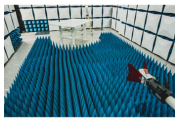
PCTEST
7185 Oakland Mills Road, Columbia, MD 21046 USA
Tel. 410.290.6652 / Fax 410.290.6654
http://www.pctest.com



DATA REFERENCING REPORT

Applicant Name:
Pivotal Commware
10801 120th Ave Ne #200,
Kirkland, WA 98033
United States

Date of Testing:
6/29/2021-8/9/2021
Test Site/Location:
PCTEST Lab. Columbia, MD, USA
Test Report Serial No.:
1M2106240071-07.2AUVU

FCC ID:	**2AUVU-P28SUHMGA1**
APPLICANT:	**Pivotal Commware**

Application Type:	Certification
Model:	PIV28SUHMGA1
EUT Type:	5G mmWave Repeater (Service Unit)
FCC Classification:	Part 20 Industrial Booster (CMRS) (B2I)
FCC Rule Part(s):	20
Test Procedure(s):	KDB 484596 D01 v01

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in §2.947. Test results reported herein relate only to the item(s) tested.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Randy Ortanez
President

ACCREDITED
CERT #2041.01

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1.0 DATA REFERENCING

1.1 Introduction

The test results presented in this filing reference the Certification test results for **FCC ID: 2AUVU-P28SUGA1**.

Results are referenced from the following test report S/Ns: 1M2010120161-03.2AUVU.

The applicant takes full responsibility to ensure that all referenced test results represent compliance for the equipment under test in this filing.

1.2 Differences Between EUT and Referenced Devices

The equipment under test (EUT) in this filing (**FCC ID: 2AUVU-P28SUHMGA1**) and the reference device certified under for **FCC ID: 2AUVU-P28SUGA1** share a common design. The EUT only differs from the reference device in that it uses larger horn antennas with higher gain for the output signal. Otherwise, all circuitry in both devices is identical.

1.3 Spot Check Verification Data

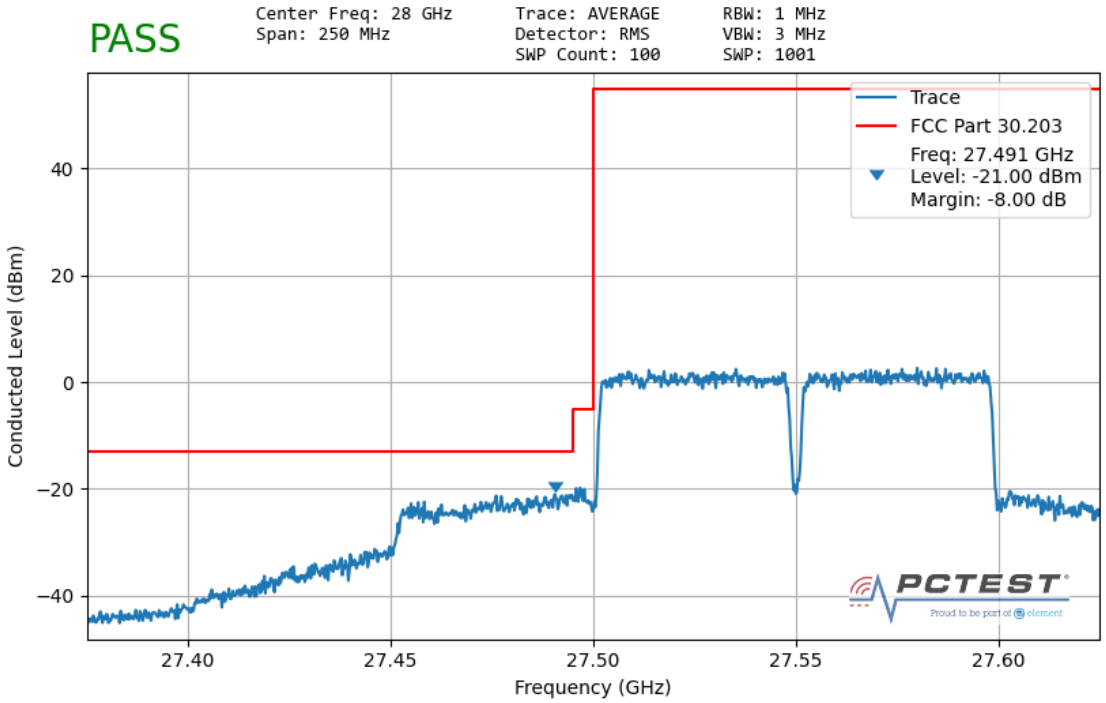
Spot checks on the EUT in this filing are performed for the worst-case data and the most crucial test cases, as noted below, against the reference device. This is done to verify that the variant EUT is still in compliance with similar results to the reference device.

