TEST REPORT

FCC Test for SDR-33-BTF

Certification

APPLICANT ADVANCED RF TECHNOLOGIES, INC

REPORT NO. HCT-RF-1911-FC029-R1

DATE OF ISSUE December 16, 2019

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HCT Co., Ltd.



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FCC ID N52-SDR-33-BTF

Applicant	ADVANCED RF TECHNOLOGIES, INC 3116 WEST VANOWEN STREET, BURBANK, CA 91505, USA
Eut Type Model Name	REPEATER SDR-33-BTF
Output Power	33 dBm (UL/DL)
Date of Test	November 13, 2019 ~ November 29, 2019
FCC Rule Parts:	CFR 47 Part 2, Part 27
	This test results were applied only to the test methods required by the standard.

Tested by Kyung Soo Kang

Technical Manager Jong Seok Lee

HCT CO., LTD. Lee Soo Chan

/ CEO



REVISION HISTORY

The revision history for this test report is shown in table.

Revision No.	Date of Issue	Description
0	November 29, 2019	Initial Release
1	December 16, 2019	Added a EUT serial number on page 5.

The result shown in this test report refer only to the sample(s) tested unless otherwise stated.

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 the FCC Rules under normal use and maintenance.



CONTENTS

1. GENERAL INFORMATION	5
1.1. APPLICANT INFORMATION	5
1.2. PRODUCT INFORMATION	5
1.3. TEST INFORMATION	5
2. FACILITIES AND ACCREDITATIONS	6
2.1. FACILITIES	6
2.2. EQUIPMENT	6
3. TEST SPECIFICATIONS	7
3.1. STANDARDS	7
3.2. ADDITIONAL DESCRIPTIONS ABOUT TEST	8
3.3. MEASUREMENTUNCERTAINTY	10
3.4. STANDARDS ENVIRONMENTAL TEST CONDITIONS	10
3.5. TEST DIAGRAMS	11
4. TEST EQUIPMENTS	12
5. TEST RESULT	13
5.1. AGC THRESHOLD	13
5.2. OUT-OF-BAND REJECTION	15
5.3. INPUT-VERSUS-OUTPUT SIGNAL COMPARISON	17
5.4. INPUT/OUTPUT POWER AND AMPLIFIER/BOOSTER GAIN	33
5.5. OUT-OF-BAND/OUT-OF-BLOCK EMISSIONS AND SPURIOUS EMISSIONS	40
5.6. RADIATED SPURIOUS EMISSIONS	140
6. Annex A_EUT AND TEST SETUP PHOTO	142



1. GENERAL INFORMATION

1.1. APPLICANT INFORMATION

Company Name	ADVANCED RF TECHNOLOGIES, INC
Company Address	3116 WEST VANOWEN STREET, BURBANK, CA 91505, USA

1.2. PRODUCT INFORMATION

ЕUT Туре	REPEATER		
EUT Serial Number	SDR33-BTF1910001	SDR33-BTF1910001	
Power Supply	110-120V AC / 210-240 AC		
Frequency Range	Band Name BRS/EBS	Uplink (MHz) 2 496	Downlink (MHz) ~ 2 690
Tx Output Power	33 dBm (UL/DL)		
Antenna Peak Gain	Uplink: 20.4 dBi,		
Antenna Feak Gain	Downlink: 5.3 dBi		

1.3. TEST INFORMATION

FCC Rule Parts	CFR 47 Part 2, Part 27
Measurement Standards	KDB 935210 D05 v01r03, ANSI C63.26-2015
Test Location	HCT CO., LTD.
	74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do,
	17383, Rep. of KOREA



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, 17383, Rep. of KOREA. The site is constructed in conformance with the requirements of ANSI C63.4 (Version: 2014) and CISPR Publication 22.

Detailed description of test facility was submitted to the Commission and accepted dated April 02, 2018 (Registration Number: KR0032).

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 SPECIFICATIONS

3.1. STANDARDS

The following tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 2 and Part 27.

Description	Reference	Results
AGC threshold	KDB 935210 D05 v01r03 3.2	Compliant
Out-of-band rejection	KDB 935210 D05 v01r03 3.3	Compliant
Input-versus-output signal comparison	§ 2.1049	Compliant
Input/output power and amplifier/booster gain	§ 2.1046, § 27.50(d)	Compliant
Out-of-band/out-of-block emissions and spurious emissions	§ 2.1051, § 27.53(m)	Compliant
Spurious emissions radiated	§ 2.1053	Compliant



3.2. ADDITIONAL DESCRIPTIONS ABOUT TEST

Except for the following cases, EUT was tested under normal operating conditions. : Out-of-band rejection test requires maximum gain condition without AGC.

The test was generally based on the method of KDB 935210 D05 v01r03 and only followed ANSI C63.26-2015 if there was no test method in KDB standard.

EUT was tested with following modulated signals provide by applicant.

Band Name	Tested signals
	LTE 20 MHz
BRS/EBS	LTE 20 MHz 3 Carrier (60 MHz)
	5G NR 100 MHz

The frequency stability measurement has been omitted in accordance with section 3.7 of KDB 935210 D05 v01r03.

: It can be confirmed through input-versus-output signal comparison test that EUT does not alter the input signal.

The tests results included actual loss value for attenuator and cable combination as shown in the table below. : Input Path

	Correctio	n factor table	
Frequency (MHz)	Factor (dB)	Frequency (MHz)	Factor (dB)
1 500	1.033	2 250	1.565
1 550	1.154	2 300	1.442
1 600	1.103	2 350	1.470
1 650	1.143	2 400	1.530
1 700	1.033	2 450	1.289
1 750	0.970	2 500	1.300
1 800	0.929	2 550	1.551
1 850	1.252	2 600	1.630
1 900	1.093	2 650	1.390
1 950	1.207	2 700	1.350
2 000	1.083	2 750	1.404
2 050	0.915	2 800	1.283
2 100	1.245	2 850	1.425
2 150	1.198	2 900	1.406
2 200	0.985		



: Output Path

Correction factor table			
Frequency (MHz)	Factor (dB)	Frequency (MHz)	Factor (dB)
2	30.497	6 000	33.361
10	29.846	7 000	33.551
30	29.772	8 000	33.681
50	29.780	9 000	34.452
100	29.858	10 000	36.689
200	30.053	11 000	35.860
300	30.409	12 000	35.705
400	30.536	13 000	35.262
500	30.682	14 000	36.805
600	30.773	15 000	36.468
700	30.855	16 000	36.976
800	30.878	17 000	36.639
900	30.890	18 000	37.680
1 000	30.920	19 000	37.981
1 700	31.368	20 000	39.044
1 800	31.368	21 000	40.138
2 000	31.603	22 000	40.885
2 100	31.650	23 000	39.520
2 200	31.707	24 000	40.203
3 000	32.272	25 000	43.209
4 000	32.685	26 000	41.040
5 000	32.662	26 500	45.515



3.3. MEASUREMENTUNCERTAINTY

Description	Reference	Results
AGC threshold	-	±0.87 dB
Out-of-band rejection	-	\pm 0.58 MHz
Input-versus-output signal comparison	OBW > 5 MHz	±0.58 MHz
Input/output power and amplifier/booster gain	-	±0.87 dB
Out-of-band/out-of-block emissions and spurious emissions	-	±1.08 dB
Spurious emissions radiated	$f \leq 1 GHz$	±4.80 dB
	f > 1 GHz	±6.07 dB

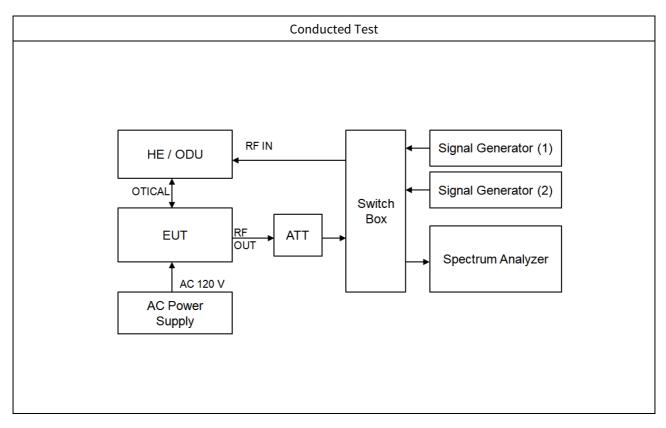
* Coverage factor k = 2, Confidence levels of 95 %

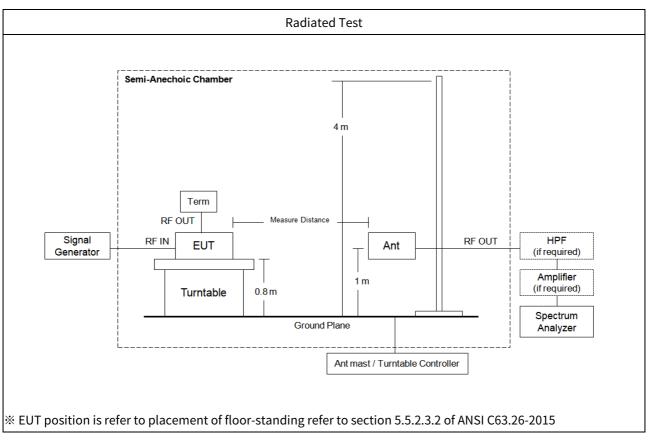
3.4. STANDARDS ENVIRONMENTAL TEST CONDITIONS

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



3.5. TEST DIAGRAMS







4. TEST EQUIPMENTS

Manufacturer	Model / Equipment	Calibration	Calibration	Serial No.
	· · · ·	Date	Interval	
Agilent	N9020A / MXA Signal Analyzer	08/21/2019	Annual	MY46471250
Keysight	N9030B / PXA Signal Analyzer	03/27/2019	Annual	MY55480167
Agilent	N5182A / MXG Vector Signal Generator	08/08/2019	Annual	MY50141649
Agilent	N5182A / MXG Vector Signal Generator	01/18/2019	Annual	MY47070406
Weinschel	WA93-30-33 / Attenuator	04/11/2019	Annual	0190
KEITHLEY	S46 / Switch	N/A	N/A	1088024
Deayoung ENT	DFSS60 / AC Power Supply	04/04/2019	Annual	1003030-1
Innco system	CO3000 / Controller(Antenna mast)	N/A	N/A	CO3000-4p
Innco system	MA4640/800-XP-EP / Antenna Position Tower	N/A	N/A	N/A
Emco	2090 / Controller	N/A	N/A	060520
Ets	Turn Table	N/A	N/A	N/A
Rohde & Schwarz	Loop Antenna	01/18/2019	Biennial	1513-175
Schwarzbeck	VULB 9160 / Hybrid Antenna	08/09/2019	Biennial	3368
Schwarzbeck	BBHA 9120D / Horn Antenna	11/21/2017	Biennial	9120D-1191
Schwarzbeck	BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)	12/04/2017	Biennial	BBHA9170541
Rohde & Schwarz	FSP(9 kHz ~ 30 GHz) / Spectrum Analyzer	09/11/2019	Annual	836650/016
Rohde & Schwarz	FSV40-N / Spectrum Analyzer	09/26/2019	Annual	101068-SZ
Wainwright	WHKX10-2700-3000-18000-40SS /	01/03/2019	Annual	4
Instruments	High Pass Filter	01/03/2019	Annual	4
CERNEX	CBLU1183540B-01 / Broadband Bench Top LNA	01/03/2019	Annual	28549
CERNEX	CBL06185030 / Broadband Low Noise Amplifier	01/03/2019	Annual	24615
CERNEX	CBL18265035 / Power Amplifier	01/03/2019	Annual	22966
CERNEX	CBL26405040 / Power Amplifier	06/18/2019	Annual	25956



5. TEST RESULT

5.1. AGC THRESHOLD

Test Requirement:

KDB 935210 D05 v01r03

Testing at and above the AGC threshold is required.

Test Procedures:

Measurements were in accordance with the test methods section 3.2 of KDB 935210 D05 v01r03.

In the case of fiber-optic distribution systems, the RF input port of the equipment under test (EUT) refers to the RF input of the supporting equipment RF to optical convertor; see also descriptions and diagrams for typical DAS booster systems in KDB Publication 935210 D02.

Devices intended to be directly connected to an RF source (donor port) only need to be evaluated for any over-theair transmit paths.

- a) Connect a signal generator to the input of the EUT.
- b) Connect a spectrum analyzer or power meter to the output of the EUT using appropriate attenuation as necessary.
- c) The signal generator should initially be configured to produce either of the required test signals.
- d) Set the signal generator frequency to the center frequency of the EUT operating band.
- e) While monitoring the output power of the EUT, measured using the methods of ANSI C63.26-2015 subclause
 5.2.4.4.1, increase the input level until a 1 dB increase in the input signal power no longer causes a 1 dB increase
 in the output signal power.
- f) Record this level as the AGC threshold level.
- g) Repeat the procedure with the remaining test signal.

Output power measurement in subclause 5.2.4.4.1 of ANSI C63.26

- a) Set span to $2 \times to 3 \times the OBW$.
- b) Set RBW = 1% to 5% of the OBW.
- c) Set VBW \geq 3 × RBW.
- d) Set number of measurement points in sweep $\geq 2 \times \text{span} / \text{RBW}$.
- e) Sweep time: auto-couple
- f) Detector = power averaging (rms).
- g) If the EUT can be configured to transmit continuously, then set the trigger to free run.
- h) Omit



- i) Trace average at least 100 traces in power averaging (rms) mode if sweep is set to auto-couple. To accurately determine the average power over multiple symbols, it can be necessary to increase the number of traces to be averaged above 100 or, if using a manually configured sweep time, increase the sweep time.
- j) Compute the power by integrating the spectrum across the OBW of the signal using the instrument's band or channel power measurement function, with the band/channel limits set equal to the OBW band edges. If the instrument does not have a band or channel power function, then sum the spectrum levels (in linear power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.

Test Band	Link	Signal	Center Frequency (MHz)	AGC Threshold Level (dBm)	Output Level (dBm)
		LTE 20M	2 595.00	-62	33.25
	Uplink	LTE 20M_3C	2 595.00	-62	33.04
		5G NR 100M	2 595.00	-62	33.33
BRS/EBS	BRS/EBS Downlink	LTE 20M	2 595.00	-62	33.26
		LTE 20M_3C	2 595.00	-62	32.86
		5G NR 100M	2 595.00	-62	33.50

Test Results:



5.2. OUT-OF-BAND REJECTION

Test Requirement:

KDB 935210 D05 v01r03

Out-of-band rejection required.

Test Procedures:

Measurements were in accordance with the test methods section 3.3 of KDB 935210 D05 v01r03.

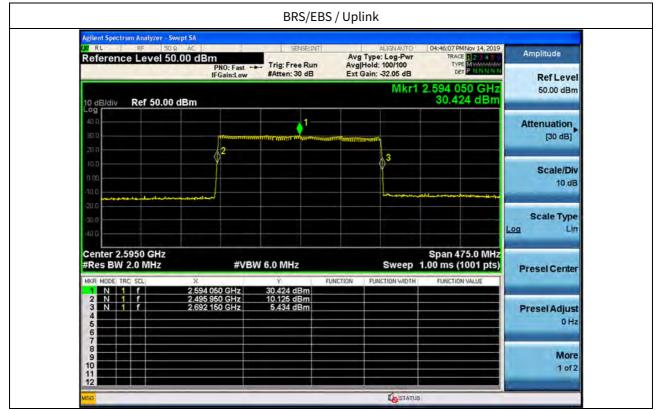
Adjust the internal gain control of the EUT to the maximum gain for which equipment certification is sought.

- a) Connect a signal generator to the input of the EUT.
- b) Configure a swept CW signal with the following parameters:
 - 1) Frequency range = ± 250 % of the passband, for each applicable CMRS band.
 - 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 = approximately 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 (RBW) of the spectrum analyzer to be 1 % to 5 % of the EUT passband, and the video bandwidth (VBW) shall be set to \geq 3 × 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.
- i) Capture the frequency response of the EUT.
- j) Repeat for all frequency bands applicable for use by the EUT.





Test Results:



Center Freq 2.59500		SENSE:INT Trig: Free Run #Atten: 30 dB	ALIGNAUTO Avg Type: Log-Pwi Avg Hold: 100/100 Ext Gain: -32.05 dB		Frequency
10 dB/div Ref 50.00		#Atten: 30 dB		1 2.591 675 GHz 30.552 dBm	Auto Tune
40 0 30 D		1			Center Freq 2.595000000 GHz
20 0 10.0 0.00 -10 0 -20 0	\$ ²		3		Start Freq 2.357500000 GHz
-200 -30.0 -40(j)					Stop Freq 2.832500000 GHz
Center 2.5950 GHz #Res BW 2.0 MHz	#VB	W 6.0 MHz	Sweep	Span 475.0 MHz 1.00 ms (1001 pts)	47.500000 MHz
MKR MODE TRC SCL 1 N 1 F 2 N 1 F 3 N 1 F 4 5	× 2.591 675 GHz 2.495 925 GHz 2.692 175 GHz	Y F 30.552 dBm 9.996 dBm 5.578 dBm	UNCTION FUNCTION WIDT	H FUNCTION VALUE	Auto Man Freq Offset 0 Hz
6 7 8 9 10					



5.3. INPUT-VERSUS-OUTPUT SIGNAL COMPARISON

Test Requirement:

§ 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 v01r03.

- 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 emission bandwidth (EBW) or alternatively, the OBW.
- f) The nominal RBW shall be in the range of 1 % to 5 % of the anticipated OBW, and the VBW shall be \geq 3 × 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. 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) Determine the reference value: Allow the trace to stabilize. Set the spectrum analyzer marker to the highest amplitude level of the displayed trace (this is the reference value) and record the associated frequency as f0.
- I) 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 -26 dB down amplitude. The 26 dB EBW (alternatively OBW) is the positive frequency difference between the two markers. If the spectral envelope crosses the -26 dB down amplitude at multiple points, the lowest or highest frequency shall be selected as the frequencies that are the furthest removed from the center frequency at which the spectral envelope crosses the -26 dB down amplitude point.
- m) Repeat steps e) to l) with the input signal connected directly to the spectrum analyzer (i.e., input signal measurement).
- n) Compare the spectral plot of the input signal (determined from step m) to the output signal (determined from



step l) 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.

- o) Repeat the procedure [steps e) to n)] with the input signal amplitude set to 3 dB above the AGC threshold.
- p) Repeat steps e) to o) with the signal generator set to the narrowband signal.
- q) Repeat steps e) to p) for all frequency bands authorized for use by the EUT.



