

## Test Report

Prepared for: Wilson Electronics, LLC (weBoost)

Model: Enterprise 4330 Series ( 4 inside ports, wall mount and rack mount)

Description: Quint Band Signal Booster

FCC ID: PWO075

ISED: 4726A-075

To

FCC Part 20  
ISED RSS-131 (Issue 4)

Date of Issue: November 28, 2023

On the behalf of the applicant:

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### Test Report Revision History

Revision	Date	Revised By	Reason for Revision
1.0	11/28/2023	Greg Corbin	Original Document

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## Test Result Summary

Specification		Test Name	Pass, Fail, N/A	Comments
FCC	ISED			
20.21(e)(3)	RSS-131_7.5	Authorized Frequency Band	Pass	
20.21(e)(3)(i)(B)	RSS-131_6.2	Spectrum Block Filter	Pass	
20.21(e)(8)(i)(B) 20.21(e)(8)(i)(C) 20.21(e)(8)(i)(D)	RSS-131_6.1.2 RSS-131_6.2 RSS-131_7.4	Maximum Power and Gain	Pass	
20.21(e)(8)(i)(F)	RSS-131_7.6	Intermodulation	Pass	
20.21(e)(8)(i)(E)	RSS-131_7.5	Out-of-Band Emissions	Pass	
2.1051 22.917(a) 24.238((a) 27.53(c) 27.53(f) 27.53(g) 27.53(h)	RSS-130_4.7.1 RSS-130_4.7.2 RSS-132_5.5 RSS-133_6.5.1 RSS-139_5.6	Conducted Spurious Emissions	Pass	
20.21(e)(8)(i)(A)	RSS-131_7.1	Noise Limits	Pass	
20.21(e)(8)(i)(I)	RSS-131_7.7	Uplink Inactivity	Pass	
20.21(e)(8)(i)(C)(1) 20.21(e)(8)(i)(H) 20.21(e)(8)(i)(C)(2)(i) (Fixed)	RSS-131_7.2	Variable Gain	Pass	
2.1049	RSS-GEN_6.7	Occupied Bandwidth	Pass	
20.21(e)(8)(ii)(A)	RSS-131_6.1.1	Anti - Oscillation	Pass	
2.1053	RSS-GEN_6.13	Radiated Spurious	Pass	
KDB Inquiry:883937	N/A	Conducted Spurious w/ modem transmitting	Pass	Additional test required for internal cellular modem
KDB Inquiry:883937	N/A	3 tone Intermodulation test w/ modem transmitting	Pass	Additional test required for internal cellular modem
KDB Inquiry:883937	N/A	Radiated Spurious w/ modem transmitting	Pass	Additional test required for internal cellular modem
KDB Inquiry:782203	N/A	Isolation	Pass	Additional test required multiple donor ports

Statements of conformity are reported as:

- Pass - the measured value is below the acceptance limit, *acceptance limit = test limit*.
- Fail - the measured value is above the acceptance limit, *acceptance limit = test limit*.

## ANAB

Compliance Testing, LLC, has been accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to the joint ISO-ILAC-IAF Communiqué dated January 2009).

The tests results contained within this test report all fall within our scope of accreditation, unless noted below.

Please refer to <http://www.compliancetesting.com/labscope.html> for current scope of accreditation.



**FCC Site Reg. #349717**

**IC Site Reg. #2044A-2**

## Test and Measurement Data

All tests and measurement data shown were performed in accordance with FCC Rules and Regulations, Part 2, Subpart J, Part: 20.21, ANSI C63.26-2015, KDB 935210 D05, RSS-131, RSS-GEN where appropriate.

### Standard Test Conditions and Engineering Practices

Except as noted herein, the following conditions and procedures were observed during the testing:

In accordance with ANSI/C63.4-2014, and unless otherwise indicated in the specific measurement results, the ambient temperature of the actual EUT was maintained within the range of 10° to 40°C (50° to 104°F), unless the particular equipment requirements specified testing over a different temperature range. Also, unless otherwise indicated, the humidity levels were in the range of 10% to 90% relative humidity.

Environmental Conditions		
Temp (°C)	Humidity (%)	Pressure (mbar)
21.3 – 27.0	21.5 – 39.2	964.1 – 983.6

Measurement results, unless otherwise noted, are worst-case measurements.

### EUT Description

**Model:** Enterprise 4330 460075 (wall mount)

**Model:** Enterprise 4330 461075 (rack mount)

**Description:** Quint Band Signal Booster

HVIN: 460075, 461075

PMN: 460075, 461075

**Serial Number:**

Wall mount: 102142277

Rack Mount: 102142415

### Additional Information:

The EUT is a In-Building bi-directional amplifier for the boosting of cellular phone signals and data communication devices.

The EUT has 4 server ports and 3 donor ports, and a internal cellular modem.

A more detailed description of the server ports, donor ports, and cellular modem is after the frequency band information.

The following frequency bands and emission types are utilized.

Frequency Band (MHz)					
Band Designator	B12	B13	B5	B25	B4
<b>Uplink</b>	698 - 716	776 – 787 (IC, 777 – 787)	824 - 849	1850 - 1915	1710 – 1755
<b>Downlink</b>	728 - 746	746 – 757 (IC, 746 – 756)	869 - 894	1930 - 1995	2110 - 2155
<b>Modulation Type</b>	LTE		GSM, CDMA, EDGE, HSPA, EVDO, LTE		CDMA, HSPA, LTE,

Emission Designators					
CDMA	HSPA	LTE	EVDO	EDGE	GSM
F9W	F9W	G7D	F9W	G7W	GXW

The modulation types and emission designators listed in the tables represent the modulations that the cell phone providers use for each frequency band. GSM, CDMA, and WCDMA represent all the modulation types (phase and amplitude or a combination thereof) utilized within the industry. EDGE, HSPA, LTE etc. are all protocols or multiplexing techniques using the base modulations.

The EUT is an In-building signal booster with 4 server ports and 3 donor ports.

The server ports are referred to as Server Port 1 thru Server Port 4 or S1 thru S4 throughout the test report. The server ports are the uplink input and downlink output ports.

The donor ports are referred to as Dedicated Donor Ports 1 thru 3, or Dedicated D1 thru D3, and Common D2. The Donor ports are the uplink output and downlink input ports.

The 3 donor ports can be switched between dedicated and common ports.

When the internal switch is set to position 1 the donor port configuration is dedicated, and the signals are routed thru the dedicated ports per Table 1.

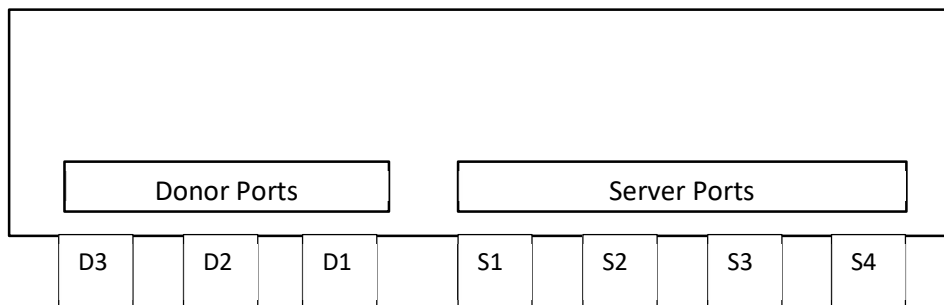
When the switch is set to position 2 the donor port configuration is Common, and the signals are routed thru the Common port per Table 1.

**Note: For the common port, the signal path for dedicated and common ports is the same for Band 4 and Band 25, so the tests for those 2 bands are only documented 1 time during dedicated port testing.**

Table 1 – Donor port assignment

Band	Switch position 1 – Dedicated ports	Switch position 2 – Common ports
12	Donor port 3 (D3)	Donor Port 2 (D2)
13	Donor port 3 (D3)	Donor Port 2 (D2)
5	Donor Port 1 (D1)	Donor Port 2 (D2)
4	Donor Port 2 (D2)	Donor Port 2 (D2)
25	Donor Port 2 (D2)	Donor Port 2 (D2)

The following figure shows the server and donor port configuration.



For all tests, the unused server and donor ports (any port not being tested) was terminated with 50 ohm termination.



The following maximum uplink and downlink Antenna gain including cable loss is from the antenna kitting document.

<b>Band</b>	<b>12</b>	<b>13</b>	<b>5</b>	<b>4</b>	<b>25</b>
Uplink Antenna gain	3.58	3.21	3.01	2.05	1.92
Downlink Antenna gain	-2.43	-1.69	-2.79	-0.33	-1.29

This booster has a pre-certified cellular modem with singular module approval that is used for remote diagnostics and is coupled into the uplink path. The modem can only transmit on the uplink path. It can transmit on any uplink band.

For all tests the modem was powered on but not transmitting except for the required tests with the modem transmitting, per KDB inquiry 882937.

KDB inquiry 882937 provides test guidance for consumer boosters with internal cellular modems used for internal diagnostics and remote monitoring capabilities.

The following tests are required per KDB inquiry 882937:

1. Conducted output power with the modem on but not transmitting.
2. Conducted spurious, with Modem transmitting and another in-band signal at the input.
3. Radiated spurious into a load with Modem transmitting and another in-band signal at the input.
4. Noise power with modem on but not transmitting.
5. 3 tone intermodulation test.

<b>Pre-certified Module</b>	<b>FCC ID</b>	<b>ISED ID</b>
Cellular	N7NRC76B	2417C-RC76B

Test Guidance was used from KDB 935210 D03 Signal Booster Measurements v04r03, KDB Inquiry 782203 (test guidance for common and dedicated ports) and KDB Inquiry 882937 (test guidance for additional tests with internal cellular modem).

KDB 935210 D03 Signal Booster Measurements v04r04 includes additional tests in section 7.15 for multiple server port configurations.

The additional tests in KDB 935210 D03 section 7.15 are:

1. For all RF paths:
  - 1) 7.1 Authorized frequency band verification test
  - 2) 7.11.2 Oscillation testing procedures; steps a) through r)
  - 3) 7.11.3 Oscillation testing procedures; steps a) through h)
  - 4) 7.11.4 Oscillation testing procedures; steps a) through h)
2. For all downlink paths:
  - i) 7.2 Maximum power measurement test procedure
  - ii) 7.6 Conducted spurious emissions test procedure
  - iii) 7.7.1 Noise limits test procedure: steps a) through g)
3. Per KDB 935210 D03 section 7.15 b)2)ii) applies to this booster. The server port antennas will be used to provide coverage to different areas within a building and will be installed with a minimum of 10 meters separation between server port antennas.

KDB Inquiry 782203 provides test guidance for consumer boosters with multiple donor ports.  
The following tests are required per KDB inquiry 782203:

1. Full port testing for each signal path.
2. Isolation between donor ports for common port and dedicated port operation.

**Note: For the common port, the signal path for dedicated and common ports is the same for Band 4 and Band 25, so the tests for those 2 bands are only documented 1 time.**

Refer to the individual test sections for additional details for each test.

#### **EUT Operation during Tests**

The EUT was in a normal operating condition.

The EUT does not have any external attenuation controls.

The EUT is powered by 120 VAC 60 Hz.

## Authorized Frequency Band

Engineer: Greg Corbin

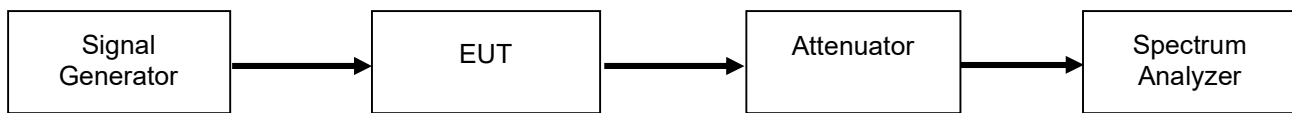
Test Date: 10/29/2023

### Test Procedure

The EUT was connected to a spectrum analyzer through an attenuator with the losses being input into the spectrum analyzer as a combination of reference level offset and correction factor as needed to ensure accurate readings. A signal generator was utilized to produce a CW input signal tuned to the center channel of the operational band. The RF input level was increased to a point just prior to the AGC being in control of the power. The Signal generator was set to sweep across 2X the operational band of the EUT while the spectrum analyzer was set to MAX HOLD. Two markers were placed at the edges of the operational band and a third marker was placed at the highest point within the band no closer than 2.5 MHz from the band edge.

All signal paths were tested as summarized in the table below.

### Test Setup



### Signal Paths measured for Authorized Frequency Band

Authorized Frequency Band					Authorized Frequency Band		
Dedicated Ports					Common Ports		
U/L					U/L		
B12	B13	B5	B4	B25	B12	B13	B5
S1 to D3	S1 to D3	S1 to D1	S1 to D2	S1 to D2	S1 to D2	S1 to D2	S1 to D2
S2 to D3	S2 to D3	S2 to D1	S2 to D2	S2 to D2	S2 to D2	S2 to D2	S2 to D2
S3 to D3	S3 to D3	S3 to D1	S3 to D2	S3 to D2	S3 to D2	S3 to D2	S3 to D2
S4 to D3	S4 to D3	S4 to D1	S4 to D2	S4 to D2	S4 to D2	S4 to D2	S4 to D2
D/L					D/L		
B12	B13	B5	B4	B25	B12	B13	B5
D3 to S1	D3 to S1	D1 to S1	D2 to S1	D2 to S1	D2 to S1	D2 to S1	D2 to S1
D3 to S2	D3 to S2	D1 to S2	D2 to S2	D2 to S2	D2 to S2	D2 to S2	D2 to S2
D3 to S3	D3 to S3	D1 to S3	D2 to S3	D2 to S3	D2 to S3	D2 to S3	D2 to S3
D3 to S4	D3 to S4	D1 to S4	D2 to S4	D2 to S4	D2 to S4	D2 to S4	D2 to S4

## Annex A Authorized Frequency Band

Refer to Annex A for Authorized Frequency Band Plots

## Spectrum Block Filtering

**Engineer:** Greg Corbin

**Test Date:** 11/8/2023

### Test Procedure

The EUT was tested for spectrum block filtering per KDB 935210 D03 v0404 section 7.13.

All spectrum blocks listed in KDB 935210-03 Appendix A were tested except for Cellular Band 5 UL 845 – 846.5 MHz paired with DL 890 – 891.5 MHz and UL 846.5 – 849 MHz paired with DL 891.5 – 894 MHz.

The uplink attenuation at the band edge must be greater than the downlink attenuation at the same corresponding band edge.

For each spectrum block, the uplink and downlink band edge attenuation were measured, referenced to the peak power.

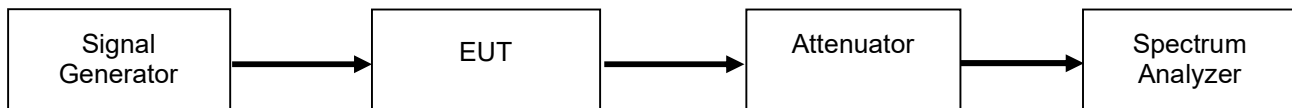
The uplink spectrum block filter band edge attenuation was calculated and compared to the corresponding downlink spectrum block filter band edge attenuation.

In all cases the uplink spectrum block filter attenuation was greater than the downlink spectrum block filter attenuation.

A spectrum analyzer plot was recorded for each spectrum block with markers for peak power and the upper and lower spectrum block band edge.

The spectrum block filtering is the same for both the dedicated and common ports. Spectrum block filter measurements were recorded for the dedicated ports only.

### Test Setup



### Spectrum Block Filter Test Results

B12							
Full band (MHz)		A Block (MHz)		B Block (MHz)		C Block (MHz)	
UL	DL	UL	DL	UL	DL	UL	DL
698 - 716	716 - 746	698 - 704	728 - 734	704 - 710	734 - 740	710 - 716	740 - 746
Nominal BW		6	6	6	6	6	6
Fc (MHz)		701	731	707	737	713	743
Dedicated path		S1 to D3	D3 to S1	S1 to D3	D3 to S1	S1 to D3	D3 to S1
Peak Power (dBm)		20.9	10.49	22.01	12.63	17.59	12.18
Filter Attn_ lower band edge (dBm)		10.28	7.47	13.23	8.9	10.9	11.54
Filter Attn_ upper band edge (dBm)		13.36	8.85	14.3	11.39	5.76	8.09
Delta attn_ low side (dB)		10.62	3.02	8.78	3.73	6.69	0.64
Delta attn_ high side (dB)		7.54	1.64	7.71	1.24	8.27	4.09
Uplink attenuation greater than downlink Attenuation		UL > DL		UL > DL		UL > DL	
Result	Pass / Fail	Pass		Pass		Pass	

<b>B13</b>			
Full band (MHz)		C Block (MHz)	
UL	DL	UL	DL
776 - 787	746 - 757	776 - 787	746 - 757
Nominal BW		11	11
Fc (MHz)		781.5	751.5
Dedicated path		S1 to D3	D3 to S1
Peak Power (dBm)		20.37	11.52
Filter Attn_ lower band edge (dBm)		-26.46	8.9
Filter Attn_ upper band edge (dBm)		-1.19	-2.08
Delta attn_ low side (dB)		46.83	2.62
Delta attn_ high side (dB)		21.56	13.6
Uplink attenuation greater than downlink Attenuation		UL > DL	
Result	Pass / Fail	Pass	

<b>B5</b>									
Full band (MHz)		A Block (MHz)				B Block (MHz)			
UL	DL	UL	DL	UL	DL	UL	DL	UL	DL
824 - 849	869 - 894	824 - 835	869 - 880	845 - 846.5	890 - 891.5	835 - 845	880 - 890	846.5 - 849	891.5 - 894
Nominal BW		11	11	EUT does not provide this spectrum block filter		10	10	EUT does not provide this spectrum block filter	
Fc (MHz)		829.5	874.5			840	885		
Dedicated path		S1 to D1	D1 to S1			S1 to D1	D1 to S1		
Peak Power (dBm)		20.65	14.96			19.1	14.93		
Filter Attn_ lower band edge (dBm)		10.28	14.05			-1.73	14.13		
Filter Attn_ upper band edge (dBm)		10.38	12.57			-3.97	8.86		
Delta attn_ low side (dB)		10.37	0.91			20.83	0.8		
Delta attn_ high side (dB)		10.27	2.39			23.07	6.07		
Uplink attenuation greater than downlink Attenuation		UL > DL		N/A		UL > DL		N/A	
Result	Pass / Fail	Pass		N/A		Pass		N/A	

<b>B25</b>									
Full band (MHz)		A Block (MHz)		B Block (MHz)		C Block (MHz)		D Block (MHz)	
UL	DL	UL	DL	UL	DL	UL	DL	UL	DL
1850 - 1915	1930 - 1995	1850 - 1865	1930 - 1945	1870 - 1885	1950 - 1965	1895 - 1910	1975 - 1990	1865 - 1870	1945 - 1950
Nominal BW		15	15	15	15	15	15	5	5
Fc (MHz)		1857.5	1937.5	1877.5	1957.5	1902.5	1982.5	1867.5	1947.5
Dedicated path		S1 to D2	D2 to S1	S1 to D2	D2 to S1	S1 to D2	D2 to S1	S1 to D2	D2 to S1
Peak Power (dBm)		20.9	7.35	19.28	12.67	18.18	8.8	22.22	10.17
Filter Attn_ lower band edge (dBm)		-1.25	2.34	-0.1	8.19	-2.32	7.75	2.26	5.58
Filter Attn_ upper band edge (dBm)		1.2	4.14	-2.74	10.53	-8.1	5.19	2.01	9.41
Delta attn_ low side (dB)		22.15	5.01	19.38	4.48	20.5	1.05	19.96	4.59
Delta attn_ high side (dB)		19.7	3.21	22.02	2.14	26.28	3.61	20.21	0.76
Uplink attenuation greater than downlink Attenuation		UL > DL		UL > DL		UL > DL		UL > DL	
Result	Pass / Fail	Pass		Pass		Pass		Pass	

<b>B25, continued</b>							
Full band (MHz)		E Block (MHz)		F Block (MHz)		G Block (MHz)	
UL	DL	UL	DL	UL	DL	UL	DL
1850 - 1915	1930 - 1995	1885 - 1890	1965 - 1970	1890 - 1895	1970 - 1975	1910 - 1915	1990 - 1995
Nominal BW		5	5	5	5	5	5
Fc (MHz)		1887.5	1967.5	1892.5	1972.5	1912.5	1992.5
Dedicated path		S1 to D2	D2 to S1	S1 to D2	D2 to S1	S1 to D2	D2 to S1
Peak Power (dBm)		18.2	12.68	19.25	11.54	15.72	8.37
Filter Attn_ lower band edge (dBm)		-1.41	11.92	-0.7	10.74	-2.67	6.44
Filter Attn_ upper band edge (dBm)		-1.45	10.5	-0.25	9.13	-3.61	7.56
Delta attn_ low side (dB)		19.61	0.76	19.95	0.8	18.39	1.93
Delta attn_ high side (dB)		19.65	2.18	19.5	2.41	19.33	0.81
Uplink attenuation greater than downlink Attenuation		UL > DL		UL > DL		UL > DL	
Result	Pass / Fail	Pass		Pass		Pass	

<b>B4</b>							
Full band (MHz)		A Block (MHz)		B Block (MHz)		C Block (MHz)	
UL	DL	UL	DL	UL	DL	UL	DL
1710 - 1755	2110 - 2155	1710 - 1720	2110 - 2120	1720 - 1730	2120 - 2130	1730 - 1735	2130 - 2135
Nominal BW		10	10	10	10	5	5
Fc (MHz)		1715	2115	1725	2125	1732.5	2132.5
Dedicated path		S1 to D2	D2 to S1	S1 to D2	D2 to S1	S1 to D2	D2 to S1
Peak Power (dBm)		19.14	10.35	20.01	12.72	19.45	13.44
Filter Attn_ lower band edge (dBm)		-4.84	7.89	-2.54	9.39	0.09	12.45
Filter Attn_ upper band edge (dBm)		-3.89	9.28	-4.02	11.29	-0.33	11.97
Delta attn_ low side (dB)		23.98	2.46	22.55	3.33	19.36	0.99
Delta attn_ high side (dB)		23.03	1.07	24.03	1.43	19.78	1.47
Uplink attenuation greater than downlink Attenuation		UL > DL		UL > DL		UL > DL	
Result	Pass / Fail	Pass		Pass		Pass	

<b>B4, continued</b>							
Full band (MHz)		D Block (MHz)		E Block (MHz)		F Block (MHz)	
UL	DL	UL	DL	UL	DL	UL	DL
1710 - 1755	2110 - 2155	1735 - 1740	2135 - 2140	1740 - 1745	2140 - 2145	1745 - 1755	2145 - 2155
Nominal BW		5	5	5	5	10	10
Fc (MHz)		1737.5	2137.5	1742.5	2142.5	1750	2150
Dedicated path		S1 to D2	D2 to S1	S1 to D2	D2 to S1	S1 to D2	D2 to S1
Peak Power (dBm)		20.64	12.86	21	12.86	19.11	12.03
Filter Attn_ lower band edge (dBm)		0.72	12.01	1.09	11.95	-3.59	11.04
Filter Attn_ upper band edge (dBm)		0.89	11.94	1.05	11.74	-4.45	9.34
Delta attn_ low side (dB)		19.92	0.85	19.91	0.91	22.7	0.99
Delta attn_ high side (dB)		19.75	0.92	19.95	1.12	23.56	2.69
Uplink attenuation greater than downlink Attenuation		UL > DL		UL > DL		UL > DL	
Result	Pass / Fail	Pass		Pass		Pass	

## Annex B Spectrum Block Filter

Refer to Annex B for Spectrum Block Filter Plots

## Maximum Power and Gain

Engineer: Greg Corbin

Test Date: 11/2/2023

### Test Procedure

The EUT was connected to a spectrum analyzer through an attenuator with the losses being input into the spectrum analyzer as a combination of reference level offset and correction factor as needed to ensure accurate readings. The spectrum analyzer and signal generator were tuned to the frequency with the highest power level in the band, as determined by the Authorized Frequency Band test. The RF input level was increased to a point just prior to the AGC being in control of the power for both pulsed single time slot GSM modulation and 4.1 MHz AWGN modulation. The maximum power was measured and verified to meet the minimum and maximum levels allowed, with the maximum gain being computed from these values. The uplink and downlink gain under each condition were verified to be within 9 dB of each other.

The input level was incremented in 2 dB steps up to the maximum input level for the EUT. The output power was recorded at the maximum input level. If the EUT shutdown before the maximum input level was reached, the input level was reduced to 1 dB before the EUT shutdown and the input and output levels were recorded.