For the EUT in this filing (**FCC ID: 2AUVU-P28SUHMGA1**), spot checks of the following tests were performed:

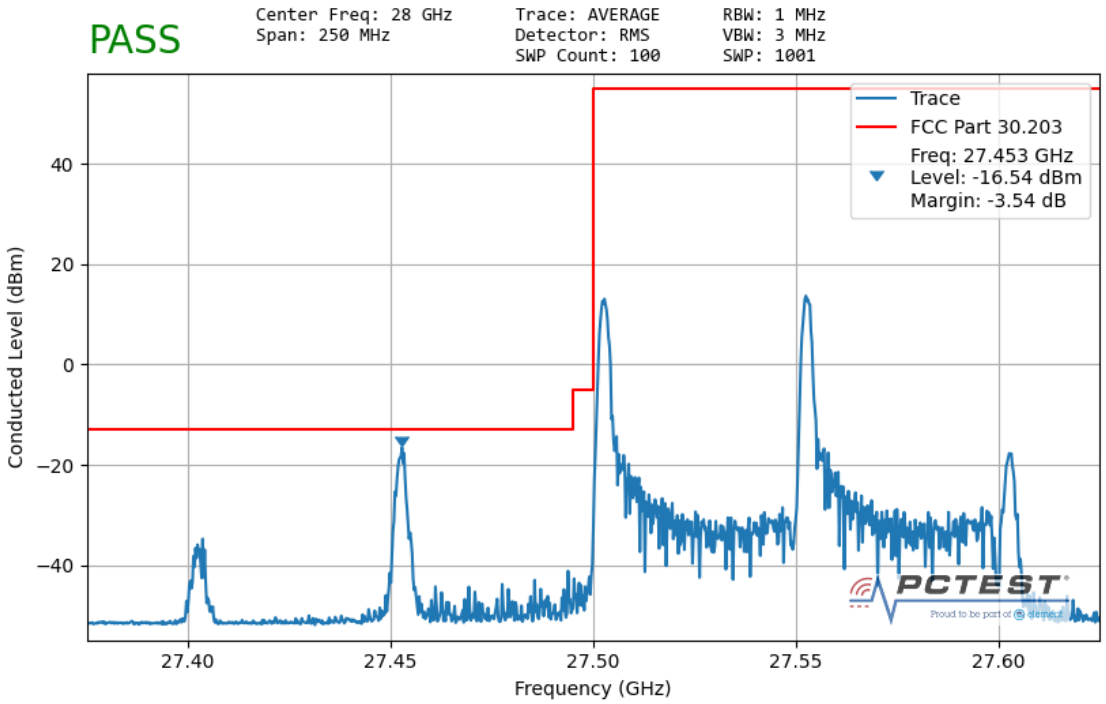
- Out-of-band Emissions Conducted Measurements
- Measuring AGC Threshold Level, Mean Output Power and Amplifier/Booster Gain

Each spot check test on the EUT was performed using the same procedures and settings that were used to perform the test on the corresponding reference device.