Test Results:

Tabular data of Output Occupied Bandwidth

Test awBand	Link	Signal	Center Frequency (MHz)	99 % OBW (MHz)	26 dB OBW (MHz)
		LTE 20M	2 595.00	17.943	19.05
	Uplink	LTE 20M_3C	2 595.00	57.806	60.78
		5G NR 100M	2 595.00	97.397	102.5
BRS/EBS		LTE 20M	2 595.00	18.018	19.78
	Downlink	LTE 20M_3C	2 595.00	57.827	60.57
		5G NR 100M	2 595.00	97.258	102.5

Tabular data of Input Occupied Bandwidth

Test Band	Link	Signal	Center Frequency (MHz)	99 % OBW (MHz)	26 dB OBW (MHz)
		LTE 20M	2 595.00	17.990	19.80
	Uplink	LTE 20M_3C	2 595.00	57.877	60.77
		5G NR 100M	2 595.00	97.694	102.7
BRS/EBS		LTE 20M	2 595.00	17.962	19.78
	Downlink	LTE 20M_3C	2 595.00	57.915	60.90
		5G NR 100M	2 595.00	97.438	102.7

Tabular data of 3 dB above the AGC threshold Output Occupied Bandwidth

Test Band	Link	Signal	Center Frequency (MHz)	99 % OBW (MHz)	26 dB OBW (MHz)
		LTE 20M	2 595.00	17.945	19.17
	Uplink	LTE 20M_3C	2 595.00	57.817	60.64
		5G NR 100M	2 595.00	97.429	102.5
BRS/EBS		LTE 20M	2 595.00	17.960	19.94
	Downlink	LTE 20M_3C	2 595.00	57.825	60.66
		5G NR 100M	2 595.00	97.382	102.5



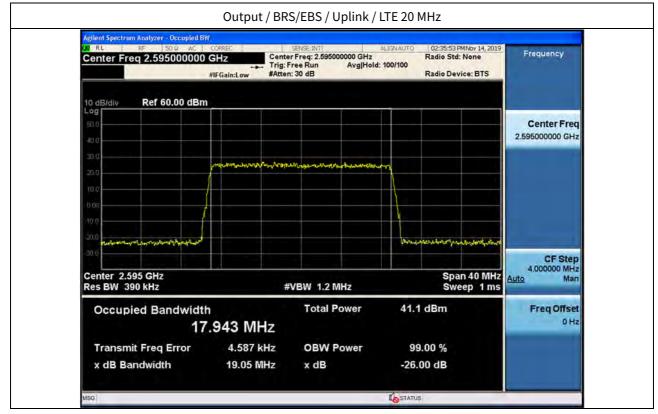
Measured Occupied Bandwidth Comparison

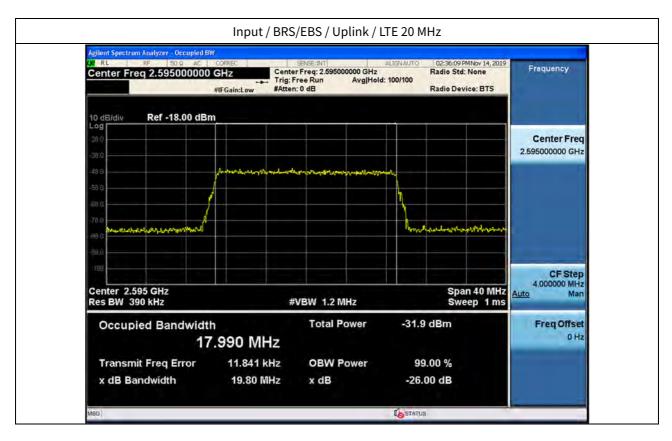
Test Band	Link	Signal	Variant of Input and output Occupied Bandwidth (%)	Variant of Input and 3 dB above the AGC threshold output Occupied Bandwidth (%)
		LTE 20M	-3.758	-3.167
	Uplink	LTE 20M_3C	0.025	-0.209
		5G NR 100M	-0.175	-0.185
BRS/EBS	BRS/EBS	LTE 20M	0.035	0.844
	Downlink	LTE 20M_3C	-0.530	-0.386
		5G NR 100M	-0.205	-0.156

* Change in input-output OBW is less than ± 5 %.

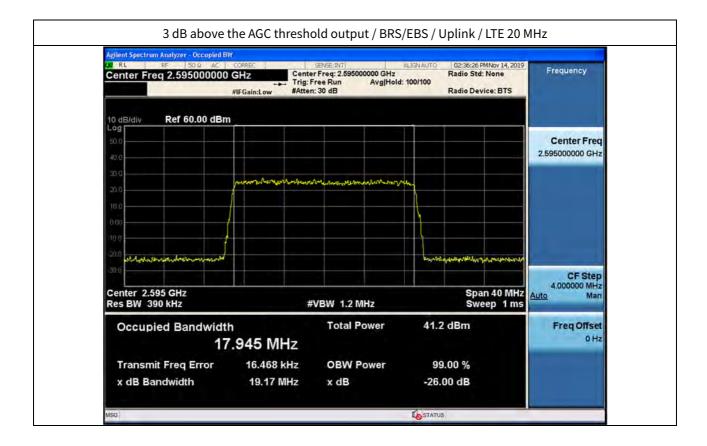


Plot data of Occupied Bandwidth

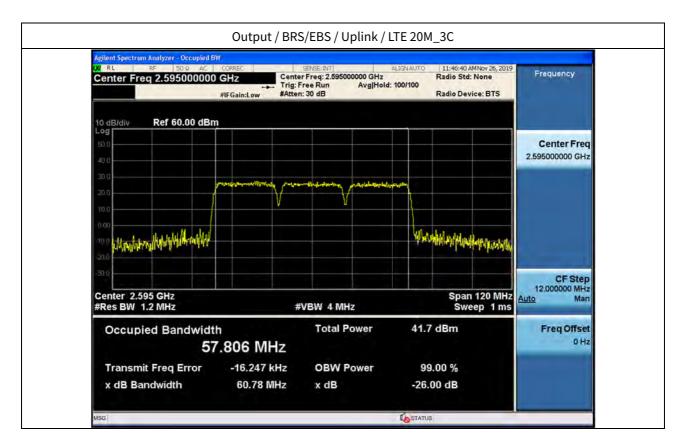


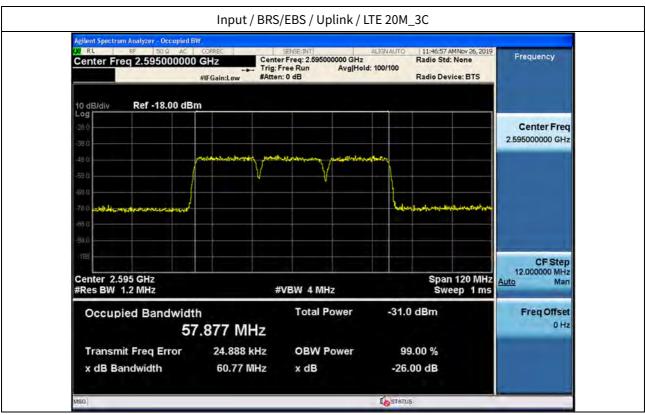




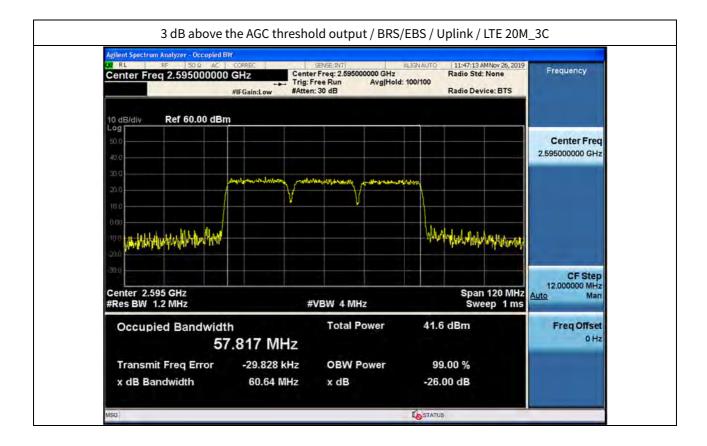




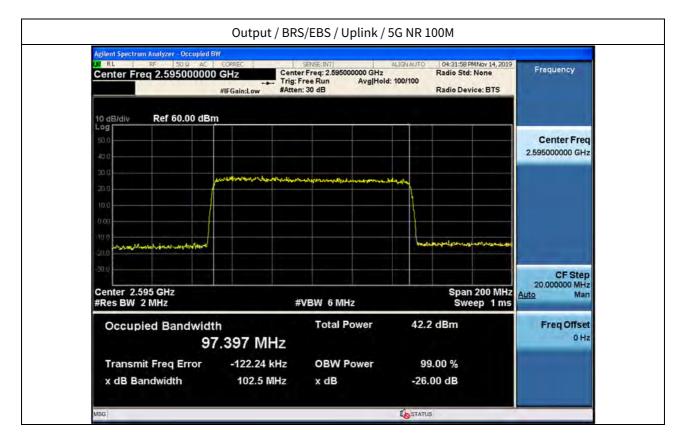


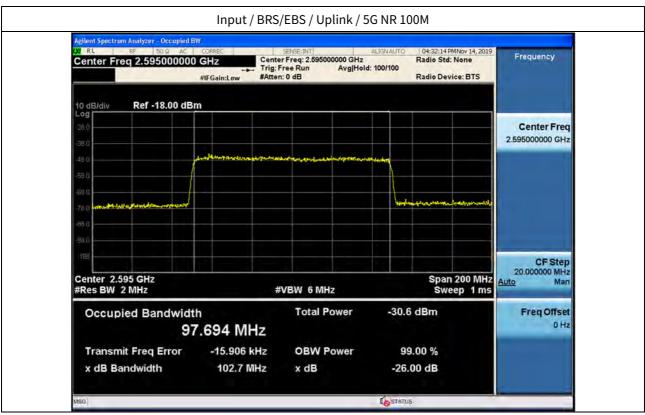




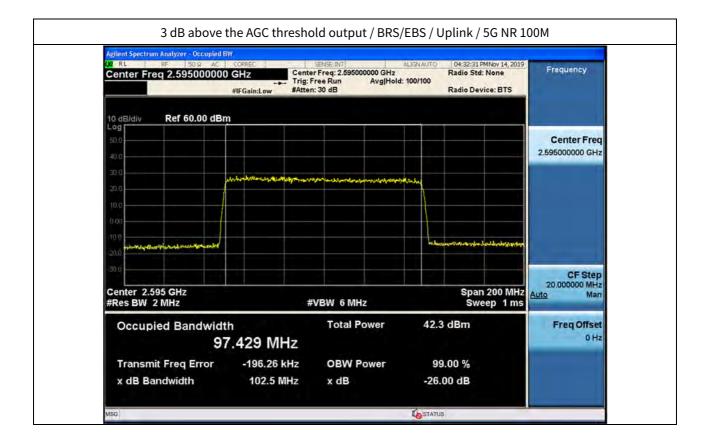




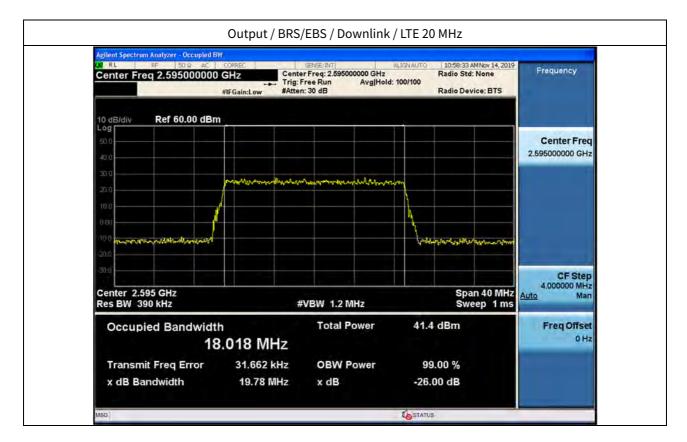


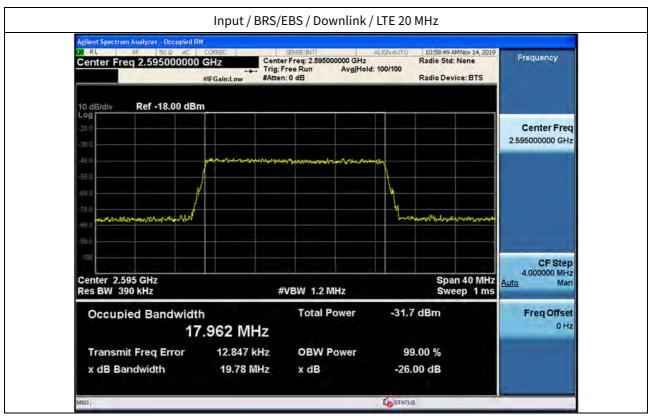




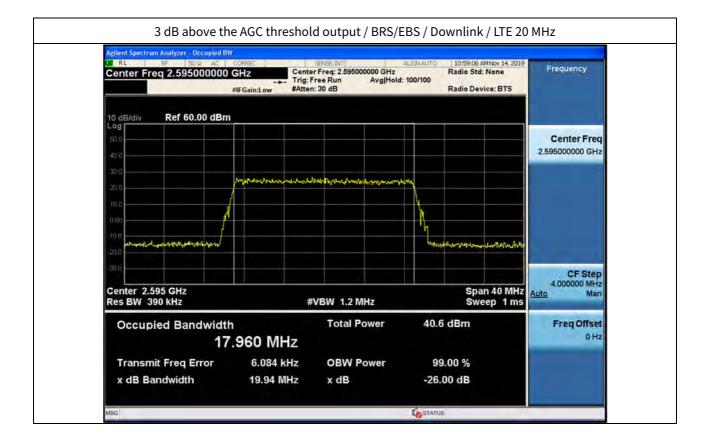




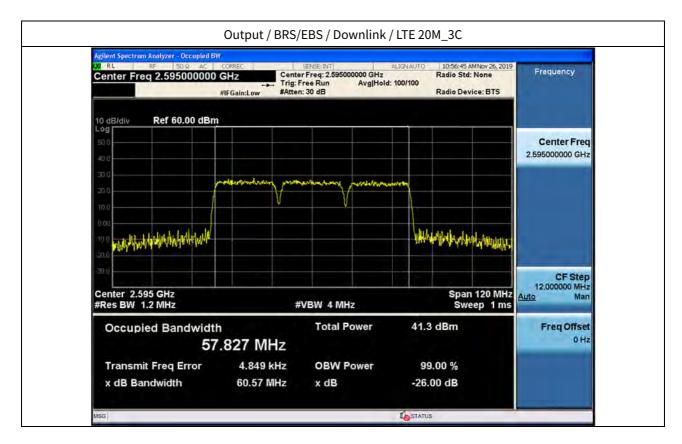


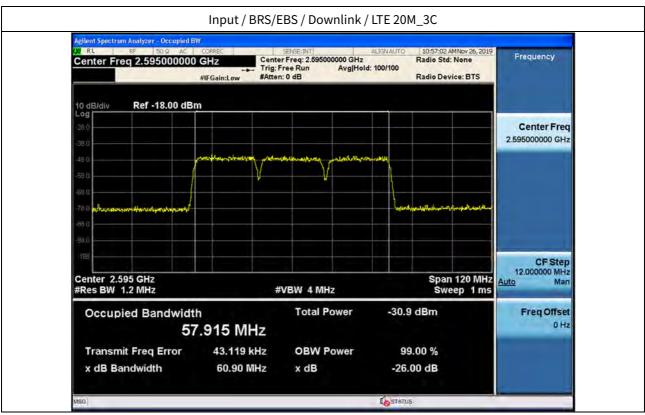




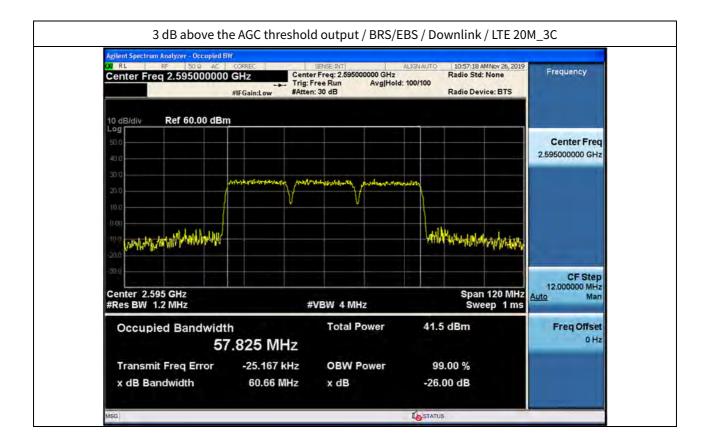




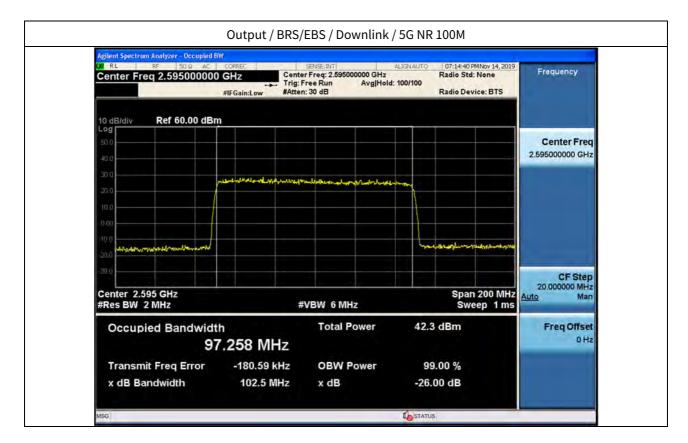


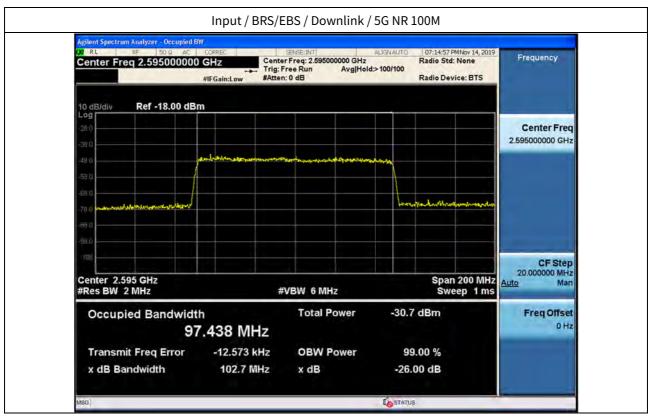




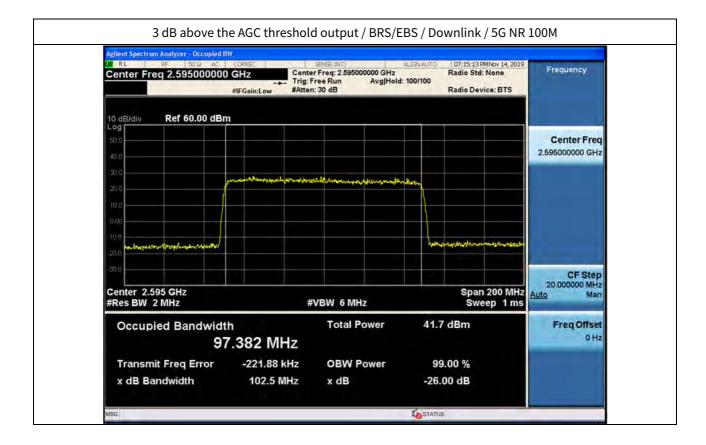














5.4. INPUT/OUTPUT POWER AND AMPLIFIER/BOOSTER GAIN

Test Requirement:

§ 2.1046 Measurements required: RF power output.

