power Control Level (PCL) = 5 and Power Class = 4. A call is established between the EUT and the SS.

2. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due Date
System Simulator	Agilent	E5515C	MY47510547	2014.06.11	2015.06.10
Power Meter	R&S	NRV2	1020.1809.02	2014.06.08	2015.06.07
Power Sensor	R&S	NRV-Z4	823.3618.03	2014.06.08	2015.06.07
Attenuator	MCE	10dB	BN3693	2014.06.11	2015.06.10

2.1.3 Test Results

Here the lowest, middle and highest channels are selected to perform testing to verify the conducted RF output power of the EUT.

1. GSM Model Test Verdict:

Band	Channel	Frequency (MHz)	Measured Output Power dBm	Verdict
GSM 850MHz	128	824.2	33.41	PASS
	190	836.6	33.51	PASS
	251	848.8	33.42	PASS
GSM 1900MHz	512	1850.2	30.72	PASS
	661	1880.0	30.78	PASS
	810	1909.8	30.68	PASS
GPRS 850MHz	128	824.2	33.02	PASS
	190	836.6	33.22	PASS
	251	848.8	33.14	PASS
GPRS 1900MHz	512	1850.2	30.60	PASS
	661	1880.0	30.64	PASS
	810	1909.8	30.63	PASS
EDGE 850MHz	128	824.2	30.32	PASS
	190	836.6	30.29	PASS
	251	848.8	30.30	PASS
EDGE 1900MHz	512	1850.2	30.28	PASS
	661	1880.0	30.36	PASS
	810	1909.8	30.27	PASS

Note 1: For the GPRS and EDGE model, all the slots were tested and just the worst data was record in this report.

2. WCDMA Model Test Verdict:

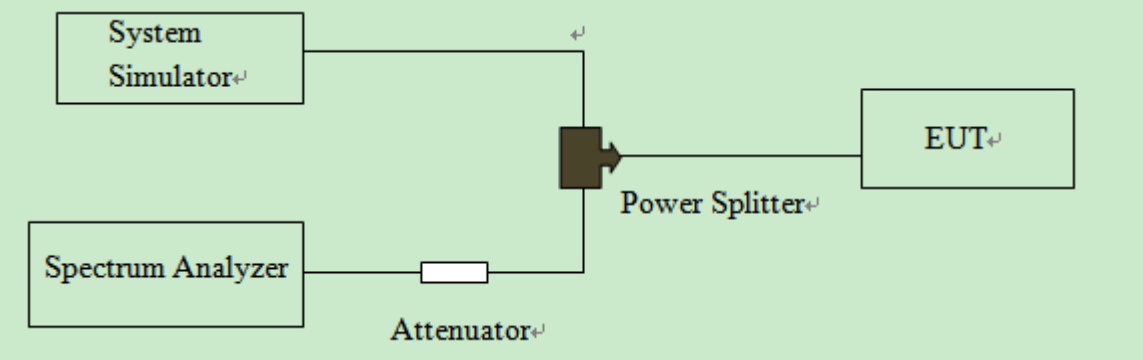
Item	band	WCDMA 850			WCDMA 1900		
	ARFCN	4132	4183	4233	9262	9400	9538
	subtest	dBm			dBm		
5.2(WCDMA)	non	23.24	23.32	23.22	23.23	23.26	23.12
HSDPA	1	22.72	22.53	22.82	22.68	22.8	22.6
	2	22.28	22.72	22.25	22.45	22.08	22.52
	3	21.7	21.92	21.74	21.84	21.92	21.9
	4	21.69	21.74	21.71	21.68	21.86	21.82
HSUPA	1	22.28	22.38	22.37	22.54	22.57	22.42
	2	22.22	22.18	22.2	22.04	21.9	21.94
	3	21.96	22.09	22.02	22.07	22.12	22.06
	4	22.04	22.14	22.23	21.92	21.81	21.79
	5	22.24	22.26	22.31	22.04	22.25	22.18

2.2 Peak to Average Radio

2.2.1 Definition

According to FCC section 2.1049 and FCC 24.232(d), the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

2.2.2 Test Description



Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due Date
System Simulator	Agilent	E5515C	MY47510547	2014.06.11	2015.06.10
Spectrum Analyzer	R&S	FSP40	100341	2014.07.07	2015.07.06
Attenuator	Resent	10dB	(n.a.)	2014.06.11	2015.06.10

2.2.3 Test Verdict

Here the lowest, middle and highest channels are selected to perform testing to verify the peak-to-average ratio.

Test procedures:

A .For GSM operating mode:

a. Set RBW=1MHz, VBW=3MHz, Peak detector on spectrum analyzer for first trace.

b. Set the RBW = 1MHz, VBW = 3MHz, RMS detector on spectrum analyzer for second trace.

c. The wanted burst signal is triggered by spectrum analyzer, and measured respectively the peak level and Mean level without burst-off time, after system simulator has synchronized with the spectrum analyzer.

B. For UMTS operating mode:

a. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.

b. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1%.

c. Record the deviation as Peak to Average Ratio.

1. Test Verdict:

Band	Channel	Frequency (MHz)	Peak to Average radio		Limit	Verdict
			dB	Refer to Plot	dB	
GSM 1900MHz	512	1850.2	0.02	Plot A1 to A3	13	PASS
	661	1880.0	0.07			PASS
	810	1909.8	0.04			PASS
EDGE 1900MHz	512	1850.2	0.04	Plot B1 to B3	13	PASS
	661	1880.0	0.07			PASS
	810	1909.8	0.06			PASS
WCDMA 1900MHz	9262	1852.4	5.88	Plot C1 to C3	13	PASS
	9400	1880.0	5.92			PASS
	9538	1907.6	5.88			PASS

2. GSM Model Test Plots:

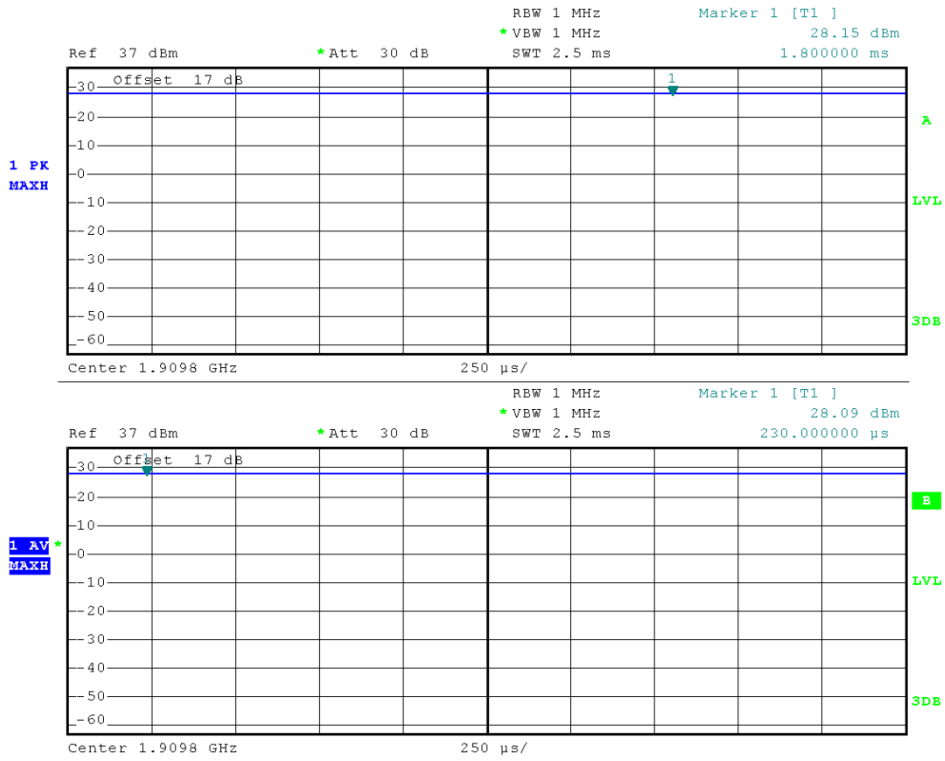
(Plot A1: GSM 1900 MHz Channel = 512)

(Plot A2: GSM 1900 MHz Channel = 661)

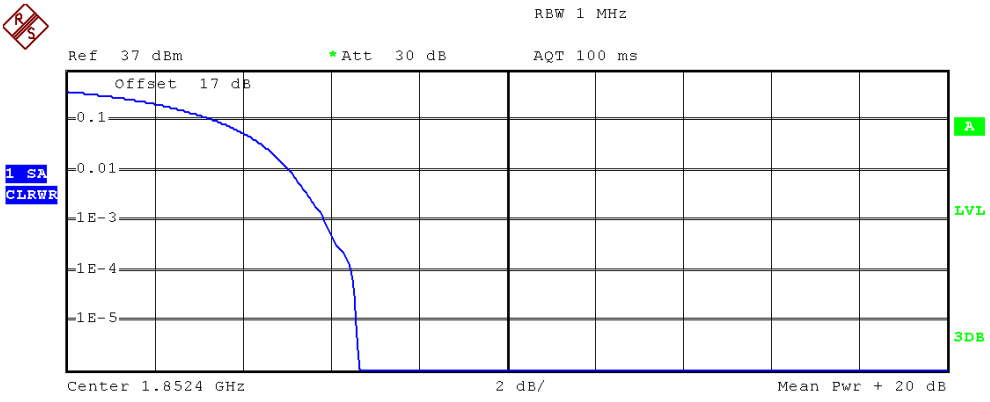
(Plot A3: GSM 1900MHz Channel = 810)

(Plot B1: EDGE 1900 MHz Channel = 512)

(Plot B2: EDGE 1900 MHz Channel = 661)



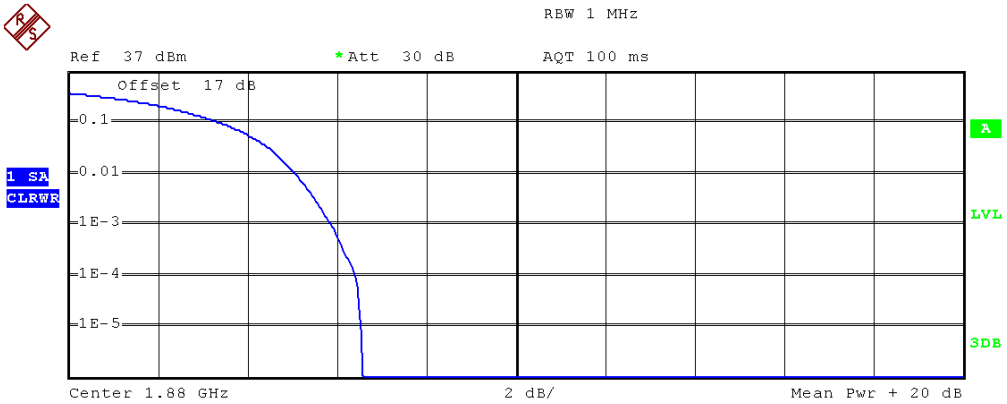
(Plot B3: EDGE 1900 MHz Channel = 810)



Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	16.44 dBm
Peak	23.09 dBm
Crest	6.65 dB
10 %	3.48 dB
1 %	5.12 dB
.1 %	5.88 dB
.01 %	6.48 dB

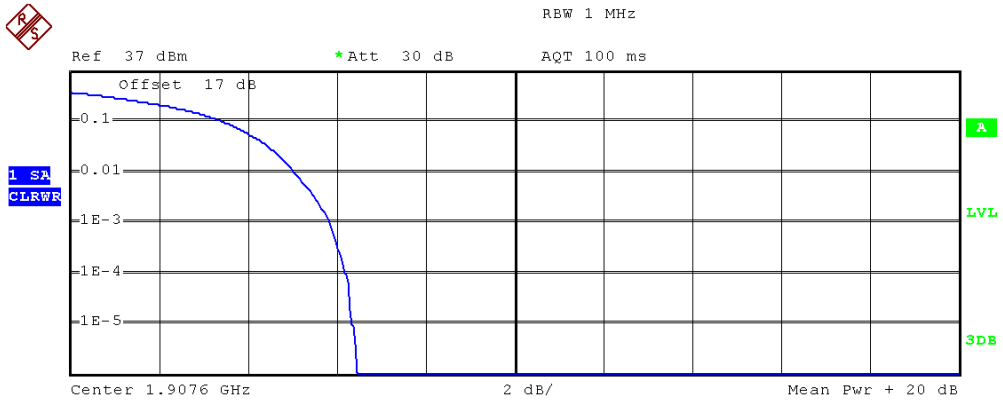
(Plot C1: WCDMA 1900MHz Channel = 9262)



Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	16.30 dBm
Peak	22.88 dBm
Crest	6.58 dB
10 %	3.48 dB
1 %	5.12 dB
.1 %	5.92 dB
.01 %	6.44 dB

(Plot C2: WCDMA 1900MHz Channel = 9400)



Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	15.51 dBm
Peak	21.96 dBm
Crest	6.46 dB
10 %	3.52 dB
1 %	5.08 dB
.1 %	5.88 dB
.01 %	6.24 dB

(Plot C3: WCDMA 1900MHz Channel = 9538)

2.3 Occupied Bandwidth

2.3.1 Definition

The 99% occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean transmitted power.
The emission bandwidth is defined as the width of the signal between two points, located at the 2 sides of the carrier frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

2.3.2 Test Description

See section 2.1.2 of this report.

2.3.3 Test Procedures

1. The testing follows FCC KDB 971168 v02r01 Section 4.2.
2. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
3. The RF output of the EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
4. The 99% occupied bandwidth were measured, set RBW= 1% of span, VBW= 3*RBW, sample detector, trace maximum hold.
5. The 26dB bandwidth were measured, set RBW= 1% of EBW, VBW= 3*RBW, peak detector, trace maximum hold.

2.3.4 Test Verdict

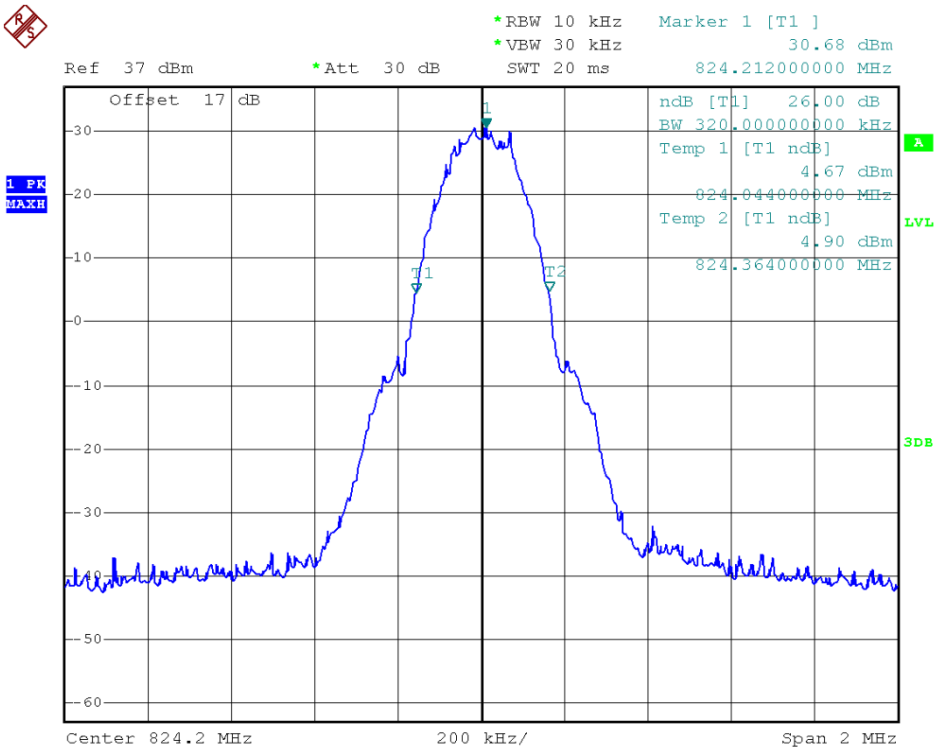
Here the lowest, middle and highest channels are selected to perform testing to verify the 99% occupied bandwidth.