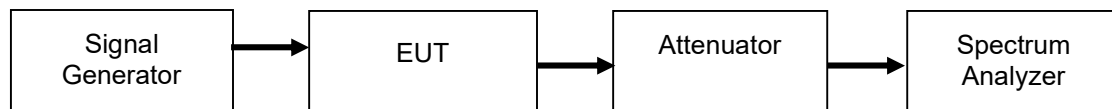
For Fixed installations the following formula was used for calculating the gain limits.

$$\text{Gain Limit (dB)} = 6.5 \text{ dB} + 20\text{Log}(F_{\text{MHz}})$$

$F_{\text{MHz}}$  is the uplink mid-band frequency with the downlink gain limit being equivalent to the paired Uplink band gain limit.

$$\text{Antenna Gain (dBi)} = \text{maximum antenna gain} + \text{the minimum cable loss}$$

### Test Setup



### Signal Paths measured for Output Power and Gain

Output Power and Gain					Output Power and Gain		
Dedicated Ports					Common Ports		
U/L					U/L		
B12	B13	B5	B4	B25	B12	B13	B5
S1 to D3	S1 to D3	S1 to D1	S1 to D2	S1 to D2	S1 to D2	S1 to D2	S1 to D2
S2 to D3	S2 to D3	S2 to D1	S2 to D2	S2 to D2	S2 to D2	S2 to D2	S2 to D2
S3 to D3	S3 to D3	S3 to D1	S3 to D2	S3 to D2	S3 to D2	S3 to D2	S3 to D2
S4 to D3	S4 to D3	S4 to D1	S4 to D2	S4 to D2	S4 to D2	S4 to D2	S4 to D2
D/L					D/L		
B12	B13	B5	B4	B25	B12	B13	B5
D3 to S1	D3 to S1	D1 to S1	D2 to S1	D2 to S1	D2 to S1	D2 to S1	D2 to S1
D3 to S2	D3 to S2	D1 to S2	D2 to S2	D2 to S2	D2 to S2	D2 to S2	D2 to S2
D3 to S3	D3 to S3	D1 to S3	D2 to S3	D2 to S3	D2 to S3	D2 to S3	D2 to S3
D3 to S4	D3 to S4	D1 to S4	D2 to S4	D2 to S4	D2 to S4	D2 to S4	D2 to S4



**Uplink Power Test Results  
Server Port 1 to Dedicated Donor Port**

Frequency Band (MHz)	Input Level (dBm)	Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Lower Limit (dBm)	Upper Limit (dBm)	Result
698 - 716 MHz Pulsed GSM	-32.9	25.2	3.58	28.78	17	30	Pass
698 - 716 MHz AWGN	-31.2	25.3	3.58	28.88	17	30	Pass
776 - 787 MHz Pulsed GSM	-31.1	25.2	3.21	28.41	17	30	Pass
776 - 787 MHz AWGN	-29.9	25.2	3.21	28.41	17	30	Pass
824 - 849 MHz Pulsed GSM	-32.7	23.8	3.01	26.81	17	30	Pass
824 - 849 MHz AWGN	-31.4	23.9	3.01	26.91	17	30	Pass
1710 - 1755 MHz Pulsed GSM	-40.0	23.6	2.05	25.65	17	30	Pass
1710 - 1755 MHz AWGN	-39.8	23.7	2.05	25.75	17	30	Pass
1850 - 1915 MHz Pulsed GSM	-37.8	24.3	1.92	26.22	17	30	Pass
1850 - 1915 MHz AWGN	-40.5	24.3	1.92	26.22	17	30	Pass

**Downlink Power Test Results  
Server Port 1 to Dedicated Donor Port**

Frequency Band (MHz)	Input Level (dBm)	Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Upper Limit (dBm)	Result
728 - 746 MHz Pulsed GSM	-42.8	14.9	-2.43	12.47	17	Pass
728 - 746 MHz AWGN	-43.7	15.1	-2.43	12.67	17	Pass
746 - 757 MHz Pulsed GSM	-46.8	15.2	-1.69	13.51	17	Pass
746 - 757 MHz AWGN	-45.5	15.5	-1.69	13.81	17	Pass
869 - 894 MHz Pulsed GSM	-46.0	16.3	-2.79	13.51	17	Pass
869 - 894 MHz AWGN	-45.2	16.4	-2.79	13.61	17	Pass
1930 - 1995 MHz Pulsed GSM	-50.1	16.7	-1.29	15.41	17	Pass
1930 - 1995 MHz AWGN	-53.5	16.6	-1.29	15.31	17	Pass
2110 - 2155 MHz Pulsed GSM	-51.9	16.5	-0.33	16.17	17	Pass
2110 - 2155 MHz AWGN	-52.6	16.1	-0.33	15.77	17	Pass

**Uplink and Downlink Gain Test Results  
Server Port 1 to Dedicated Donor Port**

Modulation	Uplink Frequency (MHz)	Downlink Frequency (MHz)	Uplink Gain (dB)	Uplink Limit (dB)	Downlink Gain (dB)	Downlink Limit (dB)	Delta (dB)	Limit (dB)	Margin (dB)
Pulsed GSM	703.31	743.5	58.1	63.5	57.7	63.5	0.4	9	-8.6
AWGN	703.31	743.5	56.5	63.5	58.8	63.5	2.3	9	-6.7
Pulsed GSM	781.907	750.57	56.3	64.4	62.0	64.4	5.7	9	-3.3
AWGN	781.907	750.57	55.1	64.4	61.0	64.4	5.9	9	-3.1
Pulsed GSM	838.08	879.14	56.5	64.9	62.3	64.9	5.8	9	-3.2
AWGN	838.08	879.14	55.3	64.9	61.6	64.9	6.3	9	-2.7
Pulsed GSM	1745.11	2129.29	63.6	71	68.4	71	4.8	9	-4.2
AWGN	1745.11	2129.29	63.5	71	68.7	71	5.2	9	-3.8
Pulsed GSM	1864.54	1961.78	62.1	72	66.8	72	4.7	9	-4.3
AWGN	1864.54	1961.78	64.8	72	70.1	72	5.3	9	-3.7

**Uplink Output Power at Maximum Input Power Test  
Server Port 1 to Dedicated Donor Port**

Frequency Band (MHz)	Maximum Input Level (dBm)	Output Power at Maximum Input Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Lower Limit (dBm)	Upper Limit (dBm)	Result
698 - 716 MHz Pulsed GSM	0.0	24.5	3.58	28.08	17	30	Pass
698 - 716 MHz AWGN	0.0	25.7	3.58	29.28	17	30	Pass
776 - 787 MHz Pulsed GSM	0.0	24.7	3.21	27.91	17	30	Pass
776 - 787 MHz AWGN	0.0	25.4	3.21	28.61	17	30	Pass
824 - 849 MHz Pulsed GSM	0.0	23.4	3.01	26.41	17	30	Pass
824 - 849 MHz AWGN	0.0	23.8	3.01	26.81	17	30	Pass
1710 - 1755 MHz Pulsed GSM	0.0	23.4	2.05	25.45	17	30	Pass
1710 - 1755 MHz AWGN	0.0	23.8	2.05	25.85	17	30	Pass
1850 - 1915 MHz Pulsed GSM	0.0	24.1	1.92	26.02	17	30	Pass
1850 - 1915 MHz AWGN	0.0	24.5	1.92	26.42	17	30	Pass

**Downlink Output Power at Maximum Input Power Test  
Server Port 1 to Dedicated Donor Port**

Frequency Band (MHz)	Maximum Input Level (dBm)	Output Power at Maximum Input Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Upper Limit (dBm)	Result
728 - 746 MHz Pulsed GSM	-20.0	14.2	-2.43	11.77	17	Pass
728 - 746 MHz AWGN	-20.0	14.8	-2.43	12.37	17	Pass
746 - 757 MHz Pulsed GSM	-20.0	15.1	-1.69	13.41	17	Pass
746 - 757 MHz AWGN	-20.0	15.2	-1.69	13.51	17	Pass
869 - 894 MHz Pulsed GSM	-20.0	15.9	-2.79	13.11	17	Pass
869 - 894 MHz AWGN	-20.0	16.2	-2.79	13.41	17	Pass
1930 - 1995 MHz Pulsed GSM	-20.0	16.1	-1.29	14.81	17	Pass
1930 - 1995 MHz AWGN	-20.0	15.9	-1.29	14.61	17	Pass
2110 - 2155 MHz Pulsed GSM	-20.0	16.5	-0.33	16.17	17	Pass
2110 - 2155 MHz AWGN	-20.0	15.4	-0.33	15.07	17	Pass

**Uplink Power Test Results  
Server Port 2 to Dedicated Donor Port**

Frequency Band (MHz)	Input Level (dBm)	Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Lower Limit (dBm)	Upper Limit (dBm)	Result
698 - 716 MHz Pulsed GSM	-32.3	25.4	3.58	28.98	17	30	Pass
698 - 716 MHz AWGN	-31.6	25.3	3.58	28.88	17	30	Pass
776 - 787 MHz Pulsed GSM	-31.3	25.0	3.21	28.21	17	30	Pass
776 - 787 MHz AWGN	-29.9	25.2	3.21	28.41	17	30	Pass
824 - 849 MHz Pulsed GSM	-33.6	23.5	3.01	26.51	17	30	Pass
824 - 849 MHz AWGN	-32.4	23.8	3.01	26.81	17	30	Pass
1710 - 1755 MHz Pulsed GSM	-39.9	23.7	2.05	25.75	17	30	Pass
1710 - 1755 MHz AWGN	-39.4	23.8	2.05	25.85	17	30	Pass
1850 - 1915 MHz Pulsed GSM	-37.8	24.7	1.92	26.62	17	30	Pass
1850 - 1915 MHz AWGN	-40.6	24.4	1.92	26.32	17	30	Pass

**Downlink Power Test Results  
Server Port 2 to Dedicated Donor Port**

Frequency Band (MHz)	Input Level (dBm)	Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Upper Limit (dBm)	Result
728 - 746 MHz Pulsed GSM	-44.2	16.6	-2.43	14.17	17	Pass
728 - 746 MHz AWGN	-43.6	16.8	-2.43	14.37	17	Pass
746 - 757 MHz Pulsed GSM	-44.8	15.6	-1.69	13.91	17	Pass
746 - 757 MHz AWGN	-45.5	15.8	-1.69	14.11	17	Pass
869 - 894 MHz Pulsed GSM	-45.9	16.7	-2.79	13.91	17	Pass
869 - 894 MHz AWGN	-45.2	16.8	-2.79	14.01	17	Pass
1930 - 1995 MHz Pulsed GSM	-50.0	16.8	-1.29	15.51	17	Pass
1930 - 1995 MHz AWGN	-53.5	16.8	-1.29	15.51	17	Pass
2110 - 2155 MHz Pulsed GSM	-52.2	16.8	-0.33	16.47	17	Pass
2110 - 2155 MHz AWGN	-52.7	16.7	-0.33	16.37	17	Pass

**Uplink and Downlink Gain Test Results  
Server Port 2 to Dedicated Donor Port**

Modulation	Uplink Frequency (MHz)	Downlink Frequency (MHz)	Uplink Gain (dB)	Uplink Limit (dB)	Downlink Gain (dB)	Downlink Limit (dB)	Delta (dB)	Limit (dB)	Margin (dB)
Pulsed GSM	700.5	738.53	57.7	63.5	60.8	63.5	3.1	9	-5.9
AWGN	700.5	738.53	56.9	63.5	60.4	63.5	3.5	9	-5.5
Pulsed GSM	781.907	750.69	56.3	64.4	60.4	64.4	4.1	9	-4.9
AWGN	781.907	750.69	55.1	64.4	61.3	64.4	6.2	9	-2.8
Pulsed GSM	838.08	879.14	57.1	64.9	62.6	64.9	5.5	9	-3.5
AWGN	838.08	879.14	56.2	64.9	62.0	64.9	5.8	9	-3.2
Pulsed GSM	1737.51	2129.42	63.6	71	69.0	71	5.4	9	-3.6
AWGN	1737.51	2129.42	63.2	71	69.4	71	6.2	9	-2.8
Pulsed GSM	1864.3	1961.65	62.5	72	66.8	72	4.3	9	-4.7
AWGN	1864.3	1961.65	65.0	72	70.3	72	5.3	9	-3.7

**Uplink Output Power at Maximum Input Power Test  
Server Port 2 to Dedicated Donor Port**

Frequency Band (MHz)	Maximum Input Level (dBm)	Output Power at Maximum Input Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Lower Limit (dBm)	Upper Limit (dBm)	Result
698 - 716 MHz Pulsed GSM	0.0	24.9	3.58	28.48	17	30	Pass
698 - 716 MHz AWGN	0.0	25.3	3.58	28.88	17	30	Pass
776 - 787 MHz Pulsed GSM	0.0	24.8	3.21	28.01	17	30	Pass
776 - 787 MHz AWGN	0.0	25.2	3.21	28.41	17	30	Pass
824 - 849 MHz Pulsed GSM	0.0	22.9	3.01	25.91	17	30	Pass
824 - 849 MHz AWGN	0.0	23.6	3.01	26.61	17	30	Pass
1710 - 1755 MHz Pulsed GSM	0.0	23.4	2.05	25.45	17	30	Pass
1710 - 1755 MHz AWGN	0.0	23.8	2.05	25.85	17	30	Pass
1850 - 1915 MHz Pulsed GSM	0.0	24.5	1.92	26.42	17	30	Pass
1850 - 1915 MHz AWGN	0.0	24.8	1.92	26.72	17	30	Pass

**Downlink Output Power at Maximum Input Power Test  
Server Port 2 to Dedicated Donor Port**

Frequency Band (MHz)	Maximum Input Level (dBm)	Output Power at Maximum Input Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Upper Limit (dBm)	Result
728 - 746 MHz Pulsed GSM	-20.0	16.1	-2.43	13.67	17	Pass
728 - 746 MHz AWGN	-20.0	16.4	-2.43	13.97	17	Pass
746 - 757 MHz Pulsed GSM	-20.0	15.1	-1.69	13.41	17	Pass
746 - 757 MHz AWGN	-20.0	15.5	-1.69	13.81	17	Pass
869 - 894 MHz Pulsed GSM	-20.0	16.7	-2.79	13.91	17	Pass
869 - 894 MHz AWGN	-20.0	16.4	-2.79	13.61	17	Pass
1930 - 1995 MHz Pulsed GSM	-20.0	16.1	-1.29	14.81	17	Pass
1930 - 1995 MHz AWGN	-20.0	15.9	-1.29	14.61	17	Pass
2110 - 2155 MHz Pulsed GSM	-20.0	16.6	-0.33	16.27	17	Pass
2110 - 2155 MHz AWGN	-20.0	16.2	-0.33	15.87	17	Pass

**Uplink Power Test Results  
Server Port 3 to Dedicated Donor Port**

Frequency Band (MHz)	Input Level (dBm)	Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Lower Limit (dBm)	Upper Limit (dBm)	Result
698 - 716 MHz Pulsed GSM	-32.8	24.9	3.58	28.48	17	30	Pass
698 - 716 MHz AWGN	-31.2	25.1	3.58	28.68	17	30	Pass
776 - 787 MHz Pulsed GSM	-30.9	25.4	3.21	28.61	17	30	Pass
776 - 787 MHz AWGN	-30.0	25.4	3.21	28.61	17	30	Pass
824 - 849 MHz Pulsed GSM	-32.8	24.1	3.01	27.11	17	30	Pass
824 - 849 MHz AWGN	-32.0	24.0	3.01	27.01	17	30	Pass
1710 - 1755 MHz Pulsed GSM	-39.8	23.7	2.05	25.75	17	30	Pass
1710 - 1755 MHz AWGN	-40.2	23.7	2.05	25.75	17	30	Pass
1850 - 1915 MHz Pulsed GSM	-36.6	24.6	1.92	26.52	17	30	Pass
1850 - 1915 MHz AWGN	-40.7	24.4	1.92	26.32	17	30	Pass

**Downlink Power Test Results  
Server Port 3 to Dedicated Donor Port**

Frequency Band (MHz)	Input Level (dBm)	Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Upper Limit (dBm)	Result
728 - 746 MHz Pulsed GSM	-44.3	16.2	-2.43	13.77	17	Pass
728 - 746 MHz AWGN	-43.6	16.5	-2.43	14.07	17	Pass
746 - 757 MHz Pulsed GSM	-46.9	15.2	-1.69	13.51	17	Pass
746 - 757 MHz AWGN	-45.5	15.6	-1.69	13.91	17	Pass
869 - 894 MHz Pulsed GSM	-46.0	16.4	-2.79	13.61	17	Pass
869 - 894 MHz AWGN	-45.2	16.7	-2.79	13.91	17	Pass
1930 - 1995 MHz Pulsed GSM	-50.0	16.0	-1.29	14.71	17	Pass
1930 - 1995 MHz AWGN	-53.5	16.0	-1.29	14.71	17	Pass
2110 - 2155 MHz Pulsed GSM	-52.6	15.0	-0.33	14.67	17	Pass
2110 - 2155 MHz AWGN	-52.9	15.0	-0.33	14.67	17	Pass

**Uplink and Downlink Gain Test Results  
Server Port 3 to Dedicated Donor Port**

Modulation	Uplink Frequency (MHz)	Downlink Frequency (MHz)	Uplink Gain (dB)	Uplink Limit (dB)	Downlink Gain (dB)	Downlink Limit (dB)	Delta (dB)	Limit (dB)	Margin (dB)
Pulsed GSM	706.8	739.19	57.7	63.5	60.5	63.5	2.8	9	-6.2
AWGN	706.8	739.19	56.3	63.5	60.1	63.5	3.8	9	-5.2
Pulsed GSM	781.907	750.69	56.3	64.4	62.1	64.4	5.8	9	-3.2
AWGN	781.907	750.69	55.4	64.4	61.1	64.4	5.7	9	-3.3
Pulsed GSM	838.08	879.14	56.9	64.9	62.4	64.9	5.5	9	-3.5
AWGN	838.08	879.14	56.0	64.9	61.9	64.9	5.9	9	-3.1
Pulsed GSM	1745.44	2144.78	63.5	71	67.6	71	4.1	9	-4.9
AWGN	1745.44	2144.78	63.9	71	67.9	71	4	9	-5
Pulsed GSM	1864.42	1961.78	61.2	72	66.0	72	4.8	9	-4.2
AWGN	1864.42	1961.78	65.1	72	69.5	72	4.4	9	-4.6

**Uplink Output Power at Maximum Input Power Test  
Server Port 3 to Dedicated Donor Port**

Frequency Band (MHz)	Maximum Input Level (dBm)	Output Power at Maximum Input Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Lower Limit (dBm)	Upper Limit (dBm)	Result
698 - 716 MHz Pulsed GSM	0.0	24.4	3.58	27.98	17	30	Pass
698 - 716 MHz AWGN	0.0	25.2	3.58	28.78	17	30	Pass
776 - 787 MHz Pulsed GSM	0.0	24.8	3.21	28.01	17	30	Pass
776 - 787 MHz AWGN	0.0	25.0	3.21	28.21	17	30	Pass
824 - 849 MHz Pulsed GSM	0.0	23.6	3.01	26.61	17	30	Pass
824 - 849 MHz AWGN	0.0	23.9	3.01	26.91	17	30	Pass
1710 - 1755 MHz Pulsed GSM	0.0	23.4	2.05	25.45	17	30	Pass
1710 - 1755 MHz AWGN	0.0	23.8	2.05	25.85	17	30	Pass
1850 - 1915 MHz Pulsed GSM	0.0	24.6	1.92	26.52	17	30	Pass
1850 - 1915 MHz AWGN	0.0	24.0	1.92	25.92	17	30	Pass

**Downlink Output Power at Maximum Input Power Test  
Server Port 3 to Dedicated Donor Port**

Frequency Band (MHz)	Maximum Input Level (dBm)	Output Power at Maximum Input Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Upper Limit (dBm)	Result
728 - 746 MHz Pulsed GSM	-20.0	16.2	-2.43	13.77	17	Pass
728 - 746 MHz AWGN	-20.0	16.2	-2.43	13.77	17	Pass
746 - 757 MHz Pulsed GSM	-20.0	15.3	-1.69	13.61	17	Pass
746 - 757 MHz AWGN	-20.0	15.3	-1.69	13.61	17	Pass
869 - 894 MHz Pulsed GSM	-20.0	15.9	-2.79	13.11	17	Pass
869 - 894 MHz AWGN	-20.0	16.4	-2.79	13.61	17	Pass
1930 - 1995 MHz Pulsed GSM	-20.0	15.4	-1.29	14.11	17	Pass
1930 - 1995 MHz AWGN	-20.0	15.1	-1.29	13.81	17	Pass
2110 - 2155 MHz Pulsed GSM	-20.0	14.9	-0.33	14.57	17	Pass
2110 - 2155 MHz AWGN	-20.0	14.2	-0.33	13.87	17	Pass

**Uplink Power Test Results  
Server Port 4 to Dedicated Donor Port**

Frequency Band (MHz)	Input Level (dBm)	Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Lower Limit (dBm)	Upper Limit (dBm)	Result
698 - 716 MHz Pulsed GSM	-32.1	25.3	3.58	28.88	17	30	Pass
698 - 716 MHz AWGN	-31.2	25.4	3.58	28.98	17	30	Pass
776 - 787 MHz Pulsed GSM	-29.7	25.4	3.21	28.61	17	30	Pass
776 - 787 MHz AWGN	-28.9	25.3	3.21	28.51	17	30	Pass
824 - 849 MHz Pulsed GSM	-32.4	24.1	3.01	27.11	17	30	Pass
824 - 849 MHz AWGN	-31.6	24.1	3.01	27.11	17	30	Pass
1710 - 1755 MHz Pulsed GSM	-38.4	23.5	2.05	25.55	17	30	Pass
1710 - 1755 MHz AWGN	-38.8	24.1	2.05	26.15	17	30	Pass
1850 - 1915 MHz Pulsed GSM	-36.0	24.8	1.92	26.72	17	30	Pass
1850 - 1915 MHz AWGN	-39.3	24.9	1.92	26.82	17	30	Pass



**Downlink Power Test Results  
Server Port 4 to Dedicated Donor Port**

Frequency Band (MHz)	Input Level (dBm)	Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Upper Limit (dBm)	Result
728 - 746 MHz Pulsed GSM	-44.5	15.8	-2.43	13.37	17	Pass
728 - 746 MHz AWGN	-43.7	16.3	-2.43	13.87	17	Pass
746 - 757 MHz Pulsed GSM	-46.8	14.9	-1.69	13.21	17	Pass
746 - 757 MHz AWGN	-45.5	15.3	-1.69	13.61	17	Pass
869 - 894 MHz Pulsed GSM	-46.0	15.8	-2.79	13.01	17	Pass
869 - 894 MHz AWGN	-45.2	16.1	-2.79	13.31	17	Pass
1930 - 1995 MHz Pulsed GSM	-50.0	14.3	-1.29	13.01	17	Pass
1930 - 1995 MHz AWGN	-53.5	14.2	-1.29	12.91	17	Pass
2110 - 2155 MHz Pulsed GSM	-51.9	14.7	-0.33	14.37	17	Pass
2110 - 2155 MHz AWGN	-52.6	14.3	-0.33	13.97	17	Pass

**Uplink and Downlink Gain Test Results  
Server Port 4 to Dedicated Donor Port**

Modulation	Uplink Frequency (MHz)	Downlink Frequency (MHz)	Uplink Gain (dB)	Uplink Limit (dB)	Downlink Gain (dB)	Downlink Limit (dB)	Delta (dB)	Limit (dB)	Margin (dB)
Pulsed GSM	703.2	739.61	57.4	63.5	60.3	63.5	2.9	9	-6.1
AWGN	703.2	739.61	56.6	63.5	60.0	63.5	3.4	9	-5.6
Pulsed GSM	782.106	750.69	55.1	64.4	61.7	64.4	6.6	9	-2.4
AWGN	782.106	750.69	54.2	64.4	60.8	64.4	6.6	9	-2.4
Pulsed GSM	838.01	879.14	56.5	64.9	61.8	64.9	5.3	9	-3.7
AWGN	838.01	879.14	55.7	64.9	61.3	64.9	5.6	9	-3.4
Pulsed GSM	1737.51	2129.16	61.9	71	66.6	71	4.7	9	-4.3
AWGN	1737.51	2129.16	62.9	71	66.9	71	4	9	-5
Pulsed GSM	1864.42	1961.91	60.8	72	64.3	72	3.5	9	-5.5
AWGN	1864.42	1961.91	64.2	72	67.7	72	3.5	9	-5.5

**Uplink Output Power at Maximum Input Power Test  
Server Port 4 to Dedicated Donor Port**

Frequency Band (MHz)	Maximum Input Level (dBm)	Output Power at Maximum Input Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Lower Limit (dBm)	Upper Limit (dBm)	Result
698 - 716 MHz Pulsed GSM	0.0	24.9	3.58	28.48	17	30	Pass
698 - 716 MHz AWGN	0.0	25.2	3.58	28.78	17	30	Pass
776 - 787 MHz Pulsed GSM	0.0	24.6	3.21	27.81	17	30	Pass
776 - 787 MHz AWGN	0.0	25.3	3.21	28.51	17	30	Pass
824 - 849 MHz Pulsed GSM	0.0	23.8	3.01	26.81	17	30	Pass
824 - 849 MHz AWGN	0.0	23.9	3.01	26.91	17	30	Pass
1710 - 1755 MHz Pulsed GSM	0.0	23.5	2.05	25.55	17	30	Pass
1710 - 1755 MHz AWGN	0.0	24.1	2.05	26.15	17	30	Pass
1850 - 1915 MHz Pulsed GSM	0.0	24.9	1.92	26.82	17	30	Pass
1850 - 1915 MHz AWGN	0.0	24.7	1.92	26.62	17	30	Pass

**Downlink Output Power at Maximum Input Power Test  
Server Port 4 to Dedicated Donor Port**

Frequency Band (MHz)	Maximum Input Level (dBm)	Output Power at Maximum Input Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Upper Limit (dBm)	Result
728 - 746 MHz Pulsed GSM	-20.0	15.5	-2.43	13.07	17	Pass
728 - 746 MHz AWGN	-20.0	15.9	-2.43	13.47	17	Pass
746 - 757 MHz Pulsed GSM	-20.0	14.4	-1.69	12.71	17	Pass
746 - 757 MHz AWGN	-20.0	14.9	-1.69	13.21	17	Pass
869 - 894 MHz Pulsed GSM	-20.0	15.3	-2.79	12.51	17	Pass
869 - 894 MHz AWGN	-20.0	15.6	-2.79	12.81	17	Pass
1930 - 1995 MHz Pulsed GSM	-20.0	13.7	-1.29	12.41	17	Pass
1930 - 1995 MHz AWGN	-20.0	13.4	-1.29	12.11	17	Pass
2110 - 2155 MHz Pulsed GSM	-20.0	14.3	-0.33	13.97	17	Pass
2110 - 2155 MHz AWGN	-20.0	13.7	-0.33	13.37	17	Pass

**Uplink Power Test Results  
Server Port 1 to Common Donor Port 2**

Frequency Band (MHz)	Input Level (dBm)	Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Lower Limit (dBm)	Upper Limit (dBm)	Result
698 - 716 MHz Pulsed GSM	-32.9	24.0	3.58	27.58	17	30	Pass
698 - 716 MHz AWGN	-31.3	24.1	3.58	27.68	17	30	Pass
776 - 787 MHz Pulsed GSM	-31.1	23.8	3.21	27.01	17	30	Pass
776 - 787 MHz AWGN	-29.8	23.6	3.21	26.81	17	30	Pass
824 - 849 MHz Pulsed GSM	-32.7	23.7	3.01	26.71	17	30	Pass
824 - 849 MHz AWGN	-31.4	23.9	3.01	26.91	17	30	Pass

**Downlink Power Test Results  
Server Port 1 to Common Donor Port 2**

Frequency Band (MHz)	Input Level (dBm)	Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Upper Limit (dBm)	Result
728 - 746 MHz Pulsed GSM	-43.1	16.2	-2.43	13.77	17	Pass
728 - 746 MHz AWGN	-42.4	16.7	-2.43	14.27	17	Pass
746 - 757 MHz Pulsed GSM	-45.7	15.3	-1.69	13.61	17	Pass
746 - 757 MHz AWGN	-44.3	15.7	-1.69	14.01	17	Pass
869 - 894 MHz Pulsed GSM	-46.0	16.3	-2.79	13.51	17	Pass
869 - 894 MHz AWGN	-45.4	16.5	-2.79	13.71	17	Pass

