FCC PART 27

FCC PART 22H, PART 24E

MEASUREMENT AND TEST REPORT

For

Berk-Tel Communications,Inc

2340 County Road J White Bear Lake, Minnesota, United States 55110

FCC ID: 2ATW2-BETK25

Report Type:	**Product Type:**
Original Report	Industrial Cellular Signal Booster

Report Number:	RKSA190531001-00A
Report Date:	2019-07-06
Reviewed By:	Jerry Zhang EMC Manager
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Dongguan) No.69 Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant	Berk-Tel Communications,Inc
Tested Model	P-25
Product Type	Industrial Cellular Signal Booster
Dimension	260mm(L)*230mm(W)*53mm(H)
Power Supply	AC 110~240V

Adapter Information:
Model: GST40A12
Input: AC100-240 V 50/60Hz 1.0A
Output:12V, 3.34A 40W Max

**All measurement and test data in this report was gathered from production sample serial number: 201905310001. (Assigned by the BACL. The EUT supplied by the applicant was received on 2019-05-31)*

Objective

This type approval report is prepared on behalf of Berk-Tel Communications,Inc in accordance with Part 2, Part 22-Subpart H, Part 24-Subpart E ,Part 27 and Part 20.21 of the Federal Communication Commission's rules.

The objective is to determine the compliance of EUT with FCC rules for output power, modulation characteristic, occupied bandwidth, and spurious emission at antenna terminal, spurious radiated emission, frequency stability, and band edge.

Related Submittal(s)/Grant(s)

No related submittal(s).

Test Methodology

Test Method: TIA/EIA 603-D, FCC KDB 935210 D05 Indus Booster Basic Meas v01r03.

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

Measurement Uncertainty

Item		Uncertainty
AC Power Lines Conducted Emissions		3.19dB
RF conducted test with spectrum		0.9dB
RF Output Power with Power meter		0.5dB
Radiated emission	30MHz~1GHz	5.91dB
	1GHz~6GHz	4.68dB
	6GHz~18GHz	4.92dB
	18GHz~40GHz	5.21dB
Occupied Bandwidth		0.5kHz
Temperature		1.0℃
Humidity		6%

Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China.

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 897218, the FCC Designation No. : CN1220.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0022.

SYSTEM TEST CONFIGURATION

Justification

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 modifications were made to the EUT.

Support Equipment List and Details

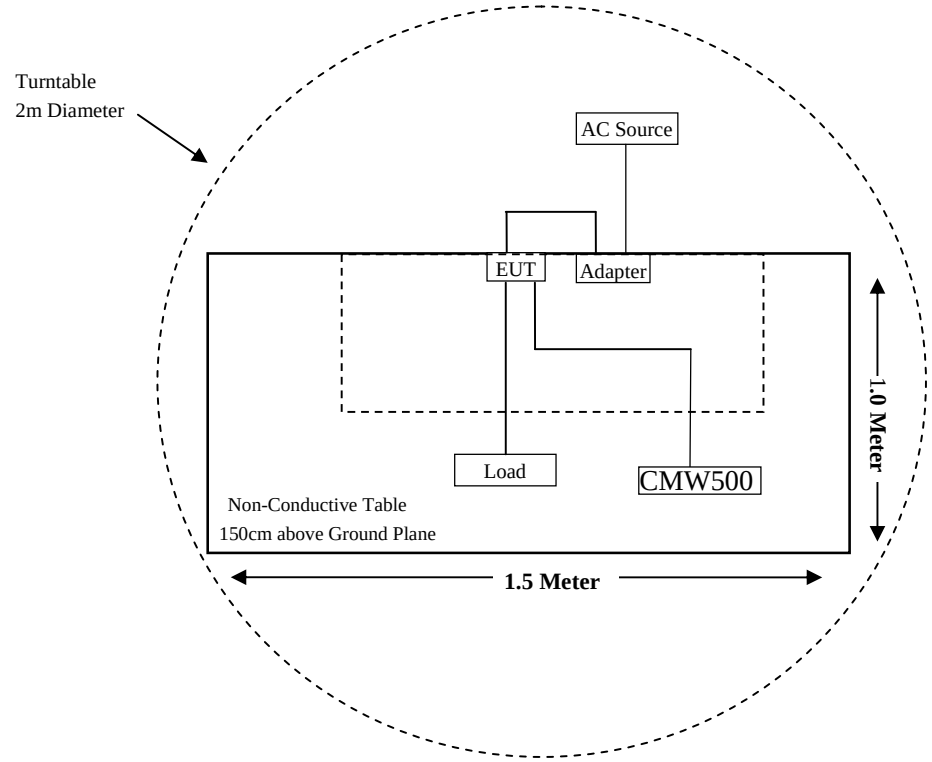
Manufacturer	Description	Model	Serial Number
N/A	Load	N/A	N/A
R & S	Wideband Radio Communication Tester	CMW500	104478

External I/O Cable

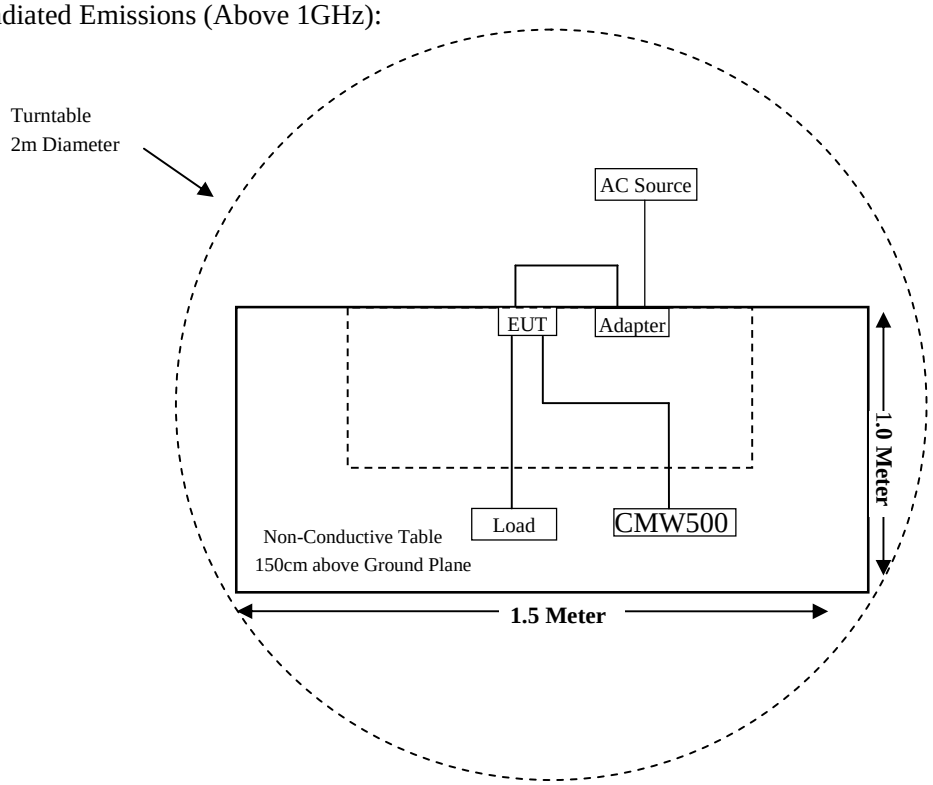
Cable Description	Length (m)	From Port	To
RF Cable	1.2	CMW500	EUT
RF Cable	1.5	EUT	Load

Block Diagram of Test Setup

For Radiated Emissions (Below 1GHz):



For Radiated Emissions (Above 1GHz):



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§ 2.1046; § 22.913; § 24.232; § 22.913; § 27.50	RF Output Power	Compliant
§ 2.1047	Modulation Characteristics	Not Applicable
§ 2.1049; § 22.917; § 24.238; §27.53	Occupied Bandwidth	Compliant
§ 2.1051; § 22.917; § 24.238; §27.53	Spurious Emissions at Antenna Terminal	Compliant
§ 2.1053; § 22.917; § 24.238; §27.53	Field Strength of Spurious Radiation	Compliant
§ 2.1053; § 22.917; § 24.238; §27.53	Band Edge & Inter modulation	Compliant
§ 2.1055; § 22.355; § 24.235; § 27.54	Frequency stability	Not Applicable*
§ 20.21	Out of Band Rejection	Compliant

Note:

Not Applicable: This device is an Industrial Signal Booster
Not Applicable*: EUT was a signal booster.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test（Chamber 1#）					
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2018-11-12	2019-11-11
HP	Signal Generator	HP 8341B	2624A00116	2018-08-29	2019-08-28
Sunol Sciences	Broadband Antenna	JB3	A090413-1	2016-12-26	2019-12-25
Sunol Sciences	Broadband Antenna	JB3	A090314-2	2019-01-09	2022-01-08
Sonoma Instrunent	Pre-amplifier	310N	171205	2018-08-15	2019-08-14
Rohde & Schwarz	Auto test Software	EMC32	100361	/	/
MICRO-COAX	Coaxial Cable	Cable-6	006	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-8	008	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-9	009	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-10	010	2018-08-15	2019-08-14
keysight	Vector signal source	N5182B	MY53051592	2018-11-30	2019-11-30
R & S	Wideband Radio Communication Tester	CMW500	104478	2018-07-21	2019-07-20
Radiated Emission Test（Chamber 2#）					
HP	Signal Generator	HP 8341B	2624A00116	2018-08-29	2019-08-28
Rohde & Schwarz	EMI Test Receiver	ESU40	100207	2018-08-27	2019-08-26
ETS-LINDGREN	Horn Antenna	3115	9311-4159	2019-01-11	2022-01-10
ETS-LINDGREN	Horn Antenna	3115	6229	2019-01-11	2022-01-10
ETS-LINDGREN	Horn Antenna	3116	00084159	2016-10-18	2019-10-17
ETS-LINDGREN	Horn Antenna	3116	2516	2016-12-12	2019-12-12
Mini-Circuits	Amplifier	ZVA-183W-S+	220701818	2018-05-20	2019-05-19
EM Electronics Corporation	Amplifier	EM18G40G	060726	2018-03-22	2019-03-21
Rohde & Schwarz	Auto test Software	EMC32	100361	/	/
MICRO-COAX	Coaxial Cable	Cable-6	006	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-11	011	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-12	012	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-13	013	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-16	016	2018-08-15	2019-08-14
keysight	Vector signal source	N5182B	MY53051592	2018-11-30	2019-11-30
R & S	Wideband Radio Communication Tester	CMW500	104478	2018-07-21	2019-07-20

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
Rohde & Schwarz	Signal Analyzer	FSV40	101116	2018-07-23	2019-07-22
Rohde & Schwarz	Signal Analyzer	FSIQ26	836131/009	2018-11-30	2019-11-29
Narda	Attenuator	6dB	006	2019-01-10	2020-01-09
Narda	Attenuator	10dB	010	2018-08-15	2019-08-14
keysight	Vector signal source	N5182B	MY53051592	2018-11-30	2019-11-30
R & S	Wideband Radio Communication Tester	CMW500	104478	2018-07-21	2019-07-20
Mini-Ciruits	Power splitter	ZFRSC-14-S+	SF019411452	2018-11-10	2019-11-09
BACL	Temperature & Humidity Chamber	BTH-150	30023	2018-10-10	2019-10-09
Berk-TelCommunications	RF Cable	Berk-TelCommunications C01	C01	Each Time	/

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

FCC §2.1047 - MODULATION CHARACTERISTIC

According to FCC § 2.1047(d), Part 22H & 24E, Part 27 there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

FCC §2.1046; § 22.913 (a); § 24.232 (c); §27.50 (b) (c) (d); - RF OUTPUT POWER and AMPLIFER GAIN

Applicable Standards

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.

According to §27.50(b)(9), control stations and mobile stations transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands and fixed stations transmitting in the 787-788 MHz and 805-806 MHz bands are limited to 30 watts ERP.

According to §27.50(c)(9), control and mobile stations in the 698-746 MHz band are limited to 30 watts ERP.

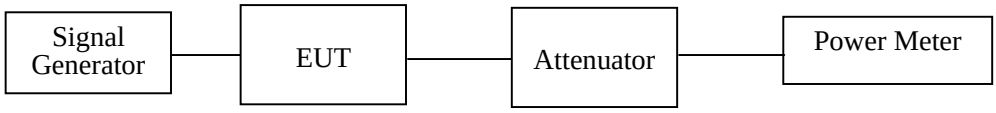
According to §27.50(d)(3), A licensee operating a base or fixed station in the 2110-2155 MHz band utilizing a power greater than 1640 watts EIRP and greater than 1640 watts/MHz EIRP must coordinate such operations in advance with all Government and non-Government satellite entities in the 2025-2110 MHz band. A licensee operating a base or fixed station in the 2110-2180 MHz band utilizing power greater than 1640 watts EIRP and greater than 1640 watts/MHz EIRP must be coordinated in advance with the following licensees authorized to operate within 120 kilometers (75 miles) of the base or fixed station operating in this band: All Broadband Radio Service (BRS) licensees authorized under this part in the 2155-2160 MHz band and all advanced wireless services (AWS) licensees authorized to operate on adjacent frequency blocks in the 2110-2180 MHz band.

According to §27.50(d)(4), Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP. Fixed stations operating in the 1710-1755 MHz band are limited to a maximum antenna height of 10 meters above ground. Mobile and portable stations operating in these bands 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 v01r03 clause 3.5



Test Data

Environmental Conditions

Temperature:	23.2℃
Relative Humidity:	51 %
ATM Pressure:	101.3kPa

The testing was performed by Carrie He on 2019-07-01.

Lower 700MHz (A+B+C Block) Band:

Modes	Frequency (MHz)	Signal Type	AGC threshold level (dBm)	Signal Level	Input power (dBm)	Output Power (dBm)	Gain (dBi)	ERP(dBm)
Uplink	708.7	AWGN	-48.3	Pre-AGC	-48.50	21.37	69.87	28.22
				3dB above AGC	-45.50	22.87	68.37	29.72
		GSM	-48.3	Pre-AGC	-48.50	20.07	68.57	26.92
				3dB above AGC	-45.50	21.53	67.03	28.38
Downlink	740.3	AWGN	-48.4	Pre-AGC	-48.60	22.74	71.34	29.59
				3dB above AGC	-45.60	23.96	69.56	30.81
		GSM	-48.4	Pre-AGC	-48.60	22.53	71.13	29.38
				3dB above AGC	-45.60	23.93	69.53	30.78

Upper 700MHz (C Block) Band:

Modes	Frequency (MHz)	Signal Type	AGC threshold level (dBm)	Signal Level	Input power (dBm)	Output Power (dBm)	Gain (dBi)	ERP(dBm)
Uplink	781.3	AWGN	-48.7	Pre-AGC	-49.00	20.12	69.12	26.97
				3dB above AGC	-46.00	21.41	67.41	28.26
		GSM	-48.7	Pre-AGC	-49.00	20.32	69.32	27.17
				3dB above AGC	-46.00	21.54	67.54	28.39
Downlink	748.8	AWGN	-49.2	Pre-AGC	-49.50	22.12	71.62	28.97
				3dB above AGC	-46.50	23.33	69.83	30.18
		GSM	-49.2	Pre-AGC	-49.50	22.03	71.53	28.88
				3dB above AGC	-46.50	23.11	69.61	29.96

Cellular Band:

Modes	Frequency (MHz)	Signal Type	AGC threshold level (dBm)	Signal Level	Input power (dBm)	Output Power (dBm)	Gain (dBi)	ERP(dBm)
Uplink	829.7	AWGN	-47.7	Pre-AGC	-48.0	21.32	69.32	28.17
				3dB above AGC	-45.0	22.11	67.11	28.96
		GSM	-47.7	Pre-AGC	-48.0	20.03	68.03	26.88
				3dB above AGC	-45.0	21.55	66.55	28.4
Downlink	884.2	AWGN	-48.00	Pre-AGC	-48.2	24.02	72.22	30.87
				3dB above AGC	-45.2	25.21	70.41	32.06
		GSM	-48.00	Pre-AGC	-48.2	23.87	72.07	30.72
				3dB above AGC	-45.2	24.96	70.16	31.81

PCS Band:

Modes	Frequency (MHz)	Signal Type	AGC threshold level (dBm)	Signal Level	Input power (dBm)	Output Power (dBm)	Gain (dBi)	EIRP(dBm)
Uplink	1887.8	AWGN	-47.3	Pre-AGC	-47.6	20.03	69.87	29.03
				3dB above AGC	-44.6	21.11	68.37	30.11
		GSM	-47.7	Pre-AGC	-48.0	19.96	68.57	28.96
				3dB above AGC	-45.0	20.56	67.03	29.56
Downlink	1956.9	AWGN	-47.2	Pre-AGC	-47.5	23.87	72.34	32.87
				3dB above AGC	-44.5	24.93	70.56	33.93
		GSM	-48.0	Pre-AGC	-48.3	23.73	72.13	32.73
				3dB above AGC	-45.3	24.86	70.53	33.86

AWS Band:

Modes	Frequency (MHz)	Signal Type	AGC threshold level (dBm)	Signal Level	Input power (dBm)	Output Power (dBm)	Gain (dBi)	EIRP(dBm)
Uplink	1743.1	AWGN	-46.9	Pre-AGC	-47.2	19.87	67.07	28.87
				3dB above AGC	-44.2	20.13	64.33	29.13
		GSM	-47.1	Pre-AGC	-47.4	19.78	67.18	28.78
				3dB above AGC	-44.4	20.03	64.43	29.03
Downlink	2135.7	AWGN	-47.2	Pre-AGC	-47.4	22.32	69.72	31.32
				3dB above AGC	-44.4	23.86	68.26	32.86
		GSM	-47.2	Pre-AGC	-47.4	22.11	69.51	31.11
				3dB above AGC	-44.4	23.56	67.96	32.56

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 9 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; §27.53- BANDWIDTH

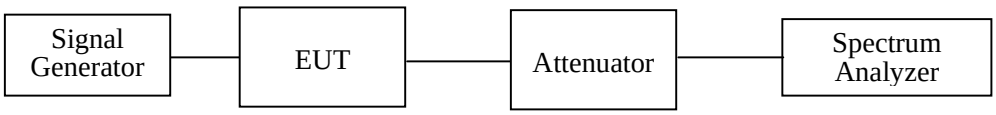
Applicable Standards

FCC 47 §2.1049, §22.917, & §24.238 and §27.53.

Test Procedure

According to KDB 935210 D05 Indus Booster Basic Meas v01r03 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 Data

Environmental Conditions

Temperature:	25℃
Relative Humidity:	51%
ATM Pressure:	103.3kPa

The testing was performed by Carrie He from 2019-06-24 to 2019-07-02.

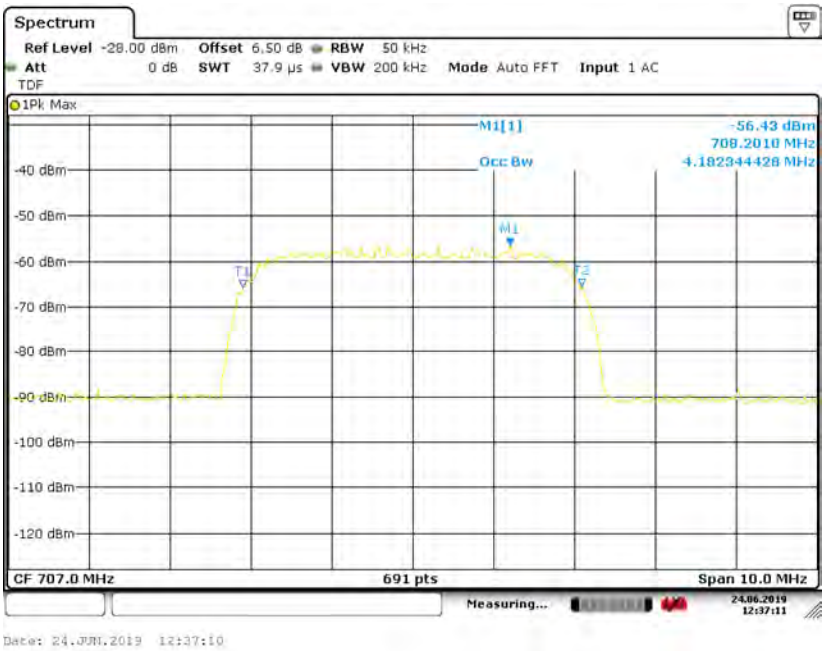
EUT operation mode: Transmitting

Test Result: Compliant.

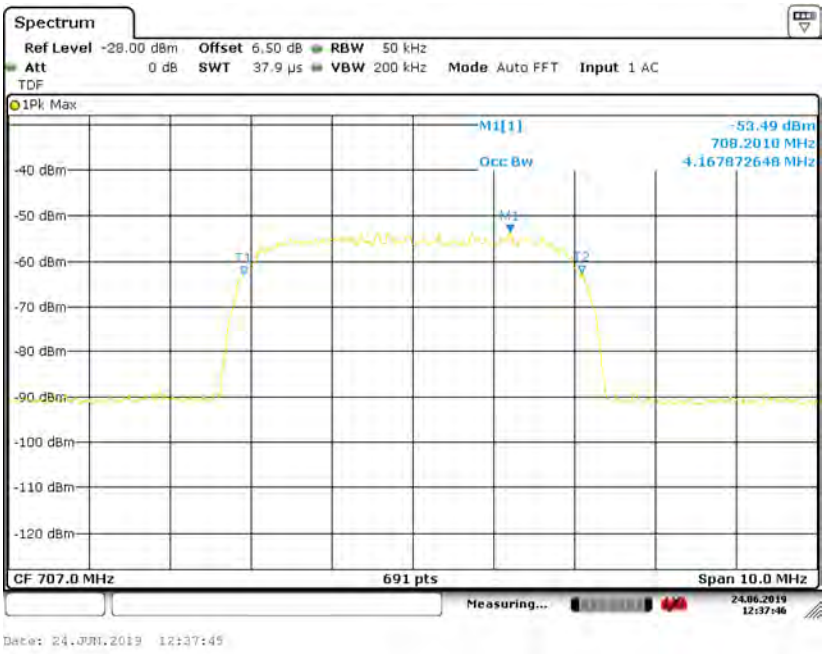
Lower 700MHz (A+B+C Block) Band:

Modes	Signal Type	Signal Level	Frequency (MHz)	99% Bandwidth (MHz)		26dB Bandwidth (MHz)	
				Input	Output	Input	Output
Uplink	AWGN	Pre-AGC	707	4.182	4.038	4.660	4.573
		3dB above AGC	707	4.168	4.052	4.645	4.573
	GSM	Pre-AGC	707	0.246	0.245	0.310	0.310
		3dB above AGC	707	0.243	0.245	0.310	0.310
Downlink	AWGN	Pre-AGC	737	4.182	4.110	4.660	4.616
		3dB above AGC	737	4.153	4.110	4.631	4.631
	GSM	Pre-AGC	737	0.243	0.243	0.311	0.310
		3dB above AGC	737	0.243	0.243	0.310	0.310

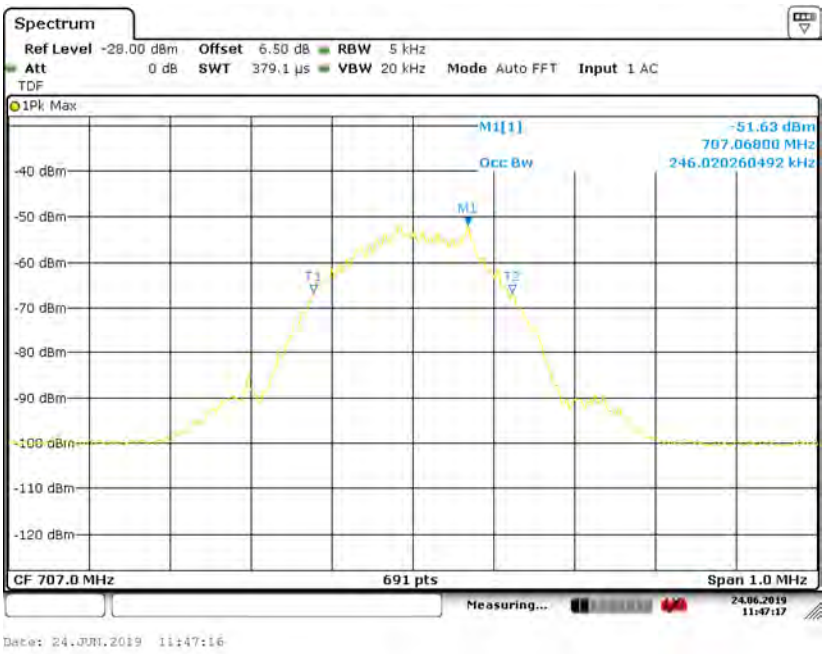
99% Bandwidth-UL-AWGN-Pre AGC-Input



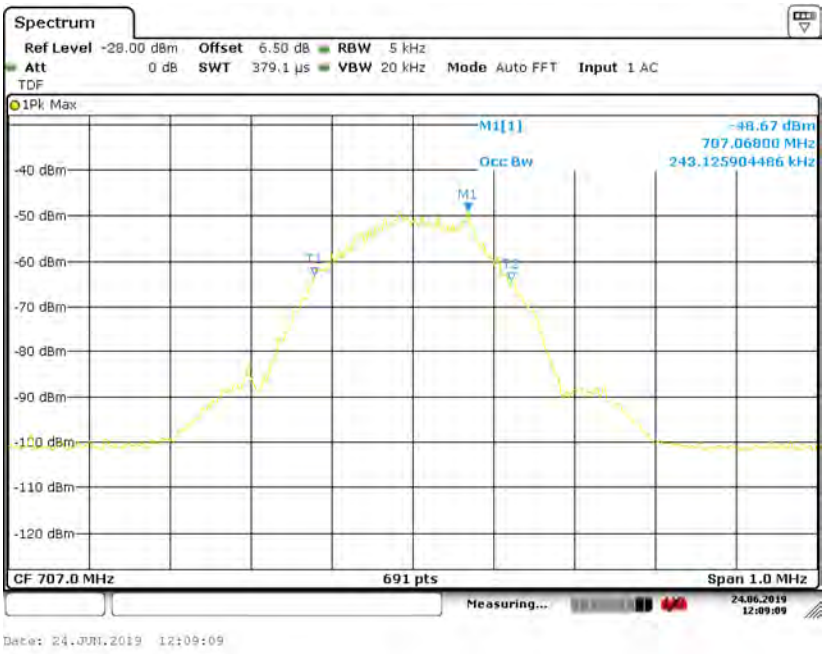
99% Bandwidth-UL- AWGN-3dB above AGC-Input



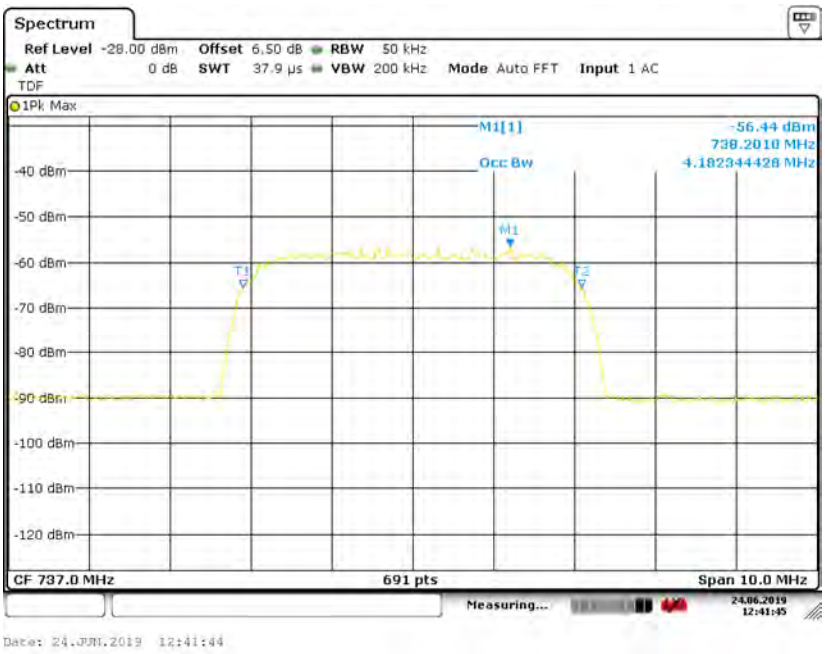
99% Bandwidth-UL-GSM-Pre AGC-Input



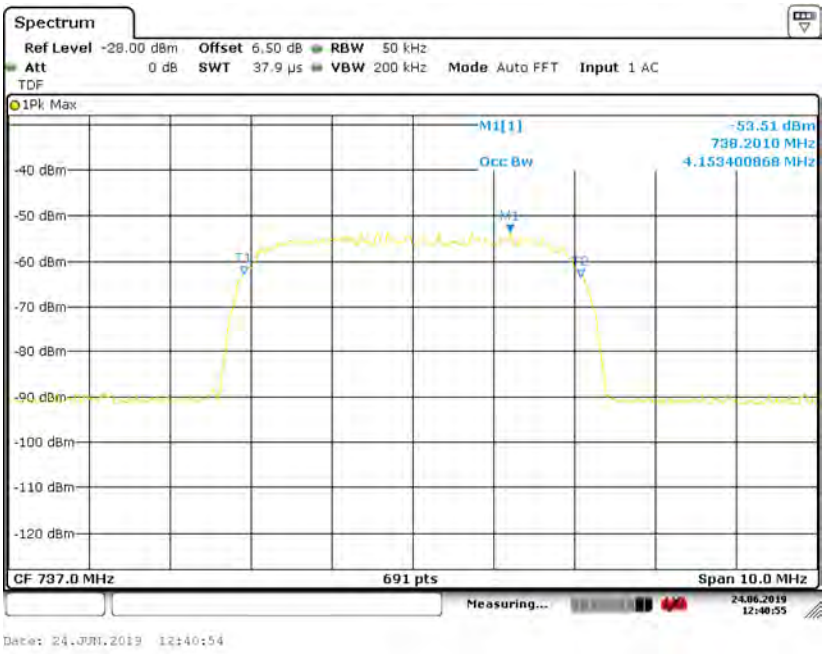
99% Bandwidth-UL- GSM-3dB above AGC-Input



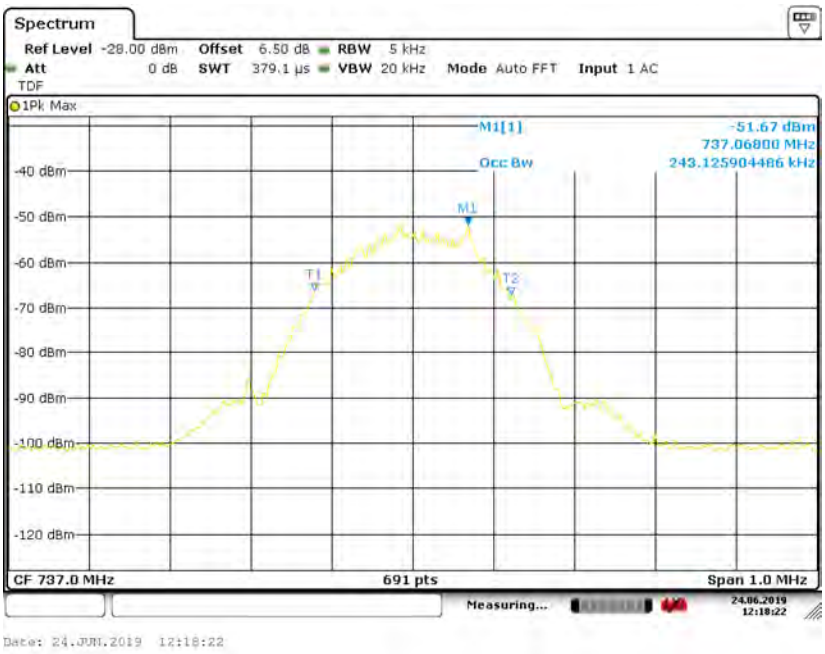
99% Bandwidth-DL-AWGN-Pre AGC-Input



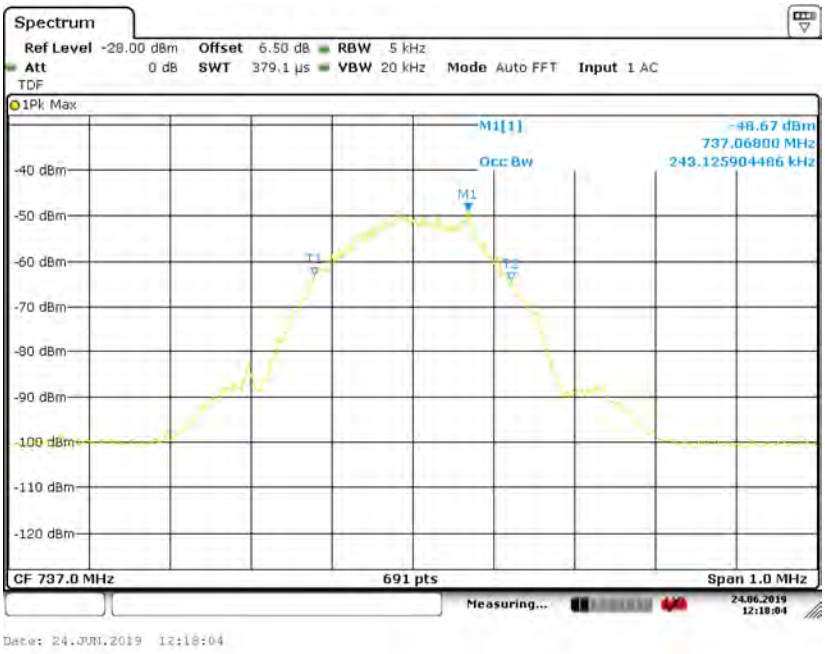
99% Bandwidth-DL- AWGN-3dB above AGC-Input



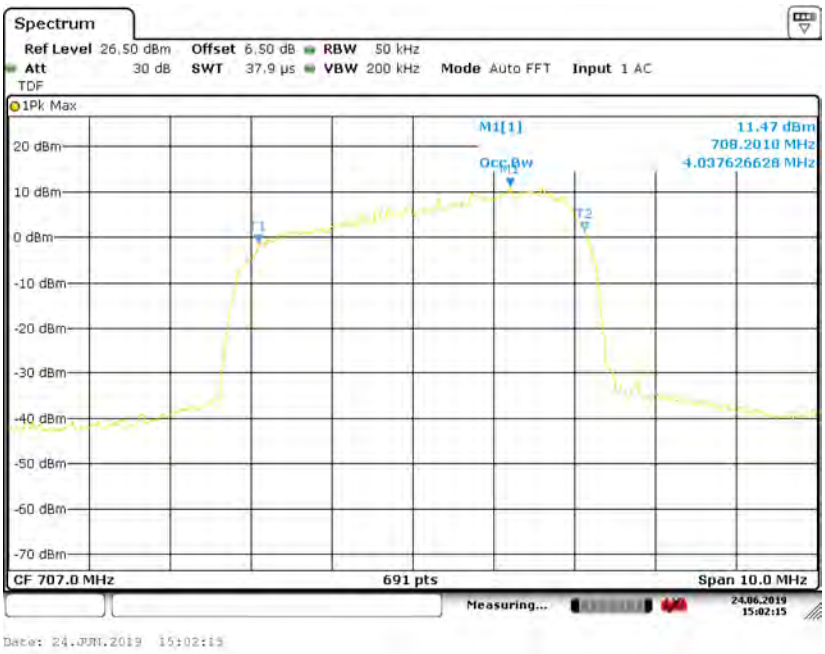
99% Bandwidth-DL-GSM-Pre AGC-Input



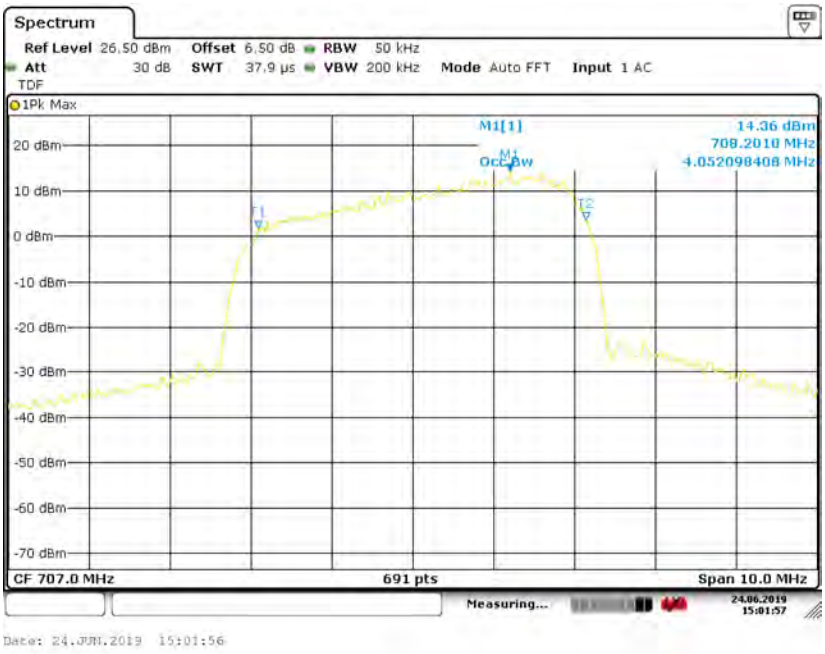
99% Bandwidth-DL- GSM-3dB above AGC-Input



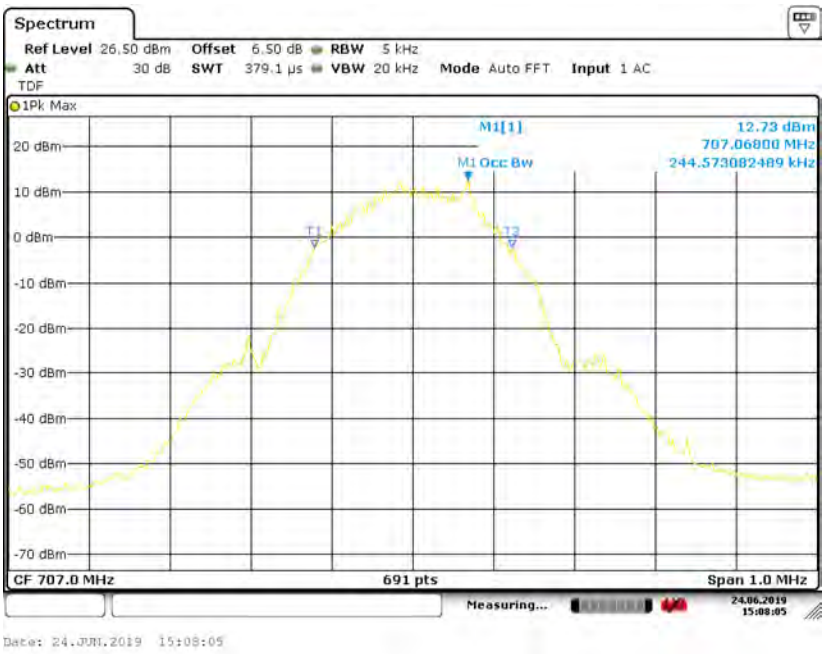
99% Bandwidth-UL-AWGN-Pre AGC- Output



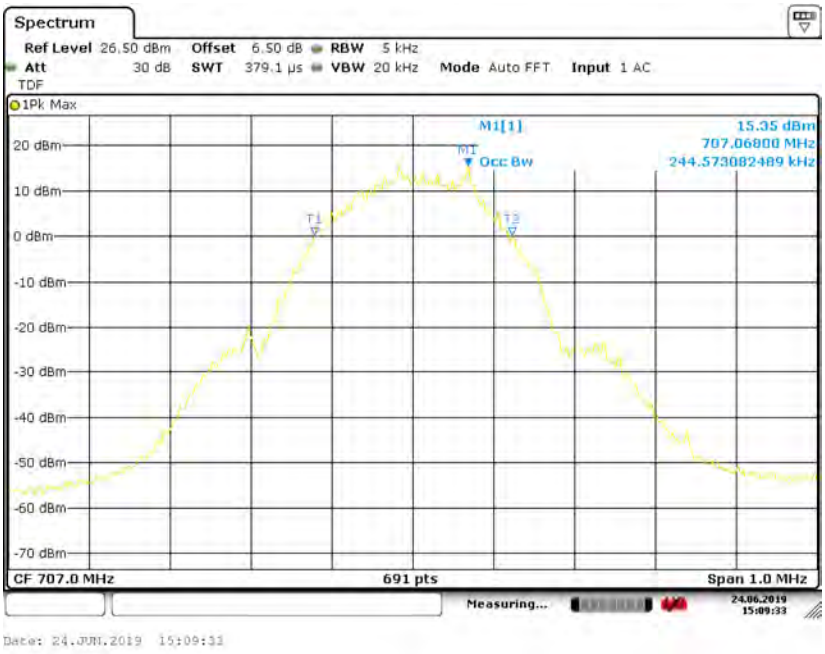
99% Bandwidth-UL- AWGN-3dB above AGC- Output



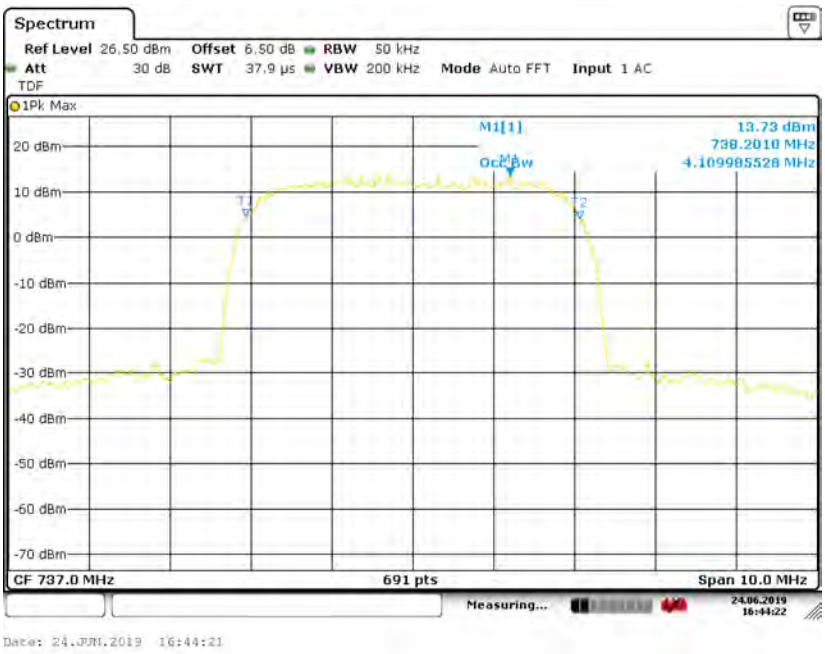
99% Bandwidth-UL-GSM-Pre AGC- Output



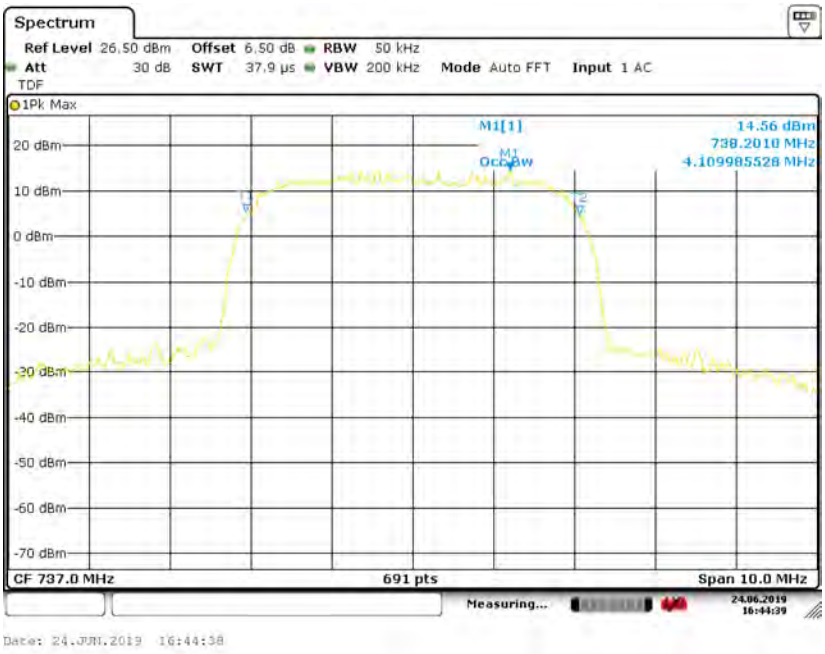
99% Bandwidth-UL- GSM-3dB above AGC- Output



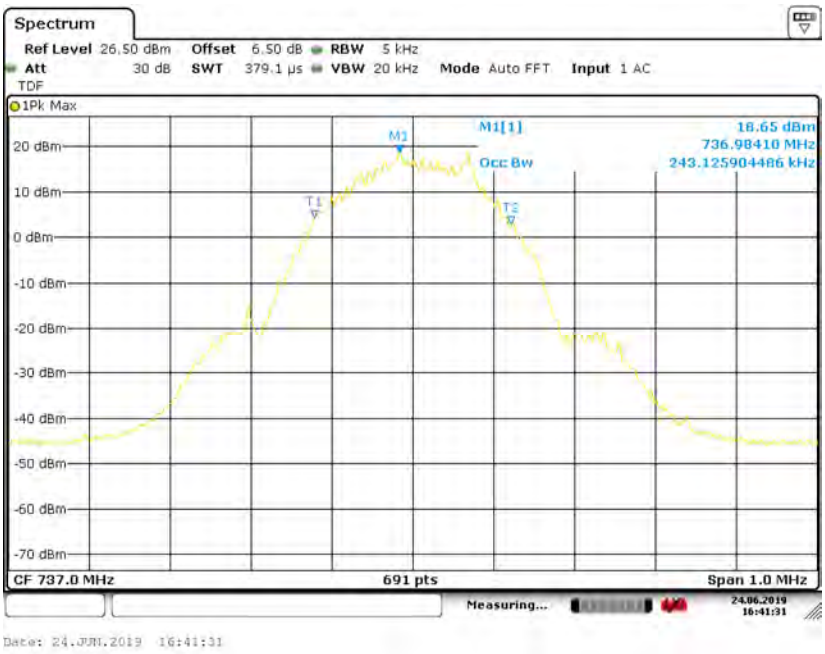
99% Bandwidth-DL-AWGN-Pre AGC- Output



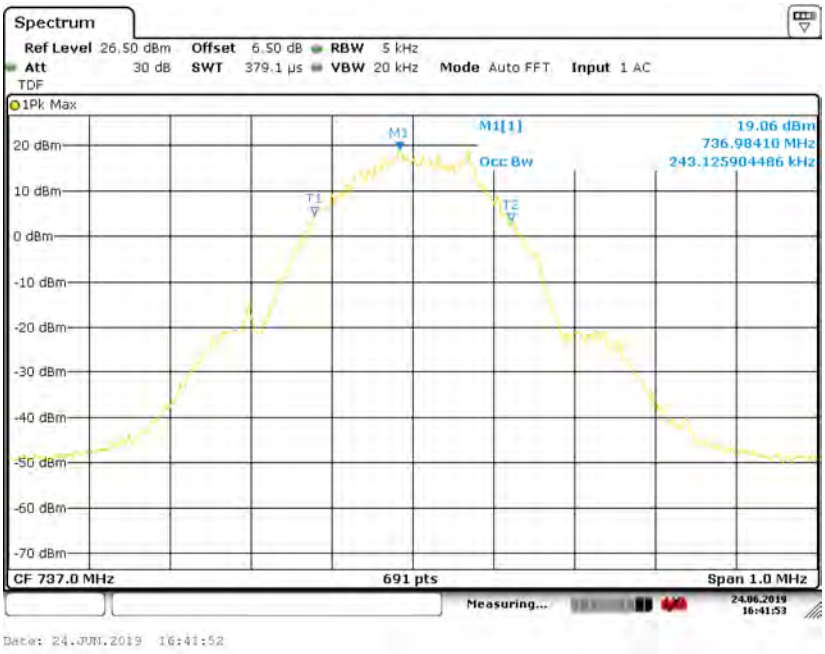
99% Bandwidth-DL- AWGN-3dB above AGC- Output



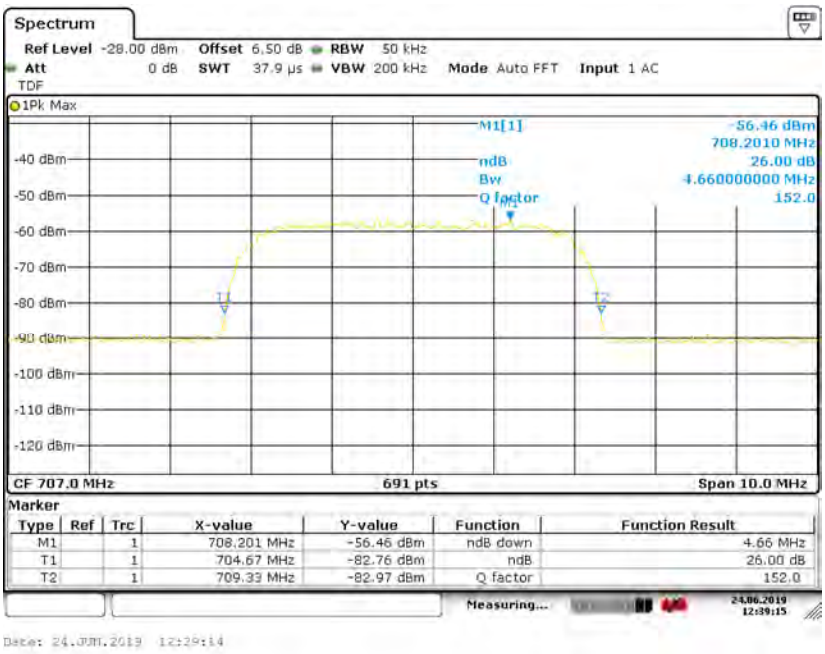
99% Bandwidth-DL-GSM-Pre AGC-Output



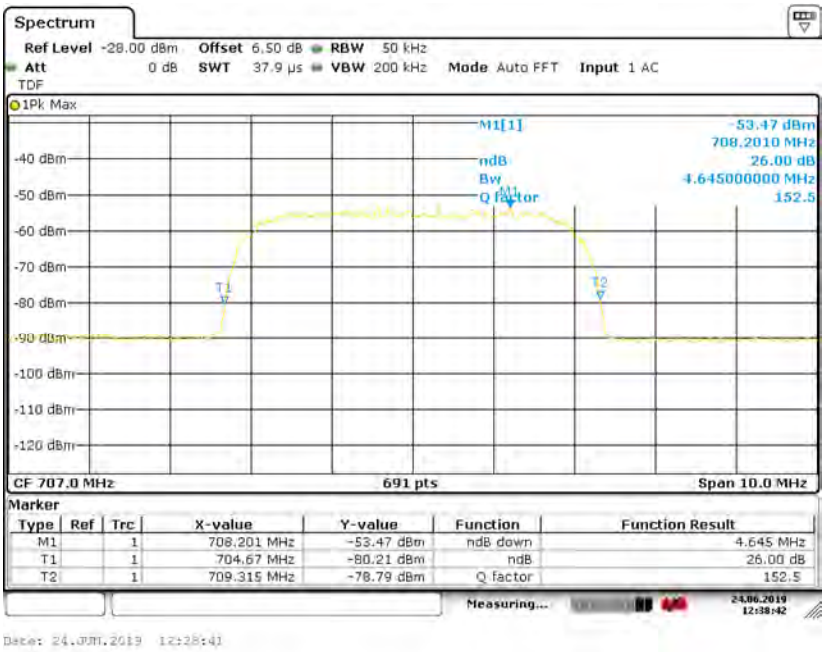
99% Bandwidth-DL- GSM-3dB above AGC-Output



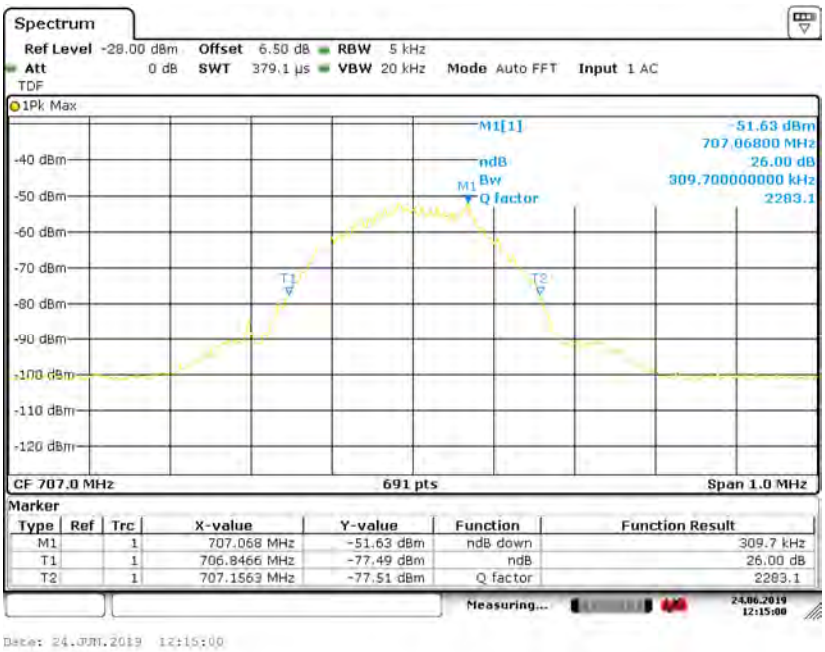
26dB Bandwidth-UL-AWGN-Pre AGC-Input



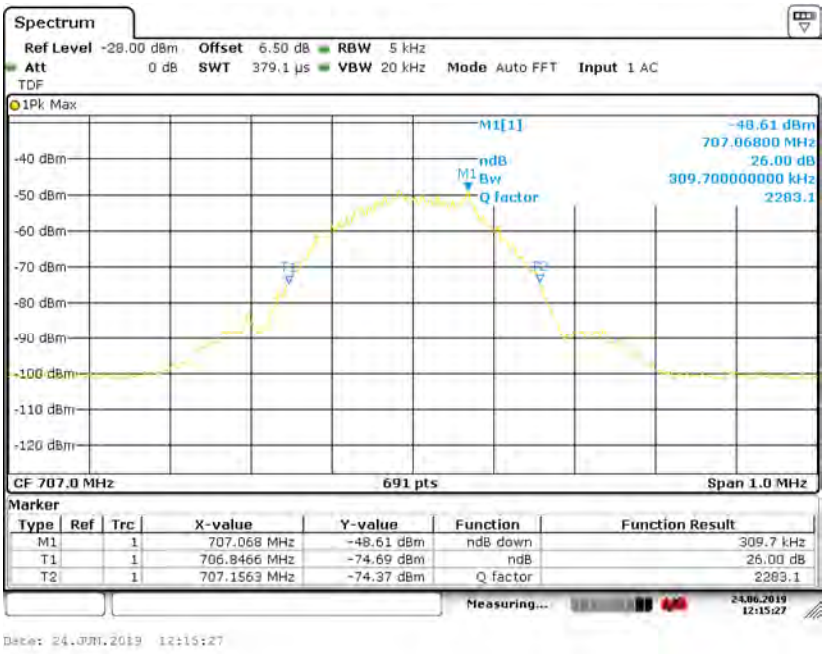
26dB Bandwidth-UL- AWGN-3dB above AGC-Input



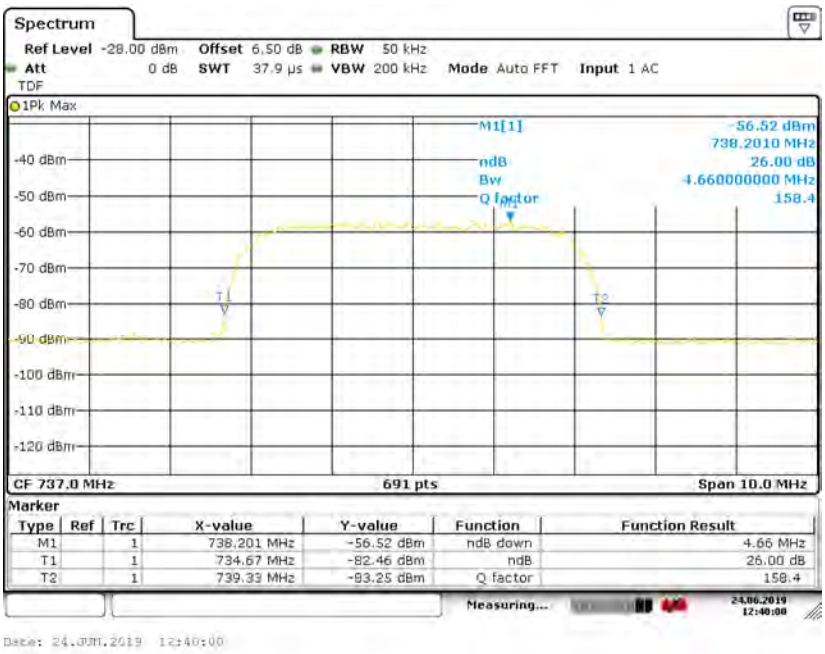
26dB Bandwidth-UL-GSM-Pre AGC-Input



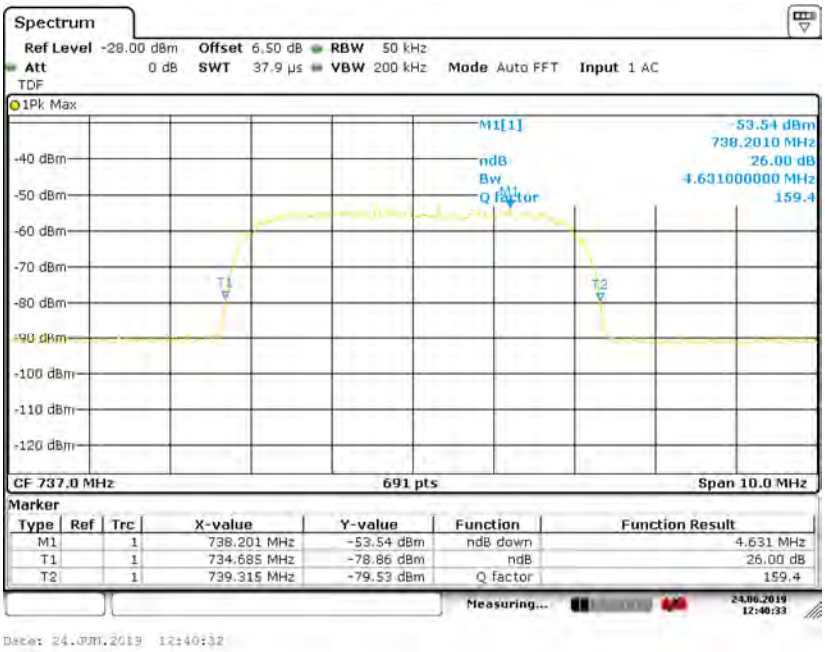
26dB Bandwidth-UL- GSM-3dB above AGC-Input



