

Company: Kumu Networks

Test of: KU5B01LTE02-US

To: FCC Part 24E & IC RSS 133 Issue 6

Report No.: KUMU03-U4 Rev A





Test of: Kumu Networks KU5B01LTE02-US

To: FCC Part 24E & IC RSS 133

Test Report Serial No.: KUMU03-U4 Rev A

This report supersedes: NONE

Applicant: Kumu Networks
960 Hamlin Court,
Sunnyvale California 94089
USA

Product Function: LTE Network Relay

Issue Date: 17th August 2017

This Test Report is Issued Under the Authority of:

MiCOM Labs, In c.
575 Boulder Court
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www.micomlabs.com



MiCOM Labs is an ISO 17025 Accredited Testing Laboratory



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1. ACCREDITATION, LISTINGS & RECOGNITION

1.1. Testing Accreditation

MiCOM Labs, Inc. is an accredited Electrical testing laboratory per the international standard ISO/IEC 17025:2005. The company is accredited by the American Association for Laboratory Accreditation (A2LA) www.a2la.org test laboratory number 2381.01. MiCOM Labs test schedule is available at the following URL; <http://www.a2la.org/scopepdf/2381-01.pdf>



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1.2. Recognition

MiCOM Labs, Inc has widely recognized wireless testing capabilities. Our international recognition includes Conformity Assessment Body designation by APEC MRA countries. MiCOM Labs test reports are accepted globally.

| Country | Recognition Body | Status | Phase | Identification No. |
|-----------|--|--------|------------|---|
| USA | Federal Communications Commission (FCC) | TCB | - | US0159 Listing #: 102167 |
| Canada | Industry Canada (IC) | FCB | APEC MRA 2 | US0159 Listing #: 4143A-2 4143A-3 |
| Japan | MIC (Ministry of Internal Affairs and Communication) | CAB | APEC MRA 2 | RCB 210 |
| | VCCI | -- | -- | A-0012 |
| Europe | European Commission | NB | EU MRA | NB 2280 |
| Australia | Australian Communications and Media Authority (ACMA) | CAB | APEC MRA 1 | US0159 |
| Hong Kong | Office of the Telecommunication Authority (OFTA) | CAB | APEC MRA 1 | |
| Korea | Ministry of Information and Communication Radio Research Laboratory (RRL) | CAB | APEC MRA 1 | |
| Singapore | Infocomm Development Authority (IDA) | CAB | APEC MRA 1 | |
| Taiwan | National Communications Commission (NCC) Bureau of Standards, Metrology and Inspection (BSMI) | CAB | APEC MRA 1 | |
| Vietnam | Ministry of Communication (MIC) | CAB | APEC MRA 1 | |

EU MRA – European Union Mutual Recognition Agreement.

NB – Notified Body

APEC MRA – Asia Pacific Economic Community Mutual Recognition Agreement. Recognition agreement under which test lab is accredited to regulatory standards of the APEC member countries.

Phase I - recognition for product testing

Phase II – recognition for both product testing and certification

1.3. Product Certification

MiCOM Labs, Inc. is an accredited Product Certification Body per the international standard ISO/IEC 17065:2012. The company is accredited by the American Association for Laboratory Accreditation (A2LA) www.a2la.org test laboratory number 2381.02. MiCOM Labs test schedule is available at the following URL; <http://www.a2la.org/scopepdf/2381-02.pdf>



United States of America – Telecommunication Certification Body (TCB)

Industry Canada – Certification Body, CAB Identifier – US0159

Europe – Notified Body (NB), NB Identifier - 2280

Japan – Recognized Certification Body (RCB), RCB Identifier - 210



Title: Kumu Networks KU5B01LTE02-US
To: FCC Part 24E & IC RSS-133 Issue 6
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2. DOCUMENT HISTORY

| Document History | | |
|------------------|------------------------------|---------------------------------|
| Revision | Date | Comments |
| Draft | 1st August 2017 | Draft report for client review. |
| Rev A | 17 th August 2017 | Initial release |
| | | |
| | | |
| | | |

In the above table the latest report revision will replace all earlier versions.

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3. TEST RESULT CERTIFICATE

| | |
|---|---|
| Manufacturer: Kumu Networks 960 Hamlin Court Sunnyvale California 94089 USA | Tested By: MiCOM Labs, Inc. 575 Boulder Court Pleasanton California 94566 USA |
| Model: KU5B01LTE02-US | Telephone: +1 925 462 0304 |
| Type Of Equipment: LTE Network Relay | Fax: +1 925 462 0306 |
| S/N's: RG5-2-R009-D015-U013-B22B10 | |
| Test Date(s): 17 th March – 18 th July 2017 | Website: www.micomlabs.com |

| STANDARD(S) | TEST RESULTS |
|-----------------------------------|--------------------|
| FCC Part 24E & IC RSS-133 Issue 6 | EQUIPMENT COMPLIES |

MiCOM Labs, Inc. tested the equipment mentioned in accordance with the requirements set forth in the above standards. Test results indicate that the equipment tested is capable of demonstrating compliance with the requirements as documented within this report.

Notes:

1. This document reports conditions under which testing was conducted and the results of testing performed.
2. Details of test methods used have been recorded and kept on file by the laboratory.
3. Test results apply only to the item(s) tested.

Approved & Released for MiCOM Labs, Inc. by:



Graeme Grieve
Quality Manager MiCOM Labs, Inc.

Gordon Hurst
President & CEO MiCOM Labs, Inc.

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4. REFERENCES AND MEASUREMENT UNCERTAINTY

4.1. References

| REF. | PUBLICATION | YEAR | TITLE |
|------|-----------------|--------------------|--|
| I | FCC Part 24E | June 24, 1994 | Subpart E—Broadband PCS; This subpart sets out the regulations governing the licensing and operations of personal communications services authorized in the 1850-1910 and 1930-1990 MHz bands. |
| II | RSS-133 Issue 6 | January 2013 | RSS-133 2GHz Personal Communications Services. This Radio Standards Specification (RSS) sets out the requirements for certification of transmitters and receivers used in radiocommunications systems to provide Personal Communications Services (PCS) in the bands 1850-1915 MHz and 1930-1995 MHz. |
| III | KDB 412172 D01 | August 7, 2015 | EIRP and ERP are similarly defined as the product of the power supplied to the antenna and the antenna gain (when the power and gain are represented in linear terms). The primary difference is that for ERP the antenna gain is expressed relative to an ideal half-wave dipole antenna, whereas with EIRP the antenna gain is expressed relative to an ideal (theoretical) isotropic antenna. EIRP and ERP can be expressed mathematically as described in the following sections. ¹ |
| IV | ETSI TR 100 028 | 2001-12 | Parts 1 and 2 Electromagnetic compatibility and Radio Spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics |
| V | M 3003 | Edition 3 Nov.2012 | Expression of Uncertainty and Confidence in Measurements |
| VI | A2LA | June 2015 | R105 - Requirement's When Making Reference to A2LA Accreditation Status |

4.2. Test and Uncertainty Procedure

Conducted and radiated emission measurements were conducted in accordance with American National Standards Institute ANSI C63.4, listed in the Normative References section of this report.

Measurement uncertainty figures are calculated in accordance with ETSI TR 100 028 Parts 1 and 2.

Measurement uncertainties stated are based on a standard uncertainty multiplied by a coverage factor $k = 2$, providing a level of confidence of approximately 95 % in accordance with UKAS document M 3003 listed in the Normative References section of this report.



5. PRODUCT DETAILS AND TEST CONFIGURATIONS

5.1. Technical Details

| Details | Description |
|----------------------------------|---|
| Purpose: | Test of the Kumu Networks KU5B01LTE02-US Evolved Universal Terrestrial Radio Access (E-UTRA) User Equipment (UE) for compliance to the requirements of FCC Part 24E & IC RSS-133 Issue 6. |
| Applicant: | Kumu Networks 960 Hamlin Court, Sunnyvale, California 94089 USA |
| Manufacturer: | As Applicant |
| Laboratory performing the tests: | MiCOM Labs, Inc. 575 Boulder Court, Pleasanton California 94566 USA |
| Test report reference number: | KUMU03- U4 Rev A |
| Date EUT received: | 29 th December 2016 |
| Standard(s) applied: | FCC PART 24E & IC RSS 133 ISSUE 6 |
| Dates of test (from - to): | 17 th March – 18 th July 2017 |
| No of Units Tested: | 1 |
| Type of Equipment: | LTE Network Relay |
| Product Code: | Relay Gen 5B |
| Product Family Name: | Self Backhaul UE Relay |
| Location for use: | Outdoor |
| Declared Frequency Band(s): | LTE Band 2 |
| Primary function of equipment: | LTE Self Backhaul/Relay |
| Secondary function of equipment: | None Provided |
| Type of Modulation: | QPSK, QAM |
| EUT Modes of Operation: | Uplink (Tx): QPSK, 16QAM Downlink (Rx): QPSK, 16QAM, 64QAM |
| Average Output Power: | +24 dBm |
| Transmit/Receive Operation: | Transceiver - Half Duplex |
| Rated Input Voltage and Current: | AC Nominal 230Vac, 1.25 A Maximum: 264 Vac Minimum: 90 Vac |
| Operating Temperature Range: | Declared Range -40°C to +85°C |
| Equipment Dimensions: | (HxWxD)10.25 in X 20 in X 6.25 in |
| Weight: | 30 lbs |
| Hardware PN/Rev: | 810-000005-1 |
| Software Version: | Release 5 |
| Firmware Version: | Release 6 |
| Antenna Configuration: | 2 backhaul and 2 eNode B access antennas specified and provided by the service provider |

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5.2. Scope Of Test Program

Kumu Networks KU5B01LTE02-US

The scope of the test program was to test the Kumu Networks Self Backhaul UE Relay configurations in the specified frequency bands for compliance against the following IMT Cellular Network specification:

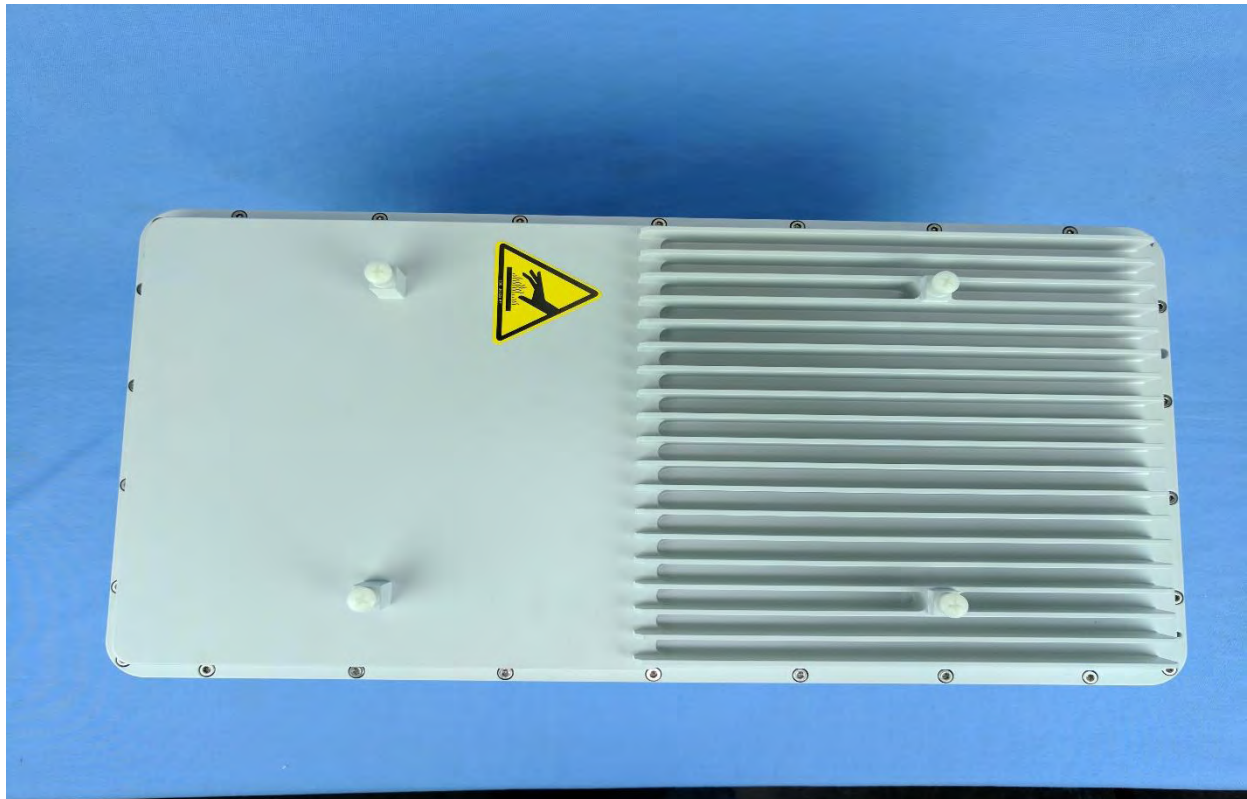
FCC PART 24 Subpart E – Broadband PCS

This subpart sets out the regulations governing the licensing and operations of personal communications services authorized in the 1850-1910 and 1930-1990 MHz bands.

Industry Canada RSS-133 Issue 6

This Radio Standards Specification (RSS) sets out the requirements for certification of transmitters and receivers used in radiocommunications systems to provide Personal Communications Services (PCS) in the bands 1850-1915 MHz and 1930-1995 MHz.

Kumu Networks Self Backhaul UE Relay



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Kumu Networks Self Backhaul UE Relay



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Kumu Networks Self Backhaul UE Relay



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Kumu Networks Self Backhaul UE Relay



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5.3. Equipment Model(s) and Serial Number(s)

| Type | Description | Manu. | Model | Serial no. | Delivery Date |
|-------------------|-------------------------|---------------|----------------|-----------------------------|---------------------------|
| EUT | LTE Self Backhaul/Relay | Kumu Networks | KU5B01LTE02-US | RG5-2-R009-D015-U013-B22B10 | 29 th Dec 2016 |
| Support Equipment | Laptop | Lenovo | W520 | -- | -- |

*Replacement unit required

5.4. Antenna Details

Antenna Configuration: 2 backhaul and 2 eNode B access antennas specified and provided by the service provider.

5.5. Cabling and I/O Ports

| Port Type | Max Cable Length | # Of Ports | Screened | Conn Type | Data Type |
|-----------------------------|------------------|------------|----------|-----------|-------------|
| Ethernet | 12ft | 1 | Y | RJ-45 | Packet Data |
| Ethernet (Maintenance Port) | -- | 1 | Y | RJ-45 | Packet Data |

5.6. Test Configurations

The KU5B01LTE02-US was tested in QPSK and 16 QAM modes

Results for the following configurations are provided in this report:

| LTE Band No. | Bandwidth (MHz) | Channels No.'s | Frequencies (MHz) |
|--------------|-----------------|---------------------|------------------------|
| 2 | 5 | 18625, 18900, 19175 | 1852.5, 1880.0, 1907.5 |
| | 10 | 18650, 18900, 19150 | 1855.0, 1880.0, 1905.0 |
| | 15 | 18675, 18900, 19125 | 1857.5, 1880.0, 1902.5 |
| | 20 | 18700, 18900, 19100 | 1860.0, 1880.0, 1900.0 |

5.7. Equipment Modifications

The following modifications were required to bring the equipment into compliance:

1. NONE

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5.8. Deviations from the Test Standard

The following deviations from the test standard were required in order to complete the test program:

1. NONE

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6. TEST SUMMARY

List of Measurements

| Test Header | Result | Data Link |
|------------------------------------|----------|---------------------------|
| Transmitter Test Parameters | | |
| Output Power | Complies | View Data |
| Peak-to-average power ratio | Complies | View Data |
| Frequency Stability | Complies | View Data |
| Emission Bandwidth | Complies | View Data |
| Out of Band Emissions | Complies | View Data |
| Receiver Spurious Emissions | Complies | View Data |

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7. MEASUREMENT AND PRESENTATION OF TEST DATA

The measurement and graphical data presented in this test report was generated automatically using state-of-the-art technology creating an easy to read report structure. Numerical measurement data is separated from supporting graphical data (plots) through hyperlinks. Numerical measurement data can be reviewed without scrolling through numerous graphical pages to arrive at the next data matrix.

Plots have been relegated into the Appendix 'Graphical Data'.

Test and report automation was performed by [MiTest](#). [MiTest](#) is an automated test system developed by MiCOM Labs. [MiTest](#) is the first cloud based modular test system enabling end-to-end automation of regulatory compliance testing for conducted RF testing.



The MiCOM Labs "[MiTest](#)" Automated Test System" (Patent Pending)

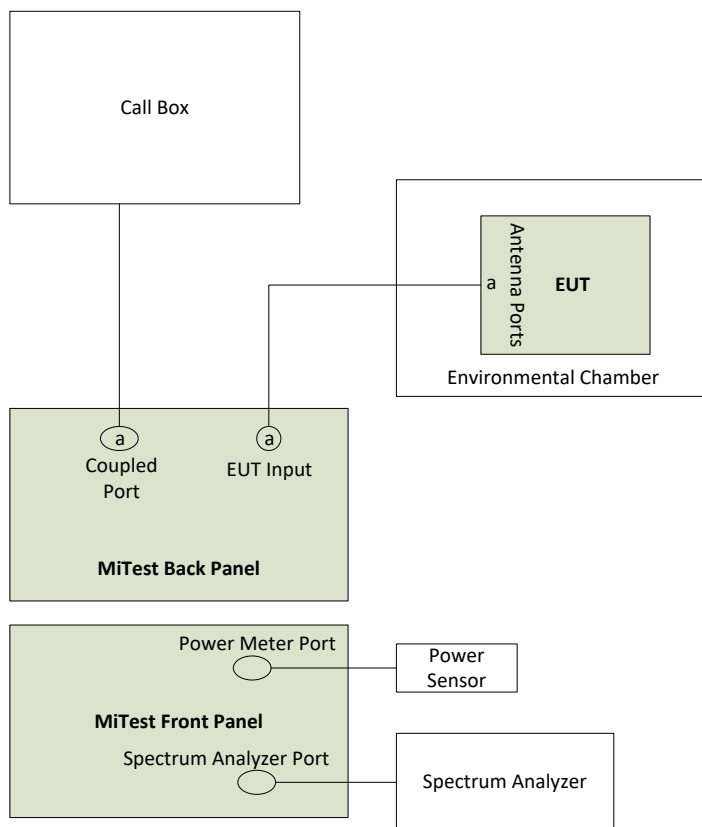
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8. TEST EQUIPMENT CONFIGURATION(S)

8.1. Conducted Testing

Conducted Test Set-up(s)

All transmitter conducted testing and Receiver Spurious Emissions testing was performed using the test setup below;





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A full system calibration was performed on the test station and any resulting system losses (or gains) were taken into account in the production of all final measurement data.

| Asset# | Description | Manufacturer | Model# | Serial# | Calibration Due Date |
|-------------|---|----------------------|----------------------|---------------|----------------------|
| 127 | Power Supply | HP | 6674A | US36370530 | Cal when used |
| 158 | Barometer/Thermometer | Control Company | 4196 | E2846 | 30 Nov 2017 |
| 248 | Resistance Thermometer | Thermotronics | GR2105-02 | 9340 #1 | 21 Oct 2017 |
| 287 | Rohde & Schwarz 40 GHz Receiver | Rhode & Schwarz | ESIB40 | 100201 | 2 May 2018 |
| 376 | USB 10MHz - 18GHz Average Power Sensor | Agilent | U2000A | MY51440005 | 23 Oct 2017 |
| 378 | Rohde & Schwarz 40 GHz Receiver with Generator | Rhode & Schwarz | ESIB40 | 100107/040 | 4 Nov 2017 |
| 381 | 4x4 RF Switch Box | MiCOM Labs | MiTest RF Switch Box | MIC002 | 2 Oct 2017 |
| 398 | MiTest RF Conducted Test Software | MiCOM | MiTest ATS | Version 4.1 | Not Required |
| 419 | Laptop with Labview Software | Lenova | W520 | TS02 | Not Required |
| 420 | USB to GPIB Interface | National Instruments | GPIB-USB HS | 1346738 | Not Required |
| 440 | USB Wideband Power Sensor | Boonton | 55006 | 9178 | 25 Sep 2017 |
| 442 | USB Wideband Power Sensor | Boonton | 55006 | 9181 | 6 Oct 2017 |
| 445 | PoE Injector | D-Link | DPE-101GL | QTAH1E2000625 | Not Required |
| 460 | Dell Computer with installation of MiTest executable. | Dell | Optiplex330 | BC944G1 | Not Required |
| 493 | USB Wideband Power Sensor | Boonton | 55006 | 9634 | 10 Mar 2018 |
| 494 | USB Wideband Power Sensor | Boonton | 55006 | 9726 | 10 Mar 2018 |
| 74 | Environmental Chamber Chamber 3 | Tenney | TTC | 12808-1 | 29 Sep 2017 |
| RF#2 GPIB#1 | GPIB cable to Power Supply | HP | GPIB | None | Not Required |
| RF#2 SMA#1 | EUT to Mitest box port 1 | Flexco | SMA Cable port1 | None | 2 Oct 2017 |
| RF#2 SMA#2 | EUT to Mitest box port 2 | Flexco | SMA Cable port2 | None | 2 Oct 2017 |
| RF#2 SMA#3 | EUT to Mitest box port 3 | Flexco | SMA Cable port3 | None | 2 Oct 2017 |
| RF#2 | EUT to Mitest box port 4 | Flexco | SMA Cable | None | 2 Oct 2017 |

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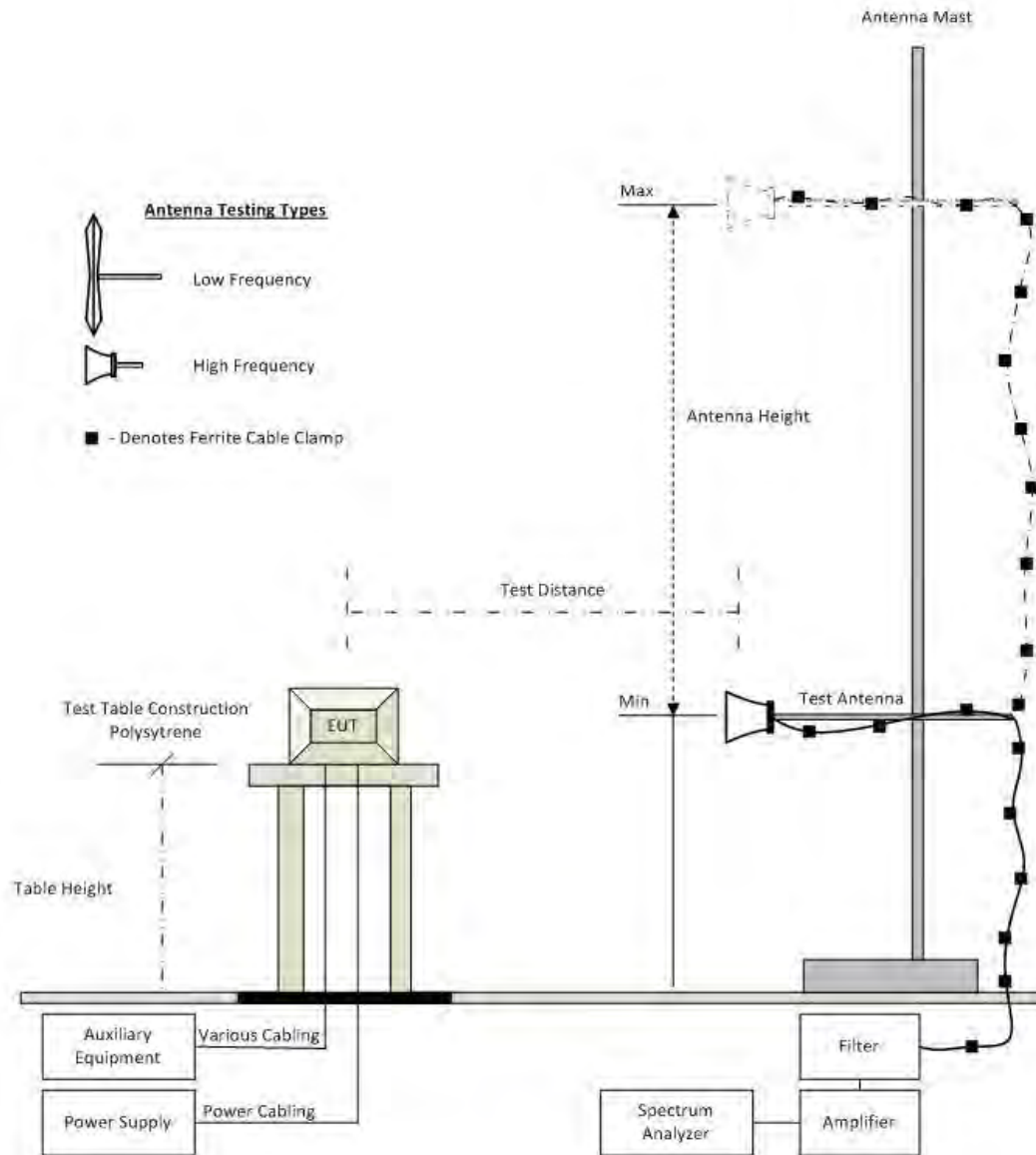
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| | | | | | |
|----------------|----------------------------|--------|-----------------|------|--------------|
| SMA#4 | | | port4 | | |
| RF#2 SMA#SA | Mitest box to SA | Flexco | SMA Cable SA | None | 2 Oct 2017 |
| RF#2 USB#1 | USB Cable to Mitest Box | Dynex | USB Cable | None | Not Required |

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8.2. Radiated Emissions - 3m Chamber

The following tests were performed using the radiated test set-up shown in the diagram below. Radiated emissions below 1GHz; and Radiated Emissions above 1GHz.



Radiated Emission Test Setup

A full system calibration was performed on the test station and any resulting system losses (or gains) were taken into account in the production of all final measurement data.



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| Asset# | Description | Manufacturer | Model# | Serial# | Calibration Due Date |
|--------|---|----------------------|---|------------|----------------------|
| 158 | Barometer/Thermometer | Control Company | 4196 | E2846 | 30 Nov 2017 |
| 170 | Video System Controller for Semi Anechoic Chamber | Panasonic | WV-CU101 | 04R08507 | Not Required |
| 287 | Rohde & Schwarz 40 GHz Receiver | Rhode & Schwarz | ESIB40 | 100201 | 2 May 2018 |
| 330 | Variac 0-280 Vac | Staco Energy Co | 3PN1020B | 0546 | Cal when used |
| 338 | Sunol 30 to 3000 MHz Antenna | Sunol | JB3 | A052907 | 30 Oct 2017 |
| 373 | 26III RMS Multimeter | Fluke | Fluke 26 series III | 76080720 | 26 Oct 2017 |
| 378 | Rohde & Schwarz 40 GHz Receiver with Generator | Rhode & Schwarz | ESIB40 | 100107/040 | 4 Nov 2017 |
| 393 | DC - 1050 MHz Low Pass Filter | Microcircuits | VLFX-1050 | N/A | 30 Oct 2017 |
| 396 | 2.4 GHz Notch Filter | Microtronics | BRM50701 | 001 | 30 Oct 2017 |
| 397 | Amp 10 - 2500MHz | MiCOM Labs | Amp 10 - 2500 MHz | NA | 9 Oct 2017 |
| 399 | ETS 1-18 GHz Horn Antenna | ETS | 3117 | 00154575 | 10 Oct 2017 |
| 406 | Amplifier for Radiated Emissions | MiCOM Labs | 40dB 1 to 18GHz Amp | 0406 | 9 Oct 2017 |
| 410 | Desktop Computer | Dell | Inspiron 620 | WS38 | Not Required |
| 411 | Mast/Turntable Controller | Sunol Sciences | SC98V | 060199-1D | Not Required |
| 412 | USB to GPIB Interface | National Instruments | GPIB-USB HS | 11B8DC2 | Not Required |
| 413 | Mast Controller | Sunol Science | TWR95-4 | 030801-3 | Not Required |
| 414 | DC Power Supply 0-60V | HP | 6274 | 1029A01285 | Cal when used |
| 415 | Turntable Controller | Sunol Sciences | Turntable Controller | None | Not Required |
| 416 | Gigabit ethernet filter | ETS-Lingren | Gigafoil 260366 | None | Not Required |
| 447 | MiTest Rad Emissions Test Software | MiCOM | Rad Emissions Test Software Version 1.0 | 447 | Not Required |
| 462 | Schwarzbeck cable from Antenna to Amplifier. | Schwarzbeck | AK 9513 | 462 | 30 Oct 2017 |
| 463 | Schwarzbeck cable from Amplifier to Bulkhead. | Schwarzbeck | AK 9513 | 463 | 30 Oct 2017 |
| 464 | Schwarzbeck cable from Bulkhead to Receiver | Schwarzbeck | AK 9513 | 464 | 30 Oct 2017 |

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| | | | | | |
|----------|------------------------------|-----------------|--------------|-------------|---------------|
| 480 | Cable - Bulkhead to Amp | SRC Haverhill | 157-3050360 | 480 | 30 Oct 2017 |
| 481 | Cable - Bulkhead to Receiver | SRC Haverhill | 151-3050787 | 481 | 30 Oct 2017 |
| 482 | Cable - Amp to Antenna | SRC Haverhill | 157-3051574 | 482 | 30 Oct 2017 |
| 87 | Uninterruptible Power Supply | Falcon Electric | ED2000-1/2LC | F3471 02/01 | Cal when used |
| VLF-1700 | Low pass filter DC-1700 MHz | Mini Circuits | VLF-1700 | None | 30 Oct 2017 |

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9. TEST RESULTS

9.1. Conducted Output Power

| Conducted Test Conditions for Output Power | | | |
|---|-------------------------------------|---------------------|-------------|
| Standard: | FCC Part 24E & IC RSS-133 | Ambient Temp. (°C): | 24.0 - 27.5 |
| Test Heading: | Output Power | Rel. Humidity (%): | 32 - 45 |
| Standard Section(s): | FCC 24E: 24.232 (c) RSS-133: 6.4 | Pressure (mBars): | 999 - 1001 |
| Reference Document(s): | See Normative References | | |
| Test Procedure for Output Power With reference to the test configuration identified in Section 8.1 Conducted Test Setup the EUT was set to transmit on the appropriate centre frequency of the selected frequency band and bandwidth. Output Power was measured on each of the active chain(s) (antenna outputs) using a power sensor connected to each antenna terminal. | | | |
| Testing was performed under ambient conditions. | | | |
| Limits Output Power FCC 24E: (c) Mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications. | | | |
| RSS-133: 6.4 Transmitter Output Power and Equivalent Isotropically Radiated Power The equivalent isotropically radiated power (e.i.r.p.) for transmitters shall not exceed the limits given in SRSP-510. Moreover, base station transmitters operating in the band 1930-1995 MHz shall not have output power exceeding 100 watts | | | |



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Equipment Configuration for Output Power

| | | | |
|--------------------------------|-------|-----------------------------------|----------------|
| Band: | 2 | Duty Cycle (%): | 99.00 |
| Modulation: | QPSK | Antenna Gain (dBi): | Not Applicable |
| Temperature (°C): | +20.0 | Beam Forming Gain (Y)(dB): | Not Applicable |
| Voltage (Vac): | 110.0 | Tested By: | CC |
| Engineering Test Notes: | None | | |

| Bandwidth (MHz) | Chanel # | Frequency (MHz) | RB (Starting) | RB # | O/P Power (dBm) | EIRP (dBm) | ERP | EIRP Limit (dBm) | Margin (dB) |
|-----------------|----------|-----------------|---------------|------|-----------------|------------|-------|------------------|-------------|
| 5 | 18625 | 1852.5 | 0 | 1 | 24.20 | 24.20 | 22.05 | 33.0 | -8.8 |
| | | | 0 | 8 | 23.91 | 23.91 | 21.76 | 33.0 | -9.1 |
| | | | 0 | 25 | 23.71 | 23.71 | 21.56 | 33.0 | -9.3 |
| | 18900 | 1880 | 0 | 1 | 23.63 | 23.63 | 21.48 | 33.0 | -9.4 |
| | | | 0 | 8 | 23.44 | 23.44 | 21.29 | 33.0 | -9.6 |
| | | | 0 | 25 | 22.86 | 22.86 | 20.71 | 33.0 | -10.1 |
| | 19175 | 1907.5 | 0 | 1 | 23.08 | 23.08 | 20.93 | 33.0 | -9.9 |
| | | | 0 | 8 | 21.78 | 21.78 | 19.63 | 33.0 | -11.2 |
| | | | 0 | 25 | 22.07 | 22.07 | 19.92 | 33.0 | -10.9 |

| Bandwidth (MHz) | Chanel # | Frequency (MHz) | RB (Starting) | RB # | O/P Power (dBm) | EIRP (dBm) | ERP | EIRP Limit (dBm) | Margin (dB) |
|-----------------|----------|-----------------|---------------|------|-----------------|------------|-------|------------------|-------------|
| 10 | 18650 | 1855 | 0 | 1 | 24.69 | 24.69 | 22.54 | 33.0 | -8.3 |
| | | | 0 | 12 | 23.63 | 23.63 | 21.48 | 33.0 | -9.4 |
| | | | 0 | 50 | 23.50 | 23.50 | 21.35 | 33.0 | -9.5 |
| | 18900 | 1880 | 0 | 1 | 23.89 | 23.89 | 21.74 | 33.0 | -9.1 |
| | | | 0 | 12 | 23.70 | 23.70 | 21.55 | 33.0 | -9.3 |
| | | | 0 | 50 | 22.73 | 22.73 | 20.58 | 33.0 | -10.3 |
| | 19150 | 1905 | 0 | 1 | 23.33 | 23.33 | 21.18 | 33.0 | -9.7 |
| | | | 0 | 12 | 22.99 | 22.99 | 20.84 | 33.0 | -10.0 |
| | | | 0 | 50 | 22.44 | 22.44 | 20.29 | 33.0 | -10.6 |

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| Bandwidth (MHz) | Chanel # | Frequency (MHz) | RB (Starting) | RB # | O/P Power (dBm) | EIRP (dBm) | ERP | EIRP Limit (dBm) | Margin (dB) |
|-----------------|----------|-----------------|---------------|------|-----------------|------------|-------|------------------|-------------|
| 15 | 18675 | 1857.5 | 0 | 1 | 24.15 | 24.15 | 22.00 | 33.0 | -8.9 |
| | | | 0 | 16 | 23.77 | 23.77 | 21.62 | 33.0 | -9.2 |
| | | | 0 | 75 | 22.86 | 22.86 | 20.71 | 33.0 | -10.1 |
| | 18900 | 1880 | 0 | 1 | 24.67 | 24.67 | 22.52 | 33.0 | -8.3 |
| | | | 0 | 16 | 23.66 | 23.66 | 21.51 | 33.0 | -9.3 |
| | | | 0 | 75 | 23.55 | 23.55 | 21.40 | 33.0 | -9.5 |
| | 19125 | 1902.5 | 0 | 1 | 23.90 | 23.90 | 21.75 | 33.0 | -9.1 |
| | | | 0 | 16 | 22.81 | 22.81 | 20.66 | 33.0 | -10.2 |
| | | | 0 | 75 | 22.15 | 22.15 | 20.00 | 33.0 | -10.9 |

| Bandwidth (MHz) | Chanel # | Frequency (MHz) | RB (Starting) | RB # | O/P Power (dBm) | EIRP (dBm) | ERP | EIRP Limit (dBm) | Margin (dB) |
|-----------------|----------|-----------------|---------------|------|-----------------|------------|-------|------------------|-------------|
| 20 | 18700 | 1860 | 0 | 1 | 24.10 | 24.10 | 21.95 | 33.0 | -8.9 |
| | | | 0 | 18 | 23.57 | 23.57 | 21.42 | 33.0 | -9.4 |
| | | | 0 | 100 | 23.56 | 23.56 | 21.41 | 33.0 | -9.4 |
| | 18900 | 1880 | 0 | 1 | 24.49 | 24.49 | 22.34 | 33.0 | -8.5 |
| | | | 0 | 18 | 24.18 | 24.18 | 22.03 | 33.0 | -8.8 |
| | | | 0 | 100 | 23.14 | 23.14 | 20.99 | 33.0 | -9.9 |
| | 19100 | 1900 | 0 | 1 | 23.03 | 23.03 | 20.88 | 33.0 | -10.0 |
| | | | 0 | 18 | 22.46 | 22.46 | 20.31 | 33.0 | -10.5 |
| | | | 0 | 100 | 23.86 | 23.86 | 21.71 | 33.0 | -9.1 |

Traceability to Industry Recognized Test Methodologies

| | |
|--------------------------|---------------------------------|
| Work Instruction: | WI-01 MEASURING RF OUTPUT POWER |
| Uncertainty: | 1.33 dB |

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Equipment Configuration for Output Power

| | | | |
|--------------------------------|--------|-----------------------------------|----------------|
| Band: | 2 | Duty Cycle (%): | 99.00 |
| Modulation: | 16 QAM | Antenna Gain (dBi): | Not Applicable |
| Temperature (°C): | +20.0 | Beam Forming Gain (Y)(dB): | Not Applicable |
| Voltage (Vac): | 110.0 | Tested By: | CC |
| Engineering Test Notes: | None | | |

| Bandwidth (MHz) | Chanel # | Frequency (MHz) | RB (Starting) | RB # | O/P Power (dBm) | EIRP (dBm) | ERP | EIRP Limit (dBm) | Margin (dB) |
|-----------------|----------|-----------------|---------------|------|-----------------|------------|-------|------------------|-------------|
| 5 | 18625 | 1852.5 | 0 | 1 | 23.40 | 23.40 | 21.25 | 33.0 | -9.6 |
| | | | 0 | 8 | 22.91 | 22.91 | 20.76 | 33.0 | -10.1 |
| | | | 0 | 25 | 22.97 | 22.97 | 20.82 | 33.0 | -10.0 |
| | 18900 | 1880 | 0 | 1 | 23.29 | 23.29 | 21.14 | 33.0 | -9.7 |
| | | | 0 | 8 | 23.03 | 23.03 | 20.88 | 33.0 | -10.0 |
| | | | 0 | 25 | 22.66 | 22.66 | 20.51 | 33.0 | -10.3 |
| | 19175 | 1907.5 | 0 | 1 | 21.24 | 21.24 | 19.09 | 33.0 | -11.8 |
| | | | 0 | 8 | 22.24 | 22.24 | 20.09 | 33.0 | -10.8 |
| | | | 0 | 25 | 21.76 | 21.76 | 19.61 | 33.0 | -11.2 |

| Bandwidth (MHz) | Chanel # | Frequency (MHz) | RB (Starting) | RB # | O/P Power (dBm) | EIRP (dBm) | ERP | EIRP Limit (dBm) | Margin (dB) |
|-----------------|----------|-----------------|---------------|------|-----------------|------------|-------|------------------|-------------|
| 10 | 18650 | 1855 | 0 | 1 | 23.69 | 23.69 | 21.54 | 33.0 | -9.3 |
| | | | 0 | 12 | 23.51 | 23.51 | 21.36 | 33.0 | -9.5 |
| | | | 0 | 50 | 23.94 | 23.94 | 21.79 | 33.0 | -9.1 |
| | 18900 | 1880 | 0 | 1 | 23.72 | 23.72 | 21.57 | 33.0 | -9.3 |
| | | | 0 | 12 | 23.71 | 23.71 | 21.56 | 33.0 | -9.3 |
| | | | 0 | 50 | 22.88 | 22.88 | 20.73 | 33.0 | -10.1 |
| | 19150 | 1905 | 0 | 1 | 23.05 | 23.05 | 20.90 | 33.0 | -10.0 |
| | | | 0 | 12 | 22.81 | 22.81 | 20.66 | 33.0 | -10.2 |
| | | | 0 | 50 | 21.76 | 21.76 | 19.61 | 33.0 | -11.2 |

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| Bandwidth (MHz) | Chanel # | Frequency (MHz) | RB (Starting) | RB # | O/P Power (dBm) | EIRP (dBm) | ERP | EIRP Limit (dBm) | Margin (dB) |
|-----------------|----------|-----------------|---------------|------|-----------------|------------|-------|------------------|-------------|
| 15 | 18675 | 1857.5 | 0 | 1 | 22.79 | 22.79 | 20.64 | 33.0 | -10.2 |
| | | | 0 | 16 | 22.69 | 22.69 | 20.54 | 33.0 | -10.3 |
| | | | 0 | 75 | 22.45 | 22.45 | 20.30 | 33.0 | -10.6 |
| | 18900 | 1880 | 0 | 1 | 23.33 | 23.33 | 21.18 | 33.0 | -9.7 |
| | | | 0 | 16 | 23.05 | 23.05 | 20.90 | 33.0 | -10.0 |
| | | | 0 | 75 | 22.50 | 22.50 | 20.35 | 33.0 | -10.5 |
| | 19125 | 1902.5 | 0 | 1 | 22.56 | 22.56 | 20.41 | 33.0 | -10.4 |
| | | | 0 | 16 | 22.63 | 22.63 | 20.48 | 33.0 | -10.4 |
| | | | 0 | 75 | 21.62 | 21.62 | 19.47 | 33.0 | -11.4 |

| Bandwidth (MHz) | Chanel # | Frequency (MHz) | RB (Starting) | RB # | O/P Power (dBm) | EIRP (dBm) | ERP | EIRP Limit (dBm) | Margin (dB) |
|-----------------|----------|-----------------|---------------|------|-----------------|------------|-------|------------------|-------------|
| 20 | 18700 | 1860 | 0 | 1 | 22.88 | 22.88 | 20.73 | 33.0 | -10.1 |
| | | | 0 | 18 | 22.95 | 22.95 | 20.80 | 33.0 | -10.1 |
| | | | 0 | 100 | 23.19 | 23.19 | 21.04 | 33.0 | -9.8 |
| | 18900 | 1880 | 0 | 1 | 23.33 | 23.33 | 21.18 | 33.0 | -9.7 |
| | | | 0 | 18 | 22.80 | 22.80 | 20.65 | 33.0 | -10.2 |
| | | | 0 | 100 | 22.16 | 22.16 | 20.01 | 33.0 | -10.8 |
| | 19100 | 1900 | 0 | 1 | 22.39 | 22.39 | 20.24 | 33.0 | -10.6 |
| | | | 0 | 18 | 21.51 | 21.51 | 19.36 | 33.0 | -11.5 |
| | | | 0 | 100 | 21.97 | 21.97 | 19.82 | 33.0 | -11.0 |

Traceability to Industry Recognized Test Methodologies

| | |
|--------------------------|---------------------------------|
| Work Instruction: | WI-01 MEASURING RF OUTPUT POWER |
| Uncertainty: | 1.33 dB |

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9.2. Peak-to-average power ratio

| Conducted Test Conditions for Peak-to-average power ratio | | | |
|--|-------------------------------------|---------------------|-------------|
| Standard: | FCC Part 24E & IC RSS-133 | Ambient Temp. (°C): | 24.0 - 27.5 |
| Test Heading: | Peak-to-average power ratio | Rel. Humidity (%): | 32 - 45 |
| Standard Section(s): | FCC 24E: 24.232 (d) RSS-133: 6.4 | Pressure (mBars): | 999 - 1001 |
| Reference Document(s): | See Normative References | | |
| <p>Test Procedure for Peak-to-average power ratio</p> <p>With reference to the test configuration identified in Section 8.1 Conducted Test Setup the EUT was set to transmit on the appropriate centre frequency of the selected frequency band and bandwidth.</p> <p>Testing was performed under ambient conditions.</p> <p>Limits Peak-to-average power ratio</p> <p>FCC 24E (d) Power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (e) of this section. In both instances, equipment employed must be authorized in accordance with the provisions of §24.51. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.</p> <p>RSS-133: 6.4 In addition, the transmitter's peak-to-average power ratio (PAPR) shall not exceed 13 dB for more than 0.1% of the time using a signal corresponding to the highest PAPR during periods of continuous transmission.</p> | | | |



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Equipment Configuration for Peak-to-Average Power Ratio (PAPR)

| | | | |
|--------------------------------|-------|-----------------------------------|----------------|
| Band: | 2 | Duty Cycle (%): | 99.00 |
| Modulation: | QPSK | Antenna Gain (dBi): | Not Applicable |
| Temperature (°C): | +20.0 | Beam Forming Gain (Y)(dB): | Not Applicable |
| Voltage (Vac): | 110.0 | Tested By: | CC |
| Engineering Test Notes: | | None | |

| Bandwidth (MHz) | Chanel # | Frequency (MHz) | RB (Starting) | RB # | PAPR (dB) | Limit (dB) | Margin (dB) |
|-----------------|----------|-----------------|---------------|------|-----------|------------|-------------|
| 5 | 18625 | 1852.5 | 0 | 1 | 1.64 | 13.0 | -11.4 |
| | | | 0 | 8 | 1.68 | 13.0 | -11.3 |
| | | | 0 | 25 | 2.82 | 13.0 | -10.2 |
| | 18900 | 1880 | 0 | 1 | 2.70 | 13.0 | -10.3 |
| | | | 0 | 8 | 2.70 | 13.0 | -10.3 |
| | | | 0 | 25 | 3.58 | 13.0 | -9.4 |
| | 19175 | 1907.5 | 0 | 1 | 3.25 | 13.0 | -9.8 |
| | | | 0 | 8 | 3.28 | 13.0 | -9.7 |
| | | | 0 | 25 | 3.79 | 13.0 | -9.2 |

| Bandwidth (MHz) | Chanel # | Frequency (MHz) | RB (Starting) | RB # | PAPR (dB) | Limit (dB) | Margin (dB) |
|-----------------|----------|-----------------|---------------|------|-----------|------------|-------------|
| 10 | 18650 | 1855 | 0 | 1 | 1.77 | 13.0 | -11.2 |
| | | | 0 | 12 | 2.83 | 13.0 | -10.2 |
| | | | 0 | 50 | 4.15 | 13.0 | -8.9 |
| | 18900 | 1880 | 0 | 1 | 2.53 | 13.0 | -10.5 |
| | | | 0 | 12 | 3.23 | 13.0 | -9.8 |
| | | | 0 | 50 | 4.37 | 13.0 | -8.6 |
| | 19150 | 1905 | 0 | 1 | 3.01 | 13.0 | -10.0 |
| | | | 0 | 12 | 3.58 | 13.0 | -9.4 |
| | | | 0 | 50 | 4.55 | 13.0 | -8.5 |