**Uplink and Downlink Gain Test Results  
Server Port 1 to Common Donor Port 2**

Modulation	Uplink Frequency (MHz)	Downlink Frequency (MHz)	Uplink Gain (dB)	Uplink Limit (dB)	Downlink Gain (dB)	Downlink Limit (dB)	Delta (dB)	Limit (dB)	Margin (dB)
Pulsed GSM	703.31	739.19	56.9	63.5	59.3	63.5	2.4	9	-6.6
AWGN	703.31	739.19	55.4	63.5	59.1	63.5	3.7	9	-5.3
Pulsed GSM	781.907	750.81	54.9	64.4	61.0	64.4	6.1	9	-2.9
AWGN	781.907	750.81	53.4	64.4	60.0	64.4	6.6	9	-2.4
Pulsed GSM	838.01	879.21	56.4	64.9	62.3	64.9	5.9	9	-3.1
AWGN	838.01	879.21	55.3	64.9	61.9	64.9	6.6	9	-2.4

**Uplink Output Power at Maximum Input Power Test  
Server Port 1 to Common Donor Port 2**

Frequency Band (MHz)	Maximum Input Level (dBm)	Output Power at Maximum Input Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Lower Limit (dBm)	Upper Limit (dBm)	Result
698 - 716 MHz Pulsed GSM	0.0	23.3	3.58	26.88	17	30	Pass
698 - 716 MHz AWGN	0.0	24.0	3.58	27.58	17	30	Pass
776 - 787 MHz Pulsed GSM	0.0	23.4	3.21	26.61	17	30	Pass
776 - 787 MHz AWGN	0.0	23.5	3.21	26.71	17	30	Pass
824 - 849 MHz Pulsed GSM	0.0	23.3	3.01	26.31	17	30	Pass
824 - 849 MHz AWGN	0.0	23.7	3.01	26.71	17	30	Pass

**Downlink Output Power at Maximum Input Power Test  
Server Port 1 to Common Donor Port 2**

Frequency Band (MHz)	Maximum Input Level (dBm)	Output Power at Maximum Input Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Upper Limit (dBm)	Result
728 - 746 MHz Pulsed GSM	-20.0	16.0	-2.43	13.57	17	Pass
728 - 746 MHz AWGN	-20.0	16.5	-2.43	14.07	17	Pass
746 - 757 MHz Pulsed GSM	-20.0	15.2	-1.69	13.51	17	Pass
746 - 757 MHz AWGN	-20.0	15.8	-1.69	14.11	17	Pass
869 - 894 MHz Pulsed GSM	-20.0	16.3	-2.79	13.51	17	Pass
869 - 894 MHz AWGN	-20.0	16.3	-2.79	13.51	17	Pass

**Uplink Power Test Results  
Server Port 2 to Common Donor Port 2**

Frequency Band (MHz)	Input Level (dBm)	Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Lower Limit (dBm)	Upper Limit (dBm)	Result
698 - 716 MHz Pulsed GSM	-31.5	24.4	3.58	27.98	17	30	Pass
698 - 716 MHz AWGN	-31.1	24.2	3.58	27.78	17	30	Pass
776 - 787 MHz Pulsed GSM	-31.0	23.7	3.21	26.91	17	30	Pass
776 - 787 MHz AWGN	-29.5	23.9	3.21	27.11	17	30	Pass
824 - 849 MHz Pulsed GSM	-33.5	23.6	3.01	26.61	17	30	Pass
824 - 849 MHz AWGN	-32.4	23.7	3.01	26.71	17	30	Pass

**Downlink Power Test Results  
Server Port 2 to Common Donor Port 2**

Frequency Band (MHz)	Input Level (dBm)	Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Upper Limit (dBm)	Result
728 - 746 MHz Pulsed GSM	-42.9	16.6	-2.43	14.17	17	Pass
728 - 746 MHz AWGN	-42.2	16.9	-2.43	14.47	17	Pass
746 - 757 MHz Pulsed GSM	-45.6	15.2	-1.69	13.51	17	Pass
746 - 757 MHz AWGN	-44.3	15.9	-1.69	14.21	17	Pass
869 - 894 MHz Pulsed GSM	-46.1	16.5	-2.79	13.71	17	Pass
869 - 894 MHz AWGN	-46.2	16.4	-2.79	13.61	17	Pass

**Uplink and Downlink Gain Test Results  
Server Port 2 to Common Donor Port 2**

Modulation	Uplink Frequency (MHz)	Downlink Frequency (MHz)	Uplink Gain (dB)	Uplink Limit (dB)	Downlink Gain (dB)	Downlink Limit (dB)	Delta (dB)	Limit (dB)	Margin (dB)
Pulsed GSM	707.31	738.47	55.9	63.5	59.5	63.5	3.6	9	-5.4
AWGN	707.31	738.47	55.3	63.5	59.1	63.5	3.8	9	-5.2
Pulsed GSM	778.516	750.81	54.7	64.4	60.8	64.4	6.1	9	-2.9
AWGN	778.516	750.81	53.4	64.4	60.2	64.4	6.8	9	-2.2
Pulsed GSM	838.08	878.38	57.1	64.9	62.6	64.9	5.5	9	-3.5
AWGN	838.08	878.38	56.1	64.9	62.6	64.9	6.5	9	-2.5

**Uplink Output Power at Maximum Input Power Test  
Server Port 2 to Common Donor Port 2**

Frequency Band (MHz)	Maximum Input Level (dBm)	Output Power at Maximum Input Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Lower Limit (dBm)	Upper Limit (dBm)	Result
698 - 716 MHz Pulsed GSM	0.0	24.3	3.58	27.88	17	30	Pass
698 - 716 MHz AWGN	0.0	24.0	3.58	27.58	17	30	Pass
776 - 787 MHz Pulsed GSM	0.0	23.0	3.21	26.21	17	30	Pass
776 - 787 MHz AWGN	0.0	23.7	3.21	26.91	17	30	Pass
824 - 849 MHz Pulsed GSM	0.0	22.9	3.01	25.91	17	30	Pass
824 - 849 MHz AWGN	0.0	23.4	3.01	26.41	17	30	Pass

**Downlink Output Power at Maximum Input Power Test  
Server Port 2 to Common Donor Port 2**

Frequency Band (MHz)	Maximum Input Level (dBm)	Output Power at Maximum Input Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Upper Limit (dBm)	Result
728 - 746 MHz Pulsed GSM	-20.0	16.2	-2.43	13.77	17	Pass
728 - 746 MHz AWGN	-20.0	16.8	-2.43	14.37	17	Pass
746 - 757 MHz Pulsed GSM	-20.0	15.5	-1.69	13.81	17	Pass
746 - 757 MHz AWGN	-20.0	16.0	-1.69	14.31	17	Pass
869 - 894 MHz Pulsed GSM	-20.0	16.5	-2.79	13.71	17	Pass
869 - 894 MHz AWGN	-20.0	16.7	-2.79	13.91	17	Pass

**Uplink Power Test Results  
Server Port 3 to Common Donor Port 2**

Frequency Band (MHz)	Input Level (dBm)	Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Lower Limit (dBm)	Upper Limit (dBm)	Result
698 - 716 MHz Pulsed GSM	-33.5	22.7	3.58	26.28	17	30	Pass
698 - 716 MHz AWGN	-31.6	23.6	3.58	27.18	17	30	Pass
776 - 787 MHz Pulsed GSM	-30.8	22.6	3.21	25.81	17	30	Pass
776 - 787 MHz AWGN	-30.0	23.6	3.21	26.81	17	30	Pass
824 - 849 MHz Pulsed GSM	-32.8	23.9	3.01	26.91	17	30	Pass
824 - 849 MHz AWGN	-31.8	23.3	3.01	26.31	17	30	Pass

**Downlink Power Test Results  
Server Port 3 to Common Donor Port 2**

Frequency Band (MHz)	Input Level (dBm)	Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Upper Limit (dBm)	Result
728 - 746 MHz Pulsed GSM	-43.0	16.2	-2.43	13.77	17	Pass
728 - 746 MHz AWGN	-42.3	16.5	-2.43	14.07	17	Pass
746 - 757 MHz Pulsed GSM	-45.7	15.3	-1.69	13.61	17	Pass
746 - 757 MHz AWGN	-44.3	15.6	-1.69	13.91	17	Pass
869 - 894 MHz Pulsed GSM	-44.5	15.5	-2.79	12.71	17	Pass
869 - 894 MHz AWGN	-44.0	15.8	-2.79	13.01	17	Pass

**Uplink and Downlink Gain Test Results  
Server Port 3 to Common Donor Port 2**

Modulation	Uplink Frequency (MHz)	Downlink Frequency (MHz)	Uplink Gain (dB)	Uplink Limit (dB)	Downlink Gain (dB)	Downlink Limit (dB)	Delta (dB)	Limit (dB)	Margin (dB)
Pulsed GSM	703.31	738.83	56.2	63.5	59.2	63.5	3	9	-6
AWGN	703.31	738.83	55.2	63.5	58.8	63.5	3.6	9	-5.4
Pulsed GSM	781.709	750.81	53.4	64.4	61.0	64.4	7.6	9	-1.4
AWGN	781.709	750.81	53.6	64.4	59.9	64.4	6.3	9	-2.7
Pulsed GSM	838.01	871.29	56.7	64.9	60.0	64.9	3.3	9	-5.7
AWGN	838.01	871.29	55.1	64.9	59.8	64.9	4.7	9	-4.3

**Uplink Output Power at Maximum Input Power Test  
Server Port 3 to Common Donor Port 2**

Frequency Band (MHz)	Maximum Input Level (dBm)	Output Power at Maximum Input Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Lower Limit (dBm)	Upper Limit (dBm)	Result
698 - 716 MHz Pulsed GSM	0.0	22.5	3.58	26.08	17	30	Pass
698 - 716 MHz AWGN	0.0	23.2	3.58	26.78	17	30	Pass
776 - 787 MHz Pulsed GSM	0.0	21.9	3.21	25.11	17	30	Pass
776 - 787 MHz AWGN	0.0	23.4	3.21	26.61	17	30	Pass
824 - 849 MHz Pulsed GSM	0.0	23.5	3.01	26.51	17	30	Pass
824 - 849 MHz AWGN	0.0	23.3	3.01	26.31	17	30	Pass

**Downlink Output Power at Maximum Input Power Test  
Server Port 3 to Common Donor Port 2**

Frequency Band (MHz)	Maximum Input Level (dBm)	Output Power at Maximum Input Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Upper Limit (dBm)	Result
728 - 746 MHz Pulsed GSM	-20.0	15.9	-2.43	13.47	17	Pass
728 - 746 MHz AWGN	-20.0	16.3	-2.43	13.87	17	Pass
746 - 757 MHz Pulsed GSM	-20.0	14.7	-1.69	13.01	17	Pass
746 - 757 MHz AWGN	-20.0	15.6	-1.69	13.91	17	Pass
869 - 894 MHz Pulsed GSM	-20.0	15.5	-2.79	12.71	17	Pass
869 - 894 MHz AWGN	-20.0	15.7	-2.79	12.91	17	Pass

**Uplink Power Test Results  
Server Port 4 to Common Donor Port 2**

Frequency Band (MHz)	Input Level (dBm)	Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Lower Limit (dBm)	Upper Limit (dBm)	Result
698 - 716 MHz Pulsed GSM	-32.0	24.0	3.58	27.58	17	30	Pass
698 - 716 MHz AWGN	-31.2	23.7	3.58	27.28	17	30	Pass
776 - 787 MHz Pulsed GSM	-29.8	23.7	3.21	26.91	17	30	Pass
776 - 787 MHz AWGN	-29.1	23.4	3.21	26.61	17	30	Pass
824 - 849 MHz Pulsed GSM	-32.4	24.1	3.01	27.11	17	30	Pass
824 - 849 MHz AWGN	-31.5	24.0	3.01	27.01	17	30	Pass

**Downlink Power Test Results  
Server Port 4 to Common Donor Port 2**

Frequency Band (MHz)	Input Level (dBm)	Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Upper Limit (dBm)	Result
728 - 746 MHz Pulsed GSM	-43.0	15.9	-2.43	13.47	17	Pass
728 - 746 MHz AWGN	-42.3	16.3	-2.43	13.87	17	Pass
746 - 757 MHz Pulsed GSM	-45.7	14.9	-1.69	13.21	17	Pass
746 - 757 MHz AWGN	-44.3	15.4	-1.69	13.71	17	Pass
869 - 894 MHz Pulsed GSM	-46.1	15.8	-2.79	13.01	17	Pass
869 - 894 MHz AWGN	-45.4	15.8	-2.79	13.01	17	Pass

**Uplink and Downlink Gain Test Results  
Server Port 4 to Common Donor Port 2**

Modulation	Uplink Frequency (MHz)	Downlink Frequency (MHz)	Uplink Gain (dB)	Uplink Limit (dB)	Downlink Gain (dB)	Downlink Limit (dB)	Delta (dB)	Limit (dB)	Margin (dB)
Pulsed GSM	703.2	739.13	56.0	63.5	58.9	63.5	2.9	9	-6.1
AWGN	703.2	739.13	54.9	63.5	58.6	63.5	3.7	9	-5.3
Pulsed GSM	778.516	750.69	53.5	64.4	60.6	64.4	7.1	9	-1.9
AWGN	778.516	750.69	52.5	64.4	59.7	64.4	7.2	9	-1.8
Pulsed GSM	838.08	879.14	56.5	64.9	61.9	64.9	5.4	9	-3.6
AWGN	838.08	879.14	55.5	64.9	61.2	64.9	5.7	9	-3.3



**Uplink Output Power at Maximum Input Power Test  
Server Port 4 to Common Donor Port 2**

Frequency Band (MHz)	Maximum Input Level (dBm)	Output Power at Maximum Input Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Lower Limit (dBm)	Upper Limit (dBm)	Result
698 - 716 MHz Pulsed GSM	0.0	23.5	3.58	27.08	17	30	Pass
698 - 716 MHz AWGN	0.0	23.6	3.58	27.18	17	30	Pass
776 - 787 MHz Pulsed GSM	0.0	23.2	3.21	26.41	17	30	Pass
776 - 787 MHz AWGN	0.0	23.2	3.21	26.41	17	30	Pass
824 - 849 MHz Pulsed GSM	0.0	23.8	3.01	26.81	17	30	Pass
824 - 849 MHz AWGN	0.0	23.8	3.01	26.81	17	30	Pass

**Downlink Output Power at Maximum Input Power Test  
Server Port 4 to Common Donor Port 2**

Frequency Band (MHz)	Maximum Input Level (dBm)	Output Power at Maximum Input Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Upper Limit (dBm)	Result
728 - 746 MHz Pulsed GSM	-20.0	15.6	-2.43	13.17	17	Pass
728 - 746 MHz AWGN	-20.0	16.0	-2.43	13.57	17	Pass
746 - 757 MHz Pulsed GSM	-20.0	14.2	-1.69	12.51	17	Pass
746 - 757 MHz AWGN	-20.0	15.2	-1.69	13.51	17	Pass
869 - 894 MHz Pulsed GSM	-20.0	15.4	-2.79	12.61	17	Pass
869 - 894 MHz AWGN	-20.0	15.6	-2.79	12.81	17	Pass

## Intermodulation

**Engineer:** Greg Corbin

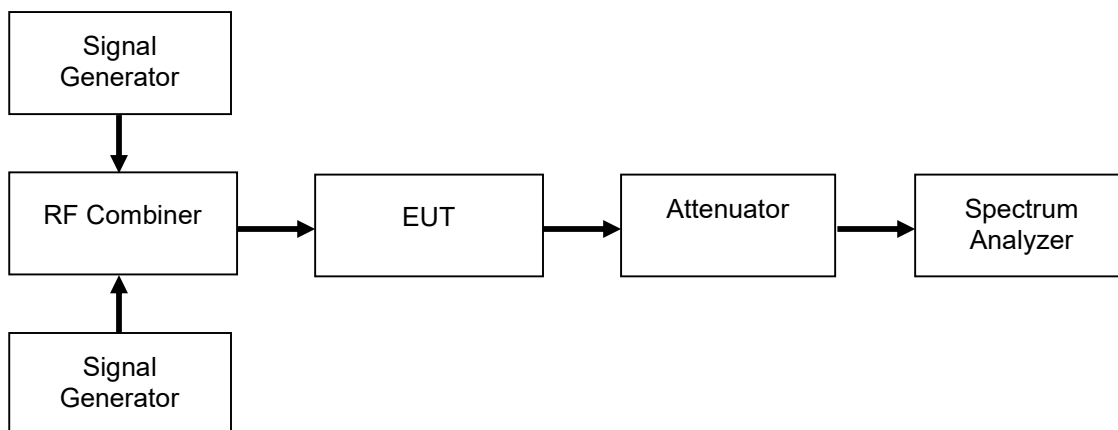
**Test Date:** 11/1/2023

### Test Procedure

The EUT was connected to a spectrum analyzer through an attenuator. Two signal generators were utilized to produce two CW signals 600 kHz apart and centered at the peak of the operational band. Attenuator and cable insertion loss correction factors were input to either the signal generator or the spectrum analyzer as required to ensure that accurate measurements were recorded. The input power was set at the maximum allowable power and the RMS intermodulation products were measured to ensure they were less than -19 dBm in a 3 kHz RBW. The uplink and downlink intermodulation products were plotted, with the levels being listed in the summary tables.

The input power was increased in 2 dB increments to 10 dB above the AGC threshold and to verify the intermod products remain below the limit. During this test, the input power was not increased past the maximum allowed. The Intermodulation level was recorded

### Test Setup



### Signal Paths measured for Intermodulation

Intermodulation Dedicated Ports					Intermodulation Common Ports		
U/L					U/L		
B12	B13	B5	B4	B25	B12	B13	B5
S1 to D3	S1 to D3	S1 to D1	S1 to D2	S1 to D2	S1 to D2	S1 to D2	S1 to D2
S2 to D3	S2 to D3	S2 to D1	S2 to D2	S2 to D2	S2 to D2	S2 to D2	S2 to D2
S3 to D3	S3 to D3	S3 to D1	S3 to D2	S3 to D2	S3 to D2	S3 to D2	S3 to D2
S4 to D3	S4 to D3	S4 to D1	S4 to D2	S4 to D2	S4 to D2	S4 to D2	S4 to D2
D/L					D/L		
B12	B13	B5	B4	B25	B12	B13	B5
D3 to S1	D3 to S1	D1 to S1	D2 to S1	D2 to S1	D2 to S1	D2 to S1	D2 to S1
D3 to S2	D3 to S2	D1 to S2	D2 to S2	D2 to S2	D2 to S2	D2 to S2	D2 to S2
D3 to S3	D3 to S3	D1 to S3	D2 to S3	D2 to S3	D2 to S3	D2 to S3	D2 to S3
D3 to S4	D3 to S4	D1 to S4	D2 to S4	D2 to S4	D2 to S4	D2 to S4	D2 to S4

**Uplink Intermodulation Test Results  
Server Port 1 to Dedicated Donor Port**

Frequency Band (MHz)	Intermodulation Level (dBm)	Limit (dBm)	Result	Intermod Level with Input Power @ AGC + 10 dB	Result (Pass / Fail)
698 - 716 MHz	-20.7	-19	Pass	-19.9	Pass
776 - 787 MHz	-20.8	-19	Pass	-21.3	Pass
824 - 849 MHz	-20.6	-19	Pass	-21.5	Pass
1710 - 1755 MHz	-21.4	-19	Pass	-23.1	Pass
1850 - 1915 MHz	-20.5	-19	Pass	-20.6	Pass

**Uplink Intermodulation Test Results  
Server Port 2 to Dedicated Donor Port**

Frequency Band (MHz)	Intermodulation Level (dBm)	Limit (dBm)	Result	Intermod Level with Input Power @ AGC + 10 dB	Result (Pass / Fail)
698 - 716 MHz	-20.2	-19	Pass	-20.2	Pass
776 - 787 MHz	-19.5	-19	Pass	-22.8	Pass
824 - 849 MHz	-21.6	-19	Pass	-21	Pass
1710 - 1755 MHz	-20.9	-19	Pass	-20.9	Pass
1850 - 1915 MHz	-19.9	-19	Pass	-19.8	Pass

**Uplink Intermodulation Test Results  
Server Port 3 to Dedicated Donor Port**

Frequency Band (MHz)	Intermodulation Level (dBm)	Limit (dBm)	Result	Intermod Level with Input Power @ AGC + 10 dB	Result (Pass / Fail)
698 - 716 MHz	-20	-19	Pass	-19.6	Pass
776 - 787 MHz	-21.3	-19	Pass	-21.1	Pass
824 - 849 MHz	-20.9	-19	Pass	-20.4	Pass
1710 - 1755 MHz	-21.1	-19	Pass	-23.4	Pass
1850 - 1915 MHz	-20.4	-19	Pass	-20.3	Pass

**Uplink Intermodulation Test Results  
Server Port 4 to Dedicated Donor Port**

Frequency Band (MHz)	Intermodulation Level (dBm)	Limit (dBm)	Result	Intermod Level with Input Power @ AGC + 10 dB	Result (Pass / Fail)
698 - 716 MHz	-19.6	-19	Pass	-19.4	Pass
776 - 787 MHz	-22.3	-19	Pass	-22.8	Pass
824 - 849 MHz	-20.5	-19	Pass	-19.7	Pass
1710 - 1755 MHz	-21	-19	Pass	-21.8	Pass
1850 - 1915 MHz	-22.6	-19	Pass	-22.3	Pass

**Downlink Intermodulation Test Results  
Dedicated Donor Port to Server Port 1**

Frequency Band (MHz)	Intermodulation Level (dBm)	Limit (dBm)	Result	Intermod Level with Input Power @ AGC + 10 dB	Result (Pass / Fail)
728 - 746 MHz	-31.5	-19	Pass	-31.8	Pass
746 - 757 MHz	-34.6	-19	Pass	-34.5	Pass
869 - 894 MHz	-30.1	-19	Pass	-30	Pass
1930 - 1995 MHz	-26.8	-19	Pass	-27.7	Pass
2110 - 2155 MHz	-29.9	-19	Pass	-20	Pass

**Downlink Intermodulation Test Results  
Dedicated Donor Port to Server Port 2**

Frequency Band (MHz)	Intermodulation Level (dBm)	Limit (dBm)	Result	Intermod Level with Input Power @ AGC + 10 dB	Result (Pass / Fail)
728 - 746 MHz	-34.4	-19	Pass	-34.2	Pass
746 - 757 MHz	-34.8	-19	Pass	-34.7	Pass
869 - 894 MHz	-30.5	-19	Pass	-31.1	Pass
1930 - 1995 MHz	-26.4	-19	Pass	-27.2	Pass
2110 - 2155 MHz	-31.2	-19	Pass	-31.7	Pass

**Downlink Intermodulation Test Results  
Dedicated Donor Port to Server Port 3**

Frequency Band (MHz)	Intermodulation Level (dBm)	Limit (dBm)	Result	Intermod Level with Input Power @ AGC + 10 dB	Result (Pass / Fail)
728 - 746 MHz	-33	-19	Pass	-32.5	Pass
746 - 757 MHz	-35.3	-19	Pass	-34.6	Pass
869 - 894 MHz	-32.6	-19	Pass	-32.9	Pass
1930 - 1995 MHz	-25.9	-19	Pass	-25.8	Pass
2110 - 2155 MHz	-27.9	-19	Pass	-28.9	Pass

**Downlink Intermodulation Test Results  
Dedicated Donor Port to Server Port 4**

Frequency Band (MHz)	Intermodulation Level (dBm)	Limit (dBm)	Result	Intermod Level with Input Power @ AGC + 10 dB	Result (Pass / Fail)
728 - 746 MHz	-34.2	-19	Pass	-33.6	Pass
746 - 757 MHz	-37.8	-19	Pass	-37.2	Pass
869 - 894 MHz	-30.8	-19	Pass	-31.2	Pass
1930 - 1995 MHz	-28.6	-19	Pass	-29.4	Pass
2110 - 2155 MHz	-33.1	-19	Pass	-33.7	Pass

**Uplink Intermodulation Test Results  
Server Port 1 to Common Donor Port 2**

Frequency Band (MHz)	Intermodulation Level (dBm)	Limit (dBm)	Result	Intermod Level with Input Power @ AGC + 10 dB	Result (Pass / Fail)
698 - 716 MHz	-19.6	-19	Pass	-19.9	Pass
776 - 787 MHz	-23.5	-19	Pass	-21.8	Pass
824 - 849 MHz	-20.3	-19	Pass	-19.3	Pass

**Uplink Intermodulation Test Results  
Server Port 2 to Common Donor Port 2**

Frequency Band (MHz)	Intermodulation Level (dBm)	Limit (dBm)	Result	Intermod Level with Input Power @ AGC + 10 dB	Result (Pass / Fail)
698 - 716 MHz	-20.8	-19	Pass	-23.7	Pass
776 - 787 MHz	-21.9	-19	Pass	-23.1	Pass
824 - 849 MHz	-20.9	-19	Pass	-20.5	Pass

**Uplink Intermodulation Test Results  
Server Port 3 to Common Donor Port 2**

Frequency Band (MHz)	Intermodulation Level (dBm)	Limit (dBm)	Result	Intermod Level with Input Power @ AGC + 10 dB	Result (Pass / Fail)
698 - 716 MHz	-20.3	-19	Pass	-19.5	Pass
776 - 787 MHz	-23.6	-19	Pass	-23.3	Pass
824 - 849 MHz	-20.5	-19	Pass	-20	Pass

**Uplink Intermodulation Test Results  
Server Port 4 to Common Donor Port 2**

Frequency Band (MHz)	Intermodulation Level (dBm)	Limit (dBm)	Result	Intermod Level with Input Power @ AGC + 10 dB	Result (Pass / Fail)
698 - 716 MHz	-21.7	-19	Pass	-21.8	Pass
776 - 787 MHz	-23.2	-19	Pass	-23.3	Pass
824 - 849 MHz	-20.1	-19	Pass	-19.4	Pass

**Downlink Intermodulation Test Results  
Common Donor Port 2 to Server Port 1**

Frequency Band (MHz)	Intermodulation Level (dBm)	Limit (dBm)	Result	Intermod Level with Input Power @ AGC + 10 dB	Result (Pass / Fail)
728 - 746 MHz	-32.3	-19	Pass	-32.1	Pass
746 - 757 MHz	-33.8	-19	Pass	-33.7	Pass
869 - 894 MHz	-30.5	-19	Pass	-30.8	Pass

**Downlink Intermodulation Test Results  
Common Donor Port 2 to Server Port 2**

Frequency Band (MHz)	Intermodulation Level (dBm)	Limit (dBm)	Result	Intermod Level with Input Power @ AGC + 10 dB	Result (Pass / Fail)
728 - 746 MHz	-35.1	-19	Pass	-34.6	Pass
746 - 757 MHz	-34.4	-19	Pass	-34.6	Pass
869 - 894 MHz	-30.5	-19	Pass	-30.4	Pass

**Downlink Intermodulation Test Results  
Common Donor Port 2 to Server Port 3**

Frequency Band (MHz)	Intermodulation Level (dBm)	Limit (dBm)	Result	Intermod Level with Input Power @ AGC + 10 dB	Result (Pass / Fail)
728 - 746 MHz	-33.8	-19	Pass	-33.8	Pass
746 - 757 MHz	-35	-19	Pass	-34.8	Pass
869 - 894 MHz	-27.6	-19	Pass	-28.1	Pass

**Downlink Intermodulation Test Results  
Common Donor Port 2 to Server Port 4**

Frequency Band (MHz)	Intermodulation Level (dBm)	Limit (dBm)	Result	Intermod Level with Input Power @ AGC + 10 dB	Result (Pass / Fail)
728 - 746 MHz	-35.2	-19	Pass	-35.2	Pass
746 - 757 MHz	-35.9	-19	Pass	-35.8	Pass
869 - 894 MHz	-30.7	-19	Pass	-30.6	Pass

**Annex C Intermodulation**

Refer to Annex C for Intermodulation Test plots.