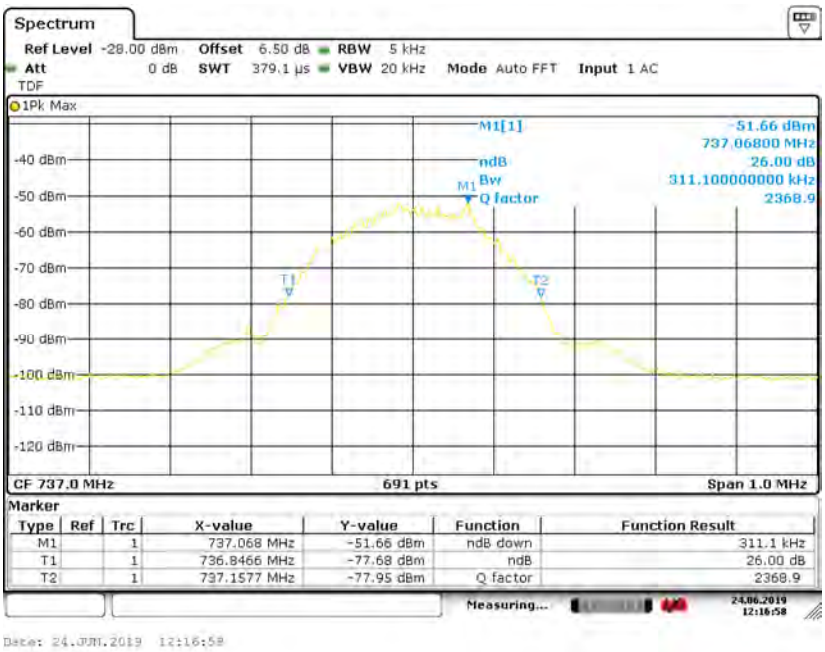
26dB Bandwidth-DL-AWGN-Pre AGC-Input



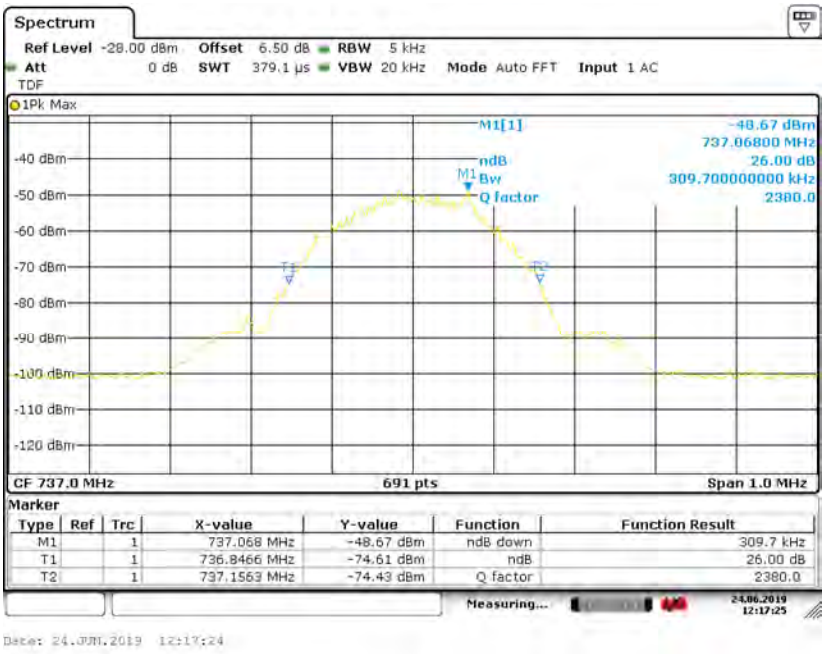
26dB Bandwidth-DL- AWGN-3dB above AGC-Input



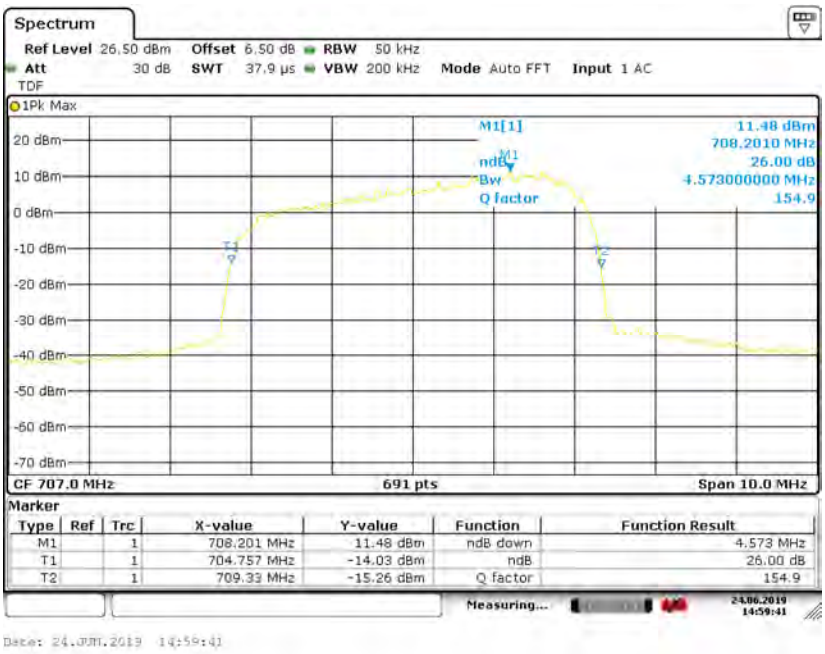
26dB Bandwidth-DL-GSM-Pre AGC-Input



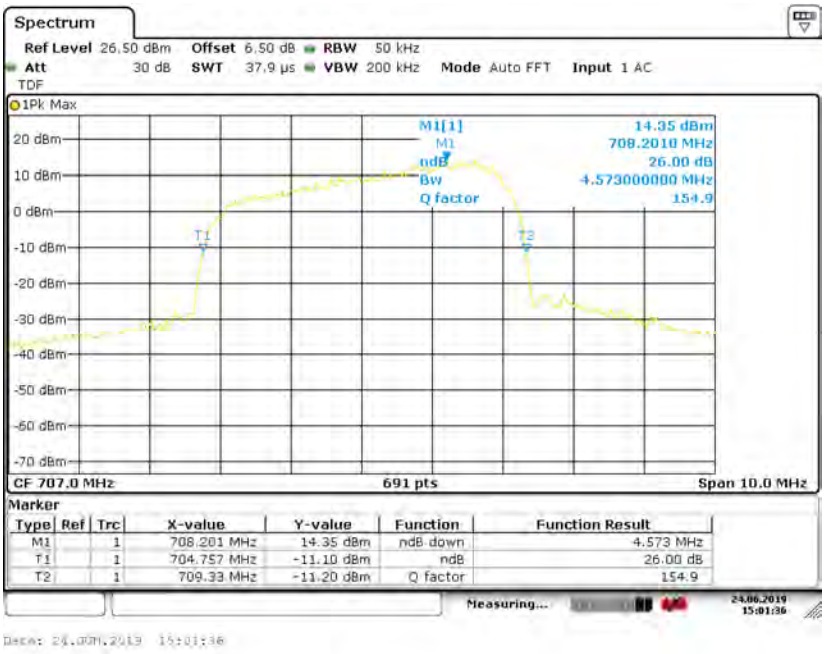
26dB Bandwidth-DL- GSM-3dB above AGC-Input



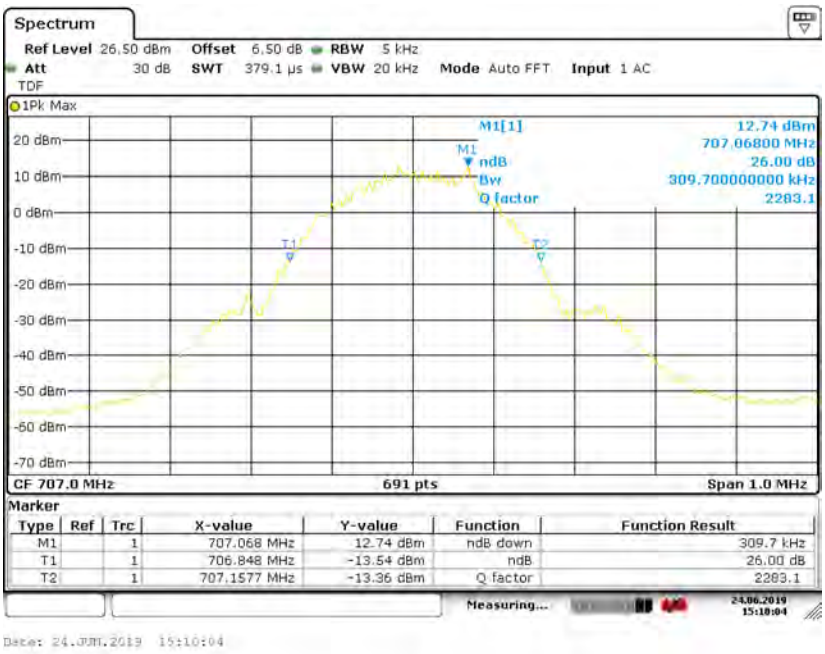
26dB Bandwidth-UL-AWGN-Pre AGC- Output



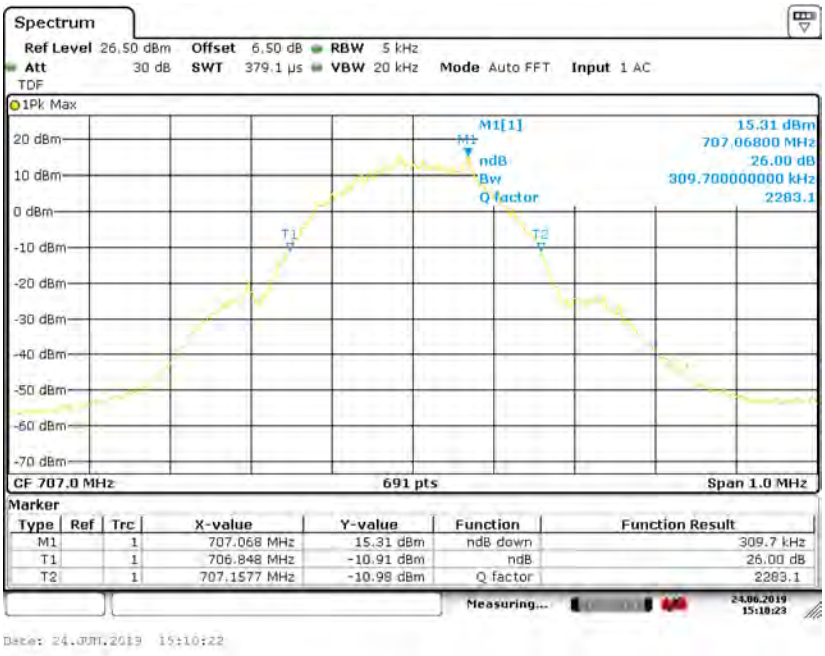
26dB Bandwidth-UL- AWGN-3dB above AGC- Output



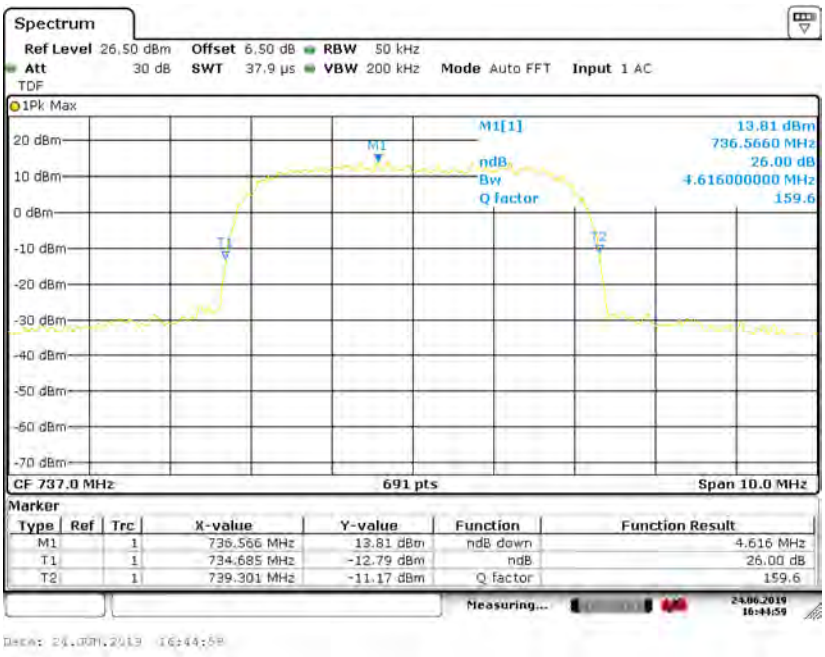
26dB Bandwidth-UL-GSM-Pre AGC- Output



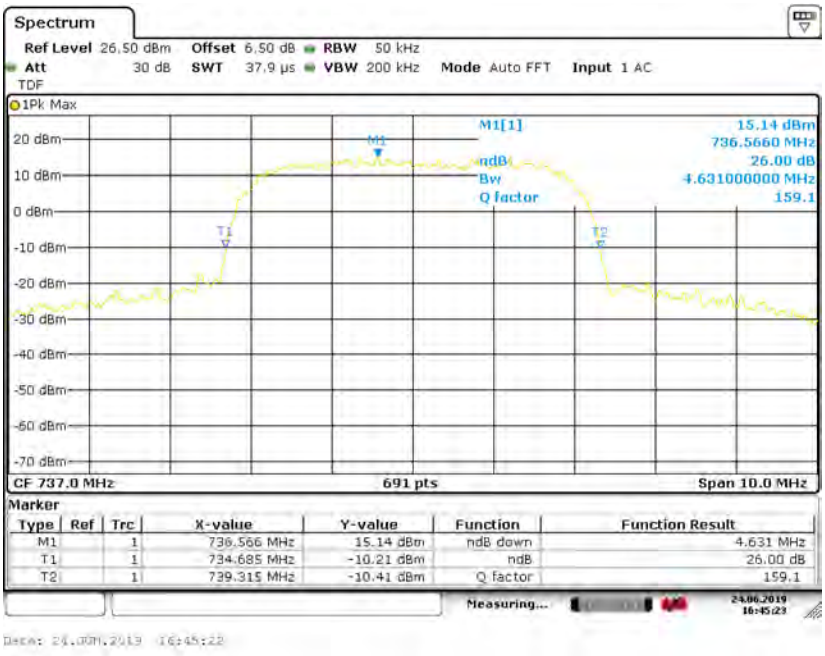
26dB Bandwidth-UL- GSM-3dB above AGC- Output



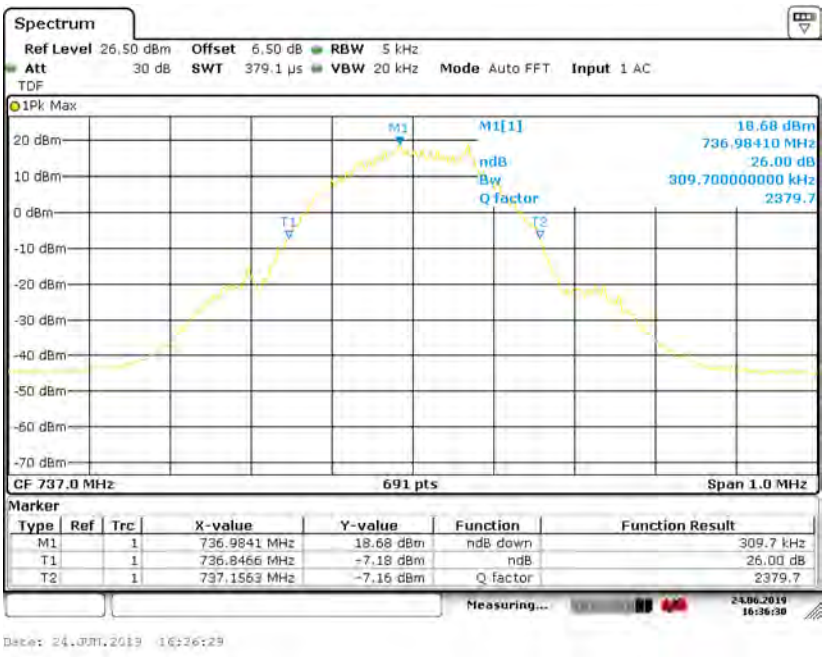
26dB Bandwidth-DL-AWGN-Pre AGC- Output



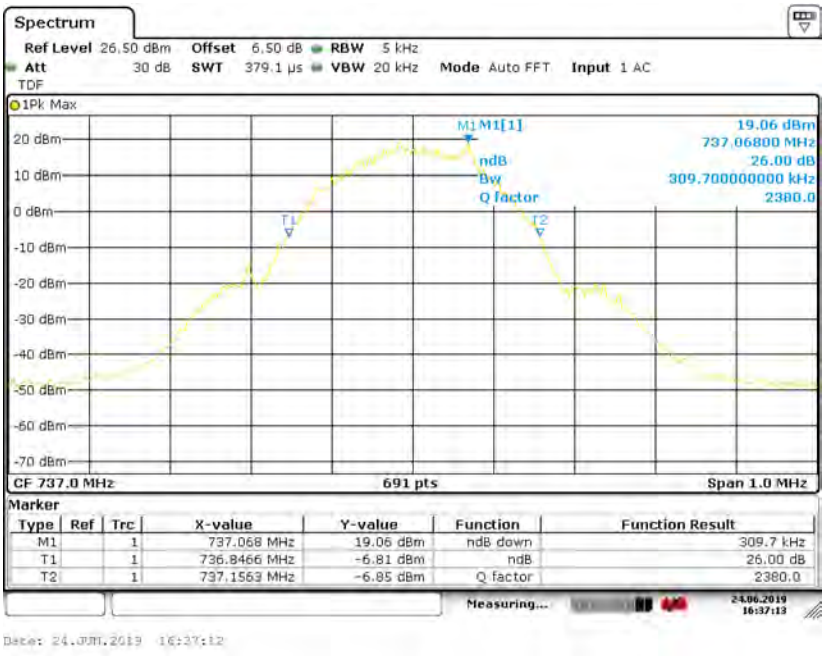
26dB Bandwidth-DL- AWGN-3dB above AGC- Output



26dB Bandwidth-DL-GSM-Pre AGC-Output



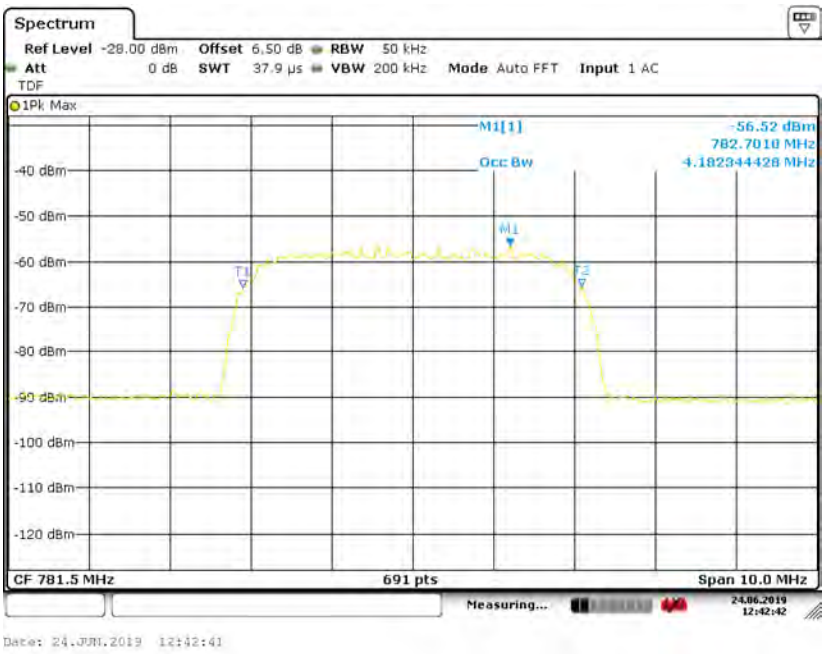
26dB Bandwidth-DL- GSM-3dB above AGC-Output



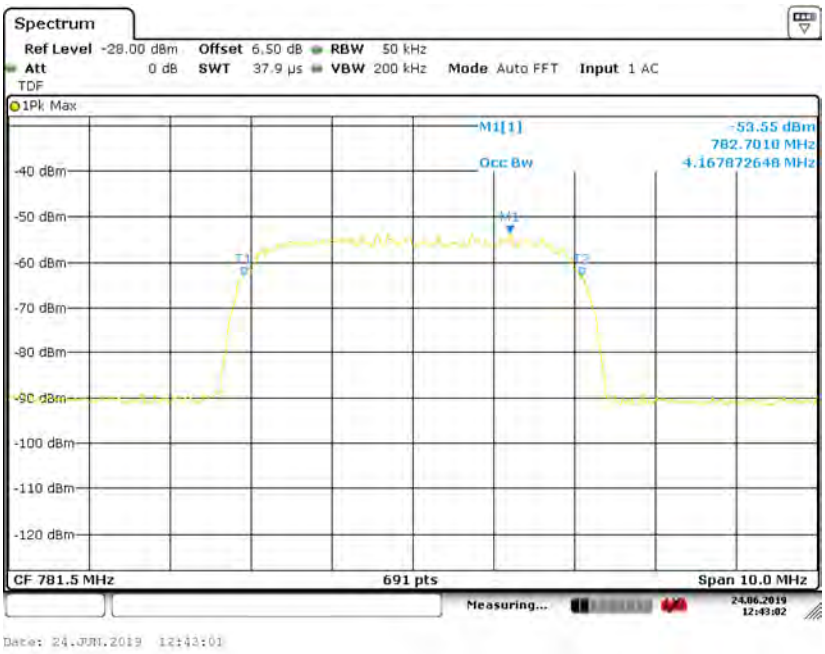
Upper 700MHz (C Block) Band:

Modes	Signal Type	Signal Level	Frequency (MHz)	99% Bandwidth (MHz)		26dB Bandwidth (MHz)	
				Input	Output	Input	Output
Uplink	AWGN	Pre-AGC	781.5	4.182	4.081	4.660	4.602
		3dB above AGC	781.5	4.168	4.096	4.645	4.631
	GSM	Pre-AGC	781.5	0.247	0.243	0.311	0.310
		3dB above AGC	781.5	0.246	0.243	0.310	0.310
Downlink	AWGN	Pre-AGC	751.5	4.182	4.110	4.660	4.616
		3dB above AGC	751.5	4.168	4.110	4.631	4.631
	GSM	Pre-AGC	751.5	0.245	0.245	0.310	0.311
		3dB above AGC	751.5	0.243	0.245	0.311	0.311

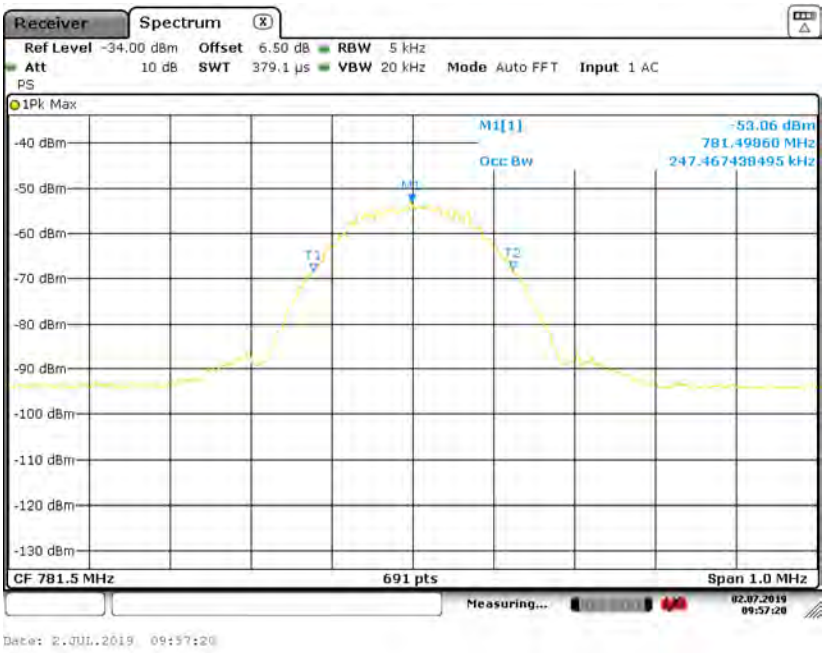
99% Bandwidth-UL-AWGN-Pre AGC-Input



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

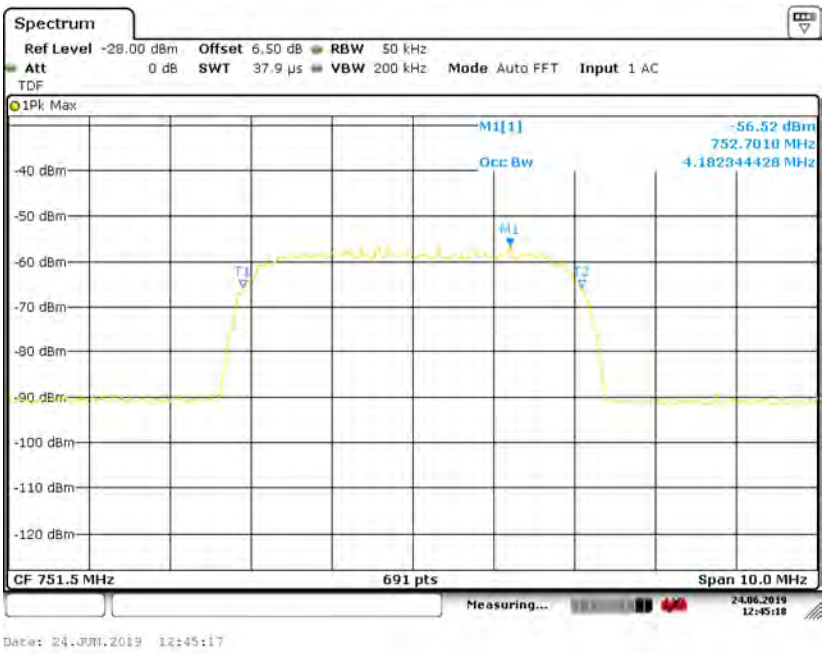


99% Bandwidth-UL-GSM-Pre AGC-Input

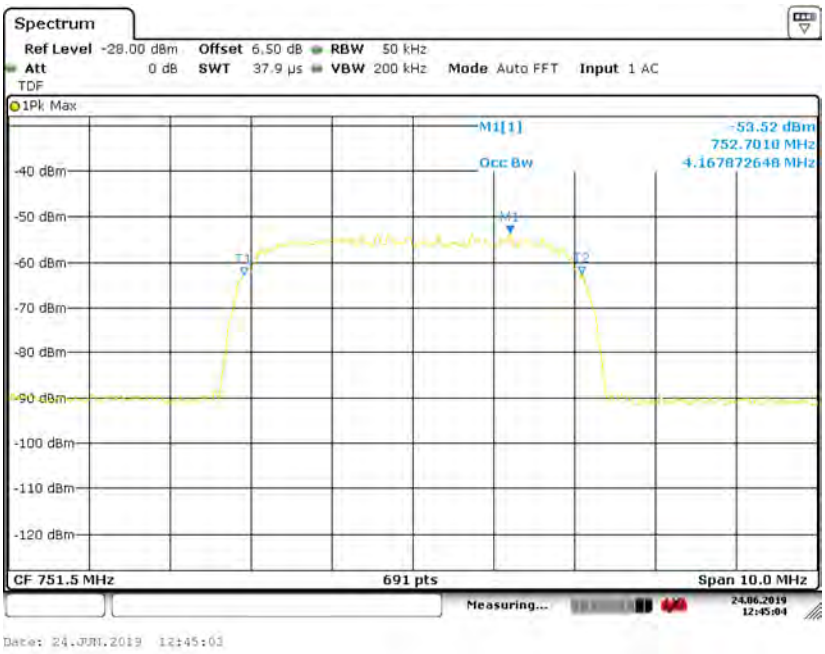


99% Bandwidth-UL- GSM-3dB above AGC-Input

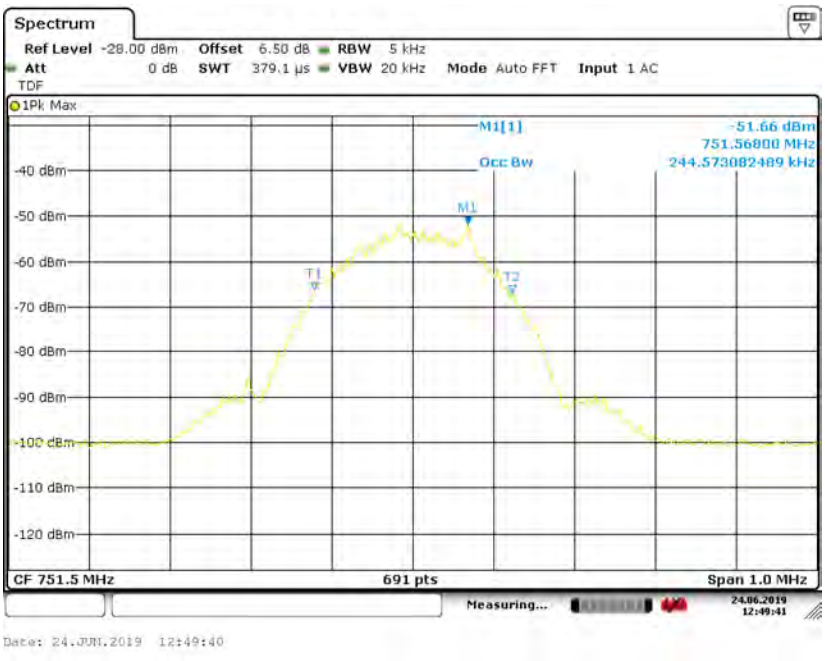
99% Bandwidth-DL-AWGN-Pre AGC-Input



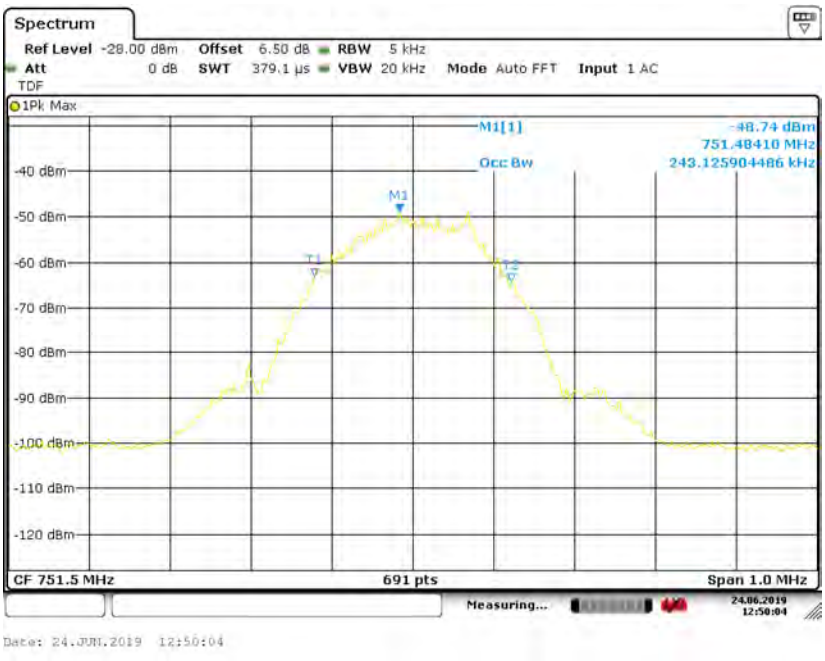
99% Bandwidth-DL- AWGN-3dB above AGC-Input



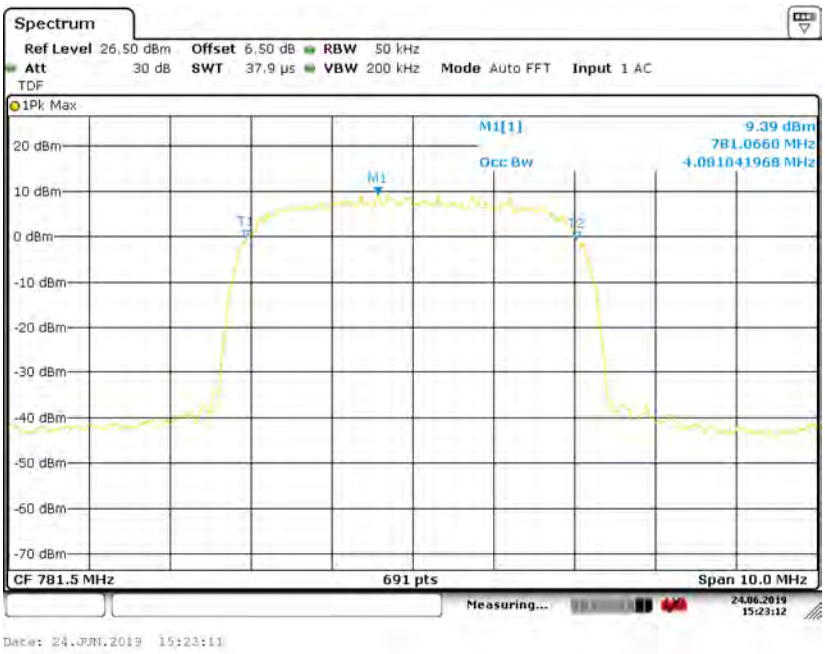
99% Bandwidth-DL-GSM-Pre AGC-Input



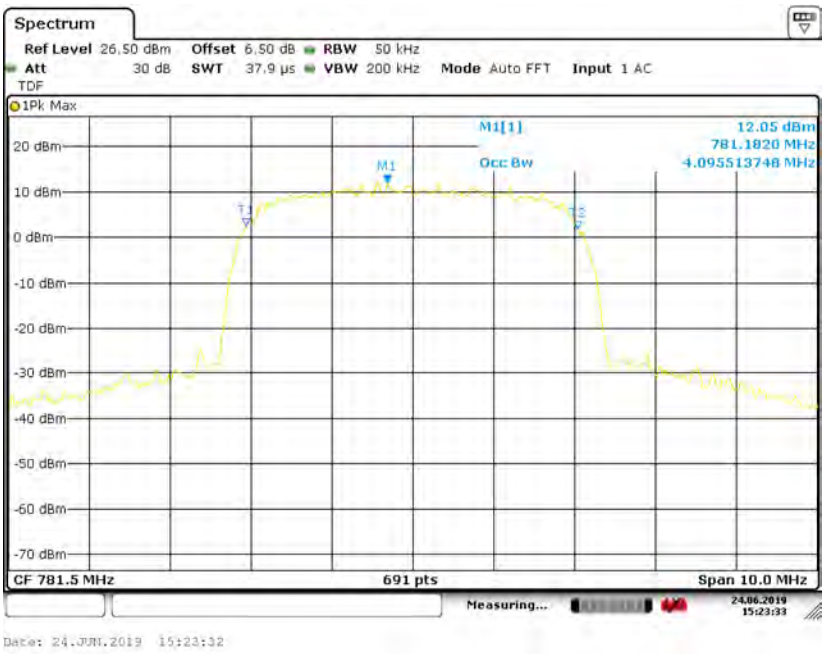
99% Bandwidth-DL- GSM-3dB above AGC-Input



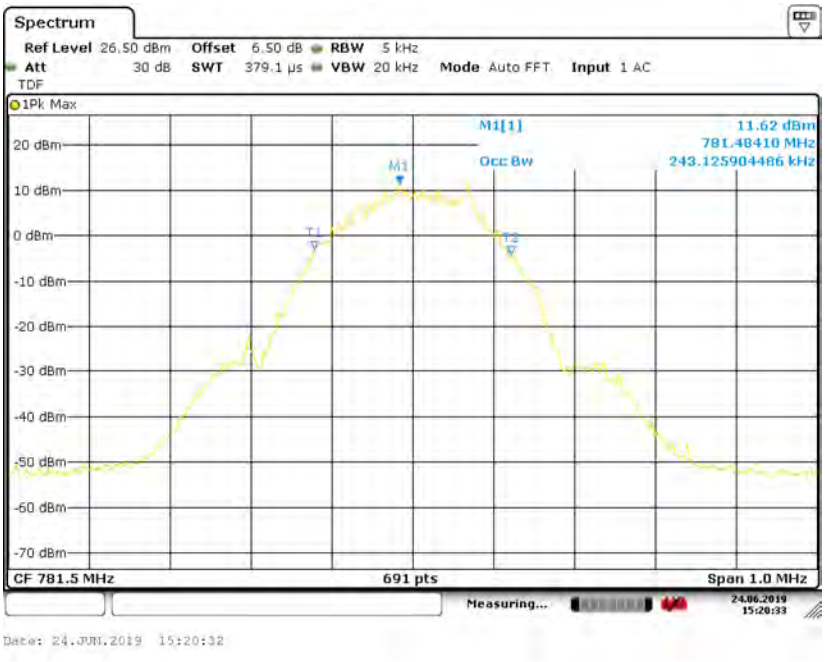
99% Bandwidth-UL-AWGN-Pre AGC- Output



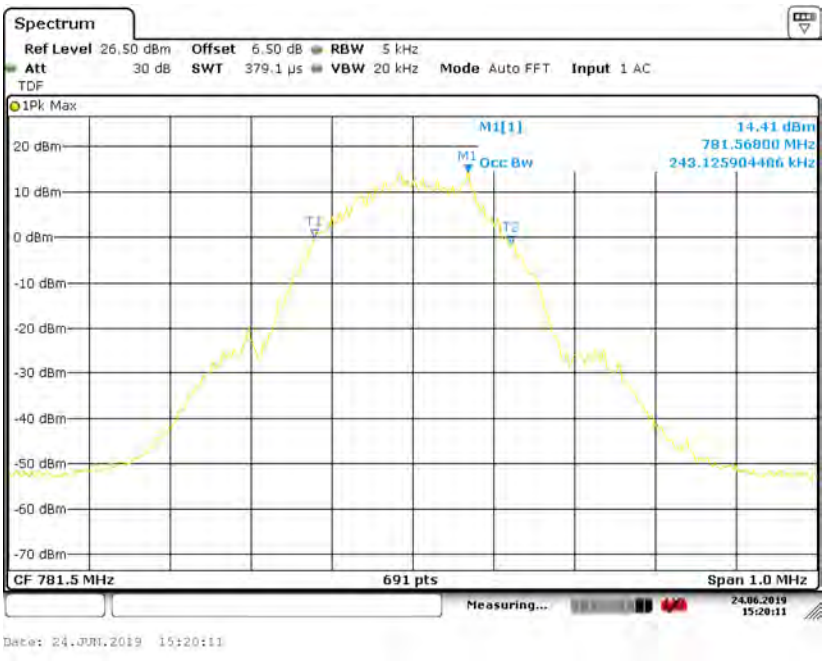
99% Bandwidth-UL- AWGN-3dB above AGC- Output



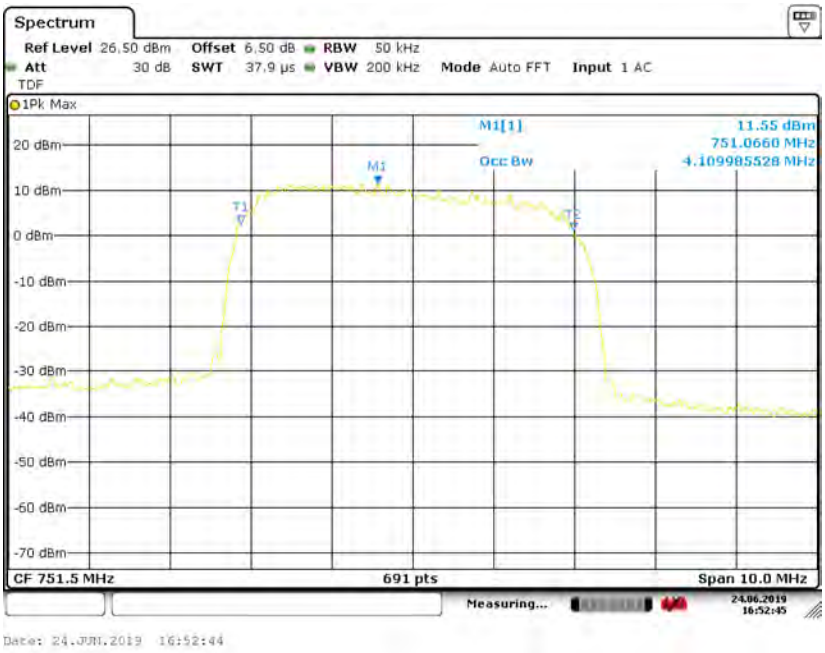
99% Bandwidth-UL-GSM-Pre AGC- Output



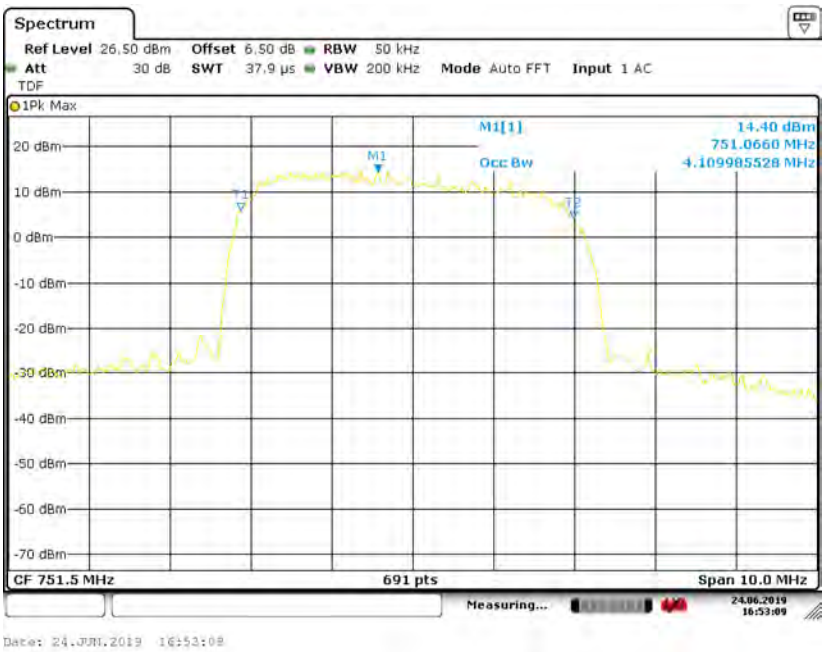
99% Bandwidth-UL- GSM-3dB above AGC- Output



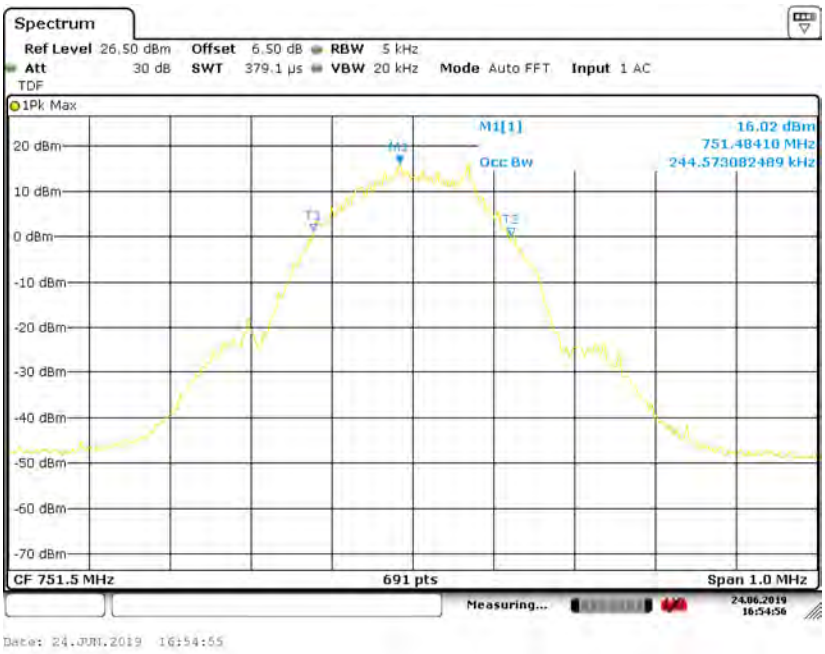
99% Bandwidth-DL-AWGN-Pre AGC- Output



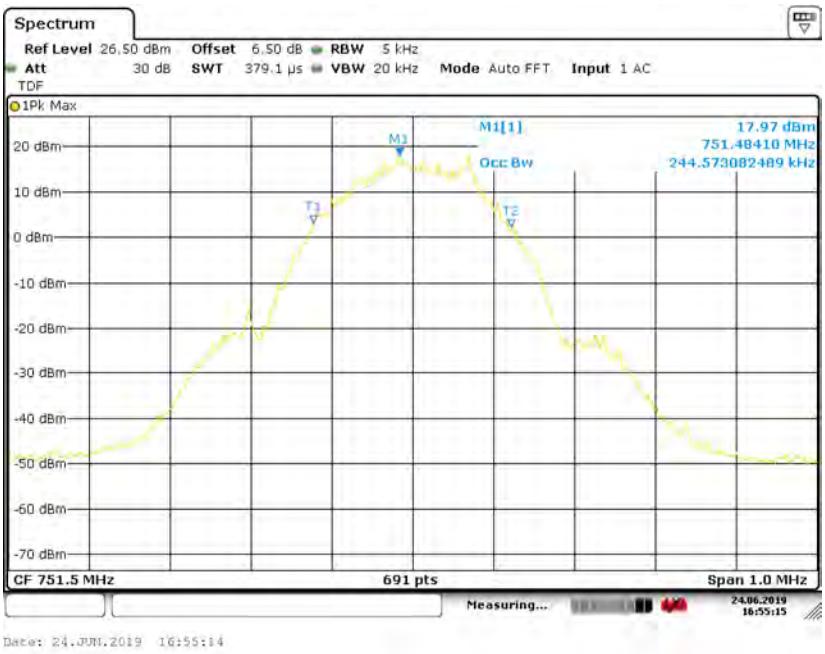
99% Bandwidth-DL- AWGN-3dB above AGC- Output



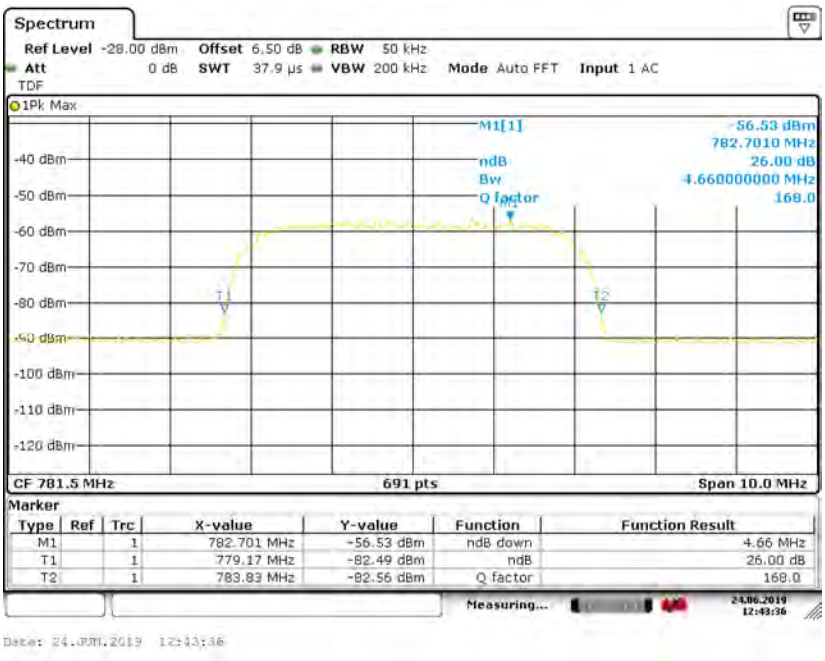
99% Bandwidth-DL-GSM-Pre AGC-Output



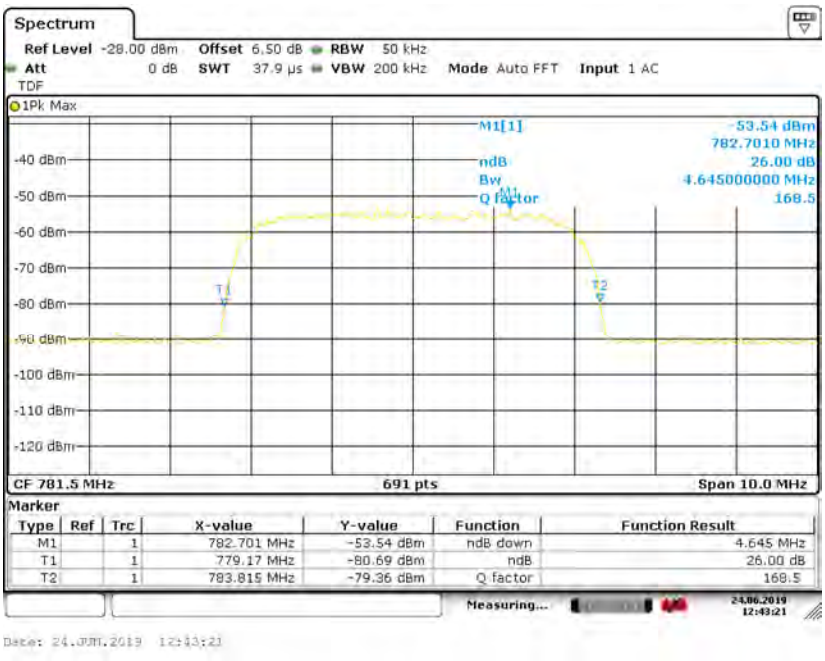
99% Bandwidth-DL- GSM-3dB above AGC-Output



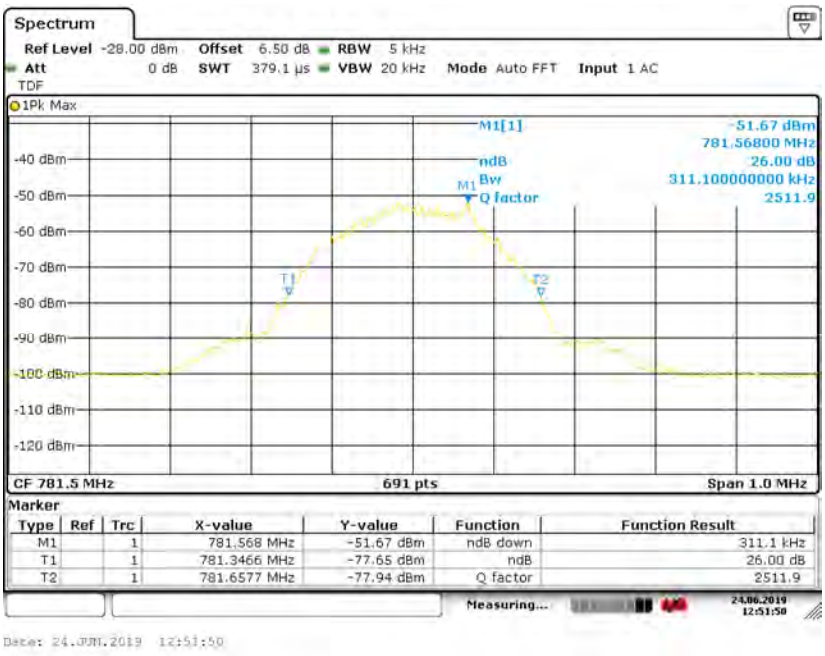
26dB Bandwidth-UL-AWGN-Pre AGC-Input



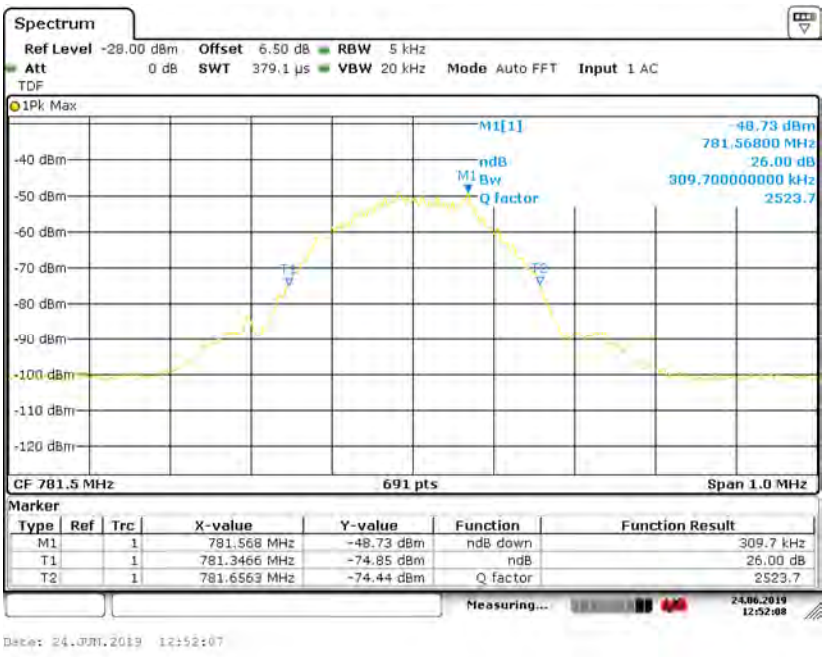
26dB Bandwidth-UL- AWGN-3dB above AGC-Input



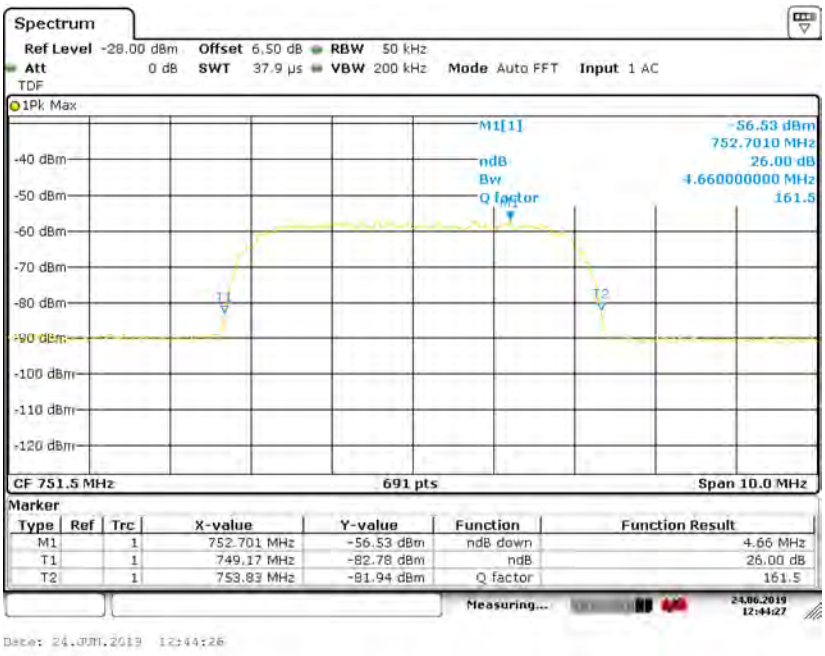
26dB Bandwidth-UL-GSM-Pre AGC-Input



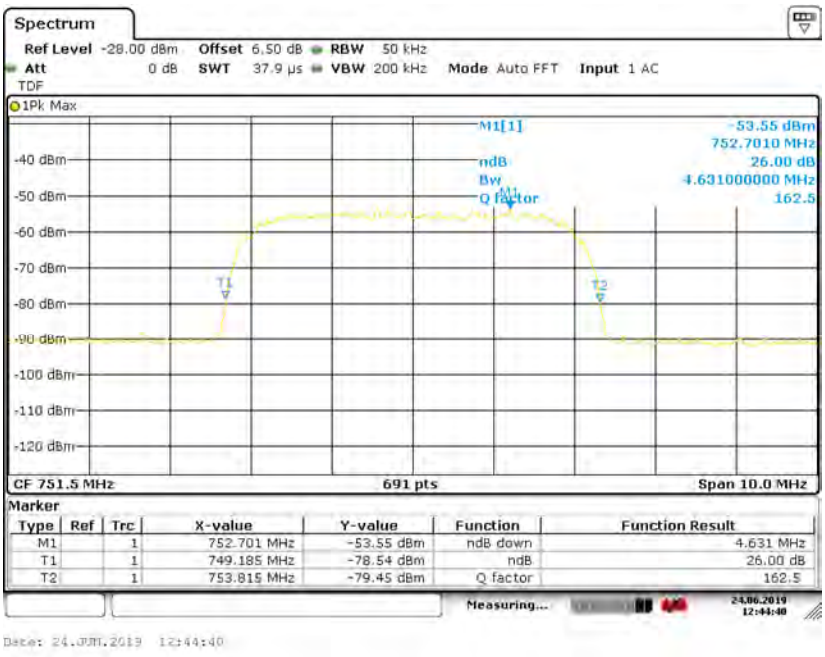
26dB Bandwidth-UL- GSM-3dB above AGC-Input



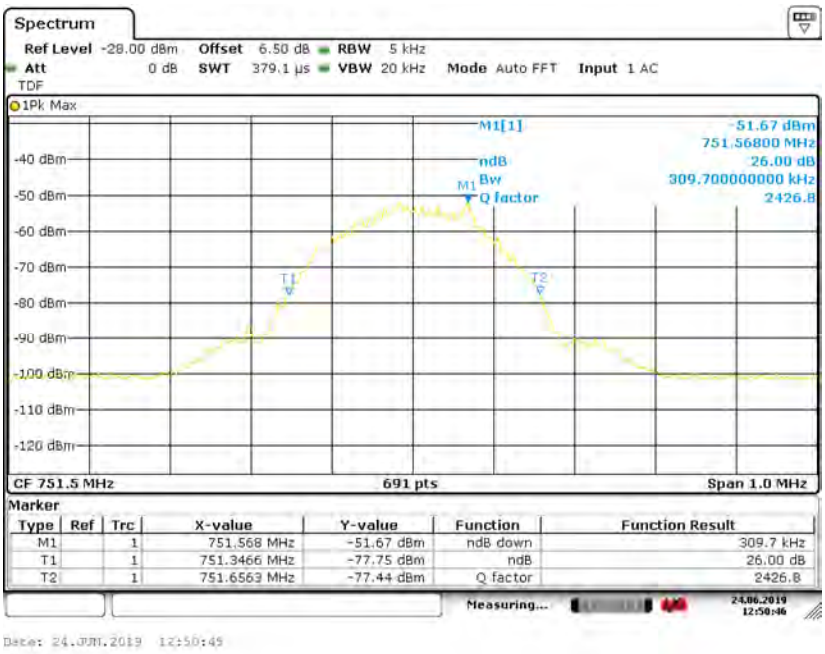
26dB Bandwidth-DL-AWGN-Pre AGC-Input



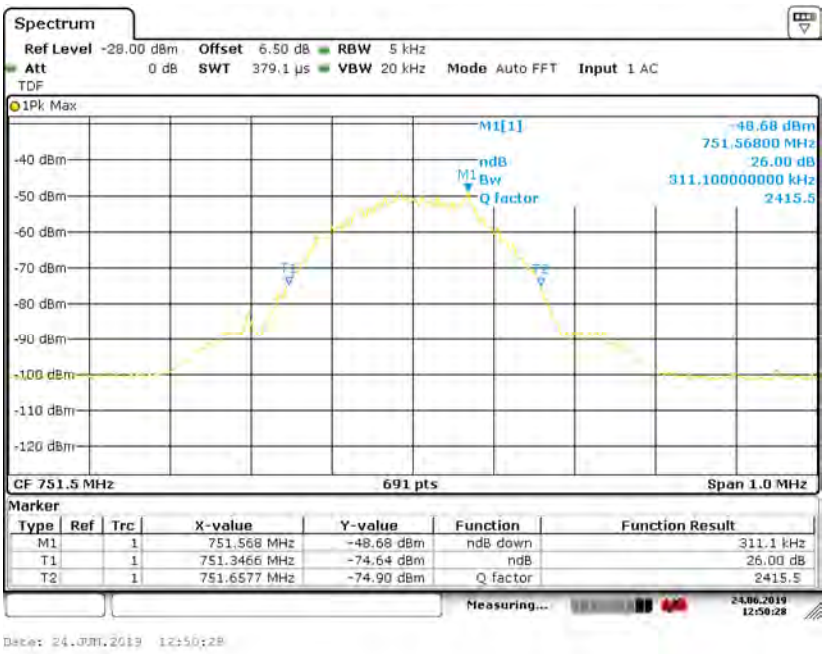
26dB Bandwidth-DL- AWGN-3dB above AGC-Input



