CERTIFICATION TEST REPORT

Report Number. : 13018918-E3V2

Applicant	:	APPLE, INC. 1 APPLE PARK WAY CUPERTINO, CA 95014, U.S.A.
Model	:	A2296
FCC ID	:	BCG-E3501A
IC	:	579C-E3501A
EUT Description	:	SMARTPHONE
Test Standard(s)	:	FCC 47 CFR PART 15 SUBPART C ISED RSS-247 ISSUE 2 ISED RSS-GEN ISSUE 5

Date Of Issue:
March 25, 2020

Prepared by:
UL Verification Services Inc.
47173 Benicia Street
Fremont, CA 94538 U.S.A.
TEL: (510) 319-4000
FAX: (510) 661-0888

NVLAP Lab code: 200065-0

REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	2/10/2020	Initial Issue	Tony Li
V2	3/25/2020	Addressed TCB Question	Joe Vang

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

REPORT REVISION HISTORY 2

1. ATTESTATION OF TEST RESULTS 5

2. TEST METHODOLOGY 6

3. FACILITIES AND ACCREDITATION 6

4. DECISION RULES AND MEASUREMENT UNCERTAINTY 7

4.1. METROLOGICAL TRACEABILITY 7

4.2. DECISION RULES 7

4.3. MEASUREMENT UNCERTAINTY 7

5. EQUIPMENT UNDER TEST 8

5.1. EUT DESCRIPTION 8

5.2. MAXIMUM OUTPUT POWER 8

5.3. DESCRIPTION OF AVAILABLE ANTENNAS 8

5.4. SOFTWARE AND FIRMWARE 8

5.5. WORST-CASE CONFIGURATION AND MODE 9

5.6. DESCRIPTION OF TEST SETUP 10

6. MEASUREMENT METHOD 14

7. TEST AND MEASUREMENT EQUIPMENT 15

8. ANTENNA PORT TEST RESULTS 16

8.1. ON TIME AND DUTY CYCLE 16

8.2. 99% BANDWIDTH 19
8.2.1. 802.11b MODE 19
8.2.2. 802.11n HT20 MODE 23
8.2.3. 802.11ax HE20 MODE 33
8.2.4. 802.11ax HE20 OFDMA MODE 2TX 57

8.3. 6 dB BANDWIDTH 77
8.3.1. 802.11b MODE 78
8.3.2. 802.11n HT20 MODE 82
8.3.3. 802.11ax HE20 MODE 92
8.3.4. 802.11ax HE20 OFDMA MODE 2TX 116

8.4. OUTPUT POWER 136
8.4.1. 802.11b MODE 137
8.4.2. 802.11n HT20 MODE 139
8.4.3. 802.11ax HE20 MODE 142
8.4.4. 802.11ax HE20 OFDMA MODE 2TX 150

8.5. POWER SPECTRAL DENSITY 154
8.5.1. 802.11b MODE 155
8.5.2. 802.11n HT20 MODE 159
8.5.3. 802.11ax HE20 MODE 169
8.5.4. 802.11ax HE20 OFDMA MODE 2TX 193

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.6. CONDUCTED SPURIOUS EMISSIONS 213
8.6.1. 802.11b MODE 214
8.6.2. 802.11n HT20 MODE 218
8.6.3. 802.11ax HE20 MODE 230
8.6.4. 802.11ax HE20 OFDMA MODE 2TX 254

9. RADIATED TEST RESULTS 286

9.1. TRANSMITTER ABOVE 1 GHz 287
9.1.1. TX ABOVE 1 GHz 802.11b MODE IN THE 2.4 GHz BAND 287
9.1.2. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 2.4 GHz 315
9.1.3. TX ABOVE 1 GHz 802.11ax HE20 MODE IN THE 2.4 GHz BAND 365
9.1.4. TX ABOVE 1 GHz 802.11ax HE20 OFDMA MODE IN THE 2.4 GHz BAND 429

9.2. WORST CASE BELOW 1 GHz 477

9.3. WORST CASE 18-26 GHZ 479

10. AC POWER LINE CONDUCTED EMISSIONS 481

10.1.1. AC Power Line Host 482
10.1.2. AC Power Line Norm 484

11. SETUP PHOTOS 486

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: APPLE INC.
1 APPLE PARK WAY
CUPERTINO, CA 95014, U.S.A

EUT DESCRIPTION: SMARTPHONE

MODEL: A2296

SERIAL NUMBER: FFMZW00APM7C, FFMZ06XPM62

DATE TESTED: AUGUST 29, 2019 – MARCH 23, 2020

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C	Complies
ISED RSS-247 Issue 2	Complies
ISED RSS-GEN Issue 5	Complies

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of the U.S. government.

Approved & Released For
UL Verification Services Inc. By:

Chin Pang
Senior Engineer
Consumer Technology Division
UL Verification Services Inc.

Prepared By:

Tony Li
Test Engineer
Consumer Technology Division
UL Verification Services Inc.

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, ANSI C63.10-2013, KDB 558074 D01 15.247 Meas Guidance v05r02, KDB 662911, RSS-GEN Issue 5, and RSS-247 Issue 2.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, and 47658 Kato Road, Fremont, California, USA. Line conducted emissions are measured only at the 47173 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

47173 Benicia Street	47266 Benicia Street	47658 Kato Rd.
☒ Chamber A (IC:2324B-1)	☐ Chamber D (IC:22541-1)	☐ Chamber I (IC: 2324A-5)
☐ Chamber B (IC:2324B-2)	☒ Chamber E (IC:22541-2)	☐ Chamber J (IC: 2324A-6)
☐ Chamber C (IC:2324B-3)	☒ Chamber F (IC:22541-3)	☐ Chamber K (IC: 2324A-1)
	☒ Chamber G (IC:22541-4)	☐ Chamber L (IC: 2324A-3)
	☒ Chamber H (IC:22541-5)	

The above test sites and facilities are covered under FCC Test Firm Registration # 208313. Chambers above are covered under Industry Canada company address and respective code

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

4. DECISION RULES AND MEASUREMENT UNCERTAINTY

4.1. METROLOGICAL TRACEABILITY

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, with a maximum time between calibrations of one year or the manufacturers' recommendation, whichever is less, and where applicable is traceable to recognized national standards.

4.2. DECISION RULES

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4:2012 Clause 8.2. (Measurement
uncertainty is not taken into account when stating conformity with a specified requirement.)

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	U_{LAB}
Worst Case Conducted Disturbance, 9KHz to 0.15 MHz	3.39 dB
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.07 dB
Worst Case Radiated Disturbance, 9KHz to 30 MHz	2.52 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	4.88 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.24 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.37 dB
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.17 dB

ncertainty figures are valid to a confidence level of 95%

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

5. EQUIPMENT UNDER TEST

5.1. EUT DESCRIPTION

The EUT is a smartphone with multimedia functions (music, application support, and video), cellular GSM, GPRS, EGPRS, UMTS, LTE, TD-SCDMA, CDMA, IEEEE 802.11 a/b/g/n/ac/ax, Bluetooth, GPS and NFC. All models support at least one UICC based SIM. The second SIM, if present, is either UICC based p-SIM (physical SIM or e-SIM (electronic SIM). The device has a built-in inductive charging receiver. The rechargeable battery is also not user accessible.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

2.4GHz BAND

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
1Tx			
2412 - 2472	802.11b	21.17	130.92
2412 - 2472	802.11g	Covered by 802.11n HT20 1TX	
2412 - 2472	802.11n HT20	21.23	132.74
2412 - 2472	802.11ax HE20	21.24	133.05

2Tx			
2412 - 2472	802.11n HT20 CDD	23.12	205.12
2412 - 2472	802.11g SDM/STBC	Covered by 802.11n HT20 2TX CDD	
2412 - 2472	802.11ax HE20	23.15	206.54

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

Frequency Range (GHz)	UAT 1 (dBi)	LAT 3 (dBi)
2.4	-2.2	-0.4

5.4. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was WiFi FW Version: 18_20_71_1.

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

5.5. WORST-CASE CONFIGURATION AND MODE

EUT was investigated in three orthogonal orientations X, Y and Z on UAT 1 and LAT 3. It was determined that X (Flatbed) orientation was worst-case orientation for UAT 1, LAT 3 and 2Tx.

Radiated band edge, harmonic, and spurious emissions from 1GHz to 18GHz were performed with the EUT set to transmit at highest power on Low/Middle/High channels.

Radiated emissions below 30MHz, below 1GHz, 18-26GHz and power line conducted emissions were performed with the EUT transmits at the channel with the highest output power as worst-case scenario.

For radiated harmonics spurious below 1GHz, 1-18GHz L/M/H channels, 18-26GHz, and power line conducted emissions were performed with the EUT set at the 2TX CDD mode among the CDD/SDM modes and 2TX HE mode with power setting equal or higher than SISO modes as worst-case scenario. G mode covered by HT20 mode since it has the same power as HT20.

Below 1GHz tests were performed with EUT connected to AC power adapter as the worst case; and for above 1GHz tests, the worst-case configuration reported was with EUT only. For AC line conducted emission, test was investigated with AC power adapter and with laptop. There were no emissions found below 30MHz within 20dB of the limit.

The output power and psd for the 802.11 ax mode were investigated between all different tones, and we found that the highest tone had the highest output power and PSD readings, the lowest tone had the highest PSD readings. Therefore, full testing was performed on both the highest and lowest tones.

The peak PSD were performed as worst case mode.

Worst-case data rates as provided by the client were:

802.11b mode: 1 Mbps
802.11n HT20mode: MCS0
802.11ax HE20mode: MCS0

There are two vendors of the WiFi/Bluetooth radio modules: variant 1 and variant 2. The Wi-Fi/Bluetooth radio modules have the same mechanical outline (e.g., the same package dimension and pin-out layout), use the same on-board antenna matching circuit, have an identical antenna structure, and are built and tested to conform to the same specifications and to operate within the same tolerances.

Baseline testing was performed on the two variants to determine the worst case on all conducted power and radiated emissions.

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
laptop	Apple	A1502	HRP003436	QDS-BRCM1080
Laptop AC/DC adapter	Liteon Technology	PA-1450-BA1	B123	NA
EUT AC Adapter	Apple	A1385	D29325SM03XDHLHC9	NA

I/O CABLES

I/O Cable List						
Cable No	**Port**	**# of identical ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	Antenna	1	SMA	Un-Shielded	0.2	To spectrum Analyzer
2	USB	1	USB	Shielded	1	N/A
3	AC	1	AC	Un-shielded	2	N/A

I/O CABLES (BELOW 1GHz AND AC POWER LINE TEST WITH ADAPTER AND LAPTOP)

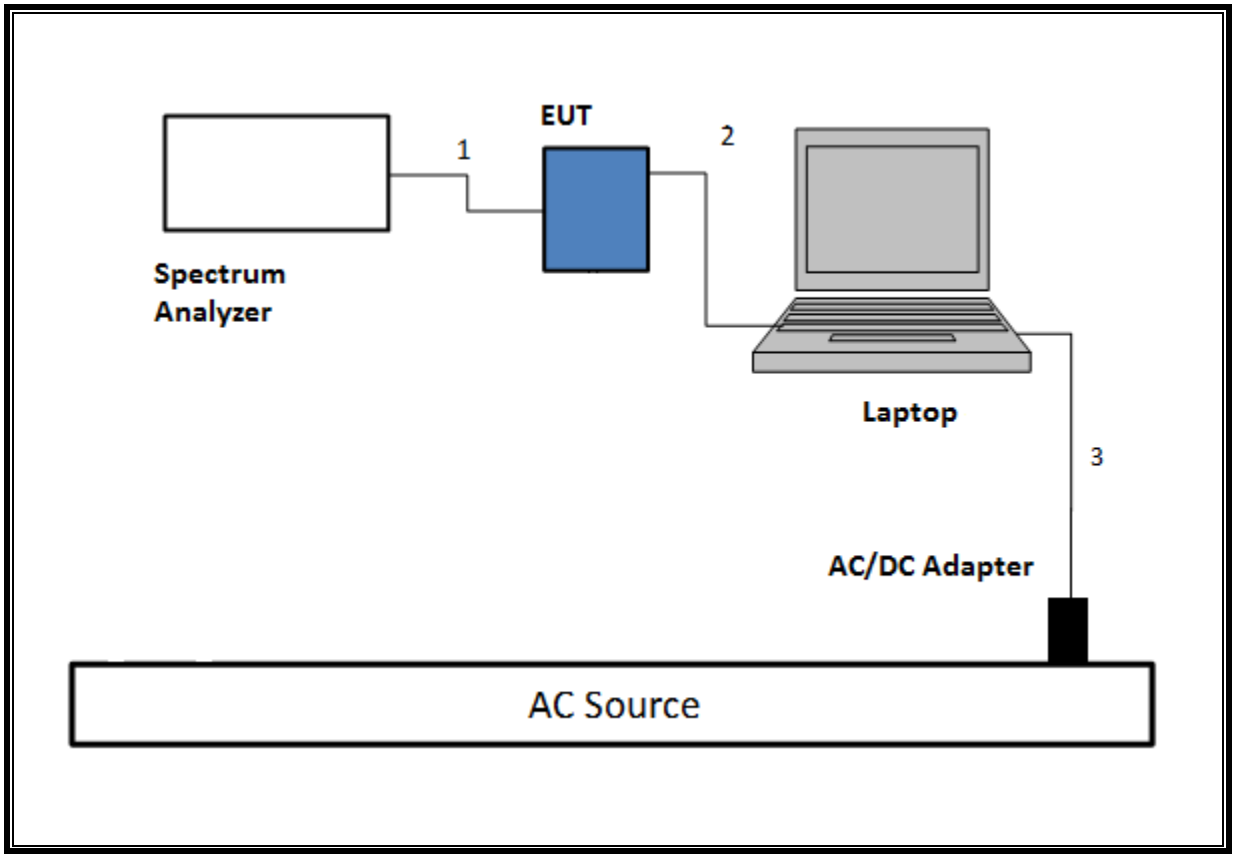
I/O Cable List						
Cable No	**Port**	**# of identical**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	AC	1	AC	Un-shielded	2	N/A
2	USB	1	USB	Un-shielded	1	N/A

TEST SETUP

The EUT is connected to a test laptop during the tests. Test software exercised the radio card.

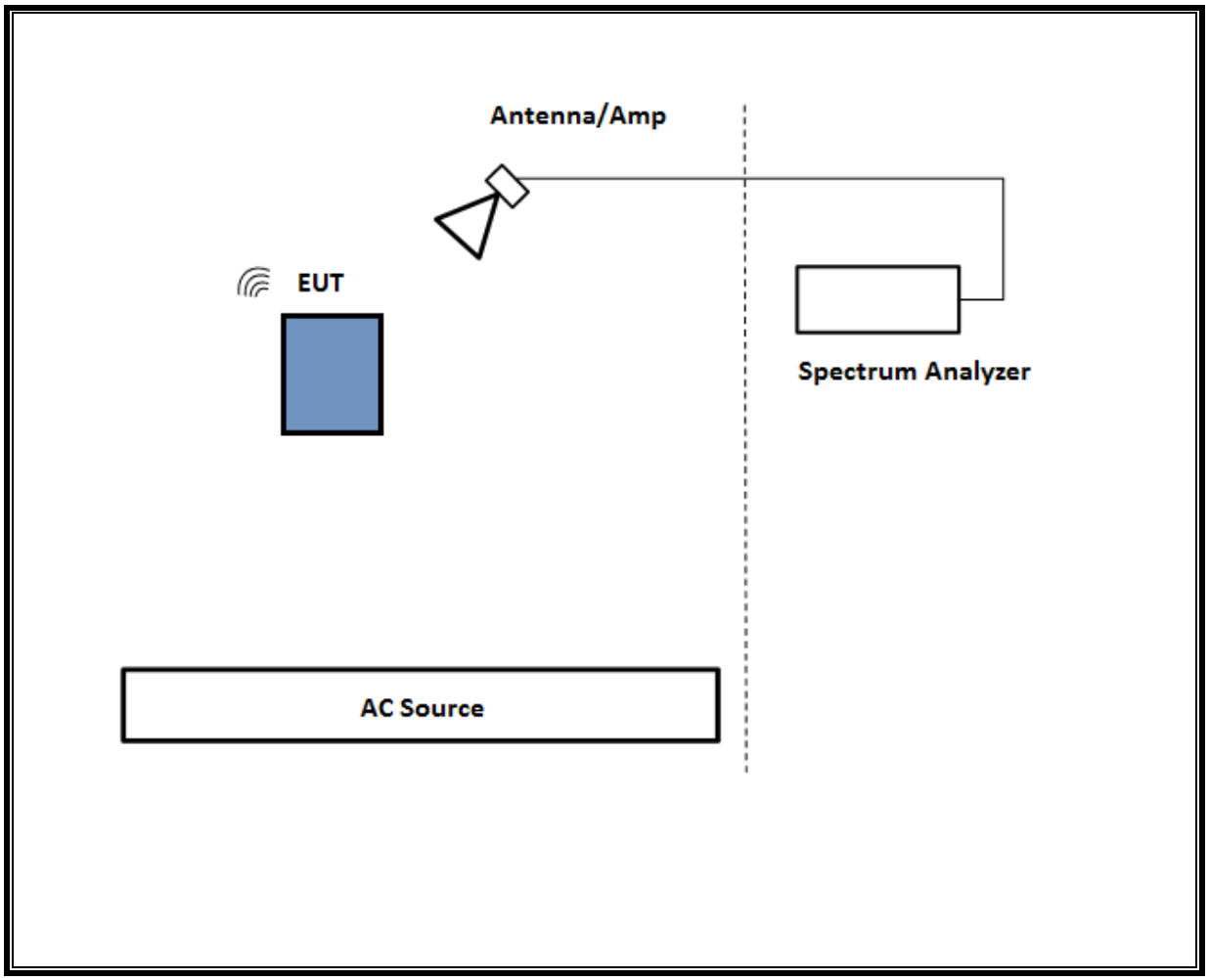
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

SETUP DIAGRAM FOR CONDUCTED TESTS



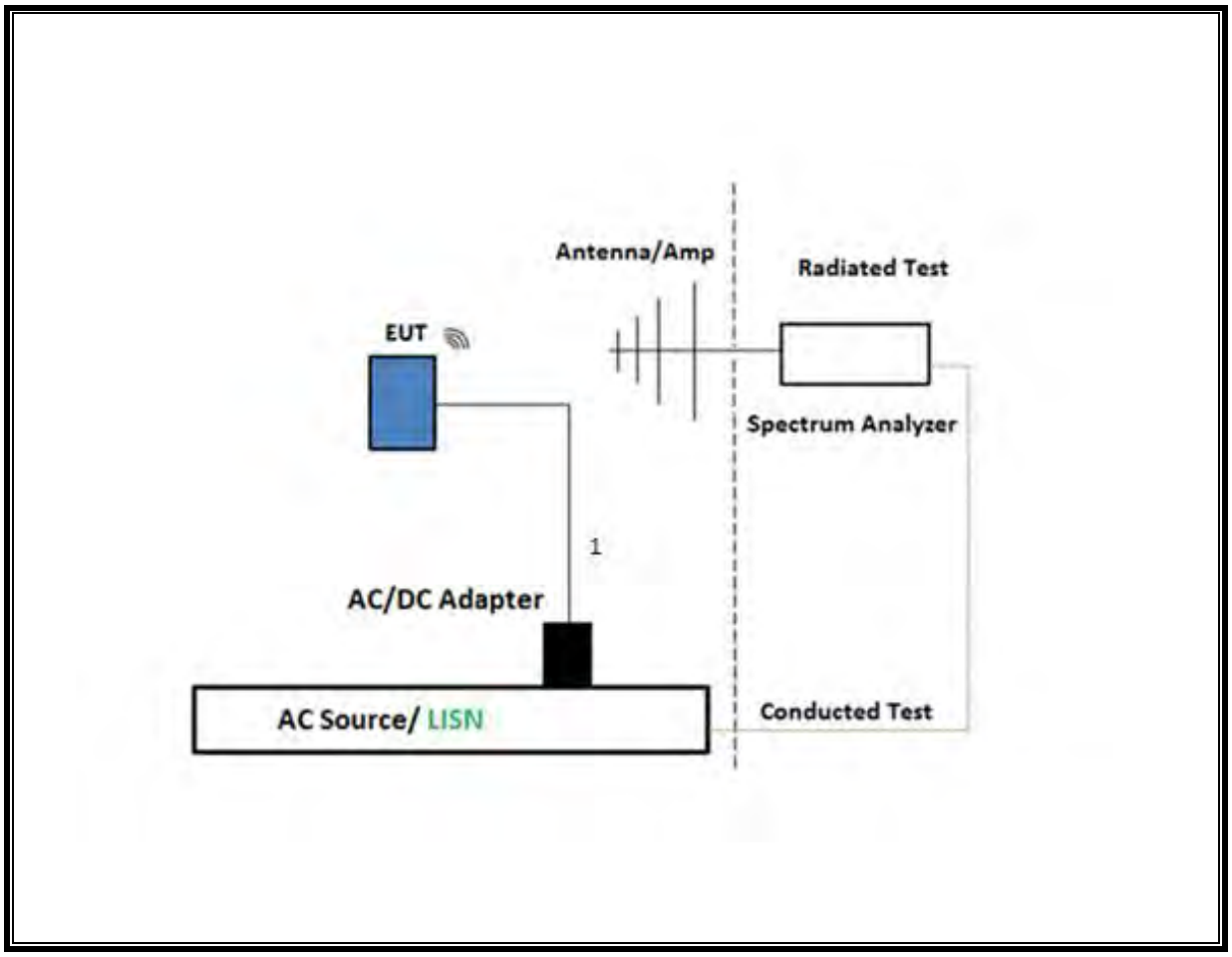
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

SETUP DIAGRAM FOR RADIATED TESTS Above 1GHz



UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

SETUP DIAGRAM FOR Below 1GHz and AC LINE CONDUCTED TEST



This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

6. MEASUREMENT METHOD

6 dB BW: ANSI C63.10 Subclause -11.8.1 RBW ≥ DTS BW

99% BW: ANSI C63.10-2013, Subclause 6.9.3.

Output Power: ANSI C63.10 Subclause -11.9.2.3.1 Method AVGPM (Measurement using an RF average-reading power meter)

PSD: ANSI C63.10 Subclause -11.10.3 Method AVGPSD-1

Radiated emissions non-restricted frequency bands: ANSI C63.10 Subclause -11.11& Clause 13

Radiated emissions restricted frequency bands: ANSI C63.10 Subclause -11.12.1 & Clause 13

Conducted emissions in restricted frequency bands: ANSI C63.10 Subclause -11.12.2

Band-edge: ANSI C63.10 Subclause -11.13.3.2 & Clause 13: Integration method -Peak detection

Band-edge: ANSI C63.10 Subclause -11.13.3.3 & Clause 13: Integration method -Trace averaging with continuous transmission at full power

AC Power Line Conducted Emissions: ANSI C63.10-2013, Subclause 6.2.

Radiated Spurious Emissions Below 30MHz: ANSI C63.10-2013 Subclause 6.4 & Clause 13

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

7. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST					
Description	**Manufacturer**	**Model**	**ID Num**	**Cal Due**	**Last Cal**
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T863	05/30/2020	05/30/2019
*Amplifier, 1 to 18GHz, 35dB	Amplical	AFS42-00101800-25-S-42	T1567	01/26/2020	01/26/2019
Antenna, Horn 1-18GHz	ETS Lindgren	3117	T136	07/02/2020	07/02/2019
Amplifier, 1 - 18GHz	MITEQ	AFS42-00101800-25-S-42	T491	05/30/2020	05/30/2019
Antenna, Horn 1-18GHz	ETS Lindgren	3117	T346	05/14/2020	05/14/2019
Amplifier, 1 to 18GHz	Miteq	AFS42-00101800-25-S-42	T931	05/11/2020	05/11/2019
Antenna, Horn 1-18GHz	ETS Lindgren	3117	T119	03/22/2020	03/22/2019
Amplifier, 1 to 18GHz	AMPLICAL	AMP1G18-35	138301	08/03/2020	08/03/2019
Spectrum Analyzer, PXA 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T917	01/21/2021	01/21/2020
*Spectrum Analyzer, PXA 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T1466	01/23/2020	01/23/2019
*Spectrum Analyzer, PXA 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T906	01/22/2020	01/22/2019
*Spectrum Analyzer, PXA 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A-544	T1113	01/22/2020	01/22/2019
Antenna, Active Loop 9KHz to 30MHz	EMCO	6502	T35	06/06/2020	06/06/2019
*Antenna Horn, 18 to 26GHz	ARA	MWH-1826	T447	08/13/2020	08/13/2019
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences	JB1	T407	05/11/2020	05/11/2019
Amplifier, 10KHz to 1GHz, 32dB	SONOMA INSTRUMENT	310N	T834	06/01/2020	06/01/2019
Pre-Amp 18-26GHz	Agilent Technology	8449B	T404	03/23/2020	03/23/2019
*Power Meter, P-series single channel	Keysight	N1911A	T1268	01/31/2020	01/31/2019
Power Sensor	Keysight	N1921A	T1228	03/01/2020	03/01/2019

AC Line Conducted					
Description	**Manufacturer**	**Model**	**ID Num**	**Cal Due**	**Last Cal**
*EMI Test Receiver 9Khz-7GHz	Rohde & Schwarz	ESCI7	T1436	02/14/2020	02/14/2019
*Power Cable, Line Conducted Emissions	UL	PG1	T861	11/31/2019	11/31/2018
*LISN for Conducted Emissions CISPR-16	Fischer	50/250-25-2-01	T1310	01/24/2020	01/24/2019
UL AUTOMATION SOFTWARE					
Radiated Software	UL	UL EMC	Ver 9.5, April 26, 2016		
Conducted Software	UL	UL EMC	Ver 5.4, October 13, 2016		
AC Line Conducted Software	UL	UL EMC	Ver 9.5, May 26, 2015		

*Testing is completed before equipment expiration date.

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8. ANTENNA PORT TEST RESULTS

8.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method.

ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
2.4GHz Band						
802.11b 1TX	1.000	1.000	1.000	100.00%	0.00	0.010
802.11n HT20 1TX	1.917	1.942	0.987	98.71%	0.00	0.010
802.11n HT20 2TX CDD	1.914	1.936	0.989	98.86%	0.00	0.010
802.11ax HE20 1Tx, 242-Tones	1.575	1.595	0.987	98.75%	0.00	0.010
802.11ax HE20 1Tx, 26-Tones	4.090	4.163	0.982	98.25%	0.00	0.010
802.11ax HE20 OFDMA, 242-Tones	1.572	1.596	0.985	98.50%	0.00	0.010
802.11ax HE20 OFDMA, 26-Tones	4.090	4.168	0.981	98.13%	0.00	0.010

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

DUTY CYCLE PLOTS

DUTY CYCLE 802.11b 1TX MODE

DUTY CYCLE 802.11n HT20 1TX MODE

DUTY CYCLE 802.11n HT20 CDD MODE

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

802.11ax HE20 1TX, 242-TONES

802.11ax HE20 1TX, 26-TONES

802.11ax HE20 OFDMA, 242-TONES

802.11ax HE20 OFDMA, 26-TONES

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

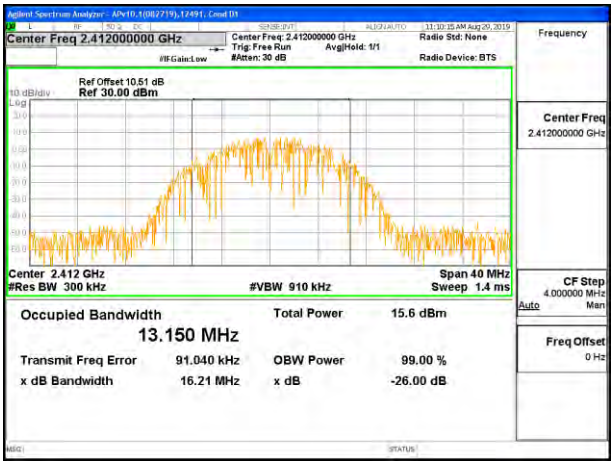
RESULTS

8.2.1. 802.11b MODE

1TX UAT 1

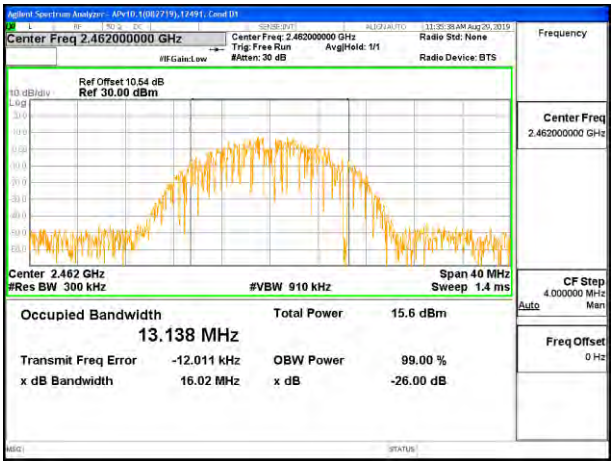
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	13.150
Mid 6	2437	13.263
High 11	2462	13.138
High 12	2467	13.141
High 13	2472	13.300

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

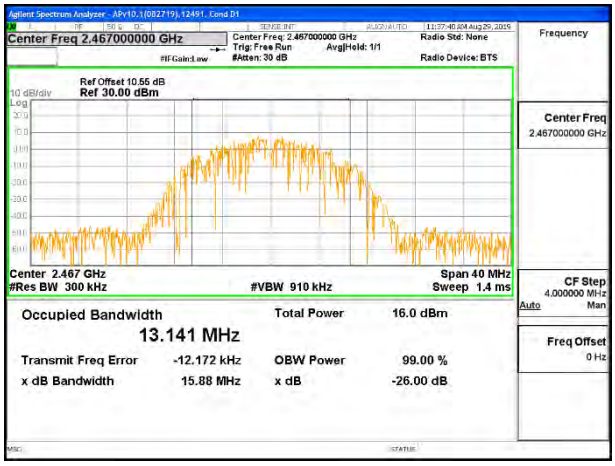


LOW CHANNEL 1

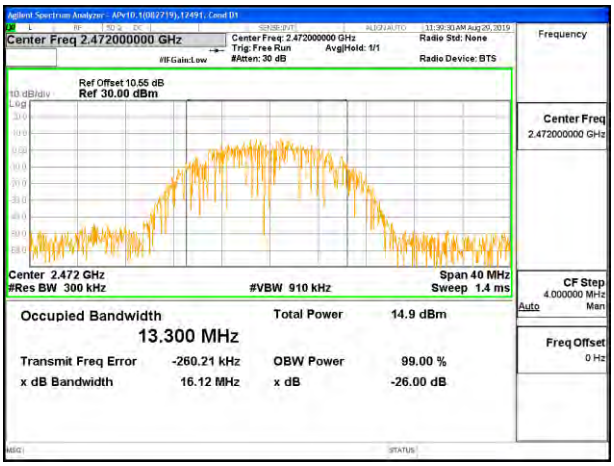
MID CHANNEL 6



HIGH CHANNEL 11



HIGH CHANNEL 12



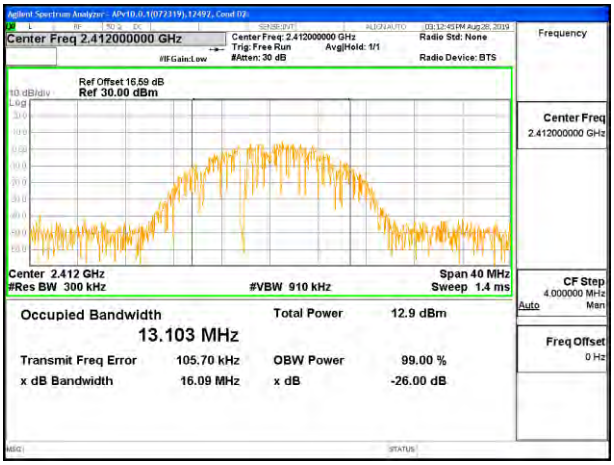
HIGH CHANNEL 13

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

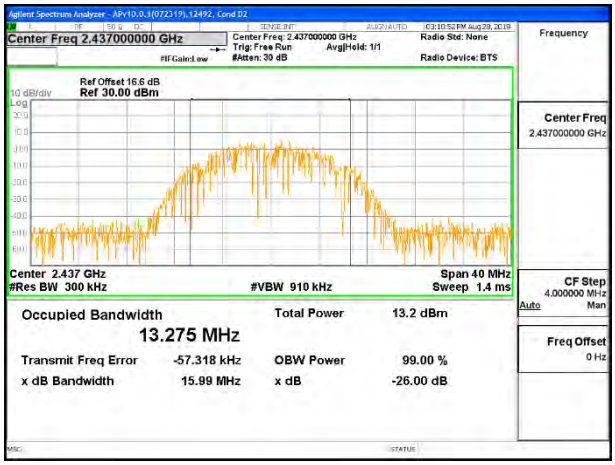
1TX LAT 3

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	13.103
Mid 6	2437	13.275
High 11	2462	13.321
High 12	2467	13.072
High 13	2472	13.120

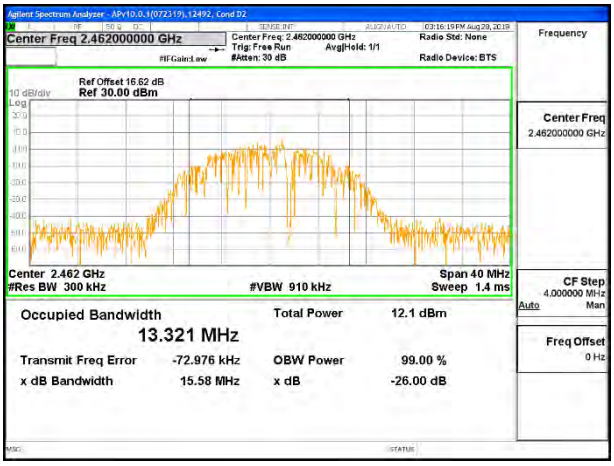
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



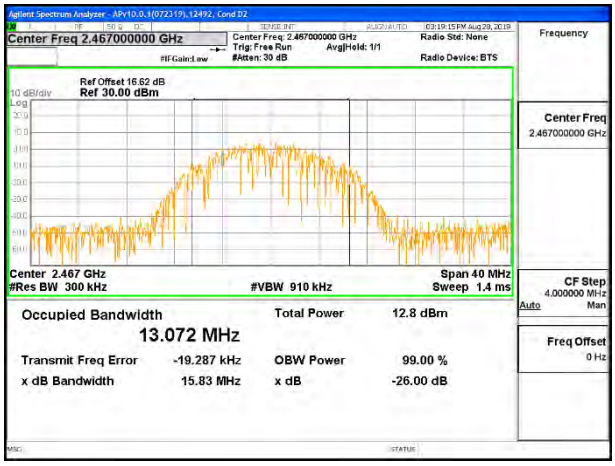
LOW CHANNEL 1



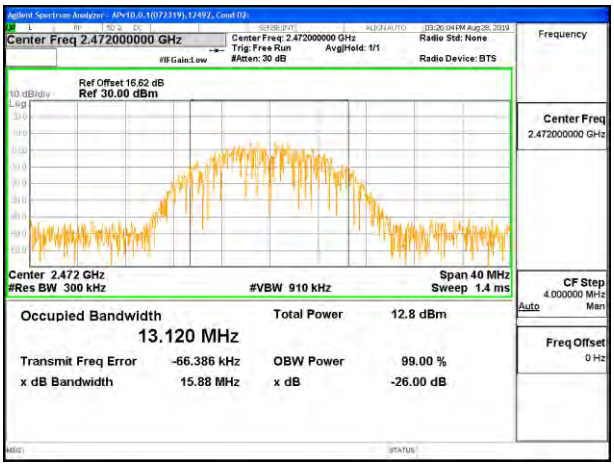
MID CHANNEL 6



HIGH CHANNEL 11



HIGH CHANNEL 12



HIGH CHANNEL 13

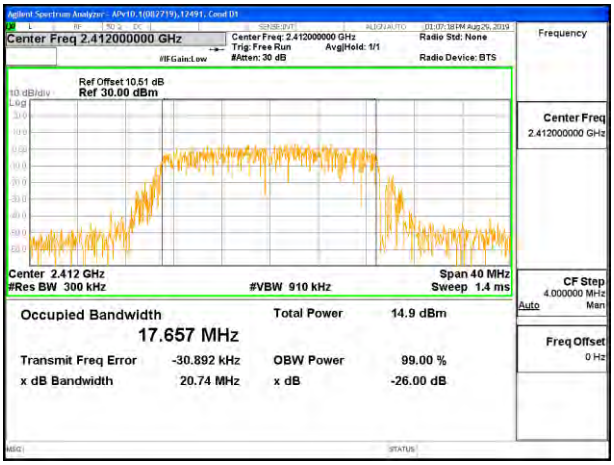
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.2.2. 802.11n HT20 MODE

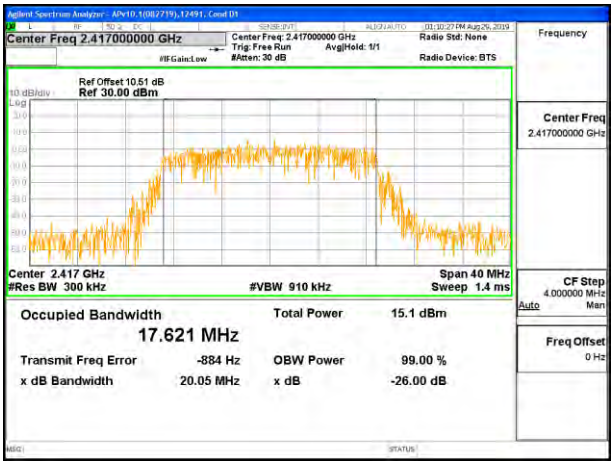
1TX UAT 1

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	17.657
Low 2	2417	17.621
Low 3	2422	17.632
Mid 6	2437	17.625
High 9	2452	17.725
High 10	2457	17.725
High 11	2462	17.638
High 12	2467	17.689
High 13	2472	17.594

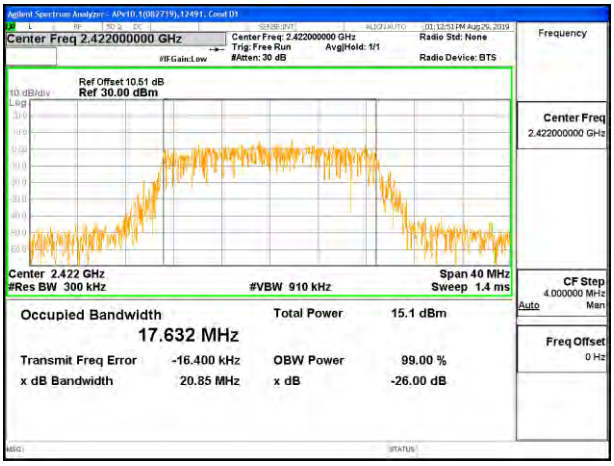
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



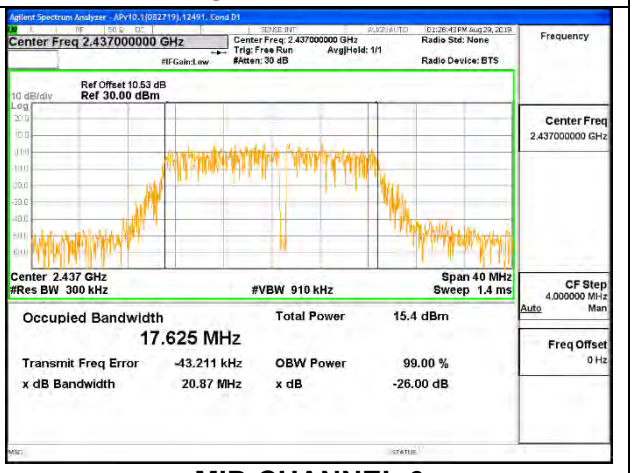
LOW CHANNEL 1



LOW CHANNEL 2

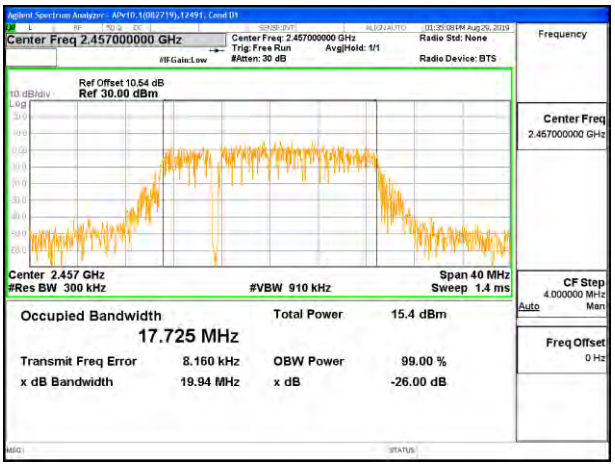


LOW CHANNEL 3



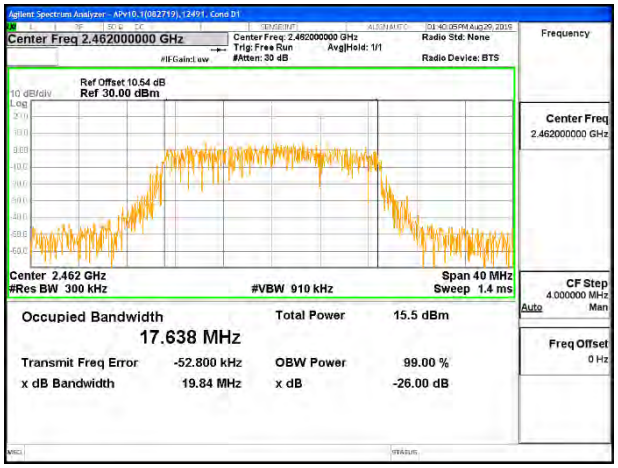
MID CHANNEL 6

HIGH CHANNEL 9

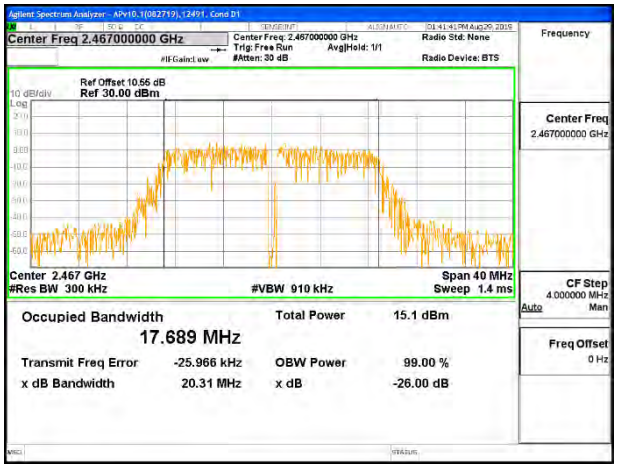


HIGH CHANNEL 10

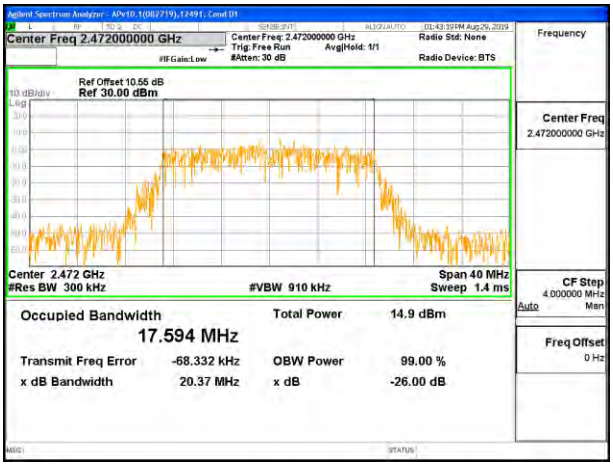
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



HIGH CHANNEL 11



HIGH CHANNEL 12



HIGH CHANNEL 13

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

1TX LAT 3

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	17.646
Low 2	2417	17.595
Low 3	2422	17.631
Mid 6	2437	17.721
High 9	2452	17.623
High 10	2457	17.664
High 11	2462	17.685
High 12	2467	17.577
High 13	2472	17.604

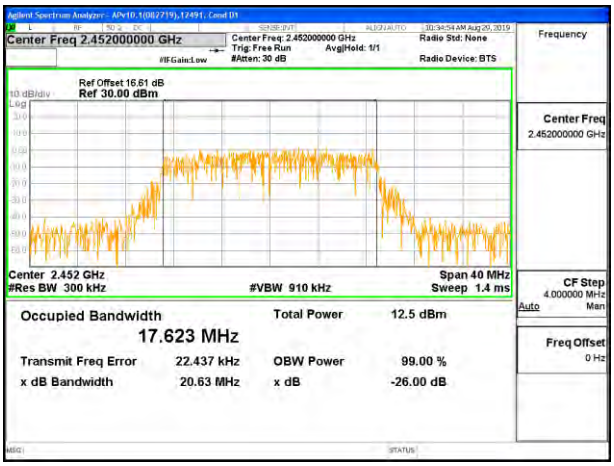
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

LOW CHANNEL 1

LOW CHANNEL 2

LOW CHANNEL 3

MID CHANNEL 6

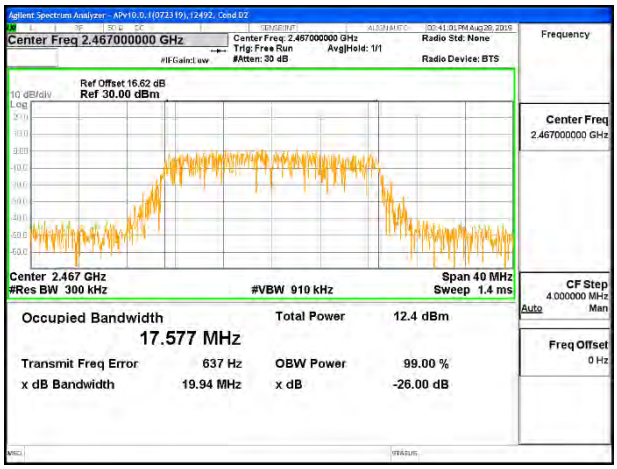


HIGH CHANNEL 9

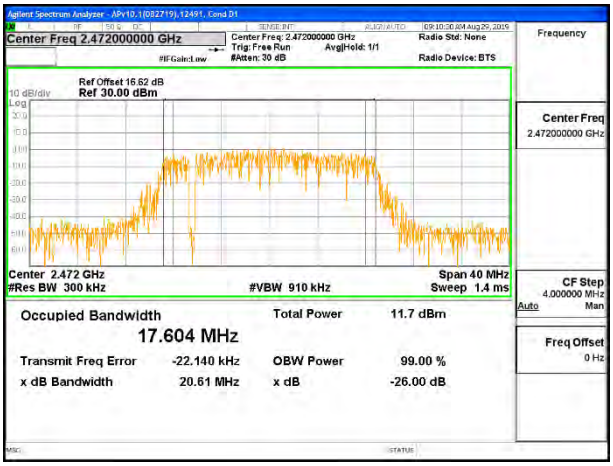
HIGH CHANNEL 10

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

HIGH CHANNEL 11



HIGH CHANNEL 12



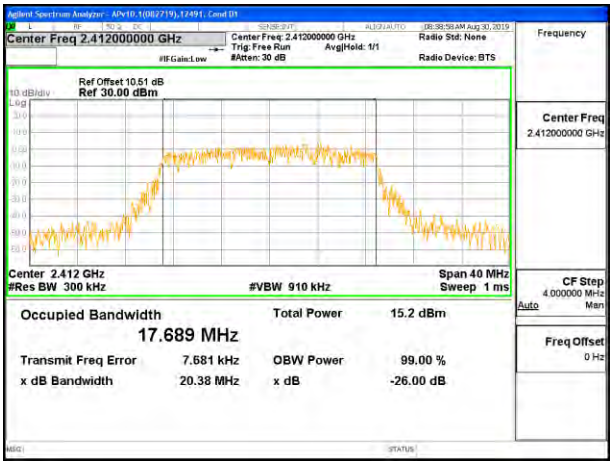
HIGH CHANNEL 13

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

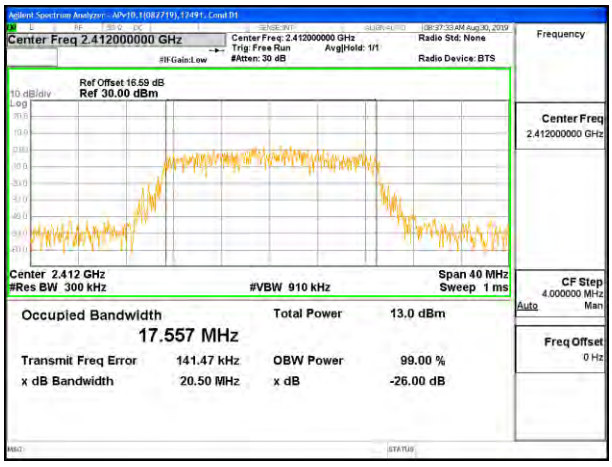
2TX UAT 1 + LAT 3 CDD MODE

Channel	Frequency (MHz)	99% Bandwidth UAT 1 (MHz)	99% Bandwidth LAT 3 (MHz)
Low 1	2412	17.689	17.557
Low 2	2417	17.657	17.648
Low 3	2422	17.673	17.594
Mid 6	2437	17.668	17.653
High 9	2452	17.709	17.703
High 10	2457	17.746	17.610
High 11	2462	17.664	17.641
High 12	2467	17.557	17.639
High 13	2472	17.573	17.697

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



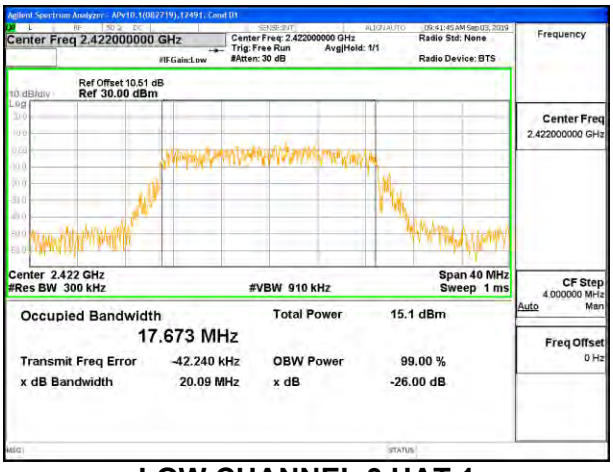
LOW CHANNEL 1 UAT 1



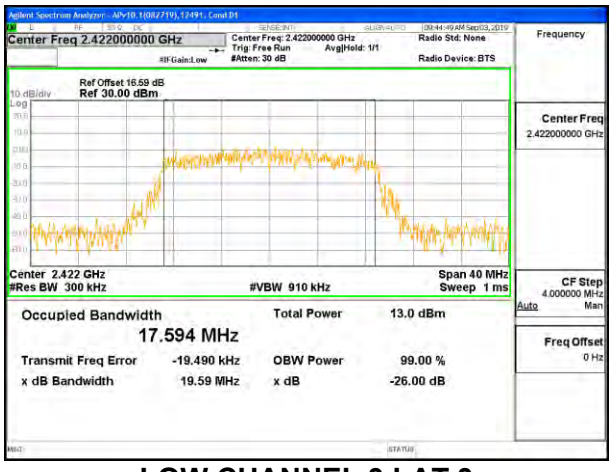
LOW CHANNEL 1 LAT 3

LOW CHANNEL 2 UAT 1

LOW CHANNEL 2 LAT 3

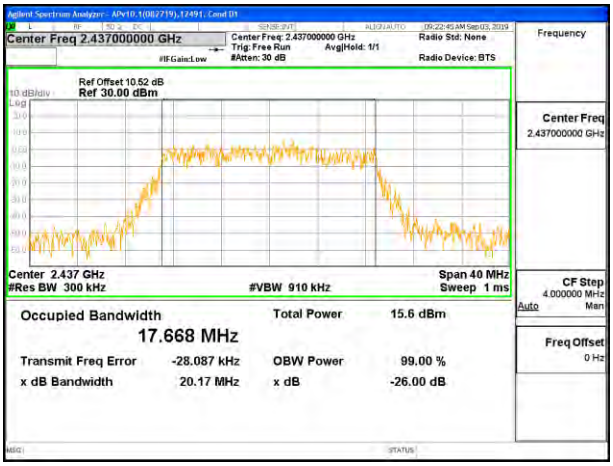


LOW CHANNEL 3 UAT 1

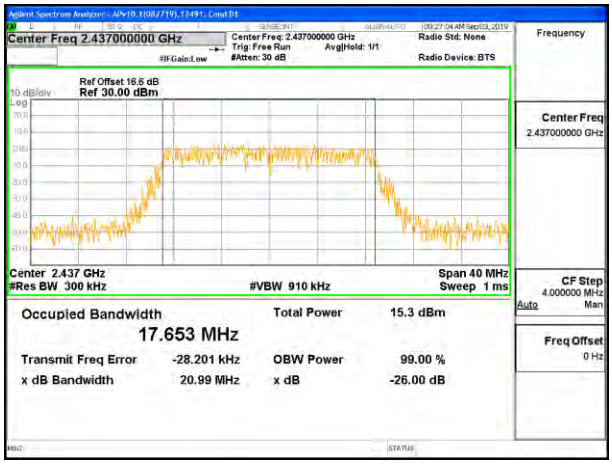


LOW CHANNEL 3 LAT 3

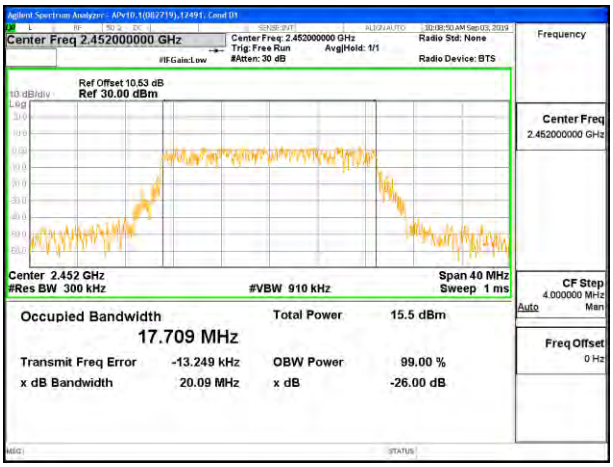
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



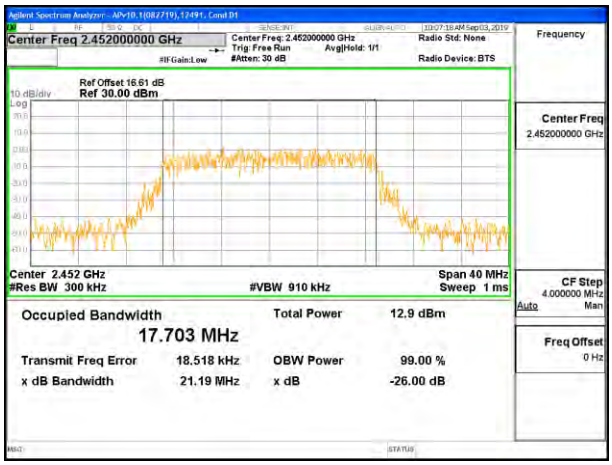
MID CHANNEL 6 UAT 1



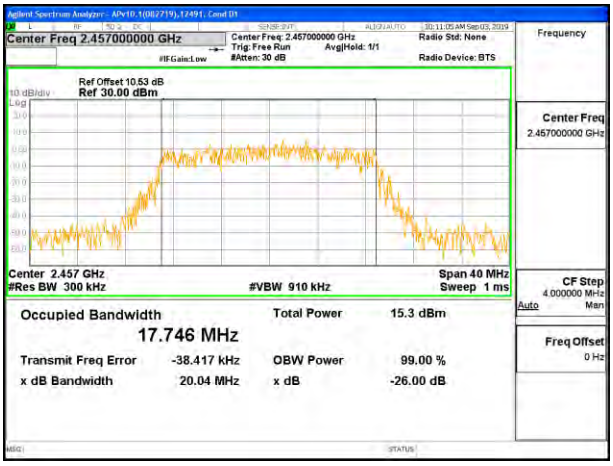
MID CHANNEL 6 LAT 3



HIGH CHANNEL 9 UAT 1



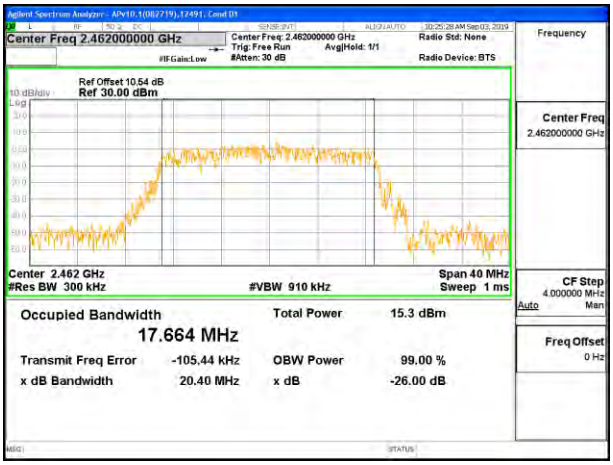
HIGH CHANNEL 9 LAT 3



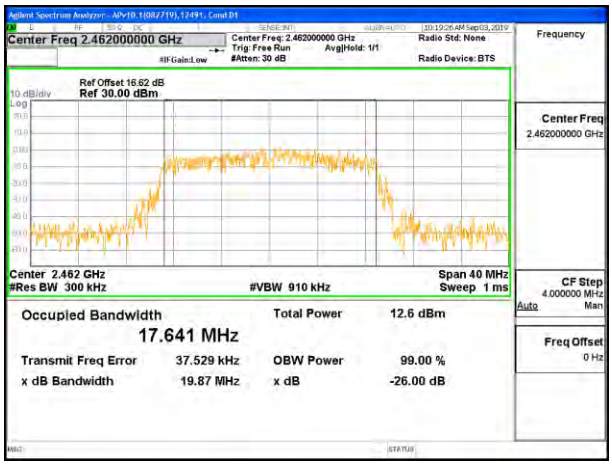
HIGH CHANNEL 10 UAT 1

HIGH CHANNEL 10 LAT 3

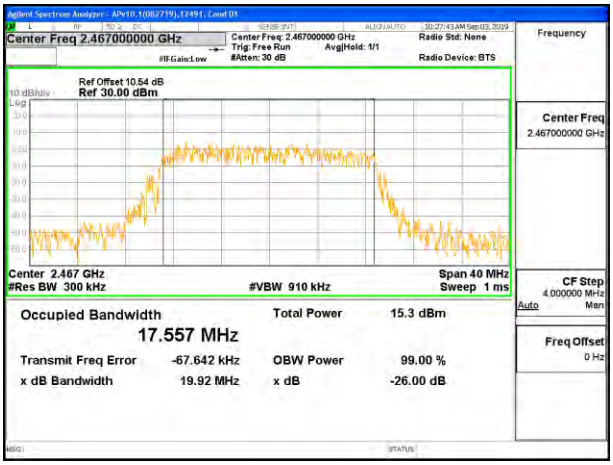
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