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| Bandwidth (MHz) | Chanel # | Frequency (MHz) | RB (Starting) | RB # | PAPR (dB) | Limit (dB) | Margin (dB) |
|-----------------|----------|-----------------|---------------|------|-----------|------------|-------------|
| 15 | 18675 | 1857.5 | 0 | 1 | 3.82 | 13.0 | -9.2 |
| | | | 0 | 16 | 5.89 | 13.0 | -7.1 |
| | | | 0 | 75 | 5.59 | 13.0 | -7.4 |
| | 18900 | 1880 | 0 | 1 | 3.63 | 13.0 | -9.4 |
| | | | 0 | 16 | 5.85 | 13.0 | -7.2 |
| | | | 0 | 75 | 5.53 | 13.0 | -7.5 |
| | 19125 | 1902.5 | 0 | 1 | 3.78 | 13.0 | -9.2 |
| | | | 0 | 16 | 5.90 | 13.0 | -7.1 |
| | | | 0 | 75 | 5.56 | 13.0 | -7.4 |

| Bandwidth (MHz) | Chanel # | Frequency (MHz) | RB (Starting) | RB # | PAPR (dB) | Limit (dB) | Margin (dB) |
|-----------------|----------|-----------------|---------------|------|-----------|------------|-------------|
| 20 | 18700 | 1860 | 0 | 1 | 4.00 | 13.0 | -9.0 |
| | | | 0 | 18 | 9.87 | 13.0 | -3.1 |
| | | | 0 | 100 | 6.32 | 13.0 | -6.7 |
| | 18900 | 1880 | 0 | 1 | 3.49 | 13.0 | -9.5 |
| | | | 0 | 18 | 9.40 | 13.0 | -3.6 |
| | | | 0 | 100 | 6.20 | 13.0 | -6.8 |
| | 19100 | 1900 | 0 | 1 | 2.74 | 13.0 | -10.3 |
| | | | 0 | 18 | 9.29 | 13.0 | -3.7 |
| | | | 0 | 100 | 6.75 | 13.0 | -6.3 |

Traceability to Industry Recognized Test Methodologies

| | |
|--------------------------|---------------------------------------|
| Work Instruction: | WI-01 MEASURING PEAK-TO-AVERAGE-POWER |
| Uncertainty: | 1.33 dB |

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Equipment Configuration for Peak-to-Average Power Ratio (PAPR)

| | | | |
|--------------------------------|--------|-----------------------------------|----------------|
| Band: | 2 | Duty Cycle (%): | 99.00 |
| Modulation: | 16 QAM | Antenna Gain (dBi): | Not Applicable |
| Temperature (°C): | +20.0 | Beam Forming Gain (Y)(dB): | Not Applicable |
| Voltage (Vac): | 110.0 | Tested By: | CC |
| Engineering Test Notes: | None | | |

| Bandwidth (MHz) | Chanel # | Frequency (MHz) | RB (Starting) | RB # | PAPR (dB) | Limit (dB) | Margin (dB) |
|-----------------|----------|-----------------|---------------|------|-----------|------------|-------------|
| 5 | 18625 | 1852.5 | 0 | 1 | 1.90 | 13.0 | -11.1 |
| | | | 0 | 8 | 2.00 | 13.0 | -11.0 |
| | | | 0 | 25 | 3.82 | 13.0 | -9.2 |
| | 18900 | 1880 | 0 | 1 | 2.68 | 13.0 | -10.3 |
| | | | 0 | 8 | 2.79 | 13.0 | -10.2 |
| | | | 0 | 25 | 4.30 | 13.0 | -8.7 |
| | 19175 | 1907.5 | 0 | 1 | 3.58 | 13.0 | -9.4 |
| | | | 0 | 8 | 3.60 | 13.0 | -9.4 |
| | | | 0 | 25 | 4.24 | 13.0 | -8.8 |

| Bandwidth (MHz) | Chanel # | Frequency (MHz) | RB (Starting) | RB # | PAPR (dB) | Limit (dB) | Margin (dB) |
|-----------------|----------|-----------------|---------------|------|-----------|------------|-------------|
| 10 | 18650 | 1855 | 0 | 1 | 8.39 | 13.0 | -4.6 |
| | | | 0 | 12 | 8.42 | 13.0 | -4.6 |
| | | | 0 | 50 | 8.42 | 13.0 | -4.6 |
| | 18900 | 1880 | 0 | 1 | 3.80 | 13.0 | -9.2 |
| | | | 0 | 12 | 4.70 | 13.0 | -8.3 |
| | | | 0 | 50 | 8.51 | 13.0 | -4.5 |
| | 19150 | 1905 | 0 | 1 | 3.64 | 13.0 | -9.4 |
| | | | 0 | 12 | 4.04 | 13.0 | -9.0 |
| | | | 0 | 50 | 5.53 | 13.0 | -7.5 |

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| Bandwidth (MHz) | Chanel # | Frequency (MHz) | RB (Starting) | RB # | PAPR (dB) | Limit (dB) | Margin (dB) |
|-----------------|----------|-----------------|---------------|------|-----------|------------|-------------|
| 15 | 18675 | 1857.5 | 0 | 1 | 4.08 | 13.0 | -8.9 |
| | | | 0 | 16 | 6.28 | 13.0 | -6.7 |
| | | | 0 | 75 | 6.14 | 13.0 | -6.9 |
| | 18900 | 1880 | 0 | 1 | 4.02 | 13.0 | -9.0 |
| | | | 0 | 16 | 6.23 | 13.0 | -6.8 |
| | | | 0 | 75 | 6.09 | 13.0 | -6.9 |
| | 19125 | 1902.5 | 0 | 1 | 4.45 | 13.0 | -8.6 |
| | | | 0 | 16 | 6.28 | 13.0 | -6.7 |
| | | | 0 | 75 | 6.29 | 13.0 | -6.7 |

| Bandwidth (MHz) | Chanel # | Frequency (MHz) | RB (Starting) | RB # | PAPR (dB) | Limit (dB) | Margin (dB) |
|-----------------|----------|-----------------|---------------|------|-----------|------------|-------------|
| 20 | 18700 | 1860 | 0 | 1 | 3.37 | 13.0 | -9.6 |
| | | | 0 | 18 | 10.43 | 13.0 | -2.6 |
| | | | 0 | 100 | 6.82 | 13.0 | -6.2 |
| | 18900 | 1880 | 0 | 1 | 2.97 | 13.0 | -10.0 |
| | | | 0 | 18 | 6.72 | 13.0 | -6.3 |
| | | | 0 | 100 | 6.58 | 13.0 | -6.4 |
| | 19100 | 1900 | 0 | 1 | 2.41 | 13.0 | -10.6 |
| | | | 0 | 18 | 9.75 | 13.0 | -3.3 |
| | | | 0 | 100 | 6.70 | 13.0 | -6.3 |

| Traceability to Industry Recognized Test Methodologies | |
|--|---------------------------------------|
| Work Instruction: | WI-01 MEASURING PEAK-TO-AVERAGE-POWER |
| Uncertainty: | 1.33 dB |

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9.3. Frequency Stability

| Conducted Test Conditions for Frequency Stability | | | |
|---|---------------------------------|----------------------------|-------------|
| Standard: | FCC Part 24E & IC RSS-133 | Ambient Temp. (°C): | 20.0 - 24.5 |
| Test Heading: | Frequency Stability | Rel. Humidity (%): | 32 - 45 |
| Standard Section(s): | FCC 24E: 24.235 RSS-133: 6.3 | Pressure (mBars): | 999 - 1001 |
| Reference Document(s): | See Normative References | | |

Test Procedure for Frequency Stability

The center frequency is the center of the channel declared by the manufacturer as part of the declared channel plan(s). Centre

Testing was performed over environmental extremes of voltage and temperature and results reported are for a single antenna port. Test configuration and setup used for the measurement was per the Conducted Test Set-up specified in this document.

Limits Frequency Stability

FCC 24E: The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

RSS-133: The carrier frequency shall not depart from the reference frequency, in excess of ± 2.5 ppm for mobile stations and ± 1.0 ppm for base stations. In lieu of meeting the above stability values, the test report may show that the frequency stability is sufficient to ensure that the emission bandwidth stays within the operating frequency block when tested to the temperature and supply voltage variations specified in RSS-Gen.

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Equipment Configuration for Frequency Stability

| | | | |
|--------------------------------|-------|-----------------------------------|----------------|
| Band: | 2 | Duty Cycle (%): | Not Applicable |
| Modulation: | QPSK | Antenna Gain (dBi): | Not Applicable |
| Temperature (°C): | +20.0 | Beam Forming Gain (Y)(dB): | Not Applicable |
| Voltage (Vac): | 110.0 | Tested By: | CC |
| Engineering Test Notes: | None | | |

| Bandwidth (MHz) | Chanel # | Frequency (MHz) | Temperature C | Vac | Frequency Error | | Limit | Margin |
|-----------------|----------|-----------------|---------------|-------|-----------------|----------|------------|--------|
| | | | | | kHz | ppm | ppm | ppm |
| 5 | 18625 | 1852.5 | -30 | 110 | 2.1600 | 1.17E-03 | 2.5 to 2.5 | -2.50 |
| | | | -20 | 110 | 0.0160 | 8.64E-06 | 2.5 to 2.5 | -2.50 |
| | | | -10 | 110 | 0.0052 | 2.81E-06 | 2.5 to 2.5 | -2.50 |
| | | | 0 | 110 | 0.0116 | 6.26E-06 | 2.5 to 2.5 | -2.50 |
| | | | 10 | 110 | 0.0110 | 5.94E-06 | 2.5 to 2.5 | -2.50 |
| | | | 20 | 93.5 | 0.0088 | 4.75E-06 | 2.5 to 2.5 | -2.50 |
| | | | 20 | 126.5 | 0.0015 | 8.10E-07 | 2.5 to 2.5 | -2.50 |
| | | | 30 | 110 | 0.0013 | 7.02E-07 | 2.5 to 2.5 | -2.50 |
| | | | 40 | 110 | 0.0127 | 6.86E-06 | 2.5 to 2.5 | -2.50 |
| | | | 50 | 110 | 0.0022 | 1.19E-06 | 2.5 to 2.5 | -2.50 |

| | | | | | | | | |
|---|-------|------|-----|-------|--------|----------|------------|-------|
| 5 | 18900 | 1880 | -30 | 110 | 1.1200 | 5.96E-04 | 2.5 to 2.5 | -2.50 |
| | | | -20 | 110 | 0.0048 | 2.55E-06 | 2.5 to 2.5 | -2.50 |
| | | | -10 | 110 | 0.0008 | 4.26E-07 | 2.5 to 2.5 | -2.50 |
| | | | 0 | 110 | 0.0030 | 1.60E-06 | 2.5 to 2.5 | -2.50 |
| | | | 10 | 110 | 0.0029 | 1.54E-06 | 2.5 to 2.5 | -2.50 |
| | | | 20 | 93.5 | 0.0060 | 3.19E-06 | 2.5 to 2.5 | -2.50 |
| | | | 20 | 126.5 | 0.0009 | 4.79E-07 | 2.5 to 2.5 | -2.50 |
| | | | 30 | 110 | 0.0079 | 4.20E-06 | 2.5 to 2.5 | -2.50 |
| | | | 40 | 110 | 0.0037 | 1.97E-06 | 2.5 to 2.5 | -2.50 |
| | | | 50 | 110 | 0.0027 | 1.44E-06 | 2.5 to 2.5 | -2.50 |

| | | | | | | | | |
|---|-------|--------|-----|-------|--------|----------|------------|-------|
| 5 | 19175 | 1907.5 | -30 | 110 | 0.0250 | 1.31E-05 | 2.5 to 2.5 | -2.50 |
| | | | -20 | 110 | 0.0064 | 3.36E-06 | 2.5 to 2.5 | -2.50 |
| | | | -10 | 110 | 0.0077 | 4.04E-06 | 2.5 to 2.5 | -2.50 |
| | | | 0 | 110 | 0.0004 | 2.10E-07 | 2.5 to 2.5 | -2.50 |
| | | | 10 | 110 | 0.0011 | 5.77E-07 | 2.5 to 2.5 | -2.50 |
| | | | 20 | 93.5 | 0.0050 | 2.62E-06 | 2.5 to 2.5 | -2.50 |
| | | | 20 | 126.5 | 0.0046 | 2.41E-06 | 2.5 to 2.5 | -2.50 |
| | | | 30 | 110 | 0.0088 | 4.61E-06 | 2.5 to 2.5 | -2.50 |
| | | | 40 | 110 | 0.0020 | 1.05E-06 | 2.5 to 2.5 | -2.50 |
| | | | 50 | 110 | 0.0088 | 4.61E-06 | 2.5 to 2.5 | -2.50 |

Traceability to Industry Recognized Test Methodologies

| | |
|--------------------------|---------------------------|
| Work Instruction: | WI-02 MEASURING FREQUENCY |
| Measurement Uncertainty: | ±0.86 ppm |

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Equipment Configuration for Frequency Stability

| | | | |
|--------------------------------|-------|-----------------------------------|----------------|
| Band: | 2 | Duty Cycle (%): | Not Applicable |
| Modulation: | QPSK | Antenna Gain (dBi): | Not Applicable |
| Temperature (°C): | +20.0 | Beam Forming Gain (Y)(dB): | Not Applicable |
| Voltage (Vac): | 110.0 | Tested By: | CC |
| Engineering Test Notes: | None | | |

| Bandwidth (MHz) | Chanel # | Frequency (MHz) | Temperature C | Vac | Frequency Error | | Limit | Margin |
|-----------------|----------|-----------------|---------------|-------|-----------------|----------|------------|--------|
| | | | | | kHz | ppm | ppm | ppm |
| 10 | 18650 | 1855 | -30 | 110 | 0.0250 | 1.35E-05 | 2.5 to 2.5 | -2.50 |
| | | | -20 | 110 | 0.0085 | 4.58E-06 | 2.5 to 2.5 | -2.50 |
| | | | -10 | 110 | 0.1340 | 7.22E-05 | 2.5 to 2.5 | -2.50 |
| | | | 0 | 110 | 0.0122 | 6.58E-06 | 2.5 to 2.5 | -2.50 |
| | | | 10 | 110 | 0.0104 | 5.61E-06 | 2.5 to 2.5 | -2.50 |
| | | | 20 | 93.5 | 0.0041 | 2.21E-06 | 2.5 to 2.5 | -2.50 |
| | | | 20 | 126.5 | 0.0113 | 6.09E-06 | 2.5 to 2.5 | -2.50 |
| | | | 30 | 110 | 0.0010 | 5.39E-07 | 2.5 to 2.5 | -2.50 |
| | | | 40 | 110 | 0.0006 | 3.23E-07 | 2.5 to 2.5 | -2.50 |
| | | | 50 | 110 | 0.0015 | 8.09E-07 | 2.5 to 2.5 | -2.50 |

| | | | | | | | | |
|----|-------|------|-----|-------|--------|----------|------------|-------|
| 10 | 18900 | 1880 | -30 | 110 | 0.1000 | 5.32E-05 | 2.5 to 2.5 | -2.50 |
| | | | -20 | 110 | 0.0060 | 3.19E-06 | 2.5 to 2.5 | -2.50 |
| | | | -10 | 110 | 0.0072 | 3.83E-06 | 2.5 to 2.5 | -2.50 |
| | | | 0 | 110 | 0.0062 | 3.30E-06 | 2.5 to 2.5 | -2.50 |
| | | | 10 | 110 | 0.0062 | 3.30E-06 | 2.5 to 2.5 | -2.50 |
| | | | 20 | 93.5 | 0.0074 | 3.94E-06 | 2.5 to 2.5 | -2.50 |
| | | | 20 | 126.5 | 0.0057 | 3.03E-06 | 2.5 to 2.5 | -2.50 |
| | | | 30 | 110 | 0.0012 | 6.38E-07 | 2.5 to 2.5 | -2.50 |
| | | | 40 | 110 | 0.0155 | 8.24E-06 | 2.5 to 2.5 | -2.50 |
| | | | 50 | 110 | 0.0065 | 3.46E-06 | 2.5 to 2.5 | -2.50 |

| | | | | | | | | |
|----|-------|------|-----|-------|--------|----------|------------|-------|
| 10 | 19150 | 1905 | -30 | 110 | 0.0060 | 3.15E-06 | 2.5 to 2.5 | -2.50 |
| | | | -20 | 110 | 0.0060 | 3.15E-06 | 2.5 to 2.5 | -2.50 |
| | | | -10 | 110 | 0.0009 | 4.72E-07 | 2.5 to 2.5 | -2.50 |
| | | | 0 | 110 | 0.0062 | 3.25E-06 | 2.5 to 2.5 | -2.50 |
| | | | 10 | 110 | 0.0155 | 8.14E-06 | 2.5 to 2.5 | -2.50 |
| | | | 20 | 93.5 | 0.0130 | 6.82E-06 | 2.5 to 2.5 | -2.50 |
| | | | 20 | 126.5 | 0.0029 | 1.52E-06 | 2.5 to 2.5 | -2.50 |
| | | | 30 | 110 | 0.0032 | 1.68E-06 | 2.5 to 2.5 | -2.50 |
| | | | 40 | 110 | 0.0016 | 8.40E-07 | 2.5 to 2.5 | -2.50 |
| | | | 50 | 110 | 0.0025 | 1.31E-06 | 2.5 to 2.5 | -2.50 |

Traceability to Industry Recognized Test Methodologies

| | |
|--------------------------|---------------------------|
| Work Instruction: | WI-02 MEASURING FREQUENCY |
| Measurement Uncertainty: | ±0.86 ppm |

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Equipment Configuration for Frequency Stability

| | | | |
|--------------------------------|-------|-----------------------------------|----------------|
| Band: | 2 | Duty Cycle (%): | Not Applicable |
| Modulation: | QPSK | Antenna Gain (dBi): | Not Applicable |
| Temperature (°C): | +20.0 | Beam Forming Gain (Y)(dB): | Not Applicable |
| Voltage (Vac): | 110.0 | Tested By: | CC |
| Engineering Test Notes: | None | | |

| Bandwidth (MHz) | Chanel # | Frequency (MHz) | Temperature C | Vac | Frequency Error | | Limit | Margin |
|-----------------|----------|-----------------|---------------|-------|-----------------|----------|------------|--------|
| | | | | | kHz | ppm | ppm | ppm |
| 15 | 18675 | 1857.5 | -30 | 110 | 0.0440 | 2.37E-05 | 2.5 to 2.5 | -2.50 |
| | | | -20 | 110 | 0.0780 | 4.20E-05 | 2.5 to 2.5 | -2.50 |
| | | | -10 | 110 | 0.0061 | 3.28E-06 | 2.5 to 2.5 | -2.50 |
| | | | 0 | 110 | 0.0057 | 3.07E-06 | 2.5 to 2.5 | -2.50 |
| | | | 10 | 110 | 0.0090 | 4.85E-06 | 2.5 to 2.5 | -2.50 |
| | | | 20 | 93.5 | 0.0057 | 3.07E-06 | 2.5 to 2.5 | -2.50 |
| | | | 20 | 126.5 | 0.0042 | 2.26E-06 | 2.5 to 2.5 | -2.50 |
| | | | 30 | 110 | 0.0033 | 1.78E-06 | 2.5 to 2.5 | -2.50 |
| | | | 40 | 110 | 0.0014 | 7.54E-07 | 2.5 to 2.5 | -2.50 |
| | | | 50 | 110 | 0.0057 | 3.07E-06 | 2.5 to 2.5 | -2.50 |

| | | | | | | | | |
|----|-------|------|-----|-------|--------|----------|------------|-------|
| 15 | 18900 | 1880 | -30 | 110 | 0.0142 | 7.55E-06 | 2.5 to 2.5 | -2.50 |
| | | | -20 | 110 | 0.0120 | 6.38E-06 | 2.5 to 2.5 | -2.50 |
| | | | -10 | 110 | 0.0110 | 5.85E-06 | 2.5 to 2.5 | -2.50 |
| | | | 0 | 110 | 0.0081 | 4.31E-06 | 2.5 to 2.5 | -2.50 |
| | | | 10 | 110 | 0.0043 | 2.29E-06 | 2.5 to 2.5 | -2.50 |
| | | | 20 | 93.5 | 0.0053 | 2.82E-06 | 2.5 to 2.5 | -2.50 |
| | | | 20 | 126.5 | 0.0001 | 5.32E-08 | 2.5 to 2.5 | -2.50 |
| | | | 30 | 110 | 0.0063 | 3.35E-06 | 2.5 to 2.5 | -2.50 |
| | | | 40 | 110 | 0.0018 | 9.57E-07 | 2.5 to 2.5 | -2.50 |
| | | | 50 | 110 | 0.0184 | 9.79E-06 | 2.5 to 2.5 | -2.50 |

| | | | | | | | | |
|----|-------|--------|-----|-------|--------|----------|------------|-------|
| 15 | 19125 | 1902.5 | -30 | 110 | 0.0080 | 4.20E-06 | 2.5 to 2.5 | -2.50 |
| | | | -20 | 110 | 0.0111 | 5.83E-06 | 2.5 to 2.5 | -2.50 |
| | | | -10 | 110 | 0.0052 | 2.73E-06 | 2.5 to 2.5 | -2.50 |
| | | | 0 | 110 | 0.0024 | 1.26E-06 | 2.5 to 2.5 | -2.50 |
| | | | 10 | 110 | 0.0034 | 1.79E-06 | 2.5 to 2.5 | -2.50 |
| | | | 20 | 93.5 | 0.0016 | 8.41E-07 | 2.5 to 2.5 | -2.50 |
| | | | 20 | 126.5 | 0.0028 | 1.47E-06 | 2.5 to 2.5 | -2.50 |
| | | | 30 | 110 | 0.0011 | 5.78E-07 | 2.5 to 2.5 | -2.50 |
| | | | 40 | 110 | 0.0092 | 4.84E-06 | 2.5 to 2.5 | -2.50 |
| | | | 50 | 110 | 0.0009 | 4.73E-07 | 2.5 to 2.5 | -2.50 |

Traceability to Industry Recognized Test Methodologies

| | |
|--------------------------|---------------------------|
| Work Instruction: | WI-02 MEASURING FREQUENCY |
| Measurement Uncertainty: | ±0.86 ppm |

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Equipment Configuration for Frequency Stability

| | | | |
|--------------------------------|-------|-----------------------------------|----------------|
| Band: | 2 | Duty Cycle (%): | Not Applicable |
| Modulation: | QPSK | Antenna Gain (dBi): | Not Applicable |
| Temperature (°C): | +20.0 | Beam Forming Gain (Y)(dB): | Not Applicable |
| Voltage (Vac): | 110.0 | Tested By: | CC |
| Engineering Test Notes: | None | | |

| Bandwidth (MHz) | Chanel # | Frequency (MHz) | Temperature C | Vac | Frequency Error | | Limit | Margin |
|-----------------|----------|-----------------|---------------|-------|-----------------|----------|------------|--------|
| | | | | | kHz | ppm | ppm | ppm |
| 20 | 18700 | 1860 | -30 | 110 | 0.0190 | 1.02E-05 | 2.5 to 2.5 | -2.50 |
| | | | -20 | 110 | 0.0043 | 2.31E-06 | 2.5 to 2.5 | -2.50 |
| | | | -10 | 110 | 0.0112 | 6.02E-06 | 2.5 to 2.5 | -2.50 |
| | | | 0 | 110 | 0.0075 | 4.03E-06 | 2.5 to 2.5 | -2.50 |
| | | | 10 | 110 | 0.0046 | 2.47E-06 | 2.5 to 2.5 | -2.50 |
| | | | 20 | 93.5 | 0.0196 | 1.05E-05 | 2.5 to 2.5 | -2.50 |
| | | | 20 | 126.5 | 0.0080 | 4.30E-06 | 2.5 to 2.5 | -2.50 |
| | | | 30 | 110 | 0.0119 | 6.40E-06 | 2.5 to 2.5 | -2.50 |
| | | | 40 | 110 | 0.0130 | 6.99E-06 | 2.5 to 2.5 | -2.50 |
| | | | 50 | 110 | 0.0037 | 1.99E-06 | 2.5 to 2.5 | -2.50 |

| | | | | | | | | |
|----|-------|------|-----|-------|--------|----------|------------|-------|
| 20 | 18900 | 1880 | -30 | 110 | 0.0110 | 5.85E-06 | 2.5 to 2.5 | -2.50 |
| | | | -20 | 110 | 0.0050 | 2.66E-06 | 2.5 to 2.5 | -2.50 |
| | | | -10 | 110 | 0.0028 | 1.49E-06 | 2.5 to 2.5 | -2.50 |
| | | | 0 | 110 | 0.0042 | 2.23E-06 | 2.5 to 2.5 | -2.50 |
| | | | 10 | 110 | 0.0102 | 5.43E-06 | 2.5 to 2.5 | -2.50 |
| | | | 20 | 93.5 | 0.0012 | 6.38E-07 | 2.5 to 2.5 | -2.50 |
| | | | 20 | 126.5 | 0.0034 | 1.81E-06 | 2.5 to 2.5 | -2.50 |
| | | | 30 | 110 | 0.0023 | 1.22E-06 | 2.5 to 2.5 | -2.50 |
| | | | 40 | 110 | 0.0009 | 4.79E-07 | 2.5 to 2.5 | -2.50 |
| | | | 50 | 110 | 0.0042 | 2.23E-06 | 2.5 to 2.5 | -2.50 |

| | | | | | | | | |
|----|-------|------|-----|-------|--------|----------|------------|-------|
| 20 | 19100 | 1900 | -30 | 110 | 0.0010 | 5.26E-07 | 2.5 to 2.5 | -2.50 |
| | | | -20 | 110 | 0.0760 | 4.00E-05 | 2.5 to 2.5 | -2.50 |
| | | | -10 | 110 | 0.0043 | 2.26E-06 | 2.5 to 2.5 | -2.50 |
| | | | 0 | 110 | 0.0006 | 3.16E-07 | 2.5 to 2.5 | -2.50 |
| | | | 10 | 110 | 0.0133 | 7.00E-06 | 2.5 to 2.5 | -2.50 |
| | | | 20 | 93.5 | 0.0022 | 1.16E-06 | 2.5 to 2.5 | -2.50 |
| | | | 20 | 126.5 | 0.0059 | 3.11E-06 | 2.5 to 2.5 | -2.50 |
| | | | 30 | 110 | 0.0010 | 5.26E-07 | 2.5 to 2.5 | -2.50 |
| | | | 40 | 110 | 0.0068 | 3.58E-06 | 2.5 to 2.5 | -2.50 |
| | | | 50 | 110 | 0.0069 | 3.63E-06 | 2.5 to 2.5 | -2.50 |

Traceability to Industry Recognized Test Methodologies

| | |
|--------------------------|---------------------------|
| Work Instruction: | WI-02 MEASURING FREQUENCY |
| Measurement Uncertainty: | ±0.86 ppm |

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9.4. Emission Bandwidth

| Conducted Test Conditions for Emission Bandwidth | | | |
|--|---------------------------------|---------------------|-------------|
| Standard: | FCC Part 24E & IC RSS-133 | Ambient Temp. (°C): | 20.0 - 24.5 |
| Test Heading: | Emission Bandwidth | Rel. Humidity (%): | 32 - 45 |
| Standard Section(s): | FCC 24E: 24.238 (b) RSS-133: | Pressure (mBars): | 999 - 1001 |
| Reference Document(s): | See Normative References | | |

Test Procedure for Emission Bandwidth

Per the standard **emission** bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

Testing was performed under ambient conditions.

Test configuration and setup used for the measurement was per the Conducted Test Set-up specified in this document.

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Equipment Configuration for Emissions Bandwidth

| | | | |
|--------------------------------|-------|-----------------------------------|----------------|
| Band: | 2 | Duty Cycle (%): | 99.00 |
| Modulation: | QPSK | Antenna Gain (dBi): | Not Applicable |
| Temperature (°C): | +20.0 | Beam Forming Gain (Y)(dB): | Not Applicable |
| Voltage (Vac): | 110.0 | Tested By: | CC |
| Engineering Test Notes: | None | | |

| Bandwidth (MHz) | Chanel # | Frequency (MHz) | RB (Starting) | RB # | 99% Occupied Bandwidth (MHz) | 26 dB Occupied Bandwidth (MHz) |
|-----------------|----------|-----------------|---------------|------|------------------------------|--------------------------------|
| 5 | 18625 | 1852.5 | 0 | 25 | 6.06 | 11.28 |
| | 18900 | 1880 | 0 | 25 | 4.55 | 9.82 |
| | 19175 | 1907.5 | 0 | 25 | 4.54 | 8.66 |

| Bandwidth (MHz) | Chanel # | Frequency (MHz) | RB (Starting) | RB # | 99% Occupied Bandwidth (MHz) | 26 dB Occupied Bandwidth (MHz) |
|-----------------|----------|-----------------|---------------|------|------------------------------|--------------------------------|
| 10 | 18650 | 1855 | 0 | 50 | 10.79 | 21.86 |
| | 18900 | 1880 | 0 | 50 | 9.13 | 19.04 |
| | 19150 | 1905 | 0 | 50 | 9.07 | 18.29 |

| Bandwidth (MHz) | Chanel # | Frequency (MHz) | RB (Starting) | RB # | 99% Occupied Bandwidth (MHz) | 26 dB Occupied Bandwidth (MHz) |
|-----------------|----------|-----------------|---------------|------|------------------------------|--------------------------------|
| 15 | 18675 | 1857.5 | 0 | 75 | 14.62 | 28.34 |
| | 18900 | 1880 | 0 | 75 | 13.61 | 25.11 |
| | 19125 | 1902.5 | 0 | 75 | 13.53 | 22.11 |

| Bandwidth (MHz) | Chanel # | Frequency (MHz) | RB (Starting) | RB # | 99% Occupied Bandwidth (MHz) | 26 dB Occupied Bandwidth (MHz) |
|-----------------|----------|-----------------|---------------|------|------------------------------|--------------------------------|
| 20 | 18700 | 1860 | 0 | 100 | 18.13 | 31.72 |
| | 18900 | 1880 | 0 | 100 | 18.03 | 31.59 |
| | 19100 | 1900 | 0 | 100 | 17.94 | 25.47 |

Traceability to Industry Recognized Test Methodologies

| | |
|--------------------------|----------------------------------|
| Work Instruction: | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB |

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9.5. Out of Band Emissions

| Conducted Test Conditions for Out of Band Emissions | | | |
|---|---------------------------------------|----------------------------|-------------|
| Standard: | FCC Part 24E & IC RSS-133 | Ambient Temp. (°C): | 20.0 - 24.5 |
| Test Heading: | Frequency Stability | Rel. Humidity (%): | 32 - 45 |
| Standard Section(s): | FCC 24E: 24.238 a & b RSS-133: 6.5 | Pressure (mBars): | 999 - 1001 |
| Reference Document(s): | See Normative References | | |

Test Procedure for Out of Band Emissions

With reference to the test configuration identified in Section 8.1 Conducted Test Setup the EUT was set to transmit on the appropriate center frequency of the selected frequency band and bandwidth. Out of Band emissions was tested under QPSK.

Testing was performed under ambient conditions.

Limits Out of Band Emissions

FCC 24E: §24.238 Emission limitations for Broadband PCS equipment.

(a) *Out of band emissions.* The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

(b) *Measurement procedure.* Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (*i.e.* 1 MHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

RSS-133: (i) In the 1.0 MHz bands immediately outside and adjacent to the equipment's operating frequency block, the emission power per any 1% of the emission bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least $43 + 10 \log_{10} P$ (watts). 2 GHz Personal Communications Services RSS-133 4

(ii) After the first 1.0 MHz, the emission power in any 1 MHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least $43 + 10 \log_{10} P$ (watts). If the measurement is performed using 1% of the emission bandwidth, power integration over 1.0 MHz is required.



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Equipment Configuration for Out Of Band Emissions

| | | | |
|--------------------------------|-------|-----------------------------------|----------------|
| Band: | 2 | Duty Cycle (%): | 99.00 |
| Modulation: | QPSK | Antenna Gain (dBi): | Not Applicable |
| Temperature (°C): | +20.0 | Beam Forming Gain (Y)(dB): | Not Applicable |
| Voltage (Vac): | 110.0 | Tested By: | CC |
| Engineering Test Notes: | None | | |

| Channel # | Test Frequency (MHz) | Bandwidth (MHz) | RB (Starting) | RB # | Frequency Range (MHz) | Limit dBm | Amplitude dBm | Margin dB | Pass/Fail |
|-----------|----------------------|-----------------|---------------|------|-----------------------|-----------|---------------|-----------|-----------|
| 18625 | 1852.5 | 5 | 0 | 1 | 0.009 – 0.150 | -13 | -48.86 | -35.86 | Pass |
| | | | 0 | 25 | 0.009 – 0.150 | -13 | -48.80 | -35.80 | Pass |
| | | | 0 | 1 | 0.150 – 30.00 | -13 | -65.78 | -52.78 | Pass |
| | | | 0 | 25 | 0.150 – 30.00 | -13 | -65.86 | -52.86 | Pass |
| | | | 0 | 1 | 30.00 – 1000.00 | -13 | -64.70 | -51.70 | Pass |
| | | | 0 | 25 | 30.00 – 1000.00 | -13 | 64.72 | 77.72 | Pass |
| | | | 0 | 1 | 1000.00 – 1850.0 | -13 | 20.29 | 33.29 | - |
| | | | 0 | 25 | 1000.00 – 1850.0 | -13 | 15.02 | 28.02 | - |
| | | | 0 | 1 | 1849.00 - 18510.00 | -13 | -21.49 | -8.49 | Pass |
| | | | 0 | 25 | 1849.00 - 18510.00 | -13 | -16.95 | -3.95 | Pass |
| | | | 0 | 1 | 1910.00 – 26000.0 | -13 | -47.11 | -34.11 | Pass |
| | | | 0 | 25 | 1910.00 – 26000.0 | -13 | -47.12 | -34.12 | Pass |

Traceability to Industry Recognized Test Methodologies

| | |
|--------------------------|----------------------------------|
| Work Instruction: | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB |

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Equipment Configuration for Out Of Band Emissions

| | | | |
|--------------------------------|-------|-----------------------------------|----------------|
| Band: | 2 | Duty Cycle (%): | 99.00 |
| Modulation: | QPSK | Antenna Gain (dBi): | Not Applicable |
| Temperature (°C): | +20.0 | Beam Forming Gain (Y)(dB): | Not Applicable |
| Voltage (Vac): | 110.0 | Tested By: | CC |
| Engineering Test Notes: | None | | |

| Channel # | Test Frequency (MHz) | Bandwidth (MHz) | RB (Starting) | RB # | Frequency Range (MHz) | Limit dBm | Amplitude dBm | Margin dB | Pass/Fail |
|-----------|----------------------|-----------------|---------------|------|-----------------------|-----------|---------------|-----------|-----------|
| 18900 | 1880 | 5 | 0 | 1 | 0.009 – 0.150 | -13 | -48.82 | -35.82 | Pass |
| | | | 0 | 25 | 0.009 – 0.150 | -13 | -48.76 | -35.76 | Pass |
| | | | 0 | 1 | 0.150 – 30.00 | -13 | -65.91 | -52.91 | Pass |
| | | | 0 | 25 | 0.150 – 30.00 | -13 | -65.51 | -52.51 | Pass |
| | | | 0 | 1 | 30.00 – 1000.00 | -13 | -64.71 | -51.71 | Pass |
| | | | 0 | 25 | 30.00 – 1000.00 | -13 | 64.75 | 77.75 | Pass |
| | | | 0 | 1 | 1000.00 – 1850.0 | -13 | -54.95 | -41.95 | Pass |
| | | | 0 | 25 | 1000.00 – 1850.0 | -13 | -53.62 | -40.62 | Pass |
| | | | 0 | 1 | 1910.00 – 26000.0 | -13 | -47.12 | -34.12 | Pass |
| | | | 0 | 25 | 1910.00 – 26000.0 | -13 | -47.11 | -34.11 | Pass |

Traceability to Industry Recognized Test Methodologies

| | |
|--------------------------|----------------------------------|
| Work Instruction: | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB |

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To: FCC Part 24E & IC RSS-133 Issue 6
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Equipment Configuration for Out Of Band Emissions

| | | | |
|--------------------------------|-------|-----------------------------------|----------------|
| Band: | 2 | Duty Cycle (%): | 99.00 |
| Modulation: | QPSK | Antenna Gain (dBi): | Not Applicable |
| Temperature (°C): | +20.0 | Beam Forming Gain (Y)(dB): | Not Applicable |
| Voltage (Vac): | 110.0 | Tested By: | CC |
| Engineering Test Notes: | None | | |

| Channel # | Test Frequency (MHz) | Bandwidth (MHz) | RB (Starting) | RB # | Frequency Range (MHz) | Limit dBm | Amplitude dBm | Margin dB | Pass/Fail |
|-----------|----------------------|-----------------|---------------|------|-----------------------|-----------|---------------|-----------|-----------|
| 19175 | 1907.5 | 5 | 0 | 1 | 0.009 – 0.150 | -13 | -48.88 | -35.88 | Pass |
| | | | 0 | 25 | 0.009 – 0.150 | -13 | -48.84 | -35.84 | Pass |
| | | | 0 | 1 | 0.150 – 30.00 | -13 | -65.30 | -52.30 | Pass |
| | | | 0 | 25 | 0.150 – 30.00 | -13 | -65.10 | -52.10 | Pass |
| | | | 0 | 1 | 30.00 – 1000.00 | -13 | -64.80 | -51.80 | Pass |
| | | | 0 | 25 | 30.00 – 1000.00 | -13 | -64.80 | -51.80 | Pass |
| | | | 0 | 1 | 1000.00 – 1850.0 | -13 | -54.98 | -41.98 | Pass |
| | | | 0 | 25 | 1000.00 – 1850.0 | -13 | -55.08 | -42.08 | Pass |
| | | | 0 | 1 | 1909.00 - 1911.00 | -13 | -61.72 | -48.72 | Pass |
| | | | 0 | 25 | 1909.00 - 1911.00 | -13 | -19.86 | -6.86 | Pass |
| | | | 0 | 1 | 1910.00 – 26000.0 | -13 | -47.10 | -34.10 | Pass |
| | | | 0 | 25 | 1910.00 – 26000.0 | -13 | 7.01 | 20.01 | - |

Traceability to Industry Recognized Test Methodologies

| | |
|--------------------------|----------------------------------|
| Work Instruction: | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB |

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Equipment Configuration for Out Of Band Emissions

| | | | |
|--------------------------------|-------|-----------------------------------|----------------|
| Band: | 2 | Duty Cycle (%): | 99.00 |
| Modulation: | QPSK | Antenna Gain (dBi): | Not Applicable |
| Temperature (°C): | +20.0 | Beam Forming Gain (Y)(dB): | Not Applicable |
| Voltage (Vac): | 110.0 | Tested By: | CC |
| Engineering Test Notes: | None | | |

| Channel # | Test Frequency (MHz) | Bandwidth (MHz) | RB (Starting) | RB # | Frequency Range (MHz) | Limit dBm | Amplitude dBm | Margin dB | Pass/Fail |
|-----------|----------------------|-----------------|---------------|------|-----------------------|-----------|---------------|-----------|-----------|
| 18650 | 1855 | 10 | 0 | 1 | 0.009 – 0.150 | -13 | -48.73 | -35.73 | Pass |
| | | | 0 | 50 | 0.009 – 0.150 | -13 | -48.90 | -35.90 | Pass |
| | | | 0 | 1 | 0.150 – 30.00 | -13 | -64.40 | -51.40 | Pass |
| | | | 0 | 50 | 0.150 – 30.00 | -13 | -65.59 | -52.59 | Pass |
| | | | 0 | 1 | 30.00 – 1000.00 | -13 | -64.87 | -51.87 | Pass |
| | | | 0 | 50 | 30.00 – 1000.00 | -13 | -64.65 | -51.65 | Pass |
| | | | 0 | 1 | 1000.00 – 1850.0 | -13 | 20.84 | 33.84 | - |
| | | | 0 | 50 | 1000.00 – 1850.0 | -13 | 11.01 | 24.01 | - |
| | | | 0 | 1 | 1849.00 - 18510.00 | -13 | -29.65 | -16.65 | Pass |
| | | | 0 | 50 | 1849.00 - 18510.00 | -13 | -17.77 | -4.77 | Pass |
| | | | 0 | 1 | 1910.00 – 26000.0 | -13 | -47.12 | -34.12 | Pass |
| | | | 0 | 50 | 1910.00 – 26000.0 | -13 | -47.12 | -34.12 | Pass |

Traceability to Industry Recognized Test Methodologies

| | |
|---------------------------------|----------------------------------|
| Work Instruction: | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB |

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Equipment Configuration for Out Of Band Emissions

| | | | |
|--------------------------------|-------|-----------------------------------|----------------|
| Band: | 2 | Duty Cycle (%): | 99.00 |
| Modulation: | QPSK | Antenna Gain (dBi): | Not Applicable |
| Temperature (°C): | +20.0 | Beam Forming Gain (Y)(dB): | Not Applicable |
| Voltage (Vac): | 110.0 | Tested By: | CC |
| Engineering Test Notes: | None | | |

| Channel # | Test Frequency (MHz) | Bandwidth (MHz) | RB (Starting) | RB # | Frequency Range (MHz) | Limit dBm | Amplitude dBm | Margin dB | Pass/Fail |
|-----------|----------------------|-----------------|---------------|------|-----------------------|-----------|---------------|-----------|-----------|
| 18900 | 1880 | 10 | 0 | 1 | 0.009 – 0.150 | -13 | -48.80 | -35.80 | Pass |
| | | | 0 | 50 | 0.009 – 0.150 | -13 | -48.76 | -35.76 | Pass |
| | | | 0 | 1 | 0.150 – 30.00 | -13 | -64.82 | -51.82 | Pass |
| | | | 0 | 50 | 0.150 – 30.00 | -13 | -65.86 | -52.86 | Pass |
| | | | 0 | 1 | 30.00 – 1000.00 | -13 | -64.76 | -51.76 | Pass |
| | | | 0 | 50 | 30.00 – 1000.00 | -13 | -64.65 | -51.65 | Pass |
| | | | 0 | 1 | 1000.00 – 1850.0 | -13 | -54.85 | -41.85 | Pass |
| | | | 0 | 50 | 1000.00 – 1850.0 | -13 | -44.32 | -31.32 | Pass |
| | | | 0 | 1 | 1910.00 – 26000.0 | -13 | -47.06 | -34.06 | Pass |
| | | | 0 | 50 | 1910.00 – 26000.0 | -13 | -47.12 | -34.12 | Pass |

Traceability to Industry Recognized Test Methodologies

| | |
|--------------------------|----------------------------------|
| Work Instruction: | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB |

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Equipment Configuration for Out Of Band Emissions

| | | | |
|--------------------------------|-------|-----------------------------------|----------------|
| Band: | 2 | Duty Cycle (%): | 99.00 |
| Modulation: | QPSK | Antenna Gain (dBi): | Not Applicable |
| Temperature (°C): | +20.0 | Beam Forming Gain (Y)(dB): | Not Applicable |
| Voltage (Vac): | 110.0 | Tested By: | CC |
| Engineering Test Notes: | None | | |

| Channel # | Test Frequency (MHz) | Bandwidth (MHz) | RB (Starting) | RB # | Frequency Range (MHz) | Limit dBm | Amplitude dBm | Margin dB | Pass/Fail |
|-----------|----------------------|-----------------|---------------|------|-----------------------|-----------|---------------|-----------|-----------|
| 19150 | 1905 | 10 | 0 | 1 | 0.009 – 0.150 | -13 | -48.88 | -35.88 | Pass |
| | | | 0 | 50 | 0.009 – 0.150 | -13 | -48.78 | -35.78 | Pass |
| | | | 0 | 1 | 0.150 – 30.00 | -13 | -65.95 | -52.95 | Pass |
| | | | 0 | 50 | 0.150 – 30.00 | -13 | -65.95 | -52.95 | Pass |
| | | | 0 | 1 | 30.00 – 1000.00 | -13 | -64.60 | -51.60 | Pass |
| | | | 0 | 50 | 30.00 – 1000.00 | -13 | -64.67 | -51.67 | Pass |
| | | | 0 | 1 | 1000.00 – 1850.0 | -13 | -54.99 | -41.99 | Pass |
| | | | 0 | 50 | 1000.00 – 1850.0 | -13 | -53.97 | -40.97 | Pass |
| | | | 0 | 1 | 1909.00 - 1911.00 | -13 | -59.08 | -46.08 | Pass |
| | | | 0 | 50 | 1909.00 - 1911.00 | -13 | -19.71 | -6.71 | Pass |
| | | | 0 | 1 | 1910.00 – 26000.0 | -13 | -47.10 | -34.10 | Pass |
| | | | 0 | 50 | 1910.00 – 26000.0 | -13 | -16.58 | -3.58 | Pass |

Traceability to Industry Recognized Test Methodologies

| | |
|---------------------------------|----------------------------------|
| Work Instruction: | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB |

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Equipment Configuration for Out Of Band Emissions

| | | | |
|--------------------------------|-------|-----------------------------------|----------------|
| Band: | 2 | Duty Cycle (%): | 99.00 |
| Modulation: | QPSK | Antenna Gain (dBi): | Not Applicable |
| Temperature (°C): | +20.0 | Beam Forming Gain (Y)(dB): | Not Applicable |
| Voltage (Vac): | 110.0 | Tested By: | CC |
| Engineering Test Notes: | None | | |

| Channel # | Test Frequency (MHz) | Bandwidth (MHz) | RB (Starting) | RB # | Frequency Range (MHz) | Limit dBm | Amplitude dBm | Margin dB | Pass/Fail |
|-----------|----------------------|-----------------|---------------|------|-----------------------|-----------|---------------|-----------|-----------|
| 18675 | 1857.5 | 15 | 0 | 1 | 0.009 – 0.150 | -13 | -48.8 | -35.8 | Pass |
| | | | 0 | 75 | 0.009 – 0.150 | -13 | -48.82 | -35.82 | Pass |
| | | | 0 | 1 | 0.150 – 30.00 | -13 | -64.99 | -51.99 | Pass |
| | | | 0 | 75 | 0.150 – 30.00 | -13 | -65.7 | -52.7 | Pass |
| | | | 0 | 1 | 30.00 – 1000.00 | -13 | -64.74 | -51.74 | Pass |
| | | | 0 | 75 | 30.00 – 1000.00 | -13 | -64.59 | -51.59 | Pass |
| | | | 0 | 1 | 1000.00 – 1850.0 | -13 | 20.77 | 33.77 | - |
| | | | 0 | 75 | 1000.00 – 1850.0 | -13 | -64.59 | -51.59 | Pass |
| | | | 0 | 1 | 1849.00 - 18510.00 | -13 | -29.19 | -16.19 | Pass |
| | | | 0 | 75 | 1849.00 - 18510.00 | -13 | -19.54 | -6.54 | Pass |
| | | | 0 | 1 | 1910.00 – 26000.0 | -13 | -47.18 | -34.18 | Pass |
| | | | 0 | 75 | 1910.00 – 26000.0 | -13 | -47.1 | -34.1 | Pass |