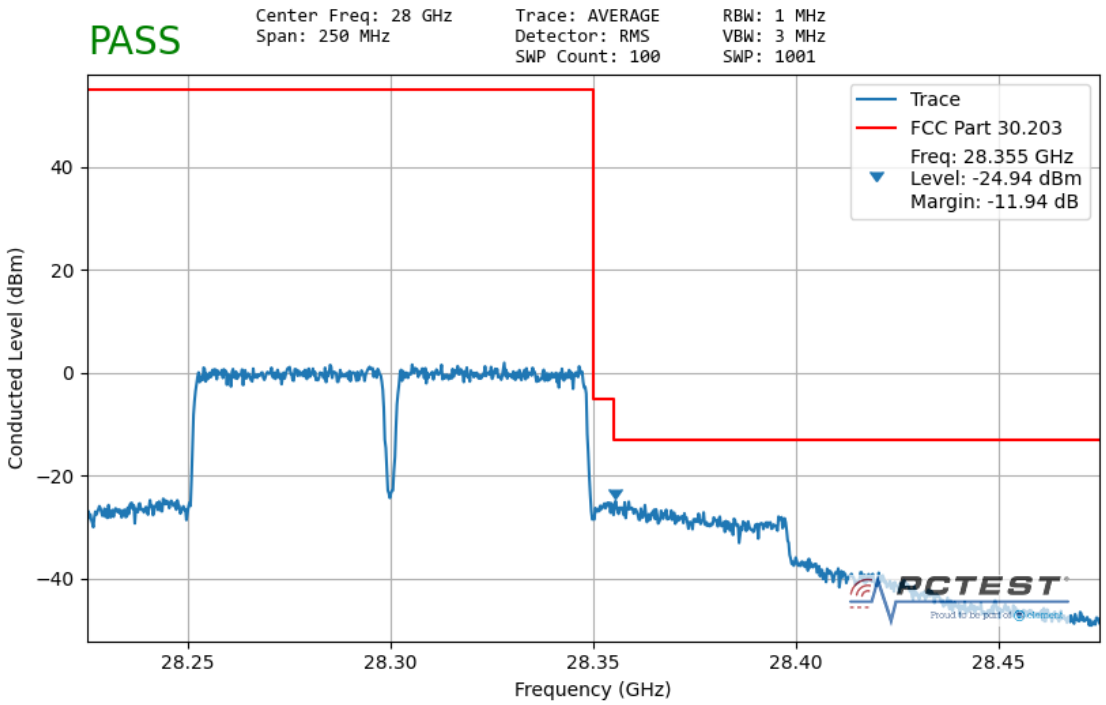
1.3.1 Out-of-band Emissions Conducted Measurements



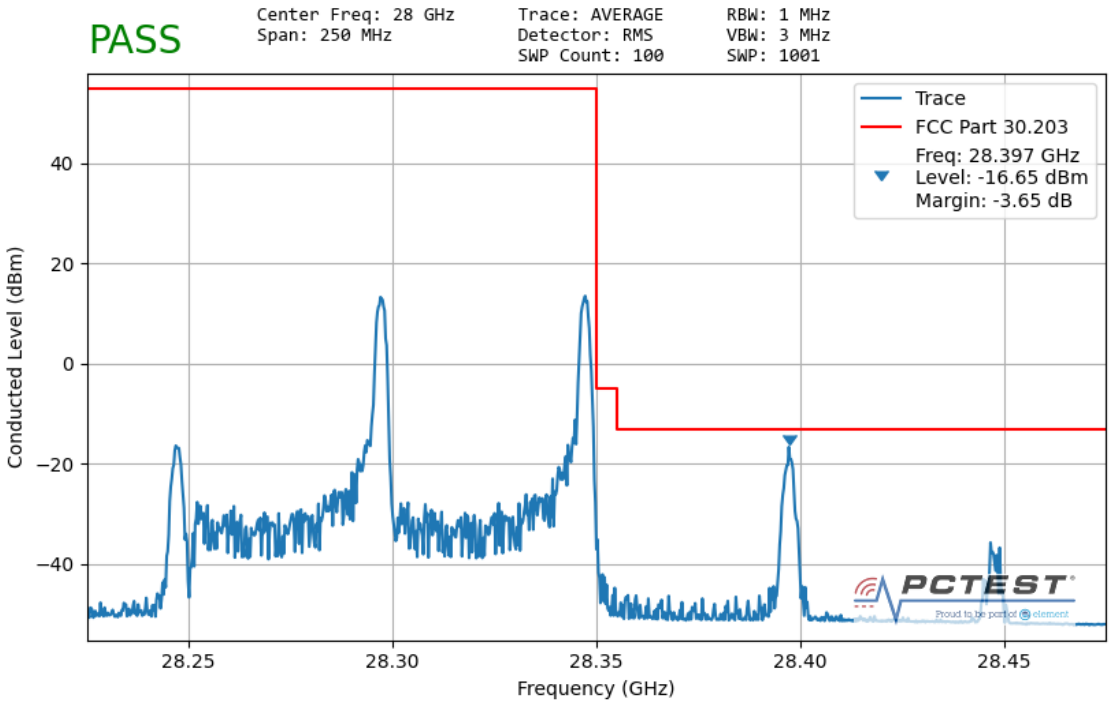
Plot 1-1. Horn Antenna Lower Band Edge Plot with 2 Carriers – Full RB
Reference Device (FCC ID: 2AUVU-P28SUGA1)



