FCC PART 22H, PART 24E

TEST REPORT

For

SHENZHEN HUAPTEC CO., LTD

5th FL, E BLDG, Sogood Science Park, Sanwei Commun Hangkong Road,
Xixiang, Bao'an, Shenzhen, 518102 China

FCC ID: OWWF23K-CP

Report Type:	Product Type:
Original Report	Wireless Cellular Repeater

Test Engineer:	Rocky Kang
Report Number:	RSZ160610002-00B
Report Date:	2016-07-12
Reviewed By:	Bell Hu RF Engineer
Prepared By:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F, the 3rd Phase of WanLi Industrial Building ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *SHENZHEN HUAPTEC CO., LTD's* product, model number: *F23K-CP (FCC ID: OWWF23K-CP)* or the "EUT" in this report was a *Wireless Cellular Repeater,* which was measured approximately: 218 mm (L) × 165 mm (W) × 50 mm (H), rated with input voltage: rated with input voltage: DC 12V from adapter.

Manufacturer information:
Company Name: SHENZHEN HUAPTEC CO., LTD
Address: 5th FL, E BLDG, Sogood Science Park, Sanwei Community, Hangkong Road, Xixiang, Bao'an, Shenzhen, 518102 China

Adapter Information:
Model: WT1203000
Input: AC 100-240V, 50/60 Hz, 1.6A
Output: DC 12V, 3.0A

Specification:(For F23K-CP model)

Support Band	UL (MHz)	DL (MHz)	UL Max. power (dBm)	DL Max. power (dBm)
CELLULAR	824-849	869-894	21.0	25.0
PCS	1850-1910	1930-1990	21.0	25.0

Note: The series product, model F20K-CP,F17K-CP,F13K-CP,F10K-CP and F23K-CP, they named differently just due to different output power levels and gains achieved by adjusting the software, or different shell, however they have the same designs, PCB board, electronic device. Model F23K-CP was selected for fully testing, which was explained in the attached product similarity declaration letter.

**All measurement and test data in this report was gathered from production sample serial number: 1602485 (Assigned by Shenzhen BACL).The EUT supplied by the applicant was received on 2016-06-10.*

Objective

This test report is prepared on behalf of *SHENZHEN HUAPTEC CO., LTD* in accordance with Part 2-Subpart J, Part 22-Subpart H , Part 24-Subpart E of the Federal Communication Commissions rules.

Related Submittal(s)/Grant(s)

No related submittal(s).

Test Methodology

All tests and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47 Part 2-Subpart J as well as the following parts:

Part 20.21 – Signal Boosters
Part 22 Subpart H - Public Mobile Services
Part 24 Subpart E - Personal Communication Services

Applicable Standards: TIA/EIA 603-D, ANSI C63.4-2014, FCC KDB 935210 D05 v01r01.

All radiated and conducted emissions measurements were performed at Bay Area Compliance Laboratories Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement uncertainty with radiated emission is 5.81 dB for 30MHz-1GHz.and 4.88 dB for above 1GHz, 1.95dB for conducted measurement.

Test Facility

The test site used by Bay Area Compliance Laboratories Corp.(Shenzhen) to collect test data is located on the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China.

Test site at Bay Area Compliance Laboratories Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on October 31, 2013. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The EUT was configured for testing according to TIA/EIA-603-D.

The final qualification test was performed with the EUT operating at normal mode.

Equipment Modifications

No modification was made to the EUT.

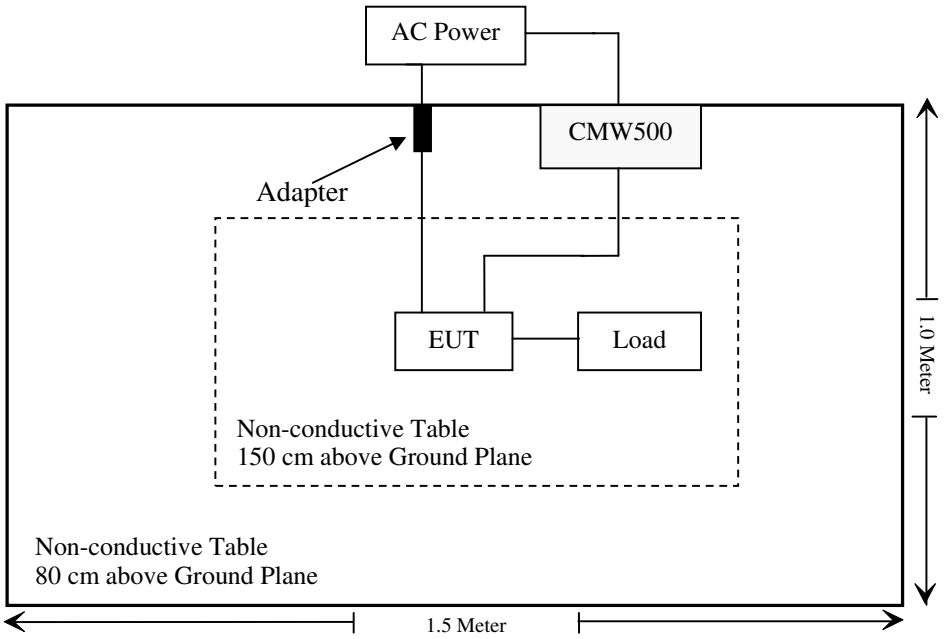
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
R & S	Wideband Radio Communication tester	CMW500	1201.002K50-146520-wh
Agilent	ESG Vector Signal Generator	E4438C	US41461205

External I/O Cable

Cable Description	Length (m)	From/Port	To
Un-shielding Un-detachable DC Power Cable	2.0	Adapter	EUT
Un-shielding Detachable AC Power Cable	1.8	AC Power	Adapter

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§ 2.1091	Maximum Permissible exposure (MPE)	Compliance
§ 2.1046; § 22.913; § 24.232; § 22.913	RF Output Power	Compliance
§ 2.1047	Modulation Characteristics	Not Applicable
§ 2.1049; § 22.917; § 24.238	Bandwidth	Compliance
§ 2.1051; § 22.917; § 24.238	Spurious Emissions at Antenna Terminal	Compliance
§ 2.1053; § 22.917; § 24.238	Field Strength of Spurious Radiation	Compliance
§ 2.1053; § 22.917; § 24.238	Band Edge & Intermodulation	Compliance
§ 2.1055; § 22.355; § 24.235	Frequency stability	N/A*
§ 20.21	Out of Band Rejection	Compliance

N/A*: EUT was a signal booster.

FCC §1.1307 & §2.1091 - MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart 15.247 (i) and subpart 1.1307 (b)(1), 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

Limits for General Population/Uncontrolled Exposure

Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (V/m)**	**Magnetic Field Strength (A/m)**	**Power Density (mW/cm^2)**	**Averaging Time (Minutes)**
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*($180/f^2$)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz
* = Plane-wave equivalent power density

Result

Calculated Formulary:

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

S = power density (in appropriate units, e.g. mW/cm2)
P = power input to the antenna (in appropriate units, e.g., mW).
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain.
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

For worst case:

Uplink

Frequency (MHz)	Max tune-up power		Antenna Gain		Evaluation Distance (cm)	Power Density (mW/cm^2)	MPE Limit (mW/cm^2)
	(dBm)	(mW)	(dBi)	(numeric)			
824-849	21.00	125.89	7	5.01	30	0.056	0.56
1850-1910	21.00	125.89	7	5.01	30	0.056	1.00

Downlink

Frequency (MHz)	Max tune-up power		Antenna Gain		Evaluation Distance (cm)	Power Density (mW/cm^2)	MPE Limit (mW/cm^2)
	(dBm)	(mW)	(dBi)	(numeric)			
869-894	25.00	316.23	7	5.01	30	0.140	0.59
1930-1990	25.00	316.23	7	5.01	30	0.140	1.00

The Maximum indoor and outdoor Gain is 7.0 dBi

Note: To maintain compliance with the FCC's RF exposure guidelines, place the equipment at least 30cm from nearby persons.

Result: Compliance

FCC §2.1047 - MODULATION CHARACTERISTIC

According to FCC § 2.1047(d), Part 22H & 24E there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

FCC § 2.1046, § 22.913 (a) & § 24.232 (c) - RF OUTPUT POWER AND AMPLIFER GAIN

Applicable Standard

According to FCC §2.1046 and §22.913 (a), the maximum effective radiated power (ERP) of base transmitters and cellular repeaters must not exceed 500 Watts.

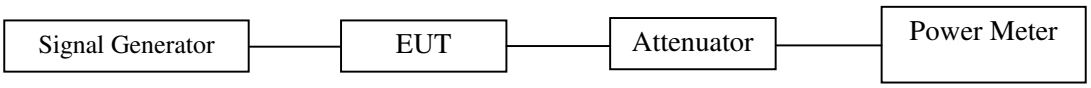
According to FCC §2.1046 and §24.232 (a)(1) Base stations with an emission bandwidth of 1 MHz or less are limited to 1640 watts equivalent isotropically radiated power (EIRP) with an antenna height up to 300 meters HAAT, except as described in paragraph (b) below.
(2) Base stations with an emission bandwidth greater than 1 MHz are limited to 1640 watts/MHz equivalent isotropically radiated power (EIRP) with an antenna height up to 300 meters HAAT, except as described in paragraph (b) below.
(3) Base station antenna heights may exceed 300 meters HAAT with a corresponding reduction in power; *see* Tables 1 and 2 of this section.

(c) Mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

Test Procedure

Conducted method:

According to KDB 935210 D05 Indus Booster Basic Meas v01r01 clause 3.5



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	P-Series Power Meter	N1912A	MY5000448	2015-11-03	2016-11-03
Agilent	Wideband Power Sensor	N1921A	ESR3	2015-12-12	2016-12-11
Ducommun technologies	RF Cable	RG-214	3	2016-06-15	2017-06-15
Ducommun technologies	RF Cable	RG-214	2	2016-06-15	2017-06-15
WEINSCHEL	10dB Attenuator	5324	AU0709	2016-06-18	2017-06-18
Agilent	ESG Vector Signal Generator	E4438C	US41461205	2015-11-12	2016-11-12

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	23 ℃
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

The testing was performed by Rocky Kang on 2016-06-29.

For F23K-CP model:

CELLULAR Band:

Modes	Frequency (MHz)	Signal Type	Signal Level	Input power (dBm)	Output Power (dBm)	Gain (dB)	ERP (dBm)
Uplink	836.6	AWGN	Pre-AGC	-53	19.97	72.97	24.82
			3dB above AGC	-50	20.39	70.39	25.24
		GSM	Pre-AGC	-53	18.50	71.50	23.35
			3dB above AGC	-50	18.81	68.81	23.66
Downlink	881.5	AWGN	Pre-AGC	-54	23.87	77.87	28.72
			3dB above AGC	-51	24.27	75.27	29.12
		GSM	Pre-AGC	-54	23.92	77.92	28.77
			3dB above AGC	-51	23.83	74.83	28.68

PCS Band:

Modes	Frequency (MHz)	Signal Type	Signal Level	Input power (dBm)	Output Power (dBm)	Gain (dB)	EIRP (dBm)
Uplink	1880	AWGN	Pre-AGC	-53	19.95	72.95	26.95
			3dB above AGC	-50	20.15	70.15	27.15
		GSM	Pre-AGC	-53	18.70	71.70	25.7
			3dB above AGC	-50	18.95	68.95	25.95
Downlink	1960	AWGN	Pre-AGC	-54	23.89	77.89	30.89
			3dB above AGC	-51	24.12	75.12	31.12
		GSM	Pre-AGC	-54	23.40	77.40	30.4
			3dB above AGC	-51	23.59	74.59	30.59

Note: ERP=Conducted Output Power (dBm) +Antenna Gain (dBi)-2.15 dB
EIRP=Conducted Output Power (dBm) +Antenna Gain (dBi)
The Maximum indoor and outdoor Gain for all Bands is 7.0 dBi
The frequency was selected to test, which according to the peak of the frequency point from out-of-band rejection test.

For F20K-CP model:

CELLULAR Band:

Modes	Frequency (MHz)	Signal Type	Signal Level	Input power (dBm)	Output Power (dBm)	Gain (dB)	ERP (dBm)
Uplink	836.6	AWGN	Pre-AGC	-49	18.37	67.37	23.22
			3dB above AGC	-46	18.99	64.99	23.84
		GSM	Pre-AGC	-48	17.32	65.32	22.17
			3dB above AGC	-45	17.41	62.41	22.26
Downlink	881.5	AWGN	Pre-AGC	-50	21.94	71.94	26.79
			3dB above AGC	-47	22.07	69.07	26.92
		GSM	Pre-AGC	-50	21.57	71.57	26.42
			3dB above AGC	-47	21.52	68.52	26.37

PCS Band:

Modes	Frequency (MHz)	Signal Type	Signal Level	Input power (dBm)	Output Power (dBm)	Gain (dB)	EIRP (dBm)
Uplink	1880	AWGN	Pre-AGC	-49	18.32	67.32	25.32
			3dB above AGC	-46	18.42	64.42	25.42
		GSM	Pre-AGC	-48	18.10	66.10	25.10
			3dB above AGC	-45	18.17	63.17	25.17
Downlink	1960	AWGN	Pre-AGC	-50	22.38	72.38	29.38
			3dB above AGC	-47	22.91	69.91	29.91
		GSM	Pre-AGC	-49	22.82	71.82	29.82
			3dB above AGC	-46	22.86	68.86	29.86

Note: ERP=Conducted Output Power (dBm) +Antenna Gain (dBi)-2.15 dB
EIRP=Conducted Output Power (dBm) +Antenna Gain (dBi)
The Maximum indoor and outdoor Gain for all Bands are 7.0 dBi
The frequency was selected to test, which according to the peak of the frequency point from out-of-band rejection test.

For F17K-CP model:

CELLULAR Band:

Modes	Frequency (MHz)	Signal Type	Signal Level	Input power (dBm)	Output Power (dBm)	Gain (dB)	ERP (dBm)
Uplink	836.6	AWGN	Pre-AGC	-51	17.56	68.56	22.41
			3dB above AGC	-48	17.96	65.96	22.81
		GSM	Pre-AGC	-50	18.49	68.49	23.34
			3dB above AGC	-47	18.95	65.95	23.80
Downlink	881.5	AWGN	Pre-AGC	-52	17.42	69.42	22.27
			3dB above AGC	-49	17.44	66.44	22.29
		GSM	Pre-AGC	-50	18.61	68.61	23.46
			3dB above AGC	-47	18.78	65.78	23.63

PCS Band:

Modes	Frequency (MHz)	Signal Type	Signal Level	Input power (dBm)	Output Power (dBm)	Gain (dB)	EIRP (dBm)
Uplink	1880	AWGN	Pre-AGC	-52	18.32	70.32	25.32
			3dB above AGC	-49	18.61	67.61	25.61
		GSM	Pre-AGC	-51	18.33	69.33	25.33
			3dB above AGC	-48	18.56	66.56	25.56
Downlink	1960	AWGN	Pre-AGC	-53	17.15	70.15	24.15
			3dB above AGC	-50	17.32	67.32	24.32
		GSM	Pre-AGC	-49	18.70	67.70	25.70
			3dB above AGC	-46	18.93	64.93	25.93

Note: ERP=Conducted Output Power (dBm) +Antenna Gain (dBi)-2.15 dB
EIRP=Conducted Output Power (dBm) +Antenna Gain (dBi)
The Maximum indoor and outdoor Gain for all Bands are 7.0 dBi
The frequency was selected to test, which according to the peak of the frequency point from out-of-band rejection test.

For F13K-CP model:

CELLULAR Band:

Modes	Frequency (MHz)	Signal Type	Signal Level	Input power (dBm)	Output Power (dBm)	Gain (dB)	ERP (dBm)
Uplink	836.6	AWGN	Pre-AGC	-47	17.54	64.54	22.39
			3dB above AGC	-44	17.46	61.46	22.31
		GSM	Pre-AGC	-45	18.62	63.62	23.47
			3dB above AGC	-42	18.69	60.69	23.54
Downlink	881.5	AWGN	Pre-AGC	-57	13.15	70.15	18.00
			3dB above AGC	-54	13.32	67.32	18.17
		GSM	Pre-AGC	-54	14.22	68.22	19.07
			3dB above AGC	-51	14.76	65.76	19.61

PCS Band:

Modes	Frequency (MHz)	Signal Type	Signal Level	Input power (dBm)	Output Power (dBm)	Gain (dB)	EIRP (dBm)
Uplink	1880	AWGN	Pre-AGC	-46	18.66	64.66	25.66
			3dB above AGC	-43	19.07	62.07	26.07
		GSM	Pre-AGC	-44	19.62	63.62	26.62
			3dB above AGC	-41	19.83	60.83	26.83
Downlink	1960	AWGN	Pre-AGC	-54	13.21	67.21	20.21
			3dB above AGC	-51	13.23	64.23	20.23
		GSM	Pre-AGC	-51	14.68	65.68	21.68
			3dB above AGC	-48	14.83	62.83	21.83

Note: ERP=Conducted Output Power (dBm) +Antenna Gain (dBi)-2.15 dB
EIRP=Conducted Output Power (dBm) +Antenna Gain (dBi)
The Maximum indoor and outdoor Gain for all Bands are 7.0 dBi
The frequency was selected to test, which according to the peak of the frequency point from out-of-band rejection test.

For F10K-CP model:

CELLULAR Band:

Modes	Frequency (MHz)	Signal Type	Signal Level	Input power (dBm)	Output Power (dBm)	Gain (dB)	ERP (dBm)
Uplink	836.6	AWGN	Pre-AGC	-44	18.06	62.06	22.91
			3dB above AGC	-41	18.33	59.33	23.18
		GSM	Pre-AGC	-42	18.54	60.54	23.39
			3dB above AGC	-39	18.68	57.68	23.53
Downlink	881.5	AWGN	Pre-AGC	-58	9.74	67.74	14.59
			3dB above AGC	-55	9.91	64.91	14.76
		GSM	Pre-AGC	-55	10.54	65.54	15.39
			3dB above AGC	-52	10.95	62.95	15.80

PCS Band:

Modes	Frequency (MHz)	Signal Type	Signal Level	Input power (dBm)	Output Power (dBm)	Gain (dB)	EIRP (dBm)
Uplink	1880	AWGN	Pre-AGC	-44	18.08	62.08	25.08
			3dB above AGC	-41	18.22	59.22	25.22
		GSM	Pre-AGC	-43	18.03	61.03	25.03
			3dB above AGC	-40	18.13	58.13	25.13
Downlink	1960	AWGN	Pre-AGC	-57	9.75	66.75	16.75
			3dB above AGC	-54	9.81	63.81	16.81
		GSM	Pre-AGC	-55	10.22	65.22	17.22
			3dB above AGC	-52	10.93	62.93	17.93

Note: ERP=Conducted Output Power (dBm) +Antenna Gain (dBi)-2.15 dB
EIRP=Conducted Output Power (dBm) +Antenna Gain (dBi)
The Maximum indoor and outdoor Gain for all Bands are 7.0 dBi
The frequency was selected to test, which according to the peak of the frequency point from out-of-band rejection test.

FCC §2.1049, §22.917 & §24.238 - BANDWIDTH

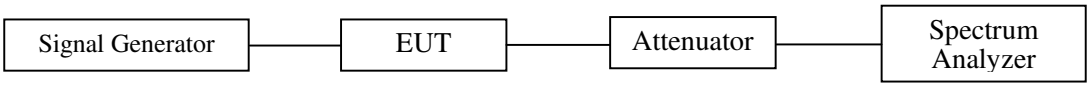
Applicable Standard

FCC §2.1049, §22.917, §22.905, §24.238.

Test Procedure

According to KDB 935210 D05 Indus Booster Basic Meas v01r01 clause 3.4

A 26 dB bandwidth measurement shall be performed on the input signal and the output signal (alternatively, the 99% OBW can be measured and used) to demonstrate compliance to the technical requirements specified in §90.219(e)(4)(i) and (ii). See KDB Publication 971168 for more information regarding measuring the OBW.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2015-12-11	2016-12-11
WEINSCHEL	10dB Attenuator	5324	AU0709	2016-06-18	2017-06-18
Ducommun technologies	RF Cable	RG-214	3	2016-06-15	2017-06-15
Ducommun technologies	RF Cable	RG-214	2	2016-06-15	2017-06-15
Agilent	ESG Vector Signal Generator	E4438C	US41461205	2015-11-12	2016-11-12

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	23 ℃
Relative Humidity:	52 %
ATM Pressure:	101.0 kPa

The testing was performed by Rocky Kang on 2016-06-29.

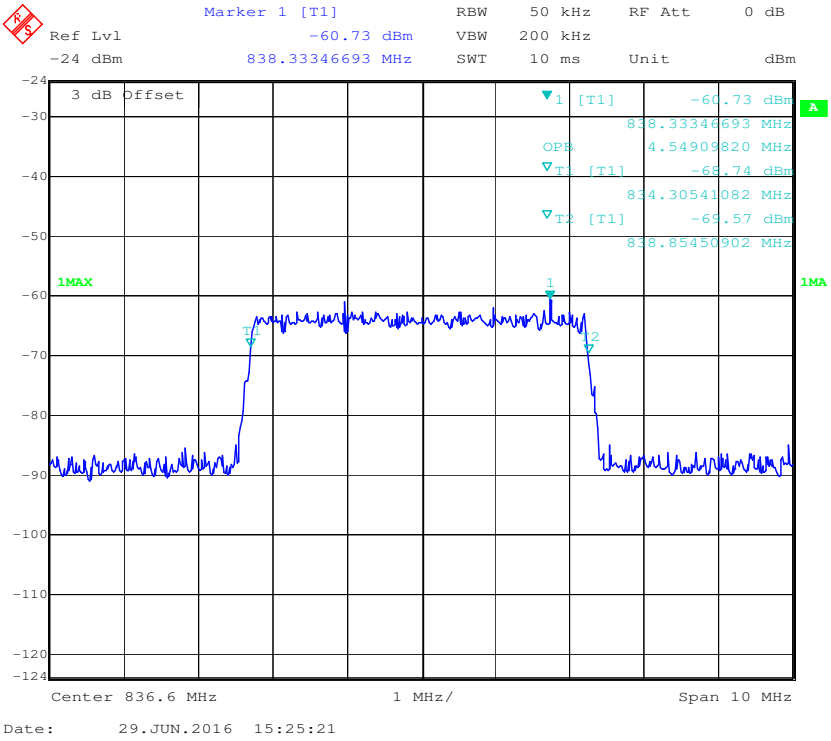
EUT operation mode: Transmitting

Test Result: Compliance. Please refer to the following tables and plots.

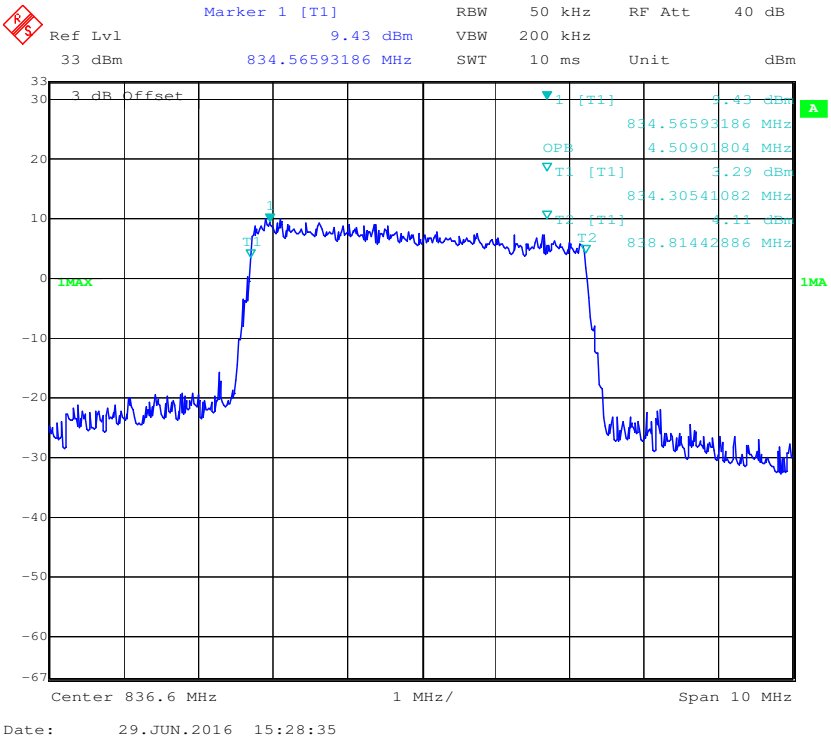
CELLULAR Band

Mode	Signal Type	Signal Level	Frequency (MHz)	99% Bandwidth (MHz)	
				Input	Output
Uplink	AWGN	Pre-AGC	836.6	4.549	4.509
		3dB above AGC	836.6	4.549	4.509
	GSM	Pre-AGC	836.6	0.244	0.244
		3dB above AGC	836.6	0.244	0.244
Downlink	AWGN	Pre-AGC	881.5	4.589	4.509
		3dB above AGC	881.5	4.549	4.609
	GSM	Pre-AGC	881.5	0.244	0.244
		3dB above AGC	881.5	0.244	0.242

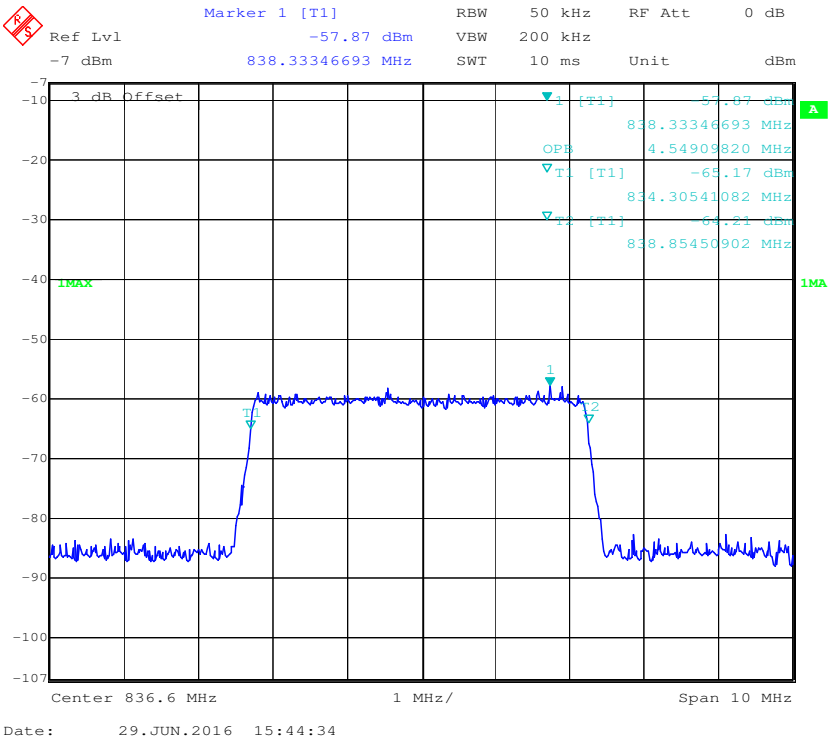
99% Bandwidth-UL-AWGN-Pre AGC-Input



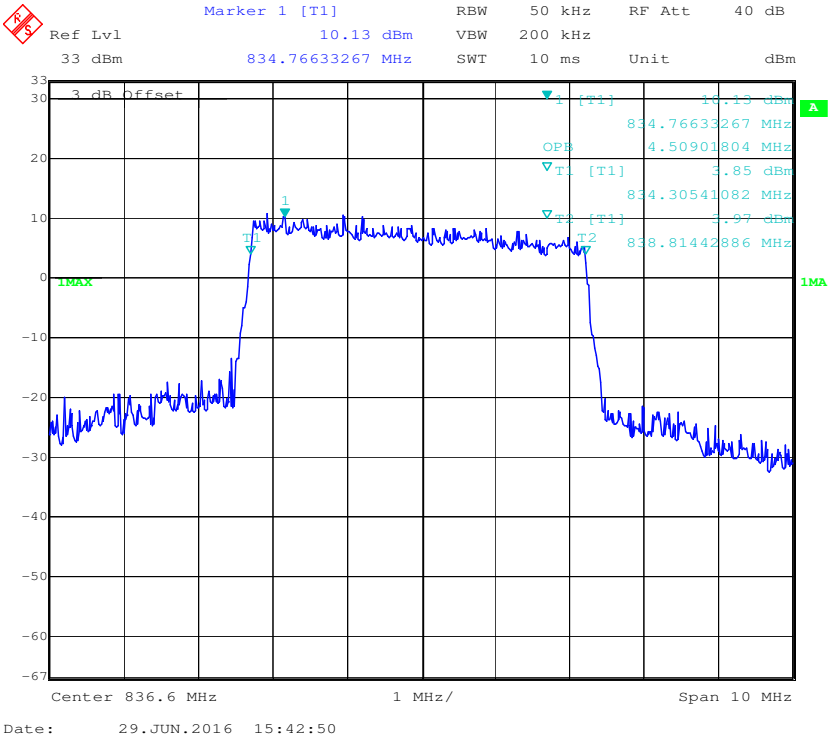
99% Bandwidth-UL- AWGN- Pre AGC -Output



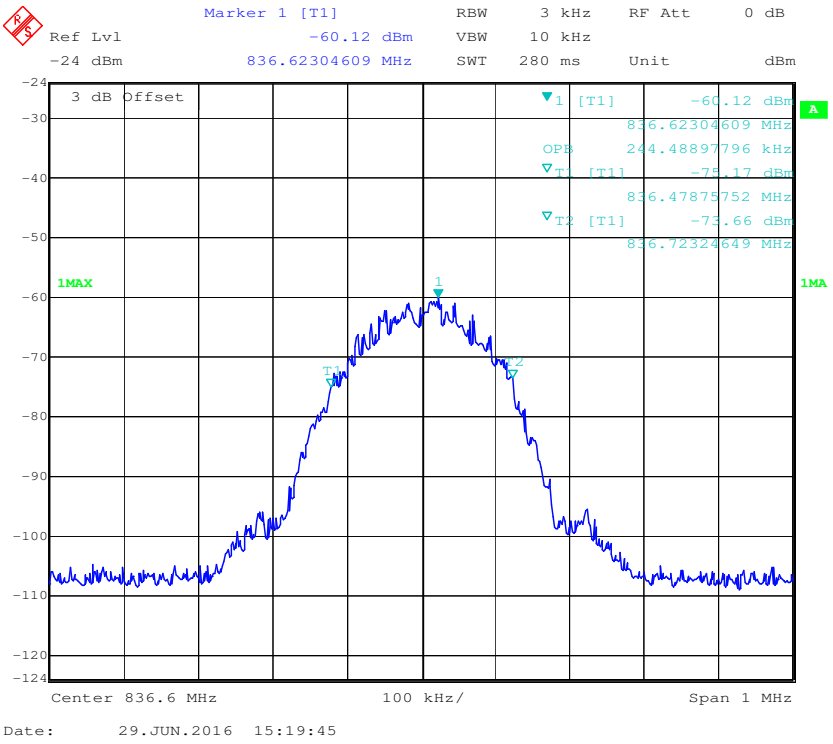
99% Bandwidth-UL- AWGN-3dB above AGC-Input



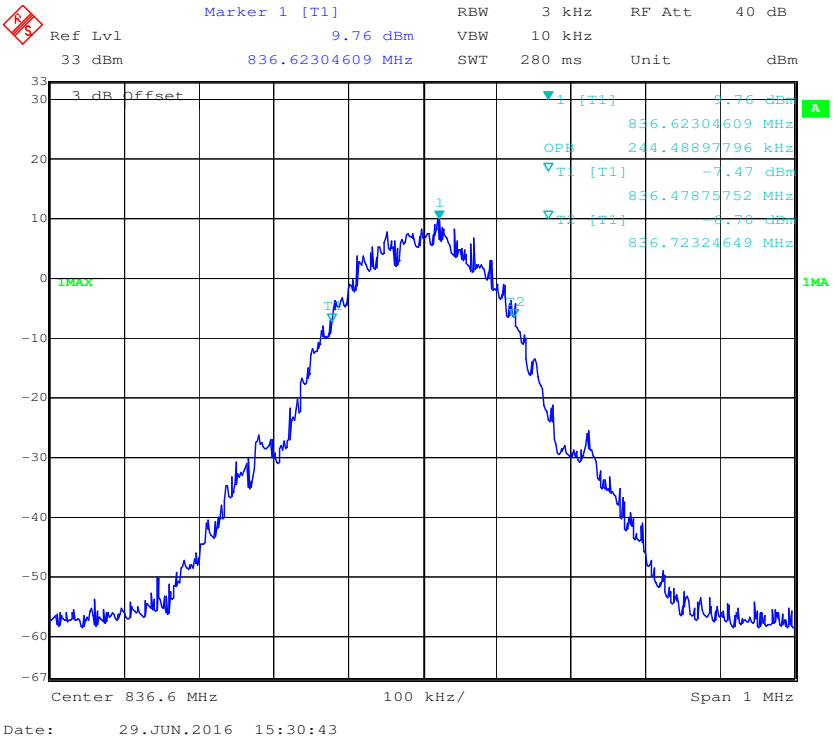
99% Bandwidth-UL- AWGN-3dB above AGC-Output



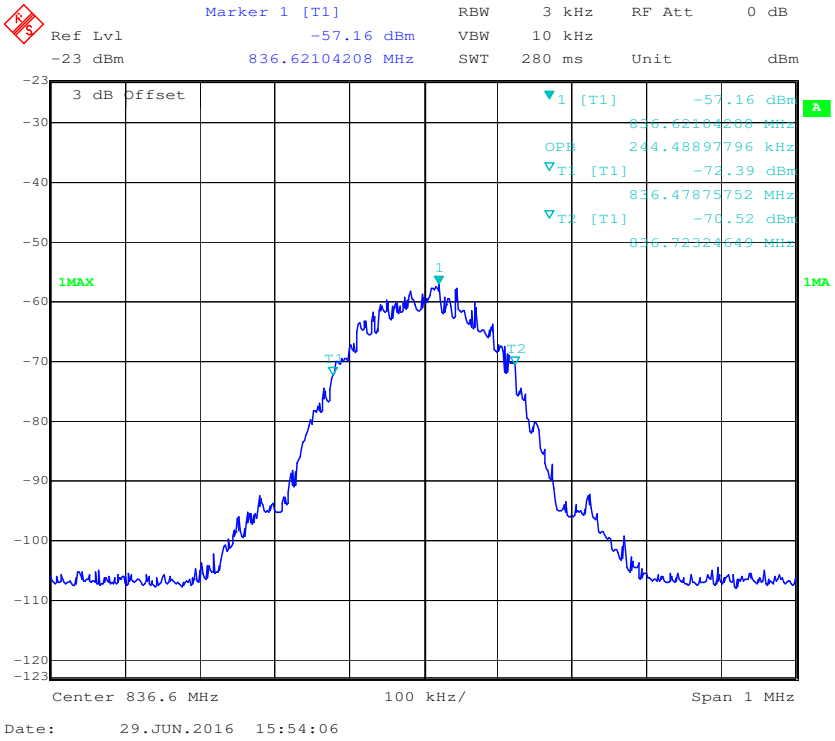
99% Bandwidth-UL-GSM-Pre AGC-Input



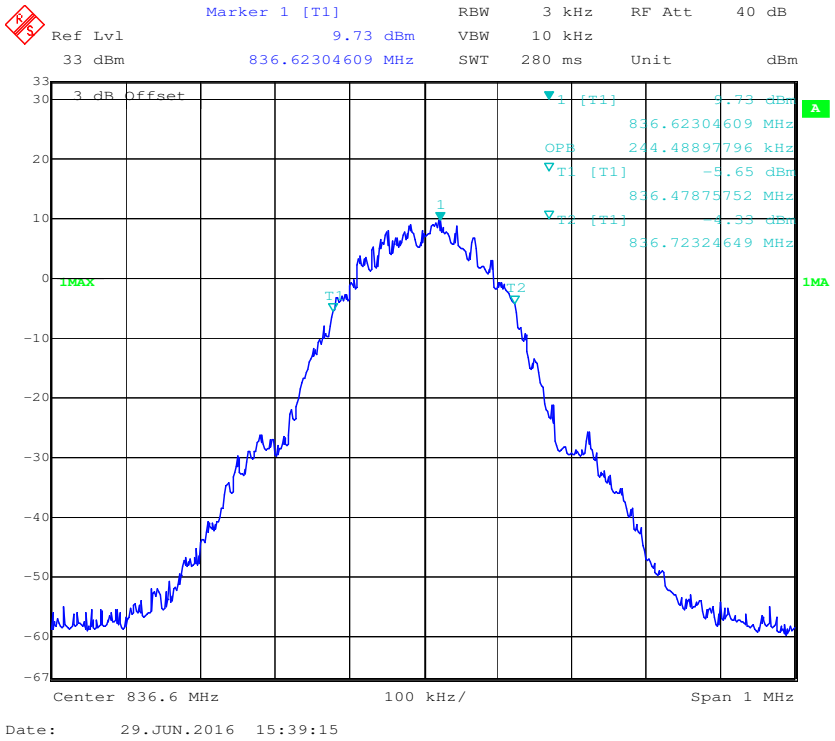
99% Bandwidth-UL- GSM- Pre AGC -Output



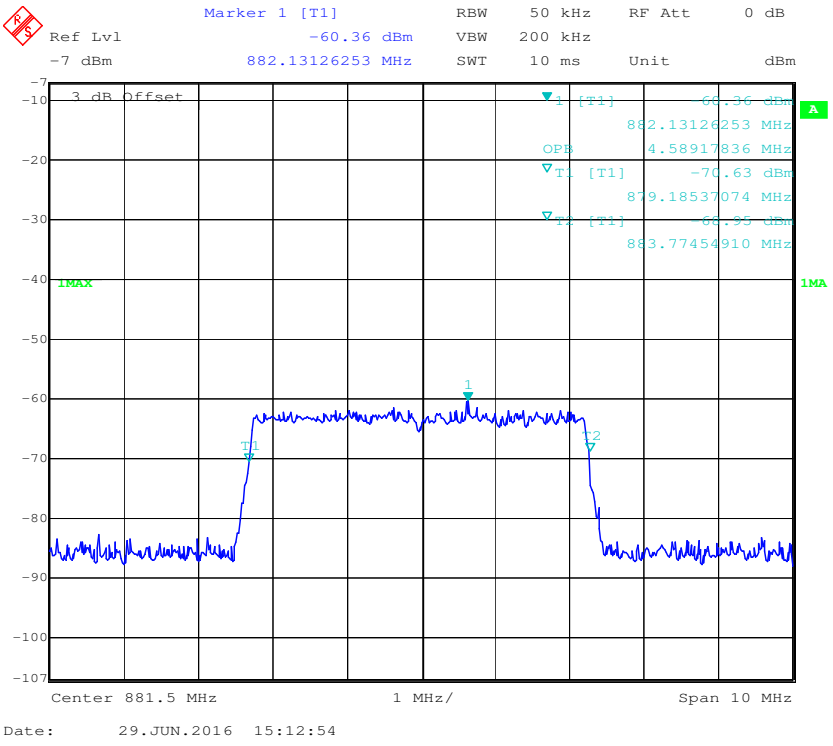
99% Bandwidth-UL- GSM-3dB above AGC-Input



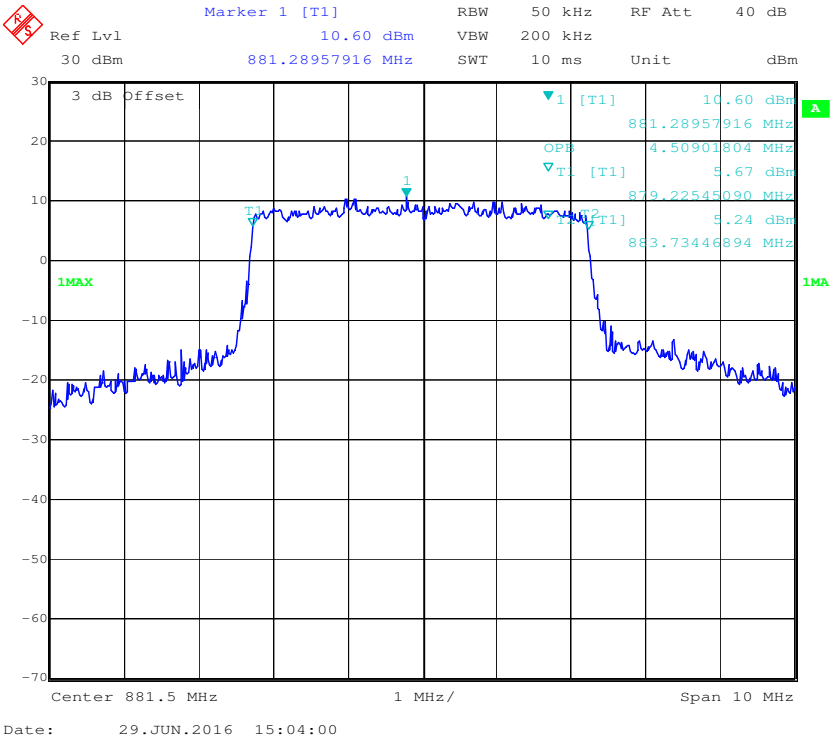
99% Bandwidth-UL- GSM-3dB above AGC-Output