Traceability to Industry Recognized Test Methodologies

| | |
|--------------------------|----------------------------------|
| Work Instruction: | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB |

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Equipment Configuration for Out Of Band Emissions

| | | | |
|--------------------------------|-------|-----------------------------------|----------------|
| Band: | 2 | Duty Cycle (%): | 99.00 |
| Modulation: | QPSK | Antenna Gain (dBi): | Not Applicable |
| Temperature (°C): | +20.0 | Beam Forming Gain (Y)(dB): | Not Applicable |
| Voltage (Vac): | 110.0 | Tested By: | CC |
| Engineering Test Notes: | None | | |

| Channel # | Test Frequency (MHz) | Bandwidth (MHz) | RB (Starting) | RB # | Frequency Range (MHz) | Limit dBm | Amplitude dBm | Margin dB | Pass/Fail |
|-----------|----------------------|-----------------|---------------|------|-----------------------|-----------|---------------|-----------|-----------|
| 18900 | 1880 | 15 | 0 | 1 | 0.009 – 0.150 | -13 | -48.82 | -35.82 | Pass |
| | | | 0 | 75 | 0.009 – 0.150 | -13 | -48.6 | -35.6 | Pass |
| | | | 0 | 1 | 0.150 – 30.00 | -13 | -65.83 | -52.83 | Pass |
| | | | 0 | 1 | 0.150 – 30.00 | -13 | -66.01 | -53.01 | Pass |
| | | | 0 | 75 | 30.00 – 1000.00 | -13 | -64.63 | -51.63 | Pass |
| | | | 0 | 25 | 30.00 – 1000.00 | -13 | -64.74 | -51.74 | Pass |
| | | | 0 | 1 | 1000.00 – 1850.0 | -13 | -52.21 | -39.21 | Pass |
| | | | 0 | 75 | 1000.00 – 1850.0 | -13 | -36.37 | -23.37 | Pass |
| | | | 0 | 1 | 1910.00 – 26000.0 | -13 | -47.09 | -34.09 | Pass |
| | | | 0 | 75 | 1910.00 – 26000.0 | -13 | -47.18 | -34.18 | Pass |

Traceability to Industry Recognized Test Methodologies

| | |
|---------------------------------|----------------------------------|
| Work Instruction: | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB |

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Equipment Configuration for Out Of Band Emissions

| | | | |
|--------------------------------|-------|-----------------------------------|----------------|
| Band: | 2 | Duty Cycle (%): | 99.00 |
| Modulation: | QPSK | Antenna Gain (dBi): | Not Applicable |
| Temperature (°C): | +20.0 | Beam Forming Gain (Y)(dB): | Not Applicable |
| Voltage (Vac): | 110.0 | Tested By: | CC |
| Engineering Test Notes: | None | | |

| Channel # | Test Frequency (MHz) | Bandwidth (MHz) | RB (Starting) | RB # | Frequency Range (MHz) | Limit dBm | Amplitude dBm | Margin dB | Pass/Fail |
|-----------|----------------------|-----------------|---------------|------|-----------------------|-----------|---------------|-----------|-----------|
| 19125 | 1902.5 | 15 | 0 | 1 | 0.009 – 0.150 | -13 | -48.89 | -35.89 | Pass |
| | | | 0 | 75 | 0.009 – 0.150 | -13 | -48.82 | -35.82 | Pass |
| | | | 0 | 1 | 0.150 – 30.00 | -13 | -65.03 | -52.03 | Pass |
| | | | 0 | 1 | 0.150 – 30.00 | -13 | -66.14 | -53.14 | Pass |
| | | | 0 | 75 | 30.00 – 1000.00 | -13 | -64.67 | -51.67 | Pass |
| | | | 0 | 25 | 30.00 – 1000.00 | -13 | -64.76 | -51.76 | Pass |
| | | | 0 | 1 | 1000.00 – 1850.0 | -13 | -54.85 | -41.85 | Pass |
| | | | 0 | 75 | 1000.00 – 1850.0 | -13 | -48.37 | -35.37 | Pass |
| | | | 0 | 1 | 1909.00 - 1911.00 | -13 | -60.40 | -47.4 | Pass |
| | | | 0 | 75 | 1909.00 - 1911.00 | -13 | -20.27 | -7.27 | Pass |
| | | | 0 | 1 | 1910.00 – 26000.0 | -13 | -47.11 | -34.11 | Pass |
| | | | 0 | 75 | 1910.00 – 26000.0 | -13 | -18.73 | -5.73 | Pass |

Traceability to Industry Recognized Test Methodologies

| | |
|--------------------------|----------------------------------|
| Work Instruction: | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB |

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Equipment Configuration for Out Of Band Emissions

| | | | |
|--------------------------------|-------|-----------------------------------|----------------|
| Band: | 2 | Duty Cycle (%): | 99.00 |
| Modulation: | QPSK | Antenna Gain (dBi): | Not Applicable |
| Temperature (°C): | +20.0 | Beam Forming Gain (Y)(dB): | Not Applicable |
| Voltage (Vac): | 110.0 | Tested By: | CC |
| Engineering Test Notes: | None | | |

| Channel # | Test Frequency (MHz) | Bandwidth (MHz) | RB (Starting) | RB # | Frequency Range (MHz) | Limit dBm | Amplitude dBm | Margin dB | Pass/Fail |
|-----------|----------------------|-----------------|---------------|------|-----------------------|-----------|---------------|-----------|-----------|
| 18700 | 1860 | 20 | 0 | 1 | 0.009 – 0.150 | 1 | -13 | -48.8 | -35.8 |
| | | | 0 | 100 | 0.009 – 0.150 | 1 | -13 | -48.86 | -35.86 |
| | | | 0 | 1 | 0.150 – 30.00 | 10 | -13 | -65.56 | -52.56 |
| | | | 0 | 100 | 0.150 – 30.00 | 10 | -13 | -65.81 | -52.81 |
| | | | 0 | 1 | 30.00 – 1000.00 | 100 | -13 | -64.66 | -51.66 |
| | | | 0 | 100 | 30.00 – 1000.00 | 100 | -13 | -64.65 | -51.65 |
| | | | 0 | 1 | 1000.00 – 1850.0 | 1000 | -13 | 20.21 | 33.21 |
| | | | 0 | 100 | 1000.00 – 1850.0 | 1000 | -13 | 4.92 | 17.92 |
| | | | 0 | 1 | 1849.00 - 18510.00 | 160 | -13 | -32.82 | -19.82 |
| | | | 0 | 100 | 1849.00 - 18510.00 | 160 | -13 | -20.41 | -7.41 |
| | | | 0 | 1 | 1910.00 – 26000.0 | 1000 | -13 | -47.15 | -34.15 |
| | | | 0 | 100 | 1910.00 – 26000.0 | 1000 | -13 | -47.1 | -34.1 |

Traceability to Industry Recognized Test Methodologies

| | |
|--------------------------|----------------------------------|
| Work Instruction: | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB |

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Equipment Configuration for Out Of Band Emissions

| | | | |
|--------------------------------|-------|-----------------------------------|----------------|
| Band: | 2 | Duty Cycle (%): | 99.00 |
| Modulation: | QPSK | Antenna Gain (dBi): | Not Applicable |
| Temperature (°C): | +20.0 | Beam Forming Gain (Y)(dB): | Not Applicable |
| Voltage (Vac): | 110.0 | Tested By: | CC |
| Engineering Test Notes: | None | | |

| Channel # | Test Frequency (MHz) | Bandwidth (MHz) | RB (Starting) | RB # | Frequency Range (MHz) | Limit dBm | Amplitude dBm | Margin dB | Pass/Fail |
|-----------|----------------------|-----------------|---------------|------|-----------------------|-----------|---------------|-----------|-----------|
| 18900 | 1880 | 20 | 0 | 1 | 0.009 – 0.150 | 1 | -13 | -48.69 | -35.69 |
| | | | 0 | 100 | 0.009 – 0.150 | 1 | -13 | -48.77 | -35.77 |
| | | | 0 | 1 | 0.150 – 30.00 | 10 | -13 | -65.31 | -52.31 |
| | | | 0 | 100 | 0.150 – 30.00 | 10 | -13 | -65.47 | -52.47 |
| | | | 0 | 1 | 30.00 – 1000.00 | 100 | -13 | -64.64 | -51.64 |
| | | | 0 | 100 | 30.00 – 1000.00 | 100 | -13 | -64.52 | -51.52 |
| | | | 0 | 1 | 1000.00 – 1850.0 | 1000 | -13 | -54.51 | -41.51 |
| | | | 0 | 100 | 1000.00 – 1850.0 | 1000 | -13 | -35.46 | -22.46 |
| | | | 0 | 1 | 1910.00 – 26000.0 | 1000 | -13 | -47.15 | -34.15 |
| | | | 0 | 100 | 1910.00 – 26000.0 | 1000 | -13 | -41.52 | -28.52 |

Traceability to Industry Recognized Test Methodologies

| | |
|--------------------------|----------------------------------|
| Work Instruction: | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB |

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Equipment Configuration for Out Of Band Emissions

| | | | |
|--------------------------------|-------|-----------------------------------|----------------|
| Band: | 2 | Duty Cycle (%): | 99.00 |
| Modulation: | QPSK | Antenna Gain (dBi): | Not Applicable |
| Temperature (°C): | +20.0 | Beam Forming Gain (Y)(dB): | Not Applicable |
| Voltage (Vac): | 110.0 | Tested By: | CC |
| Engineering Test Notes: | None | | |

| Channel # | Test Frequency (MHz) | Bandwidth (MHz) | RB (Starting) | RB # | Frequency Range (MHz) | Limit dBm | Amplitude dBm | Margin dB | Pass/Fail |
|-----------|----------------------|-----------------|---------------|------|-----------------------|-----------|---------------|-----------|-----------|
| 19100 | 1900 | 20 | 0 | 1 | 0.009 – 0.150 | 1 | -13 | -48.76 | -35.76 |
| | | | 0 | 100 | 0.009 – 0.150 | 1 | -13 | -48.8 | -35.8 |
| | | | 0 | 1 | 0.150 – 30.00 | 10 | -13 | -65 | -52 |
| | | | 0 | 100 | 0.150 – 30.00 | 10 | -13 | -65.47 | -52.47 |
| | | | 0 | 1 | 30.00 – 1000.00 | 100 | -13 | -64.61 | -51.61 |
| | | | 0 | 100 | 30.00 – 1000.00 | 100 | -13 | -64.57 | -51.57 |
| | | | 0 | 1 | 1000.00 – 1850.0 | 1000 | -13 | -54.88 | -41.88 |
| | | | 0 | 100 | 1000.00 – 1850.0 | 1000 | -13 | -44.78 | -31.78 |
| | | | 0 | 1 | 1909.00 - 1911.00 | 160 | -13 | -60.45 | -47.45 |
| | | | 0 | 100 | 1909.00 - 1911.00 | 160 | -13 | -20.95 | -7.95 |
| | | | 0 | 1 | 1910.00 – 26000.0 | 1000 | -13 | -47.17 | -34.17 |
| | | | 0 | 100 | 1910.00 – 26000.0 | 1000 | -13 | -20.25 | -7.25 |

Traceability to Industry Recognized Test Methodologies

| | |
|--------------------------|----------------------------------|
| Work Instruction: | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB |

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9.5.1 Radiated Out of Band Emissions

FCC 24E: §24.238 Emission limitations for Broadband PCS equipment.

(a) *Out of band emissions.* The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

Equipment Configuration for Radiated Spurious Emissions

| | | | |
|---------------------------------|----------------|------------------------|----------------|
| Antenna: | 50 Ohm Term | Variant: | 5 MHz |
| Antenna Gain (dBi): | Not Applicable | Modulation: | QPSK |
| Beam Forming Gain (Y): | Not Applicable | Duty Cycle (%): | 99.00 |
| Channel Frequency (MHz): | 1885.00 | Data Rate: | Not Applicable |
| Power Setting: | Default | Tested By: | JMH |

Test Measurement Results

| 1000.00 - 18000.00 MHz | | | | | | | | | | | | |
|---|---------------|----------|---------------|--------|--------------|------------------|----------|--------|---------|--------------|-----------|------------|
| Num | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| #1 | 1906.22 | 65.25 | 2.50 | -13.03 | 54.72 | Fundamental | Vertical | 100 | 0 | -- | -- | |
| #2 | 7600.01 | 61.42 | 4.39 | -6.99 | 58.82 | Max Peak | Vertical | 196 | 78 | 82.2 | -23.5 | Pass |
| #3 | 7600.01 | 54.40 | 4.39 | -6.99 | 51.80 | Max Avg | Vertical | 196 | 78 | 82.2 | -30.5 | Pass |
| Test Notes: EUT powered up and originating call with Anritsu outside chamber, $43 - 10 \text{ LOG}(P)$ Transmitter spurious limit = -13 dBm or 82.23 dBμV/m at 3 meters | | | | | | | | | | | | |

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9.6. Receiver Spurious Emissions

| Conducted Test Conditions for Receiver Spurious Emissions | | | |
|--|--------------------------|---------------------|-------------|
| Standard: | IC RSS-133 | Ambient Temp. (°C): | 20.0 - 24.5 |
| Test Heading: | Frequency Stability | Rel. Humidity (%): | 32 - 45 |
| Standard Section(s): | RSS-133: 6.6 | Pressure (mBars): | 999 - 1001 |
| Reference Document(s): | See Normative References | | |
| Test Procedure for Receiver Spurious Emissions With reference to the test configuration identified in Section 8.1 Conducted Test Setup the EUT was set to transmit on the appropriate center frequency of the selected frequency band and bandwidth. Out of Band emissions was tested under QPSK. Testing was performed under ambient conditions. | | | |
| Limits Receiver Spurious Emissions RSS-133: Receiver spurious emissions shall comply with the limits specified in RSS-Gen. | | | |

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Receiver Spurious Limit

Equipment Configuration for Radiated Receiver Spurious Emissions

| | | | |
|---------------------------------|----------------|------------------------|-----|
| Antenna: | 50 Ohm Term | Variant: | |
| Antenna Gain (dBi): | Not Applicable | Modulation: | |
| Beam Forming Gain (Y): | Not Applicable | Duty Cycle (%): | |
| Channel Frequency (MHz): | 1885.00 | Data Rate: | |
| Power Setting: | Default | Tested By: | JMH |

Test Measurement Results

| 1000.00 - 18000.00 MHz | | | | | | | | | | | | |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|----------|--------|---------|--------------|-----------|------------|
| Num | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| #1 | 1906.22 | 65.25 | 2.50 | -13.03 | 54.72 | Fundamental | Vertical | 100 | 0 | -- | -- | |
| #2 | 7600.01 | 61.42 | 4.39 | -6.99 | 58.82 | Max Peak | Vertical | 196 | 78 | 74.0 | -15.2 | Pass |
| #3 | 7600.01 | 54.40 | 4.39 | -6.99 | 51.80 | Max Avg | Vertical | 196 | 78 | 54.0 | -3.2 | Pass |

Test Notes: EUT powered up and originating call with Anritsu outside chamber

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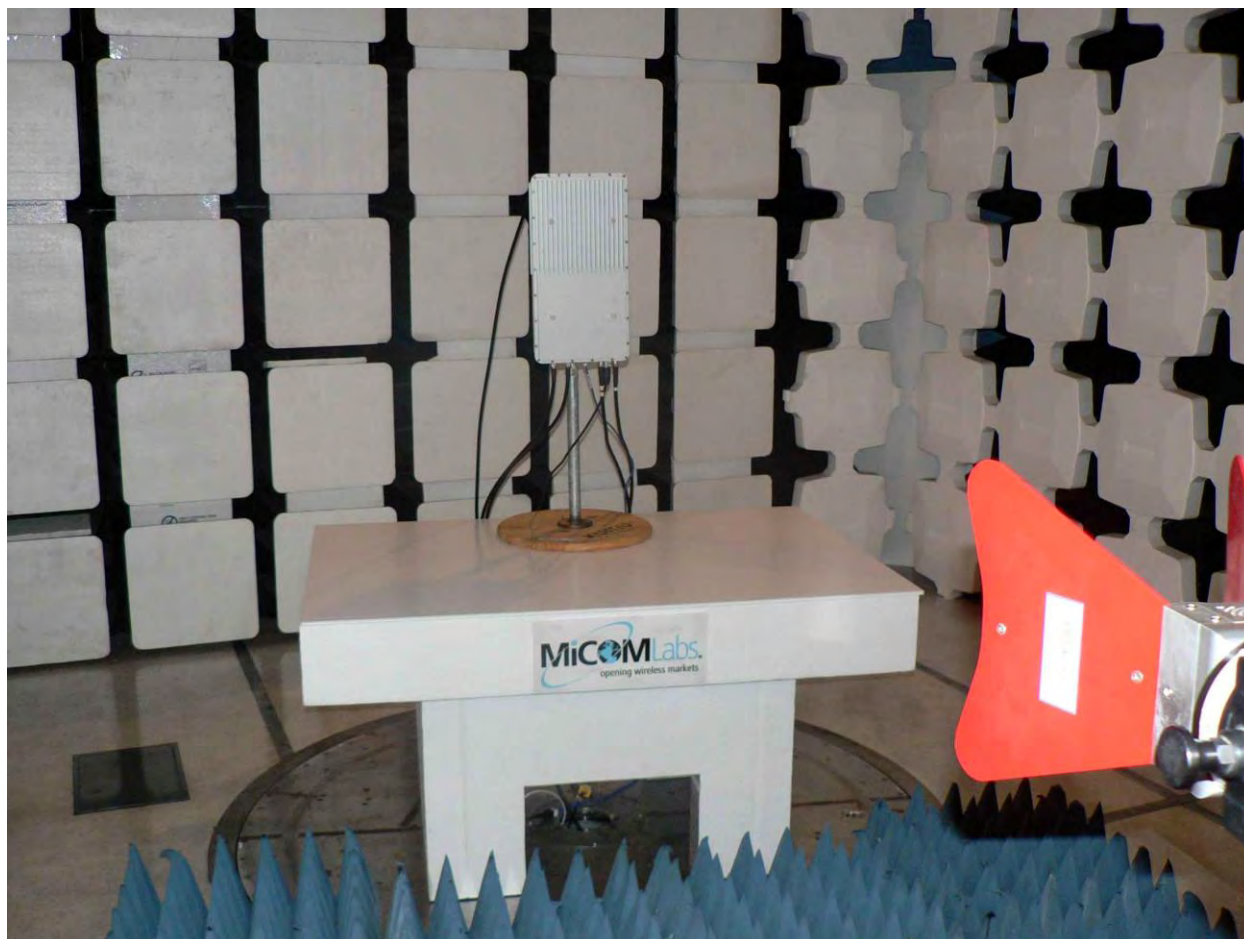
10. PHOTOGRAPHS

10.1. Conducted



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10.2. Radiated



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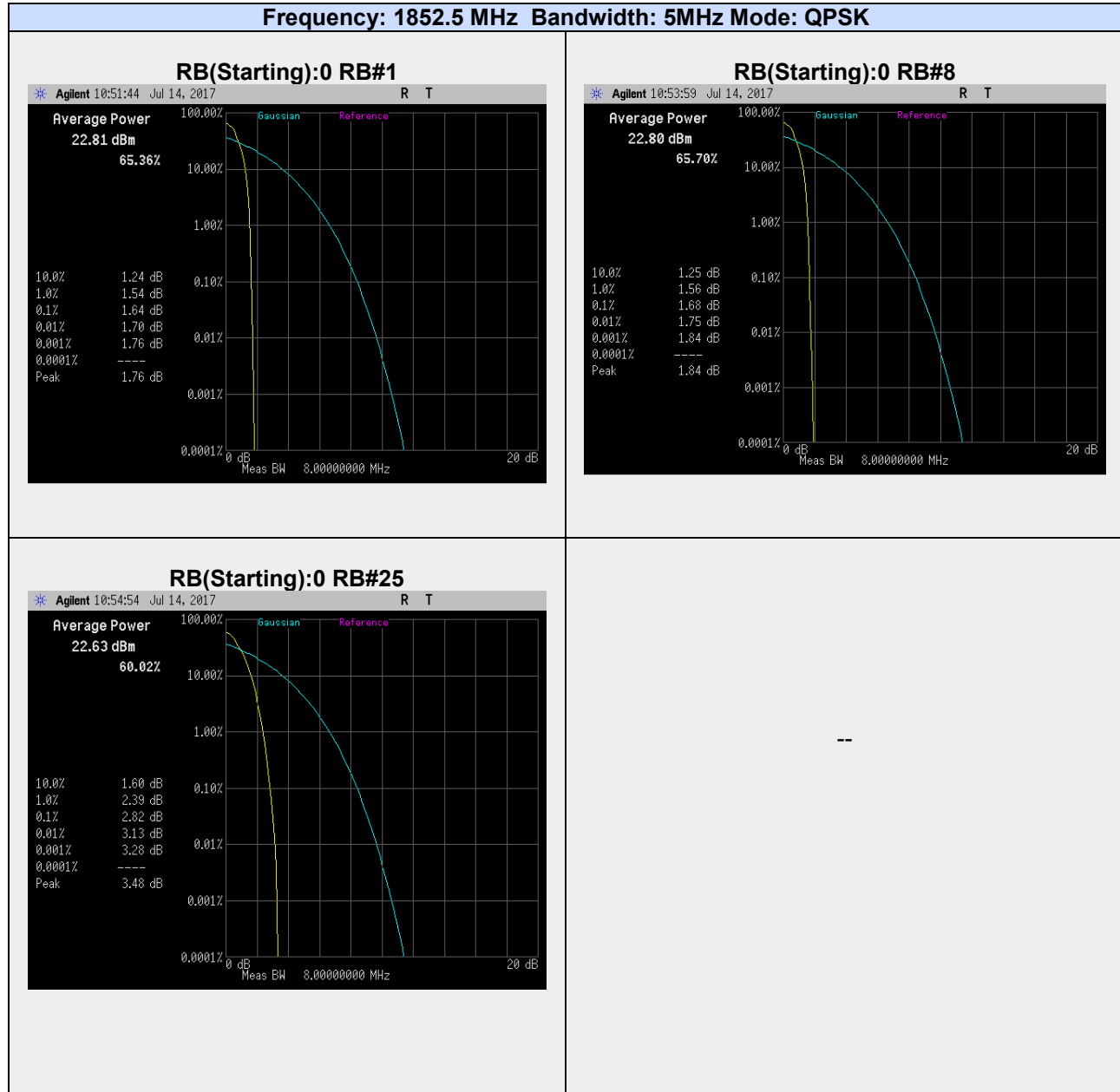
APPENDIX

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A.1. CONDUCTED TEST PLOTS

A.1.1. Peak-to-average power ratio

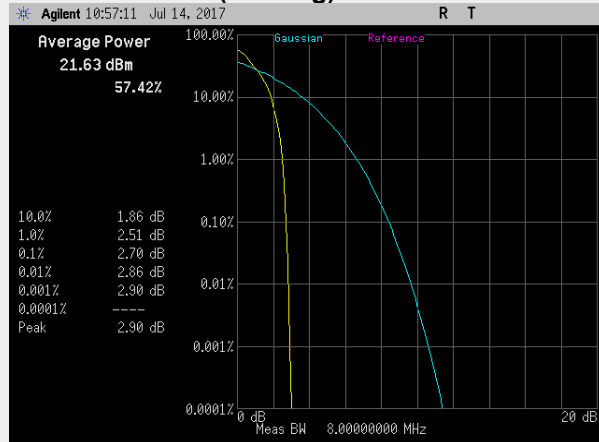


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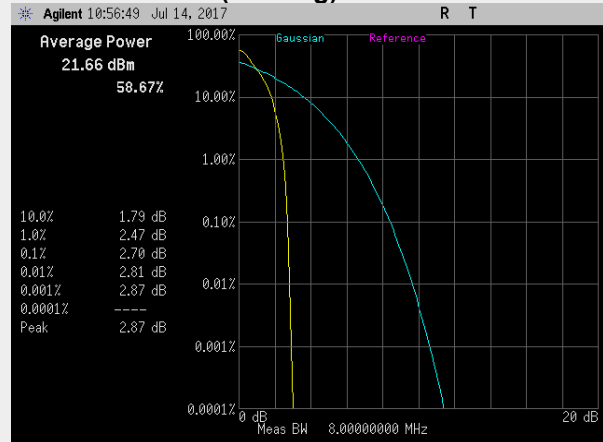


Frequency: 1880.0 MHz Bandwidth: 5MHz Mode: QPSK

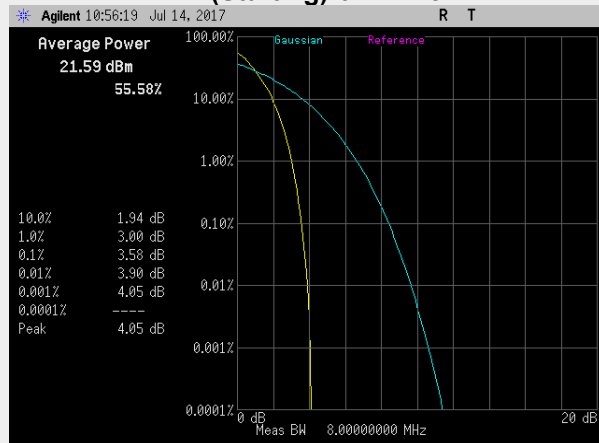
RB(Starting):0 RB#1



RB(Starting):0 RB#8



RB(Starting):0 RB#25



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Frequency: 1907.5 MHz Bandwidth: 5MHz Mode: QPSK

RB(Starting):0 RB#1



RB(Starting):0 RB#8



RB(Starting):0 RB#25



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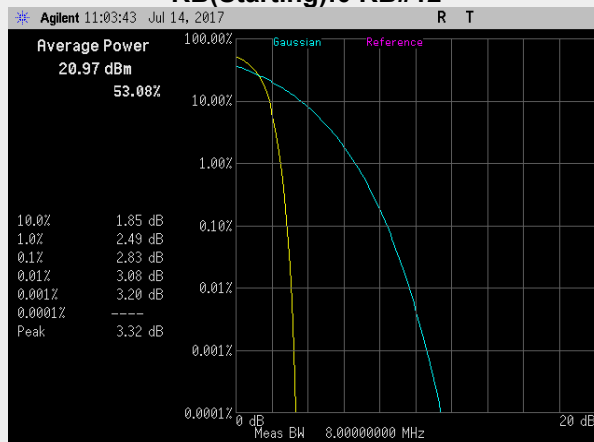


Frequency: 1855.0 MHz Bandwidth: 10MHz Mode: QPSK

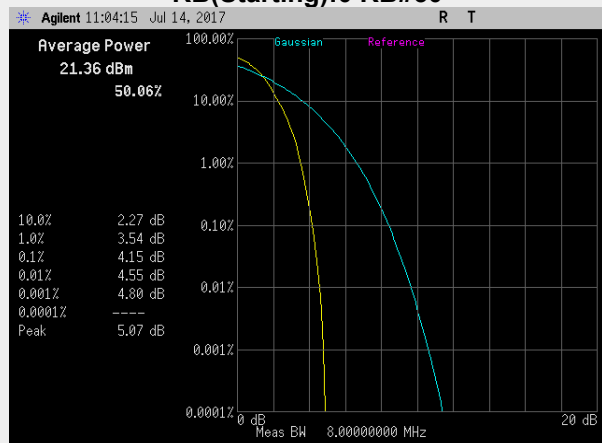
RB(Starting):0 RB#1



RB(Starting):0 RB#12



RB(Starting):0 RB#50



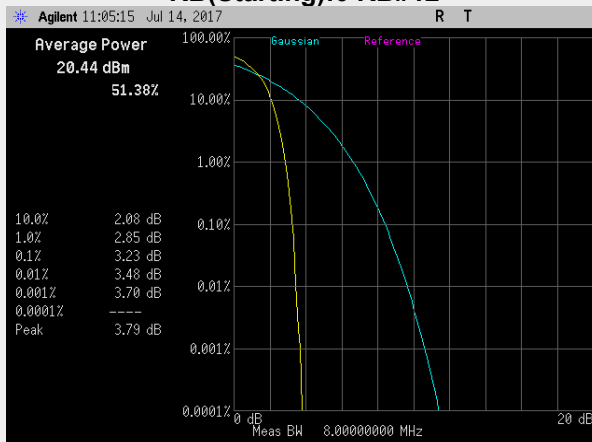


Frequency: 1880.0 MHz Bandwidth: 10MHz Mode: QPSK

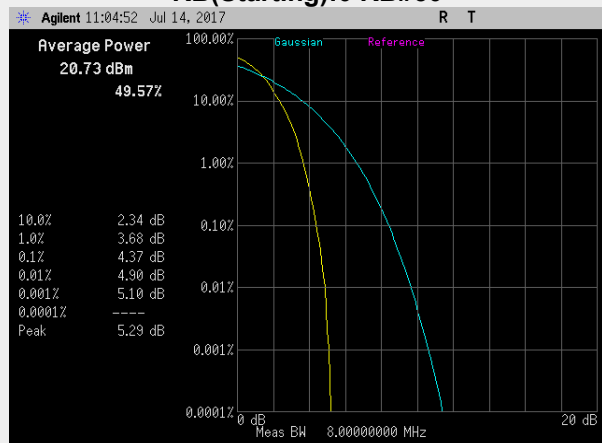
RB(Starting):0 RB#1



RB(Starting):0 RB#12



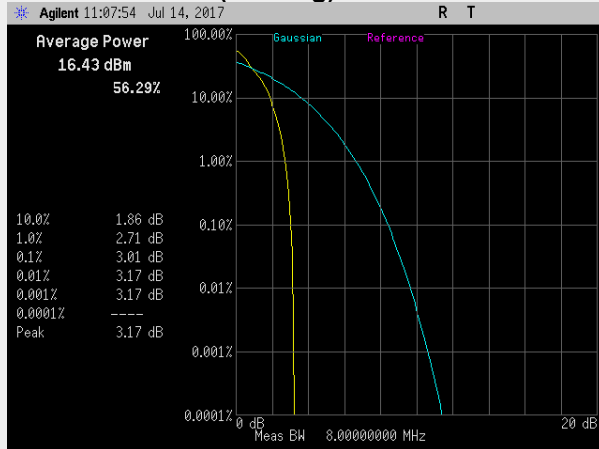
RB(Starting):0 RB#50



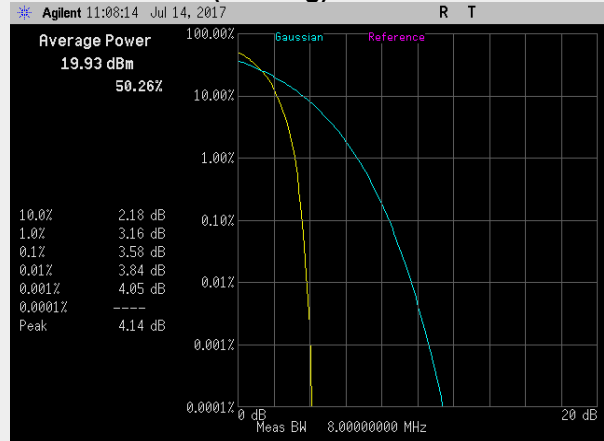


Frequency: 1905.0 MHz Bandwidth: 10MHz Mode: QPSK

RB(Starting):0 RB#1



RB(Starting):0 RB#12



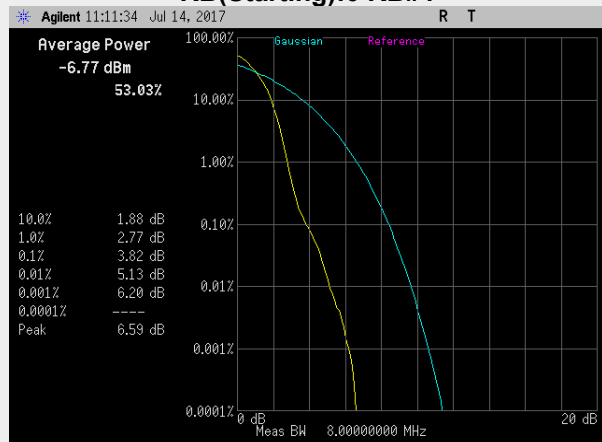
RB(Starting):0 RB#50



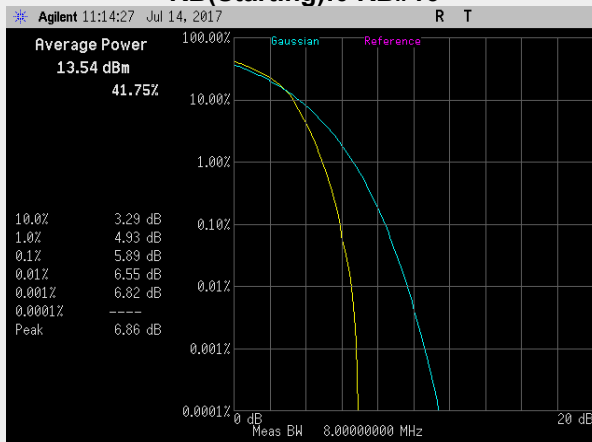


Frequency: 1857.5 MHz Bandwidth: 15MHz Mode: QPSK

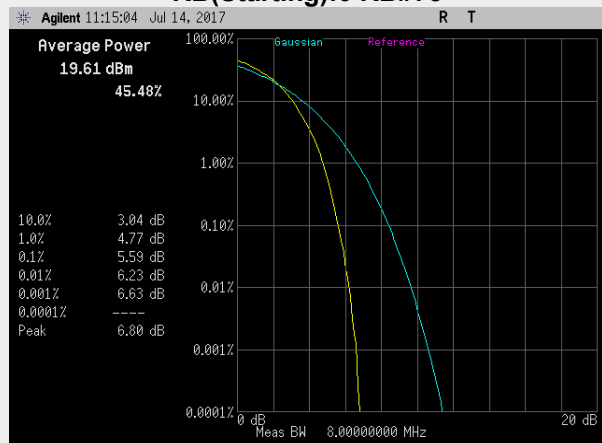
RB(Starting):0 RB#1



RB(Starting):0 RB#16



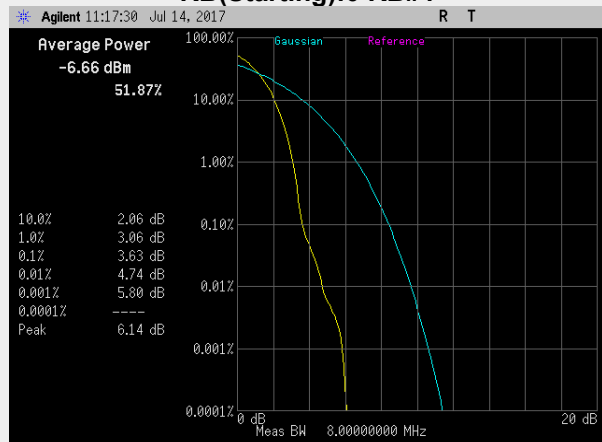
RB(Starting):0 RB#75



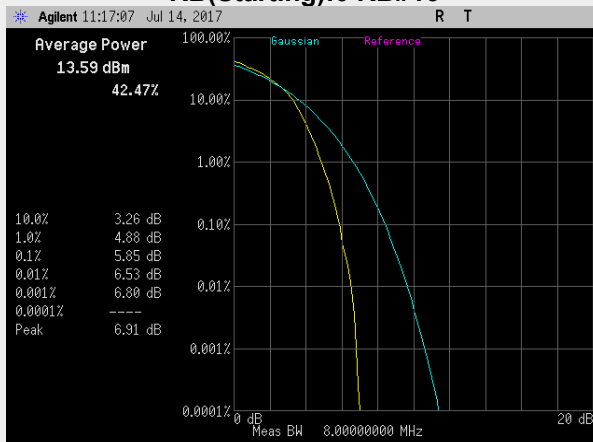


Frequency: 1880.0 MHz Bandwidth: 15MHz Mode: QPSK

RB(Starting):0 RB#1



RB(Starting):0 RB#16



RB(Starting):0 RB#75

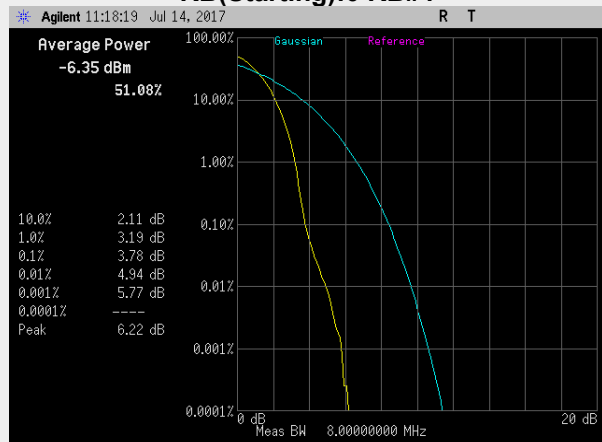


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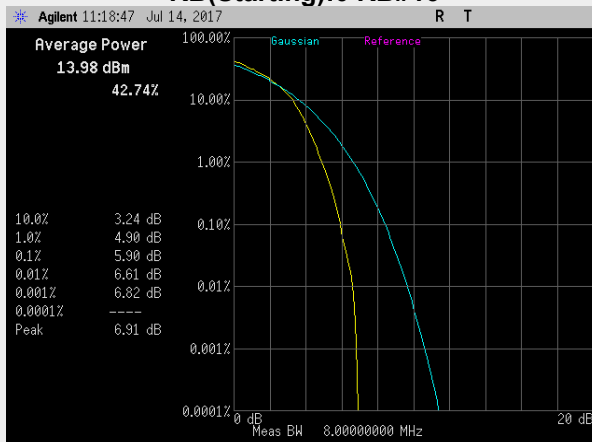


Frequency: 1902.5 MHz Bandwidth: 15MHz Mode: QPSK

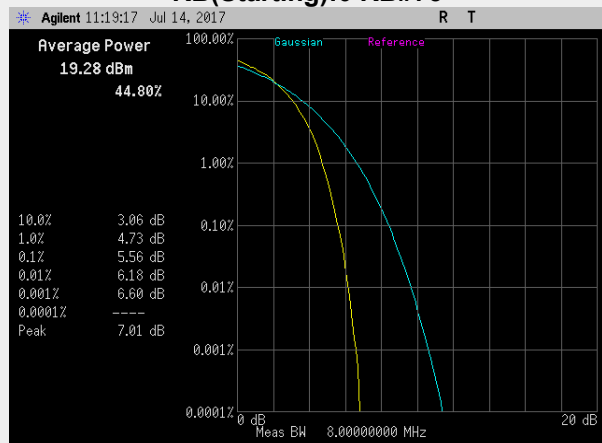
RB(Starting):0 RB#1



RB(Starting):0 RB#16



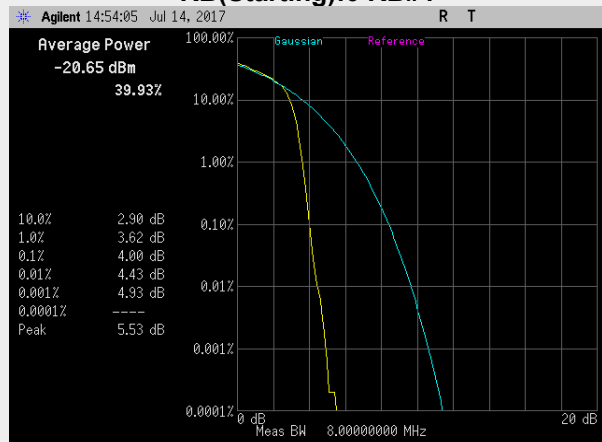
RB(Starting):0 RB#75



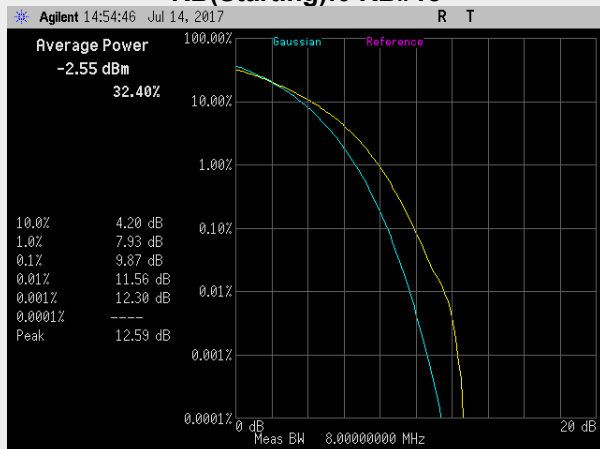


Frequency: 1860.0 MHz Bandwidth: 20MHz Mode: QPSK

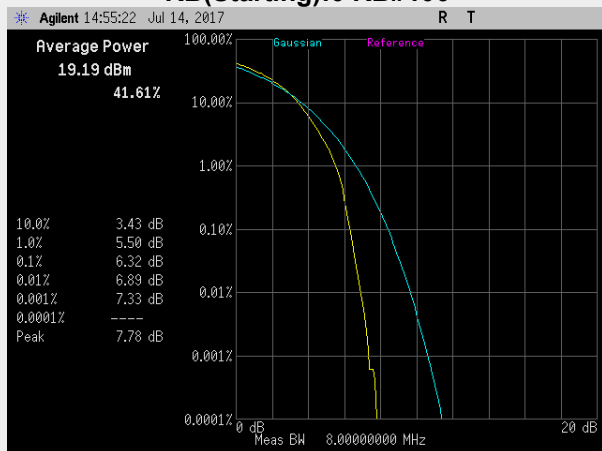
RB(Starting):0 RB#1



RB(Starting):0 RB#18



RB(Starting):0 RB#100

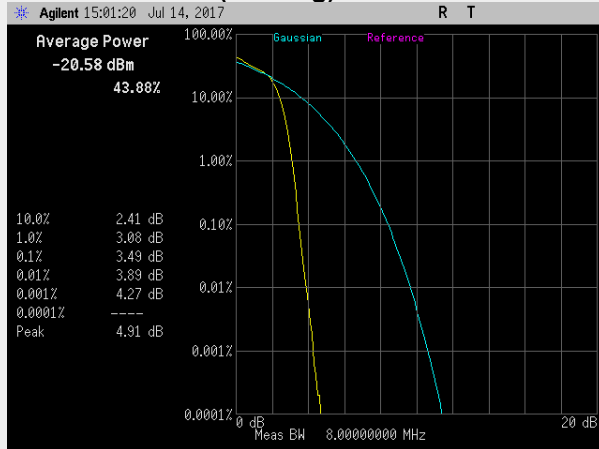


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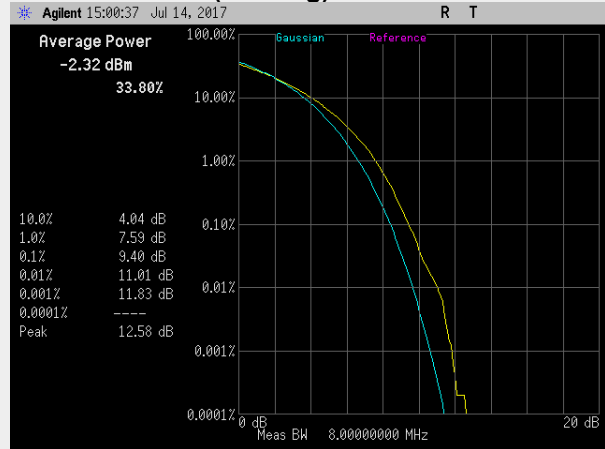


Frequency: 1880.0 MHz Bandwidth: 20MHz Mode: QPSK

RB(Starting):0 RB#1



RB(Starting):0 RB#18



RB(Starting):0 RB#100

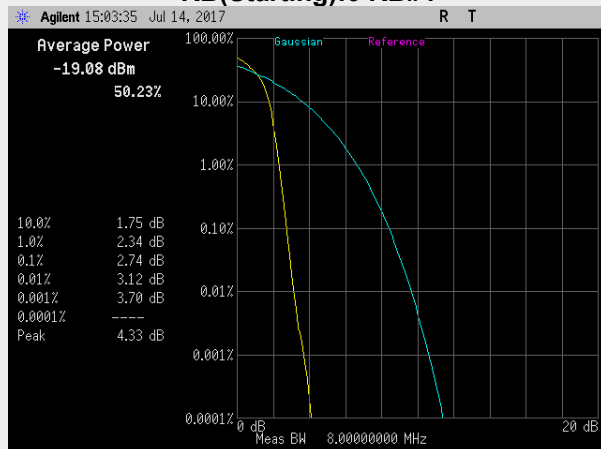


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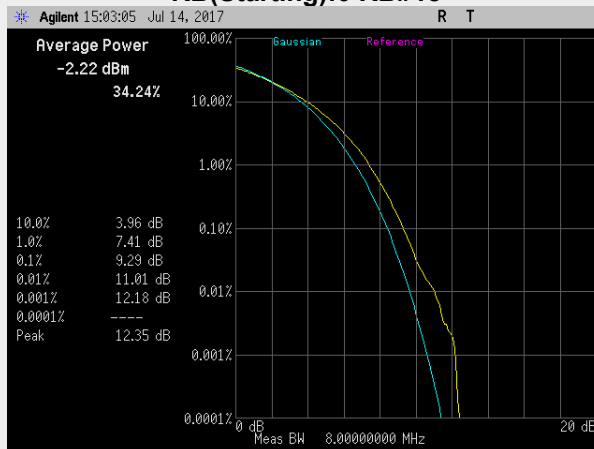


Frequency: 1900.0 MHz Bandwidth: 20MHz Mode: QPSK

RB(Starting):0 RB#1



RB(Starting):0 RB#18



RB(Starting):0 RB#100



--

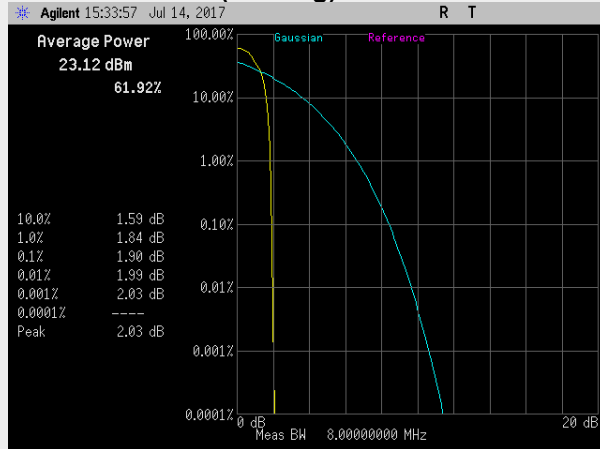
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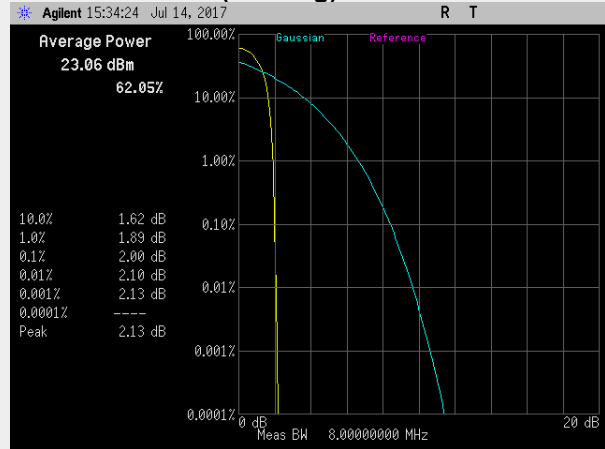
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Frequency: 1852.5 MHz Bandwidth: 5MHz Mode: 16 QAM