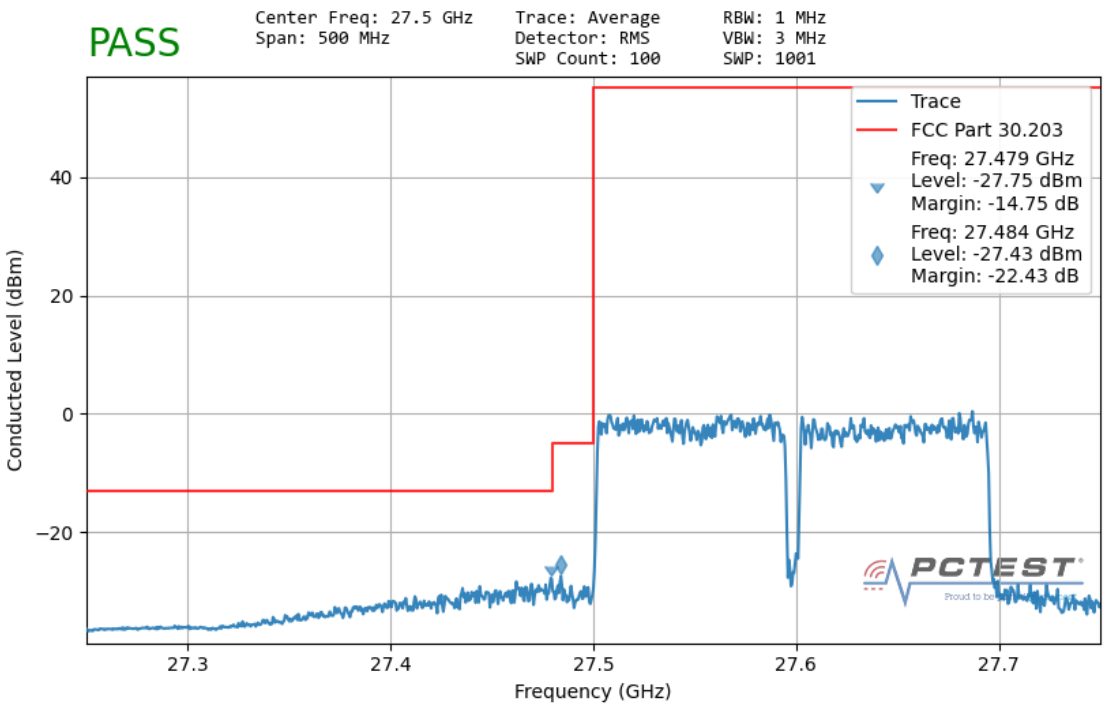
Plot 1-2. Horn Antenna Lower Band Edge Plot with 2 Carriers – 1RB
Reference Device (FCC ID: 2AUVU-P28SUGA1)