(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.

(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 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.

(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 limits and duty cycle.

(h) The following power limits shall apply in the BRS and EBS:

(1) Main, booster and base stations.

(i) The maximum EIRP of a main, booster or base station shall not exceed 33 dBW + 10log(X/Y) dBW, where X is the actual channel width in MHz and Y is either 6 MHz if prior to transition or the station is in the MBS following transition or 5.5 MHz if the station is in the LBS and UBS following transition, except as provided in paragraph (h)(1)(ii) of this section.

(ii) If a main or booster station sectorizes or otherwise uses one or more transmitting antennas with a nonomnidirectional horizontal plane radiation pattern, the maximum EIRP in dBW in a given direction shall be determined by the following formula: EIRP = 33 dBW + 10 log(X/Y) dBW + 10 log(360/beamwidth) dBW, where X is the actual channel width in MHz, Y is either (i) 6 MHz if prior to transition or the station is in the MBS following transition or (ii) 5.5 MHz if the station is in the LBS and UBS following transition, and beamwidth is the total horizontal plane beamwidth of the individual transmitting antenna for the station or any sector measured at the half-power points.



Test Procedures:

Measurements were in accordance with the test methods section 3.5 of KDB 935210 D05 v01r03.

Adjust the internal gain control of the EUT to the maximum gain for which the equipment certification is being sought. Any EUT attenuation settings shall be set to their minimum value.

Input power levels (uplink and downlink) should be set to maximum input ratings while confirming that the device is not capable of operating in saturation (non-linear mode) at the rated input levels, including during the performance of the input/output power measurements.

3.5.2 Measuring the EUT mean input and output power

- a) Connect a signal generator to the input of the EUT.
- b) Configure to generate the test signal.
- c) The frequency of the signal generator shall be set to the frequency f_0 as determined from out-of-band rejection test.
- 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, but not more than 0.5 dB below.
- f) Measure and record the output power of the EUT; use ANSI C63.26-2015 subclause 5.2.4.4.1, for power measurement.
- g) Remove the EUT from the measurement setup. Using the same signal generator settings, repeat the power measurement at the signal generator port, which was used as the input signal to the EUT, and record as the input power. EUT gain may be calculated as described in 3.5.5.
- h) Repeat steps f) and g) with input signal amplitude set to 3 dB above the AGC threshold level.
- i) Repeat steps e) to h) with the narrowband test signal.
- j) Repeat steps e) to i) for all frequency bands authorized for use by the EUT.

3.5.5 Calculating amplifier, repeater, or industrial booster gain

After the input and output power levels have been measured as described in the preceding subclauses, the gain of the EUT can be determined from:

Gain (dB) = output power (dBm) - input power (dBm).

Report the gain for each authorized operating frequency band, and each test signal stimulus.

Note. If f₀ *that determined from out-of-band test is smaller or greater than difference of test signal's center frequency and operation band block, test is performed at the lowest or the highest frequency that test signals can be passed.*



Test Results:

Tabular data of Input / Output Power and Gain

Test Band	Link	Signal	f₀ Frequency (MHz)	Input Power (dBm)	Output Power (dBm)	Gain (dB)
		LTE 20M	2 594.05	-61.72	33.16	94.88
	Uplink	LTE 20M_3C	2 594.05	-61.21	32.96	94.17
		5G NR 100M	2 594.05	-60.93	33.37	94.30
BRS/EBS		LTE 20M	2 591.68	-61.67	33.37	95.04
Down	Downlink	LTE 20M_3C	2 591.68	-61.16	32.94	94.10
		5G NR 100M	2 591.68	-60.85	33.47	94.32

Tabular data of Input / 3 dB above AGC threshold Output Power and Gain

Test Band	Link	Signal	f₀ Frequency (MHz)	Input Power (dBm)	+3 dB Output Power (dBm)	Gain (dB)
		LTE 20M	2 594.05	-61.72	33.27	94.99
	Uplink	LTE 20M_3C	2 594.05	-61.21	32.89	94.10
	222/222	5G NR 100M	2 594.05	-60.93	33.53	94.46
BRS/EBS		LTE 20M	2 591.68	-61.67	33.59	95.26
Downlink	LTE 20M_3C	2 591.68	-61.16	33.00	94.16	
		5G NR 100M	2 591.68	-60.85	32.72	93.57

Tabular data of PAPR

Test Band	Link	Signal	f₀ Frequency (MHz)	0.1 % PAPR (dB)
		LTE 20M	2 594.05	8.45
	Uplink	LTE 20M_3C	2 594.05	11.51
		5G NR 100M	2 594.05	8.38
BRS/EBS		LTE 20M	2 591.68	8.45
	Downlink	LTE 20M_3C	2 591.68	11.36
		5G NR 100M	2 591.68	8.34





Plot data of PAPR

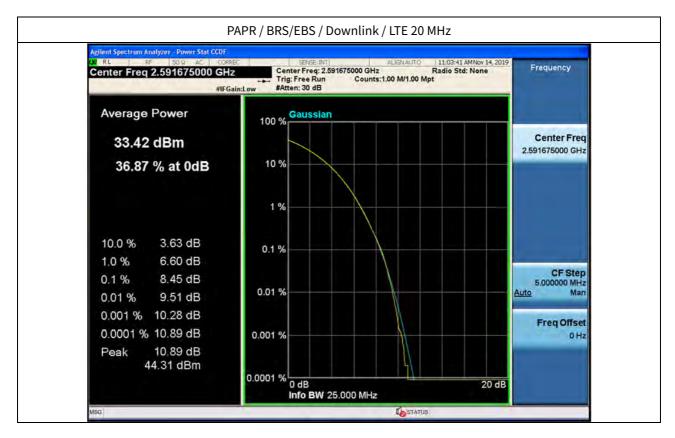






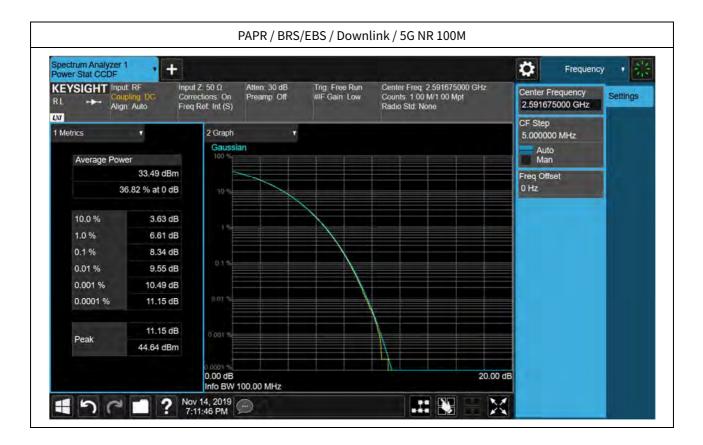














5.5. OUT-OF-BAND/OUT-OF-BLOCK EMISSIONS AND SPURIOUS EMISSIONS

Test Requirements:

§ 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.

(m) For BRS and EBS stations, the power of any emissions outside the licensee's frequency bands of operation shall be attenuated below the transmitter power (P) measured in watts in accordance with the standards below. If a licensee has multiple contiguous channels, out-of-band emissions shall be measured from the upper and lower edges of the contiguous channels.

(2) For digital base stations, the attenuation shall be not less than 43 + 10 log (P) dB, unless a documented interference complaint is received from an adjacent channel licensee with an overlapping Geographic Service Area. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS No. 1 on the same terms and conditions as adjacent channel BRS or EBS licensees. Provided that a documented interference complaint cannot be mutually resolved between the parties prior to the applicable deadline, then the following additional attenuation requirements shall apply:

(i) If a pre-existing base station suffers harmful interference from emissions caused by a new or modified base station located 1.5 km or more away, within 24 hours of the receipt of a documented interference complaint the licensee of the new or modified base station must attenuate its emissions by at least 67 +10 log (P) dB measured at 3 megahertz, above or below, from the channel edge of its frequency block and shall immediately notify the complaining licensee upon implementation of the additional attenuation. No later than 60 days after the implementation of such additional attenuation, the licensee of the complaining base station must attenuate its base station must attenuate its base station emissions by at least 67 +10 log (P) dB measured at 3 megahertz, above or below, from the channel edge of the complaining base station must attenuate its base station emissions by at least 67 +10 log (P) dB measured at 3 megahertz, above or below, from the channel edge of its frequency block of the new or modified base station.

(ii) If a pre-existing base station suffers harmful interference from emissions caused by a new or modified base station located less than 1.5 km away, within 24 hours of receipt of a documented interference complaint the licensee of the new or modified base station must attenuate its emissions by at least 67 +10 log (P)-20 log (Dkm/1.5) dB measured at 3 megahertz, above or below, from the channel edge of its frequency block of the complaining licensee, or if both base stations are co-located, limit its undesired signal level at the pre-existing base station receiver(s) to no more than -107 dBm measured in a 5.5 megahertz bandwidth and shall immediately notify the complaining licensee upon such reduction in the undesired signal level. No later than 60 days after such reduction in the undesired signal level, the complaining licensee must attenuate its base station emissions by at least 67 +10 log (P) dB measured at 3 megahertz, above or below, from the channel edge of its frequency block of the new or modified base station.

(iii) If a new or modified base station suffers harmful interference from emissions caused by a pre-existing base



station located 1.5 km or more away, within 60 days of receipt of a documented interference complaint the licensee of each base station must attenuate its base station emissions by at least 67 +10 log (P) dB measured at 3 megahertz, above or below, from the channel edge of its frequency block of the other licensee. (iv) If a new or modified base station suffers harmful interference from emissions caused by a pre-existing base station located less than 1.5 km away, within 60 days of receipt of a documented interference complaint: (a) The licensee of the new or modified base station must attenuate its OOBE by at least 67 +10 log (P) –20 log (Dkm/1.5) measured 3 megahertz above or below, from the channel edge of its frequency block of the other licensee, or if the base stations are co-located, limit its undesired signal level at the other base station receiver(s) to no more than –107 dBm measured in a 5.5-megahertz bandwidth; and (b) the licensee causing the interference must attenuate its emissions by at least 67 +10 log (P) dB measured, above or below, from the channel edge of 13 megahertz, above or below, from the channel edge of 9 dB measured at 3 megahertz, above or below, from the channel edge of 9 dB measured at 3 megahertz, above or below, from the channel edge of 9 dB measured in a 5.4 measured in a 5.4 measured at 3 megahertz, above or below, from the channel edge of 9 dB measured at 3 megahertz, above or below, from the channel edge of 9 dB measured in a 5.4 measured in a 5.4 measured at 3 megahertz, above or below, from the channel edge of 9 dB measured in a 5.4 measured in a 5.4 measured at 3 megahertz, above or below, from the channel edge of 9 dB measured in a 5.4 measured in a 5.4 measured at 3 megahertz, above or below, from the channel edge of 9 dB measured in a 5.4 measured in a 5.4 measured at 3 megahertz, above or below, from the channel edge of 9 dB measured in a 5.4 measured in a 5.4 measured at 3 megahertz, above or below, from the channel edge of 9 dB measured in a 5.4 measured 14 dB measu

Test Procedures:

Measurements were in accordance with the test methods section 3.6 of KDB 935210 D05 v01r03.

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/out-of-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 may be excluded from the test stipulated in step a).

3.6.2 Out-of-band/out-of-block emissions conducted measurements

- a) Connect a signal generator to the input of the EUT.
 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 this two-signal test.
- b) Set the signal generator to produce two AWGN signals as previously described.
- 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 under test.
- d) Set the composite power levels such that the input signal is just below the AGC threshold, 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.
- 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.
- g) Set the VBW = 3 × RBW.



- h) Set the detector to power averaging (rms) detector.
- i) Set the Sweep time = auto-couple.
- j) Set the spectrum 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 (rms) mode.
- l) 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 steps k) to m) with the composite input power level set to 3 dB above the AGC threshold.
- o) Reset the frequencies of the input signals to the lower edge of the frequency block or band under test.
- 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.

3.6.3 Spurious emissions conducted measurements

- 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.
- 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, 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.
- g) Set the VBW \geq 3 × RBW.
- h) Set the Sweep time = auto-couple.
- i) Set the spectrum analyzer start frequency to the lowest RF signal generated in the equipment, without going below 9 kHz, and the stop frequency to the lower band/block edge frequency minus 1 MHz.

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.

- j) Select the power averaging (rms) detector function.
- k) Trace average at least 10 traces in power averaging (rms) mode.
- 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 spectrum analyzer start frequency to the upper band/block edge frequency plus 1 MHz, and the spectrum analyzer stop frequency to 10 times the highest frequency of the fundamental emission. 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 (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; also provide tabular data, if required.
- p) Repeat steps i) to o) with the input test signals firstly tuned to a middle band/block frequency/channel, and then tuned to a high band/block frequency/channel.
- q) Repeat steps b) to p) with the narrowband test signal.
- r) Repeat steps b) to q) for all authorized frequency bands/blocks used by the EUT.

Note1. In 9 kHz-150 kHz and 150 kHz-30 MHz bands, RBW was reduced to 1 kHz and 10 kHz and correction factor was applied according to section 5.7.2 of ANSI C63.26-2015

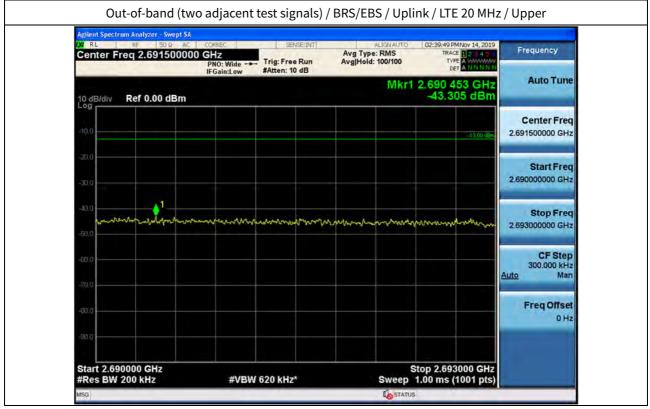
Band	9 ~ 150 kHz Correction	150 kHz ~ 30 MHz Correction		
Above 1 GHz (Ref.RBW: 1 MHz)	30 dB	20 dB		

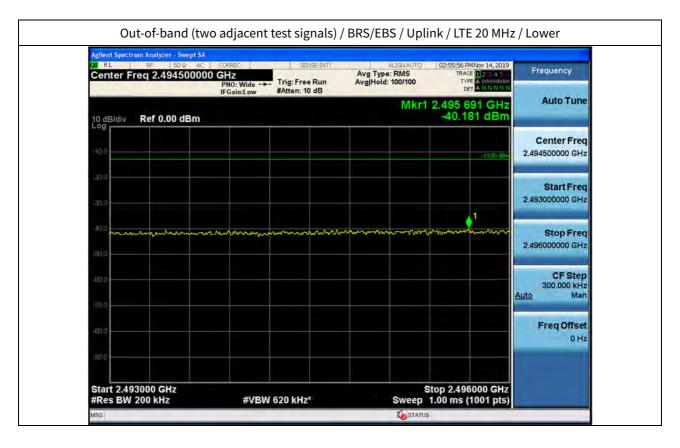
Note2. Measurement bandwidth specified in the applicable rule section for the supported frequency band.