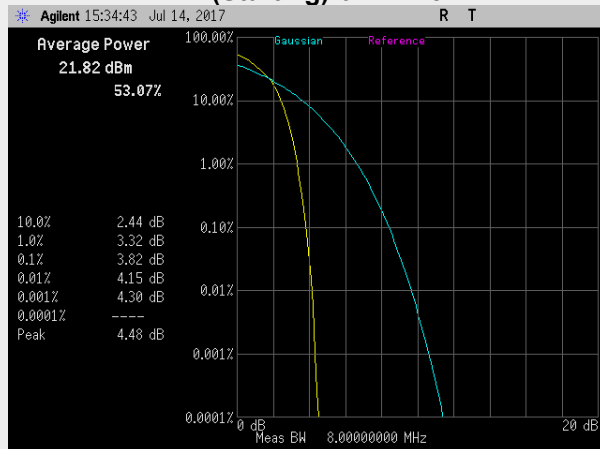
RB(Starting):0 RB#1



RB(Starting):0 RB#8



RB(Starting):0 RB#25



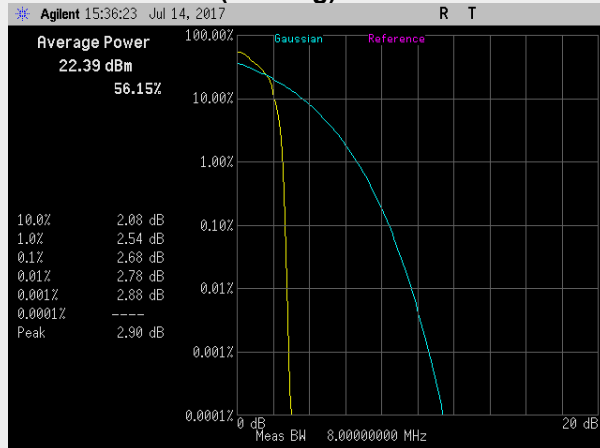
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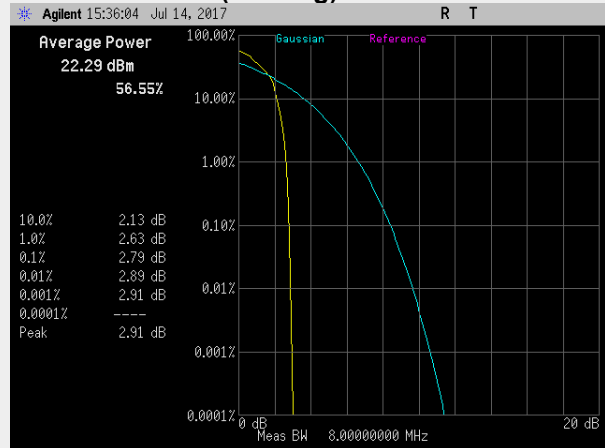
Title: Kumu Networks KU5B01LTE02-US
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Frequency: 1880.0 MHz Bandwidth: 5MHz Mode: 16 QAM

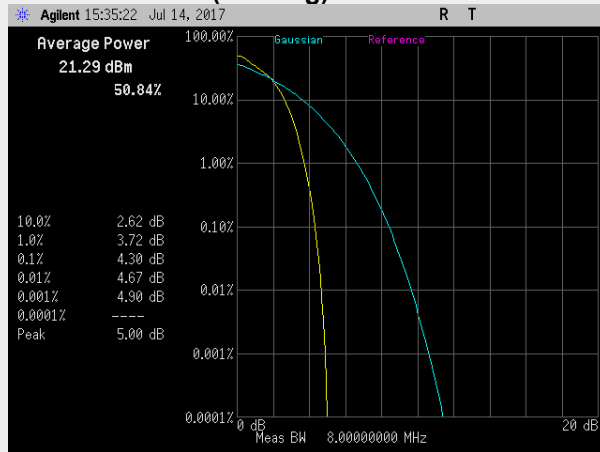
RB(Starting):0 RB#1



RB(Starting):0 RB#8



RB(Starting):0 RB#25



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Frequency: 1907.5 MHz Bandwidth: 5MHz Mode: 16 QAM

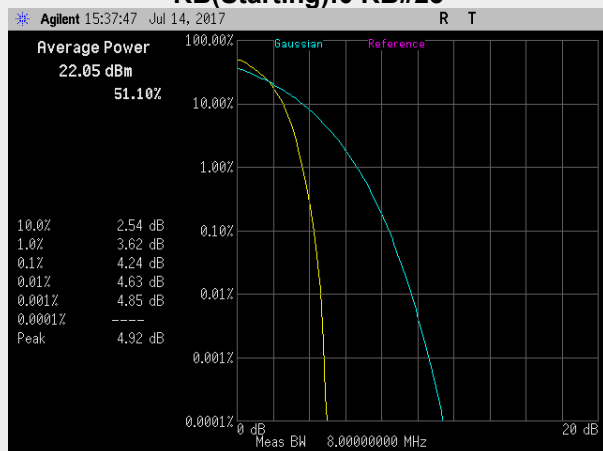
RB(Starting):0 RB#1



RB(Starting):0 RB#8



RB(Starting):0 RB#25



--



Frequency: 1855.0 MHz Bandwidth: 10MHz Mode: 16 QAM

RB(Starting):0 RB#1



RB(Starting):0 RB#12



RB(Starting):0 RB#50



--

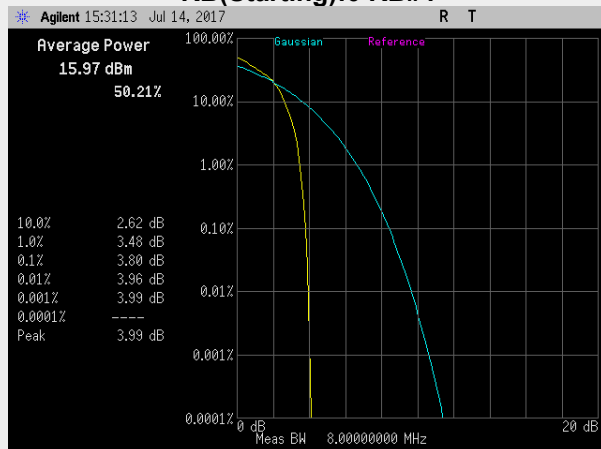
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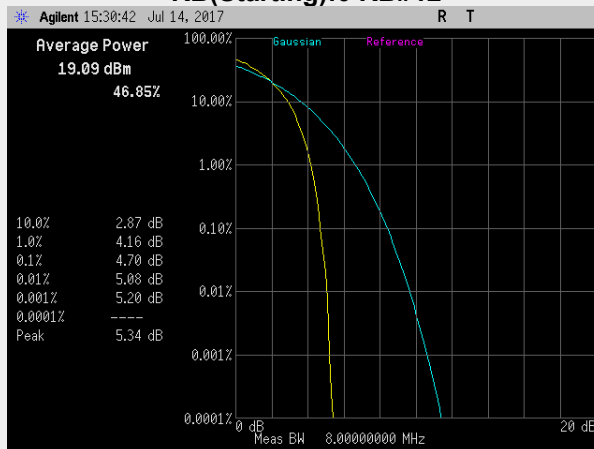
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Frequency: 1880.0 MHz Bandwidth: 10MHz Mode: 16 QAM

RB(Starting):0 RB#1



RB(Starting):0 RB#12



RB(Starting):0 RB#50



--

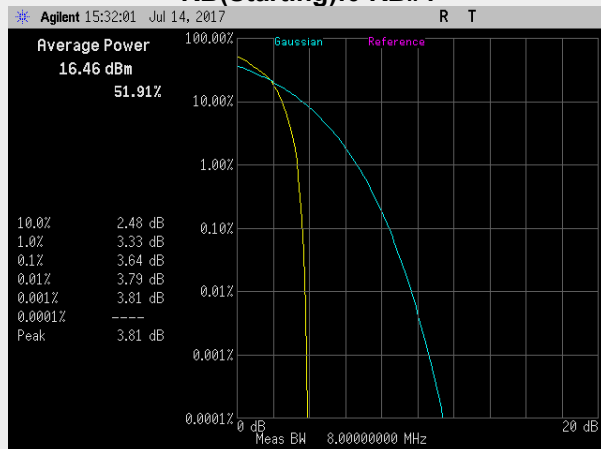
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Frequency: 1905.0 MHz Bandwidth: 10MHz Mode: 16 QAM

RB(Starting):0 RB#1



RB(Starting):0 RB#12



RB(Starting):0 RB#50



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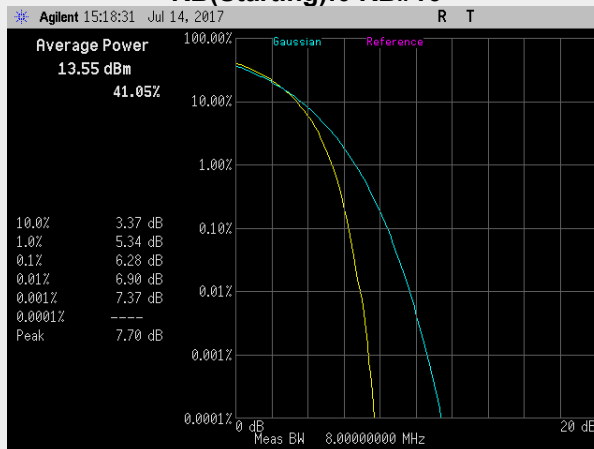


Frequency: 1857.5 MHz Bandwidth: 15MHz Mode: 16 QAM

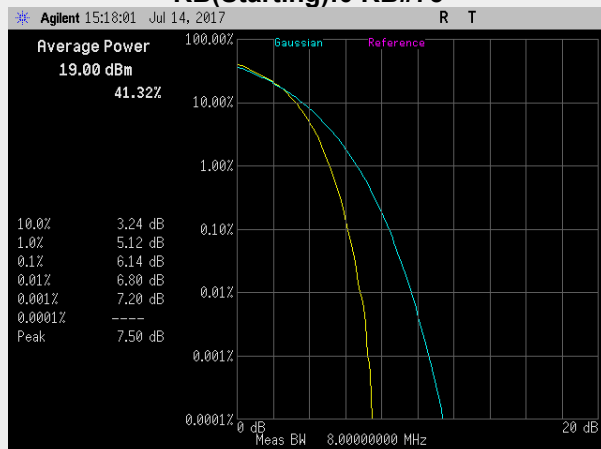
RB(Starting):0 RB#1



RB(Starting):0 RB#16



RB(Starting):0 RB#75

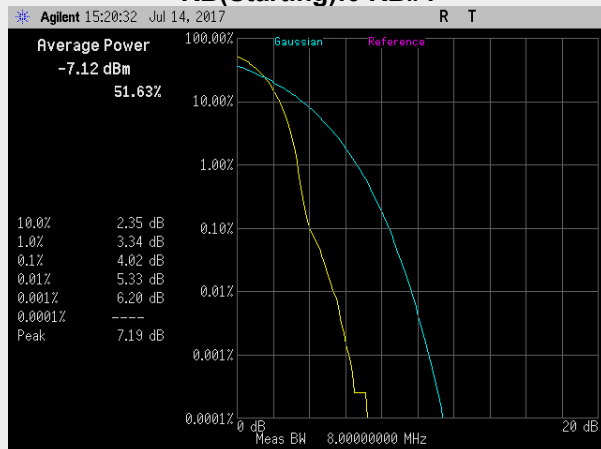


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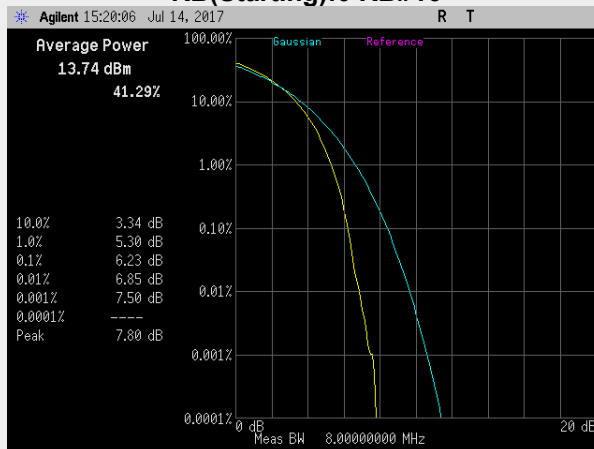


Frequency: 1880.0 MHz Bandwidth: 15MHz Mode: 16 QAM

RB(Starting):0 RB#1



RB(Starting):0 RB#16



RB(Starting):0 RB#75



--



Frequency: 1902.5 MHz Bandwidth: 15MHz Mode: 16 QAM

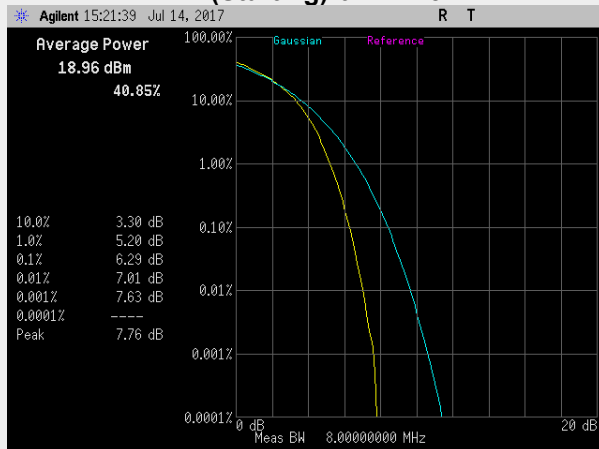
RB(Starting):0 RB#1



RB(Starting):0 RB#16



RB(Starting):0 RB#75



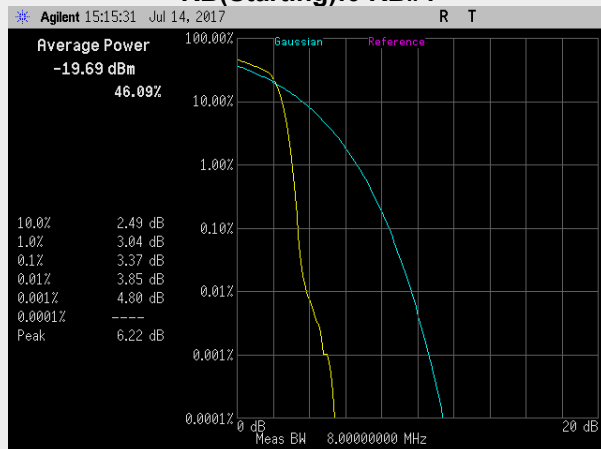
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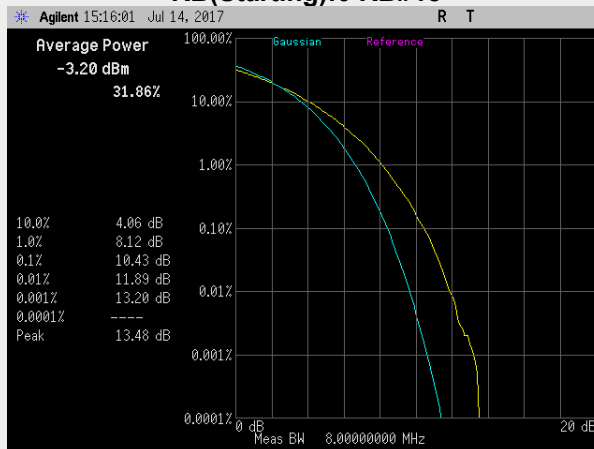


Frequency: 1860.0 MHz Bandwidth: 20MHz Mode: 16 QAM

RB(Starting):0 RB#1



RB(Starting):0 RB#18



RB(Starting):0 RB#100

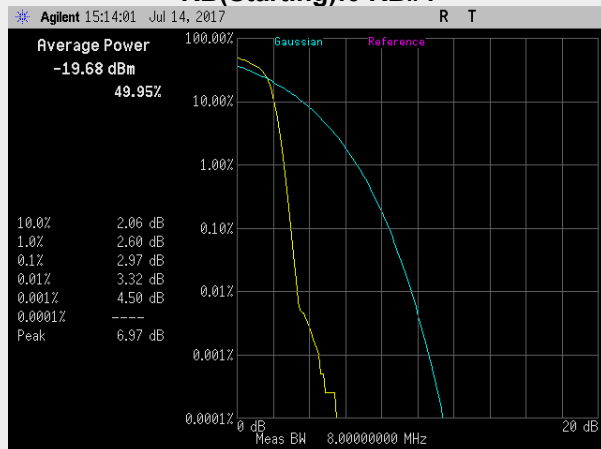


--

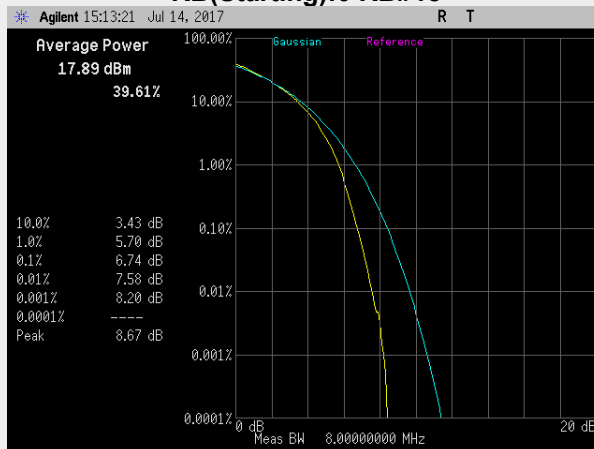


Frequency: 1880.0 MHz Bandwidth: 20MHz Mode: 16 QAM

RB(Starting):0 RB#1



RB(Starting):0 RB#18



RB(Starting):0 RB#100

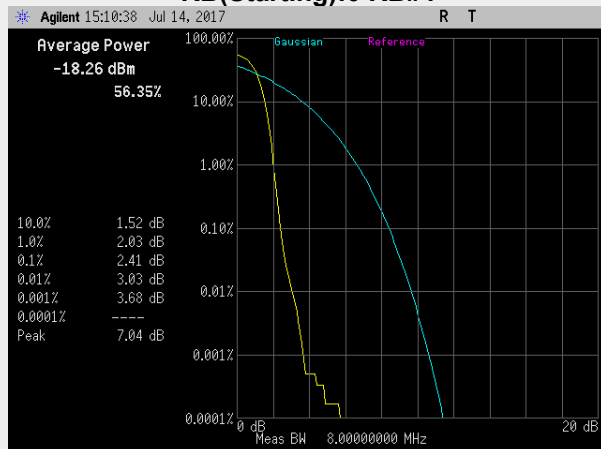


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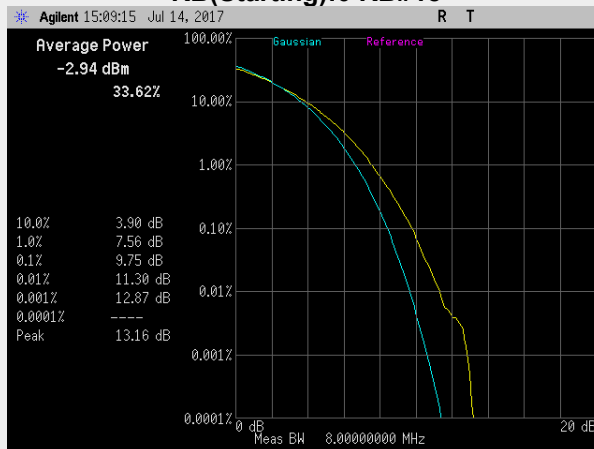


Frequency: 1900.0 MHz Bandwidth: 20MHz Mode: 16 QAM

RB(Starting):0 RB#1



RB(Starting):0 RB#18

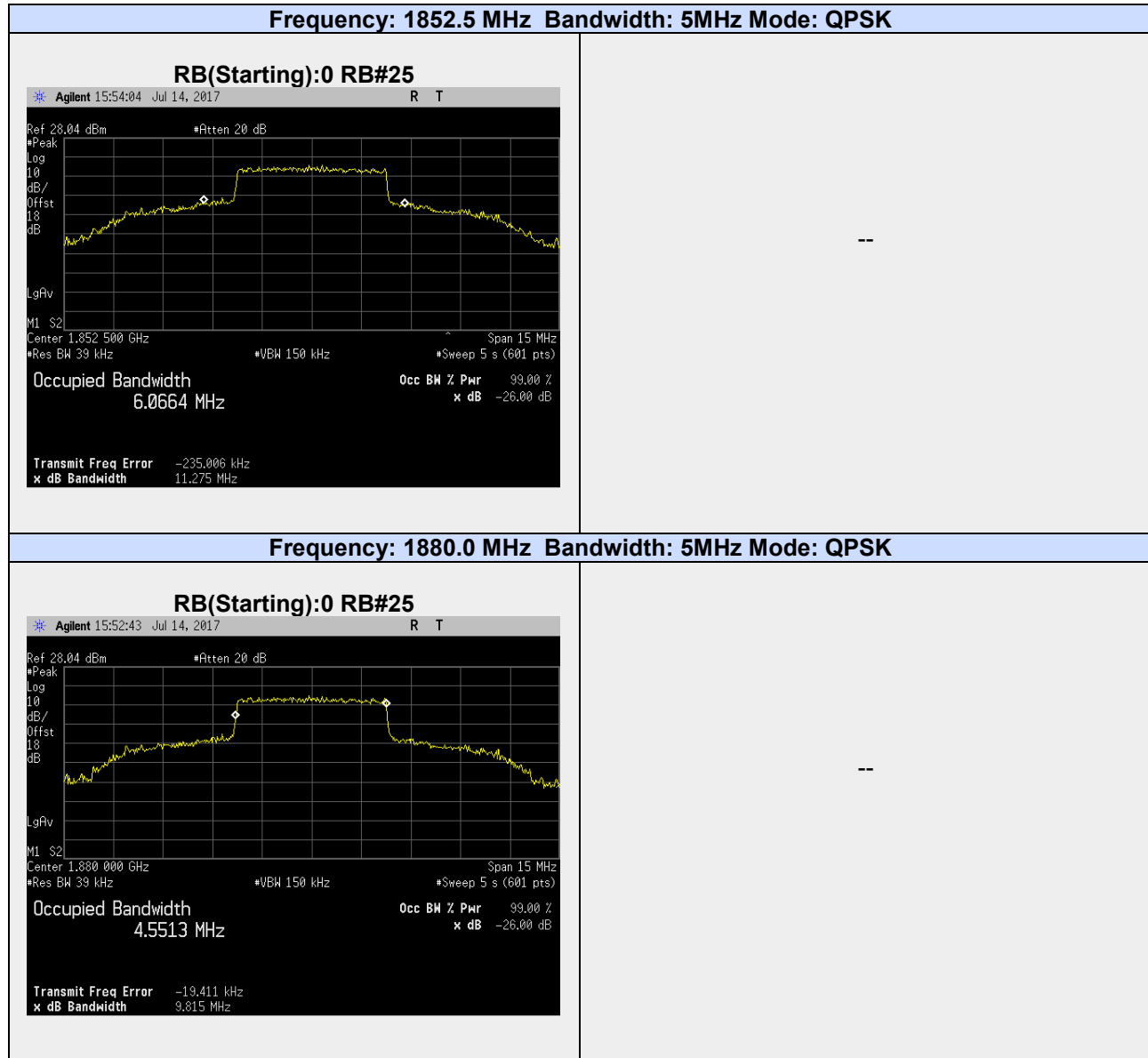


RB(Starting):0 RB#100



--

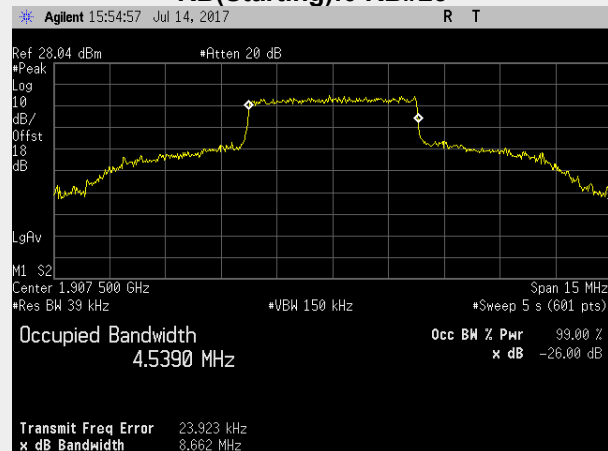
A.1.2. Emissions Bandwidth



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Frequency: 1907.5.0 MHz Bandwidth: 5MHz Mode: QPSK

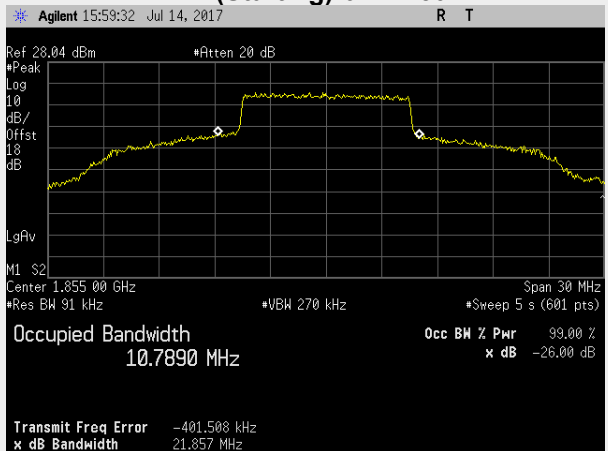
RB(Starting):0 RB#25



--

Frequency: 1855.0 MHz Bandwidth: 10MHz Mode: QPSK

RB(Starting):0 RB#50

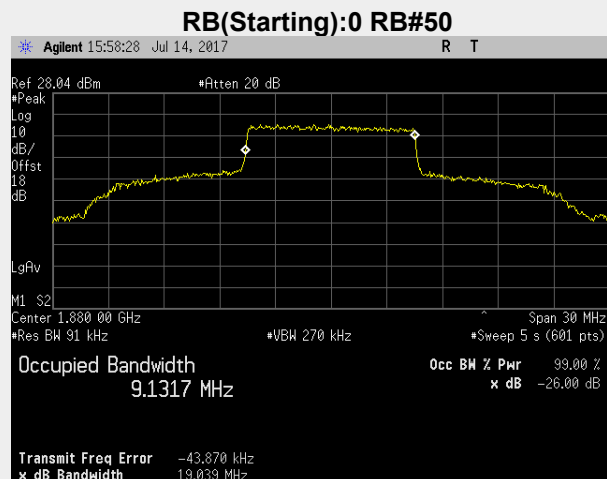


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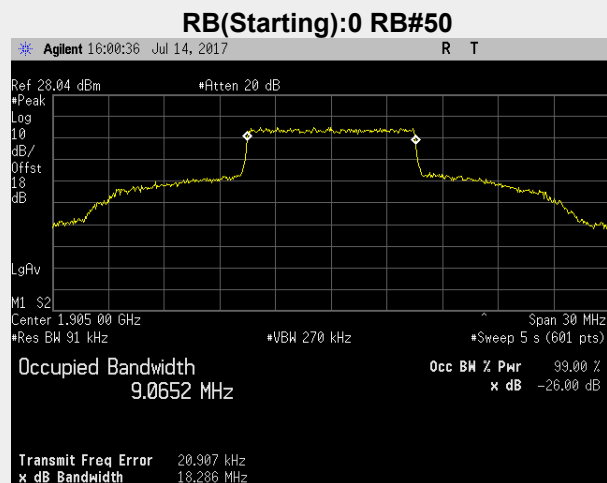
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Page: 88 of 128

Frequency: 1880.0 MHz Bandwidth: 10MHz Mode: QPSK



--

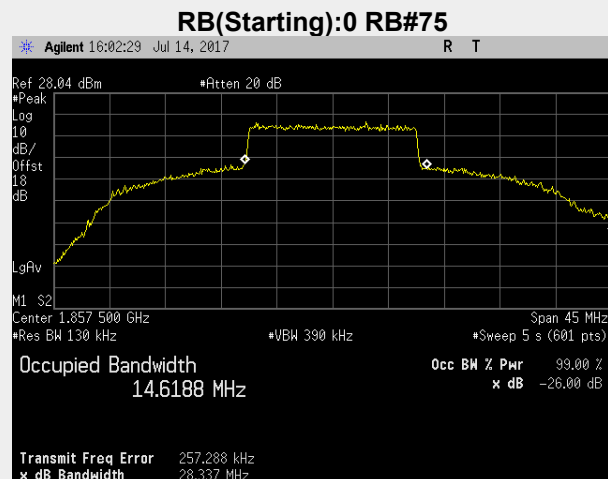
Frequency: 1905.0 MHz Bandwidth: 10MHz Mode: QPSK



--

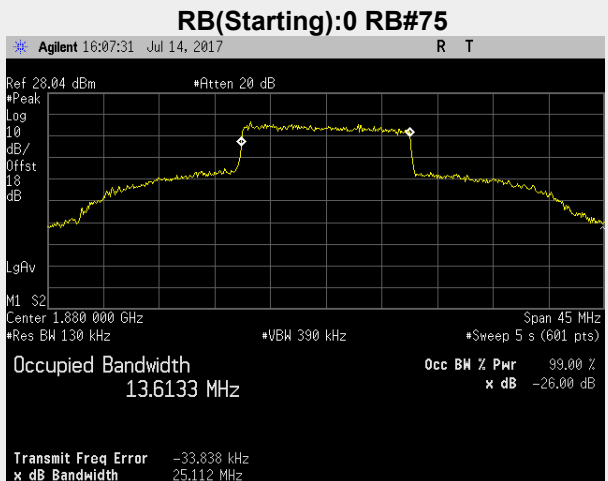
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. All changes will be noted in the Document History section of the report.

Frequency: 1857.5 MHz Bandwidth: 15MHz Mode: QPSK



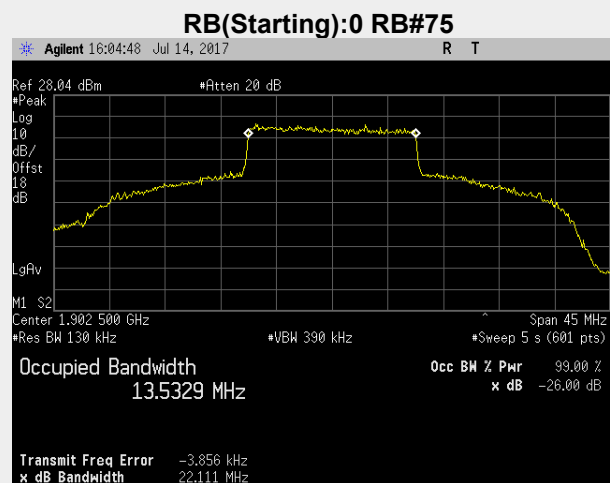
--

Frequency: 1880.0 MHz Bandwidth: 15MHz Mode: QPSK



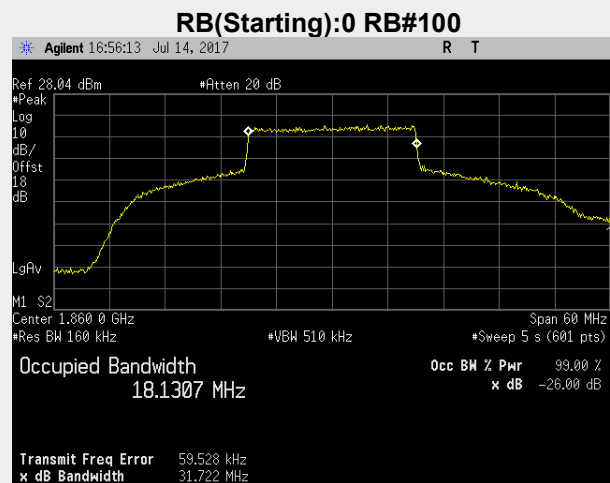
--

Frequency: 1902.5 MHz Bandwidth: 15MHz Mode: QPSK



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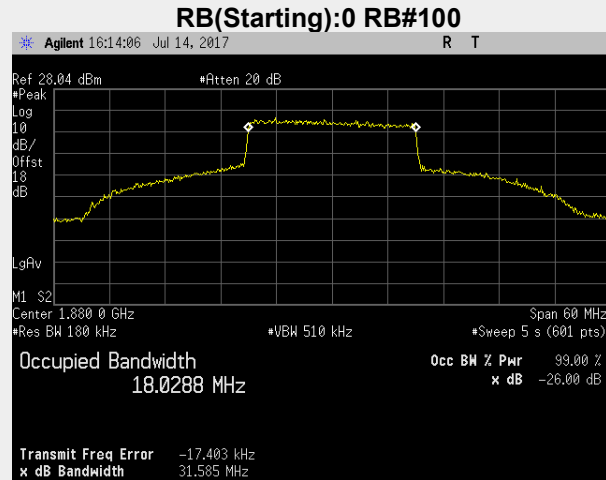
Frequency: 1860.0 MHz Bandwidth: 20MHz Mode: QPSK



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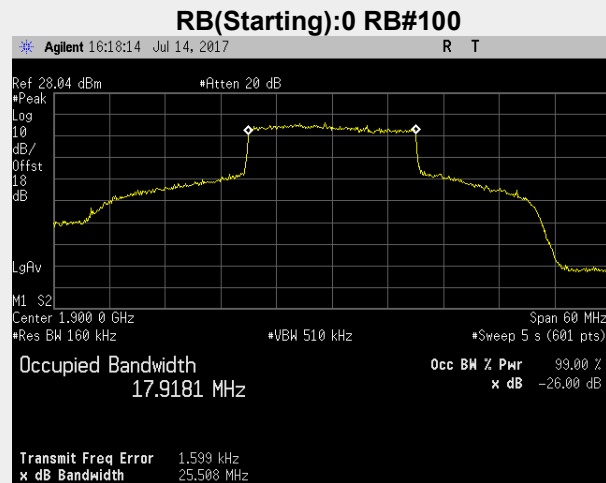


Frequency: 1880.0 MHz Bandwidth: 20MHz Mode: QPSK



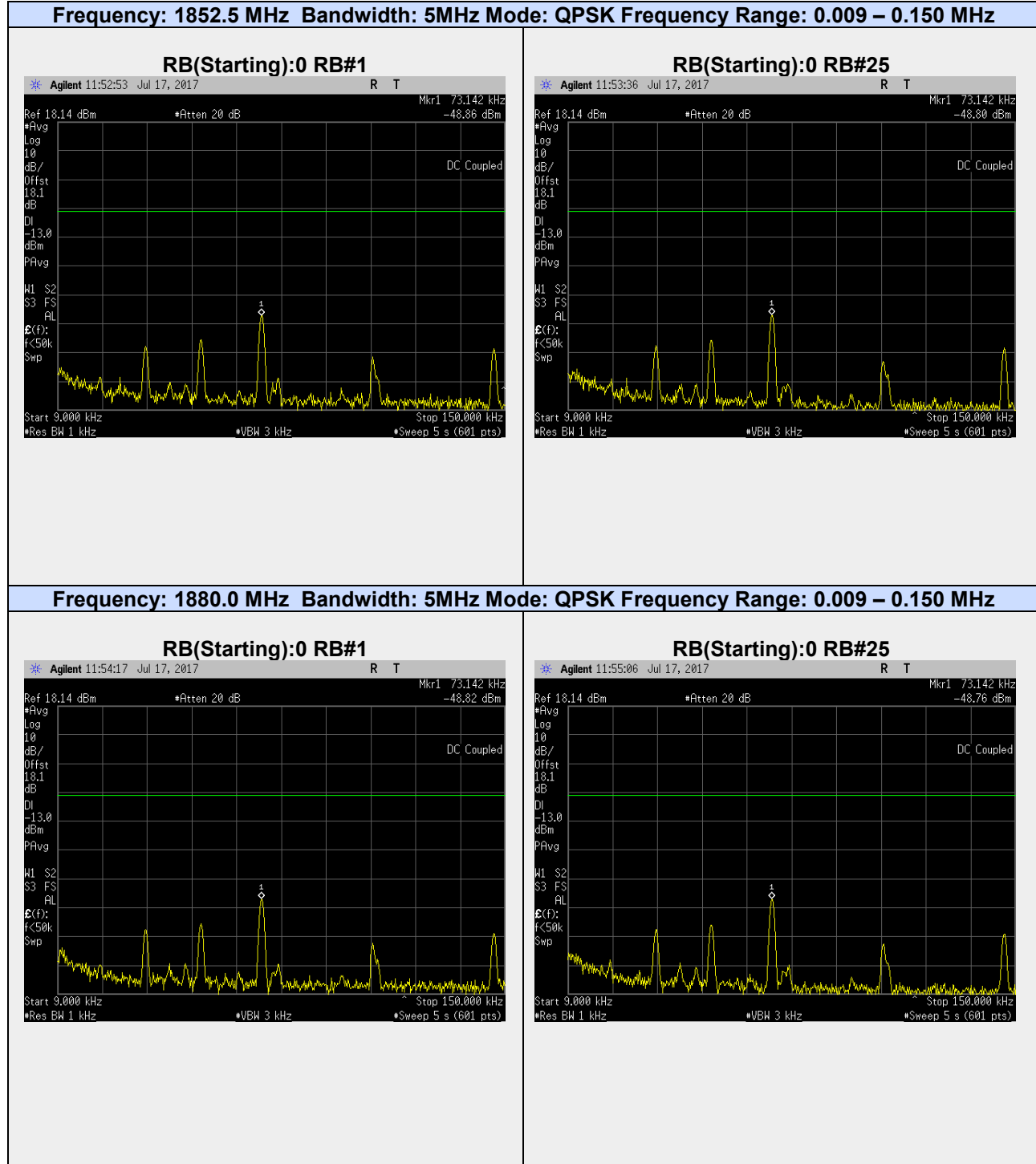
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Frequency: 1900.0 MHz Bandwidth: 20MHz Mode: QPSK



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A.1.3. Out of Band Emissions

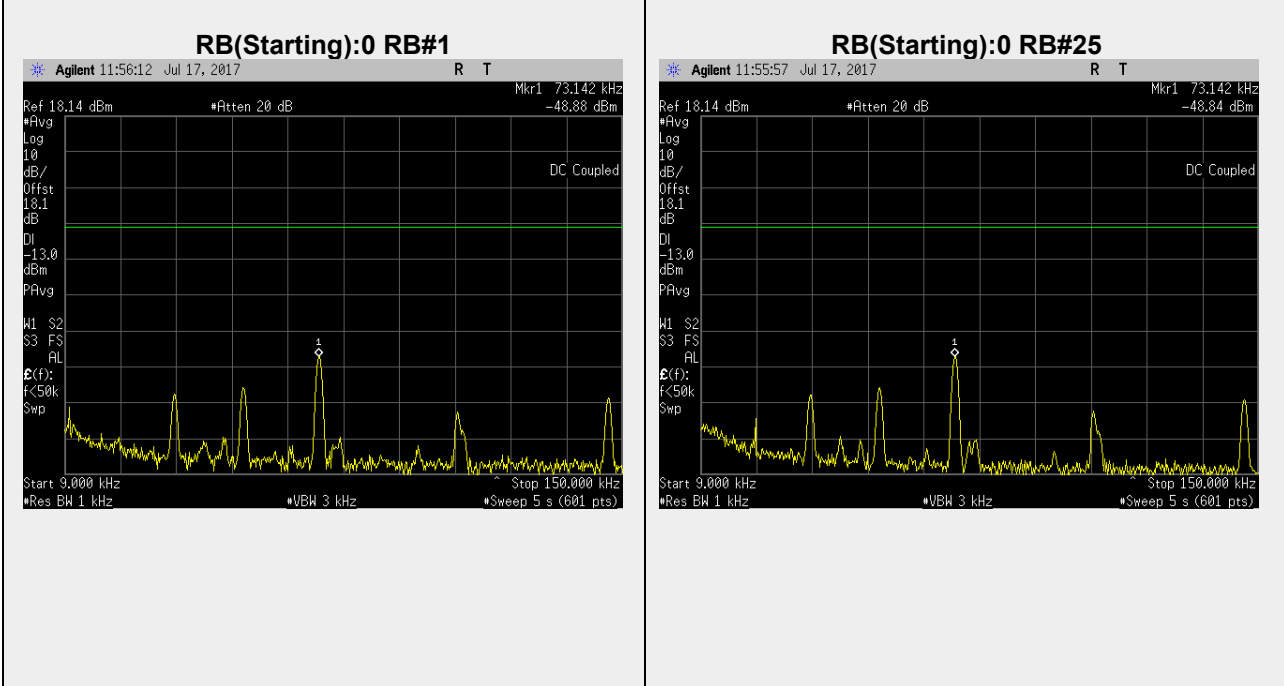


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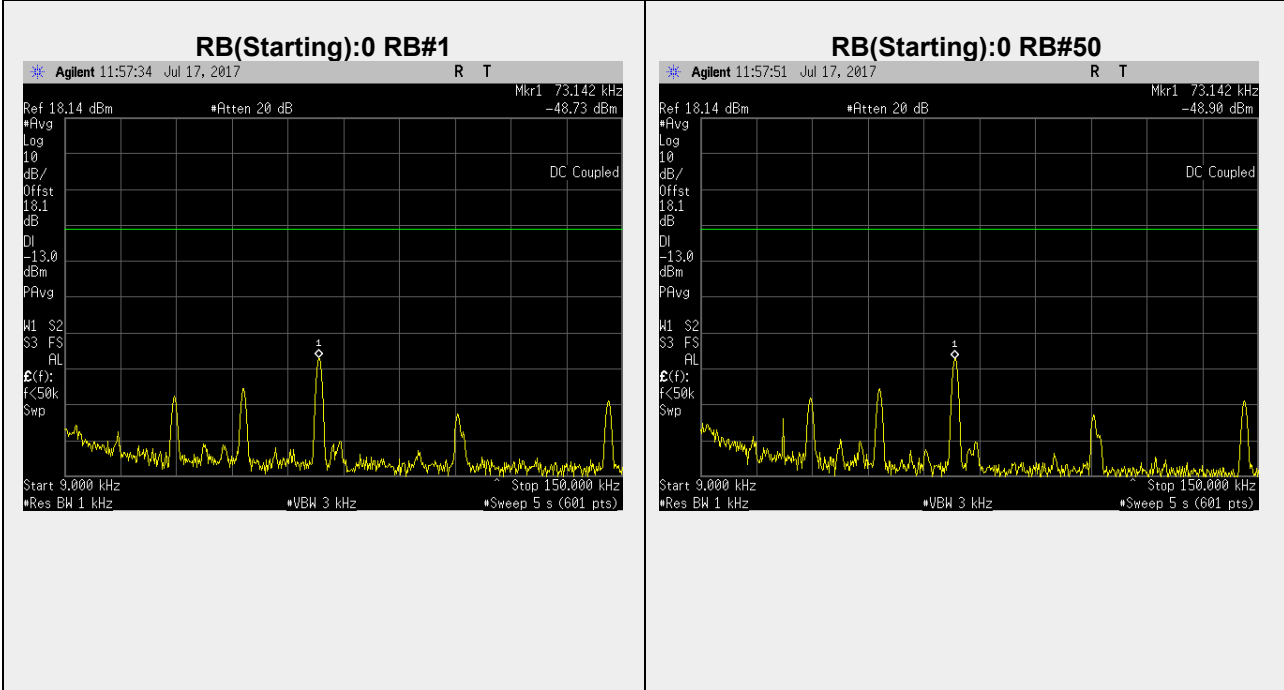


Title: Kumu Networks KU5B01LTE02-US
To: FCC Part 24E & IC RSS-133 Issue 6
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Frequency: 1907.5 MHz Bandwidth: 5MHz Mode: QPSK Frequency Range: 0.009 – 0.150 MHz



Frequency: 1855.0 MHz Bandwidth: 10MHz Mode: QPSK Frequency Range: 0.009 – 0.150 MHz