1. Test Verdict:

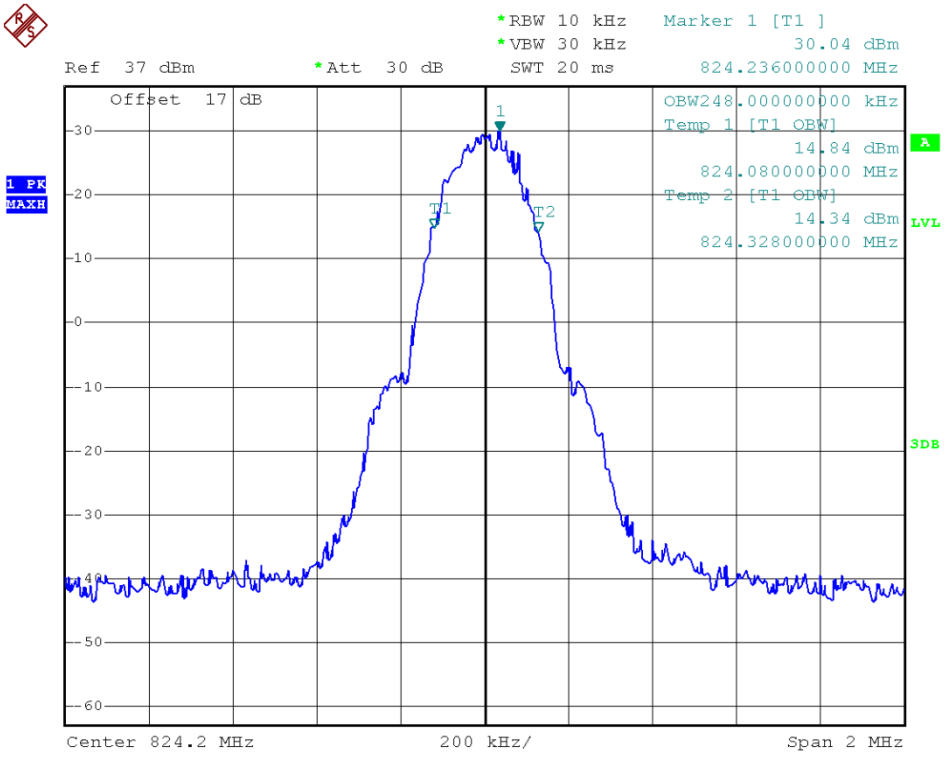
Band	Channel	Frequency (MHz)	26dB bandwidth	99% Occupied Bandwidth	Refer to Plot
GSM 850MHz	128	824.2	320KHz	248KHz	Plot A1-A2
	190	836.6	316KHz	244KHz	Plot A3-A4
	251	848.8	324KHz	252KHz	Plot A5-A6
GSM 1900MHz	512	1850.2	316KHz	244KHz	Plot B1-B2
	661	1880.0	320KHz	248KHz	Plot B3-B4
	810	1909.8	324KHz	240KHz	Plot B5-B6

Band	Channel	Frequency (MHz)	26dB bandwidth	99% Occupied Bandwidth	Refer to Plot
EDGE 850MHz	128	824.2	324KHz	248KHz	Plot C1-C2
	190	836.6	324KHz	244KHz	Plot C3-C4
	251	848.8	320KHz	244KHz	Plot C5-C6
EDGE 1900MHz	512	1850.2	316KHz	240KHz	Plot D1-D2
	661	1880.0	320KHz	244KHz	Plot D3-D4
	810	1909.8	328KHz	244KHz	Plot D5-D6
WCDMA Band V	4132	826.4	4.72MHz	4.16MHz	Plot E1-E2
	4183	836.6	4.68MHz	4.16MHz	Plot E3-E4
	4233	846.6	4.68MHz	4.18MHz	Plot E5-E6
WCDMA Band II	9262	1852.4	4.72MHz	4.16MHz	Plot F1-F2
	9400	1880	4.72MHz	4.18MHz	Plot F3-F4
	9538	1907.6	4.74MHz	4.18MHz	Plot F5-F6

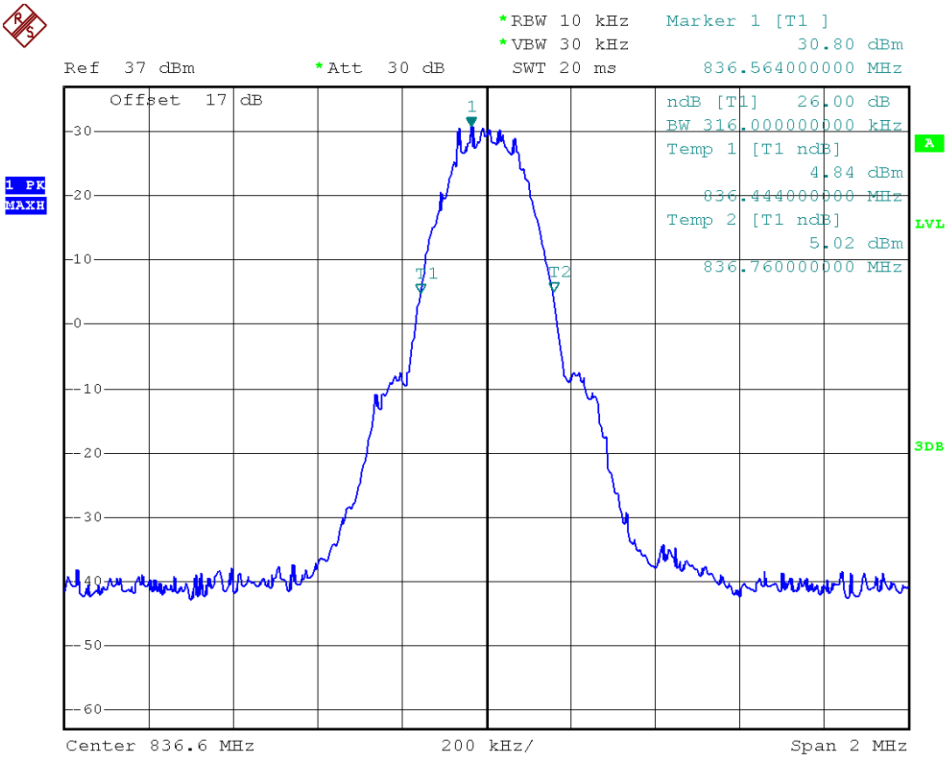
2. Test Plots:



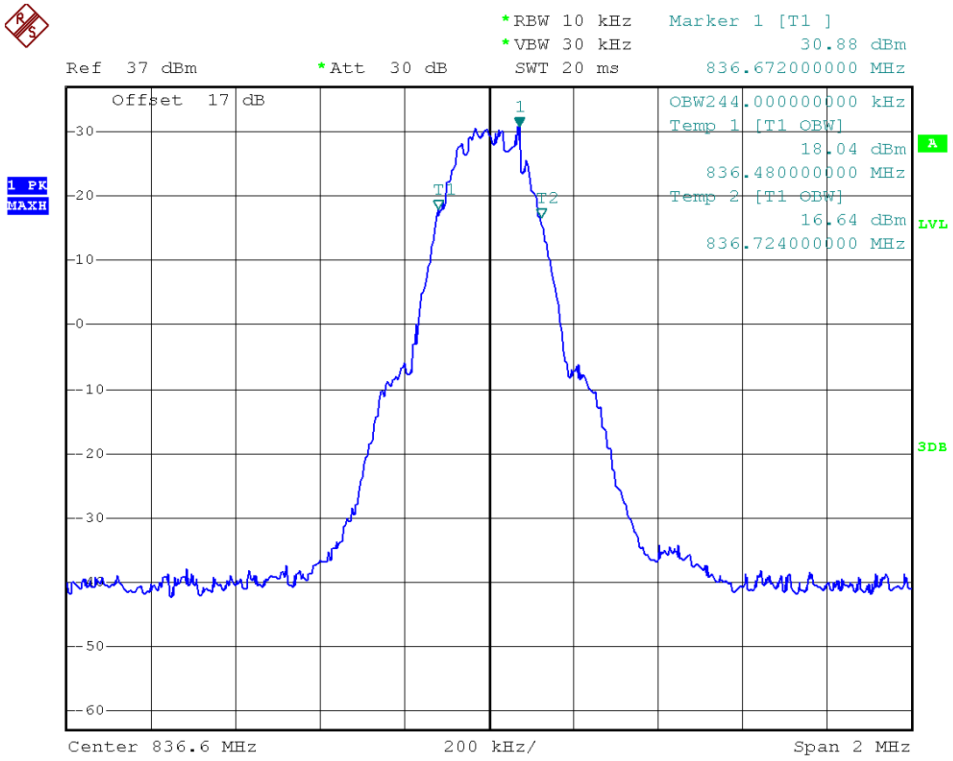
(Plot A1: GSM 850MHz Channel = 128)



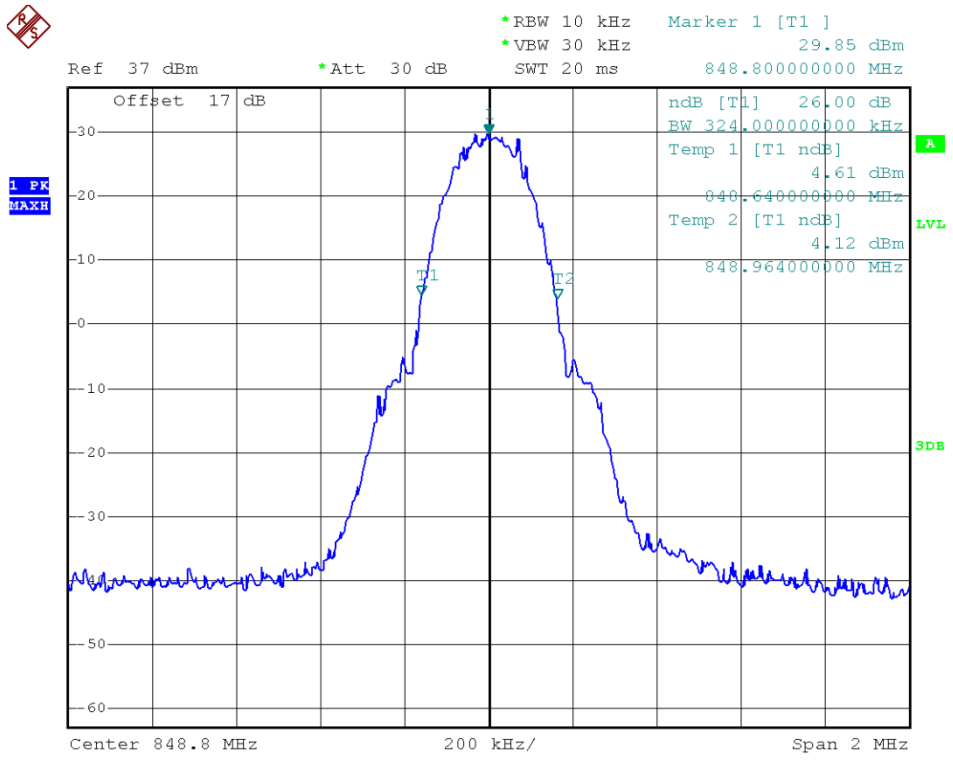
(Plot A2: GSM 850MHz Channel = 128)



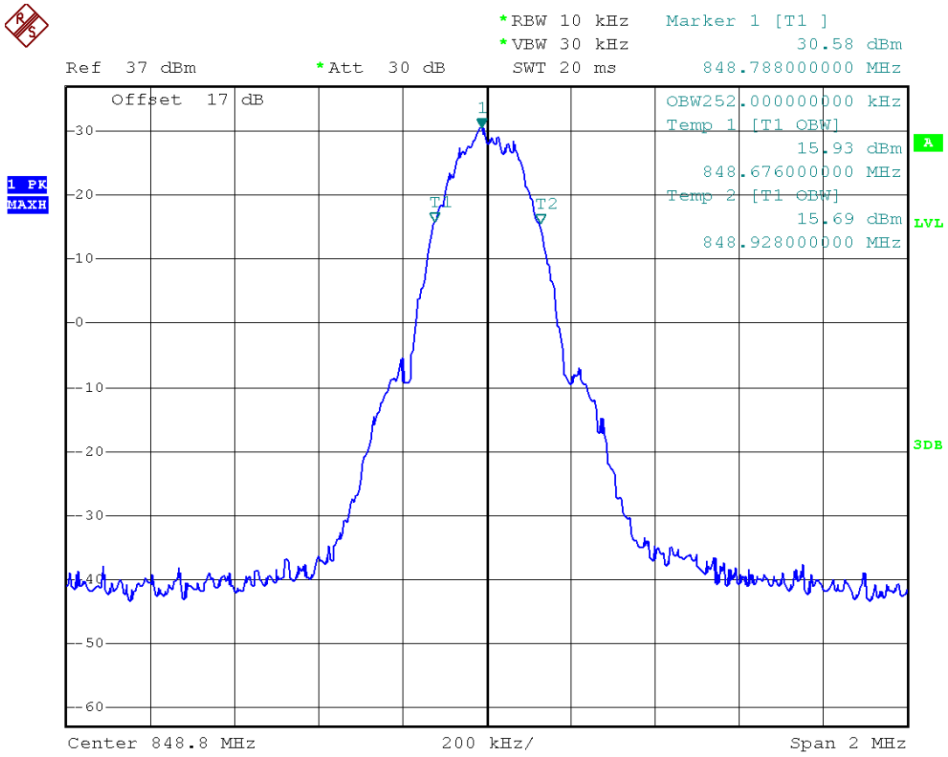
(Plot A3: GSM 850MHz Channel = 190)



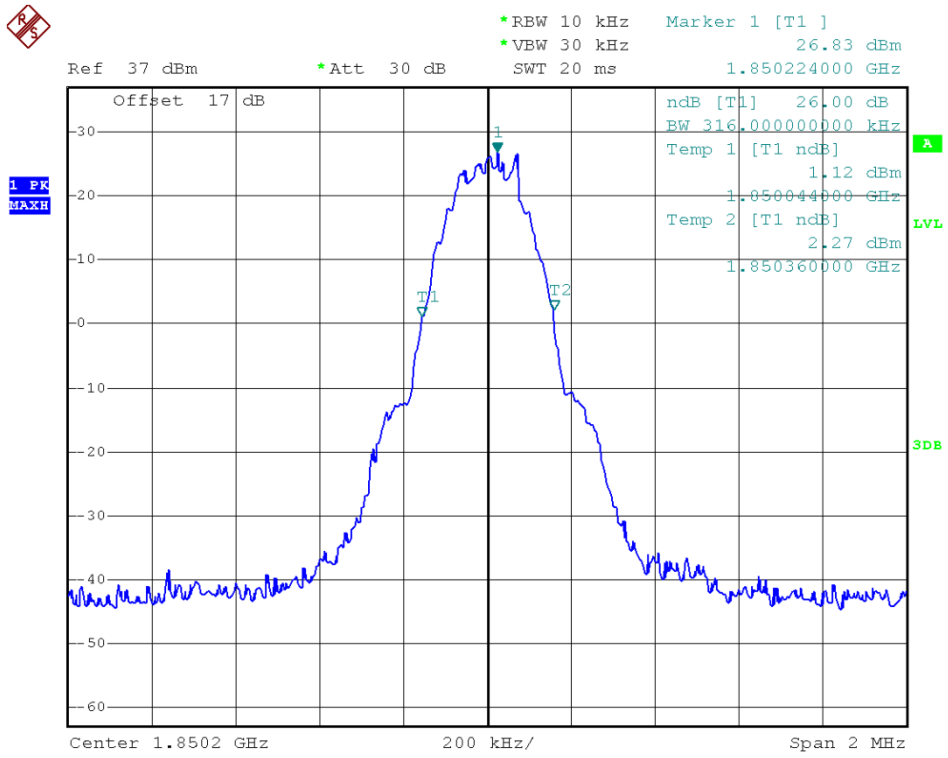
(Plot A4: GSM 850MHz Channel = 190)



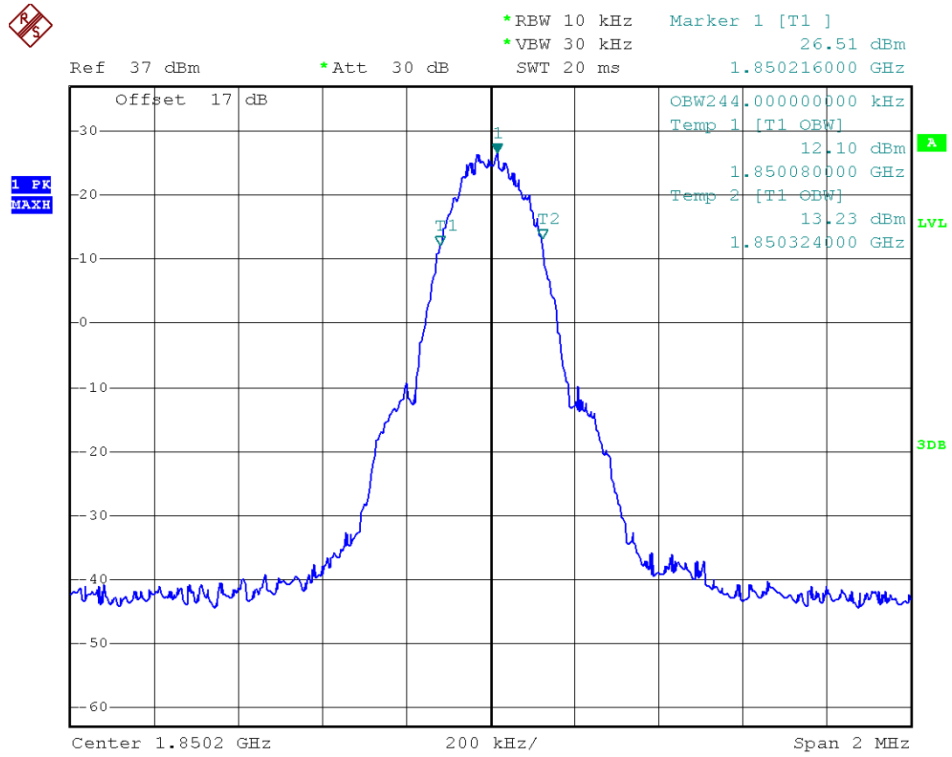
(Plot A5: GSM 850MHz Channel = 251)