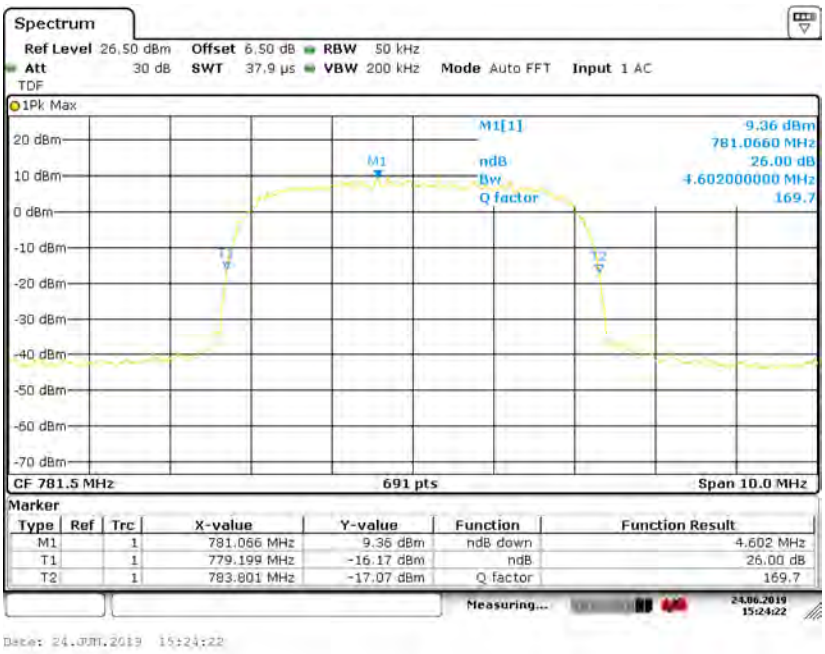
26dB Bandwidth-DL-GSM-Pre AGC-Input



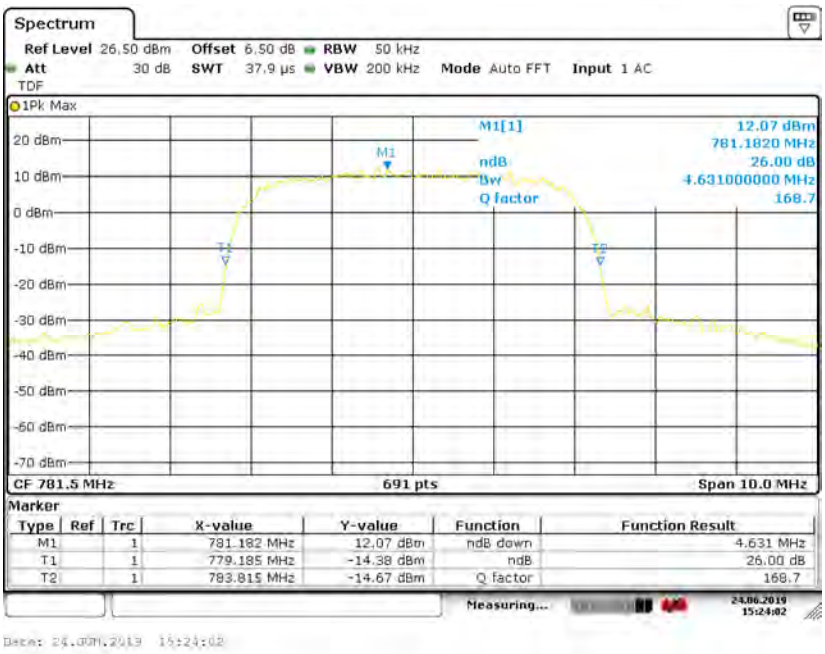
26dB Bandwidth-DL- GSM-3dB above AGC-Input



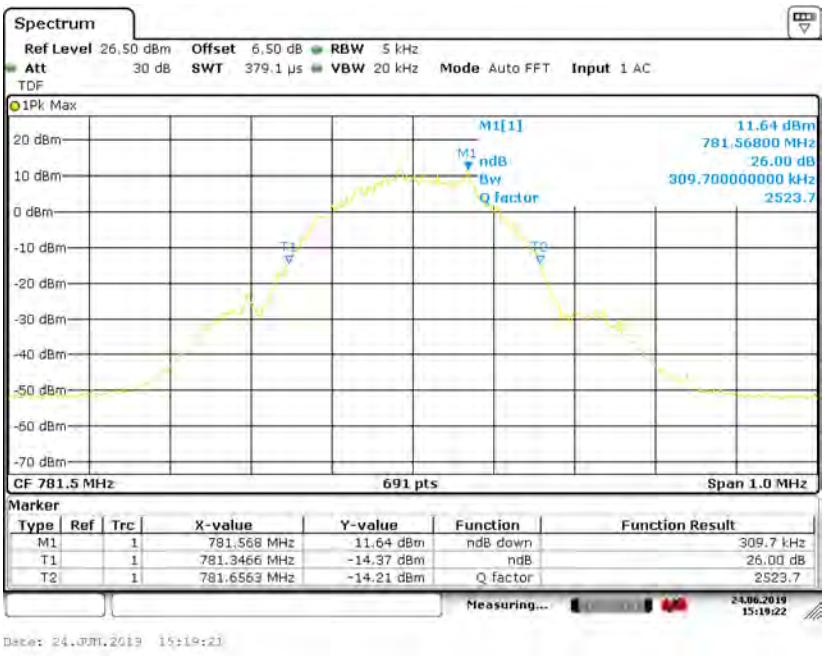
26dB Bandwidth-UL-AWGN-Pre AGC- Output



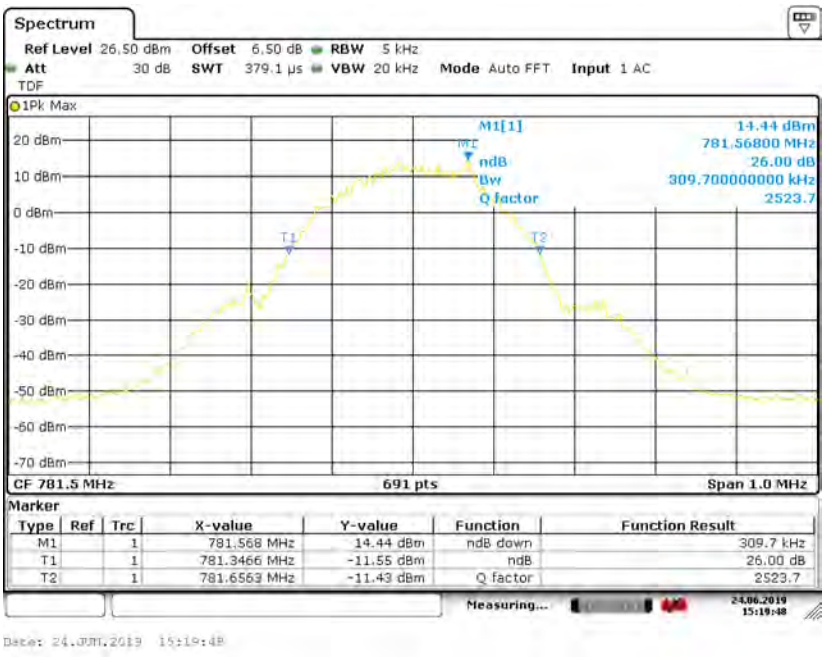
26dB Bandwidth-UL- AWGN-3dB above AGC- Output



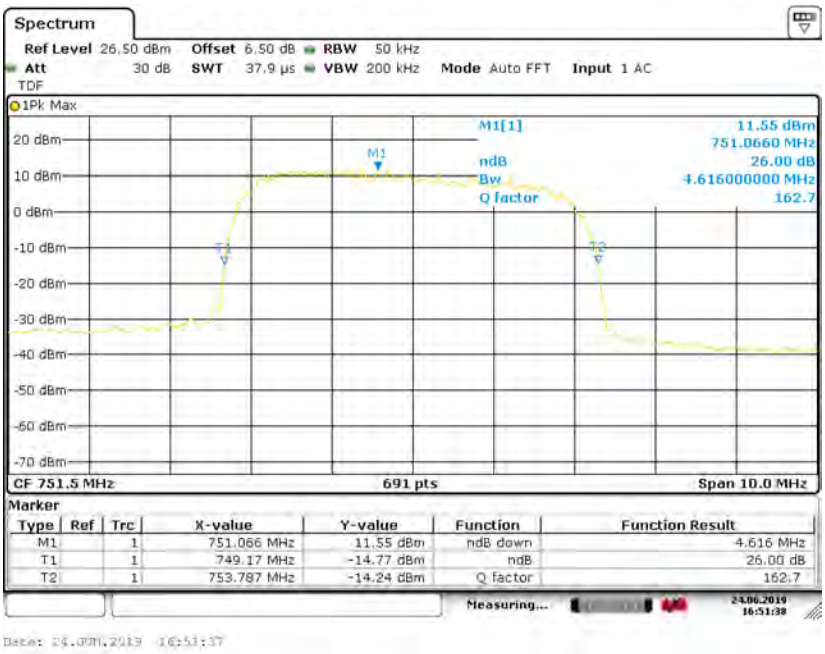
26dB Bandwidth-UL-GSM-Pre AGC- Output



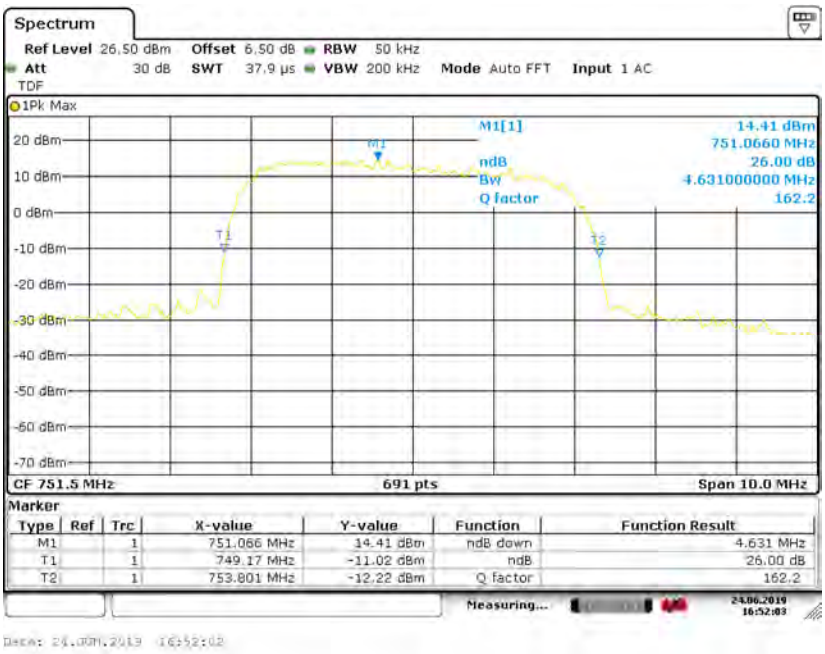
26dB Bandwidth-UL- GSM-3dB above AGC- Output



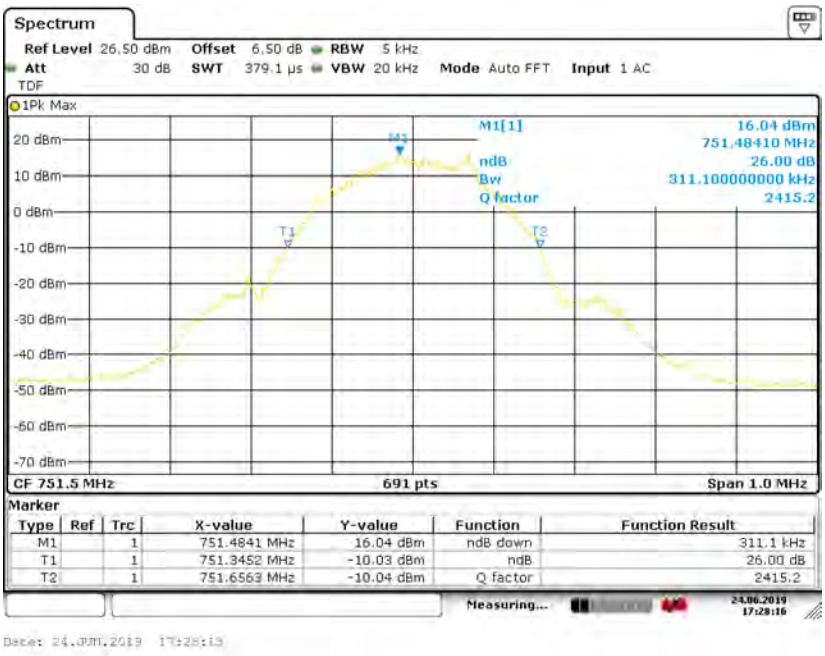
26dB Bandwidth-DL-AWGN-Pre AGC- Output



26dB Bandwidth-DL- AWGN-3dB above AGC- Output



26dB Bandwidth-DL-GSM-Pre AGC-Output



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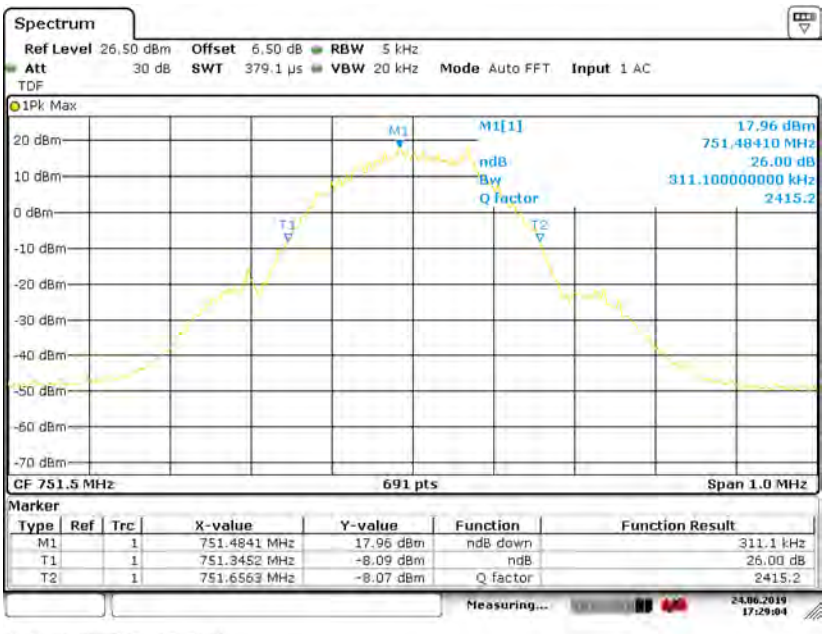
26dB Bandwidth-DL- GSM-3dB above AGC-Output



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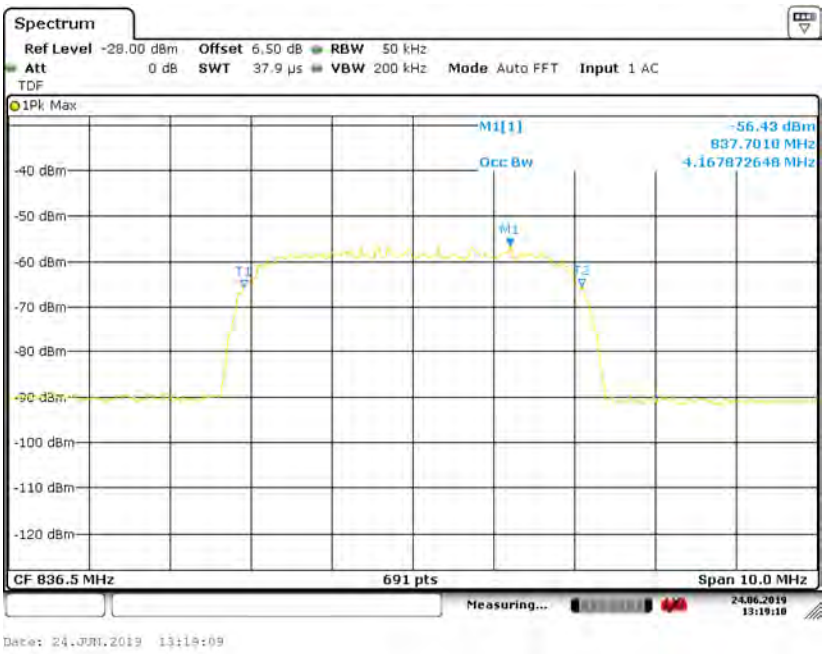
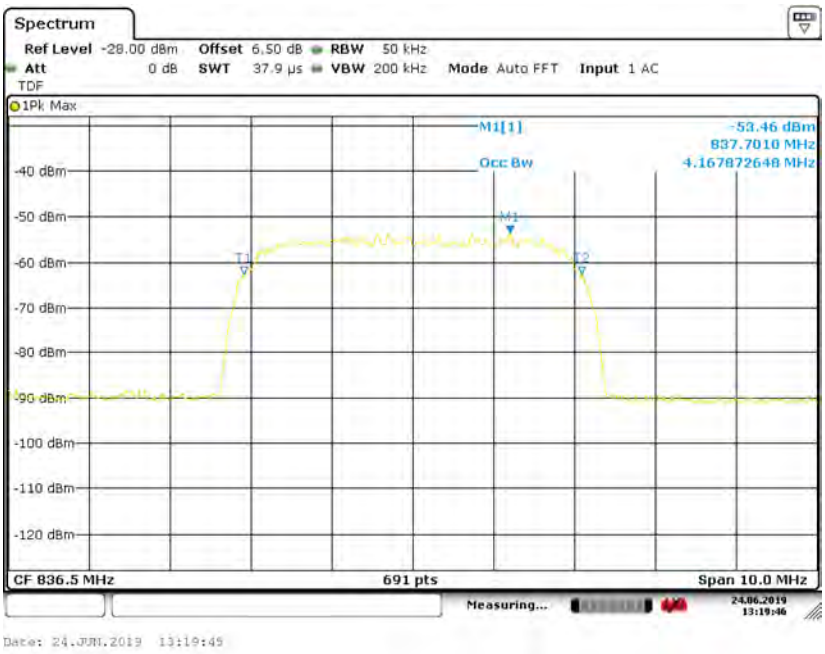
Cellular Band

Modes	Signal Type	Signal Level	Frequency (MHz)	99% Bandwidth (MHz)		26dB Bandwidth (MHz)	
				Input	Output	Input	Output
Uplink	AWGN	Pre-AGC	836.5	4.168	4.153	4.645	4.631
		3dB above AGC	836.5	4.168	4.168	4.631	4.660
	GSM	Pre-AGC	836.5	0.246	0.243	0.311	0.310
		3dB above AGC	836.5	0.243	0.243	0.311	0.310
Downlink	AWGN	Pre-AGC	881.5	4.182	4.139	4.660	4.645
		3dB above AGC	881.5	4.168	4.139	4.645	4.660
	GSM	Pre-AGC	881.5	0.243	0.243	0.310	0.310
		3dB above AGC	881.5	0.243	0.243	0.310	0.310

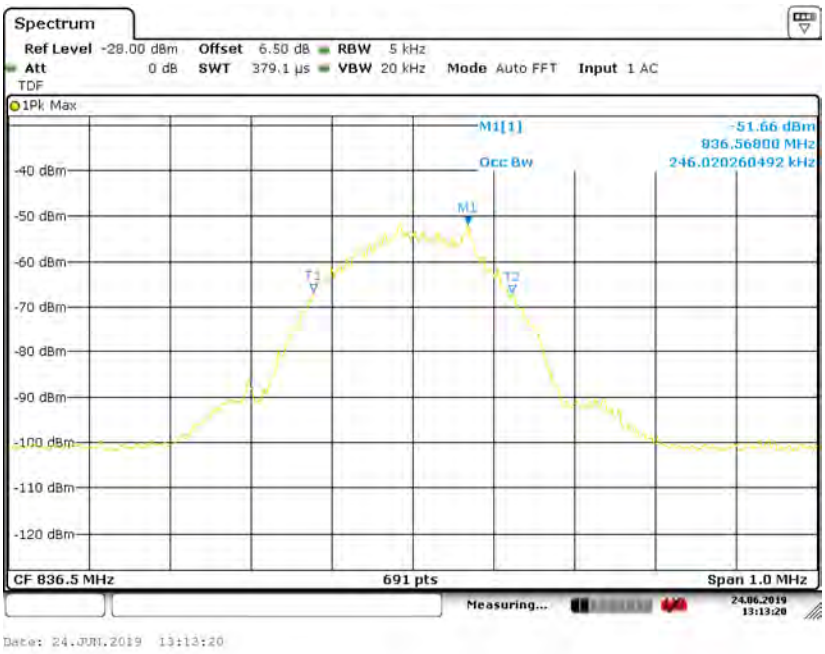
99% Bandwidth-UL-AWGN-Pre AGC-Input



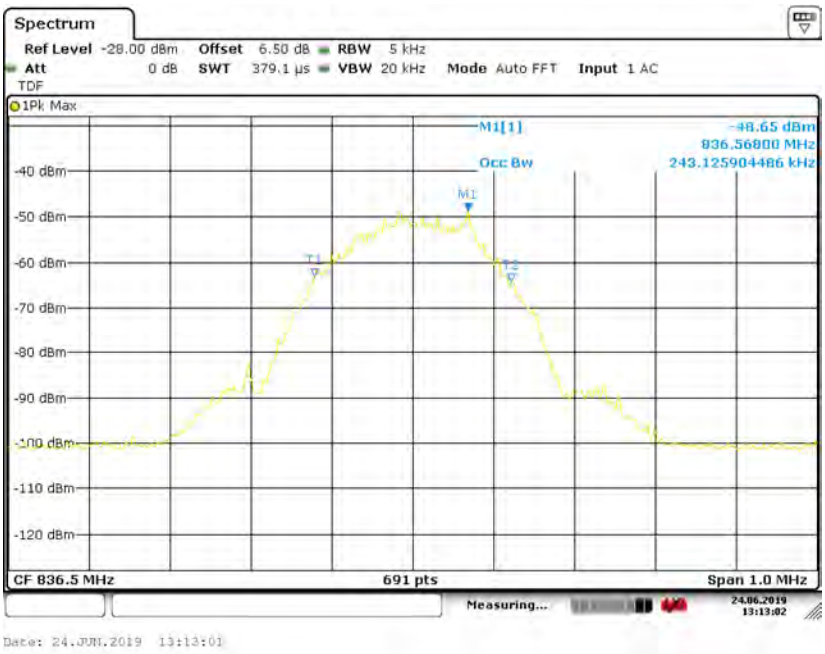
99% Bandwidth-UL- AWGN-3dB above AGC-Input



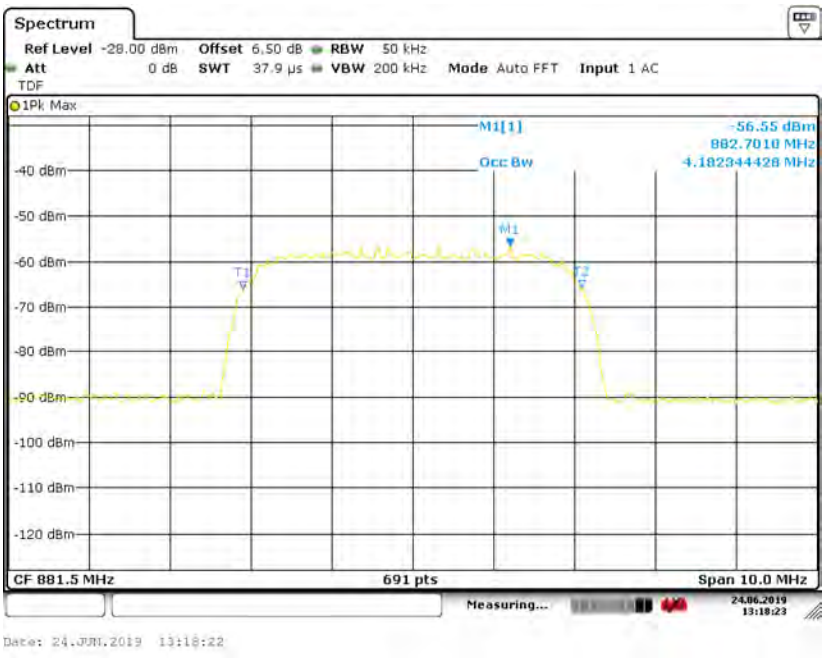
99% Bandwidth-UL-GSM-Pre AGC-Input



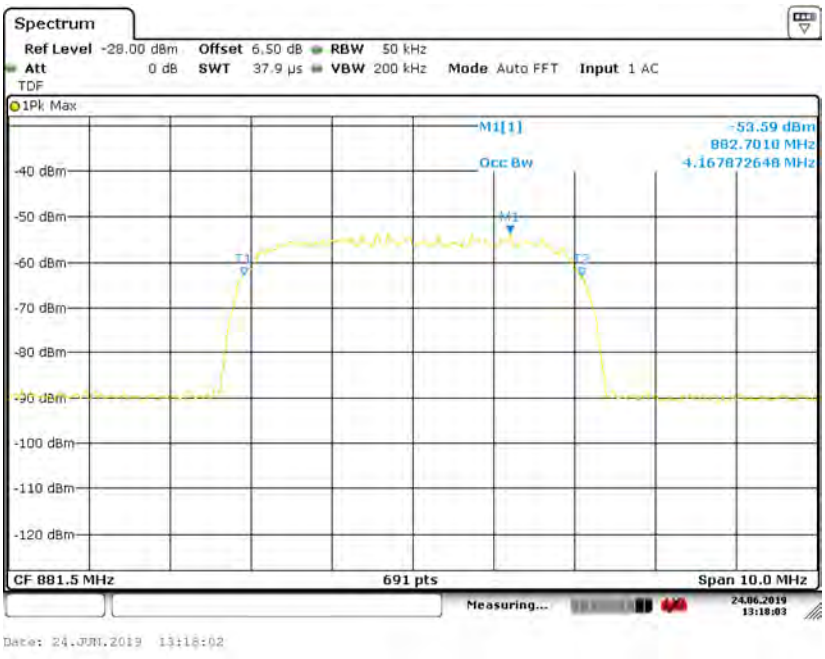
99% Bandwidth-UL- GSM-3dB above AGC-Input



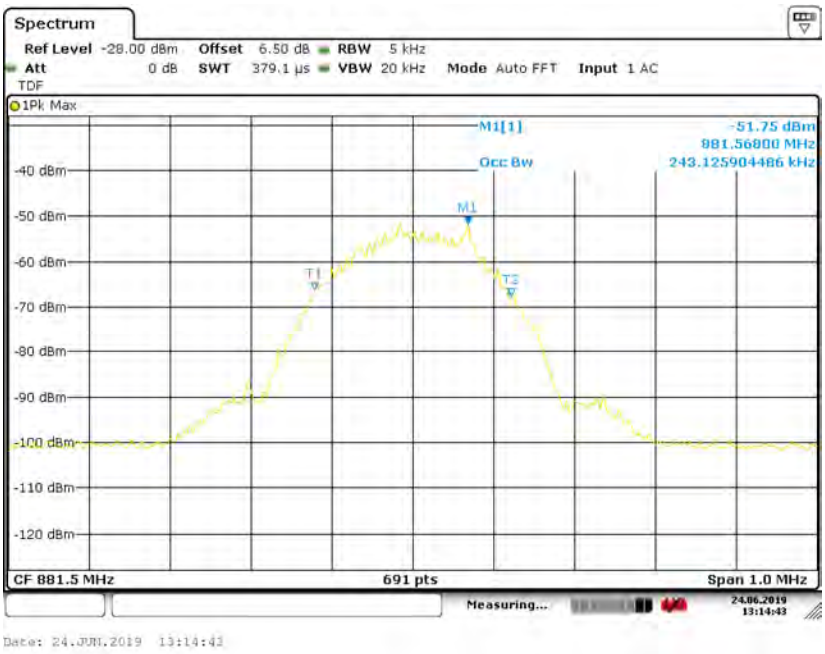
99% Bandwidth-DL-AWGN-Pre AGC-Input



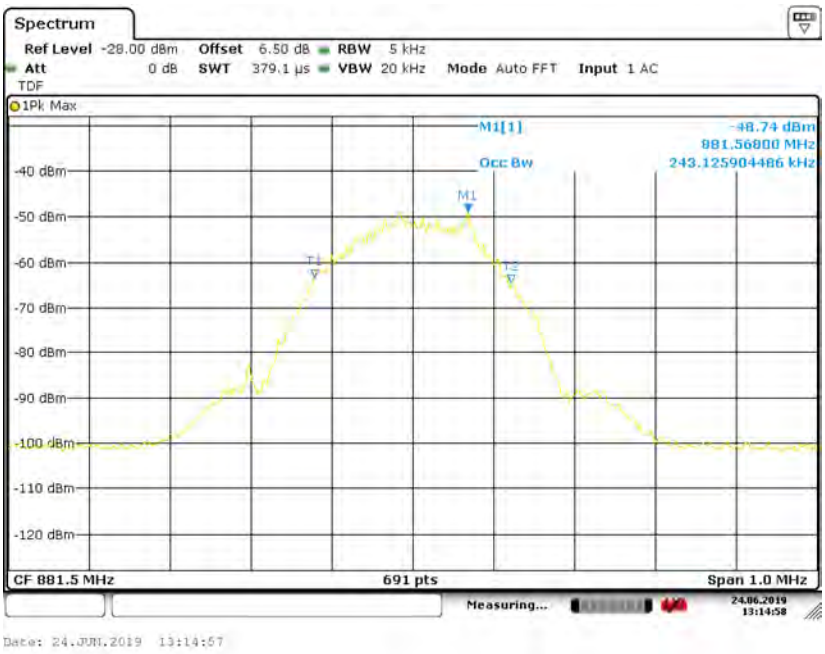
99% Bandwidth-DL- AWGN-3dB above AGC-Input



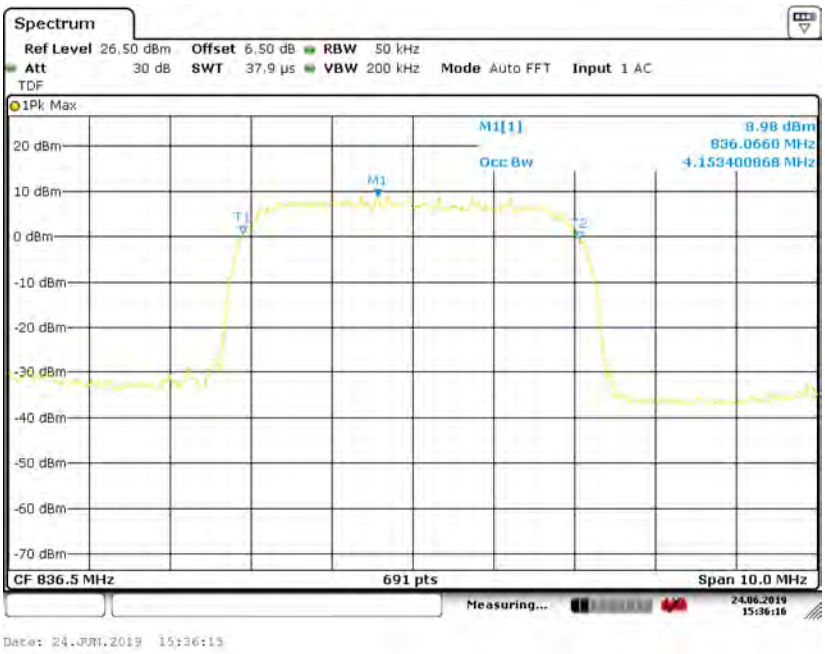
99% Bandwidth-DL-GSM-Pre AGC-Input



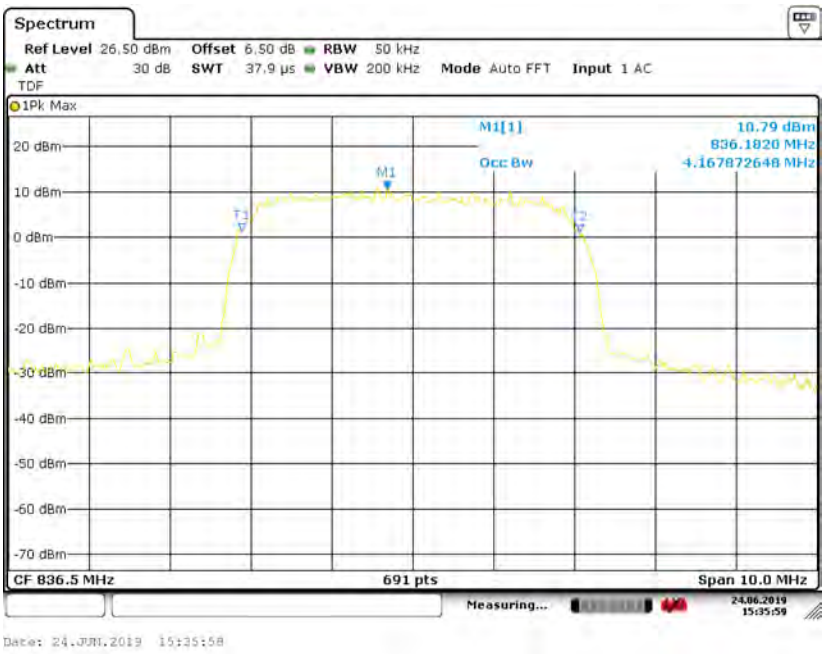
99% Bandwidth-DL- GSM-3dB above AGC-Input



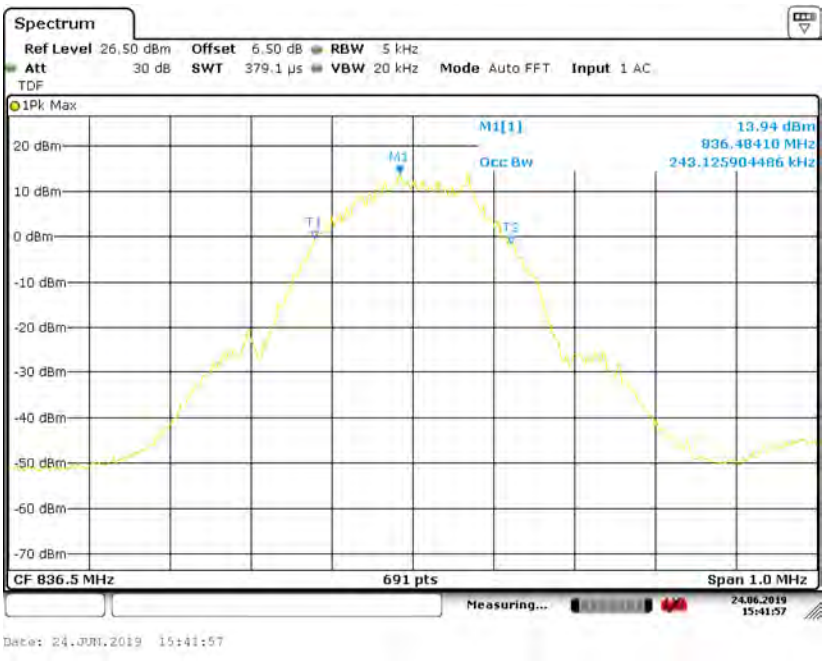
99% Bandwidth-UL-AWGN-Pre AGC- Output



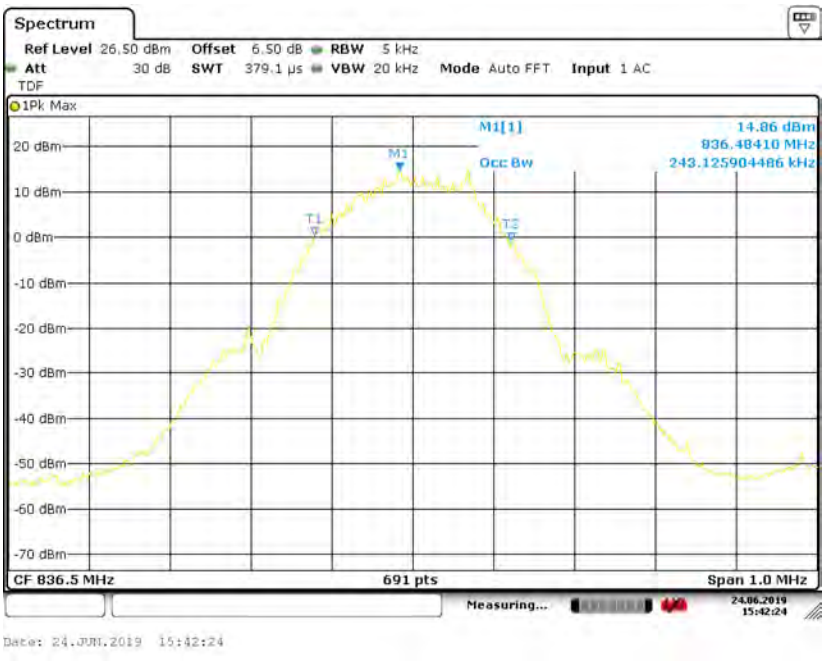
99% Bandwidth-UL- AWGN-3dB above AGC- Output



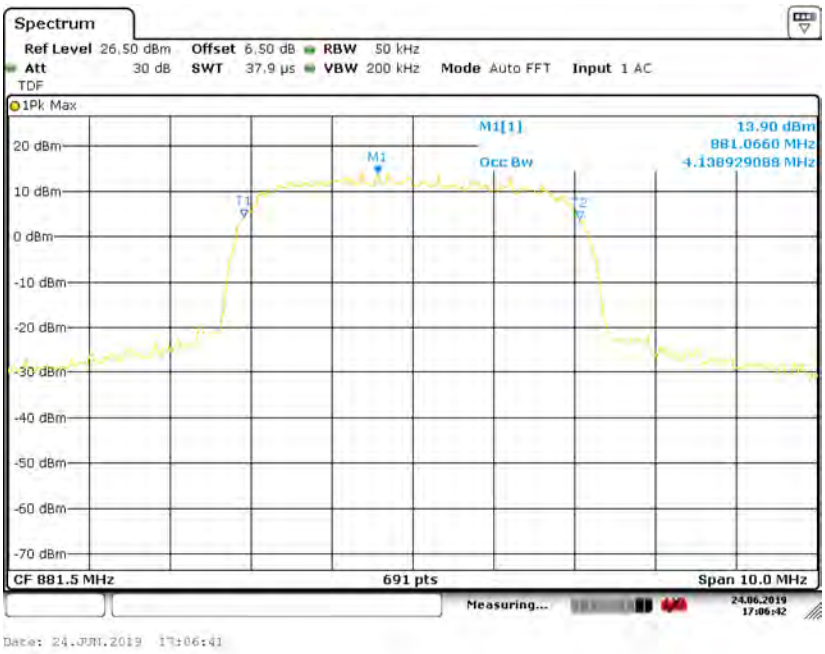
99% Bandwidth-UL-GSM-Pre AGC- Output



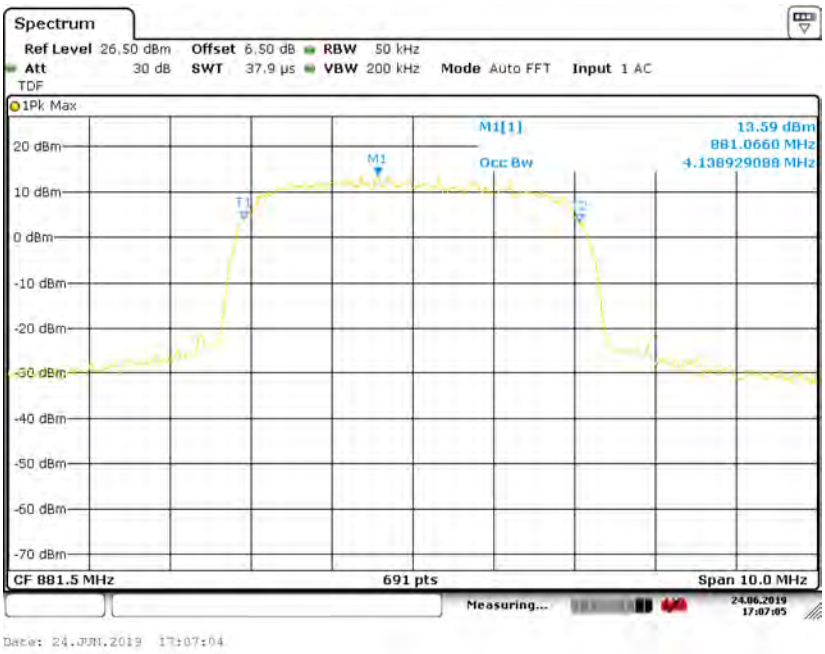
99% Bandwidth-UL- GSM-3dB above AGC- Output



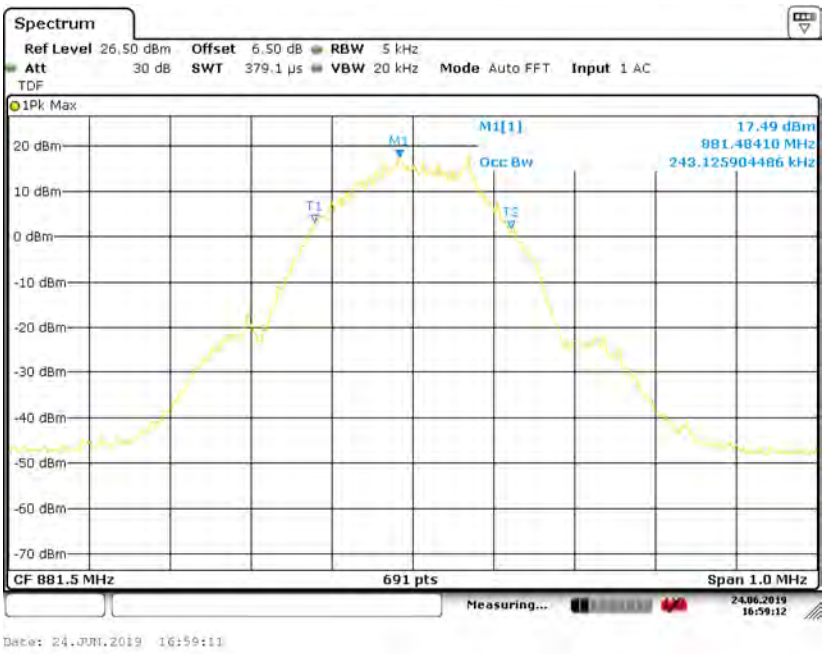
99% Bandwidth-DL-AWGN-Pre AGC- Output



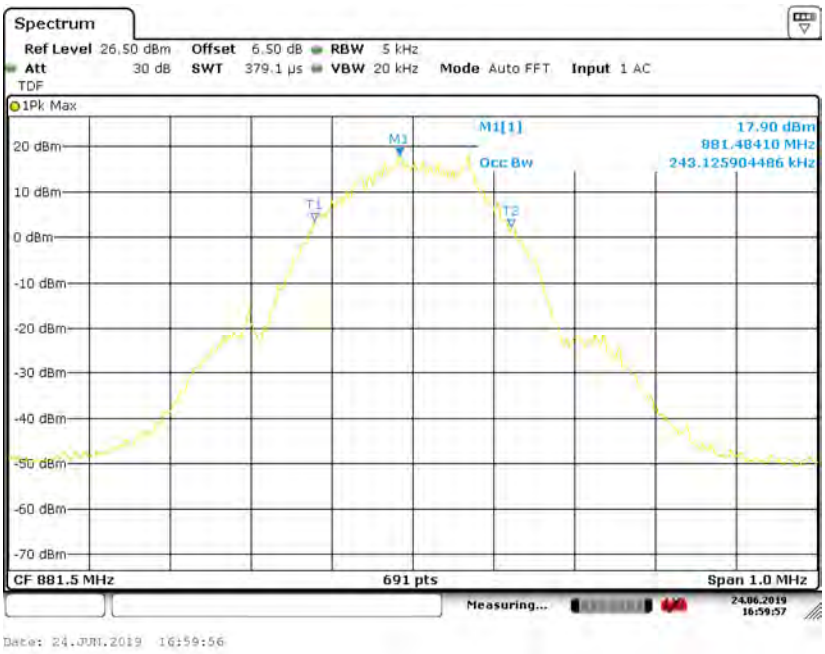
99% Bandwidth-DL- AWGN-3dB above AGC- Output



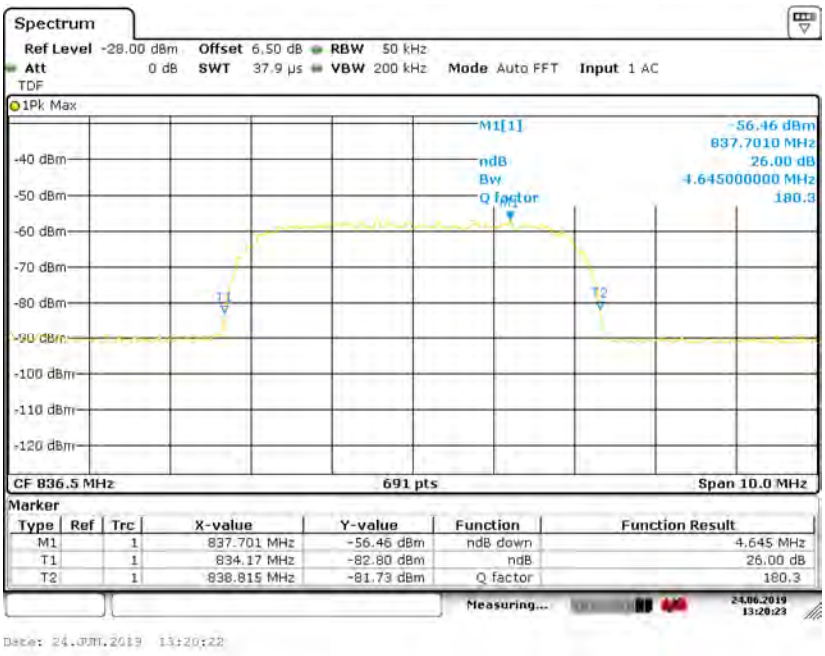
99% Bandwidth-DL-GSM-Pre AGC-Output



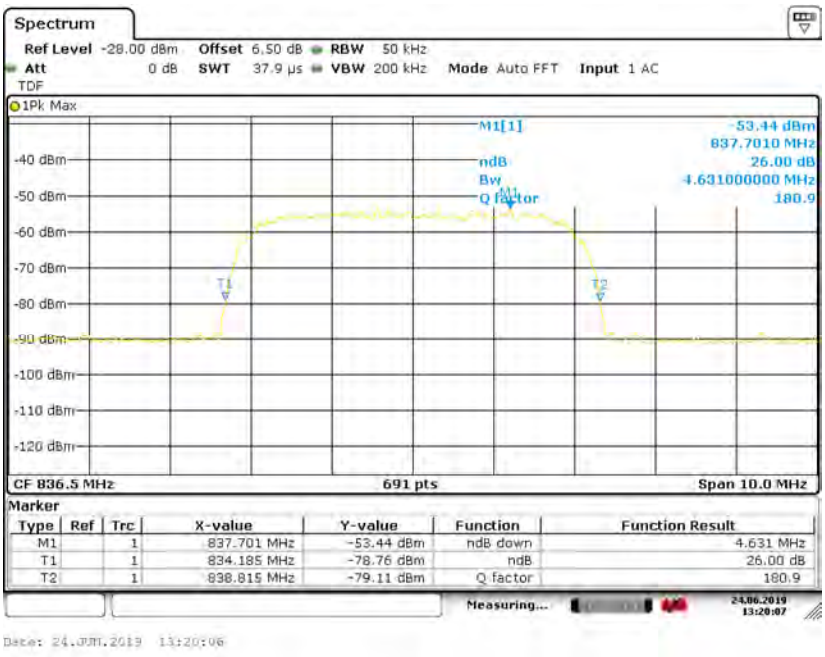
99% Bandwidth-DL- GSM-3dB above AGC-Output



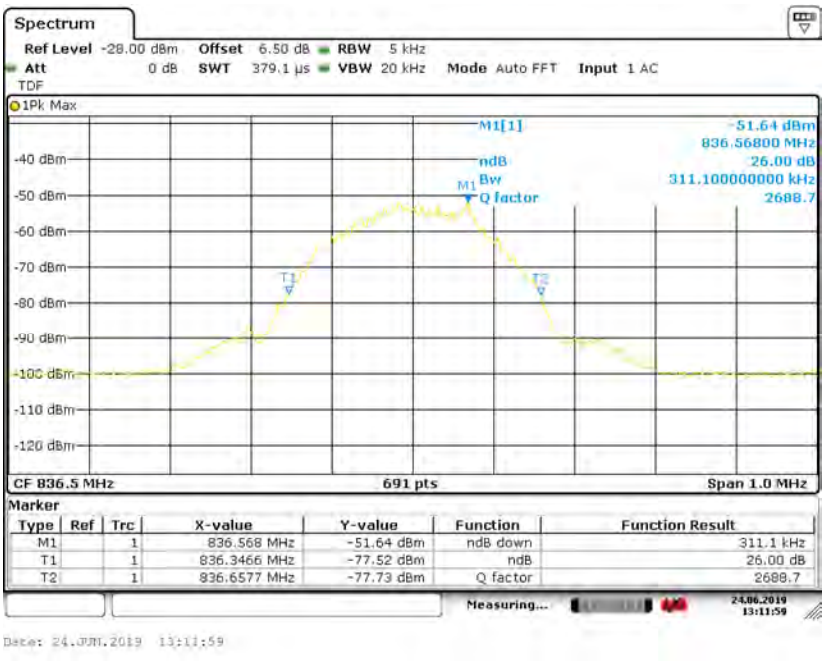
26dB Bandwidth-UL-AWGN-Pre AGC-Input



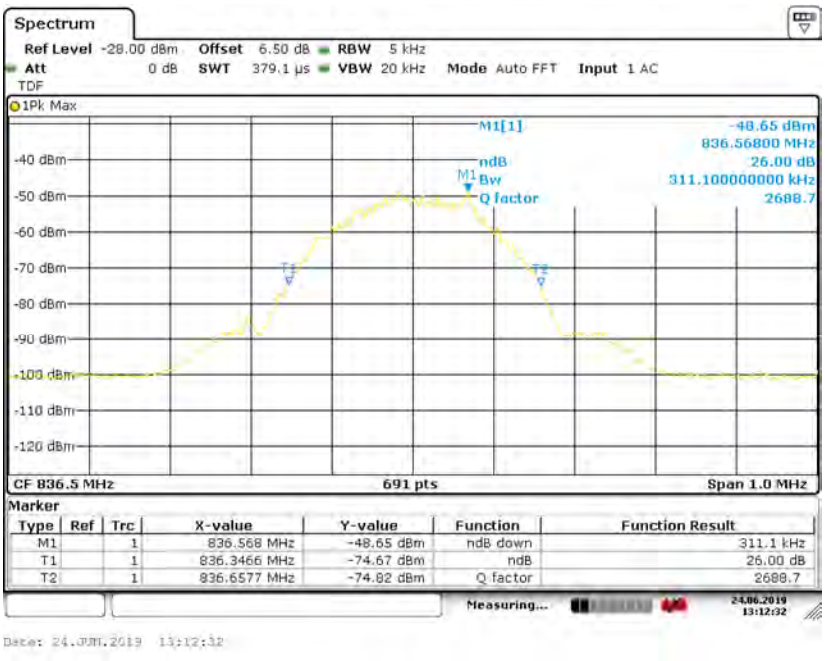
26dB Bandwidth-UL- AWGN-3dB above AGC-Input



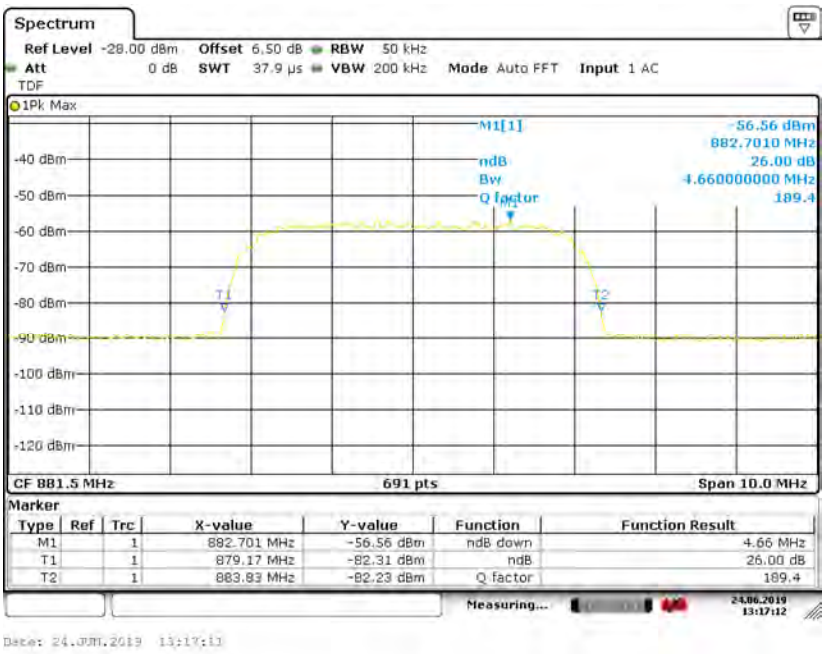
26dB Bandwidth-UL-GSM-Pre AGC-Input



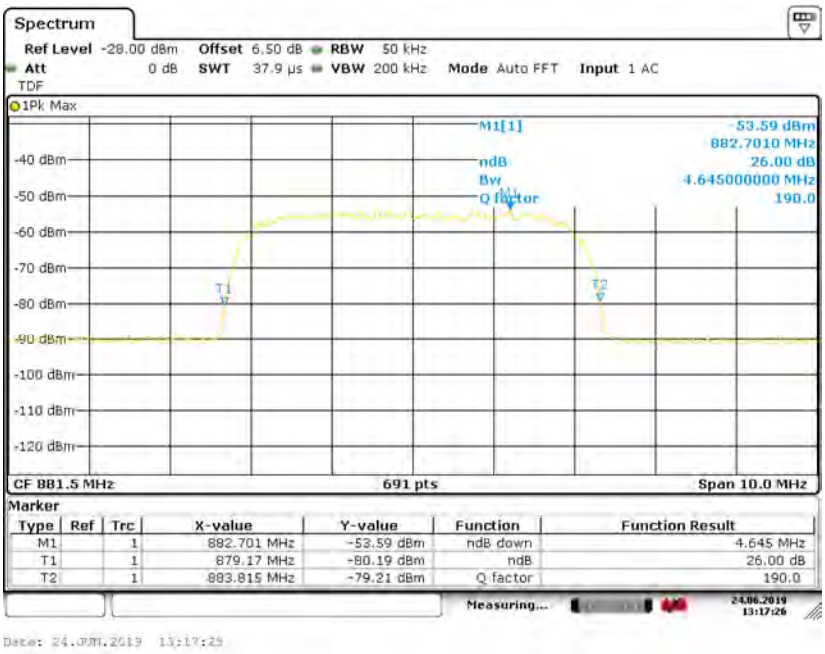
26dB Bandwidth-UL- GSM-3dB above AGC-Input



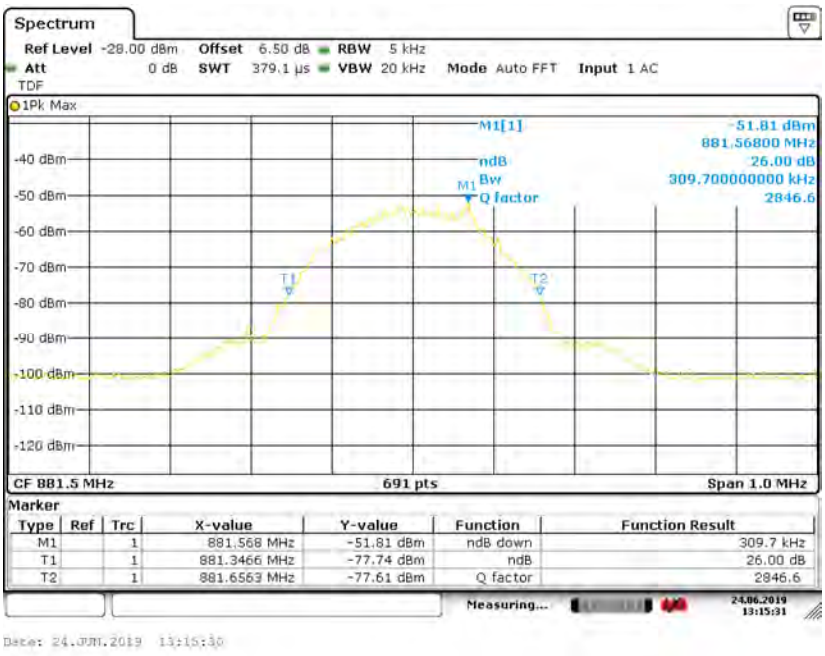
26dB Bandwidth-DL-AWGN-Pre AGC-Input



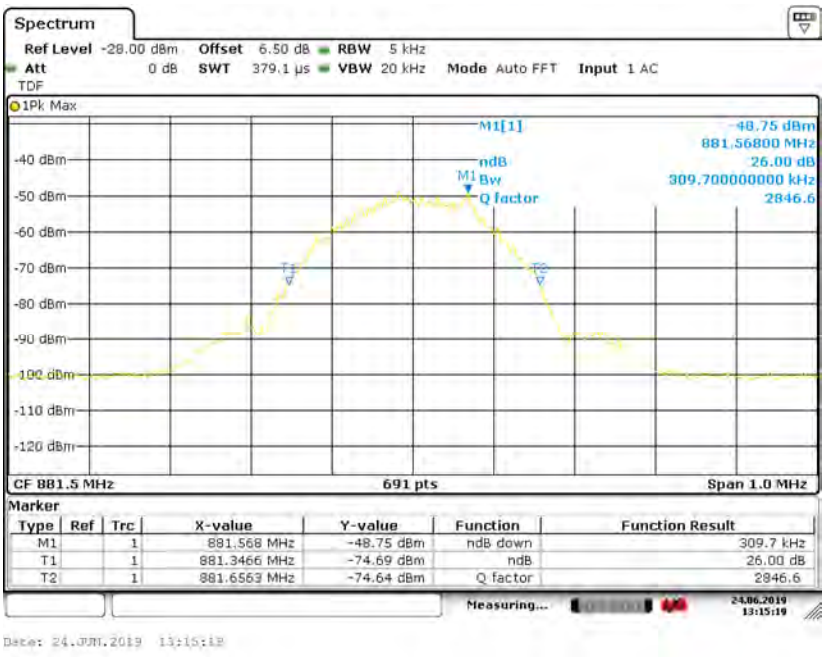
26dB Bandwidth-DL- AWGN-3dB above AGC-Input