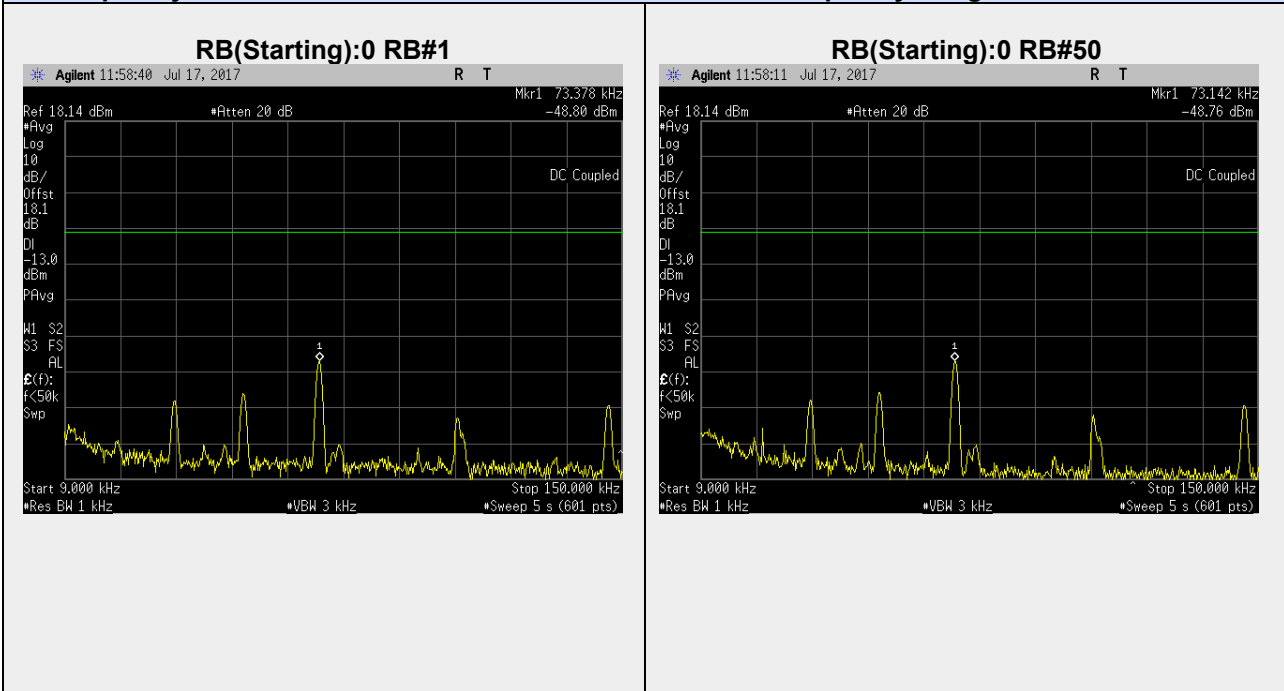


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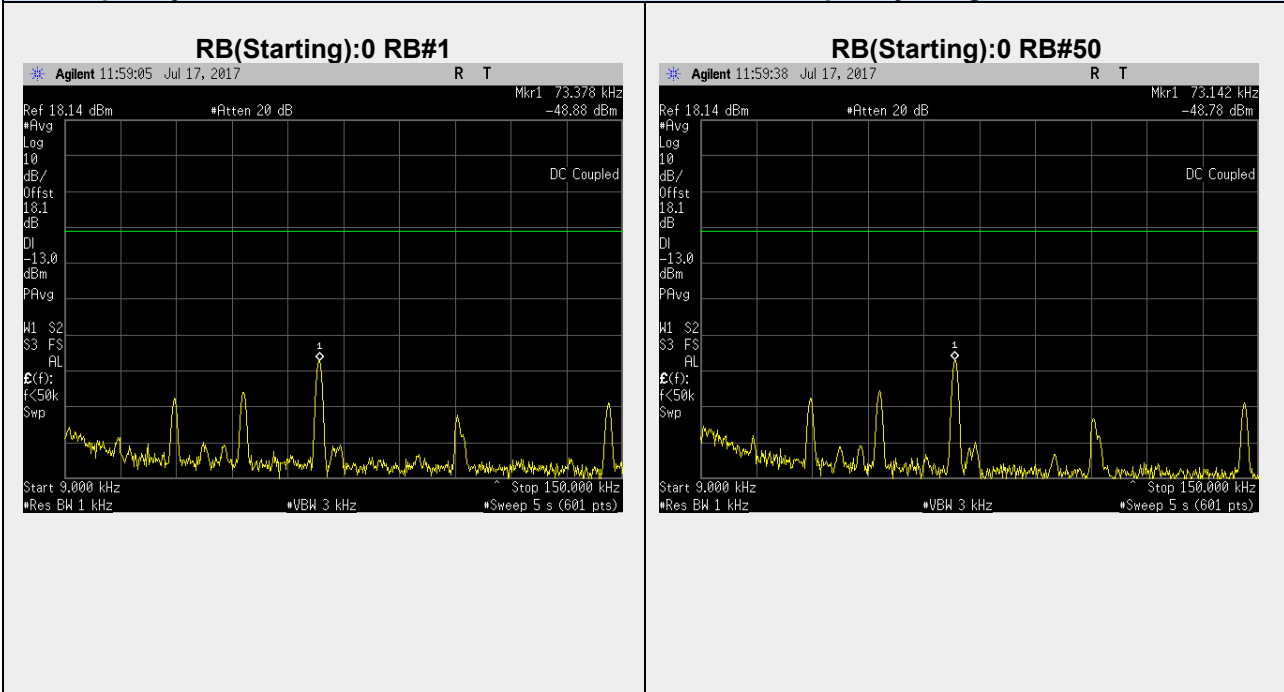


Title: Kumu Networks KU5B01LTE02-US
To: FCC Part 24E & IC RSS-133 Issue 6
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Frequency: 1800.0 MHz Bandwidth: 10MHz Mode: QPSK Frequency Range: 0.009 – 0.150 MHz



Frequency: 1905.0 MHz Bandwidth: 10MHz Mode: QPSK Frequency Range: 0.009 – 0.150 MHz

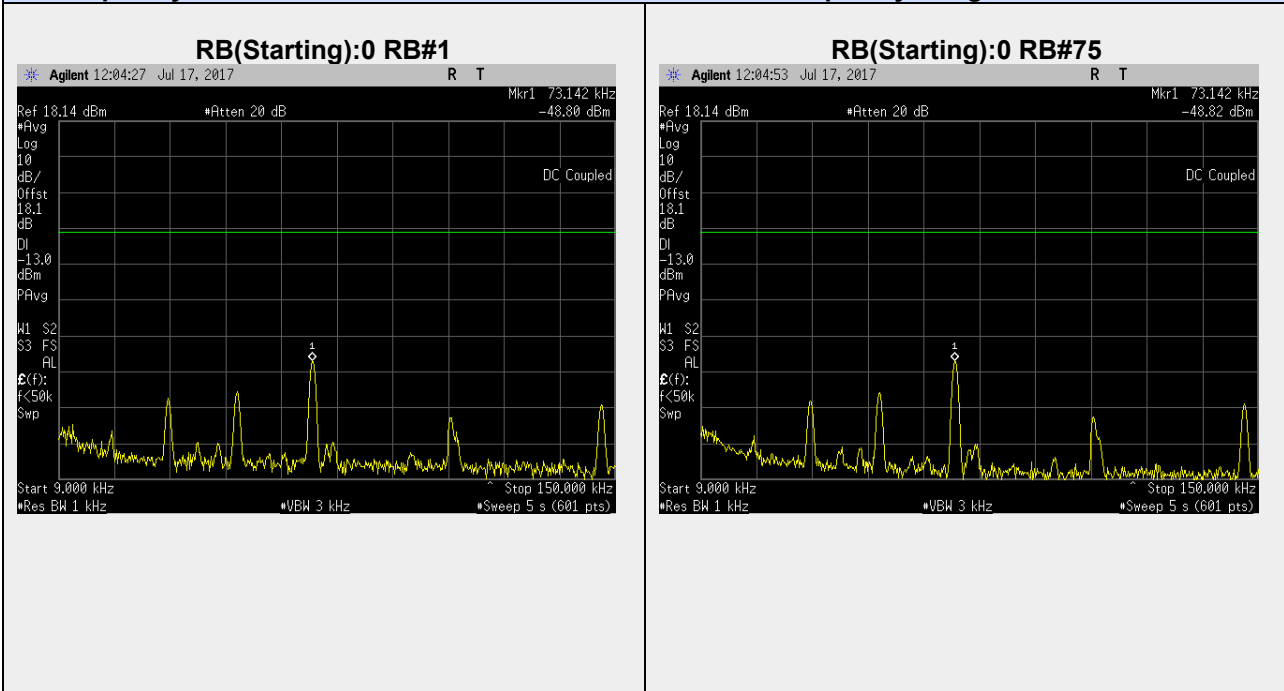


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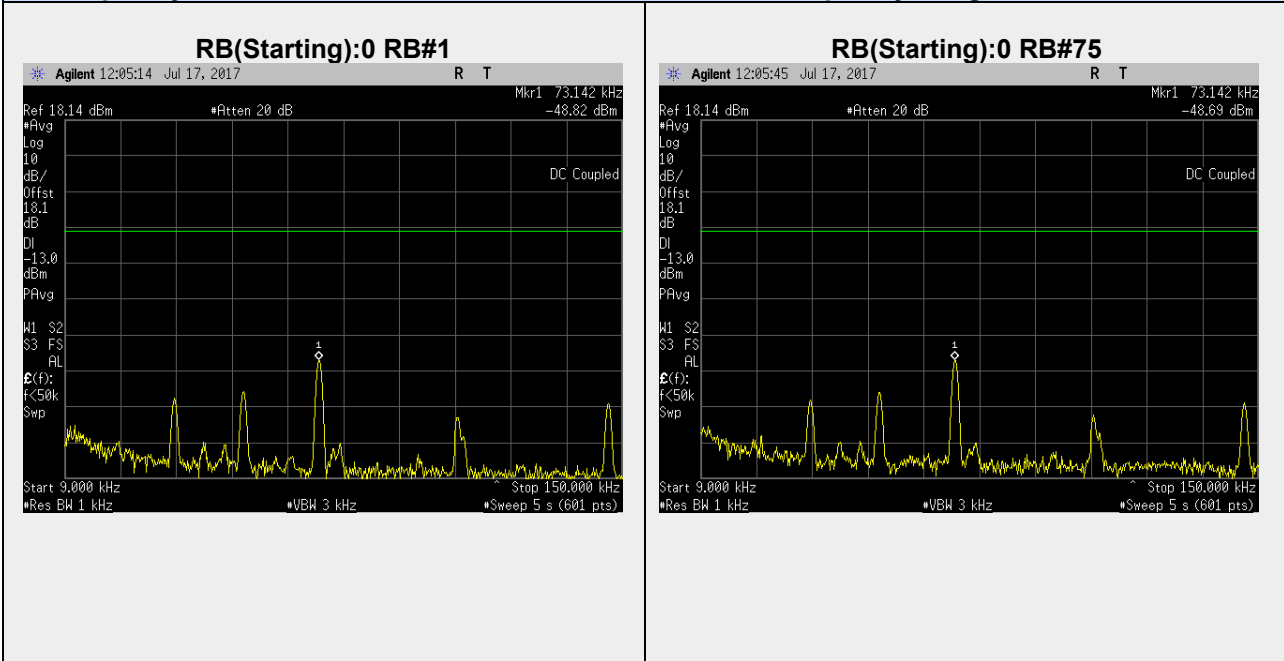


Title: Kumu Networks KU5B01LTE02-US
To: FCC Part 24E & IC RSS-133 Issue 6
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Frequency: 1857.5 MHz Bandwidth: 15MHz Mode: QPSK Frequency Range: 0.009 – 0.150 MHz

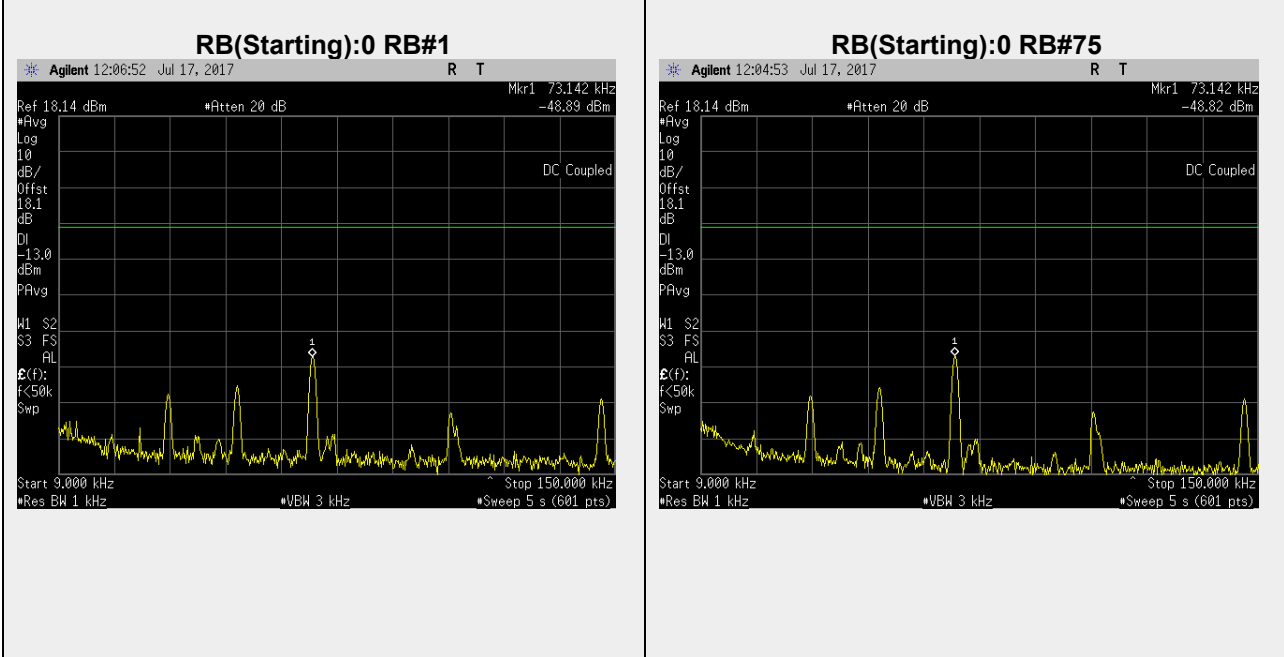


Frequency: 1880.0 MHz Bandwidth: 15MHz Mode: QPSK Frequency Range: 0.009 – 0.150 MHz

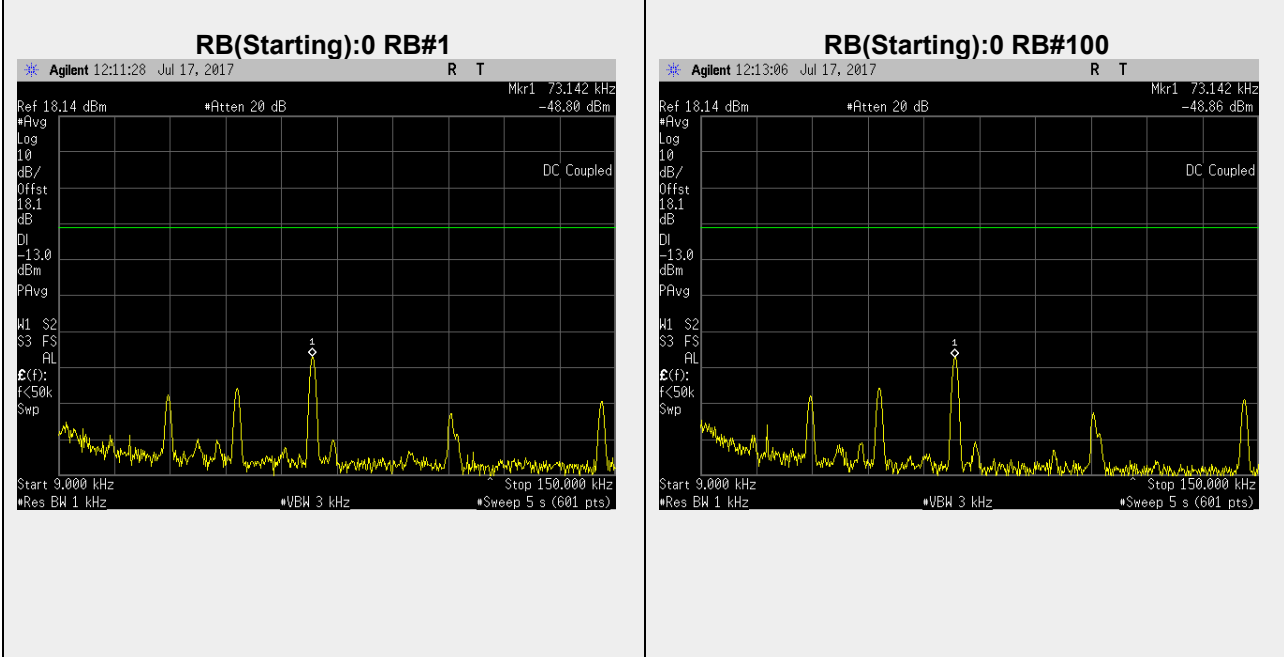


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Frequency: 1905.5 MHz Bandwidth: 15MHz Mode: QPSK Frequency Range: 0.009 – 0.150 MHz



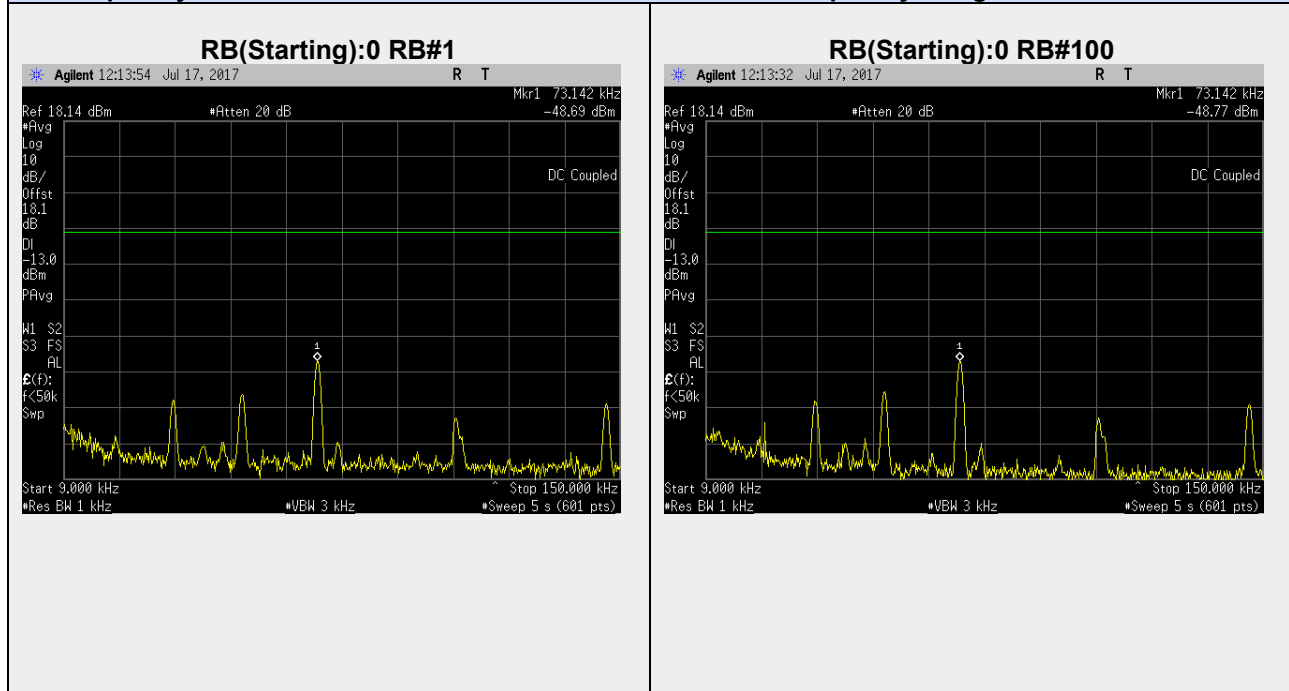
Frequency: 1860.0 MHz Bandwidth: 20MHz Mode: QPSK Frequency Range: 0.009 – 0.150 MHz



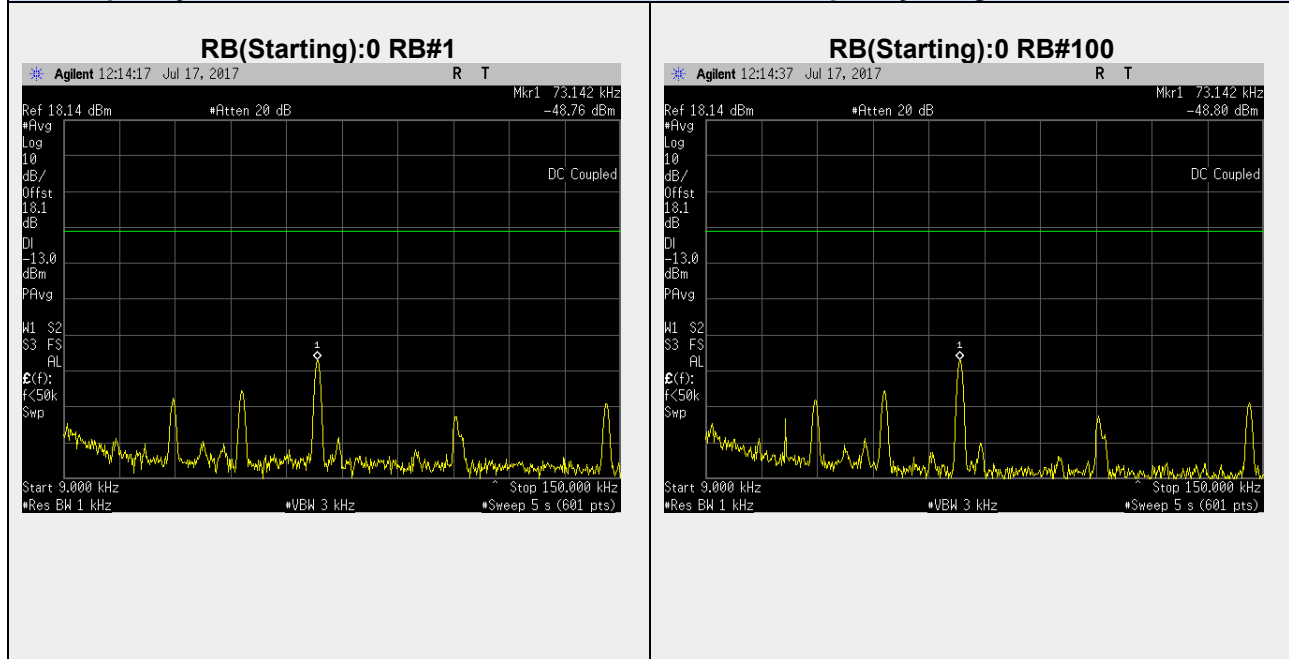
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Frequency: 1880.0 MHz Bandwidth: 20MHz Mode: QPSK Frequency Range: 0.009 – 0.150 MHz



Frequency: 1900.0 MHz Bandwidth: 20MHz Mode: QPSK Frequency Range: 0.009 – 0.150 MHz

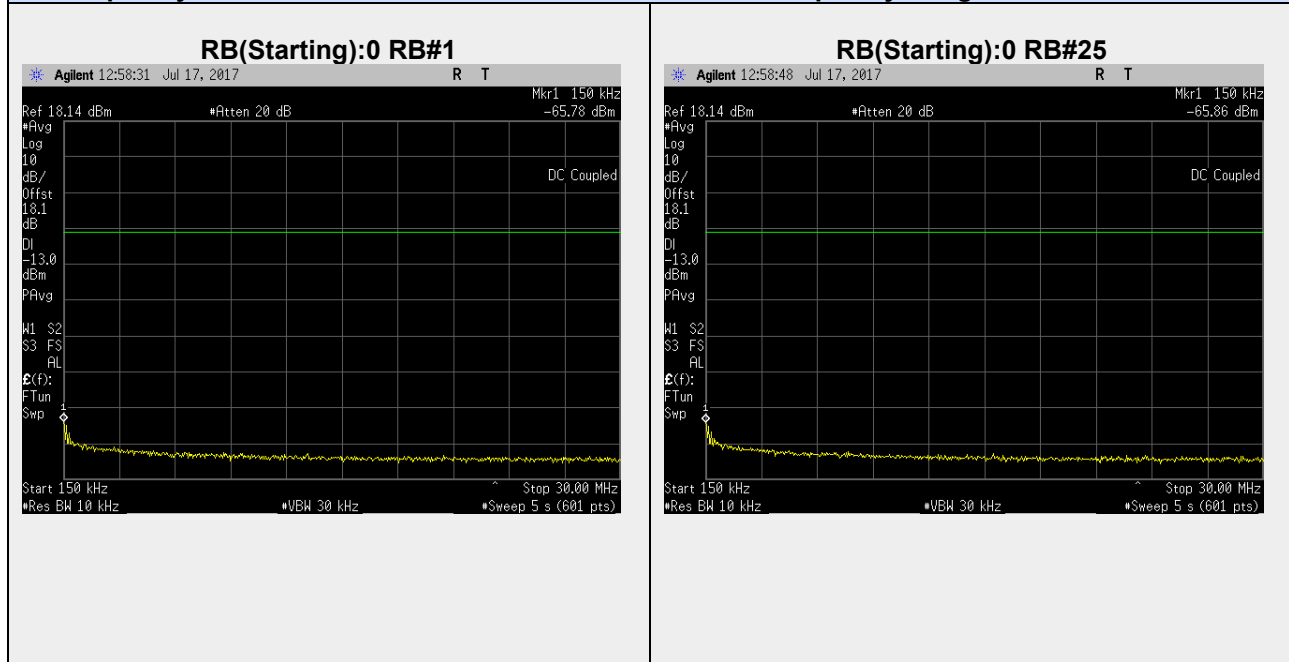


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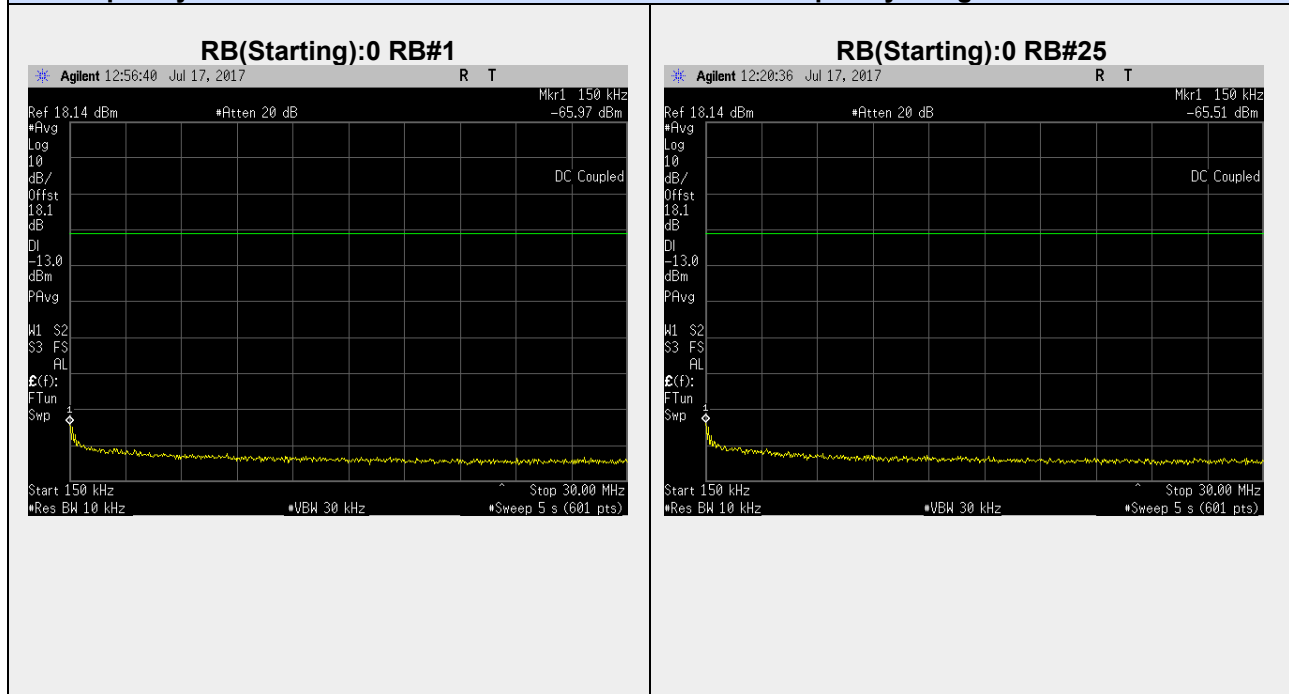


Title: Kumu Networks KU5B01LTE02-US
To: FCC Part 24E & IC RSS-133 Issue 6
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Frequency: 1852.5 MHz Bandwidth: 5MHz Mode: QPSK Frequency Range: 0.150 – 30.000 MHz



Frequency: 1880.0 MHz Bandwidth: 5MHz Mode: QPSK Frequency Range: 0.150 – 30.000 MHz

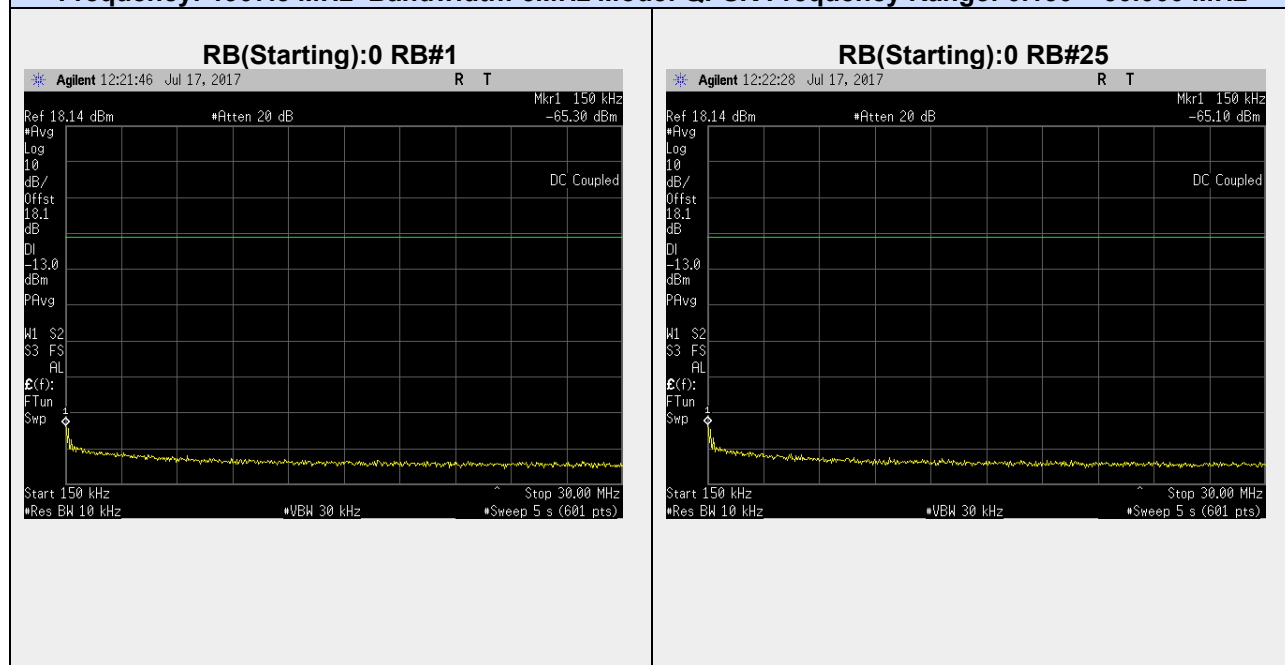


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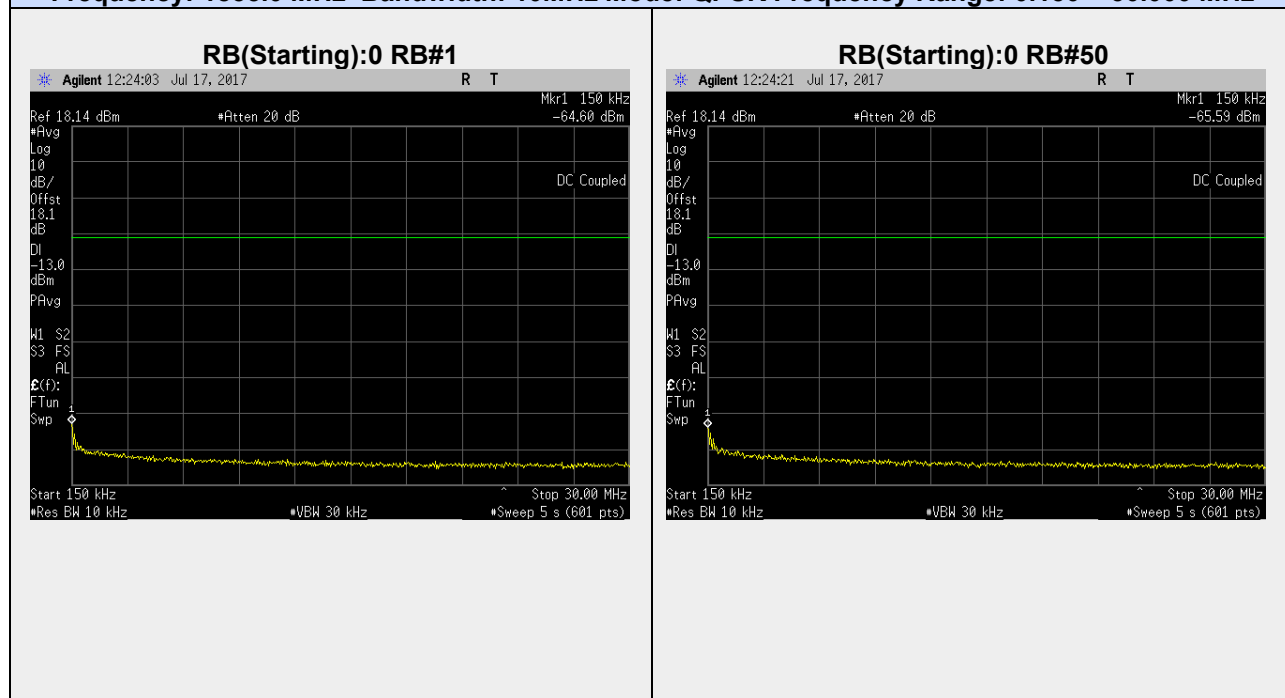


Title: Kumu Networks KU5B01LTE02-US
To: FCC Part 24E & IC RSS-133 Issue 6
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Frequency: 1907.5 MHz Bandwidth: 5MHz Mode: QPSK Frequency Range: 0.150 – 30.000 MHz



Frequency: 1855.0 MHz Bandwidth: 10MHz Mode: QPSK Frequency Range: 0.150 – 30.000 MHz

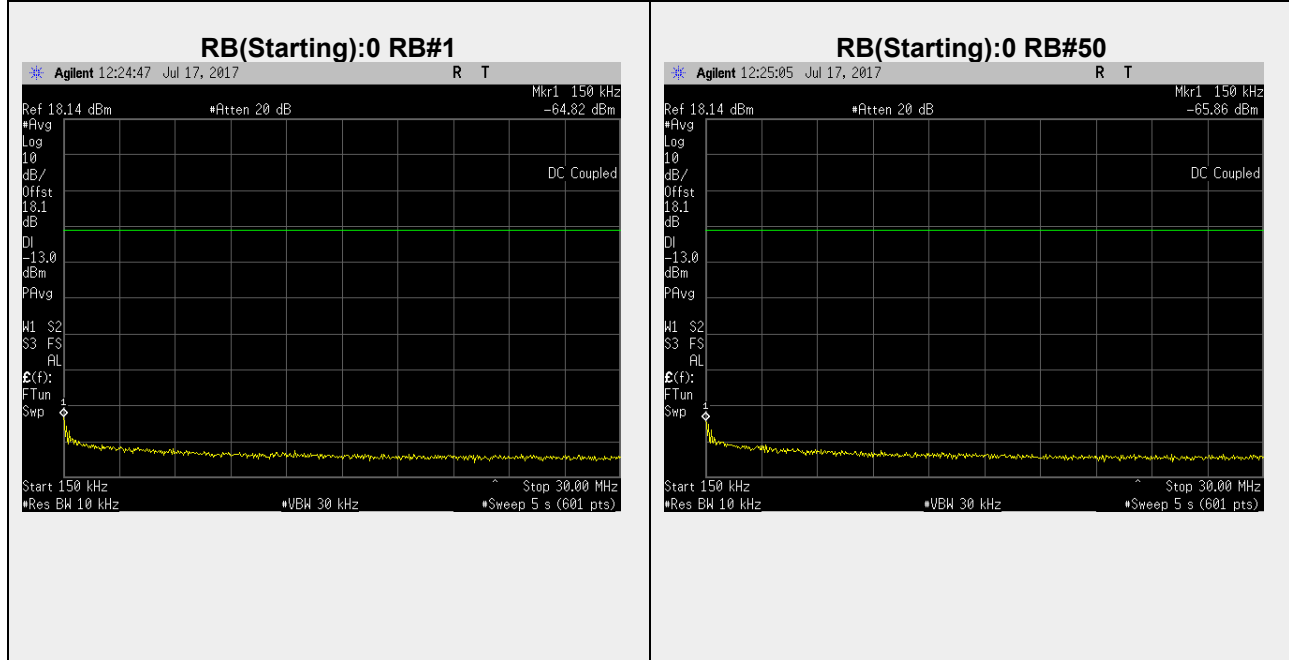


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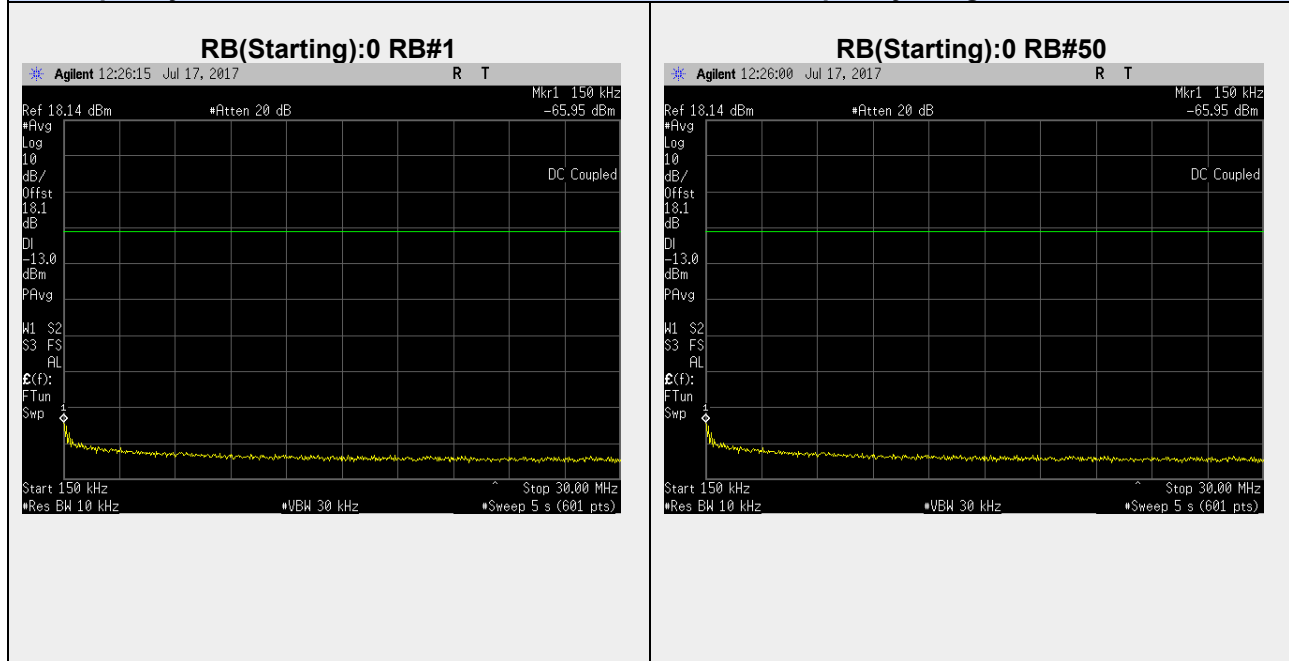


Title: Kumu Networks KU5B01LTE02-US
To: FCC Part 24E & IC RSS-133 Issue 6
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Frequency: 1880.0 MHz Bandwidth: 10MHz Mode: QPSK Frequency Range: 0.150 – 30.000 MHz



Frequency: 1905.0 MHz Bandwidth: 10MHz Mode: QPSK Frequency Range: 0.150 – 30.000 MHz

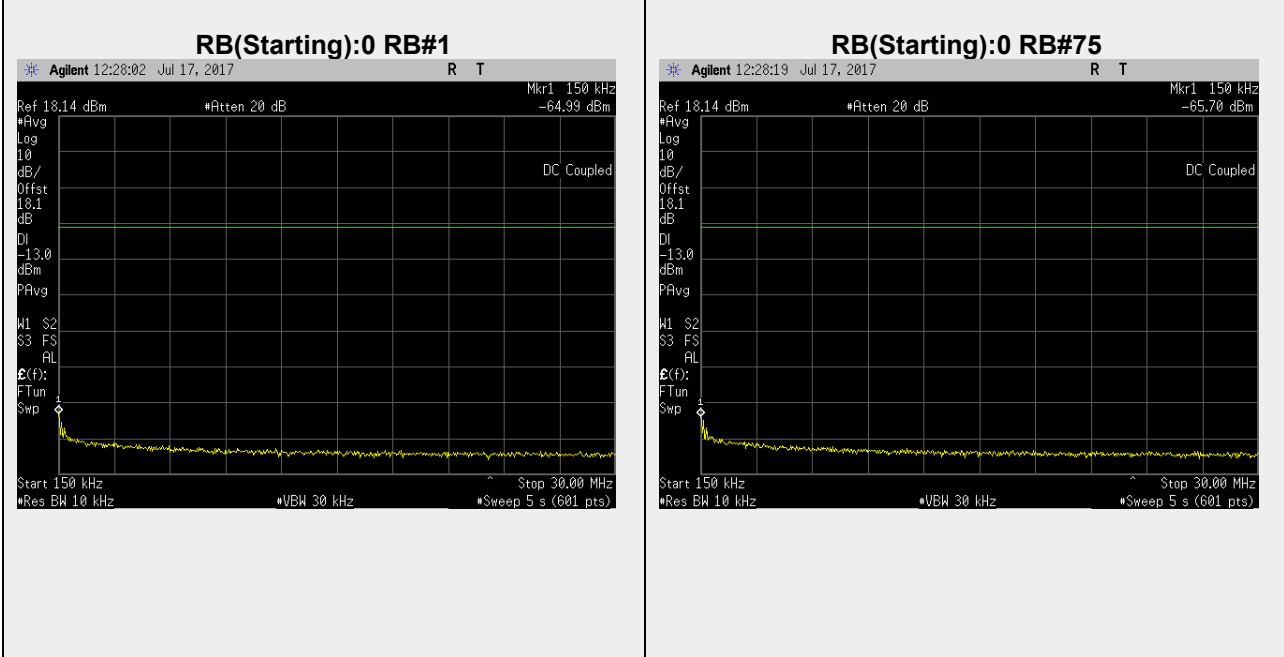


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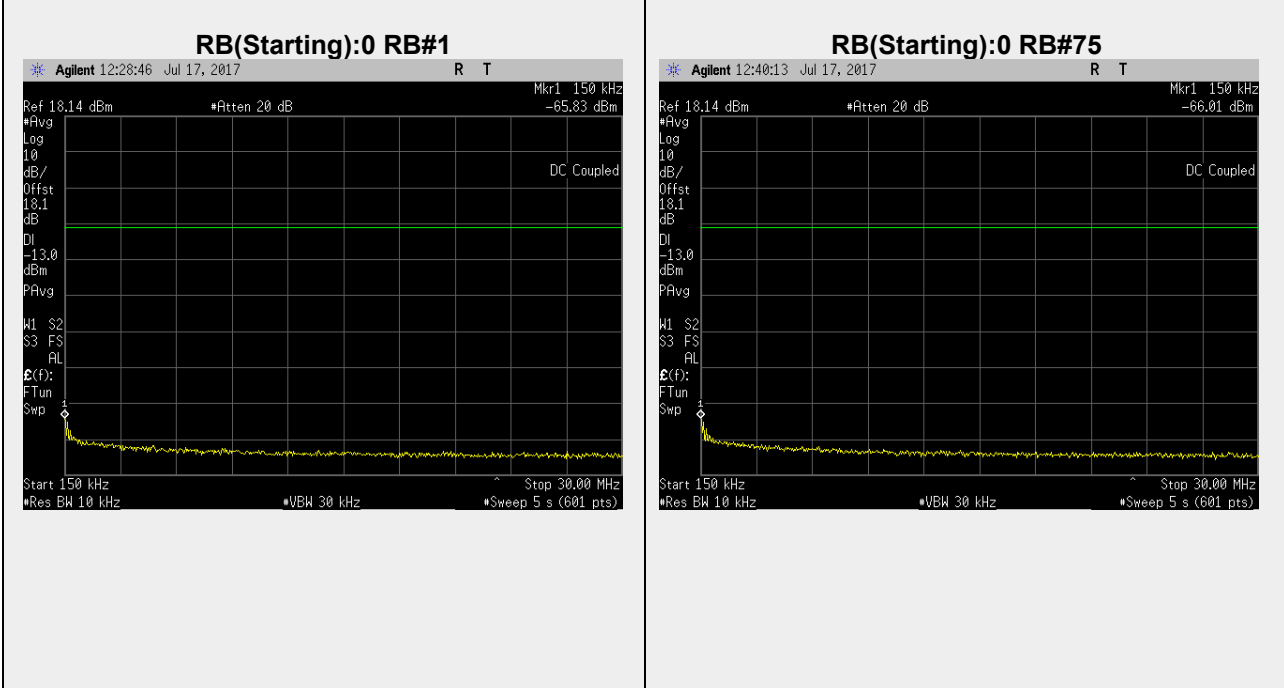


Title: Kumu Networks KU5B01LTE02-US
To: FCC Part 24E & IC RSS-133 Issue 6
Serial #: KUMU03-U4 Rev A
Issue Date: 17th August 2017
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Frequency: 1857.5 MHz Bandwidth: 15MHz Mode: QPSK Frequency Range: 0.150 – 30.000 MHz



Frequency: 1880.0 MHz Bandwidth: 15MHz Mode: QPSK Frequency Range: 0.150 – 30.000 MHz