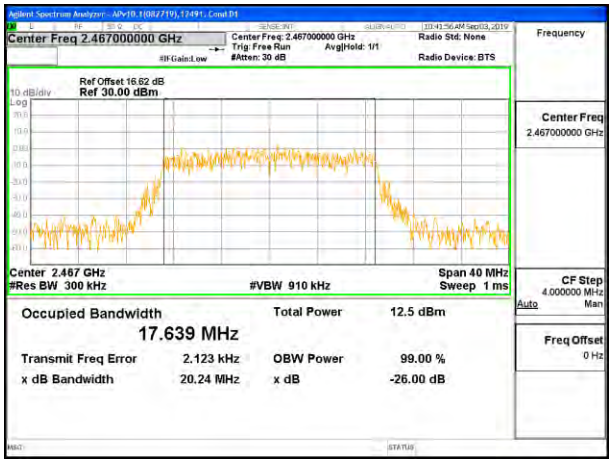
HIGH CHANNEL 11 UAT 1



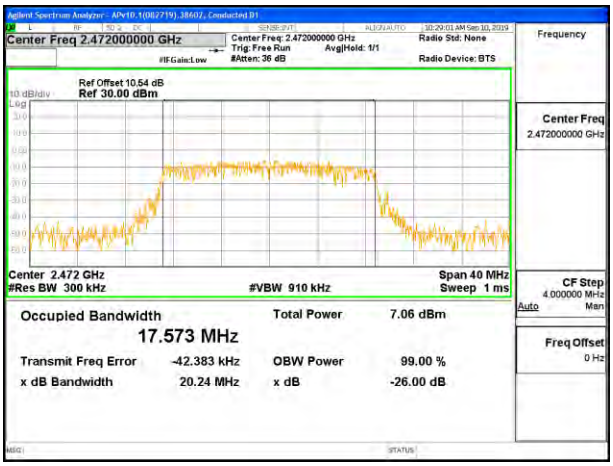
HIGH CHANNEL 11 LAT 3



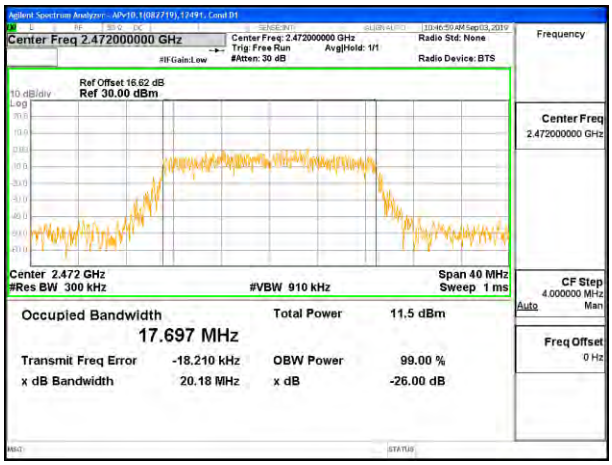
HIGH CHANNEL 12 UAT 1



HIGH CHANNEL 12 LAT 3



HIGH CHANNEL 13 UAT 1



HIGH CHANNEL 13 LAT 3

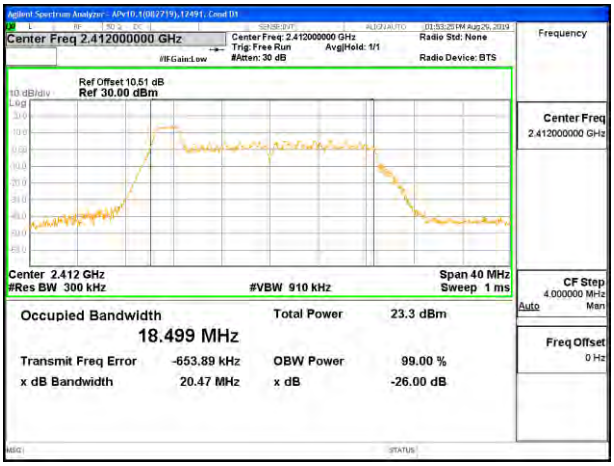
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.2.3. 802.11ax HE20 MODE

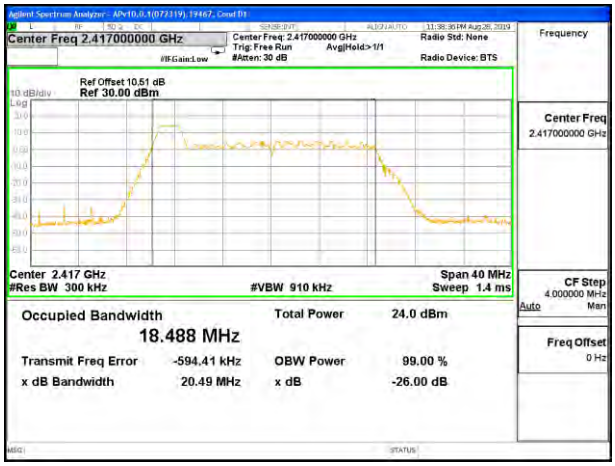
UAT 1, LEGACY SISO MODE: 26-Tones, RU index 0

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	18.499
Low 2	2417	18.488
Low 3	2422	18.491
Mid 6	2437	18.413
High 9	2452	18.540
High 10	2457	18.472
High 11	2462	18.433
High 12	2467	18.336
High 13	2472	18.316

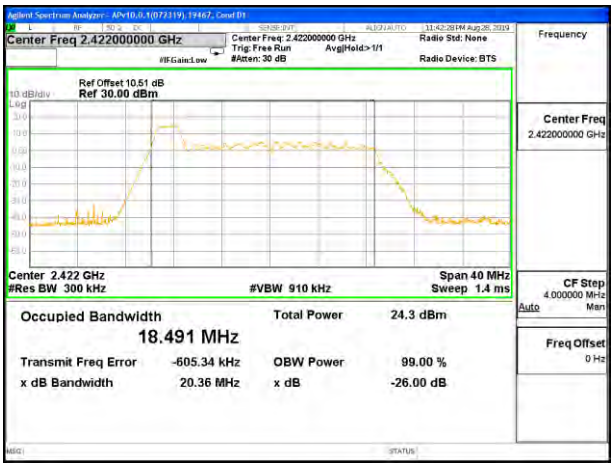
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



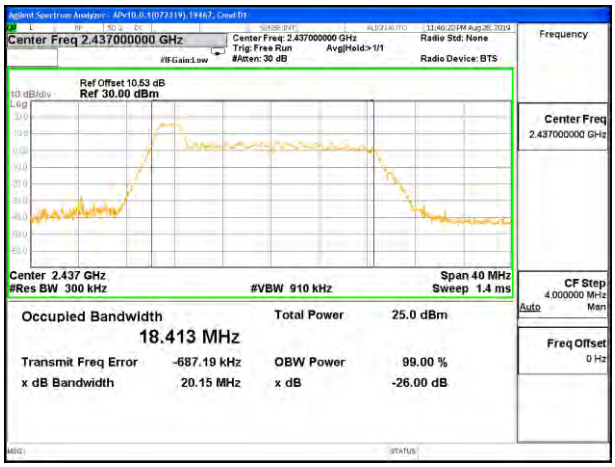
LOW CHANNEL 1



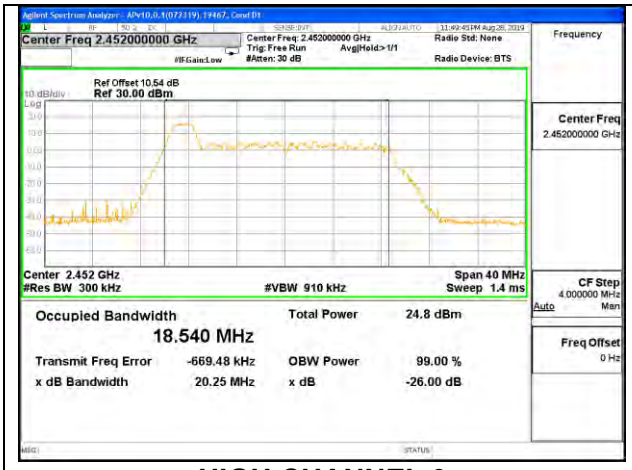
LOW CHANNEL 2



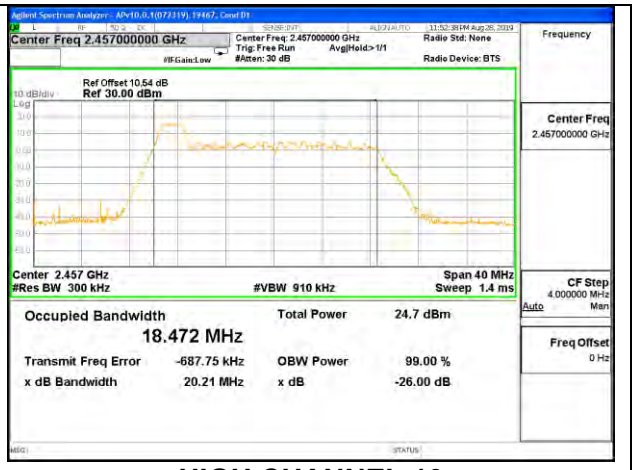
LOW CHANNEL 3



MID CHANNEL 6

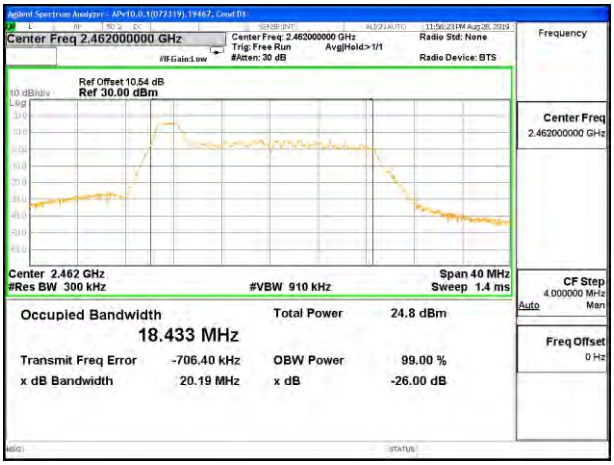


HIGH CHANNEL 9

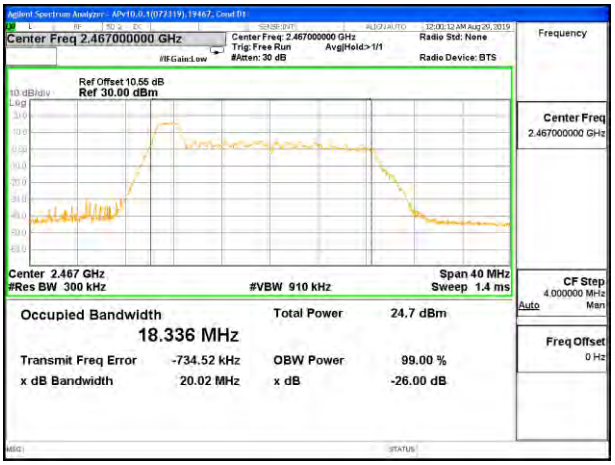


HIGH CHANNEL 10

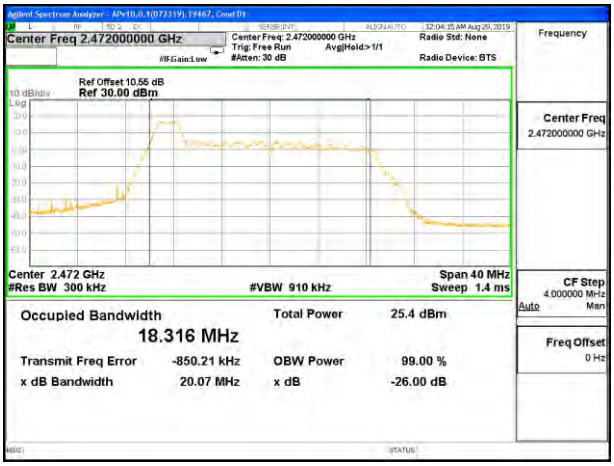
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



HIGH CHANNEL 11



HIGH CHANNEL 12



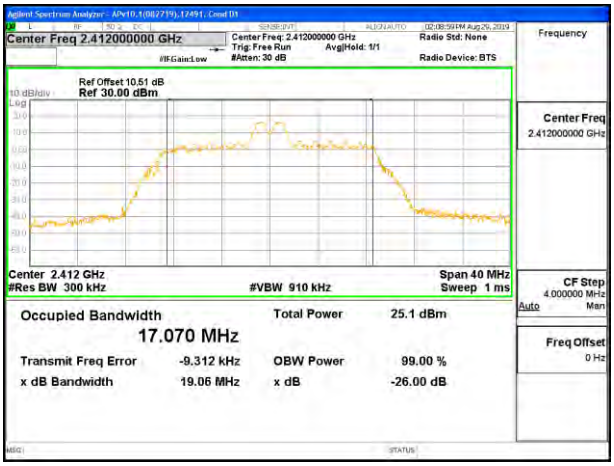
HIGH CHANNEL 13

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

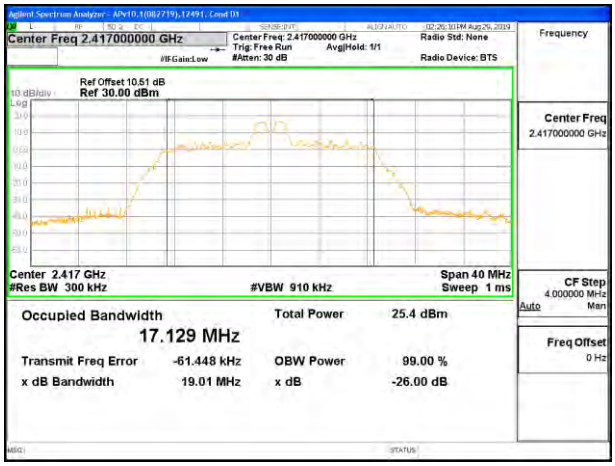
UAT 1, LEGACY SISO MODE: 26-Tones, RU index 4

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	17.070
Low 2	2417	17.129
Low 3	2422	17.029
Mid 6	2437	17.047
High 9	2452	17.135
High 10	2457	17.102
High 11	2462	17.030
High 12	2467	17.064
High 13	2472	17.033

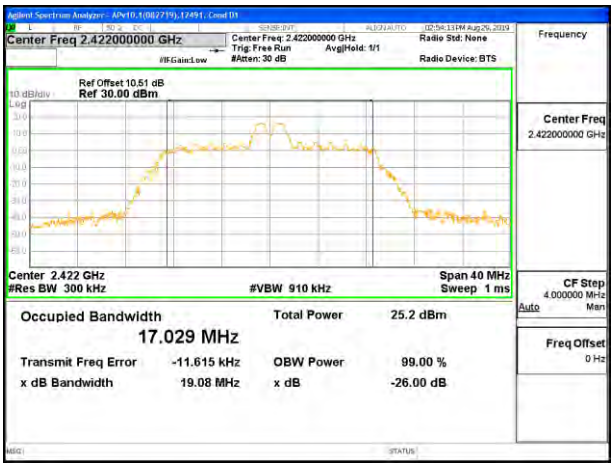
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



LOW CHANNEL 1

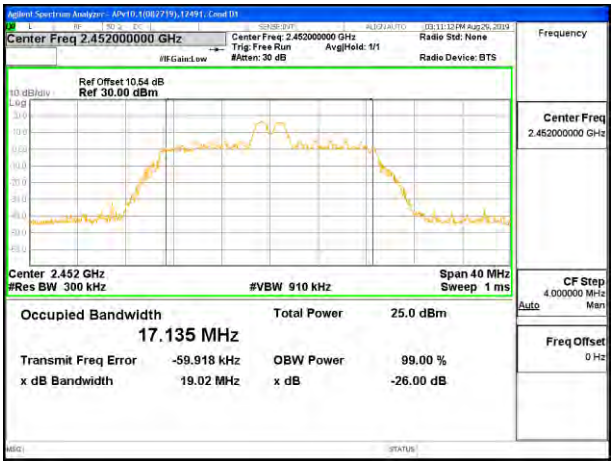


LOW CHANNEL 2



LOW CHANNEL 3

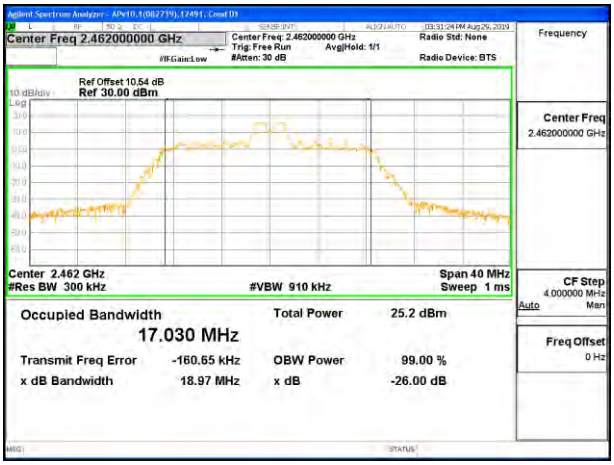
MID CHANNEL 6



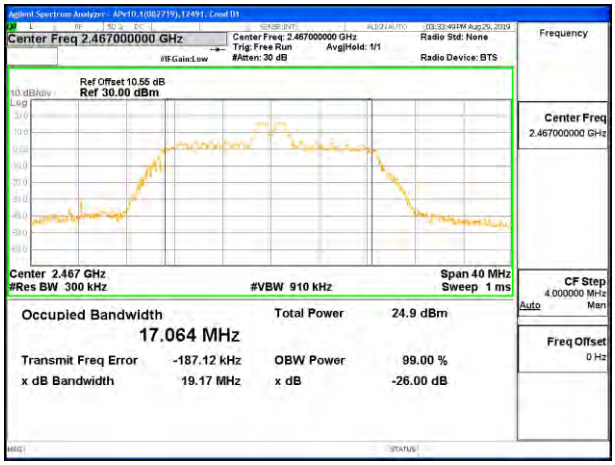
HIGH CHANNEL 9

HIGH CHANNEL 10

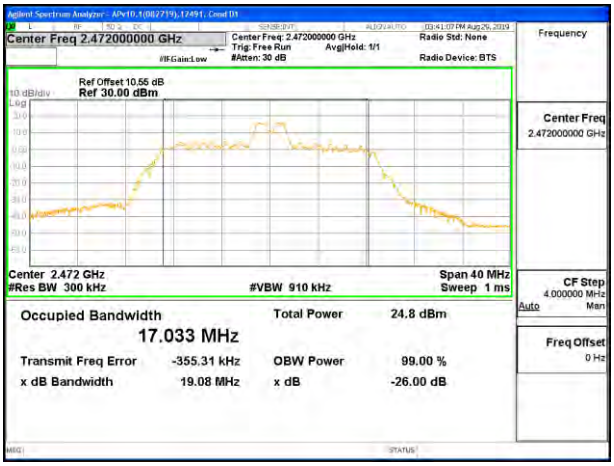
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



HIGH CHANNEL 11



HIGH CHANNEL 12



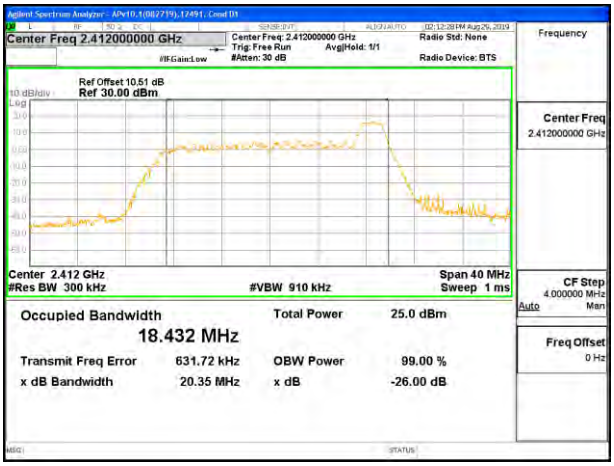
HIGH CHANNEL 13

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

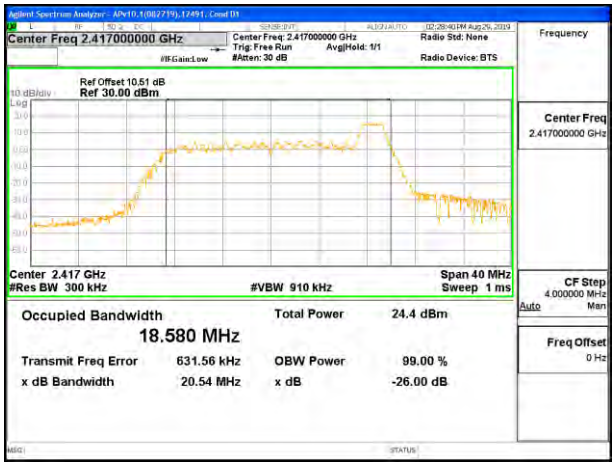
UAT 1, LEGACY SISO MODE: 26-Tones, RU index 8

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	18.432
Low 2	2417	18.580
Low 3	2422	18.537
Mid 6	2437	18.648
High 9	2452	18.565
High 10	2457	18.664
High 11	2462	18.589
High 12	2467	18.748
High 13	2472	18.794

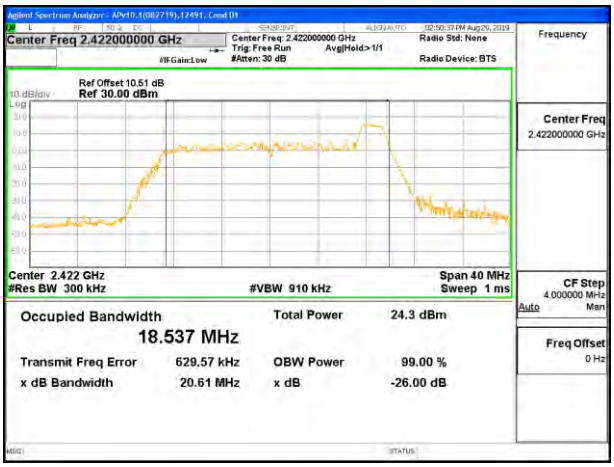
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



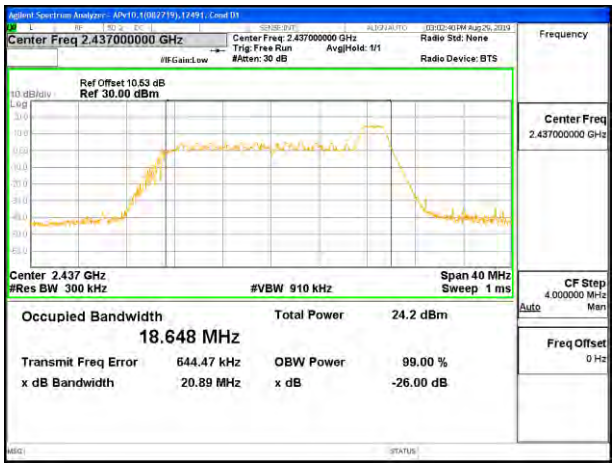
LOW CHANNEL 1



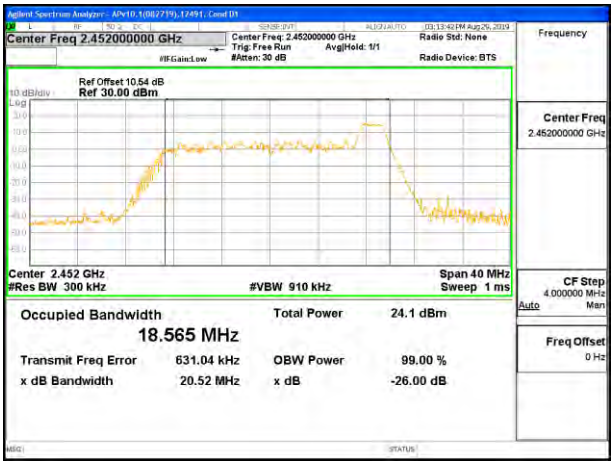
LOW CHANNEL 2



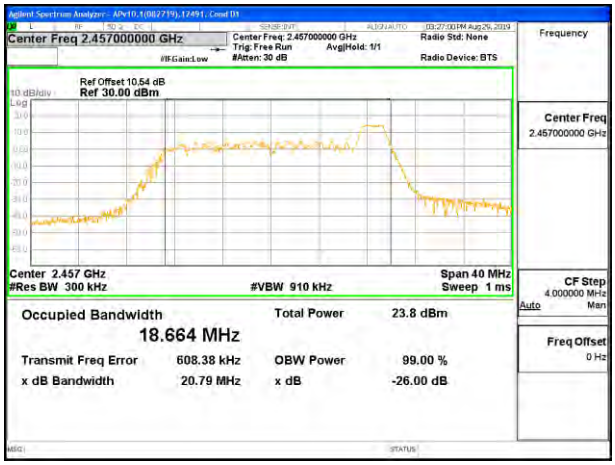
LOW CHANNEL 3



MID CHANNEL 6

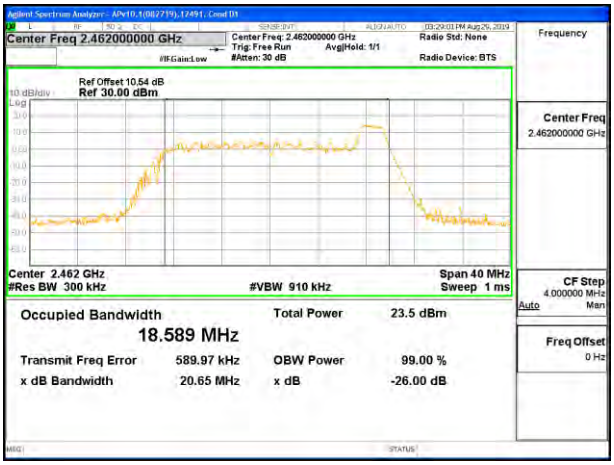


HIGH CHANNEL 9

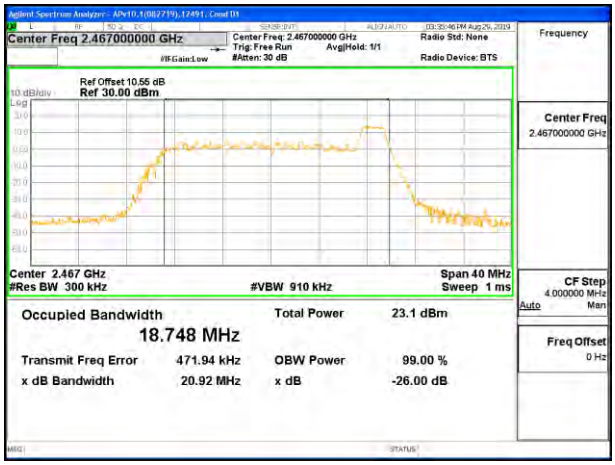


HIGH CHANNEL 10

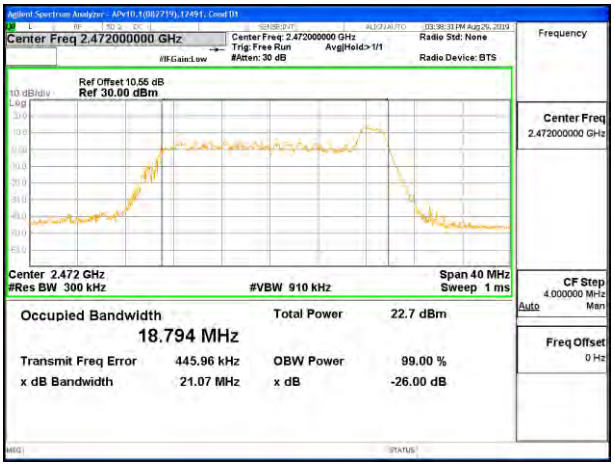
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



HIGH CHANNEL 11



HIGH CHANNEL 12



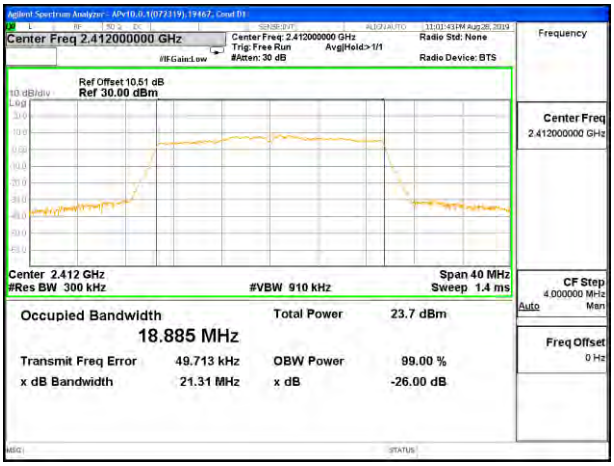
HIGH CHANNEL 13

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

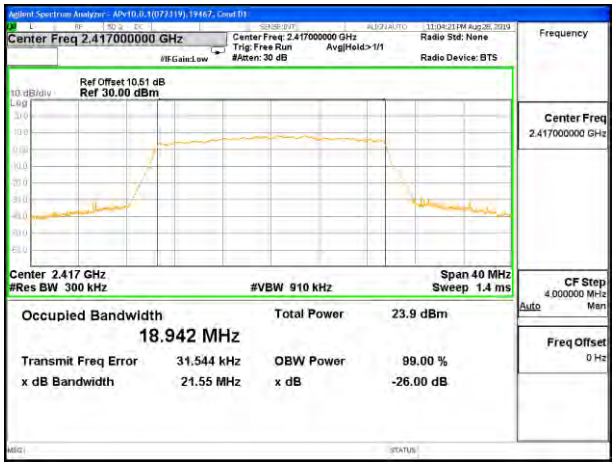
UAT 1, LEGACY SISO MODE: 242-Tones, RU index 61

