CERTIFICATION TEST REPORT

Report Number : 13018973-E3V4

Applicant	:	APPLE, INC. 1 APPLE PARK WAY CUPERTINO, CA 95014, U.S.A
Model	:	A2275, A2297, A2298
FCC ID	:	BCG- E3500A
IC	:	579C- E3500A
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
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NVLAP Lab code: 200065-0

REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	2/10/2020	Initial Issue	Tony Li
V2	3/19/2020	Addressed TCB question	Joe Vang
V3	3/20/2020	Addressed TCB question	Joe Vang
V4	3/25/2020	Addressed TCB question	Joe Vang

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1. ATTESTATION OF TEST RESULTS

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

EUT DESCRIPTION: SMARTPHONE

MODEL: A2275, A2297, A2298

SERIAL NUMBER: FFMZV04ZPM63, FFMZW0B3PM63

DATE TESTED: AUGUST 28, 2019 – DECEMBER 12, 2019

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.

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)	☐ Chamber M (IC: 2324A-2)

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

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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

Uncertainty figures are valid to a confidence level of 95%.

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5. EQUIPMENT UNDER TEST

5.1. EUT DESCRIPTION

EUT is a smartphone with multimedia functions (music, application support, and video), cellular GSM, GPRS, EGPRS, UMTS, LTE, TD-SCDMA, CDMA, IEEE 802.11a/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 pSIM (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. DIFFERENCE IN MODEL NUMBER

Model A2275, A2297 and A2298 is electrically identical to Model A2275. Three model numbers are allocated for marketing and logistic purposes only. A2275 was used to perform all final tests.

5.3. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
1Tx			
2412 - 2472	802.11b	21.41	138.36
2412 - 2472	802.11g	Covered by 802.11n HT20 1TX	
2412 - 2472	802.11n HT20	21.39	137.72
2412 - 2472	802.11ax HE20	21.49	140.93

2Tx			
2412 - 2472	802.11n HT20 CDD	23.31	214.29
2412 - 2472	802.11g SDM/STBC	Covered by 802.11n HT20 2TX CDD	
2412 - 2472	802.11ax HE20	23.38	217.77

5.4. DESCRIPTION OF AVAILABLE ANTENNAS

Frequency Range (GHz)	UAT 1 (dBi)	LAT 3 (dBi)
2.4	-2.50	-1.30

5.5. SOFTWARE AND FIRMWARE

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

5.6. WORST-CASE CONFIGURATION AND MODE

EUT was investigated in three orthogonal orientations X, Y and Z on UAT1, LAT3 and 2TX. It was determined that X (Flatbed) orientation was worst-case orientation for both UAT1 and 2TX and Z (Portrait) orientation for LAT3.

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 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.

5.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
laptop	Apple	A1398	C02PM012G3QD	QDS-BRCM1069
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.

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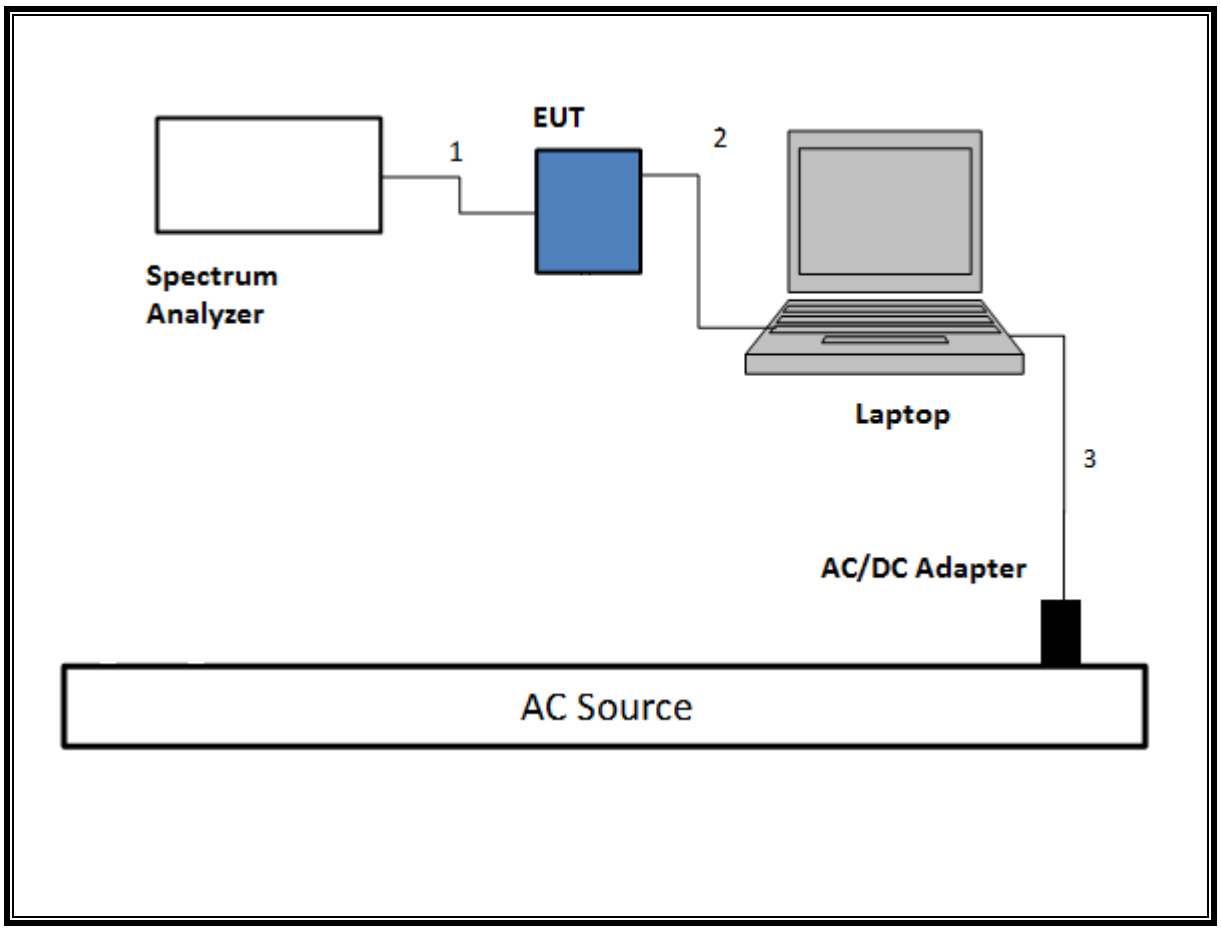
SETUP DIAGRAM FOR CONDUCTED TESTS