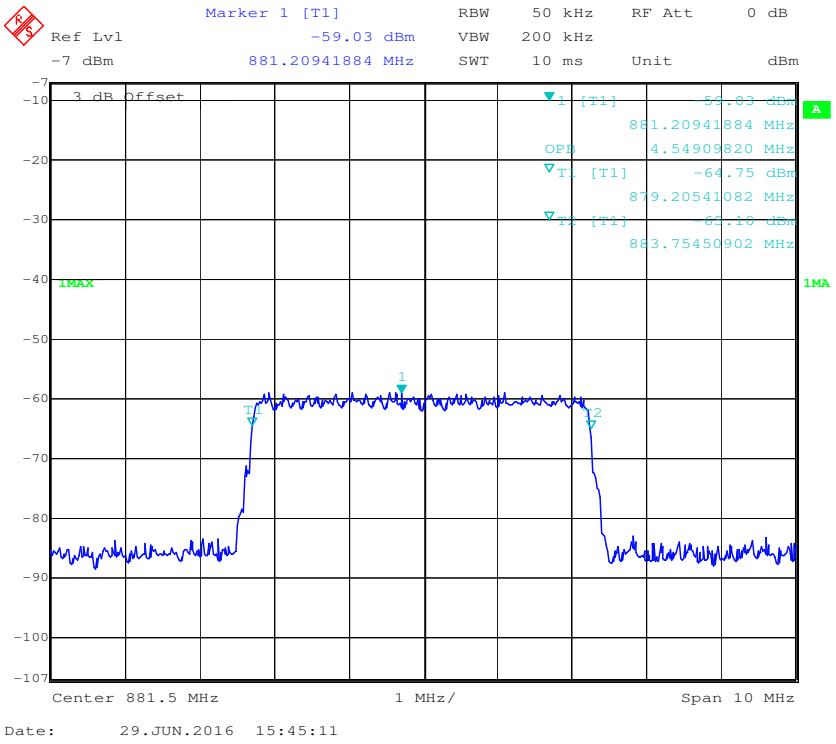
99% Bandwidth-DL- AWGN- Pre AGC -Input



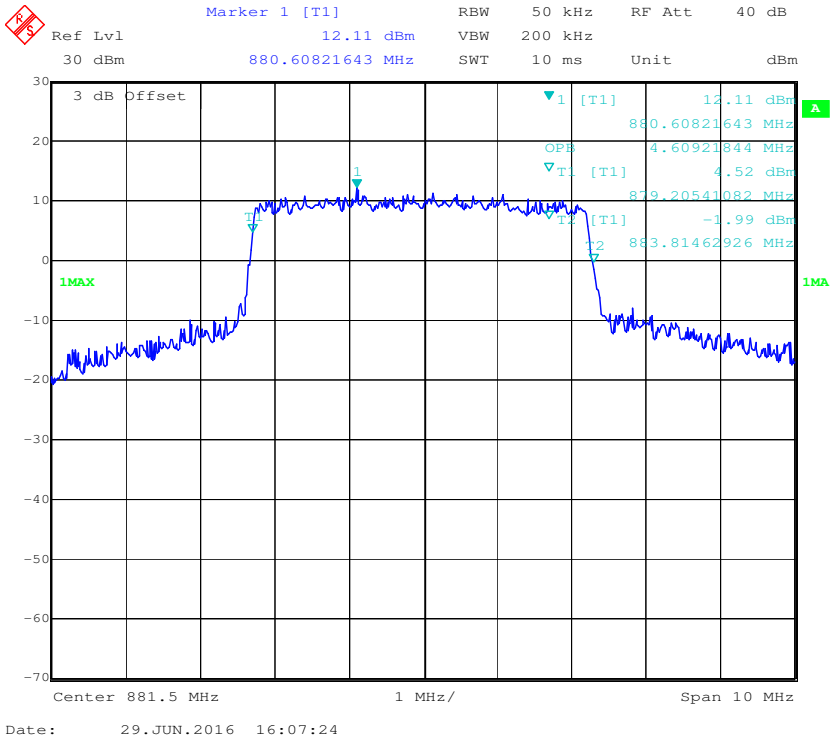
99% Bandwidth-DL- AWGN- Pre AGC -Output



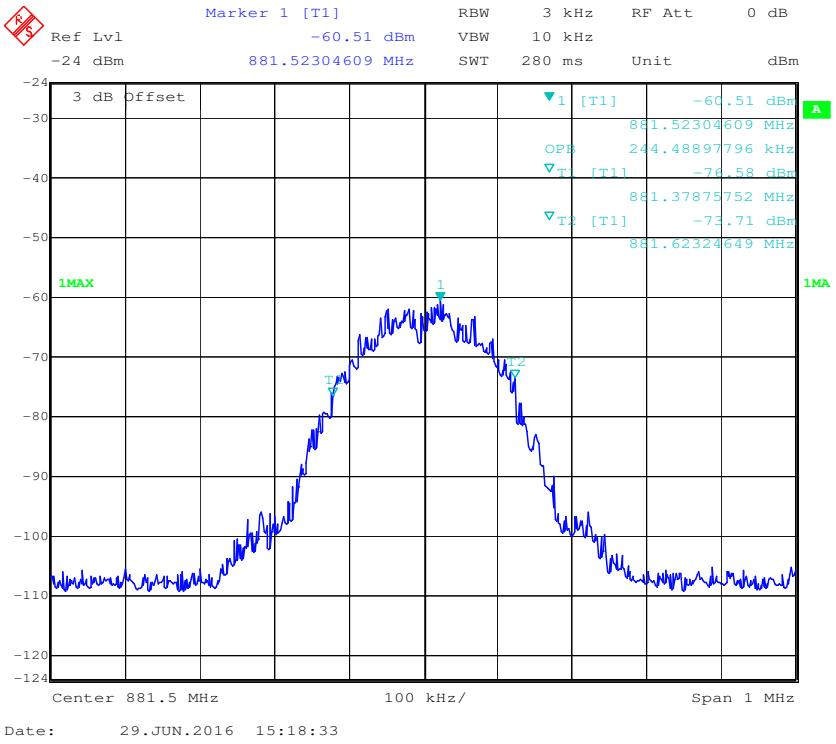
99% Bandwidth-DL- AWGN- 3dB Above AGC -Input



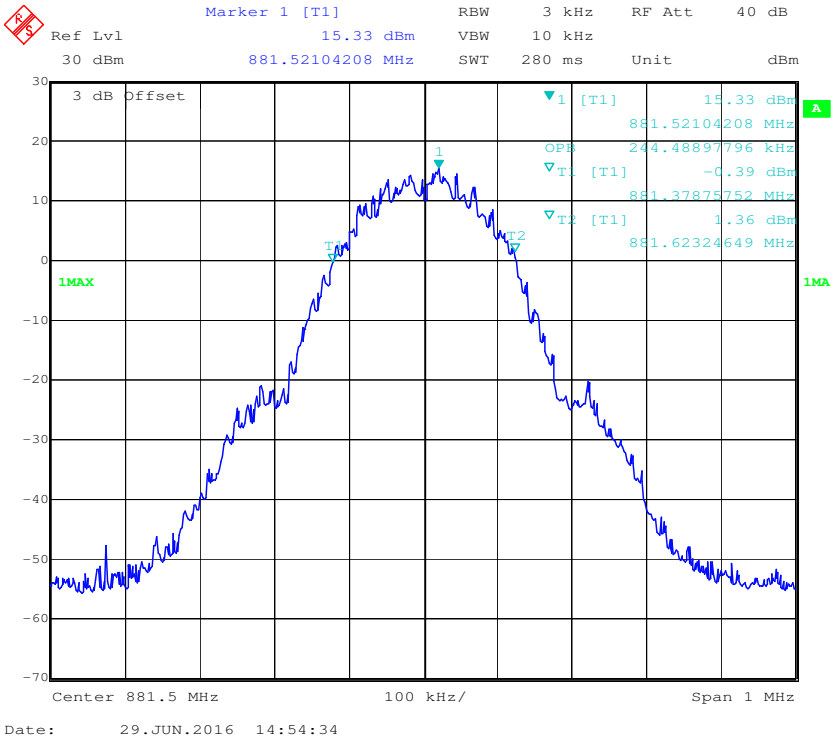
99% Bandwidth-DL- AWGN- 3dB Above AGC –Output



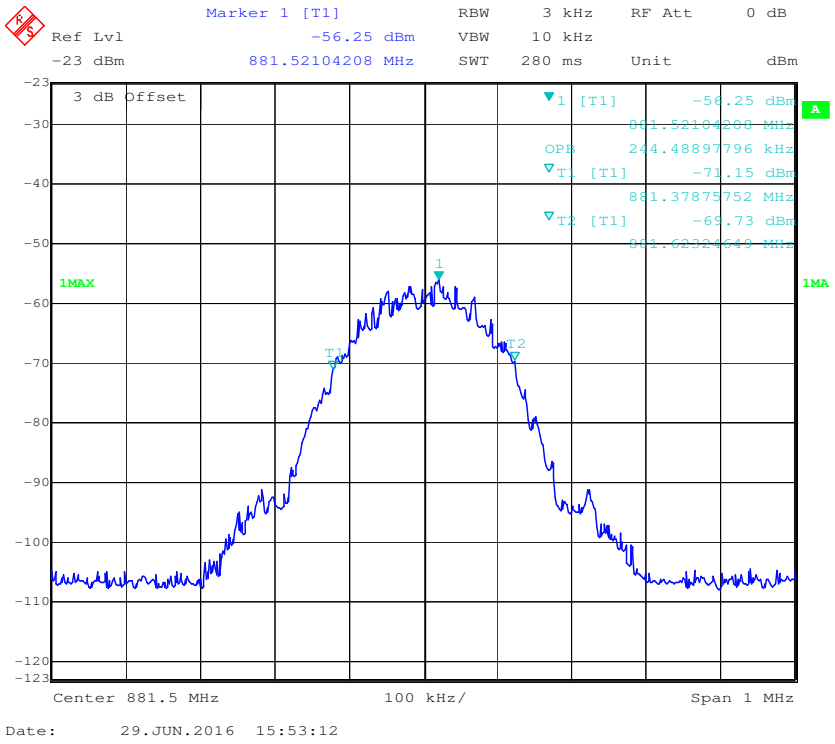
99% Bandwidth-DL- GSM- Pre AGC -Input



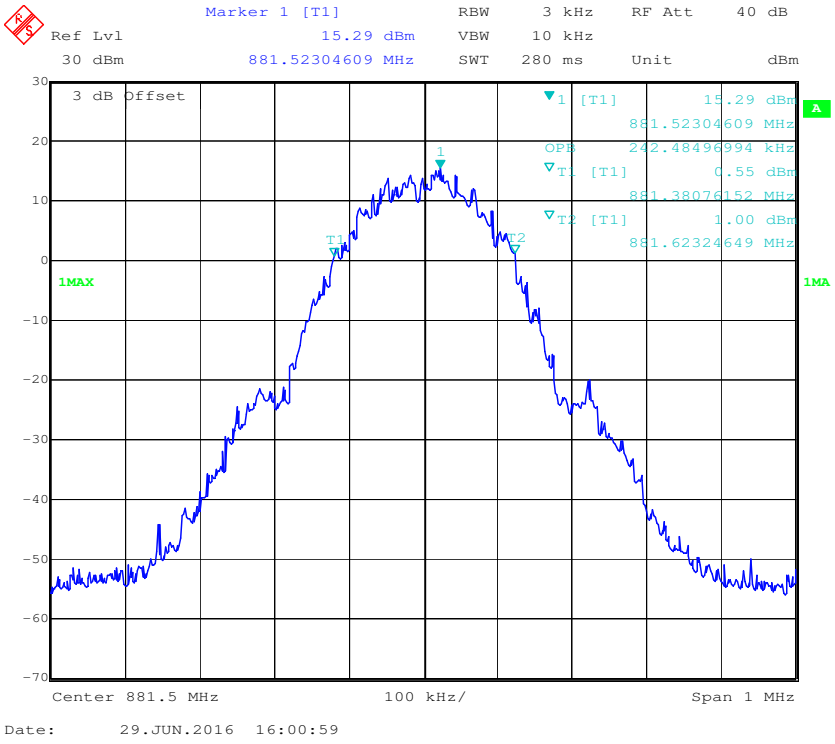
99% Bandwidth-DL- GSM- Pre AGC -Output



99% Bandwidth-DL- GSM- 3dB Above AGC -Input



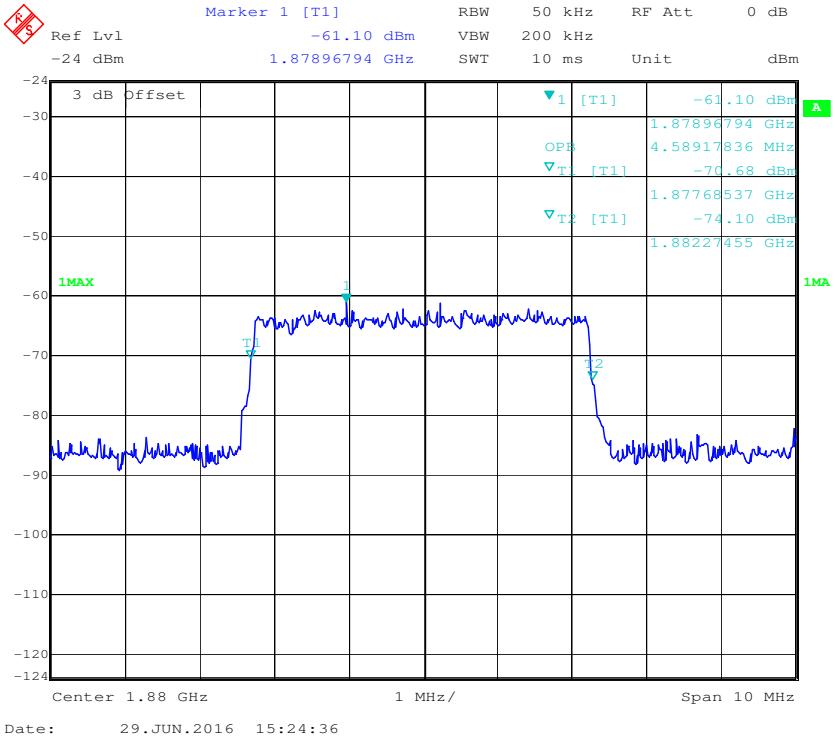
99% Bandwidth-DL- GSM- 3dB Above AGC -Output



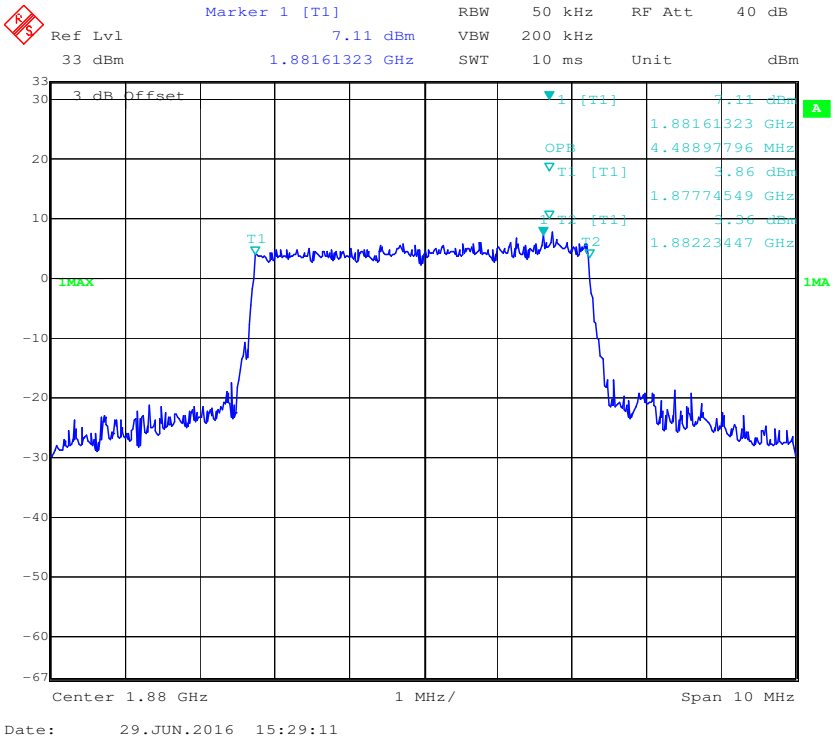
PCS Band

Mode	Signal Type	Signal Level	Frequency (MHz)	99% Bandwidth (MHz)	
				Input	Output
Uplink	AWGN	Pre-AGC	1880	4.589	4.489
		3dB above AGC	1880	4.549	4.649
	GSM	Pre-AGC	1880	0.244	0.244
		3dB above AGC	1880	0.244	0.244
Downlink	AWGN	Pre-AGC	1960	4.589	4.569
		3dB above AGC	1960	4.549	4.549
	GSM	Pre-AGC	1960	0.244	0.244
		3dB above AGC	1960	0.244	0.244

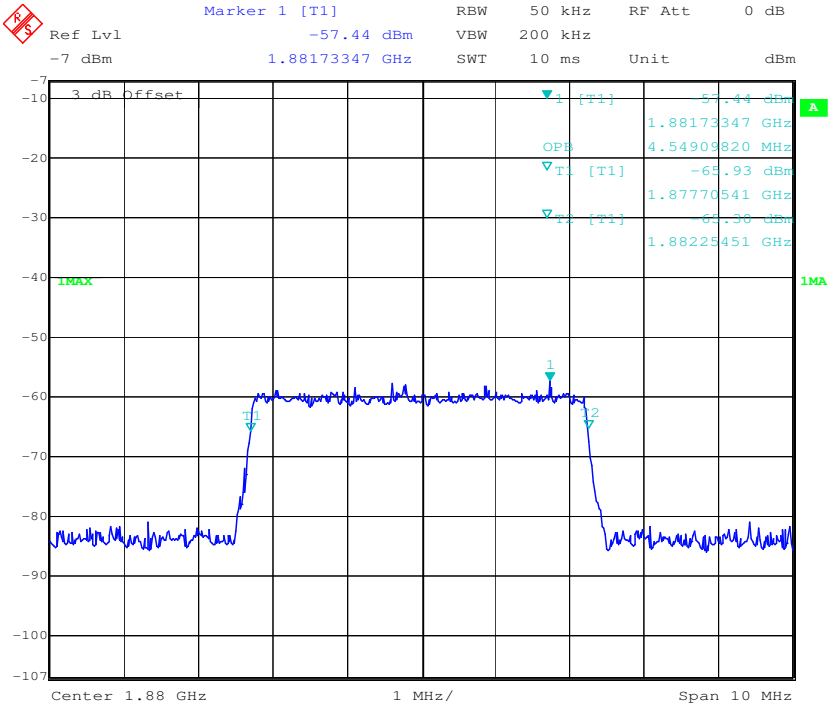
99% Bandwidth-UL-AWGN-Pre AGC-Input



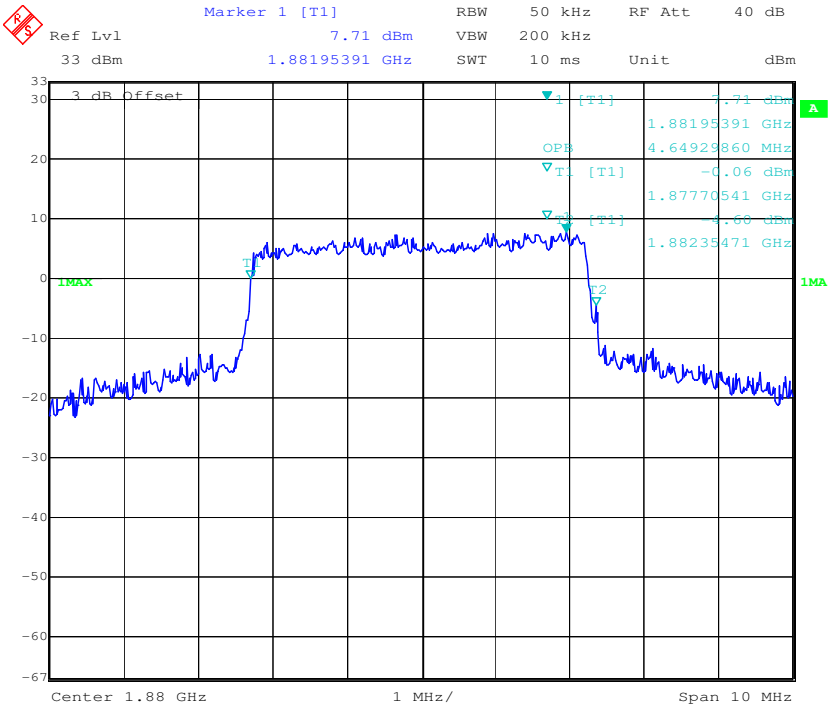
99% Bandwidth-UL- AWGN- Pre AGC -Output



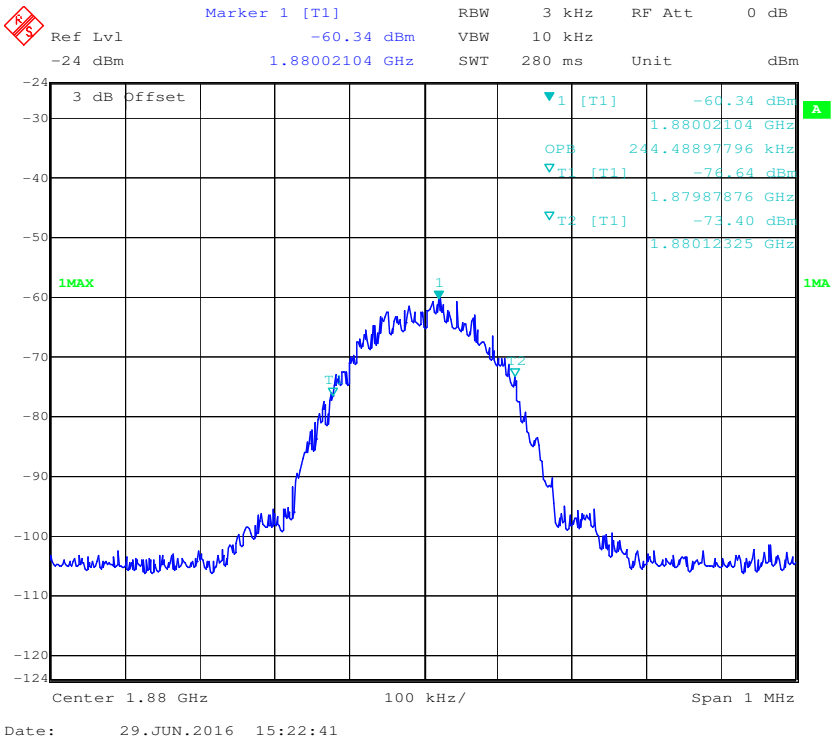
99% Bandwidth-UL- AWGN-3dB above AGC-Input



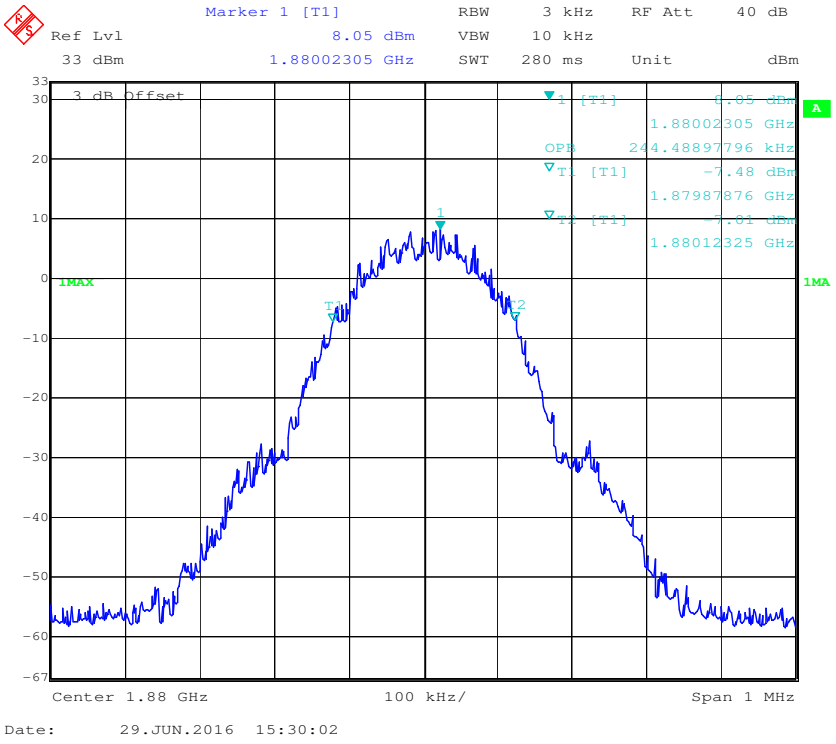
99% Bandwidth-UL- AWGN-3dB above AGC-Output



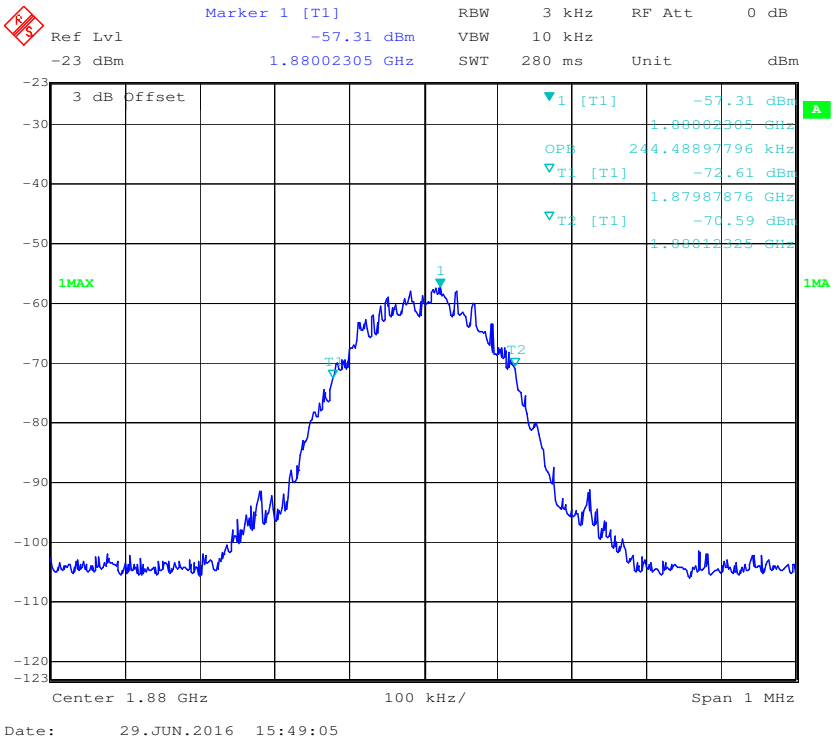
99% Bandwidth-UL-GSM-Pre AGC-Input



99% Bandwidth-UL- GSM- Pre AGC -Output

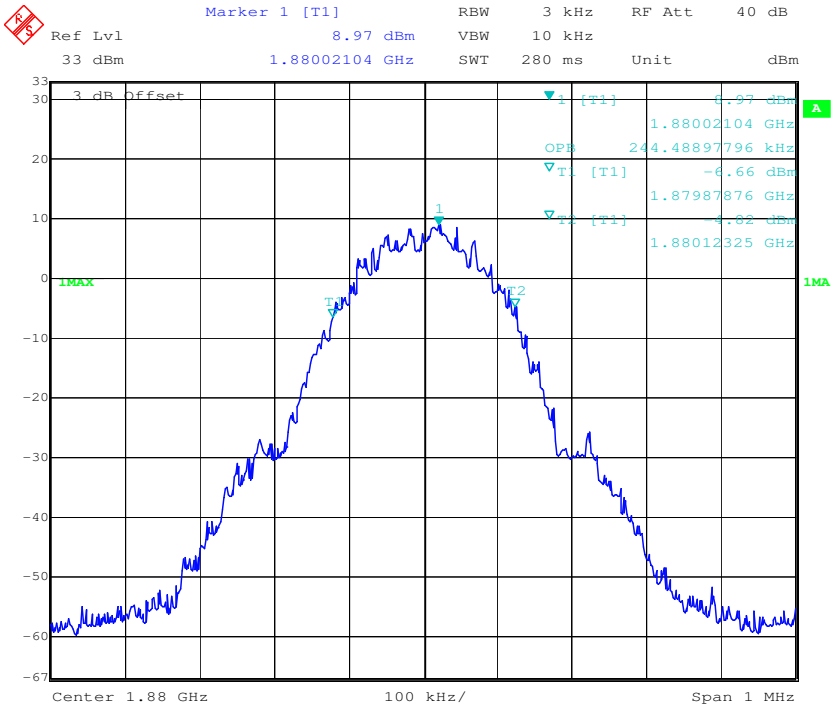


99% Bandwidth-UL- GSM-3dB above AGC-Input



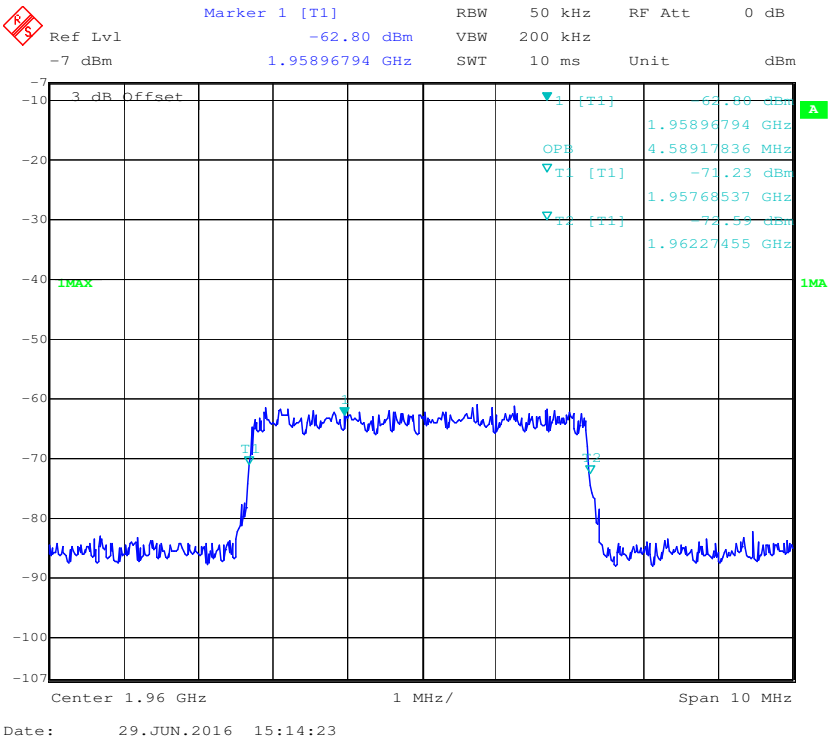
Date: 29.JUN.2016 15:49:05

99% Bandwidth-UL- GSM-3dB above AGC-Output

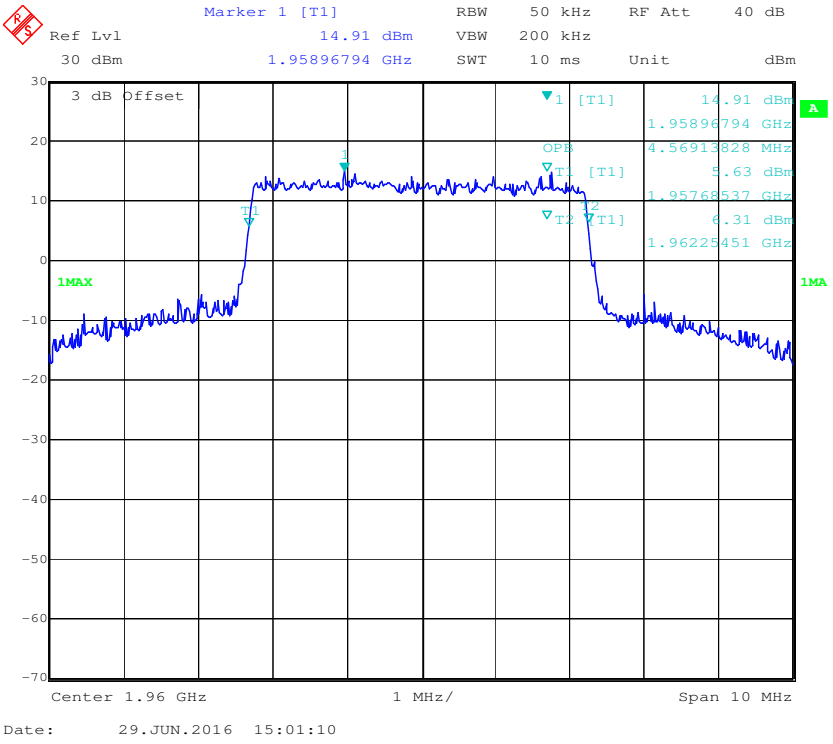


Date: 29.JUN.2016 15:41:18

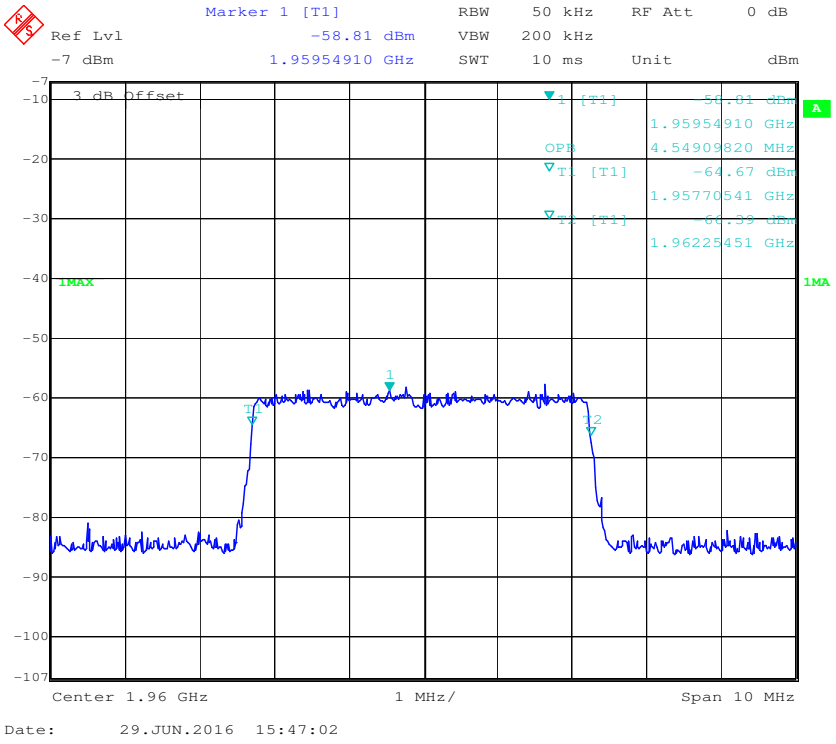
99% Bandwidth-DL- AWGN- Pre AGC -Input



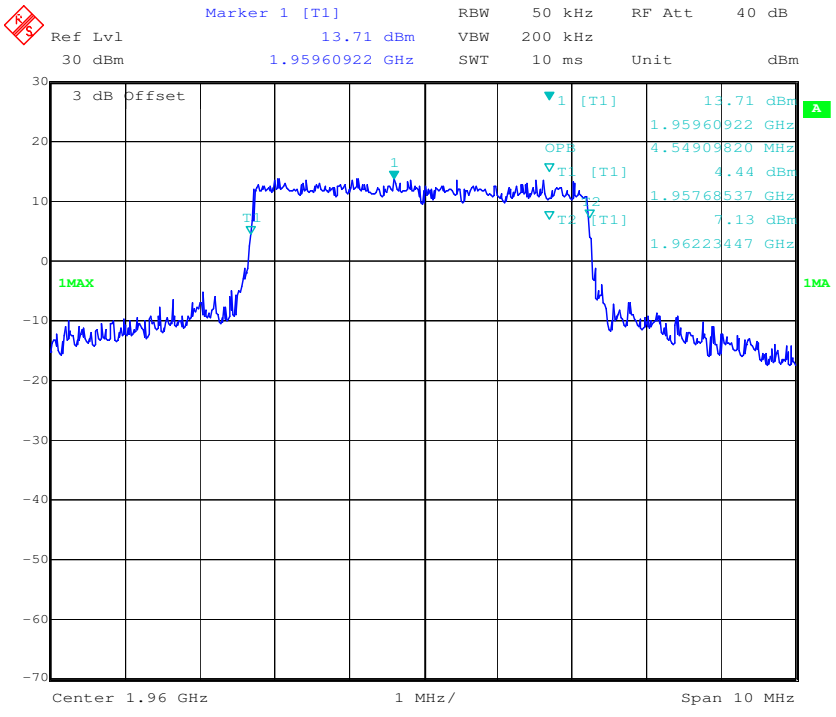
99% Bandwidth-DL- AWGN- Pre AGC -Output



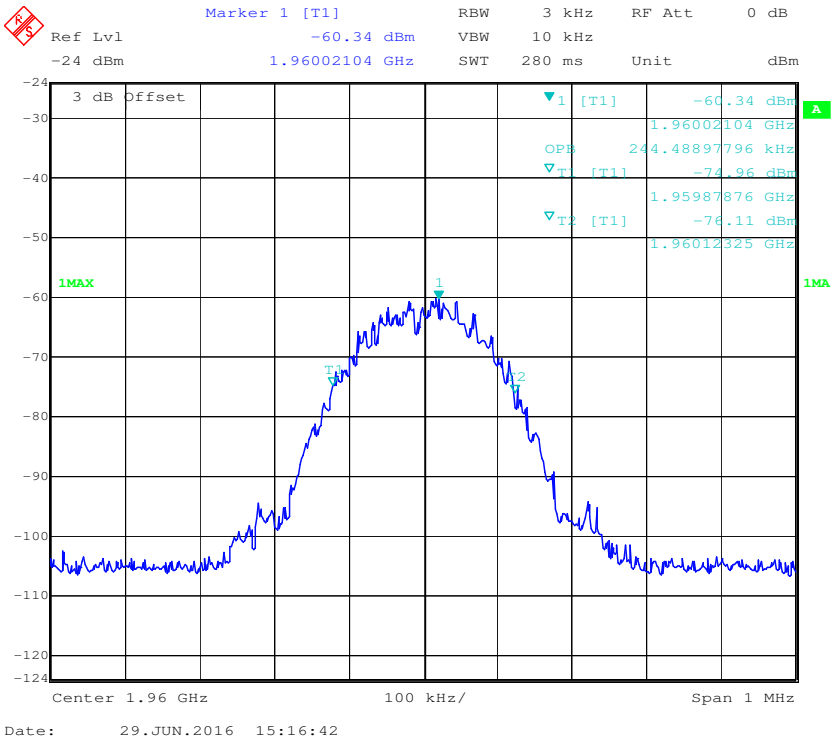
99% Bandwidth-DL- AWGN- 3dB Above AGC -Input



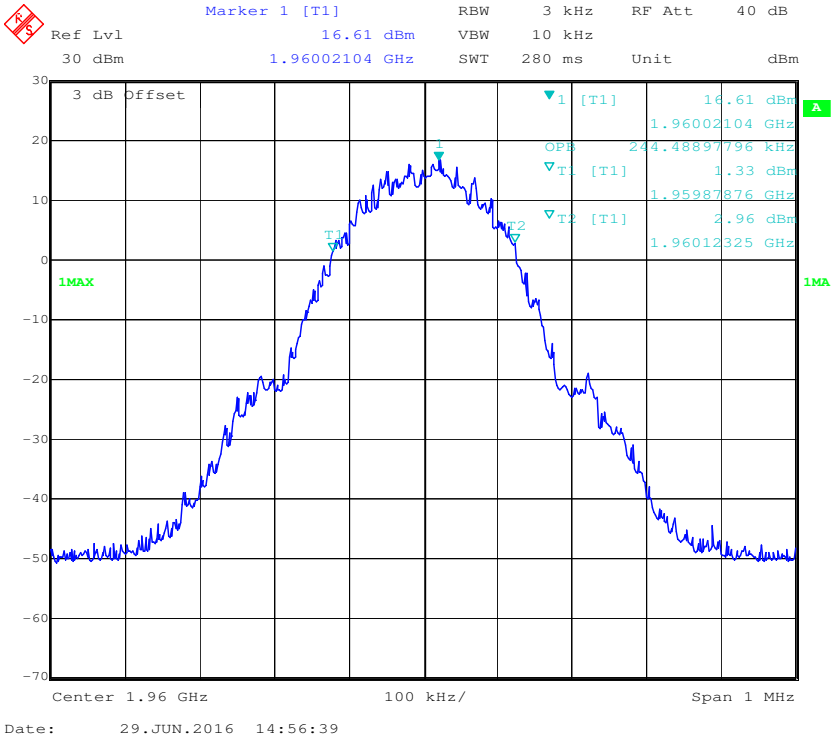
99% Bandwidth-DL- AWGN- 3dB Above AGC -Output



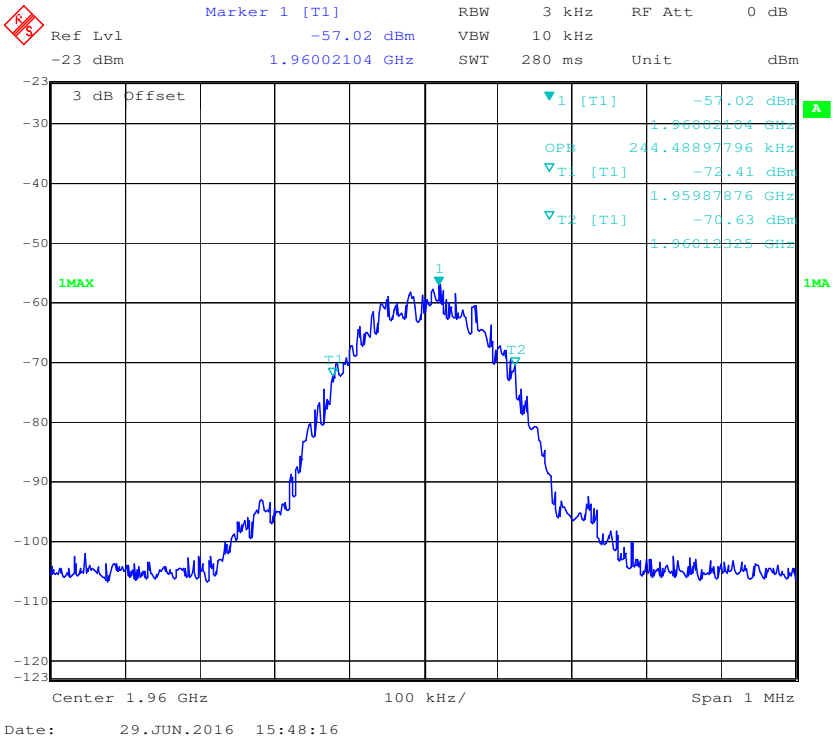
99% Bandwidth-DL- GSM- Pre AGC -Input



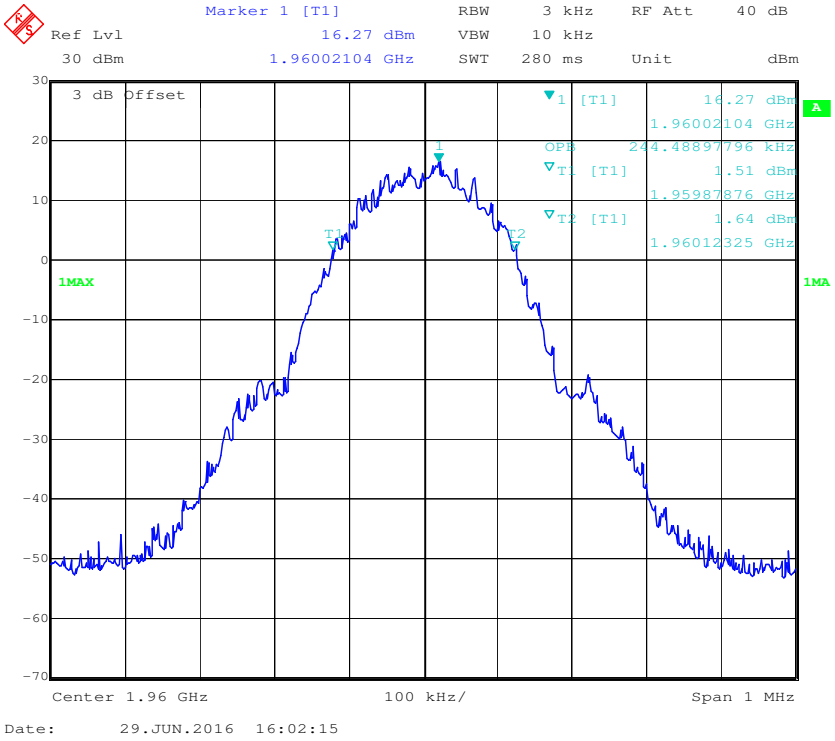
99% Bandwidth-DL- GSM- Pre AGC -Output



99% Bandwidth-DL- GSM- 3dB Above AGC -Input



99% Bandwidth-DL- GSM- 3dB Above AGC -Output



FCC §2.1051, §22.917 & §24.238 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Applicable Standard

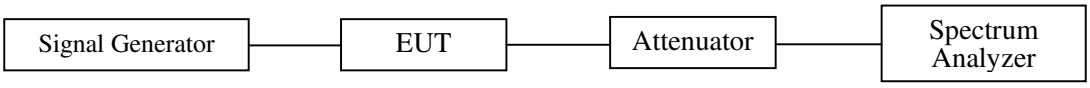
FCC §2.1051, §22.917, §24.238.