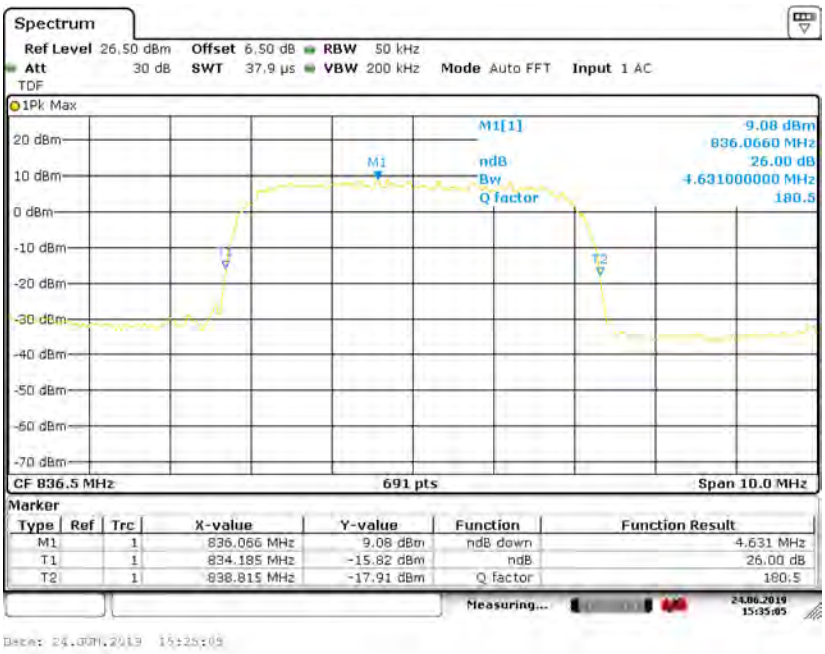
26dB Bandwidth-DL-GSM-Pre AGC-Input



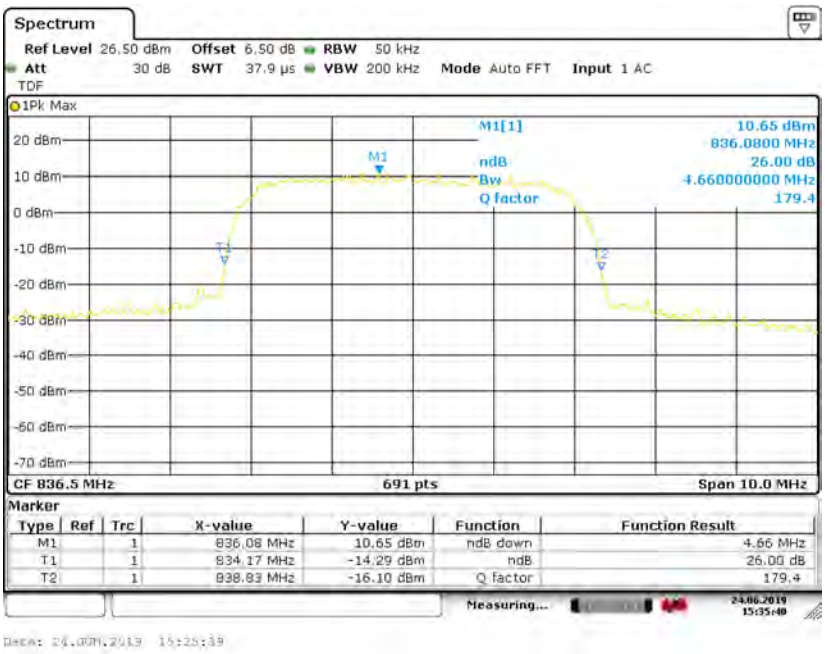
26dB Bandwidth-DL- GSM-3dB above AGC-Input



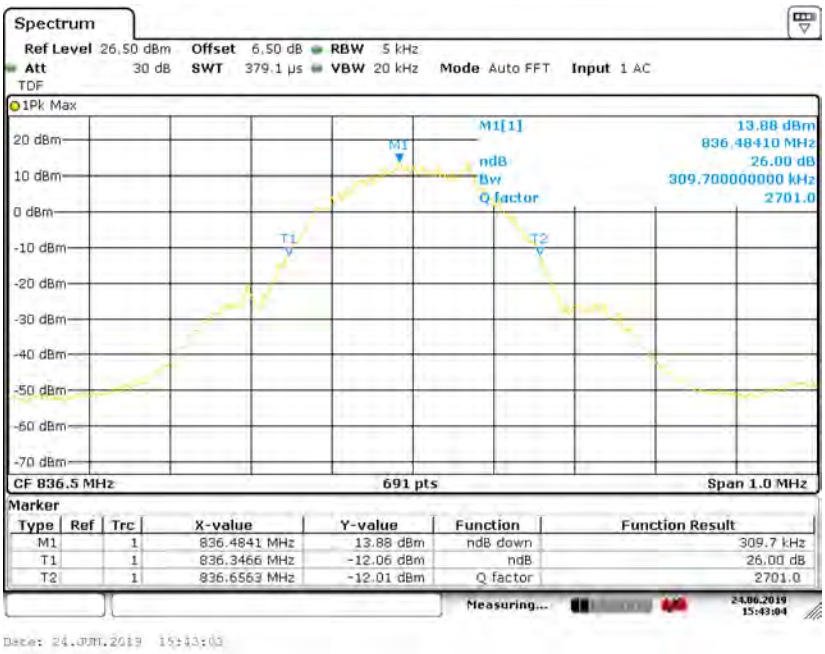
26dB Bandwidth-UL-AWGN-Pre AGC- Output



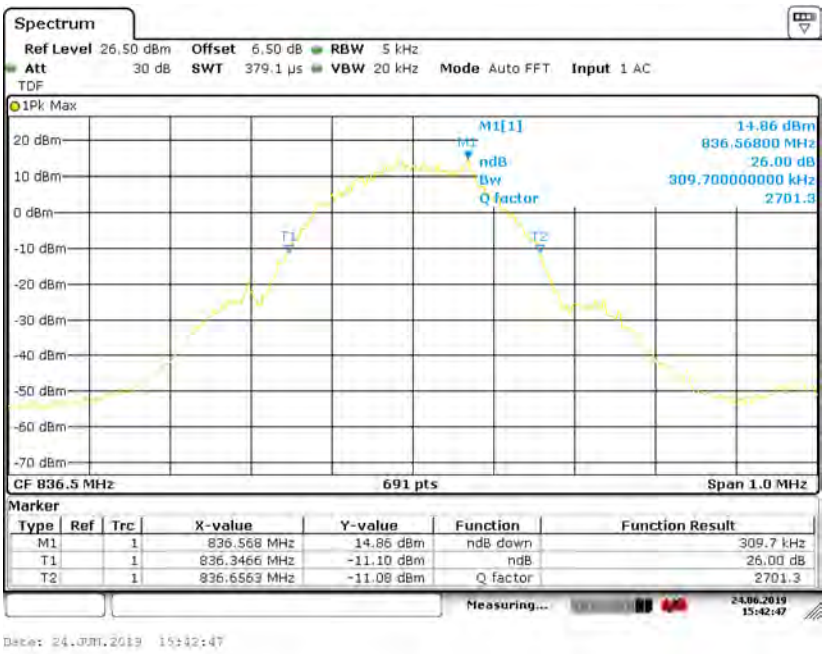
26dB Bandwidth-UL- AWGN-3dB above AGC- Output



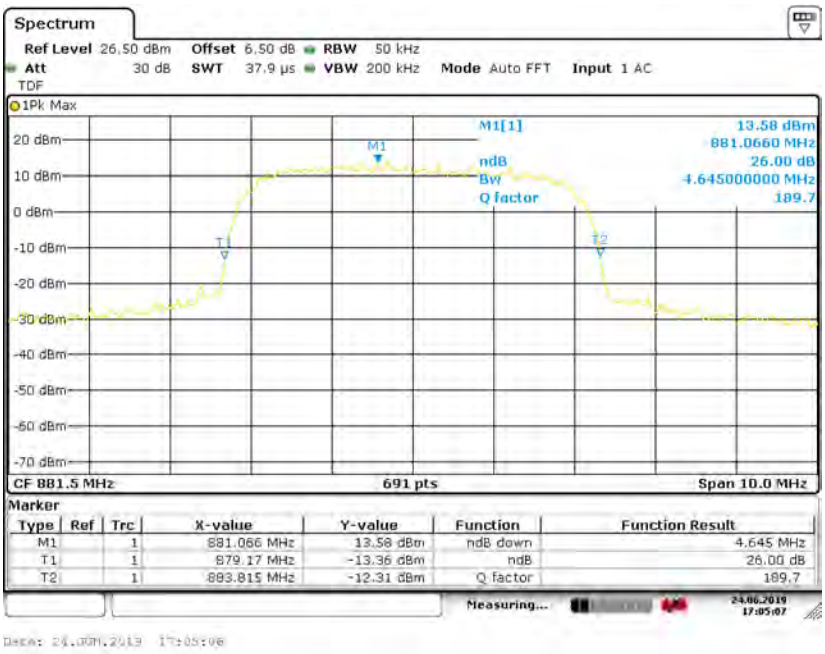
26dB Bandwidth-UL-GSM-Pre AGC- Output



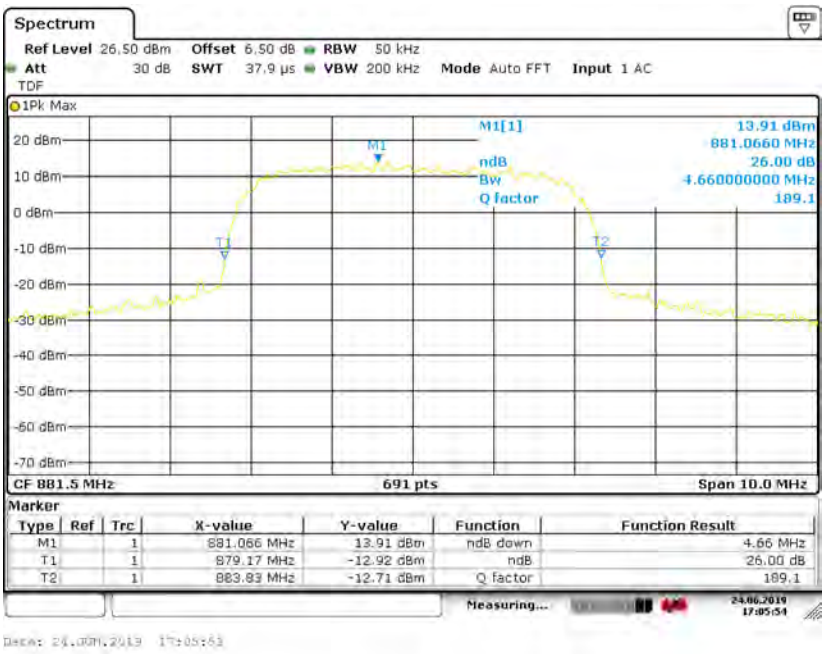
26dB Bandwidth-UL- GSM-3dB above AGC- Output



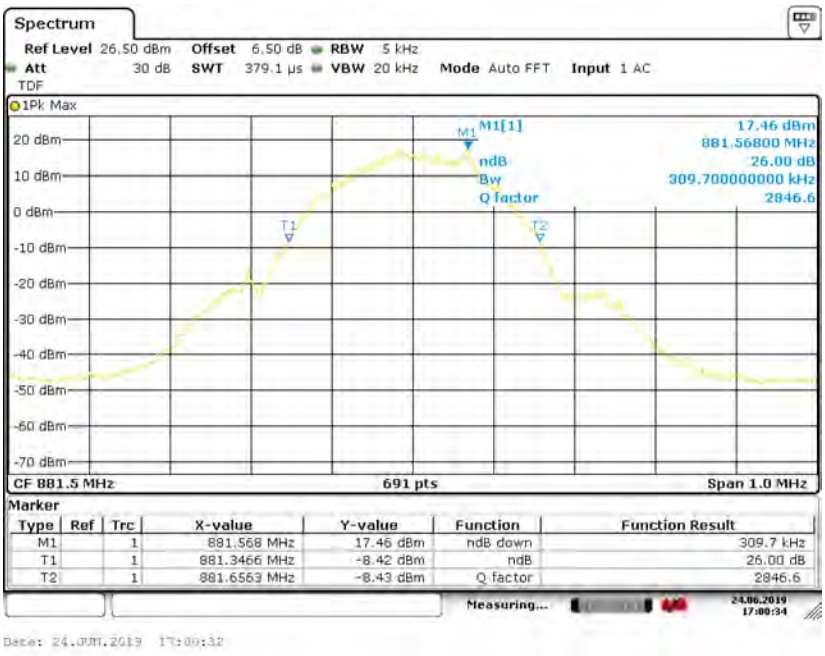
26dB Bandwidth-DL-AWGN-Pre AGC- Output



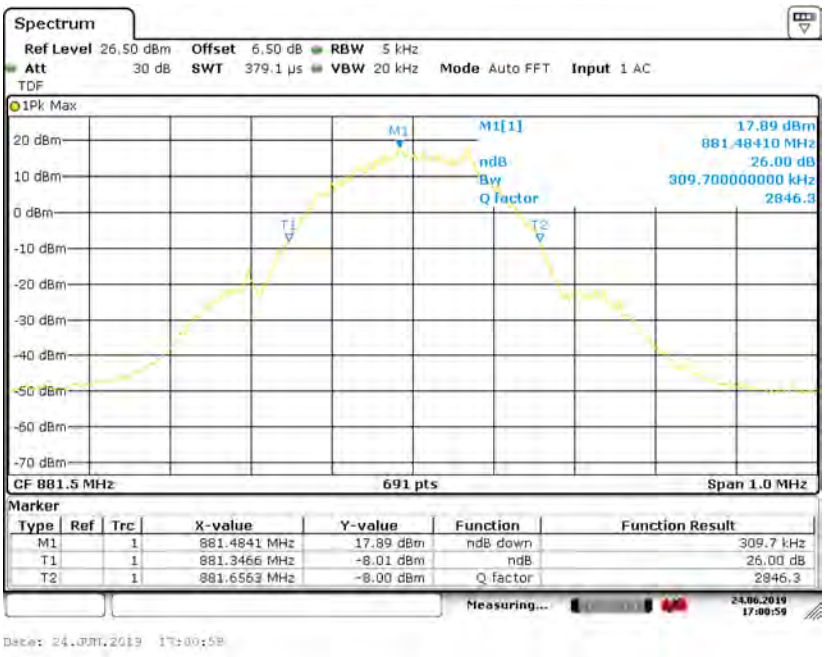
26dB Bandwidth-DL- AWGN-3dB above AGC- Output



26dB Bandwidth-DL-GSM-Pre AGC-Output



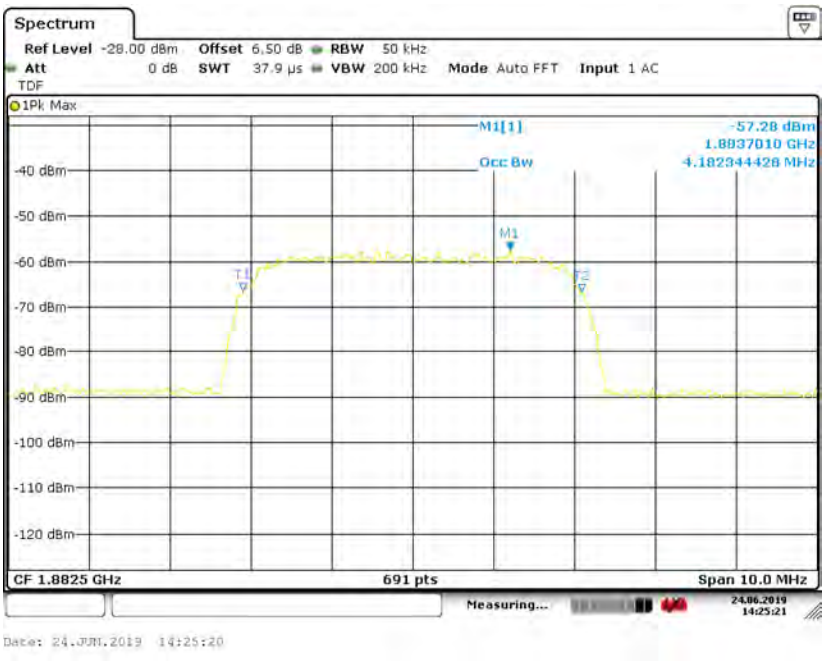
26dB Bandwidth-DL- GSM-3dB above AGC-Output



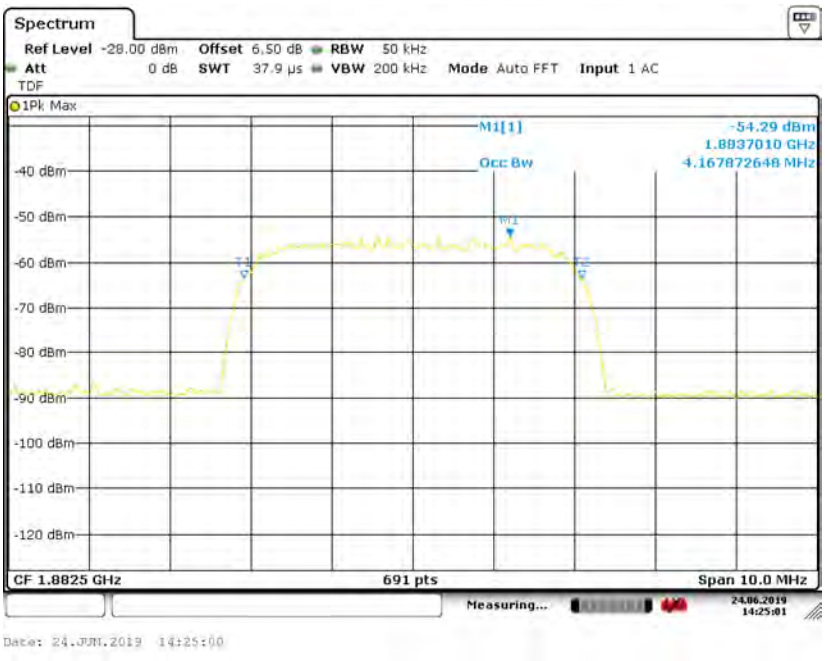
PCS Band

Modes	Signal Type	Signal Level	Frequency (MHz)	99% Bandwidth (MHz)		26dB Bandwidth (MHz)	
				Input	Output	Input	Output
Uplink	AWGN	Pre-AGC	1882.5	4.182	4.139	4.660	4.616
		3dB above AGC	1882.5	4.168	4.153	4.660	4.631
	GSM	Pre-AGC	1882.5	0.245	0.243	0.313	0.310
		3dB above AGC	1882.5	0.246	0.243	0.311	0.310
Downlink	AWGN	Pre-AGC	1962.5	4.182	4.153	4.660	4.645
		3dB above AGC	1962.5	4.168	4.153	4.645	4.674
	GSM	Pre-AGC	1962.5	0.245	0.243	0.313	0.311
		3dB above AGC	1962.5	0.245	0.243	0.310	0.311

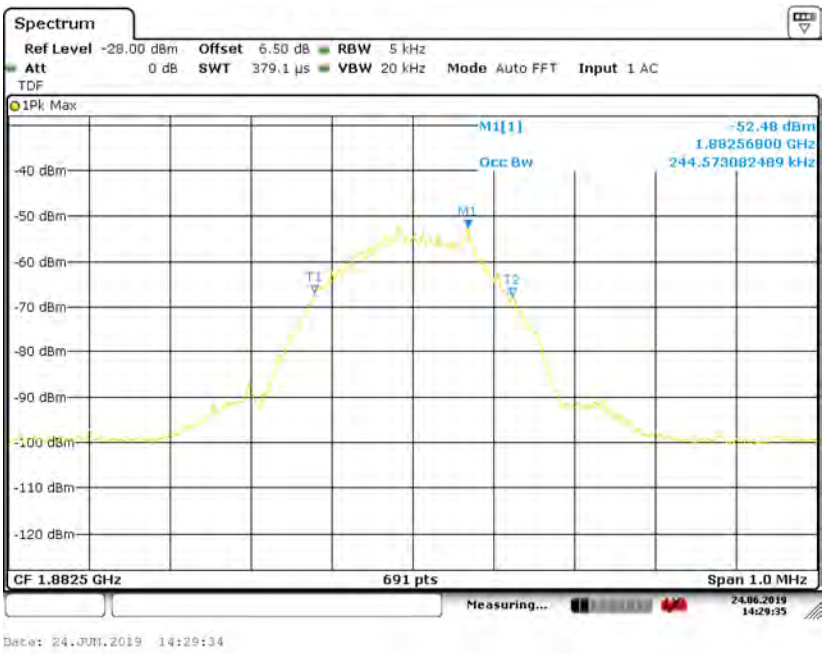
99% Bandwidth-UL-AWGN-Pre AGC-Input



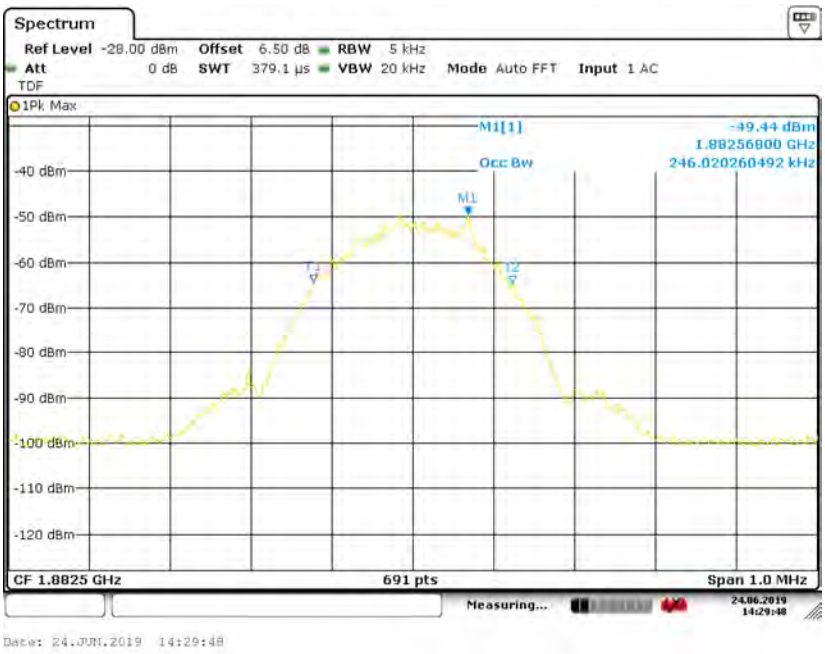
99% Bandwidth-UL- AWGN-3dB above AGC-Input



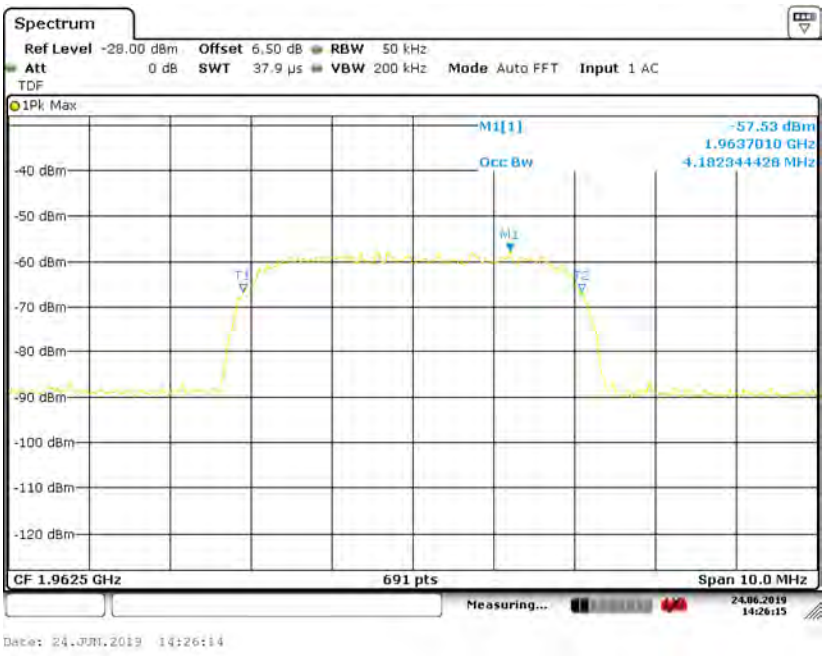
99% Bandwidth-UL-GSM-Pre AGC-Input



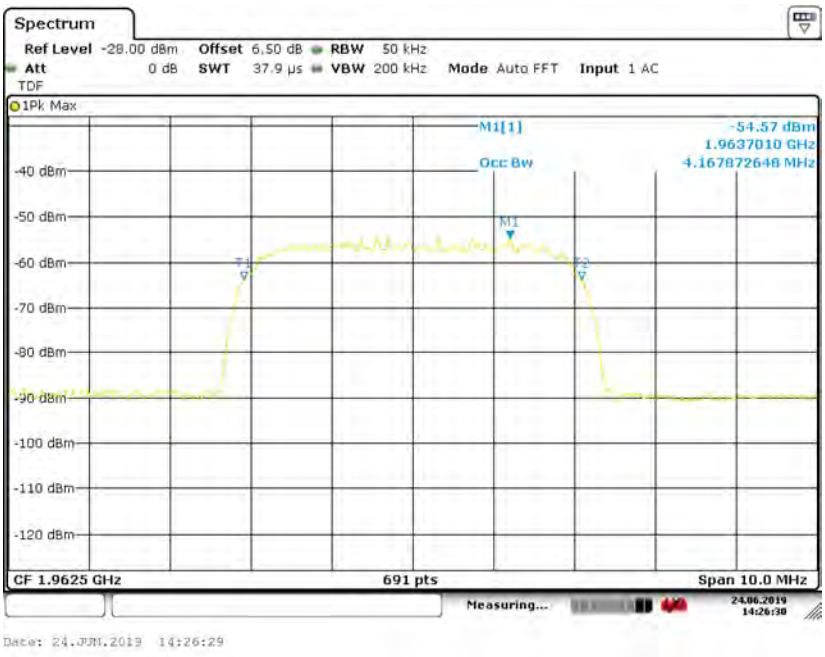
99% Bandwidth-UL- GSM-3dB above AGC-Input



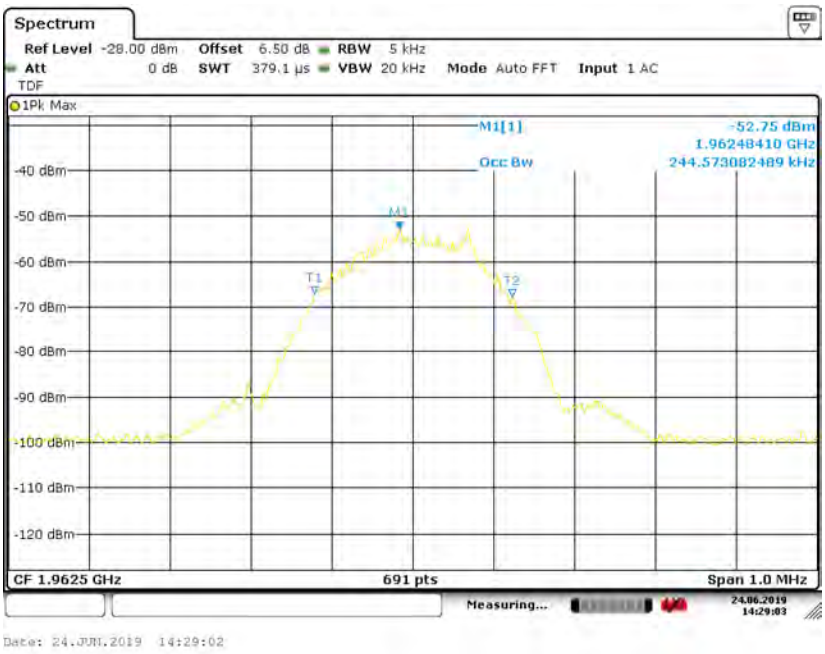
99% Bandwidth-DL-AWGN-Pre AGC-Input



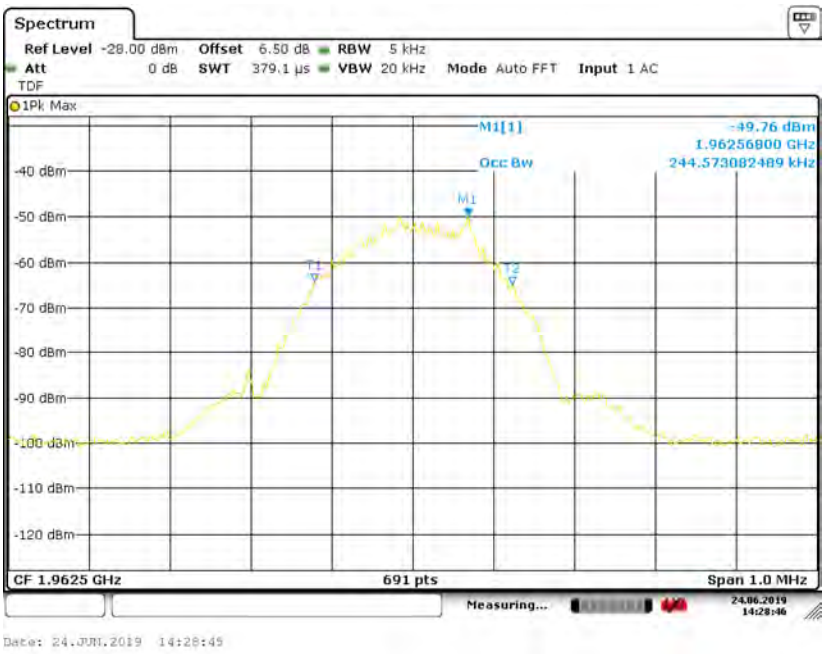
99% Bandwidth-DL- AWGN-3dB above AGC-Input



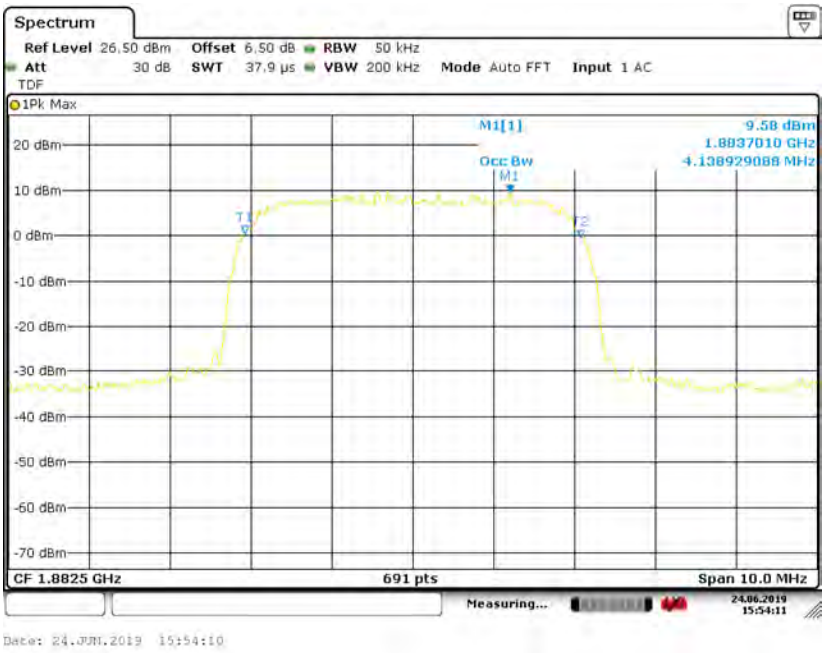
99% Bandwidth-DL-GSM-Pre AGC-Input



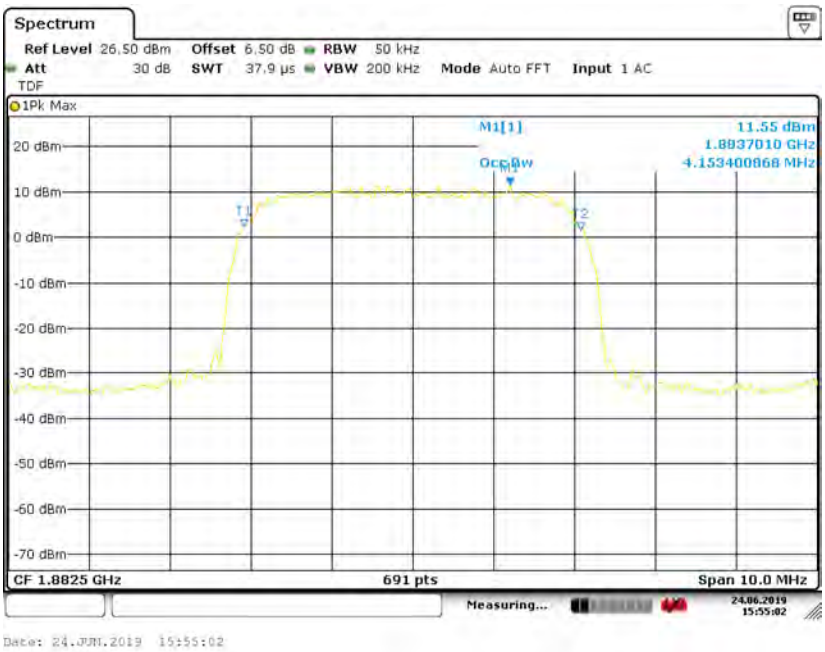
99% Bandwidth-DL- GSM-3dB above AGC-Input



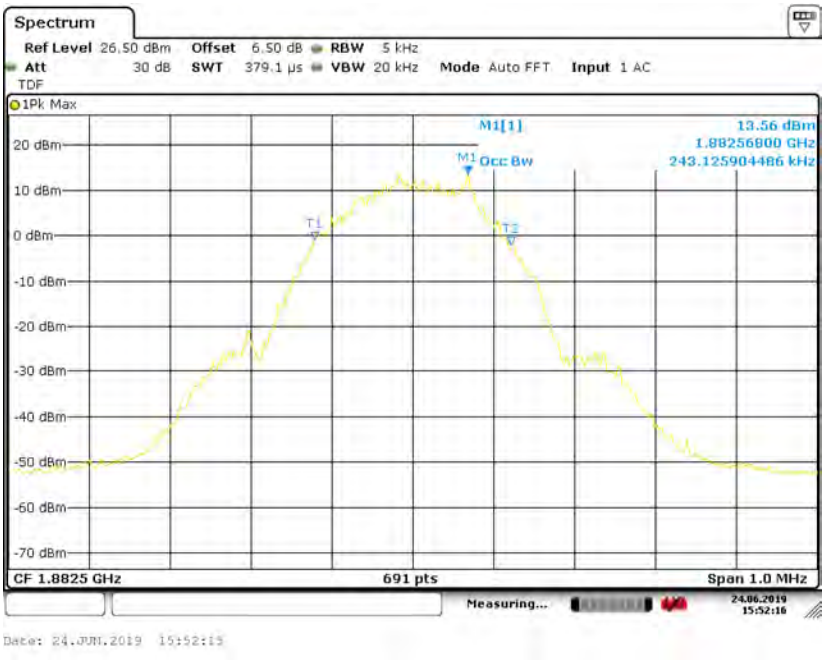
99% Bandwidth-UL-AWGN-Pre AGC- Output



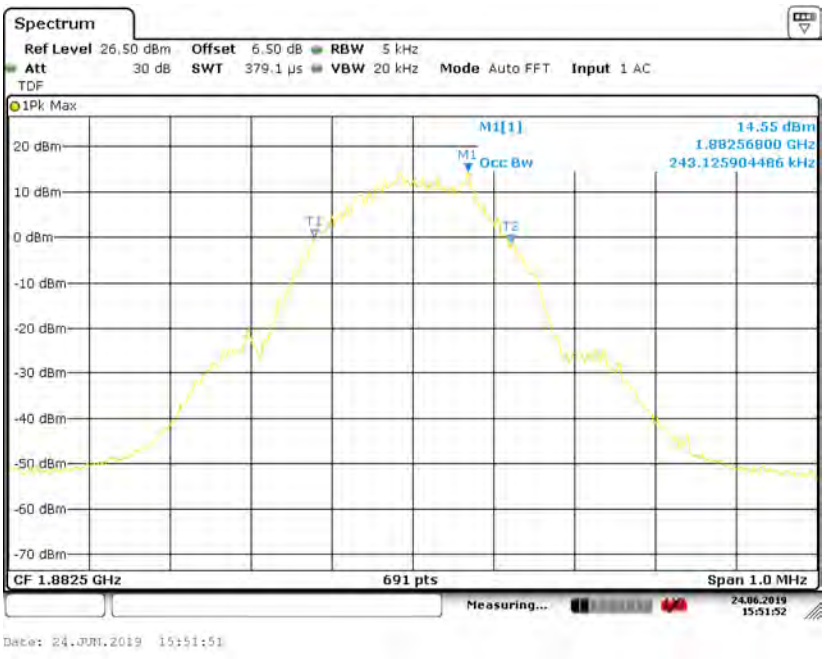
99% Bandwidth-UL- AWGN-3dB above AGC- Output



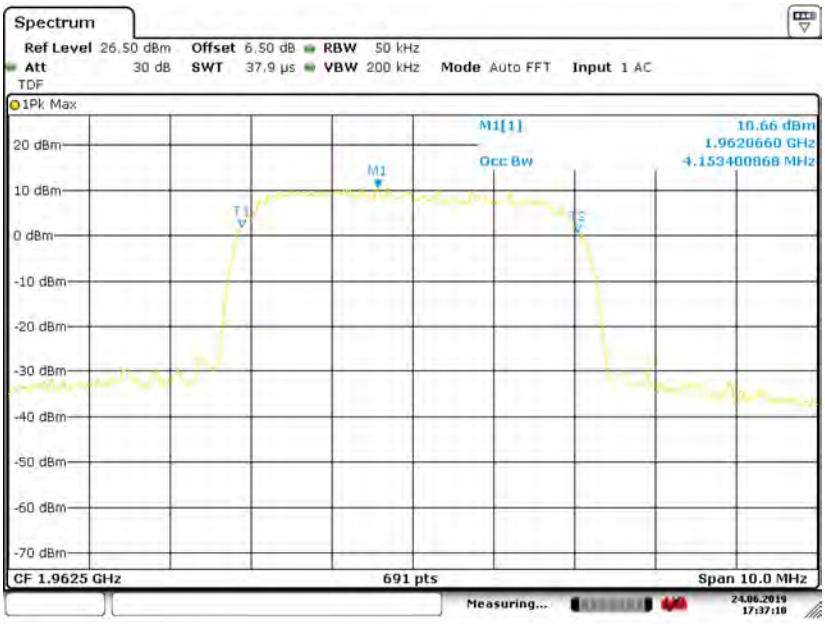
99% Bandwidth-UL-GSM-Pre AGC- Output



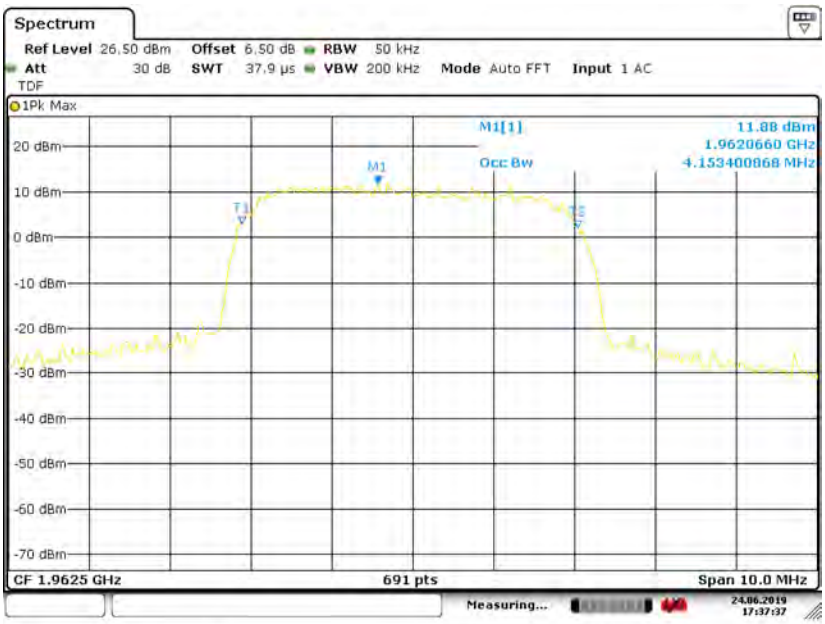
99% Bandwidth-UL- GSM-3dB above AGC- Output



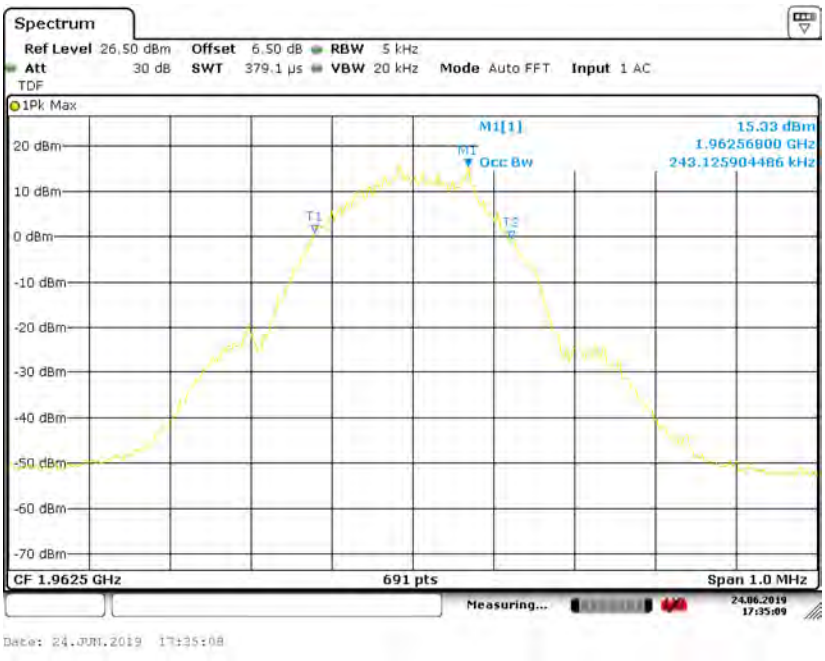
99% Bandwidth-DL-AWGN-Pre AGC- Output



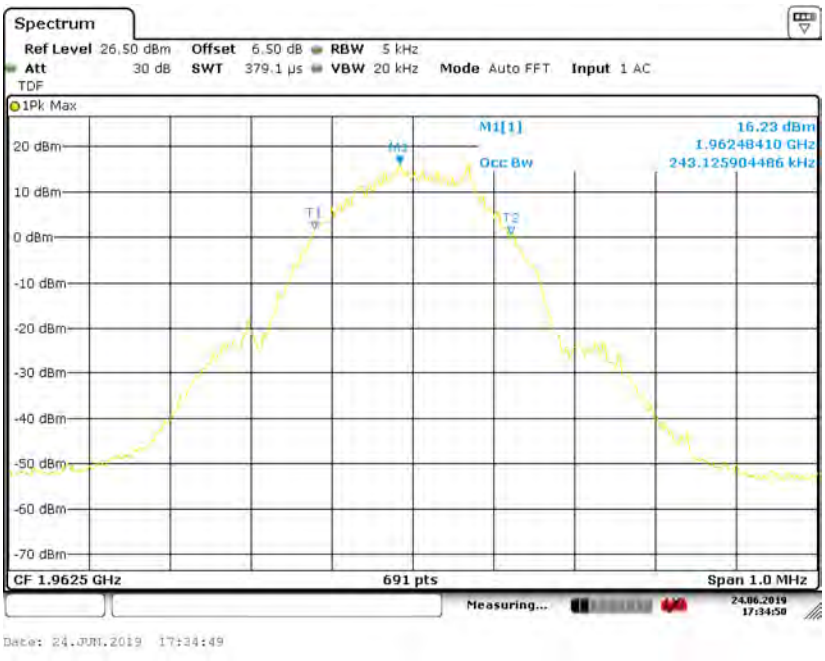
99% Bandwidth-DL- AWGN-3dB above AGC- Output



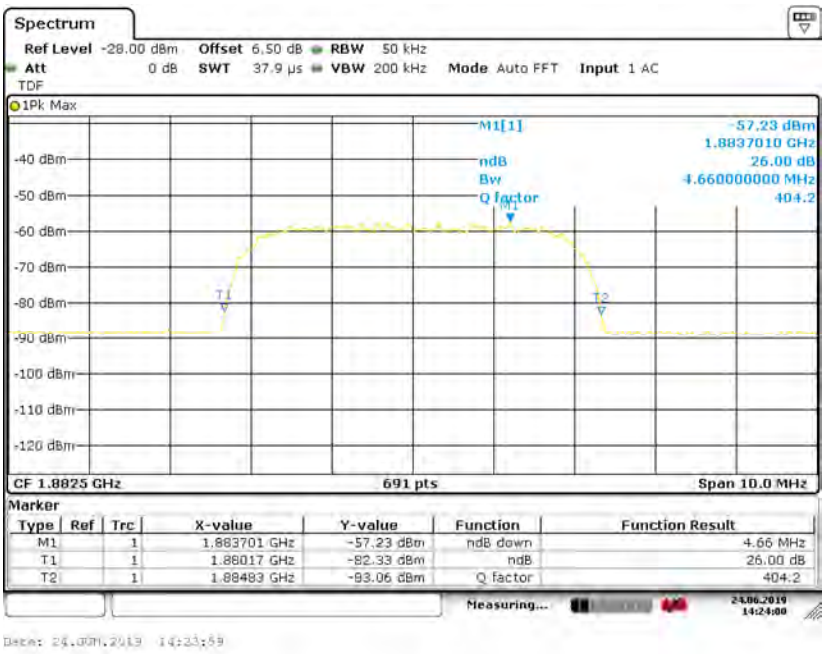
99% Bandwidth-DL-GSM-Pre AGC-Output



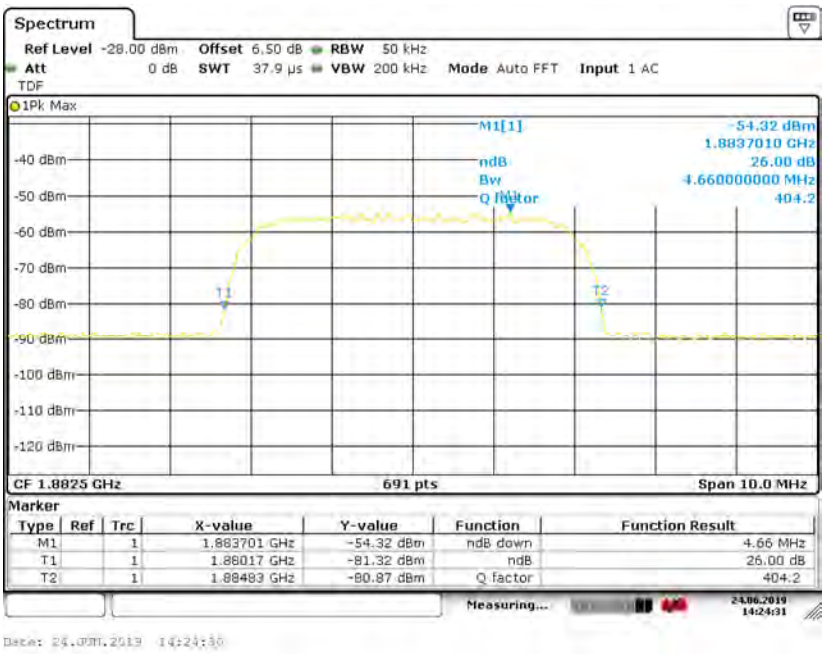
99% Bandwidth-DL- GSM-3dB above AGC-Output



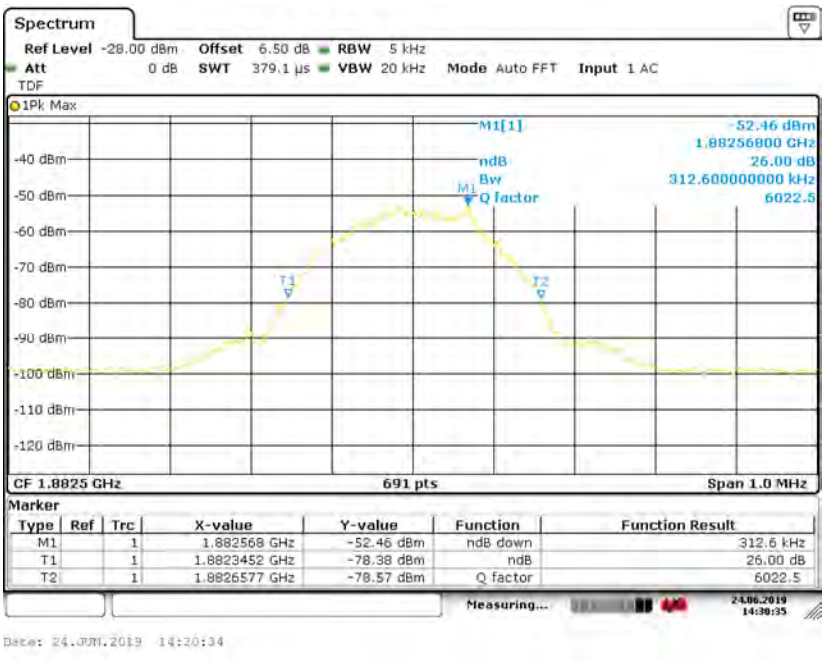
26dB Bandwidth-UL-AWGN-Pre AGC-Input



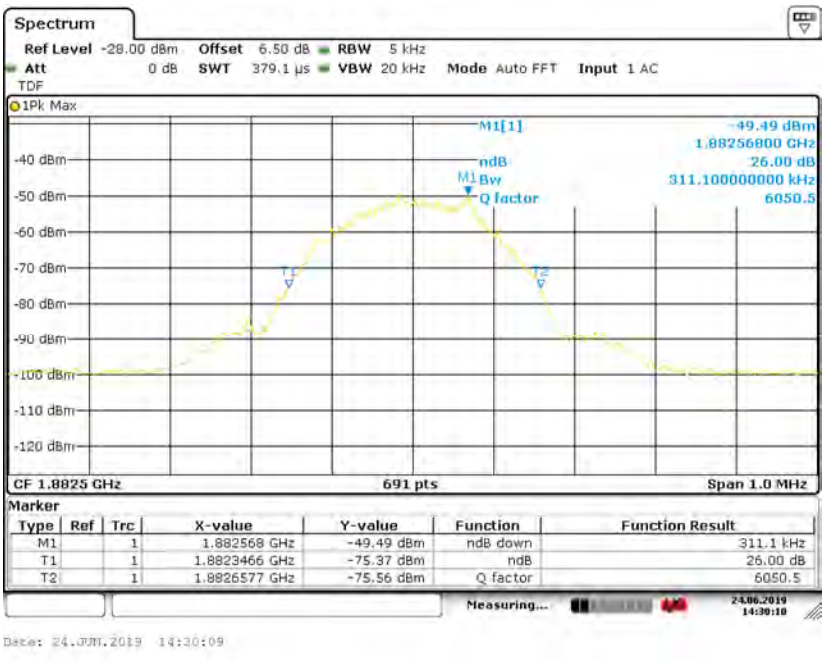
26dB Bandwidth-UL- AWGN-3dB above AGC-Input



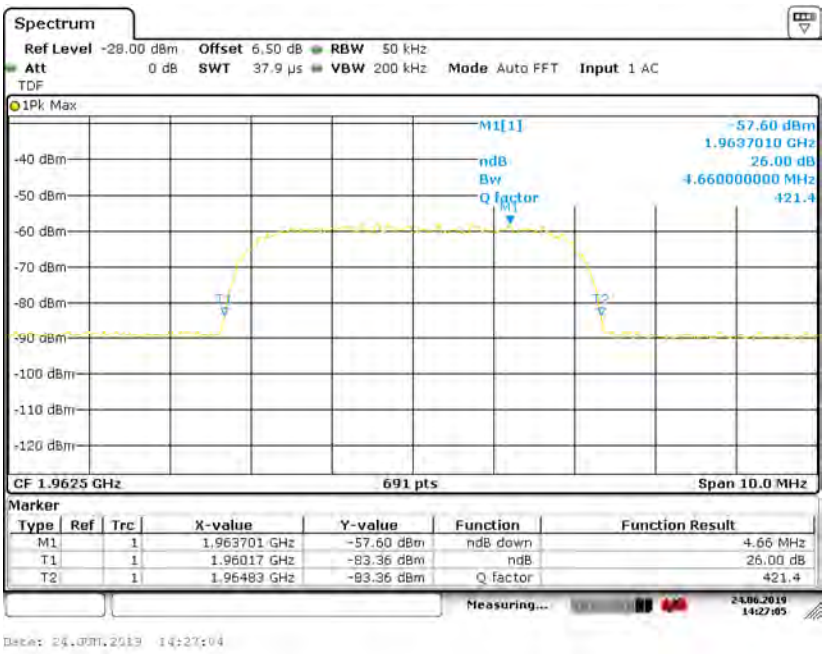
26dB Bandwidth-UL-GSM-Pre AGC-Input



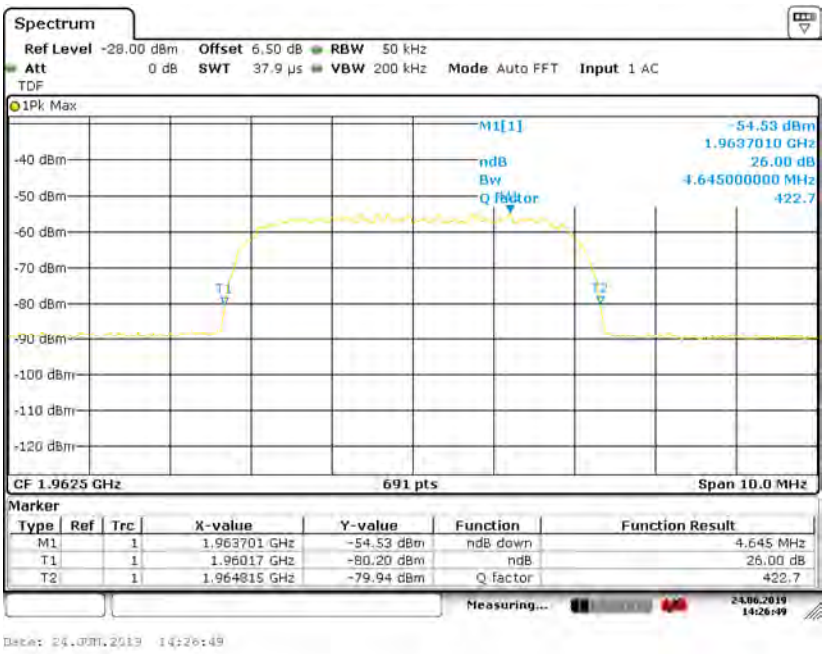
26dB Bandwidth-UL- GSM-3dB above AGC-Input



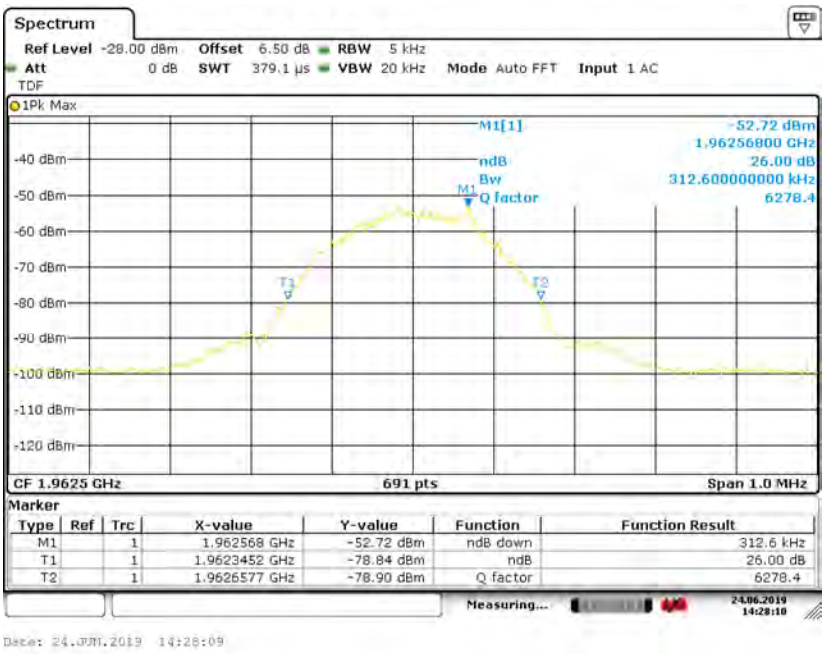
26dB Bandwidth-DL-AWGN-Pre AGC-Input



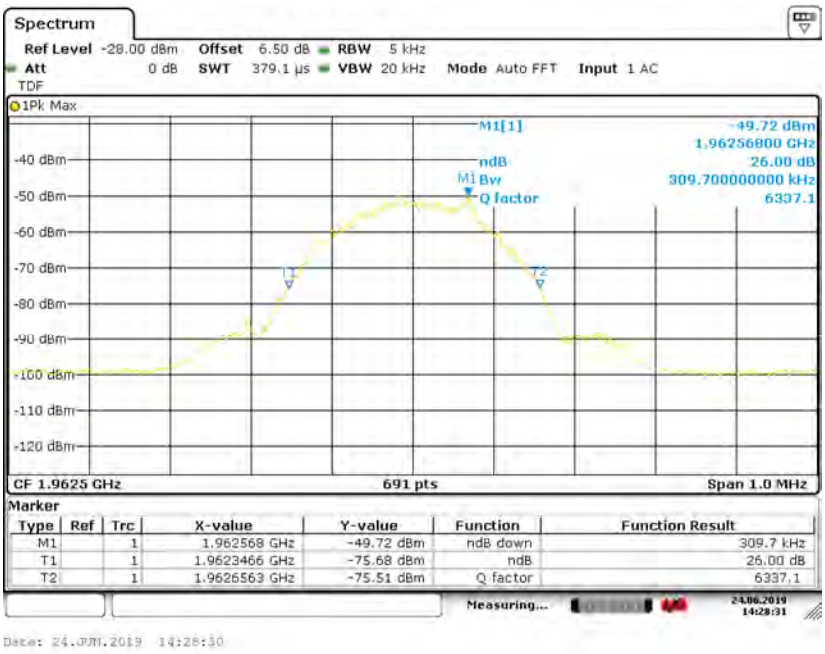
26dB Bandwidth-DL- AWGN-3dB above AGC-Input



