

TEST REPORT

FCC ID: A7V-SR65703001

Product: Signal Booster

Model No.: A7V-SR65703001

Additional Model No.: FiDAS

Trade Mark: SolidRF, Intactwave, L-Com, AmazBoost, PrimBoost, PRO-CELL

Report No.: TCT180808E028

Issued Date: Sep. 05, 2018

Issued for:

ShenZhen SolidRF Communications Co., Ltd

No. 8, Shop D, Block C, Shan Shui Ju, Long Wei Rd, Shenzhen, 518049 China

Issued By:

Shenzhen Tongce Testing Lab.

1B/F., Building 1, Yibaolai Industrial Park, Qiaotou, Fuyong, Baoan District,
Shenzhen, Guangdong, China

TEL: +86-755-27673339

FAX: +86-755-27673332

Note: This report shall not be reproduced except in full, without the written approval of Shenzhen Tongce Testing Lab.

This document may be altered or revised by Shenzhen Tongce Testing Lab. personnel only, and shall be noted in the revision section of the document. The test results in the report only apply to the tested sample.

TABLE OF CONTENTS

1. Test Certification.....	3
2. Test Result Summary	4
3. EUT Description	5
4. General Information.....	6
4.1. Test environment	6
4.2. Description of Support Units	6
5. Facilities and Accreditations	7
5.1. Facilities	7
5.2. Location	7
5.3. Measurement Uncertainty	7
6. Test Results and Measurement Data	8
6.1. Authorized Frequency Band Verification.....	8
6.2. Maximum Power	15
6.3. Intermodulation Product.....	31
6.4. Out of Band Emission.....	43
6.5. Conducted Spurious Emission.....	105
6.6. Noise Limits	122
6.7. Uplink Inactivity.....	134
6.8. Variable Booster Gain.....	139
6.9. Occupied Bandwidth.....	146
6.10. Oscillation Detection and Mitigation	179
7. Radiation Spurious Emission	199
Appendix A: Photographs of Test Setup	
Appendix B: Photographs of EUT	

1. Test Certification

Product:	Signal booster
Model No.:	A7V-SR65703001
Additional Model:	FIDAS
Trade Mark:	SolidRF, Intactwave, L-Com, AmazBoost, PrimBoost, PRO-CELL
Applicant:	ShenZhen SolidRF Communications Co., Ltd
Address:	No. 8, Shop D, Block C, Shan Shui Ju, Long Wei Rd, Shenzhen, 518049 China
Manufacturer:	ShenZhen SolidRF Communications Co., Ltd
Address:	No. 8, Shop D, Block C, Shan Shui Ju, Long Wei Rd, Shenzhen, 518049 China
Date of Test:	Aug. 08, 2018 – Sep. 04, 2018
Applicable Standards:	FCC CFR Title 47 Part 20.21

The above equipment has been tested by Shenzhen Tongce Testing Lab. and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Tested By:



Brews Xu

Date:

Sep. 04, 2018

Reviewed By:



Bery Zhao

Date:

Sep. 05, 2018

Approved By:



Tomsin

Date:

Sep. 05, 2018

2. Test Result Summary

Requirement	CFR 47 Section	Result
Authorized Frequency Band Verification Test	§20.21(e)(3)	PASS
Maximum Power Measurement Procedure	§2.1046/20.21(e)(8)(i)(D)	PASS
Maximum Booster Gain Computation	§20.21(e)(8)(i)(B)	PASS
Intermodulation Product	§20.21(e)(8)(i)(F)	PASS
Out of Band Emissions	§20.21(e)(8)(i)(E)	PASS
Conducted Spurious Emission	§2.1051/§27	PASS
Noise Limit Procedure Variable Noise Variable Noise Timing	§20.21(e)(8)(i)(A)(2)(i) §20.21(e)(8)(i)(A)(1) §20.21(e)(8)(i)(H)	PASS
Uplink inactivity	§20.21(e)(8)(i)(I)	PASS
Variable Booster Gain Variable Uplink Gain Timing	§20.21(e)(8)(i)(C) (1), (2)(i) §20.21(e)(8)(i)(H)	PASS
Occupied Band Width	§2.1049/§27	PASS
Anti-Oscillation	§20.21(e)(8)(ii)(A)	PASS
Radiated Spurious Emission	§2.1053/§27	PASS
Spectrum Block Filter	N/A	N/A

Note:

1. PASS: Test item meets the requirement.
2. Fail: Test item does not meet the requirement.
3. N/A: Test case does not apply to the test object.
4. The test result judgment is decided by the limit of test standard.

3. EUT Description

Product Name:	Signal booster
Model :	A7V-SR65703001
Additional Model:	FiDAS
Trade Mark:	SolidRF, Intactwave, L-Com, AmazBoost, PrimBoost, PRO-CELL
Operation Frequency:	Band 2 Uplink: 1850 MHz - 1910MHz, Downlink: 1930 MHz - 1990MHz Band 4 Uplink: 1710 MHz - 1755MHz, Downlink: 2110 MHz - 2155MHz Band 5 Uplink: 824 MHz - 849MHz, Downlink: 869 MHz - 894MHz Band 12 Uplink: 698 MHz - 716MHz, Downlink: 728 MHz - 746MHz Band 13 Uplink: 776 MHz - 787MHz, Downlink: 746 MHz - 757MHz
Emission Designator:	F9W, G7D, G7W, GXW
FCC Classification:	B2W/Wideband Consumer Booster(CMRS)
Gain:	Uplink Gain: 55±3 dB Downlink Gain: 60±3 dB
Power Supply:	AC 120V/60Hz
Remark:	All models above are identical in interior structure, electrical circuits and components, just model names are different for the marketing requirement.

4. General Information

4.1. Test environment

Operating Environment:	
Temperature:	25.0 °C
Humidity:	56 % RH
Atmospheric Pressure:	1010 mbar

4.2. Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Equipment	Model No.	Serial No.	FCC ID	Trade Name
/	/	/	/	/

5. Facilities and Accreditations

5.1. Facilities

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

- FCC - Registration No.: 645098

Shenzhen Tongce Testing Lab

The 3m Semi-anechoic chamber has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

- IC - Registration No.: 10668A-1

The 3m Semi-anechoic chamber of Shenzhen TCT Testing Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing

5.2. Location

Shenzhen Tongce Testing Lab

Address: 1B/F., Building 1, Yibaolai Industrial Park, Qiaotou, Fuyong, Baoan District, Shenzhen, Guangdong, China

TEL: +86-755-27673339

5.3. Measurement Uncertainty

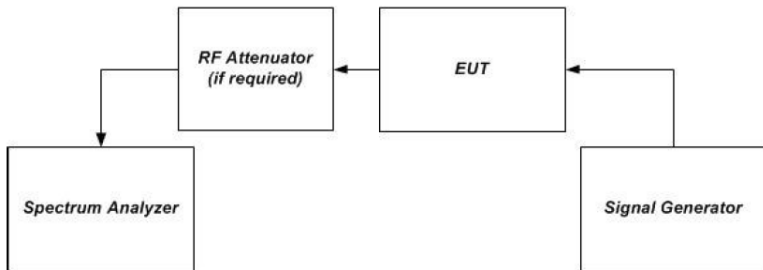
The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

No.	Item	MU
1	Conducted Emission	$\pm 2.56\text{dB}$
2	RF power, conducted	$\pm 0.12\text{dB}$
3	Spurious emissions, conducted	$\pm 0.11\text{dB}$
4	All emissions, radiated(<1G)	$\pm 3.92\text{dB}$
5	All emissions, radiated(>1G)	$\pm 4.28\text{dB}$
6	Temperature	$\pm 0.1^{\circ}\text{C}$
7	Humidity	$\pm 1.0\%$

6. Test Results and Measurement Data

6.1. Authorized Frequency Band Verification

6.1.1. Test Specification

Test Requirement:	FCC Part20 Section 20.21(e)(3)
Test Method:	935210 D03 Signal Booster Measurements v04r02
Limit	Band 2 Uplink: 1850 MHz - 1910MHz, Downlink: 1930 MHz - 1990MHz Band 4 Uplink: 1710 MHz - 1755MHz, Downlink: 2110 MHz - 2155MHz Band 5 Uplink: 824 MHz - 829MHz, Downlink: 869 MHz - 894MHz
Test Setup:	 <pre> graph LR SG[Signal Generator] --> EUT[EUT] EUT --> RA[RF Attenuator (if required)] RA --> SA[Spectrum Analyzer] </pre>
Test Procedure:	935210 D03 Signal Booster Measurement v04r02 - Connect the EUT to the test equipment as shown in Figure 1. Begin with the uplink output (donor) port connected to the spectrum analyzer. - Set the spectrum analyzer resolution bandwidth (RBW) for 100 kHz with the video bandwidth (VBW) $\geq 3 \times$ the RBW, using a PEAK detector with the MAX HOLD function. - Set the center frequency of the spectrum analyzer to the center of the operational band under test with a span of 1 MHz. - Set the signal generator for CW mode and tune to the center frequency of the operational band under test. - Set the initial signal generator power to a level that is at least 6 dB below the AGC level specified by the manufacturer. - Slowly increase the signal generator power level until the output signal reaches the AGC operational level. - Reduce the signal generator power to a level that is 3 dB below the level noted above, then manually reset the EUT (e.g., cycle ac/dc power). - Reset the spectrum analyzer span to 2xthe width of the CMRS band under test. Adjust the tuned frequency of the signal generator to sweep 2xthe width of the CMRS band using the sweep function. The AGC must be deactivated throughout the entire sweep. - Using three markers, identify the CMRS band edges and the frequency with the highest power. Affirm that the values of all markers are visible on the display of the spectrum analyzer (e.g., marker table set to on). - Capture the spectrum analyzer trace for inclusion in the test report. - Repeat 7.1c) to 7.1j) for all operational uplink and downlink bands.
Test Result:	PASS

6.1.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Signal Generator	Agilent	N5182A	MY47070282	Sep. 28, 2017	Sep. 27, 2018
Spectrum Analyzer	R&S	FSQ40	200061	Sep. 28, 2017	Sep. 27, 2018
Attenuation	AF115A-09-34	JFW	907763	Sep. 28, 2017	Sep. 27, 2018

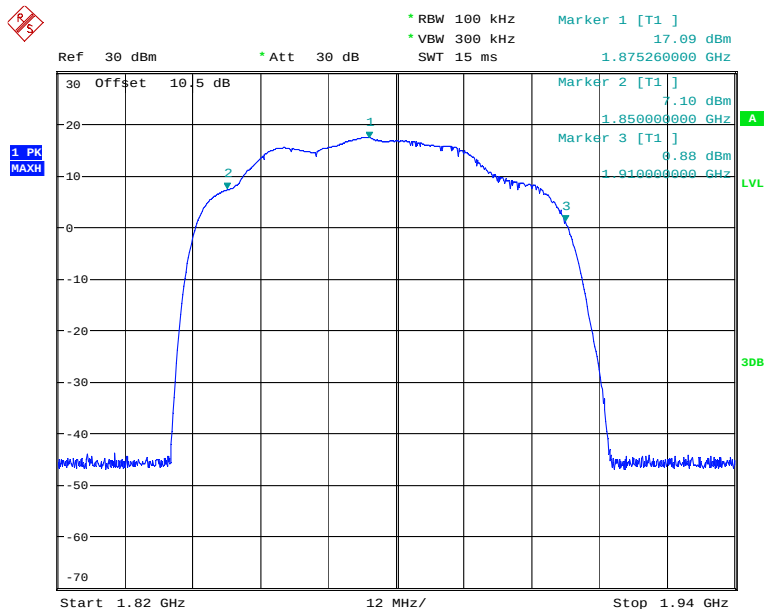
Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

6.1.3. Test data

Test Plots

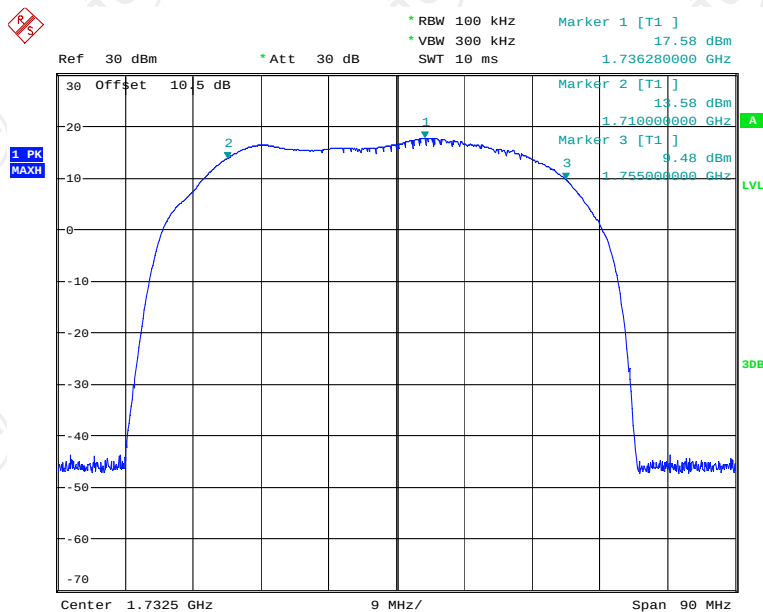
Uplink

Band2



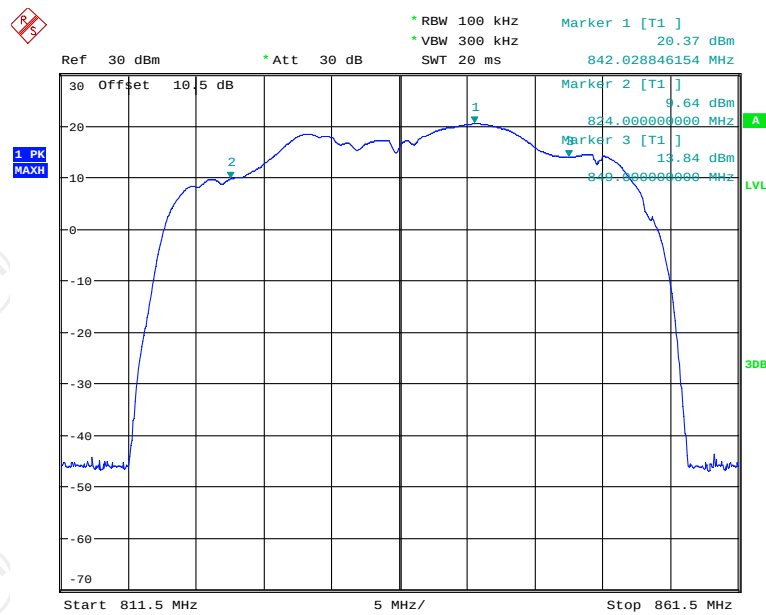
Date: 5.SEP.2018 18:01:17

Band4



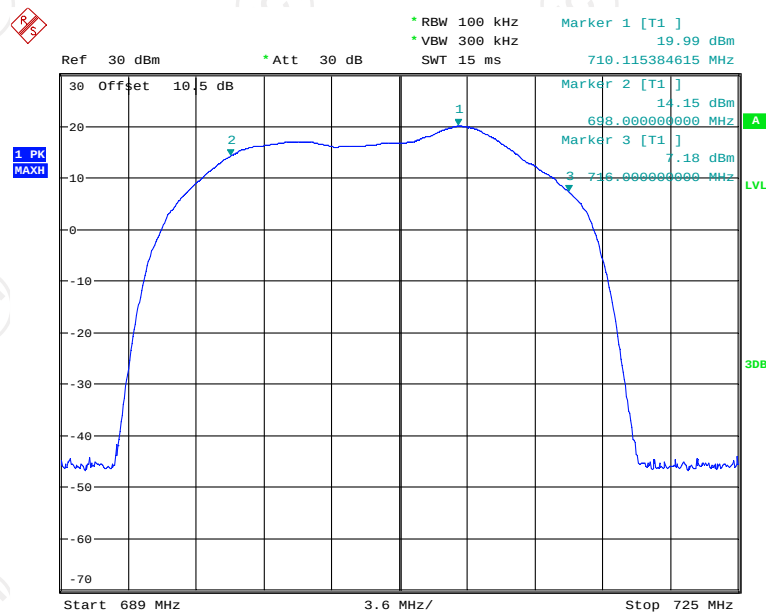
Date: 5.SEP.2018 17:27:55

Band5



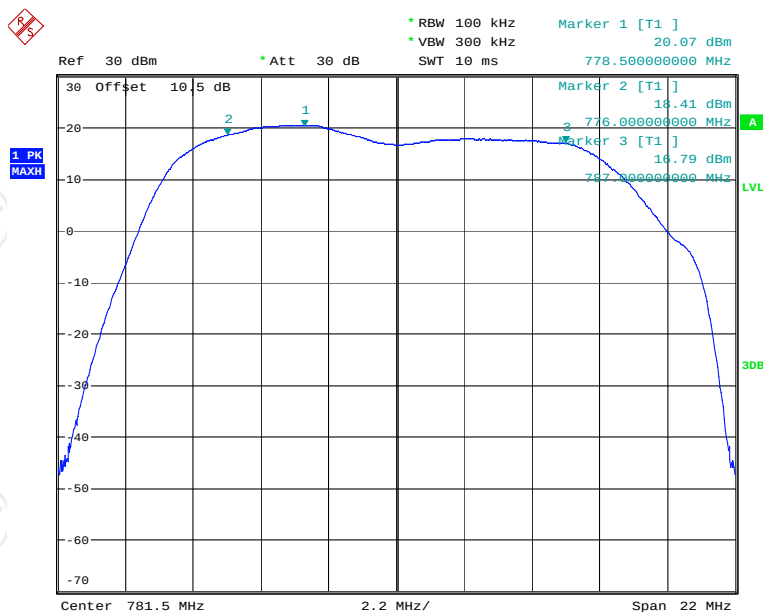
Date: 24.AUG.2018 16:09:17

Band12



Date: 24.AUG.2018 16:26:00

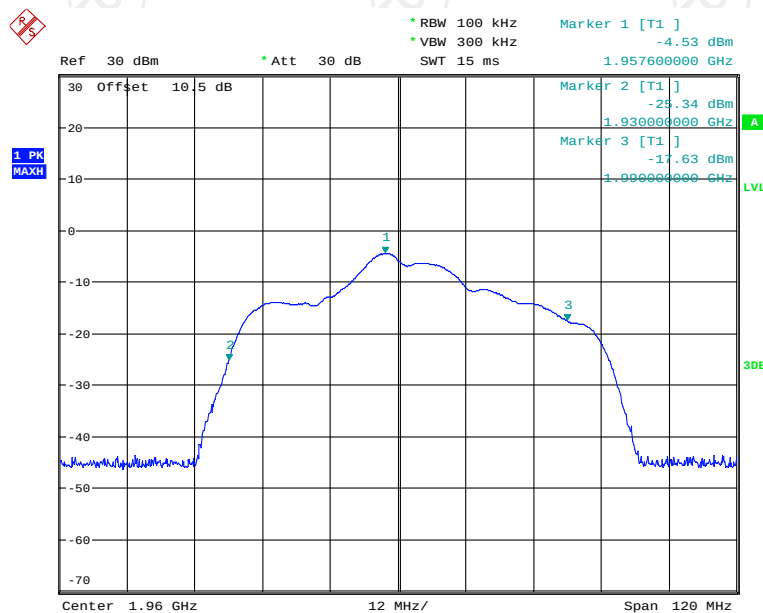
Band13



Date: 5.SEP.2018 17:45:28

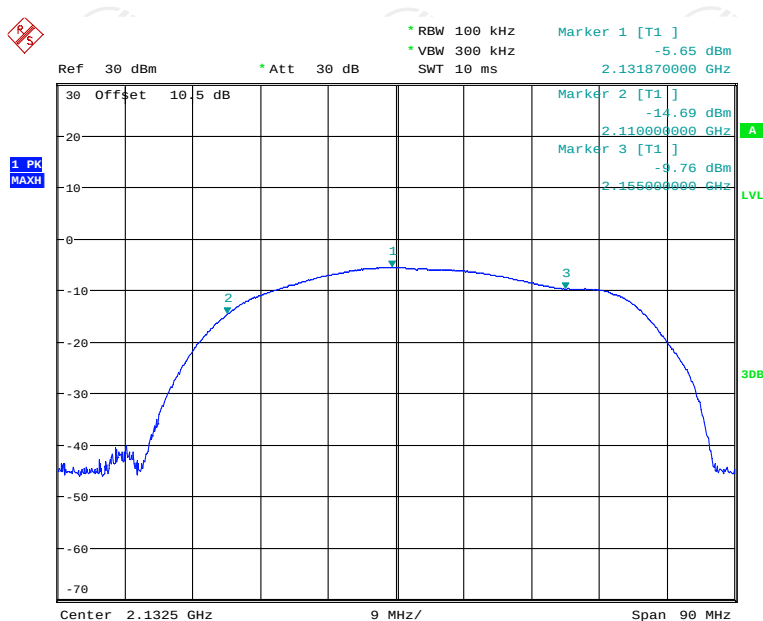
Downlink

Band2



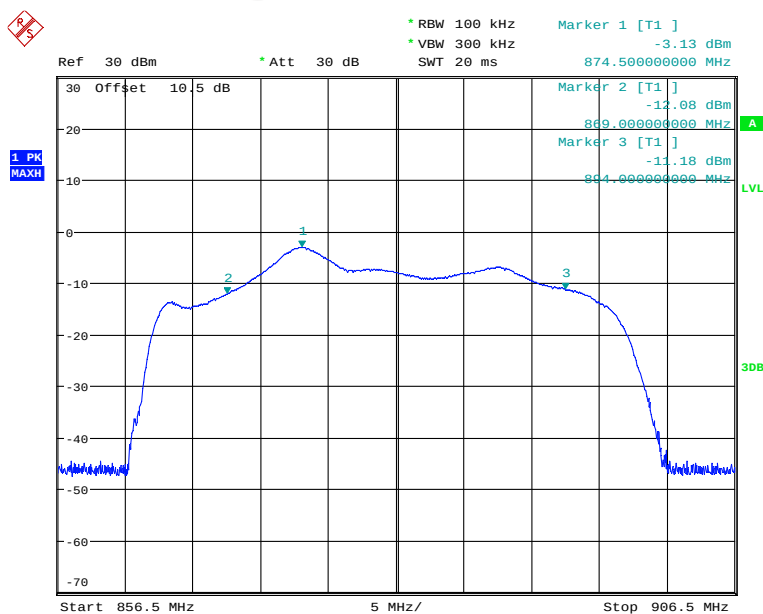
Date: 25.AUG.2018 16:36:09

Band4



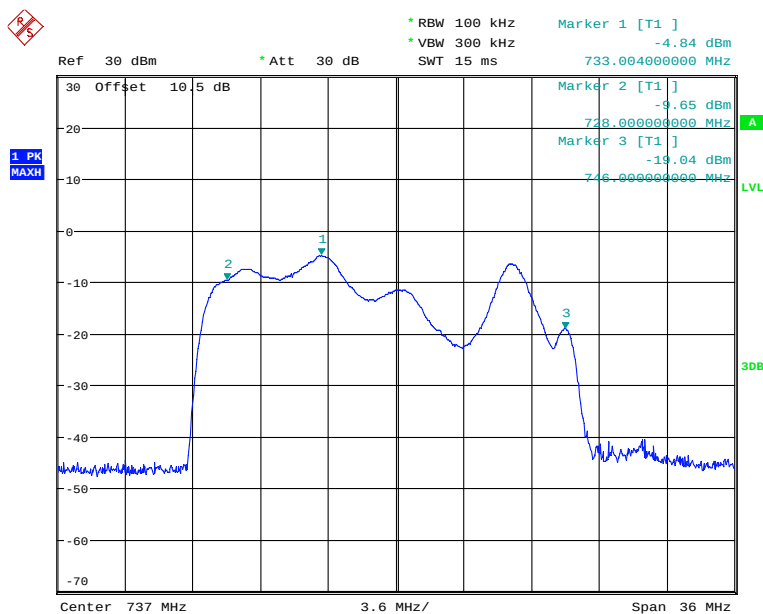
Date: 25.AUG.2018 16:12:51

Band5



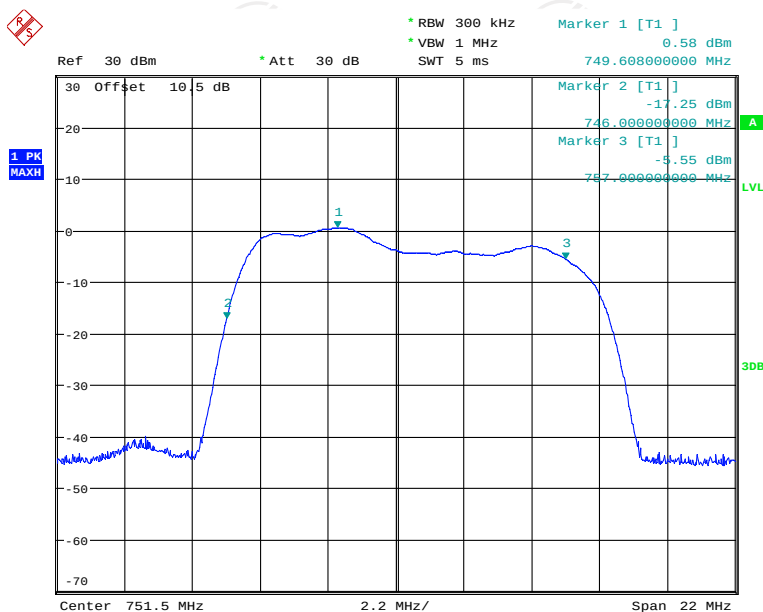
Date: 25.AUG.2018 17:26:08

Band12



Date: 25.AUG.2018 17:41:17

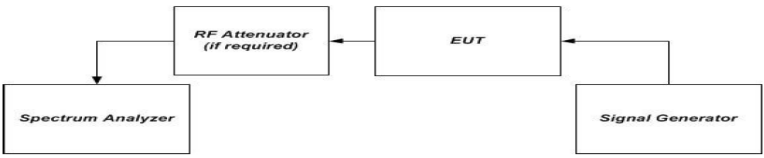
Band13



Date: 25.AUG.2018 15:58:55

6.2. Maximum Power

6.2.1. Test Specification

Test Requirement:	FCC Part 20.21 (e)(8)(i)(B); FCC Part 20.21 (e)(8)(i)(D)
Test Method:	KDB935210 D03 Signal Booster Measurement v04r02
Test Setup:	 <pre> graph LR SG[Signal Generator] --> EUT[EUT] EUT --> RA[RF Attenuator (if required)] RA --> SA[Spectrum Analyzer] </pre>
Test Procedure:	- Connect the EUT to the test equipment as shown in Set-Up. Begin with the uplink output (donor port) connected to the spectrum analyzer. - Configure the signal generator and spectrum analyzer for operation on the frequency determined in Frequency Band with the highest power level, but with the center frequency of the signal no closer than 2.5 MHz from the band edge. The spectrum analyzer span shall be set to at least 10 MHz. - Set the initial signal generator power to a level well below that which causes AGC control. - Slowly increase the signal generator power level until the output signal reaches the AGC operational limit (from observation of signal behavior on the spectrum analyzer; e.g., no further increase in output power as input power is increased). - Reduce power sufficiently on the signal generator to ensure that the AGC is not controlling the power output. - Slowly increase the signal generator power to a level just below (within 0.5 dB of) the AGC limit without triggering the AGC. Note the signal generator power level as (P_{in}). - Measure the output power (P_{out}) with the spectrum analyzer as follows. - Set RBW = 100 kHz for AWGN signal type and 300 kHz for CW or GSM signal type - Set VBW $\geq 3 \times$ RBW - Select either the BURST POWER or CHANNEL POWER measurement tool, as required for each signal type. The channel power integration bandwidth shall be 99% occupied bandwidth (4.1 MHz). - Select the RMS (power averaging) detector. - Ensure that the number of measurement points per sweep $\geq (2 \times \text{span})/\text{RBW}$ (Note: This requirement does not apply for BURST power measurement mode). - Set sweep time = auto couple, or as necessary (but no less than auto couple value). - Trace average at least 100 traces in power averaging (i.e., RMS) mode. - Record the measured power level as P_{out} with one set of results for the GSM or CW input stimulus and another set of results for the AWGN input stimulus. - Repeat the procedure for each operational uplink and downlink frequency band supported by the booster.
Test Result:	PASS

6.2.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Signal Generator	Agilent	N5182A	MY47070282	Sep. 28, 2017	Sep. 27, 2018
Spectrum Analyzer	R&S	FSQ40	200061	Sep. 28, 2017	Sep. 27, 2018
Attenuation	AF115A-09-34	JFW	907763	Sep. 28, 2017	Sep. 27, 2018

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

6.2.3. Test Data

Max. Gain

Frequency Band	Signal Type	Pre AGC Input Level (dBm)	Conducted Output Level (dBm)	Gain (dB)	Gain Limit (dB)
Band2 Uplink	CW	-36.8	17.76	54.56	71.98
	AWGN	-37.4	17.32	54.72	
Band4 Uplink	CW	-33.2	18.74	51.94	71.27
	AWGN	-33.8	17.84	51.64	
Band5 Uplink	CW	-33.5	21.27	54.77	64.95
	AWGN	-34.4	19.12	53.52	
Band12 Uplink	CW	-35.2	21.07	56.27	63.49
	AWGN	-36.3	19.13	55.43	
Band13 Uplink	CW	-35.4	21.13	56.53	64.36
	AWGN	-36.2	19.34	55.54	
Band2 Downlink	CW	-59.5	0.80	60.30	71.98
	AWGN	-60.4	-1.59	58.81	
Band4 Downlink	CW	-56.7	-0.77	55.93	71.27
	AWGN	-57.6	-3.25	54.35	
Band5 Downlink	CW	-61.6	-1.34	60.26	64.95
	AWGN	-62.3	-3.27	59.03	
Band12 Downlink	CW	-58.7	-3.03	55.67	63.49
	AWGN	-59.7	-3.44	56.26	
Band13 Downlink	CW	-56.7	4.67	61.37	64.36
	AWGN	-57.6	2.51	60.11	

Note: Fixed Booster maximum gain shall not exceed $6.5 \text{ dB} + 20 \text{ Log}_{10} (\text{Frequency})$, where Frequency is the uplink mid-band frequency of the supported spectrum bands in MHz.

Max. Input test level

Frequency Band	Signal Type	Max. Input Level (dBm)	Conducted Output Level (dBm)	Lower Limit(dBm)	Upper Limit(dBm)
Band2 Uplink	CW	0	17.76	17	30
	AWGN	0	17.32		
Band4 Uplink	CW	0	18.74		
	AWGN	0	17.84		
Band5 Uplink	CW	0	21.27		
	AWGN	0	19.12		
Band12 Uplink	CW	0	21.07		
	AWGN	0	19.13		
Band13 Uplink	CW	0	21.13		
	AWGN	0	19.34		
Band2 Downlink	CW	-42	0.62	N/A	17
	AWGN	-43	-1.77		
Band4 Downlink	CW	-44	-0.95		
	AWGN	-45	-3.53		
Band5 Downlink	CW	-47	-1.48		
	AWGN	-49	-3.46		
Band12 Downlink	CW	-43	-3.24		
	AWGN	-44	-3.62		
Band13 Downlink	CW	-41	4.43		
	AWGN	-42	2.29		

Max. Output Power

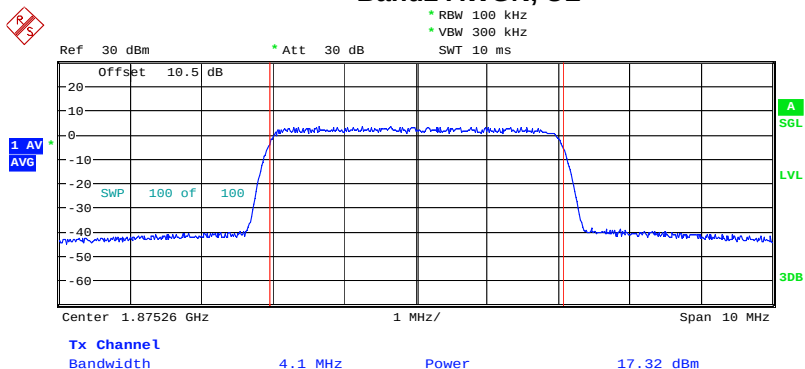
Frequency Band	Signal Type	Conducted Output Level (dBm)	Max. Antenna Gain (dB)	Min. Cable Loss (dB)	EIRP (dBm)	Lower Limit (dbm)	Upper Limit (dbm)
Band2 Uplink	CW	17.76	10	2.9	24.86	>17	<30
	AWGN	17.32	10	2.9	24.42		
Band4 Uplink	CW	18.74	10	2.55	26.19		
	AWGN	17.84	10	2.55	25.29		
Band5 Uplink	CW	21.27	9	1.95	28.32		
	AWGN	19.12	9	1.95	26.17		
Band12 Uplink	CW	21.07	9	1.9	28.17		
	AWGN	19.13	9	1.9	26.23		
Band13 Uplink	CW	21.13	9	1.9	28.23	N/A	<17
	AWGN	19.34	9	1.9	26.44		
Band2 Downlink	CW	0.80	10	1.8	9.00		
	AWGN	-1.59	10	1.8	6.61		
Band4 Downlink	CW	-0.77	10	1.9	7.33		
	AWGN	-3.25	10	1.9	4.85		
Band5 Downlink	CW	-1.34	9	1.35	6.31		
	AWGN	-3.27	9	1.35	4.38		
Band12 Downlink	CW	-3.03	9	1.3	4.67		
	AWGN	-3.44	9	1.3	4.26		
Band13 Downlink	CW	4.67	9	1.3	12.37		
	AWGN	2.51	9	1.3	10.21		

Uplink Gain VS Downlink Gain

Band	Signal Type	Uplink Gain (dB)	Downlink Gain (dB)	D-value	Limit (dB)
Band2	CW	54.56	60.30	5.74	<9
	AWGN	54.72	58.81	4.09	
Band4	CW	51.94	55.93	3.99	
	AWGN	51.64	54.35	2.71	
Band5	CW	54.77	60.26	5.49	
	AWGN	53.52	59.03	5.51	
Band12	CW	56.27	55.67	0.60	
	AWGN	55.43	56.26	0.83	
Band13	CW	56.53	61.37	4.84	
	AWGN	55.54	60.11	4.57	

