



Radio Test Report

Report No.: STS2509145W01

Issued for

Shenzhen Jusihuixiang Technology Co., Ltd.

1915, Global Logistics Center, South China City, No. 1, South China Avenue, Hehua Community, Pinghu Sub-district, Longgang District, Shenzhen China

Product Name: Cell phone signal booster

Brand Name: N/A

Model Name: HB-20

Series Model(s): HB-20H, HB-20C, HB-20B, HB-20E, HB-20A

FCC ID: 2BS27-HBJYCZ20

Test Standards: FCC Part 20

The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Shenzhen STS Test Services Co., Ltd.

**TEST REPORT**

Applicant's Name.....: Shenzhen Jusihiuixiang Technology Co., Ltd.
1915, Global Logistics Center, South China City, No. 1, South
Address.....: China Avenue, Hehua Community, Pinghu Sub-district, Longgang
District, Shenzhen China
Manufacture's Name.....: Shenzhen Jusihiuixiang Technology Co., Ltd.
1915, Global Logistics Center, South China City, No. 1, South
Address.....: China Avenue, Hehua Community, Pinghu Sub-district, Longgang
District, Shenzhen China

Product Description

Product Name: Cell phone signal booster
Brand Name: N/A
Model Name.....: HB-20
Series Model.....: HB-20H, HB-20C, HB-20B, HB-20E, HB-20A
Test Standards.....: FCC Part 20
ANSI C63.26-2015
Test Procedure: KDB Publication 935210 D03, D04 and D05

This device described above has been tested by STS, the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Shenzhen STS Test Services Co., Ltd.

Date of Test.....:
Date of receipt of test item.....: 10 Oct . 2025
Date of performance of tests ..: 10 Oct . 2025~18 Dec. 2025
Date of Issue.....: 18 Dec. 2025
Test Result: Pass

Testing Engineer :

(Aaron Bu)

Technical Manager :

(Skylar Li)

Authorized Signatory :

(Bovey Yang)



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**Revision History**

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	20 Oct. 2025	STS2509145W01	ALL	Initial Issue



SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

The radiated emission testing was performed according to the procedures of KDB 971168 D01 v03r01 and ANSI C63.26 RSS-GEN

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
Requirement	CFR 47 Section	Result



1 INTRODUCTION

1.1 TEST FACTORY

SHENZHEN STS TEST SERVICES CO., LTD

Add. : 101, Building B, Zhuoke Science Park, No.190 Chongqing Rd, Zhancheng Shequ, Fuhai Sub-District, Shenzhen, Guangdong, P.R.C.

FCC test Firm Registration Number: 625569

IC test Firm Registration Number: 12108A

A2LA Certificate No.: 4338.01

1.2 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	Uncertainly
1	RF output power, conducted	$\pm 0.68\text{dB}$
2	Unwanted Emissions, conducted	$\pm 2.988\text{dB}$
3	All emissions, radiated 30-1GHz	$\pm 6.7\text{dB}$
4	All emissions, radiated 1G-6GHz	$\pm 5.5\text{dB}$
5	All emissions, radiated >6G	$\pm 5.8\text{dB}$
6	Conducted Emission (9KHz-150KHz)	$\pm 4.43\text{dB}$
7	Conducted Emission (150KHz-30MHz)	$\pm 5\text{dB}$



2 PRODUCT INFORMATION

Product Name	Cell phone signal booster
Brand Name	N/A
Model Name	HB-20
Series Model(s)	HB-20H, HB-20C, HB-20B, HB-20E, HB-20A
Model Difference	The only difference is the model name.
Tx Frequency:	Lower 700MHz Band (B12) Uplink: 698~716MHz, Downlink: 728~746MHz Cellular Band (B5) Uplink: 824~849MHz, Downlink: 869~894MHz PCS Band (B25) Uplink: 1850~1915MHz, Downlink: 1930~1995MHz AWS Band(B4) Uplink: 1710~1755MHz, Downlink: 2110~2155MHz
Gain	Uplink: $\leq 63\text{dB}$ Downlink: $\leq 62\text{dB}$
Conducted Output Power	Uplink: 20.95dBm Downlink: 8.53dBm
Max. Antenna Gain	Uplink: 7.5dBi Downlink: 6.5 dBi
FCC Classification	B2W/Wideband Consumer Booster(CMRS)
Power Rating	Input: DC12V 1A
Hardware version number:	BR_RF13_5_20250808V1.0
Software version number:	BREBE250910V1.0



Antenna Information:

Antenna	/		Uplink Frequency(MHz)			
			698-716	824-849	1850-1915	1710-1780
Log Periodic Antenna	Outdoor Antenna Gain (Model:TB-6127-9)(dBi)		5	6.5	7.5	7.5
	Cable loss (dB)	3D-FB(50Feet)	3.7	4	4.5	4.2
		4D-FB(50Feet)	3.2	3.5	4	3.8
		5D-FB(50Feet)	3	3.2	3.8	3.2
Yagi Antenna	Outdoor Antenna Gain (Model:TB6127-8) (dBi)		5	5	6.5	6
	Cable loss (dB)	3D-FB(50Feet)	3.7	4	4.5	4.2
		4D-FB(50Feet)	3.2	3.5	4	3.8
		5D-FB(50Feet)	3	3.2	3.8	3.2
Panel An- tenna	Outdoor Antenna Gain (Model:TB-6127-9) (dBi)		5	5	6.5	6.5
	Cable loss (dB)	3D-FB(50Feet)	3.7	4	4.5	4.2
		4D-FB(50Feet)	3.2	3.5	4	3.8
		5D-FB(50Feet)	3	3.2	3.8	3.2
Omni An- tenna	Outdoor Antenna Gain (Model:TB6927-2) (dBi)		5	5	5.5	5.5
	Cable loss (dB)	3D-FB(50Feet)	3.7	4	4.5	4.2
		4D-FB(50Feet)	3.2	3.5	4	3.8
		5D-FB(50Feet)	3	3.2	3.8	3.2
Antenna	/		Downlink Frequency(MHz)			
			728-746	869-894	1930-1995	2110-2200
Right Angle Antenna-A	Indoor Antenna Gain (Model:TB-2518-1) (dBi)		1	1	1.5	1.5
	Cable loss (dB)	3D-FB(50Feet)	1.2	1.4	1.5	1.4
		4D-FB(50Feet)	1	1.2	1.2	1.2
		5D-FB(50Feet)	0.8	1	1	1
Right Angle Antenna-B	Indoor Antenna Gain (Model:TB-6527-6) (dBi)		1	1	1.2	1.2
	Cable loss (dB)	3D-FB(50Feet)	1.2	1.4	1.5	1.4
		4D-FB(50Feet)	1	1.2	1.2	1.2
		5D-FB(50Feet)	0.8	1	1	1
Right Angle	Indoor Antenna Gain		1.2	1.3	1.2	1.3



Antenna-C	(Model:TB-6826-9) (dBi)					
	Cable loss (dB)	3D-FB(50Feet)	1.2	1.4	1.5	1.4
		4D-FB(50Feet)	1	1.2	1.2	1.2
		5D-FB(50Feet)	0.8	1	1	1
Panel An- tenna	Indoor Antenna Gain (Model:TB-6127-10) (dBi)		5.5	5.5	6.5	6
	Cable loss (dB)	3D-FB(50Feet)	1.2	1.4	1.5	1.4
		4D-FB(50Feet)	1	1.2	1.2	1.2
		5D-FB(50Feet)	0.8	1	1	1
Top Suction Antenna	Indoor Antenna Gain (Model:TB-6127-2) (dBi)		3.5	3.5	4	4
	Cable loss (dB)	3D-FB(50Feet)	1.2	1.4	1.5	1.4
		4D-FB(50Feet)	1	1.2	1.2	1.2
		5D-FB(50Feet)	0.8	1	1	1



3 MEASUREMENT INSTRUMENTS

RF Radiation Test Equipment					
Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
Temperature & Humidity	SW-108	SuWei	N/A	2025.02.24	2026.02.23
Signal Generator	Keysight	N5182A	MY46240556	2025.09.26	2026.09.25
Signal Generator	Keysight	N5182B	MY57301448	2025.09.26	2026.09.25
Pre-Amplifier(0.1M-3GHz)	EM	EM330	060665	2025.02.22	2026.02.21
Pre-Amplifier (1G-18GHz)	SKET	LNPA-01018G-45	SK2018080901	2025.09.25	2026.09.24
Pre-Amplifier(18G-40GHz)	SKET	LNPA_1840-50	SK2018101801	2025.02.22	2026.02.21
Positioning Controller	MF	MF-7802	MF-780208587	N/A	N/A
Signal Analyzer	R&S	FSV 40-N	101823	2025.09.26	2026.09.25
Switch Control Box	N/A	N/A	N/A	N/A	N/A
Filter Box	BALUN Technology	SU319E	BL-SZ1530051	N/A	N/A
Video Controller	SKET	FCS C-3	N/A	N/A	N/A
Bilog Antenna	TESEQ	CBL6111D	34678	2025.09.27	2027.09.26
Horn Antenna	SCHWARZBECK	BBHA 9120D	02014	2025.09.27	2027.09.26
Horn Antenna	A-INFOMW	LB-180400-KF	J211020657	2025.09.27	2027.09.26
Antenna Mast	MF	MFA-440H	N/A	N/A	N/A
Turn Table	MF	N/A	N/A	N/A	N/A
AC Power Source	APC	KDF-11010G	F214050035	N/A	N/A
DC Power Supply	Zhaoxin	RXN 605D	20R605D11010081	N/A	N/A
Test SW	EMC Test Software	15.2.0.339			
	EZ-EMC	Ver.STSLAB-03A1 RE			
RF Connected Test Equipment					
Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
Temperature & Humidity	SW-108	SuWei	N/A	2025.02.24	2026.02.23
Signal Generator	Keysight	N5182A	MY46240556	2025.09.26	2026.09.25
Signal Generator	Keysight	N5182B	MY57301448	2025.09.26	2026.09.25
Signal Analyzer	Agilent	N9020A	MY52440124	2025.02.22	2026.02.21
RF Automatic Test System	Maiwei	MW200-SFCB	N/A	N/A	N/A
Temperature & Humidity Test Chamber	Safety test	AG80L	171200018	2025.02.22	2026.02.21
Programmable Power Supply	Agilent	E3642A	MY40002025	2025.09.26	2026.09.25
POWER DIVIDER	eastsheep	PD-0.5/0.6-2S	N/A	2025.02.25	2026.02.24

4 TEST ITEMS

4.1 AUTHORIZED FREQUENCY BAND VERIFICATION

Test Requirement:

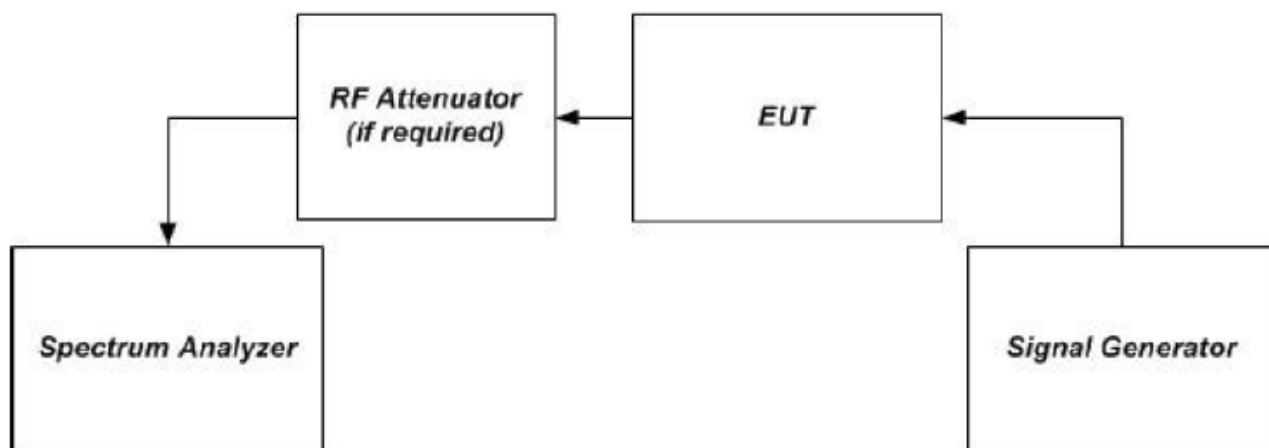
FCC Part20 Section 20.21(e)(3)

Test Procedures

935210 D03 Signal Booster Measurement v02r01

- 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 Setup

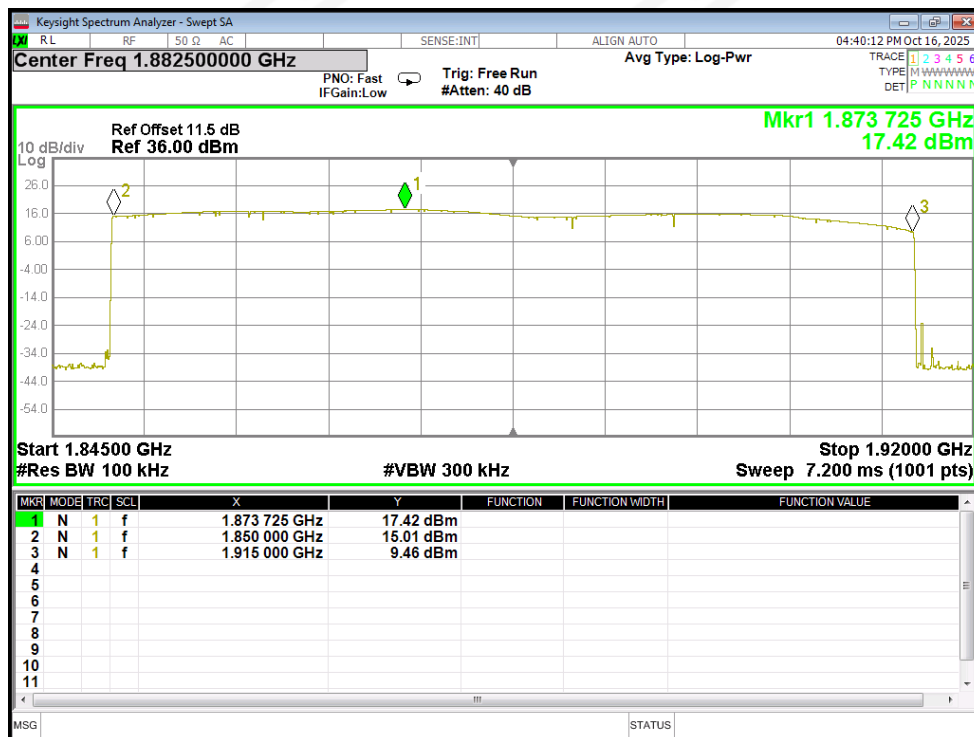




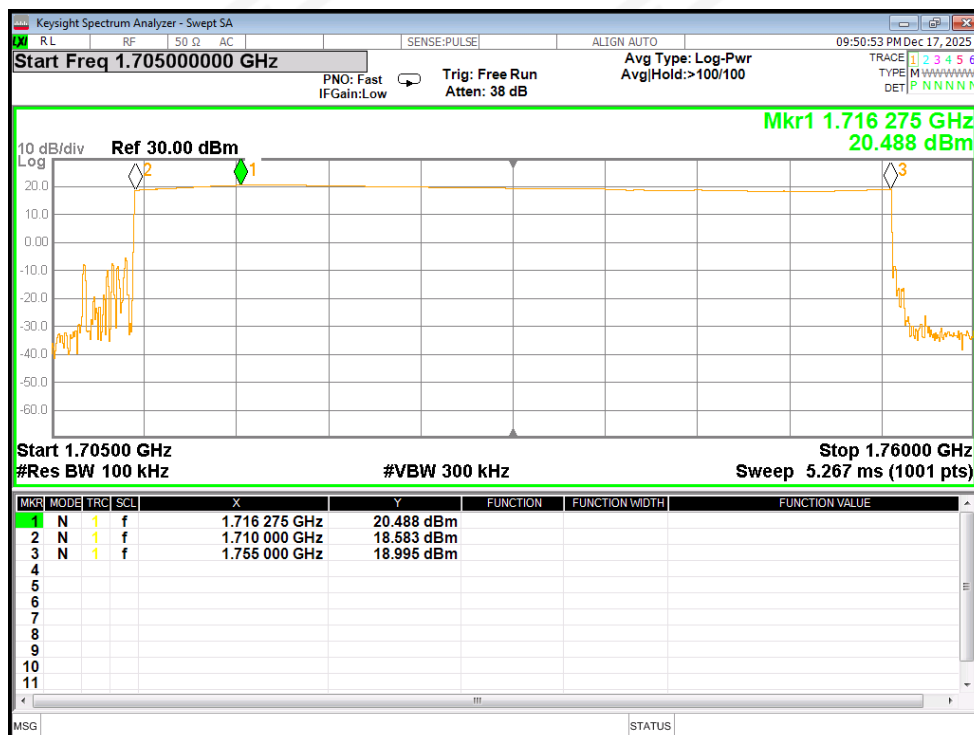
Test Data

Uplink

PCS

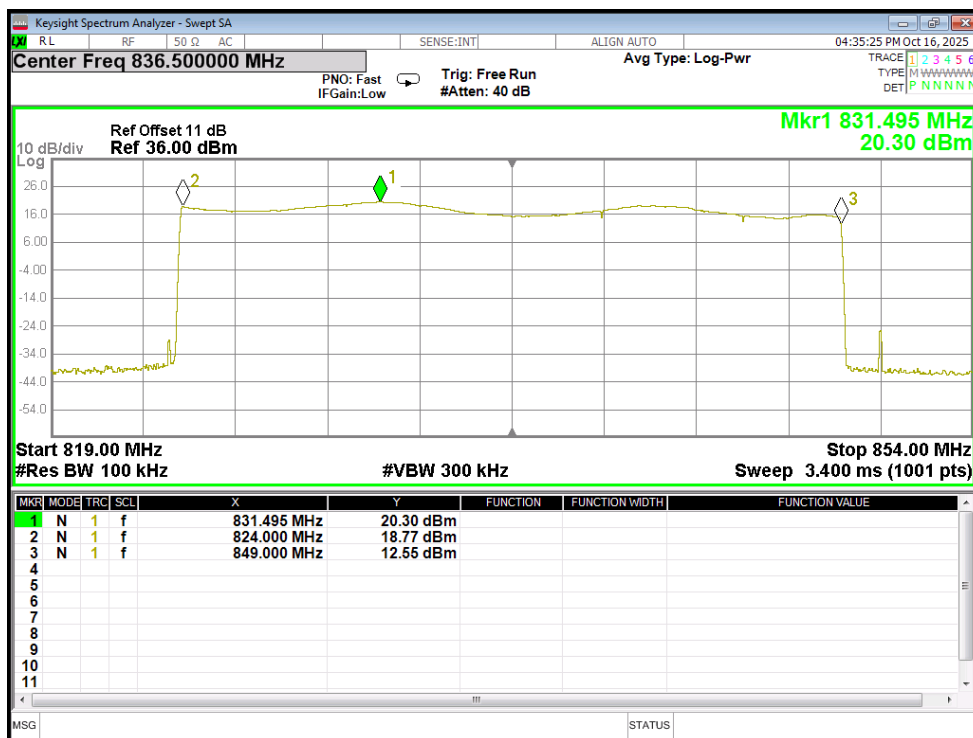


AWS

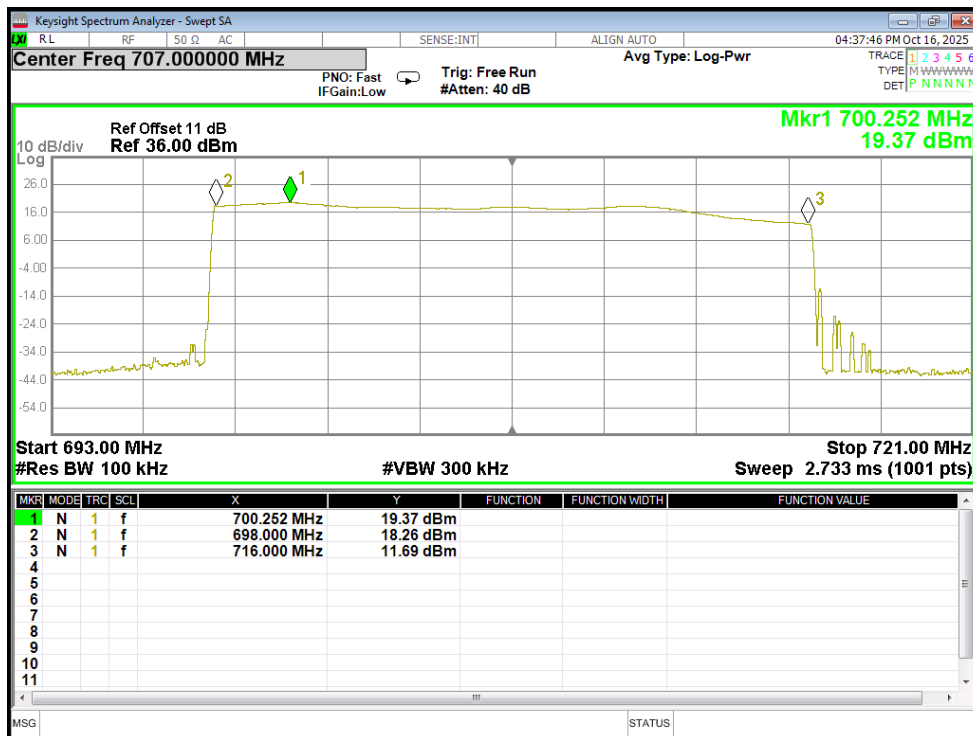




Cellular



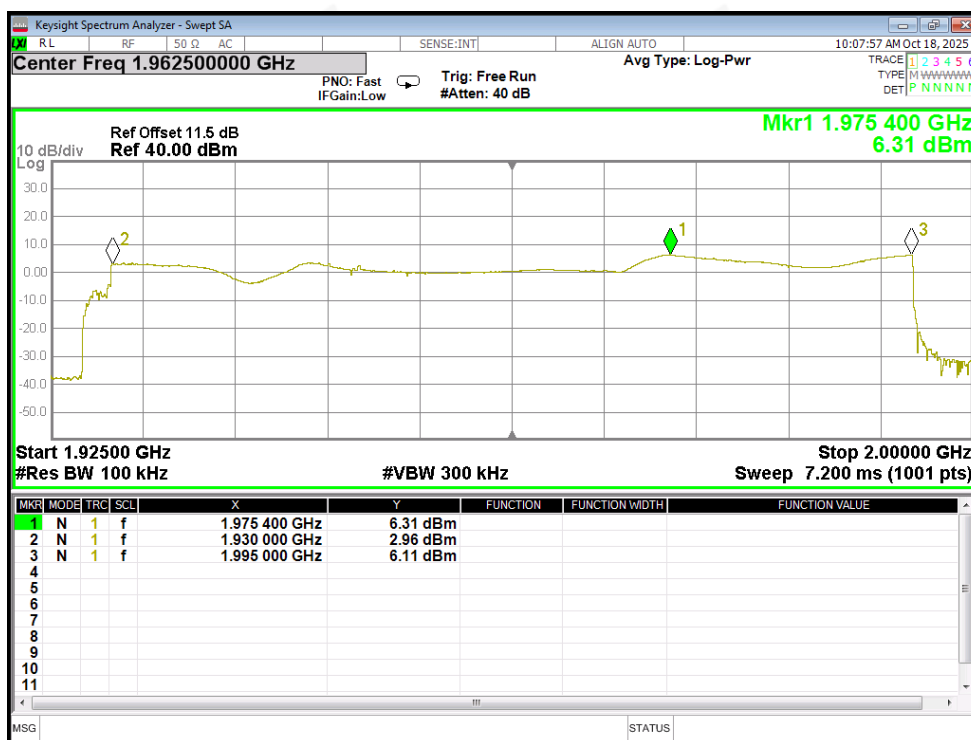
Lower 700



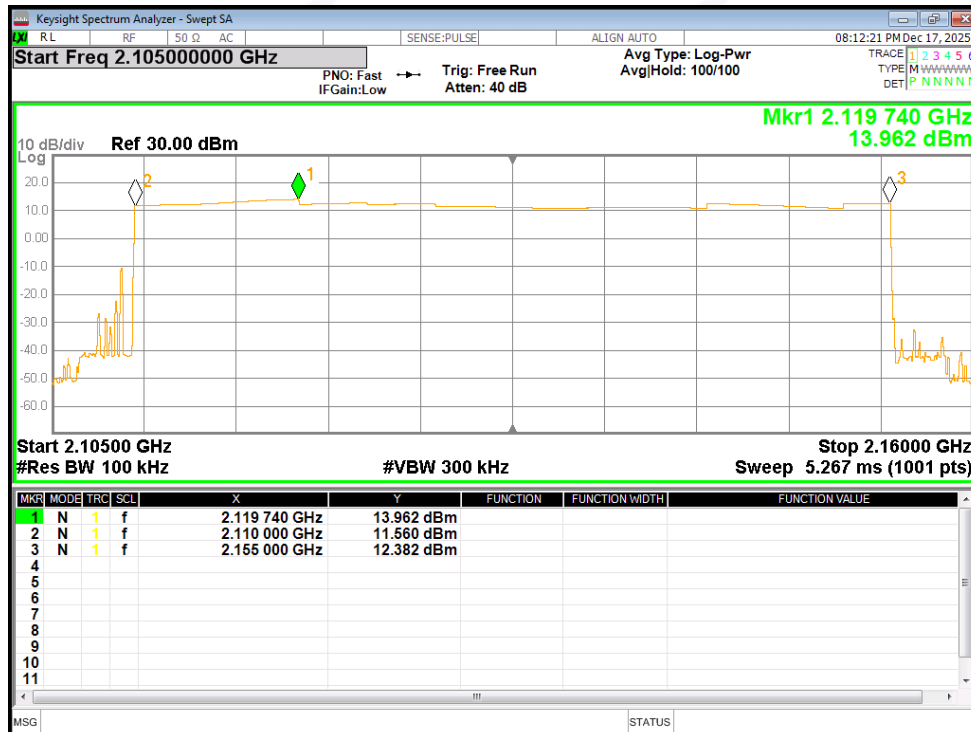


Downlink

PCS

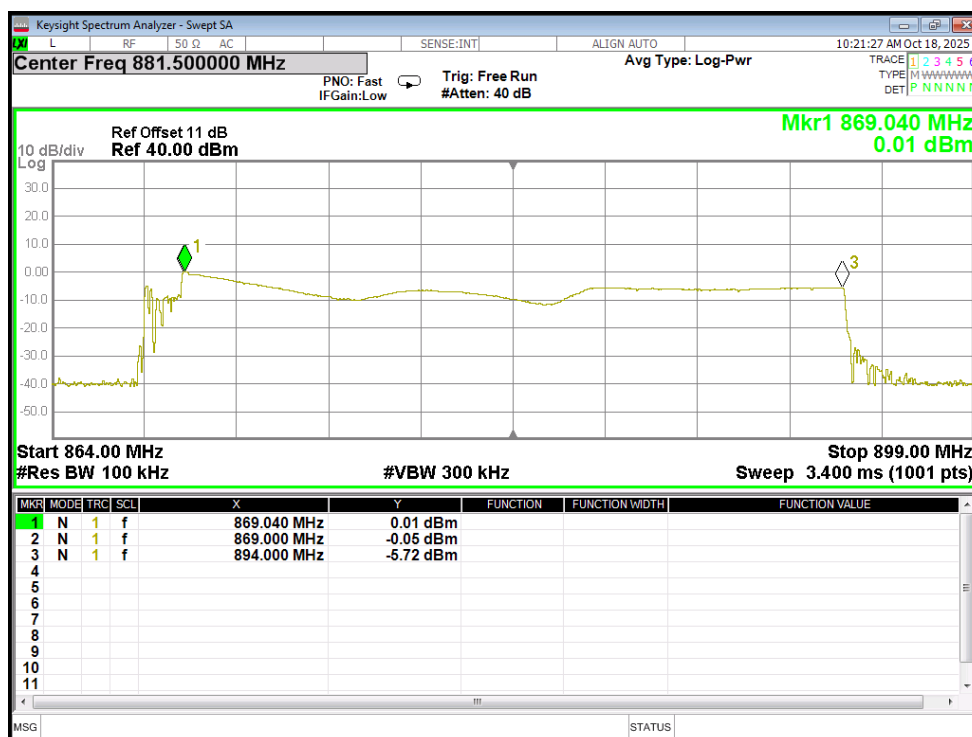


AWS

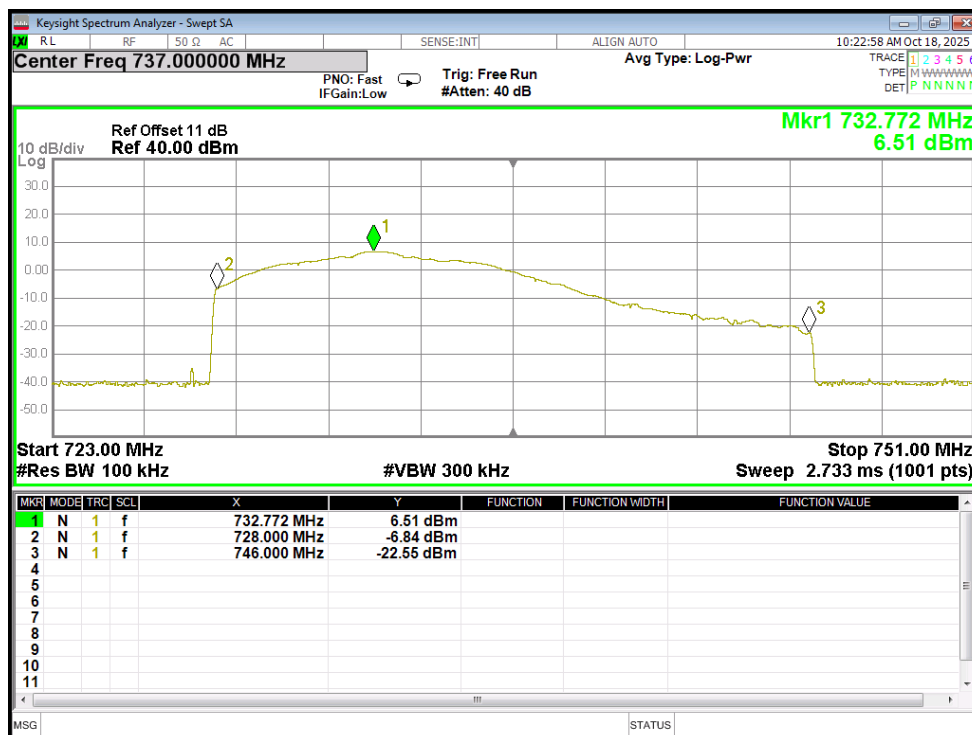




Cellular



Lower 700





4.2 MAXIMUM POWER

Test Requirement

FCC Part 20.21 (e)(8)(i)(B); FCC Part 20.21 (e)(8)(i)(D)

Limit

Uplink: Upper / 1 W (30 dBm), Lower / 50 mW (17 dBm)

Downlink: Upper / 50 mW (17 dBm)

TEST PROCEDURES

KDB935210 D03 Signal Booster Measurement v04

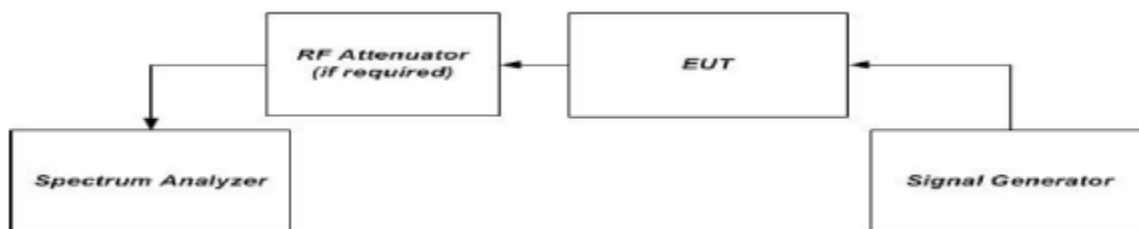
- a) Connect the EUT to the test equipment as shown in Set-Up. Begin with the uplink output (donor port) connected to the spectrum analyzer.
- b) Configure the signal generator and spectrum analyzer for operation on the frequency determined in Frequency Band with the highest power level, but with the 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 (Pin).
- g) Measure the output power (Pout) 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 $\geq 3 \times$ 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 $\geq (2 \times \text{span})/\text{RBW}$ (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 Pout 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.

Test Setup



Test Data

Max Gain							
Mode	Operation Band	Signal Type	Pre AGC Input Level (dBm)	Conducted Output Level (dBm)	Max Gain (dB)	Gain Limit (dB)	Verdict
Uplink	Lower 700 Band	CW	-36	20.03	56.03	≤63.49	PASS
		AWGN	-32	19.44	51.44		PASS
	Cellular Band	CW	-34	18.64	52.64	≤64.94	PASS
		AWGN	-30	18.19	48.19		PASS
	PCS Band	CW	-37	19.69	56.69	≤71.99	PASS
		AWGN	-30	18.82	48.82		PASS
	AWS Band	CW	-34	20.57	54.57	≤71.27	PASS
		AWGN	-30	19.49	49.49		PASS
Downlink	Lower 700 Band	CW	-51	8.53	59.53	≤63.85	PASS
		AWGN	-43	5.72	48.72		PASS
	Cellular Band	CW	-49	0.95	49.95	≤65.40	PASS
		AWGN	-42	-0.82	41.18		PASS
	PCS Band	CW	-49	7.53	56.53	≤72.34	PASS
		AWGN	-42	5.51	47.51		PASS
	AWS Band	CW	-48	6.85	54.85	≤73.08	PASS
		AWGN	-43	1.26	44.26		PASS

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						
Mode	Operation Band	Signal Type	AGC Level (dBm)	Max Input Level (dBm)	Max Input Level limit (dBm)	Verdict
Uplink	Lower 700 Band	CW	-43	-20	≤27	PASS
		AWGN	-31	-20		PASS
	Cellular Band	CW	-38	-19		PASS
		AWGN	-28	-18		PASS
	PCS Band	CW	-38	-20		PASS
		AWGN	-32	-18		PASS
	AWS Band	CW	-40	-21		PASS
		AWGN	-31	-22		PASS
Downlink	Lower 700 Band	CW	-46	-22	≤-20	PASS
		AWGN	-35	-21		PASS
	Cellular Band	CW	-46	-21		PASS
		AWGN	-36	-20		PASS
	PCS Band	CW	-47	-21		PASS
		AWGN	-38	-18		PASS
	AWS Band	CW	-53	-22		PASS
		AWGN	-43	-22		PASS

Max Output Power															
Mode	Operation Band	Signal Type	Conducted Output Power (dBm)	Total Con-ducted Output Power (dBm)	Conducted Output Power limit(dBm)	Antenna Gain (dBi)	Cable Loss (dB)	EIRP (dBm)	ERP (dBm)	EIRP Limit (dBm)	Verdict				
Uplink	Lower 700	CW	20.03	/	17-30	5	3.7	/	19.18	≤30	PASS				
		AWGN	19.44			5	3.7		19.18		PASS				
	Cellular	CW	18.64			6.5	4		18.59		PASS				
		AWGN	18.19			6.5	4		18.99		PASS				
	PCS	CW	19.69			7.5	4.5	22.69	/		PASS				
		AWGN	18.82			7.5	4.5	21.82			PASS				
	AWS	CW	20.57			7.5	4.2	23.87			PASS				
		AWGN	19.49			7.5	4.2	22.79			PASS				
	Downlink	Lower 700	CW			6.09	8.53	/	5.5		1.2	/	10.68	≤17	PASS
						4.87			5.5		1.2				PASS

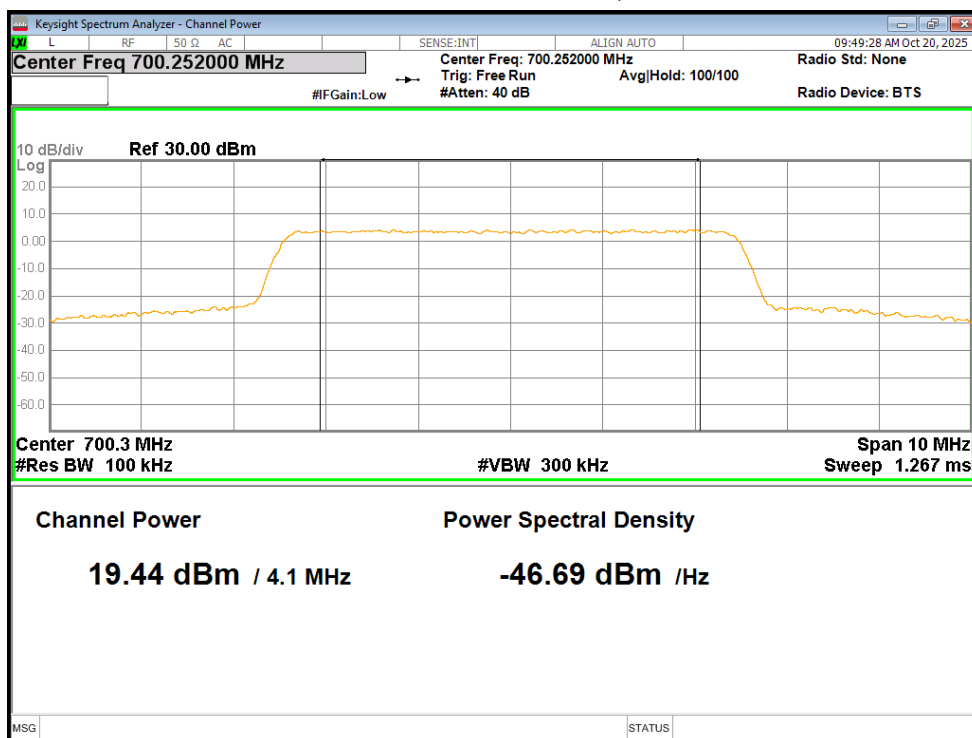


		AWGN	4.87	5.72		5.5	1.2		7.87		PASS		
			-1.77			5.5	1.2				PASS		
	Cellular	CW	-0.13	0.95		5.5	1.4		2.90		PASS		
			-5.63			5.5	1.4				PASS		
		AWGN	-1.34	-0.82		5.5	1.4		1.13		PASS		
			-10.32			5.5	1.4				PASS		
	PCS	CW	6.31	7.53		6.5	1.5	12.53	/		PASS		
			1.43			6.5	1.5				PASS		
		AWGN	4.95	5.51		6.5	1.5	10.51			PASS		
			-3.66			6.5	1.5				PASS		
	AWS	CW	4.181	6.62		6	1.4	11.45			PASS		
			3.47			6	1.4				PASS		
		AWGN	-1.56	1.26		6	1.4	5.86			PASS		
			-1.95			6	1.4				PASS		