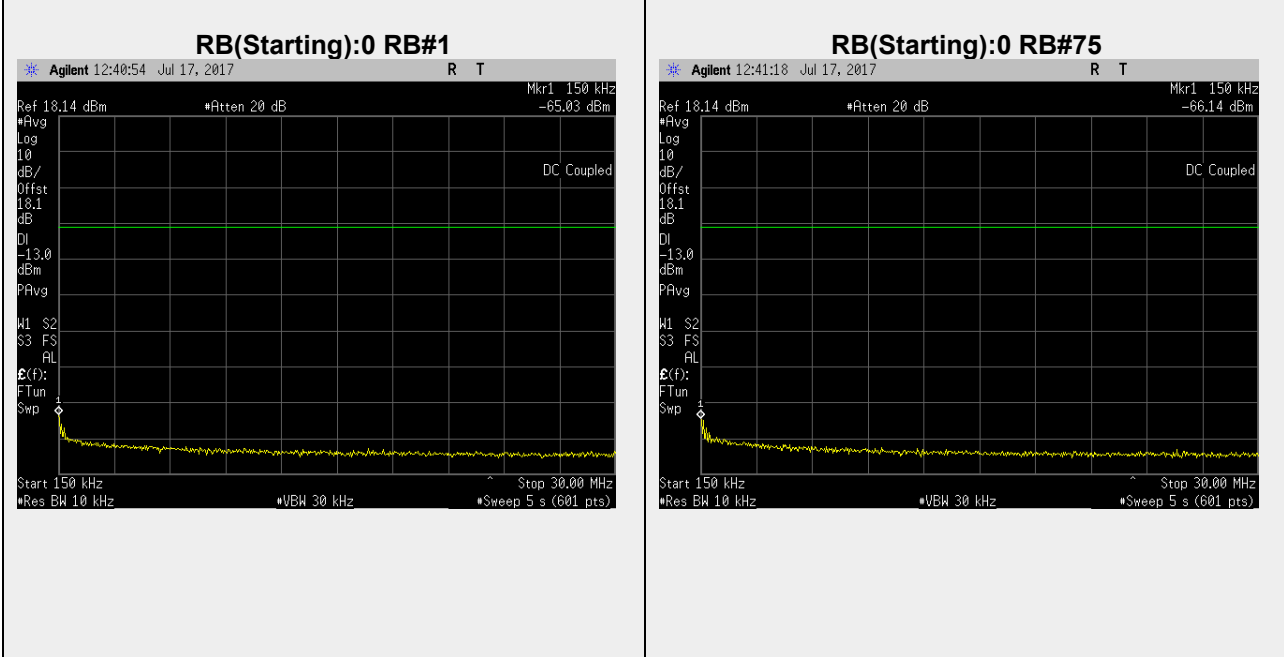


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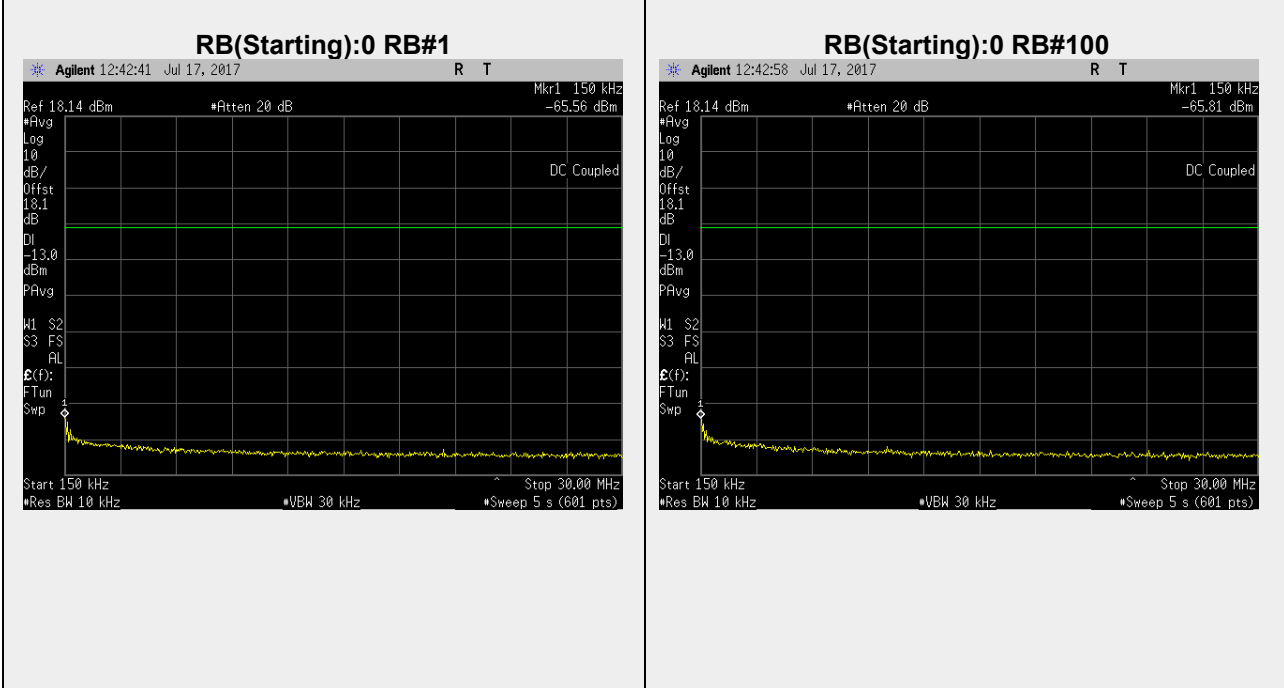


Title: Kumu Networks KU5B01LTE02-US
To: FCC Part 24E & IC RSS-133 Issue 6
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Frequency: 1902.5 MHz Bandwidth: 15MHz Mode: QPSK Frequency Range: 0.150 – 30.000 MHz



Frequency: 1860.0 MHz Bandwidth: 20MHz Mode: QPSK Frequency Range: 0.150 – 30.000 MHz

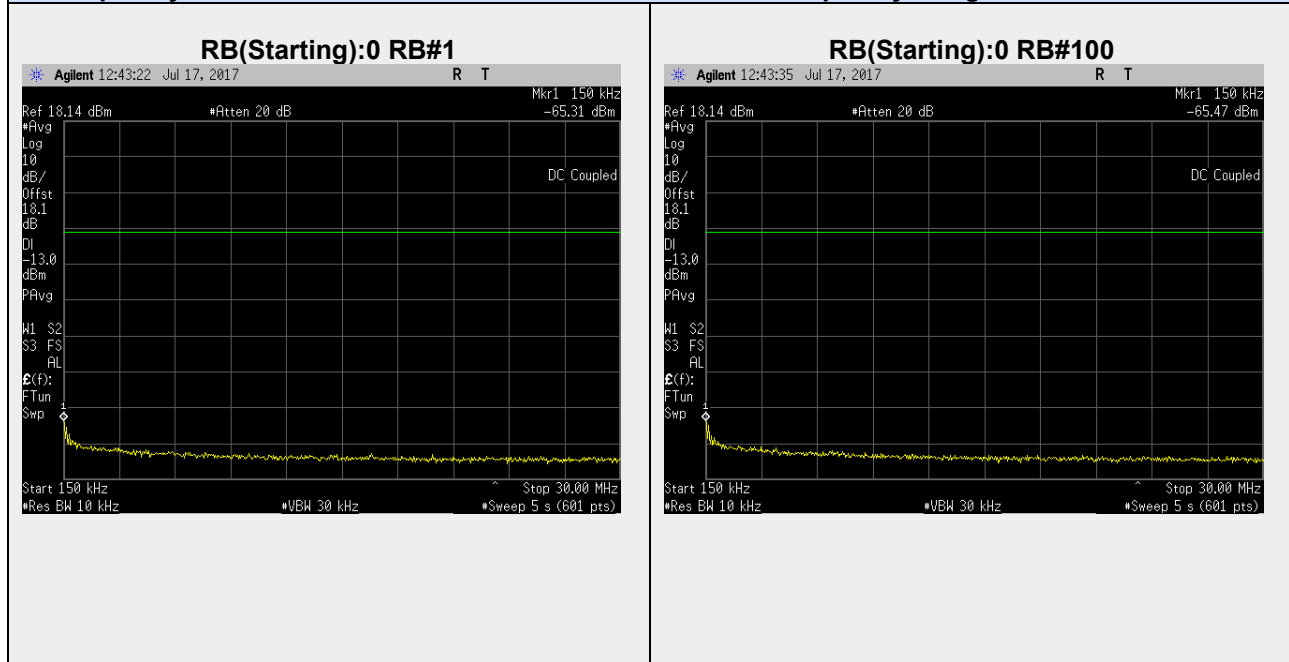


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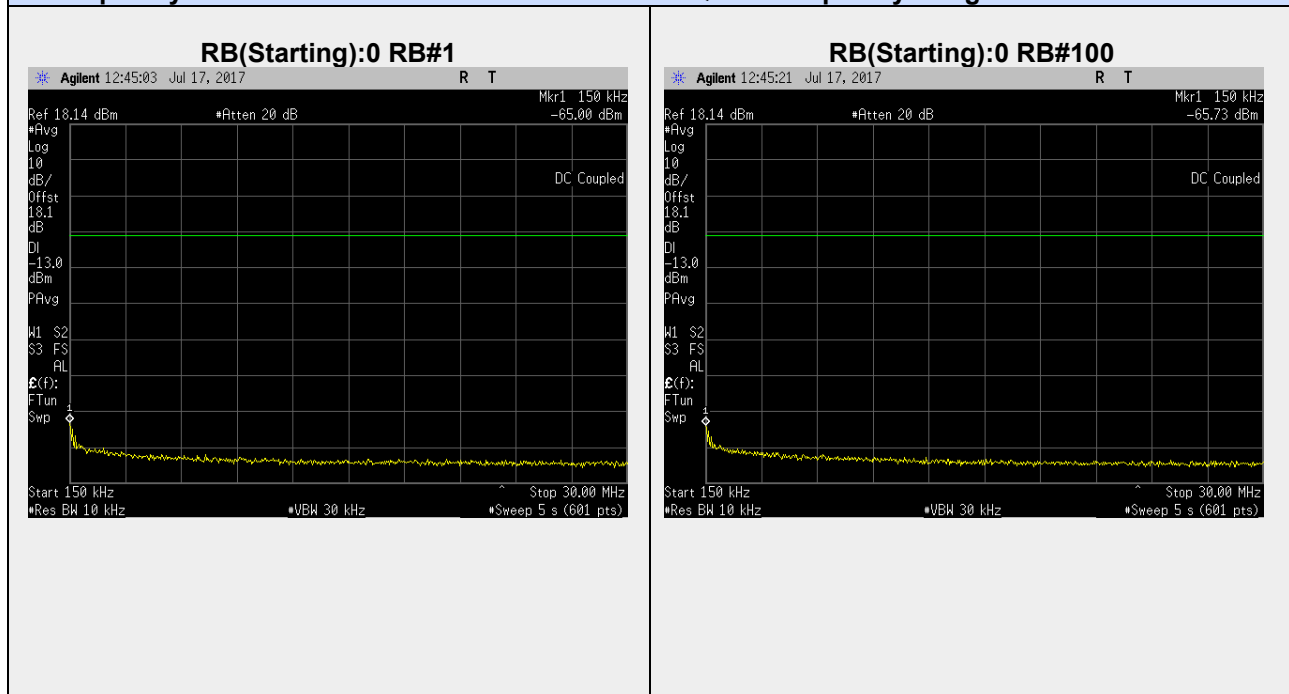


Title: Kumu Networks KU5B01LTE02-US
To: FCC Part 24E & IC RSS-133 Issue 6
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Frequency: 1880.0 MHz Bandwidth: 20MHz Mode: QPSK Frequency Range: 0.150 – 30.000 MHz



Frequency: 1900.0 MHz Bandwidth: 20MHz Mode: QPSK Frequency Range: 0.150 – 30.000 MHz

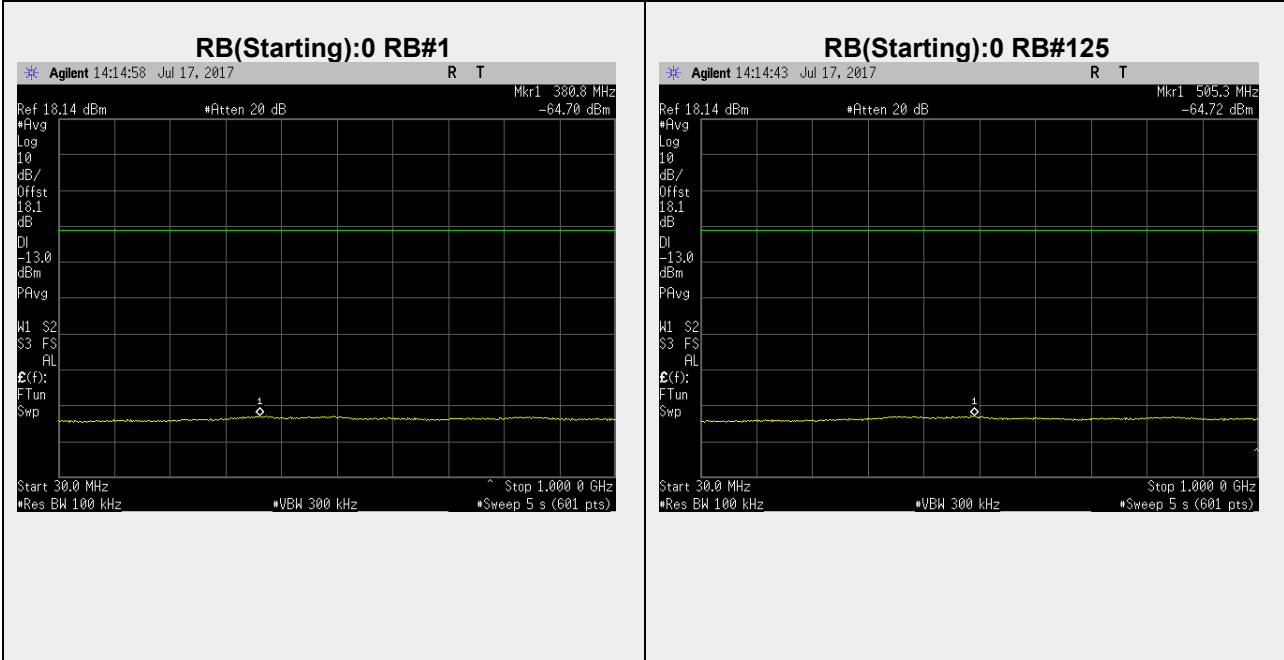


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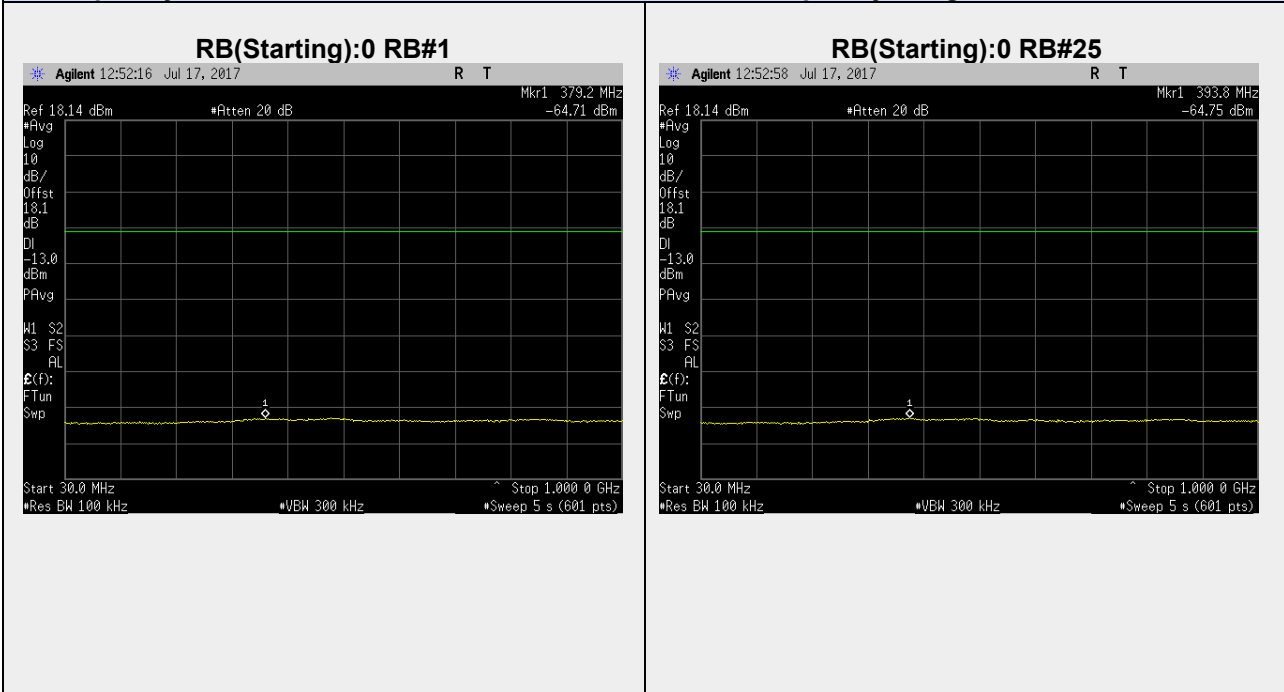


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Frequency: 1852.5 MHz Bandwidth: 5MHz Mode: QPSK Frequency Range: 30.00 – 1000.00 MHz



Frequency: 1880.0 MHz Bandwidth: 5MHz Mode: QPSK Frequency Range: 30.00 – 1000.00 MHz

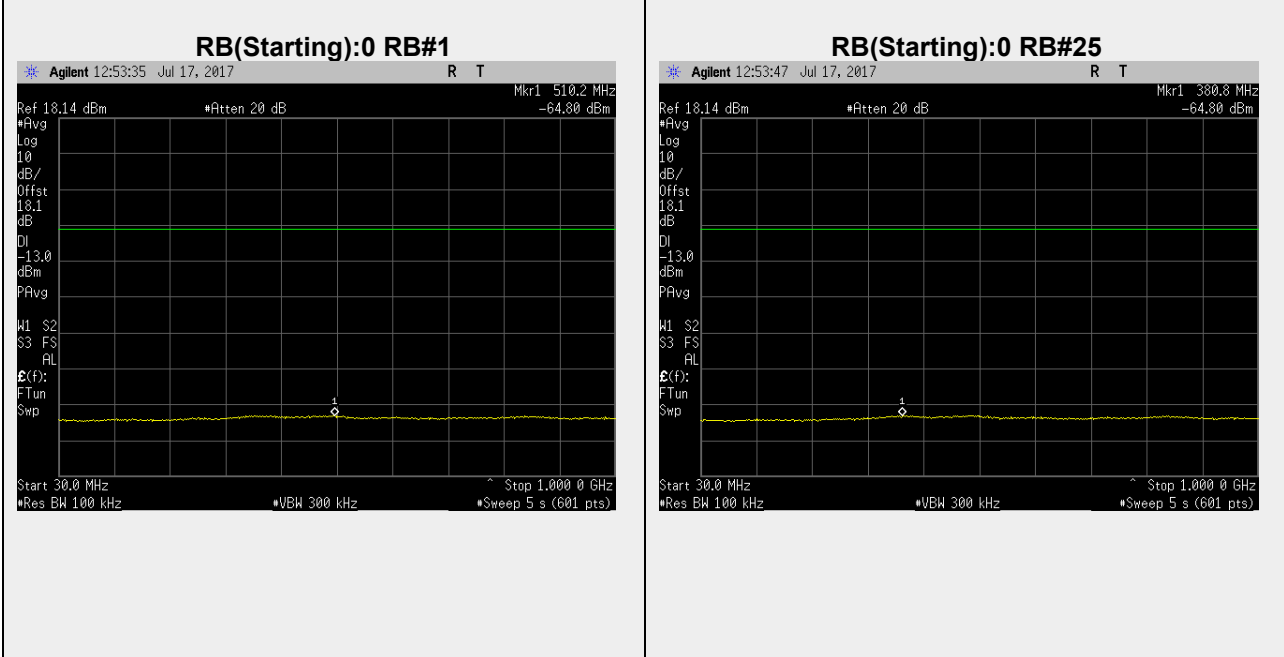


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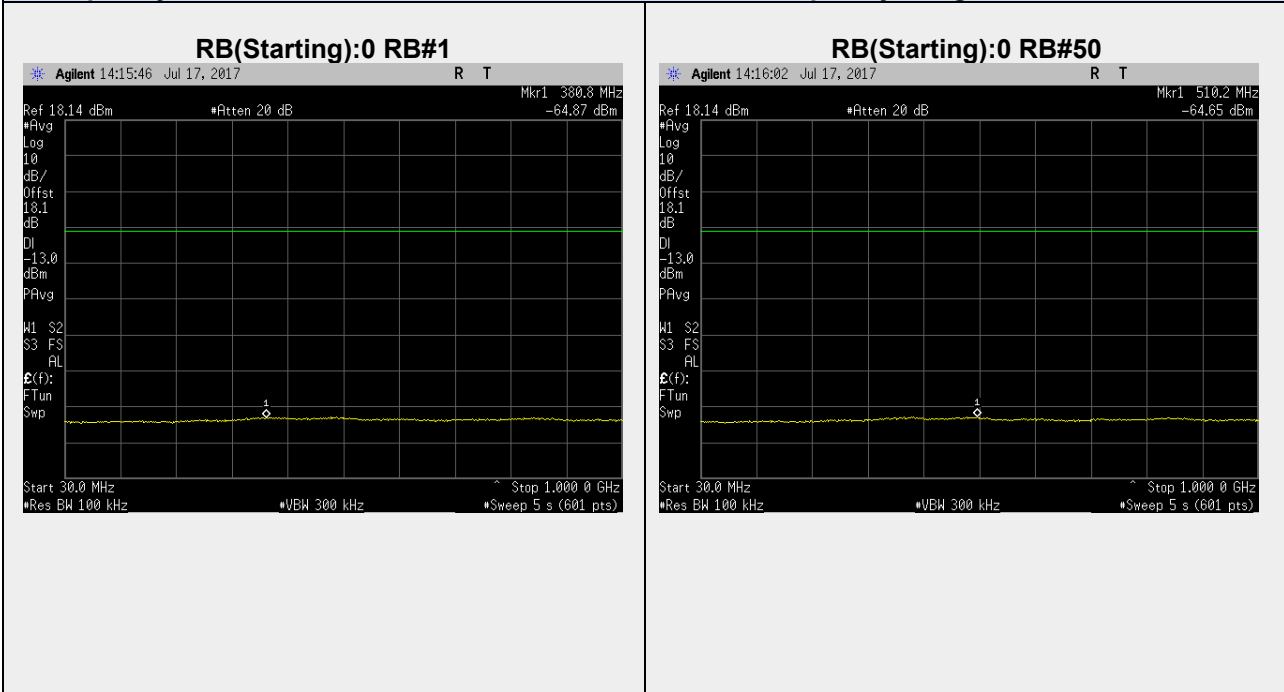


Title: Kumu Networks KU5B01LTE02-US
To: FCC Part 24E & IC RSS-133 Issue 6
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Frequency: 1907.5 MHz Bandwidth: 5MHz Mode: QPSK Frequency Range: 30.00 – 1000.00 MHz



Frequency: 1855.0 MHz Bandwidth: 10MHz Mode: QPSK Frequency Range: 30.00 – 1000.00 MHz

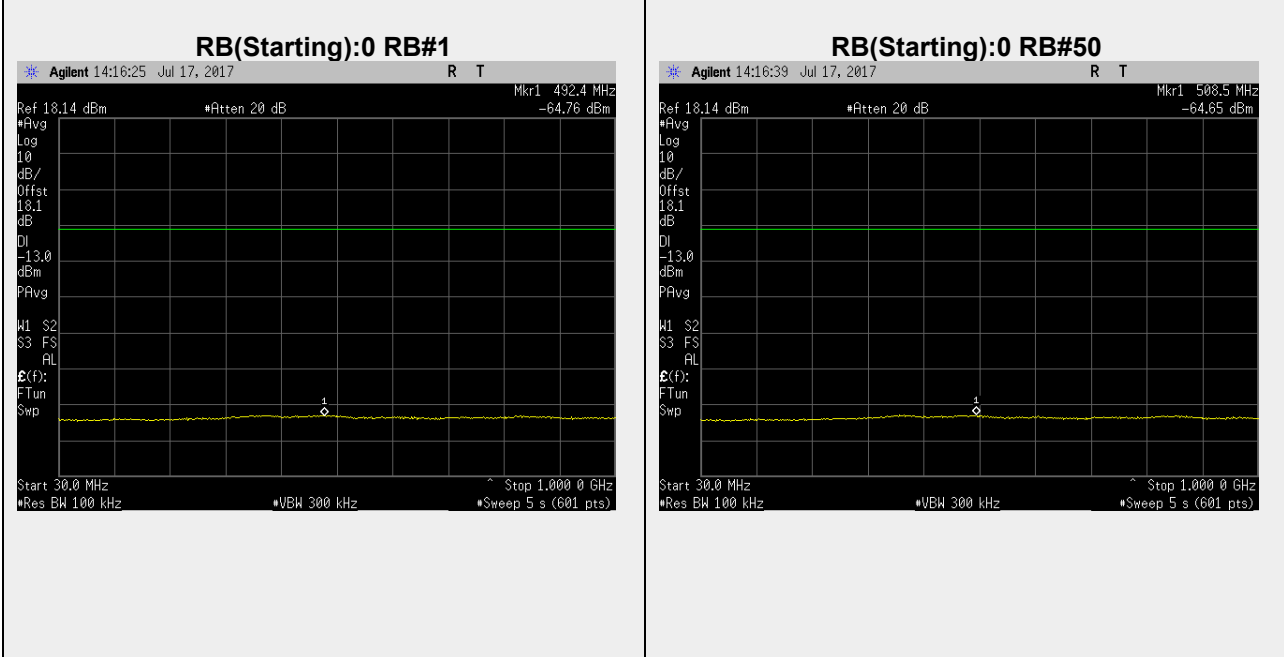


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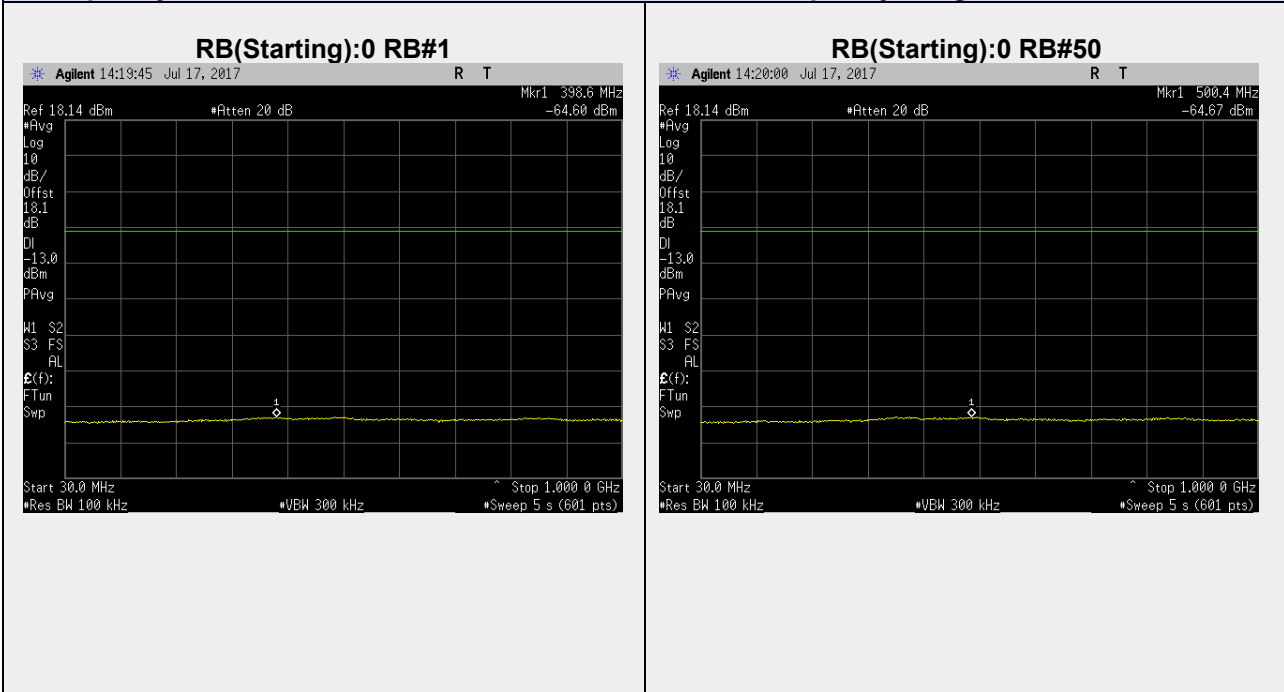


Title: Kumu Networks KU5B01LTE02-US
To: FCC Part 24E & IC RSS-133 Issue 6
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Frequency: 1880.0 MHz Bandwidth: 10MHz Mode: QPSK Frequency Range: 30.00 – 1000.00 MHz



Frequency: 1905.0 MHz Bandwidth: 10MHz Mode: QPSK Frequency Range: 30.00 – 1000.00 MHz

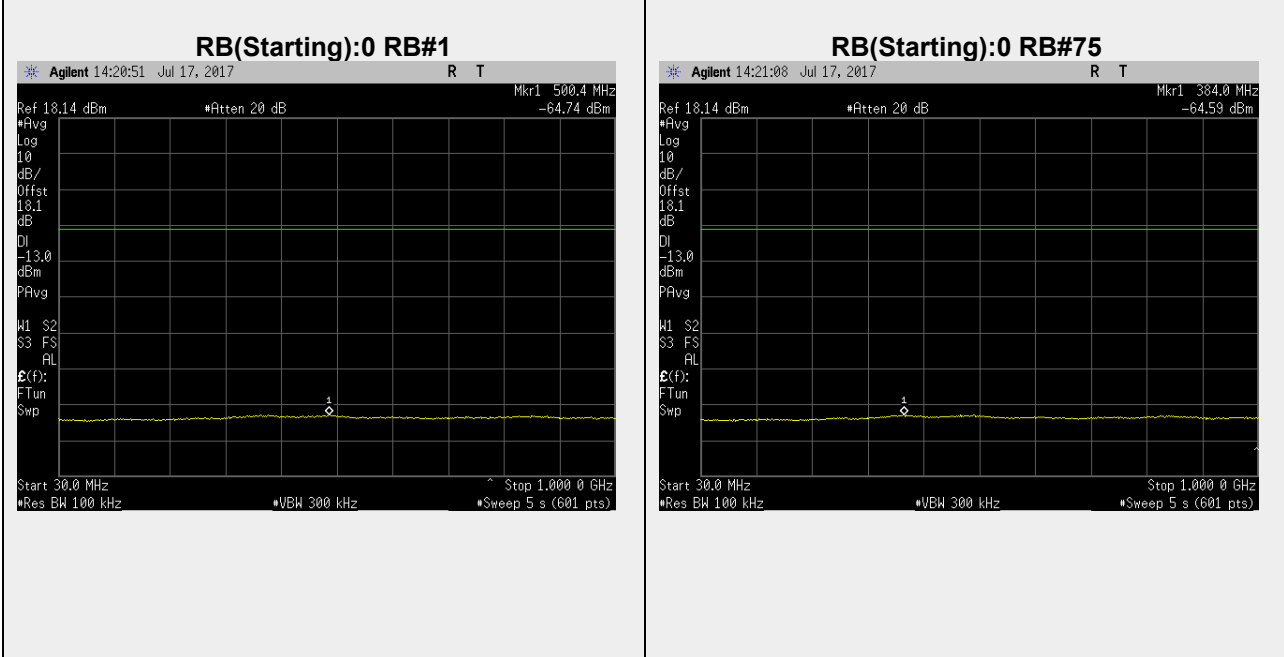


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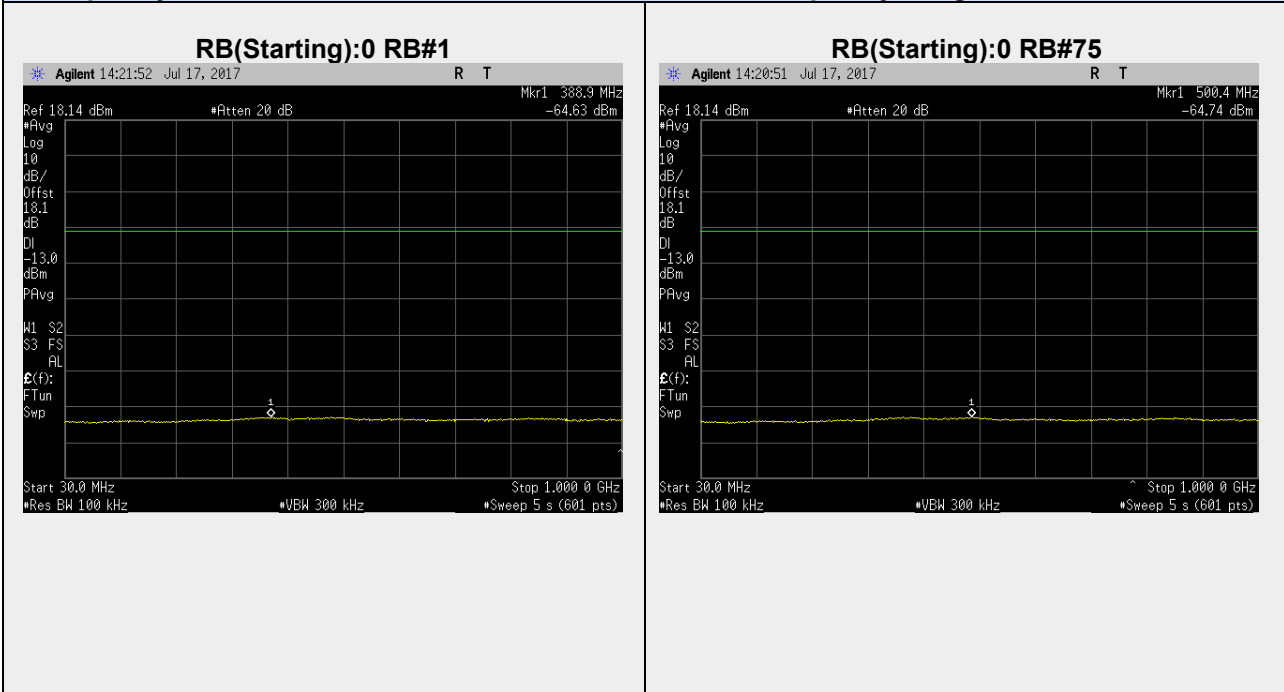


Title: Kumu Networks KU5B01LTE02-US
To: FCC Part 24E & IC RSS-133 Issue 6
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Frequency: 1857.5.0 MHz Bandwidth: 15MHz Mode: QPSK Frequency Range: 30.00 – 1000.00 MHz



Frequency: 1880.0 MHz Bandwidth: 15MHz Mode: QPSK Frequency Range: 30.00 – 1000.00 MHz

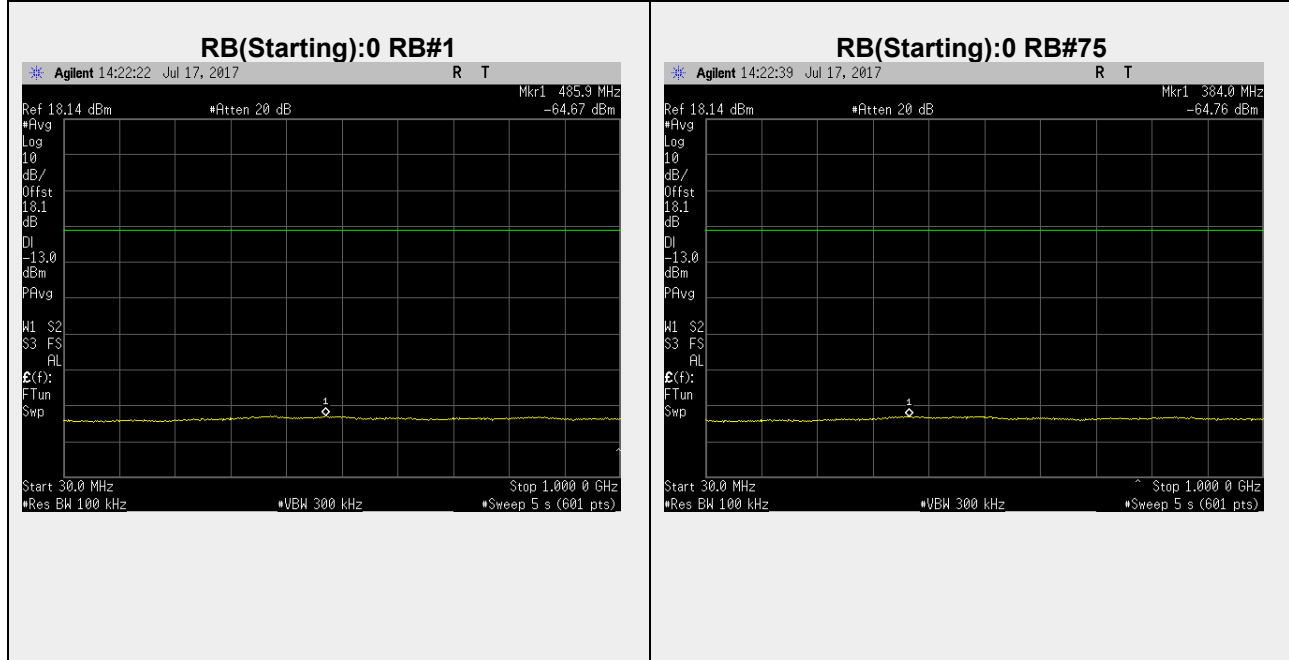


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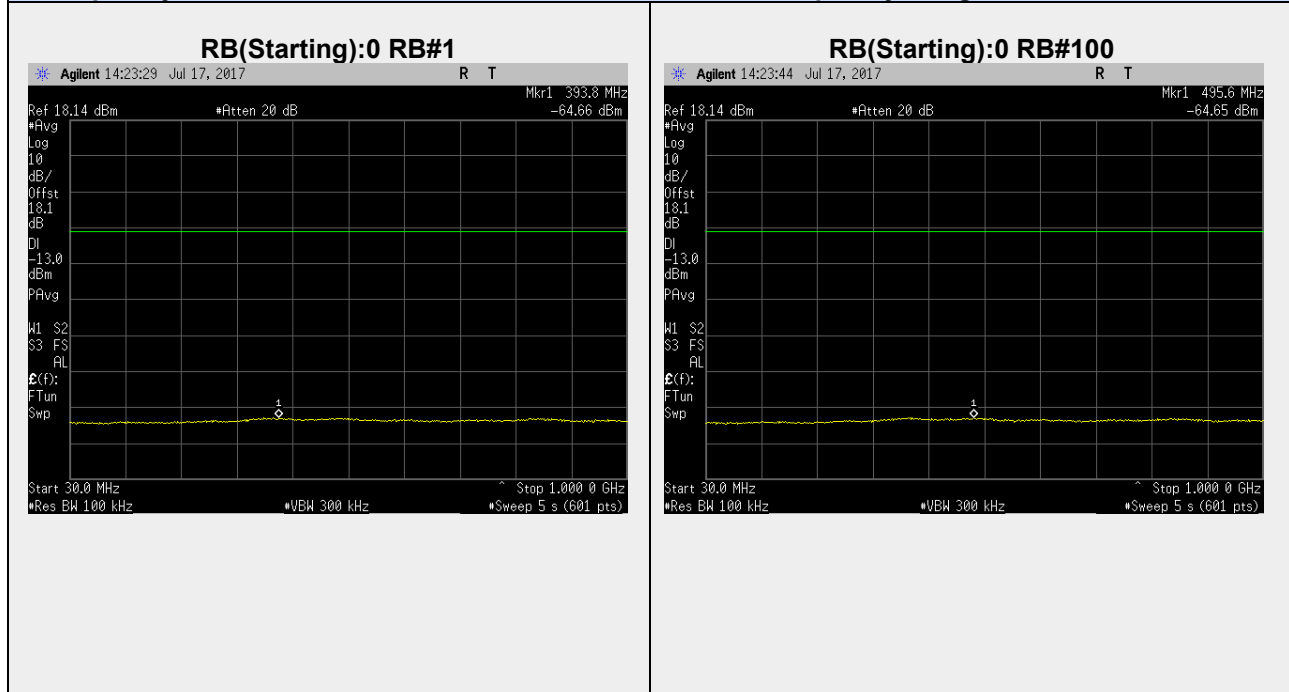


Title: Kumu Networks KU5B01LTE02-US
To: FCC Part 24E & IC RSS-133 Issue 6
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Frequency: 1902.5 MHz Bandwidth: 15MHz Mode: QPSK Frequency Range: 30.00 – 1000.00 MHz



Frequency: 1860.0 MHz Bandwidth: 20MHz Mode: QPSK Frequency Range: 30.00 – 1000.00 MHz

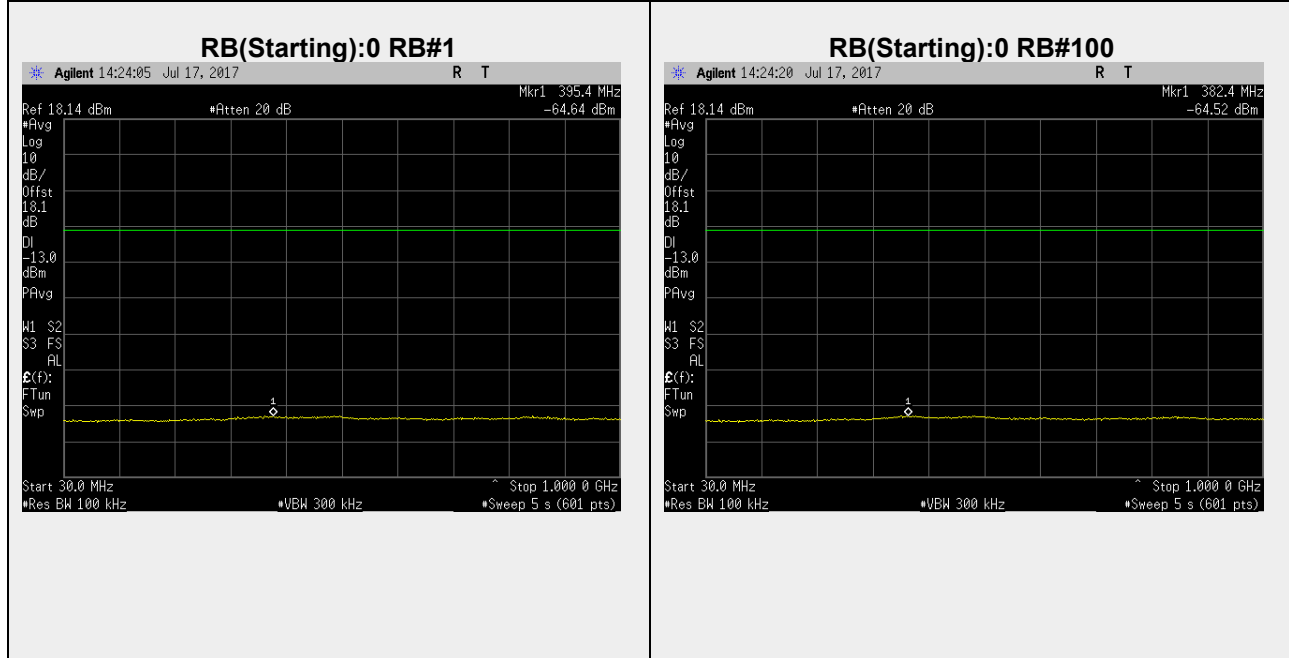


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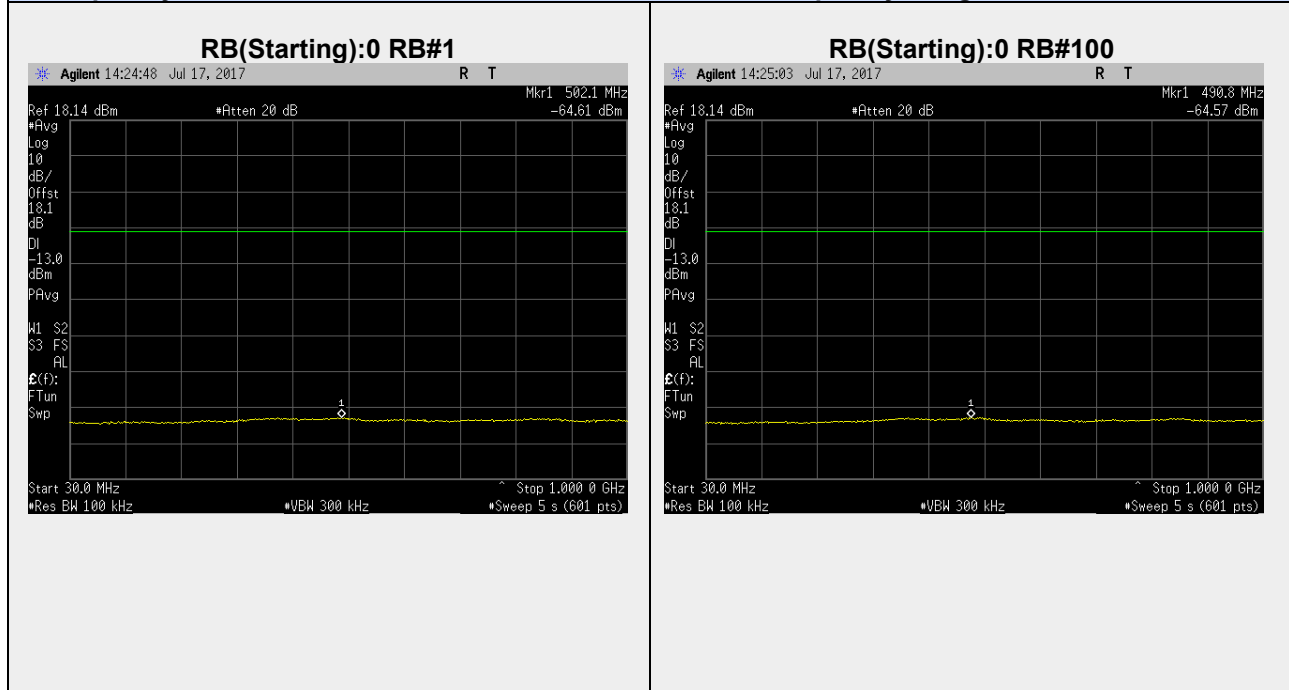


Title: Kumu Networks KU5B01LTE02-US
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Frequency: 1880.00 MHz Bandwidth: 20MHz Mode: QPSK Frequency Range: 30.00 – 1000.00 MHz



Frequency: 1900.0 MHz Bandwidth: 20MHz Mode: QPSK Frequency Range: 30.00 – 1000.00 MHz