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	18.885
Low 2	2417	18.942
Low 3	2422	18.908
Mid 6	2437	18.904
High 9	2452	19.065
High 10	2457	18.923
High 11	2462	18.972
High 12	2467	18.954
High 13	2472	18.853

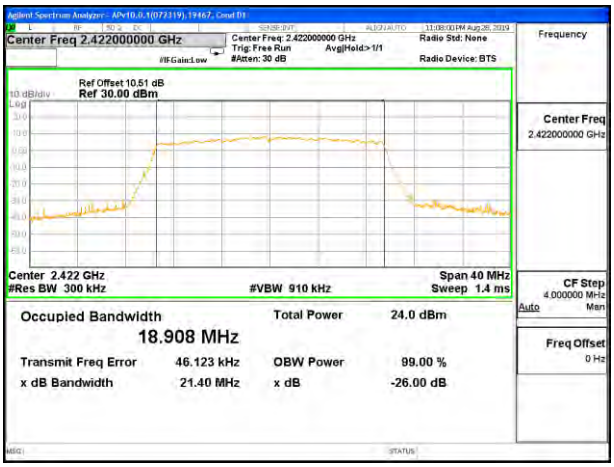
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



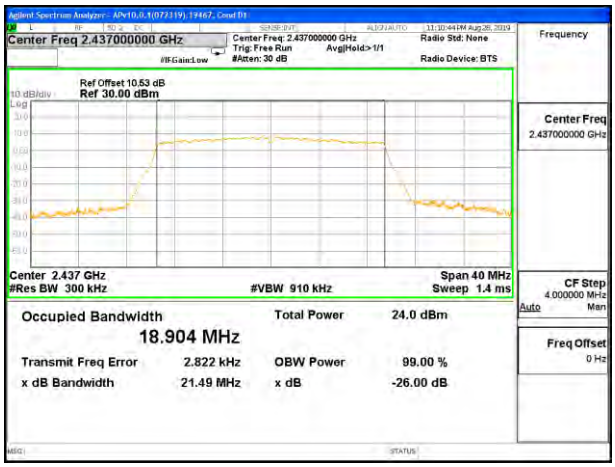
LOW CHANNEL 1



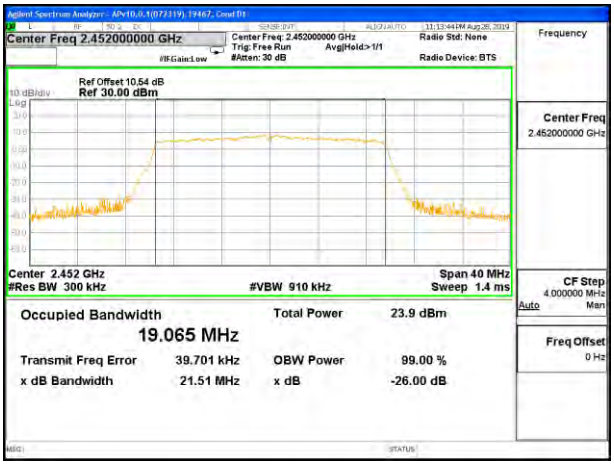
LOW CHANNEL 2



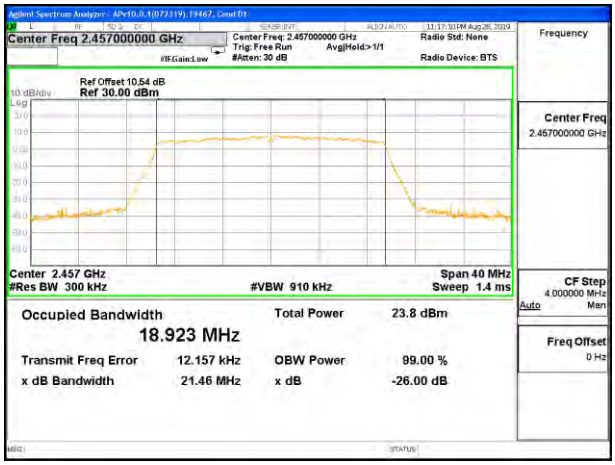
LOW CHANNEL 3



MID CHANNEL 6

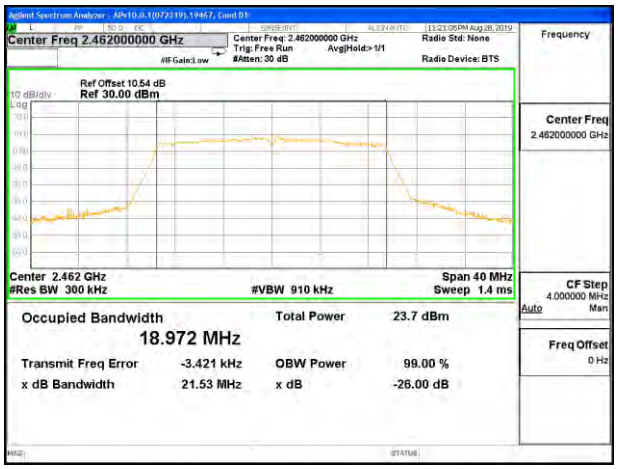


HIGH CHANNEL 9



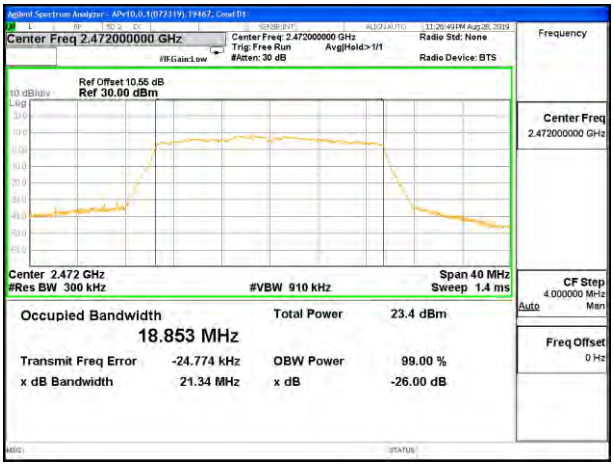
HIGH CHANNEL 10

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



HIGH CHANNEL 11

HIGH CHANNEL 12



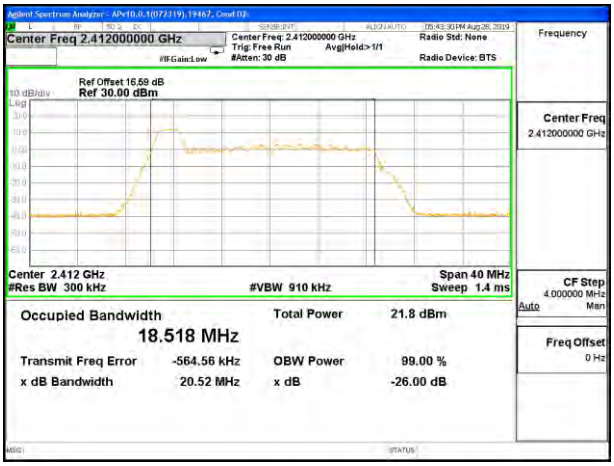
HIGH CHANNEL 13

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

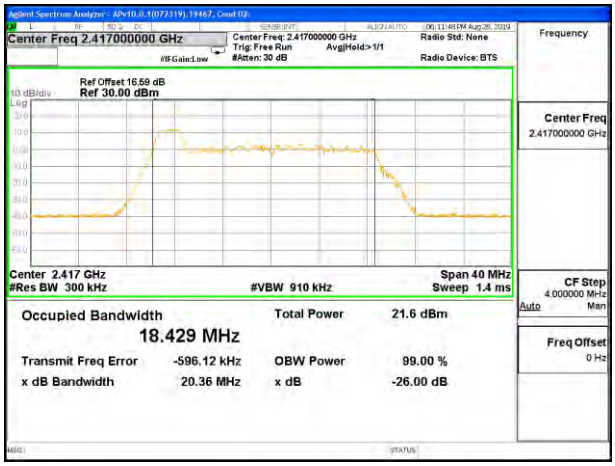
LAT 3, LEGACY SISO MODE: 26-Tones, RU index 0

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	18.518
Low 2	2417	18.429
Low 3	2422	18.389
Mid 6	2437	18.365
High 9	2452	18.525
High 10	2457	18.400
High 11	2462	18.531
High 12	2467	18.492
High 13	2472	18.309

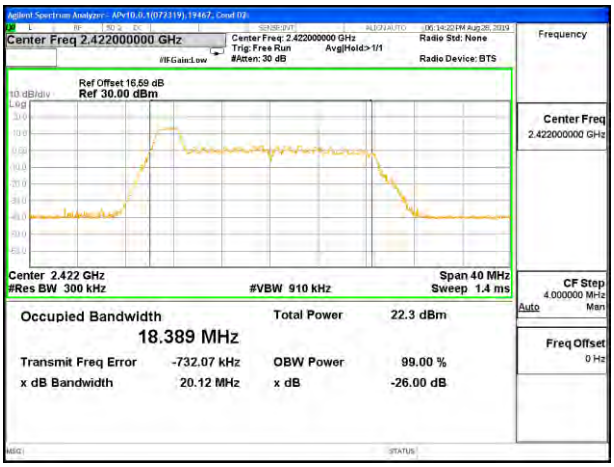
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



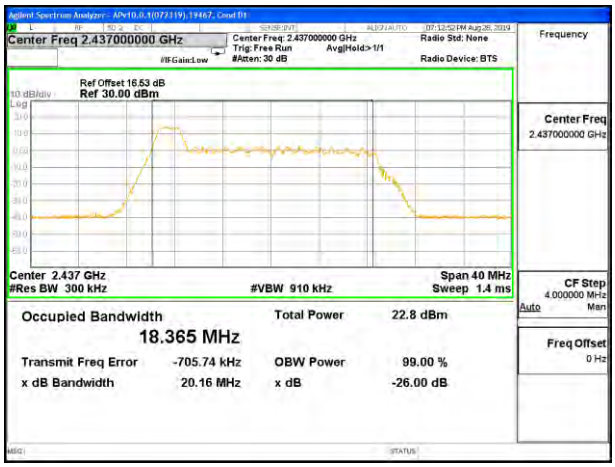
LOW CHANNEL 1



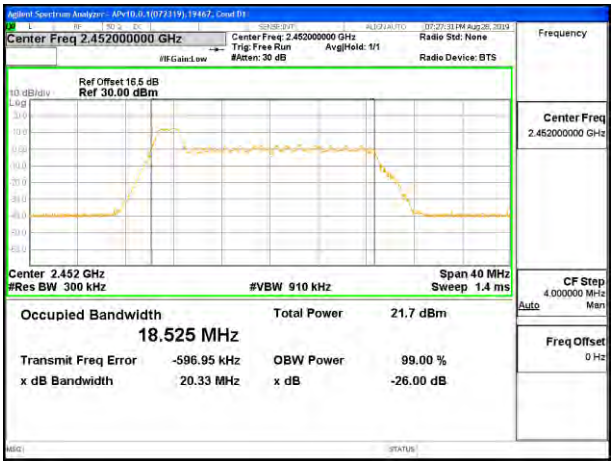
LOW CHANNEL 2



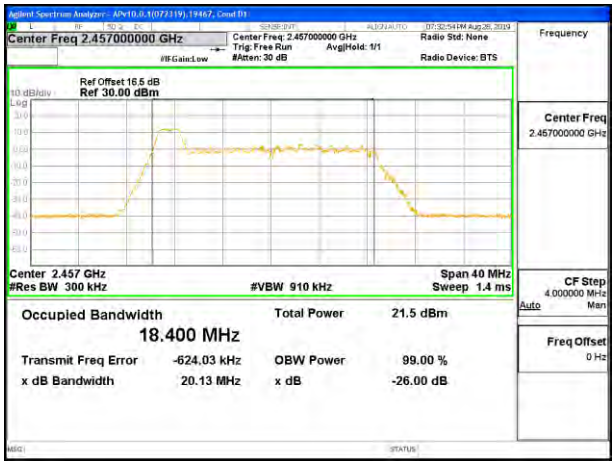
LOW CHANNEL 3



MID CHANNEL 6

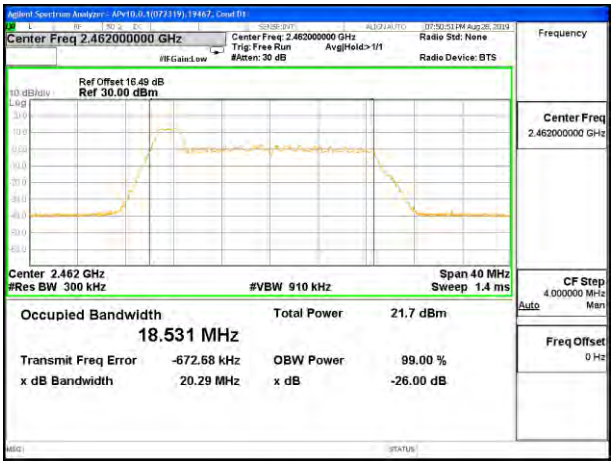


HIGH CHANNEL 9

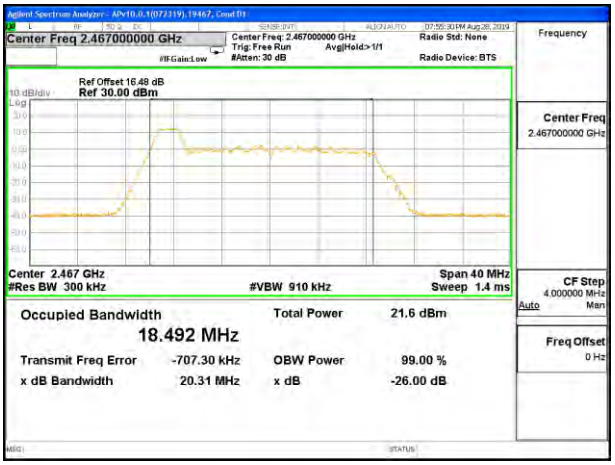


HIGH CHANNEL 10

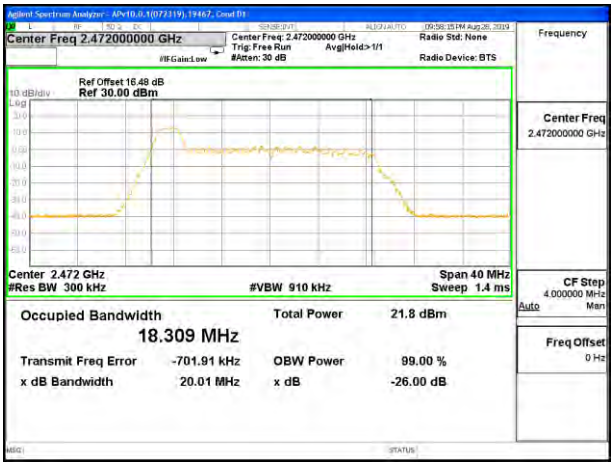
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



HIGH CHANNEL 11



HIGH CHANNEL 12



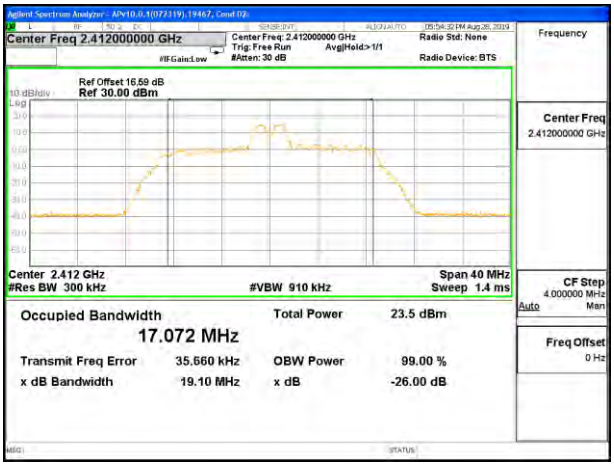
HIGH CHANNEL 13

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

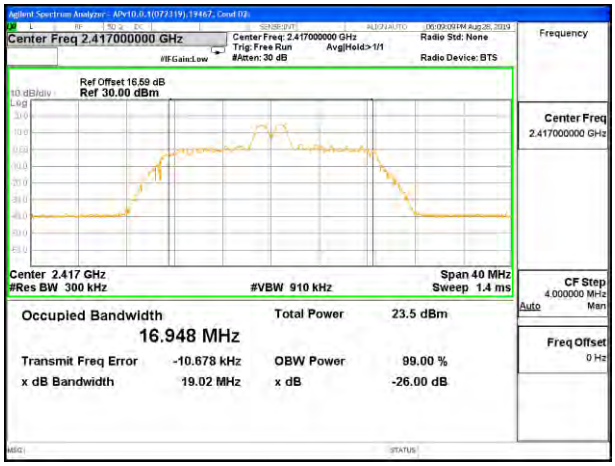
LAT 3, LEGACY SISO MODE: 26-Tones, RU index 4

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	17.072
Low 2	2417	16.948
Low 3	2422	17.110
Mid 6	2437	17.383
High 9	2452	17.235
High 10	2457	17.117
High 11	2462	17.122
High 12	2467	17.159
High 13	2472	17.113

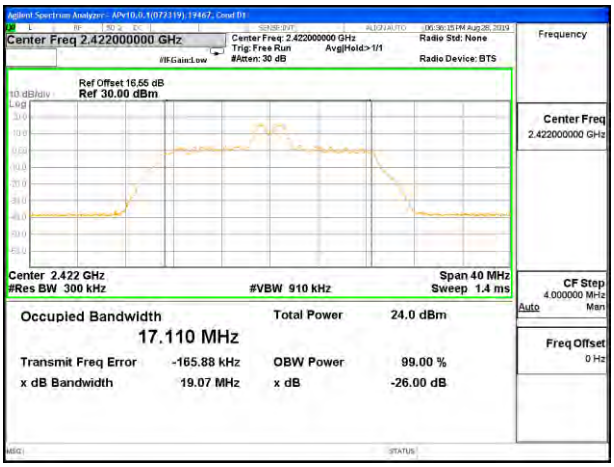
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



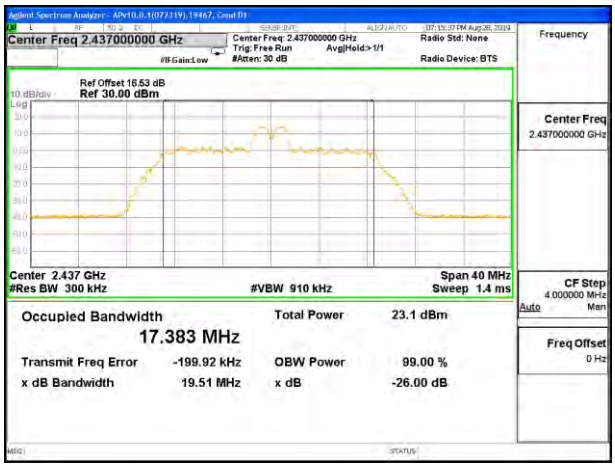
LOW CHANNEL 1



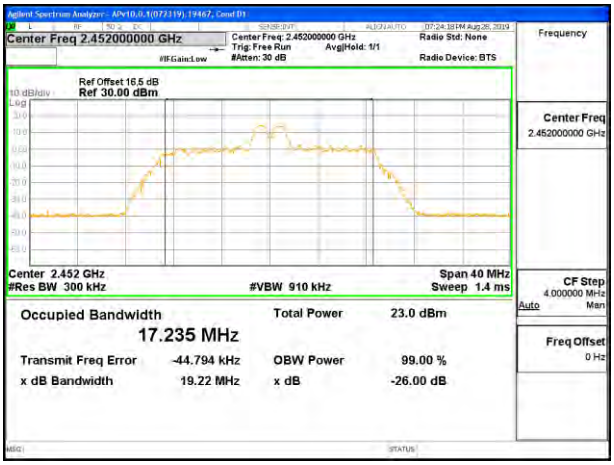
LOW CHANNEL 2



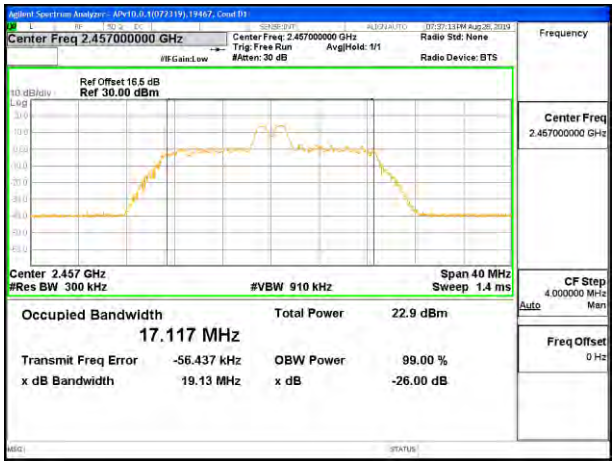
LOW CHANNEL 3



MID CHANNEL 6

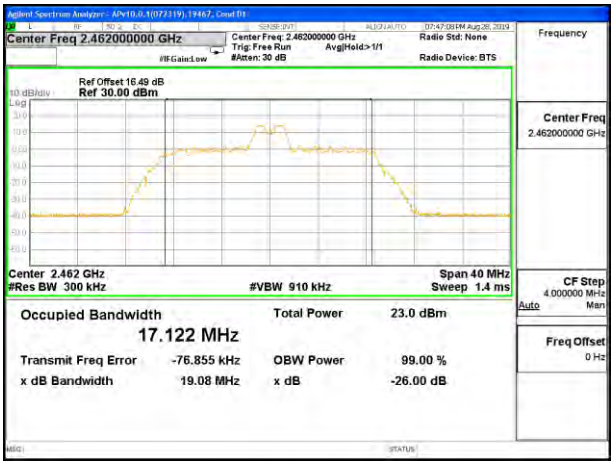


HIGH CHANNEL 9

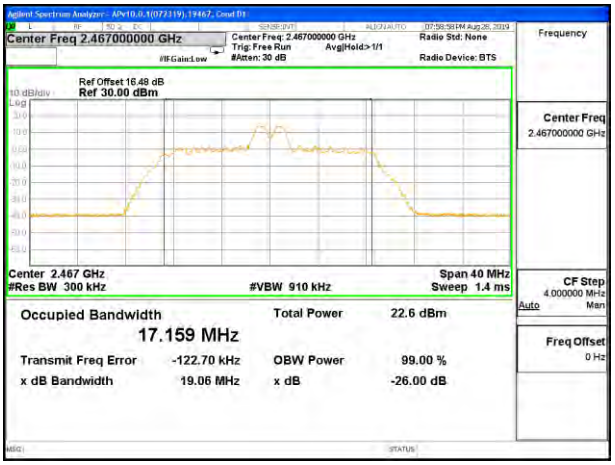


HIGH CHANNEL 10

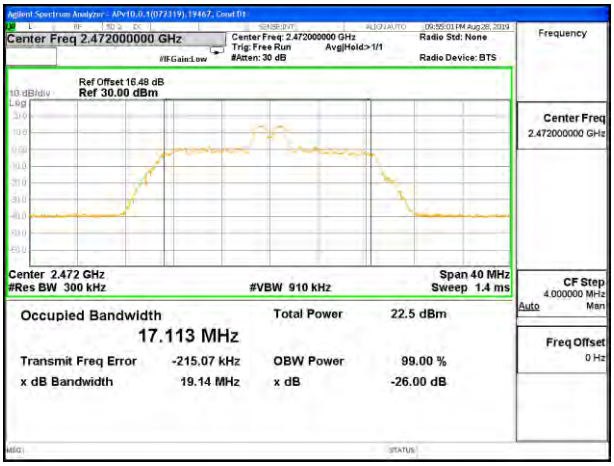
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



HIGH CHANNEL 11



HIGH CHANNEL 12



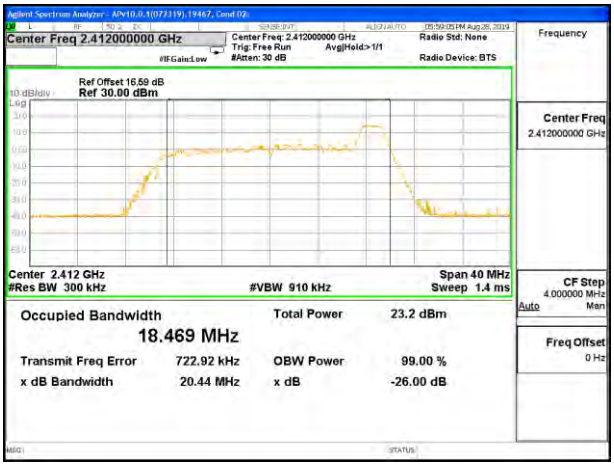
HIGH CHANNEL 13

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

LAT 3, LEGACY SISO MODE: 26-Tones, RU index 8

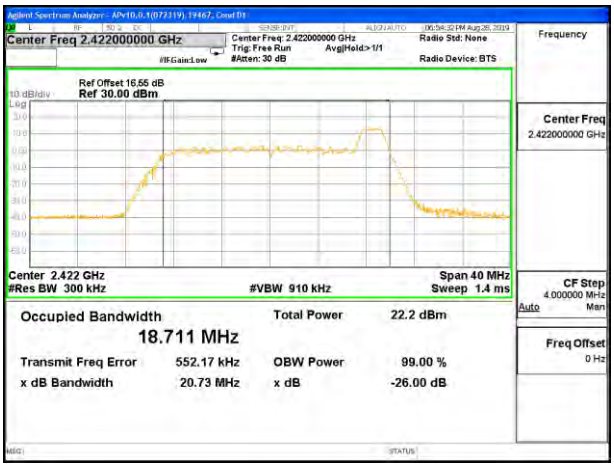
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	18.469
Low 2	2417	18.534
Low 3	2422	18.711
Mid 6	2437	18.820
High 9	2452	18.685
High 10	2457	18.611
High 11	2462	18.575
High 12	2467	18.747
High 13	2472	18.867

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

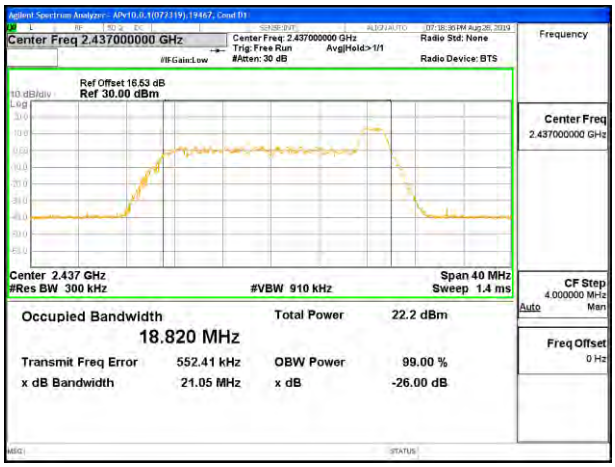


LOW CHANNEL 1

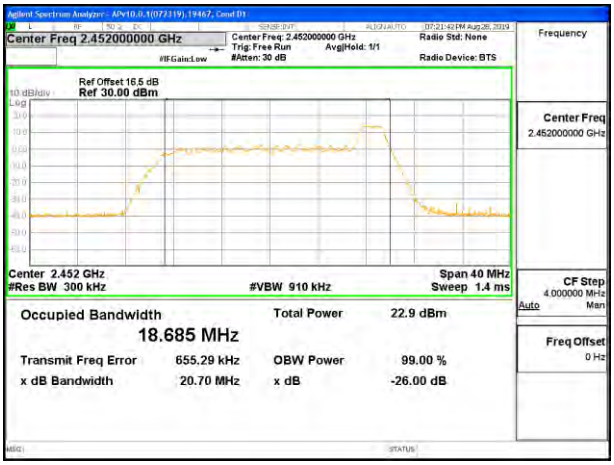
LOW CHANNEL 2



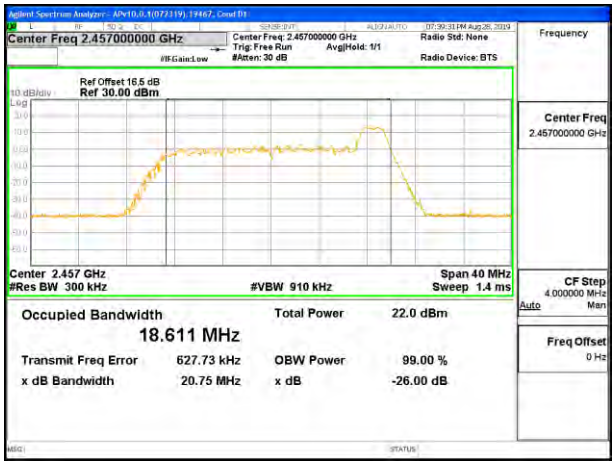
LOW CHANNEL 3



MID CHANNEL 6

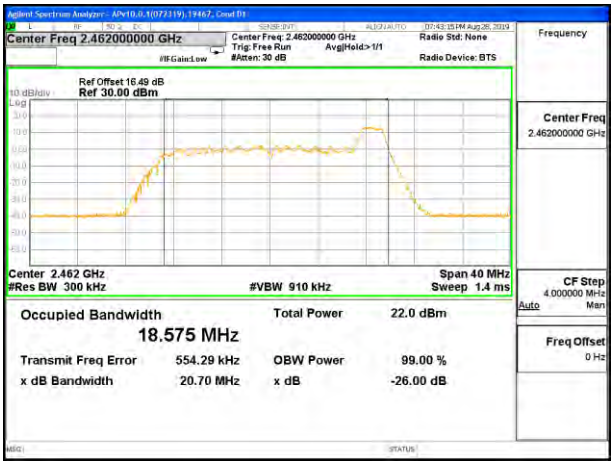


HIGH CHANNEL 9

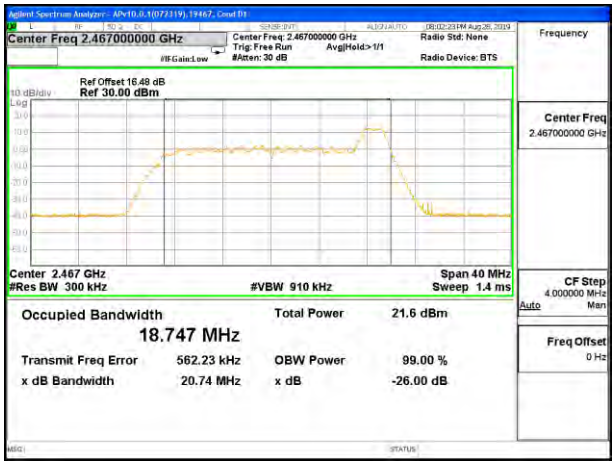


HIGH CHANNEL 10

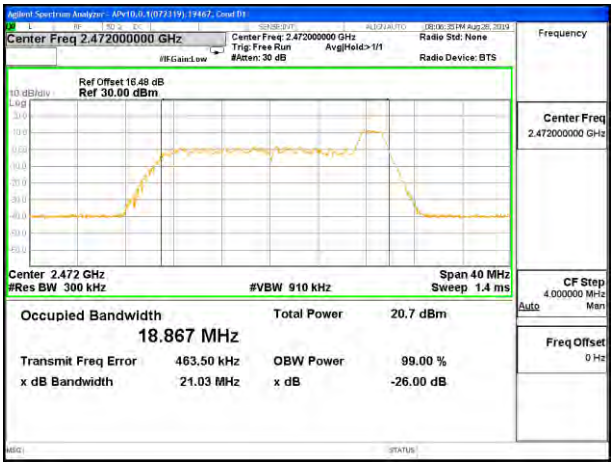
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



