



H.B. Compliance Solutions

Intentional Radiator Test Report

For the

Wilson Electronics.

Quint Band Signal Booster

Tested under

The FCC Rules contained in Title 47 of the CFR, Part 20 and ISED RSS-131 Issue 3

For Fixed Consumer Signal Booster

Prepared for:

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Cert # ATL-0062-E

Engineering Statement: The measurements shown in this report were made in accordance with the procedure indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurement made, the equipment tested is capable of operation in accordance with the requirements of Part 20 of the FCC Rules under normal use and maintenance. All results contained herein relate only to the sample tested.

Report Status Sheet

Revision #	Report Date	Reason for Revision
∅	July/23/2020	Initial Issue
1	August/10/2020	Uplink Plots
2	August 12, 2020	Added W7D Emission Designator

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EXECUTIVE SUMMARY

1. Testing Summary

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 20. All tests were conducted using measurement procedure from FCC Signal Booster Measurement KDB 935210 D03 v04r04 Apr 03, 2020, RSS-GEN Issue 5 and RSS-131 Issue 3 as appropriate.

Test Name	Test Method/FCC Standard	ISED Standard	Result	Comments
Authorized Frequency Band	20.21(e)(3)	§5.1.1.2	Pass	
Maximum Power & Booster Gain	20.21(e)(8)(i)(B) 20.21(e)(8)(i)(C) 20.21(e)(8)(i)(D)	§5.1.1.2, §5.1.3.3 & §5.1.2	Pass	
Intermodulation	20.21(e)(8)(i)(F)	§5.1.3.5	Pass	
Out-of-Band Emissions	20.21(e)(8)(i)(E)	§5.1.3.4	Pass	
Conducted Spurious Emissions	2.1051	§4.2	Pass	
Noise Limits/Transmit power off mode	20.21(e)(8)(i)(A) 20.21(e)(9)(i)(I)	§5.1.3.1, §5.1.3.2 & §5.1.3.6	Pass	
Uplink Inactivity	20.21(e)(8)(i)(I) 20.21(e)(9)(i)(J)	§5.1.3.7	Pass	
Variable Booster Gain	20.21(e)(8)(i)(C)	§5.1.1.3 & §5.1.3.2	Pass	
Occupied Bandwidth	2.1049	RSS-Gen §7.0	Pass	
Oscillation Detection	20.21(e)(8)(ii)(A)	§5.1.1.1	Pass	
Radiated Spurious Emissions	2.1053		Pass	
Spectrum Block Filtering	20.21(e)(8)(i)(B)		N/A	Applies to devices utilizing spectrum block filtering, In this case this is not applicable



EQUIPMENT CONFIGURATION

1. Overview

H.B. Compliance Solutions was contracted by Wilson Electronics to perform testing on the Signal Booster under the purchase order number 22333.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of the Wilson Electronics, Signal Booster.

The tests were based on FCC Part 20 Rules. The tests described in this document were formal tests as described with the objective of the testing was to evaluate compliance of the Equipment Under Test (EUT) to the requirements of the aforementioned specifications. Wilson Electronics should retain a copy of this document and it should be kept on file for at least five years after the manufacturing of the EUT has been permanently discontinued. The results obtained relate only to the item(s) tested.

Product Name:	Quint Band Signal Booster
Model(s) Tested:	460062 Signal Booster
FCC ID:	PWO-460062
IC ID:	4726A-460062
Supply Voltage Input:	Primary Power: 12.0 Vdc
Frequency Range:	Uplink 698-716, 776-787MHz, 824-849MHz, 1710-1755 & 1850-1915MHz, Downlink 728-746MHz, 746-757MHz, 869-894MHz, 1930-1995MHz & 2110-2155MHz
No. of Channels:	N/A
Type(s) of Modulation:	CDMA, GSM, EDGE, HSPA, EVDO, LTE
Range of Operation Power:	0.005 – 0.28W
Emission Designator:	F9W, GXW, G7W & G7D, W7D
Channel Spacing(s)	N/A
Test Item:	Pre-Production
Type of Equipment:	Fixed Consumer Booster
Firmware Version:	V2.9
Antenna Requirement	External
Environmental Test Conditions:	Temperature: 15-35°C Humidity: 30-60% Barometric Pressure: 860-1060 mbar
Modification to the EUT:	None
Evaluated By:	Staff at H.B. Compliance Solutions
Test Date(s):	07/06/2020 – 07/24/2020

2. Test Facility

All testing was performed at H.B. Compliance Solutions. This facility is located at 5005 S. Ash Avenue, Suite # A-10, Tempe AZ-85282. All equipment used in making physical determination is accurate and bears recent traceability to the National Institute of Standards and Technology.

Radiated Emissions measurements from 30MHz to 1GHz were performed in a GTEM chamber (equivalent to an Open Area Test Site). Radiated Emission above 1GHz were performed on an Open Area Test Site (OATS). In accordance with §2.948(a)(3), a complete site description is contained at H.B. Compliance Solutions.

Test facility H.B. Compliance Solutions is an ANAB accredited test site. The ANAB certificate number is L2458. The scope of accreditation can be found on ANAB website www.anab.org

ISED Test Site Registration number is 9481A



3. Description of Test Sample

The Wilson Electronics is a quint-band bi-directional amplifier for enhancing the range of cell phones and data communication devices (computer, PDAs, etc.) in both mobile and in-building applications. The amplifier is connected to an external antenna mounted outside the building. An inside antenna is positioned within the building and connected to the amplifier. The inside antenna enables a wireless connection to host devices located inside the building. The components are contained in a metal enclosure.

4. Equipment Configuration

Ref. ID	Name / Description	Model Number	Serial Number
# 1	Quint Band Bi-Directional Amplifier	460062	N/A

Table 1. Equipment Configuration

5. Support Equipment

All support equipment supplied is listed in the following Support Equipment List.

Ref ID	Name / Description	Manufacturer	Model #	Serial #
# 2	AC/DC Power Adaptor	EDACPOWER	EA1024PU-120	-

Table 2. Support Equipment

6. Ports and Cabling Information

Ref ID	Port name on the EUT	Cable Description	Qty.	Length (m)	Shielded? (Y/N)	Termination Box ID & Port ID
#3	Power	2 wire	1	1.5	N	AC/DC Power Adaptor

Table 3. Ports and Cabling Information

7. Method of Monitoring EUT Operation

A test receiver will be used to monitor the data transmission from the EUT.

8. Mode of Operation

The EUT will be configured as defined in each section of this document. These settings were created for testing purpose only.

9. Modifications

9.1 Modifications to EUT

No modifications were made to the EUT

9.2 Modifications to Test Standard

No Modifications were made to the test standard.

10. Disposition of EUT

The test sample including all support equipment submitted to H.B Compliance Solutions for testing will be returned to Wilson Electronics. upon completion of testing & certification

Criteria for Intentional Radiators

1. Authorized Frequency Band

Test Requirement(s):	§20.21(e)(3) and RSS-131 §5.1.1.2	Test Engineer(s):	Keith Thornton
Test Results:	Pass	Test Date(s):	July/06/2020

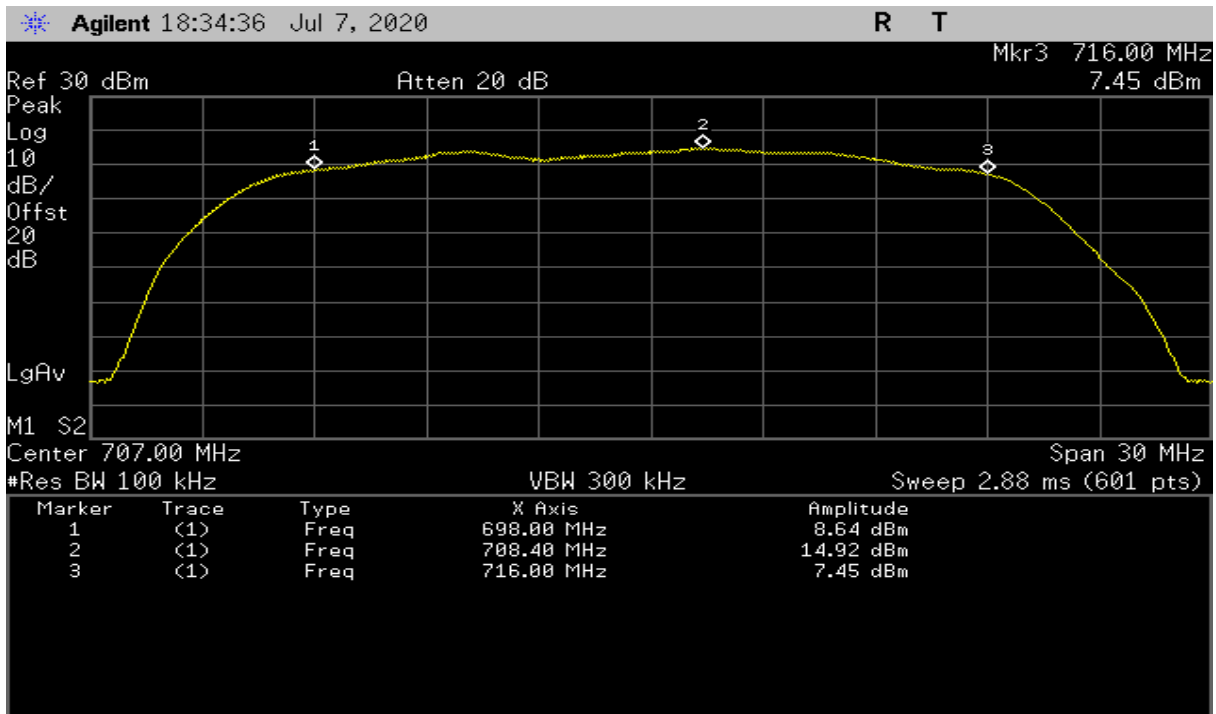
Test Procedures: As required by 47 CFR §20.21(e)(3) and RSS-131 §5.1.1.2, Authorized frequency band measurements were made at the RF output terminals of the EUT.

The EUT was connected through an attenuator to a Spectrum Analyzer. A signal generator was used for the input to the EUT to provide a CW signal tuned to the center channel of each uplink and downlink operational band. Measurements were made at the low and high channels of each uplink and downlink frequency band.

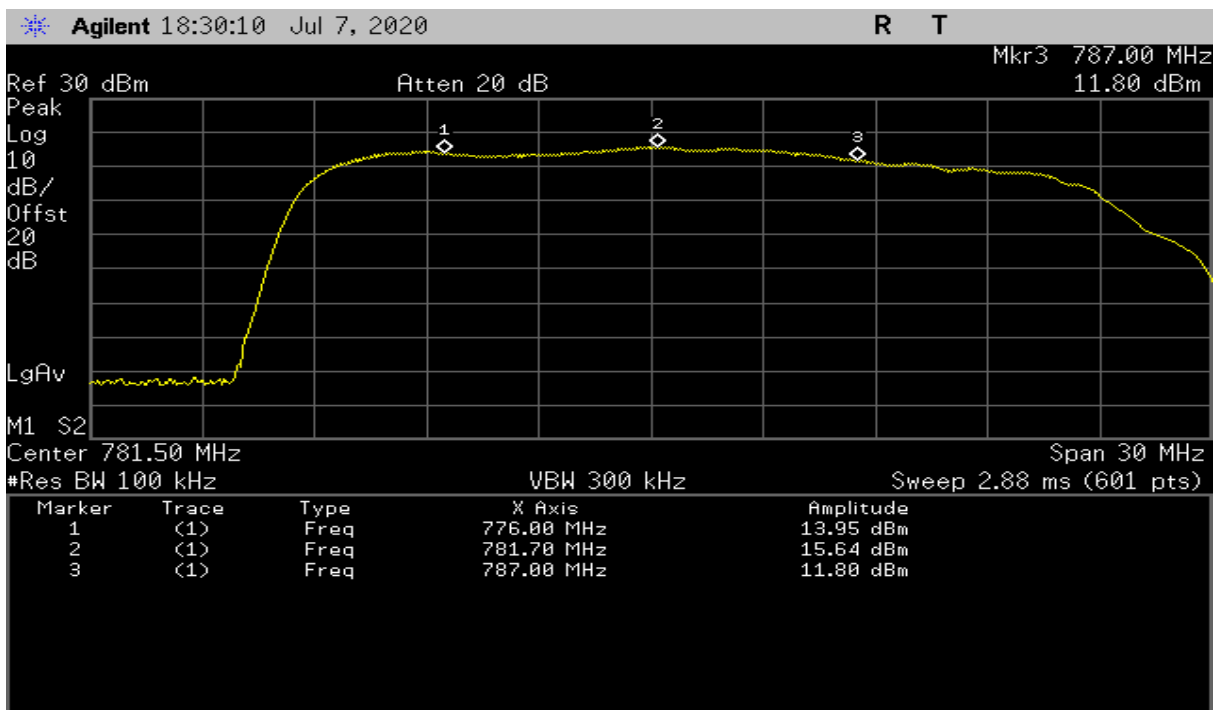
Test Setup:



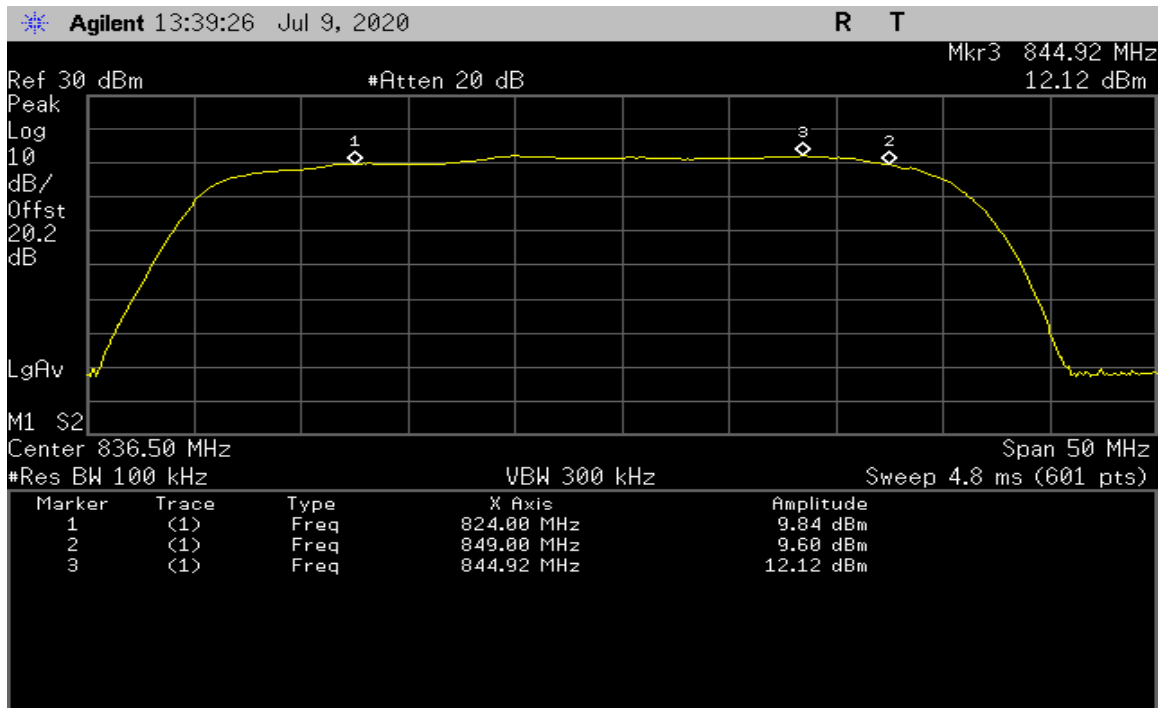
Figure 1 – Band Verification



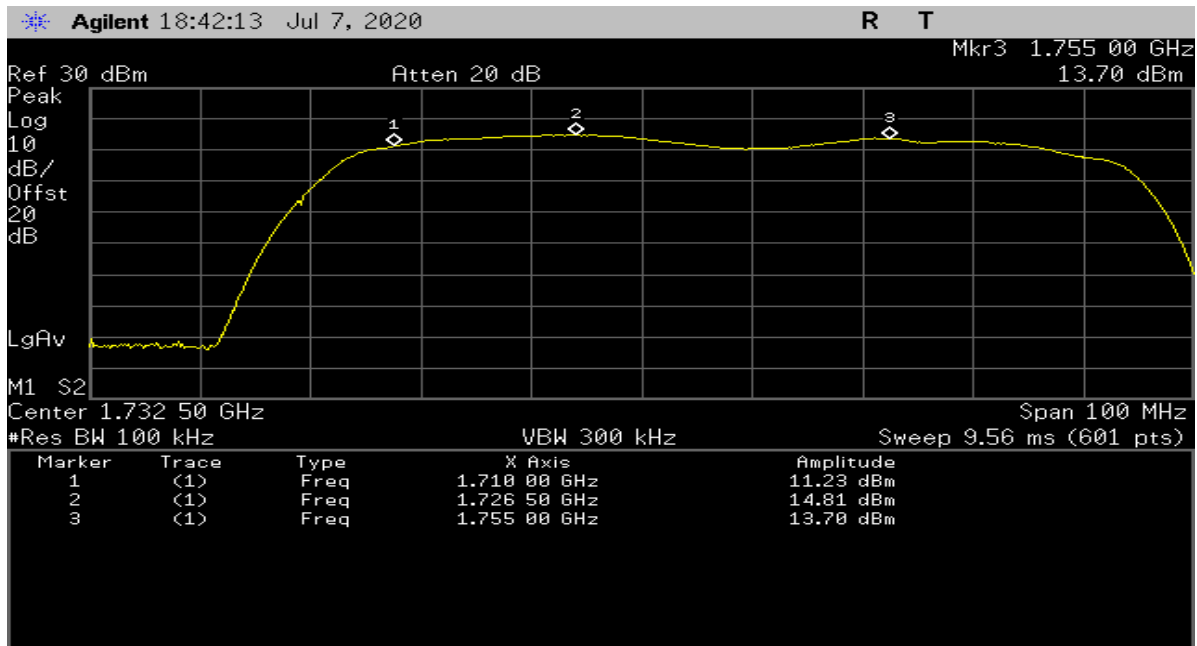
Plot 1 – 698-716MHz Band – Uplink



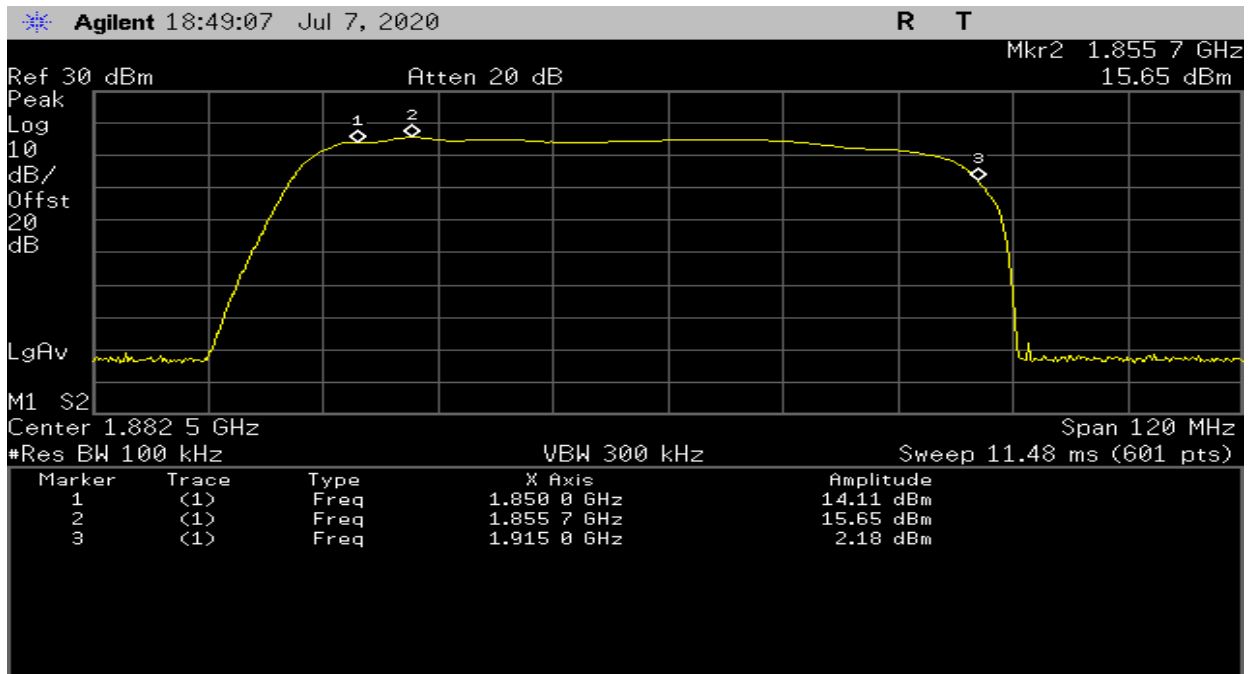
Plot 2 – 776-787MHz Band – Uplink



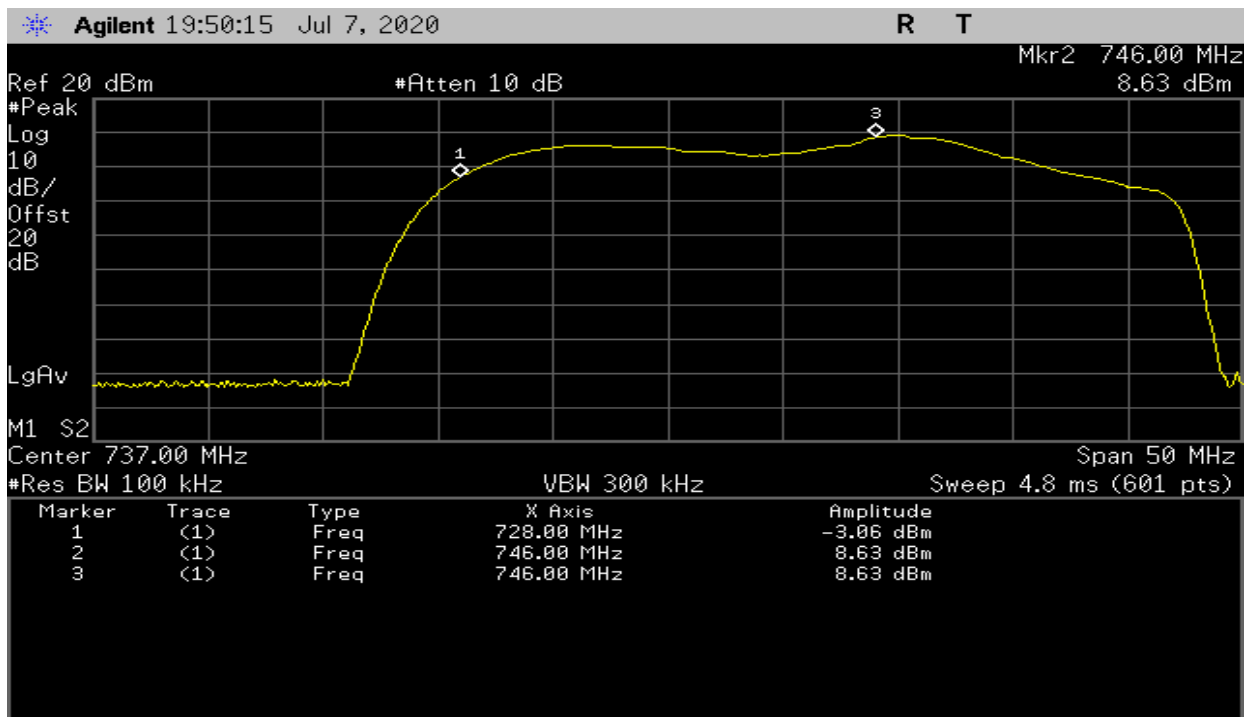
Plot 3 – 824-849MHz Band – Uplink



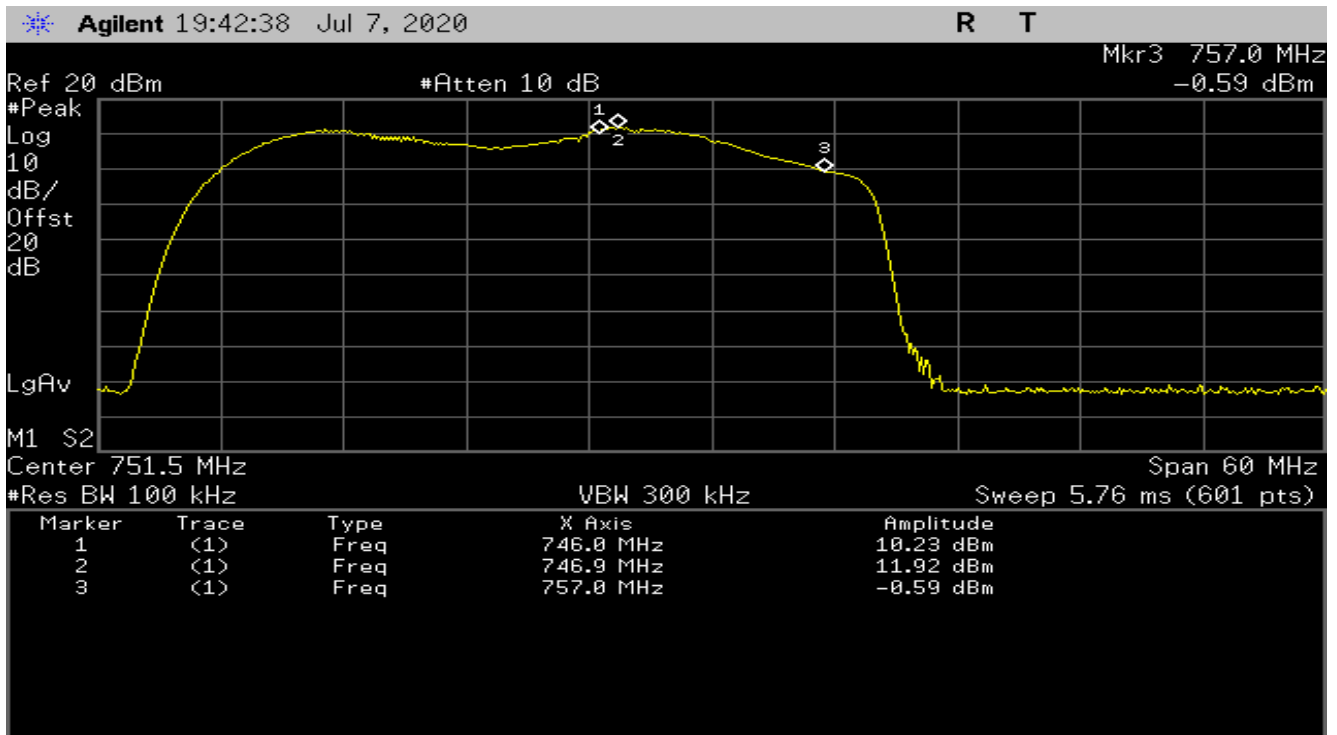
Plot 4 – 1710-1755MHz Band – Uplink



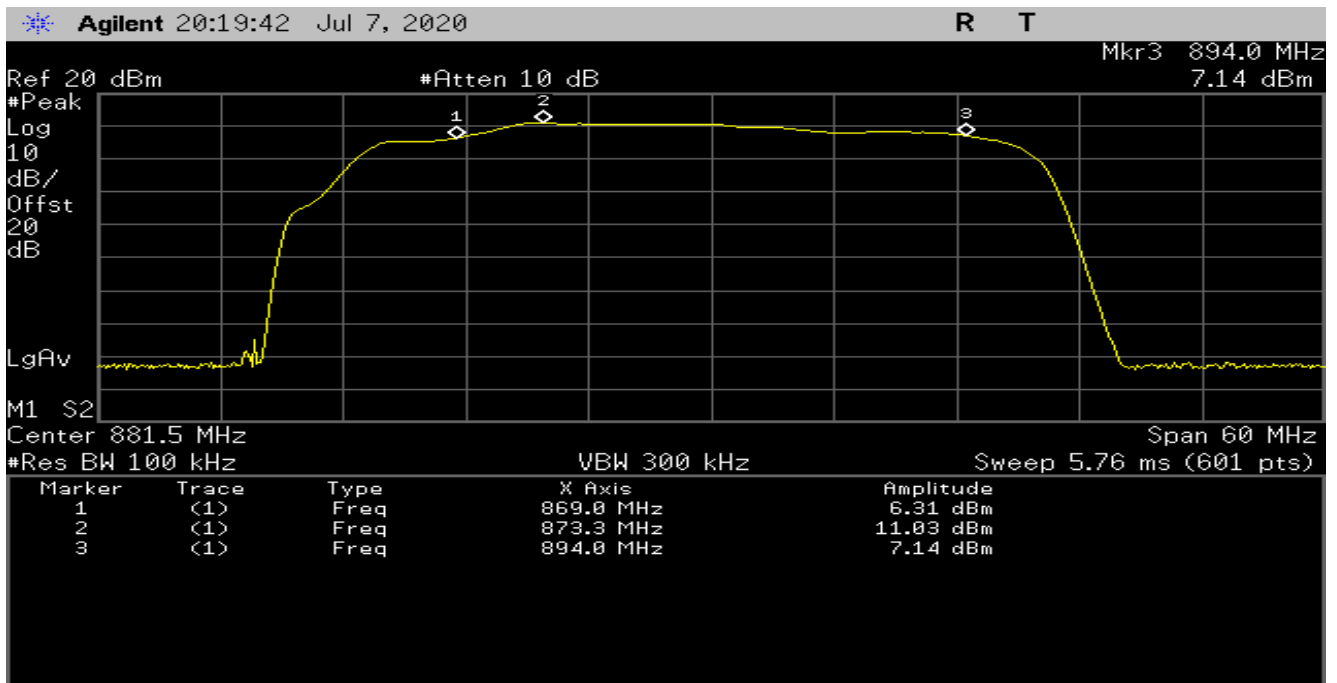
Plot 5 – 1850-1915MHz Band – Uplink



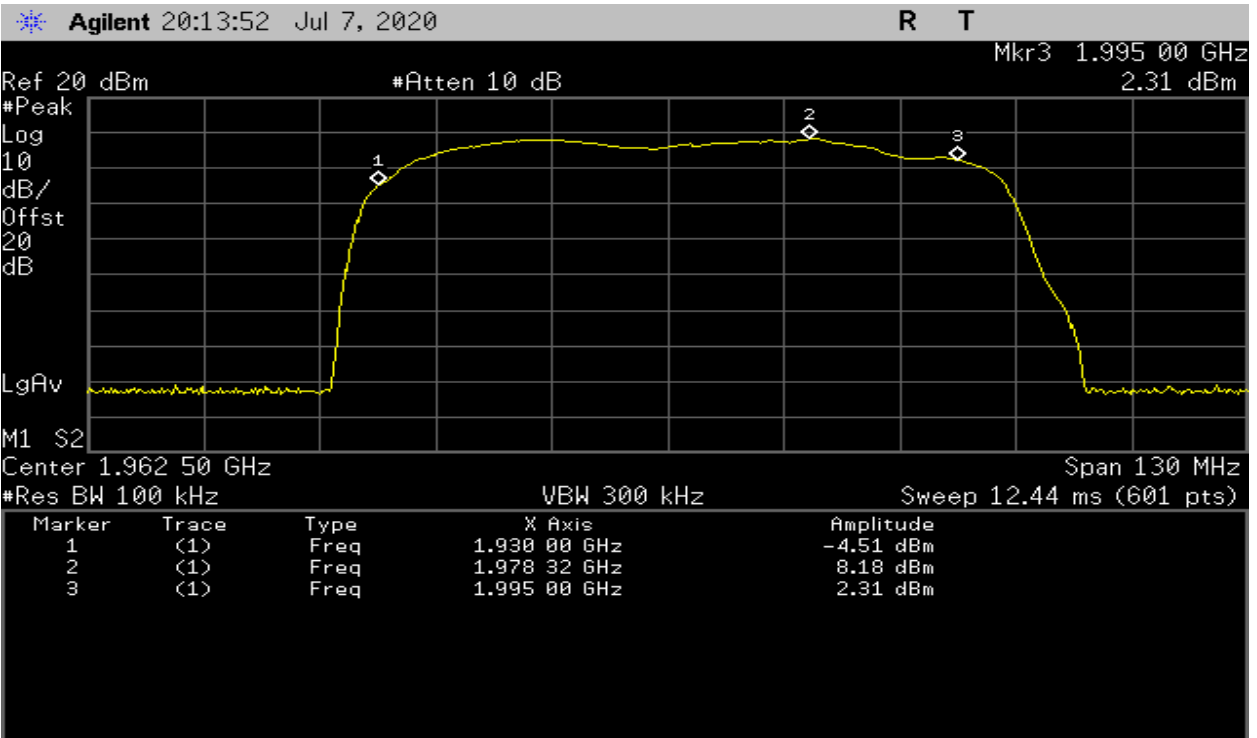
Plot 6 – 728-746MHz Band – Downlink



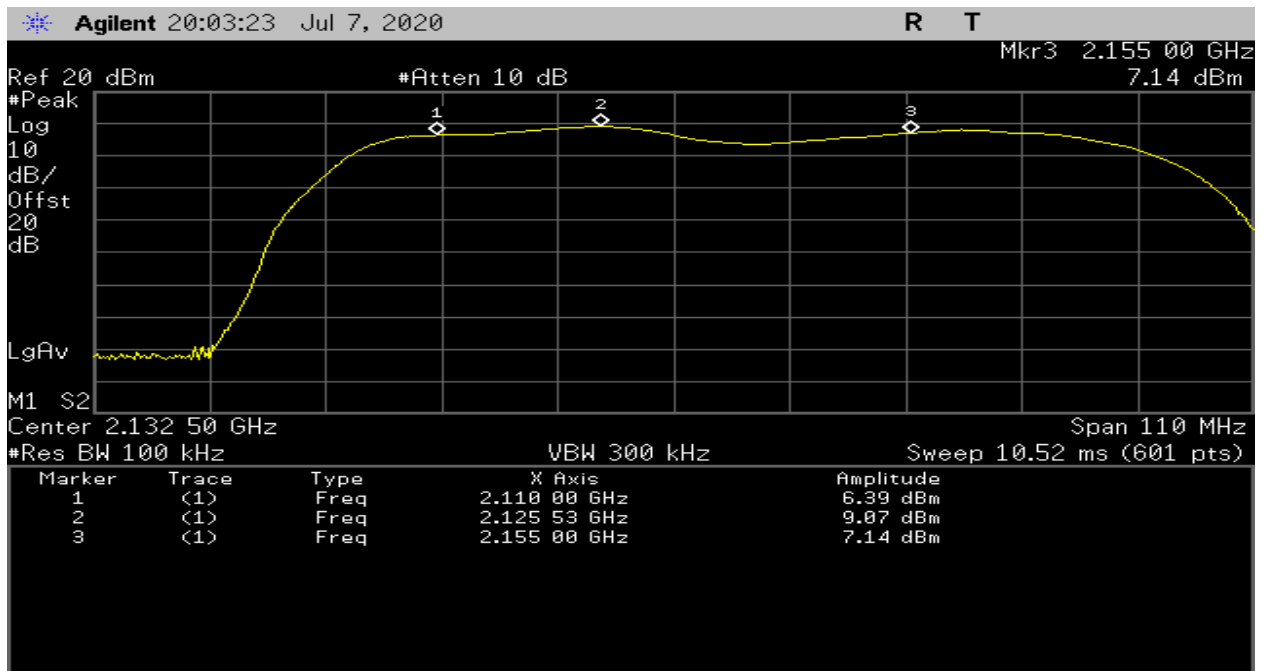
Plot 7 – 746-757MHz Band – Downlink



Plot 8 – 869-894MHz Band – Downlink



Plot 9 – 1930-1995MHz Band – Downlink



Plot 10 – 2110-2155MHz Band – Downlink

2. Maximum Power and Gain

Test Requirement(s):	§20.21(e)(8)(i)(D) and RSS-131 §5.1.1.2, §5.1.3.3 & §5.1.2	Test Engineer(s):	Keith Thornton
Test Results:	Pass	Test Date(s):	July/09/2020

Test Procedure: As required by 47 CFR 20.21(e)(8)(i)(D) and RSS-131 §5.1.1.2, §5.1.3.3 & §5.1.2: Maximum power measurements were made at the RF output terminals of the EUT.

The EUT was connected as per Figure 1 through an attenuator to a Spectrum Analyzer. A signal generator was used for the input to the EUT to provide a GSM & AWGN with 99% of 4.1MHz bandwidth signal tuned to the highest frequency measured in Authorized frequency band test of each uplink and downlink operational band.

KDB Procedure 935210 D03 §7.2.2 and §7.3 was used to measure the maximum power of Fixed Booster and to calculate the maximum gain.

Test Results:

Frequency (MHz)	Input Level (dBm)	Output Power (dBm)	Lower Limit (dBm)	Upper Limit (dBm)
698-716 GSM	-40.4	23.03	17	30
698-716 AWGN	-41.2	20.05	17	30
776-787 GSM	-37.4	20.5	17	30
776-787 AWGN	-35.6	18.7	17	30
824-849 GSM	-37.1	24.32	17	30
824-849 AWGN	-38.5	22.47	17	30
1710-1755 GSM	-45.8	22.23	17	30
1710-1755 AWGN	-47.0	21.2	17	30
1850-1915 GSM	-43.8	24.6	17	30
1850-1915 AWGN	-47.7	20.5	17	30

Table 1. Uplink Max Power Test Results

Frequency (MHz)	Input Level (dBm)	Output Power (dBm)	Upper Limit (dBm)
728-746 GSM	-46.0	9.88	17
728-746 AWGN	-44.5	11.65	17
746-757 GSM	-49.6	10.6	17
746-757 AWGN	-48.1	8.01	17
869-894 GSM	-49.6	11.48	17
869-894 AWGN	-56.5	5.26	17
1930-1995 GSM	-60.3	7.21	17
1930-1995 AWGN	-54.6	9.93	17
2110-2155 GSM	-58.3	8.71	17
2110-2155 AWGN	-53.4	11.75	17

Table 2. Downlink Max Power Test Results

Modulation	Uplink Frequency (MHz)	Downlink Frequency (MHz)	Uplink Gain (dB)	Uplink Limit (dB)	Downlink Gain (dB)	Downlink Limit (dB)	UL Gain - DL Gain (Delta in dB)	Limit (dB)	Margin (dB)
GSM	707.25	744.8	63.43	63.49	55.88	63.8	8.32	9	-7.55
AWGN	707.25	744.8	61.25	63.49	56.15	63.8	5.1	9	-3.9
GSM	776.62	748.0	57.9	64.35	60.2	64.0	2.3	9	-11.3
AWGN	776.62	748.0	54.3	64.35	56.11	64.0	1.81	9	-7.19
GSM	836.20	879.87	61.42	64.94	61.08	65.4	0.34	9	-8.66
AWGN	836.20	879.97	60.97	64.94	61.76	65.4	0.79	9	-8.21
GSM	1733.20	1949.0	68.03	71.27	67.51	72.35	0.51	9	-8.49
AWGN	1733.20	1949.0	68.2	71.27	64.53	72.35	3.67	9	-5.33
GSM	1865.45	2128.62	68.4	71.99	67.01	73.07	1.39	9	-7.61
AWGN	1865.45	2128.62	68.2	71.99	65.15	73.07	3.05	9	-5.95

Table 3. Maximum Booster Gain Test Results

Statement: Device complies with 10dB above AGC power level for both uplink and downlink bands

3. Intermodulation

Test Requirement(s):	CFR §20.21(e)(8)(i)(F) and RSS-131 §5.1.3.5	Test Engineer(s):	Hoosamuddin B.
Test Results:	Pass	Test Date(s):	July/24/2020

Test Procedures: As required by 47 CFR §20.21(e)(8)(i)(F) and RSS-131 §5.1.3.5, Intermodulation measurements were made at the RF output terminals of the EUT.

The EUT was connected through an attenuator to a Spectrum Analyzer. Signal generator was setup for a two-tone CW signal with 300kHz offset below and above the operational band frequency. Measurements were made as per KDB 935210 D03 §7.4 procedure.

Detector Setting	Resolution Bandwidth	Video Bandwidth	Span
RMS	3kHz	≥3 x RBW	5MHz

Table 4 – Analyzer Settings

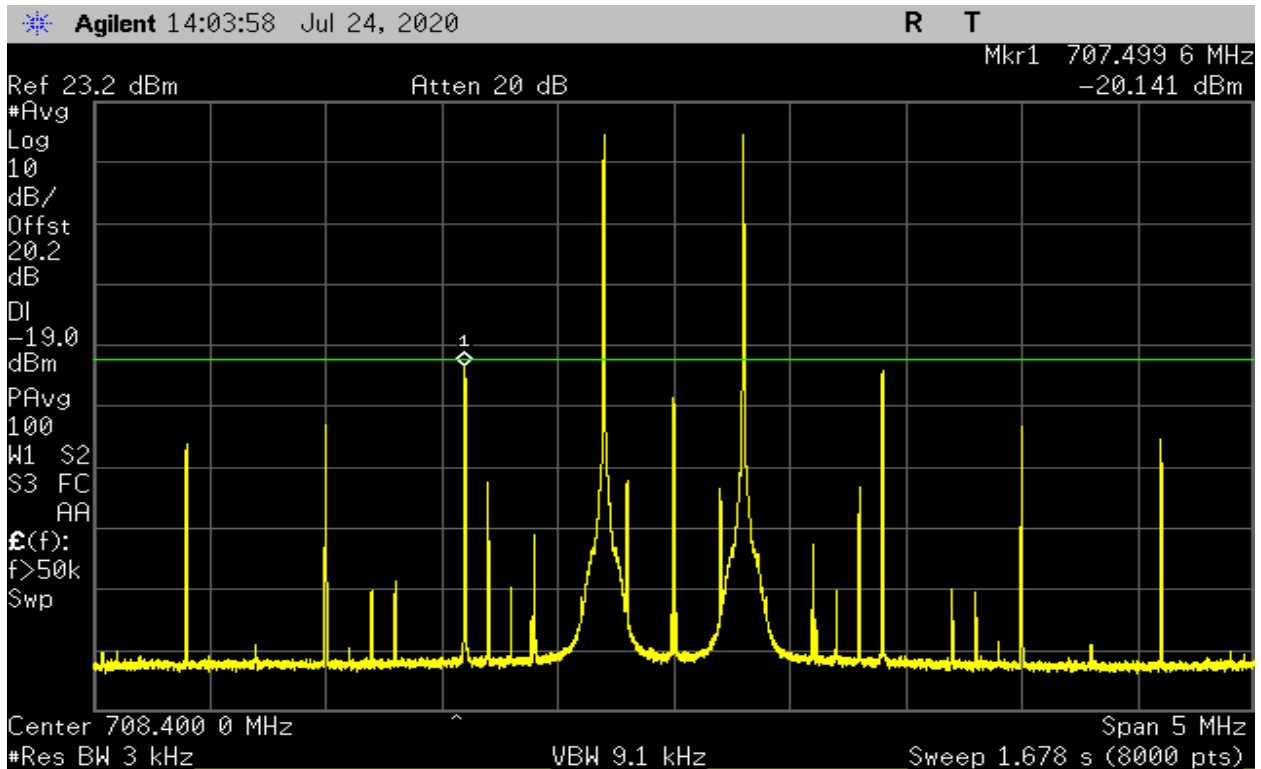
Frequency Band (MHz)	Intermodulation Level (dBm)	Limit (dBm)	Margin (dB)
698-716	-20.14	-19	-1.14
776-787	-27.83	-19	-8.83
824-849	-19.86	-19	-0.86
1710-1755	-19.19	-19	-0.19
1850-1915	-20.33	-19	-1.33

Table 5. Summary Uplink Intermodulation, Test Results

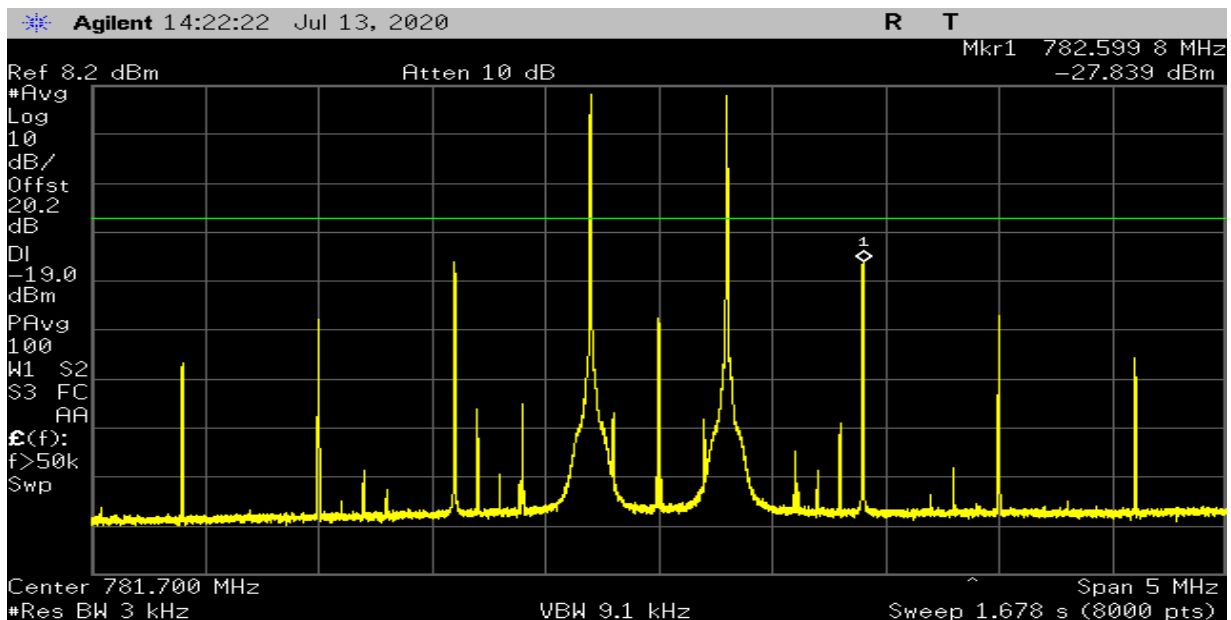
Frequency (MHz)	Intermodulation Level (dBm)	Limit (dBm)	Margin (dB)
728-746	-44.24	-19	-25.25
746-757	-44.51	-19	-25.51
869-894	-33.83	-19	-14.83
1930-1995	-47.03	-19	-28.03
2110-2155	-35.96	-19	-16.96

Table 6. Summary Downlink Intermodulation Test Results

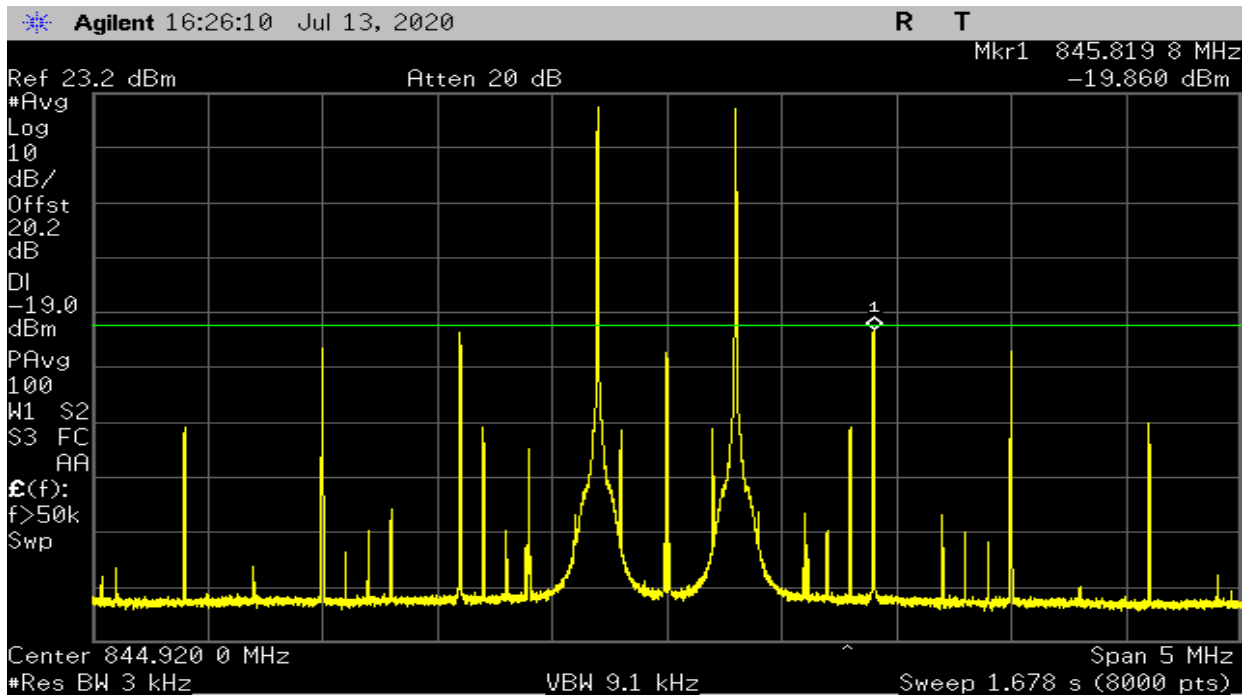
Statement: Device complies with 10dB above AGC power level for both uplink and downlink bands



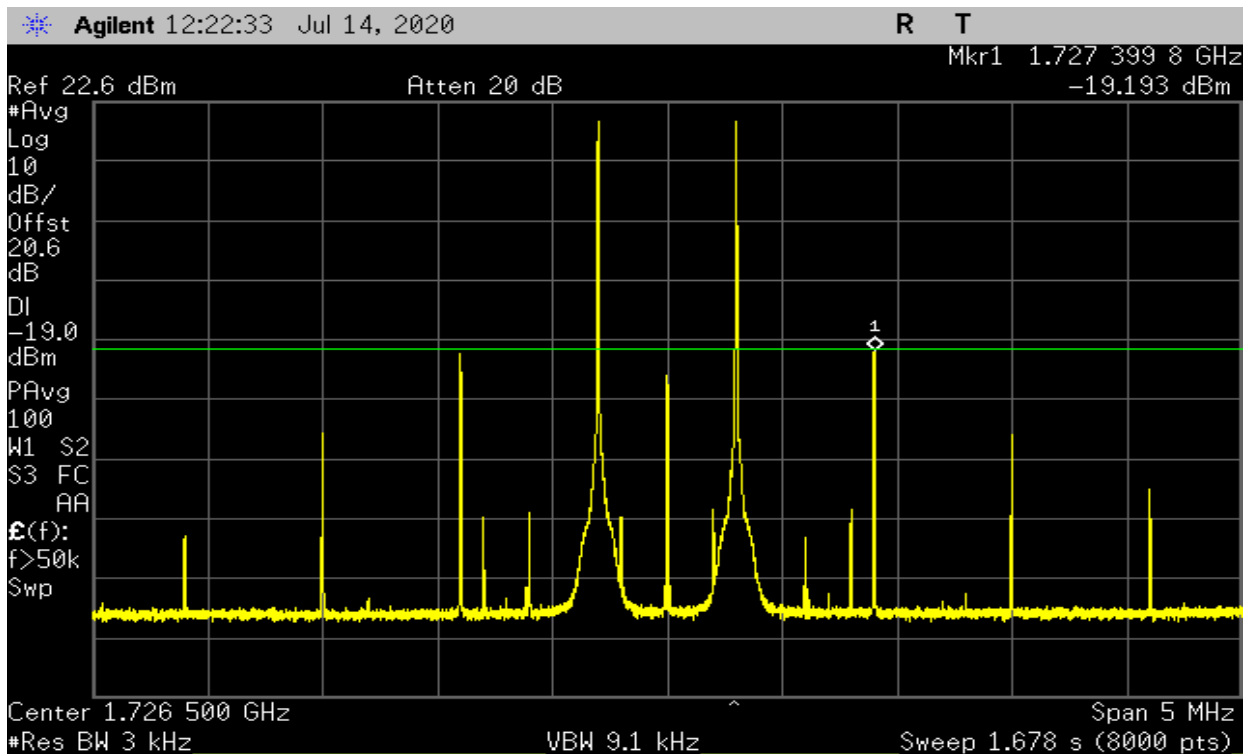
Plot 11 698-716MHz Band – Uplink



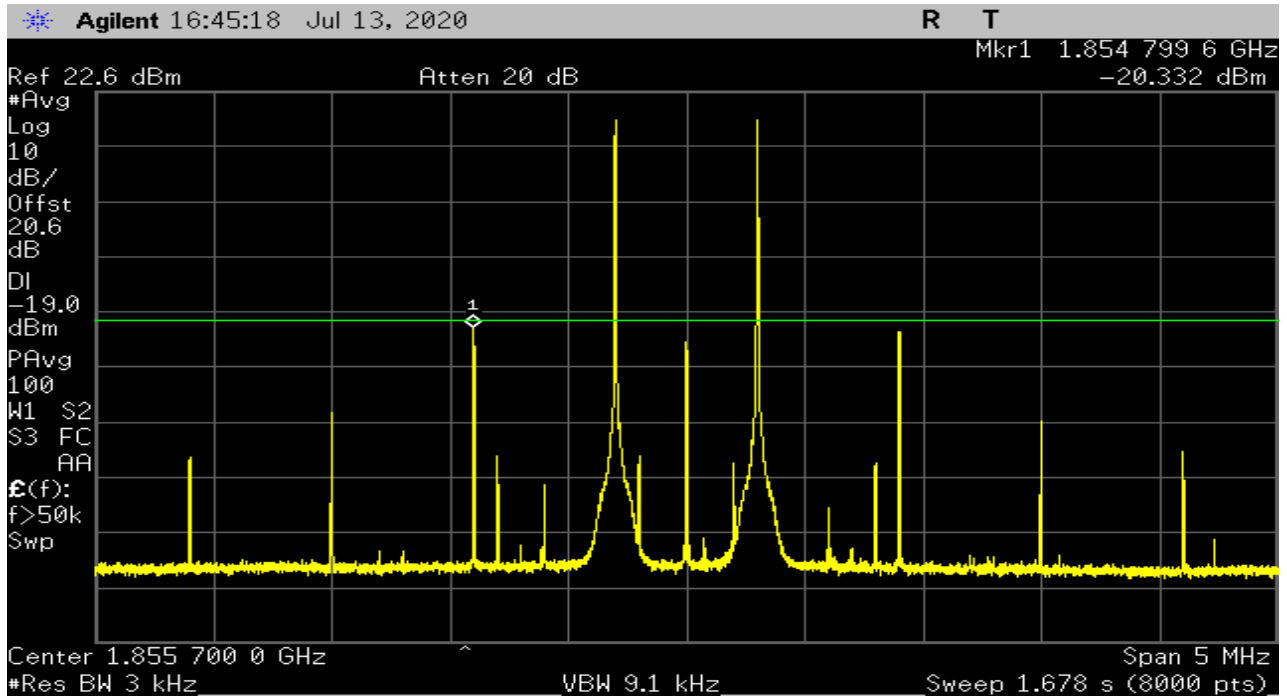
Plot 12 – 776-787MHz Band – Uplink



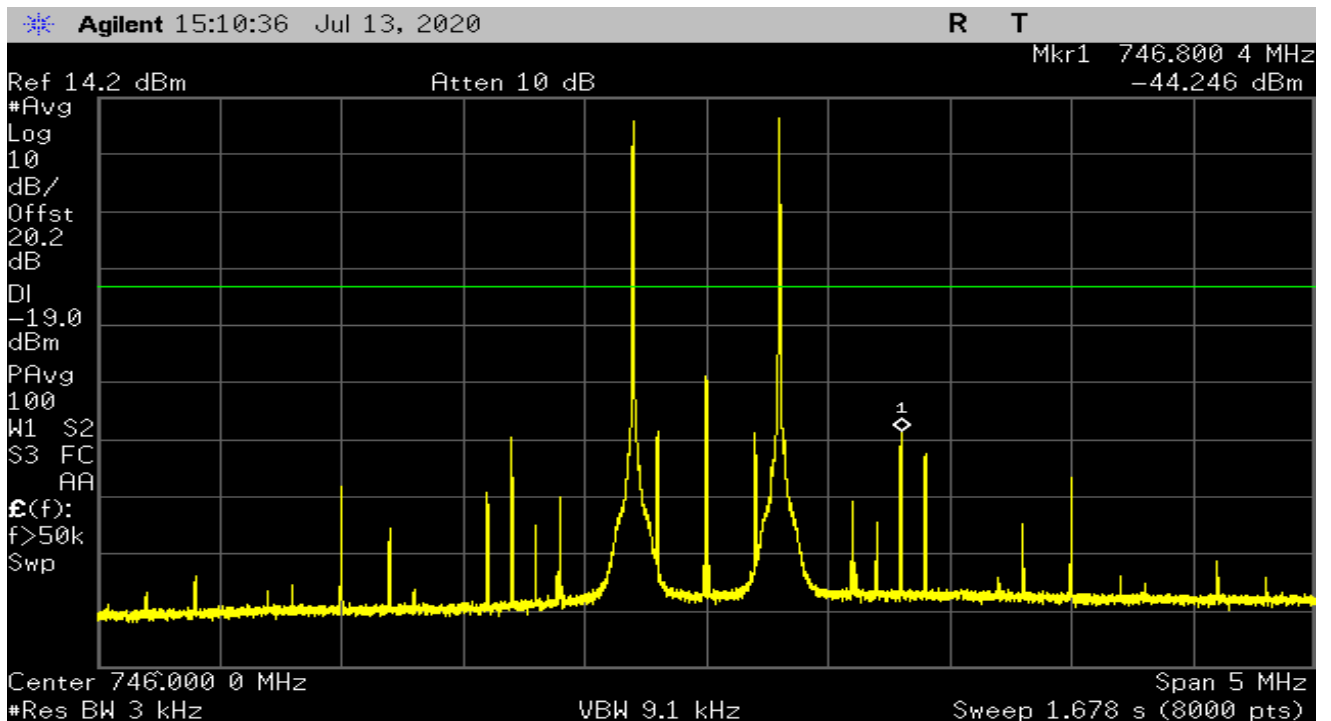
Plot 13 – 824-849MHz Band – Uplink



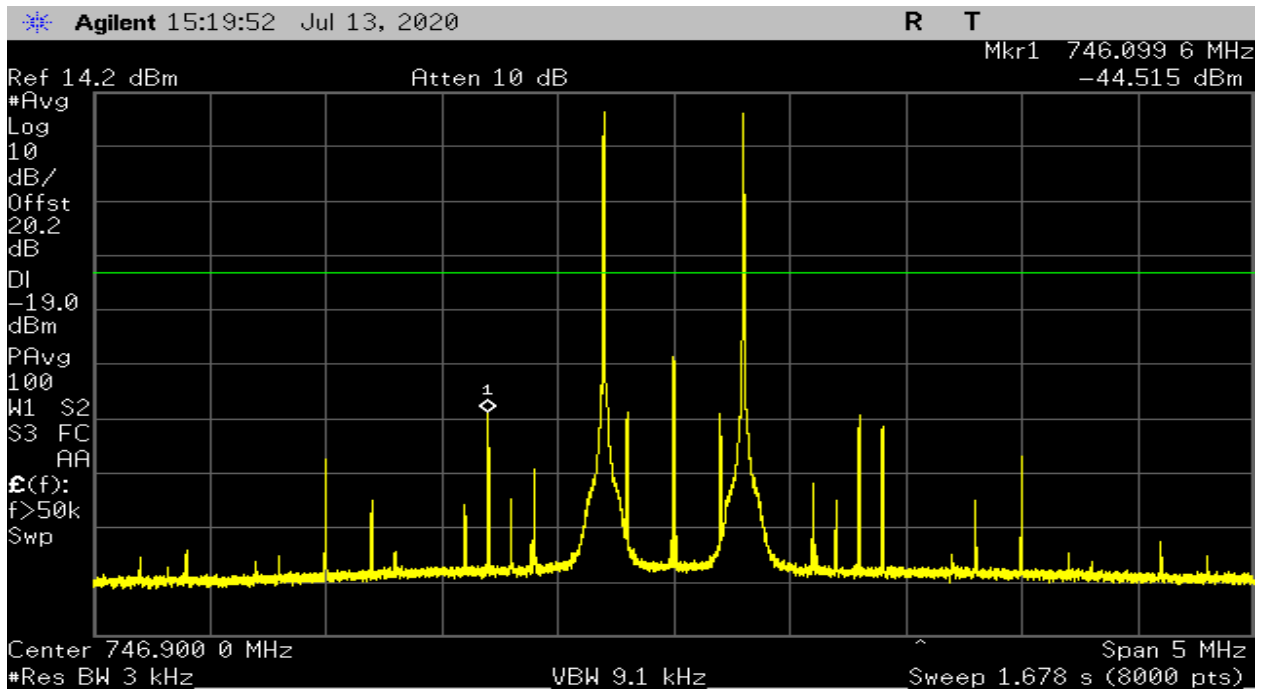
Plot 14 – 1710-1755MHz Band – Uplink



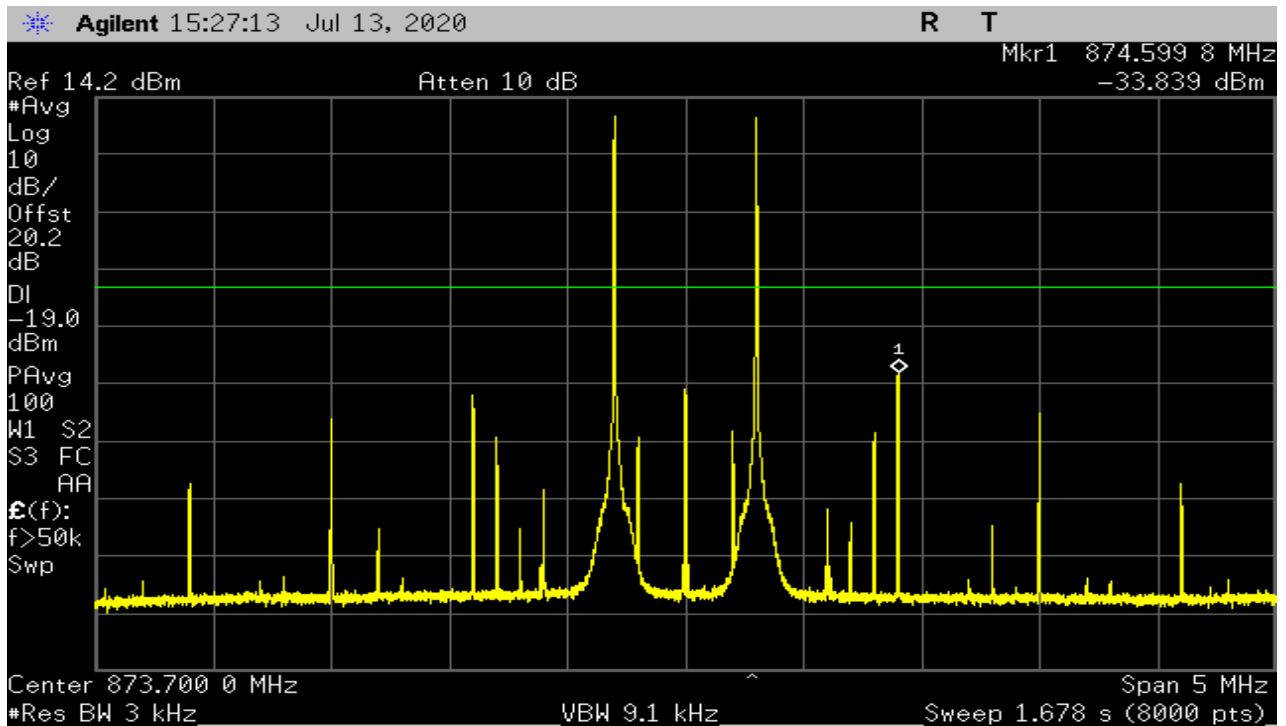
Plot 15 – 1850-1915MHz Band – Uplink



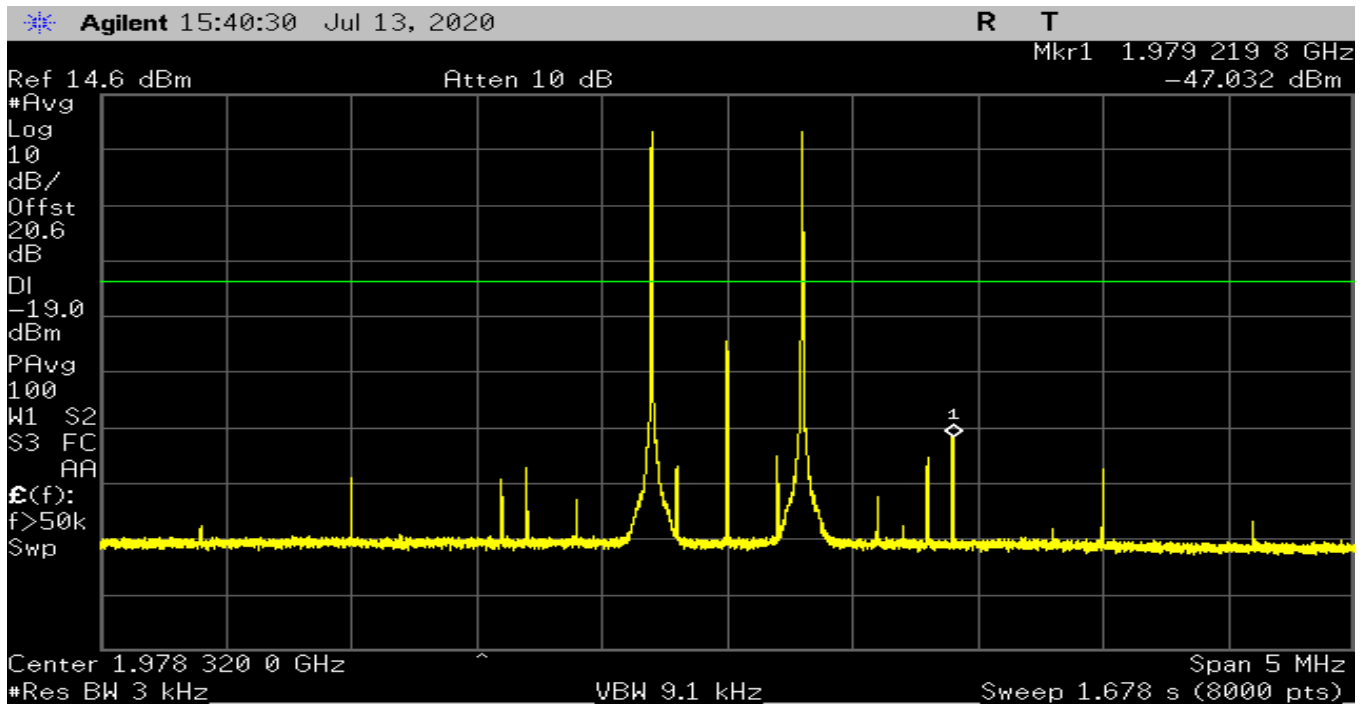
Plot 16 – 728-746MHz Band – Downlink



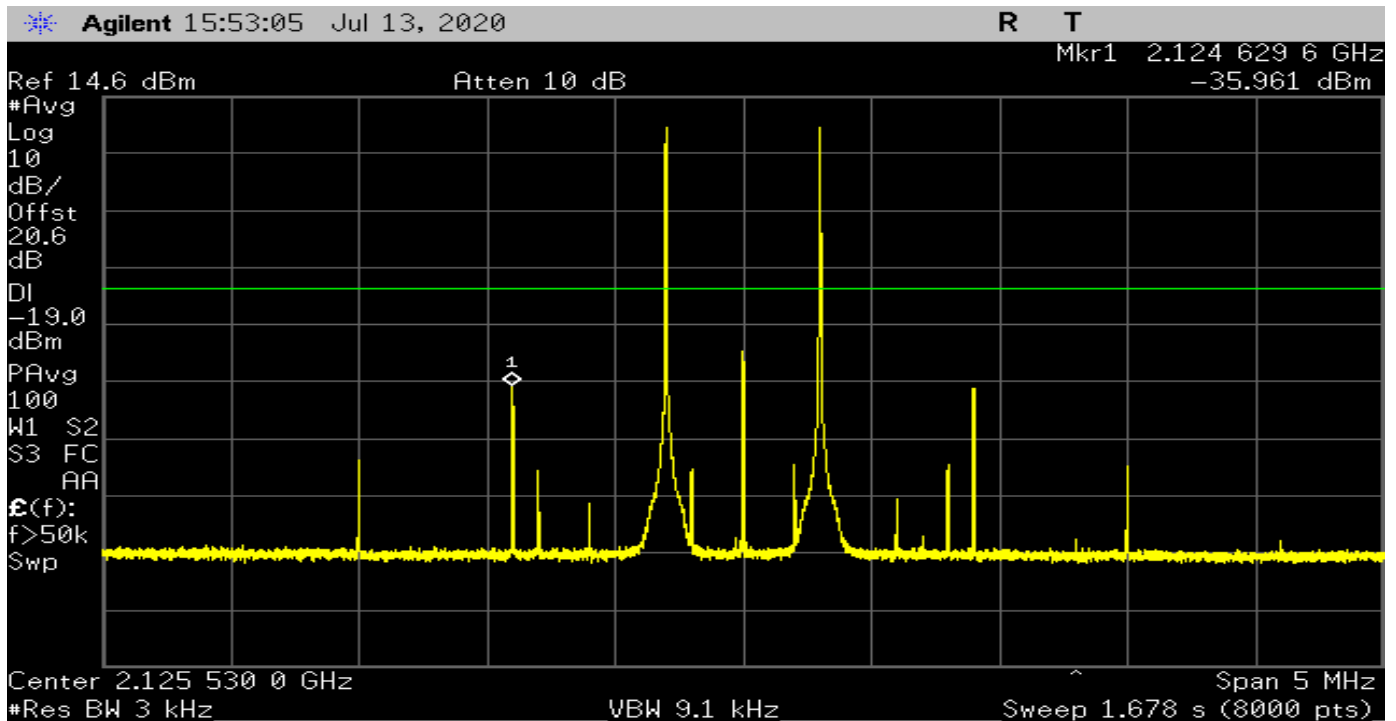
Plot 17 – 746-757MHz Band – Downlink



Plot 18 – 869-894MHz Band – Downlink



Plot 19 – 1930-1995MHz Band – Downlink



Plot 20 – 2110-2155MHz Band – Downlink

4. Out-of-band emissions

Test Requirement(s):	§20.21§(8)(i)(E) and RSS-131 §5.1.3.4	Test Engineer(s):	Sean E.
Test Results:	Pass	Test Date(s):	July/14/2020

Test Procedures: As required by 47 CFR §20.21(8)(i)(E) and RSS-131 §5.1.3.4, Out-of-band emissions measurements were made at the RF output terminals of the EUT.

The EUT was connected through an attenuator to a Spectrum Analyzer as per figure 1. Signal generator was setup to produce GSM, LTE & CDMA signals for all uplink and downlink bands. Measurements were made as per procedure defined in KDB 935210 D03 §7.5.

Out of Band Emission Limits = $P1 - 6 - (43 - 10\log(P2)) = -19\text{dBm}$

Where P1 = Power in dBm and P2 = Power in Watts

Frequency Band (MHz)	Band Edge	Measured Level (dBm)	Limit (dBm)
698-716	Lower	-31.18	-19
698-716	Upper	-31.98	-19
776-787	Lower	-30.05	-19
776-787	Upper	-33.03	-19
824-849	Lower	-35.04	-19
824-849	Upper	-35.59	-19
1710-1755	Lower	-39.71	-19
1710-1755	Upper	-38.18	-19
1850-1915	Lower	-34.84	-19
1850-1915	Upper	-47.79	-19

Table 7. GSM Uplink – Out-of band Emissions, Test Results

Frequency Band (MHz)	Band Edge	Measured Level (dBm)	Limit (dBm)
698-716	Lower	-33.53	-19
698-716	Upper	-38.59	-19
776-787	Lower	-37.51	-19
776-787	Upper	-34.38	-19
824-849	Lower	-32.55	-19
824-849	Upper	-31.44	-19
1710-1755	Lower	-37.93	-19
1710-1755	Upper	-39.81	-19
1850-1915	Lower	-40.43	-19
1850-1915	Upper	-56.74	-19

Table 8. CDMA Uplink – Out-of band Emissions, Test Results

Frequency Band (MHz)	Band Edge	Measured Level (dBm)	Limit (dBm)
698-716	Lower	-36.07	-19
698-716	Upper	-41.17	-19
776-787	Lower	-40.59	-19
776-787	Upper	-30.72	-19
824-849	Lower	-29.79	-19
824-849	Upper	-25.38	-19
1710-1755	Lower	-34.71	-19
1710-1755	Upper	-33.78	-19
1850-1915	Lower	-34.04	-19
1850-1915	Upper	-49.88	-19

Table 9. LTE Uplink – Out-of band Emissions, Test Results

Frequency Band (MHz)	Band Edge	Measured Level (dBm)	Limit (dBm)
728-746	Lower	-46.78	-19
728-746	Upper	-34.09	-19
746-757	Lower	-38.17	-19
746-757	Upper	-50.18	-19
869-894	Lower	-36.68	-19
869-894	Upper	-38.64	-19
1930-1995	Lower	-43.14	-19
1930-1995	Upper	-39.46	-19
2110-2155	Lower	-40.1	-19
2110-2155	Upper	-37.4	-19

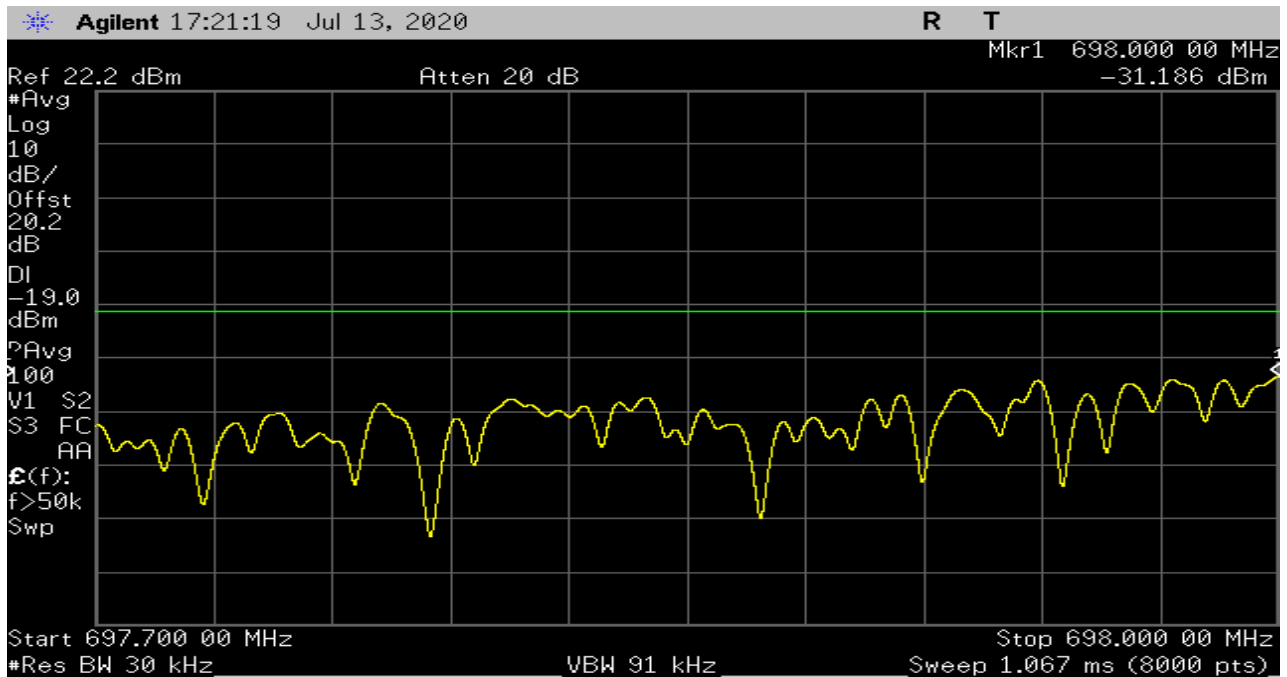
Table 10. GSM Downlink – Out-of band Emissions, Test Results

Frequency Band (MHz)	Band Edge	Measured Level (dBm)	Limit (dBm)
728-746	Lower	-62.93	-19
728-746	Upper	-50.16	-19
746-757	Lower	-59.76	-19
746-757	Upper	-63.46	-19
869-894	Lower	-60.8	-19
869-894	Upper	-62.74	-19
1930-1995	Lower	-65.36	-19
1930-1995	Upper	-58.5	-19
2110-2155	Lower	-48.73	-19
2110-2155	Upper	-48.94	-19

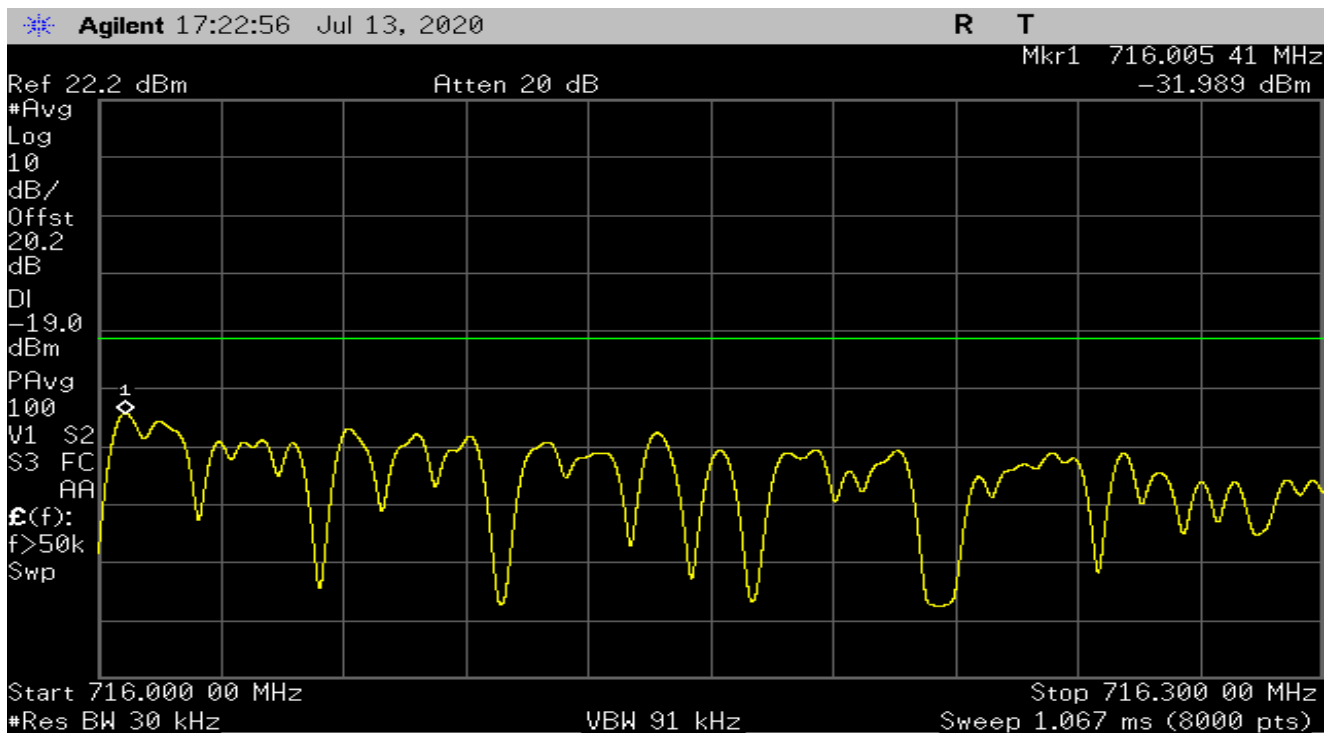
Table 11. CDMA Downlink – Out-of band Emissions, Test Results

Frequency Band (MHz)	Band Edge	Measured Level (dBm)	Limit (dBm)
728-746	Lower	-60.61	-19
728-746	Upper	-50.27	-19
746-757	Lower	-54.20	-19
746-757	Upper	-66.97	-19
869-894	Lower	-54.52	-19
869-894	Upper	-53.45	-19
1930-1995	Lower	-55.02	-19
1930-1995	Upper	-48.36	-19
2110-2155	Lower	-47.69	-19
2110-2155	Upper	-46.1	-19

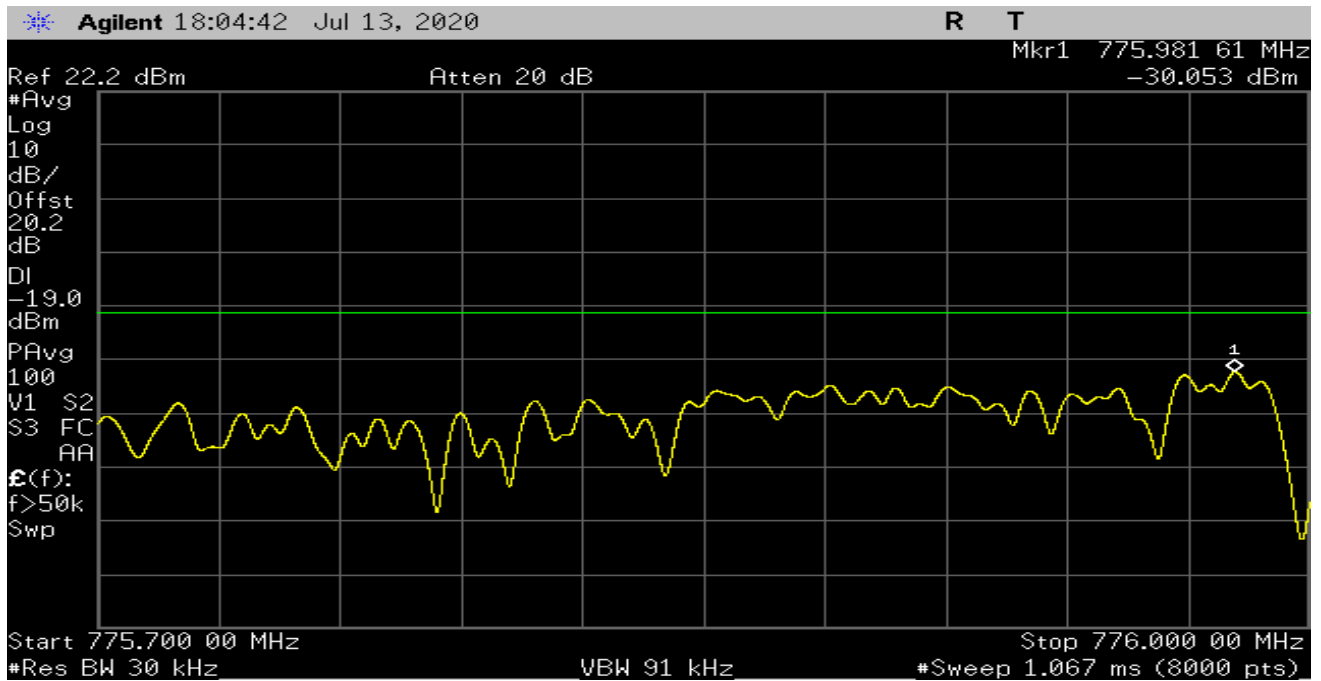
Table 12. LTE Downlink – Out-of band Emissions, Test Results



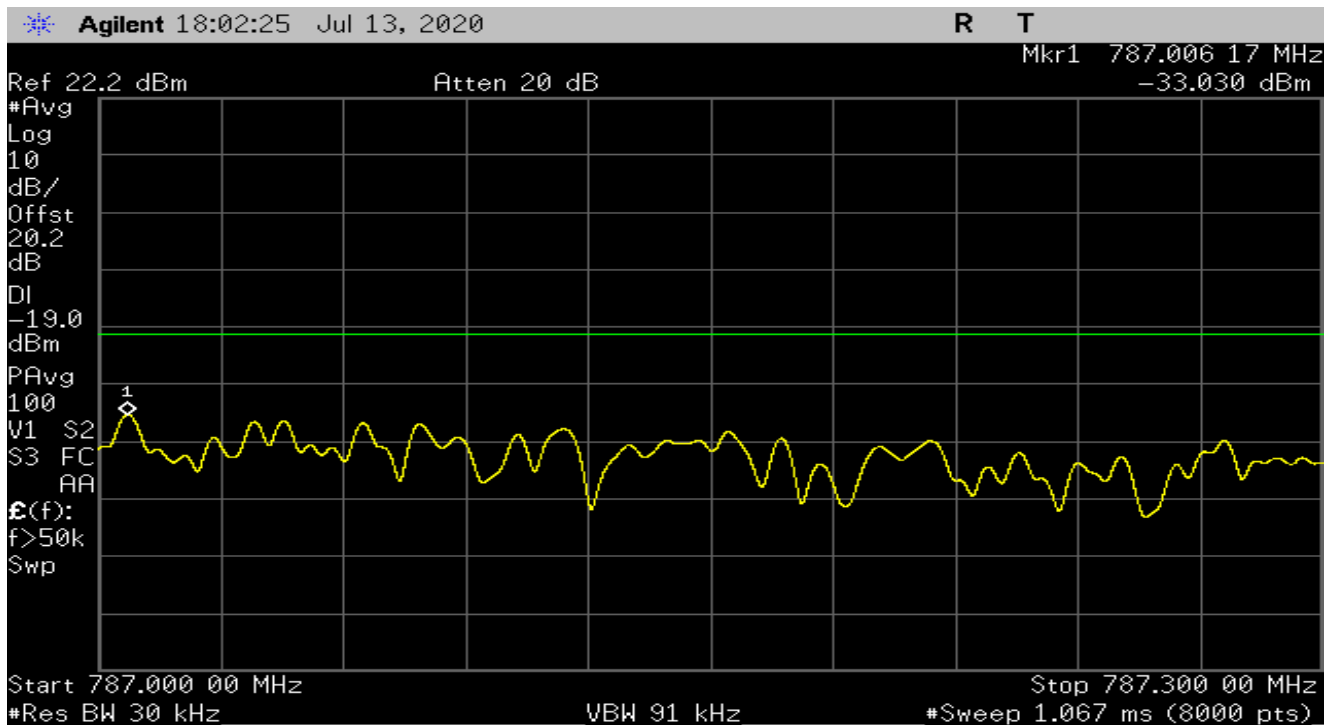
Plot 21 – 698-716MHz Band – GSM Uplink Lower Band Edge



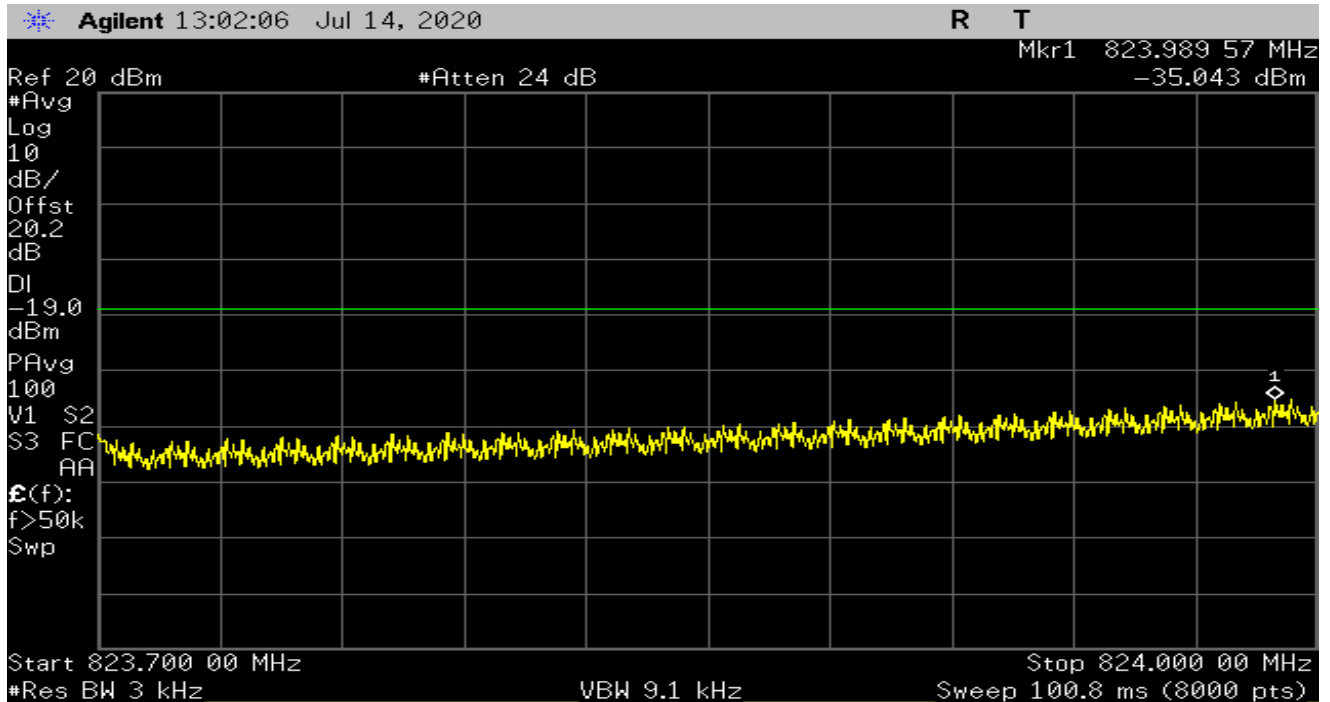
Plot 22 - 698-716MHz Band – GSM Uplink Upper Band Edge



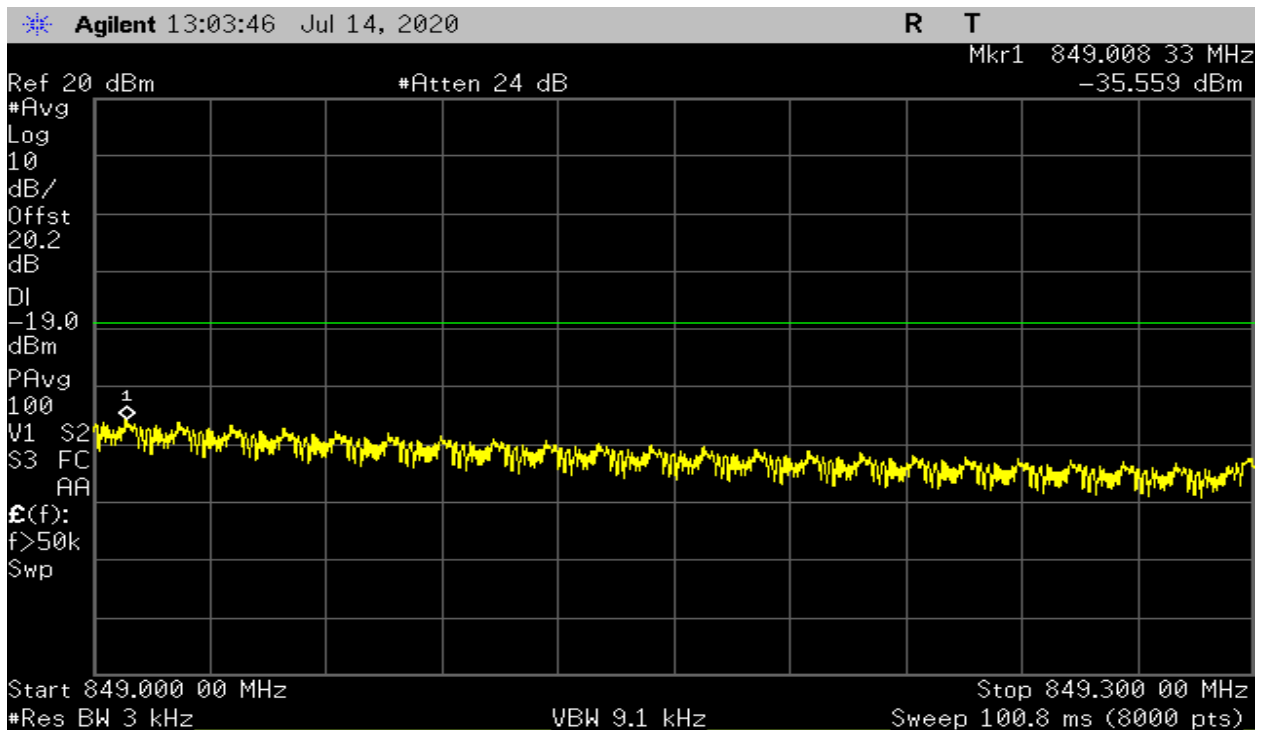
Plot 23 – 776-787MHz Band – GSM Uplink Lower Band Edge



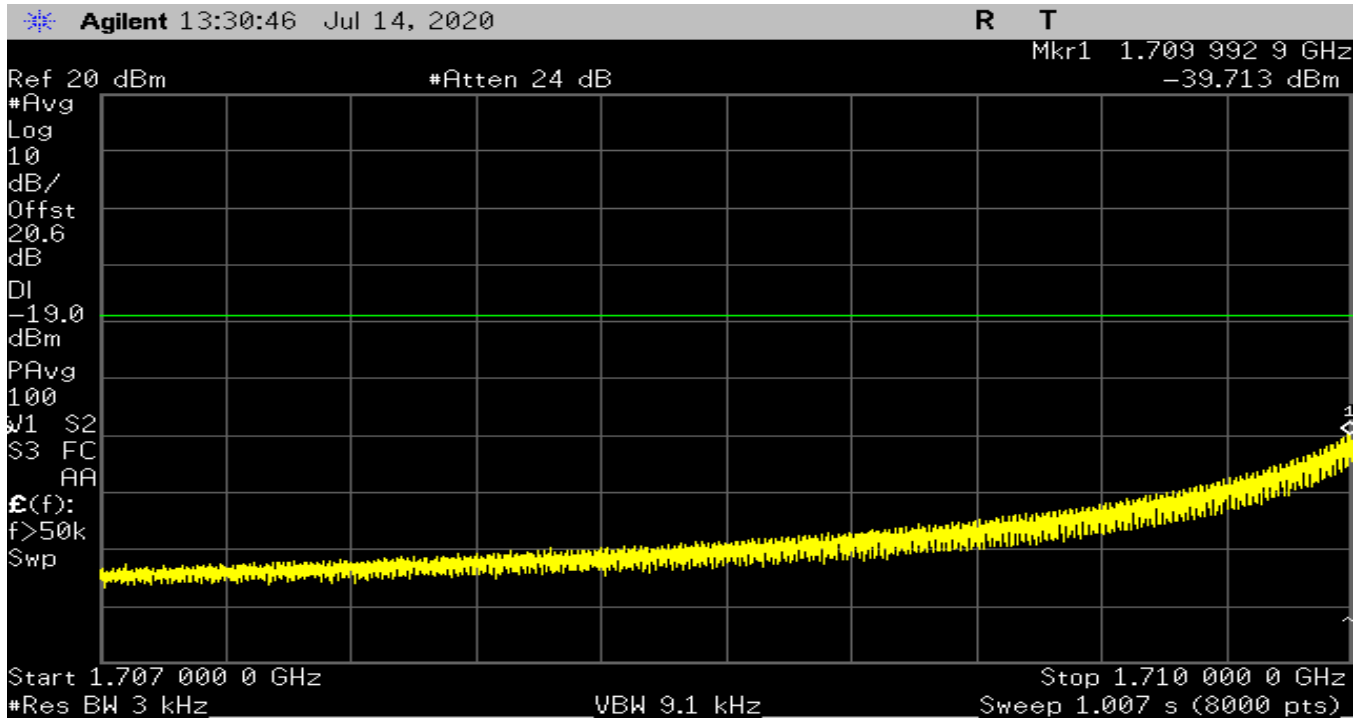
Plot 24 – 776-787MHz Band – GSM Uplink Upper Band Edge



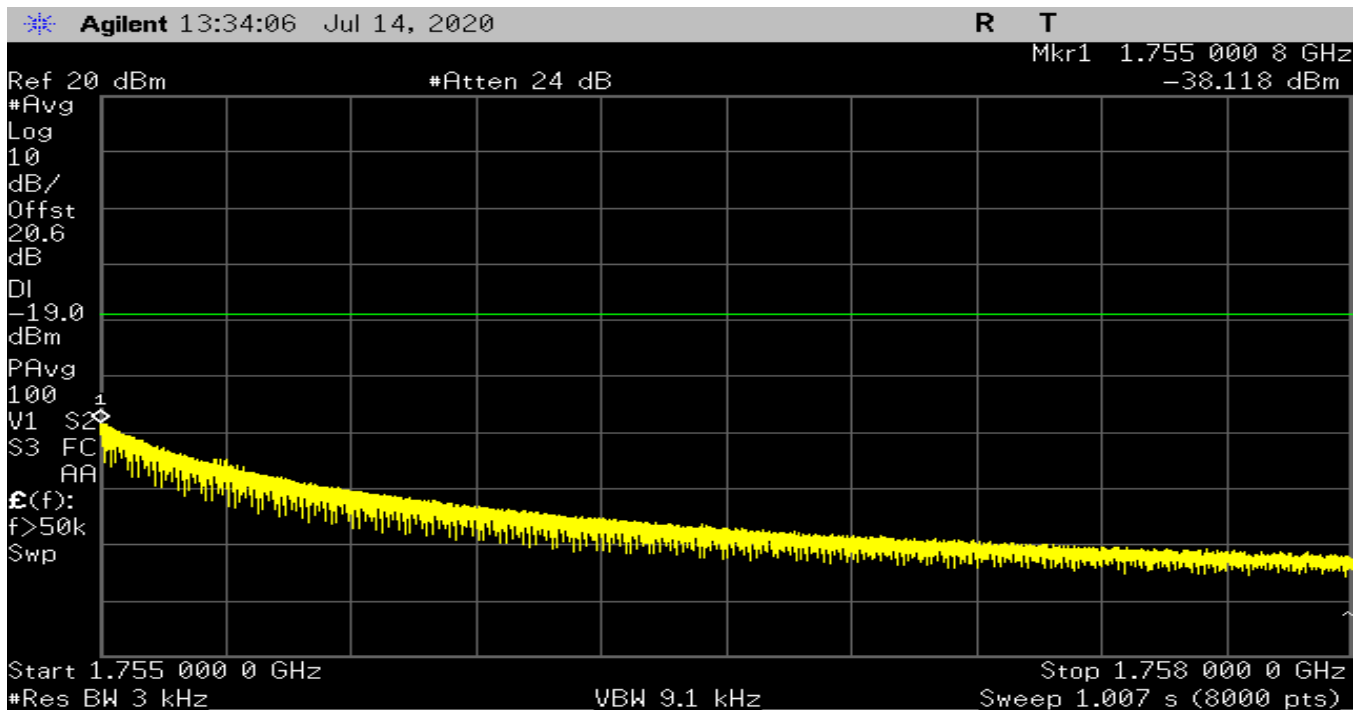
Plot 25 – 824-849MHz Band – GSM Uplink Lower Band Edge