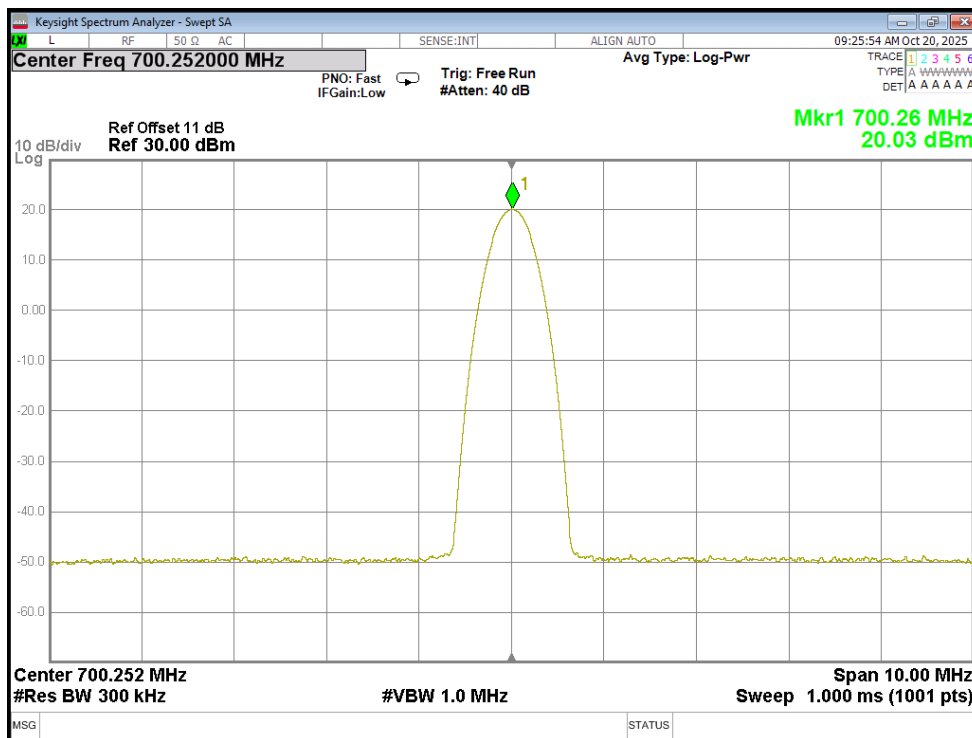
Uplink Gain VS Downlink Gain						
Band	Signal Type	Uplink Gain (dB)	Downlink Gain (dB)	Calculated (dB)	Limit (dB)	Verdict
Lower 700 Band	CW	56.03	59.53	-3.5	≤9	PASS
	AWGN	51.44	48.72	2.72		PASS
Cellular Band	CW	52.64	49.95	2.69		PASS
	AWGN	48.19	41.18	7.01		PASS
PCS Band	CW	56.69	56.53	0.16		PASS
	AWGN	48.82	47.51	1.31		PASS
AWS Band	CW	54.57	54.85	-0.28		PASS
	AWGN	49.49	44.26	5.23		PASS



Lower 700MHz AWGN, UL

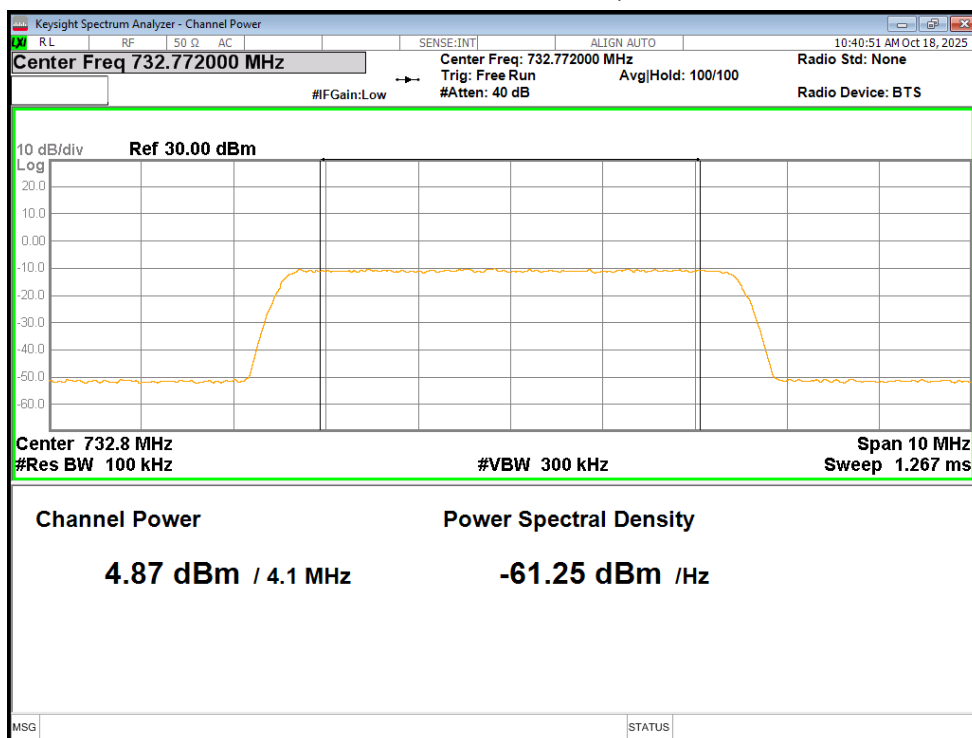


Lower 700MHz CW, UL

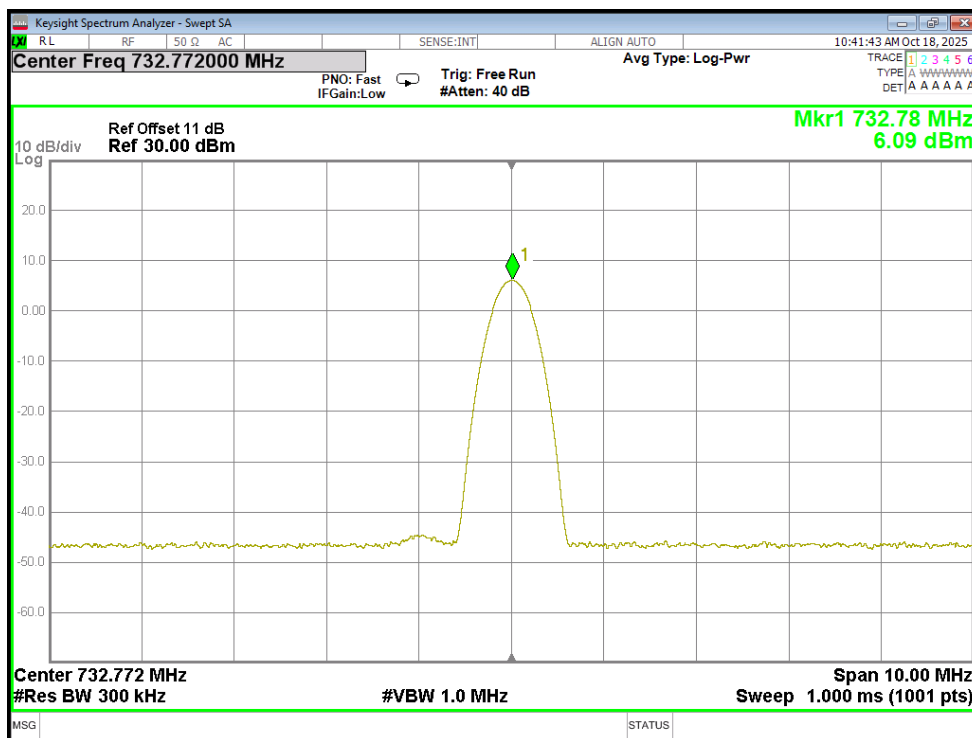




Lower 700MHz AWGN, DL

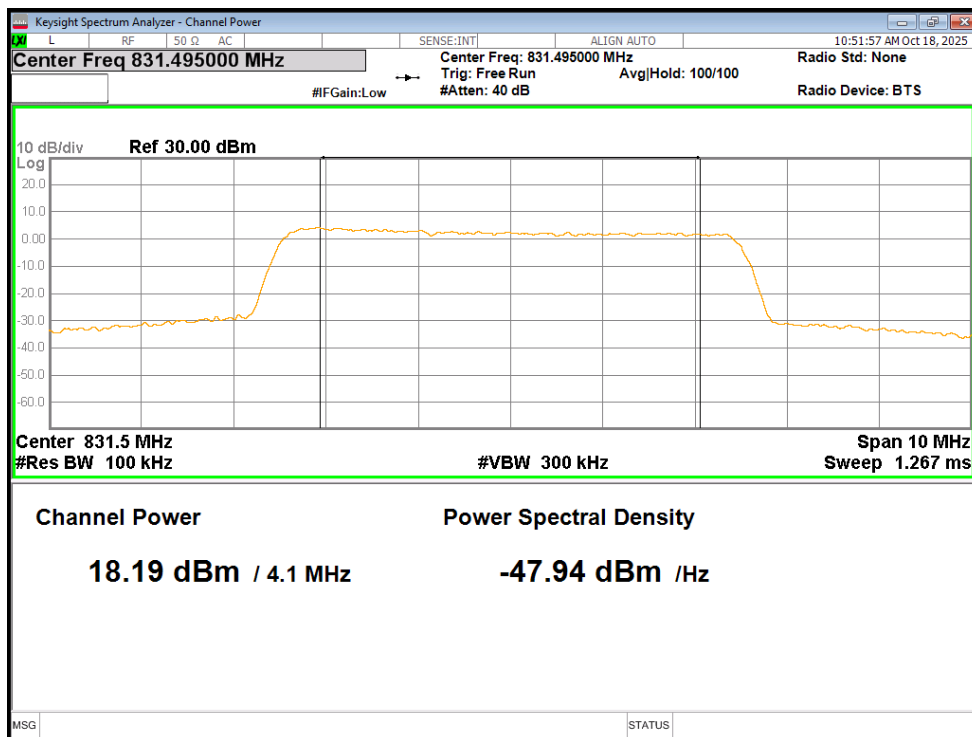


Lower 700MHz CW, DL

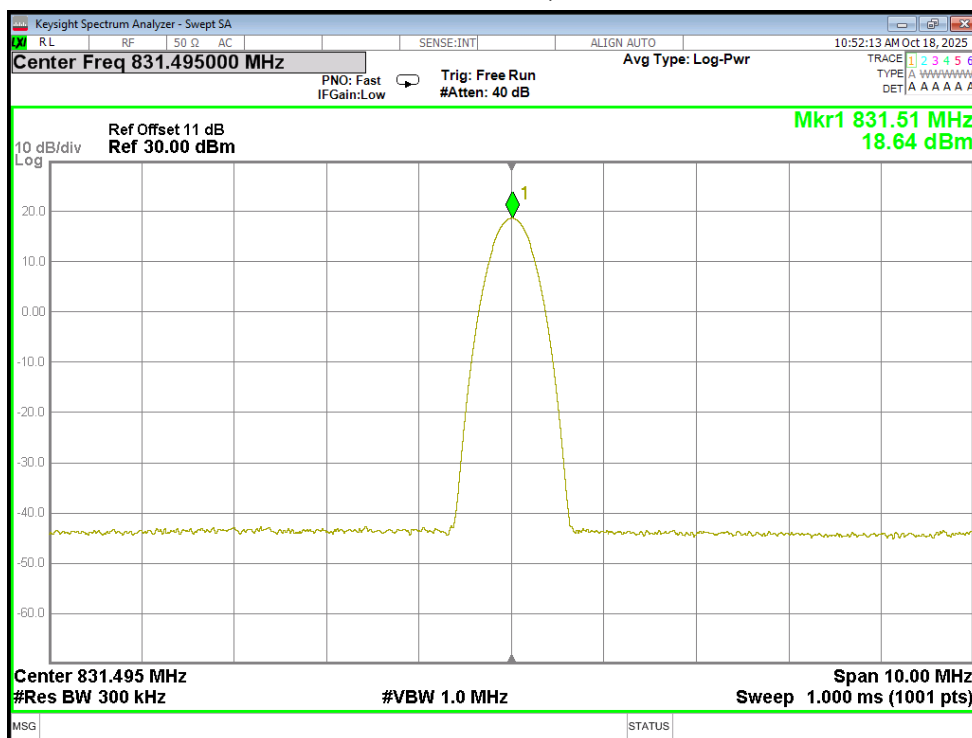




Cellular AWGN, UL

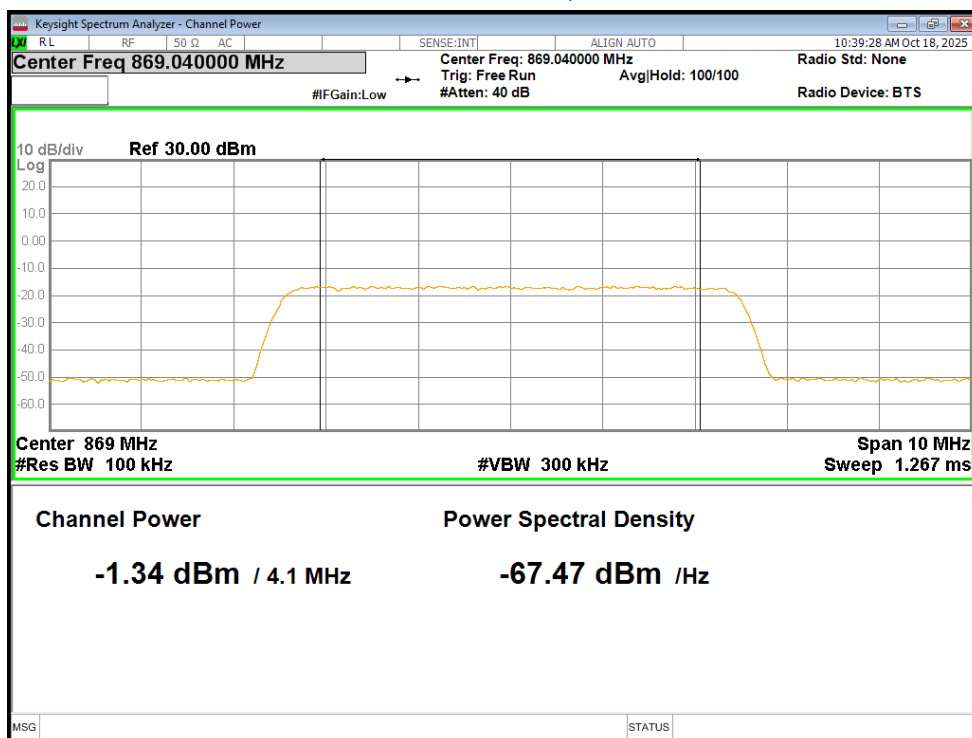


Cellular CW, UL

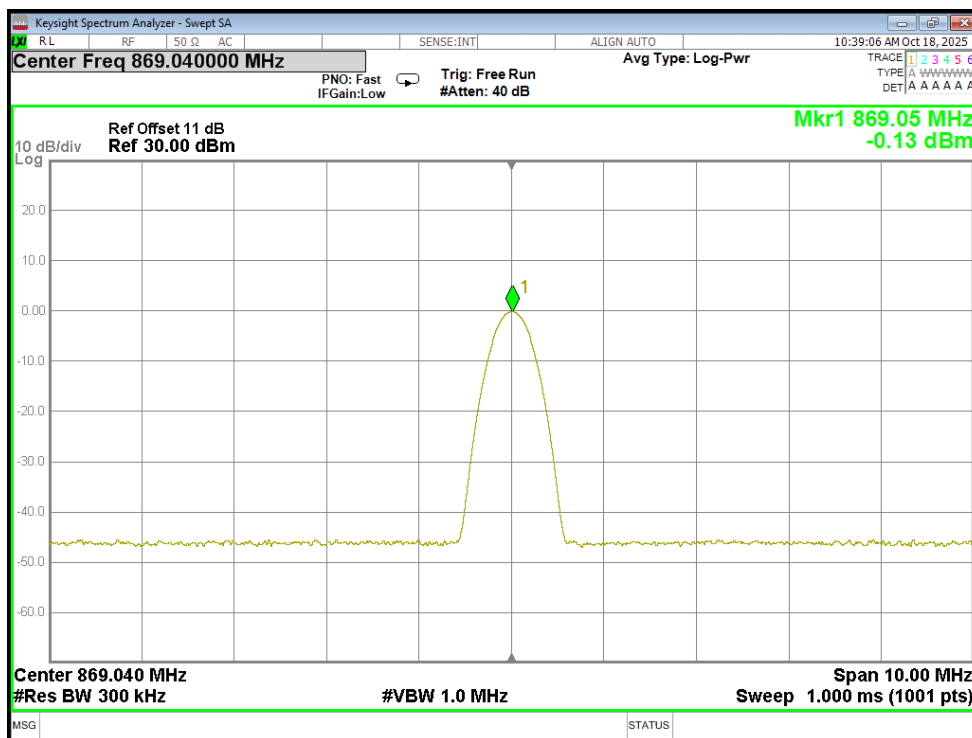




Cellular AWGN, DL

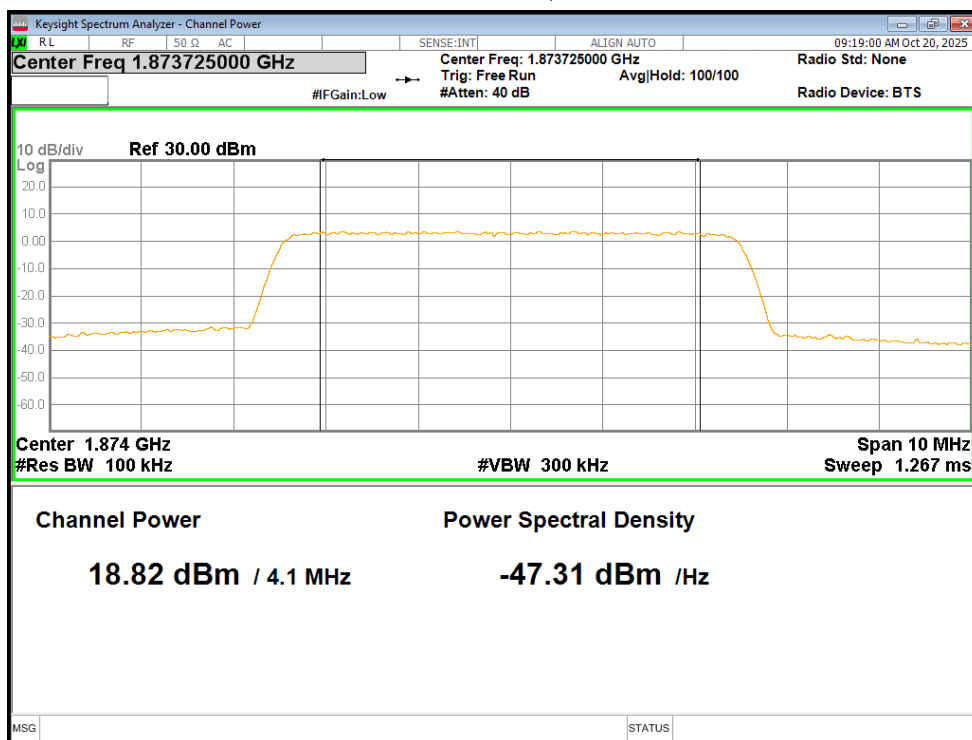


Cellular CW, DL

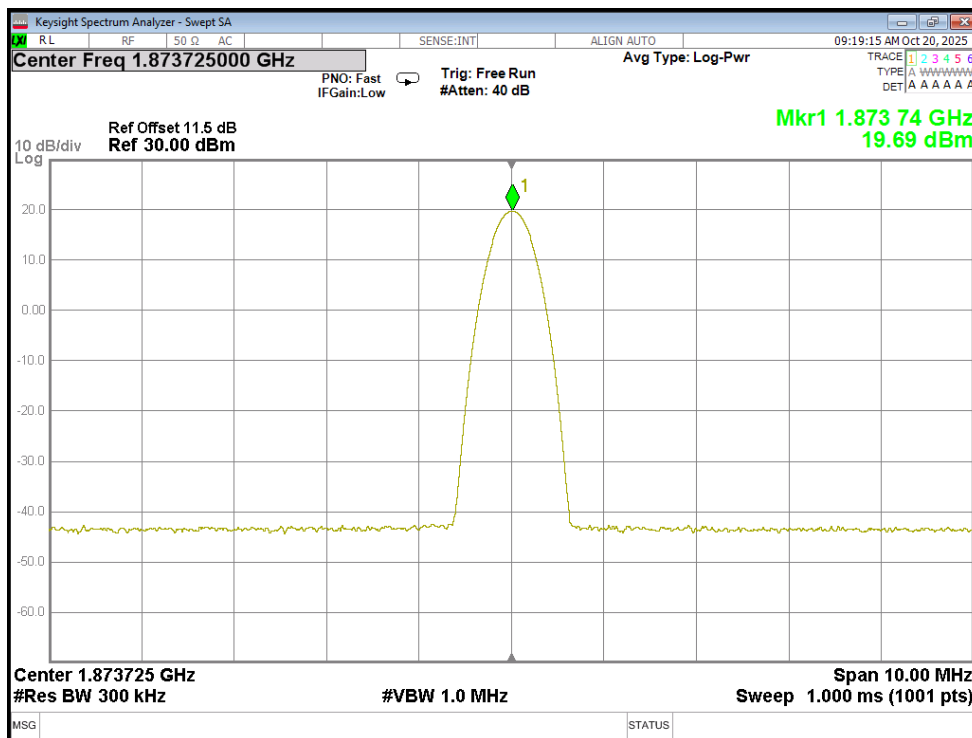




PCS AWGN, UL

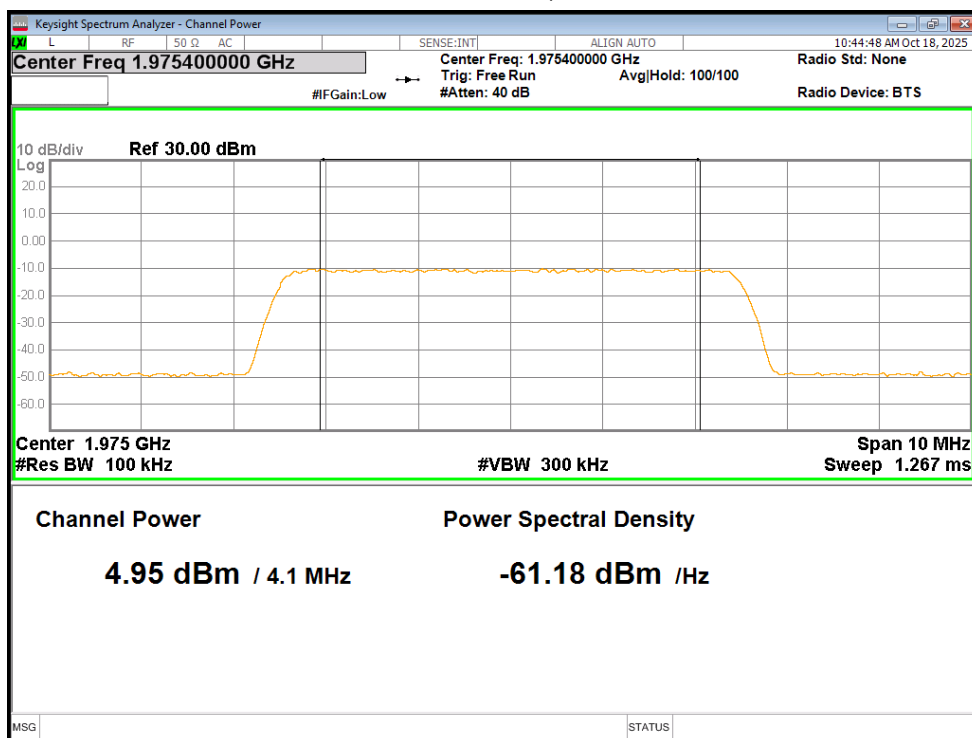


PCS CW, UL

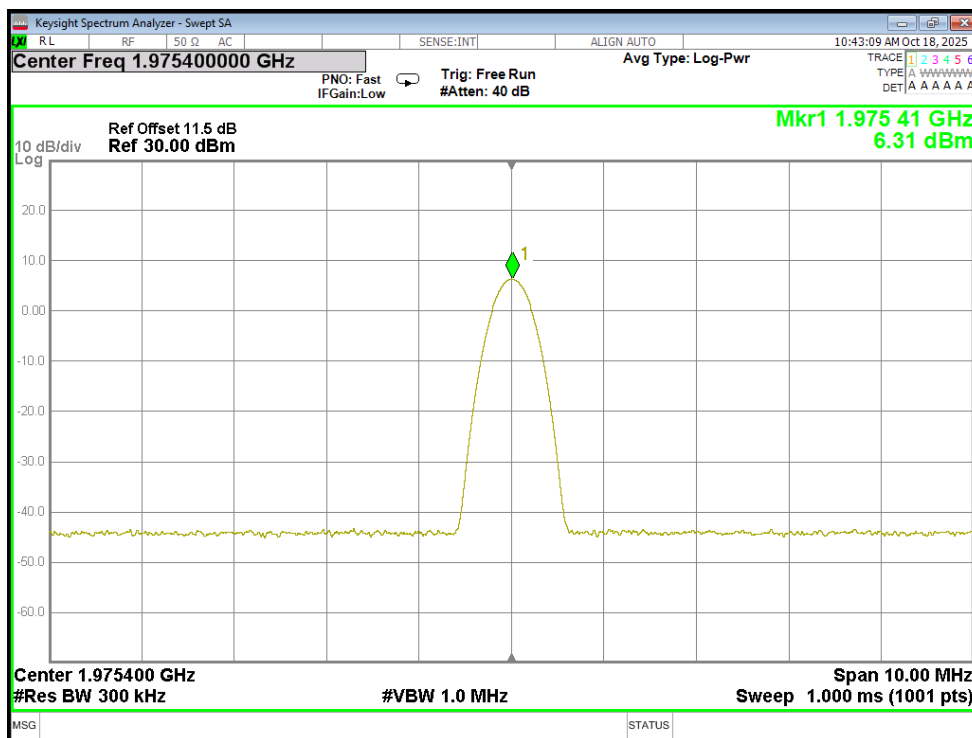




PCS AWGN, DL

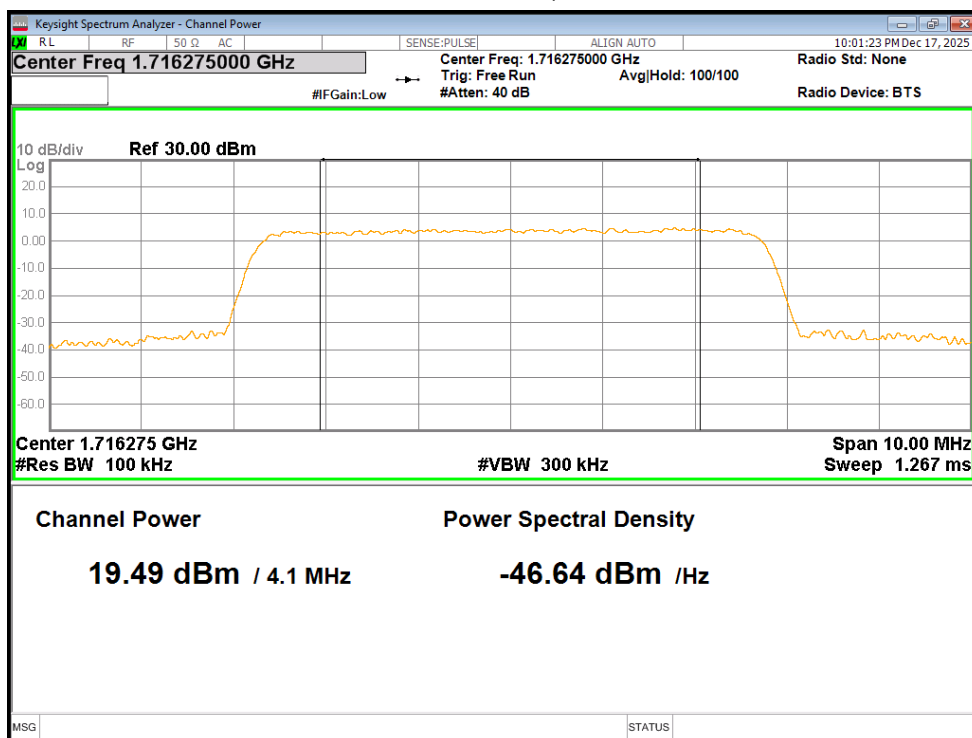


PCS CW, DL

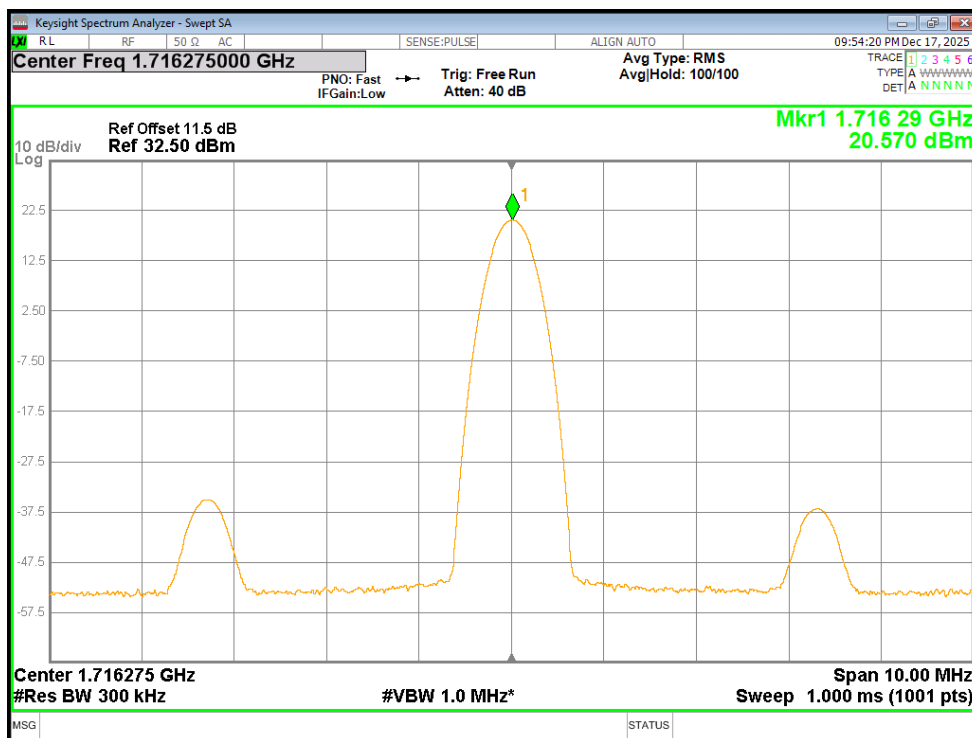




AWS AWGN, UL

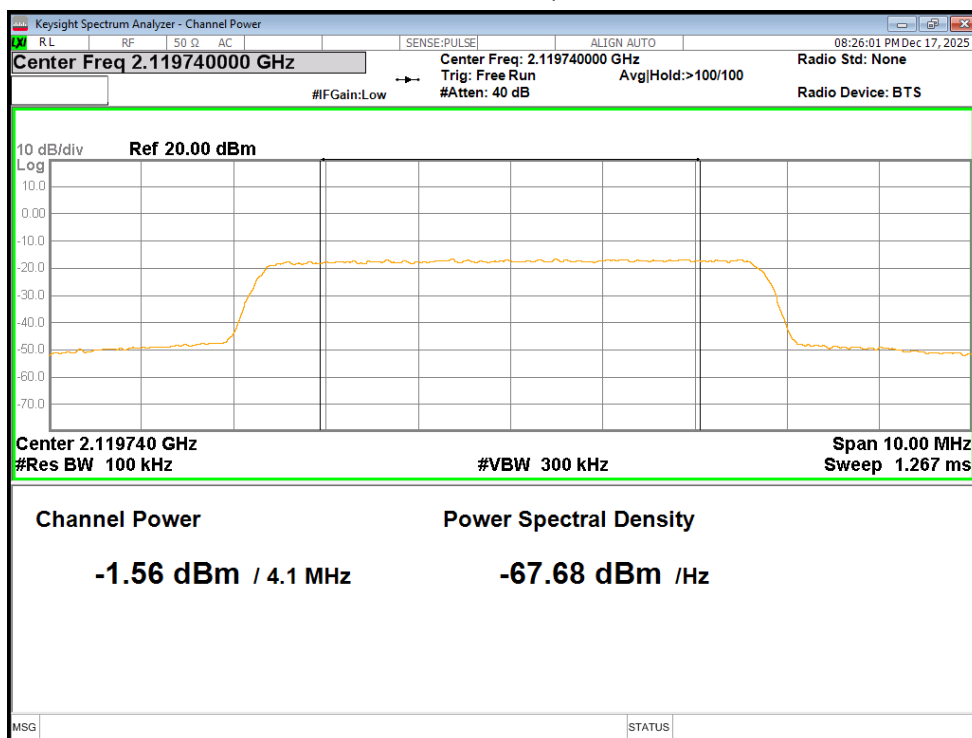


AWS CW, UL

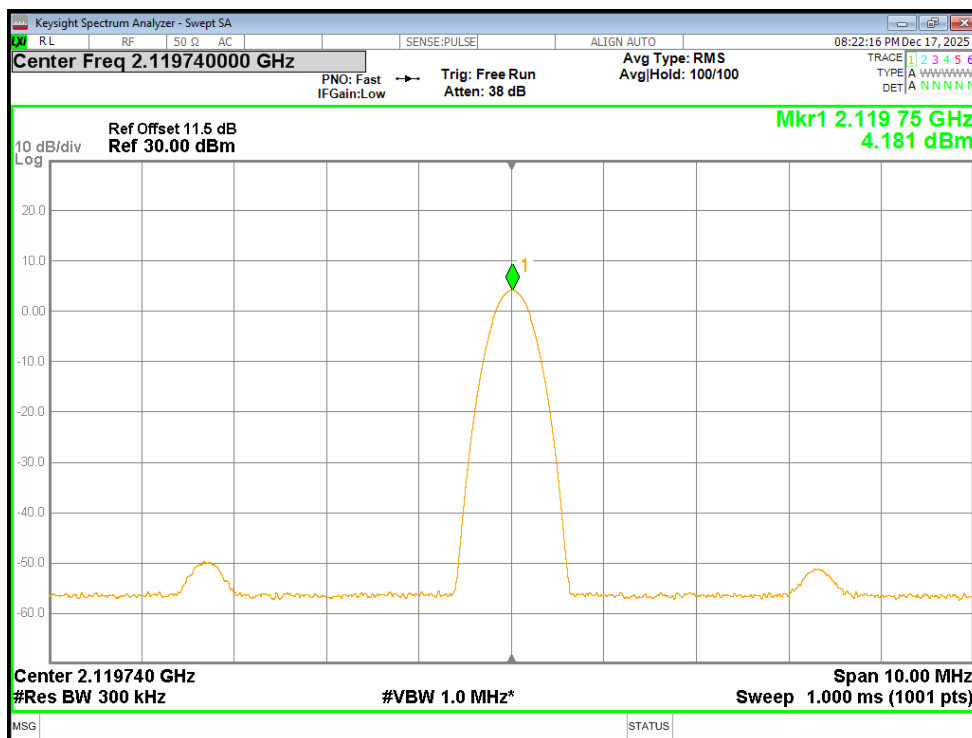




AWS AWGN, DL



AWS CW, DL





4.3 INTERMODULATION PRODUCT

Test Overview

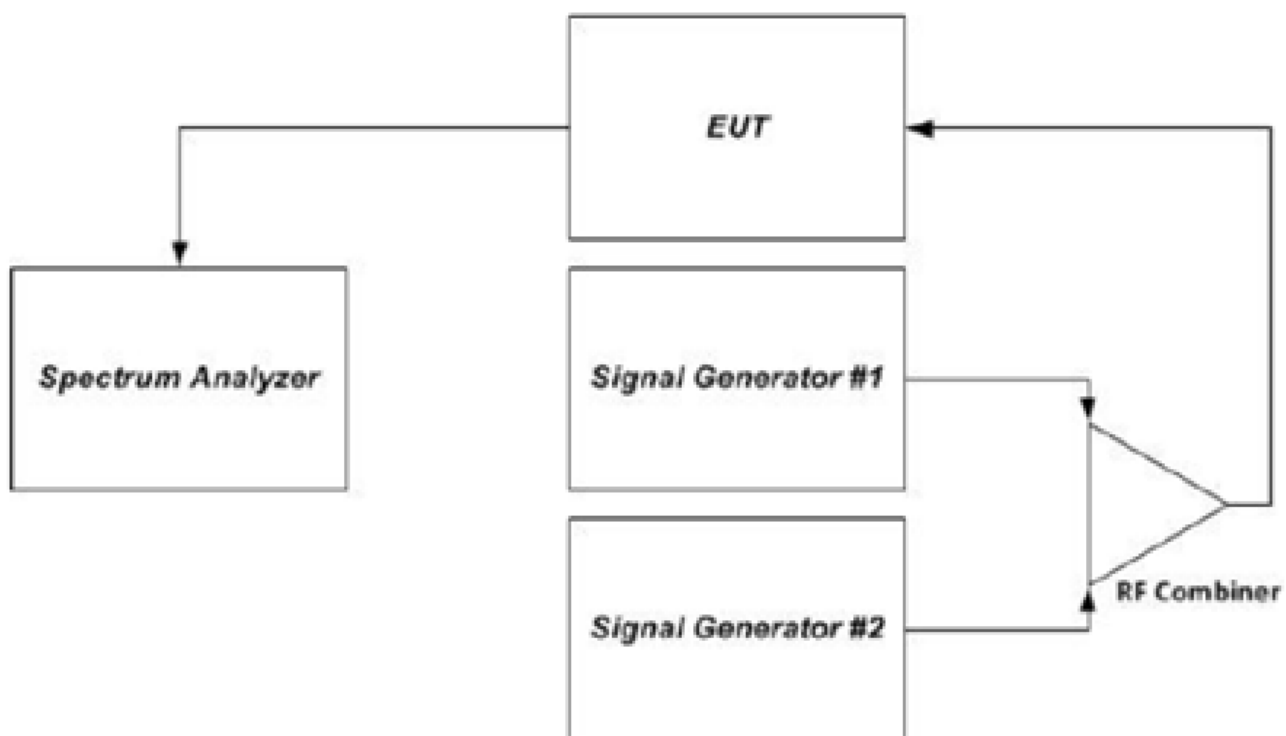
FCC Part20 Section 20.21(e)(8)(i)(F)