HIGH CHANNEL 11



HIGH CHANNEL 12



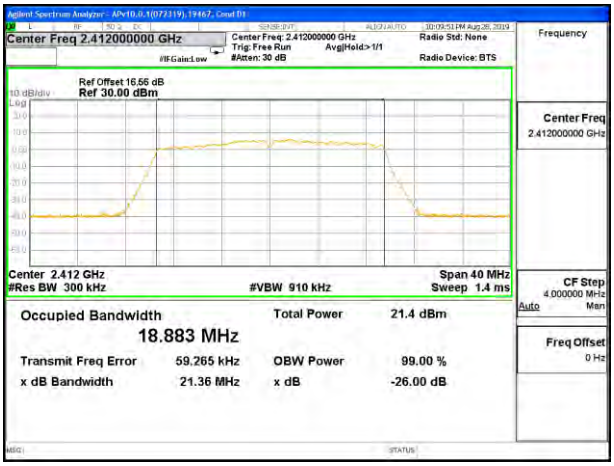
HIGH CHANNEL 13

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

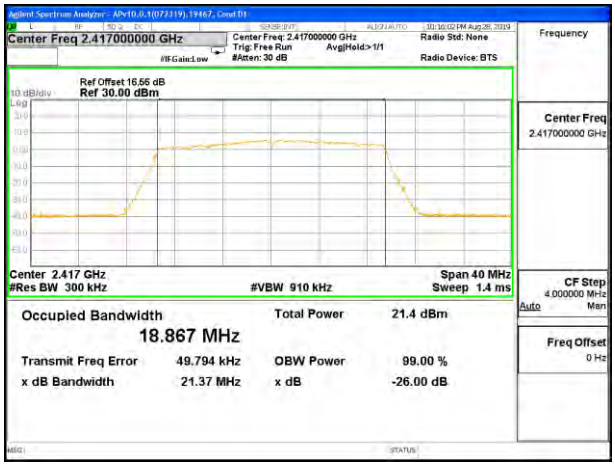
LAT 3, LEGACY SISO MODE: 242-Tones, RU index 61

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	18.883
Low 2	2417	18.867
Low 3	2422	18.853
Mid 6	2437	19.022
High 9	2452	19.004
High 10	2457	18.947
High 11	2462	18.934
High 12	2467	18.944
High 13	2472	18.899

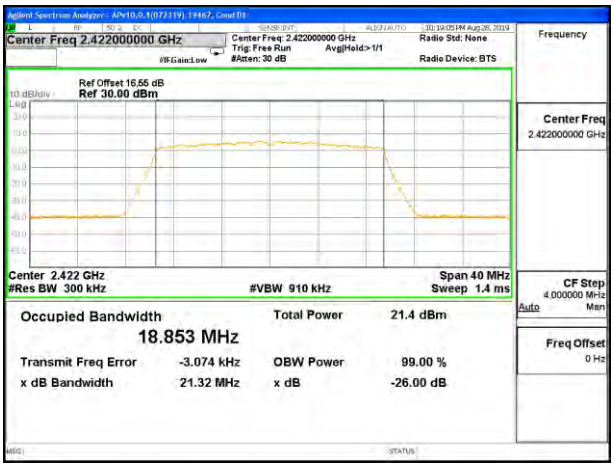
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



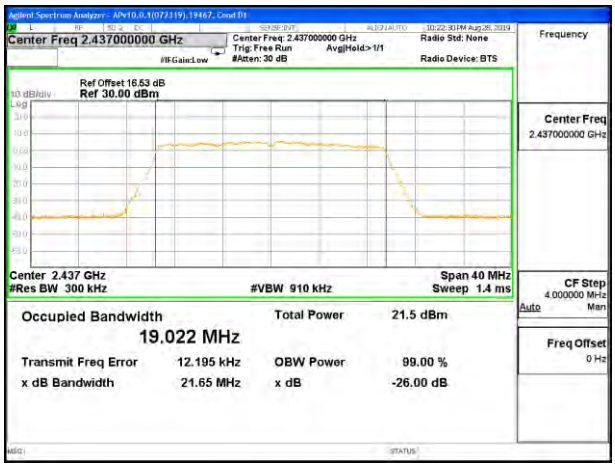
LOW CHANNEL 1



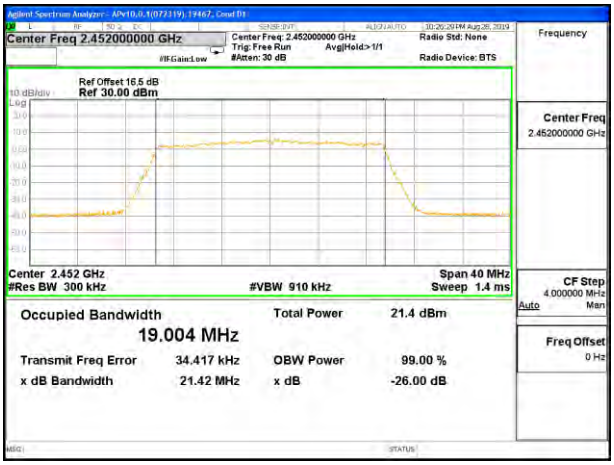
LOW CHANNEL 2



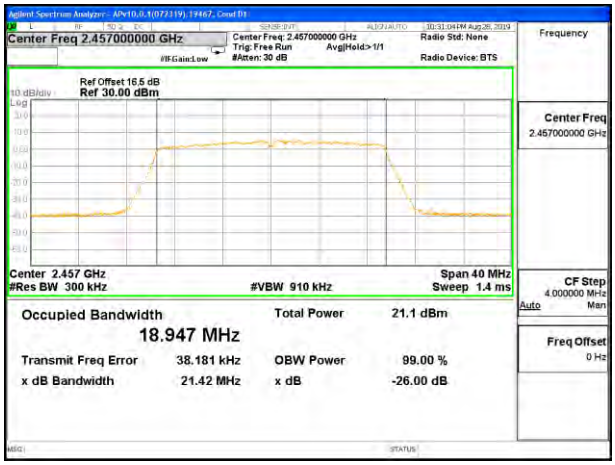
LOW CHANNEL 3



MID CHANNEL 6

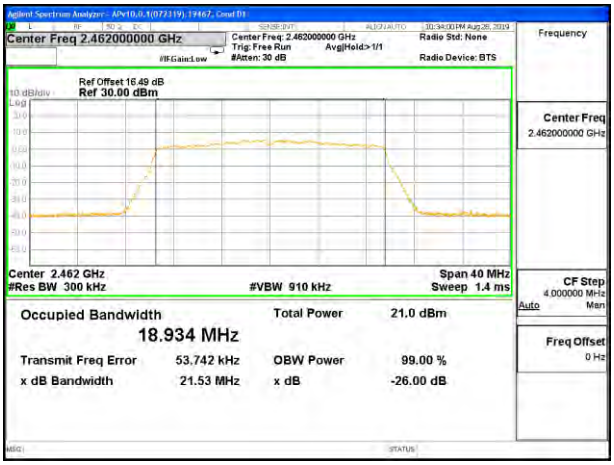


HIGH CHANNEL 9

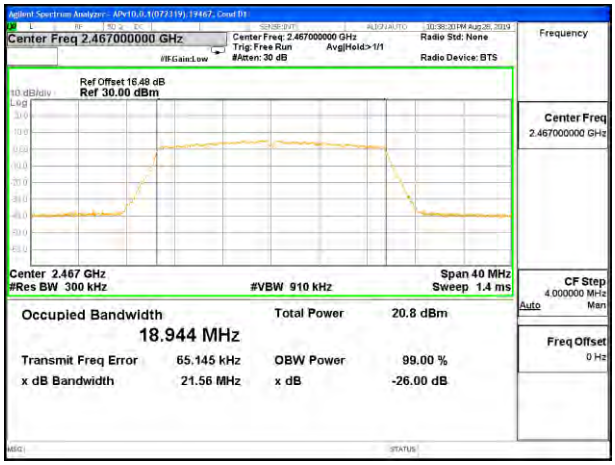


HIGH CHANNEL 10

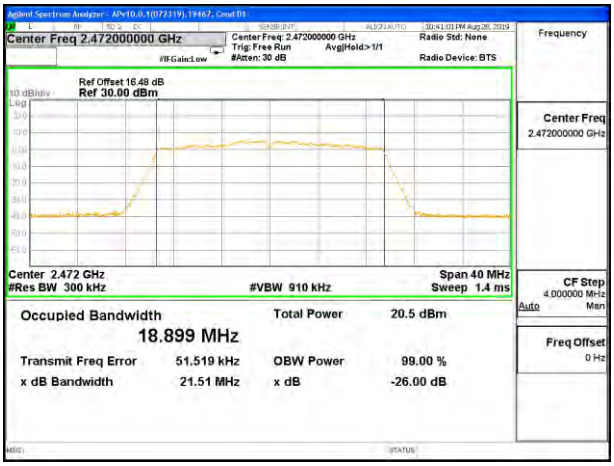
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



HIGH CHANNEL 11



HIGH CHANNEL 12



HIGH CHANNEL 13

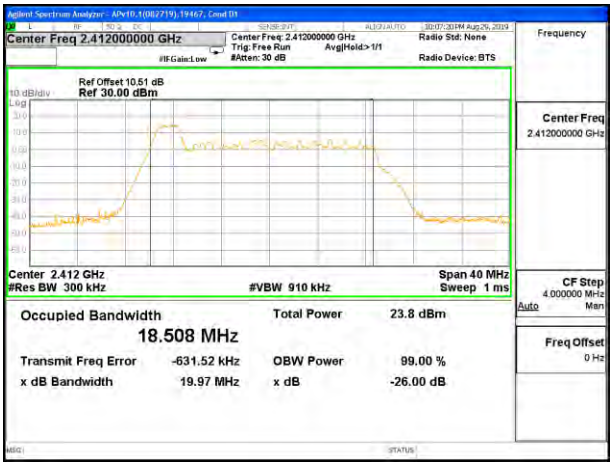
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.2.4. 802.11ax HE20 OFDMA MODE 2TX

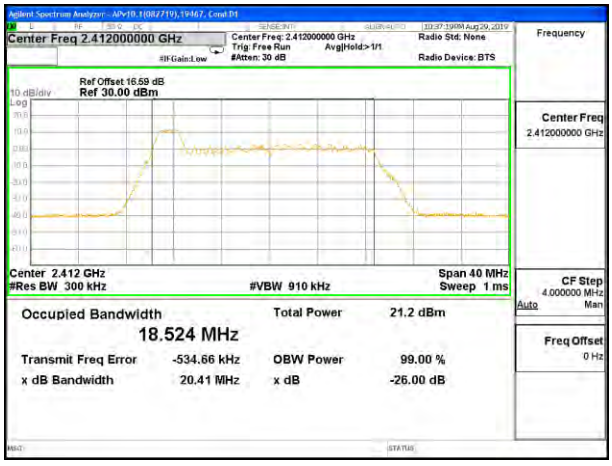
UAT 1 + LAT 3 2TX MODE: 26-Tones, RU Index 0

Channel	Frequency (MHz)	99% Bandwidth UAT 1 (MHz)	99% Bandwidth LAT 3 (MHz)
Low 1	2412	18.508	18.524
Low 2	2417	18.346	18.473
Low 3	2422	18.349	18.362
Low 4	2427	18.359	18.491
Mid 6	2437	18.400	18.465
High 9	2452	18.368	18.574
High 10	2457	18.325	18.507
High 11	2462	18.242	18.407
High 12	2467	18.097	18.388
High 13	2472	18.040	18.178

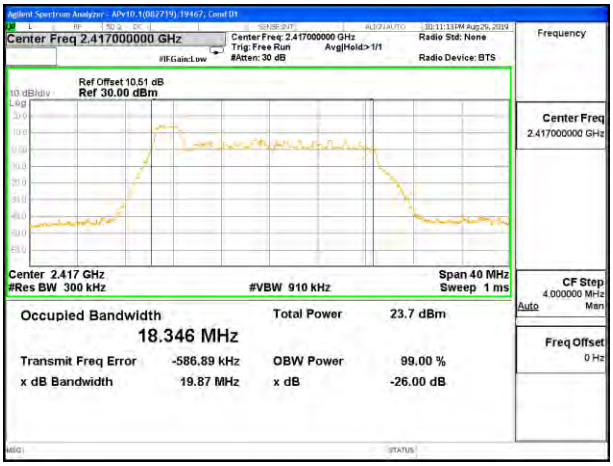
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



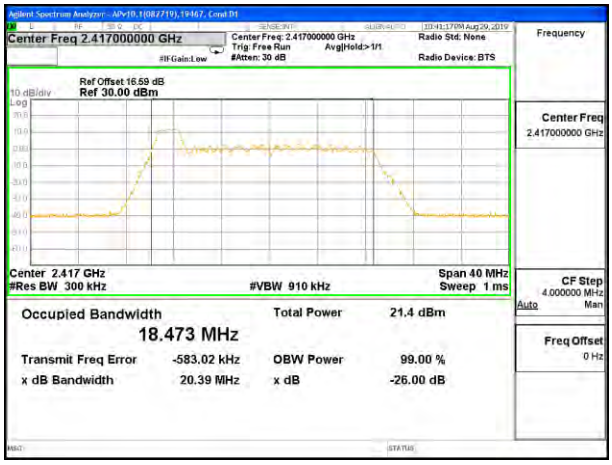
LOW CHANNEL 1 UAT 1



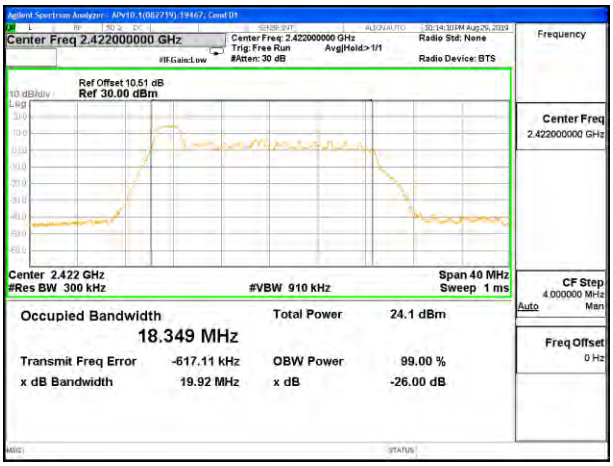
LOW CHANNEL 1 LAT 3



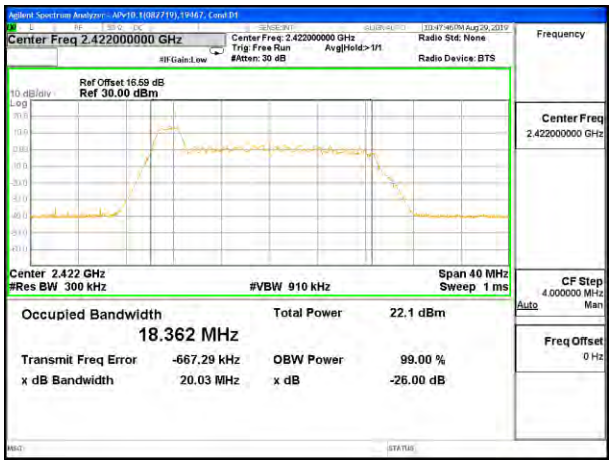
LOW CHANNEL 2 UAT 1



LOW CHANNEL 2 LAT 3

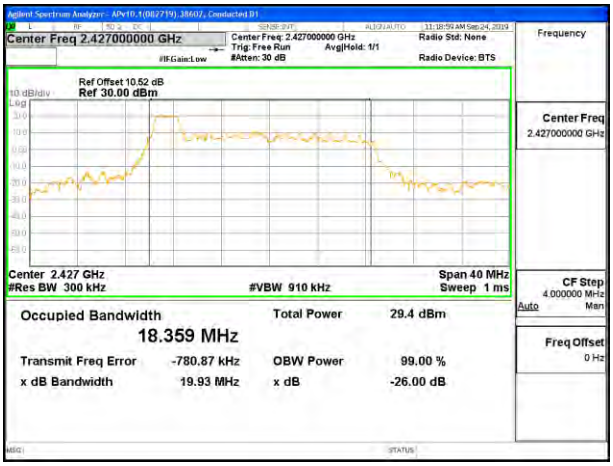


LOW CHANNEL 3 UAT 1

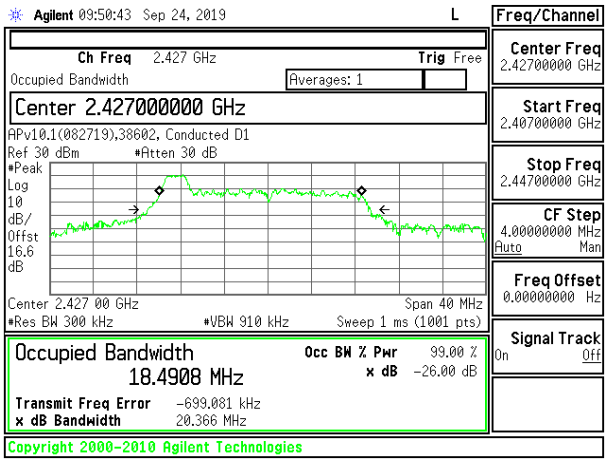


LOW CHANNEL 3 LAT 3

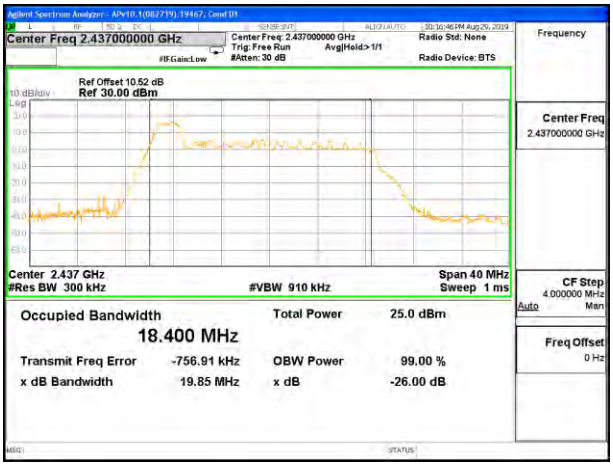
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



LOW CHANNEL 4 UAT 1

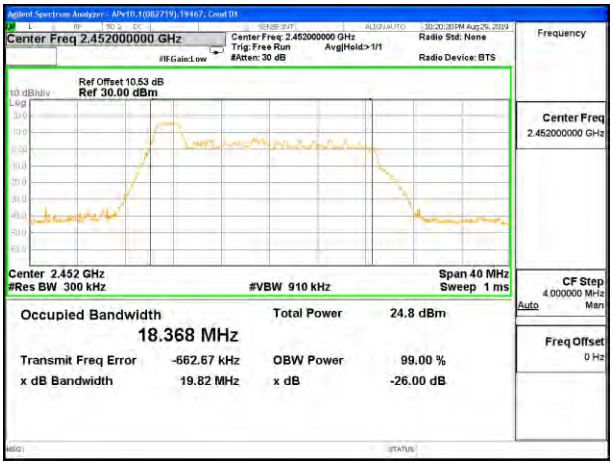


LOW CHANNEL 4 LAT 3

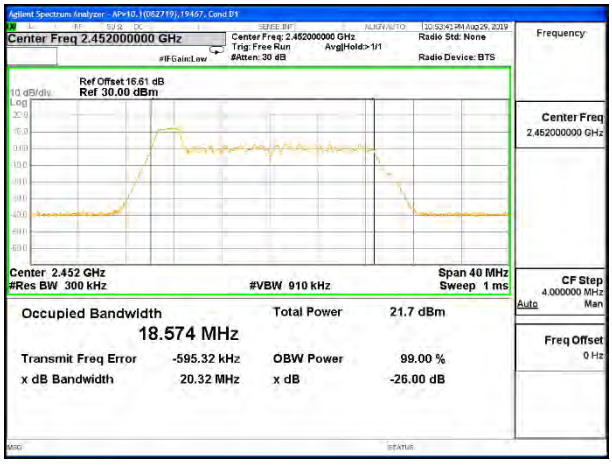


MID CHANNEL 6 UAT 1

MID CHANNEL 6 LAT 3

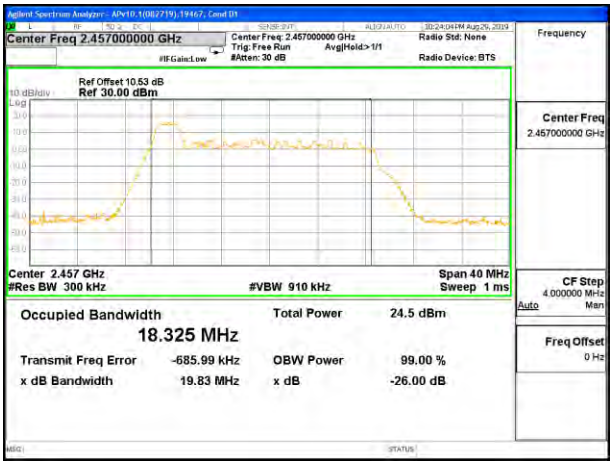


HIGH CHANNEL 9 UAT 1



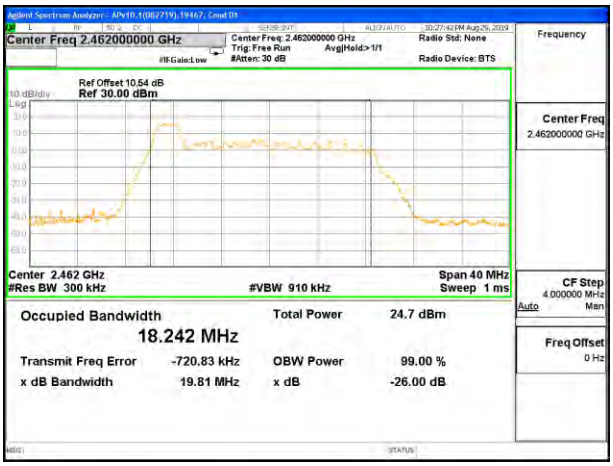
HIGH CHANNEL 9 LAT 3

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

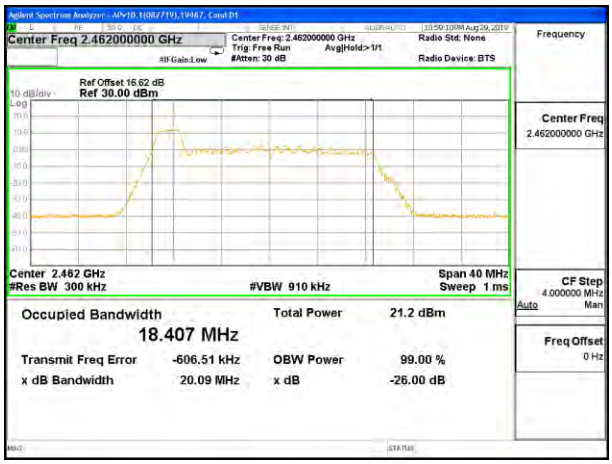


HIGH CHANNEL 10 UAT 1

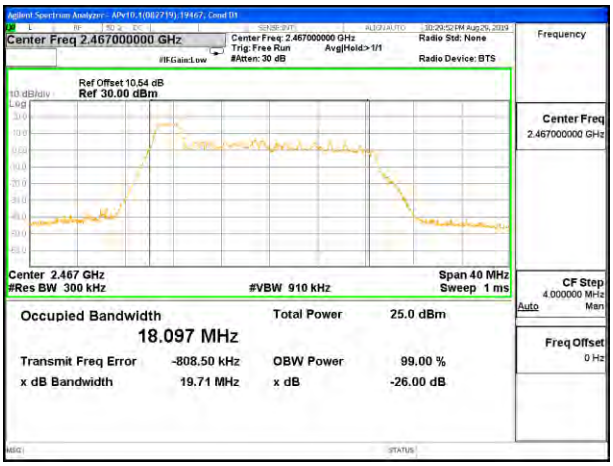
HIGH CHANNEL 10 LAT 3



HIGH CHANNEL 11 UAT 1



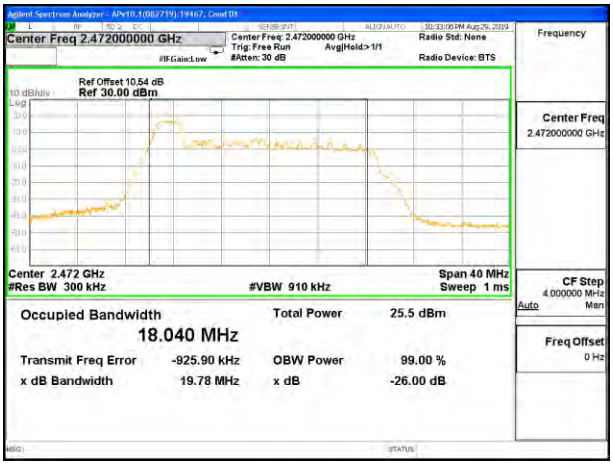
HIGH CHANNEL 11 LAT 3



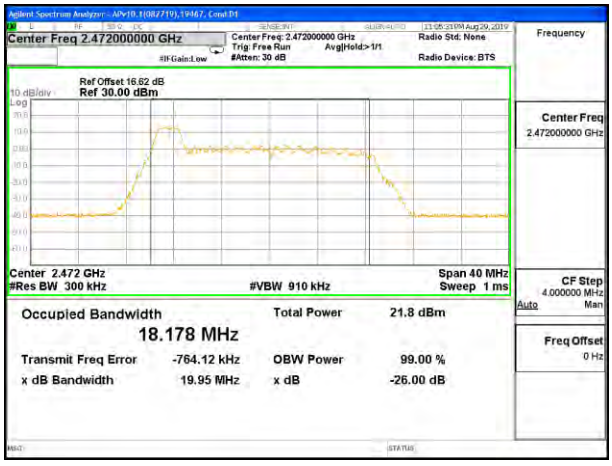
HIGH CHANNEL 12 UAT 1

HIGH CHANNEL 12 LAT 3

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



HIGH CHANNEL 13 UAT 1



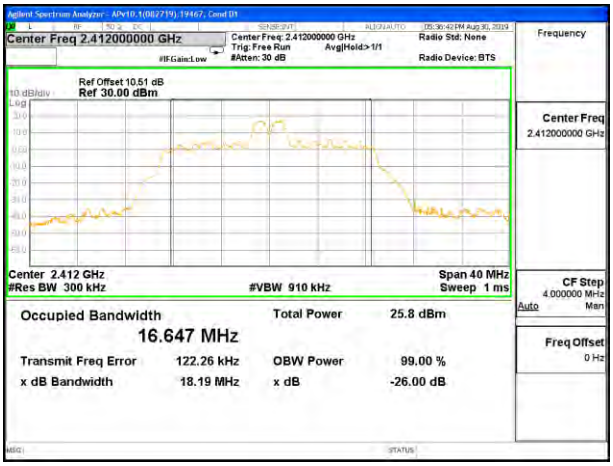
HIGH CHANNEL 13 LAT 3

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

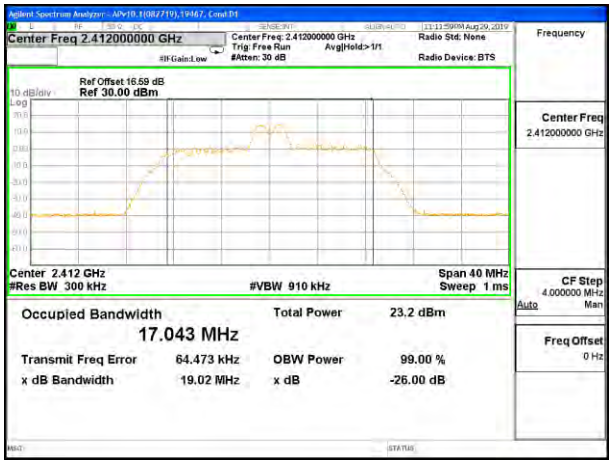
UAT 1 + LAT 3 2TX MODE: 26-Tones, RU Index 4