The spectrum was to be investigated to the tenth harmonics of the highest fundamental frequency as specified in § 2.1051.

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.

Test Procedure

Please refer to KDB 935210 D05 Indus Booster Basic Meas v01r01 clause 3.6.3



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2015-12-11	2016-12-11
Ducommun technologies	RF Cable	RG-214	3	2016-06-15	2017-06-15
Ducommun technologies	RF Cable	RG-214	2	2016-06-15	2017-06-15
WEINSCHEL	3dB Attenuator	5321	AU0709	2016-06-18	2017-06-18
Agilent	ESG Vector Signal Generator	E4438C	US41461205	2015-11-12	2016-11-12

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

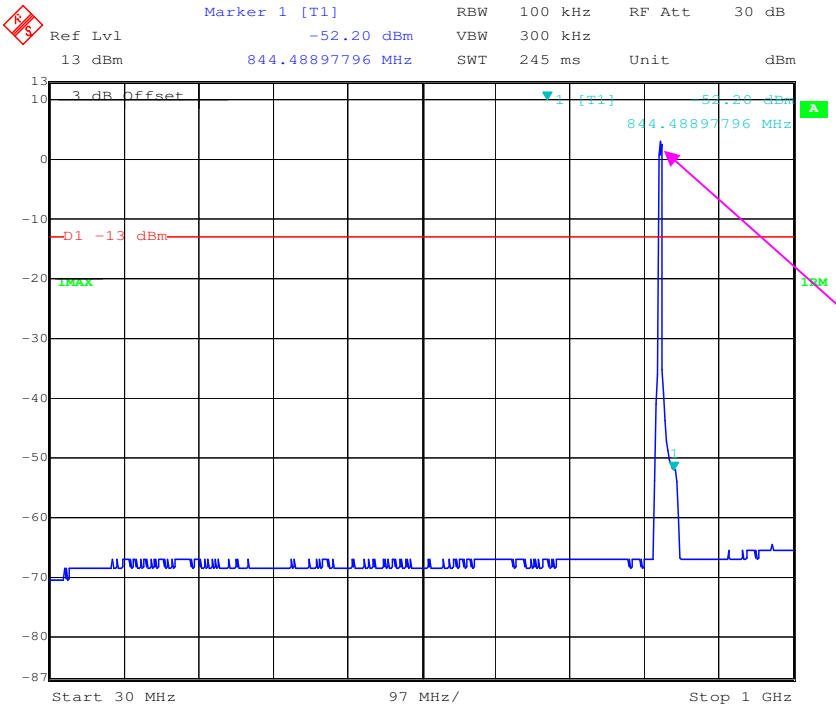
Temperature:	24 ℃
Relative Humidity:	52 %
ATM Pressure:	101.0 kPa

The testing was performed by Rocky Kang on 2016-06-29.

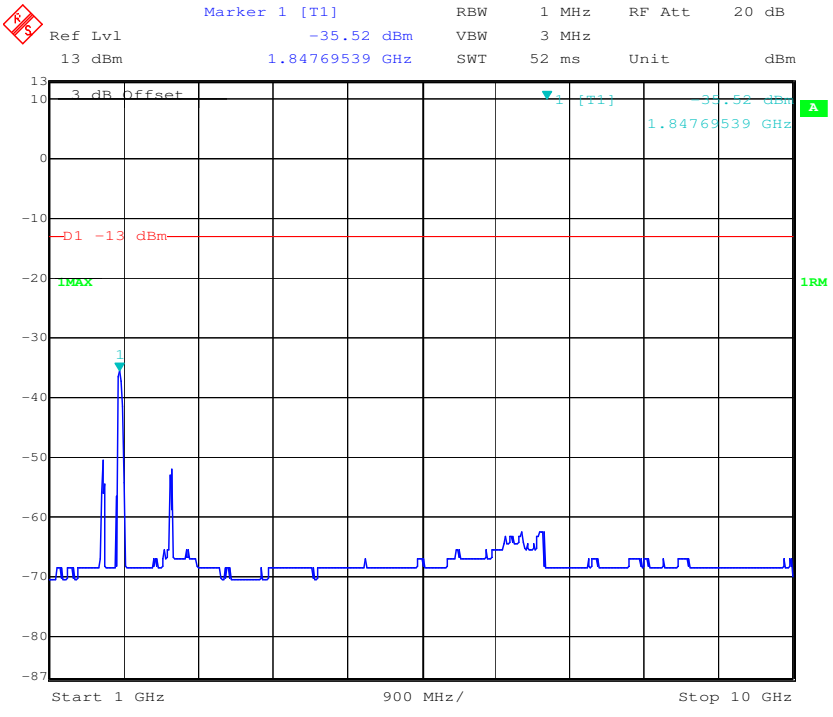
Test result: Compliance, please refer to the following plots.

Uplink:

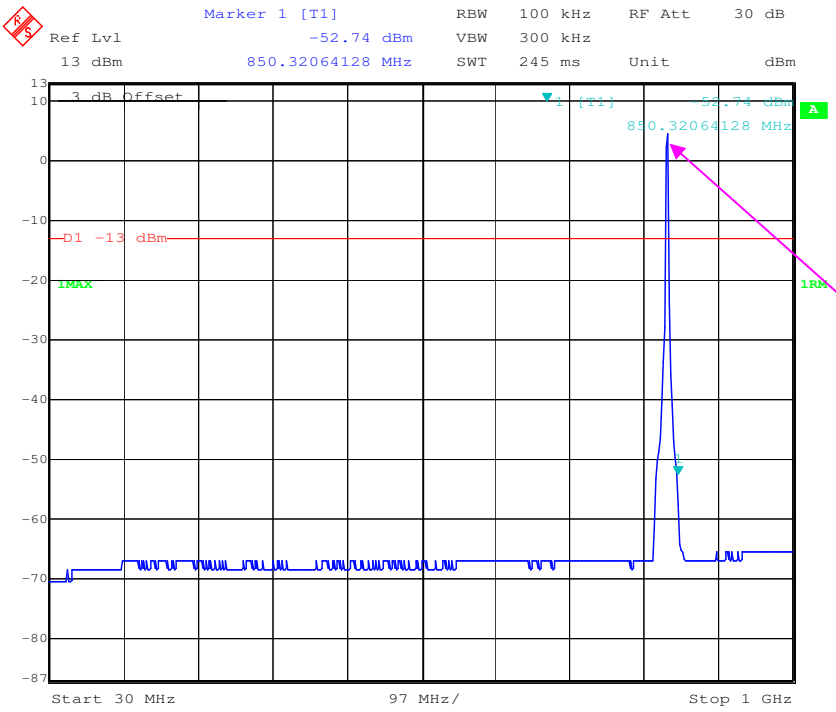
CELLULAR - AWGN-Pre AGC-Low Channel



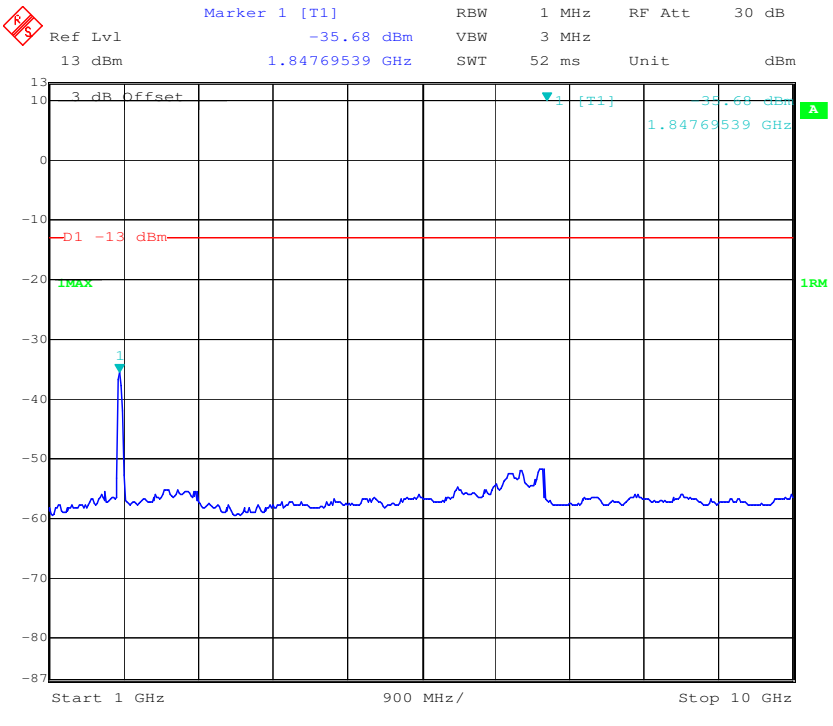
Fundamental test



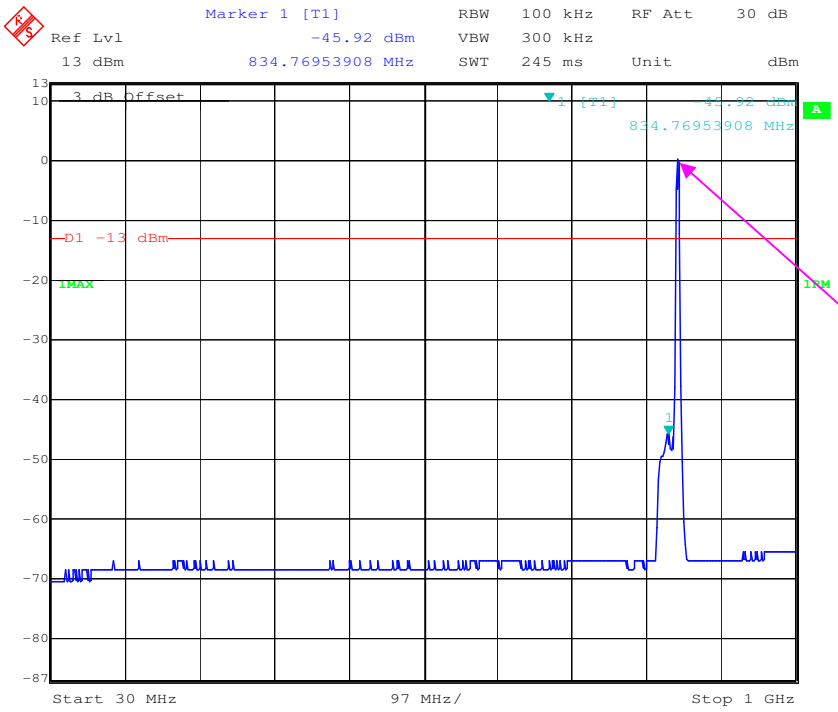
CELLULAR - AWGN-Pre AGC-Middle Channel



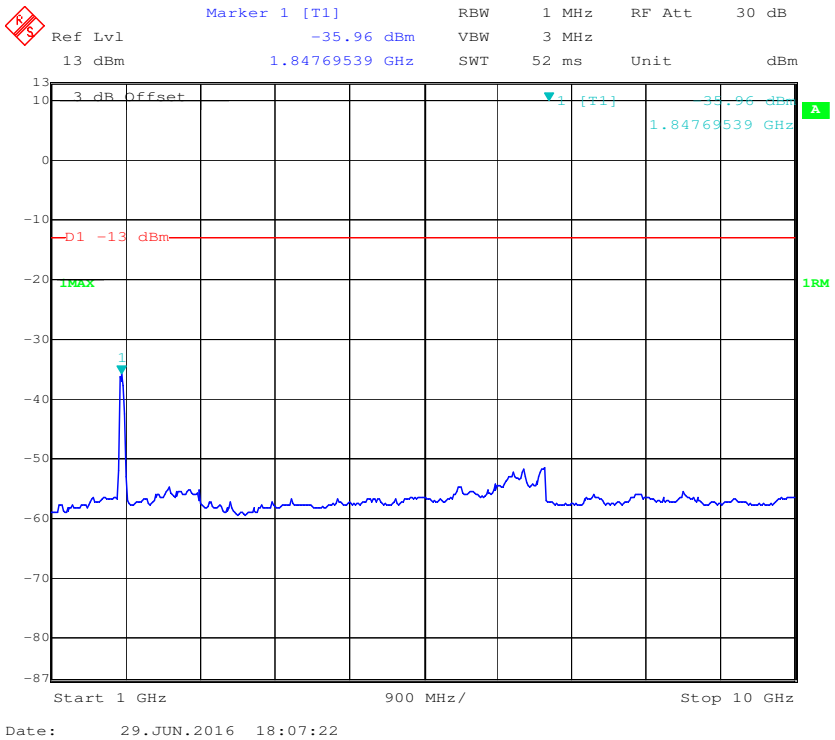
Fundamental test



CELLULAR - AWGN-Pre AGC-High Channel

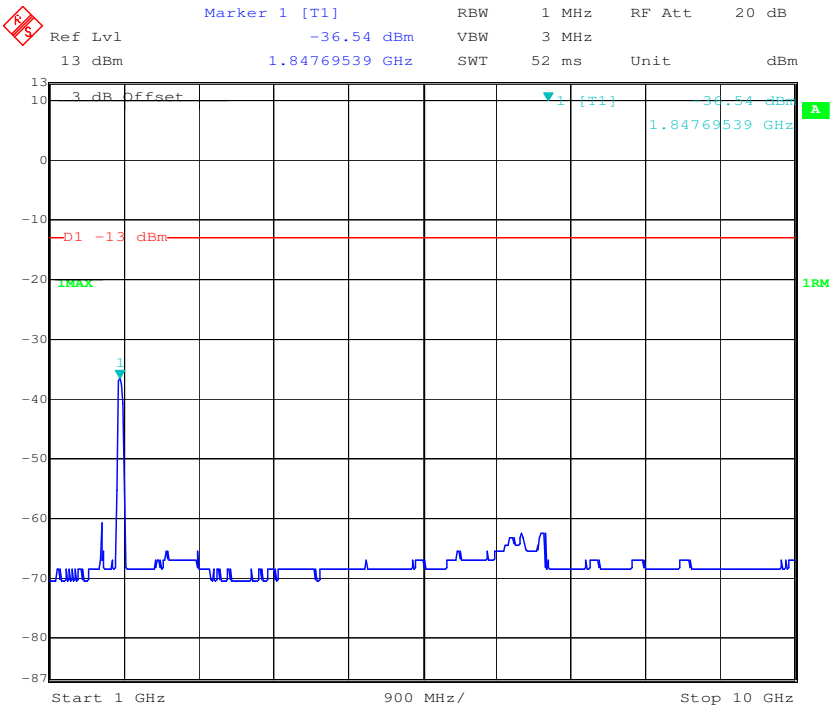


Fundamental test



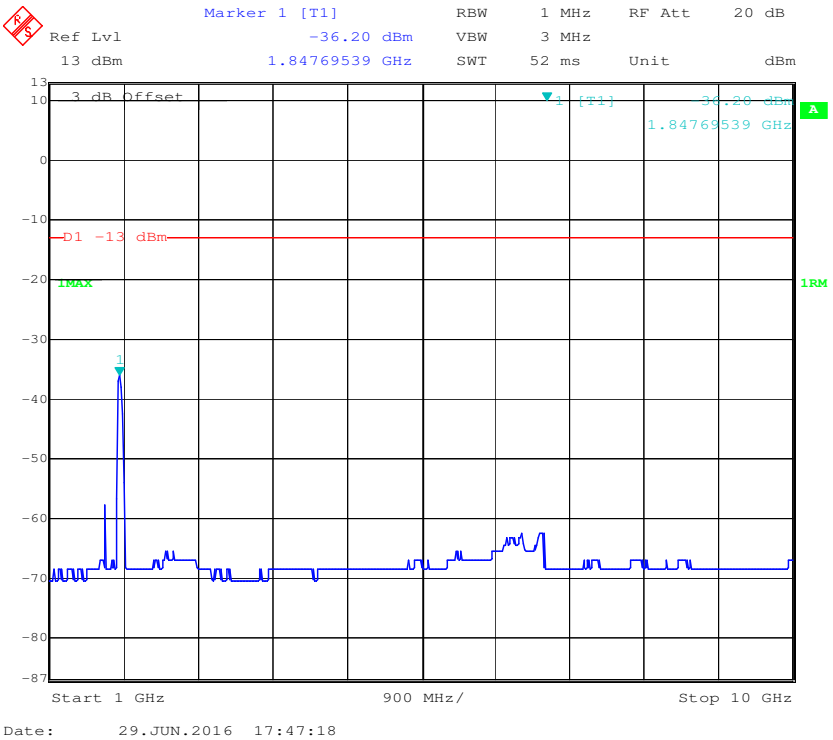
CELLULAR - GSM-Pre AGC-Low Channel

Fundamental test

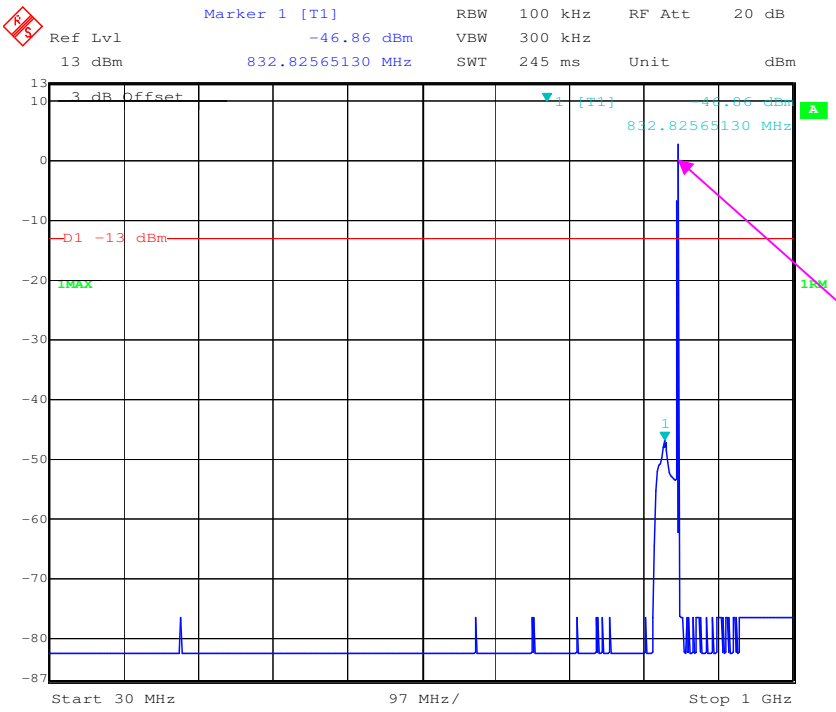


CELLULAR - GSM-Pre AGC-Middle Channel

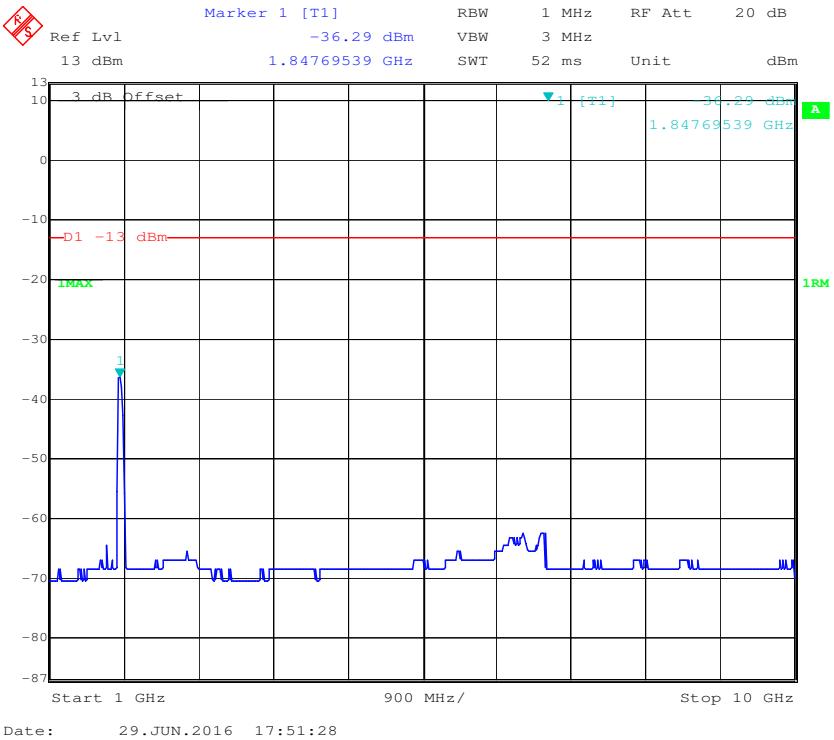
Fundamental test



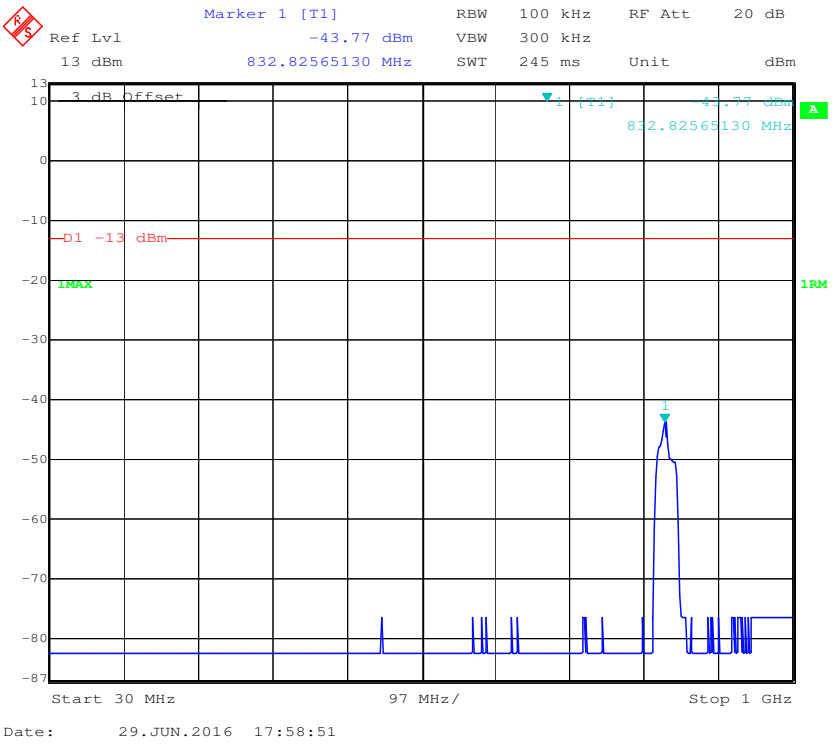
CELLULAR - GSM-Pre AGC-High Channel

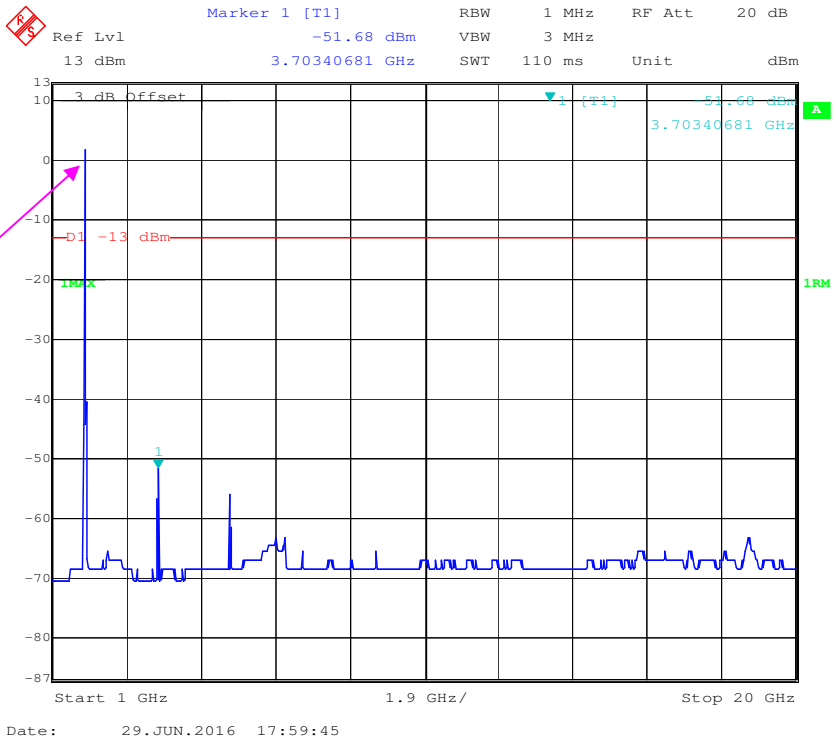


Fundamental test



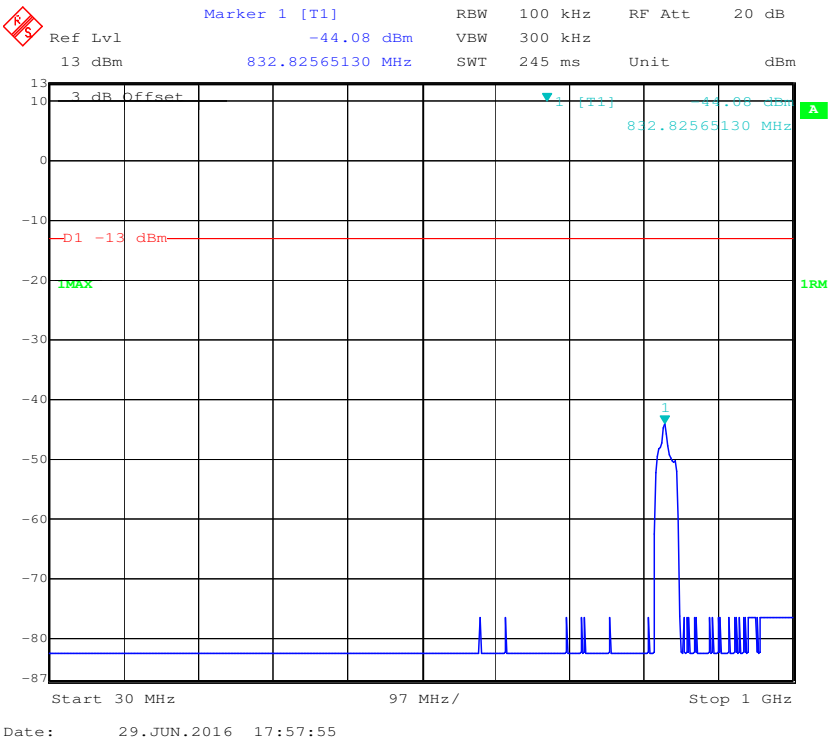
PCS- AWGN-Pre AGC-Low Channel

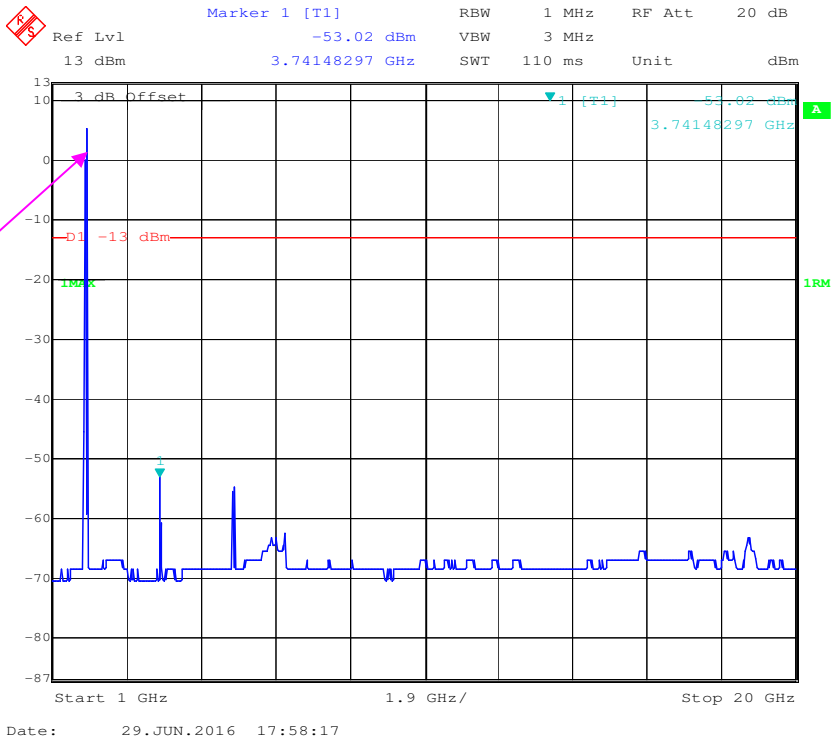




Fundamental test

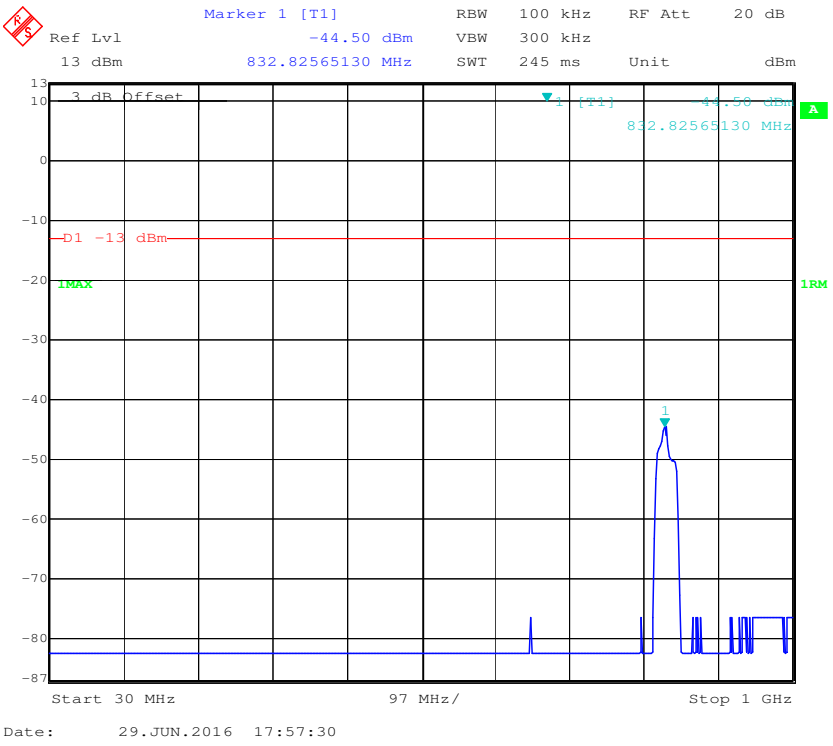
PCS- AWGN-Pre AGC-Middle Channel

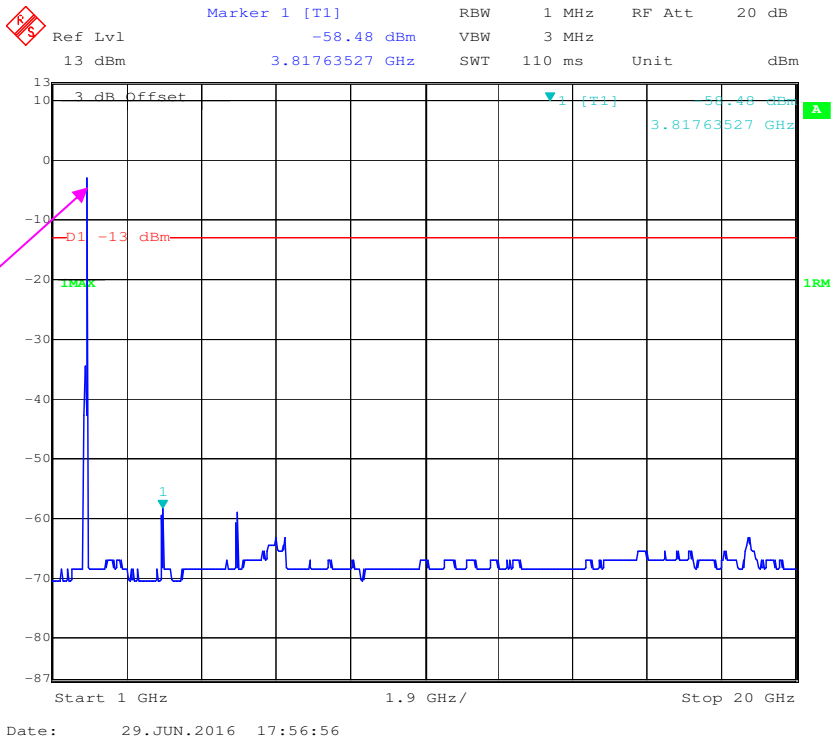




Fundamental test

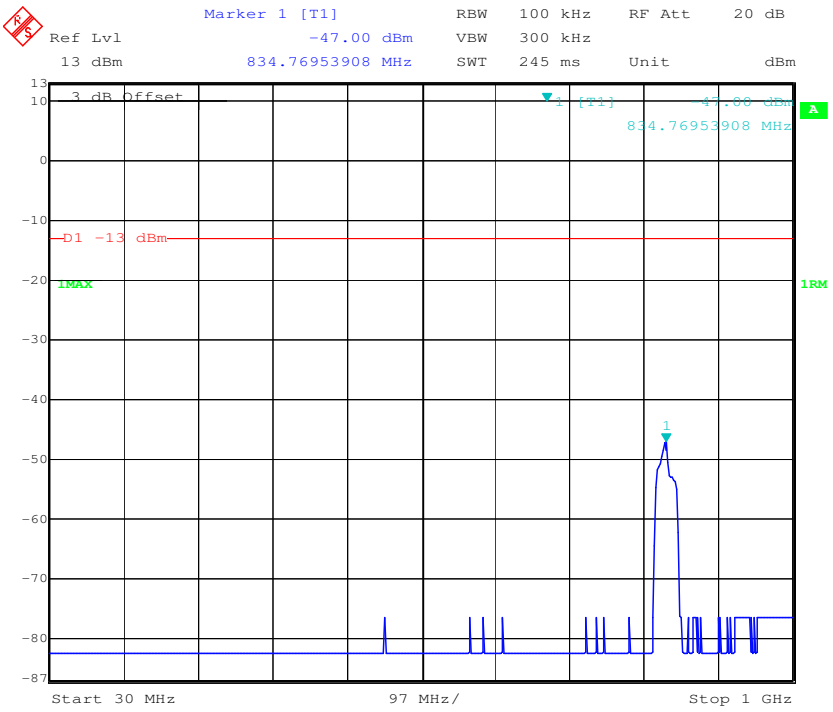
PCS- AWGN-Pre AGC-High Channel

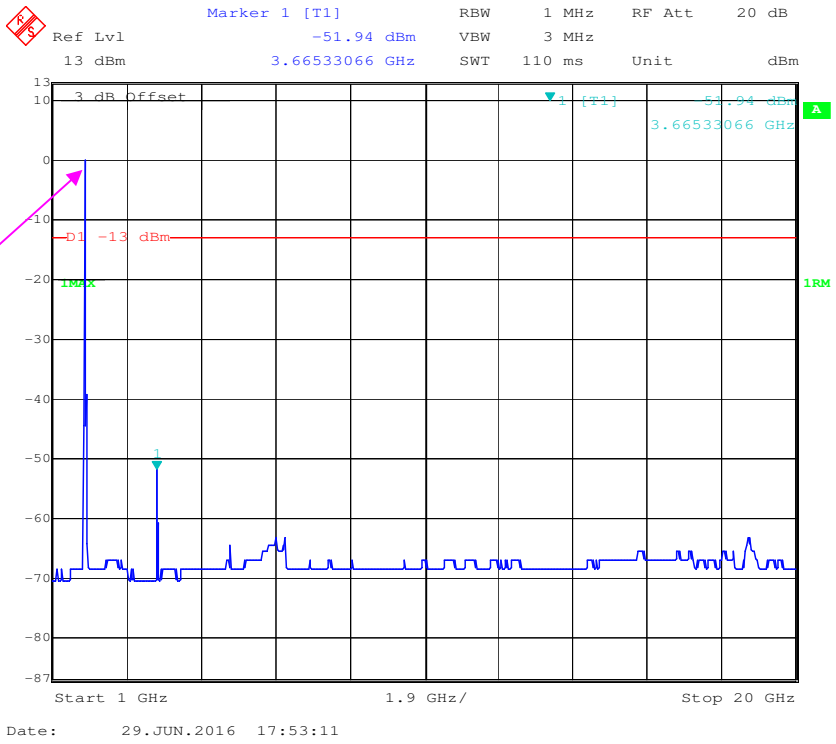




Fundamental test

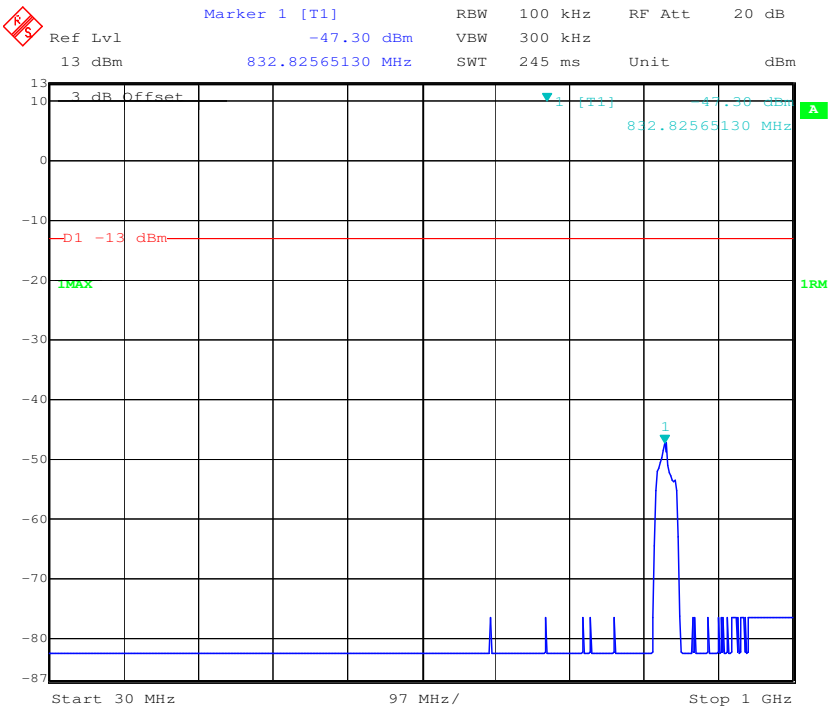
PCS- GSM-Pre AGC-Low Channel

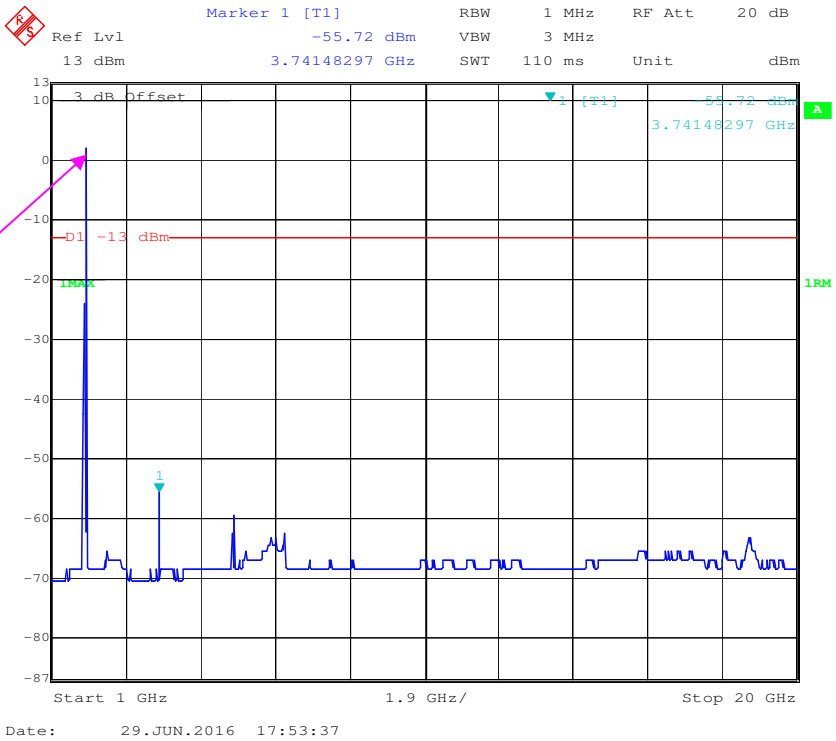




Fundamental test

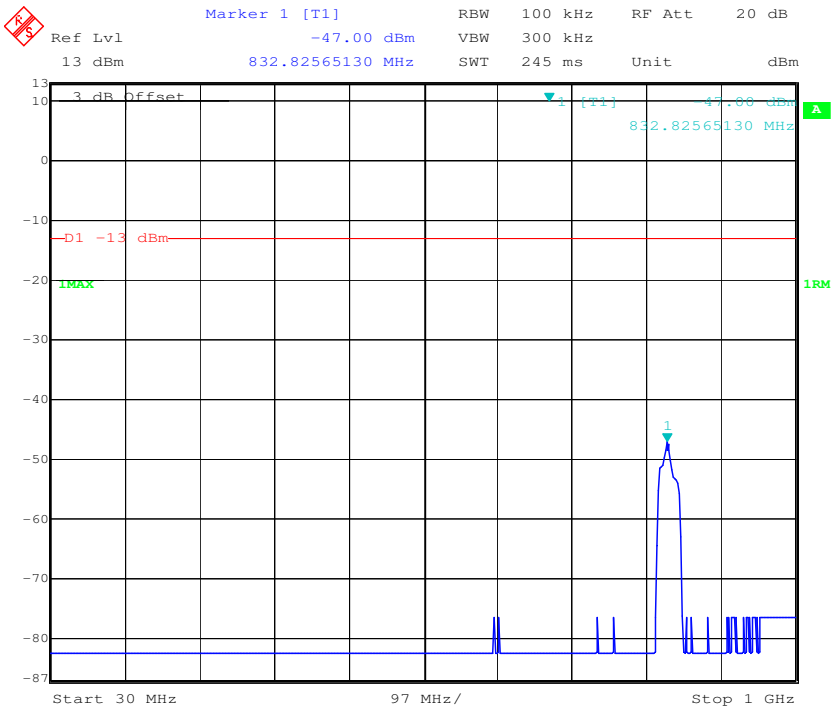
PCS- GSM-Pre AGC-Middle Channel

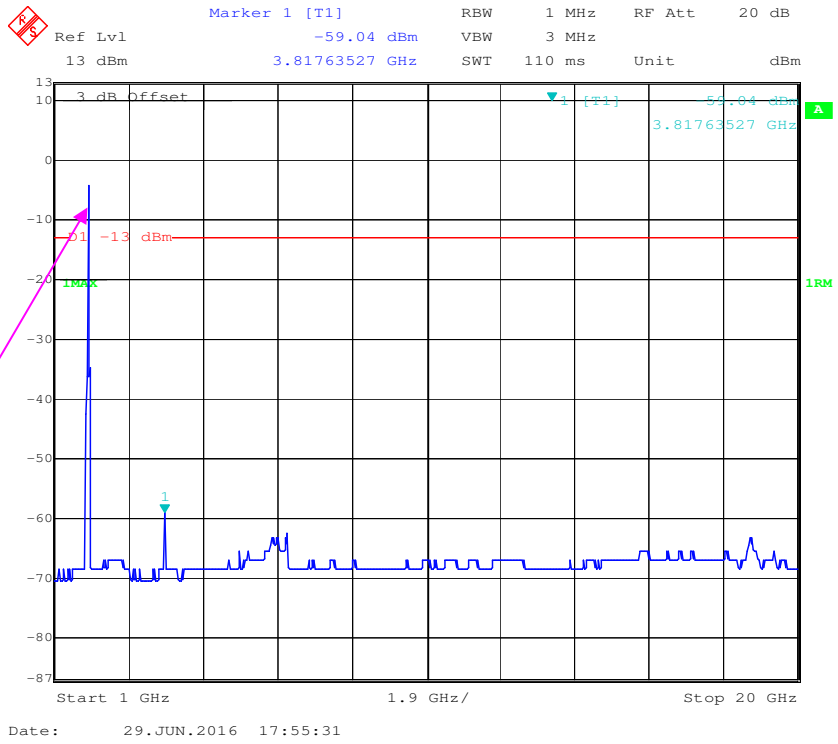




Fundamental test

PCS- GSM-Pre AGC-High Channel

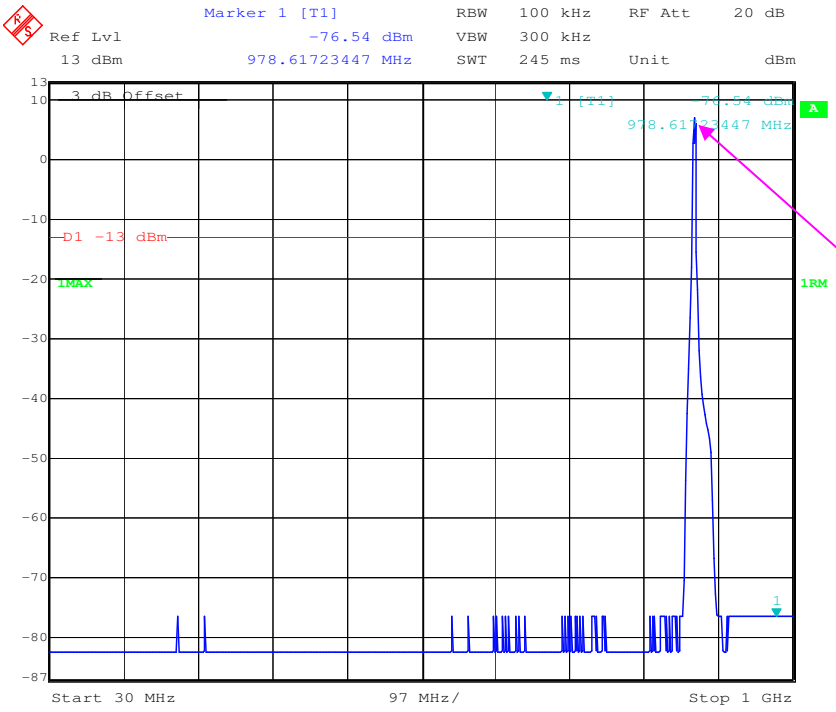




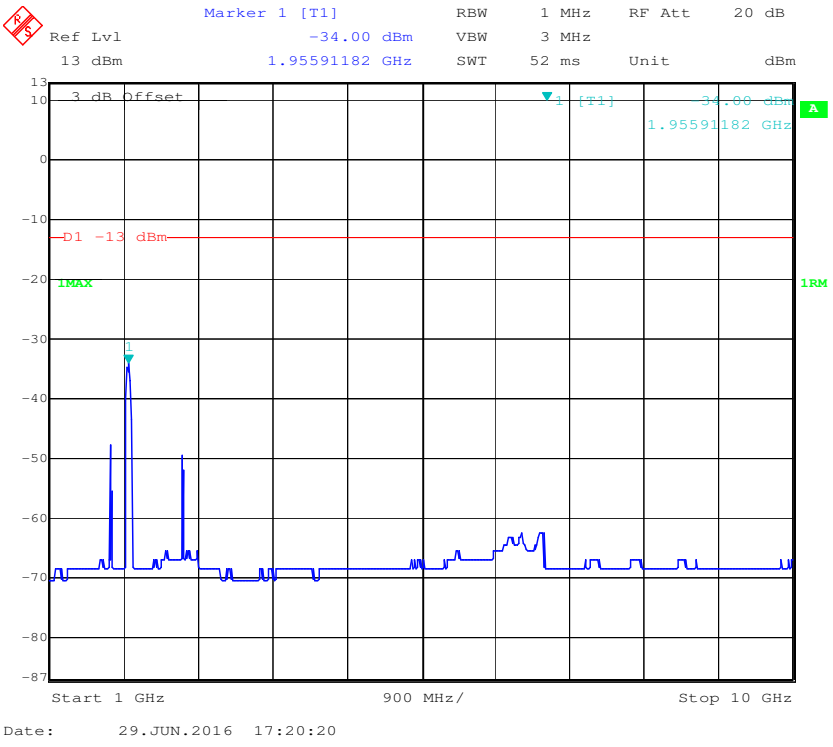
Fundamental test

Downlink:

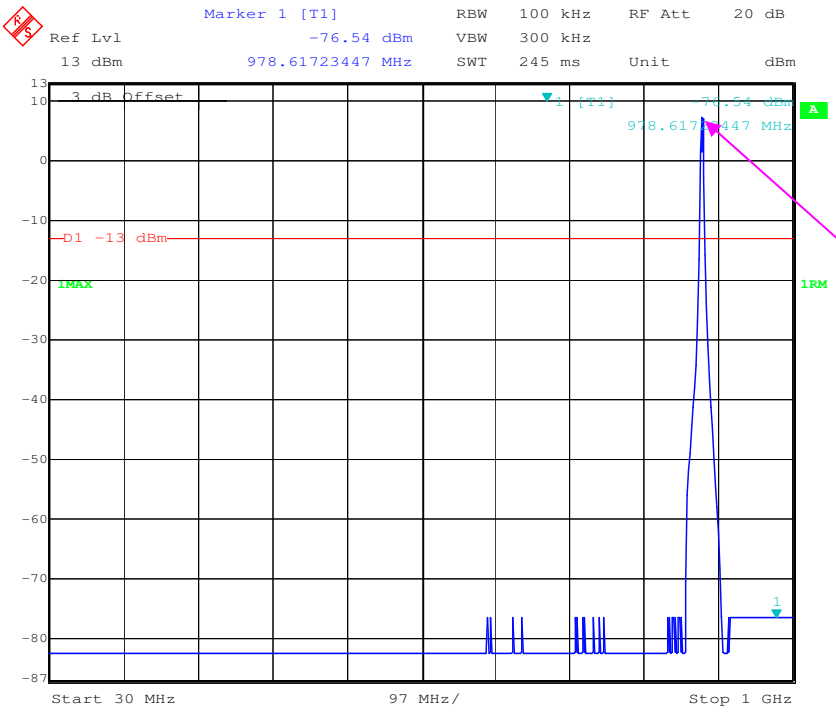
CELLULAR - AWGN-Pre AGC-Low Channel



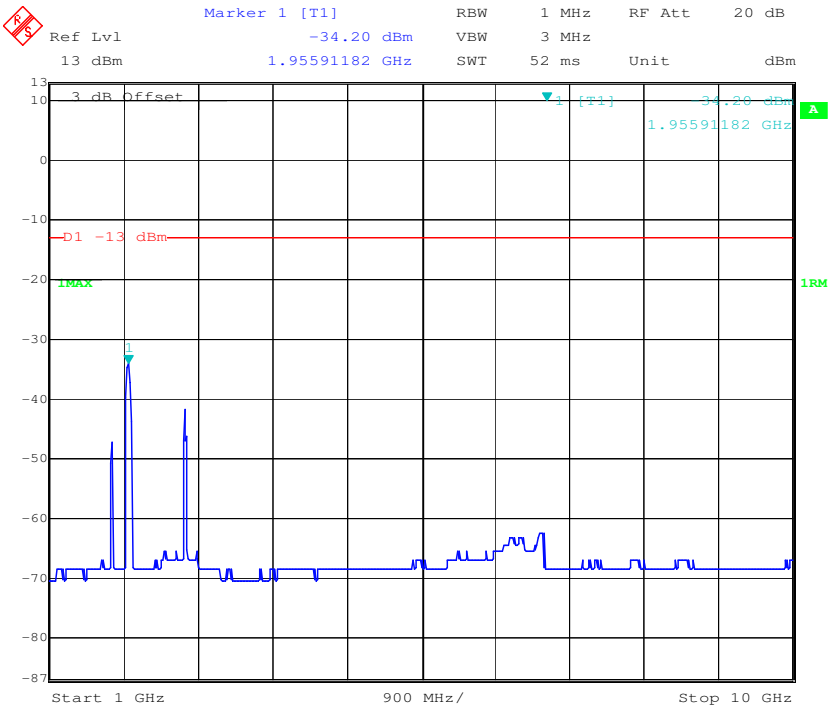
Fundamental test



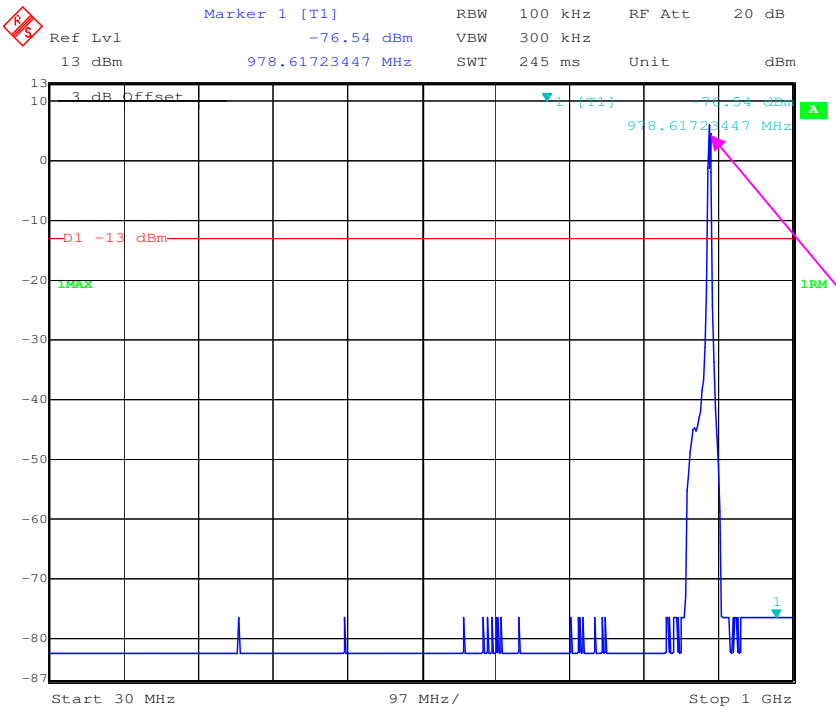
CELLULAR - AWGN-Pre AGC-Middle Channel



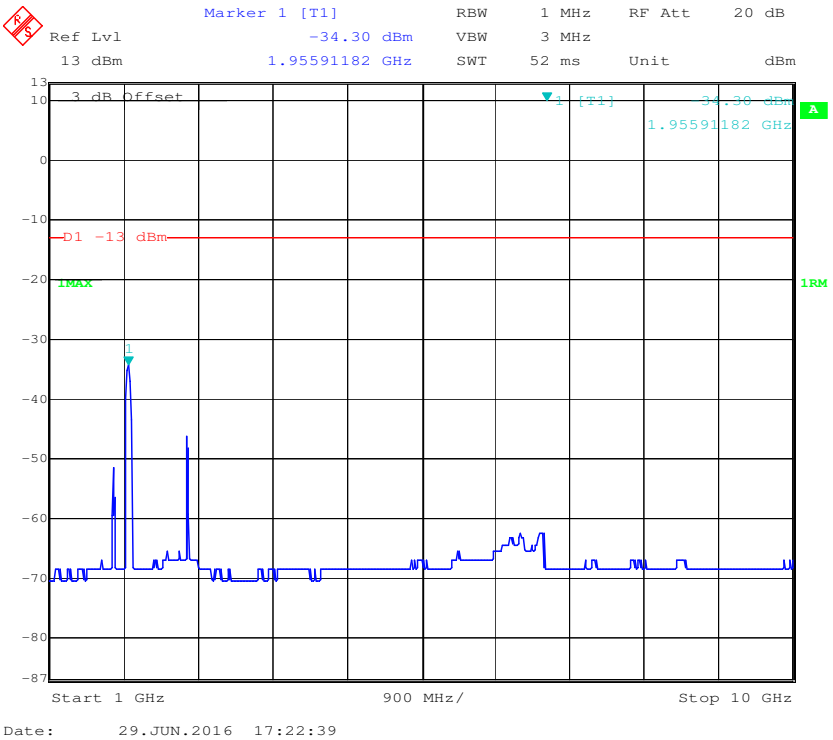
Fundamental test



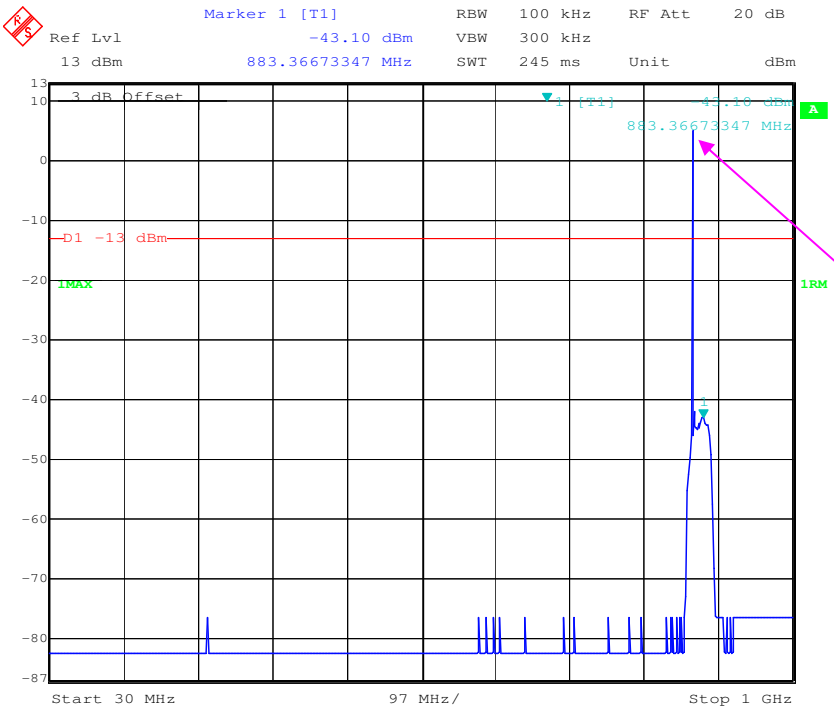
CELLULAR - AWGN-Pre AGC-High Channel



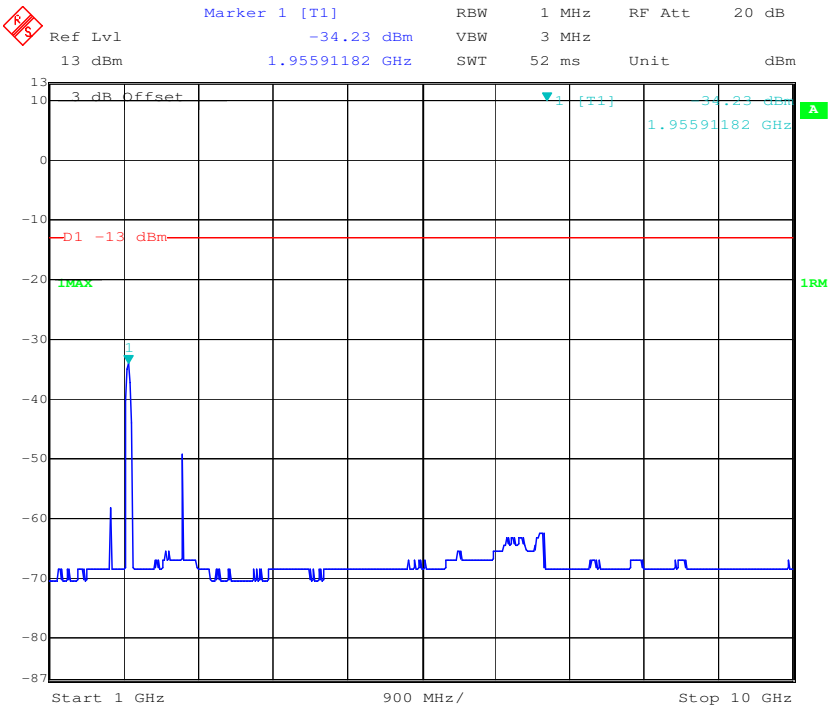
Fundamental test



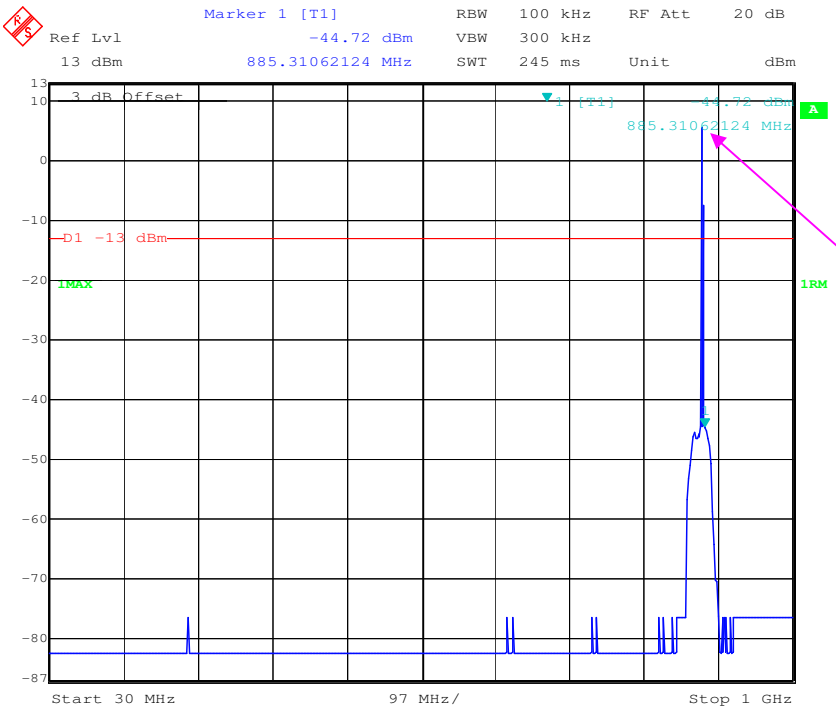
CELLULAR -GSM-Pre AGC-Low Channel



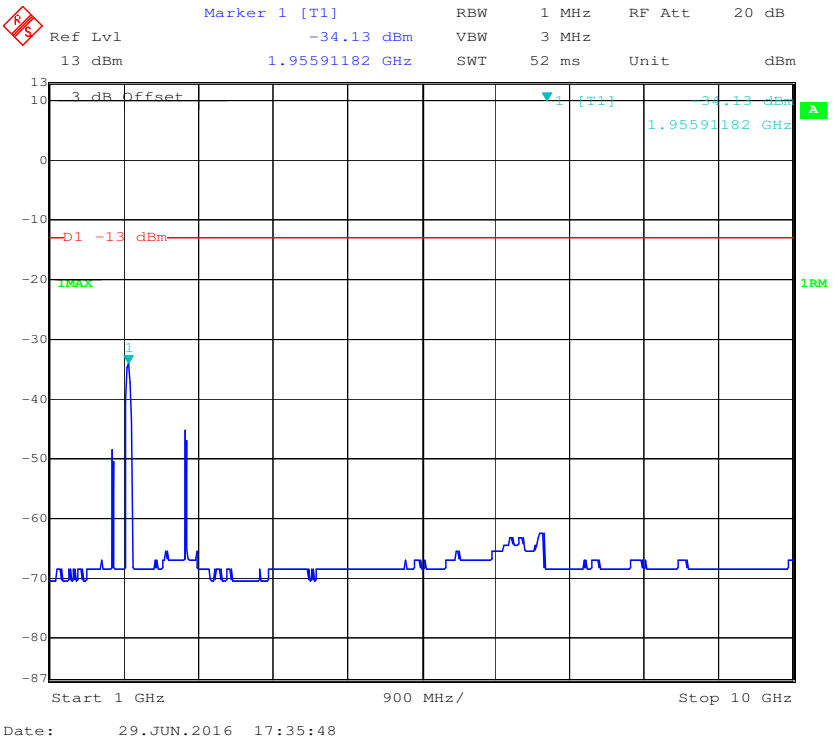
Fundamental test



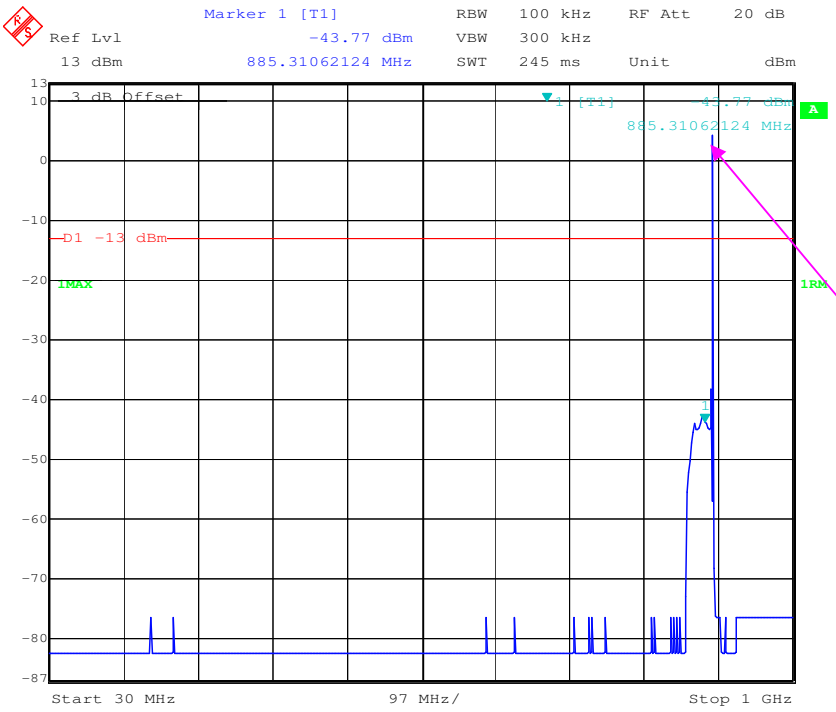
CELLULAR - GSM-Pre AGC-Middle Channel



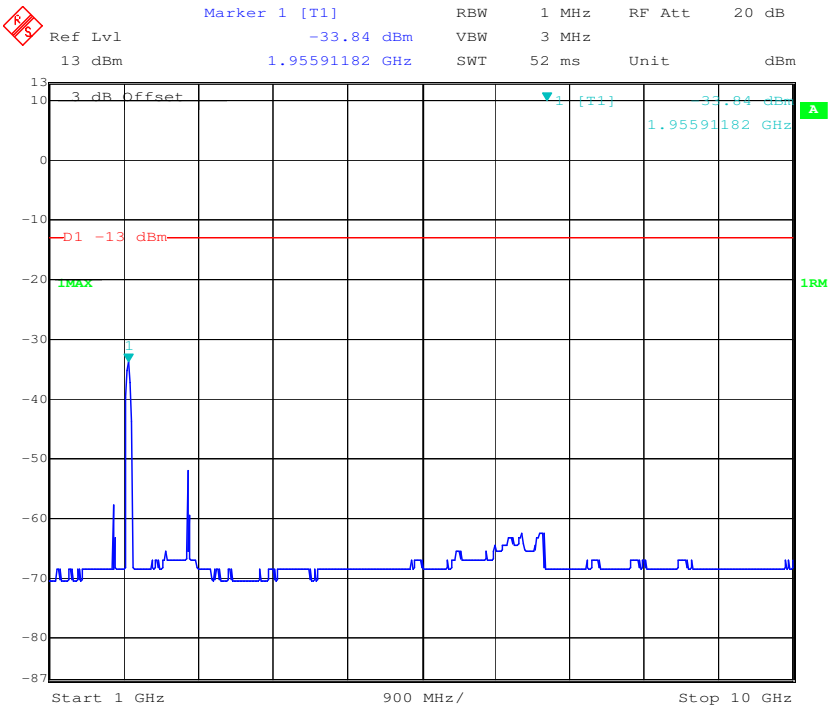
Fundamental test



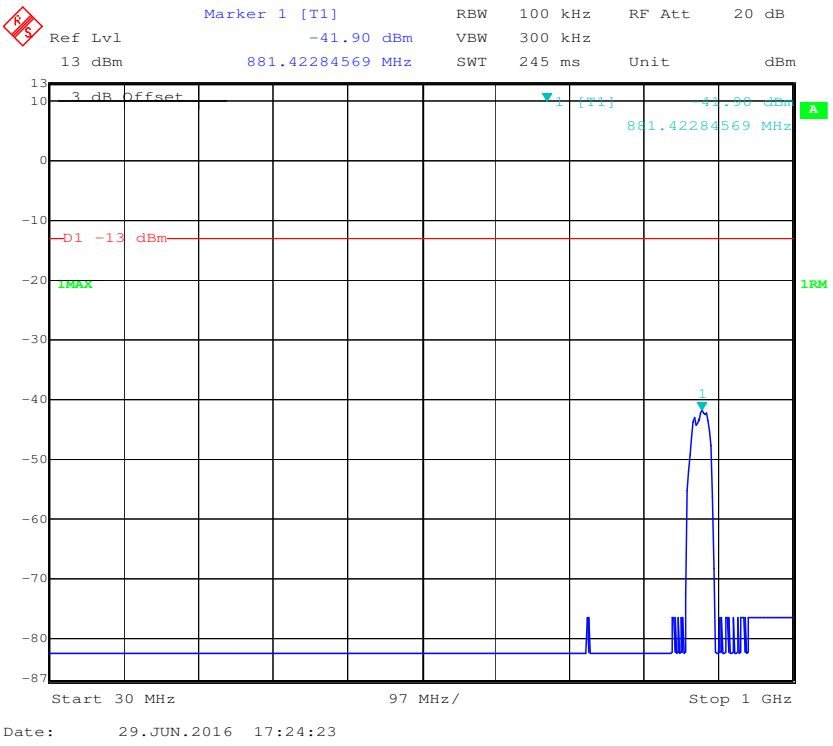
CELLULAR - GSM-Pre AGC-High Channel

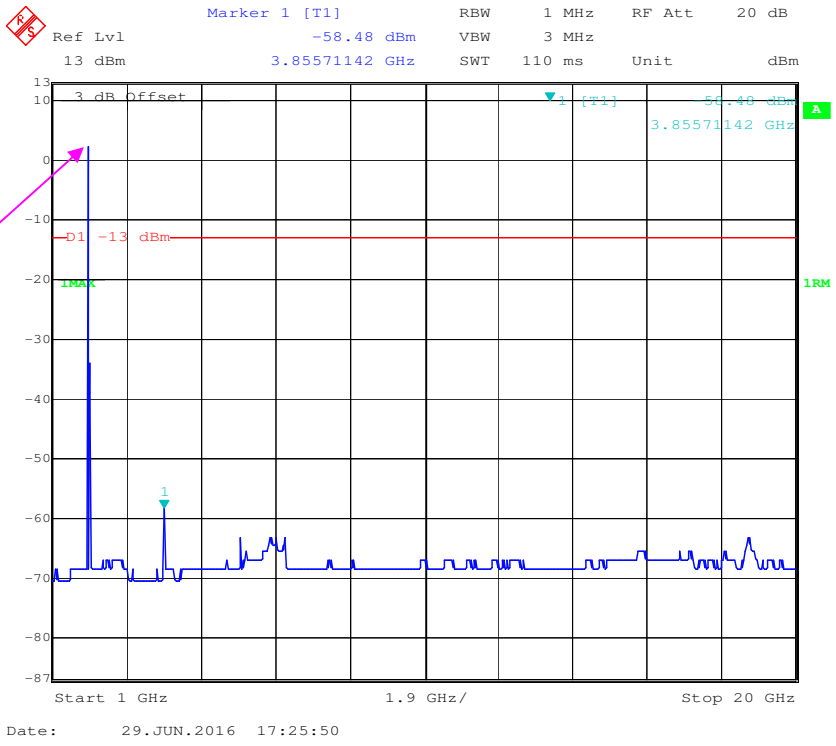


Fundamental test



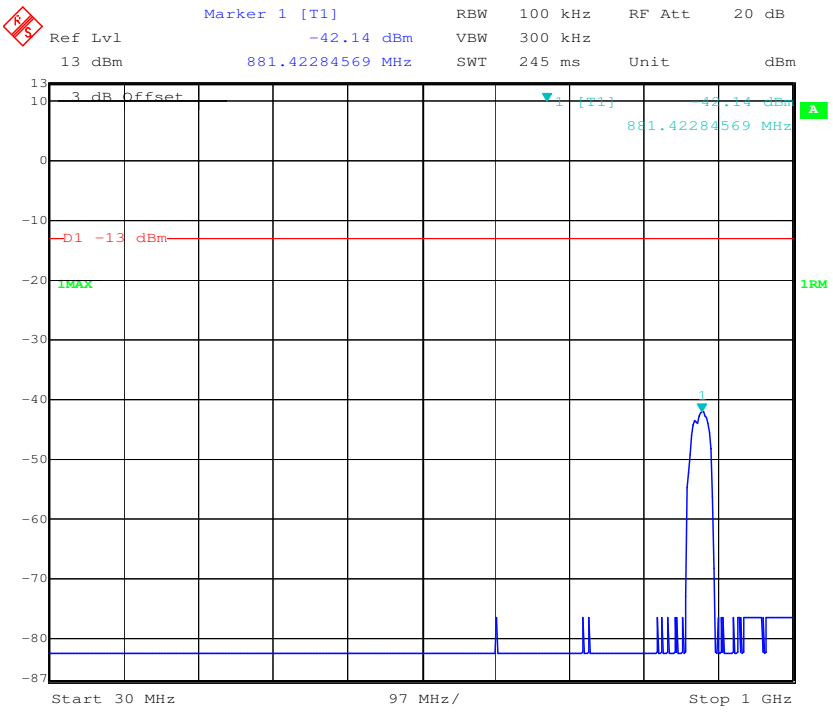
PCS- AWGN-Pre AGC-Low Channel

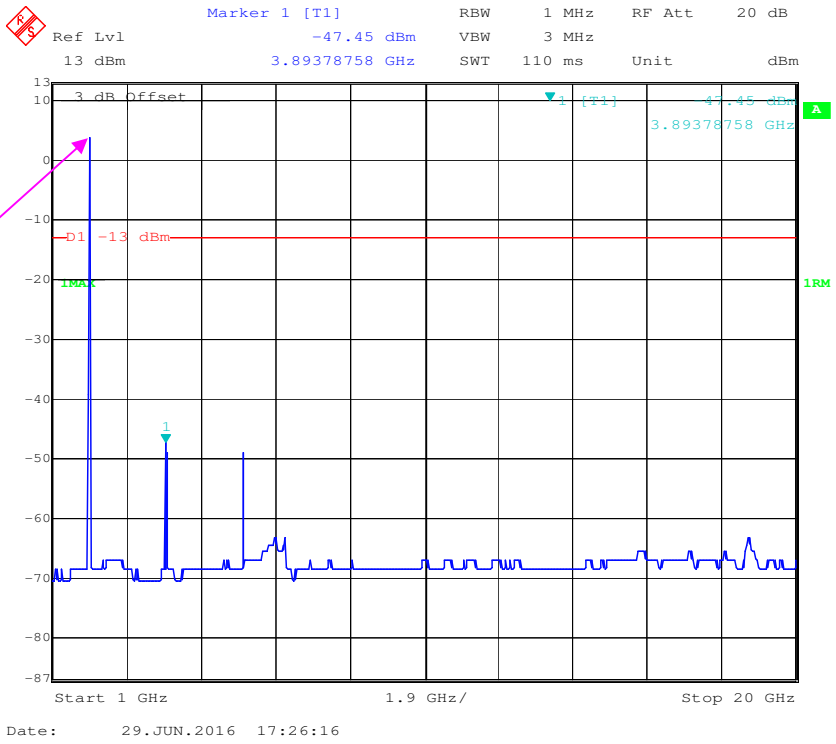




Fundamental test

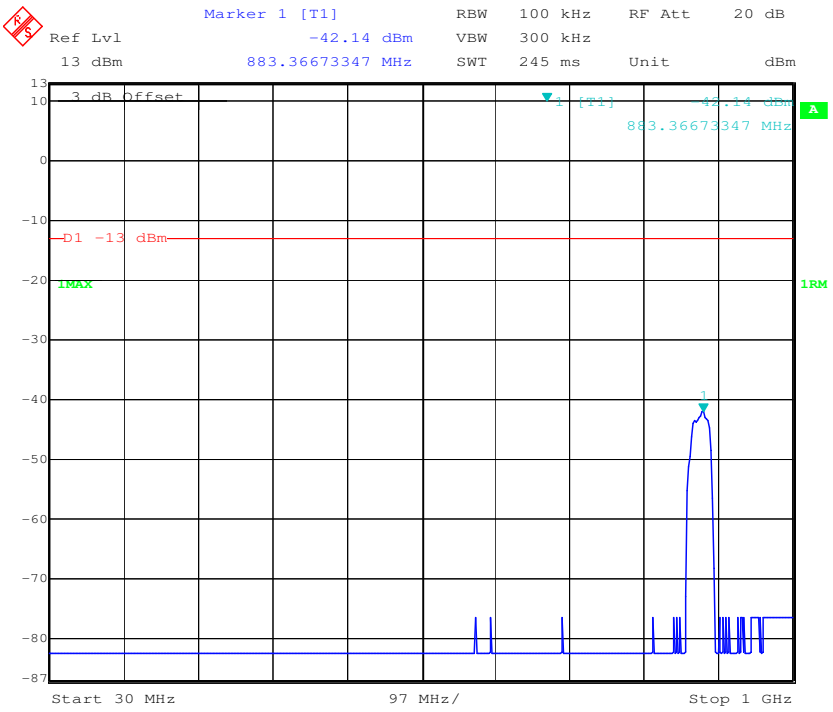
PCS- AWGN-Pre AGC-Middle Channel

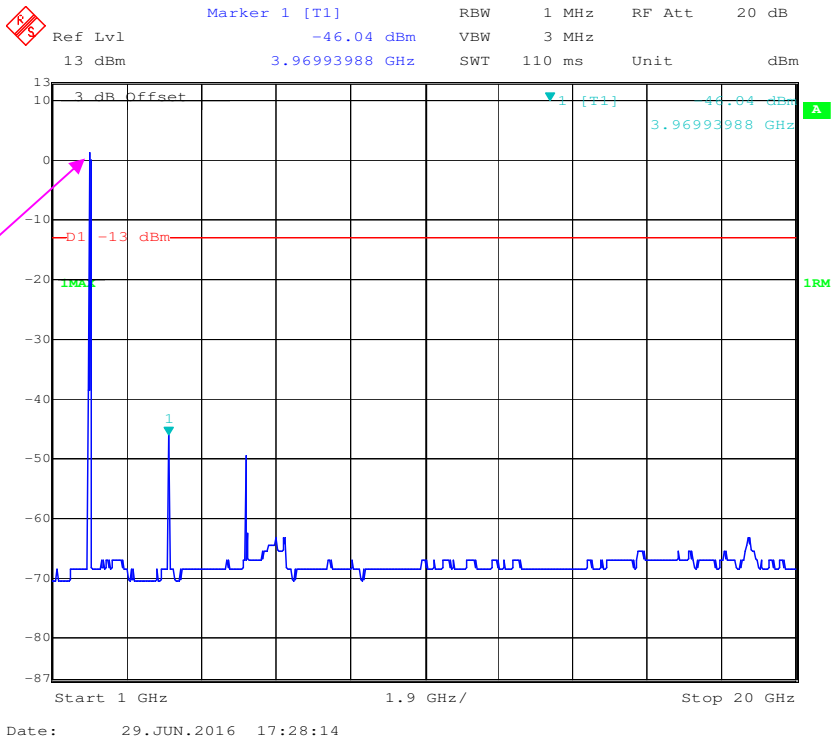




Fundamental test

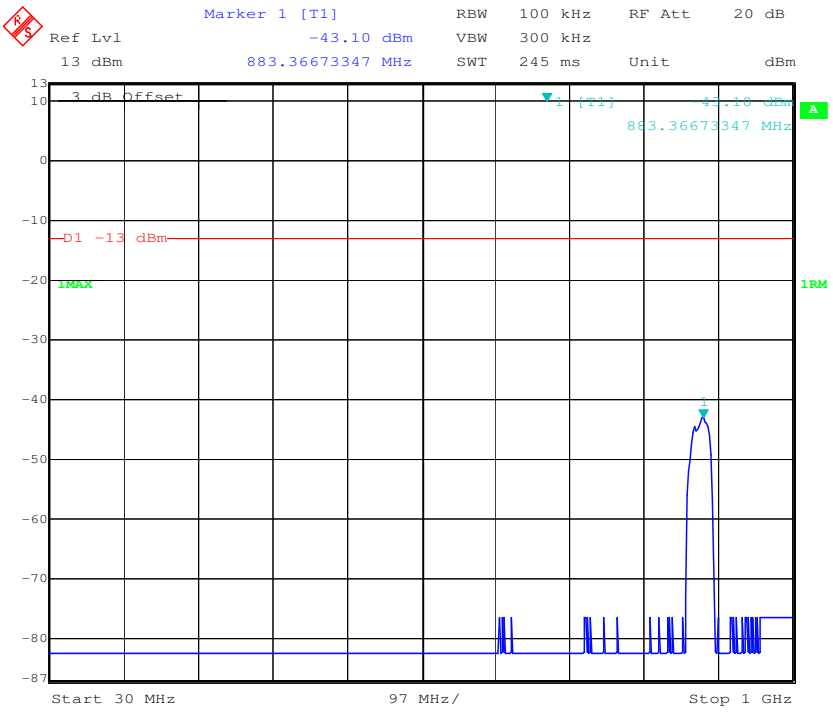
PCS- AWGN-Pre AGC-High Channel

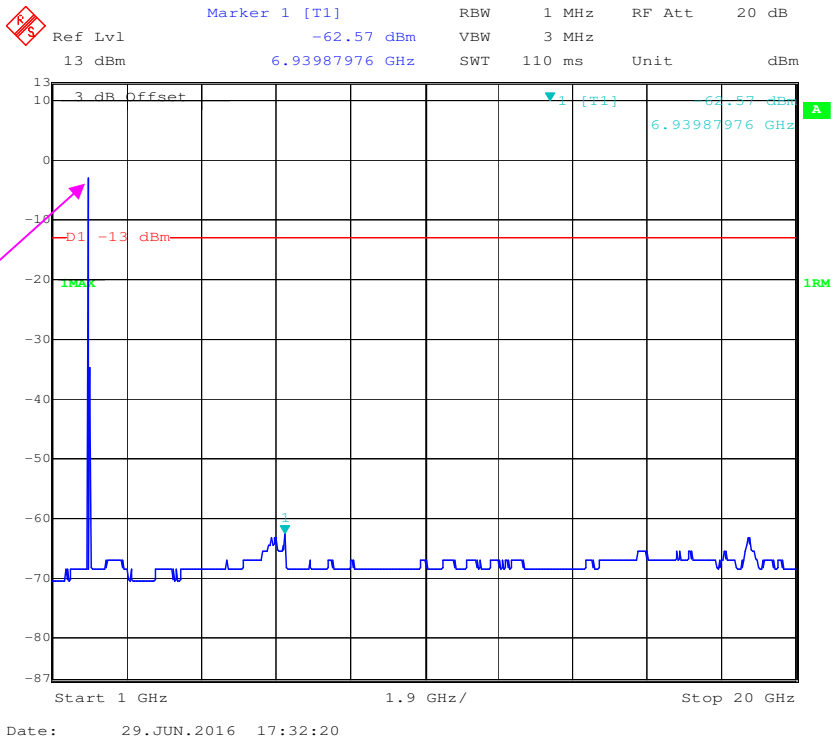




Fundamental test

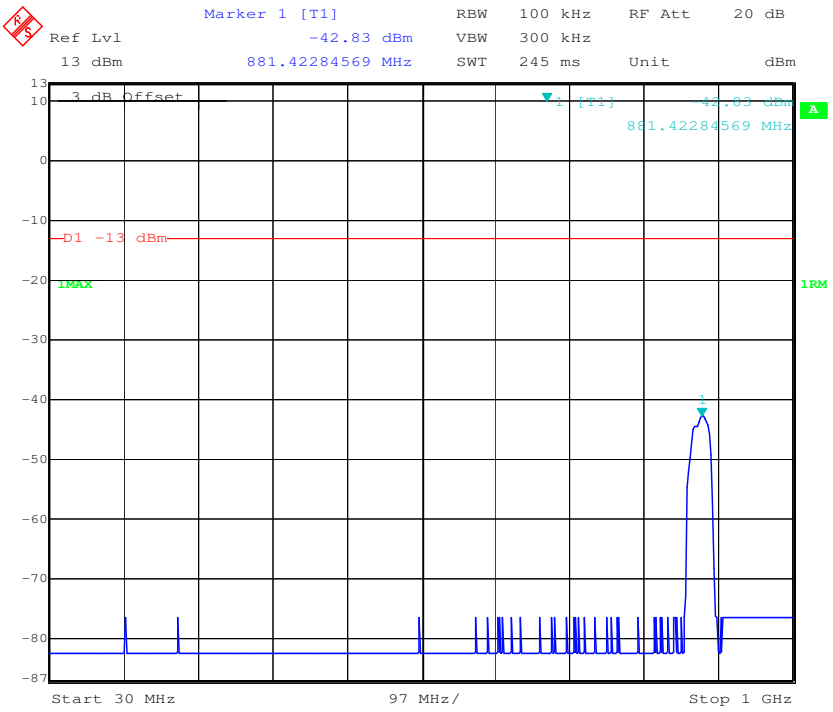
PCS- GSM-Pre AGC-Low Channel

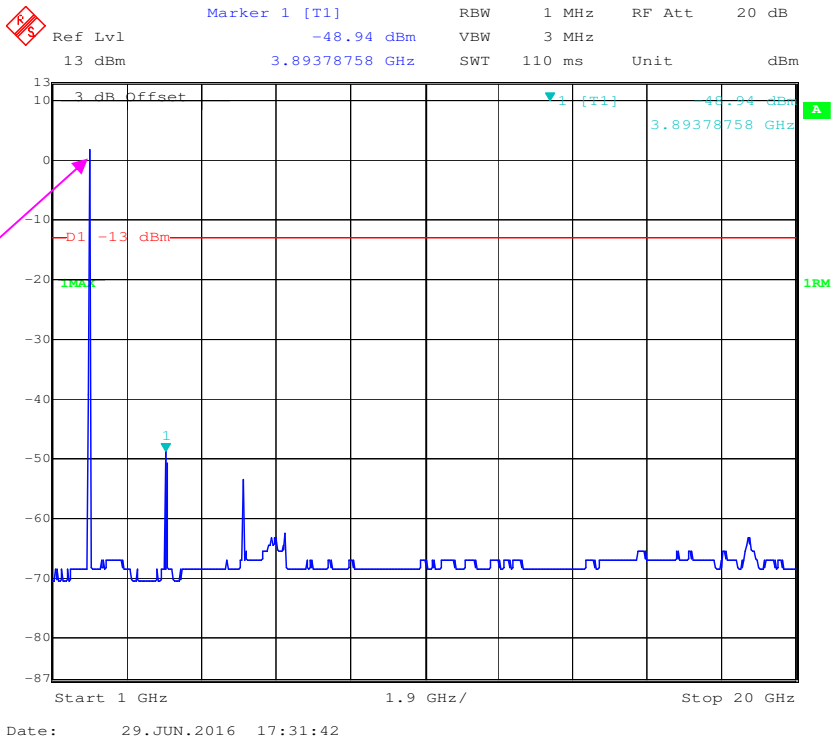




Fundamental test

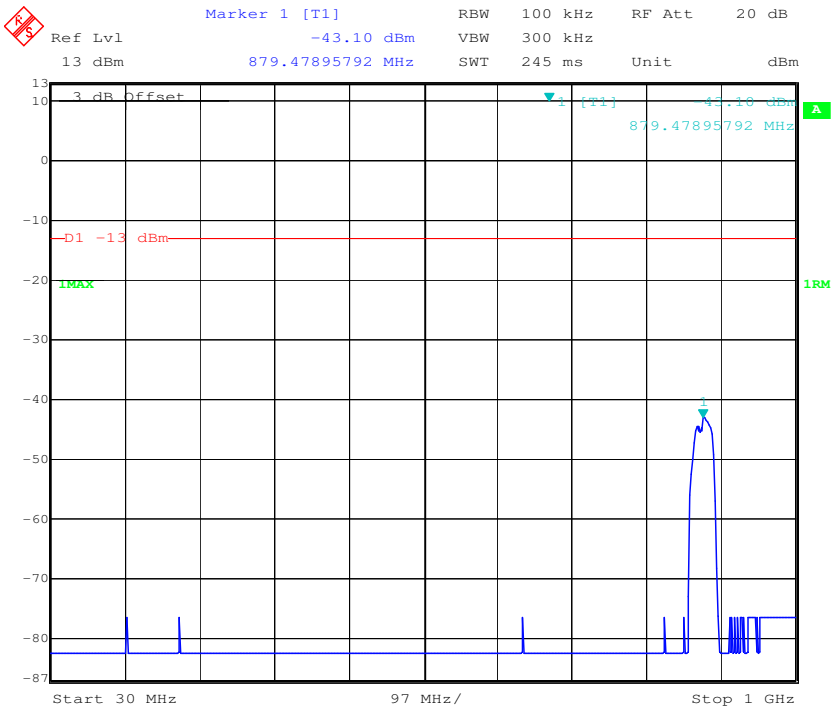
PCS- GSM-Pre AGC-Middle Channel

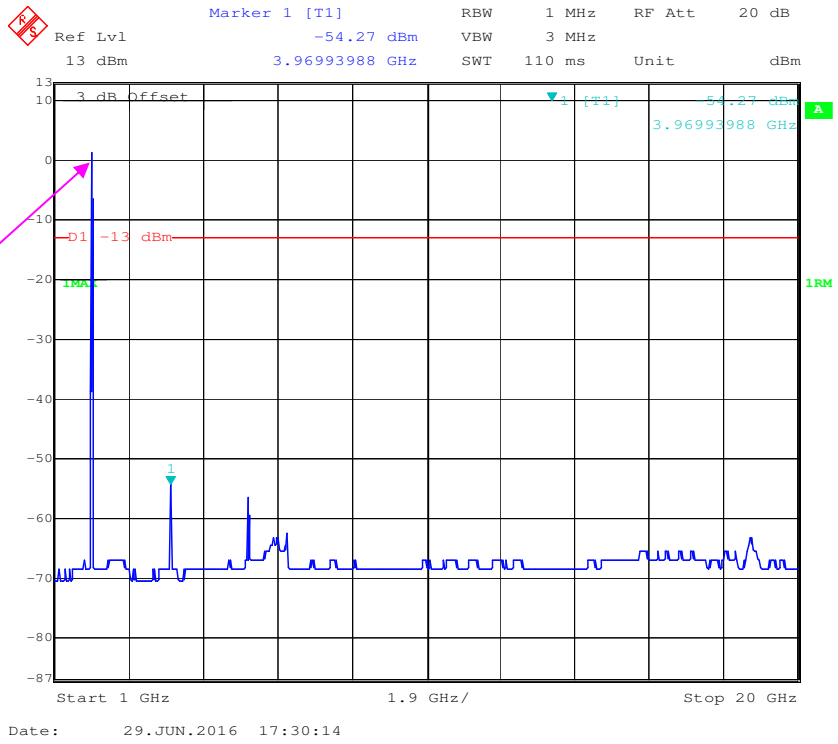




Fundamental test

PCS- GSM-Pre AGC-High Channel





Fundamental test

FCC §2.1053, §22.917 & §24.238 - SPURIOUS RADIATED EMISSIONS

Applicable Standard

FCC § 2.1053, §22.917 and § 24.238.

Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the receiving antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB = 10 lg (TXpwr in Watts/0.001) – the absolute level

Spurious attenuation limit in dB = 43 + 10 Log_{10} (power out in Watts)

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sunol Sciences	Horn Antenna	DRH-118	A052604	2014-12-29	2017-12-28
Sunol Sciences	Bi-log Antenna	JB1	A040904-2	2014-12-07	2017-12-06
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2015-12-11	2016-12-11
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2015-11-03	2016-11-03
Mini	Pre-amplifier	ZVA-183-S+	5969001149	2016-04-23	2017-04-23
HP	Amplifier	HP8447E	1937A01046	2016-05-06	2017-05-06
HP	Signal Generator	HP 8341B	2624A00116	2015-07-02	2016-07-01
COM POWER	Dipole Antenna	AD-100	721027	2015-08-18	2016-08-18
A.H. System	Horn Antenna	SAS-200/571	135	2015-08-18	2018-08-17
Electro-Mechanics	Horn Antenna	3116	9510-2270	2013-10-14	2016-10-13
R & S	Wideband Radio Communication tester	CMW500	1201.002K50 -146520-wh	2016-06-03	2017-06-03
Agilent	ESG Vector Signal Generator	E4438C	US41461205	2015-11-12	2016-11-12

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

The testing was performed by Rocky Kang on 2016-06-29.

EUT operation mode: Transmitting (worst case as below)

For F23K-CP model

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H/24E	
			Height (m)	Polar (H/V)	SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		Limit (dBm)	Margin (dB)
Uplink										
CELLULAR Band										
Middle Channel (836.6MHz)										
185.91	42.80	7	1.9	H	-54.2	0.29	0	-54.49	-13	41.49
185.91	41.36	212	1.5	V	-55.6	0.29	0	-55.89	-13	42.89
1673.20	42.36	346	2.2	H	-65.0	1.60	6.90	-59.70	-13	46.70
1673.20	44.23	296	1.0	V	-63.6	1.60	6.90	-58.30	-13	45.30
PCS Band										
Middle Channel (1880MHz)										
185.91	42.21	139	1.8	H	-54.8	0.29	0	-55.09	-13	42.09
185.91	42.05	144	2.0	V	-54.9	0.29	0	-55.19	-13	42.19
3760.00	39.69	65	1.0	H	-59.8	1.90	9.90	-51.80	-13	38.80
3760.00	39.41	142	1.2	V	-59.7	1.90	9.90	-51.70	-13	38.70

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H/24E	
			Height (m)	Polar (H/V)	SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		Limit (dBm)	Margin (dB)
Downlink										
CELLULAR Band										
Middle Channel (881.5MHz)										
185.91	42.54	43	1.4	H	-54.5	0.29	0	-54.79	-13	41.79
185.91	42.17	130	1.4	V	-54.8	0.29	0	-55.09	-13	42.09
1763.00	40.13	281	2.5	H	-67.7	1.40	7.10	-62.00	-13	49.00
1763.00	40.28	50	2.1	V	-67.5	1.40	7.10	-61.80	-13	48.80
PCS Band										
Middle Channel (1960MHz)										
185.91	41.49	302	1.3	H	-55.5	0.29	0	-55.79	-13	42.79
185.91	40.95	108	1.6	V	-56.0	0.29	0	-56.29	-13	43.29
3920.00	40.31	265	1.4	H	-59.1	2.20	9.90	-51.40	-13	38.40
3920.00	40.57	91	1.4	V	-58.0	2.20	9.90	-50.30	-13	37.30

Note:
1) Absolute Level = SG Level - Cable loss + Antenna Gain
2) Margin = Limit- Absolute Level

For F20K-CP model

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H/24E	
			Height (m)	Polar (H/V)	SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		Limit (dBm)	Margin (dB)
Uplink										
CELLULAR Band										
Middle Channel (836.6MHz)										
159.85	39.88	6	1.6	H	-57.1	0.27	0	-57.37	-13	44.37
159.85	37.89	60	1.3	V	-59.1	0.27	0	-59.37	-13	46.37
1673.20	42.83	92	1.7	H	-64.6	1.60	6.90	-59.30	-13	46.30
1673.20	45.99	174	1.4	V	-61.8	1.60	6.90	-56.50	-13	43.50
PCS Band										
Middle Channel (1880MHz)										
159.85	40.42	189	1.7	H	-56.6	0.27	0	-56.87	-13	43.87
159.85	38.75	251	2.5	V	-58.2	0.27	0	-58.47	-13	45.47
3760.00	39.35	66	1.8	H	-60.1	1.90	9.90	-52.10	-13	39.10
3760.00	39.73	119	1.5	V	-59.3	1.90	9.90	-51.30	-13	38.30

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H/24E	
			Height (m)	Polar (H/V)	SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		Limit (dBm)	Margin (dB)
Downlink										
CELLULAR Band										
Middle Channel (881.5MHz)										
159.85	41.28	298	1.5	H	-55.7	0.27	0	-55.97	-13	42.97
159.85	39.71	45	1.2	V	-57.3	0.27	0	-57.57	-13	44.57
1763.00	41.66	184	2.0	H	-66.2	1.40	7.10	-60.50	-13	47.50
1763.00	41.75	258	2.0	V	-66.0	1.40	7.10	-60.30	-13	47.30
PCS Band										
Middle Channel (1960MHz)										
159.85	40.58	303	1.6	H	-56.4	0.27	0	-56.67	-13	43.67
159.85	39.25	283	2.1	V	-57.7	0.27	0	-57.97	-13	44.97
3920.00	40.71	237	2.2	H	-58.7	2.20	9.90	-51.00	-13	38.00
3920.00	40.89	355	2.0	V	-57.7	2.20	9.90	-50.00	-13	37.00

Note:
1) Absolute Level = SG Level - Cable loss + Antenna Gain
2) Margin = Limit- Absolute Level

For F17K-CP model

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H/24E	
			Height (m)	Polar (H/V)	SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		Limit (dBm)	Margin (dB)
Uplink										
CELLULAR Band										
Middle Channel (836.6MHz)										
191.55	38.94	233	1.1	H	-58.1	0.29	0	-58.39	-13	45.39
191.55	37.13	153	1.8	V	-59.9	0.29	0	-60.19	-13	47.19
1673.20	40.11	182	2.0	H	-56.3	1.62	6.90	-50.99	-13	37.99
1673.20	39.46	322	1.3	V	-57.4	1.62	6.90	-52.07	-13	39.07
PCS Band										
Middle Channel (1880MHz)										
191.55	39.22	343	1.5	H	-57.8	0.29	0	-58.09	-13	45.09
191.55	38.15	171	1.4	V	-58.8	0.29	0	-59.09	-13	46.09
3760.00	37.95	337	1.1	H	-51.7	1.92	9.90	-43.71	-13	30.71
3760.00	38.82	303	2.0	V	-50.4	1.92	9.90	-42.44	-13	29.44

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H/24E	
			Height (m)	Polar (H/V)	SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		Limit (dBm)	Margin (dB)
Downlink										
CELLULAR Band										
Middle Channel (881.5MHz)										
191.55	37.24	165	2.0	H	-59.8	0.29	0	-60.09	-13	47.09
191.55	38.35	116	2.4	V	-58.6	0.29	0	-58.89	-13	45.89
1763.00	37.19	246	1.1	H	-60.0	1.38	7.10	-54.23	-13	41.23
1763.00	39.55	187	1.8	V	-57.5	1.38	7.10	-51.80	-13	38.80
PCS Band										
Middle Channel (1960MHz)										
191.55	39.41	52	2.2	H	-57.6	0.29	0	-57.89	-13	44.89
191.55	38.57	90	1.3	V	-58.4	0.29	0	-58.69	-13	45.69
3920.00	37.66	175	1.6	H	-51.6	2.17	9.90	-43.85	-13	30.85
3920.00	37.65	73	2.1	V	-51.2	2.17	9.90	-43.47	-13	30.47

Note:
1) Absolute Level = SG Level - Cable loss + Antenna Gain
2) Margin = Limit- Absolute Level

For F13K-CP model

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H/24E	
			Height (m)	Polar (H/V)	SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		Limit (dBm)	Margin (dB)
Uplink										
CELLULAR Band										
Middle Channel (836.6MHz)										
215.57	37.15	70	1.3	H	-59.8	0.30	0	-60.10	-13	47.10
215.57	38.26	28	1.3	V	-58.7	0.30	0	-59.00	-13	46.00
1673.20	38.22	254	1.3	H	-58.2	1.62	6.90	-52.88	-13	39.88
1673.20	37.89	38	1.7	V	-58.9	1.62	6.90	-53.64	-13	40.64
PCS Band										
Middle Channel (1880MHz)										
215.57	36.21	136	1.1	H	-60.8	0.30	0	-61.10	-13	48.10
215.57	37.27	2	1.3	V	-59.7	0.30	0	-60.00	-13	47.00
3760.00	37.95	92	2.4	H	-51.7	1.92	9.90	-43.71	-13	30.71
3760.00	37.28	245	2.2	V	-52.0	1.92	9.90	-43.98	-13	30.98

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H/24E	
			Height (m)	Polar (H/V)	SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		Limit (dBm)	Margin (dB)
Downlink										
CELLULAR Band										
Middle Channel (881.5MHz)										
215.57	36.68	175	1.2	H	-60.3	0.30	0	-60.60	-13	47.60
215.57	37.14	292	1.7	V	-59.9	0.30	0	-60.20	-13	47.20
1763.00	37.59	52	1.3	H	-59.6	1.38	7.10	-53.83	-13	40.83
1763.00	38.23	89	2.1	V	-58.8	1.38	7.10	-53.12	-13	40.12
PCS Band										
Middle Channel (1960MHz)										
215.57	36.82	25	1.4	H	-60.2	0.30	0	-60.50	-13	47.50
215.57	37.85	237	1.9	V	-59.1	0.30	0	-59.40	-13	46.40
3920.00	36.33	84	1.7	H	-52.9	2.17	9.90	-45.18	-13	32.18
3920.00	36.94	82	1.8	V	-51.9	2.17	9.90	-44.18	-13	31.18

Note:
1) Absolute Level = SG Level - Cable loss + Antenna Gain
2) Margin = Limit- Absolute Level

For F10K-CP model

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H/24E	
			Height (m)	Polar (H/V)	SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		Limit (dBm)	Margin (dB)
Uplink										
CELLULAR Band										
Middle Channel (836.6MHz)										
635.4	27.78	155	2.4	H	-69.2	0.57	0	-69.77	-13	56.77
635.4	29.55	294	1.4	V	-67.4	0.57	0	-67.97	-13	54.97
1673.20	36.27	171	1.9	H	-60.1	1.62	6.90	-54.83	-13	41.83
1673.20	35.38	173	2.0	V	-61.4	1.62	6.90	-56.15	-13	43.15
PCS Band										
Middle Channel (1880MHz)										
635.4	26.42	91	1.9	H	-70.6	0.57	0	-71.17	-13	58.17
635.4	27.29	353	2.4	V	-69.7	0.57	0	-70.27	-13	57.27
3760.00	37.15	282	2.2	H	-52.5	1.92	9.90	-44.51	-13	31.51
3760.00	36.11	317	1.5	V	-53.1	1.92	9.90	-45.15	-13	32.15

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H/24E	
			Height (m)	Polar (H/V)	SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		Limit (dBm)	Margin (dB)
Downlink										
CELLULAR Band										
Middle Channel (881.5MHz)										
635.4	26.81	42	2.1	H	-70.2	0.57	0	-70.77	-13	57.77
635.4	27.28	37	2.5	V	-69.7	0.57	0	-70.27	-13	57.27
1763.00	35.26	75	1.1	H	-61.9	1.38	7.10	-56.16	-13	43.16
1763.00	36.46	13	2.4	V	-60.6	1.38	7.10	-54.89	-13	41.89
PCS Band										
Middle Channel (1960MHz)										
635.4	29.57	288	1.4	H	-67.4	0.57	0	-67.97	-13	54.97
635.4	31.28	177	2.3	V	-65.7	0.57	0	-66.27	-13	53.27
3920.00	35.62	348	2.1	H	-53.6	2.17	9.90	-45.89	-13	32.89
3920.00	34.78	167	1.7	V	-54.1	2.17	9.90	-46.34	-13	33.34

Note:
1) Absolute Level = SG Level - Cable loss + Antenna Gain
2) Margin = Limit- Absolute Level

FCC §2.1053, §22.917 & §24.238 - BAND EDGES & INTERMODULATION

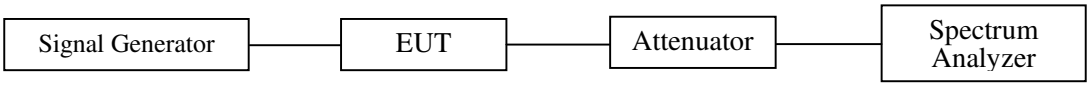
Applicable Standard

FCC §2.1053, §22.917 and §24.238.

The power of any emissions 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.

Test Procedure

Please refer to KDB 935210 D05 Indus Booster Basic Meas v01r01 clause 3.6.2



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2015-12-11	2016-12-11
Ducommun technologies	RF Cable	RG-214	3	2016-06-15	2017-06-15
Ducommun technologies	RF Cable	RG-214	2	2016-06-15	2017-06-15
WEINSCHEL	3dB Attenuator	5324	AU0709	2016-06-18	2017-06-18
Agilent	ESG Vector Signal Generator	E4438C	US41461205	2015-11-12	2016-11-12

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	24℃
Relative Humidity:	52 %
ATM Pressure:	101.5 kPa

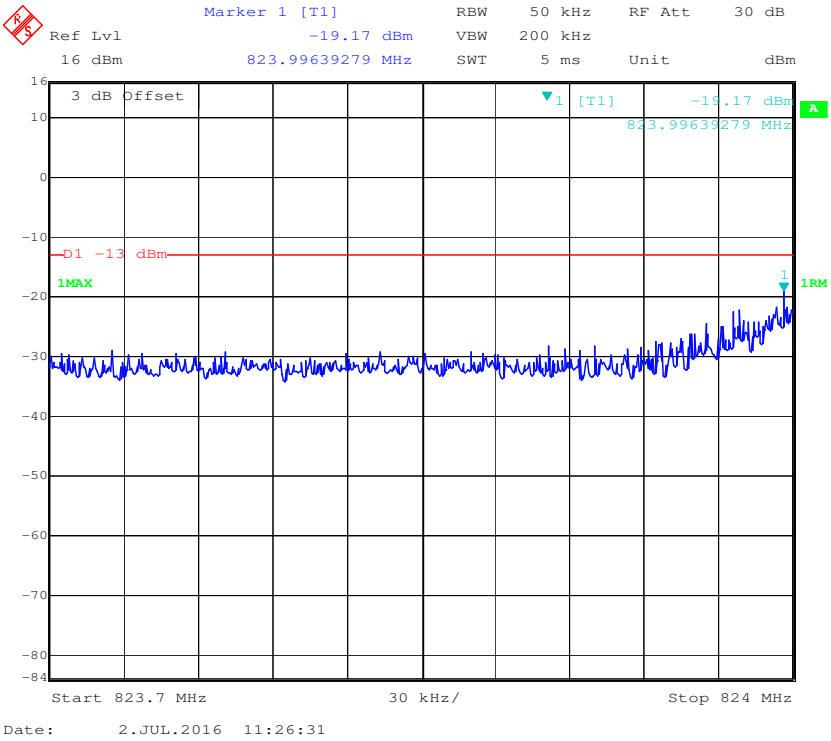
The testing was performed by Rocky Kang on 2016-07-02.

EUT operation mode: Transmitting

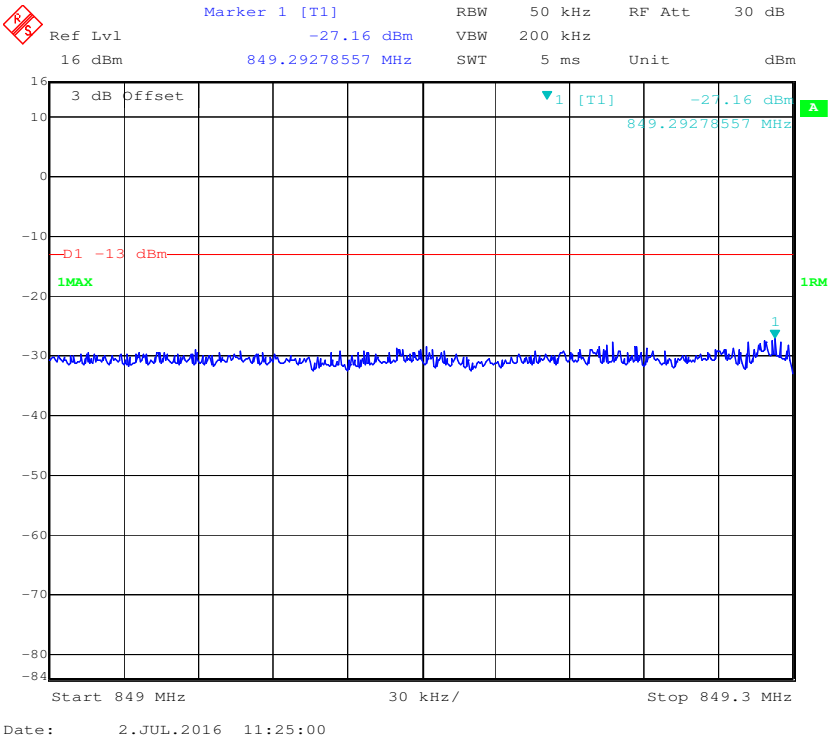
Test Result: Compliance. Please refer to the following plots.

For Band Edge:
Uplink:

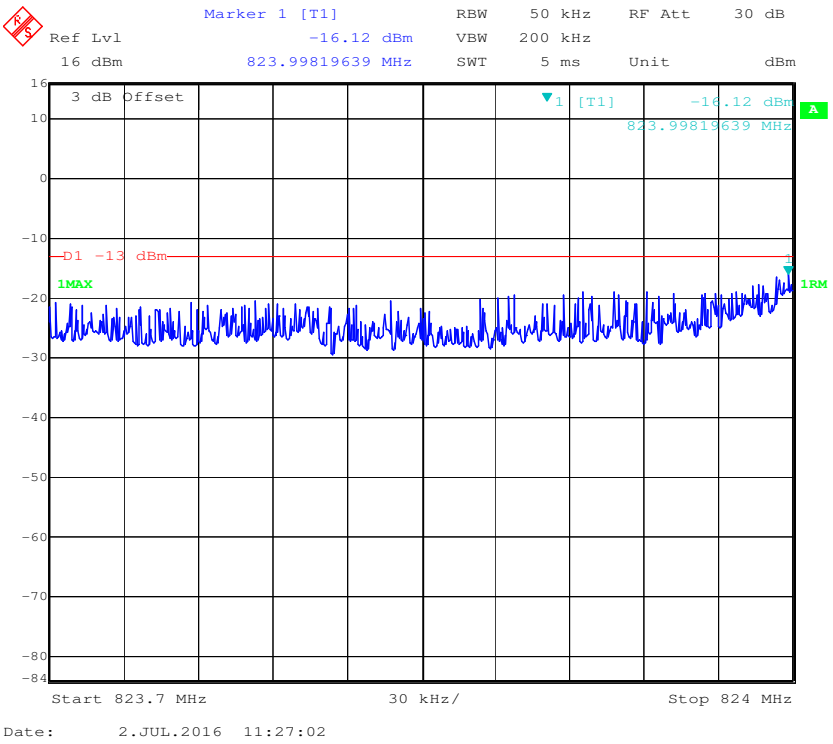
CELLULAR Band, Left Band Edge for AWGN-Pre AGC



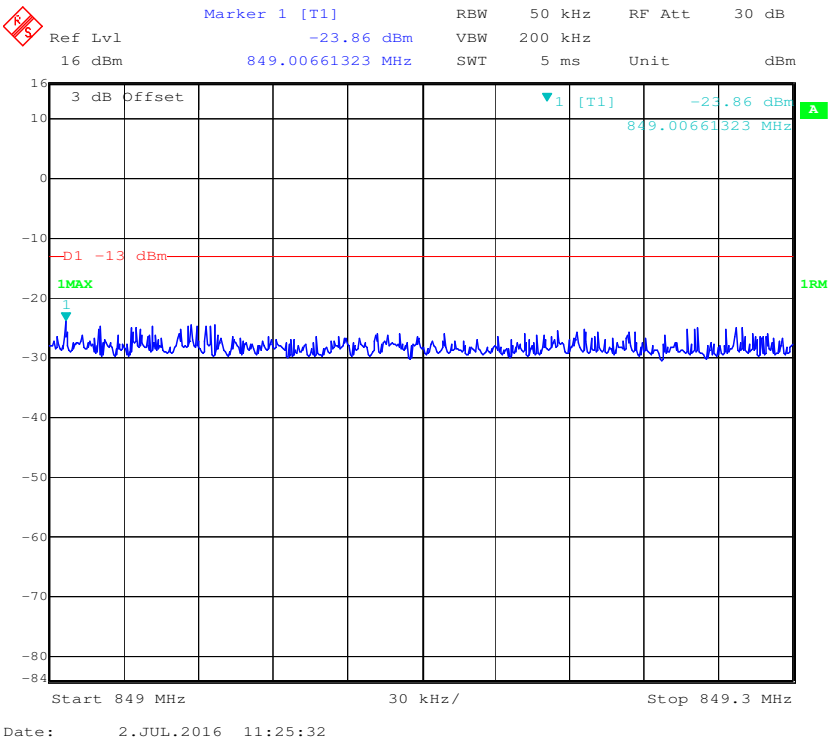
CELLULAR Band, Right Band Edge for AWGN-Pre AGC



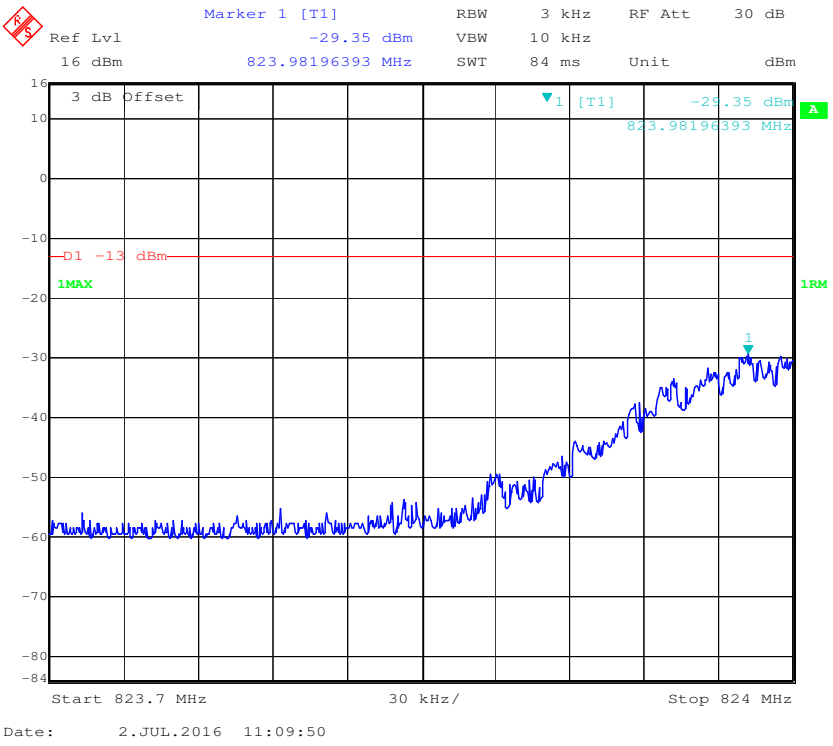
CELLULAR Band, Left Band Edge for AWGN-3dB above AGC



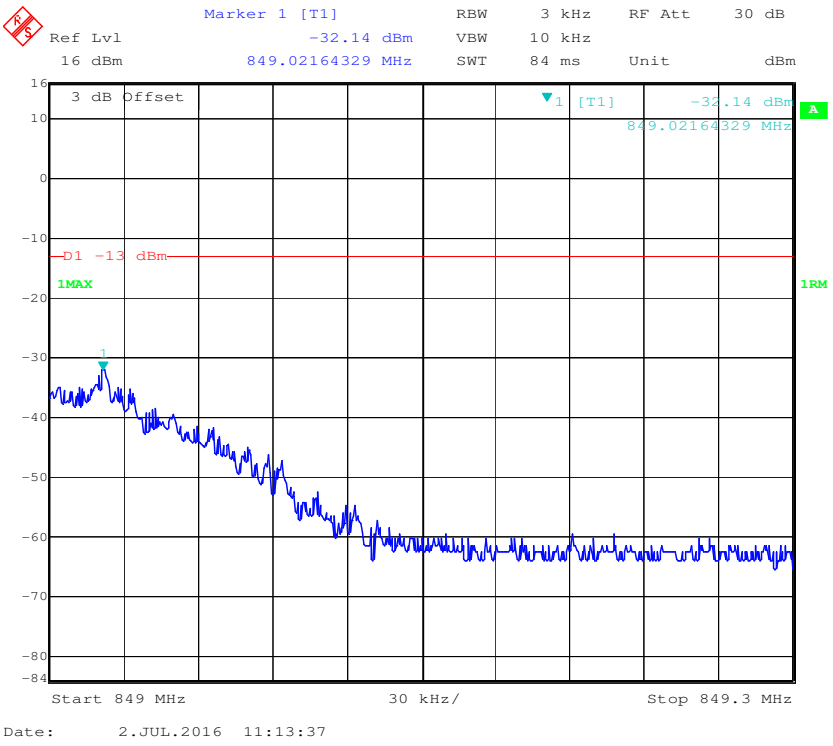
CELLULAR Band, Right Band Edge for AWGN-3dB above AGC



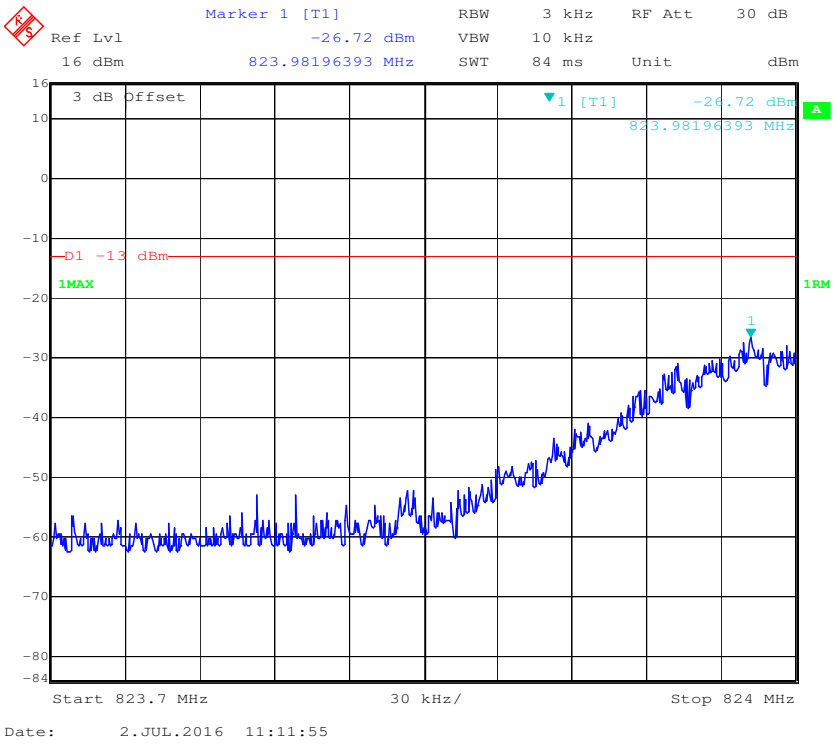
CELLULAR Band, Left Band Edge for GSM-Pre AGC