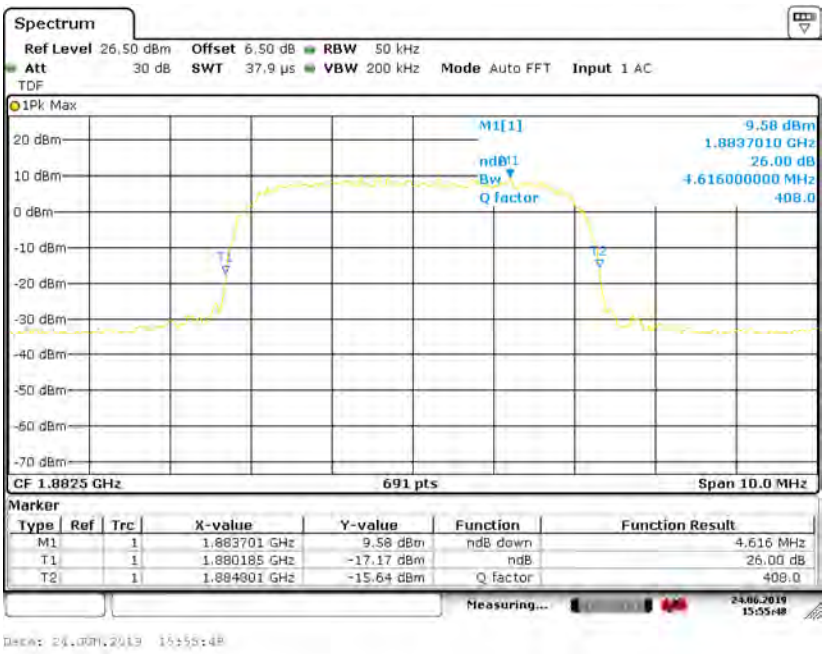
26dB Bandwidth-DL-GSM-Pre AGC-Input



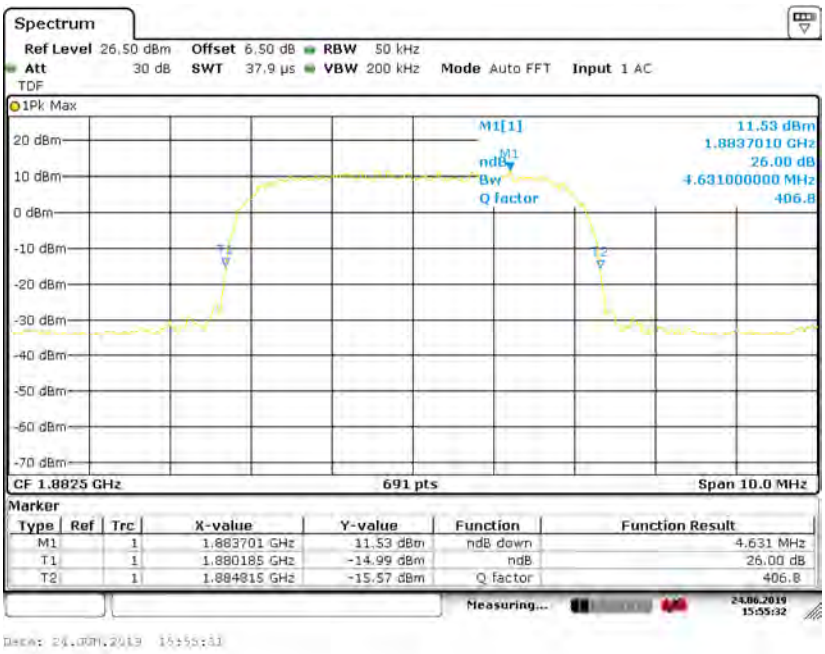
26dB Bandwidth-DL- GSM-3dB above AGC-Input



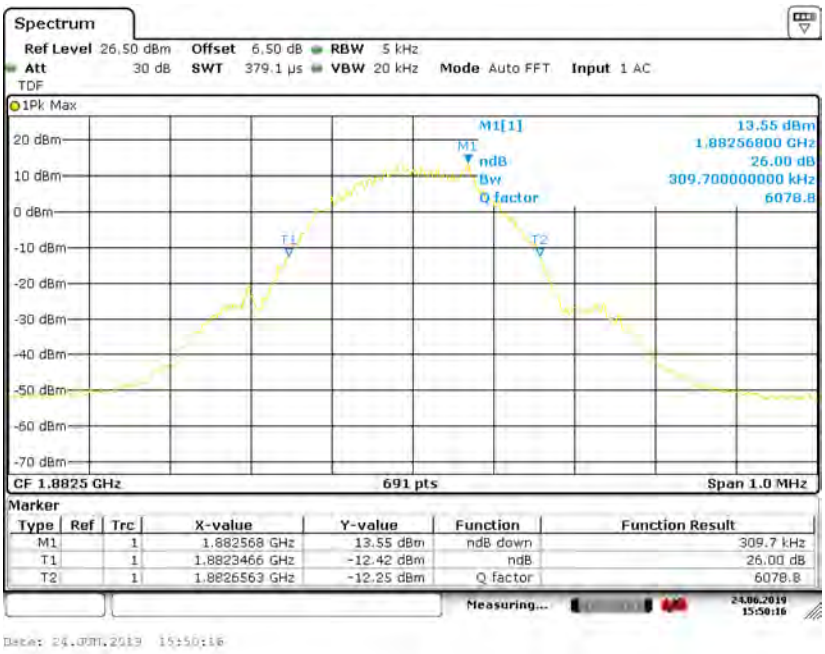
26dB Bandwidth-UL-AWGN-Pre AGC- Output



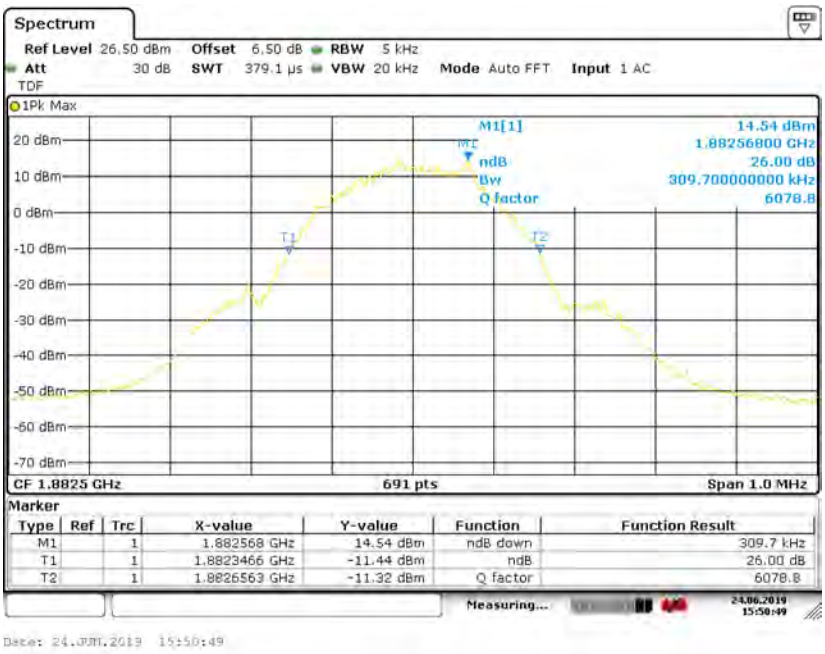
26dB Bandwidth-UL- AWGN-3dB above AGC- Output



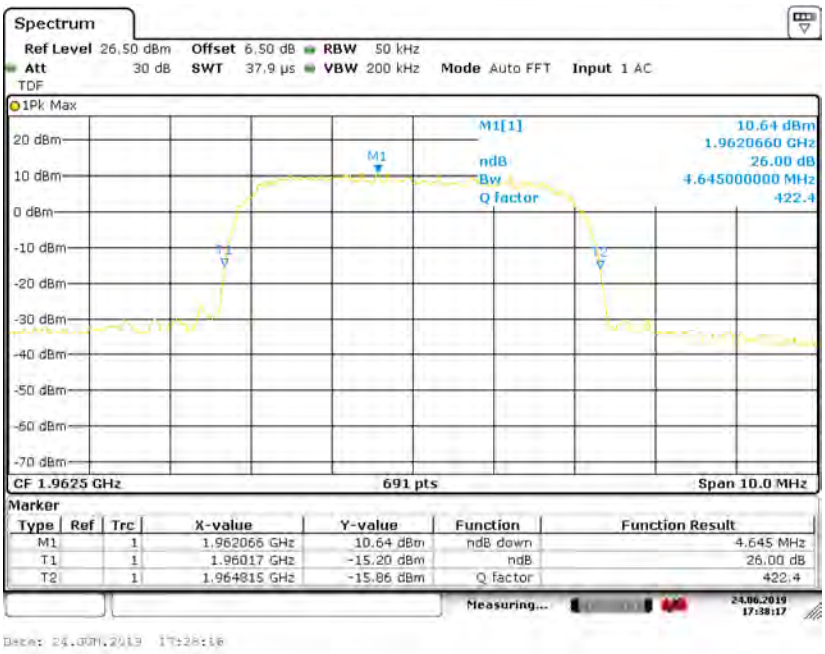
26dB Bandwidth-UL-GSM-Pre AGC- Output



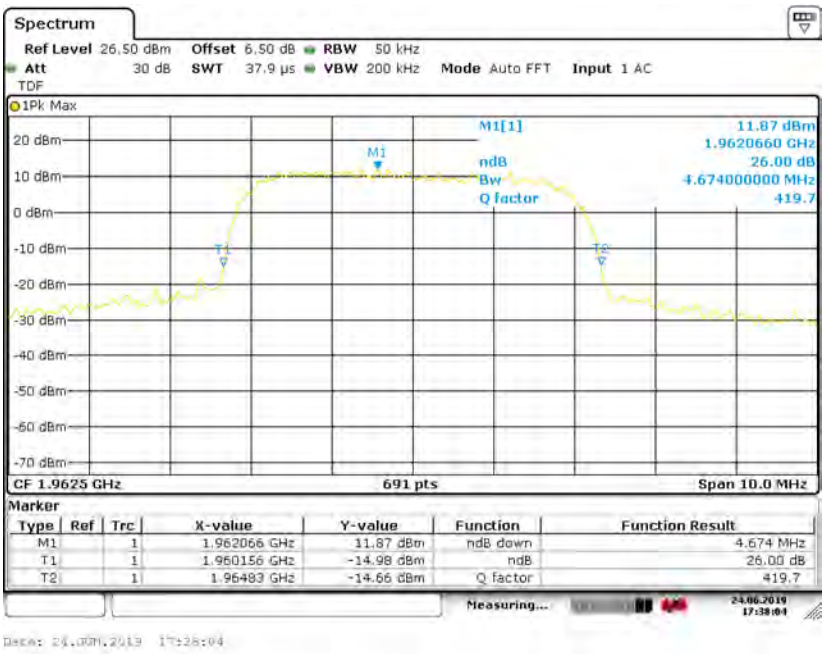
26dB Bandwidth-UL- GSM-3dB above AGC- Output



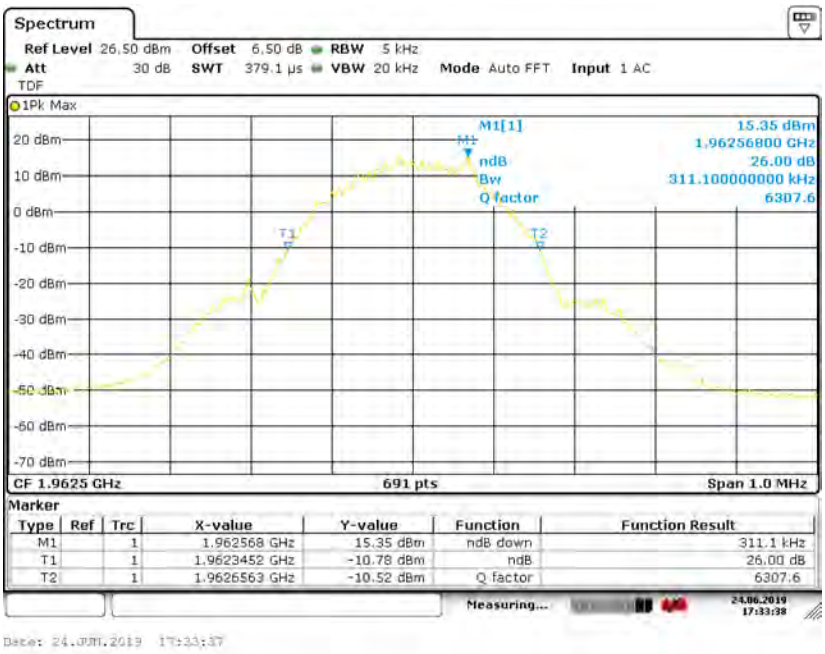
26dB Bandwidth-DL-AWGN-Pre AGC- Output



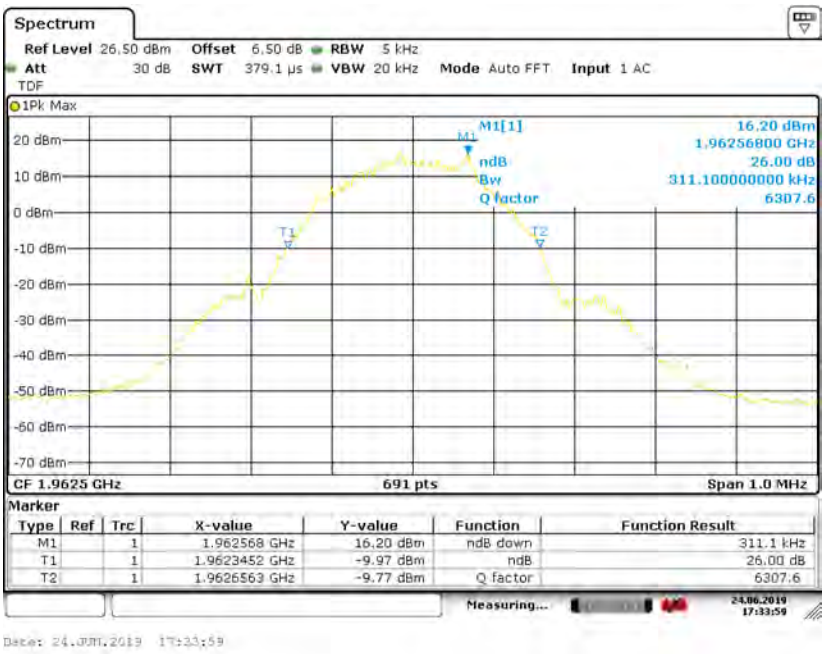
26dB Bandwidth-DL- AWGN-3dB above AGC- Output



26dB Bandwidth-DL-GSM-Pre AGC-Output



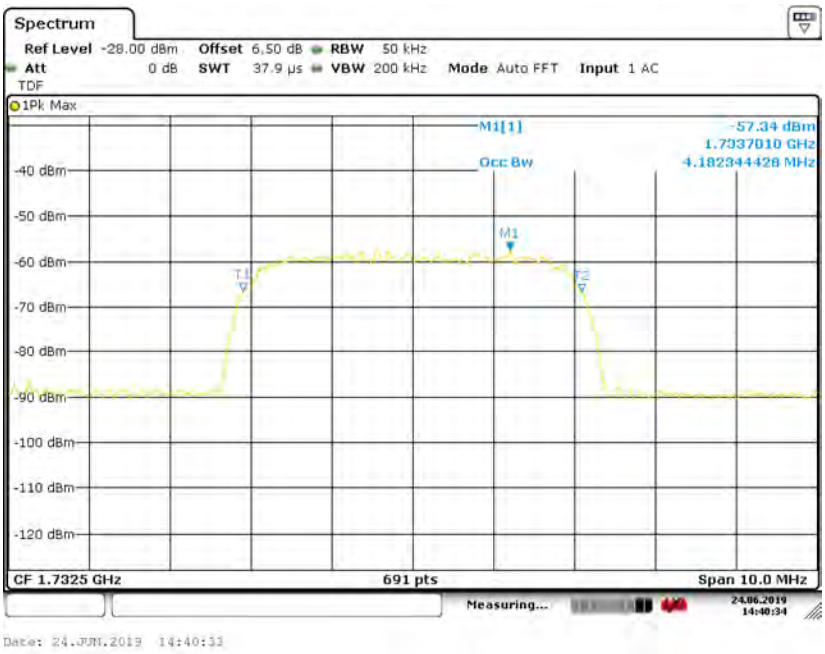
26dB Bandwidth-DL- GSM-3dB above AGC-Output



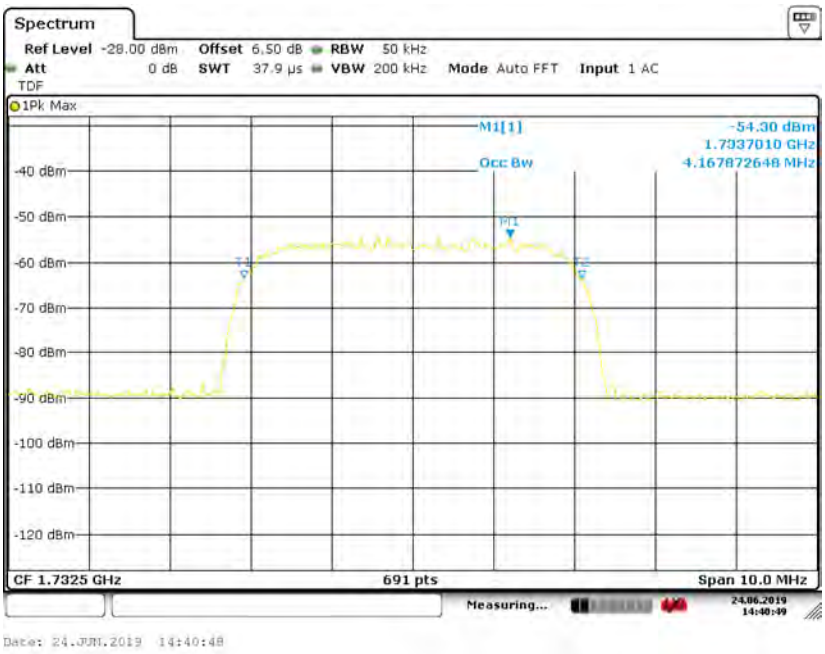
AWS Band

Modes	Signal Type	Signal Level	Frequency (MHz)	99% Bandwidth (MHz)		26dB Bandwidth (MHz)	
				Input	Output	Input	Output
Uplink	AWGN	Pre-AGC	1732.5	4.182	4.153	4.674	4.602
		3dB above AGC	1732.5	4.168	4.153	4.645	4.602
	GSM	Pre-AGC	1732.5	0.246	0.243	0.311	0.310
		3dB above AGC	1732.5	0.245	0.243	0.313	0.310
Downlink	AWGN	Pre-AGC	2132.5	4.182	4.153	4.660	4.660
		3dB above AGC	2132.5	4.168	4.168	4.645	4.660
	GSM	Pre-AGC	2132.5	0.246	0.243	0.311	0.308
		3dB above AGC	2132.5	0.243	0.243	0.310	0.310

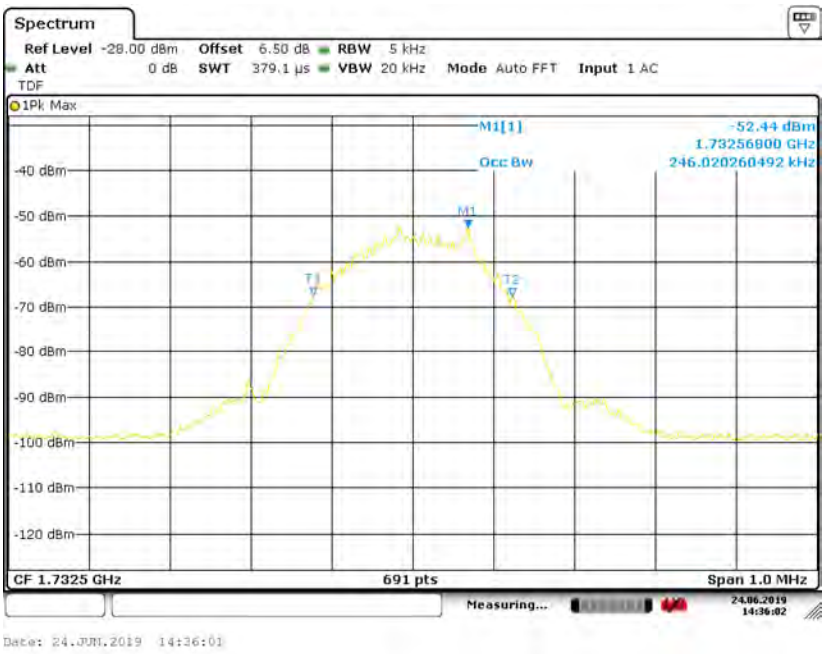
99% Bandwidth-UL-AWGN-Pre AGC-Input



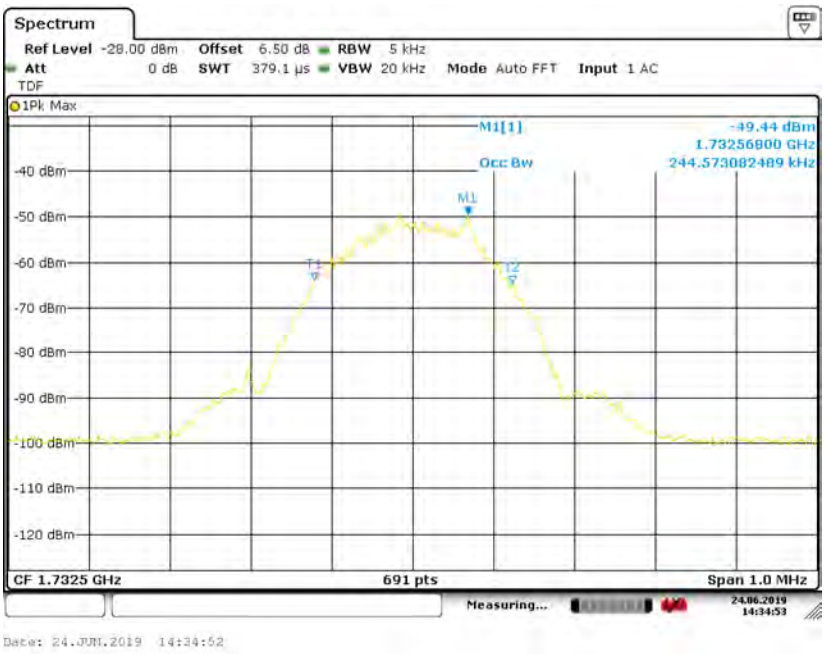
99% Bandwidth-UL- AWGN-3dB above AGC-Input



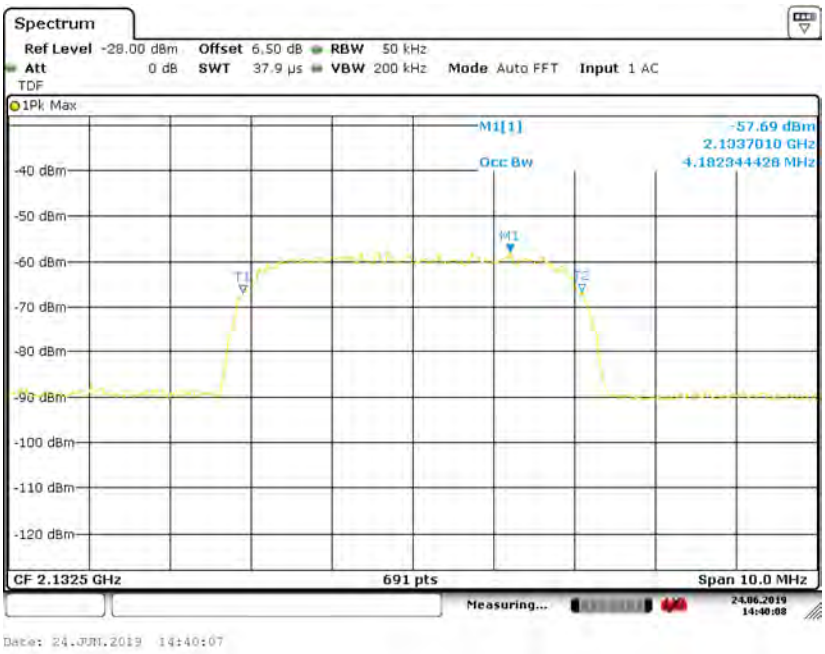
99% Bandwidth-UL-GSM-Pre AGC-Input



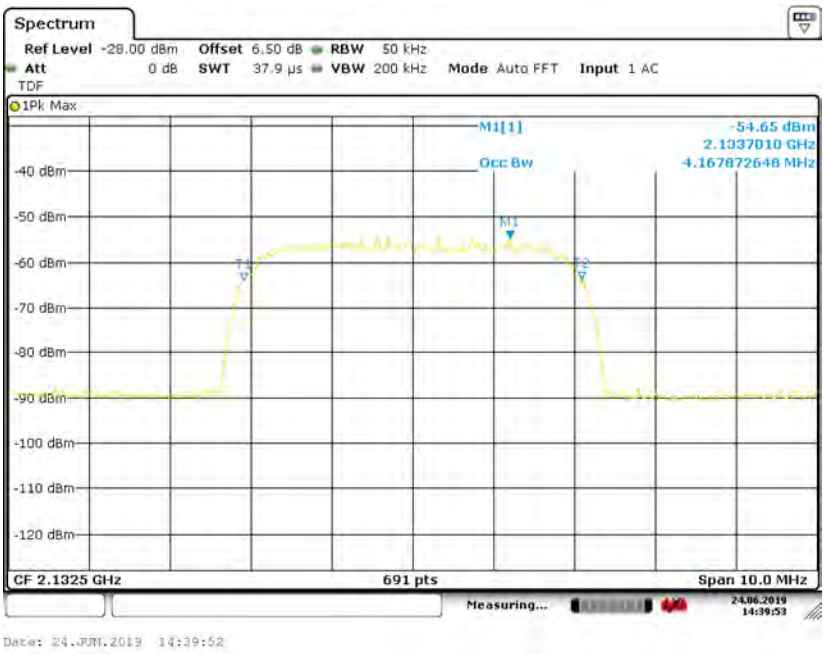
99% Bandwidth-UL- GSM-3dB above AGC-Input



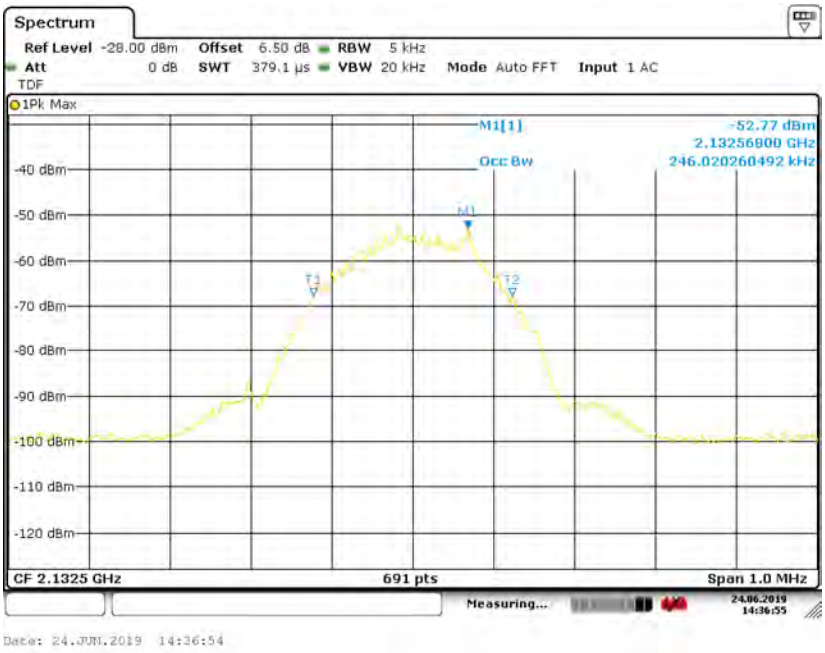
99% Bandwidth-DL-AWGN-Pre AGC-Input



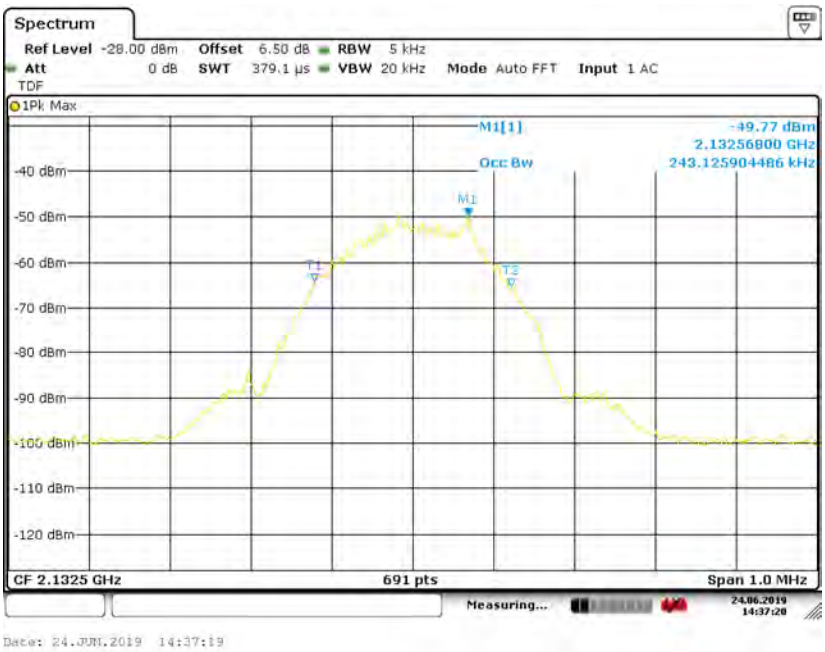
99% Bandwidth-DL- AWGN-3dB above AGC-Input



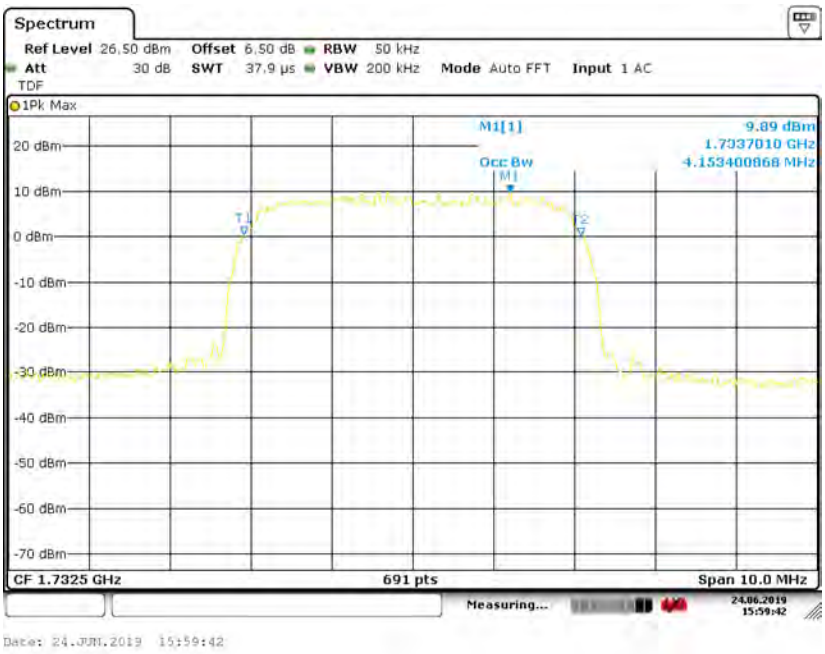
99% Bandwidth-DL-GSM-Pre AGC-Input



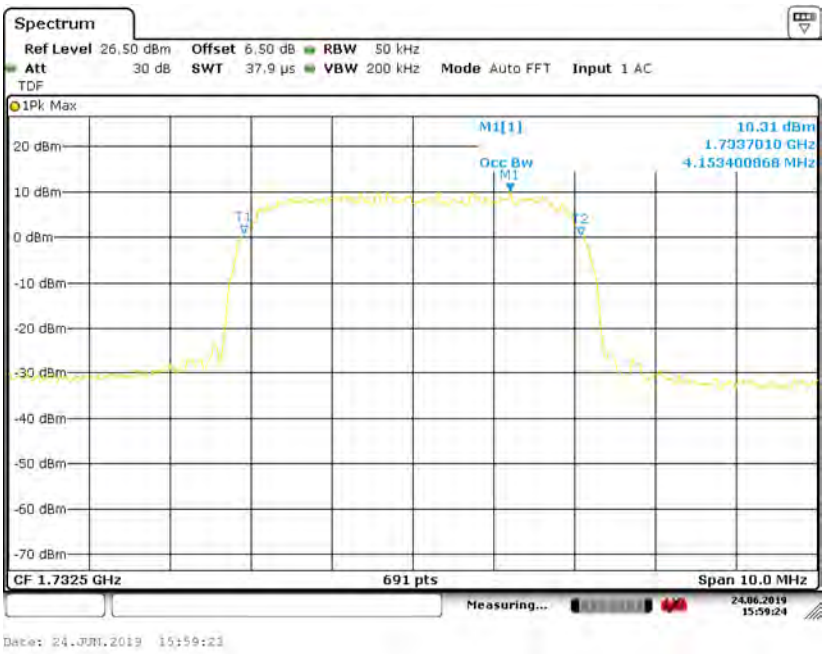
99% Bandwidth-DL- GSM-3dB above AGC-Input



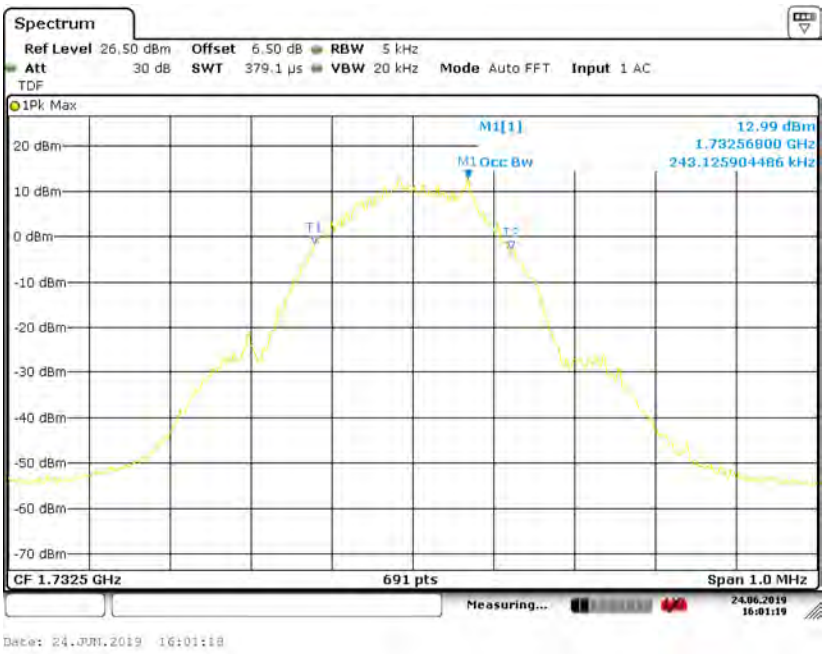
99% Bandwidth-UL-AWGN-Pre AGC- Output



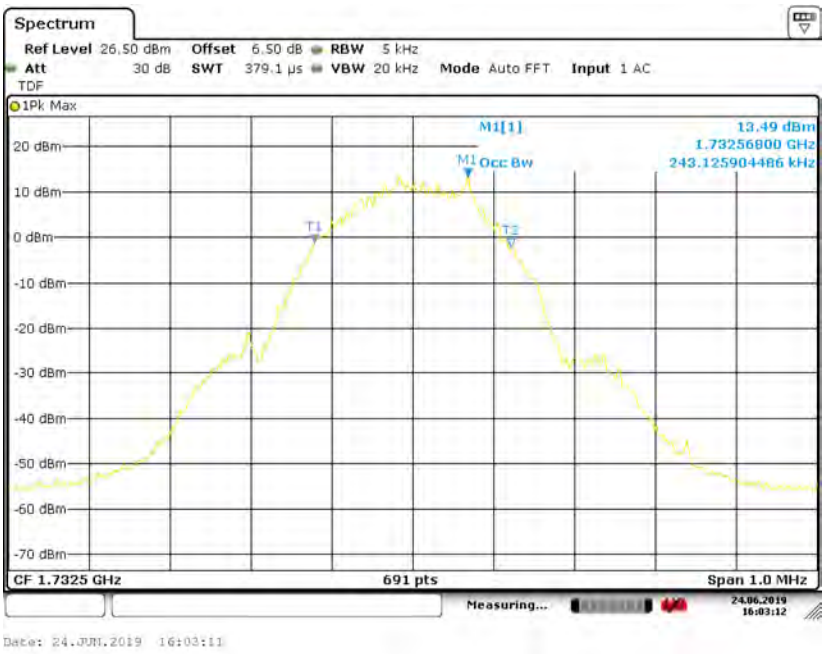
99% Bandwidth-UL- AWGN-3dB above AGC- Output



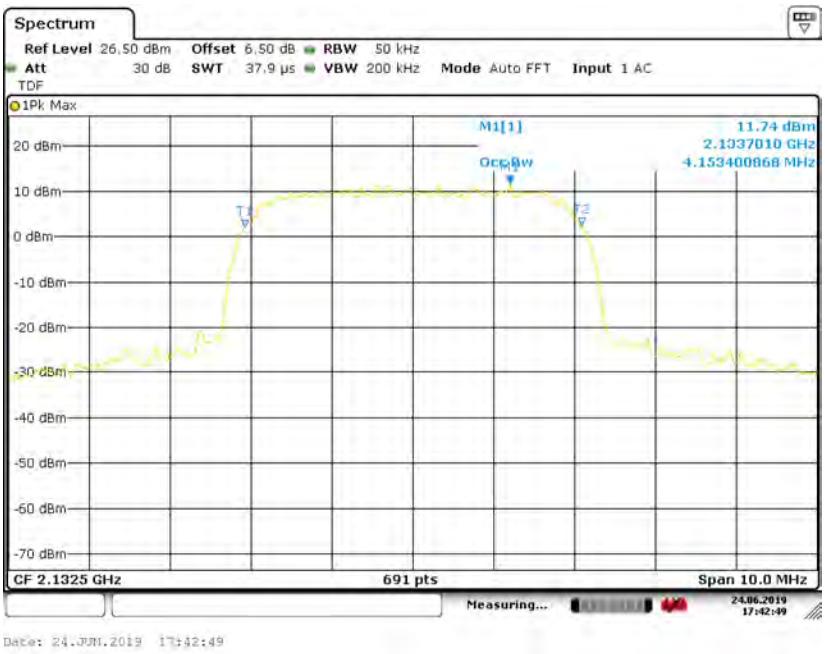
99% Bandwidth-UL-GSM-Pre AGC- Output



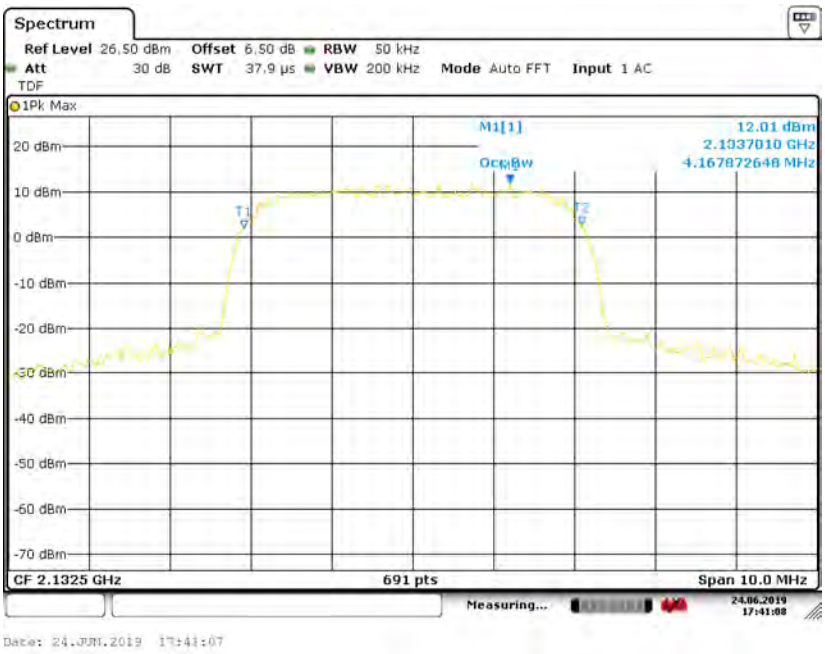
99% Bandwidth-UL- GSM-3dB above AGC- Output



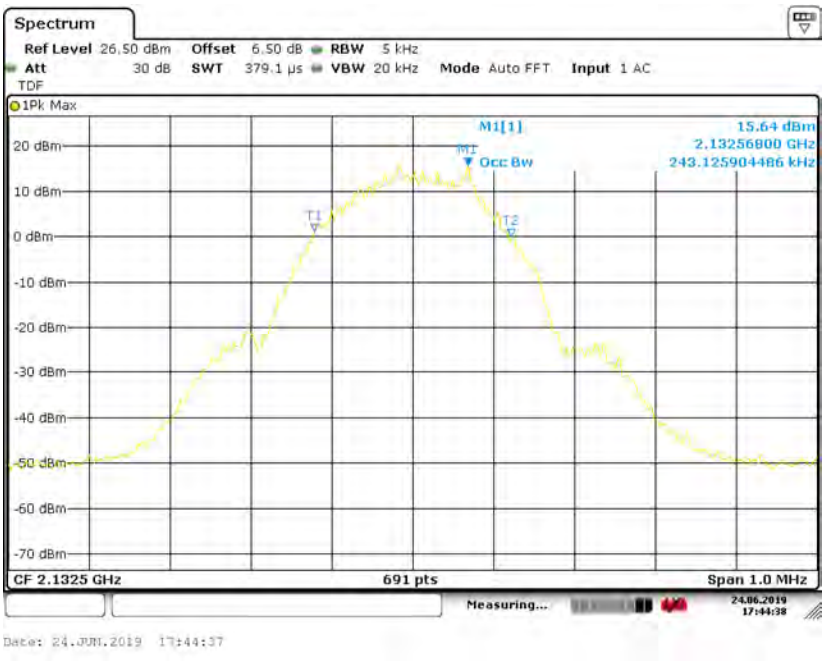
99% Bandwidth-DL-AWGN-Pre AGC- Output



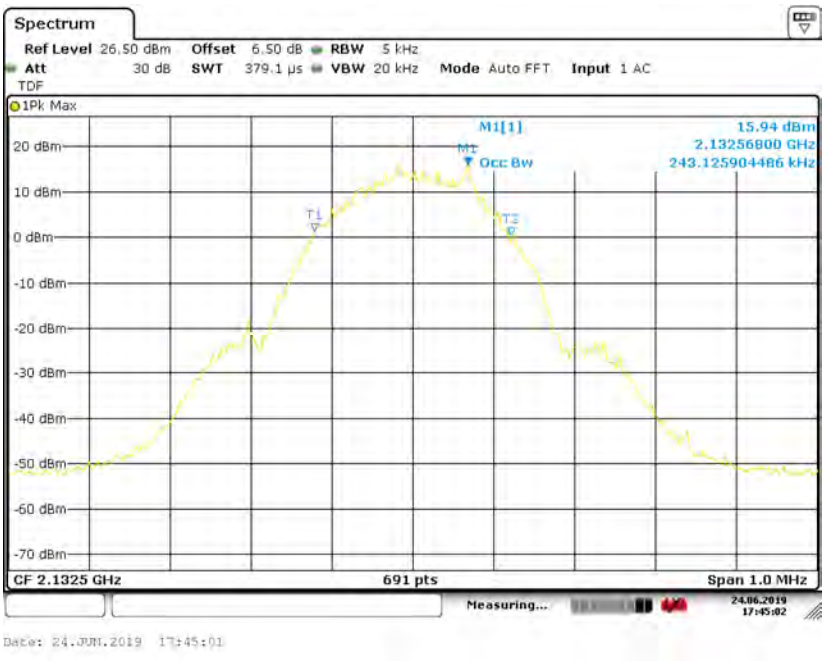
99% Bandwidth-DL- AWGN-3dB above AGC- Output



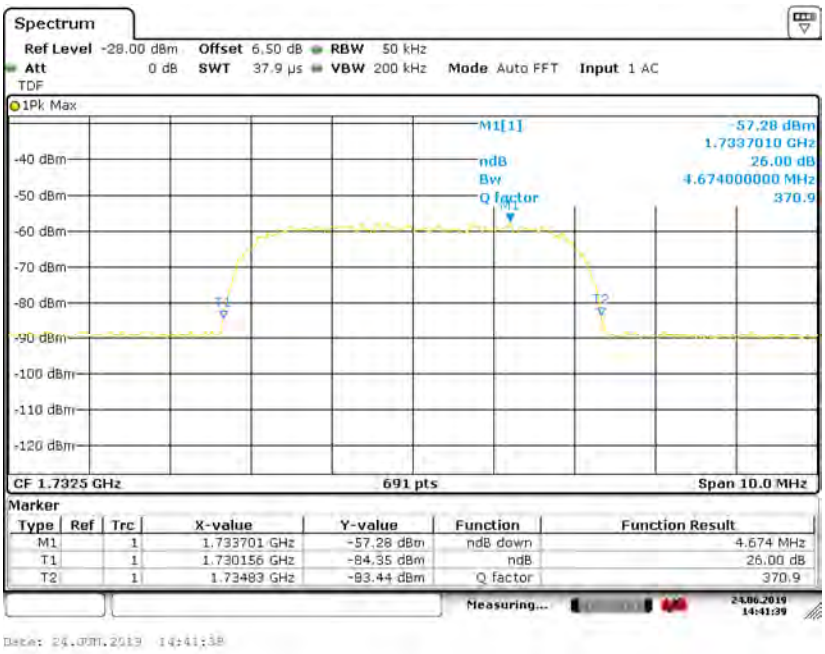
99% Bandwidth-DL-GSM-Pre AGC-Output



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

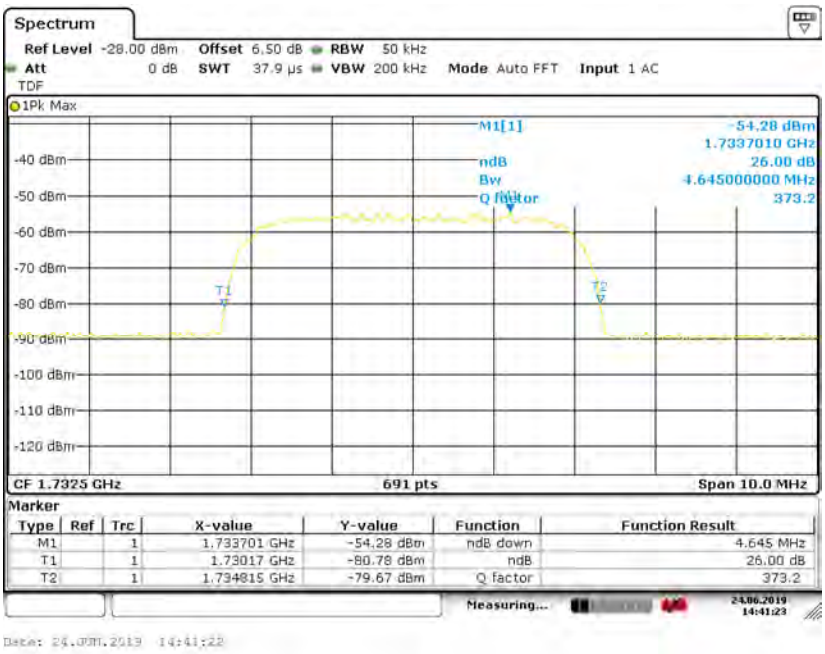


26dB Bandwidth-UL-AWGN-Pre AGC-Input



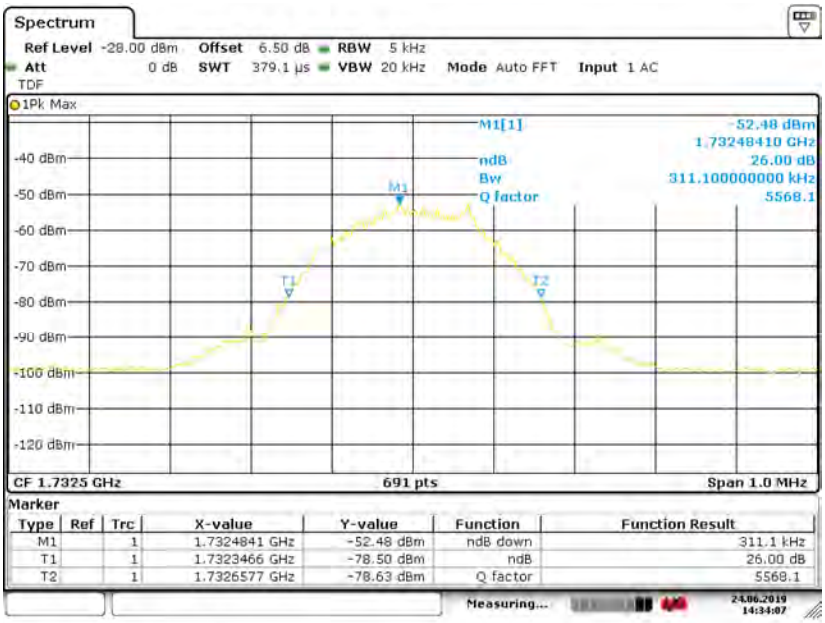
Date: 24.JUN.2019 14:41:38

26dB Bandwidth-UL- AWGN-3dB above AGC-Input

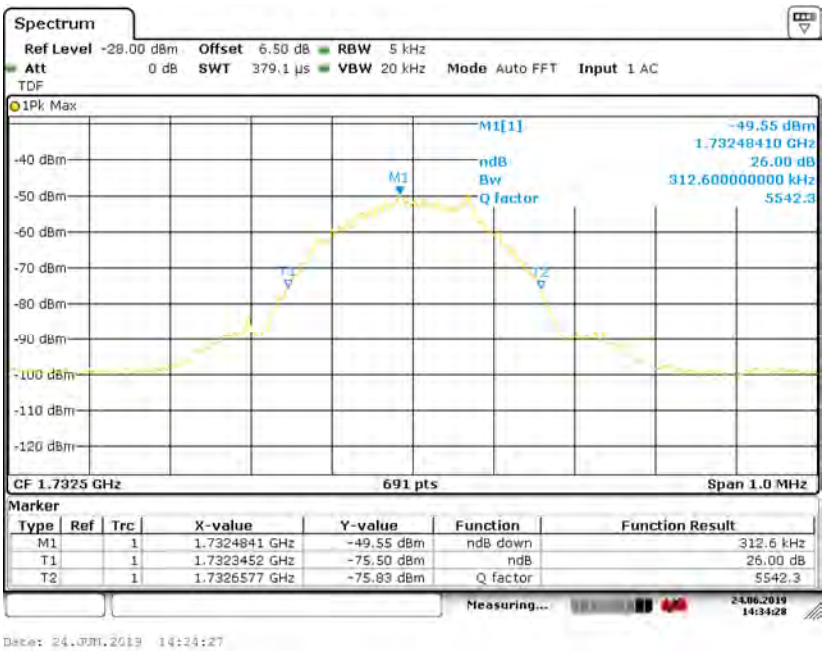


Date: 24.JUN.2019 14:41:22

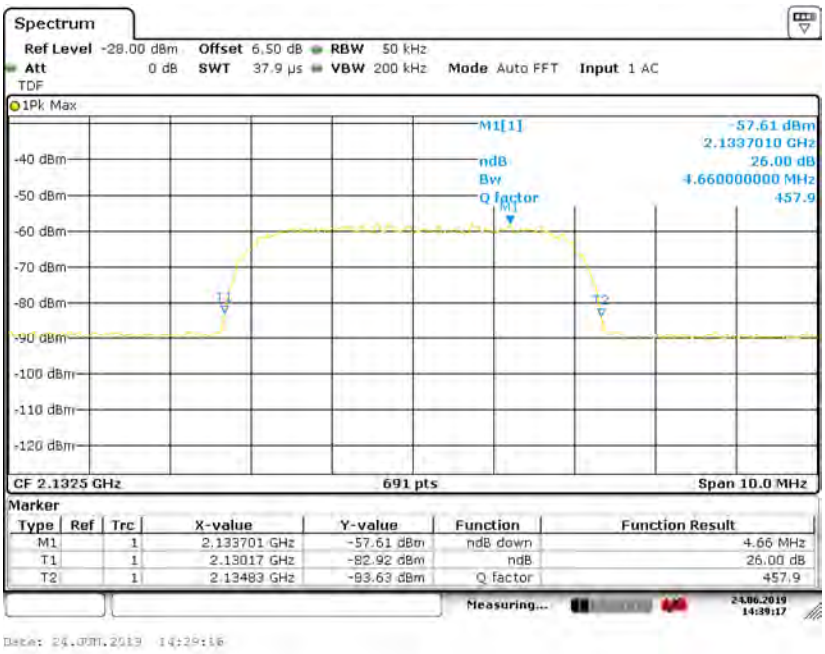
26dB Bandwidth-UL-GSM-Pre AGC-Input



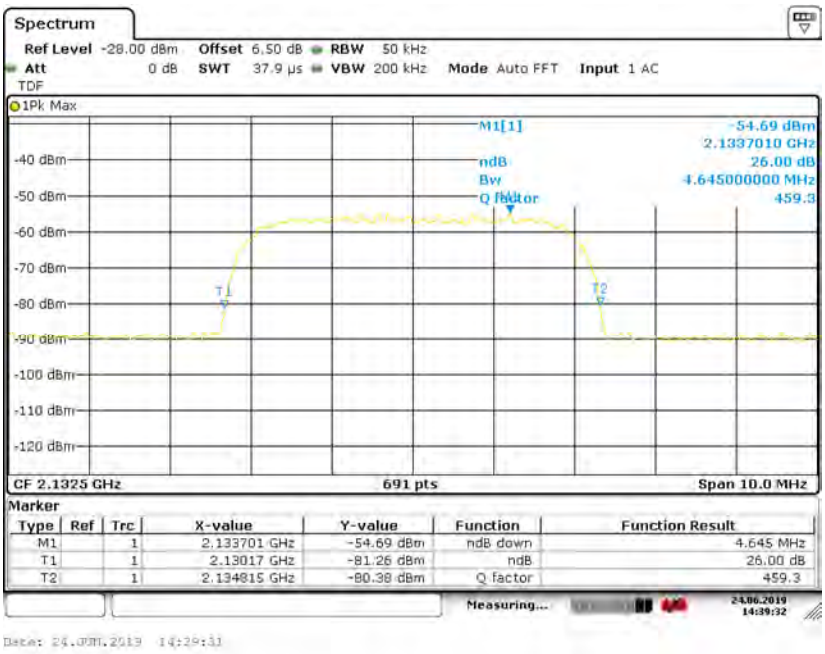
26dB Bandwidth-UL- GSM-3dB above AGC-Input



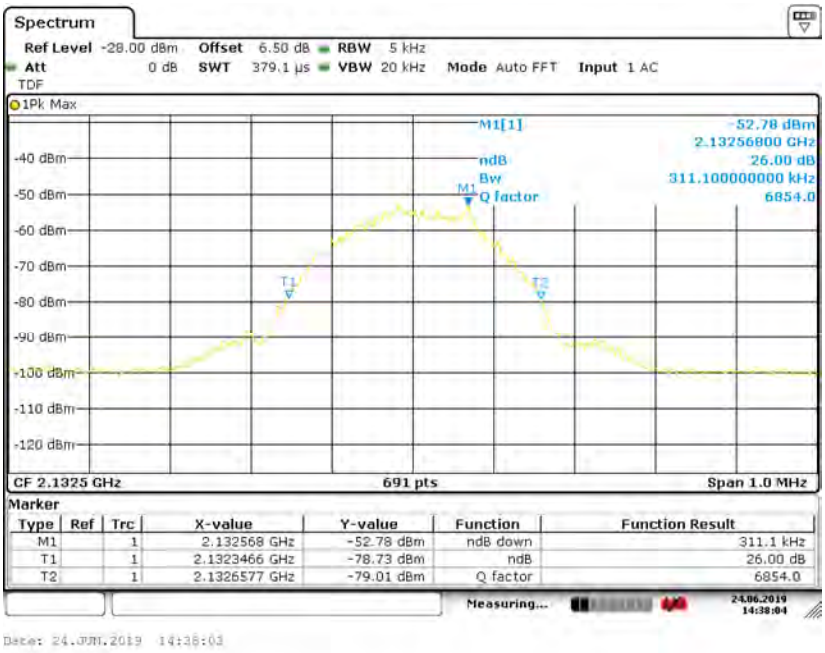
26dB Bandwidth-DL-AWGN-Pre AGC-Input



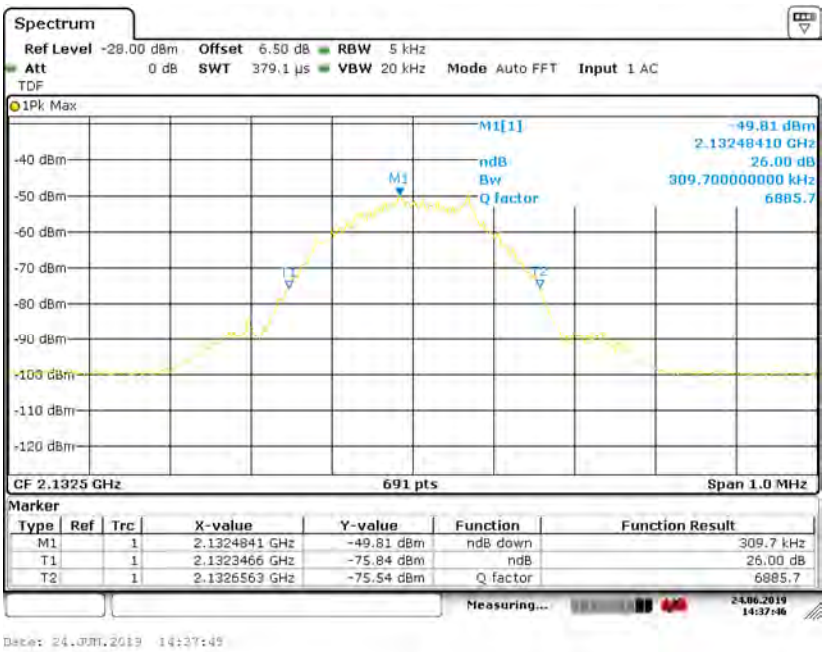
26dB Bandwidth-DL- AWGN-3dB above AGC-Input