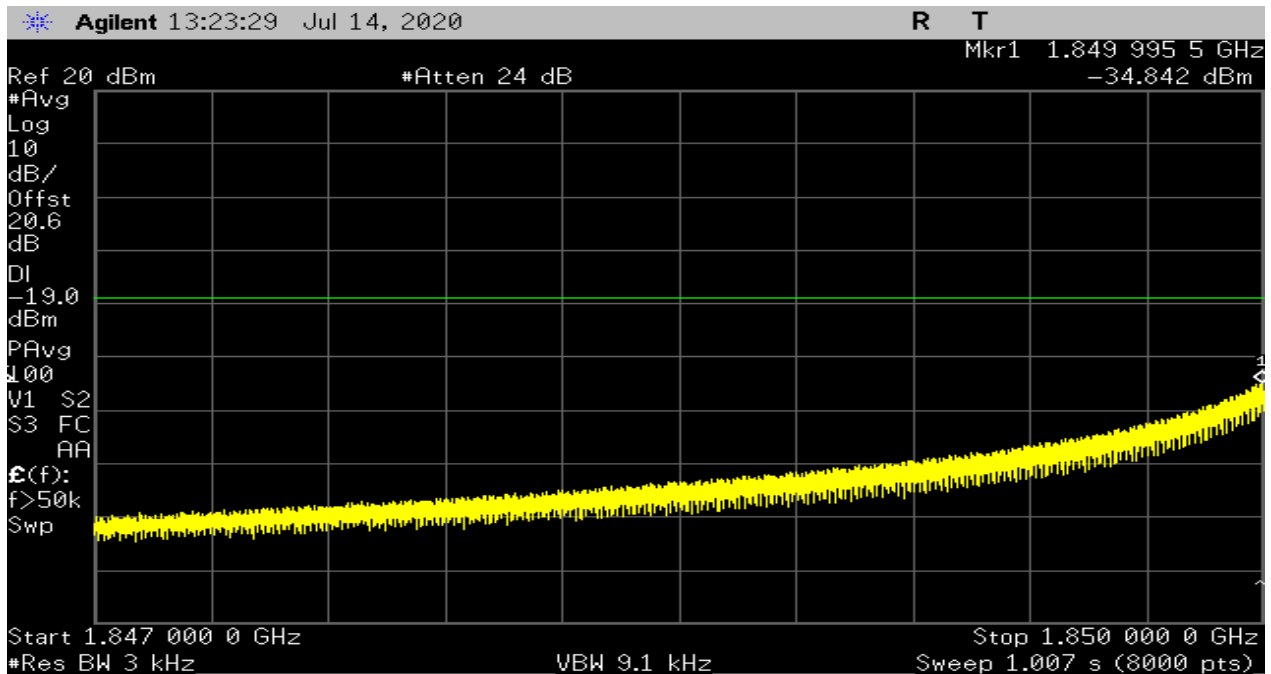
Plot 26 – 824-849MHz Band – GSM Uplink Upper Band Edge



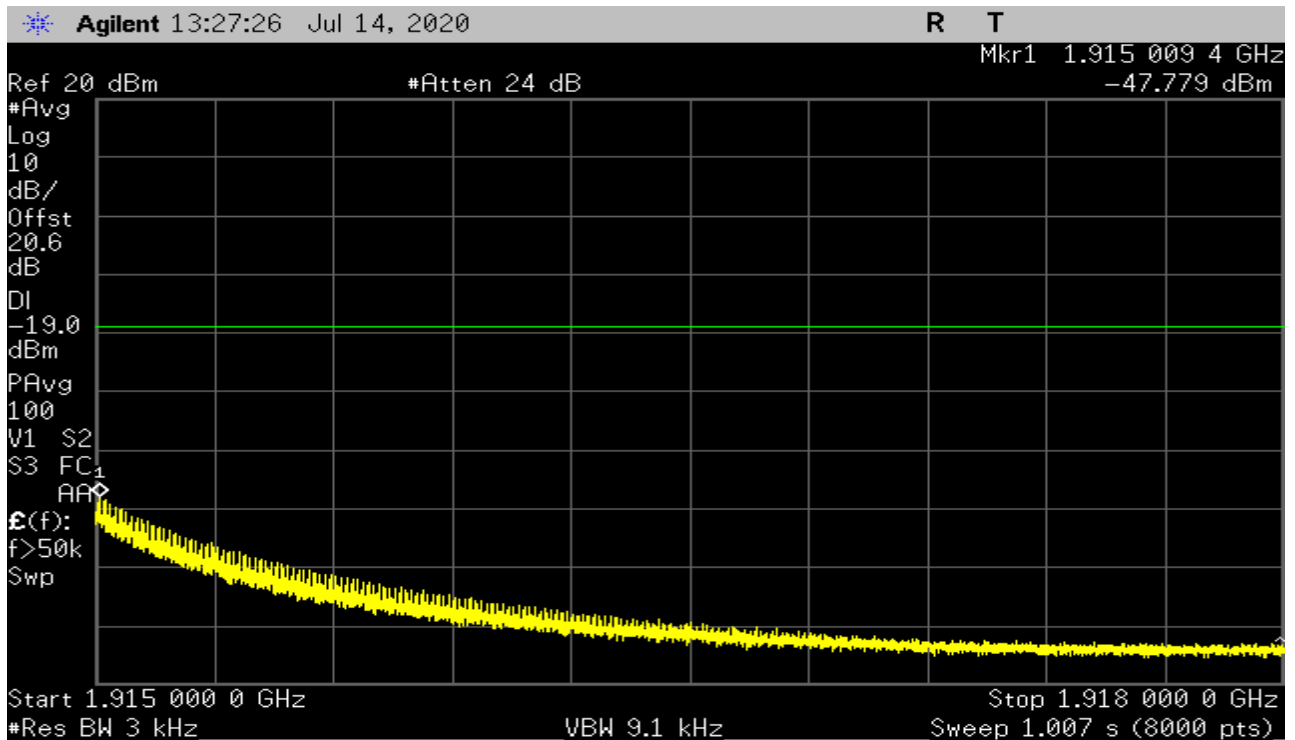
Plot 26 – 1710-1755MHz Band – GSM Uplink Lower Band Edge



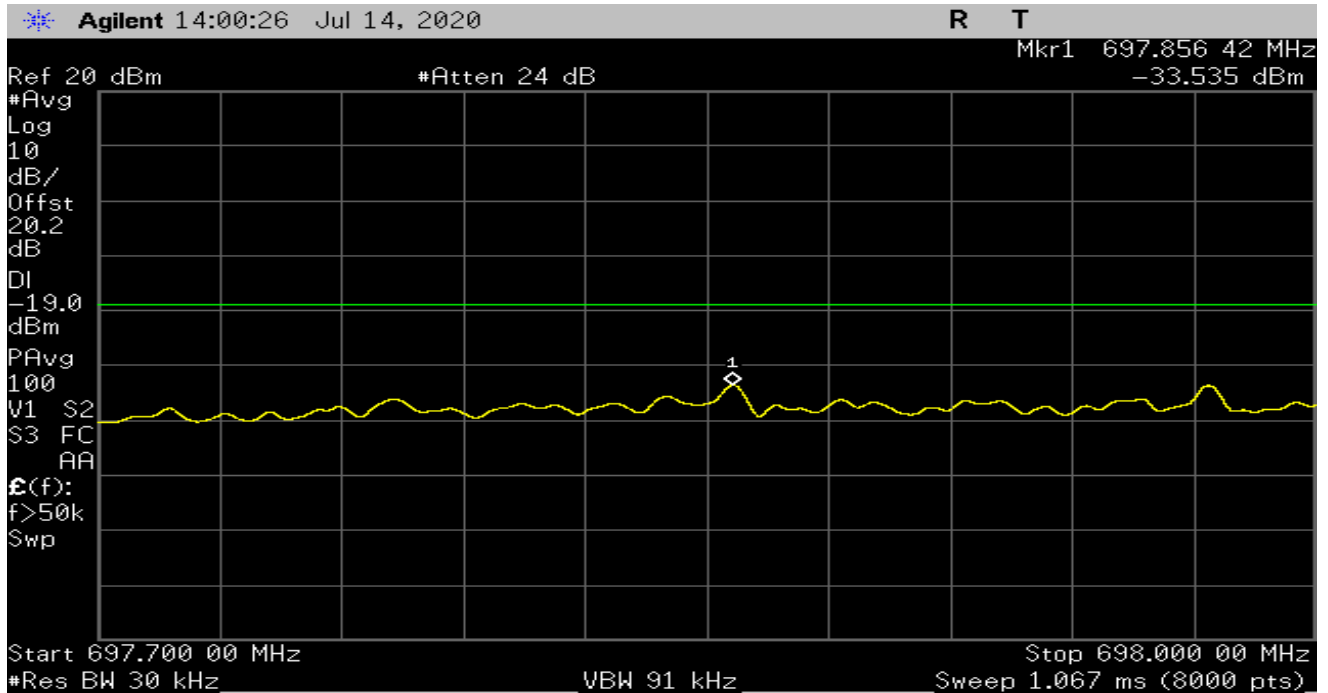
Plot 27 – 1710-1755MHz Band – GSM Uplink Upper Band Edge



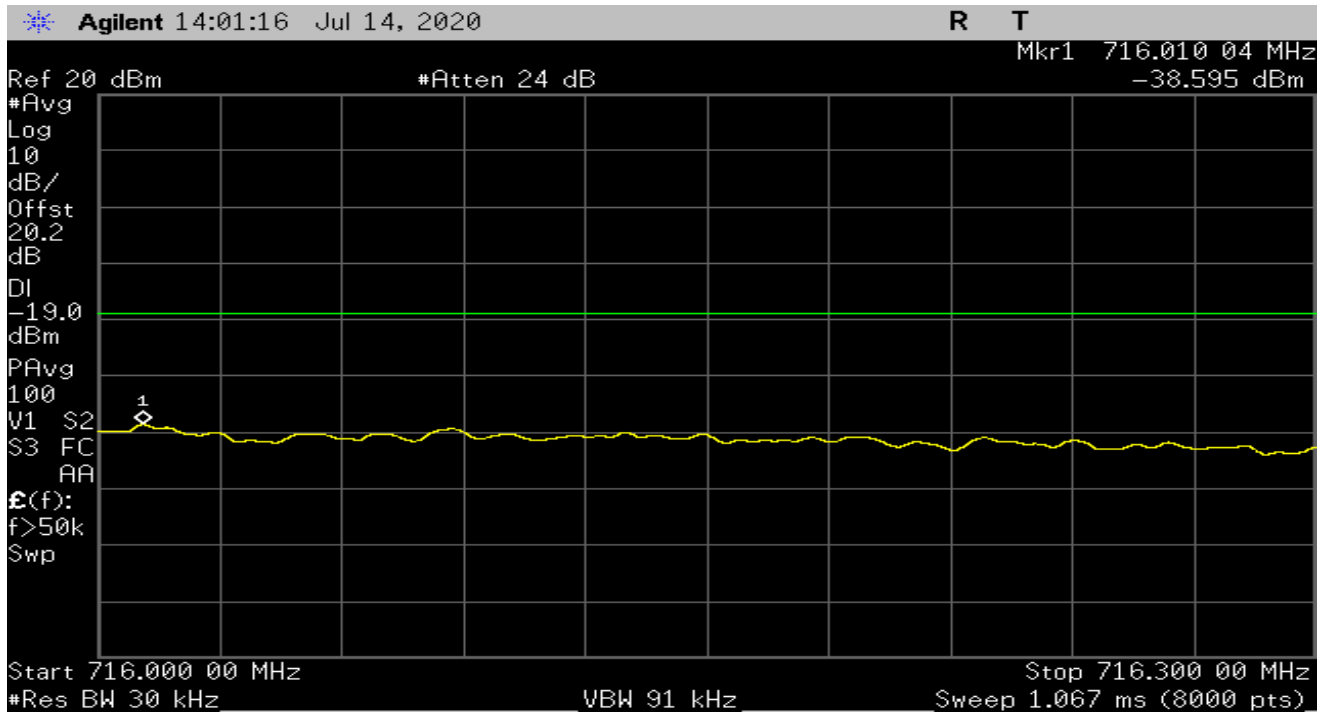
Plot 28 – 1850-1915MHz Band – GSM Uplink Lower Band Edge



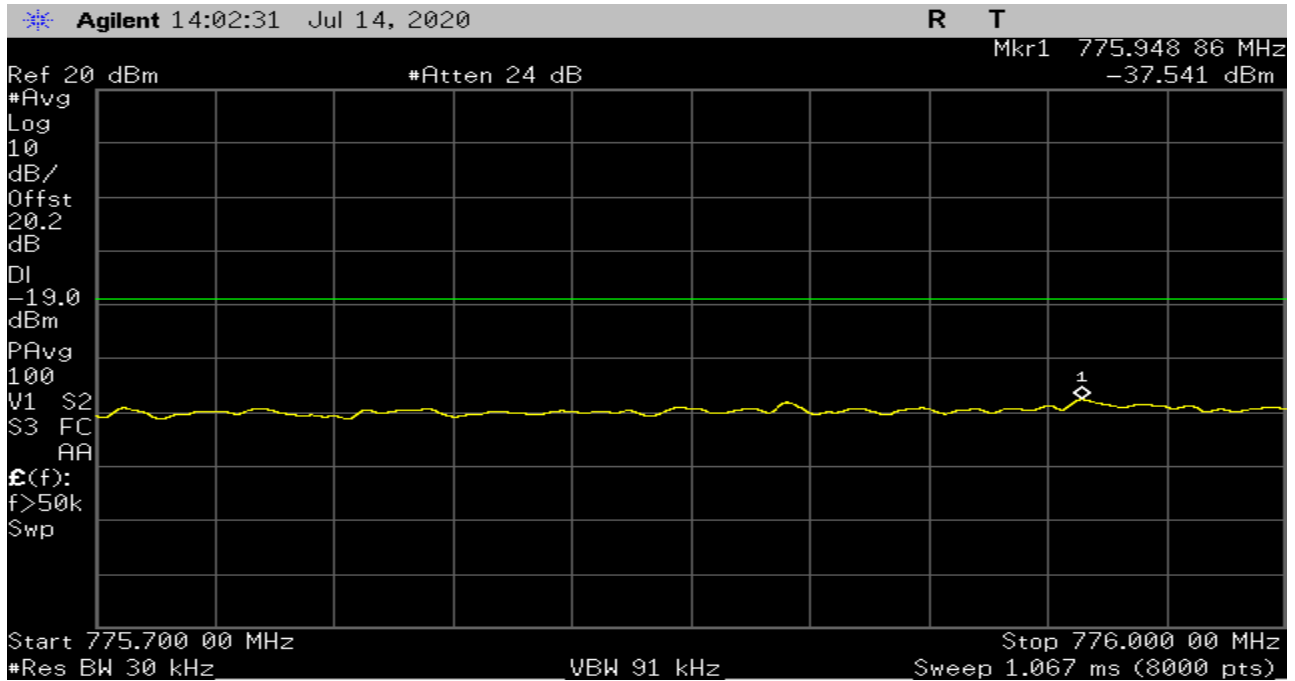
Plot 29 – 1850-1915MHz Band – GSM Uplink Upper Band Edge



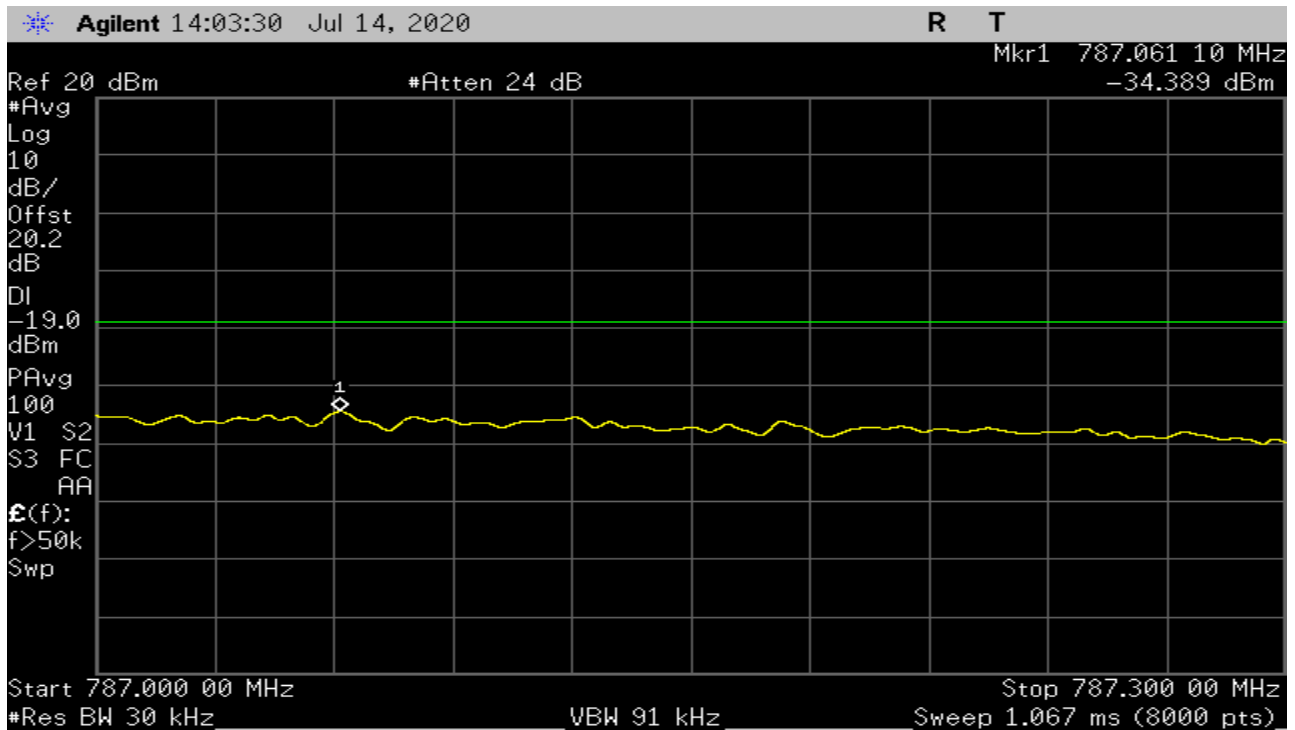
Plot 30 – 698-716MHz Band – CDMA Uplink Lower Band Edge



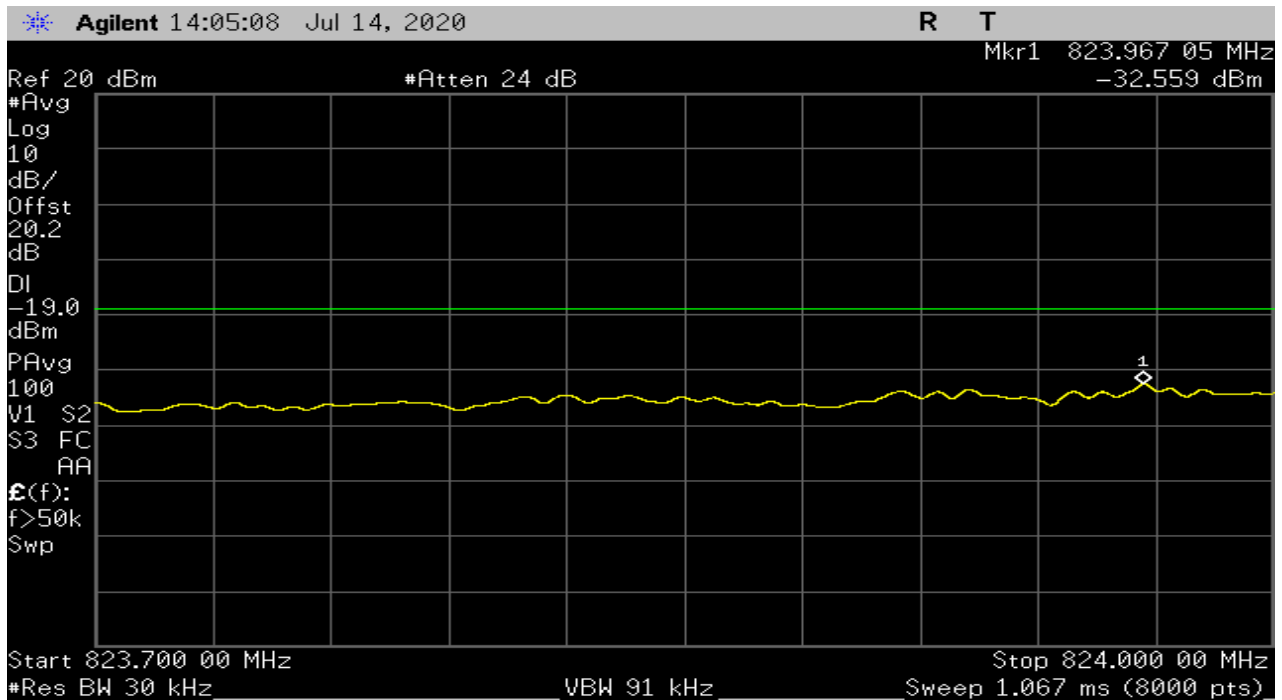
Plot 31 – 698-716MHz Band – CDMA Uplink Upper Band Edge



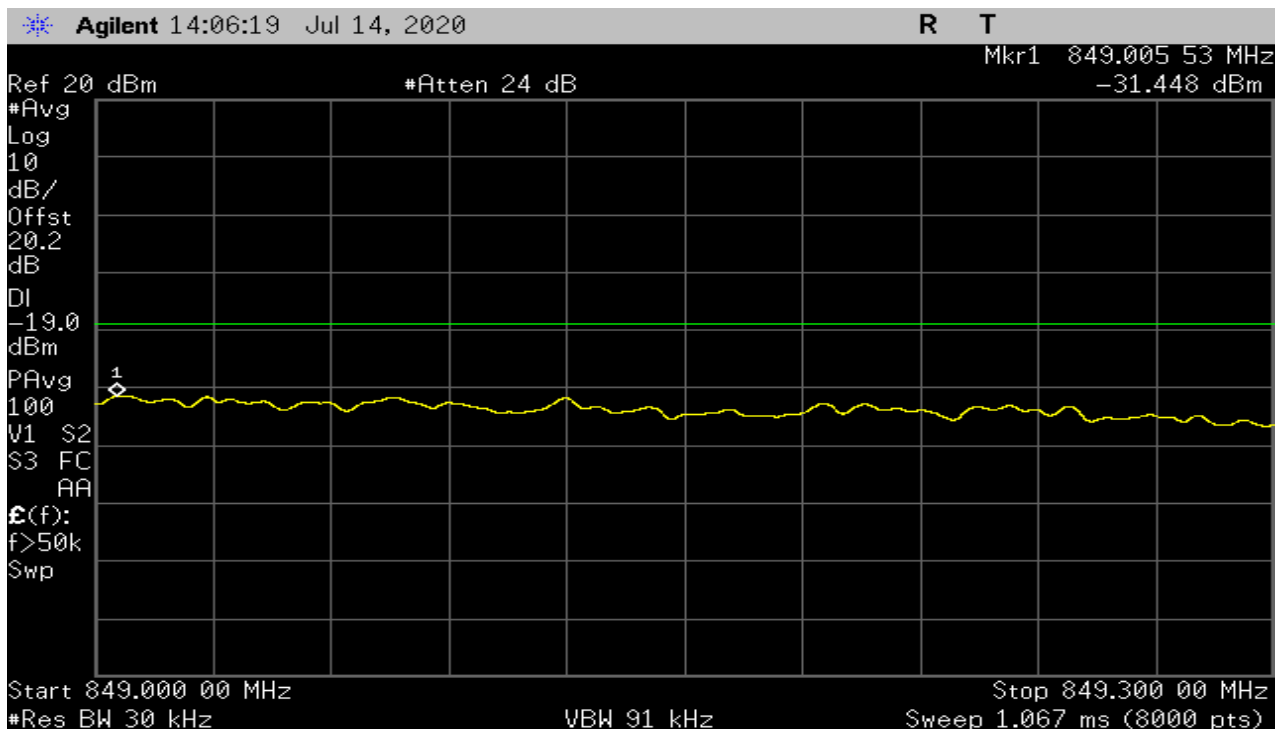
Plot 32 – 776-787MHz Band – CDMA Uplink Lower Band Edge



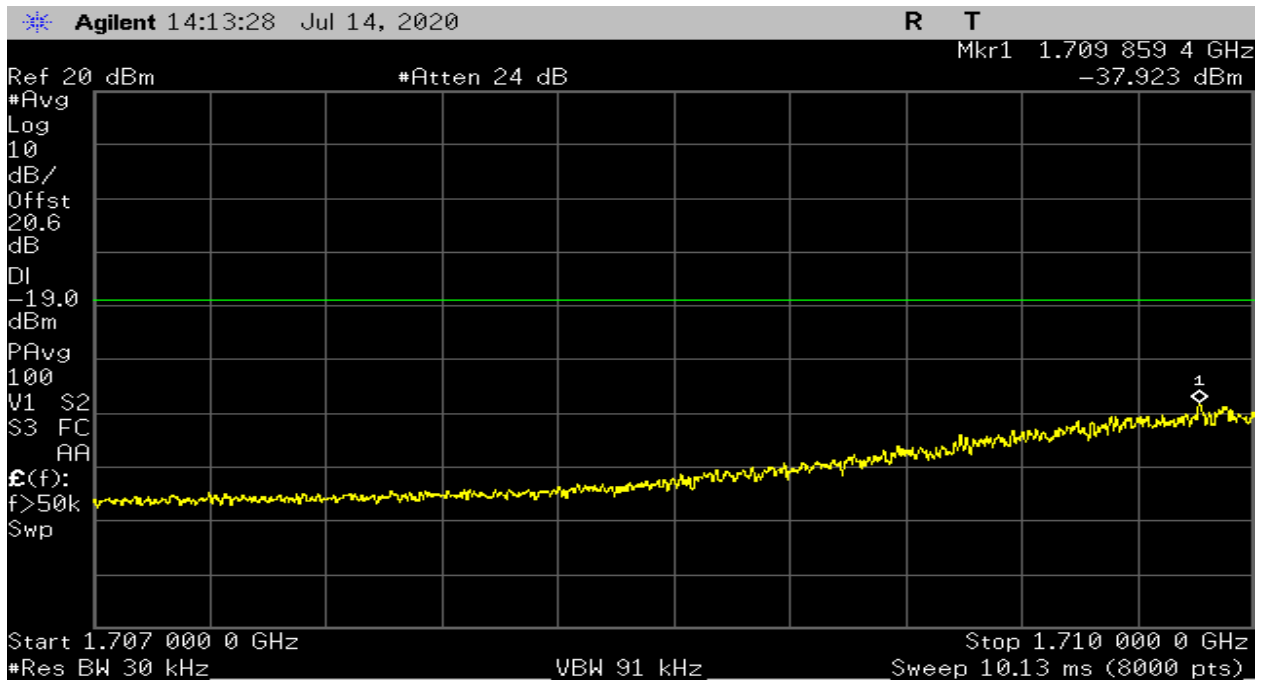
Plot 33 – 776-787MHz Band – CDMA Uplink Upper Band Edge



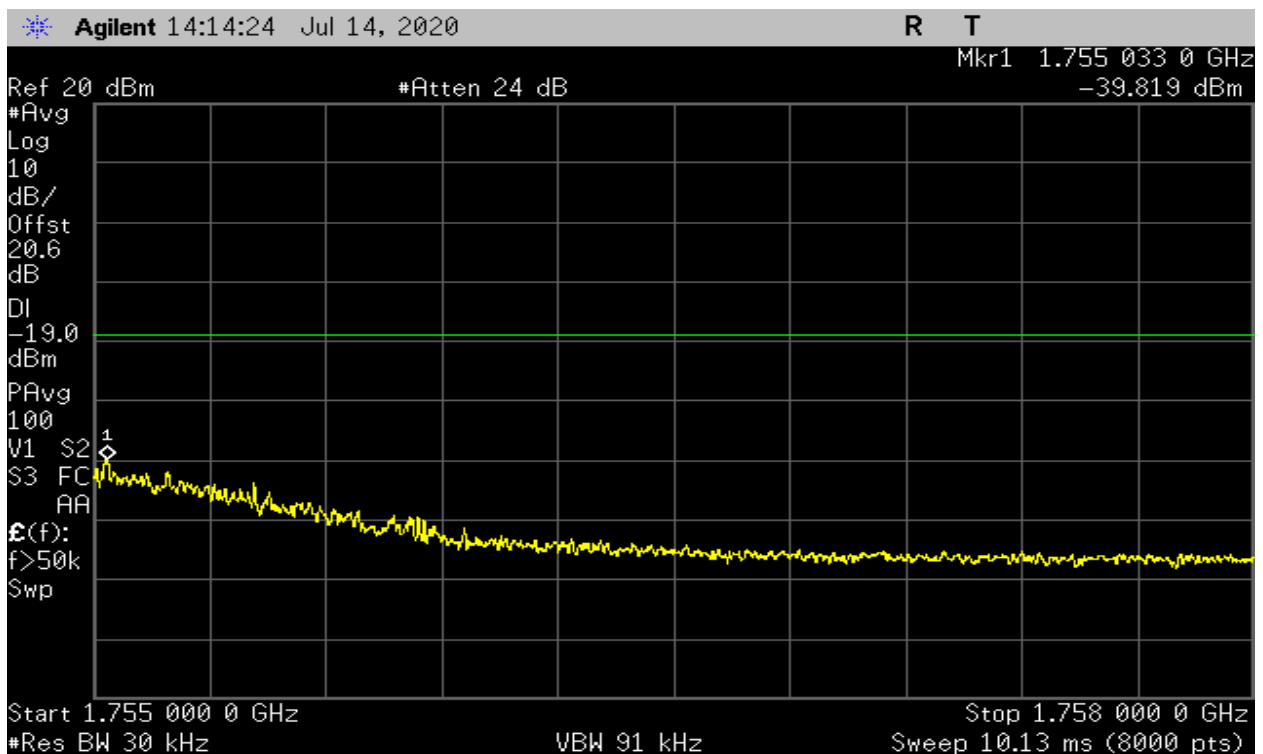
Plot 34 – 824-849MHz Band – CDMA Uplink Lower Band Edge



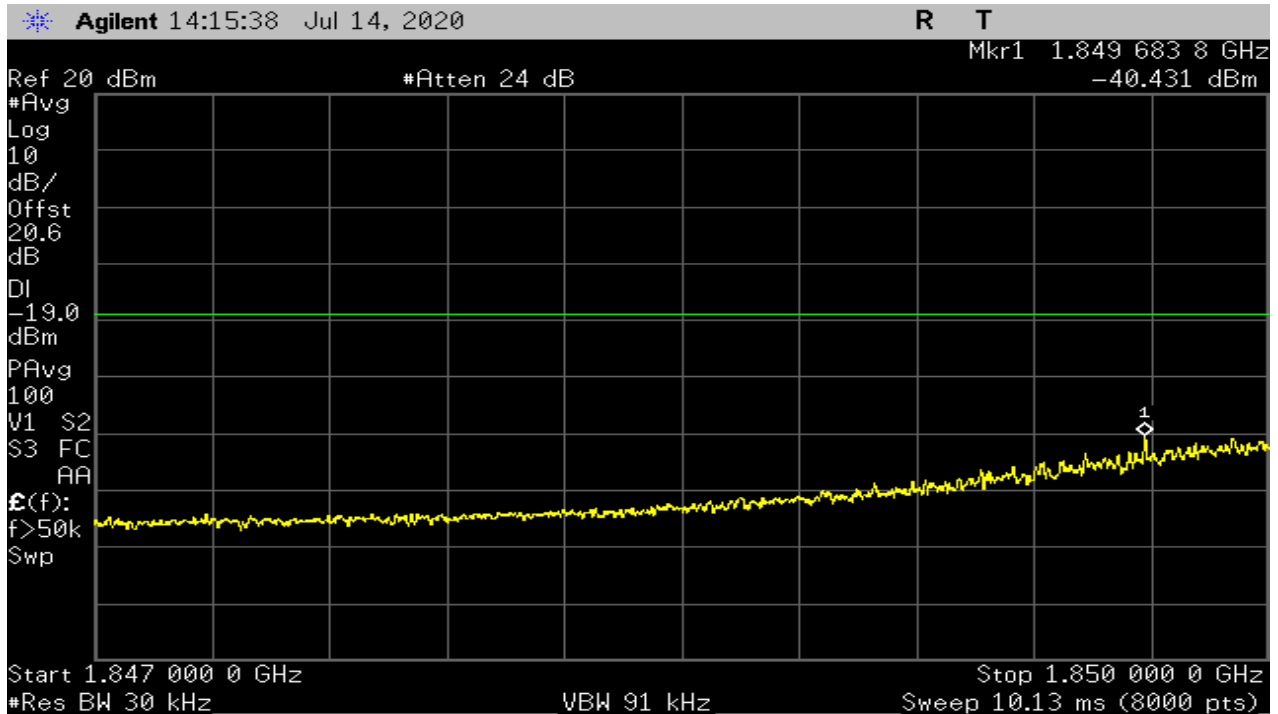
Plot 35 – 824-849MHz Band – CDMA Uplink Upper Band Edge



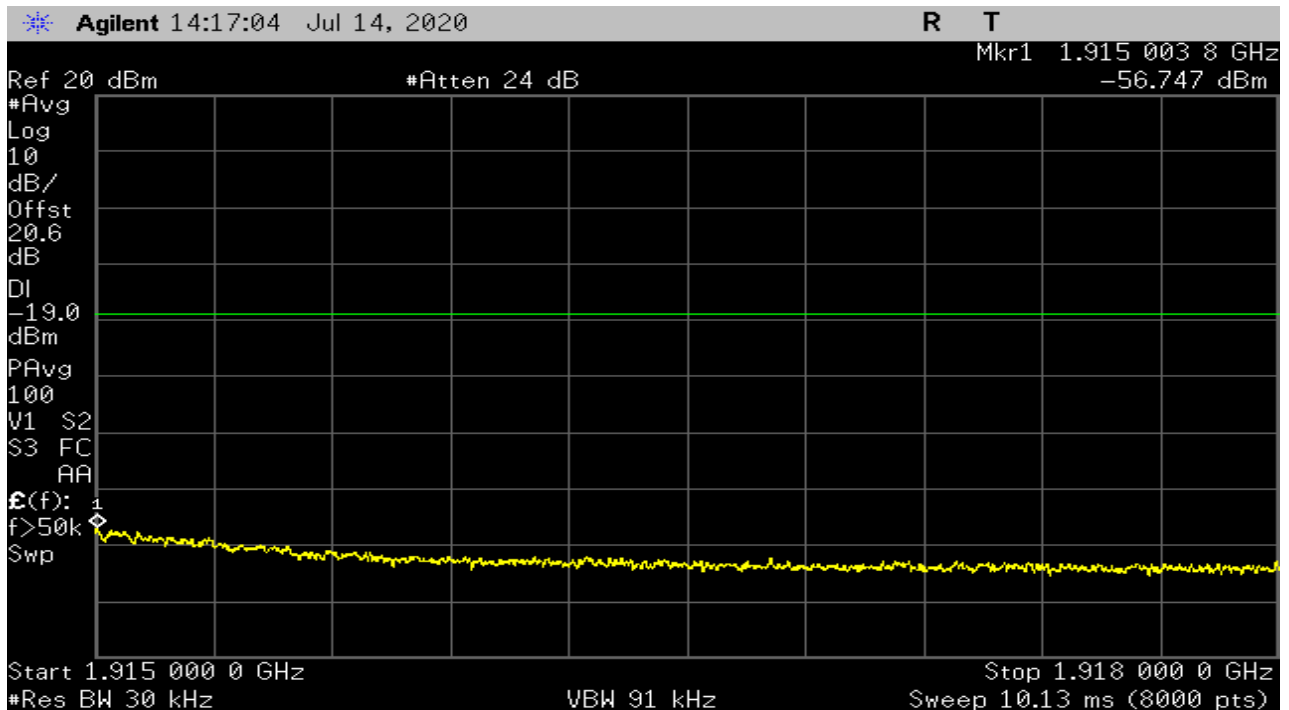
Plot 36 – 1710-1755MHz Band – CDMA Uplink Lower Band Edge



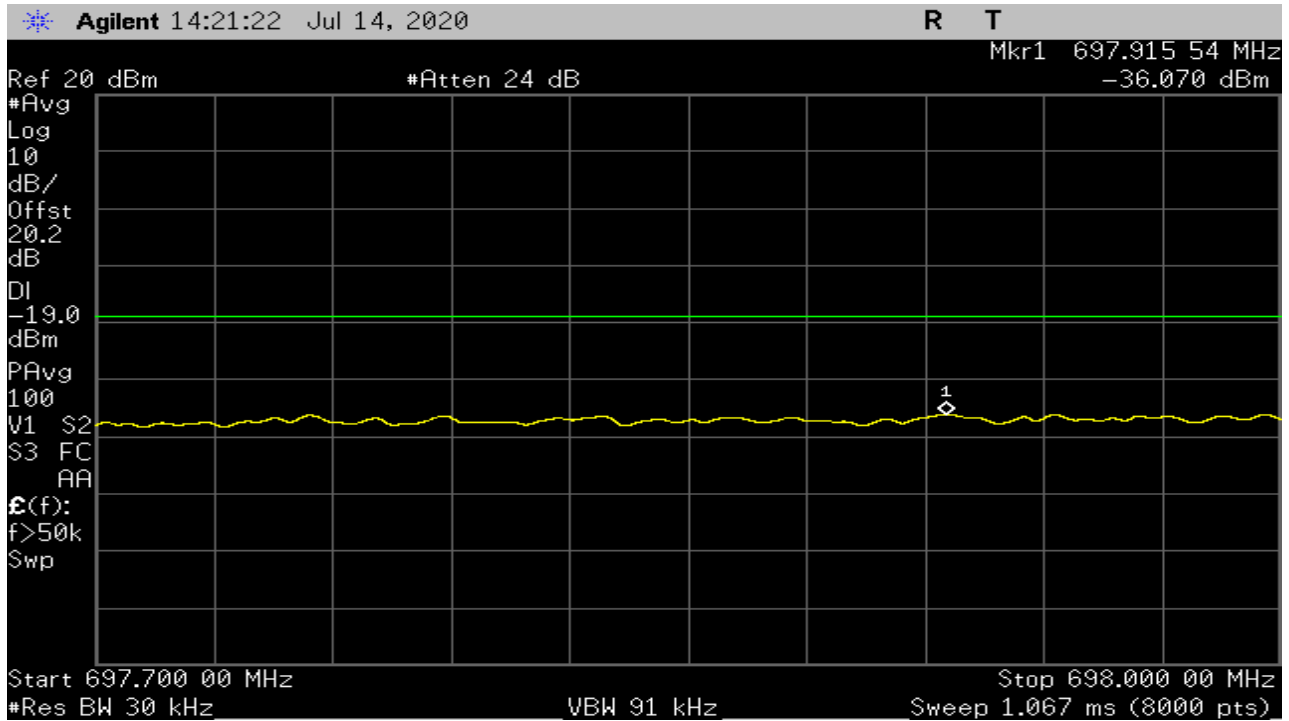
Plot 37 – 1710-1755MHz Band – CDMA Uplink Upper Band Edge



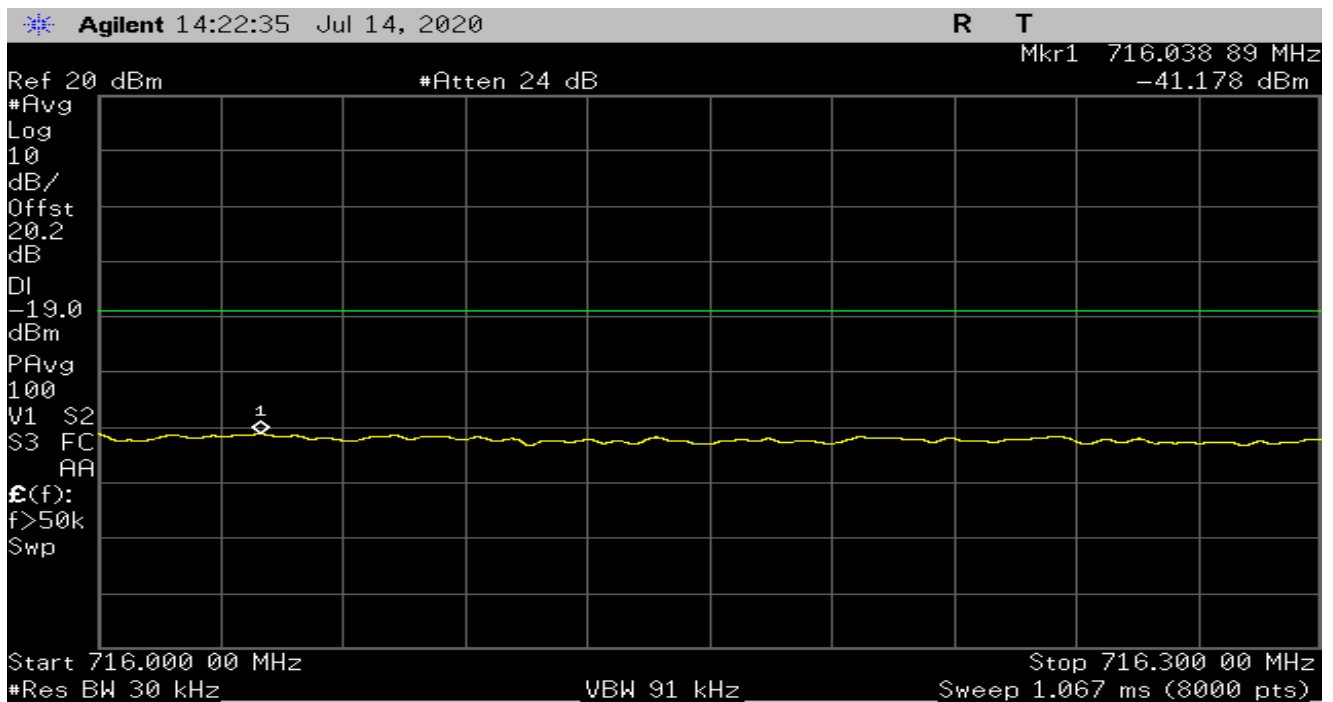
Plot 38 – 1850-1915MHz Band – CDMA Uplink Lower Band Edge



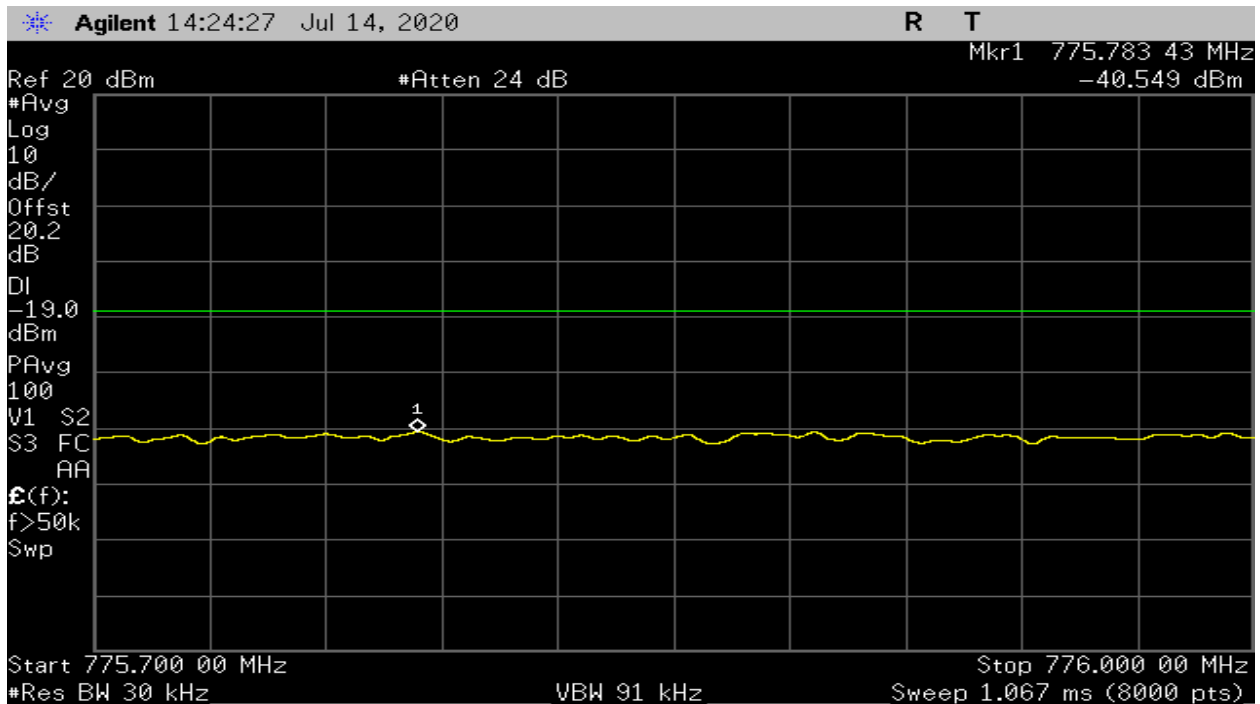
Plot 39 – 1850-1915MHz Band – CDMA Uplink Upper Band Edge



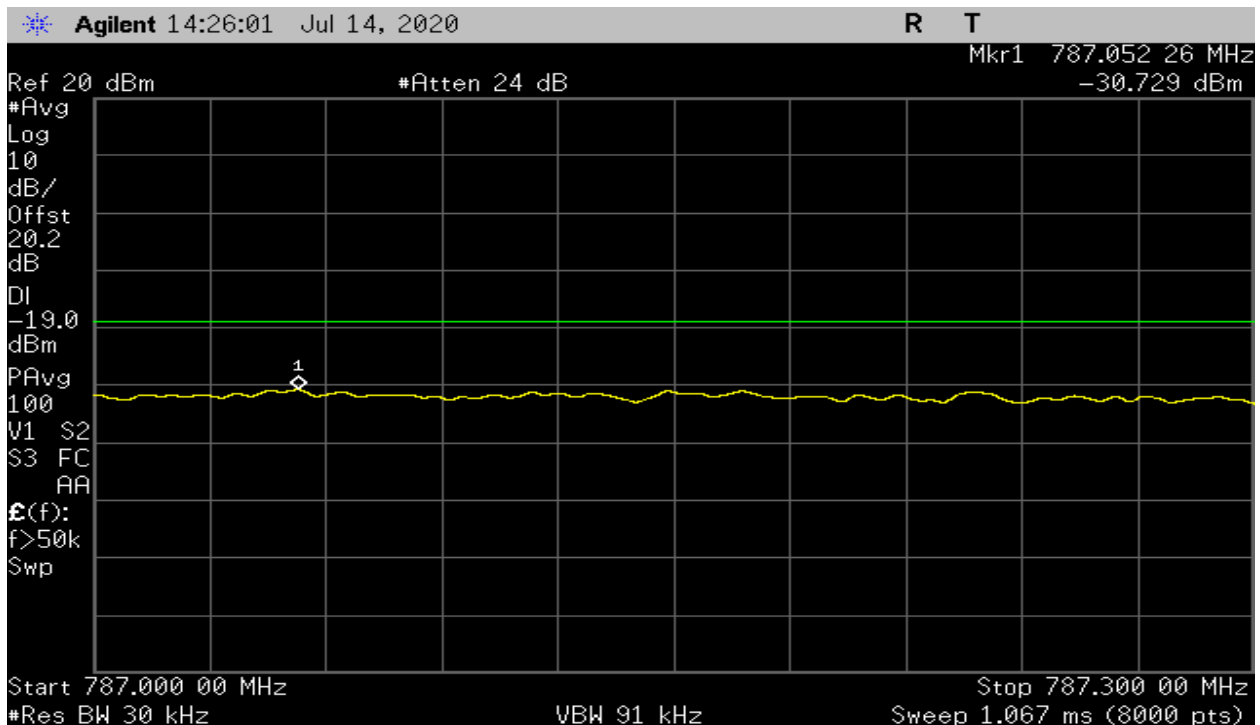
Plot 40 – 698-716MHz Band – LTE Uplink Lower Band Edge



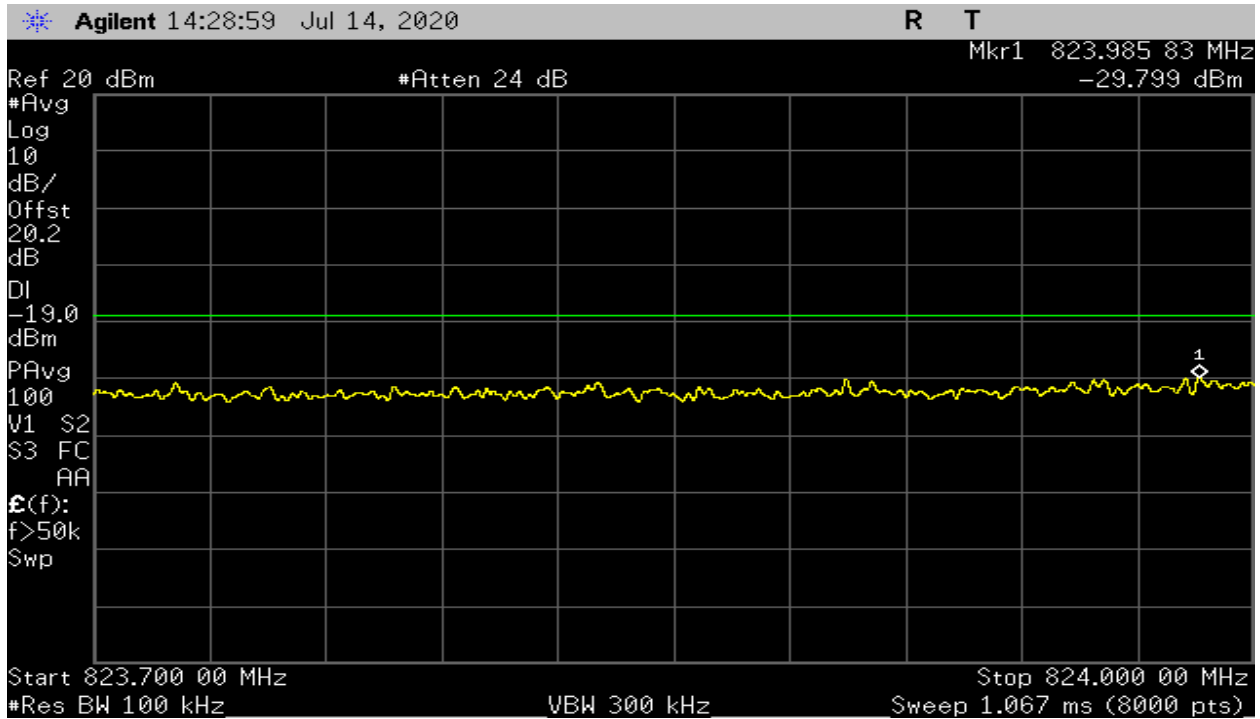
Plot 41 – 698-716MHz Band – LTE Uplink Upper Band Edge



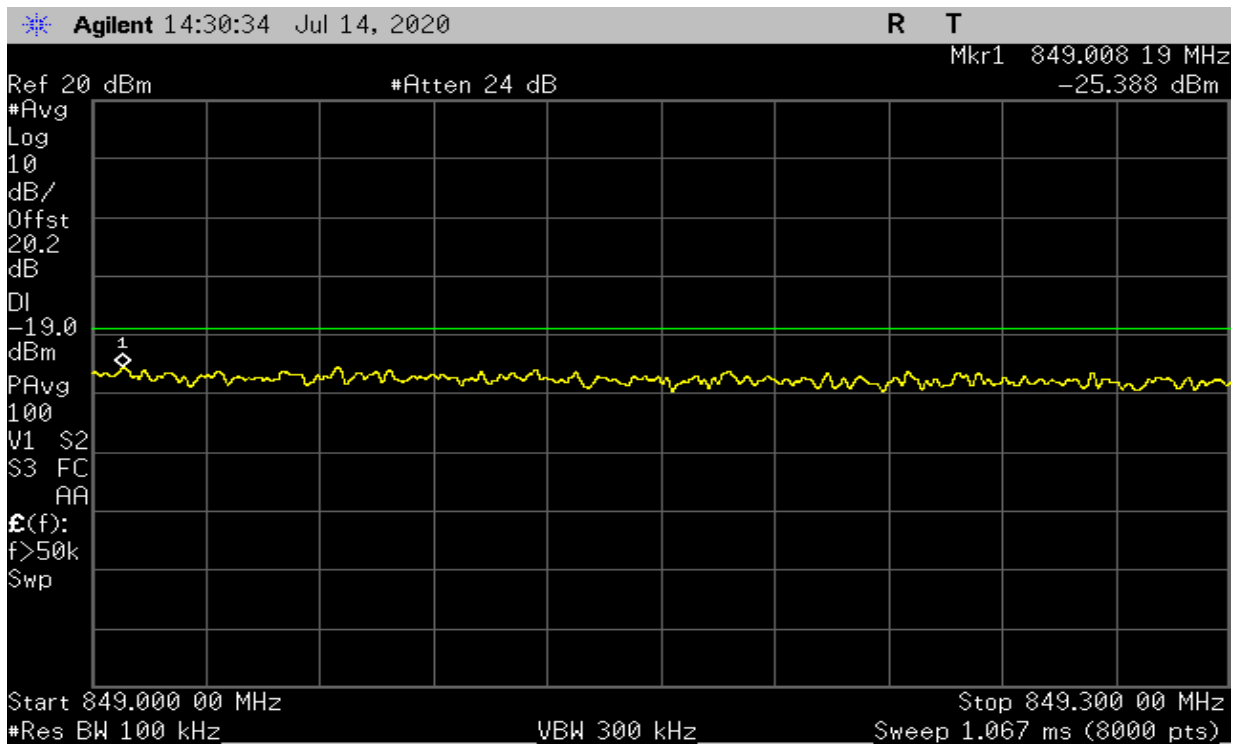
Plot 42 – 776-787MHz Band – LTE Uplink Lower Band Edge



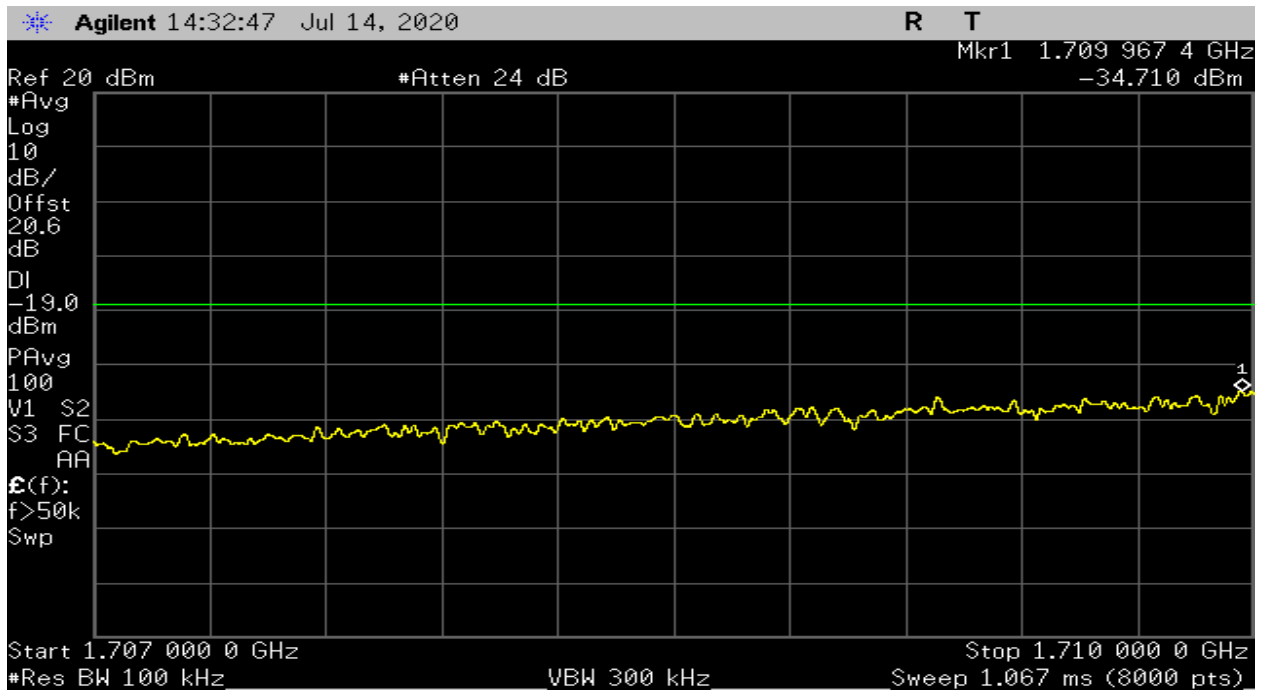
Plot 43 – 776-787MHz Band – LTE Uplink Upper Band Edge



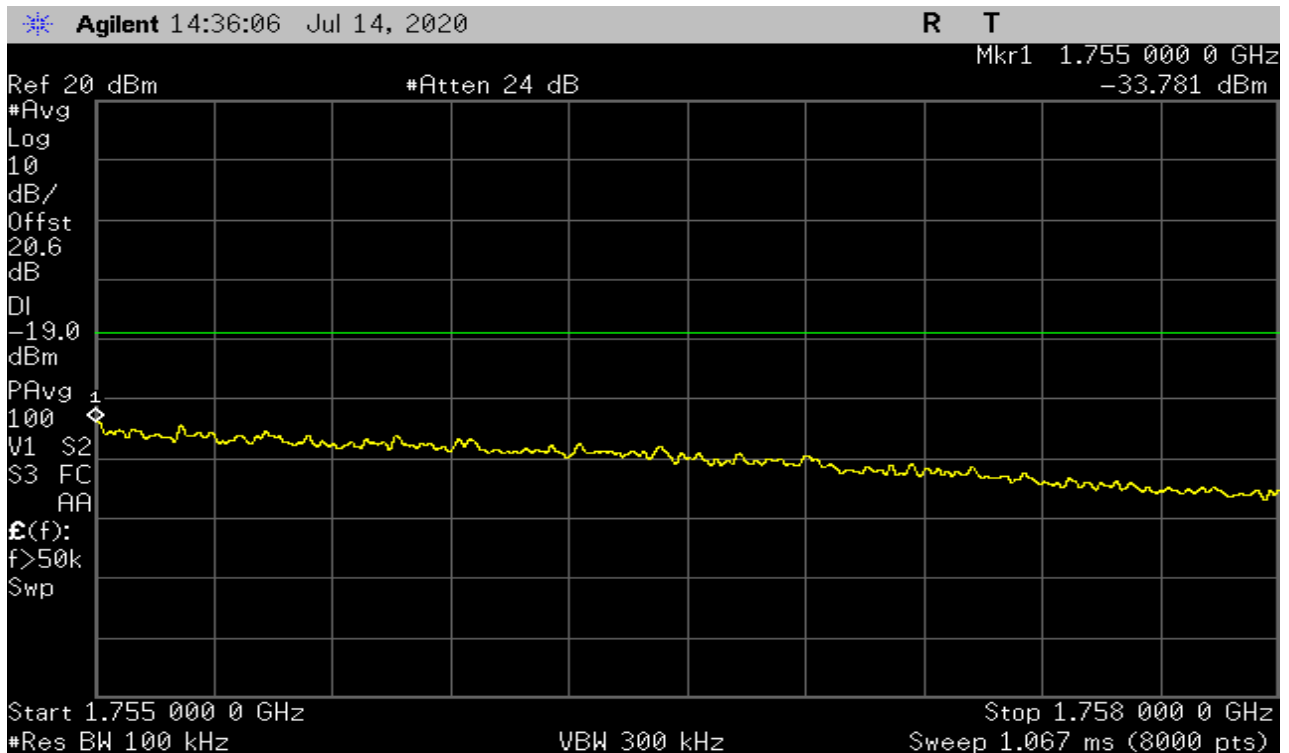
Plot 44 – 824-849MHz Band – LTE Uplink Lower Band Edge



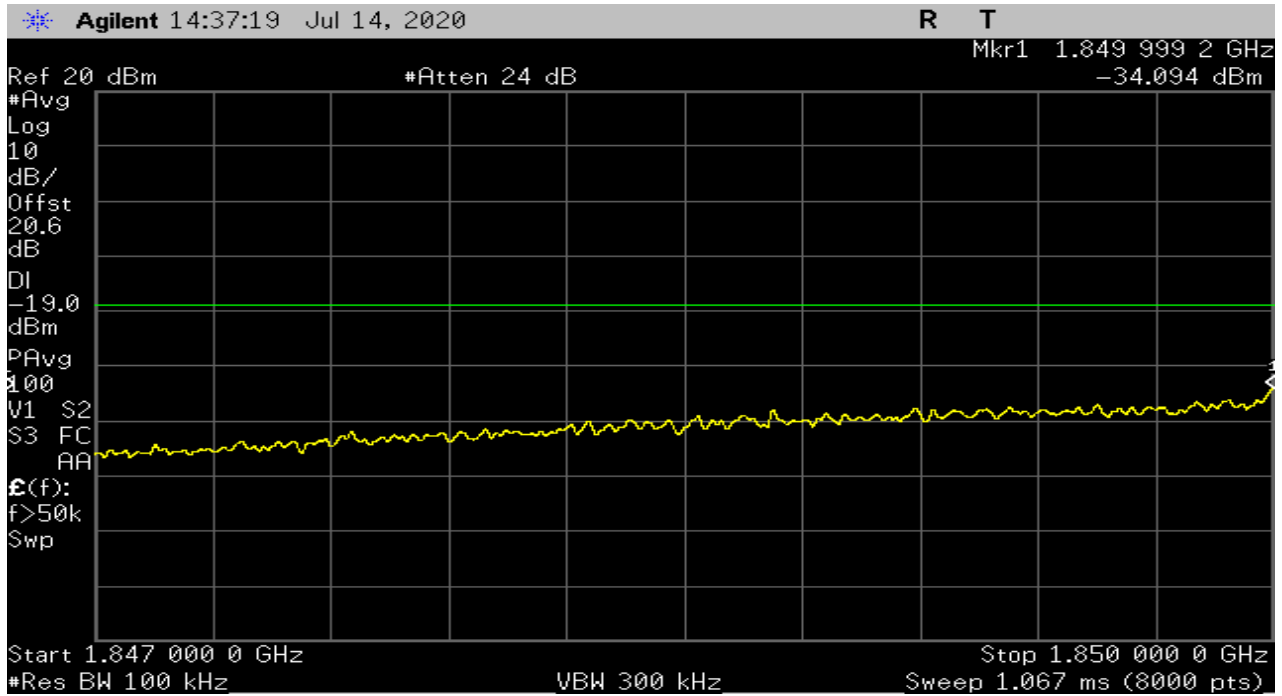
Plot 45 – 824-849MHz Band – LTE Uplink Upper Band Edge



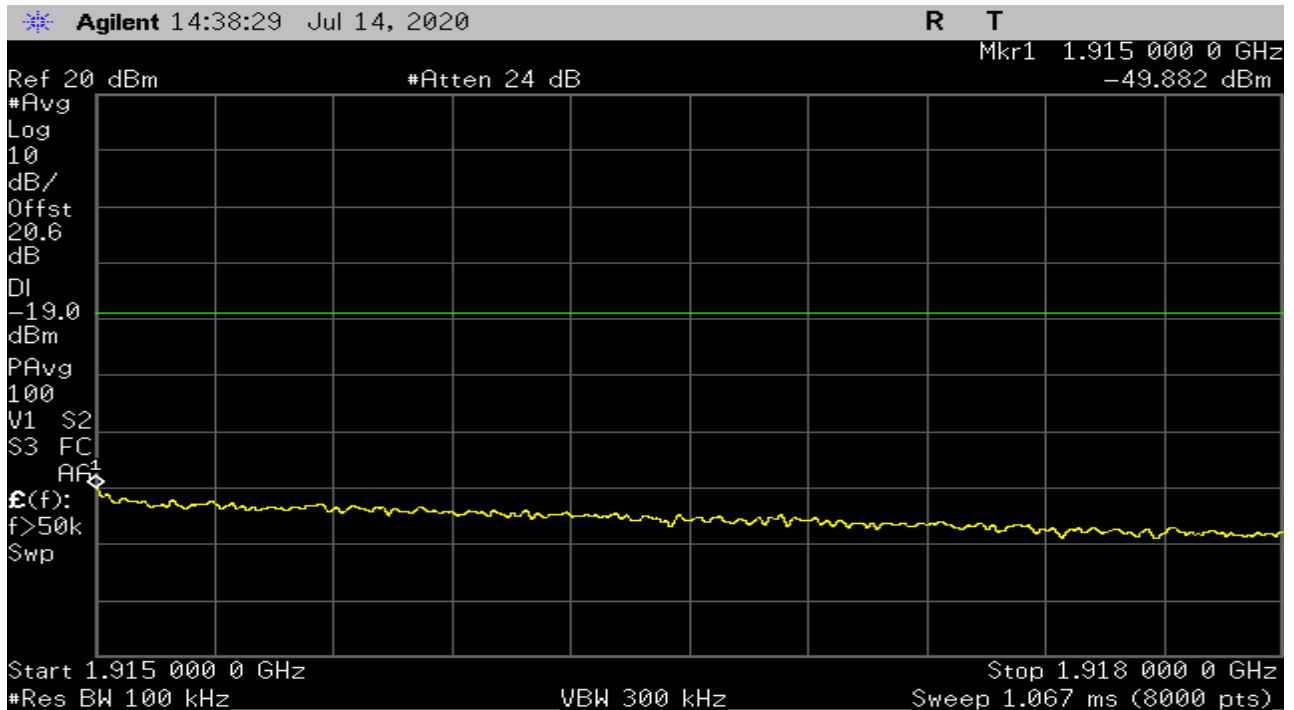
Plot 46 – 1710-1755MHz Band – LTE Uplink Lower Band Edge



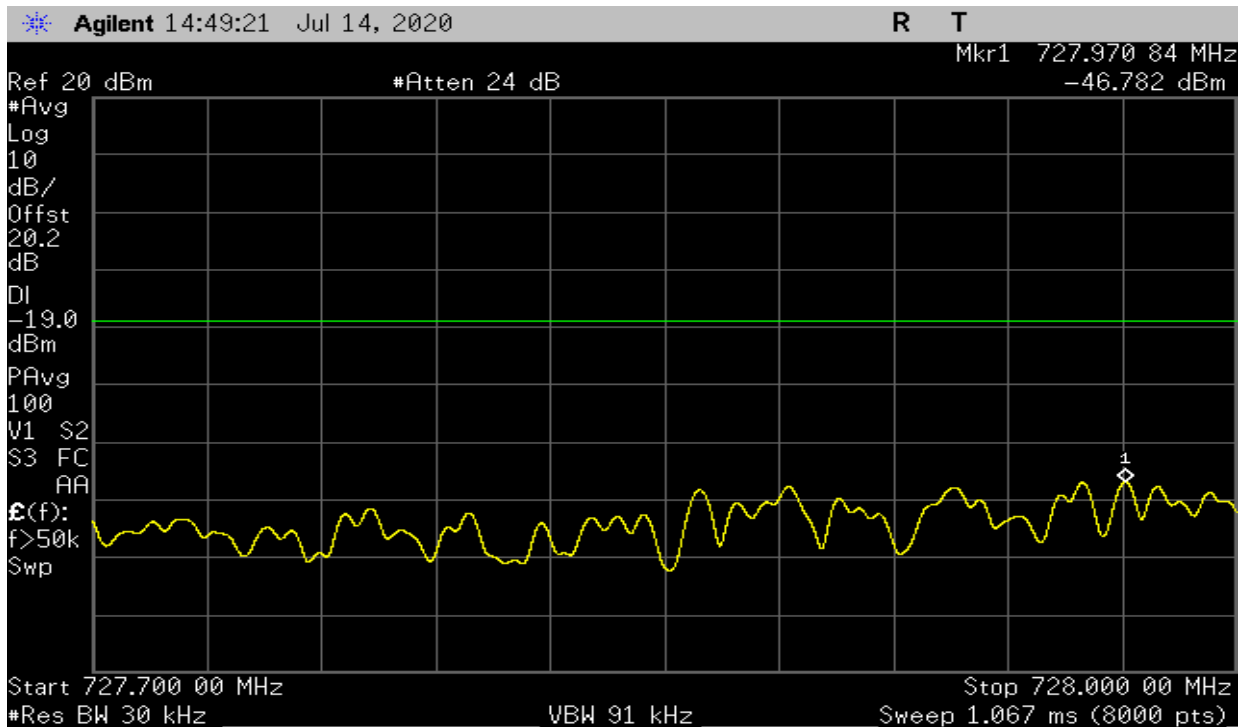
Plot 47 – 1710-1755MHz Band – LTE Uplink Upper Band Edge



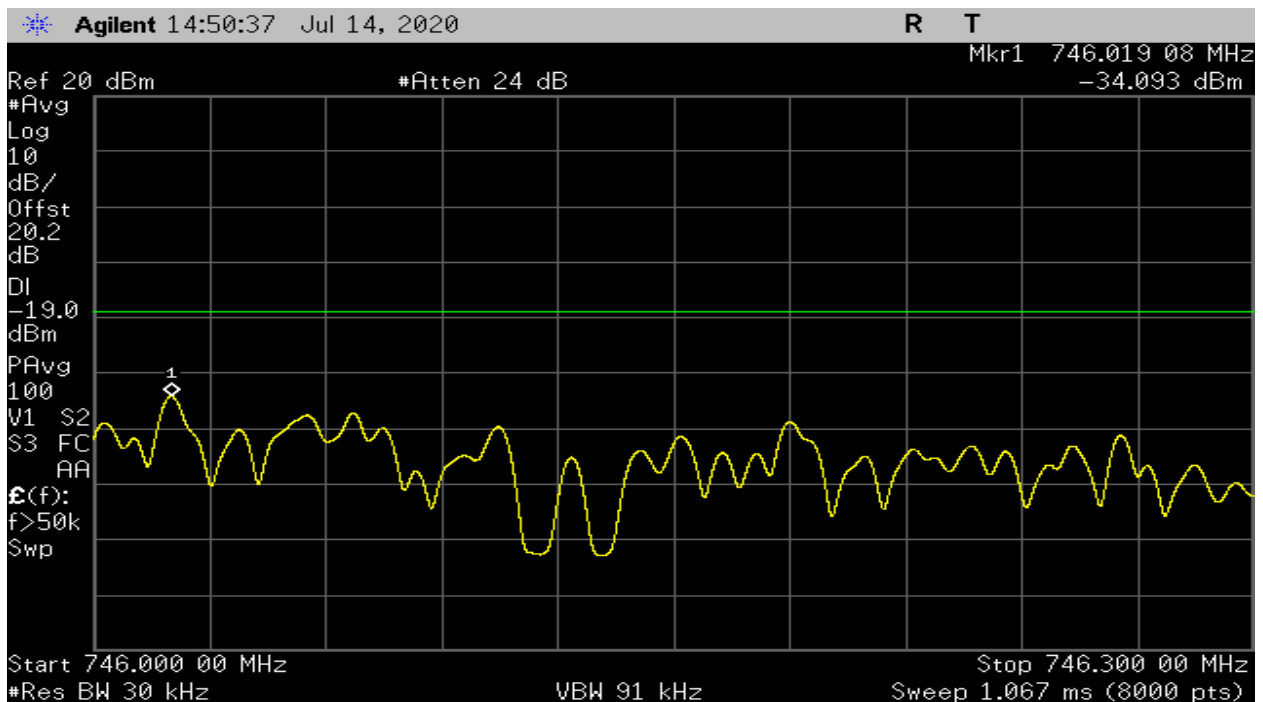
Plot 48 – 1850-1915MHz Band – LTE Uplink Lower Band Edge



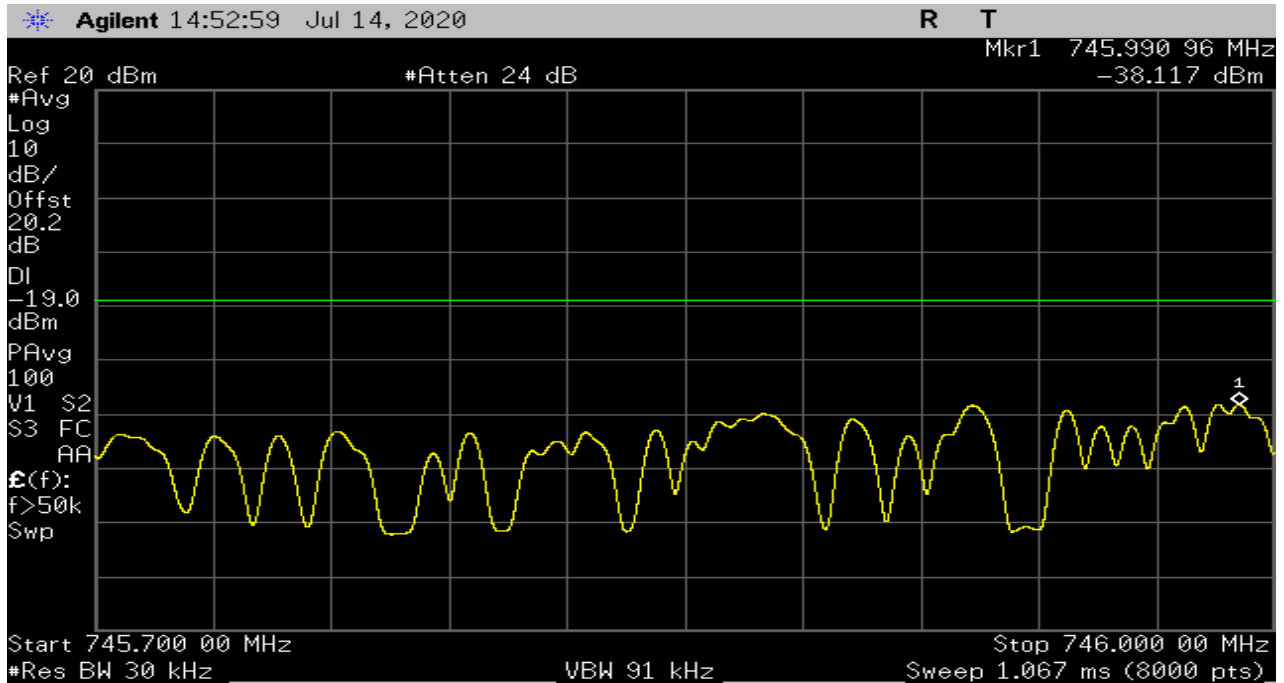
Plot 49 – 1850-1915MHz Band – LTE Uplink Upper Band Edge



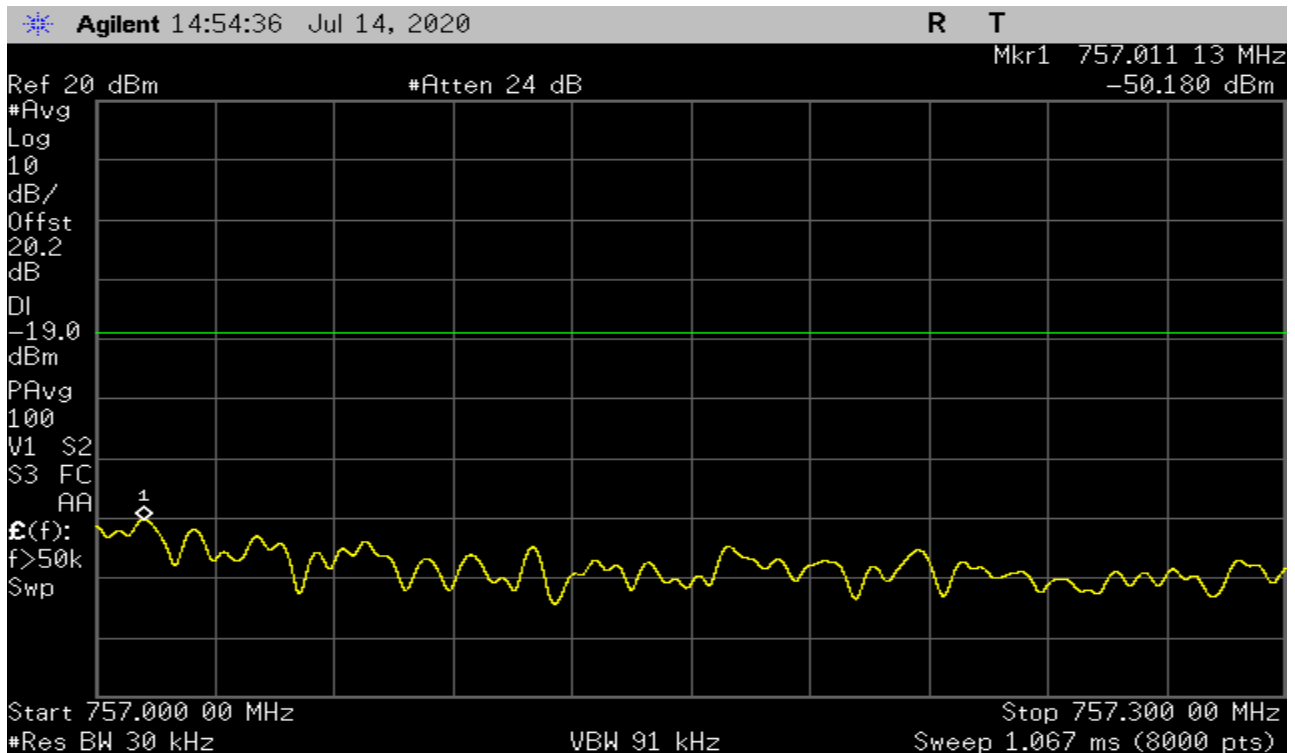
Plot 50 – 728-746MHz Band – GSM Downlink Lower Band Edge



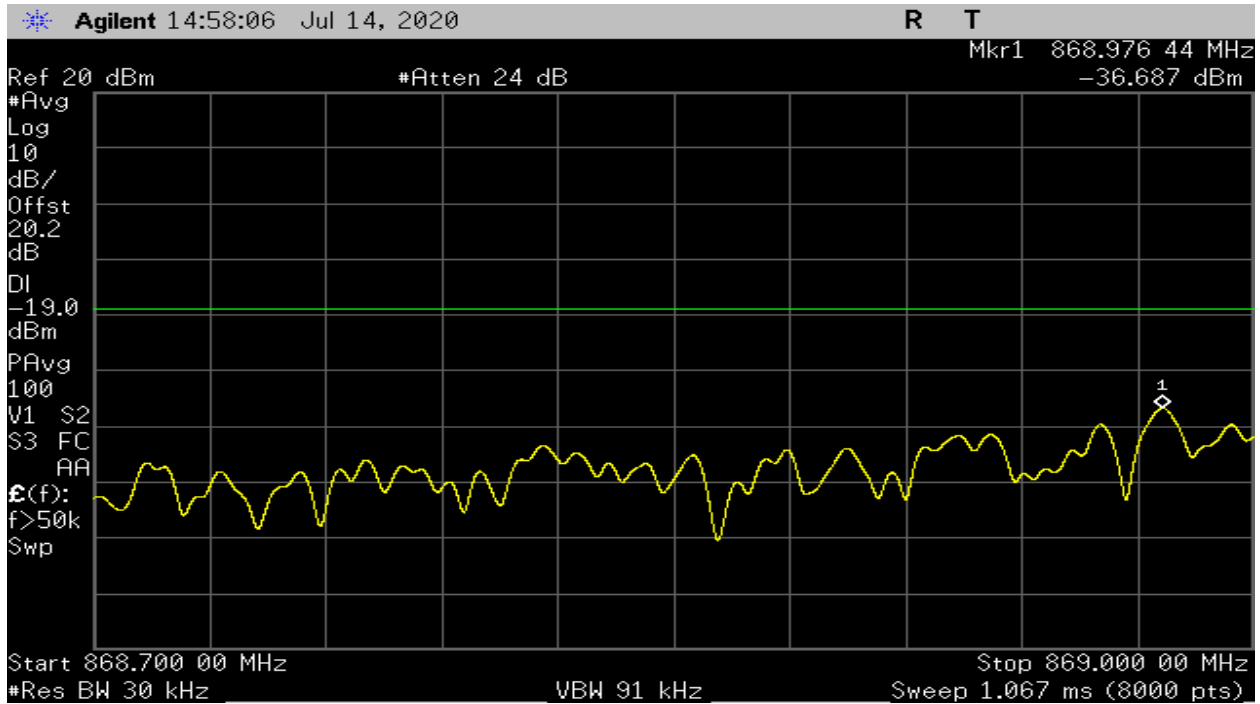
Plot 51 – 728-746MHz Band – GSM Downlink Upper Band Edge



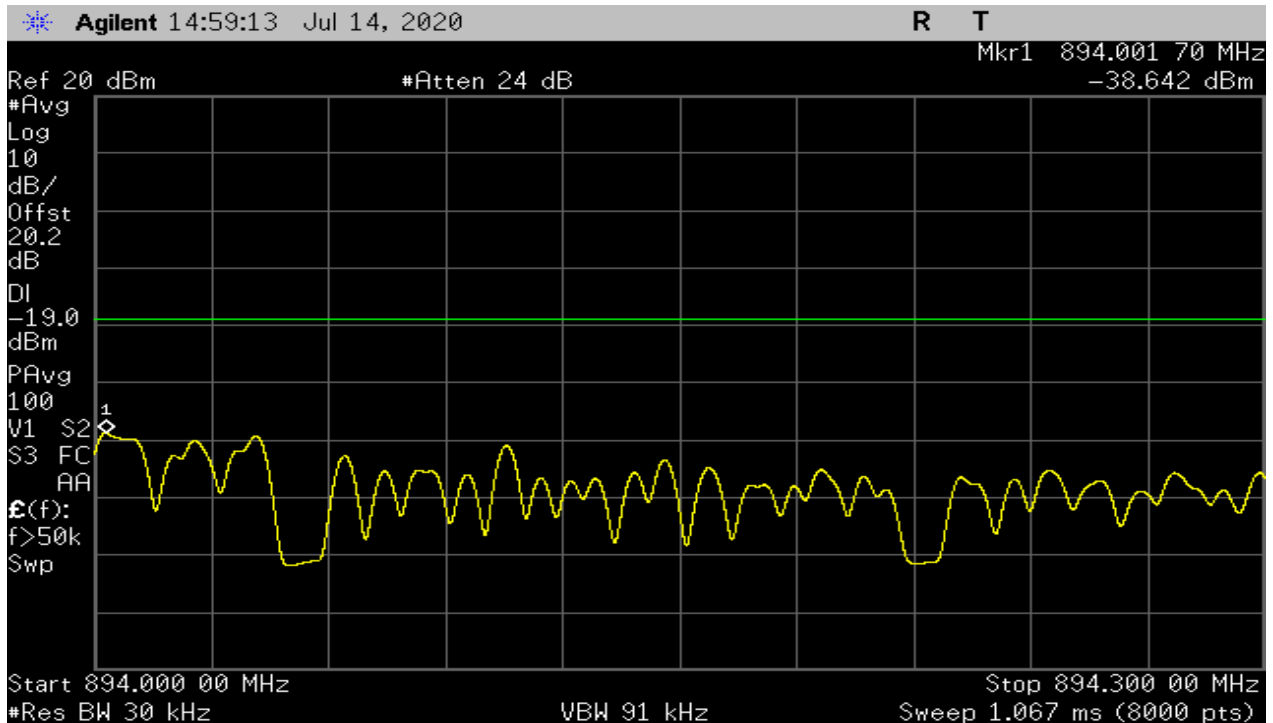
Plot 52 – 746-757MHz Band – GSM Downlink Lower Band Edge



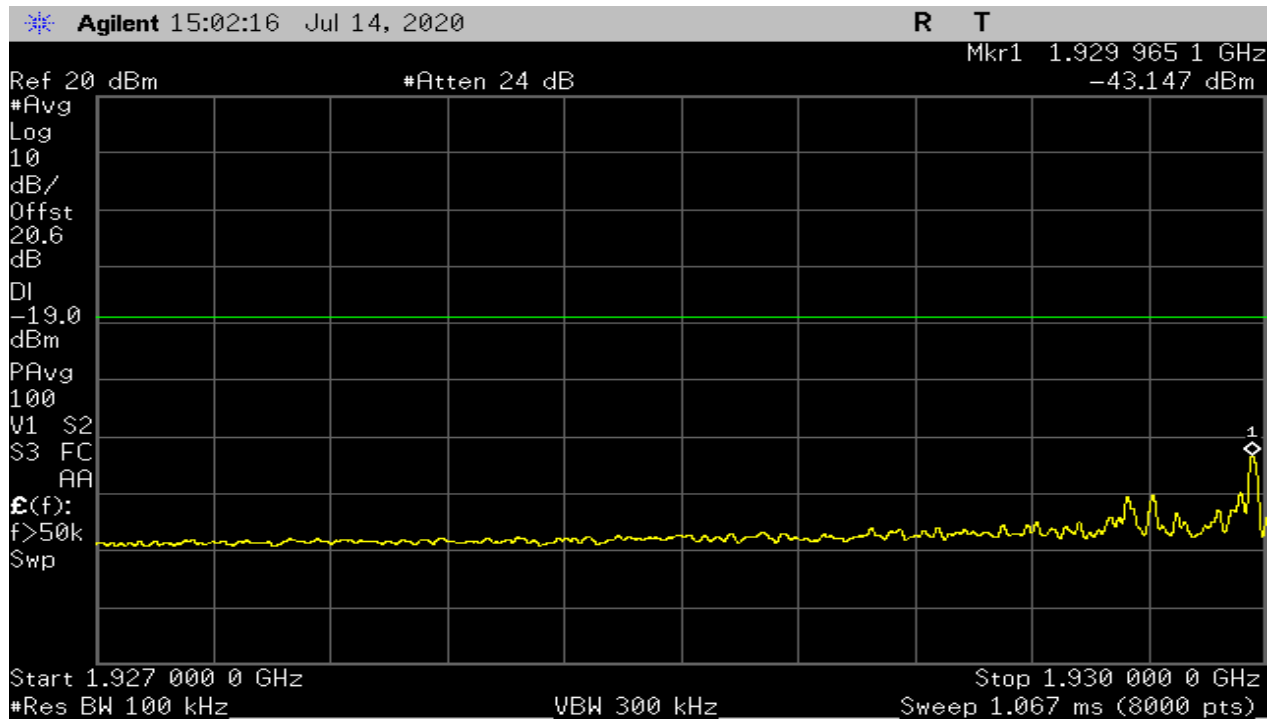
Plot 53 – 746-757MHz Band – GSM Downlink Upper Band Edge



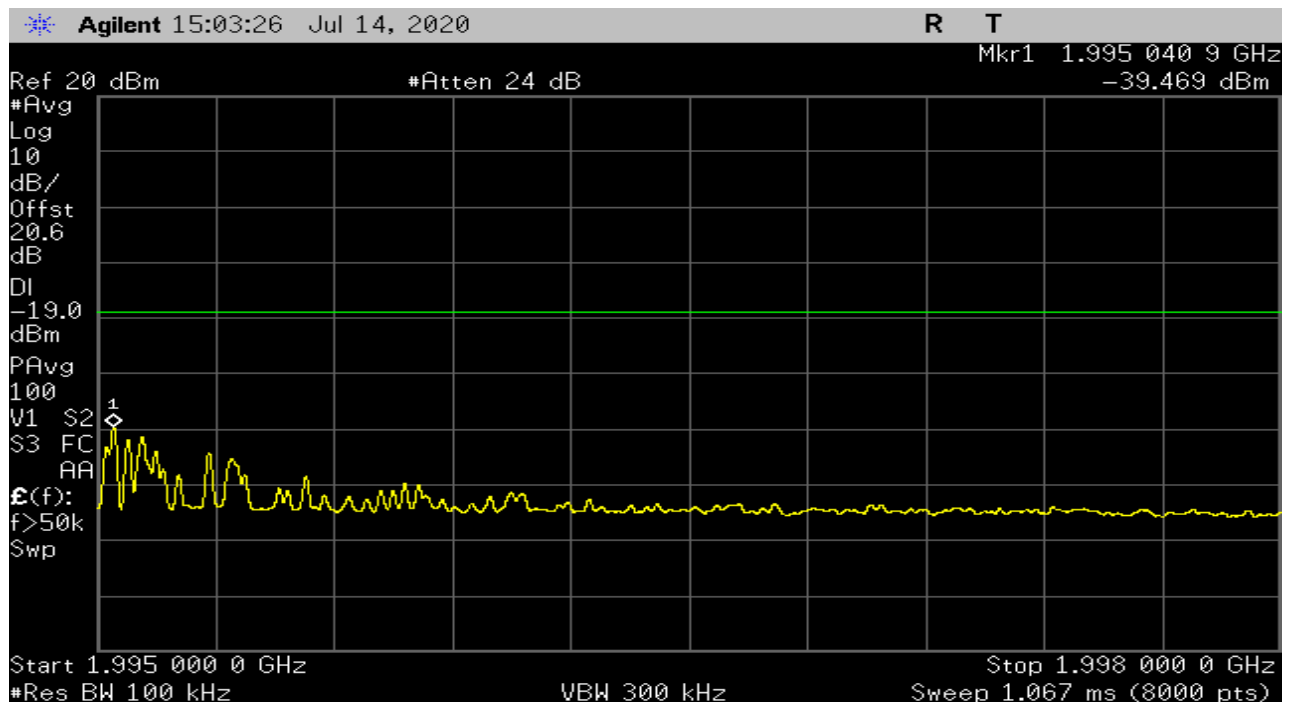
Plot 54 – 869-894MHz Band – GSM Downlink Lower Band Edge



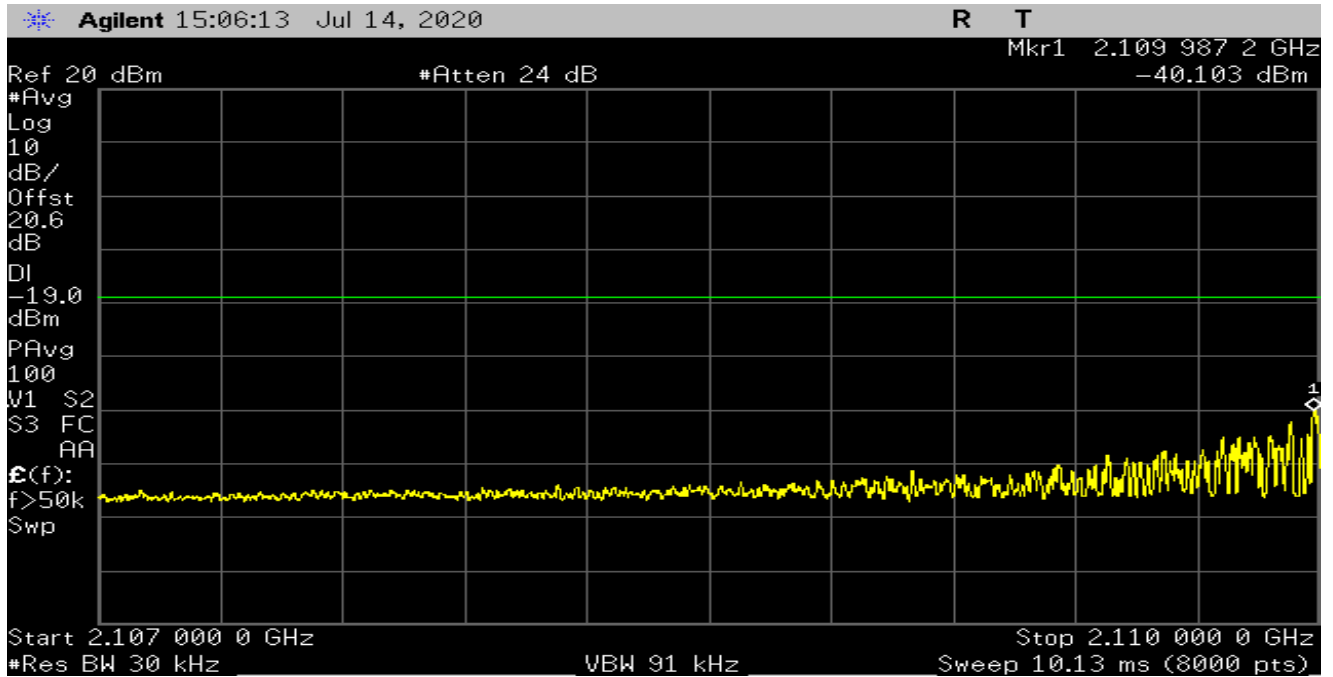
Plot 55 – 869-894MHz Band – GSM Downlink Upper Band Edge



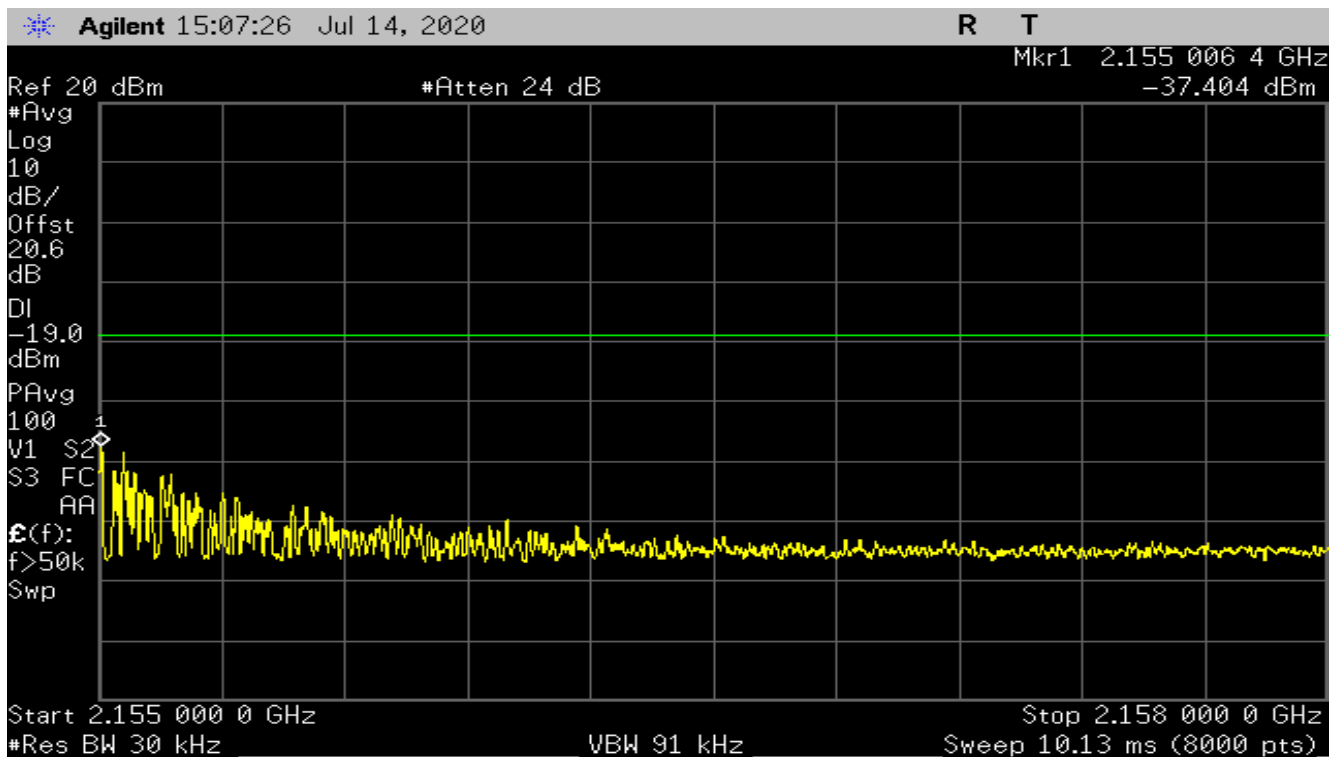
Plot 56 – 1930-1995MHz Band – GSM Downlink Lower Band Edge



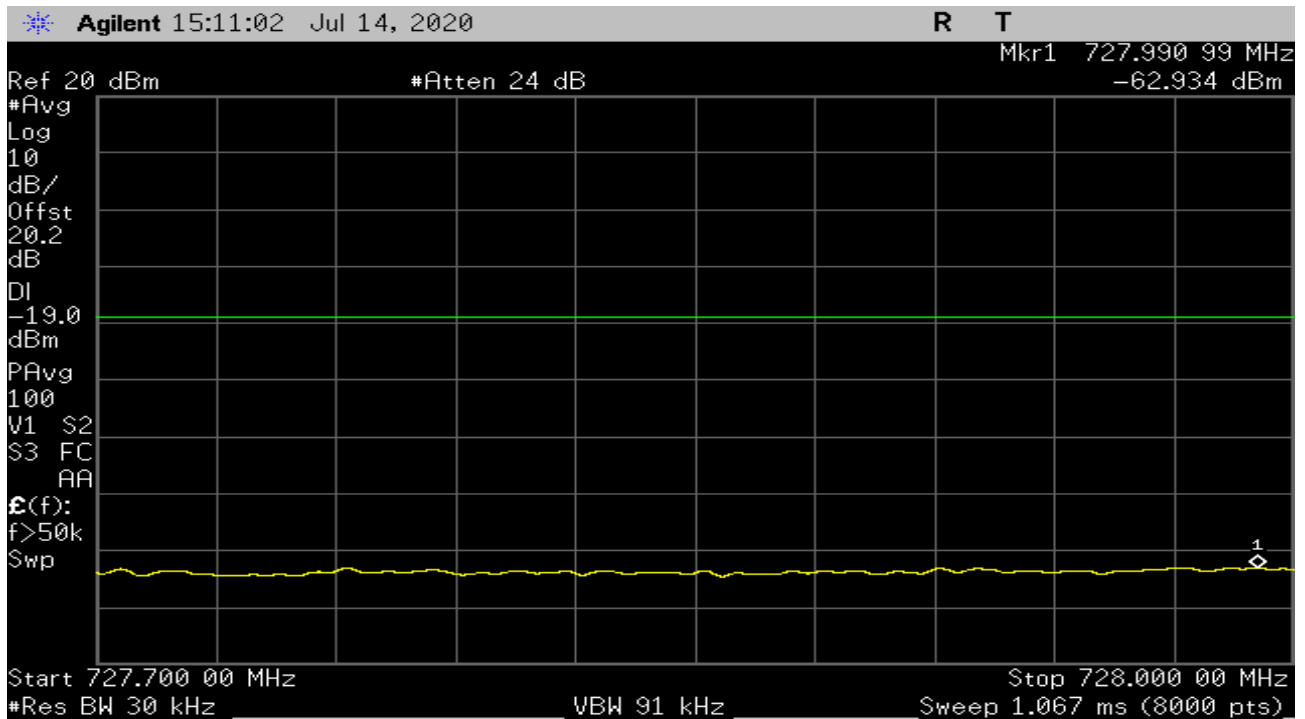
Plot 57 – 1930-1995MHz Band – GSM Downlink Upper Band Edge