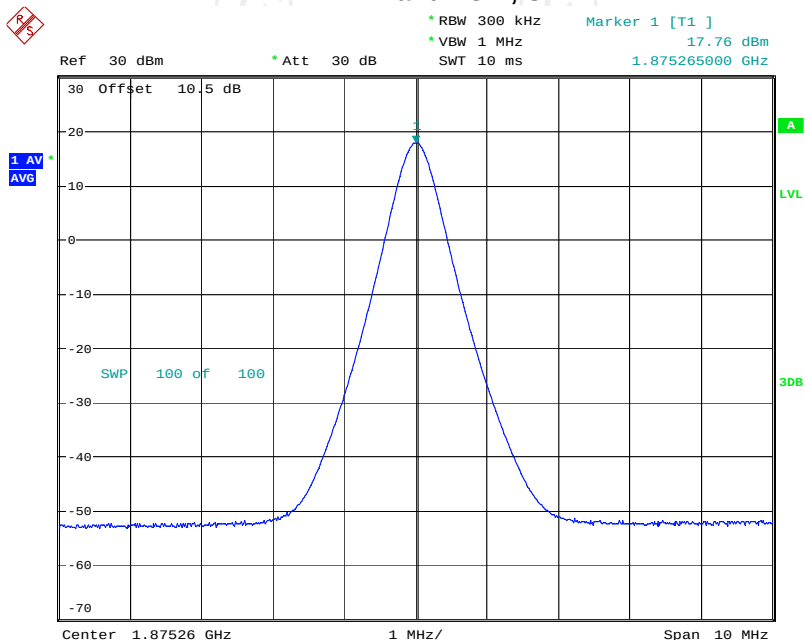
Test Plots

Band2 AWGN, UL

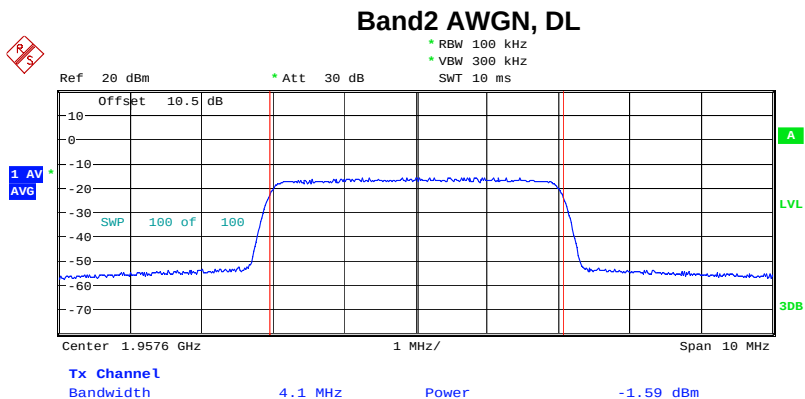


Date: 5.SEP.2018 16:33:45

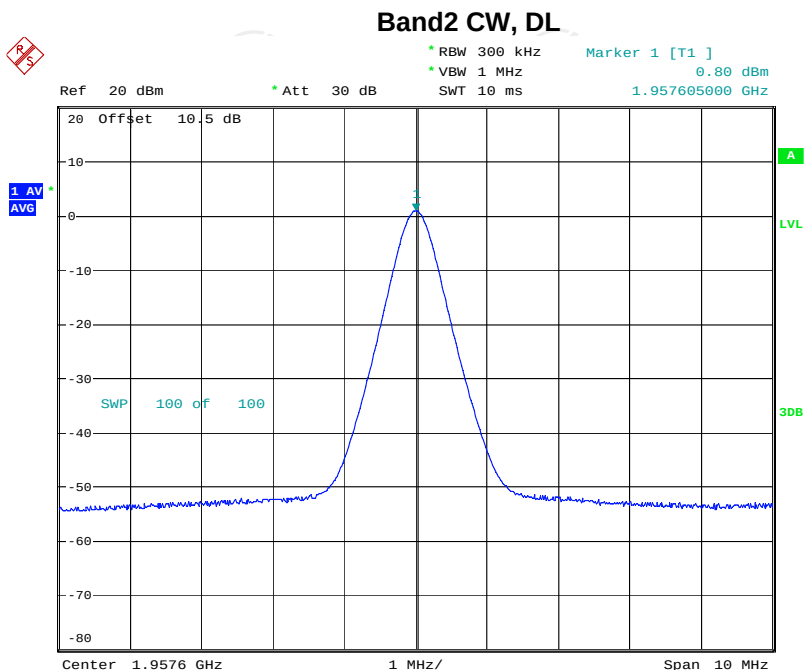
Band2 CW, UL



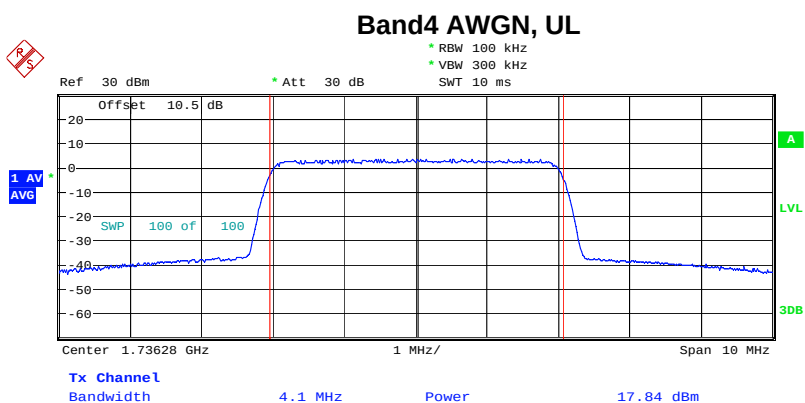
Date: 5.SEP.2018 16:31:16



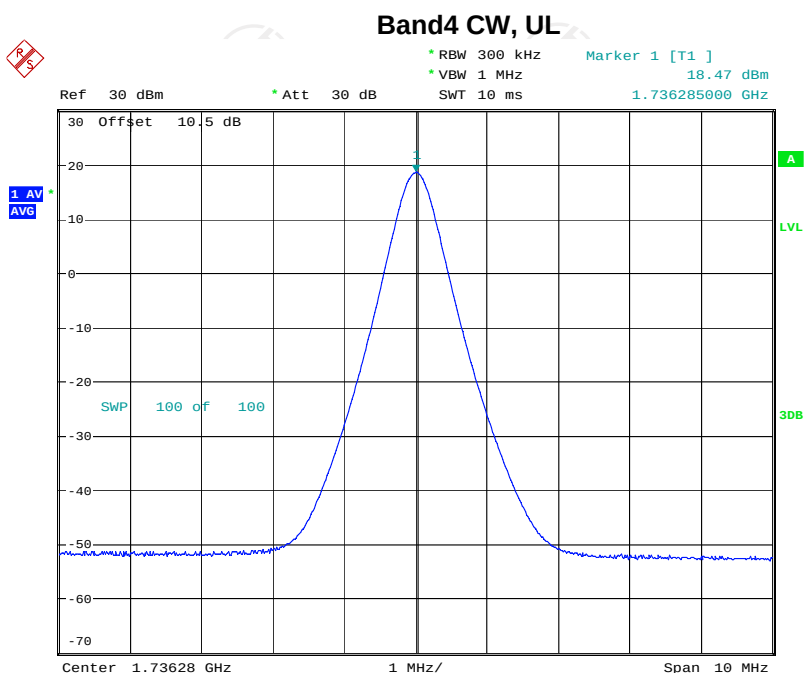
Date: 6.SEP.2018 09:13:34



Date: 6.SEP.2018 09:12:10

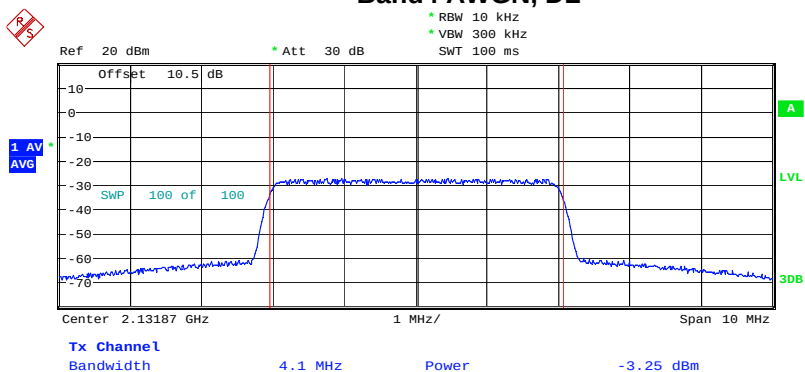


Date: 5.SEP.2018 17:31:28



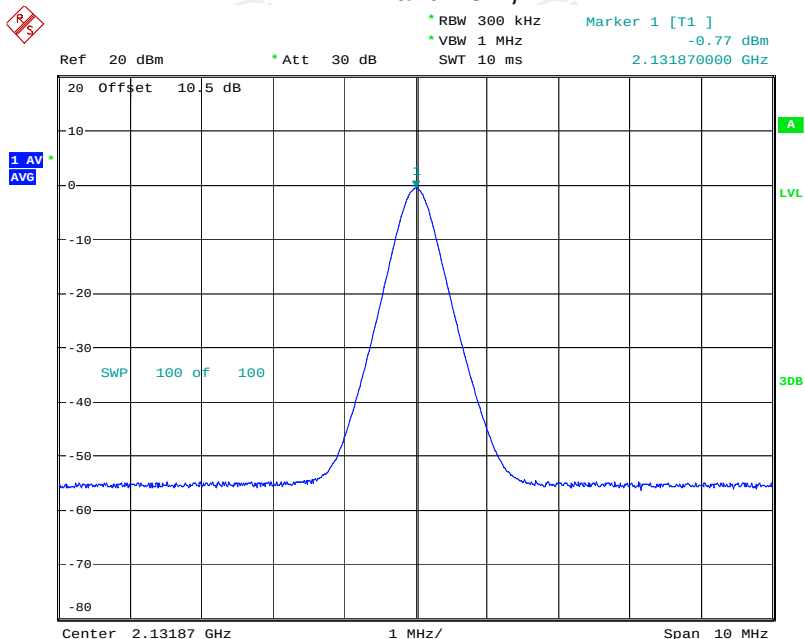
Date: 5.SEP.2018 17:29:30

Band4 AWGN, DL

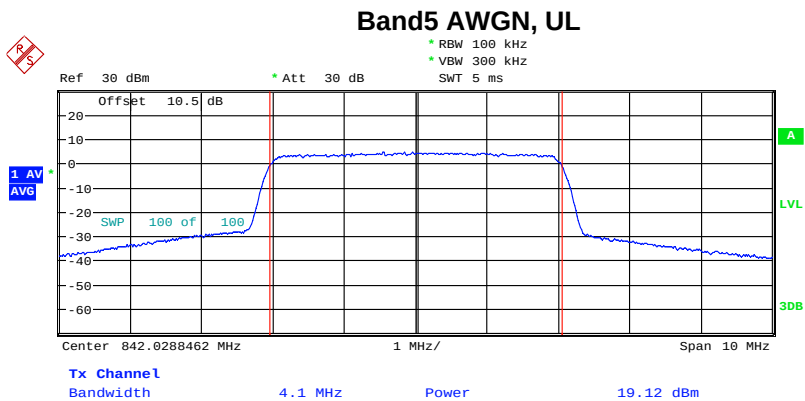


Date: 6.SEP.2018 09:28:30

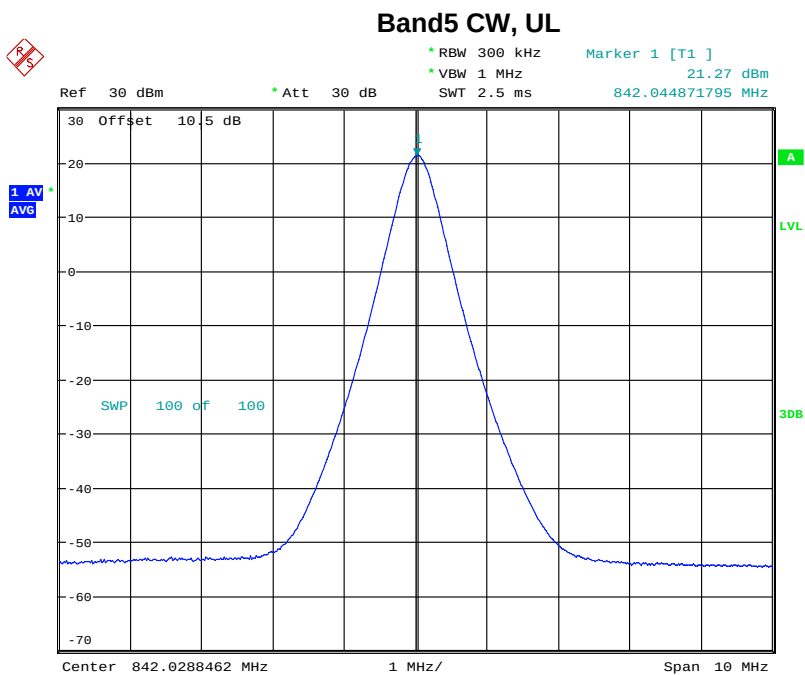
Band4 CW, DL



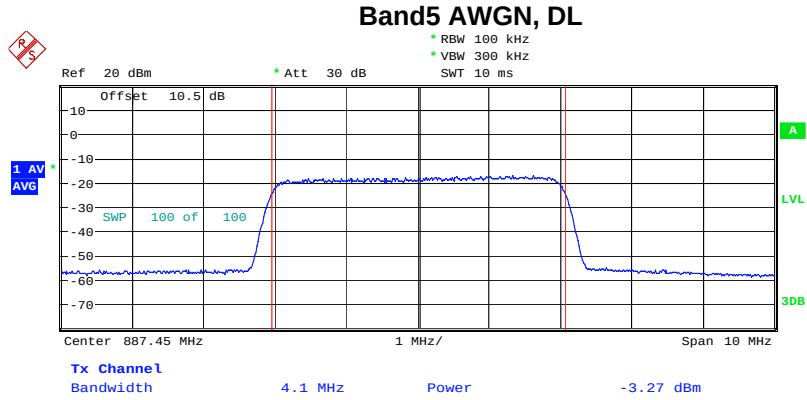
Date: 6.SEP.2018 09:27:52



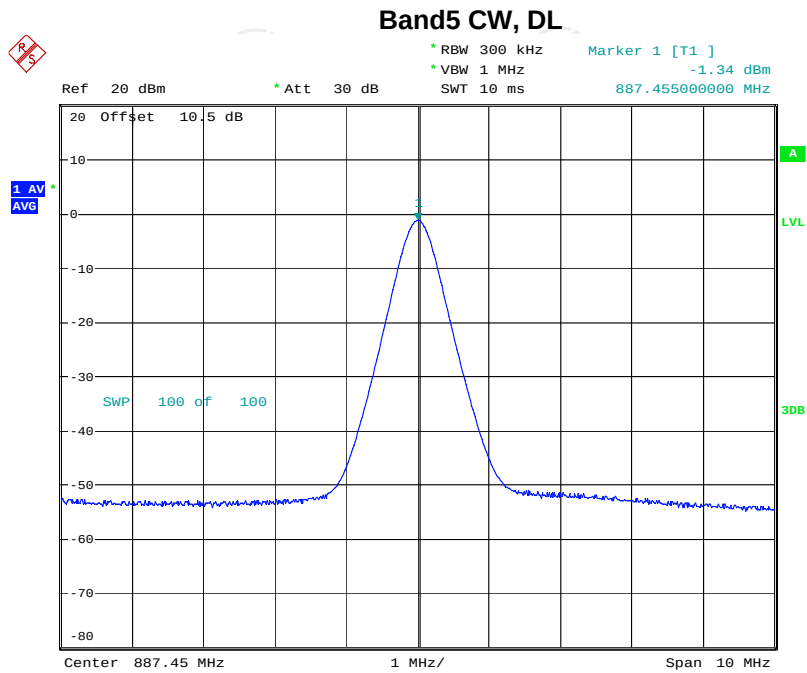
Date: 24.AUG.2018 16:17:39



Date: 24.AUG.2018 16:13:10

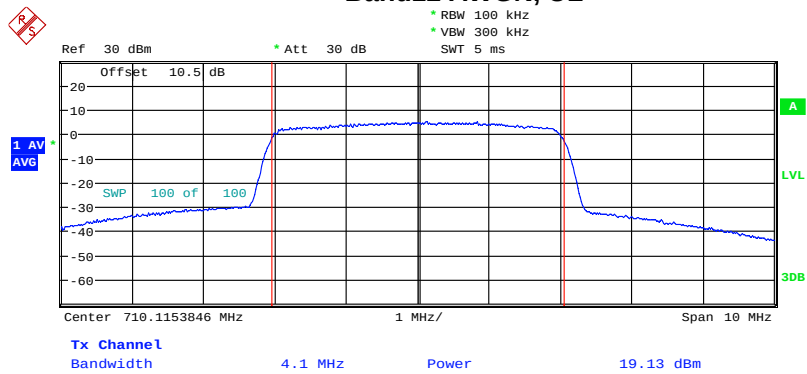


Date: 6.SEP.2018 09:16:33



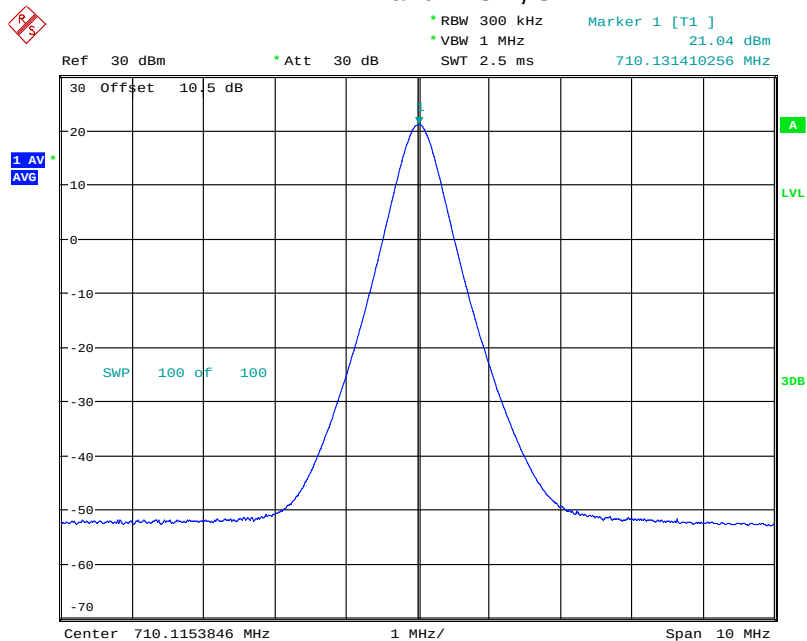
Date: 6.SEP.2018 09:15:55

Band12 AWGN, UL



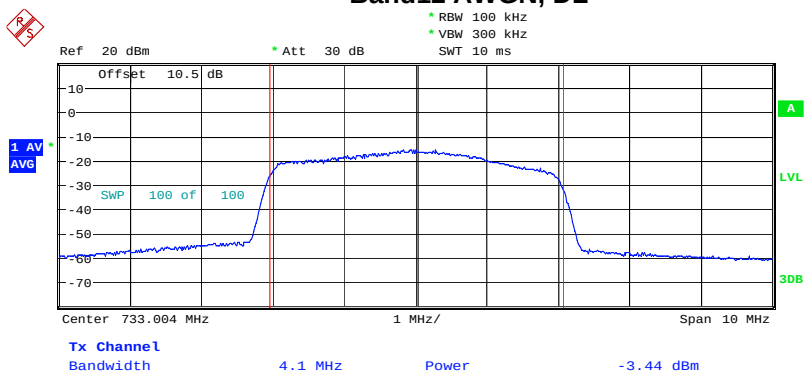
Date: 24.AUG.2018 16:32:27

Band12 CW, UL



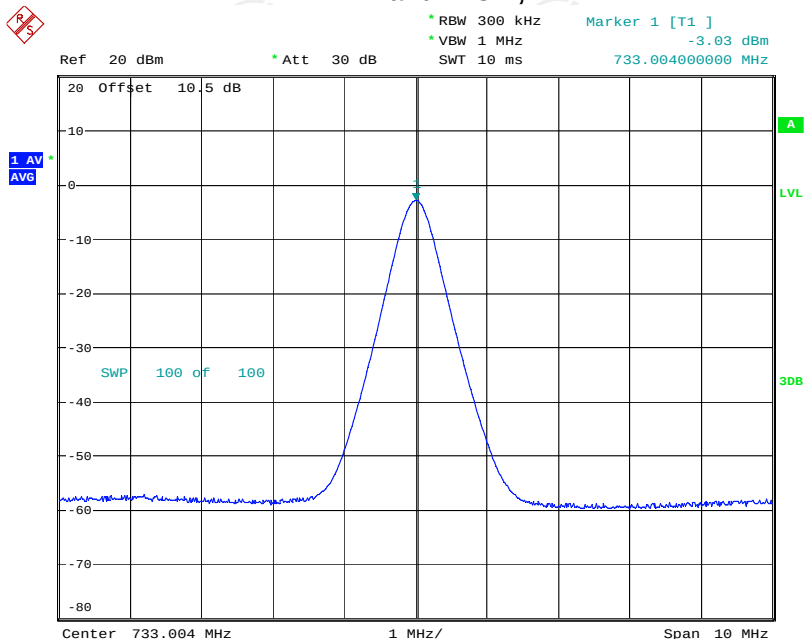
Date: 24.AUG.2018 16:30:19

Band12 AWGN, DL



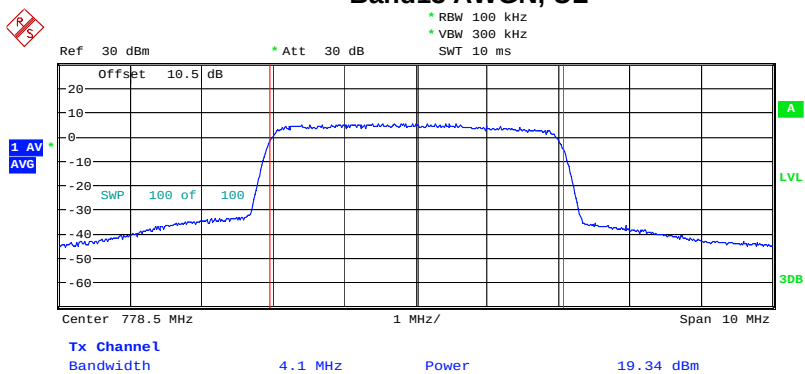
Date: 6.SEP.2018 09:20:50

Band12 CW, DL



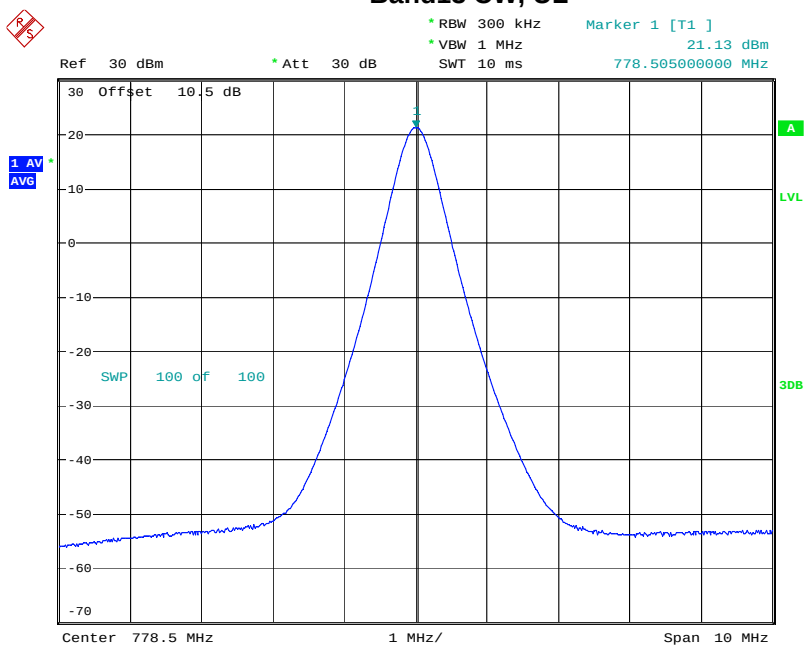
Date: 6.SEP.2018 09:19:48

Band13 AWGN, UL



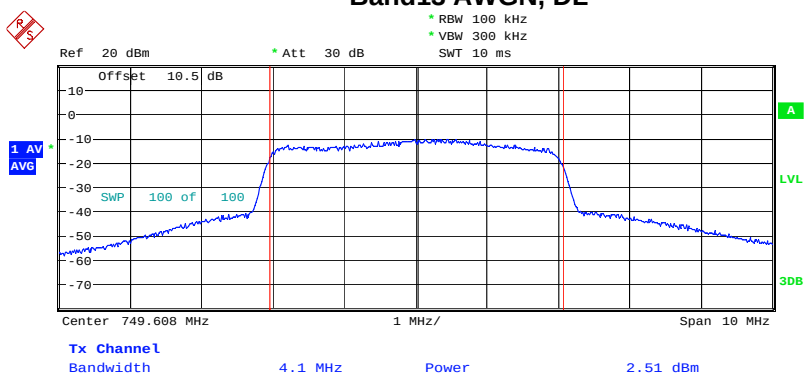
Date: 5.SEP.2018 17:39:00

Band13 CW, UL



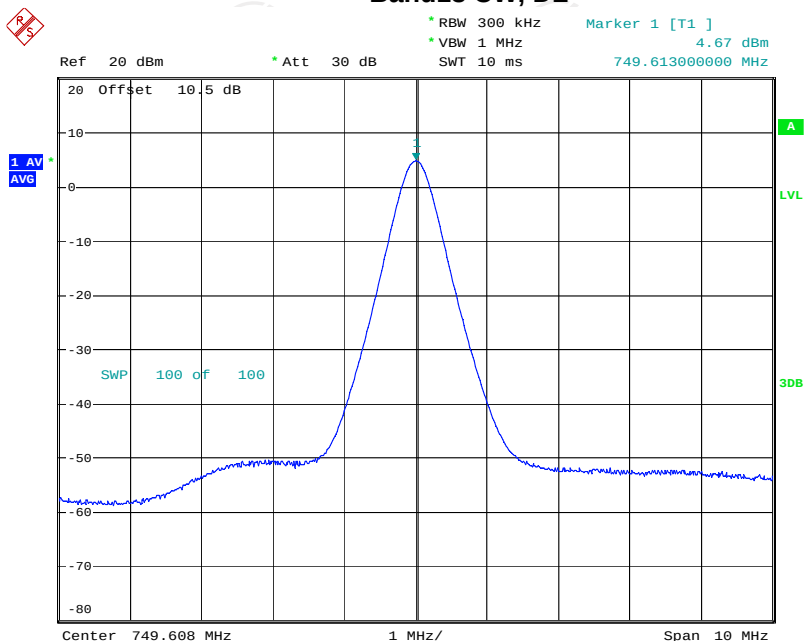
Date: 5.SEP.2018 17:38:10

Band13 AWGN, DL



Date: 6.SEP.2018 09:25:38

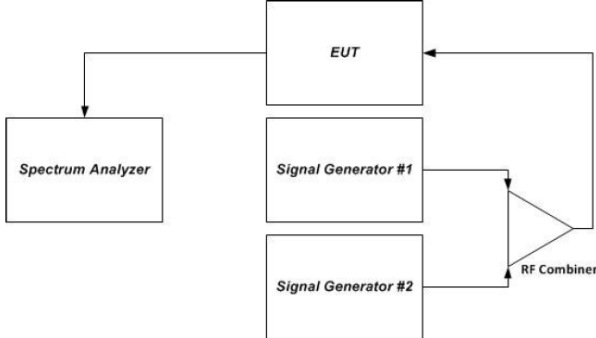
Band13 CW, DL



Date: 6.SEP.2018 09:23:56

6.3. Intermodulation Product

6.3.1. Test Specification

Test Requirement:	FCC Part20 Section 20.21(e)(8)(i)(F)
Test Method:	KDB935210 D03 Signal Booster Measurement v04r02
Limit:	-19dBm
Test Setup:	 Figure 2 – Intermodulation product instrumentation test setup
Test Procedure:	a) Connect the signal booster to the test equipment as shown in Set-Up. Begin with the uplink output connected to the spectrum analyzer. b) Set the spectrum analyzer RBW = 3 kHz. c) Set the VBW $\geq 3 \times$ the RBW. d) Select the RMS detector. e) Set the spectrum analyzer center frequency to the center of the supported operational band under test. f) Set the span to 5 MHz. g) Configure the two signal generators for CW operation with generator 1 tuned 300 kHz below the operational band center frequency and generator 2 tuned 300 kHz above the operational band center frequency. h) Set the signal generator amplitudes so that the power from each into the RF combiner is equivalent and turn on the RF output. i) Increase the signal generators' amplitudes equally until just before the EUT begins AGC and ensure that all intermodulation products (if any exist), are below the specified limit of -19 dBm. j) Utilize the trace averaging function of the spectrum analyzer and wait for the trace to stabilize. Place a marker at the highest amplitude intermodulation product. k) Record the maximum intermodulation product amplitude level that is observed. l) Capture the spectrum analyzer trace for inclusion in the test report. m) Repeat steps e) to l) for all uplink and downlink operational bands. Note: If using a single signal generator with dual outputs, ensure that intermodulation products are not the result of the generator. n) Increase the signal generator amplitude in 2 dB steps to 10 dB above the AGC threshold determined in i) to ensure that the EUT maintains compliance with the intermodulation
Test Result:	PASS

6.3.2. Test Instruments

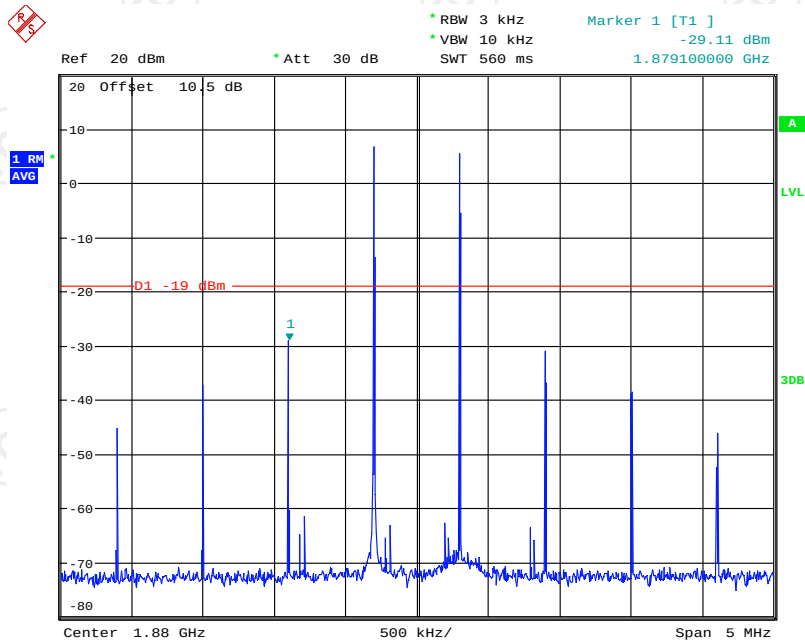
Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Signal Generator	Agilent	E4421B	GB39340839	Sep. 28, 2017	Sep. 27, 2018
Signal Generator	Agilent	N5182A	MY4707028 2	Sep. 28, 2017	Sep. 27, 2018
Spectrum Analyzer	R&S	FSQ40	200061	Sep. 28, 2017	Sep. 27, 2018
RF Combiner	SUNVNDN	SUD-CS 0800	16230009	Sep. 28, 2017	Sep. 27, 2018
Attenuation	AF115A-09- 34	JFW	907763	Sep. 28, 2017	Sep. 27, 2018

