TCT 通测检测 TESTING CENTRE TECHNOLOGY

TEST REPORT

FCC ID. ..... :	YYOTX2IN-US59
Test Report No..... :	TCT240524E015
Date of issue..... :	Jul. 05, 2024
Testing laboratory ..... :	SHENZHEN TONGCE TESTING LAB
Testing location/ address:	2101 & 2201, Zhenchang Factory Renshan Industrial Zone, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, 518103, People's Republic of China
Applicant's name..... :	Phonetone Technology (Shenzhen) Co., Ltd.
Address..... :	Room 404, Building 12, Qianlong Garden, Minzhi Street, Bao'an District, Shenzhen, 518031 China
Manufacturer's name ... :	Phonetone Technology (Shenzhen) Co., Ltd.
Address..... :	Room 404, Building 12, Qianlong Garden, Minzhi Street, Bao'an District, Shenzhen, 518031 China
Standard(s) ..... :	FCC CFR Title 47 Part 20.21 KDB935210 D03 Signal Booster Measurements v04r04
Product Name..... :	Cell Phone Signal Booster
Trade Mark ..... :	ANTLENT PHONETONE INVCALL CELSGN
Model/Type reference..... :	TX2IN-US59
Rating(s)..... :	Adapter Information: MODEL: SK03T1-1200200U INPUT: AC 100-240V, 50/60Hz, 0.6A OUTPUT: DC 12V, 2A
Date of receipt of test item ..... :	May 24, 2024
Date (s) of performance of test..... :	May 24, 2024 ~ Jul. 05, 2024
Tested by (+signature) ... :	Rleo LIU
Check by (+signature).... :	Beryl ZHAO
Approved by (+signature):	Tomsin

General disclaimer:

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Table of Contents

Hotline: 400-6611-140 Tel: 86-755-27673339 Fax: 86-755-27673332 http://www.tct-lab.com

1. General Product Information

1.1. EUT description

Product Name ..... :	Cell Phone Signal Booster
Model/Type reference ..... :	TX2IN-US59
Sample Number.....:	TCT240524E015-0101
Operation Frequency..... :	PCS Uplink: 1850MHz - 1915MHz, Downlink: 1930MHz - 1995MHz AWS Uplink: 1710MHz - 1755MHz, Downlink: 2110MHz - 2155MHz Cellular Uplink: 824MHz - 849MHz, Downlink: 869MHz - 894MHz Lower700MHz Uplink: 698MHz - 716MHz, Downlink: 728MHz - 746MHz Upper700MHz Uplink: 776MHz - 787MHz, Downlink: 746MHz - 757MHz
Signal Booster Type ..... :	Fixed Consumer Signal Booster
Emission Designator ..... :	F9W, G7D, G7W, GXW, W7D
FCC Classification ..... :	B2W/Wideband Consumer Booster(CMRS)
Rating(s) ..... :	Adapter Information: MODEL: SK03T1-1200200U INPUT: AC 100-240V, 50/60Hz, 0.6A OUTPUT: DC 12V, 2A

Note: The antenna gain listed in this report is provided by applicant, and the test laboratory is not responsible for this parameter.

1.2. Model(s) list

None.

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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.

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3. General Information

3.1. Test environment

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

3.2. 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
/	/	/	/	/

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4. Facilities and Accreditations

4.1. Facilities

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

- FCC - Registration No.: 645098

  SHENZHEN TONGCE TESTING LAB

  Designation Number: CN1205

  The testing lab 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

  SHENZHEN TONGCE TESTING LAB

  CAB identifier: CN0031

  The testing lab has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing.

4.2. Location

SHENZHEN TONGCE TESTING LAB

Address: 2101 & 2201, Zhenchang Factory Renshan Industrial Zone, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, 518103, People's Republic of China

TEL: +86-755-27673339

4.3. Measurement Uncertainty

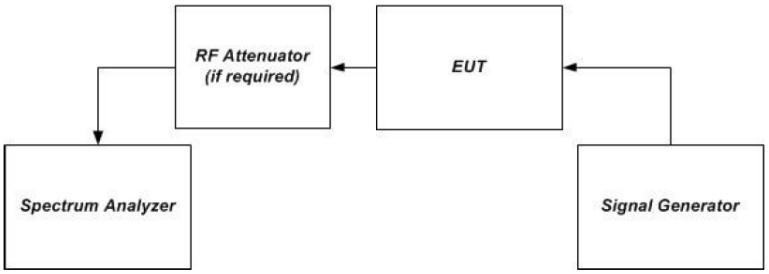
The reported uncertainty of measurement y ± U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

No.	Item	MU
1	Conducted Emission	± 3.10 dB
2	RF power, conducted	± 0.12 dB
3	Spurious emissions, conducted	± 0.11 dB
4	All emissions, radiated(<1 GHz)	± 4.56 dB
5	All emissions, radiated(1 GHz - 18 GHz)	± 4.22 dB
6	All emissions, radiated(18 GHz- 40 GHz)	± 4.36 dB

5. Test Results and Measurement Data

5.1. Authorized Frequency Band Verification

5.1.1. Test Specification

Test Requirement:	FCC Part20 Section 20.21(e)(3)
Test Method:	KDB935210 D03 Signal Booster Measurements v04r04
Limit	PCS Uplink: 1850MHz - 1915MHz, Downlink: 1930MHz - 1995MHz AWS Uplink: 1710MHz - 1755MHz, Downlink: 2110MHz - 2155MHz Cellular Uplink: 824MHz - 849MHz, Downlink: 869MHz - 894MHz Lower700MHz Uplink: 698MHz - 716MHz, Downlink: 728MHz - 746MHz Upper700MHz Uplink: 776MHz - 787MHz, Downlink: 746MHz - 757MHz
Test Setup:	
Test Procedure:	935210 D03 Signal Booster Measurement v04r04 a) Connect the EUT to the test equipment as shown in Figure 1. Begin with the uplink output (donor) port connected to the spectrum analyzer. b) Set the spectrum analyzer resolution bandwidth (RBW) for 100 kHz with the video bandwidth (VBW) ≥ 3 x the RBW, using a PEAK detector with the MAX HOLD function. c) Set the center frequency of the spectrum analyzer to the center of the operational band under test with a span of 1 MHz. d) Set the signal generator for CW mode and tune to the center frequency of the operational band under test. e) Set the initial signal generator power to a level that is at least 6 dB below the AGC level specified by the manufacturer. f) Slowly increase the signal generator power level until the output signal reaches the AGC operational level. g) 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). h) 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. i) 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). j) Capture the spectrum analyzer trace for inclusion in the test report. k) Repeat 7.1c) to 7.1j) for all operational uplink and downlink bands.

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Test Result:	PASS

5.1.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Signal Generator	Agilent	N5182A	MY47070282	Feb. 01, 2024	Jan. 31, 2025
Spectrum Analyzer	R&S	FSV40-N	102188	Feb. 01, 2024	Jan. 31, 2025
Attenuator	50FP-006-H3	JFW	907763	/	/

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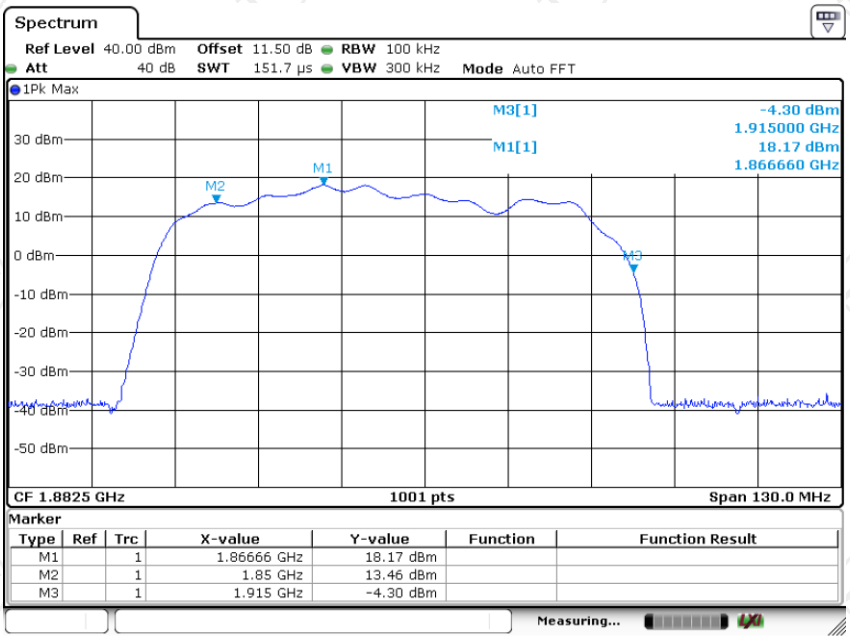
5.1.3. Test data

Test Plots

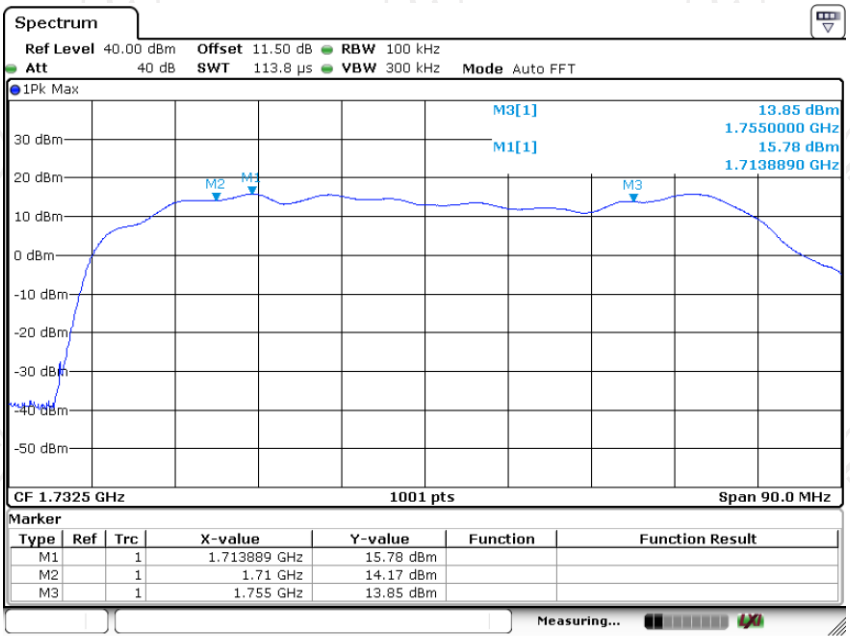
Uplink:

Outdoor + Indoor 1

PCS



AWS



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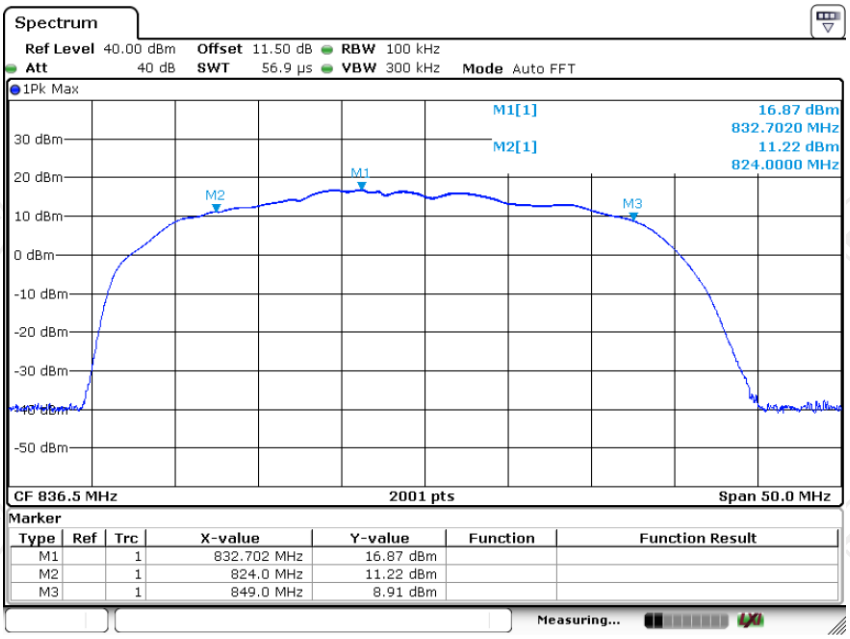

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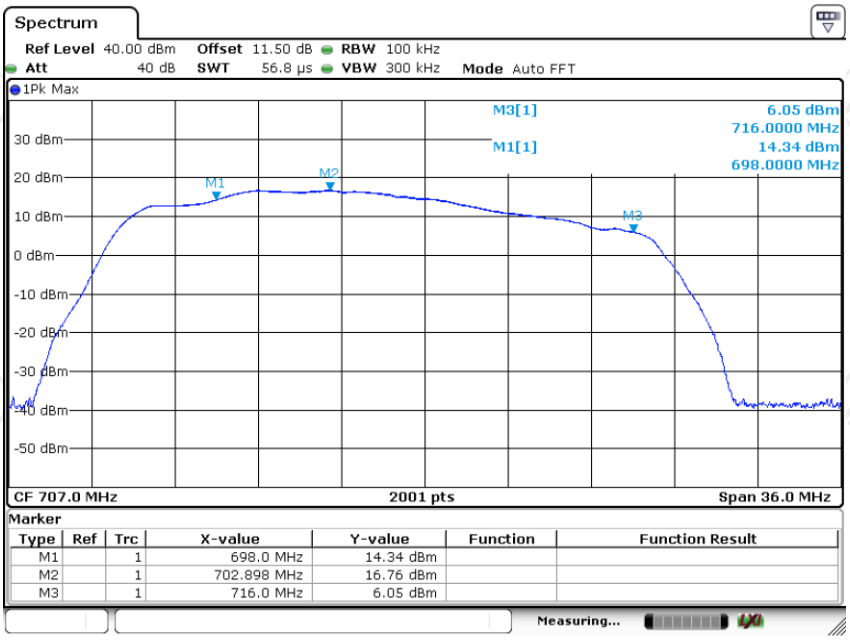
Lower700MHz



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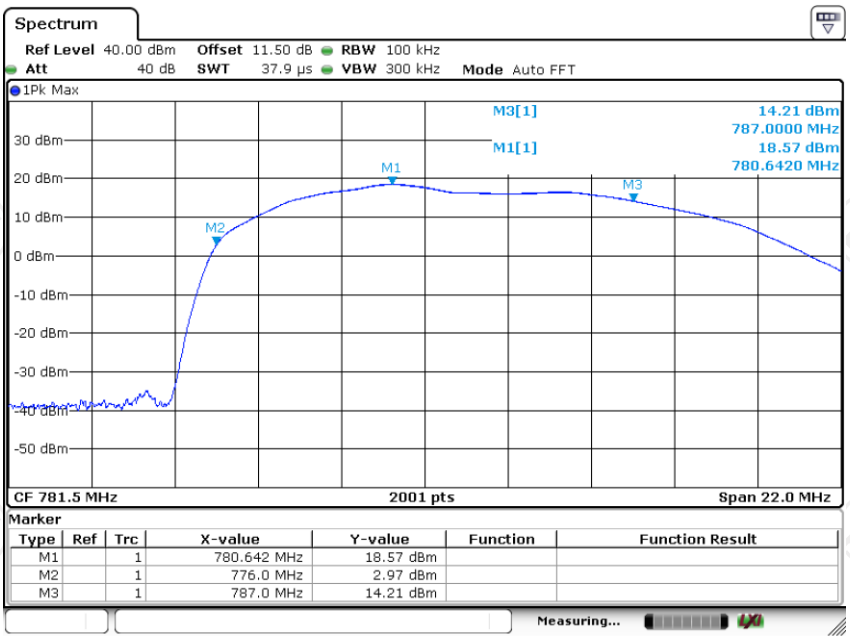
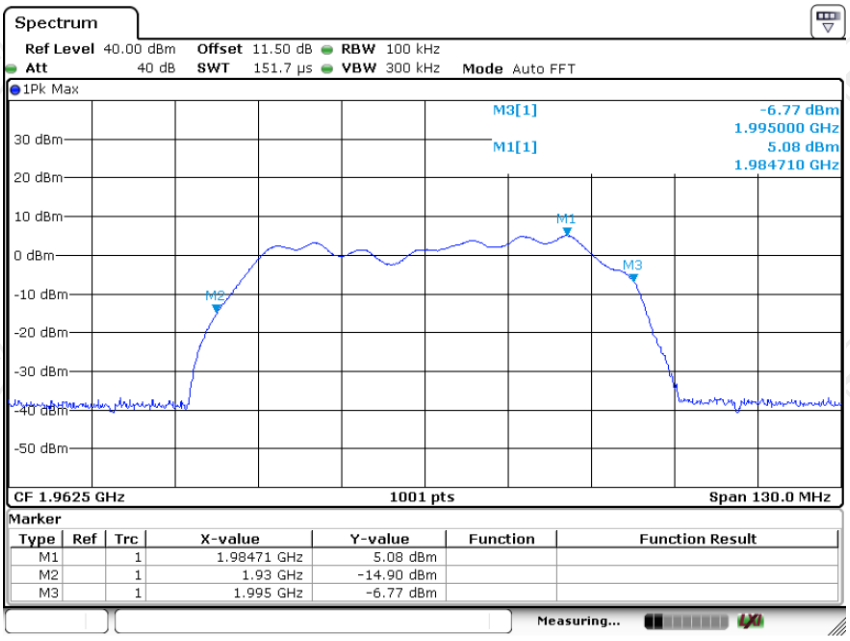
Upper700MHz



Downlink :

Outdoor + Indoor 1

PCS



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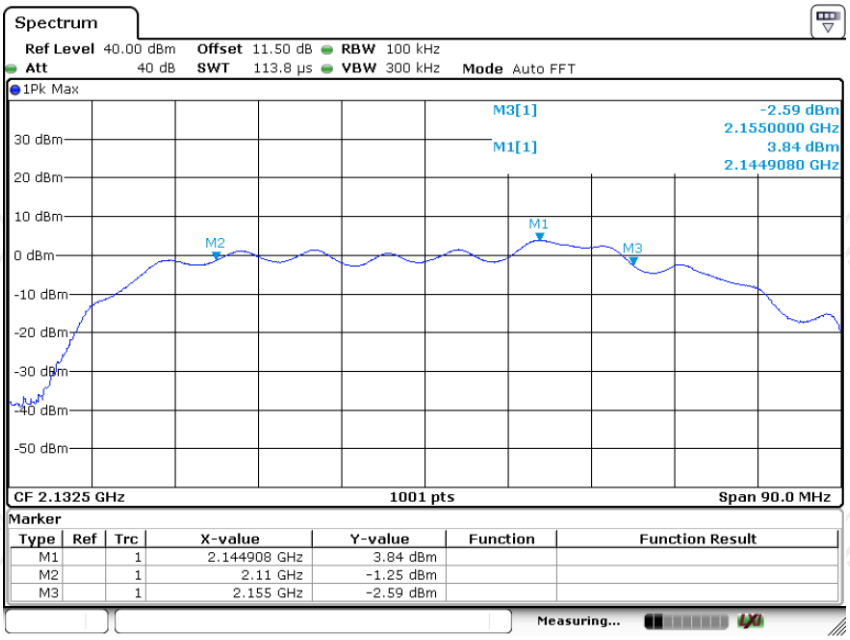

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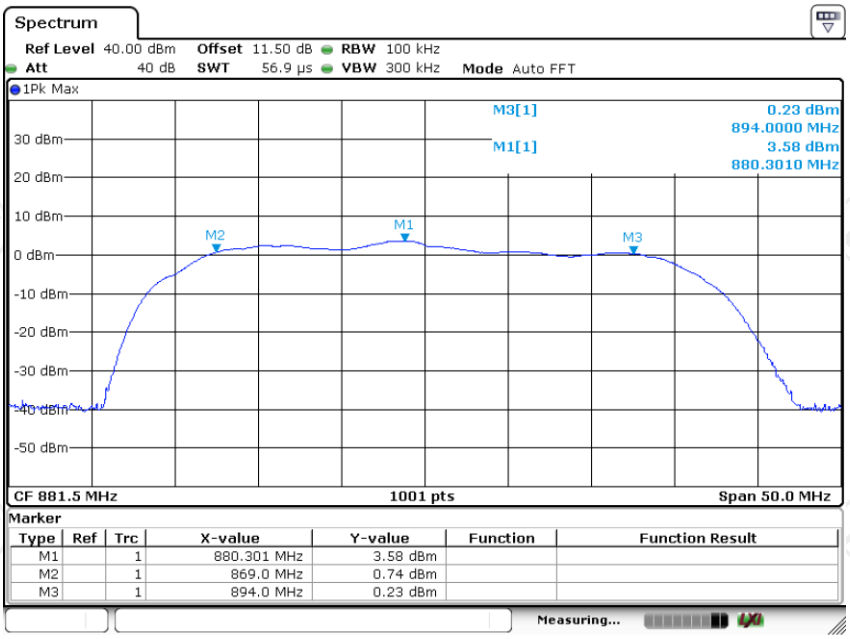