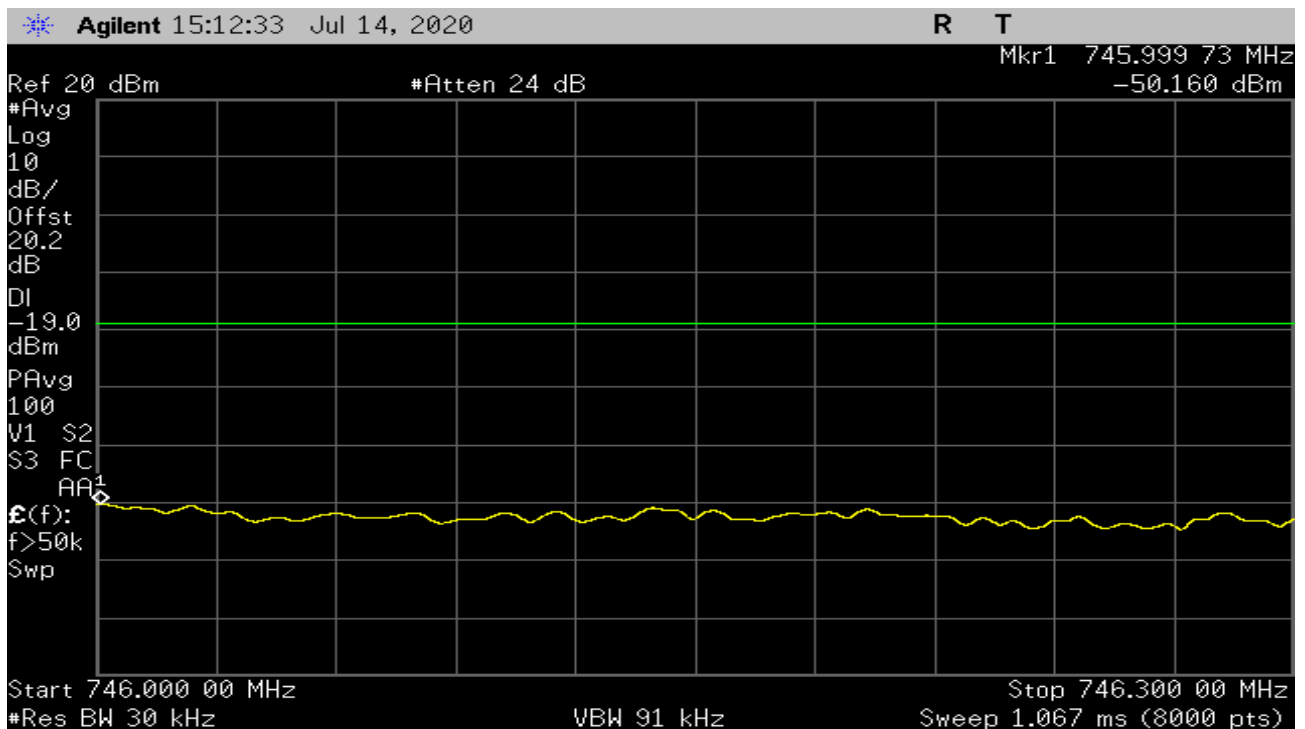
Plot 58 – 2110-2155MHz Band – GSM Downlink Lower Band Edge



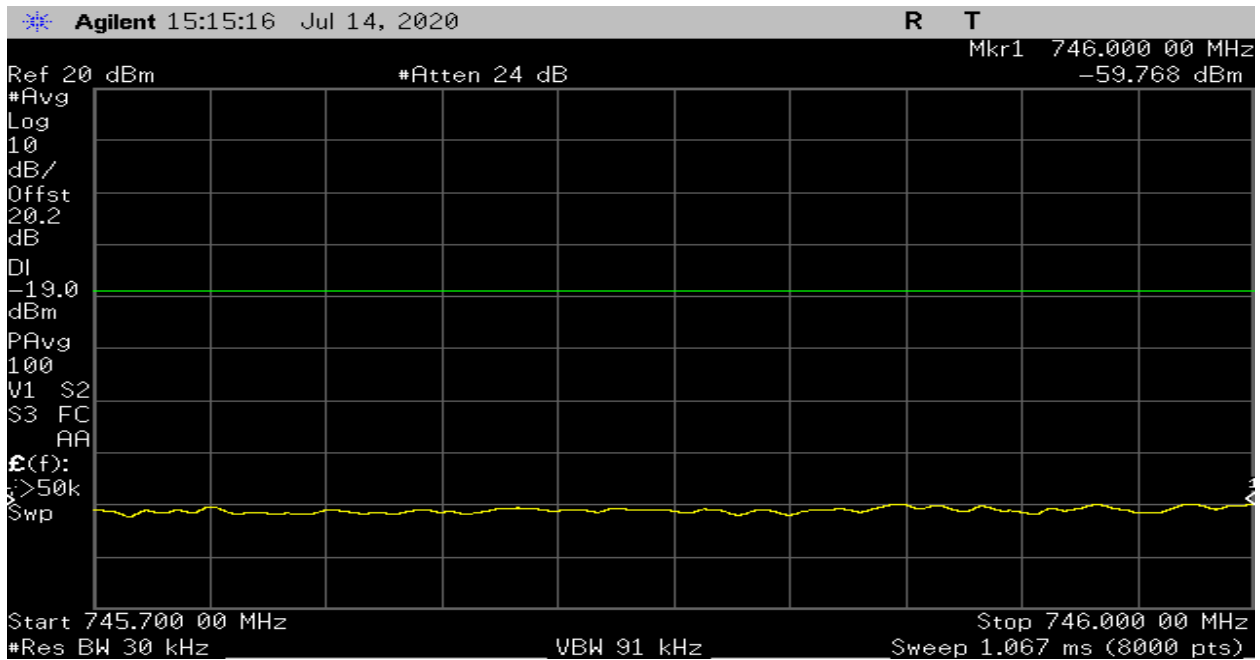
Plot 59 – 2110-2155MHz Band – GSM Downlink Upper Band Edge



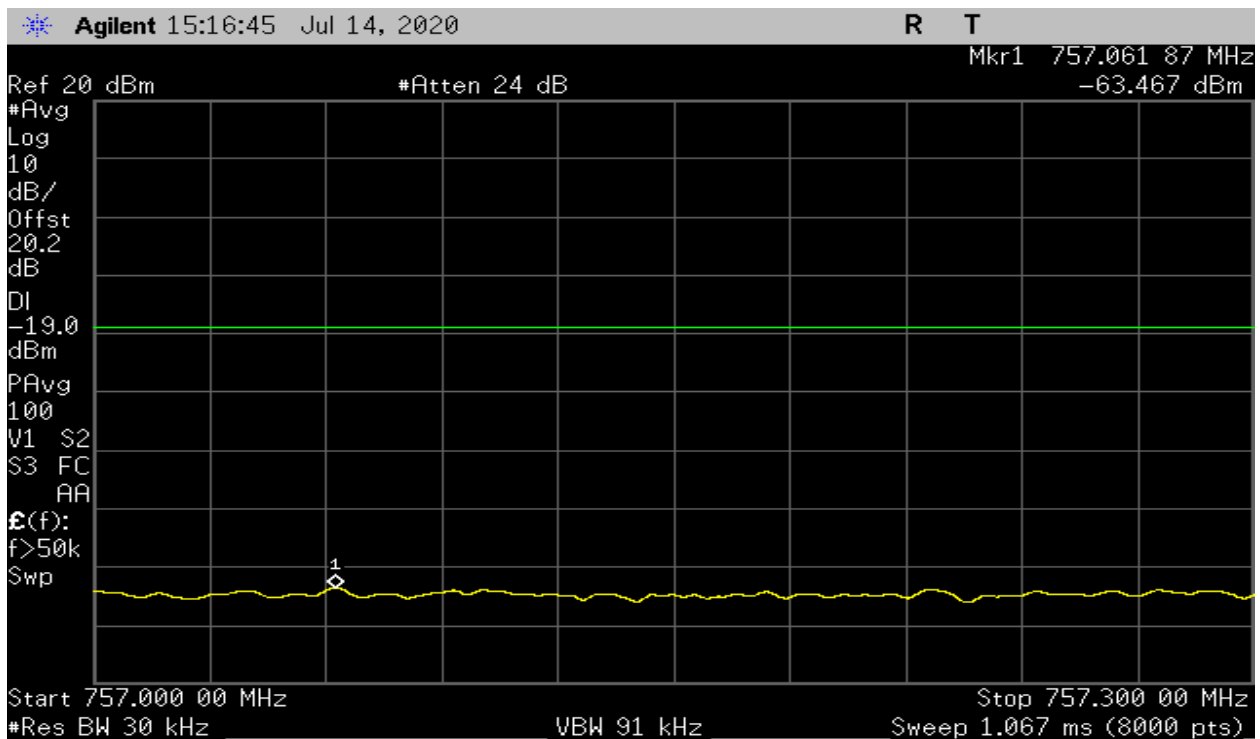
Plot 60 – 728-746MHz Band – CDMA Downlink Lower Band Edge



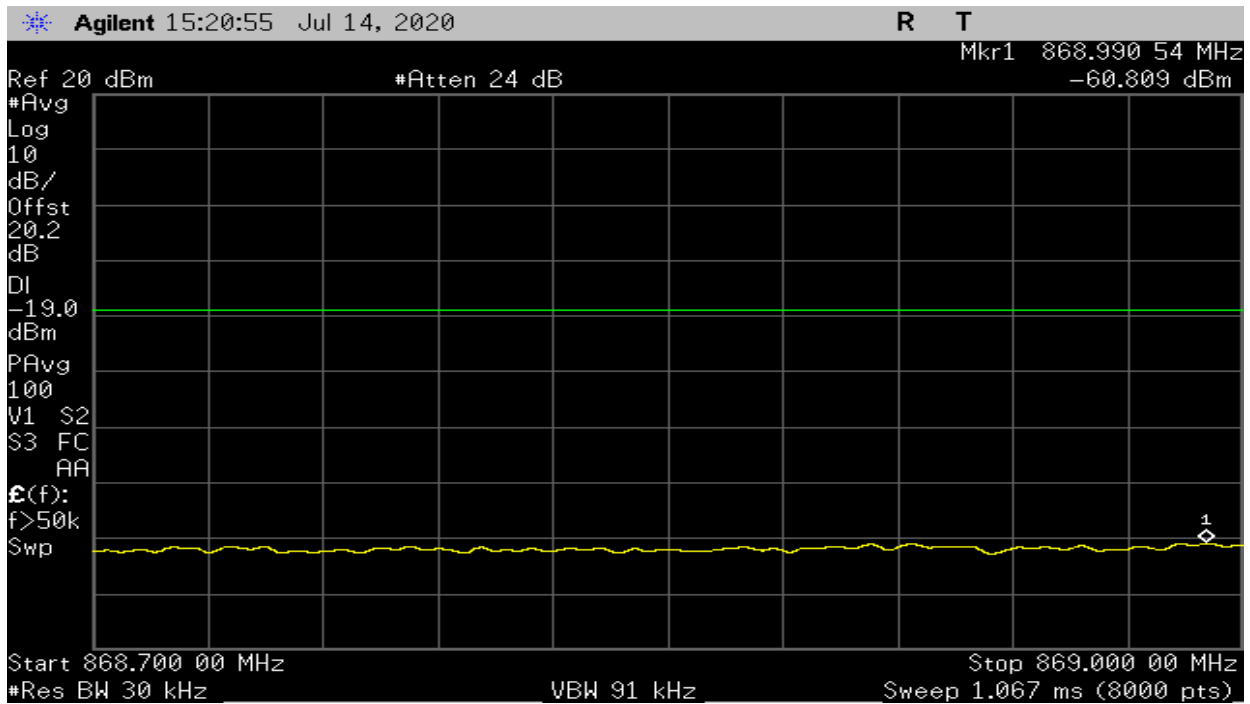
Plot 61 – 728-746MHz Band – CDMA Downlink Upper Band Edge



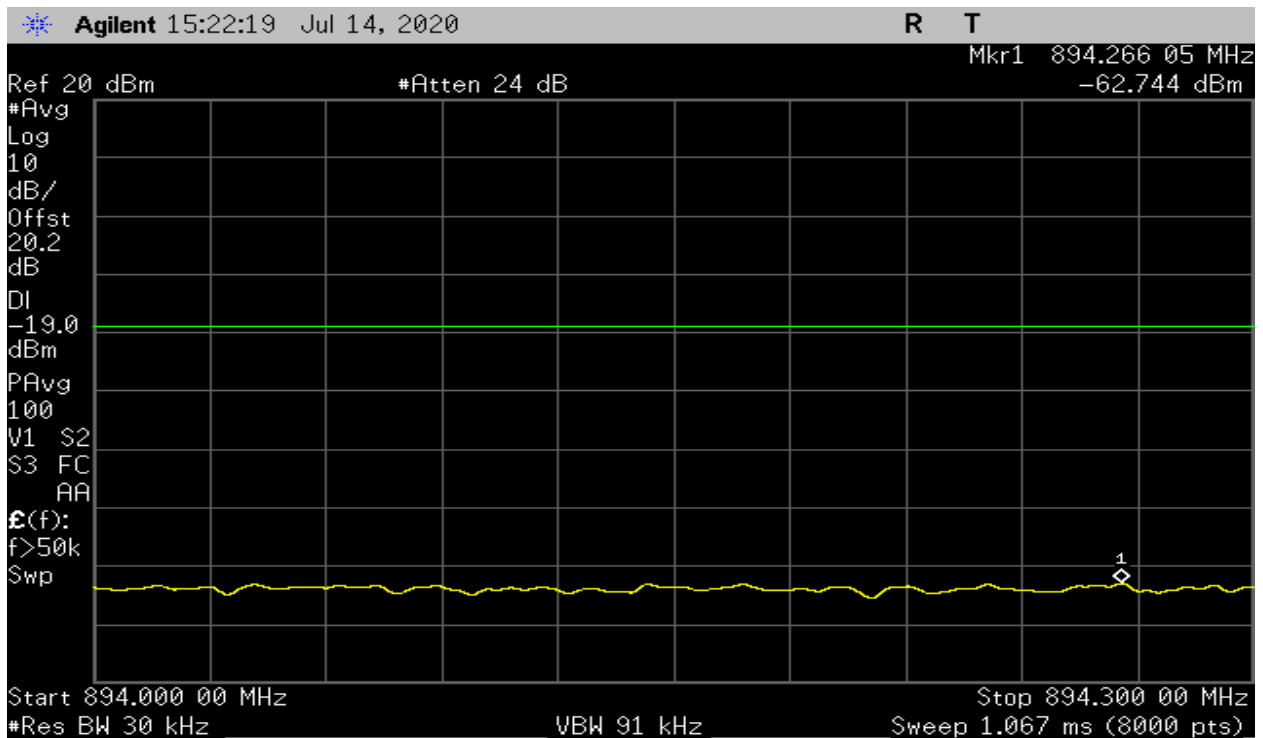
Plot 62 –746-757MHz Band – CDMA Downlink Lower Band Edge



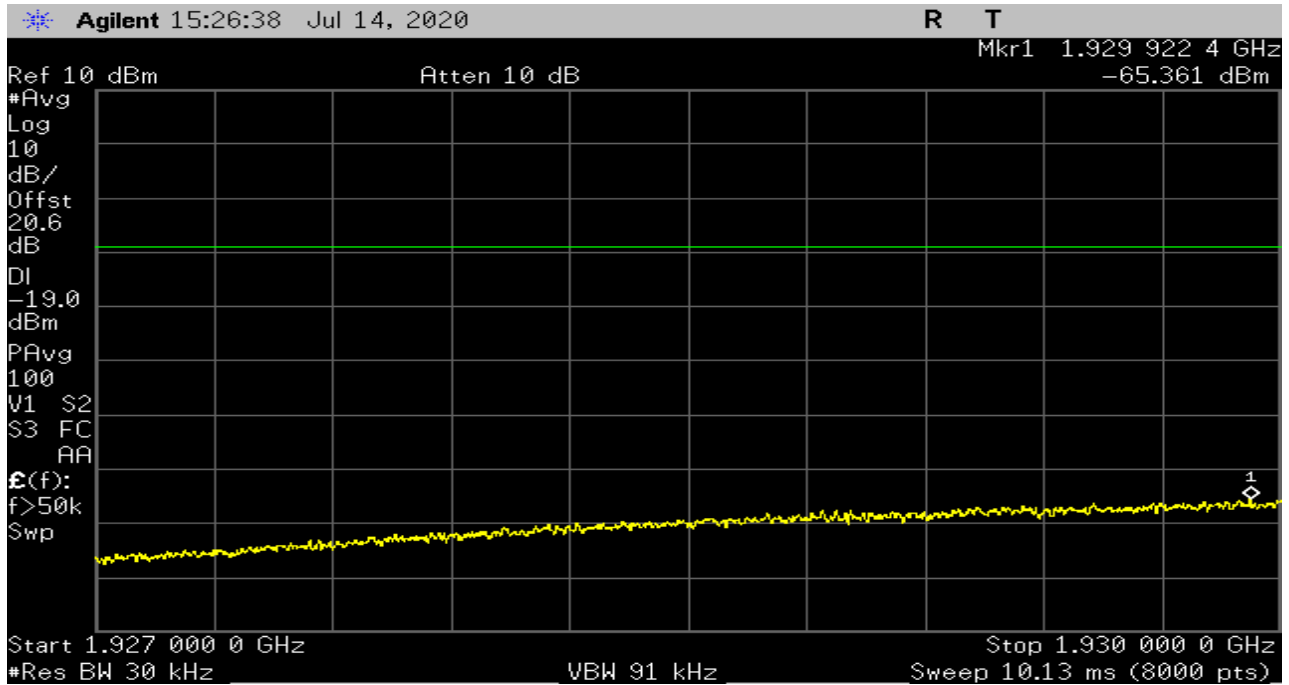
Plot 63 – 746-757MHz Band – CDMA Downlink Upper Band Edge



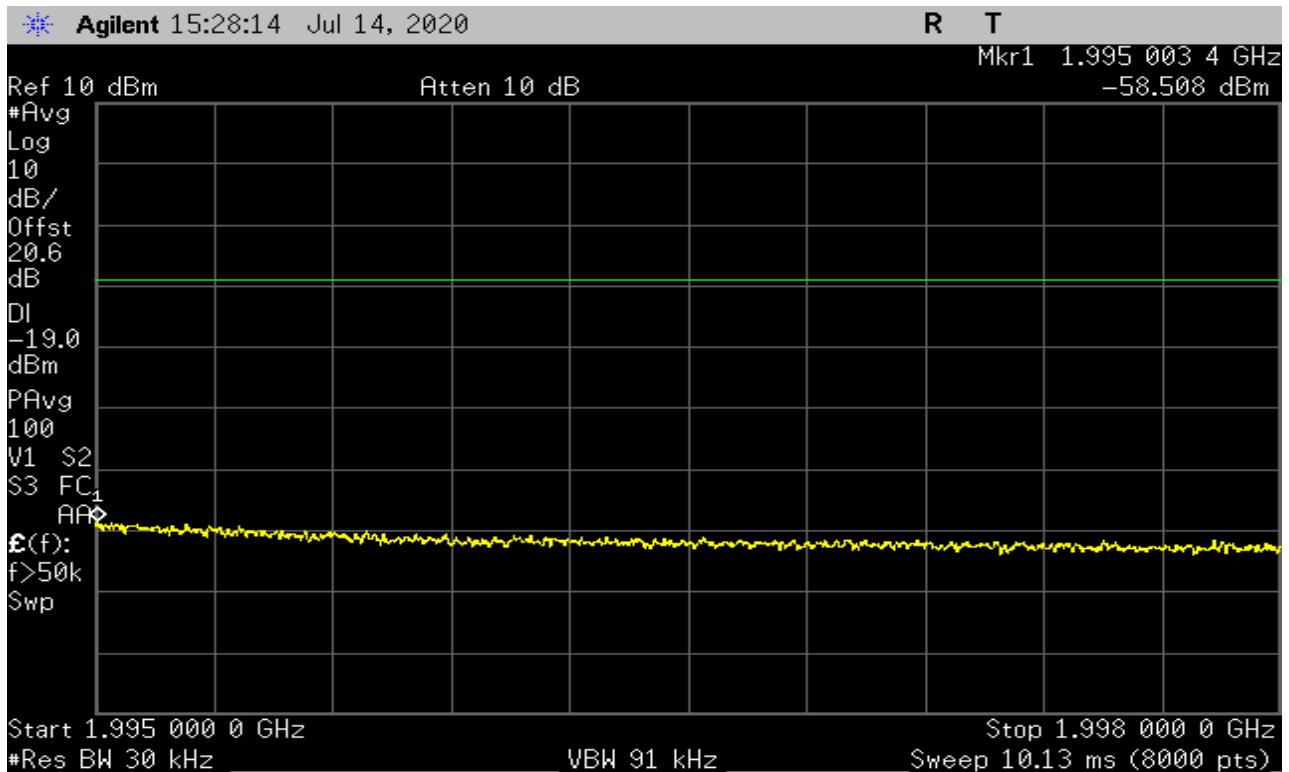
Plot 64 – 869-894MHz Band – CDMA Downlink Lower Band Edge



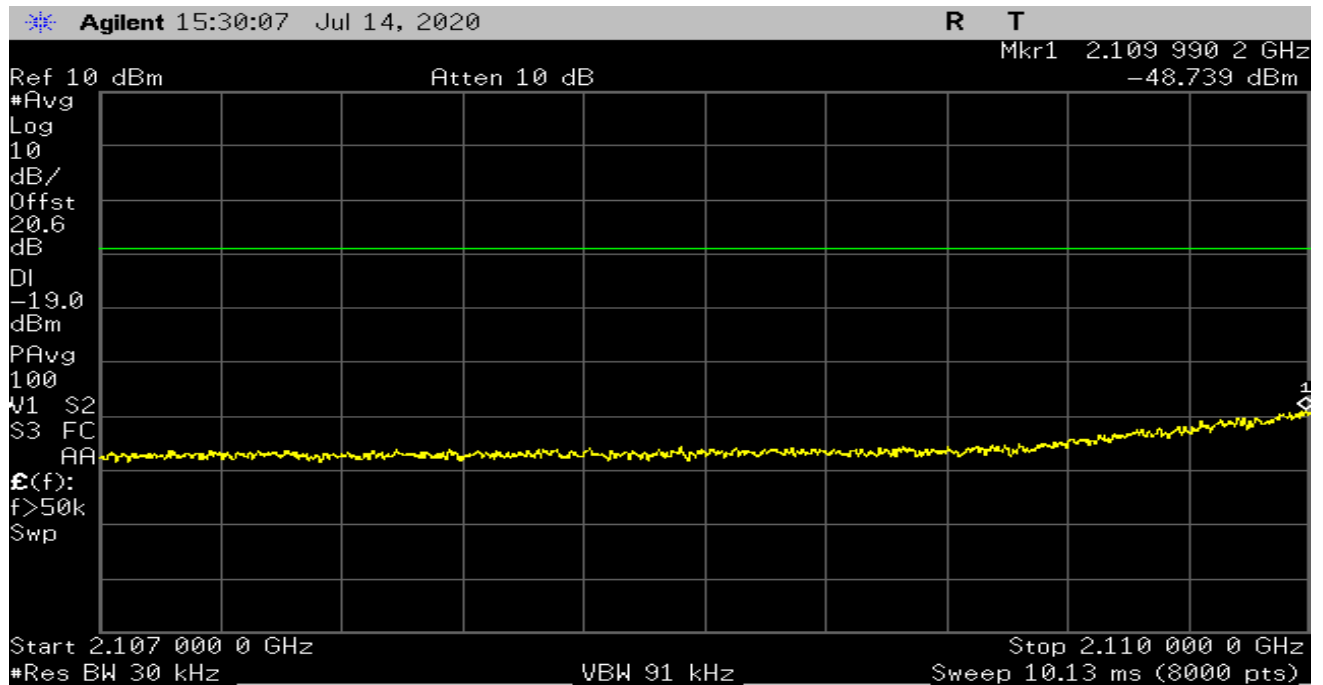
Plot 65 – 869-894MHz Band – CDMA Downlink Upper Band Edge



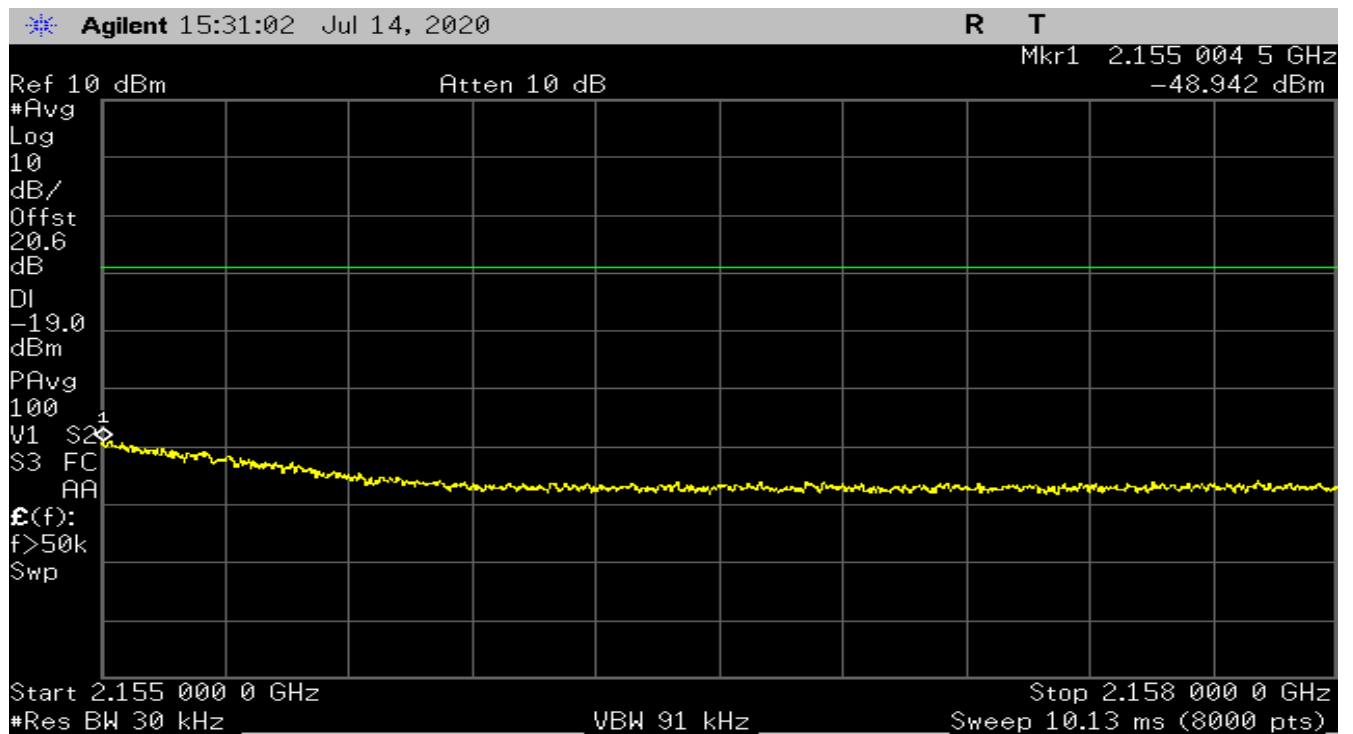
Plot 66 – 1930-1955MHz Band – CDMA Downlink Lower Band Edge



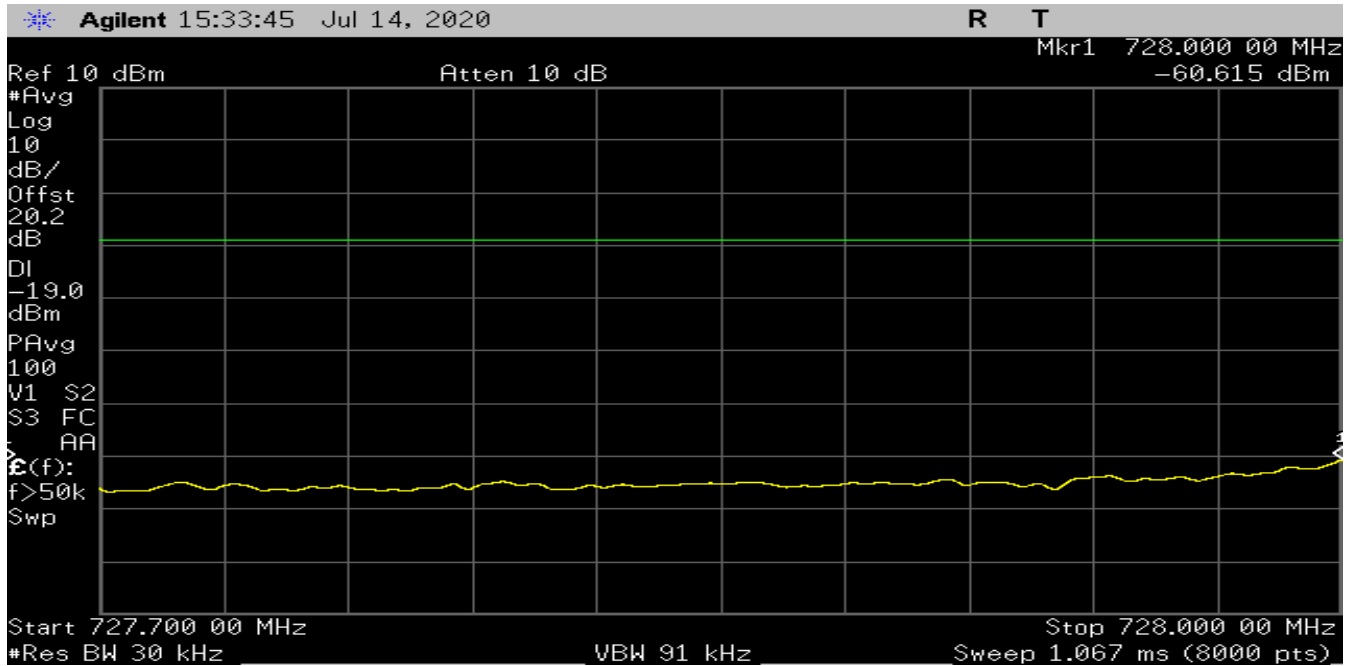
Plot 67 – 1930-1955MHz Band – CDMA Downlink Upper Band Edge



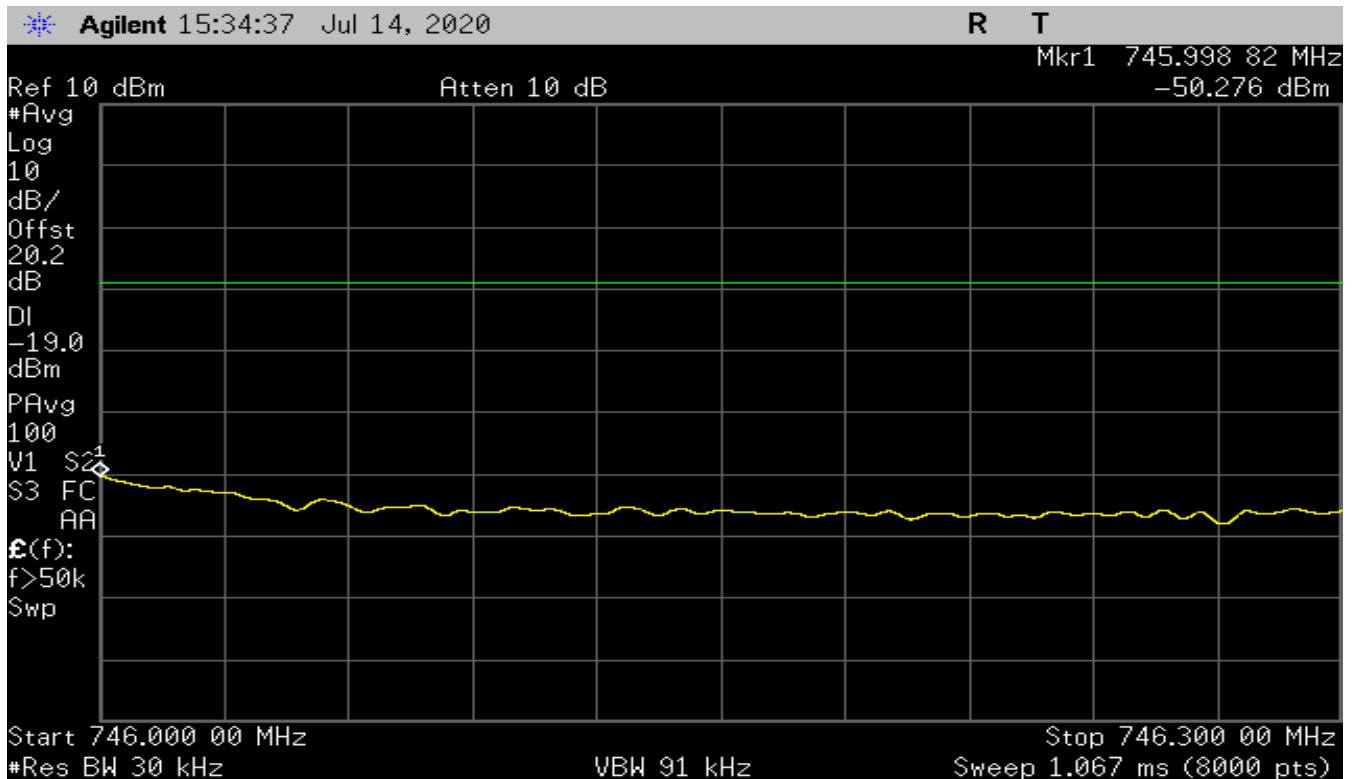
Plot 68 – 2110-2155MHz Band – CDMA Downlink Lower Band Edge



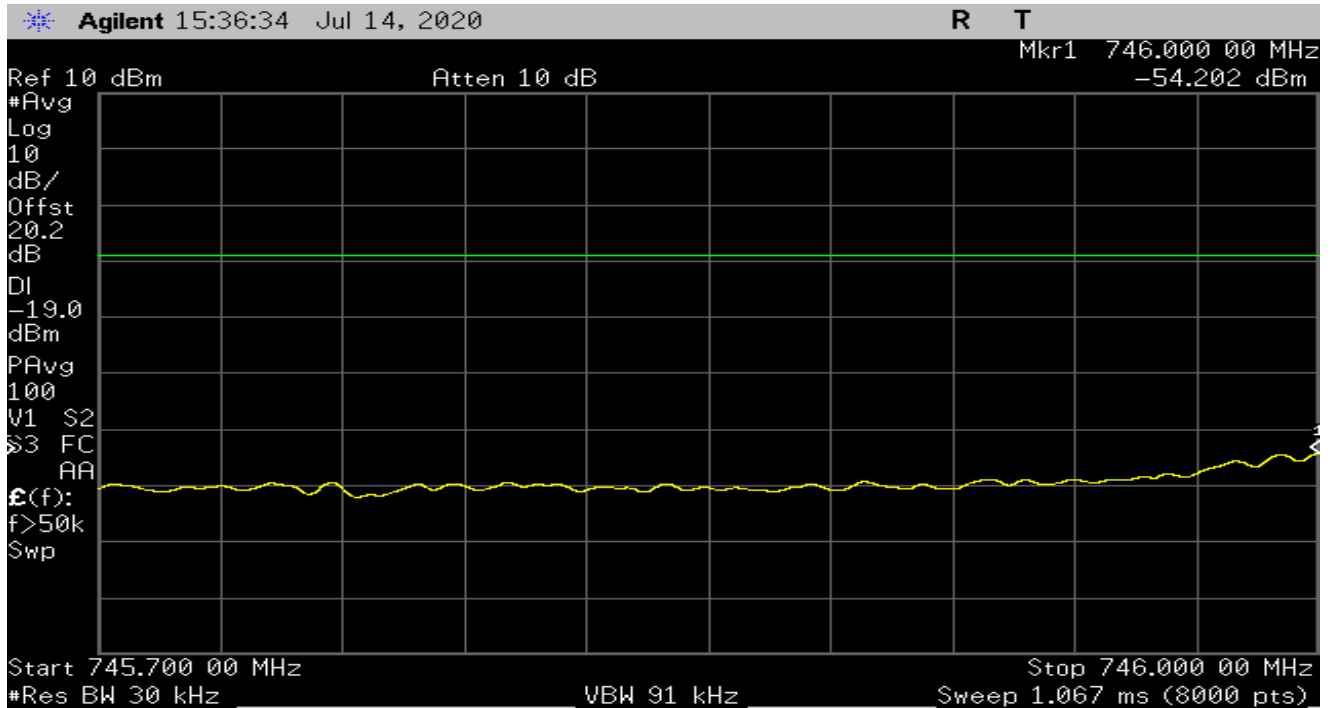
Plot 69 – 2110-2155MHz Band – CDMA Downlink Upper Band Edge



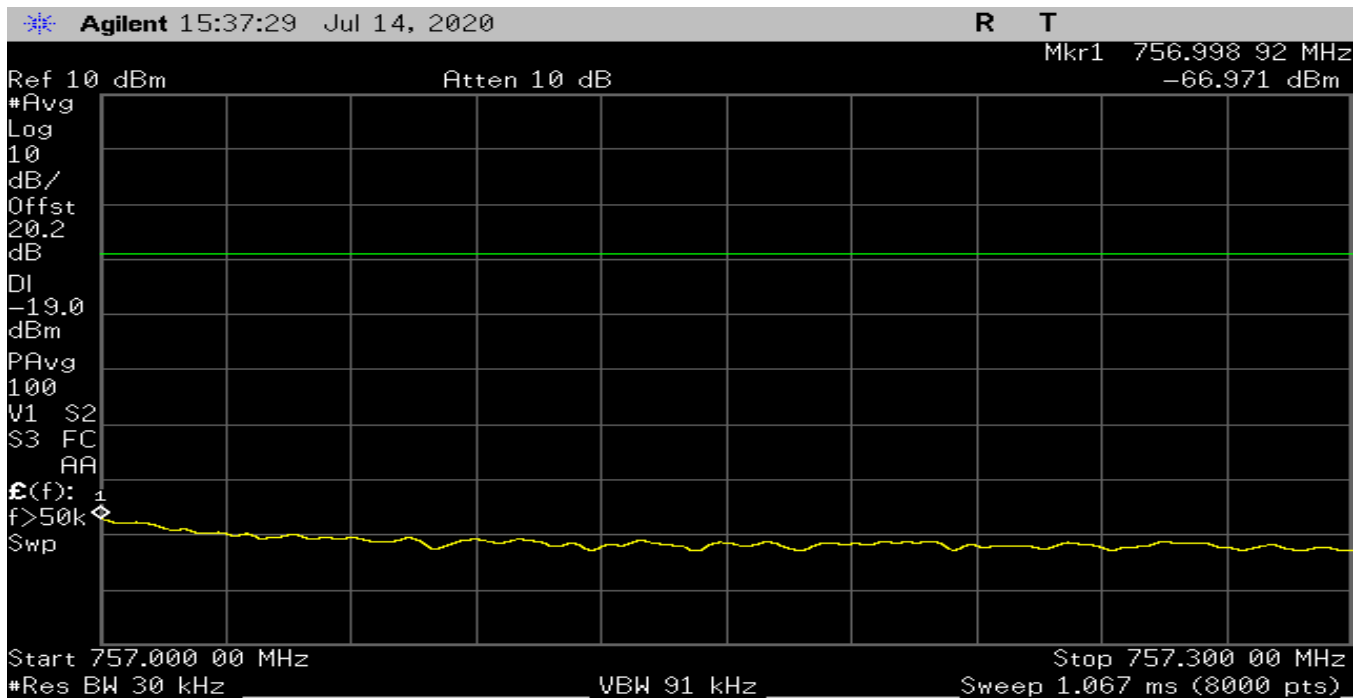
Plot 70 – 728-746MHz Band – LTE Downlink Lower Band Edge



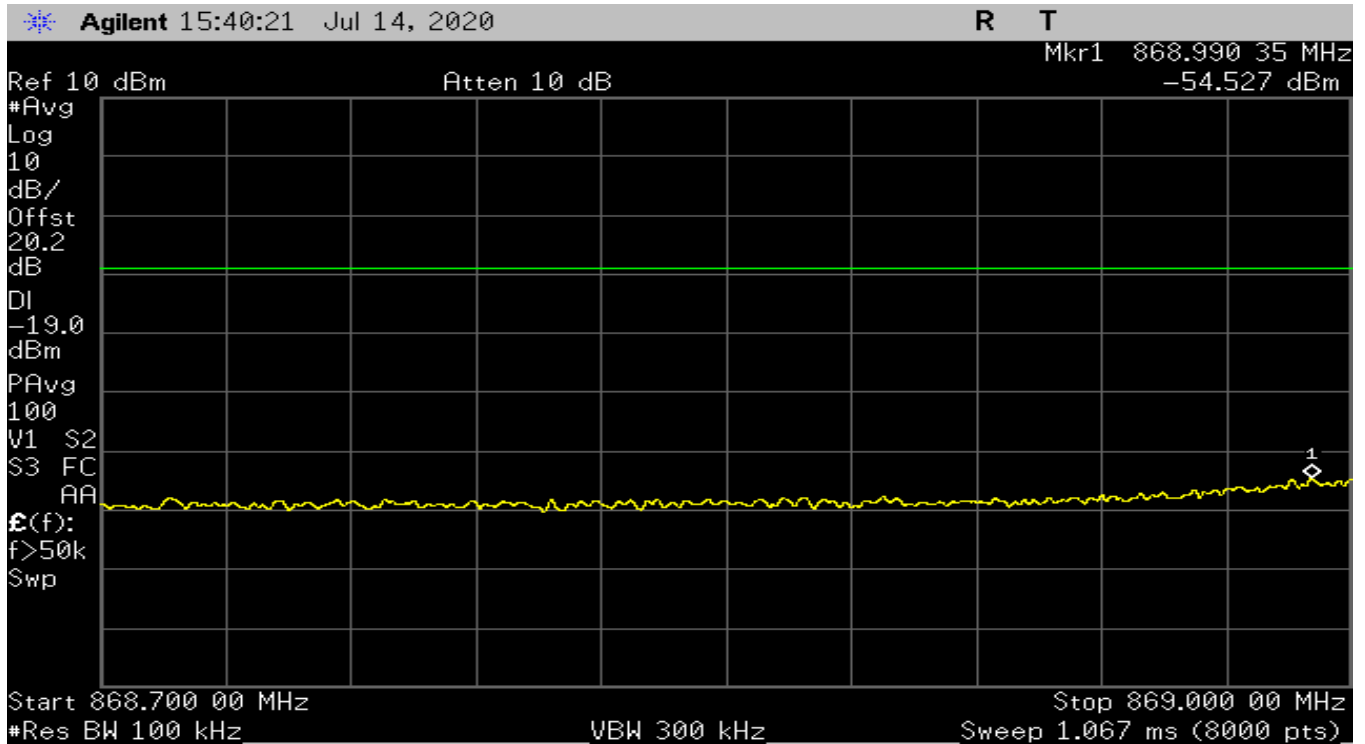
Plot 71 – 728-746MHz Band – LTE Downlink Upper Band Edge



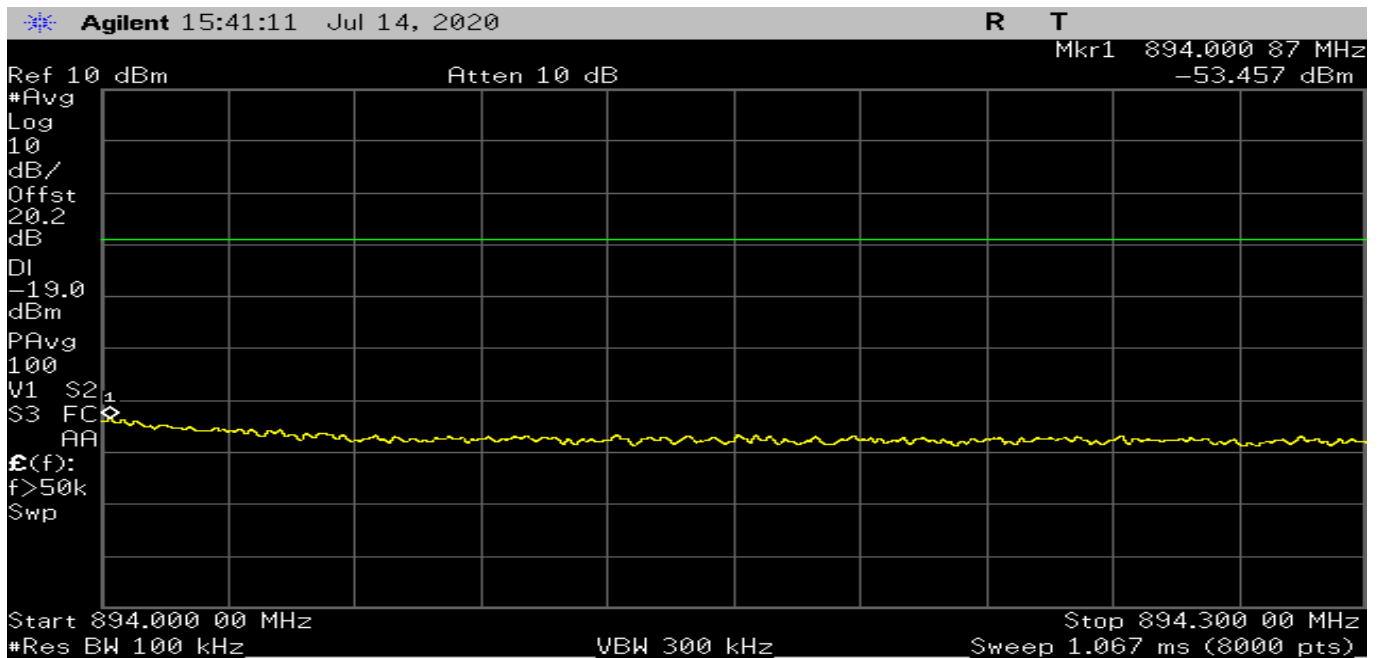
Plot 72 – 746-757MHz Band – LTE Downlink Lower Band Edge



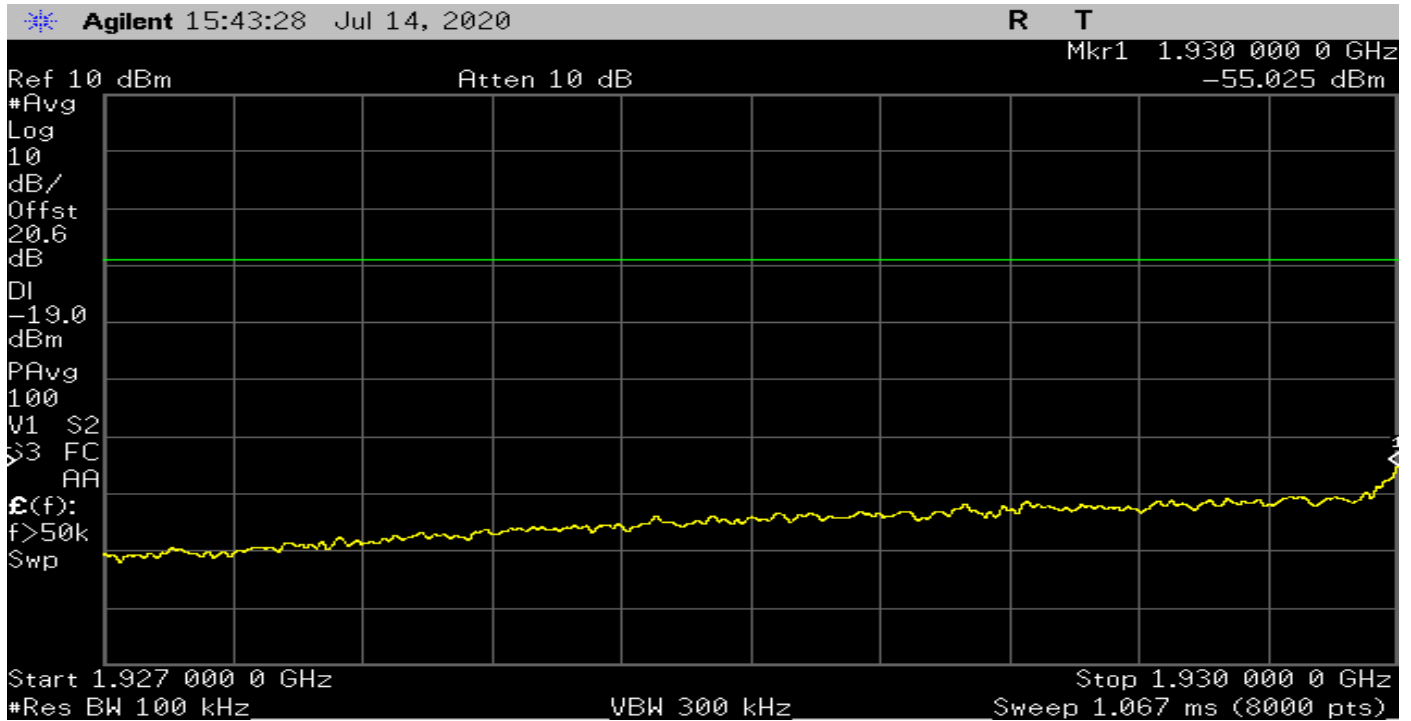
Plot 73 – 746-757MHz Band – LTE Downlink Upper Band Edge



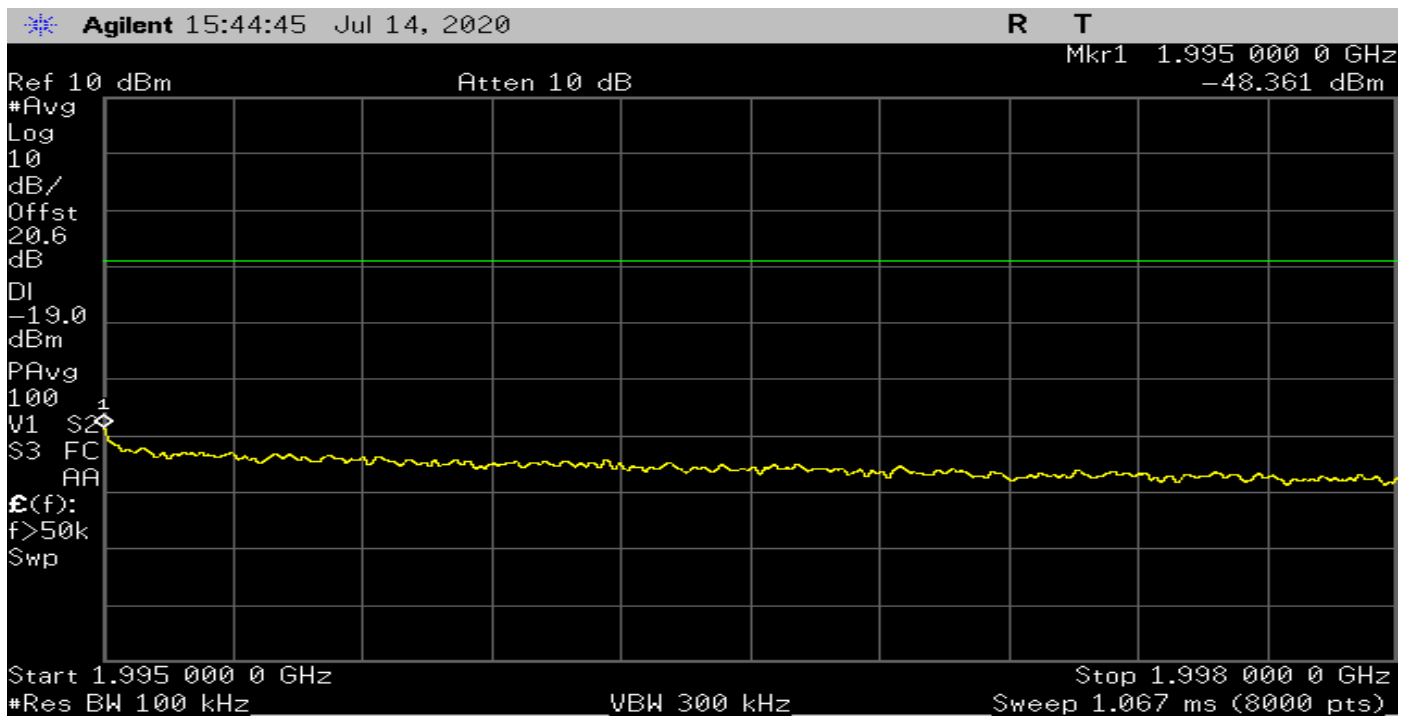
Plot 74 – 869-894MHz Band – LTE Downlink Lower Band Edge



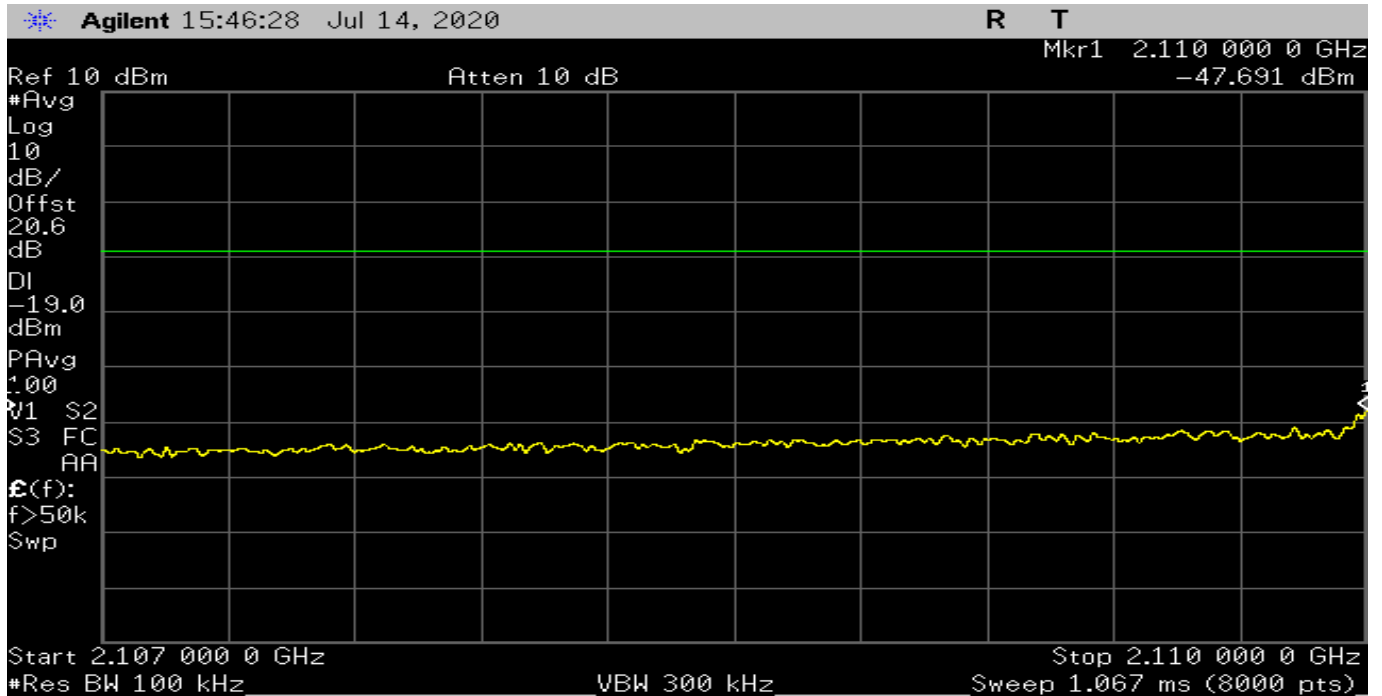
Plot 75 – 869-894MHz Band – LTE Downlink Upper Band Edge



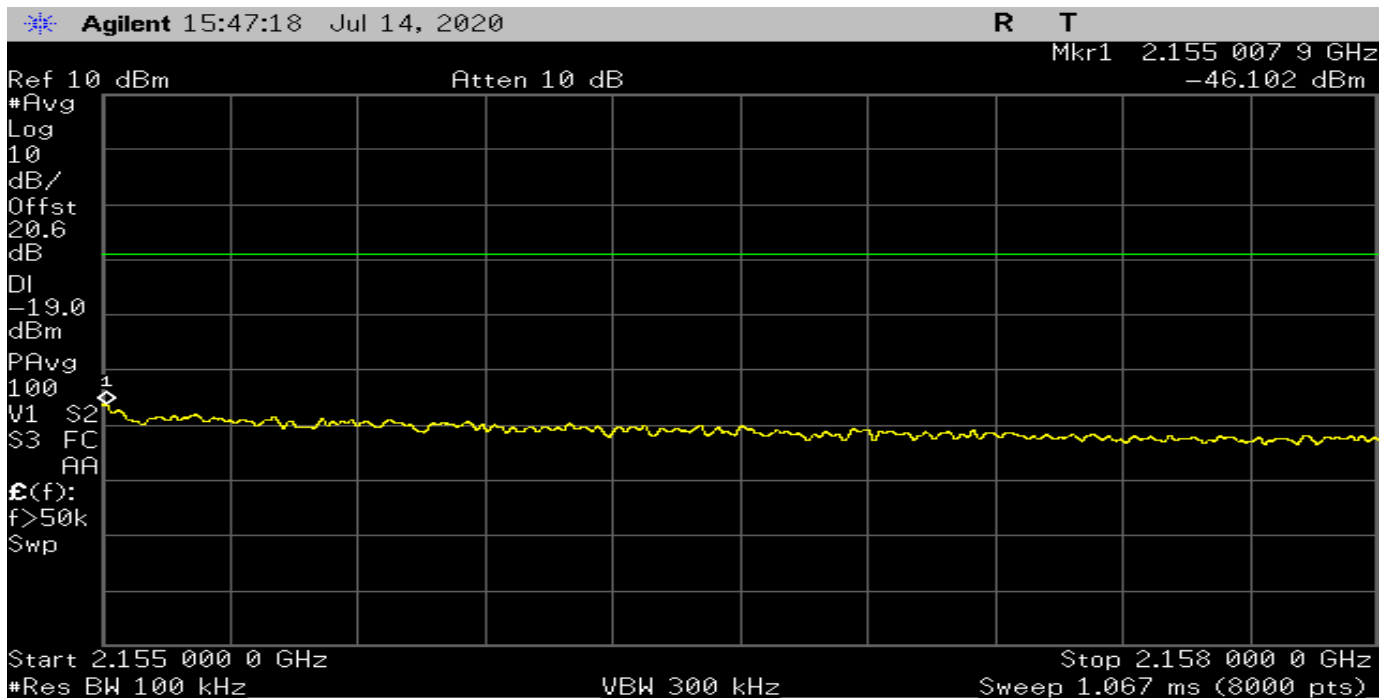
Plot 76 – 1930-1995MHz Band – LTE Downlink Lower Band Edge



Plot 77 – 1930-1995MHz Band – LTE Downlink Upper Band Edge



Plot 78 – 2110-2155MHz Band – LTE Downlink Lower Band Edge



Plot 79 – 2110-2155MHz Band – LTE Downlink Upper Band Edge

5. Conducted Spurious Emissions

Test Requirement(s):	§2.1051 and RSS-131 §4.2	Test Engineer(s):	Sean Eggleston.
Test Results:	Pass	Test Date(s):	July/14/2020

Test Procedures: As required by 47 CFR §2.1051 and RSS-131 §4.2, Spurious emissions measurements were made at antenna terminals in accordance with the procedures of the KDB 935210 D03.

The EUT was connected through an attenuator to a spectrum analyzer. A signal generator was used at the input of the EUT to produce a 4.1MHz AWGN signal at the center of each CMRS operating band. Measurements were made at the low and high frequency of the uplink and downlink operational band. The required minimum resolution bandwidth was used as stated by different rule part (i.e. Part 22, 27, 24 etc.)

Frequency Band (MHz)	Measured Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Margin
698-716	7053	-34.83	-13	-21.83
776-787	775	-33.23	-13	-20.23
824-849	6965	-35.33	-13	-22.33
1710-1755	1554	-34.83	-13	-21.83
1850-1915	19653	-34.33	-13	-21.33

Table 13 – Conducted Spurious Emission Data – Uplink Summary

Frequency Band (MHz)	Measured Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Margin
728-746	6910	-35.5	-13	-22.5
746-757	6893	-35.33	-13	-22.33
869-894	7605	-35.67	-13	-22.67
1930-1995	19940	-34.5	-13	-21.5
2110-2155	20000	-34.5	-13	-21.5

Table 14 – Conducted Spurious Emission Data – Downlink Summary

Per FCC § 27.53 (C) for frequency operating in 746 – 758MHz and 776-788MHz band following additional requirements apply

As per § 27.53 (C)(4) On all frequencies between 763-775MHz and 793-895MHz, by a factor not less than $65 + 10\log(P)$ dB in a 6.25kHz band segment, for mobile and portable stations.

BW correction for 6.25kHz to 10kHz RBW is following

BW correction factor = $10\log B1/B2$

Therefore, BW correction factor = $10\log 6.25/10 = -2.04$

Frequency Range (MHz)	Measured Frequency (MHz)	Measured Level (dBm)	RBW correction Factor (dB)	Corrected Level (dBm)	Limit (dBm)	Margin (dB)
763-775	774.0	-52.92	-2.04	-50.88	-35	-15.88
793-805	793.0	-65.73	-2.04	-67.77	-35	-32.77

Table 15 – Conducted Spurious Emission Data – 776-787MHz Uplink Band Summary

Frequency Range (MHz)	Measured Frequency (MHz)	Measured Level (dBm)	RBW correction Factor (dB)	Corrected Level (dBm)	Limit (dBm)	Margin (dB)
763-775	768.9	-82.47	-2.04	-84.51	-35	-49.51
793-805	794.3	-82.60	-2.04	-84.64	-35	-49.64

Table 16 – Conducted Spurious Emission Data – 746-757MHz Downlink Band Summary

Per FCC § 27.53 (f) for frequency operating in 746 – 763MHz and 775-793MHz emissions in the band 1559-1610MHz shall be limited to -70dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80dBW EIRP for discrete emissions of less than 700Hz bandwidth.

Since the limit is in EIRP, the MSCL (Cable Loss) information supplied by manufacturer is added along with the bandwidth correction factor.

BW correction for 700Hz to 10kHz RBW is following

$$\text{BW correction factor} = 10\log B1/B2$$

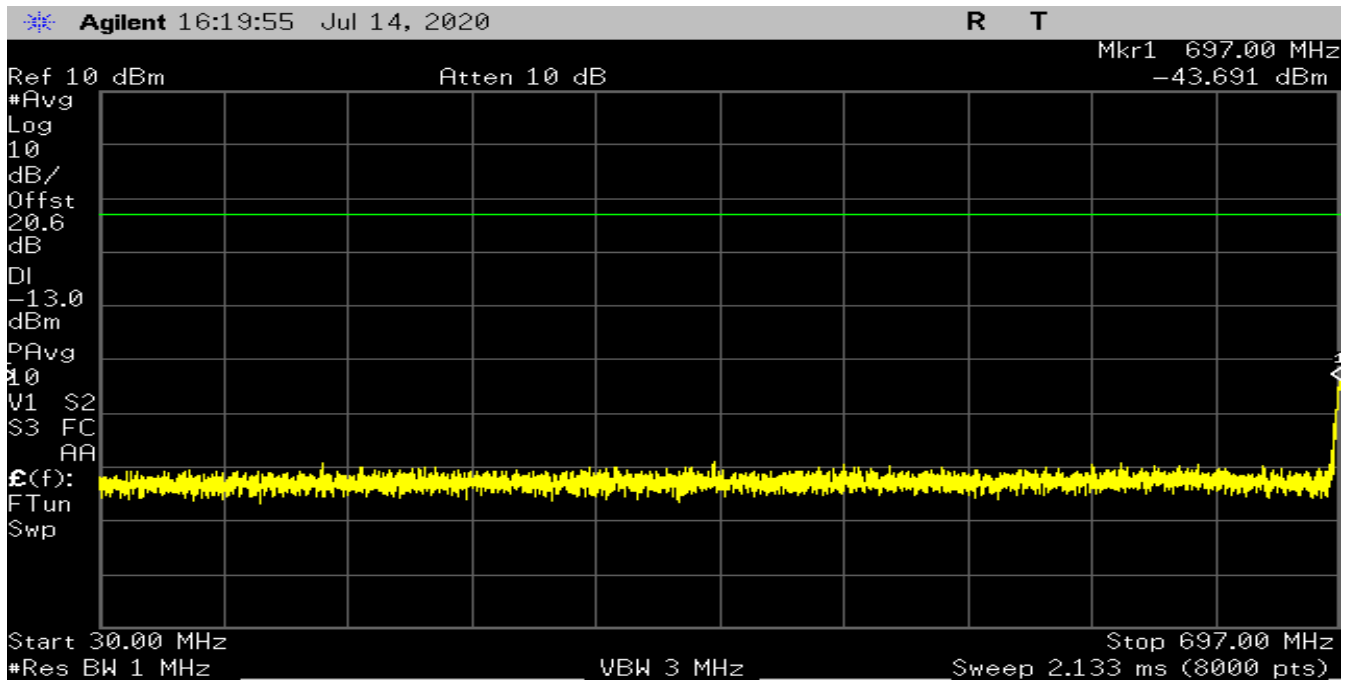
$$\text{Therefore, BW correction factor} = 10\log 700/1000 = -11.55$$

Frequency Range (MHz)	Measured Frequency (MHz)	Measured Level (dBm)	RBW correction Factor (dB)	Gain/Loss (dB) from Antenna Kitting Info (dB)	Corrected Level (dBm)	Limit (dBm)	Margin (dB)
1559-1610 (Wideband)	1562.99	-61.44	0	10.1	-51.34	-40	-11.34
1559-1610 (Narrowband)	1592.15	-82.93	-11.55	10.1	-84.38	-50	-34.38

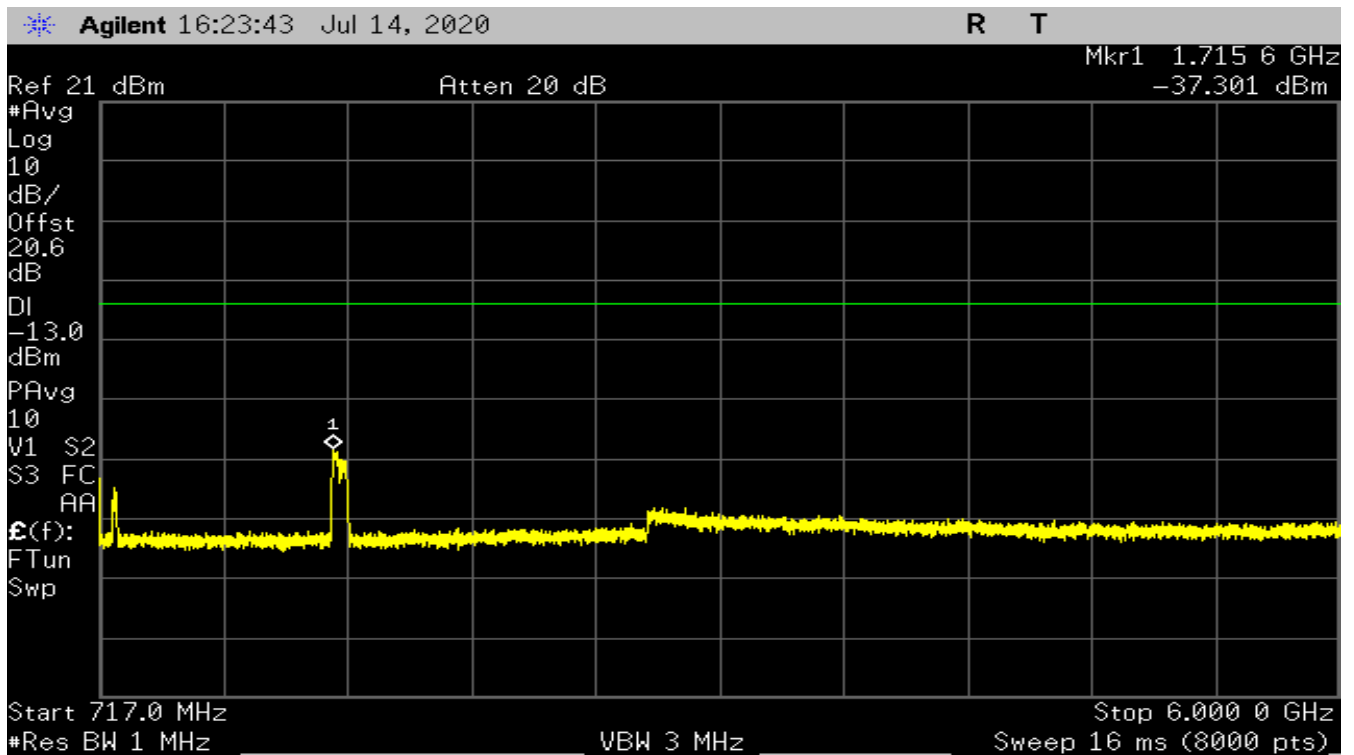
Table 17 – Conducted Spurious Emission Data – 776-787MHz Uplink Band Summary

Frequency Range (MHz)	Measured Frequency (MHz)	Measured Level (dBm)	RBW correction Factor (dB)	MSCL (dB)	Corrected Level (dBm)	Limit (dBm)	Margin (dB)
1559-1610 (Wideband)	1560.79	-61.66	0	10.1	-51.56	-40	-11.56
1559-1610 (Narrowband)	1586.92	-83.0	-11.55	10.1	-84.45	-50	-34.45

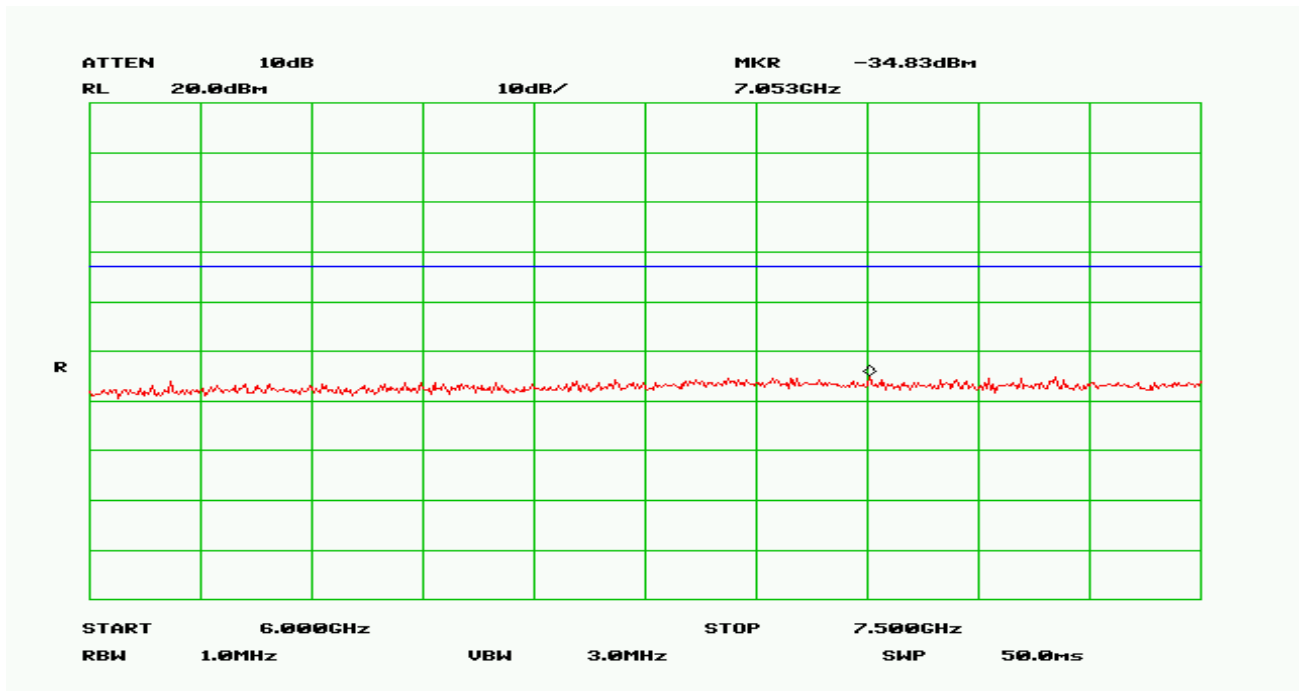
Table 18 – Conducted Spurious Emission Data – 746-757MHz Downlink Band Summary