## Out-of-Band Emissions

Engineer: Greg Corbin

Test Date: 11/15/2023

### Test Procedure

The EUT was connected to a spectrum analyzer through an attenuator with the losses being input into the spectrum analyzer as a combination of reference level offset and correction factor in order to ensure accurate readings. A signal generator was utilized to produce the following signals: GSM, CDMA, and WCDMA. The signal generator was tuned to the lowest allowable upper and lower channel within the EUT operational band for each respective modulation type. The RF input level was increased to a point just prior to the AGC being in control of the power. For each modulation type the Out of Band Emissions were measured to ensure they met the limits.

The following formula was used for calculating the limits:

$$\text{Limit} = P1 - 6 - (43 + 10\text{Log}(P2)) = -19\text{dBm}$$

P1 = power in dBm

P2 = power in Watts

The input power was increased in 2 dB steps up to the maximum input power for the booster being tested. The OOBE was verified to stay below the OOBE Limit. This was recorded as Pass / Fail in the OOBE tables.

Per 935210 D03 v04r02 page 13, The test report shall include either a statement describing that the device complies at 10 dB above AGC or at the 5.5 power levels, or a table showing compliance at the additional input power(s) required.

**The Booster is compliant to the maximum input levels per 935210 D03 v04r02 section 5.5.**

### Test Setup



Out of band Emissions was tested using the worst case determined by the signal path with the highest output power and gain.

### Signal Paths measured for Out of Band Emissions

OOBE					OOBE		
Dedicated Ports					Common Ports		
U/L					U/L		
B12	B13	B5	B4	B25	B12	B13	B5
S2 to D3	S3 to D3	S3 to D1	S4 to D2	S4 to D2	S2 to D2	S1 to D2	S4 to D2
D/L					D/L		
B12	B13	B5	B4	B25	B12	B13	B5
D3 to S3	D3 to S3	D1 to S2	D2 to S2	D2 to S2	D2 to S2	D2 to S2	D2 to S2



**GSM Uplink Test Results\_ Dedicated Ports**  
Refer to table on page 34 for signal paths utilized

Frequency Band (MHz)	Band Edge	Measured Level (dBm)	Limit (dBm)	Result	Oobe Below Limit at Max Input Power (Yes / No)
698 - 716	Lower	-26.9	-19	Pass	Y
698 - 716	Upper	-26.4	-19	Pass	Y
776 - 787	Lower	-32.8	-19	Pass	Y
776 - 787	Upper	-27.8	-19	Pass	Y
824 - 849	Lower	-33.8	-19	Pass	Y
824 - 849	Upper	-41.0	-19	Pass	Y
1710 - 1755	Lower	-31.7	-19	Pass	Y
1710 - 1755	Upper	-32.7	-19	Pass	Y
1850 - 1915	Lower	-36.2	-19	Pass	Y
1850 - 1915	Upper	-45.6	-19	Pass	Y

**CDMA Uplink Test Results\_ Dedicated Ports**  
Refer to table on page 34 for signal paths utilized

Frequency Band (MHz)	Band Edge	Measured Level (dBm)	Limit (dBm)	Result	Oobe Below Limit at Max Input Power (Yes / No)
698 - 716	Lower	-51.2	-19	Pass	Y
698 - 716	Upper	-49.6	-19	Pass	Y
776 - 787	Lower	-50.5	-19	Pass	Y
776 - 787	Upper	-49.1	-19	Pass	Y
824 - 849	Lower	-49.4	-19	Pass	Y
824 - 849	Upper	-45.5	-19	Pass	Y
1710 - 1755	Lower	-50	-19	Pass	Y
1710 - 1755	Upper	-51.2	-19	Pass	Y
1850 - 1915	Lower	-42.4	-19	Pass	Y
1850 - 1915	Upper	-54.3	-19	Pass	Y

**WCDMA Uplink Test Results\_ Dedicated Ports**  
Refer to table on page 37 for signal paths utilized

Frequency Band (MHz)	Band Edge	Measured Level (dBm)	Limit (dBm)	Result	Oobe Below Limit at Max Input Power (Yes / No)
698 - 716	Lower	-54.2	-19	Pass	Y
698 - 716	Upper	-50.1	-19	Pass	Y
776 - 787	Lower	-50.9	-19	Pass	Y
776 - 787	Upper	-49.1	-19	Pass	Y
824 - 849	Lower	-48.9	-19	Pass	Y
824 - 849	Upper	-44.7	-19	Pass	Y
1710 - 1755	Lower	-45.2	-19	Pass	Y
1710 - 1755	Upper	-47	-19	Pass	Y
1850 - 1915	Lower	-39.5	-19	Pass	Y
1850 - 1915	Upper	-50.4	-19	Pass	Y

**GSM Downlink Test Results\_ Dedicated Ports**  
Refer to table on page 37 for signal paths utilized

Frequency Band (MHz)	Band Edge	Measured Level (dBm)	Limit (dBm)	Result	Oobe Below Limit at Max Input Power (Yes / No)
728 - 746 MHz	Lower	-34.6	-19	Pass	Y
728 - 746 MHz	Upper	-31.8	-19	Pass	Y
746 - 757 MHz	Lower	-35.5	-19	Pass	Y
746 - 757 MHz	Upper	-45.4	-19	Pass	Y
869 - 894 MHz	Lower	-45.8	-19	Pass	Y
869 - 894 MHz	Upper	-43.8	-19	Pass	Y
1930 - 1995 MHz	Lower	-49.5	-19	Pass	Y
1930 - 1995 MHz	Upper	-43.5	-19	Pass	Y
2110 - 2155 MHz	Lower	-44.8	-19	Pass	Y
2110 - 2155 MHz	Upper	-44.1	-19	Pass	Y

**CDMA Downlink Test Results\_ Dedicated Ports**  
Refer to table on page 37 for signal paths utilized

Frequency Band (MHz)	Band Edge	Measured Level (dBm)	Limit (dBm)	Result	Oobe Below Limit at Max Input Power (Yes / No)
728 - 746 MHz	Lower	-53.3	-19	Pass	Y
728 - 746 MHz	Upper	-52.4	-19	Pass	Y
746 - 757 MHz	Lower	-52.2	-19	Pass	Y
746 - 757 MHz	Upper	-60.1	-19	Pass	Y
869 - 894 MHz	Lower	-45.5	-19	Pass	Y
869 - 894 MHz	Upper	-53.3	-19	Pass	Y
1930 - 1995 MHz	Lower	-58.1	-19	Pass	Y
1930 - 1995 MHz	Upper	-54.1	-19	Pass	Y
2110 - 2155 MHz	Lower	-52.8	-19	Pass	Y
2110 - 2155 MHz	Upper	-46.4	-19	Pass	Y

**WCDMA Downlink Test Results\_ Dedicated Ports**  
Refer to table on page 37 for signal paths utilized

Frequency Band (MHz)	Band Edge	Measured Level (dBm)	Limit (dBm)	Result	Oobe Below Limit at Max Input Power (Yes / No)
728 - 746 MHz	Lower	-55.6	-19	Pass	Y
728 - 746 MHz	Upper	-56.1	-19	Pass	Y
746 - 757 MHz	Lower	-52.8	-19	Pass	Y
746 - 757 MHz	Upper	-62.2	-19	Pass	Y
869 - 894 MHz	Lower	-45.3	-19	Pass	Y
869 - 894 MHz	Upper	-50.9	-19	Pass	Y
1930 - 1995 MHz	Lower	-52.4	-19	Pass	Y
1930 - 1995 MHz	Upper	-49.9	-19	Pass	Y
2110 - 2155 MHz	Lower	-49.3	-19	Pass	Y
2110 - 2155 MHz	Upper	-43.4	-19	Pass	Y

**GSM Uplink Test Results\_ Common Ports**  
Refer to table on page 37 for signal paths utilized

Frequency Band (MHz)	Band Edge	Measured Level (dBm)	Limit (dBm)	Result	Oobe Below Limit at Max Input Power (Yes / No)
698 - 716	Lower	-28.0	-19	Pass	Y
698 - 716	Upper	-27.6	-19	Pass	Y
776 - 787	Lower	-31.7	-19	Pass	Y
776 - 787	Upper	-28	-19	Pass	Y
824 - 849	Lower	-32.7	-19	Pass	Y
824 - 849	Upper	-39.1	-19	Pass	Y

**CDMA Uplink Test Results\_ Common Ports**  
Refer to table on page 37 for signal paths utilized

Frequency Band (MHz)	Band Edge	Measured Level (dBm)	Limit (dBm)	Result	Oobe Below Limit at Max Input Power (Yes / No)
698 - 716	Lower	-50.8	-19	Pass	Y
698 - 716	Upper	-51.1	-19	Pass	Y
776 - 787	Lower	-52	-19	Pass	Y
776 - 787	Upper	-50.4	-19	Pass	Y
824 - 849	Lower	-47.2	-19	Pass	Y
824 - 849	Upper	-44.3	-19	Pass	Y

**WCDMA Uplink Test Results\_ Common Ports**  
Refer to table on page 37 for signal paths utilized

Frequency Band (MHz)	Band Edge	Measured Level (dBm)	Limit (dBm)	Result	Oobe Below Limit at Max Input Power (Yes / No)
698 - 716	Lower	-53.9	-19	Pass	Y
698 - 716	Upper	-53.1	-19	Pass	Y
776 - 787	Lower	--52.7	-19	Pass	Y
776 - 787	Upper	-50.2	-19	Pass	Y
824 - 849	Lower	-49.2	-19	Pass	Y
824 - 849	Upper	-44.1	-19	Pass	Y

**GSM Downlink Test Results\_ Common Ports**  
Refer to table on page 37 for signal paths utilized

Frequency Band (MHz)	Band Edge	Measured Level (dBm)	Limit (dBm)	Result	Oobe Below Limit at Max Input Power (Yes / No)
728 - 746 MHz	Lower	-35.8	-19	Pass	Y
728 - 746 MHz	Upper	-31.4	-19	Pass	Y
746 - 757 MHz	Lower	-31.7	-19	Pass	Y
746 - 757 MHz	Upper	-45.7	-19	Pass	Y
869 - 894 MHz	Lower	-37.2	-19	Pass	Y
869 - 894 MHz	Upper	-43.8	-19	Pass	Y

**CDMA Downlink Test Results\_ Common Ports**  
Refer to table on page 37 for signal paths utilized

Frequency Band (MHz)	Band Edge	Measured Level (dBm)	Limit (dBm)	Result	Oobe Below Limit at Max Input Power (Yes / No)
728 - 746 MHz	Lower	-55.1	-19	Pass	Y
728 - 746 MHz	Upper	-52.9	-19	Pass	Y
746 - 757 MHz	Lower	-51.7	-19	Pass	Y
746 - 757 MHz	Upper	-59.4	-19	Pass	Y
869 - 894 MHz	Lower	-49.2	-19	Pass	Y
869 - 894 MHz	Upper	-52.2	-19	Pass	Y

**WCDMA Downlink Test Results\_ Common Ports**  
Refer to table on page 37 for signal paths utilized

Frequency Band (MHz)	Band Edge	Measured Level (dBm)	Limit (dBm)	Result	Oobe Below Limit at Max Input Power (Yes / No)
728 - 746 MHz	Lower	-55.6	-19	Pass	Y
728 - 746 MHz	Upper	-55.7	-19	Pass	Y
746 - 757 MHz	Lower	-51.4	-19	Pass	Y
746 - 757 MHz	Upper	-59.2	-19	Pass	Y
869 - 894 MHz	Lower	-47.2	-19	Pass	Y
869 - 894 MHz	Upper	-52.2	-19	Pass	Y

**Annex D Out of Band Emission**

Refer to Annex D for Out of Band Emission plots

## Conducted Spurious Emissions

**Engineer:** Greg Corbin

**Test Date:** 11/13/2023

### Test Procedure

The EUT was connected to a spectrum analyzer through an attenuator, with the losses being input into the spectrum analyzer as a combination of reference level offset and correction factor as needed to ensure accurate readings. A signal generator was utilized to produce a 4.1 MHz AWGN signal operating at the maximum allowable power. The conducted spurious emissions from 9 kHz to 10 times the highest tunable frequency for each operational band were measured (excluding the band defined by the Out of band emissions test). The emissions were plotted and the highest level was recorded in the summary table.

For UL Conducted Spurious tests, only the worst-case signal path (as determined from Power / Gain) was tested.

For the DL, all paths were tested per KDB 935210 D03 section 7.15 b)1)ii).

### Signal Paths measured for Conducted Spurious Emissions

Conducted Spurious					Conducted Spurious		
Dedicated Ports					Common Ports		
U/L					U/L		
B12	B13	B5	B4	B25	B12	B13	B5
S2 to D3	S3 to D3	S3 to D1	S4 to D2	S4 to D2	S2 to D2	S1 to D2	S4 to D2
D/L					D/L		
B12	B13	B5	B4	B25	B12	B13	B5
D3 to S1	D3 to S1	D1 to S1	D2 to S1	D2 to S1	D2 to S1	D2 to S1	D2 to S1
D3 to S2	D3 to S2	D1 to S2	D2 to S2	D2 to S2	D2 to S2	D2 to S2	D2 to S2
D3 to S3	D3 to S3	D1 to S3	D2 to S3	D2 to S3	D2 to S3	D2 to S3	D2 to S3
D3 to S4	D3 to S4	D1 to S4	D2 to S4	D2 to S4	D2 to S4	D2 to S4	D2 to S4

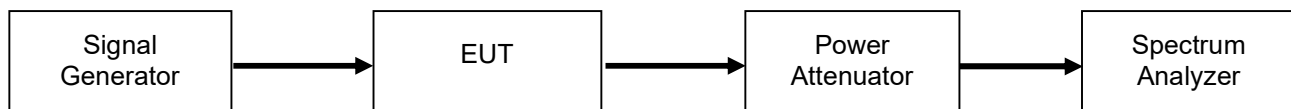
The following formulas are used for calculating the limits.

Conducted Spurious Emissions Limit =  $P1 - (43 + 10\text{Log}(P2)) = -13 \text{ dBm}$

P1 = power in dBm

P2 = power in Watts

### Test Setup



**Conducted Spurious Uplink Test Results  
Dedicated Port**

Frequency Band (MHz)	Measured Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Result
698 - 716	6016.7	-40.9	-13	Pass
776 - 787	775.9	-36.8	-13	Pass
824 - 849	6671.7	-40.8	-13	Pass
1710 - 1755	17169.7	-32	-13	Pass
1850 - 1915	19148.7	-33.3	-13	Pass

**Conducted Spurious Uplink Test Results  
Common Port**

Frequency Band (MHz)	Measured Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Result
698 - 716	6611.4	-41.3	-13	Pass
776 - 787	7434.6	-39.7	-13	Pass
824 - 849	8.465	-39.8	-13	Pass

**Conducted Spurious Downlink Test Results  
Dedicated Donor Port to Server Port 1**

Frequency Band (MHz)	Measured Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Result
728 - 746	1954.6	-38.7	-13	Pass
746 - 757	1966.1	-38.1	-13	Pass
869 - 894	1962	-39.3	-13	Pass
1930 - 1995	19696.1	-30.7	-13	Pass
2110 - 2155	19895.4	-30.8	-13	Pass

**Conducted Spurious Downlink Test Results  
Dedicated Donor Port to Server Port 2**

Frequency Band (MHz)	Measured Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Result
728 - 746	1964.3	-38.6	-13	Pass
746 - 757	1957.9	-38.9	-13	Pass
869 - 894	1966.1	-37.3	-13	Pass
1930 - 1995	19641.1	-31	-13	Pass
2110 - 2155	21775.2	-30.7	-13	Pass

**Conducted Spurious Downlink Test Results  
Dedicated Donor Port to Server Port 3**

Frequency Band (MHz)	Measured Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Result
728 - 746	2128.7	-40	-13	Pass
746 - 757	1958.4	-40	-13	Pass
869 - 894	7288.7	-39.1	-13	Pass
1930 - 1995	19594.3	-29.7	-13	Pass
2110 - 2155	2177.5	-31.1	-13	Pass

**Conducted Spurious Downlink Test Results  
Dedicated Donor Port to Server Port 4**

Frequency Band (MHz)	Measured Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Result
728 - 746	7294	-39.7	-13	Pass
746 - 757	2143.6	-40.3	-13	Pass
869 - 894	8625	-40.4	-13	Pass
1930 - 1995	19739.9	-30.7	-13	Pass
2110 - 2155	19789.3	-30.1	-13	Pass



**Conducted Spurious Downlink Test Results  
Common Donor Port 2 to Server Port 1**

Frequency Band (MHz)	Measured Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Result
728 - 746	1961.6	-38.5	-13	Pass
746 - 757	2131.9	-38.8	-13	Pass
869 - 894	1951.7	-39.1	-13	Pass

**Conducted Spurious Downlink Test Results  
Common Donor Port 2 to Server Port 2**

Frequency Band (MHz)	Measured Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Result
728 - 746	1953.4	-39.8	-13	Pass
746 - 757	2173.7	-38.1	-13	Pass
869 - 894	7974.3	-39.2	-13	Pass

**Conducted Spurious Downlink Test Results  
Common Donor Port 2 to Server Port 3**

Frequency Band (MHz)	Measured Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Result
728 - 746	1960.3	-39.4	-13	Pass
746 - 757	2144.3	-40	-13	Pass
869 - 894	1967.2	-39	-13	Pass

**Conducted Spurious Downlink Test Results  
Common Donor Port 2 to Server Port 4**

Frequency Band (MHz)	Measured Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Result
728 - 746	7449.3	-40.9	-13	Pass
746 - 757	7253.1	-40.5	-13	Pass
869 - 894	8918.6	-40.2	-13	Pass

For the 746 – 758 downlink and 776 – 788 Uplink bands of operation, the following additional spurious emissions requirements apply.

**FCC 27.53(c)**

For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than  $76 + 10 \log (P)$  dB in a 6.25 kHz band segment, for base and fixed stations;

**776 – 787 MHz Uplink Band  
Server port S3 to Dedicated Port D3**

Spurious Frequency Range (MHz)	Measured Frequency (MHz)	Measured Value (dBm)	RBW (kHz)	Final Value (dBm)	Limit (dBm)	Margin (dB)
763 – 775	769.001	-63.8	6.25	-63.80	-46	-17.80
793 – 805	803.619	-65.6	6.25	-65.60	-46	-19.60

**776 – 787 MHz Uplink Band  
Server port S1 to Common Port D2**

Spurious Frequency Range (MHz)	Measured Frequency (MHz)	Measured Value (dBm)	RBW (kHz)	Final Value (dBm)	Limit (dBm)	Margin (dB)
763 – 775	764.32	-76.9	6.25	-76.90	-46	-30.90
793 – 805	801.476	-77	6.25	-77.00	-46	-31.00

**746 - 757 MHz Downlink Band  
Dedicated Port D3 to Server Port S1**

Spurious Frequency Range (MHz)	Measured Frequency (MHz)	Measured Value (dBm)	RBW (kHz)	Final Value (dBm)	Limit (dBm)	Margin (dB)
763 – 775	772.535	-66.3	6.25	-66.30	-46	-20.30
793 – 805	804.672	-66.7	6.25	-66.70	-46	-20.70

**746 - 757 MHz Downlink Band  
Dedicated Port D3 to Server Port S2**

Spurious Frequency Range (MHz)	Measured Frequency (MHz)	Measured Value (dBm)	RBW (kHz)	Final Value (dBm)	Limit (dBm)	Margin (dB)
763 – 775	767.907	-66.2	6.25	-66.20	-46	-20.20
793 – 805	796.501	-66.9	6.25	-66.90	-46	-20.90

**746 - 757 MHz Downlink Band  
Dedicated Port D3 to Server Port S3**

Spurious Frequency Range (MHz)	Measured Frequency (MHz)	Measured Value (dBm)	RBW (kHz)	Final Value (dBm)	Limit (dBm)	Margin (dB)
763 – 775	764.55	-66.2	6.25	-66.20	-46	-20.20
793 – 805	793.827	-65.7	6.25	-65.70	-46	-19.70

**746 - 757 MHz Downlink Band  
Dedicated Port D3 to Server Port S4**

Spurious Frequency Range (MHz)	Measured Frequency (MHz)	Measured Value (dBm)	RBW (kHz)	Final Value (dBm)	Limit (dBm)	Margin (dB)
763 – 775	772.461	-66.9	6.25	-66.90	-46	-20.90
793 – 805	799.366	-67.1	6.25	-67.10	-46	-21.10

**746 - 757 MHz Downlink Band  
Common Port D2 to Server Port S1**

Spurious Frequency Range (MHz)	Measured Frequency (MHz)	Measured Value (dBm)	RBW (kHz)	Final Value (dBm)	Limit (dBm)	Margin (dB)
763 – 775	768.955	-76.3	6.25	-76.30	-46	-30.30
793 – 805	796.499	-73.5	6.25	-73.50	-46	-27.50

**746 - 757 MHz Downlink Band  
Common Port D2 to Server Port S2**

Spurious Frequency Range (MHz)	Measured Frequency (MHz)	Measured Value (dBm)	RBW (kHz)	Final Value (dBm)	Limit (dBm)	Margin (dB)
763 – 775	774.576	-77	6.25	-77.00	-46	-31.00
793 – 805	796.5	-73.6	6.25	-73.60	-46	-27.60

**746 - 757 MHz Downlink Band  
Common Port D2 to Server Port S3**

Spurious Frequency Range (MHz)	Measured Frequency (MHz)	Measured Value (dBm)	RBW (kHz)	Final Value (dBm)	Limit (dBm)	Margin (dB)
763 – 775	766.887	-77	6.25	-77.00	-46	-31.00
793 – 805	796.5	-72.9	6.25	-72.90	-46	-26.90

**746 - 757 MHz Downlink Band  
Common Port D2 to Server Port S4**

Spurious Frequency Range (MHz)	Measured Frequency (MHz)	Measured Value (dBm)	RBW (kHz)	Final Value (dBm)	Limit (dBm)	Margin (dB)
763 – 775	766.499	-75.9	6.25	-75.90	-46	-29.90
793 – 805	796.5	-73.8	6.25	-73.80	-46	-27.80

**FCC 27.53(e)**

For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

Since the limit is referenced to EIRP, the final data is computed using the Conducted Spurious Emission data and adding the BW correction factor plus the final gain/loss data from the antenna kitting information supplied by the manufacturer.

Final Value (dBm) = conducted measurement + final gain/loss from Antenna Kitting document

The Limit for discreet (narrowband) emissions is -80dBW (-50 dBm) in 700 MHz BW.

The Limit for (wideband Emissions) is -70 dBW (-40 dBm) in a 1 MHz BW.