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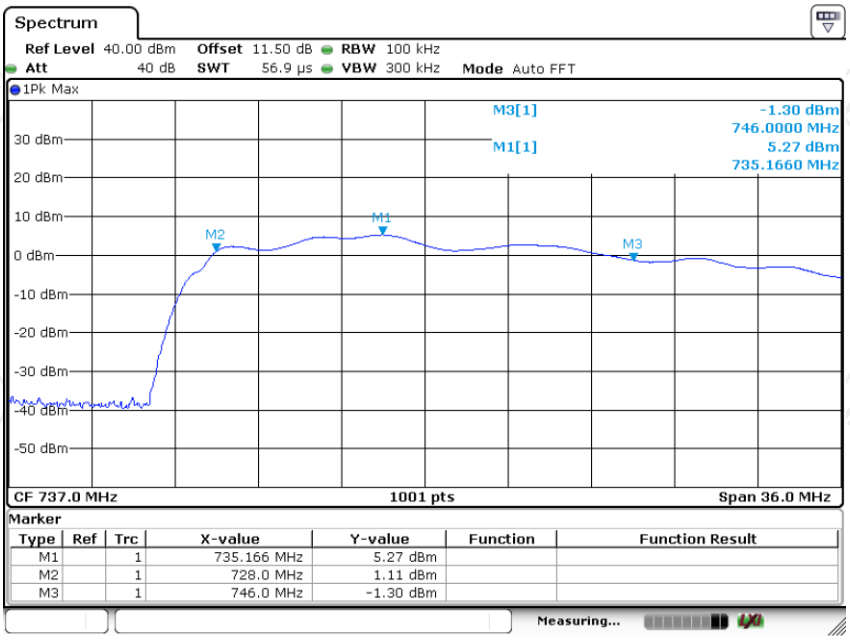

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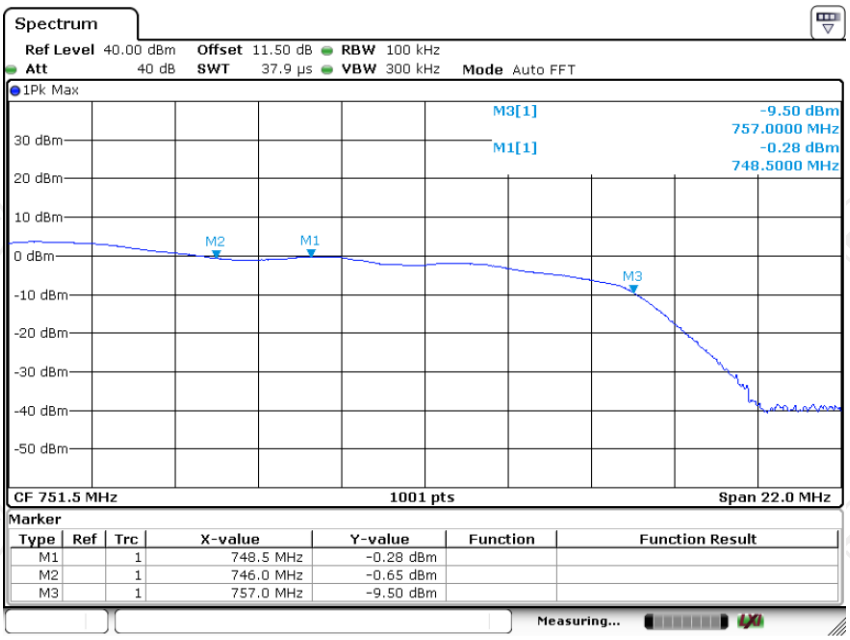
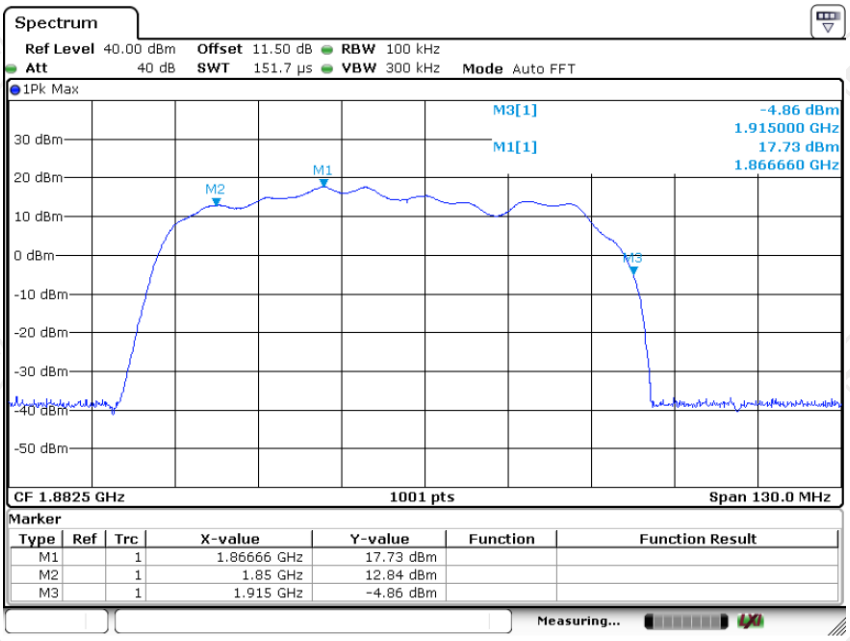


Uplink :

Outdoor + Indoor 2

PCS



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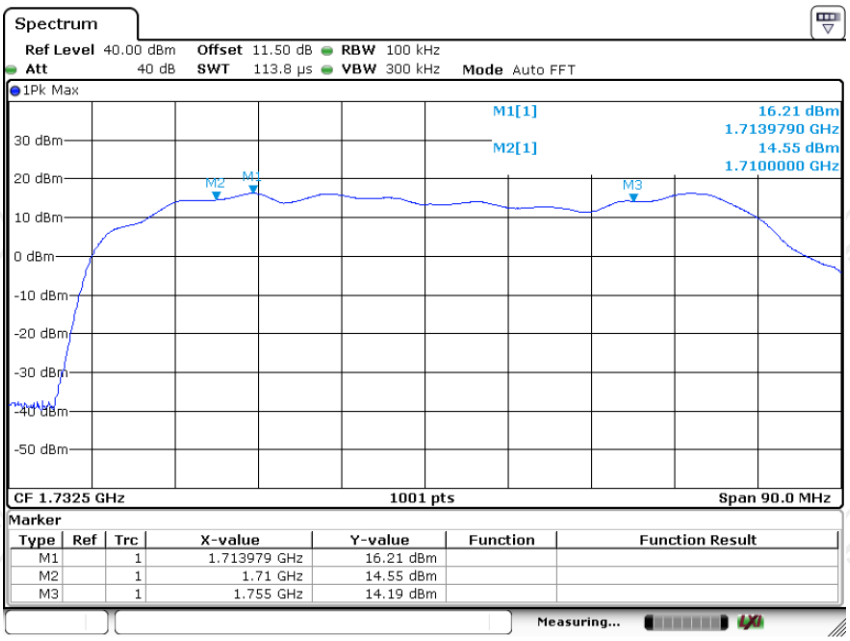

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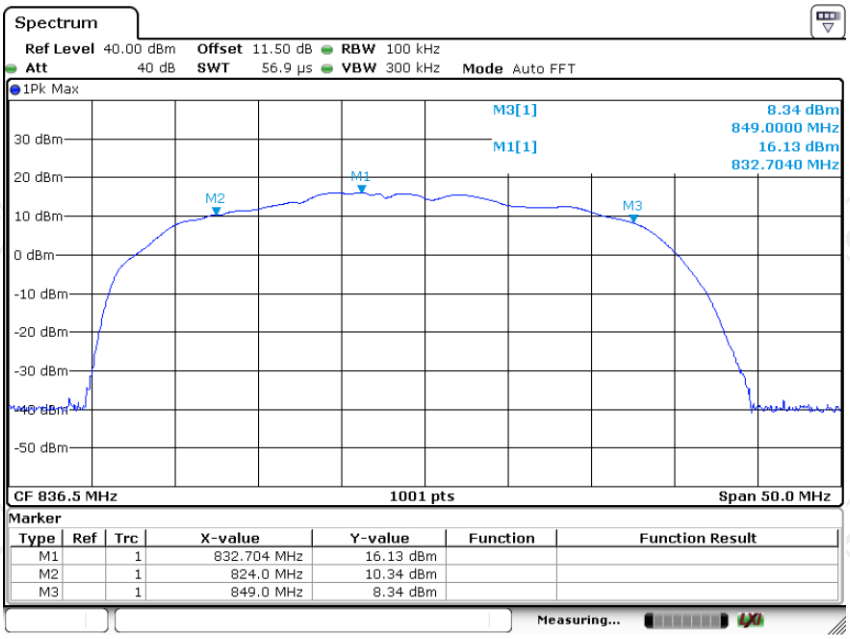
Cellular



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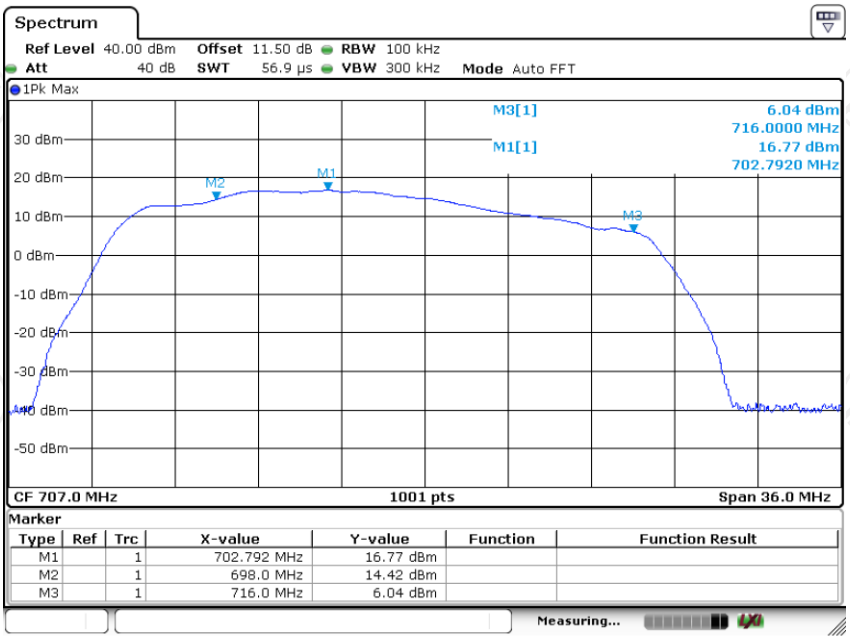
Lower700MHz



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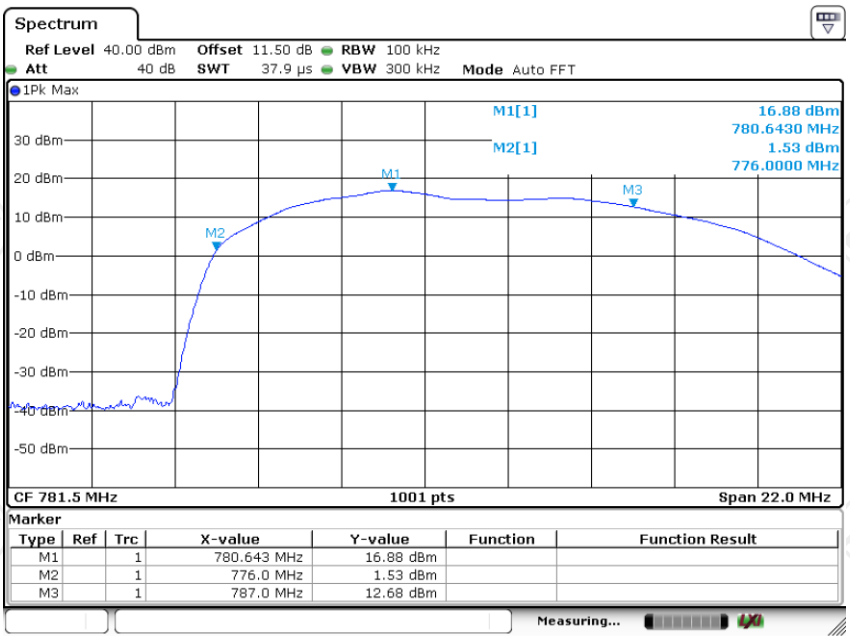
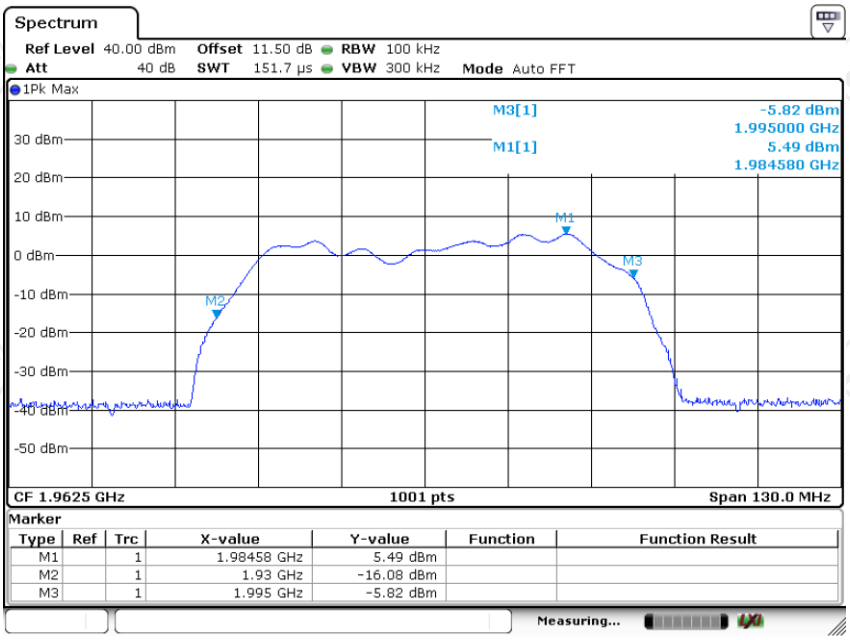
Upper700MHz



Downlink:

Outdoor + Indoor 2

PCS



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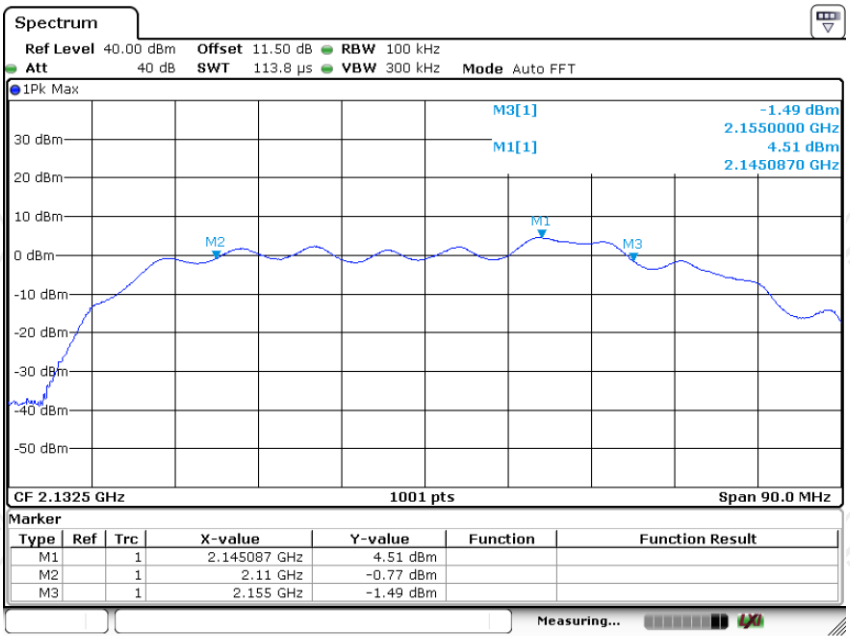

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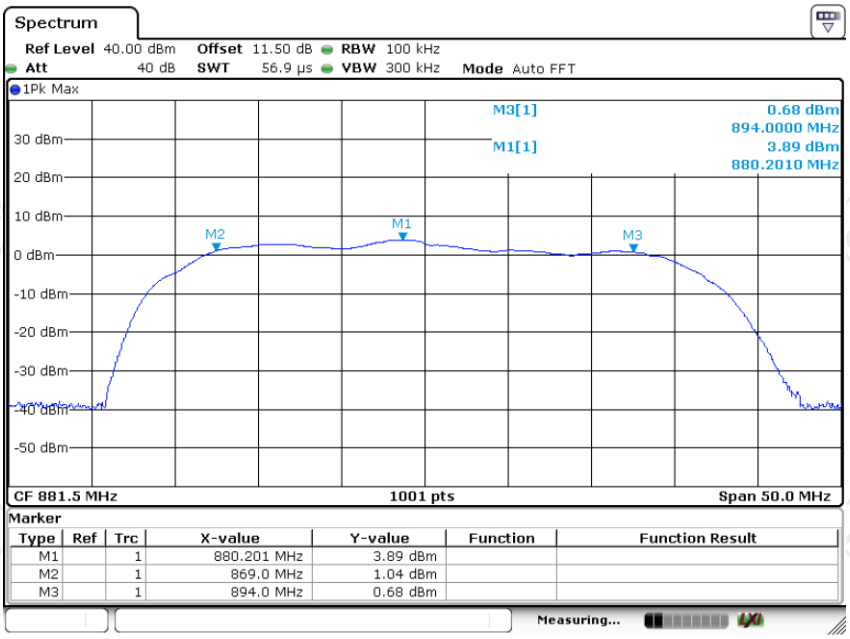

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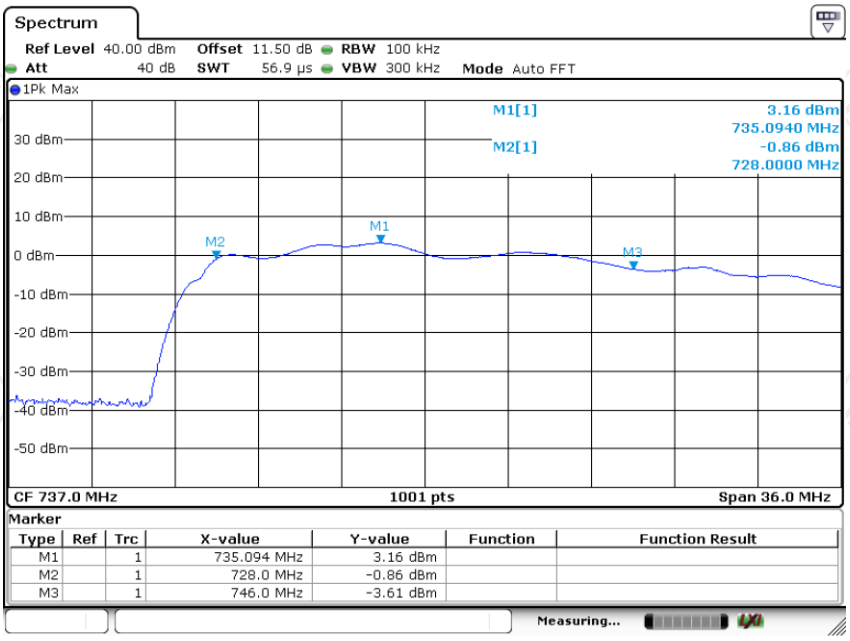
Lower700MHz



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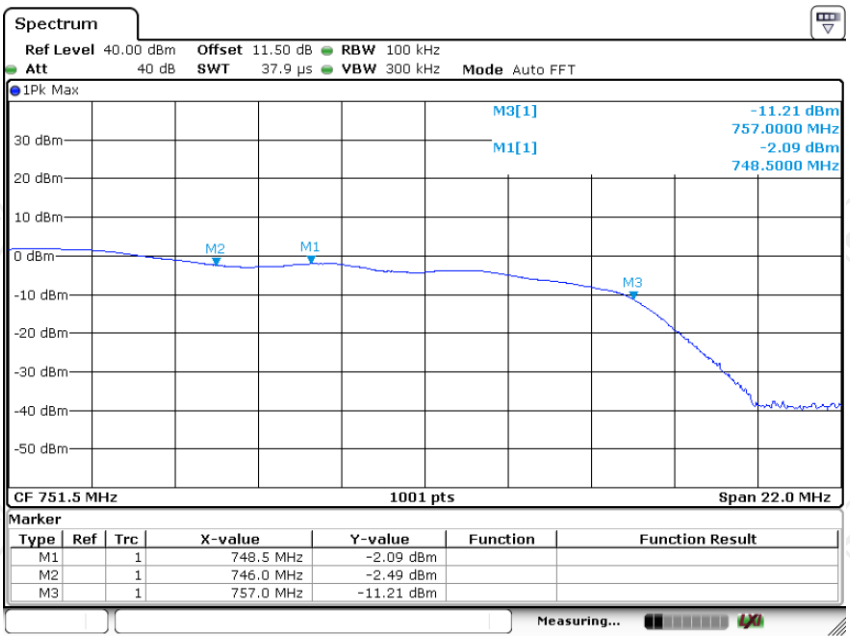
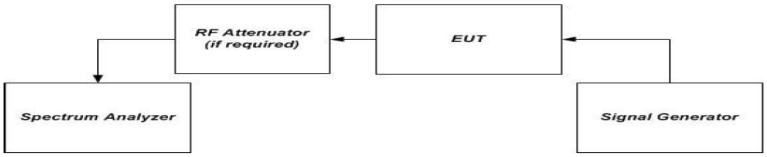
Upper700MHz



5.2. Maximum Power

5.2.1. 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 Measurements v04r04
Limit:	Gain: Fixed Booster maximum gain shall not exceed 6.5 dB + 20 Log10 (Frequency) *Where, Frequency is the uplink mid-band frequency of the supported spectrum bands in MHz.* Conducted Output Power: 17dBm<P_{uplink} <30dBm, $P_{donwlink}$<17dBm. EIRP: Uplink<30dBm, Donwlink<17dBm.
Test Setup:	
Test Procedure:	a) Connect the EUT to the test equipment as shown in Set-Up. Begin with the uplink output (donor port) connected to the spectrum analyzer. b) 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. c) Set the initial signal generator power to a level well below that which causes AGC control. d) 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). e) Reduce power sufficiently on the signal generator to ensure that the AGC is not controlling the power output. f) 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}). g) Measure the output power (P_{out}) with the spectrum analyzer as follows. h) Set RBW = 100 kHz for AWGN signal type and 300 kHz for CW or GSM signal type i) Set VBW ≥ 3X RBW j) 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). k) Select the RMS (power averaging) detector. l) Ensure that the number of measurement points per sweep ≥ (2 x span)/RBW (Note: This requirement does not apply for BURST power measurement mode). m) Set sweep time = auto couple, or as necessary (but no less than auto couple value). n) Trace average at least 100 traces in power averaging (i.e., RMS) mode. o) 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. p) Repeat the procedure for each operational uplink and downlink frequency band supported by the booster.

