

FCC REPORT

FCC Certification

Applicant Name:

ADRF Korea, inc

Address:

5-5, Mojeon-Ri, Backsa-Myun, Icheon-City,

Kyunggi-Do, Korea

Date of Issue: July 24, 2015 Test Site/Location: HCT CO., LTD., 74, Seoicheon-ro 578beon-gil, Majangmyeon, Icheon-si, Gyeonggi-do, Korea Report No.: HCT-R-1506-F076-2

HCT FRN: 0005866421

FCC ID : N52-ADX-HPR-A

APPLICANT : ADRF Korea, inc

EUT Type:	DAS(Distributed Antenna System)
Model:	ADX-HPR-A46
Frequency Ranges:	DL : 2 110 MHz ~ 2 155 MHz UL : 1 710 MHz ~ 1 755 MHz
Conducted Output Power:	DL : 50 W(47 dBm) UL : 0.1 mW(-10.00 dBm)
FCC Rules Part(s):	CFR 47, Part 27

Engineering Statement:

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of Part 27 of the FCC Rules under normal use and maintenance.

Report prepared by : Yong Hyun Lee Test engineer of RF Team

Approved by : Sang Jun Lee Manager of RF Team

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<u>Version</u>

TEST REPORT NO.	DATE	DESCRIPTION
HCT-R-1506-F076	June 30, 2015	- First Approval Report
HCT-R-1506-F076-1	July 08,2015	-Revised the Output max power
HCT-R-1506-F076-2	July 24,2015	- Revised Power limits and Emission limits



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1. CLIENT INFORMATION

The EUT has been tested by request of

Company	ADRF Korea, inc 5-5, Mojeon-Ri, Backsa-Myun, Icheon-City, Kyunggi-Do, Korea
Contact Point	Attention/ E-Mail: HK Song/ hk4464@adrftech.com Tel./ H.P. : +82-31-637-4435/ +82-10-3191-4773

- FCC ID: N52-ADX-HPR-A
- APPLICANT: ADRF Korea, inc
- EUT Type: DAS(Distributed Antenna System)
- Model: ADX-HPR-A46
- Frequency Ranges: DL : 2 110 MHz ~ 2 155 MHz UL : 1 710 MHz ~ 1 755 MHz
- Conducted Output Power: DL : 50 W(47 dBm) UL : 0.1 mW(-10.00 dBm)
- Antenna Gain(s) : 3 dBi
- Date(s) of Tests: 2015. 05. 15. ~ 2015. 06. 18
- FCC Rules Part(s): CFR Title 47 Part 27
- Measurement standard(s): ANSI/TIA-603-C-2004, KDB 971168 D01 v02r02, KDB 935210 D02 v03, KDB 935210 D05 v01
- Place of Tests: 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggido, Korea. (IC Recognition No. : 5944A-3)

2. FACILITIES AND ACCREDITATIONS

2.1. FACILITIES

The SAC(Semi-Anechoic Chamber) and conducted measurement facility used to collect the radiated data are located at the 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea. The site is constructed in conformance with the requirements of ANSI C63.4. (Version :2003) and CISPR Publication 22. Detailed description of test facility was submitted to the Commission and accepted dated February 28, 2014 (Registration Number: 90661).

2.2. EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."



3. TEST SUMMARY

3.1. STANDARDS

The following tests were conducted on a sample of the equipment for the purpose of demonstrating

compliance with

FCC Part 24.

Description	Reference	Results
Conducted RF Output Power	§2.1046; §27.50	Compliant
Occupied Bandwidth	§2.1049	Compliant
Spurious Emissions at Antenna Terminals	§2.1051, §27.53	Compliant
Out of Band Rejection	KDB 935210 D03 v02r01	Compliant
Radiated Spurious Emissions	§2.1053, §27.53	Compliant
Frequency Stability	§2.1055, §27.54	N/A The EUT does not perform frequency translation

3.2. MODE OF OPERATION DURING THE TEST

The EUT was operated in a manner representative of the typical usage of the equipment.

During all testing, system components were manipulated within the confines of typical usage to maximize each emission.

The device does not supply antenna(s) with the system, so the dummy loads were connected to the RF output ports for radiated spurious emission testing.

4. STANDARDS ENVIRONMENTAL TEST CONDITIONS

Temperature :	+ 15 ℃ to + 35 ℃	
Relative humidity:	30 % to 60 %	
Air pressure	860 mbar to 1 060 mbar	



5. TEST EQUIPMENT

Manufacturer	Model / Equipment	Cal Interval	Calibration Date	Serial No.
Agilent	E4438C /Signal Generator	Annual	09/11/2014	MY42082646
Agilent	N5182A /Signal Generator	Annual	04/07/2015	MY50141649
NANGYEUL CO., LTD.	NY-THR18750/ Temperature and Humidity Chamber	Annual	10/29/2014	NY-2009012201A
Agilent	N9020A /Signal Analyzer	Annual	04/10/2015	US46220219
WEINSCHEL	67-30-33 / Fixed Attenuator	Annual	11/04/2014	BU5347
Weinschel	AF9003-69-31 / Step Attenuator	Annual	10/24/2014	11787
HD	MA240/ Antenna Position Tower	N/A	N/A	556
EMCO	1050/ Turn Table	N/A	N/A	114
HD GmbH	HD 100/ Controller	N/A	N/A	13
MITEQ	AMF-6D-001180-35-20P/AMP	Annual	09/04/2014	1081666
Schwarzbeck	BBHA 9120D/ Horn Antenna	Biennial	09/01/2014	147
Schwarzbeck	VULB 9160/TRILOG Antenna	Biennial	11/17/2014	3150

6. RF OUTPUT POWER

Test Requirements:

§ 2.1046 Measurements required: RF power output:

§ 2.1046 (a) For transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in §2.1033(c)(8). The electrical characteristics of the radio frequency load attached to the output terminals when this test is made shall be stated.

§ 2.1046 (b) For single sideband, independent sideband, and single channel, controlled carrier radiotelephone transmitters, the procedure specified in paragraph (a) of this section shall be employed and, in addition, the transmitter shall be modulated during the test as specified and as applicable in § 2.1046 (b) (1-5). In all tests, the input level of the modulating signal shall be such as to develop rated peak envelope power or carrier power, as appropriate, for the transmitter.

§ 2.1046 (c) For measurements conducted pursuant to paragraphs (a) and (b) of this section, all calculations and methods used by the applicant for determining carrier power or peak envelope power, as appropriate, on the basis of measured power in the radio frequency load attached to the transmitter output terminals shall be shown. Under the test conditions specified, no components of the emission spectrum shall exceed the limits specified in the applicable rule parts as necessary for meeting occupied bandwidth or emission limitations.

§ 27.50 Power and antenna height limits.

(d) The following power and antenna height requirements apply to stations transmitting in the 1710–1755 MHz and 2110–2155 MHz bands:

(1) The power of each fixed or base station transmitting in the 2110–2155 MHz band and located in any county with population density of 100 or fewer persons per square mile, based upon the most recently available population statistics from the Bureau of the Census

(2) The power of each fixed or base station transmitting in the 2110–2155 MHz band and situated in any geographic location other than that described in paragraph (d)(1) is limited to:

(A) an equivalent isotropically radiated power (EIRP) of 1640 watts when transmitting with an emission bandwidth of 1 MHz or less;

(B) an EIRP of 1640 watts/MHz when transmitting with an emission bandwidth greater than 1 MHz.

(4) Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP. Fixed stations operating in this band are limited to a maximum antenna height of 10 meters above ground. Mobile and portable stations operating in this band must employ a means for limiting power to the minimum necessary for successful communications.

Test Procedures:

Measurements were in accordance with the test methods section 3.5.2 of KDB 935210 D05 v01.

a) Connect a signal generator to the input of the EUT.

b) Configure to generate the AWGN (broadband) test signal.

c) The frequency of the signal generator shall be set to the frequency of (f0) as determined from 3.3.

d) Connect a spectrum analyzer or power meter to the output of the EUT using appropriate attenuation as necessary.

e) Set the signal generator output power to a level that produces an EUT output level that is just below the AGC threshold (see 3.2), but not more than 0.5 dB below.

f) Measure the output power of the EUT and record (Power measurement with a spectrum analyzer).

g) Remove the EUT from the measurement setup and using the same signal generator settings, repeat the power measurement on the input signal to the EUT and record as input power.

h) Repeat the procedure with the narrowband test signal.