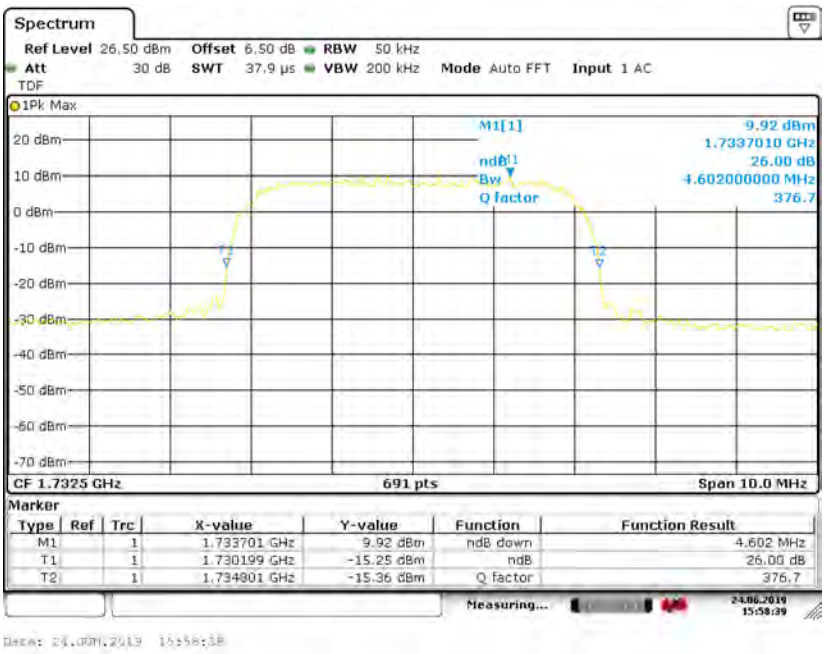
26dB Bandwidth-DL-GSM-Pre AGC-Input



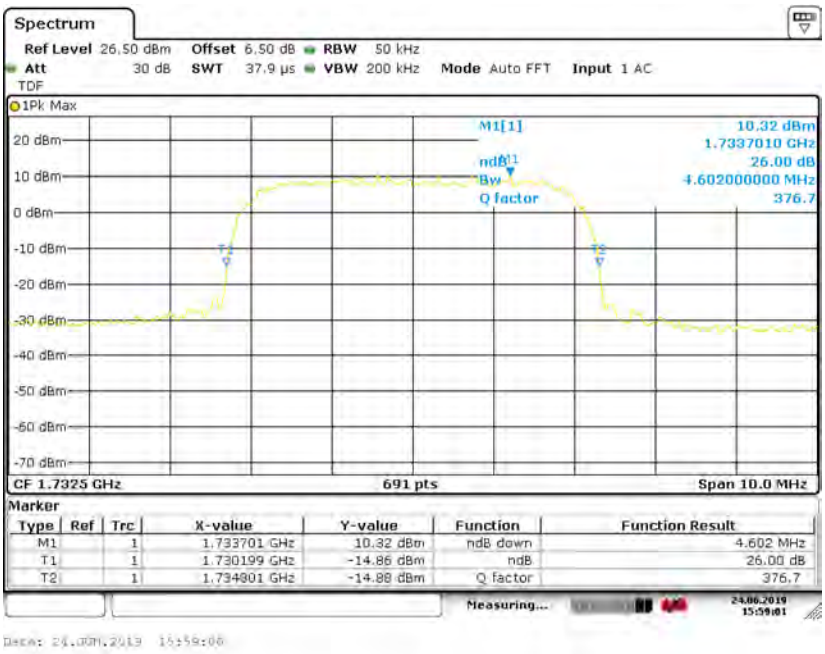
26dB Bandwidth-DL- GSM-3dB above AGC-Input



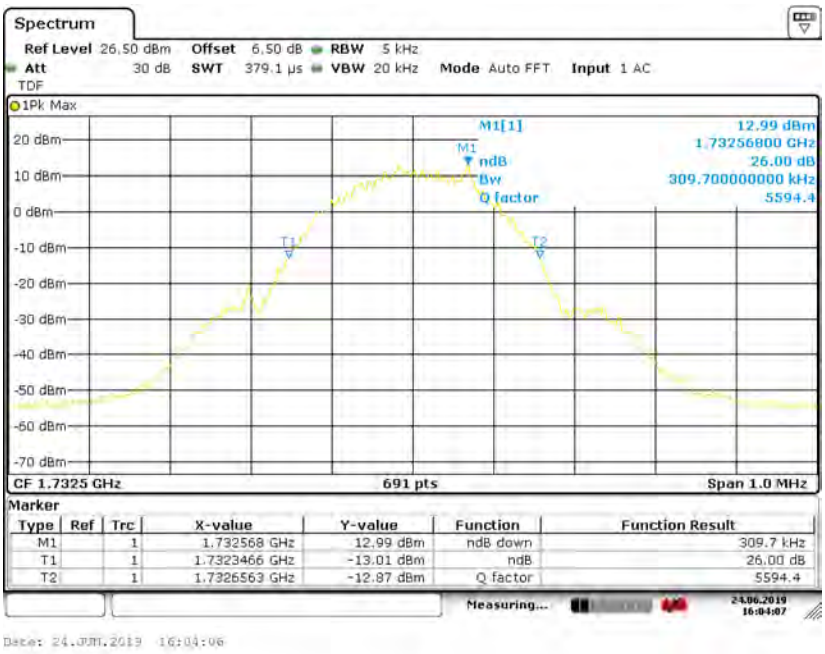
26dB Bandwidth-UL-AWGN-Pre AGC- Output



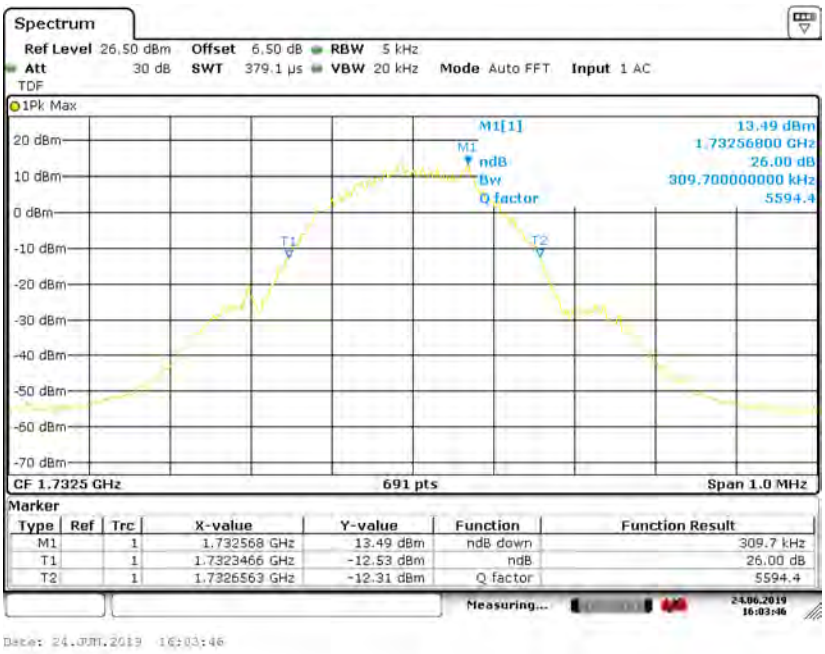
26dB Bandwidth-UL- AWGN-3dB above AGC- Output



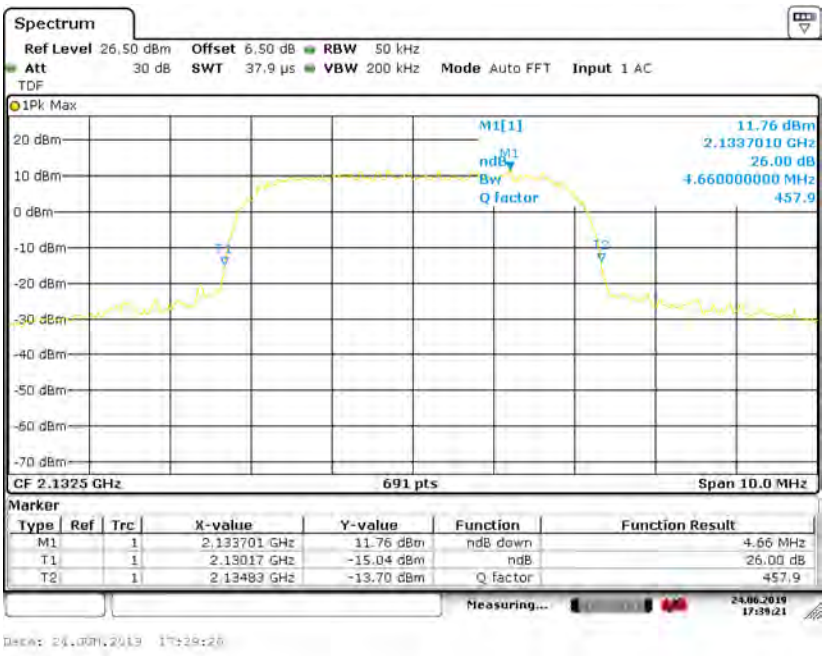
26dB Bandwidth-UL-GSM-Pre AGC- Output



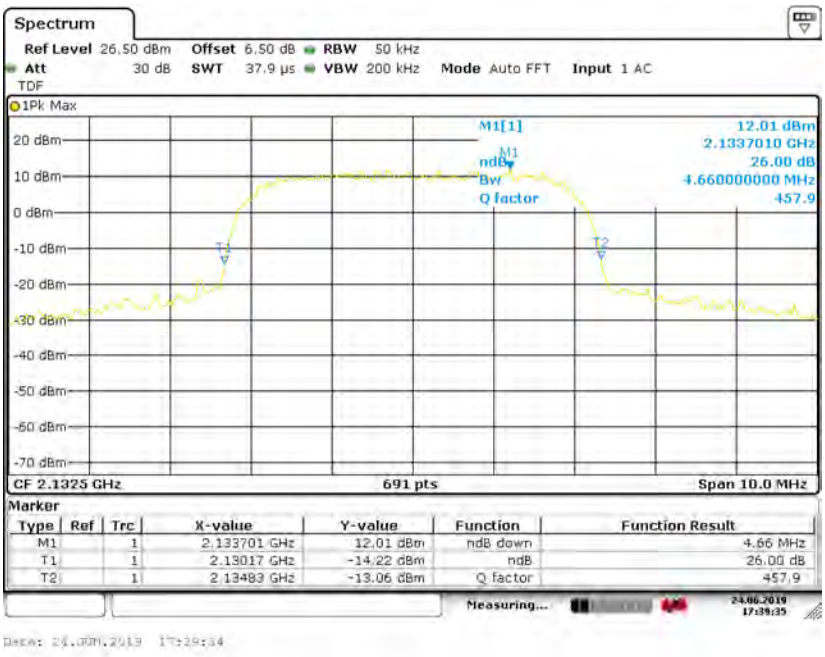
26dB Bandwidth-UL- GSM-3dB above AGC- Output



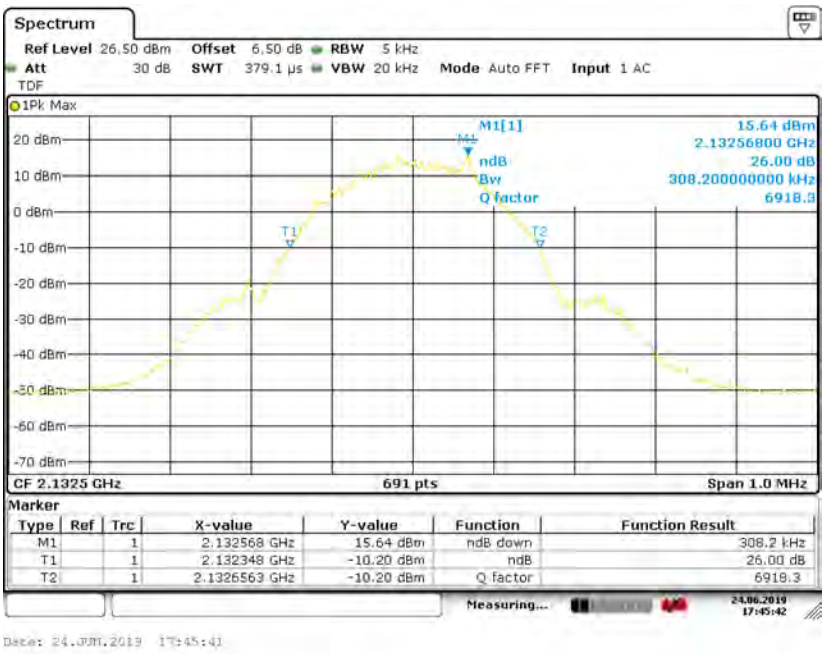
26dB Bandwidth-DL-AWGN-Pre AGC- Output



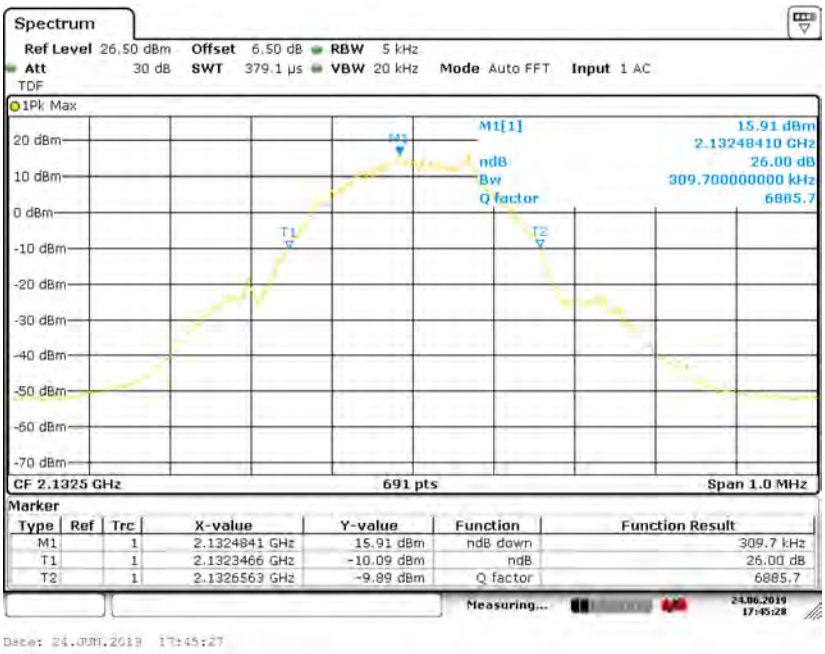
26dB Bandwidth-DL- AWGN-3dB above AGC- Output



26dB Bandwidth-DL-GSM-Pre AGC-Output



26dB Bandwidth-DL- GSM-3dB above AGC-Output



FCC § 2.1051; § 22.917 (a); § 24.238 (a); §27.53 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Applicable Standards

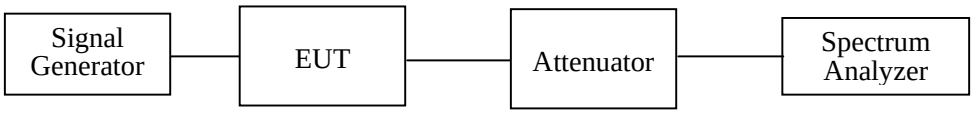
FCC §2.1051, §22.917, §24.238 and §27.53.

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 $43 + 10 \log_{10}(P)$ dB.

Test Procedure

Please refer to KDB 935210 D05 Indus Booster Basic Meas v01r03 clause 3.6.3



Test Data

Environmental Conditions

Temperature:	25℃
Relative Humidity:	51%
ATM Pressure:	101.3kPa

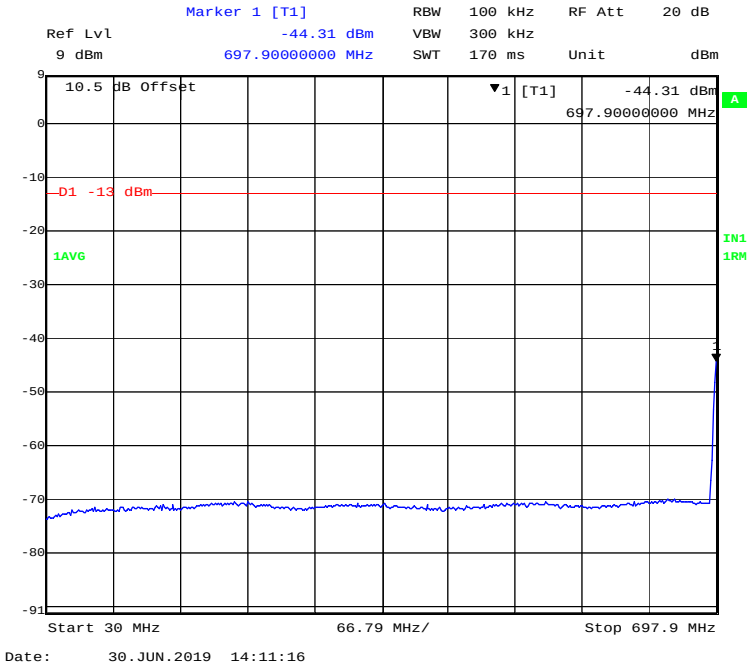
The testing was performed by Carrie He from 2019-06-30.

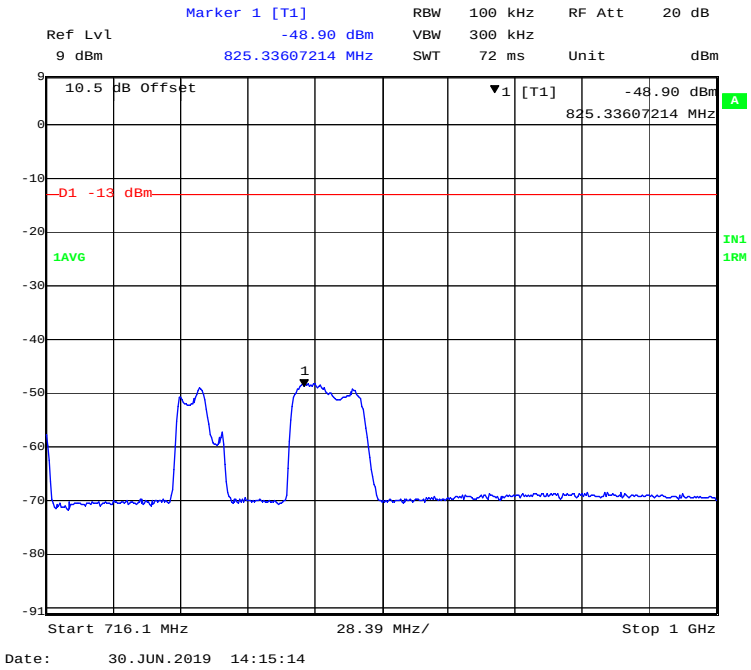
EUT operation mode: Transmitting

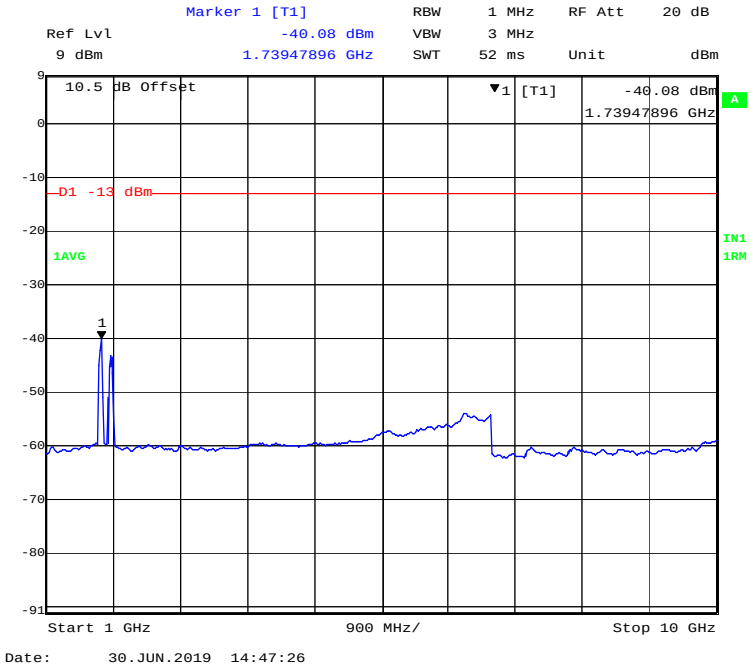
Test Result: Compliant.

Uplink:

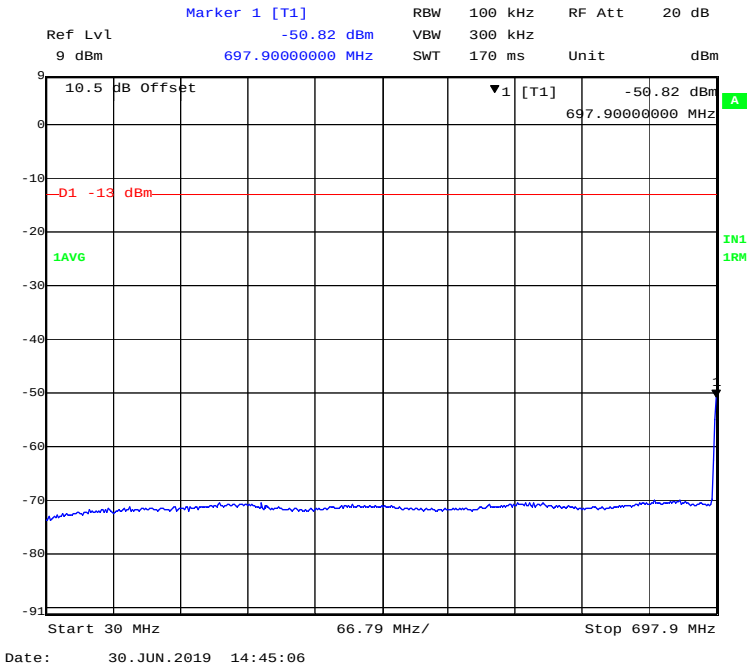
Lower 700MHz (A+B+C Block)-AWGN-Pre AGC-Low Channel

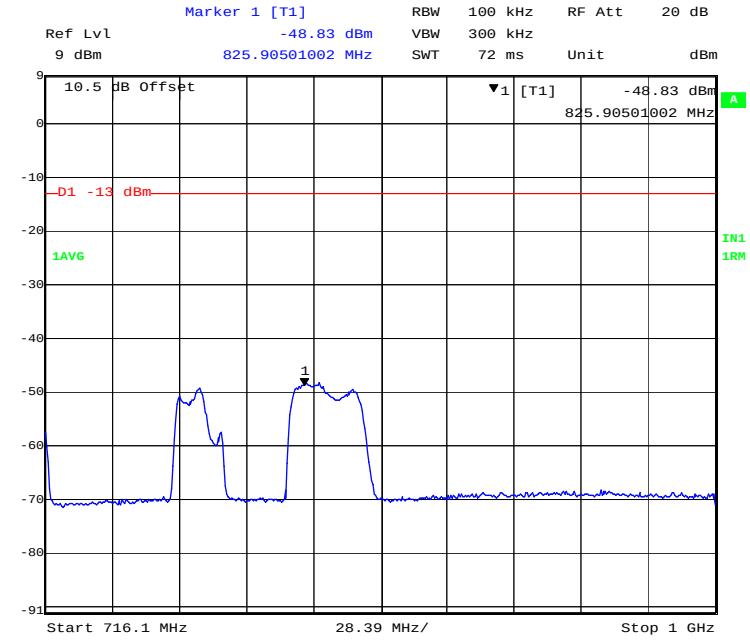


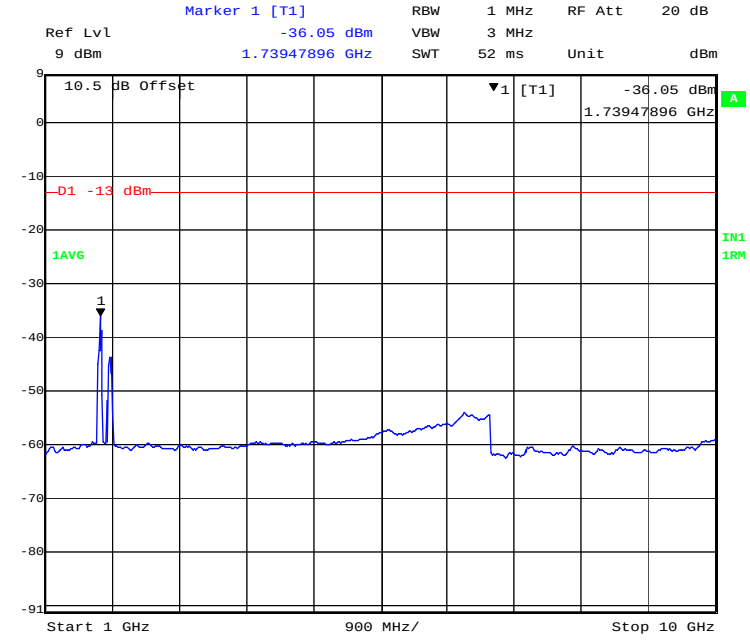




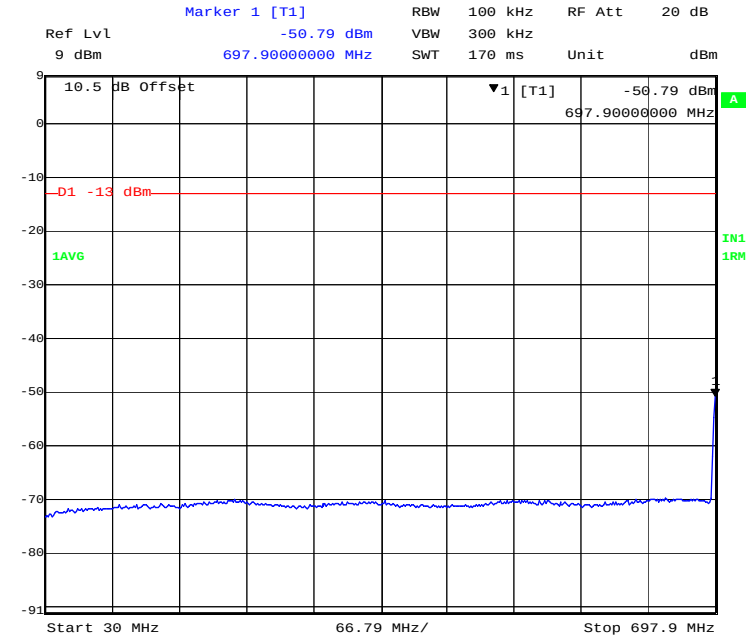
Lower 700MHz (A+B+C Block) - AWGN-Pre AGC-Middle Channel

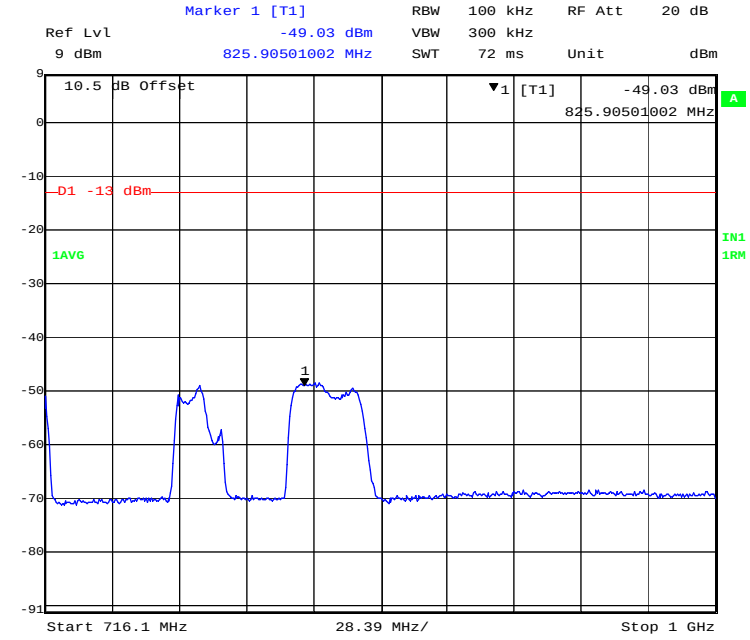


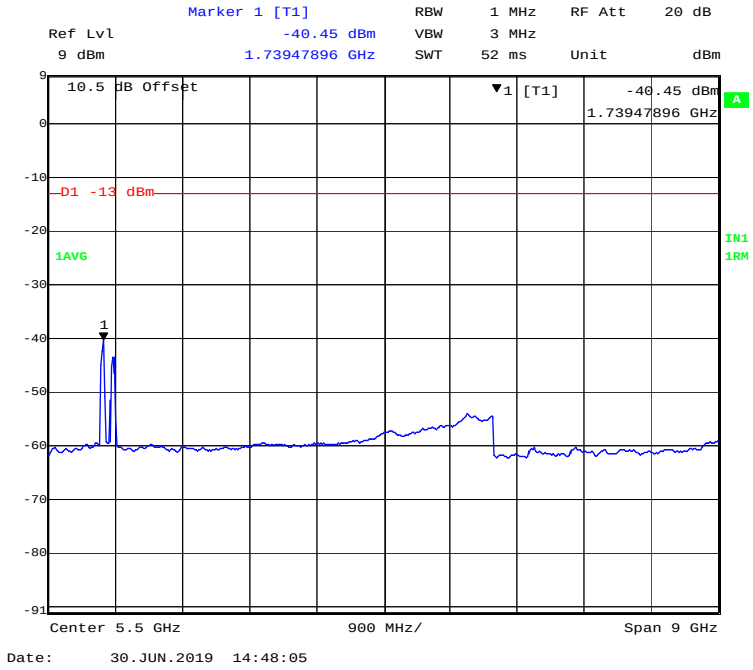

Marker 1 [T1]
RBW 100 kHz
RF Att 20 dB
Ref Lvl
-48.83 dBm
VBW 300 kHz
9 dBm
825.90501002 MHz
SWT 72 ms
Unit dBm
10.5 dB Offset
1 [T1]
-48.83 dBm
825.90501002 MHz
D1 -13 dBm
1AVG
IN1
1RM
Start 716.1 MHz
28.39 MHz/
Stop 1 GHz
Date: 30.JUN.2019 14:46:12


Marker 1 [T1]
RBW 1 MHz
RF Att 20 dB
Ref Lvl
-36.05 dBm
VBW 3 MHz
9 dBm
1.73947896 GHz
SWT 52 ms
Unit dBm
10.5 dB Offset
1 [T1]
-36.05 dBm
1.73947896 GHz
D1 -13 dBm
1AVG
IN1
1RM
Start 1 GHz
900 MHz/
Stop 10 GHz
Date: 30.JUN.2019 14:46:40

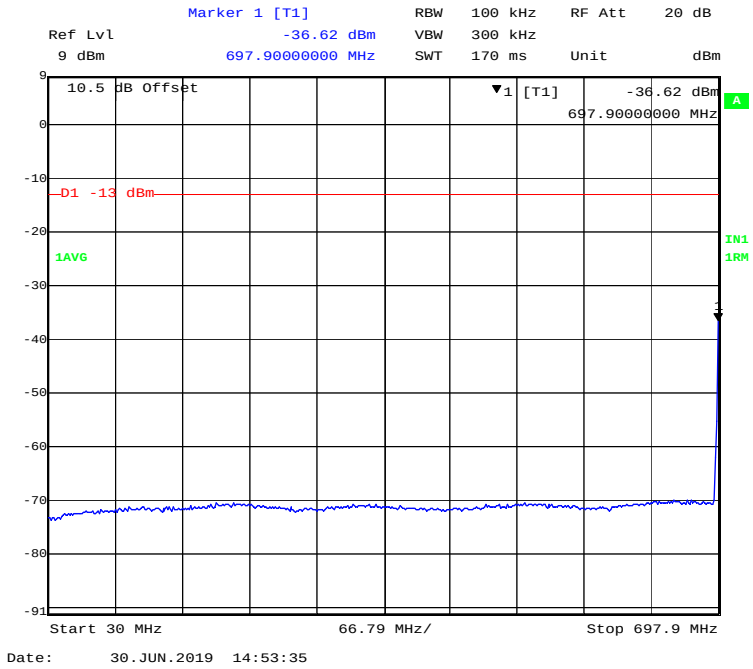
Lower 700MHz (A+B+C Block) - AWGN-Pre AGC-High Channel

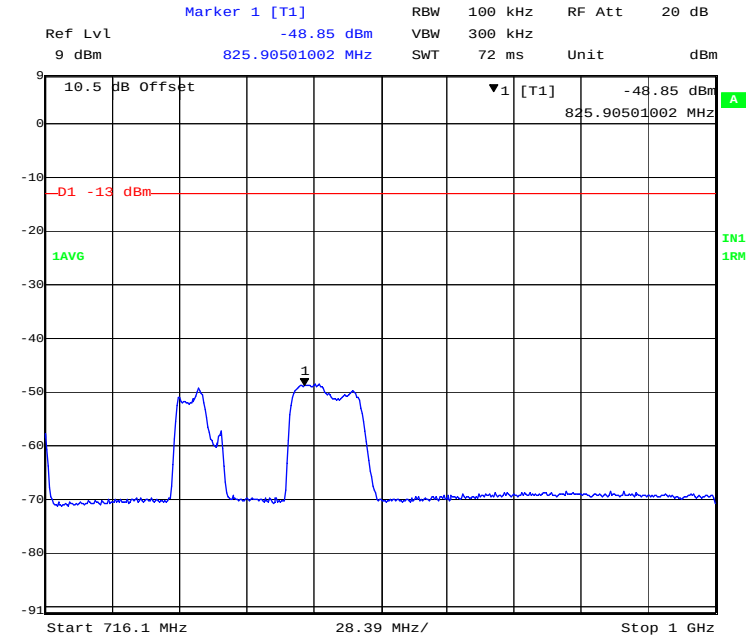


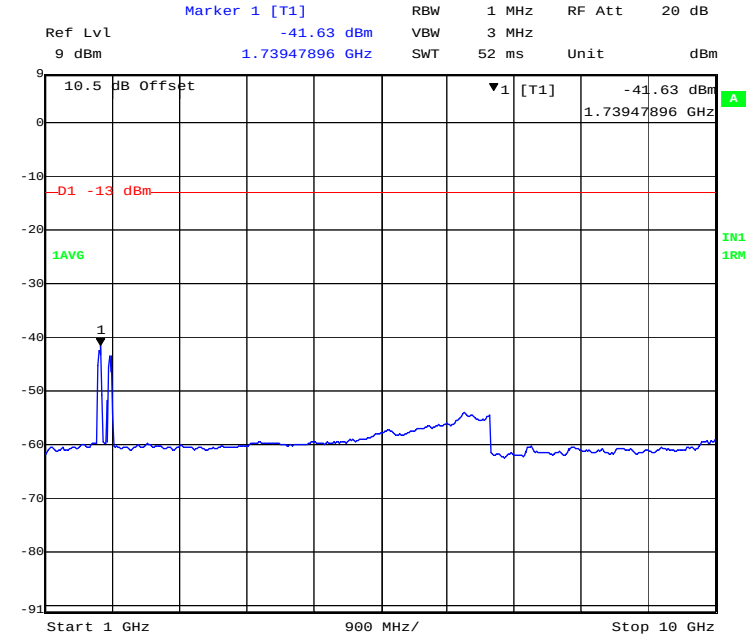




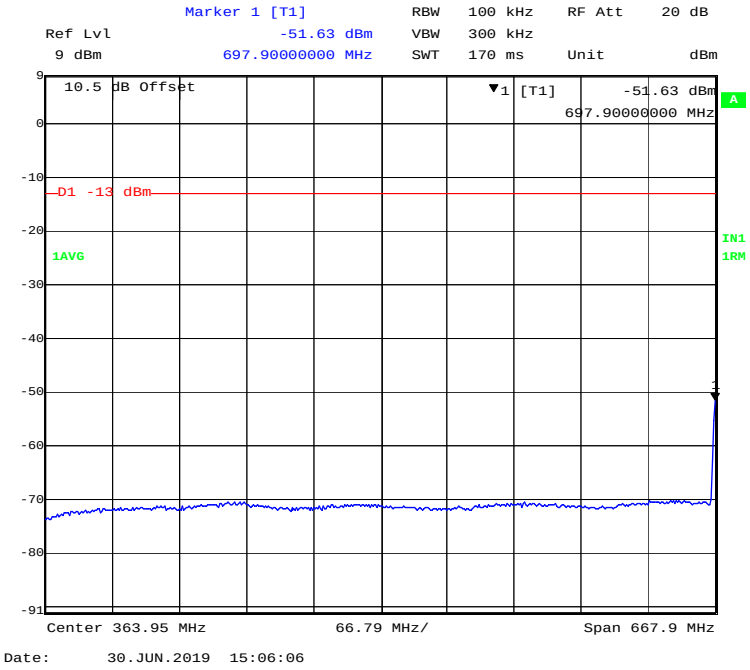
Lower 700MHz (A+B+C Block) - GSM-Pre AGC-Low Channel

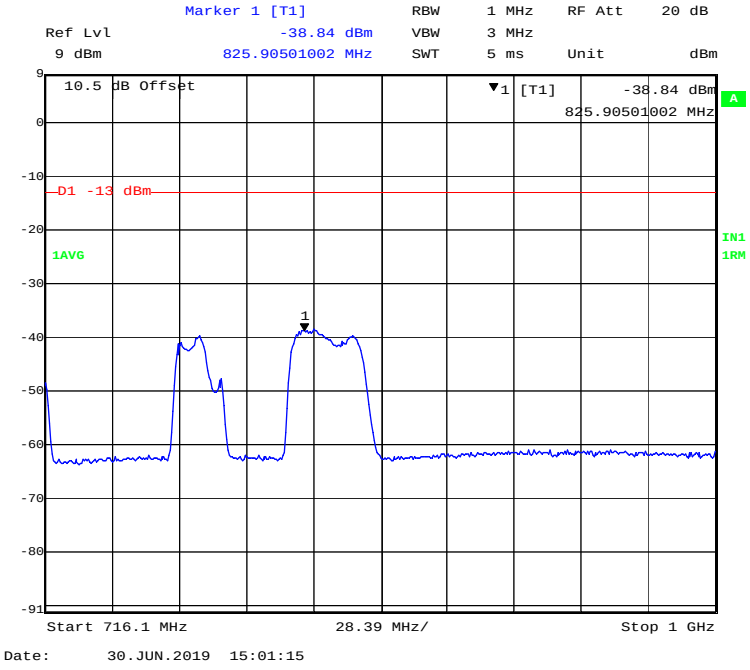


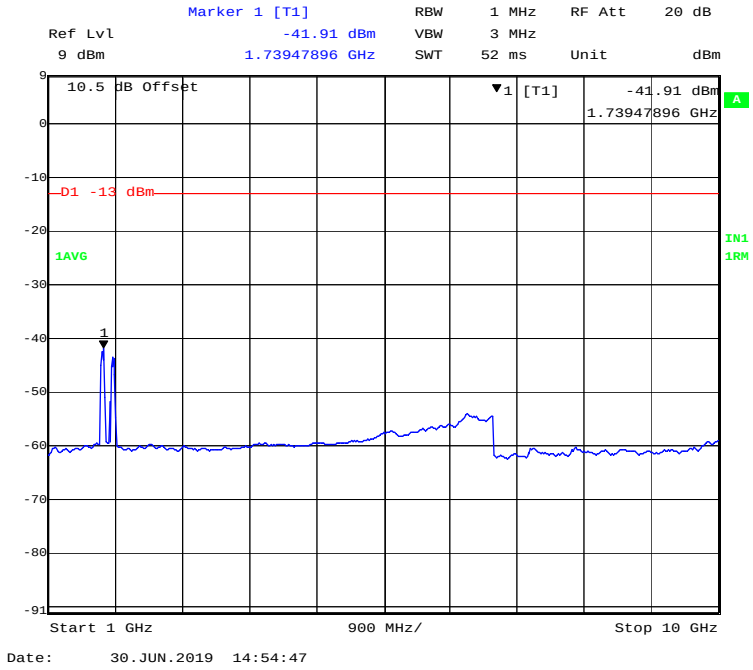

Marker 1 [T1]
RBW 100 kHz
RF Att 20 dB
Ref Lvl
-48.85 dBm
VBW 300 kHz
9 dBm
825.90501002 MHz
SWT 72 ms
Unit dBm
10.5 dB Offset
1 [T1]
-48.85 dBm
825.90501002 MHz
D1 -13 dBm
1AVG
IN1
1RM
Start 716.1 MHz
28.39 MHz/
Stop 1 GHz
Date: 30.JUN.2019 15:07:01


Marker 1 [T1]
RBW 1 MHz
RF Att 20 dB
Ref Lvl
-41.63 dBm
VBW 3 MHz
9 dBm
1.73947896 GHz
SWT 52 ms
Unit dBm
10.5 dB Offset
1 [T1]
-41.63 dBm
1.73947896 GHz
D1 -13 dBm
1AVG
IN1
1RM
Start 1 GHz
900 MHz/
Stop 10 GHz
Date: 30.JUN.2019 14:54:08

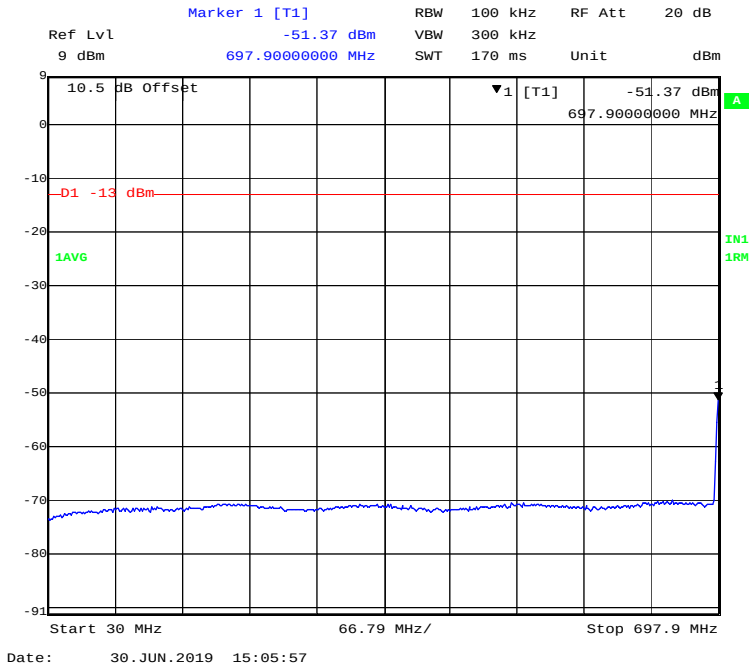
Lower 700MHz (A+B+C Block) - GSM-Pre AGC-Middle Channel

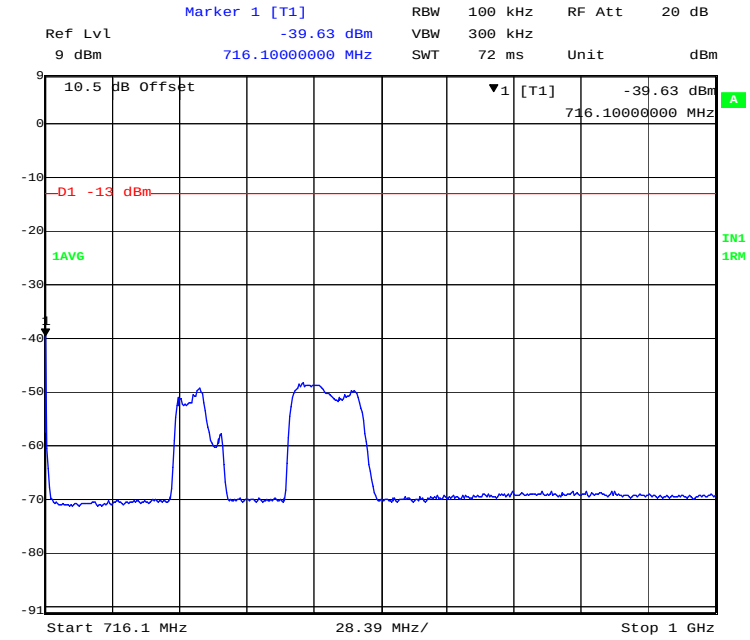


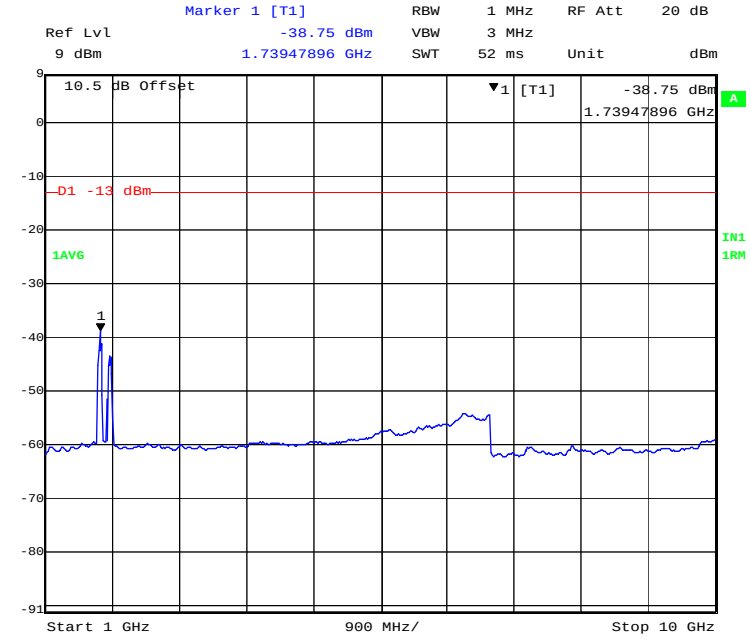




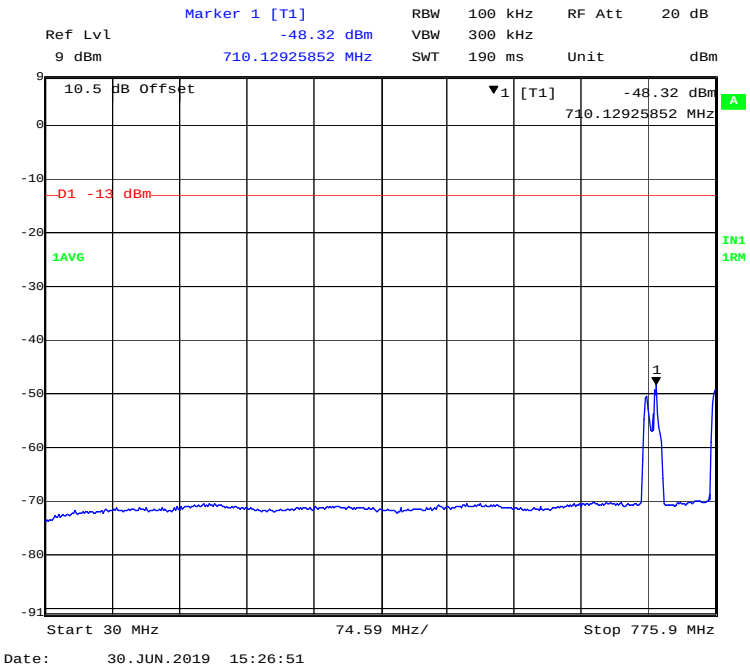
Lower 700MHz (A+B+C Block) - GSM-Pre AGC-High Channel

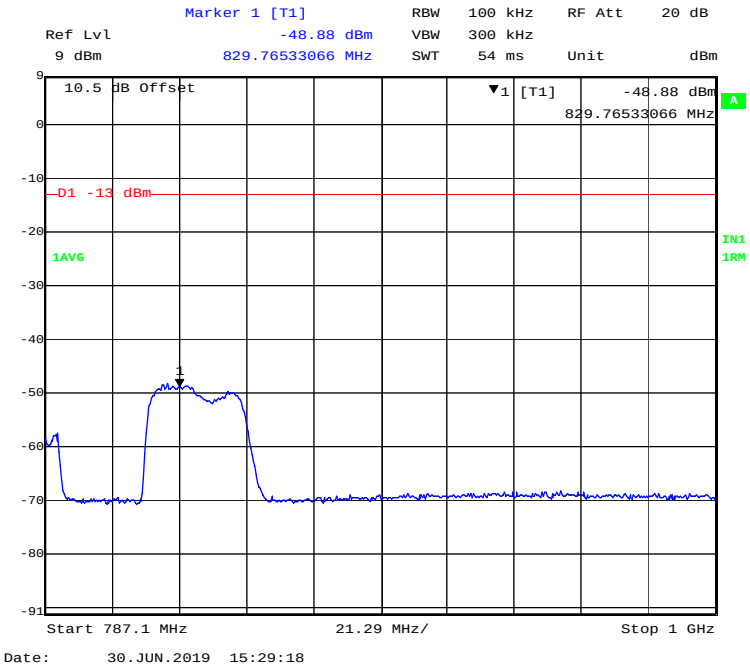


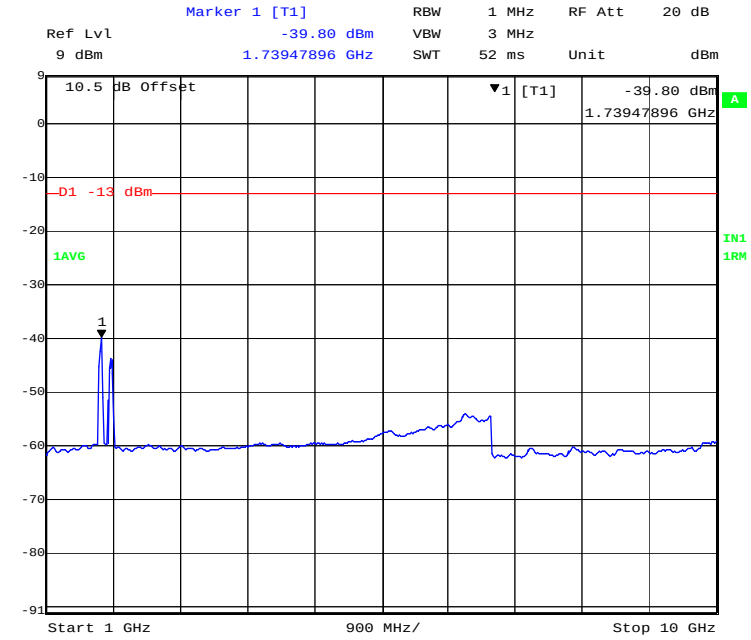

Marker 1 [T1]
RBW 100 kHz
RF Att 20 dB
Ref Lvl
-39.63 dBm
VBW 300 kHz
9 dBm
716.10000000 MHz
SWT 72 ms
Unit dBm
10.5 dB Offset
1 [T1]
-39.63 dBm
716.10000000 MHz
D1 -13 dBm
1AVG
A
IN1
1RM
Start 716.1 MHz
28.39 MHz/
Stop 1 GHz
Date: 30.JUN.2019 15:04:22


Marker 1 [T1]
RBW 1 MHz
RF Att 20 dB
Ref Lvl
-38.75 dBm
VBW 3 MHz
9 dBm
1.73947896 GHz
SWT 52 ms
Unit dBm
10.5 dB Offset
1 [T1]
-38.75 dBm
1.73947896 GHz
D1 -13 dBm
1AVG
A
IN1
1RM
Start 1 GHz
900 MHz/
Stop 10 GHz
Date: 30.JUN.2019 15:13:33

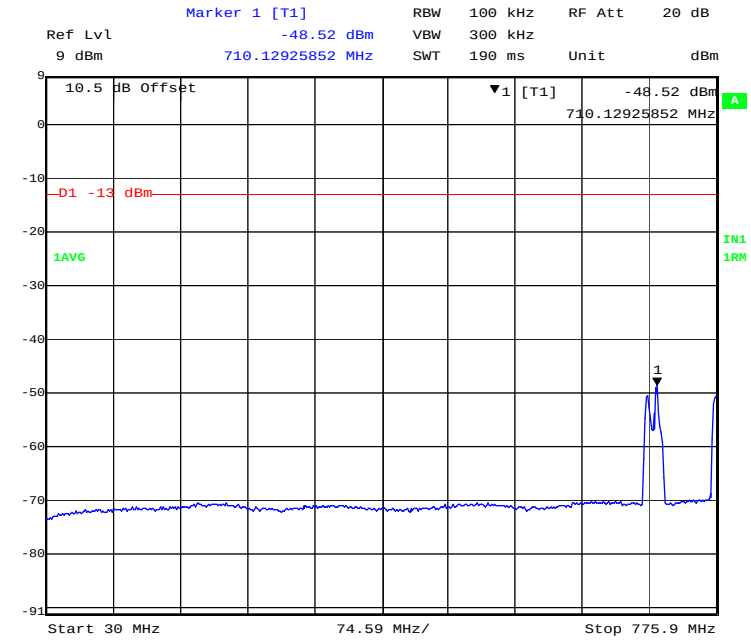
Upper 700MHz (C Block)-AWGN-Pre AGC-Low Channel

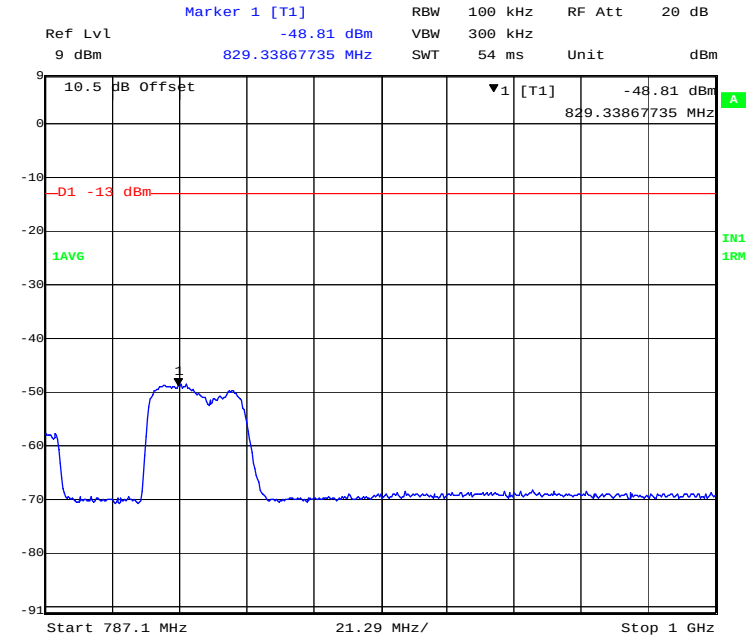


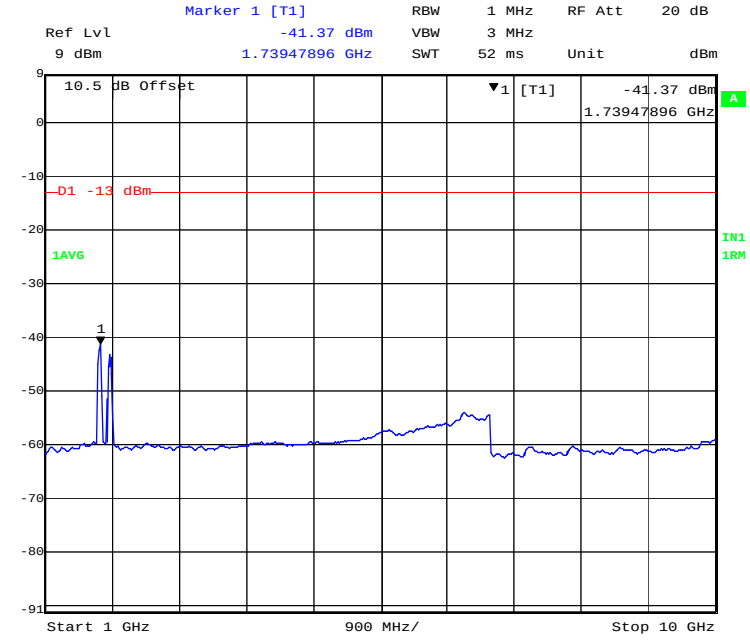




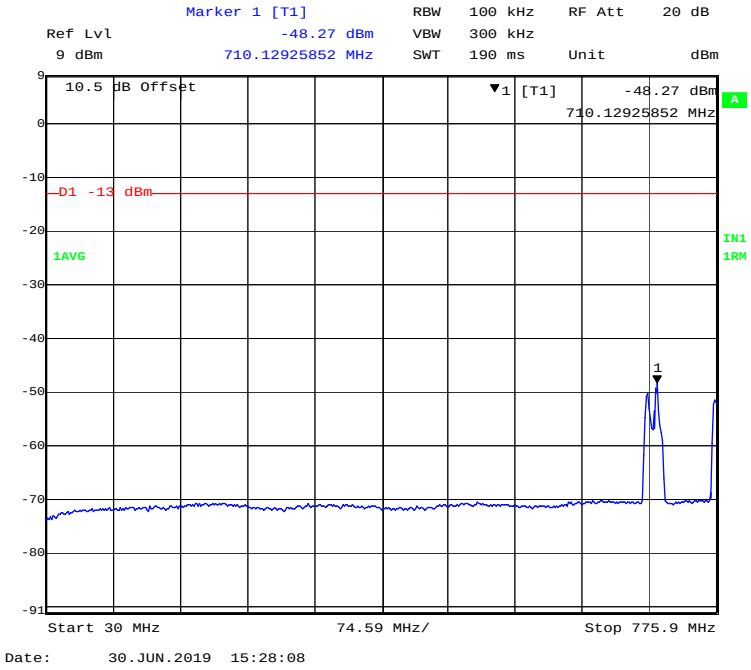
Upper 700MHz (C Block) - AWGN-Pre AGC-Middle Channel