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Test Result:	PASS

5.2.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Signal Generator	Agilent	N5182A	MY47070282	Feb. 01, 2024	Jan. 31, 2025
Spectrum Analyzer	R&S	FSV40-N	102188	Feb. 01, 2024	Jan. 31, 2025
Attenuator	50FP-006-H3	JFW	907763	/	/

5.2.3. Test Data

Max. Gain

Outdoor + Indoor 1

Frequency Band	Signal Type	Pre AGC Input Level (dBm)	Conducted Output Level (dBm)	Gain (dB)	Gain Limit (dB)
PCS Uplink	CW	-41.2	22.97	64.17	71.98
	AWGN	-40.3	22.06	62.36	
AWS Uplink	CW	-47.7	17.14	64.84	71.27
	AWGN	-48.2	17.36	65.56	
Cellular Uplink	CW	-40.1	20.20	60.30	64.95
	AWGN	-40.3	20.17	60.47	
Lower700MHz Uplink	CW	-39.3	17.09	56.39	63.49
	AWGN	-39.2	17.28	56.48	
Upper700MHz Uplink	CW	-37.8	19.42	57.22	64.36
	AWGN	-37.8	18.04	55.84	
PCS Downlink	CW	-62.8	5.32	68.12	71.98
	AWGN	-62.8	4.12	66.92	
AWS Downlink	CW	-60.1	7.70	67.80	71.27
	AWGN	-60.1	7.18	67.28	
Cellular Downlink	CW	-57.9	4.93	62.83	64.95
	AWGN	-57.4	4.43	61.83	
Lower700MHz Downlink	CW	-55.8	6.11	61.91	63.49
	AWGN	-58.1	4.58	62.68	
Upper700MHz Downlink	CW	-53.2	4.53	57.73	64.36
	AWGN	-52.4	4.66	57.06	

Note: Fixed Booster maximum gain shall not exceed 6.5 dB + 20 Log10 (Frequency), where Frequency is the uplink mid-band frequency of the supported spectrum bands in MHz.

Outdoor + Indoor 2

Frequency Band	Signal Type	Pre AGC Input Level (dBm)	Conducted Output Level (dBm)	Gain (dB)	Gain Limit (dB)
PCS Uplink	CW	-40.8	22.67	63.47	71.98
	AWGN	-40.2	22.17	62.37	
AWS Uplink	CW	-47.6	17.02	64.62	71.27
	AWGN	-48.3	17.30	65.60	
Cellular Uplink	CW	-40.0	20.52	60.52	64.95
	AWGN	-40.2	19.58	59.78	
Lower700MHz Uplink	CW	-39.2	17.08	56.28	63.49
	AWGN	-40.1	17.51	57.61	
Upper700MHz Uplink	CW	-38.2	19.42	57.62	64.36
	AWGN	-38.2	17.94	56.14	
PCS Downlink	CW	-62.8	4.99	67.79	71.98
	AWGN	-63.0	4.39	67.39	
AWS Downlink	CW	-60.0	8.10	68.10	71.27
	AWGN	-60.1	7.10	67.20	
Cellular Downlink	CW	-57.8	5.24	63.04	64.95
	AWGN	-57.6	4.40	62.00	
Lower700MHz Downlink	CW	-56.0	5.38	61.38	63.49
	AWGN	-58.0	4.73	62.73	
Upper700MHz Downlink	CW	-53.3	4.90	58.20	64.36
	AWGN	-53.1	3.74	56.84	

Note: Fixed Booster maximum gain shall not exceed 6.5 dB + 20 Log10 (Frequency), where Frequency is the uplink mid-band frequency of the supported spectrum bands in MHz.

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Conducted output power at max. Input test level

Outdoor + Indoor 1

Frequency Band	Signal Type	Input Level (dBm)	Conducted Output Level (dBm)	Lower Limit(dBm)	Upper Limit(dBm)
PCS Uplink	CW	-22.5	23.04	17	30
	AWGN	-21.2	21.97		
AWS Uplink	CW	-28.3	17.23		
	AWGN	-29.4	17.20		
Cellular Uplink	CW	-21.7	20.92		
	AWGN	-21.6	20.03		
Lower700MHz Uplink	CW	-20.4	17.16		
	AWGN	-20.3	17.21		
Upper700MHz Uplink	CW	-18.1	19.56		
	AWGN	-18.1	17.89		
PCS Downlink	CW	-43.5	5.47	N/A	17
	AWGN	-43.5	4.49		
AWS Downlink	CW	-41.2	7.23		
	AWGN	-41.2	6.77		
Cellular Downlink	CW	-38.6	4.51		
	AWGN	-38.4	4.28		
Lower700MHz Downlink	CW	-36.1	6.03		
	AWGN	-39.8	4.76		
Upper700MHz Downlink	CW	-34.3	4.60		
	AWGN	-33.1	4.01		

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Outdoor + Indoor 2

Frequency Band	Signal Type	Input Level (dBm)	Conducted Output Level (dBm)	Lower Limit(dBm)	Upper Limit(dBm)
PCS Uplink	CW	-21.6	22.76	17	30
	AWGN	-21.3	21.97		
AWS Uplink	CW	-28.4	17.08		
	AWGN	-29.1	17.12		
Cellular Uplink	CW	-21.5	20.67		
	AWGN	-21.3	19.58		
Lower700MHz Uplink	CW	-20.8	17.11		
	AWGN	-21.2	17.51		
Upper700MHz Uplink	CW	-19.7	19.48		
	AWGN	-19.7	17.95		
PCS Downlink	CW	-43.4	5.06	N/A	17
	AWGN	-44.2	4.47		
AWS Downlink	CW	-41.0	8.10		
	AWGN	-41.5	6.88		
Cellular Downlink	CW	-38.7	4.96		
	AWGN	-38.3	4.49		
Lower700MHz Downlink	CW	-37.2	5.33		
	AWGN	-39.0	4.83		
Upper700MHz Downlink	CW	-34.6	5.49		
	AWGN	-34.3	3.95		

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Max. EIRP

Outdoor + Indoor 1

Frequency Band	Signal Type	Max Conducted Output Level (dBm)	Max. Antenna Gain (dBi)	Min. Cable Loss (dB)	EIRP (dBm)	EIRP Limit (dBm)
PCS Uplink	CW	23.04	3	1.03	25.01	<30
	AWGN	22.06	3	1.03	24.03	
AWS Uplink	CW	17.23	3	0.87	19.36	
	AWGN	17.36	3	0.87	19.49	
Cellular Uplink	CW	20.92	3	0.74	23.18	
	AWGN	20.17	3	0.74	22.43	
Lower700MHz Uplink	CW	17.16	2.7	0.71	19.15	
	AWGN	17.28	2.7	0.71	19.27	
Upper700MHz Uplink	CW	19.56	2.7	0.71	21.55	
	AWGN	18.04	2.7	0.71	20.03	
PCS Downlink	CW	5.47	8	1.73	11.74	<17
	AWGN	4.49	8	1.73	10.76	
AWS Downlink	CW	7.70	8	1.80	13.90	
	AWGN	7.18	8	1.80	13.38	
Cellular Downlink	CW	4.93	6	1.34	9.59	
	AWGN	4.43	6	1.34	9.09	
Lower700MHz Downlink	CW	6.11	6	0.90	11.21	
	AWGN	4.76	6	0.90	9.86	
Upper700MHz Downlink	CW	4.60	6	0.90	9.70	
	AWGN	4.66	6	0.90	9.76	

Note1: Path1 and Path2 have been tested, only the worst case (Path1) is calculated and reported.
Note2: Path1 is Outdoor + Indoor 1
Note3: Path2 is Outdoor + Indoor 2

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Uplink Gain VS Downlink Gain

Outdoor +Indoor 1

Band	Signal Type	Uplink Gain (dB)	Downlink Gain (dB)	D-value	Limit (dB)
PCS	CW	64.17	68.12	3.95	<9
	AWGN	62.36	66.92	4.56	
AWS	CW	64.84	67.80	2.96	
	AWGN	65.56	67.28	1.72	
Cellular	CW	60.30	62.83	2.53	
	AWGN	60.47	61.83	1.36	
Lower700MHz	CW	56.39	61.91	5.52	
	AWGN	56.48	62.68	6.20	
Upper700MHz	CW	57.22	57.73	0.51	
	AWGN	55.84	57.06	1.22	

Outdoor + Indoor 2

Band	Signal Type	Uplink Gain (dB)	Downlink Gain (dB)	D-value	Limit (dB)
PCS	CW	63.47	67.79	4.32	<9
	AWGN	62.37	67.39	5.02	
AWS	CW	64.62	68.10	3.48	
	AWGN	65.60	67.20	1.60	
Cellular	CW	60.52	63.04	2.52	
	AWGN	59.78	62.00	2.22	
Lower700MHz	CW	56.28	61.38	5.10	
	AWGN	57.61	62.73	5.12	
Upper700MHz	CW	57.62	58.20	0.58	
	AWGN	56.14	56.84	0.70	

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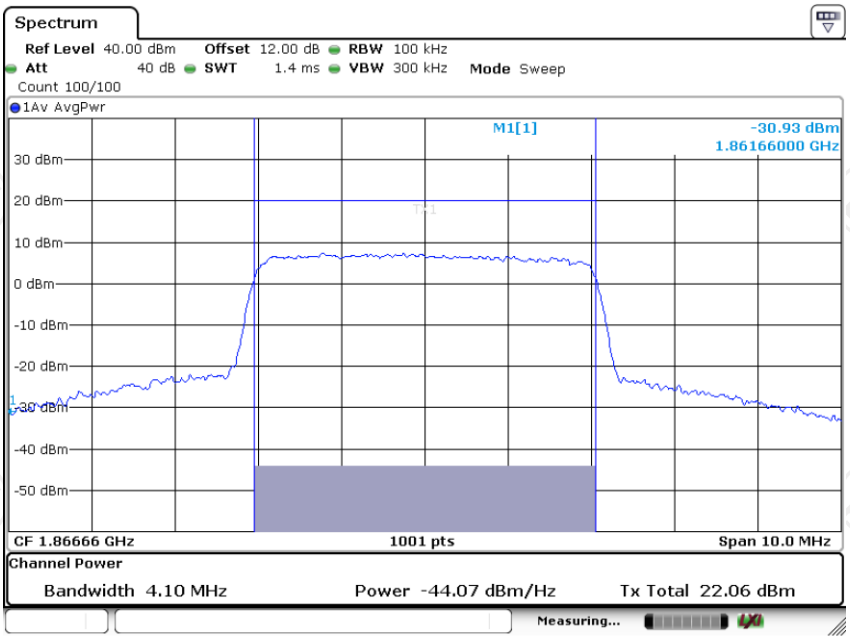
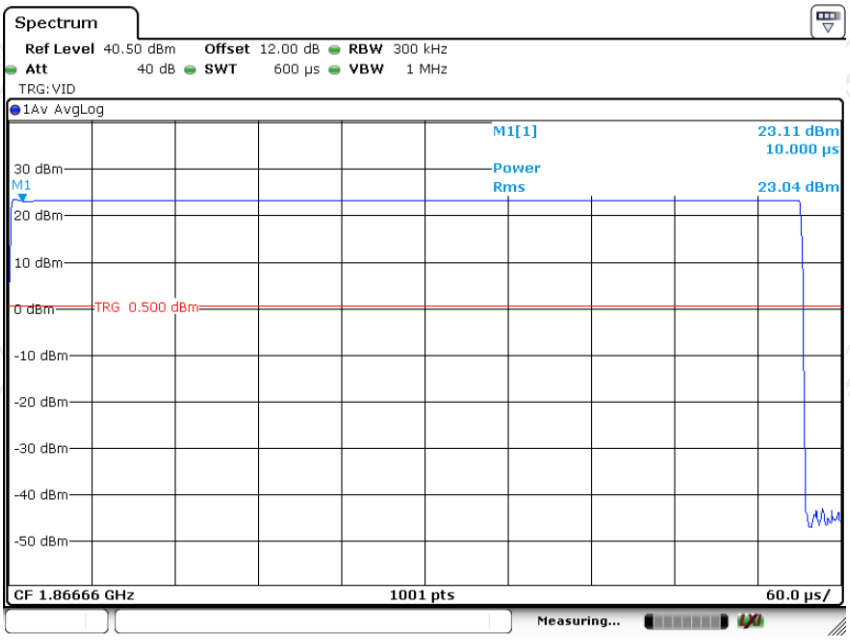
Test Plots

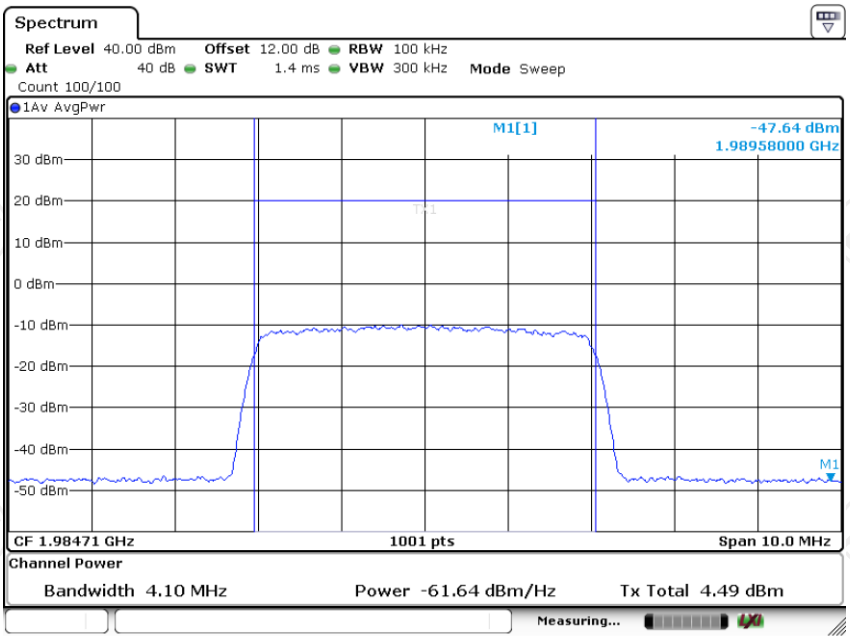
PCS AWGN, UL



PCS CW, UL



PCS AWGN, DL



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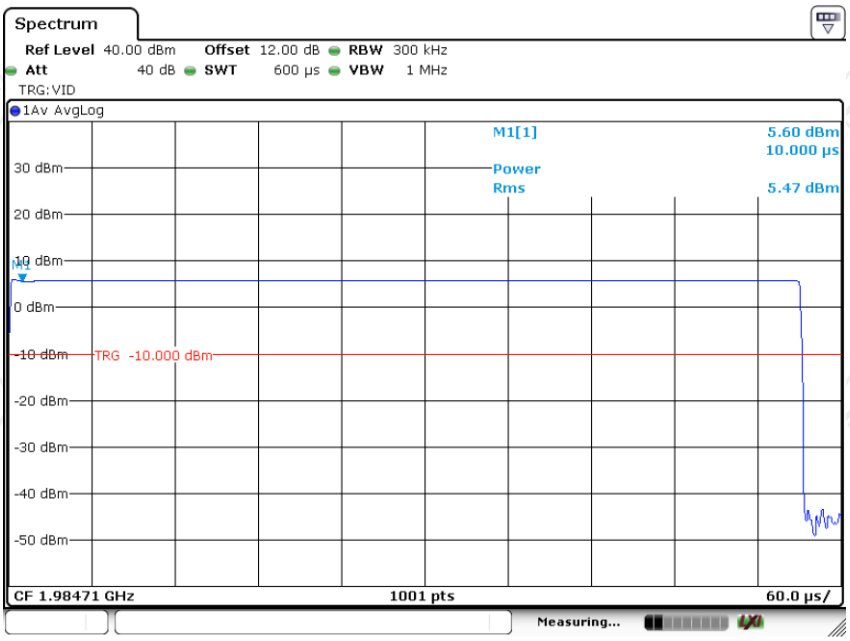
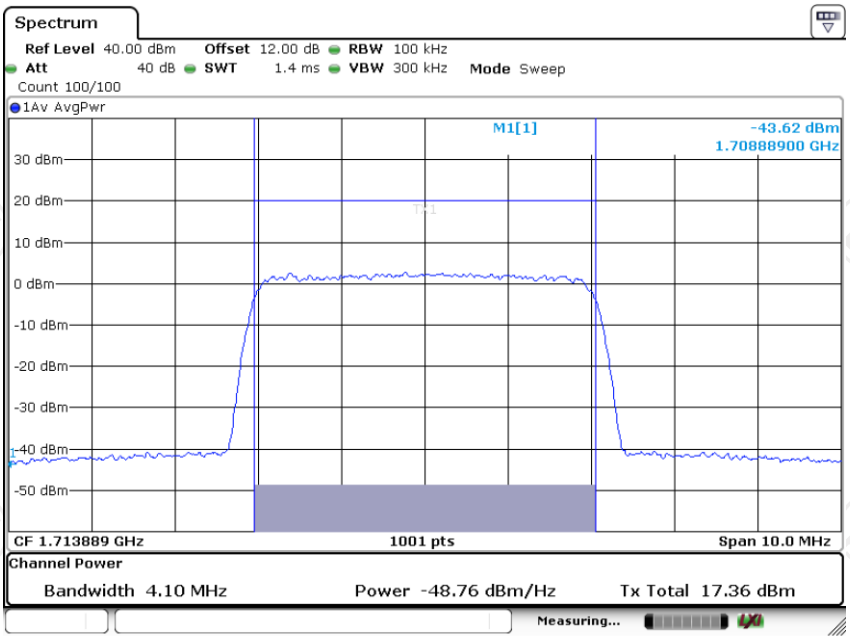
PCS CW, DL



Date: 26.JUN.2024 16:21:56

AWS AWGN, UL



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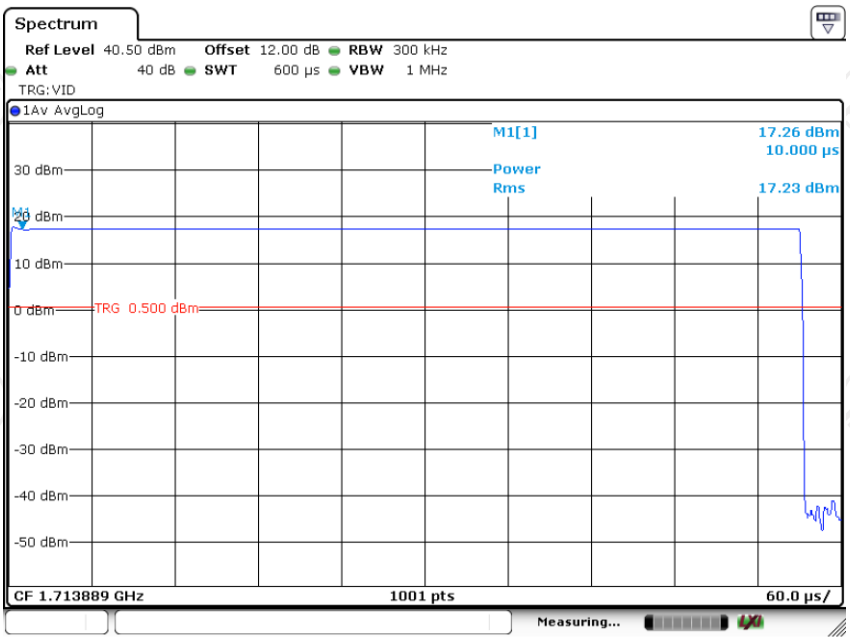
AWS CW, UL