Channel	Frequency (MHz)	99% Bandwidth UAT 1 (MHz)	99% Bandwidth LAT 3 (MHz)
Low 1	2412	16.647	17.043
Low 2	2417	16.699	16.975
Low 3	2422	16.706	17.089
Low 4	2427	16.696	17.049
Mid 6	2437	16.757	17.376
High 9	2452	16.751	17.237
High 10	2457	16.658	17.156
High 11	2462	16.645	17.095
High 12	2467	16.686	17.173
High 13	2472	16.019	17.056

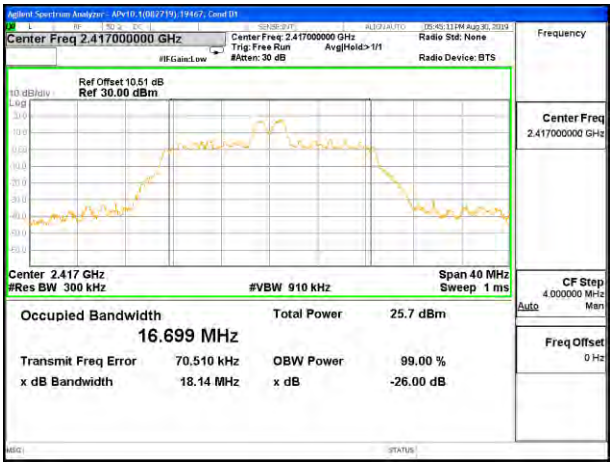
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



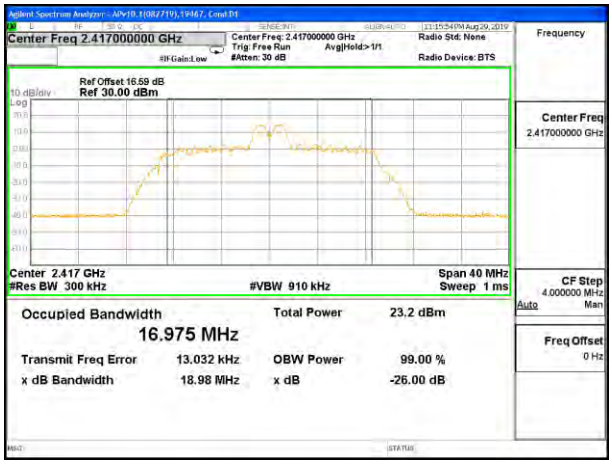
LOW CHANNEL 1 UAT 1



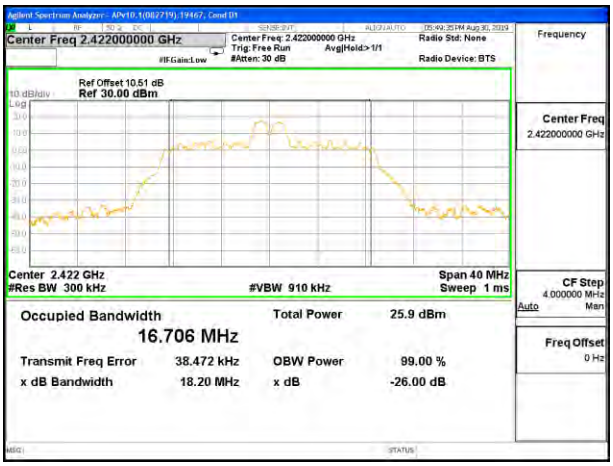
LOW CHANNEL 1 LAT 3



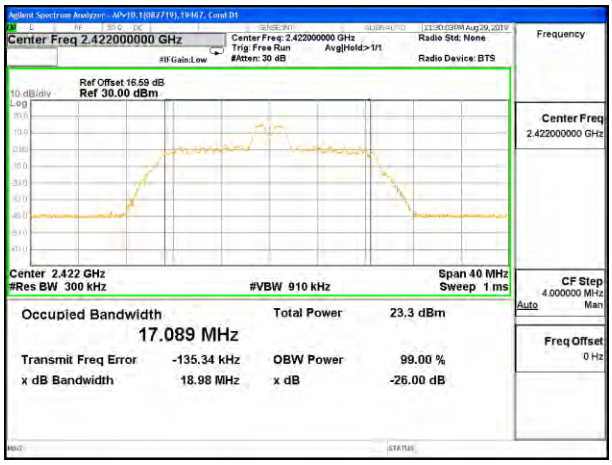
LOW CHANNEL 2 UAT 1



LOW CHANNEL 2 LAT 3

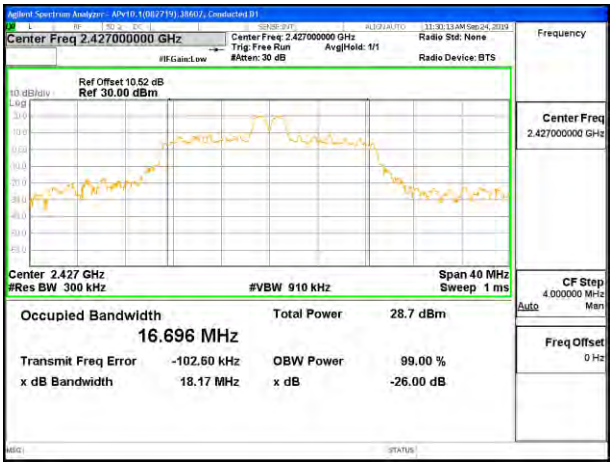


LOW CHANNEL 3 UAT 1

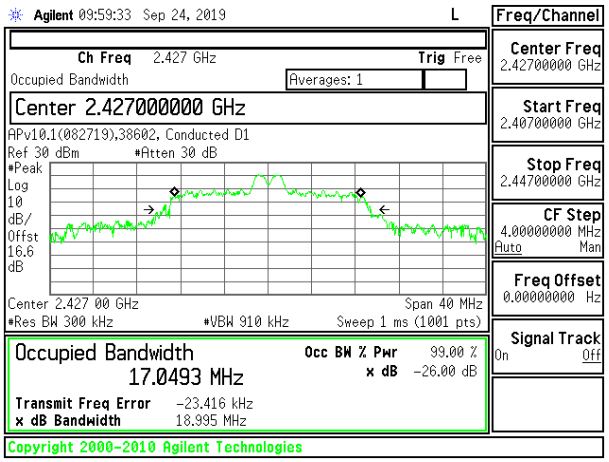


LOW CHANNEL 3 LAT 3

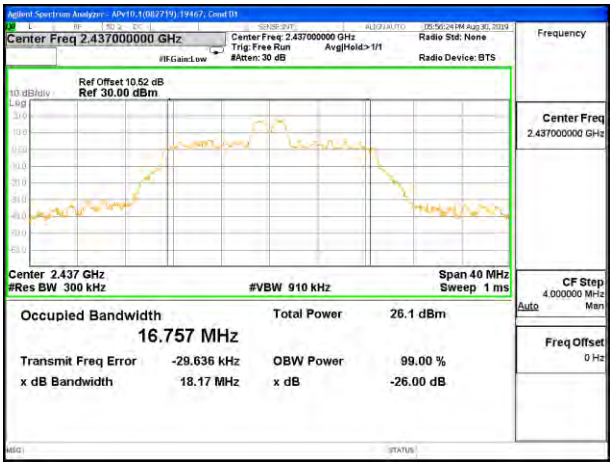
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



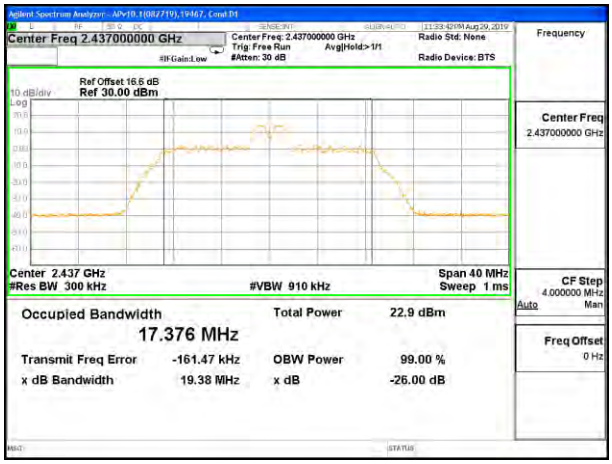
LOW CHANNEL 4 UAT 1



LOW CHANNEL 4 LAT 3

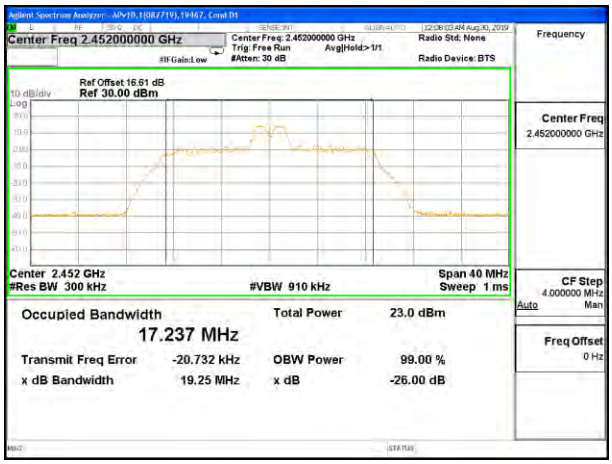


MID CHANNEL 6 UAT 1



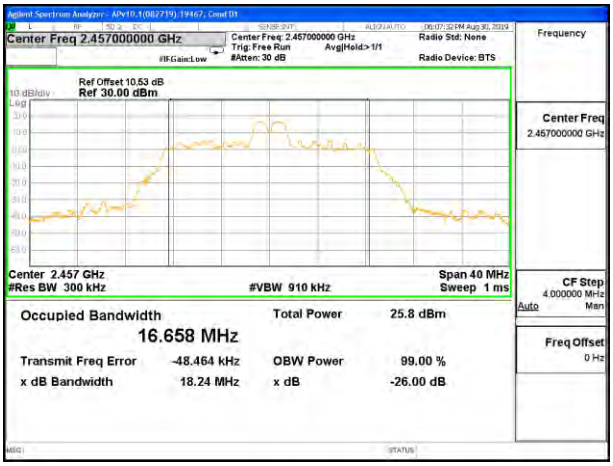
MID CHANNEL 6 LAT 3

HIGH CHANNEL 9 UAT 1

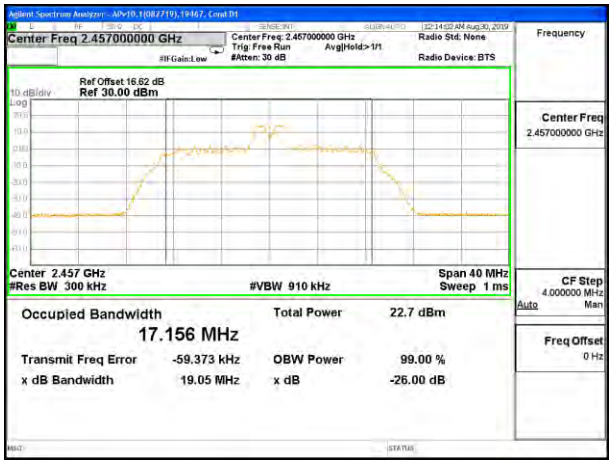


HIGH CHANNEL 9 LAT 3

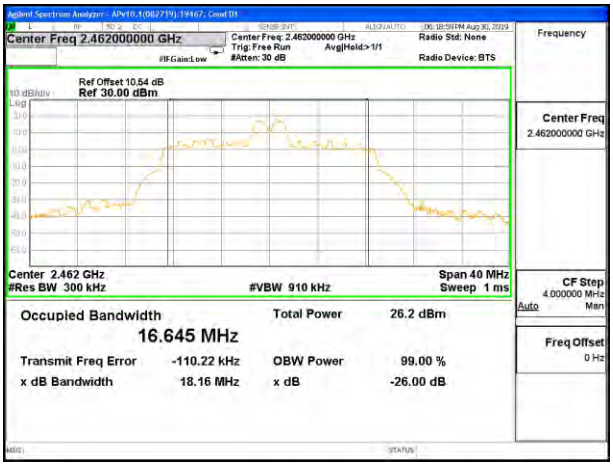
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



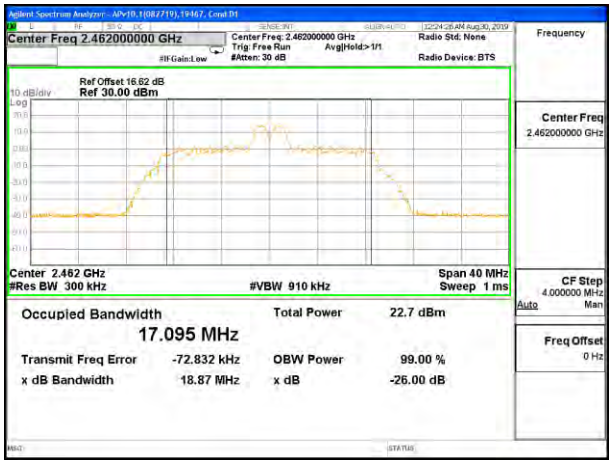
HIGH CHANNEL 10 UAT 1



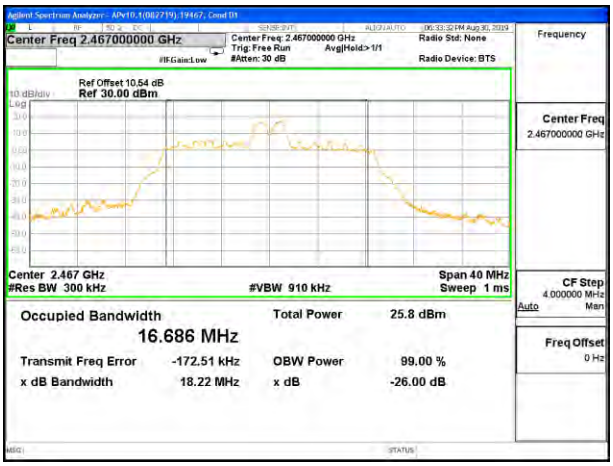
HIGH CHANNEL 10 LAT 3



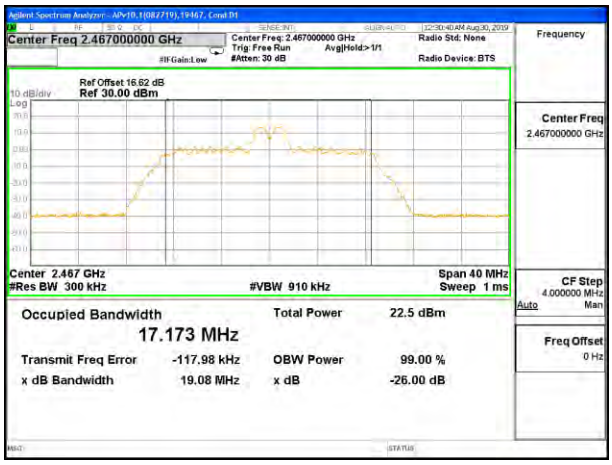
HIGH CHANNEL 11 UAT 1



HIGH CHANNEL 11 LAT 3

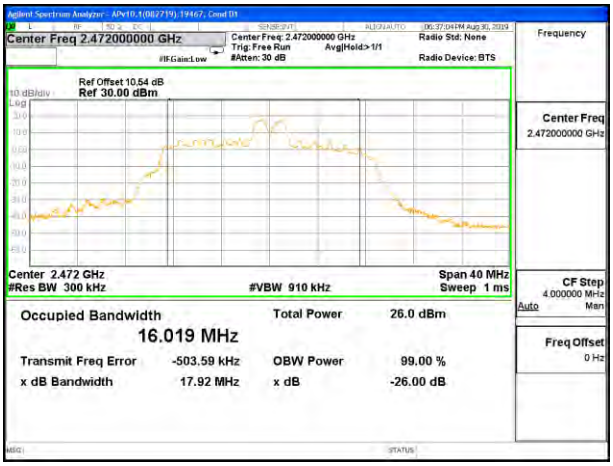


HIGH CHANNEL 12 UAT 1

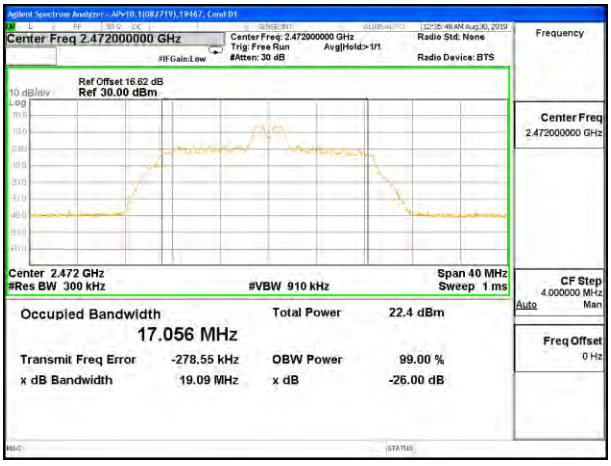


HIGH CHANNEL 12 LAT 3

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



HIGH CHANNEL 13 UAT 1



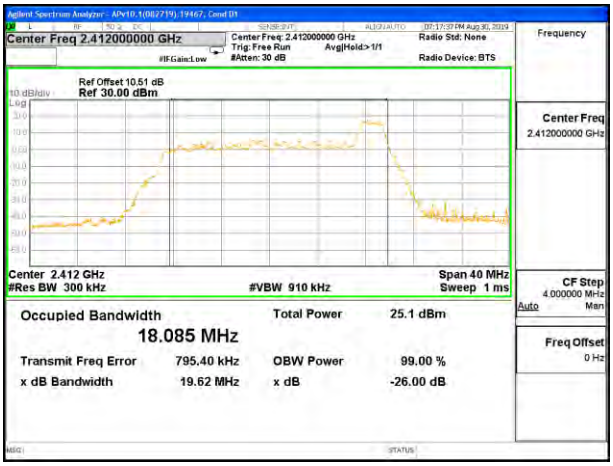
HIGH CHANNEL 13 LAT 3

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

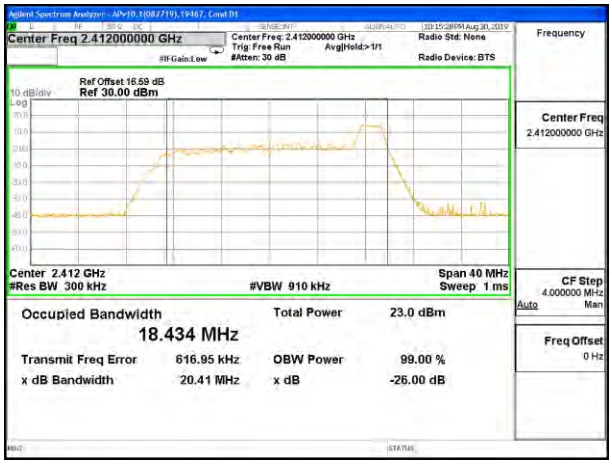
UAT 1 + LAT 3 2TX MODE: 26-Tones, RU Index 8

Channel	Frequency (MHz)	99% Bandwidth UAT 1 (MHz)	99% Bandwidth LAT 3 (MHz)
Low 1	2412	18.085	18.434
Low 2	2417	18.146	18.532
Low 3	2422	18.293	18.638
Low 4	2427	18.486	18.851
Mid 6	2437	18.490	18.904
High 9	2452	18.337	18.733
High 10	2457	18.438	18.690
High 11	2462	18.448	18.668
High 12	2467	18.497	18.685
High 13	2472	18.548	18.776

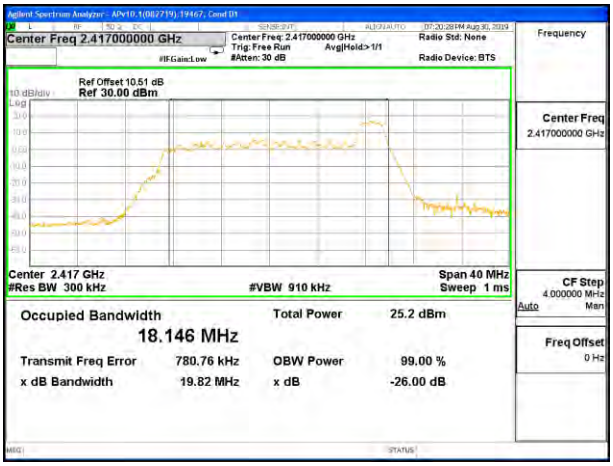
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



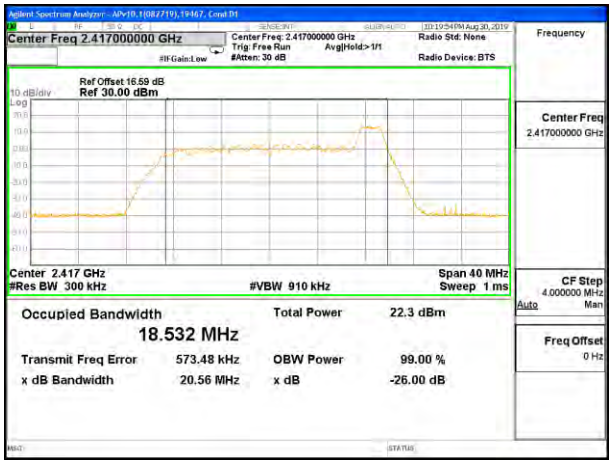
LOW CHANNEL 1 UAT 1



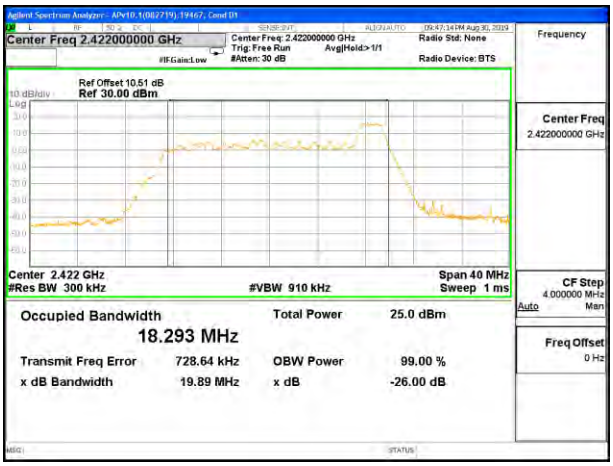
LOW CHANNEL 1 LAT 3



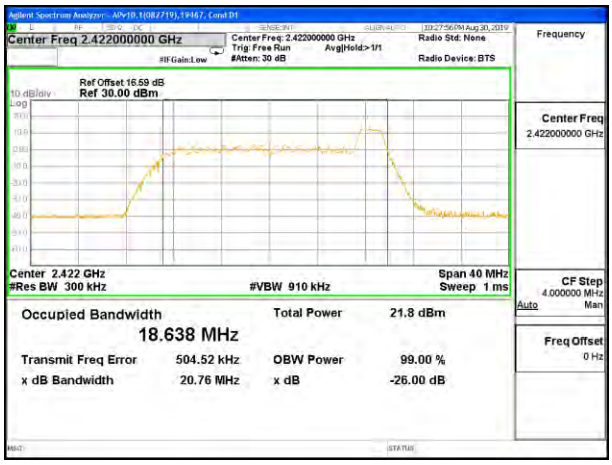
LOW CHANNEL 2 UAT 1



LOW CHANNEL 2 LAT 3

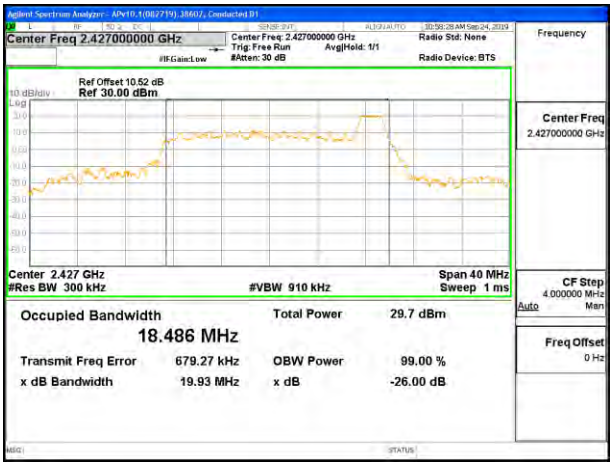


LOW CHANNEL 3 UAT 1

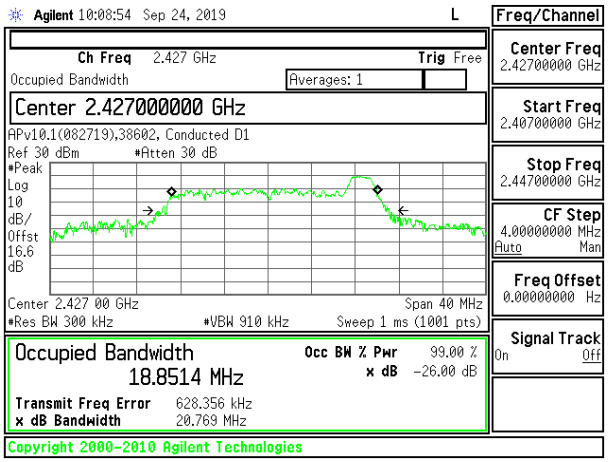


LOW CHANNEL 3 LAT 3

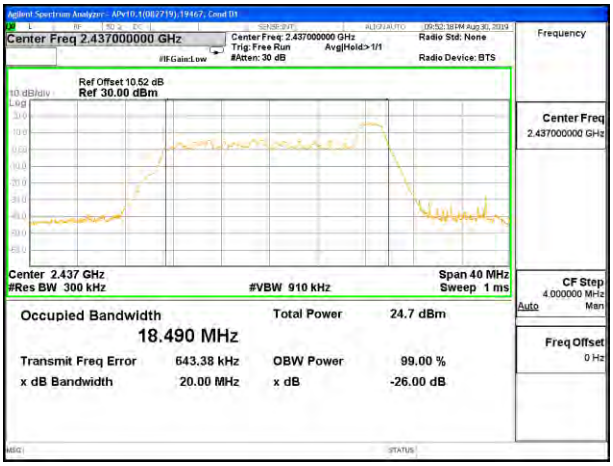
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