Band	RBW Requirements
	Reference 1 MHz or greater
BRS/EBS	1% of fundamental emission bandwidth in the 1 MHz bands immediately block
	outside



Test Results: Plot data of Out-of-band/out-of-block emissions





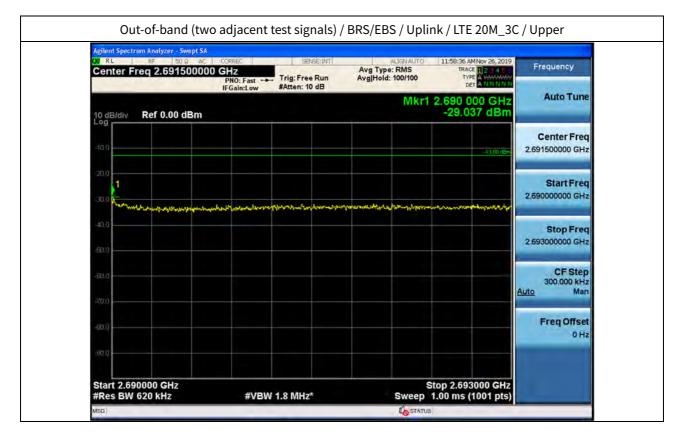


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40.0 10.0	mmmmmm	mmmmm	mmmmm	1 Lorman Martanta	Stop Freq 2.693000000 GHz
-60.0					CF Step 300.000 kHz Auto Man
-80.0					Freq Offset
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-30.0				Start Freq 2.493000000 GHz
40.0 mm mm	mmmmmmm	m	1 million	Stop Freq 2.496000000 GHz
-60.0				CF Step 300.000 kHz <u>Auto</u> Man
-80.0				Freq Offset 0 Hz
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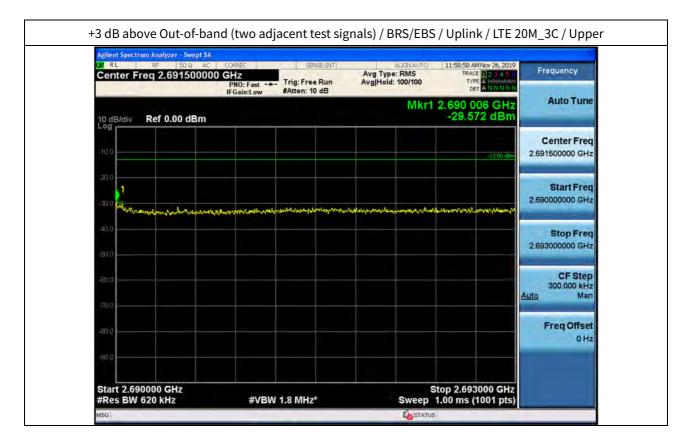






Center Freq 2.494	500000 GHz PNO: Fast IFGain:Low	Trig: Free Run #Atten: 10 dB	Avg Type: RMS Avg Hold: 100/100	01:45:16 PMNov 26, 2019 TRACE 2 3 4 5 3 TYPE A WARMAN DET A N.N.N.N.N	Frequency
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-60.0					CF Step 300.000 kHz Auto Mar
-70.0					Freq Offse





00 RL RF 509 Center Freq 2.494500	AC CORREC	SENSE:INT	ALIGNAUTO Avg Type: RMS Avg Hold: 100/100	01:45:36 PMNov 26, 2019 TRACE 2 3 4 5 0 TYPE A WASSAMM DET A N.N.N.N.N	Frequency
10 dB/div Ref 0.00 dB	IFGain:Low	#Atten: 10 dB	Mkr1	2.496 000 GHz -29.928 dBm	Auto Tune
-ià 0				-15.00 dBm	Center Freq 2.494500000 GHz
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-60,0					CF Step 300.000 kHz <u>Auto</u> Man
-80.0					Freq Offset 0 Hz
9.09					





UM RL RF SOΩ AC	PNO: Wide	Trig: Free Run #Atten: 10 dB	ALIGNAUTO Avg Type: RMS Avg Hold: 100/100	06:46:37 PMNov 14, 2019 TRACE 2 3 4 5 TYPE A MANAMAN DET A N.N.N.N.N	Frequency
10 dB/div Ref 0.00 dBm			Mkr	1 2.690 009 GHz -43.061 dBm	Auto Tune
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40.0 1	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			Stop Freq 2.693000000 GHz
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	PNO: Wide Trig: Free Run IFGain:Low #Atten: 10 dB	-	DET A N.N.N.N.N	Auto Tune
10 dB/div Ref 0.00 dBm		Mkr1	2.496 000 GHz -43.417 dBm	Auto Tune
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-30.0			-23.00 dBm	Start Freq 2.493000000 GHz
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-70.0				Freq Offset 0 Hz
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10 dB/div Ref 0.00 dBm			Mkr1	2.496 000 GHz -44.413 dBm	Auto Tune
=10.0					Center Freq 2.494500000 GHz
-20,0				-23.00 dBm	Start Freq 2.493000000 GHz
-10.0	~~~~~			1	Stop Freq 2.496000000 GHz
-60.0					CF Step 300,000 kHz <u>Auto</u> Man
-70.0					Freq Offset 0 Hz
50 0 Start 2.493000 GHz				Stop 2.496000 GHz 1.00 ms (1001 pts)	



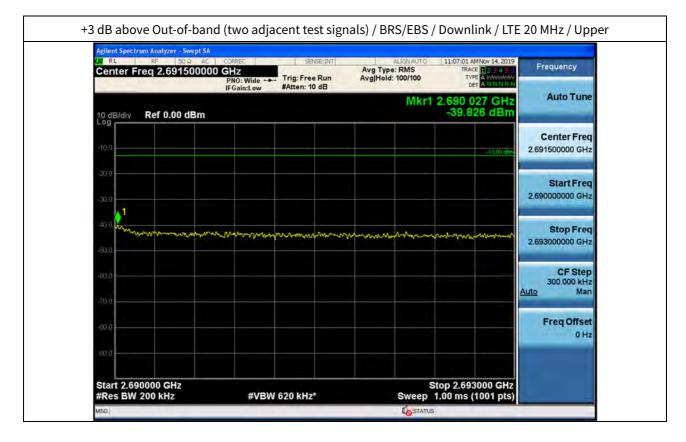


00 RL RF 50 Q AC Center Freq 2.69150000	PNO: Wide	rig: Free Run Atten: 10 dB	Avg Type: RMS Avg Hold: 100/100	11:05:44 AMNov 14, 2019 TRACE 2 3 4 5 TVPE A WWWWWW DET A N.N.N.N.N.N	Frequency
10 dB/div Ref 0.00 dBm	IFGain:Low #	Atten: 10 dB	Mkr1	2.690 003 GHz -38.227 dBm	Auto Tune
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10 dB/div Ref 0.00 dBm				Mkr1 2.	495 997 GHz -39.520 dBm	Auto Tune
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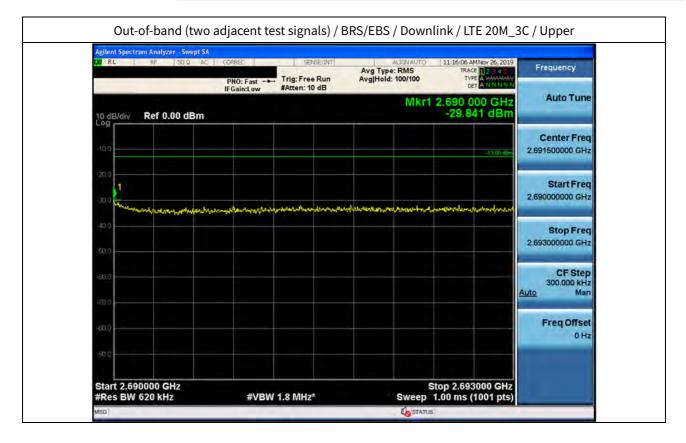




Agilent Spectrum Analyzer - Swept SA RL RF SOG AC Center Freq 2.49450000	O GHz PNO: Wide Trig: Fr	ee Run Avgl	ALIGNAUTO 1 Type: RMS Hold: 100/100	1:42:46 AMNov 14, 2019 TRACE 2 3 4 5 J TYPE A MANAMAN DET A NN N N	Frequency
10 dB/div Ref 0.00 dBm	IFGain:Low #Atten:		Mkr1 2.	495 997 GHz -39.508 dBm	Auto Tune
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-20.0					Start Freq 2.493000000 GHz
40.0 mmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmm	ma mana	www.w	annenenene	manutant	Stop Freq 2.496000000 GHz
-60.0					CF Step 300.000 kHz Auto Man
-80.0					Freq Offset 0 Hz
90 0 Start 2.493000 GHz				o 2.496000 GHz	



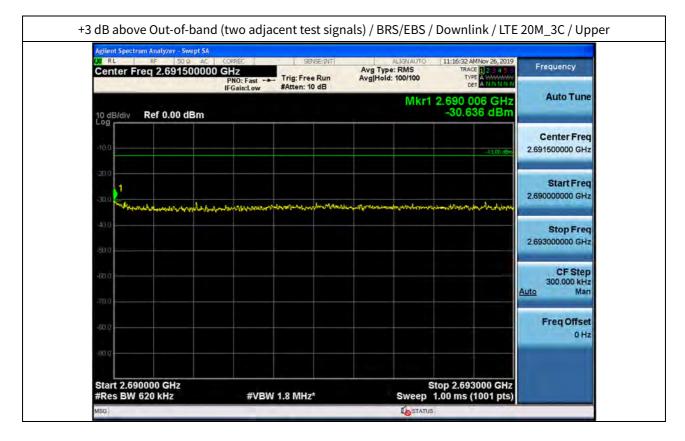




Center Freq 2.	494500000				Avg Type: Avg Hold: 1		TRAC	MNov 26, 2019 E 2 3 4 5 4 E A MARAMAN T A N N N N N	Frequency
10 dB/div Ref	0.00 dBm	IF Gain.Low				Mkr1	2.495 9	94 GHz 32 dBm	Auto Tune
-i0.0								-13.00 cEm	Center Freq 2.494500000 GHz
-20.0								1	Start Freq 2.493000000 GHz
-40,0	anachabellan frihab	nintrif for the providence of the second	a filing and a second	uleannolain	ungeneralitet	Methernert	in yn ochonwyn	A-Window and	Stop Freq 2.496000000 GHz
-60.0									CF Step 300.000 kHz Auto Man
-50.0									Freq Offset 0 Hz
Start 2.493000							stop 2.496		







Center Freq 2		OGHZ PNO: Fast	1.00		Avg Type Avg Hold		TRAC	MNov 26, 2019 28 1 2 3 4 5 0 PE A MANANAN ET A N.N.N.N.N	Frequency
	f 0.00 dBm					Mkr1		76 GHz 61 dBm	Auto Tune
-10,0								-13,00 dBm	Center Fred 2.494500000 GH:
-30.0									Start Freq 2.493000000 GHz
-40.0	mendolen	hawendtwitherview	arlyntshor	hoppingenhan	land and a start of the start o	falenala) ferrandi	assurated	Milwyniaese	Stop Freq 2.496000000 GHz
-60,0									CF Step 300.000 kHz Auto Man
-70,0									Freq Offset 0 Hz
-90.0									



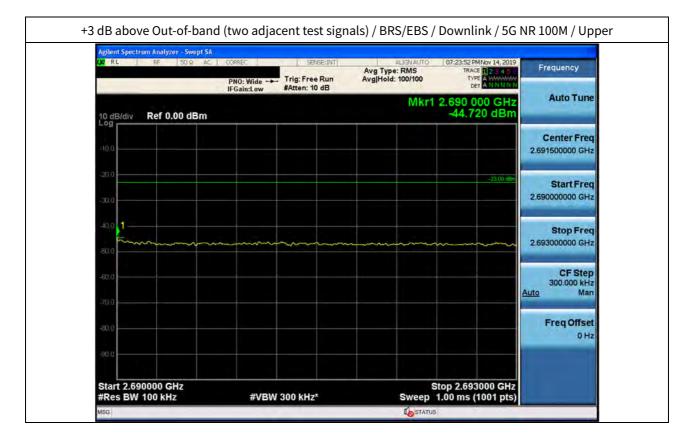


UN RL RF SOΩ AC	1	SENSE:INT	ALIGNAUTO Avg Type: RMS Avg Hold: 100/100	07:23:18 PMNov 14, 2019 TRACE 2:3:4 5 TYPE A MANNIN DET A NN NN N	Frequency
		Atten: 10 dB			
10 dB/div Ref 0.00 dBm			Mkr1	2.690 006 GHz -43.946 dBm	Auto Tune
-10,0					Center Fred 2.691500000 GH:
-20.0				-23.00 cēm	Start Freq 2,69000000 GHz
-40,0 1			·····		Stop Freq 2.693000000 GHz
-60.0					CF Step 300.000 kHz
.70.0					<u>Auto</u> Mar
-80.0					Freq Offset 0 Hz
-90.0					

Agilent Spectrum Analyzer - Swept SA VI RL RF 50.0 AC	PNO: Wide Ti	ig: Free Run tten: 10 dB	ALIGNAUTO Avg Type: RMS Avg Hold: 100/100	07:44:09 PMNov 14, 2019 TRACE 2 2 3 4 5 TYPE A WARMAN DET A N N N N	Frequency
10 dB/div Ref 0.00 dBm			Mkr	1 2.496 000 GHz -44.184 dBm	Auto Tune
-10.0					Center Freq 2.494500000 GHz
-30.0				-23.00 dBm	Start Freq 2.493000000 GHz
50.0 0.50	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			1	Stop Freq 2.496000000 GHz
-80.0					CF Step 300.000 kHz <u>Auto</u> Man
-80.0					Freq Offset 0 Hz
Start 2.493000 GHz				Stop 2.496000 GHz	



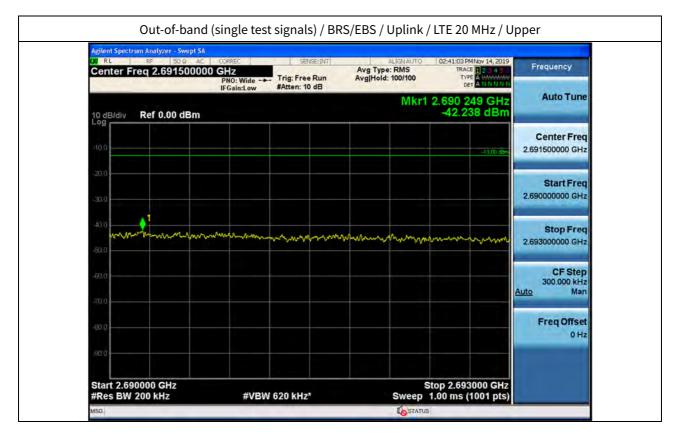




XIRL RF 50-Ω AC	PNO: Wide +++ Trig: Free Run IFGain:Low #Atten: 10 dB	ALIGNAUTO Avg Type: RMS Avg Hold: 100/100	07:44:50 PMNov 14, 2019 TRACE 2 3 4 5 0 TYPE A MARAMAN DET A N N N N N	Frequency
10 dB/div Ref 0.00 dBm		Mkr1 2	.496 000 GHz -45.643 dBm	Auto Tune
-10.0				Center Fred 2.494500000 GH:
-30,0			-23.00 dBm	Start Free 2.493000000 GHz
-40.0			1	Stop Free 2.496000000 GHz
-60.0				CF Step 300.000 kHz <u>Auto</u> Man
-80.0				Freq Offset 0 Hz
.eo.g				



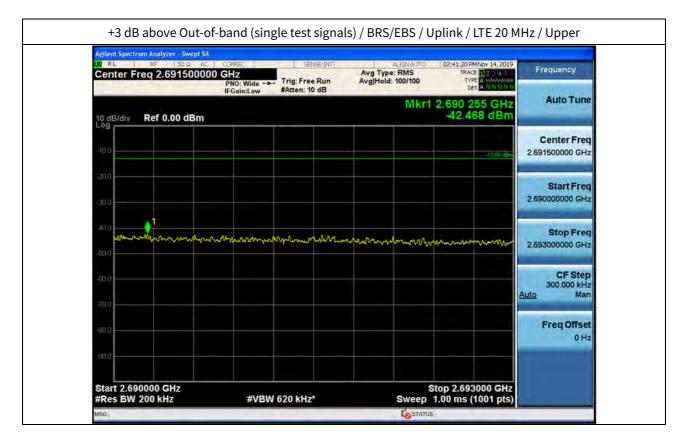




Agilent Spectrum Analyzer	Swept SA		ISE:INT	ALIGNAUTO	02:56:36 PMNov 14, 2019	
Center Freq 2.49	4500000 GHz	Vide Trig: Free	Run Avg	Type: RMS Hold: 100/100	TRACE 1 2 3 4 5 TYPE A MARAMAN DET A N N N N	Frequency
10 dB/div Ref 0.0	IFGain 0 dBm	Low #Atten: 10	0 68	Mkr1	2.495 802 GHz -36.515 dBm	Auto Tune
-100					-13.00 d@m	Center Freq 2.494500000 GHz
-20.0						Start Freq 2,493000000 GHz
40.0	mannin		non monom	an marine marine	Margan Marina	Stop Freq
-50,0						2 496000000 GHz CF Step
-20.0						300.000 kHz Auto Man
-80.0 -80.0						Freq Offset 0 Hz
Start 2.493000 GH #Res BW 200 kHz		#VBW 620 kHz		st	top 2.496000 GHz .00 ms (1001 pts)	



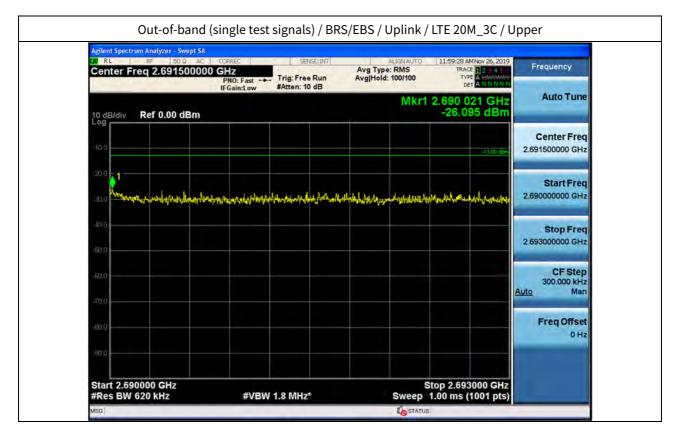




Agilent Spectrum Analyzer - Swept SA	CORREC SENSE:INT	ALIGNAUTO	02:56:53 PMNov 14, 2019	
Center Freq 2.49450000		Avg Type: RMS Avg Hold: 100/100	TRACE 23450 TYPE A MARMAN DET A N.N.N.N.N	Frequency
10 dB/div Ref 0.00 dBm	I Gam.Luw State C	Mkr1 2	2.495 337 GHz -36.487 dBm	Auto Tune
-10.0			-43.00 dBm	Center Freq 2.494500000 GHz
-30.0				Start Freq 2.493000000 GHz
.40.0	mmersee and the second	minninn	www.ta.whombogo	Stop Freq 2.496000000 GHz
-60.0				CF Step 300.000 kHz Auto Man
-70.0				Freq Offset 0 Hz
80.0 Start 2.493000 GHz			op 2.496000 GHz	







Center Freq 2.494500000				46:00 PMNov 26, 2019 TRACE 2 2 3 4 5 1 TVPE A MARAMAN DET A N N N N N	Frequency
10 dB/div Ref 0.00 dBm				95 991 GHz 26.913 dBm	Auto Tune
-10.0				-18,00 dBm	Center Fred 2.494500000 GHz
-20.0 -30.0 Witchtforman/hourd hours	ahandron Mandaland anta hada	mandation	how have been all been been	1.	Start Freq 2.493000000 GHz
40.0					Stop Freq 2.496000000 GHz
-80.0					CF Step 300.000 kHz Auto Man
-60.0					Freq Offset 0 Hz
·20.0					





Center Freq 2.691		ast Trig: Fre	e Run /	ALIGNAUT Avg Type: RMS Avg Hold: 100/100	TRACI TVP		Frequency
10 dB/div Ref 0.00		UW Pratein		Mk	r1 2.690 0 -28.92	27 GHz 23 dBm	Auto Tune
=10.0						-13,00 dBm	Center Fred 2.691500000 GHz
-30.0							Start Freq 2.69000000 GHz
40.0	ylyollogrammiliadaying	woodcastrateliste	And appropriate	normania	addetallignedailaad	Manaplaty	Stop Freq 2.693000000 GHz
-60.0							CF Step 300.000 kHz Auto Man
-80.0							Freq Offset 0 Hz
-90 Q							