Limit

-19dBm

Test Procedure

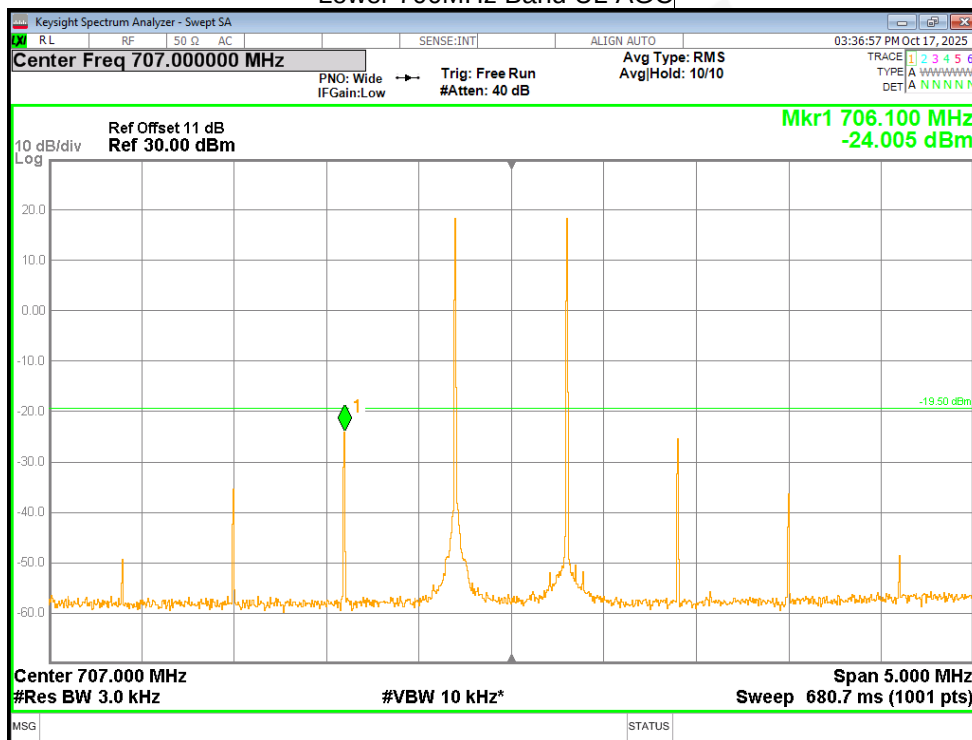
- a) Connect the signal booster to the test equipment as shown in Set-Up. Begin with the uplink output connected to the spectrum analyzer.
 - b) Set the spectrum analyzer RBW = 3 kHz.
 - c) Set the VBW $\geq 3 \times$ the RBW.
 - d) Select the RMS detector.
 - e) Set the spectrum analyzer center frequency 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 Setup

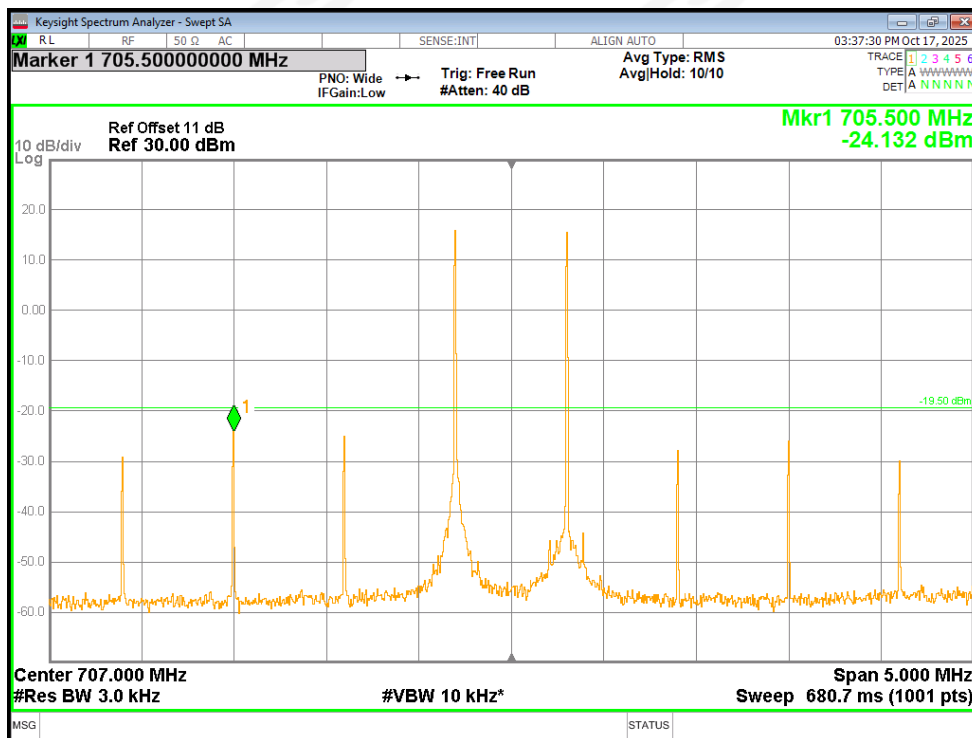


Test Data

Lower 700MHz Band UL AGC

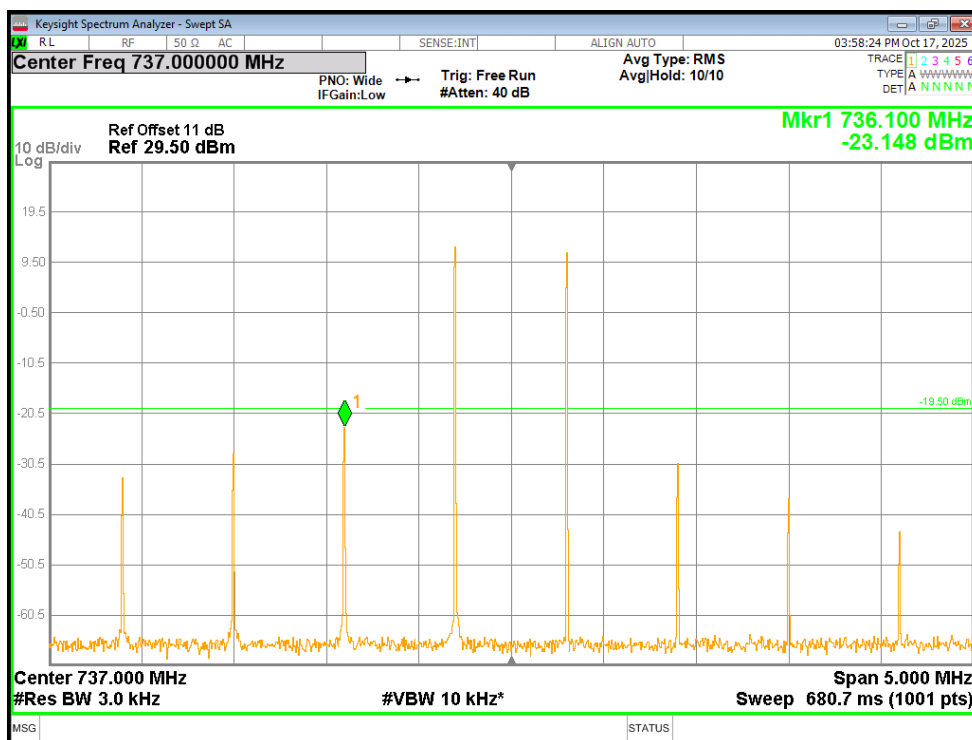


Lower700MHz Band UL AGC+10dB

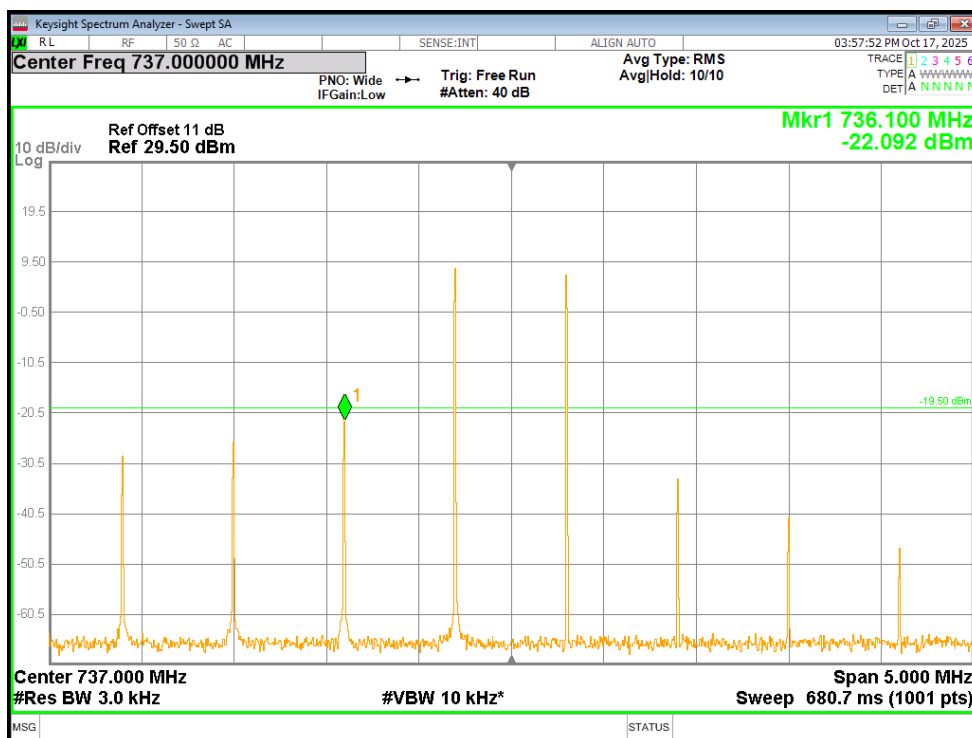




Lower 700MHz Band DL AGC

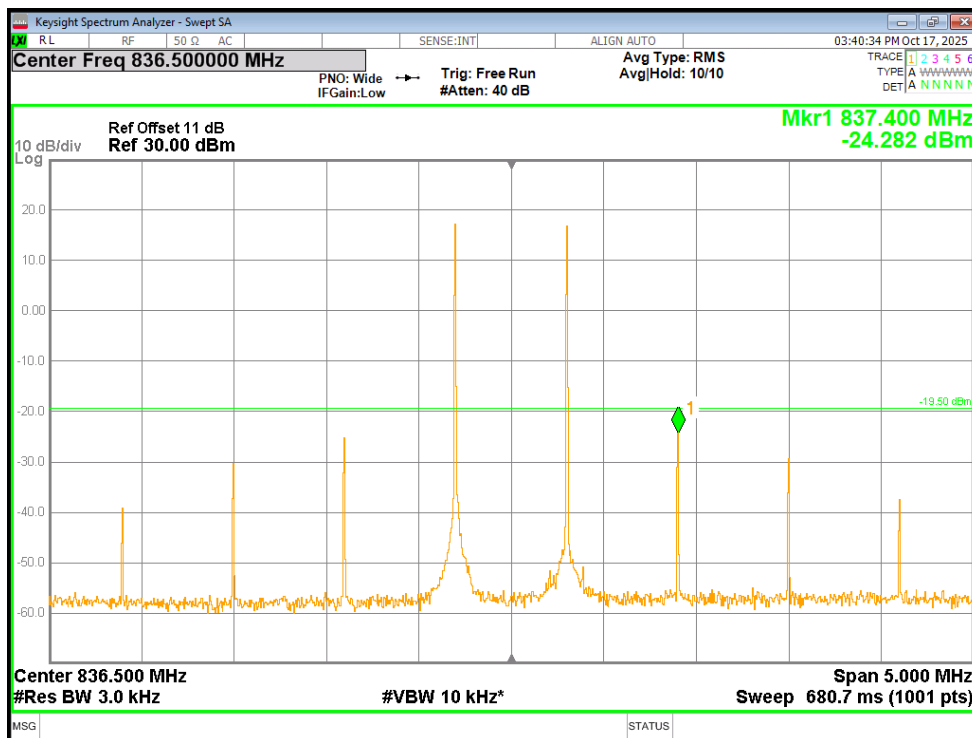


Lower 700MHz Band DL AGC +10dB

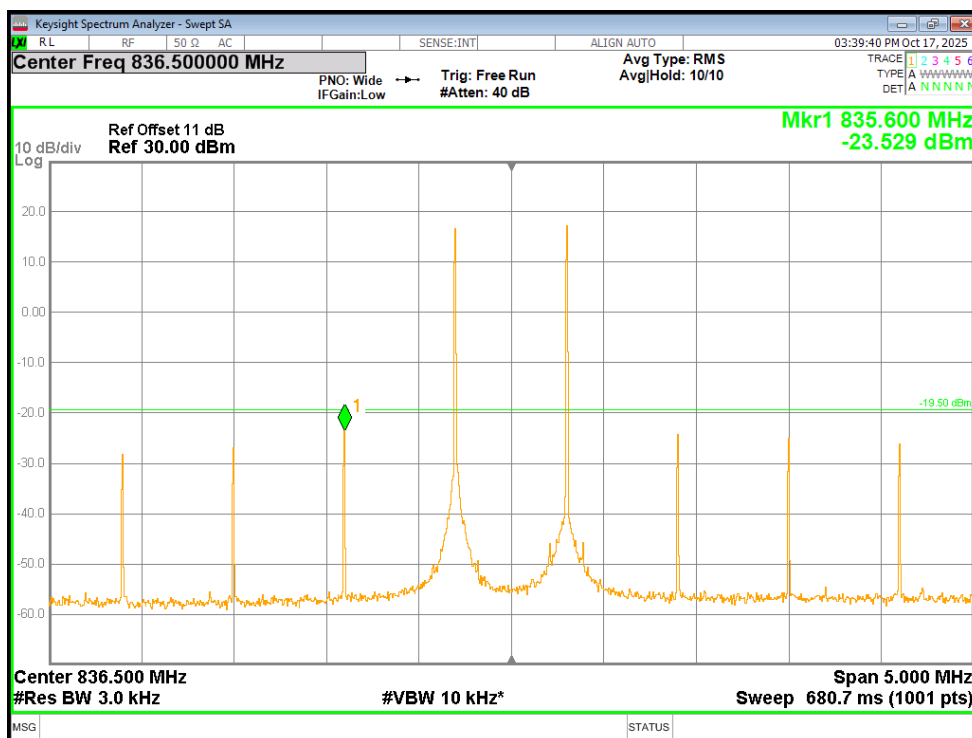




Cellular Band UL AGC

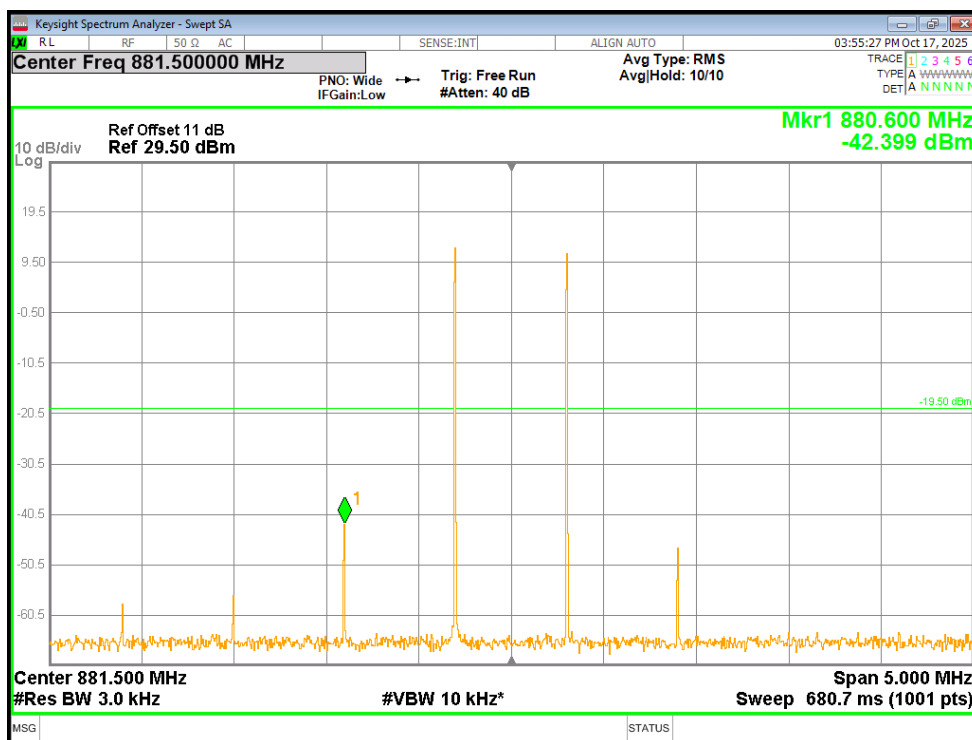


Cellular Band UL AGC+10dB

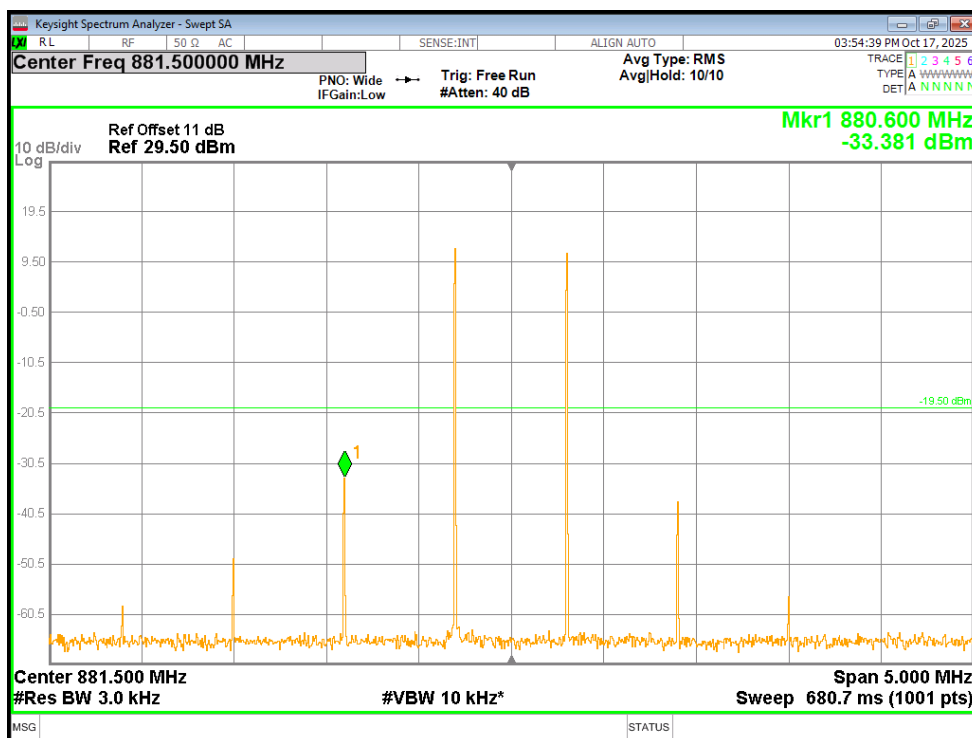




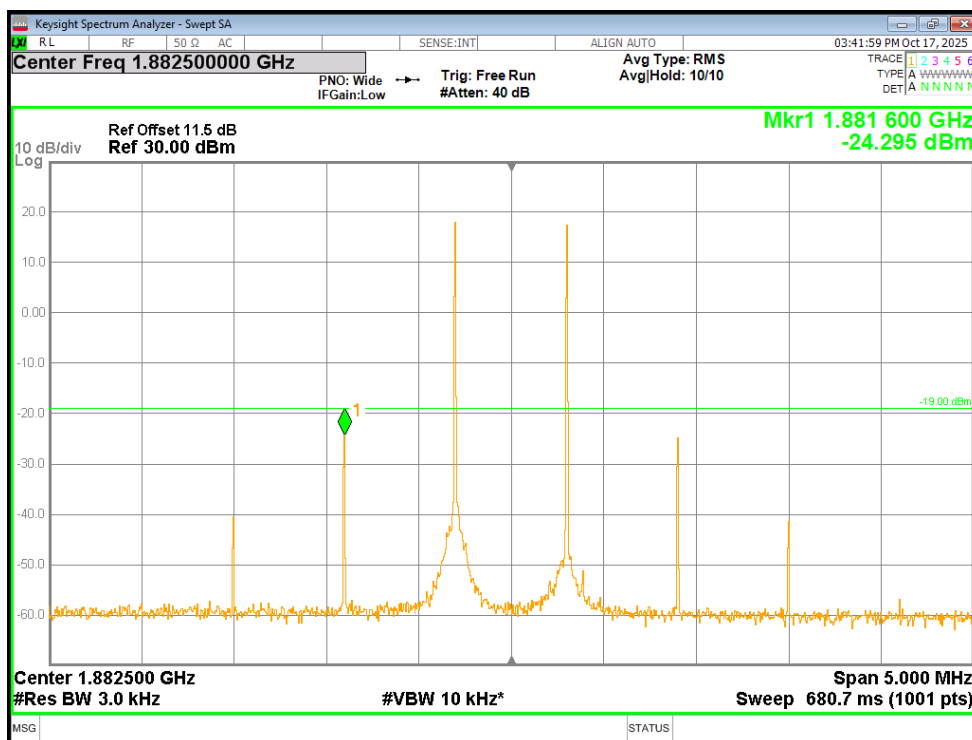
Cellular Band DL AGC



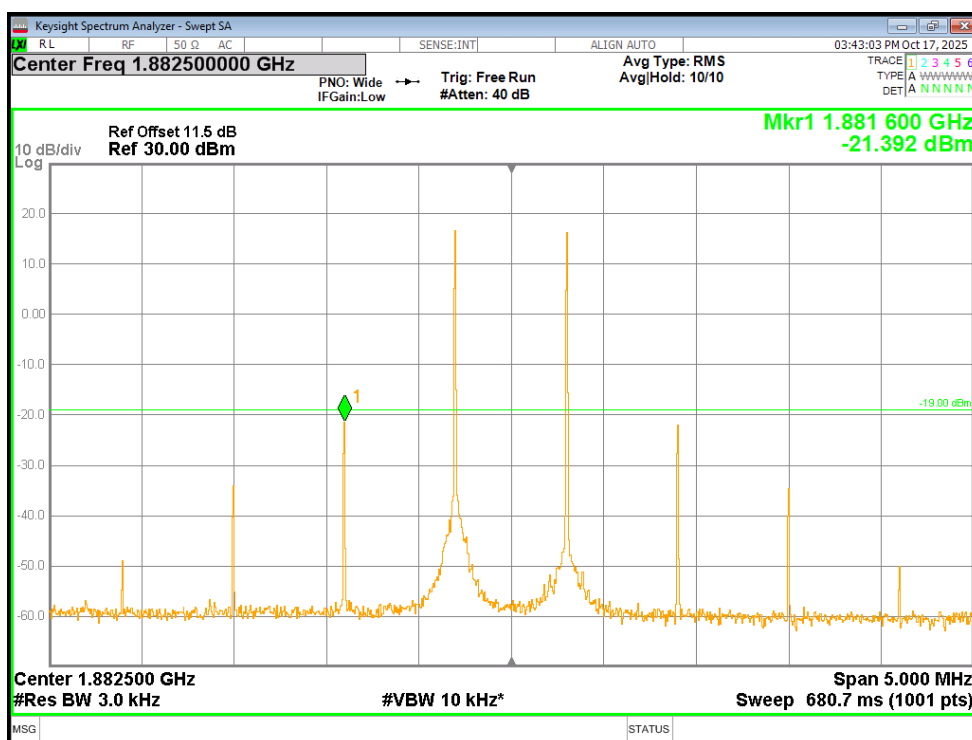
Cellular Band DL AGC+10dB



PCS Band UL AGC

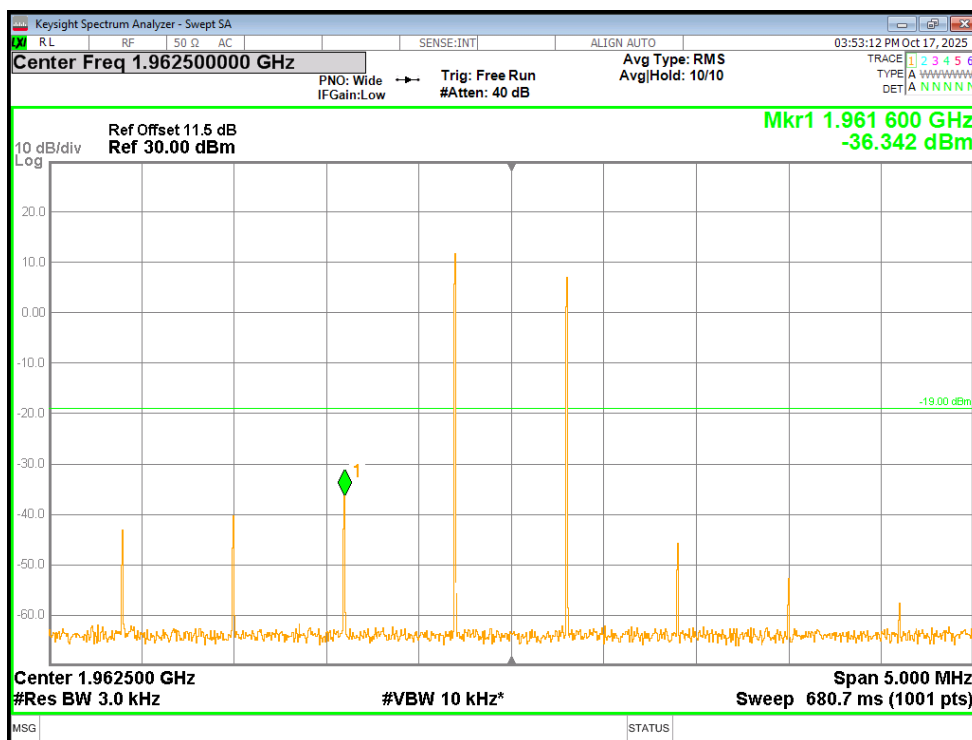


PCS Band UL AGC+10dB

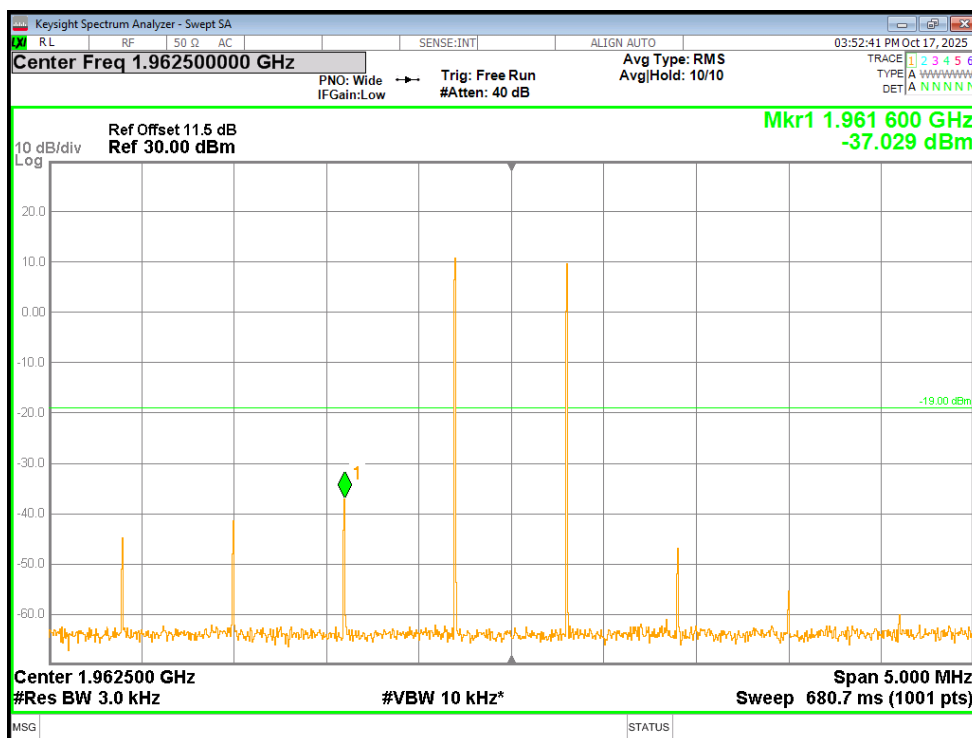




PCS Band DL AGC

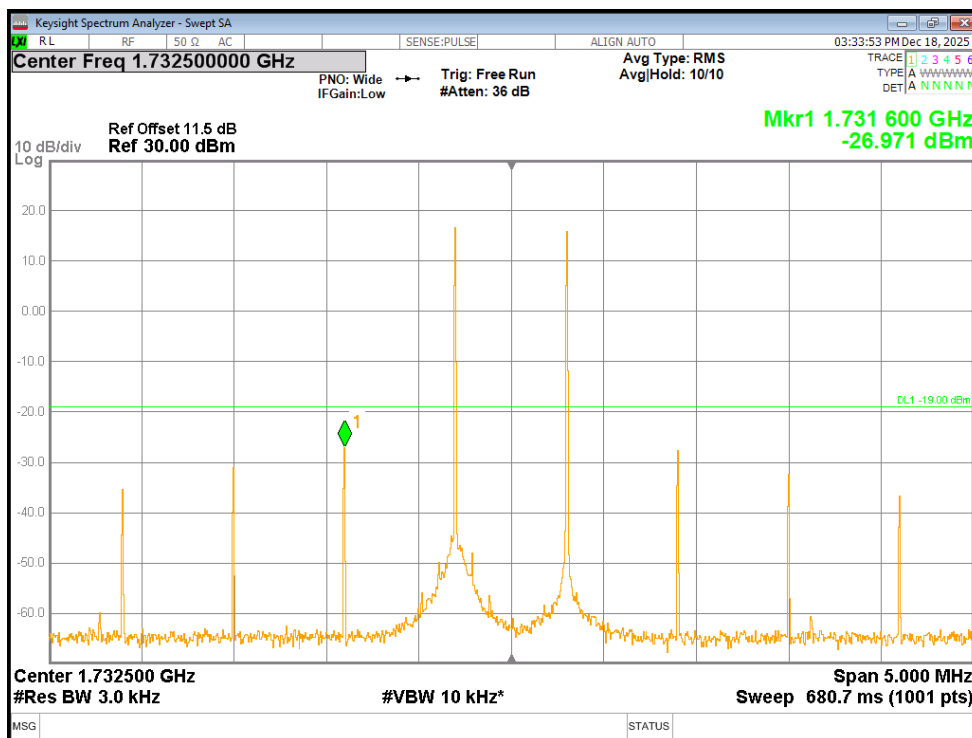


PCS Band DL AGC+10dB

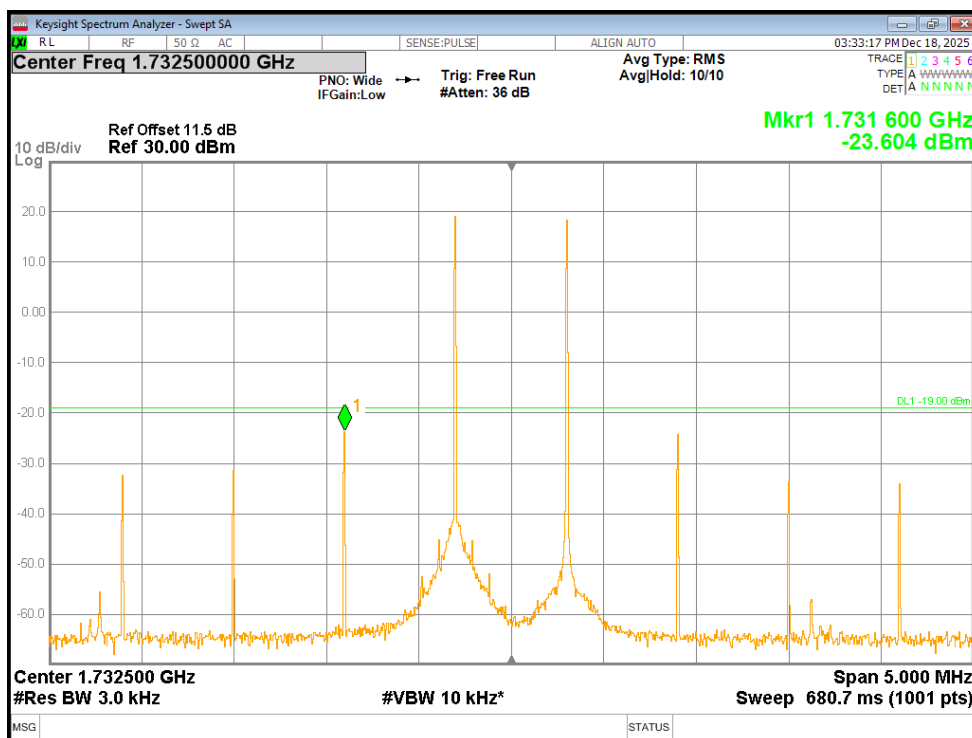




AWS Band UL AGC

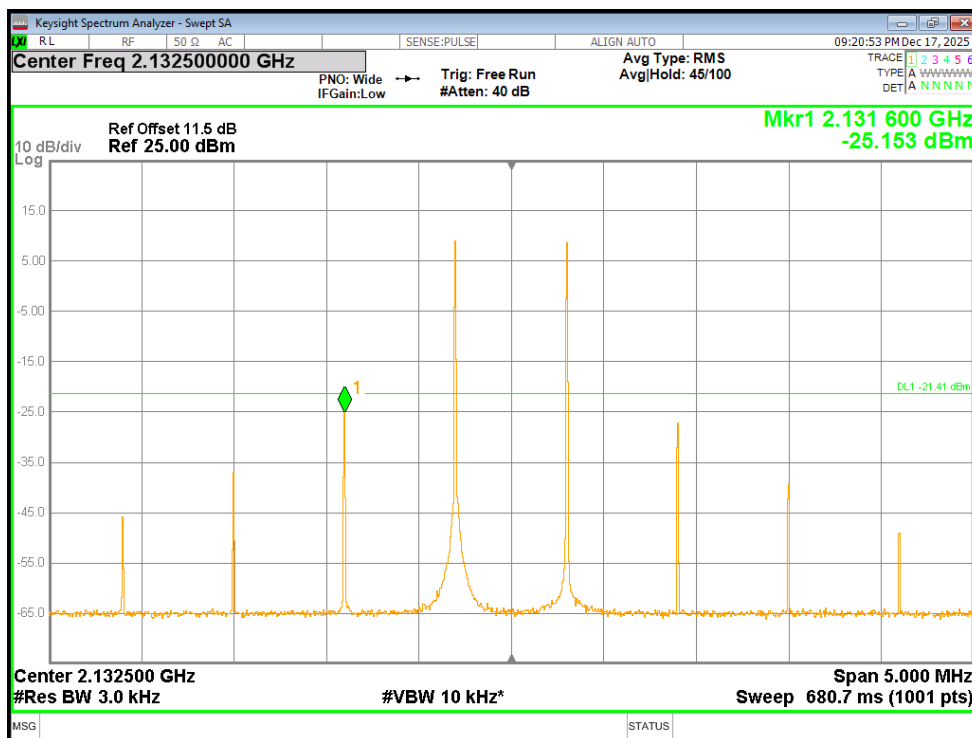


AWS Band UL AGC+10dB

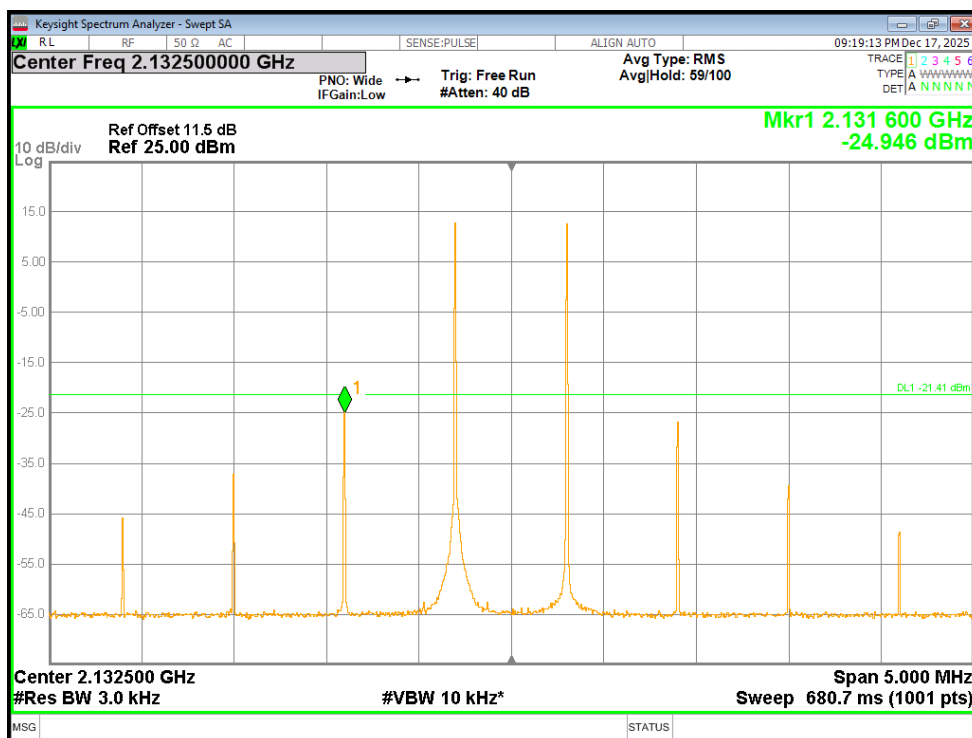




AWS Band DL AGC



AWS Band DL AGC+10dB





4.4 OUT OF BAND EMISSION

Test Overview

FCC Part20 Section 20.21(e)(8)(i)(E)

Limit

-19dBm

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.

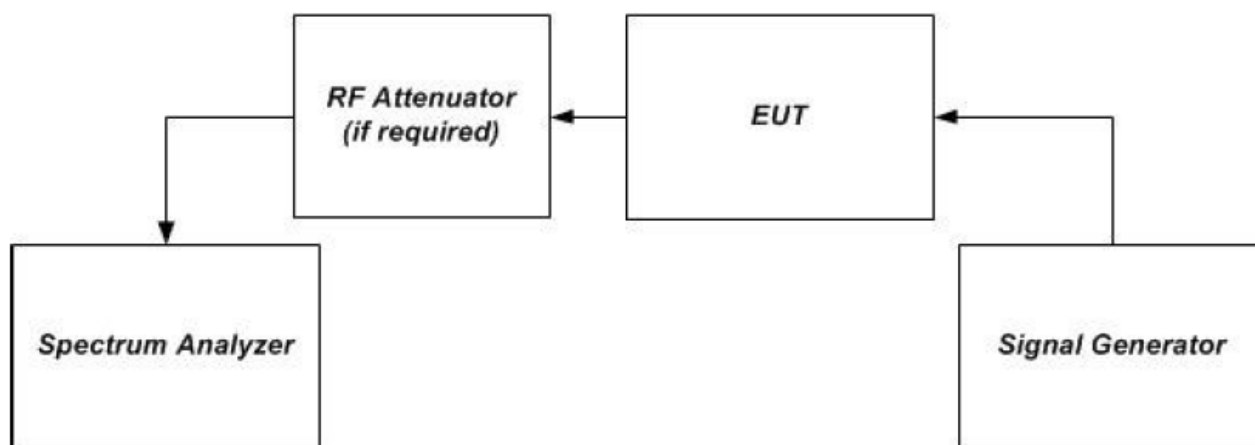
k) Capture the spectrum analyzer trace of the power level for inclusion in the test report.