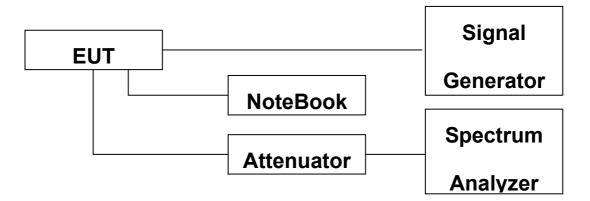
i) Repeat the procedure for both test signals with input signal amplitude set to 3 dB above the AGC threshold level.

j) Repeat for all frequency bands authorized for use by the EUT.

Power measurement Method :

Guidance for performing input/output power measurements using a spectrum or signal analyzer is provided in 5.2 of KDB Publication 971168.





Block Diagram 1. RF Power Output Test Setup

Test Results:

Input Signal	Input Level (dBm)	Maximum Amp Gain
LTE 20 MHz	DL : -11.8 dBm UL : -47.3 dBm	DL : 58 dB UL : 38 dB



[Downlink]

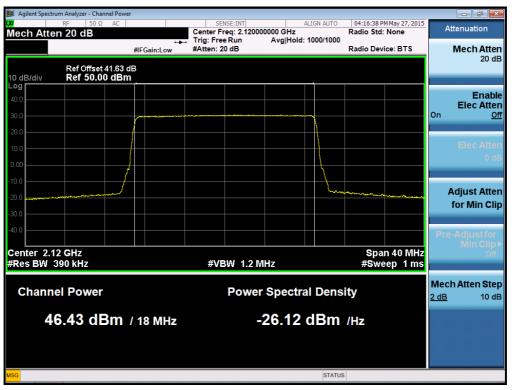
	Observat	Frequency	Output Power	
	Channel	(MHz)	(dBm)	(W)
	Low	2120.00	46.43	43.95
AWS (AGC threshold)	Middle	2132.50	46.48	44.46
	High	2145.00	46.50	44.67
	Low	2120.00	46.45	44.16
AWS ('+3dBm above the AGC threshold)	Middle	2132.50	46.58	45.50
	High	2145.00	46.54	45.08

[Uplink]

	Ohennel	Frequency (MHz)	Output Power	
	Channel		(dBm)	(mW)
	Low	1720.00	-8.80	0.132
AWS (AGC threshold)	Middle	1732.50	-8.66	0.136
	High	1745.00	-8.64	0.137

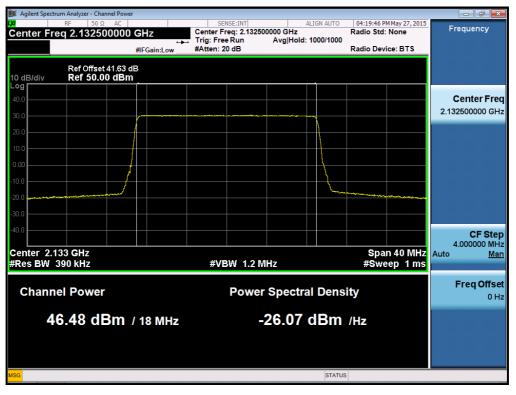


Plots of RF Output Power

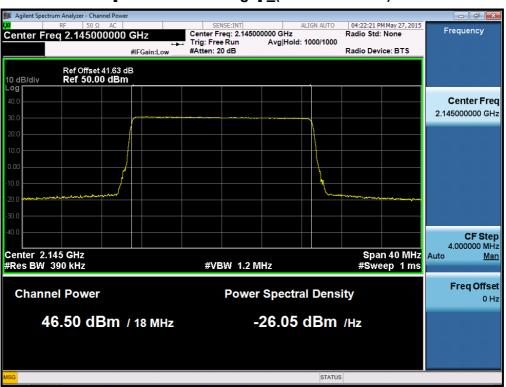


[AWS Downlink Low]_(AGC threshold)

[AWS Downlink Middle] _(AGC threshold)







[AWS Downlink High] _(AGC threshold)

[AWS Downlink Low]_('+3dBm above the AGC threshold)







[AWS Downlink Middle] _('+3dBm above the AGC threshold)

[AWS Downlink High] _('+3dBm above the AGC threshold)



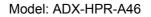




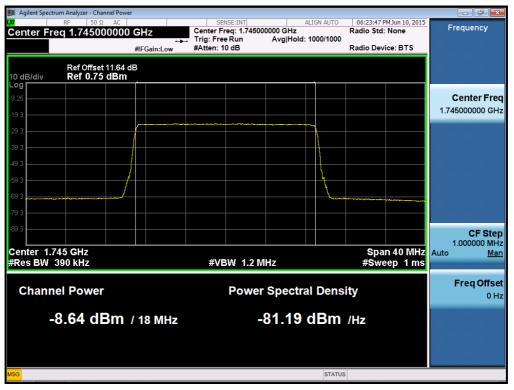
[AWS Uplink Low]_(AGC threshold)

[AWS Uplink Middle] _(AGC threshold)









[AWS Uplink High] _(AGC threshold)

7. OCCUPIED BANDWIDTH

FCC Rules

Test Requirement(s): § 2.1049 Measurements required: Occupied bandwidth:

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to

0.5 percent of the total mean power radiated by a given emission shall be measured

under the specified conditions of § 2.1049 (a) through (i) as applicable.

Test Procedures:

Measurements were in accordance with the test methods section 3.4 of KDB 935210 D05 v01 and section 4.2 of KDB 971168 D01 v02r02.

Test is 99% OBW measured and used.

a) Connect a signal generator to the input of the EUT.

b) Configure the signal generator to transmit the AWGN signal.

c) Configure the signal amplitude to be just below the AGC threshold level (see 3.2), but not more than 0.5 dB below.

d) Connect a spectrum analyzer to the output of the EUT using appropriate attenuation.

e) Set the spectrum analyzer center frequency to the center frequency of the operational band under

test. The span range of the spectrum analyzer shall be between 2 times to 5 times the OBW.

f) The nominal resolution bandwidth (RBW) shall be in the range of 1% to 5 % of the anticipated OBW, and the VBW shall be \geq 3 \times RBW.

g) Set the reference level of the instrument as required to preclude the signal from exceeding the maximum spectrum analyzer input mixer level for linear operation. In general, the peak of the spectral envelope must be more than [10 log (OBW / RBW)] below the reference level.

NOTE—Steps f) and g) may require iteration to enable adjustments within the specified tolerances.

h) The noise floor of the spectrum analyzer at the selected RBW shall be at least 36 dB below the reference level.

i) Set spectrum analyzer detection function to positive peak.

j) Set the trace mode to max hold.

k) Use the 99 % power bandwidth function of the spectrum analyzer (if available) and report the measured bandwidth.

I) Repeat steps e) to k) with the input signal connected directly to the spectrum analyzer (i.e., input signal measurement).

m) Compare the spectral plot of the input signal (determined from step I) to the output signal (determined from step k) to affirm that they are similar (in passband and rolloff characteristic features and relative spectral locations), and include plot(s) and descriptions in test report.

n) Repeat for all frequency bands authorized for use by the EUT.



Test Results: The EUT complies with the requirements of this section.