Agilent Spectrum Analyzer - Swept Sk				
07 RL RF 50.9 AC Center Freq 2.49450000			01:46:16 PMNov 26, 2019 TRACE 2 3 4 5 0 TYPE A MANANAN DET A NNNNN	Frequency
10 dB/div Ref 0.00 dBm		Mk	1 2.495 997 GHz -27.172 dBm	Auto Tune
-10.0			-13,00 dBm	Center Freq 2.494500000 GHz
-30.0 Mathematical	Marconstructures and the second	mained the anti-angle of the	ulynory gan hyren fait	Start Freq 2.493000000 GHz
-50.0				Stop Freq 2.496000000 GHz
-60.0				CF Step 300.000 kHz Auto Man
-80.0				Freq Offset 0 Hz
Start 2.493000 GHz #Res BW 620 kHz	#VBW 1.8 MHz*		Stop 2.496000 GHz 1.00 ms (1001 pts)	





Agilent Spectrum Analyzer - Swept SA (X) RL RF 50.Ω AC	CORREC SENSE:INT		06:43:42 PMNov 14, 2019	Francisco
	PNO: Wide Trig: Free Run IFGain:Low #Atten: 10 dB	Avg Type: RMS Avg Hold: 100/100	TRACE 2 3 4 5 0 TYPE A MANANA DET A N N N N N	Frequency
10 dB/div Ref 0.00 dBm		Mkr1 2	.690 000 GHz -44.233 dBm	Auto Tune
-10.0				Center Fred 2.691500000 GHz
-30.0			-23.00 dBm	Start Freq 2,69000000 GHz
-40,0 1				Stop Freq 2.693000000 GHz
-80.0				CF Step 300.000 kHz Auto Man
-70.0				Freq Offset 0 Hz
-eo.g				

Agilent Spectrum Analyzer - Swept SA				
(M) RL RF SO.Ω AC	PNO: Wide Trig: Free Run	ALIGNAUTO (Avg Type: RMS Avg Hold: 100/100	07:03:40 PMNov 14, 2019 TRACE 23.45 TYPE A MARAMAN DET A N N N N N	Frequency
10 dB/div Ref 0.00 dBm	IFGain:Low #Atten: 10 dB	Mkr1 2.	495 991 GHz -43.631 dBm	Auto Tune
=10.0				Center Freq 2.494500000 GHz
-30.0			-23.00 cēm	Start Freq 2.493000000 GHz
40.0			1	Stop Freq 2.496000000 GHz
-60.0				CF Step 300.000 kHz <u>Auto</u> Man
-80.0				Freq Offset 0 Hz
80 0 Start 2.493000 GHz			p 2.496000 GHz	



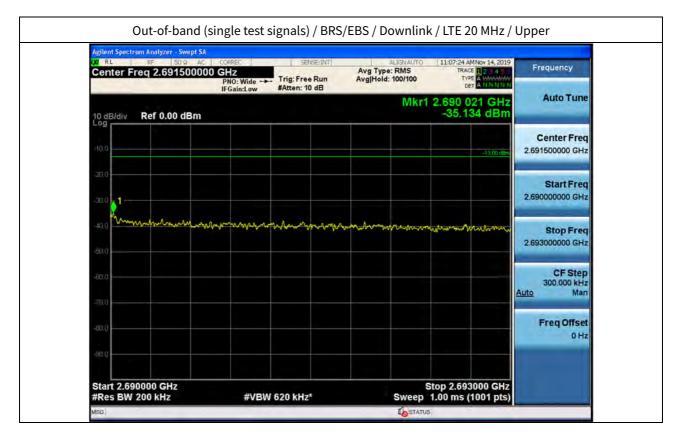


NO RL RF SDQ AC	CORREC SENSE: INT		06:44:12 PMNov 14, 2019	Frequency
	PNO: Wide Trig: Free Run IFGain:Low #Atten: 10 dB	Avg Type: RMS Avg Hold: 100/100	TRACE 2 3 4 5 0 TYPE A MANANAN DET A N N N N N	
10 dB/div Ref 0.00 dBm		Mkr1 2	.690 000 GHz -45.374 dBm	Auto Tun
-10.0				Center Free 2.691500000 GH
-30.0			-23.00 dBm	Start Free 2,69000000 GH2
40.0		m	~~~~~	Stop Free 2.693000000 GH
-60.ú				CF Step 300.000 kHz Auto Mar
-80.0				Freq Offse
-30 û				

Agilent Spectrum Analyzer - Swept SA VI RL RF 50.9 AC	PNO: Wide	SENSE:INT Trig: Free Run #Atten: 10 dB	ALIGNAUTO Avg Type: RMS Avg Hold: 100/100	07:04:10 PMNov 14, 2019 TRACE 12 3 4 5 0 TYPE A WWWWW DET A N N N N N	Frequency
10 dB/div Ref 0.00 dBm			Mkr1	2.495 997 GHz -44.066 dBm	Auto Tune
-10.0					Center Freq 2.494500000 GHz
-30.0				-23.00 dBm	Start Freq 2.493000000 GHz
40.0	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			1	Stop Freq 2.496000000 GHz
-60.0					CF Step 300.000 kHz <u>Auto</u> Man
-70.0					Freq Offset 0 Hz
30.0 Start 2.493000 GHz				Stop 2.496000 GHz	







Agilent Spectrum Analyzer - Swept SA				
Center Freq 2.494500000	GHz PNO: Wide Trig: Free Run	Avg Type: RMS Avg Hold: 100/100	11:39:58 AMNov 14, 2019 TRACE 2 3 4 5 0 TYPE A MANAMAN DET A N N N N N	Frequency
10 dB/div Ref 0.00 dBm	IFGain:Low #Atten: 10 dB	Mkr1 2	.496 000 GHz -37.142 dBm	Auto Tune
-10.0			-13,00 đếm	Center Fred 2.494500000 GHz
-20.0				Start Freq 2.493000000 GHz
-40.0			1	Stop Freq
50.0	mannamana	www.www.www	nongly his die v	2.496000000 GHz
-60.0				CF Step 300.000 kHz Auto Man
-80.0				Freq Offset
-90.0				
Start 2.493000 GHz #Res BW 200 kHz	#VBW 620 kHz*	Steep 1.	op 2.496000 GHz 00 ms (1001 pts)	

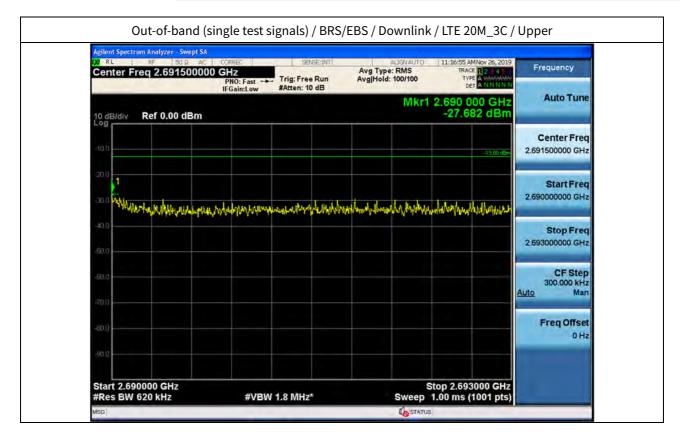


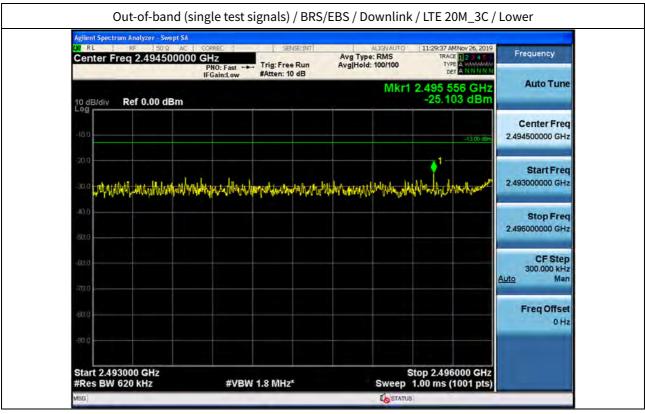
Center Freq 2.6915000	PNO: Wide Trig		Avg Type: RMS Avg Hold: 100/100	TRACE 2 3 4 5 TYPE A MANANA DET A N N N N	
10 dB/div Ref 0.00 dBm			Mkr	1 2.690 009 GH -35.682 dBr	
-10.0				-13,00 dE	Center Fred 2.691500000 GH2
-20.0					Start Free 2.69000000 GHz
40.0 minunghormonit	mmmmmadae	harmon	Mannapanna	and the second and a second	* Stop Freq 2.693000000 GHz
-60.á					CF Step 300.000 kHz Auto Man
-80.0					Freq Offset
-90 Q					

00 RL RF 50.9 AC Center Freq 2.49450000		Avg Type: RMS Avg Hold: 100/100	11:40:14 AMNov 14, 2019 TRACE 2 3 4 5 TYPE A MANANAN DET A N N N N N	Frequency
10 dB/div Ref 0.00 dBm		Mkr1	2.496 000 GHz -37.957 dBm	Auto Tune
-10.0			-13.00 d@m	Center Freq 2.494500000 GHz
-30.0				Start Freq 2.493000000 GHz
-10.0 whenhamingan 10.0 50.0	munimprompri	mmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmm	mmmmmmm	Stop Freq 2.496000000 GHz
-60.0				CF Step 300.000 kHz Auto Man
-70.0				Freq Offset 0 Hz
.ea a				













Center Freq 2.69150	PNO: Fast Tr		ALIGNAUTO 11: 1 Type: RMS Hold: 100/100	17:12 AMNov 26, 2019 TRACE 1 2 3 4 5 0 TVPE A MANANANA DET A N.N.N.N.N	Frequency
10 dB/div Ref 0.00 dB	3m			90 027 GHz 27.886 dBm	Auto Tune
-10,0				-13,00 d Q m	Center Freq 2.691500000 GHz
-20.0	Mone Jak Inter Me	R-1734444-Allowhallysoolis	nsis kereliker de desena	الم مندية الله	Start Freq 2.690000000 GHz
-900	de litran varati, nita te druta, te dever, nit	li (h. s. bahasin, h. swa Afrakun	de al de la construction de la cons La construction de la construction d	A to a William Aland	Stop Freq 2.693000000 GHz
-60.0					CF Step 300.000 kHz Auto Man
-80.0					Freq Offset 0 Hz
20.0 D DS					

Agilent Spectrum Analyzer - Swept SA 20 RL RF SOQ AC Center Freq 2.494500000		ALIGNAUTO 11 Avg Type: RMS Avg Hold: 100/100	29:54 AMNov 26, 2019 TRACE 1 2 3 4 5 0 TYPE A WARAWAY DET A N N N N	Frequency
10 dB/div Ref 0.00 dBm		Mkr1 2.4	93 822 GHz 24.544 dBm	Auto Tune
-10 0			-13.00 đếm	Center Freq 2.494500000 GHz
.20.0 .30.0 Umaninghite Una nafhalalaga	1 Waterprofile applied to the second	www.hundled.ch.ee.	Wather Hawken and	Start Freq 2.493000000 GHz
-40.0				Stop Freq 2.49600000 GHz
-60.0			Au	CF Step 300.000 kHz to Man
-80.0				Freq Offset 0 Hz
Start 2.493000 GHz #Res BW 620 kHz		Stop	2.496000 GHz ms (1001 pts)	





Agilent Spectrum Analyzer - Swept SA UN RL RF 50.0 AC	CORREC	SENSE:INT	ALIGNAUTO	07:24:28 PMNov 14, 2019	English
	PNO: Wide IFGain:Low	Trig: Free Run #Atten: 10 dB	Avg Type: RMS Avg Hold: 100/100	TRACE 2 3 4 5 TYPE A MANANA DET A N N N N N	Frequency
10 dB/div Ref 0.00 dBm			Mkr1	2.690 000 GHz -44.073 dBm	Auto Tune
=10.0					Center Fred 2.691500000 GH:
-30.0				-23,00 cem	Start Freq 2.69000000 GHz
40.0 1					Stop Freq 2.693000000 GHz
-60.0					CF Step 300.000 kHz Auto Man
-80.0					Freq Offset
·eo.α					

Agilent Spectrum Analyzer - Swept SA			
UN RL I RF SOLQ AC	PNO: Wide Trig: Free IFGain:Low #Atten: 10	TRACE 1 2 3 4 5	Frequency
10 dB/div Ref 0.00 dBm	IFGain:Low #Attent. In	lkr1 2.495 997 GHz -44.008 dBm	Auto Tune
=10.0			Center Fred 2.494500000 GHz
-30.0		-23.00 dBm	Start Freq 2.493000000 GHz
40.0		 1	Stop Freq 2.496000000 GHz
-50.0			CF Step 300.000 kHz Auto Man
-80.0			Freq Offset 0 Hz
-90.0			



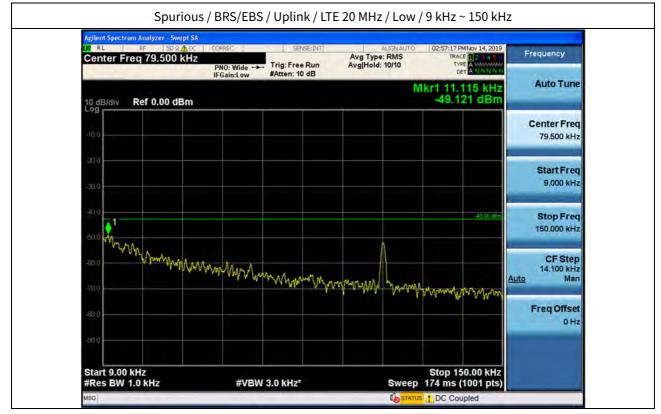


CM RL RF 50Ω AC	PNO: Wide T	rig: Free Run Atten: 10 dB	Avg Type: RMS Avg Hold: 100/100	07:24:57 PMNov 14, 2019 TRACE 2 2:3 4 5 TVPE A WWWWW DET A N N N N N	Frequency
10 dB/div Ref 0.00 dBm	I GUILLEW		Mkr	2.690 000 GHz -45.097 dBm	Auto Tuno
=10.0					Center Free 2.691500000 GH
-30.0				-23,00 đếm	Start Free 2.690000000 GH2
-40.0.1	······				Stop Fred 2.693000000 GHz
-60.0					CF Step 300.000 kHz Auto Man
-80.0					Freq Offset
-90.0					

Agilent Spectrum Analyzer - Swept SA VI RL RF 50.9 AC 1	CORREC SE PNO: Wide →→ IFGain:Low #Atten: 1		S TRACE 2345	Frequency
10 dB/div Ref 0.00 dBm		Ν	1kr1 2.495 997 GHz -45.402 dBm	Auto Tune
=10.0				Center Freq 2.494500000 GHz
-30.0			-23.00 cēm	Start Freq 2.493000000 GHz
40.0		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	1	Stop Freq 2.496000000 GHz
-50.0				CF Step 300.000 kHz Auto Man
-80.0				Freq Offset 0 Hz
90.0 Start 2.493000 GHz			Stop 2.496000 GHz	



Plot data of Spurious Emissions



00 RL RF 50 R▲DC Center Freq 15.075000 F	PNO: Fast Trig: Free Run	Aug Type: RMS Avg Hold: 10/10	02:57:28 PMNov 14, 2019 TRACE 1 2 3 4 5 TYPE A MANAMAN DET A N N N N N	Frequency
10 dB/div Ref 0.00 dBm	IFGain:Low #Atten: 10 dB		Mkr1 160 kHz -49.602 dBm	Auto Tune
-10.0				Center Freq 15.075000 MHz
-20.0			-33.00 c em	Start Freq 150,000 kHz
-40.0				Stop Freq 30.000000 MHz
-60.0				CF Step 2.985000 MHz Auto Man
-20.0	મંત્રિય કરવે છે. કે કાર મુખ્ય પ્રયત્ન કરવા છે. કે કાર મુખ્ય પ્રયત્ન કરવે છે. આ દેવે કે પ્રયત્ન કરવે છે. કે કાર મુખ્ય મેળવું કે કુ કુ કે કે ગળવા છે. તે મુખ્ય પ્રયત્ન કરવે છે. આ દેવે છે. તે પ્રયત્ન કરવે છે. તે કે		na pangangan kanganganganganganganganganganganganganga	Freq Offset 0 Hz
90.0 Start 150 kHz			Stop 30.00 MHz	



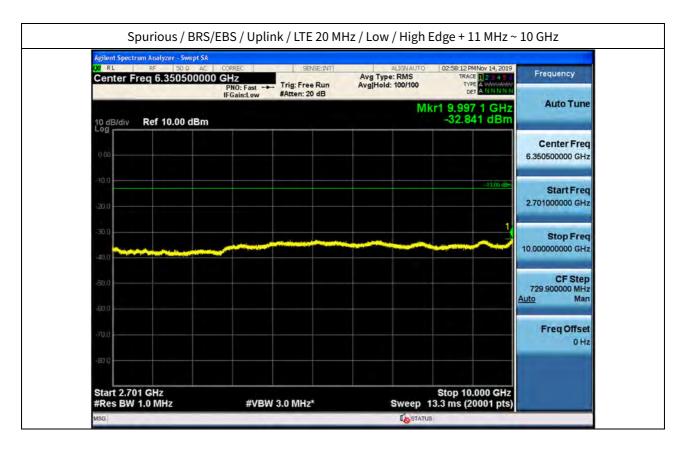
Center Freq 1.25750	AC CORREC 00000 GHz PN0: Fast ~	SENSE:INT	Avg Type: RMS Avg Hold: 10/10	02:57:36 PMNov 14, 2019 TRACE 2 3 4 5 TVPE A MANANAN DET A N N N N N	Frequency
10 dB/div Ref 0.00 dE	IFGain:Low	#Atten: 16 dB	Mkr	1 2.485 00 GHz -35.312 dBm	Auto Tune
-10.0				-13,00 đếm	Center Freq 1.257500000 GHz
-30.0					Start Freq 30.000000 MHz
40.0	and a standard we have	CONTRACTOR OF THE R. P. C.	are any her delay a spatro bill and the	ate p. Andal for Phillip Indiana and the	Stop Freq
-50.0	leg medatest at a side sanda	alle over the second second as	na ana ang ang ang ang ang ang ang ang a	en larrigen proprietan galad	2,485000000 GHz CF Step 245,500000 MHz Auto Man
-50.0 V-Matcheld in the Marine	ika parisikite kakite inida	aty was filed on the file of the addition	in kandrada kana papa pila pa		2.485000000 GHz CF Step 245.500000 MHz

Center Freq 2.490000000		ALIGNAUTO Avg Type: RMS Avg Hold: 10/10	02:57:43 PMNov 14, 2019 TRACE 1 2:3:4 5 0 TYPE A MANAMAN DET A N.N.N.N.N	Frequency
10 dB/div Ref 20.00 dBm		Mkr	1 2.489 52 GHz -34.247 dBm	Auto Tune
100				Center Freq 2.490000000 GHz
0.00 -100				Start Freq 2.485000000 GHz
-20.0	1		-23 00 dệm	Stop Freq 2.495000000 GHz
	mon man market	mannana		CF Step 1.000000 MHz Auto Man
-50.0				Freq Offset 0 Hz
70 0 Start 2.485000 GHz			stop 2.495000 GHz	