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).

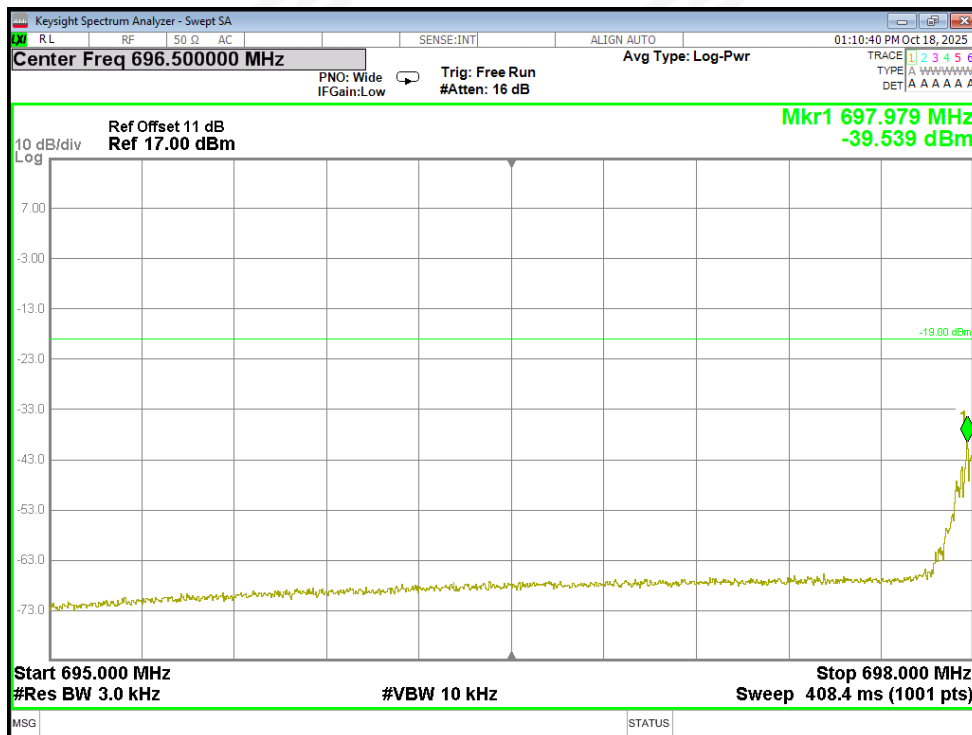
Test Setup



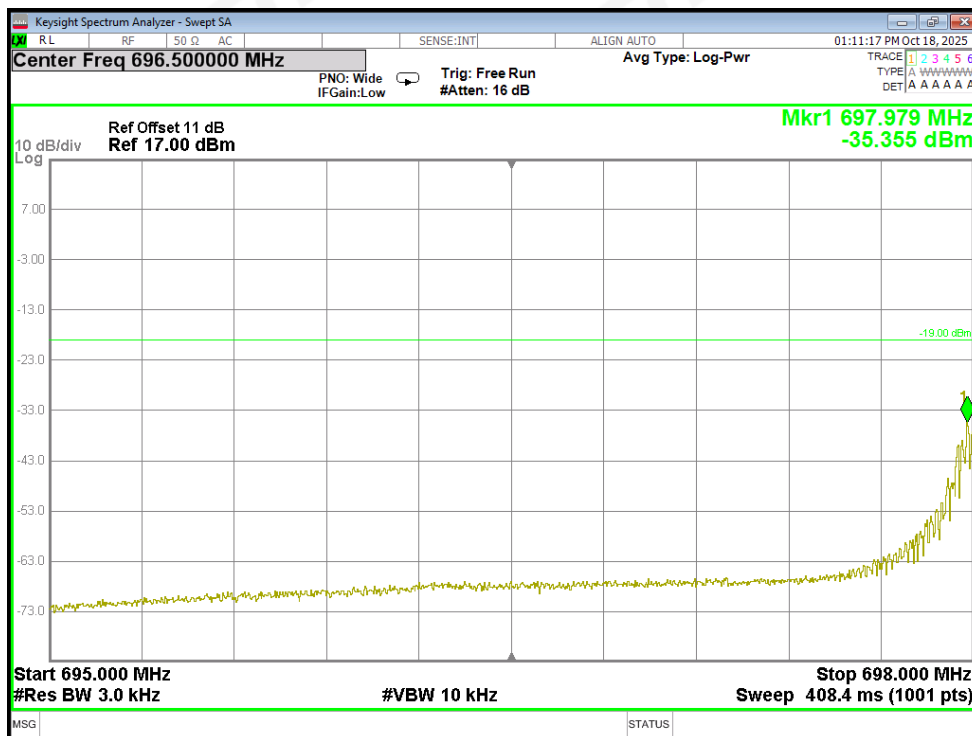


Test Data

Lower 700MHz Band UL GSM Left Side Pre AGC

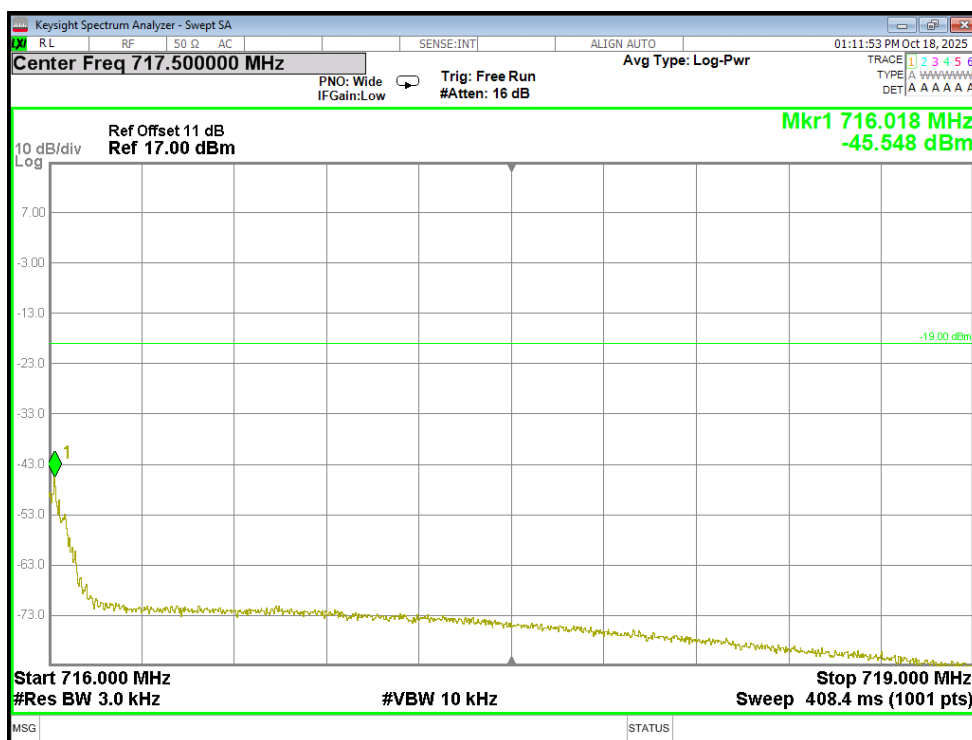


Lower 700MHz Band UL GSM Left Side Pre AGC+10dB

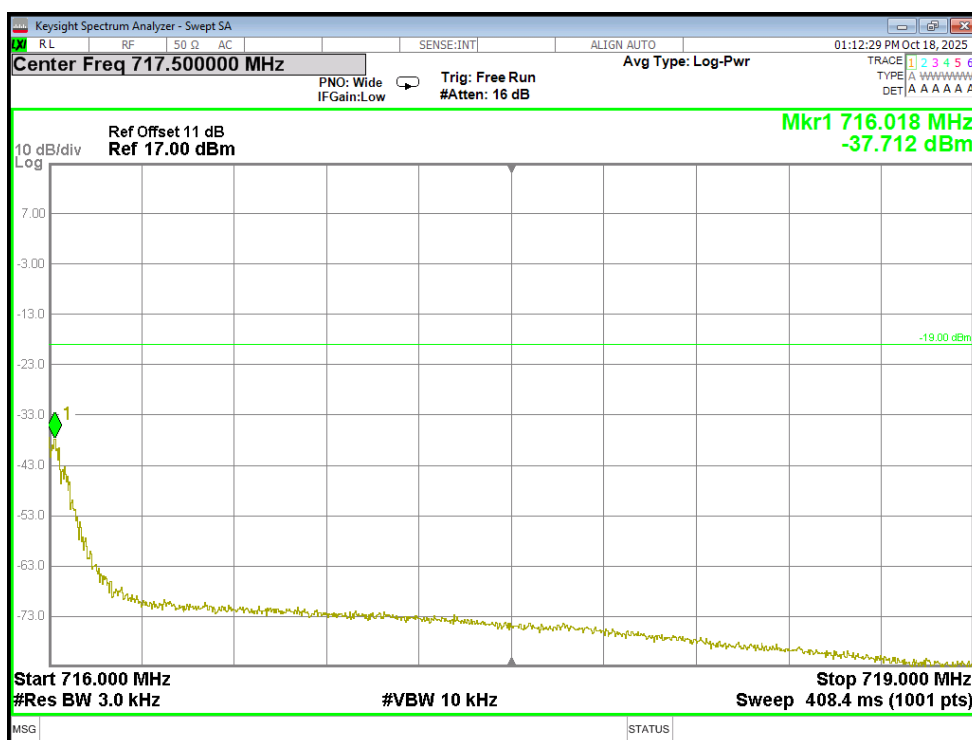




Lower 700MHz Band UL GSM Right Side Pre AGC

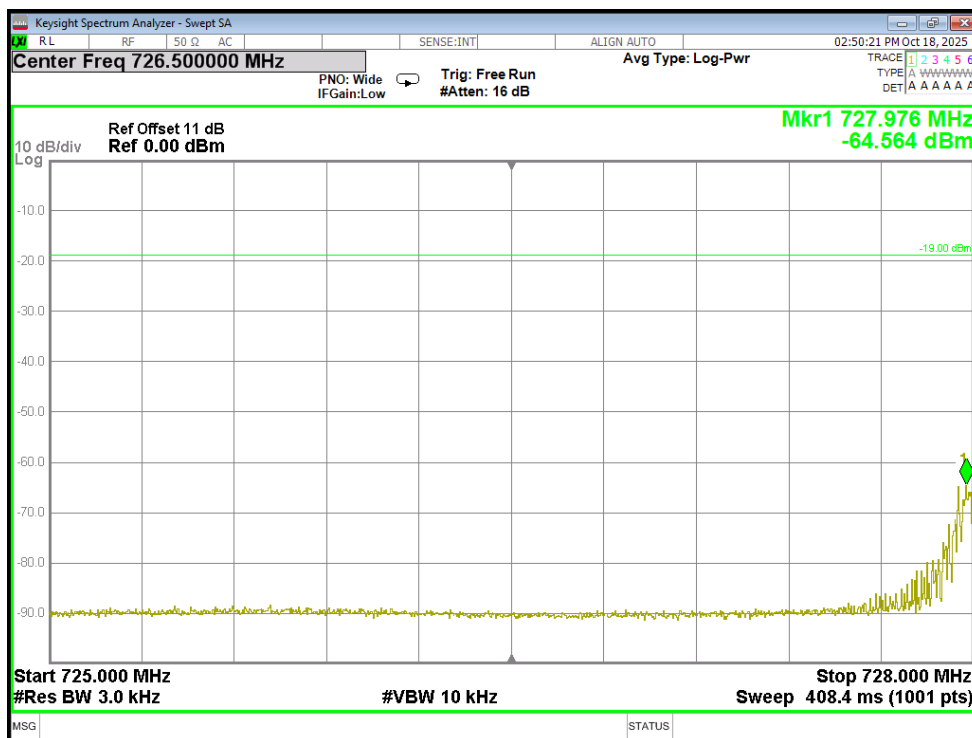


Lower 700MHz Band UL GSM Right Side Pre AGC+10dB

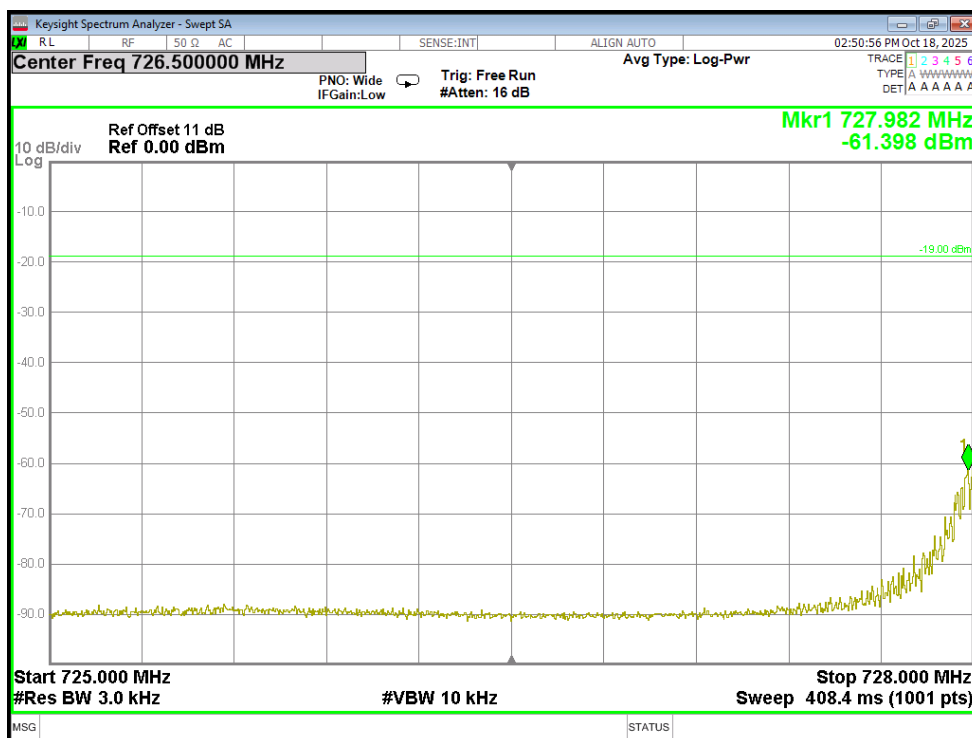




Lower 700MHz Band DL GSM Left Side Pre AGC

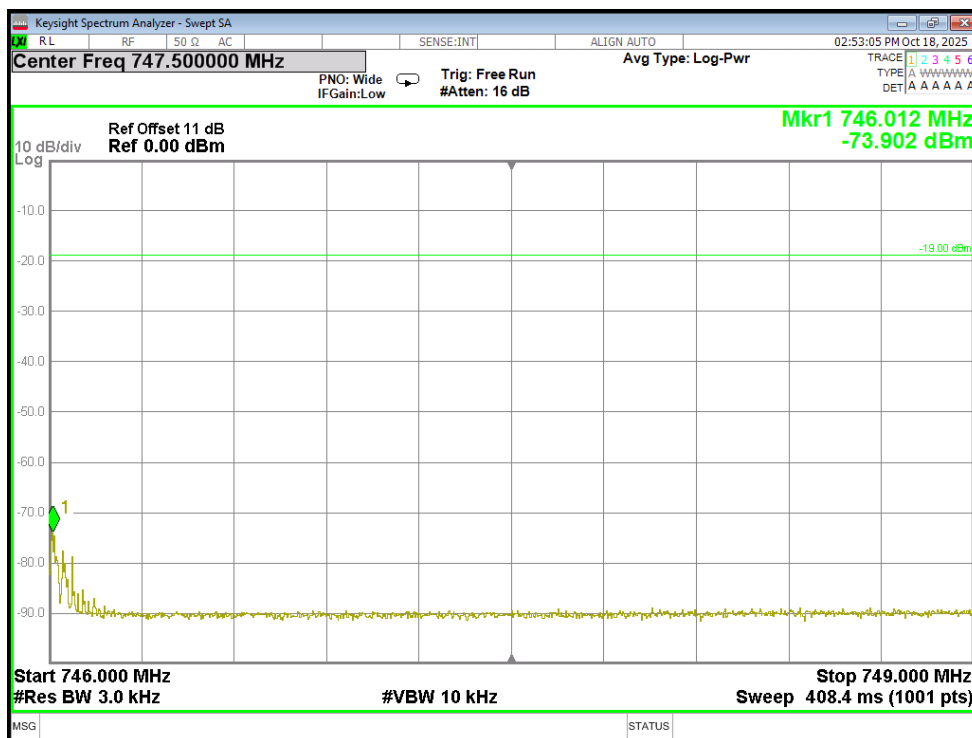


Lower 700MHz Band DL GSM Left Side Pre AGC+10dB

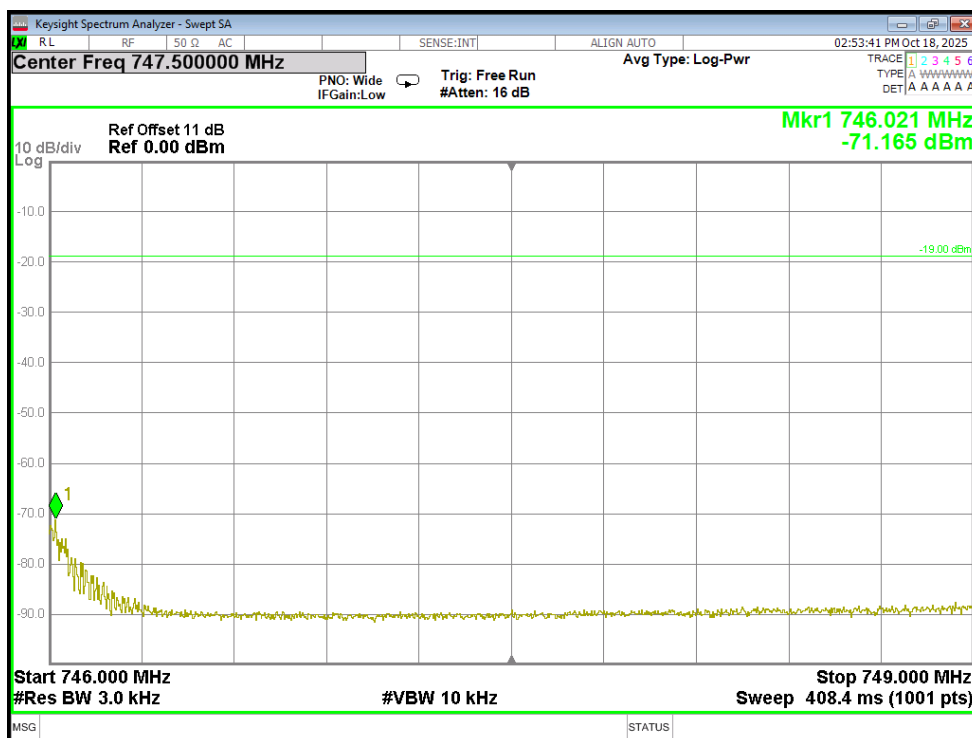




Lower 700MHz Band DL GSM Right Side Pre AGC

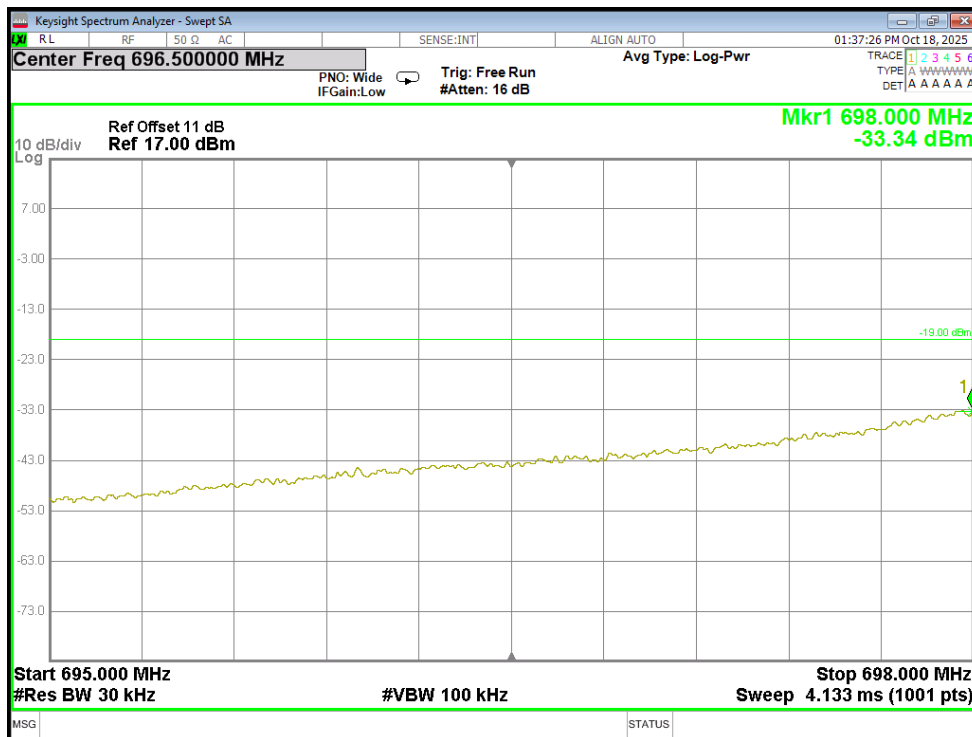


Lower 700MHz Band DL GSM Right Side Pre AGC+10Db

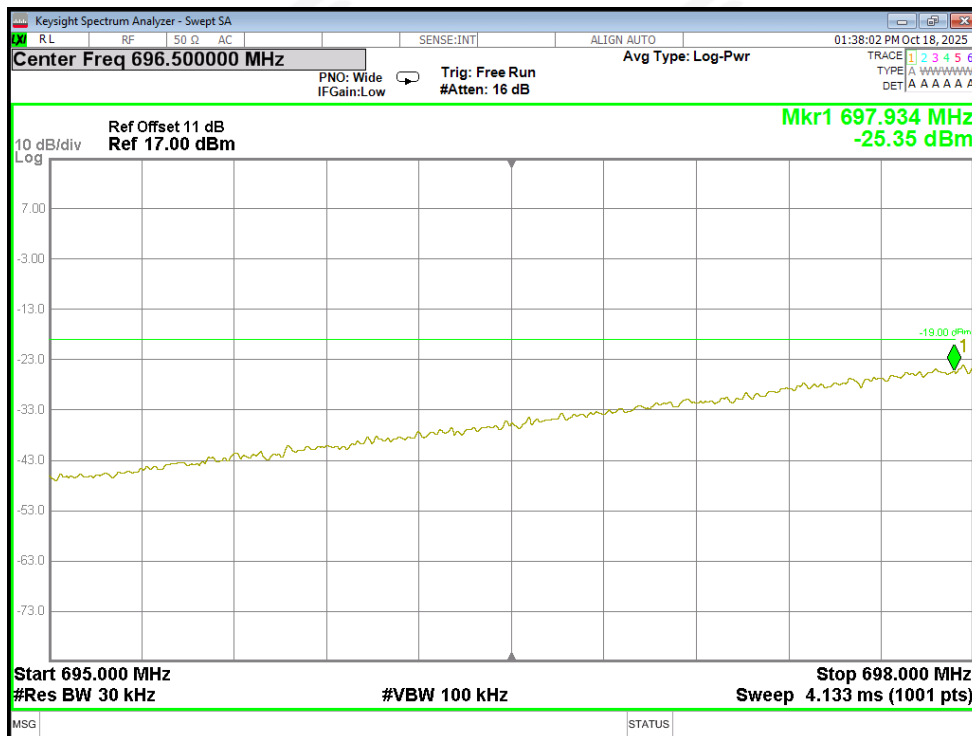




Lower 700MHz Band UL CDMA Left Side Pre AGC

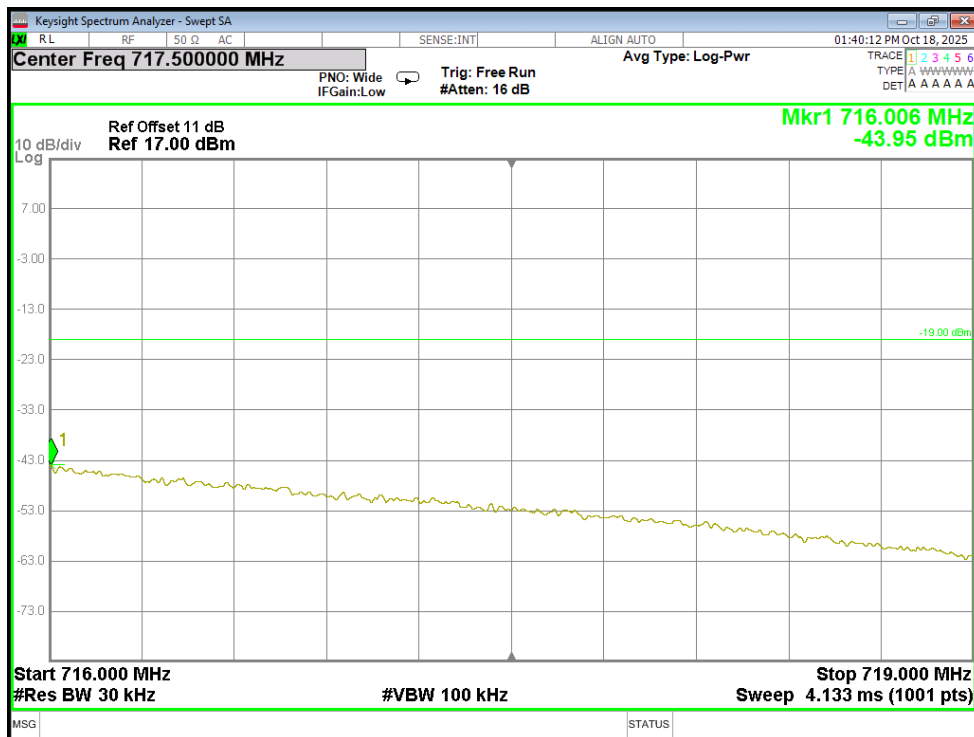


Lower 700MHz Band UL CDMA Left Side Pre AGC+10dB

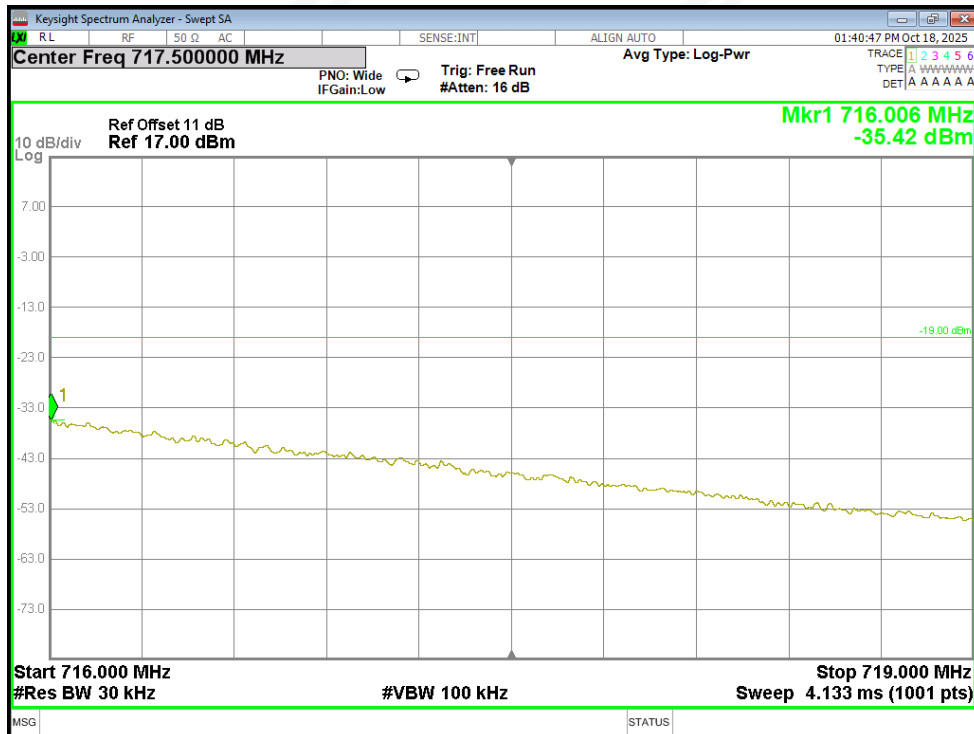




Lower 700MHz Band UL CDMA Right Side Pre AGC

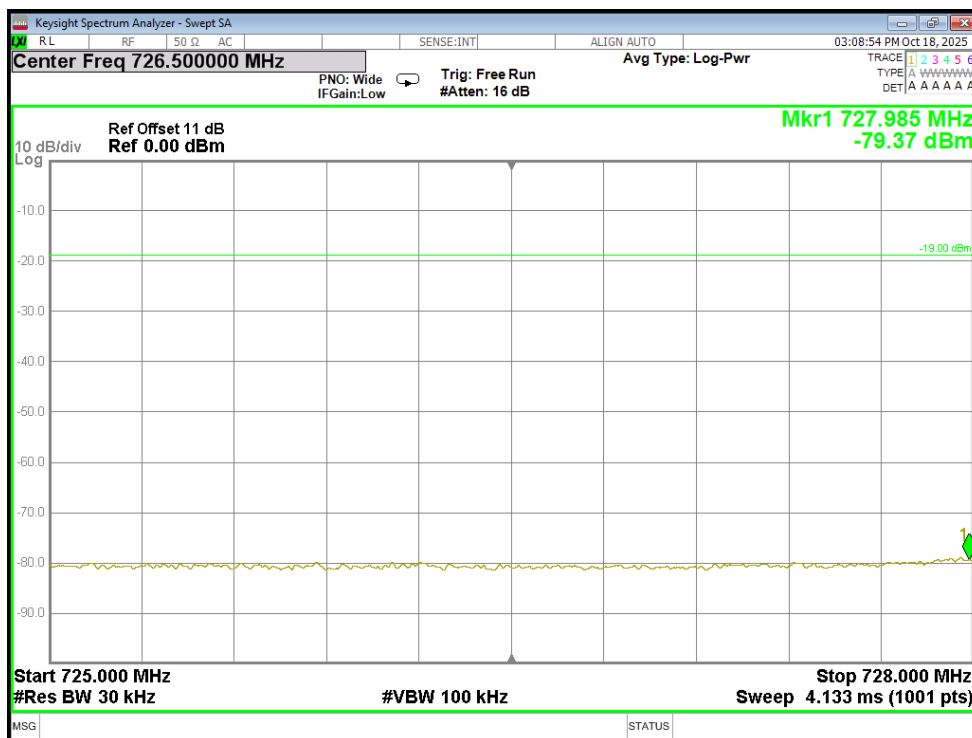


Lower 700MHz Band UL CDMA Right Side Pre AGC+10dB

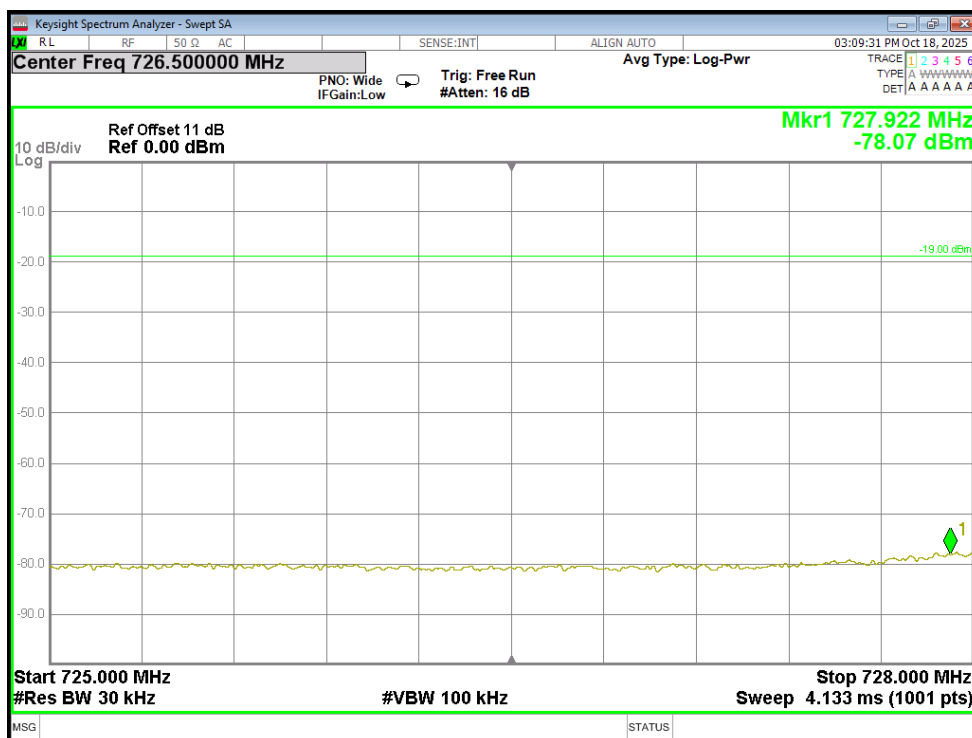




Lower 700MHz Band DL CDMA Left Side Pre AGC

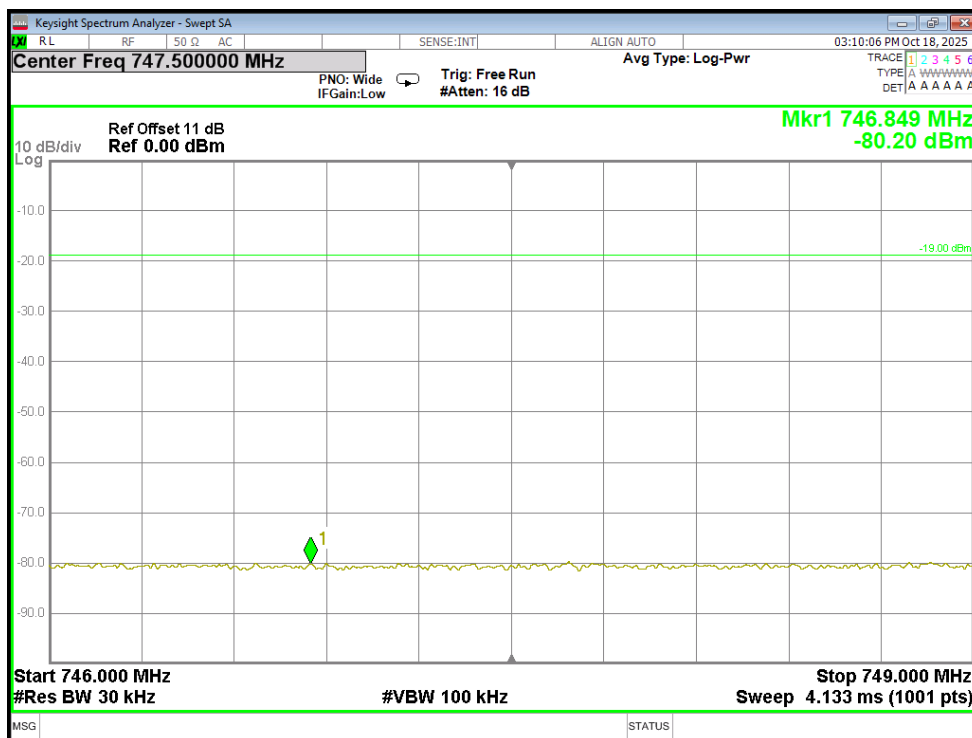


Lower 700MHz Band DL CDMA Left Side Pre AGC+10dB

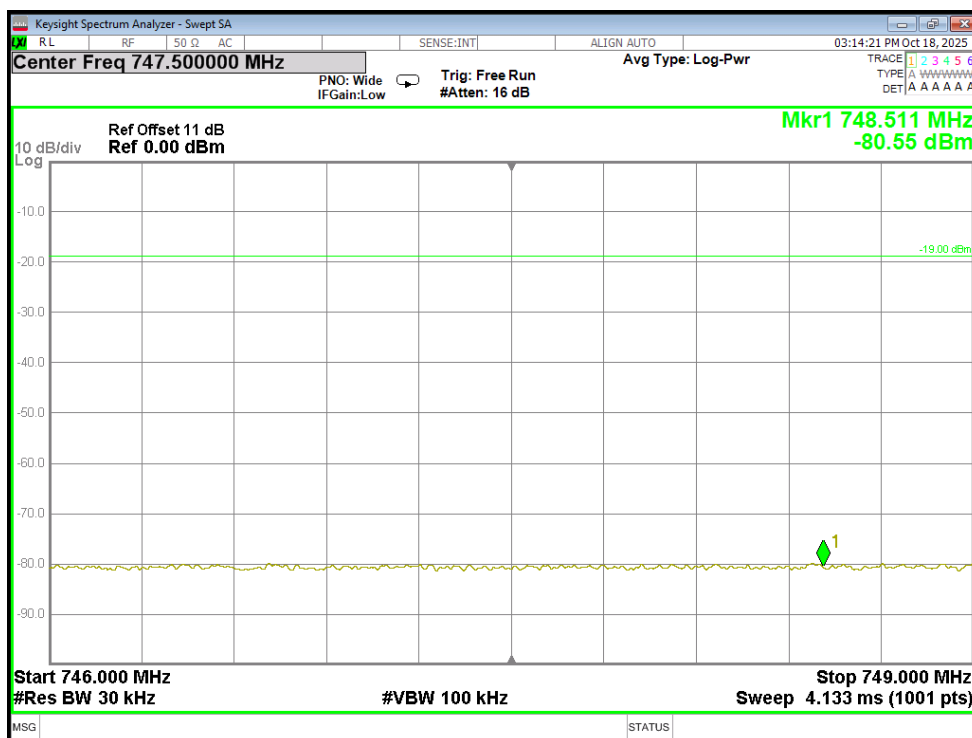




Lower 700MHz Band DL CDMA Right Side Pre AGC