**776 – 787 MHz Uplink Band  
Server port S3 to Dedicated Port D3**

Spurious Frequency Range (MHz)	Measured Frequency (MHz)	Measured Value (dBm)	RBW	Gain/Loss from Antenna Kitting Information (dB)	Final Value (dBm)	Limit (dBm)	Margin (dB)
1559 – 1610 (Wideband)	1562.952	-72.4	1 MHz	3.21	-69.19	-40	-29.19
1559 – 1610 (Narrowband)	1563	-77.9	700 Hz	3.21	-74.69	-50	-24.69

**776 – 787 MHz Uplink Band  
Server port S1 to Common Port D2**

Spurious Frequency Range (MHz)	Measured Frequency (MHz)	Measured Value (dBm)	Bandwidth Correction Factor (dB)	Gain/Loss from Antenna Kitting Information (dB)	Final Value (dBm)	Limit (dBm)	Margin (dB)
1559 – 1610 (Wideband)	1609.972	-71.5	1 MHz	3.21	-68.29	-40	-28.29
1559 – 1610 (Narrowband)	1559.763	-101.6	700 Hz	3.21	-98.39	-50	-48.39

**746 - 757 MHz Downlink Band  
Dedicated Port D3 to Server Port S1**

Spurious Frequency Range (MHz)	Measured Frequency (MHz)	Measured Value (dBm)	Bandwidth Correction Factor (dB)	Gain/Loss from Antenna Kitting Information (dB)	Final Value (dBm)	Limit (dBm)	Margin (dB)
1559 – 1610 (Wideband)	1608.18	-71.1	1 MHz	-1.69	-72.79	-40	-32.79
1559 – 1610 (Narrowband)	1608.425	-101.6	700 Hz	-1.69	-103.29	-50	-53.29

**746 - 757 MHz Downlink Band  
Dedicated Port D3 to Server Port S2**

Spurious Frequency Range (MHz)	Measured Frequency (MHz)	Measured Value (dBm)	Bandwidth Correction Factor (dB)	Gain/Loss from Antenna Kitting Information (dB)	Final Value (dBm)	Limit (dBm)	Margin (dB)
1559 – 1610 (Wideband)	1578.903	-70.7	1 MHz	-1.69	-72.39	-40	-32.39
1559 – 1610 (Narrowband)	1575.999	-101.7	700 Hz	-1.69	-103.39	-50	-53.39

**746 - 757 MHz Downlink Band  
Dedicated Port D3 to Server Port S3**

Spurious Frequency Range (MHz)	Measured Frequency (MHz)	Measured Value (dBm)	Bandwidth Correction Factor (dB)	Gain/Loss from Antenna Kitting Information (dB)	Final Value (dBm)	Limit (dBm)	Margin (dB)
1559 – 1610 (Wideband)	1573.051	-71.3	1 MHz	-1.69	-72.99	-40	-32.99
1559 – 1610 (Narrowband)	1594.029	-101.9	700 Hz	-1.69	-103.59	-50	-53.59

**746 - 757 MHz Downlink Band  
Dedicated Port D3 to Server Port S4**

Spurious Frequency Range (MHz)	Measured Frequency (MHz)	Measured Value (dBm)	Bandwidth Correction Factor (dB)	Gain/Loss from Antenna Kitting Information (dB)	Final Value (dBm)	Limit (dBm)	Margin (dB)
1559 – 1610 (Wideband)	1580.49	-72.1	1 MHz	-1.69	-73.79	-40	-33.79
1559 – 1610 (Narrowband)	1583.574	-101.6	700 Hz	-1.69	-103.29	-50	-53.29

**746 - 757 MHz Downlink Band  
Common Port D2 to Server Port S1**

Spurious Frequency Range (MHz)	Measured Frequency (MHz)	Measured Value (dBm)	Bandwidth Correction Factor (dB)	Gain/Loss from Antenna Kitting Information (dB)	Final Value (dBm)	Limit (dBm)	Margin (dB)
1559 – 1610 (Wideband)	1564.187	-71.5	1 MHz	-1.69	-73.19	-40	-33.19
1559 – 1610 (Narrowband)	1569.115	-100.7	700 Hz	-1.69	-102.39	-50	-52.39

**746 - 757 MHz Downlink Band  
Common Port D2 to Server Port S2**

Spurious Frequency Range (MHz)	Measured Frequency (MHz)	Measured Value (dBm)	Bandwidth Correction Factor (dB)	Gain/Loss from Antenna Kitting Information (dB)	Final Value (dBm)	Limit (dBm)	Margin (dB)
1559 – 1610 (Wideband)	1559.651	-70.9	1 MHz	-1.69	-72.59	-40	-32.59
1559 – 1610 (Narrowband)	1609.699	-101.3	700 Hz	-1.69	-102.99	-50	-52.99

**746 - 757 MHz Downlink Band  
Common Port D2 to Server Port S3**

Spurious Frequency Range (MHz)	Measured Frequency (MHz)	Measured Value (dBm)	Bandwidth Correction Factor (dB)	Gain/Loss from Antenna Kitting Information (dB)	Final Value (dBm)	Limit (dBm)	Margin (dB)
1559 – 1610 (Wideband)	1608.009	-71.6	1 MHz	-1.69	-73.29	-40	-33.29
1559 – 1610 (Narrowband)	1578.055	-101.7	700 Hz	-1.69	-103.39	-50	-53.39

**746 - 757 MHz Downlink Band  
Common Port D2 to Server Port S4**

Spurious Frequency Range (MHz)	Measured Frequency (MHz)	Measured Value (dBm)	Bandwidth Correction Factor (dB)	Gain/Loss from Antenna Kitting Information (dB)	Final Value (dBm)	Limit (dBm)	Margin (dB)
1559 – 1610 (Wideband)	1591.299	-71.8	1 MHz	-1.69	-73.49	-40	-33.49
1559 – 1610 (Narrowband)	1593.785	-101.4	700 Hz	-1.69	-103.09	-50	-53.09

**Annex E Conducted Spurious Emission**

Refer to Annex E for Conducted Spurious Emission plots.

**Noise Limits**

**Engineer:** Greg Corbin

**Test Date:** 11/2/2023

**Test Procedure**

The EUT was connected to a spectrum analyzer through an attenuator with the losses being input into the spectrum analyzer as a combination of reference level offset and correction factor as necessary to ensure that accurate readings were obtained. A series of three tests were performed: the maximum uplink and downlink noise, the variable noise for the uplink and downlink in the presence of a downlink signal, and the variable uplink noise timing. The detailed procedures from the latest version of KDB 935210 D03 were followed.

For the Uplink, measured each band on the dedicated port, then measured each band on the common port.  
 For the Downlink, measured each band on each server port.

**Signal Paths measured for Noise Limits**

Noise Power				
Dedicated Ports				
U/L				
B12	B13	B5	B4	B25
D3	D3	D1	D2	D2
D/L				
B12	B13	B5	B4	B25
S1	S1	S1	S1	S1
S2	S2	S2	S2	S2
S3	S3	S3	S3	S3
S4	S4	S4	S4	S4
Common Ports				
U/L				
B12	B13	B5	B4	B25
D2	D2	D2	D2	D2

**Variable Noise Power and Timing**

Reviewed all the power and gain data and selected the worst case (highest gain and output power) and measured the variable noise power and gain on that port.

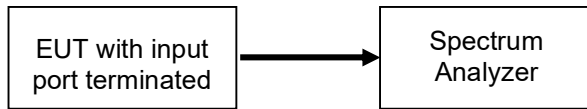
The following formulas are used for calculating the limits. Note – Downlink noise power limit is calculated with the center frequency of the associated uplink band.

Noise Power = -102.5+LOG10(Band Center Frequency)\*20

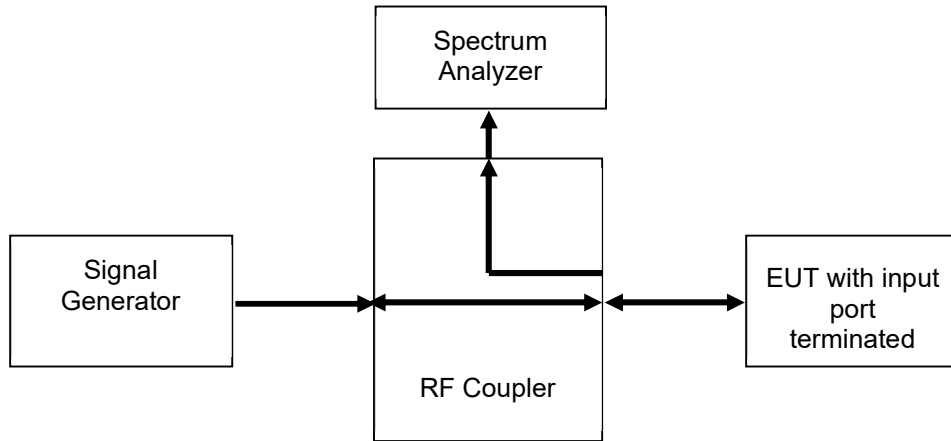
Variable Noise = -103 dBm/MHz-RSSI

### Test Setup

#### Maximum Noise Power



#### Variable Uplink Noise Power and Timing





**Maximum Uplink Noise Test Results  
Dedicated Ports**

Frequency Band (MHz)	Measured Noise (dBm)	Limit (dBm)	Margin (dB)	Result
698 - 716	-45.9	-45.5	-0.4	Pass
776 - 787	-45.2	-44.6	-0.6	Pass
824 - 849	-45.2	-44.1	-1.1	Pass
1710 - 1755	-38.1	-37.7	-0.4	Pass
1850 - 1915	-38.2	-37.0	-1.2	Pass

**Maximum Uplink Noise Test Results  
Common Port 2**

Frequency Band (MHz)	Measured Noise (dBm)	Limit (dBm)	Margin (dB)	Result
698 - 716	-47.2	-45.5	-1.7	Pass
776 - 787	-46.4	-44.6	-1.8	Pass
824 - 849	-45.3	-44.1	-1.2	Pass
1710 - 1755	-38	-37.7	-0.3	Pass
1850 - 1915	-37.5	-37.0	-0.5	Pass

**Maximum Downlink Noise Test Results  
Server Port 1**

Frequency Band (MHz)	Measured Noise (dBm)	Limit (dBm)	Margin (dB)	Result
728 - 746	-46.5	-45.5	-1.0	Pass
746 - 757	-45.8	-44.6	-1.2	Pass
869 - 894	-45.6	-44.1	-1.5	Pass
1930 - 1995	-37.7	-37.0	-0.7	Pass
2110 - 2155	-39.1	-37.7	-1.4	Pass

**Maximum Downlink Noise Test Results  
Server Port 2**

Frequency Band (MHz)	Measured Noise (dBm)	Limit (dBm)	Margin (dB)	Result
728 - 746	-46.1	-45.5	-0.6	Pass
746 - 757	-45.8	-44.6	-1.2	Pass
869 - 894	-45.7	-44.1	-1.6	Pass
1930 - 1995	-37.9	-37.0	-0.9	Pass
2110 - 2155	-38.5	-37.7	-0.8	Pass

**Maximum Downlink Noise Test Results  
Server Port 3**

Frequency Band (MHz)	Measured Noise (dBm)	Limit (dBm)	Margin (dB)	Result
728 - 746	-46.9	-45.5	-1.4	Pass
746 - 757	-45.9	-44.6	-1.3	Pass
869 - 894	-46	-44.1	-1.9	Pass
1930 - 1995	-38.5	-37.0	-1.5	Pass
2110 - 2155	-40	-37.7	-2.3	Pass

**Maximum Downlink Noise Test Results  
Server Port 4**

Frequency Band (MHz)	Measured Noise (dBm)	Limit (dBm)	Margin (dB)	Result
728 - 746	-46.9	-45.5	-1.4	Pass
746 - 757	-46.5	-44.6	-1.9	Pass
869 - 894	-46.5	-44.1	-2.4	Pass
1930 - 1995	-40.6	-37.0	-3.6	Pass
2110 - 2155	-40.8	-37.7	-3.1	Pass

**Uplink Noise Timing Test Results  
Dedicated Ports**

Frequency Band (MHz)	Measured Timing (Seconds)	Limit (Seconds)	Result
698 - 716	0.55	3.0	Pass
776 - 787	0.62	3.0	Pass
824 - 849	0.70	3.0	Pass
1710 - 1755	1.37	3.0	Pass
1850 - 1915	1.07	3.0	Pass

**Annex F Noise Power and Uplink Noise Timing**

Refer to Annex F for Noise Power and Uplink Noise Timing Plots

**Signal Paths measured for Uplink Variable Noise**

Variable Noise				
Dedicated Ports				
U/L				
B12	B13	B5	B4	B25
S2 to D3	S3 to D3	S3 to D1	S4 to D2	S4 to D2
Common Ports				
U/L				
B12	B13	B5		
S2 to D2	S1 to D2	S4 to D2		

**Variable Uplink Noise Limit Test Results  
Dedicated Ports**

**698 - 716 MHz**

**Server Port 2 to Dedicated Port 3**

RSSI (dBm)	Noise Limit (dBm)	Measured Noise (dBm)	Margin (dB)
-61.0	-45.5	-46.8	-1.3
-60.0	-45.5	-47.6	-2.1
-59.0	-45.5	-47.8	-2.3
-51.0	-52.0	-54.6	-2.6
-44.0	-59.0	-61.9	-2.9
-36.0	-67.0	-69.1	-2.1

**776 - 787 MHz**

**Server Port 3 to Dedicated Port 3**

RSSI (dBm)	Noise Limit (dBm)	Measured Noise (dBm)	Margin (dB)
-61.0	-44.6	-46.1	-1.5
-60.0	-44.6	-47.5	-2.9
-59.0	-44.6	-48.2	-3.6
-53.0	-50.0	-53.6	-3.6
-48.0	-55.0	-58.6	-3.6
-38.0	-65.0	-67.8	-2.8

**824 - 849 MHz**

**Server Port 3 to Dedicated Port 1**

RSSI (dBm)	Noise Limit (dBm)	Measured Noise (dBm)	Margin (dB)
-66.0	-44.1	-45.5	-1.4
-65.0	-44.1	-45.3	-1.2
-64.0	-44.1	-46.4	-2.3
-63.0	-44.1	-47.2	-3.1
-62.0	-44.1	-47	-2.9
-61.0	-44.1	-48.3	-4.2

**1710 - 1755 MHz  
Server Port 4 to Dedicated Port 2**

<b>RSSI (dBm)</b>	<b>Noise Limit (dBm)</b>	<b>Measured Noise (dBm)</b>	<b>Margin (dB)</b>
-65.0	-38.0	-38.7	-0.7
-64.0	-39.0	-40.1	-1.1
-63.0	-40.0	-41.2	-1.2
-62.0	-41.0	-42.2	-1.2
-60.0	-43.0	-44	-1.0
-59.0	-44.0	-45	-1.0

**1850 - 1915 MHz  
Server Port 4 to Dedicated Port 2**

<b>RSSI (dBm)</b>	<b>Noise Limit (dBm)</b>	<b>Measured Noise (dBm)</b>	<b>Margin (dB)</b>
-63.0	-40.0	-41.7	-1.7
-62.0	-41.0	-42.6	-1.6
-61.0	-42.0	-43.9	-1.9
-59.0	-44.0	-45.6	-1.6
-58.0	-45.0	-46.7	-1.7
-57.0	-46.0	-47.8	-1.8

**Common Port**

**698 - 716 MHz  
Server Port 2 to Common Port 2**

<b>RSSI (dBm)</b>	<b>Noise Limit (dBm)</b>	<b>Measured Noise (dBm)</b>	<b>Margin (dB)</b>
-56.0	-47.0	-50.2	-3.2
-53.0	-50.0	-53.3	-3.3
-47.0	-56.0	-59.3	-3.3
-45.0	-58.0	-61.2	-3.2
-43.0	-60.0	-63	-3.0
-39.0	-64.0	-66.9	-2.9

**776 - 787 MHz  
Server Port 1 to Common Port 2**

<b>RSSI (dBm)</b>	<b>Noise Limit (dBm)</b>	<b>Measured Noise (dBm)</b>	<b>Margin (dB)</b>
-55.0	-48.0	-51.5	-3.5
-53.0	-50.0	-53.1	-3.1
-50.0	-53.0	-56.5	-3.5
-49.0	-54.0	-57.4	-3.4
-46.0	-57.0	-60.6	-3.6
-39.0	-64.0	-66.9	-2.9

**824 - 849 MHz  
Server Port 4 to Common Port 2**

<b>RSSI (dBm)</b>	<b>Noise Limit (dBm)</b>	<b>Measured Noise (dBm)</b>	<b>Margin (dB)</b>
-66.0	-44.1	-46	-1.9
-65.0	-44.1	-45.3	-1.2
-64.0	-44.1	-45.8	-1.7
-63.0	-44.1	-47.4	-3.3
-62.0	-44.1	-47.6	-3.5
-61.0	-44.1	-48.9	-4.8

**Uplink Inactivity**

**Engineer:** Greg Corbin

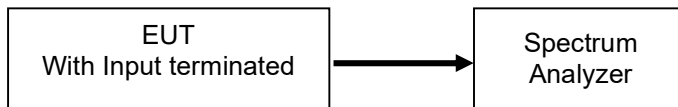
**Test Date:** 11/16/2023

**Test Procedure**

The EUT was connected directly to a spectrum analyzer set to operate in the center of the EUT operational uplink bands. The span was set to 0 Hz with a sweep time of 350 seconds and MAX HOLD operation. The EUT was powered on and the time for the uplink to return to an inactive state was measured using the DELTA MARKER method to ensure that it was less than 300 seconds. The noise level after the return to an inactive state was less than -70 dBm/MHz.

The server ports were terminated with 50 ohms.  
The Uplink Inactivity was measured at the Dedicated Donor Port outputs.

**Test Setup**



**Uplink Test Results**

Frequency Band (MHz)	Measured Time (Seconds)	Limit (Seconds)	Result
698 - 716	286.125	300	Pass
776 - 787	286.125	300	Pass
824 - 849	286.125	300	Pass
1710 - 1755	286.125	300	Pass
1850 - 1915	286.125	300	Pass

**Annex G Uplink Inactivity**

Refer to Annex G for Uplink Inactivity Plots

**Variable Gain**

**Engineer:** Greg Corbin

**Test Date:** 11/7/2023

**Test Procedure**

The EUT was connected to a spectrum analyzer through an attenuator with the losses being input into the spectrum analyzer as a combination of reference level offset and correction factor in order to ensure accurate readings were obtained. The uplink gain in the presence of a downlink signal was measured for each operational uplink band using the detailed procedures from the latest version of KDB 935210 D03.

For the Uplink variable gain and gain timing, the test was performed on each band thru the dedicated port and the measurement was repeated for Bands 5, 12 and 13 on the common port. Reviewed all the power and gain data and selected the worst case (highest gain and output power) and measured the variable noise power and gain on that port.

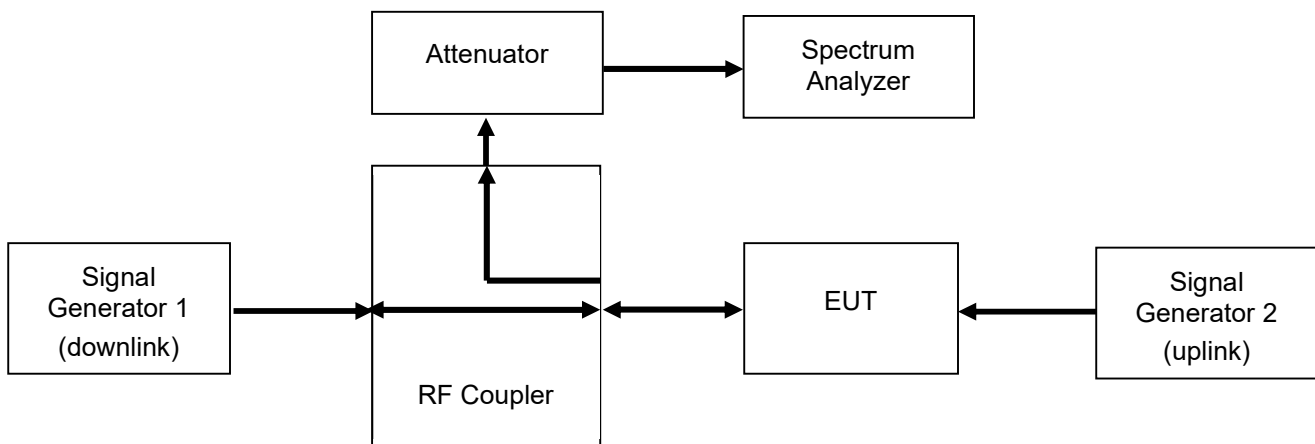
**Signal Paths measured for Variable Gain and Gain Timing**

Variable Gain and Gain Timing				
Dedicated Ports				
U/L				
B12	B13	B5	B4	B25
S2 to D3	S3 to D3	S3 to D1	S4 to D2	S4 to D2
Common Ports				
U/L				
B12	B13	B5		
S2 to D2	S1 to D2	S4 to D2		

The following formula is used for calculating the limits:

$$\text{Variable Gain} = -34 \text{ dB} - \text{RSSI} + \text{MSCL}$$

**Test Setup**



### Uplink Test Results

#### 698 - 716 MHz Server Port 2 to Dedicated Donor Port 3

RSSI (dBm)	MSCL (dB)	Gain Limit (dBm)	P(in) (dBm)	P(out) (dBm)	Gain (dB)	Margin (dB)
-61.0	40.2	63.5	-36.6	20.5	57.1	-6.4
-60.0	40.2	63.5	-36.6	19.5	56.1	-7.4
-59.0	40.2	63.5	-36.6	18.5	55.1	-8.4
-58.0	40.2	63.5	-36.6	17.5	54.1	-9.4
-48.0	40.2	54.2	-36.6	8.1	44.7	-9.5
-46.0	40.2	52.2	-36.6	6.2	42.8	-9.3

#### 776 - 787 MHz Server Port 3 to Dedicated Donor Port 3

RSSI (dBm)	MSCL (dB)	Gain Limit (dBm)	P(in) (dBm)	P(out) (dBm)	Gain (dB)	Margin (dB)
-63.0	40.3	64.0	-35.0	20.5	55.5	-8.5
-62.0	40.3	64.0	-35.0	20.5	55.5	-8.5
-61.0	40.3	64.0	-35.0	19.5	54.5	-9.5
-60.0	40.3	64.0	-35.0	18.5	53.5	-10.5
-59.0	40.3	64.0	-35.0	17.5	52.5	-11.5
-58.0	40.3	64.0	-35.0	16.5	51.5	-12.5

#### 824 - 849 MHz Server Port 3 to Dedicated Donor Port 1

RSSI (dBm)	MSCL (dB)	Gain Limit (dBm)	P(in) (dBm)	P(out) (dBm)	Gain (dB)	Margin (dB)
-66.0	42.0	65.0	-37.0	18.9	55.9	-9.1
-65.0	42.0	65.0	-37.0	18.9	55.9	-9.1
-64.0	42.0	65.0	-37.0	17.8	54.8	-10.2
-63.0	42.0	65.0	-37.0	17.4	54.4	-10.6
-62.0	42.0	65.0	-37.0	16.3	53.3	-11.7
-61.0	42.0	65.0	-37.0	15.8	52.8	-12.2

#### 1710 - 1755 MHz Server Port 4 to Dedicated Donor Port 2

RSSI (dBm)	MSCL (dB)	Gain Limit (dBm)	P(in) (dBm)	P(out) (dBm)	Gain (dB)	Margin (dB)
-67.0	45.8	71.0	-43.8	19.4	63.2	-7.8
-66.0	45.8	71.0	-43.8	18.9	62.7	-8.3
-65.0	45.8	71.0	-43.8	17.6	61.4	-9.6
-64.0	45.8	71.0	-43.8	16.6	60.4	-10.6
-63.0	45.8	71.0	-43.8	15.7	59.5	-11.5
-62.0	45.8	71.0	-43.8	14.6	58.4	-12.6



**1850 - 1915 MHz  
Server Port 4 to Dedicated Donor Port 2**

RSSI (dBm)	MSCL (dB)	Gain Limit (dBm)	P(in) (dBm)	P(out) (dBm)	Gain (dB)	Margin (dB)
-69.0	47.5	72.0	-44.3	18.0	62.3	-9.7
-68.0	47.5	72.0	-44.3	17.5	61.8	-10.2
-67.0	47.5	72.0	-44.3	16.6	60.9	-11.1
-66.0	47.5	72.0	-44.3	15.7	60.0	-12.0
-65.0	47.5	72.0	-44.3	14.8	59.1	-12.9
-64.0	47.5	72.0	-44.3	13.9	58.2	-13.8

**698 - 716 MHz  
Server Port 2 to Common Donor Port 2**

RSSI (dBm)	MSCL (dB)	Gain Limit (dBm)	P(in) (dBm)	P(out) (dBm)	Gain (dB)	Margin (dB)
-60.0	40.2	63.5	-36.1	19.4	55.5	-8.0
-59.0	40.2	63.5	-36.1	18.9	55.0	-8.5
-58.0	40.2	63.5	-36.1	17.8	53.9	-9.6
-57.0	40.2	63.2	-36.1	16.9	53.0	-10.2
-56.0	40.2	62.2	-36.1	15.9	52.0	-10.2
-55.0	40.2	61.2	-36.1	14.9	51.0	-10.2

**776 - 787 MHz  
Server Port 1 to Common Donor Port 2**

RSSI (dBm)	MSCL (dB)	Gain Limit (dBm)	P(in) (dBm)	P(out) (dBm)	Gain (dB)	Margin (dB)
-61.0	40.3	64.4	-34.8	19.0	53.8	-10.6
-60.0	40.3	64.4	-34.8	18.0	52.8	-11.6
-59.0	40.3	64.4	-34.8	17.0	51.8	-12.6
-52.0	40.3	58.3	-34.8	10.6	45.4	-12.9
-50.0	40.3	56.3	-34.8	8.6	43.4	-12.9
-48.0	40.3	54.3	-34.8	6.2	41.0	-13.3

**824 - 849 MHz  
Server Port 4 to Common Donor Port 2**

RSSI (dBm)	MSCL (dB)	Gain Limit (dBm)	P(in) (dBm)	P(out) (dBm)	Gain (dB)	Margin (dB)
-66.0	42.0	65.0	-36.5	18.6	55.1	-9.9
-65.0	42.0	65.0	-36.5	18.6	55.1	-9.9
-64.0	42.0	65.0	-36.5	17.6	54.1	-10.9
-63.0	42.0	65.0	-36.5	17.0	53.5	-11.5
-62.0	42.0	65.0	-36.5	16.0	52.5	-12.5
-61.0	42.0	65.0	-36.5	15.5	52.0	-13.0

## Uplink Gain Timing Test Results

### Dedicated Ports

Frequency Band (MHz)	Measured Timing (Seconds)	Limit (Seconds)	Result
704 - 716	1.15	3.0	Pass
776 - 787	0.82	3.0	Pass
824 - 849	0.88	3.0	Pass
1710 - 1755	1.33	3.0	Pass
1850 - 1915	1.37	3.0	Pass

### Common Port

Frequency Band (MHz)	Measured Timing (Seconds)	Limit (Seconds)	Result
704 - 716	1.00	3.0	Pass
776 - 787	0.70	3.0	Pass
824 - 849	0.75	3.0	Pass

## Annex H Uplink Gain Timing

Refer to Annex H for Uplink Gain Timing Plots

## Occupied Bandwidth

**Engineer:** Greg Corbin

**Test Date:** 11/8/2023

### Test Procedure

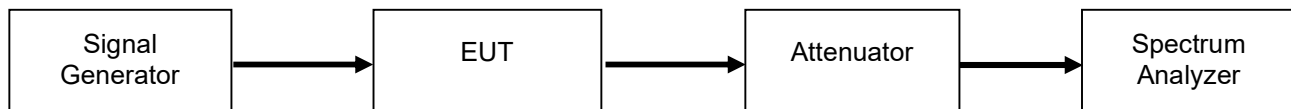
The EUT was connected to a spectrum analyzer through an attenuator with the losses being input into the spectrum analyzer as a combination of reference level offset and correction factor as required to ensure that accurate readings were obtained. A signal generator was utilized to produce the following signals: GSM, CDMA, and WCDMA. The signal generator was tuned to the center channel of each of the EUT operational uplink and downlink bands with the RF level set at a point just prior to the AGC being in control of the power. For each modulation type, the input and output signal was measured and plotted to ensure that the signals were similar.