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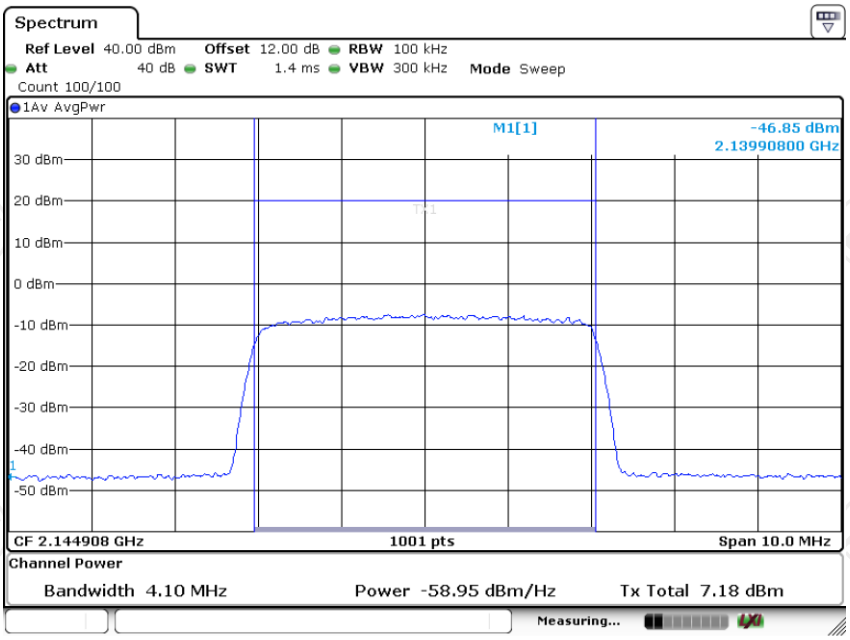
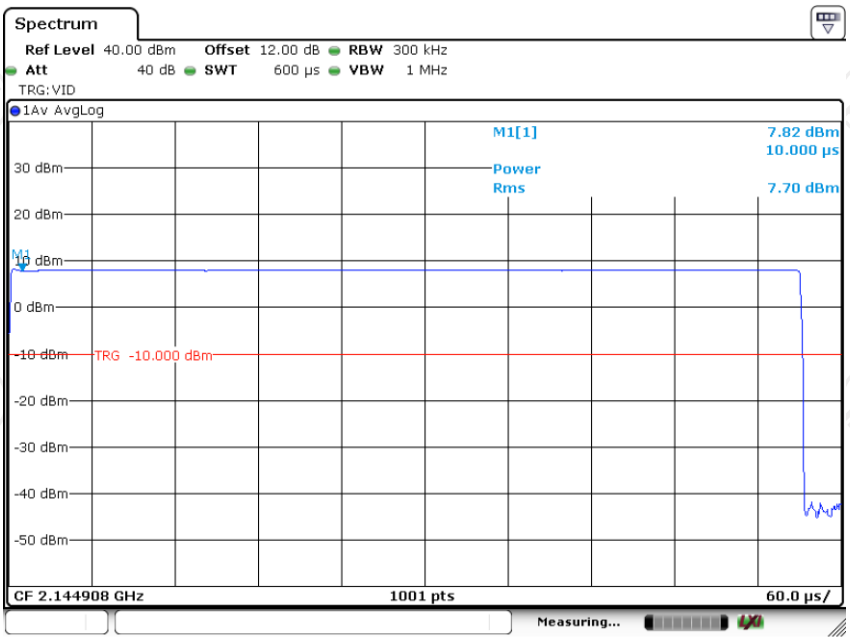
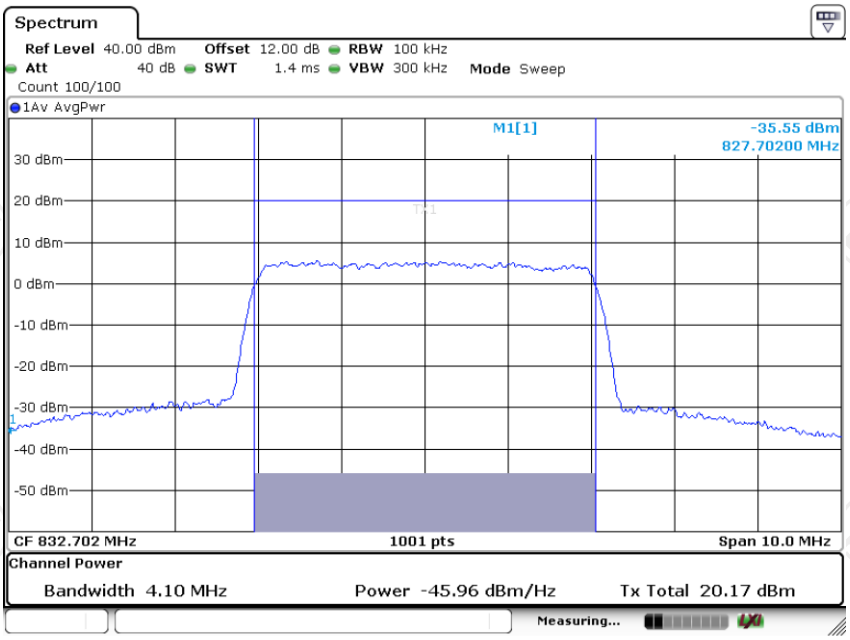
AWS AWGN, DL



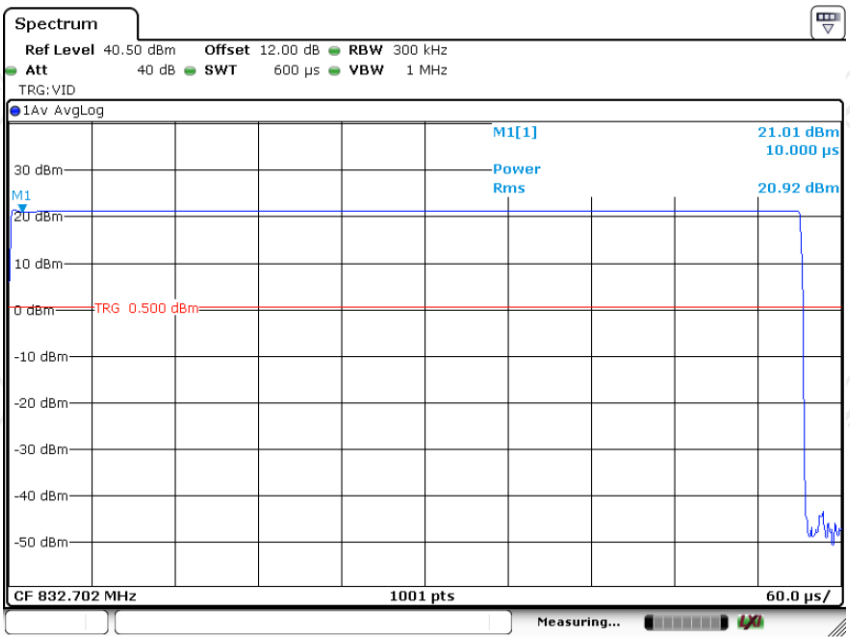
AWS CW, DL



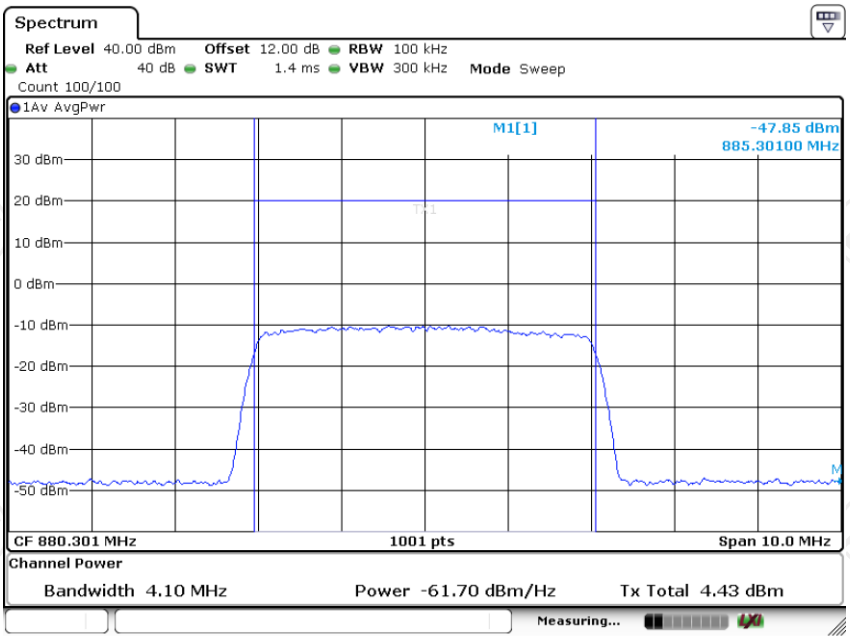
Cellular AWGN, UL



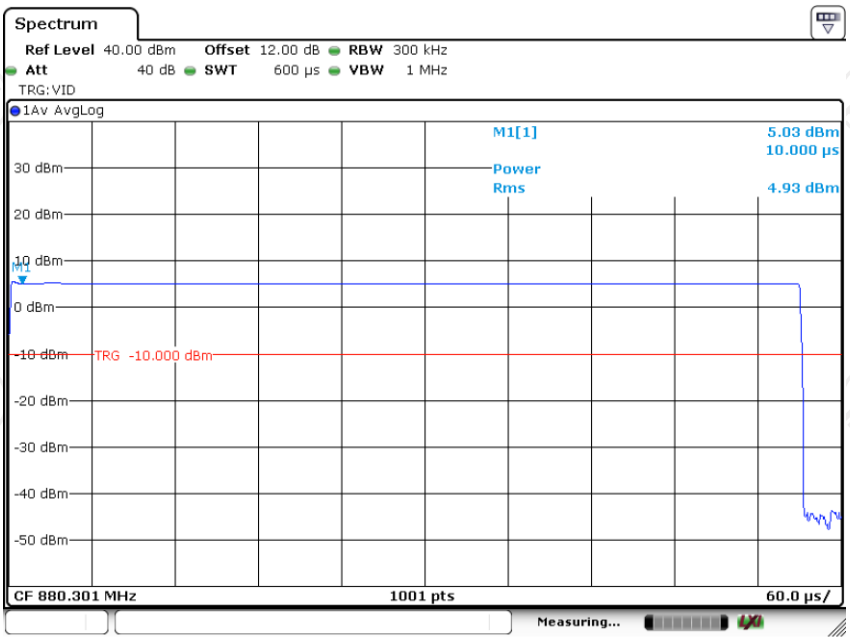
Cellular CW, UL



Cellular AWGN, DL



Cellular CW, DL



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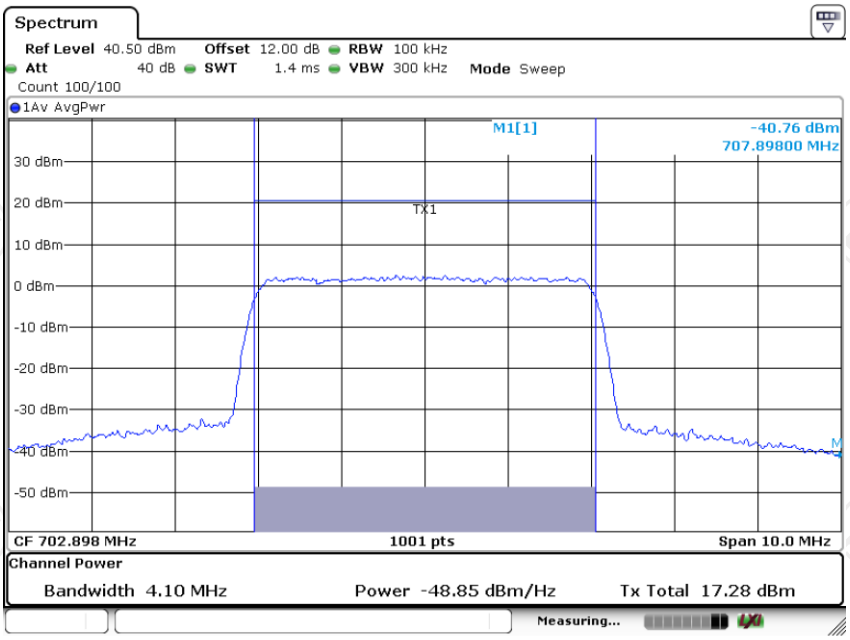
Lower700MHz AWGN, UL



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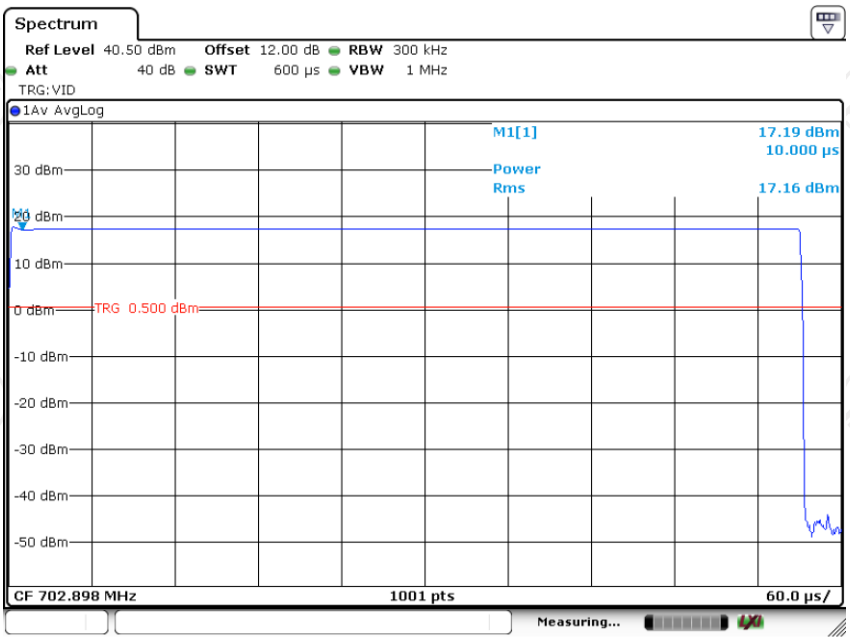
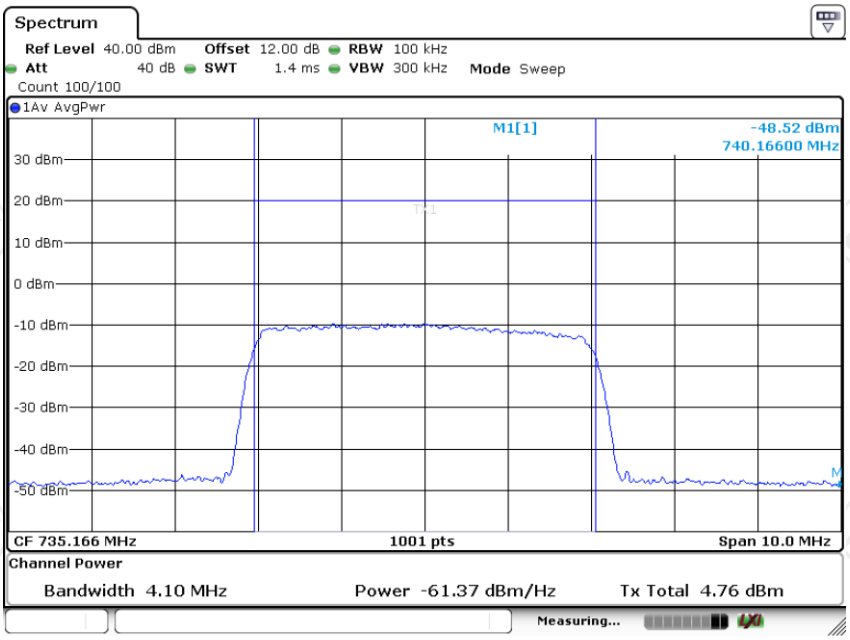
Lower700MHz CW, UL



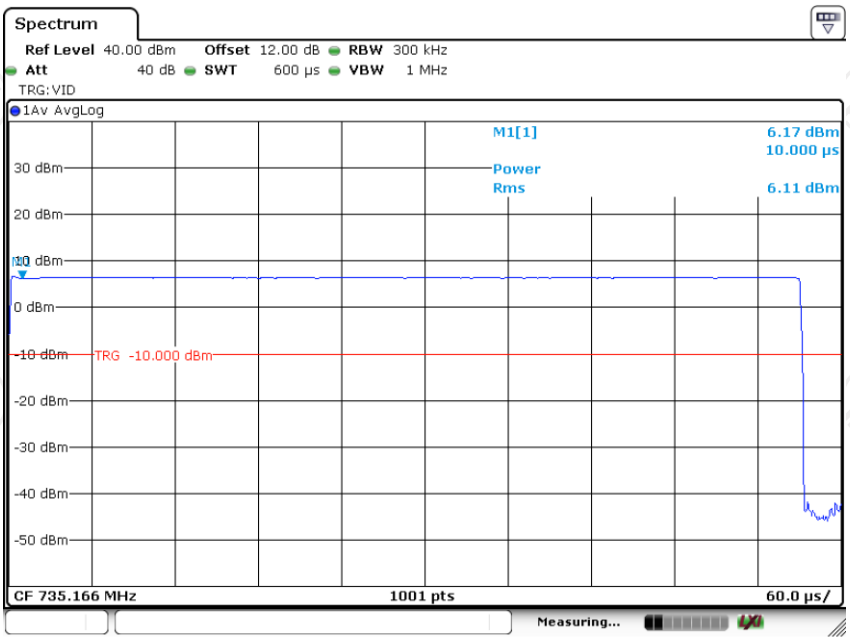
Date: 26.JUN.2024 16:07:19

Lower700MHz AWGN, DL



Date: 26.JUN.2024 17:50:26

Lower700MHz CW, DL



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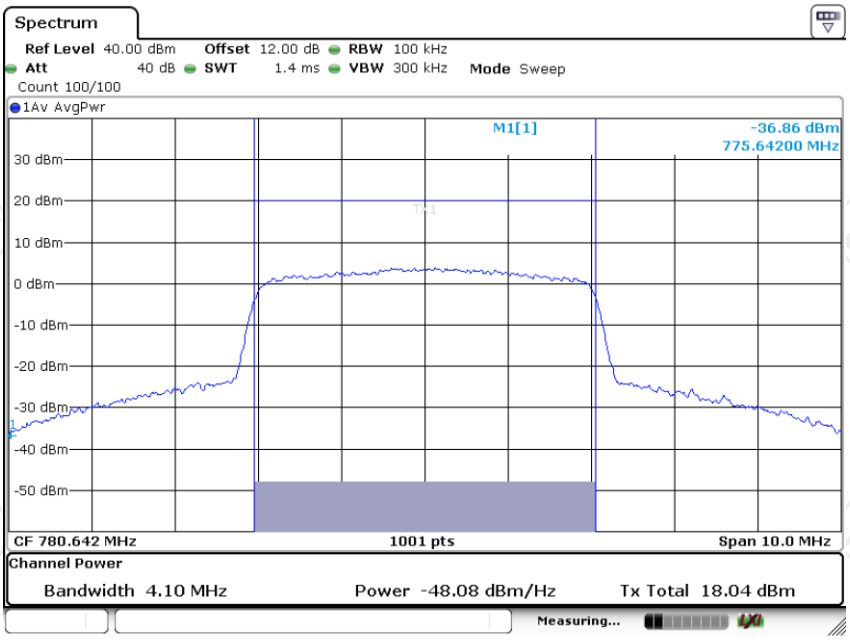
Upper700MHz AWGN, UL