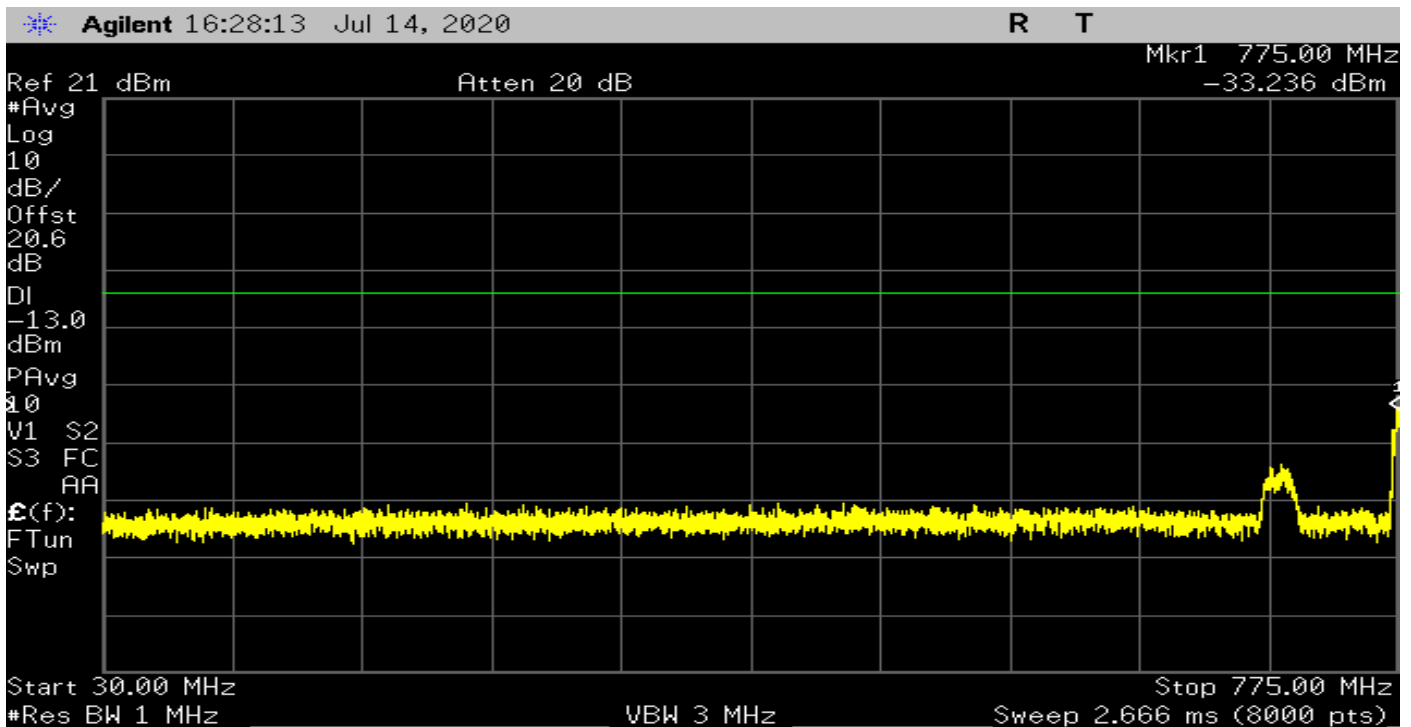
Plot 80 – 698-716MHz Band – Uplink



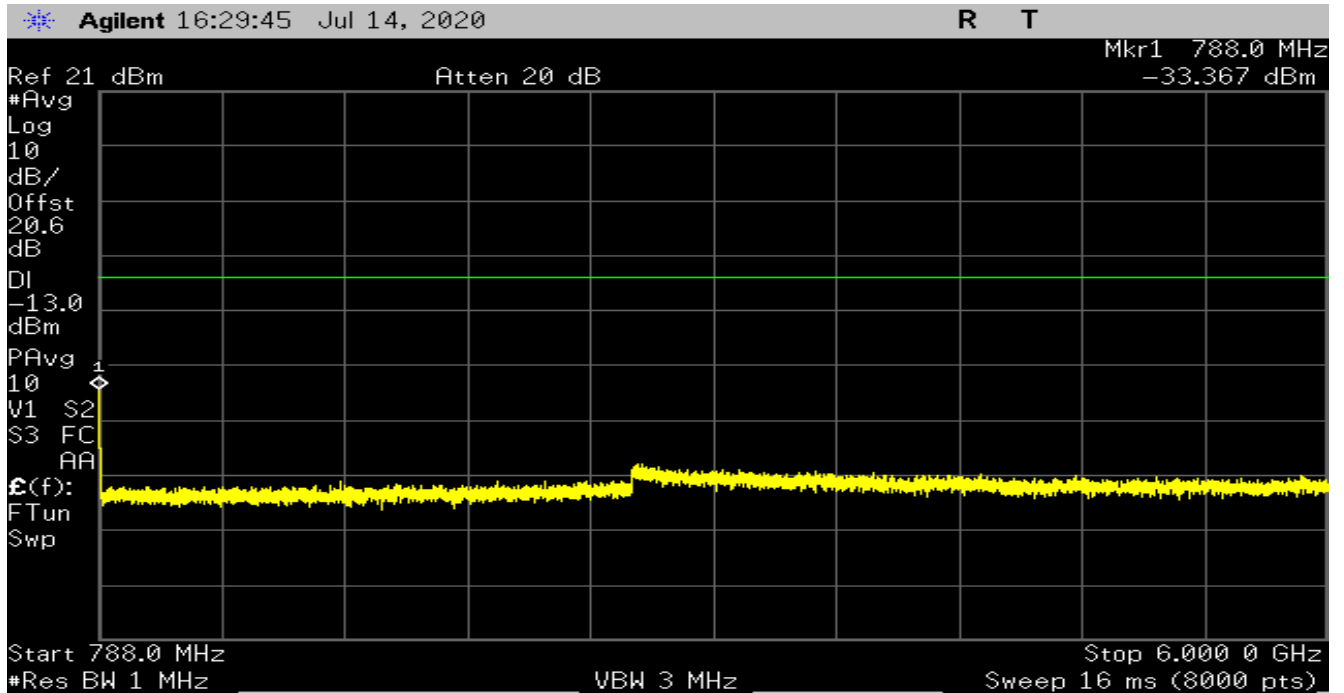
Plot 81 - 698-716MHz Band – Uplink



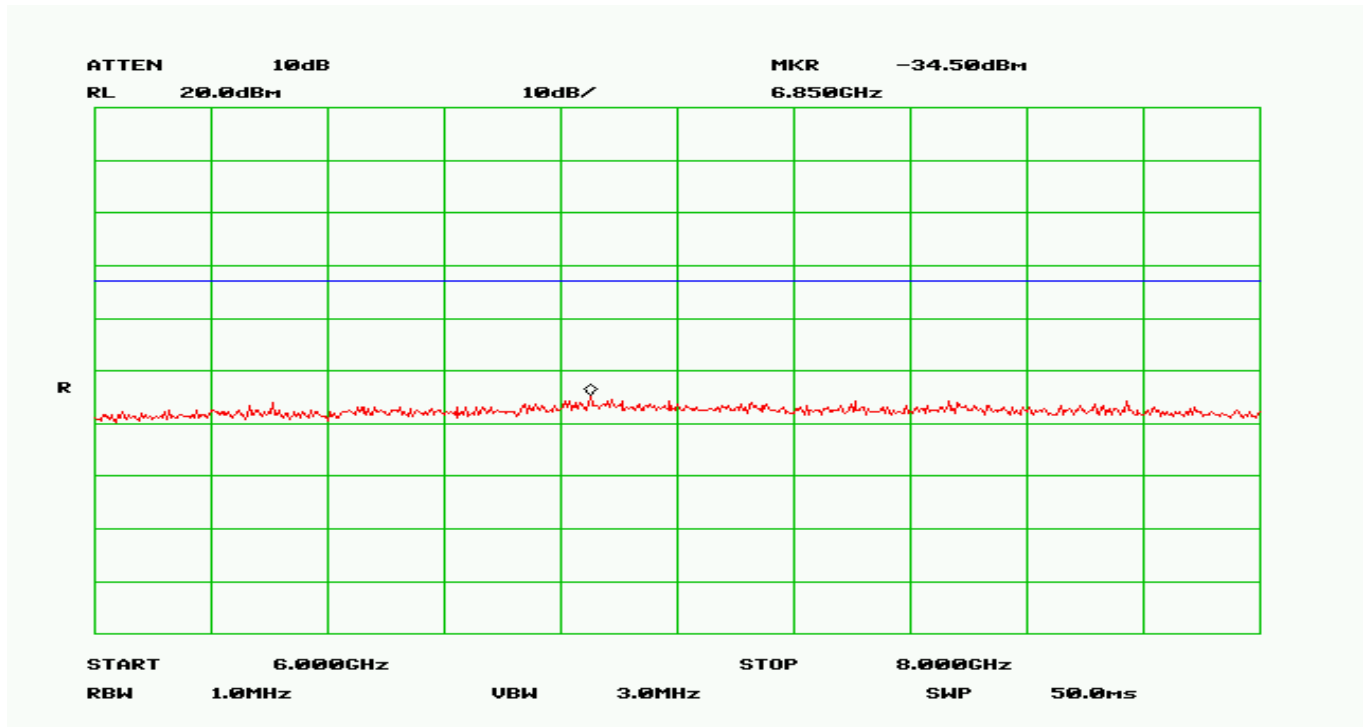
Plot 82 – 698-716MHz Band – Uplink



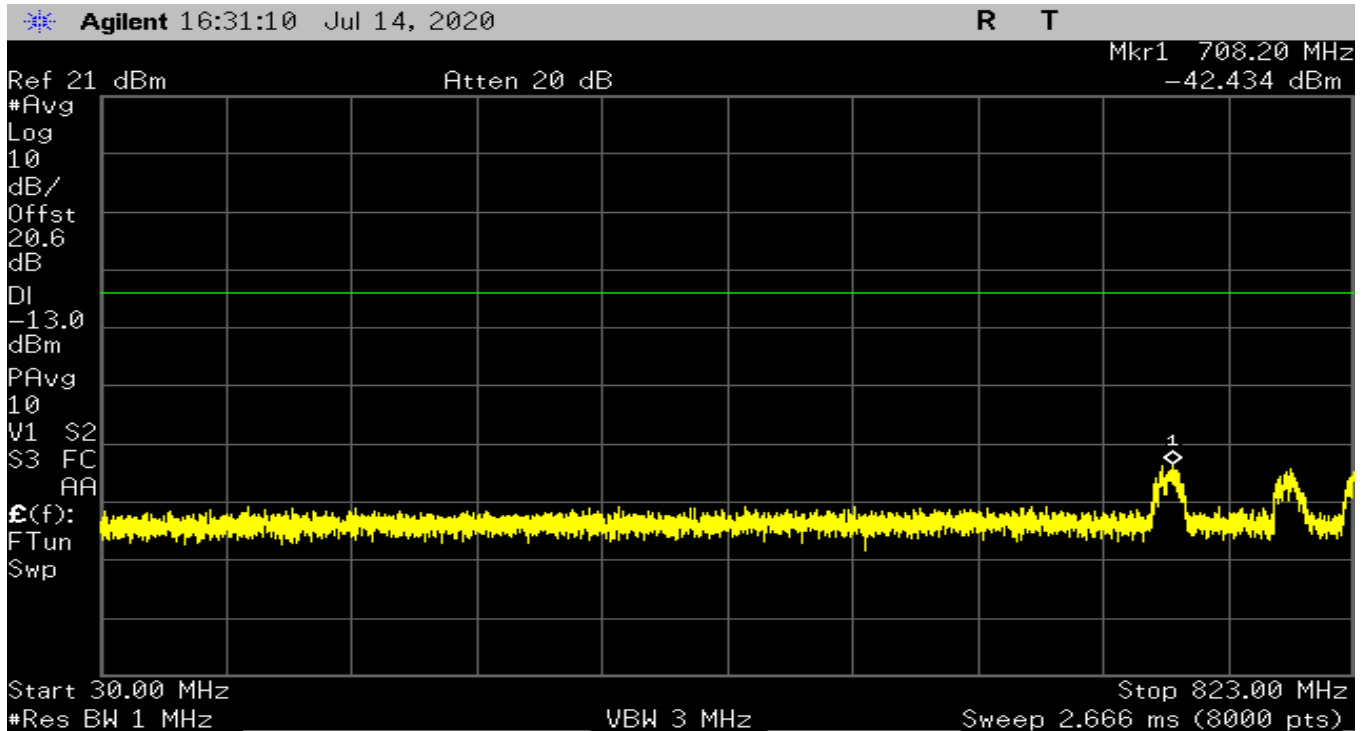
Plot 83 – 776-787MHz Band – Uplink



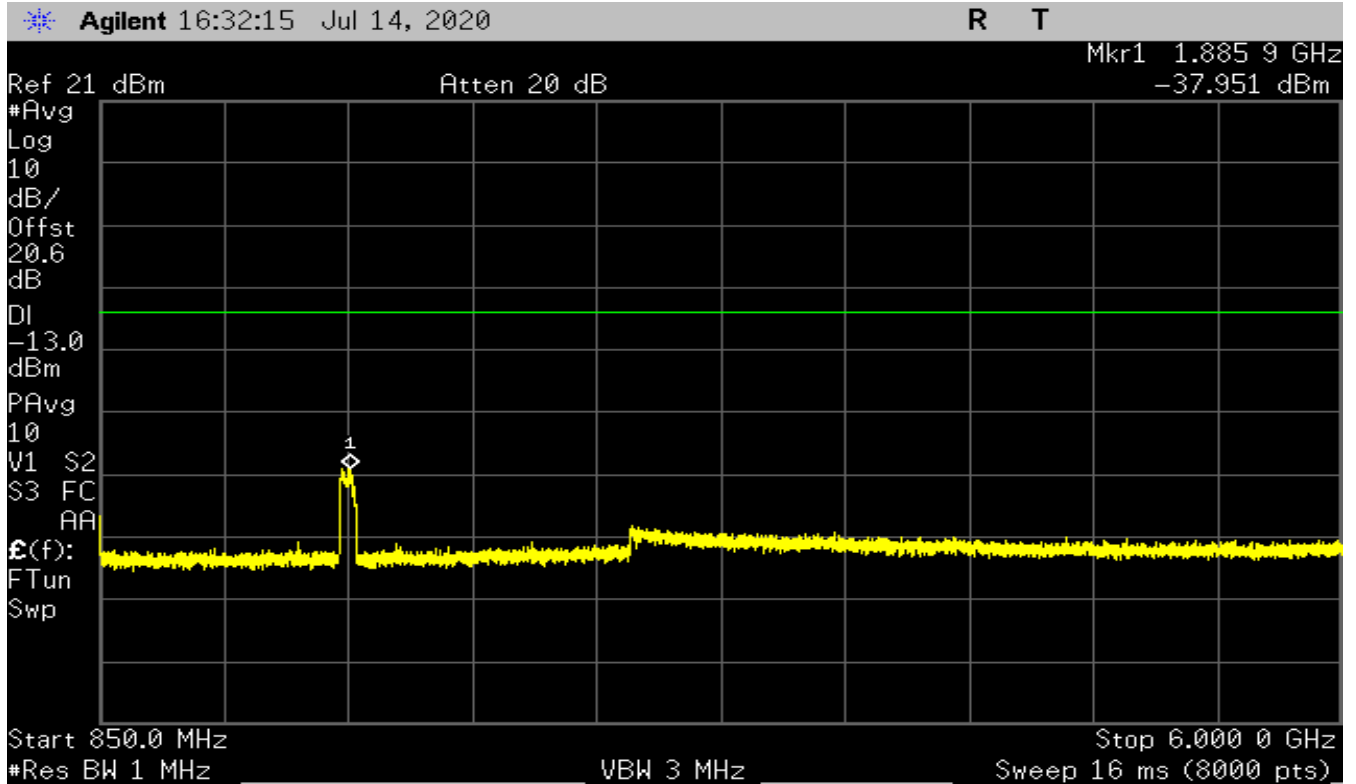
Plot 84 – 776-787MHz Band – Uplink



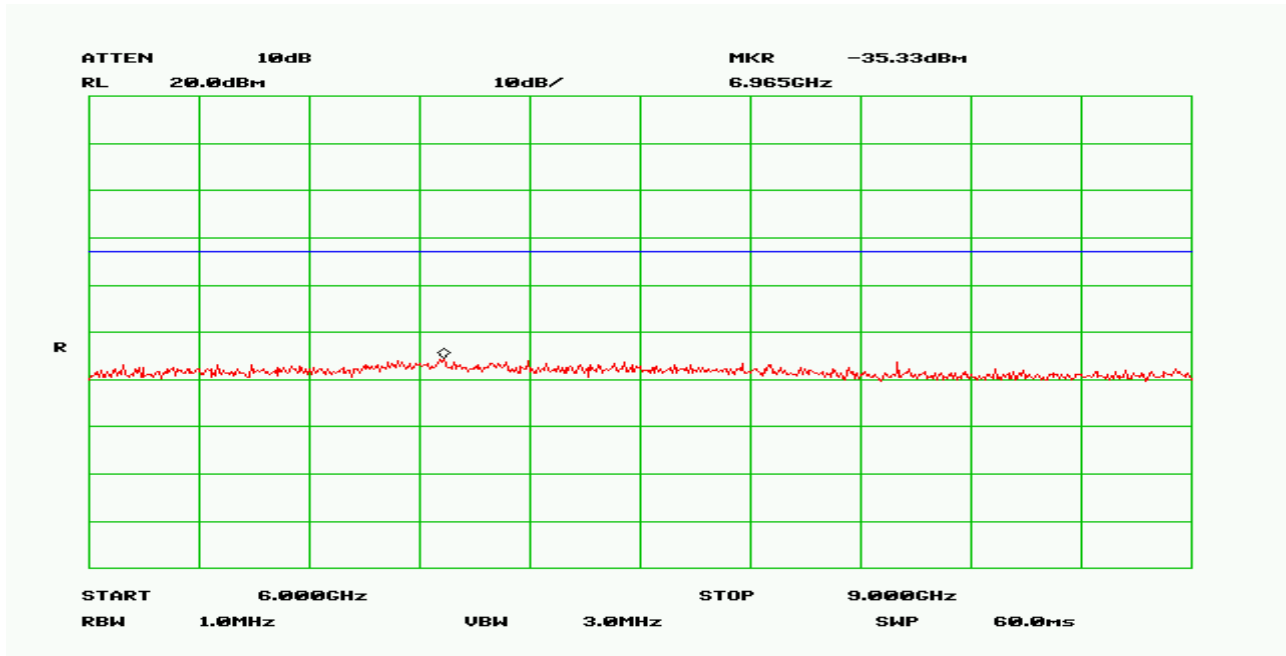
Plot 85 – 776-787MHz Band – Uplink



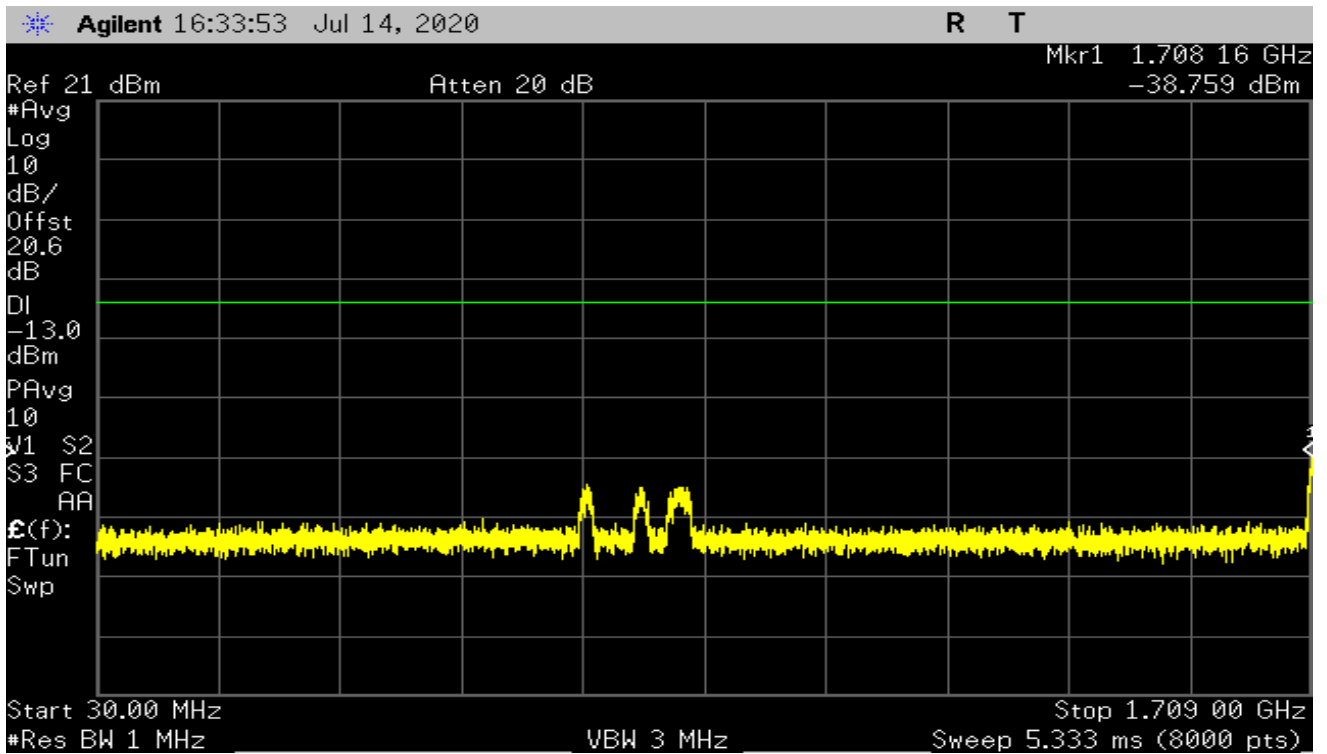
Plot 86 – 824-849MHz Band – Uplink



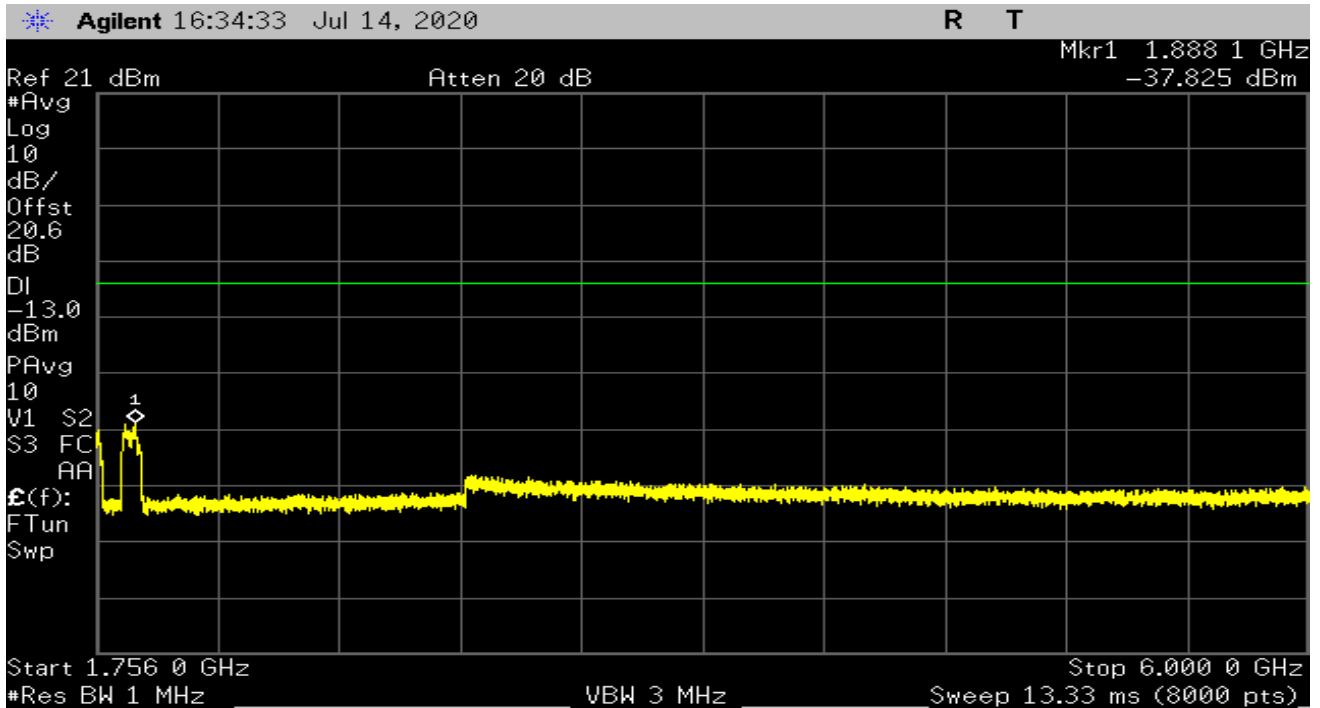
Plot 87 – 824-849MHz Band –Uplink



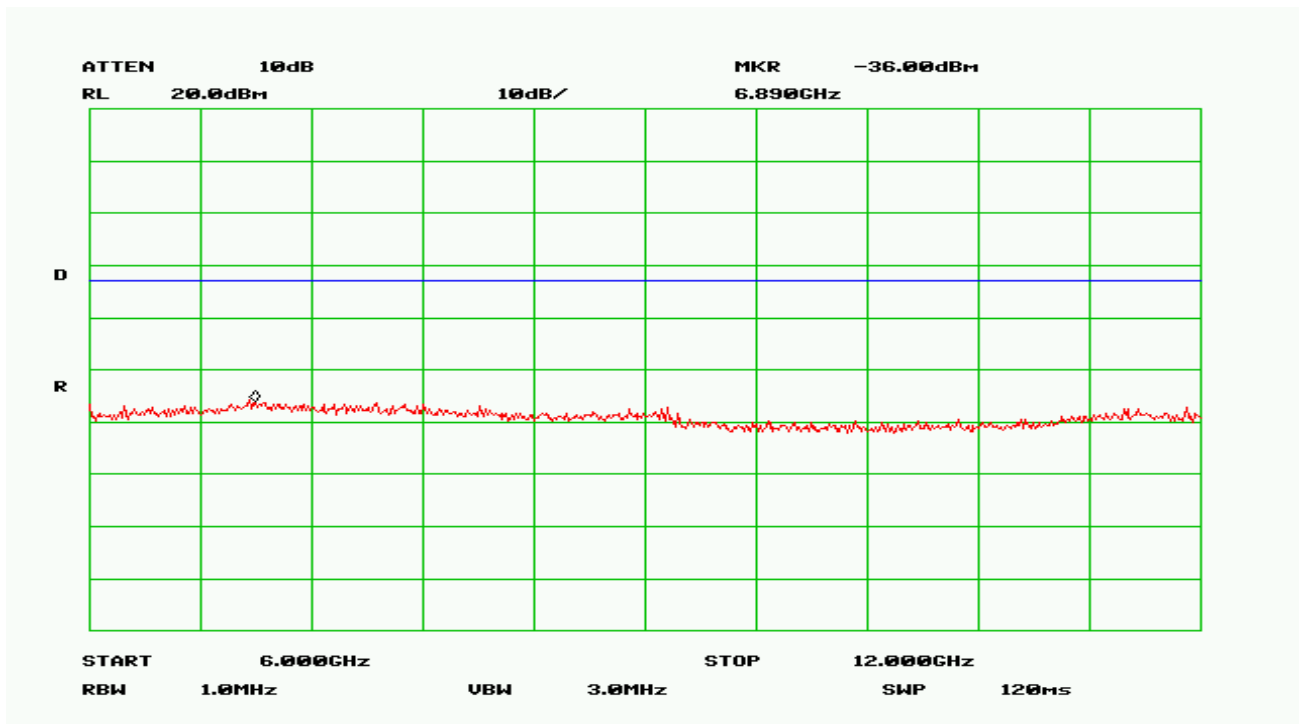
Plot 88 - 824-849MHz Band – Uplink



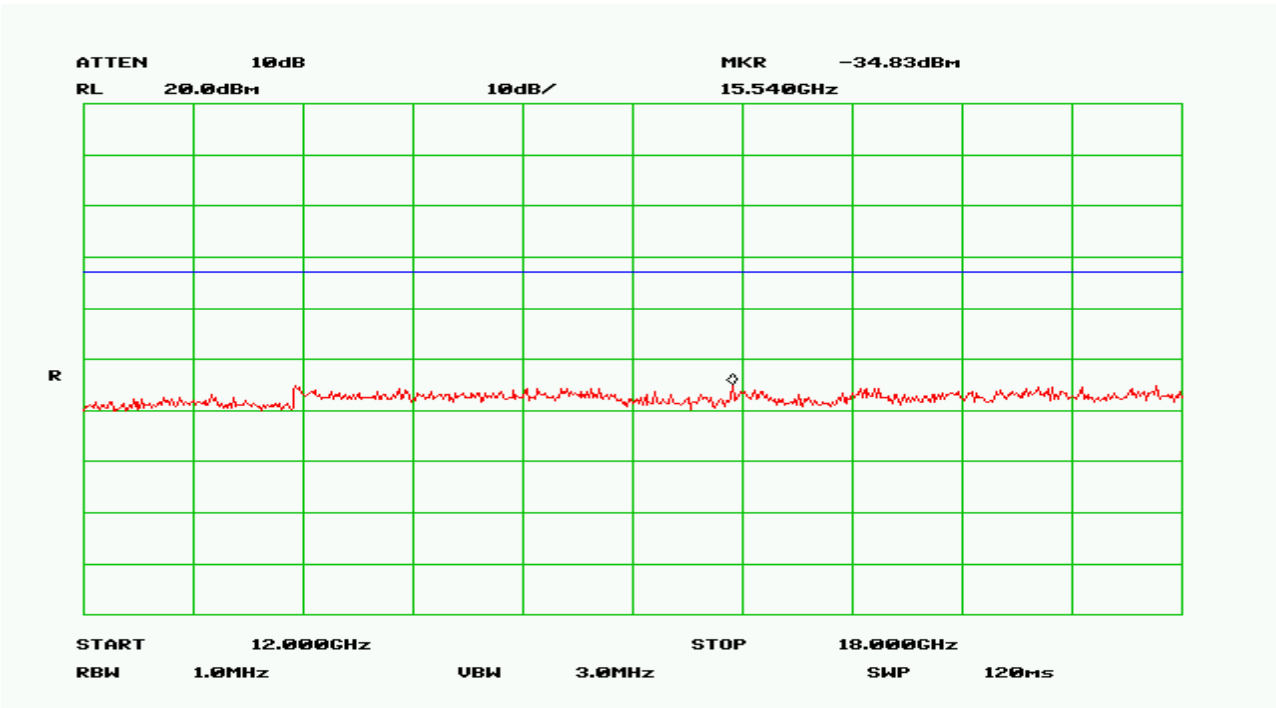
Plot 89 – 1710-1755MHz Band – Uplink



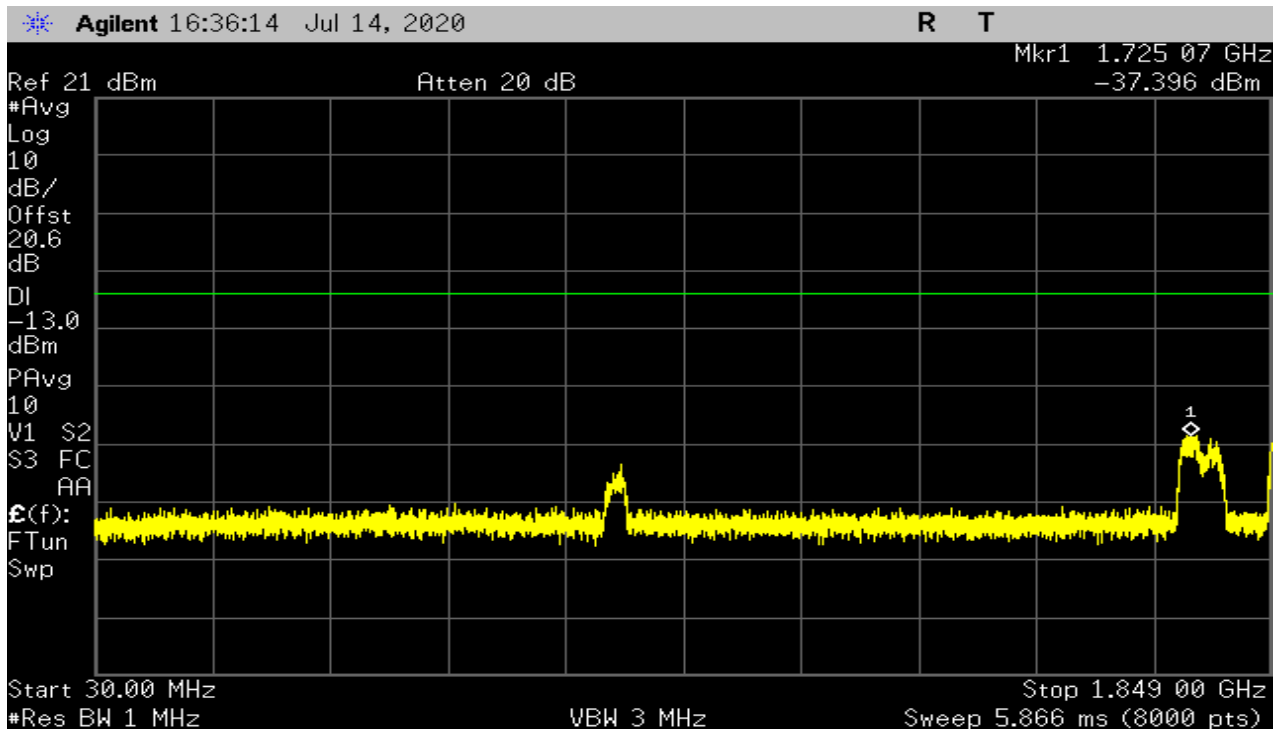
Plot 90 – 1710-1755MHz Band – Uplink



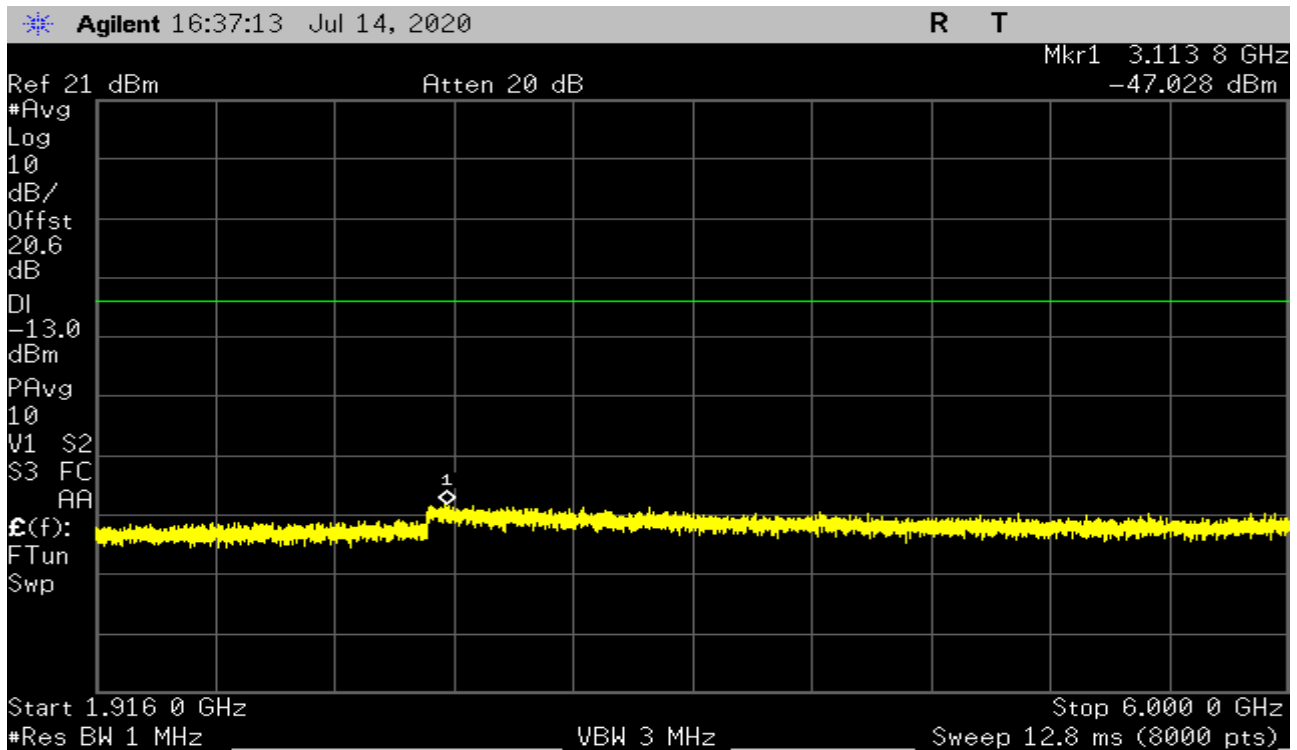
Plot 91 - 1710-1755MHz Band – Uplink



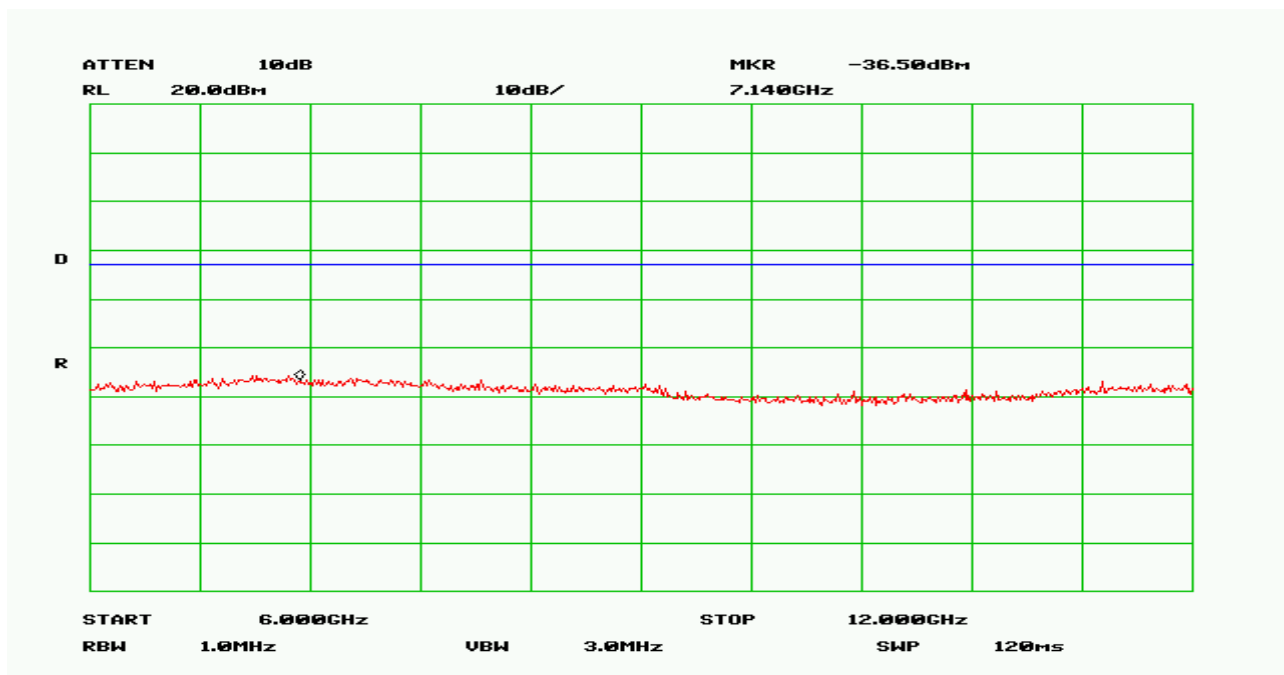
Plot 92 - 1710-1755MHz Band – Uplink



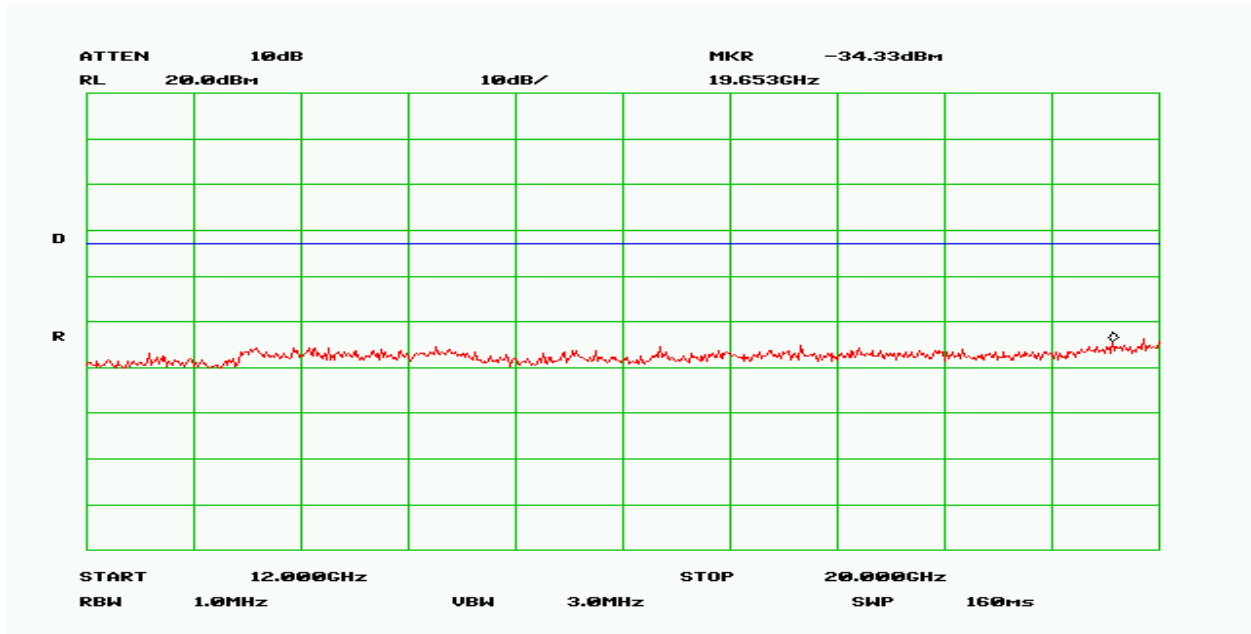
Plot 93 – 1850-1915MHz Band – Uplink



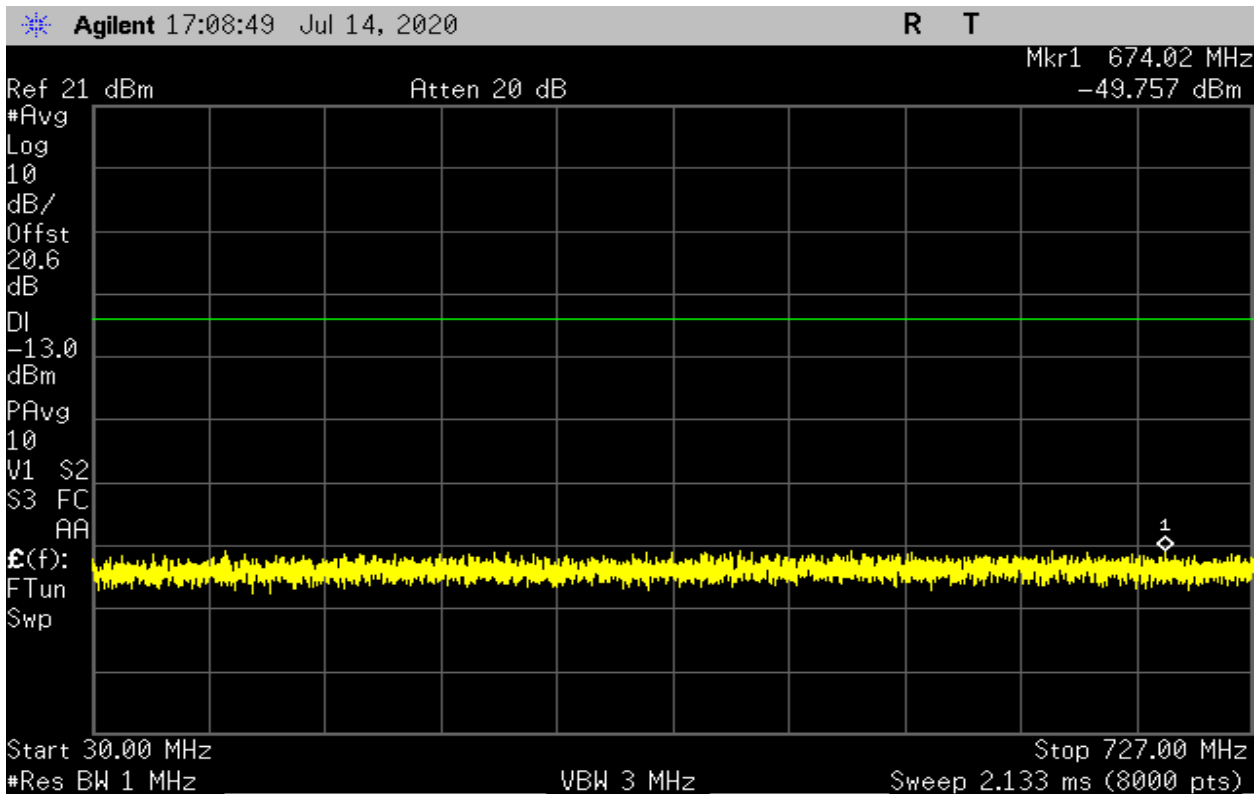
Plot 94 – 1850-1915MHz Band – Uplink



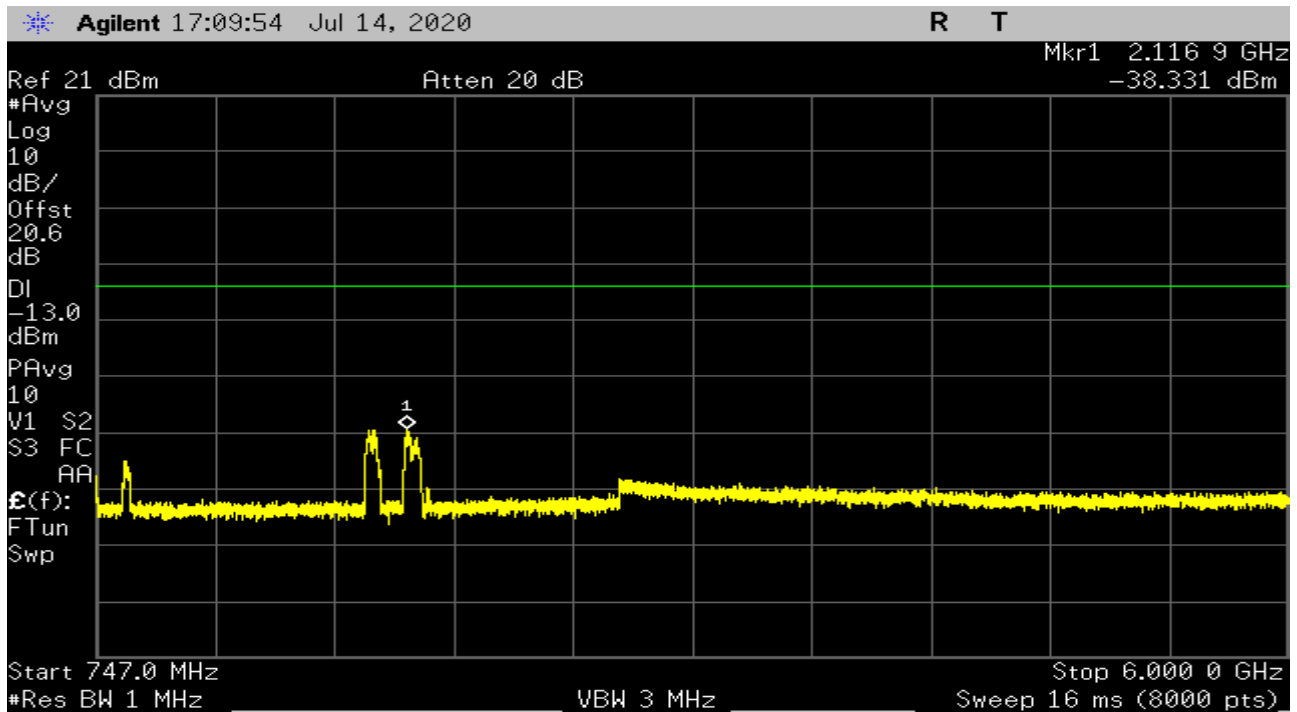
Plot 95 – 1850-1915MHz Band – Uplink



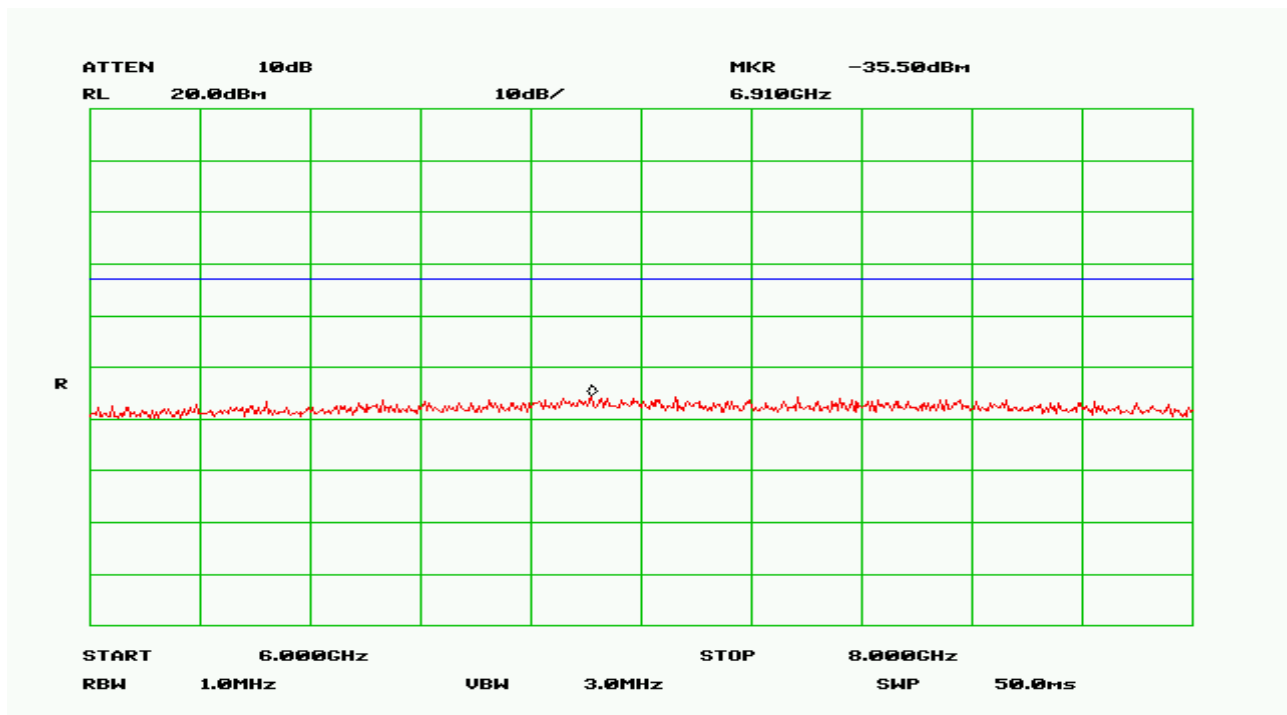
Plot 96 – 1850-1915MHz Band – Uplink



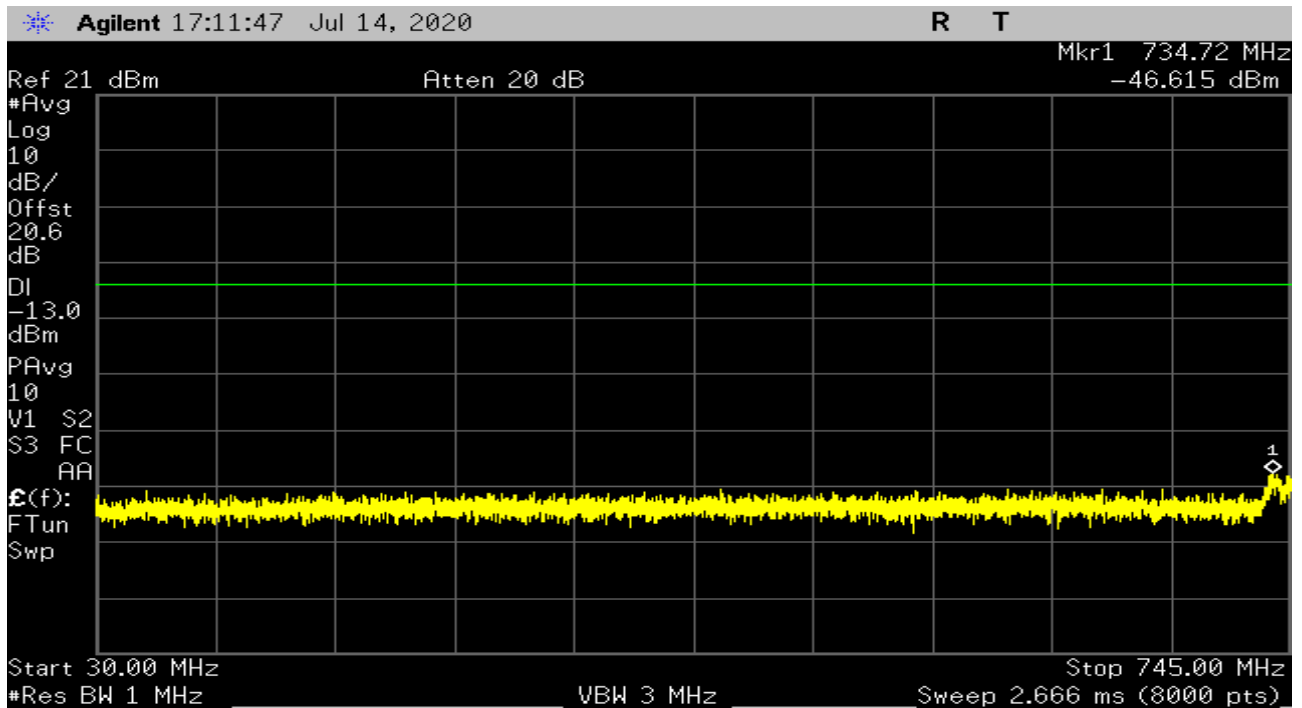
Plot 97 – 728-746MHz Band – Downlink



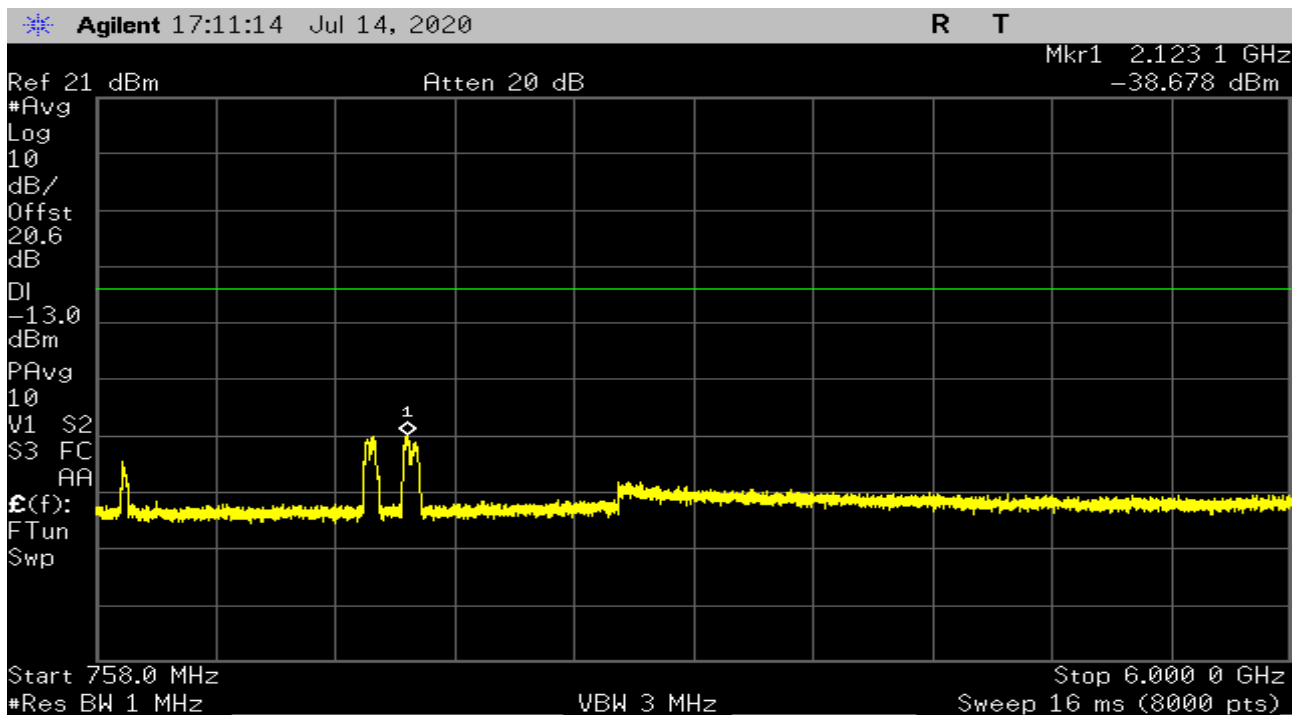
Plot 98 – 728-746MHz Band – Downlink



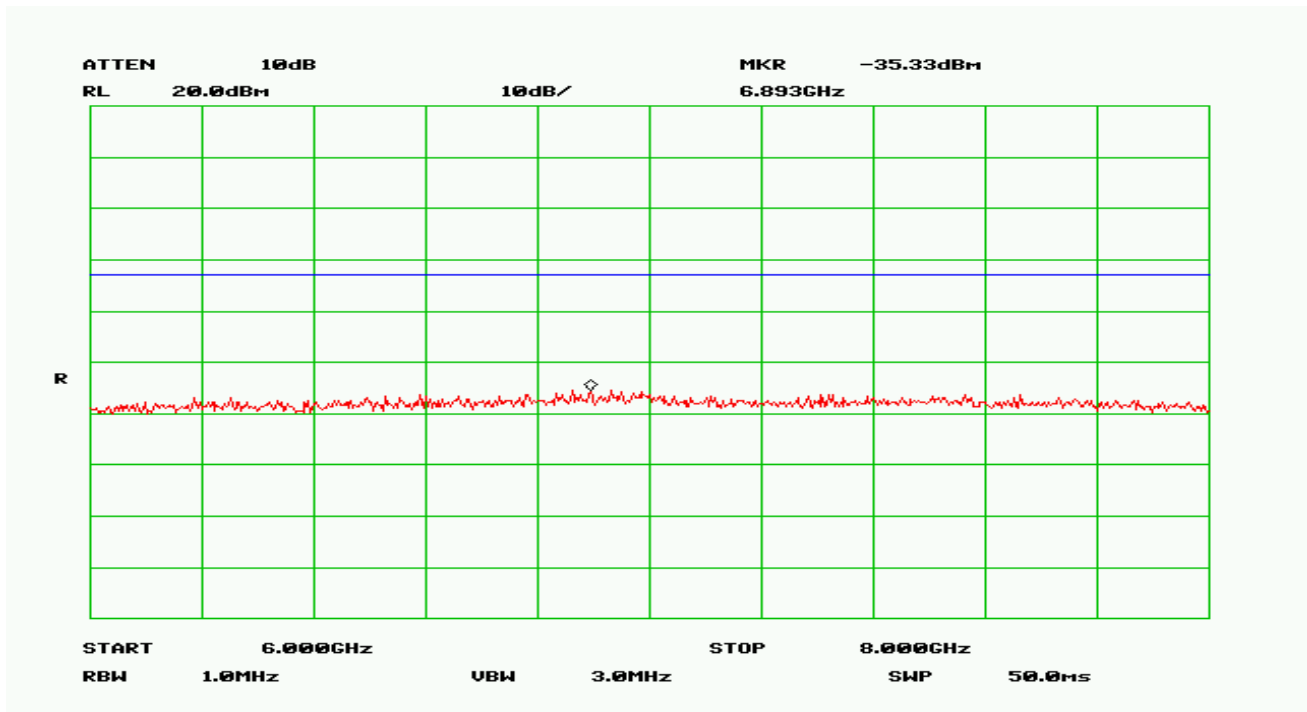
Plot 99 – 728-746MHz Band – Downlink



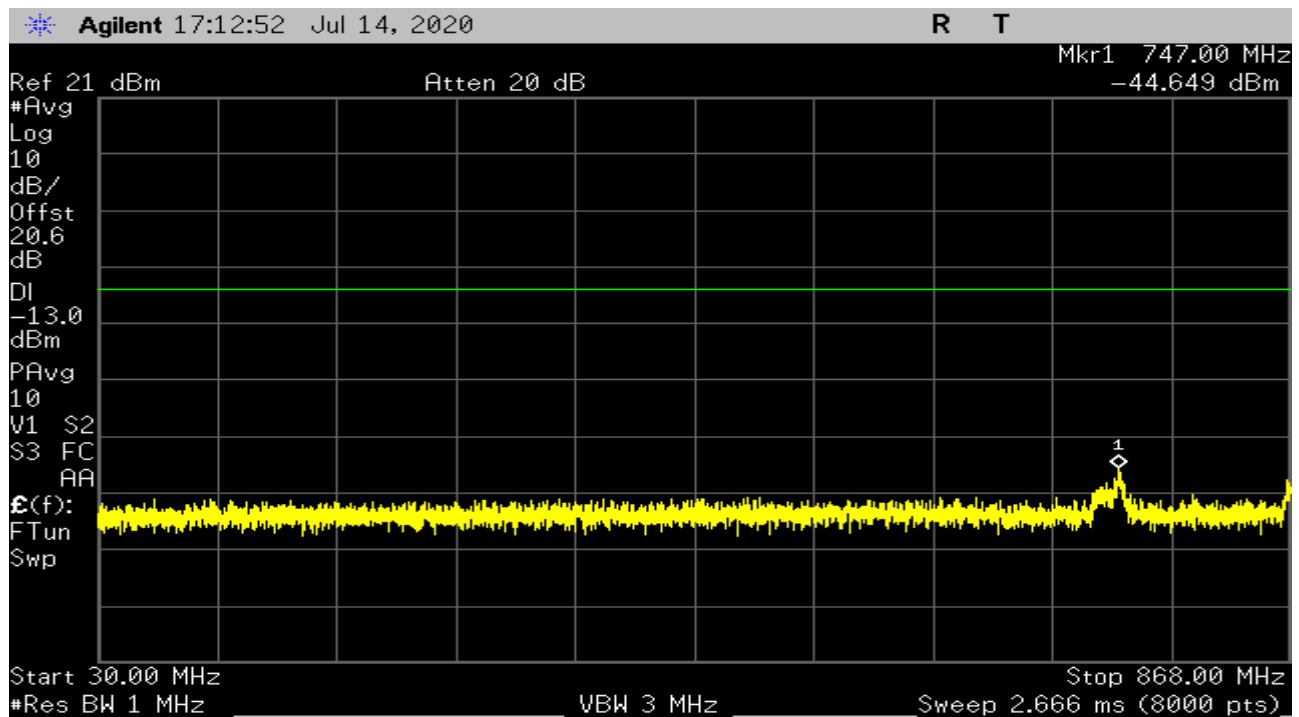
Plot 100 – 746-757MHz Band – Downlink



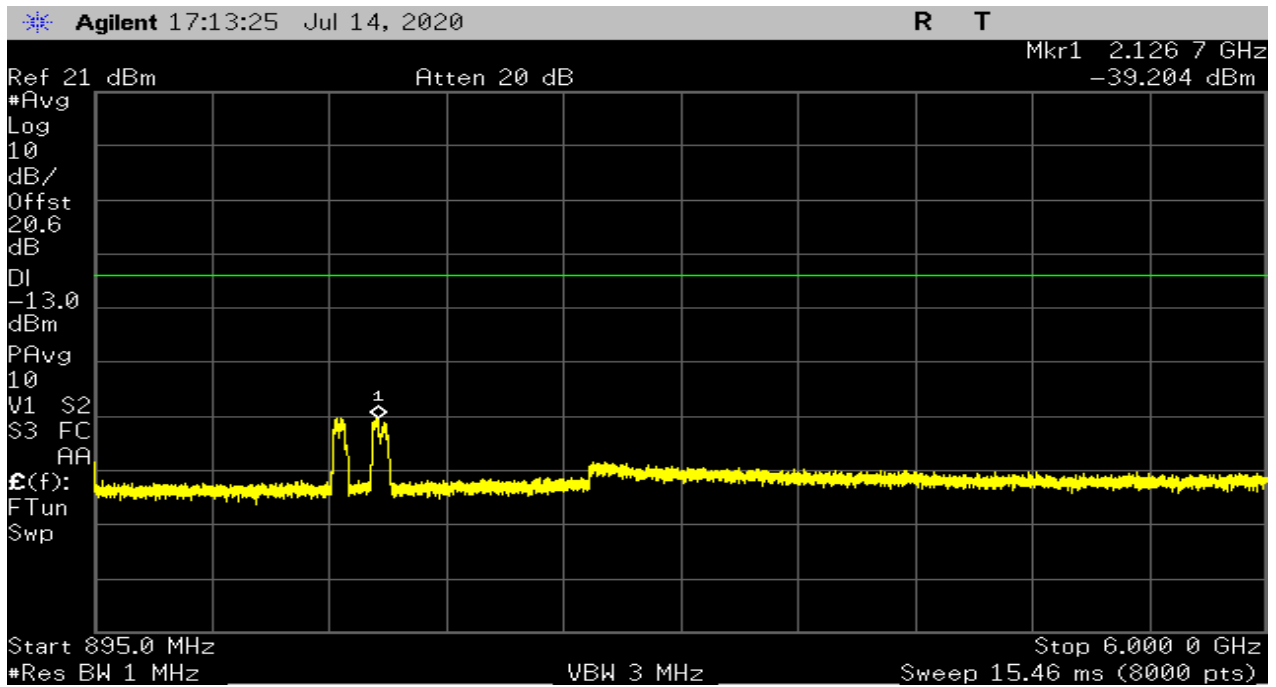
Plot 101 – 746-757MHz Band – Downlink



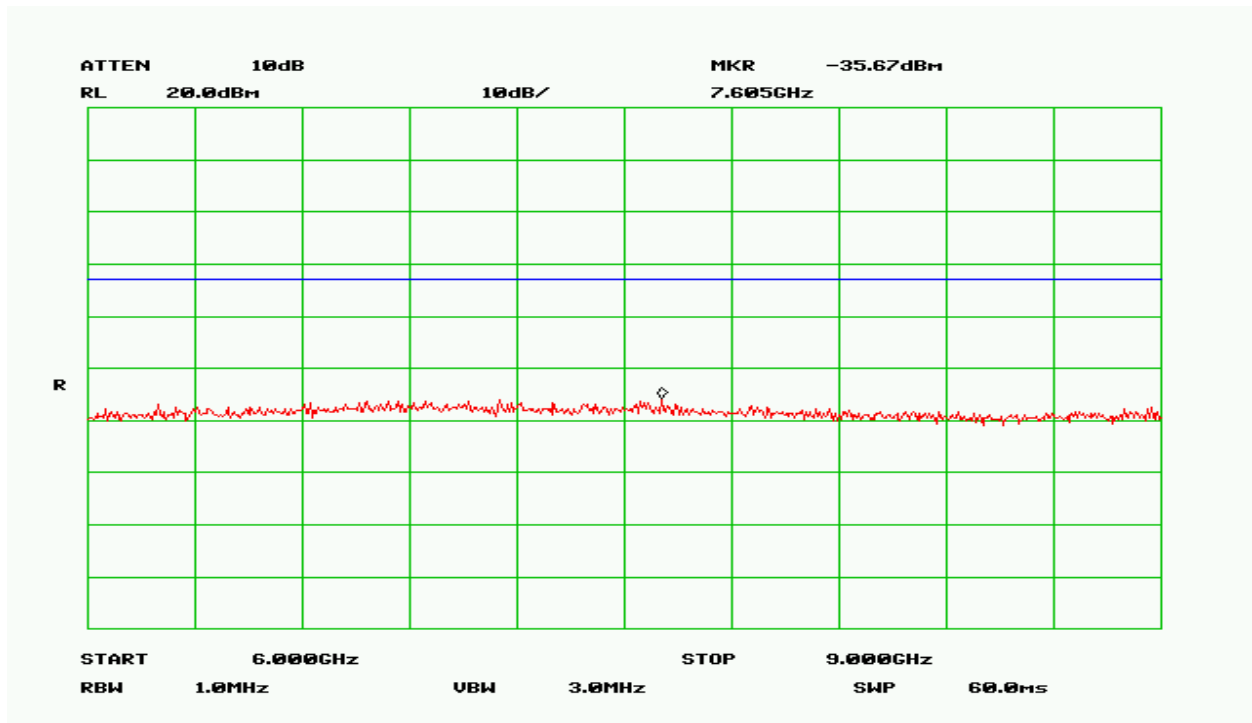
Plot 102 – 746-757MHz Band – Downlink



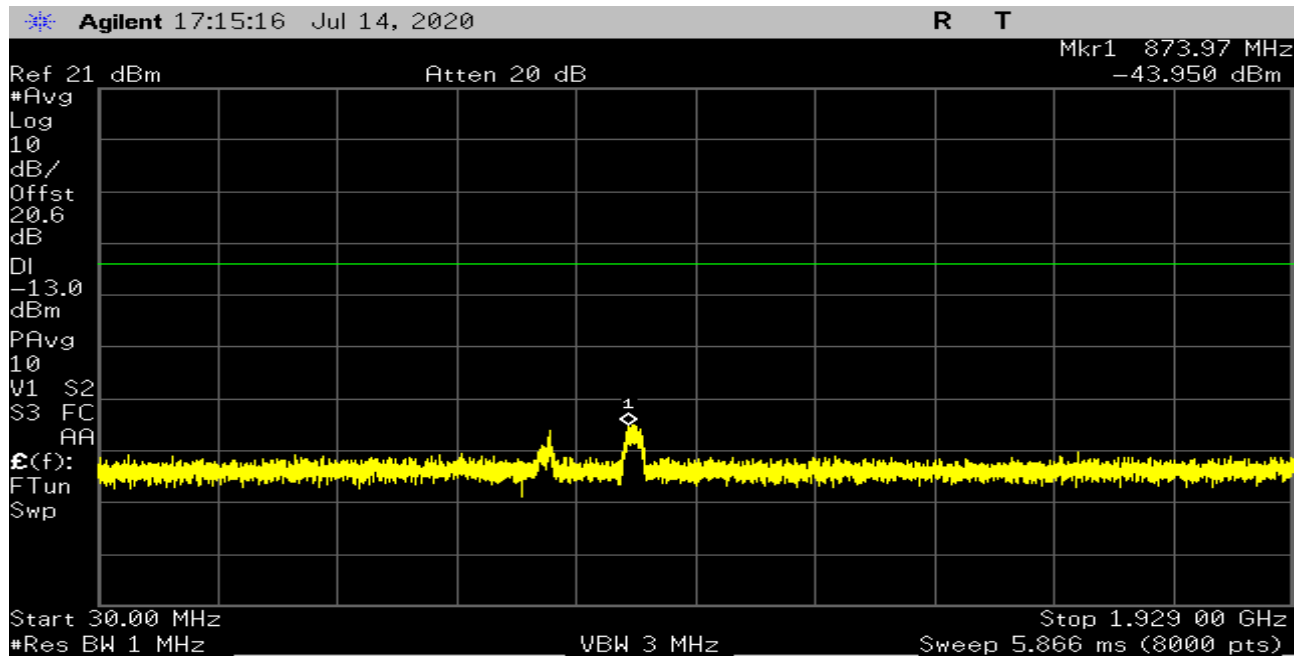
Plot 103 – 869-894MHz Band – Downlink



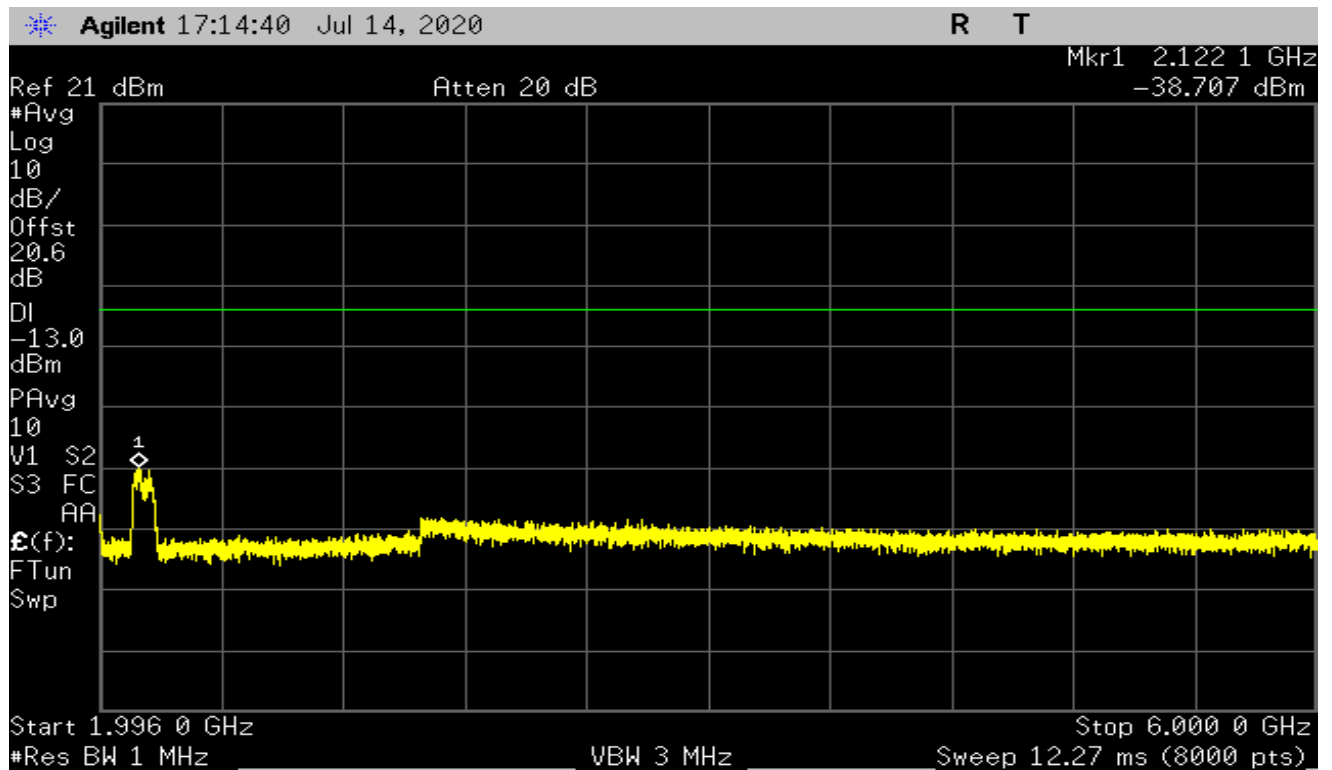
Plot 104 – 869-894MHz Band – Downlink



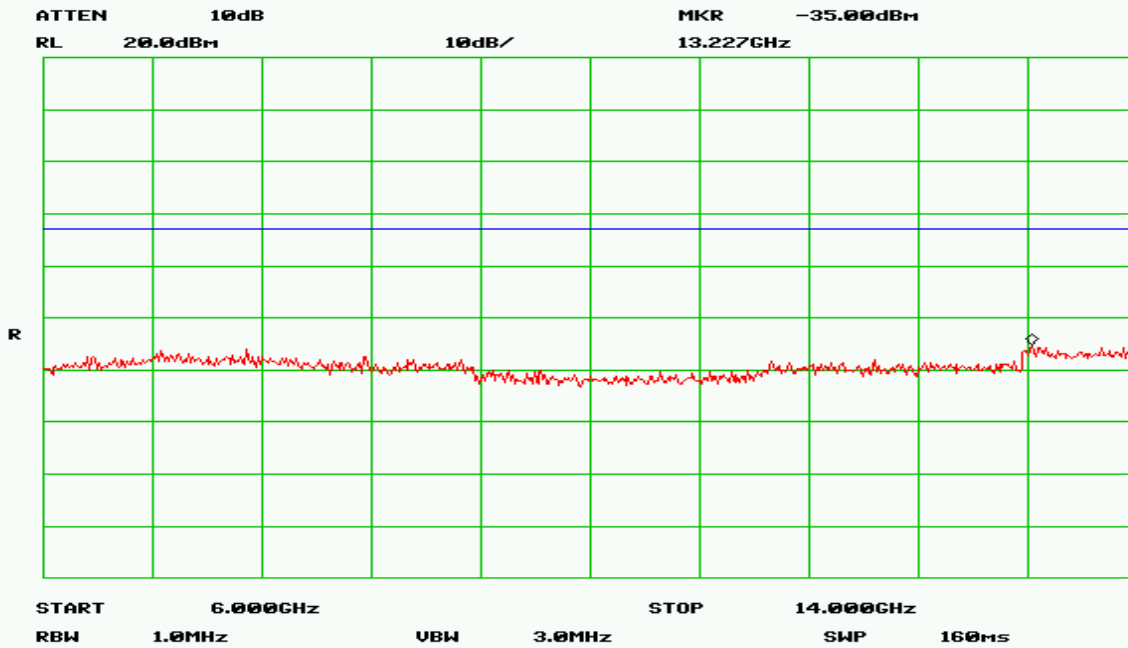
Plot 105 – 869-894MHz Band – Downlink



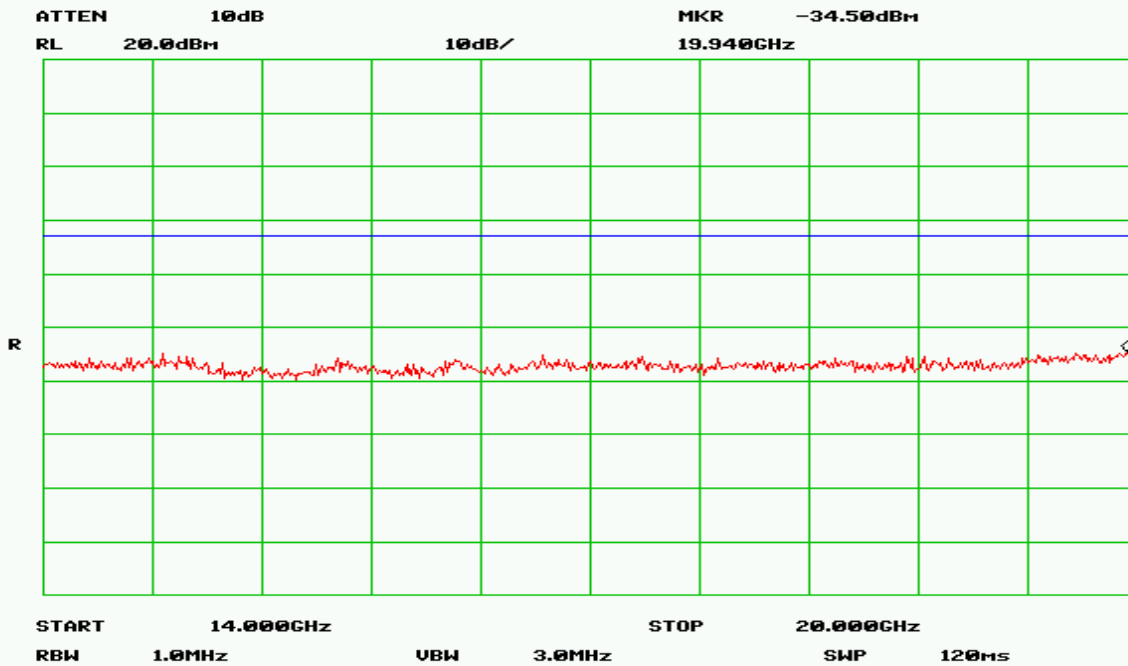
Plot 106 – 1930-1995MHz Band – Downlink



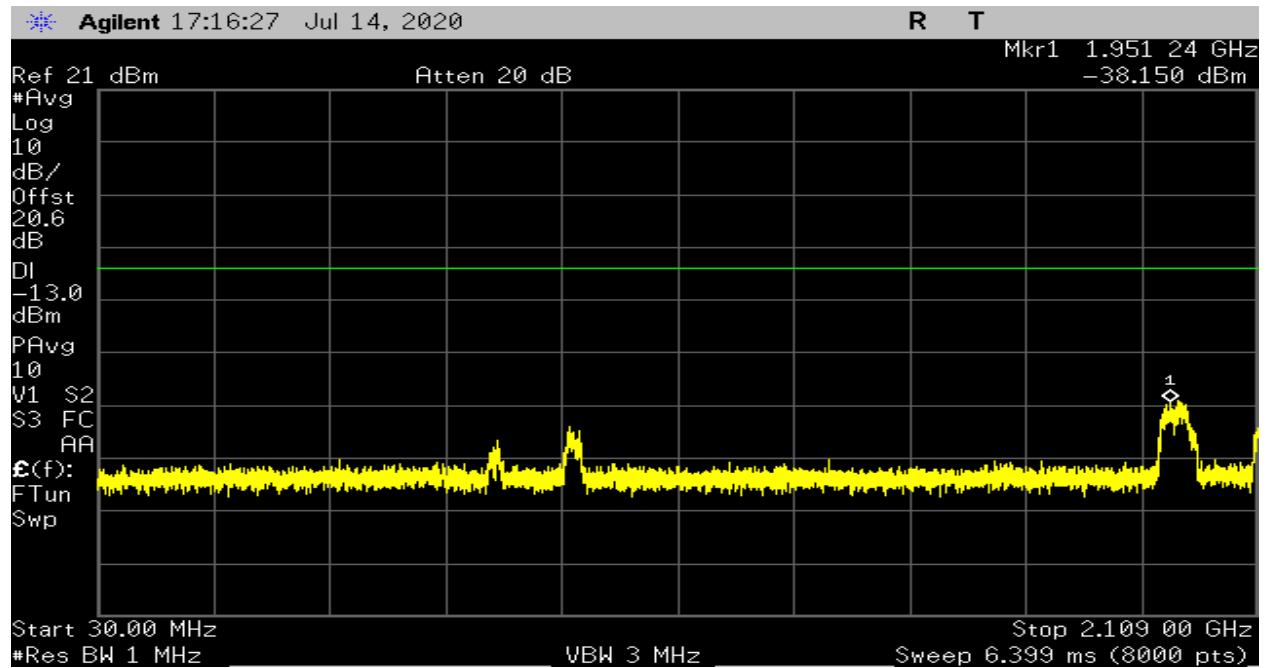
Plot 107 – 1930-1995MHz Band – Downlink



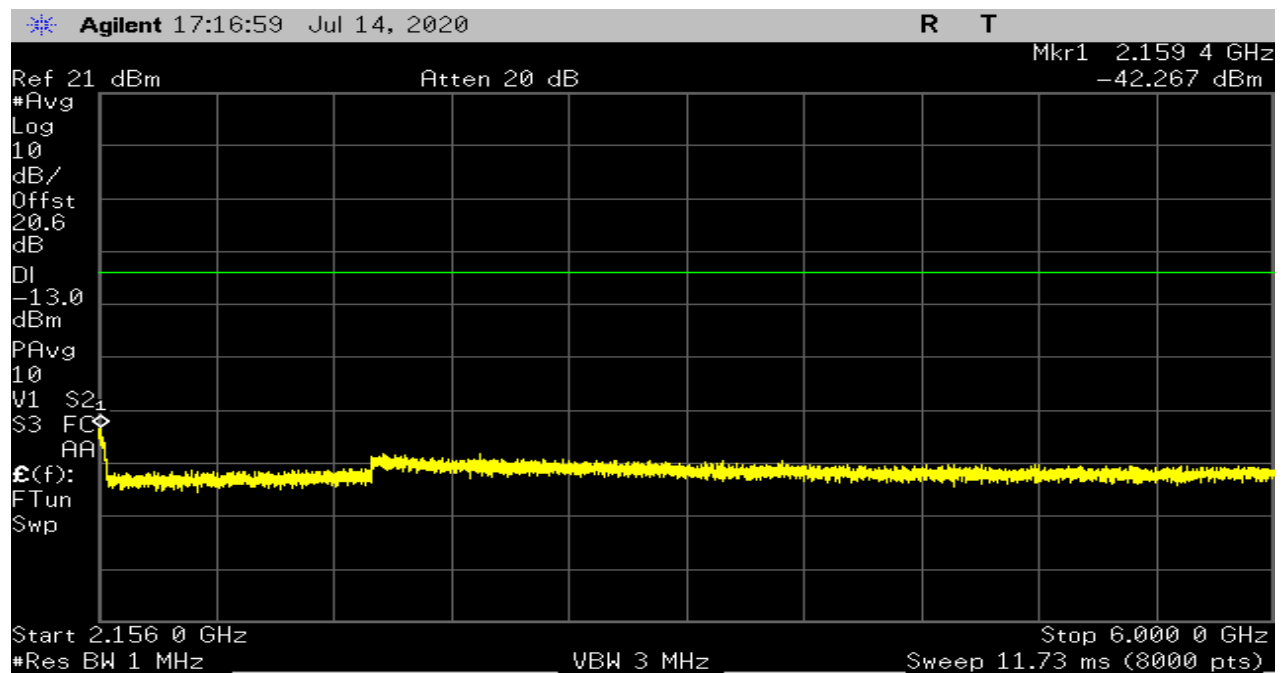
Plot 108 – 1930-1995MHz Band – Downlink



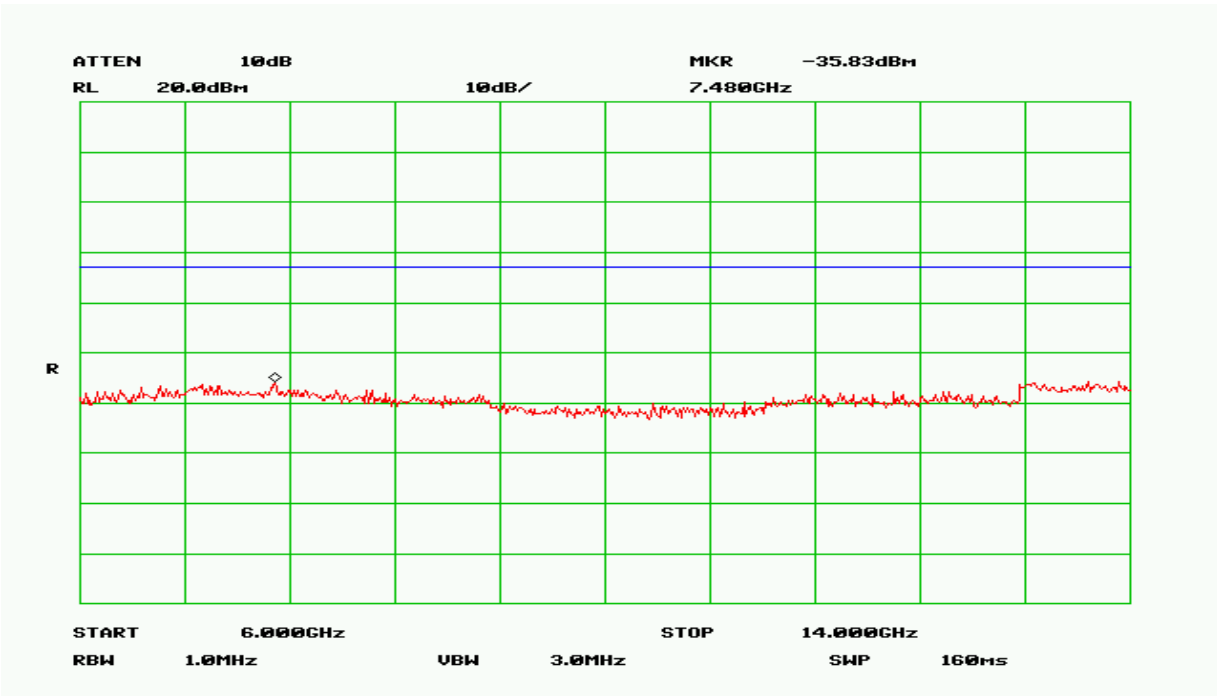
Plot 109 – 1930-1995MHz Band – Downlink



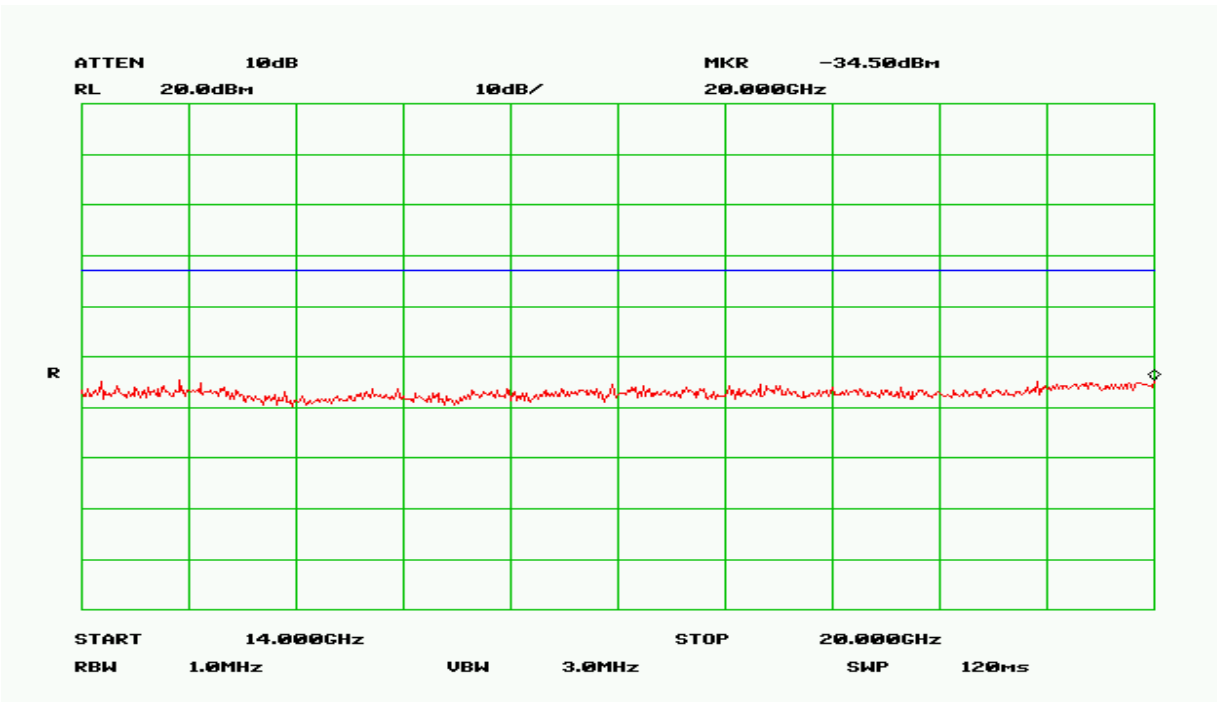
Plot 110 – 2110-2155MHz Band – Downlink



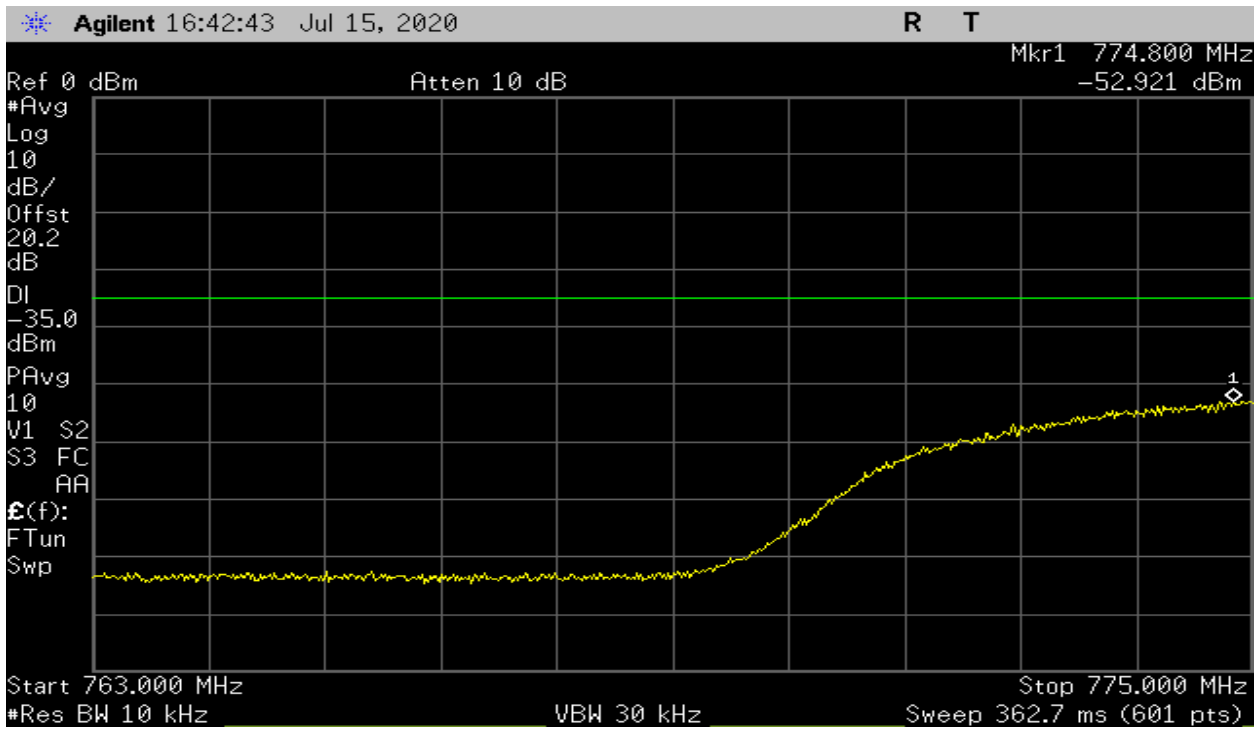
Plot 111 – 2110-2155MHz Band – Downlink



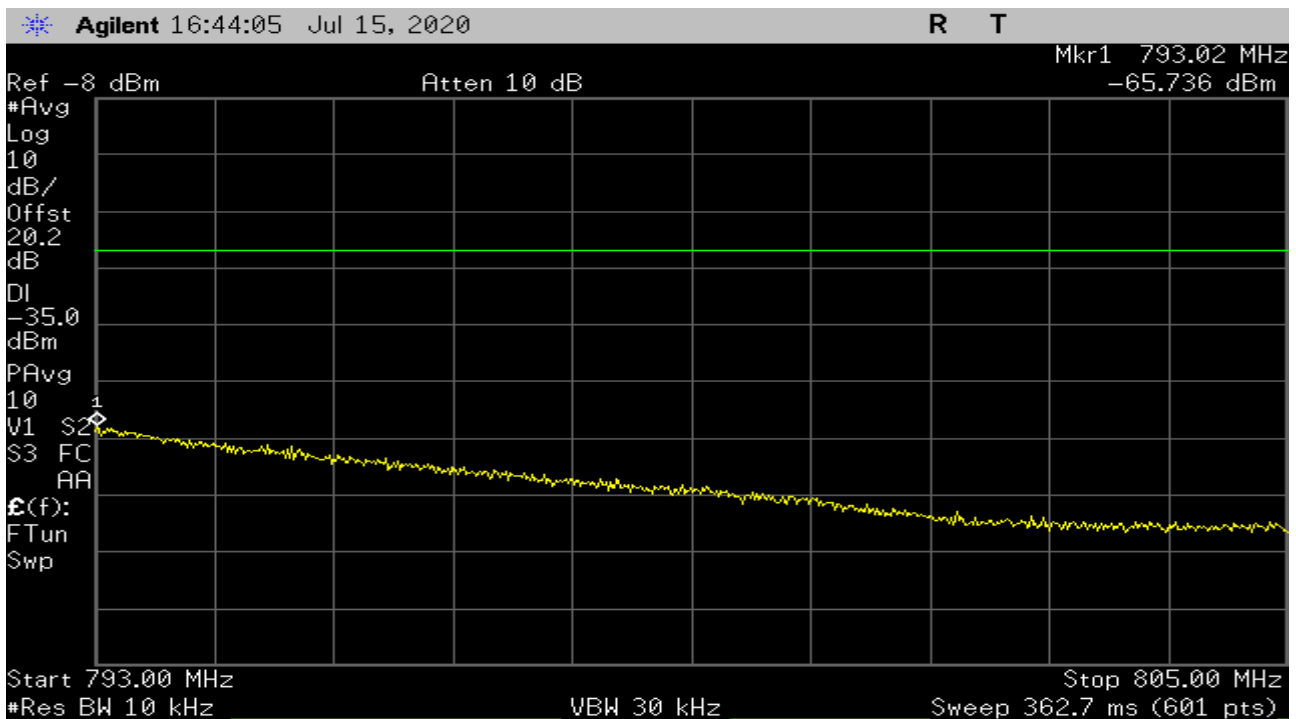
Plot 112 –2110-2155MHz Band – Downlink



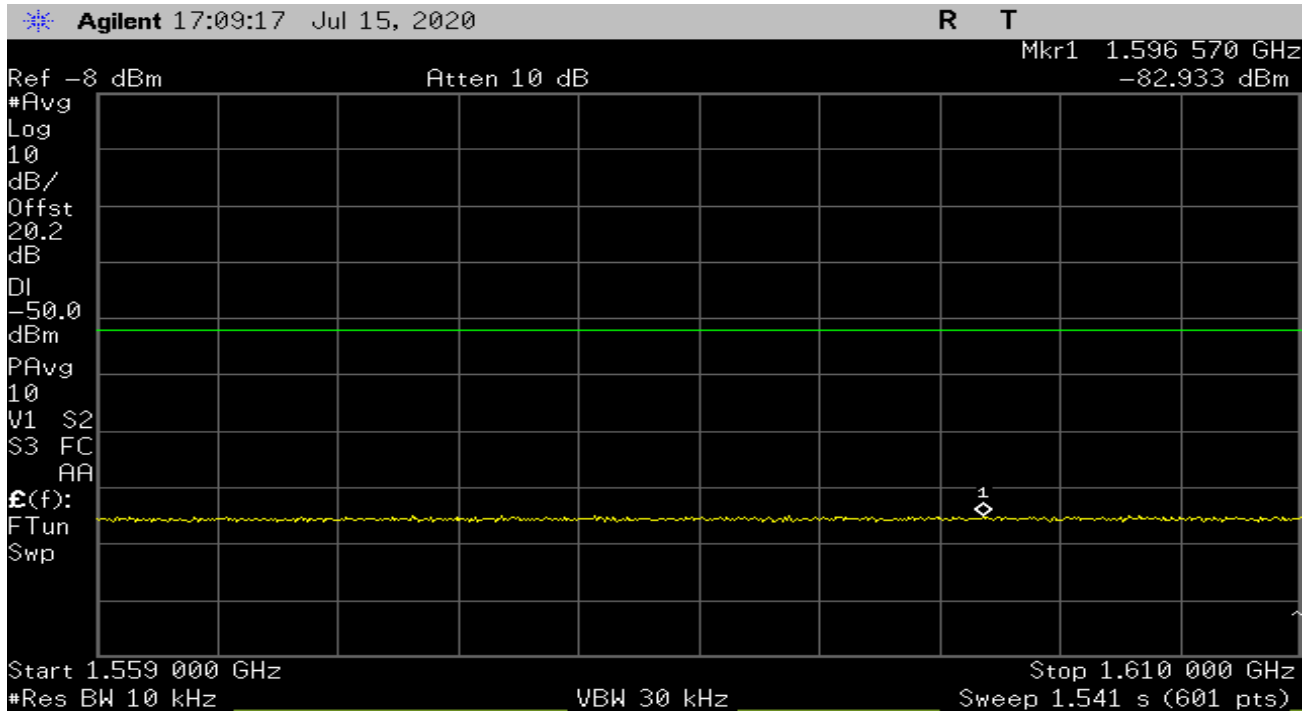
Plot 113 –2110-2155MHz Band – Downlink



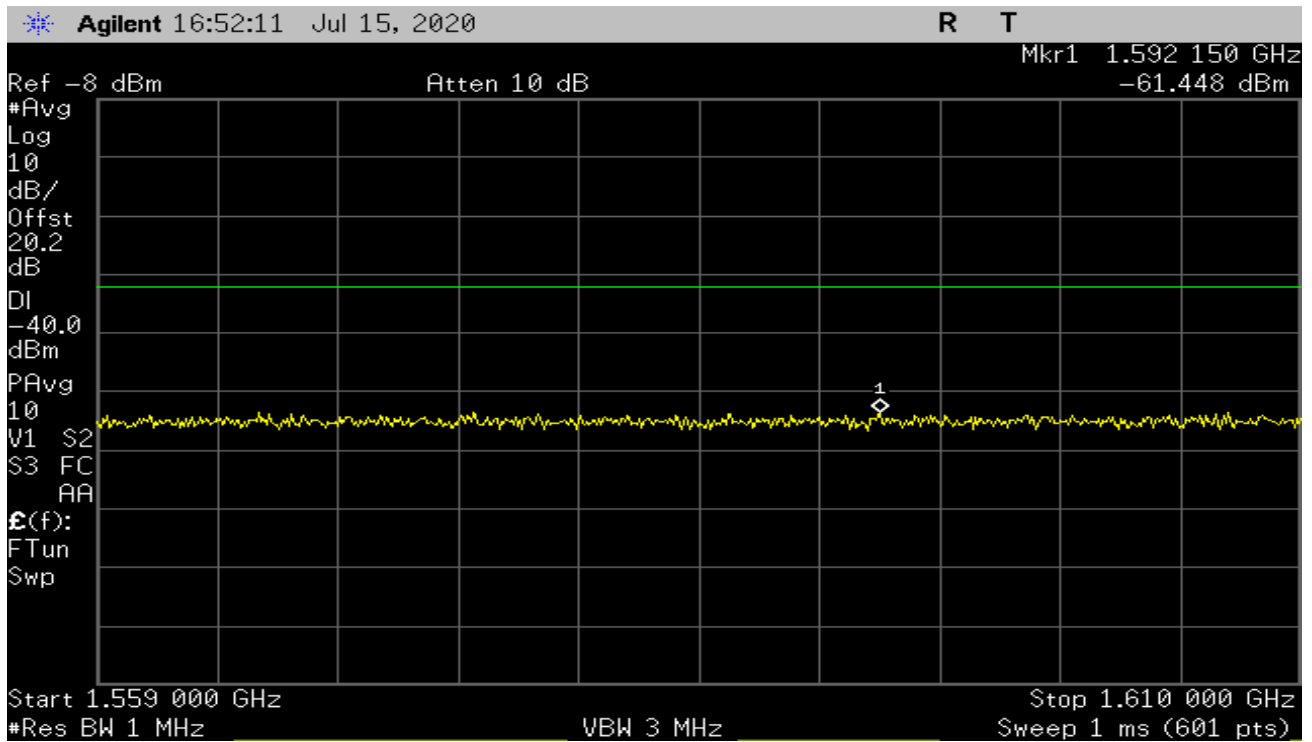
Plot 114 -27.53c4 - Uplink



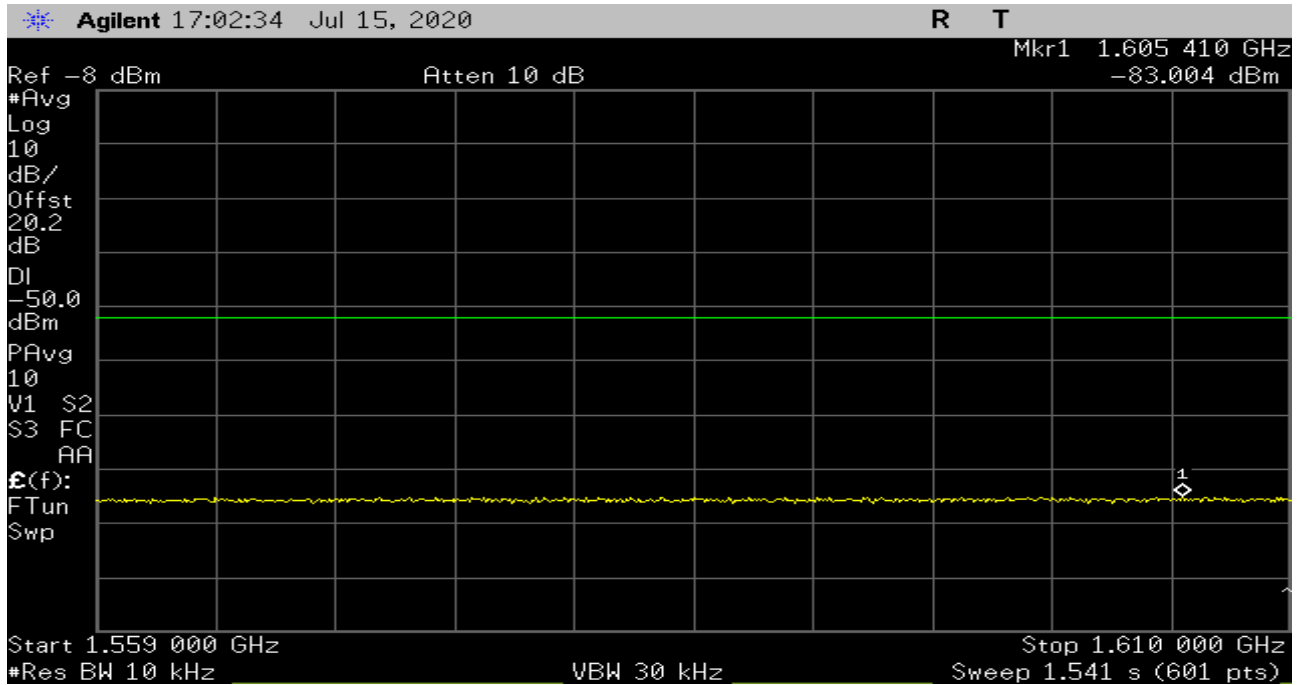
Plot 115 -27.53c4 - Uplink



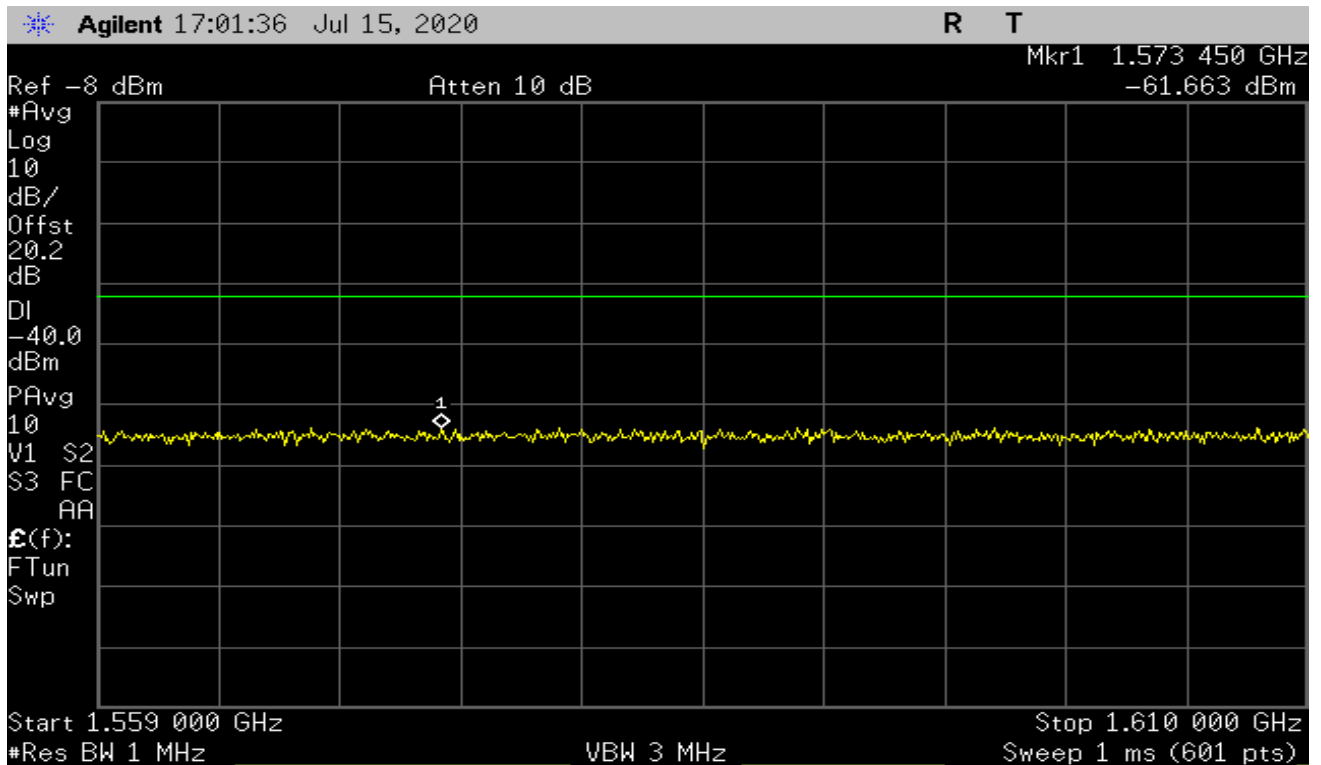
Plot 116 -27.53f – Uplink Narrowband



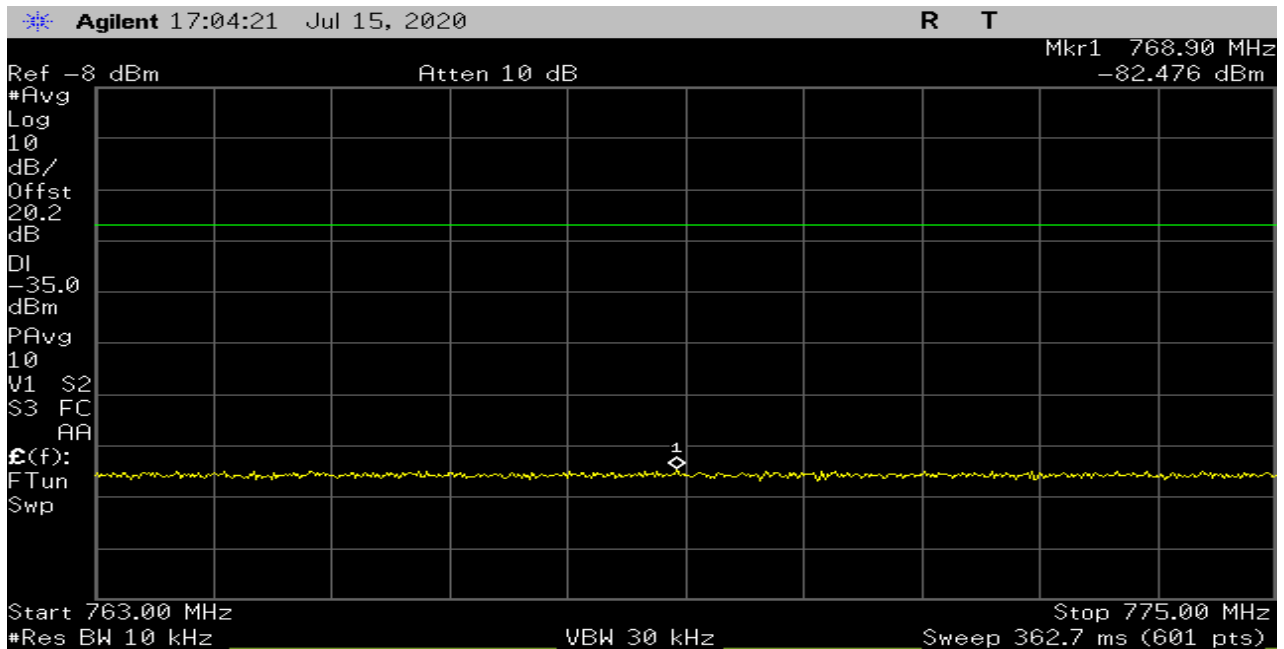
Plot 117 -27.53f – Uplink Wideband



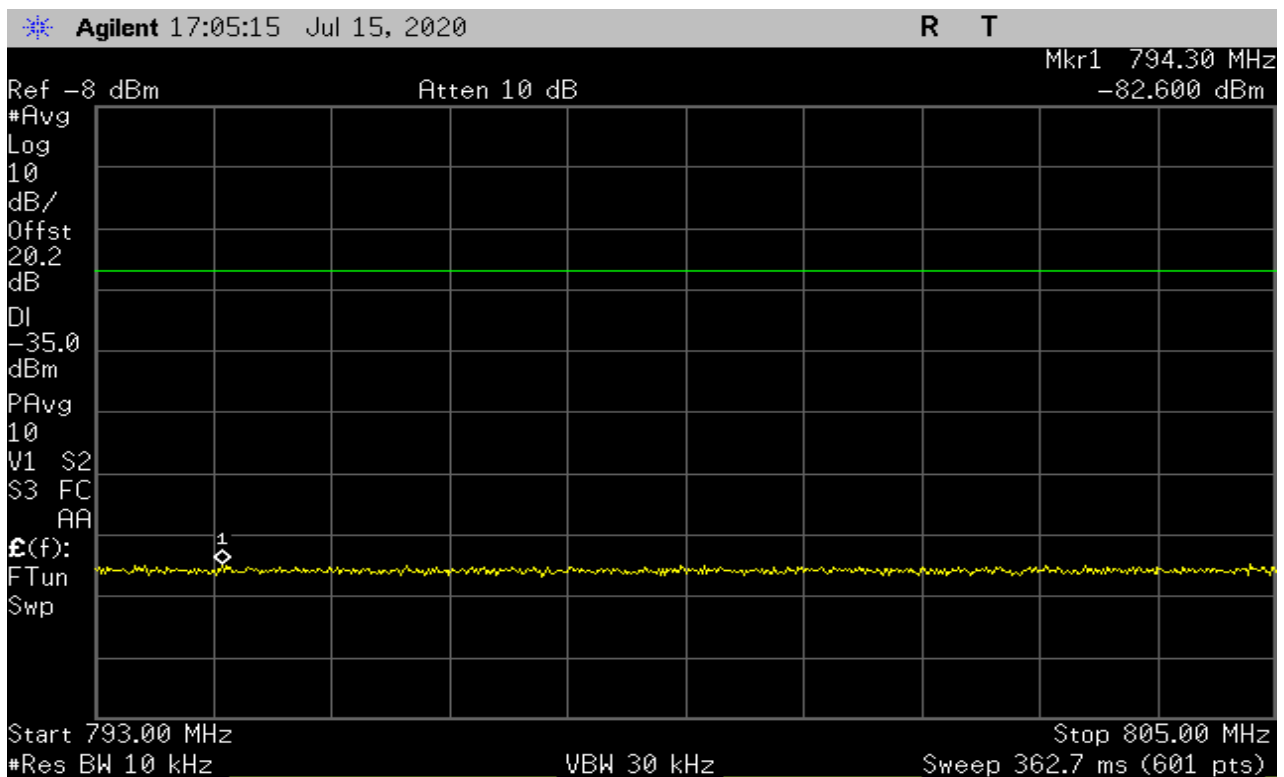
Plot 118 -27.53f - Downlink Narrowband



Plot 119 -27.53f - Downlink Wideband



Plot 120 -27.53c4 - Downlink



Plot 121 -27.53c4 - Downlink

6. Noise Limits/Transmit Power Off Mode

Test Requirement(s):	§20.21(e)(8)(i)(A) and RSS-131 §5.1.3.1, §5.1.3.2 & §5.1.3.6	Test Engineer(s):	Sean Eggleston
Test Results:	Pass	Test Date(s):	Jul/16/2020

Test Procedures: As required by 47 CFR §20.21(e)(8)(i)(A) and RSS-131 §5.1.3.1, §5.1.3.2 & §5.1.3.6, Noise limits measurements were made as per the FCC KDB 935210 D03 procedures defined in §7.7.

The EUT was set up as per Figure 2 and 3.