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

6.3.3. Test data

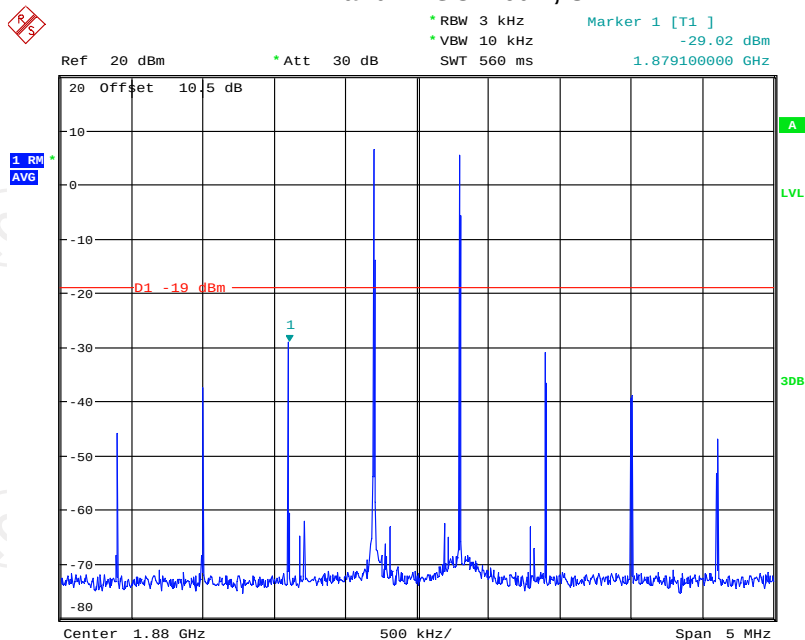
Test Plots

Band2 Pre AGC, UL



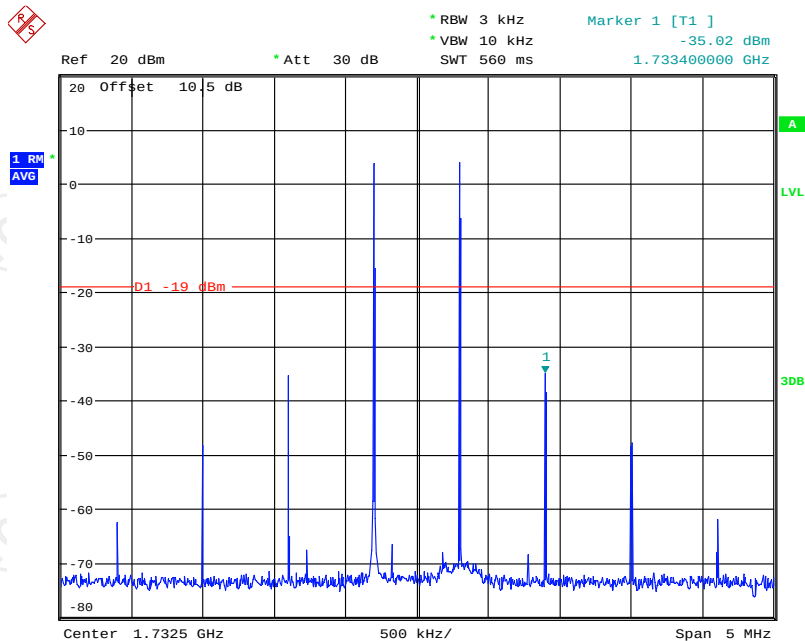
Date: 27.AUG.2018 09:58:56

Band2 AGC+10dB, UL



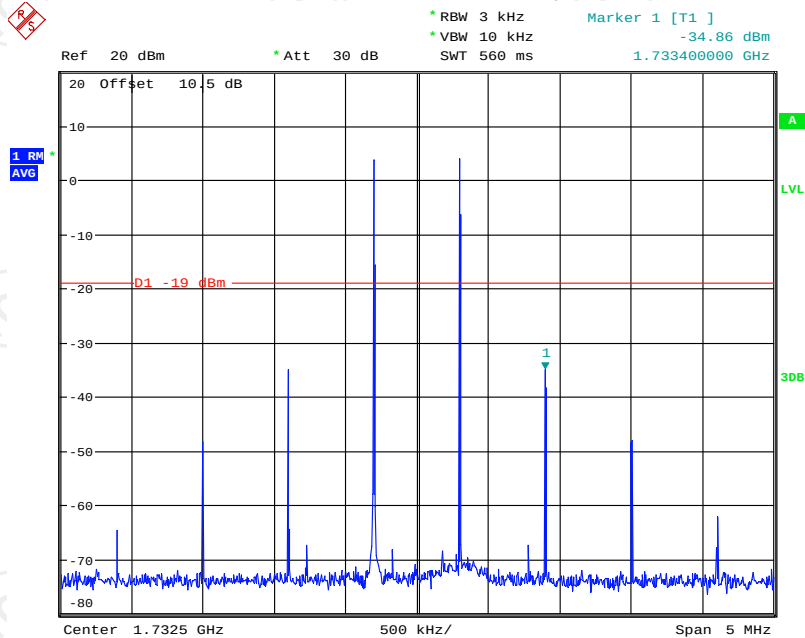
Date: 27.AUG.2018 09:59:50

Band4 Pre AGC, UL



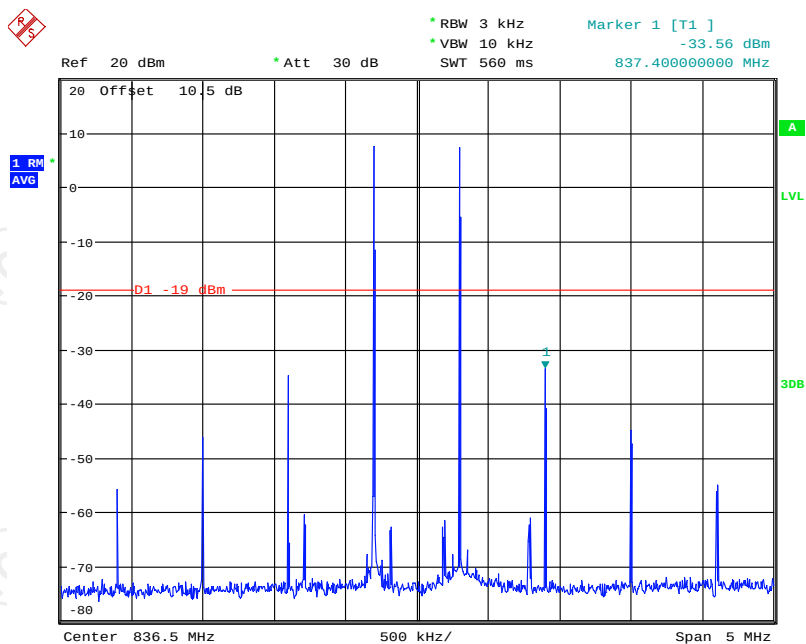
Date: 27.AUG.2018 10:09:21

Band4 AGC+10dB, UL



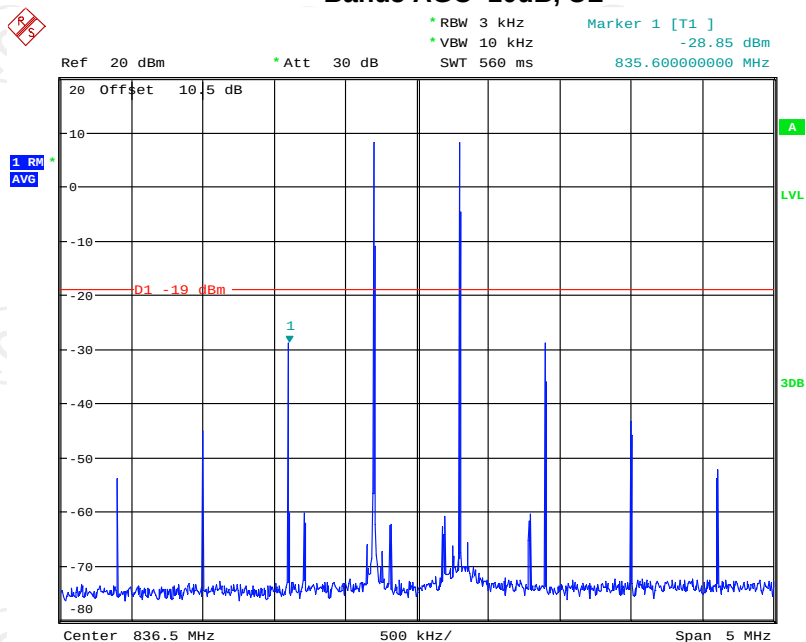
Date: 27.AUG.2018 10:09:49

Band5 Pre AGC, UL



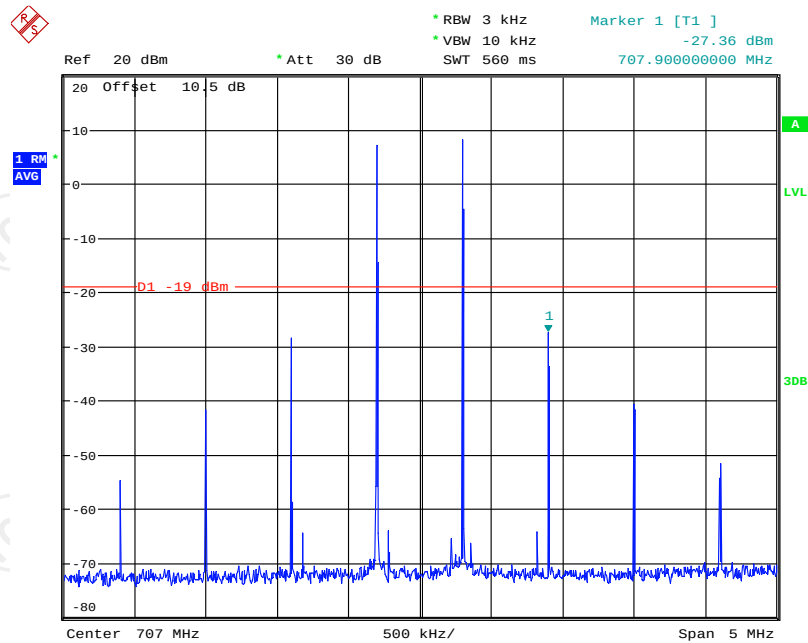
Date: 27.AUG.2018 10:03:14

Band5 AGC+10dB, UL



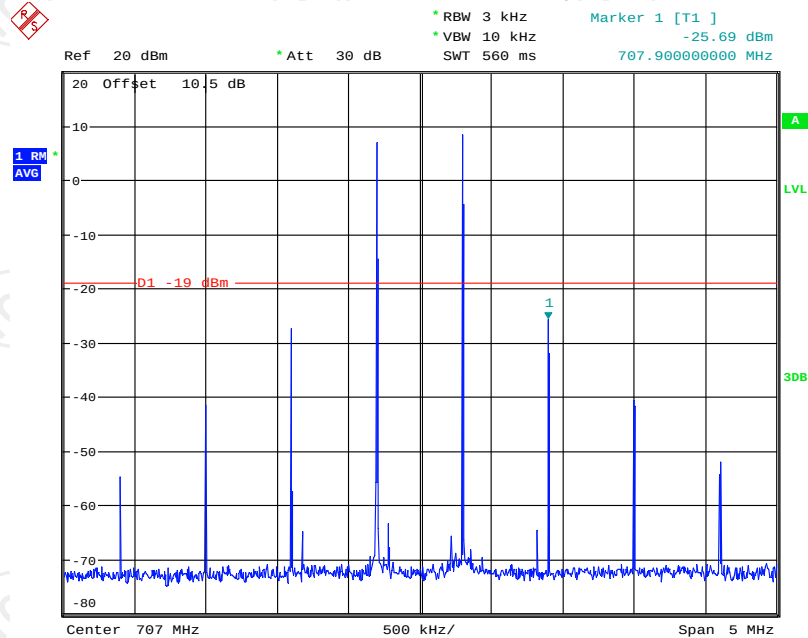
Date: 27.AUG.2018 10:04:31

Band12 Pre AGC, UL



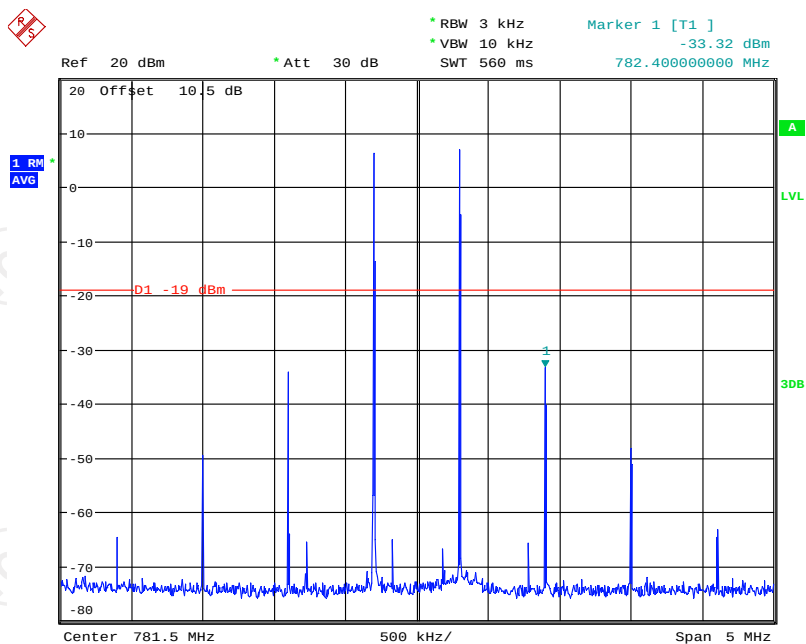
Date: 27.AUG.2018 10:06:30

Band12 AGC+10dB, UL



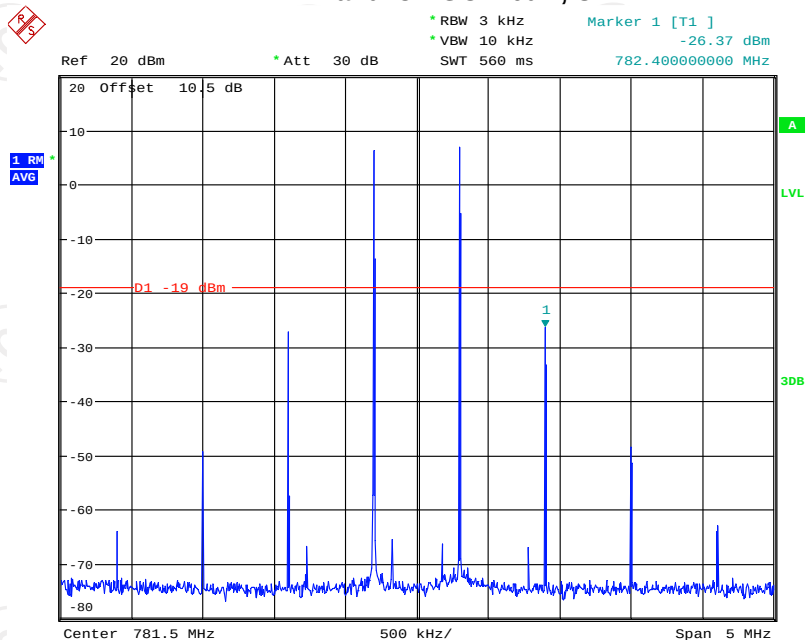
Date: 27.AUG.2018 10:07:17

Band13 Pre AGC, UL



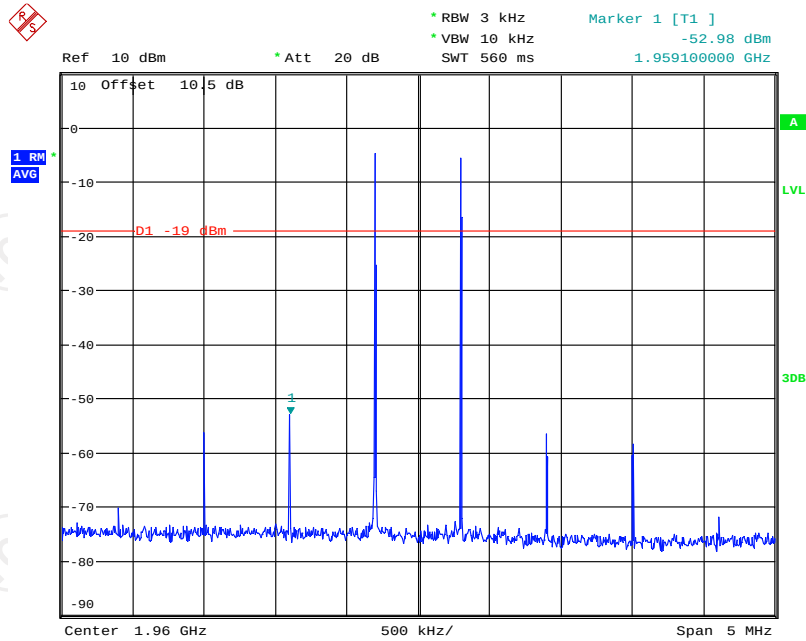
Date: 27.AUG.2018 10:13:23

Band13 AGC+10dB, UL



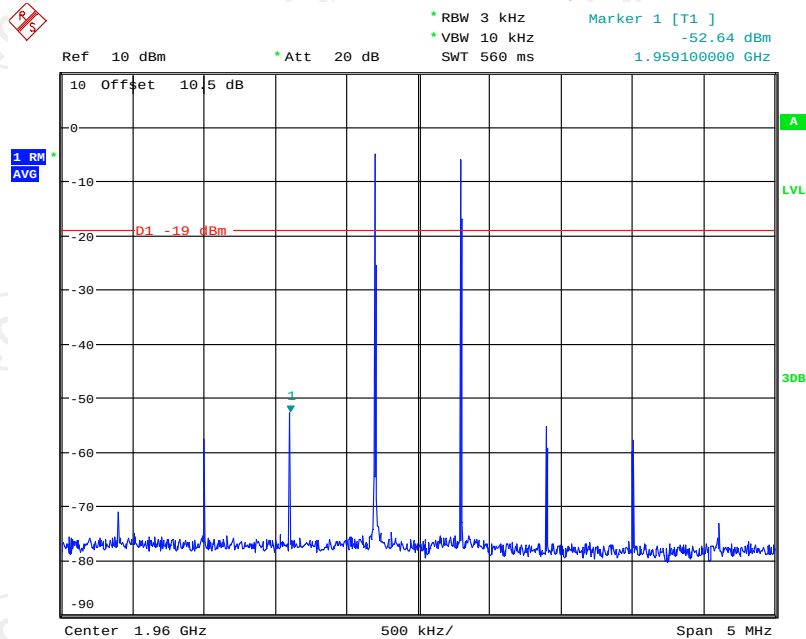
Date: 27.AUG.2018 10:14:03

Band2 Pre AGC, DL



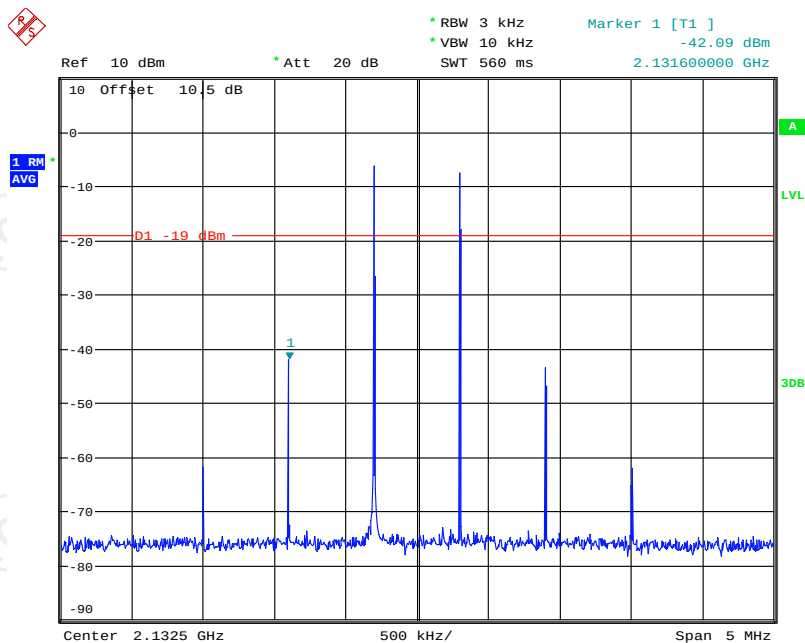
Date: 27.AUG.2018 10:31:12

Band2 AGC+10dB, DL



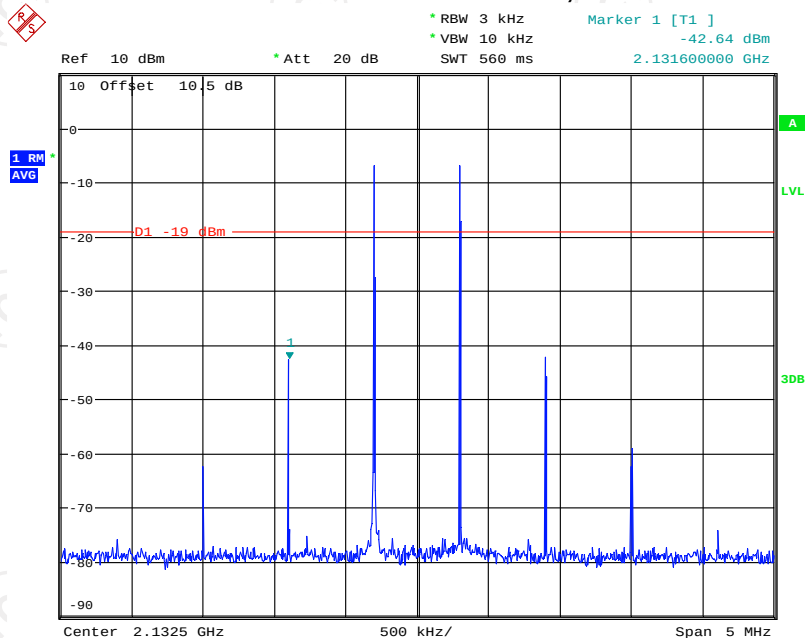
Date: 27.AUG.2018 10:31:47

Band4 Pre AGC, DL



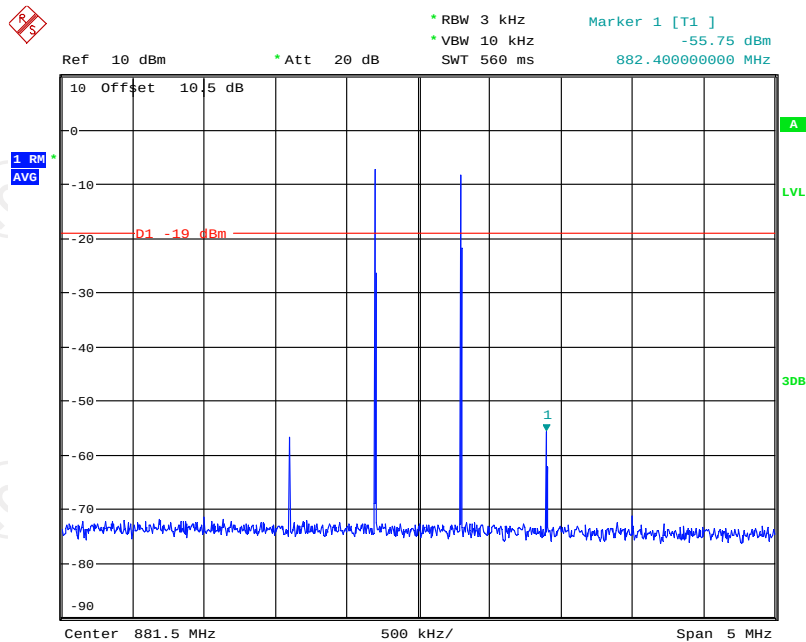
Date: 27.AUG.2018 10:25:34

Band4 AGC+10dB, DL



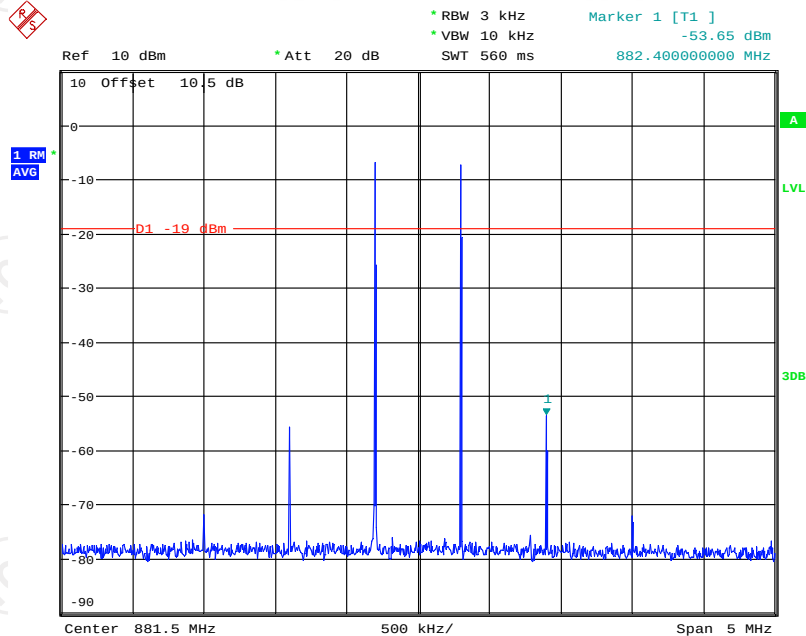
Date: 27.AUG.2018 10:26:09

Band5 Pre AGC, DL



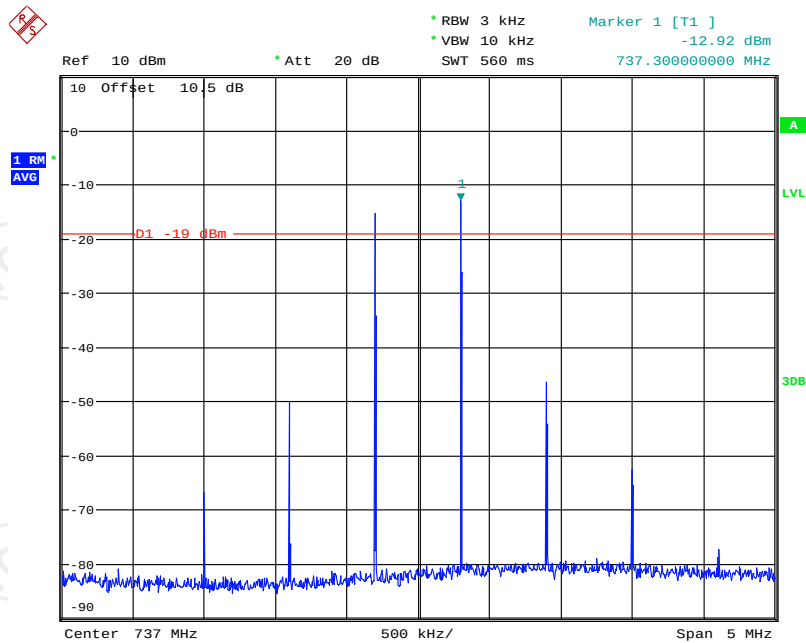
Date: 27.AUG.2018 10:34:52

Band5 AGC+10dB, DL



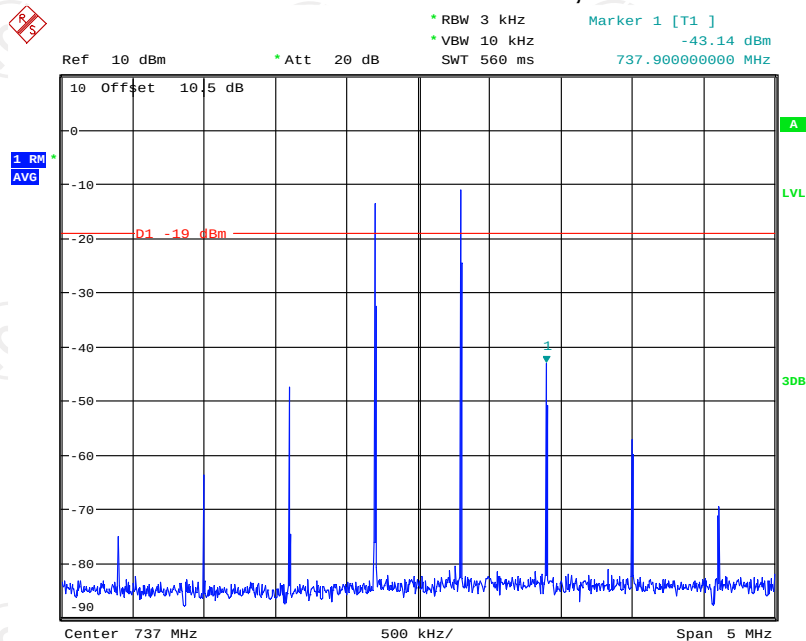
Date: 27.AUG.2018 10:35:28

Band12 Pre AGC, DL



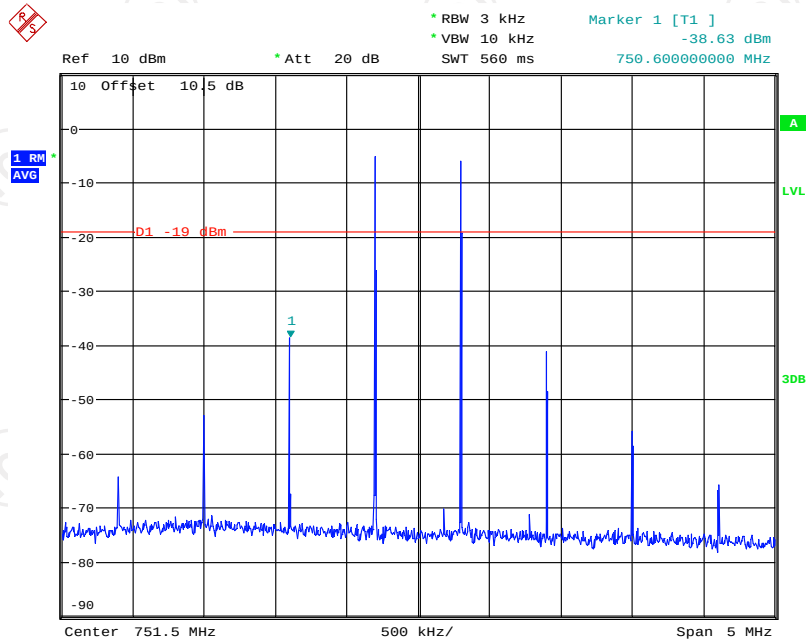
Date: 27.AUG.2018 10:37:37

Band12 AGC+10dB, DL



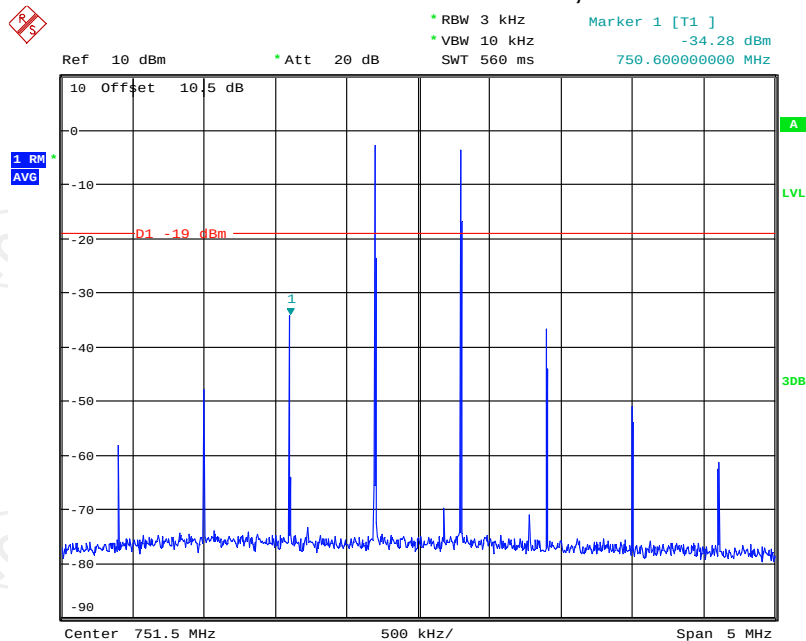
Date: 27.AUG.2018 10:38:05

Band13 Pre AGC, DL



Date: 27.AUG.2018 10:21:44

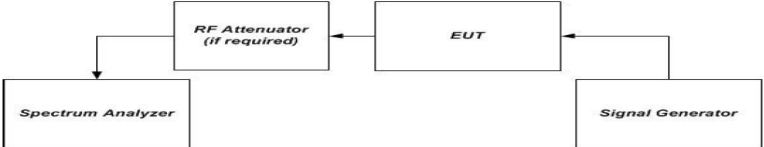
Band13 AGC+10dB, DL



Date: 27.AUG.2018 10:22:27

6.4. Out of Band Emission

6.4.1. Test Specification

Test Requirement:	FCC Part20 Section 20.21(e)(8)(i)(E)
Test Method:	KDB935210 D03 Signal Booster Measurement v04r02
Limit:	-19dBm
Test Setup:	 <pre> graph LR SG[Signal Generator] --> EUT[EUT] EUT --> RA[RF Attenuator (if required)] RA --> SA[Spectrum Analyzer] </pre>
Test Procedure:	a) Connect the EUT to the test equipment as shown in Set-Up. Begin with the uplink output connected to the spectrum analyzer. b) Configure the signal generator for the appropriate operation for all uplink and downlink bands: i) GSM: 0.2 MHz from upper and lower band edge ii) LTE (5 MHz): 2.5 MHz from upper and lower band edge iii) CDMA: 1.25 MHz from upper and lower band edge, except for cellular as follows (only the upper and lower frequencies need to be tested): 824.88 MHz, 845.73 MHz, 836.52 MHz, 848.10 MHz, 869.88 MHz, 890.73 MHz, 881.52 MHz, 893.10 MHz. Note 1: Alternative test modulation types: • CDMA (alternative 1.25 MHz AWGN) • LTE 5 MHz (alternative W-CDMA or 4.1 MHz AWGN) Note 2: For LTE, the signal generator should utilize the uplink and downlink signal types for these modulations in uplink and downlink tests, respectively. LTE shall use 5 MHz signal 25 resource blocks transmitting. Note 3: AWGN is the measured 99% occupied bandwidth. c) Set the signal generator amplitude to the maximum power level prior to AGC similar to the procedures in method of Maximum power d) to f) of power measurement procedure for appropriate modulations. d) Set RBW = measurement bandwidth specified in the applicable rule section for the supported frequency band. e) Set VBW = 3 x RBW. f) Select the RMS (power averaging) detector. g) Sweep time = auto-couple. h) Set the analyzer start frequency to the upper band/block edge frequency and the stop frequency to the upper band/block edge frequency plus 300 kHz (when operational frequency is < 1 GHz) or 3 MHz (when operational frequency is ≥ 1 GHz). i) Trace average at least 100 traces in power averaging (i.e., RMS) mode. j) Use peak marker function to find the maximum power level. k) Capture the spectrum analyzer trace of the power level for inclusion in the test report. l) Increase the signal generator amplitude in 2 dB steps until the maximum input level indicated in 5.4 is reached. Ensure that the EUT maintains compliance with the OOB limits. m) Reset the analyzer start frequency to the lower band/block edge frequency minus 100 kHz or 1 MHz, as per applicable rule part, and the stop frequency to the lower band/block edge frequency and repeat steps j) to l).

	n) Repeat steps b) through m) for each uplink and downlink operational band.
Test Result:	PASS

6.4.2. Test Instruments

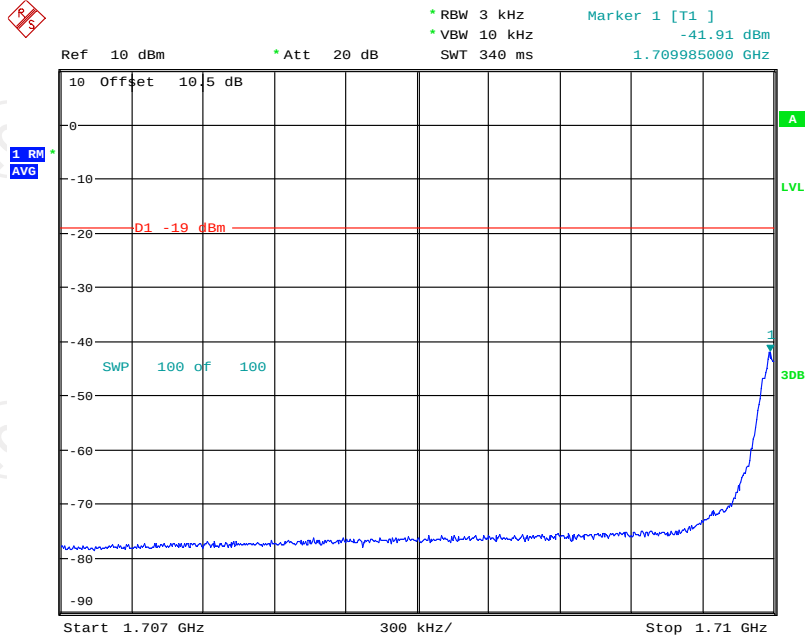
Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Signal Generator	Agilent	N5182A	MY47070282	Sep. 28, 2017	Sep. 27, 2018
Spectrum Analyzer	R&S	FSQ40	200061	Sep. 28, 2017	Sep. 27, 2018
Attenuation	AF115A-09-34	JFW	907763	Sep. 28, 2017	Sep. 27, 2018