Input Signal	Input Level (dBm)	Maximum Amp Gain
LTE 20 MHz	DL : -11.8 dBm UL : -47.3 dBm	DL : 58 dB UL : 38 dB

[Downlink Output]

	Channel	Frequency (MHz)	OBW (MHz)
	Low	2120.00	17.911
AWS	Middle	2132.50	17.930
	High	2145.00	17.917

[Downlink Input]

	Channel	Frequency (MHz)	OBW (MHz)
	Low	2120.00	17.930
AWS	Middle	2132.50	17.933
	High	2145.00	17.927

[Uplink Output]

	Channel	Frequency (MHz)	OBW (MHz)
	Low	1720.00	17.933
AWS	Middle	1732.50	17.938
	High	1745.00	17.915

[Uplink Input]

	Channel	Frequency (MHz)	OBW (MHz)
	Low	1720.00	17.919
AWS	Middle	1732.50	17.930
	High	1745.00	17.929

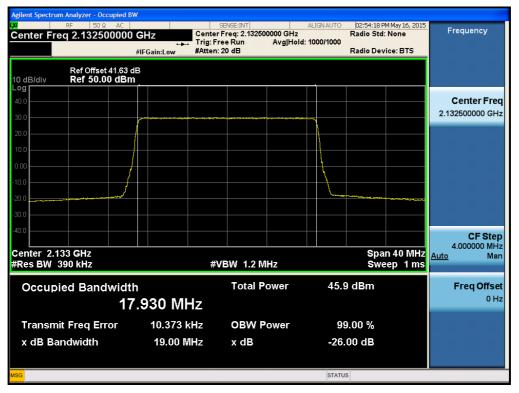


Plots of Occupied Bandwidth

02:49:18 PM May 16, 2015 Radio Std: None Center Freq: 2.120000000 GHz Trig: Free Run Avg|Hold #Atten: 20 dB Frequency Center Freq 2.120000000 GHz Avg|Hold: 1000/1000 Radio Device: BTS #IFGain:Low Ref Offset 41.63 dB Ref 50.00 dBm 10 dB/div og **Center Freq** 2 120000000 GHz CF Step 4.000000 MHz Center 2.12 GHz #Res BW 390 kHz Span 40 MHz Sweep 1 ms <u>Auto</u> Man #VBW 1.2 MHz 46.0 dBm **Total Power Occupied Bandwidth Freq Offset** 0 Hz 17.911 MHz **Transmit Freg Error** 25.708 kHz **OBW Power** 99.00 % x dB Bandwidth 18.99 MHz x dB -26.00 dB

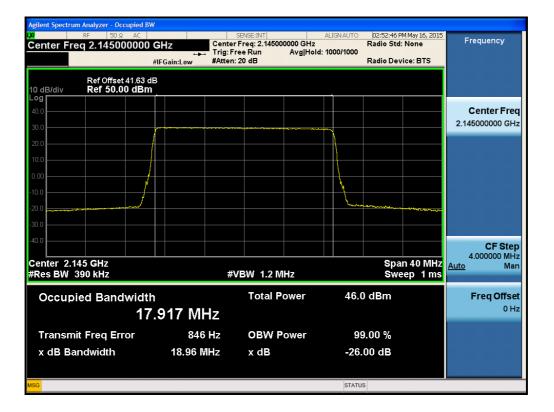
[Output AWS Downlink Low]

[Output AWS Downlink Middle]





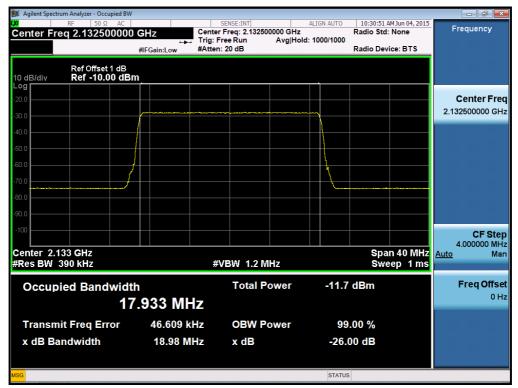
[Output AWS Downlink High]



[Input AWS Downlink Low]



[Input AWS Downlink Middle]



[Input AWS Downlink High]



[Output AWS Uplink Low]



[Output AWS Uplink Middle]

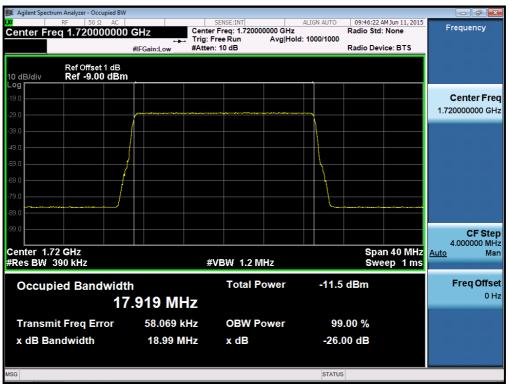




[Output AWS Uplink High]



[Input AWS Uplink Low]

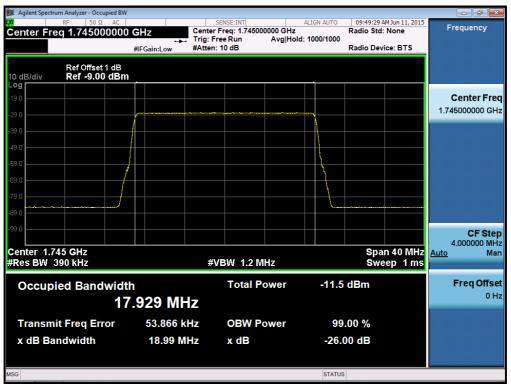


[Input AWS Uplink Middle]





[Input AWS Uplink High]



8. OUT OF BAND REJECTION

Test Requirement(s): KDB 935210 D02 v03

Out of Band Rejection – Test for rejection of out of band signals. Filter freq. response plots are acceptable.

Test Procedures:

a) Connect a signal generator to the input of the EUT.

b) Configure a swept CW signal with the following parameters:

1) Frequency range = \pm 250 % of the passband from the center of the passband.

2) Level = a sufficient level to affirm that the out-of-band rejection is > 20 dB above the noise floor and will not engage the AGC during the entire sweep.

3) Dwell time = approx. 10 ms.

4) Number of points = SPAN/(RBW/2).

c) Connect a spectrum analyzer to the output of the EUT using appropriate attenuation.

d) Set the span of the spectrum analyzer to the same as the frequency range of the signal generator.

e) Set the resolution bandwidth of the spectrum analyzer to be 1 % to 5 % of the passband and the video bandwidth shall be set to \geq 3 \times RBW.

f) Set the detector to Peak Max-Hold and wait for the spectrum analyzer's spectral display to fill.

g) Place a marker to the peak of the frequency response and record this frequency as f0.

h) Place two markers, one at the lowest and the other at the highest frequency of the envelope of the spectral display such that each marker is at or slightly below the -20 dB down amplitude to determine the 20 dB bandwidth. Capture the frequency response of the EUT.

Test Results: The EUT complies with the requirements of this section.

Input Level (dBm)	Maximum Amp Gain	
Input Signal : Sinusoidal		
DL: -11.8 dBm	DL : 58 dB	
UL : -47.3 dBm	UL : 38 dB	



[Downlink]

20 dB point frequency (MHz)	Output power (dBm)	Gain (dB)
2085.85 ~ 2176.70	46.01	57.81

[Uplink]

20 dB point frequency (MHz)	Output power (dBm)	Gain (dB)
1691.10 ~ 1773.675	-8.36	38.94

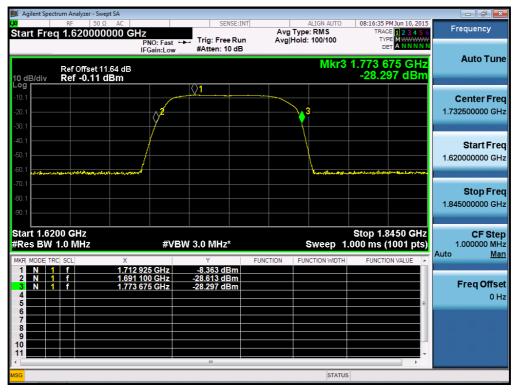


Out of Band Rejection

[Downlink]



[Uplink]



9. SPURIOUS AND HARMONIC EMISSION AT ANTENNA TERMINAL

Test Requirement(s): § 2.1051 Measurements required: Spurious emissions at antenna terminals:

The radio frequency voltage or powers generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of each harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in § 2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified.

§ 27.53 Emission limits

(h) For operations in the 1710–1755 MHz and 2110–2155 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P) dB$.

Test Procedures:

Measurements were in accordance with the test methods section

3.5.2 of KDB 935210 D05 v01.

1. General

Spurious emissions shall be measured using a single test signal sequentially tuned to the low, middle and high channels or frequencies within each authorized frequency band of operation.

Out-of-band/block emissions (including intermodulation products) shall be measured under each of the following two stimulus conditions:

a) two adjacent test signals sequentially tuned to the lower and upper frequency band/block edges;

b) a single test signal, sequentially tuned to the lowest and highest frequencies or channels within the frequency band/block under examination.

NOTE—Single channel boosters that cannot accommodate two simultaneous signals within the passband, can be excluded from the test stipulated in step a).

2. EUT out-of-band/block emissions conducted measurement

a) Connect a signal generator to the input of the EUT.