Occupied Bandwidth was only tested from Server Port 1 to Dedicated Ports.  
 OCC BW for Common and Dedicated Ports will look the same and no need to test both.

### Signal Paths measured for Occupied BW

Occupied BW				
U/L				
B12	B13	B5	B4	B25
S1 to D3	S1 to D3	S1 to D1	S1 to D2	S1 to D2
D/L				
B12	B13	B5	B4	B25
D3 to S1	D3 to S1	D1 to S1	D2 to S1	D2 to S1

### Test Setup



## Annex I Occupied Bandwidth

Refer to Annex I for Occupied Bandwidth plots.

## Anti-Oscillation

**Engineer:** Greg Corbin

**Test Date:** 11/21/2023

### Test Procedure

The EUT was connected to a spectrum analyzer set for zero span mode. The EUT uplink and downlink were loop backed to each other through a selectable band pass filter and variable attenuator. The EUT uplink and downlink were tested to ensure that the presence of oscillation was detected and that the EUT output turned off within 300 mS for the Uplink and 1 second for the Downlink and remained off for 1 minute. The time was extended to capture how many times the unit attempted to restart.

Anti-Oscillation was measured for all signal paths.

Per the manufacturer, for the Restart Timing and # of Restarts test, the signal booster shuts down after the first oscillation detection and there are no restarts to be measured.

The restart test was monitored and recorded for 350 seconds to verify no restarts for all bands in dedicated mode from server port 1 to the dedicated port.

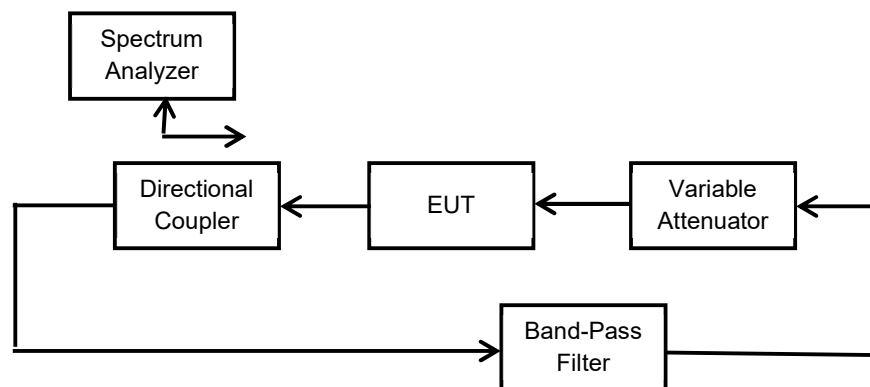
For the remainder of the restart timing tests the monitoring time was reduced to 120 seconds.

For all bands and modes there was no restart after the 1<sup>st</sup> oscillation was detected and the unit shutdown.

### Signal Paths measured for Anti-Oscillation

Anti-Oscillation					Anti-Oscillation		
Dedicated Ports					Common Ports		
U/L					U/L		
B12	B13	B5	B4	B25	B12	B13	B5
S1 to D3	S1 to D3	S1 to D1	S1 to D2	S1 to D2	S1 to D2	S1 to D2	S1 to D2
S2 to D3	S2 to D3	S2 to D1	S2 to D2	S2 to D2	S2 to D2	S2 to D2	S2 to D2
S3 to D3	S3 to D3	S3 to D1	S3 to D2	S3 to D2	S3 to D2	S3 to D2	S3 to D2
S4 to D3	S4 to D3	S4 to D1	S4 to D2	S4 to D2	S4 to D2	S4 to D2	S4 to D2
D/L					D/L		
B12	B13	B5	B4	B25	B12	B13	B5
D3 to S1	D3 to S1	D1 to S1	D2 to S1	D2 to S1	D2 to S1	D2 to S1	D2 to S1
D3 to S2	D3 to S2	D1 to S2	D2 to S2	D2 to S2	D2 to S2	D2 to S2	D2 to S2
D3 to S3	D3 to S3	D1 to S3	D2 to S3	D2 to S3	D2 to S3	D2 to S3	D2 to S3
D3 to S4	D3 to S4	D1 to S4	D2 to S4	D2 to S4	D2 to S4	D2 to S4	D2 to S4

### Oscillation Detection Test Setup



### Uplink Detection Time Test Results

#### Server Port 1 to Dedicated Donor Port

Frequency Band (MHz)	Measured Time (mS)	Limit (mS)	Result
698 - 716	275	300	Pass
776 - 787	125	300	Pass
824 - 849	162.5	300	Pass
1710 - 1755	150	300	Pass
1850 - 1915	125	300	Pass

#### Uplink Detection Time

#### Server Port 2 to Dedicated Donor Port

Frequency Band (MHz)	Measured Time (mS)	Limit (mS)	Result
698 - 716	287.5	300	Pass
776 - 787	137.5	300	Pass
824 - 849	175	300	Pass
1710 - 1755	125	300	Pass
1850 - 1915	125	300	Pass

#### Uplink Detection Time

#### Server Port 3 to Dedicated Donor Port

Frequency Band (MHz)	Measured Time (mS)	Limit (mS)	Result
698 - 716	287.5	300	Pass
776 - 787	125	300	Pass
824 - 849	125	300	Pass
1710 - 1755	237.5	300	Pass
1850 - 1915	125	300	Pass

#### Uplink Detection Time

#### Server Port 4 to Dedicated Donor Port

Frequency Band (MHz)	Measured Time (mS)	Limit (mS)	Result
698 - 716	250	300	Pass
776 - 787	125	300	Pass
824 - 849	112.5	300	Pass
1710 - 1755	225	300	Pass
1850 - 1915	237.5	300	Pass

**Uplink Detection Time  
Server Port 1 to Common Donor Port 2**

Frequency Band (MHz)	Measured Time (mS)	Limit (mS)	Result
698 - 716	187.5	300	Pass
776 - 787	137.5	300	Pass
824 - 849	125	300	Pass

**Uplink Detection Time  
Server Port 2 to Common Donor Port 2**

Frequency Band (MHz)	Measured Time (mS)	Limit (mS)	Result
698 - 716	200	300	Pass
776 - 787	137.5	300	Pass
824 - 849	250	300	Pass

**Uplink Detection Time  
Server Port 3 to Common Donor Port 2**

Frequency Band (MHz)	Measured Time (mS)	Limit (mS)	Result
698 - 716	150	300	Pass
776 - 787	125	300	Pass
824 - 849	262.5	300	Pass

**Uplink Detection Time  
Server Port 4 to Common Donor Port 2**

Frequency Band (MHz)	Measured Time (mS)	Limit (mS)	Result
698 - 716	225	300	Pass
776 - 787	125	300	Pass
824 - 849	125	300	Pass

## Downlink Detection Time Test Results

### Dedicated Donor Port to Server Port 1

Frequency Band (MHz)	Measured Time (mS)	Limit (mS)	Result
728 - 746	287.5	1000	Pass
746 - 757	200	1000	Pass
869 - 894	200	1000	Pass
1930 - 1995	225	1000	Pass
2110 - 2155	212.5	1000	Pass

### Downlink Detection Time Dedicated Donor Port to Server Port 2

Frequency Band (MHz)	Measured Time (mS)	Limit (mS)	Result
728 - 746	500	1000	Pass
746 - 757	237.5	1000	Pass
869 - 894	187.5	1000	Pass
1930 - 1995	300	1000	Pass
2110 - 2155	187.5	1000	Pass

### Downlink Detection Time Dedicated Donor Port to Server Port 3

Frequency Band (MHz)	Measured Time (mS)	Limit (mS)	Result
728 - 746	225	1000	Pass
746 - 757	225	1000	Pass
869 - 894	175.00	1000	Pass
1930 - 1995	200	1000	Pass
2110 - 2155	275	1000	Pass

### Downlink Detection Time Dedicated Donor Port to Server Port 4

Frequency Band (MHz)	Measured Time (mS)	Limit (mS)	Result
728 - 746	325	1000	Pass
746 - 757	200	1000	Pass
869 - 894	200	1000	Pass
1930 - 1995	250	1000	Pass
2110 - 2155	200	1000	Pass

**Downlink Detection Time  
Common Donor Port 2 to Server Port 1**

Frequency Band (MHz)	Measured Time (mS)	Limit (mS)	Result
728 - 746	112.5	1000	Pass
746 - 757	112.5	1000	Pass
869 - 894	137.5	1000	Pass

**Downlink Detection Time  
Common Donor Port 2 to Server Port 2**

Frequency Band (MHz)	Measured Time (mS)	Limit (mS)	Result
728 - 746	137.5	1000	Pass
746 - 757	75	1000	Pass
869 - 894	125	1000	Pass

**Downlink Detection Time  
Common Donor Port 2 to Server Port 3**

Frequency Band (MHz)	Measured Time (mS)	Limit (mS)	Result
728 - 746	112.5	1000	Pass
746 - 757	112.5	1000	Pass
869 - 894	237.5	1000	Pass

**Downlink Detection Time  
Common Donor Port 2 to Server Port 4**

Frequency Band (MHz)	Measured Time (mS)	Limit (mS)	Result
728 - 746	112.5	1000	Pass
746 - 757	125	1000	Pass
869 - 894	125	1000	Pass



**Note: For all uplink and downlink signal paths**

Per the manufacturer, for the Restart Timing and # of Restarts test, the signal booster shuts down after the first oscillation detection and there are no restarts to be measured.

The restart test was monitored and recorded for 350 seconds to verify no restarts for all bands in dedicated mode from server port 1 to the dedicated port.

For the remainder of the restart timing tests the monitoring time was reduced to 120 seconds.

For all bands and modes there was no restart after the 1<sup>st</sup> oscillation was detected and the unit shutdown.

**Uplink Restart Time Test Results**

Frequency Band (MHz)	Measured Time (S)	Limit (S)	Result
698 - 716	No Restarts	≥60	Pass
776 - 787	No Restarts	≥60	Pass
824 - 849	No Restarts	≥60	Pass
1710 - 1755	No Restarts	≥60	Pass
1850 - 1915	No Restarts	≥60	Pass

**Downlink Restart Time Test Results**

Frequency Band (MHz)	Measured Time (S)	Limit (S)	Result
728 - 746	No Restarts	≥60	Pass
746 - 757	No Restarts	≥60	Pass
869 - 894	No Restarts	≥60	Pass
1930 - 1995	No Restarts	≥60	Pass
2110 - 2155	No Restarts	≥60	Pass

**Uplink Restart Count Test Results**

Frequency Band (MHz)	Restarts	Limit	Result
698 - 716	No Restarts	≤5	Pass
776 - 787	No Restarts	≤5	Pass
824 - 849	No Restarts	≤5	Pass
1710 - 1755	No Restarts	≤5	Pass
1850 - 1915	No Restarts	≤5	Pass

**Downlink Restart Count Test Results**

Frequency Band (MHz)	Restarts	Limit	Result
728 - 746	No Restarts	≤5	Pass
746 - 757	No Restarts	≤5	Pass
869 - 894	No Restarts	≤5	Pass
1930 - 1995	No Restarts	≤5	Pass
2110 - 2155	No Restarts	≤5	Pass

**Annex J Anti-Oscillation**

**Refer to Annex J for Anti-Oscillation Plots**

## Oscillation Mitigation

**Engineer:** Greg Corbin

**Test Date:** 11/22/2023

### Test Procedure

The EUT was connected as shown per KDB 935210 D03. The EUT was verified to shut down in the presence of an oscillation.

The total attenuation from output to input was set +5 dB higher than the gain for the band being tested.

For EUT's that do not shutdown, the peak oscillation was measured and the variable attenuator was reduced in 1 dB increments until the booster shuts off.

The frequency and amplitude of the highest oscillation and the lowest level in the valley next to the oscillation was recorded for each 1 dB step as required per the KDB.

For oscillations that exceeded the 12 dB limit, the time required for the booster to mitigate the oscillation to less than 12 dB was recorded.

If the booster mitigated the oscillation within the 300 second time limit, the time required to mitigate the oscillation was recorded along with the final level of the oscillation after mitigation.

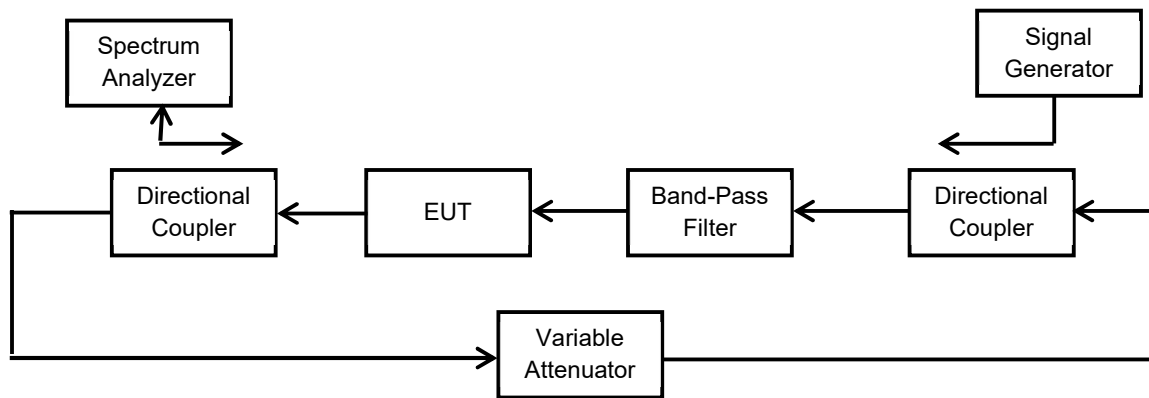
Oscillation Mitigation was measured for all signal paths.

**Note:** In all cases the booster mitigated the oscillation to less than 12 dB before the 300 second limit.

### Signal Paths measured for Oscillation Mitigation

Oscillation Mitigation					Oscillation Mitigation		
Dedicated Ports					Common Ports		
U/L					U/L		
B12	B13	B5	B4	B25	B12	B13	B5
S1 to D3	S1 to D3	S1 to D1	S1 to D2	S1 to D2	S1 to D2	S1 to D2	S1 to D2
S2 to D3	S2 to D3	S2 to D1	S2 to D2	S2 to D2	S2 to D2	S2 to D2	S2 to D2
S3 to D3	S3 to D3	S3 to D1	S3 to D2	S3 to D2	S3 to D2	S3 to D2	S3 to D2
S4 to D3	S4 to D3	S4 to D1	S4 to D2	S4 to D2	S4 to D2	S4 to D2	S4 to D2
D/L					D/L		
B12	B13	B5	B4	B25	B12	B13	B5
D3 to S1	D3 to S1	D1 to S1	D2 to S1	D2 to S1	D2 to S1	D2 to S1	D2 to S1
D3 to S2	D3 to S2	D1 to S2	D2 to S2	D2 to S2	D2 to S2	D2 to S2	D2 to S2
D3 to S3	D3 to S3	D1 to S3	D2 to S3	D2 to S3	D2 to S3	D2 to S3	D2 to S3
D3 to S4	D3 to S4	D1 to S4	D2 to S4	D2 to S4	D2 to S4	D2 to S4	D2 to S4

### Oscillation Mitigation Test Setup



### Uplink Oscillation Mitigation Test Data – Dedicated Ports

Oscillation Mitigation – Uplink Server Port 1 to Dedicated Port 3									
Band	698 – 716 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	703.55	-58.7	703.79	-72.4	13.7	<12	240	< 300	P
+4	EUT Shutdown								P

Oscillation Mitigation – Uplink Server Port 1 to Dedicated Port 3									
Band	776 – 787 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	781.411	-59	781.611	-72.6	13.6	<12	165	< 300	P
+4	781.411	-65.4	781.611	-74.5	9.1	<12	N/A	< 300	P
+3	781.411	-66.3	781.611	-75.3	9	<12	N/A	< 300	P
+2	781.411	-64.3	781.611	-75.4	11.1	<12	N/A	< 300	P
+1	781.411	-63.3	781.611	-75.8	12.5	<12	40	< 300	P
+0	EUT Shutdown								P

Oscillation Mitigation – Uplink Server Port 1 to Dedicated Port 1									
Band	824 - 849 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	838.8	-60.5	839.1	-71.5	11	<12	N/A	< 300	P
+4	838.8	-58.5	839.1	-72.2	13.7	<12	138	< 300	P
+3	838.8	-64.8	839.1	-73.8	9	<12	N/A	< 300	P
+2	838.8	-64.9	839.1	-74.3	9.4	<12	N/A	< 300	P
+1	838.8	-63.9	839.1	-74.2	10.3	<12	N/A	< 300	P
+0	838.8	-62.6	839.1	-75.3	12.7	<12	68	< 300	P
-1	838.8	-69.7	839.1	-77.8	8.1	<12	N/A	< 300	P
-2	838.8	-68.7	839.1	-78.9	10.2	<12	N/A	< 300	P
-3	838.8	-67.1	839.1	-79.5	12.4	<12	104	< 300	P
-4	838.8	-70.6	839.1	-80.9	10.3	<12	N/A	< 300	P
-5	838.8	-70.7	839.1	-80.3	9.6	<12	N/A	< 300	P

Oscillation Mitigation – Uplink Server Port 1 to Dedicated Port 2									
Band	1710 - 1755 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	1722.3	-51.2	1722.9	-64.8	13.6	<12	167	< 300	P
+4	1722.3	-51.5	1722.9	-65.1	13.6	<12	150	< 300	P
+3	1722.3	-56.3	1722.9	-66.8	10.5	<12	N/A	< 300	P
+2	1722.3	-55.4	1722.9	-67.3	11.9	<12	N/A	< 300	P
+1	1722.3	-53.3	1722.9	-68.1	14.8	<12	109	< 300	P
+0	1722.3	-57.2	1722.9	-68.9	11.7	<12	N/A	< 300	P
-1	1722.3	-55.2	1722.9	-69.8	14.6	<12	126	< 300	P
-2	1722.3	-63.2	1722.9	-72	8.8	<12	N/A	< 300	P
-3	1722.3	-63.3	1722.9	-72.1	8.8	<12	N/A	< 300	P
-4	1722.3	-61.3	1722.9	-72.6	11.3	<12	N/A	< 300	P
-5	1722.3	-60.6	1722.9	-75.3	14.7	<12	95	< 300	P

Oscillation Mitigation – Uplink Server Port 1 to Dedicated Port 2									
Band	1850 - 1915 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	1867.2	-48.6	1867.7	-64.1	15.5	<12	162	< 300	P
+4	1867.2	-59.3	1867.7	-67.2	7.9	<12	N/A	< 300	P
+3	1867.2	-57.5	1867.7	-67.2	9.7	<12	N/A	< 300	P
+2	1867.2	-56.8	1867.7	-68.2	11.4	<12	N/A	< 300	P
+1	1867.2	-53.5	1867.7	-68.2	14.7	<12	80	< 300	P
+0	1867.2	-62.4	1867.7	-71	8.6	<12	N/A	< 300	P
-1	1867.2	-61.8	1867.7	-72.3	10.5	<12	N/A	< 300	P
-2	1867.2	-60.6	1867.7	-71.9	11.3	<12	N/A	< 300	P
-3	1867.2	-58.9	1867.7	-72.3	13.4	<12	95	< 300	P
-4	EUT Shutdown								P

Oscillation Mitigation – Uplink Server Port 2 to Dedicated Port 3									
Band	698 – 716 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	706.75	-62.2	706.99	-72.5	10.3	<12	N/A	< 300	P
+4	706.75	-61.8	706.99	-72.7	10.9	<12	N/A	< 300	P
+3	706.75	-58.3	706.99	-73.1	14.8	<12	127	< 300	P
+2	EUT Shutdown								P

Oscillation Mitigation – Uplink Server Port 2 to Dedicated Port 3									
Band	776 – 787 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	778.2	-58.7	778.4	-72.7	14	<12	155	< 300	P
+4	778.2	-66.5	778.4	-75	8.5	<12	N/A	< 300	P
+3	778.2	-65.8	778.4	-75.3	9.5	<12	N/A	< 300	P
+2	778.2	-64.5	778.4	-75.4	10.9	<12	N/A	< 300	P
+1	778.2	-62.9	778.4	-75.9	13	<12	92	< 300	P
+0	EUT Shutdown								P

Oscillation Mitigation – Uplink Server Port 2 to Dedicated Port 1									
Band	824 - 849 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	839.7	-60.7	840	-71.1	10.4	<12	N/A	< 300	P
+4	839.7	-58.7	840	-72	13.3	<12	137	< 300	P
+3	839.7	-65.5	840	-74.5	9	<12	N/A	< 300	P
+2	839.7	-64.4	840	-75.9	11.5	<12	N/A	< 300	P
+1	839.7	-63.1	840	-75.8	12.7	<12	119	< 300	P
+0	839.7	-69.7	840	-78.4	8.7	<12	N/A	< 300	P
-1	839.7	-70.4	840	-78	7.6	<12	N/A	< 300	P
-2	839.7	-69.6	840	-78	8.4	<12	N/A	< 300	P
-3	839.7	-68.5	840	-79	10.5	<12	N/A	< 300	P
-4	839.7	-65.8	840	-80	14.2	<12	71	< 300	P
-5	839.7	-73.8	840	-81.6	7.8	<12	N/A	< 300	P

Oscillation Mitigation – Uplink Server Port 2 to Dedicated Port 2									
Band	1710 - 1755 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	1741.3	-53.6	1741.8	-64.7	11.1	<12	N/A	< 300	P
+4	1741.3	-51.9	1741.8	-65.6	13.7	<12	137	< 300	P
+3	1741.3	-61.5	1741.8	-68.2	6.7	<12	N/A	< 300	P
+2	1741.3	-61	1741.8	-68.5	7.5	<12	N/A	< 300	P
+1	1741.3	-60.4	1741.8	-70.2	9.8	<12	N/A	< 300	P
+0	1741.3	-58.5	1741.8	-69.8	11.3	<12	N/A	< 300	P
-1	1741.3	-57.9	1741.8	-71	13.1	<12	68	< 300	P
-2	1741.3	-68.5	1741.8	-74.9	6.4	<12	N/A	< 300	P
-3	1741.3	-67.9	1741.8	-73.9	6	<12	N/A	< 300	P
-4	1741.3	-67	1741.8	-75.1	8.1	<12	N/A	< 300	P
-5	1741.3	-67.2	1741.8	-74.5	7.3	<12	N/A	< 300	P

Oscillation Mitigation – Uplink Server Port 2 to Dedicated Port 2									
Band	1850 - 1915 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	1871.2	-50.7	1871.7	-63.8	13.1	<12	115	< 300	P
+4	1871.2	-59	1871.7	-67.8	8.8	<12	N/A	< 300	P
+3	1871.2	-58.8	1871.7	-67.9	9.1	<12	N/A	< 300	P
+2	1871.2	-57.1	1871.7	-68.4	11.3	<12	N/A	< 300	P
+1	1871.2	-55.5	1871.7	-69	13.5	<12	82	< 300	P
+0	EUT Shutdown								P

Oscillation Mitigation – Uplink Server Port 3 to Dedicated Port 3									
Band	698 – 716 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	704.9	-64.5	705.2	-72.2	7.7	<12	N/A	< 300	P
+4	704.9	-63.8	705.2	-71.7	7.9	<12	N/A	< 300	P
+3	704.9	-61.8	705.2	-72.8	11	<12	N/A	< 300	P
+2	704.9	-60.4	705.2	-73.2	12.8	<12	97	< 300	P
+1	EUT Shutdown								P

Oscillation Mitigation – Uplink Server Port 3 to Dedicated Port 3									
Band	776 – 787 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	778.5	-64	778.71	-69.3	5.3	<12	N/A	< 300	P
+4	778.5	-63.8	778.71	-69.9	6.1	<12	N/A	< 300	P
+3	778.5	-63.2	778.71	-70.5	7.3	<12	N/A	< 300	P
+2	778.5	-62.2	778.71	-71.1	8.9	<12	N/A	< 300	P
+1	778.5	-61.2	778.71	-71.4	10.2	<12	N/A	< 300	P
+0	778.5	-60.6	778.71	-71.3	10.7	<12	N/A	< 300	P
-1	778.5	-59.4	778.71	-72.7	13.3	<12	47	< 300	P
-2	EUT Shutdown								P



Oscillation Mitigation – Uplink Server Port 3 to Dedicated Port 1									
Band	824 - 849 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	826.14	-62.6	826.55	-71.6	9	<12	N/A	< 300	P
+4	826.14	-61.9	826.55	-71.3	9.4	<12	N/A	< 300	P
+3	826.14	-60.4	826.55	-71.6	11.2	<12	N/A	< 300	P
+2	826.14	-58.7	826.55	-73.1	14.4	<12	96	< 300	P
+1	826.14	-69.1	826.55	-77.1	8	<12	N/A	< 300	P
+0	826.14	-69.1	826.55	-77.3	8.2	<12	N/A	< 300	P
-1	826.14	-67.2	826.55	-76.6	9.4	<12	N/A	< 300	P
-2	826.14	-66.6	826.55	-76.8	10.2	<12	N/A	< 300	P
-3	826.14	-66.4	826.55	-77.4	11	<12	N/A	< 300	P
-4	826.14	-64.5	826.55	-78.1	13.6	<12	52	< 300	P
-5	826.14	-75.2	826.55	-82	6.8	<12	N/A	< 300	P

Oscillation Mitigation – Uplink Server Port 3 to Dedicated Port 2									
Band	1710 - 1755 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	1745.69	-53.6	1746.2	-65.4	11.8	<12	N/A	< 300	P
+4	1745.69	-52.5	1746.2	-65.6	13.1	<12	115	< 300	P
+3	1745.69	-58.8	1746.2	-68.2	9.4	<12	N/A	< 300	P
+2	1745.69	-58.8	1746.2	-69.2	10.4	<12	N/A	< 300	P
+1	1745.69	-57.2	1746.2	-68.8	11.6	<12	N/A	< 300	P
+0	1745.69	-55.6	1746.2	-69.7	14.1	<12	80	< 300	P
-1	EUT Shutdown								P

Oscillation Mitigation – Uplink Server Port 3 to Dedicated Port 2									
Band	1850 - 1915 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	1896.49	-52	1897.01	-66.3	14.3	<12	14.3	< 300	P
+4	1896.49	-59.9	1897.01	-68.9	9	<12	9	< 300	P
+3	1896.49	-58	1897.01	-69.1	11.1	<12	11.1	< 300	P
+2	1896.49	-56	1897.01	-70.1	14.1	<12	14.1	< 300	P
+1	EUT Shutdown								P