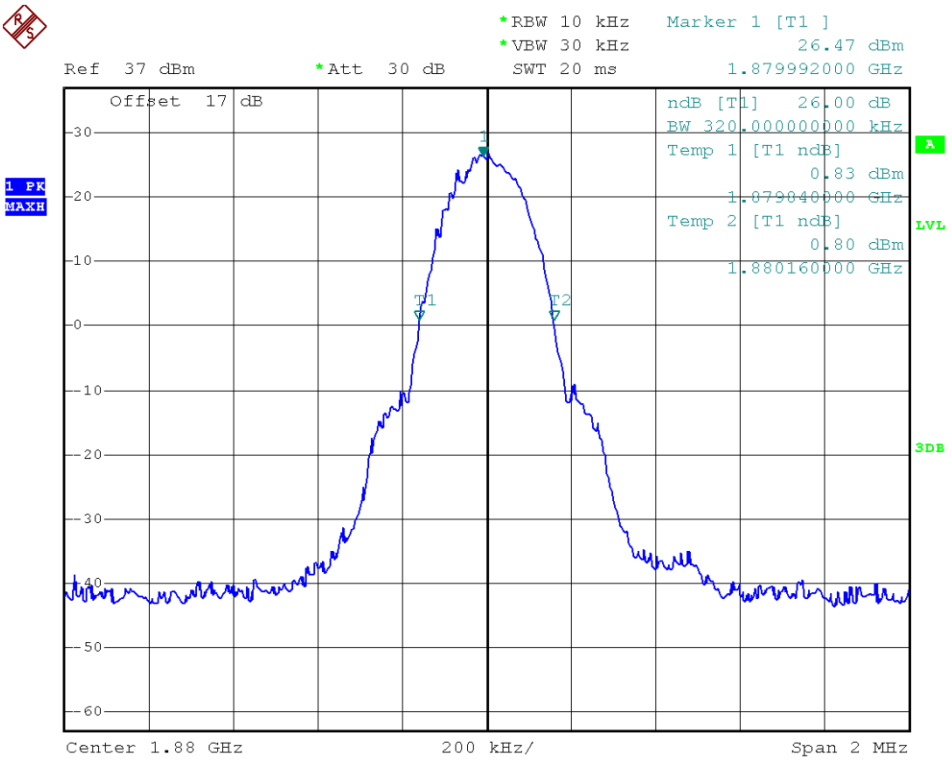
(Plot A6: GSM 850MHz Channel = 251)



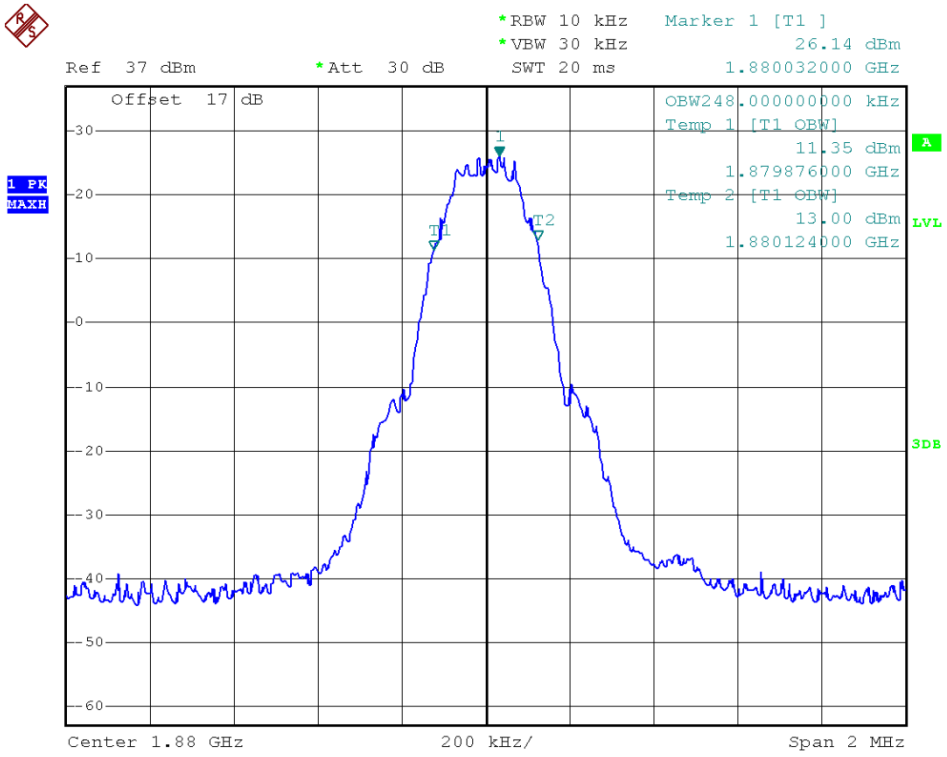
(Plot B1: GSM 1900MHz Channel = 512)



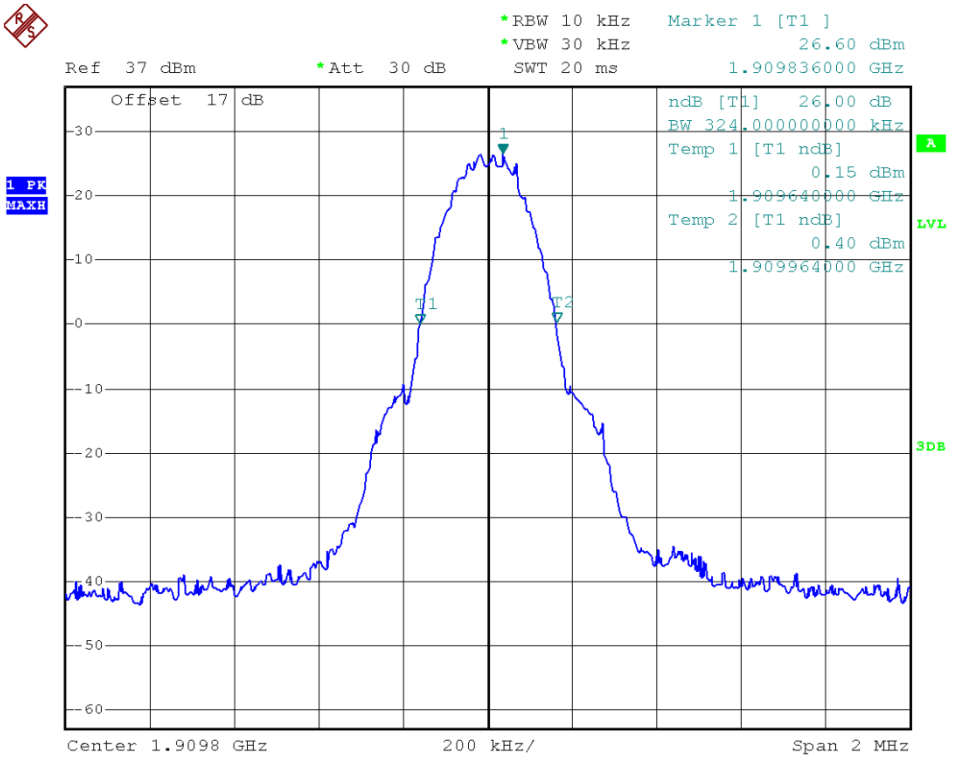
(Plot B2: GSM 1900MHz Channel = 512)



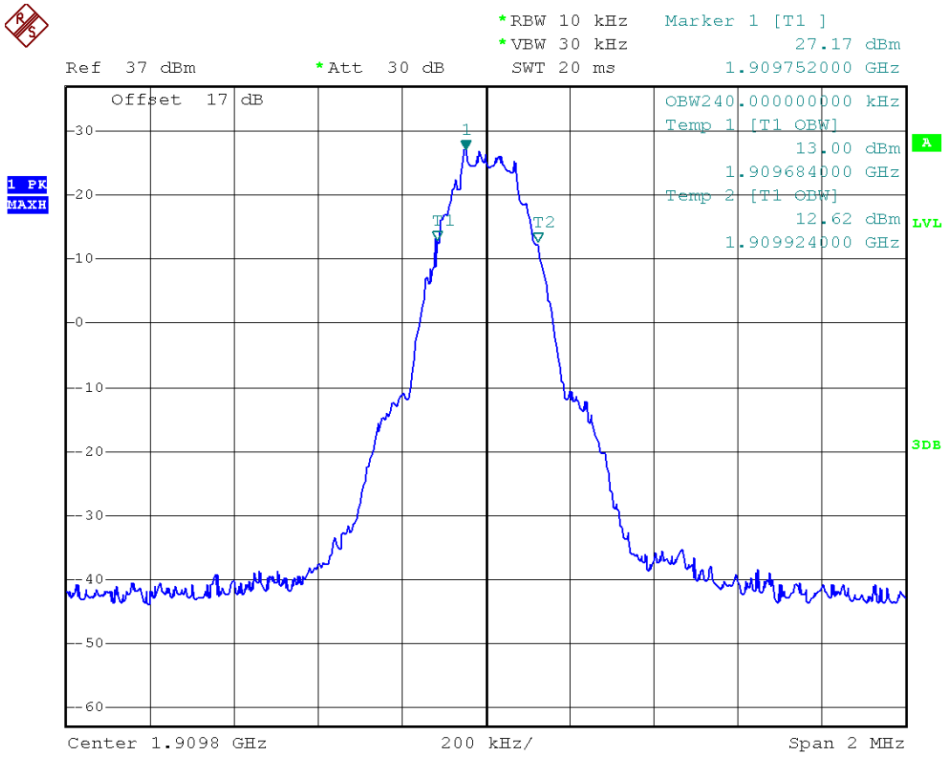
(Plot B3: GSM 1900MHz Channel = 661)



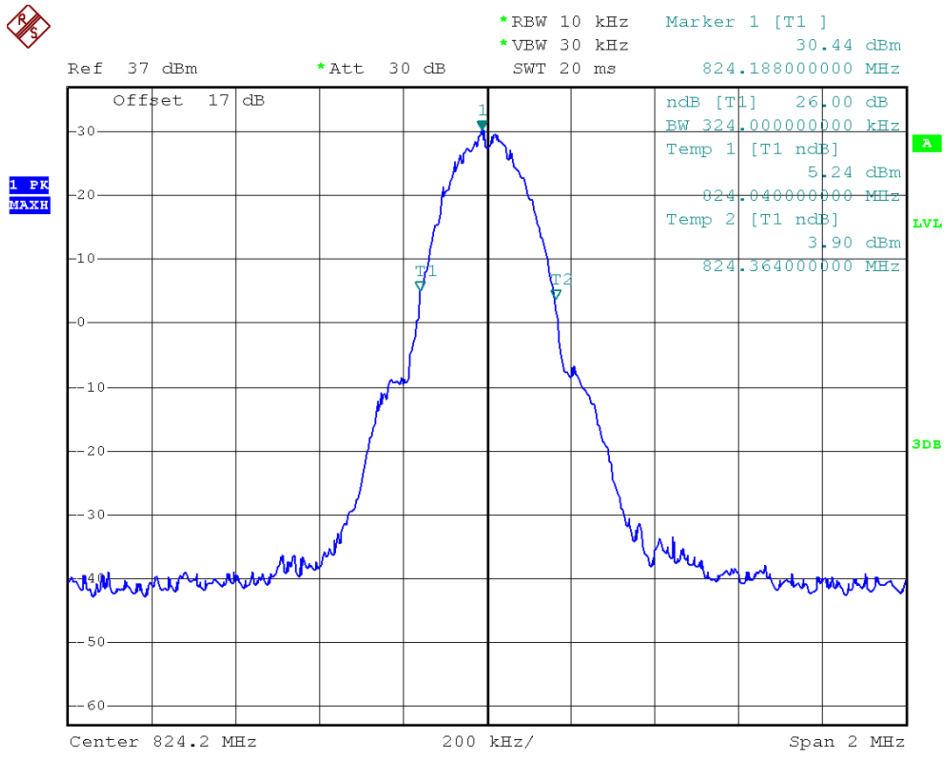
(Plot B4: GSM 1900MHz Channel = 661)



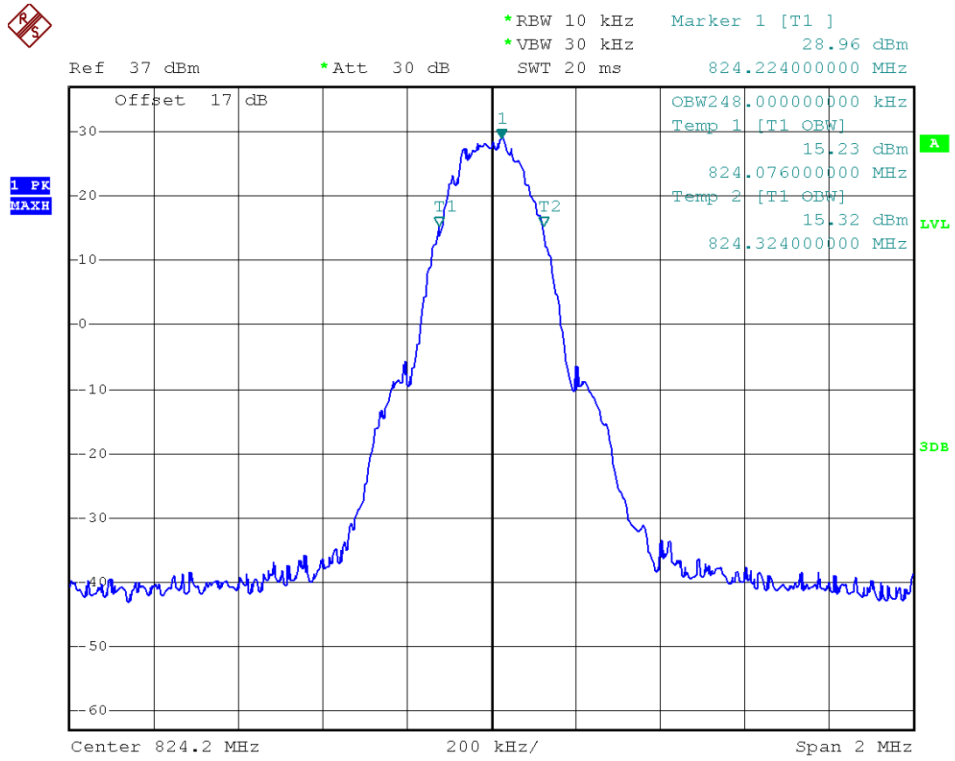
(Plot B5: GSM 1900MHz Channel = 810)



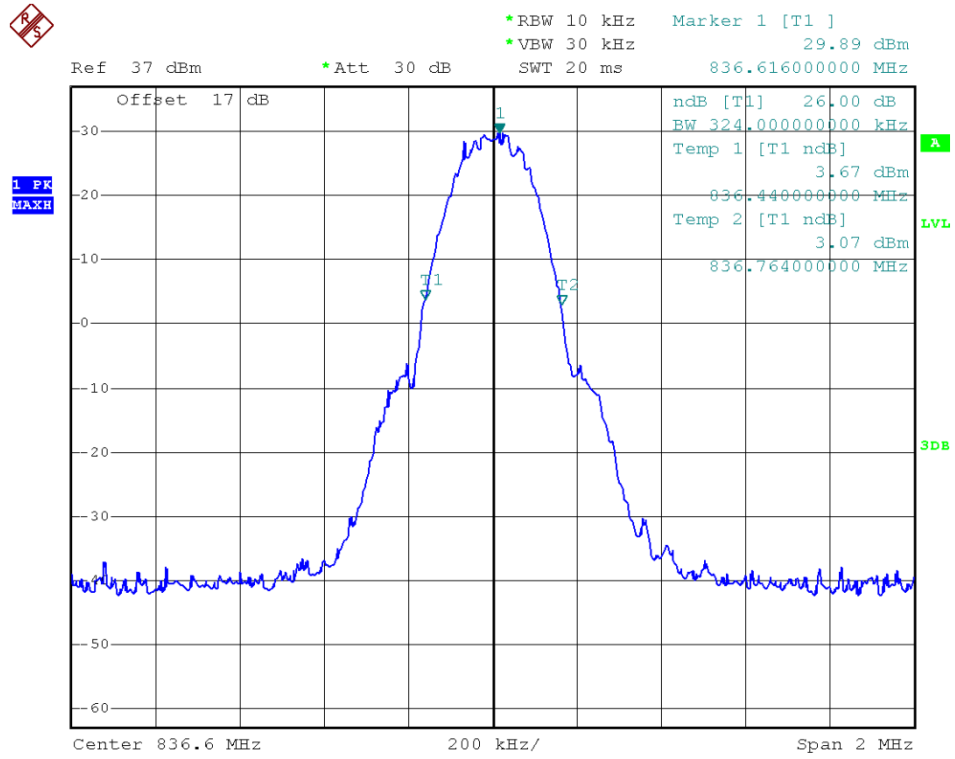
(Plot B6: GSM 1900MHz Channel = 810)