NOTE—If the signal generator is not capable of generating two modulated carriers simultaneously, then two discrete signal generators can be connected with an appropriate combining network to support the two-tone test.

b) Set the signal generator to produce two AWGN signals as previously described (e.g., 4.1 MHz OBW).

c) Set the center frequencies such that the AWGN signals occupy adjacent channels, as defined by industry standards such as 3GPP or 3GPP2, at the upper edge of the frequency band or block of interest.

d) Set the composite power levels such that the input signal is just below the AGC threshold (see 3.2), but not more than 0.5 dB below. The composite power can be measured using the procedures provided in KDB Publication 971168, but it will be necessary to expand the power integration bandwidth so as to include both of the transmit channels. Alternatively, the composite power can be measured using an average power meter as described in KDB Publication 971168.

e) Connect a spectrum analyzer to the output of the EUT using appropriate attenuation as necessary.

f) Set the RBW = reference bandwidth in the applicable rule section for the supported frequency band (typically 1 % of the emission bandwidth, 100 kHz, or 1 MHz)

g) Set the VBW = $3 \times RBW$.

h) Set the detector to power averaging (rms) detector.

i) Set the Sweep time = auto-couple.

j) Set the analyzer start frequency to the upper block edge frequency and the stop frequency to the upper block edge frequency plus 300 kHz or 3 MHz for frequencies below and above 1 GHz, respectively.

k) Trace average at least 100 traces in power averaging (i.e., rms) mode.

I) Use the marker function to find the maximum power level.

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

n) Repeat the procedure with the composite input power level set to 3 dB above the AGC threshold.

o) Reset the input signals frequencies to the lower edge of the frequency block or band under examination.

p) Reset the spectrum analyzer start frequency to the lower block edge frequency minus 300 kHz, or 3 MHz (for frequencies below and above 1 GHz, respectively), and the stop frequency to the lower band or block edge frequency.

q) Repeat steps k) to n).

r) Repeat steps a) to q) with the signal generator configured for a single test signal tuned as close as possible to the block edges.

s) Repeat steps a) to r) with the narrowband test signal.

t) Repeat steps a) to s) for all authorized frequency bands or blocks used by the EUT.

3. EUT spurious emissions conducted measurement

a) Connect a signal generator to the input of the EUT.

b) Set the signal generator to produce the broadband test signal as previously described (e.g., 4.1 MHz OBW AWGN).

c) Set the center frequency of the test signal to the lowest available channel within the frequency band or block.

d) Set the EUT input power to a level that is just below the AGC threshold (see 3.2), but not more than 0.5 dB below.

e) Connect a spectrum analyzer to the output of the EUT using appropriate attenuation as necessary.

f) Set the RBW = reference bandwidth in the applicable rule section for the supported frequency band of operation (e.g., reference bandwidth is typically 100 kHz or 1 MHz). g) Set the VBW \geq 3 × RBW.

g Set the VBW $\geq 5 \land RBW$.

h) Set the Sweep time = auto-couple.

i) Set the analyzer start frequency to the lowest radio frequency signal generated in the equipment, without going below 9 kHz, and the stop frequency to the lower band/block edge frequency minus 100 kHz or 1 MHz, as specified in the applicable rule part.

NOTE—The number of measurement points in each sweep must be \geq (2 \times

span/RBW) which may require that the measurement range defined by the start and stop frequencies be subdivided, depending on the available number of measurement points provided by the spectrum analyzer.

j) Select the power averaging (rms) detector function.

k) Trace average at least 10 traces in power averaging (i.e., rms) mode.

I) Use the peak marker function to identify the highest amplitude level over each measured frequency range. Record the frequency and amplitude and capture a plot for inclusion in the test report.

m) Reset the analyzer start frequency to the upper band/block edge frequency plus 100 kHz or 1 MHz, as specified in the applicable rule part, and the analyzer stop frequency to 10 times the highest frequency of the fundamental emission (see §2.1057). Note that the number of measurement points in each sweep must be \geq (2 × span/RBW) which may require that the measurement range defined by the start and stop

frequencies be subdivided, depending on the available number of measurement points provided by the spectrum analyzer.

n) Trace average at least 10 traces in power averaging (i.e., rms) mode.

o) Use the peak marker function to identify the highest amplitude level over each of the measured frequency ranges. Record the frequency and amplitude and capture a plot for inclusion in the test report and provide tabular data, if required.

p) Repeat the procedure with the input test signals tuned to a middle band/block frequency/channel and then a high band/block frequency/channel.

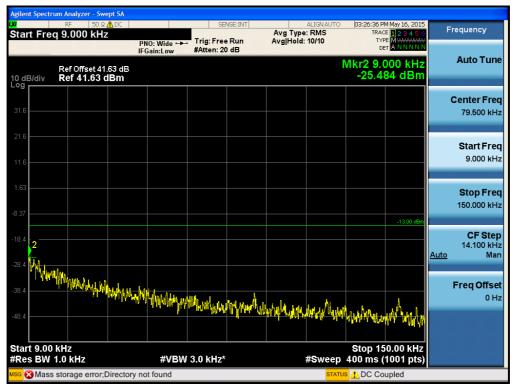
q) Repeat entire procedure with the narrowband test signal.

r) Repeat for all authorized frequency bands/blocks used by the EUT.

Test Results: The EUT complies with the requirements of this section. There were no Detectable Spurious emissions for this EUT.

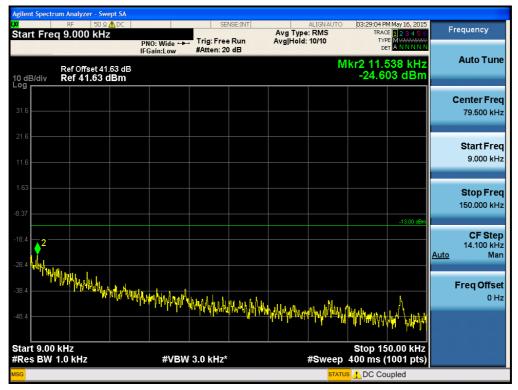


Plots of Spurious Emission Conducted Spurious Emissions (9 kHz – 150 kHz)



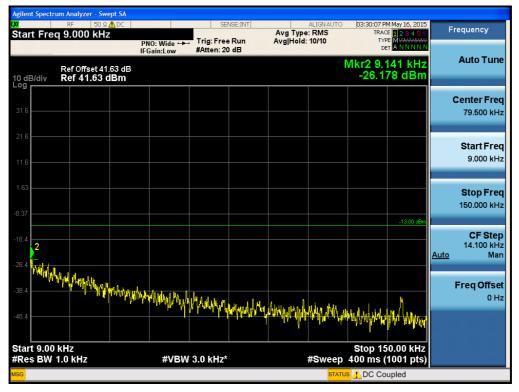
[AWS Downlink Low]

[AWS Downlink Middle]





[AWS Downlink High]



[AWS Uplink Low]





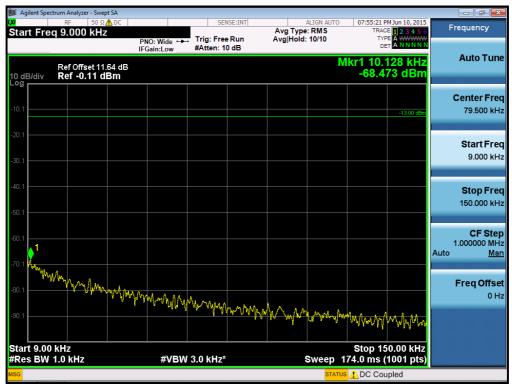
07:54:34 PM Jun 10, 20 Avg Type: RMS Avg|Hold: 10/10 Frequency Start Freq 9.000 kHz 12345 Trig: Free Run #Atten: 10 dB TYP PNO: Wide ↔→ IFGain:Low en: 10 dB DE Auto Tune Mkr1 9.141 kHz -69.061 dBm Ref Offset 11.64 dB Ref -0.11 dBm 10 dB/div **Center Freq** 79 500 kHz Start Freq 9.000 kHz Stop Freq 150.000 kHz CF Step 1.000000 MHz Auto Man m Mary Mary May Mary Mark Freq Offset 0 Hz w m/ Start 9.00 kHz #Res BW 1.0 kHz Stop 150.00 kHz Sweep 174.0 ms (1001 pts)

[AWS Uplink Middle]

[AWS Uplink High]