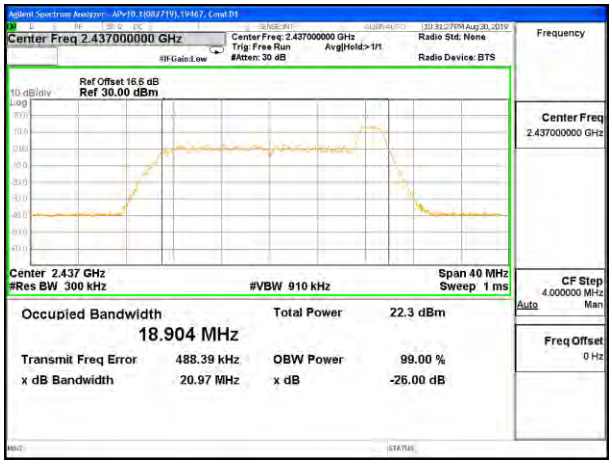
LOW CHANNEL 4 UAT 1



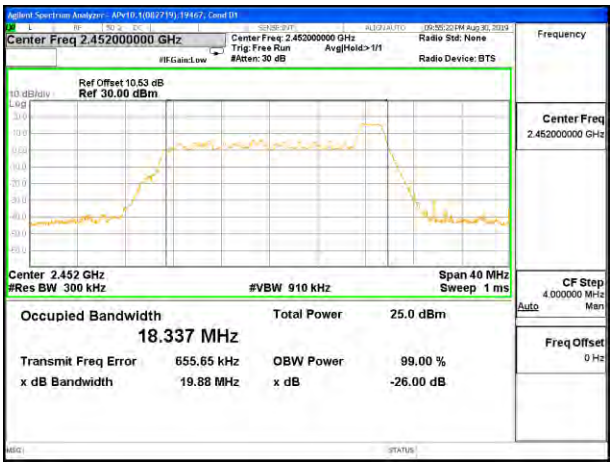
LOW CHANNEL 4 LAT 3



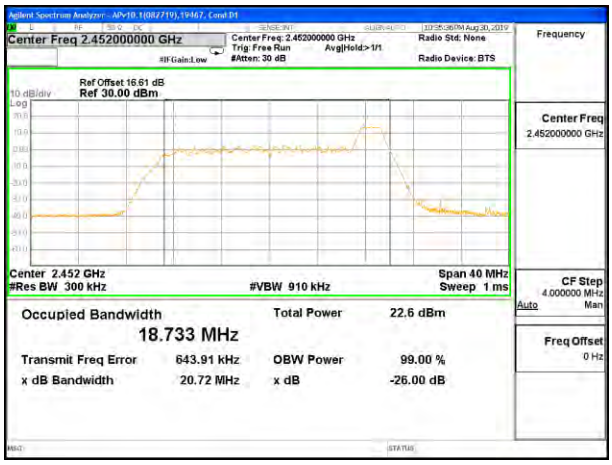
MID CHANNEL 6 UAT 1



MID CHANNEL 6 LAT 3

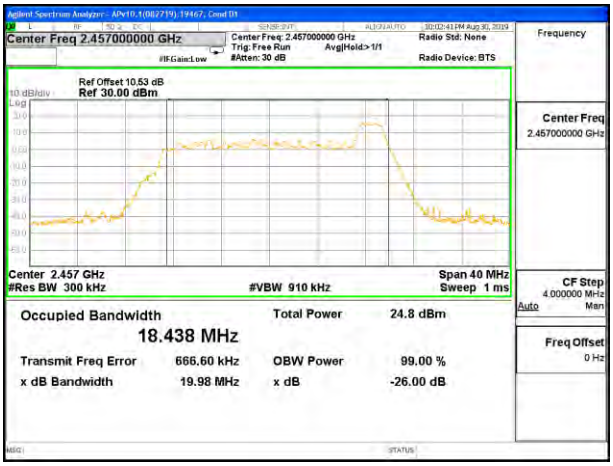


HIGH CHANNEL 9 UAT 1

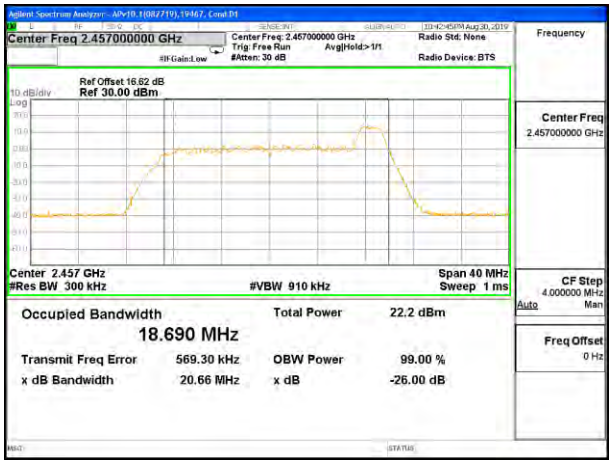


HIGH CHANNEL 9 LAT 3

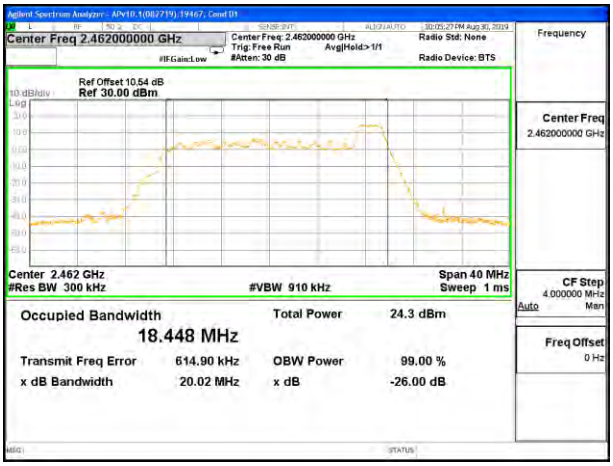
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



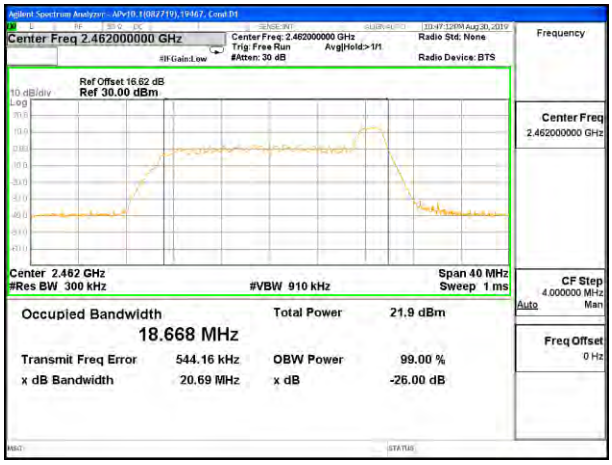
HIGH CHANNEL 10 UAT 1



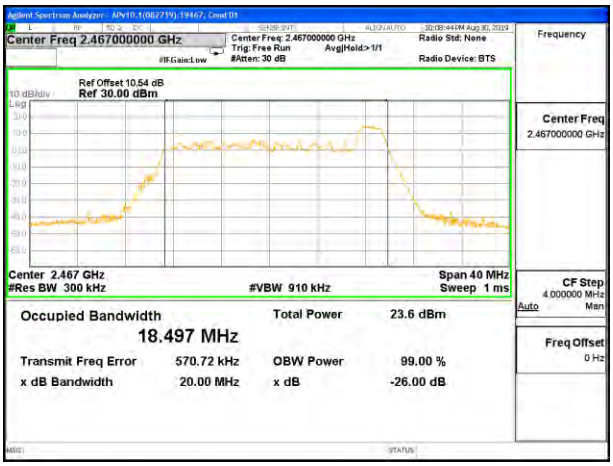
HIGH CHANNEL 10 LAT 3



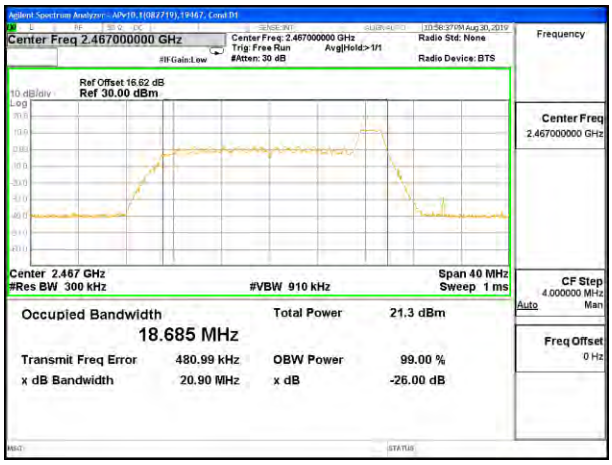
HIGH CHANNEL 11 UAT 1



HIGH CHANNEL 11 LAT 3

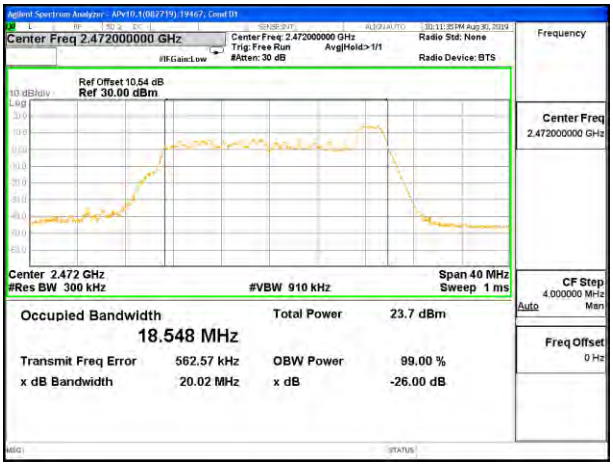


HIGH CHANNEL 12 UAT 1

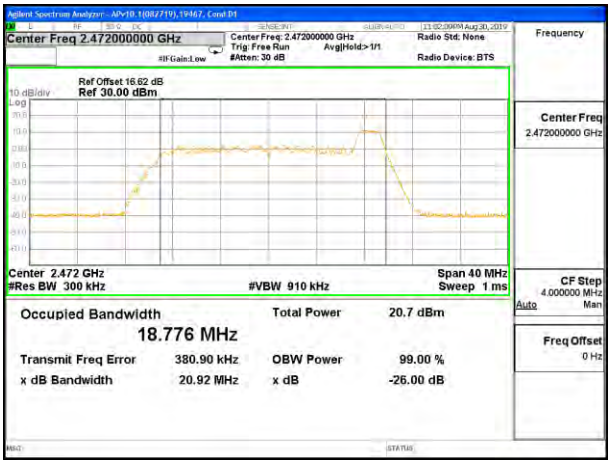


HIGH CHANNEL 12 LAT 3

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



HIGH CHANNEL 13 UAT 1



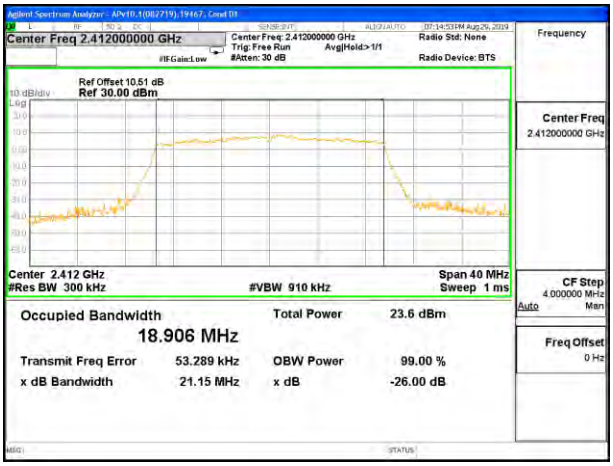
HIGH CHANNEL 13 LAT 3

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

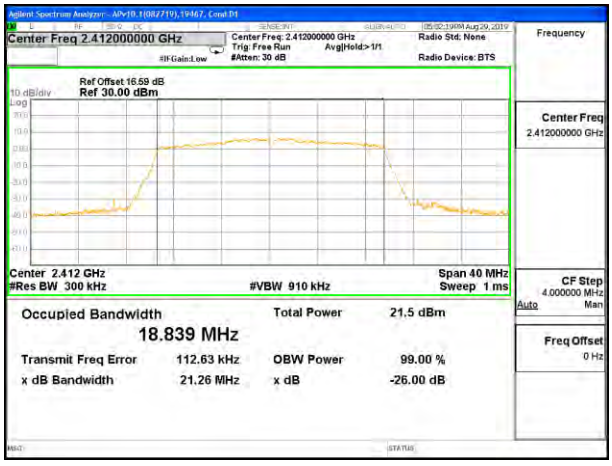
UAT 1 + LAT 3 2TX MODE: 242T-Tones, RU Index 61

Channel	Frequency (MHz)	99% Bandwidth UAT 1 (MHz)	99% Bandwidth LAT 3 (MHz)
Low 1	2412	18.906	18.839
Low 2	2417	18.923	18.880
Low 3	2422	18.850	18.897
Low 4	2427	19.272	20.342
Mid 6	2437	19.032	18.952
High 9	2452	18.932	18.939
High 10	2457	18.976	18.947
High 11	2462	18.882	18.931
High 12	2467	18.909	18.832
High 13	2472	18.883	18.849

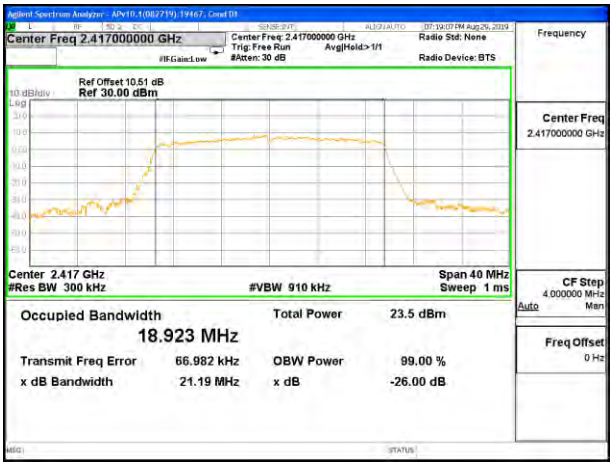
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



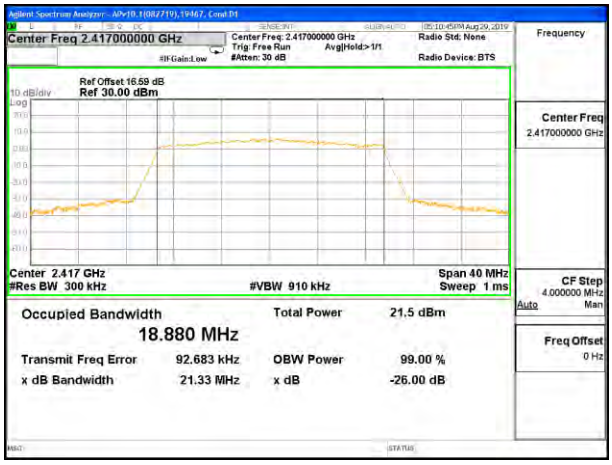
LOW CHANNEL 1 UAT 1



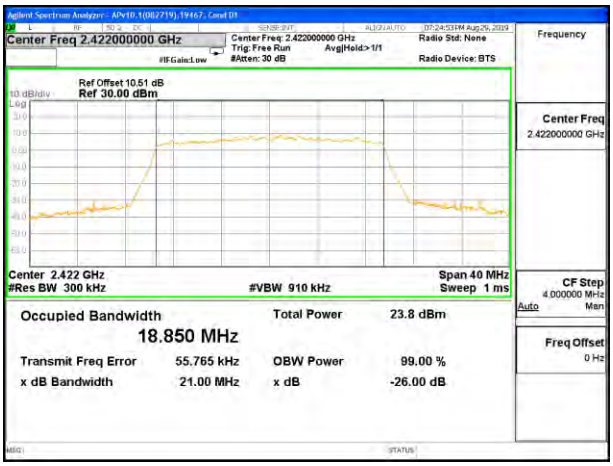
LOW CHANNEL 1 LAT 3



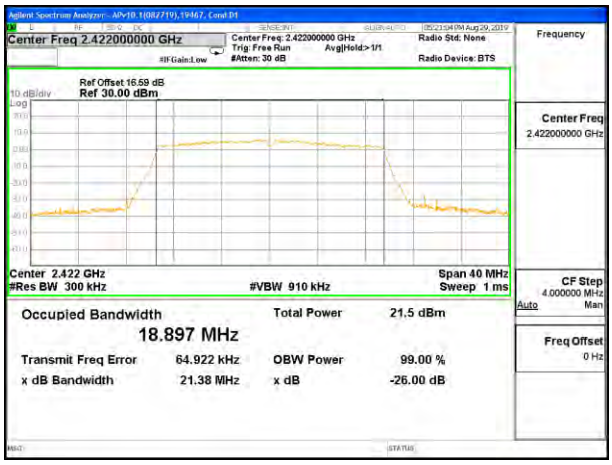
LOW CHANNEL 2 UAT 1



LOW CHANNEL 2 LAT 3

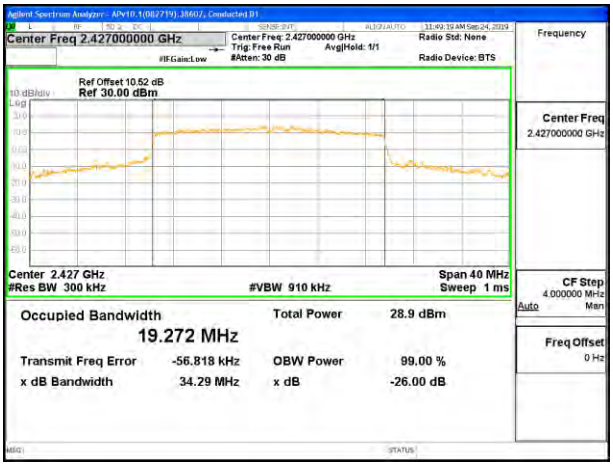


LOW CHANNEL 3 UAT 1

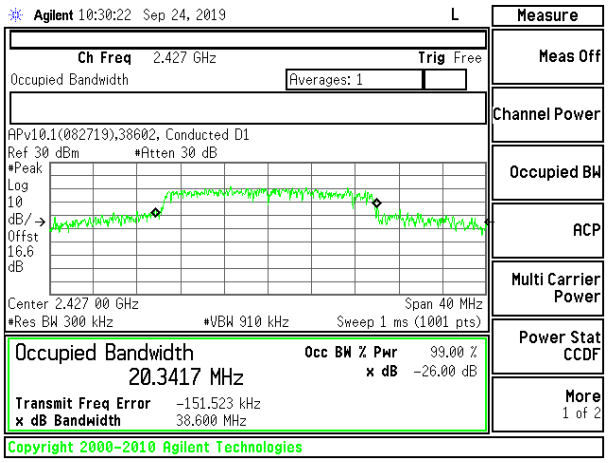


LOW CHANNEL 3 LAT 3

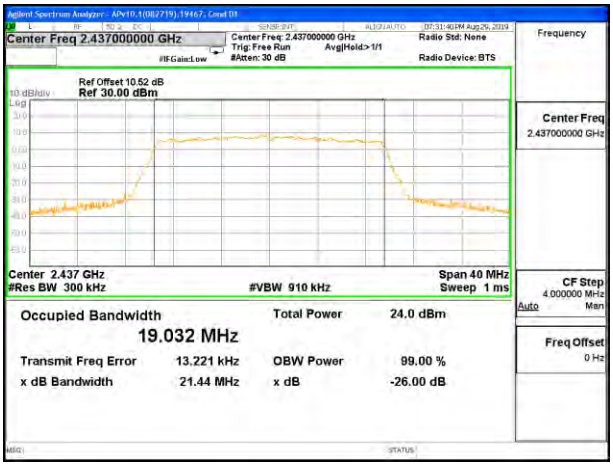
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



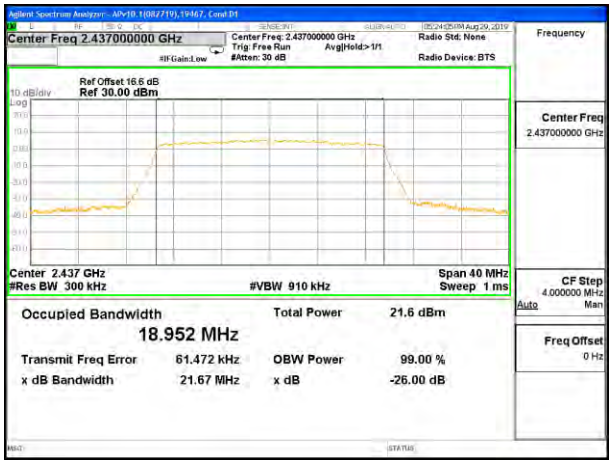
LOW CHANNEL 4 UAT 1



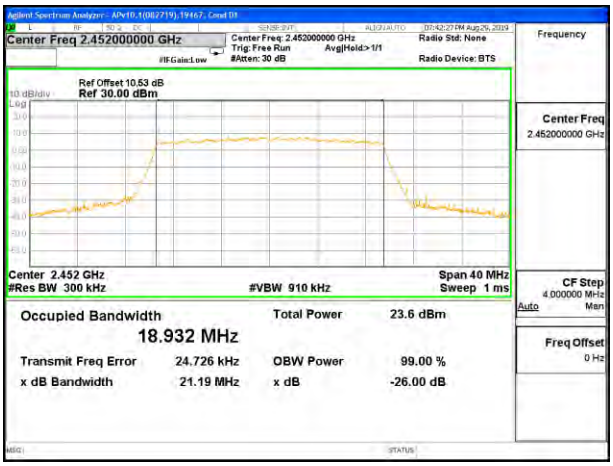
LOW CHANNEL 4 LAT 3



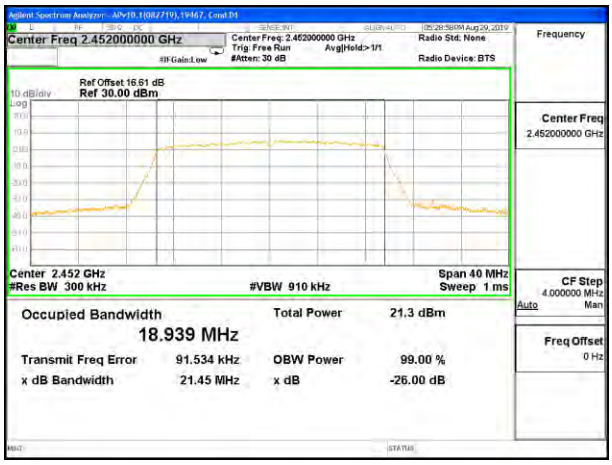
MID CHANNEL 6 UAT 1



MID CHANNEL 6 LAT 3

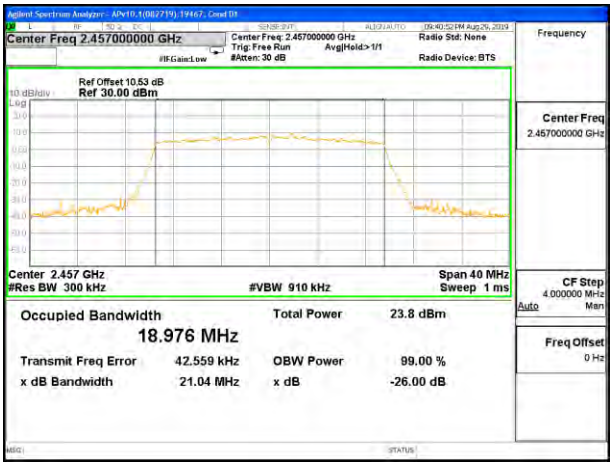


HIGH CHANNEL 9 UAT 1

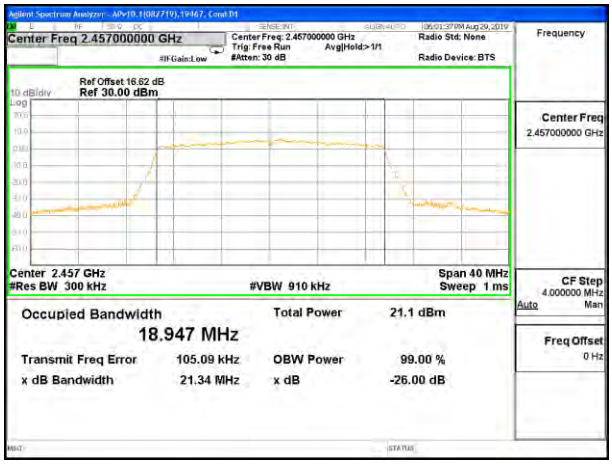


HIGH CHANNEL 9 LAT 3

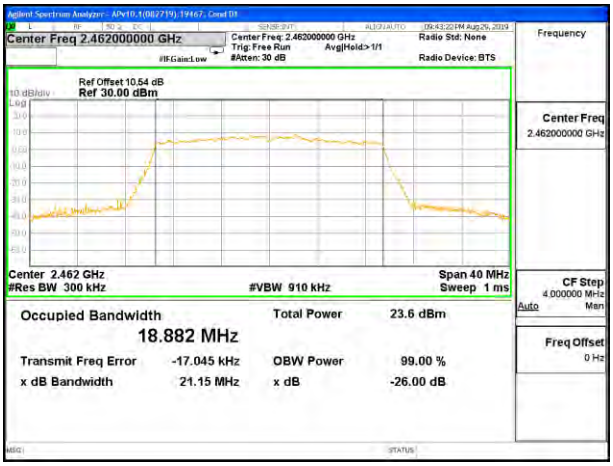
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



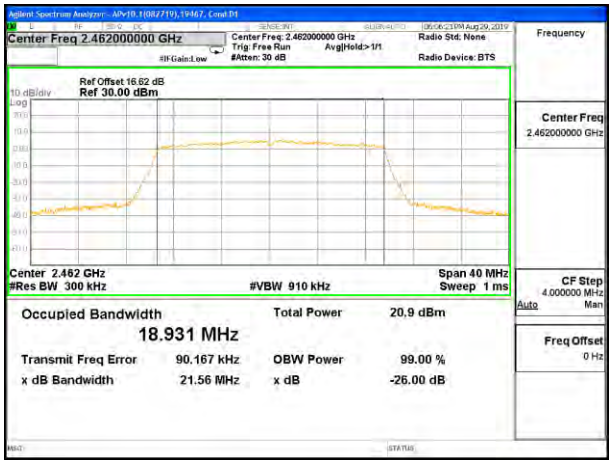
HIGH CHANNEL 10 UAT 1



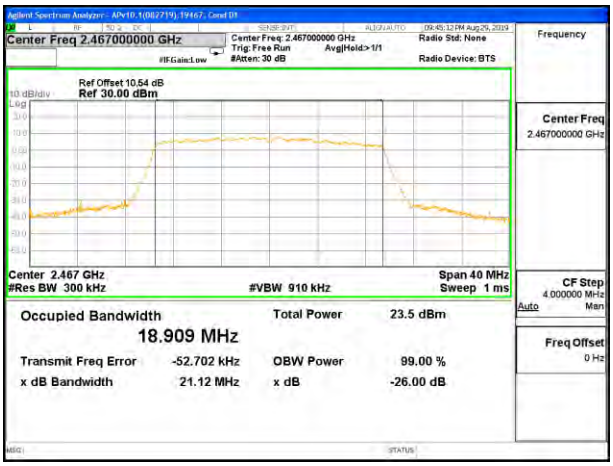
HIGH CHANNEL 10 LAT 3



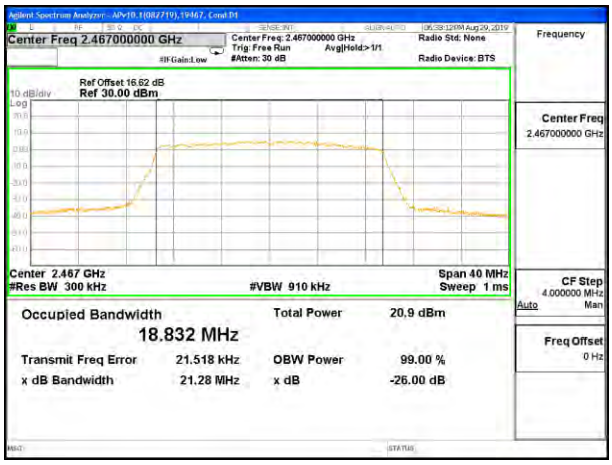
HIGH CHANNEL 11 UAT 1



HIGH CHANNEL 11 LAT 3

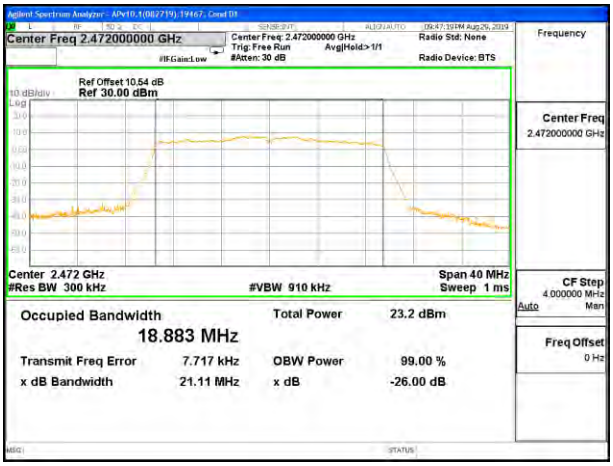


HIGH CHANNEL 12 UAT 1

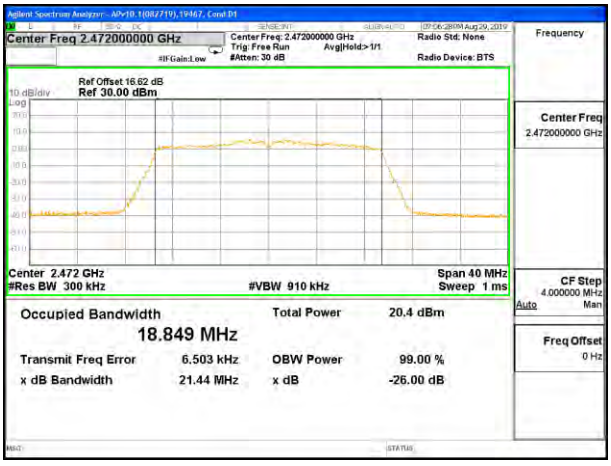


HIGH CHANNEL 12 LAT 3

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



HIGH CHANNEL 13 UAT 1



HIGH CHANNEL 13 LAT 3

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.3. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

RSS-247 5.2 (a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

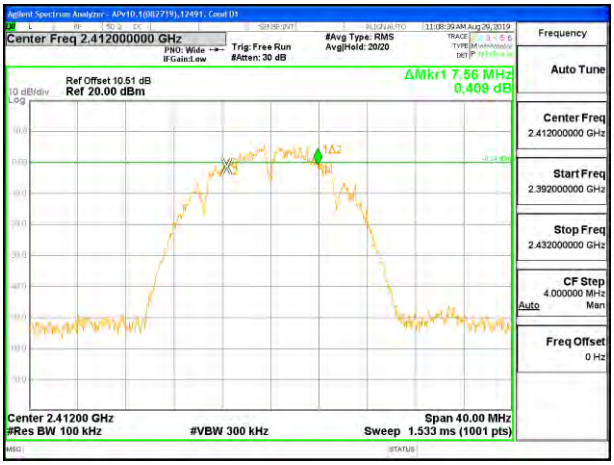
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.3.1. 802.11b MODE