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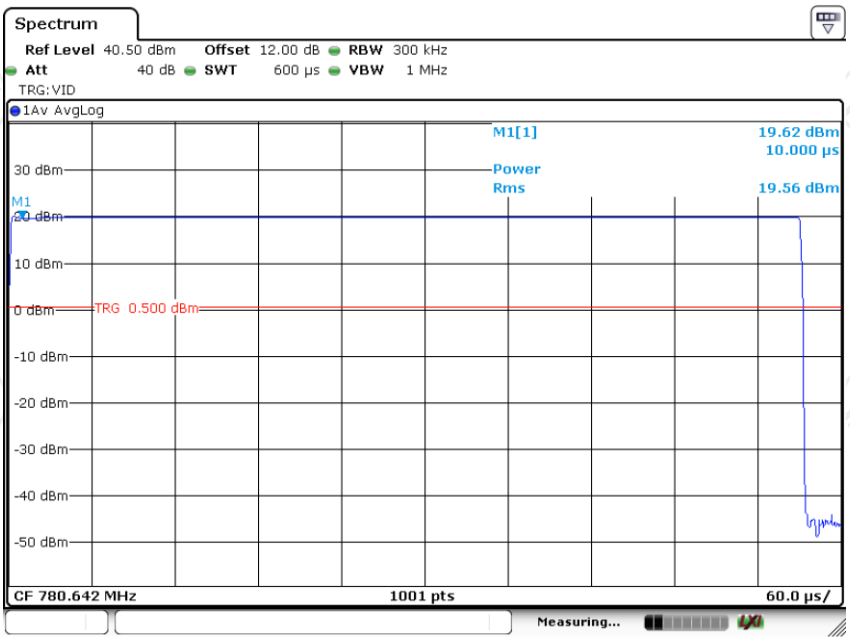
Upper700MHz CW, UL



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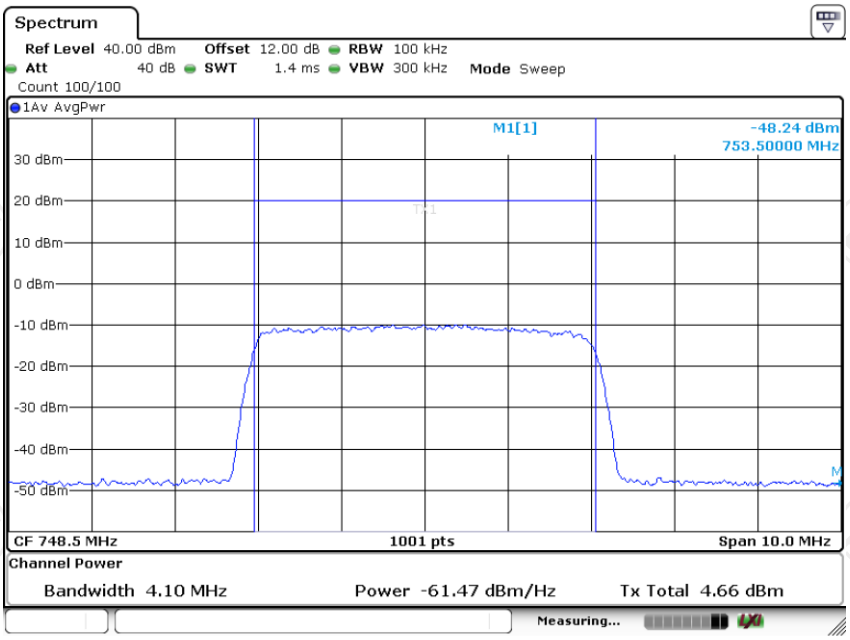
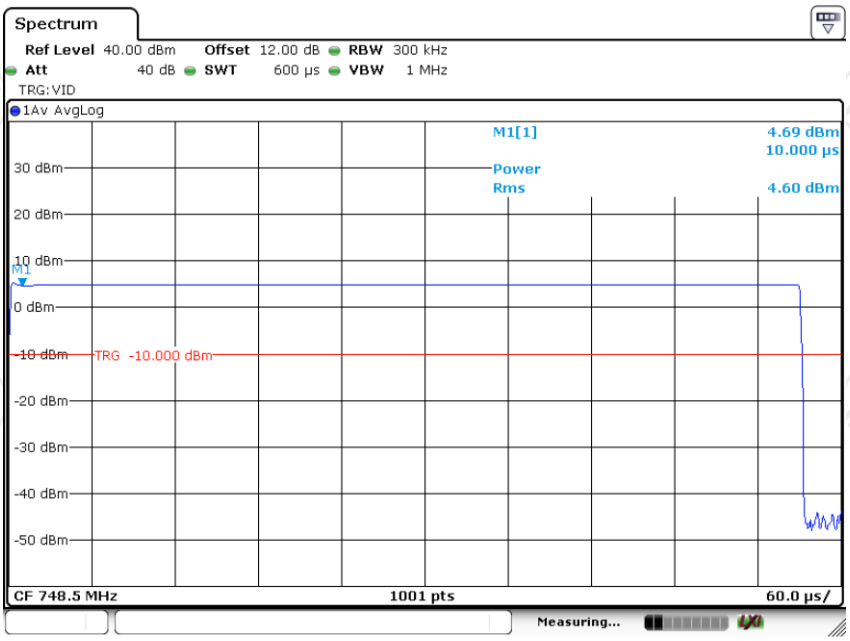
Upper700MHz AWGN, DL



Date: 26.JUN.2024 17:48:00

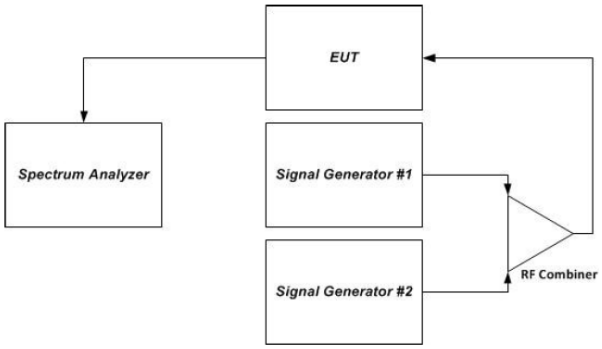
Upper700MHz CW, DL



Date: 26.JUN.2024 16:15:51

5.3. Intermodulation Product

5.3.1. Test Specification

Test Requirement:	FCC Part20 Section 20.21(e)(8)(i)(F)
Test Method:	KDB935210 D03 Signal Booster Measurements v04r04
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 ≥ 3 X 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

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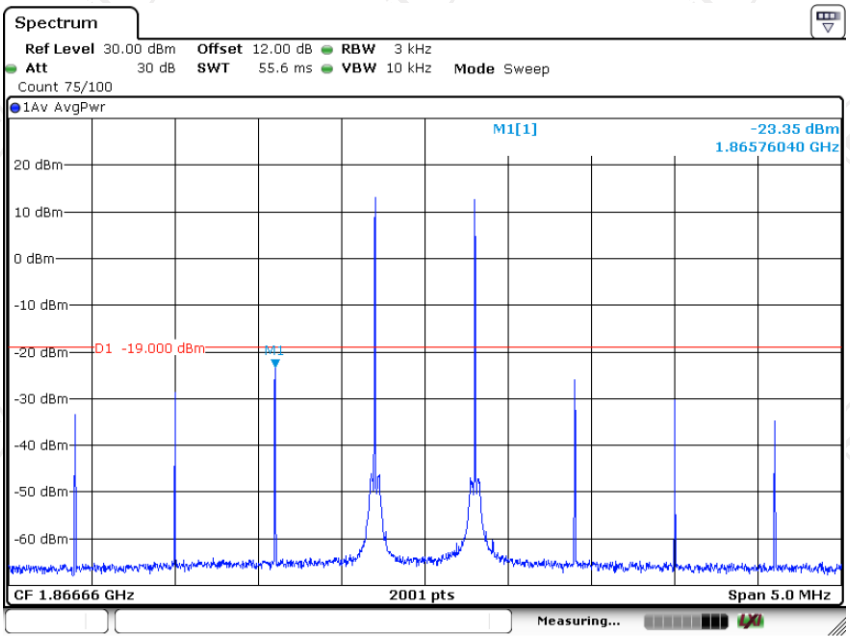
5.3.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Signal Generator	Agilent	N5182B	MY53052214	Jun. 27, 2024	Jun. 26, 2025
Signal Generator	Agilent	N5182A	MY47070282	Feb. 01, 2024	Jan. 31, 2025
Spectrum Analyzer	R&S	FSV40-N	102188	Feb. 01, 2024	Jan. 31, 2025
RF Combiner	SUNVNDN	SUD-CS 0800	16230009	/	/
Attenuator	50FP-006-H3	JFW	907763	/	/