L DC Coupled

#VBW 3.0 kHz*



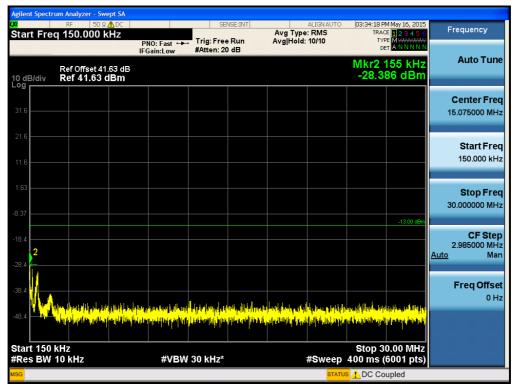


Conducted Spurious Emissions (150 kHz – 30 MHz)

07:21:05 PM May 27, 2015 TRACE 1 2 3 4 5 6 TYPE DET A N N N N AUTO Avg Type: RMS Avg|Hold: 10/10 Frequency 150.000 kHz Start Frec PNO: Fast ↔→ IFGain:Low Trig: Free Run #Atten: 20 dB Auto Tune Mkr1 155 kHz -28.136 dBm Ref Offset 41.63 dB Ref 39.94 dBm 10 dB/div **Center Freq** 15.075000 MHz Start Freq 150.000 kHz Stop Freq 30.000000 MHz CF Step 2.985000 MHz Auto Man Freq Offset 0 Hz لاحالان اللو بر الدريانية واله an a dhara ta a 100 ЬĽ. Start 150 kHz #Res BW 10 kHz Stop 30.00 MHz #Sweep 400.0 ms (6001 pts) #VBW 30 kHz* DC Coupled

[AWS Downlink Low]

[AWS Downlink Middle]





Agilent Spectru	um Analyzer - Swept SA					
Start Free	RF 50Ω <u>A</u> DC	SE	NSE:INT Avg Type	E: RMS TR.	PM May 16, 2015 ACE 1 2 3 4 5 6	Frequency
Otart Free	4 100.000 KHZ	PNO: Fast ↔ Trig: Free IFGain:Low #Atten: 20	e Run Avg Hold	· 10/10 T	DET A N N N N N	
10 dB/div Log	Ref Offset 41.63 dB Ref 41.63 dBm				717 kHz 990 dBm	Auto Tune
31.6						Center Freq 15.075000 MHz
21.6						Start Freq 150.000 kHz
1.63 -8.37					-13.00 dBm	Stop Freq 30.000000 MHz
-18.4 -28.4						CF Step 2.985000 MHz uto Man
-38.4	a (na) a fil da Marina (la Marina).	taloya).	And a start of the s	ر من المربعة بالمربعة أوابية المربعة المربعة من المربعة من المربعة من المربعة من المربعة من المربعة من المربعة مستقدمة من المربعة من ال		Freq Offset 0 Hz
-48.4	nakan pertindakan pada tana dara tana ka	kon a talapaténé tanàna takéné dia gi		<mark>na na mana ina kana na mana kana kana kana kana kana</mark>		
#Res BW		#VBW 30 kHz*		#Sweep 400 ms		
MSG				STATUS 🥂 DC C	oupled	



	ilent Spect	trum Analyze										
<mark>IXI</mark> Store		RF	50 Ω/		SEN	NSE:INT	Avg Type	ALIGN AUTO		M Jun 10, 2015	Fr	requency
Sta	t Fred	q 150.0	00 K	PNO: Fast ↔ IFGain:Low	Trig: Free #Atten: 10		Avg Hold:		TYP			
10 dE Log	3/div	Ref Offs Ref -1(Mkr1 * -71.4	150 kHz 00 dBm		Auto Tune
-20.1										-13.00 dBm		Center Freq 5.075000 MHz
-30.1 -40.1												Start Freq 150.000 kHz
-50.1 -60.1											30	Stop Freq 0.000000 MHz
-70.1 -80.1	1										1 Auto	CF Step 1.000000 MHz <u>Man</u>
-90.1				na de la contra de l				<mark>en la contrata da la</mark>	anteren anteren di ja Jacob Santa Santa Jacka Santa Jacka Santa Santa Santa Santa Santa Santa Santa Santa Santa Jacob Santa Sant			Freq Offset 0 Hz
-100	t 150 k								Stop 2			
		KHZ 10 kHz		#VBW	/ 30 kHz*			Sweep 3	68.4 ms (0.00 MHz 6001 pts)		
MSG	_					í	í		DC Cou			

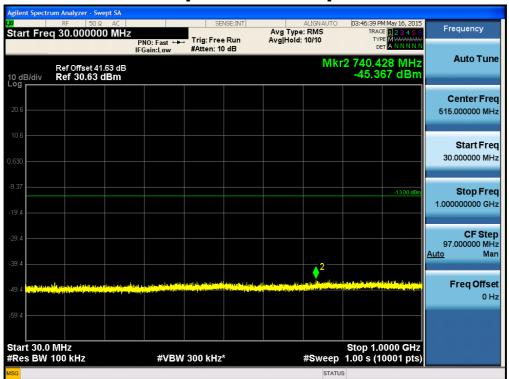
[AWS Uplink Middle]

🊺 Agi	ilent Spec		lyzer - Swe										7 X
<mark>الاا</mark> Star	t Fred	_R ⊧ a 150	50 Ω .000 k				NSE:INT	Avg Type	ALIGN AUTO RMS	TRAC	PM Jun 10, 2015	Frequen	су
					PNO:Fast ↔ FGain:Low	Trig: Free #Atten: 1		Avg Hold:	: 10/10	TY			
		Bof C)ffset 11							Mkr1	150 kHz	Auto	Tune
10 dE Log	3/div		-10.11							-71.1	25 dBm		
Log											-13.00 dBm	Center	From
-20.1												15.07500	
-30.1												Stor	t Frea
													00 kHz
-40.1												100.00	
-50.1												0 4	
												30.00000	Freq
-60.1	_												0 111 12
	1											CE	Step
-70.1	~											1.00000	0 MHz
-80.1												Auto	Man
												_	
-90.1	hiter	and play into		de als mittania		to can select the select	المراجع المراجع			ananii. waanaa	antimator	Freq	Offset 0 Hz
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-100													
	t 150									Stop 3	0.00 MHz		
	s BW	10 KH	Z		#VBW	/ 30 kHz*					6001 pts)		
MSG									STATUS	LDC Cοι	ipiea		



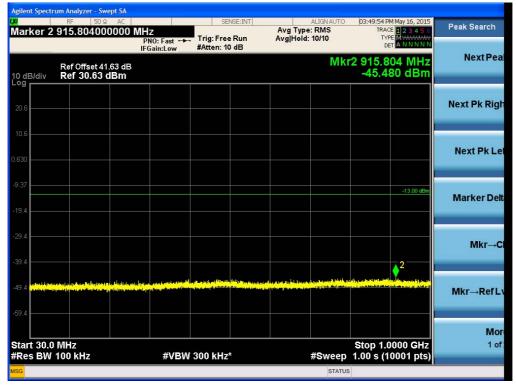
🊺 Agilent Sp	ectrum Analyze									
<mark>×</mark> Start Fre	_R ₌ eq 150.0	50 Ω <u>∧</u> DC 00 kHz			NSE:INT	Avg Type		TRAC	M Jun 10, 2015 E 1 2 3 4 5 6	Frequency
10 dB/div	Ref Offs	set 11.64 dB 0 .11 dBm	PNO: Fast IFGain:Low	, Trig: Free #Atten: 1		Avg Hold	: 10/10	DE Mkr1	160 kHz 56 dBm	Auto Tui
									-13.00 dBm	
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-20.1										15.075000 M
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-40.1										150.000 ki
40.1										
-50.1										Stop Fre
										30.000000 M
-60.1										00.000000 111
1										
70.1										CF Ste 1.000000 Mi
										Auto <u>M</u>
-80.1										
-90,1										Freq Offs
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-100				Lease free		and over 10.1	a second s			
Start 150) kHz / 10 kHz		#VRM	30 kHz*			Sween 3	Stop 3	0.00 MHz 6001 pts)	
	TV KHZ		# V D V V	JU KHZ				DC Cou		
~							STATUS		ipieu	





Conducted Spurious Emissions (30 MHz – 1 GHz) [AWS Downlink Low]

[AWS Downlink Middle]