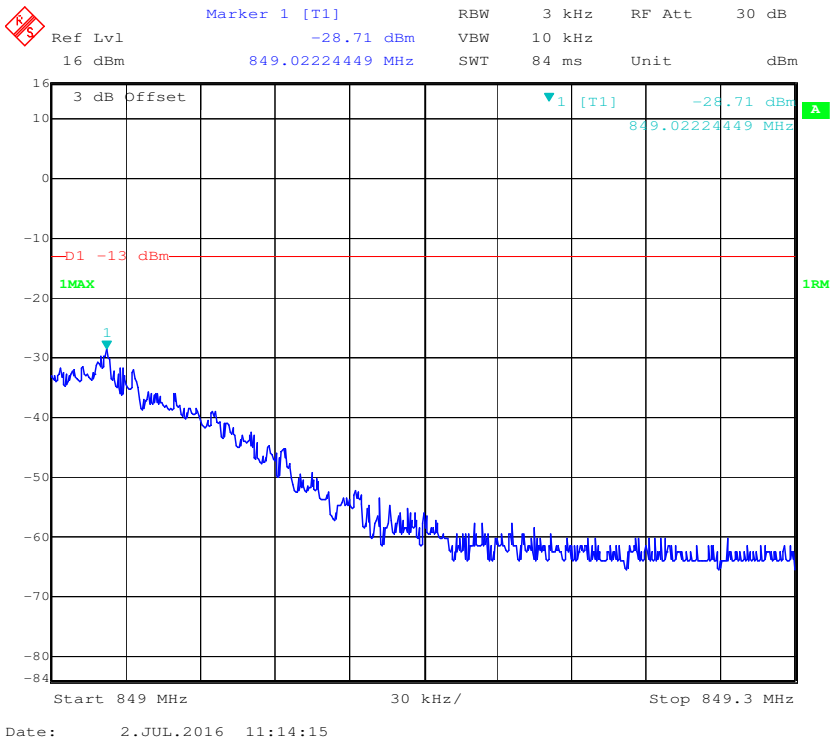
CELLULAR Band, Right Band Edge for GSM-Pre AGC



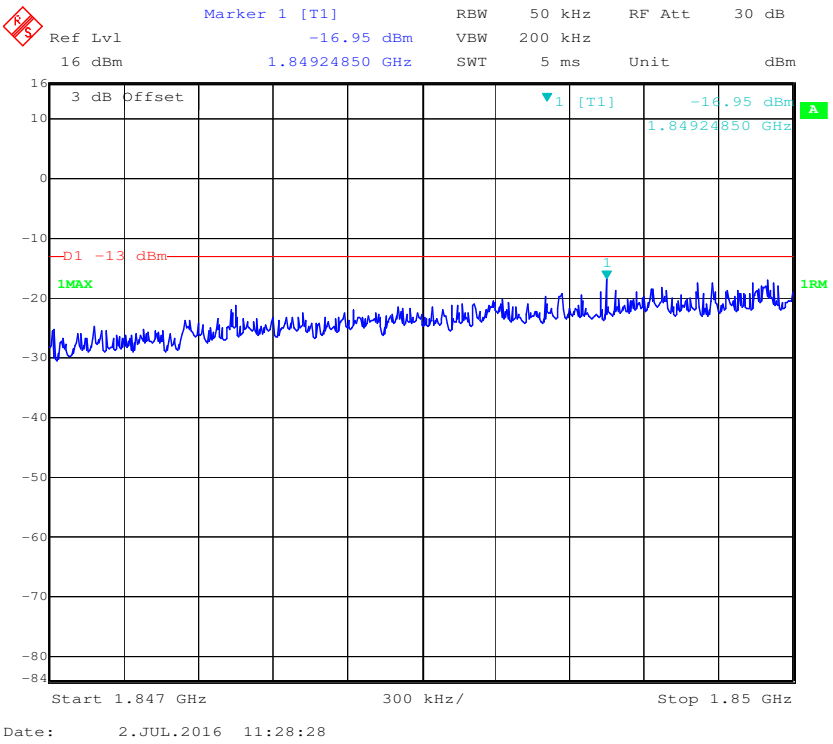
CELLULAR Band, Left Band Edge for GSM-3dB above AGC



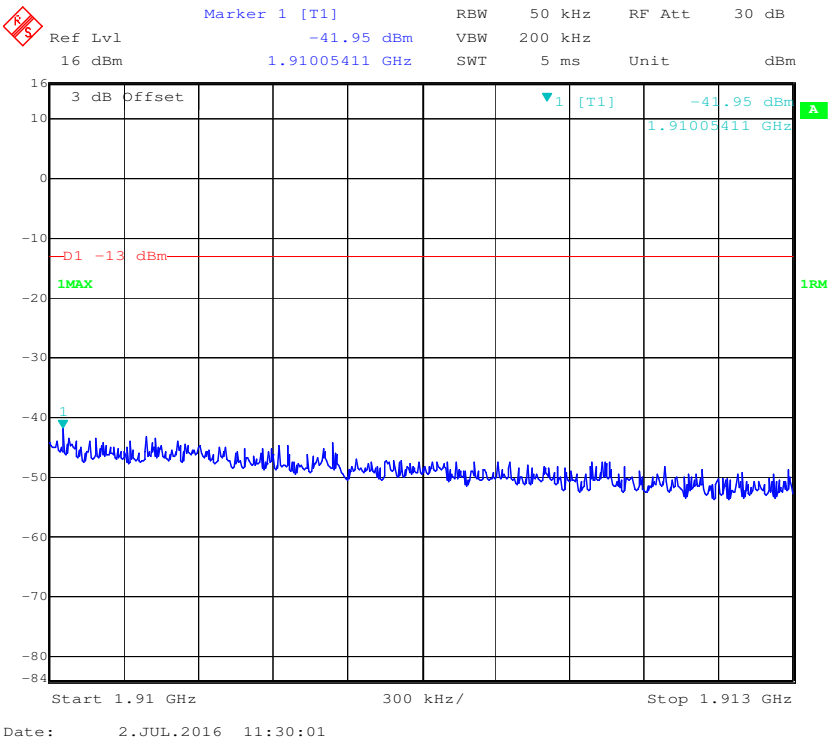
CELLULAR Band, Right Band Edge for GSM-3dB above AGC



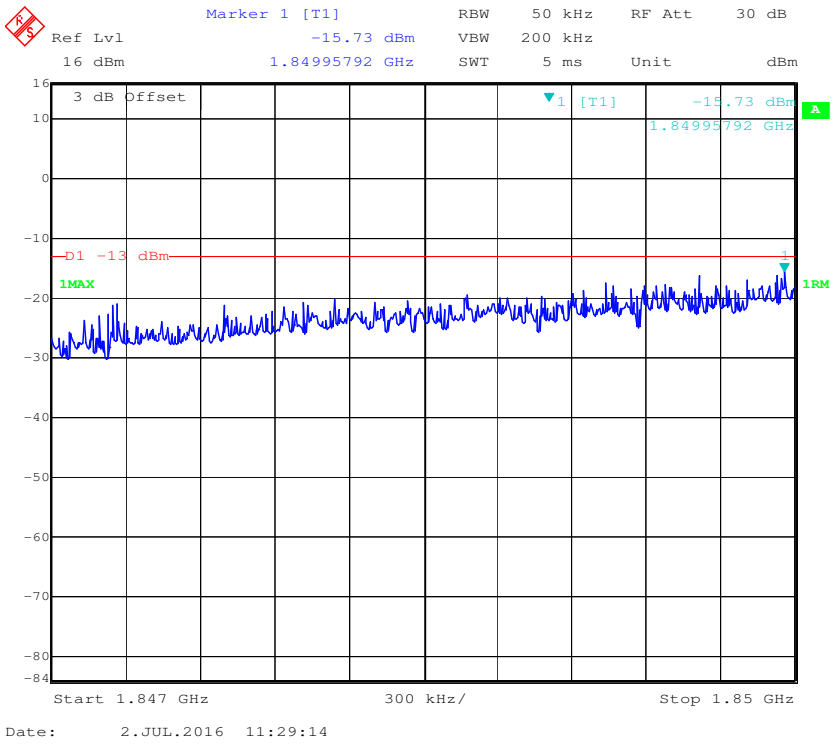
PCS Band, Left Band Edge for AWGN-Pre AGC



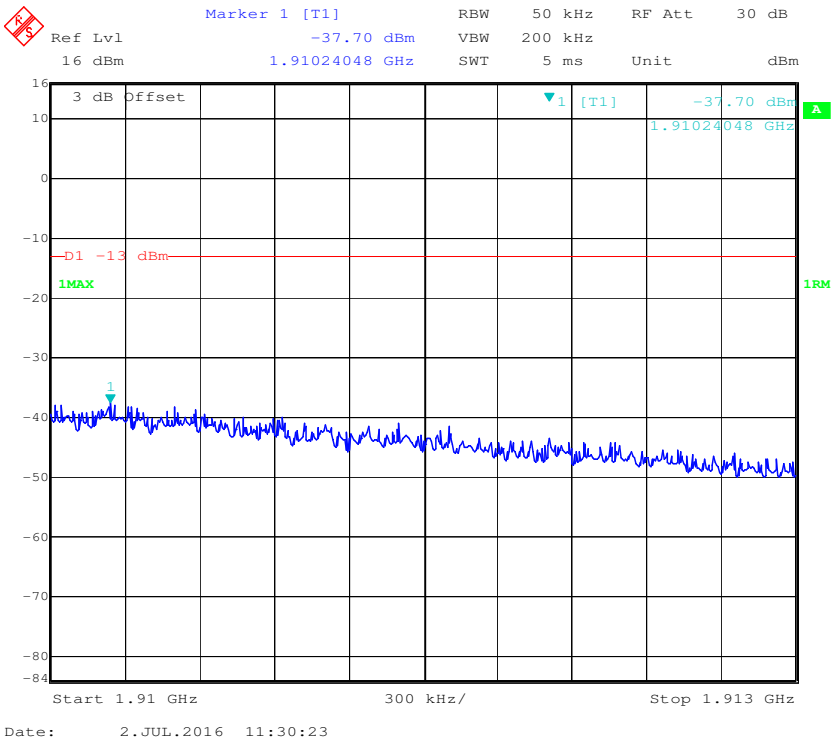
PCS Band, Right Band Edge for AWGN-Pre AGC



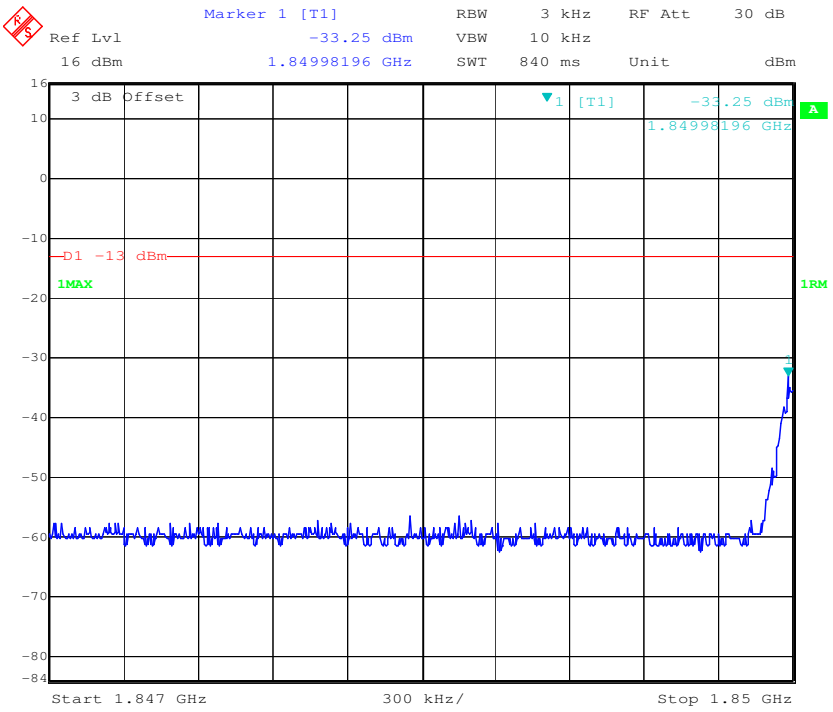
PCS Band, Left Band Edge for AWGN-3dB Above AGC



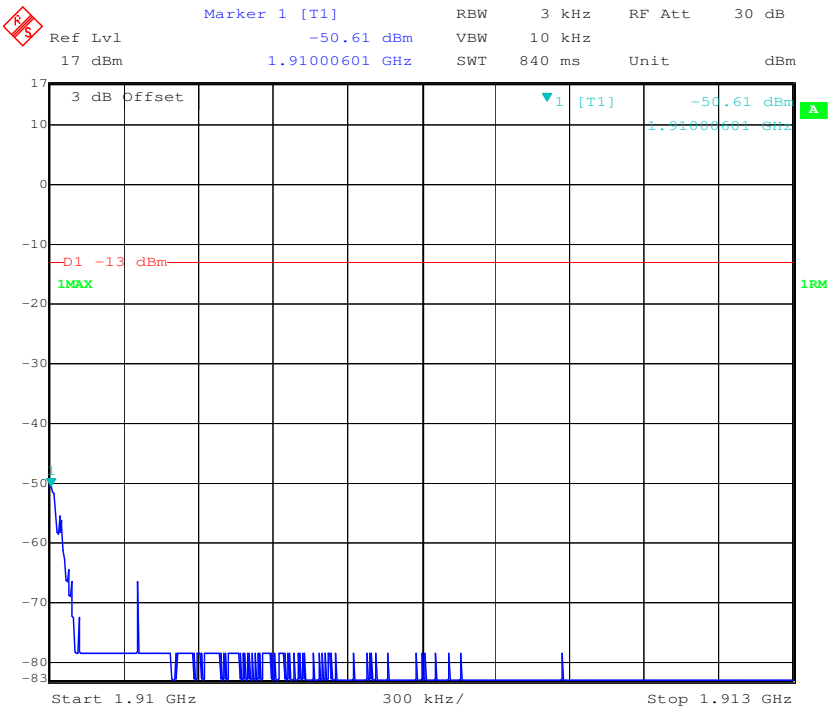
PCS Band, Right Band Edge for AWGN-3dB Above AGC



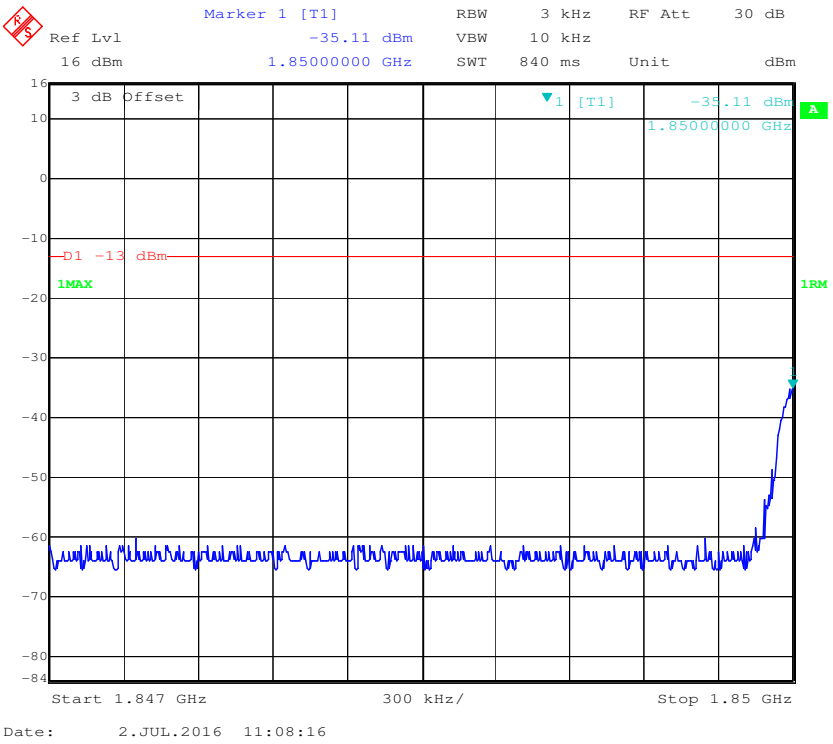
PCS Band, Left Band Edge for GSM-Pre AGC



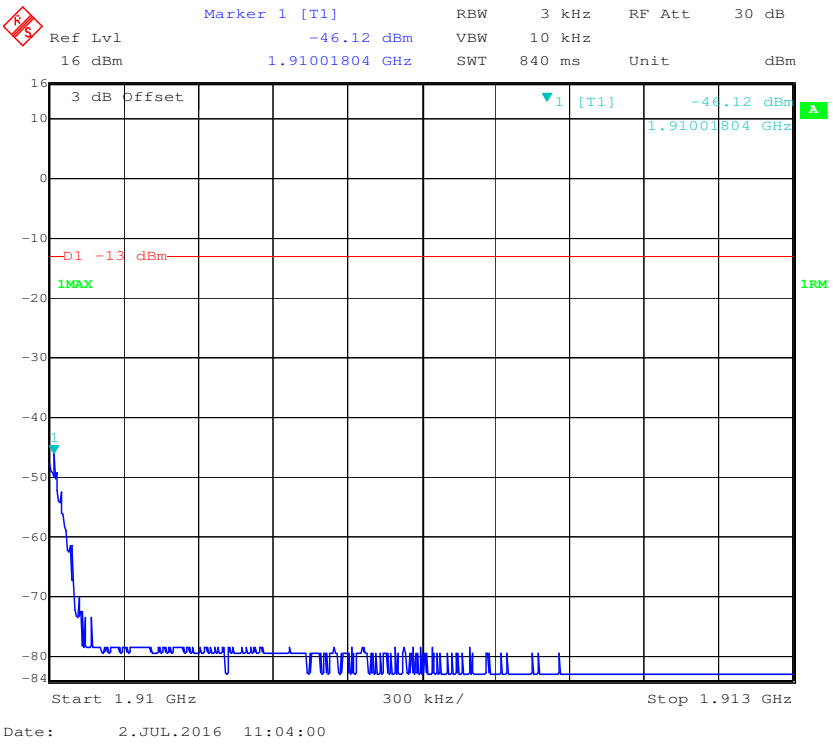
PCS Band, Right Band Edge for GSM-Pre AGC



PCS Band, Left Band Edge for GSM-3dB above AGC

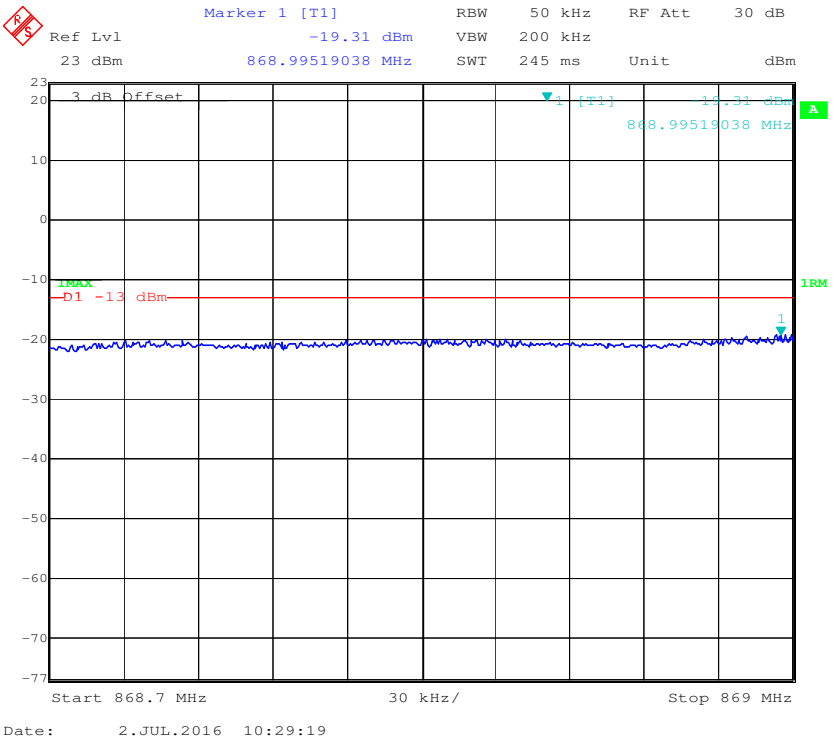


PCS Band, Right Band Edge for GSM-3dB above AGC

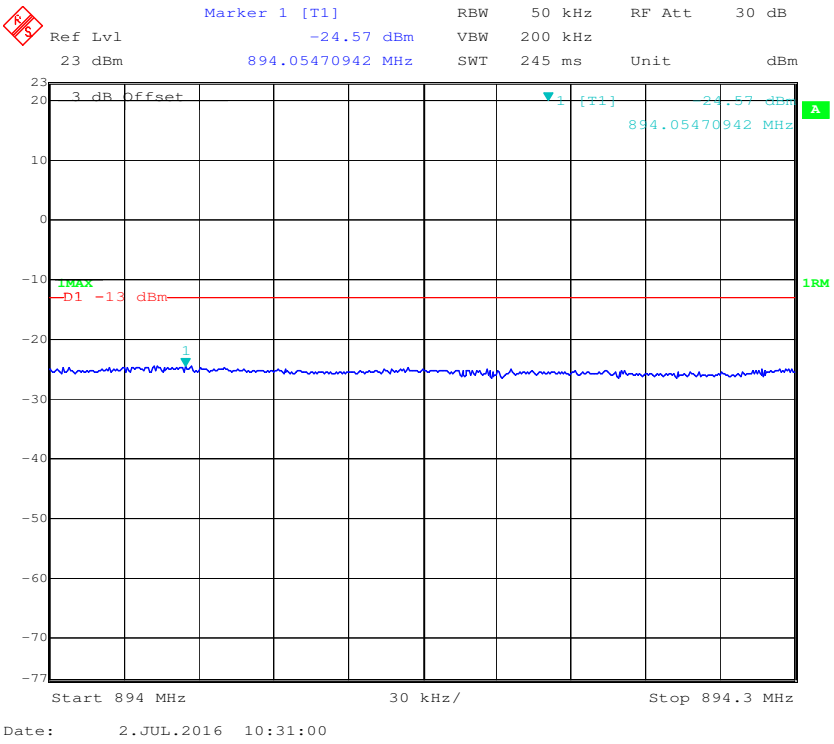


Downlink:

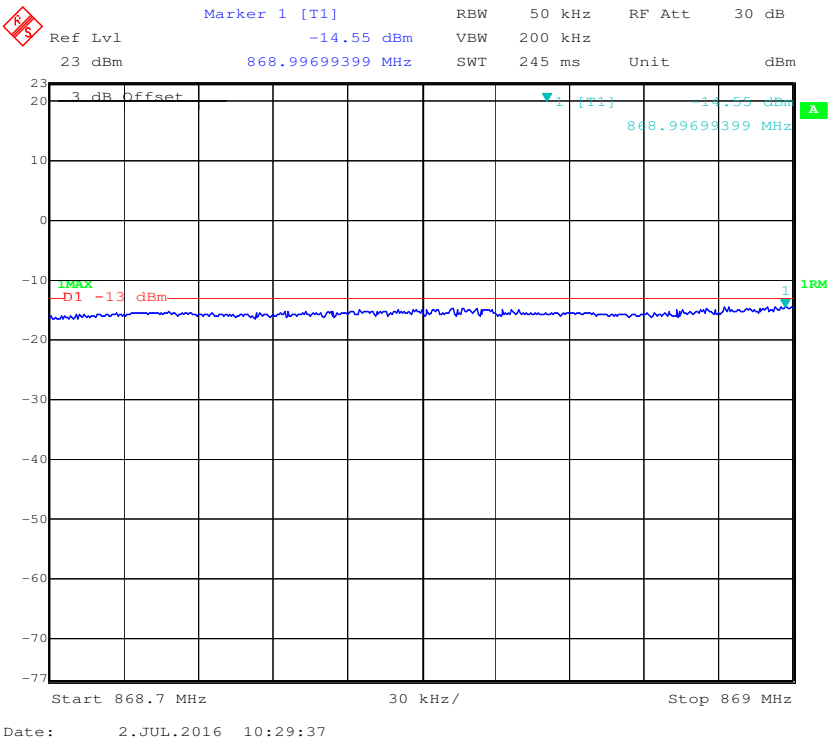
CELLULAR Band, Left Band Edge for AWGN-Pre AGC



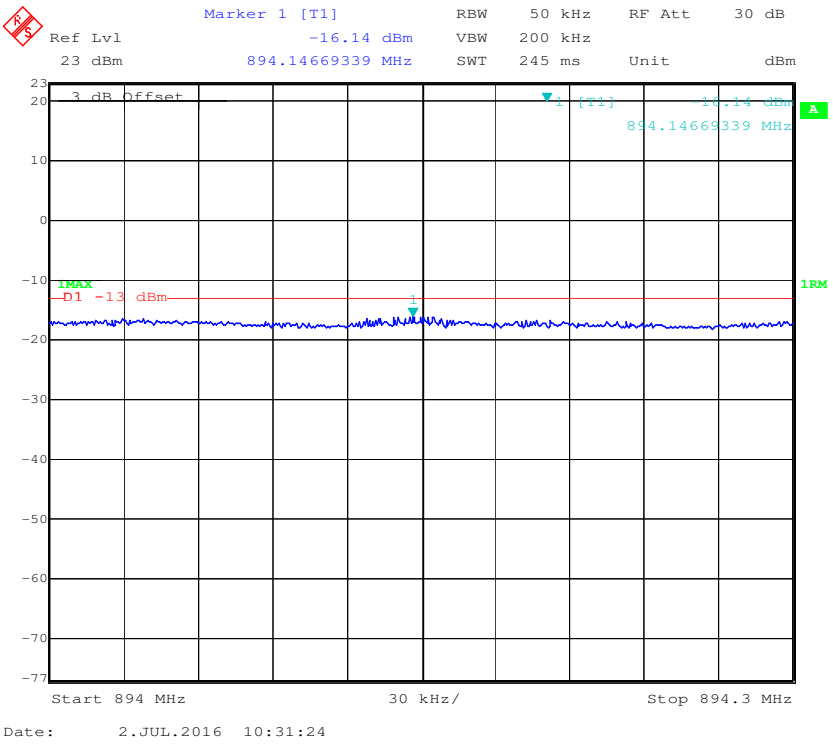
CELLULAR Band, Right Band Edge for AWGN-Pre AGC



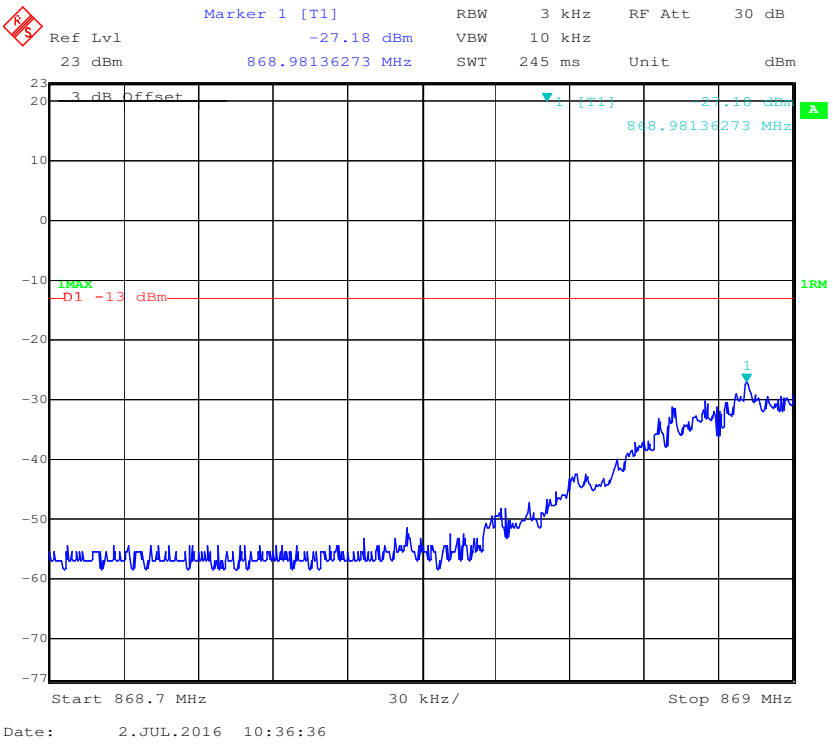
CELLULAR Band, Left Band Edge for AWGN-3dB above AGC



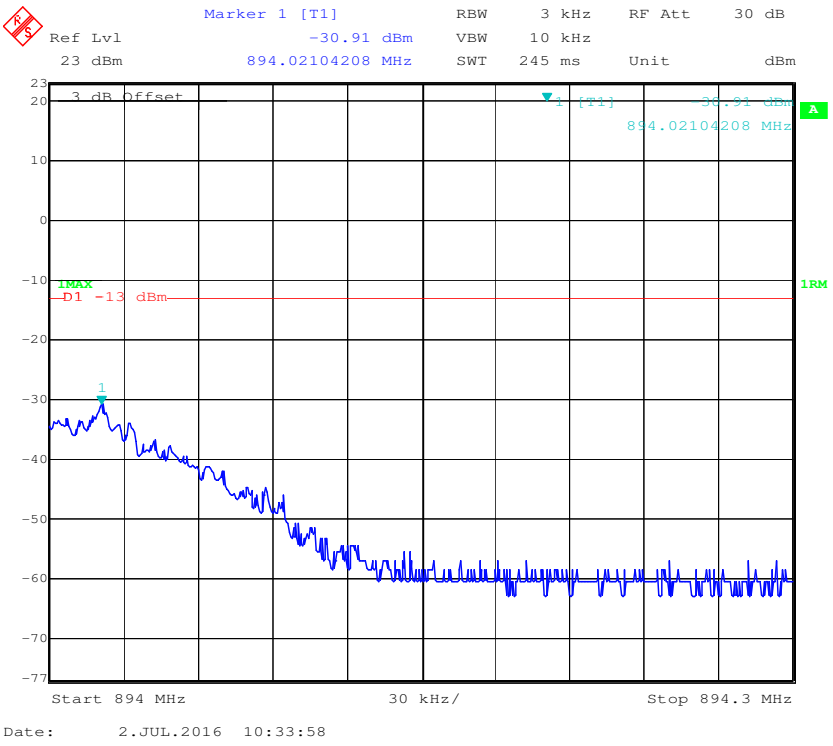
CELLULAR Band, Right Band Edge for AWGN-3dB above AGC



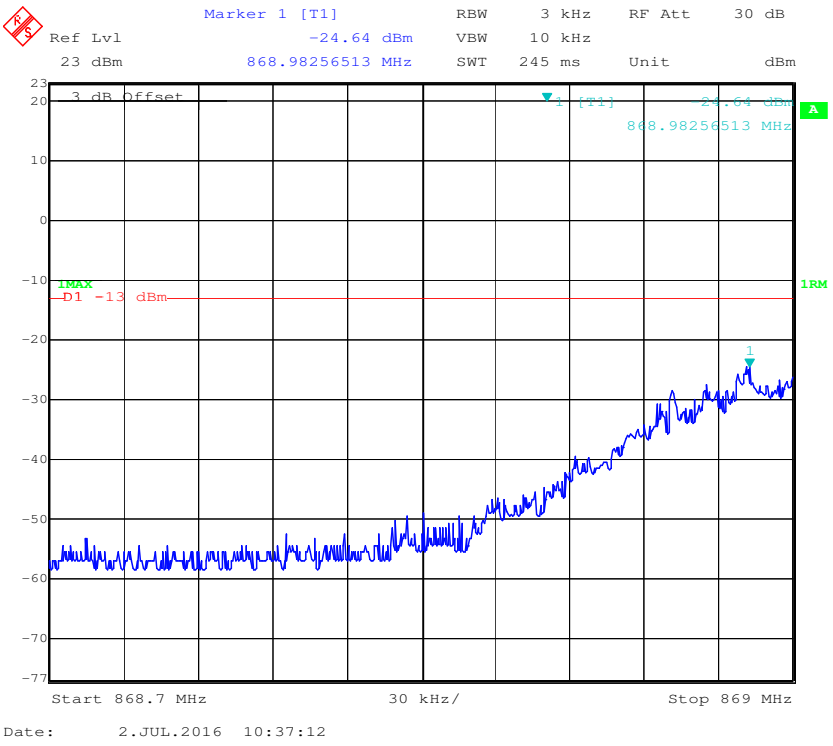
CELLULAR Band, Left Band Edge for GSM-Pre AGC



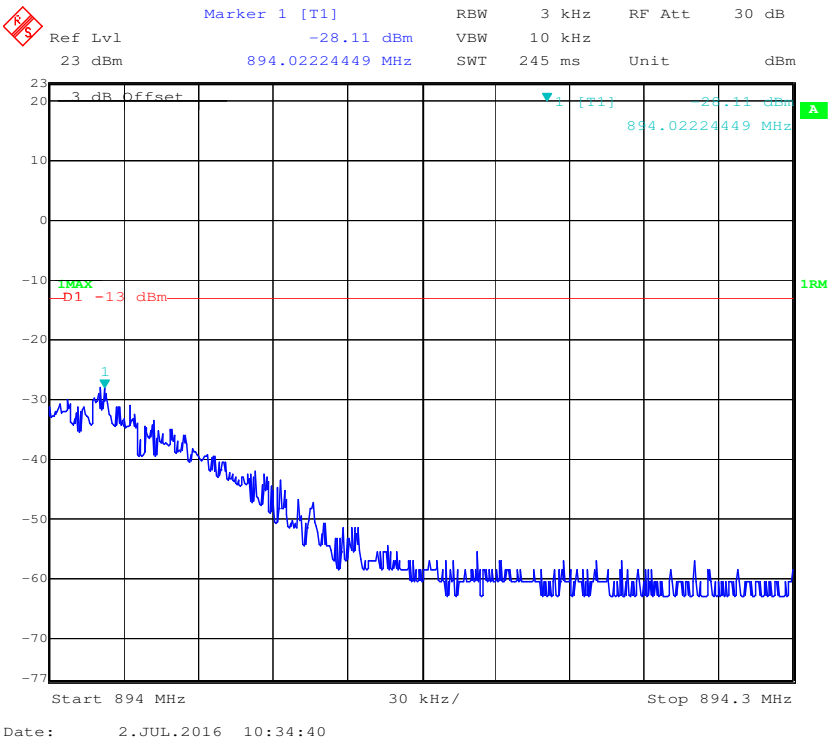
CELLULAR Band, Right Band Edge for GSM-Pre AGC



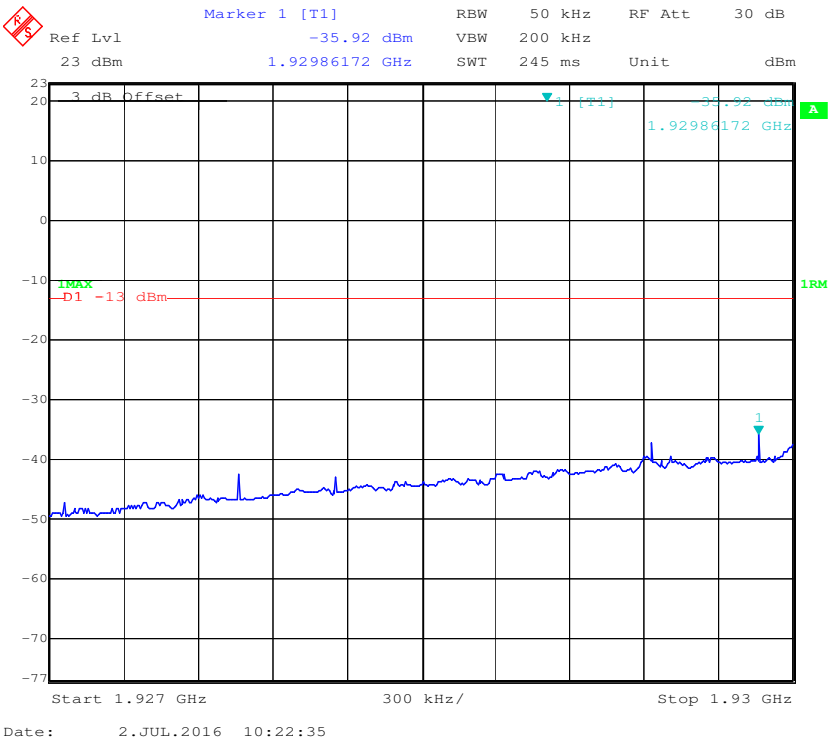
CELLULAR Band, Left Band Edge for GSM-3dB above AGC



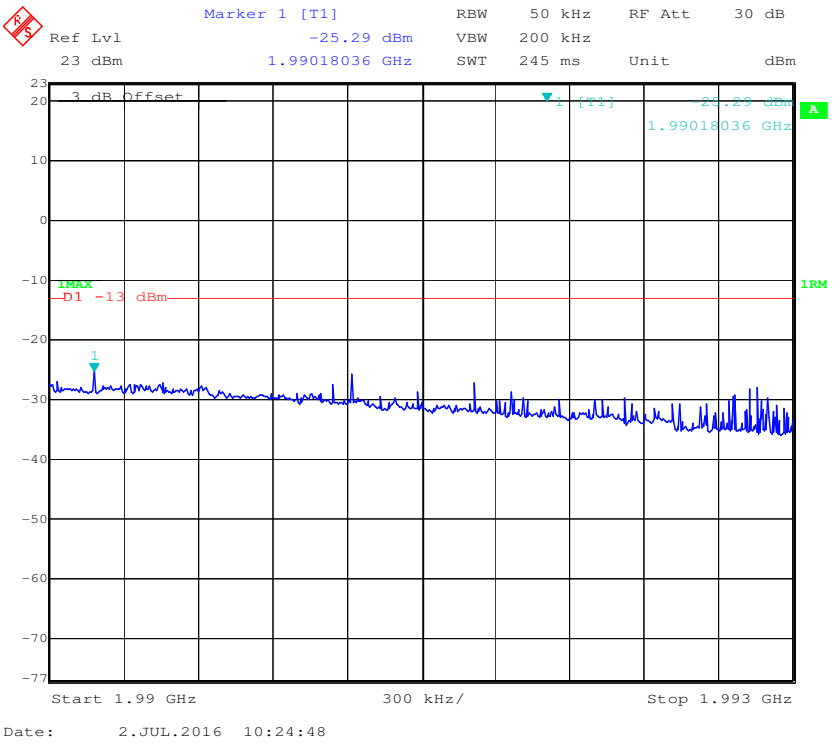
CELLULAR Band, Right Band Edge for GSM-3dB above AGC



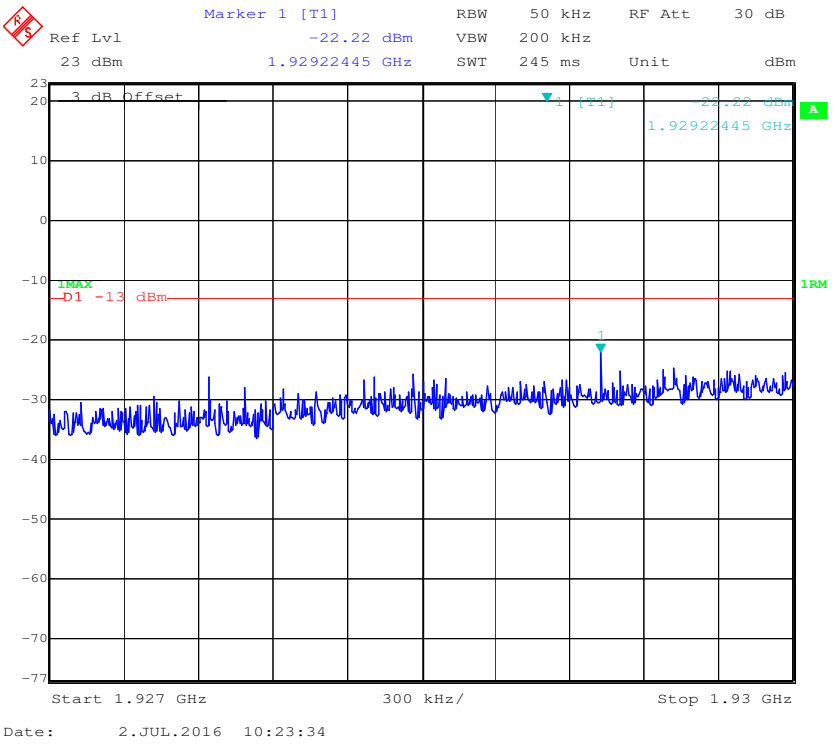
PCS Band, Left Band Edge for AWGN-Pre AGC