5.3.3. Test data

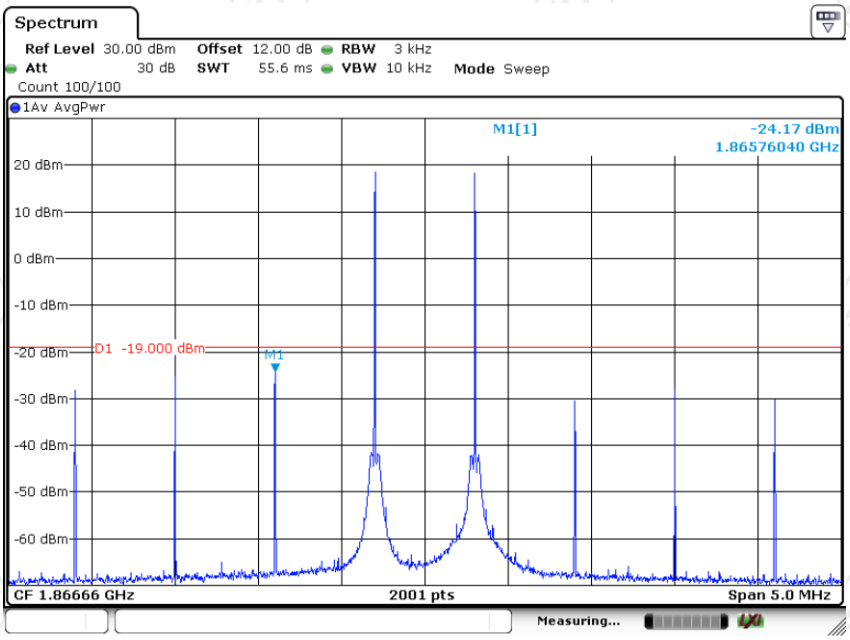
Test Plots

PCS Pre AGC, UL



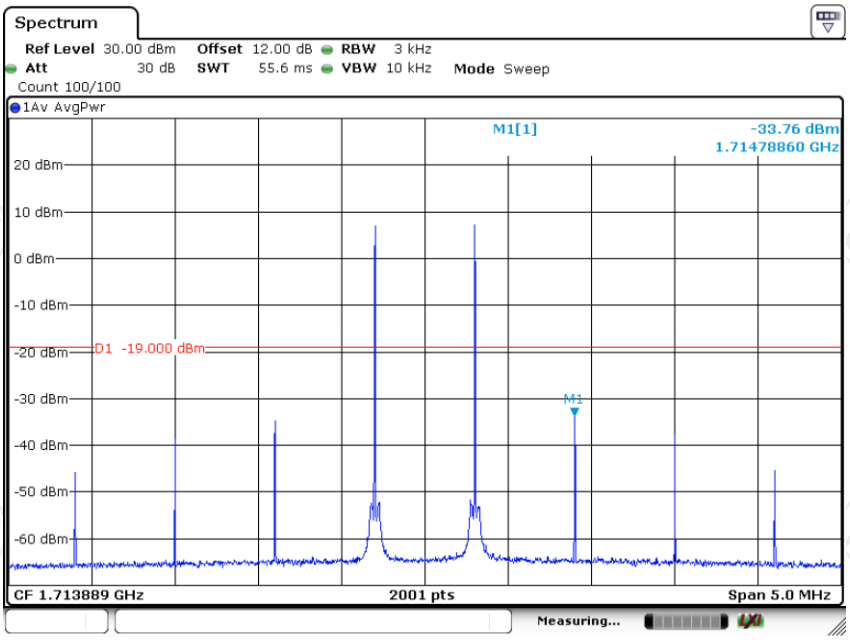
Date: 28.JUN.2024 10:51:58

PCS Pre AGC + 10 dB, UL

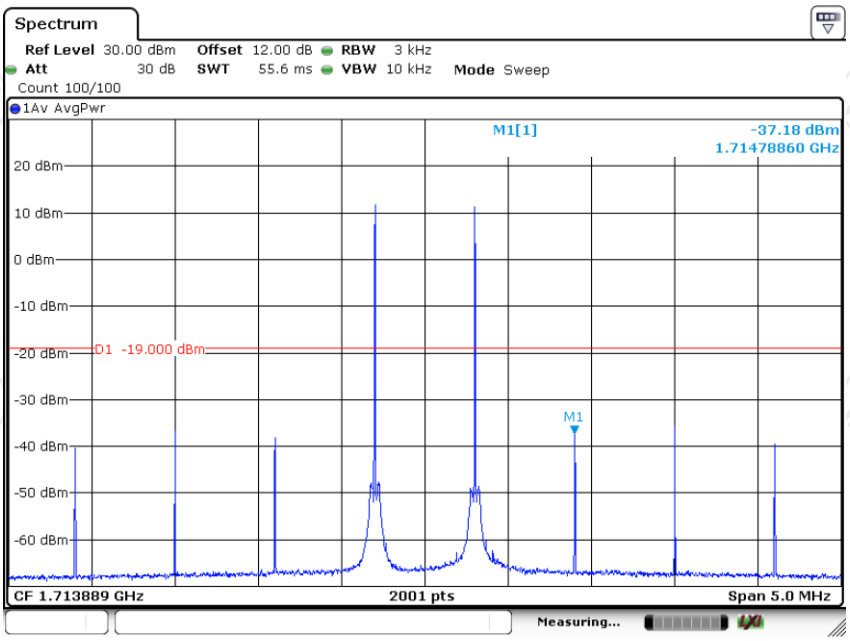


Date: 28.JUN.2024 10:52:36

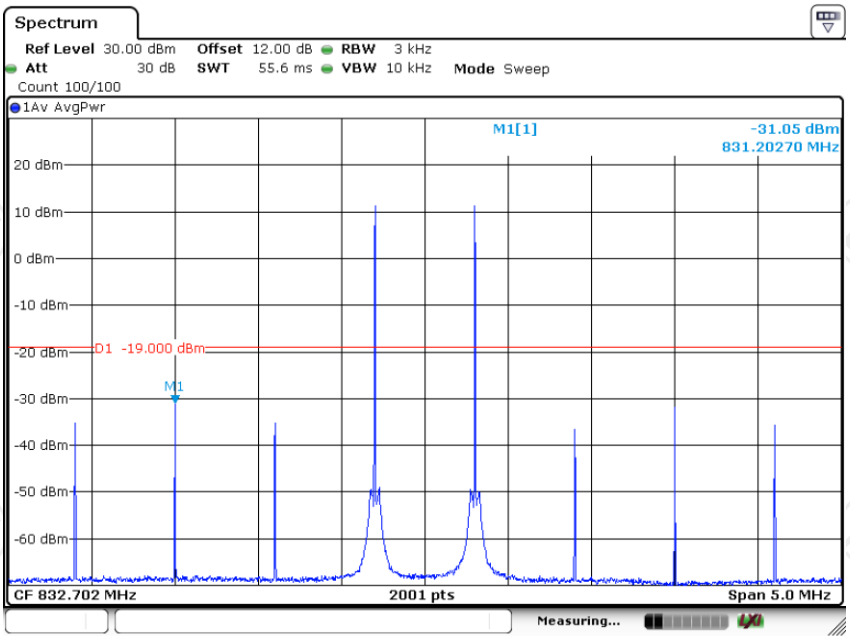
AWS Pre AGC, UL



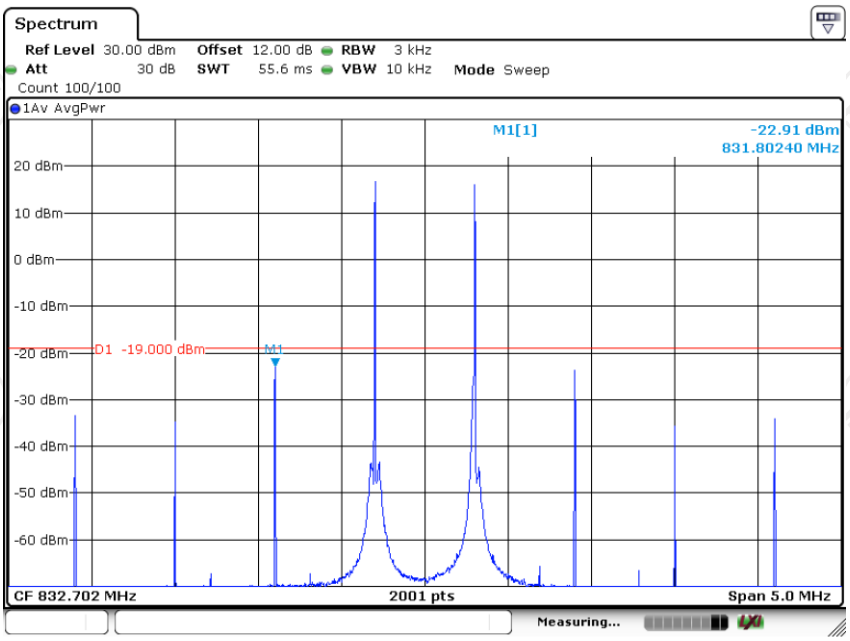
AWS Pre AGC + 10 dB, UL



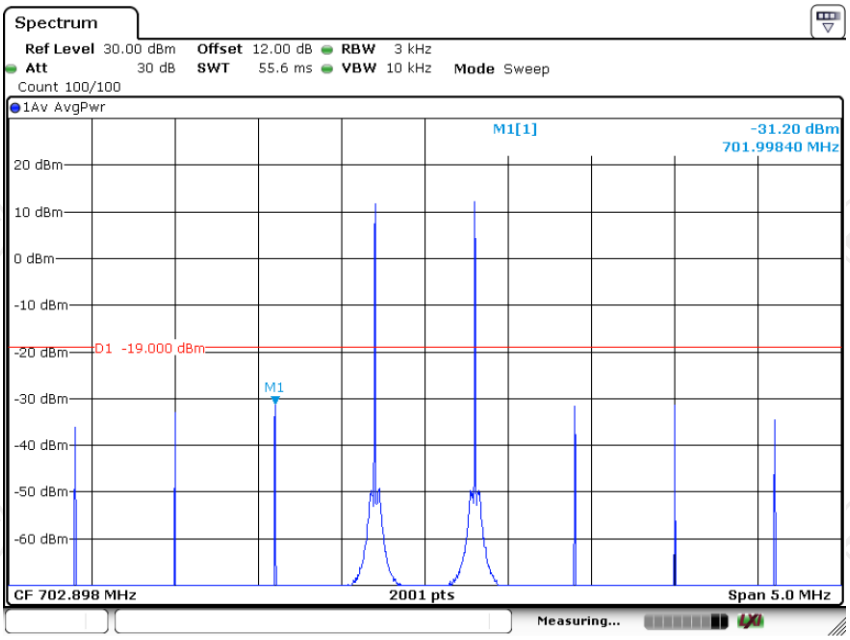
Cellular Pre AGC, UL



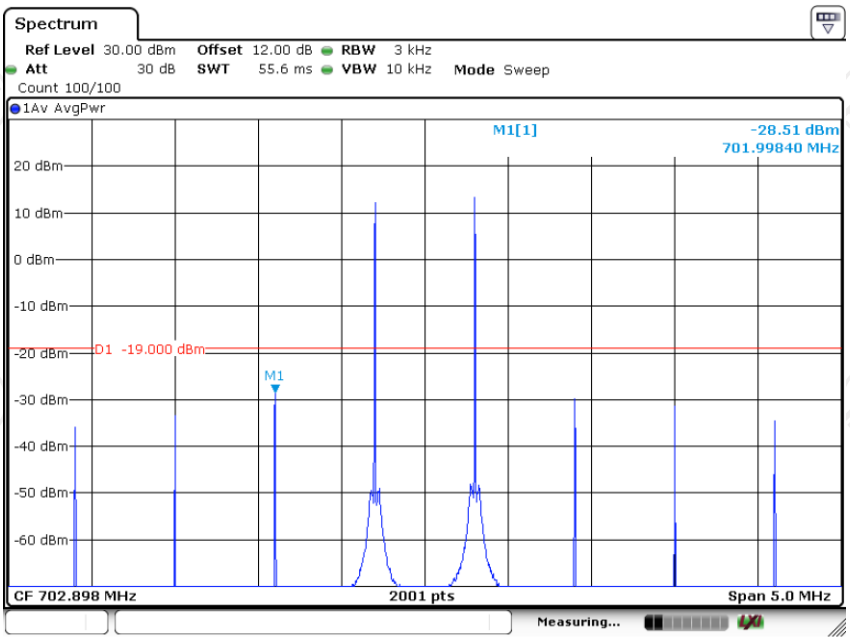
Cellular Pre AGC + 10 dB, UL



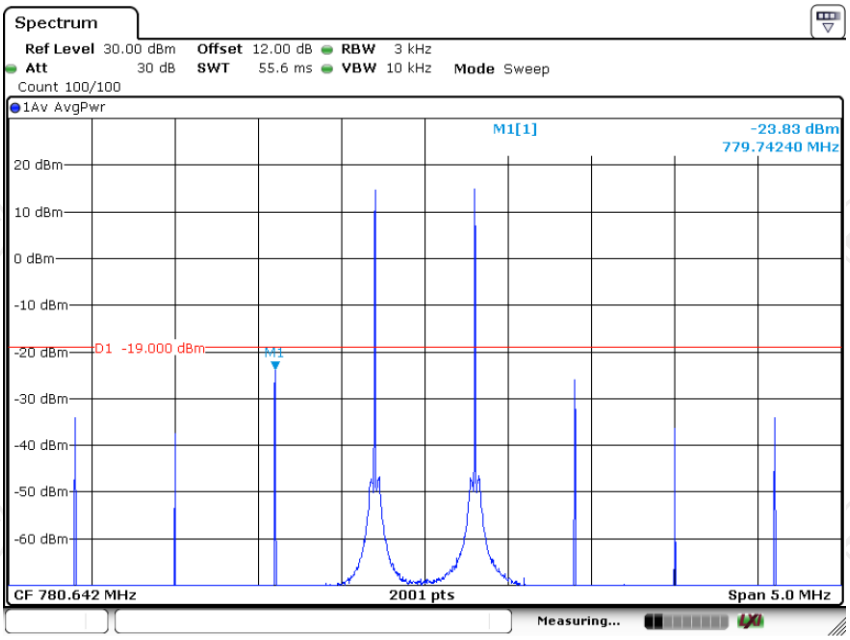
Lower700MHz Pre AGC, UL



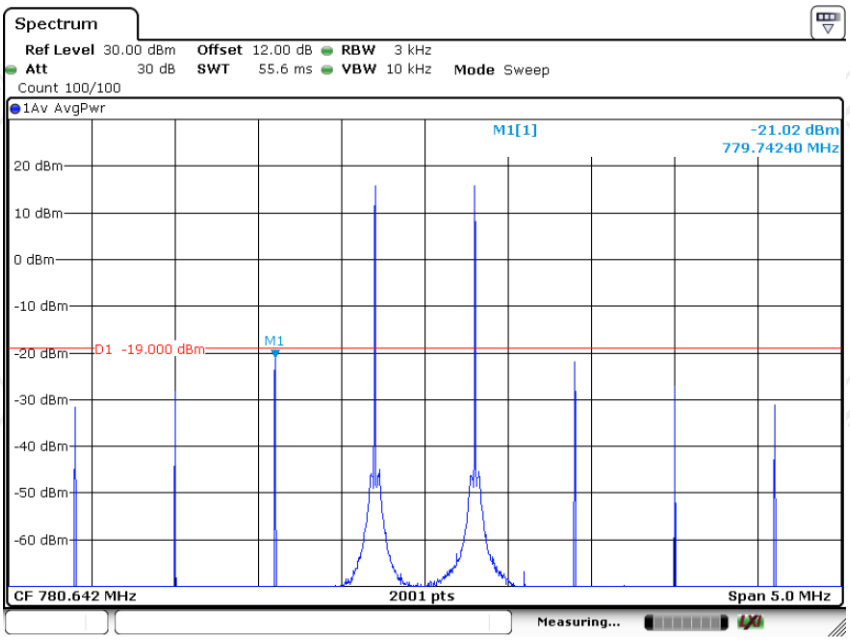
Lower700MHz Pre AGC + 10 dB, UL



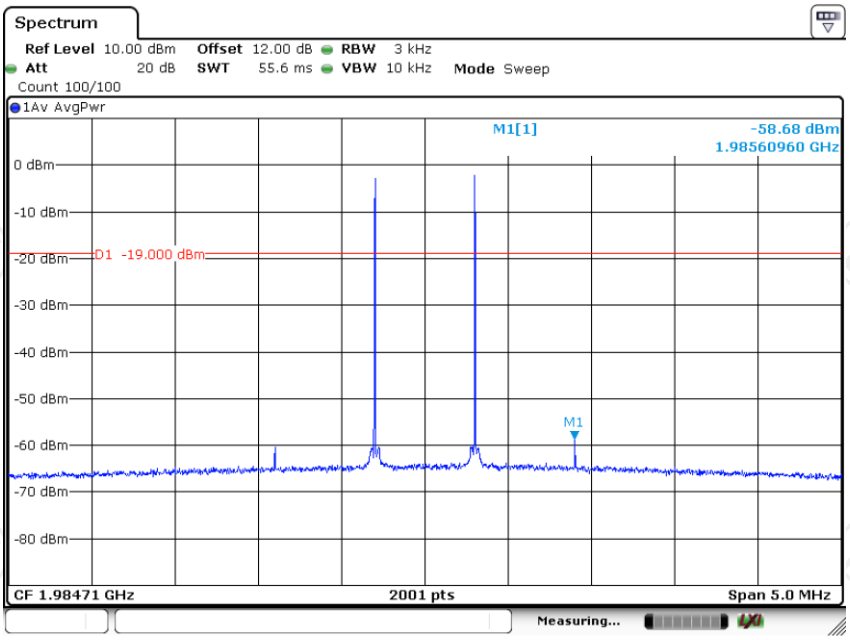
Upper700MHz Pre AGC, UL



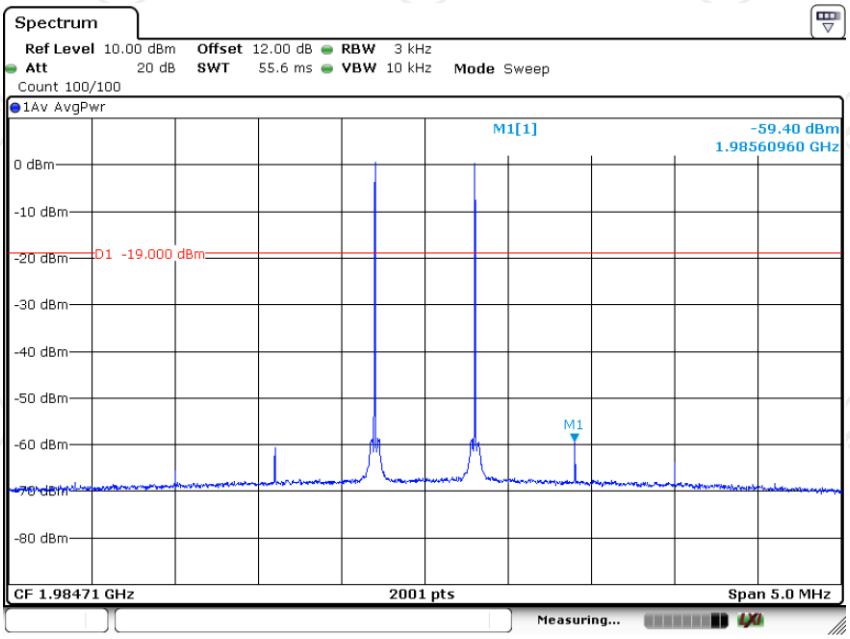
Upper700MHz Pre AGC + 10 dB, UL



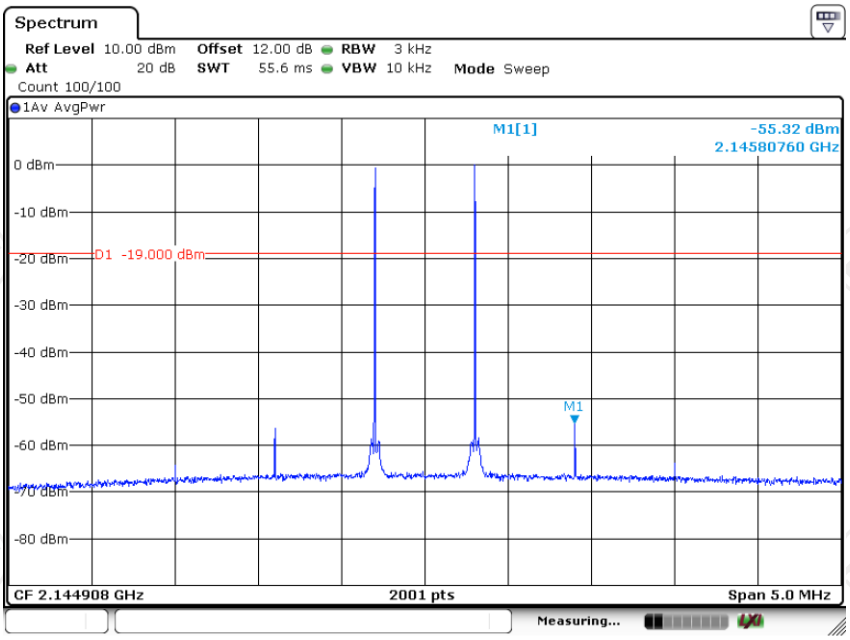
PCS Pre AGC, DL



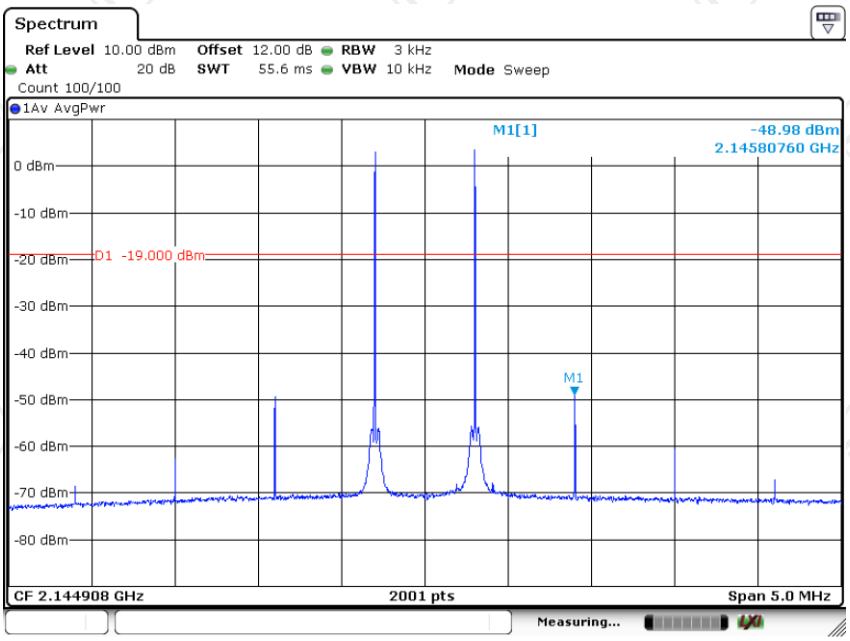
PCS Pre AGC + 10 dB, DL



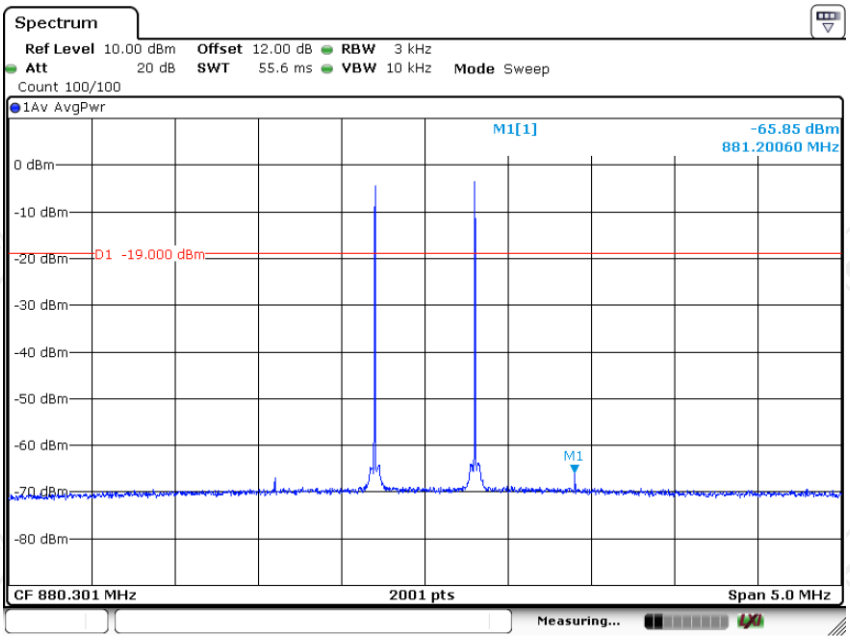
AWS Pre AGC, DL



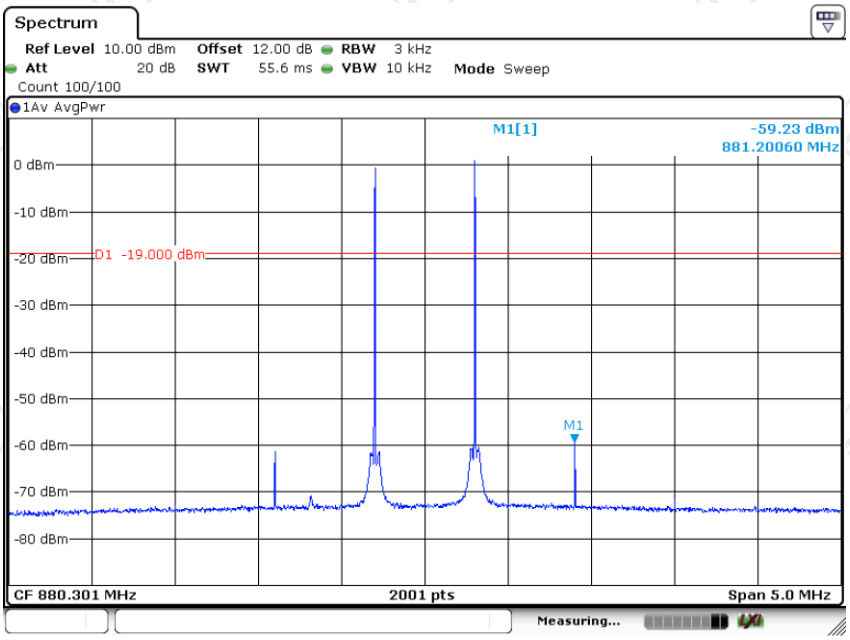
AWS Pre AGC + 10 dB, DL



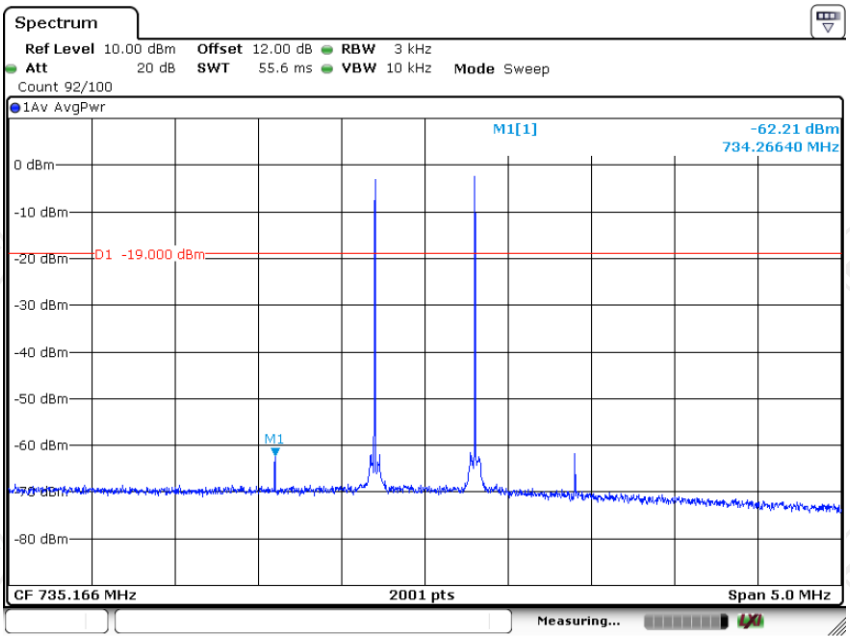
Cellular Pre AGC, DL



Cellular Pre AGC + 10 dB, DL

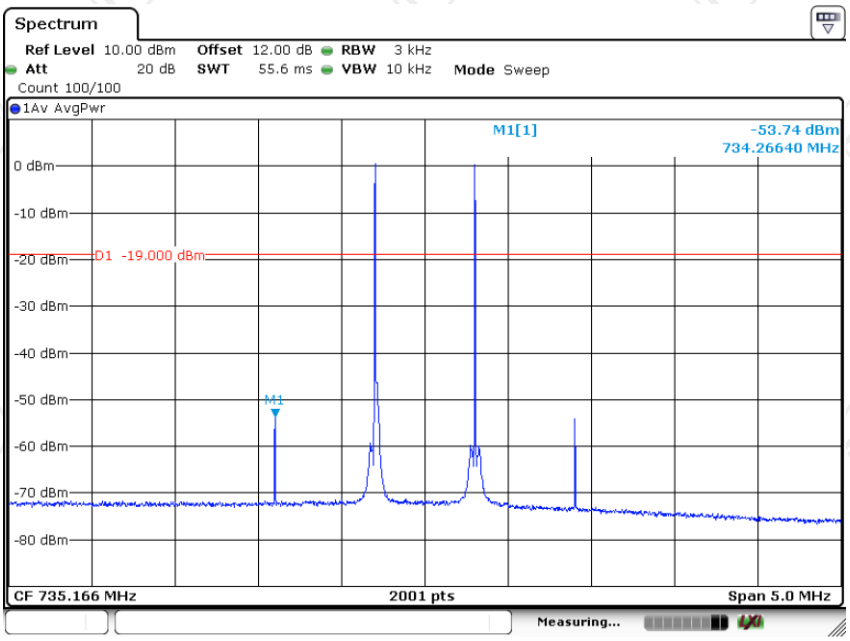


Lower700MHz Pre AGC, DL



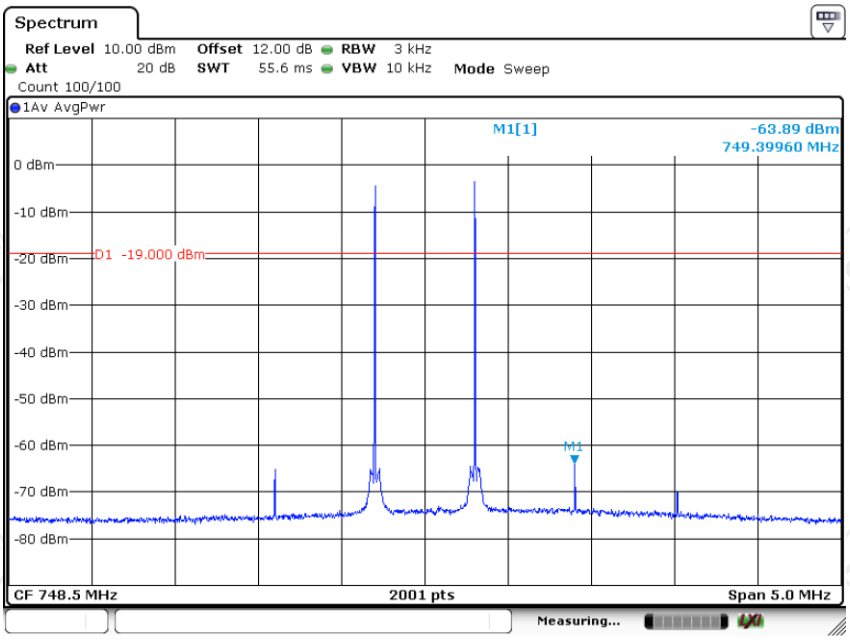
Date: 28.JUN.2024 10:33:08

Lower700MHz Pre AGC + 10 dB, DL

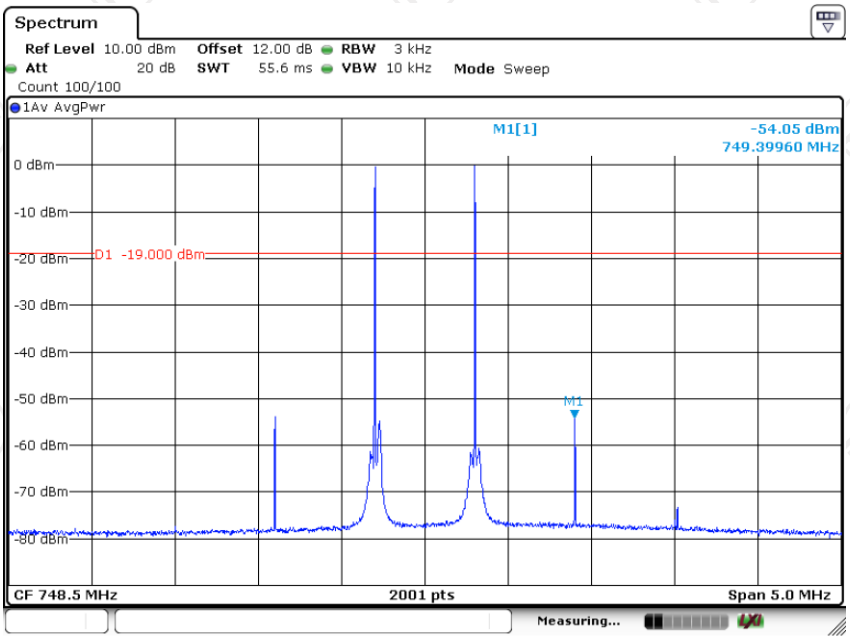


Date: 28.JUN.2024 10:33:40

Upper700MHz Pre AGC, DL



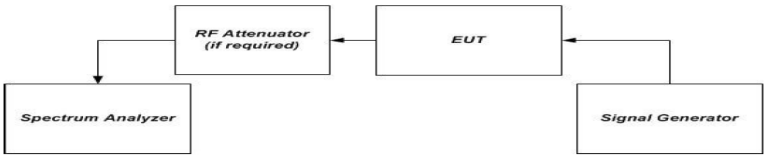
Upper700MHz Pre AGC + 10 dB, DL



Note1: Path1 and Path2 have been tested, only the worst case (Path1) is reported.
Note2: Path1 is Outdoor + Indoor 1
Note3: Path2 is Outdoor + Indoor 2