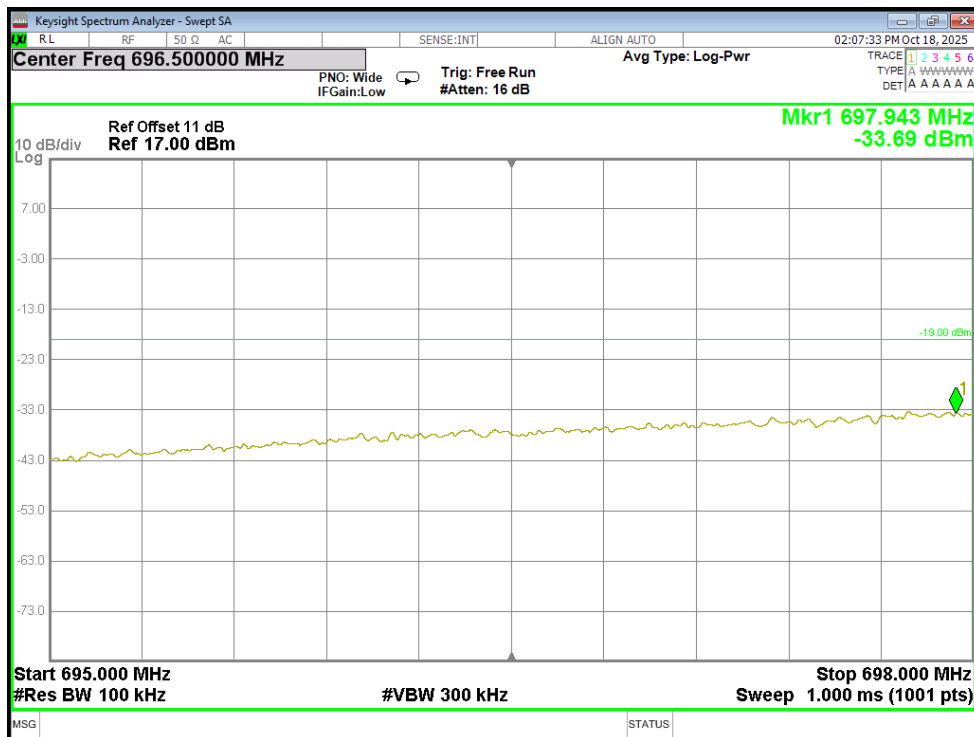


Lower 700MHz Band DL CDMA Right Side Pre AGC+10dB

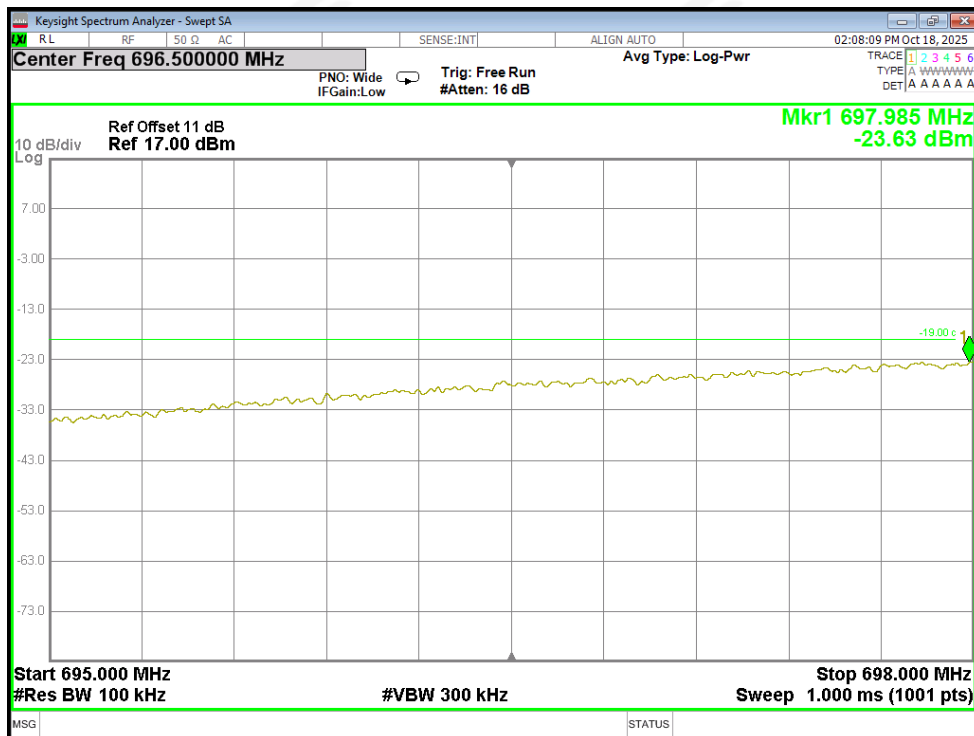




Lower 700MHz Band UL LTE Left Side Pre AGC

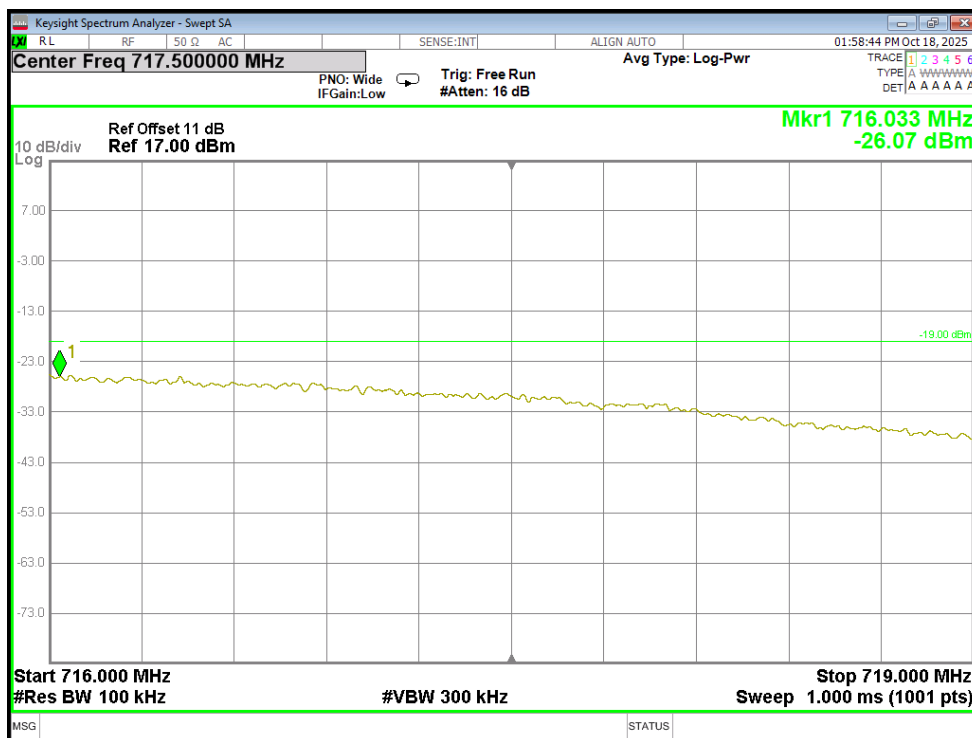


Lower 700MHz Band UL LTE Left Side Pre AGC+10dB

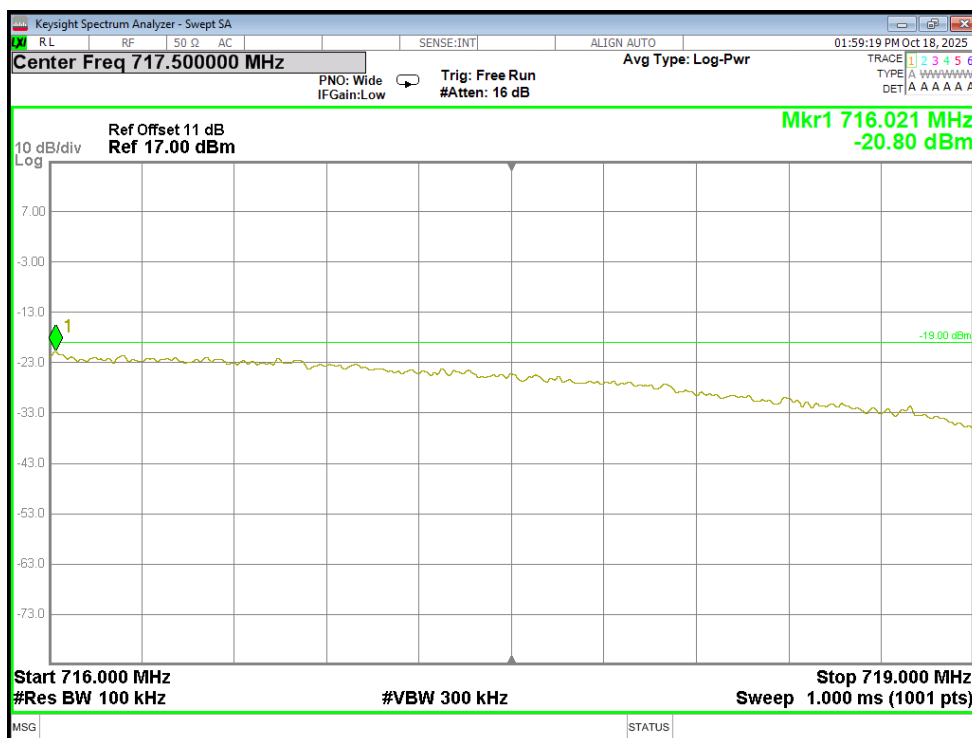




Lower 700MHz Band UL LTE Right Side Pre AGC

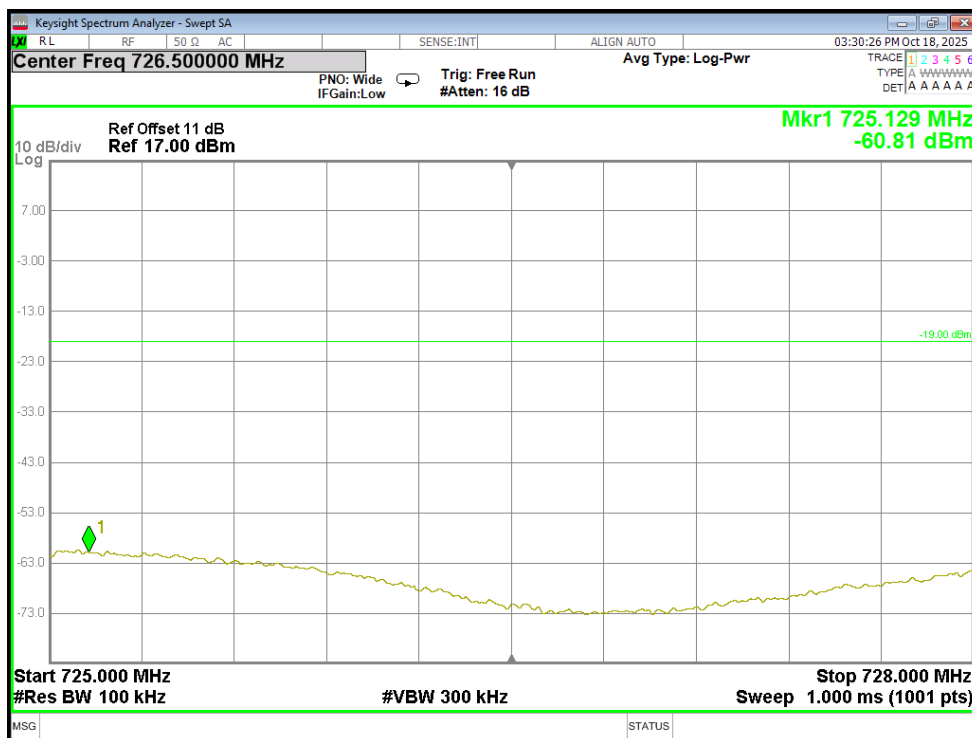


Lower 700MHz Band UL LTE Right Side Pre AGC+10dB

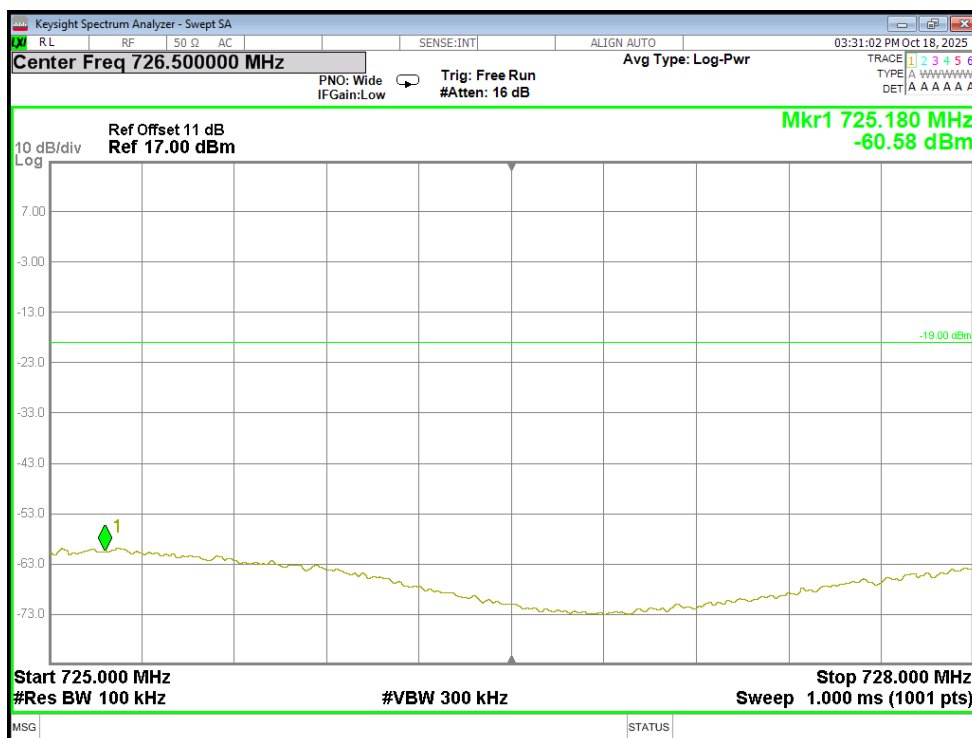




Lower 700MHz Band DL LTE Left Side Pre AGC

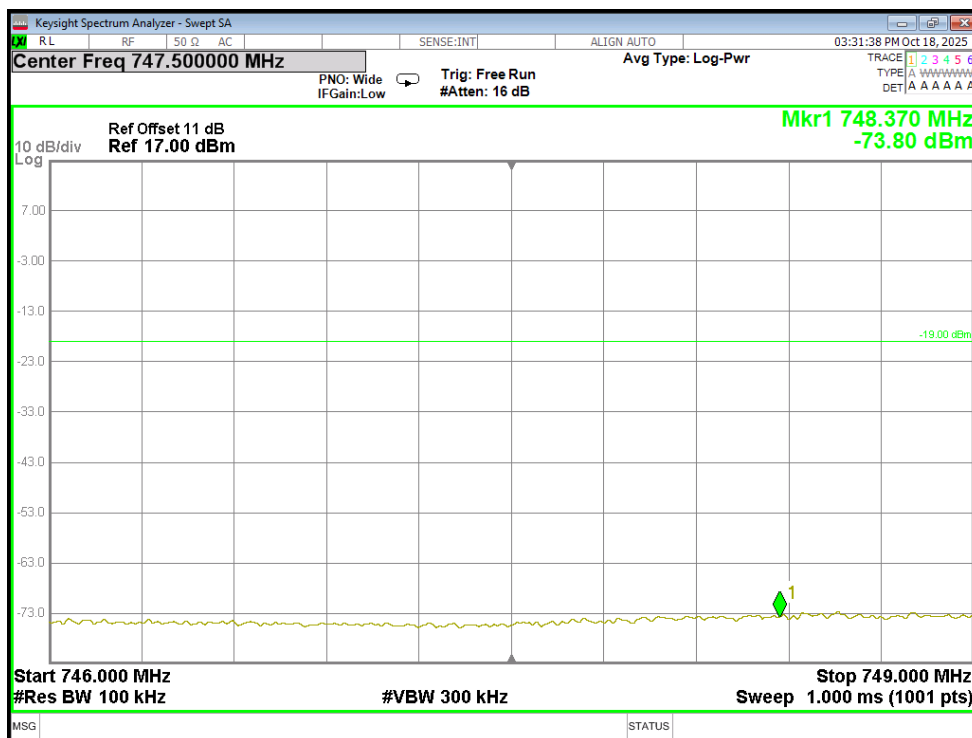


Lower 700MHz Band DL LTE Left Side Pre AGC+10dB

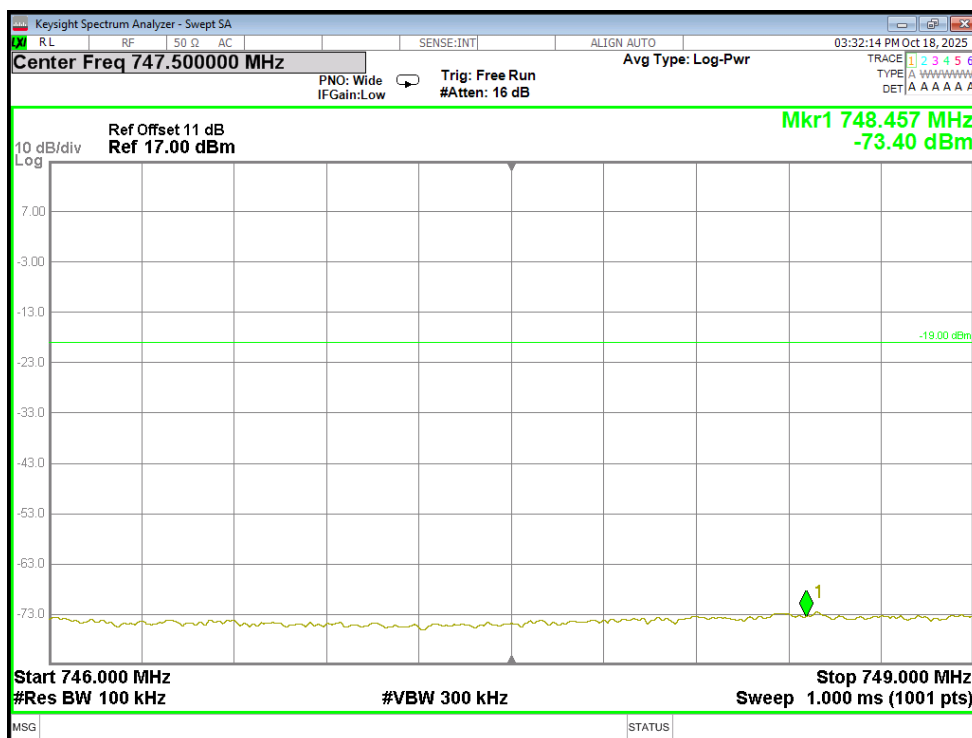




Lower 700MHz Band DL LTE Right Side Pre AGC

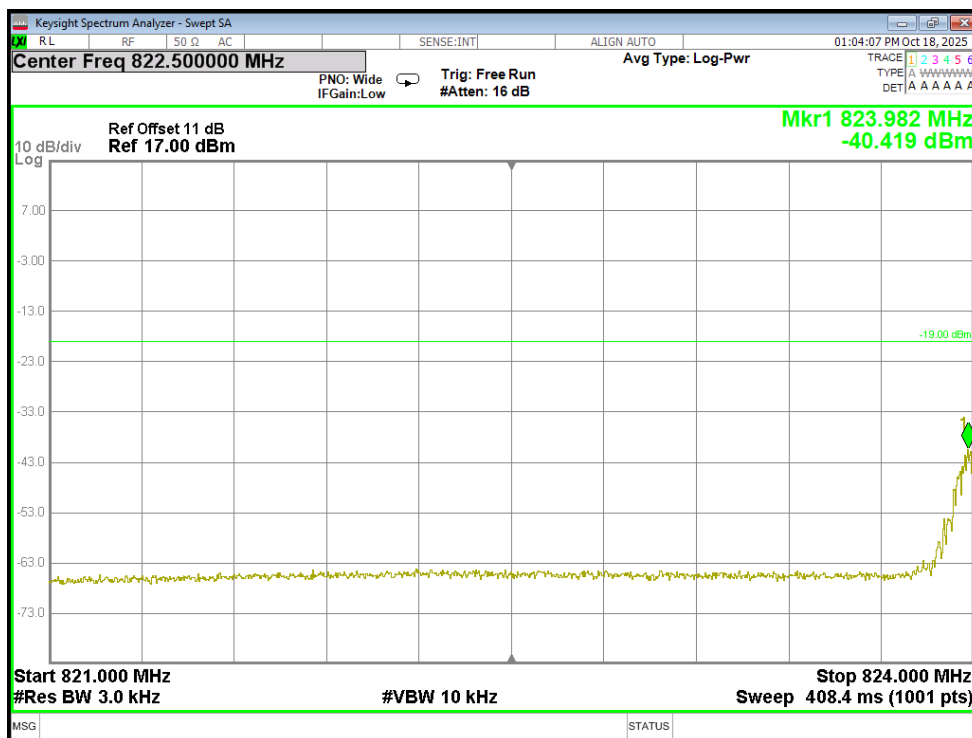


Lower 700MHz Band DL LTE Right Side Pre AGC+10dB

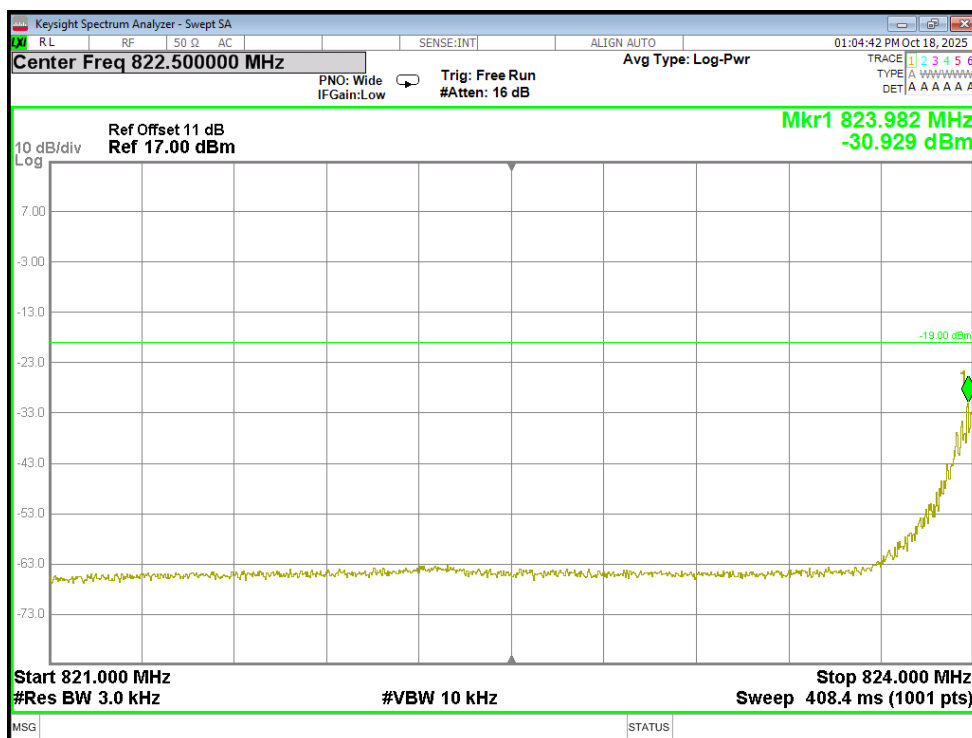




Cellular Band UL GSM Left Side Pre AGC

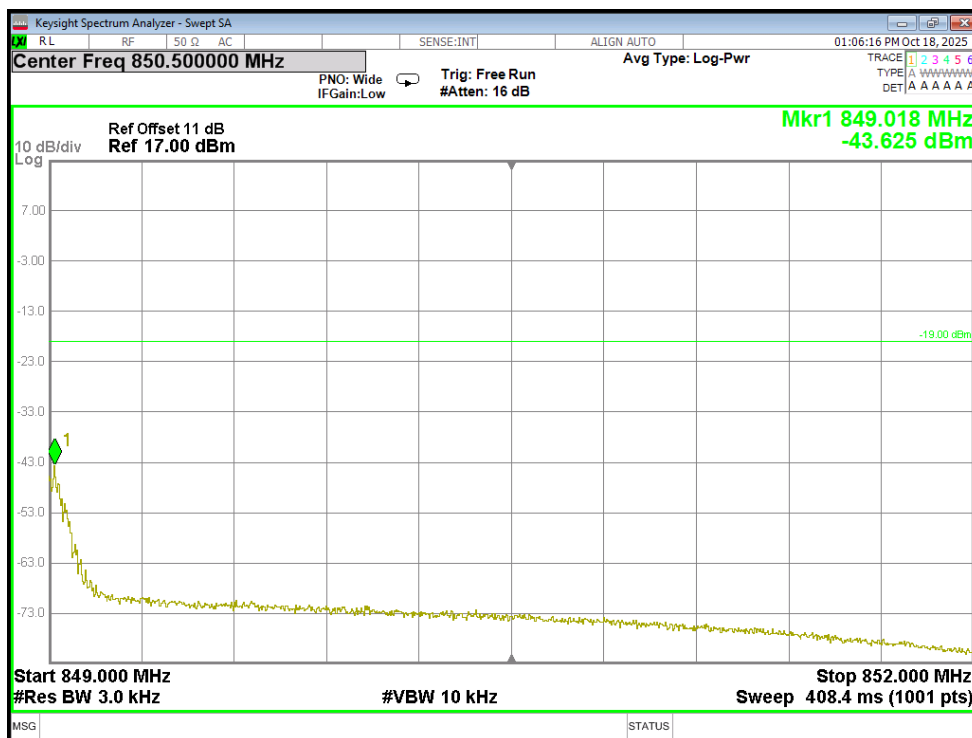


Cellular Band UL GSM Left Side Pre AGC+10dB

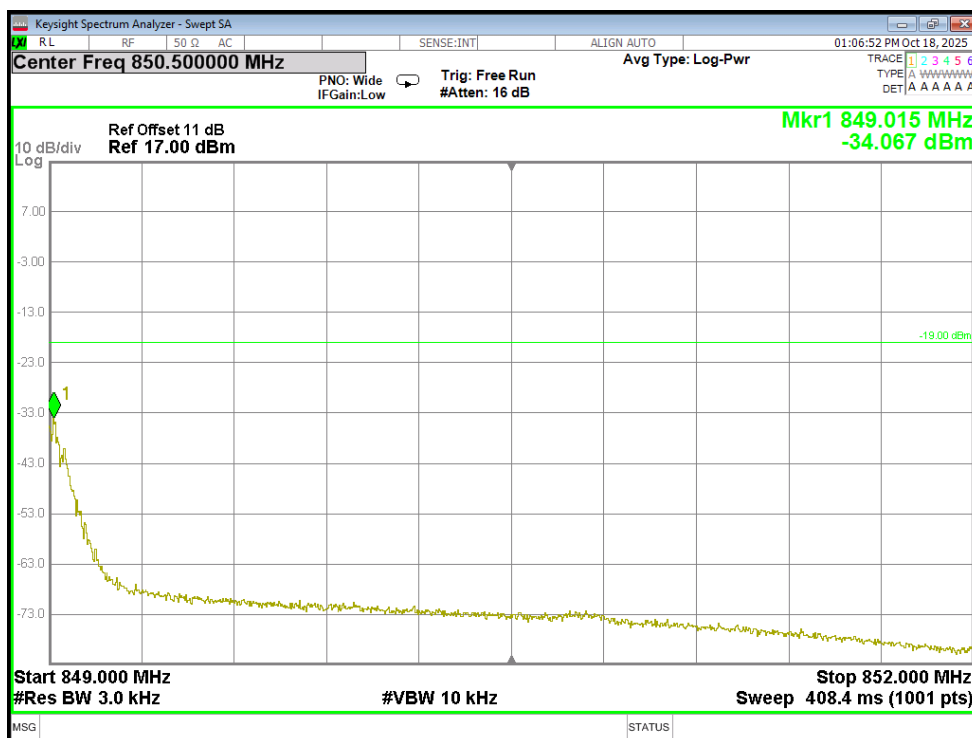




Cellular Band UL GSM Right Side Pre AGC

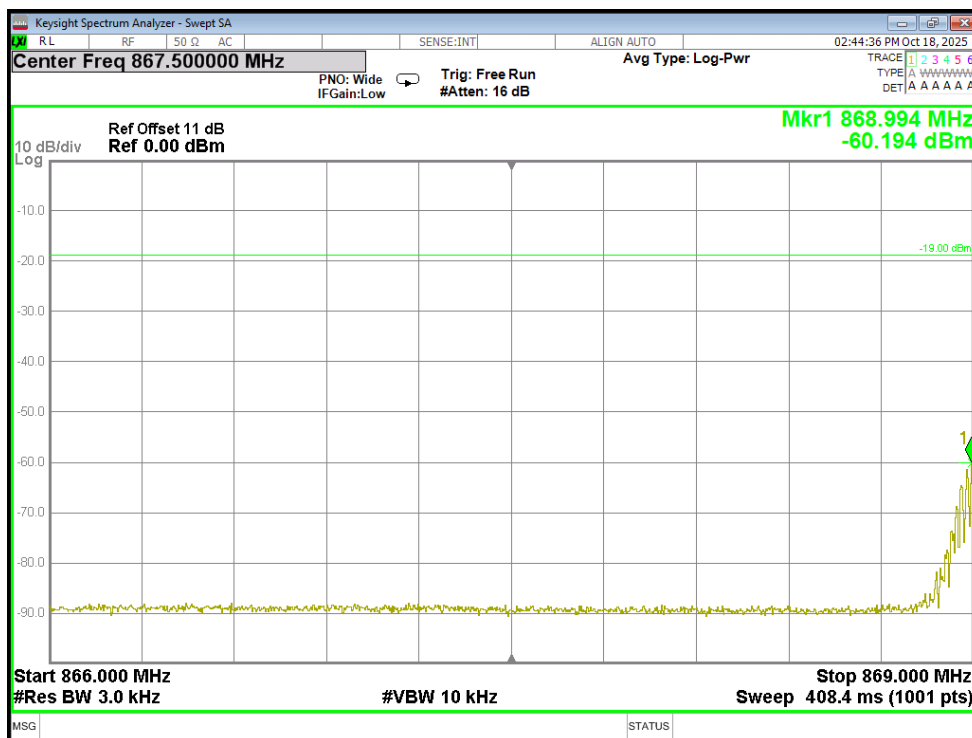


Cellular Band UL GSM Right Side Pre AGC+10dB

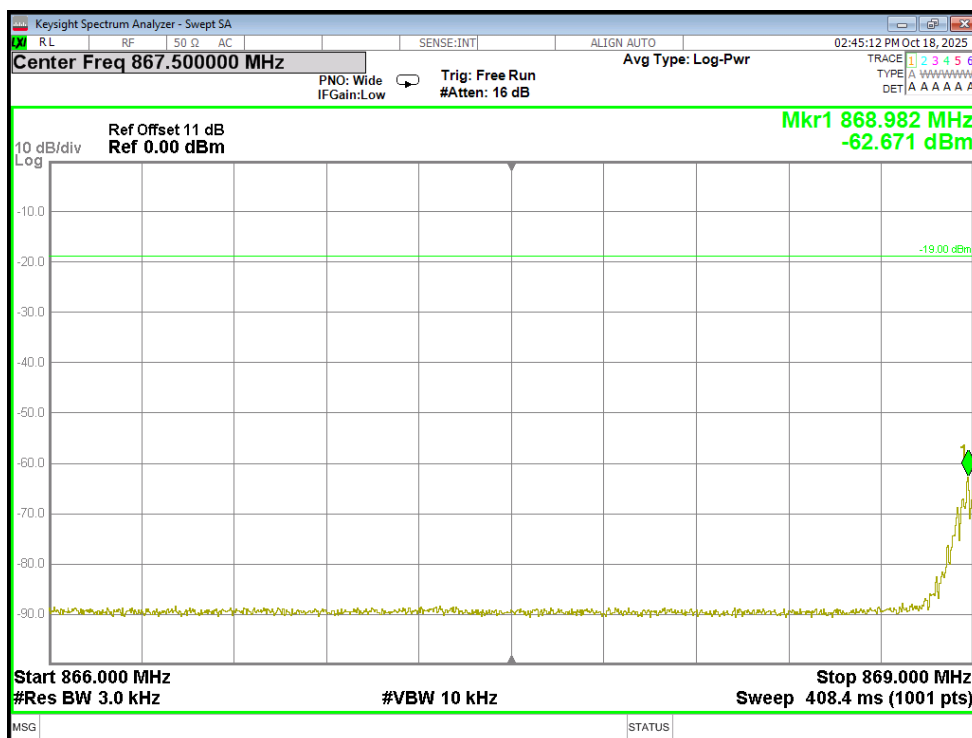




Cellular Band DL GSM Left Side Pre AGC

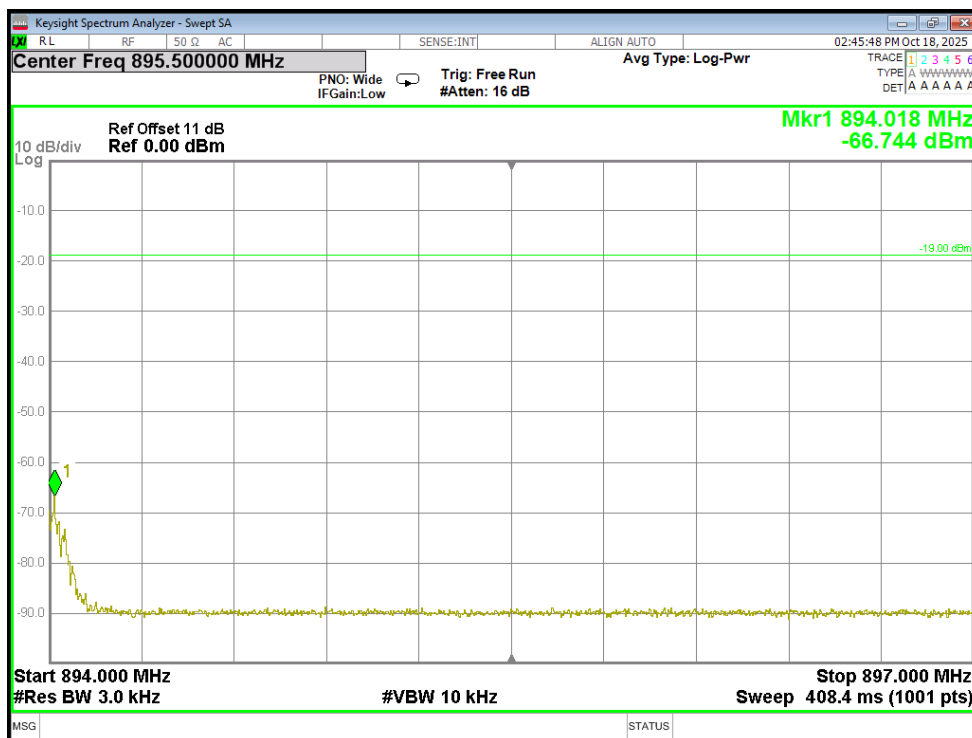


Cellular Band DL GSM Left Side Pre AGC+10dB

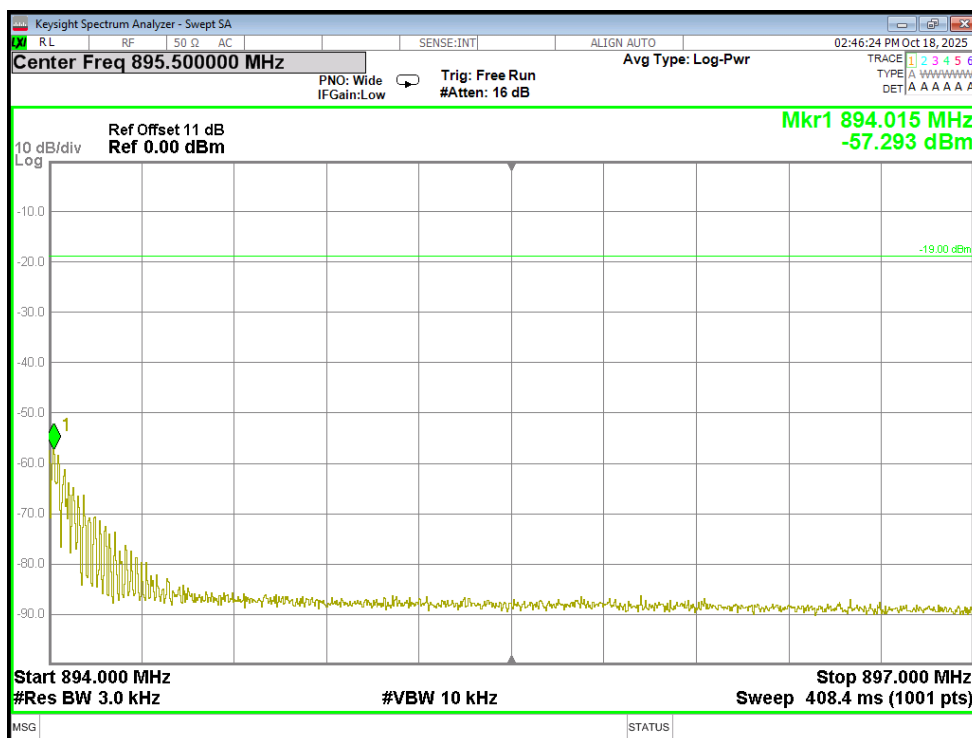




Cellular Band DL GSM Right Side Pre AGC

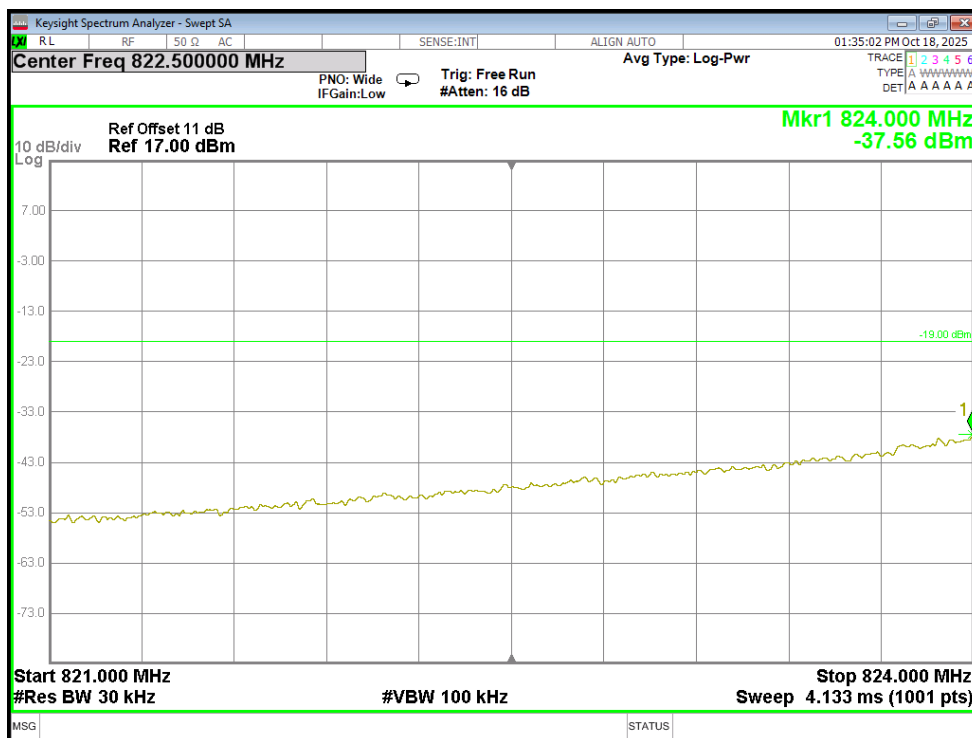