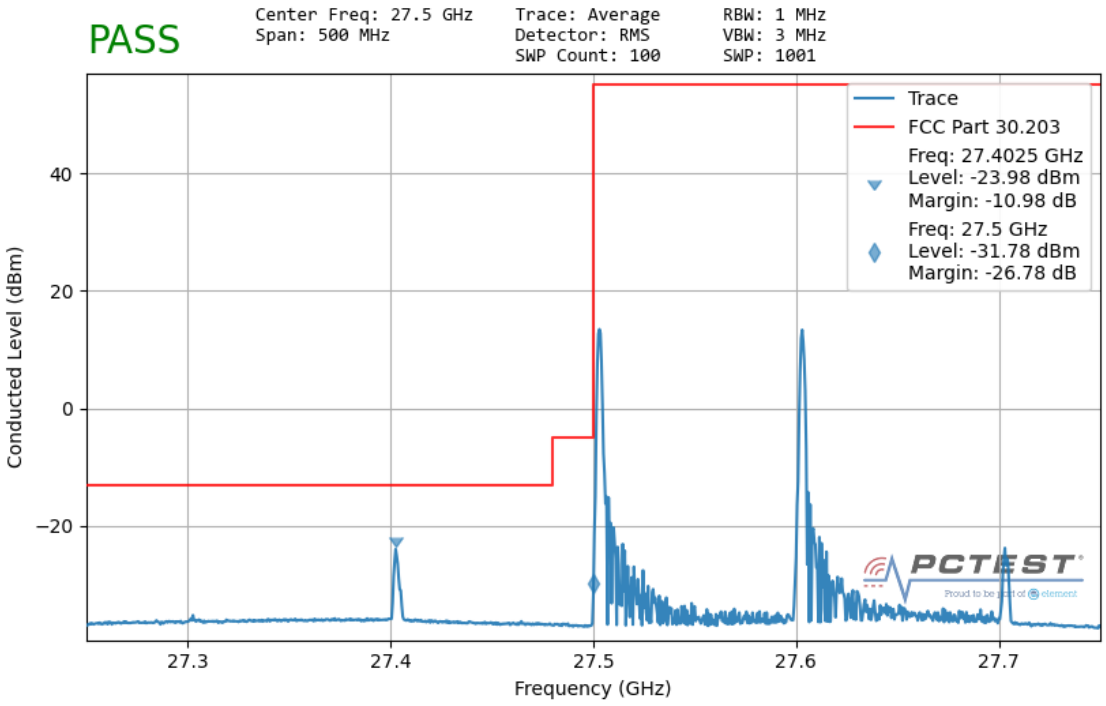
Plot 1-3. Horn Antenna Upper Band Edge Plot with 2 Carriers – Full RB
Reference Device (FCC ID: 2AUVU-P28SUGA1)



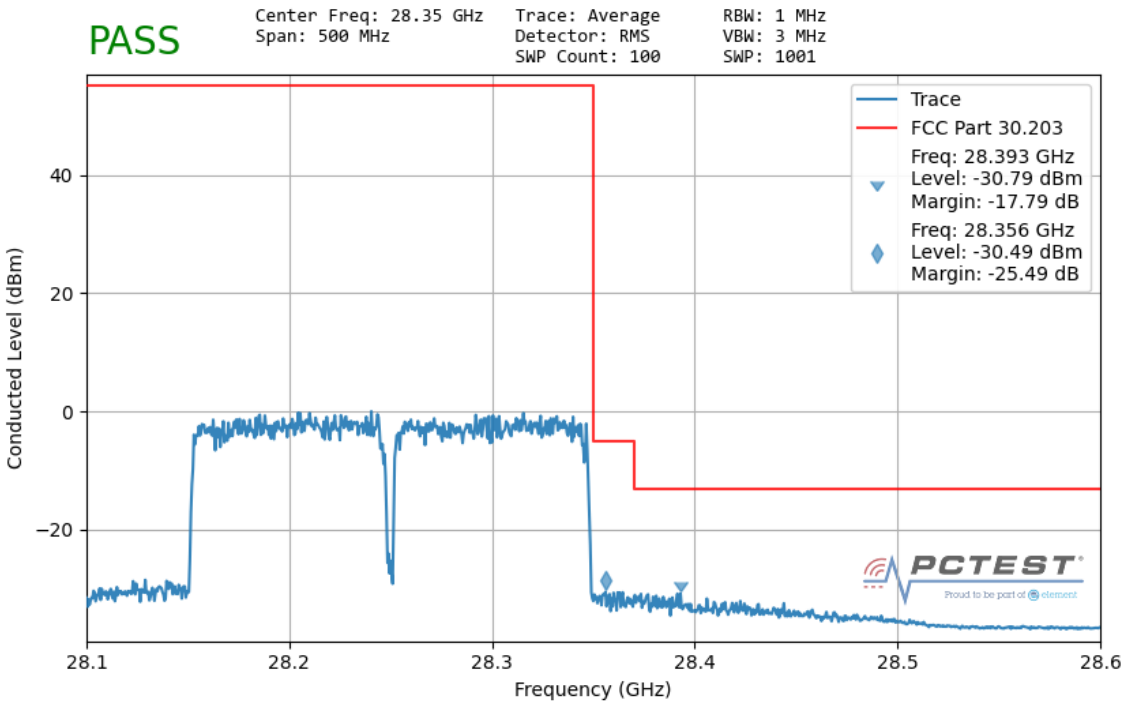
Plot 1-4. Horn Antenna Upper Band Edge Plot with 2 Carriers – 1RB
Reference Device (FCC ID: 2AUVU-P28SUGA1)