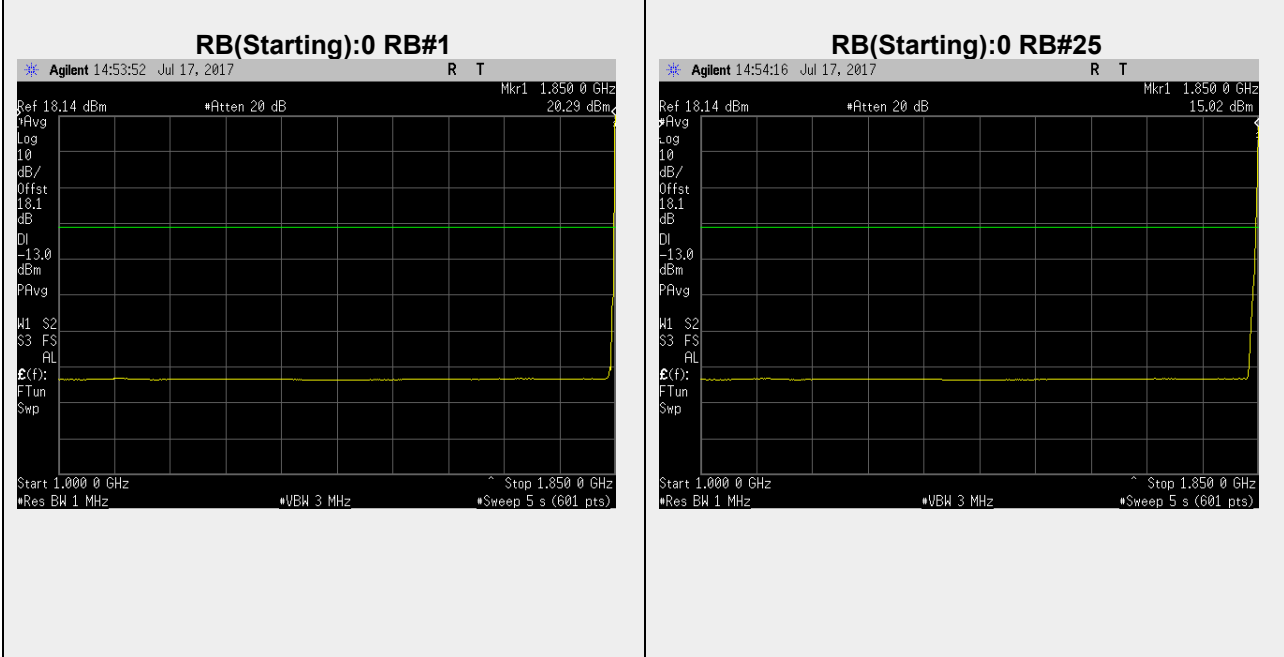


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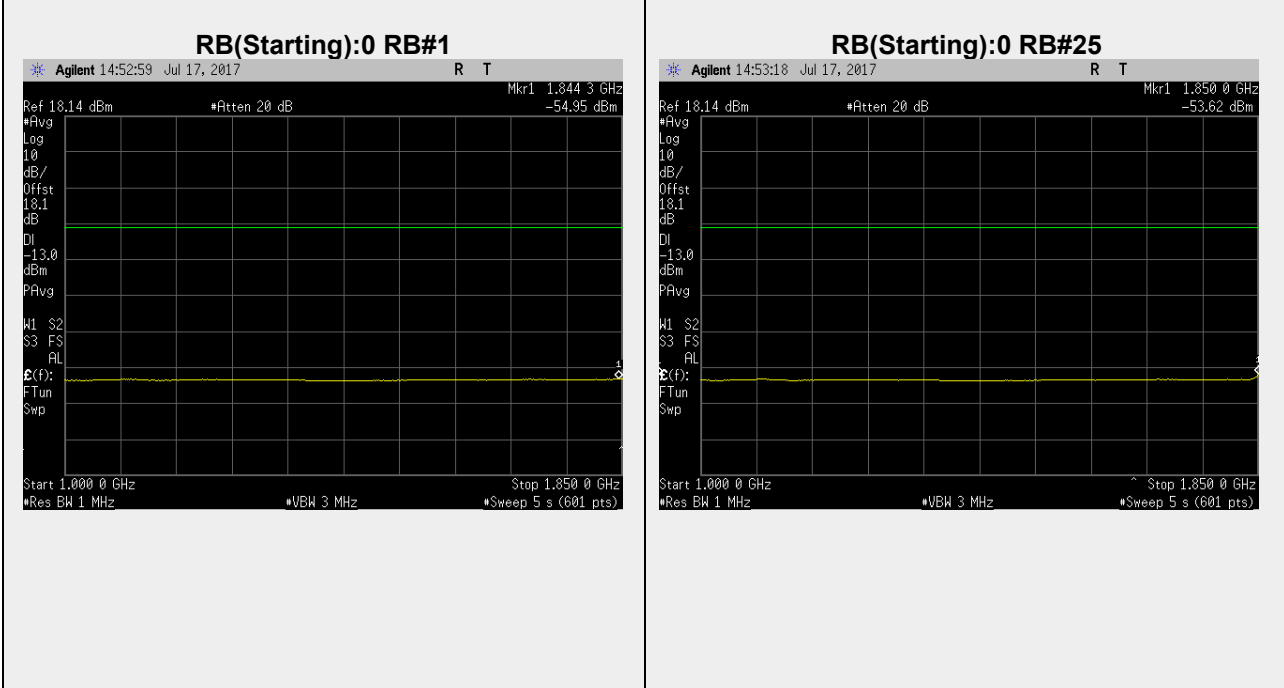


Title: Kumu Networks KU5B01LTE02-US
To: FCC Part 24E & IC RSS-133 Issue 6
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Frequency: 1852.5 MHz Bandwidth: 5MHz Mode: QPSK Frequency Range: 1000.00 – 1850.00 MHz



Frequency: 1880.0 MHz Bandwidth: 5MHz Mode: QPSK Frequency Range: 1000.00 – 1850.00 MHz

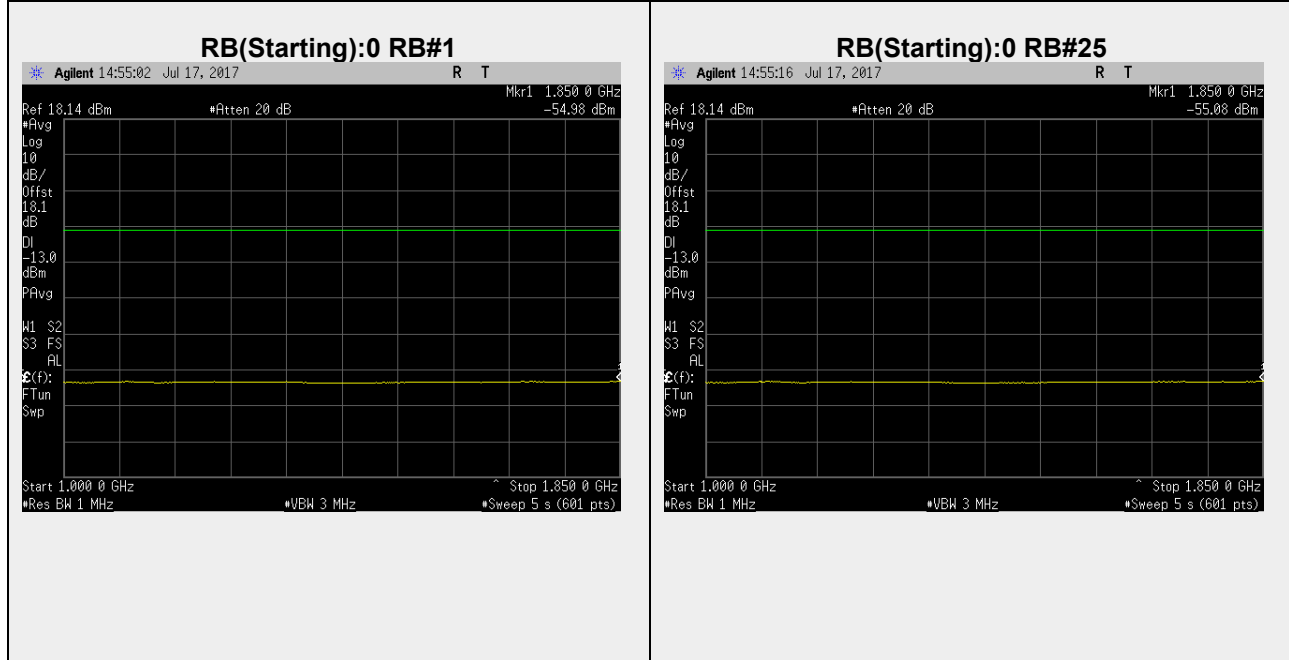


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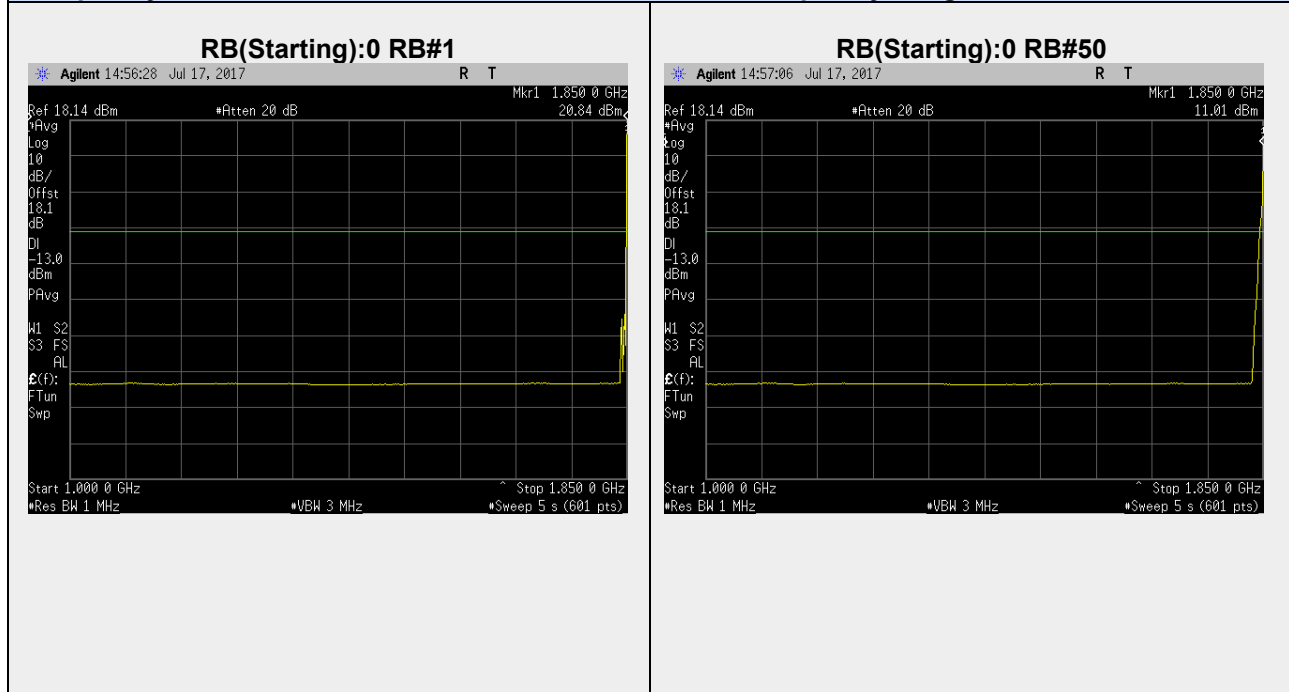


Title: Kumu Networks KU5B01LTE02-US
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Frequency: 1907.5 MHz Bandwidth: 5MHz Mode: QPSK Frequency Range: 1000.00 – 1850.00 MHz



Frequency: 1855.0 MHz Bandwidth: 10MHz Mode: QPSK Frequency Range: 1000.00 – 1850.00 MHz

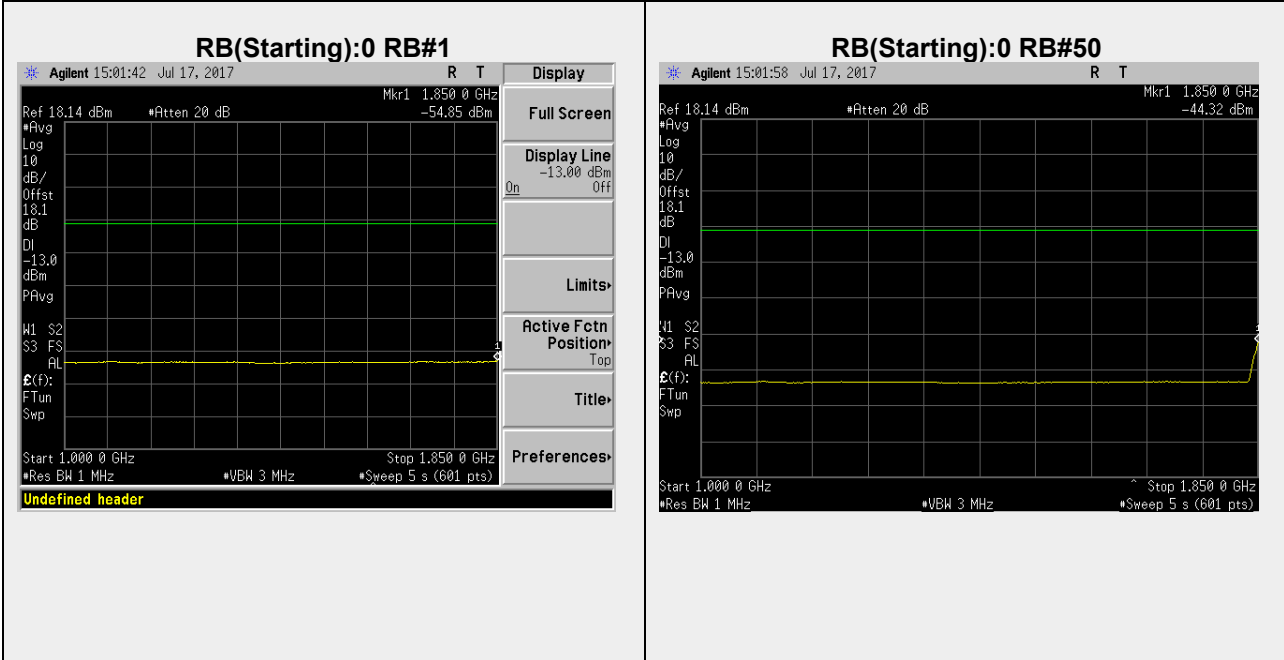


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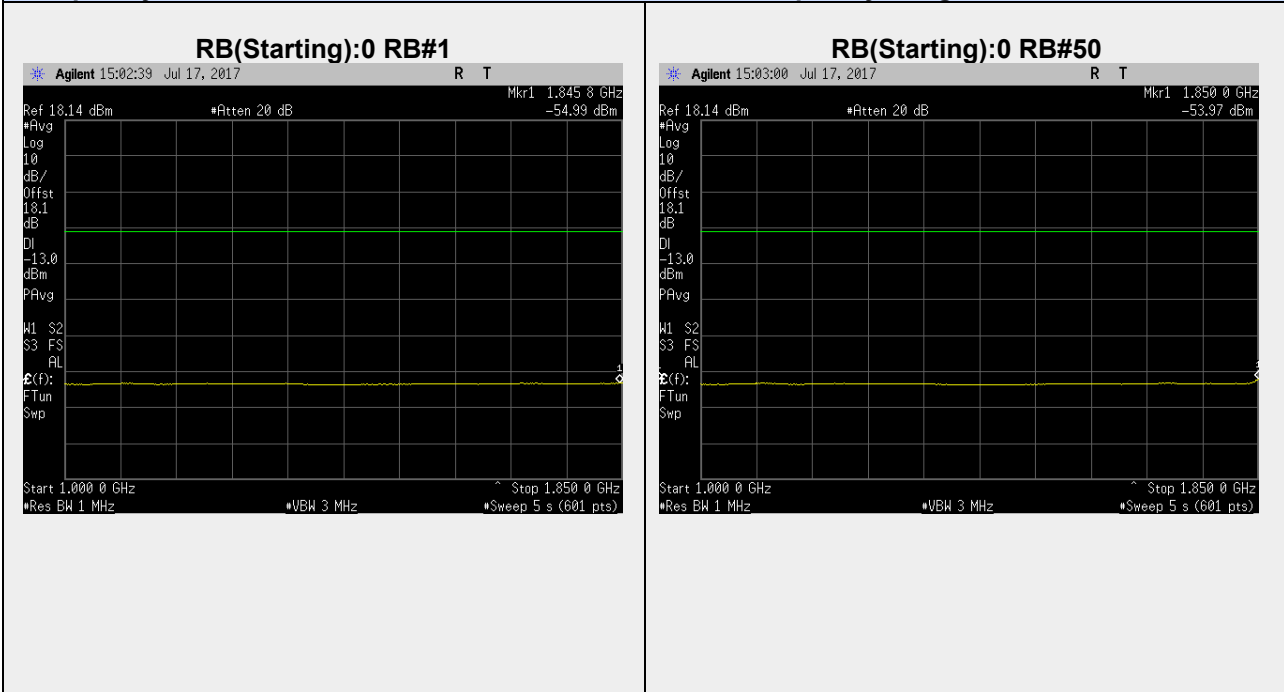


Title: Kumu Networks KU5B01LTE02-US
To: FCC Part 24E & IC RSS-133 Issue 6
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Frequency: 1880.0 MHz Bandwidth: 10MHz Mode: QPSK Frequency Range: 1000.00 – 1850.00 MHz



Frequency: 1905.0 MHz Bandwidth: 10MHz Mode: QPSK Frequency Range: 1000.00 – 1850.00 MHz

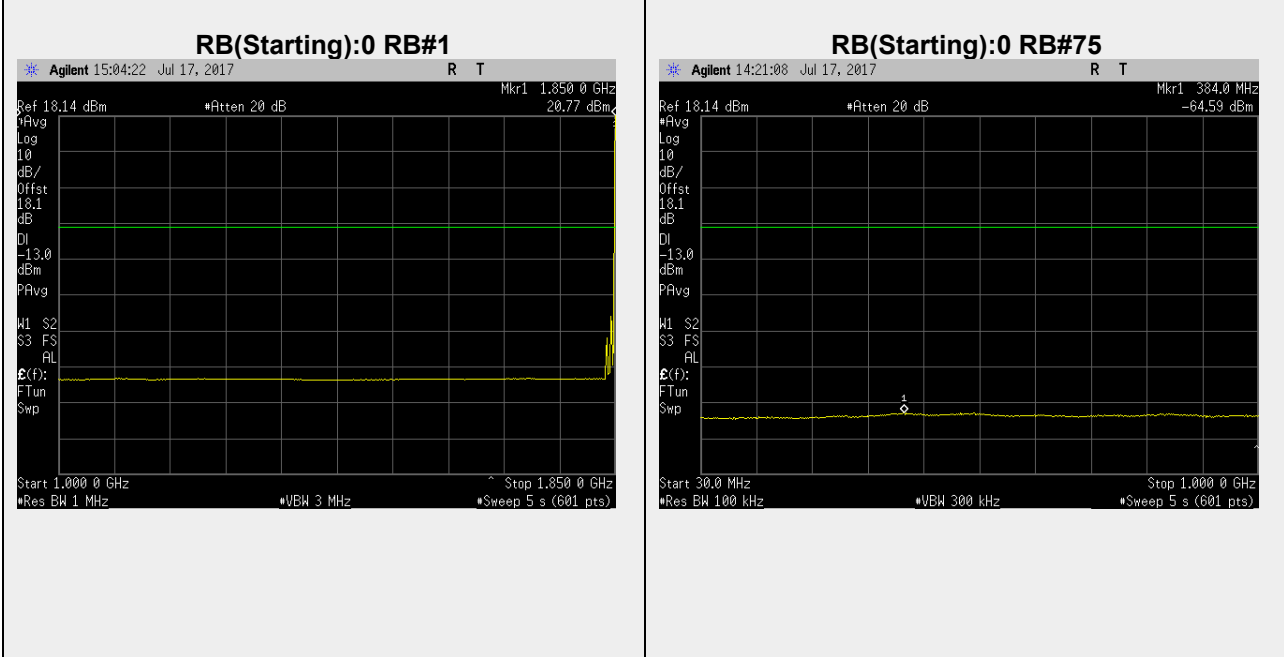


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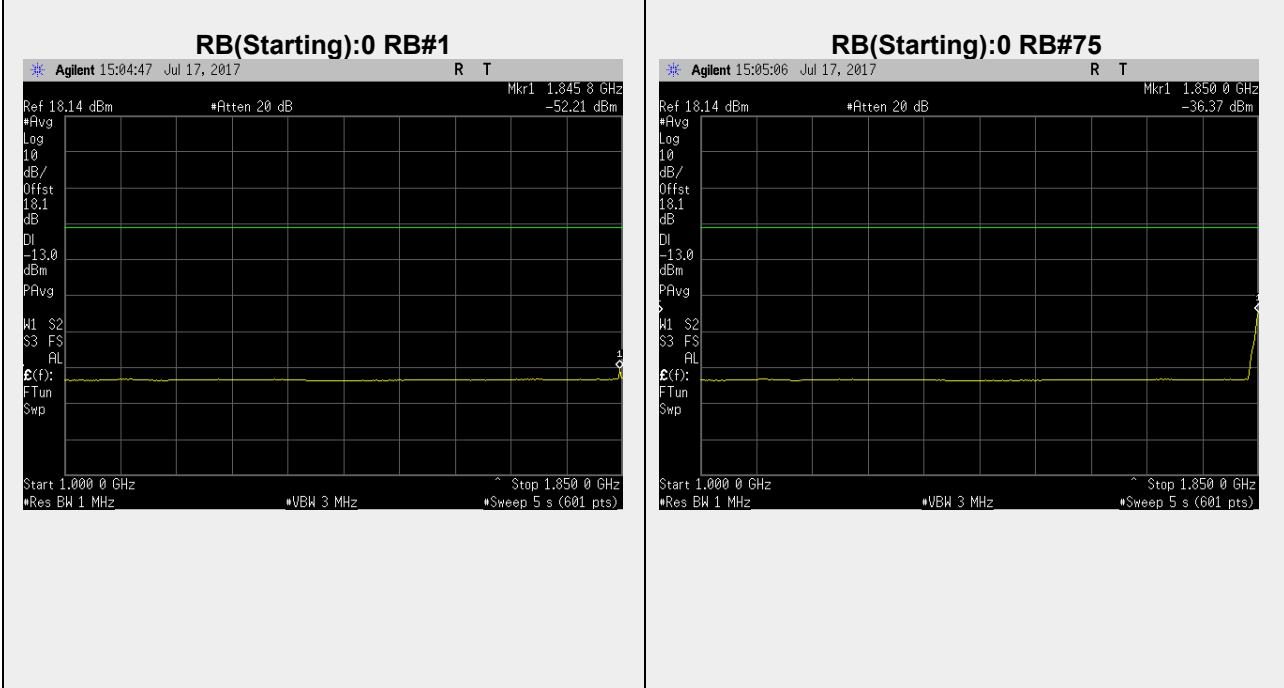


Title: Kumu Networks KU5B01LTE02-US
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Frequency: 1857.5 MHz Bandwidth: 15MHz Mode: QPSK Frequency Range: 1000.00 – 1850.00 MHz



Frequency: 1880.0 MHz Bandwidth: 15MHz Mode: QPSK Frequency Range: 1000.00 – 1850.00 MHz

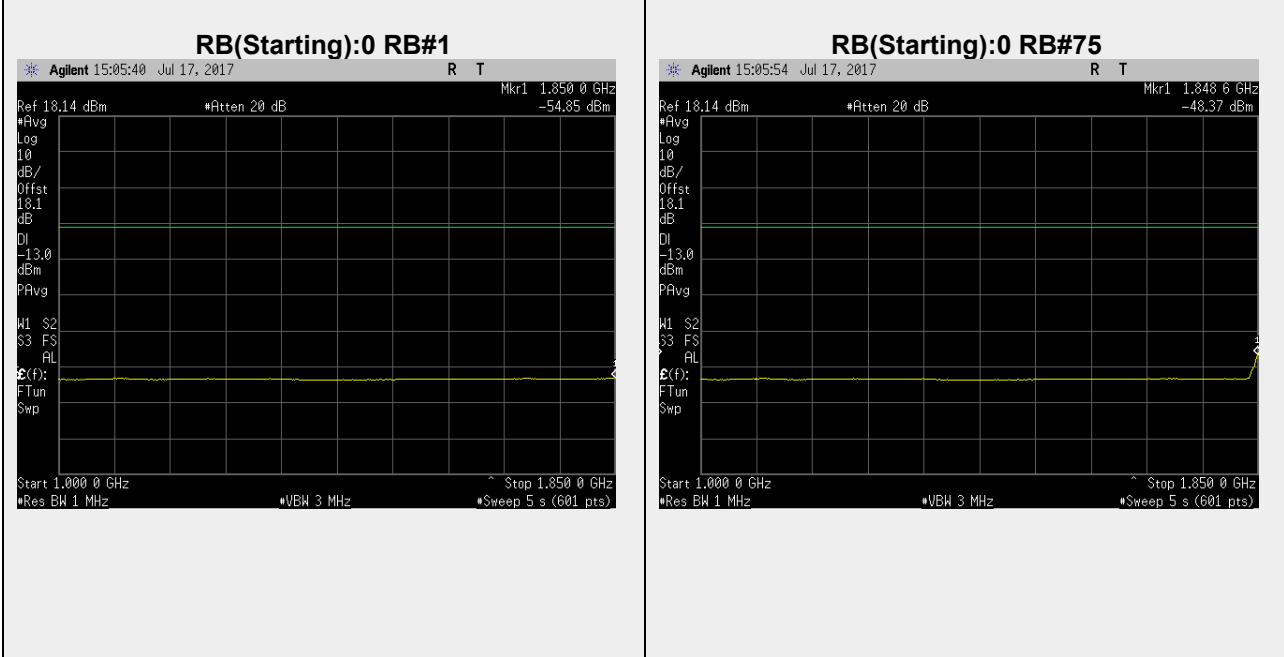


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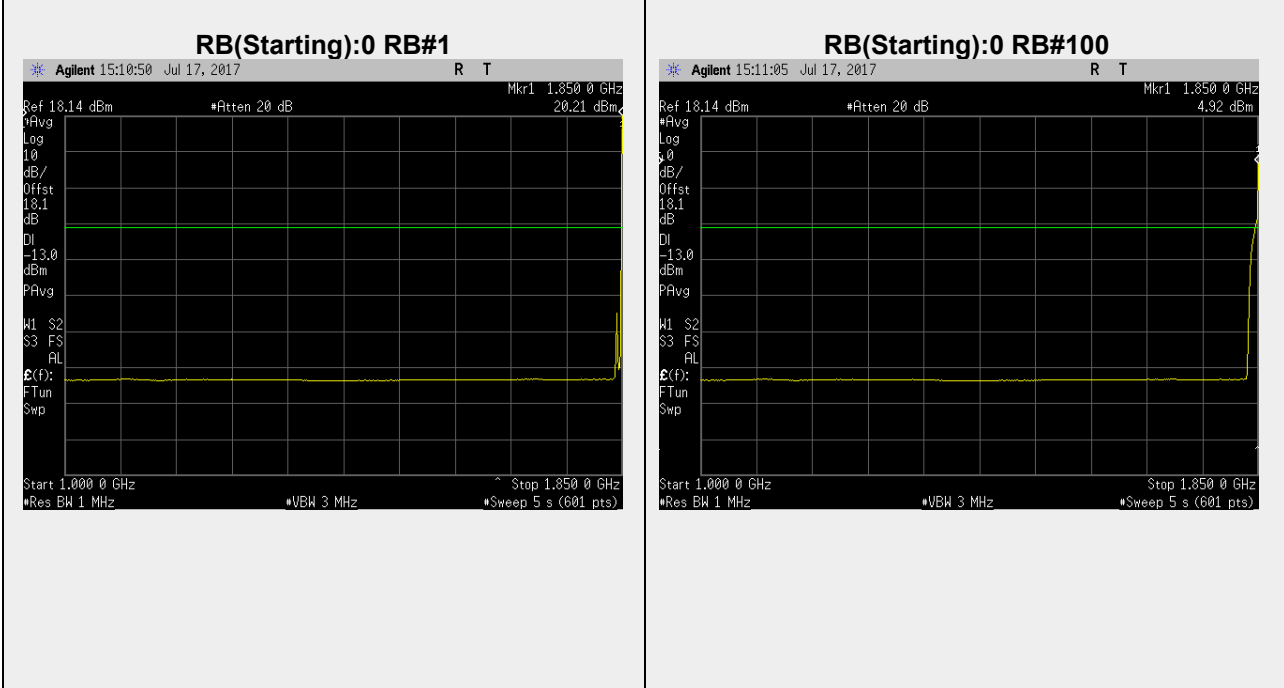


Title: Kumu Networks KU5B01LTE02-US
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Frequency: 1902.5 MHz Bandwidth: 15MHz Mode: QPSK Frequency Range: 1000.00 – 1850.00 MHz



Frequency: 1860.0 MHz Bandwidth: 20MHz Mode: QPSK Frequency Range: 1000.00 – 1850.00 MHz

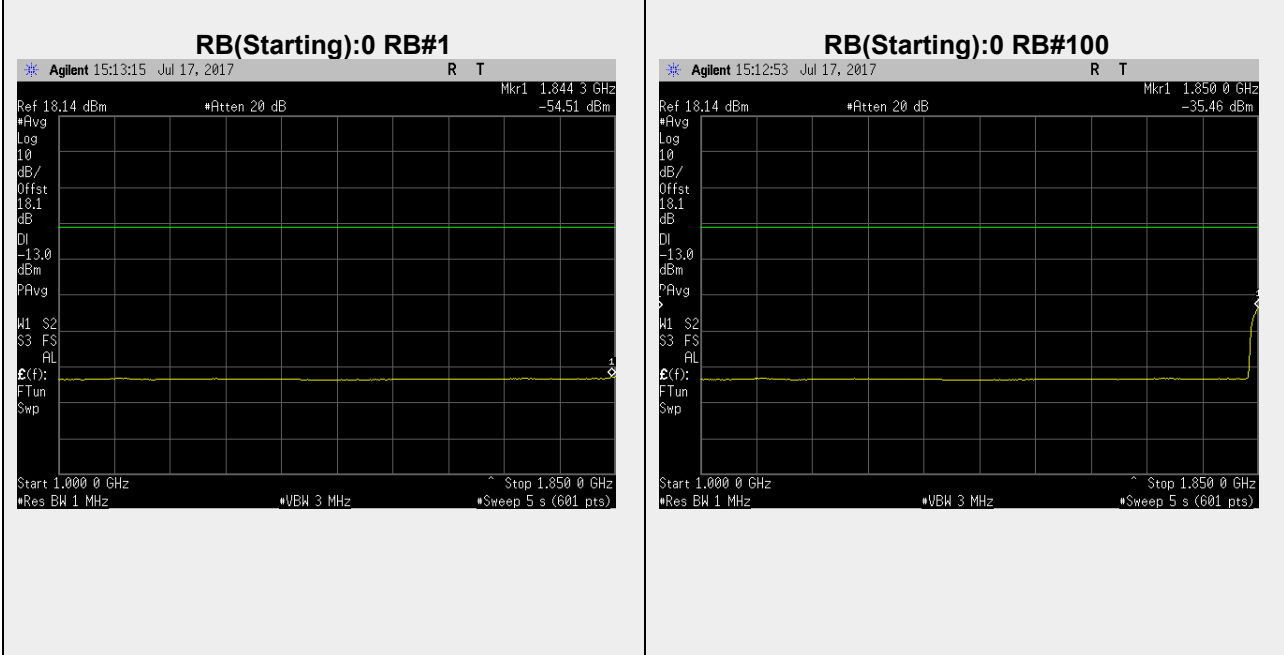


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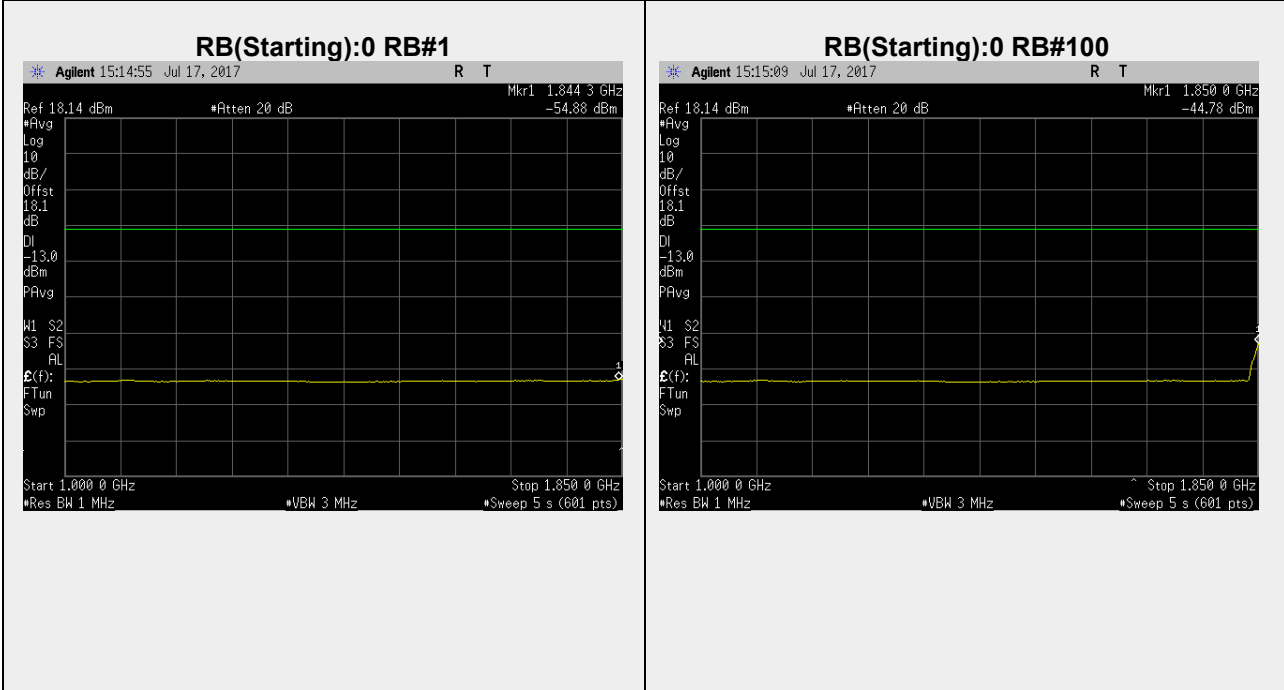


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Frequency: 1880.0 MHz Bandwidth: 20MHz Mode: QPSK Frequency Range: 1000.00 – 1850.00 MHz

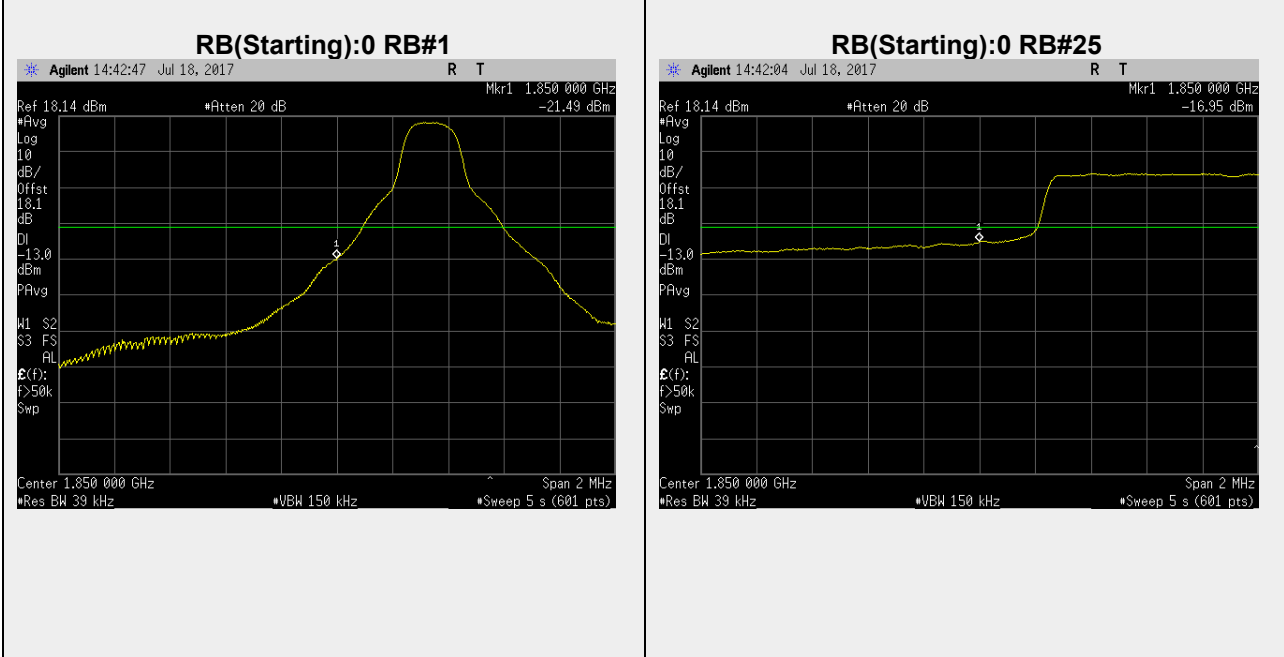


Frequency: 1900.0 MHz Bandwidth: 20MHz Mode: QPSK Frequency Range: 1000.00 – 1850.00 MHz

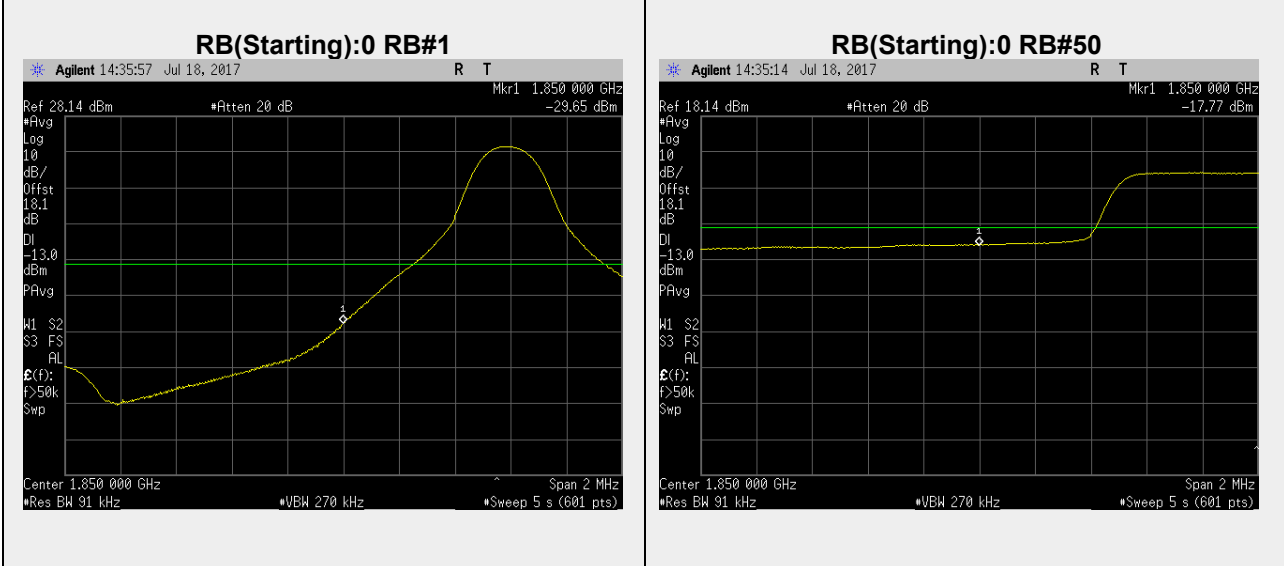


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Frequency: 1852.5 MHz Bandwidth: 5MHz Mode: QPSK Frequency Range: 1849.00 – 1851.00 MHz

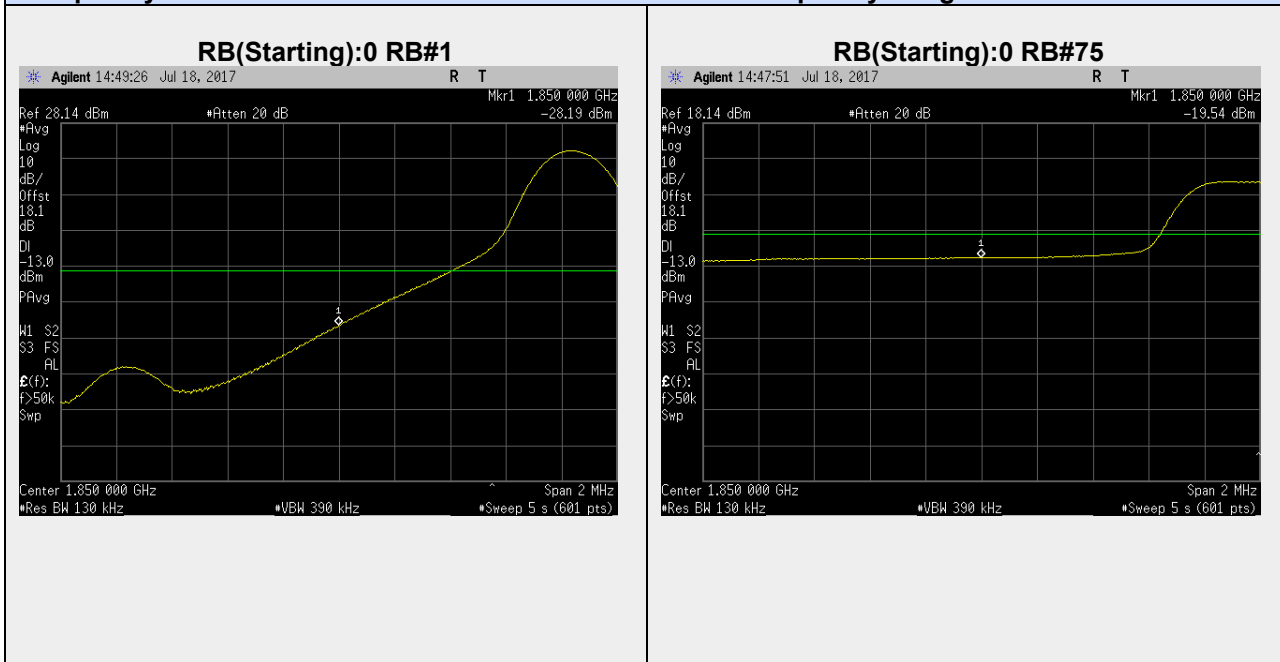


Frequency: 1855.0 MHz Bandwidth: 10MHz Mode: QPSK Frequency Range: 1849.00 – 1851.00 MHz

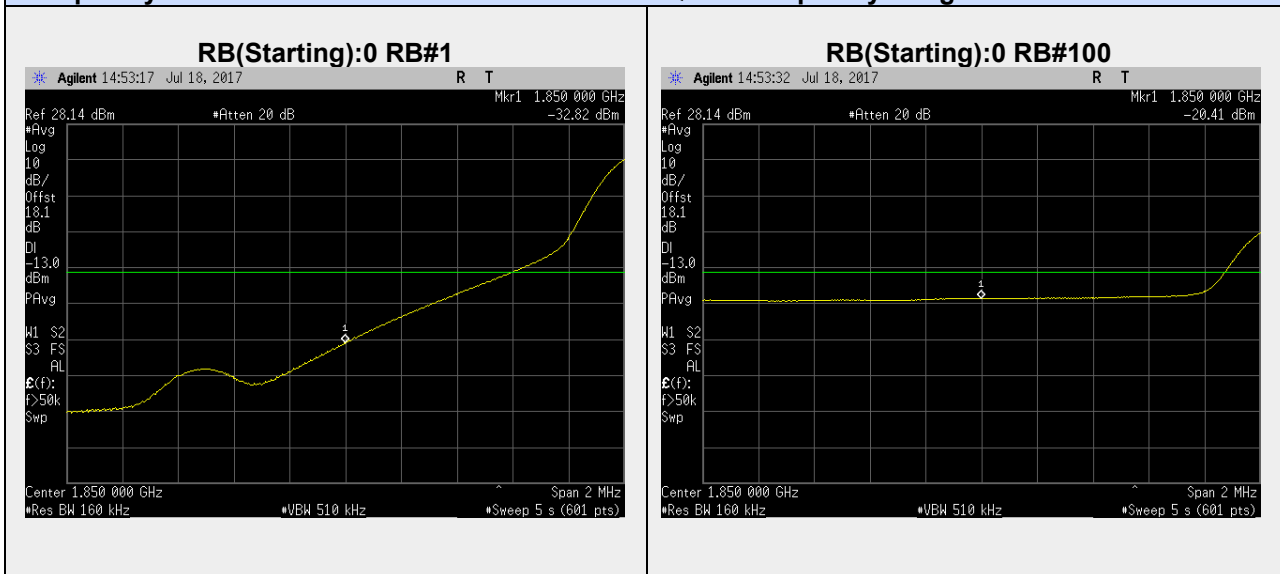


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Frequency: 1857.5 MHz Bandwidth: 15MHz Mode: QPSK Frequency Range: 1849.00 – 1851.00 MHz



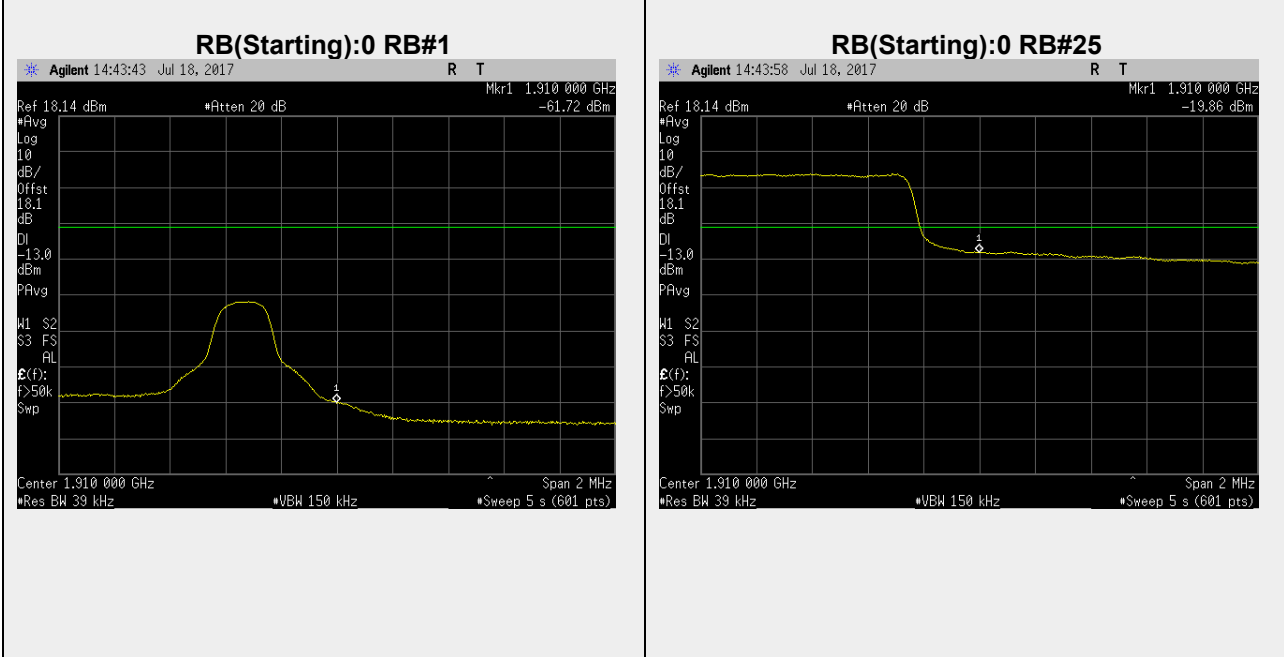
Frequency: 1860.0 MHz Bandwidth: 20MHz Mode: QPSK Frequency Range: 1849.00 – 1851.00 MHz