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

6.4.3. Test data

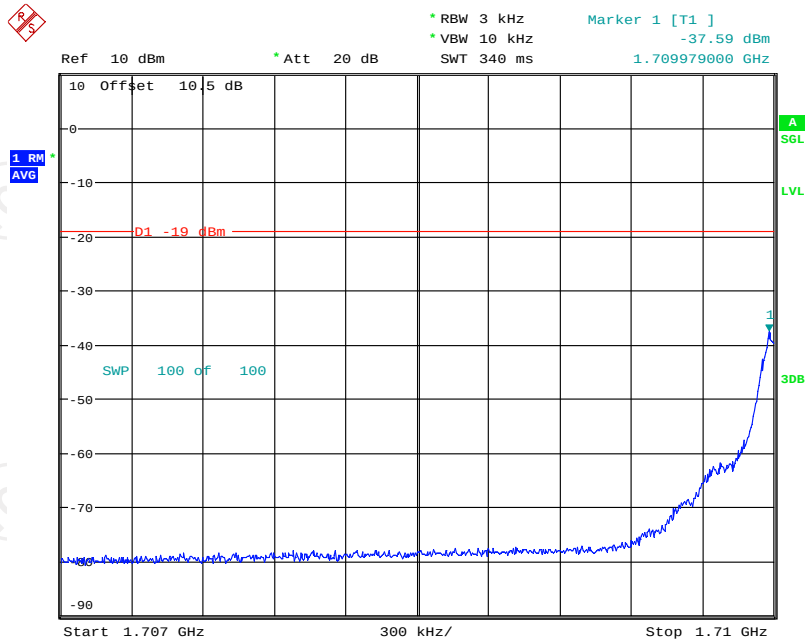
Test Plots

Band2 GSM UL Left Side Pre AGC



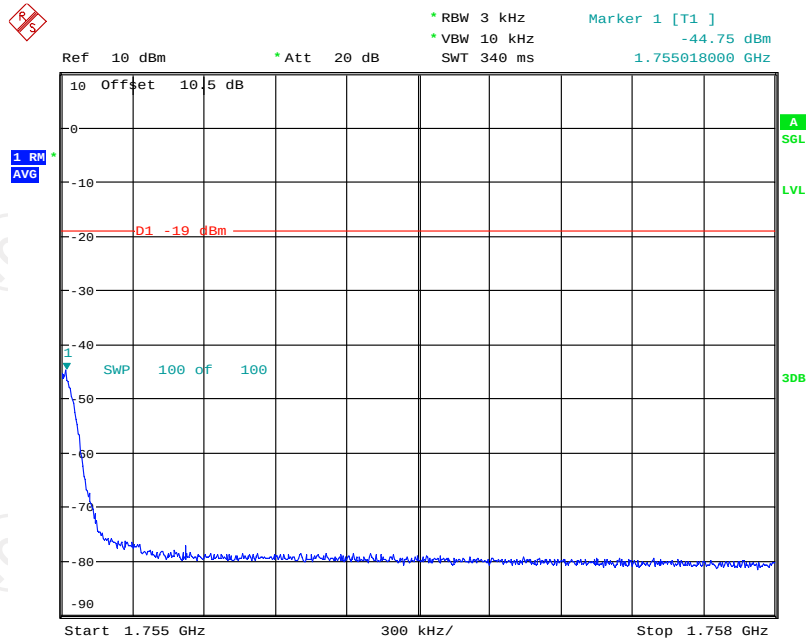
Date: 27.AUG.2018 11:31:04

Band2 GSM UL Left Side 10dB Above AGC



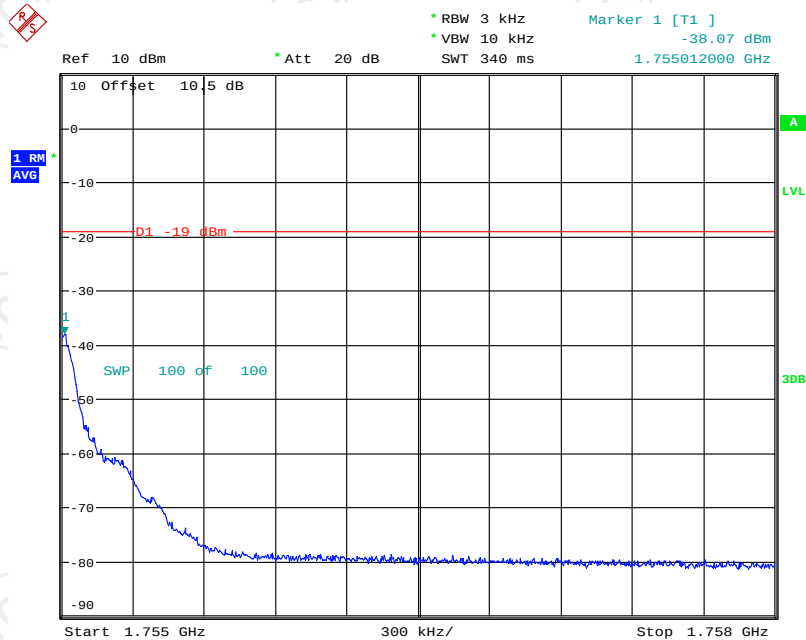
Date: 27.AUG.2018 12:01:38

Band2 GSM UL Right Side Pre AGC



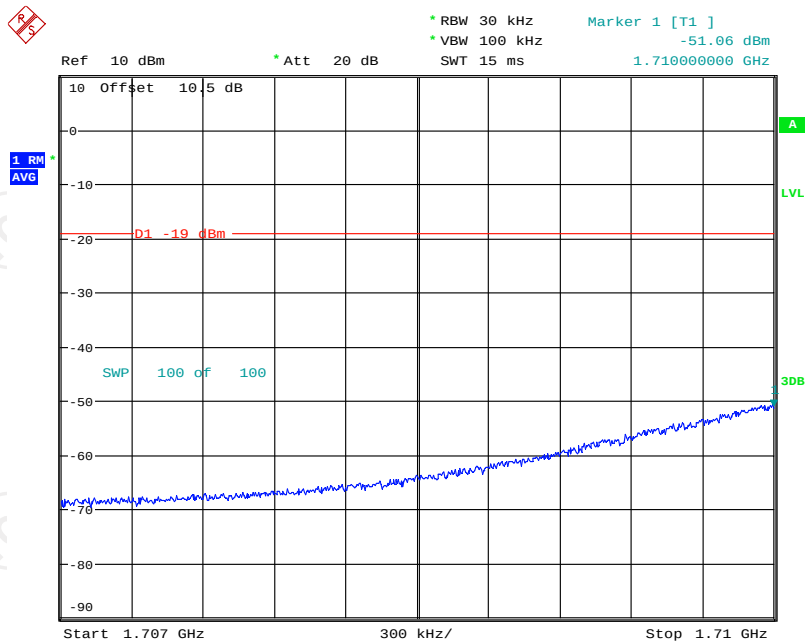
Date: 27.AUG.2018 11:58:33

Band2 GSM UL Right Side 10dB Above AGC



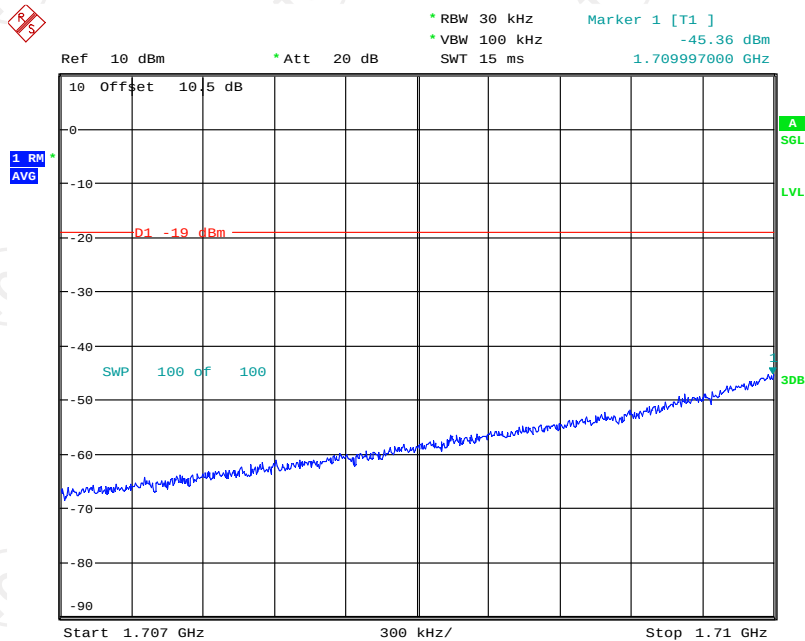
Date: 27.AUG.2018 11:59:29

Band2 CDMA UL Left Side Pre AGC



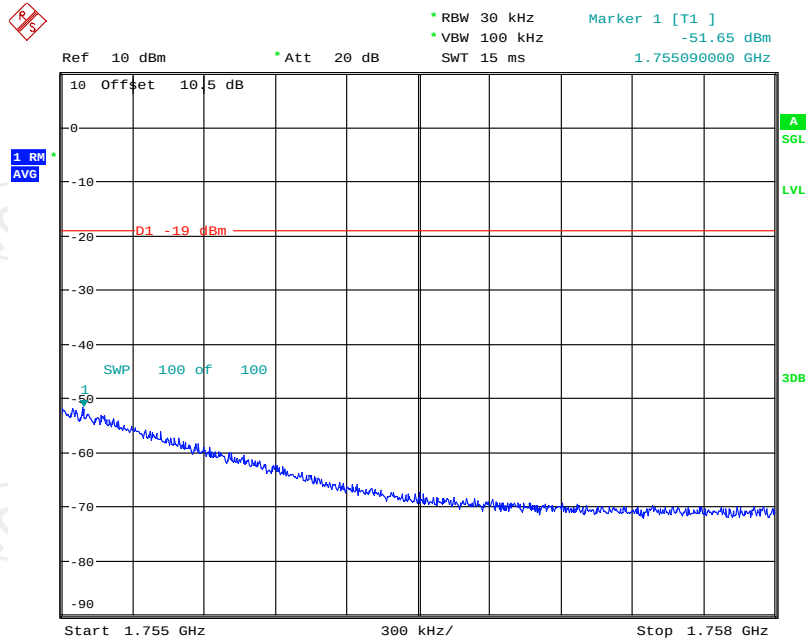
Date: 27.AUG.2018 11:38:26

Band2 CDMA UL Left Side 10dB Above AGC



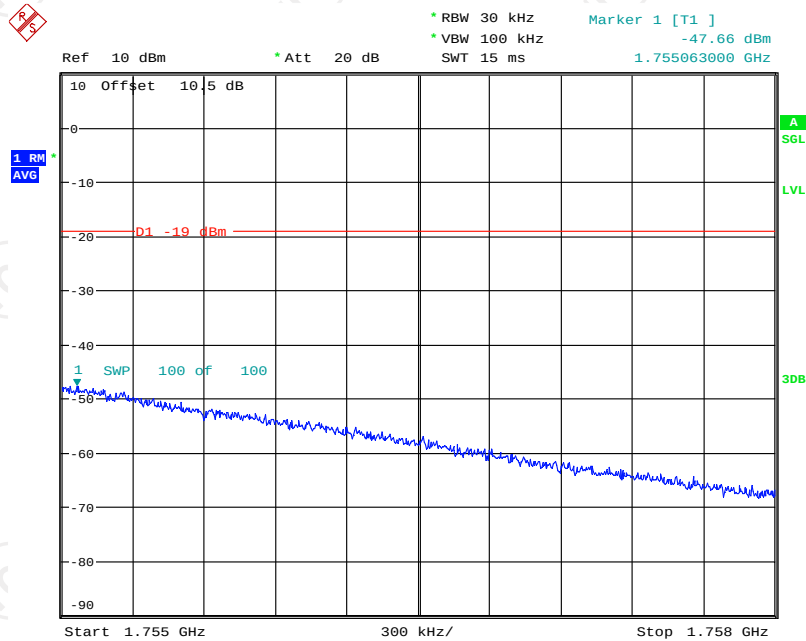
Date: 27.AUG.2018 12:02:43

Band2 CDMA UL Right Side Pre AGC



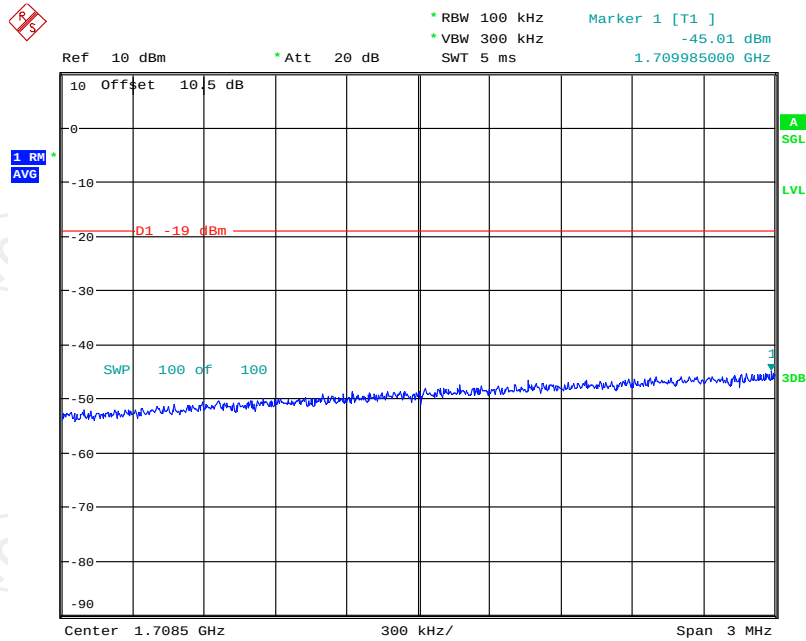
Date: 27.AUG.2018 11:56:46

Band2 CDMA UL Right Side 10dB Above AGC



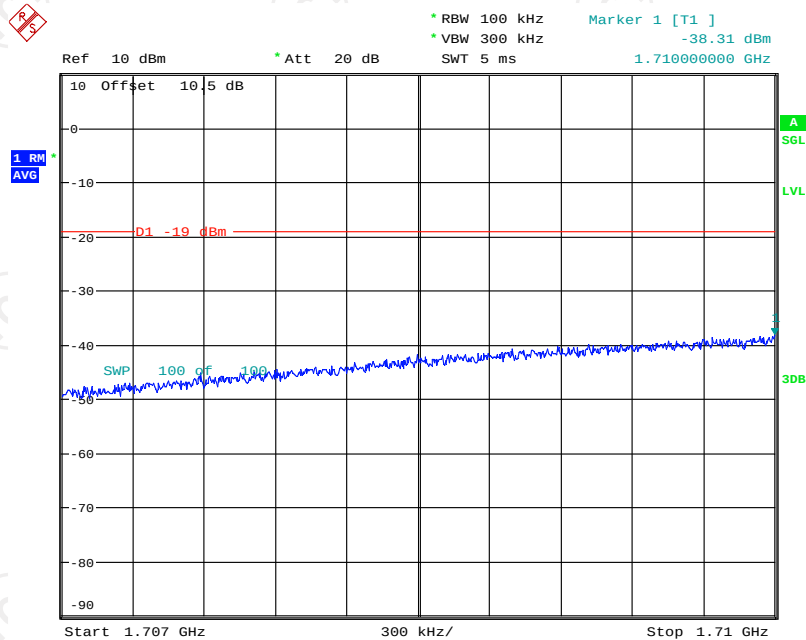
Date: 27.AUG.2018 11:57:04

Band2 LTE UL Left Side Pre AGC



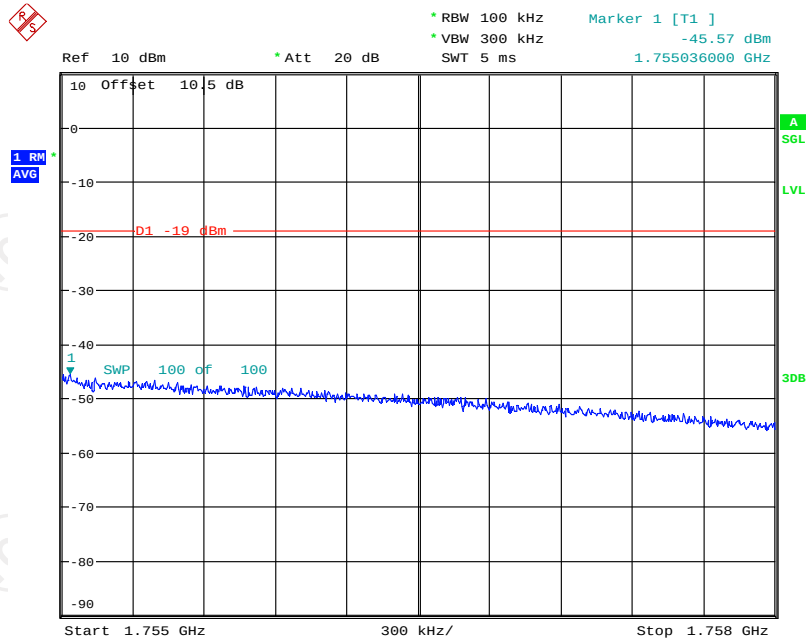
Date: 27.AUG.2018 11:46:27

Band2 LTE UL Left Side 10dB Above AGC



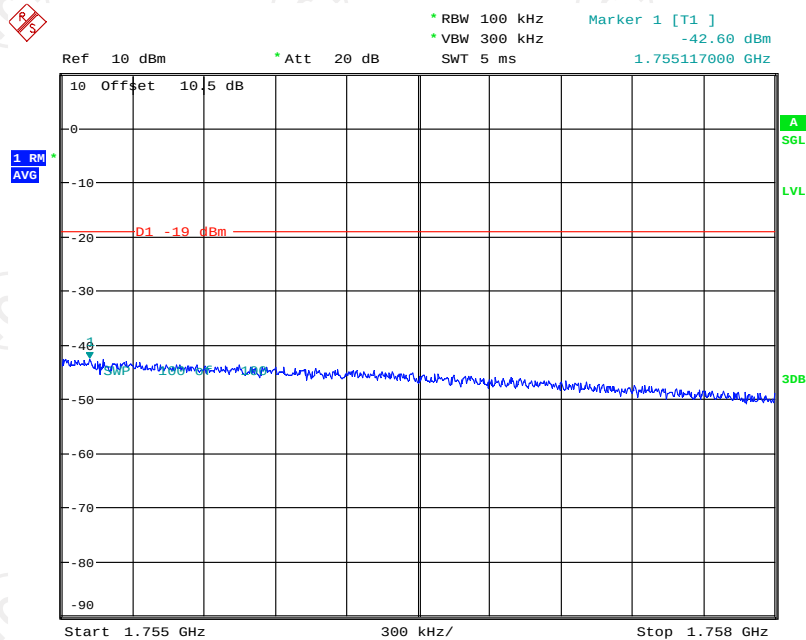
Date: 27.AUG.2018 12:03:42

Band2 LTE UL Right Side Pre AGC



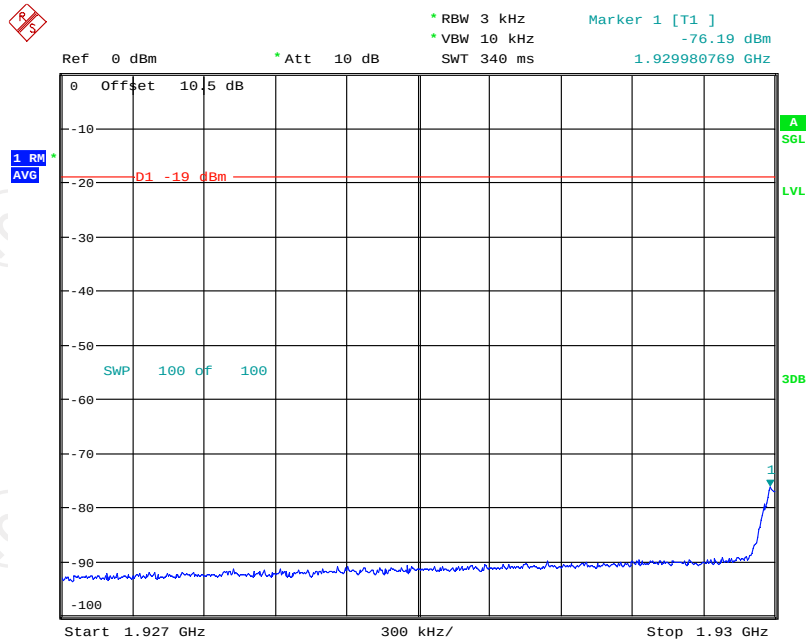
Date: 27.AUG.2018 11:49:11

Band2 LTE UL Right Side 10dB Above AGC



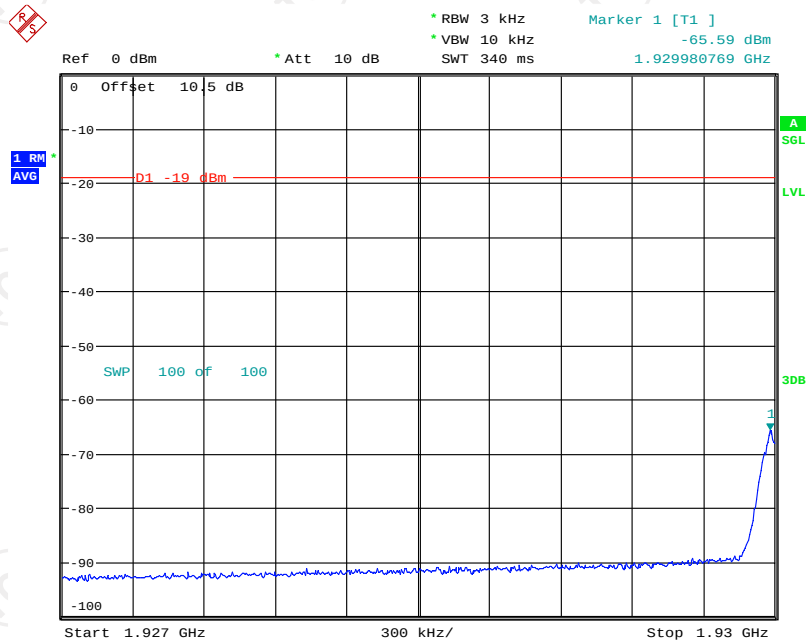
Date: 27.AUG.2018 11:53:58

Band2 GSM DL Left Side Pre AGC



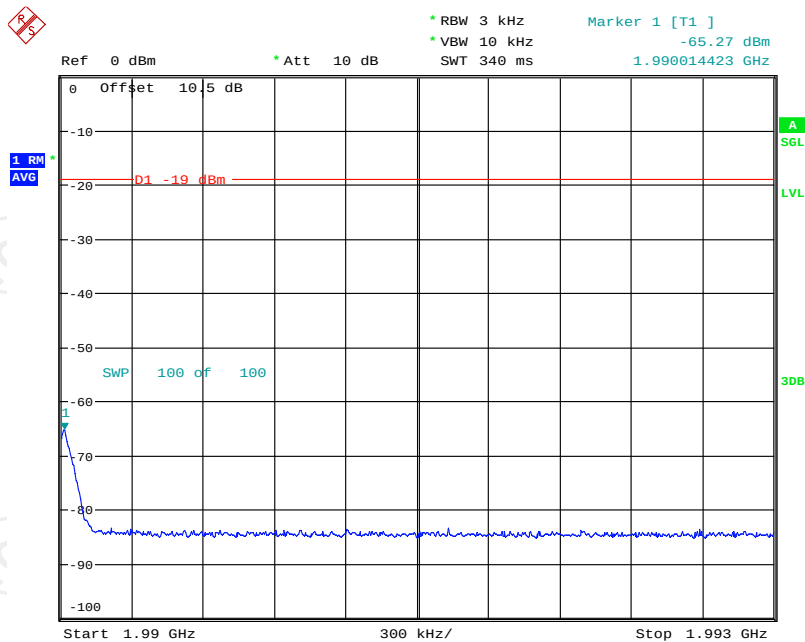
Date: 28.AUG.2018 13:57:58

Band2 GSM DL Left Side 10dB Above AGC



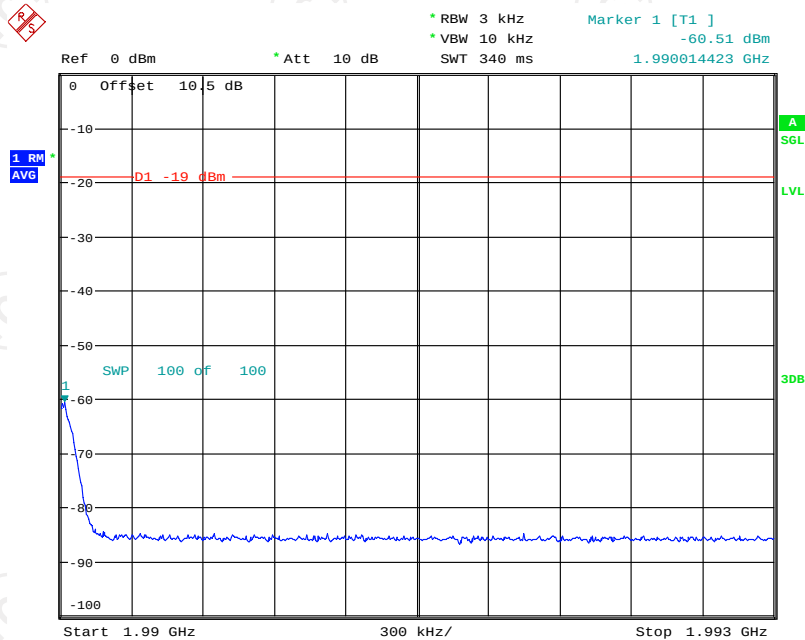
Date: 28.AUG.2018 13:59:18

Band2 GSM DL Right Side Pre AGC



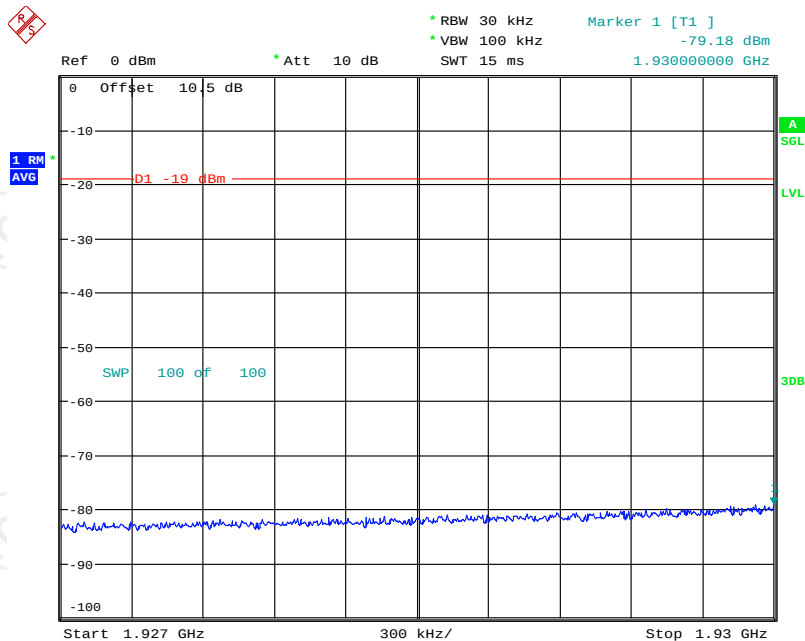
Date: 28.AUG.2018 14:14:27

Band2 GSM DL Right Side 10dB Above AGC



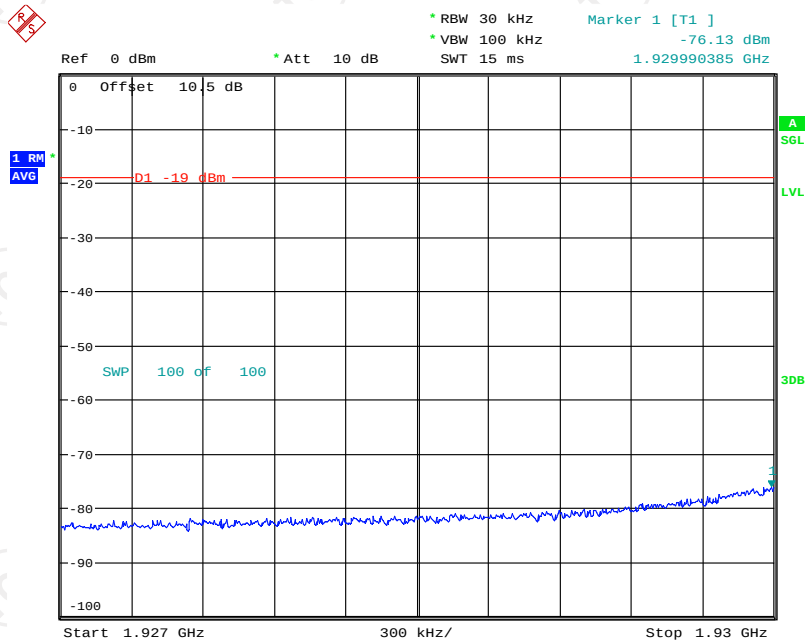
Date: 28.AUG.2018 14:16:00

Band2 CDMA DL Left Side Pre AGC



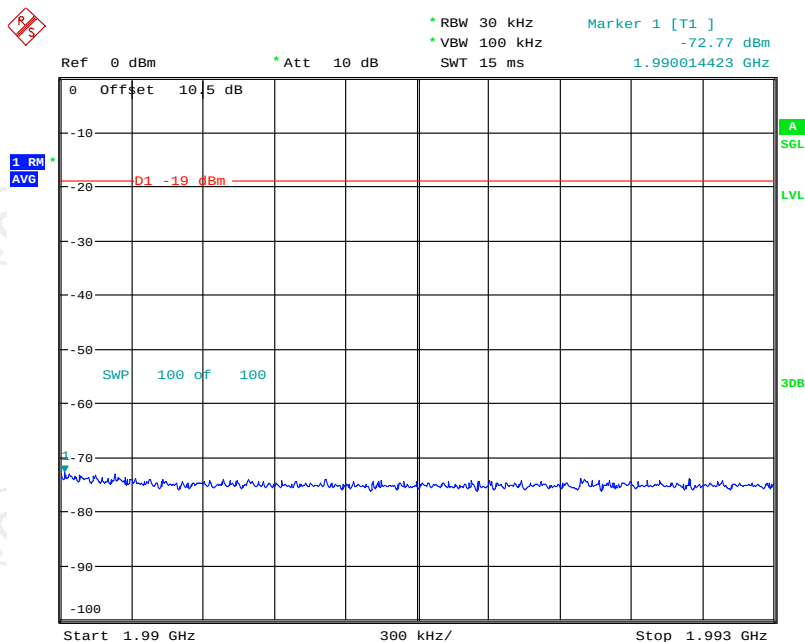
Date: 28.AUG.2018 14:03:35

Band2 CDMA DL Left Side 10dB Above AGC



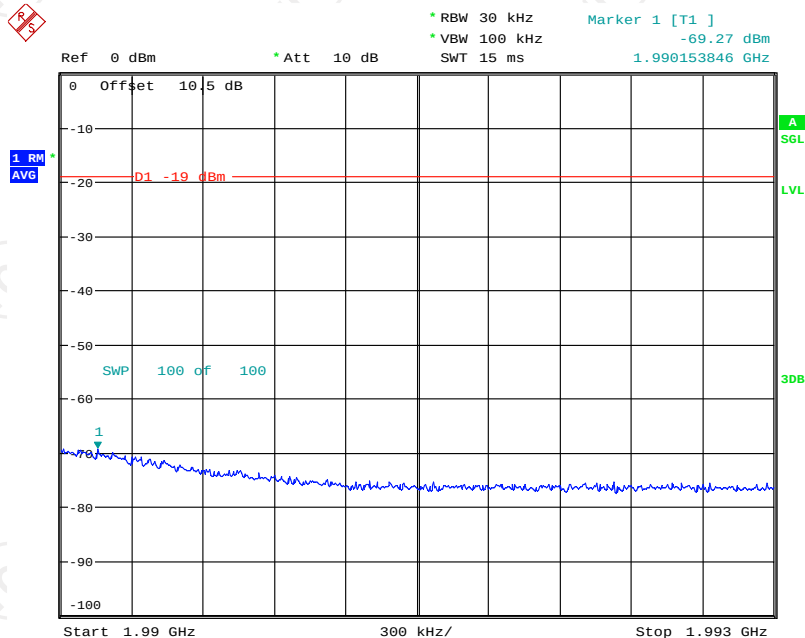
Date: 28.AUG.2018 14:04:04

Band2 CDMA DL Right Side Pre AGC



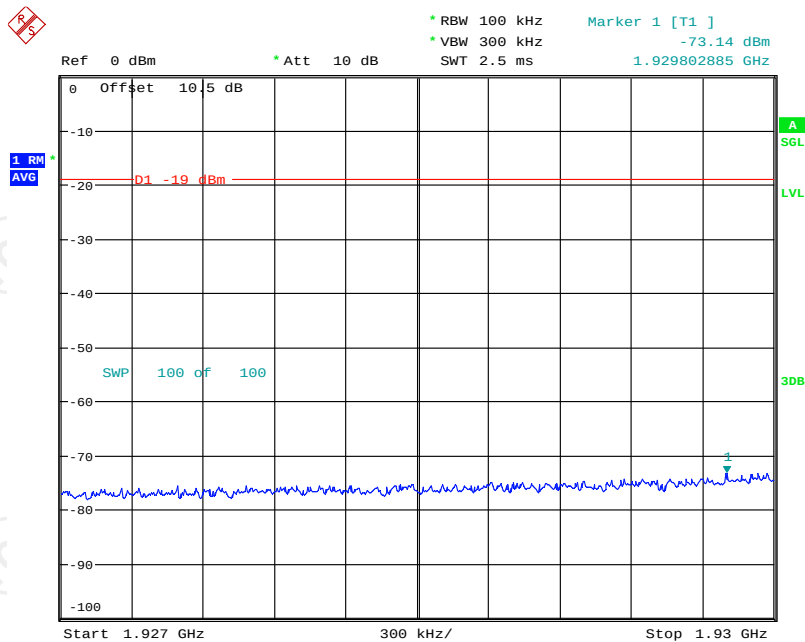
Date: 28.AUG.2018 14:10:54

Band2 CDMA DL Right Side 10dB Above AGC



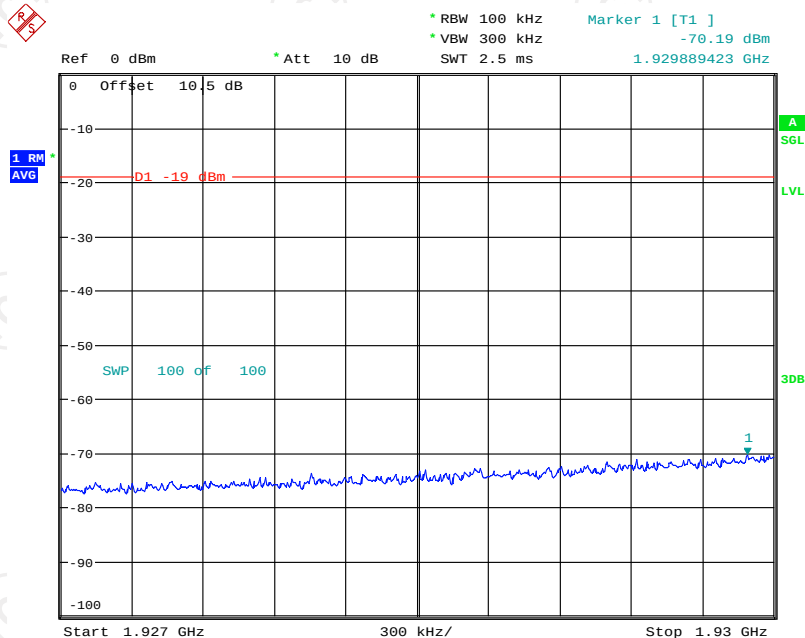
Date: 28.AUG.2018 14:11:16

Band2 LTE DL Left Side Pre AGC



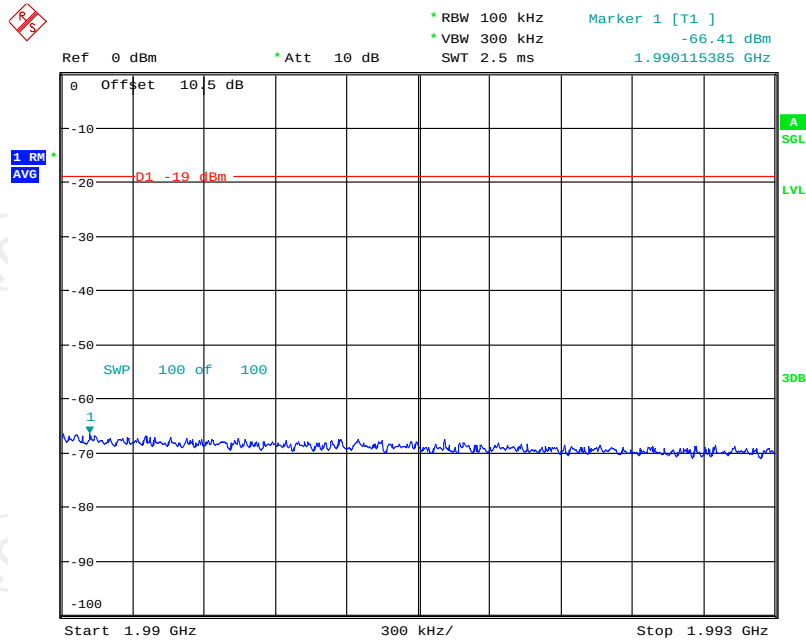
Date: 28.AUG.2018 14:05:47

Band2 LTE DL Left Side 10dB Above AGC