5.4. Out of Band Emission

5.4.1. Test Specification

Test Requirement:	FCC Part20 Section 20.21(e)(8)(i)(E)
Test Method:	KDB935210 D03 Signal Booster Measurements v04r04
Limit:	-19dBm
Test Setup:	
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 us e 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 OOBE 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

5.4.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Signal Generator	Agilent	N5182A	MY47070282	Feb. 01, 2024	Jan. 31, 2025
Spectrum Analyzer	R&S	FSV40-N	102188	Feb. 01, 2024	Jan. 31, 2025
Attenuator	50FP-006-H3	JFW	907763	/	/

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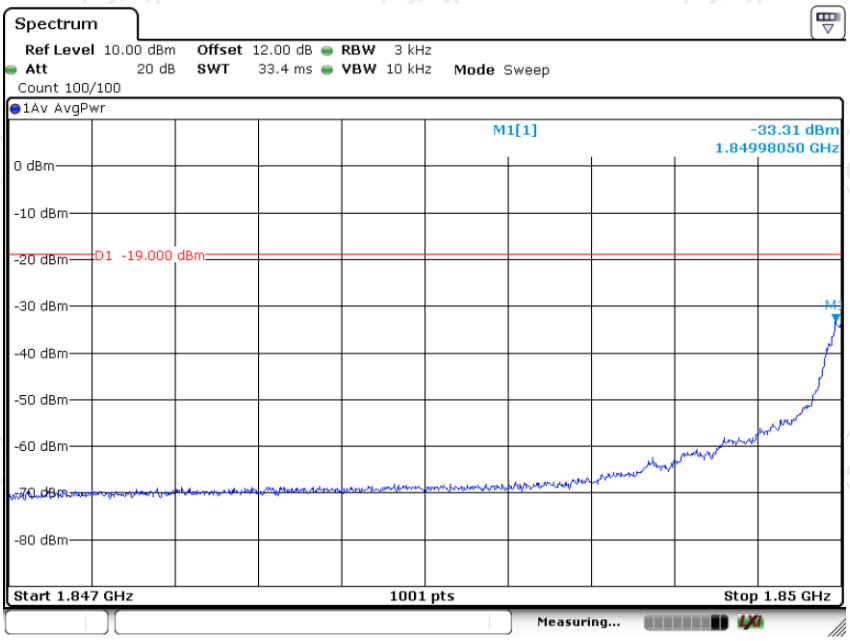
5.4.3. Test data