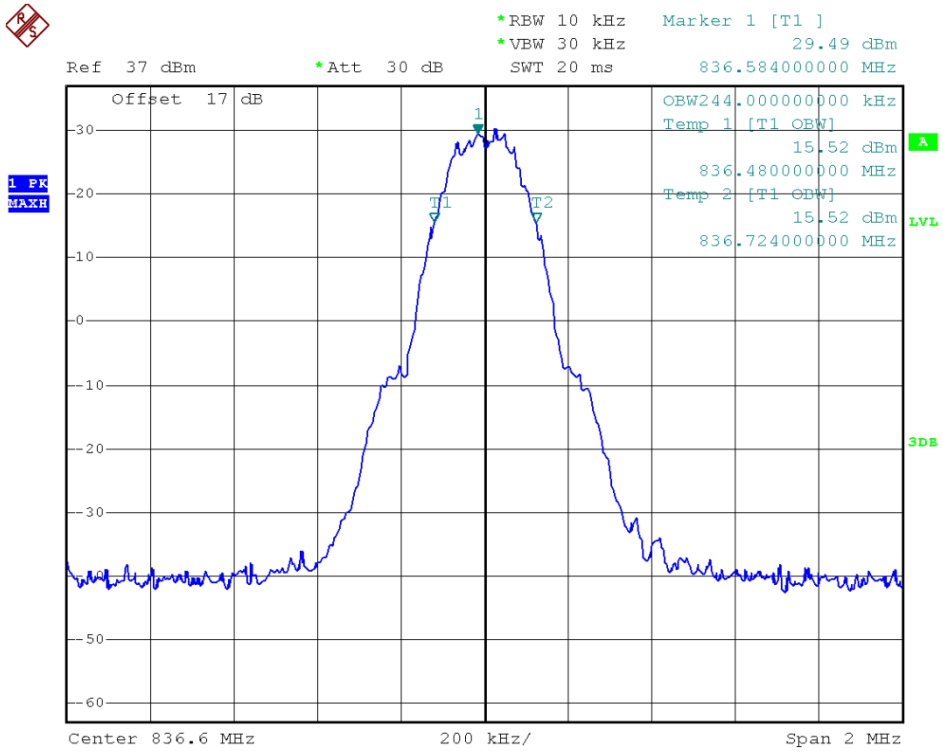
(Plot C1: EDGE 850MHz Channel = 128)



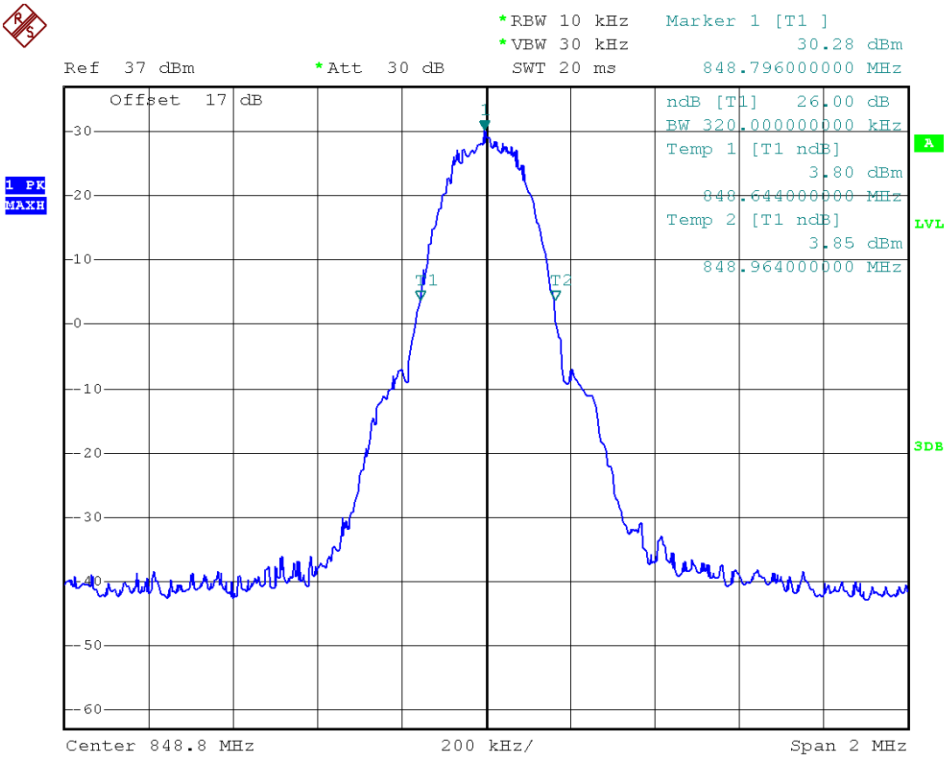
(Plot C2: EDGE 850MHz Channel = 128)



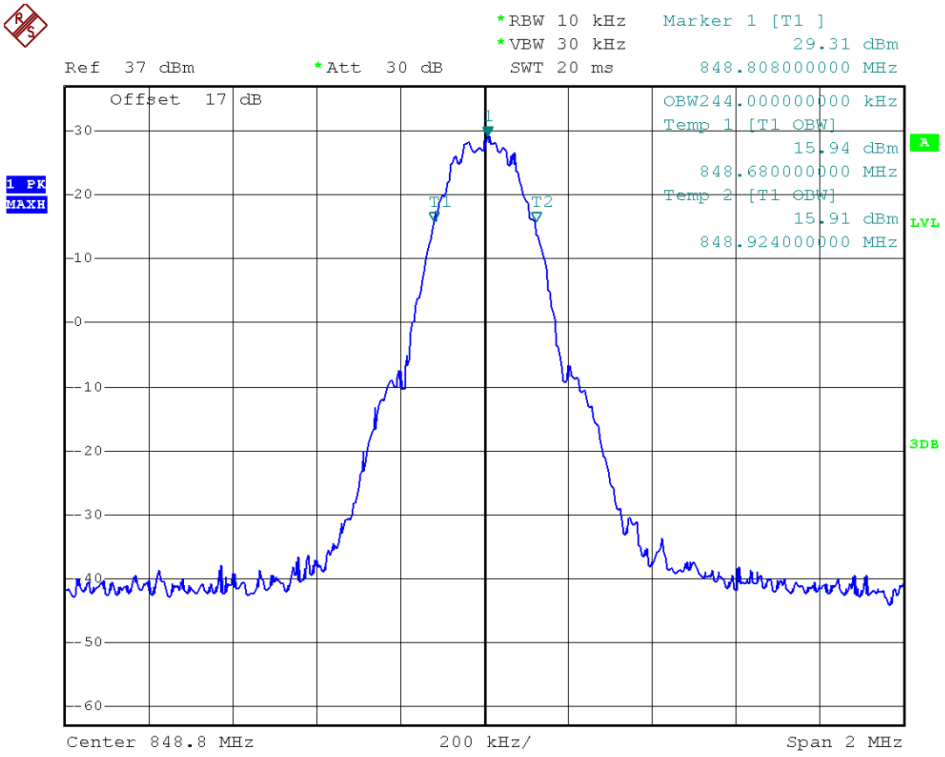
(Plot C3: EDGE 850MHz Channel = 190)



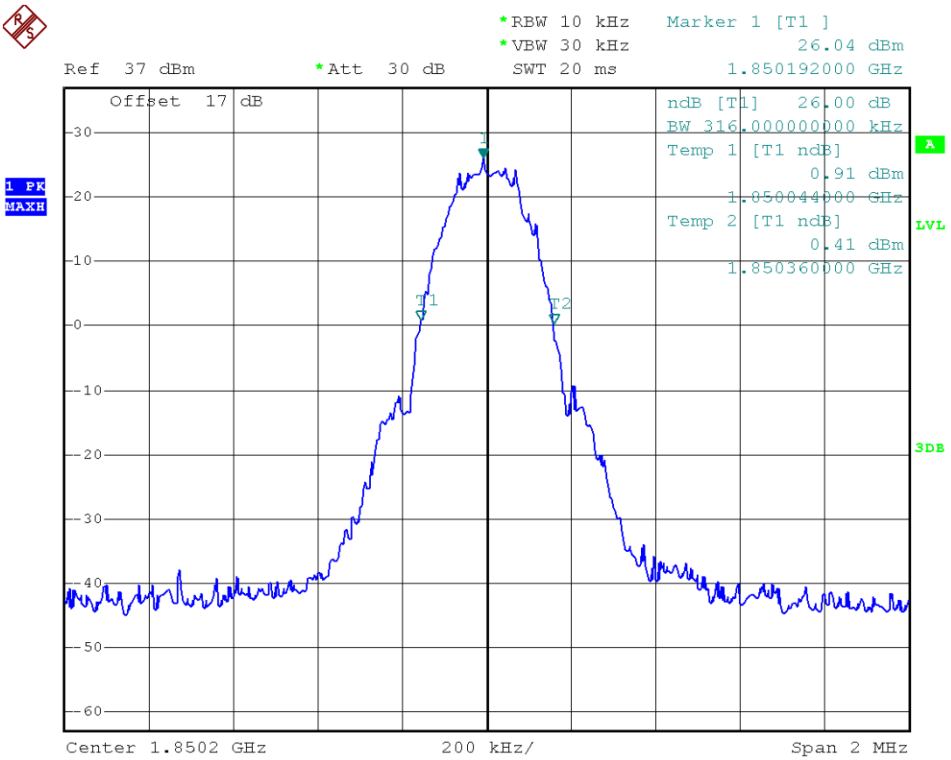
(Plot C4: EDGE 850MHz Channel = 190)



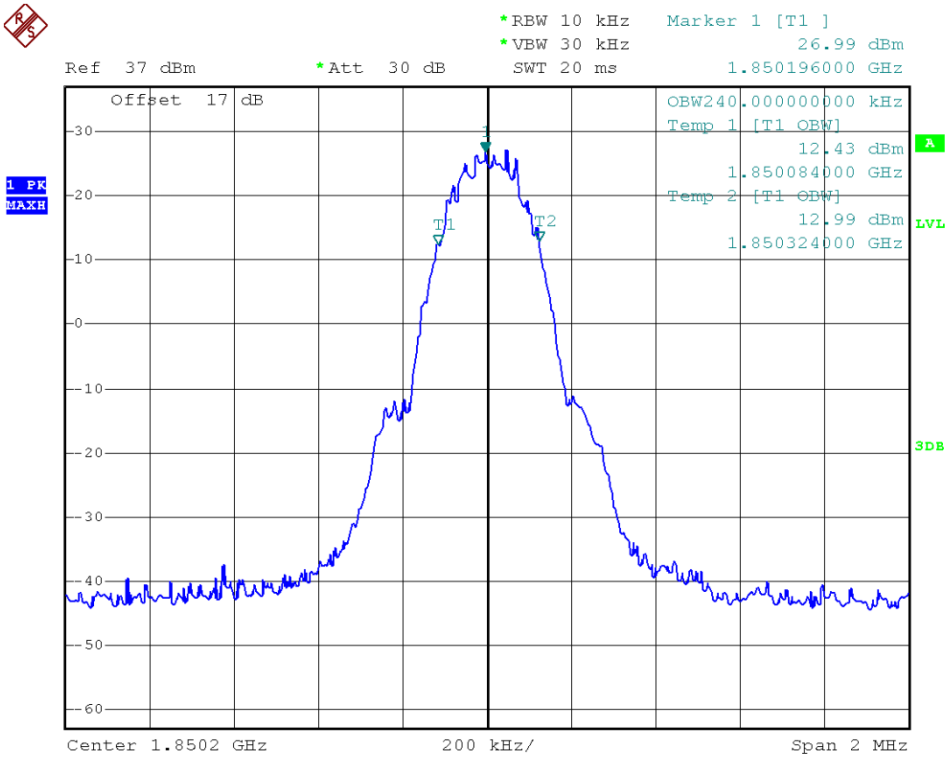
(Plot C5: EDGE 850MHz Channel = 251)



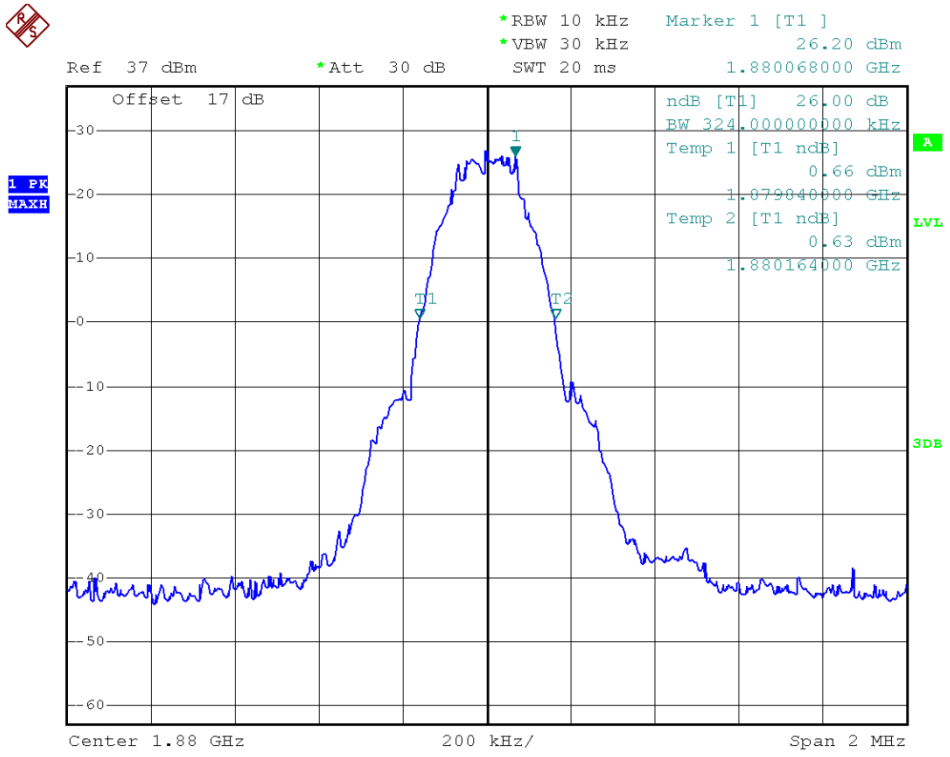
(Plot C6: EDGE 850MHz Channel = 251)



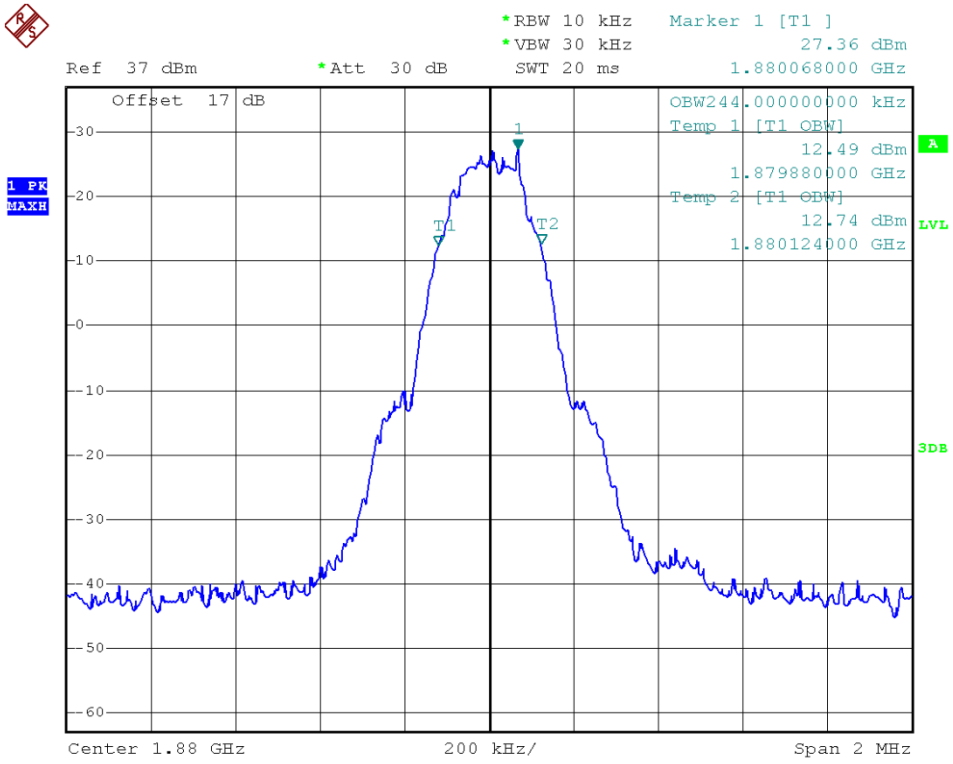
(Plot D1: EDGE 1900MHz Channel = 512)



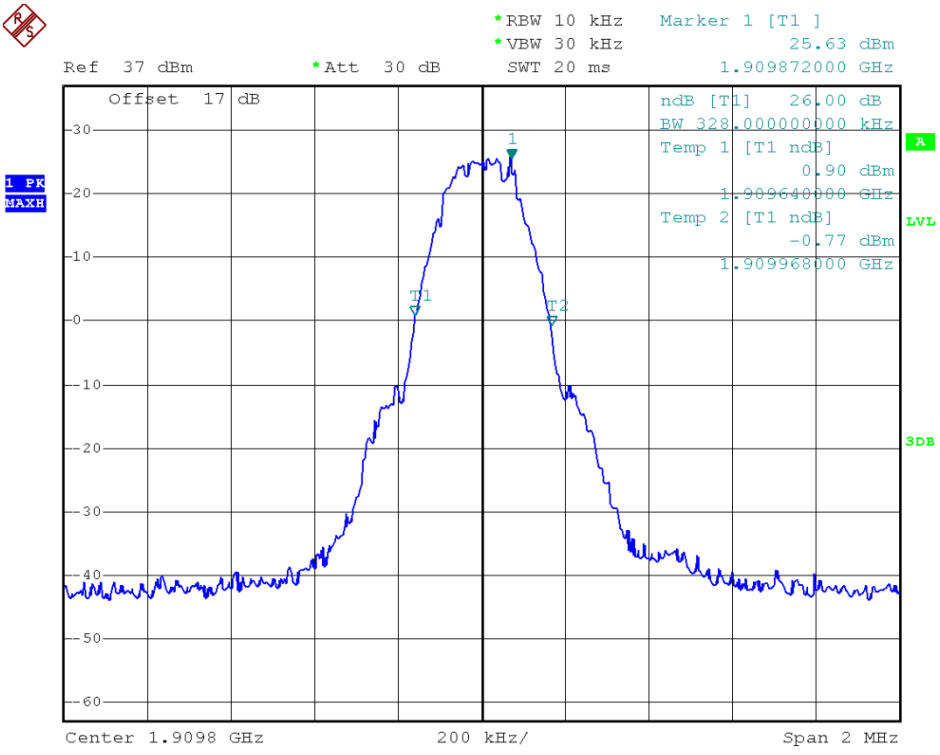
(Plot D2: EDGE 1900MHz Channel = 512)