Cellular Band DL GSM Right Side Pre AGC+10dB

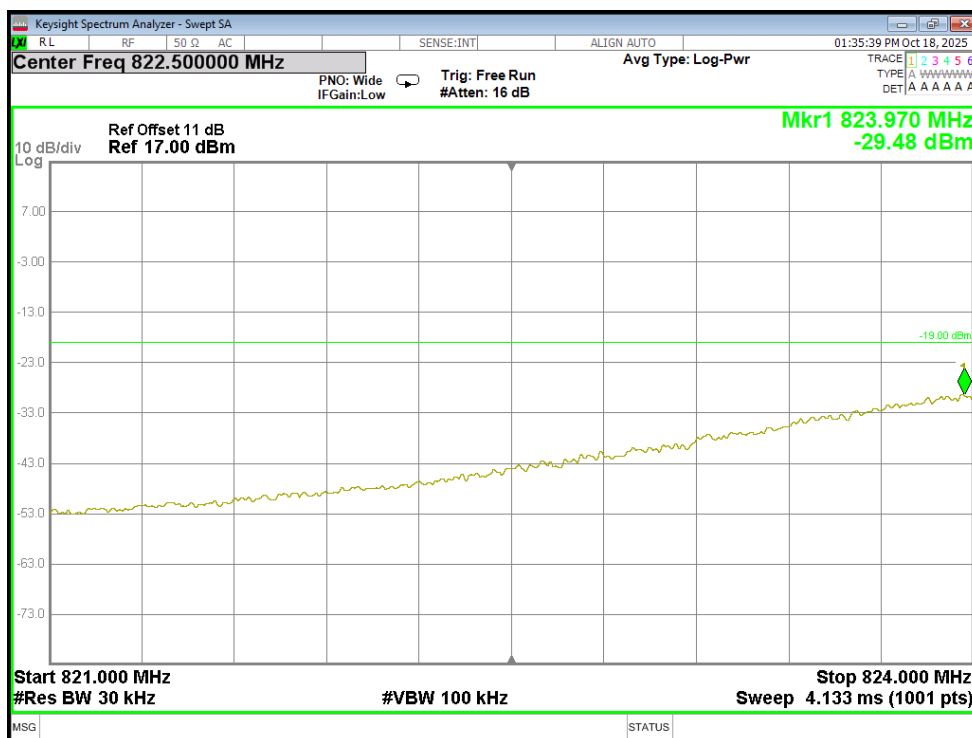




Cellular Band UL CDMA Left Side Pre AGC

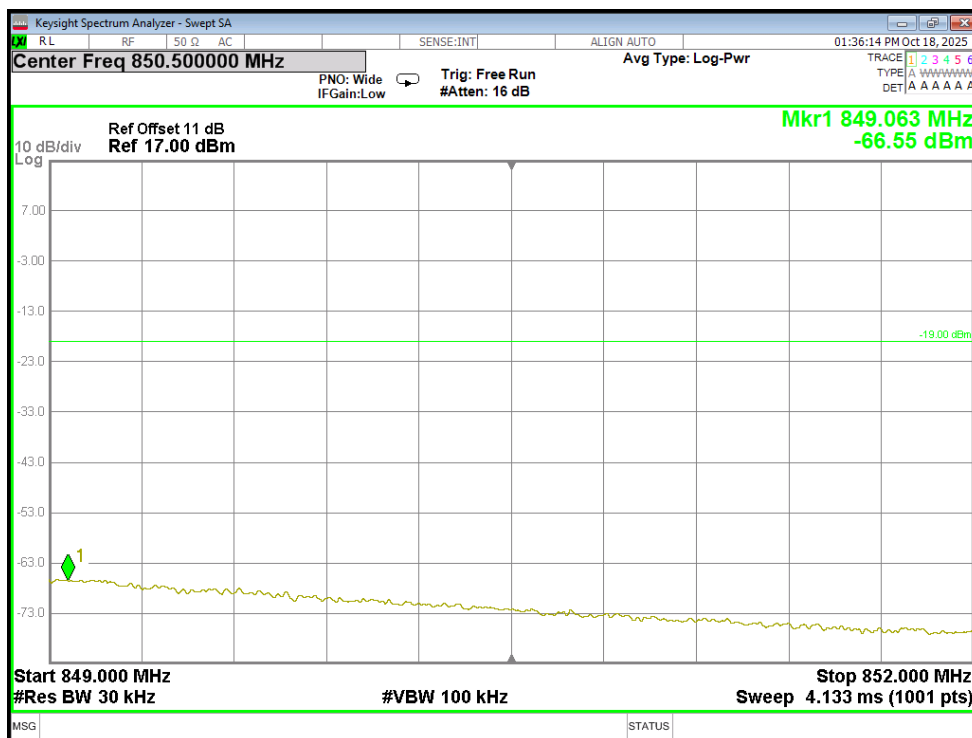


Cellular Band UL CDMA Left Side Pre AGC+10dB

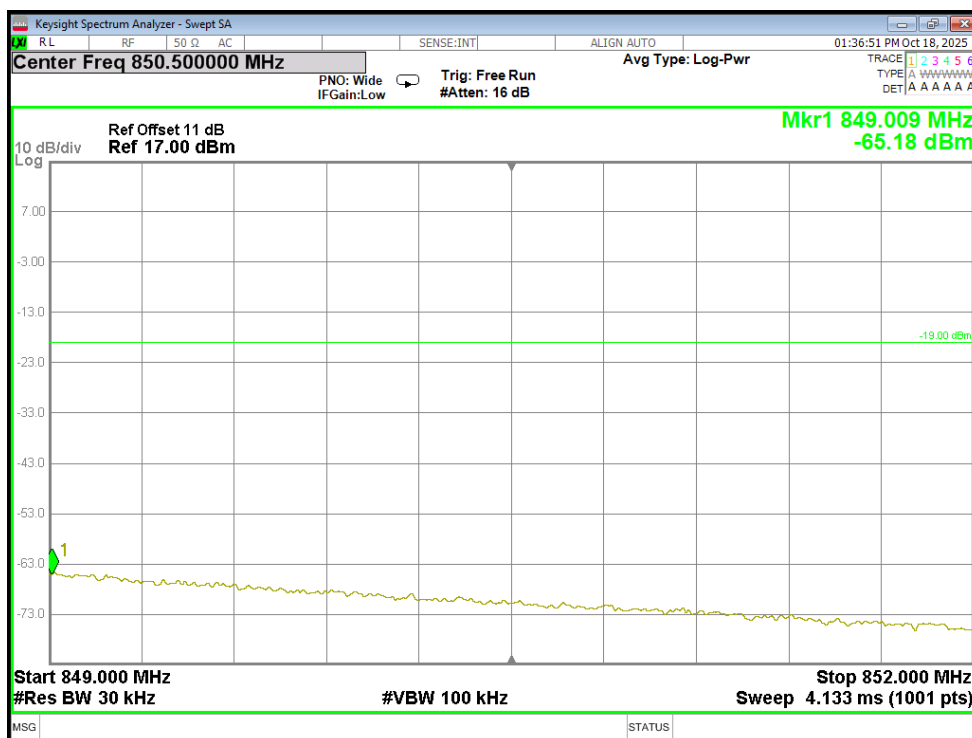




Cellular Band UL CDMA Right Side Pre AGC

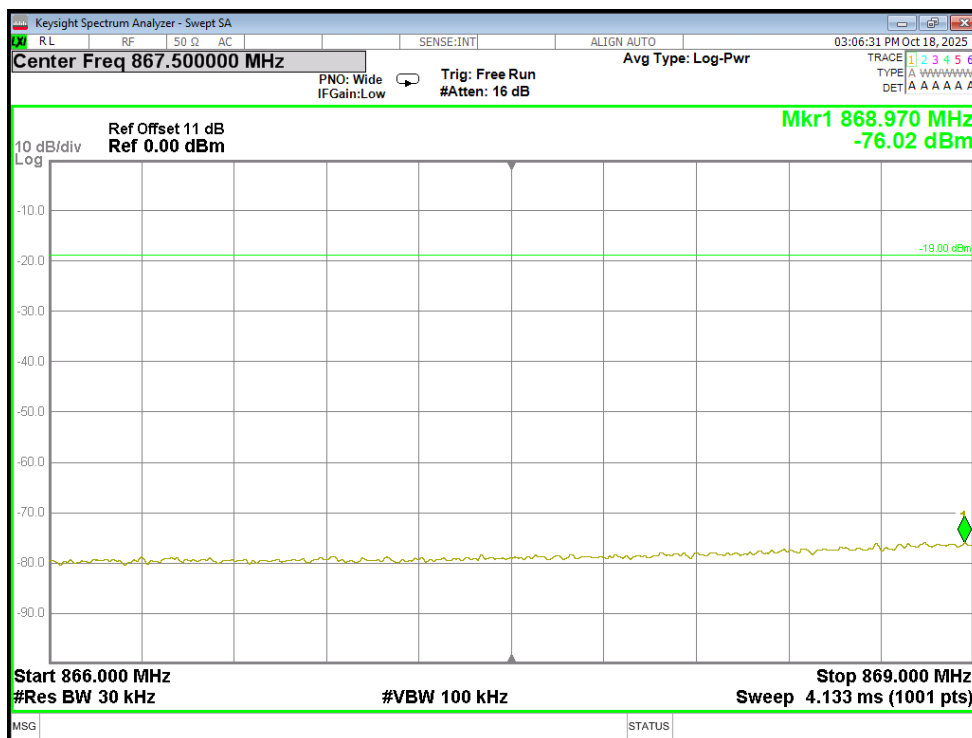


Cellular Band UL CDMA Right Side Pre AGC+10dB

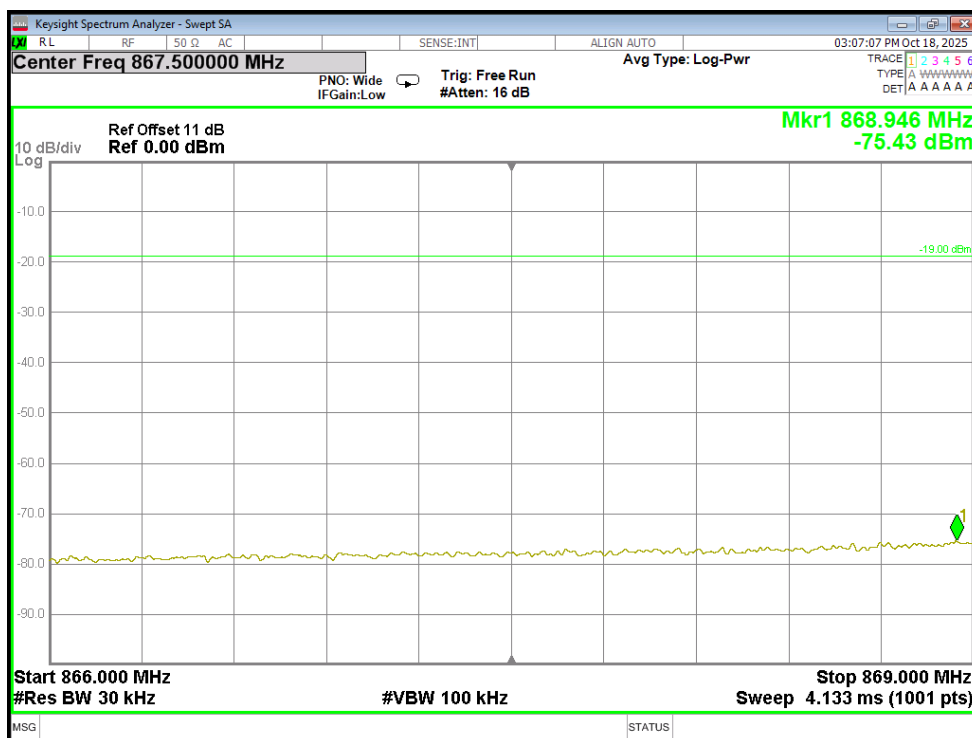




Cellular Band DL CDMA Left Side Pre AGC

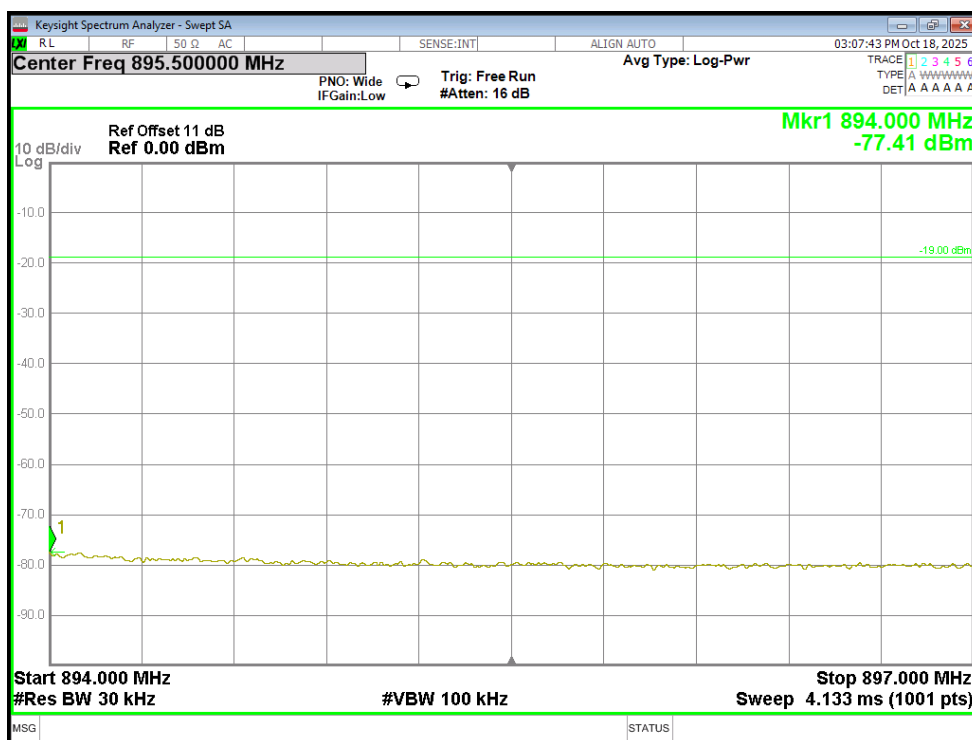


Cellular Band DL CDMA Left Side Pre AGC+10dB

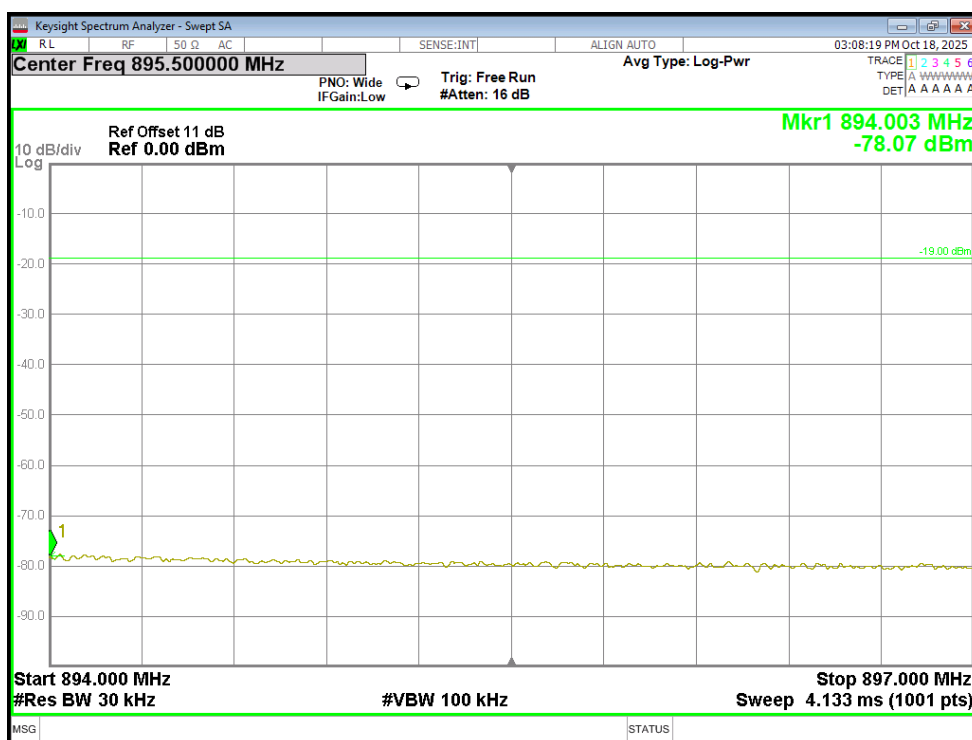




Cellular Band DL CDMA Right Side Pre AGC

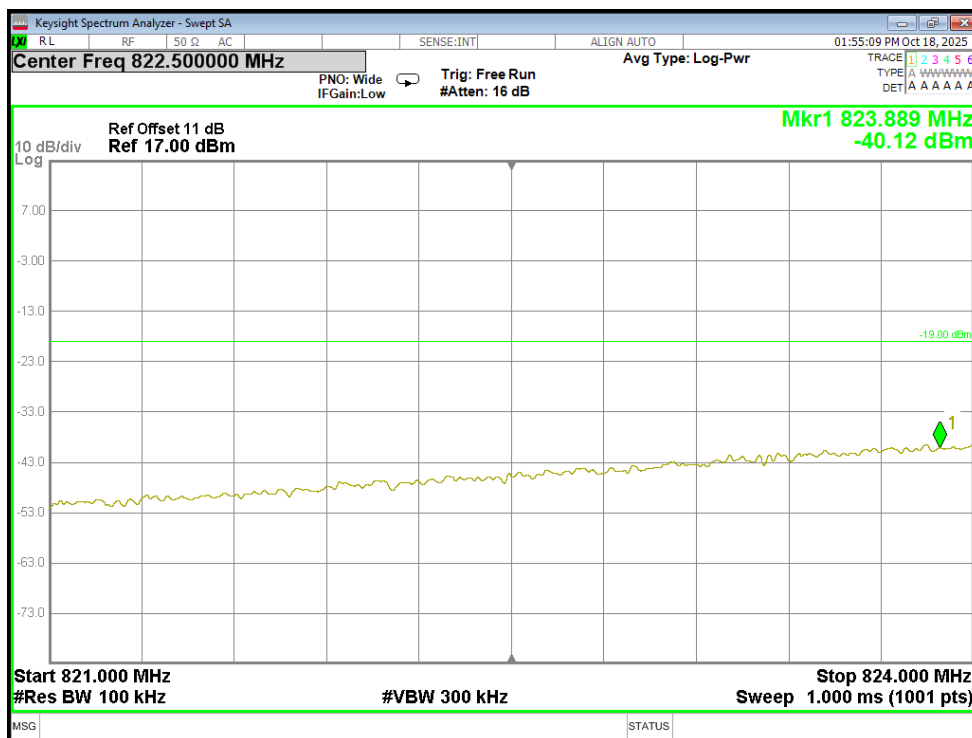


Cellular Band DL CDMA Right Side Pre AGC+10dB

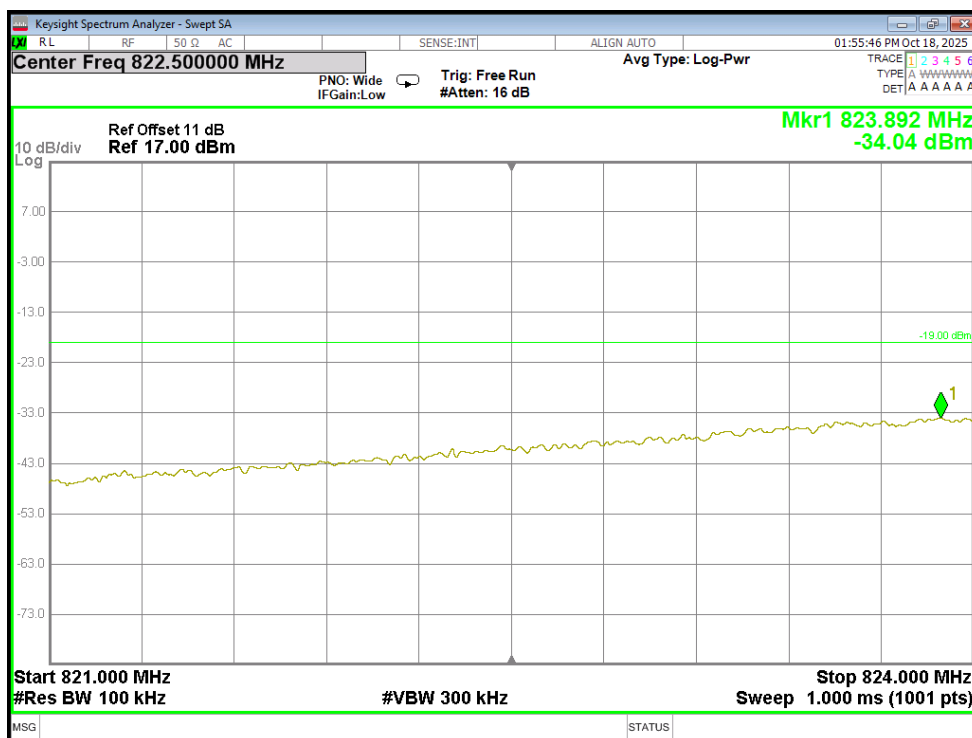




Cellular Band UL LTE Left Side Pre AGC

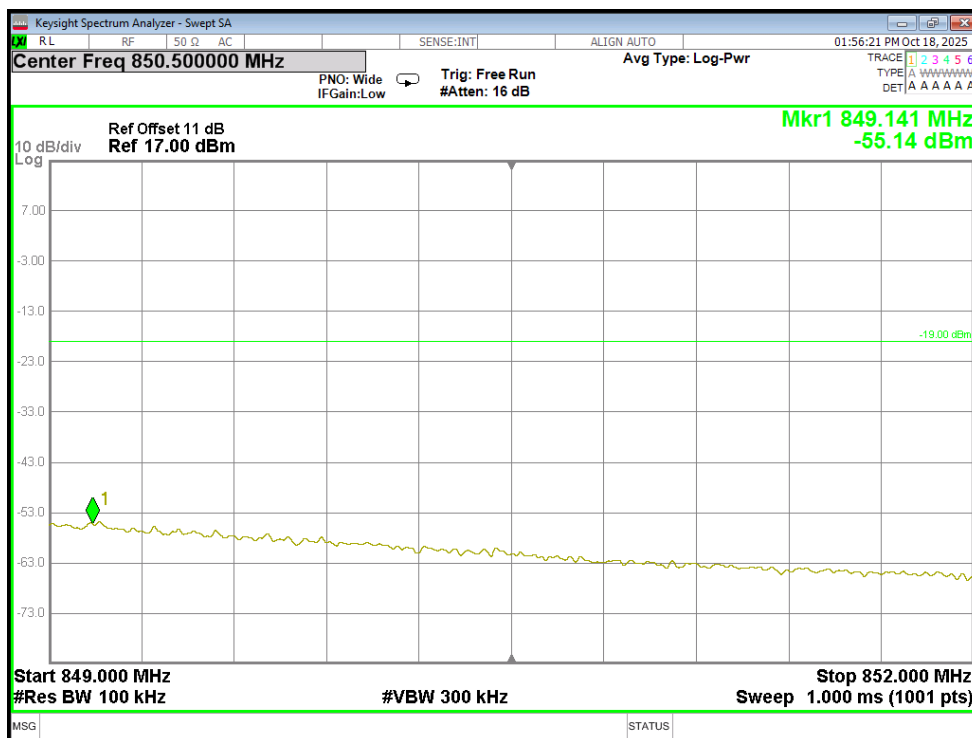


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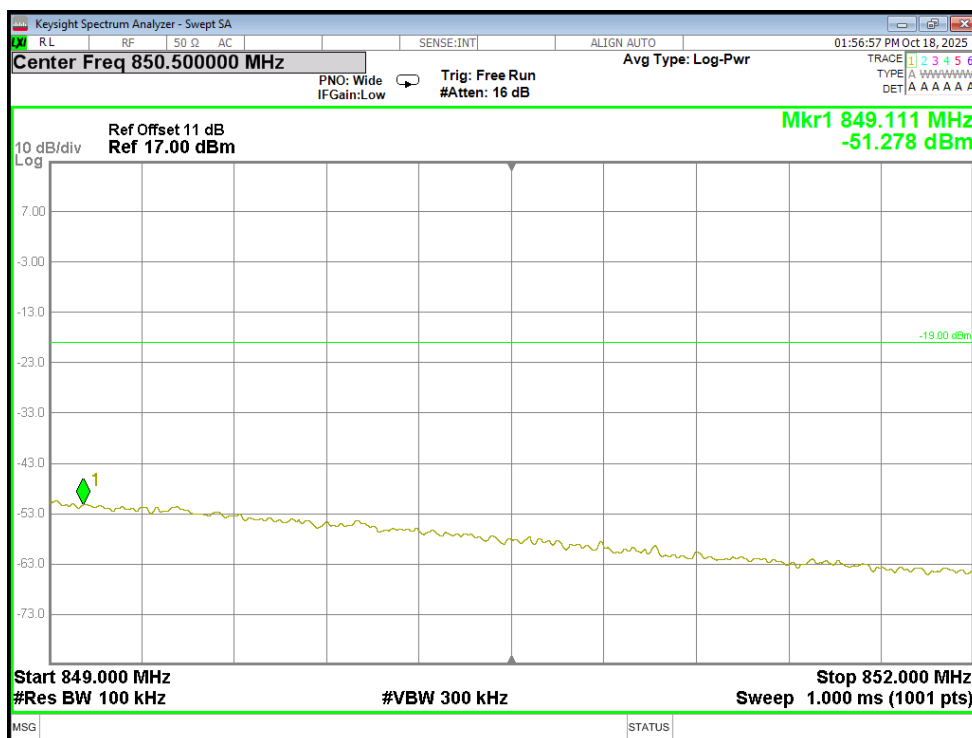




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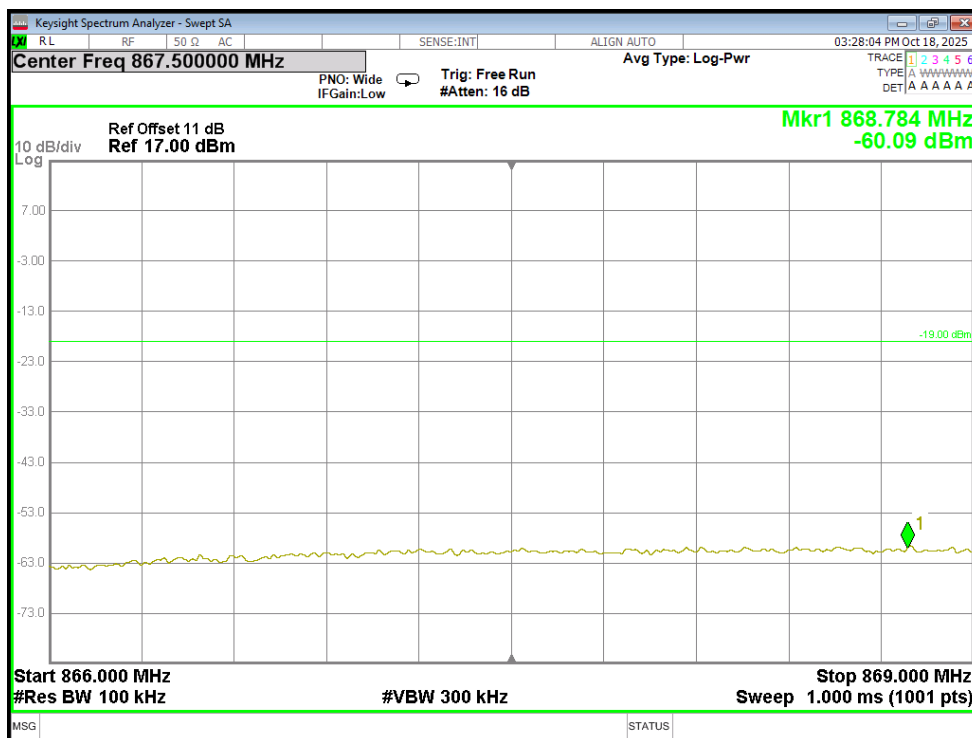


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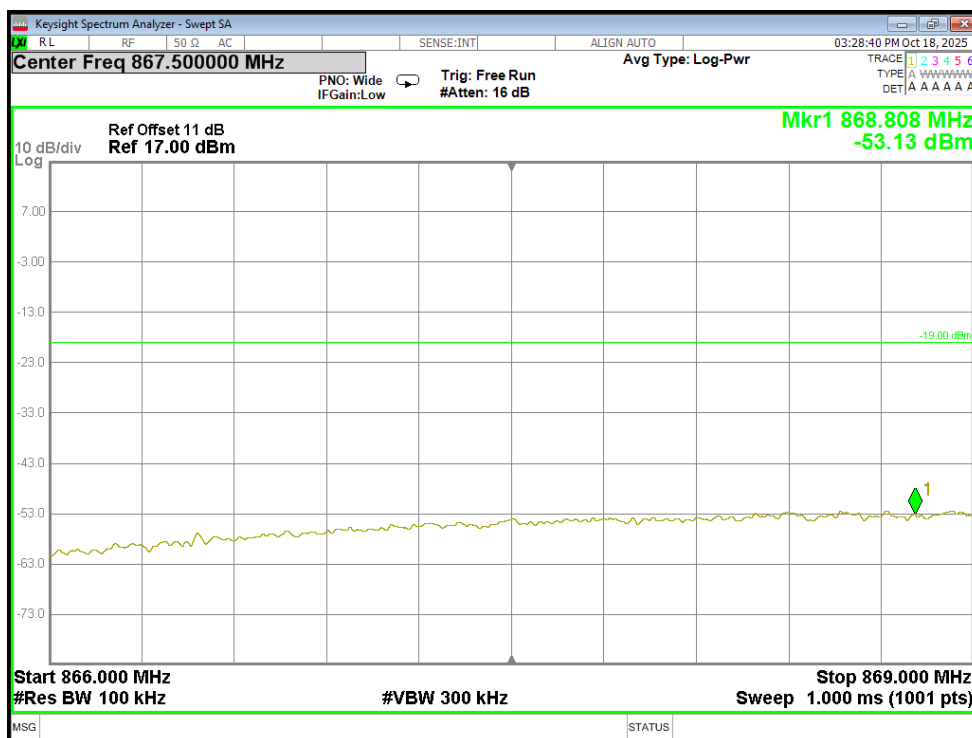




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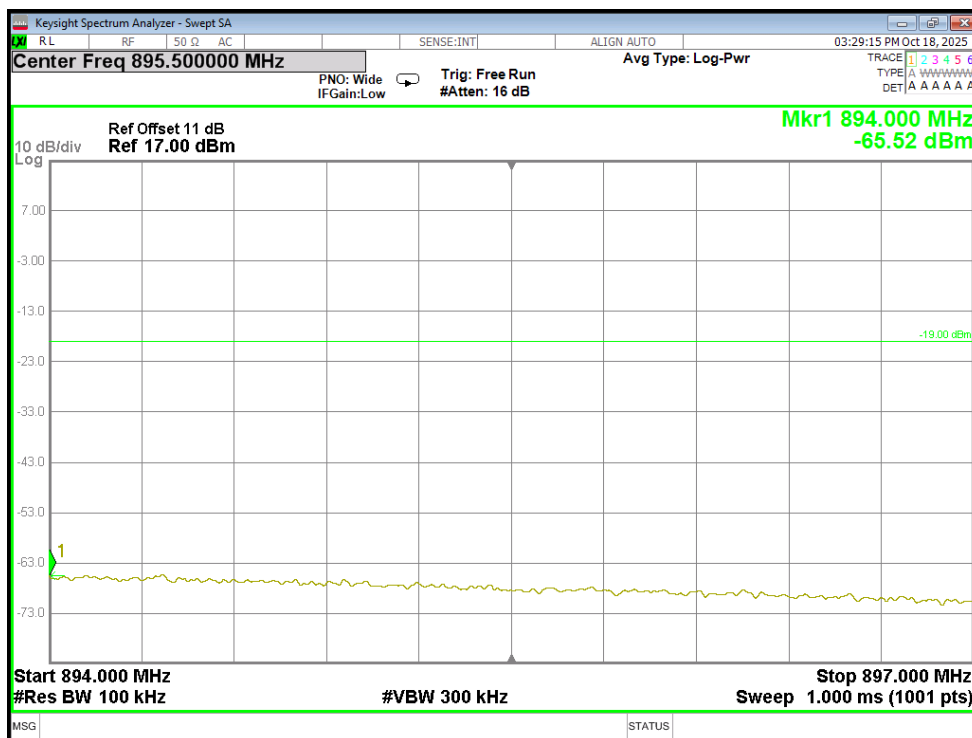


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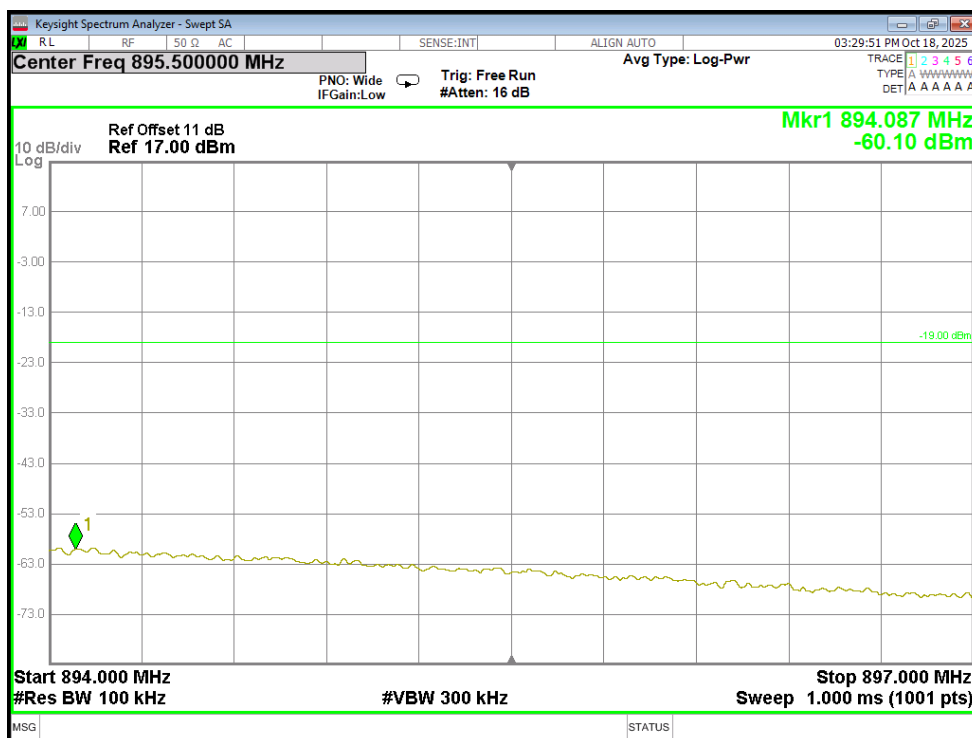




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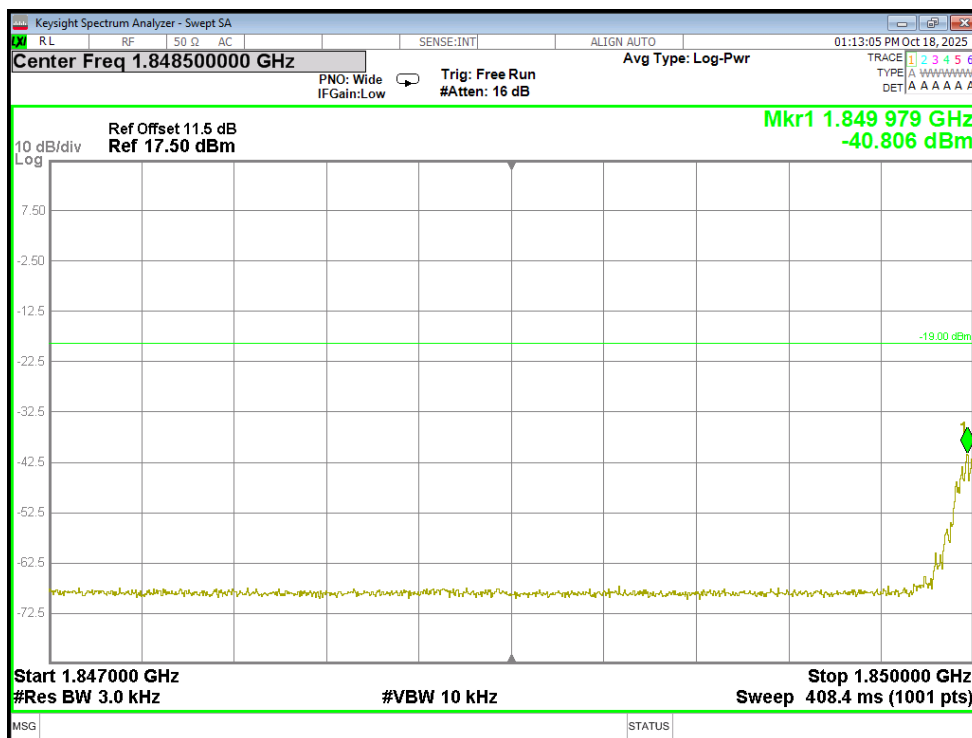