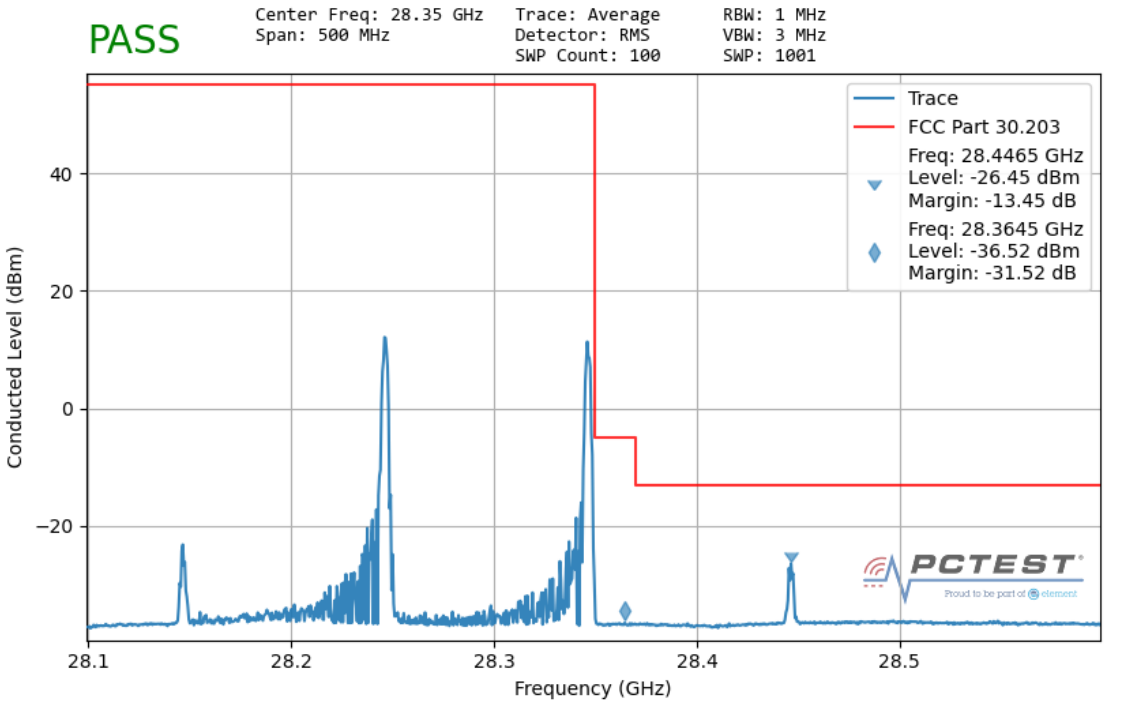
Plot 1-5. Horn Antenna Lower Band Edge Plot with 2 Carriers – Full RB
Equipment Under Test (FCC ID: 2AUVU-P28SUHMGA1)



Plot 1-6. Horn Antenna Lower Band Edge Plot with 2 Carriers – 1RB
Equipment Under Test (FCC ID: 2AUVU-P28SUHMGA1)



Plot 1-7. Horn Antenna Upper Band Edge Plot with 2 Carriers – Full RB
Equipment Under Test (FCC ID: 2AUVU-P28SUHMGA1)