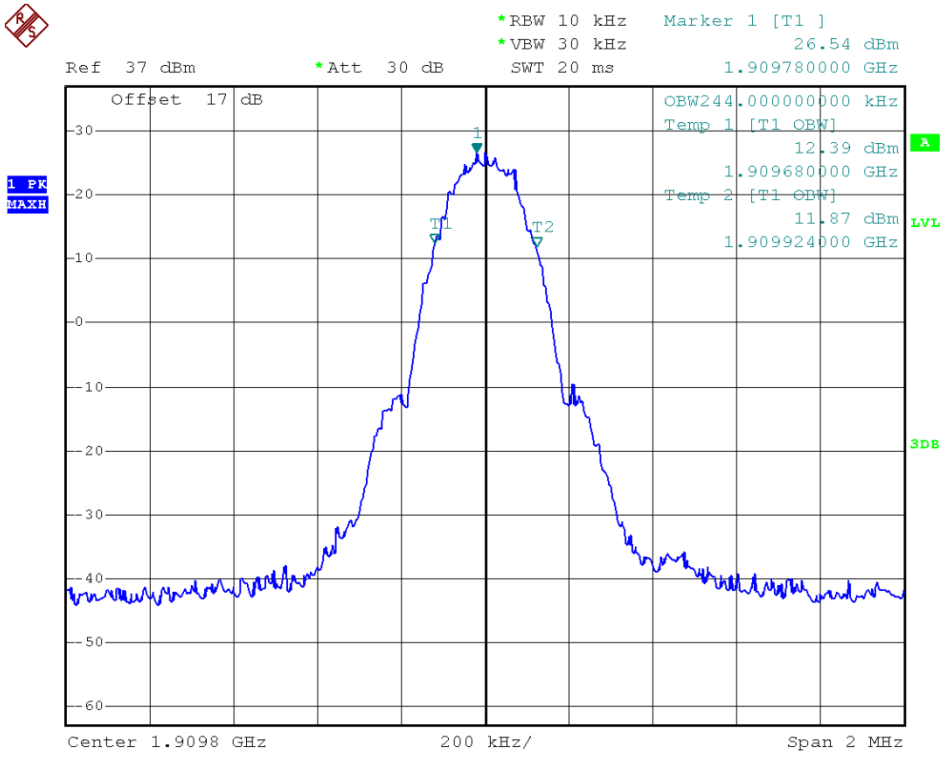
(Plot D3: EDGE 1900MHz Channel = 661)



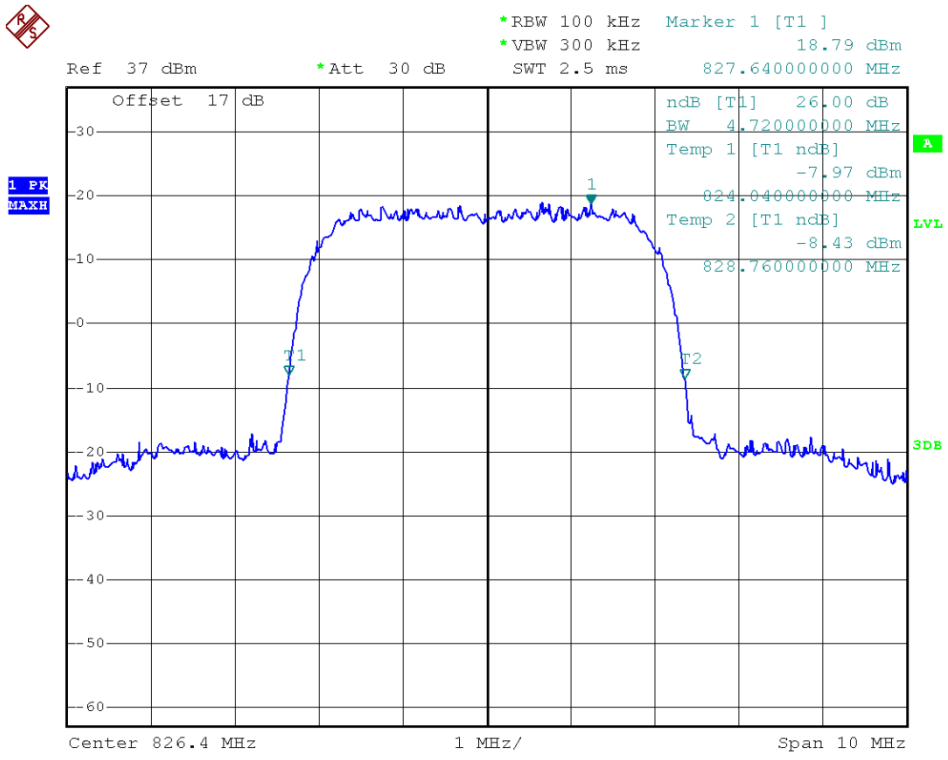
(Plot D4: EDGE 1900MHz Channel = 661)



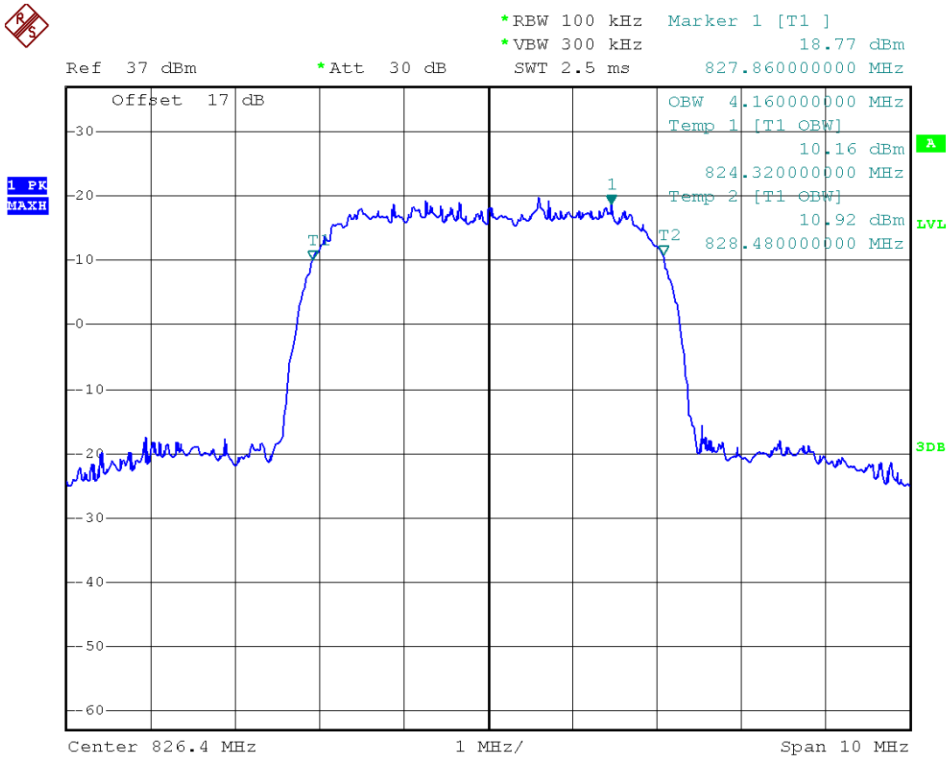
(Plot D5: EDGE 1900MHz Channel = 810)



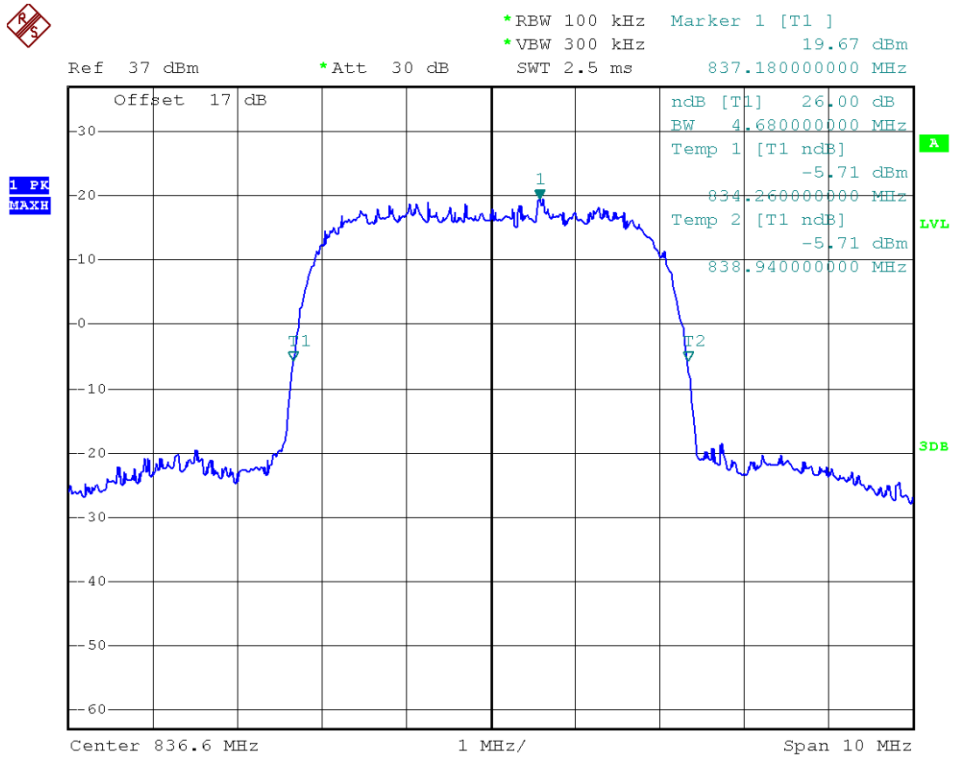
(Plot D6: EDGE 1900MHz Channel = 810)



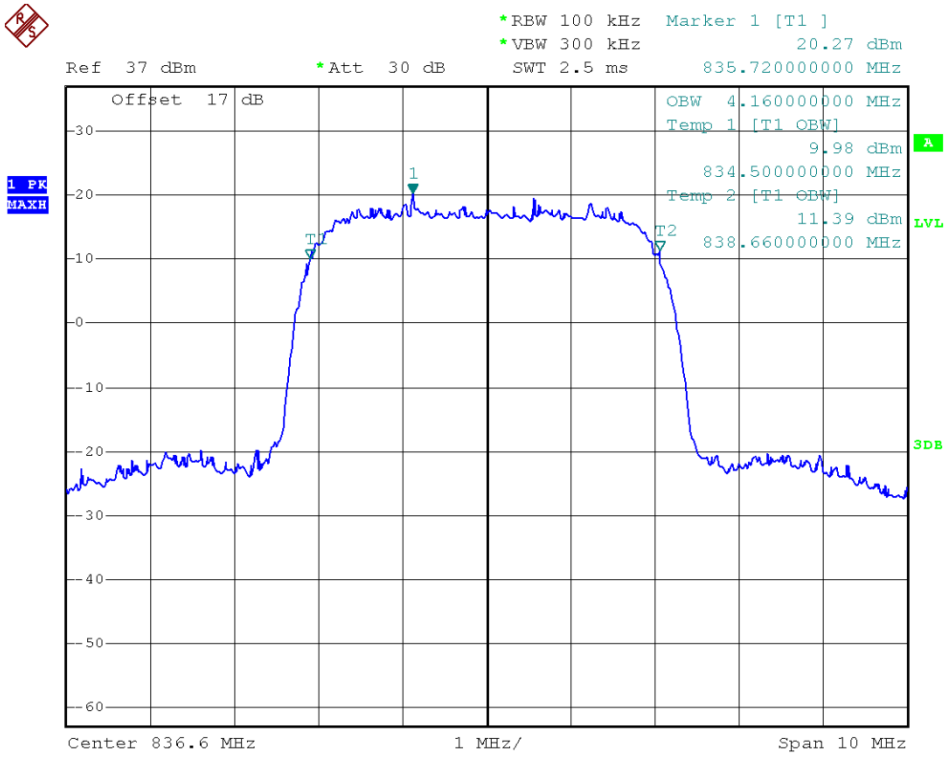
(Plot E1: WCDMA 850MHz Channel = 4132)



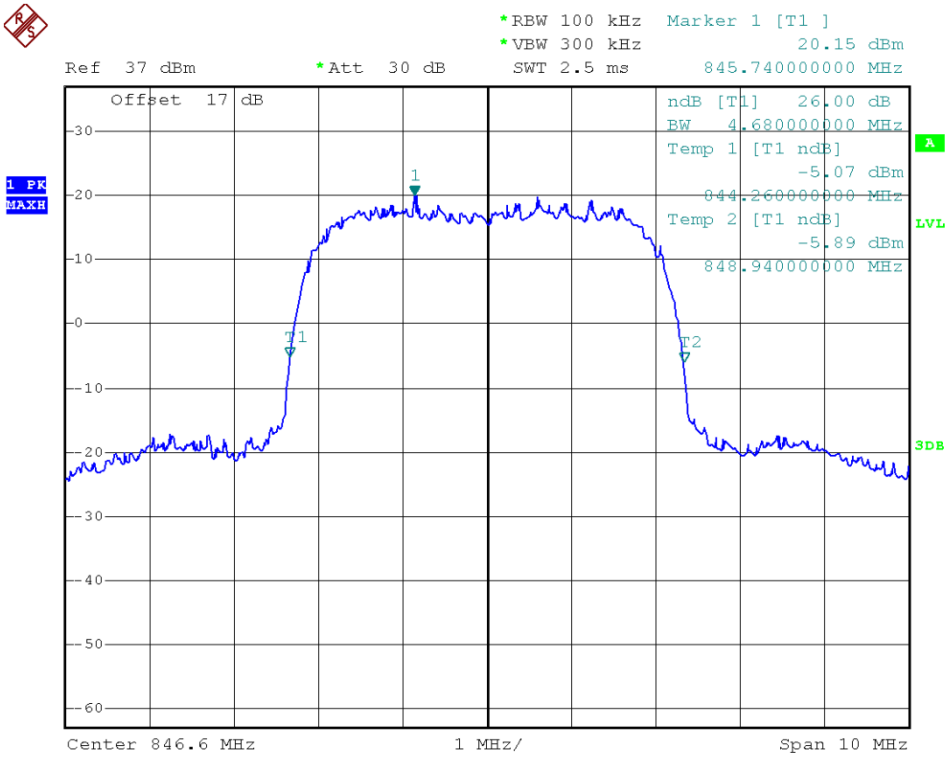
(Plot E2: WCDMA 850MHz Channel = 4132)



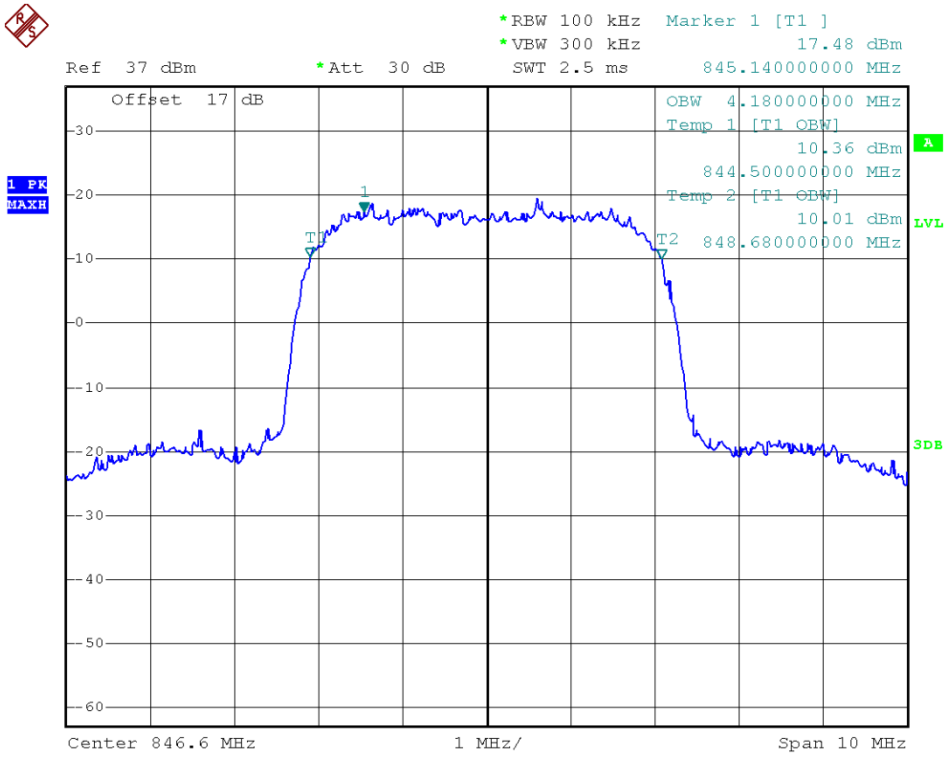
(Plot E3: WCDMA 850 MHz Channel = 4183)