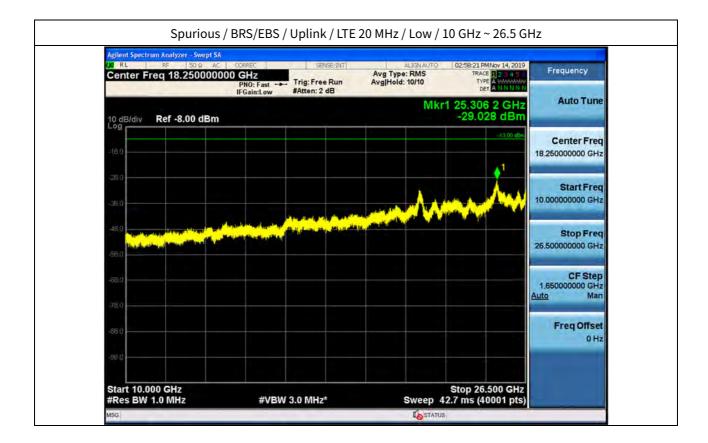




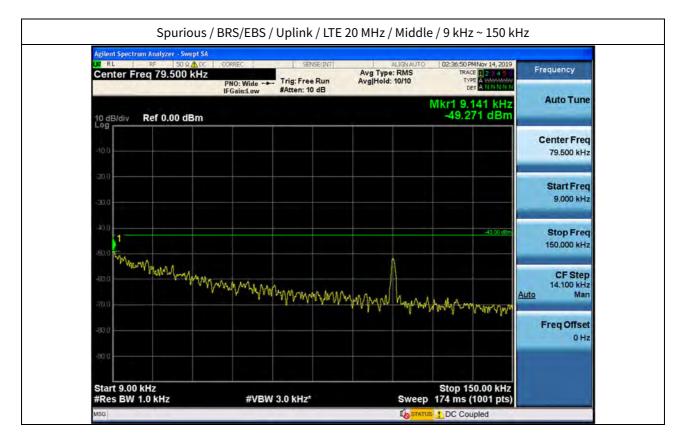
09 RL RF 50 G AC Center Freq 2.696000000		e Run Avg Type: Avg Hold:1		4 5 C Frequency
10 dB/div Ref 20.00 dBm			Mkr1 2.691 05 G -33.520 dl	
10.0				Center Fred 2.696000000 GHz
0.00 -10.0				Start Freq 2.691000000 GHz
-20.0			-29.0	2.701000000 GHz
40.0	when when when	manyman	manyamp	CF Step 1.000000 MHz Auto Man
-60.0				Freq Offset 0 Hz
-70 à				







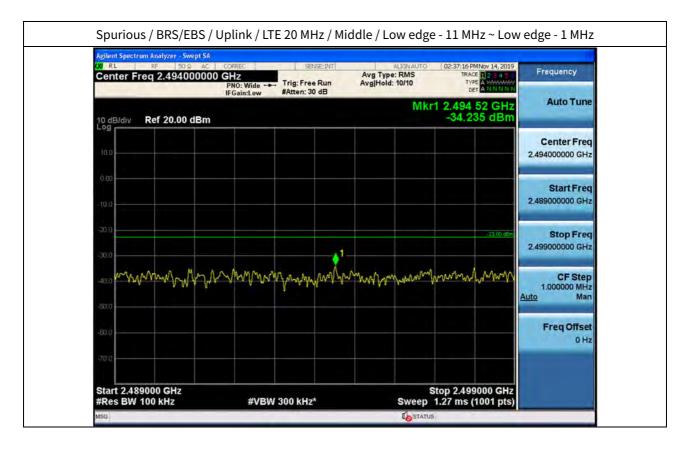




Center F	req 15.075	P	RREC NO: Fast -> Gain:Low			Avg Typ Avg Hold	TRA	PMNov 14, 2019 CE 1 2 3 4 5 0 /PE A WASAAAA DET A N N N N N	Frequency
10 dB/div	Ref 0.00 d	Bm						150 kHz 32 dBm	Auto Tune
-10.0									Center Freq 15.075000 MHz
-30,0								-33 00 cem	Start Freq 150,000 kHz
-40,0									Stop Freq 30.000000 MHz
-60.0	and and the state of the state	talionst alego.	tuli a data se	and and a second		n vasta asalik	the of Birth		CF Step 2.985000 MHz <u>Auto</u> Man
-80.0	andra and	the first the state	Windowski, dra (ng alatora (a hata	in a Road and a	liperist.		Freq Offset 0 Hz
eo o Start 150	kHz						Stop	30.00 MHz	

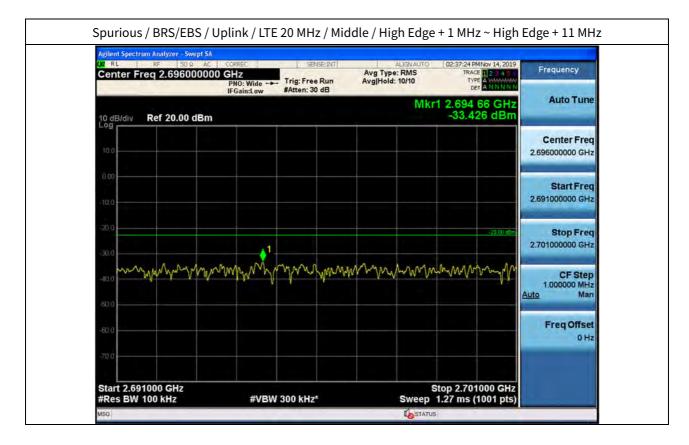


Center Freq 1.2595	000000 GHz PNO: Fast	Trig: Free Run	Avg Type: RMS Avg Hold: 10/10	TRACE 2345 TYPE A WANNAM DET A N N N N N	Frequency
	IFGain:Low	#Atten: 16 dB	-	1000	and a second
10 dB/div Ref 0.00 d	Bro		Mki	1 2.381 54 GHz -37.268 dBm	and the second sec
Log					
-10.0					Center Freq
10.0				-13,00 den	1.259500000 GHz
-20.0					Charles
20.0					Start Freq 30.000000 MHz
-30,0					201000000000000000000000000000000000000
				≬ ¹	
40.0	rek hannen an de de die die steren allere	the star present to the star of the sector	lingthe infinition opening from and the line	pa and a signal state with thing	Stop Freq
-40.0	a hay particular and a second	de ale prove ne decharge	ling in the second s	Constant and the original of t	Stop Freq 2.489000000 GHz
40.0 50.0 <mark>Harden of Alaston de B</mark>	a magan a babana a sa	ada a dala sa	ling to the second s Second second	eposition is a finite and the second s	
40.0 1983) (1983) (1994) (1994) (1994) 1995) (1994) (1994) (1994) 1995) (1994) (1994) (1994) 1995) (1994) (1994) (1994)	(a) hanga ang din kang din kan Profession din kang di	alter (den jon verse den sterne førsen i Store for den store for det for det store for en store for Store for en store f	lleger frister om den staden og hendelsongen op det det i blever	ginnes and and a first strategy of the strateg	2,489000000 GHz CF Step
-50.0 <mark>414 (604) 24 (1944)</mark> -60.0	(a) have provide the first state of a	nt a la companya na sana ang kana ang k	lingen före av grev i Tyre reda sör og by skalasigna og att (na 714 grav	els and a star of an de ander set former Vener (frank for de la star former	2,489000000 GHz
-so.a Historick (Nytest (1943)	n harren er i de kannen er er et en gegelen i de kannen er	a barda a successo a successo da succes Canada da successo da succes	line and the second	no est este di indensiti litte No est este di indensiti litte No est este indensiti di este antest	2.489000000 GHz CF Step 245.900000 MHz <u>Auto</u> Man
-50.0 <mark>414 (604) 24 (1944)</mark> -60.0	n harren er en het het harren het er net het yn yn de gemeente er en ster wet er	alle de la seconda de la contra d La contra de la contr La contra de la contr	lise of the property in a particle and probability of the particle of the particle and the particle of the par	policies cargo de inde cargo de la forma non esta cargo de la forma de la forma non esta cargo de la forma	2.48900000 GHz CF Step 245.900000 MHz <u>Auto</u> Man Freq Offset
-50.0 <mark>414 (604) 24 (17) 24 (1</mark>	(1) Anna y general (1) ⁽¹⁾ ⁽¹⁾ Anna an Anna (1) (1) Anna y general (1) ⁽¹⁾ Anna (1) Anna (1) (1) Anna y general (1) Anna (1) Anna (1) Anna (1) Anna (1) Anna (1) (1) Anna (1) Anna (1) (1) Anna (1)	nsky utek angener en en same karan karan Sugar da karan pilan ki ti karan biya pi	line of the second s	no met net en de rite de la de la Non est puer de la dela de la dela de la dela de la dela de	2.489000000 GHz CF Step 245.900000 MHz <u>Auto</u> Man
-50.0 <mark>414 (64) (12 (12 (4) (12 (4) (12 (4) (12 (4) (12 (4) (12 (4) (12 (4) (12 (4) (12 (4) (12 (12 (12 (12 (12 (12 (12 (12 (12 (12</mark>		sta de la compositiva de la compositiv Seconda de la compositiva de la composit En la compositiva de la	lle Politik en en den metode net releter general en antide en net releter general en antide en	no metanin di metanin di metanin di metanin Kana (p. 2017) kang parti di kang metanin Mana (p. 2017) kang parti di kang metanin	2.48900000 GHz CF Step 245.900000 MHz <u>Auto</u> Man Freq Offset



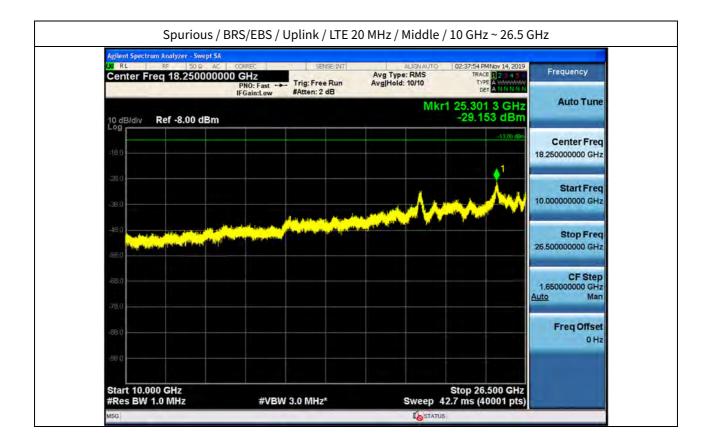




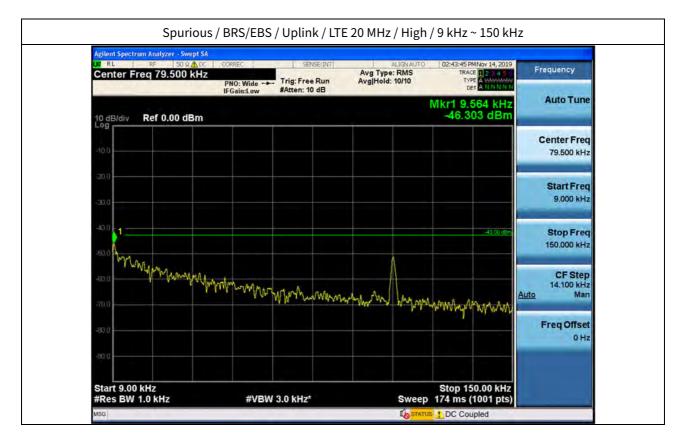


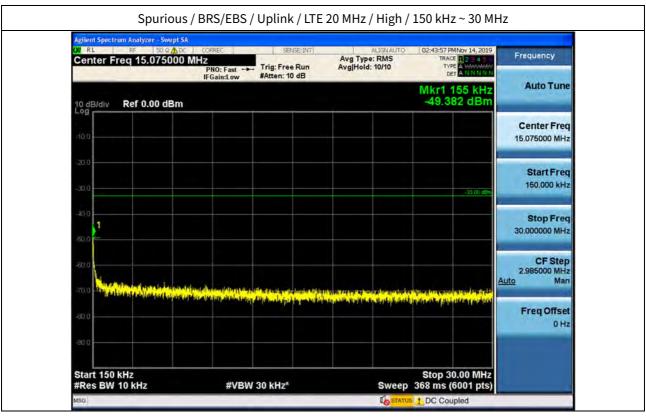












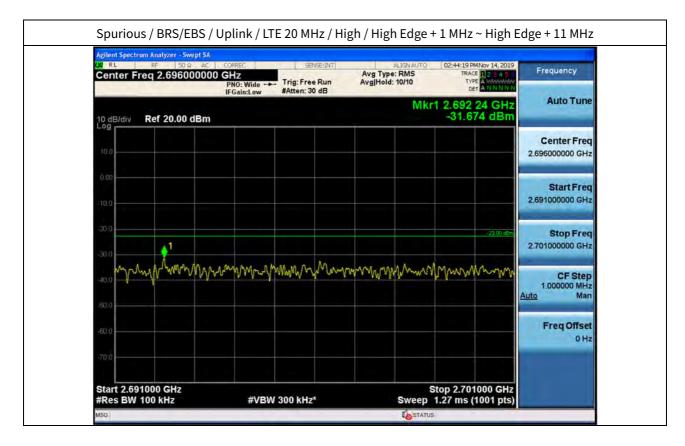


Center Freq		Z NO: Fast Trig: F	ree Run Avg	ALIGNAUTO (Type: RMS Hold: 10/10	12:44:04 PMNov 14, 2019 TRACE 2 3 4 5 TVPE A MANAMAN DET A N N N N	Frequency
10 dB/div Ref	0.00 dBm	Sain:Low #Atter	:: 16 dB	Mkr1 :	2.441 91 GHz -36.672 dBm	Auto Tune
-10.0					-13,00 dBm	Center Freq 1.259500000 GHz
-30.0						Start Freq 30.000000 MHz
-40.0 -50.0 11-0.1	an di salah sa kata sa kana sa kata sa Kata sa kata sa	den and the second of the s A second of the	an that the set of the	a se anna a sta a st Ta a sta a	a a saan a saa a saa a saa Ta a saa a s	Stop Freq 2,489000000 GHz
						CF Step 245.900000 MHz Auto Man
-60.0						
						Freq Offset 0 Hz

00 RL RF 50 A AC Center Freq 2.49400000		ALIGNAUTO Avg Type: RMS Avg Hold: 10/10	02:44:11 PMNov 14, 2019 TRACE 2 3 4 5 0 TVPE A WARMAN DET A N N N N N	Frequency
10 dB/div Ref 20.00 dBm		Mkr1	2.489 00 GHz -34.972 dBm	Auto Tune
10.0				Center Freq 2.494000000 GHz
-10.0				Start Freq 2.489000000 GHz
-20.0			-23 00 cēm	Stop Freq 2.49900000 GHz
V	www.www.www.	mmunnmun	1.	CF Step 1.000000 MHz Auto Man
-50.0				Freq Offset 0 Hz
570.0 Start 2.489000 GHz #Res BW 100 kHz		Sto	p 2.499000 GHz 27 ms (1001 pts)	



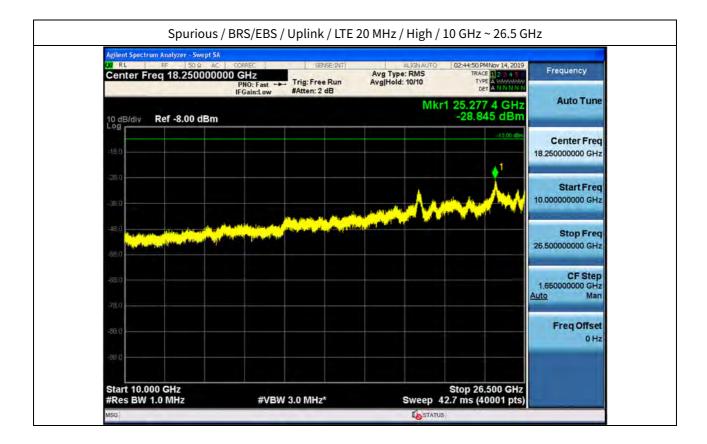






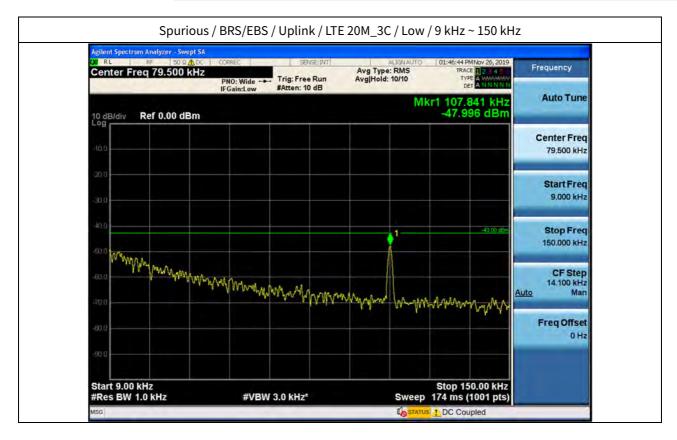








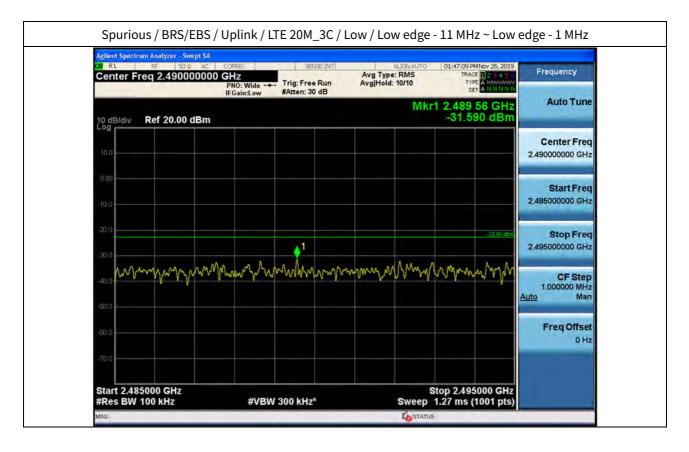




UN RL	RF 50.9,	F	PNO: Fast ++	1.110	Avg Type Avg Hold		TRA	MNov 26, 2019 CE 1 2 3 4 5 J PE A WASANAS ET A N.N.N.N.N.N	Frequency
	Ref 0.00 dE	3m					Mkr1 -51.2	155 kHz 57 dBm	Auto Tune
-10,0									Center Freq 15.075000 MHz
-20,0								-33,00 dBm	Start Freq 150.000 kHz
-40.0									Stop Freq 30.000000 MHz
-60.0	و معالم م	a hate at a							CF Step 2.985000 MHz Auto Man
-60.0				vine over	an in the state of	de danspræde Na dansbyræ		and the second s	Freq Offset 0 Hz
Start 150 kH	17						Stop 3	0.00 MHz	