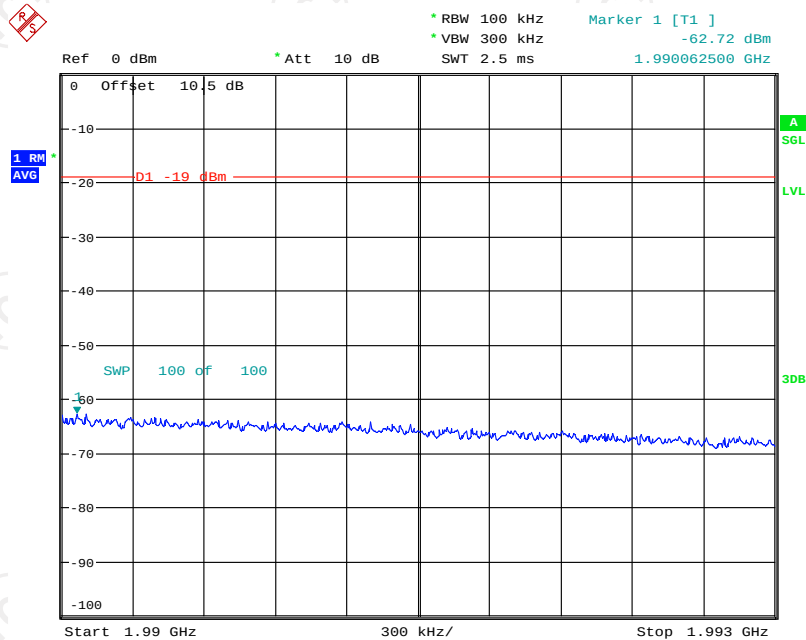
Date: 28.AUG.2018 14:06:16

Band2 LTE DL Right Side Pre AGC



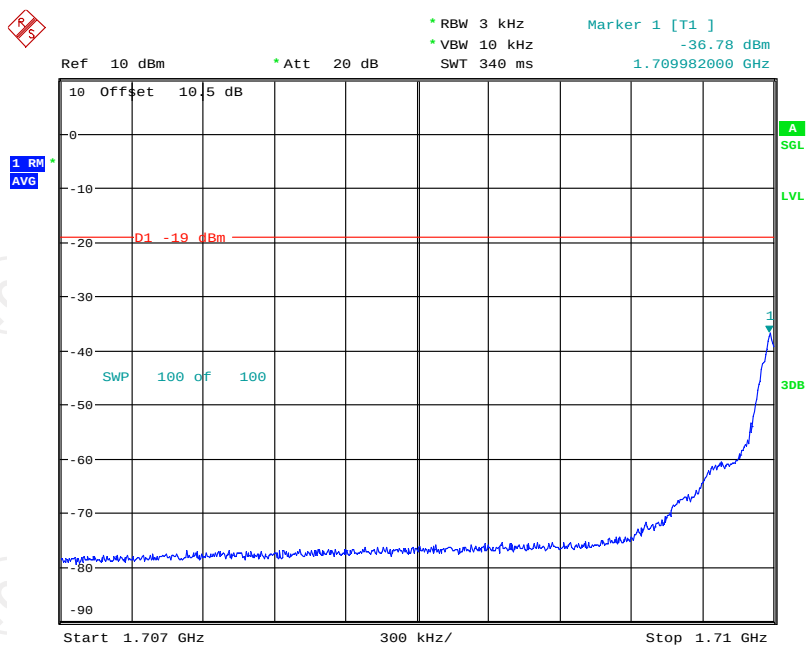
Date: 28.AUG.2018 14:08:27

Band2 LTE DL Right Side 10dB Above AGC



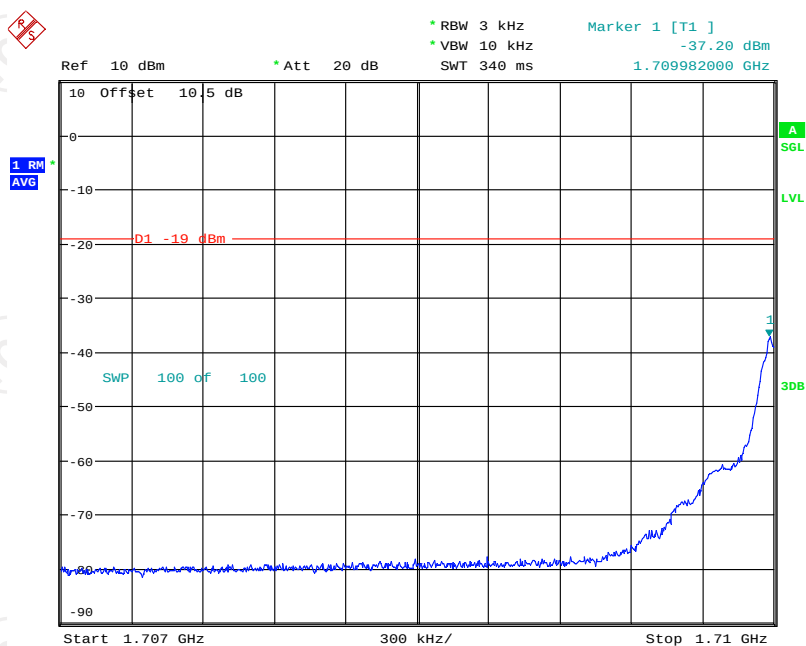
Date: 28.AUG.2018 14:08:48

Band4 GSM UL Left Side Pre AGC



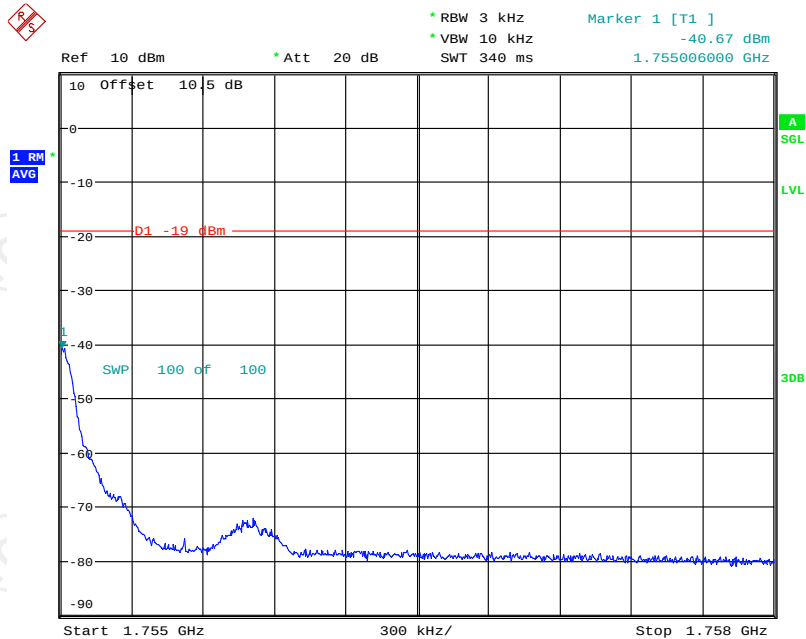
Date: 28.AUG.2018 09:59:59

Band4 GSM UL Left Side 10dB Above AGC



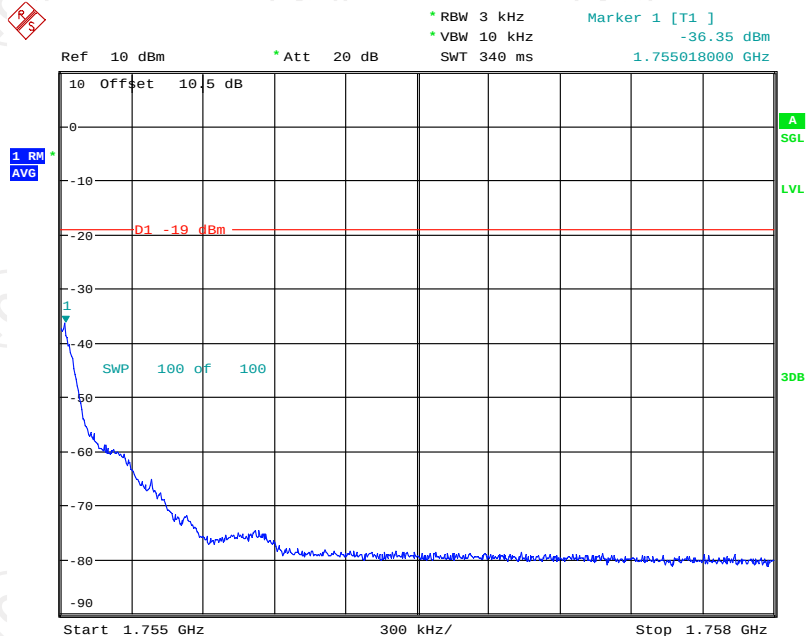
Date: 28.AUG.2018 10:01:42

Band4 GSM UL Right Side Pre AGC



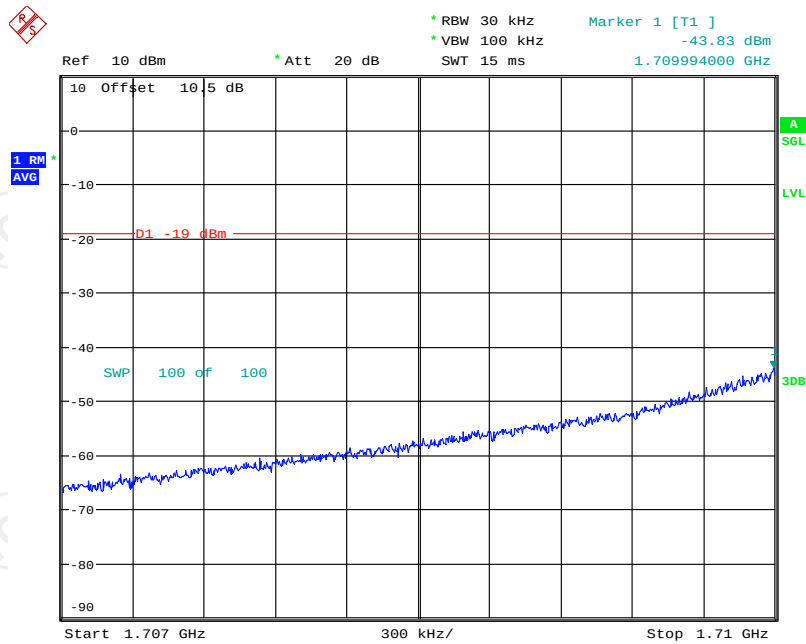
Date: 28.AUG.2018 10:22:49

Band4 GSM UL Right Side 10dB Above AGC



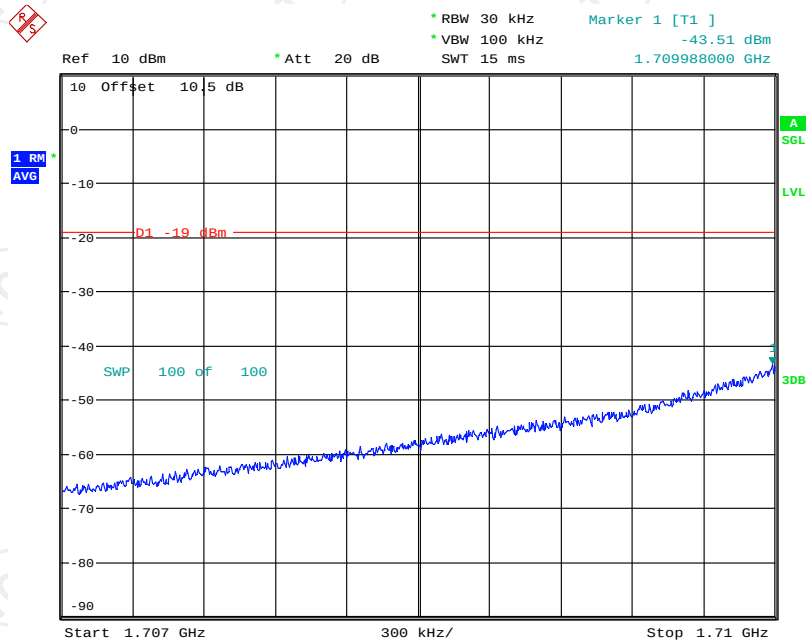
Date: 28.AUG.2018 10:23:52

Band4 CDMA UL Left Side Pre AGC



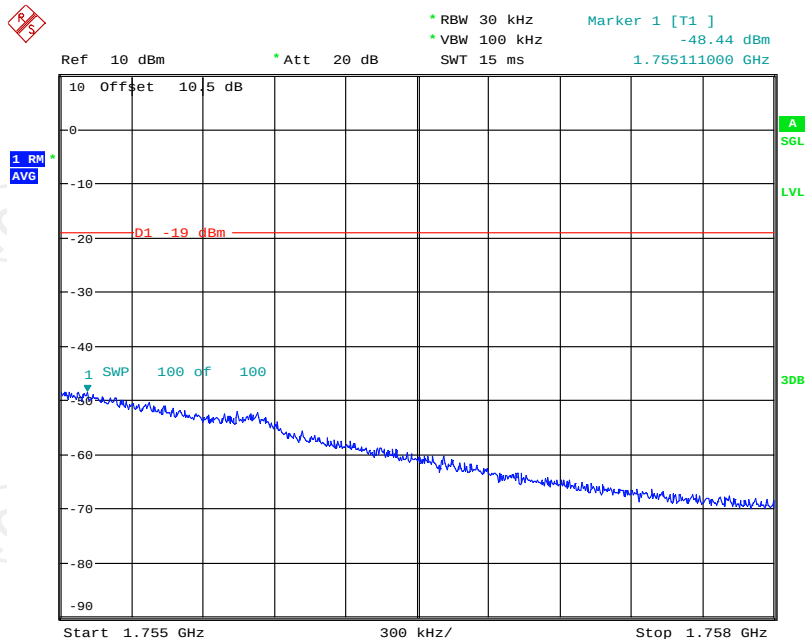
Date: 28.AUG.2018 10:03:00

Band4 CDMA UL Left Side 10dB Above AGC



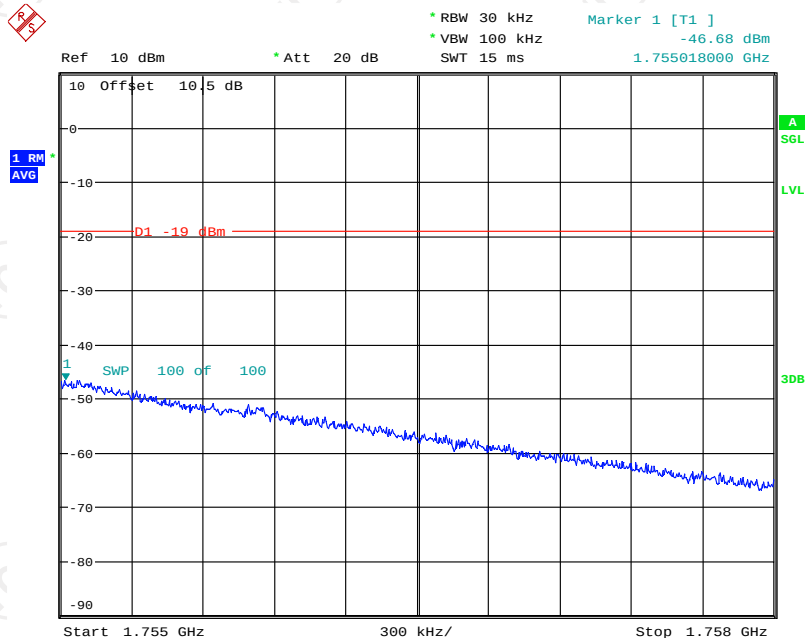
Date: 28.AUG.2018 10:03:22

Band4 CDMA UL Right Side Pre AGC



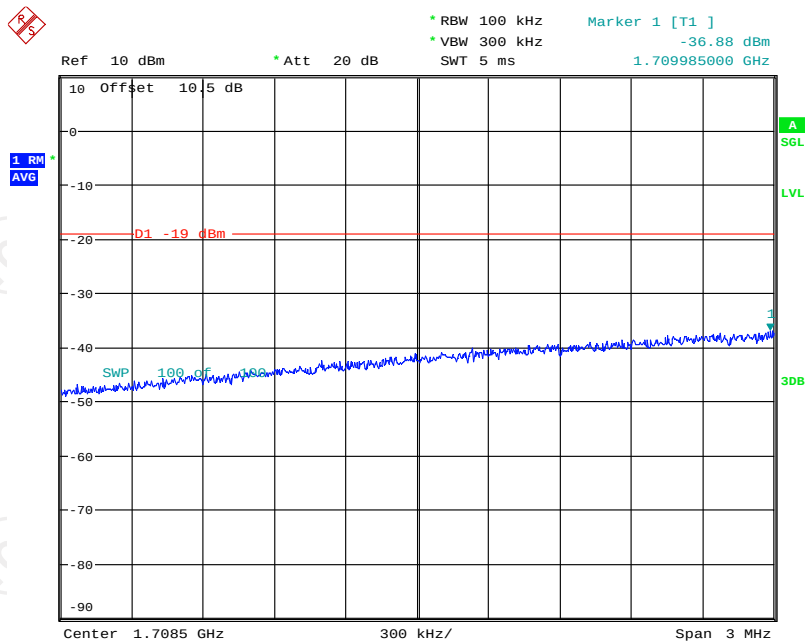
Date: 28.AUG.2018 10:17:05

Band4 CDMA UL Right Side 10dB Above AGC



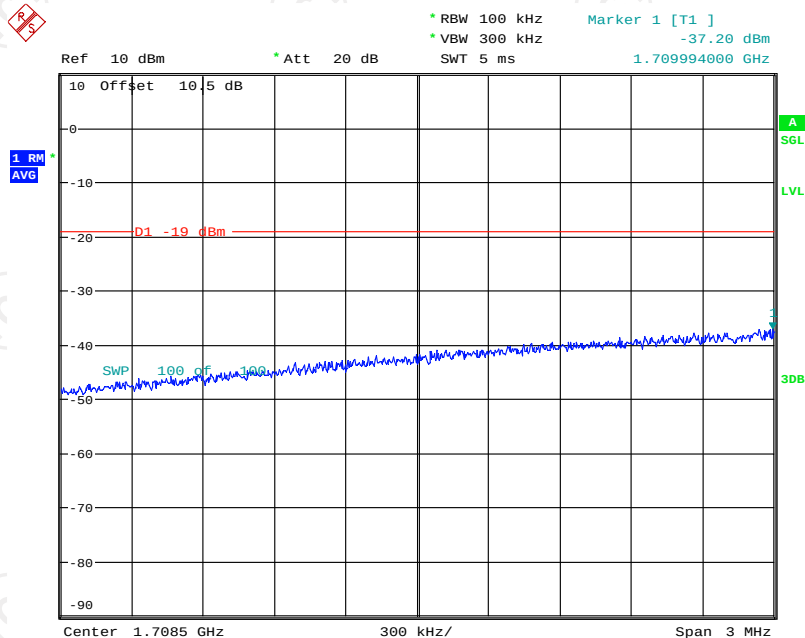
Date: 28.AUG.2018 10:20:13

Band4 LTE UL Left Side Pre AGC



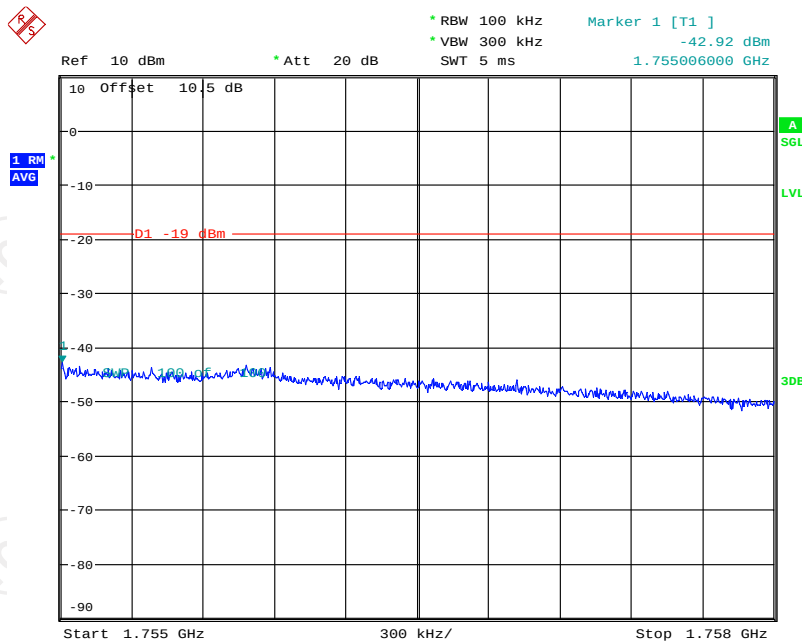
Date: 28.AUG.2018 10:06:02

Band2 LTE UL Left Side 10dB Above AGC



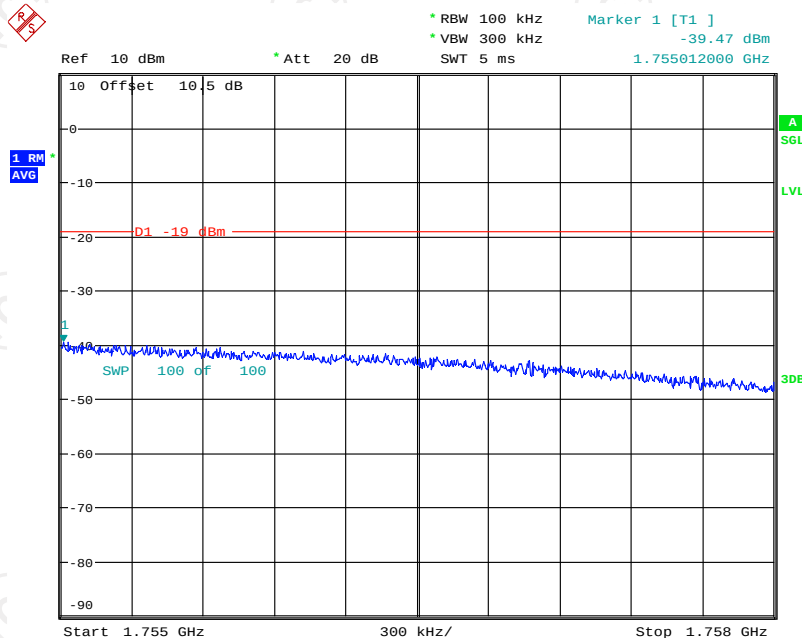
Date: 28.AUG.2018 10:07:54

Band4 LTE UL Right Side Pre AGC



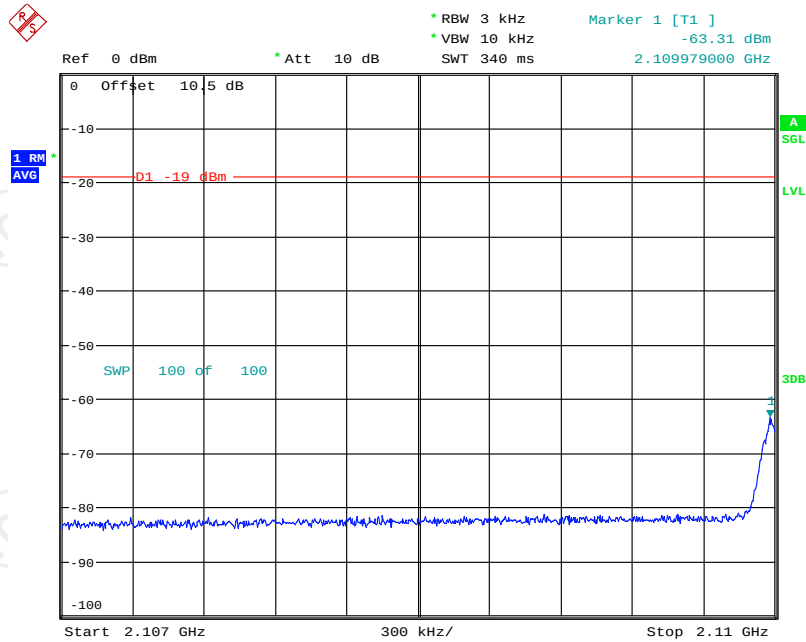
Date: 28.AUG.2018 10:15:41

Band4 LTE UL Right Side 10dB Above AGC



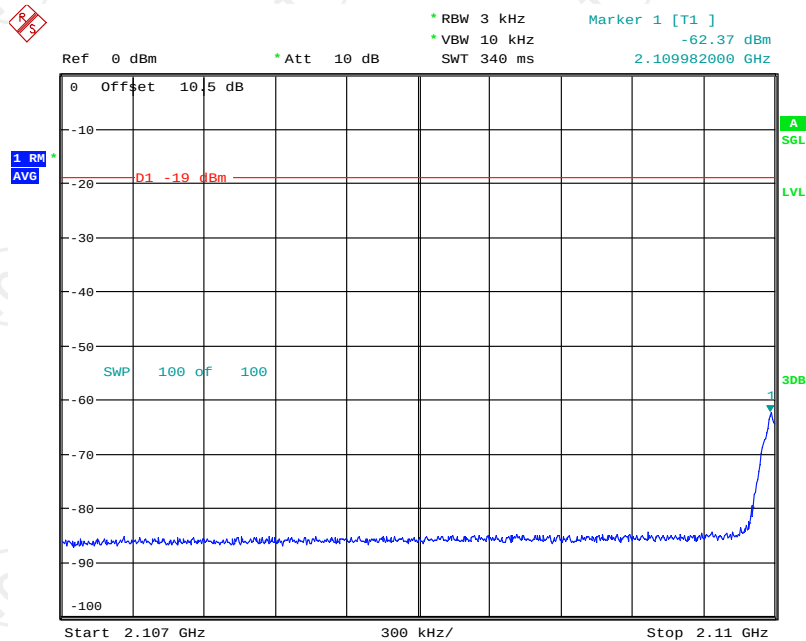
Date: 28.AUG.2018 10:16:01

Band4 GSM DL Left Side Pre AGC



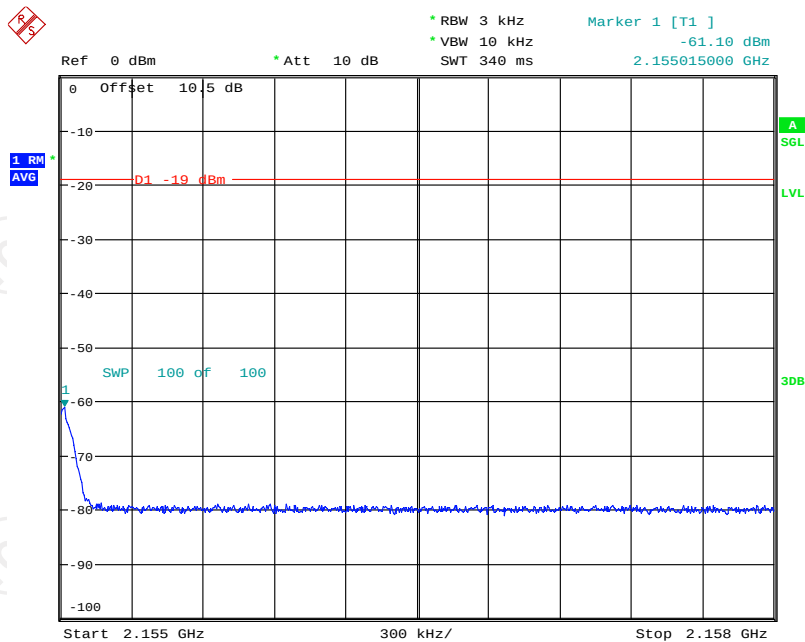
Date: 28.AUG.2018 10:41:35

Band4 GSM DL Left Side 10dB Above AGC



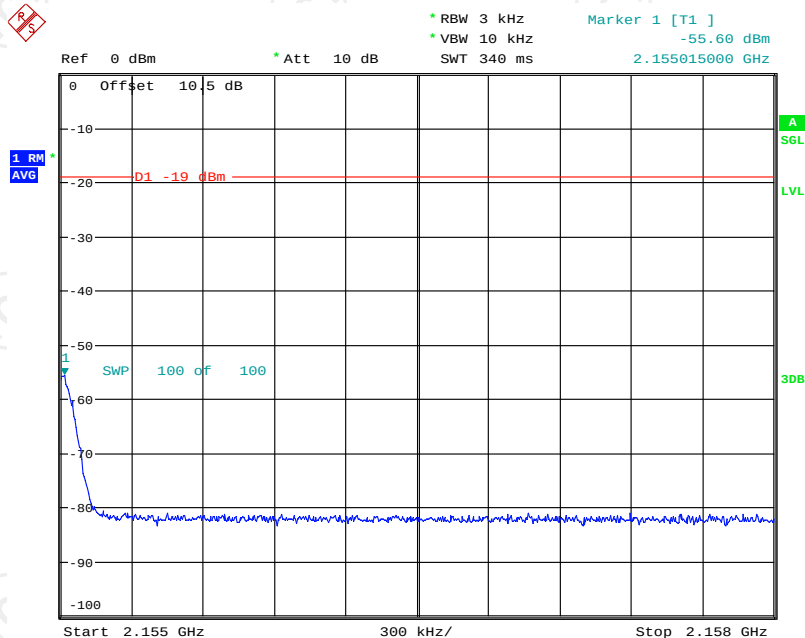
Date: 28.AUG.2018 10:42:48

Band4 GSM DL Right Side Pre AGC



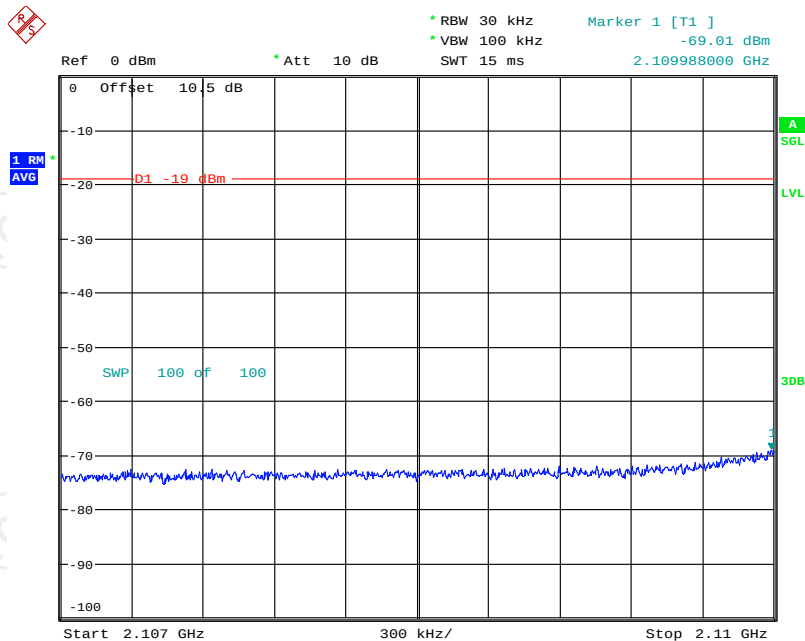
Date: 28.AUG.2018 11:30:14

Band4 GSM DL Right Side 10dB Above AGC



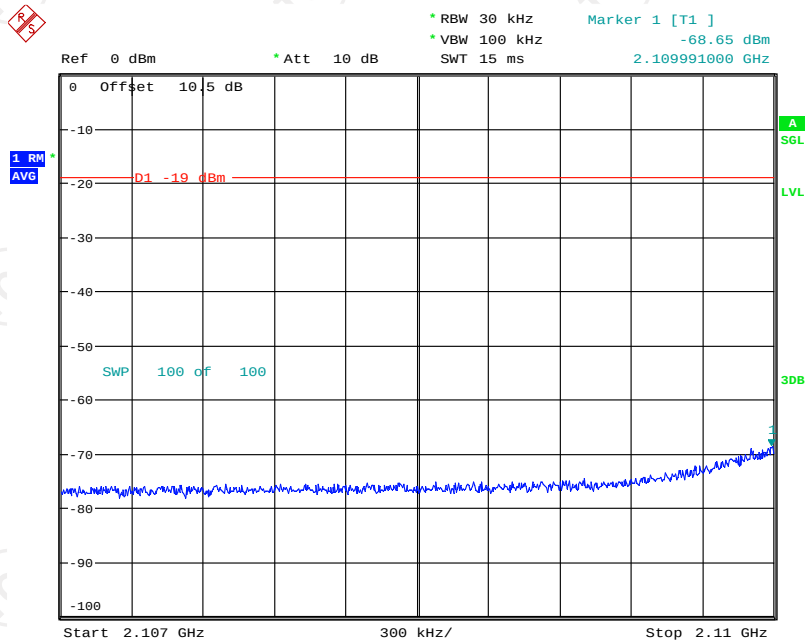
Date: 28.AUG.2018 11:32:07

Band4 CDMA DL Left Side Pre AGC



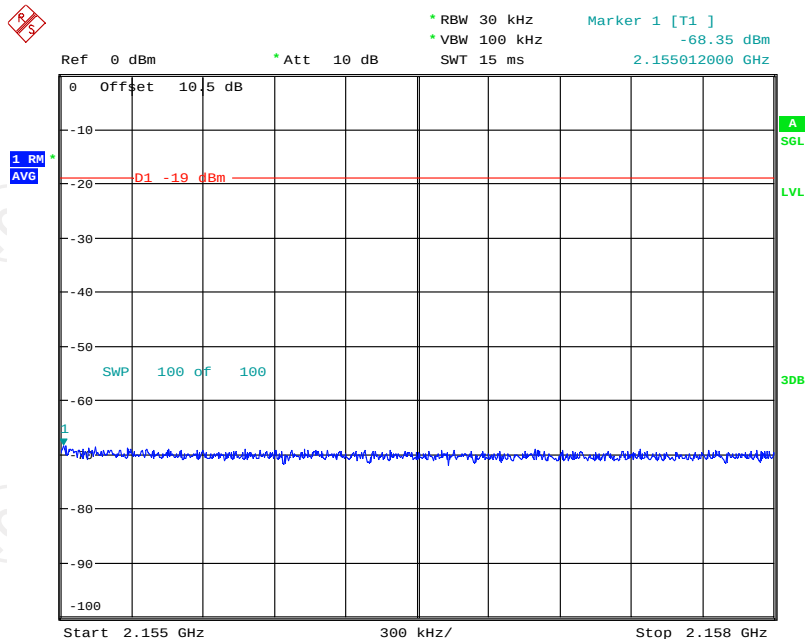
Date: 28.AUG.2018 10:44:14

Band4 CDMA DL Left Side 10dB Above AGC



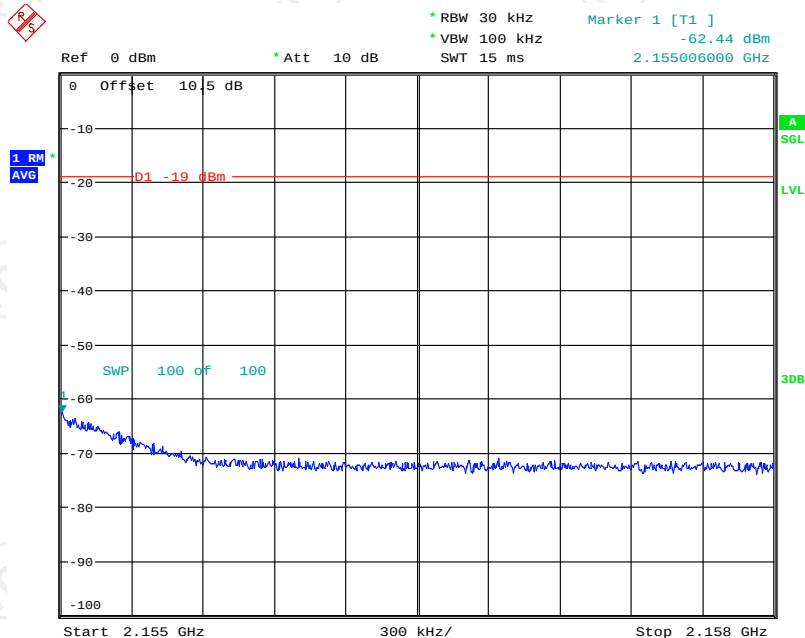
Date: 28.AUG.2018 10:44:38

Band4 CDMA DL Right Side Pre AGC



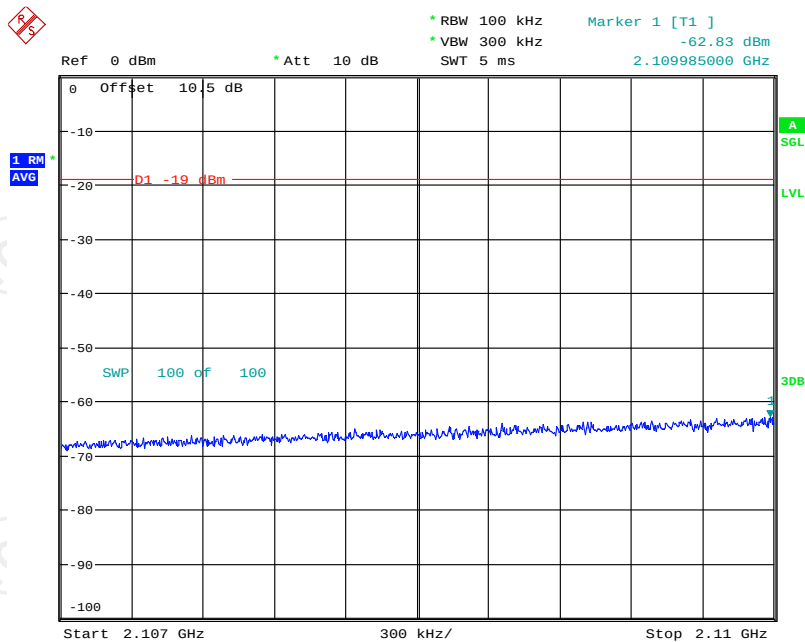
Date: 28.AUG.2018 11:26:59

Band4 CDMA DL Right Side 10dB Above AGC



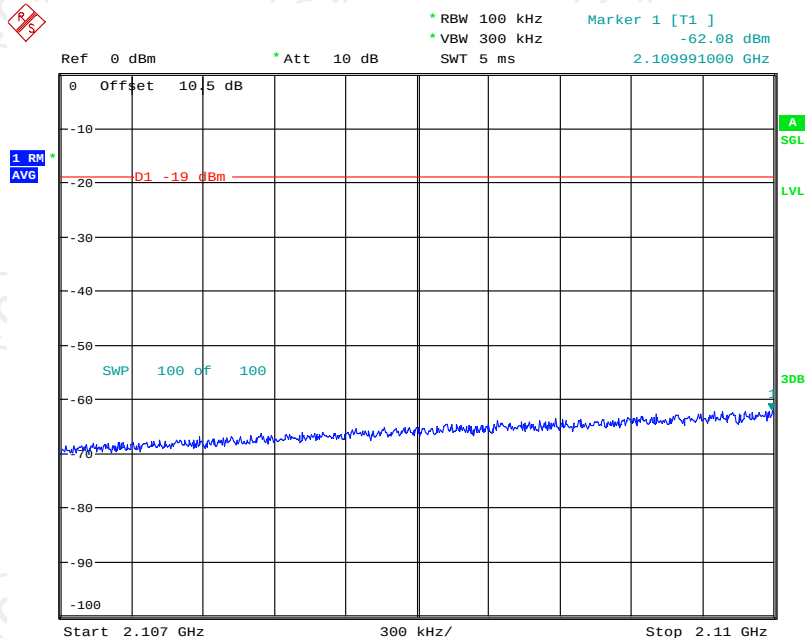
Date: 28.AUG.2018 11:27:21