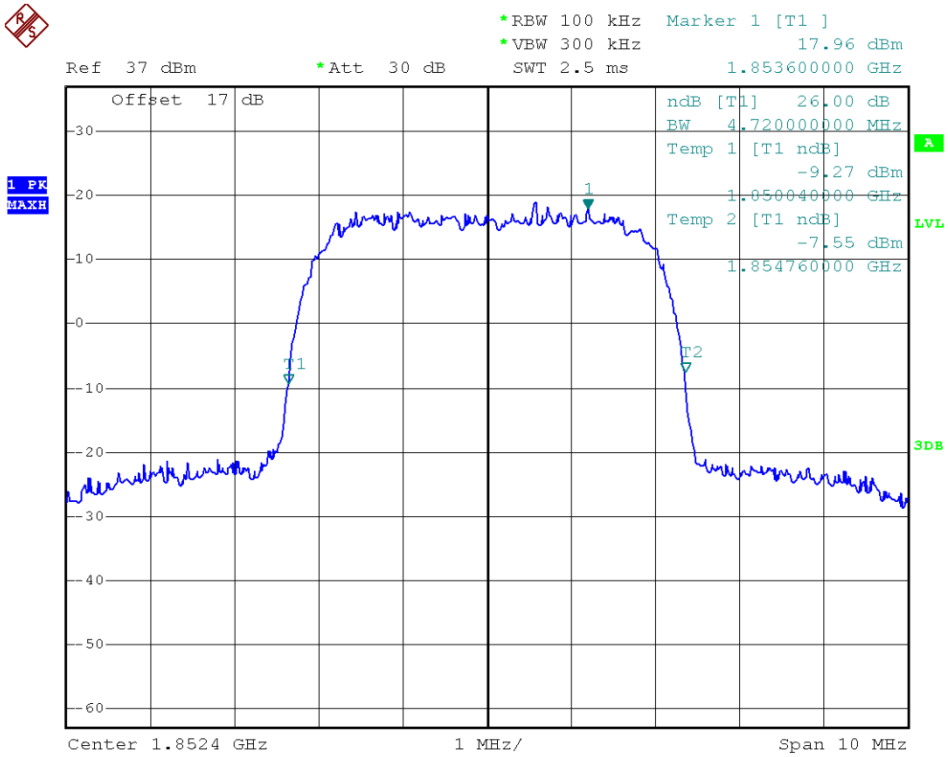
(Plot E4: WCDMA 850 MHz Channel = 4183)



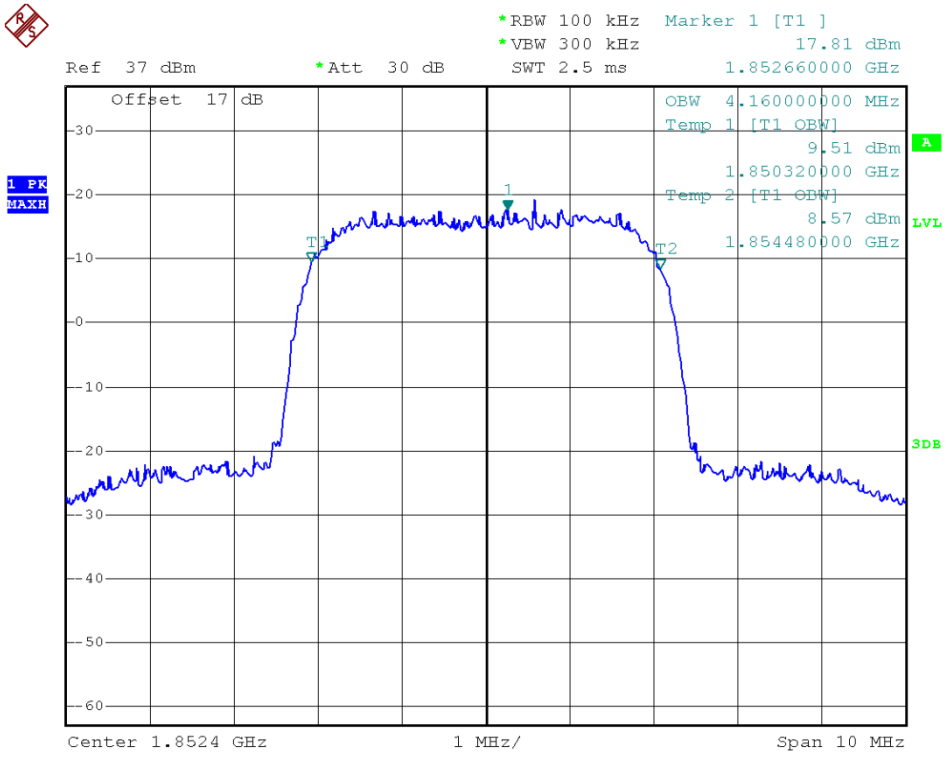
(Plot E5: WCDMA 850MHz Channel = 4233)



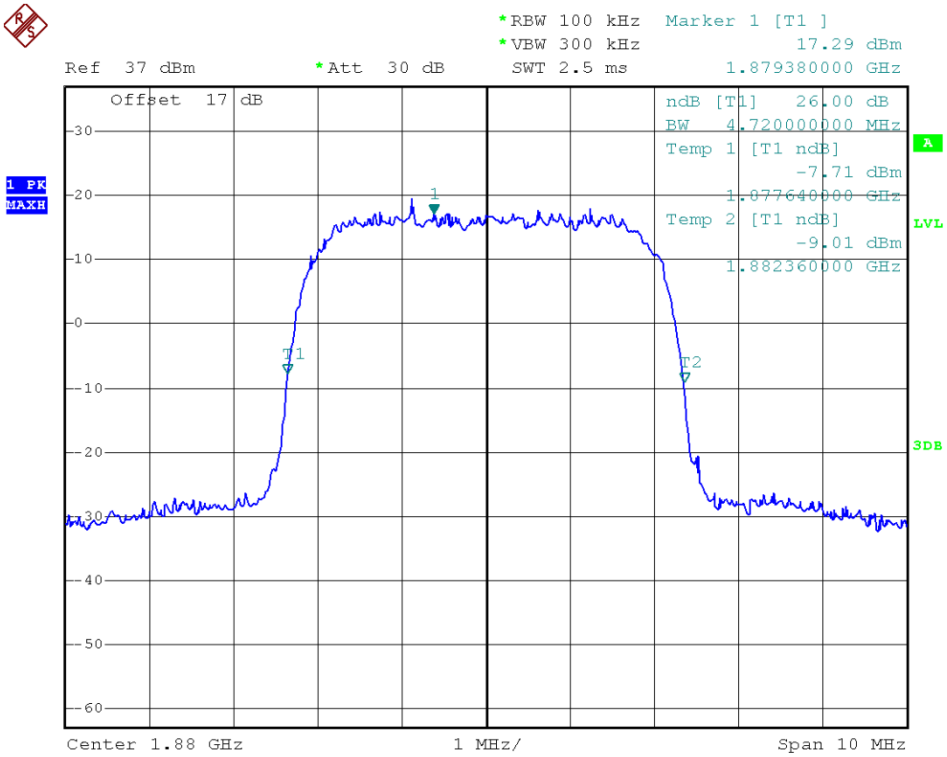
(Plot E6: WCDMA 850MHz Channel = 4233)



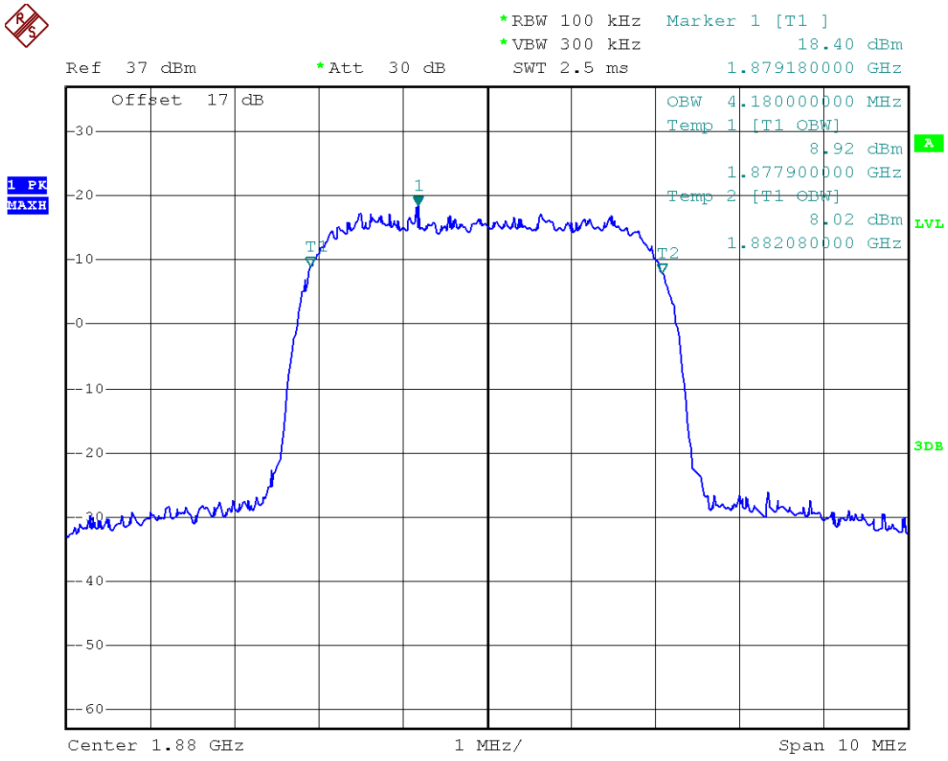
(Plot F1: WCDMA 1900MHz Channel = 9262)



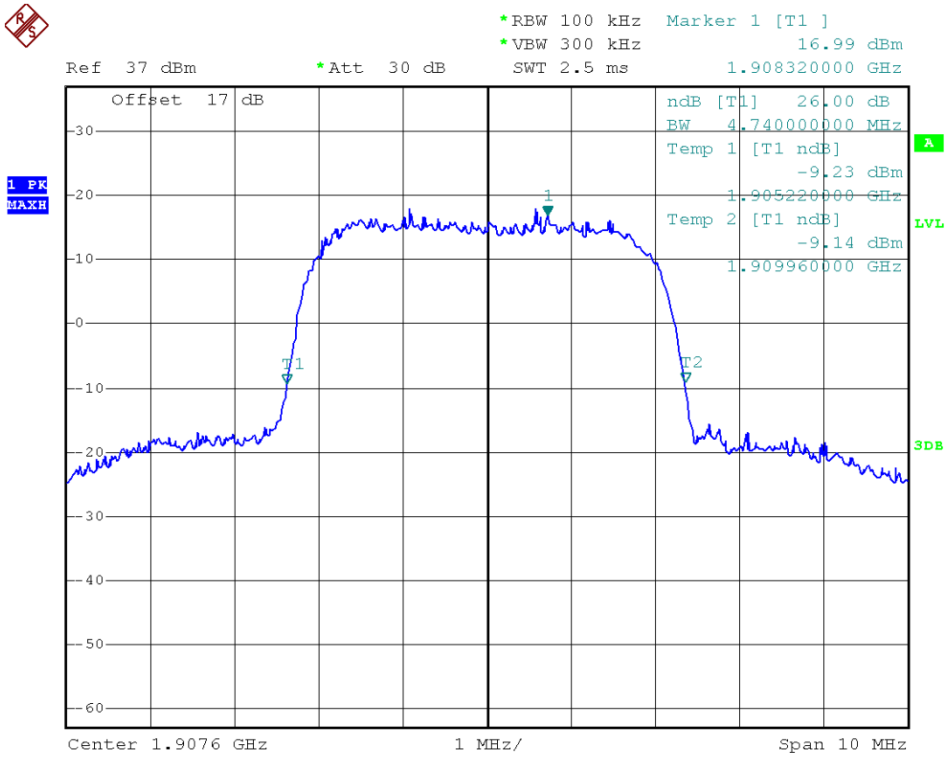
(Plot F2: WCDMA 1900MHz Channel = 9262)



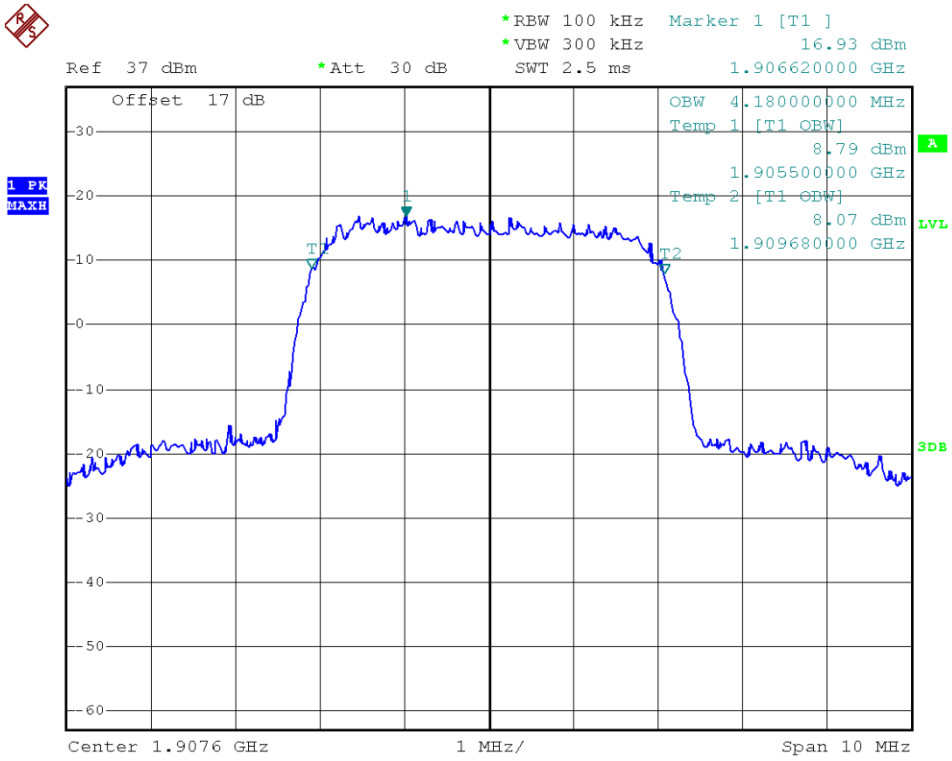
(Plot F3: WCDMA 1900 MHz Channel = 9400)



(Plot F4: WCDMA 1900 MHz Channel = 9400)



(Plot F5: WCDMA1900MHz Channel = 9538)



(Plot F6: WCDMA1900MHz Channel = 9538)

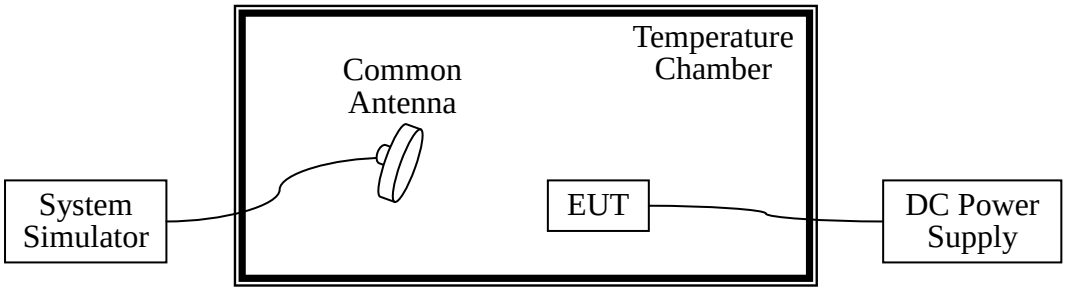
2.4 Frequency Stability

2.4.1 Requirement

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5ppm) of the center frequency.

2.4.2 Test Description

1. Test Setup:



The EUT, which is powered by the DC Power Supply directly, is located in the Temperature Chamber. The EUT is commanded by the System Simulator (SS) to operate at the maximum output power i.e. Power Control Level (PCL) = 5 and Power Class = 4. A call is established between the EUT and the SS via a Common Antenna.

2. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Data	Cal. Due Data
System Simulator	Agilent	E5515C	MY47510547	2014.06.11	2015.06.10
DC Power Supply	Good Will	GPS-3030DD	EF920938	2014.06.11	2015.06.10
Temperature Chamber	YinHe Experimental Equip.	HL4003T	(n.a.)	2014.06.11	2015.06.10
Cable	SUNHNER	SUCOFLEX 100	/	2014.06.05	2015.06.04

2.4.3 Test Procedures for Temperature Variation

1. The testing follows FCC KDB 971168 v02r01 Section 9.0.
2. The EUT was set up in the thermal chamber and connected with the system simulator.

3. With power OFF, the temperature was decreased to -30℃ and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
4. With power OFF, the temperature was raised in 10℃ steps up to 50℃. The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

2.4.4 Test Procedures for Voltage Variation

1. The testing follows FCC KDB 971168 v02r01 Section 9.0.
2. The EUT was placed in a temperature chamber at 25±5 °C and connected with the system simulator.
3. The power supply voltage to the EUT was varied from BEP to 115% of the nominal value measured at the input to the EUT.
4. The variation in frequency was measured for the worst case.