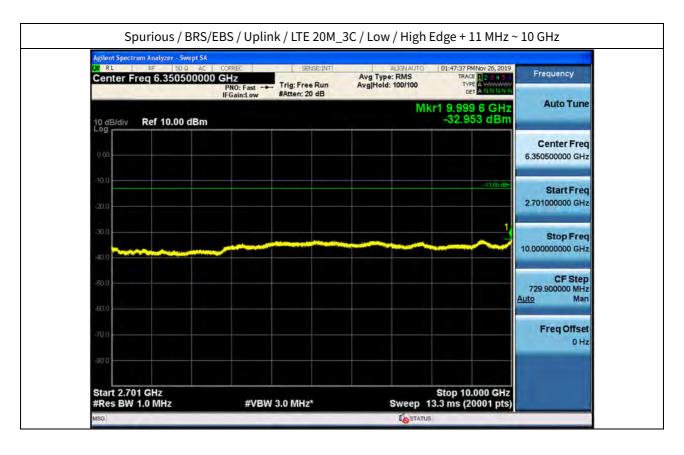
Center Freq 1.2575000		SENSE:INT	ALIGNAUTO Avg Type: RMS Avg Hold: 10/10	01:47:01 PMNov 26, 2019 TRACE 1 2 3 4 5 TVPE A MARAANA	Frequency
	PNO: Fast ++ IFGain:Low	#Atten: 16 dB	-	DET A N N N N N	Auto Tune
10 dB/div Ref 0.00 dBm	n		Mkr	1 2.484 88 GHz -24.563 dBm	Auto Tune
-10,0				-13,00 dBn	Center Freq 1.257500000 GHz
-20.0				1	Start Freq
-30,0					30.000000 MHz
ion			an a	and a method a linearing and inter	
-40.0 So der son der Standarts pilden -50.0 so <mark>so der son der son</mark>	a ta a sa a sa din ba a sin di ana Nga nang kata palanika di sa f	tenten entrisk findige Generalise og pinderet	lande tersperiet state and state state	n kon manda ka di maka analari Mana kanga papapan panga ana	Stop Freq 2,485000000 GHz
-40.0 -50.0 	e forskerer forskerer forskerer forsk Netter skrift forskerer forskerer forskerer Netter forskerer forskerer forskerer forskerer forskerer forskerer	an ing salat kita di salat Kanpun hara di salat kita di salat Kanpun hara di salat kita di salat kita di salat kita di salat kita di salat	¹ In the state of the state o	n kon a star da kan presid far Men a star da kan presid far	
-50.0 will subject the stiller of the	a da stan per tita da ang stat di ma <mark>Na statu da kata sa jug</mark> i kadi sa t	da shera sa kata bilandi sa Pangana hisi na Pinda di	n an	n fer verde sjere for en ferder Ny ner de sjere for en ferder Ner verde sjere for en ferder	2.485000000 GHz
-50.0 <mark>Kalekana dina dina dina dina dina dina dina d</mark>	n fan sjon en dele fan sjon fil yn f		n an	n fers verse en ferse ferse ferse ferse Ny neverse en ferse ferse ferse ferse ferse Na neverse en ferse ferse ferse ferse ferse ferse ferse ferse ferse	2.485000000 GHz CF Step 245.500000 MHz



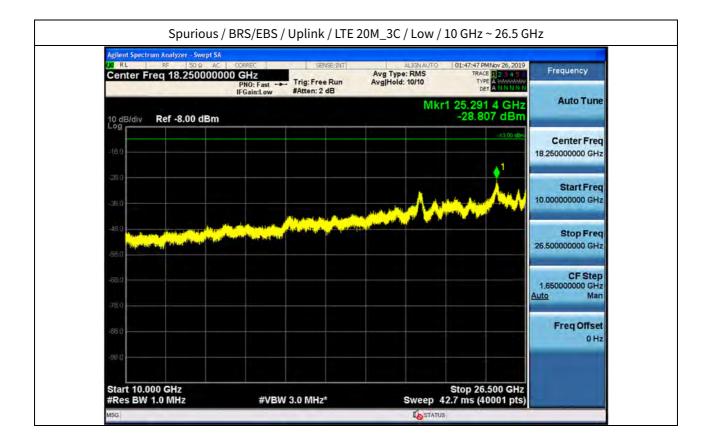




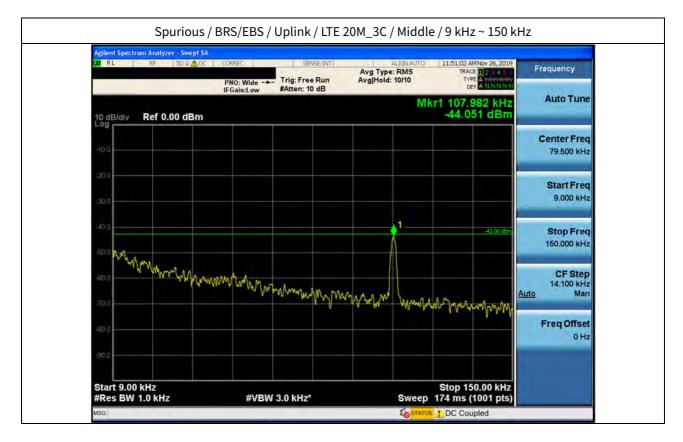
	HZ PNO: Wide Trig: Free Run FGain:Low #Atten: 30 dB	Avg Type: RMS Avg Hold: 10/10	TRACE 2345 TYPE A MUNICIPAL Frequency
0 dB/div Ref 20.00 dBm	FUGHLEUW POWER OF AD		Auto Tu 2.783 dBm
00 100			Center F 2.696000000
α.oo			Start Fr 2.691000000
20.0			2.70100000 0
10.0 My my why why	- marken warden	an many many has	MANN CF St 1.000000 N
30.á 30.ç			FreqOff
70 a			











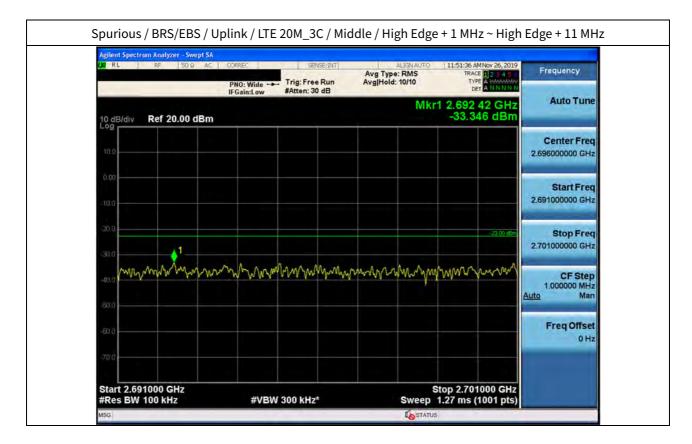
Agilent Spectrum Analyzer - Swept SA				
🗘 RL RF SO.G 🛕 DC	CORREC SENSE:INT	ALIGNAUTO Avg Type: RMS	11:51:13 AMNov 26, 2019 TRACE 1 2 3 4 5	Frequency
	PNO: Fast Trig: Free Run IFGain:Low #Atten: 10 dB	Avg Hold: 10/10	TYPE A MANAGAMAN DET A N N N N N	
			Mkr1 215 kHz	Auto Tune
10 dB/div Ref 0.00 dBm			-46.249 dBm	-
				Center Freq
=10.0				15.075000 MHz
-20.0				
				Start Freq 150.000 kHz
-30,0			-33.00 den	150.000 KHZ
-40.0 - 1				Stop Freq
				30.000000 MHz
-50,0				
-60.0			·	CF Step 2.985000 MHz
20.0	te taures werde to ble methantike, fan en die Laite die Konstande die Alestade	an and the second of the base and it will	hi ku si ku	Auto Man
and a she she she are a she are a		Warded Post of the start of the start		
-80.0				Freq Offset 0 Hz
-90.0				UTIZ
20.0				
Start 150 kHz			Stop 30.00 MHz	
#Res BW 10 kHz	#VBW 30 kHz*	Sweep	368 ms (6001 pts)	

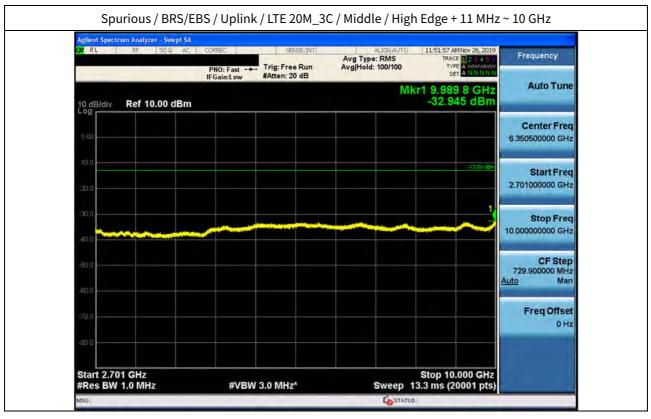


110 1 10 A 10	C CORREC S	ENSE:INT Avg Typ		AMNov 26, 2019	Frequency
	PNO: Fast Trig: Fr IFGain:Low #Atten:	ee Run Avg Hold	: 10/10 T	PE A MANAMAN DET A N.N.N.N.N	
10 dB/div Ref 0.00 dBm			Mkr1 2.486 -36.9	66 GHz 85 dBm	Auto Tune
-10.0				-13,00 dBm	Center Fred 1.259500000 GH
-30.0					Start Free 30.000000 MHz
-40.0 ayaray and satisfies a start -50.0 birds and satisfies a start	an 11 marta an Anglan an Angla Marta a Anglan an Ang	and an established district here get and a signation look			
-40.0 -50.0 (100 m 200 m 200 m 20 m 20 m 20 m 20 m 20	an NTE Escando de Septembra de La construcción de la construcción de Septembra de La Construcción de Septembra NTE de La construcción de Septembra de La Construcción de Septembra de Construcción de Septembra de Construcción	ny sila on y kontraktion falseland Genel by Proving a sign for for the t	t de la constant de la constant La de la constant de La de la constant de		Stop Fred 2,489000000 GH2 CF Step 245.900000 MH2 to Mar
-so.a <mark>h lite ni esti dasheti ini mjali d</mark>	an NTT Laward an Alabama yang di panak kang kang MTAA Jawala A. Sipati kankan Ji Filipin, kak	en officer y should be store that give and the should be store a state of the store of the store of the store			2.489000000 GH: CF Step 245.900000 MHz

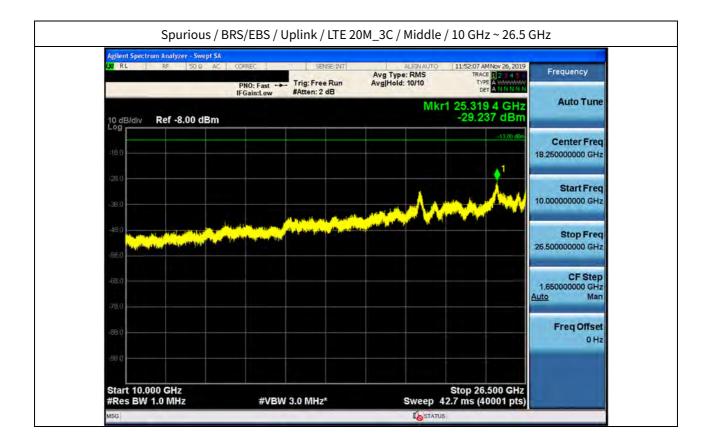
MIRL RF 50.Q AC	PNO: Wide IFGain:Low #Atten: 30 dB	ALIGNAUTO Avg Type: RMS Avg Hold: 10/10	11:51:28 AM Nov 26, 2019 TRACE 1 2 3 4 5 TYPE A MAXAMMA DET A N N N N N	Frequency
10 dB/div Ref 20.00 dBm		Mkr	1 2.497 35 GHz -35.044 dBm	Auto Tune
10.0				Center Fred 2.494000000 GHz
-10.0				Start Freq 2.489000000 GHz
-20.0			-23 00 ¢¢m.	Stop Freq 2.499000000 GHz
	rowww.manapamahara	Mannahan		CF Step 1.000000 MHz Auto Man
60.0				Freq Offset 0 Hz
-70 0			Stop 2.499000 GHz	



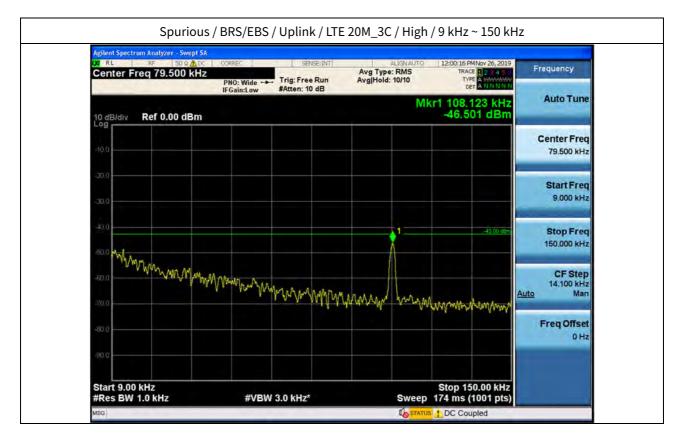












00 RL RF 50 A A DC Center Freq 15.075000 M	CORREC SENSE:INT HZ PNO: Fast IFGain:Low #Atten: 10 dB	Aug Type: RMS Avg Hold: 10/10	12:00:27 PMNov 26, 2019 TRACE 23:45 TYPE A MANAMAN DET A N.N.N.N	Frequency
10 dB/div Ref 0.00 dBm			Mkr1 215 kHz -48.176 dBm	Auto Tune
=10.0				Center Freq 15.075000 MHz
-30.0			-33 DO den	Start Freq 150.000 kHz
-40.0				Stop Freq 30.000000 MHz
-60.0				CF Step 2.985000 MHz <u>Auto</u> Man
-70.0	ang terjang penghan ang penghan ang penghan penghan penghan penghan penghan penghan penghan penghan penghan pen Penghan penghan	tarihan di king itu dadi di salam dalam dalam dalam dalam Arappan ing dalam yang ng n		Freq Offset 0 Hz
ea a Start 150 kHz			Stop 30.00 MHz	

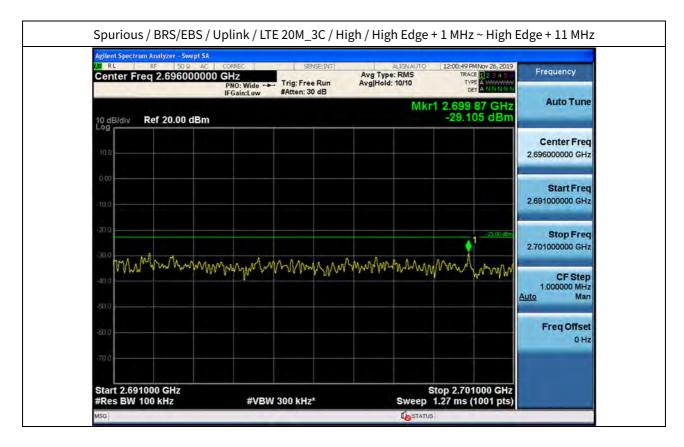


CX RL RF	50 9 AC C	DRREC	SENSE:		ALIGNAUTO	12:00:34 Pf	4Nov 26, 2019	English
Center Freq 1.		PNO: Fast	Trig: Free R	un Avg	g Type: RMS Hold: 10/10	TRAC TVP		Frequency
		FGain:Low	#Atten: 16 df	3	M1	kr1 2.450		Auto Tune
	0.00 dBm						36 dBm	
Log								Center Free
-10.0							-13,00 dBm	1.259500000 GHz
-20.0							_	StartFree
-30,0								30.000000 MHz
							(
40.0								
nyawang Ang Ang	te date de la dista de la dista	Hend to a medate 1 is	with Many Athenet State	alashinili dual	distriction des des des Internationalistent	a fact de de de la fact	un providentiti	Stop Fred
non and a sold faith 50,0 <mark>he say still and inter</mark>	and and a state of the state of	Real of Article (rif. How allow allow	annan in 1973 Annan III And	n dalama dala	a, tan di san di p	ar for all all a	Stop Fred 2,489000000 GH2
-50.0	<mark>oli 1791 de la contrata (</mark> e	naden kontration (naden kontration (al Han Hand John	direktinik darit		a ta conte parei h	an in the second	2,489000000 GH2 CF Step
-50,0 <mark>14,249,201,91,92,92,92</mark> -60.0	sentenne (Singlei) en senten <mark>en ^linglei (</mark> Singlei) en senten (S	Bentin Artento, J	na tik na fan skiering Pil Jewe stiering stier	diangen (n. 1997) Ginangen (n. 1997)		, b, face, de colar de <mark>l</mark> a	ar ara	2,489000000 GH2
-ao,o <mark>he kayi dila mak yi</mark> an	senten (dinslainen aluin _{en} nis pylsing (dinslainen pylsing)	nan na an	r i seve alkeye diber	n anna an t-ri tre tre Al rach an Al tre tre tre Al rach an Al tre tre tre		. <mark>Belgers in Providence in U</mark>	in in Chair	2.489000000 GH2 CF Step 245.900000 MH2 <u>Auto</u> Mar
-50,0 <mark>14,249,201,91,92,92,92</mark> -60.0	ng stand (find high high stand high statistic grade description)	linger of a state of the f	en fillen og som en det som en so En som en som	green with the second		a faataliyaan iy		2.48900000 GH2 CF Step 245.900000 MH2 <u>Auto</u> Mar
-50.0 -60.0 -60.0 -60.0	en de constant d'in de la port de de la de unidad apresida de la constant de unidad apresida de la constant de la constant de la constant de la constant de		er i Janue, etterare dina er i Janue, etterare dina	oppendig in the second				2.489000000 GH2 CF Step 245.900000 MH2 <u>Auto</u> Mar
-50.0 <mark>-51.0) (10.0) (1</mark>	ng shan (din di Jung ang shika atala ga kin ga da ya sa		e i la ve atter de la de la La de la d	normani i mana in anna anna anna anna anna				2.48900000 GH2 CF Step 245.900000 MH2 <u>Auto</u> Mar