Test Setup:

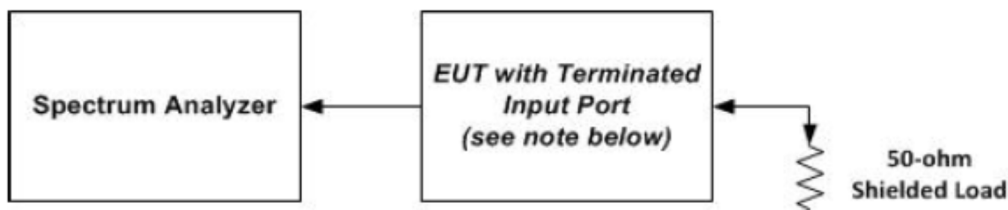


Figure 2 – Noise Limit

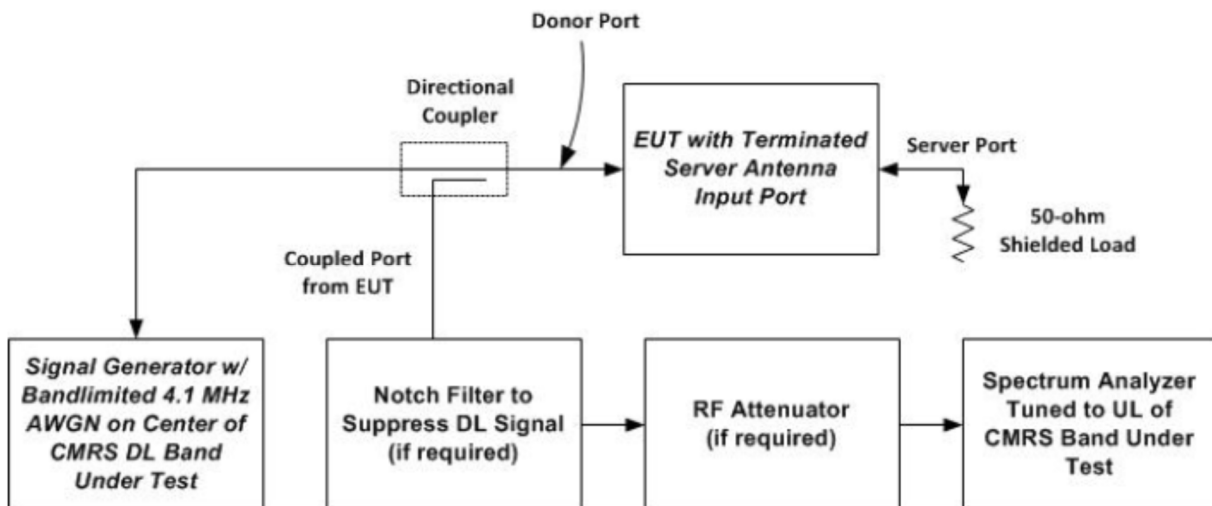


Figure 3 – Uplink Noise power in presence of a downlink signal

Limit: -103dBm/MHz - RSSI

Frequency Band (MHz)	Measured Level (dBm)	Limit (dBm)	Margin (dB)
698-716	-45.88	-45.5	-0.38
776-787	-46.42	-44.7	-1.72
824-849	-46.43	-44.1	-2.33
1710-1755	-38.93	-37.7	-1.23
1850-1915	-38.41	-37.0	-1.41

Table 19 – Maximum Uplink Noise Summary

Frequency Band (MHz)	Measured Level (dBm)	Limit (dBm)	Margin (dB)
728-746	-48.33	-45.5	-2.83
746-757	-48.8	-44.7	-4.1
869-894	-47.02	-44.1	-2.92
1930-1995	-40.58	-37.7	-2.88
2110-2155	-40.41	-37.0	-3.41

Table 20 – Maximum Downlink Noise Summary

Frequency Band (MHz)	Measured Time (Sec)	Limit (Seconds)	Margin (Seconds)
698-716	0.183	3.0	-2.817
776-787	0.116	3.0	-2.884
824-849	0.183	3.0	-2.817
1710-1755	0.983	3.0	-2.017
1850-1915	0.1	3.0	-2.9

Table 21 – Variable Uplink Noise Timing Summary

RSSI Input (dBm)	Measured Noise Power Tx dBm/MHz	Limit (dBm)	Margin (dB)
-90	-65	-46	-19
-50	-70	-53	-17
-40	-72	-63	-9.0
-34	-73	-68	-4
-30	Shutdown	-70	-
-25	Shutdown	-70	-

Table 22 – 698-716MHz Band – Uplink Noise Power Summary

RSSI Input (dBm)	Measured Noise Power Tx dBm/MHz	Limit (dBm)	Margin (dB)
-90	-64	-45	-19
-50	-69	-53	-16
-40	-72	-63	-9
-35	-73	-68	-5.0
-30	Shutdown	-70	-
-20	Shutdown	-70	-

Table 23 – 776-787MHz Band – Uplink Noise Power Summary

RSSI Input (dBm)	Measured Noise Power Tx dBm/MHz	Limit (dBm)	Margin (dB)
-90	-63	-44	-19
-50	-70	-53	-17
-40	-72	-63	-9
-35	-73	-68	-5.0
-29	-73	-70	-3.0
-20	-72.3	-70	-2.3

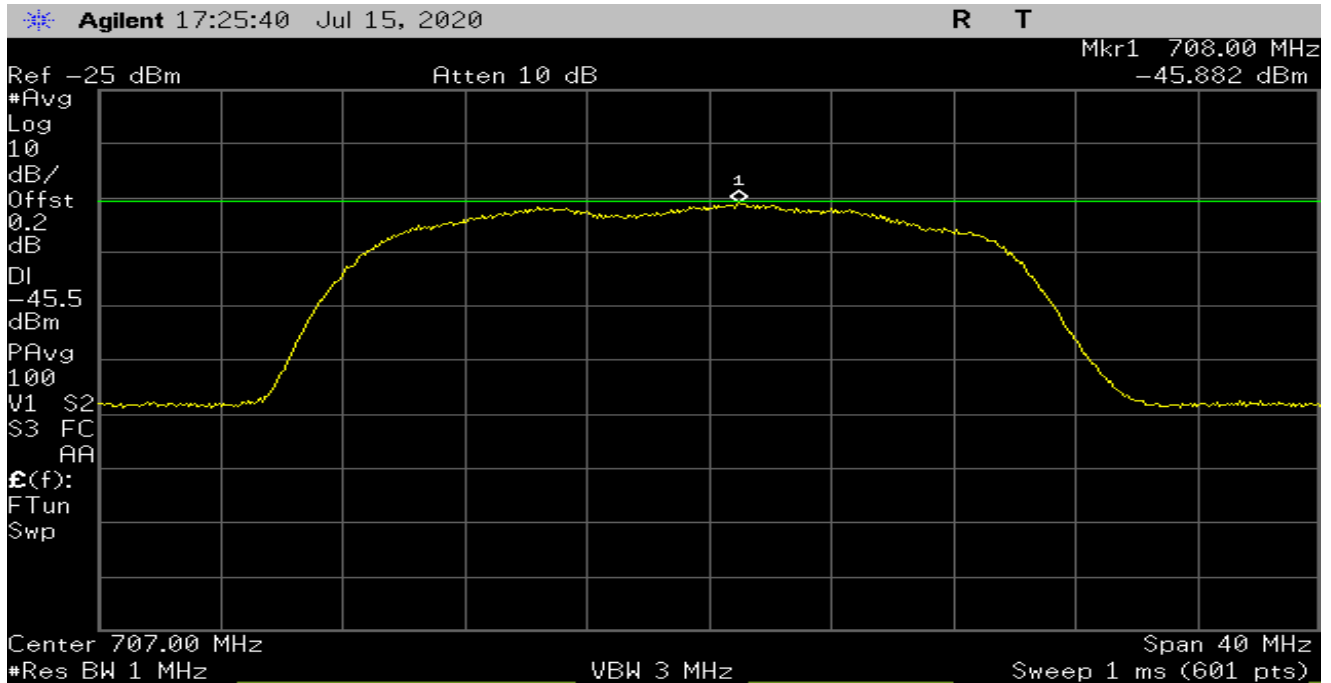
Table 24 – 824-849MHz Band – Uplink Noise Power Summary

RSSI Input (dBm)	Measured Noise Power Tx dBm/MHz	Limit (dBm)	Margin (dB)
-90	-56	-38	-18
-70	-56	-38	-18
-50	-69.5	-53	-16.5
-40	-72.3	-63	-9.3
-30	-72.5	-70	-2.5
-20	-72.4	-70	-2.4

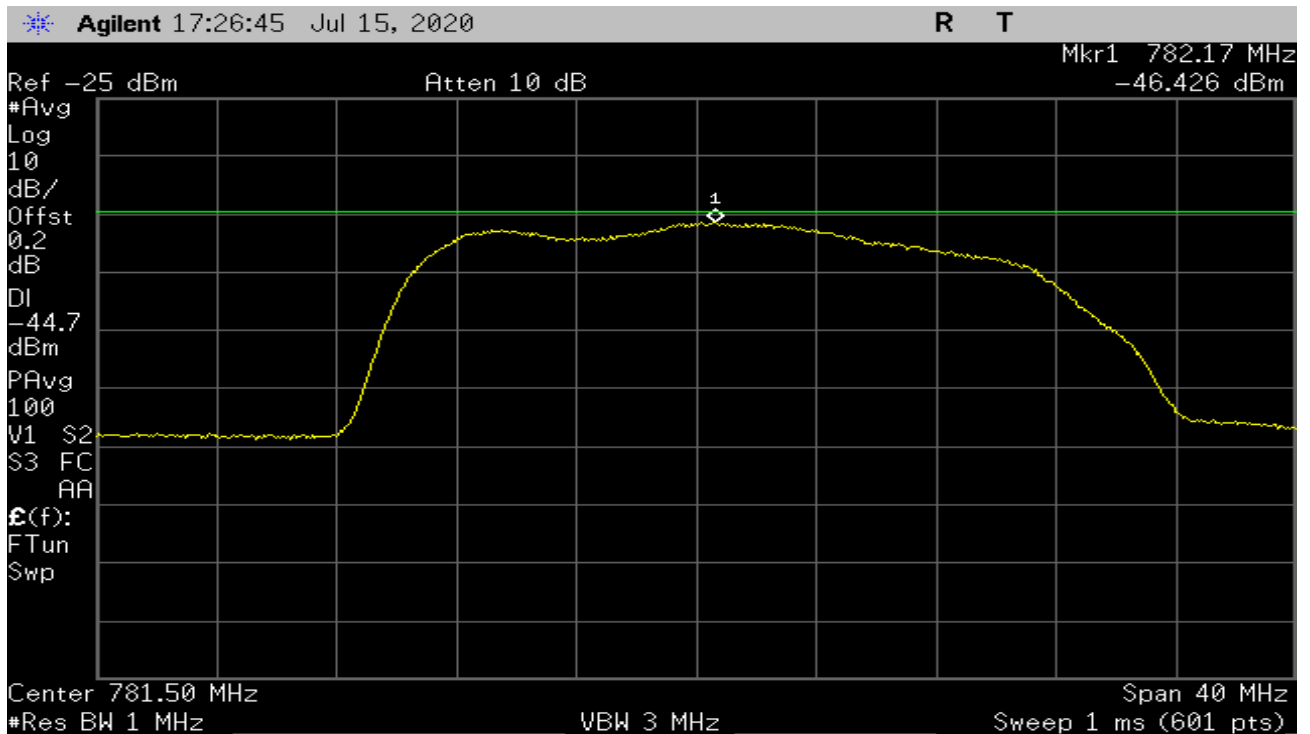
Table 25 – 1710-1755MHz Band – Uplink Noise Power Summary

RSSI Input (dBm)	Measured Noise Power Tx dBm/MHz	Limit (dBm)	Margin (dB)
-90	-62	-37	-25
-60	-70	-43	-27
-40	-72.4	-63	-9.4
-30	-72.5	-70	-2.5
-25	-72.4	-70	-2.4
-20	-72.4	-70	-2.4

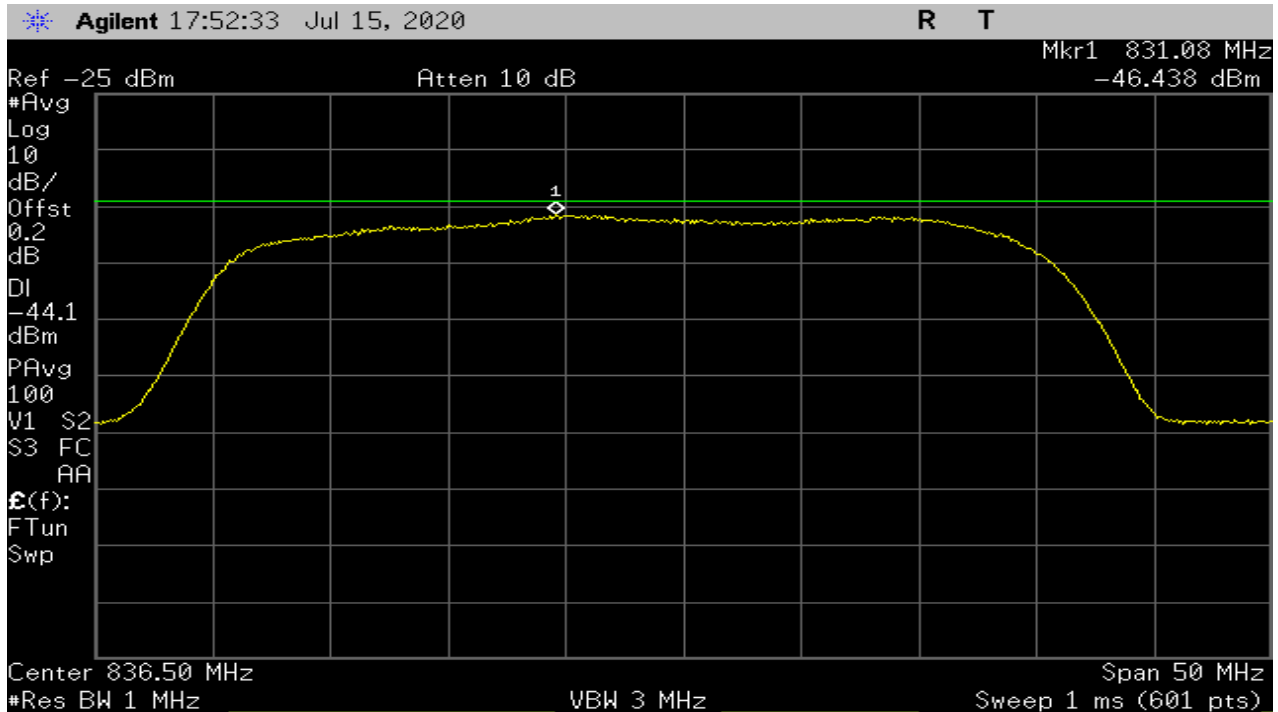
Table 26 – 1850-1915MHz Band – Uplink Noise Power Summary



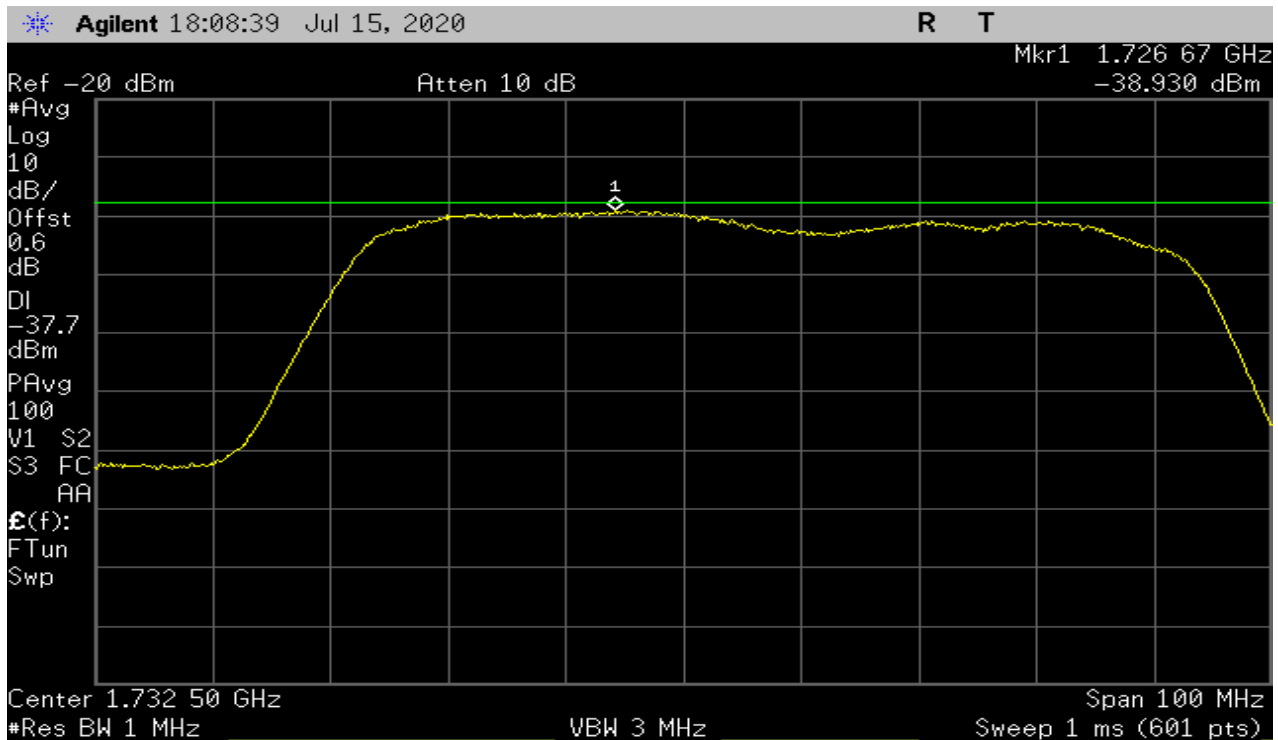
Plot 121 – 698-716MHz Band – Maximum Uplink Noise



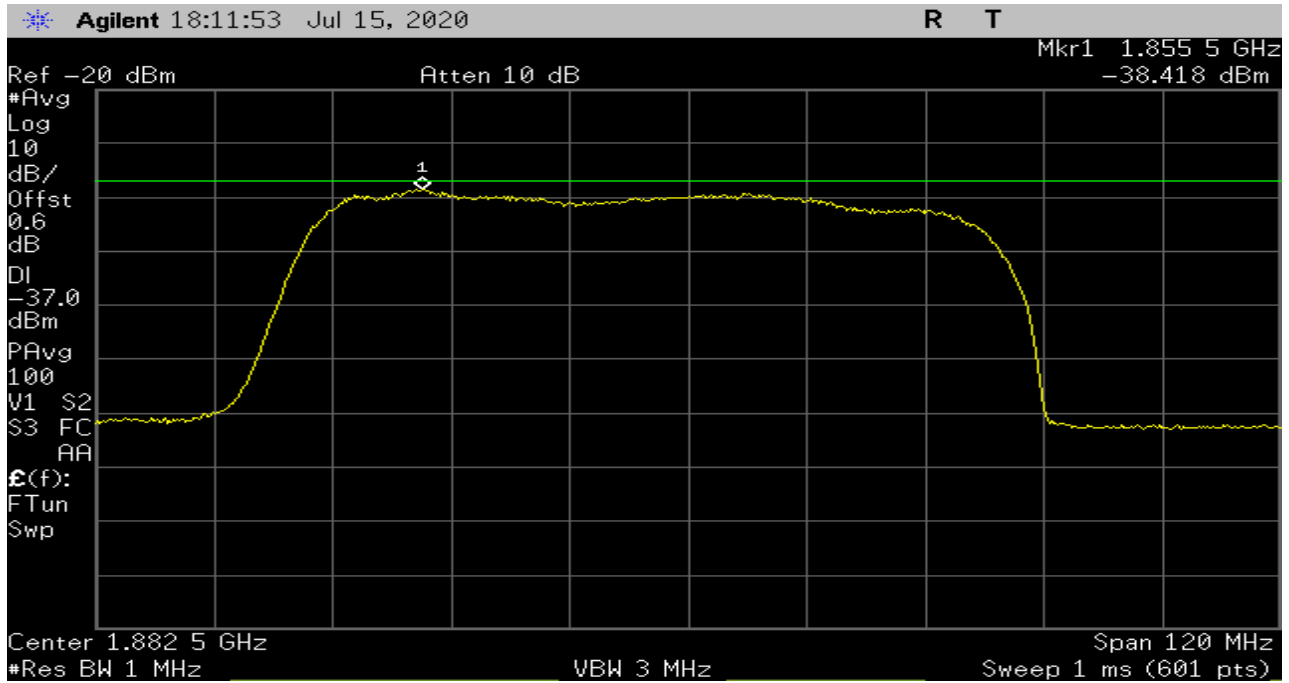
Plot 122 – 776-787MHz Band – Maximum Uplink Noise



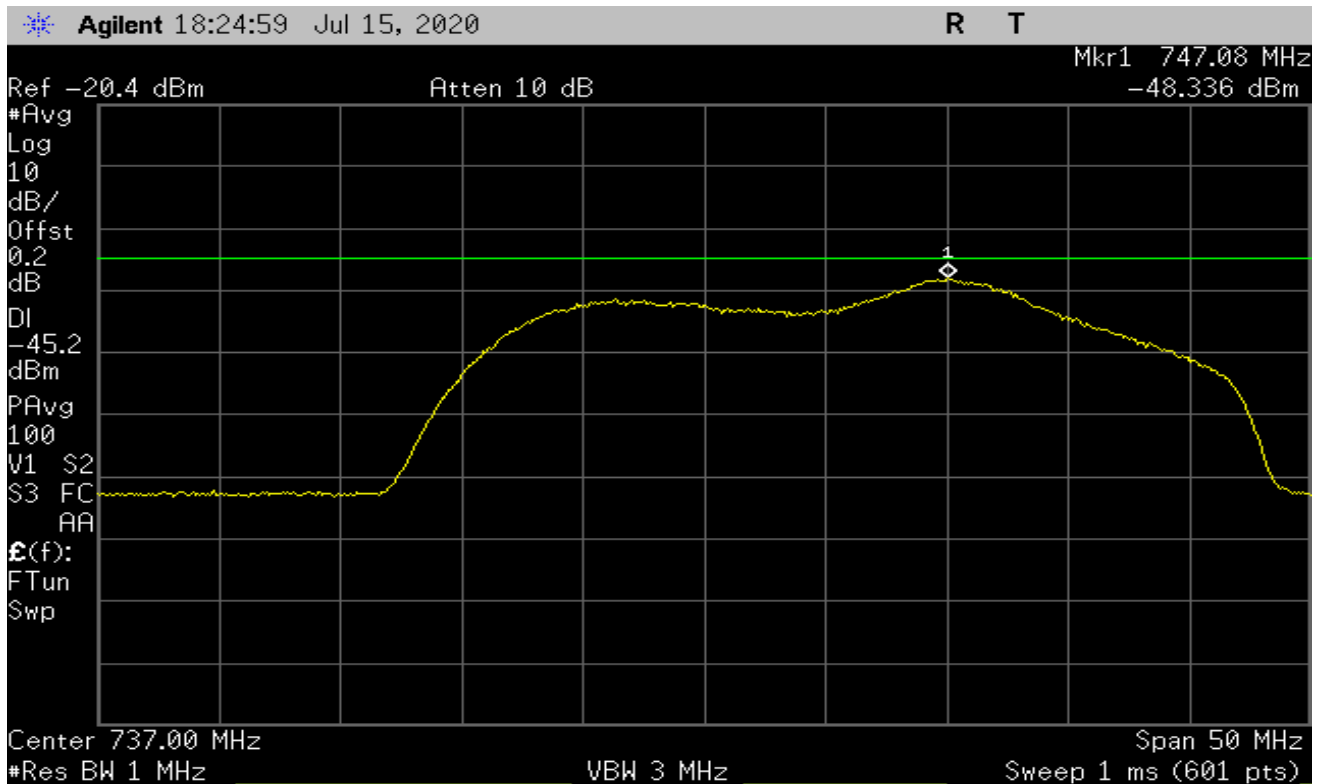
Plot 123 – 824-849MHz Band – Maximum Uplink Noise



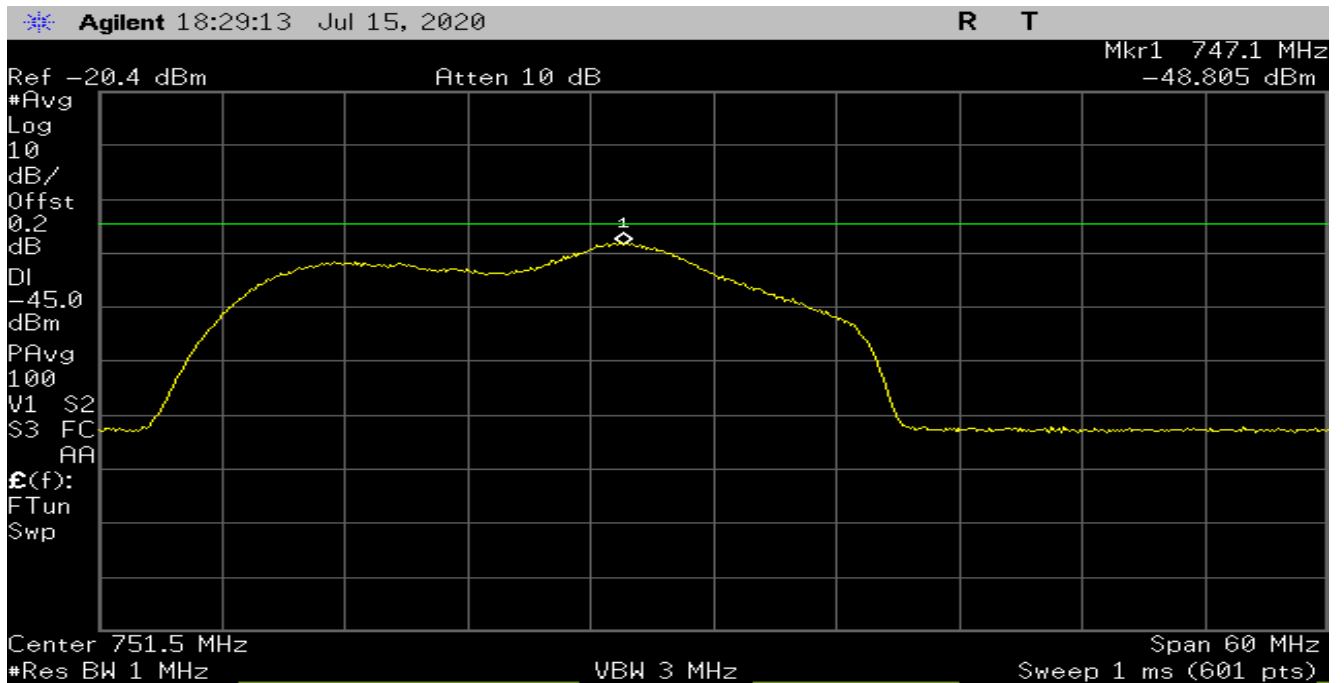
Plot 124 – 1710-1755MHz Band – Maximum Uplink Noise



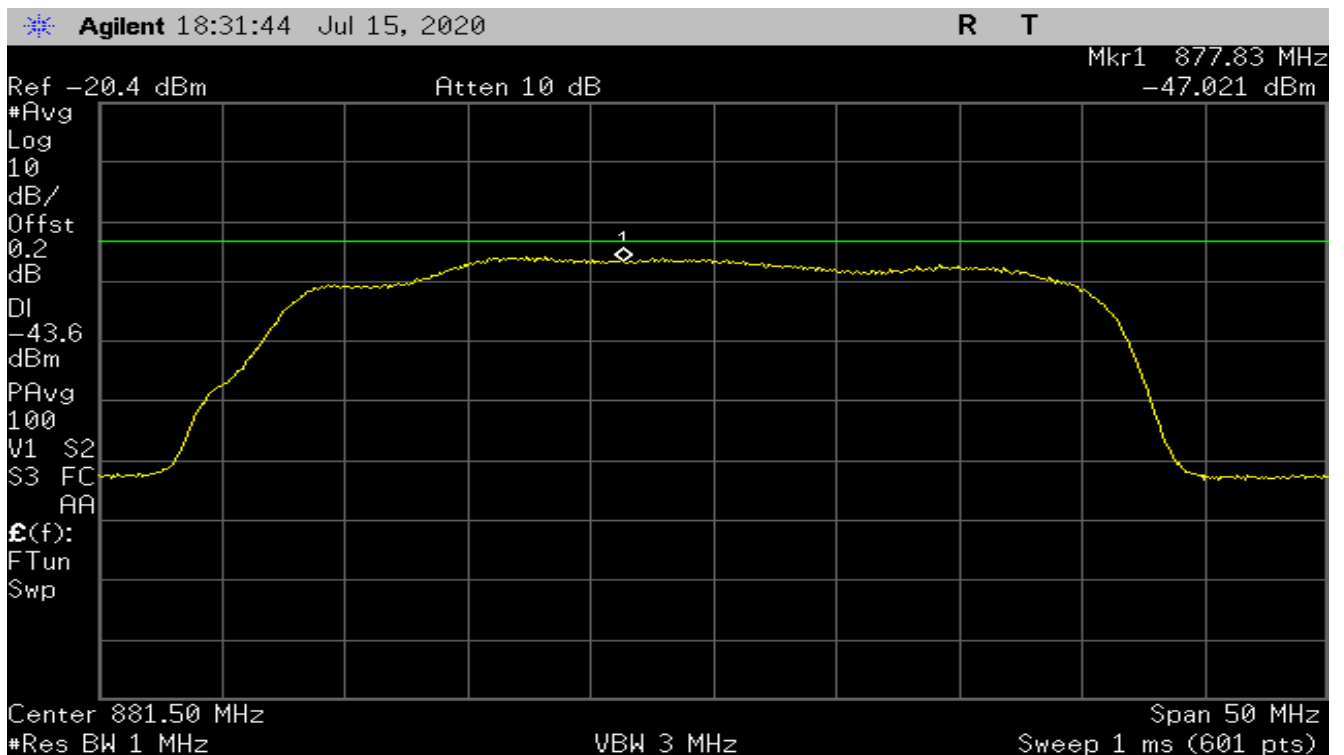
Plot 125 – 1850-1915MHz Band – Maximum Uplink Noise



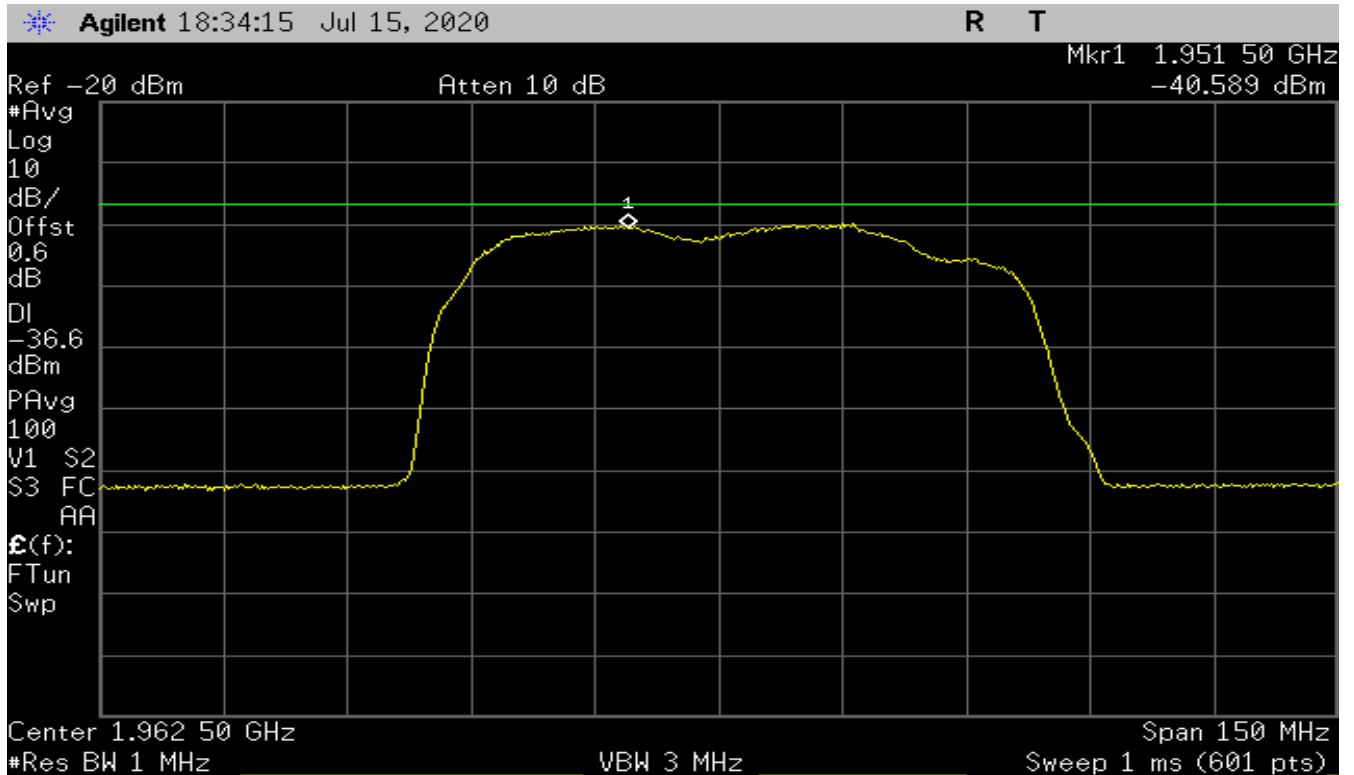
Plot 126 – 728-746MHz Band – Maximum Downlink Noise



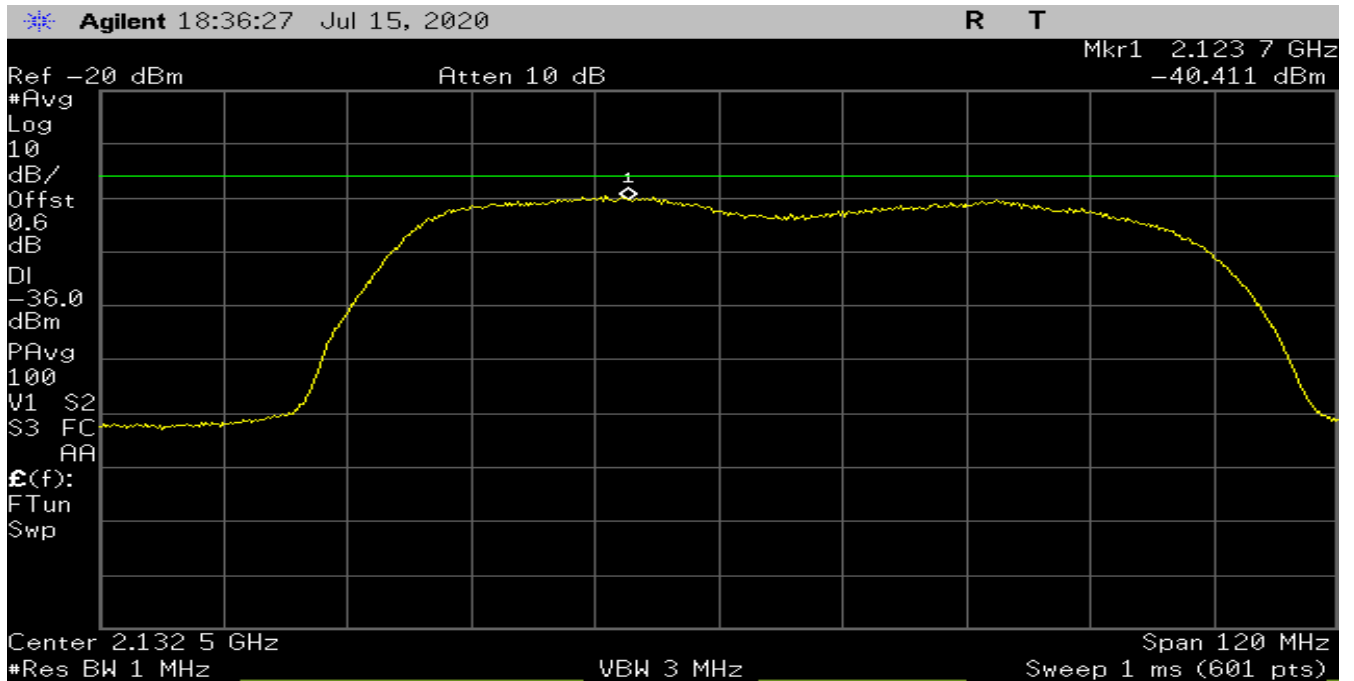
Plot 127 – 746-757MHz Band – Maximum Downlink Noise



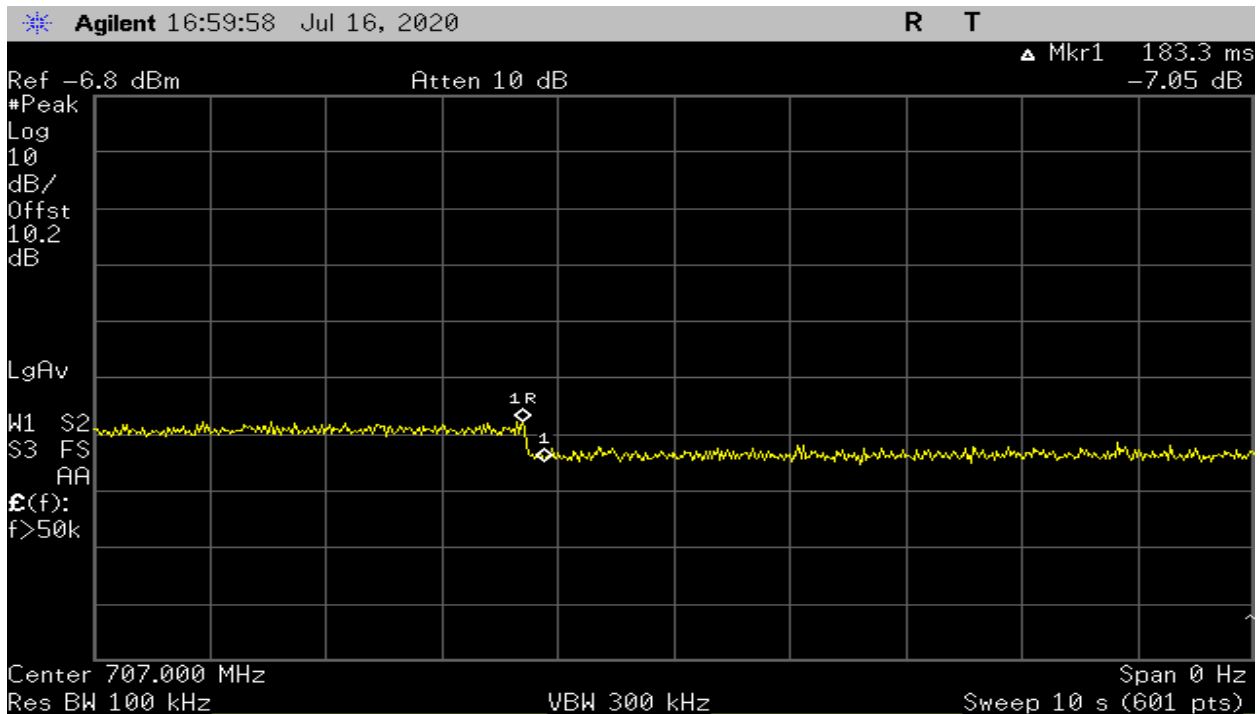
Plot 128 – 869-894MHz Band – Maximum Downlink Noise



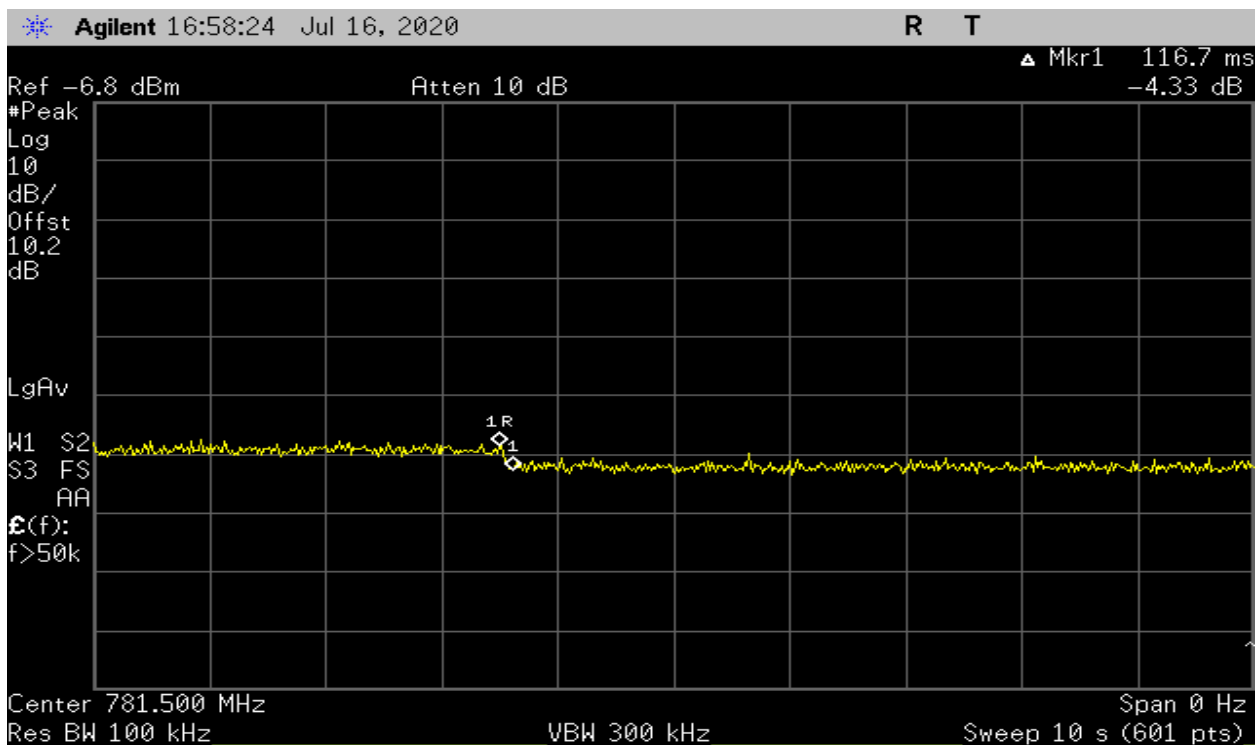
Plot 129 – 1930-1995MHz Band – Maximum Downlink Noise



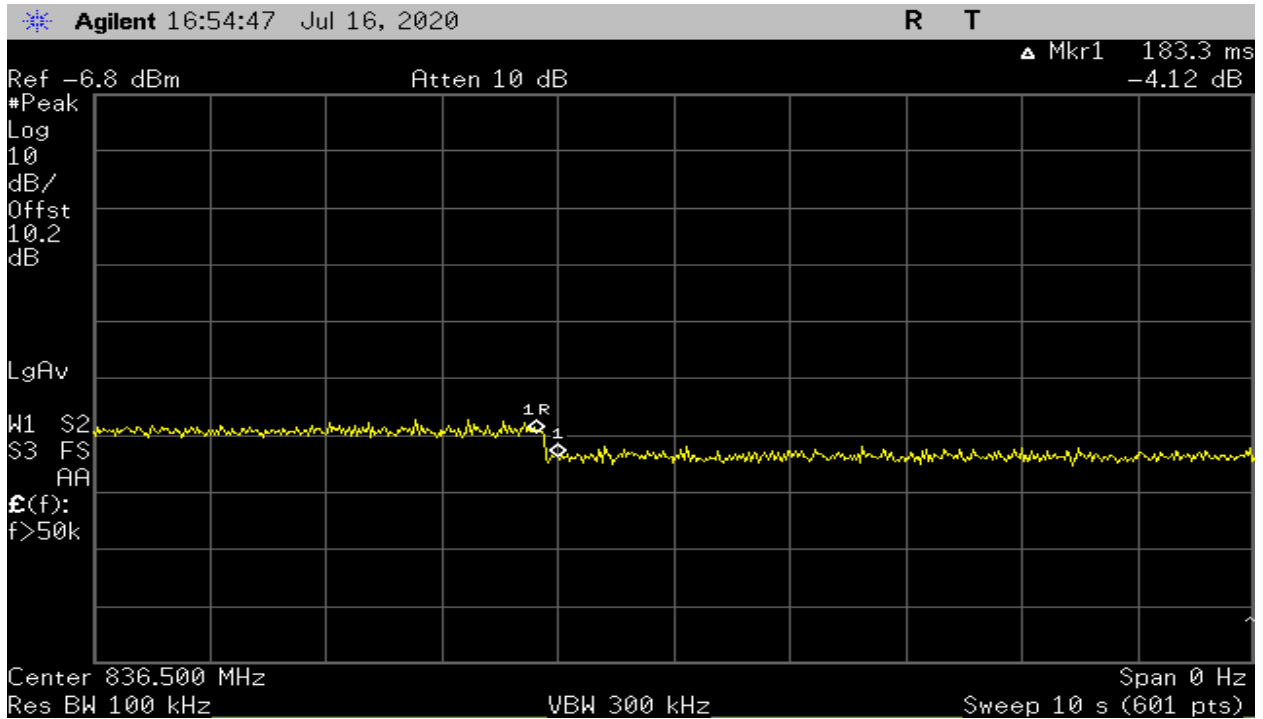
Plot 130 – 2110-2155MHz Band – Maximum Downlink Noise



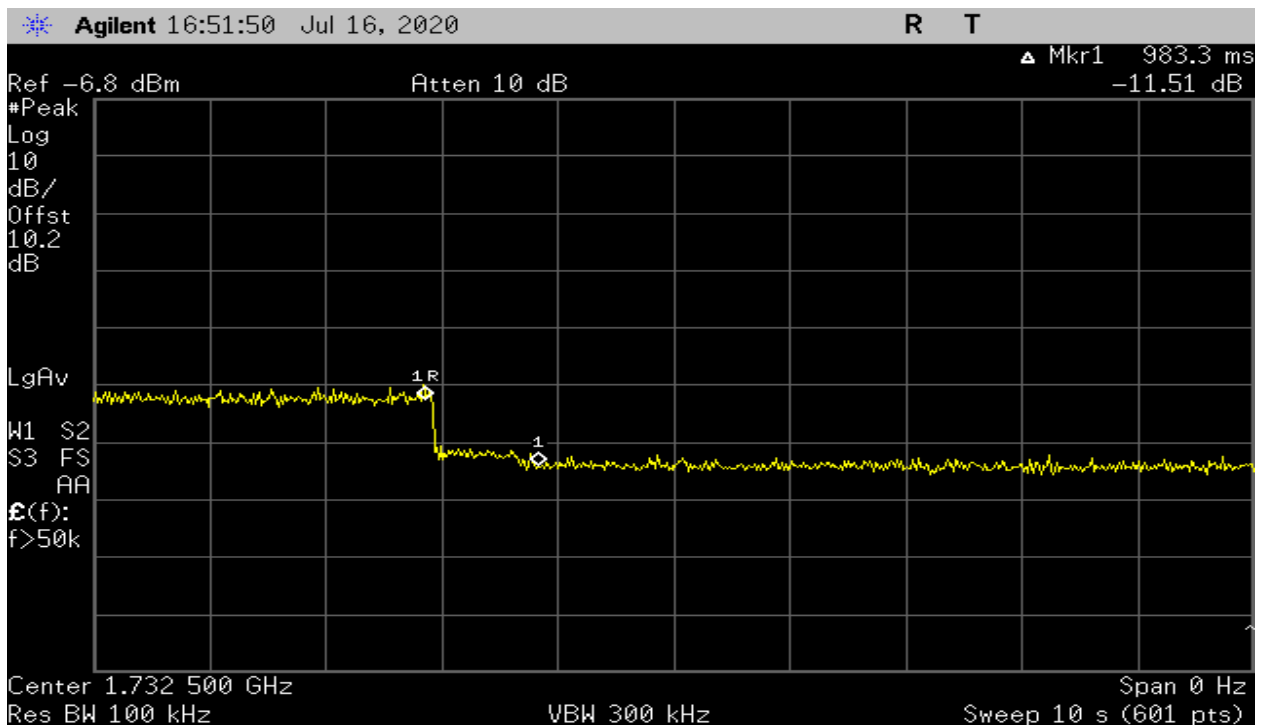
Plot 131 – 698-716MHz Band – Variable Uplink Noise Timing



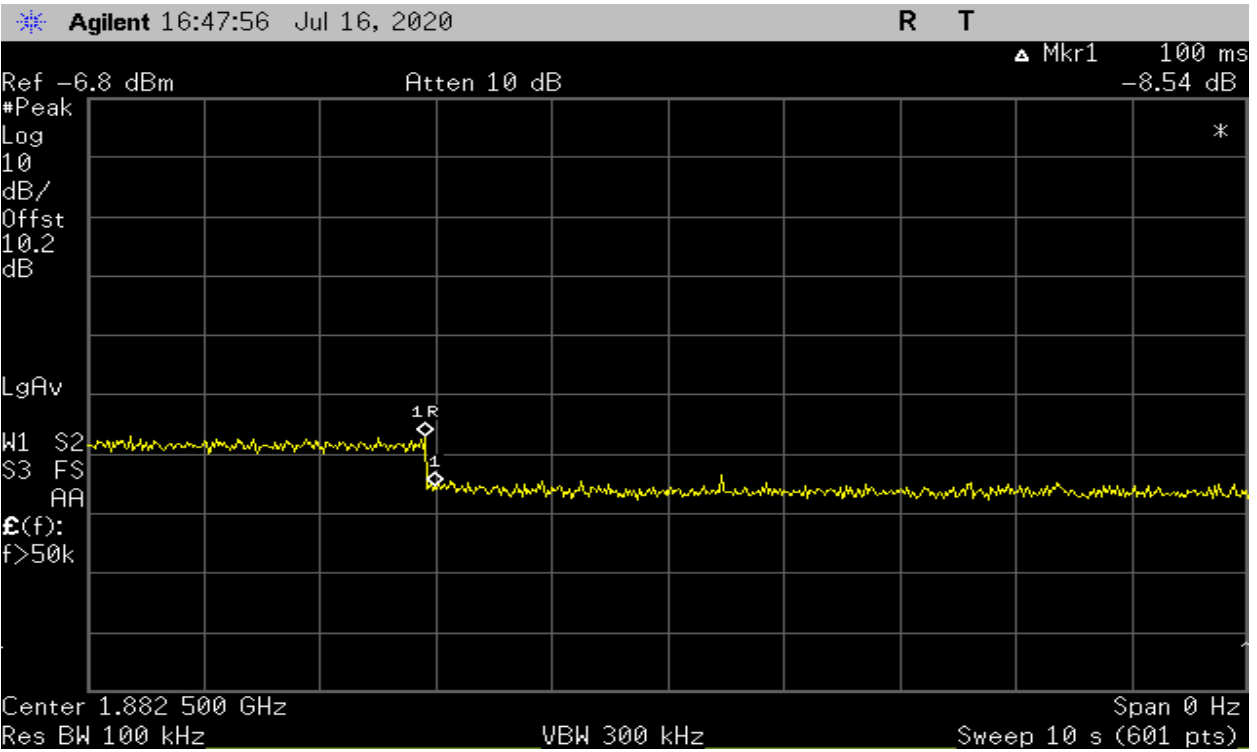
Plot 132 – 776-787MHz Band – Variable Uplink Noise Timing



Plot 133 – 824-849MHz Band – Variable Uplink Noise Timing



Plot 134 – 1710-1755MHz Band – Variable Uplink Noise Timing



Plot 135 – 1850-1915MHz Band – Variable Uplink Noise Timing

7. Uplink Inactivity

Test Requirement(s):	§20.21(e)(8)(i)(I) and RSS-131 §5.1.3.1, §5.1.3.7	Test Engineer(s):	Sean Eggleston
Test Results:	Pass	Test Date(s):	Jul/16/2020

Test Procedures: As required by 47 CFR §20.21(e)(8)(i)(I) and RSS-131 §5.1.3.7, Uplink Inactivity measurements were made as per the FCC KDB 935210 D03 procedures defined in §7.8.

The EUT was set up as per Figure 4.

Test Setup:

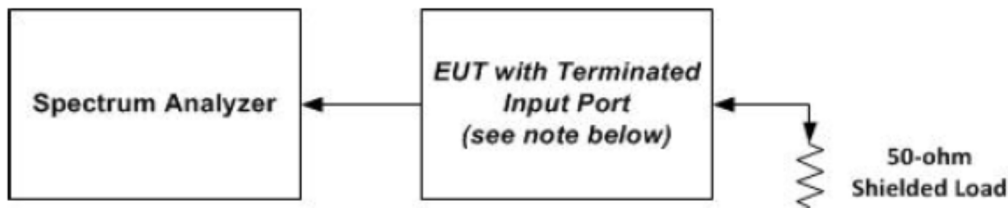
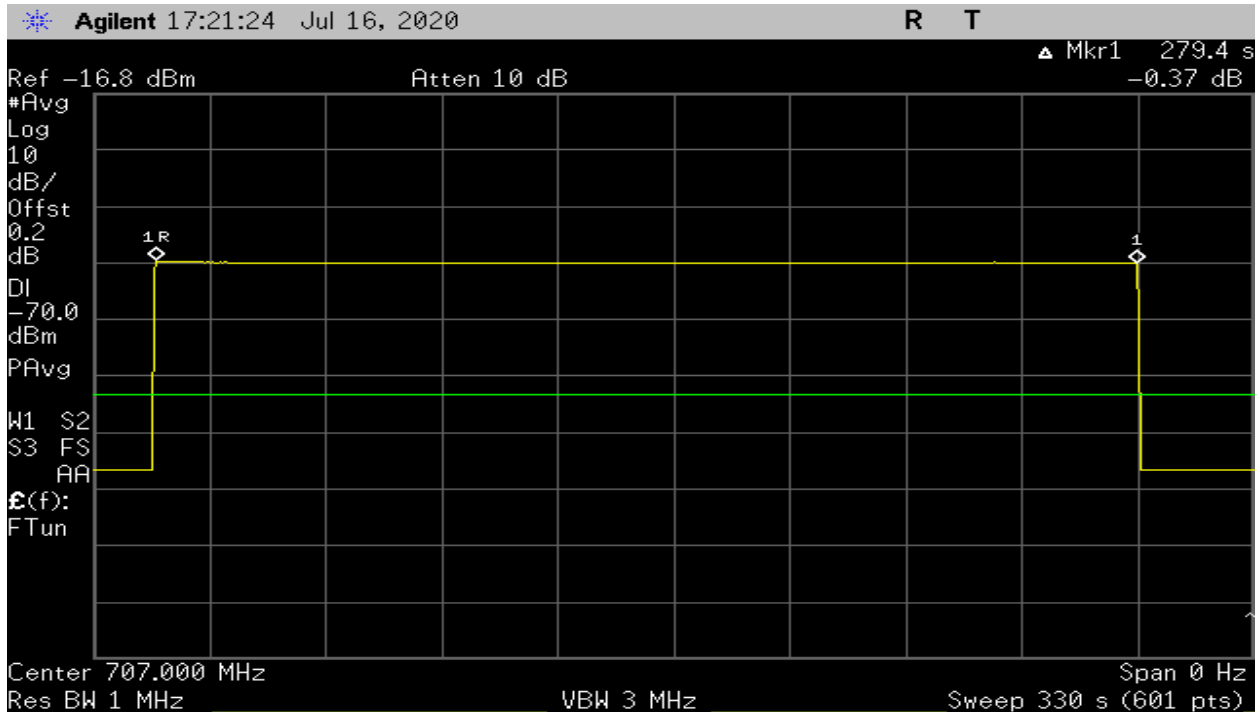


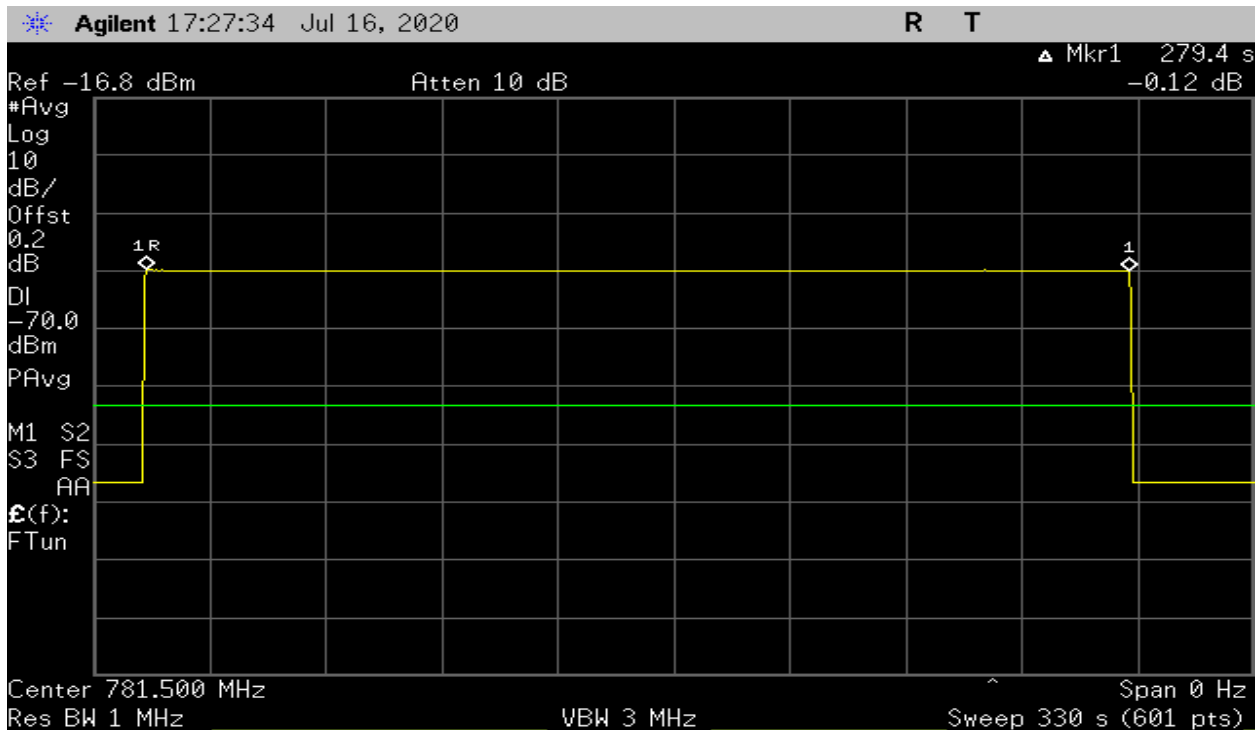
Figure 4 – Uplink Inactivity

Frequency Band (MHz)	Measured Time (Seconds)	Limit (Seconds)
698 - 716	279.4	300
776 - 787	279.4	300
824 - 849	279.4	300
1710 - 1755	279.4	300
1850 - 1915	278.9	300

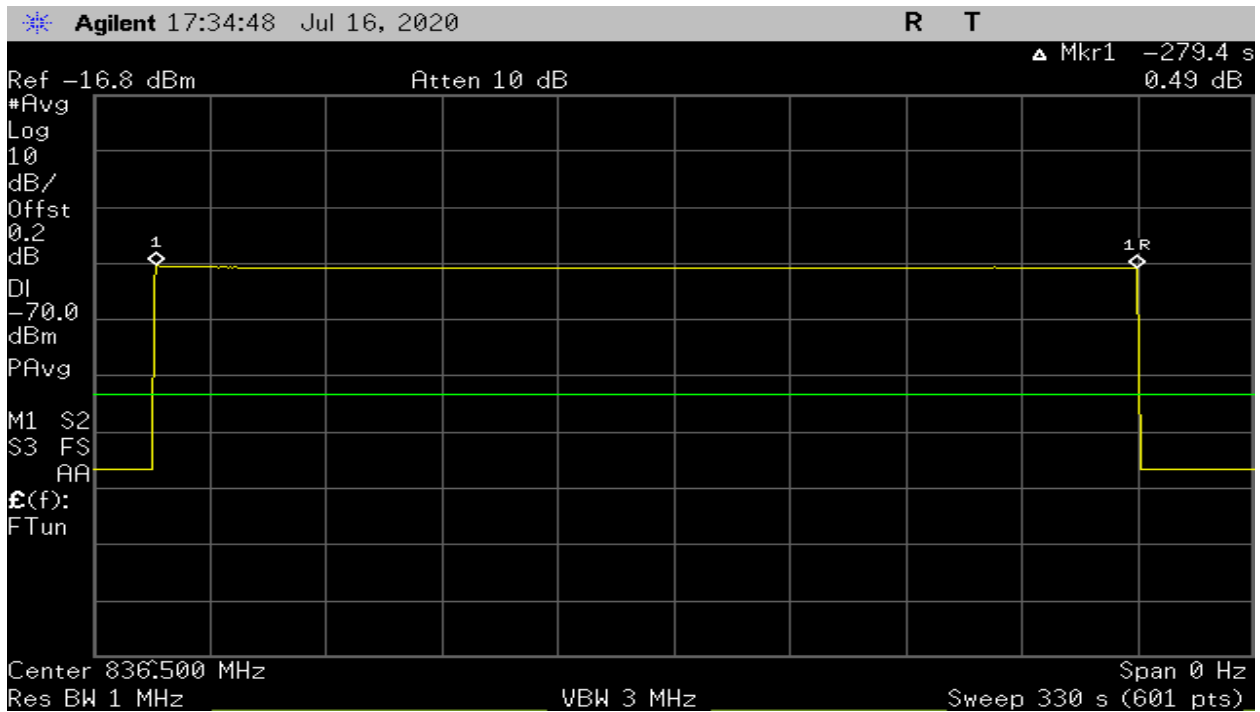
Table 27 – Uplink Inactivity Data



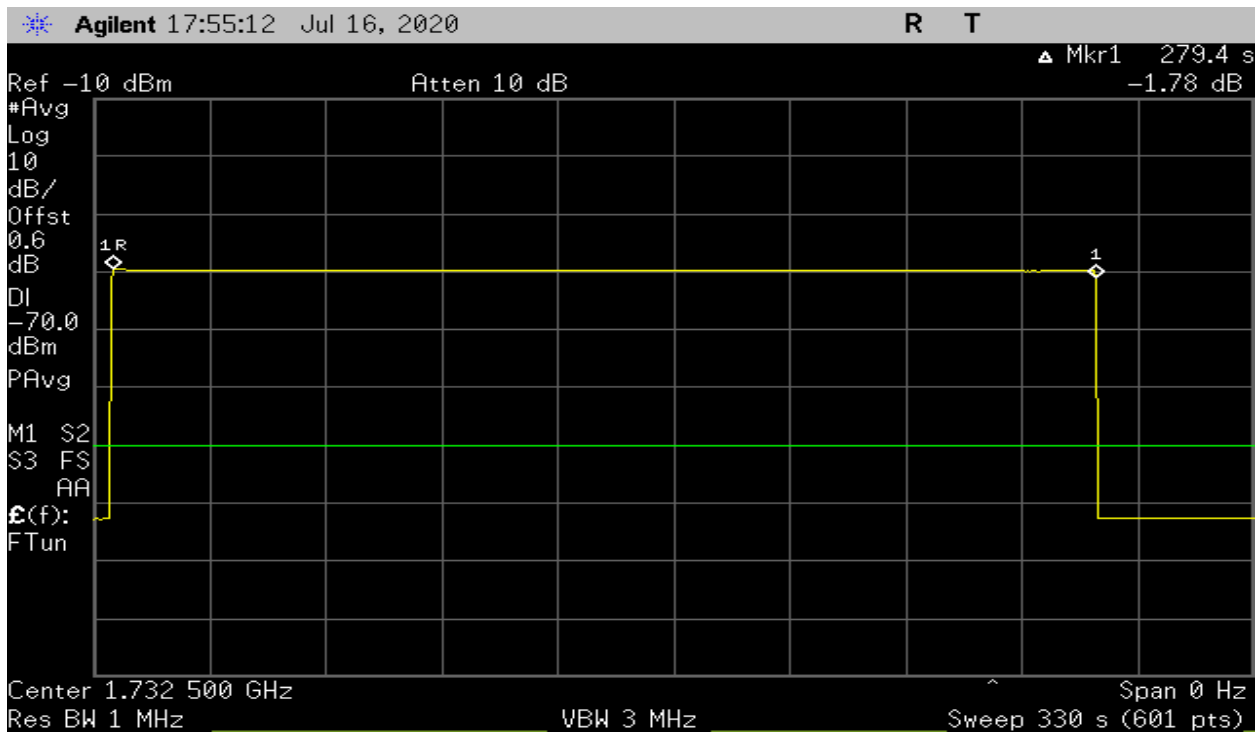
Plot 136 – 698-716MHz Band – Uplink Inactivity



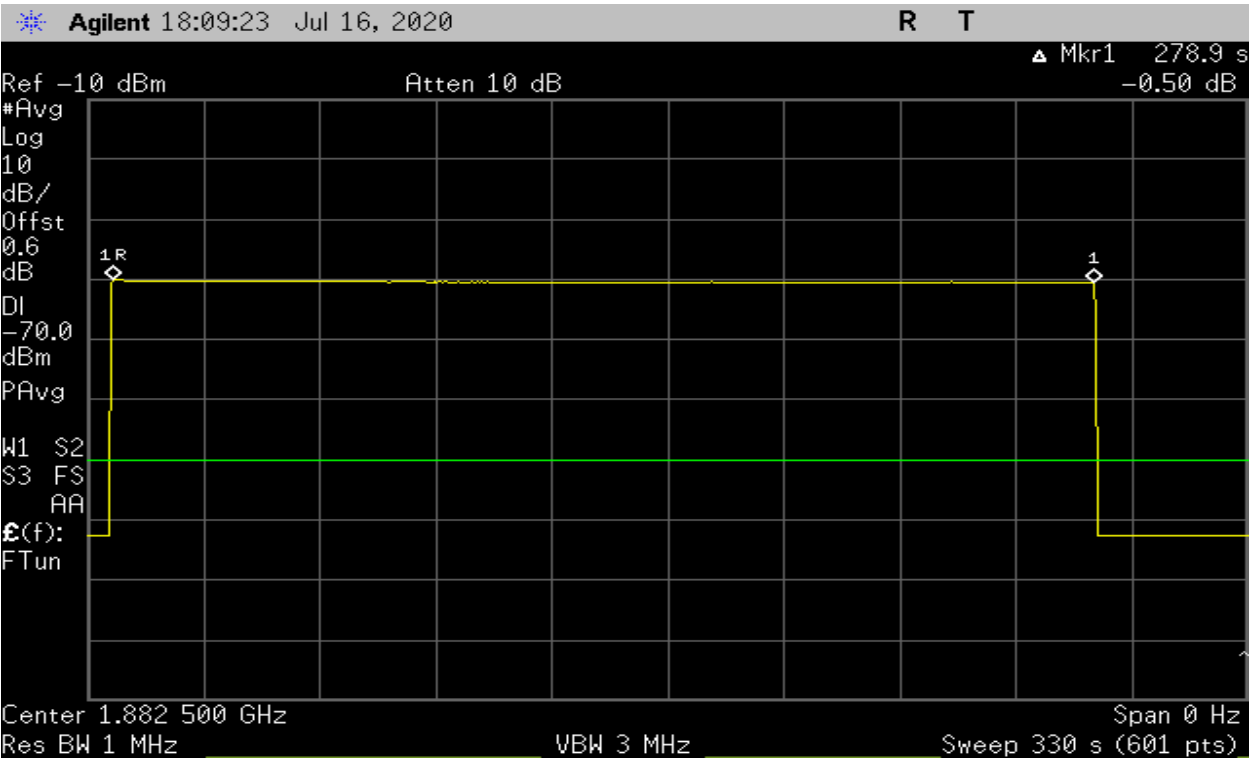
Plot 137 – 776-787MHz Band – Uplink Inactivity



Plot 138 – 824-849MHz Band – Uplink Inactivity



Plot 139 – 1710-1755MHz Band – Uplink Inactivity



Plot 140 – 1850-1915MHz Band – Uplink Inactivity

8. Variable Booster Gain

Test Requirement(s):	§20.21(e)(8)(i)(c)(1) and RSS-131 §5.1.1.3 & 5.1.3.2	Test Engineer(s):	Sean Eggleston
Test Results:	Pass	Test Date(s):	Jul/17/2020

Test Procedures: As required by 47 §20.21(e)(8)(i)(c)(1) and RSS-131 §5.1.1.3 & 5.1.3.2, Variable Booster Gain measurements were made as per FCC KDB procedures 935210 D03 defined in §7.9.

The EUT was set up as per Figure 4.

Gain limits are based on §20.21(e)(8)(i)(C) for consumer booster Fixed devices shall not exceed $-34\text{dB} - \text{RSSI} + \text{MSCL}$.

Test Setup:

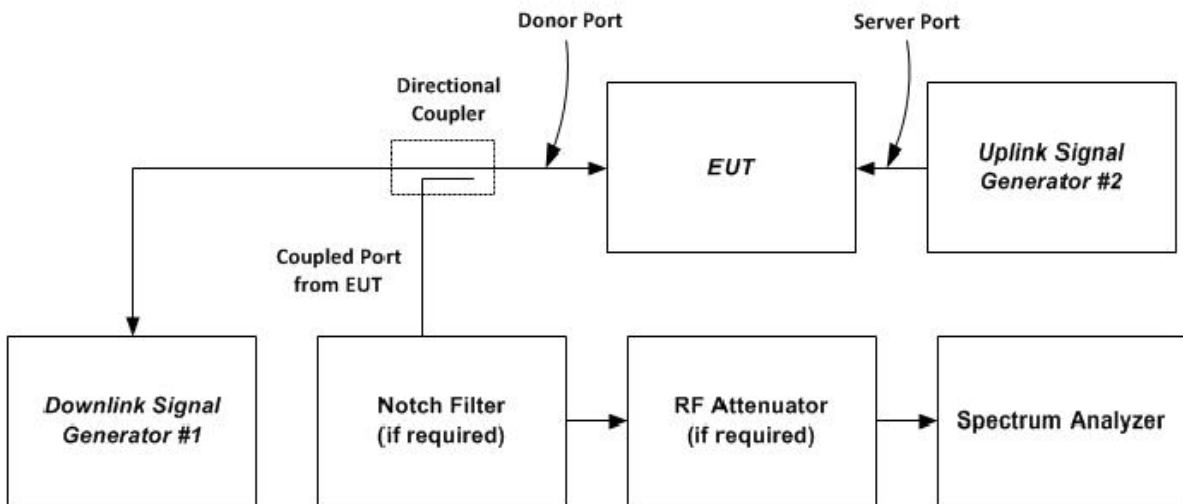


Figure 5 – Variable Gain

Detector Setting	Resolution Bandwidth	Video Bandwidth	Sweep Time
RMS	100 kHz	300 kHz	Auto

Table 28 – Analyzer Settings

Statement: Device when operating in shutoff mode it complies with uplink and downlink gain limits of transmit power off mode.

RSSI (dBm)	Gain Limit (dBm)	P(in) (dBm)	P(out) dBm	Gain (dB)	Margin (dB)
-20	21.31	-46.2	-46	0.2	-21.11
-35	36.31	-46.2	-46	0.2	-36.11
-40	41.31	-46.2	-7.2	39	-2.31
-45	46.31	-46.2	-2.9	43.3	-3.01
-50	51.31	-46.2	3.2	49.4	-1.91
-55	56.31	-46.2	8.3	54.5	-1.81

Table 29 – 698-716MHz Band – Uplink Data

RSSI (dBm)	Gain Limit (dBm)	P(in) (dBm)	P(out) dBm	Gain (dB)	Margin (dB)
-33	35.21	-40.6	-46	-5.4	-40.61
-35	37.21	-40.6	-6.8	33.8	-3.41
-40	42.21	-40.6	-1.9	38.7	-3.51
-45	47.21	-40.6	3.2	43.8	-3.41
-50	52.21	-40.6	8.4	49	-3.21
-55	57.21	-40.6	13.5	54.1	-3.11

Table 30 – 776-787MHz Band – Uplink Data

RSSI (dBm)	Gain Limit (dBm)	P(in) (dBm)	P(out) dBm	Gain (dB)	Margin (dB)
-35	38.31	-43.5	-46	-2.5	-40.81
-36	39.31	-43.5	-7.2	36.3	-3.01
-40	43.31	-43.5	-3.3	40.2	-3.11
-45	48.31	-43.5	1.6	45.1	-3.21
-50	53.31	-43.5	6.4	49.9	-3.41
-55	58.31	-43.5	12.2	55.7	-2.61

Table 31 – 824-849MHz Band – Uplink Data

RSSI (dBm)	Gain Limit (dBm)	P(in) (dBm)	P(out) dBm	Gain (dB)	Margin (dB)
-46	51.91	-52	-46	6	-45.91
-47	52.91	-52	-10.4	41.6	-11.31
-48	53.91	-52	-9.5	42.5	-11.41
-50	55.91	-52	-7.6	44.4	-11.51
-55	60.91	-52	-2.4	49.6	-11.31
-60	65.91	-52	3.2	55.2	-10.71

Table 32 – 1710-1755MHz Band – Uplink Data

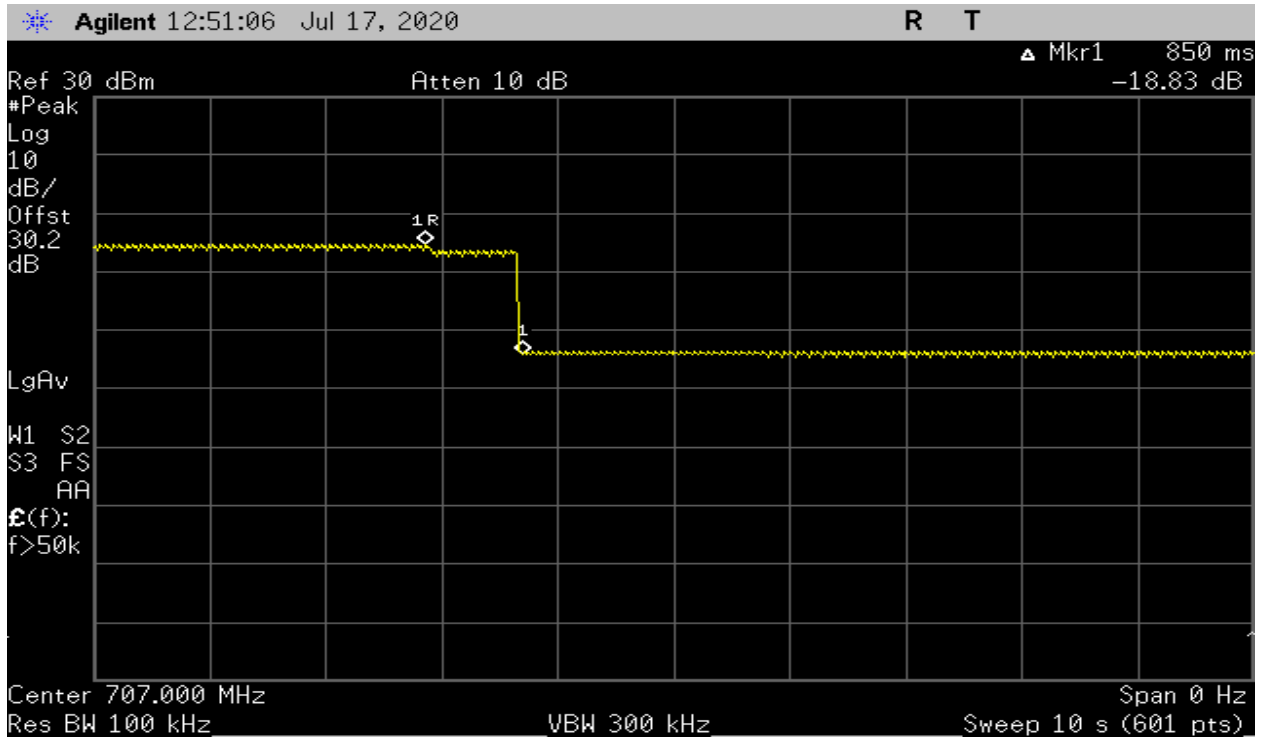
RSSI (dBm)	Gain Limit (dBm)	P(in) (dBm)	P(out) dBm	Gain (dB)	Margin (dB)
-47	53.31	-52.7	-46	6.7	-46.61
-48	54.31	-52.7	-10.3	42.4	-11.91
-50	56.31	-52.7	-8.4	44.3	-12.01
-55	61.31	-52.7	-2.9	49.8	-11.51
-60	66.31	-52.7	3	55.7	-10.61
-70	76.31	-52.7	13.9	66.6	-9.71

Table 33 – 1850-1915MHz Band – Uplink Data

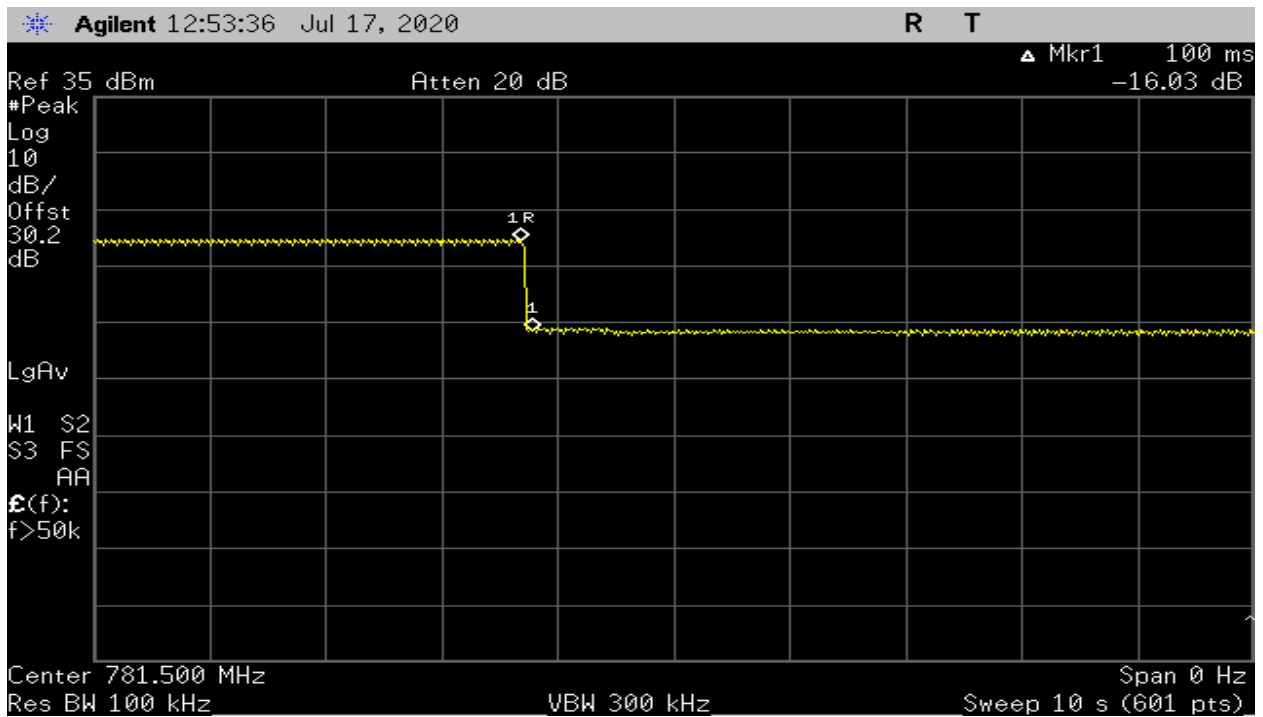
Frequency Band (MHz)	Measured Timing (Seconds)	Limit (Seconds)	Margin (Seconds)
698-716	0.85	3.0	-2.15
776-787	0.1	3.0	-2.9
824-849	0.85	3.0	-2.15
1710-1755	0.783	3.0	-2.21
1850-1915	0.783	3.0	-2.21

Table 34 – Variable Uplink Gain Timing - Summary Table

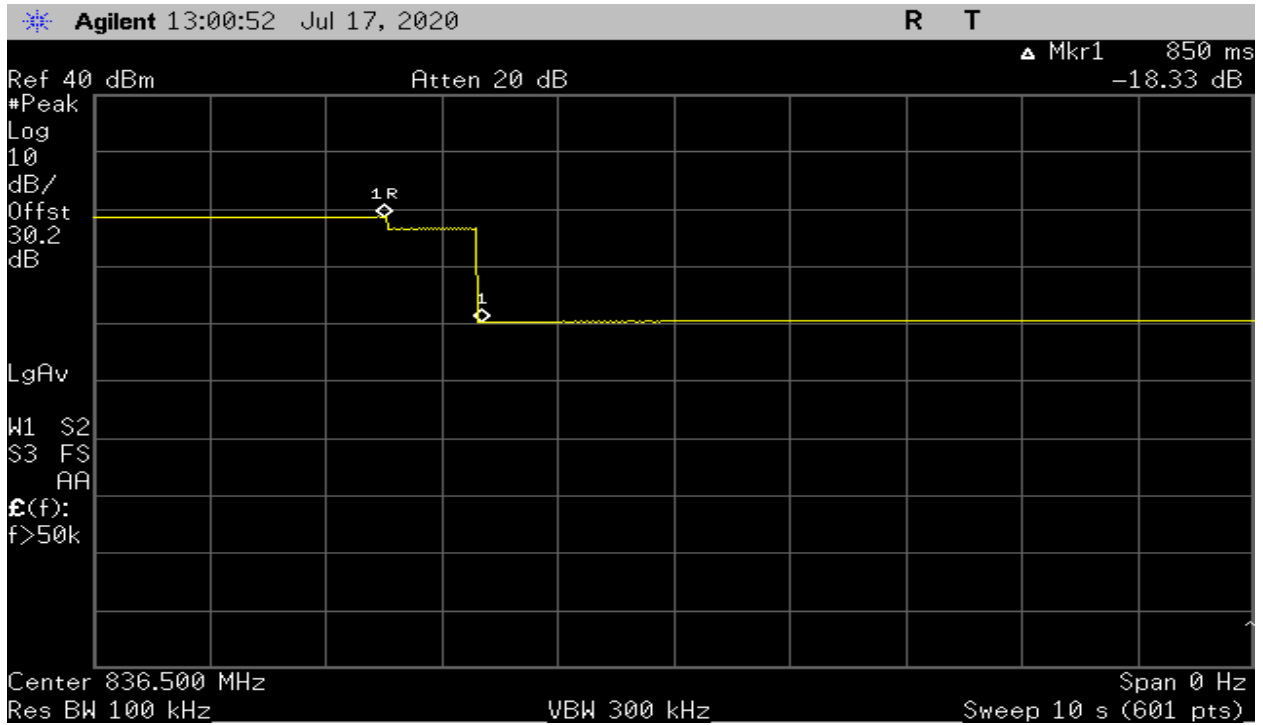
The following pages show measurements of Variable Booster Gain Timing plots:



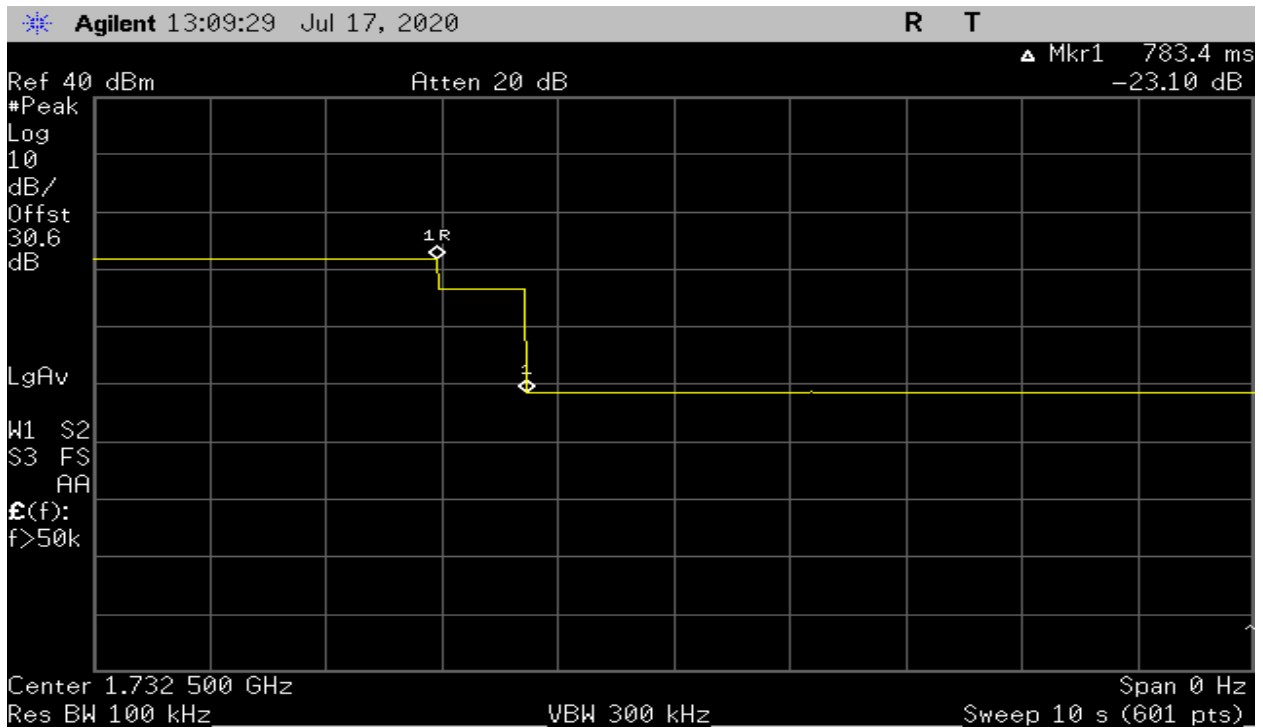
Plot 141 – 698-716MHz Band – Uplink Gain Timing



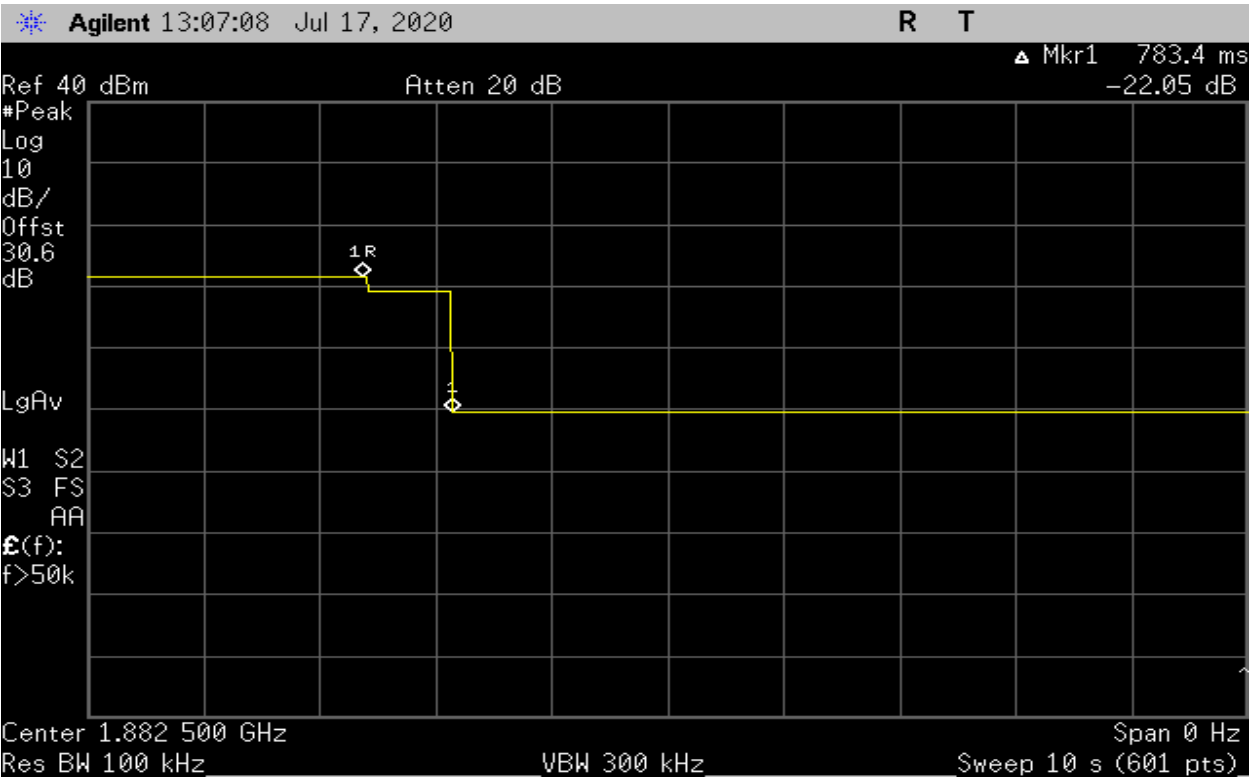
Plot 142 – 776-787MHz Band – Uplink Gain Timing



Plot 143 – 824-849MHz Band – Uplink Gain Timing



Plot 144 – 1710-1755MHz Band – Uplink Gain Timing



Plot 145 – 1850-1915MHz Band – Uplink Gain Timing

9. Occupied Bandwidth

Test Requirement(s):	§2.1049 and RSS-Gen §7.0	Test Engineer(s):	Sean Eggleston
Test Results:	Pass	Test Date(s):	Jul/15/2020

Test Procedures: As required by CFR47 §2.1049 and RSS-Gen §7.0, Occupied Bandwidth were made at the RF antenna output terminals of the EUT. Measurements were made as per the FCC KDB 935210 D03 procedures defined in §7.10

The EUT output was connected directly to a spectrum analyzer through an attenuator. A signal generator was connected to the EUT to produce GSM, CDMA & LTE signals to show the input and output signals were similar.

The following pages show measurements of Occupied Bandwidth plots:

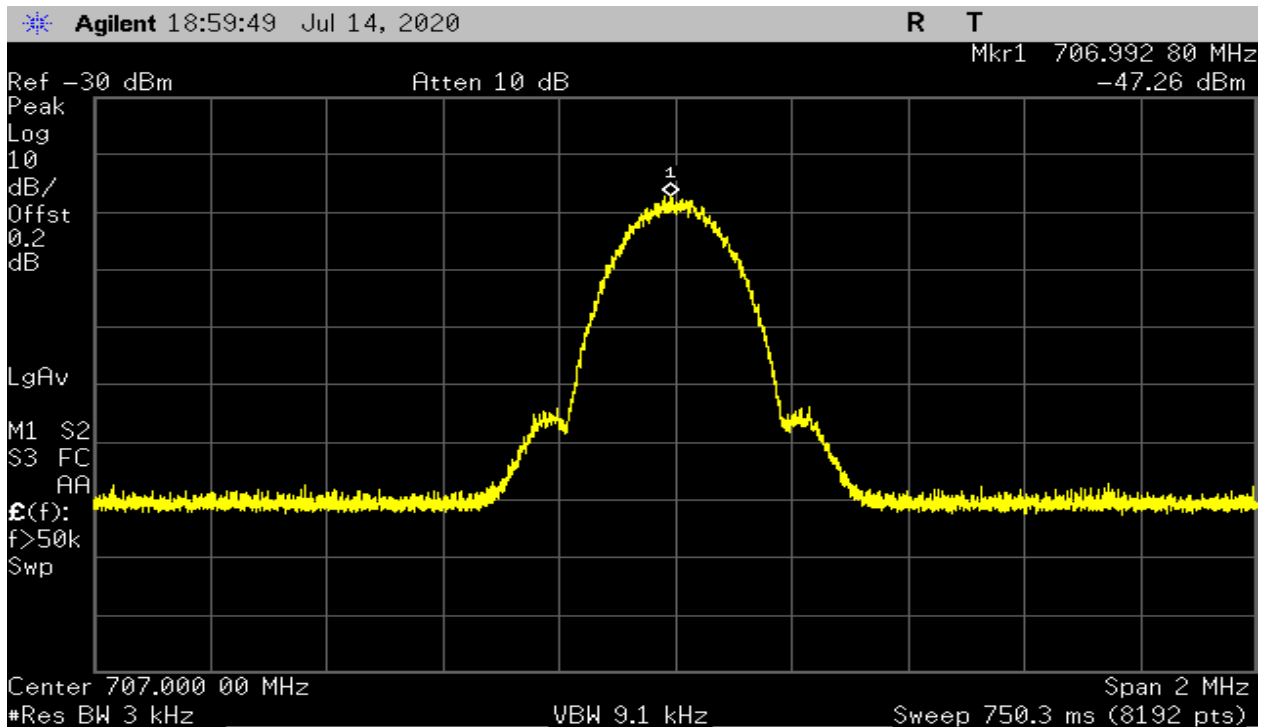
Detector Setting	Resolution Bandwidth	Video Bandwidth	Sweep Time	Span
Peak	1% - 5%	$\geq 3 \times \text{RBW}$	Auto	As per Modulation Type

Table 35 – Analyzer Settings

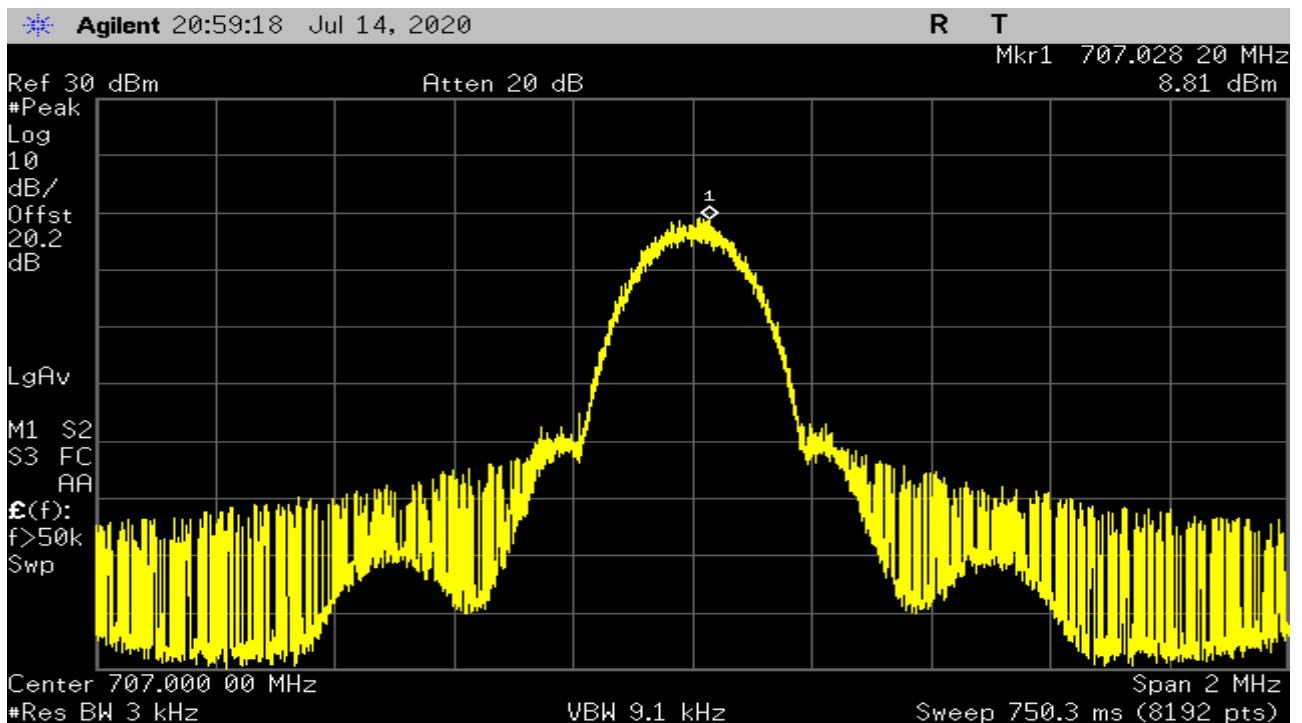
Test Setup:



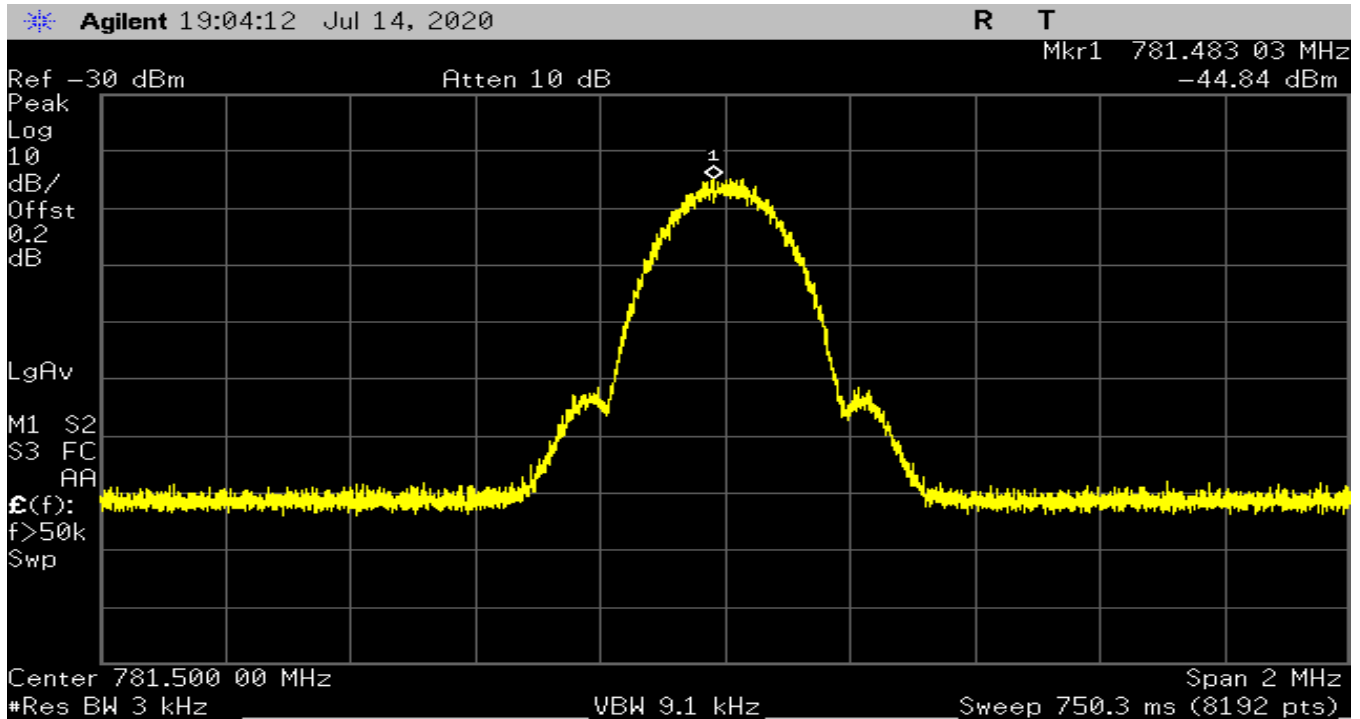
Figure 6 – Characteristics of test signals used for subsequent EUT



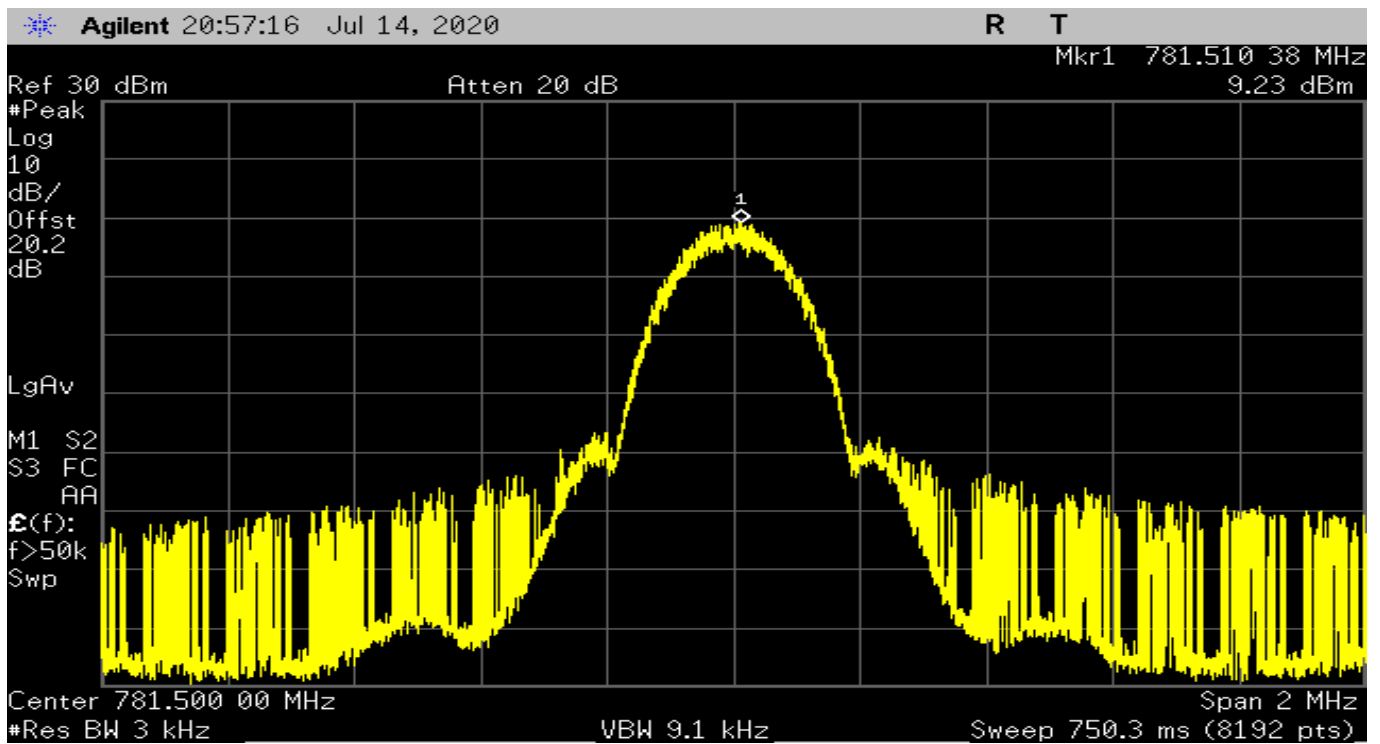
Plot 146 – 698-716MHz Band – Uplink Input – GSM



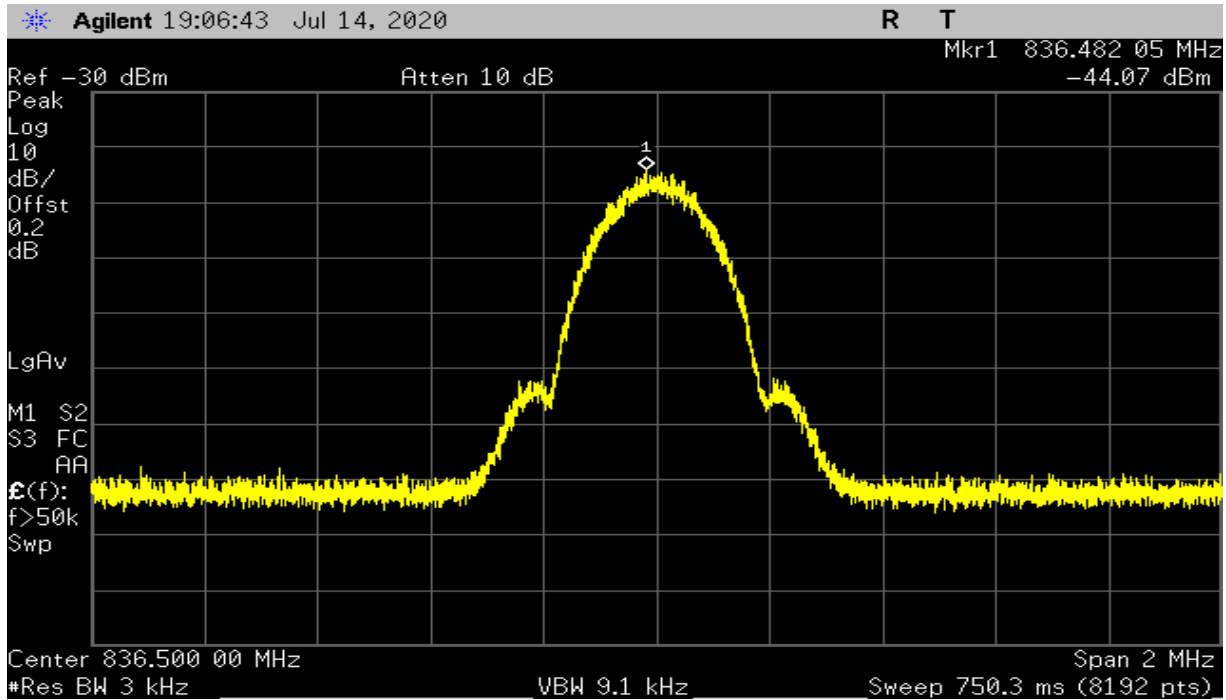
Plot 147 – 698-716MHz Band – Uplink Output – GSM



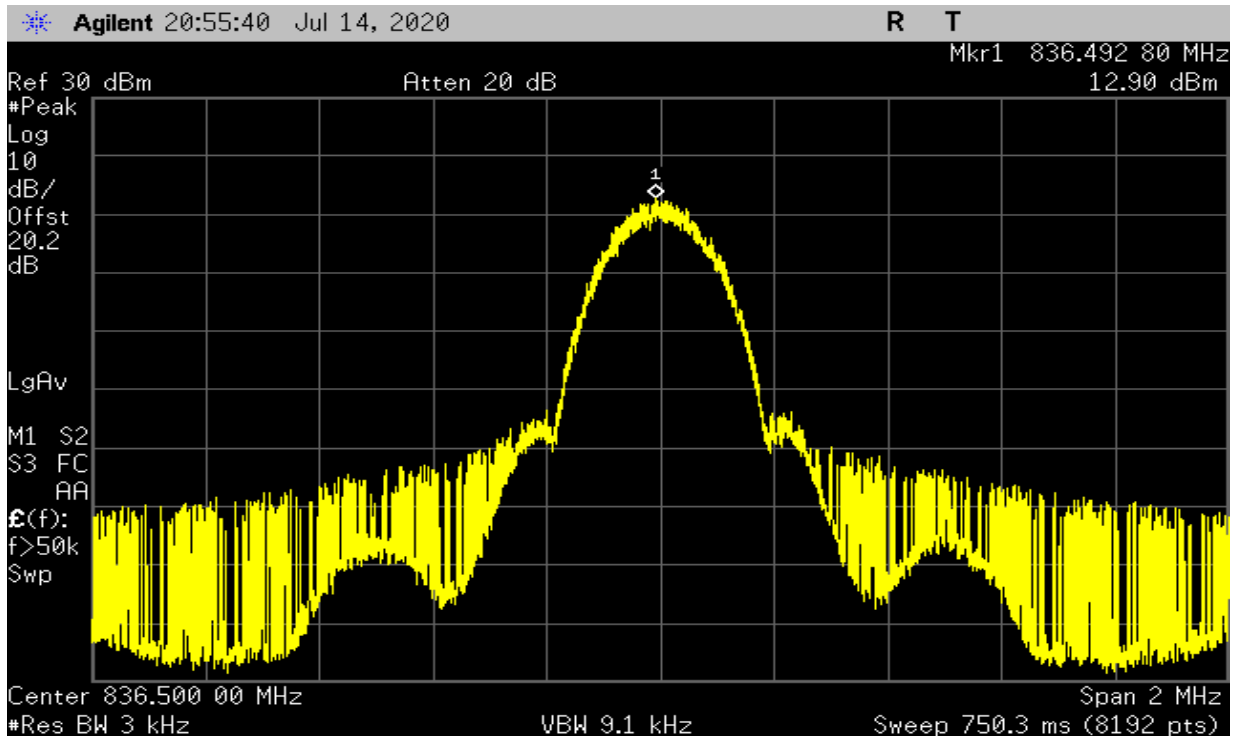
Plot 148 – 776-787MHz Band – Uplink Input – GSM



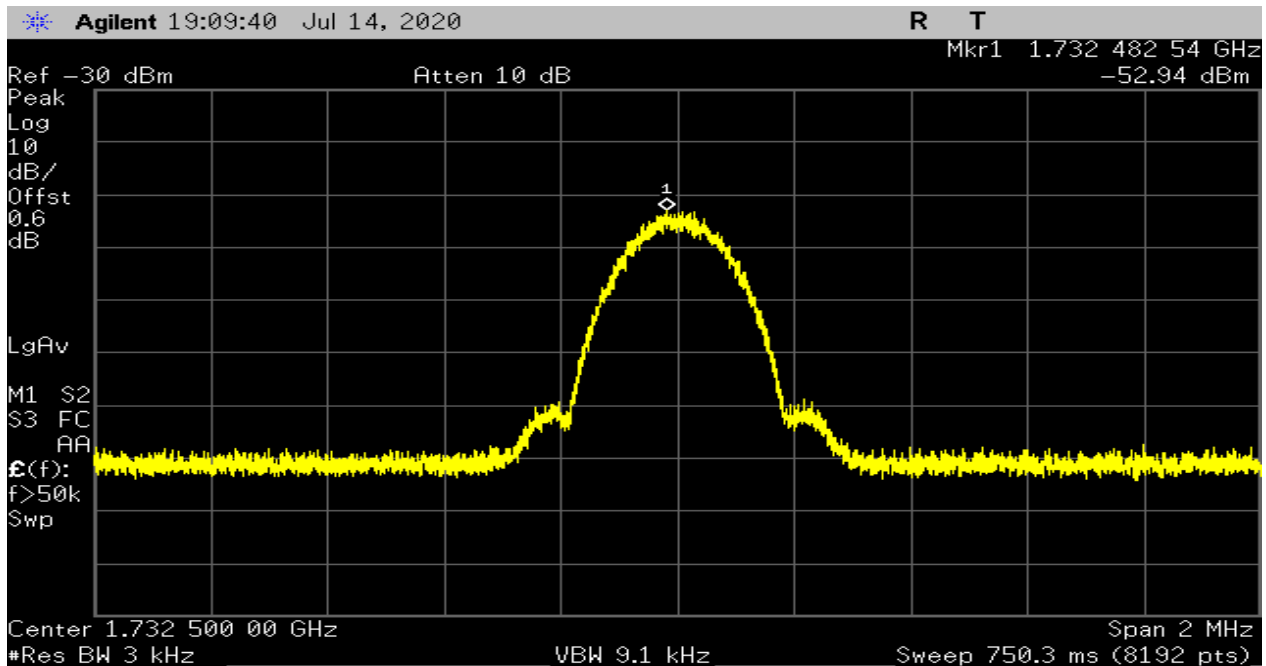
Plot 149 – 776-787MHz Band – Uplink Output – GSM