2.4.5 Test Verdict

The nominal, highest and lowest extreme voltages are separately 3.8VDC, 4.2VDC and 3.6VDC, which are specified by the applicant; the normal temperature here used is 25℃. The frequency deviation limit of 850MHz band is ±2.5ppm, and 1900MHz is ±1ppm

1. GSM 850MHz Band

Test Conditions		Frequency Deviation						Verdict
Power (VDC)	Temperature (℃)	Channel = 128 (824.2MHz)		Channel = 190 (836.6MHz)		Channel = 251 (848.8MHz)		
		Hz	Limits	Hz	Limits	Hz	Limits	
3.8	-30	10.5	±2060.5	21.73	±2091.5	15.95	±2122	PASS
	-20	11.78		25.78		16.07		
	-10	-2.57		8.24		-5.33		
	0	30.86		1.62		27.42		
	10	49.78		15.23		56.31		
	20	-10.92		39.19		-5.33		
	30	23.55		17.9		27.64		
	40	-10.96		21.83		-15.12		
	50	3.79		-15.65		3.88		
4.35	25	9.5		-13.15		15.89		
3.6	25	0.29		8.87		5.51		

2. GSM 1900MHz Band

Test Conditions		Frequency Deviation						Verdict
Power (VDC)	Temperature (℃)	Channel = 512 (1850.2MHz)		Channel = 661 (1880.0MHz)		Channel = 810 (1909.8MHz)		
		Hz	Limits	Hz	Limits	Hz	Limits	
3.8	-30	1.19	±1850.2	13.28	±1880.0	11.12	±1909.8	PASS
	-20	37.54		10.64		8.81		
	-10	51.85		19.33		22.21		
	0	19.51		41.43		47.37		
	10	13.17		9.56		14.85		
	20	16.09		29.3		33.63		
	30	2.45		40.36		38.27		
	40	32.89		60.23		57.38		
	50	22.31		19.39		21.22		
4.35	25	5.5		44.02		50.98		
3.6	25	52.07		6.47		0.95		

3. EDGE 850MHz Band

Test Conditions		Frequency Deviation						Verdict
Power (VDC)	Temperature (℃)	Channel = 128 (824.2MHz)		Channel = 190 (836.6MHz)		Channel = 251 (848.8MHz)		
		Hz	Limits	Hz	Limits	Hz	Limits	
3.8	-30	33.85	±2060.5	13.08	±2091.5	-17.98	±2122	PASS
	-20	-6.13		6.22		-11.53		
	-10	9.35		20.99		23.93		
	0	5.92		-27.99		-15.27		
	10	-24.74		-12.63		-23.94		
	20	13.81		38.98		-19.34		
	30	1.16		2.32		15.53		
	40	26.11		-14.74		-5.78		
	50	-34.43		28.87		12.55		
4.35	25	22.87		9.48		-1.23		
3.6	25	31.55		0.52		-17.17		

4. EDGE 1900MHz Band

Test Conditions		Frequency Deviation						Verdict
Power (VDC)	Temperature (℃)	Channel = 512 (1850.2MHz)		Channel = 661 (1880.0MHz)		Channel = 810 (1909.8MHz)		
		Hz	Limits	Hz	Limits	Hz	Limits	
3.8	-30	38.58	±1850.2	35.32	±1880.0	8.56	±1909.8	PASS
	-20	42.98		32.83		38.22		
	-10	0.37		13.74		17.73		
	0	13.89		7.94		13.62		
	10	34.8		1.54		-25.79		
	20	27.75		41.73		34.55		
	30	6.76		-18.57		32.22		
	40	59.39		32.29		18.09		
	50	22.25		31.31		24.65		
4.35	25	-13.21		38.49		43.11		
3.6	25	0.36		-23.57		26.22		

5. WCDMA 850MHz Band

Test Conditions		Frequency Deviation						Verdict
Power (VDC)	Temperature (℃)	Channel = 4123 (826.4MHz)		Channel = 4183 (836.6MHz)		Channel = 4233 (846.6MHz)		
		Hz	Limit	Hz	Limit	Hz	Limit	
3.8	-30	22.95	±2066	48.84	±2091.5	27.01	±2116.5	PASS
	-20	46.37		29.93		6.05		
	-10	7.57		-7.15		48.77		
	0	4.94		30.75		0.78		
	10	47.47		8.32		39.79		
	20	-1.87		7.82		-14.05		
	30	29.16		26.03		39.31		
	40	-2.02		20.2		12.75		
	55	10.07		43.48		29.08		
4.35	25	55.23		49.07		24.17		
3.6	25	42.21		10.07		61.38		

6. WCDMA 1900MHz Band

Test Conditions		Frequency Deviation						Verdict
Power (VDC)	Temperature (℃)	Channel = 9262 (1852.4MHz)		Channel = 9400 (1880.0MHz)		Channel = 9538 (1907.6MHz)		
		Hz	Limits	Hz	Limits	Hz	Limits	
3.8	-30	3.84	±1852.4	12.17	±1880.0	-1.04	±1907.6	PASS
	-20	33.06		15.24		6.98		
	-10	63.31		35.8		3.84		
	0	10.06		20.57		30.38		
	10	51.36		48.35		58.75		
	20	9.78		54.17		21.61		
	30	22.5		31.61		2.16		
	40	35.83		50.27		14.59		
	55	32.48		56.72		10.76		
4.35	25	50.57		28.06		42.25		
3.6	25	13.92		47.04		-1.92		

2.5 Conducted Out of Band Emissions

2.5.1 Requirement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.
It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th harmonic.

2.5.2 Test Description

See section 2.1.2 of this report.

2.5.3 Test Procedures

1. The testing follows FCC KDB 971168 v02r01 Section 6.0.
2. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
3. The RF output of EUT was connected to the spectrum analyzer by an RF cable and attenuator. The path loss was compensated to the results for each measurement.
4. The middle channel for the highest RF power within the transmitting frequency was measured.
5. The conducted spurious emission for the whole frequency range was taken.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
7. The limit line is derived from 43 + 10log(P) dB below the transmitter power P(Watts)
   = P(W) - [43 + 10log(P)] (dB)
   = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
   = -13dBm.

2.5.4 Test Result

The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the out of band emissions.

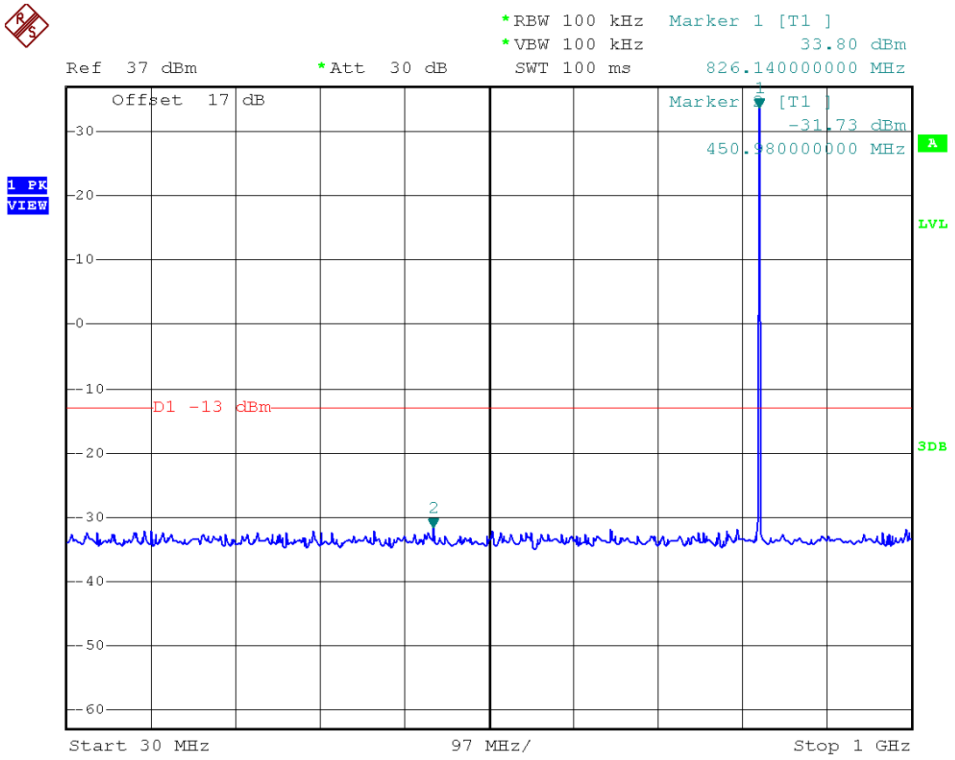
1. Test Verdict:

Band	Channel	Frequency (MHz)	Measured Max. Spurious Emission (dBm)	Refer to Plot	Limit (dBm)	Verdict
GSM 850MHz	128	824.2	-27.91	Plot A1toA1.1	-13	PASS
	190	836.6	-28.51	Plot A2toA2.1		PASS
	251	848.8	-27.64	Plot A3toA3.1		PASS
GSM 1900MHz	512	1850.2	-19.37	Plot B1toB1.1	-13	PASS
	661	1880.0	-19.87	Plot B2toB2.1		PASS
	810	1909.8	-20.36	Plot B3toB3.1		PASS

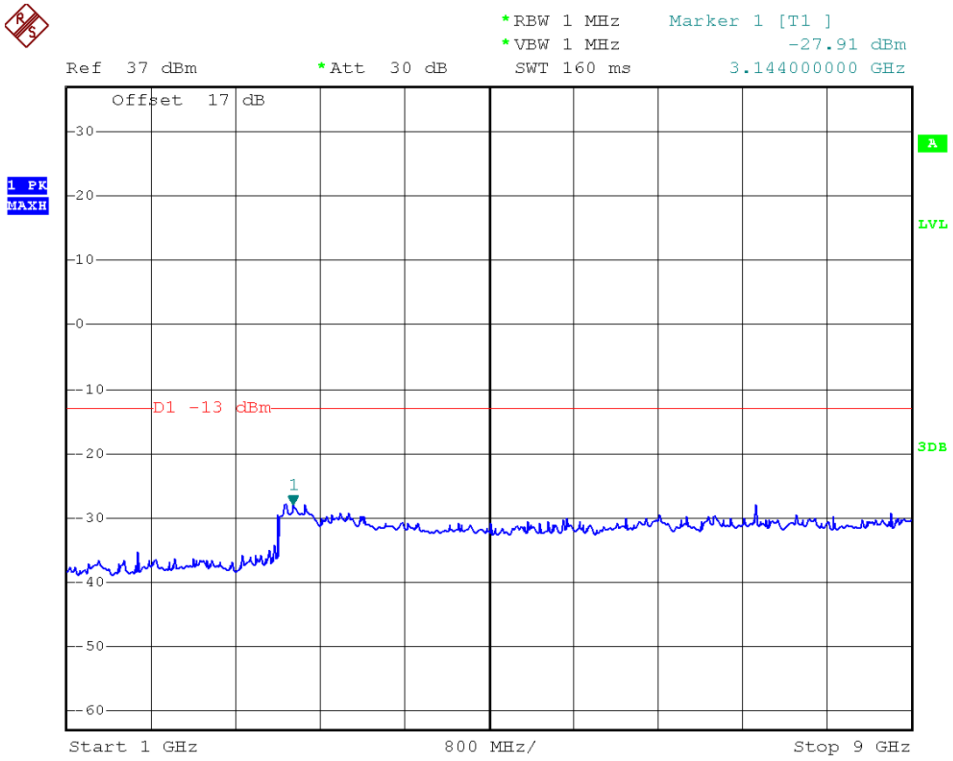
Band	Channel	Frequency (MHz)	Measured Max. Spurious Emission (dBm)	Refer to Plot	Limit (dBm)	Verdict
EDGE 850MHz	128	824.2	-24.77	Plot C1toC1.1	-13	PASS
	190	836.6	-28.51	Plot C2toC2.1		PASS
	251	848.8	-28.18	Plot C3toC3.1		PASS
EDGE 1900MHz	512	1850.2	-20.11	Plot D1toD1.1	-13	PASS
	661	1880.0	-20.20	Plot D2toD2.1		PASS
	810	1909.8	-20.17	Plot D3toD3.1		PASS
WCDMA 850MHz	4132	826.4	-28.06	Plot E1toE1.1	-13	PASS
	4183	836.6	-28.97	Plot E2toE2.1		PASS
	4233	846.6	-28.60	Plot E3toE3.1		PASS
WCDMA 1900MHz	9262	1852.4	-20.79	Plot F1toF1.1	-13	PASS
	9400	1880	-19.73	Plot F2toF2.1		PASS
	9538	1907.6	-20.70	Plot F3toF3.1		PASS

2. Test Plots for the Whole Measurement Frequency Range:

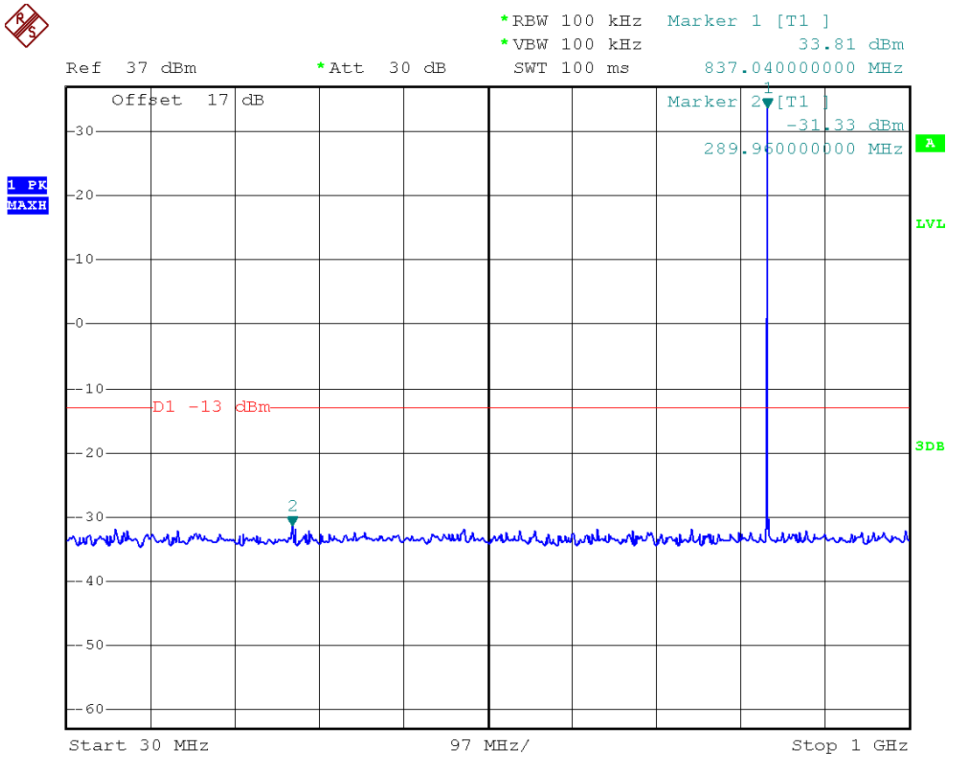
Note: the power of the EUT transmitting frequency should be ignored.