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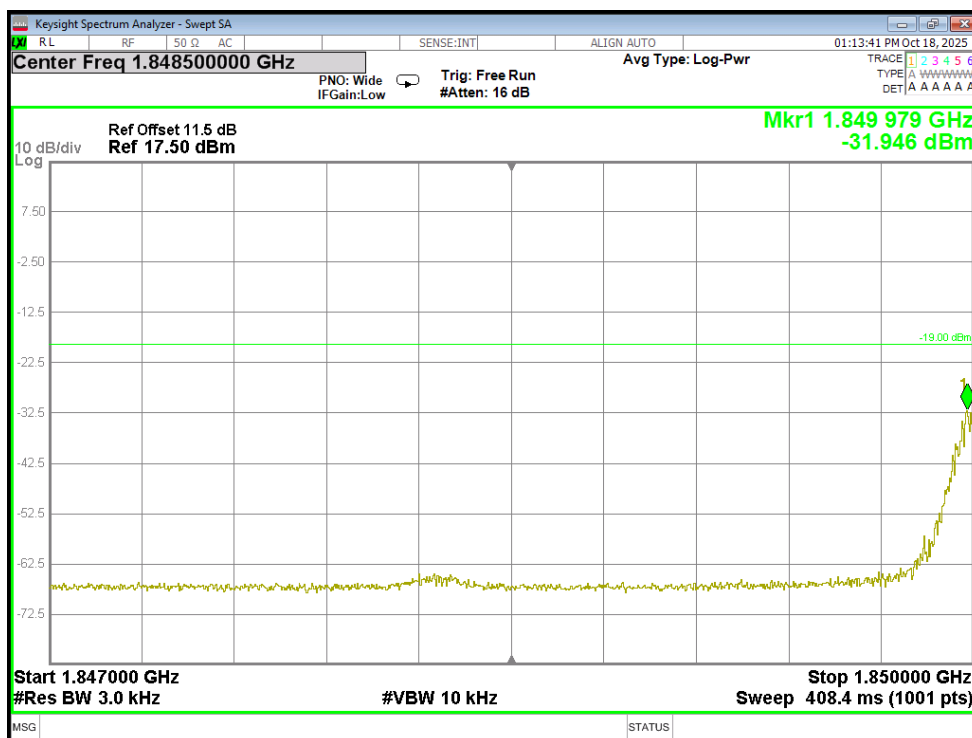




PCS Band UL GSM Left Side Pre AGC

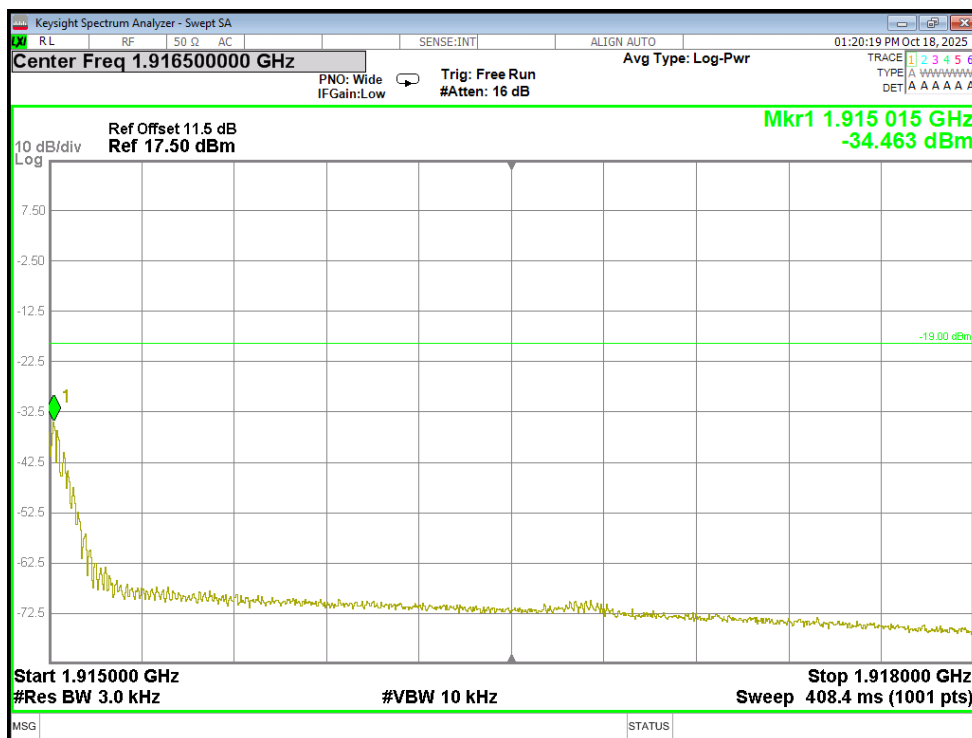


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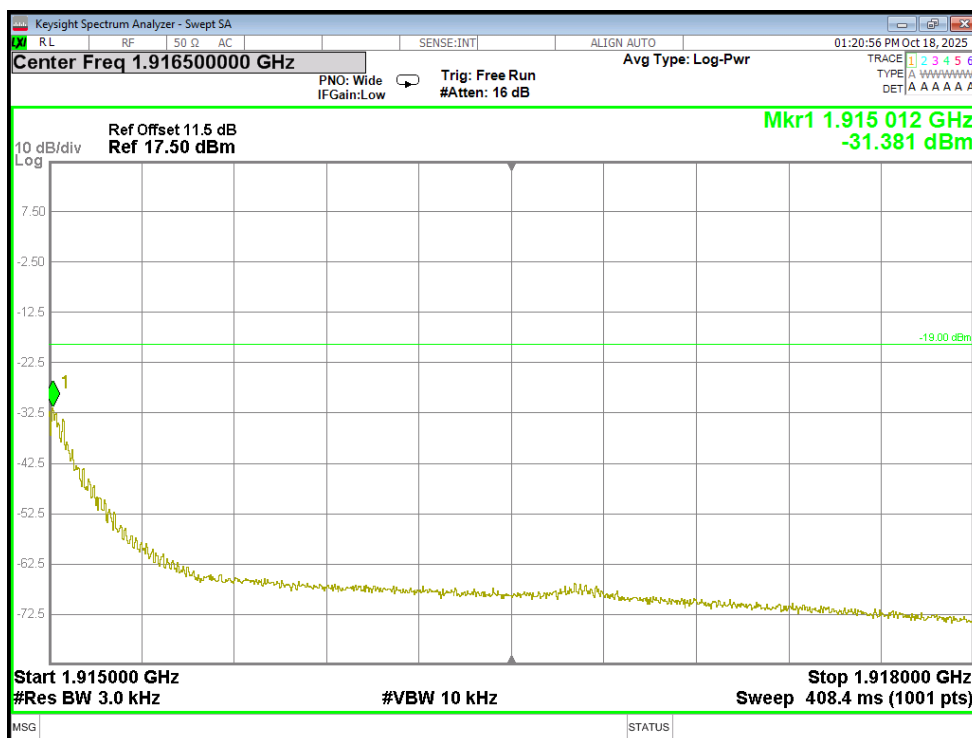




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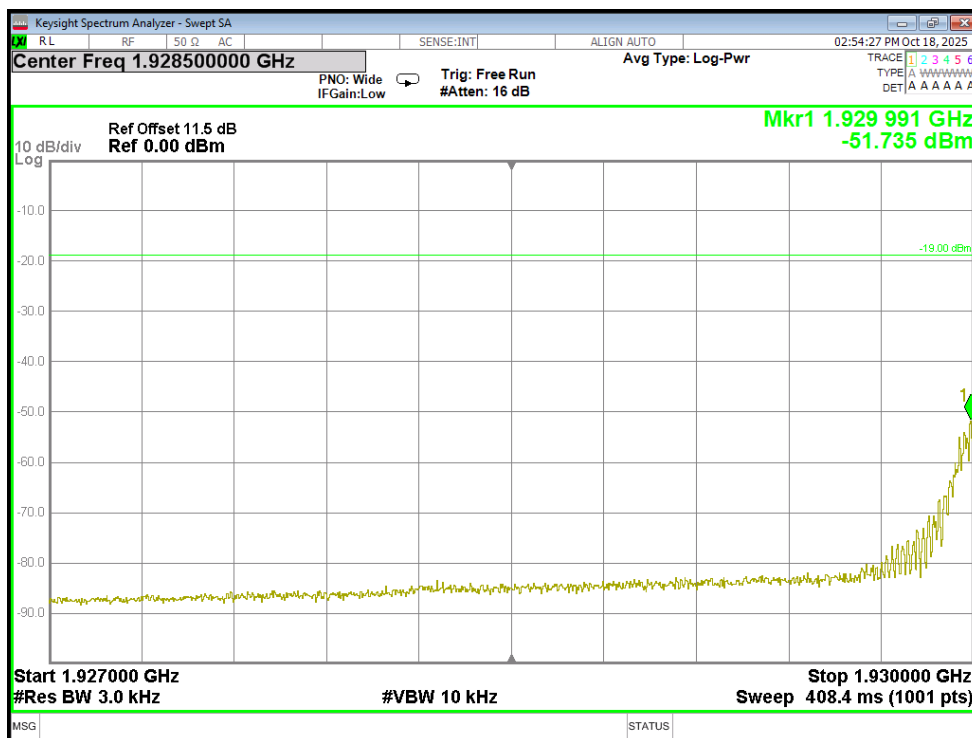


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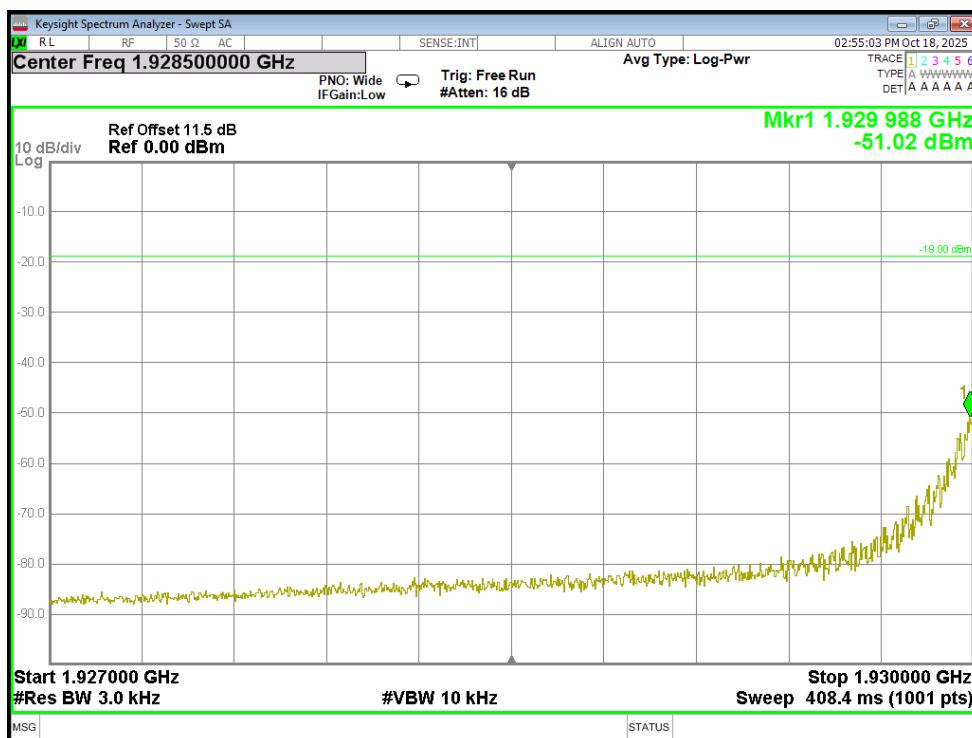




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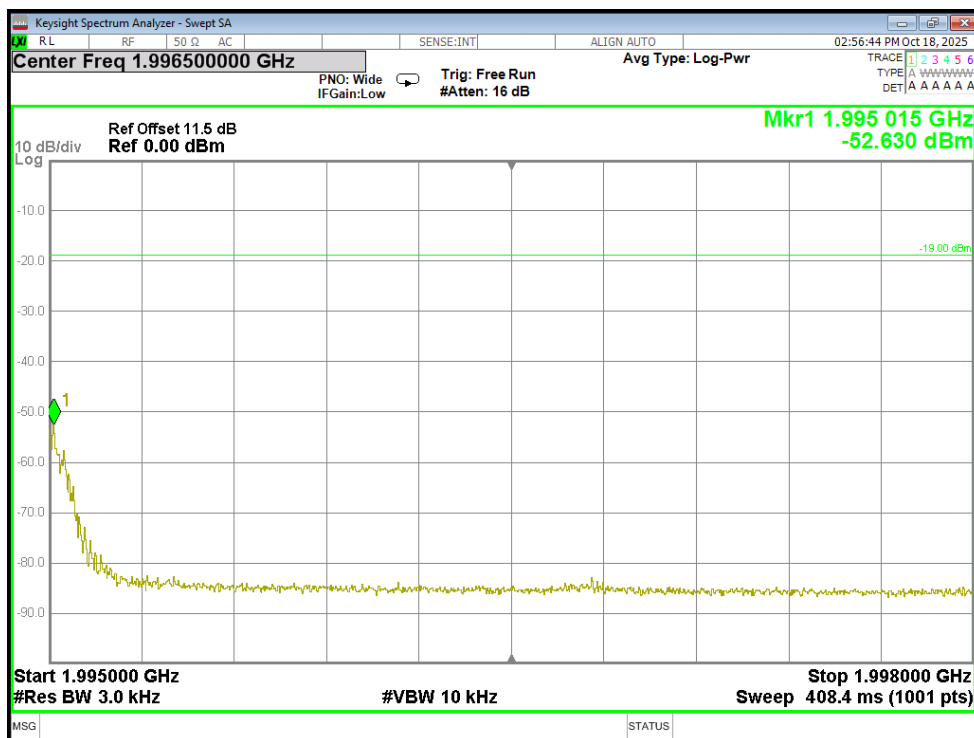


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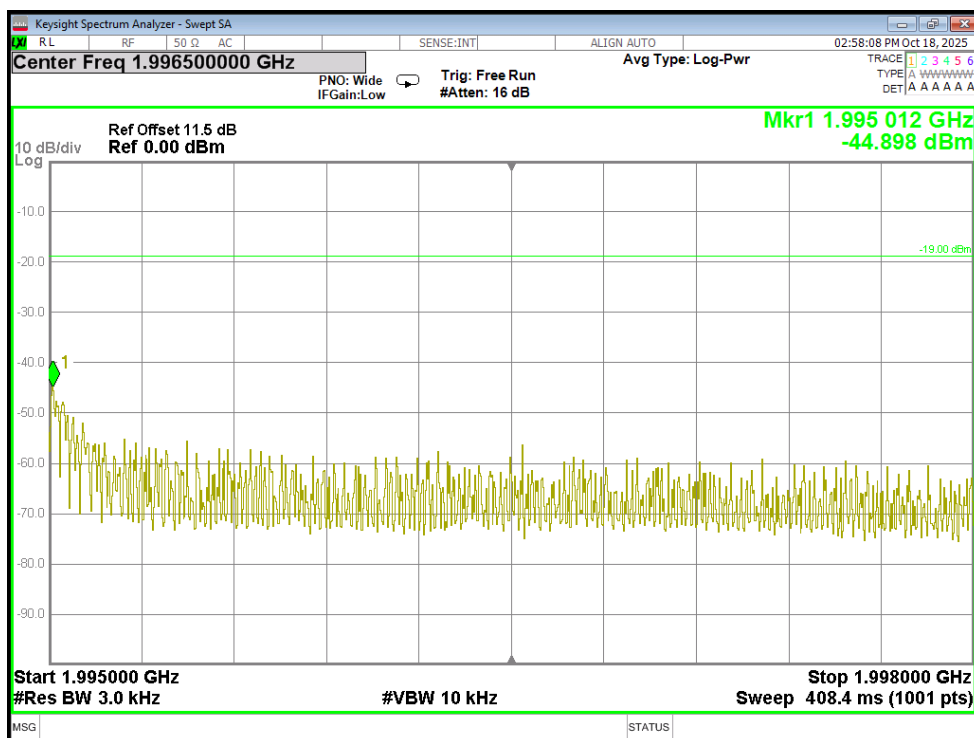




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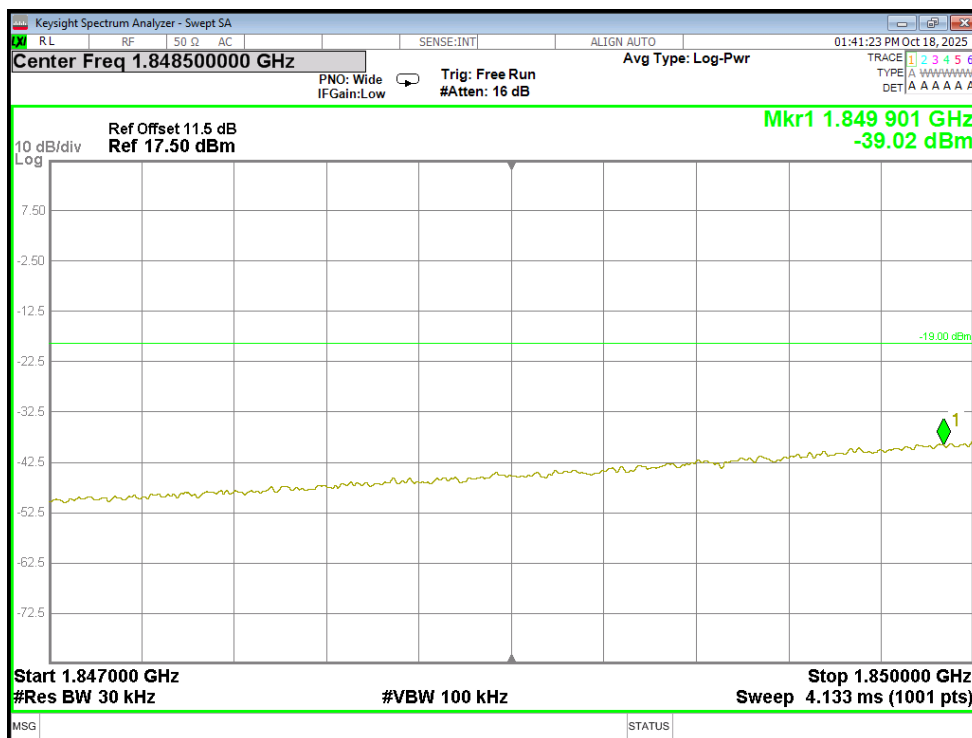


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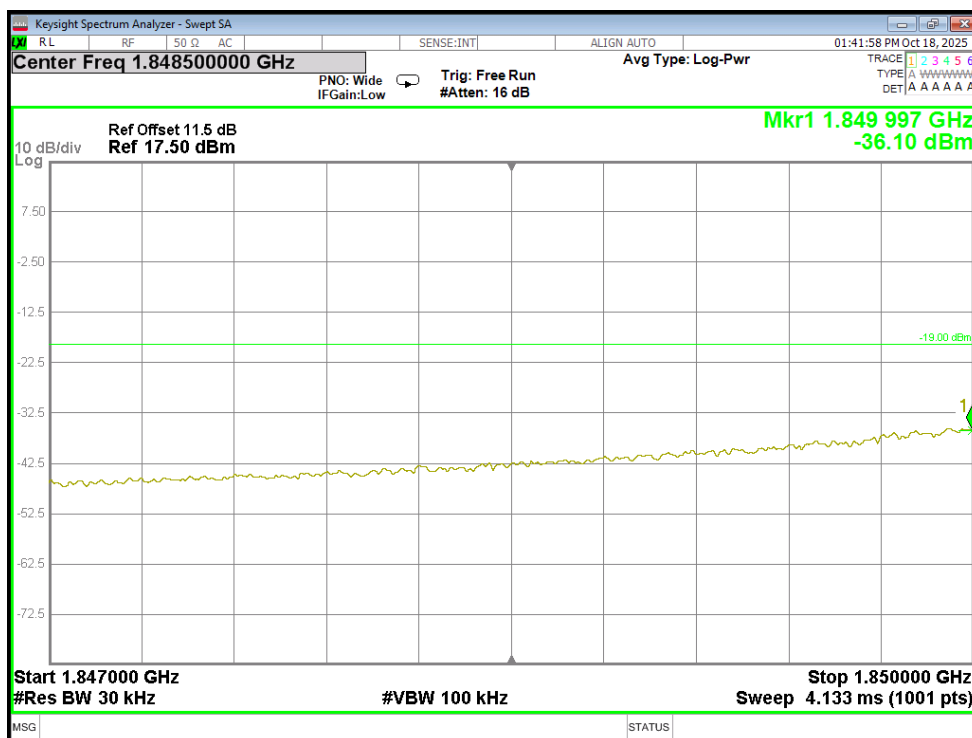




PCS Band UL CDMA Left Side Pre AGC

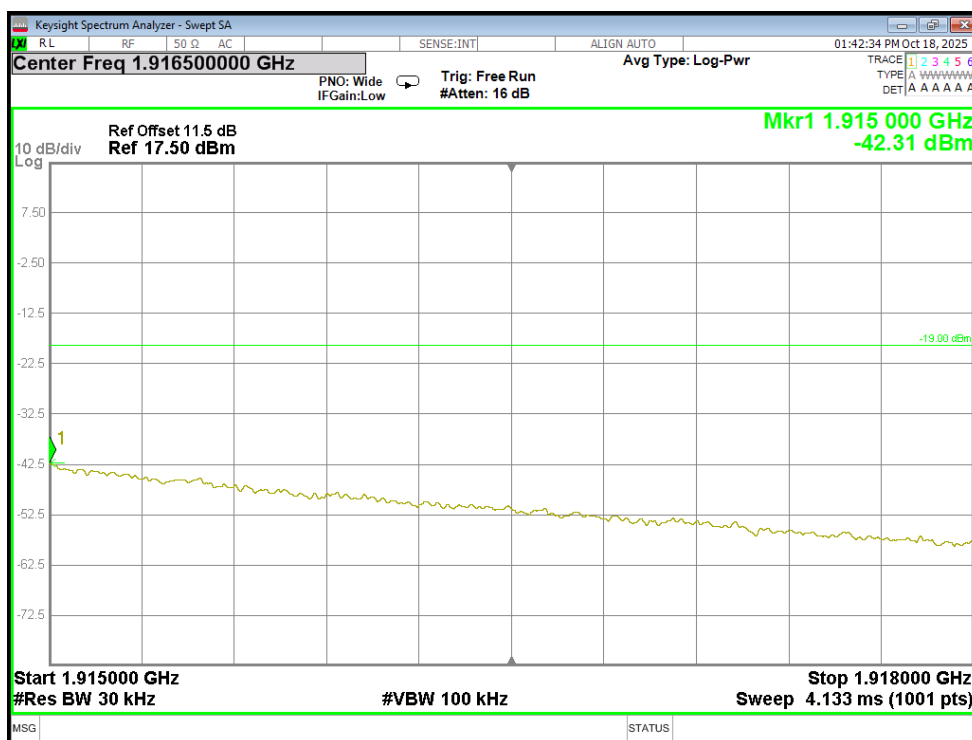


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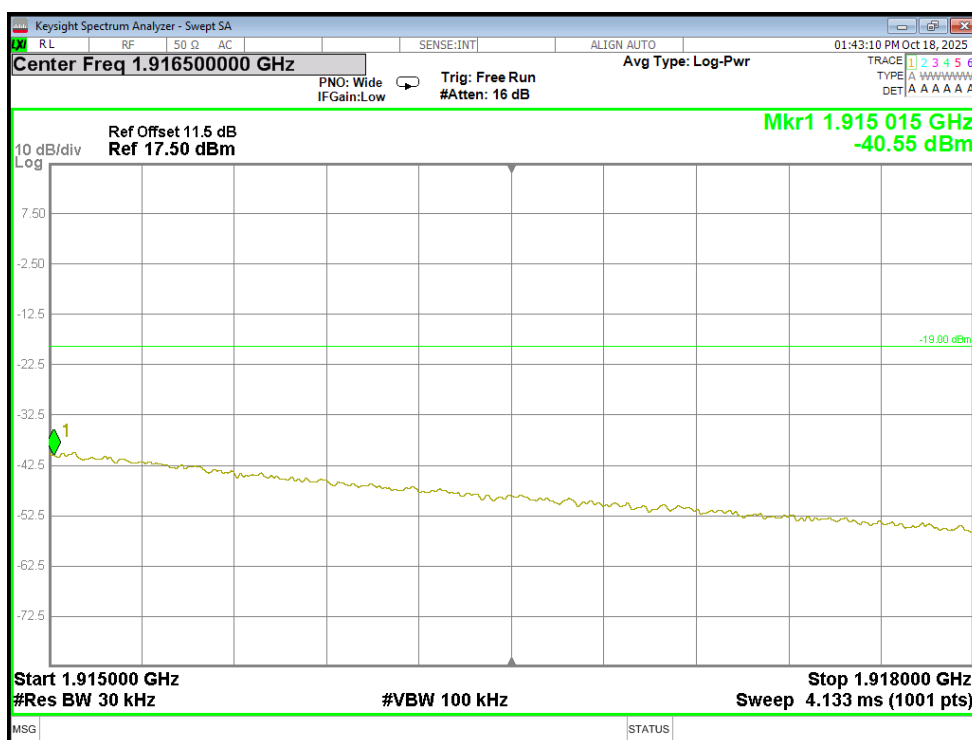




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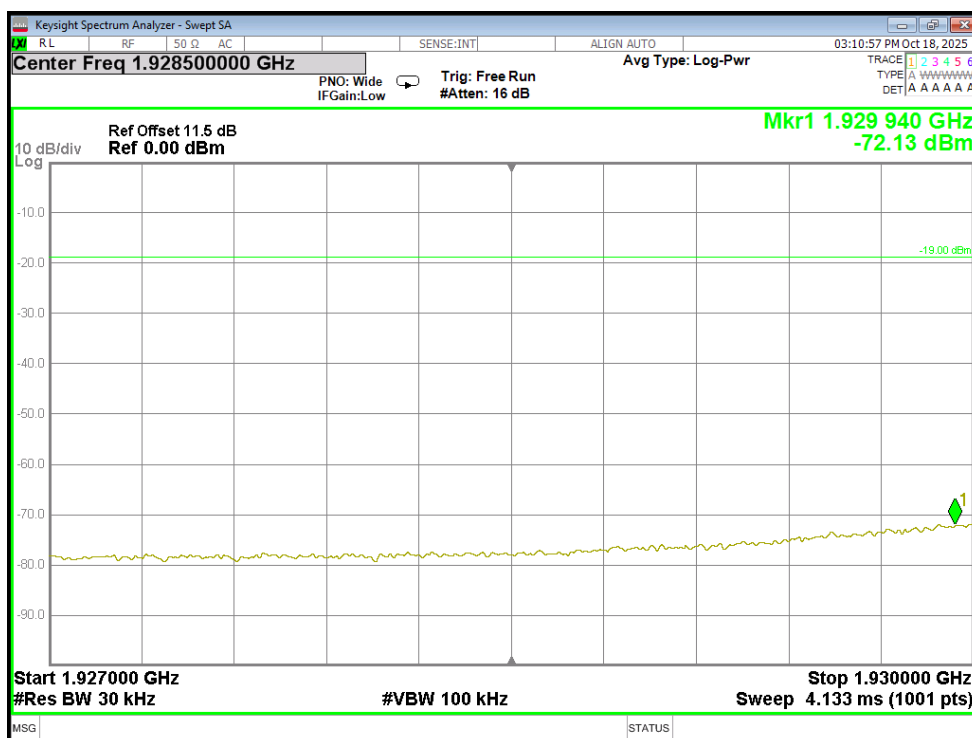


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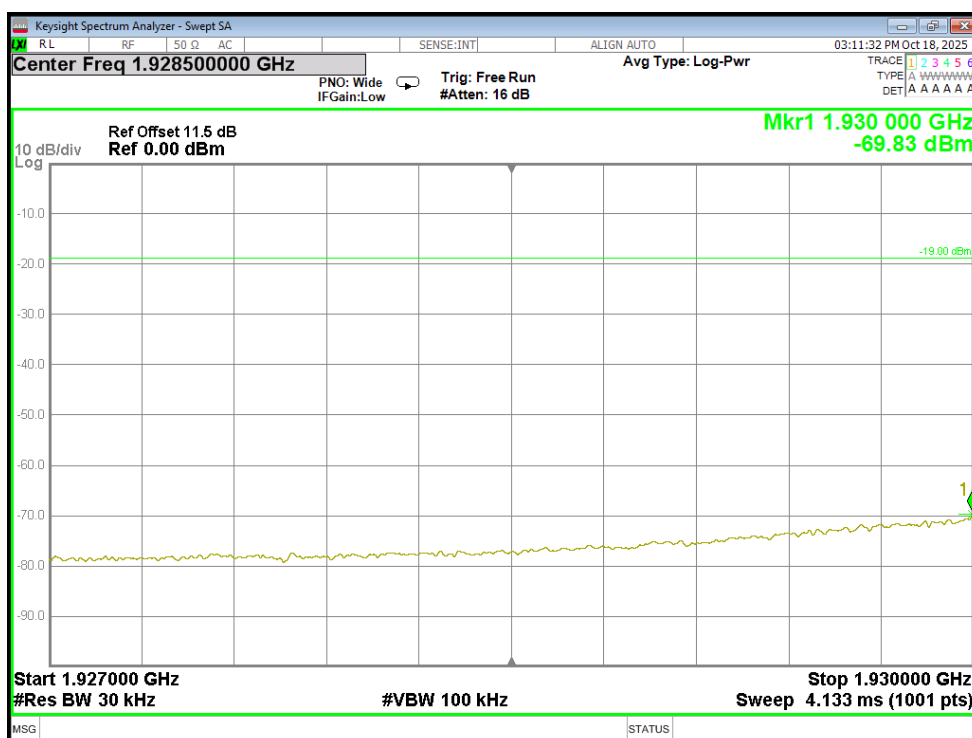




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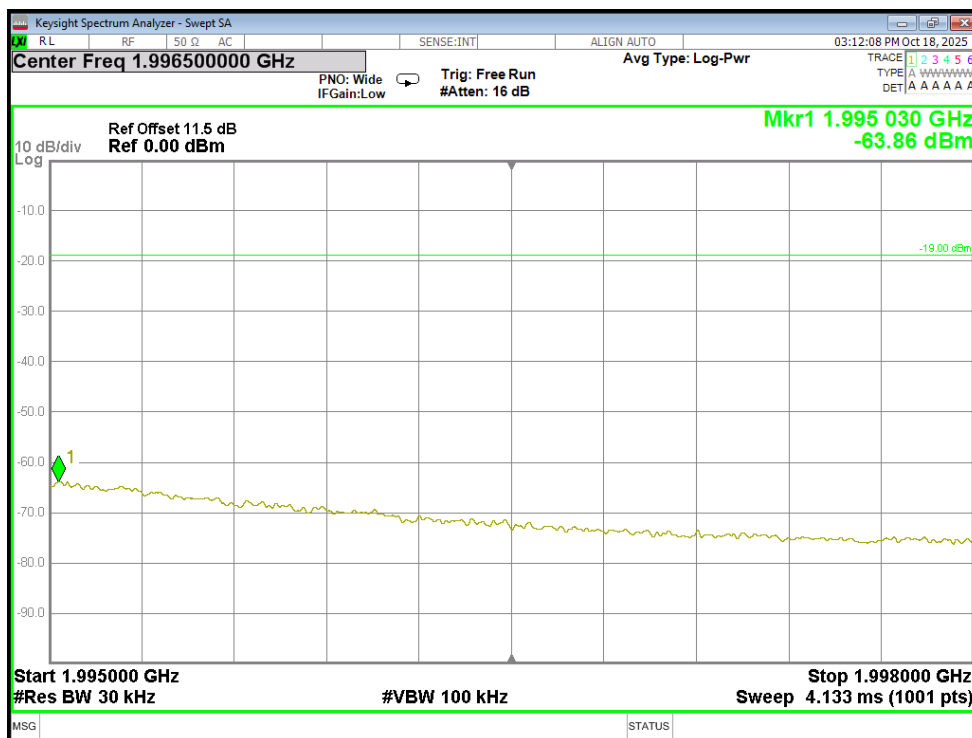


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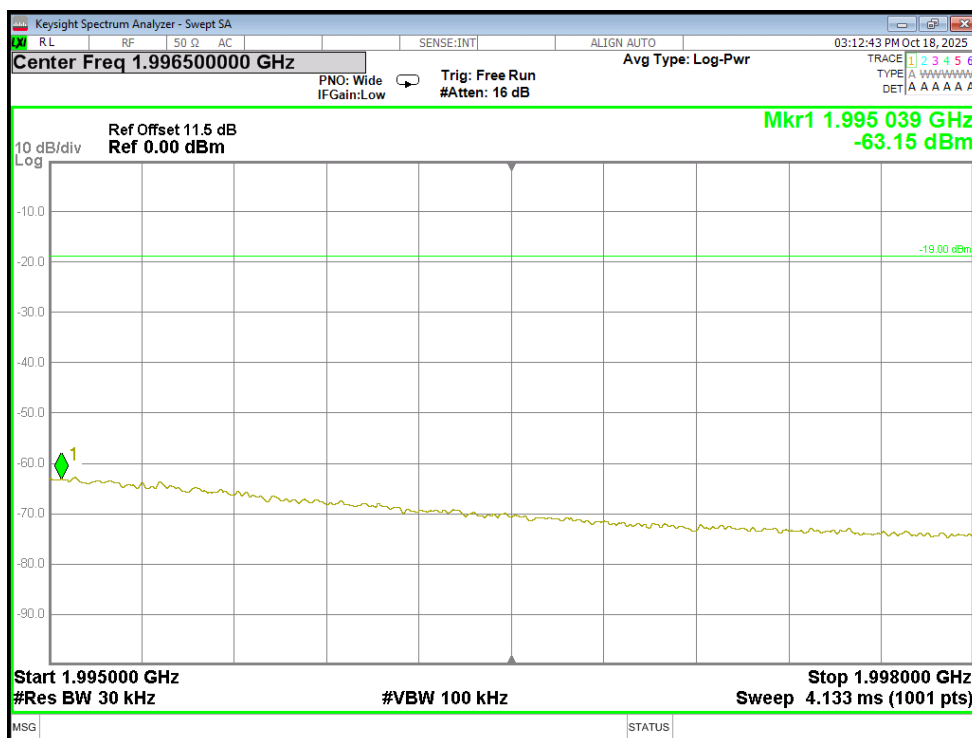




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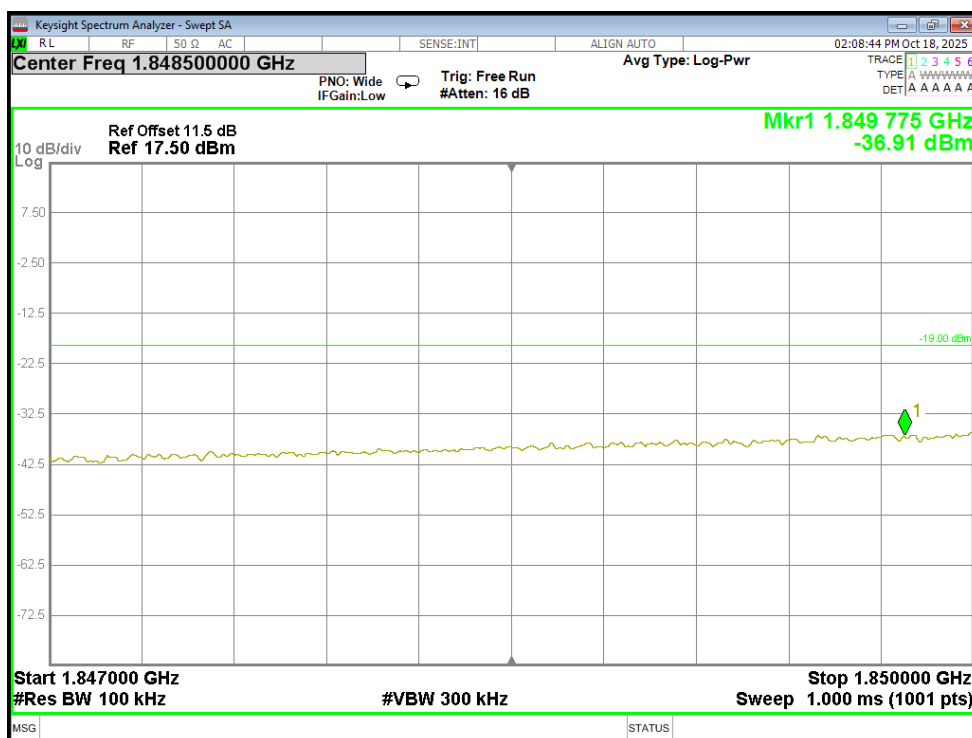


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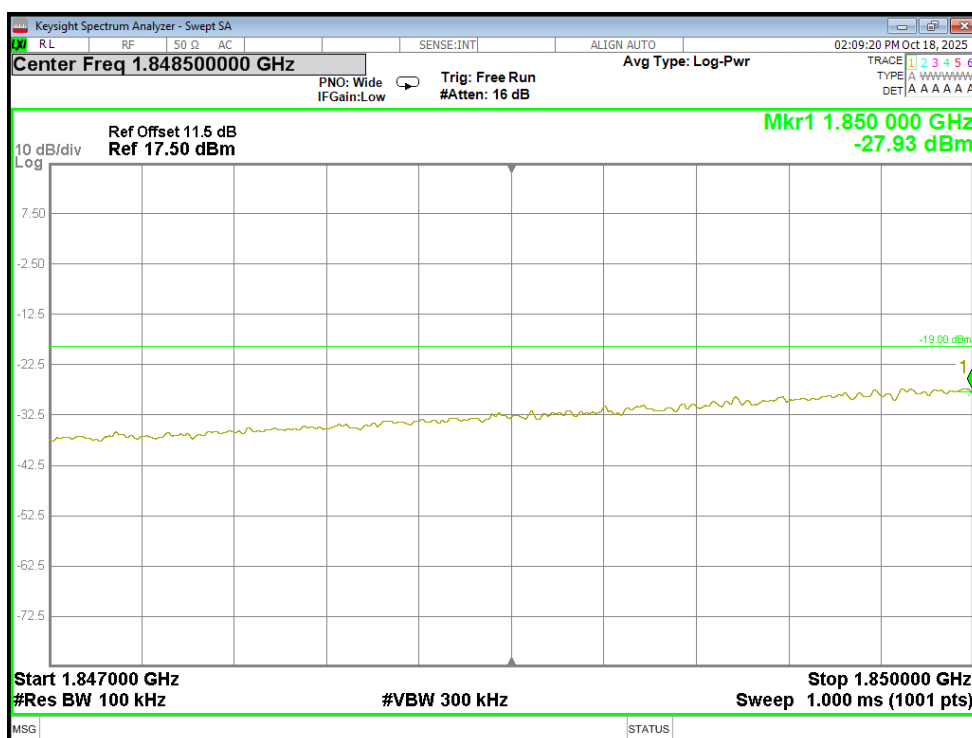