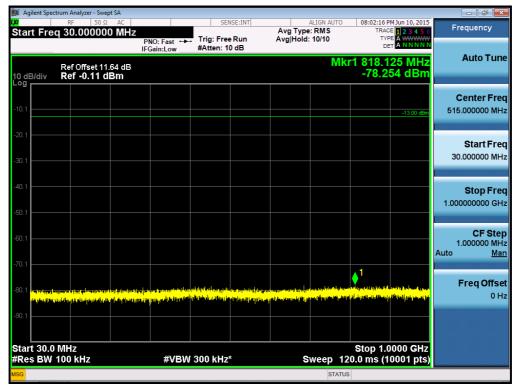


	RF 50 Ω AC		SEN	ISE:INT		ALIGN AUTO	03:50:51 PM	1 May 16, 2015	
arker 2	809.97700000			Run	Avg Type Avg Hold:		TRAC TYP	123456 M WWWWW ANNNNN	Peak Search
dB/div	Ref Offset 41.63 o Ref 30.63 dBm	dB n				Mkr	2 809.9 -45.0	77 MHz I0 dBm	NextPea
9 1.6									Next Pk Rig
30									Next Pk Lo
.4								-13.00 dBm	Marker De
.4							- 2		Mkr→
.4 <mark>ligeride</mark>	stalle et al leste being alle dat dat Regel et al leste dat	an di Januarya yang bang bang bang bang bang bang bang b	n sa tin ng katalan na katalan ka Ng katalan ng katalan na katalan ka	abi da guda alia tu	land den (Nebel	dang titun telak ketal bertak Kenyang terakan telak telak telak		на стати на прави Орима на маке и гранит	Mkr→Refl
4 art 30.0) MHz 100 kHz		W 300 kHz*			#Sweep	Stop 1.0	000 GHz	M a 1 o



🊺 Agile	ent Spectr	um Analyzer -	Swept SA								
l <mark>XI</mark> Start	Erea		0 Ω AC 000 MHz		SE	NSE:INT		ALIGN AUTO RMS	TRAC	M Jun 10, 2015	Frequency
ortant		50.000	000 11112	PNO: Fast ↔ IFGain:Low	Trig: Fre #Atten: 1		Avg Hold:		TYF		
10 dBi		Ref Offset Ref -0.1						M	kr1 909.5 -78.0	96 MHz 39 dBm	Auto Tune
Log -10.1										-13.00 dBm	Center Fred 515.000000 MHz
-20.1 -											Start Free 30.000000 MH:
-40.1 -											Stop Fred 1.000000000 GH:
-60.1 —											CF Step 1.000000 MH Auto <u>Mar</u>
-70.1 -	iland piles for	a di sini na ma ni ili <mark>n</mark>	er hier en ser	in the second		fellen Hintersforgere	lage for the second second		(ndfaardal) (ndfa) (ndfaard	1 Intelescitionalis tel	Freq Offsel
-90.1	iana () da in	<mark>(Date in Electrony)</mark>	in trade and in a filt of the second	a pana na mang na kataléh dénéh jénéh j		in a data da bilda kana da da gi yan sud s			a na sa na sa		
	30.0 P	VIHz 00 kHz		#\/B\/	/ / 300 kHz	*		weep 1	Stop 1.0 120.0 ms (1	0000 GHz	
MSG		00 RHZ			- 000 MHZ		0	STAT		ooorptaj	

[AWS Uplink Middle]





🎉 Agilent Spe	ectrum Analyzer - Swept SA								
<mark></mark> Start Fre	RF 50 Ω AC q 30.000000 MHz			ISE:INT	Avg Type Avg Hold		TRAC	M Jun 10, 2015	Frequency
	Ref Offset 11.64 dB	PNO: Fast ↔→ IFGain:Low	#Atten: 1		Avginoid		r1 879.5	26 MHz 11 dBm	Auto Tune
10 dB/div Log	Ref -0.11 dBm						-10.2	павш	
-10.1								-13.00 dBm	Center Freq 515.000000 MHz
-20.1									Start Freq
-30.1									30.000000 MHz
-40.1									Stop Freq
-50.1									1.000000000 GHz
-60.1									CF Step 1.000000 MHz Auto Man
-70.1							▲ 1		
-80.1 <mark>Transperie</mark>	an la fai da ann dha ba a bhainn a chan dhan a Ta la fai da ann dha ba a bhainn a chan dhan a ta		ekaltete iki erdet. Ma ^{la} tete i perfektorisi	alladaine da tai la Richard anna anna anna anna anna anna anna a	a dan tatan dini dan Karapatén dini dan karapatén dini dini dini dini dini dini dini di	alahawa data Mangarita	and have the state	(Annia), hereinige Ministral (Anglesia)	Freq Offset 0 Hz
-90.1									
Start 30.0 #Res BW		#VBW	300 kHz		s	weep 12	Stop 1.0 20.0 ms (1	0000 GHz	
MSG						STATU			



Conducted Spurious Emissions (1 GHz –26.5 GHz)

[AWS Downlink Low]