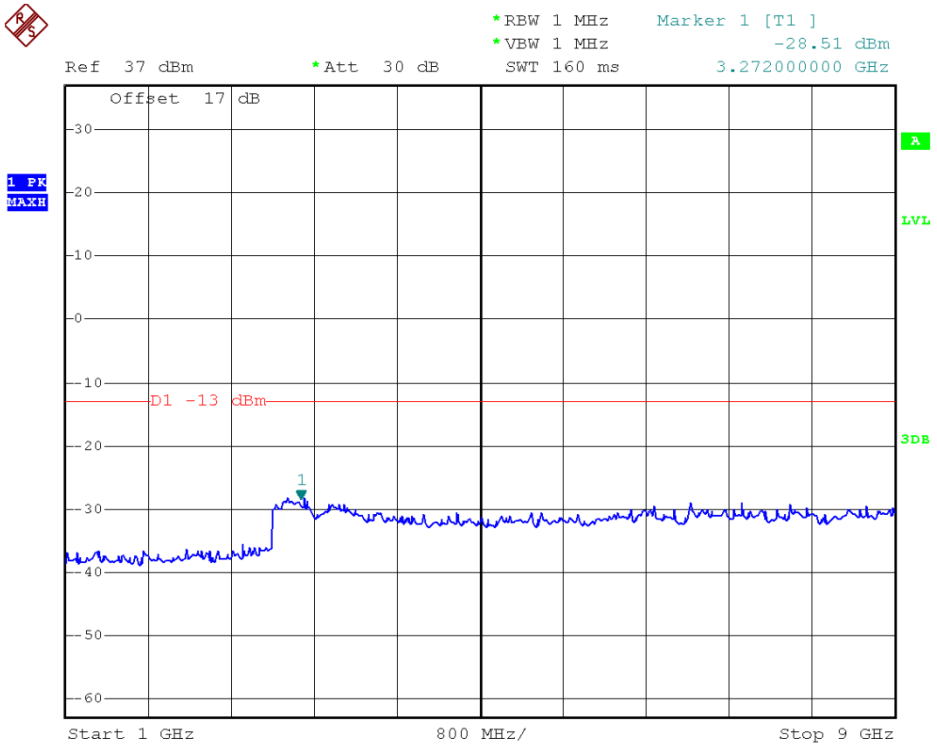
(Plot A1: GSM 850MHz Channel = 128, 30MHz to 1GHz)



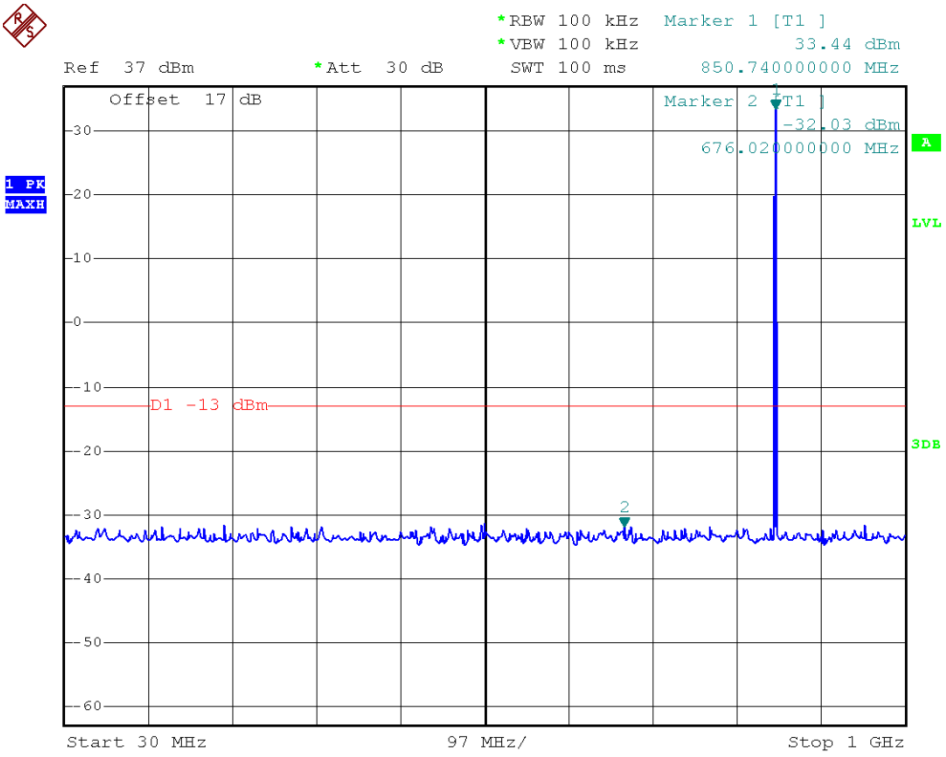
(Plot A1.1: GSM 850MHz Channel = 128, 1GHz to 9GHz)



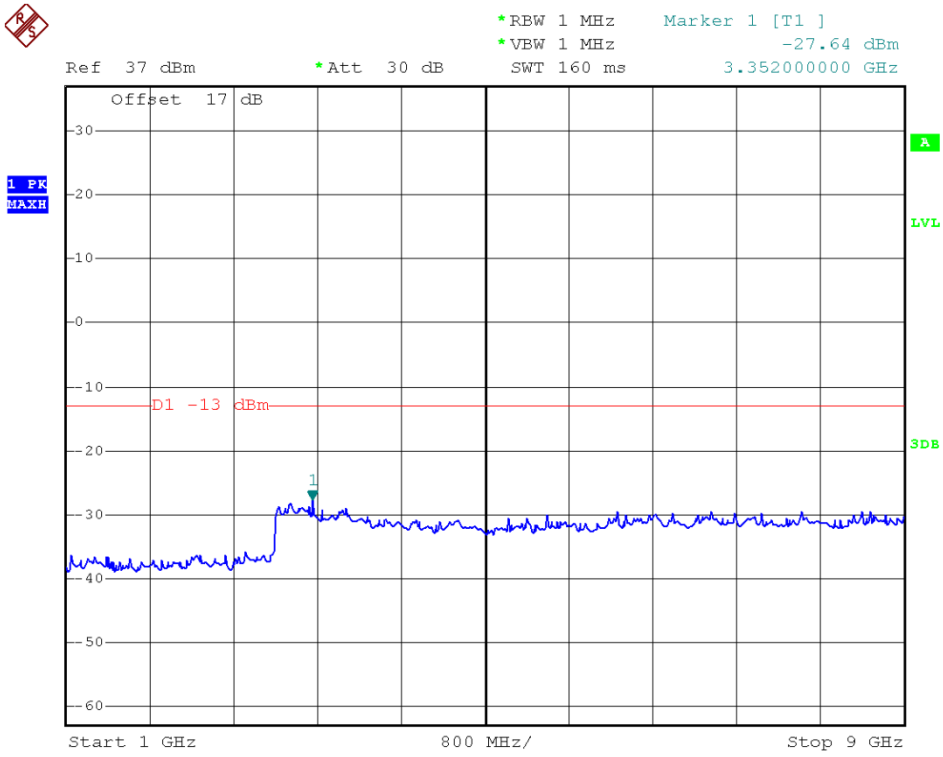
(Plot A2: GSM 850MHz Channel = 190, 30MHz to 1GHz)



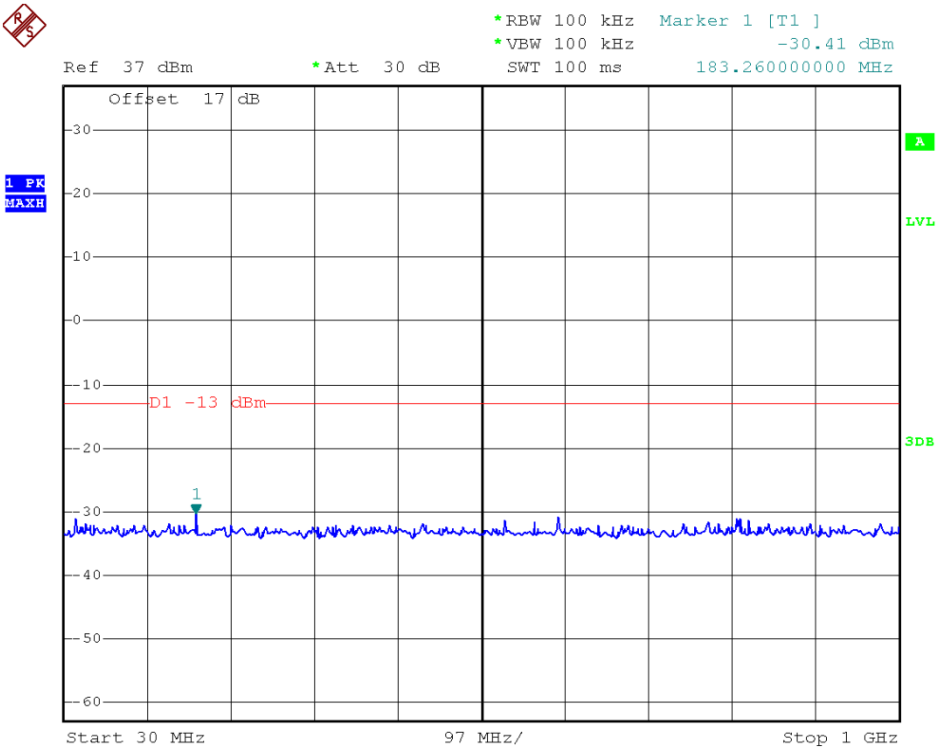
(Plot A2.1: GSM 850MHz Channel = 190, 1GHz to 9GHz)



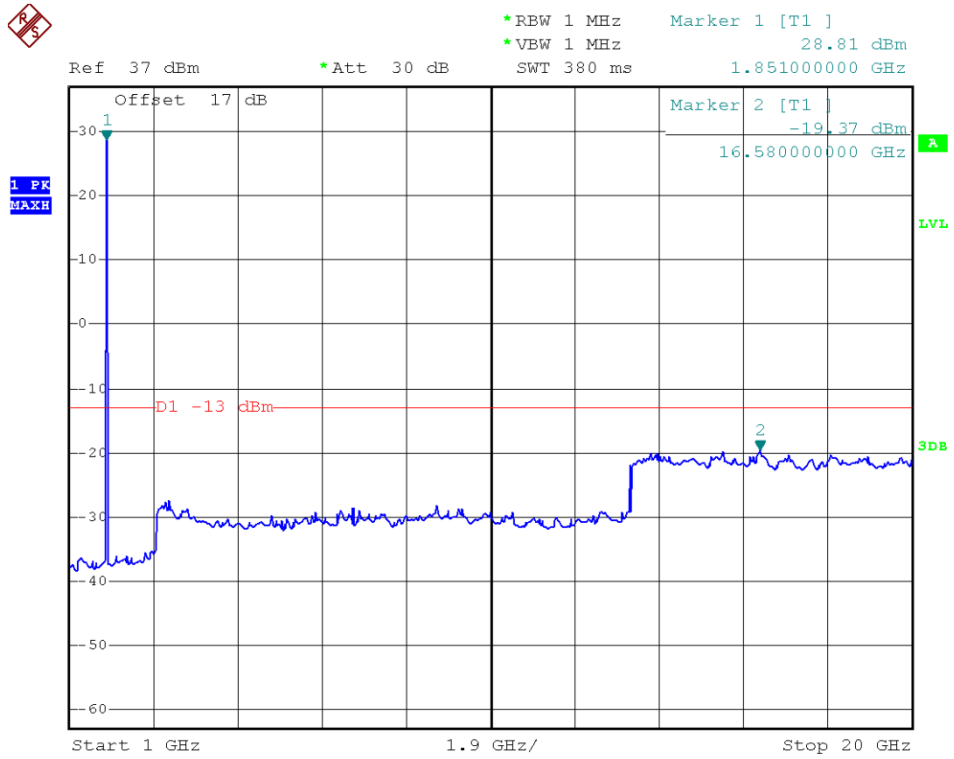
(Plot A3: GSM 850MHz Channel = 251, 30MHz to 1GHz)



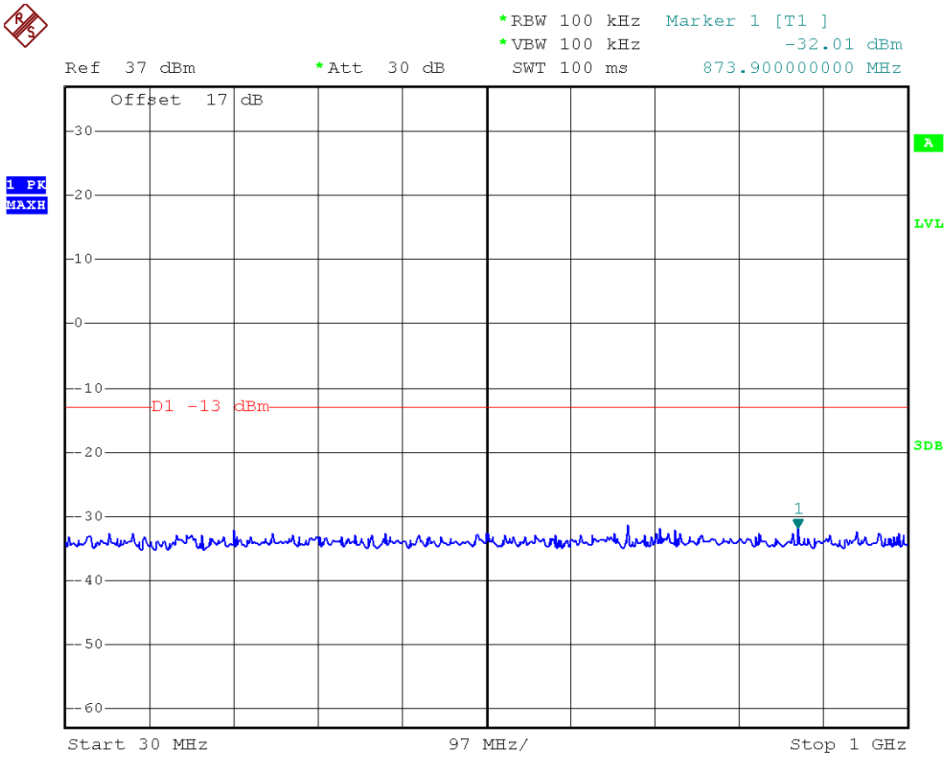
(Plot A3.1: GSM 850MHz Channel = 251, 1GHz to 9GHz)



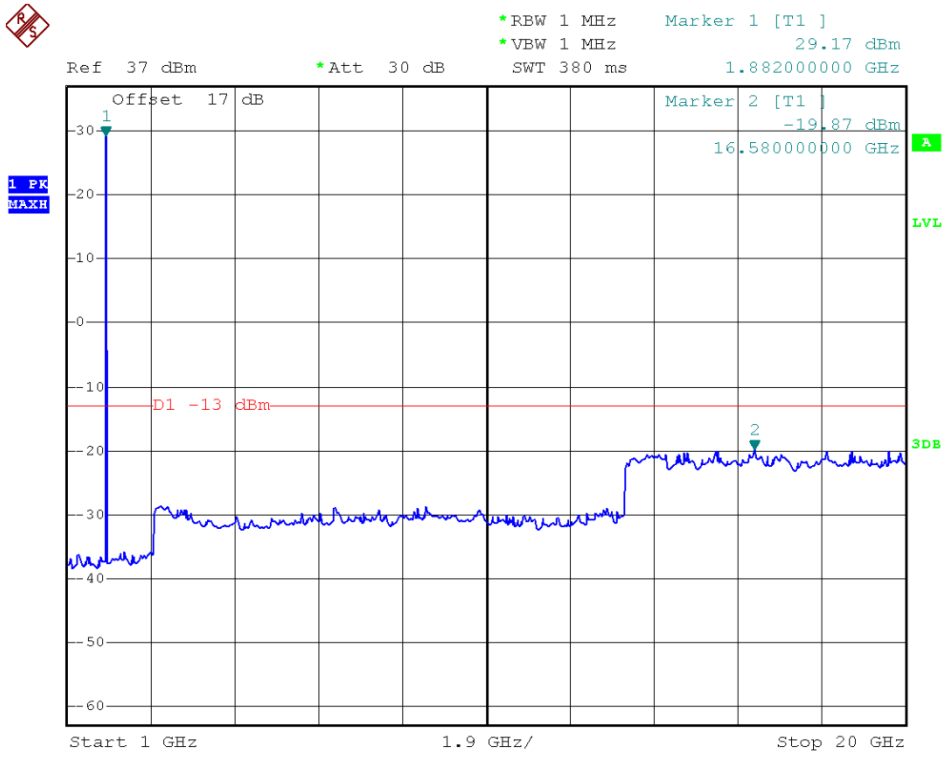
(Plot B1: GSM 1900MHz Channel = 512, 30MHz to 1GHz)



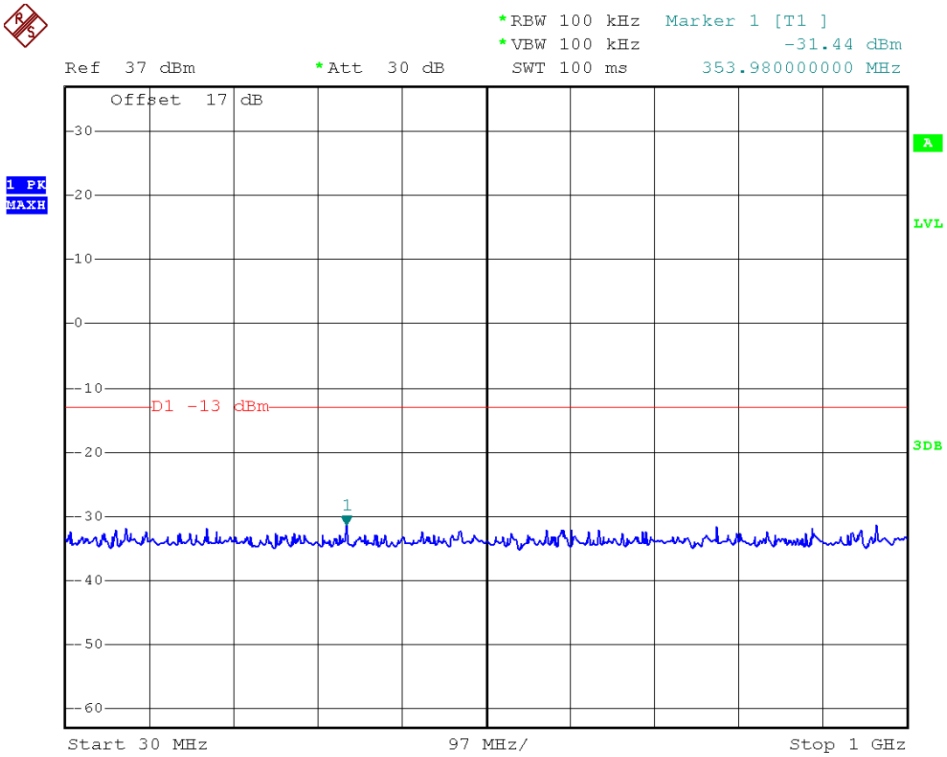
(Plot B1.1: GSM 1900MHz Channel = 512, 1GHz to 20GHz)



(Plot B2: GSM 1900MHz Channel = 661, 30MHz to 1GHz)



(Plot B2.1: GSM 1900MHz Channel = 661, 1GHz to 20GHz)



(Plot B3: GSM 1900MHz Channel = 810, 30MHz to 1GHz)