Band4 LTE DL Left Side Pre AGC



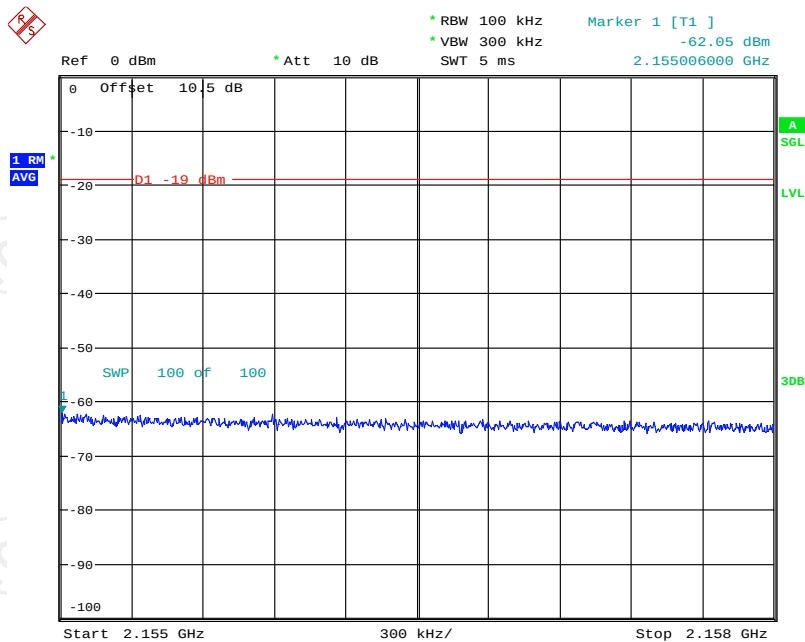
Date: 28.AUG.2018 10:46:27

Band4 LTE DL Left Side 10dB Above AGC



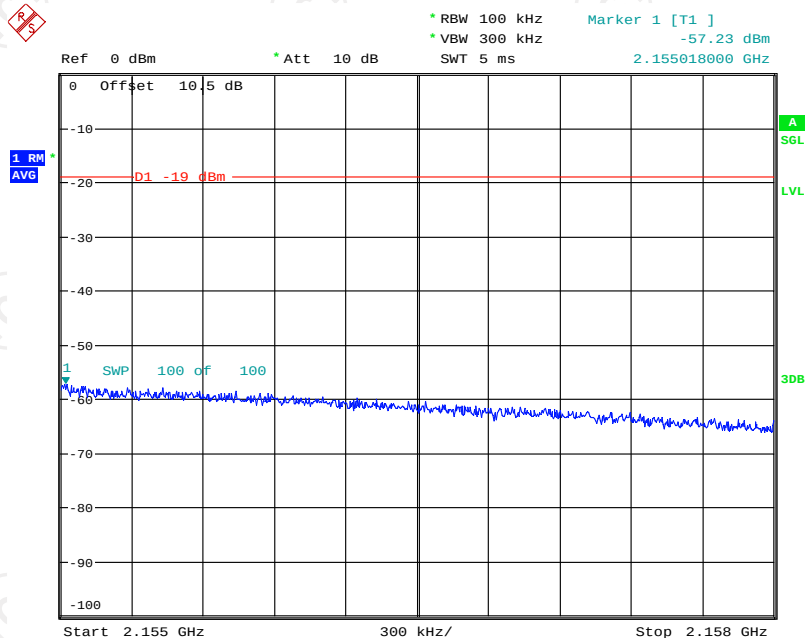
Date: 28.AUG.2018 10:46:48

Band4 LTE DL Right Side Pre AGC



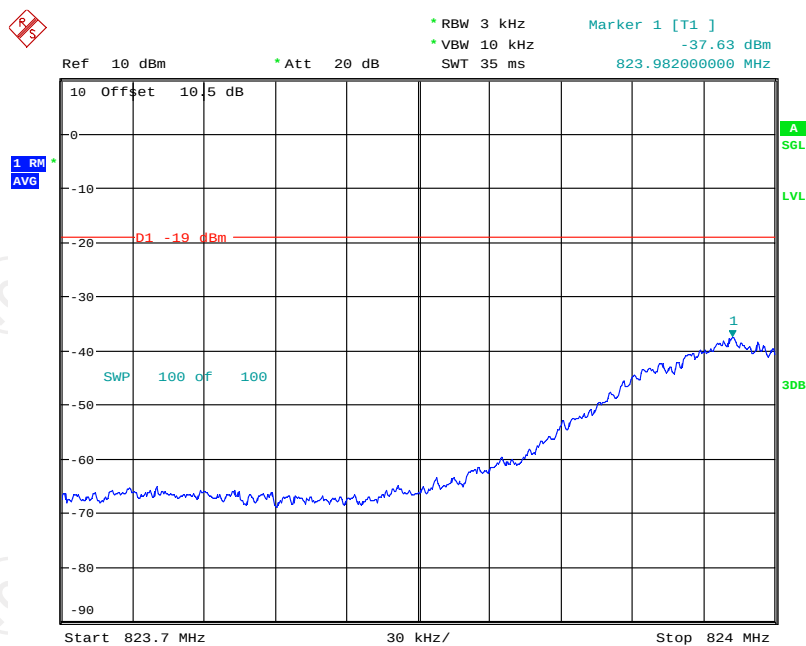
Date: 28.AUG.2018 10:50:10

Band4 LTE DL Right Side 10dB Above AGC



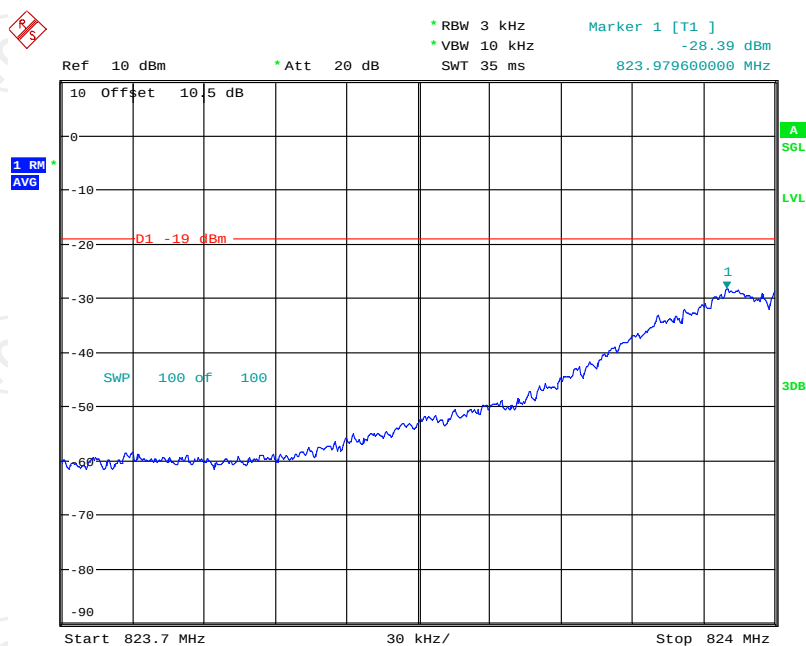
Date: 28.AUG.2018 11:19:12

Band5 GSM UL Left Side Pre AGC



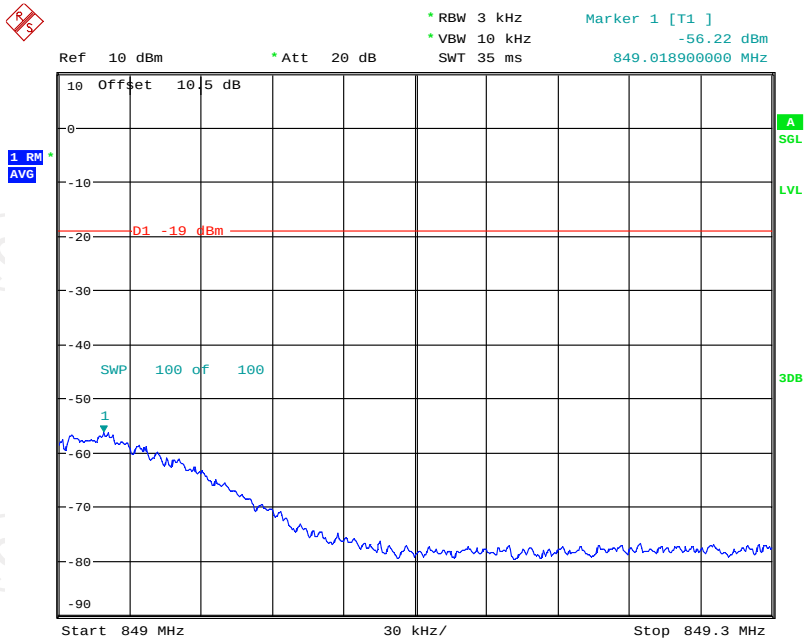
Date: 27.AUG.2018 13:48:18

Band5 GSM UL Left Side 10dB Above AGC



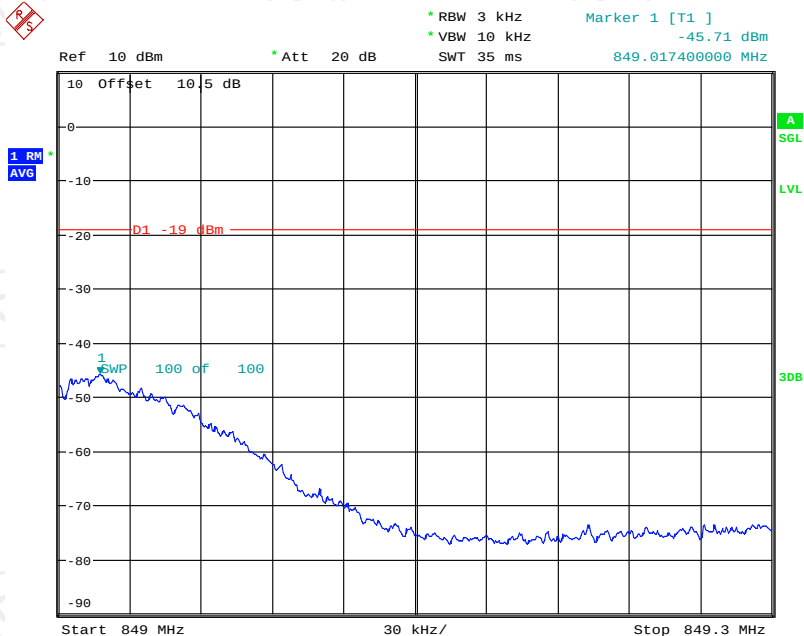
Date: 27.AUG.2018 13:48:42

Band5 GSM UL Right Side Pre AGC



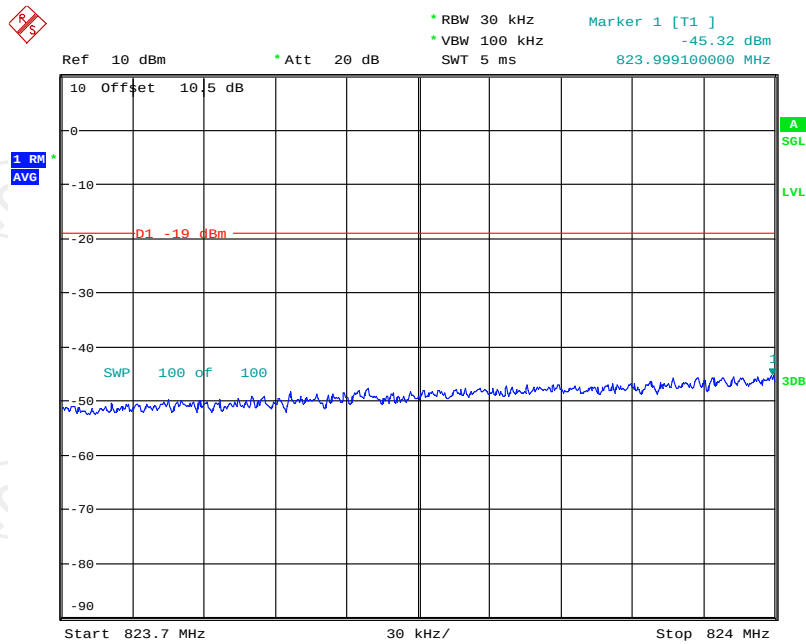
Date: 27.AUG.2018 14:06:56

Band5 GSM UL Right Side 10dB Above AGC



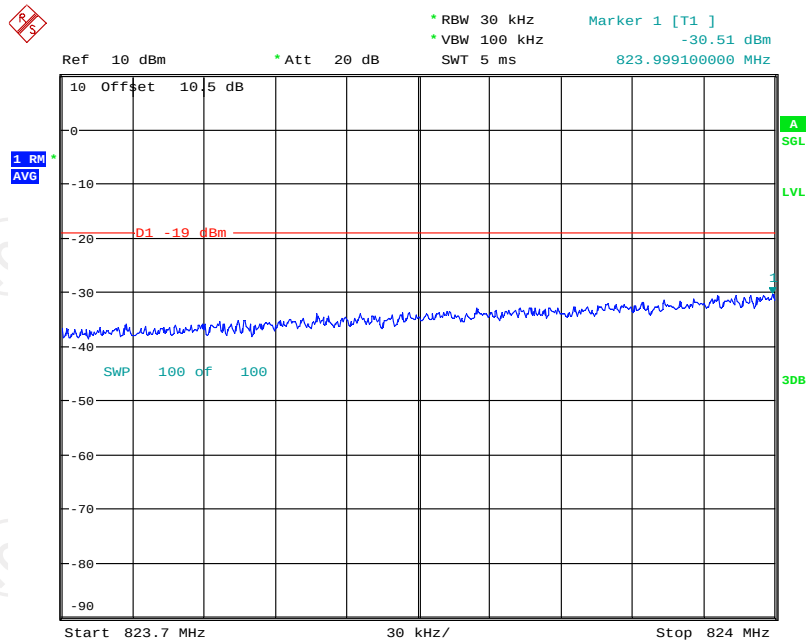
Date: 27.AUG.2018 14:07:22

Band5 CDMA UL Left Side Pre AGC



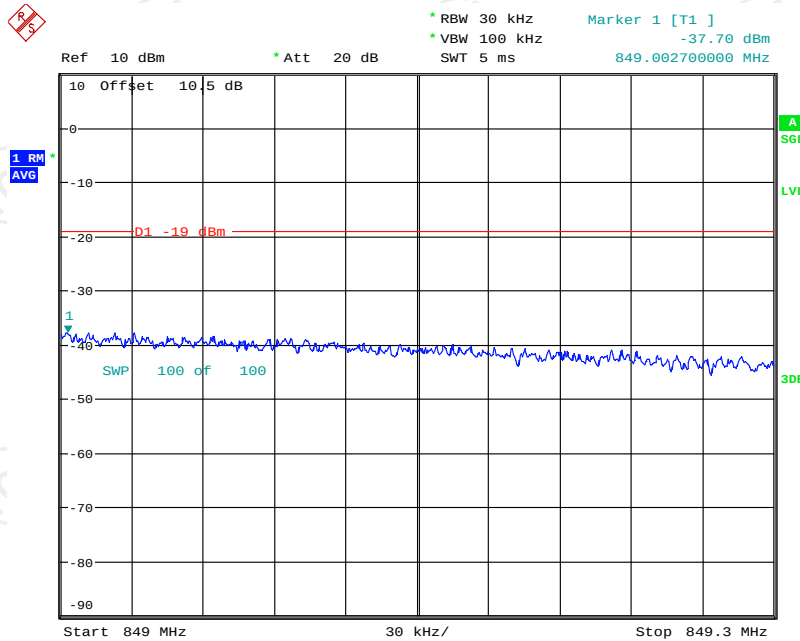
Date: 27.AUG.2018 13:50:59

Band5 CDMA UL Left Side 10dB Above AGC



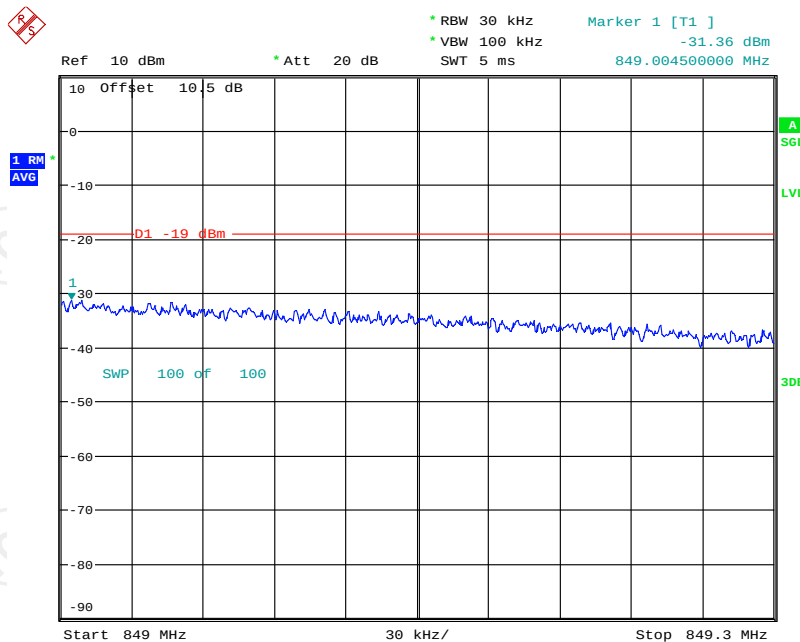
Date: 27.AUG.2018 13:51:19

Band5 CDMA UL Right Side Pre AGC



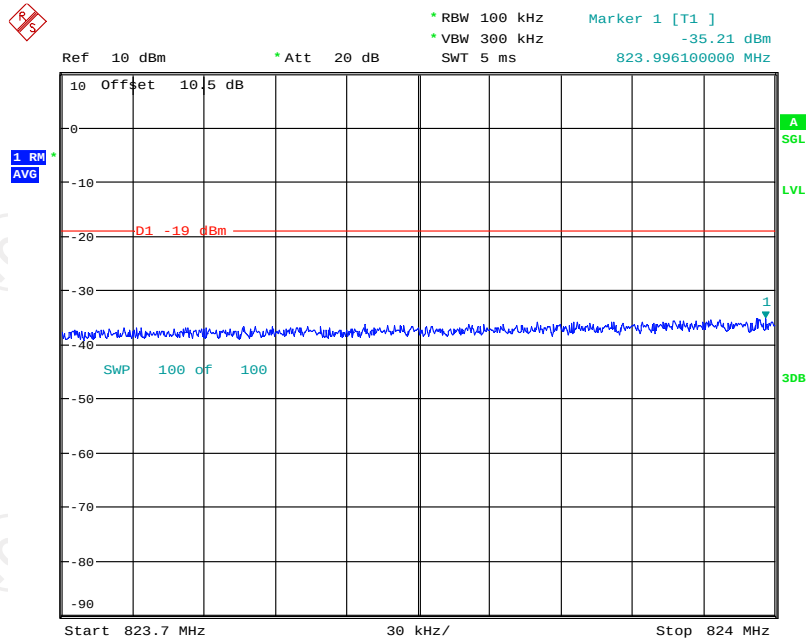
Date: 27.AUG.2018 13:58:50

Band5 CDMA UL Right Side 10dB Above AGC



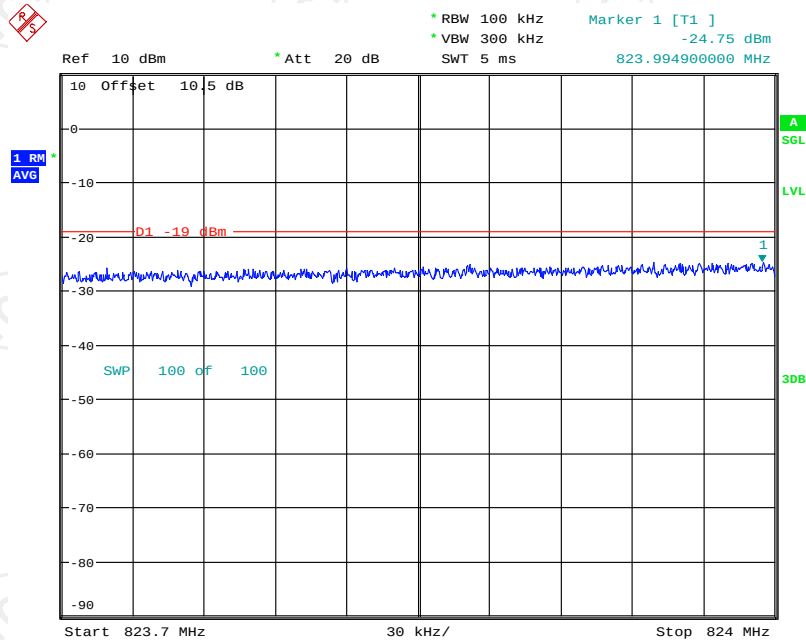
Date: 27.AUG.2018 13:59:17

Band5 LTE UL Left Side Pre AGC



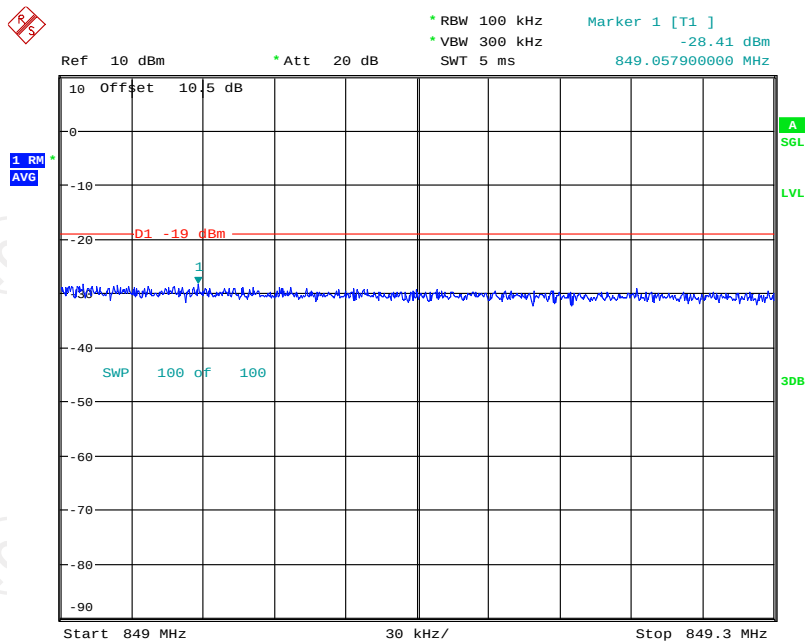
Date: 27.AUG.2018 13:53:09

Band5 LTE UL Left Side 10dB Above AGC



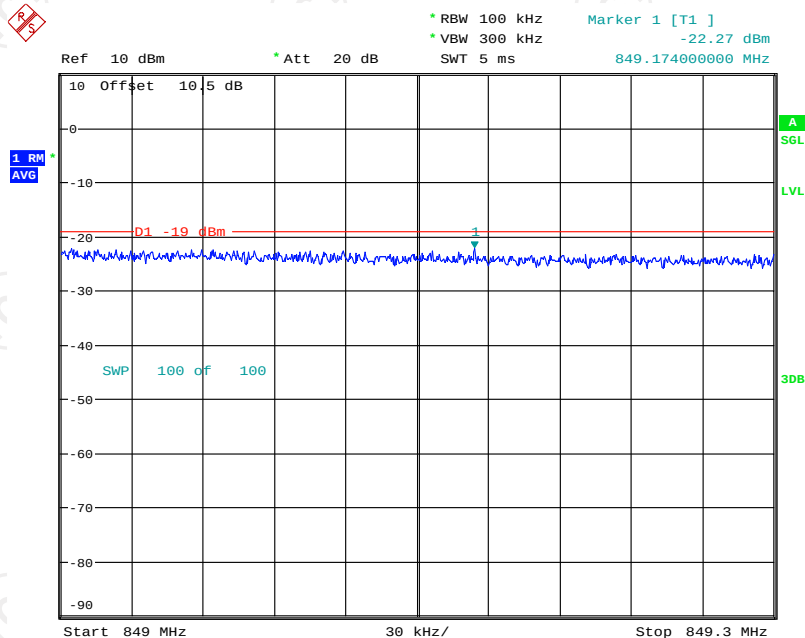
Date: 27.AUG.2018 13:53:31

Band5 LTE UL Right Side Pre AGC



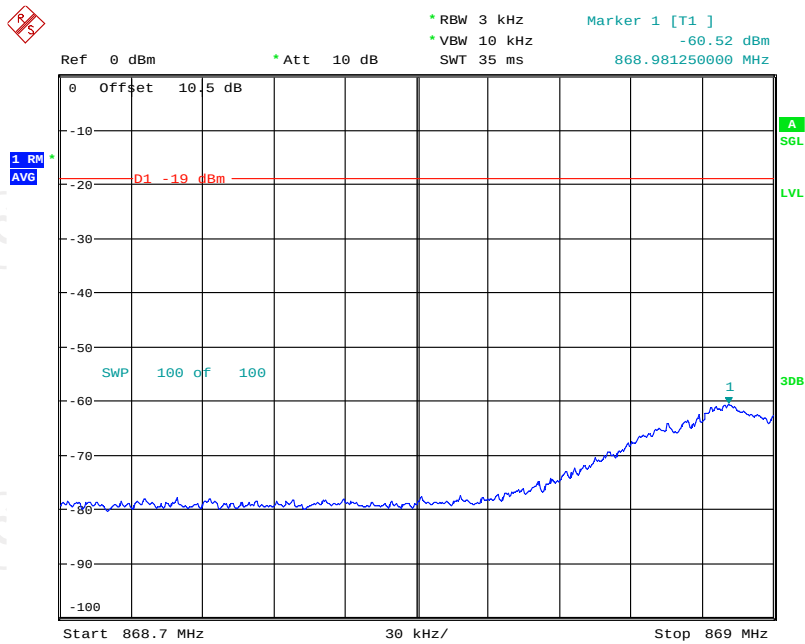
Date: 27.AUG.2018 13:55:49

Band5 LTE UL Right Side 10dB Above AGC



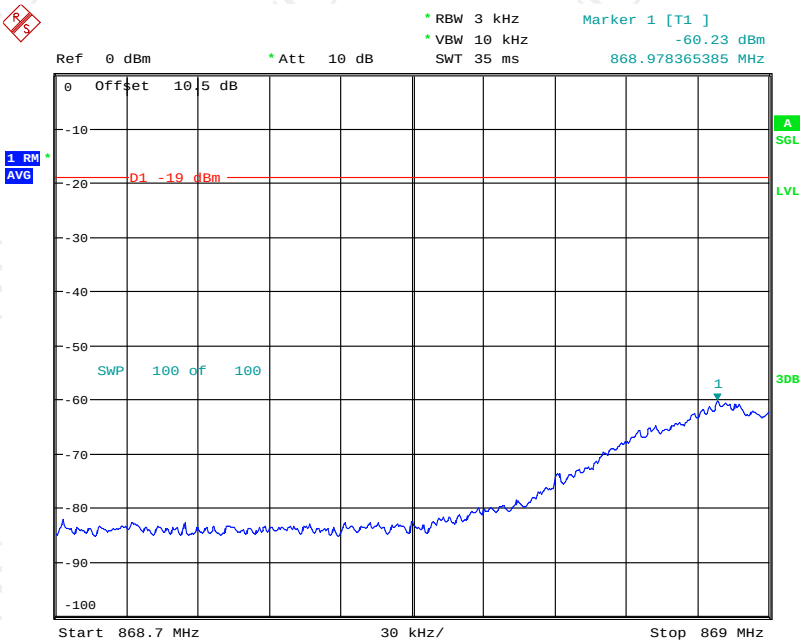
Date: 27.AUG.2018 13:56:10

Band5 GSM DL Left Side Pre AGC



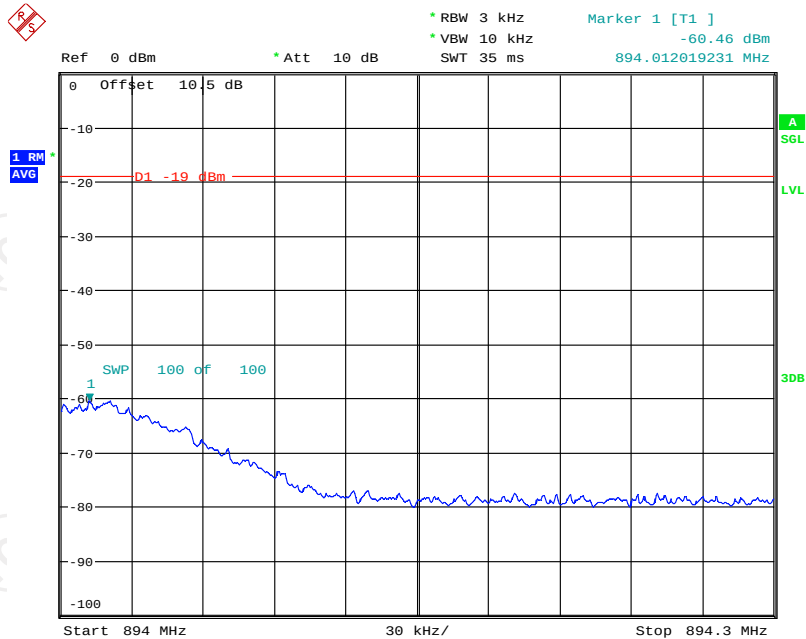
Date: 28.AUG.2018 14:19:01

Band5 GSM DL Left Side 10dB Above AGC



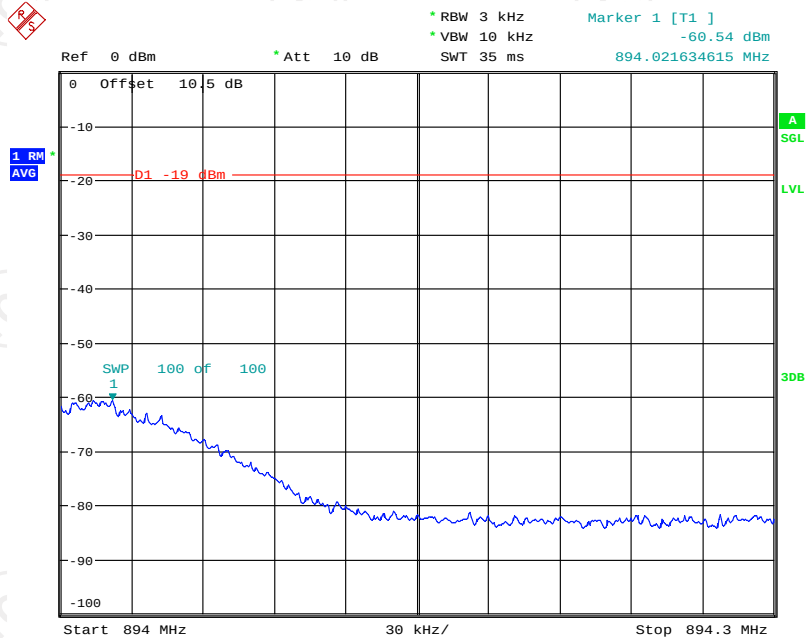
Date: 28.AUG.2018 14:20:14

Band5 GSM DL Right Side Pre AGC



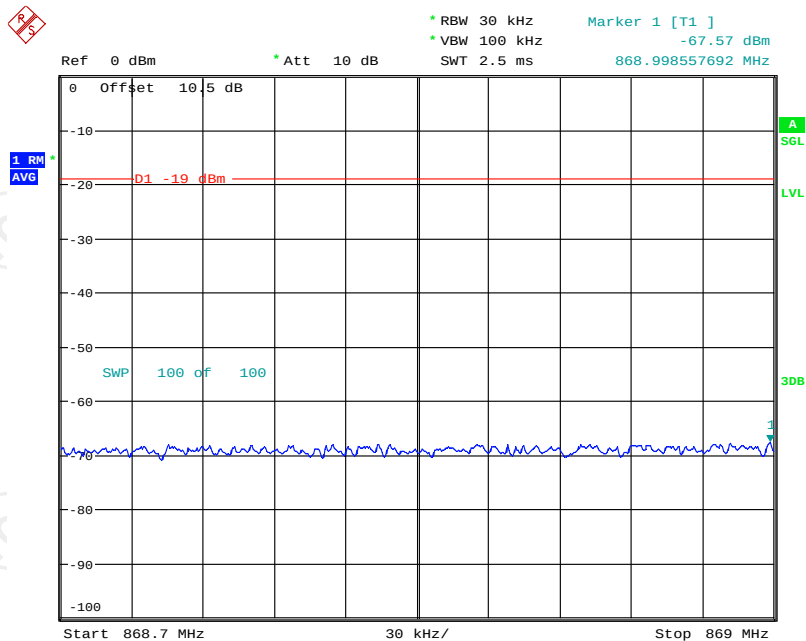
Date: 28.AUG.2018 14:34:18

Band5 GSM DL Right Side 10dB Above AGC



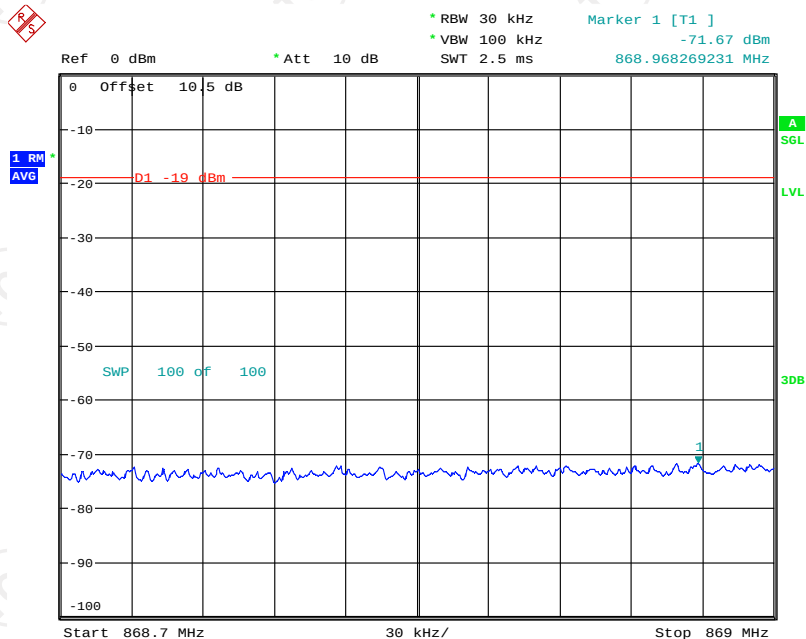
Date: 28.AUG.2018 14:34:55

Band5 CDMA DL Left Side Pre AGC



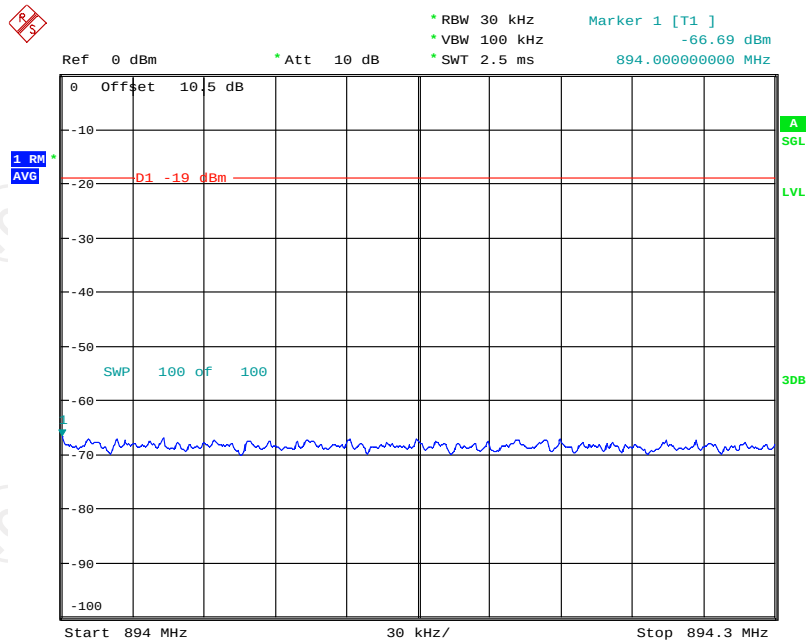
Date: 28.AUG.2018 14:21:55

Band5 CDMA DL Left Side 10dB Above AGC



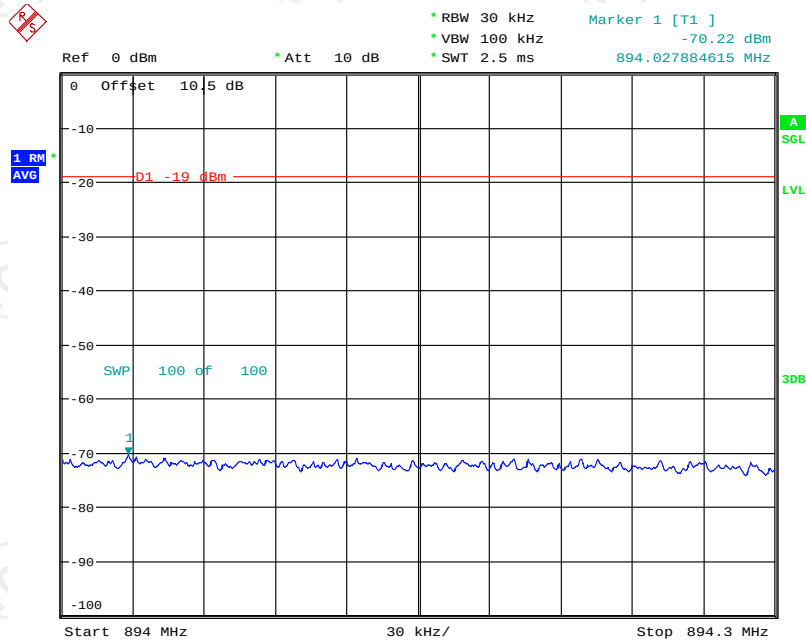
Date: 28.AUG.2018 14:22:26

Band5 CDMA DL Right Side Pre AGC