	ctrum Analyzer - Swept SA			1		
Start Fre	RF 50 Ω AC	GHz	SENSE:INT	ALIGN AUTO	06:01:37 PM May 27, 2015 TRACE 1 2 3 4 5 6 TYPE A WWWW	Frequency
	_	PNO: Fast ↔ IFGain:Low	#Atten: 14 dB	Avg Hold: 10/10	DET A NNNN	
	Ref Offset 41.63 dl	В		Mki	1 2.106 89 GHz -15.298 dBm	Auto Tune
10 dB/div Log	Ref 39.94 dBm				-15.298 dBm	
						Center Freq
29.9						1.553500001 GHz
19.9						
						Start Freq 1.00000000 GHz
9.94						
-0.06						Stop Freq
40.4						2.107000002 GHz
-10.1					-13.00 c	
-20.1					(CF Step 4.000000 MHz
-30.1						Auto <u>Man</u>
-30.1						Ener Offerst
-40.1						Freq Offset 0 Hz
-50.1						
Start 1.0	000 GHz				Stop 2.1070 GHz	
#Res BW			V 3.0 MHz*		1.000 s (10001 pts)	
MSG 🐼 Mas	s storage error;Direct	tory not found		STATU	S	
💓 Agilent Spe	RF 50 Q AC		SENSE:INT	ALIGN AUTO	06:02:53 PM May 27, 2015	
LXI	ectrum Analyzer - Swept SA RF 50 Ω AC 2 q 2.1580000000		SENSE:INT	ALIGN AUTO Avg Type: RMS Avg Hold: 10/10	TRACE 1 2 3 4 5 6	Frequency
LXI	RF 50 Ω AC	GHz PNO: Fast ↔ IFGain:Low		Avg Type: RMS Avg Hold: 10/10	TRACE 123456 TYPE A WWWW DET A NNNNN	Frequency
Start Fre	RF 50 Ω AC 2 q 2.158000000 Ref Offset 41.63 dl	PNO: Fast ↔ IFGain:Low	Trig: Free Run	Avg Type: RMS Avg Hold: 10/10	TRACE 1 2 3 4 5 6	
LXI	RF 50 Ω AC eq 2.158000000	PNO: Fast ↔ IFGain:Low	Trig: Free Run	Avg Type: RMS Avg Hold: 10/10	TRACE 1 2 3 4 5 6 TYPE A WWWW DET A NNNNN Kr1 2.158 0 GHz	Frequency Auto Tune
Start Fre	RF 50 Ω AC 2 q 2.158000000 Ref Offset 41.63 dl	PNO: Fast ↔ IFGain:Low	Trig: Free Run	Avg Type: RMS Avg Hold: 10/10	TRACE 1 2 3 4 5 6 TYPE A WWWW DET A NNNNN Kr1 2.158 0 GHz	Frequency
Start Fre	RF 50 Ω AC 2 q 2.158000000 Ref Offset 41.63 dl	PNO: Fast ↔ IFGain:Low	Trig: Free Run	Avg Type: RMS Avg Hold: 10/10	TRACE 1 2 3 4 5 6 TYPE A WWWW DET A NNNNN Kr1 2.158 0 GHz	Frequency Auto Tune Center Freq
Start Fre	RF 50 Ω AC 2 q 2.158000000 Ref Offset 41.63 dl	PNO: Fast ↔ IFGain:Low	Trig: Free Run	Avg Type: RMS Avg Hold: 10/10	TRACE 1 2 3 4 5 6 TYPE A WWWW DET A NNNNN Kr1 2.158 0 GHz	Frequency Auto Tune Center Freq 14.329000000 GHz
Start Fre	RF 50 Ω AC 2 q 2.158000000 Ref Offset 41.63 dl	PNO: Fast ↔ IFGain:Low	Trig: Free Run	Avg Type: RMS Avg Hold: 10/10	TRACE 1 2 3 4 5 6 TYPE A WWWW DET A NNNNN Kr1 2.158 0 GHz	Frequency Auto Tune Center Freq 14.329000000 GHz
10 dB/div 29.9 19.9	RF 50 Ω AC 2 q 2.158000000 Ref Offset 41.63 dl	PNO: Fast ↔ IFGain:Low	Trig: Free Run	Avg Type: RMS Avg Hold: 10/10	TRACE 1 2 3 4 5 6 TYPE A WWWW DET A NNNNN Kr1 2.158 0 GHz	Frequency Auto Tune Center Freq 14.32900000 GHz Start Freq
10 dB/div 29.9	RF 50 Ω AC 2 q 2.158000000 Ref Offset 41.63 dl	PNO: Fast ↔ IFGain:Low	Trig: Free Run	Avg Type: RMS Avg Hold: 10/10	TRACE 1 2 3 4 5 6 TYPE A WWWW DET A NNNNN Kr1 2.158 0 GHz	Frequency Auto Tune Center Freq 14.329000000 GHz Start Freq 2.158000000 GHz Stop Freq
Start Fre 10 dB/div 29.9 19.9 9.94 -0.06 -10.1	RF 50 Ω AC 2 q 2.158000000 Ref Offset 41.63 dl	PNO: Fast ↔ IFGain:Low	Trig: Free Run	Avg Type: RMS Avg Hold: 10/10	TRACE 1 2 3 4 5 6 TYPE A WWWW DET A NNNNN Kr1 2.158 0 GHz	Frequency Auto Tune Center Freq 14.329000000 GHz Start Freq 2.158000000 GHz Stop Freq
10 dB/div 29.9 19.9 9.94 -0.06	RF 50 Ω AC 2 q 2.158000000 Ref Offset 41.63 dl	PNO: Fast ↔ IFGain:Low	Trig: Free Run	Avg Type: RMS Avg Hold: 10/10	TRACE 123456 TYPE A WINNINN DET A NINNINN kr12.1580GHz -19.728dBm	Frequency Auto Tune Center Freq 14.32900000 GHz Start Freq 2.158000000 GHz Stop Freq 26.50000000 GHz
Start Fre 10 dB/div 29.9 19.9 9.94 -0.06 -10.1	RF 50 Ω AC 2 q 2.158000000 Ref Offset 41.63 dl	PNO: Fast ↔ IFGain:Low	Trig: Free Run	Avg Type: RMS Avg Hold: 10/10	TRACE 123456 TYPE A WINNINN DET A NINNINN kr12.1580GHz -19.728dBm	Frequency Auto Tune Center Freq 14.32900000 GHz Start Freq 2.158000000 GHz Stop Freq 26.50000000 GHz CF Step 4.000000 MHz
10 dB/div 29.9 19.9 9.94 -0.06 -10.1 -20.1 -30.1	RF 50 Ω AC 2q 2.158000000 AC AC Ref Offset 41.63 dl Ref 39.94 dBm AC AC	PNO: Fast ↔ IFGain:Low	Trig: Free Run	Avg Type: RMS Avg Hold: 10/10	TRACE 1 23 4 5 6 TYPE A WINNINN ART1 2.158 0 GHz -19.728 dBm	Frequency Auto Tune Center Freq 14.329000000 GHz Start Freq 2.158000000 GHz Stop Freq 26.50000000 GHz CF Step 4.000000 MHz
10 dB/div 29.9 19.9 9.94 -0.06 -10.1 -20.1	RF 50 Ω AC 2 q 2.158000000 Ref Offset 41.63 dl	PNO: Fast ↔ IFGain:Low	Trig: Free Run	Avg Type: RMS Avg Hold: 10/10	TRACE 1 23 4 5 6 TYPE A WINNINN ART1 2.158 0 GHz -19.728 dBm	Frequency Auto Tune Center Freq 14.329000000 GHz Start Freq 2.158000000 GHz Stop Freq 26.50000000 GHz 4.000000 MHz Auto Man
10 dB/div 29.9 19.9 9.94 -0.06 -10.1 -20.1 -30.1	RF 50 Ω AC 2q 2.158000000 AC AC Ref Offset 41.63 dl Ref 39.94 dBm AC AC	PNO: Fast ↔ IFGain:Low	Trig: Free Run	Avg Type: RMS Avg Hold: 10/10	TRACE 1 23 4 5 6 TYPE A WINNINN ART1 2.158 0 GHz -19.728 dBm	Frequency Auto Tune Center Freq 14.329000000 GHz Start Freq 2.158000000 GHz Stop Freq 26.500000000 GHz 4.000000 MHz Auto Man
10 dB/div 29.9 19.9 9.94 -0.06 -10.1 -20.1	RF 50 Ω AC 2q 2.158000000 AC AC Ref Offset 41.63 dl Ref 39.94 dBm AC AC	PNO: Fast ↔ IFGain:Low	Trig: Free Run	Avg Type: RMS Avg Hold: 10/10	TRACE 1 23 4 5 6 TYPE A WINNINN ART1 2.158 0 GHz -19.728 dBm	Frequency Auto Tune Center Freq 14.329000000 GHz Start Freq 2.158000000 GHz Stop Freq 26.50000000 GHz 4.000000 MHz Auto Man Freq Offset
Image: Non-Start Free 10 dB/div 29.9 19.9 9.94 -0.06 -10.1 -20.1 -30.1 -30.1 -50.1	RF 50 Ω AC 2q 2.158000000 AC AC Ref Offset 41.63 dl Ref 39.94 dBm AC AC	PNO: Fast ↔ IFGain:Low	Trig: Free Run	Avg Type: RMS Avg Hold: 10/10	13.00 dBm	Frequency Auto Tune Center Freq 14.329000000 GHz Start Freq 2.158000000 GHz Stop Freq 26.50000000 GHz 4.000000 MHz Auto Man Freq Offset
10 dB/div 29.9 19.9 9.94 -0.06 -10.1 -20.1 -30.1 -40.1	RF 50 Ω AC 2q 2.158000000 AC AC Ref Offset 41.63 dl Ref 39.94 dBm AC AC Marcola AC AC AC AC AC AC AC AC AC AC <td>PNO: Fast → IFGain:Low →</td> <td>Trig: Free Run</td> <td>Avg Type: RMS Avg Hold: 10/10</td> <td>TRACE 1 23 4 5 6 TYPE A WINNINN ART1 2.158 0 GHz -19.728 dBm</td> <td>Frequency Auto Tune Center Freq 14.329000000 GHz Start Freq 2.158000000 GHz Stop Freq 26.50000000 GHz 4.000000 MHz Auto Man Freq Offset</td>	PNO: Fast → IFGain:Low →	Trig: Free Run	Avg Type: RMS Avg Hold: 10/10	TRACE 1 23 4 5 6 TYPE A WINNINN ART1 2.158 0 GHz -19.728 dBm	Frequency Auto Tune Center Freq 14.329000000 GHz Start Freq 2.158000000 GHz Stop Freq 26.50000000 GHz 4.000000 MHz Auto Man Freq Offset



[AWS Downlink Middle]





F-01P-02-014 (Rev.00) FCC ID: N 52-ADX-HPR-A

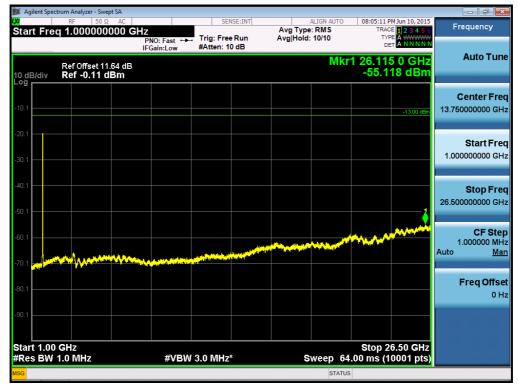








[AWS Uplink Middle]