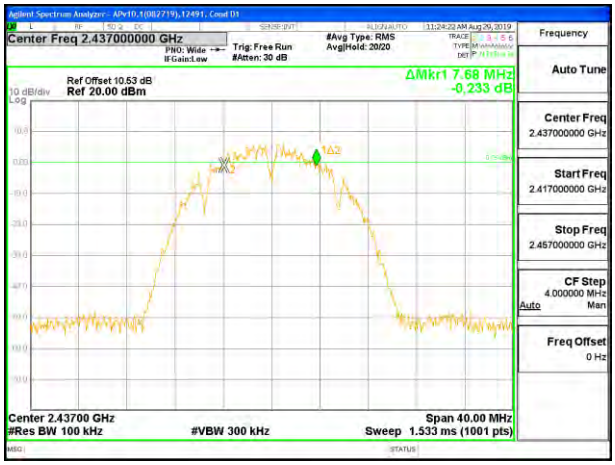
1TX UAT 1

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	7.560	0.5
Mid 6	2437	7.680	0.5
High 11	2462	7.680	0.5
High 12	2467	7.760	0.5
High 13	2472	7.680	0.5

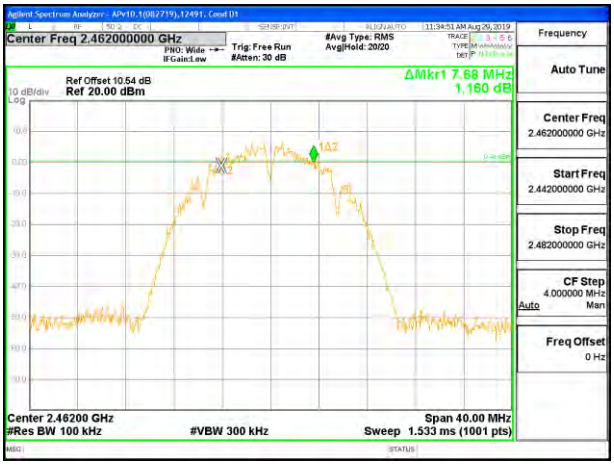
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



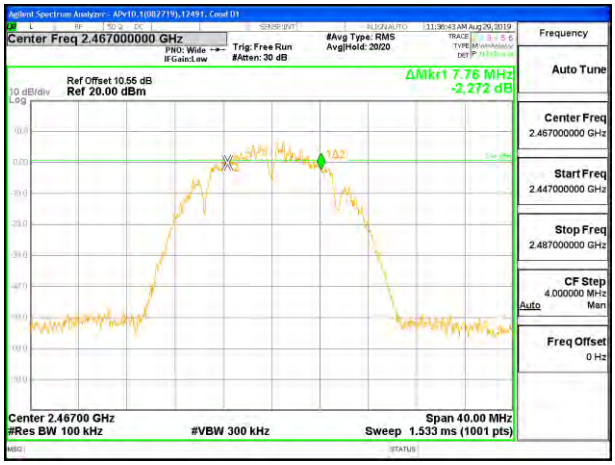
LOW CHANNEL 1



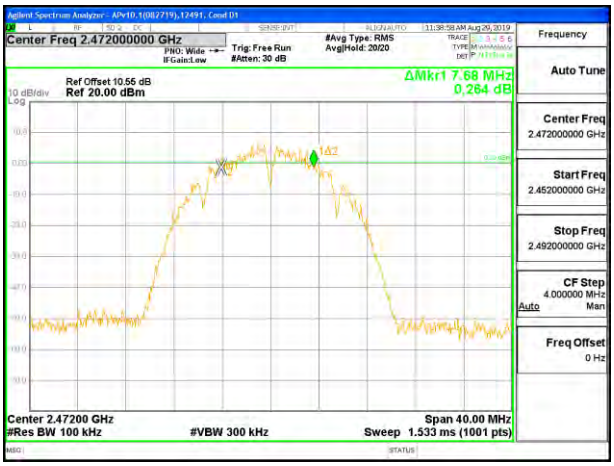
MID CHANNEL 6



HIGH CHANNEL 11



HIGH CHANNEL 12



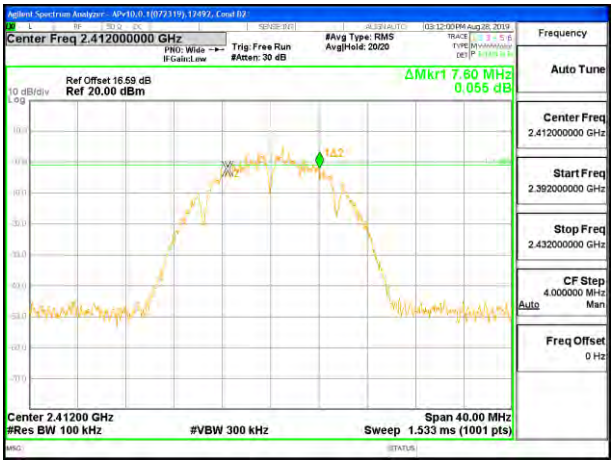
HIGH CHANNEL 13

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

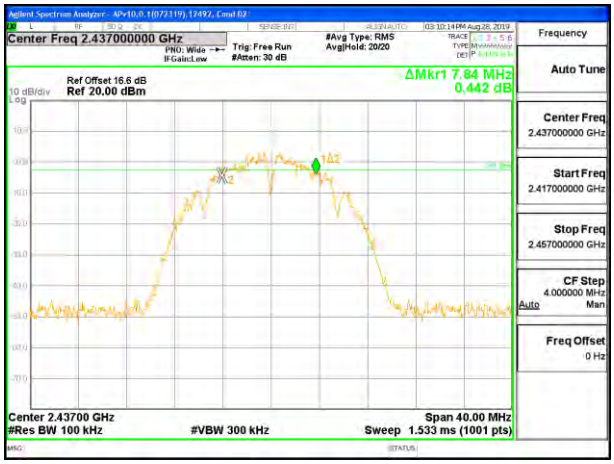
1TX LAT 3

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	7.600	0.5
Mid 6	2437	7.840	0.5
High 11	2462	7.720	0.5
High 12	2467	7.360	0.5
High 13	2472	7.960	0.5

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



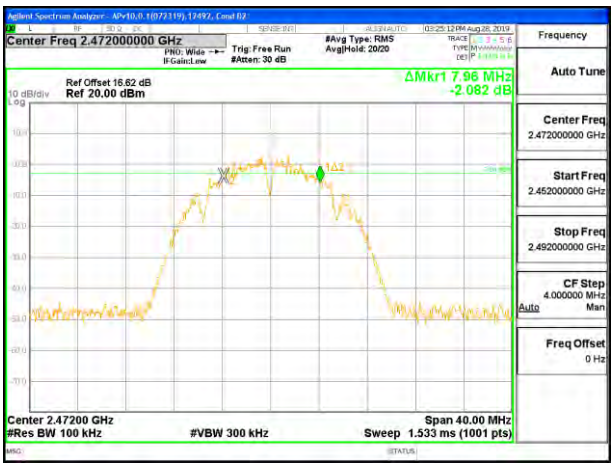
LOW CHANNEL 1



MID CHANNEL 6

HIGH CHANNEL 11

HIGH CHANNEL 12



HIGH CHANNEL 13

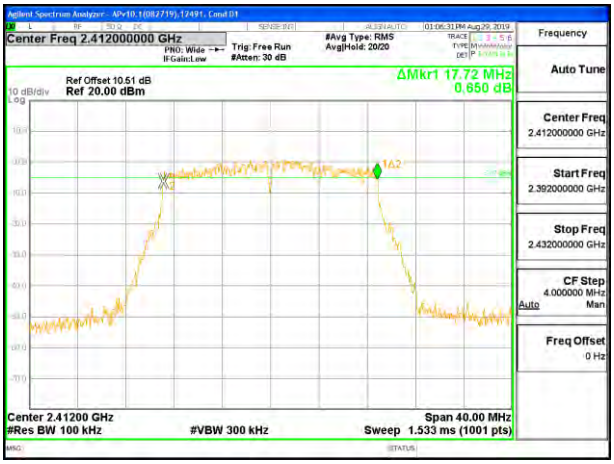
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.3.2. 802.11n HT20 MODE

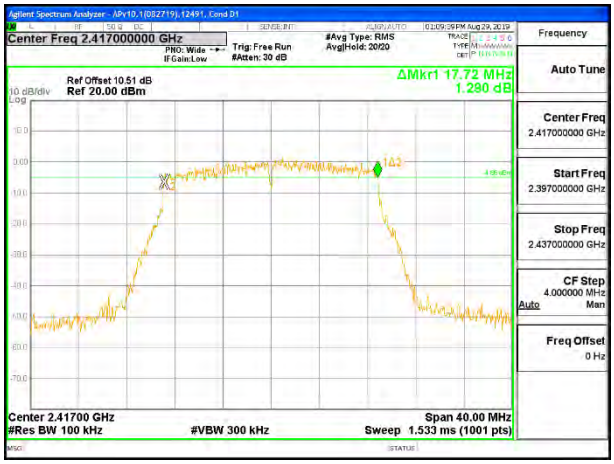
1TX UAT 1

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	17.720	0.5
Low 2	2417	17.720	0.5
Low 3	2422	17.720	0.5
Mid 6	2437	17.680	0.5
High 9	2452	17.720	0.5
High 10	2457	17.720	0.5
High 11	2462	17.640	0.5
High 12	2467	17.560	0.5
High 13	2472	17.720	0.5

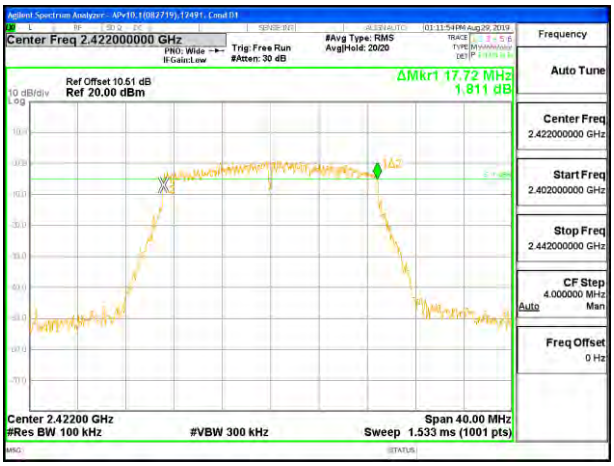
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



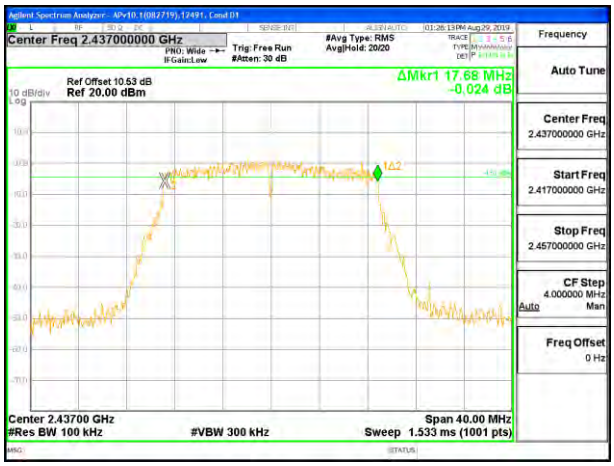
LOW CHANNEL 1



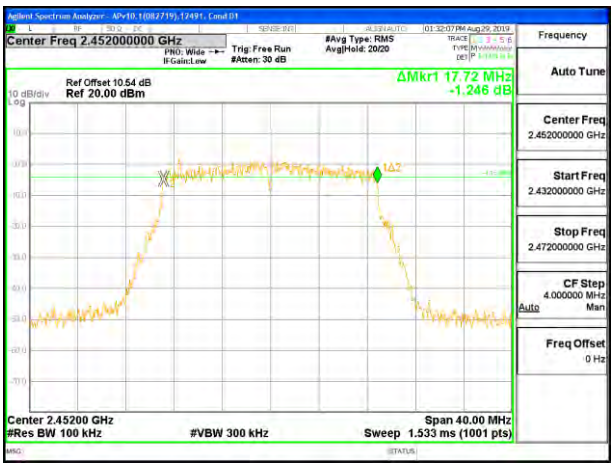
LOW CHANNEL 2



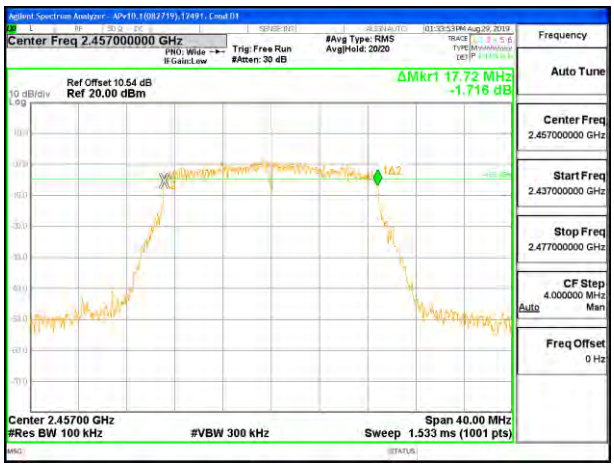
LOW CHANNEL 3



MID CHANNEL 6

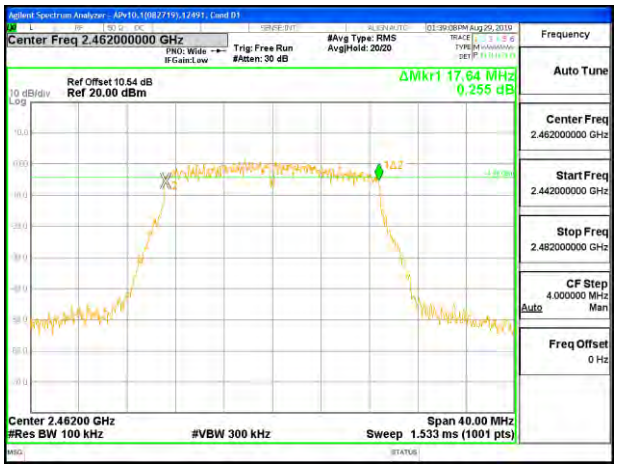


HIGH CHANNEL 9

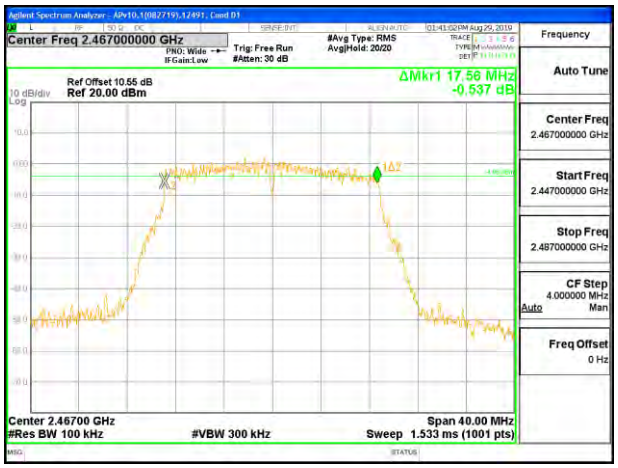


HIGH CHANNEL 10

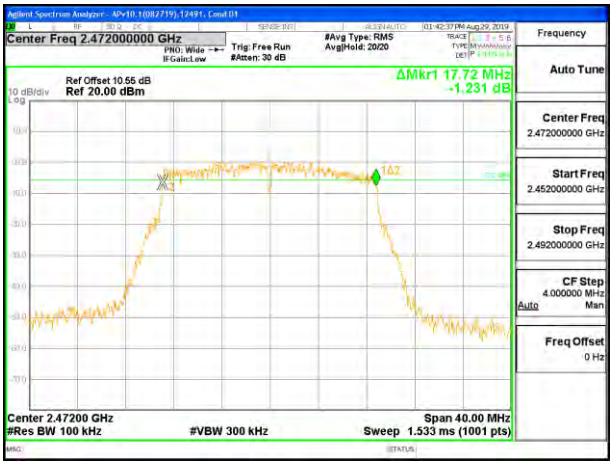
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



HIGH CHANNEL 11



HIGH CHANNEL 12



HIGH CHANNEL 13

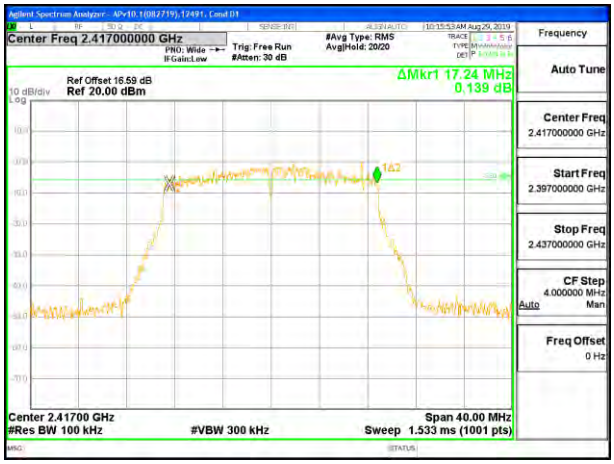
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

1TX LAT 3

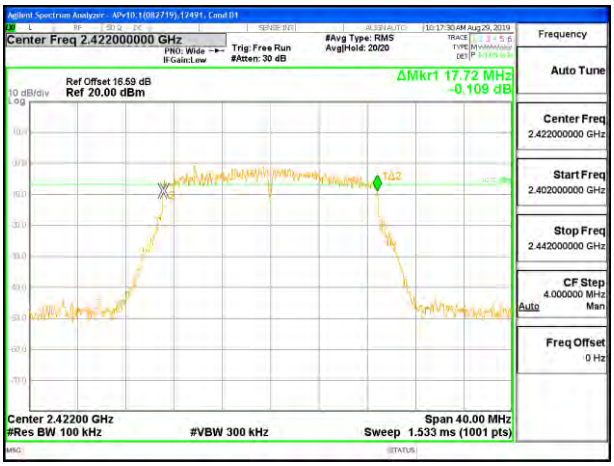
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	17.4400	0.5
Low 2	2417	17.2400	0.5
Low 3	2422	17.7200	0.5
Mid 6	2437	17.6800	0.5
High 9	2452	17.7600	0.5
High 10	2457	17.7200	0.5
High 11	2462	17.6800	0.5
High 12	2467	17.6400	0.5
High 13	2472	17.4000	0.5

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

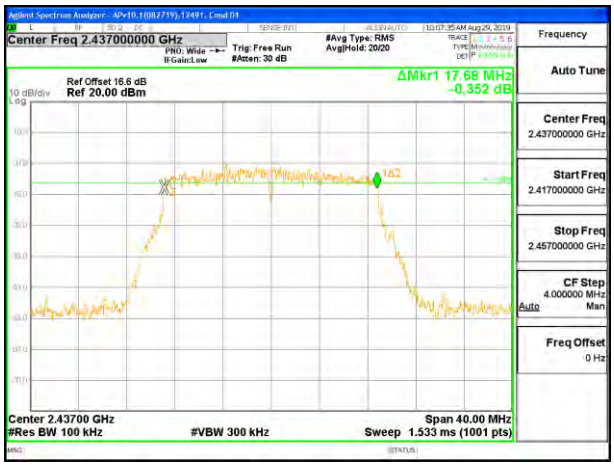
LOW CHANNEL 1



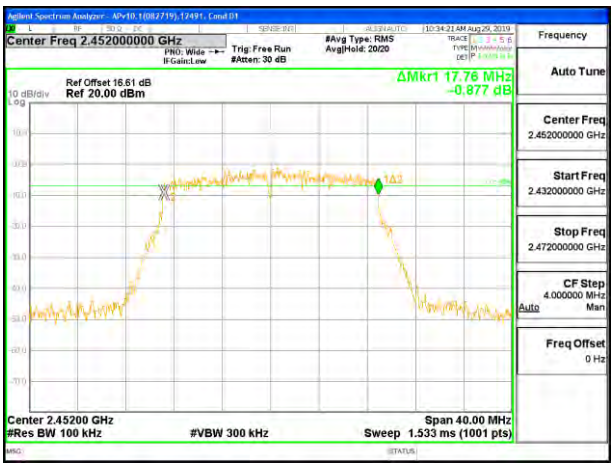
LOW CHANNEL 2



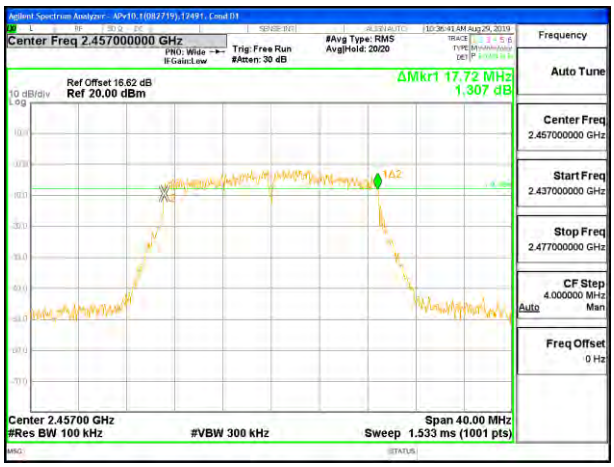
LOW CHANNEL 3



MID CHANNEL 6

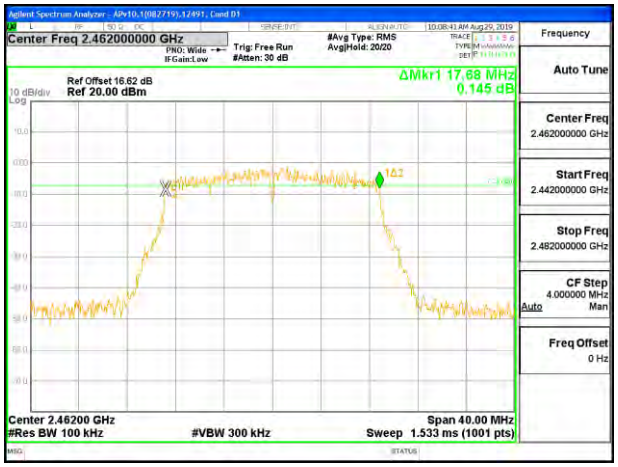


HIGH CHANNEL 9

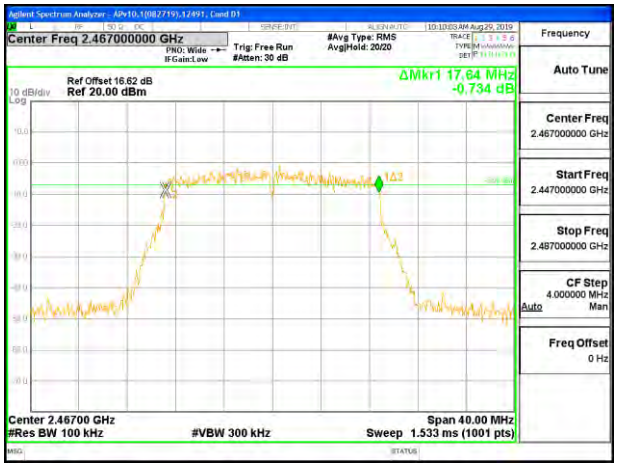


HIGH CHANNEL 10

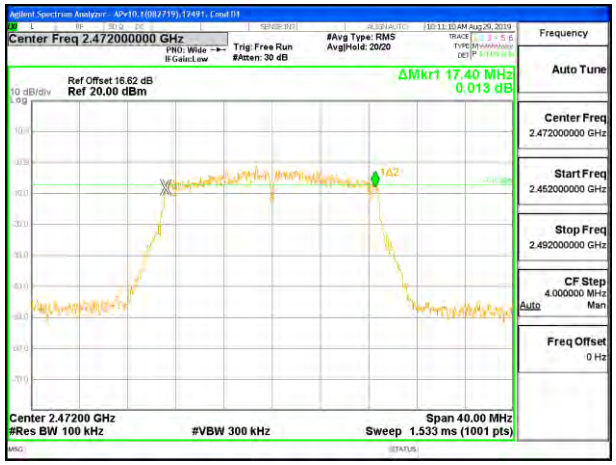
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



HIGH CHANNEL 11



HIGH CHANNEL 12



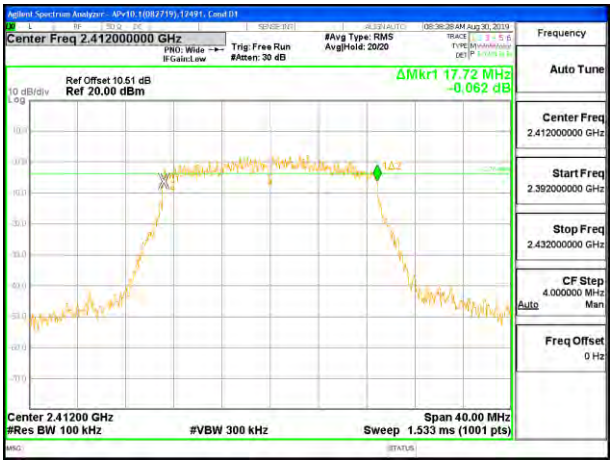
HIGH CHANNEL 13

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

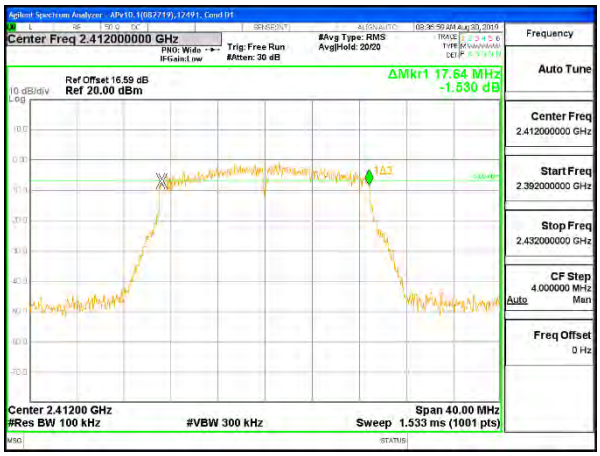
2TX UAT 1 + LAT 3 CDD MODE

Channel	Frequency (MHz)	6 dB BW UAT 1 (MHz)	6 dB BW LAT 3 (MHz)	Minimum Limit (MHz)
Low 1	2412	17.7200	17.6400	0.5
Low 2	2417	17.6400	17.6800	0.5
Low 3	2422	17.6400	17.6800	0.5
Mid 6	2437	17.6400	17.7600	0.5
High 9	2452	17.6400	17.7200	0.5
High 10	2457	17.6400	17.7200	0.5
High 11	2462	17.6800	17.6800	0.5
High 12	2467	17.6800	17.6800	0.5
High 13	2472	17.7200	17.6800	0.5

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

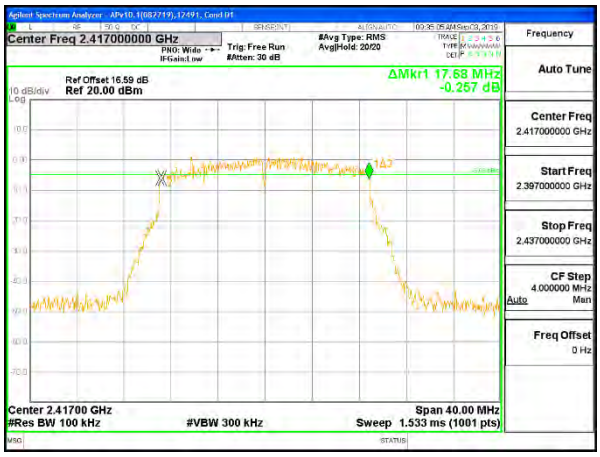


LOW CHANNEL 1 UAT 1

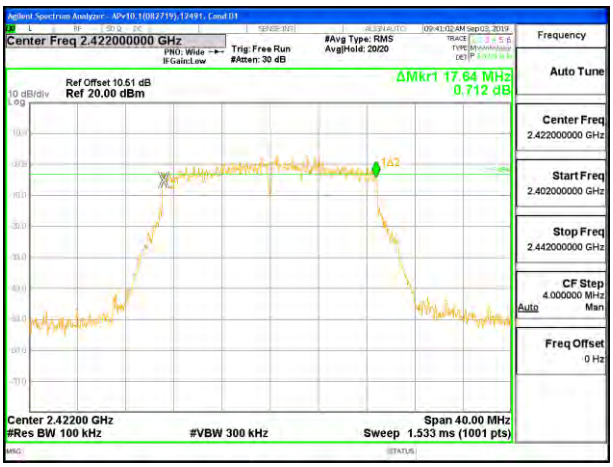


LOW CHANNEL 1 LAT 3

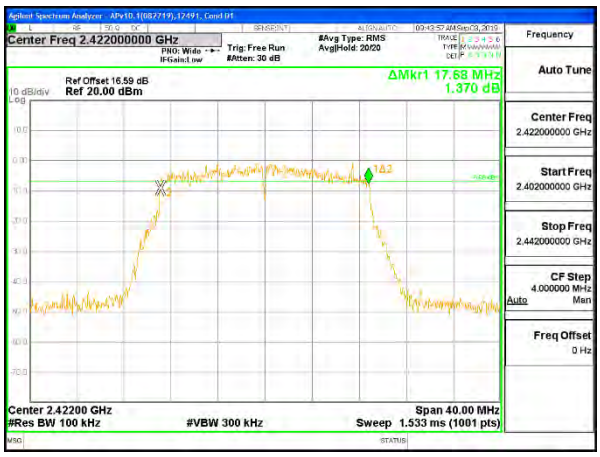
LOW CHANNEL 2 UAT 1



LOW CHANNEL 2 LAT 3



LOW CHANNEL 3 UAT 1



LOW CHANNEL 3 LAT 3

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.