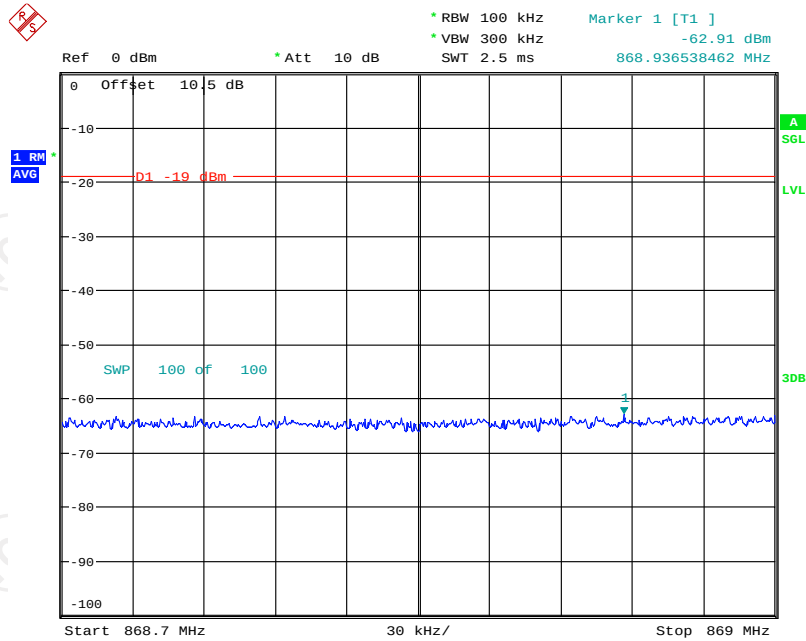
Date: 28.AUG.2018 14:32:28

Band5 CDMA DL Right Side 10dB Above AGC



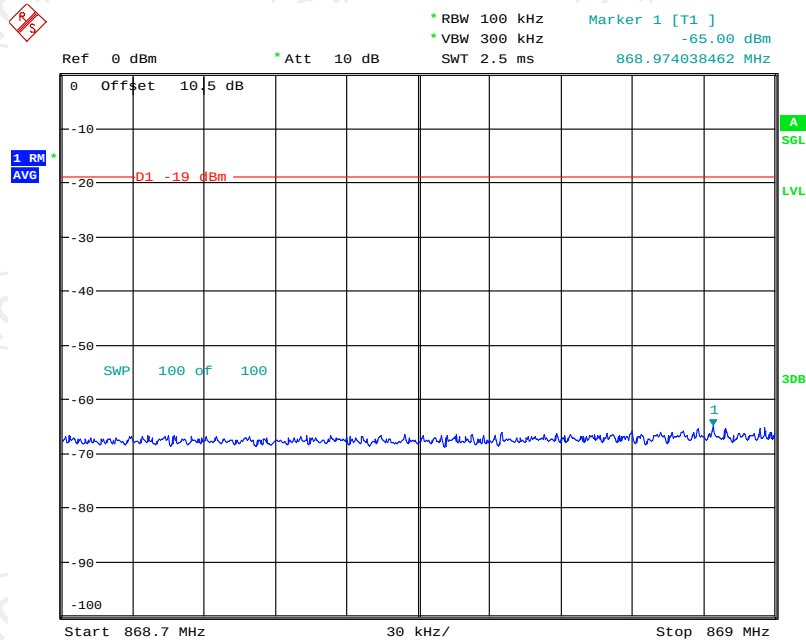
Date: 28.AUG.2018 14:32:54

Band5 LTE DL Left Side Pre AGC



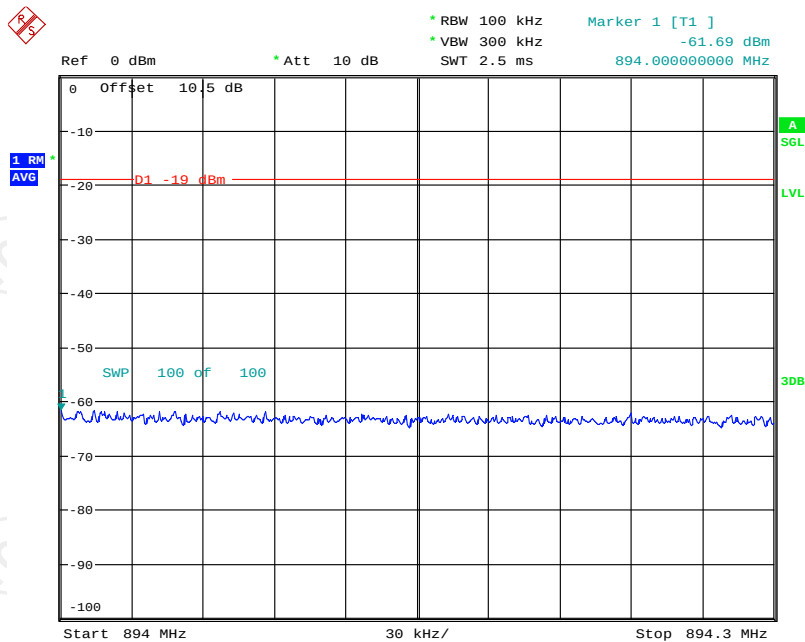
Date: 28.AUG.2018 14:24:12

Band5 LTE DL Left Side 10dB Above AGC



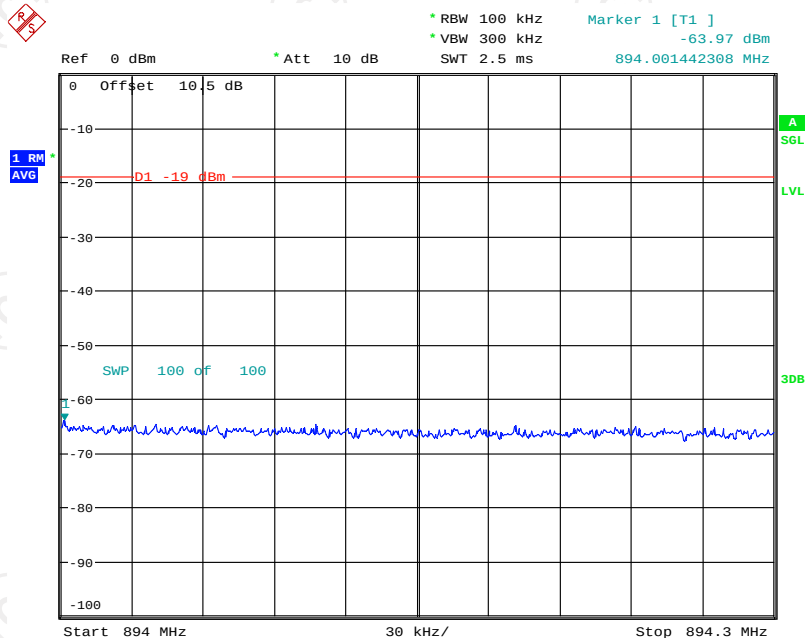
Date: 28.AUG.2018 14:24:38

Band5 LTE DL Right Side Pre AGC



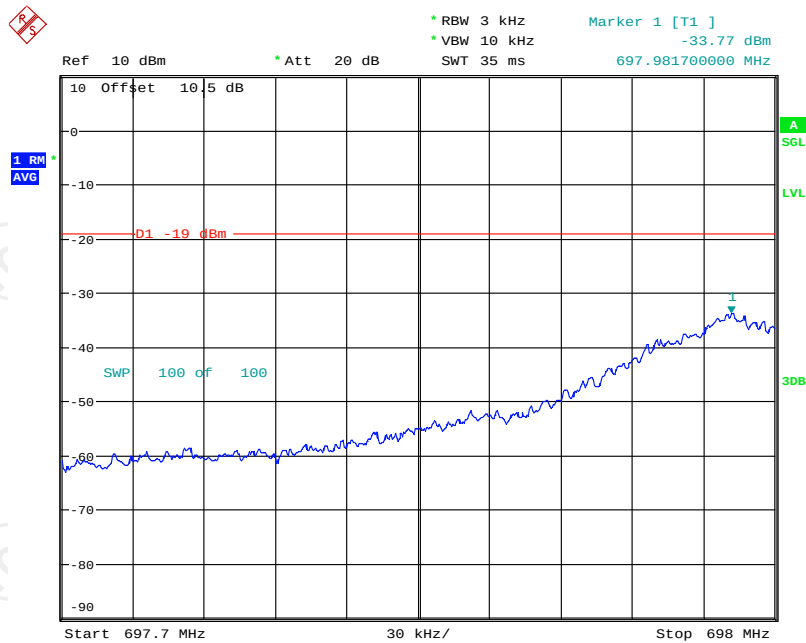
Date: 28.AUG.2018 14:30:01

Band5 LTE DL Right Side 10dB Above AGC



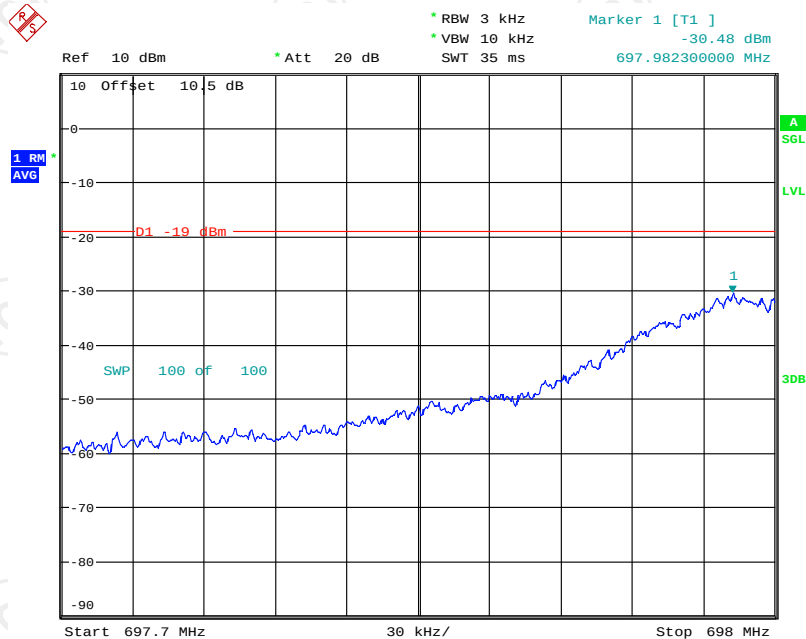
Date: 28.AUG.2018 14:30:28

Band12 GSM UL Left Side Pre AGC



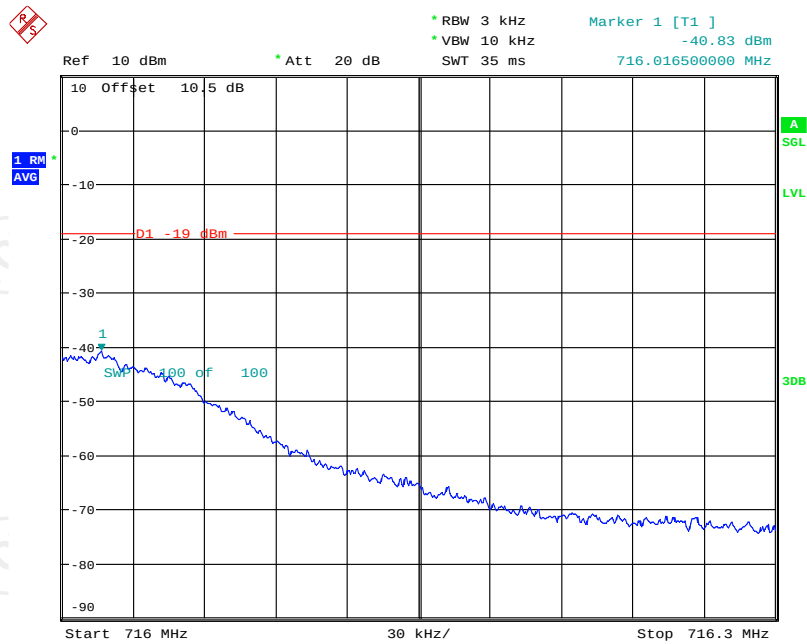
Date: 27.AUG.2018 14:09:57

Band12 GSM UL Left Side 10dB Above AGC



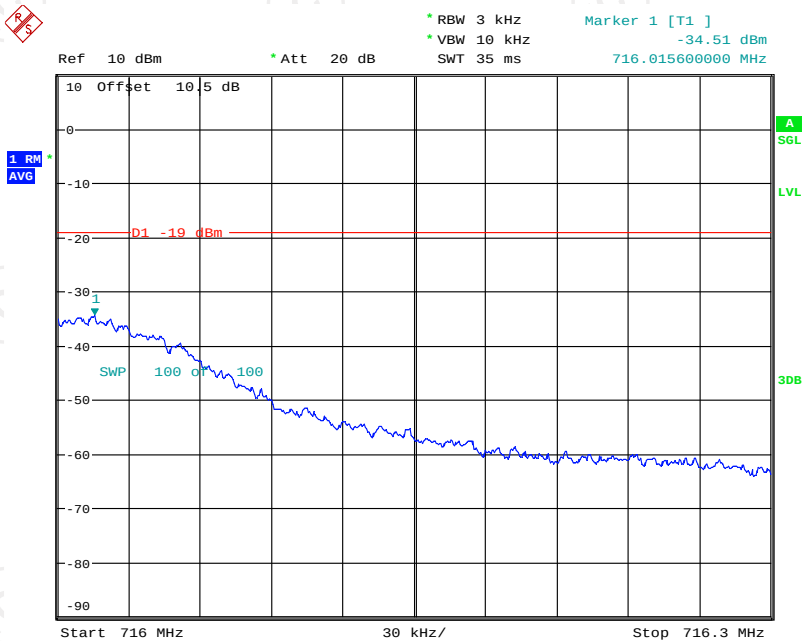
Date: 27.AUG.2018 14:10:25

Band12 GSM UL Right Side Pre AGC



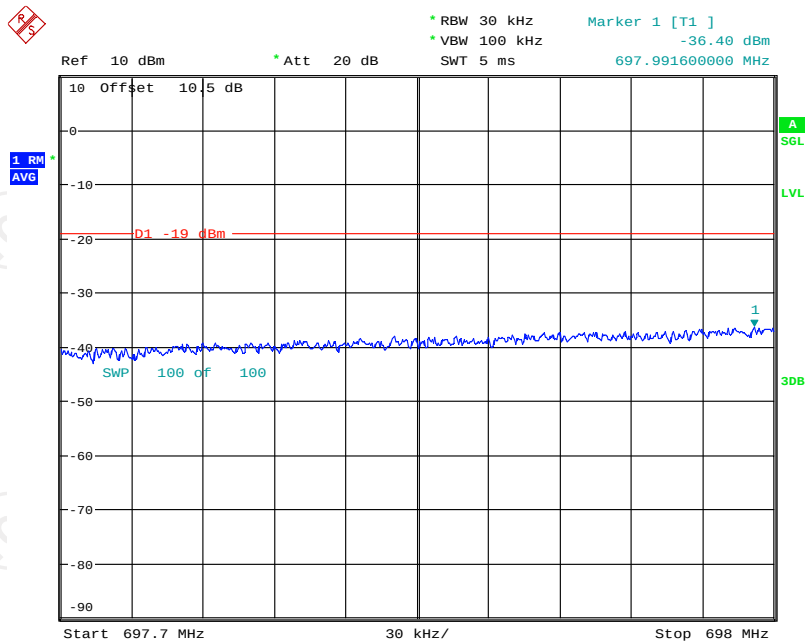
Date: 27.AUG.2018 14:20:48

Band12 GSM UL Right Side 10dB Above AGC



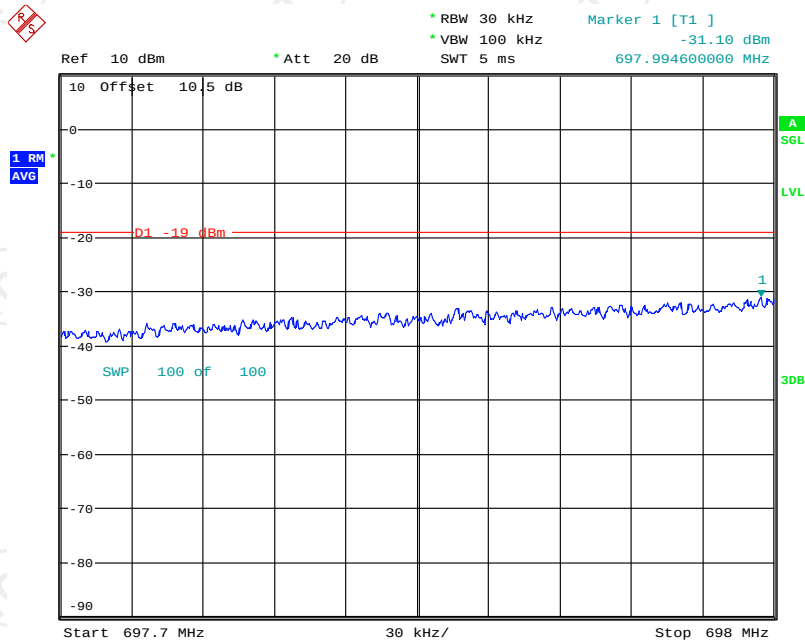
Date: 27.AUG.2018 14:21:06

Band12 CDMA UL Left Side Pre AGC



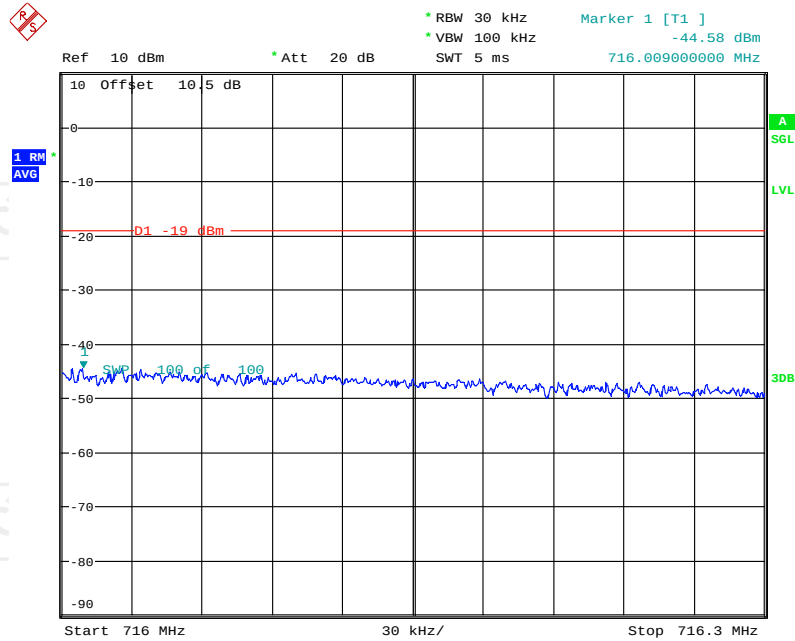
Date: 27.AUG.2018 14:11:22

Band12 CDMA UL Left Side 10dB Above AGC



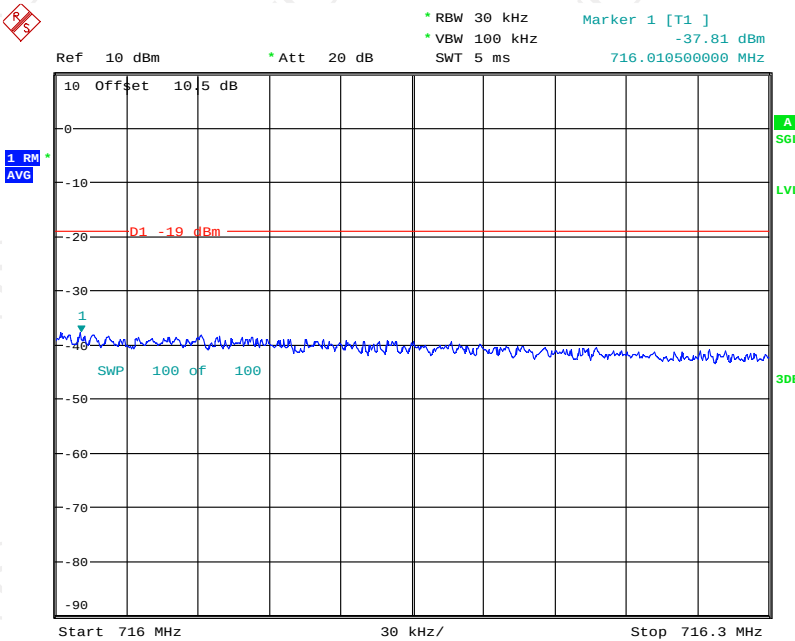
Date: 27.AUG.2018 14:11:38

Band12 CDMA UL Right Side Pre AGC



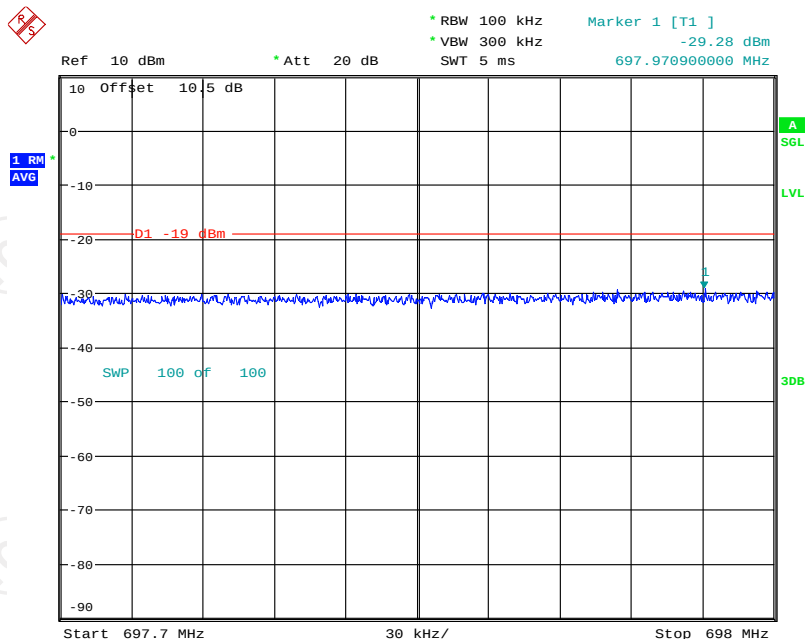
Date: 27.AUG.2018 14:19:25

Band12 CDMA UL Right Side 10dB Above AGC



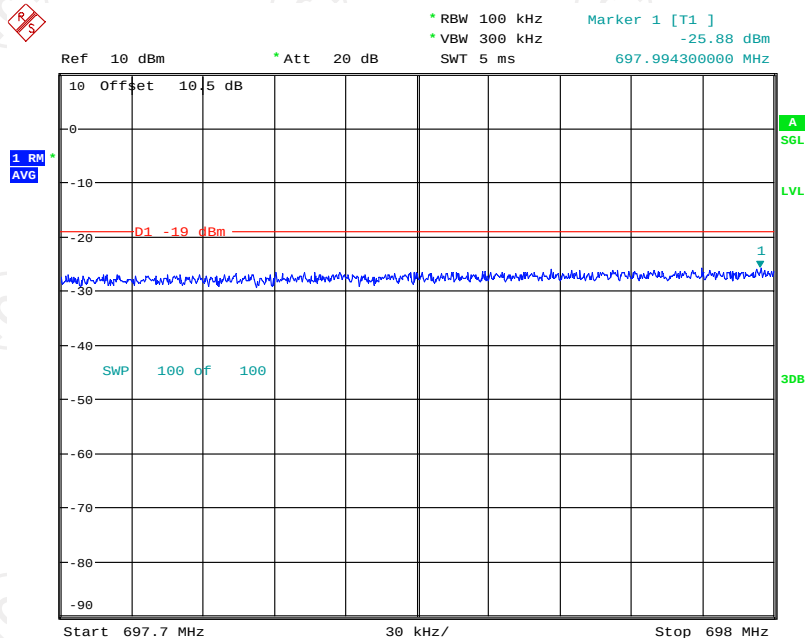
Date: 27.AUG.2018 14:19:42

Band12 LTE UL Left Side Pre AGC



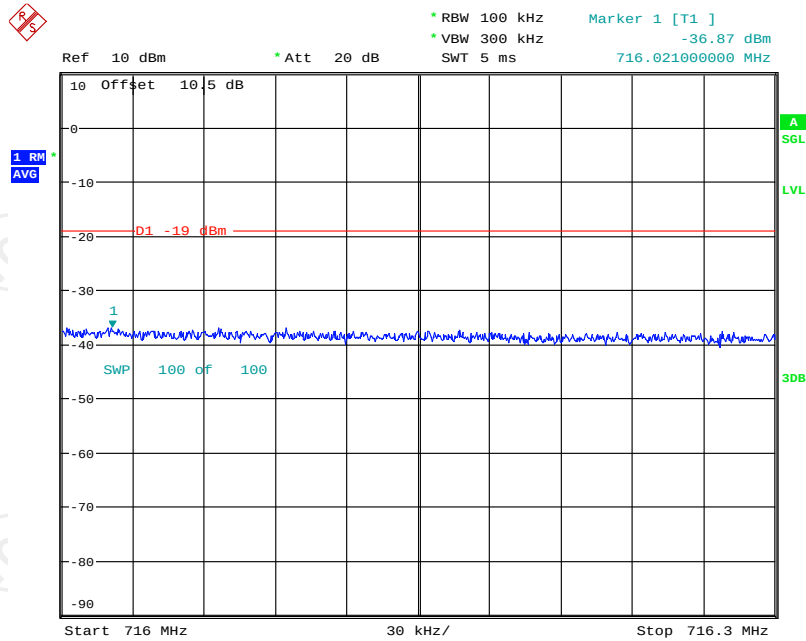
Date: 27.AUG.2018 14:12:49

Band12 LTE UL Left Side 10dB Above AGC



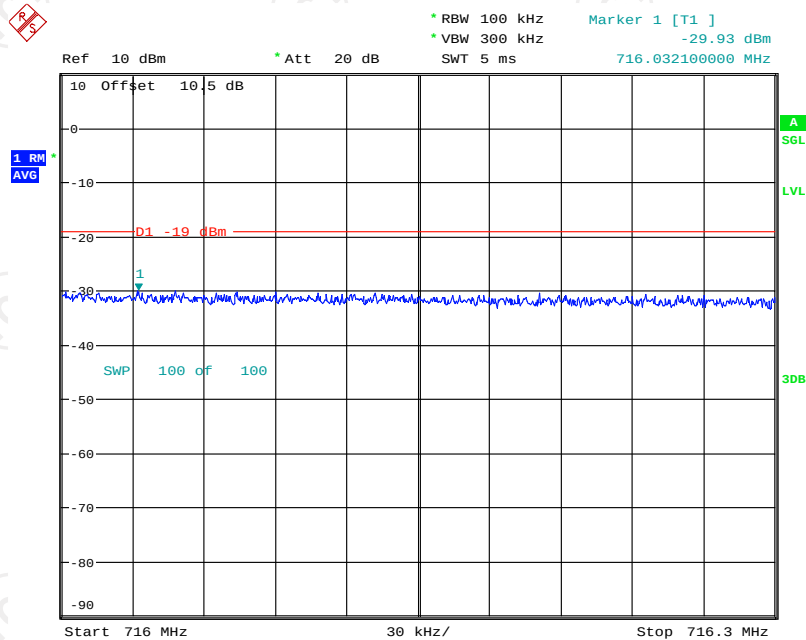
Date: 27.AUG.2018 14:15:05

Band12 LTE UL Right Side Pre AGC



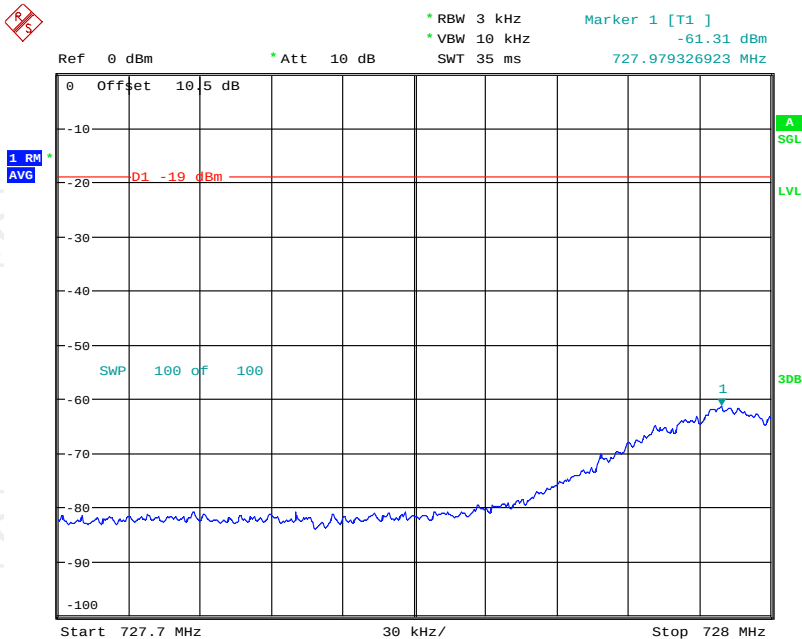
Date: 27.AUG.2018 14:17:46

Band12 LTE UL Right Side 10dB Above AGC



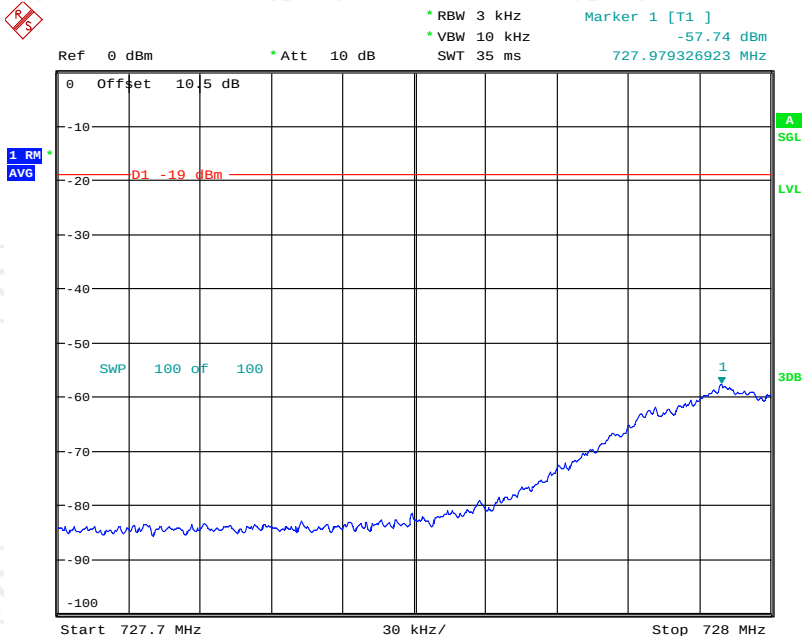
Date: 27.AUG.2018 14:18:09

Band12 GSM DL Left Side Pre AGC



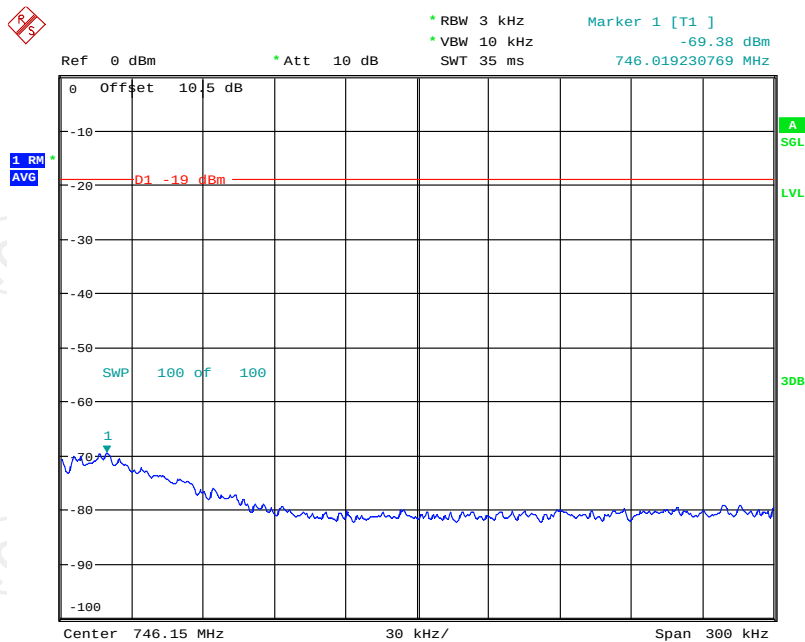
Date: 28.AUG.2018 14:38:54

Band12 GSM DL Left Side 10dB Above AGC



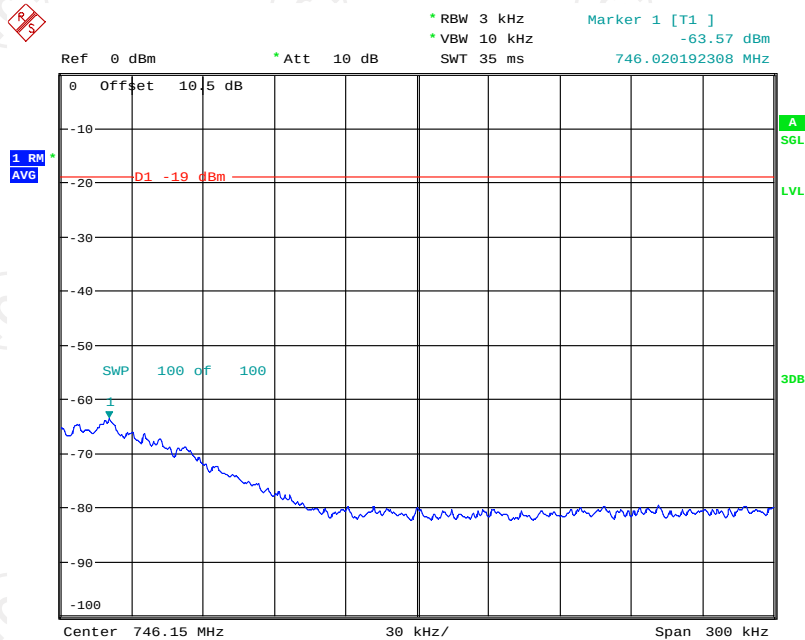
Date: 28.AUG.2018 14:39:19

Band12 GSM DL Right Side Pre AGC



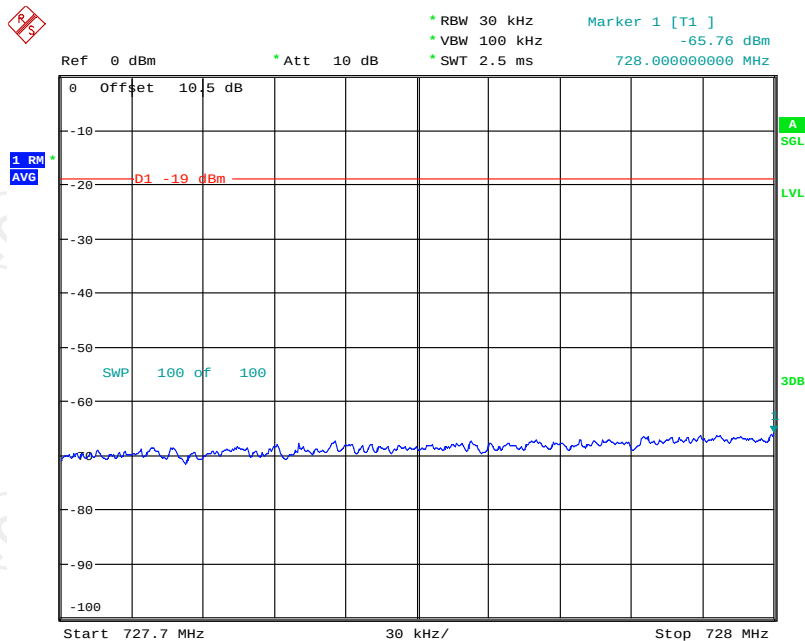
Date: 28.AUG.2018 14:52:26

Band12 GSM DL Right Side 10dB Above AGC



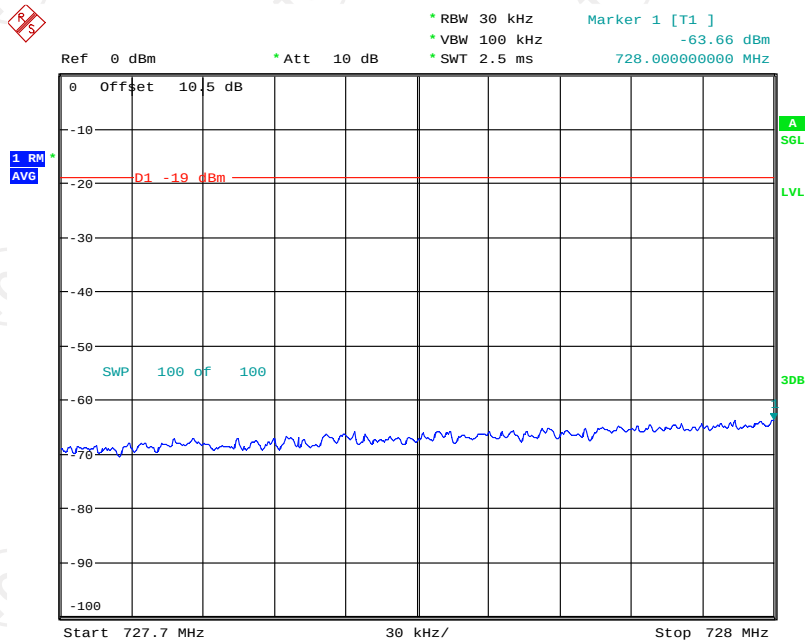
Date: 28.AUG.2018 14:52:49

Band12 CDMA DL Left Side Pre AGC



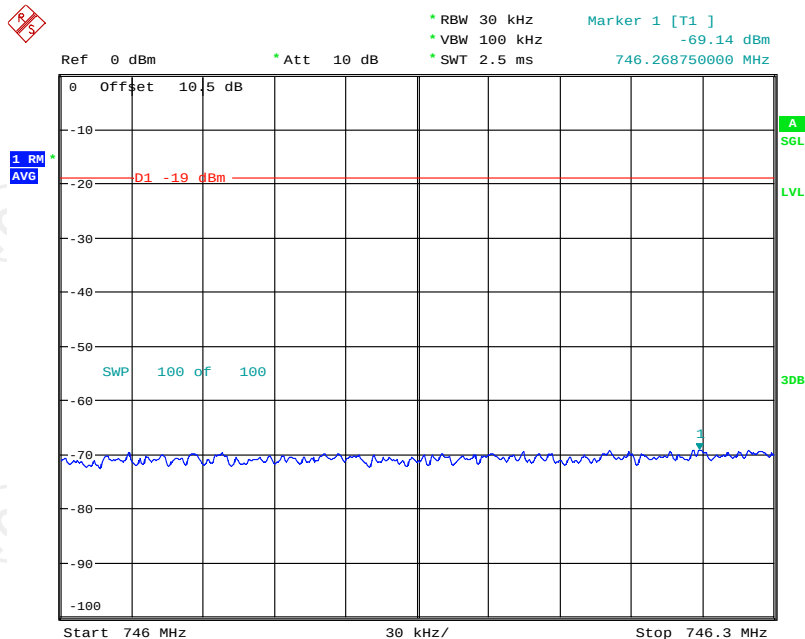
Date: 28.AUG.2018 14:40:22