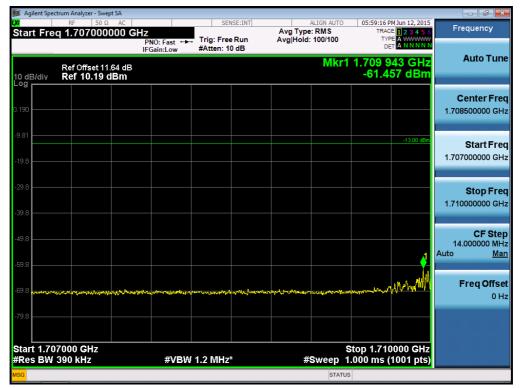
Intermodulation Spurious Emissions

[AWS Downlink Low]

Agilent Spectrum Analy						
Start Freq 2.10	50 Ω AC 7000000 GH	Z PNO:Fast ↔→→	SENSE:INT	ALIGN AUTO Avg Type: RMS Avg Hold: 10/10	03:19:50 PM Jun 15, 2015 TRACE 1 2 3 4 5 6 TYPE A	Frequency
Ref Of 10 dB/div Ref 2		PNU: Fast ↔→→ FGain:Low	#Atten: 14 dB	•	1 2.109 949 GHz -14.544 dBm	Auto Tune
15.6						Center Freq 2.108500000 GHz
-4.37					-13.00 🔏	Start Freq 2.107000000 GHz
-14.4						Stop Freq 2.110000000 GHz
-34.4						CF Step 4.000000 MHz Auto <u>Man</u>
-54.4						Freq Offset 0 Hz
-64.4						
Start 2.107000 G #Res BW 390 kH		#VBW	1.2 MHz*		Stop 2.110000 GHz 1.000 s (1001 pts)	
MSG				STATI	JS	







Agilent Spectrum Analyzer - Swept SA				
RF 50 Ω AC Start Freq 1.755000000 GF		Avg Type: RMS	06:05:46 PM Jun 12, 2015 TRACE 1 2 3 4 5 6 TYPE A WWWWW	Frequency
Ref Offset 11.64 dB 0 dB/div Ref 10.19 dBm	PNO: Fast Trig: Free Rur IFGain:Low #Atten: 10 dB	•	DET A NNNNN I 1.755 033 GHz -62.668 dBm	Auto Tune
190				Center Freq 1.756500000 GHz
9.81			-13.00 dBm	Start Freq 1.755000000 GHz
39.8				Stop Freq 1.758000000 GHz
49.8				CF Step 14.000000 MHz Auto <u>Mar</u>
59.8 MMMMM	A., A. Hanney and the set of the fact and the fact and	anginanan afanan Anaratan M	Jullian an Scanlard and	Freq Offset 0 Hz
79.8 Start 1.755000 GHz			Stop 1.758000 GHz	
Res BW 390 kHz sg	#VBW 1.2 MHz*	#Sweep	1.000 ms (1001 pts)	



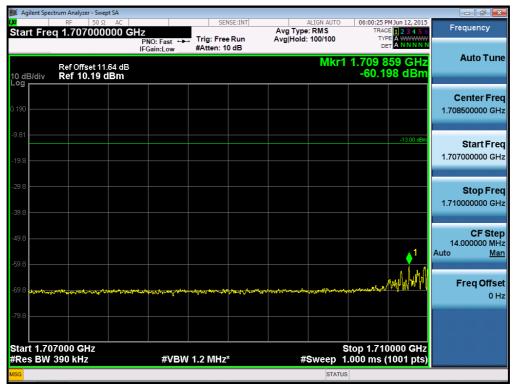
Band Edge

[AWS Downlink Low]













9. OUT OF BAND REJECTION

Test Requirement(s): KDB 935210 D02 v01r01

Out of Band Rejection – Test for rejection of out of band signals. Filter freq. response plots are acceptable.

- **Test Procedures:** A modulated carrier generated by the signal generator carrier was connected to either the Uplink or Downlink RF port at a maximum level as determined by the spectrum analyzer was connected to either the Uplink or Downlink port depending on the circuitry being measured. Signal generator sweep from the frequency more lower than the operating frequency to the frequency more higher than it, find the product band filter characteristic
- **Test Results:** The EUT complies with the requirements of this section.



Out of Band Rejection

ent Spectrum Analyzer - Swept SA :28 PM May 16, 201 Avg Type: RMS Avg|Hold: 100/100 Marker Marker 3 2.176700000000 GHz RACE 1234 TYPE MWWWWW DET A N N N N Trig: Free Run #Atten: 22 dB PNO: Fast +++ IFGain:Low Select Marker Mkr3 2.176 70 GHz 25.910 dBm 3 Ref Offset 41.63 dB Ref 50.00 dBm 10 dB/div Log X-1 12 3 Normal Delta T **Fixed** Center 2.1325 GHz Span 250.0 MHz Sweep 39.0 ms (5001 pts) #Res BW 100 kHz #VBW 100 kHz* Off FUNCTION FUNCTION FUNCTION VALUE 46.012 dBm 25.981 dBm 25.910 dBm 2.136 90 GHz 2.085 85 GHz 2.176 70 GHz 1 f N 4 **Properties** 6 7 8 4 More 10 1 of 2 1' 12 STATUS

[AWS Downlink]

[AWS Uplink]



10. FIELD STRENGTH OF SPURIOUS RADIATION

Test Requirement(s): § 2.1053 Measurements required: Field strength of spurious radiation.

§ 2.1053 (a) Measurements shall be made to detect spurious emissions that may be Radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal conditions of installation and operation. Curves or equivalent data shall be supplied showing the magnitude of each harmonic and other spurious emission. For this test, single sideband, independent sideband, and controlled carrier transmitters shall be modulated under the conditions specified in paragraph (c) of § 2.1049, as appropriate. For equipment operating on frequencies below 890 MHz, an open field test is normally required with the measuring instrument antenna located in the far-field at all test frequencies. In the event it is either impractical or impossible to make open field measurements (e.g. a broadcast transmitter installed in a building) measurements will be accepted of the equipment as installed. Such measurements must be accompanied by a description of the site where the measurements were made showing the location of any possible source of reflections which might distort the field strength measurements. Information submitted shall include the relative radiated power of each spurious emission with reference to the rated power output of the transmitter, assuming all emissions are radiated from half-wave dipole antennas.

§ 2.1053 (b): The measurements specified in paragraph (a) of this section shall be made for the following equipment:

- (1) Those in which the spurious emissions are required to be 60 dB or more Below the mean power of the transmitter.
- (2) All equipment operating on frequencies higher than 25 MHz.

(3) All equipment where the antenna is an integral part of, and attached directly to The transmitter.

(4) Other types of equipment as required, when deemed necessary by the Commission.

Test Procedures:As required by 47 CFR 2.1053, field strength of radiated spurious
measurements were made in accordance with the procedures of ANSI/TIA-603-
C-2004 "Land Mobile FM or PM Communications Equipment Measurement and
Performance Standards".

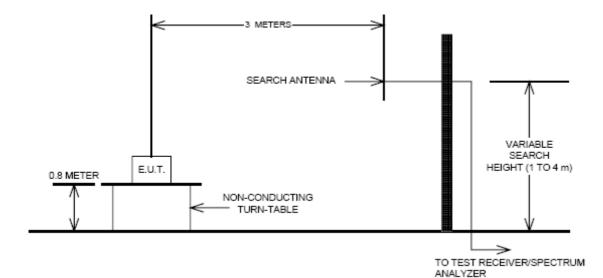
Radiated emission measurements were performed inside a 3 meter semi-

anechoic chamber.

The EUT was set at a distance of 3m from the receiving antenna. The EUT's RF ports were terminated to 50ohm load. The EUT was set to transmit at the low, mid and high channels of the transmitter frequency range at its maximum power level. The EUT was rotated about 360

and the receiving antenna scanned from 1-3m in order to capture the maximum emission. A calibrated antenna source was positioned in place of the EUT and the previously recorded signal was duplicated. The maximum EIRP of the emission was calculated by adding the forward power to the calibrated source plus its appropriate gain value. These steps were carried. out with the receiving antenna in both vertical and horizontal polarization. Harmonic emissions up to the 10th or 40GHz, whichever was the lesser, were investigated.

Radiated Spurious Emissions Test Setup



Test Result:

Note.

Input signal is the LTE 20 MHz signal.

Harmonics were not found.

[Downlink]

		<u>Substitute</u>	Ant. Gain			ERP	Margin
Tx Freq.(MHz)	Freq.(MHz)	Level	(dBd)	C.L	Pol.	(dBm)	(dB)
		[dBm]					
2120.0							
2132.5			No Pea	k Found			
2145.0							