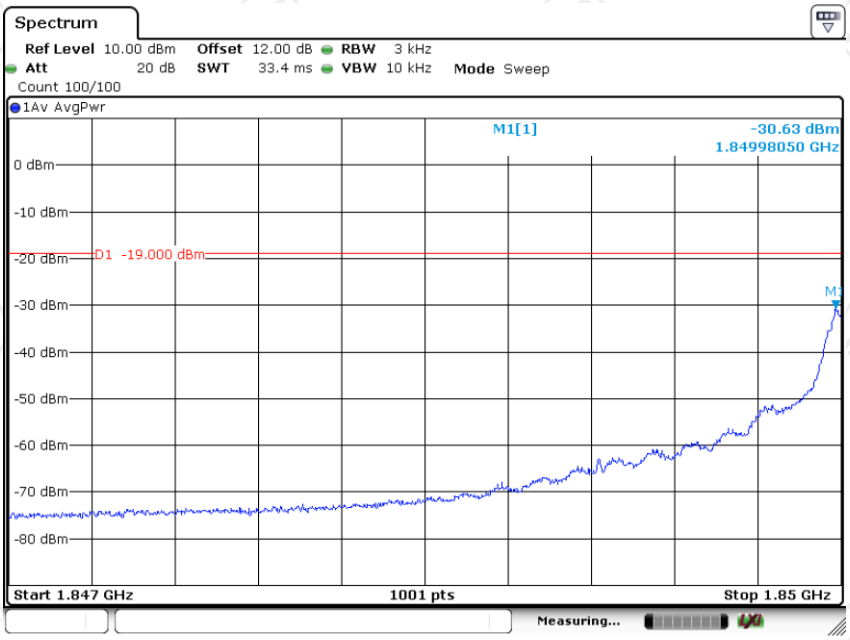
Test Plots

PCS GSM UL Left Side Pre AGC



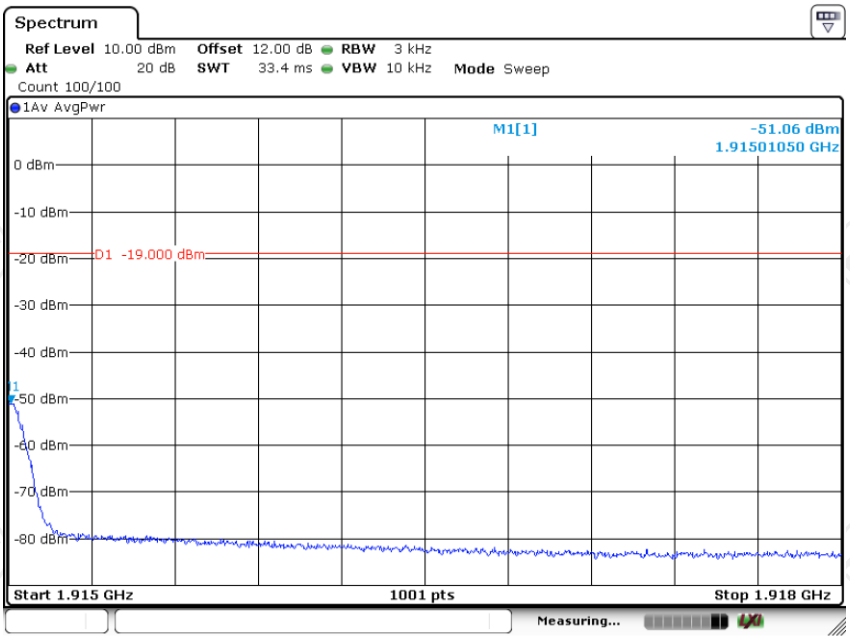
Date: 27.JUN.2024 14:26:58

PCS GSM UL Left Side Pre AGC + 10 dB



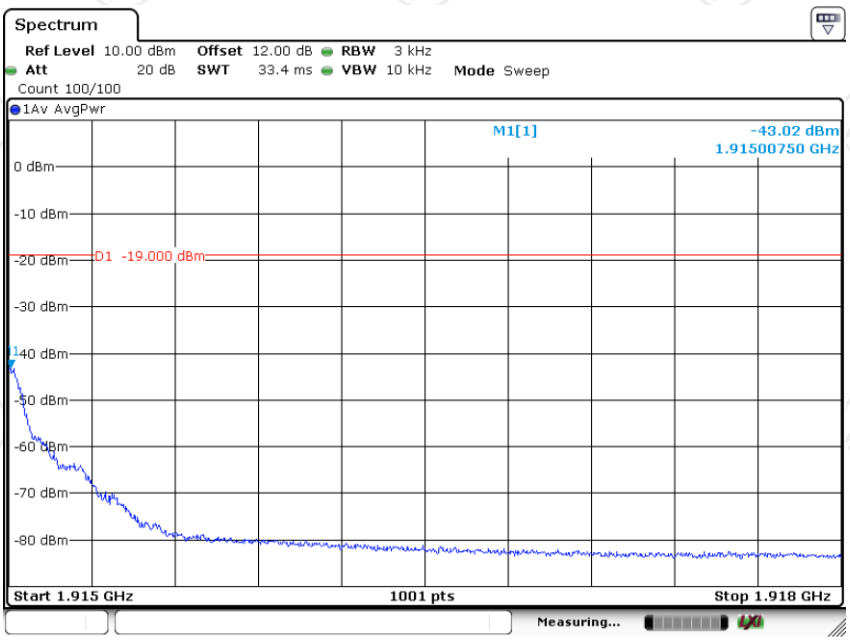
Date: 27.JUN.2024 14:26:25

PCS GSM UL Right Side Pre AGC



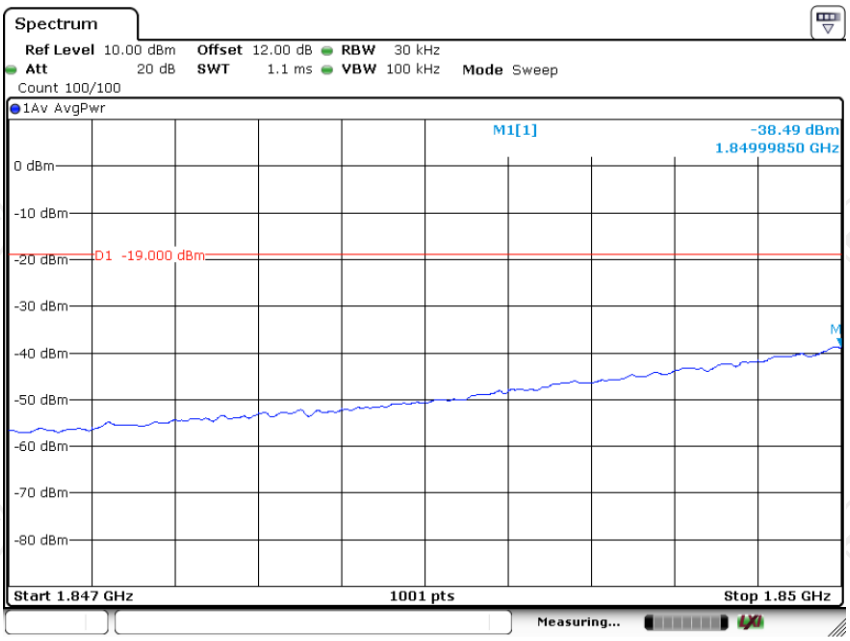
Date: 27.JUN.2024 14:31:38

PCS GSM UL Right Side Pre AGC + 10 dB



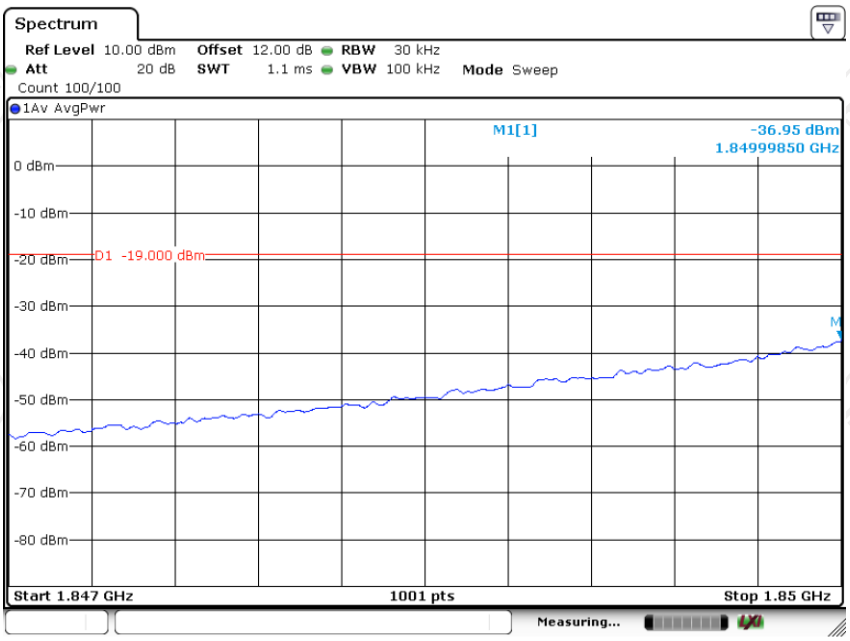
Date: 27.JUN.2024 14:32:18

PCS CDMA UL Left Side Pre AGC



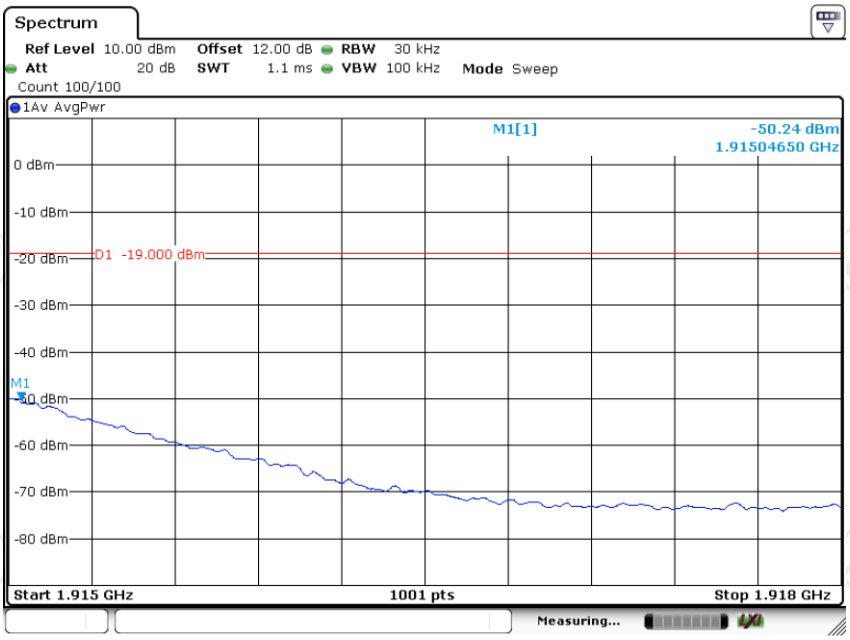
Date: 27.JUN.2024 14:27:54

PCS CDMA UL Left Side Pre AGC + 10 dB



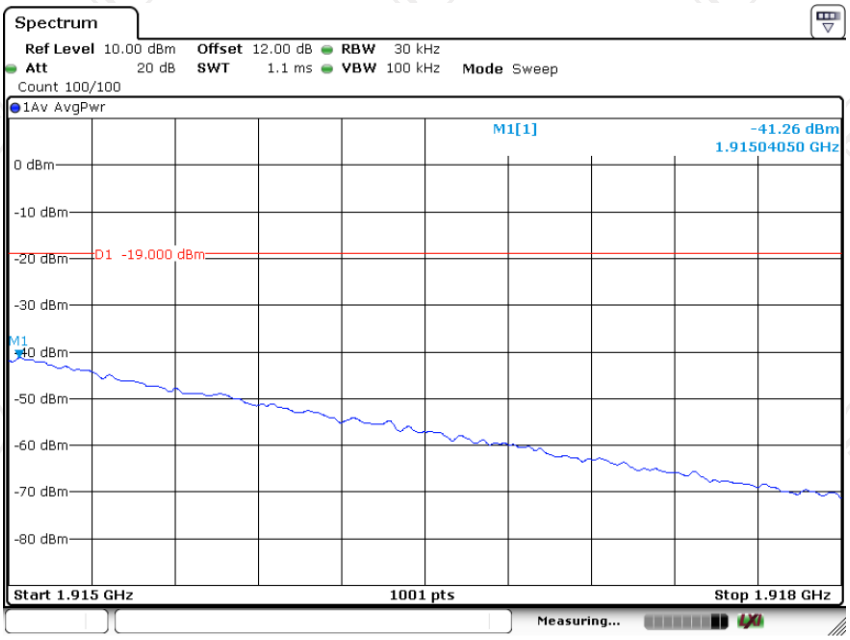
Date: 27.JUN.2024 14:28:13

PCS CDMA UL Right Side Pre AGC



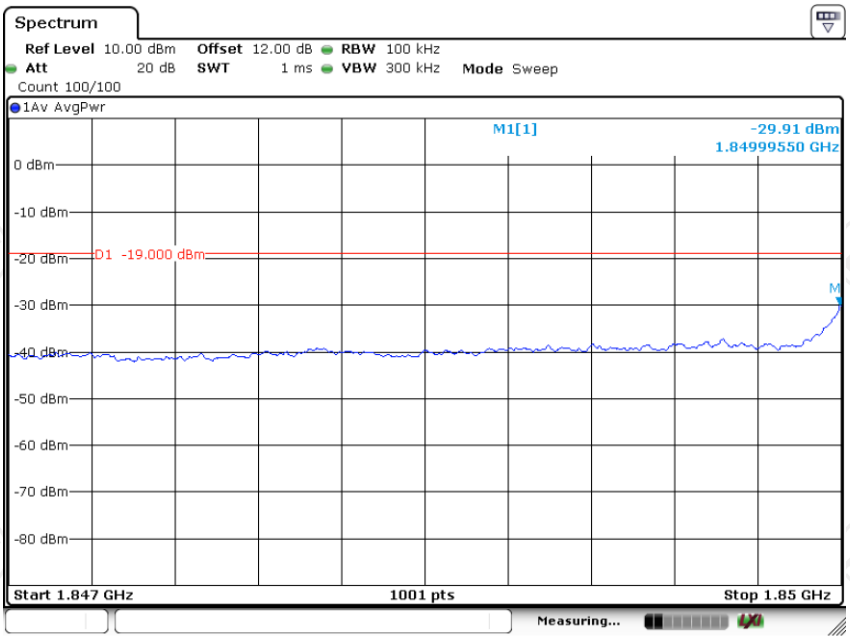
Date: 27.JUN.2024 14:30:31

PCS CDMA UL Right Side Pre AGC + 10 dB



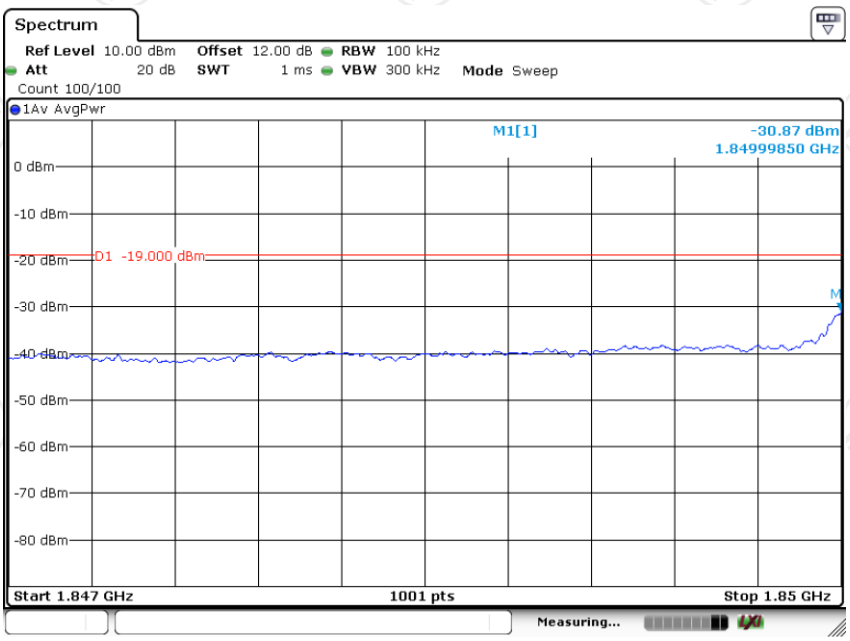
Date: 27.JUN.2024 14:30:46

PCS LTE UL Left Side Pre AGC



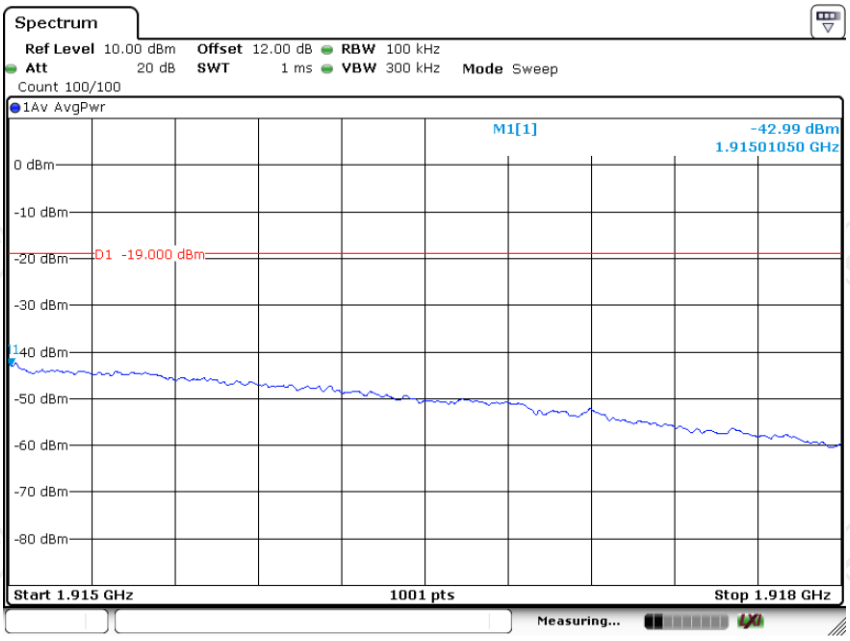
Date: 27.JUN.2024 14:28:47

PCS LTE UL Left Side Pre AGC + 10 dB



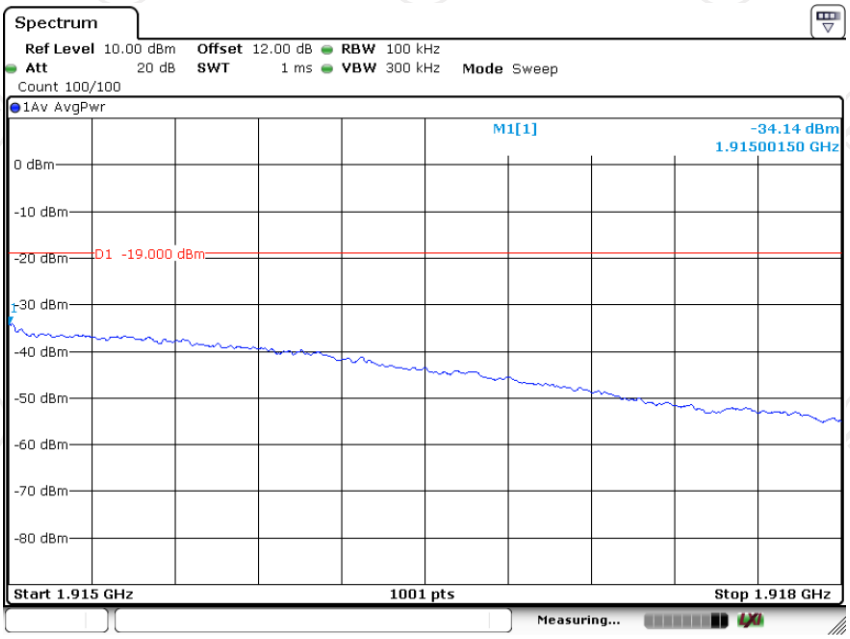
Date: 27.JUN.2024 14:29:02

PCS LTE UL Right Side Pre AGC



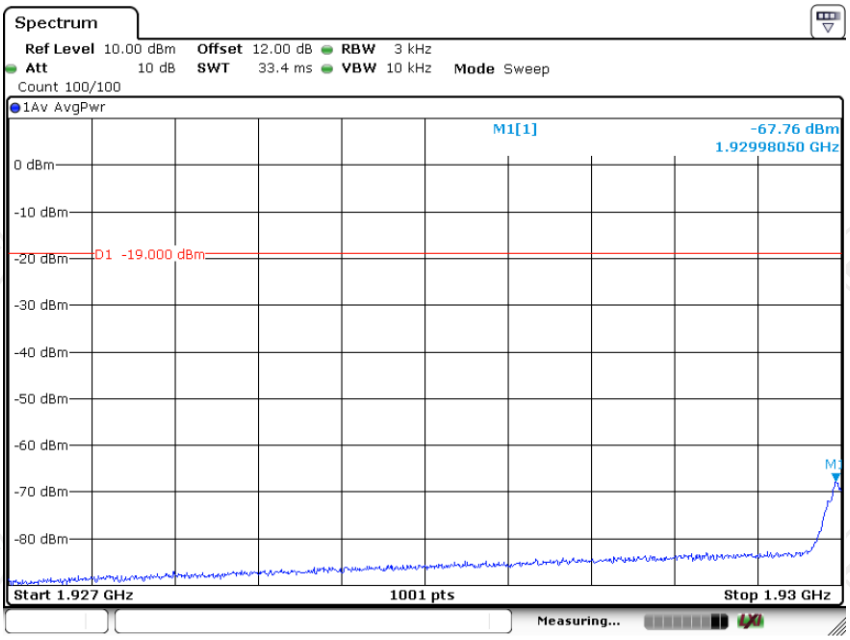
Date: 27.JUN.2024 14:29:40

PCS LTE UL Right Side Pre AGC + 10 dB



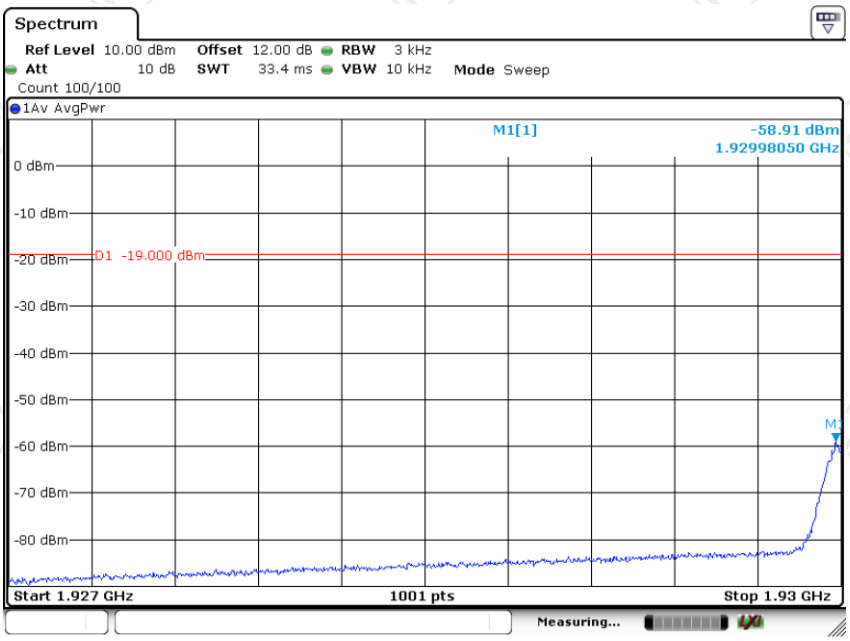
Date: 27.JUN.2024 14:29:52

PCS GSM DL Left Side Pre AGC



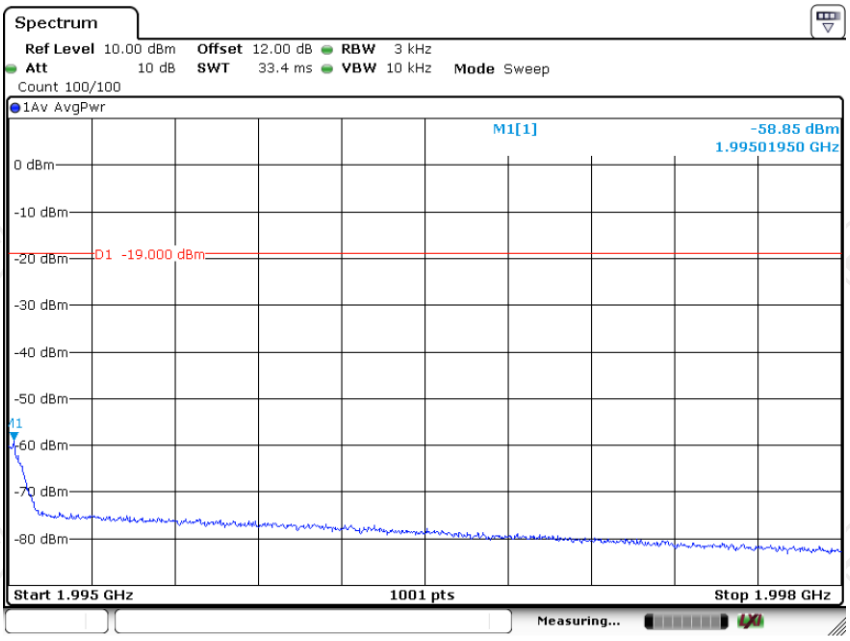
Date: 27.JUN.2024 14:16:40

PCS GSM DL Left Side Pre AGC + 10 dB



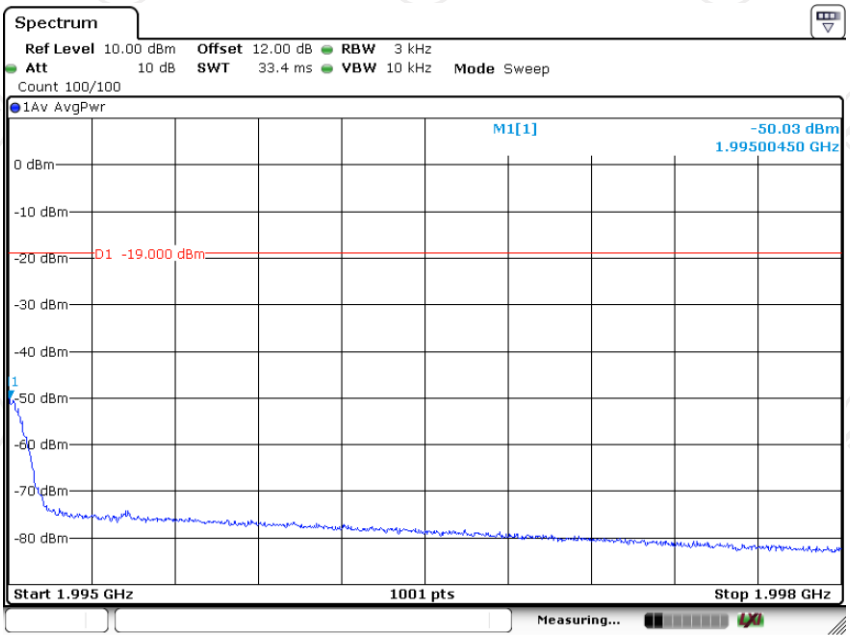
Date: 27.JUN.2024 14:17:00

PCS GSM DL Right Side Pre AGC



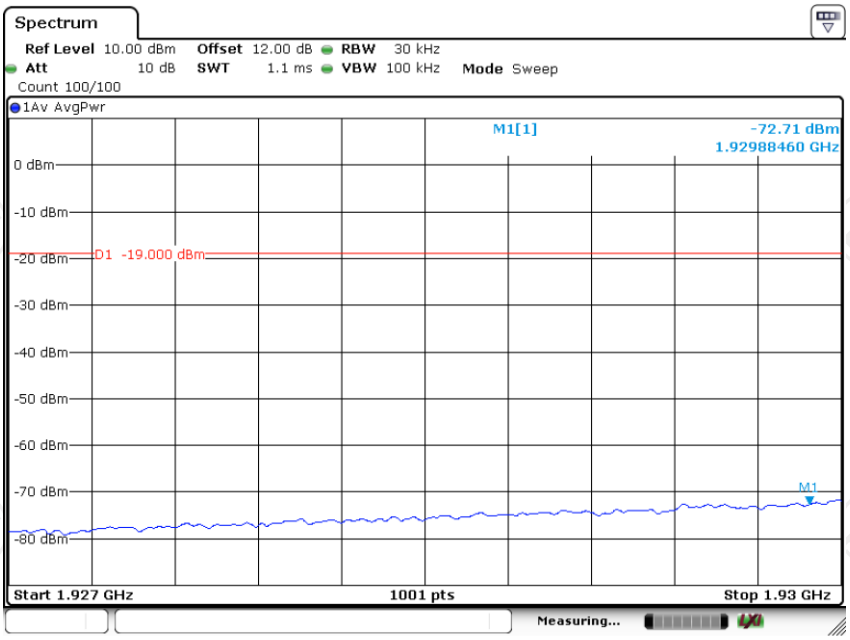
Date: 27.JUN.2024 14:17:43

PCS GSM DL Right Side Pre AGC + 10 dB



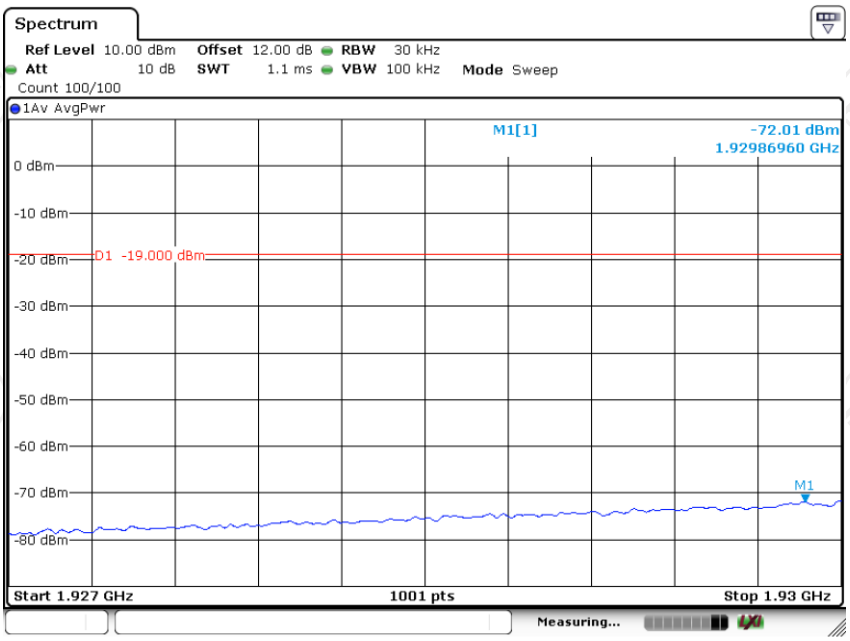
Date: 27.JUN.2024 14:18:00

PCS CDMA DL Left Side Pre AGC



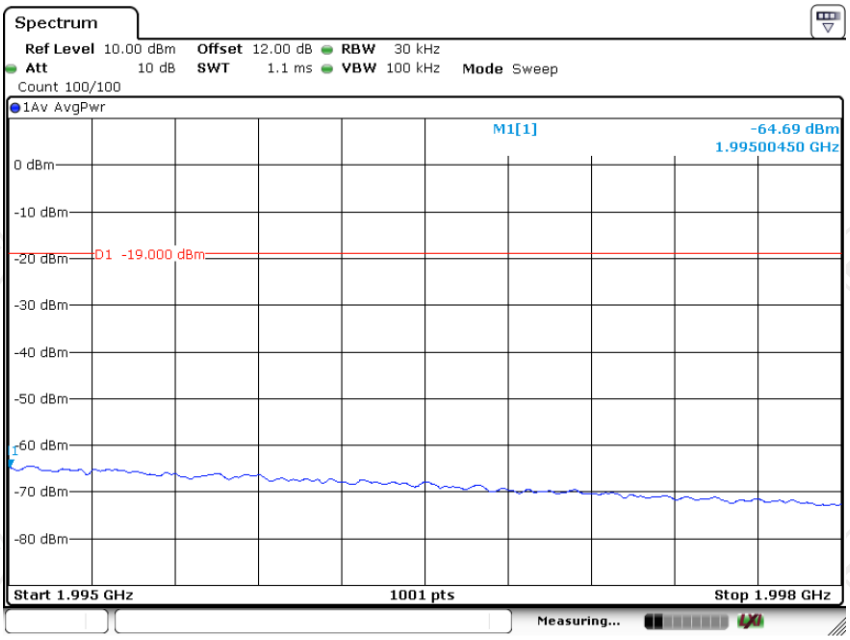
Date: 27.JUN.2024 14:15:16

PCS CDMA DL Left Side Pre AGC + 10 dB



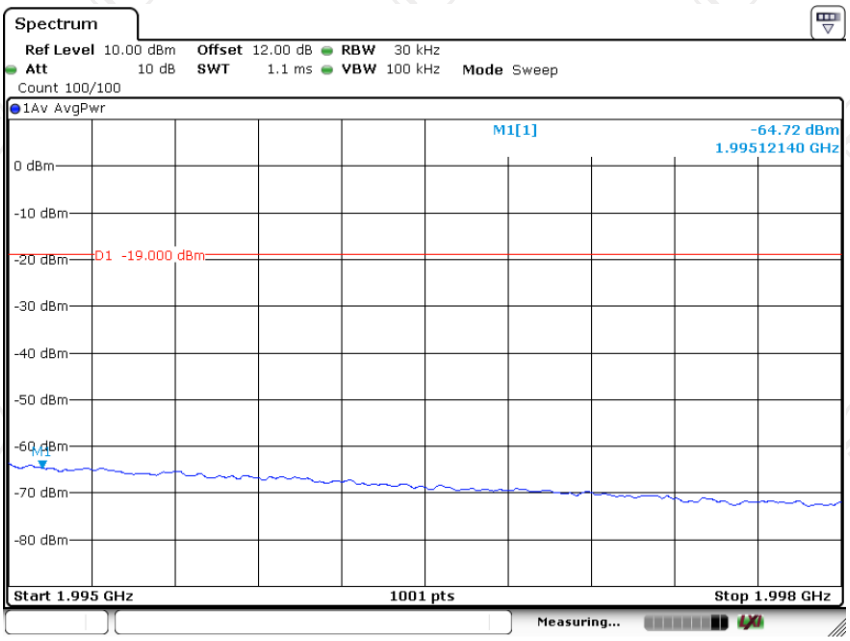
Date: 27.JUN.2024 14:15:33

PCS CDMA DL Right Side Pre AGC



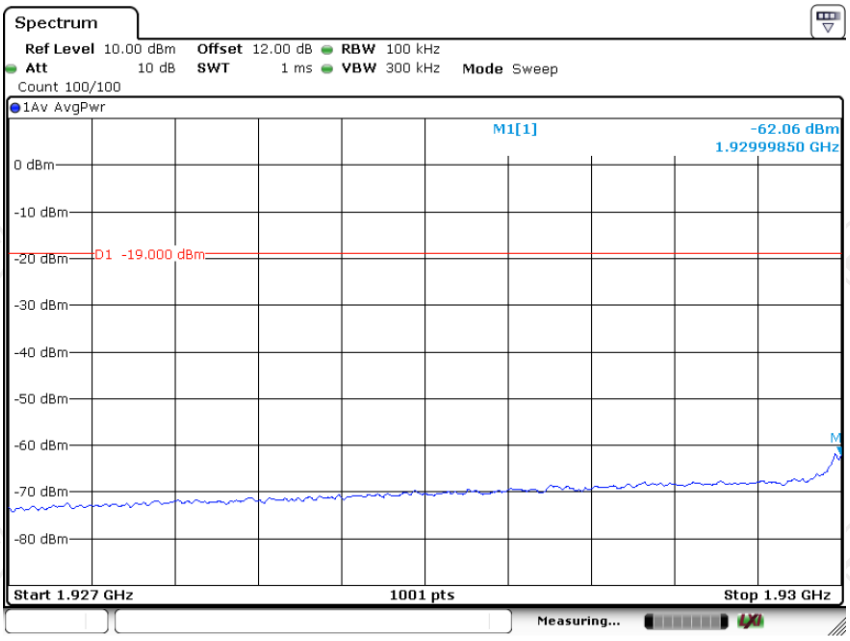
Date: 27.JUN.2024 14:18:34

PCS CDMA DL Right Side Pre AGC + 10 dB



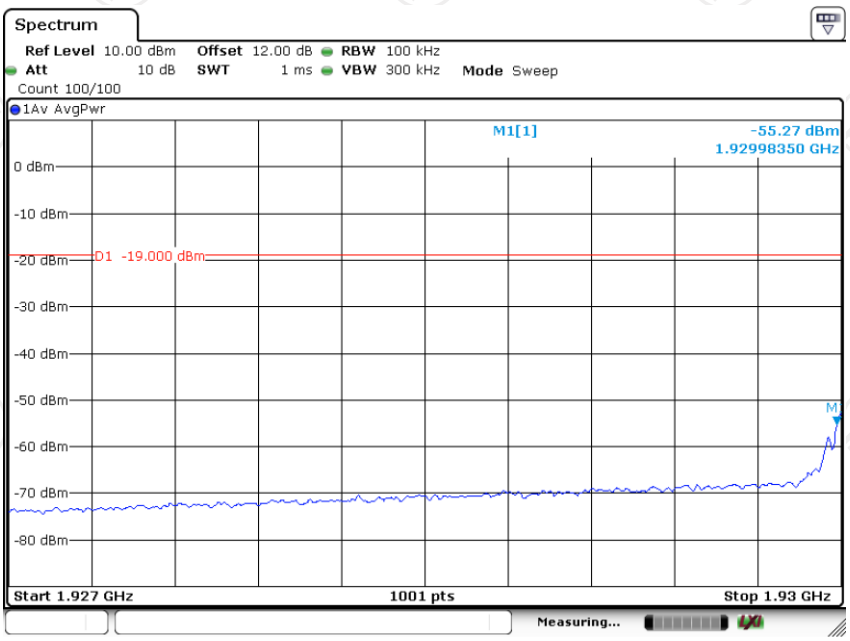
Date: 27.JUN.2024 14:18:47

PCS LTE DL Left Side Pre AGC



Date: 27.JUN.2024 14:14:29

PCS LTE DL Left Side Pre AGC + 10 dB



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