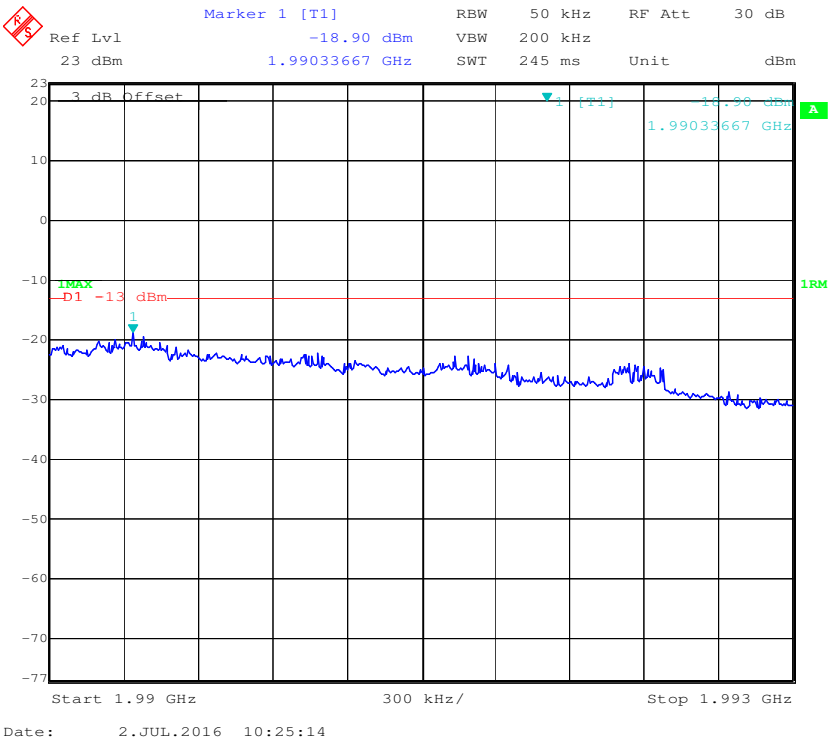
PCS Band, Right Band Edge for AWGN-Pre AGC



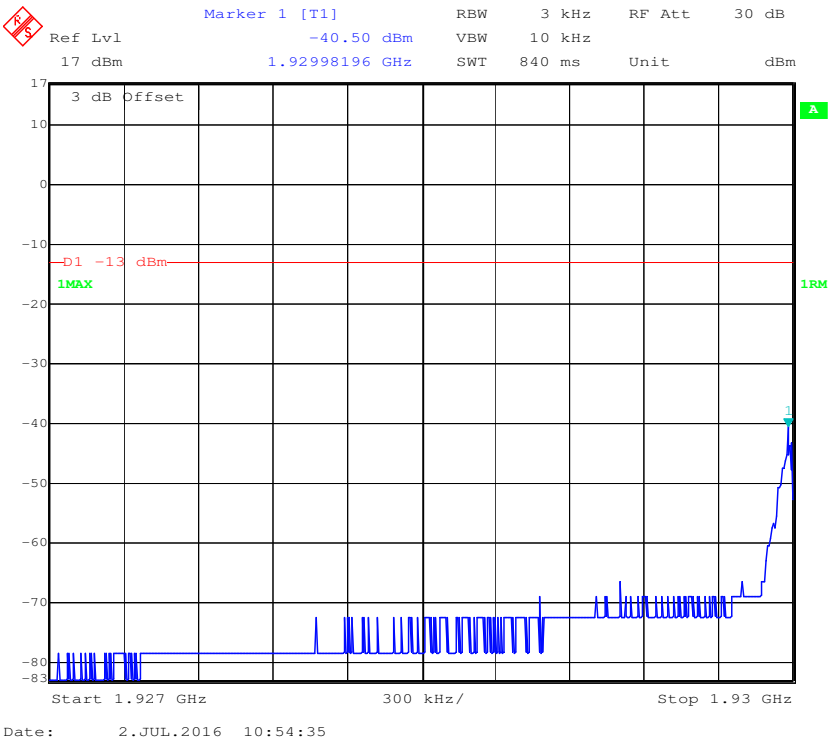
PCS Band, Left Band Edge for AWGN-3dB above AGC



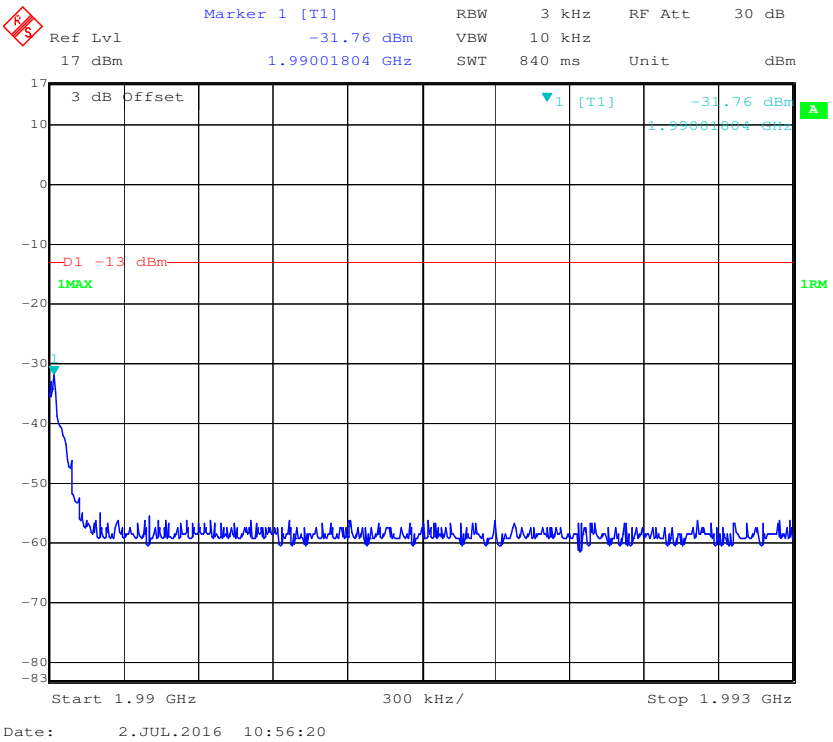
PCS Band, Right Band Edge for AWGN-3dB above AGC



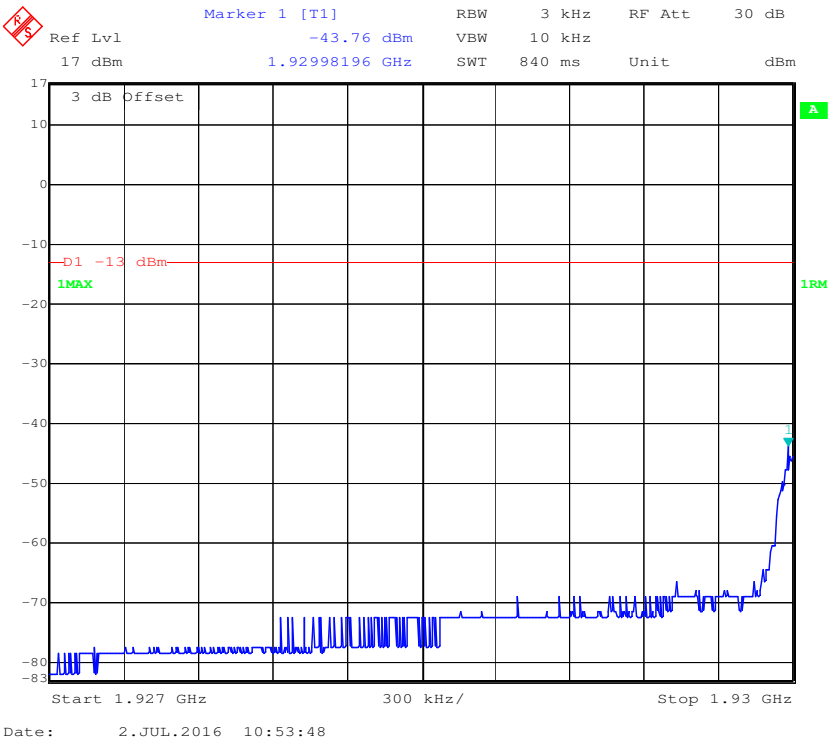
PCS Band, Left Band Edge for GSM-Pre AGC



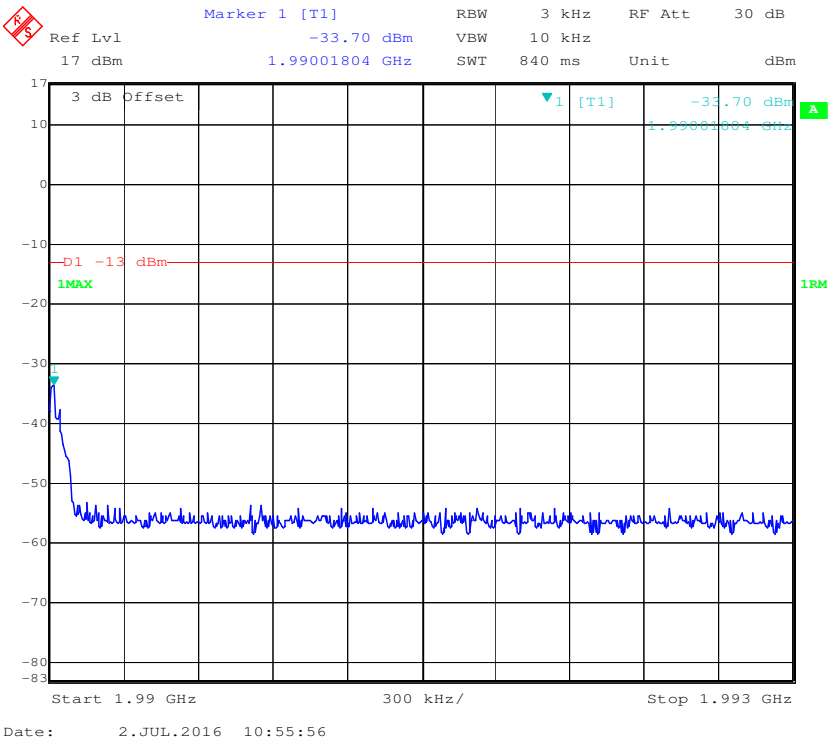
PCS Band, Right Band Edge for GSM-Pre AGC



PCS Band, Left Band Edge for GSM-3dB above AGC

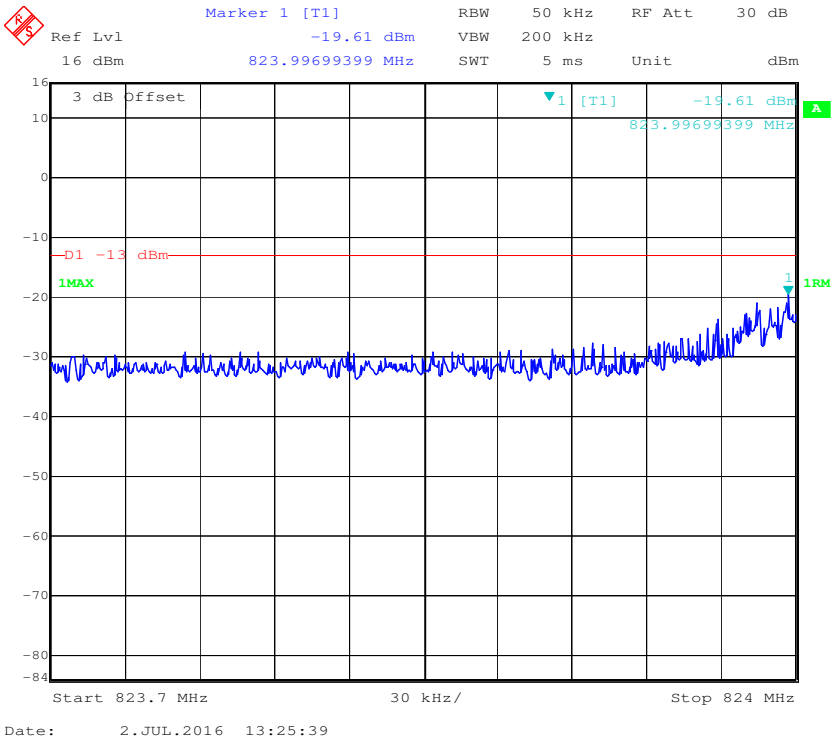


PCS Band, Right Band Edge for GSM-3dB above AGC

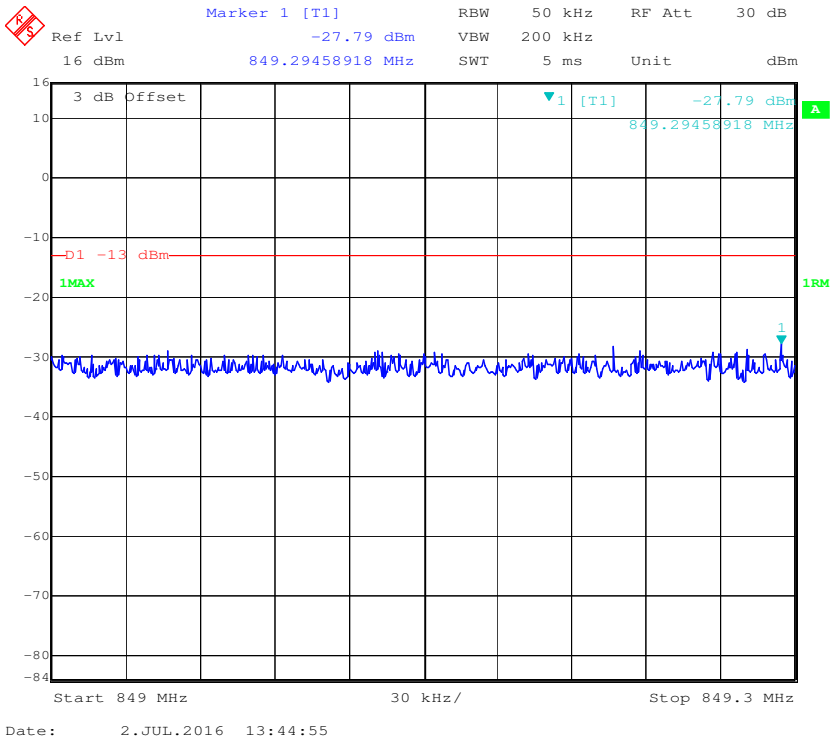


Inter-Modulation
Uplink:

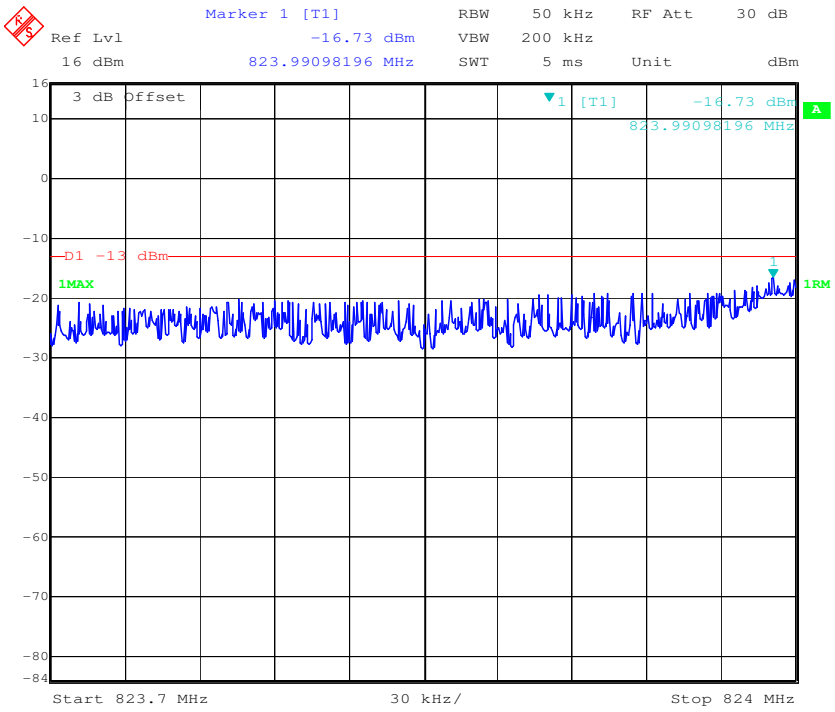
CELLULAR Band, Left Band Edge for AWGN-Pre AGC



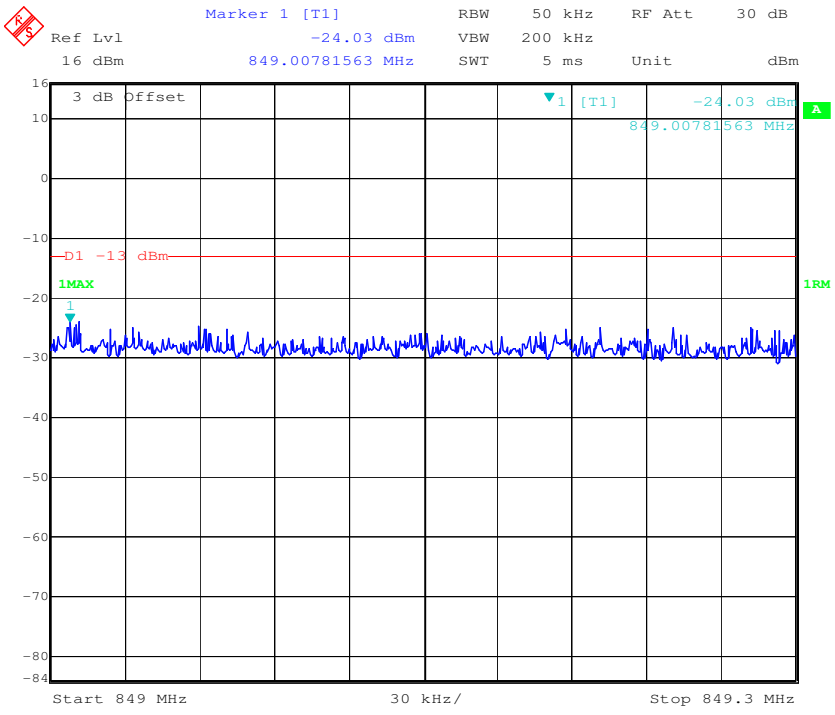
CELLULAR Band, Right Band Edge for AWGN-Pre AGC



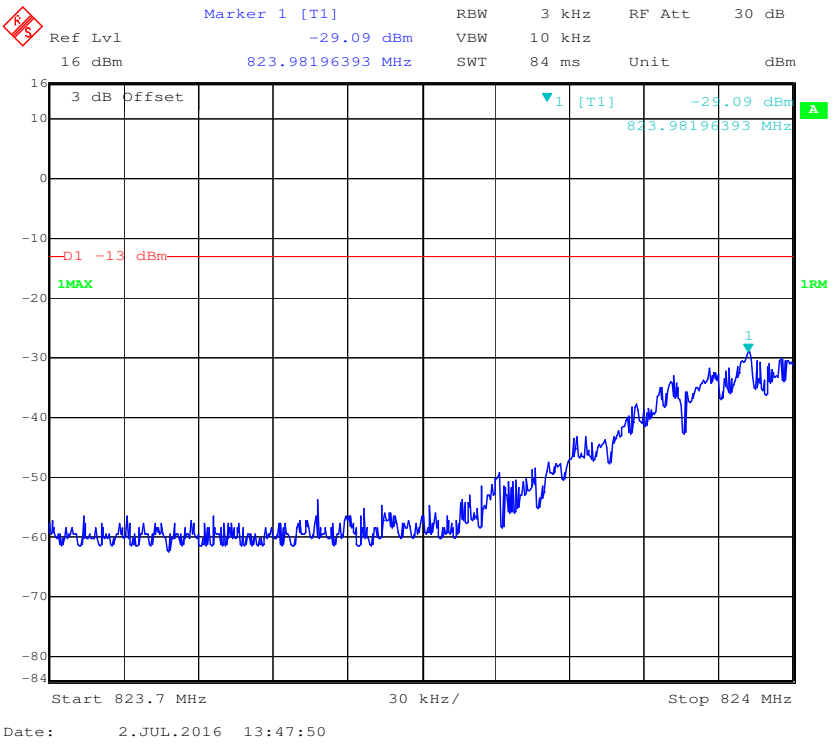
CELLULAR Band, Left Band Edge for AWGN-3dB above AGC



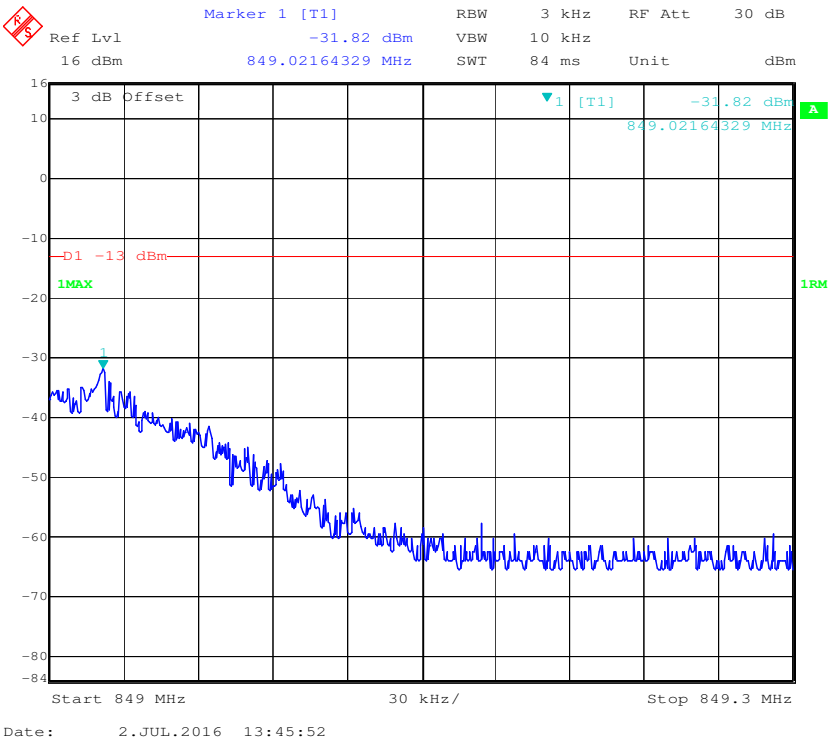
CELLULAR Band, Right Band Edge for AWGN-3dB above AGC



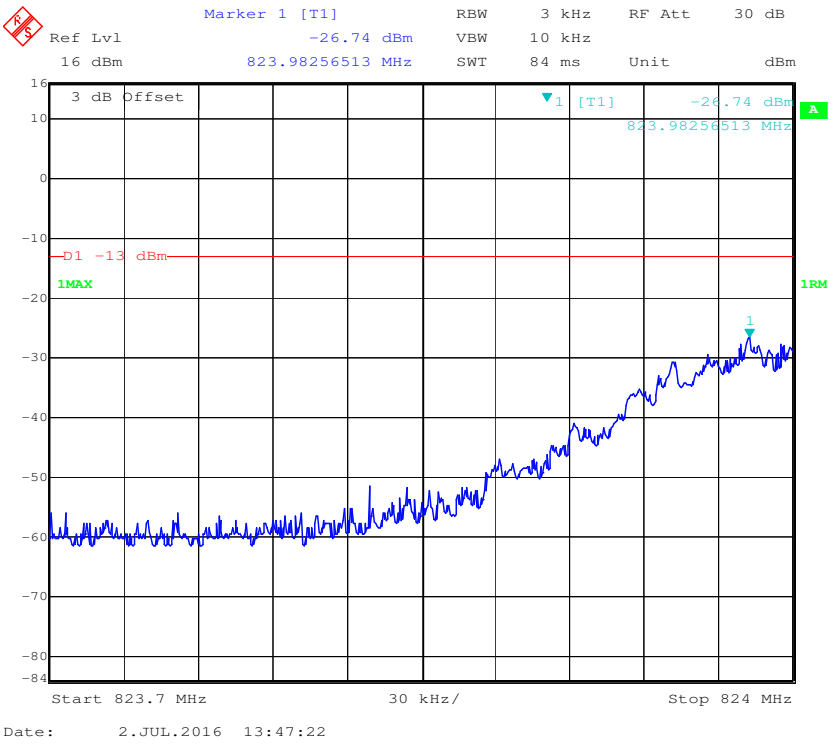
CELLULAR Band, Left Band Edge for GSM-Pre AGC



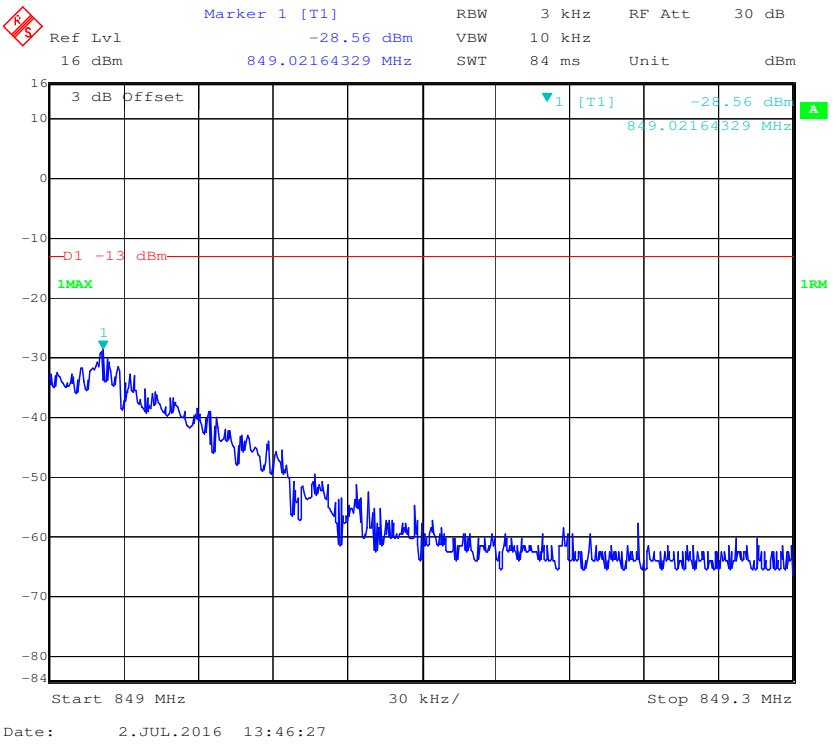
CELLULAR Band, Right Band Edge for GSM-Pre AGC



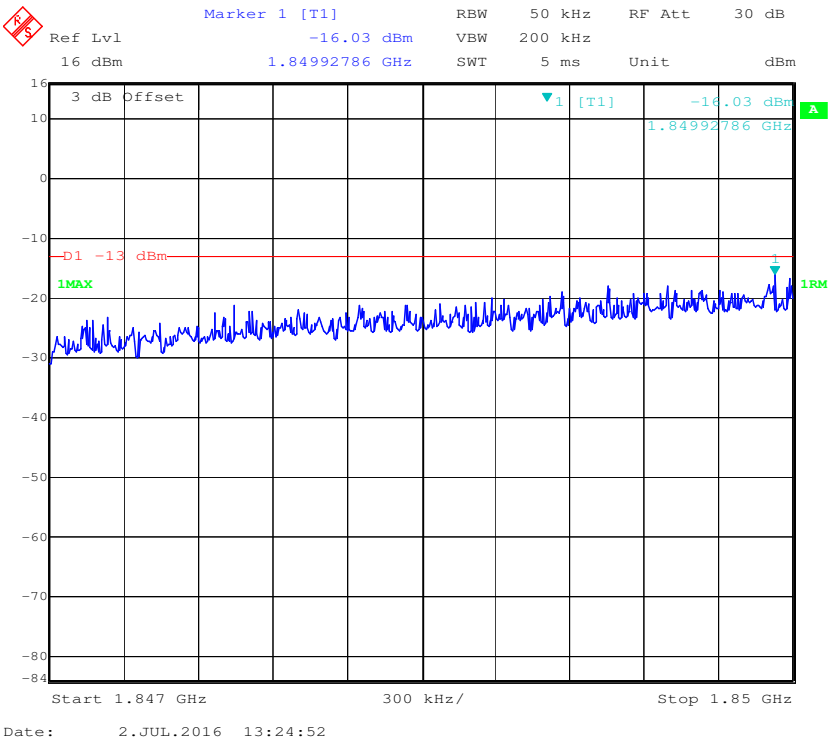
CELLULAR Band, Left Band Edge for GSM-3dB above AGC



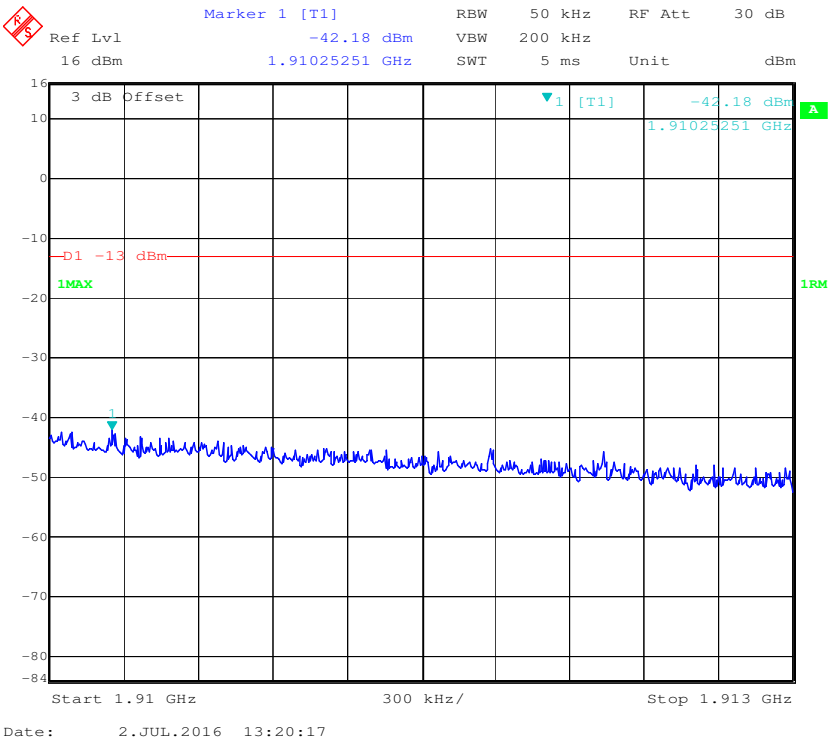
CELLULAR Band, Right Band Edge for GSM-3dB above AGC



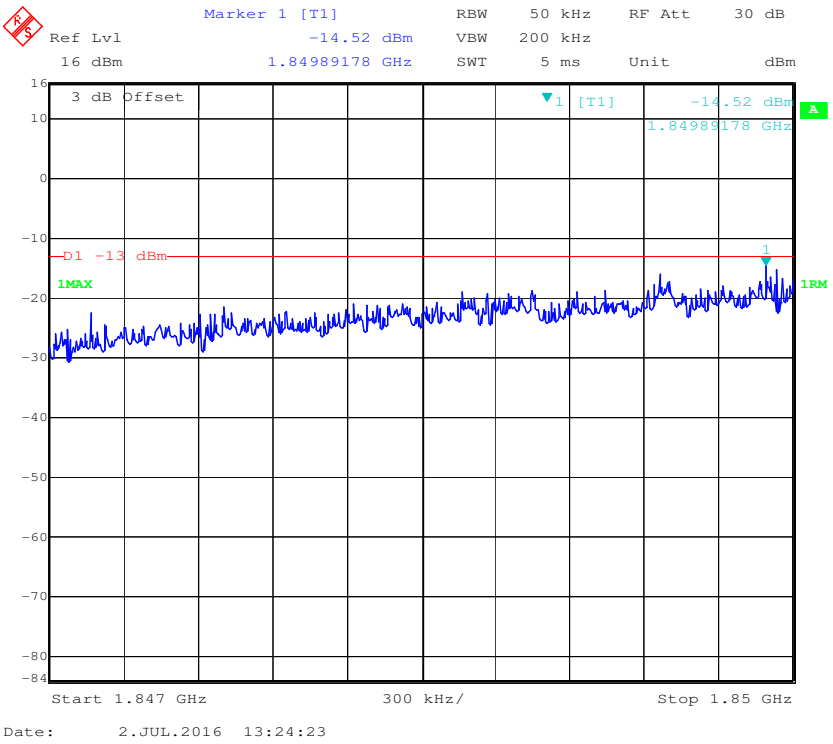
PCS Band, Left Band Edge for AWGN-Pre AGC



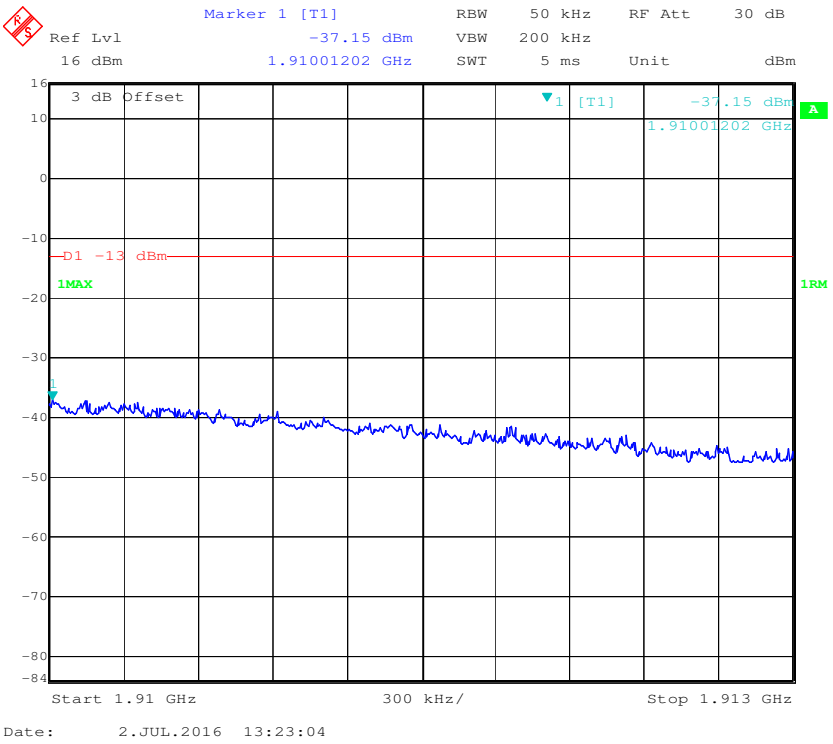
PCS Band, Right Band Edge for AWGN-Pre AGC



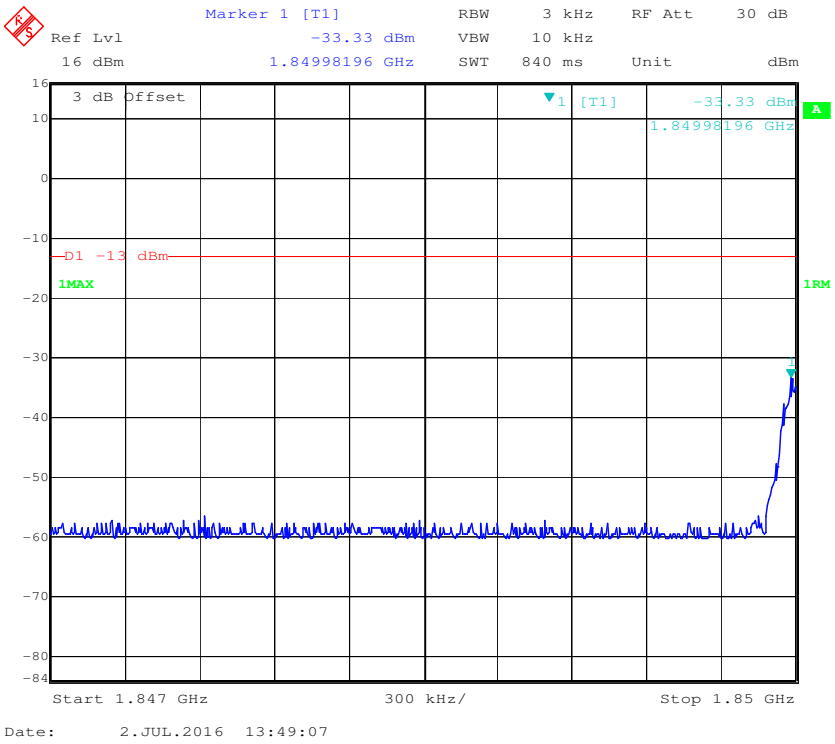
PCS Band, Left Band Edge for AWGN-3dB above AGC



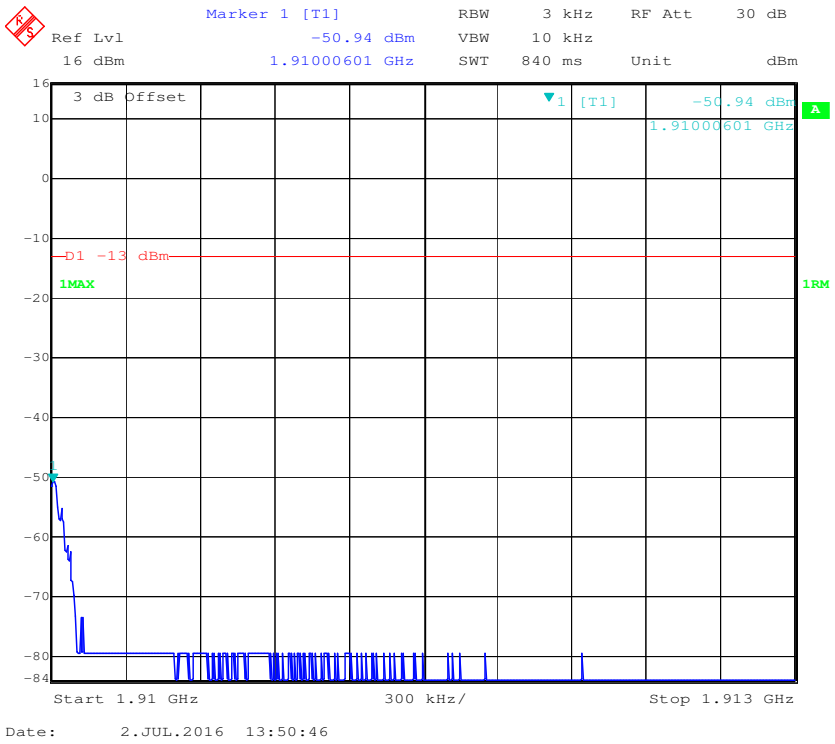
PCS Band, Right Band Edge for AWGN-3dB above AGC



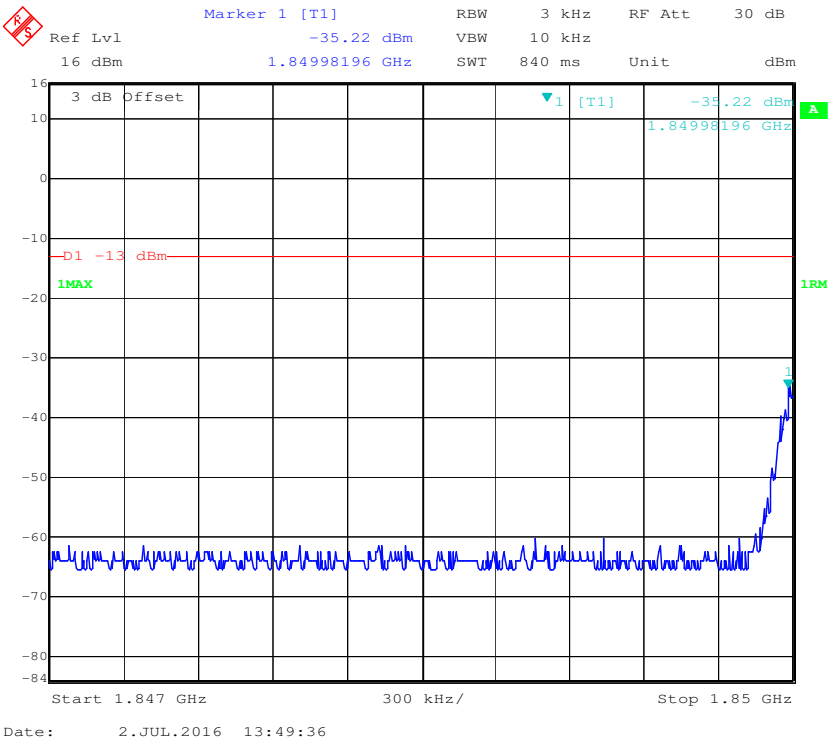
PCS Band, Left Band Edge for GSM-Pre AGC



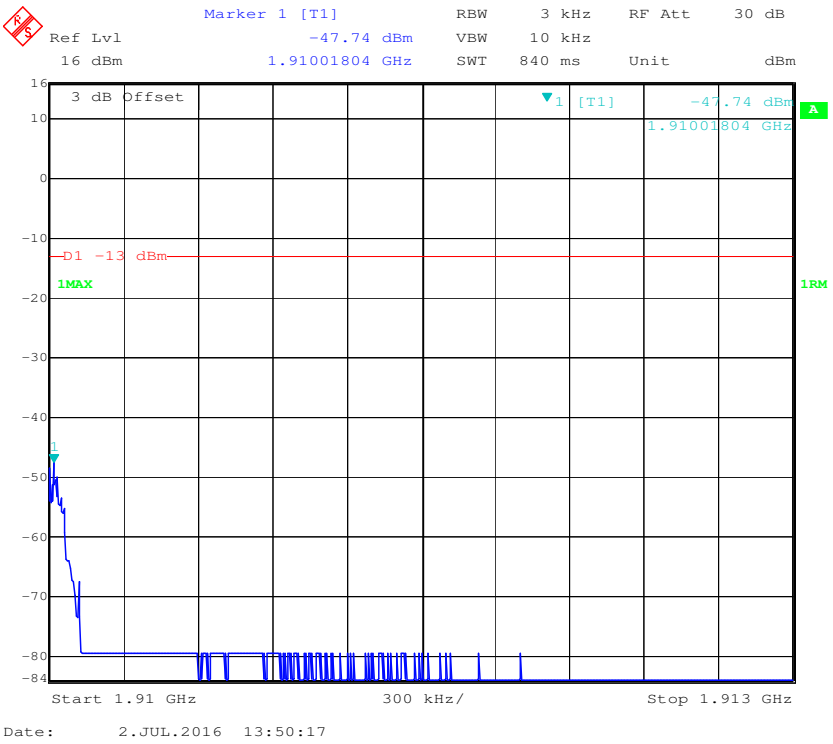
PCS Band, Right Band Edge for GSM-Pre AGC