Plot 1-8. Horn Antenna Upper Band Edge Plot with 2 Carriers – 1RB
Equipment Under Test (FCC ID: 2AUVU-P28SUHMGA1)

1.3.2 Measuring AGC Threshold Level, Mean Output Power & Amplifier/Booster Gain

Bandwidth (MHz)	Frequency [MHz]	Channel	Modulation	RB Size	EUT Input Power Level (dBm)	Conducted Power [dBm]	Calculated Change in Output Power	Calculated gain (dB)
50	27924.96	Mid	QPSK	Full RB	-36.64	15.41	-	52.05
50	27924.96	Mid	QPSK	Full RB	-35.57	16.34	0.93	51.91
50	27924.96	Mid	QPSK	Full RB	-34.55	17.29	0.95	51.84
50	27924.96	Mid	QPSK	Full RB	-33.58	18.09	0.80	51.67
50	27924.96	Mid	QPSK	Full RB	-32.58	18.82	0.73	51.40
50	27924.96	Mid	QPSK	Full RB	-31.45	18.92	0.10	50.37
50	27924.96	Mid	QPSK	Full RB	-30.41	19.05	0.13	49.46
50	27924.96	Mid	QPSK	Full RB	-29.49	18.59	-0.46	48.08
50	27924.96	Mid	QPSK	Full RB	-28.54	19.12	0.53	47.66
50	27924.96	Mid	QPSK	Full RB	-27.48	18.98	-0.14	46.46
50	27924.96	Mid	QPSK	Full RB	-26.48	19.31	0.33	45.79
50	27924.96	Mid	QPSK	Full RB	-25.52	19.25	-0.06	44.77

Table 1-1. Full RB AGC Threshold and Booster Gain – 50MHz 1CC
Reference Device (FCC ID: 2AUVU-P28SUGA1)

Note: AGC Level is found at **-31.45dBm** EUT Input Power Level.

Bandwidth (MHz)	Frequency [MHz]	Channel	Modulation	RB Size	EUT Input Power Level (dBm)	Conducted Power [dBm]	Calculated Change in Output Power	Calculated gain (dB)
100	27924.96	Mid	QPSK	Full RB	-39.91	10.05	-	49.96
100	27924.96	Mid	QPSK	Full RB	-39.08	11.01	0.96	50.09
100	27924.96	Mid	QPSK	Full RB	-38.29	11.93	0.92	50.22
100	27924.96	Mid	QPSK	Full RB	-37.54	12.94	1.01	50.48
100	27924.96	Mid	QPSK	Full RB	-36.67	13.86	0.92	50.53
100	27924.96	Mid	QPSK	Full RB	-35.89	14.74	0.88	50.63
100	27924.96	Mid	QPSK	Full RB	-34.92	15.69	0.95	50.61
100	27924.96	Mid	QPSK	Full RB	-34.11	16.54	0.85	50.65
100	27924.96	Mid	QPSK	Full RB	-33.11	17.31	0.77	50.42
100	27924.96	Mid	QPSK	Full RB	-32.19	17.61	0.30	49.80
100	27924.96	Mid	QPSK	Full RB	-31.20	16.27	-1.34	47.47
100	27924.96	Mid	QPSK	Full RB	-30.24	17.05	0.78	47.29

Table 1-2. Full RB AGC Threshold and Booster Gain – 100MHz 4CC
Reference Device (FCC ID: 2AUVU-P28SUGA1)

Note: AGC Level is found at **-33.11dBm** EUT Input Power Level.

Bandwidth (MHz)	Frequency [MHz]	Channel	Modulation	RB Size	EUT Input Power Level (dBm)	Conducted Power [dBm]	Calculated Change in Output Power	Calculated gain (dB)
50	27924.96	Mid	QPSK	Full RB	-39.56	12.41	-	51.97
50	27924.96	Mid	QPSK	Full RB	-38.54	13.40	0.99	51.94
50	27924.96	Mid	QPSK	Full RB	-37.52	14.38	0.98	51.90
50	27924.96	Mid	QPSK	Full RB	-36.51	15.36	0.98	51.87
50	27924.96	Mid	QPSK	Full RB	-35.53	16.31	0.95	51.84
50	27924.96	Mid	QPSK	Full RB	-34.56	17.24	0.93	51.80
50	27924.96	Mid	QPSK	Full RB	-33.55	18.20	0.96	51.75
50	27924.96	Mid	QPSK	Full RB	-32.53	19.17	0.97	51.70
50	27924.96	Mid	QPSK	Full RB	-31.53	20.11	0.94	51.64
50	27924.96	Mid	QPSK	Full RB	-30.54	19.81	-0.30	50.35
50	27924.96	Mid	QPSK	Full RB	-29.59	19.31	-0.50	48.90
50	27924.96	Mid	QPSK	Full RB	-28.59	20.30	0.99	48.89