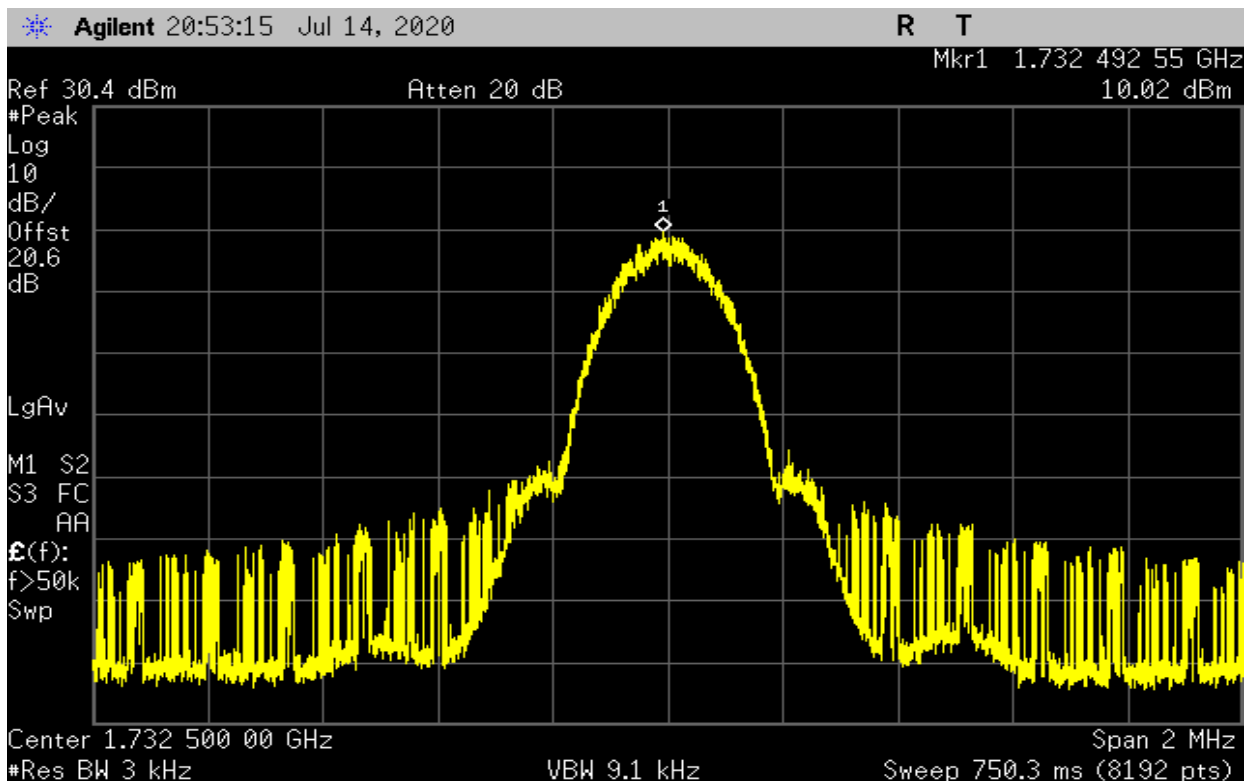
Plot 150 – 824-849MHz Band – Uplink Input – GSM



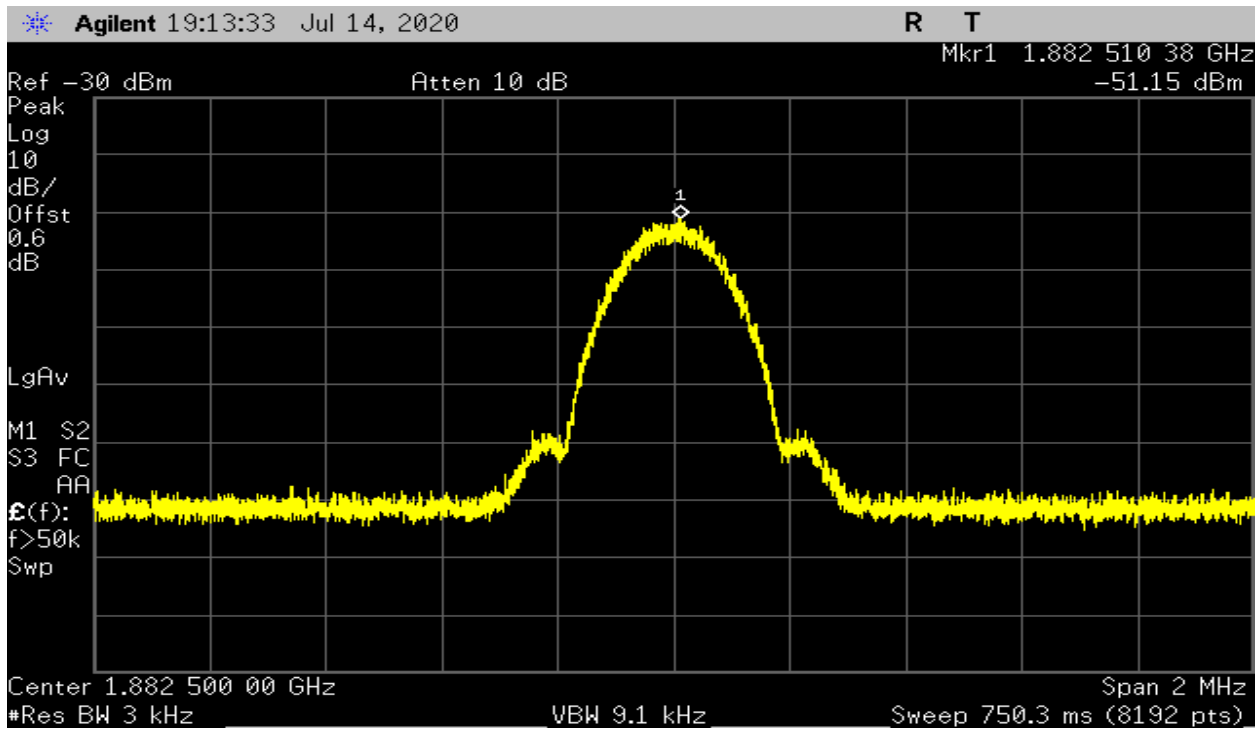
Plot 151 – 824-849MHz Band – Uplink Output – GSM



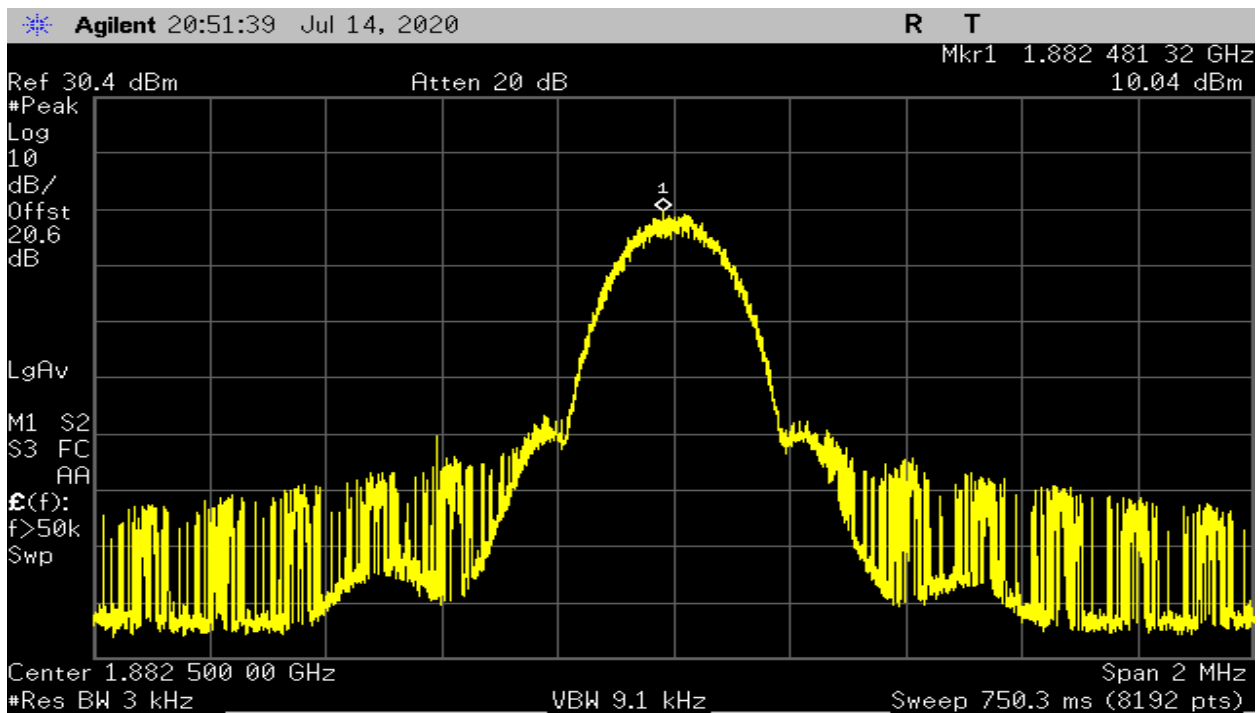
Plot 152 – 1710-1755MHz Band – Uplink Input – GSM



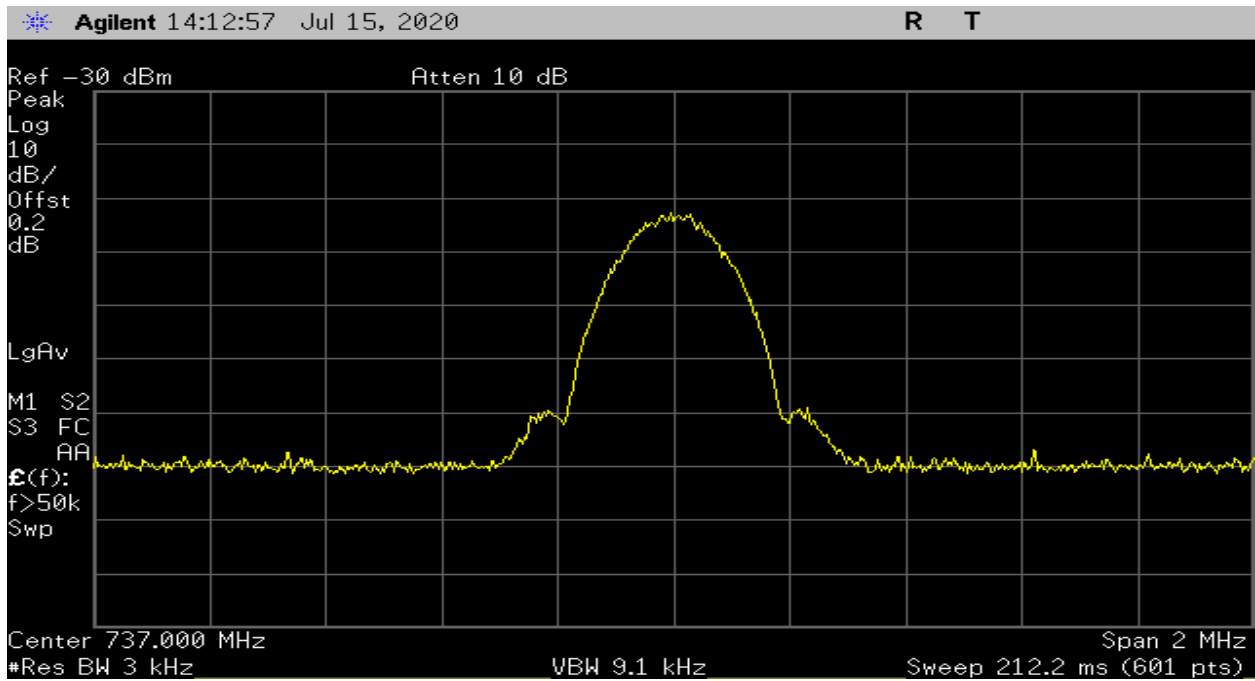
Plot 153 – 1710-1755MHz Band – Uplink Output – GSM



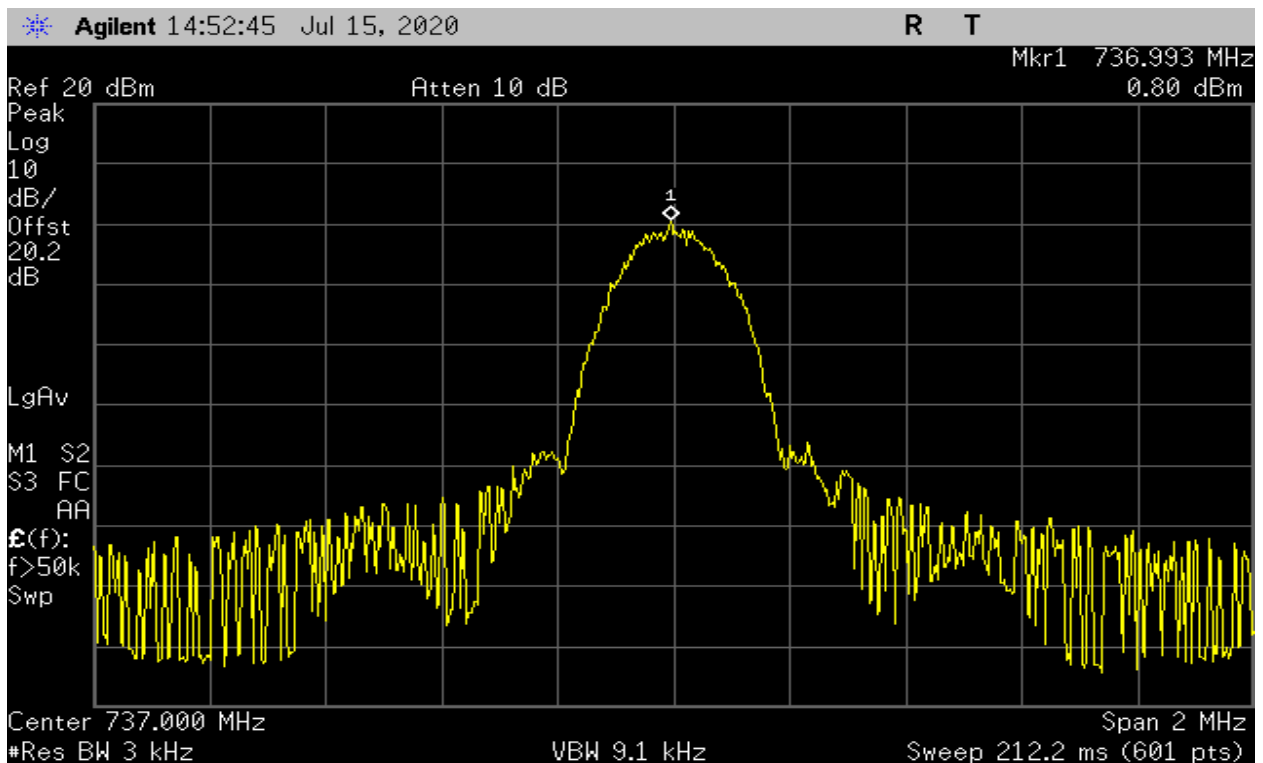
Plot 154 – 1850-1915MHz Band – Uplink Input – GSM



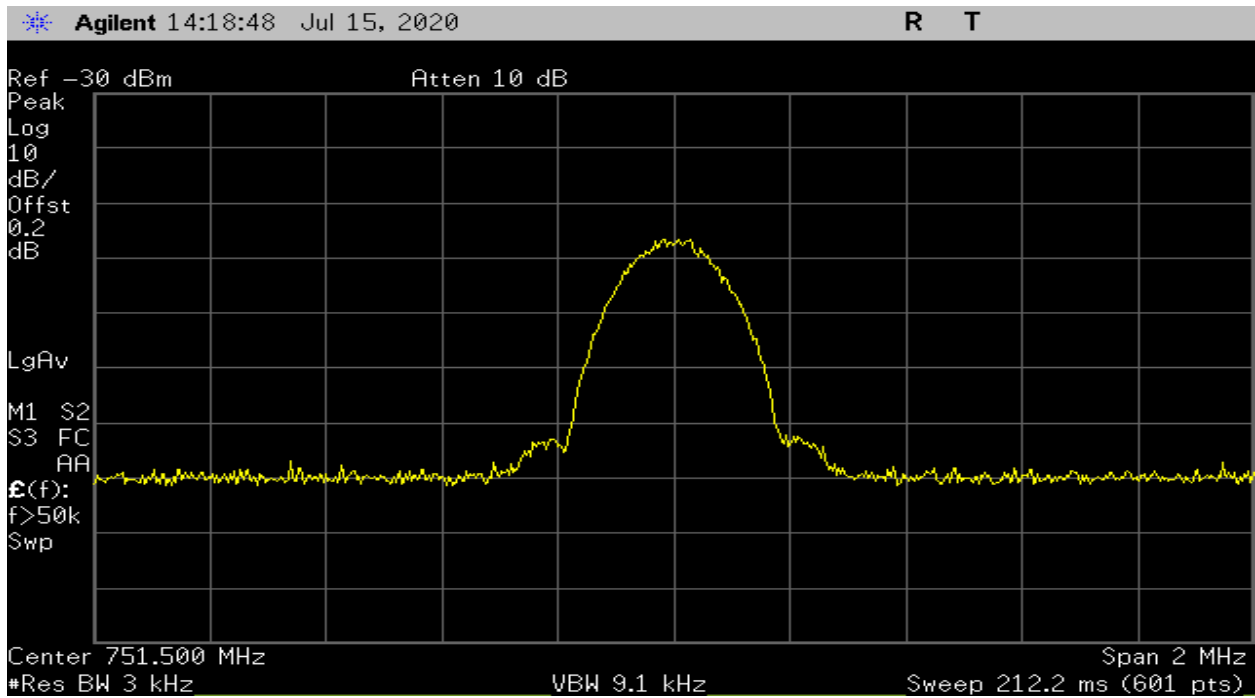
Plot 155 – 1850-1915MHz Band – Uplink Output – GSM



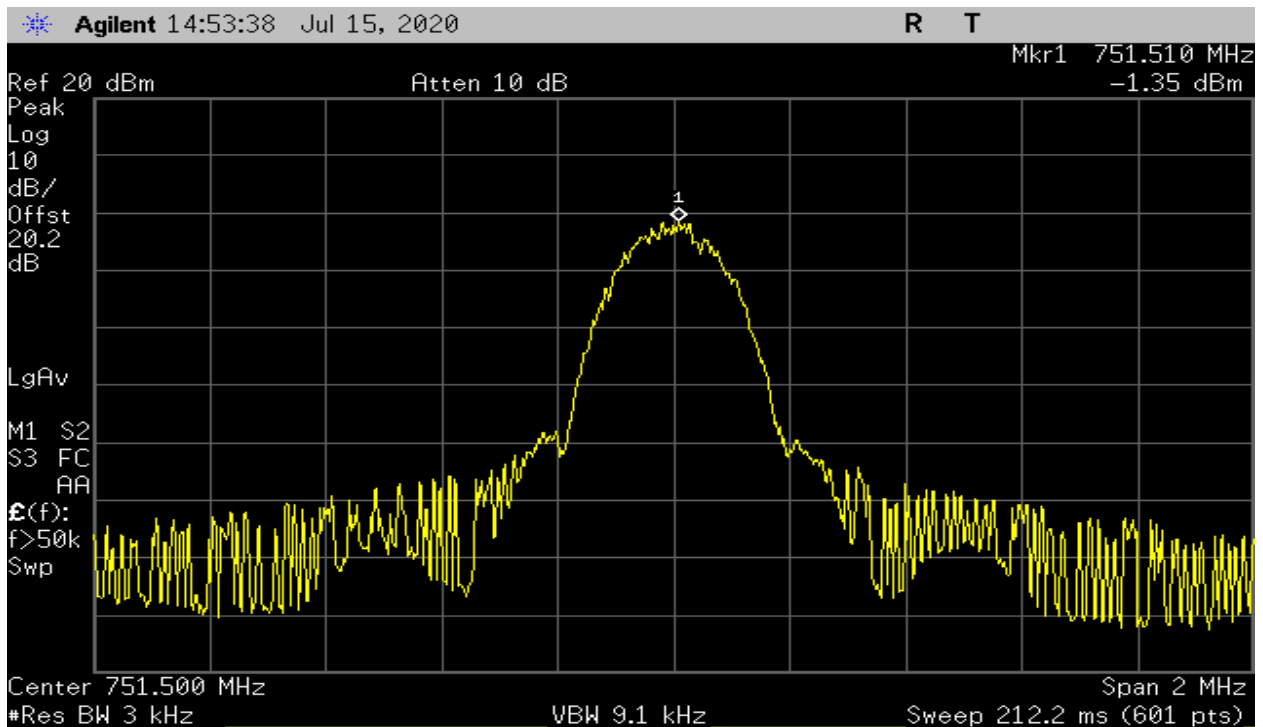
Plot 156 – 728-746MHz Band – Downlink Input – GSM



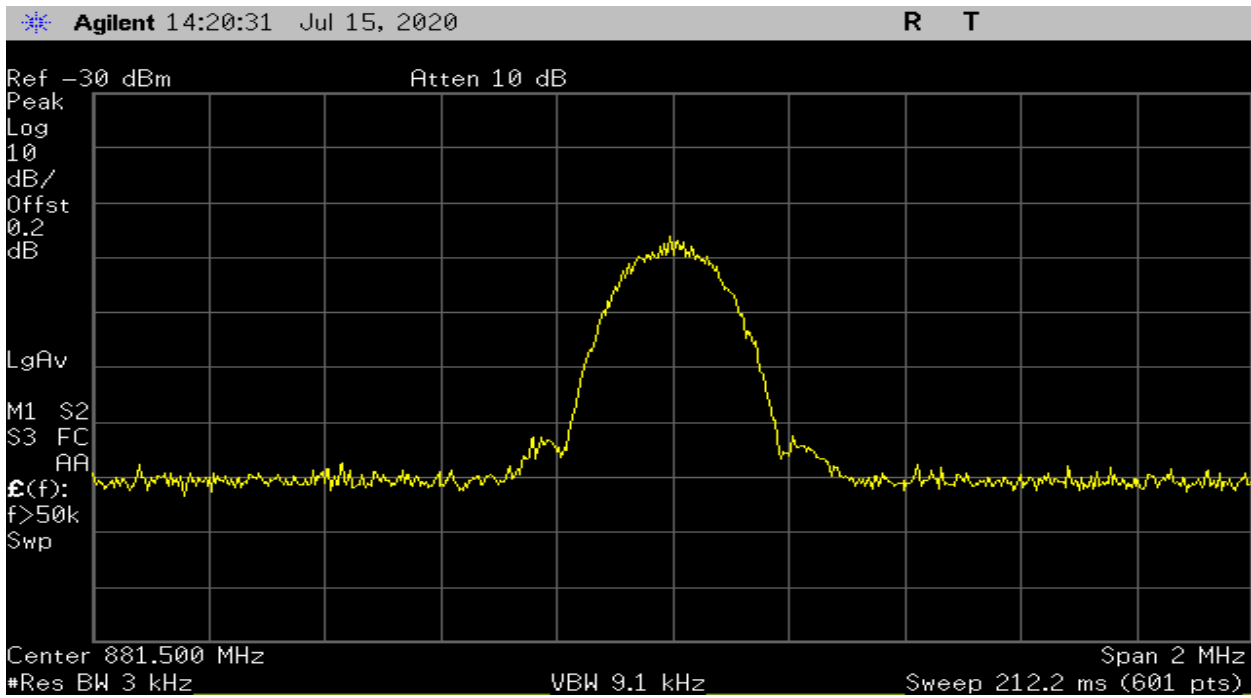
Plot 157 – 728-746MHz Band – Downlink Output – GSM



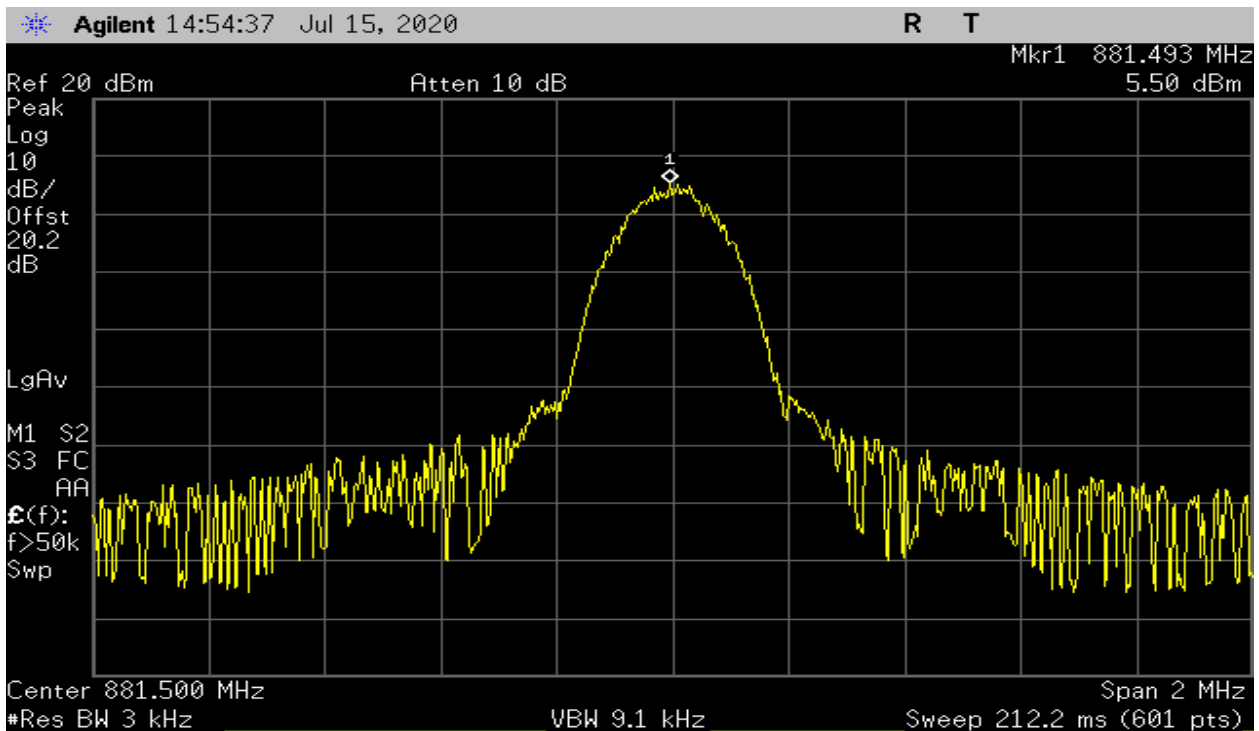
Plot 158 – 746-757MHz Band – Downlink Input – GSM



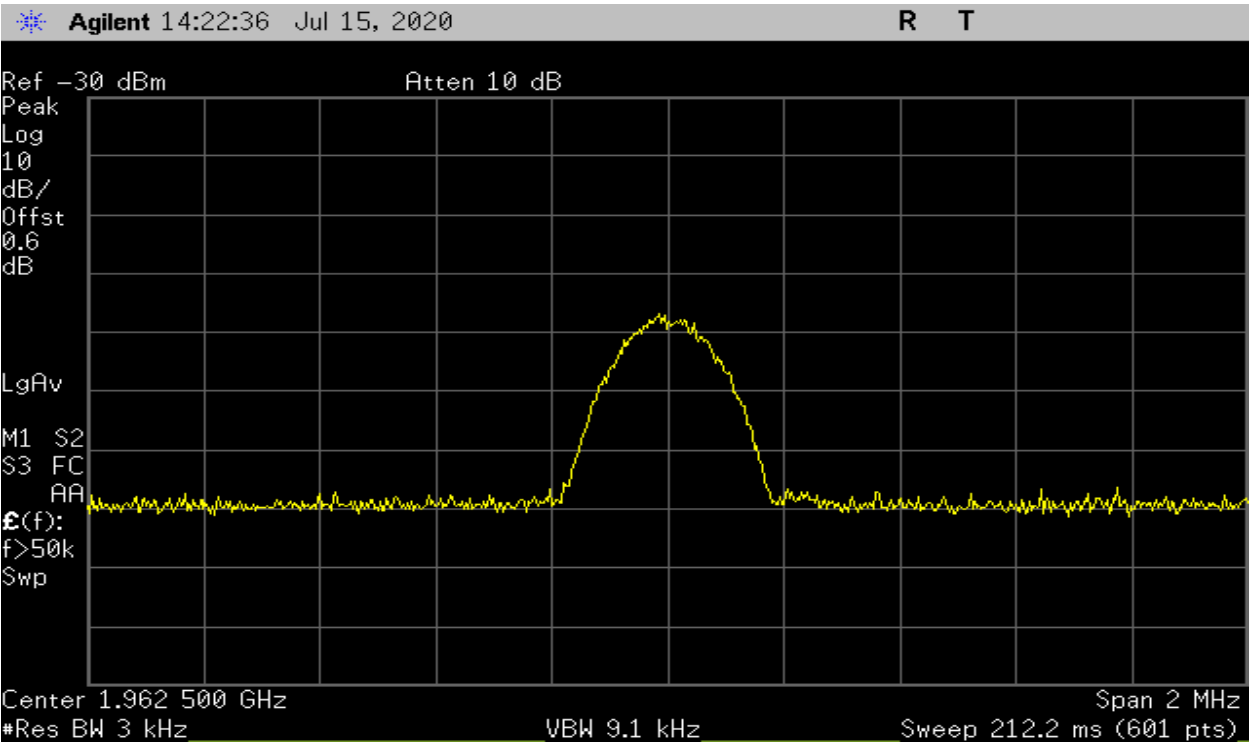
Plot 159 – 746-757MHz Band – Downlink Output – GSM



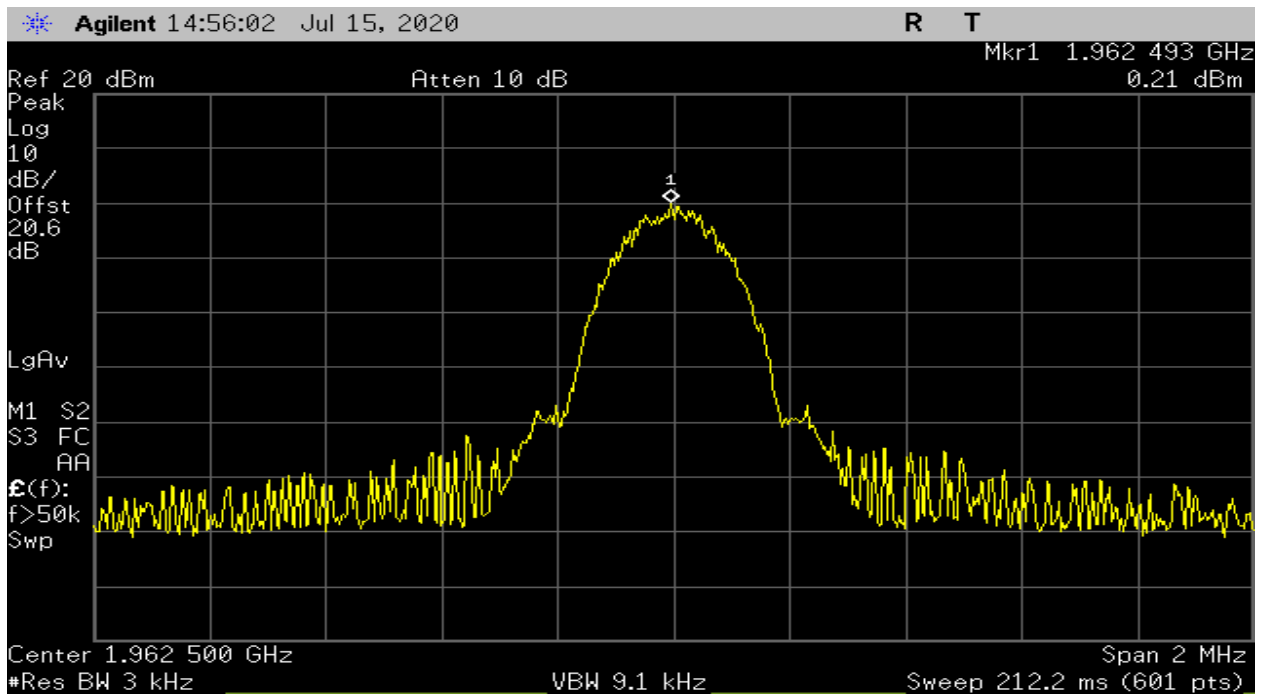
Plot 160 – 869-894MHz Band – Downlink Input – GSM



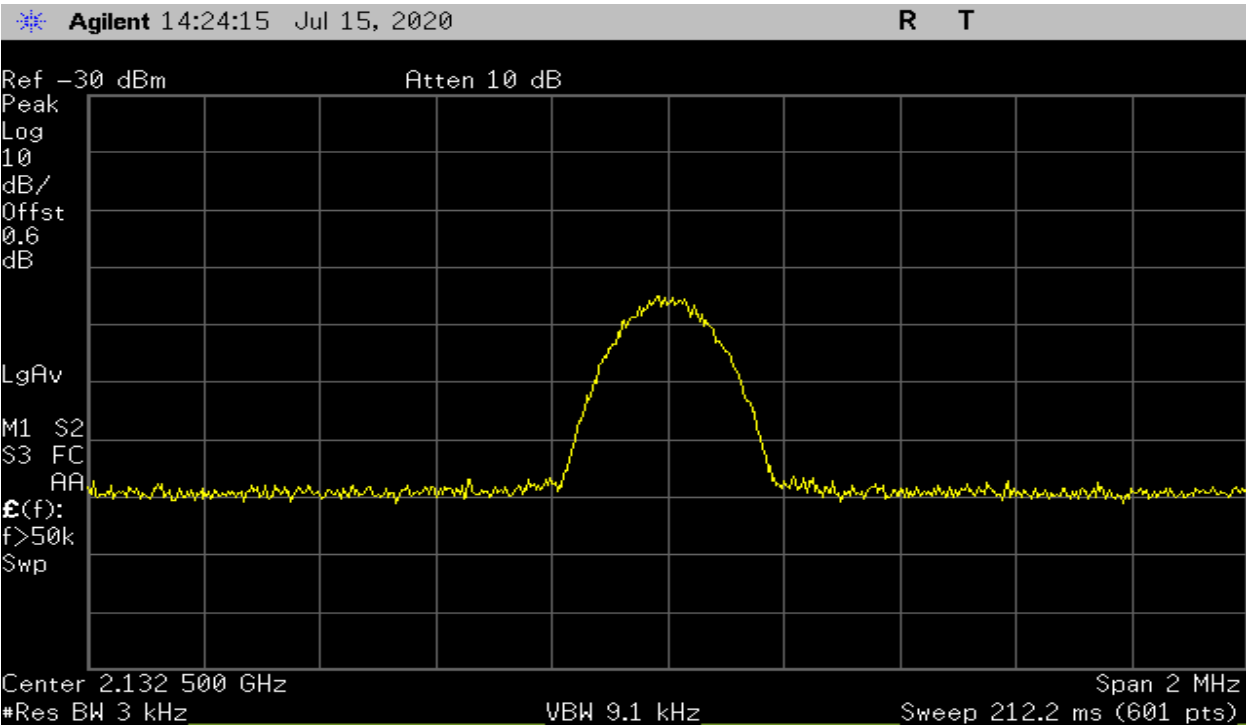
Plot 161 – 869-894MHz Band – Uplink Output – GSM



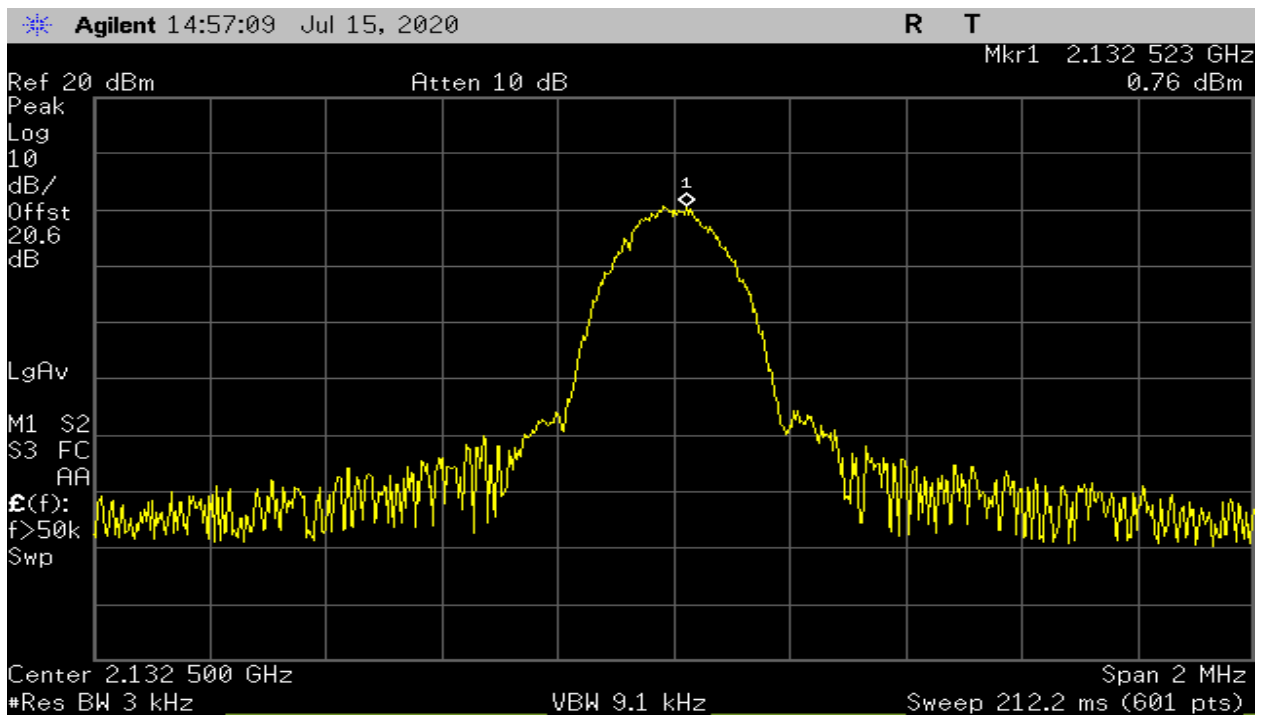
Plot 162 – 1930-1995MHz Band – Downlink Input – GSM



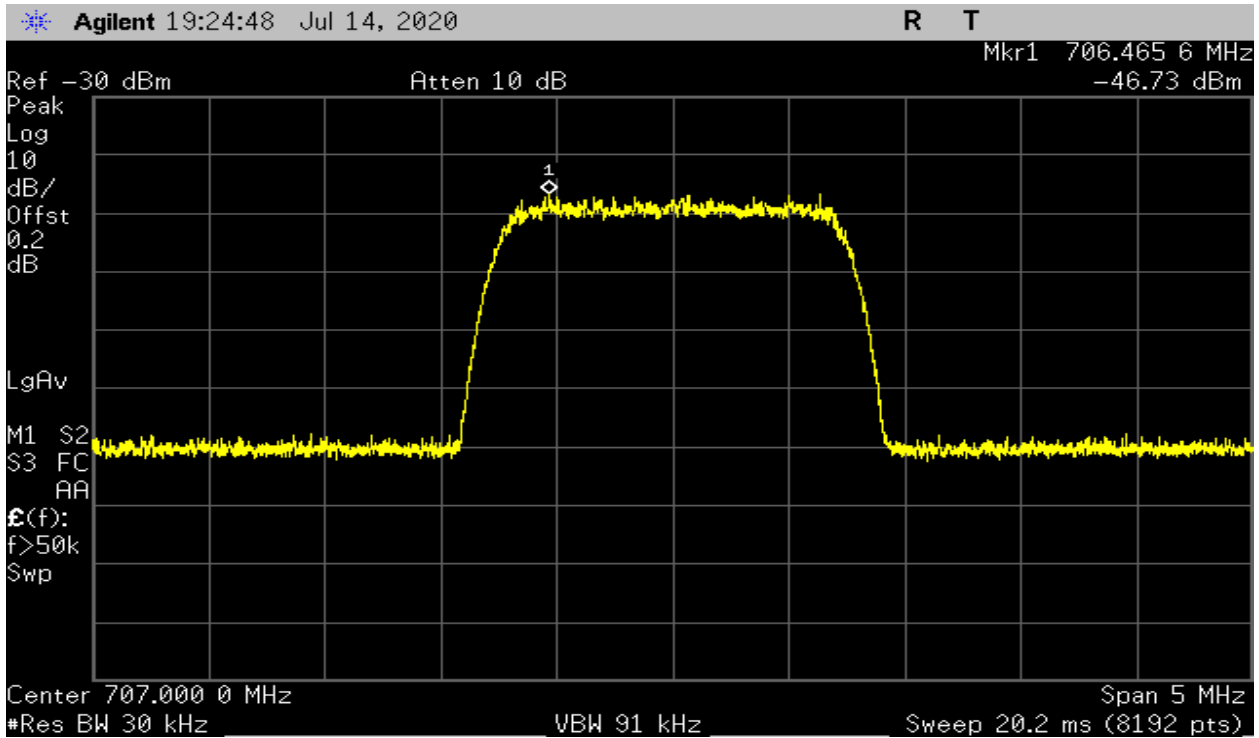
Plot 163 – 1930-1995MHz Band – Downlink Output – GSM



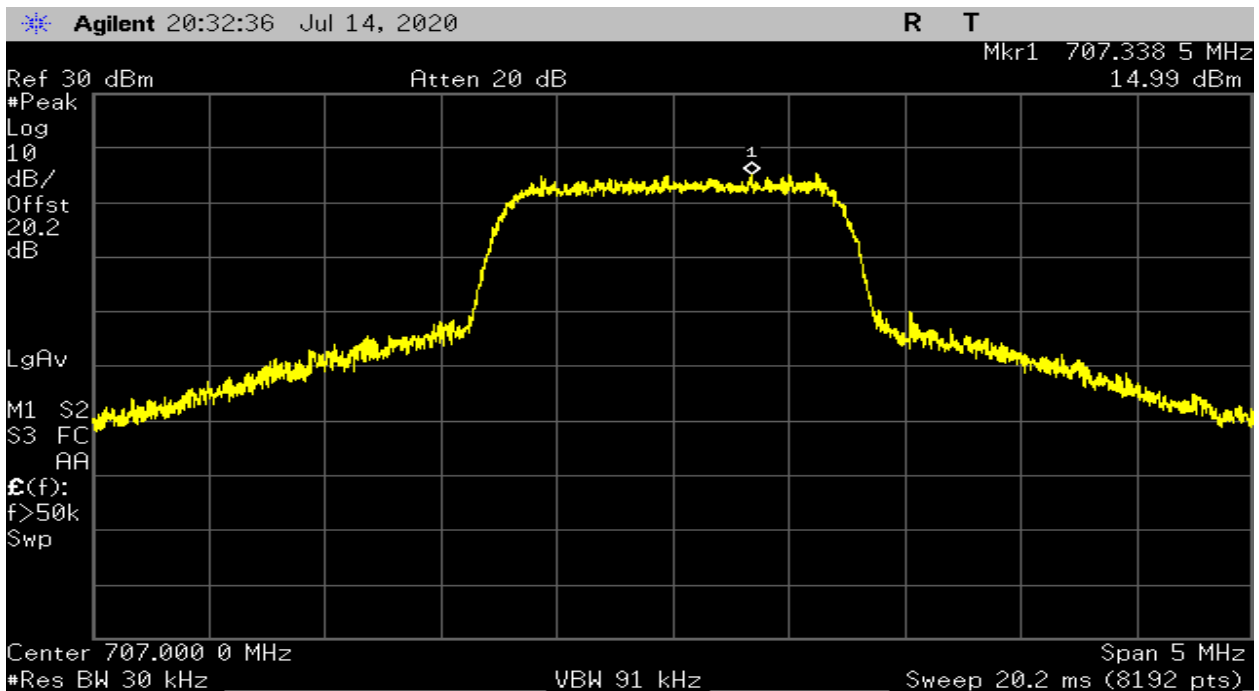
Plot 164 – 2110-2155MHz Band – Downlink Input – GSM



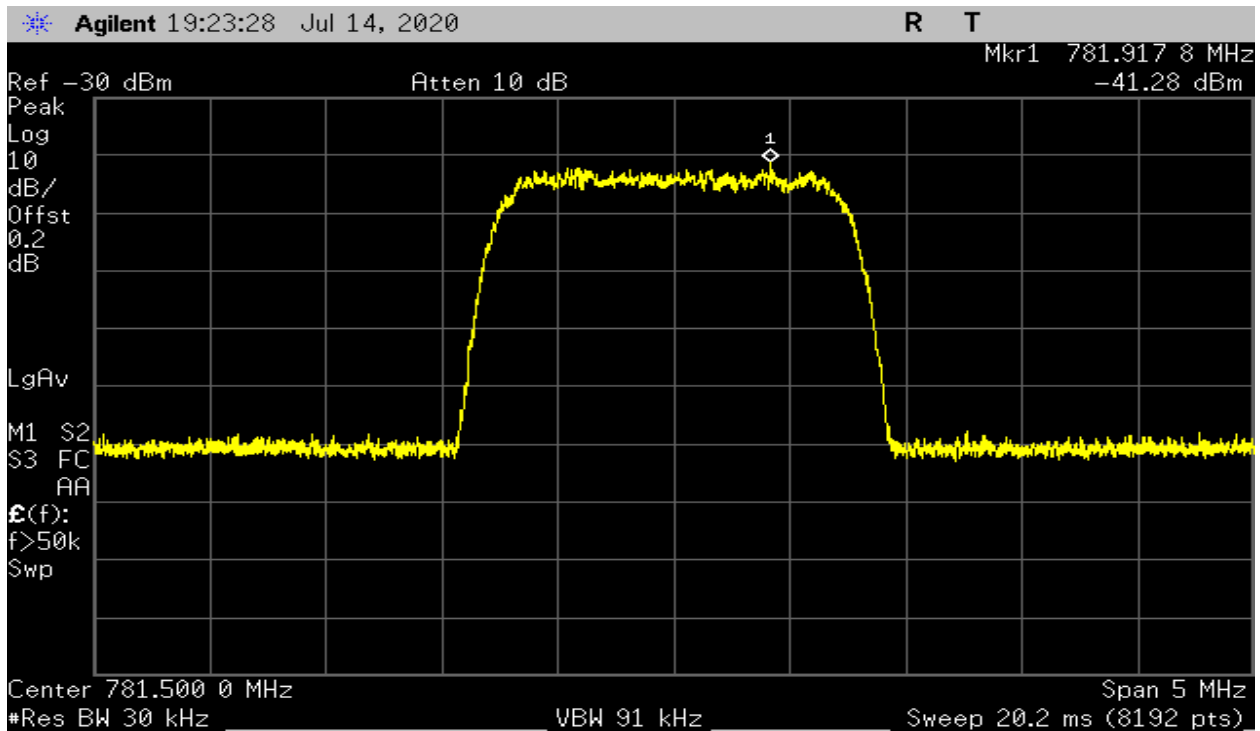
Plot 165 – 2110-2155MHz Band – Downlink Output – GSM



Plot 166 – 698-716MHz Band – Uplink Input – CDMA

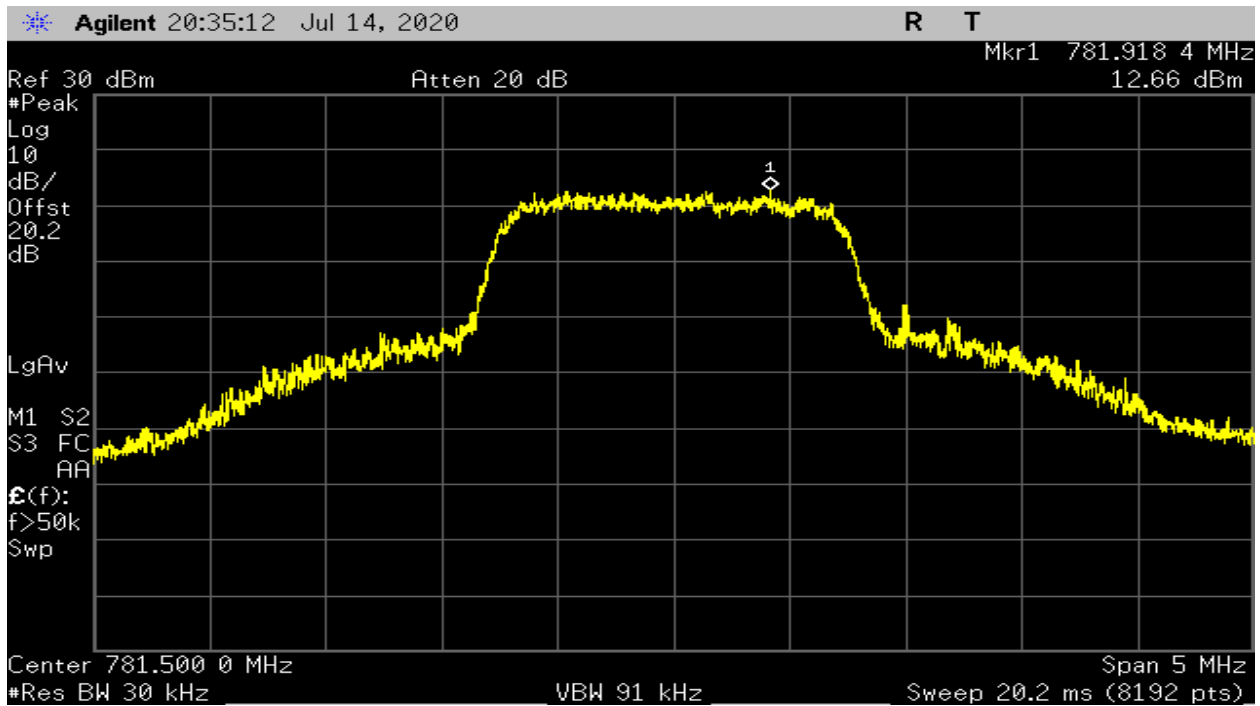


Plot 167 – 698-716MHz Band – Uplink Output – CDMA

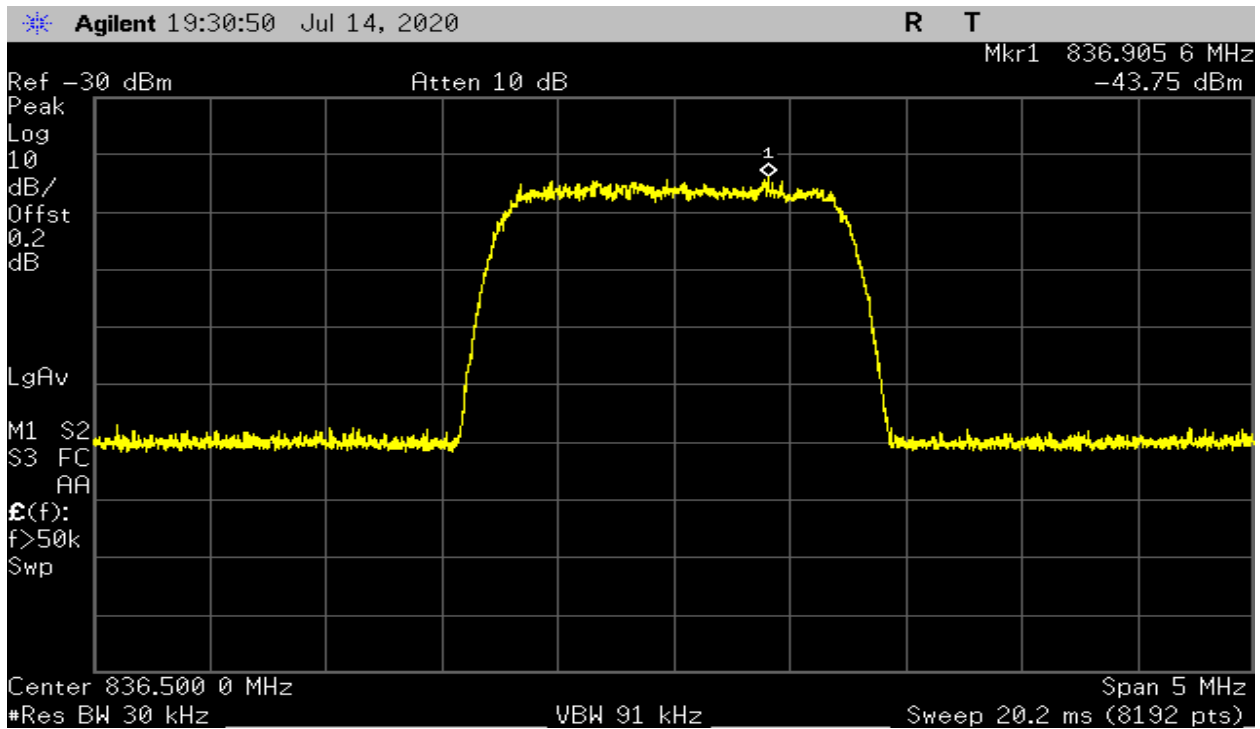


Plot 168 – 776-787MHz Band – Uplink Input – CDMA

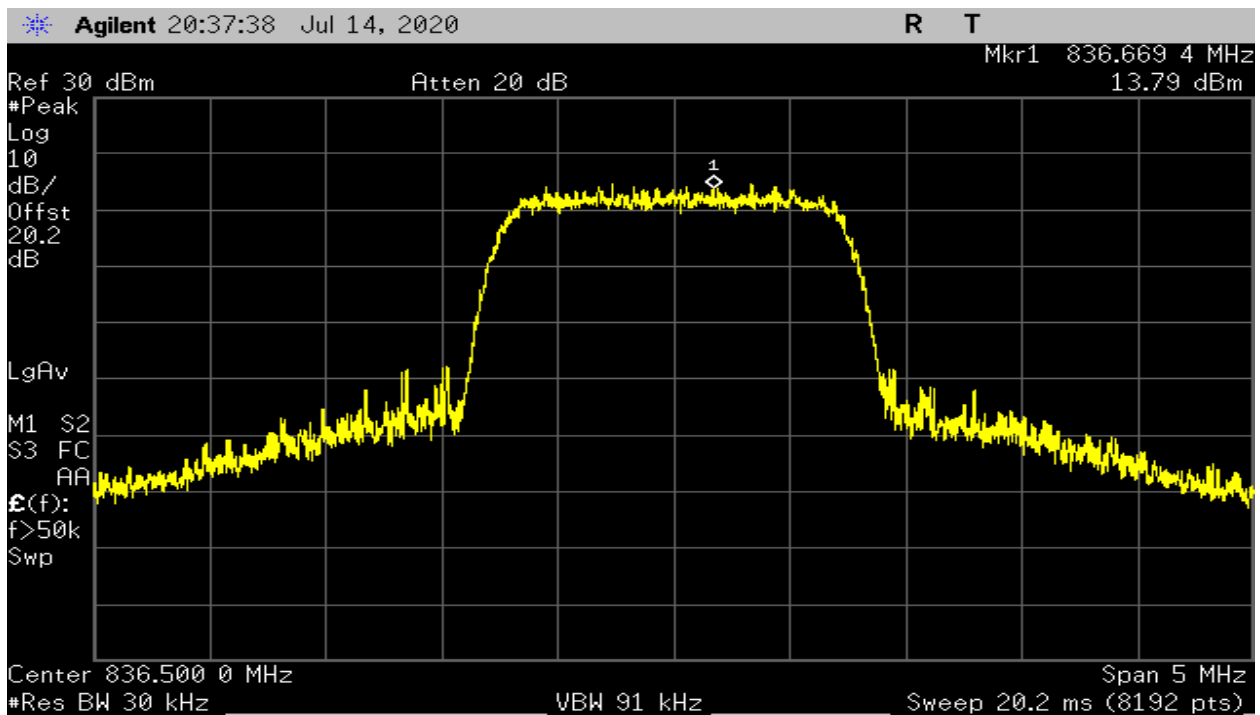
v



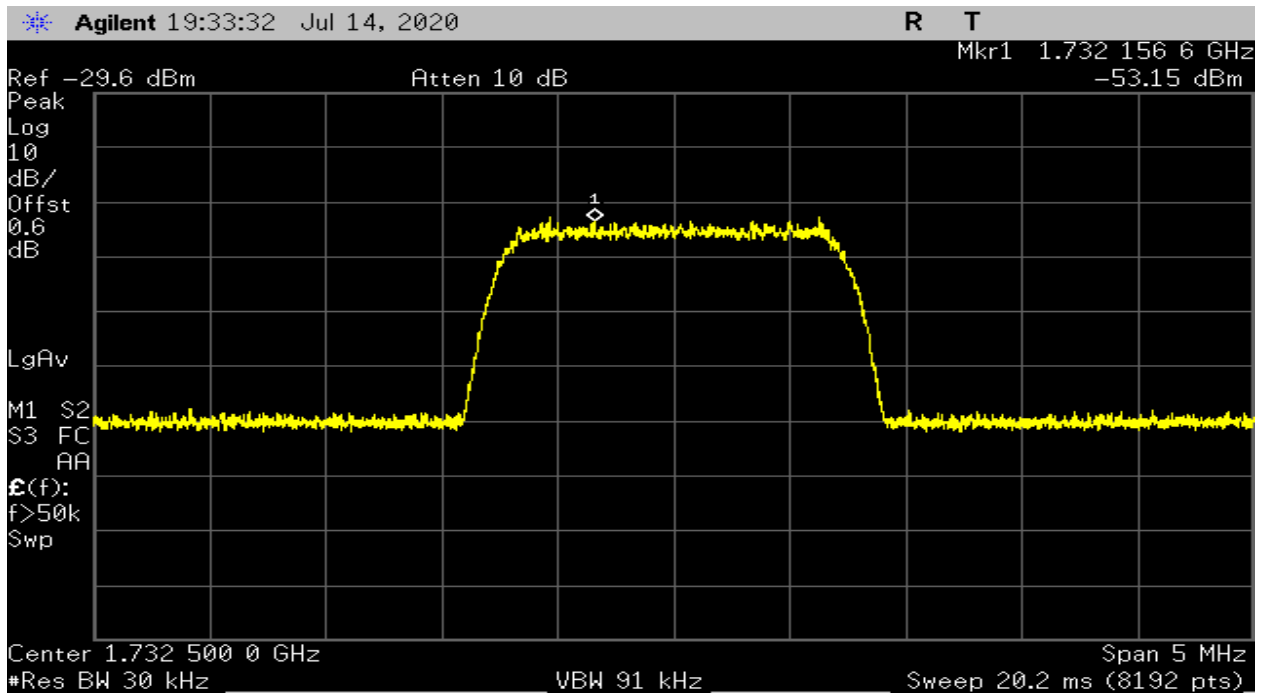
Plot 169 – 776-787MHz Band – Uplink Output – CDMA



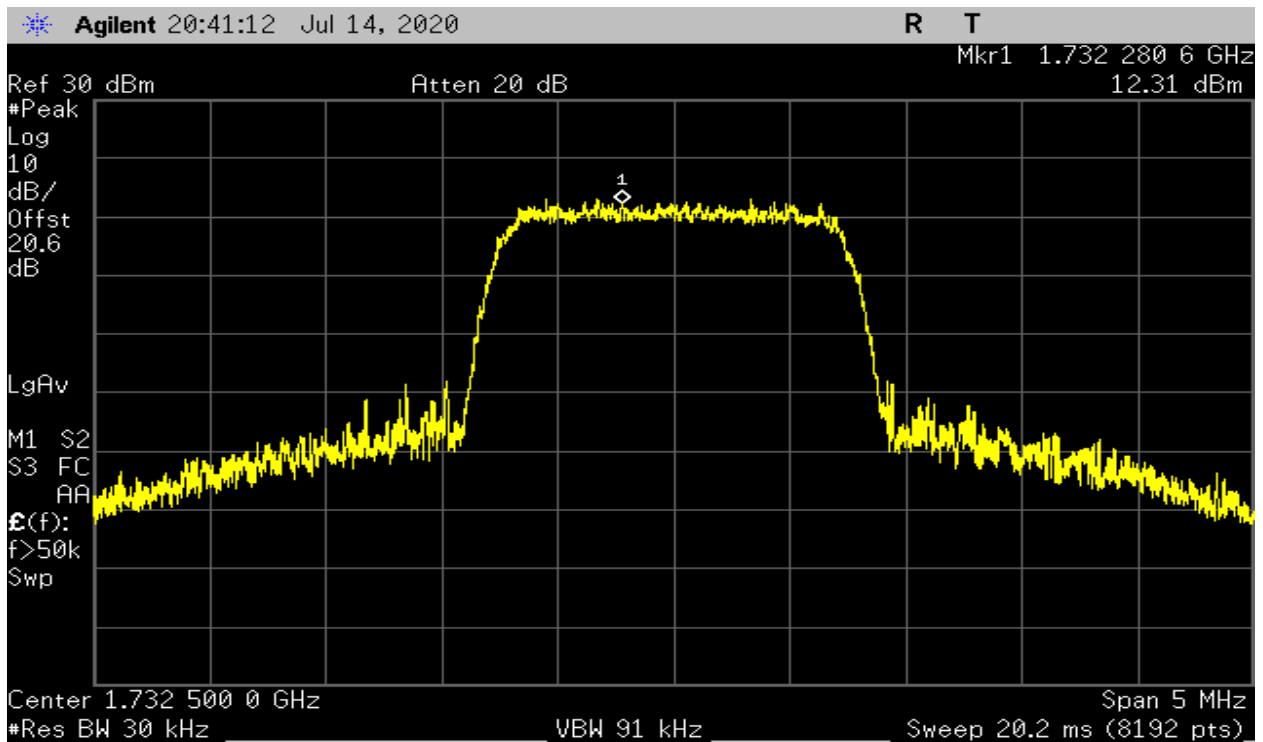
Plot 170 – 824-849MHz Band – Uplink Input – CDMA



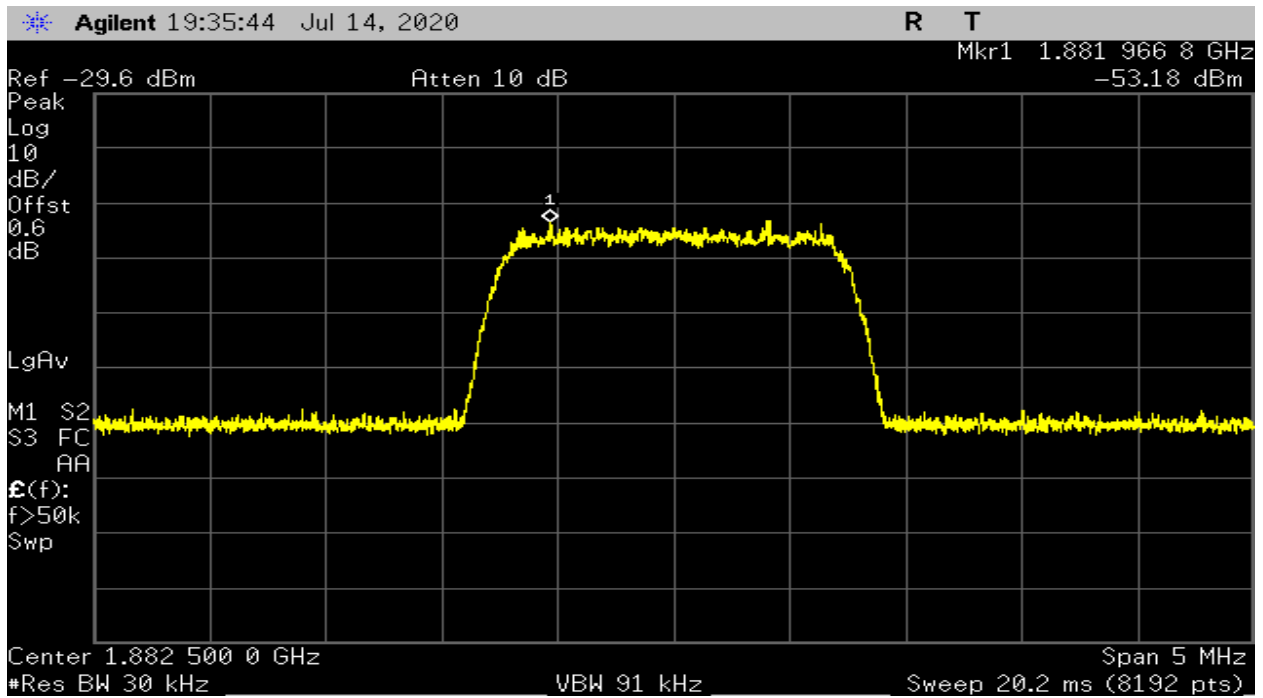
Plot 171 – 824-849MHz Band – Uplink Output – CDMA



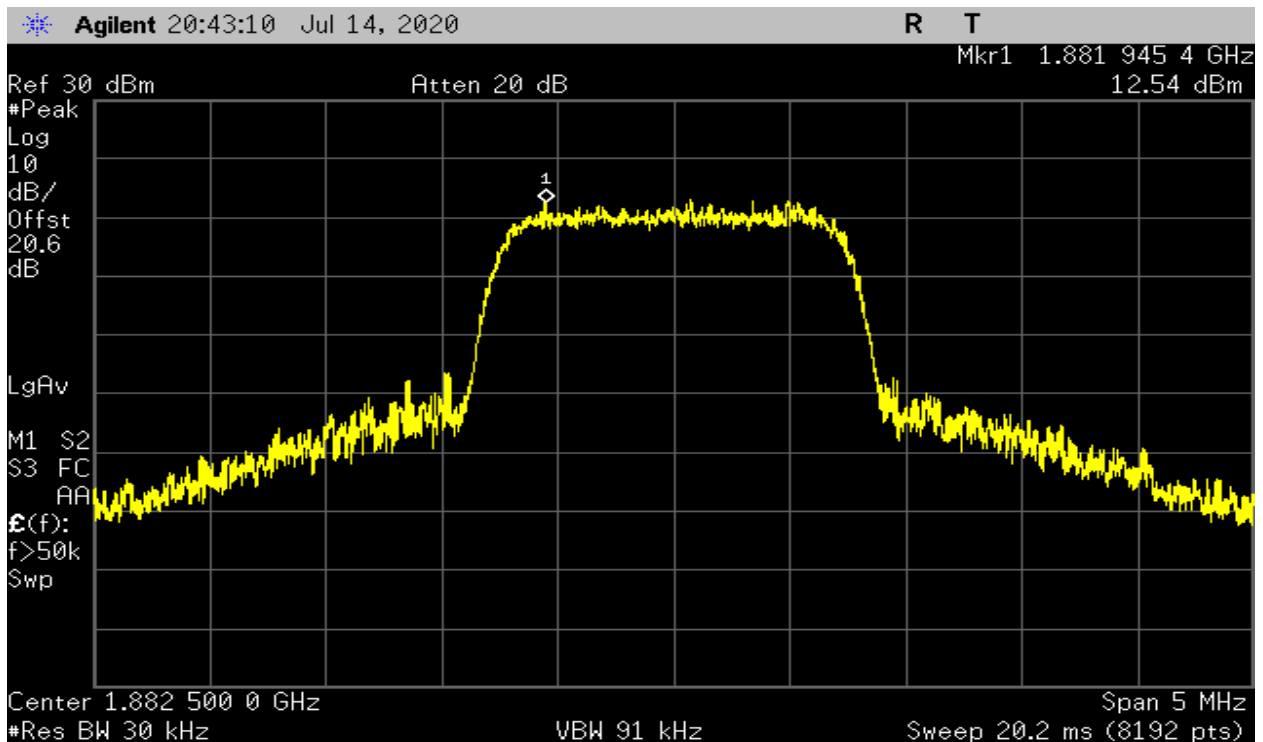
Plot 172 – 1710-1755MHz Band – Uplink Input – CDMA



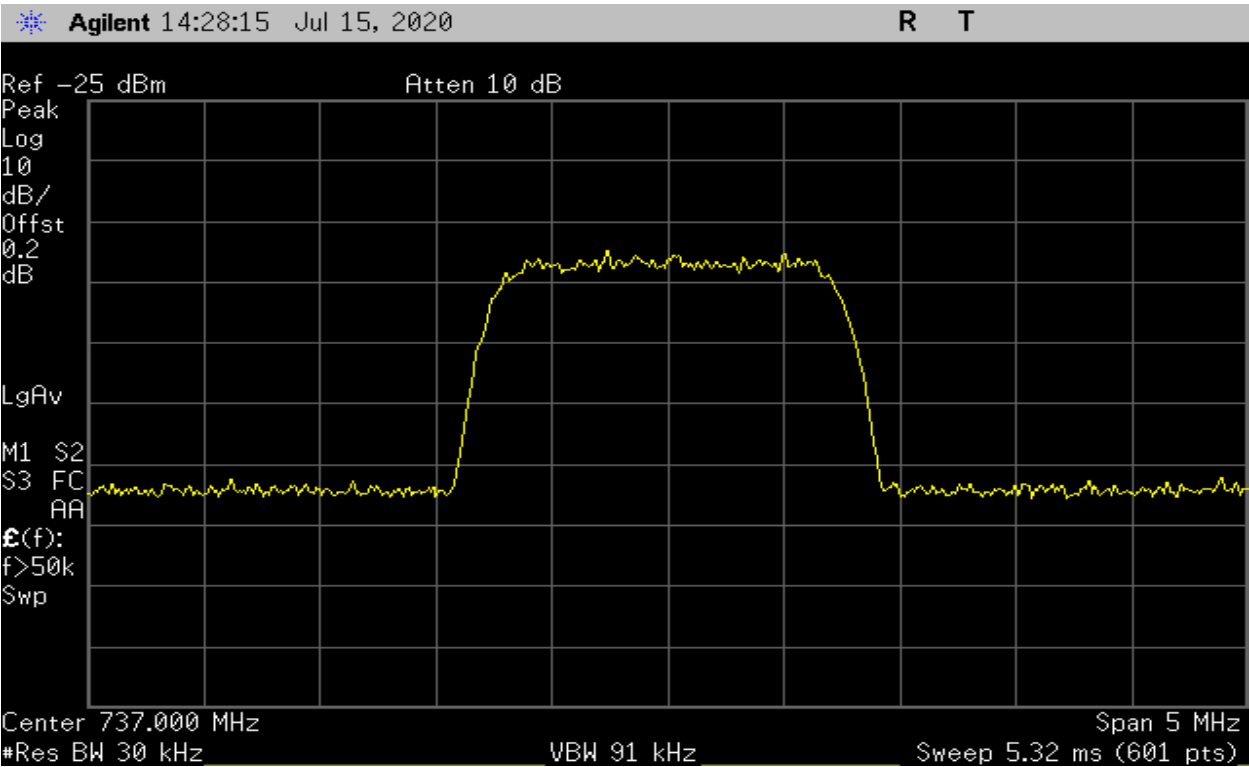
Plot 173 – 1710-1755MHz Band – Uplink Output – CDMA



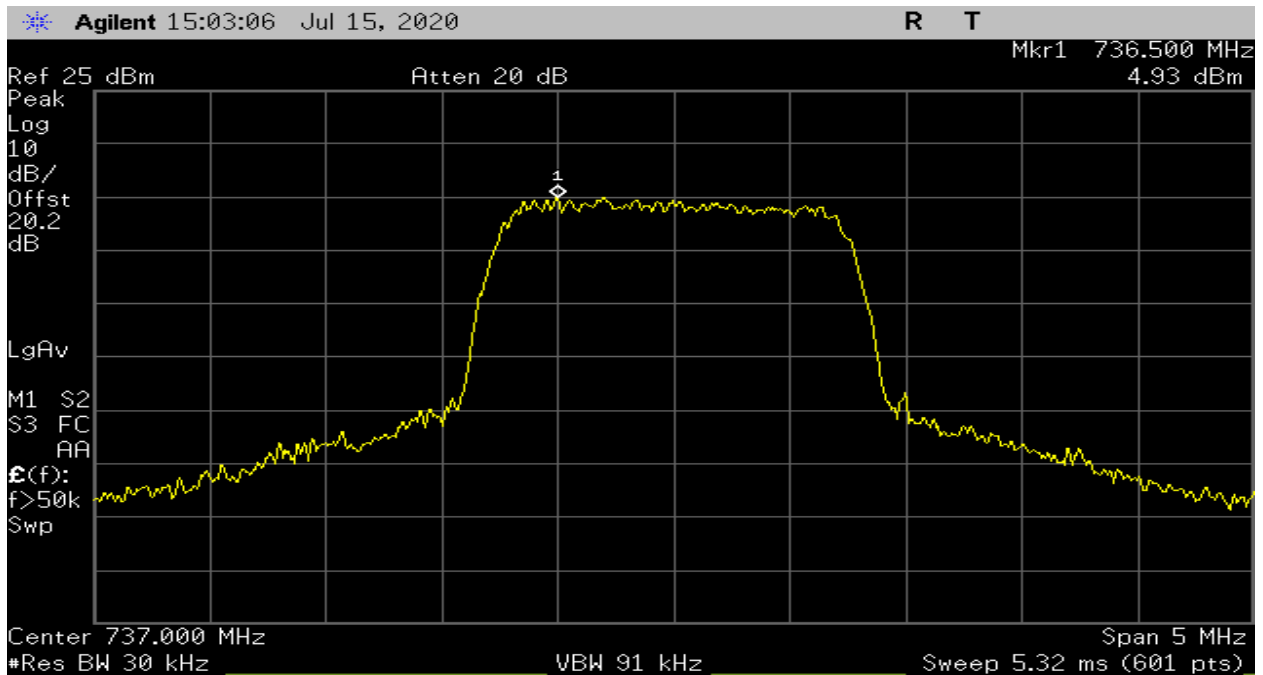
Plot 174 – 1850-1915MHz Band – Uplink Input – CDMA



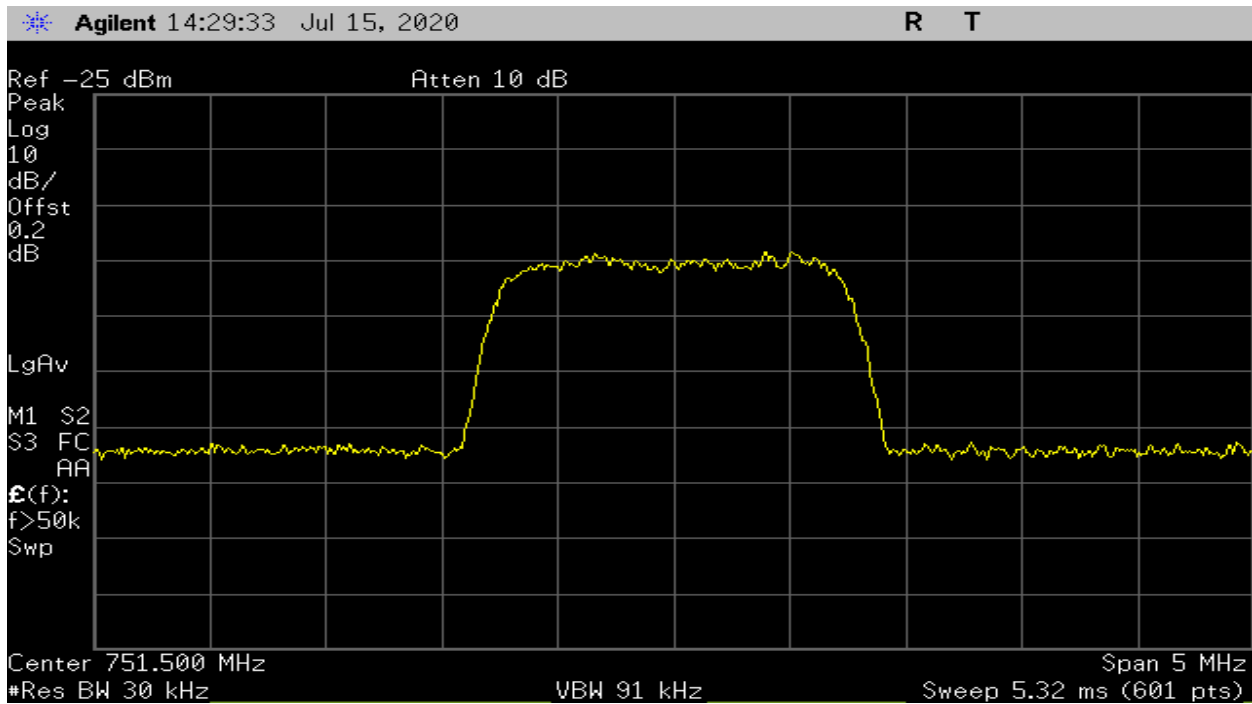
Plot 175 – 1850-1915MHz Band – Uplink Output – CDMA



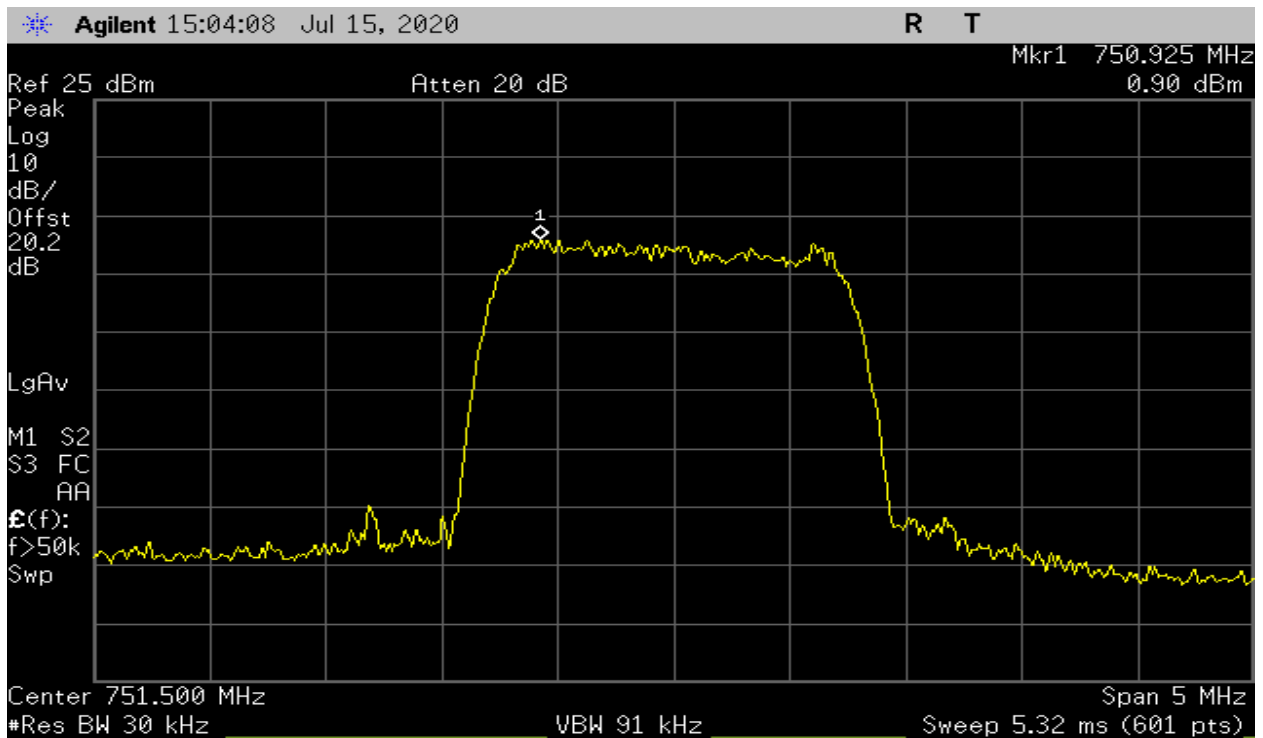
Plot 176 – 728-746MHz Band – Downlink Input – CDMA



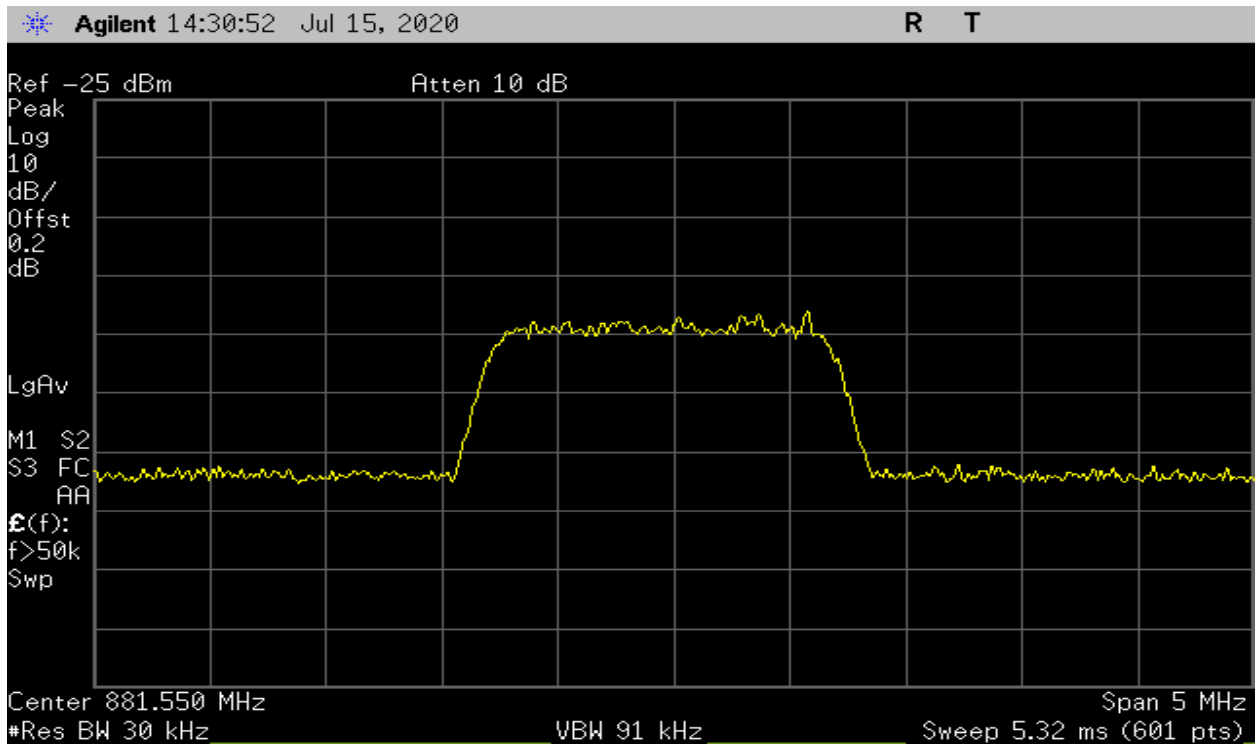
Plot 177 – 728-746MHz Band – Downlink Output – CDMA



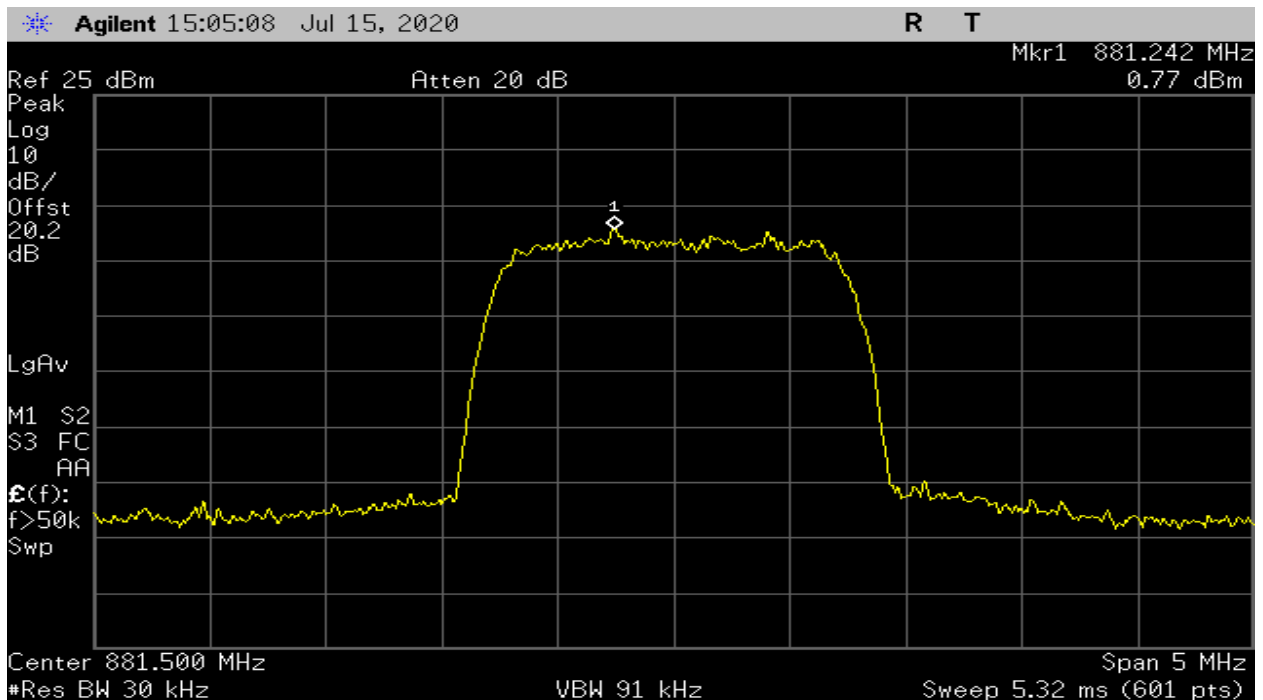
Plot 178 – 746-757MHz Band – Downlink Input – CDMA



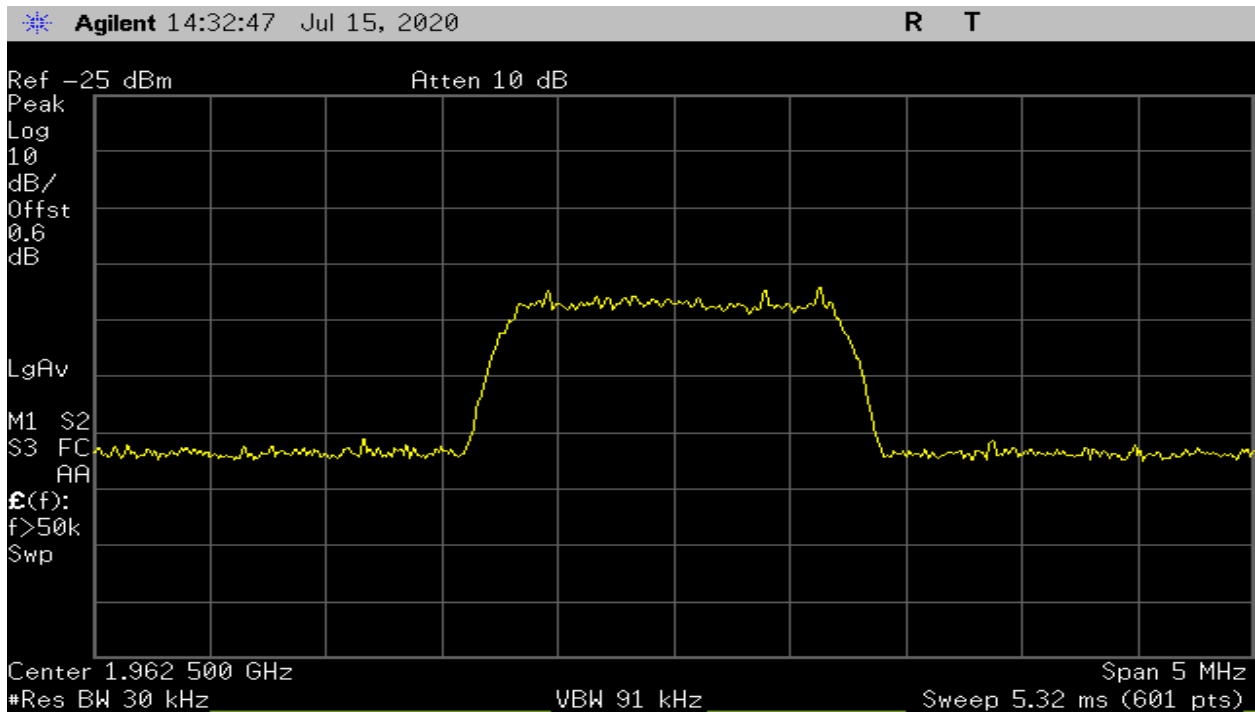
Plot 179 – 746-757MHz Band – Downlink Output – CDMA



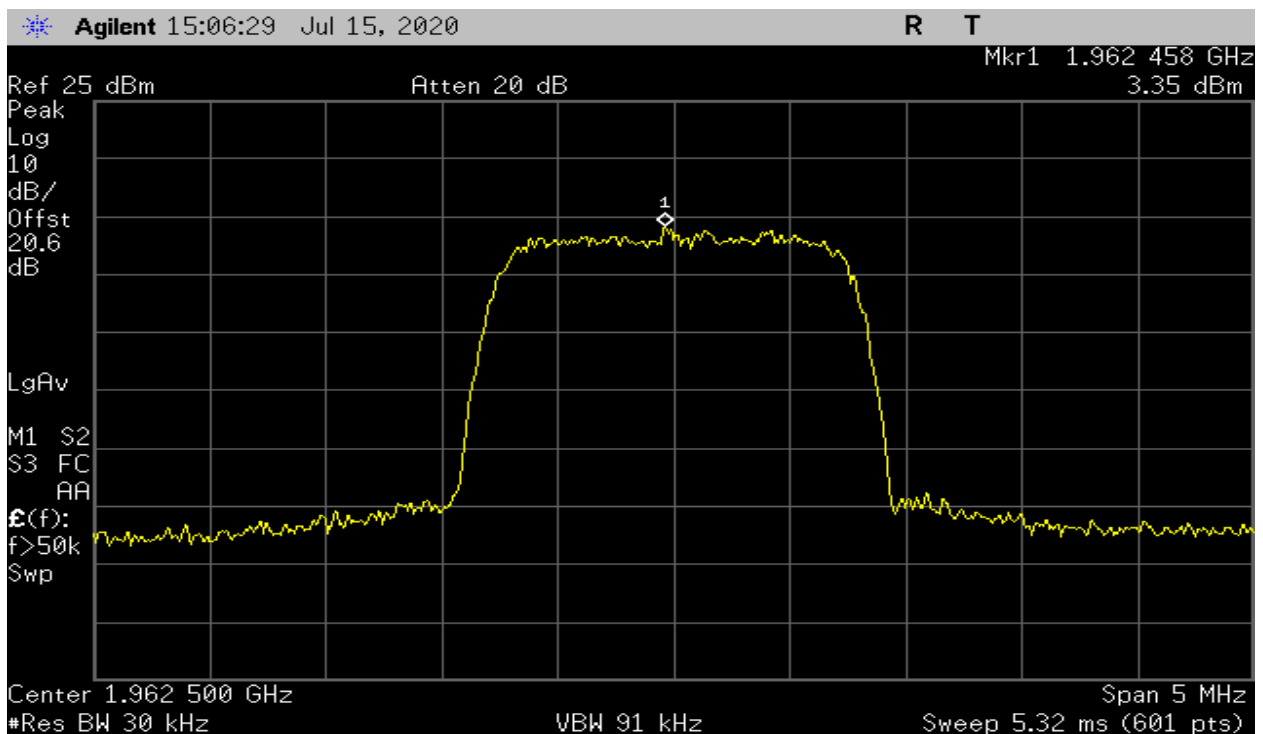
Plot 180 – 869-894MHz Band – Downlink Input – CDMA



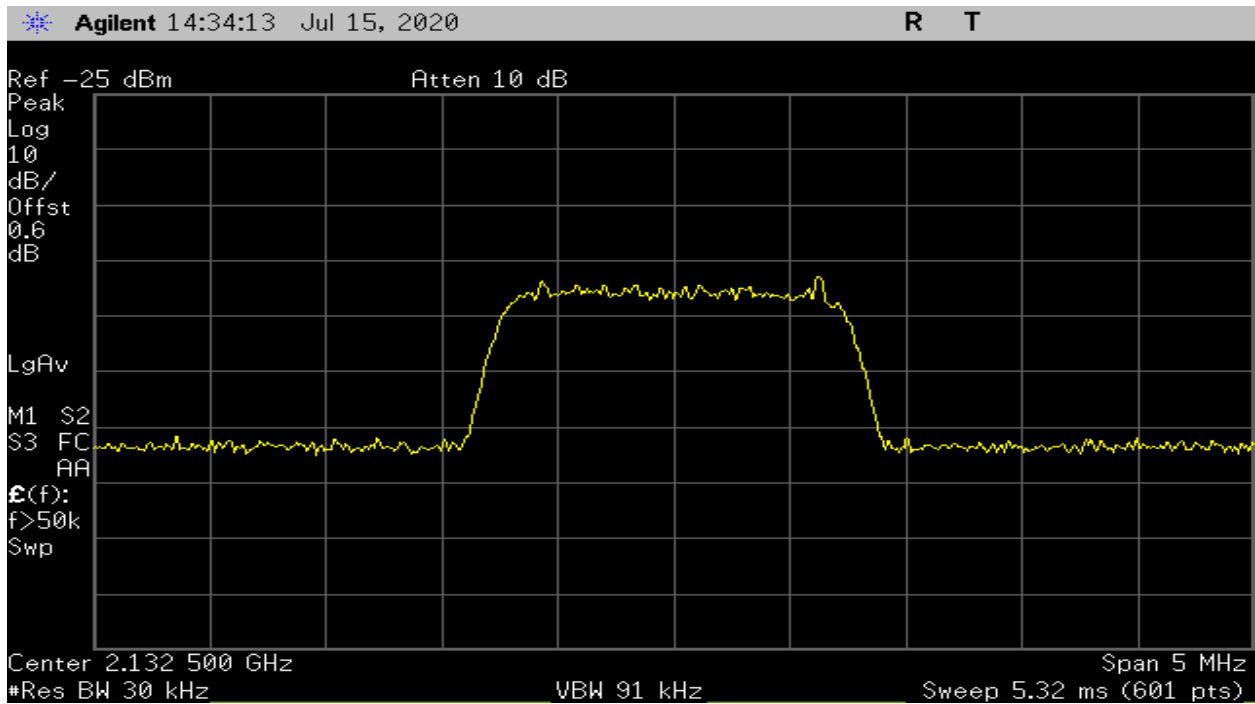
Plot 181 – 869-894MHz Band – Downlink Output – CDMA



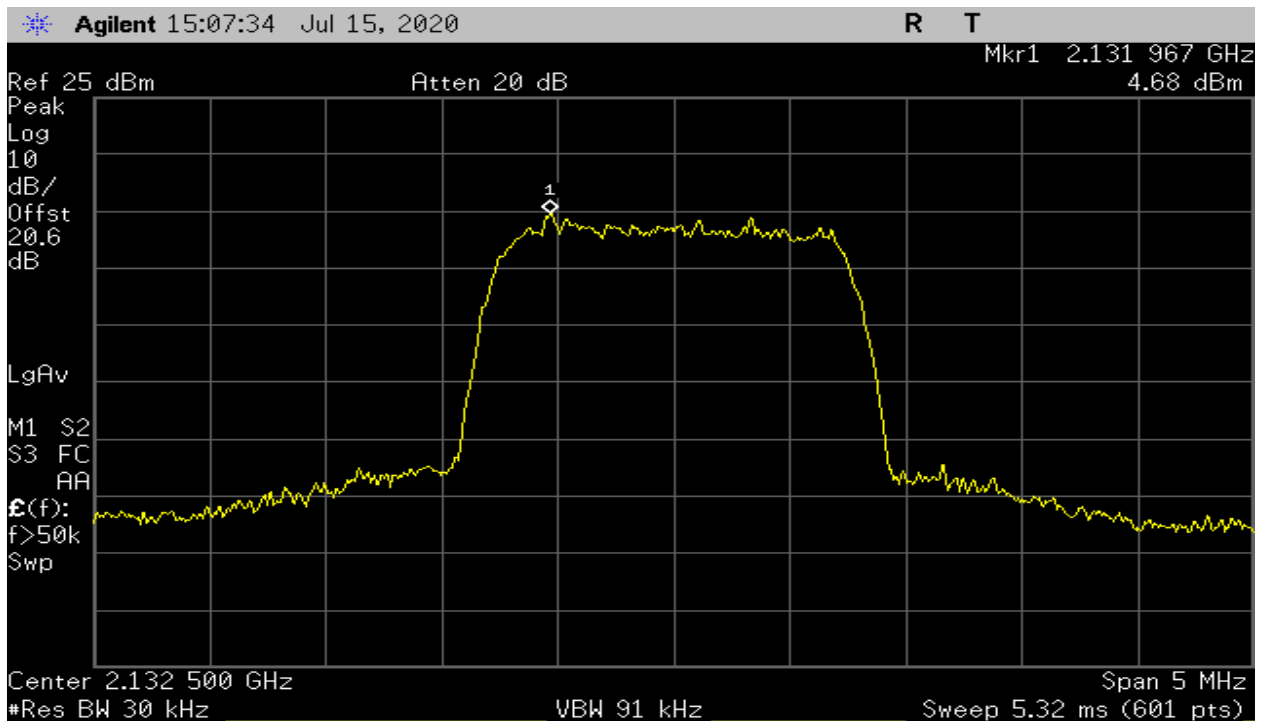
Plot 182 – 1930-1995MHz Band – Downlink Input – CDMA



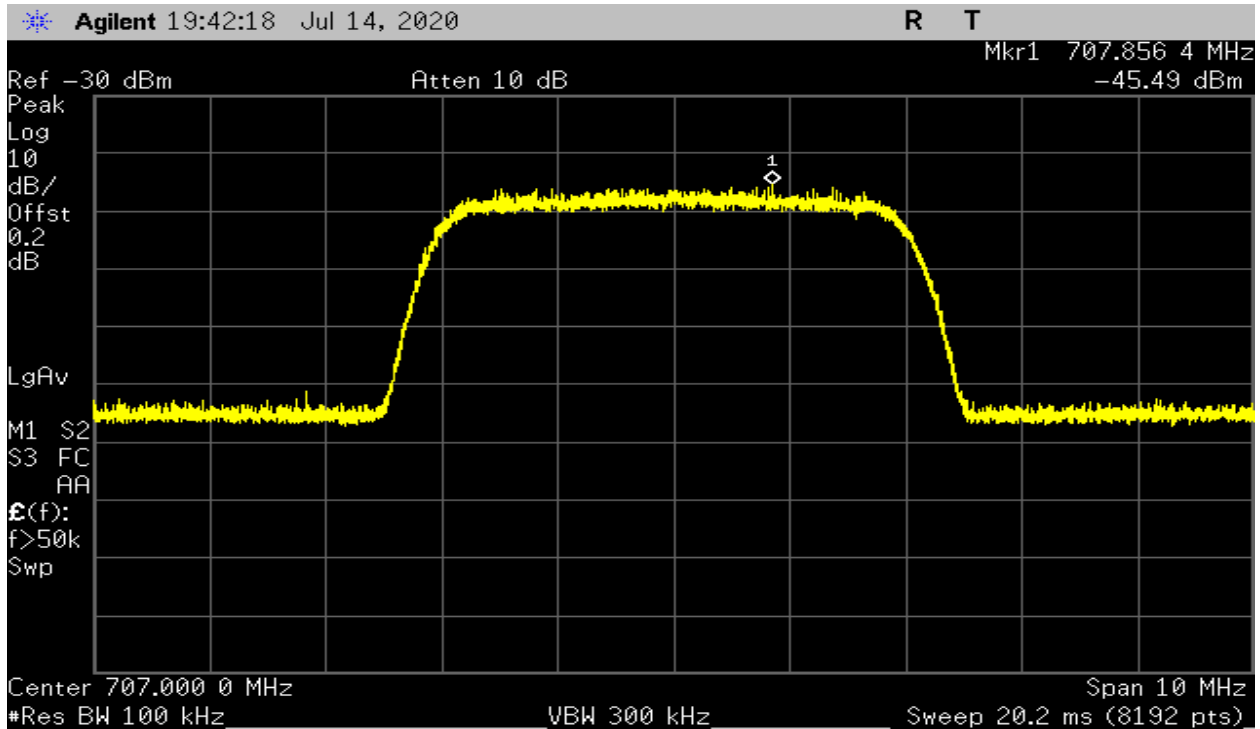
Plot 183 – 1930-1995MHz Band – Downlink Output – CDMA