00 RL RF 50 Q AC Center Freq 2.494000000		ALIGNAUTO Avg Type: RMS Avg Hold: 10/10	12:00:42 PMNov 26, 2019 TRACE 2 3 4 5 TYPE A WANNAW DET A N N N N N	Frequency
10 dB/div Ref 20.00 dBm		Mkr1	2.498 18 GHz -35.034 dBm	Auto Tune
10.0				Center Freq 2.494000000 GHz
0.00 -10.0				Start Freq 2.48900000 GHz
-20.0			-23.00 cfm	Stop Freq 2.499000000 GHz
	mannanna	mannan		CF Step 1.000000 MHz uto Man
-50.0				Freq Offset 0 Hz
570.0 Start 2.489000 GHz			op 2.499000 GHz	

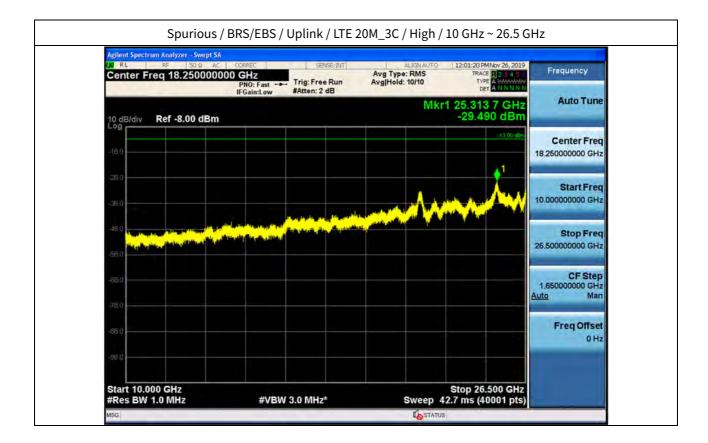




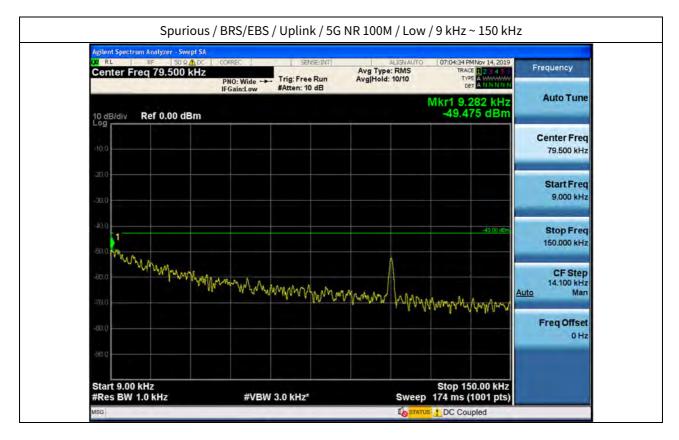












Agilent Spectrum Analyzer - Sv SVI RL RF 50 (SENSE:IN	πi l	ALIGNAUTO	07:04:46 0	MNov 14, 2019	
Center Freq 15.075		Tel Free Pro	Avg Typ	e: RMS	TRAC	E 1 2 3 4 5 0	Frequency
	IFGain:Low	#Atten: 10 dB		APRIL .		50 kHz	Auto Tune
10 dB/div Ref 0.00 d	IBm					71 dBm	
-10,0							Center Freq 15.075000 MHz
-20.0							StartFreq
-30,0						-33.00 dBm	150.000 kHz
-40,0							Stop Freq 30.000000 MHz
-60.0							CF Step 2.985000 MHz
-70.0			and having the basis of the second states of the second states of the second states of the second states of the				<u>Auto</u> Man
-80.0							Freq Offset 0 Hz
20.0							
Start 150 kHz #Res BW 10 kHz		V 30 kHz*			Stop 3 368 ms (0.00 MHz	

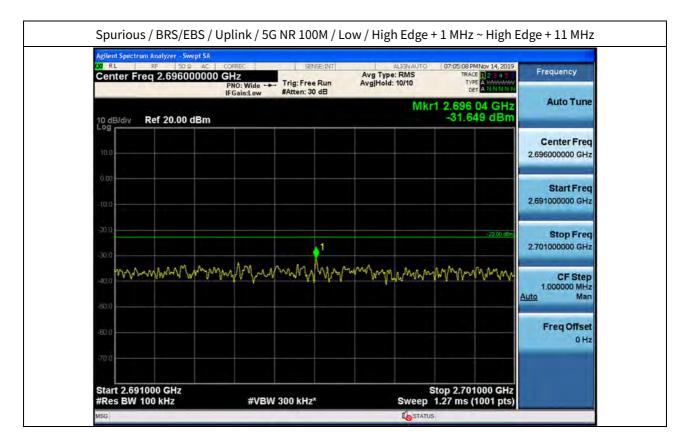


Center Freq 1.257500	PNO: Fast	SENSE:INT	Avg Type: RMS Avg Hold: 10/10	TO 07:04:53 PMNov 14, 20 TRACE 2 3 4 TVPE A MANAGE DET A N N N	Frequency
10 dB/div Ref 0.00 dB	IFGain:Low	#Atten: 16 dB	N	1kr1 2.482 18 GH -34.305 dBi	z Auto Tune
=10.0				-13,00 d	Center Fred 1.257500000 GH
-20.0					Start Freq
					30,000000 MHz
-40.0	ing and the state of the state	and the spectra of the spectrum of the	<mark>- Standargen (1911) (1</mark>	in en he datter tid blad blad stelle Name gazete forstelle finster get	
	is no en casing i i de den na secto d Genera _{l d} e training la finte dense y _{en} pr	nos for a new call benchmenne (Prani lago dan pelini land	es de la contra de La contra de la contr La contra de la cont	en solita da statum sa da da kasa da da grada sa gota Javid da tarra ng sa	Stop Freq 2.48500000 GHz CF Step 245.500000 MHz
-40.0 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	is a service district in the service of the service	en le _n en paret kan den statis Politik for an den statis Politik for an den statis	a sele analogi kati se ang	la productiva productiva da da da da da na na n	Stop Freq 2.48500000 GHz CF Step 245.50000 MHz

00 RL RF 509 AC Center Freq 2.49000000	CORREC DO GHZ PNO: Wide	SENSE:INT Trig: Free Run #Atten: 30 dB	Aug Type: RMS Avg Hold: 10/10	07:05:00 PMNov 14, 2019 TRACE 1 2 3 4 5 TYPE A MMMMMM DET A N N N N N	Frequency
10 dB/div Ref 20.00 dBm			Mk	r1 2.490 03 GHz -34.916 dBm	Auto Tune
10.0					Center Freq 2.490000000 GHz
άφ) -100					Start Freq 2.485000000 GHz
-20.0		1		-23 00 đe m	Stop Freq 2.495000000 GHz
40.0 MWMmMmmmm	www.howy	Mann	Annowallyman	www.www.w	CF Step 1.000000 MHz <u>Auto</u> Man
-60.0					Freq Offset 0 Hz
570 0 Start 2.485000 GHz #Res BW 100 kHz				Stop 2.495000 GHz 1.27 ms (1001 pts)	



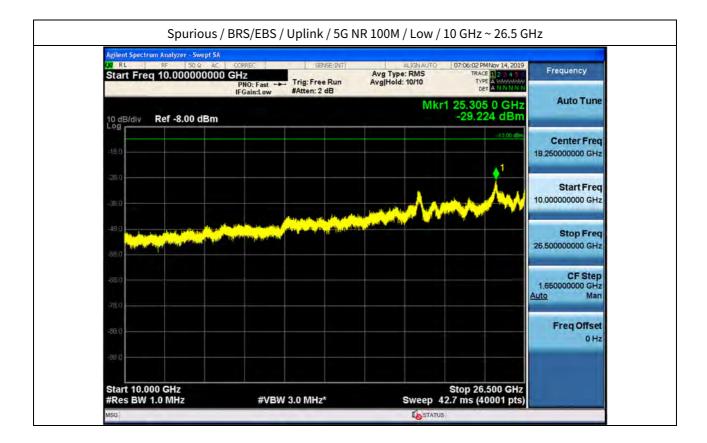




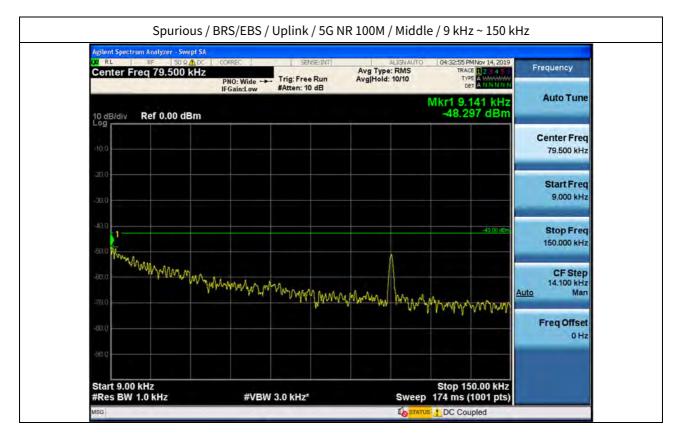












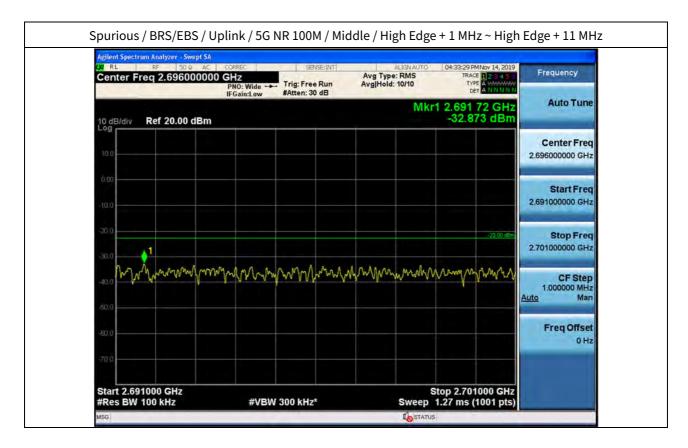
Agilent Spectrum Analyzer - S CXI RL RF SC		SENSE:17	al I	ALIGNAUTO	04:33:06 PMNov 14, 2	210
Center Freq 15.07	5000 MHz		Avg Typ	e: RMS	TRACE 2 3 4 TYPE A WARM	Frequency
	PNO: Fast IFGain:Low	#Atten: 10 dB			DET A N.N.N	
10 dB/div Ref 0.00	dBm				Mkr1 160 kł -50.957 dB	12
-10.0						Center Freq 15.075000 MHz
-20.0						
-30,0					-33.00	Start Freq 150.000 kHz
-40.0						Stop Freq
.50.0						30.000000 MHz
+60.0		_				CF Step 2.985000 MHz
	in the second					Auto Man
-60.0						Freq Offset 0 Hz
90.0						UHZ

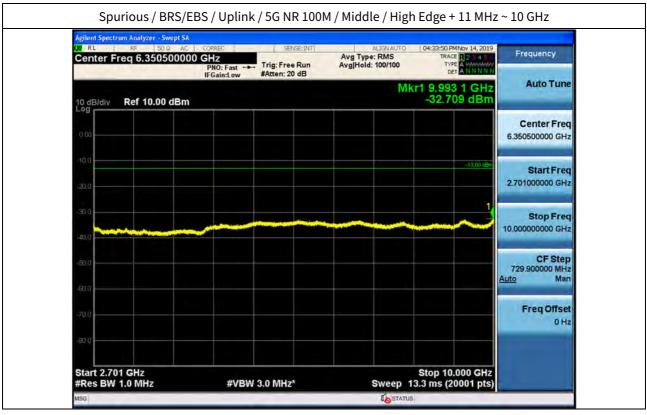


Center Freq 1.25	P	NO: Fast	Trig: Free		Avg Type Avg Hold:	RMS 10/10	TRAC	MNov 14, 2019 E 2 3 4 5 6 E A MANAMA T A N N N N N	Frequency
10 dB/div Ref 0.00		Gain:Low	#Atten: 16	dB		Mkr	1 2.489		Auto Tune
=10.0								-13,00 dBm	Center Fred 1.259500000 GHz
-30.0									Start Free 30.000000 MHz
-40.0 -50.0	ad anti-anti-the de A doubter of the state	an ta mana ta ta Anglata da angla na	ogi kata si art Mana sa	ave (stand)s og J.N.J. frattaf yks	nde litte set a Nov ¹² Test day	ana dia mandri di Kabupatén di di Kabupatén di	no tal bad baba Ni fan papa di Alipa	nador Handdild Ygr prozen yf er	Stop Free 2.489000000 GH:
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-50.0 any just of the latest	s od miek oo spelen (e (bilos ii) čes jejen bie	ala te na bita (b) da alagi da gana	anga kata sa Juga sa Ingga kata sa Juga sa	nie drame ja se J.L. je kentra i jad	nden Hiller mit de retro ter Estel de y	energi de lange sekted An de pangel y de la fekt	nga pa ka di sa di Ni hay ng da di K	n mire I (n billin) Ye foreis (n billin	2.489000000 GH2 CF Step 245.900000 MH2

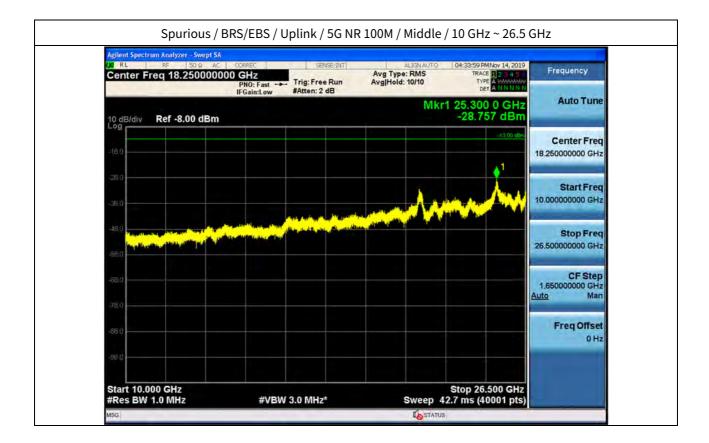
Center Freq 2.49400000	CORREC SENSE:INT OO CHZ PNO: Wide If Gain:Low #Atten: 30 dB	ALIGNAUTO Avg Type: RMS Avg Hold: 10/10	04:33:21 PMNov 14, 2019 TRACE 2:3:4:5 0 TYPE A MMMMM DET A N.N.N.N	Frequency
10 dB/div Ref 20.00 dBm		Mkr1 :	2.493 30 GHz -34.078 dBm	Auto Tune
to.0				Center Freq 2.494000000 GHz
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.40.0 MAMMAMMMMM	an many many many many many many many ma	mmyyyy		CF Step 1.000000 MHz uto Man
-60.0				Freq Offset 0 Hz
70 0 Start 2.489000 GHz #Res BW 100 kHz		Sto Sweep 1.2	p 2.499000 GHz	



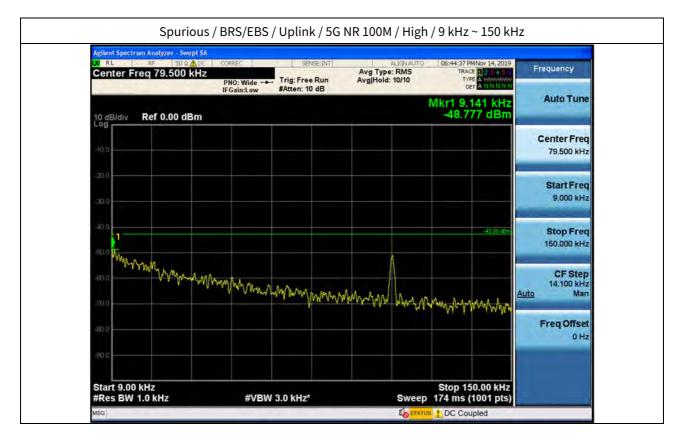












gilent Spectrum Analyzer - Swept SA				
RL RF 50 0 ADC Center Freq 15.075000 M	Hz	Avg Type: RMS	06:44:48 PMNov 14, 2019 TRACE 2 3 4 5 0 TVPE A WASHING	Frequency
	PNO: Fast IFGain:Low #Atten: 10 dB	n Avginoid. 10/10	DET A N.N.N.N.N	A
10 dB/div Ref 0.00 dBm			Mkr1 170 kHz -51.221 dBm	Auto Tune
				Center Freq 15.075000 MHz
20.0				
.20.0				Start Freq
-30,0			-33,00 d e m	150.000 kHz
-40,0				Stop Freq
-50.0				30.000000 MHz
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-20.0 Welleyte is a state of the day is a state of the	liter barrentit dan tari aktivit adam birtina			Auto Man
		osishing a and the product the internation	a the tax and the instantic by polision	Freq Offset
-80.0				0 Hz
0.02				
Start 150 kHz #Res BW 10 kHz	#VBW 30 kHz*		Stop 30.00 MHz 368 ms (6001 pts)	



Center Freq 1.259500	AC CORREC	SENSE:INT	ALIGN AUTO Avg Type: RMS	06:44:56 PMNov 14, 2019 TRACE 2 2 4 5	Frequency
Center Freq 1.259500	PNO: Fast ++ IFGain:Low	#Atten: 16 dB	Avg Hold: 10/10	DET A N N N N	
10 dB/div Ref 0.00 dBr	n		Mkr	1 2.487 89 GHz -37.227 dBm	Auto Tune
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40.0		en de la constante de la const Anticipation de la constante de	isteal and protection finderical	1 Protection and the state Protection of the state of the	Stop Free 2.489000000 GHz
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-50.0 <mark>4.11364 (da.9) (</mark>		en hen en e	aan amay na ako maa kana ka	1 By an a far an a baile da a ta Part a far a fa Far a far	2.489000000 GH2 CF Step 245.900000 MH2

00 RL RF 509 AC Center Freq 2.494000000		ALIGNAUTO (Avg Type: RMS Avg Hold: 10/10	16:45:03 PMNov 14, 2019 TRACE 2 3 4 5 0 TYPE A WARMAN DET A N.N.N.N.N	Frequency
10 dB/div Ref 20.00 dBm			2.491 22 GHz -34.441 dBm	Auto Tune
10.0				Center Freq 2.494000000 GHz
-10.0				Start Freq 2.489000000 GHz
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	he how Marine Marine	www.www.www.	Myr Myr Ma	CF Step 1.000000 MHz Ito Man
-60.0				Freq Offset 0 Hz
-70 0 Start 2.489000 GHz			p 2.499000 GHz	