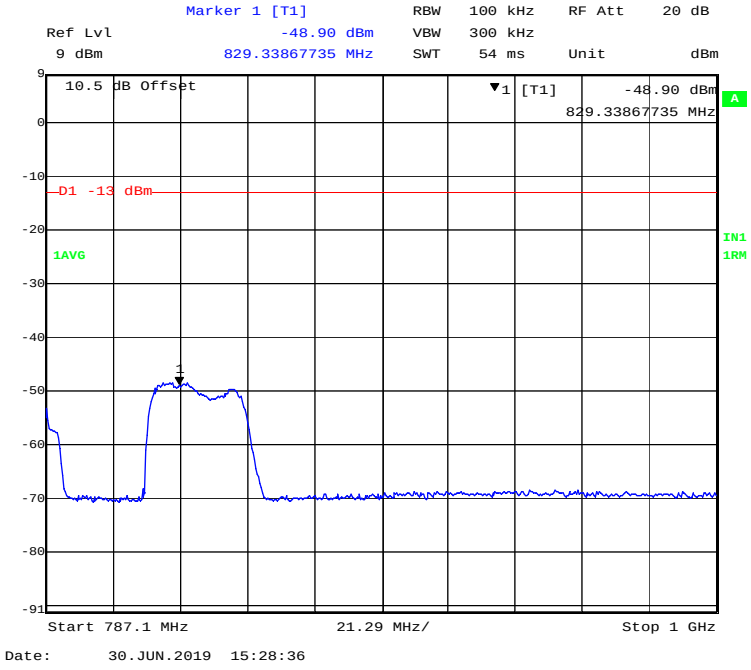


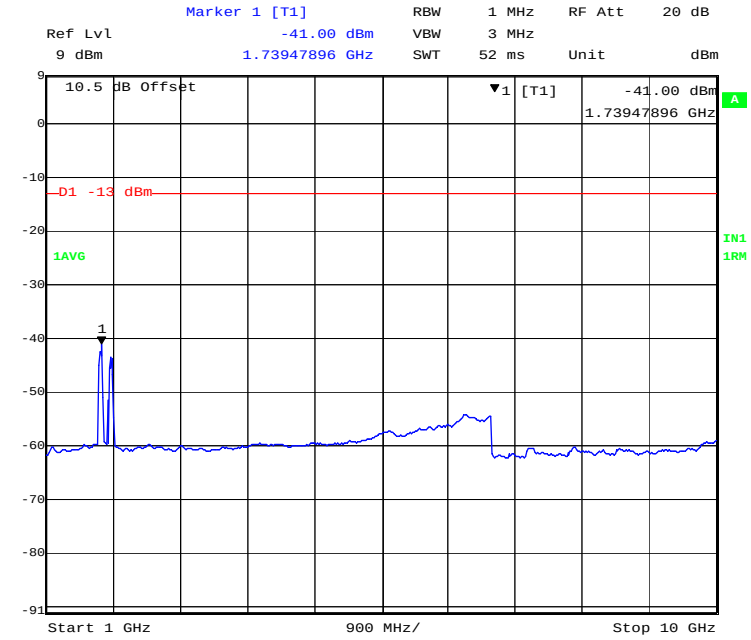

Marker 1 [T1]
RBW 100 kHz
RF Att 20 dB
Ref Lvl
-48.81 dBm
VBW 300 kHz
9 dBm
829.33867735 MHz
SWT 54 ms
Unit dBm
10.5 dB Offset
1 [T1]
-48.81 dBm
829.33867735 MHz
D1 -13 dBm
1AVG
IN1
1RM
Start 787.1 MHz
21.29 MHz/
Stop 1 GHz
Date: 30.JUN.2019 15:28:54


Marker 1 [T1]
RBW 1 MHz
RF Att 20 dB
Ref Lvl
-41.37 dBm
VBW 3 MHz
9 dBm
1.73947896 GHz
SWT 52 ms
Unit dBm
10.5 dB Offset
1 [T1]
-41.37 dBm
1.73947896 GHz
D1 -13 dBm
1AVG
IN1
1RM
Start 1 GHz
900 MHz/
Stop 10 GHz
Date: 30.JUN.2019 15:25:28

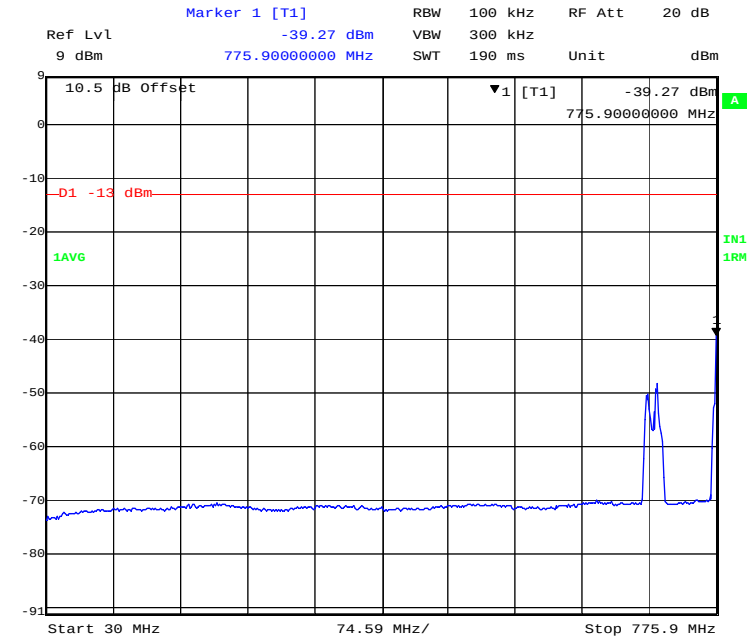
Upper 700MHz (C Block) - AWGN-Pre AGC-High Channel

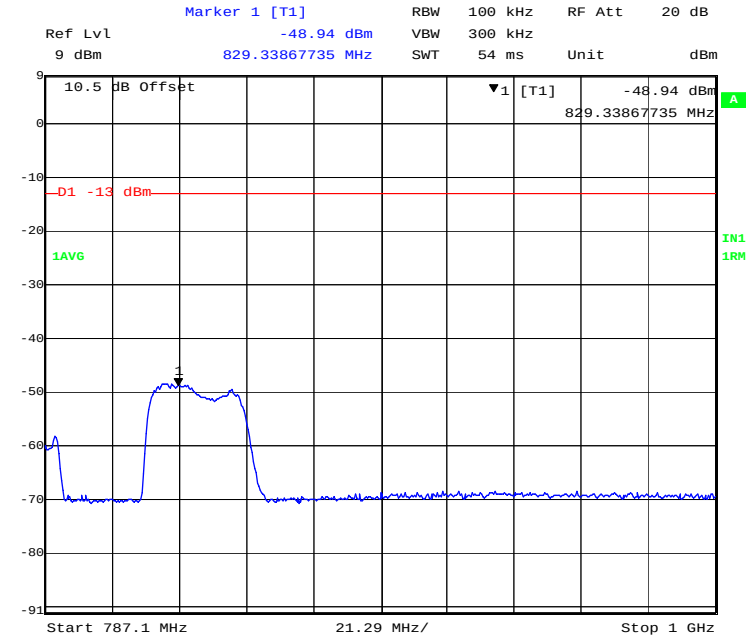


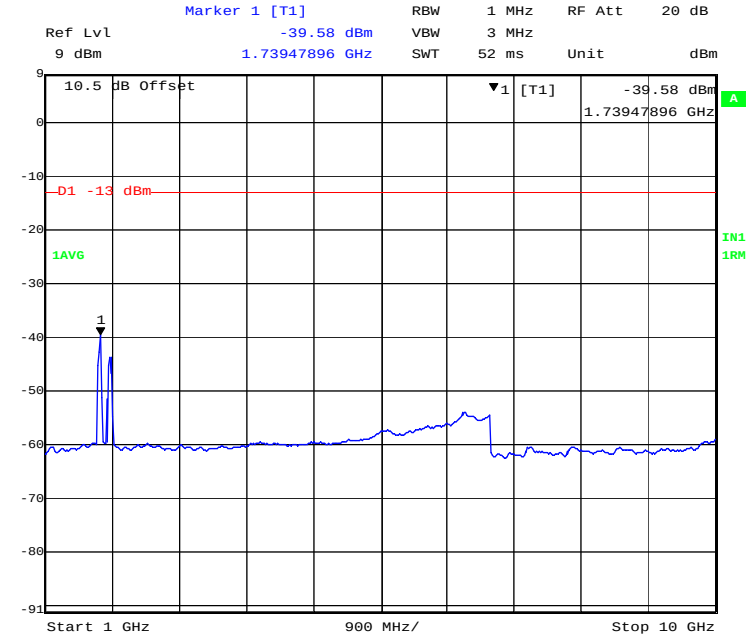




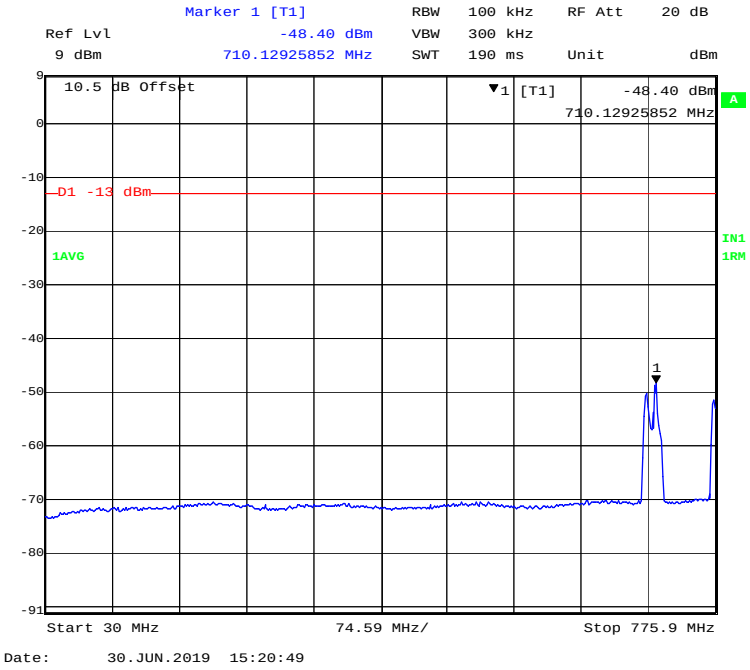
Upper 700MHz (C Block) - GSM-Pre AGC-Low Channel

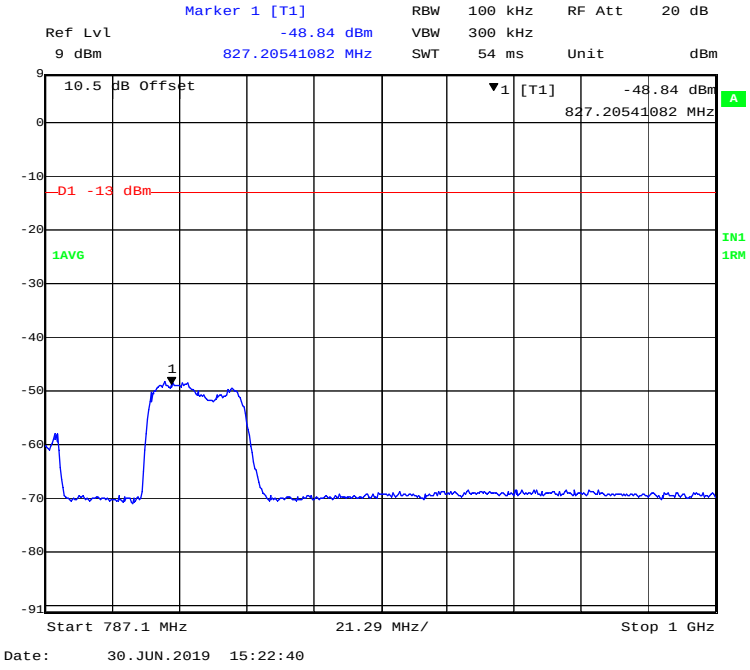


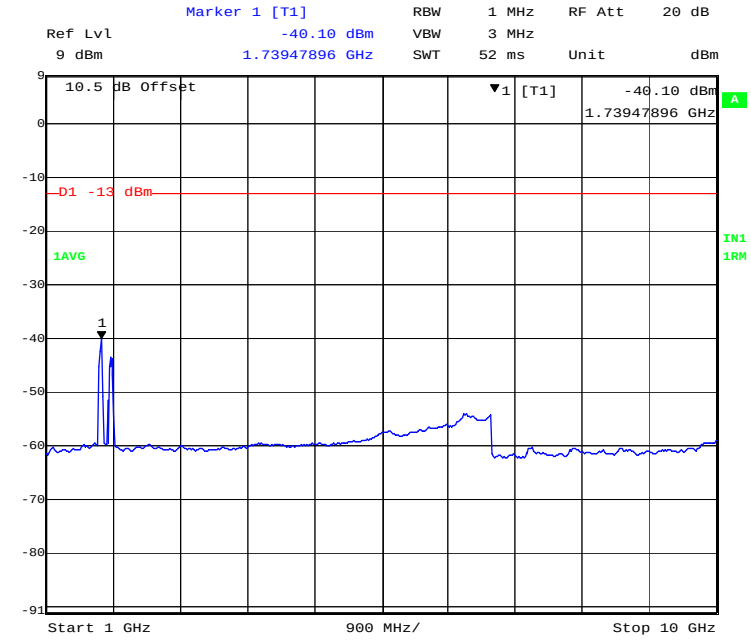

Marker 1 [T1]
Ref Lvl
9 dBm
-48.94 dBm
829.33867735 MHz
RBW 100 kHz
VBW 300 kHz
SWT 54 ms
RF Att 20 dB
Unit dBm
10.5 dB Offset
1 [T1]
-48.94 dBm
829.33867735 MHz
D1 -13 dBm
1AVG
IN1
1RM
Start 787.1 MHz
21.29 MHz/
Stop 1 GHz
Date: 30.JUN.2019 15:23:01


Marker 1 [T1]
Ref Lvl
9 dBm
-39.58 dBm
1.73947896 GHz
RBW 1 MHz
VBW 3 MHz
SWT 52 ms
RF Att 20 dB
Unit dBm
10.5 dB Offset
1 [T1]
-39.58 dBm
1.73947896 GHz
D1 -13 dBm
1AVG
IN1
1RM
Start 1 GHz
900 MHz/
Stop 10 GHz
Date: 30.JUN.2019 15:23:43

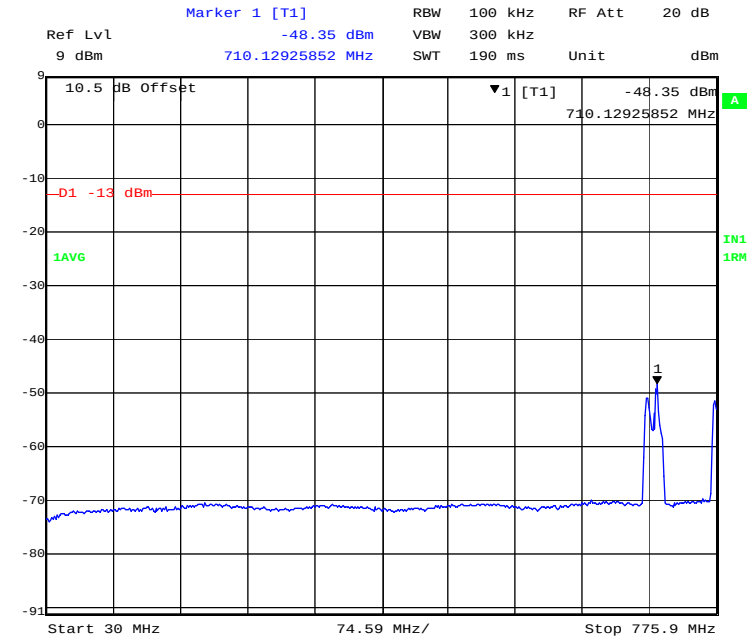
Upper 700MHz (C Block) - GSM-Pre AGC-Middle Channel

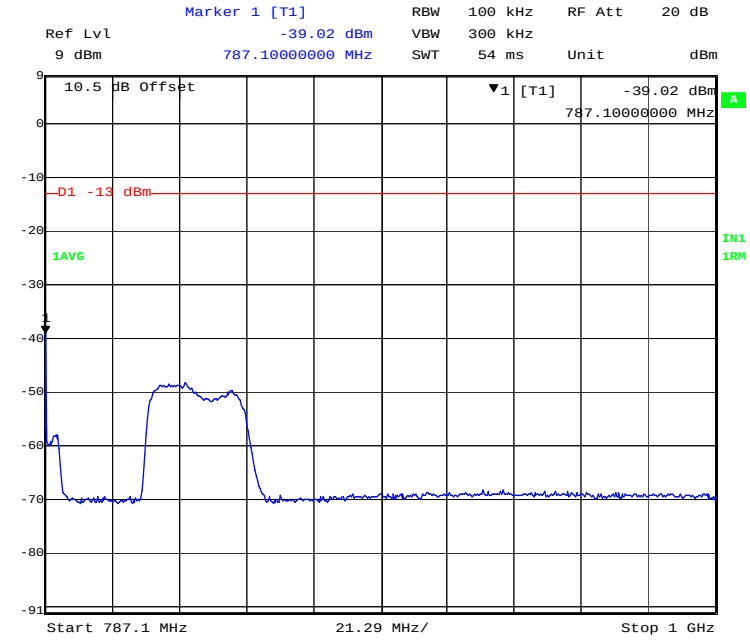


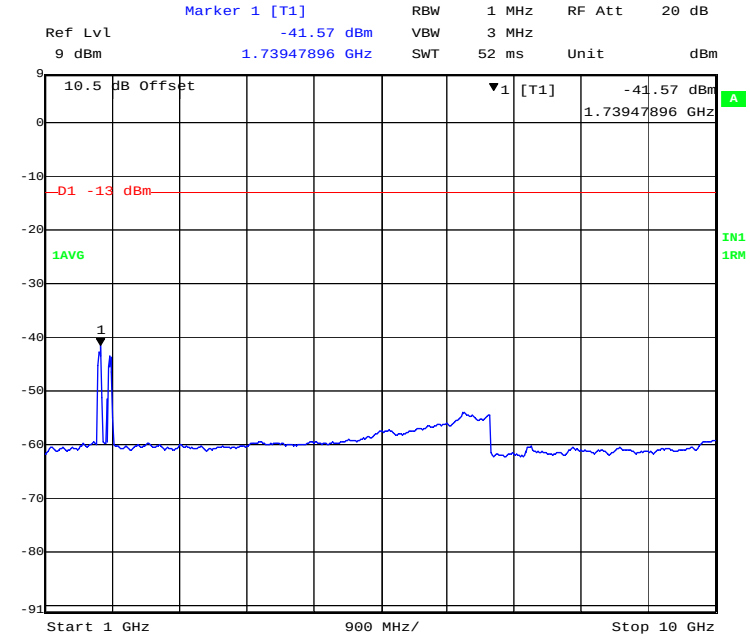




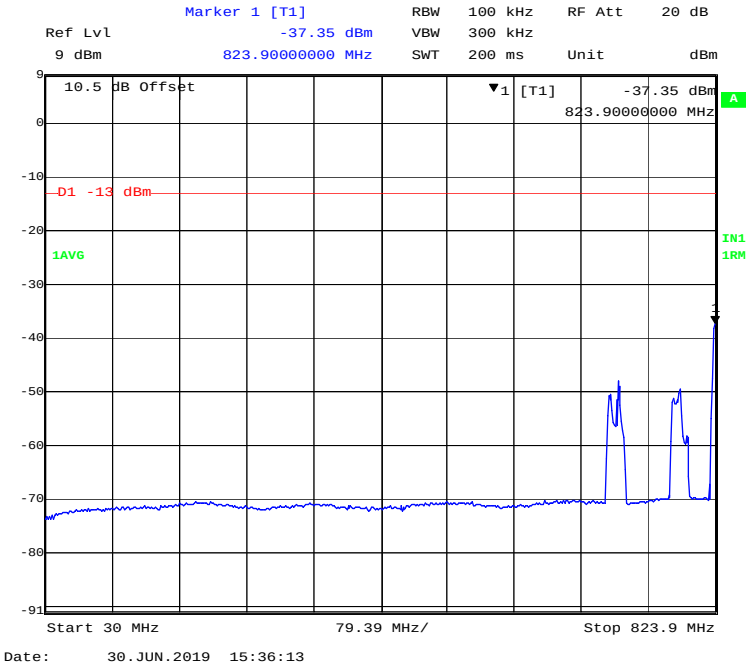
Upper 700MHz (C Block) - GSM-Pre AGC-High Channel

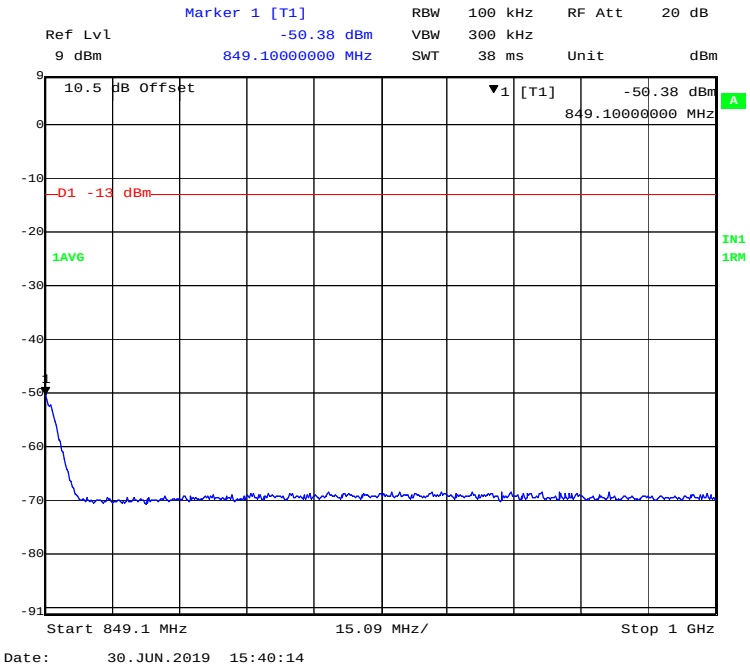


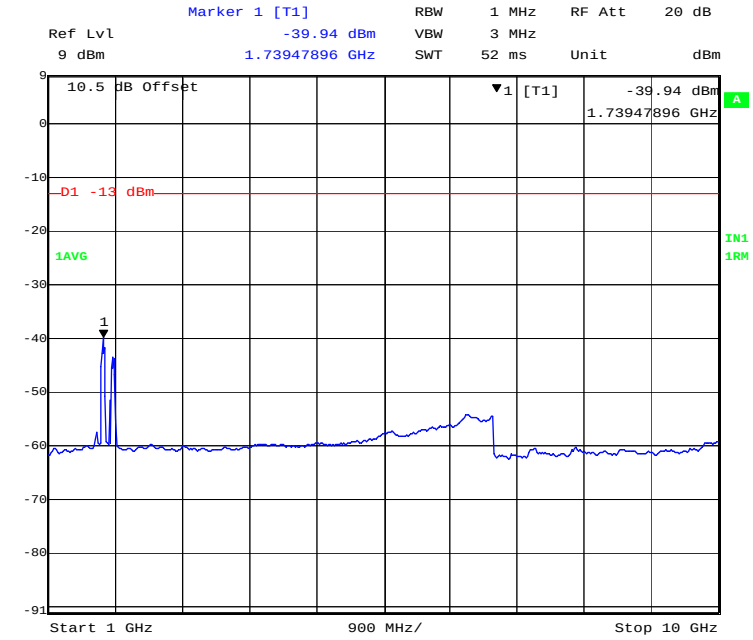

Marker 1 [T1]
RBW 100 kHz
RF Att 20 dB
Ref Lvl
-39.02 dBm
VBW 300 kHz
9 dBm
787.10000000 MHz
SWT 54 ms
Unit dBm
10.5 dB Offset
1 [T1]
-39.02 dBm
787.10000000 MHz
D1 -13 dBm
1AVG
A
IN1
1RM
Start 787.1 MHz
21.29 MHz/
Stop 1 GHz
Date: 30.JUN.2019 15:22:00


Marker 1 [T1]
RBW 1 MHz
RF Att 20 dB
Ref Lvl
-41.57 dBm
VBW 3 MHz
9 dBm
1.73947896 GHz
SWT 52 ms
Unit dBm
10.5 dB Offset
1 [T1]
-41.57 dBm
1.73947896 GHz
D1 -13 dBm
1AVG
A
IN1
1RM
Start 1 GHz
900 MHz/
Stop 10 GHz
Date: 30.JUN.2019 15:24:30

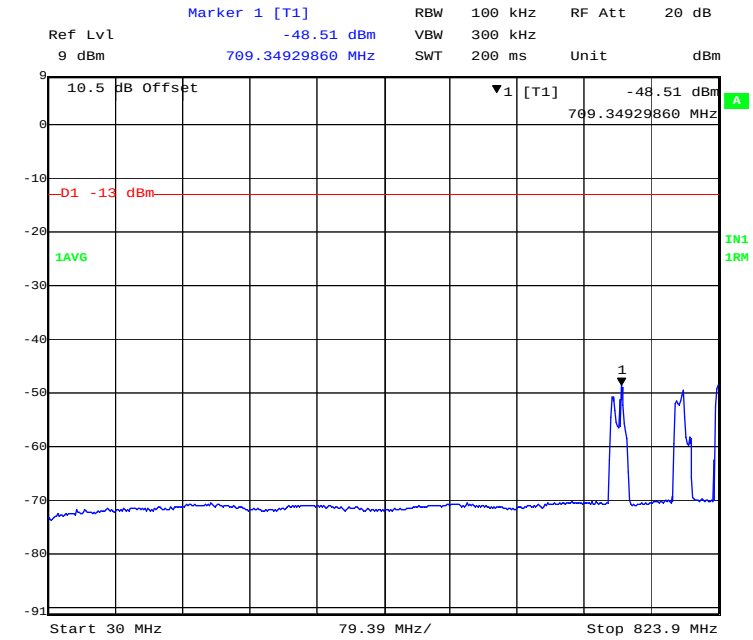
Cellular - AWGN-Pre AGC-Low Channel

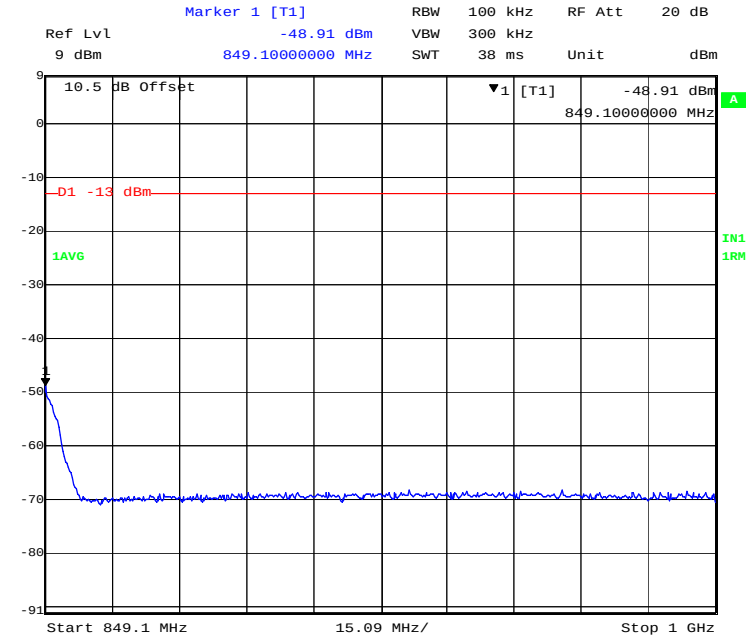


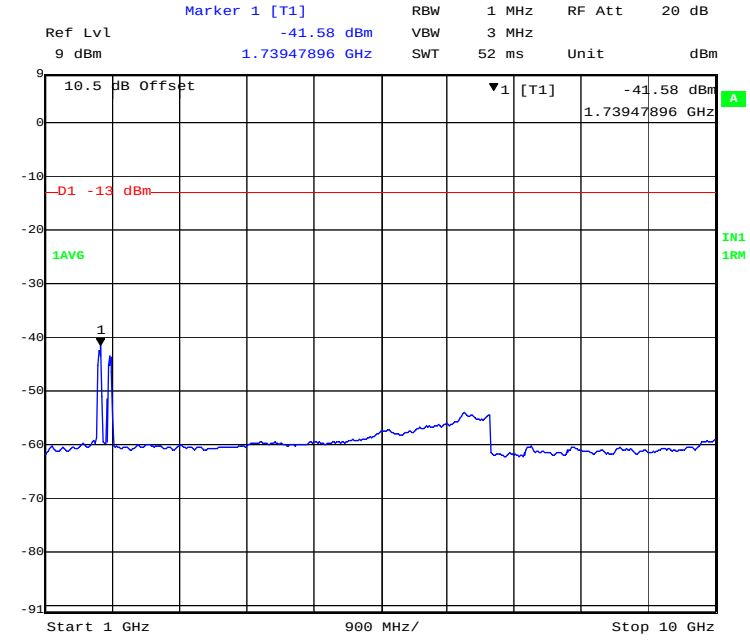




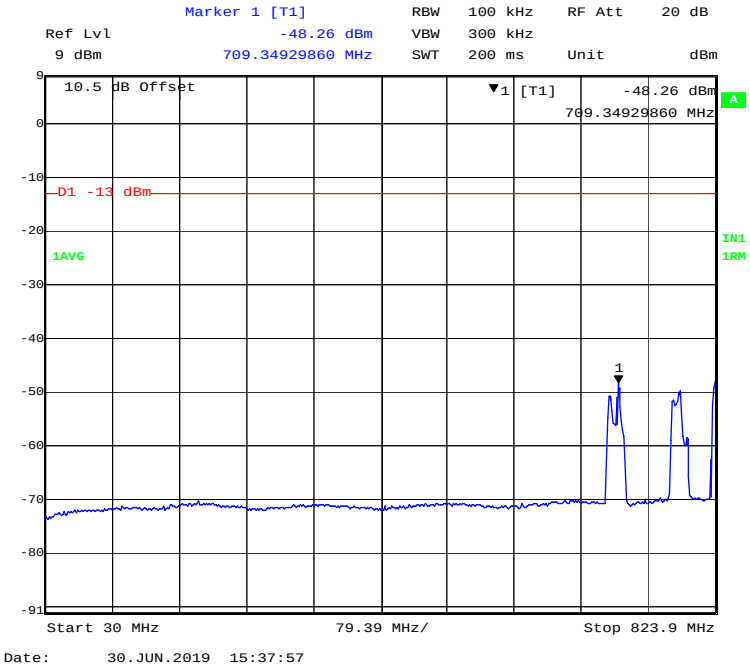
Cellular - AWGN-Pre AGC-Middle Channel

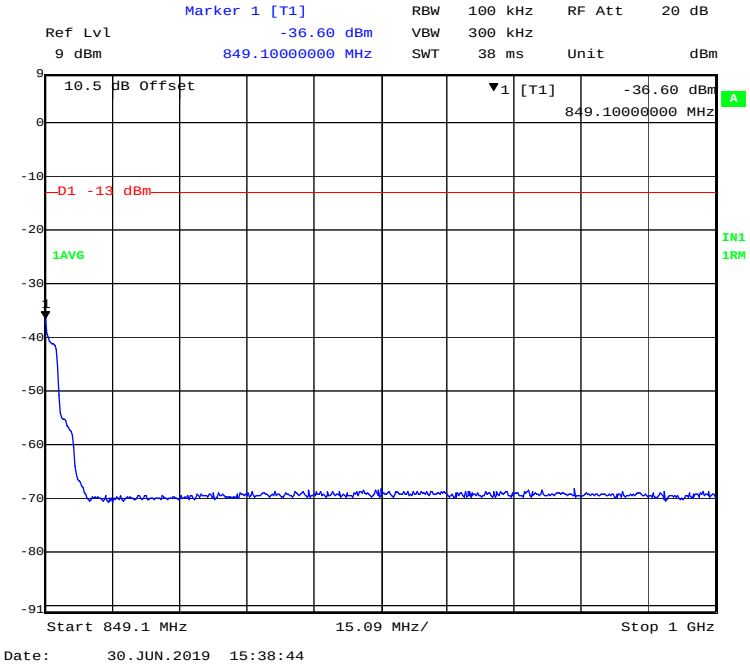


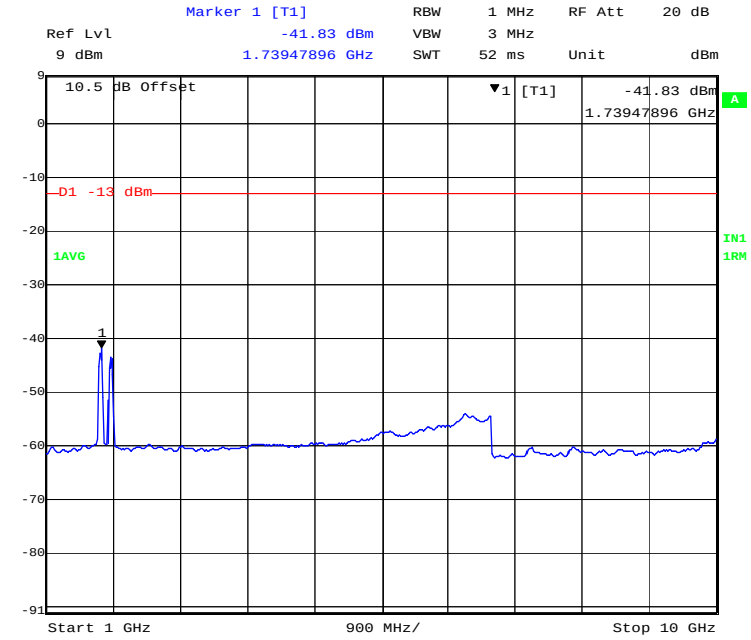

Marker 1 [T1]
RBW 100 kHz
RF Att 20 dB
Ref Lvl
-48.91 dBm
VBW 300 kHz
9 dBm
849.10000000 MHz
SWT 38 ms
Unit dBm
10.5 dB Offset
1 [T1]
-48.91 dBm
849.10000000 MHz
D1 -13 dBm
1AVG
A
IN1
1RM
Start 849.1 MHz
15.09 MHz/
Stop 1 GHz
Date: 30.JUN.2019 15:39:51


Marker 1 [T1]
RBW 1 MHz
RF Att 20 dB
Ref Lvl
-41.58 dBm
VBW 3 MHz
9 dBm
1.73947896 GHz
SWT 52 ms
Unit dBm
10.5 dB Offset
1 [T1]
-41.58 dBm
1.73947896 GHz
D1 -13 dBm
1AVG
A
IN1
1RM
Start 1 GHz
900 MHz/
Stop 10 GHz
Date: 30.JUN.2019 15:41:39

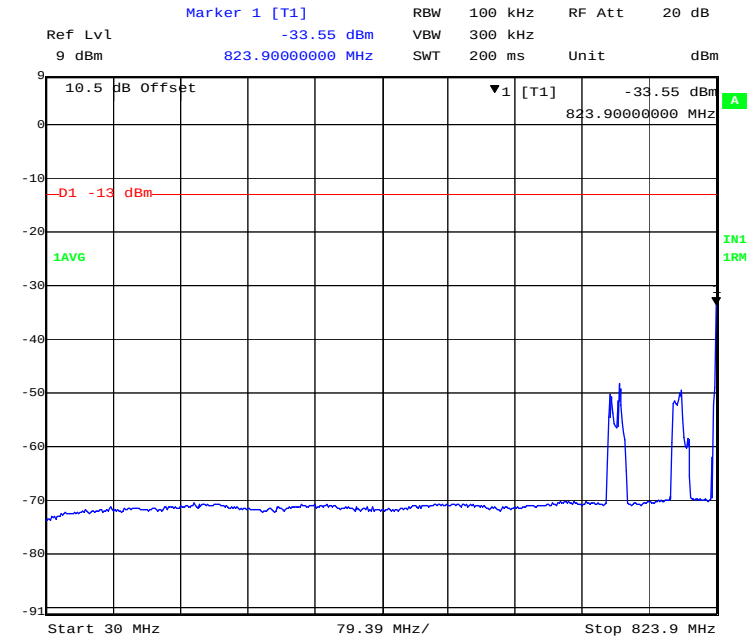
Cellular - AWGN-Pre AGC-High Channel

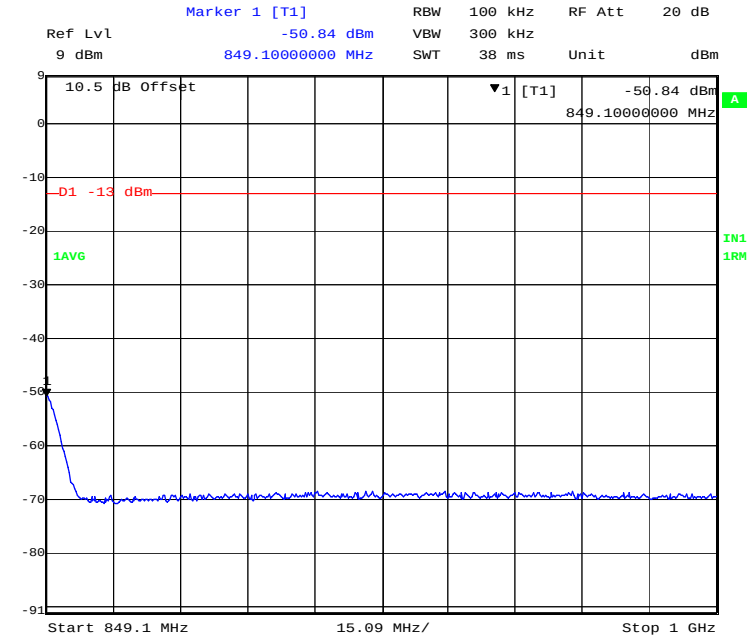


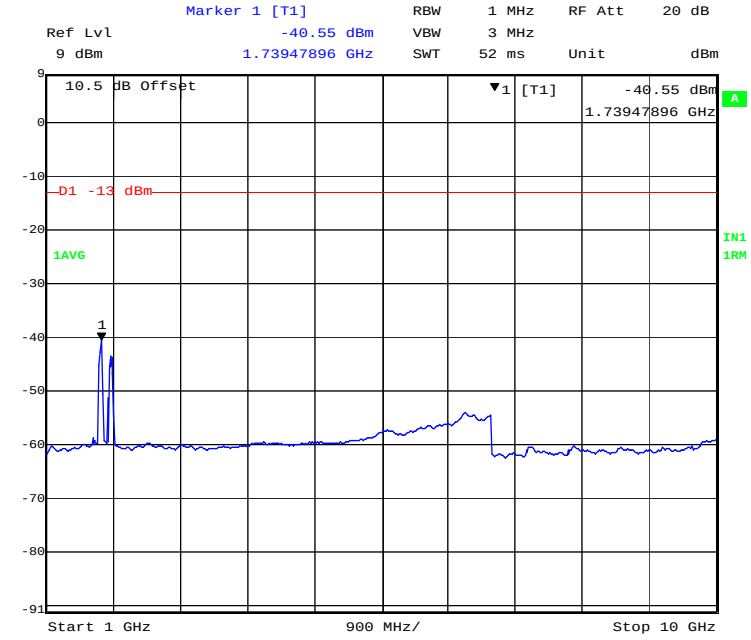




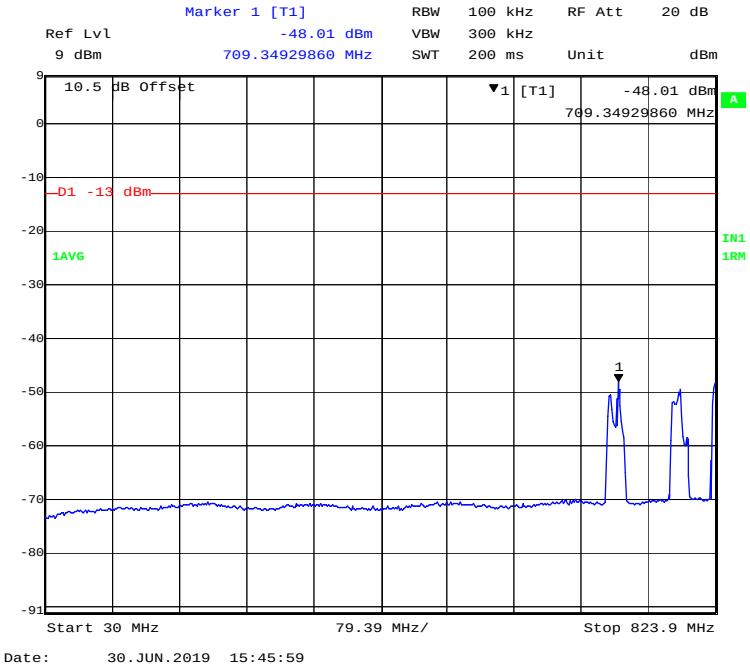
Cellular - GSM-Pre AGC-Low Channel

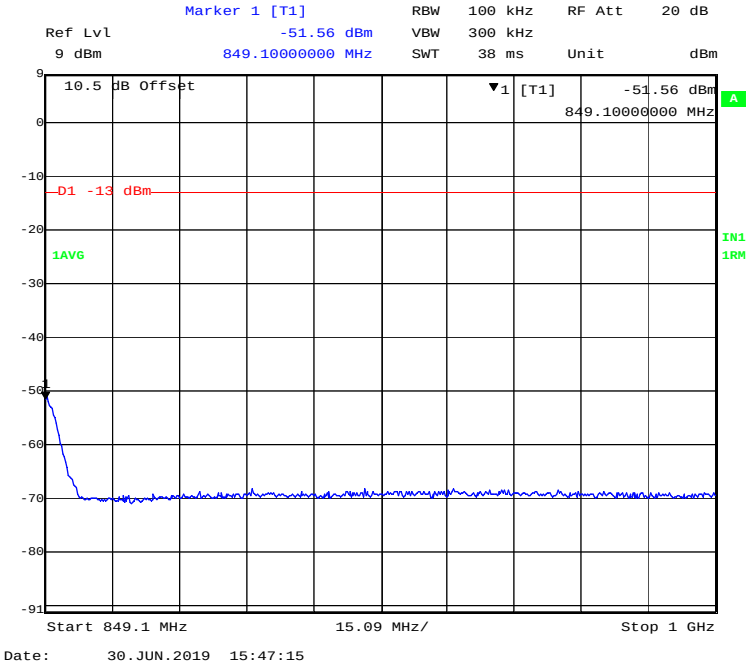


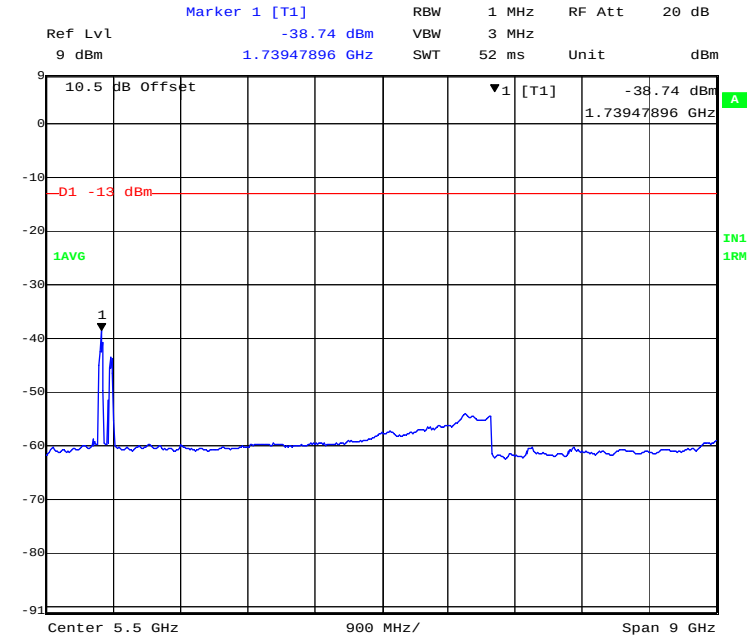

Marker 1 [T1]
RBW 100 kHz
RF Att 20 dB
Ref Lvl
-50.84 dBm
VBW 300 kHz
9 dBm
849.10000000 MHz
SWT 38 ms
Unit dBm
10.5 dB Offset
1 [T1]
-50.84 dBm
849.10000000 MHz
D1 -13 dBm
1AVG
IN1
1RM
Start 849.1 MHz
15.09 MHz/
Stop 1 GHz
Date: 30.JUN.2019 15:47:34


Marker 1 [T1]
RBW 1 MHz
RF Att 20 dB
Ref Lvl
-40.55 dBm
VBW 3 MHz
9 dBm
1.73947896 GHz
SWT 52 ms
Unit dBm
10.5 dB Offset
1 [T1]
-40.55 dBm
1.73947896 GHz
D1 -13 dBm
1AVG
IN1
1RM
Start 1 GHz
900 MHz/
Stop 10 GHz
Date: 30.JUN.2019 15:44:20

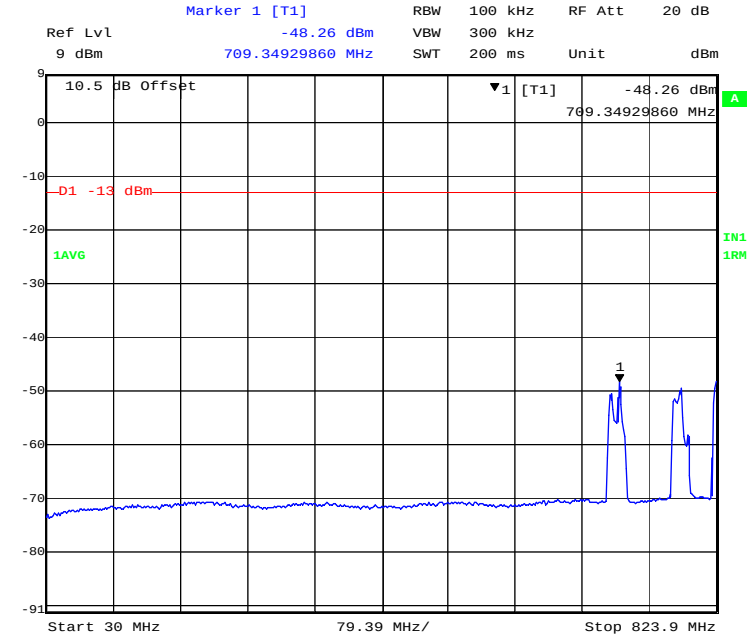
Cellular - GSM-Pre AGC-Middle Channel

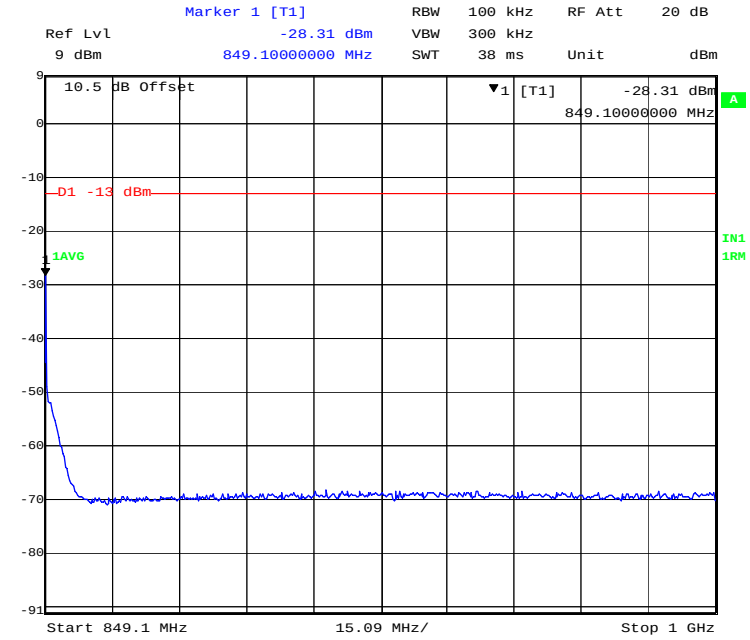






Cellular - GSM-Pre AGC-High Channel





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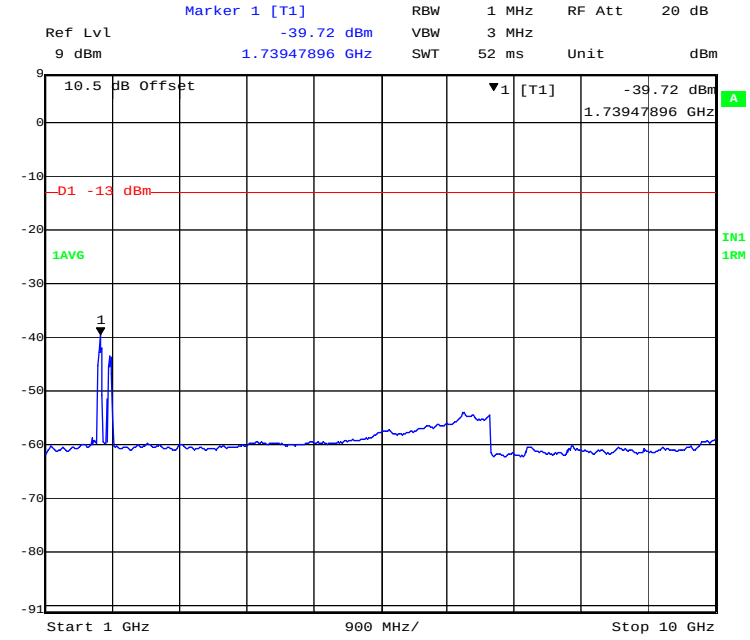
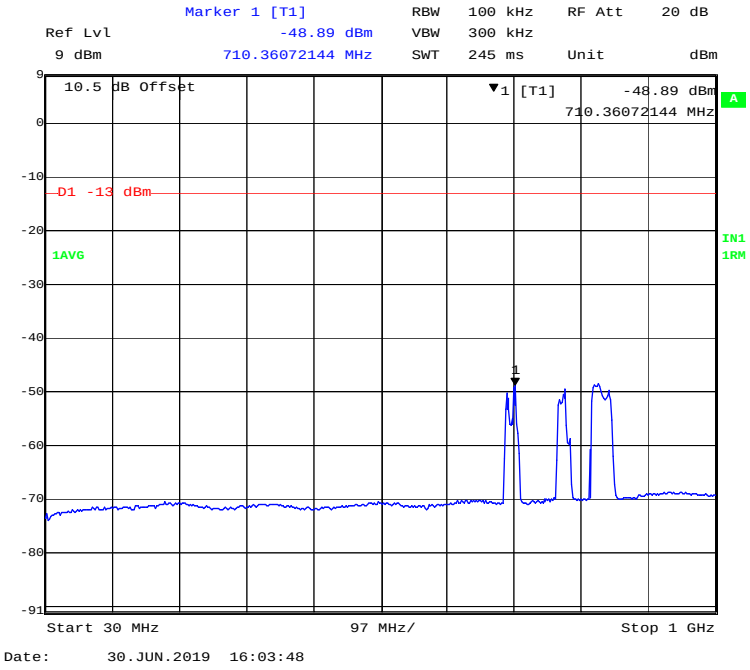
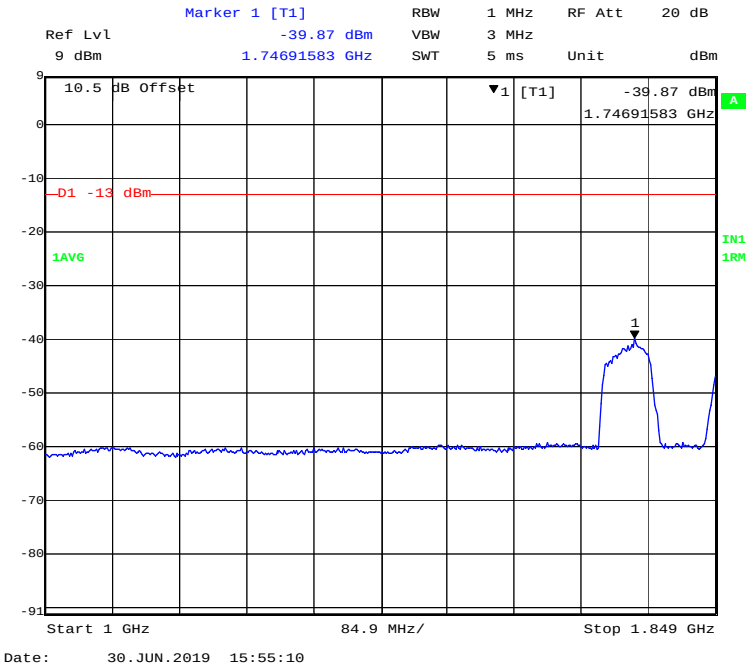
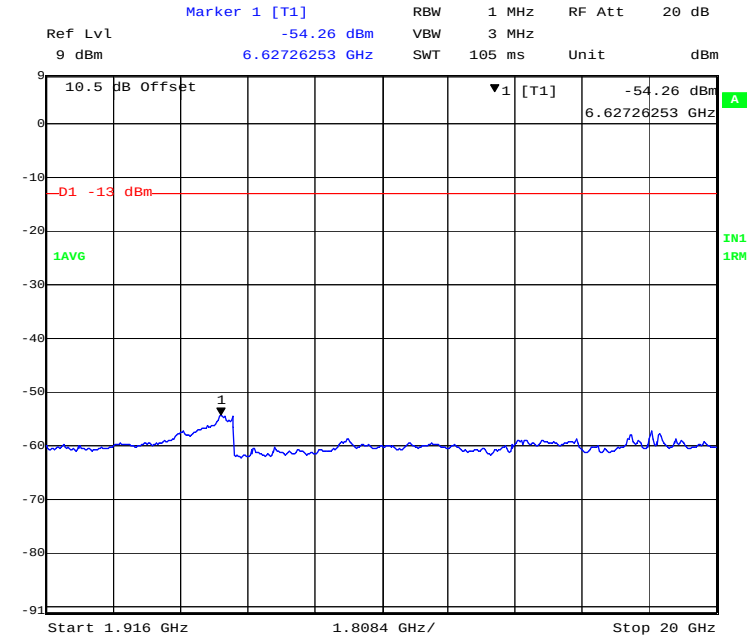