Band12 CDMA DL Left Side 10dB Above AGC



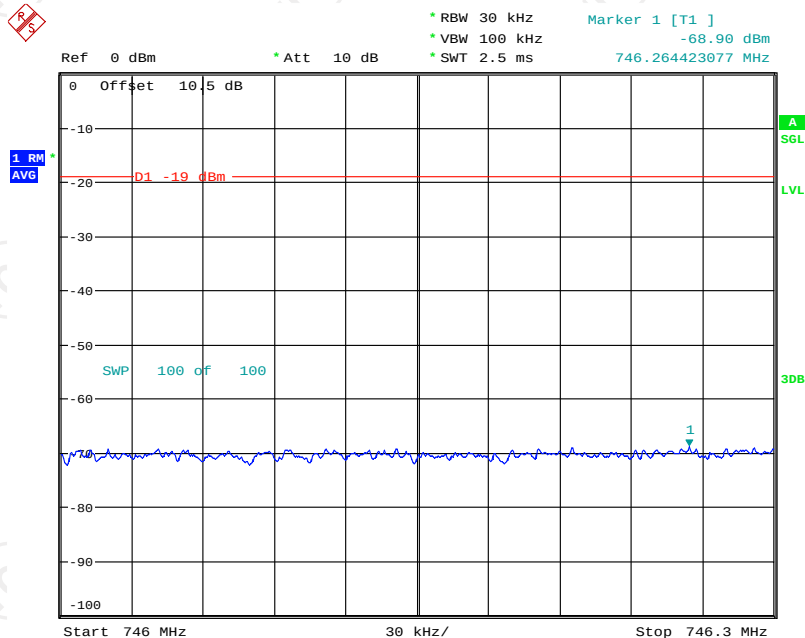
Date: 28.AUG.2018 14:40:38

Band12 CDMA DL Right Side Pre AGC



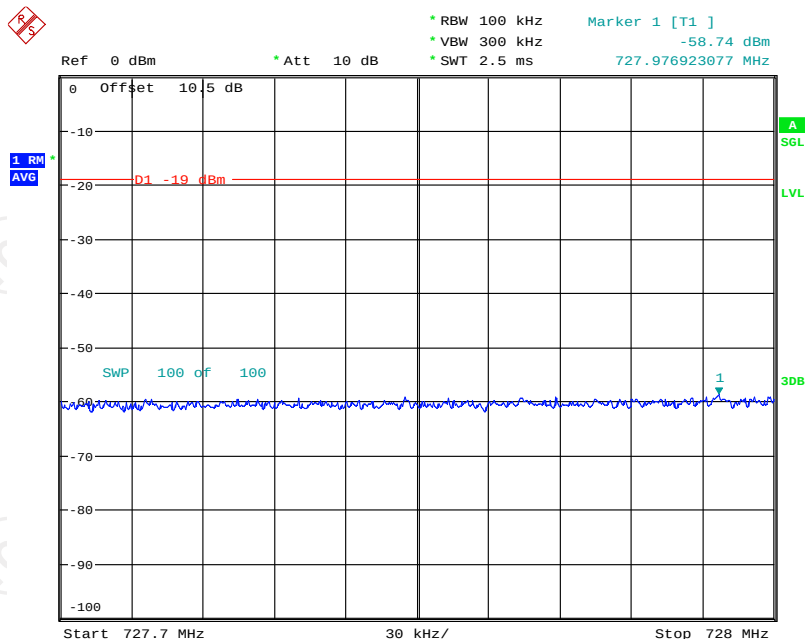
Date: 28.AUG.2018 14:48:24

Band12 CDMA DL Right Side 10dB Above AGC



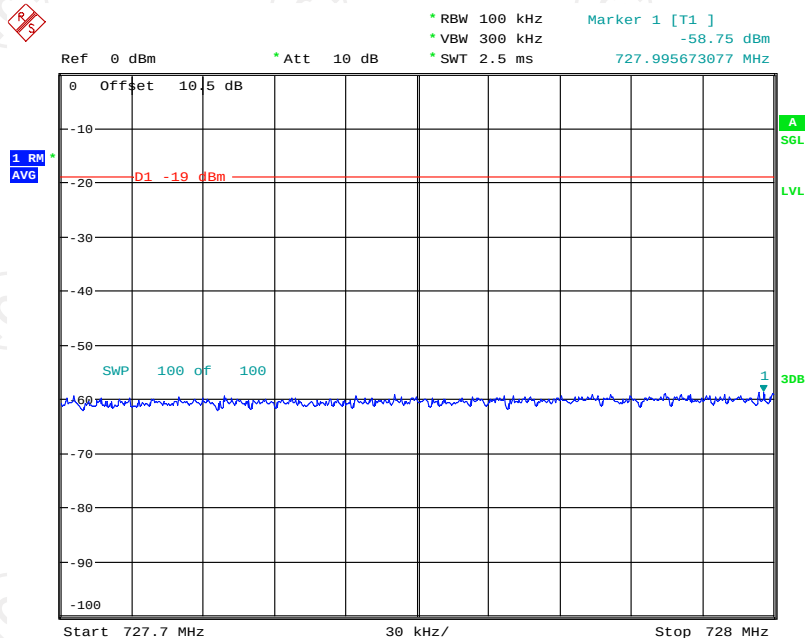
Date: 28.AUG.2018 14:48:55

Band12 LTE DL Left Side Pre AGC



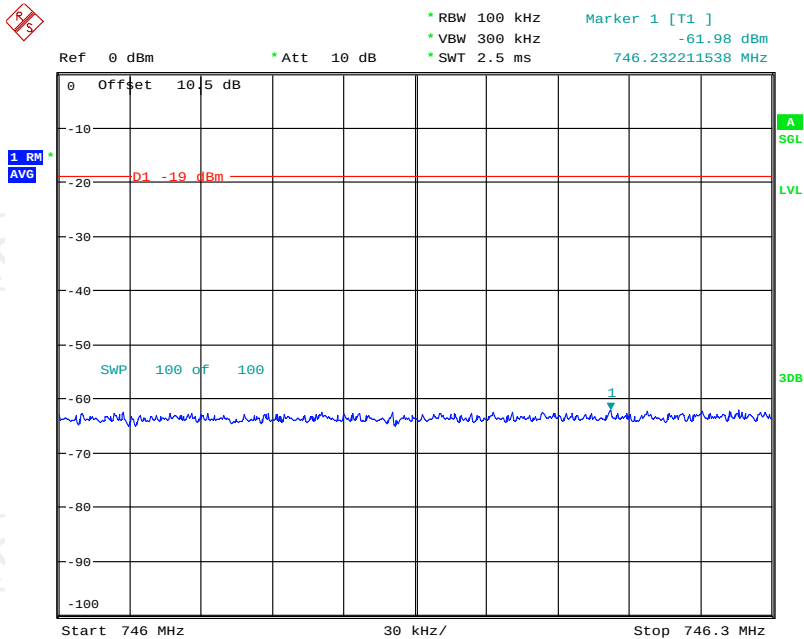
Date: 28.AUG.2018 14:41:50

Band12 LTE DL Left Side 10dB Above AGC



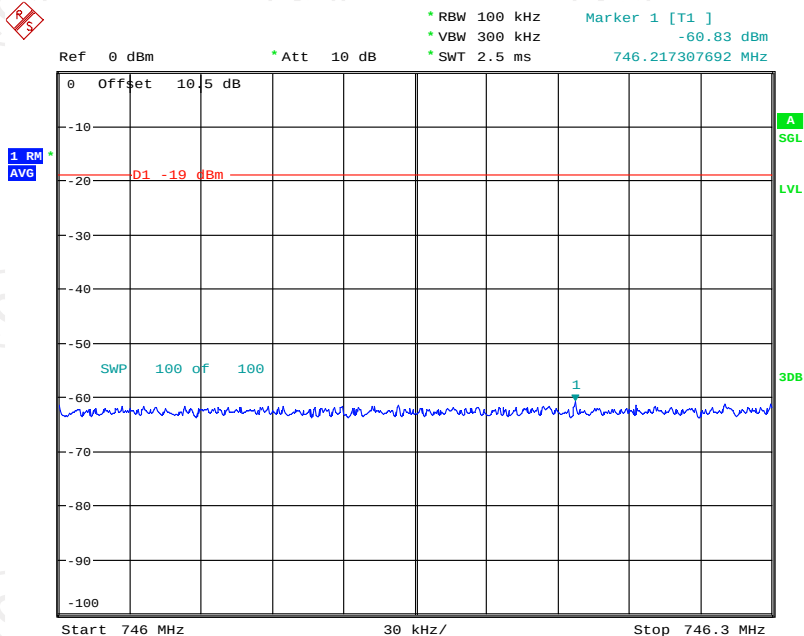
Date: 28.AUG.2018 14:42:16

Band12 LTE DL Right Side Pre AGC



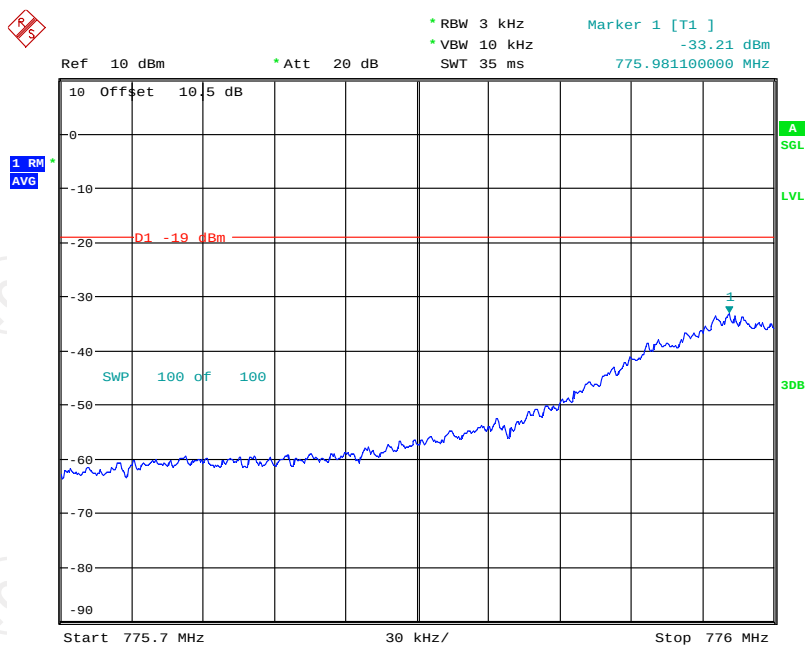
Date: 28.AUG.2018 14:46:41

Band12 LTE DL Right Side 10dB Above AGC



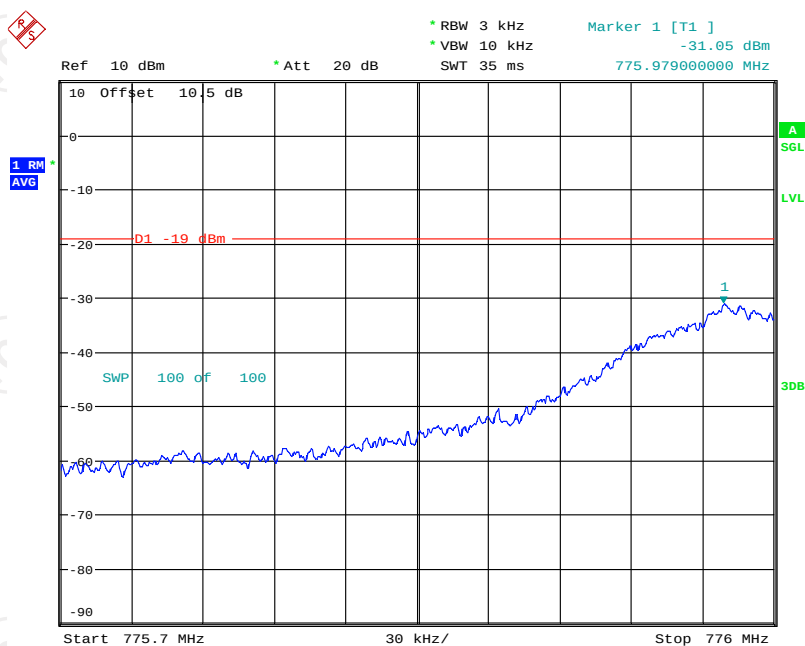
Date: 28.AUG.2018 14:46:59

Band13 GSM UL Left Side Pre AGC



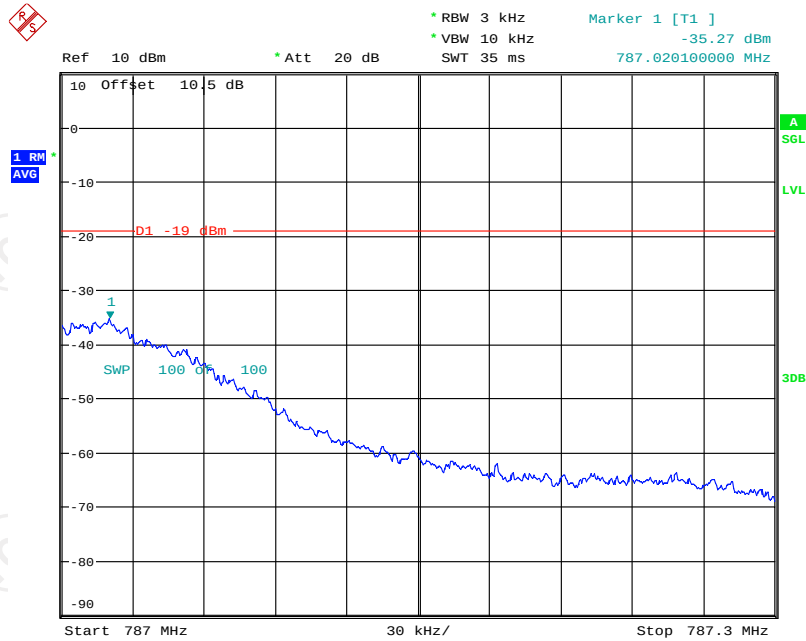
Date: 27.AUG.2018 14:26:06

Band13 GSM UL Left Side 10dB Above AGC



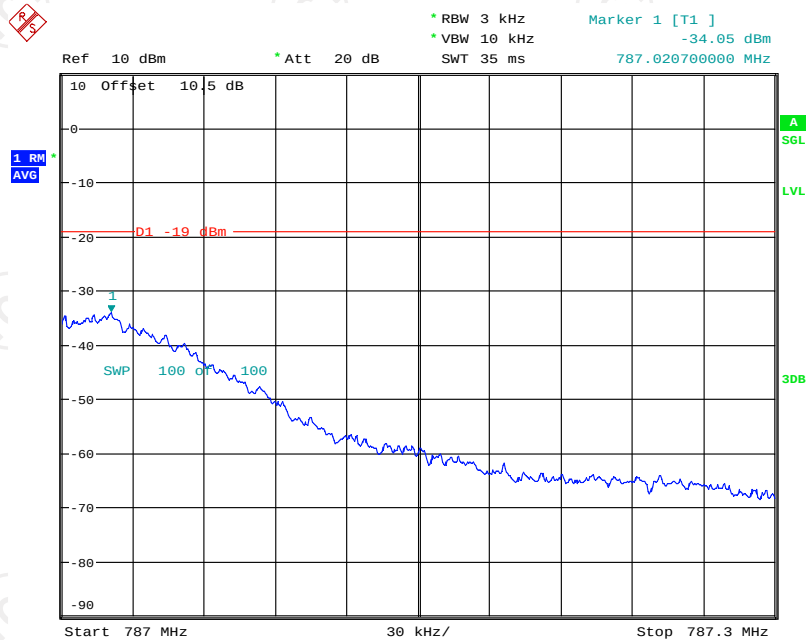
Date: 27.AUG.2018 14:26:36

Band13 GSM UL Right Side Pre AGC



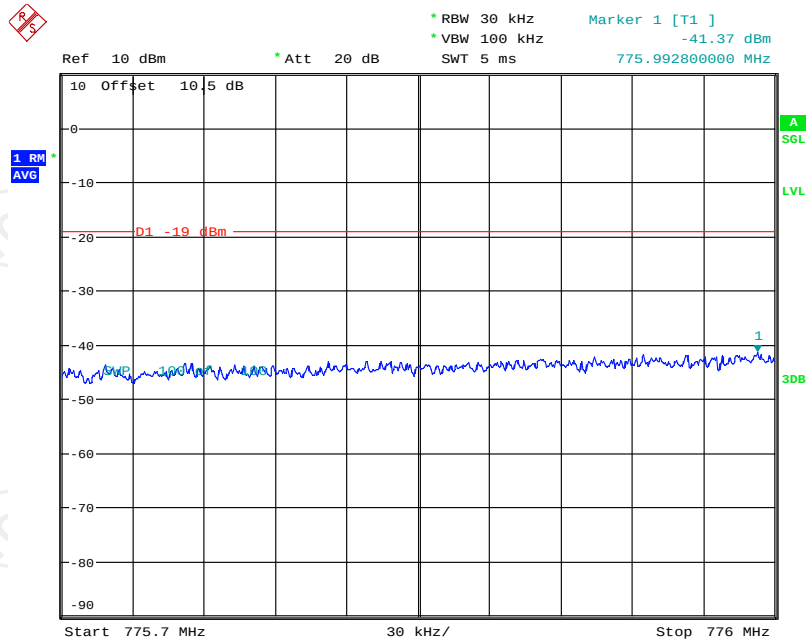
Date: 27.AUG.2018 14:37:36

Band13 GSM UL Right Side 10dB Above AGC



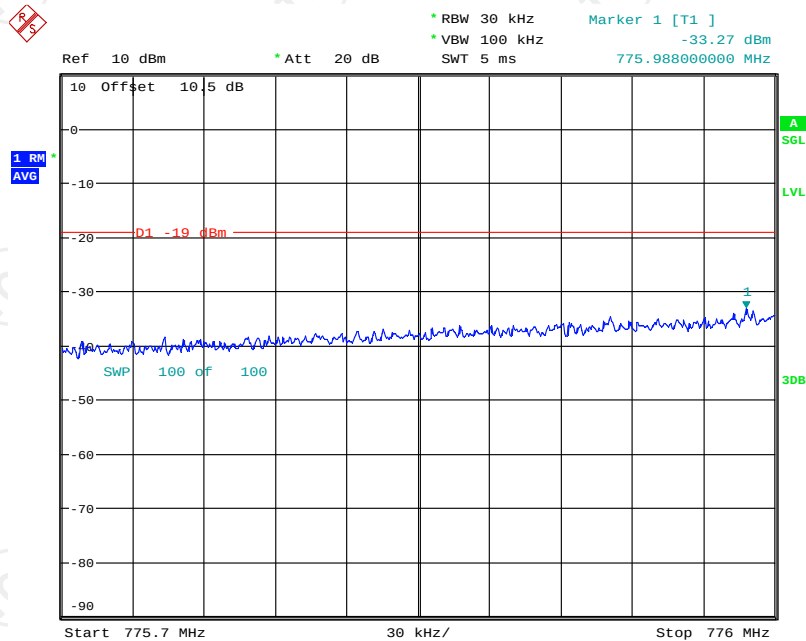
Date: 27.AUG.2018 14:37:55

Band13 CDMA UL Left Side Pre AGC



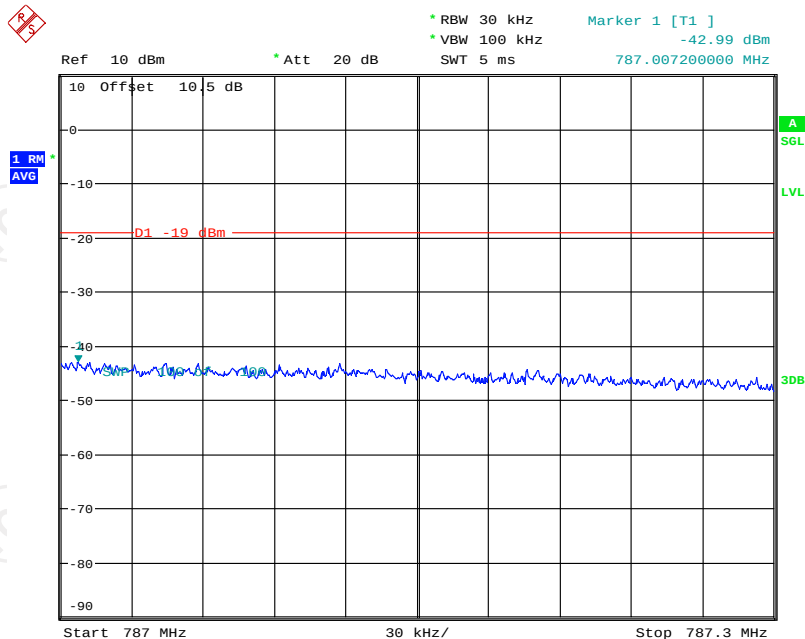
Date: 27.AUG.2018 14:29:14

Band13 CDMA UL Left Side 10dB Above AGC



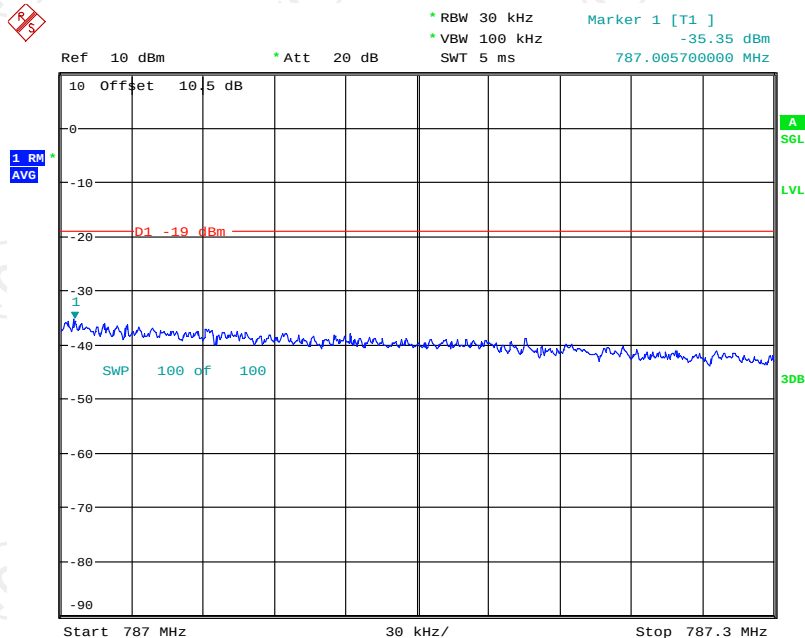
Date: 27.AUG.2018 14:29:30

Band13 CDMA UL Right Side Pre AGC



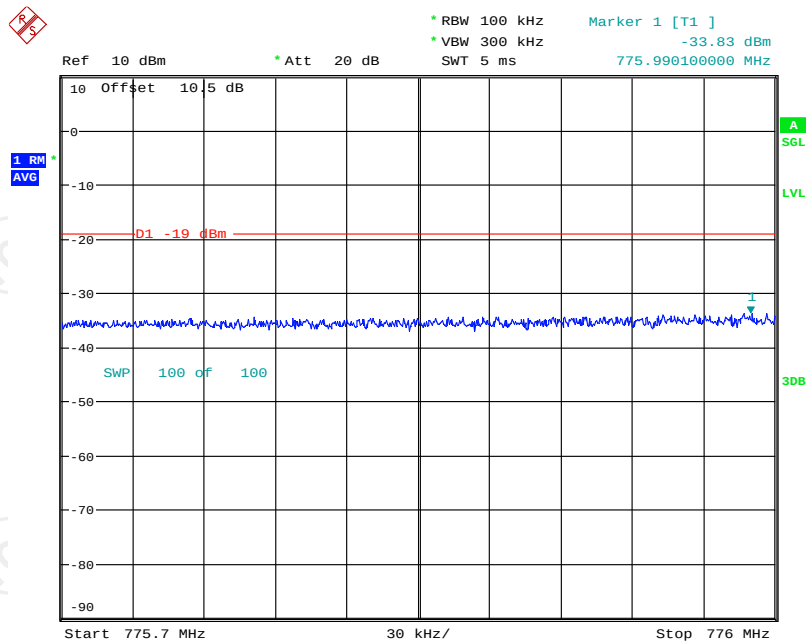
Date: 27.AUG.2018 14:36:23

Band13 CDMA UL Right Side 10dB Above AGC



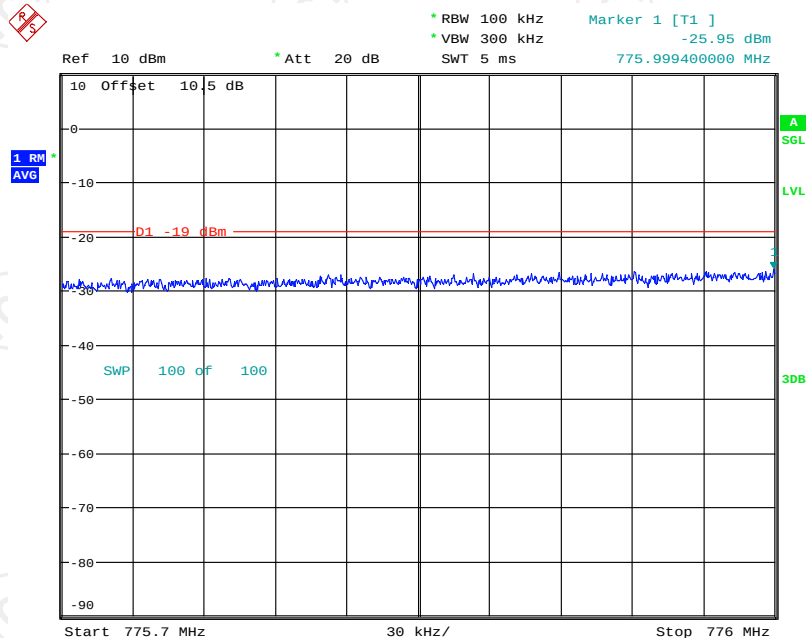
Date: 27.AUG.2018 14:36:39

Band13 LTE UL Left Side Pre AGC



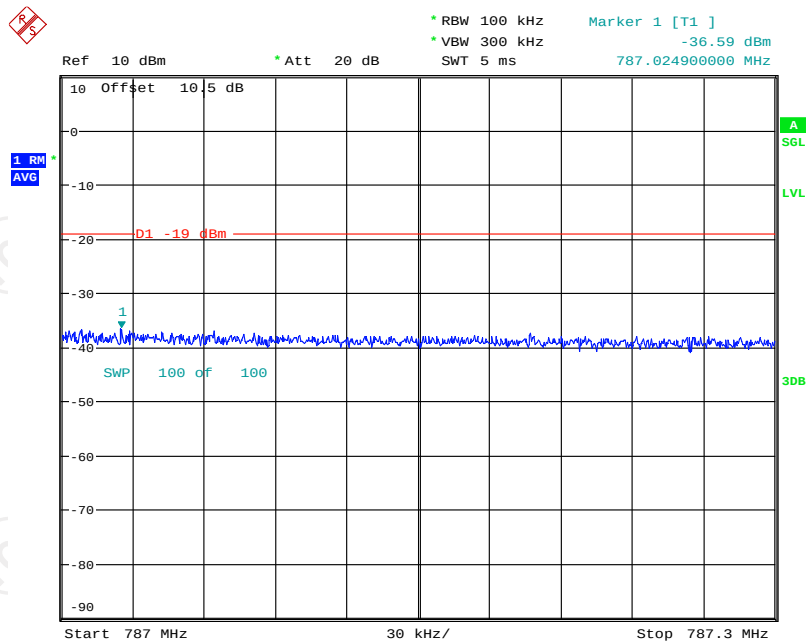
Date: 27.AUG.2018 14:30:35

Band13 LTE UL Left Side 10dB Above AGC



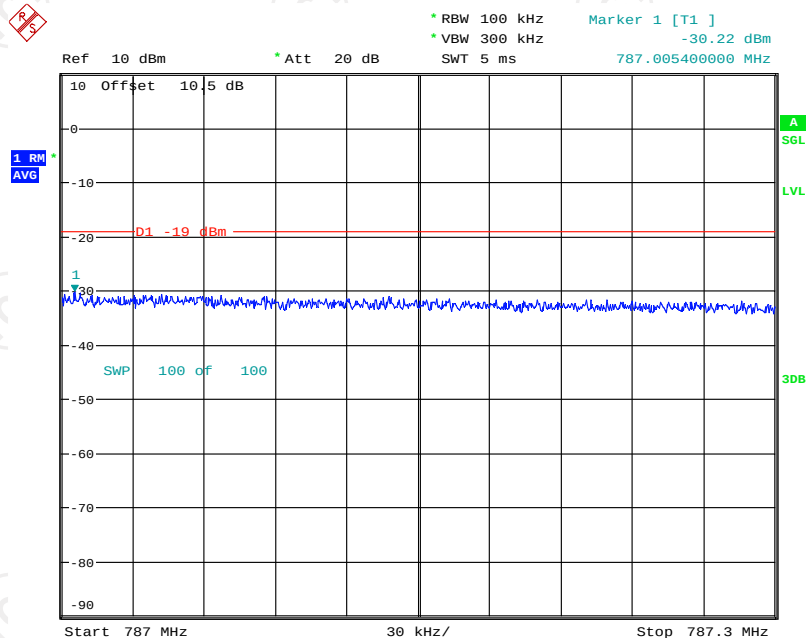
Date: 27.AUG.2018 14:30:58

Band13 LTE UL Right Side Pre AGC



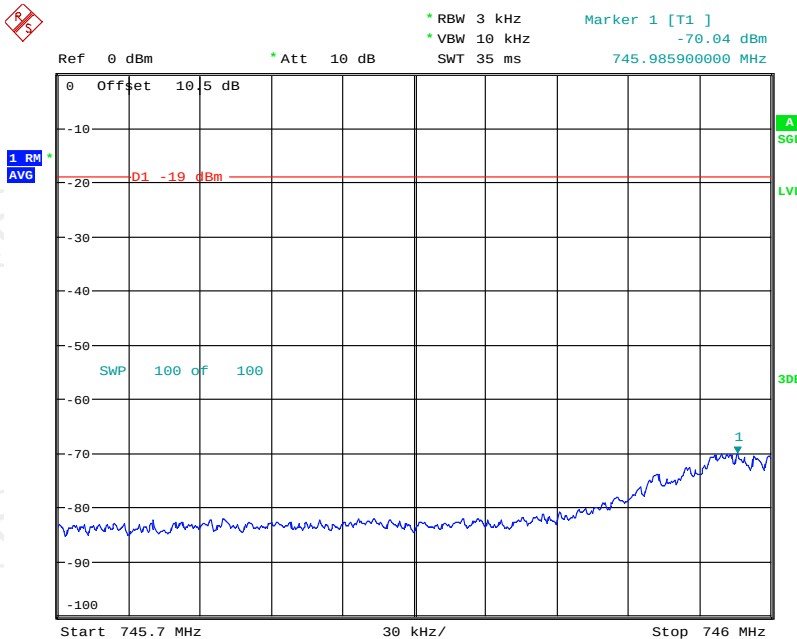
Date: 27.AUG.2018 14:33:06

Band13 LTE UL Right Side 10dB Above AGC



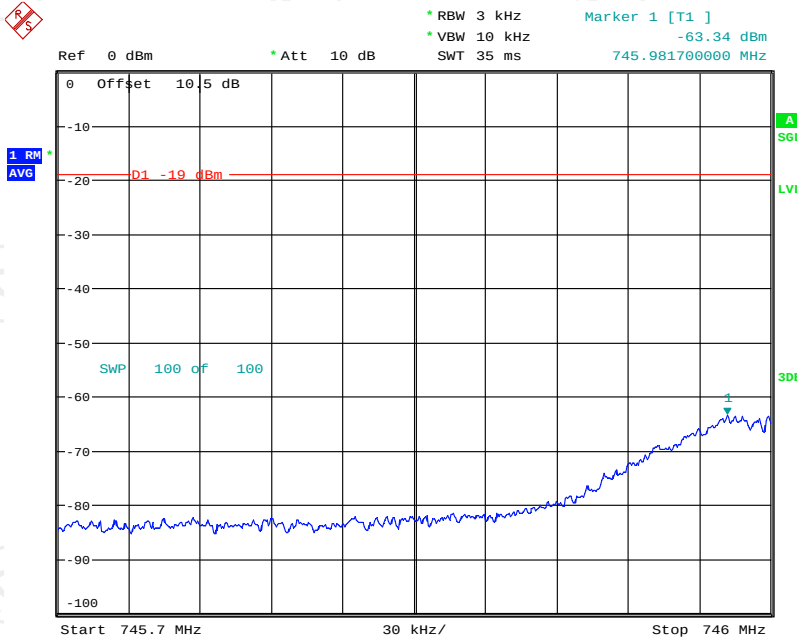
Date: 27.AUG.2018 14:33:24

Band13 GSM DL Left Side Pre AGC



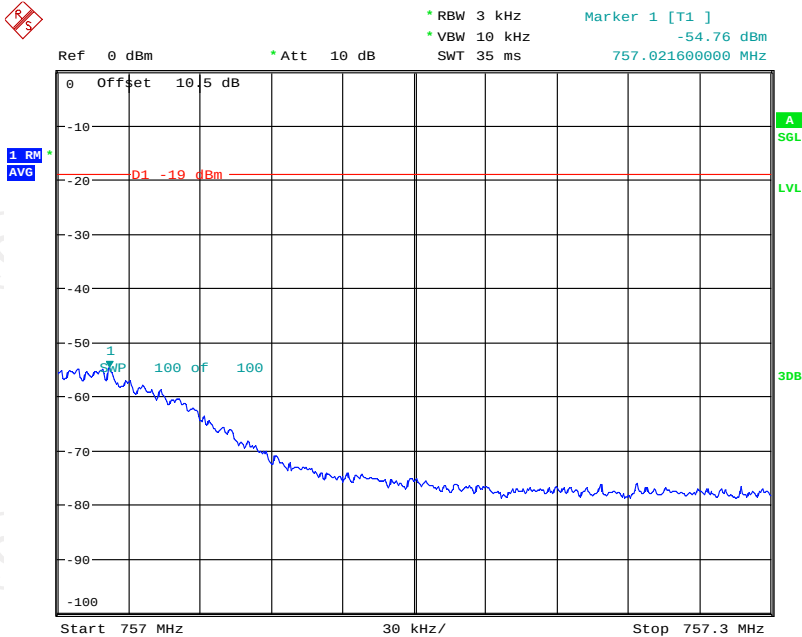
Date: 28.AUG.2018 11:37:04

Band13 GSM DL Left Side 10dB Above AGC



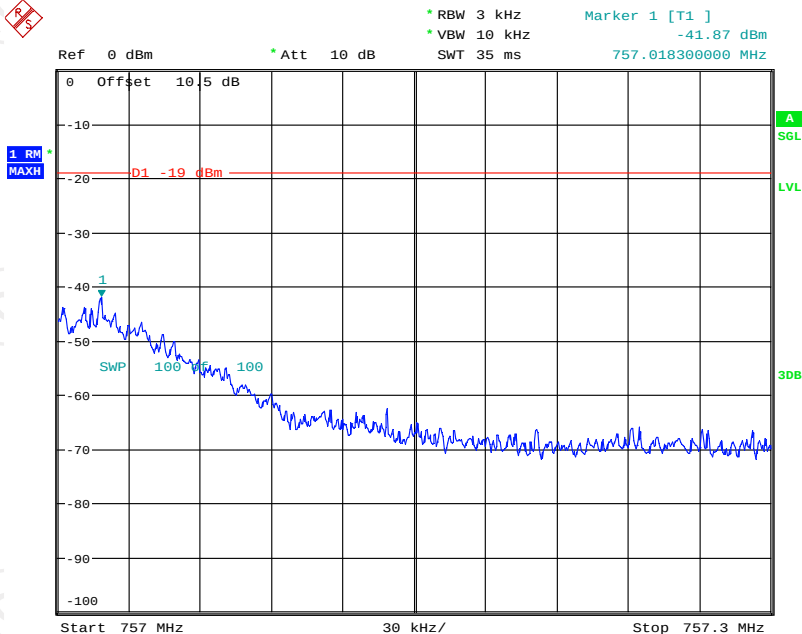
Date: 28.AUG.2018 11:37:29

Band13 GSM DL Right Side Pre AGC



Date: 28.AUG.2018 11:50:38

Band13 GSM DL Right Side 10dB Above AGC



Date: 28.AUG.2018 11:51:02