PCS Band, Left Band Edge for GSM-3dB above AGC

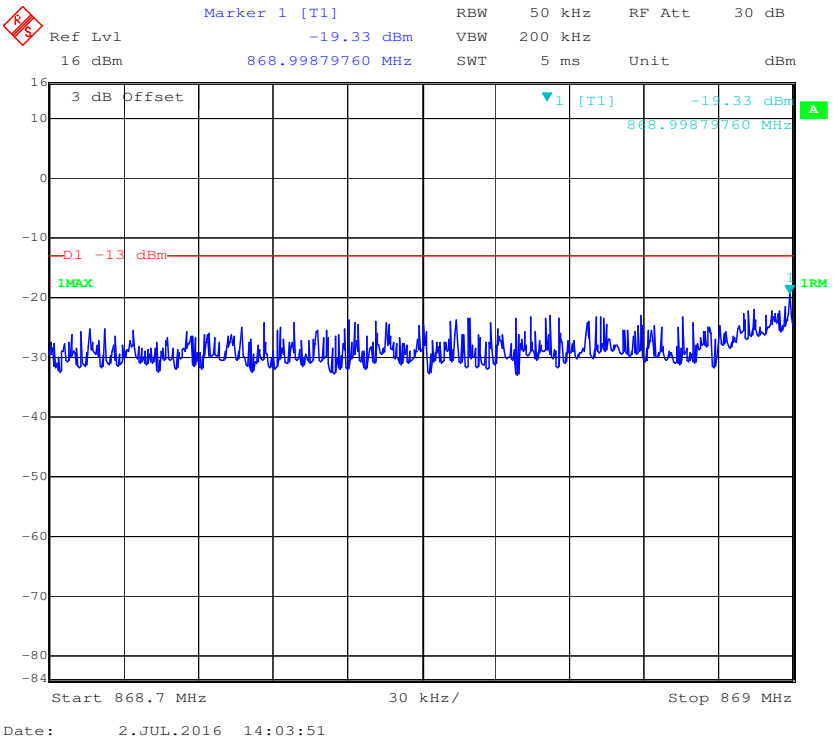


PCS Band, Right Band Edge for GSM-3dB above AGC

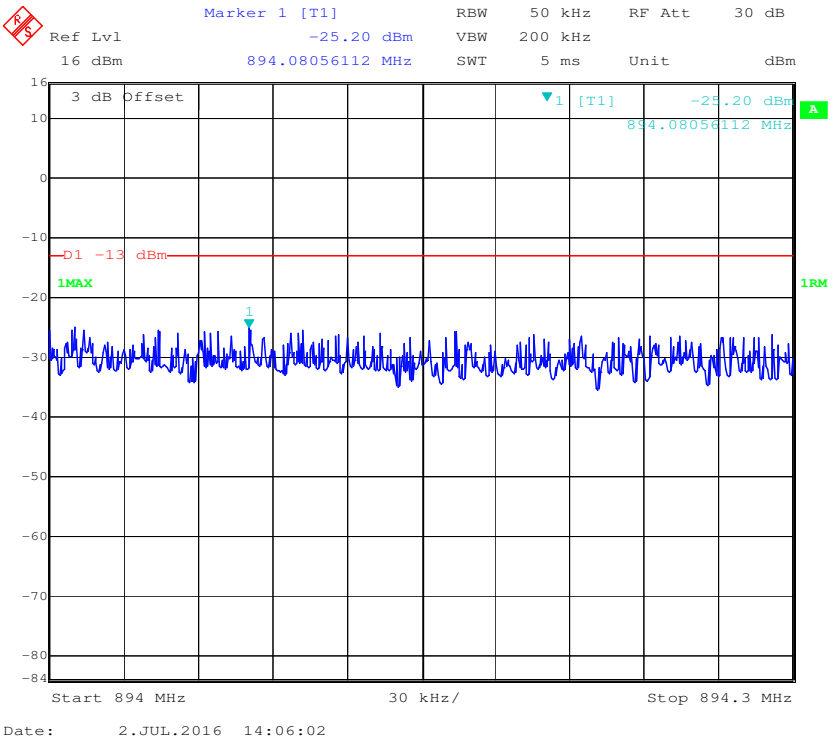


Downlink:

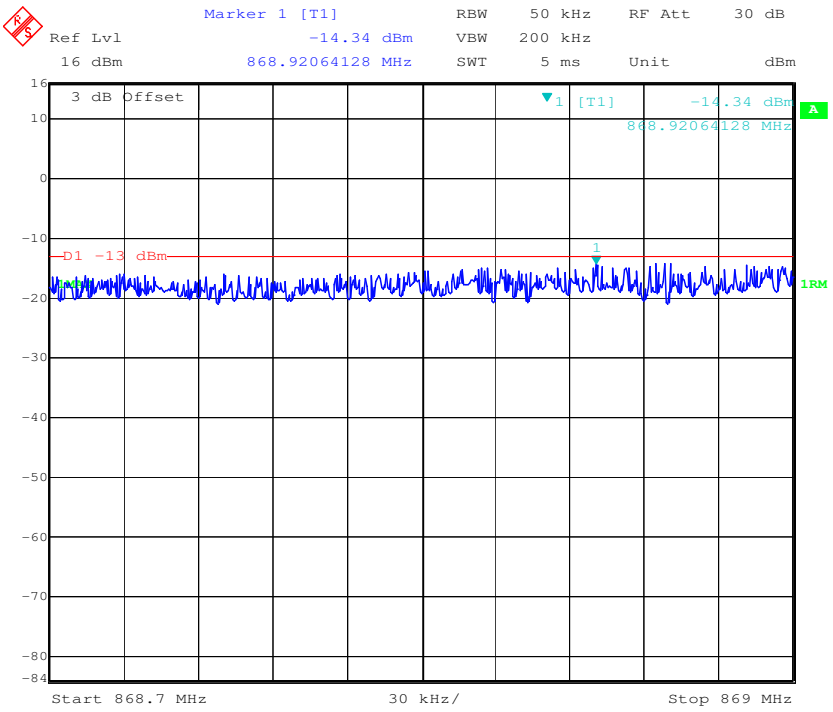
CELLULAR Band, Left Band Edge for AWGN-Pre AGC



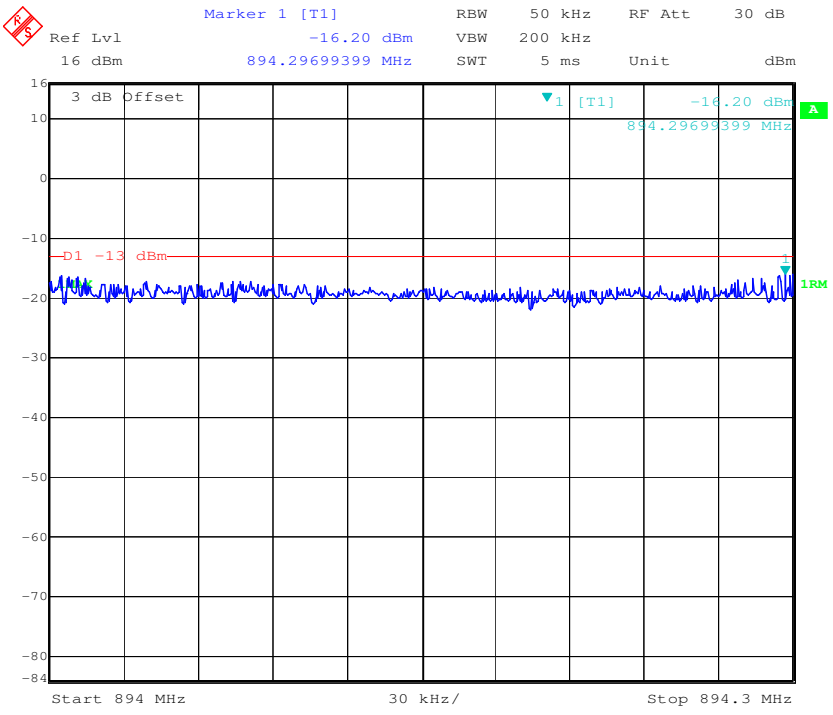
CELLULAR Band, Right Band Edge for AWGN-Pre AGC



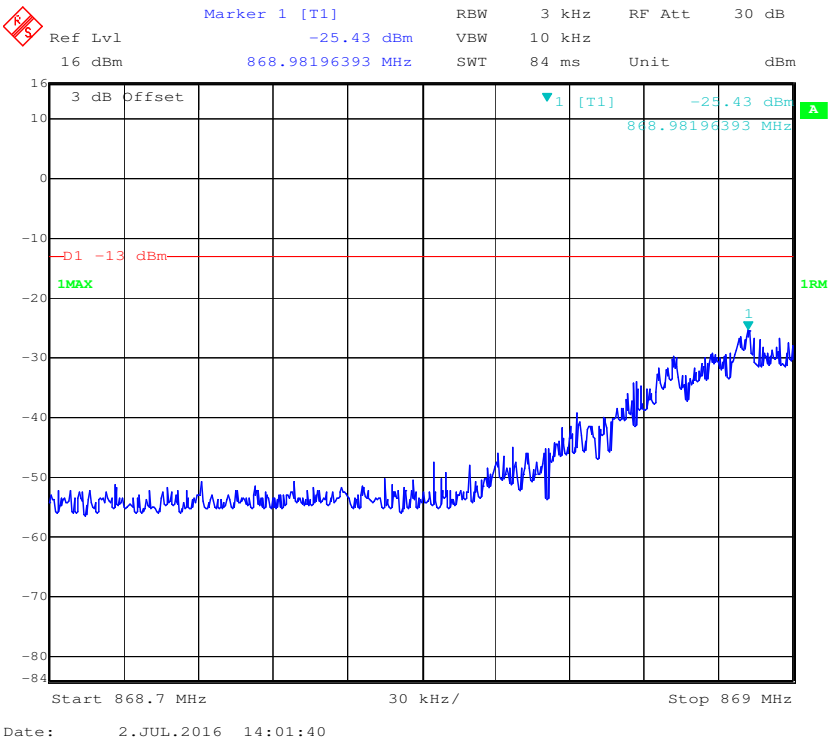
CELLULAR Band, Left Band Edge for AWGN-3dB above AGC



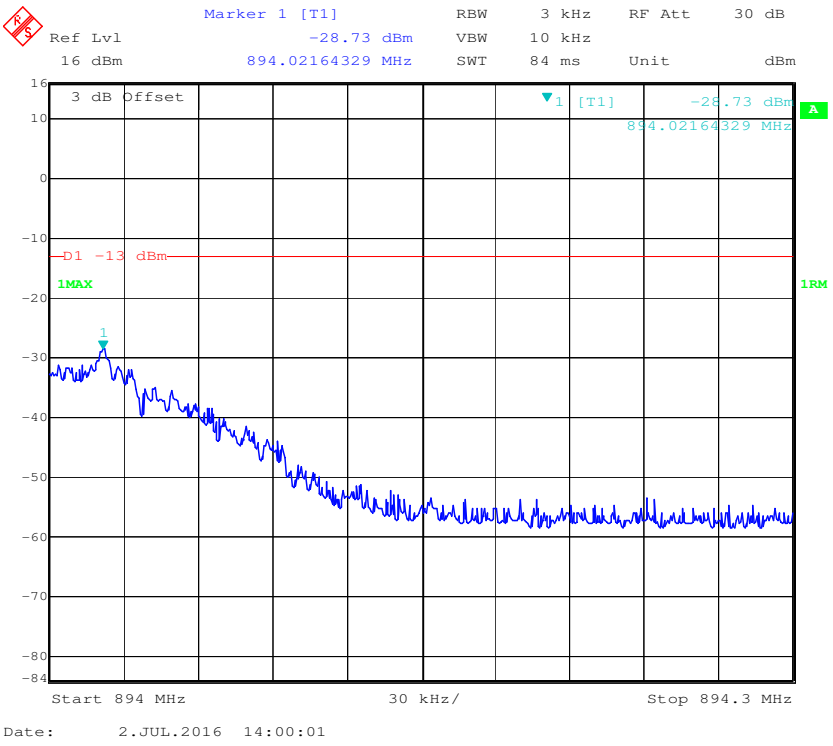
CELLULAR Band, Right Band Edge for AWGN-3dB above AGC



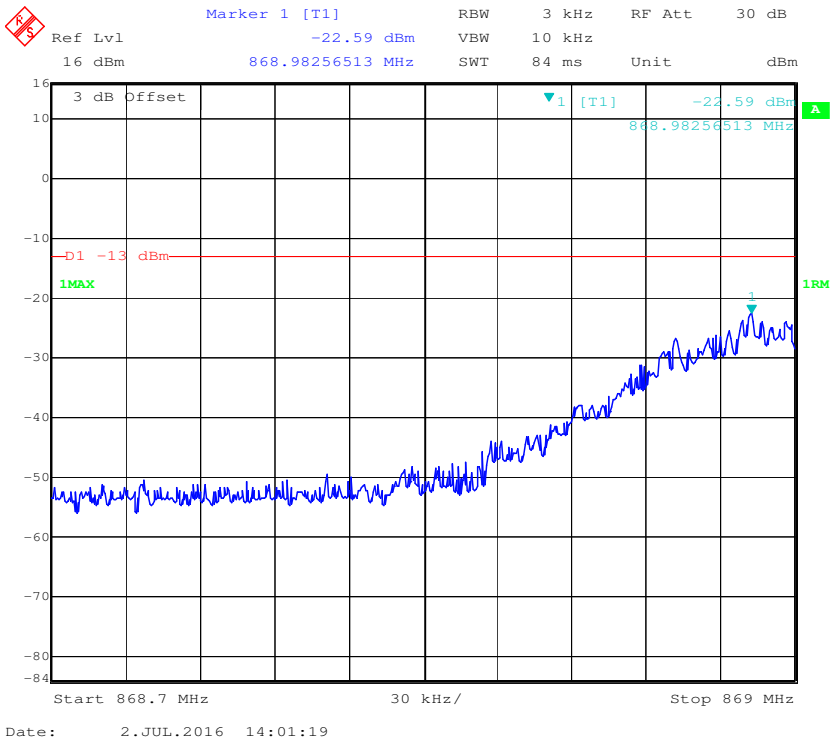
CELLULAR Band, Left Band Edge for GSM-Pre AGC



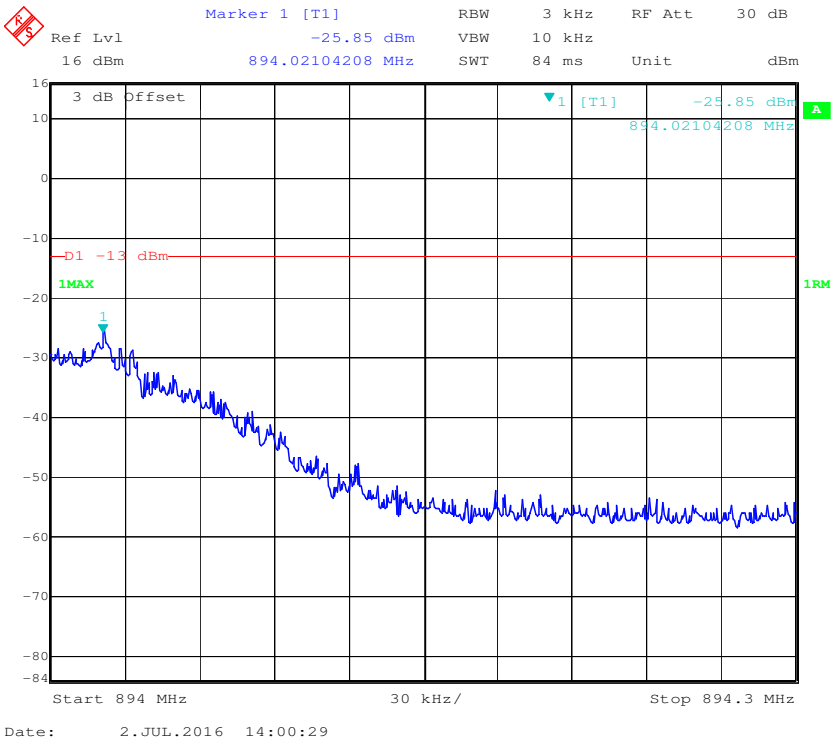
CELLULAR Band, Right Band Edge for GSM-Pre AGC



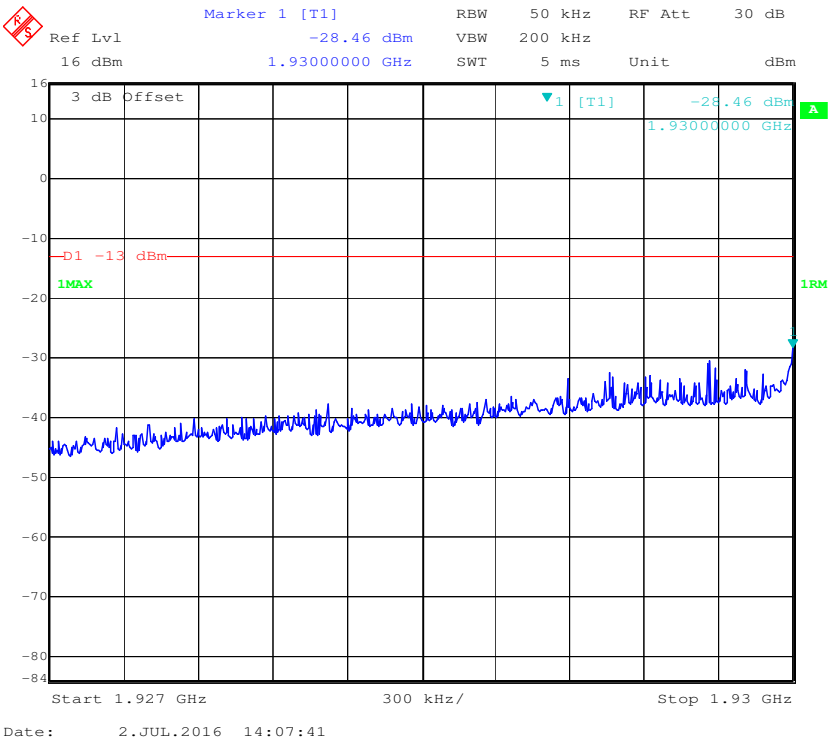
CELLULAR Band, Left Band Edge for GSM-3dB above AGC



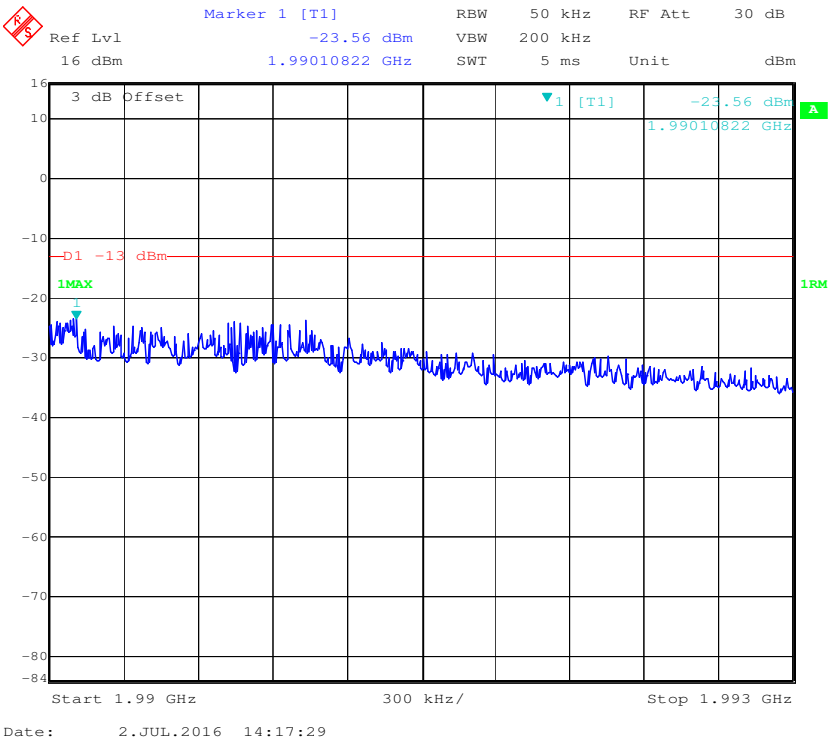
CELLULAR Band, Right Band Edge for GSM-3dB above AGC



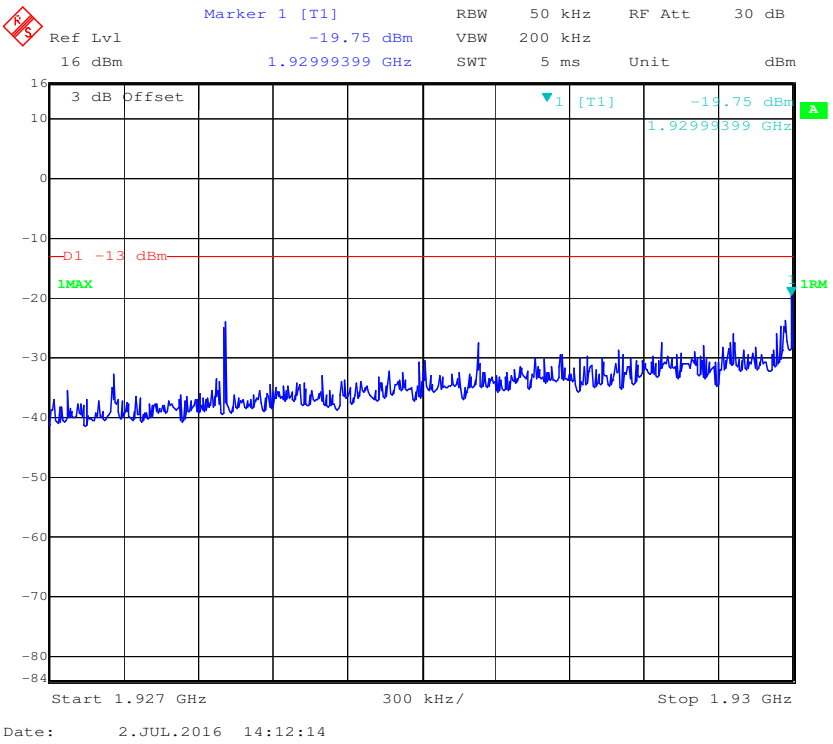
PCS Band, Left Band Edge for AWGN-Pre AGC



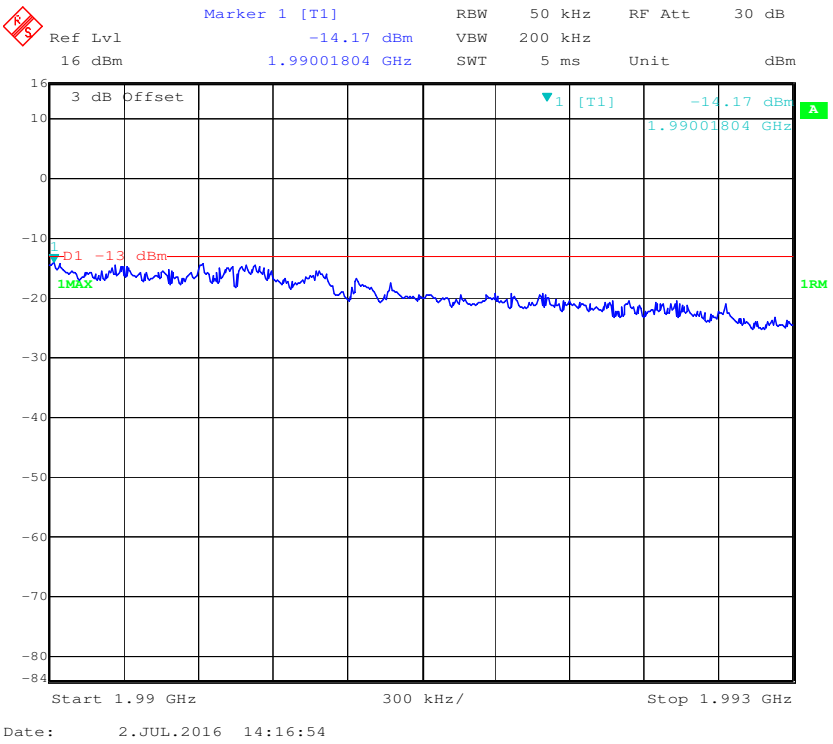
PCS Band, Right Band Edge for AWGN-Pre AGC



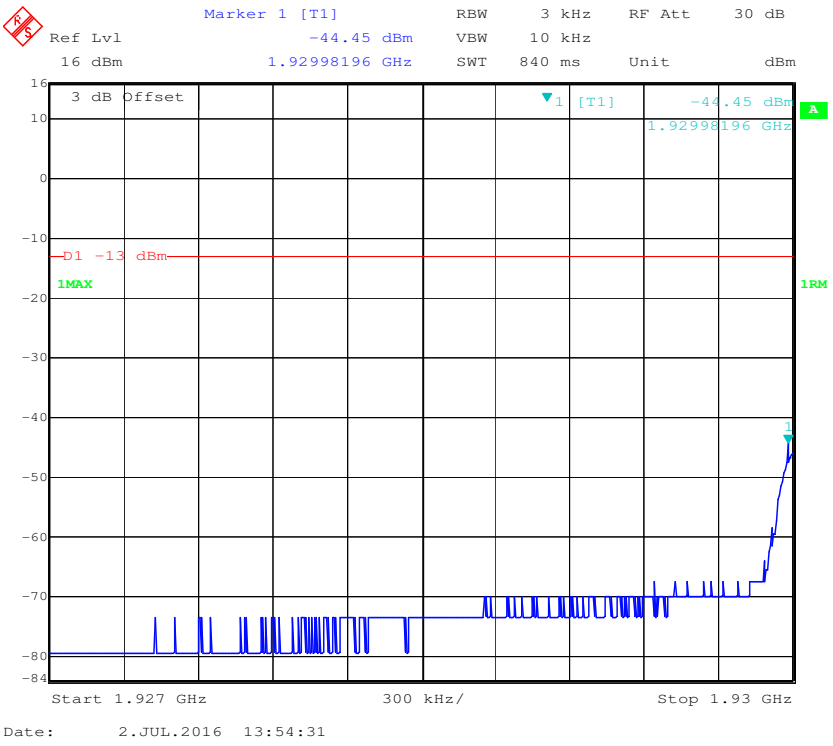
PCS Band, Left Band Edge for AWGN-3dB above AGC



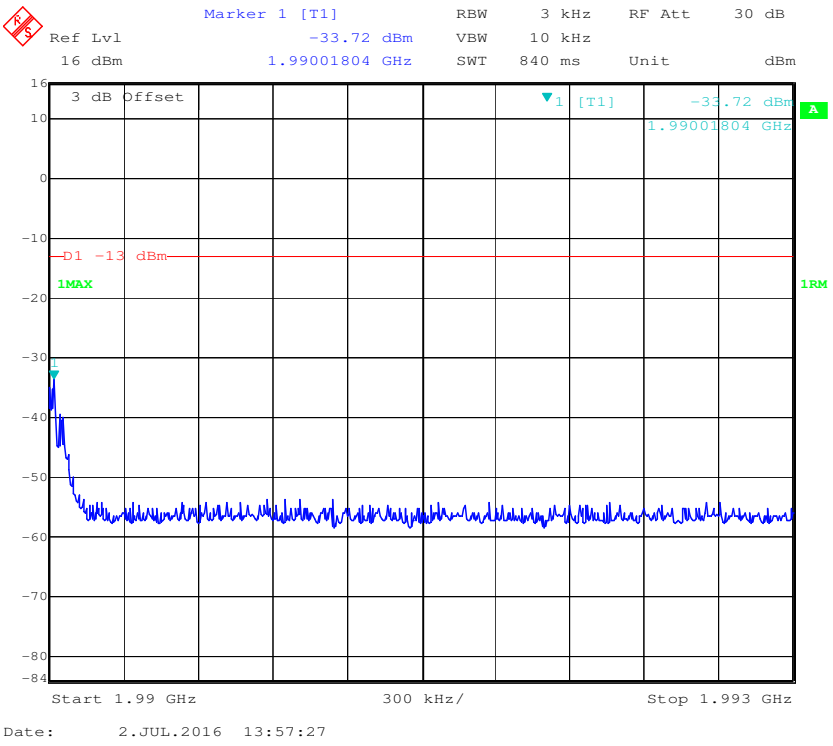
PCS Band, Right Band Edge for AWGN-3dB above AGC



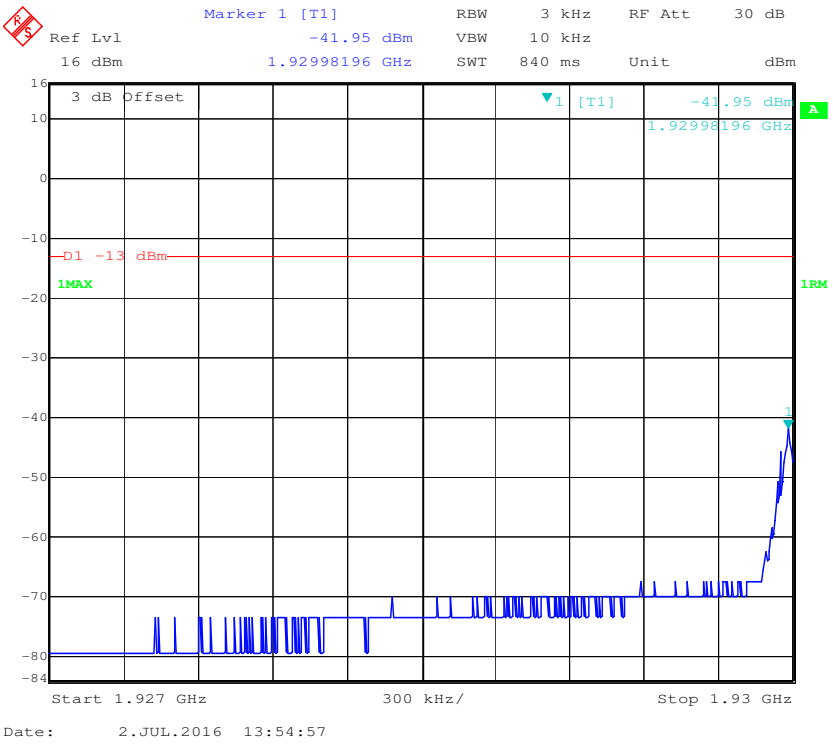
PCS Band, Left Band Edge for GSM-Pre AGC



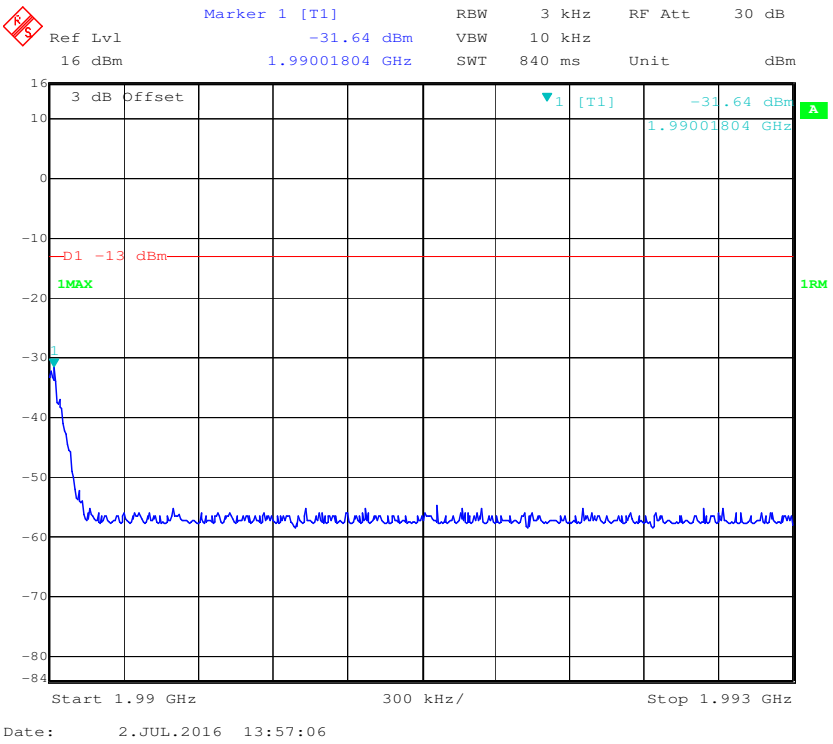
PCS Band, Right Band Edge for GSM-Pre AGC



PCS Band, Left Band Edge for GSM-3dB above AGC



PCS Band, Right Band Edge for GSM-3dB above AGC



FCC §20.21 - OUT OF BAND REJECTION

Applicable Standard

FCC Part § 20.21

Test Procedure

KDB 935210 D05 Indus Booster Basic Meas v01r01, Section 3.3.

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.The span of the spectrum analyzer was set to be wide enough in order to capture the spectrum of entire operating band.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2015-12-11	2016-12-11
Ducommun technologies	RF Cable	RG-214	3	2016-06-15	2017-06-15
Ducommun technologies	RF Cable	RG-214	2	2016-06-15	2017-06-15
WEINSCHEL	3dB Attenuator	5321	AU0709	2016-06-18	2017-06-18
Agilent	ESG Vector Signal Generator	E4438C	US41461205	2015-11-12	2016-11-12

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	22 ℃
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

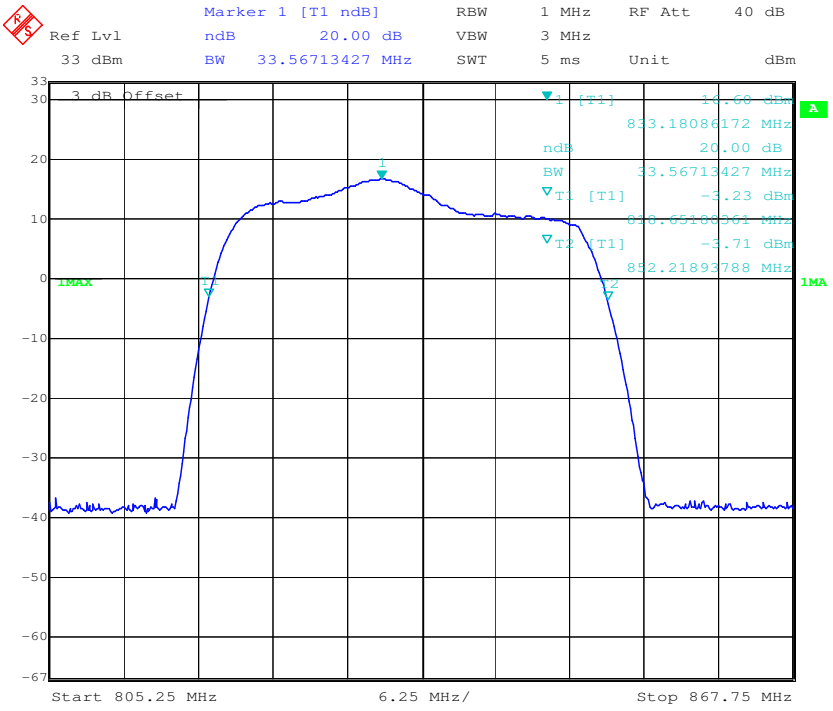
The testing was performed by Rocky Kang on 2016-07-02.

EUT operation mode: Transmitting

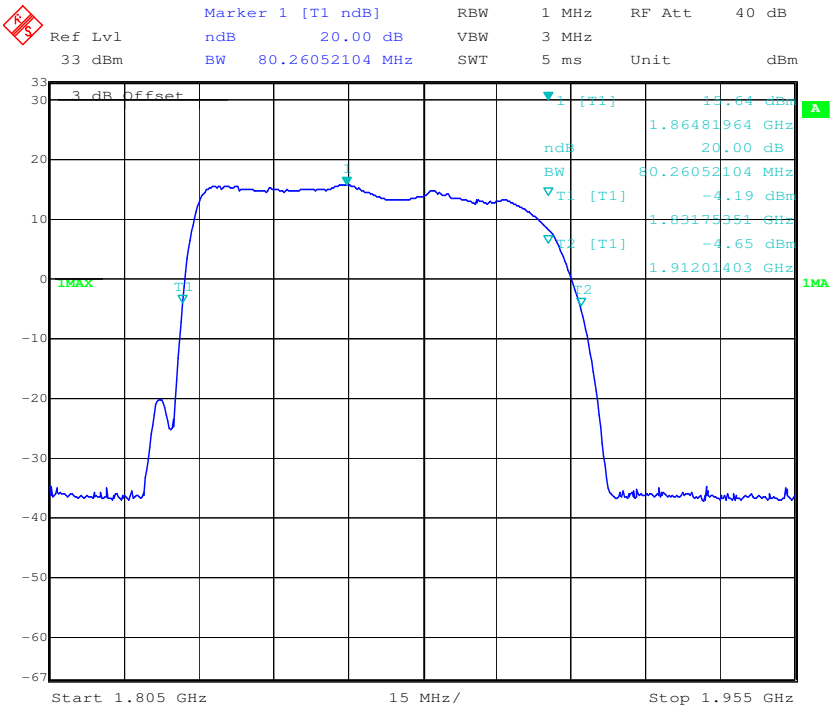
Test Result: Compliance. Please refer to the following plots.

Uplink:

CELLULAR Band

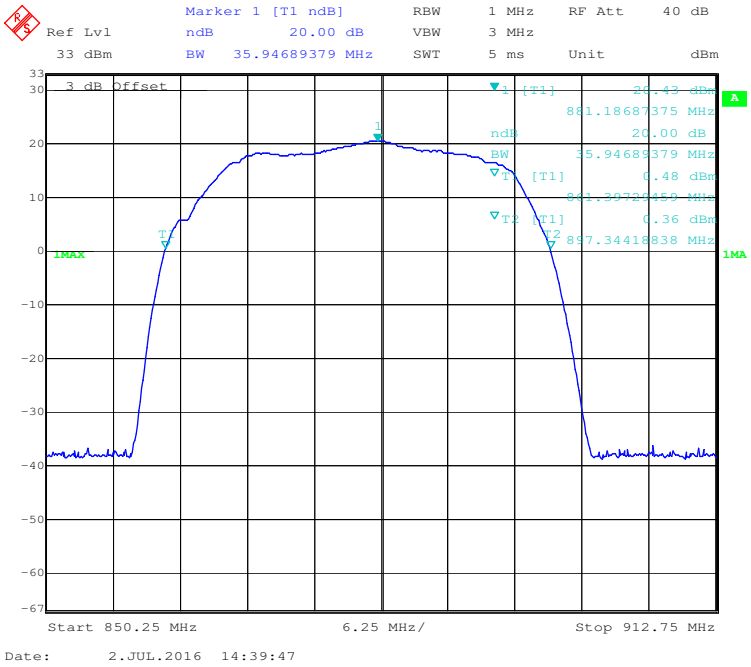


PCS Band

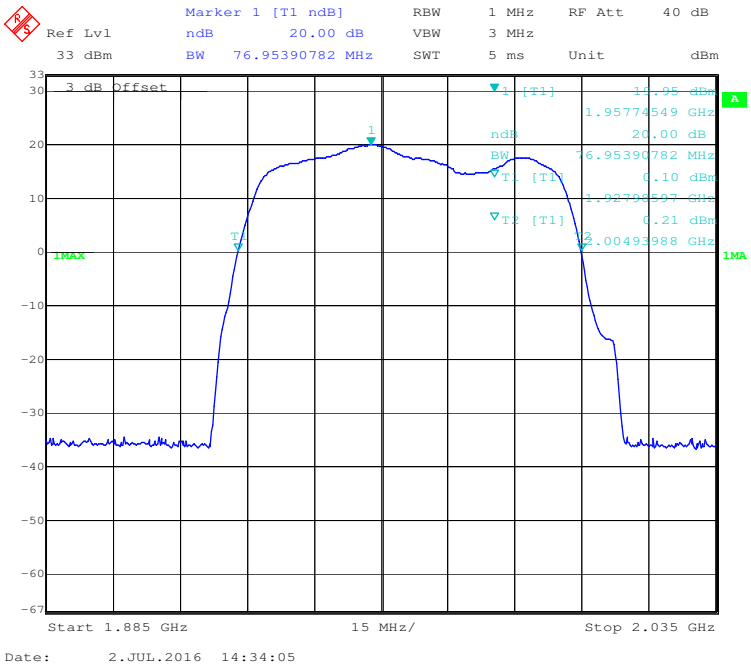


Downlink:

CELLULAR Band



PCS Band



******* END OF REPORT *******