Date: 30.JUN.2019 15:44:54

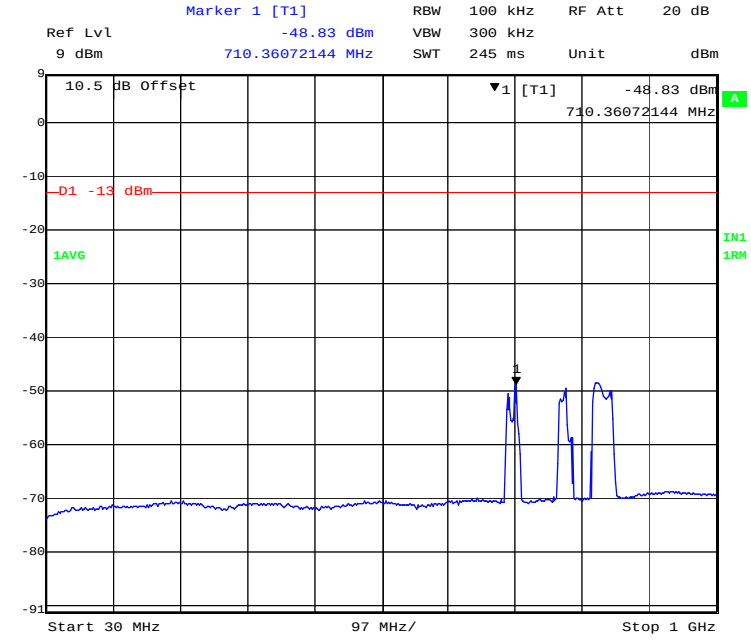
PCS- AWGN-Pre AGC-Low Channel

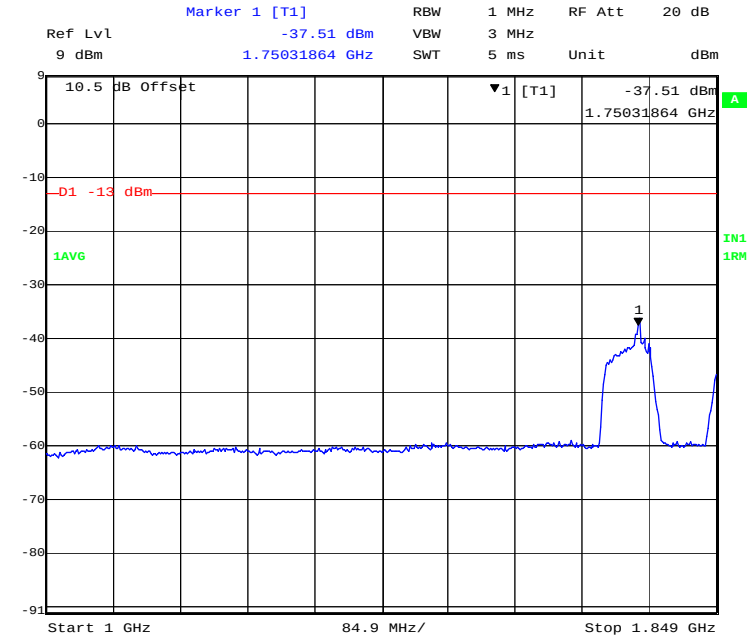




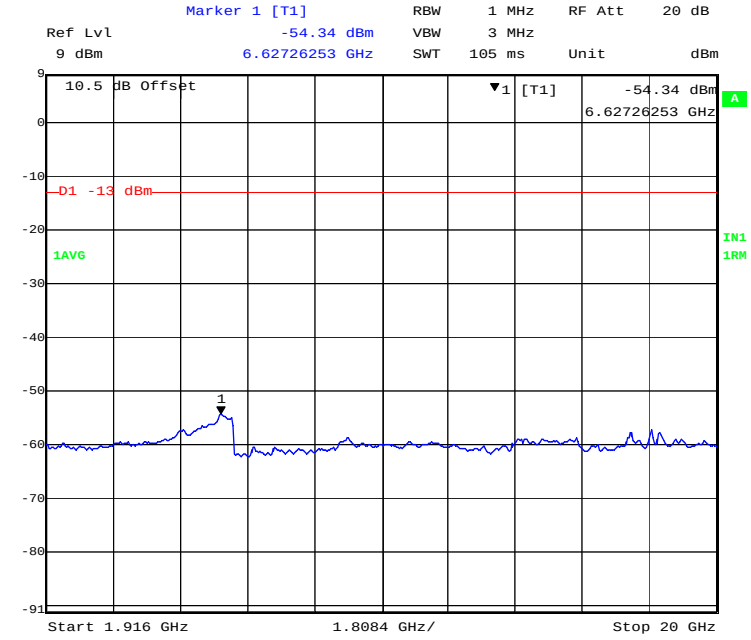


PCS- AWGN-Pre AGC-Middle Channel



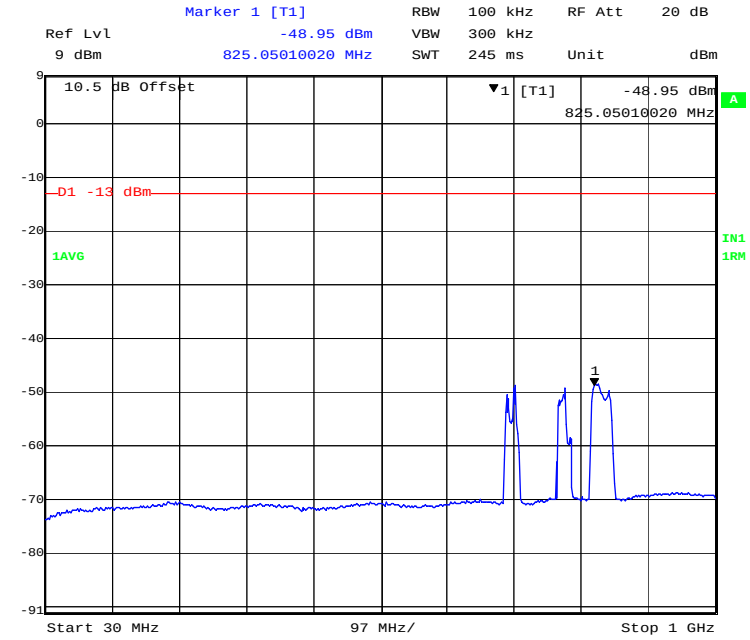


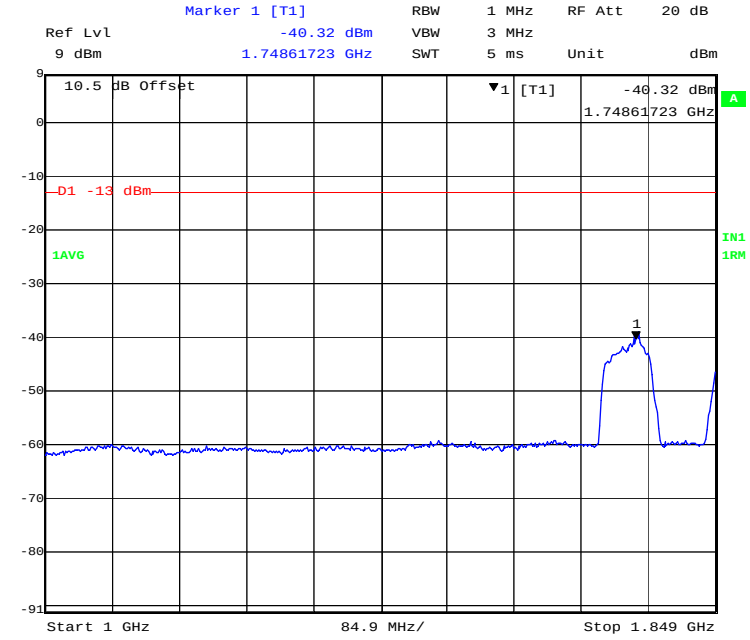
Date: 30.JUN.2019 15:57:33

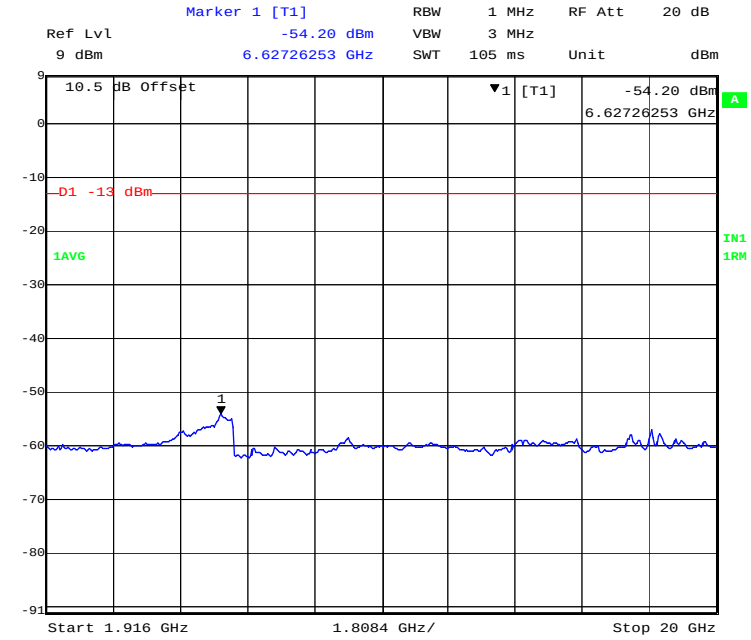


Date: 30.JUN.2019 16:00:21

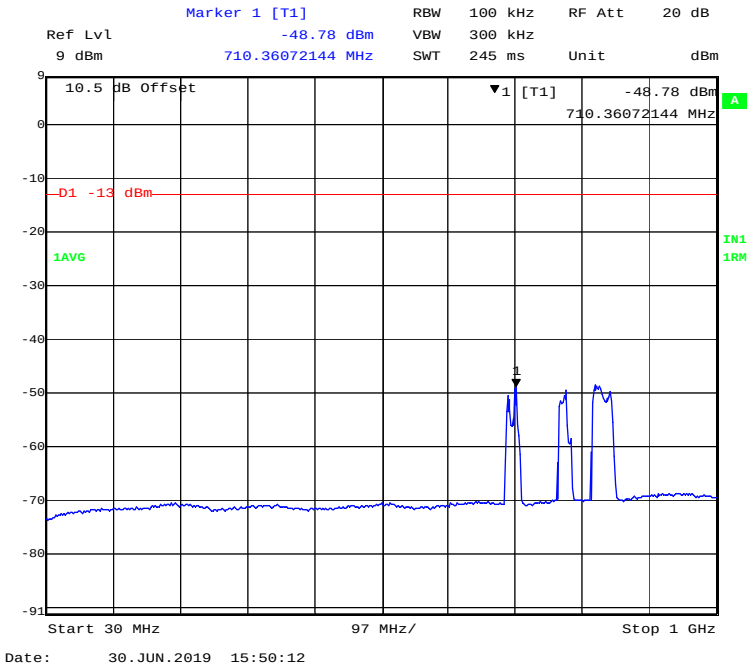
PCS- AWGN-Pre AGC-High Channel

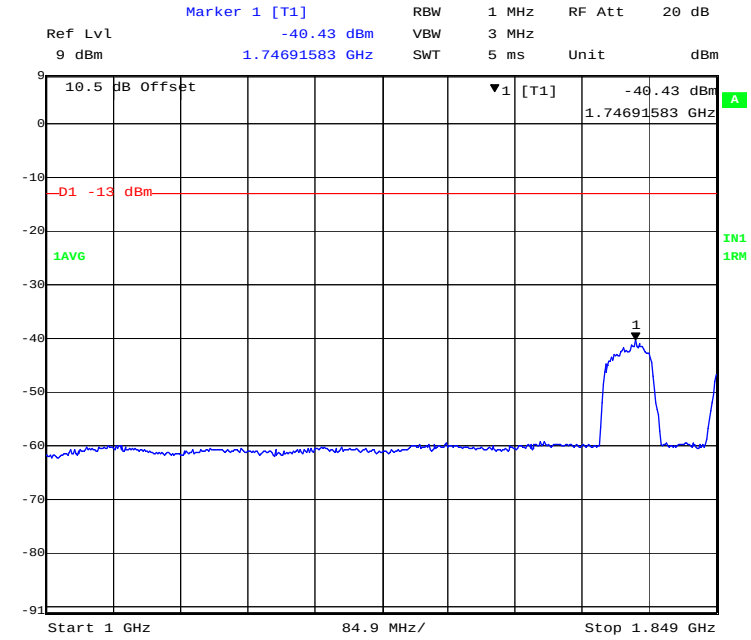




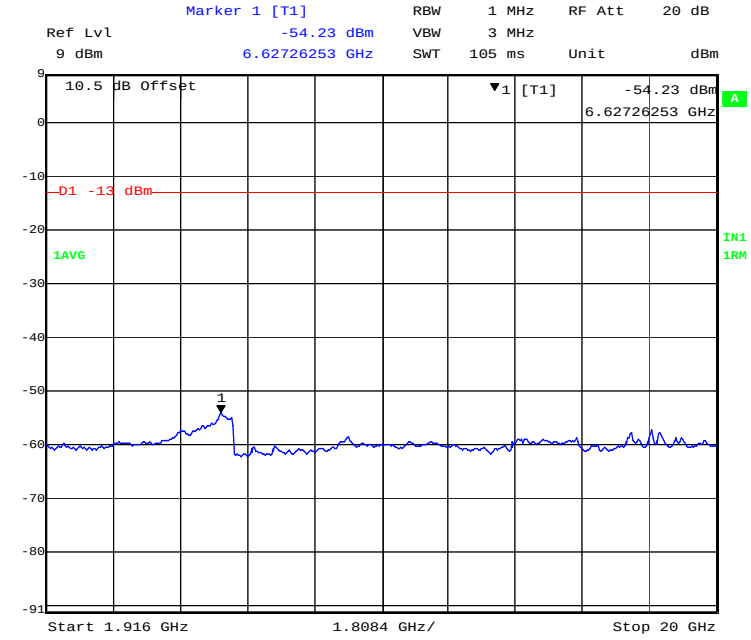


PCS- GSM-Pre AGC-Low Channel





Date: 30.JUN.2019 15:53:28



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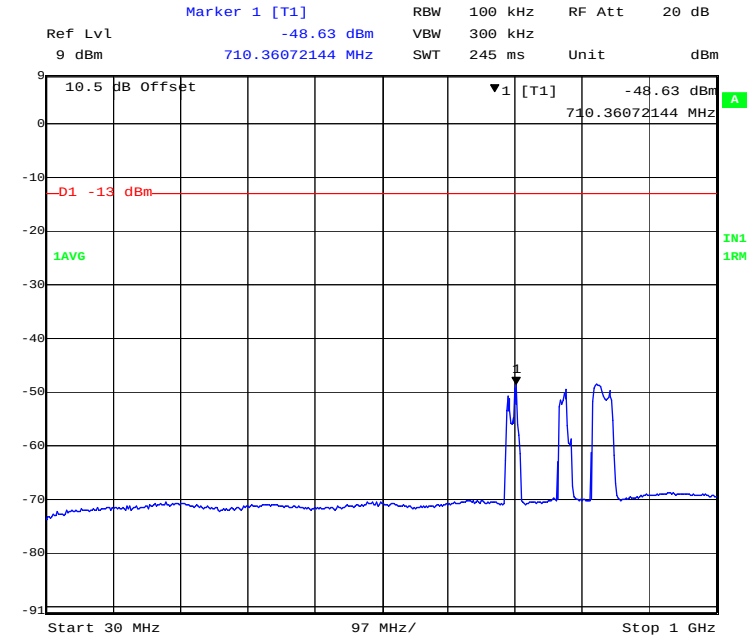
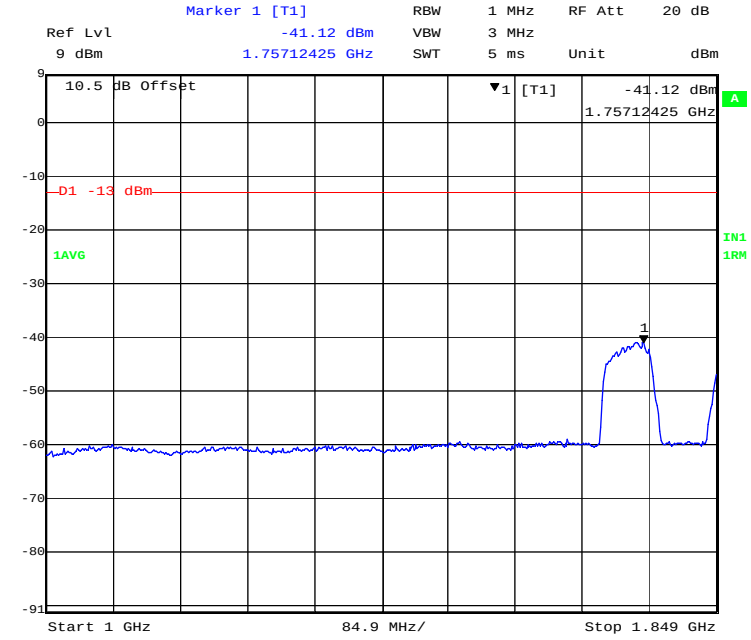
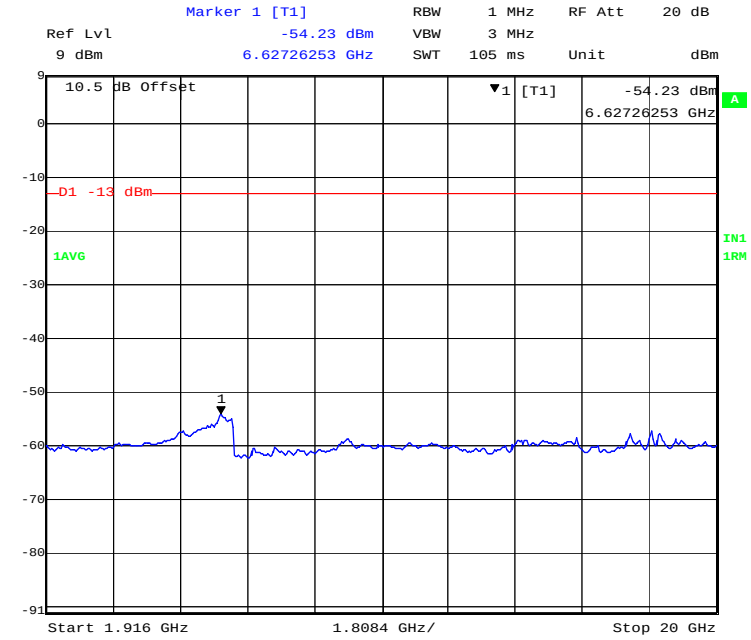
PCS- GSM-Pre AGC-Middle Channel







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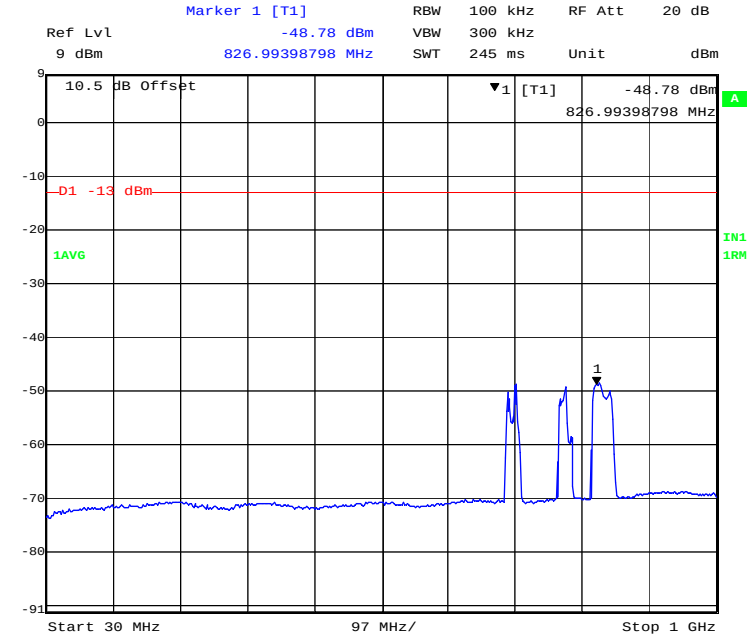
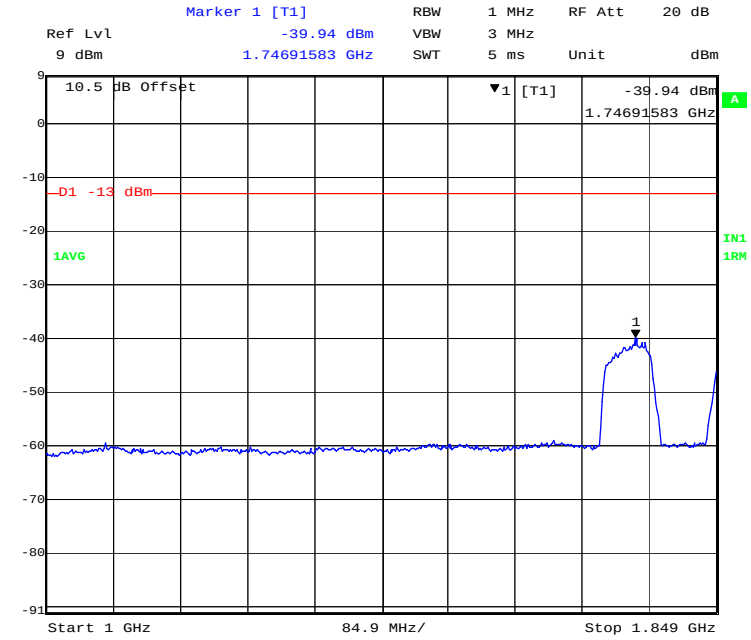
PCS- GSM-Pre AGC-High Channel



Date: 30.JUN.2019 15:51:04



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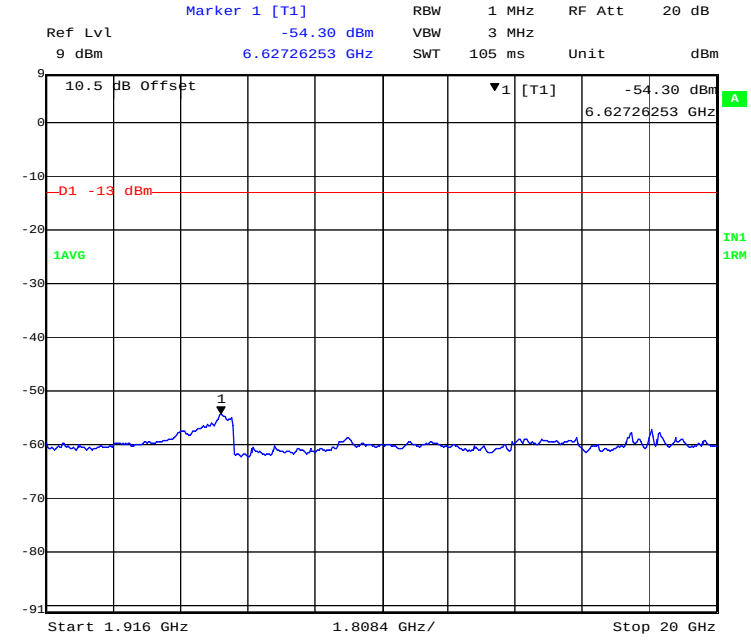

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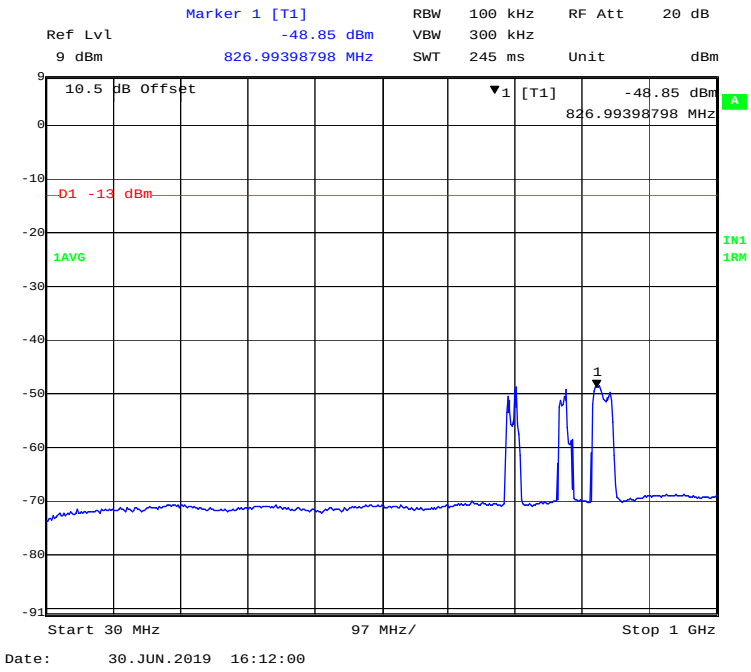
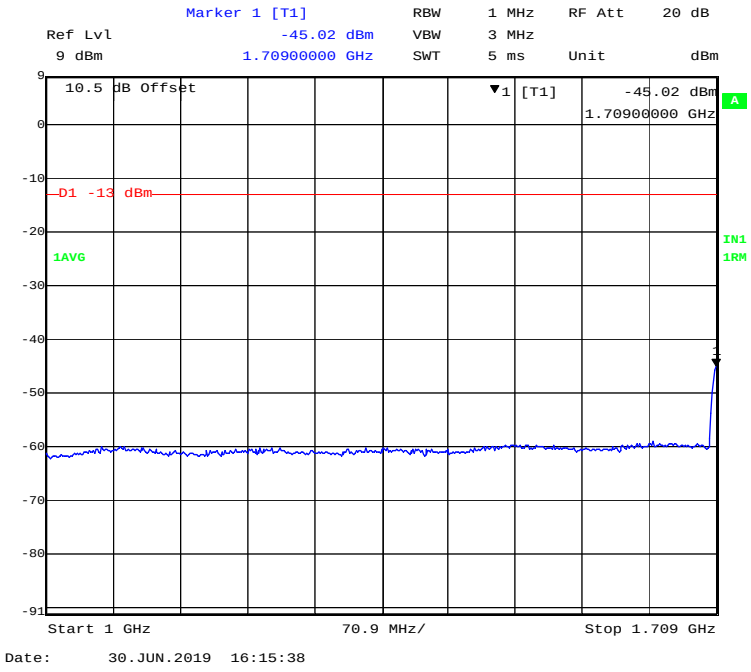
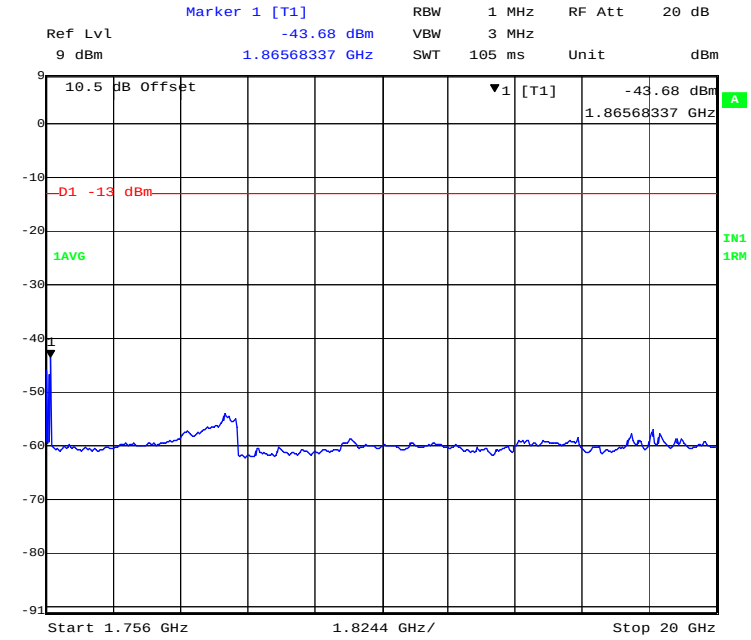
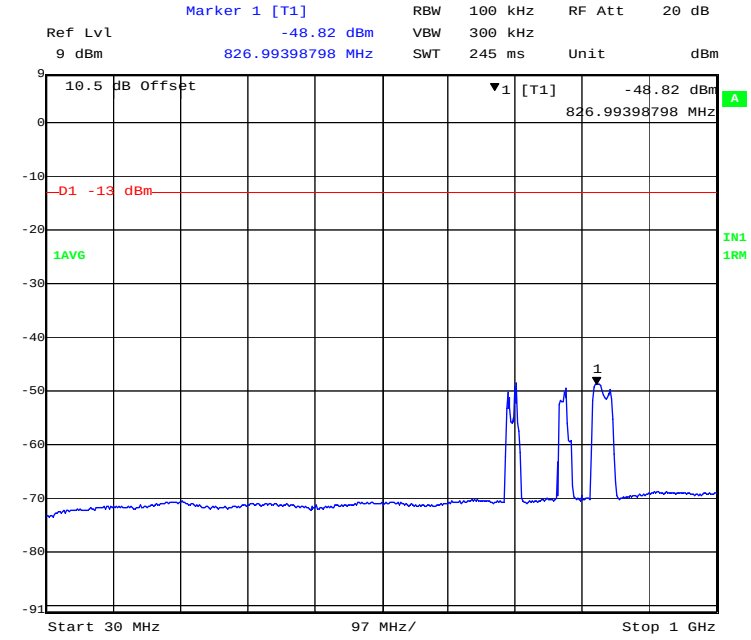
AWS- AWGN-Pre AGC-Low Channel

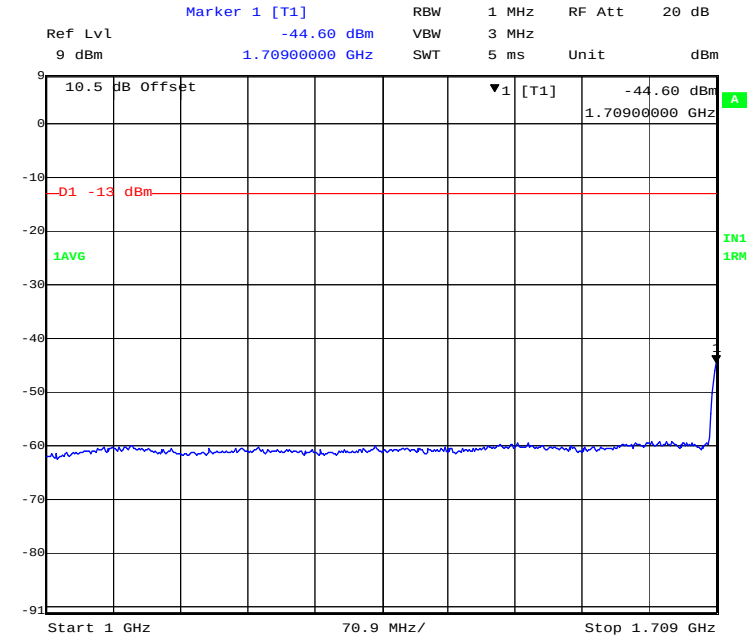




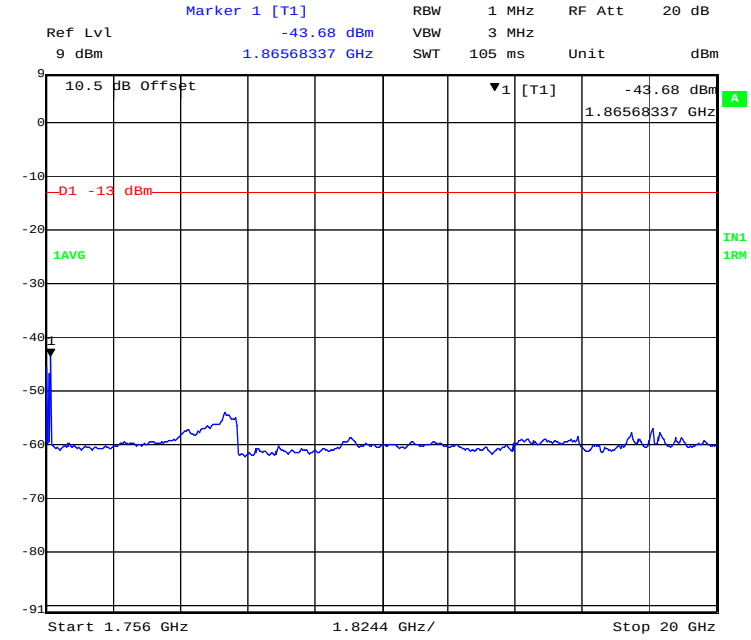


AWS- AWGN-Pre AGC-Middle Channel



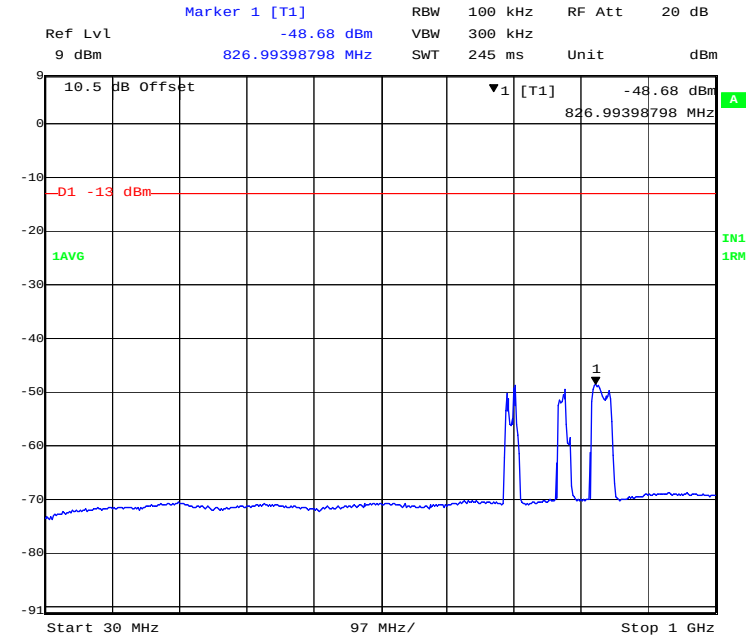


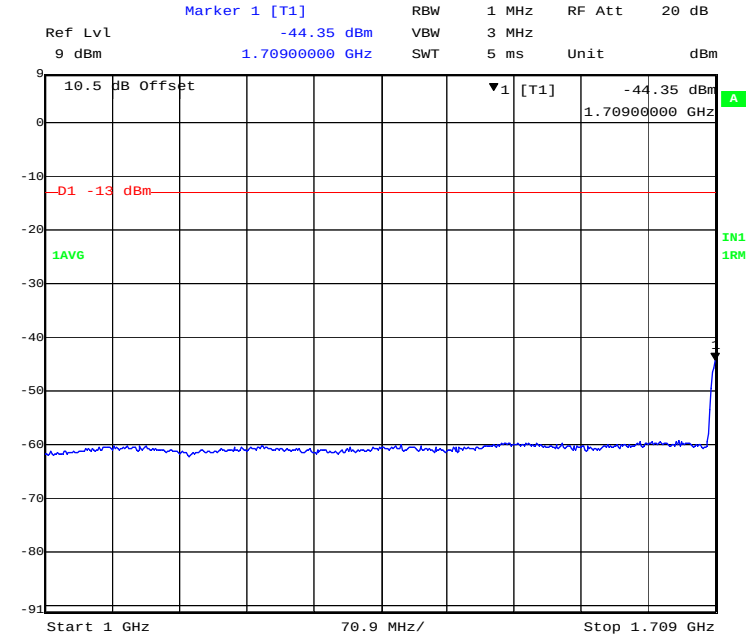
Date: 30.JUN.2019 16:16:02

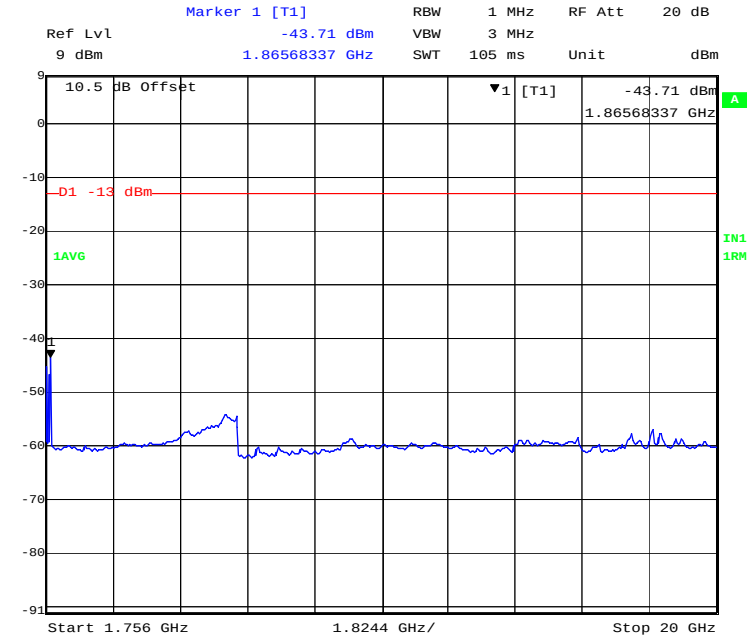


Date: 30.JUN.2019 16:17:44

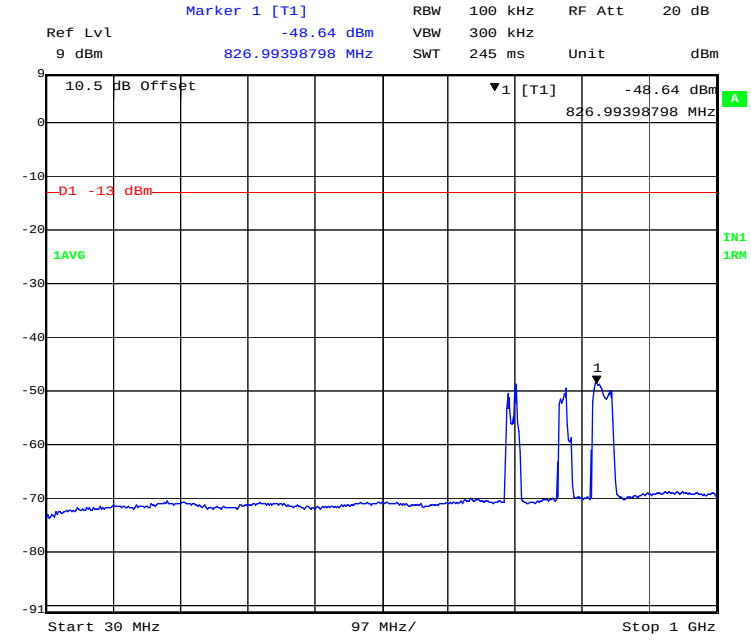
AWS- AWGN-Pre AGC-High Channel

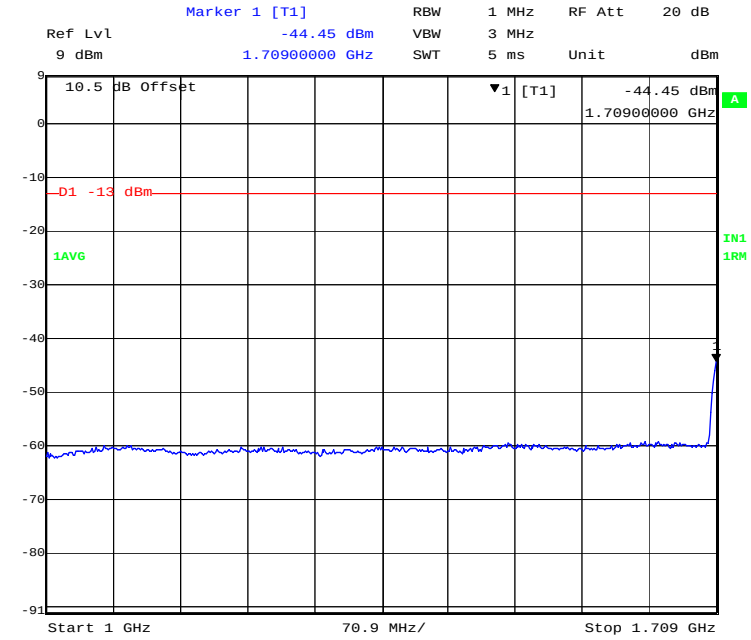




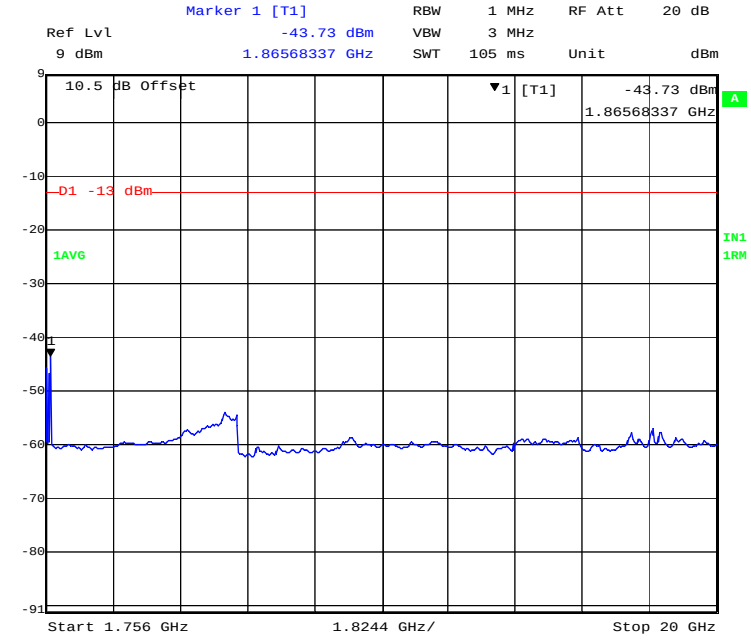


AWS- GSM-Pre AGC-Low Channel





Date: 30.JUN.2019 16:15:49



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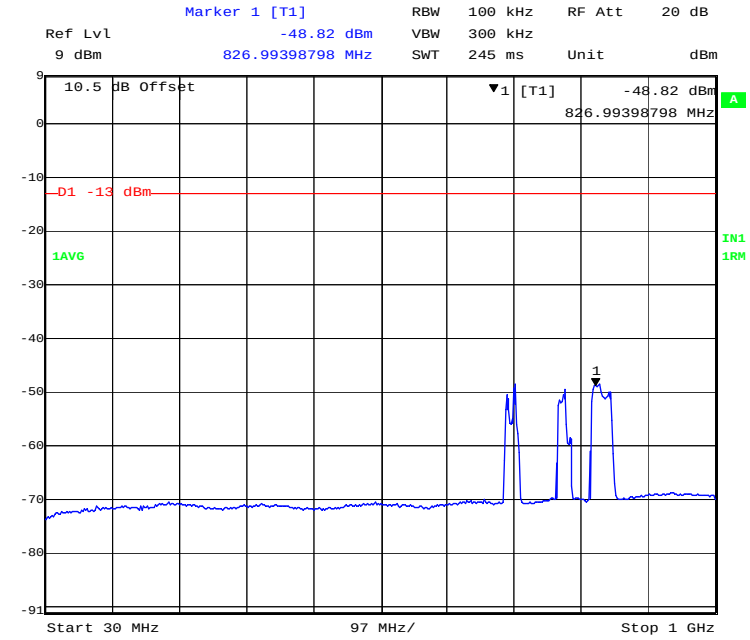
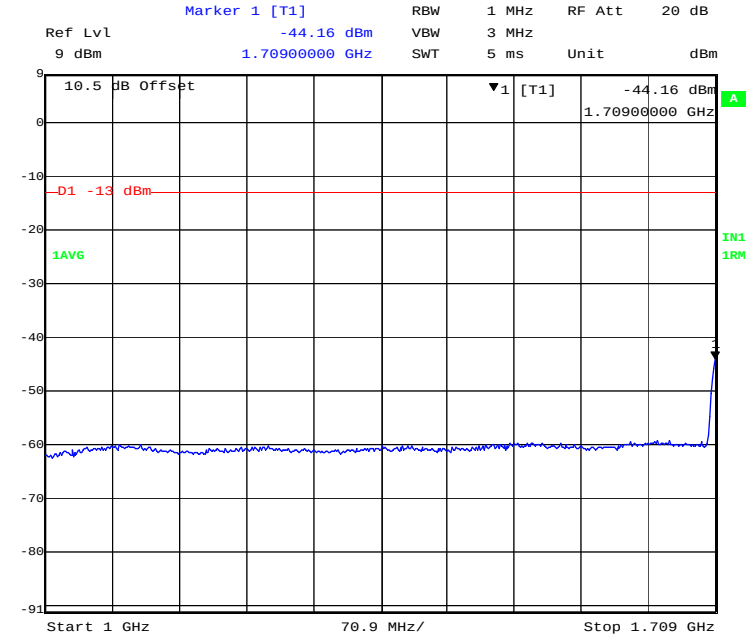
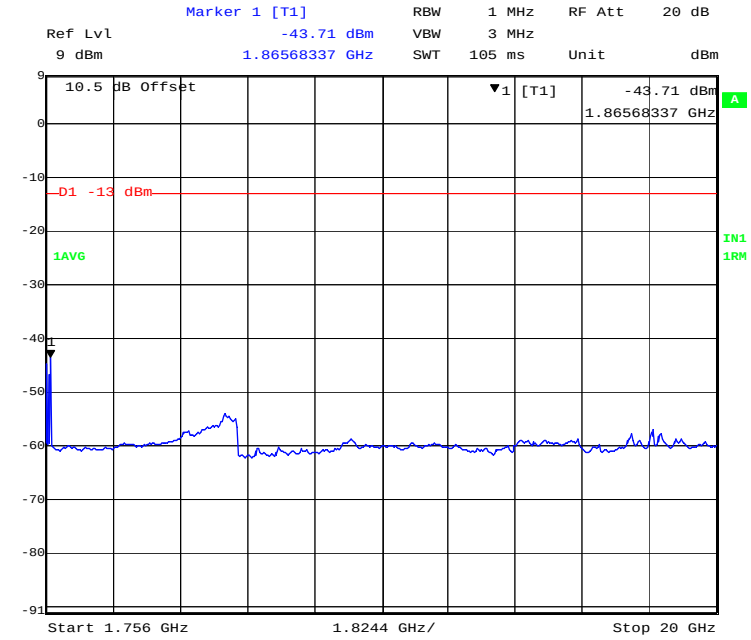
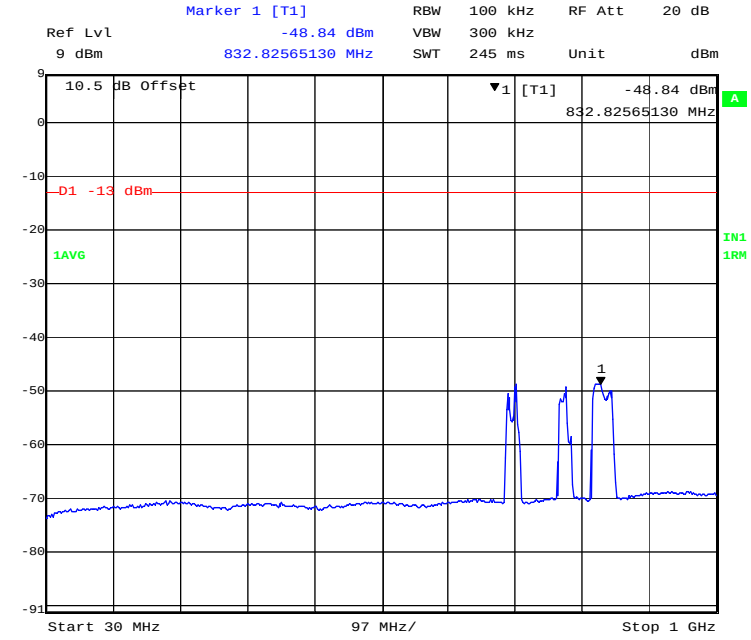
AWS- GSM-Pre AGC-Middle Channel

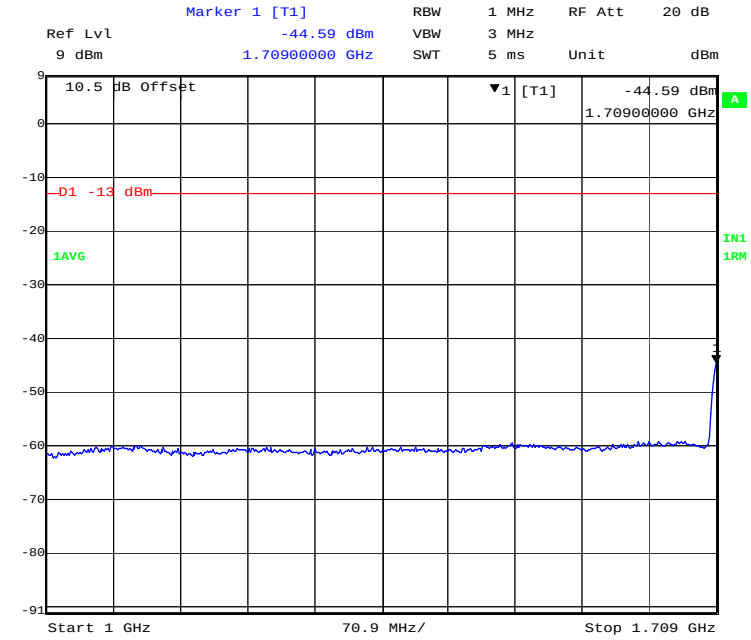




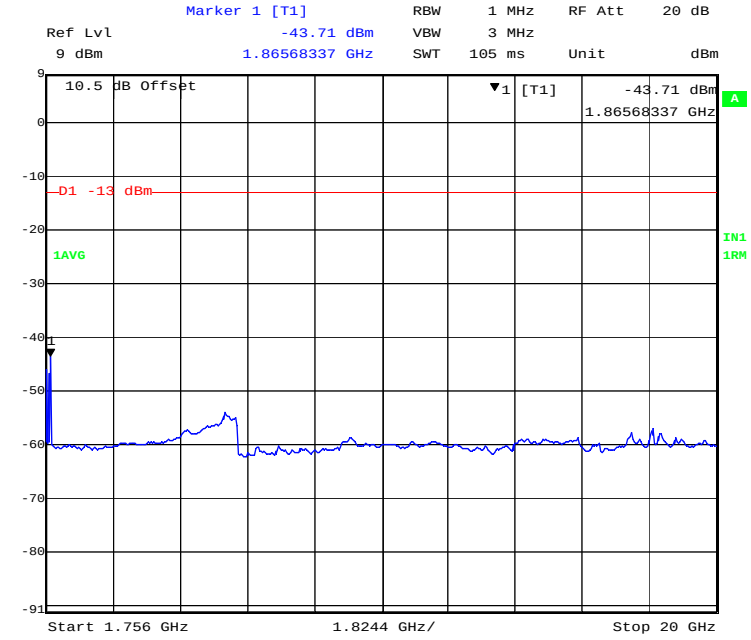


AWS- GSM-Pre AGC-High Channel





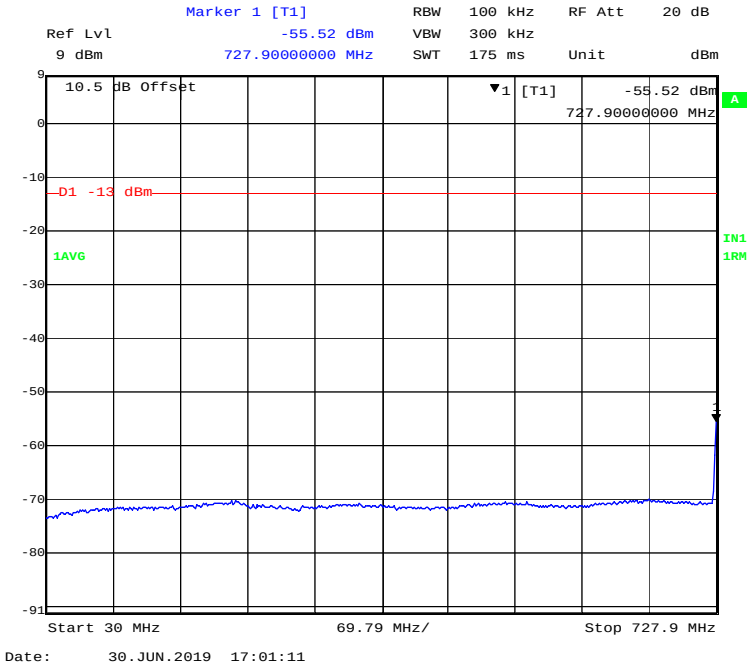
Date: 30.JUN.2019 16:15:29

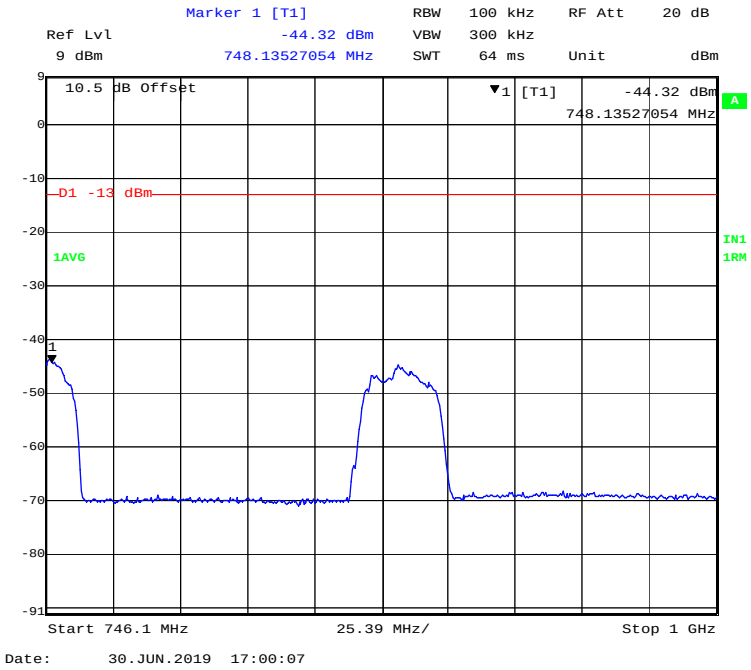


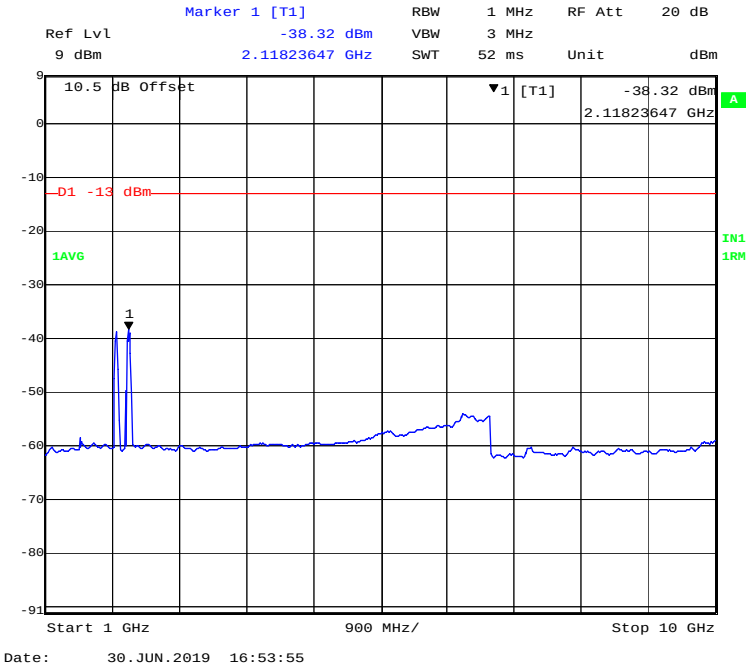
Date: 30.JUN.2019 16:17:14

Downlink:

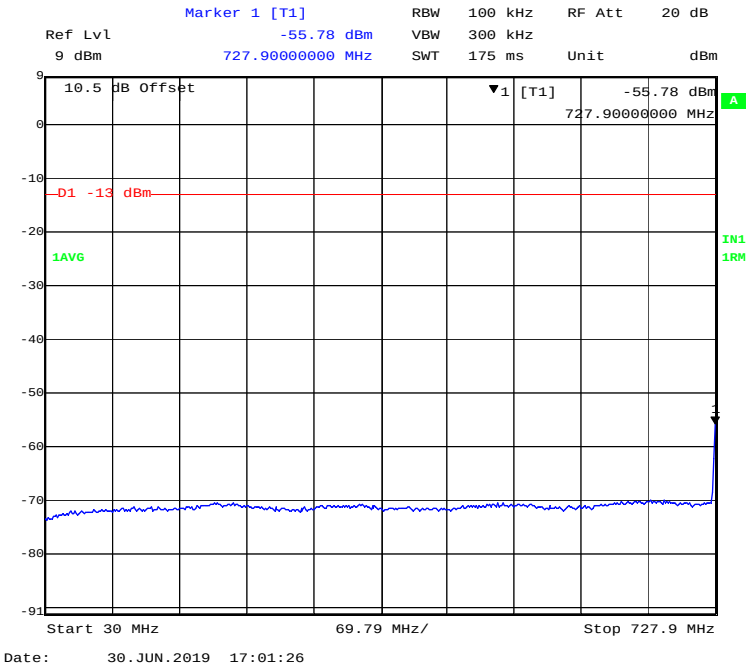
Lower 700MHz (A+B+C Block)-AWGN-Pre AGC-Low Channel

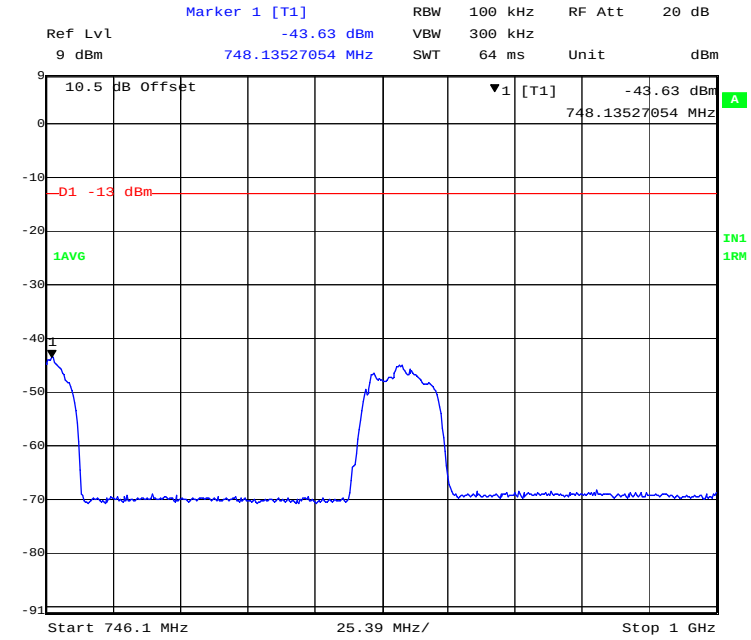


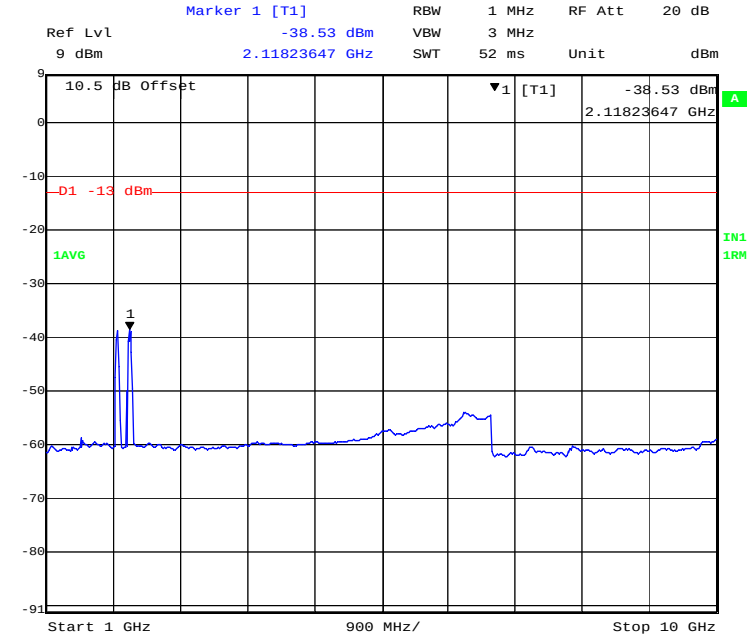




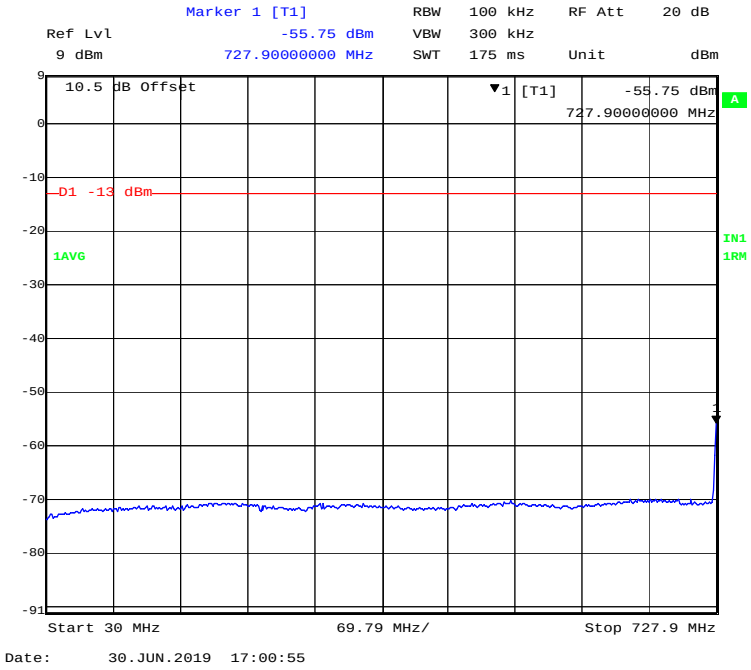
Lower 700MHz (A+B+C Block) - AWGN-Pre AGC-Middle Channel

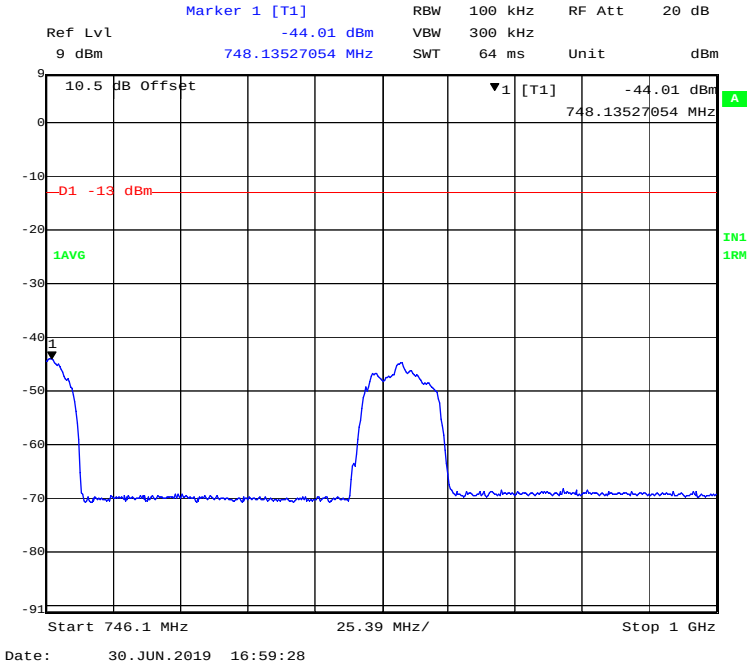



Marker 1 [T1]
RBW 100 kHz
RF Att 20 dB
Ref Lvl
-43.63 dBm
VBW 300 kHz
9 dBm
748.13527054 MHz
SWT 64 ms
Unit dBm
10.5 dB Offset
1 [T1]
-43.63 dBm
748.13527054 MHz
D1 -13 dBm
1AVG
IN1
1RM
Start 746.1 MHz
25.39 MHz/
Stop 1 GHz
Date: 30.JUN.2019 17:00:24


Marker 1 [T1]
RBW 1 MHz
RF Att 20 dB
Ref Lvl
-38.53 dBm
VBW 3 MHz
9 dBm
2.11823647 GHz
SWT 52 ms
Unit dBm
10.5 dB Offset
1 [T1]
-38.53 dBm
2.11823647 GHz
D1 -13 dBm
1AVG
IN1
1RM
Start 1 GHz
900 MHz/
Stop 10 GHz
Date: 30.JUN.2019 16:54:11

Lower 700MHz (A+B+C Block) - AWGN-Pre AGC-High Channel





Lower 700MHz (A+B+C Block) - GSM-Pre AGC-Low Channel