Oscillation Mitigation – Uplink Server Port 4 to Dedicated Port 3									
Band	698 – 716 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	703.1	-61	702.9	-71.8	10.8	<12	N/A	< 300	P
+4	703.1	-61.9	702.9	-72.2	10.3	<12	N/A	< 300	P
+3	703.1	-57.8	702.9	-72.5	14.7	<12	96	< 300	P
+2	EUT Shutdown								P

Oscillation Mitigation – Uplink Server Port 4 to Dedicated Port 3									
Band	776 – 787 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	777.9	-60.5	778.11	-71.6	11.1	<12	N/A	< 300	P
+4	777.9	-59.1	778.11	-72.5	13.4	<12	135	< 300	P
+3	EUT Shutdown								P

Oscillation Mitigation – Uplink Server Port 4 to Dedicated Port 1									
Band	824 - 849 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	828.63	-63.3	829.04	-72.2	8.9	<12	N/A	< 300	P
+4	828.63	-62	829.04	-72.1	10.1	<12	N/A	< 300	P
+3	828.63	-59.5	829.04	-73.5	14	<12	126	< 300	P
+2	828.63	-70.3	829.04	-75.9	5.6	<12	N/A	< 300	P
+1	828.63	-69.8	829.04	-77	7.2	<12	N/A	< 300	P
+0	828.63	-69.2	829.04	-76.6	7.4	<12	N/A	< 300	P
-1	828.63	-68.4	829.04	-77.8	9.4	<12	N/A	< 300	P
-2	828.63	-67.5	829.04	-77.2	9.7	<12	N/A	< 300	P
-3	828.63	-64.8	829.04	-77.7	12.9	<12	31	< 300	P
-4	828.63	-75.6	829.04	-81.3	5.7	<12	N/A	< 300	P
-5	828.63	-75.2	829.04	-81.8	6.6	<12	212	< 300	P

Oscillation Mitigation – Uplink Server Port 4 to Dedicated Port 2									
Band	1710 - 1755 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	1740.37	-53.8	1740.9	-64.3	10.5	<12	N/A	< 300	P
+4	1740.37	-52.4	1740.9	-65.4	13	<12	137	< 300	P
+3	1740.37	-59.9	1740.9	-68	8.1	<12	N/A	< 300	P
+2	1740.37	-58.3	1740.9	-68.5	10.2	<12	N/A	< 300	P
+1	1740.37	-56.8	1740.9	-68.1	11.3	<12	N/A	< 300	P
+0	1740.37	-54.6	1740.9	-68.8	14.2	<12	99	< 300	P
-1	EUT Shutdown								P

Oscillation Mitigation – Uplink Server Port 4 to Dedicated Port 2									
Band	1850 - 1915 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	1867.89	-45.3	1868.43	-65.1	19.8	<12	165	< 300	P
+4	1867.89	-58.9	1868.43	-68.6	9.7	<12	N/A	< 300	P
+3	1867.89	-58	1868.43	-67.9	9.9	<12	N/A	< 300	P
+2	1867.89	-55.3	1868.43	-68.7	13.4	<12	119	< 300	P
+1	EUT Shutdown								P

### Uplink Oscillation Mitigation Test Data – Common Port

Oscillation Mitigation – Uplink Server Port 1 to Common Port 2									
Band	698 – 716 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	706.56	-62.7	706.78	-73.2	10.5	<12	N/A	< 300	P
+4	706.56	-61.4	706.78	-74.4	13	<12	141	< 300	P
+3	EUT Shutdown								P

Oscillation Mitigation – Uplink Server Port 1 to Common Port 2									
Band	776 – 787 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	779.1	-61.3	779.3	-72.5	11.2	<12	N/A	< 300	P
+4	779.1	-60.7	779.3	-73.8	13.1	<12	142	< 300	P
+3	EUT Shutdown								P

Oscillation Mitigation – Uplink Server Port 1 to Common Port 2									
Band	824 - 849 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	838.36	-60.1	838.71	-71.5	11.4	<12	N/A	< 300	P
+4	838.36	-58.2	838.71	-71.6	13.4	<12	146	< 300	P
+3	838.36	-64.8	838.71	-74.2	9.4	<12	N/A	< 300	P
+2	838.36	-64.4	838.71	-74.1	9.7	<12	N/A	< 300	P
+1	838.36	-63.6	838.71	-74.6	11	<12	97	< 300	P
+0	838.36	-62	838.71	-74.7	12.7	<12	100	< 300	P
-1	838.36	-68.7	838.71	-77.8	9.1	<12	N/A	< 300	P
-2	838.36	-68.3	838.71	-78	9.7	<12	N/A	< 300	P
-3	838.36	-67.8	838.71	-78.3	10.5	<12	N/A	< 300	P
-4	838.36	-66.1	838.71	-78.8	12.7	<12	81	< 300	P
-5	838.36	-72.7	838.71	-80.6	7.9	<12	N/A	< 300	P

Oscillation Mitigation – Uplink Server Port 2 to Common Port 2									
Band	698 – 716 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	703.14	-63.3	703.41	-73.4	10.1	<12	N/A	< 300	P
+4	703.14	-62.1	703.41	-73.5	11.4	<12	N/A	< 300	P
+3	703.14	-60.9	703.41	-74.3	13.4	<12	135	< 300	P
+2	EUT Shutdown								P

Oscillation Mitigation – Uplink Server Port 2 to Common Port 2									
Band	776 – 787 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	778.38	-59.6	778.62	-74.4	14.8	<12	154	< 300	P
+4	EUT Shutdown								P

Oscillation Mitigation – Uplink Server Port 2 to Common Port 2									
Band	824 - 849 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	839.2	-59.5	839.5	-71	11.5	<12	N/A	< 300	P
+4	839.2	-57.8	839.5	-71.6	13.8	<12	144	< 300	P
+3	839.2	-64.6	839.5	-73.9	9.3	<12	N/A	< 300	P
+2	839.2	-64.2	839.5	-75.2	11	<12	N/A	< 300	P
+1	839.2	-64.1	839.5	-75.8	11.7	<12	N/A	< 300	P
+0	839.2	-60.6	839.5	-75.6	15	<12	90	< 300	P
-1	839.2	-69	839.5	-78.3	9.3	<12	N/A	< 300	P
-2	839.2	-67.8	839.5	-79.2	11.4	<12	N/A	< 300	P
-3	839.2	-65.1	839.5	-79.3	14.2	<12	115	< 300	P
-4	839.2	-72.8	839.5	-81.3	8.5	<12	N/A	< 300	P
-5	839.2	-71.9	839.5	-81.5	9.6	<12	N/A	< 300	P

Oscillation Mitigation – Uplink Server Port 3 to Common Port 2									
Band	698 – 716 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	703.14	-60.89	703.36	-73.5	12.61	<12	155	< 300	P
+4	EUT Shutdown								P

Oscillation Mitigation – Uplink Server Port 3 to Common Port 2									
Band	776 – 787 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	779.22	-62.6	779.47	-73.3	10.7	<12	N/A	< 300	P
+4	779.22	-60.8	779.47	-74.4	13.6	<12	156	< 300	P
+3	EUT Shutdown								P

Oscillation Mitigation – Uplink Server Port 3 to Common Port 2									
Band	824 - 849 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	831.78	-62.8	832.18	-72.1	9.3	<12	N/A	< 300	P
+4	831.78	-61.4	832.18	-72.3	10.9	<12	N/A	< 300	P
+3	831.78	-60.2	832.18	-73	12.8	<12	125	< 300	P
+2	831.78	-70.3	832.18	-76.4	6.1	<12	N/A	< 300	P
+1	831.78	-68.6	832.18	-77.3	8.7	<12	N/A	< 300	P
+0	831.78	-67.7	832.18	-77.2	9.5	<12	N/A	< 300	P
-1	831.78	-66.4	832.18	-76.8	10.4	<12	N/A	< 300	P
-2	831.78	-66.7	832.18	-78.1	11.4	<12	N/A	< 300	P
-3	831.78	-63.8	832.18	-78.1	14.3	<12	40	< 300	P
-4	831.78	-75.7	832.18	-81.6	5.9	<12	N/A	< 300	P
-5	831.78	-74.1	832.18	-81.8	7.7	<12	N/A	< 300	P

Oscillation Mitigation – Uplink Server Port 4 to Common Port 2									
Band	698 – 716 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	703.58	-62.3	703.82	-73.6	11.3	<12	N/A	< 300	P
+4	703.58	-60.7	703.82	-75.3	14.6	<12	142	< 300	P
+3	EUT Shutdown								P

Oscillation Mitigation – Uplink Server Port 4 to Common Port 2									
Band	776 – 787 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	778.58	-62.4	778.78	-72.9	10.5	<12	N/A	< 300	P
+4	778.58	-59.9	778.78	-73.9	14	<12	149	< 300	P
+3	EUT Shutdown								P

Oscillation Mitigation – Uplink Server Port 4 to Common Port 2									
Band	824 - 849 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	839.33	-61.2	839.68	-71.9	10.7	<12	N/A	< 300	P
+4	839.33	-58.5	839.68	-72.6	14.1	<12	125	< 300	P
+3	839.33	-65.5	839.68	-74.5	9	<12	N/A	< 300	P
+2	839.33	-65.2	839.68	-75.2	10	<12	46	< 300	P
+1	839.33	-62.5	839.68	-74.1	11.6	<12	N/A	< 300	P
+0	839.33	-61.6	839.68	-75.3	13.7	<12	95	< 300	P
-1	839.33	-69.3	839.68	-77.4	8.1	<12	N/A	< 300	P
-2	839.33	-69	839.68	-78	9	<12	N/A	< 300	P
-3	839.33	-68.3	839.68	-78.4	10.1	<12	N/A	< 300	P
-4	839.33	-66.5	839.68	-79.1	12.6	<12	85	< 300	P
-5	839.33	-73.9	839.68	-81.6	7.7	<12	N/A	< 300	P



### Downlink Oscillation Mitigation Test Data – Dedicated Ports

Oscillation Mitigation – Downlink Dedicated Port 3 to Server Port 1									
Band	728 - 746 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	738.23	-63.5	738.49	-74.6	11.1	<12	N/A	< 300	P
+4	738.23	-61.9	738.49	-75.6	13.7	<12	121	< 300	P
+3	EUT Shutdown								P

Oscillation Mitigation – Downlink Dedicated Port 3 to Server Port 1									
Band	746 - 757 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	746.66	-58.2	746.92	-73.8	15.6	<12	146	< 300	P
+4	EUT Shutdown								P

Oscillation Mitigation – Downlink Dedicated Port 1 to Server Port 1									
Band	869 - 894 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	878.41	-64	878.76	-74	10	<12	N/A	< 300	P
+4	878.41	-64.2	878.76	-73.6	9.4	<12	N/A	< 300	P
+3	878.41	-62.5	878.76	-72.6	10.1	<12	N/A	< 300	P
+2	878.41	-61.3	878.76	-73.4	12.1	<12	65	< 300	P
+1	878.41	-67.2	878.76	-75.6	8.4	<12	N/A	< 300	P
+0	878.41	-66.1	878.76	-76.4	10.3	<12	N/A	< 300	P
-1	878.41	-64.8	878.76	-76.7	11.9	<12	N/A	< 300	P
-2	878.41	-63.4	878.76	-76.7	13.3	<12	90	< 300	P
-3	878.41	-70.4	878.76	-80.2	9.8	<12	N/A	< 300	P
-4	878.41	-69.7	878.76	-79.1	9.4	<12	N/A	< 300	P
-5	878.41	-68.7	878.76	-80.2	11.5	<12	N/A	< 300	P

Oscillation Mitigation – Downlink Dedicated Port 2 to Server Port 1									
Band	1930 - 1995 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	1963.98	-36.9	1964.55	-65	28.1	<12	95	< 300	P
+4	1963.98	-61.5	1964.55	-70.7	9.2	<12	N/A	< 300	P
+3	1963.98	-60.4	1964.55	-70	9.6	<12	N/A	< 300	P
+2	1963.98	-59.7	1964.55	-70.9	11.2	<12	N/A	< 300	P
+1	1963.98	-58.2	1964.55	-71.5	13.3	<12	75	< 300	P
+0	EUT Shutdown								P

Oscillation Mitigation – Downlink Dedicated Port 2 to Server Port 1									
Band	2110 - 2155 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	2141.74	-51.9	2142.38	-65	13.1	<12	103	< 300	P
+4	2141.74	-58.8	2142.38	-67.6	8.8	<12	N/A	< 300	P
+3	2141.74	-58.6	2142.38	-68.1	9.5	<12	N/A	< 300	P
+2	2141.74	-56.4	2142.38	-68.1	11.7	<12	N/A	< 300	P
+1	2141.74	-54.6	2142.38	-69.1	14.5	<12	109	< 300	P
+0	EUT Shutdown								P

Oscillation Mitigation – Downlink Dedicated Port 3 to Server Port 2									
Band	728 - 746 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	738.81	-63.9	739.07	-74.7	10.8	<12	N/A	< 300	P
+4	738.81	-62.5	739.07	-76.7	14.2	<12	142	< 300	P
+3	EUT Shutdown								P

Oscillation Mitigation – Downlink Dedicated Port 3 to Server Port 2									
Band	746 - 757 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	746.54	-62.4	746.8	-73.8	11.4	<12	N/A	< 300	P
+4	746.54	-61.1	746.8	-74.3	13.2	<12	103	< 300	P
+3	EUT Shutdown								P

Oscillation Mitigation – Downlink Dedicated Port 1 to Server Port 2									
Band	869 - 894 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	877.72	-61.9	878.09	-70.7	8.8	<12	N/A	< 300	P
+4	877.72	-61.3	878.09	-72.3	11	<12	N/A	< 300	P
+3	877.72	-58.6	878.09	-71.9	13.3	<12	89	< 300	P
+2	877.72	-64.9	878.09	-74.6	9.7	<12	N/A	< 300	P
+1	877.72	-63.6	878.09	-75.1	11.5	<12	N/A	< 300	P
+0	877.72	-62.7	878.09	-75.9	13.2	<12	120	< 300	P
-1	877.72	-69	878.09	-77.9	8.9	<12	N/A	< 300	P
-2	877.72	-68.1	878.09	-77.2	9.1	<12	N/A	< 300	P
-3	877.72	-66.5	878.09	-77.9	11.4	<12	N/A	< 300	P
-4	877.72	-64.8	878.09	-79	14.2	<12	51	< 300	P
-5	877.72	-71	878.09	-79.4	8.4	<12	N/A	< 300	P

Oscillation Mitigation – Downlink Dedicated Port 2 to Server Port 2									
Band	1930 - 1995 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	1962.12	-35.2	1962.62	-65.9	30.7	<12	137	< 300	P
+4	1962.12	-61.8	1962.62	-68.8	7	<12	N/A	< 300	P
+3	1962.12	-59.9	1962.62	-69.7	9.8	<12	N/A	< 300	P
+2	1962.12	-59.3	1962.62	-70.1	10.8	<12	N/A	< 300	P
+1	1962.12	-57.2	1962.62	-70.9	13.7	<12	90	< 300	P
+0	EUT Shutdown								P

Oscillation Mitigation – Downlink Dedicated Port 2 to Server Port 2									
Band	2110 - 2155 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	2144.03	-51.8	2144.57	-63.4	11.6	<12	N/A	< 300	P
+4	2144.03	-50.6	2144.57	-65.1	14.5	<12	108	< 300	P
+3	2144.03	-58	2144.57	-66.9	8.9	<12	N/A	< 300	P
+2	2144.03	-56.4	2144.57	-67.7	11.3	<12	N/A	< 300	P
+1	2144.03	-56.2	2144.57	-67.8	11.6	<12	N/A	< 300	P
+0	2144.03	-54	2144.57	-68.6	14.6	<12	93	< 300	P
-1	EUT Shutdown								P

Oscillation Mitigation – Downlink Dedicated Port 3 to Server Port 3									
Band	728 - 746 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	738.24	-64.4	738.46	-75	10.6	<12	N/A	< 300	P
+4	738.24	-62.1	738.46	-76	13.9	<12	69	< 300	P
+3	EUT Shutdown								P

Oscillation Mitigation – Downlink Dedicated Port 3 to Server Port 3									
Band	746 - 757 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	749.27	-63.8	749.49	-75.3	11.5	<12	11.5	< 300	P
+4	749.27	-63.9	749.49	-75.1	11.2	<12	11.2	< 300	P
+3	749.27	-61.8	749.49	-75.1	13.3	<12	13.3	< 300	P
+2	EUT Shutdown								P

Oscillation Mitigation – Downlink Dedicated Port 1 to Server Port 3									
Band	869 - 894 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	875.53	-64.9	875.89	-72.6	7.7	<12	N/A	< 300	P
+4	875.53	-64.7	875.89	-73.1	8.4	<12	N/A	< 300	P
+3	875.53	-63.2	875.89	-72.6	9.4	<12	N/A	< 300	P
+2	875.53	-61	875.89	-73.8	12.8	<12	33	< 300	P
+1	875.53	-67.4	875.89	-75.6	8.2	<12	N/A	< 300	P
+0	875.53	-66.5	875.89	-76.5	10	<12	N/A	< 300	P
-1	875.53	-65.4	875.89	-76.1	10.7	<12	N/A	< 300	P
-2	875.53	-62.3	875.89	-77.5	15.2	<12	115	< 300	P
-3	875.53	-69.7	875.89	-78.9	9.2	<12	N/A	< 300	P
-4	875.53	-69.1	875.89	-79.9	10.8	<12	N/A	< 300	P
-5	875.53	-68.3	875.89	-80	11.7	<12	N/A	< 300	P

Oscillation Mitigation – Downlink Dedicated Port 2 to Server Port 3									
Band	1930 - 1995 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	1963.88	-63.7	1964.43	-70.7	7	<12	N/A	< 300	P
+4	1963.88	-62.1	1964.43	-71	8.9	<12	N/A	< 300	P
+3	1963.88	-61.4	1964.43	-70.9	9.5	<12	N/A	< 300	P
+2	1963.88	-61	1964.43	-71.2	10.2	<12	N/A	< 300	P
+1	1963.88	-58	1964.43	-71.8	13.8	<12	45	< 300	P
+0	EUT Shutdown								P

Oscillation Mitigation – Downlink Dedicated Port 2 to Server Port 3									
Band	2110 - 2155 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	2129.81	-55.1	2130.35	-65.8	10.7	<12	N/A	< 300	P
+4	2129.81	-53.8	2130.35	-67.2	13.4	<12	130	< 300	P
+3	2129.81	-60.8	2130.35	-68.9	8.1	<12	N/A	< 300	P
+2	2129.81	-59.4	2130.35	-68.7	9.3	<12	N/A	< 300	P
+1	2129.81	-57.9	2130.35	-68.6	10.7	<12	N/A	< 300	P
+0	2129.81	-57.8	2130.35	-69.4	11.6	<12	N/A	< 300	P
-1	2129.81	-54.9	2130.35	-70.2	15.3	<12	87	< 300	P
-2	EUT Shutdown								P

Oscillation Mitigation – Downlink Dedicated Port 3 to Server Port 4									
Band	728 - 746 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	739.48	-64.7	739.71	-76	11.3	<12	N/A	< 300	P
+4	739.48	-63.6	739.71	-75.2	11.6	<12	N/A	< 300	P
+3	739.48	-61.6	739.71	-76.2	14.6	<12	125	< 300	P
+2	EUT Shutdown								P

Oscillation Mitigation – Downlink Dedicated Port 3 to Server Port 4									
Band	746 - 757 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	750.52	-63.1	750.73	-74.7	11.6	<12	N/A	< 300	P
+4	750.52	-60.8	750.73	-74.2	13.4	<12	148	< 300	P
+3	750.52	-65.2	750.73	-75.9	10.7	<12	N/A	< 300	P
+2	750.52	-63.6	750.73	-75.1	11.5	<12	N/A	< 300	P
+1	750.52	-62.1	750.73	-76.3	14.2	<12	124	< 300	P
+0	EUT Shutdown								P

Oscillation Mitigation – Downlink Dedicated Port 1 to Server Port 4									
Band	869 - 894 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	875.54	-62.9	875.73	-72.9	10	<12	N/A	< 300	P
+4	875.54	-61.2	875.73	-72.3	11.1	<12	N/A	< 300	P
+3	875.54	-59.8	875.73	-73.4	13.6	<12	91	< 300	P
+2	875.54	-66	875.73	-75.2	9.2	<12	N/A	< 300	P
+1	875.54	-65.6	875.73	-76.2	10.6	<12	N/A	< 300	P
+0	875.54	-62.6	875.73	-76	13.4	<12	115	< 300	P
-1	875.54	-66.2	875.73	-77.2	11	<12	N/A	< 300	P
-2	875.54	-65.2	875.73	-77	11.8	<12	N/A	< 300	P
-3	875.54	-62.4	875.73	-78.3	15.9	<12	117	< 300	P
-4	875.54	-70.3	875.73	-79.3	9	<12	N/A	< 300	P
-5	875.54	-68.6	875.73	-79.8	11.2	<12	N/A	< 300	P

Oscillation Mitigation – Downlink Dedicated Port 2 to Server Port 4									
Band	1930 - 1995 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	1961.06	-64.2	1961.63	-73.1	8.9	<12	N/A	< 300	P
+4	1961.06	-63.4	1961.63	-72.8	9.4	<12	N/A	< 300	P
+3	1961.06	-63.1	1961.63	-73.2	10.1	<12	N/A	< 300	P
+2	1961.06	-61.6	1961.63	-72.6	11	<12	N/A	< 300	P
+1	1961.06	-59.5	1961.63	-74	14.5	<12	105	< 300	P
+0	EUT Shutdown								P

Oscillation Mitigation – Downlink Dedicated Port 2 to Server Port 4									
Band	2110 - 2155 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	2142.78	-54.4	2143.3	-66.3	11.9	<12	N/A	< 300	P
+4	2142.78	-53	2143.3	-66.3	13.3	<12	66	< 300	P
+3	2142.78	-60.7	2143.3	-69.6	8.9	<12	N/A	< 300	P
+2	2142.78	-60.3	2143.3	-70.3	10	<12	N/A	< 300	P
+1	2142.78	-59	2143.3	-70	11	<12	N/A	< 300	P
+0	2142.78	-56.9	2143.3	-71.4	14.5	<12	106	< 300	P
-1	EUT Shutdown								P



### Downlink Oscillation Mitigation Test Data – Common Port

Oscillation Mitigation – Downlink Common Donor Port 2 to Server Port 1									
Band	728 - 746 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	739.44	-65.1	739.69	-75.9	10.8	<12	N/A	< 300	P
+4	739.44	-63.6	739.69	-77	13.4	<12	142	< 300	P
+3	EUT Shutdown								P

Oscillation Mitigation – Downlink Common Donor Port 2 to Server Port 1									
Band	746 - 757 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	746.6	-60.8	746.88	-73.5	12.7	<12	162	< 300	P
+4	EUT Shutdown								P

Oscillation Mitigation – Downlink Common Donor Port 2 to Server Port 1									
Band	869 - 894 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	879.55	-61.8	879.93	-71.8	10	<12	N/A	< 300	P
+4	879.55	-59.8	879.93	-72.9	13.1	<12	146	< 300	P
+3	879.55	-66.3	879.93	-75	8.7	<12	N/A	< 300	P
+2	879.55	-64.5	879.93	-74.1	9.6	<12	N/A	< 300	P
+1	879.55	-63.1	879.93	-74.7	11.6	<12	N/A	< 300	P
+0	879.55	-61.3	879.93	-75.1	13.8	<12	96	< 300	P
-1	879.55	-67.5	879.93	-77	9.5	<12	N/A	< 300	P
-2	879.55	-67.6	879.93	-78.4	10.8	<12	N/A	< 300	P
-3	879.55	-65.2	879.93	-78.3	13.1	<12	100	< 300	P
-4	879.55	-70.6	879.93	-79.3	8.7	<12	N/A	< 300	P
-5	879.55	-71	879.93	-81	10	<12	N/A	< 300	P

Oscillation Mitigation – Downlink Common Donor Port 2 to Server Port 2									
Band	728 - 746 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	738.18	-64.3	738.38	-75.4	11.1	<12	N/A	< 300	P
+4	738.18	-62.6	738.38	-76.3	13.7	<12	210	< 300	P
+3	EUT Shutdown								P

Oscillation Mitigation – Downlink Common Donor Port 2 to Server Port 2									
Band	746 - 757 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	746.48	-63.1	746.71	-73.6	10.5	<12	N/A	< 300	P
+4	746.48	-61.3	746.71	-74.9	13.6	<12	120	< 300	P
+3	EUT Shutdown								P

Oscillation Mitigation – Downlink Common Donor Port 2 to Server Port 2									
Band	869 - 894 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	878.88	-61.1	879.18	-71.3	10.2	<12	N/A	< 300	P
+4	878.88	-59.7	879.18	-71.6	11.9	<12	N/A	< 300	P
+3	878.88	-58.3	879.18	-71.8	13.5	<12	50	< 300	P
+2	878.88	-65.4	879.18	-74.3	8.9	<12	N/A	< 300	P
+1	878.88	-63.4	879.18	-74.1	10.7	<12	N/A	< 300	P
+0	878.88	-61.9	879.18	-75	13.1	<12	130	< 300	P
-1	878.88	-68	879.18	-77.4	9.4	<12	N/A	< 300	P
-2	878.88	-67.4	879.18	-77	9.6	<12	N/A	< 300	P
-3	878.88	-66.4	879.18	-76.9	10.5	<12	N/A	< 300	P
-4	878.88	-64.3	879.18	-77.7	13.4	<12	95	< 300	P
-5	878.88	-71.5	879.18	-78.9	7.4	<12	N/A	< 300	P

Oscillation Mitigation – Downlink Common Donor Port 2 to Server Port 3									
Band	728 - 746 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	738.52	-64.6	738.78	-75.1	10.5	<12	N/A	< 300	P
+4	738.52	-63.9	738.78	-75	11.1	<12	N/A	< 300	P
+3	738.52	-61.4	738.78	-76.2	14.8	<12	101	< 300	P
+2	EUT Shutdown								P

Oscillation Mitigation – Downlink Common Donor Port 2 to Server Port 3									
Band	746 - 757 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	751.26	-62.1	751.48	-73.6	11.5	<12	N/A	< 300	P
+4	751.26	-61.4	751.48	-74.1	12.7	<12	130	< 300	P
+3	EUT Shutdown								P

Oscillation Mitigation – Downlink Common Donor Port 2 to Server Port 3									
Band	869 - 894 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	878.15	-58.2	878.56	-73	14.8	<12	160	< 300	P
+4	878.15	-64.5	878.56	-73.9	9.4	<12	N/A	< 300	P
+3	878.15	-63.4	878.56	-74.3	10.9	<12	N/A	< 300	P
+2	878.15	-61.9	878.56	-75.7	13.8	<12	117	< 300	P
+1	878.15	-68.5	878.56	-76.3	7.8	<12	N/A	< 300	P
+0	878.15	-68	878.56	-78.5	10.5	<12	N/A	< 300	P
-1	878.15	-66.2	878.56	-77.5	11.3	<12	N/A	< 300	P
-2	878.15	-65.6	878.56	-79.4	13.8	<12	80	< 300	P
-3	878.15	-71.6	878.56	-80.2	8.6	<12	N/A	< 300	P
-4	878.15	-69.8	878.56	-81.3	11.5	<12	N/A	< 300	P
-5	878.15	-68.3	878.56	-80	11.7	<12	N/A	< 300	P

Oscillation Mitigation – Downlink Common Donor Port 2 to Server Port 4									
Band	728 - 746 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	739.29	-65.6	739.53	-75.1	9.5	<12	N/A	< 300	P
+4	739.29	-65.1	739.53	-75.1	10	<12	N/A	< 300	P
+3	739.29	-62.1	739.53	-77	14.9	<12	130	< 300	P
+2	EUT Shutdown								P

Oscillation Mitigation – Downlink Common Donor Port 2 to Server Port 4									
Band	746 - 757 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB		sec	
+5	751.14	-62.7	751.36	-74.6	11.9	<12	N/A	< 300	P
+4	751.14	-61.7	751.36	-74.9	13.2	<12	125	< 300	P
+3	EUT Shutdown								P

Oscillation Mitigation – Downlink Common Donor Port 2 to Server Port 4									
Band	869 - 894 MHz								
Test Signal Type	CDMA								
Variable Attenuator Setting	Oscillations and Power Levels				Margin	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Pass / Fail
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	878.97	-62.2	879.3	-72.2	10	<12	N/A	< 300	P
+4	878.97	-60	879.3	-71.8	11.8	<12	N/A	< 300	P
+3	878.97	-58.8	879.3	-73	14.2	<12	132	< 300	P
+2	878.97	-65.1	879.3	-75.2	10.1	<12	N/A	< 300	P
+1	878.97	-64.4	879.3	-75.8	11.4	<12	N/A	< 300	P
+0	878.97	-61.8	879.3	-76.4	14.6	<12	120	< 300	P
-1	878.97	-68.5	879.3	-77.8	9.3	<12	N/A	< 300	P
-2	878.97	-68	879.3	-79.1	11.1	<12	N/A	< 300	P
-3	878.97	-66.7	879.3	-80	13.3	<12	116	< 300	P
-4	878.97	-71.9	879.3	-80.7	8.8	<12	N/A	< 300	P
-5	878.97	-71	879.3	-80	9	<12	N/A	< 300	P

**Radiated Spurious (with modem TX on)**

**Engineer:** Greg Corbin

**Test Date:** 12/6/2023

**Test Procedure**

The EUT was tested in a semi-anechoic chamber with the turntable set 3m from the receiving antenna. A spectrum analyzer was used to verify that the EUT met the requirements for Radiated Emissions. The EUT was tested by rotating it 360 degrees with the antenna in both the vertical and horizontal orientation while raised from 1 to 4 meters to ensure that the signal levels were maximized. All cable and antenna correction factors were input into the spectrum analyzer ensuring an accurate measurement in ERP/EIRP with the resultant power in dBm. A signal generator was used to provide a CW signal centered in each operational uplink and downlink band. The EUT output was terminated into a 50 Ohm non-radiating load.