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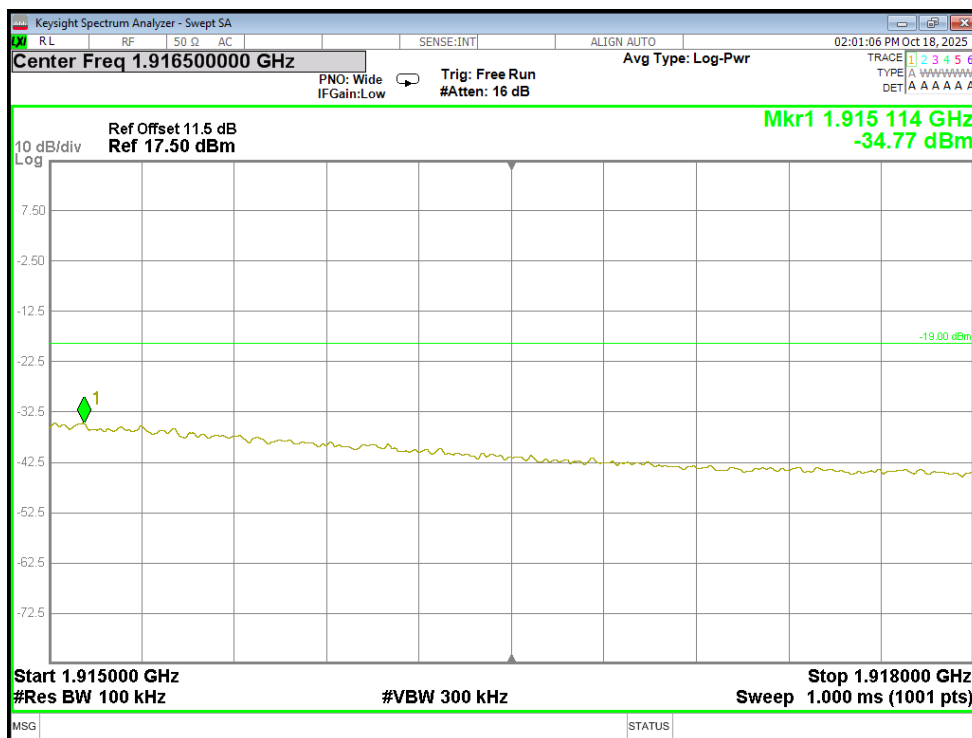


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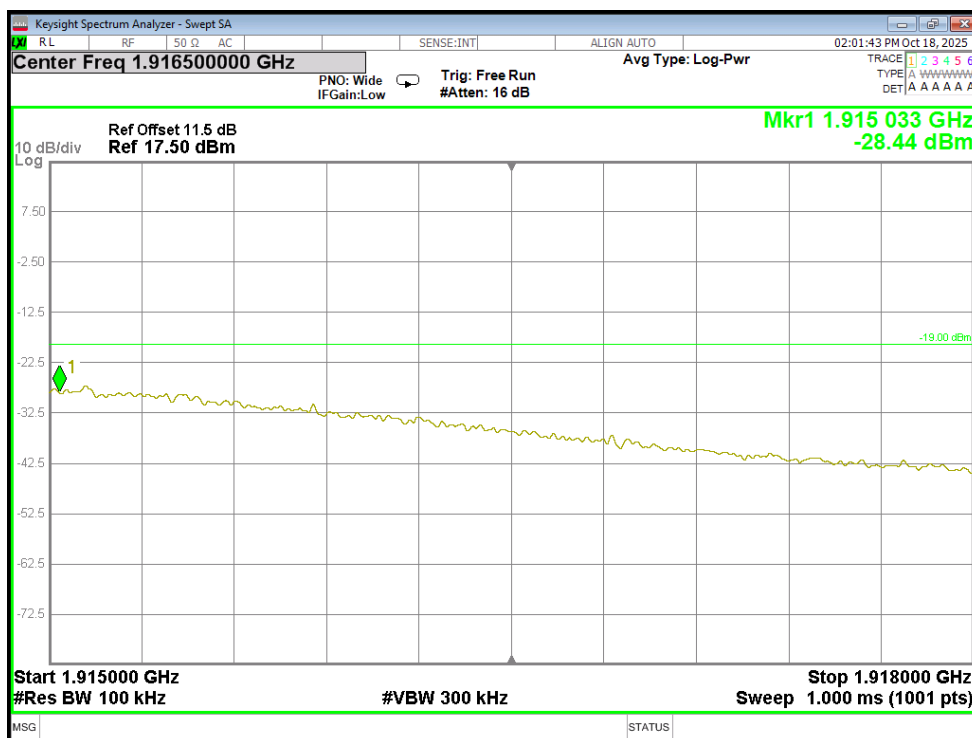




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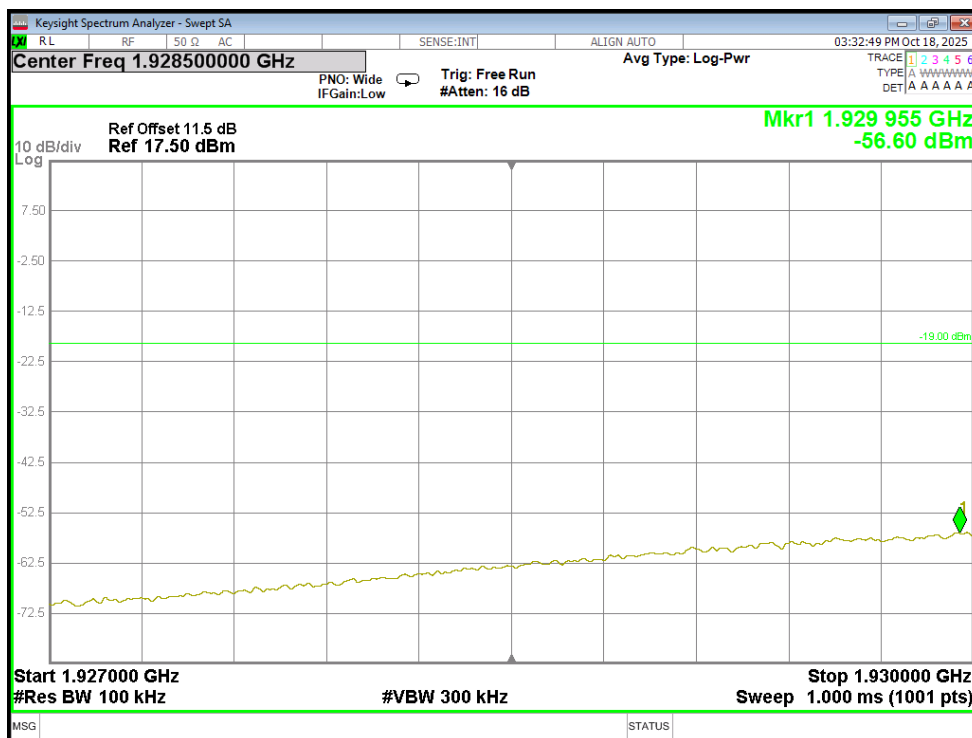


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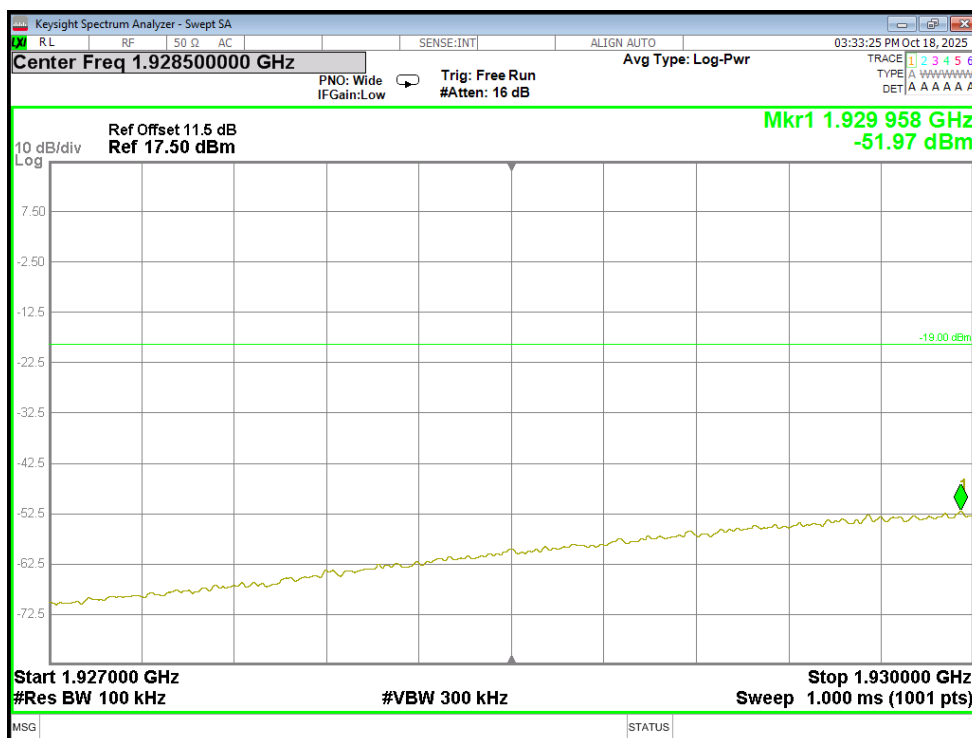




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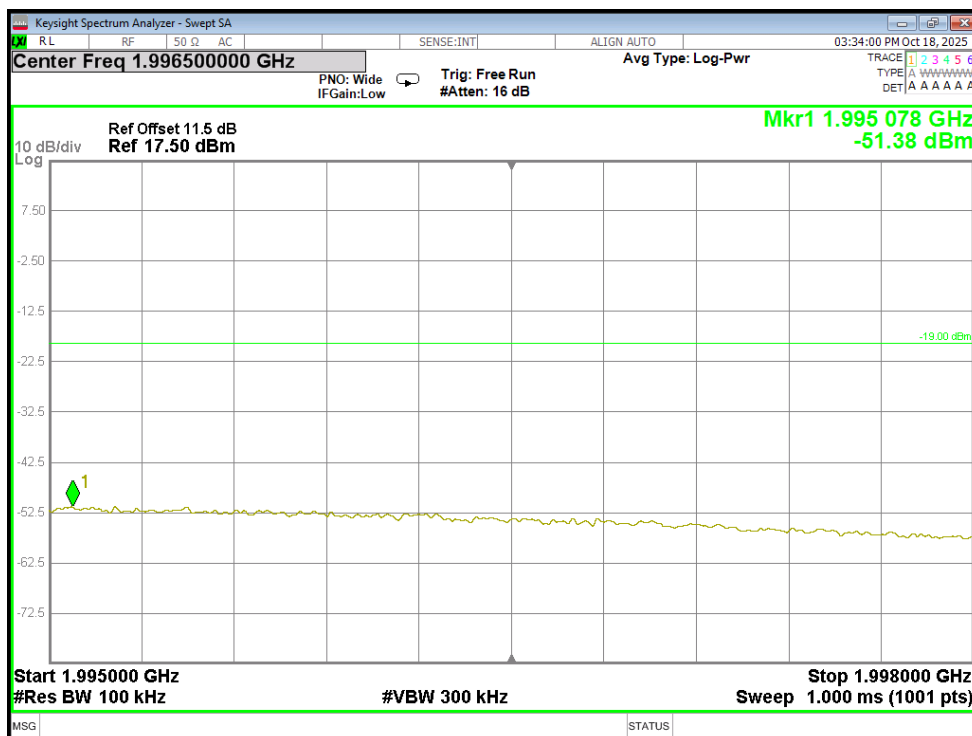


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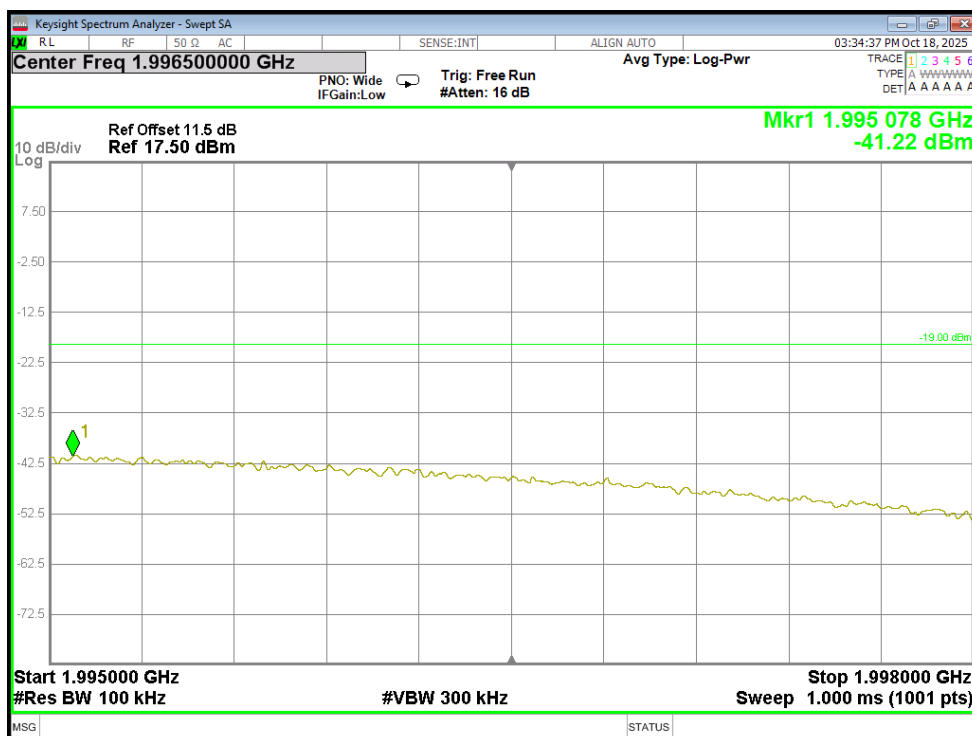




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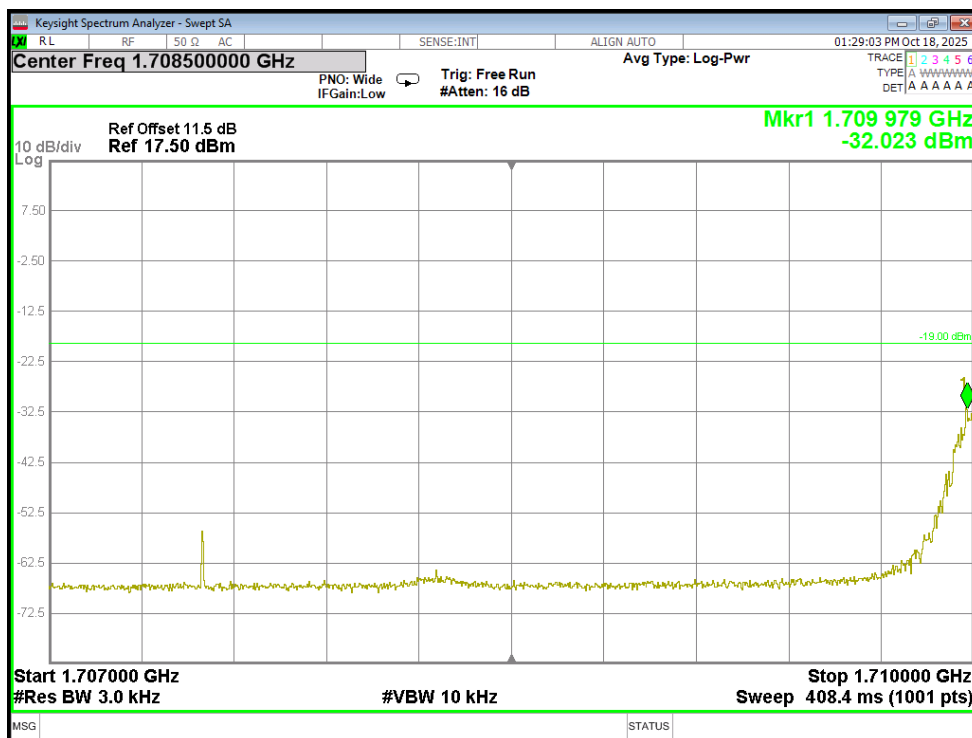


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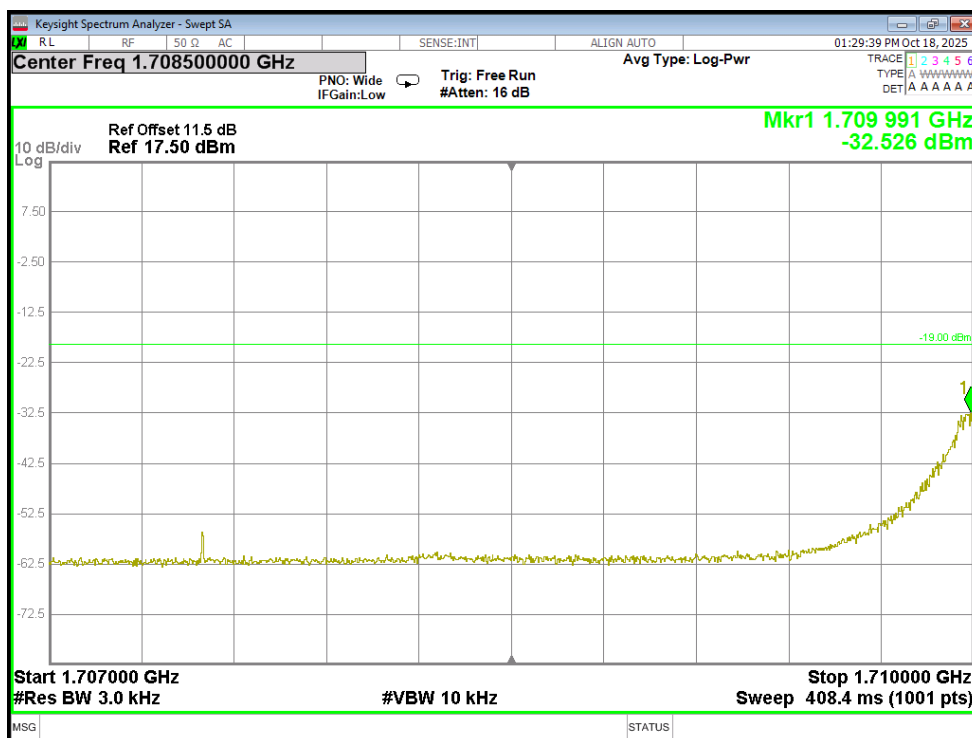




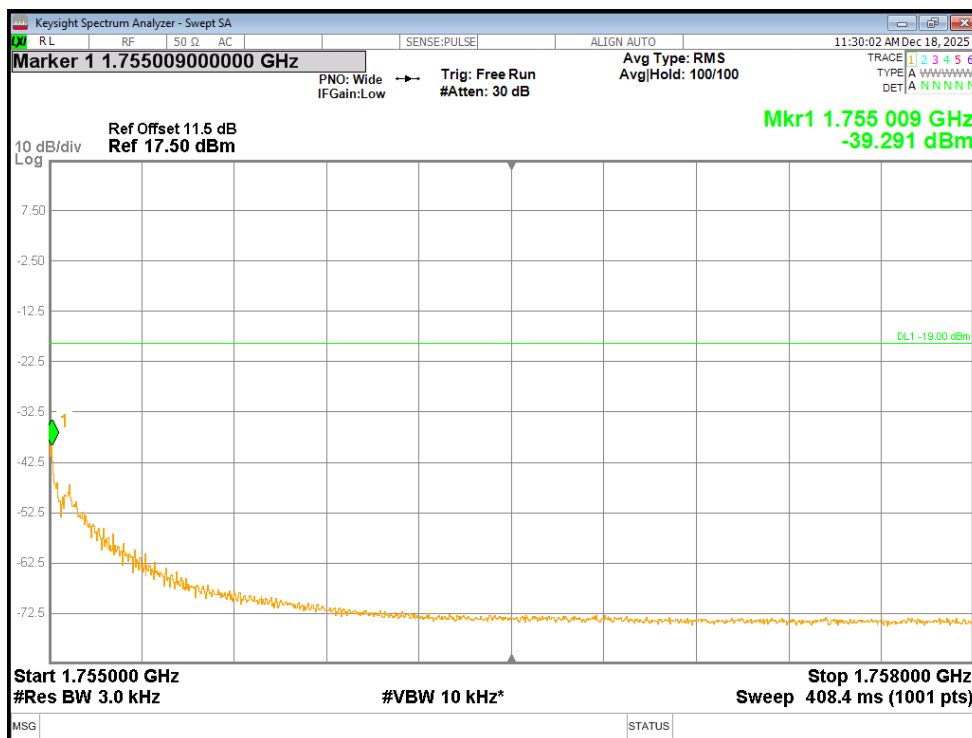
AWS Band UL GSM Left Side Pre AGC



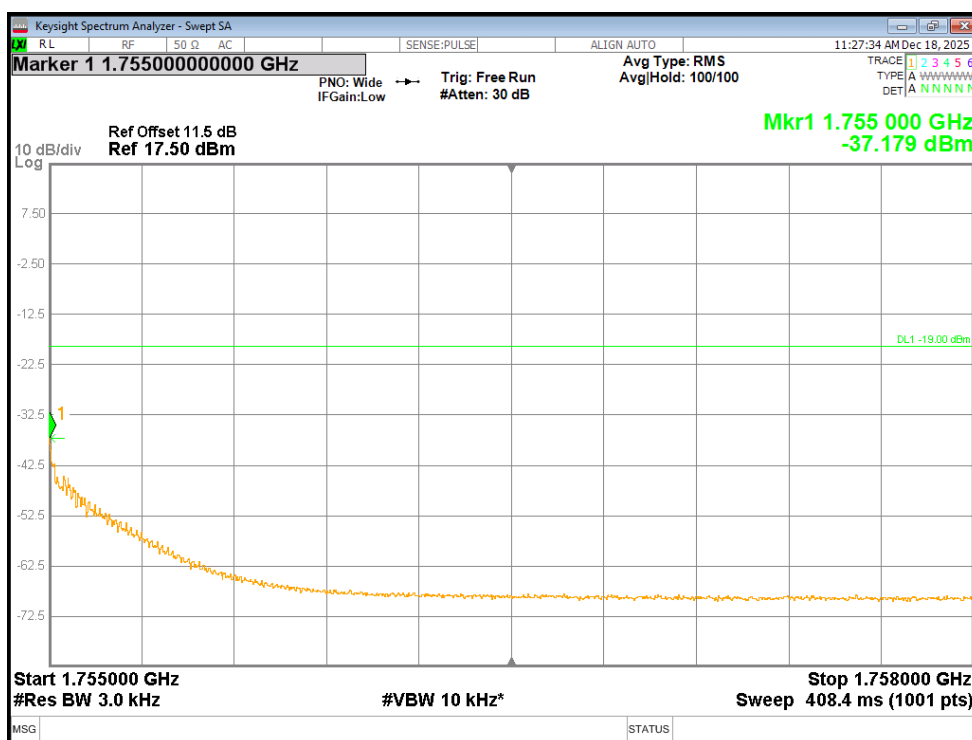
AWS Band UL GSM Left Side Pre AGC+10dB



AWS Band UL GSM Right Side Pre AGC

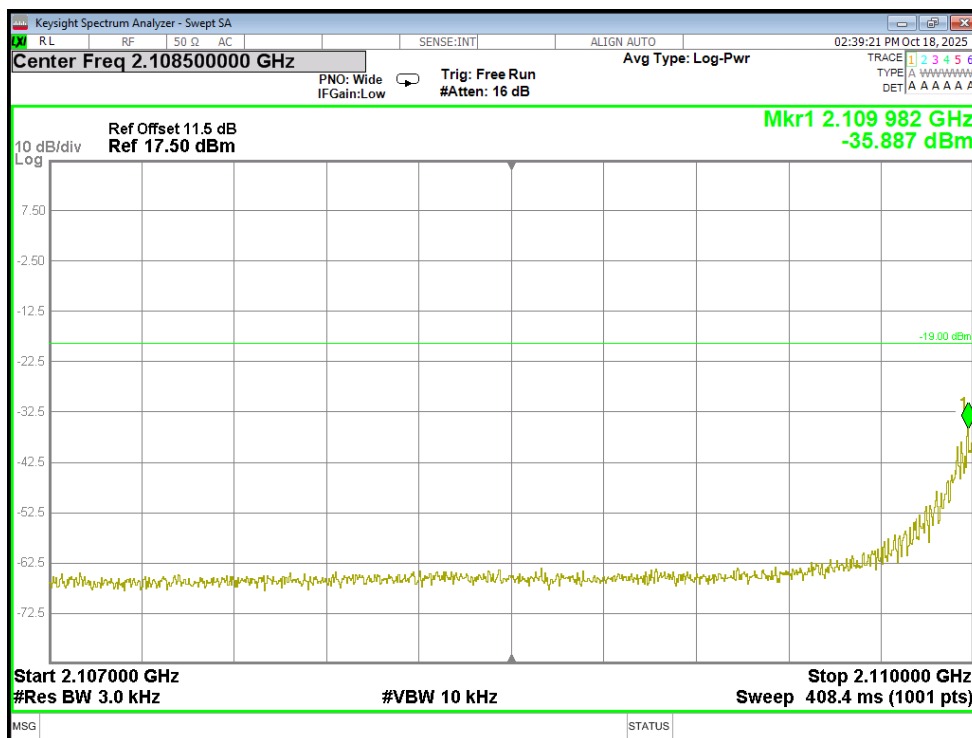


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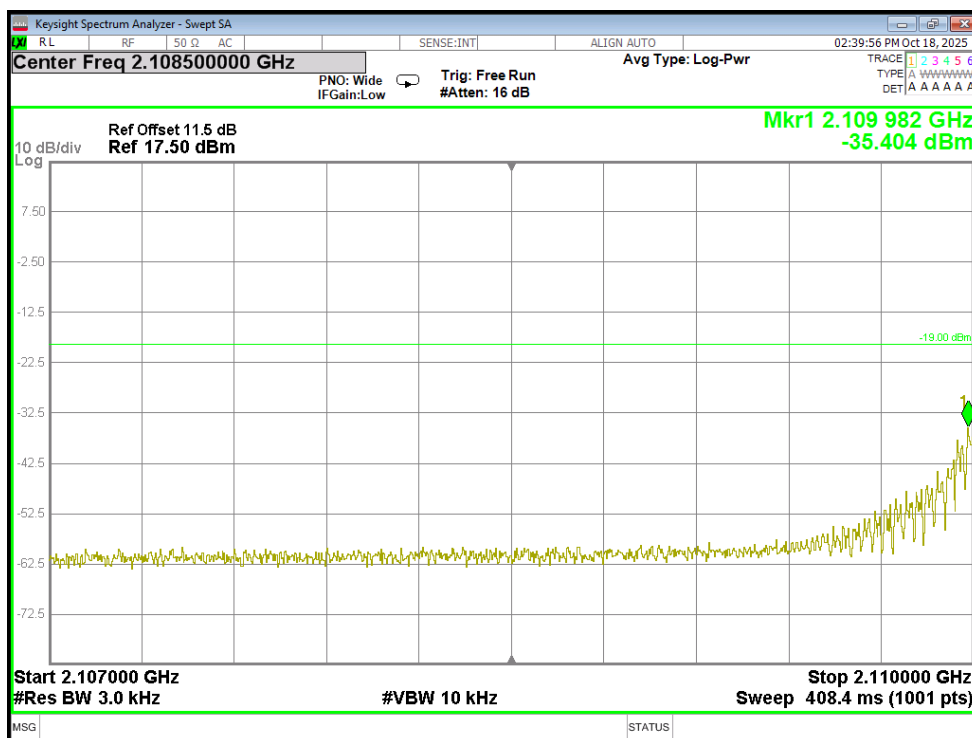




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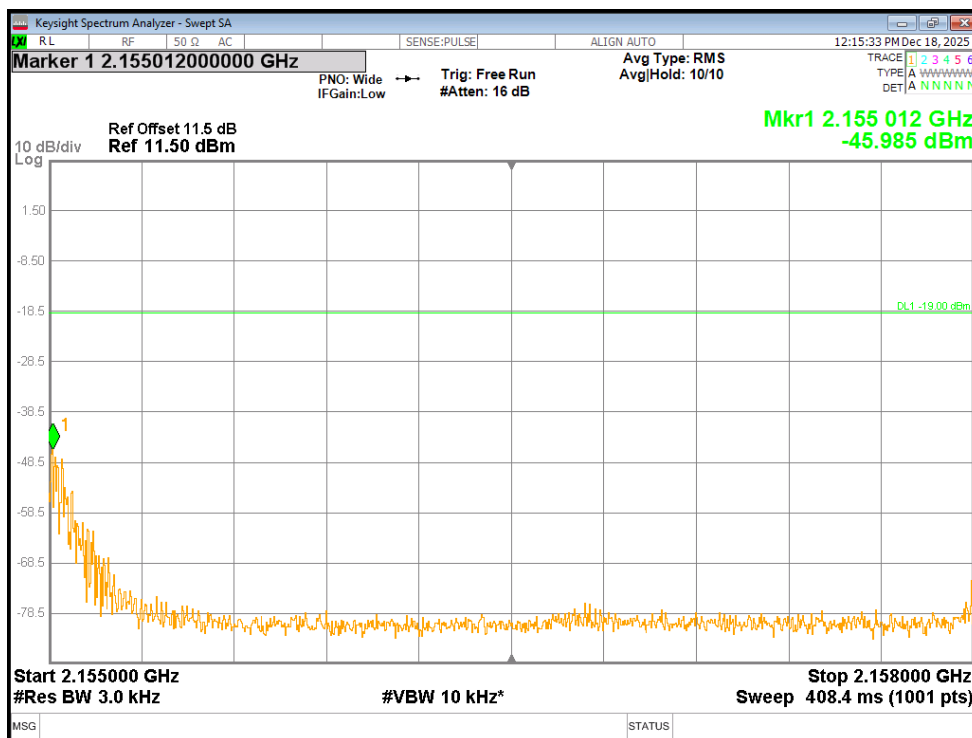


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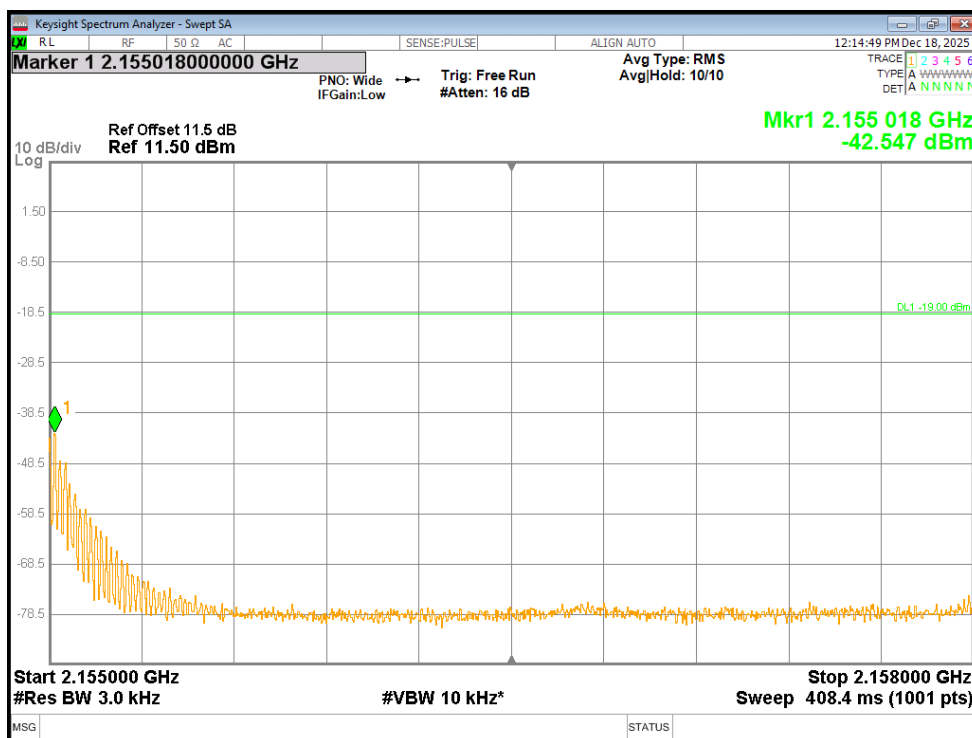




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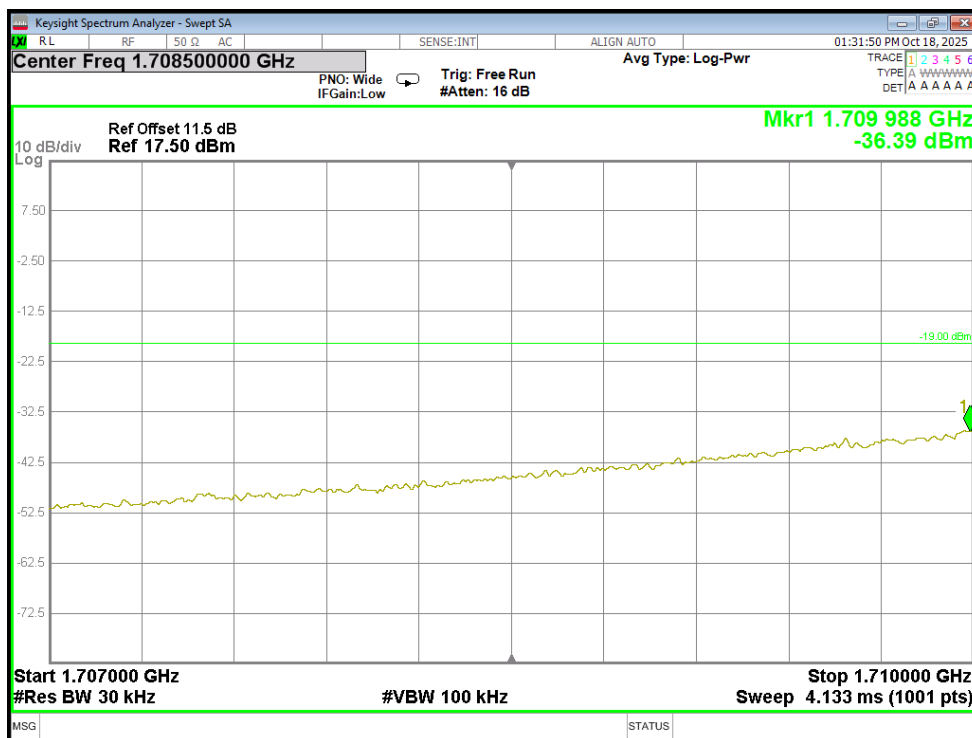


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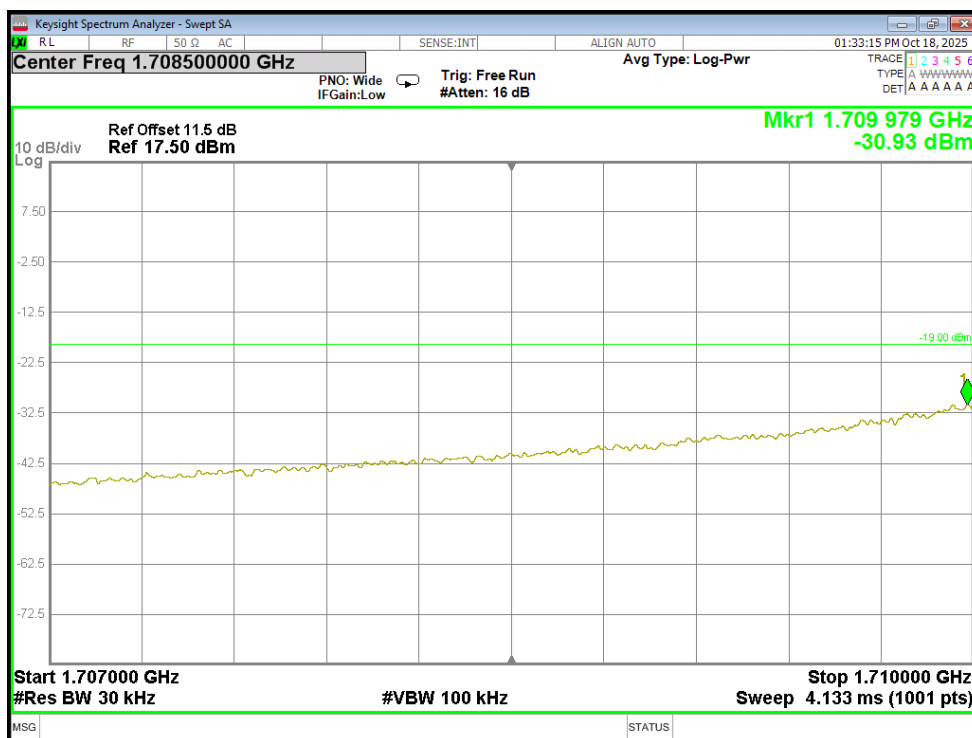




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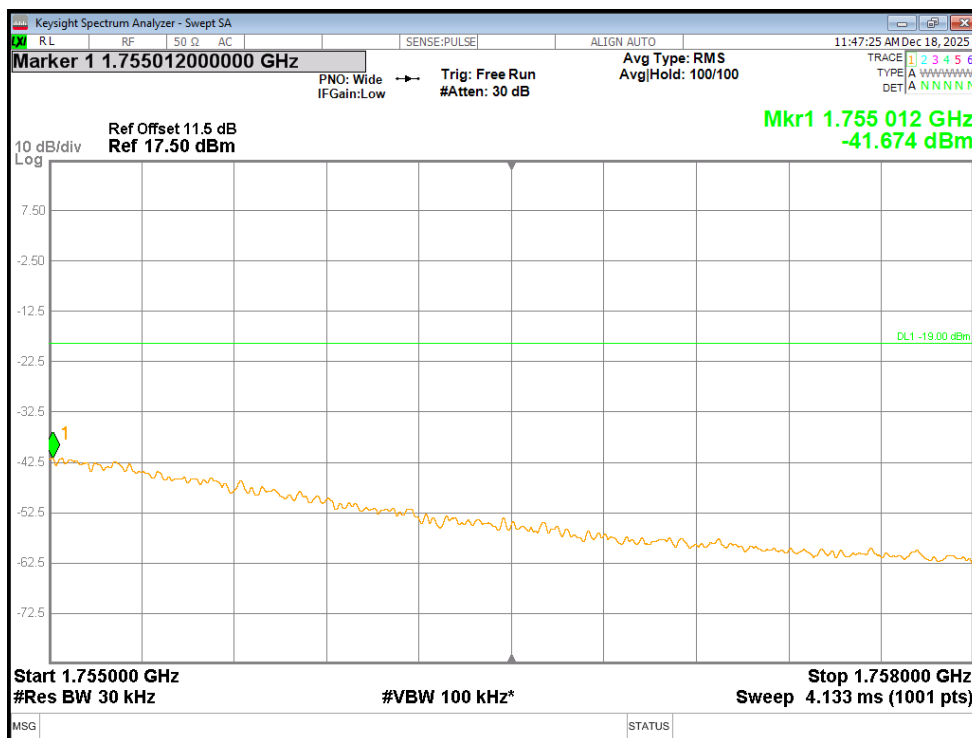


AWS Band UL CDMA Left Side Pre AGC+10dB





AWS Band UL CDMA Right Side Pre AGC



AWS Band UL CDMA Right Side Pre AGC+10dB