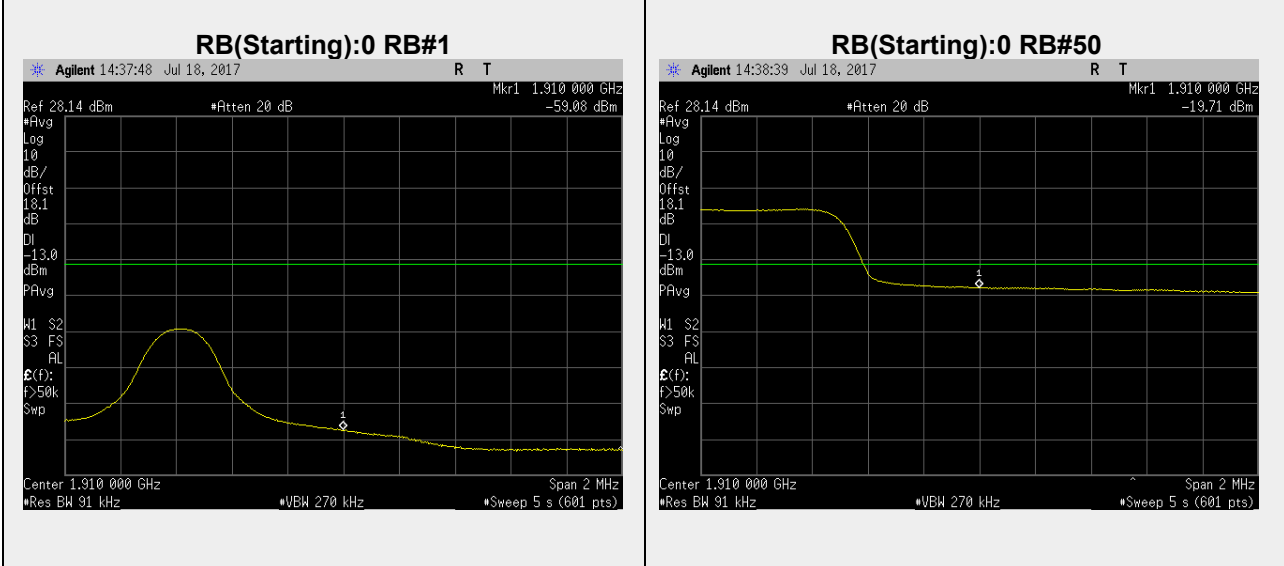


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Frequency: 1907.5 MHz Bandwidth: 5MHz Mode: QPSK Frequency Range: 1909.00 – 1911.00 MHz



Frequency: 1905.0 MHz Bandwidth: 10MHz Mode: QPSK Frequency Range: 1909.00 – 1911.00 MHz

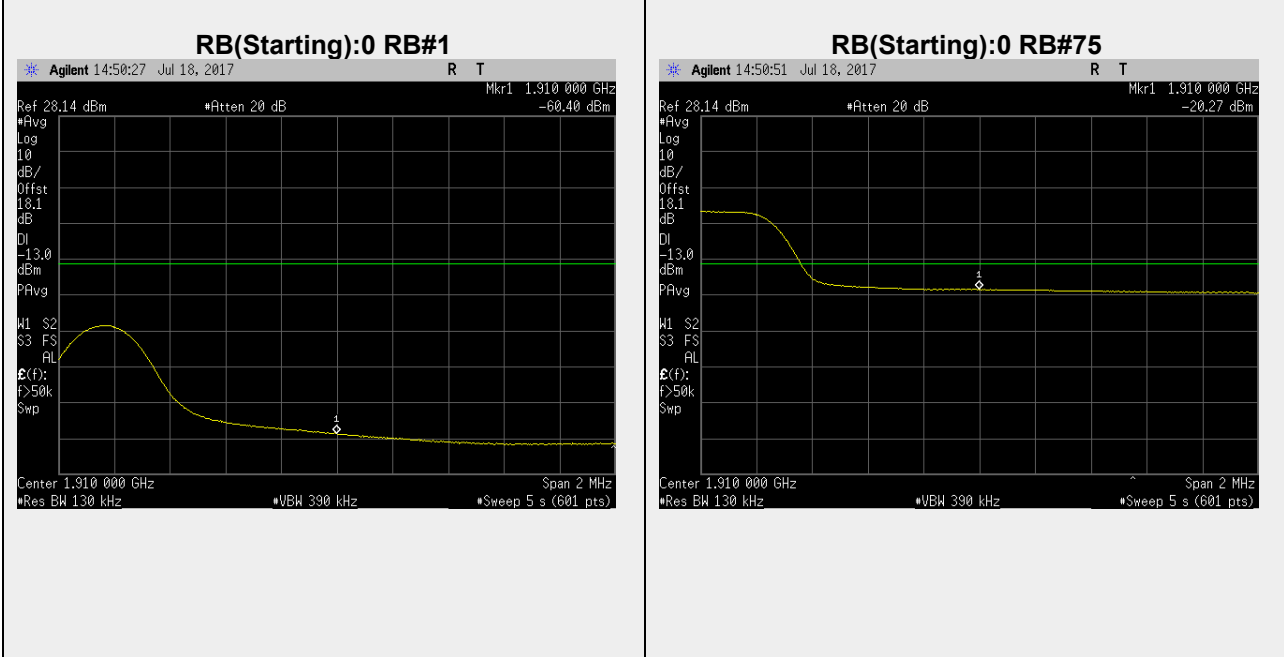


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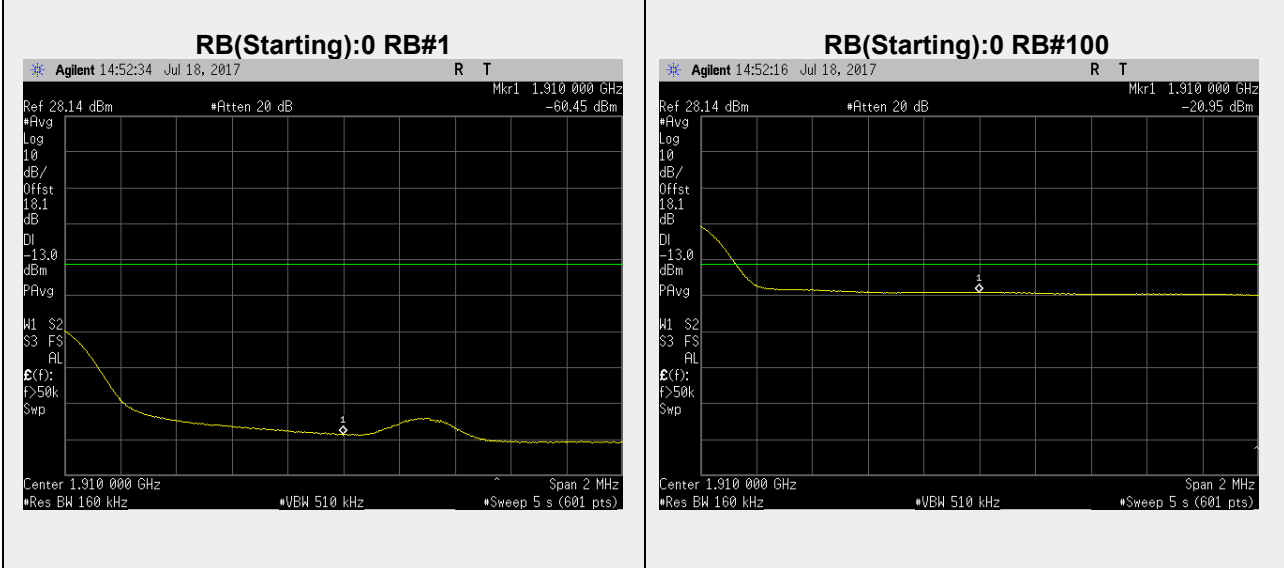


Title: Kumu Networks KU5B01LTE02-US
To: FCC Part 24E & IC RSS-133 Issue 6
Serial #: KUMU03-U4 Rev A
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Frequency: 1902.5 MHz Bandwidth: 15MHz Mode: QPSK Frequency Range: 1909.00 – 1911.00 MHz



Frequency: 1900.0 MHz Bandwidth: 20MHz Mode: QPSK Frequency Range: 1909.00 – 1911.00 MHz

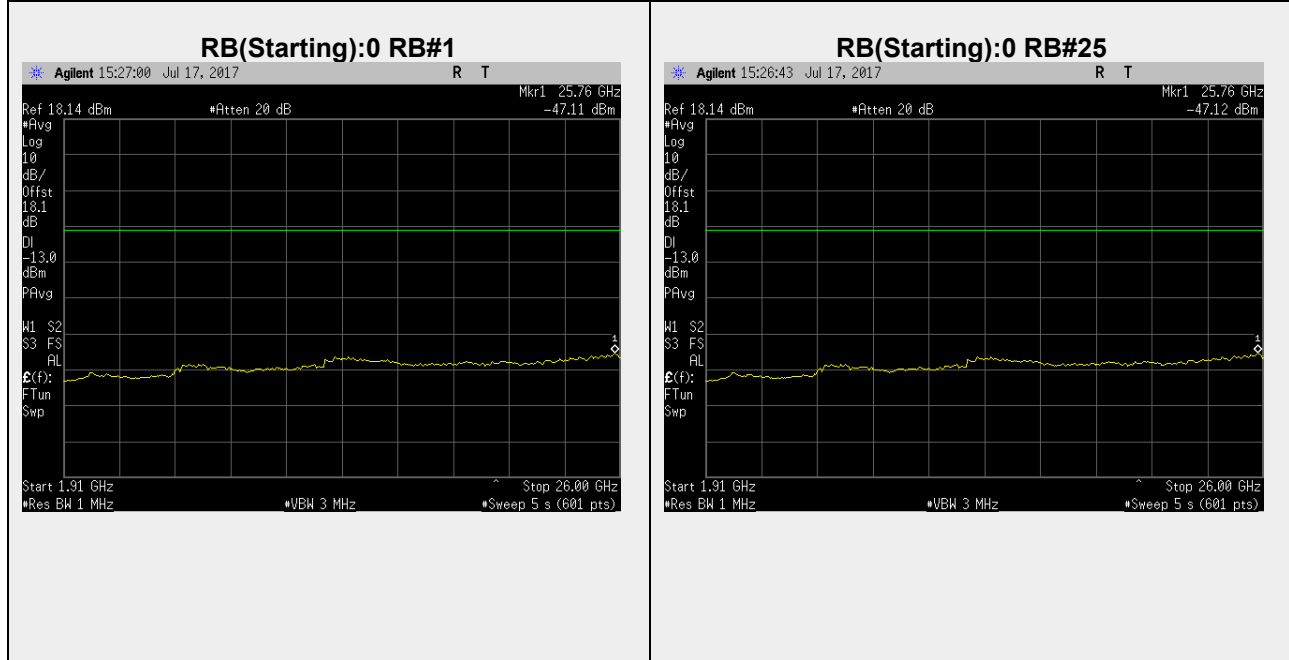


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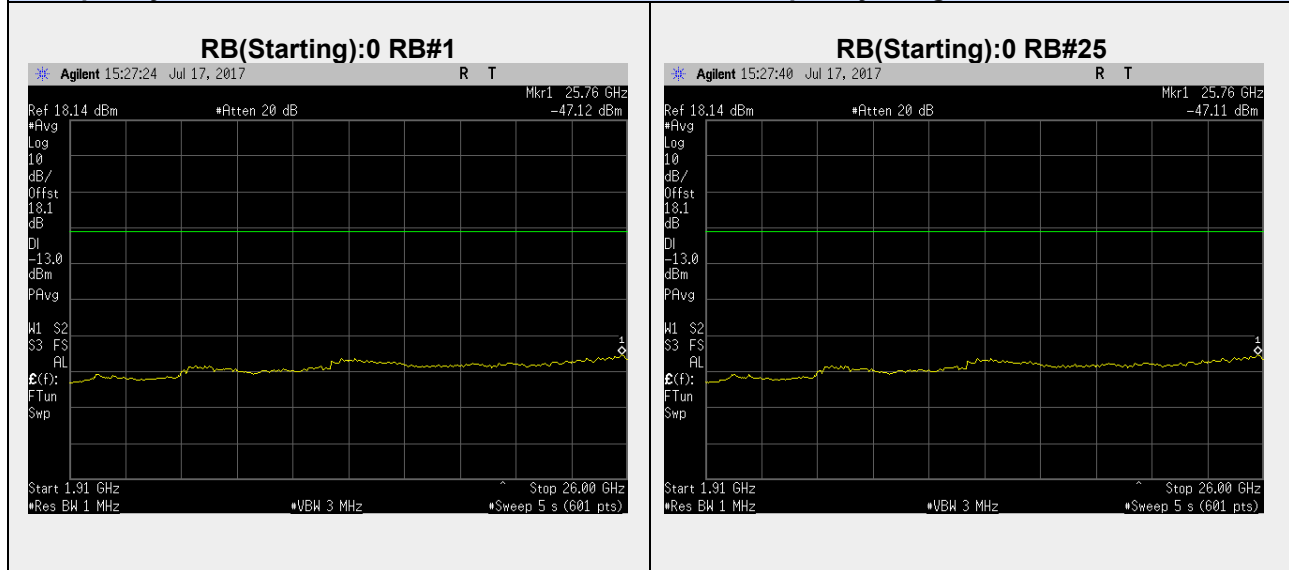


Title: Kumu Networks KU5B01LTE02-US
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Frequency: 1852.5 MHz Bandwidth: 5MHz Mode: QPSK Frequency Range: 1910.00 – 26000.00MHz



Frequency: 1880.0 MHz Bandwidth: 5MHz Mode: QPSK Frequency Range: 1910.00 – 26000.00MHz

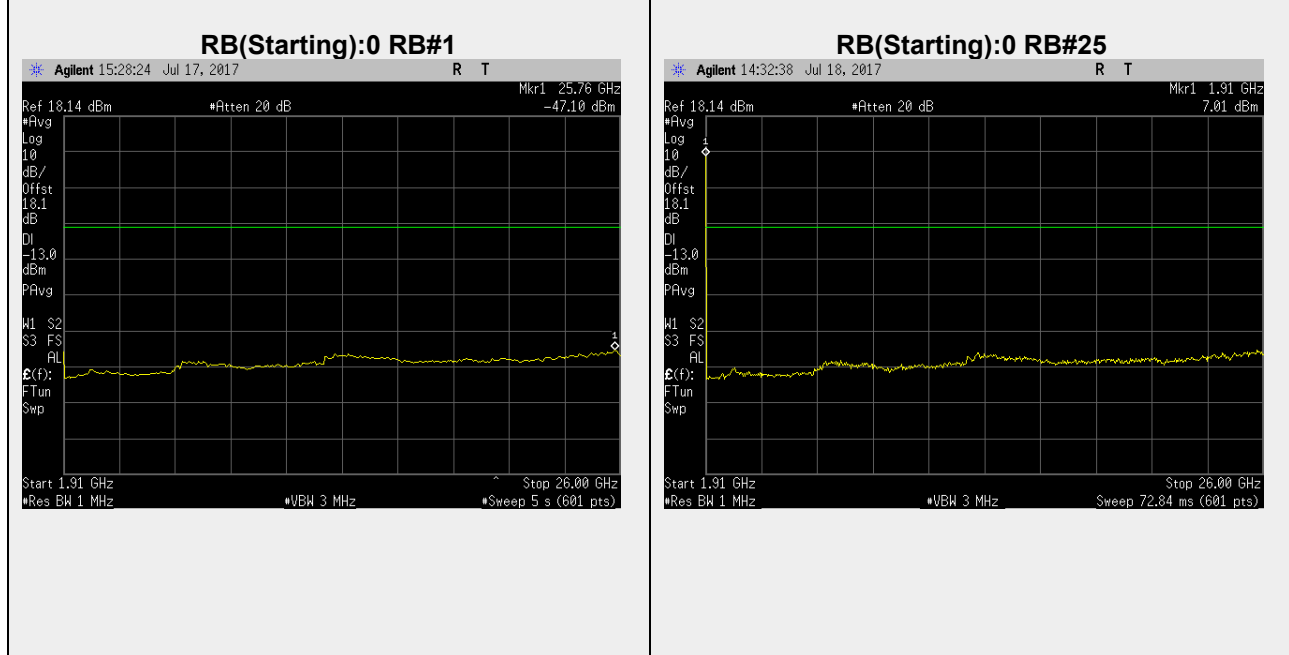


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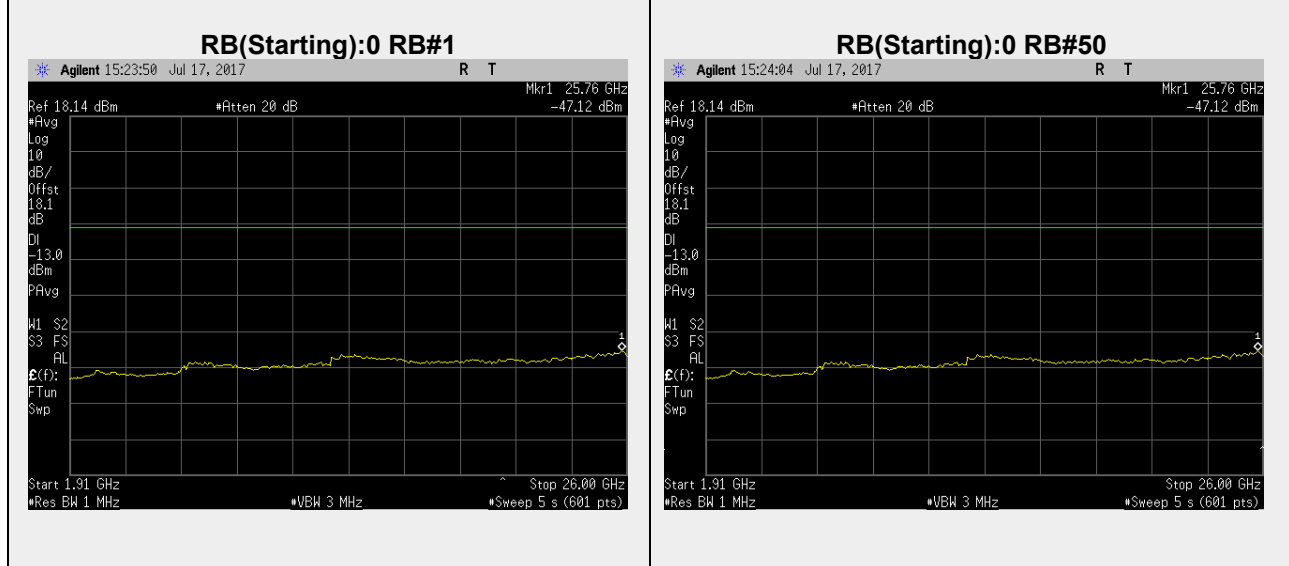


Title: Kumu Networks KU5B01LTE02-US
To: FCC Part 24E & IC RSS-133 Issue 6
Serial #: KUMU03-U4 Rev A
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Frequency: 1907.5 MHz Bandwidth: 5MHz Mode: QPSK Frequency Range: 1910.00 – 26000.00MHz



Frequency: 1855.0 MHz Bandwidth: 10MHz Mode: QPSK Frequency Range: 1910.00 – 26000.00MHz

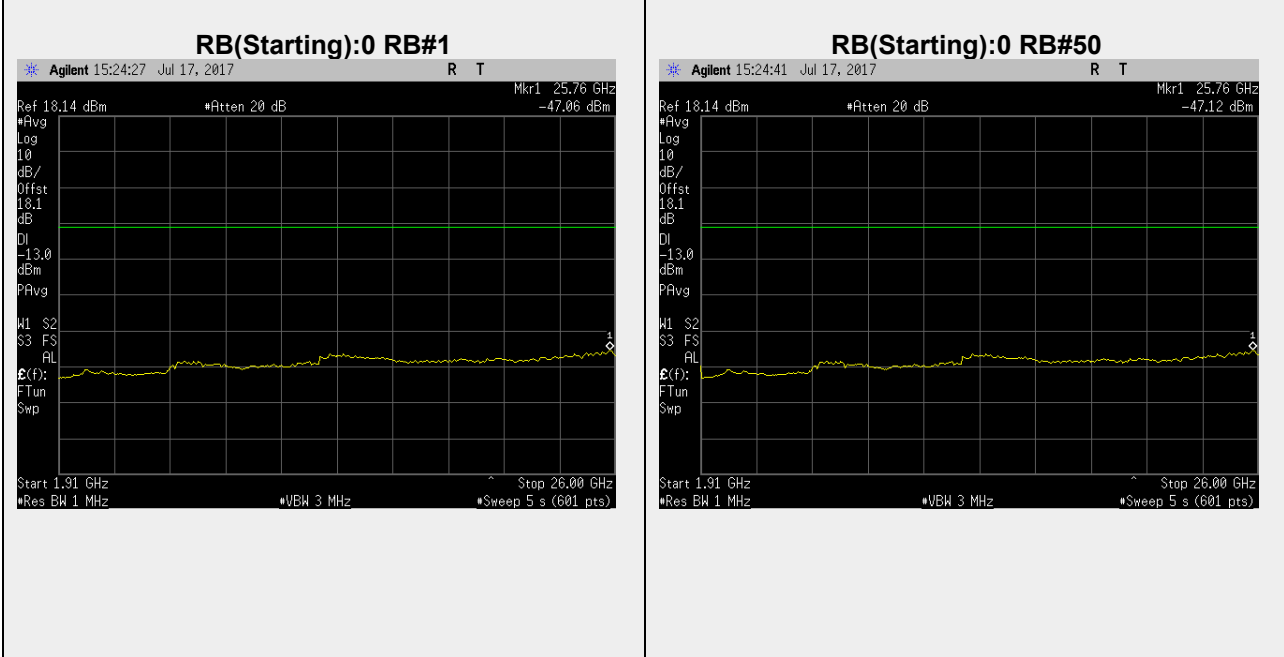


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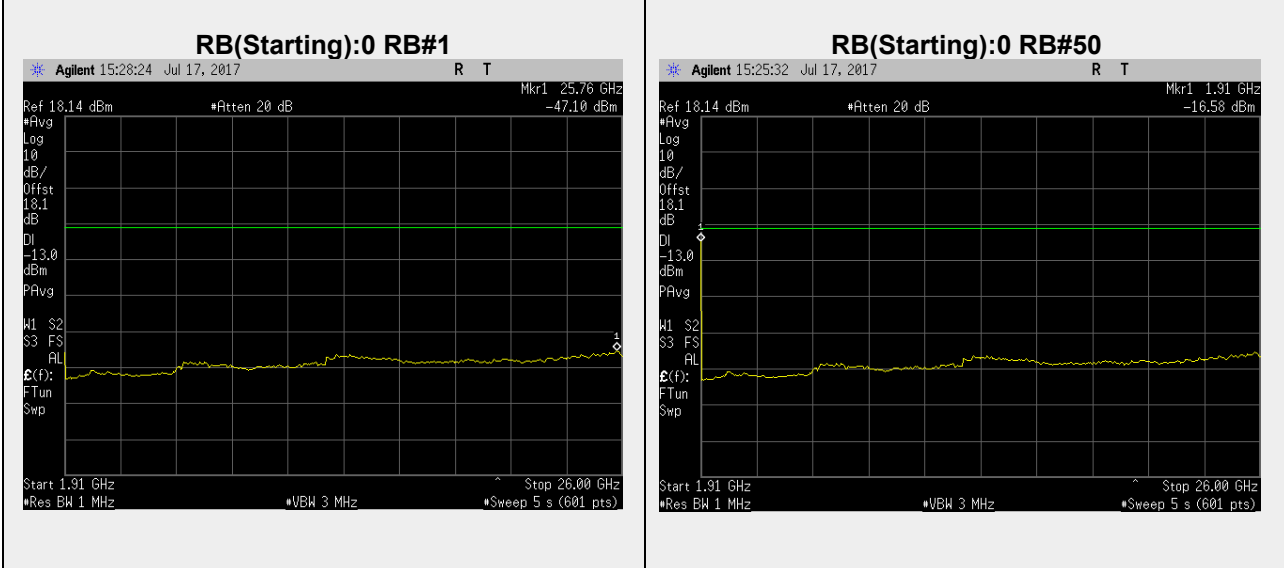


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Frequency: 1880.0 MHz Bandwidth: 10MHz Mode: QPSK Frequency Range: 1910.00 – 26000.00MHz



Frequency: 1905.0 MHz Bandwidth: 10MHz Mode: QPSK Frequency Range: 1910.00 – 26000.00MHz

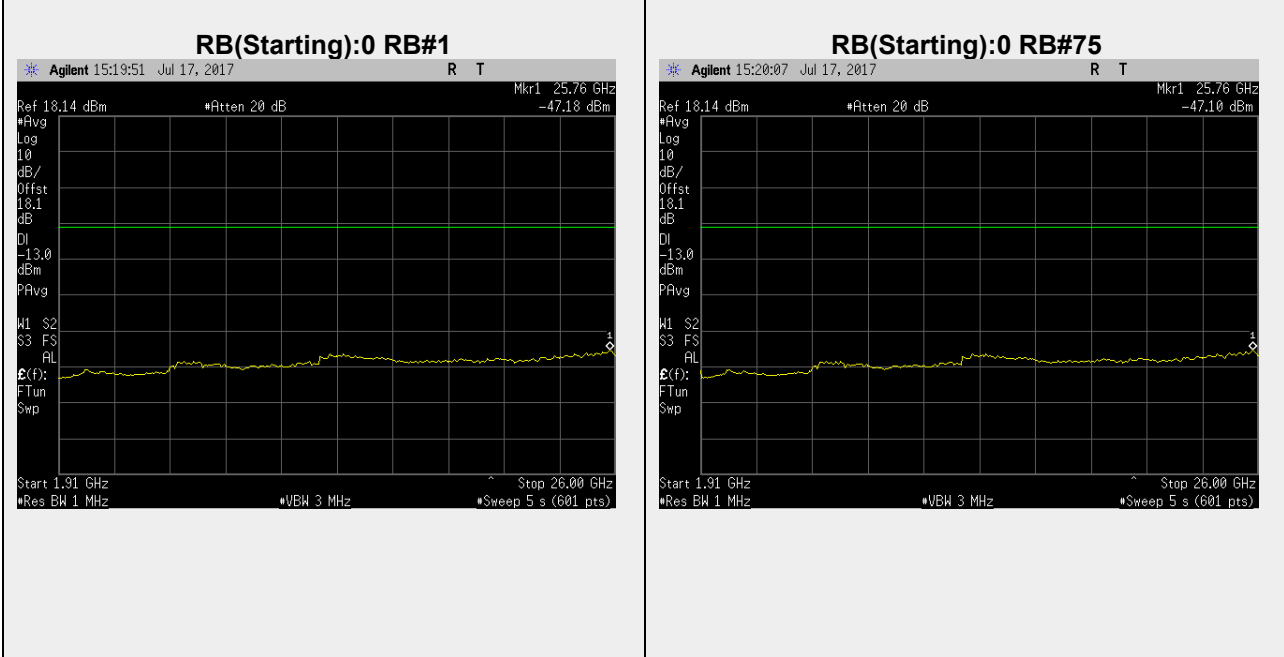


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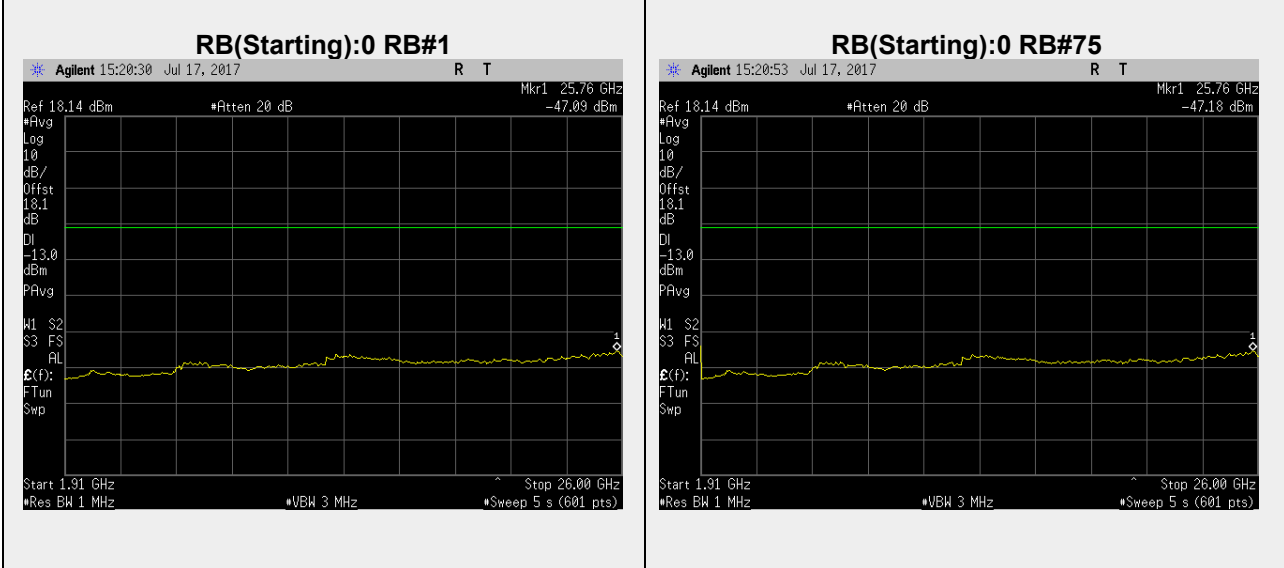


Title: Kumu Networks KU5B01LTE02-US
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Frequency: 1857.5 MHz Bandwidth: 15MHz Mode: QPSK Frequency Range: 1910.00 – 26000.00MHz



Frequency: 1880.0 MHz Bandwidth: 15MHz Mode: QPSK Frequency Range: 1910.00 – 26000.00MHz

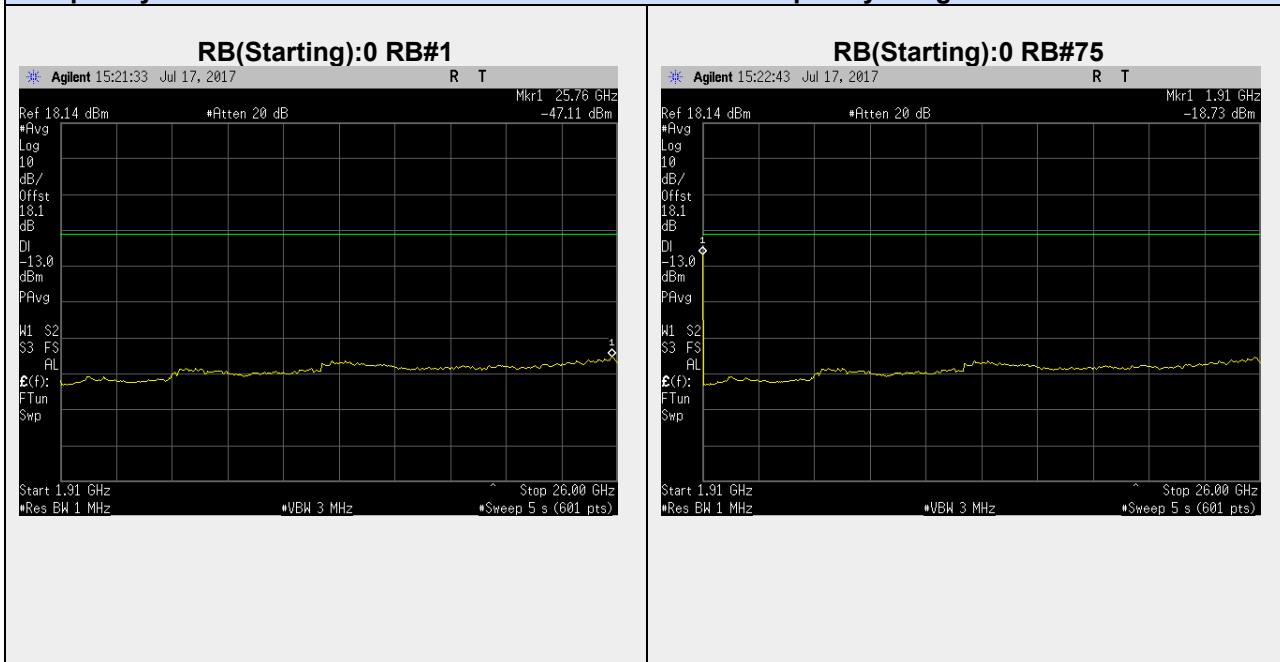


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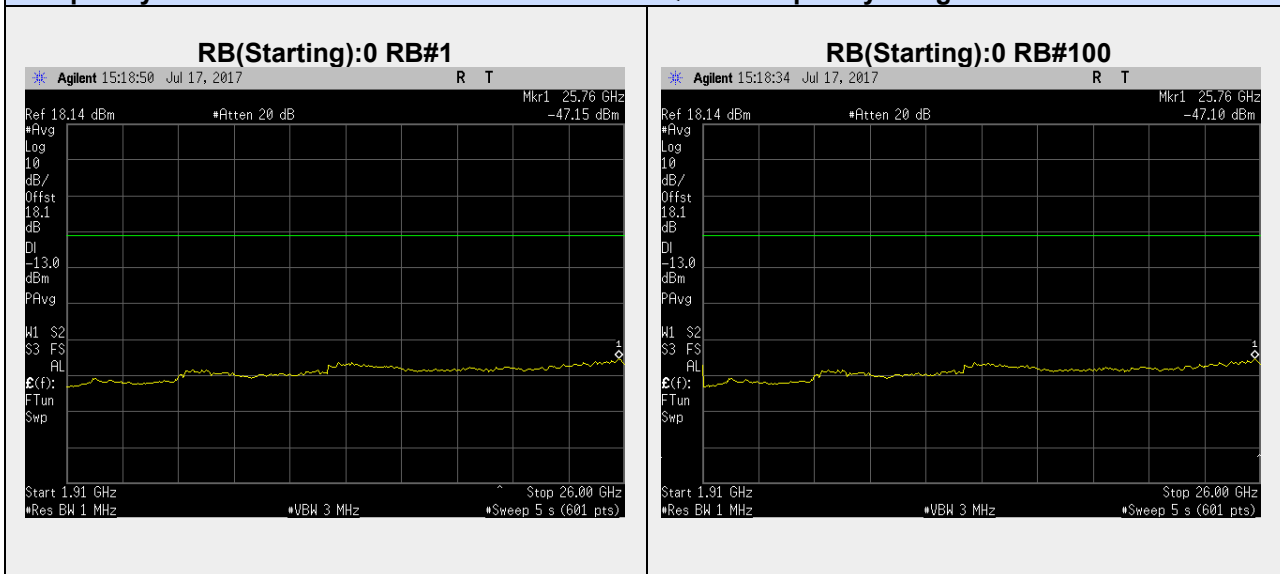


Title: Kumu Networks KU5B01LTE02-US
To: FCC Part 24E & IC RSS-133 Issue 6
Serial #: KUMU03-U4 Rev A
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Frequency: 1902.5 MHz Bandwidth: 15MHz Mode: QPSK Frequency Range: 1910.00 – 26000.00MHz



Frequency: 1860.0 MHz Bandwidth: 20MHz Mode: QPSK Frequency Range: 1910.00 – 26000.00MHz

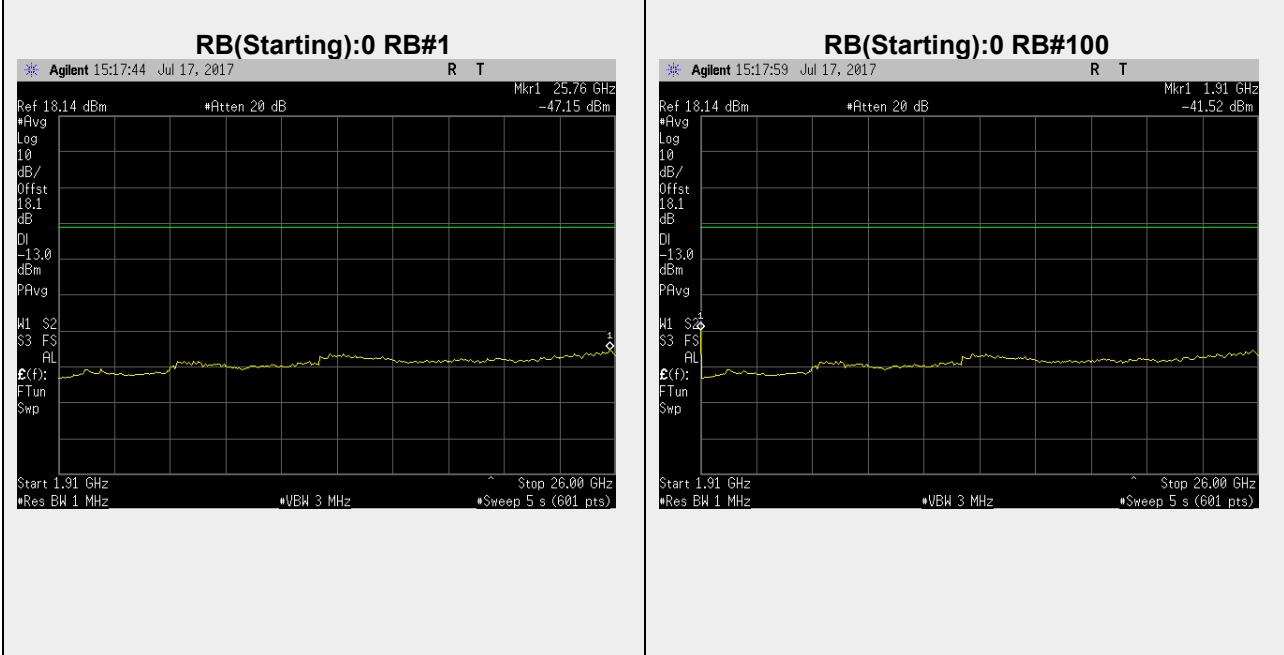


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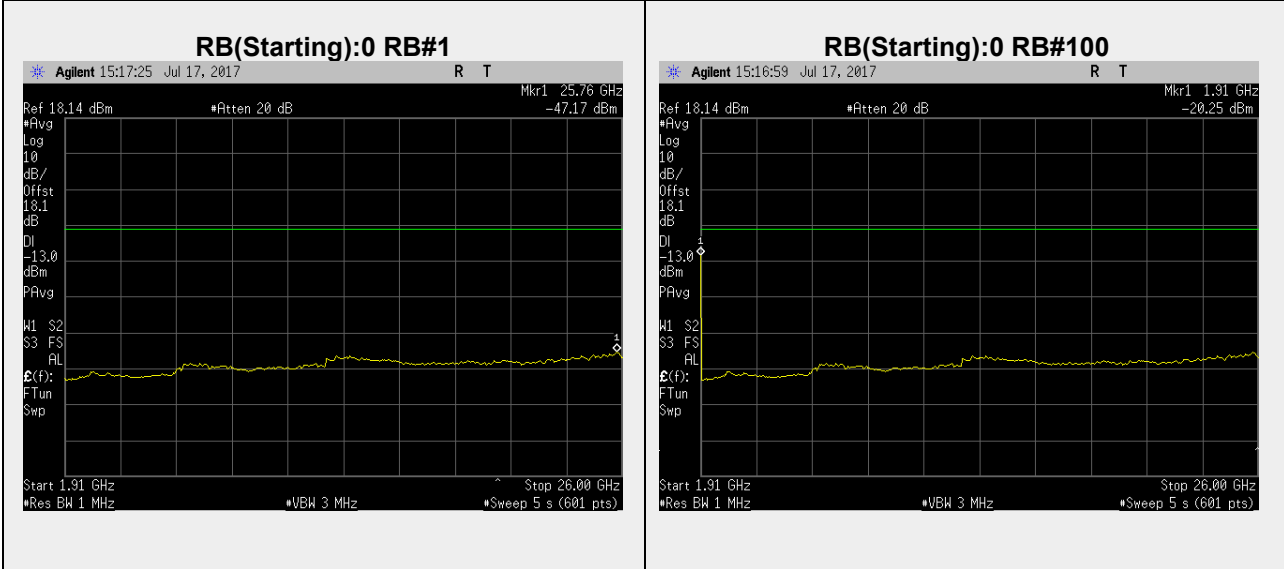


Title: Kumu Networks KU5B01LTE02-US
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Frequency: 1880.0 MHz Bandwidth: 20MHz Mode: QPSK Frequency Range: 1910.00 – 26000.00MHz



Frequency: 1900.0 MHz Bandwidth: 20MHz Mode: QPSK Frequency Range: 1910.00 – 26000.00MHz

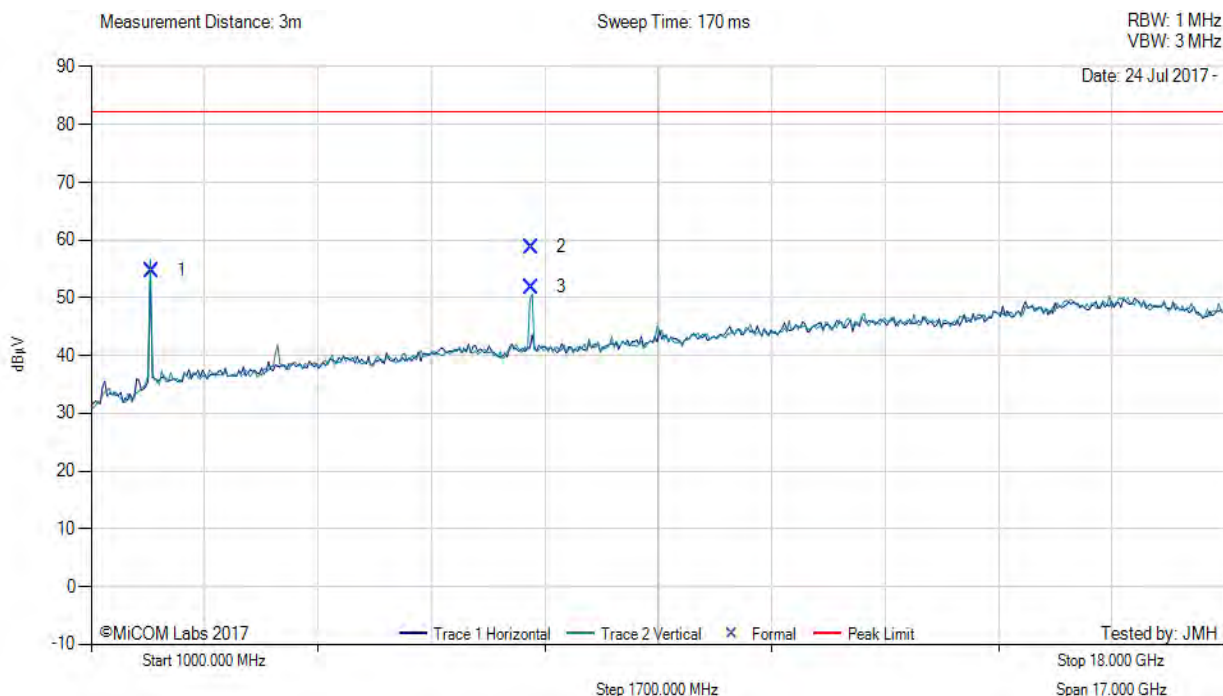


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A.1.4. Radiated Spurious Out of Band Emissions



Variant: , Test Freq: 1885.00 MHz, Power Setting: Default



| 1000.00 - 18000.00 MHz | | | | | | | | | | | | |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|----------|--------|---------|--------------|-----------|------------|
| Num | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1 | 1906.22 | 65.25 | 2.50 | -13.03 | 54.72 | Fundamental | Vertical | 100 | 0 | -- | -- | |
| 2 | 7600.01 | 61.42 | 4.39 | -6.99 | 58.82 | Max Peak | Vertical | 196 | 78 | 82.2 | -23.5 | Pass |
| 3 | 7600.01 | 54.40 | 4.39 | -6.99 | 51.80 | Max Avg | Vertical | 196 | 78 | 82.2 | -30.5 | Pass |

Test Notes: EUT powered up and originating call with Anritsu outside chamber, 43 – 10 LOG(P) Transmitter spurious limit = -13 dBm or 82.23 dBuV/m at 3 meters

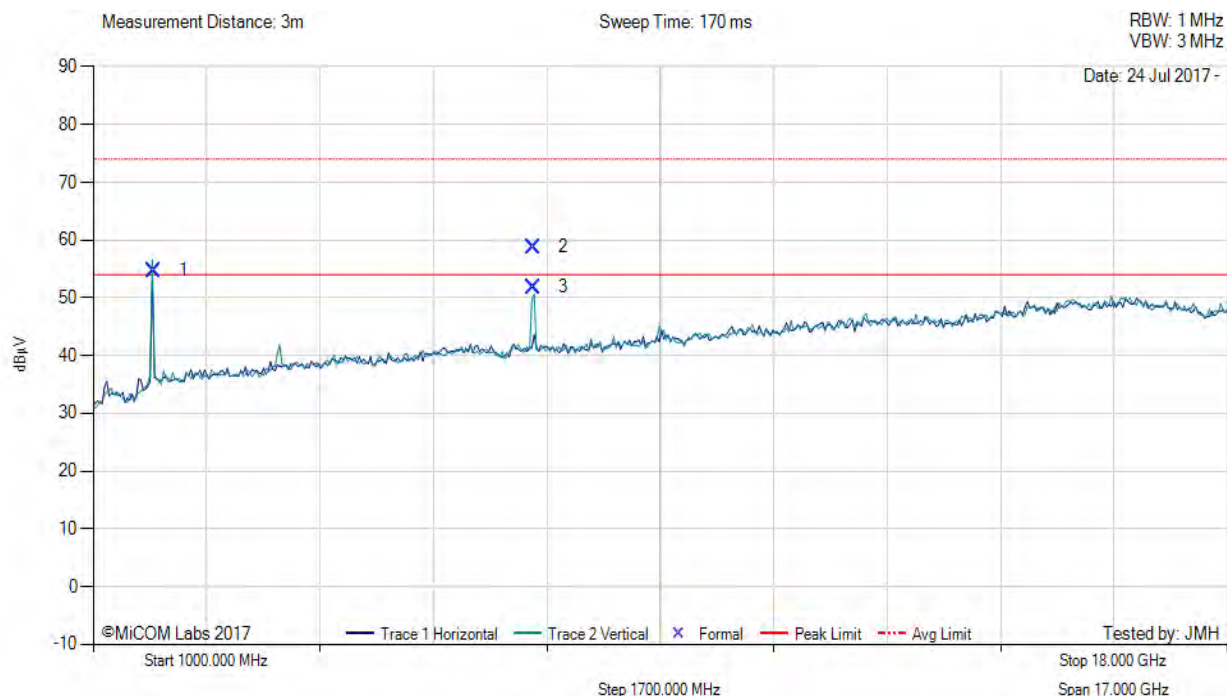
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A.1.5. Radiated Receiver Emissions



Variant: , Test Freq: 1885.00 MHz, Power Setting: Default



| 1000.00 - 18000.00 MHz | | | | | | | | | | | | |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|----------|--------|---------|--------------|-----------|------------|
| Num | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1 | 1906.22 | 65.25 | 2.50 | -13.03 | 54.72 | Fundamental | Vertical | 100 | 0 | -- | -- | |
| 2 | 7600.01 | 61.42 | 4.39 | -6.99 | 58.82 | Max Peak | Vertical | 196 | 78 | 74.0 | -15.2 | Pass |
| 3 | 7600.01 | 54.40 | 4.39 | -6.99 | 51.80 | Max Avg | Vertical | 196 | 78 | 54.0 | -3.2 | Pass |

Test Notes: EUT powered up and originating call with Anritsu outside chamber

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