Table 1-3. Full RB AGC Threshold and Booster Gain – 50MHz 1CC
Equipment Under Test (FCC ID: 2AUVU-P28SUHMGA1)

Note: AGC Level is found at **-30.54dBm** EUT Input Power Level.

Bandwidth (MHz)	Frequency [MHz]	Channel	Modulation	RB Size	Signal Generator Level [dBm]	EUT Input Power Level (dBm)	Conducted Power [dBm]	Calculated Change in Output Power	Calculated gain (dB)
100	27924.96	Mid	QPSK	Full RB	-20.0	-39.98	11.36	-	51.34
100	27924.96	Mid	QPSK	Full RB	-19.0	-39.12	12.31	0.95	51.43
100	27924.96	Mid	QPSK	Full RB	-18.0	-38.27	13.28	0.97	51.55
100	27924.96	Mid	QPSK	Full RB	-17.0	-37.40	14.20	0.92	51.60
100	27924.96	Mid	QPSK	Full RB	-16.0	-36.49	15.18	0.98	51.67
100	27924.96	Mid	QPSK	Full RB	-15.0	-35.52	16.16	0.98	51.68
100	27924.96	Mid	QPSK	Full RB	-14.0	-34.58	17.09	0.93	51.67
100	27924.96	Mid	QPSK	Full RB	-13.0	-33.65	18.04	0.95	51.69
100	27924.96	Mid	QPSK	Full RB	-12.0	-32.71	16.96	-1.08	49.67
100	27924.96	Mid	QPSK	Full RB	-11.0	-31.73	17.55	0.59	49.28
100	27924.96	Mid	QPSK	Full RB	-10.0	-30.78	18.49	0.94	49.27
100	27924.96	Mid	QPSK	Full RB	-9.0	-29.76	18.38	-0.11	48.14

Table 1-4. Full RB AGC Threshold and Booster Gain – 100MHz 4CC
Equipment Under Test (FCC ID: 2AUVU-P28SUHMGA1)

Note: AGC Level is found at **-32.71dBm** EUT Input Power Level.

1.4 Reference Section

The results presented in the test report(s) for the EUT in this filing (**FCC ID: 2AUVU-P28SUHMGA1**) may include both data obtained from testing on the EUT as well as data referenced from other devices. This section displays the source of referenced data presented in the test reports in this filing.

Note: Data presented in test reports that are not cross-referenced in this section were obtained from direct testing of the EUT in this filing.

FCC Part 20 / KDB 935210 D05

Test Report S/N (EUT)	Section	Test Description	Frequency Range(s) [MHz]	Mode(s)	FCC ID of Referenced Device	Test Report S/N (Referenced Device)
1M2106240071-03.2AUVU	6.2	Input-Versus-Output Signal Comparison	27500 - 28350	NR Band n261	2AUVU-P28SUGA1	1M2010120161-03.2AUVU
1M2106240071-03.2AUVU	6.3	Out-of-band Emissions Conducted Measurements	27500 - 28350	NR Band n261	2AUVU-P28SUGA1	1M2010120161-03.2AUVU
1M2106240071-03.2AUVU	6.4	Out-of-band Rejection	27500 - 28350	NR Band n261	2AUVU-P28SUGA1	1M2010120161-03.2AUVU
1M2106240071-03.2AUVU	6.5	Measuring AGC Threshold Level, Mean Output Power and Amplifier/Booster Gain	27500 - 28350	NR Band n261	2AUVU-P28SUGA1	1M2010120161-03.2AUVU

Table 1-5. Cross-Referenced Data (FCC Part 20)