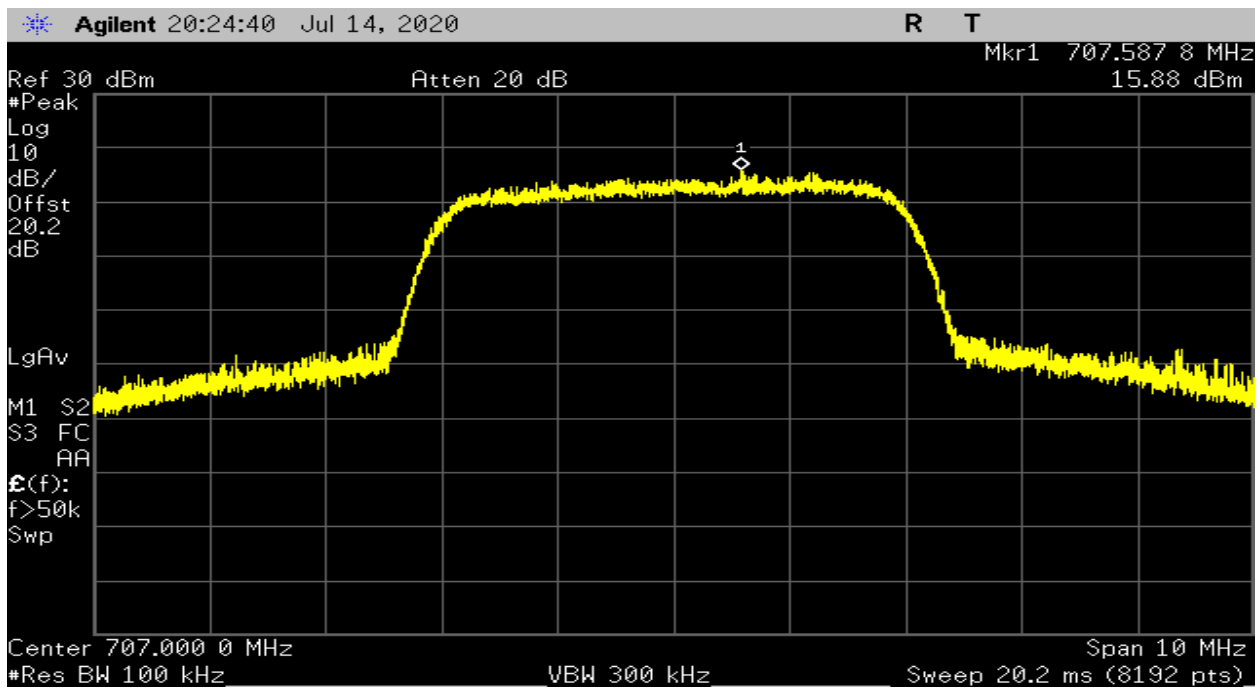
Plot 184 – 2110-2155MHz Band – Downlink Input – CDMA



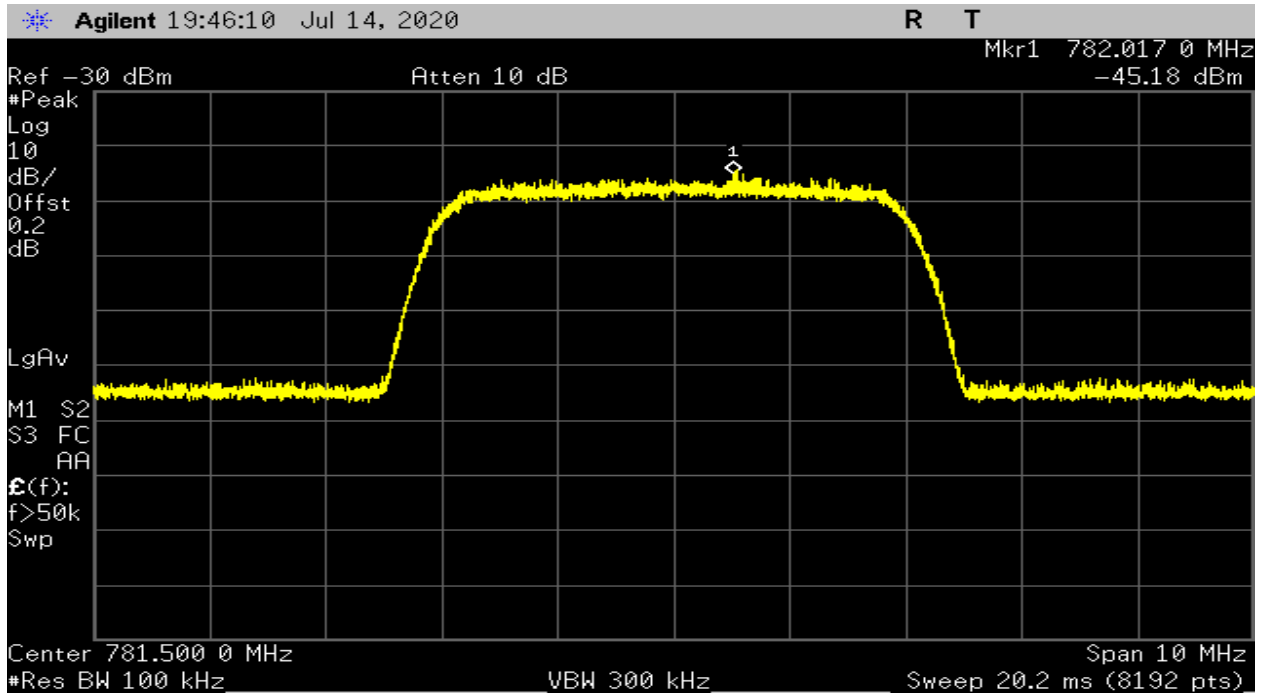
Plot 185 – 2110-2155MHz Band – Downlink Output – CDMA



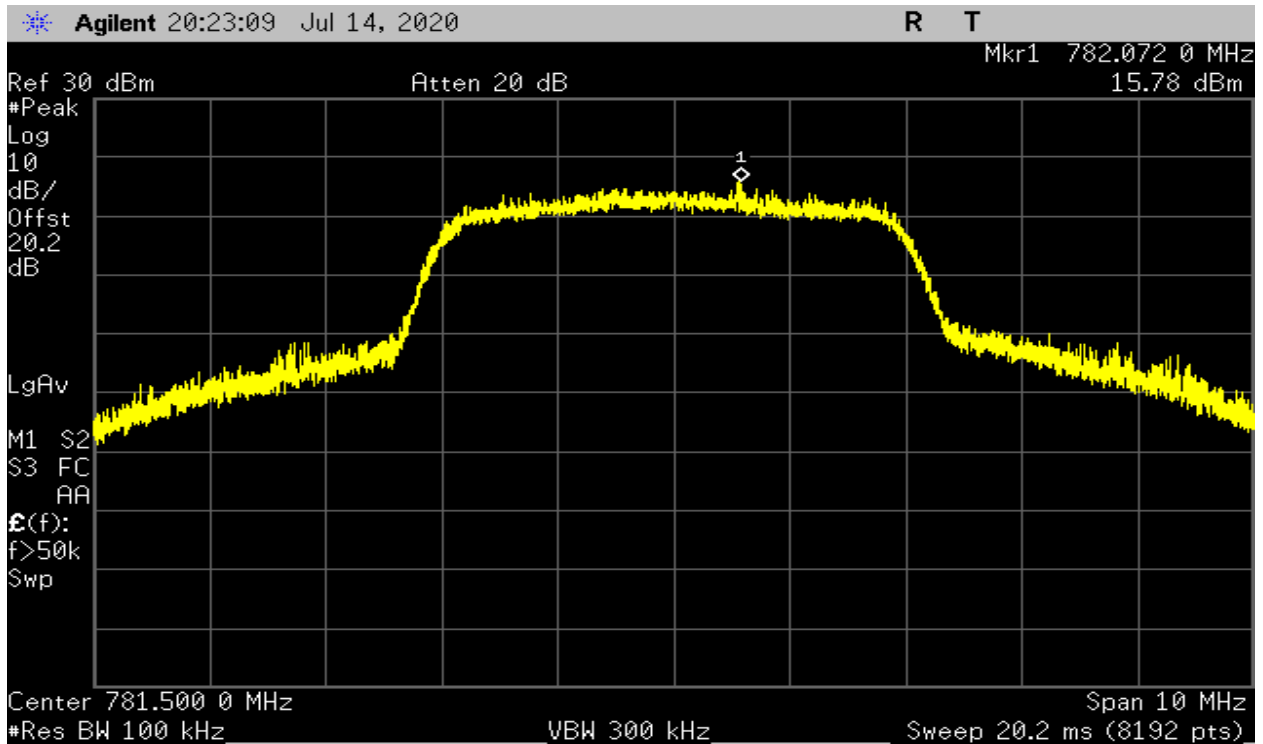
Plot 186 – 698-716MHz Band – Uplink Input – LTE



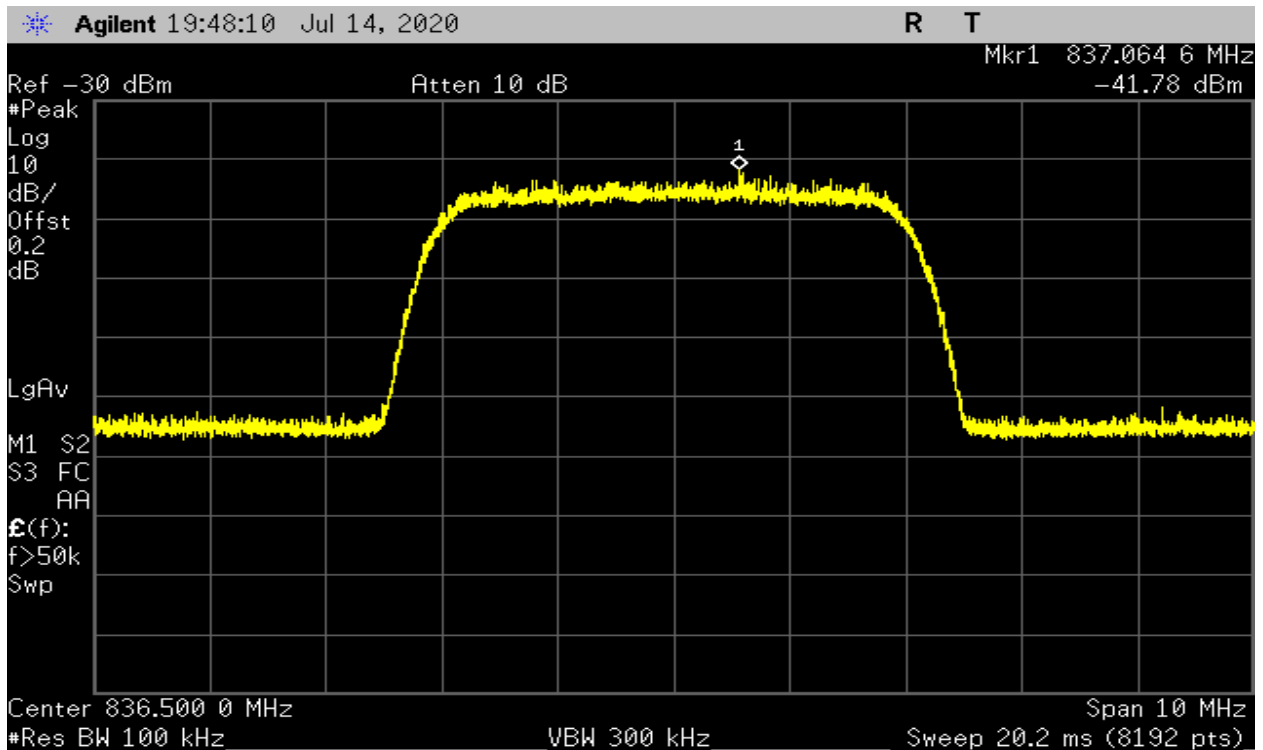
Plot 187 – 698-716MHz Band – Uplink Output – LTE



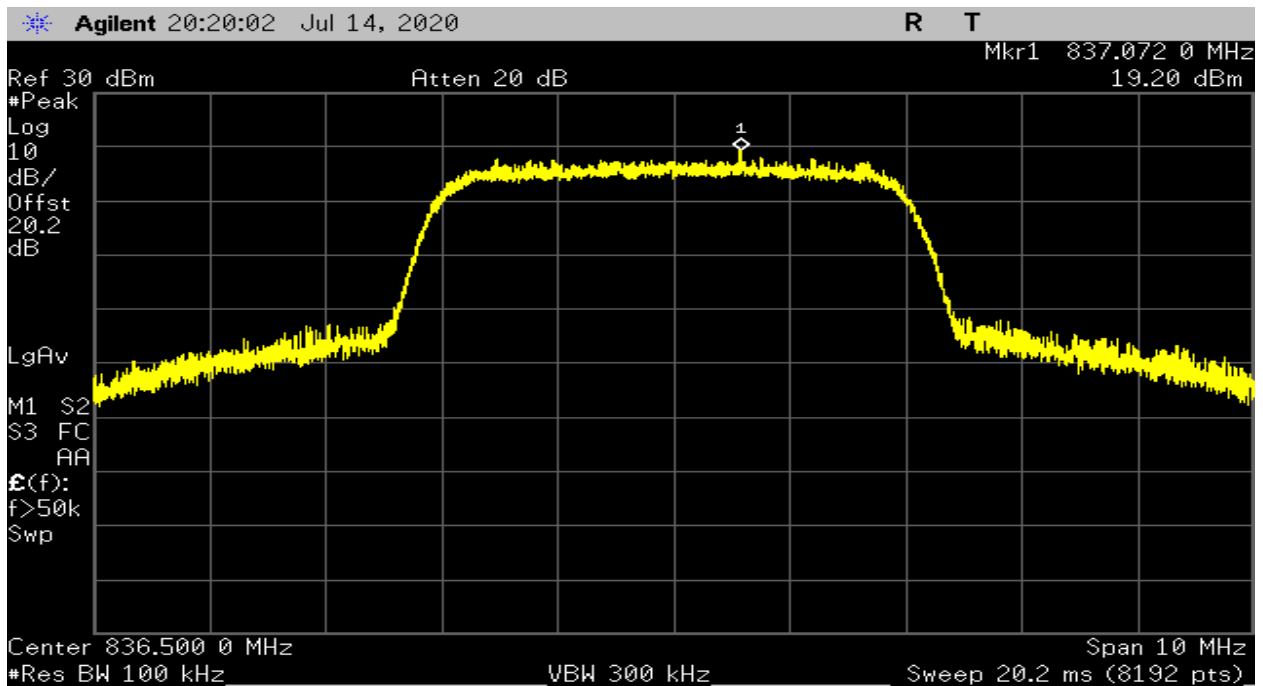
Plot 188 – 776-787MHz Band – Uplink Input – LTE



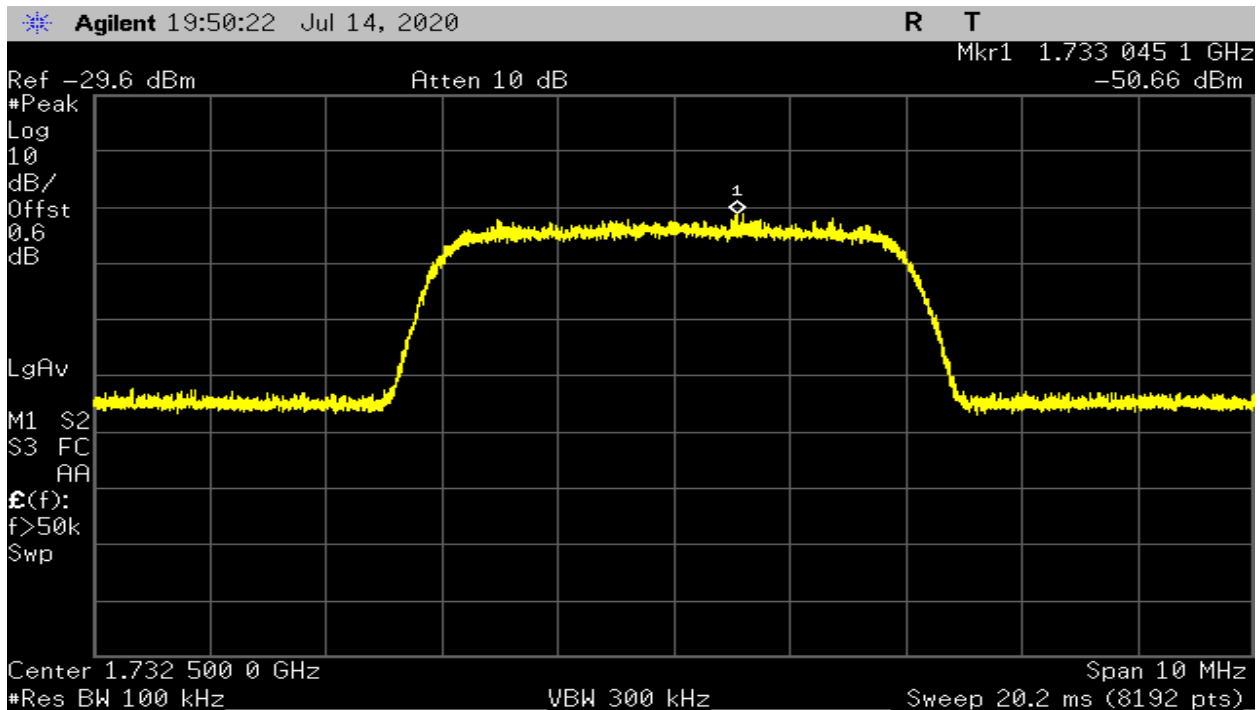
Plot 189 – 776-787MHz Band – Uplink Output – LTE



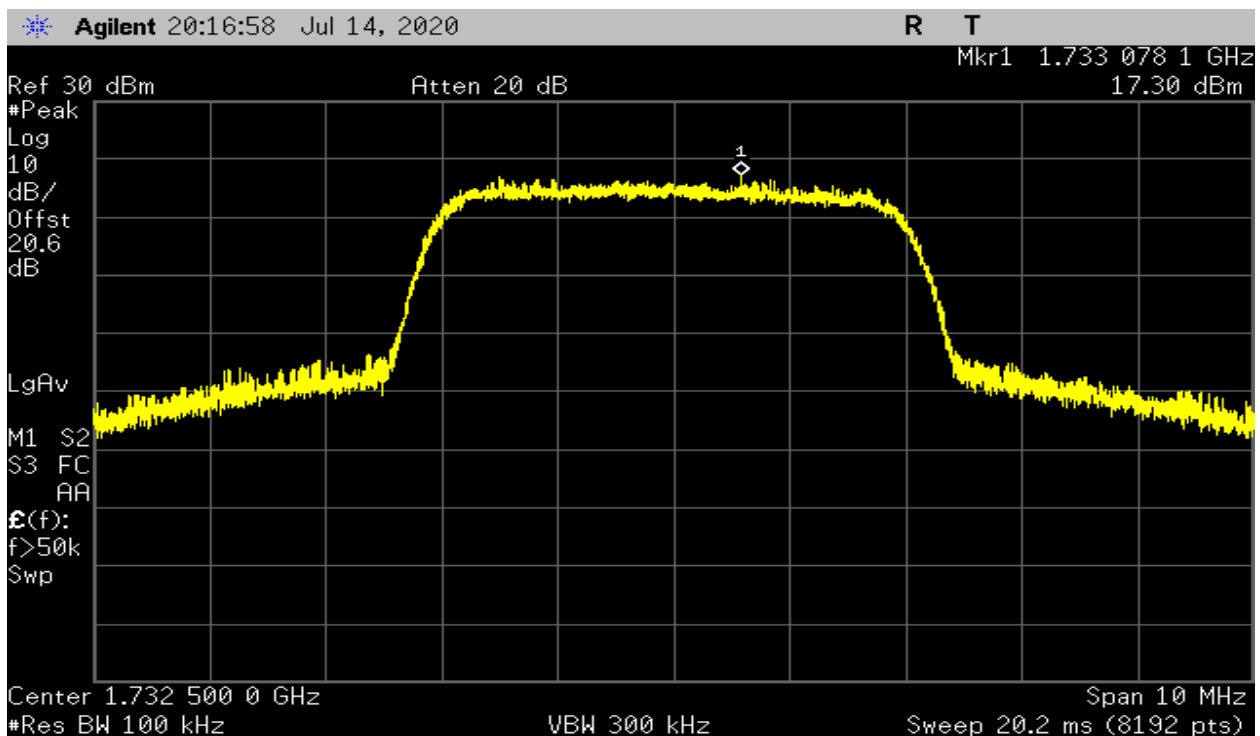
Plot 190 – 824-849MHz Band – Uplink Input – LTE



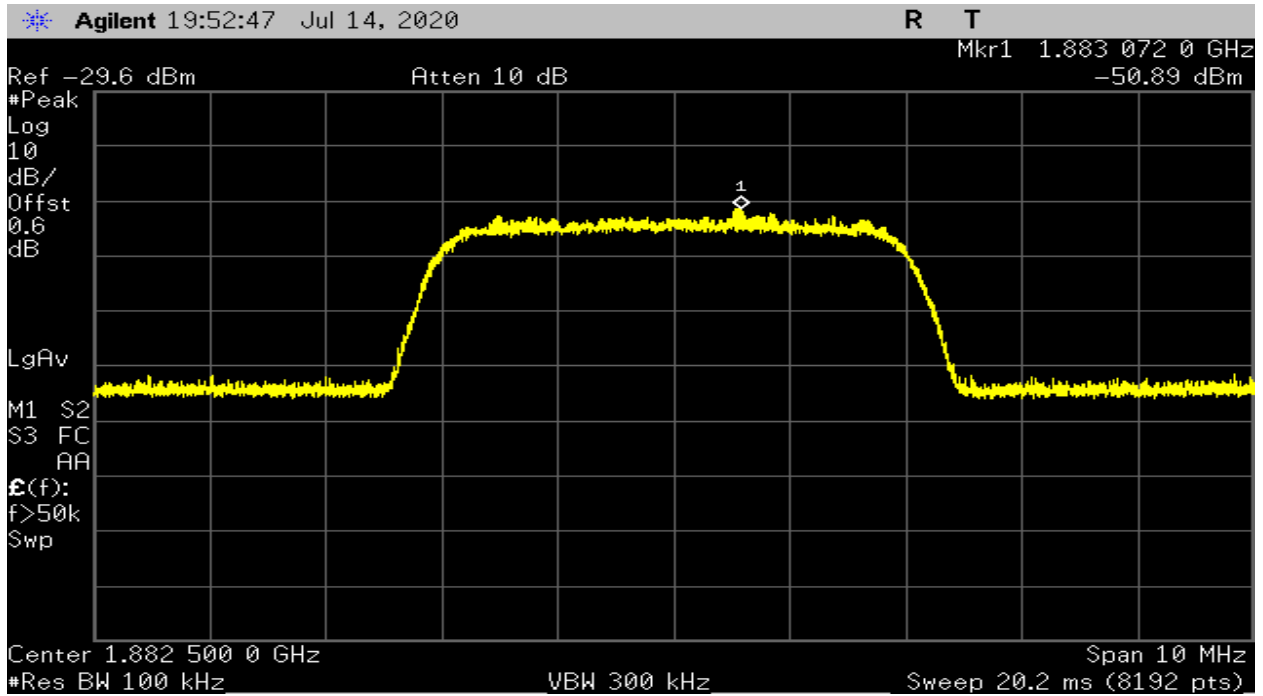
Plot 191 – 824-849MHz Band – Uplink Output – LTE



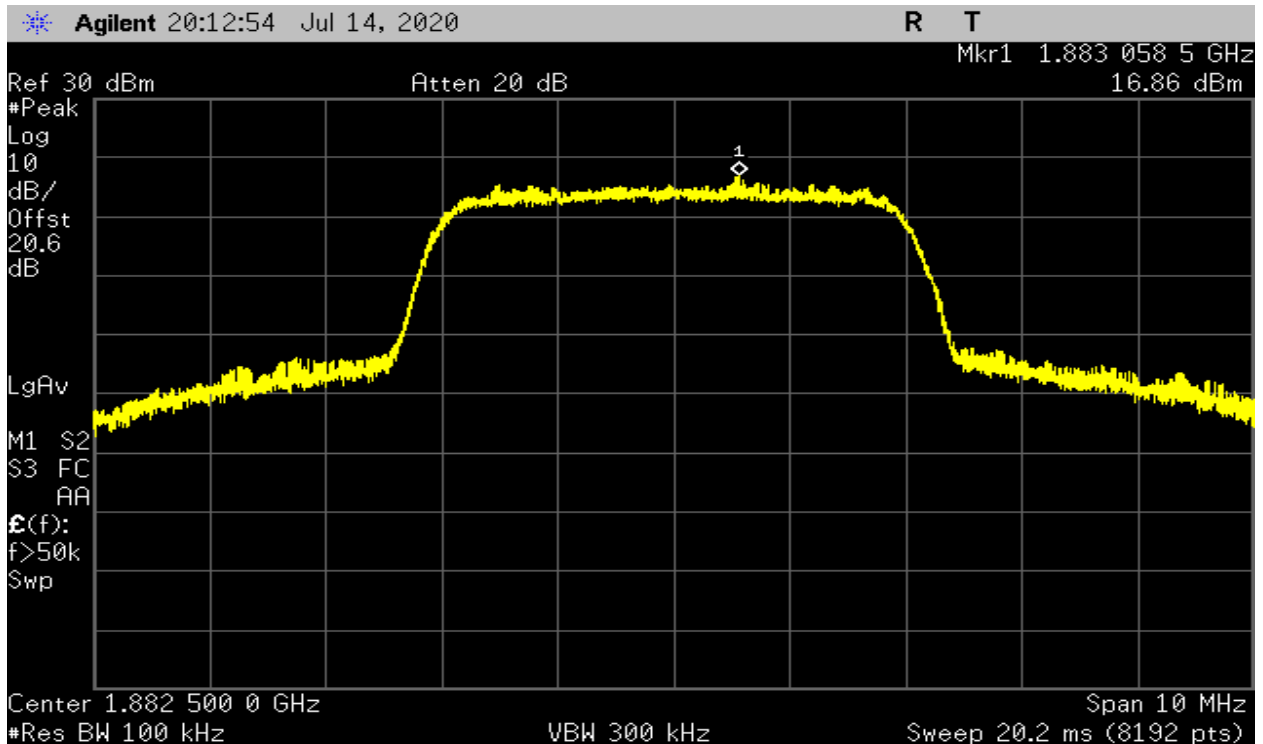
Plot 192 – 1710-1755MHz Band – Uplink Input – LTE



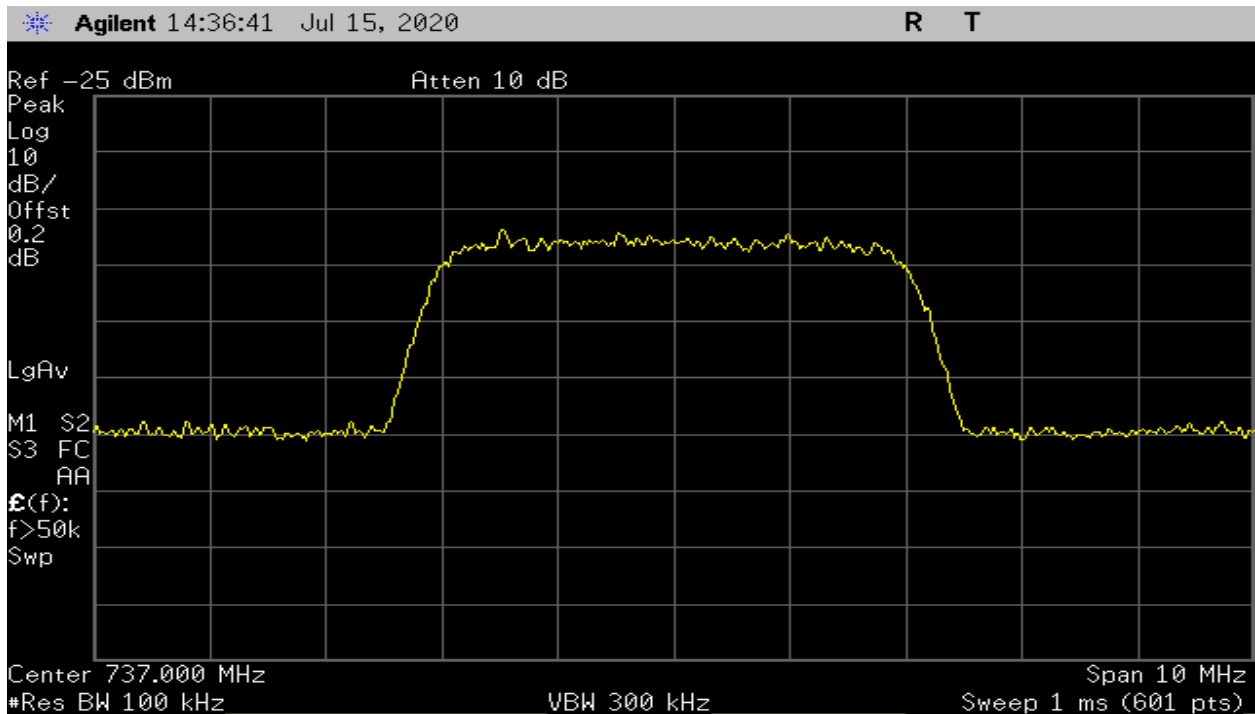
Plot 193 – 1710-1755MHz Band – Uplink Output – LTE



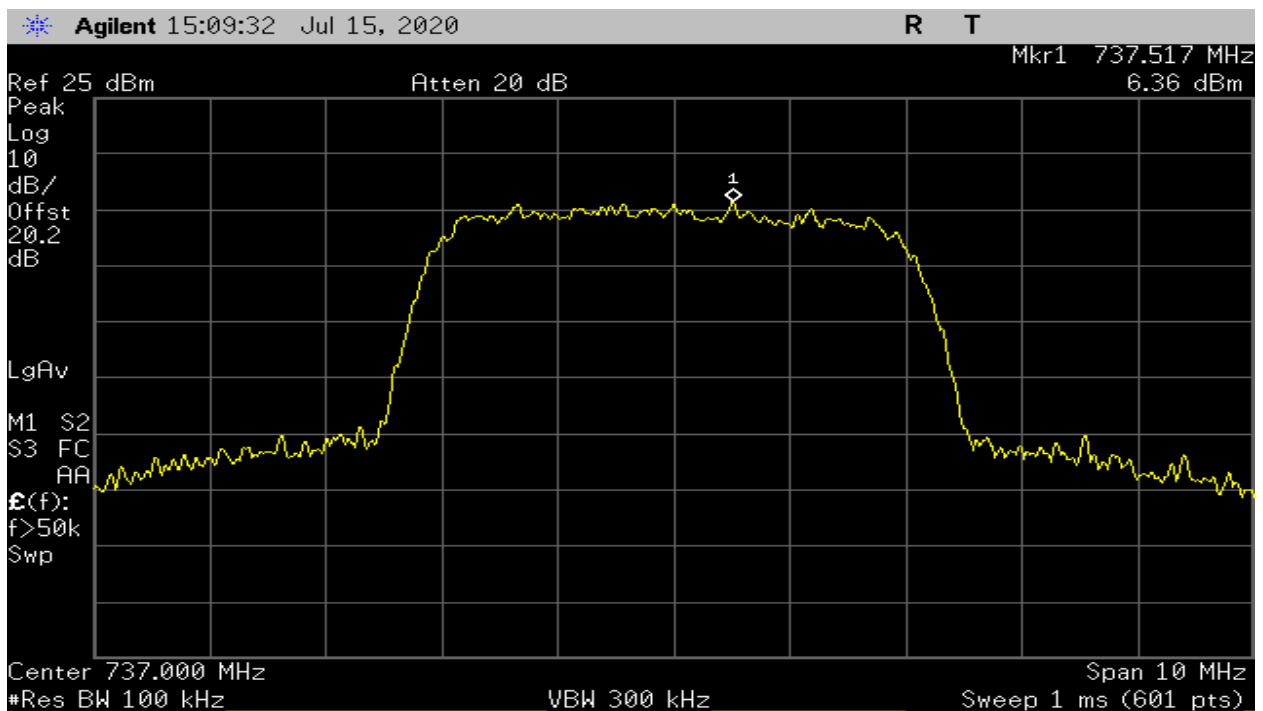
Plot 194 – 1850-1915MHz Band – Uplink Input – LTE



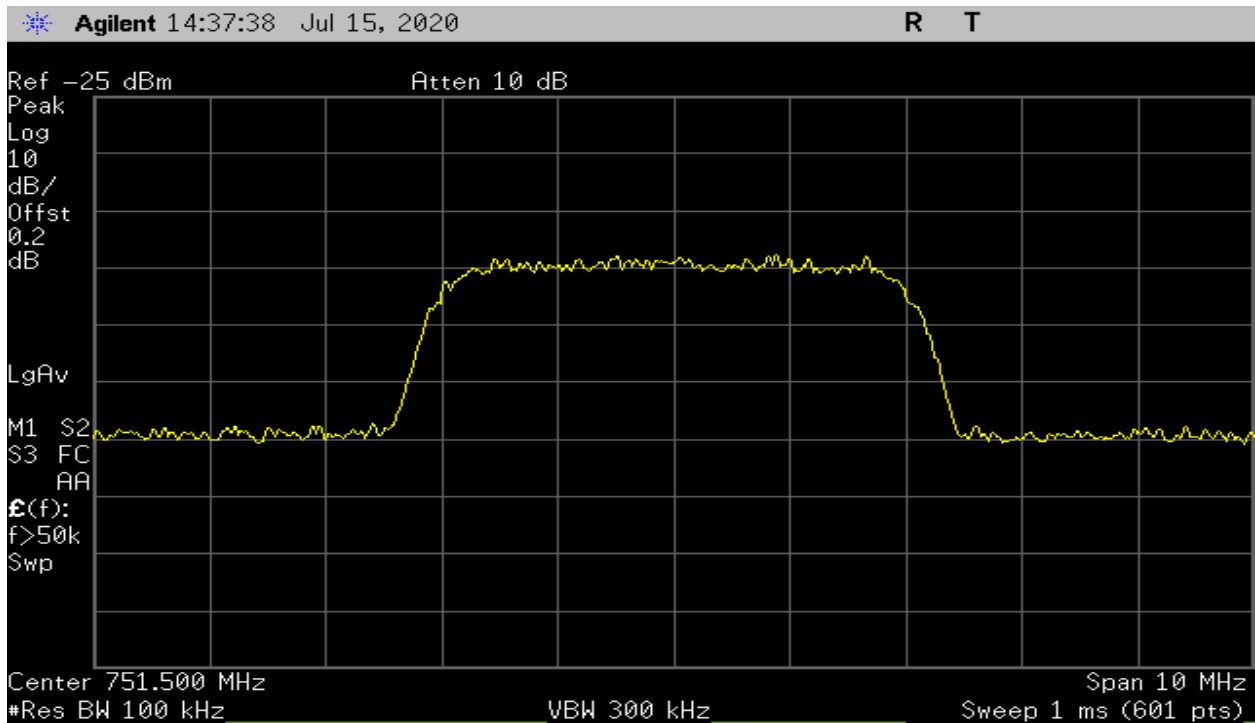
Plot 195 – 1850-1915MHz Band – Uplink Output – LTE



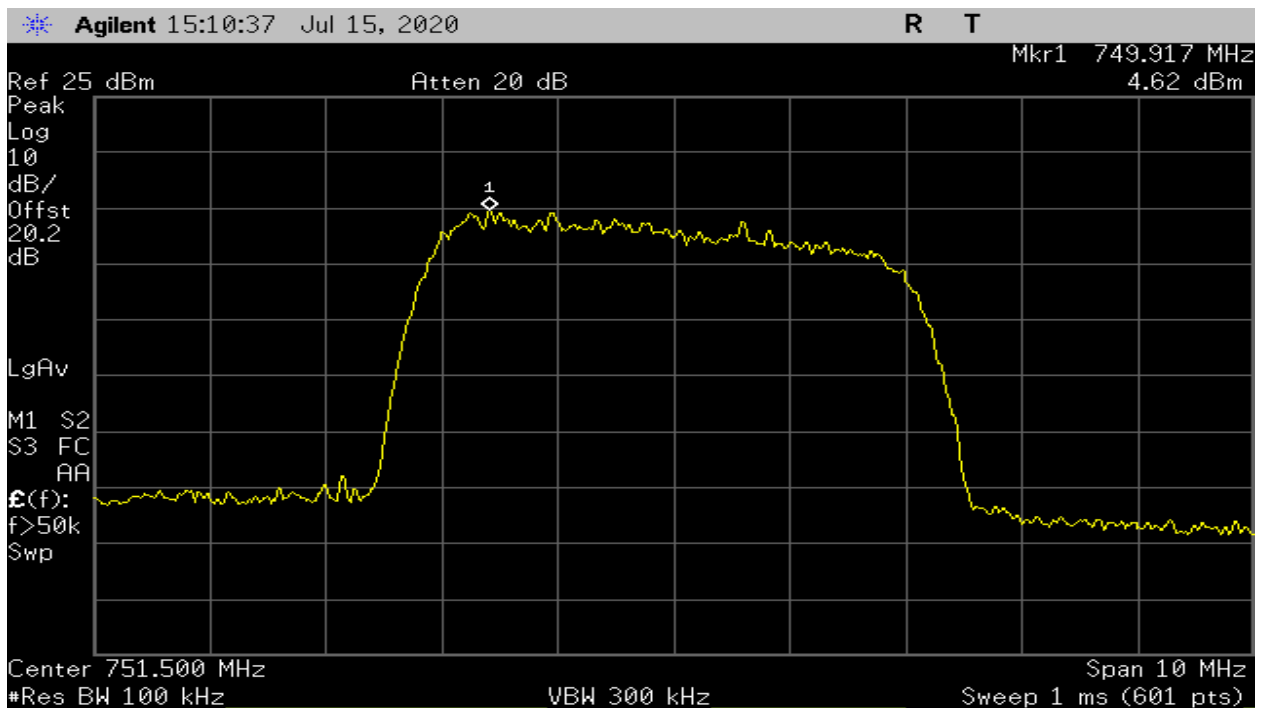
Plot 196 – 728-746MHz Band – Downlink Input – LTE



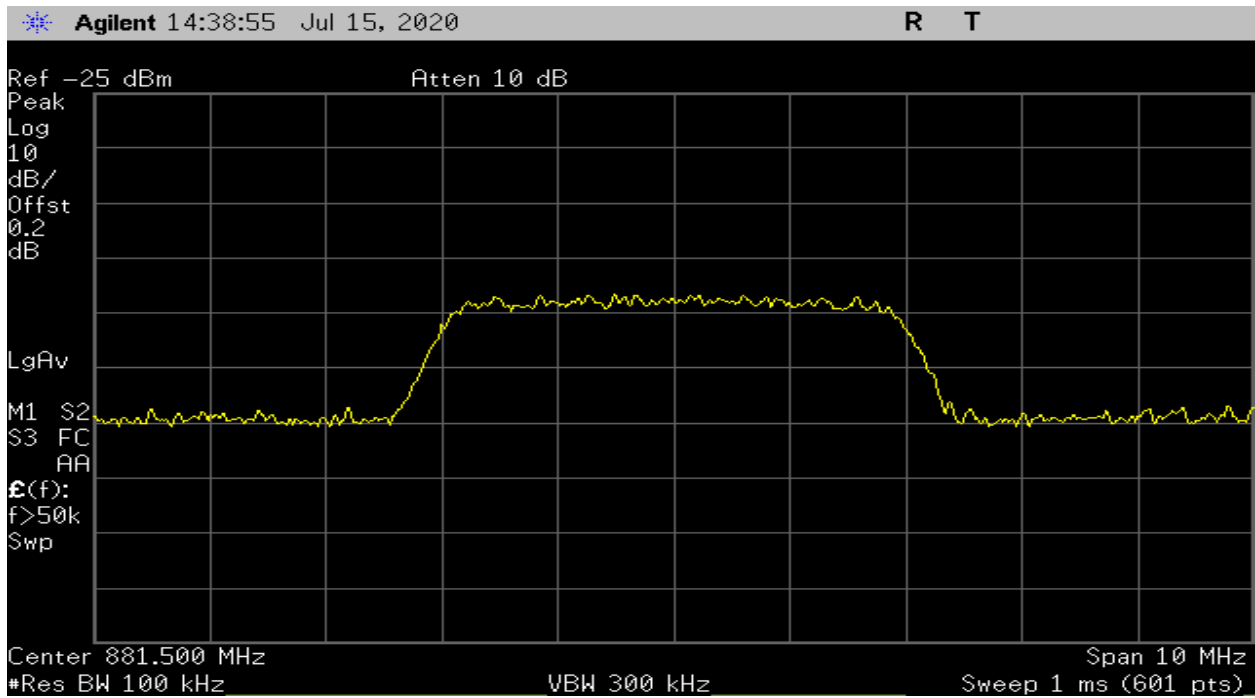
Plot 197 – 728-746MHz Band – Downlink Output – LTE



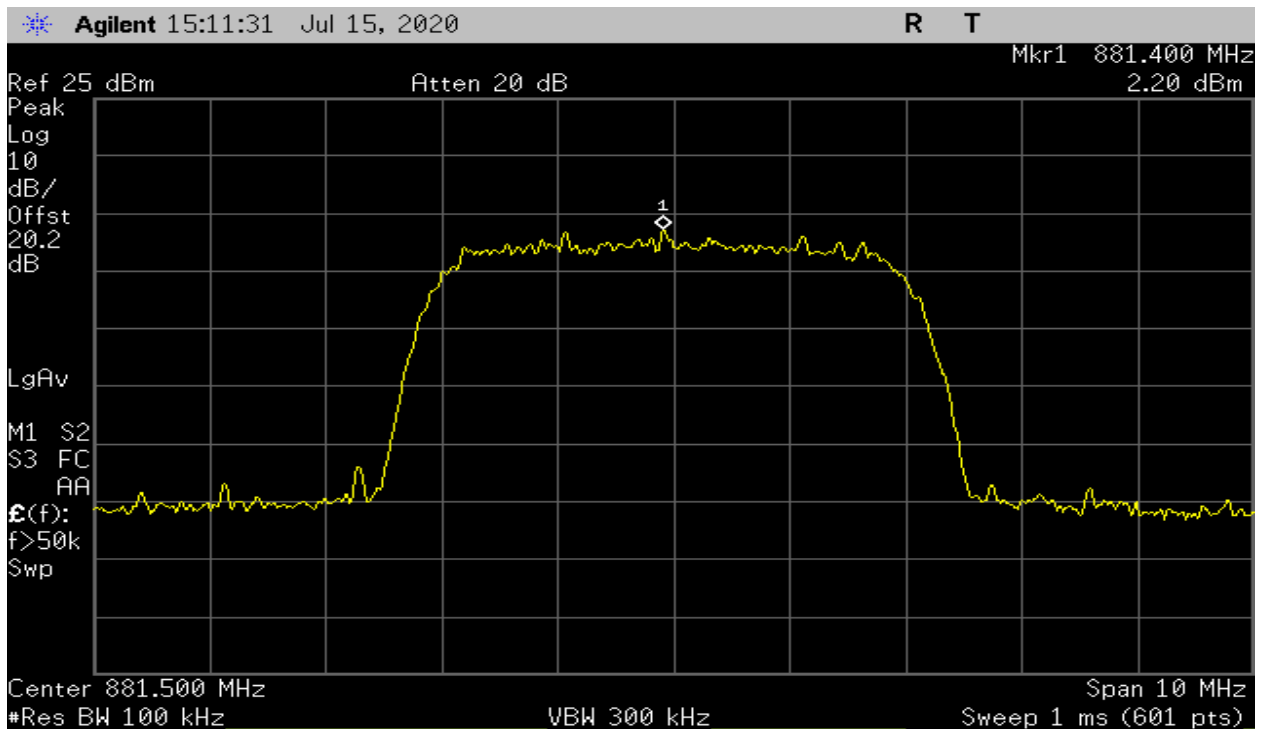
Plot 198 – 746-757MHz Band – Downlink Input – LTE



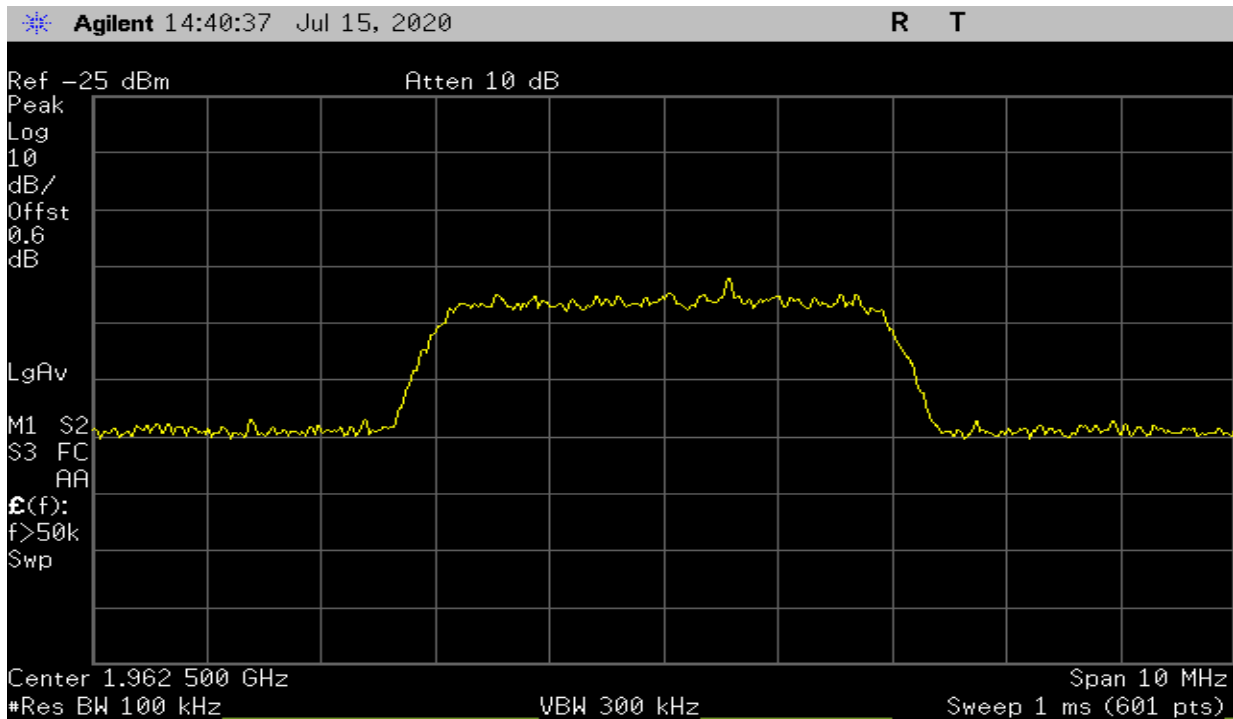
Plot 199 – 746-757MHz Band – Downlink Output – LTE



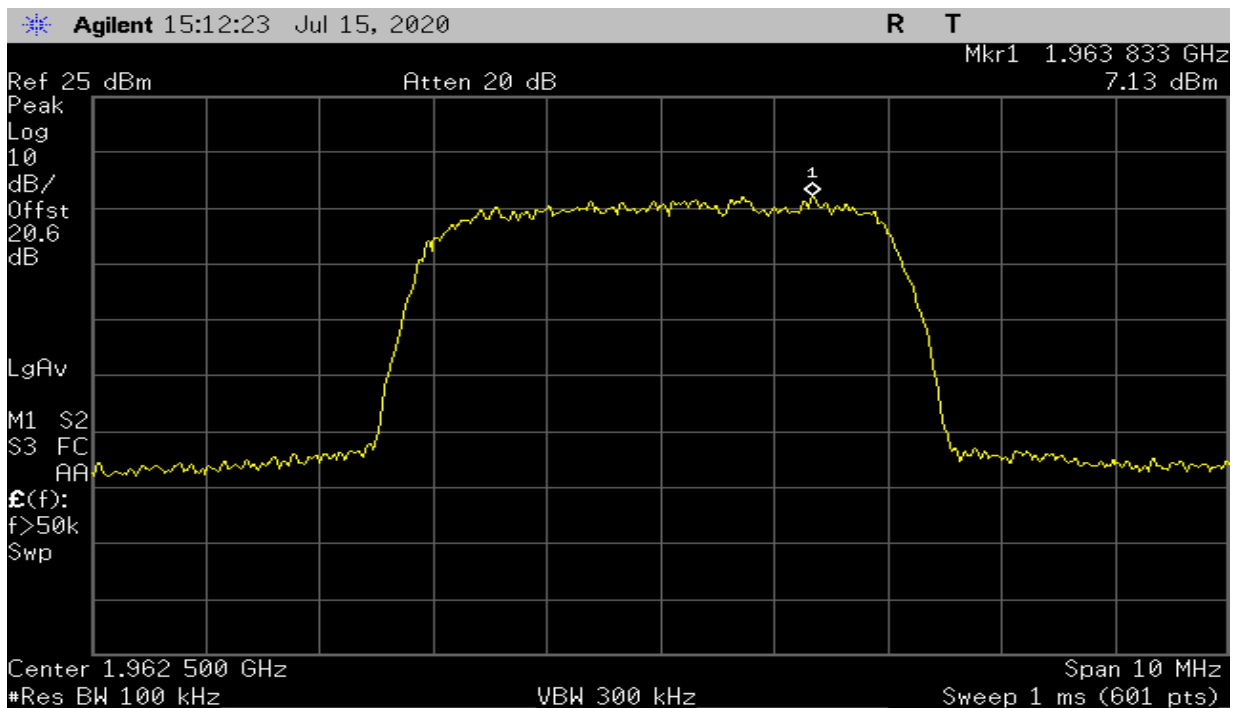
Plot 200 – 869-894MHz Band – Downlink Input – LTE



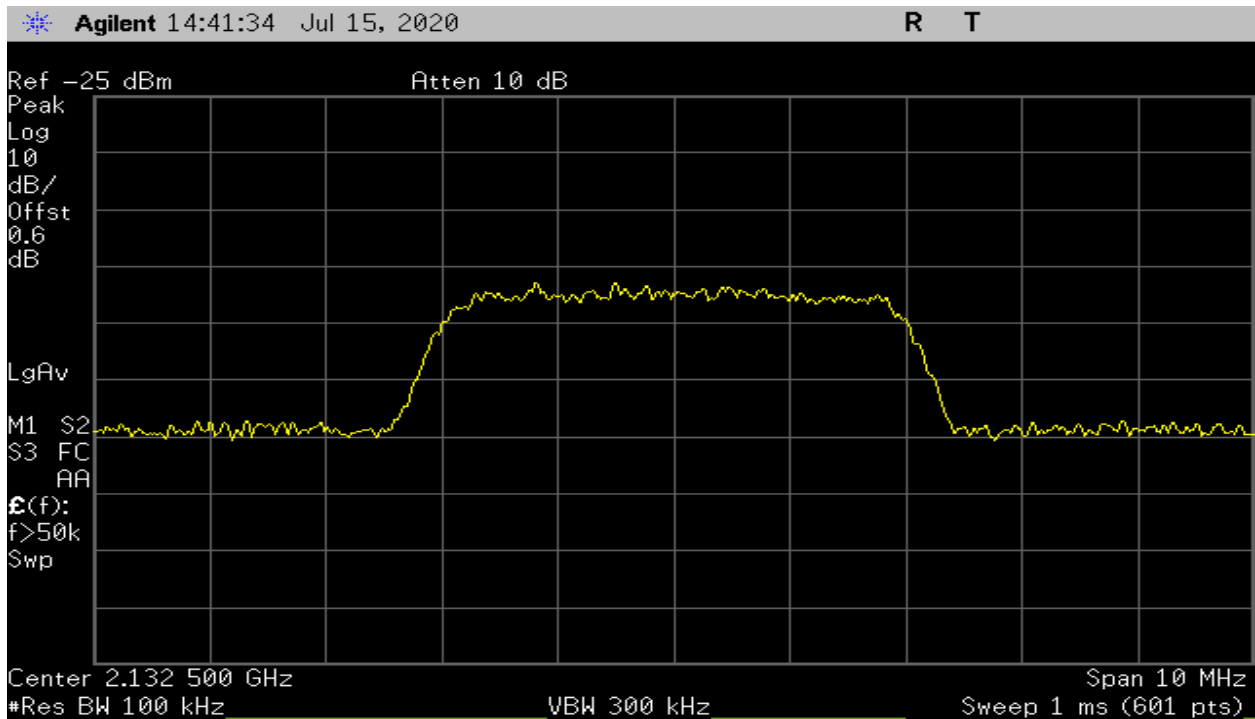
Plot 201 – 869-894MHz Band – Downlink Output – LTE



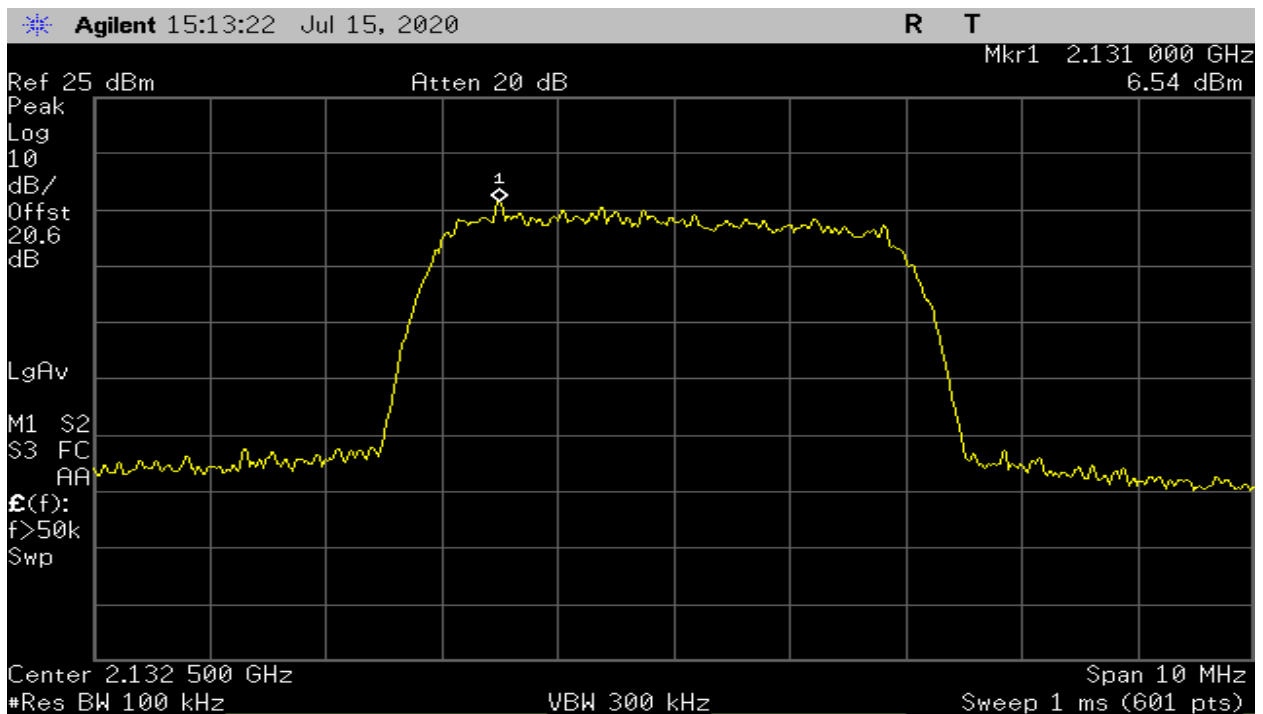
Plot 202 – 1930-1995MHz Band – Downlink Input – LTE



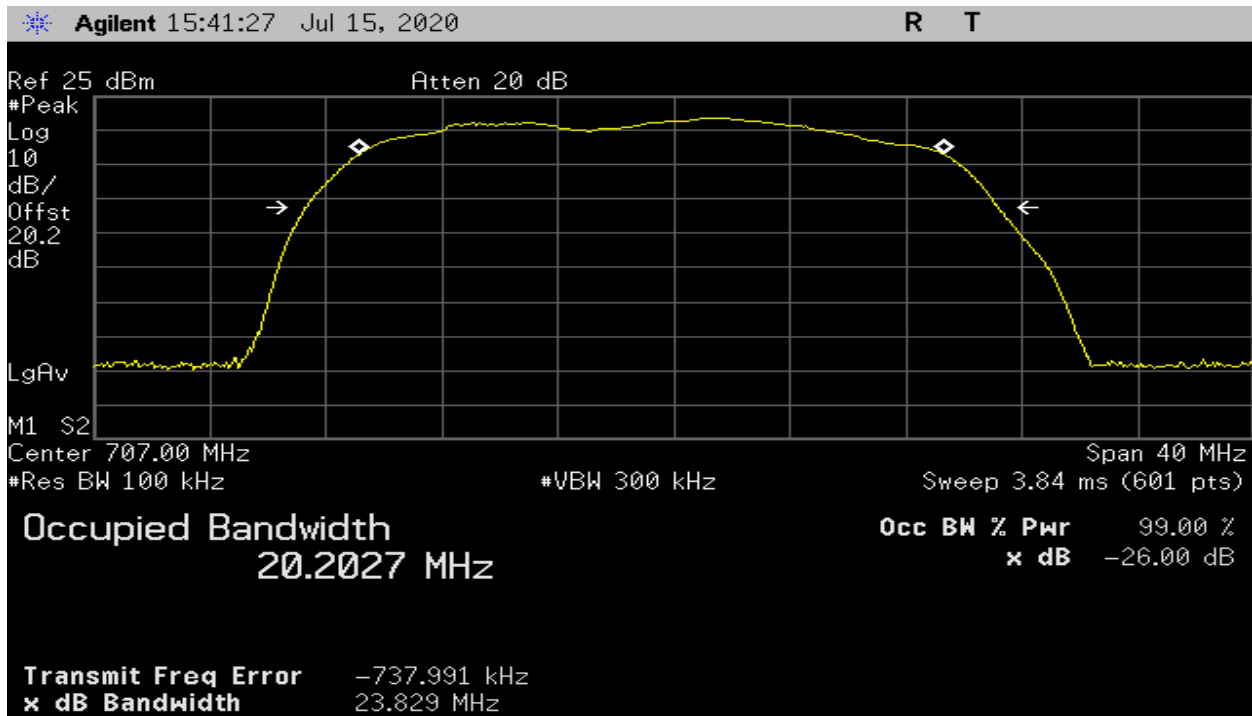
Plot 203 – 1930-1995MHz Band – Downlink Output – LTE



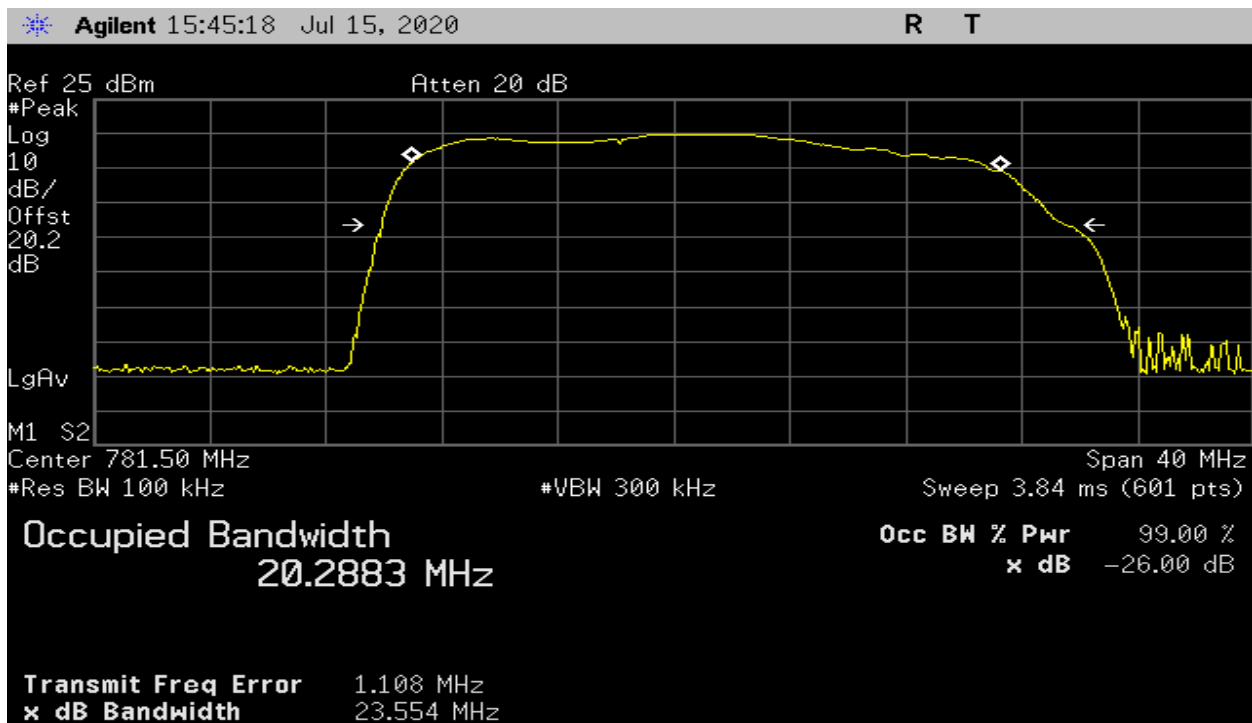
Plot 204 – 2110-2155MHz Band – Downlink Input – LTE



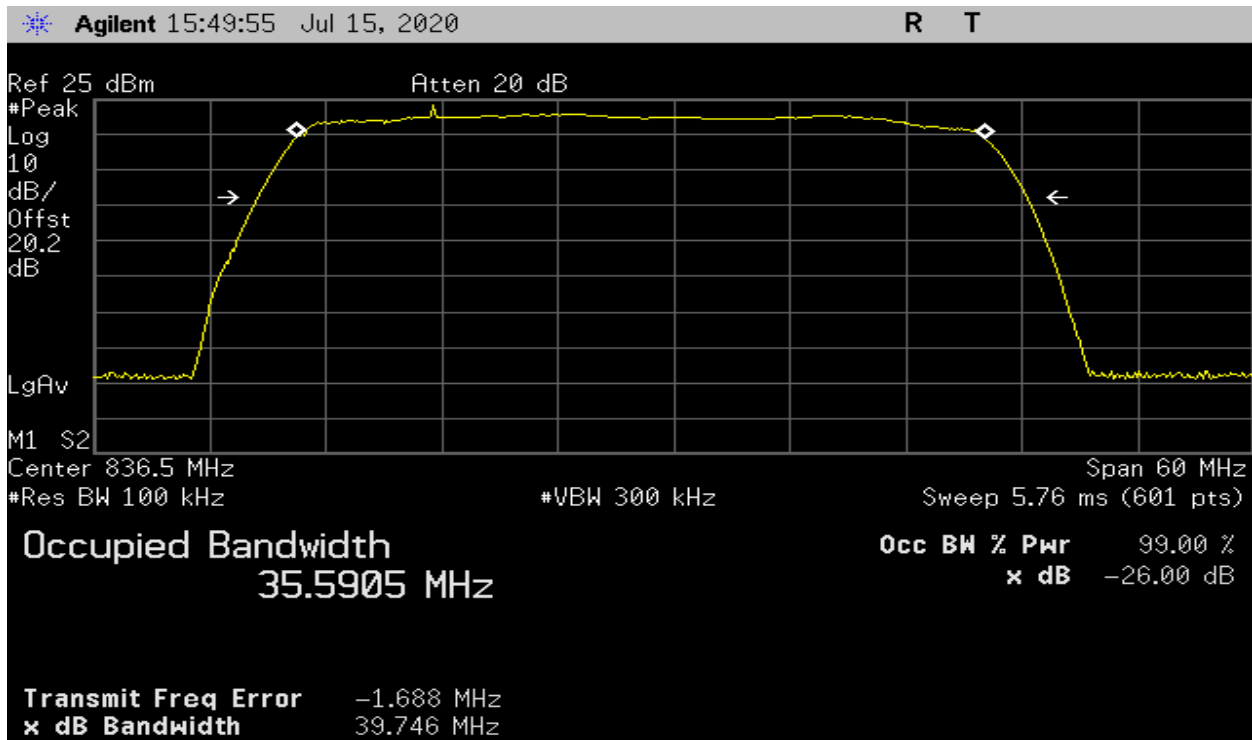
Plot 205 – 2110-2155MHz Band – Downlink Output – LTE



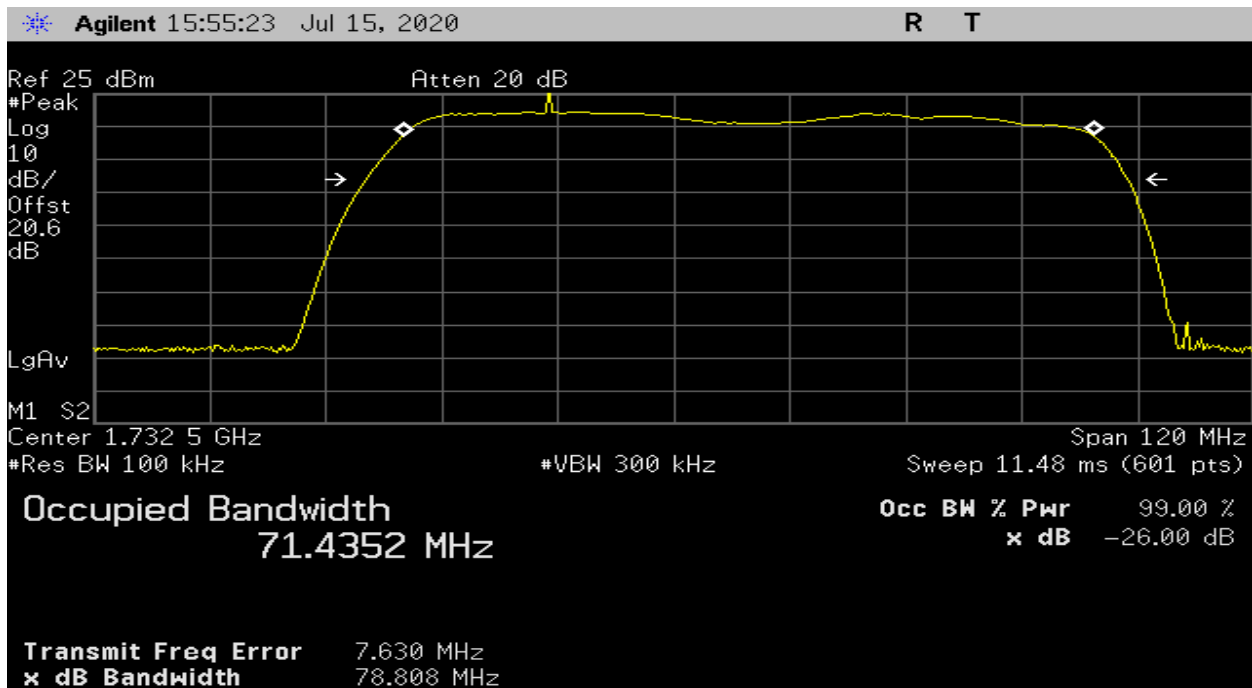
Plot 206 – 698-716MHz Band – Uplink – 99% BW for ISED (Canada)



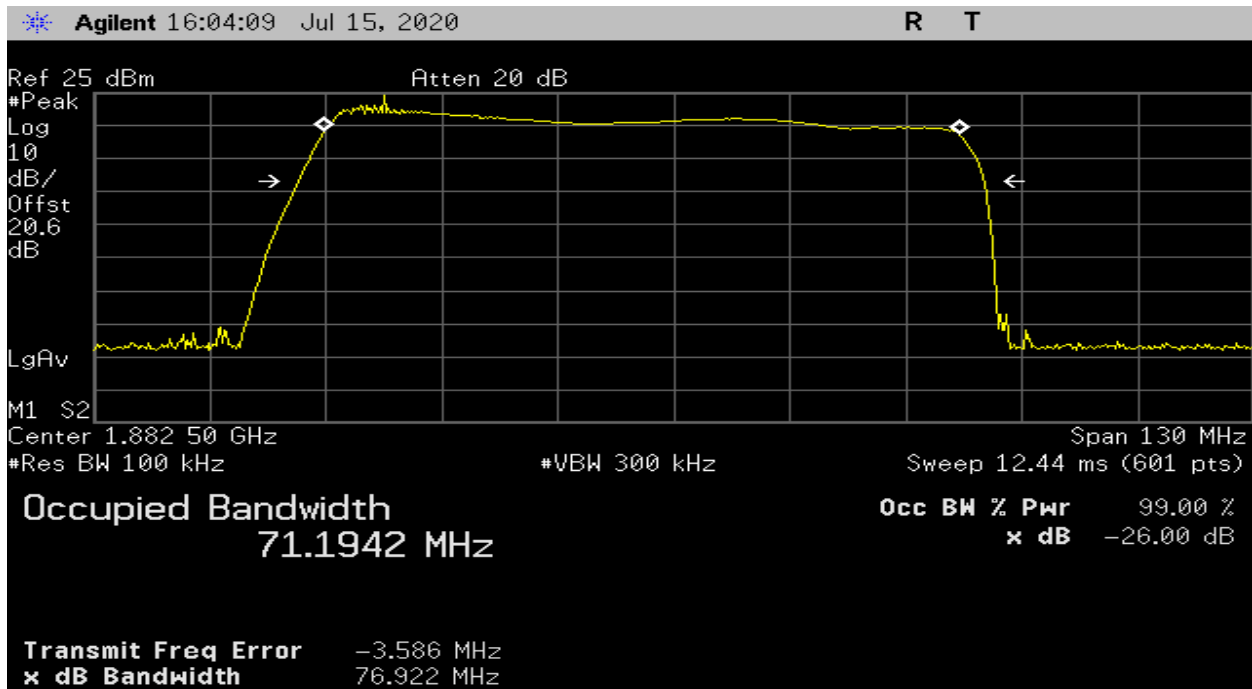
Plot 207 – 776-787MHz Band – Uplink – 99% BW for ISED (Canada)



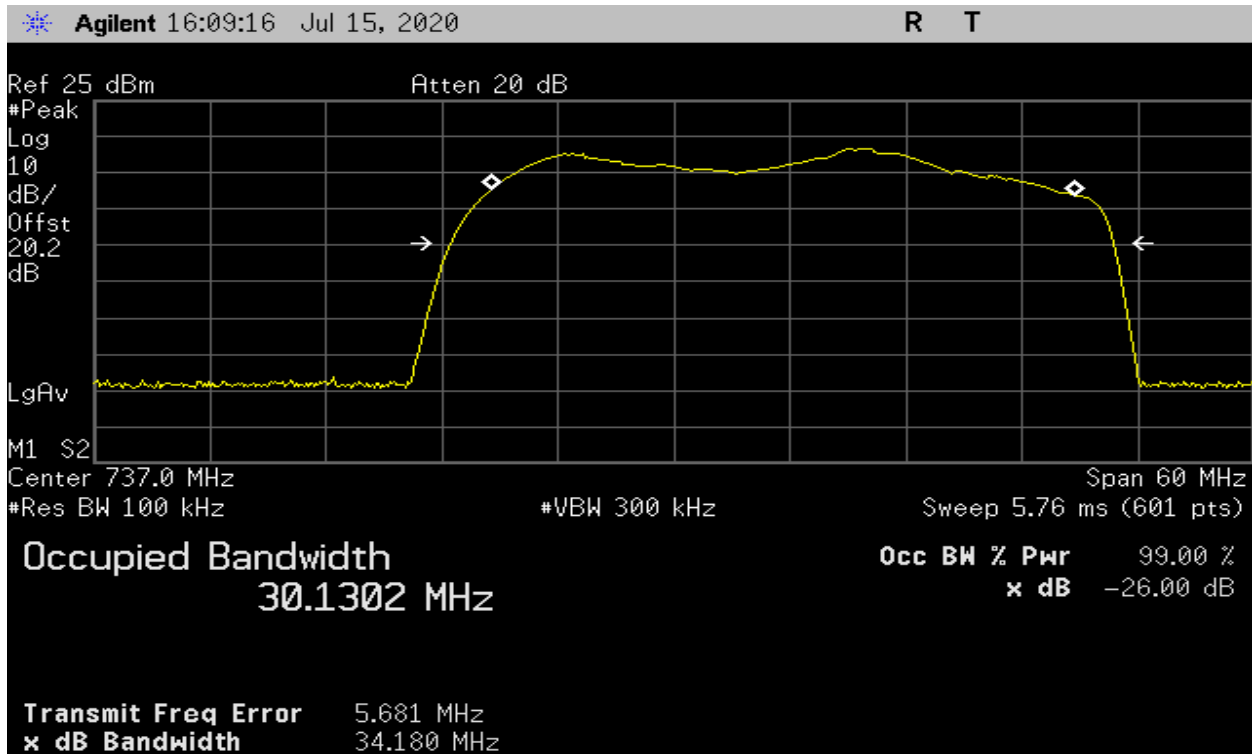
Plot 208 – 824-849MHz Band – Uplink – 99% BW for ISED (Canada)



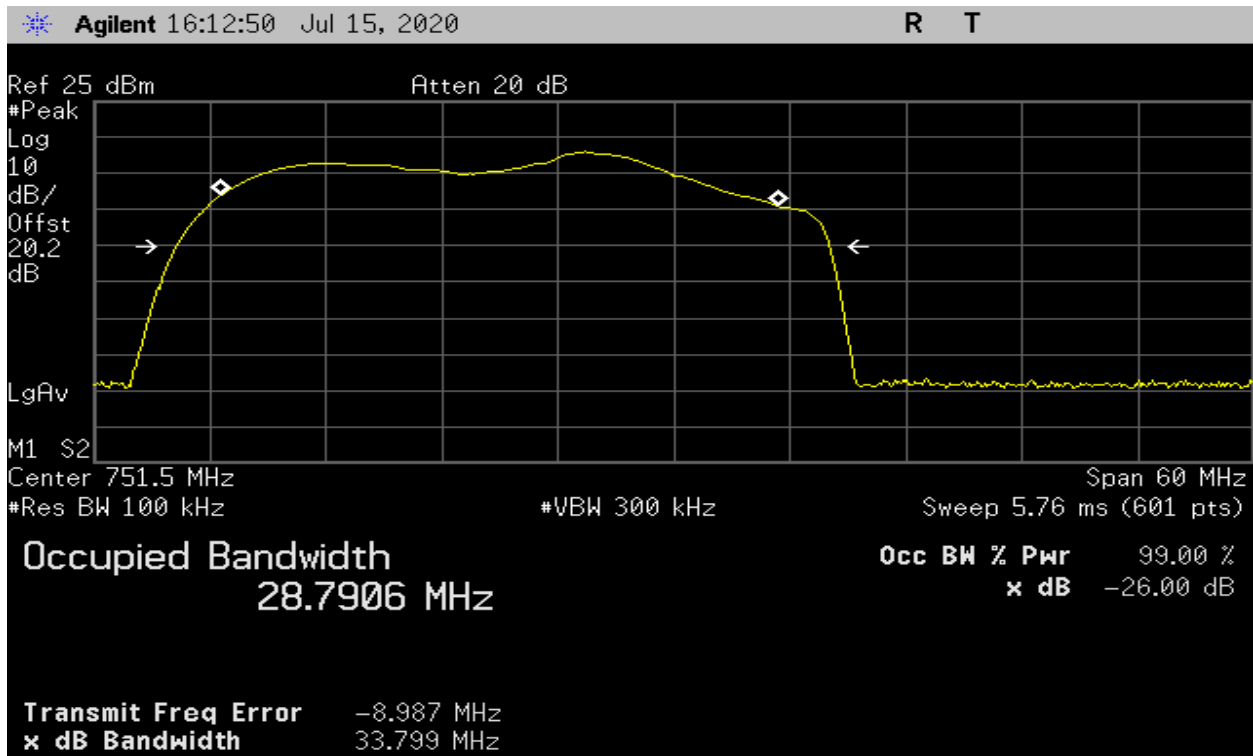
Plot 209 – 1710-1755MHz Band – Uplink – 99% BW for ISED (Canada)



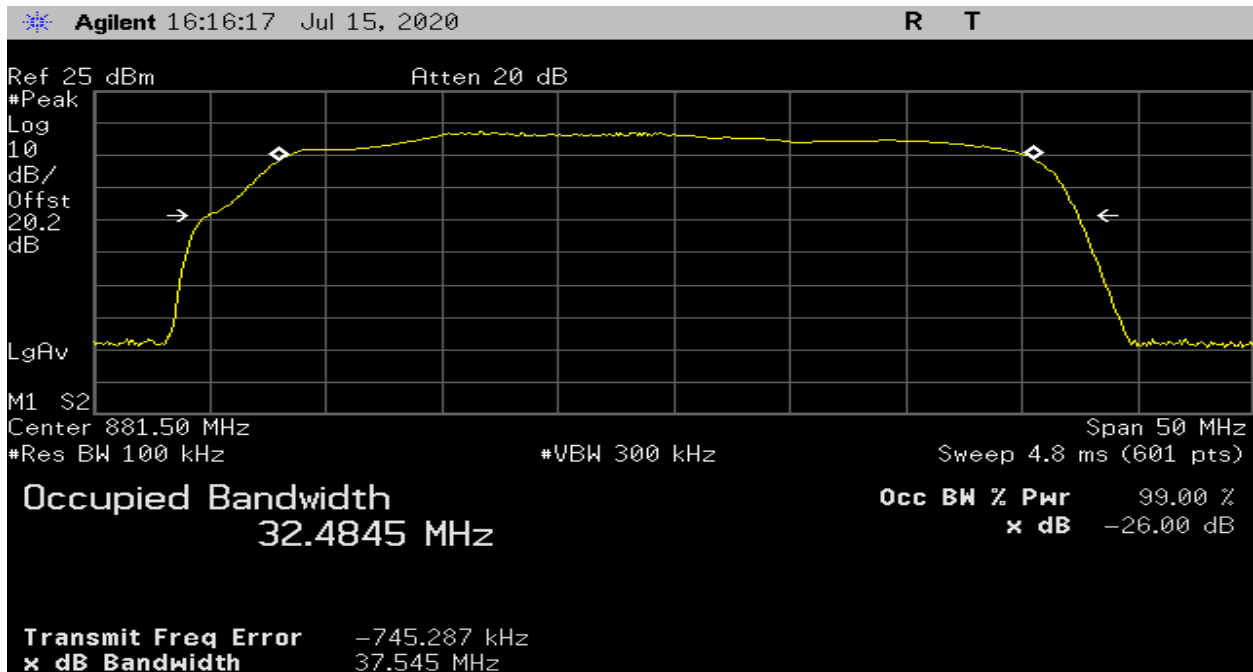
Plot 210 – 1850-1915MHz Band – Uplink – 99% BW for ISED (Canada)



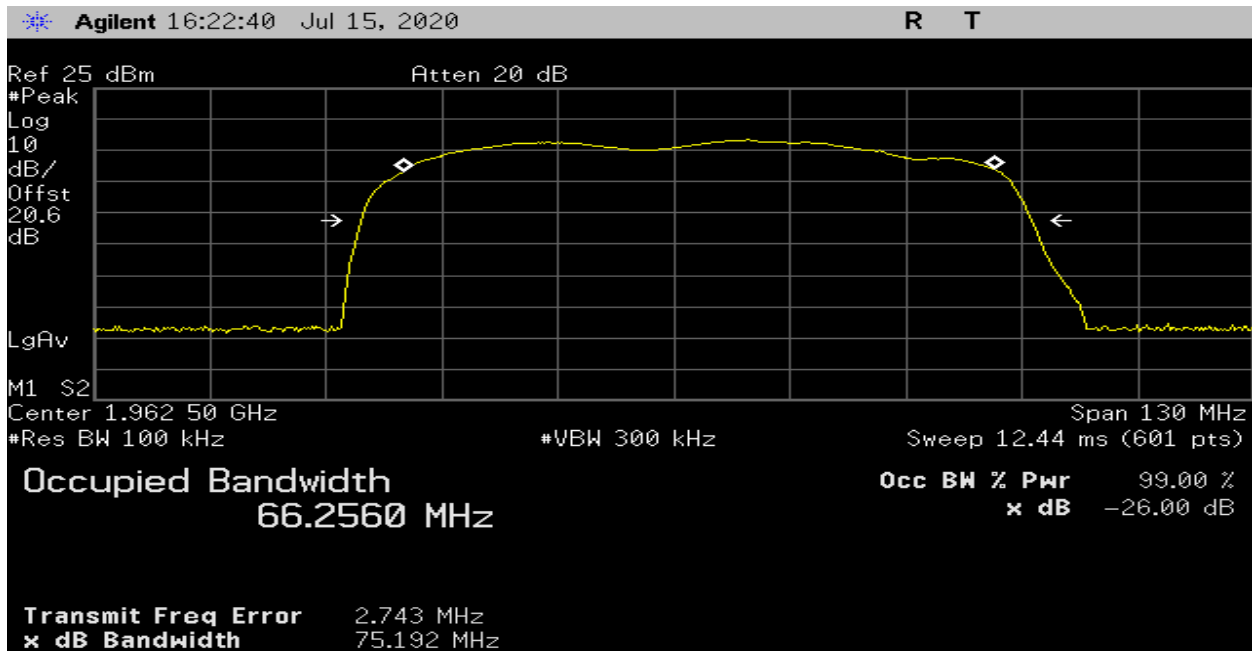
Plot 211 – 728-746MHz Band – Downlink – 99% BW for ISED (Canada)



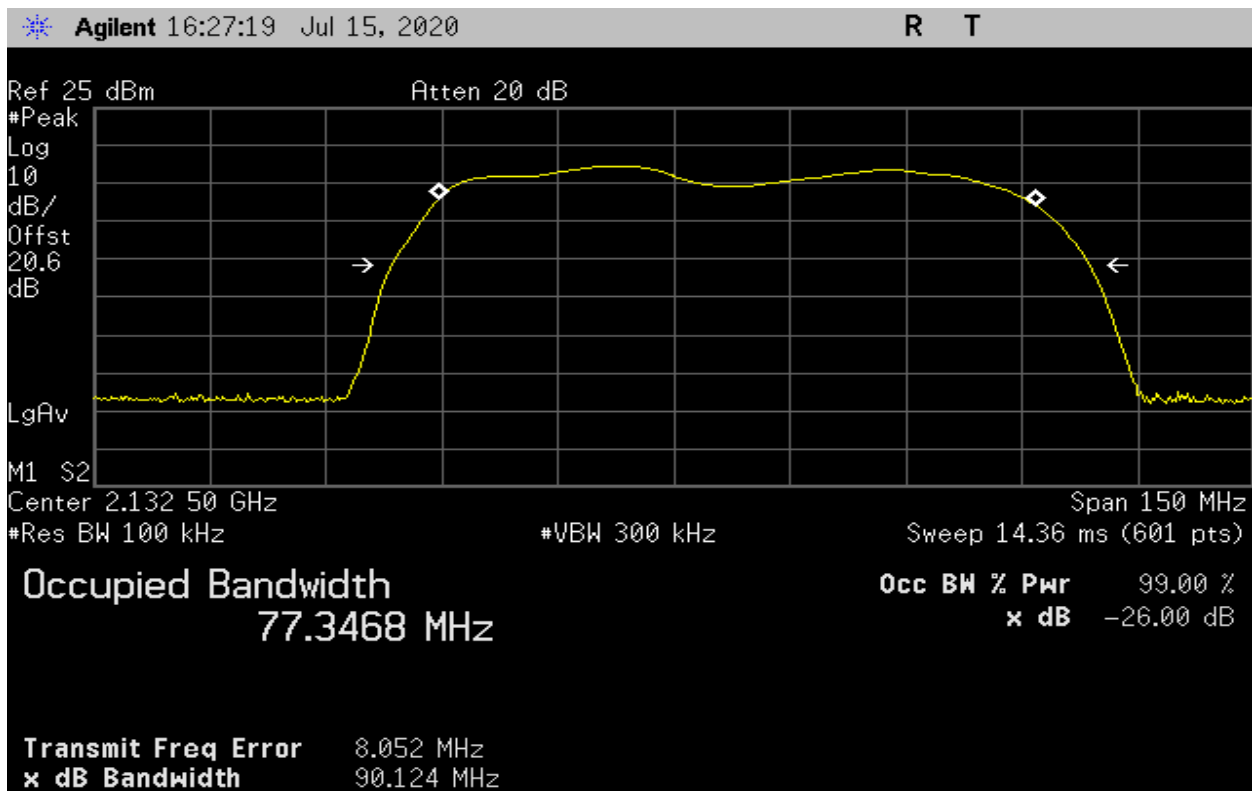
Plot 212 – 746-757MHz Band – Downlink – 99% BW for ISED (Canada)



Plot 213 – 869-894MHz Band – Downlink – 99% BW for ISED (Canada)



Plot 214 – 1930-1995MHz Band – Downlink – 99% BW for ISED (Canada)



Plot 215 – 2110-2155MHz Band – Downlink – 99% BW for ISED (Canada)

10. Oscillation Detection

Test Requirement(s):	§20.21(e)(8)(ii)(A) and RSS-131 §5.1.1.1	Test Engineer(s):	Sean Eggleston
Test Results:	Pass	Test Date(s):	Jul/21/2018

Test Procedures: As required by 47 §20.21(e)(8)(ii)(A) and RSS-131 §5.1.1.1, Oscillation detection measurement were made at the RF antenna output terminals of the EUT.

The EUT output was connected to the spectrum analyzer through a 30dB coupled directional coupler. The measurements were made as per procedure defined in KDB 935210 D03 §7.11.