For each band, the spurious emissions were measured from 30 MHz to the 10<sup>th</sup> Harmonic of the band being investigated.

The internal cellular modem was powered on and transmitting at maximum power in the uplink direction at the frequency listed in the table.

Note: the cellular modem only transmits ion the uplink direction, so no downlink tests are impacted by the cellular modem transmitting.

**For all UL tests, there was no difference with the modem on or off, so all UL Radiated Spurious test data is recorded with the modem on and transmitting at full power in the band being recorded.**

To verify modem was transmitting, installed temporary antenna at dedicated port output and observed modem transmitting on spectrum analyzer

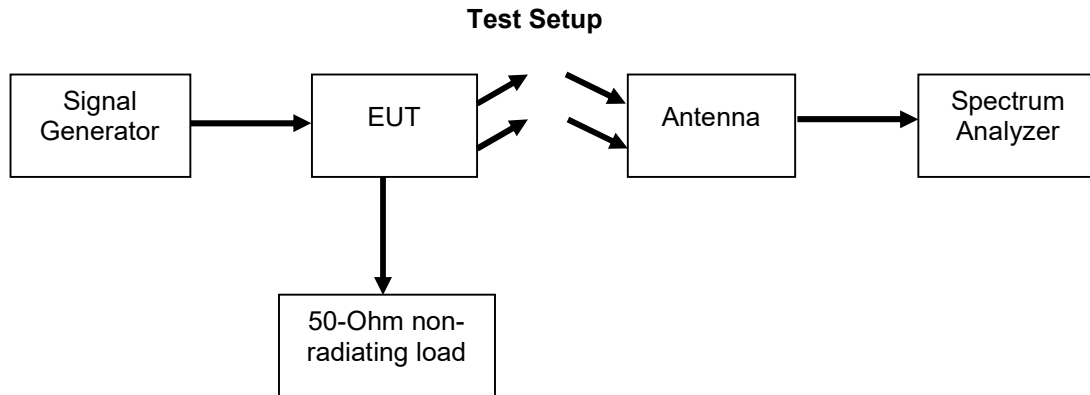
**Signal Paths measured for Radiated Spurious**

Radiated Spurious							
Dedicated Ports					Common Ports		
U/L					U/L		
B12	B13	B5	B4	B25	B12	B13	B5
S4	S4	S4	S4	S4	S4	S4	S4
D/L					D/L		
B12	B13	B5	B4	B25	B12	B13	B5
D3	D3	D1	D2	D2	D2	D2	D2

Note: Port listed is signal injection port.

Frequency Band (MHz)	Cellular modem Frequency (MHz)
698 - 716	710
776 - 787	778
824 - 849	832
1710 - 1755	1742
1850 - 1910	1870

The following formula was used for calculating the limits:  
 Radiated Spurious Emissions Limit =  $P1 - (43 + 10\text{Log}(P2)) = -13\text{dBm}$   
 P1 = power in dBm  
 P2 = power in Watts



**Annex K Radiated Spurious Emission (wall mount)**

**Annex L Radiated Spurious Emission (rack mount)**

**Refer to Annex K for Radiated Spurious Emission plots for the wall mount configuration**

**Refer to Annex L for Radiated Spurious Emission plots for the rack mount configuration**

All emissions were lower than -13 dBm.

## Conducted Spurious Emissions with Modem Transmitting

**Engineer:** Greg Corbin

**Test Date:** 12/4/2023

### Test Procedure

The EUT was connected to a spectrum analyzer through an attenuator, with the losses being input into the spectrum analyzer as a combination of reference level offset and correction factor as needed to ensure accurate readings. A signal generator was utilized to produce a 4.1 MHz AWGN signal operating at the maximum allowable power.

The conducted spurious emissions from 9 kHz to 10 times the highest tunable frequency for each operational band were measured (excluding the band defined by the Out of band emissions test). The emissions were recorded and the highest level was recorded in the summary table.

The internal cellular modem was powered on and transmitting at maximum power in the uplink direction at the frequency listed in the table.

Note: the cellular modem only transmits ion the uplink direction, so no downlink tests are impacted by the cellular modem transmitting.

### Signal Paths measured for Conducted Spurious Emissions with Modem Transmitting

Conducted Spurious Emissions with Modem Transmitting							
Dedicated Ports					Common Ports		
U/L					U/L		
B12	B13	B5	B4	B25	B12	B13	B5
S4 to D3	S4 to D3	S4 to D1	S4 to D2	S4 to D2	S4 to D2	S4 to D2	S4 to D2

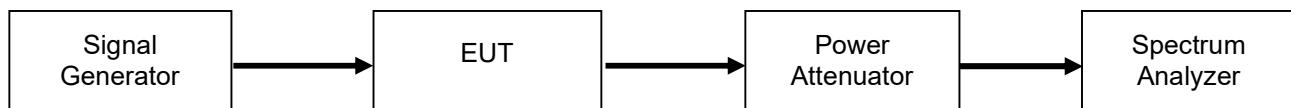
The following formulas are used for calculating the limits.

Conducted Spurious Emissions Limit =  $P1 - (43 + 10\text{Log}(P2)) = -13 \text{ dBm}$

P1 = power in dBm

P2 = power in Watts

### Test Setup



### Uplink Test Results

#### Server Port 4 to Dedicated Donor Port

Frequency Band (MHz)	Cellular modem Frequency	Measured Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Result
698 - 716	710	6612	-32.2	-13	Pass
776 - 787	778	775.8	-26.3	-13	Pass
824 - 849	832	5124.7	-31.4	-13	Pass
1710 - 1755	1742	16630.8	-24.9	-13	Pass
1850 - 1910	1870	16732.7	-23.5	-13	Pass

#### Server Port 4 to Common Donor Port

Frequency Band (MHz)	Cellular modem Frequency	Measured Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Result
698 - 716	710	697.8	-37.5	-13	Pass
776 - 787	778	775.9	-30.7	-13	Pass
824 - 849	832	1853.1	-29.7	-13	Pass

**Annex M**      **Conducted Spurious Emission with cellular modem on**

**Refer to Annex M for Conducted Spurious Emission plots with the cellular modem on**



## Intermodulation with Modem Transmitting

**Engineer:** Greg Corbin

**Test Date:** 12/4/2023

### Test Procedure

2 tests were performed for 3-tone intermodulation.

The first test was performed using 3 CW signals combined at the EUT input.

The internal modem was powered on but not transmitting.

The CW signals were spaced 300 kHz apart and centered at the peak of the operational band.

Attenuator, combiner, and cable insertion loss correction factors were input to either the signal generator or the spectrum analyzer as required to ensure that accurate measurements were recorded.

The input power was increased until the AGC level was reached. The input power was then set to 0.2 dB below the AGC level and intermodulation products were measured to ensure they were less than -19 dBm in a 3 kHz RBW.

The spectrum analyzer screenshot was recorded, and the highest-level intermodulation signal was recorded in the test summary table.

The input power was increased in 2 dB increments to 10 dB above the AGC threshold to verify the intermodulation products remain below the limit. During this test, the input power was not increased past the maximum allowed.

The intermodulation level with the input power 10 dB higher than the AGC threshold was recorded in the test summary table.

For the 2<sup>nd</sup> test, a two-tone test with the modem transmitting was performed. The 2 CW signals were centered at the peak of the passband.

The modem was tuned to a channel near the CW signals without masking the intermodulation signals.

Before setting the modem to transmit mode, a screen capture of the 2-tone intermodulation products was recorded with the input power set to 0.2 dB below the AGC threshold.

The modem was then set to transmit mode at the maximum power level and the intermodulation products were recorded along with the spectrum analyzer screen capture.

The input power was increased in 2 dB increments to 10 dB above the AGC threshold to verify the intermodulation products remain below the limit. During this test, the input power was not increased past the maximum allowed.

The intermodulation level with the input power 10 dB higher than the AGC threshold was recorded in the test summary table.

At no time during the test did the intermodulation products exceed the -19 dBm limit.

For all tests an Average detector was used and the RBW was set to 3 kHz.

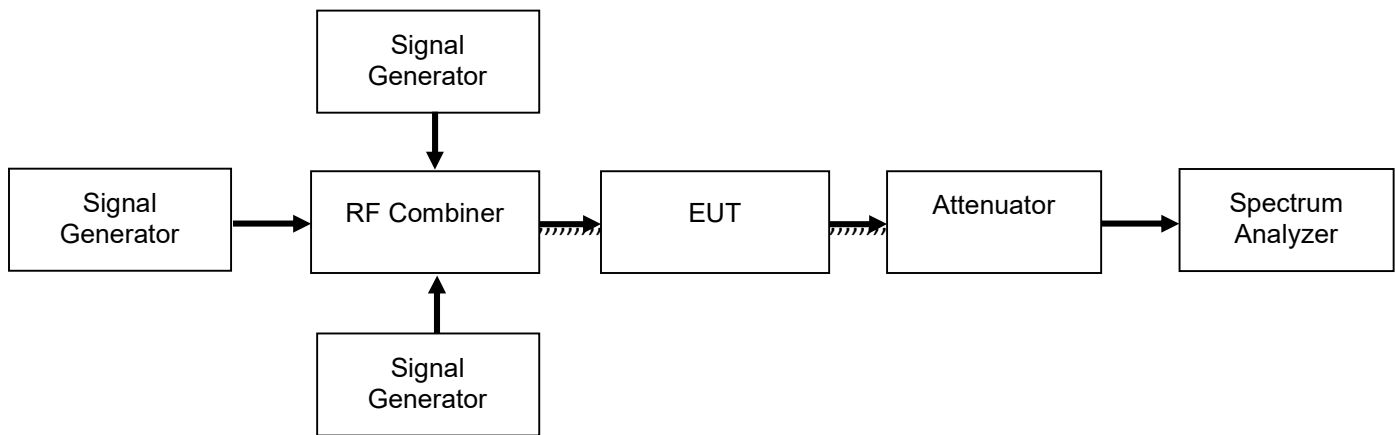
### Measurement Summary

1. Measured 3 tone with 3 CW signals using 3 separate signal generators \_0.2 dB below AGC
2. Measured 3 tone with 3 CW signals using 3 separate signal generators\_ Pin + 10 dB
3. Measured 2 tone with modem TX off\_0.2 dB below AGC
4. Measured 2 tone with modem TX on\_0.2 dB below AGC
5. Measured 2 tone with modem TX on\_ Pin + 10 dB

### Signal Paths measured for 3 Tone Intermodulation Test with Modem Transmitting

3 Tone Intermodulation Test with Modem Transmitting							
Dedicated Ports					Common Ports		
U/L					U/L		
B12	B13	B5	B4	B25	B12	B13	B5
S4 to D3	S4 to D3	S4 to D1	S4 to D2	S4 to D2	S4 to D2	S4 to D2	S4 to D2

### 3 Tone Intermodulation Test Setup



### Intermodulation Test Results with 3 CW signals

#### Server Port 4 to Dedicated Donor Port

Uplink Band (MHz)	1 <sup>st</sup> Tone (MHz)	2 <sup>nd</sup> Tone (MHz)	3 <sup>rd</sup> Tone (MHz)	Intermodulation Level (dBm)	Limit (dBm)	Result (Pass / Fail)	Intermod Level with Input Power @ AGC + 10 dB	Result (Pass / Fail)
698 - 716	702.9	703.2	703.5	-31.9	-19	Pass	-29.6	Pass
776 – 787	781.81	782.11	782.41	-34.4	-19	Pass	-34.2	Pass
824 – 849	837.71	838.01	838.31	-23.5	-19	Pass	-22.8	Pass
1710 – 1755	1737.21	1737.51	1737.81	-28.7	-19	Pass	-24.1	Pass
1850 – 1915	1864.12	1864.42	1864.72	-19.6	-19	Pass	-19.3	Pass

#### Server Port 4 to Common Donor Port 2

Uplink Band (MHz)	1 <sup>st</sup> Tone (MHz)	2 <sup>nd</sup> Tone (MHz)	3 <sup>rd</sup> Tone (MHz)	Intermodulation Level (dBm)	Limit (dBm)	Result (Pass / Fail)	Intermod Level with Input Power @ AGC + 10 dB	Result (Pass / Fail)
698 - 716	702.9	703.2	703.5	-34.7	-19	Pass	-31.4	Pass
776 – 787	781.81	782.11	782.41	-36.6	-19	Pass	-36.4	Pass
824 – 849	837.71	838.01	838.31	-23.0	-19	Pass	-22.4	Pass

**Intermodulation Test Results with 2 CW signals and Modem Transmitting**

**Server Port 4 to Dedicated Donor Port**

Uplink Band (MHz)	1 <sup>st</sup> Tone (MHz)	2 <sup>nd</sup> Tone (MHz)	Modem Frequency (MHz)	Intermodulation Level (dBm)	Limit (dBm)	Result (Pass / Fail)	Intermod Level with Input Power @ AGC + 10 dB	Result (Pass / Fail)
698 - 716	702.9	703.5	710	-35.9	-19	Pass	-32.1	Pass
776 – 787	781.81	782.41	778	-44.3	-19	Pass	-32.8	Pass
824 – 849	837.71	838.31	832	-28.8	-19	Pass	-21.3	Pass
1710 – 1755	1737.21	1737.81	1742	-31.7	-19	Pass	-28.2	Pass
1850 – 1915	1864.12	1864.72	1870	-31.8	-19	Pass	-23.8	Pass

**Server Port 4 to Common Donor Port 2**

Uplink Band (MHz)	1 <sup>st</sup> Tone (MHz)	2 <sup>nd</sup> Tone (MHz)	Modem Frequency (MHz)	Intermodulation Level (dBm)	Limit (dBm)	Result (Pass / Fail)	Intermod Level with Input Power @ AGC + 10 dB	Result (Pass / Fail)
698 - 716	702.9	703.5	710	-37.7	-19	Pass	-36.5	Pass
776 – 787	781.81	782.41	778	-40.7	-19	Pass	-33.7	Pass
824 – 849	837.71	838.31	832	-32.0	-19	Pass	-23.2	Pass

**Annex N      3 Tone Intermodulation**

**Refer to Annex N for 3 Tone Intermodulation Test Data**

## Isolation

**Engineer:** Greg Corbin

**Test Date:** 11/15/2023

### Test Procedure

The EUT was connected as shown in Test Set-up.

For the uplink with switch in position 1 (dedicated ports), a CW signal at center frequency of the uplink band was injected into server port 1 with the input power set to just below the AGC Threshold.

The signal was measured at the wanted dedicated port output, and at the unwanted dedicated port outputs.

The difference in the amplitude of the signal at the wanted port and the signal at the unwanted ports is the isolation.

The test was repeated on the uplink with the switch set to position 2 (Common Port). The CW signal was injected into server port 1 and the wanted signal was measured at donor port 1 and the isolation was measured for donor ports 2 and 3.

For the downlink with switch in position 1 (dedicated ports), a CW signal at center frequency of the uplink band was injected into the dedicated donor port with the input power set to just below the AGC Threshold.

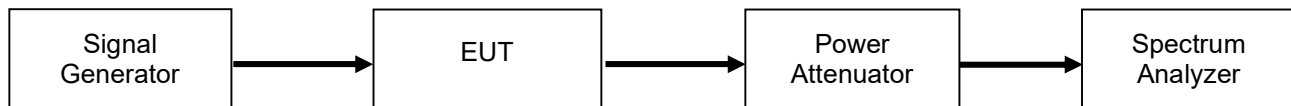
The wanted signal was measured at the server port 1 output. The unwanted signal was measured at the other 2 donor ports.

This test was repeated for the common port downlink path. The CW signal was injected into Donor port 1.

The wanted signal was measured at the server port 1 output. The unwanted signal was measured at the donor port 2 and donor port 3.

This test was repeated for the signal paths shown in the table below.

### Test Setup



### Signal Paths measured for the Isolation Test

Isolation_Uplink									
Dedicated_Switch Position 1					Common_Switch Position 2				
Band	Signal Inject Port	Wanted Port	Isolated ports		Band	Signal Inject Port	Wanted Port	Isolated ports	
B12	S1	D3	D1	D2	B12	S1	D2	D1	D3
B13	S1	D3	D1	D2	B13	S1	D2	D1	D3
B5	S1	D1	D2	D3	B5	S1	D2	D2	D3
B4	S1	D2	D1	D3					
B25	S1	D2	D1	D3					

Isolation_Downlink					Isolation_Downlink				
Dedicated_Switch Position 1					Common_Switch Position 2				
Band	Signal Inject Port	Wanted Port	Isolated ports		Band	Signal Inject Port	Wanted Port	Isolated ports	
B12	D3	S1	D1	D2	B12	D2	S1	D1	D3
B13	D3	S1	D1	D2	B13	D2	S1	D1	D3
B5	D1	S1	D2	D3	B5	D2	S1	D2	D3
B4	D2	S1	D1	D3					
B25	D2	S1	D1	D3					

### Isolation Test Results

#### Uplink Dedicated Port

Band	Wanted Signal direction	Isolated Port #1 signal direction	Isolated Port #2 Signal direction	Wanted Port Signal Level	Isolated Port #1 Signal Level	Isolated Port #2 signal level	Isolation Port #1	Isolation Port #2
Marker on Graph-->				MR	M1	M2	dB	dB
				dBm	dBm	dBm		
12	S1 to D3	S1 to D1	S1 to D2	23.8	-51.2	-52.0	-75	-75.8
13	S1 to D3	S1 to D1	S1 to D2	23.3	-19.6	-48.7	-42.9	-72
5	S1 to D1	S1 to D2	S1 to D3	20.6	-17.4	-45.0	-38	-65.6
4	S1 to D2	S1 to D1	S1 to D3	21.5	-36.4	-51.8	-57.9	-73.3
25	S1 to D2	S1 to D1	S1 to D3	19.9	-39.6	-52.9	-59.5	-72.8

### Downlink Dedicated Port

Band	Wanted Signal direction	Isolated Port #1 signal direction	Isolated Port #2 Signal direction	Wanted Port Signal Level	Isolated Port #1 Signal Level	Isolated Port #2 signal level	Isolation Port #1	Isolation Port #2
Marker on Graph-->				MR	M1	M2	dB	dB
				dBm	dBm	dBm		
12	D3 to S1	D1 to S1	D2 to S1	13.9	-26.8	-56.8	-40.7	-70.7
13	D3 to S1	D1 to S1	D2 to S1	12.8	-27.6	-52.2	-40.4	-65
5	D1 to S1	D2 to S1	D3 to S1	13.3	-25.8	-48.8	-39.1	-62.1
4	D2 to S1	D1 to S1	D3 to S1	13.9	-47.3	-46.7	-61.2	-60.6
25	D2 to S1	D1 to S1	D3 to S1	14.1	-36.1	-45.3	-50.2	-59.4

### Uplink Common Port

Band	Wanted Signal direction	Isolated Port #1 signal direction	Isolated Port #2 Signal direction	Wanted Port Signal Level	Isolated Port #1 Signal Level	Isolated Port #2 signal level	Isolation Port #1	Isolation Port #2
Marker on Graph-->				MR	M1	M2	dB	dB
				dBm	dBm	dBm		
12	S1 to D2	S1 to D1	S1 to D3	22.3	-20.0	-16.7	-42.3	-39
13	S1 to D2	S1 to D1	S1 to D3	21.6	-18.9	-17.8	-40.5	-39.4
5	S1 to D2	S1 to D1	S1 to D3	20.4	-19.6	-44.3	-40	-64.7

### Downlink Common Port

Band	Wanted Signal direction	Isolated Port #1 signal direction	Isolated Port #2 Signal direction	Wanted Port Signal Level	Isolated Port #1 Signal Level	Isolated Port #2 signal level	Isolation Port #1	Isolation Port #2
Marker on Graph-->				MR	M1	M2	dB	dB
				dBm	dBm	dBm		
12	D2 to S1	D1 to S1	D3 to S1	13.9	-27.0	-26.5	-40.9	-40.4
13	D2 to S1	D1 to S1	D3 to S1	13.0	-31.5	-30.0	-44.5	-43
5	D2 to S1	D1 to S1	D3 to S1	13.5	-25.7	-52.4	-39.2	-65.9

On the test data in Annex M the markers are assigned as follows:

Marker MR = wanted signal, M1 = unwanted signal at isolated port #1, M2 = unwanted signal at isolated port #2

## Annex O Isolation

Refer to Annex O for Isolation Test Data

## Measurement Uncertainty

Measurement Uncertainty for Compliance Testing is listed in the table below.

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

Measurement Type	Expanded Uncertainty
Conducted Emissions, AC Powerline	± 3.28 dB
Radiated Emissions_30 – 1000 MHz	± 4.82 dB
Radiated Emissions_1 – 18 GHz	± 5.73 dB
Frequency Error	± 22 Hz
Conducted RF Power	± 0.98 dB
Conducted Spurious Emission	± 2.49 dB
AC Voltage	± 2.3 %
DC Voltage	± 0.12 %
Temperature	± 1.0 deg C
Humidity	± 4.32 %

## Test Equipment Utilized

Description	Manufacturer	Model #	CT Asset #	Last Cal Date	Cal Due Date
Horn Antenna	EMCO	3116	i00085	2/22/21	2/22/23
Tunable Notch Filter	Eagle	TNF-1-(250-850MHz)	i00124	Verified on: 11/13/23	
Horn Antenna	ARA	DRG-118/A	i00271	8/11/22	8/11/24
Humidity / Temp Meter	Newport	IBTHX-W-5	i00686	1/5/23	1/5/24
Vector Signal Generator	Agilent	E4438C	i00348	6/19/23	6/19/24
Bi-Log Antenna	Schaffner	CBL 6111D	i00349	2/7/23	2/7/25
Signal Generator	Rohde & Schwarz	SMU200A	i00405	1/25/23	1/025/24
Spectrum Analyzer	Textronix	RSA5126A	i00424	6/21/23	6/21/24
3 Meter Semi-Anechoic Chamber	Panashield	3 Meter Semi-Anechoic Chamber	i00428	6/27/23	6/27/24
Highpass Filter (1 GHz)	K&L	7IH40-980/T6000-O/O	i00432	Verified on: 11/13/23	
PSA Spectrum Analyzer	Agilent	E4445A	i00471	12/29/22	12/29/23
Voltmeter	Fluke	179	i00488	6/19/23	6/19/24
MXE EMI receiver	Keysight	N9038A	i00552	2/23/23	2/23/24
Preamplifier	Eravant	SBB-0115034018-2F2F-E3	i00646	Verified on: 7/27/23	

In addition to the equipment listed above, standard RF connectors and cables were utilized in the testing of the described equipment. Prior to testing these components were tested to verify proper operation.

END OF TEST REPORT