Detector Setting	Resolution Bandwidth	Video Bandwidth	Sweep Time
Peak	≥1 MHz	>3X RBW	Auto

Table 36 – Analyzer settings – Oscillation Detection

Detector Setting	Resolution Bandwidth	Video Bandwidth	Sweep Time
RMS (Power Averaging)	30 kHz	>3X RBW	≥ 2 x Span/RBW

Table 37 – Analyzer settings – Oscillation Mitigation or Shutdown

Test Setup:

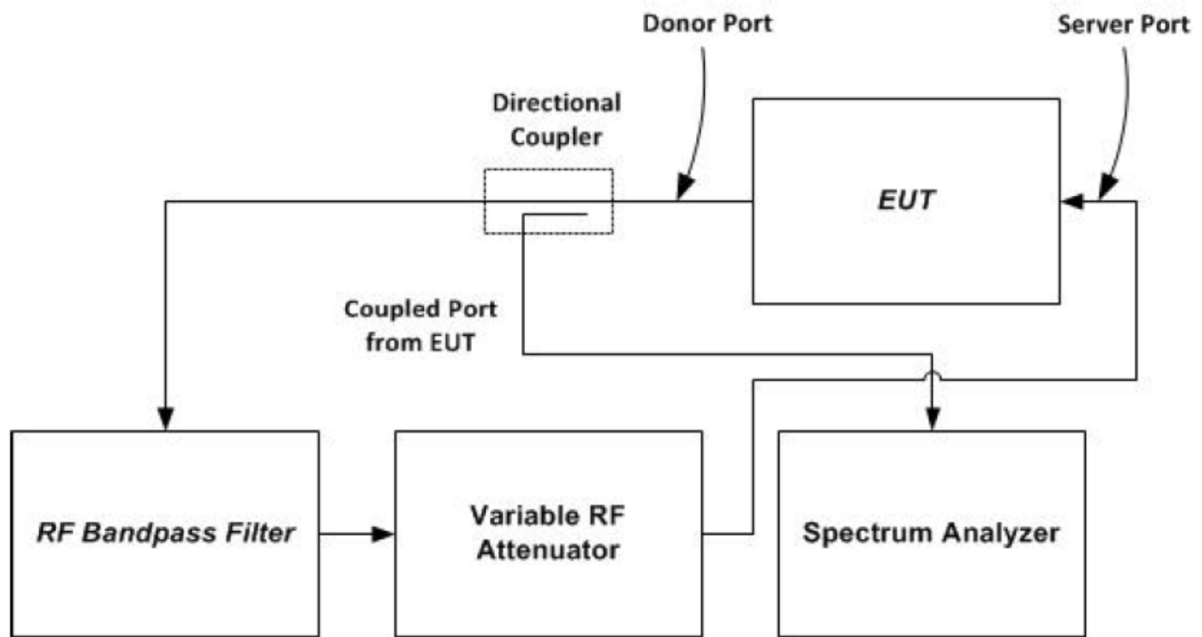


Figure 7 – Oscillation detection

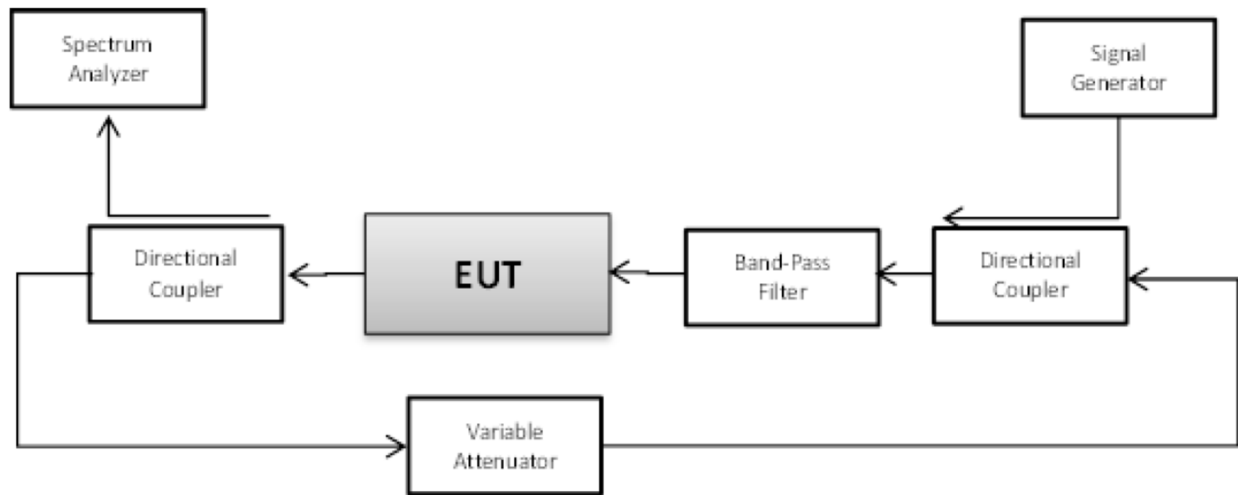


Figure 8 – Oscillation mitigation/shutdown

Frequency Band (MHz)	Measured Time (mS)	Limit (mS)
698-716	165.8	300
776-787	80.83	300
824-849	66.67	300
1710-1755	54.17	300
1850-1915	35.83	300

Table 38 –Uplink Detection Time – Summary

Frequency Band (MHz)	Measured Time (Second)	Limit (Second)
728-746	0.125	1.0
746-757	0.06	1.0
869-894	0.04	1.0
1930-1995	0.055	1.0
2110-2155	0.052	1.0

Table 39 –Downlink Detection Time – Summary

Frequency Band (MHz)	Measured Time (Second)	Limit (Second)
698-716	69.9	≥60
776-787	69.9	≥60
824-849	69.9	≥60
1710-1755	69.9	≥60
1850-1915	69.7	≥60

Table 40 –Uplink Restart Time – Summary

Frequency Band (MHz)	Measured Time (Second)	Limit (Second)
728-746	69.75	≥60
746-757	70.2	≥60
869-894	70.35	≥60
1930-1995	69.9	≥60
2110-2155	69.75	≥60

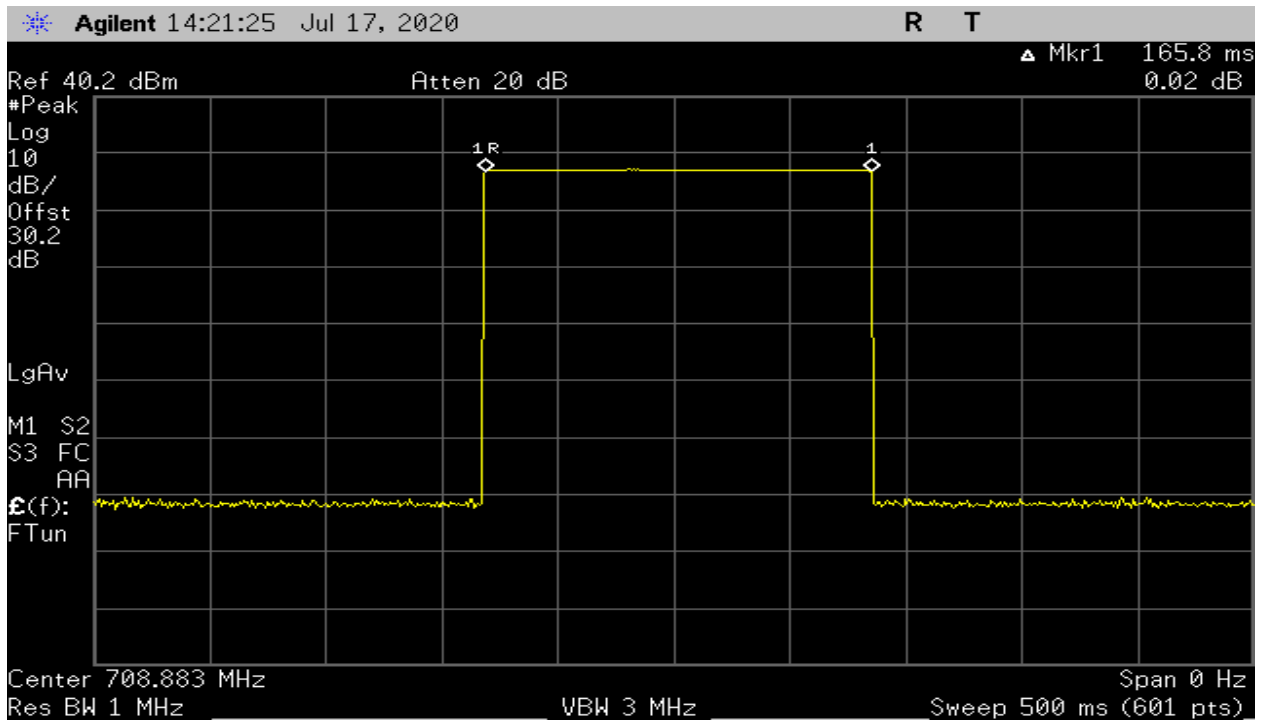
Table 41 –Downlink Restart Time – Summary

Frequency Band (MHz)	Restart	Limit
698-716	5	≤5
776-787	4	≤5
824-849	5	≤5
1710-1755	5	≤5
1850-1915	5	≤5

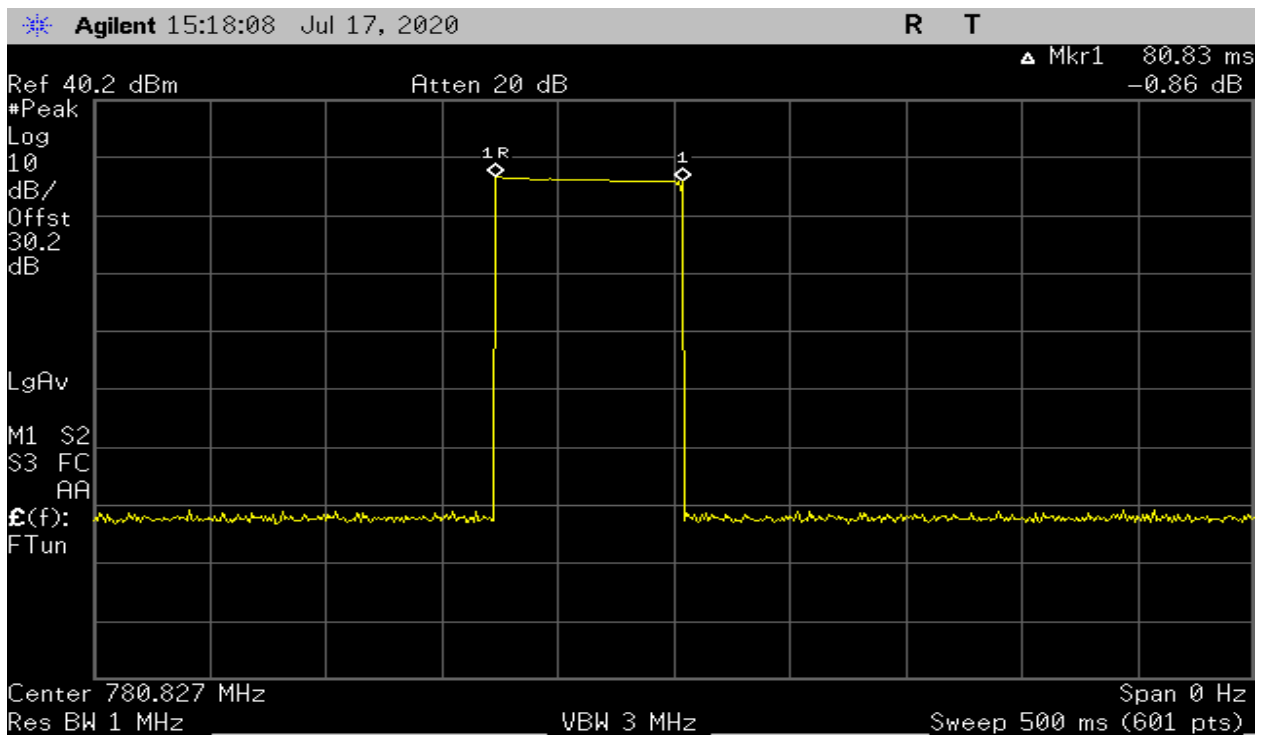
Table 42 –Uplink Restart Count – Summary

Frequency Band (MHz)	Restart	Limit
728-746	1	≤5
746-757	1	≤5
869-894	1	≤5
1930-1995	1	≤5
2110-2155	1	≤5

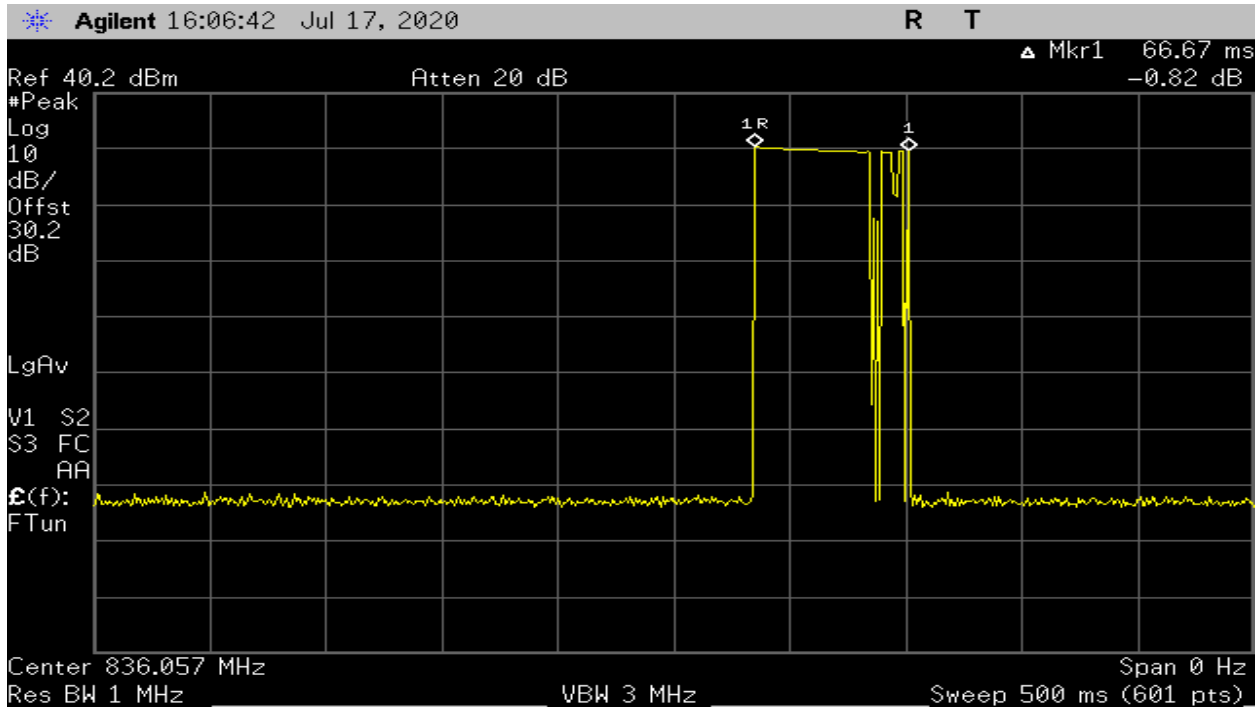
Table 43 –Downlink Restart Count – Summary



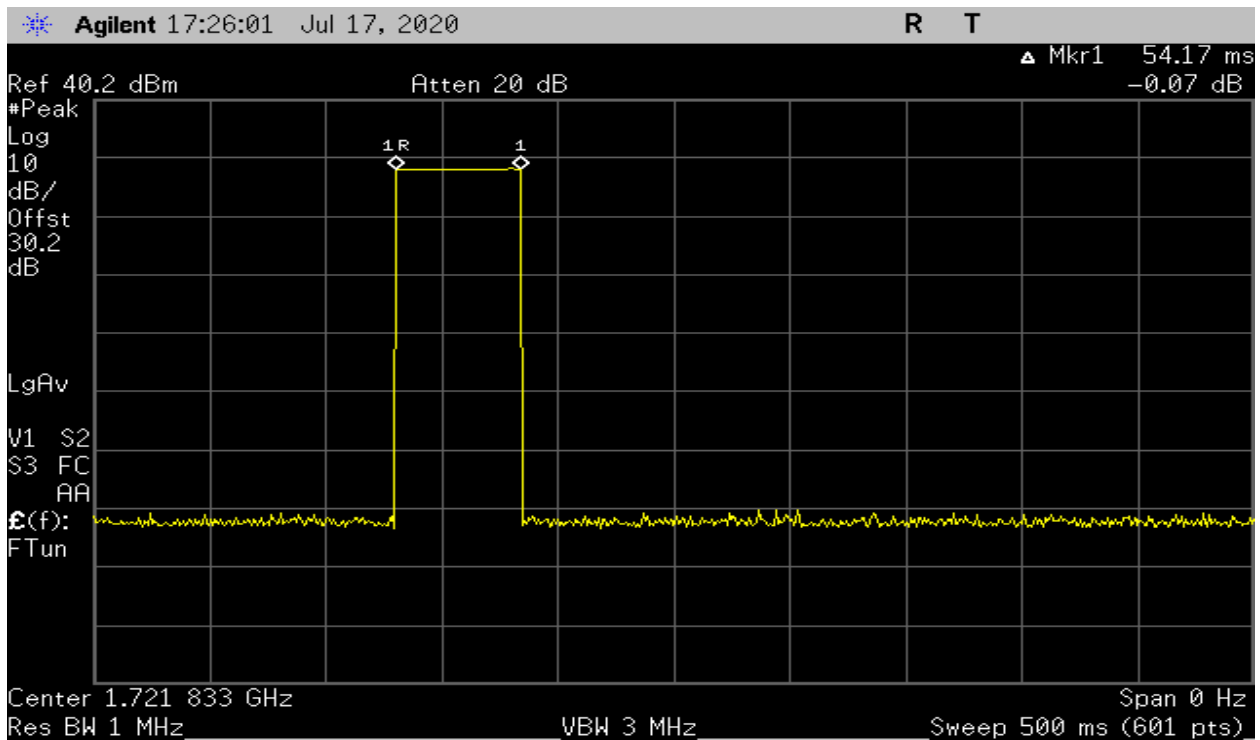
Plot 216 – 698-716MHz Band – Uplink Oscillation Detection Time



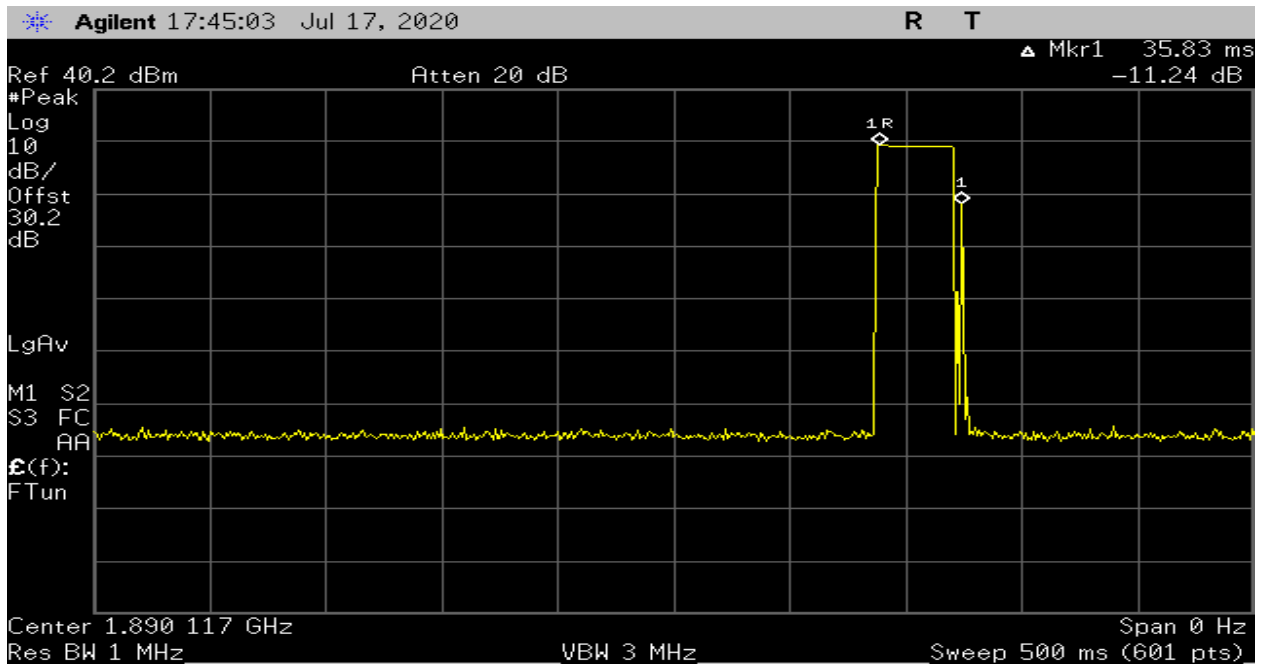
Plot 217 – 776-787MHz Band – Uplink Oscillation Detection Time



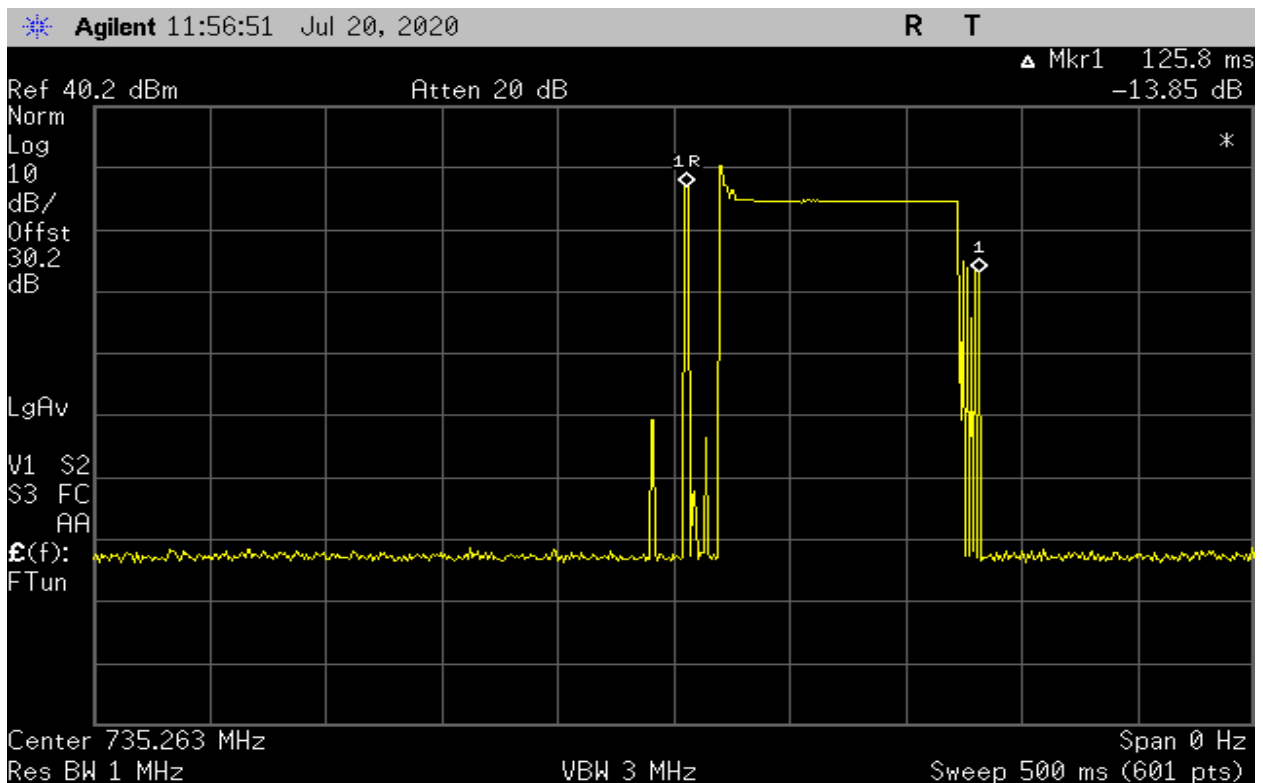
Plot 218 – 824-849MHz Band – Uplink Oscillation Detection Time



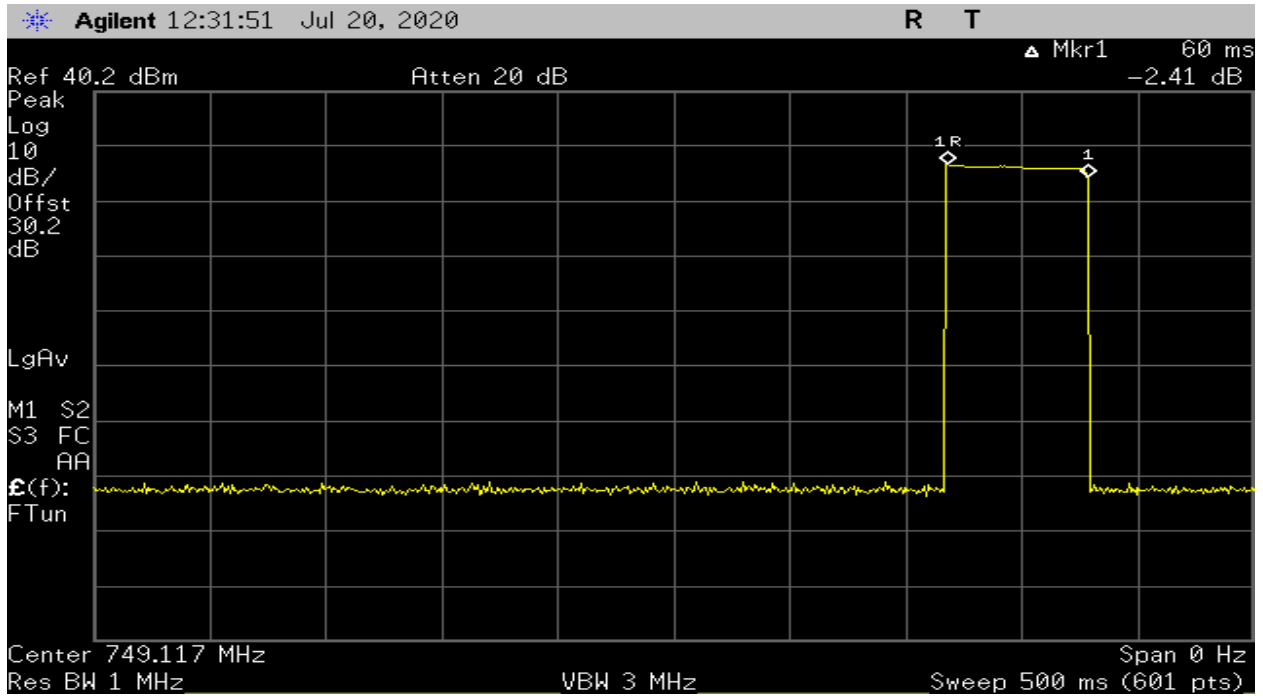
Plot 219 – 1710-1755MHz Band – Uplink Oscillation Detection Time



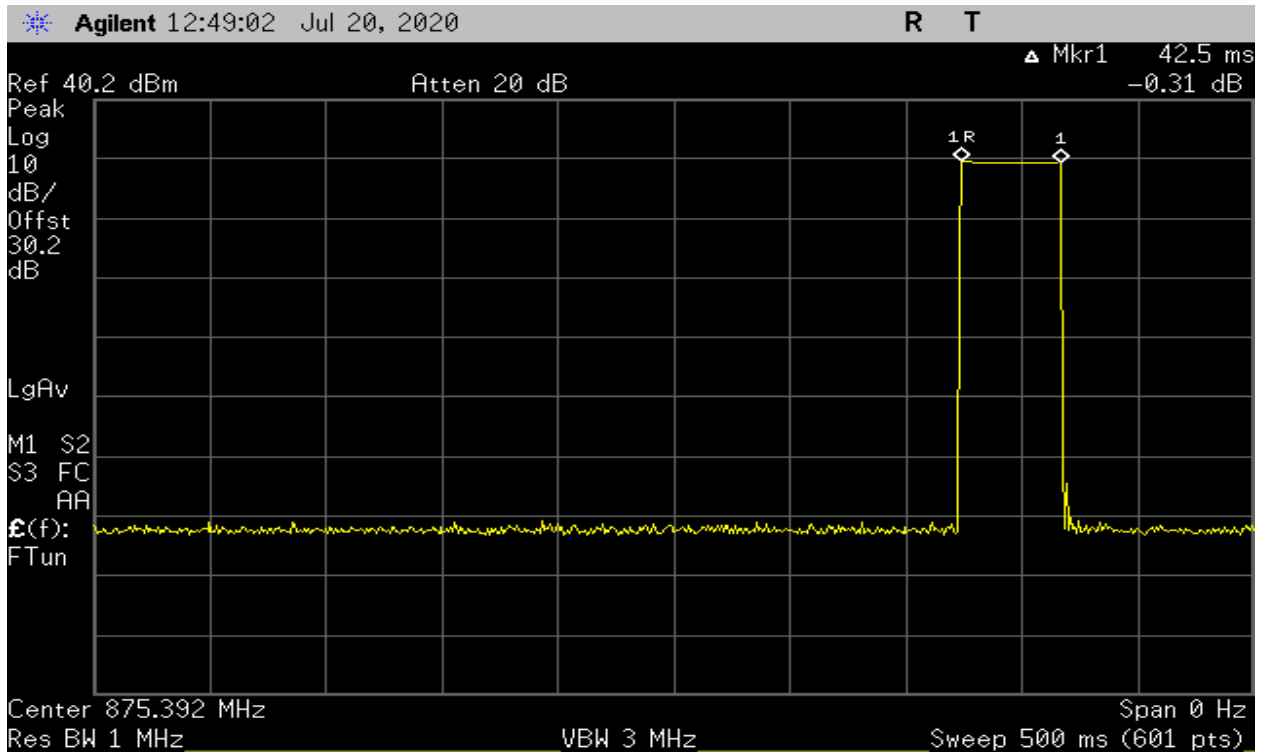
Plot 220 – 1850-1915MHz Band – Uplink Oscillation Detection Time



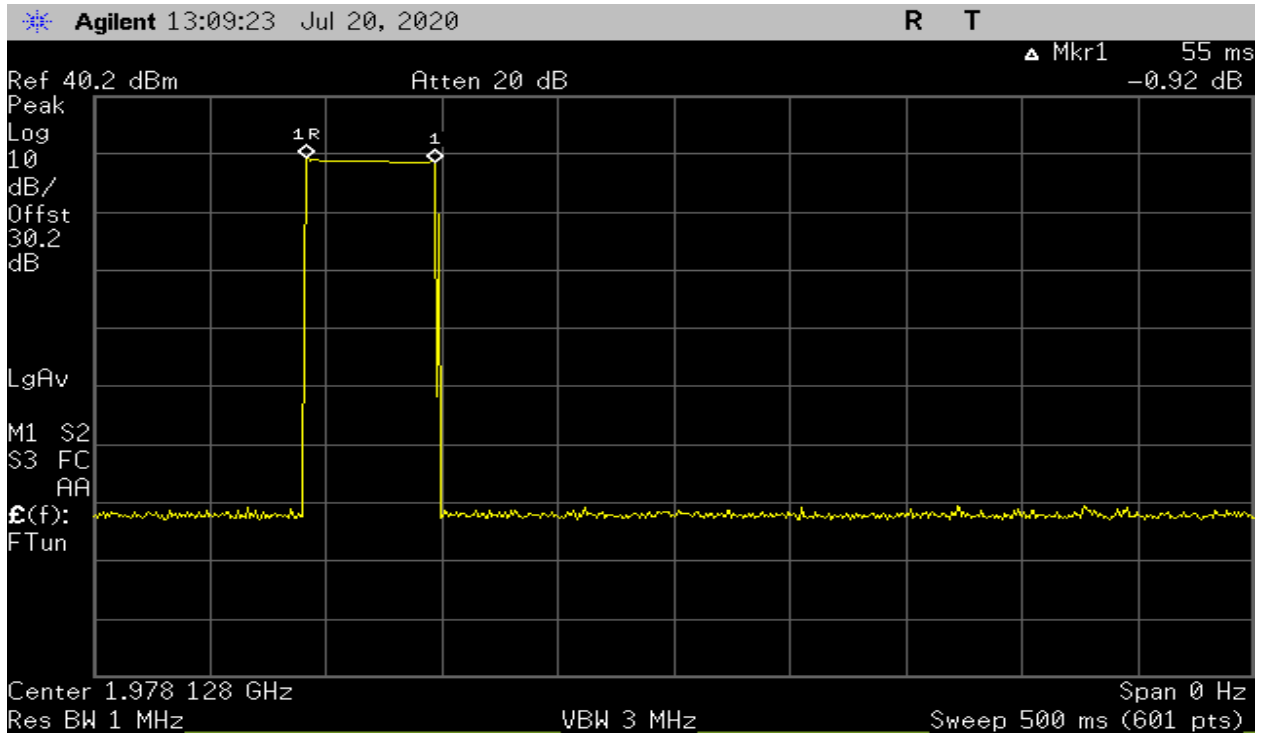
Plot 221 – 728-746MHz Band – Downlink Oscillation Detection Time



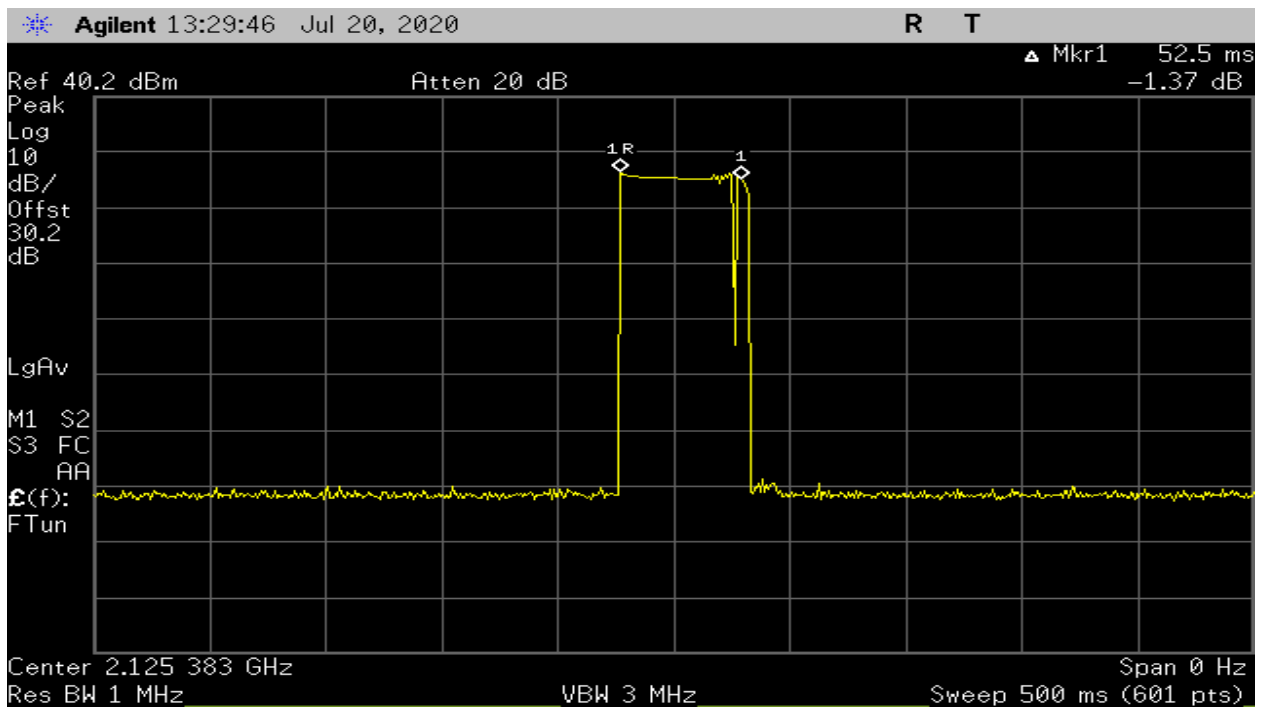
Plot 222 – 746-757MHz Band – Downlink Oscillation Detection Time



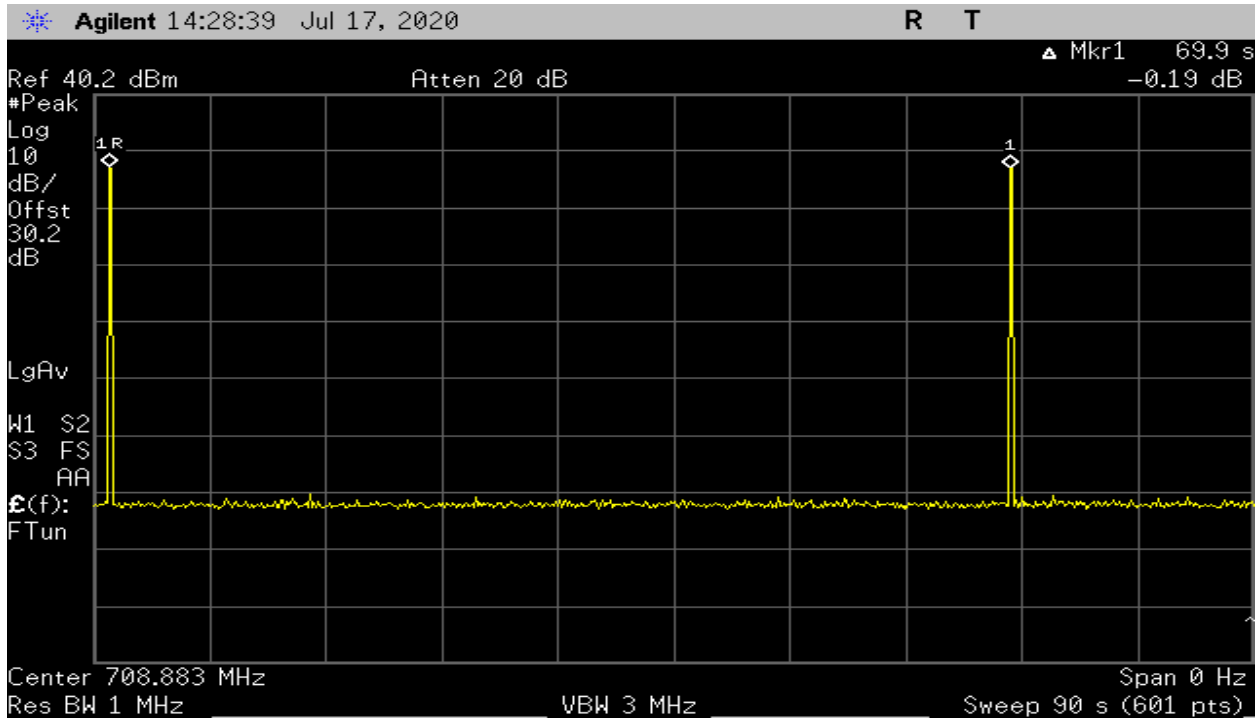
Plot 223 – 869-894MHz Band – Downlink Oscillation Detection Time



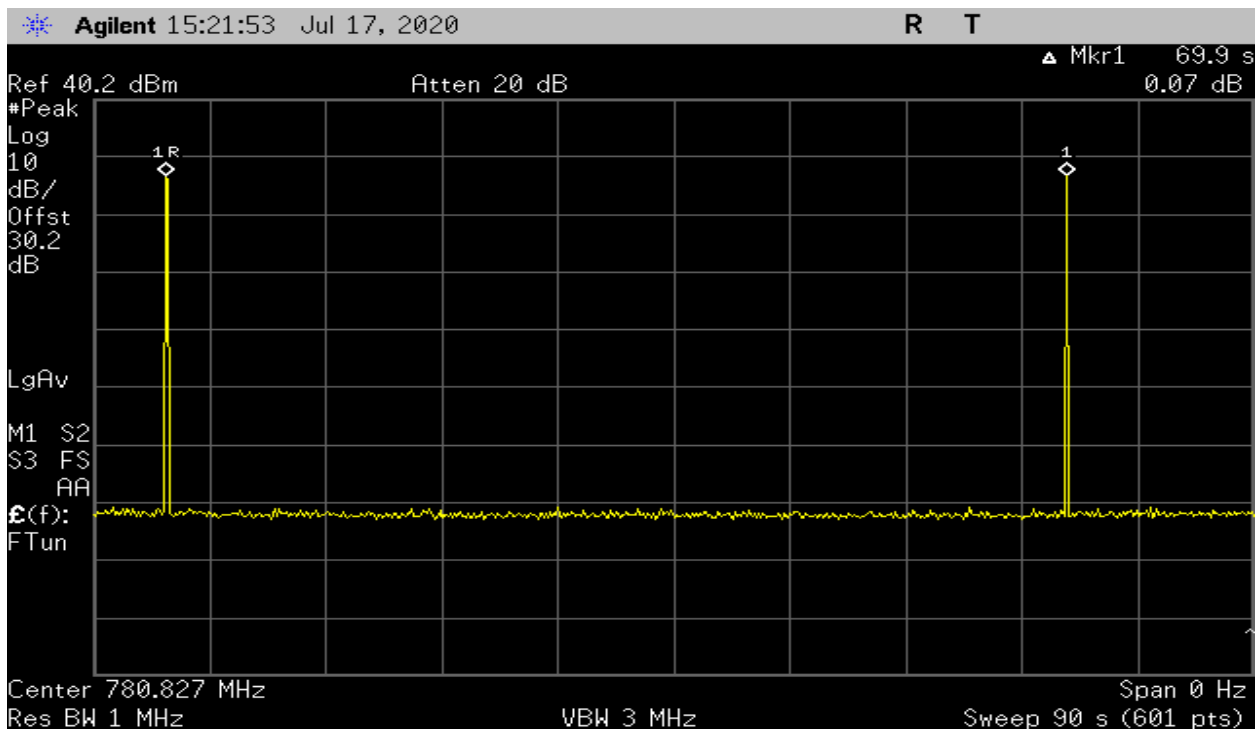
Plot 224 – 1930-1995MHz Band – Downlink Oscillation Detection Time



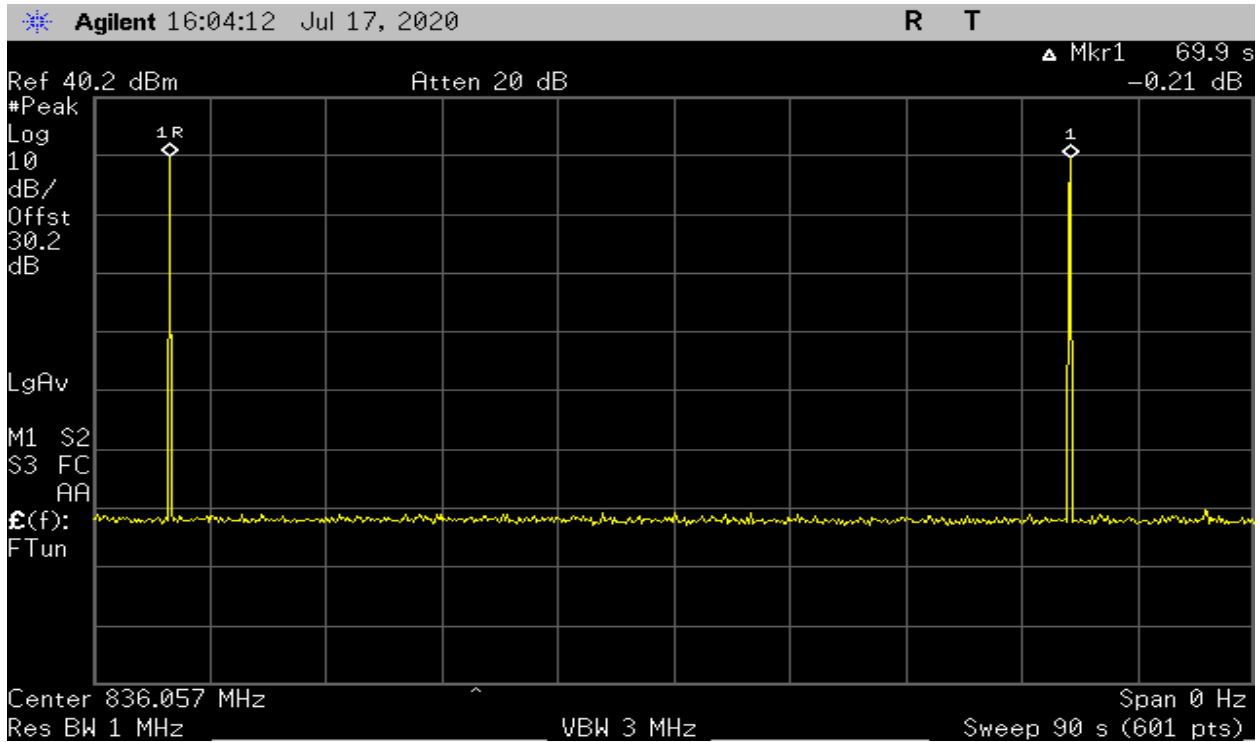
Plot 225 – 2110-2155MHz Band – Downlink Oscillation Detection Time



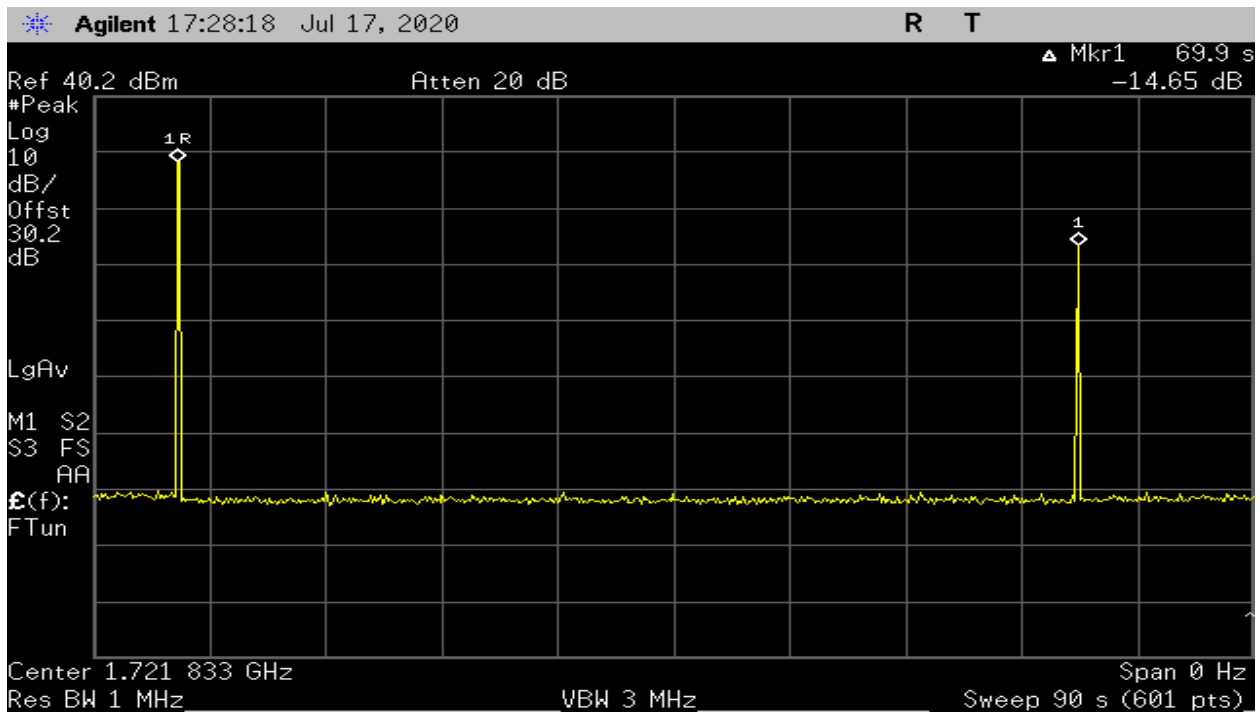
Plot 226 – 698-716MHz Band –Uplink Restart Time



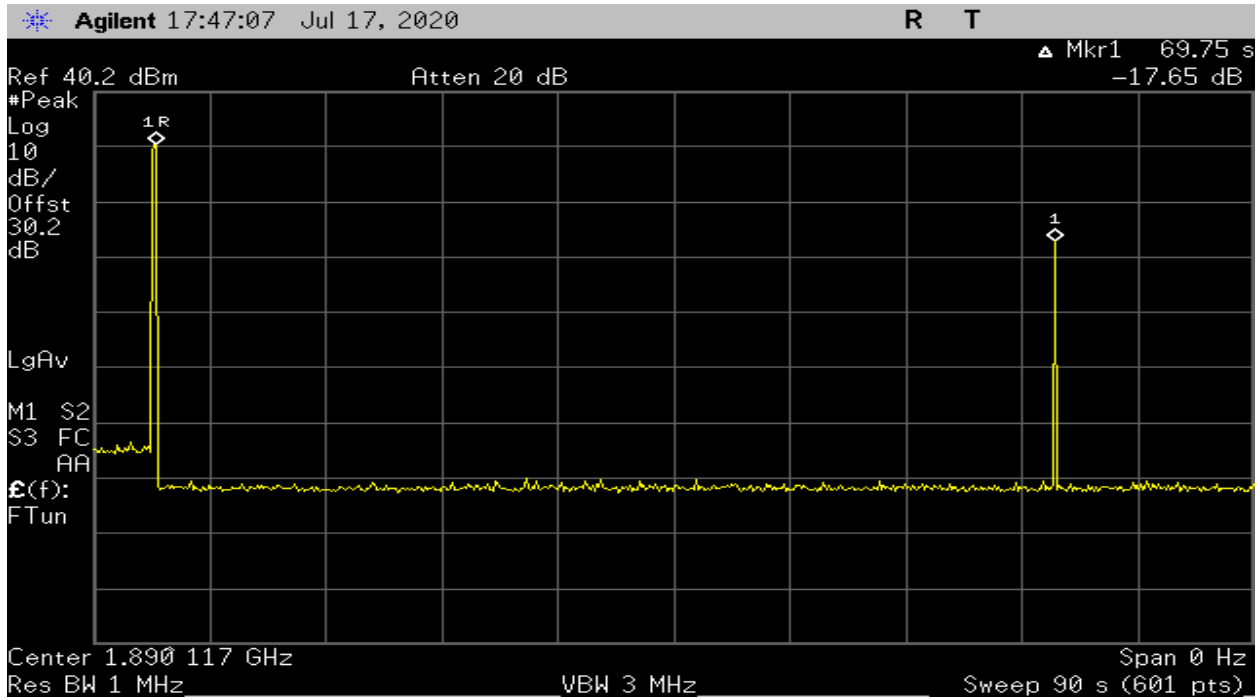
Plot 227 – 776-787MHz Band –Uplink Restart Time



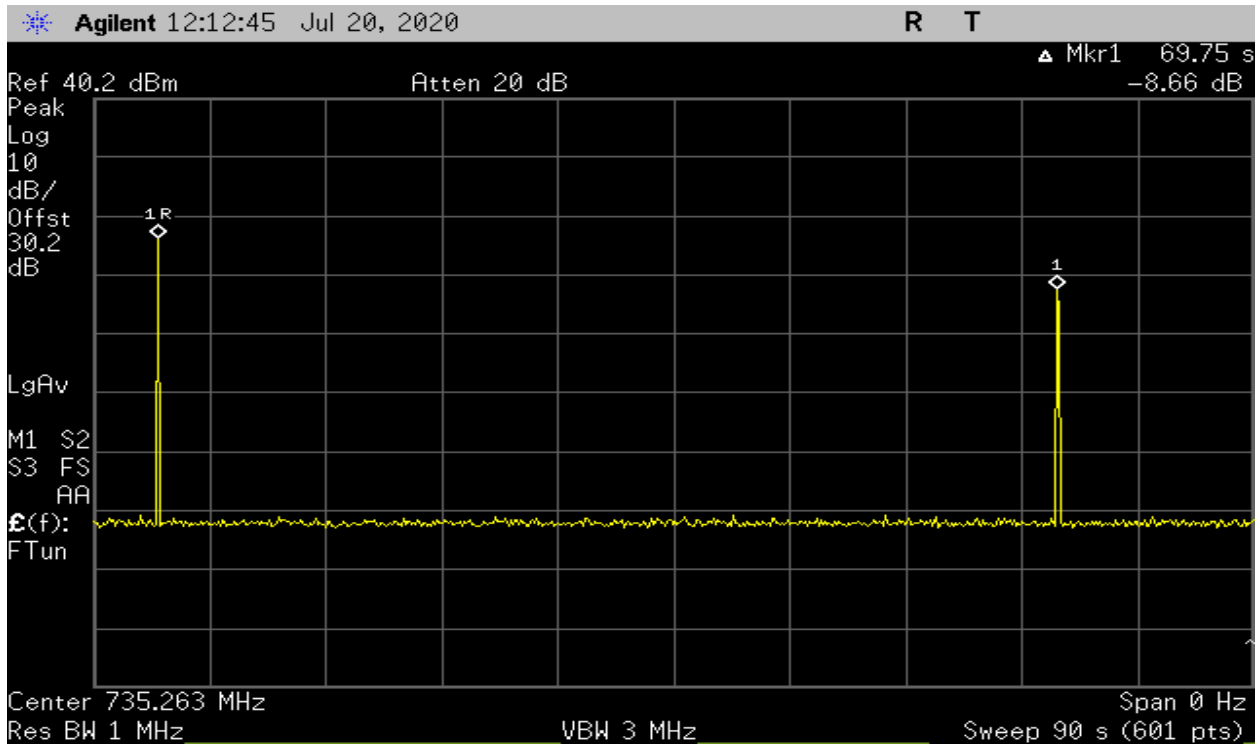
Plot 228 – 824-849MHz Band –Uplink Restart Time



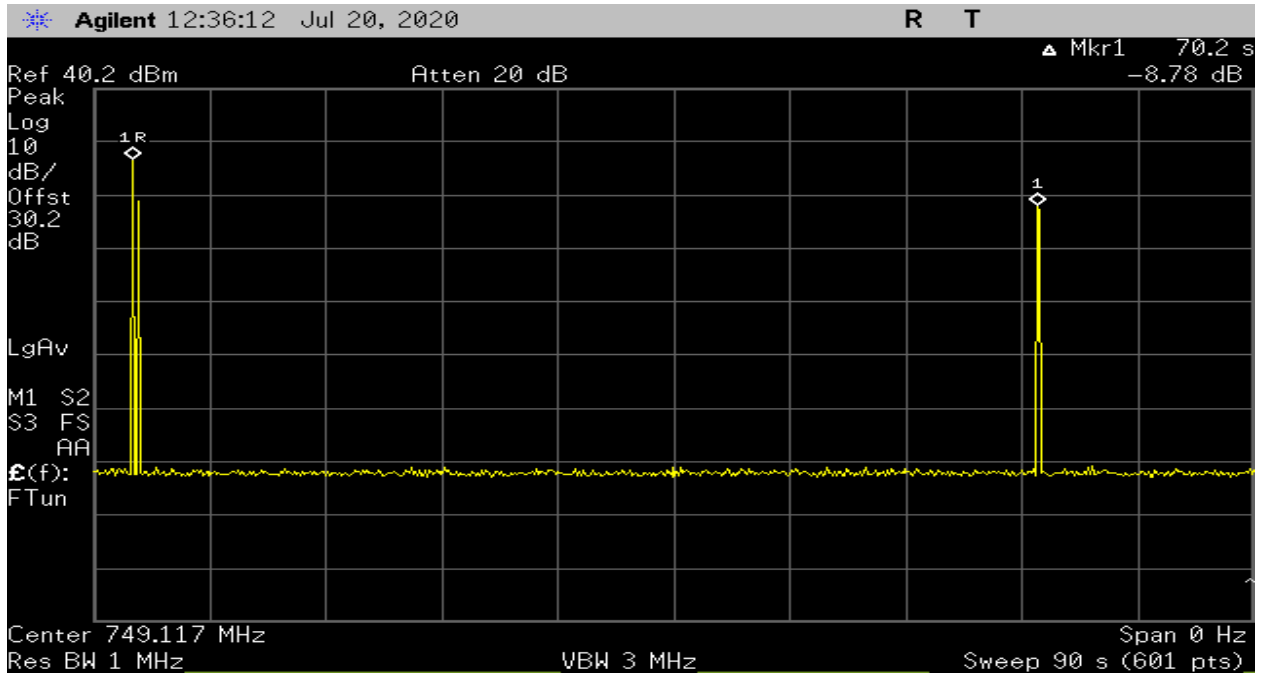
Plot 229 – 1710-1755MHz Band –Uplink Restart Time



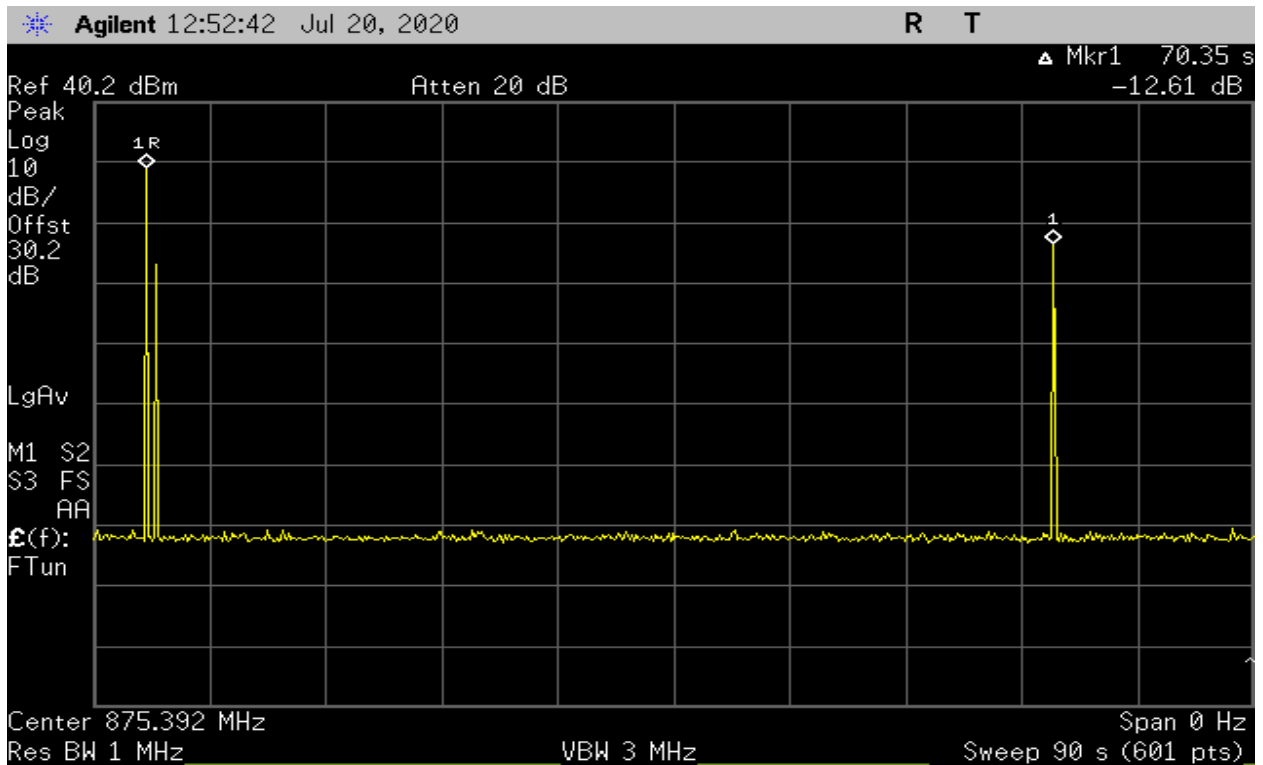
Plot 230 – 1850-1915MHz Band –Uplink Restart Time



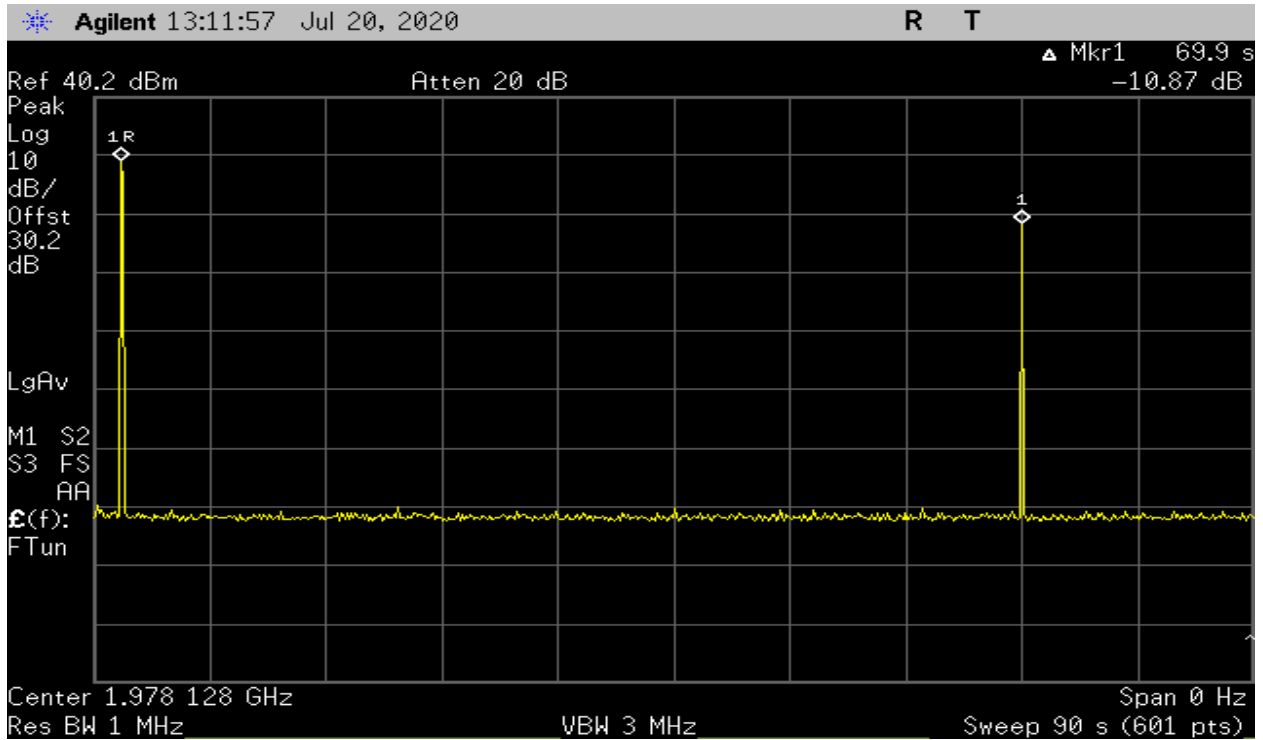
Plot 231 – 728-746MHz Band –Downlink Restart Time



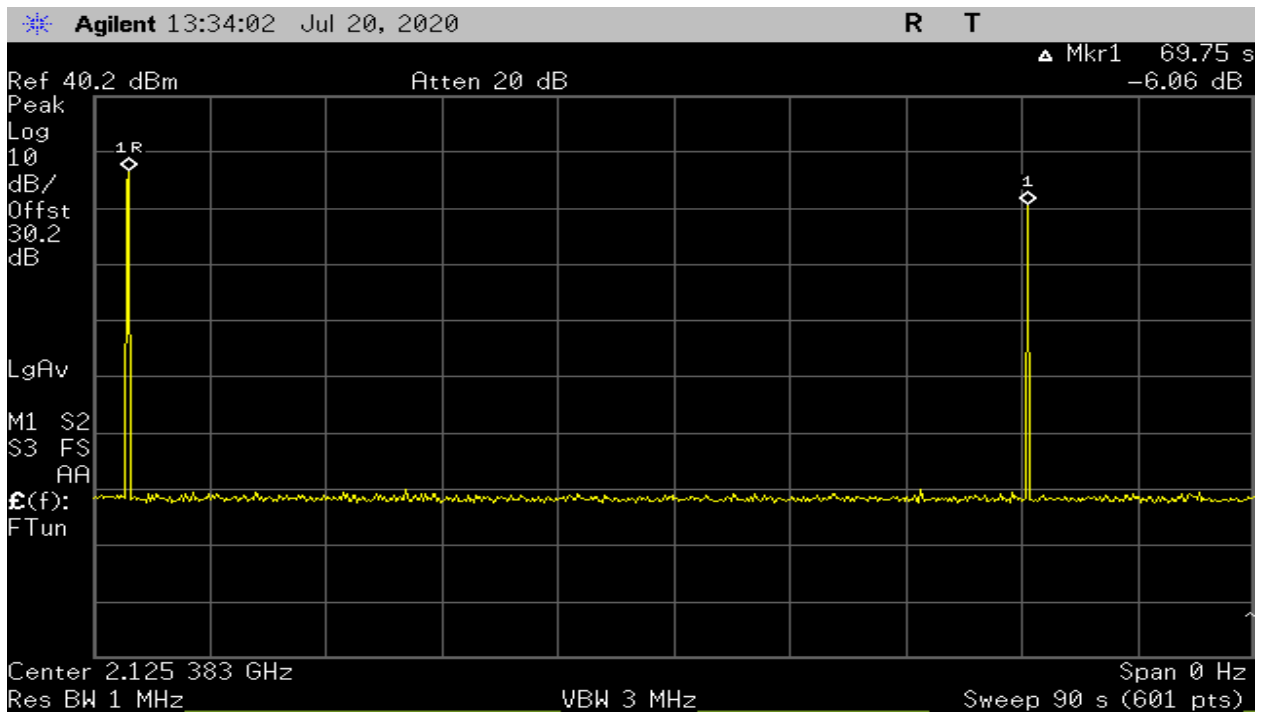
Plot 232 – 746-757MHz Band –Downlink Restart Time



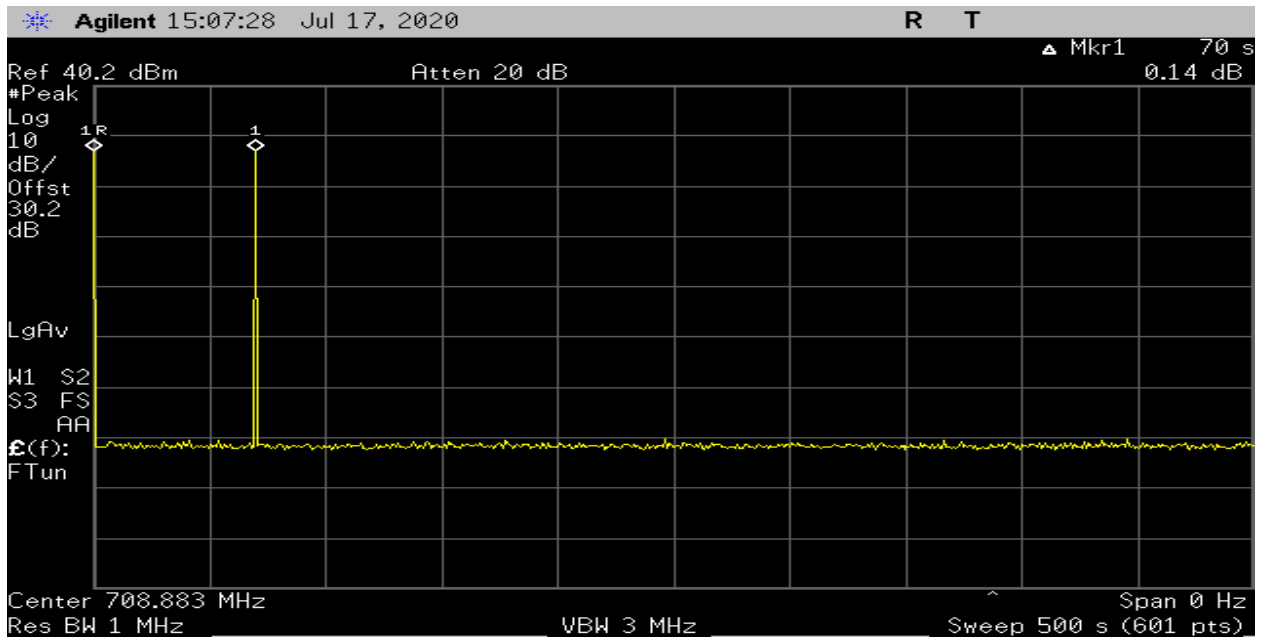
Plot 233 – 869-894MHz Band –Downlink Restart Time



Plot 234 – 1930-1995MHz Band –Downlink Restart Time

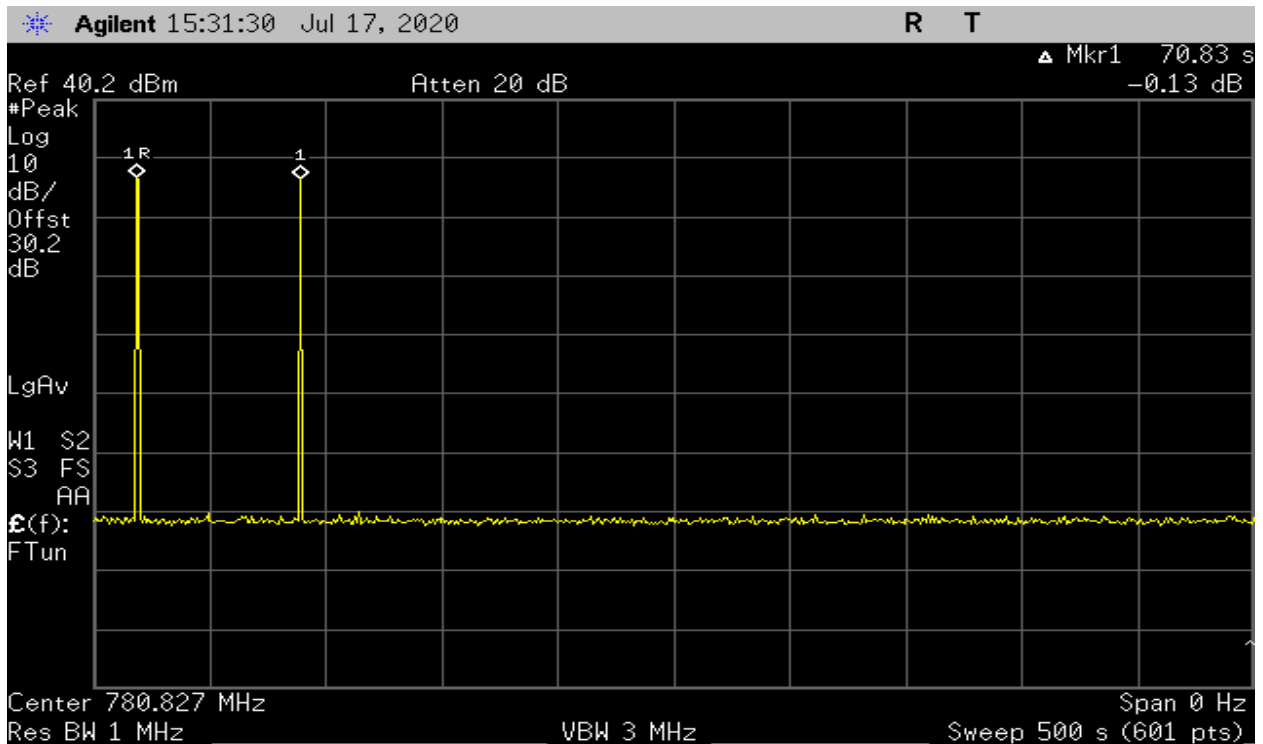


Plot 235 – 2110-2155MHz Band –Downlink Restart Time

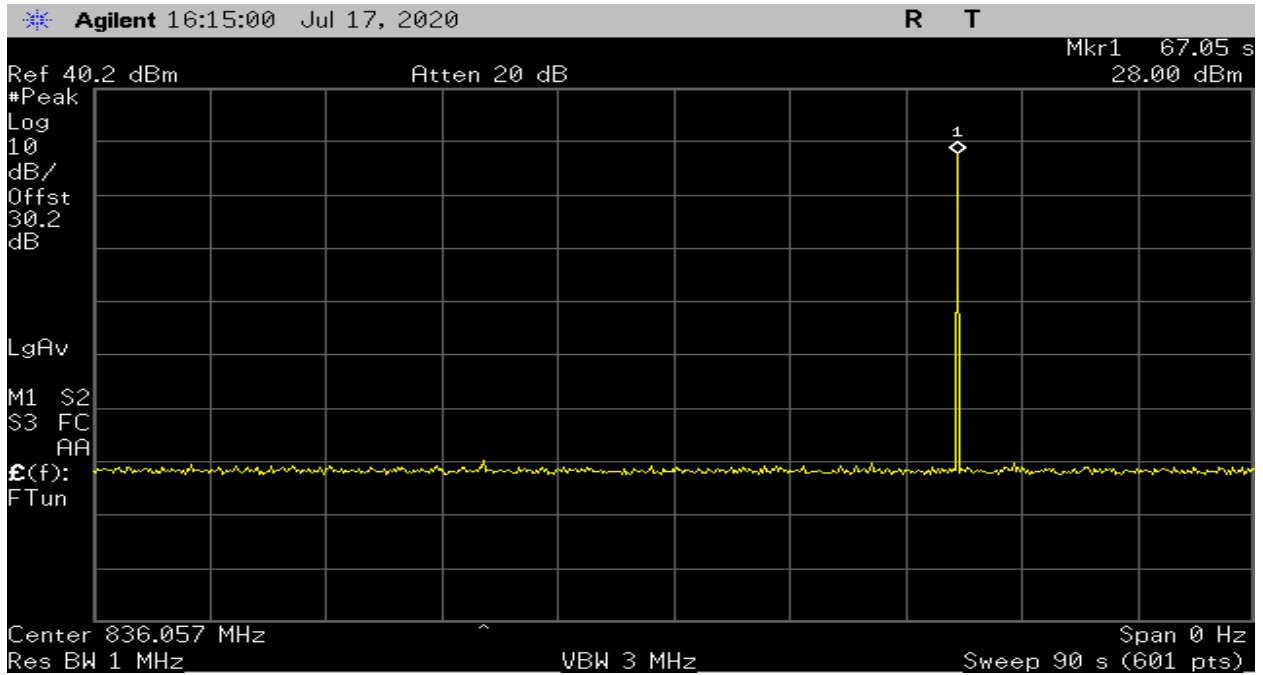


Plot 236 – 698-716MHz Band – Uplink # of Restart Time

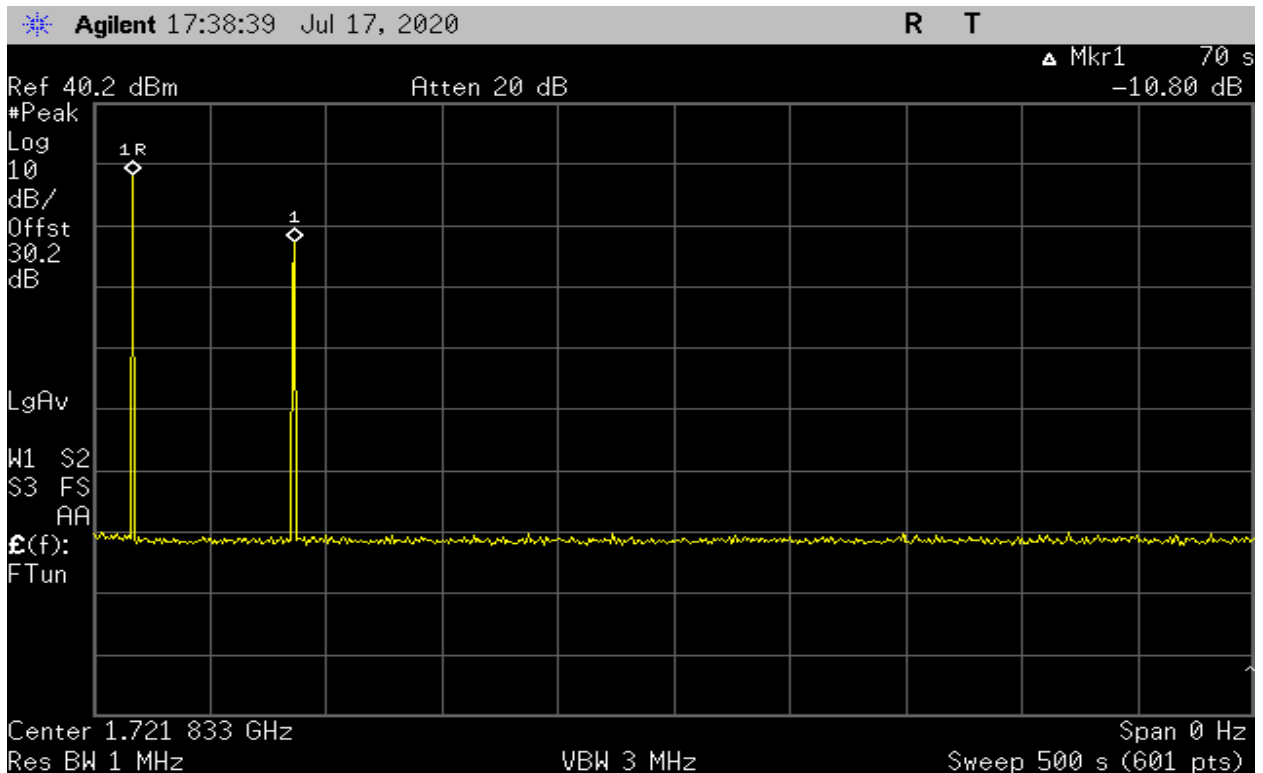
Note: The first pulse is Oscillation Shutdown and startup. Rest are the restart attempts



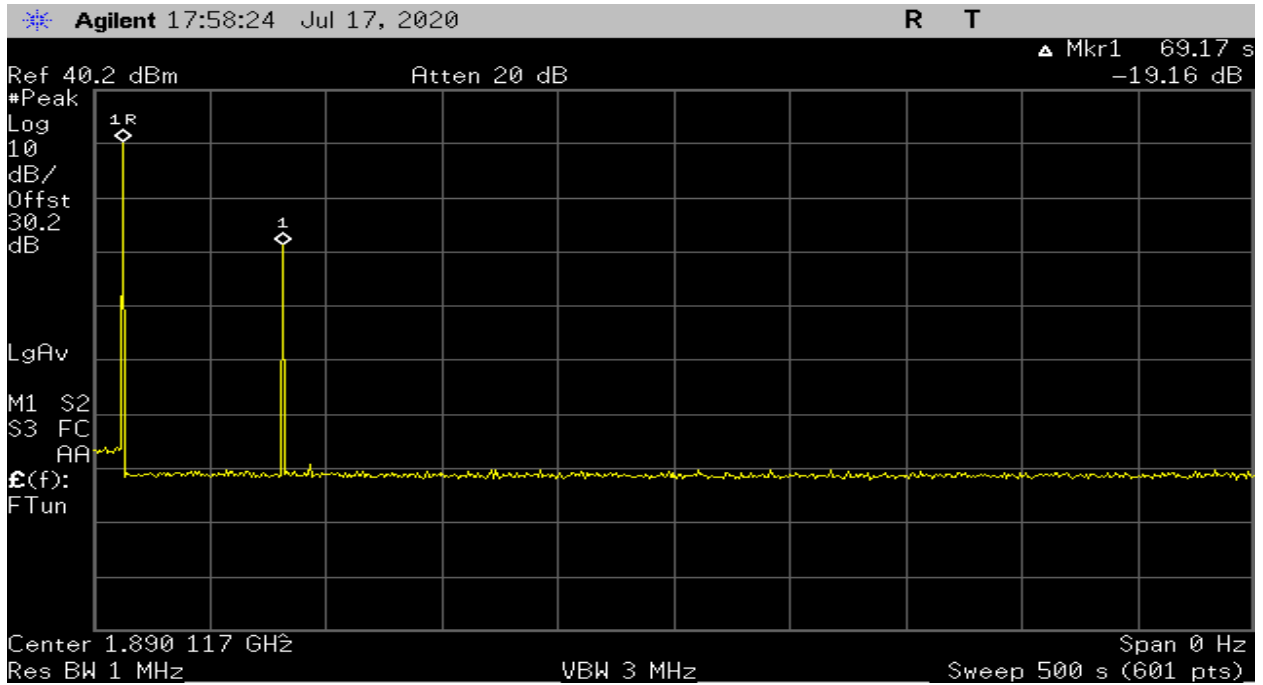
Plot 237 – 776-787MHz Band – Uplink # of Restart Time



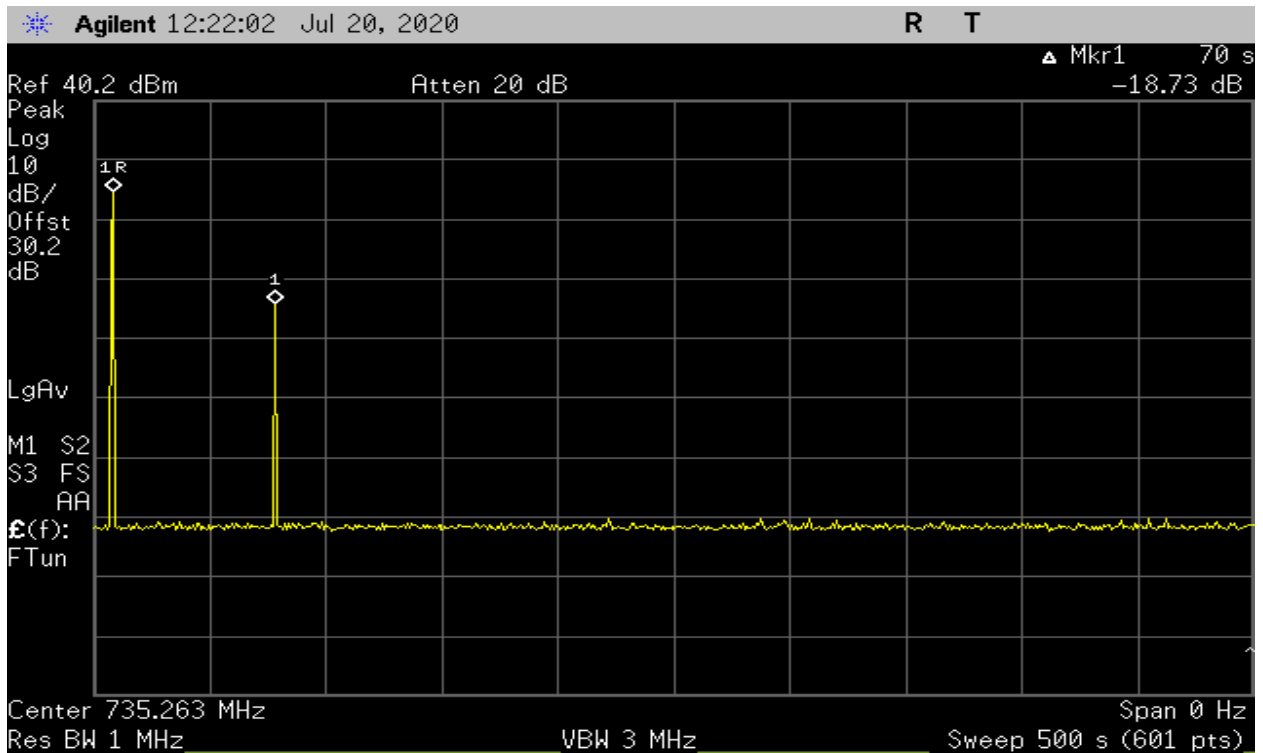
Plot 238 – 824-849MHz Band – Uplink # of Restart Time



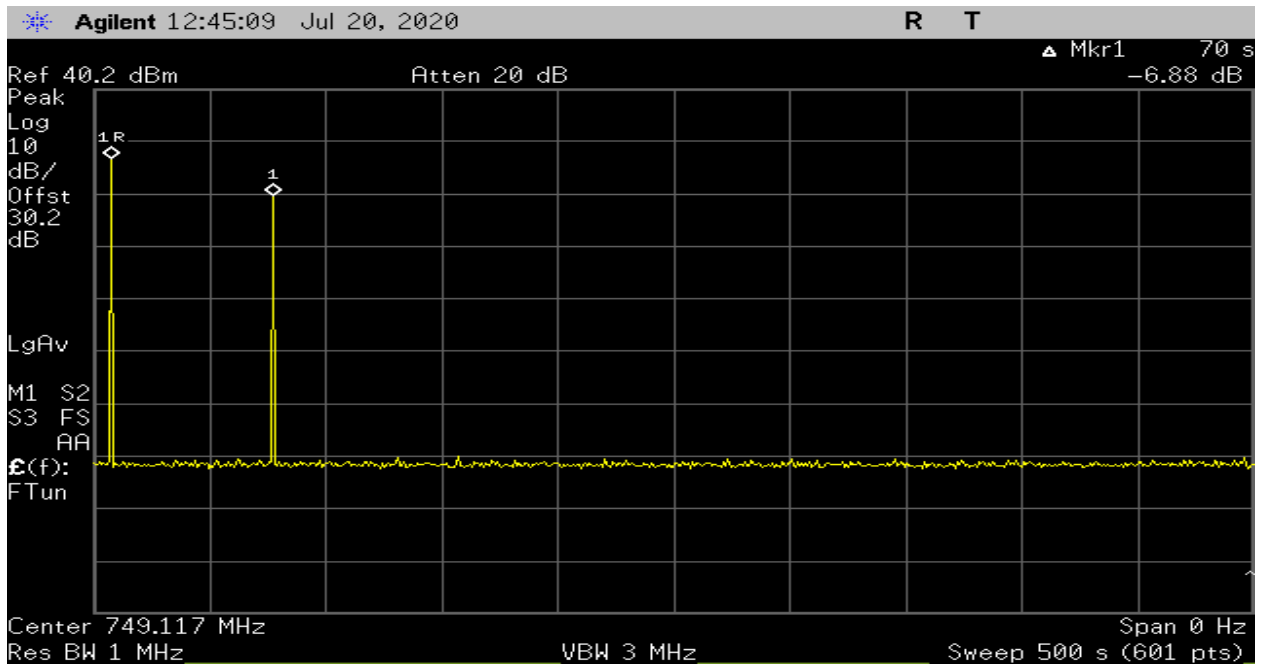
Plot 239 – 1710-1755MHz Band – Uplink # of Restart Time



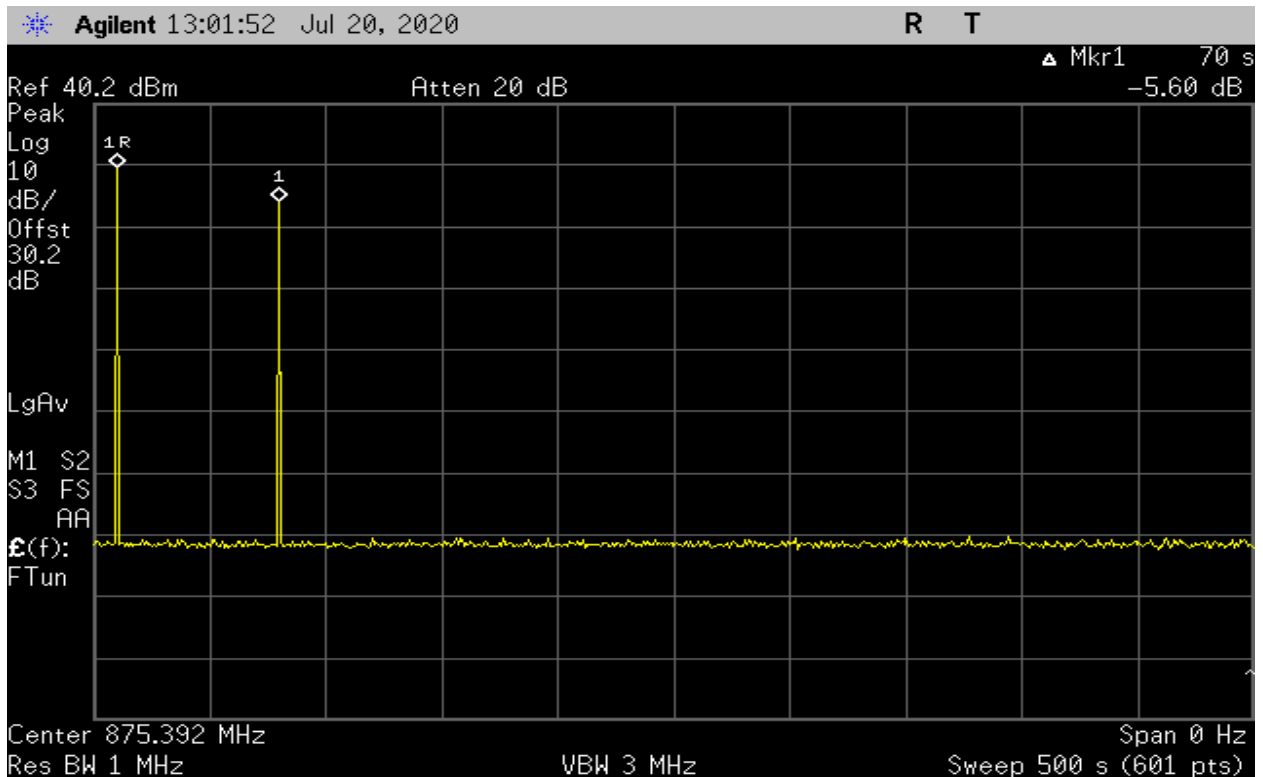
Plot 240 – 1850-1915MHz Band – Uplink # of Restart Time



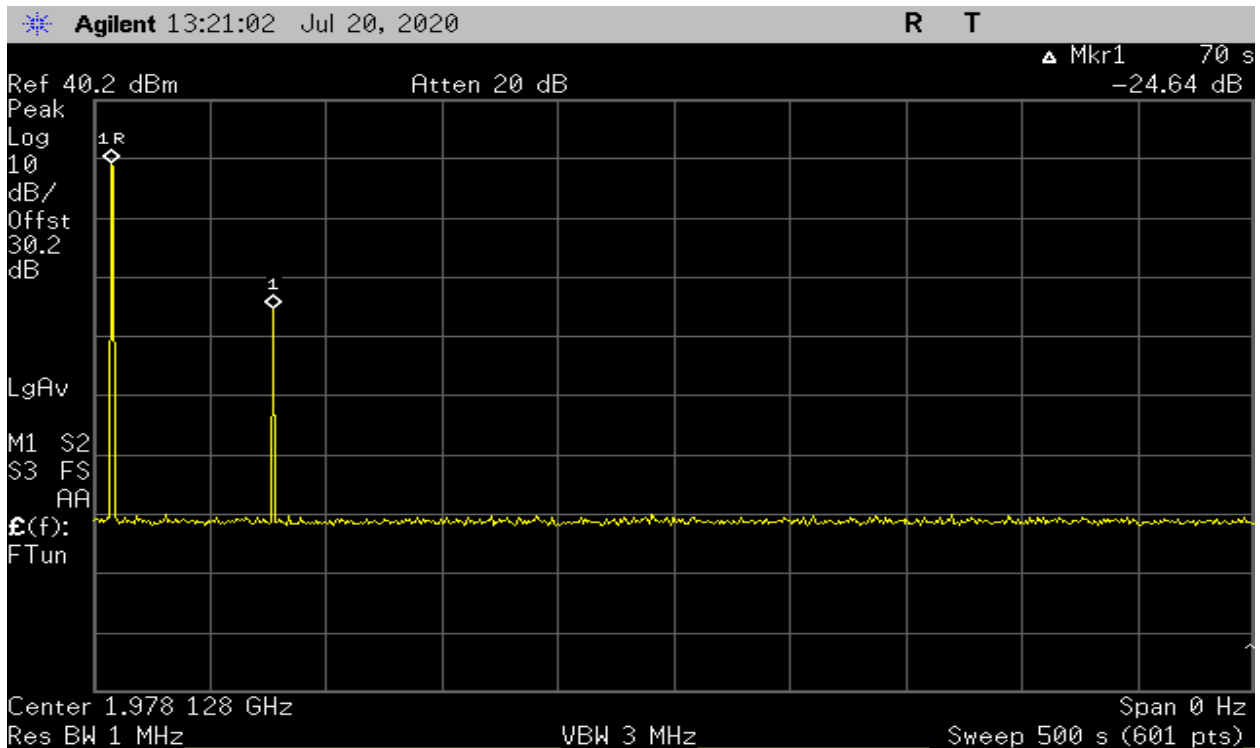
Plot 241 – 728-746MHz Band – Downlink # of Restart Time



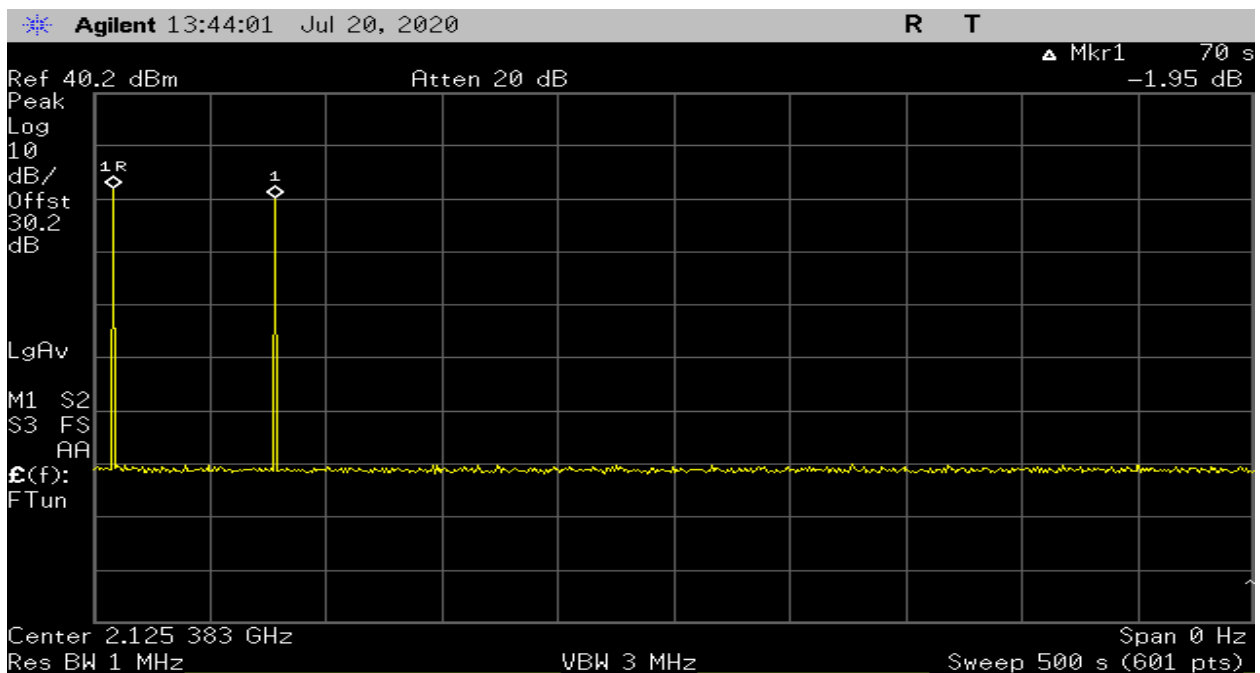
Plot 242 – 746-757MHz Band – Downlink # of Restart Time



Plot 243 – 869-894MHz Band – Downlink # of Restart Time



Plot 244 – 1930-1995MHz Band – Downlink # of Restart Time



Plot 245 – 2110-2155MHz Band – Downlink # of Restart Time

Oscillation Mitigation / Shutdown

Max Gain (dB)	Peak (dBm)	Min (dBm)	Difference (dB)	Limit (dB)
+5dB	-56.7	-64.4	7.7	12
+4dB	-59	-66	7	12
+3dB	-58.6	-66.3	7.7	12
+2dB	-58.2	-66	7.8	12
+1dB	-57.5	-66.1	8.6	12
0dB	-56.6	-66.4	9.8	12
-1dB	-59	-67.3	8.3	12
-2dB	-57.9	-67.4	9.5	12
-3dB	-57.4	-67.6	10.2	12
-4dB	-61.1	-68.3	7.2	12
-5dB	-60.3	-68.6	8.3	12

Table 44 – 698-716MHz Uplink Band – Mitigation/Shutdown Test Data

Max Gain (dB)	Peak (dBm)	Min (dBm)	Difference (dB)	Limit (dB)
+5dB	-56.5	-66.1	9.6	12
+4dB	-59.2	-67.2	8	12
+3dB	-57.6	-68	10.4	12
+2dB	-60.5	-69.1	8.6	12
+1dB	-59.9	-68.9	9	12
0dB	-58.9	-68.9	10	12
-1dB	-60.2	-69.4	9.2	12
-2dB	-58.3	-69.6	11.3	12
-3dB	-61	-69.8	8.8	12
-4dB	-60.3	-69.6	9.3	12
-5dB	-58.5	-69.5	11	12

Table 45 – 776-787MHz Uplink Band – Oscillation/Shutdown Test Data

Max Gain (dB)	Peak (dBm)	Min (dBm)	Difference (dB)	Limit (dB)
+5dB	-58.8	-63.3	4.5	12
+4dB	-58.4	-63.2	4.8	12
+3dB	-56.6	-63.8	7.2	12
+2dB	-56.1	-64.2	8.1	12
+1dB	-54.9	-63.9	9	12
0dB	-56.3	-63.8	7.5	12
-1dB	-56.1	-63.5	7.4	12
-2dB	-58.9	-64.2	5.3	12
-3dB	-58.8	-64	5.2	12
-4dB	-58.6	-64.3	5.7	12
-5dB	-58.5	-64.3	5.8	12

Table 46 – 824-849MHz Uplink Band – Oscillation/Shutdown Test Data

Max Gain (dB)	Peak (dBm)	Min (dBm)	Difference (dB)	Limit (dB)
+5dB	-58.8	-66.7	7.9	12
+4dB	-58.3	-66.6	8.3	12
+3dB	-56.8	-67.2	10.4	12
+2dB	-59.2	-67.7	8.5	12
+1dB	-61.1	-68.3	7.2	12
0dB	-60.2	-68.6	8.4	12
-1dB	-59.4	-68.5	9.1	12
-2dB	-57.1	-68.1	11	12
-3dB	-63.5	-68.5	5	12
-4dB	-62.8	-68.8	6	12
-5dB	-62.2	-68.8	6.6	12

Table 47 – 1710-1755MHz Uplink Band – Oscillation/Shutdown Test Data

Max Gain (dB)	Peak (dBm)	Min (dBm)	Difference (dB)	Limit (dB)
+5dB	-48.5	-60	11.5	12
+4dB	-51.2	-61.7	10.5	12
+3dB	-49.9	-61.2	11.3	12
+2dB	-52.8	-63.2	10.4	12
+1dB	-50.3	-61.8	11.5	12
0dB	-56.5	-65.6	9.1	12
-1dB	-56.5	-65.7	9.2	12
-2dB	-55.7	-65.9	10.2	12
-3dB	-54.7	-66	11.3	12
-4dB	-56.9	-67.3	10.4	12
-5dB	-56.2	-67.1	10.9	12

Table 48 – 1850-1915MHz Uplink Band – Oscillation/Shutdown Test Data

Max Gain (dB)	Peak (dBm)	Min (dBm)	Difference (dB)	Limit (dB)
+5dB	-60.4	-67.7	7.3	12
+4dB	-59.5	-68.1	8.6	12
+3dB	-60.4	-67.5	7.1	12
+2dB	-63.6	-69.1	5.5	12
+1dB	-63.5	-69.3	5.8	12
0dB	-63.4	-69.2	5.8	12
-1dB	-63.1	-69.2	6.1	12
-2dB	-62.5	-69.4	6.9	12
-3dB	-65.3	-69.2	3.9	12
-4dB	-65.7	-69.8	4.1	12
-5dB	-64.8	-69.7	4.9	12

Table 49 – 728-746MHz Downlink Band – Oscillation/Shutdown Test Data

Max Gain (dB)	Peak (dBm)	Min (dBm)	Difference (dB)	Limit (dB)
+5dB	-63.3	-69.1	5.8	12
+4dB	-61.1	-69.7	8.6	12
+3dB	-63.2	-69.4	6.2	12
+2dB	-63.1	-69.1	6	12
+1dB	-61.6	-69.3	7.7	12
0dB	-66.2	-70	3.8	12
-1dB	-66.5	-69.9	3.4	12
-2dB	-66.6	-70	3.4	12
-3dB	-66.4	-70.1	3.7	12
-4dB	-64.3	-70.2	5.9	12
-5dB	-64.7	-70.2	5.5	12

Table 50 – 746-757MHz Downlink Band – Oscillation/Shutdown Test Data

Max Gain (dB)	Peak (dBm)	Min (dBm)	Difference (dB)	Limit (dB)
+5dB	-57.3	-63.4	6.1	12
+4dB	-57.4	-63.1	5.7	12
+3dB	-57.2	-63.1	5.9	12
+2dB	-56.9	-63.3	6.4	12
+1dB	-57.6	-63.4	5.8	12
0dB	-58.2	-62.6	4.4	12
-1dB	-59.3	-63.7	4.4	12
-2dB	-58.3	-63.8	5.5	12
-3dB	-58.9	-63.7	4.8	12
-4dB	-58.8	-63.9	5.1	12
-5dB	-59	-63.7	4.7	12

Table 51 – 869-894MHz Downlink Band – Oscillation/Shutdown Test Data

Max Gain (dB)	Peak (dBm)	Min (dBm)	Difference (dB)	Limit (dB)
+5dB	-49.5	-60.5	11	12
+4dB	-48.8	-60.6	11.8	12
+3dB	-51.3	-61.8	10.5	12
+2dB	-50.3	-62.2	11.9	12
+1dB	-52.8	-63.7	10.9	12
0dB	-52.2	-64.1	11.9	12
-1dB	-53.9	-64.9	11	12
-2dB	-54.4	-65.9	11.5	12
-3dB	-54.2	-65.8	11.6	12
-4dB**	SD			12
-5dB**	SD			12

Table 52 – 1930-1995MHz Downlink Band – Oscillation/Shutdown Test Data

** The device shuts down immediately

Max Gain (dB)	Peak (dBm)	Min (dBm)	Difference (dB)	Limit (dB)
+5dB	-55.5	-65.4	9.9	12
+4dB	-54.5	-65.9	11.4	12
+3dB	-53.8	-65.5	11.7	12
+2dB	-53.5	-65.3	11.8	12
+1dB	-56.7	-67	10.3	12
0dB	-56	-67.1	11.1	12
-1dB	-54.8	-66.5	11.7	12
-2dB	-60	-68	8	12
-3dB	-59.8	-67.8	8	12
-4dB	-58.7	-68	9.3	12
+5dB	-57.1	-68.1	11	12

Table 53 – 2110-2155MHz Downlink Band – Oscillation/Shutdown

11. Radiated Spurious Emissions

Test Requirement(s):	§2.1053	Test Engineer(s):	Keith Thornton
Test Results:	Pass	Test Date(s):	Jul/22/2020

Test Procedures: As required by 47 §2.1053, Radiated Spurious Emissions measurement were made in accordance with the procedures of ANSI C63.26-2015 and KDB 935210 D03 §7.12.

The EUT was placed on a wooden table inside a 3-meter open area alternate test site. The EUT was transmitting into a 50Ω non-radiating load which was directly connected to the EUT antenna port as shown in figure 4.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3 orthogonal axis. The frequency range up to the 10th harmonic was investigated.

Spurious attenuation limit in dB = $P1 - (43 + 10 \log_{10} (P2)) = -13\text{dBm}$

Where P1 = Transmitter Power in dBm and P2= Power in Watt

Test Setup:

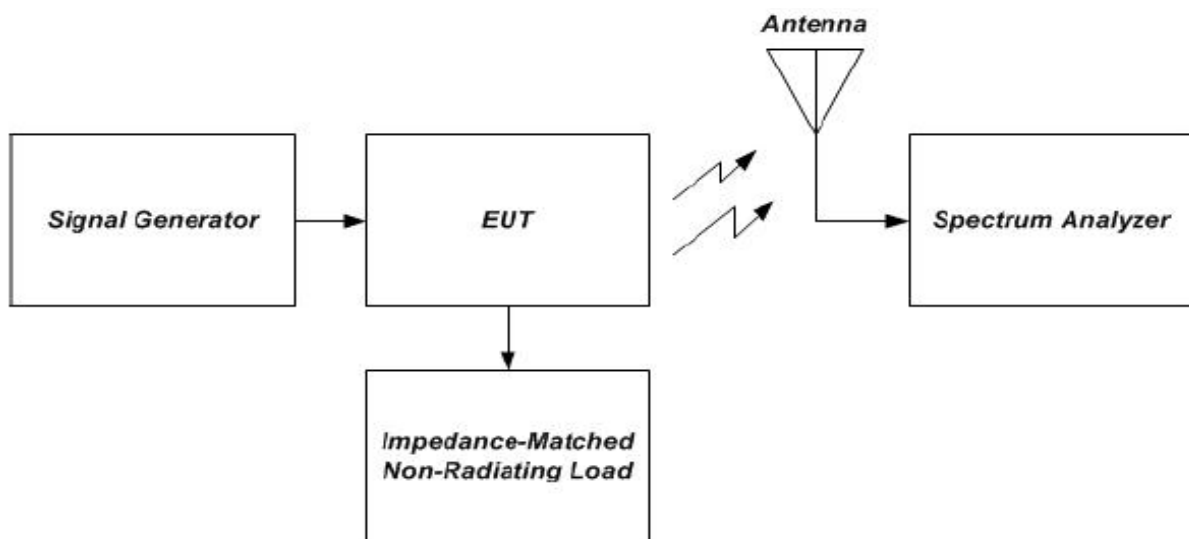
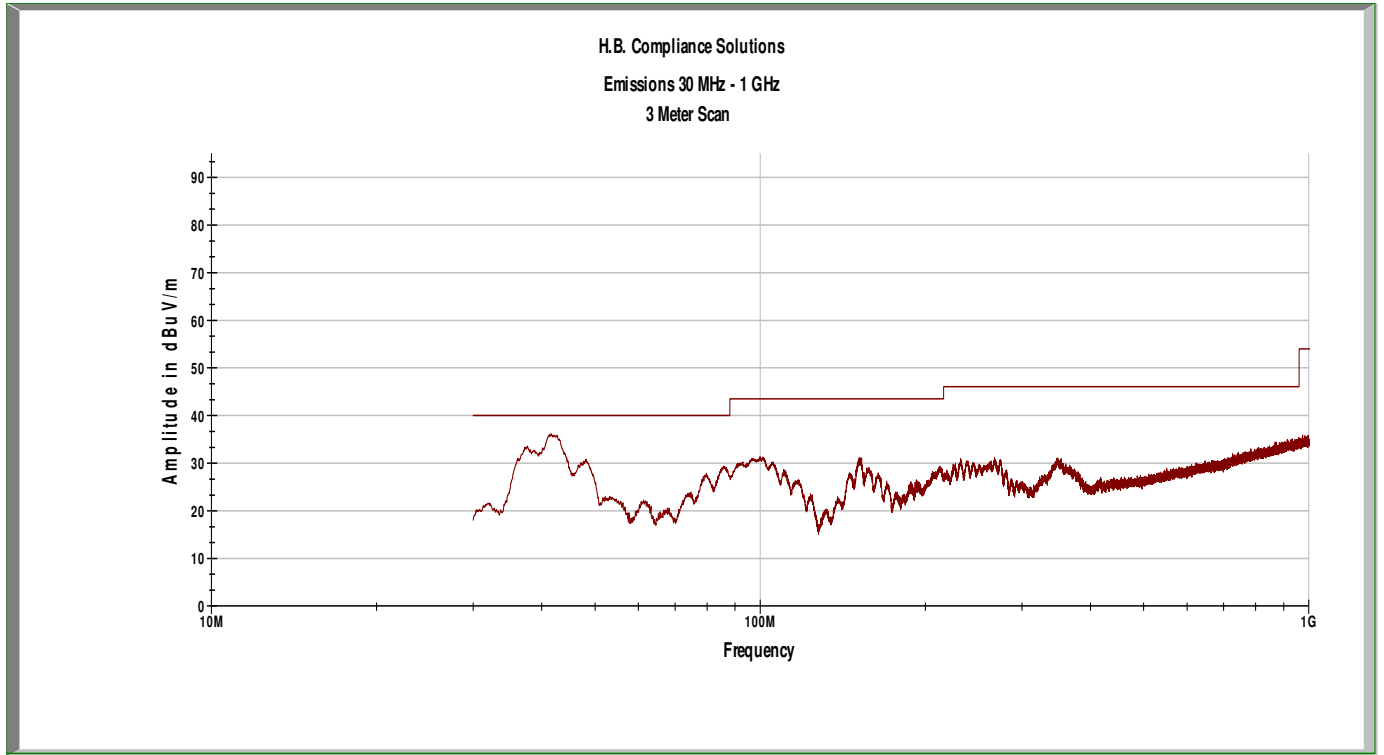


Figure 9 – Radiated Spurious Emission Test Setup



Plot 246 – Radiated Emissions – 30MHz to 1GHz

Frequency Band (MHz)	Measured Level (dBm)	Antenna Polarity (V/H)	Limit (dBm)	Margin (dBm)
1673	-64	V	-13	-51
2509	-64	V	-13	-51

Table 54 – 824-849MHz Uplink Band – Radiated Spurious Test Data

Frequency Band (MHz)	Measured Level (dBm)	Antenna Polarity (V/H)	Limit (dBm)	Margin (dBm)
3765	-60	V	-13	-47
5197	-60	V	-13	-47

Table 55 – 1850-1915MHz Uplink Band – Radiated Spurious Test Data

Frequency Band (MHz)	Measured Level (dBm)	Antenna Polarity (V/H)	Limit (dBm)	Margin (dBm)
3465	-60	V	-13	-47
5197	-60	V	-13	-47

Table 56 – 1710-1755MHz Uplink Band – Radiated Spurious Test Data

Frequency Band (MHz)	Measured Level (dBm)	Antenna Polarity (V/H)	Limit (dBm)	Margin (dBm)
1415	-65	V	-13	-52
2122	Noise Floor	-	-13	-
2830	-66	V	-13	-53

Table 57 – 698-716MHz Uplink Band – Radiated Spurious Test Data

Frequency Band (MHz)	Measured Level (dBm)	Antenna Polarity (V/H)	Limit (dBm)	Margin (dBm)
1563	-64	V	-13	-51
2344	-62	V	-13	-49

Table 58 – 776-787MHz Uplink Band – Radiated Spurious Test Data

Frequency Band (MHz)	Measured Level (dBm)	Antenna Polarity (V/H)	Limit (dBm)	Margin (dBm)
1763	-64	V	-13	-51
2644	-65	V	-13	-52

Table 59 – 869-894MHz Downlink Band – Radiated Spurious Test Data

Frequency Band (MHz)	Measured Level (dBm)	Antenna Polarity (V/H)	Limit (dBm)	Margin (dBm)
3925	-60	V	-13	-47
5887	-60	V	-13	-47

Table 60 – 1930-1995MHz Downlink Band – Radiated Spurious Test Data

Frequency Band (MHz)	Measured Level (dBm)	Antenna Polarity (V/H)	Limit (dBm)	Margin (dBm)
4265	-60	V	-13	-47
6397	-60	V	-13	-47

Table 61 – 2110-2155MHz Downlink Band – Radiated Spurious Test Data

Frequency Band (MHz)	Measured Level (dBm)	Antenna Polarity (V/H)	Limit (dBm)	Margin (dBm)
1474	-64	V	-13	-51
2211	-64	V	-13	-51

Table 62 – 728-746MHz Downlink Band – Radiated Spurious Test Data

Frequency Band (MHz)	Measured Level (dBm)	Antenna Polarity (V/H)	Limit (dBm)	Margin (dBm)
1503	-65	V	-13	-52
2254	-63	V	-13	-50

Table 63 – 746-757MHz Downlink Band – Radiated Spurious Test Data

NOTE: There were no detectable emissions above the 2nd harmonic. Measurement was made above 2nd harmonic to show the Receiver Noise Floor (N.F)

12. Test Equipment

Equipment	Manufacturer	Model	Serial #	Last Cal Date	Cal Due Date
Spectrum Analyzer	Agilent	E4443A	US41420164	Jan-03-20	Jan-03-21
Spectrum Analyzer	Hewlett Packard	8563E	3821A09316	May-01-20	May-01-21
Directional Coupler	Andrew	C-10-CPUS-N	150503142544	May-22-20	May-22-22
Attenuator 20dB	Weinschel	41-20-12	86332	May-06-20	May-06-21
Variable Attenuator	JFW	50R-320-SMA	7054221439	Verified	
Signal Generator	Agilent	E4432B	US40053021	Sep-23-19	Sep-23-21
Signal Generator	Agilent	E4432B	US38220446	Verified	
Horn Antenna	Com-Power	AHA-118	071150	Nov-12-18	Nov-12-20
Horn Antenna	Com-Power	AH-118	71350	Verified	
Antenna	EMCO	GTEM 5417	1063	Verified	
Attenuator 10dB	Huber+Suhner	6810.17.A	747300	May-06-20	May-06-21
Digital Multimeter	Fluke	77 III	72550270	Apr-10-20	Apr-10-21

Table 64 – Test Equipment List

***Statement of Traceability:** Test equipment is maintained and calibrated on a regular basis. All calibrations have been performed by a 17025 accredited test facility, traceable to National Institute of Standards and Technology (NIST)

13. Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. These measurements figures are calculated in accordance with ETSI TR 100 028 Parts 1 and 2. Instrumentation measurement uncertainty has **not** been taken into account to determine compliance.

The following measurement uncertainty values have been calculated as show in the table below:

Measured Parameter	Measurement Unit	Frequency Range	Expanded Uncertainty
Conducted Emissions (AC Power)	dBuV or dBuA	150kHz – 30MHz	± 4.3dB
Radiated Emissions below 1GHz	dBuV/m	30 – 1000MHz	± 5.6dB
Radiated Emissions above 1GHz	dBuV/m	1 – 26.5GHz	± 4.1dB

The reported expanded uncertainty has been estimated at a 95% confidence level (k=2)

END OF TEST REPORT