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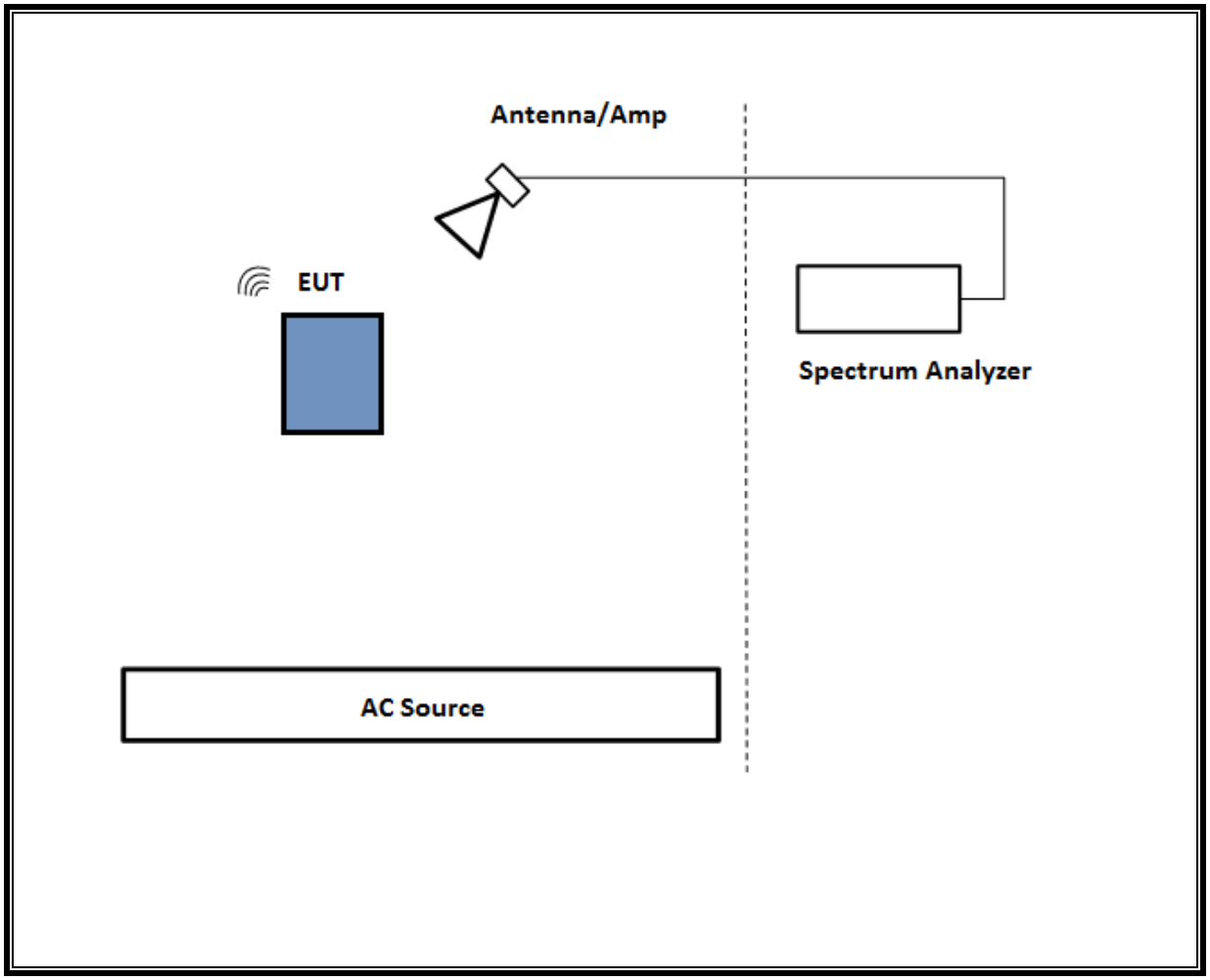
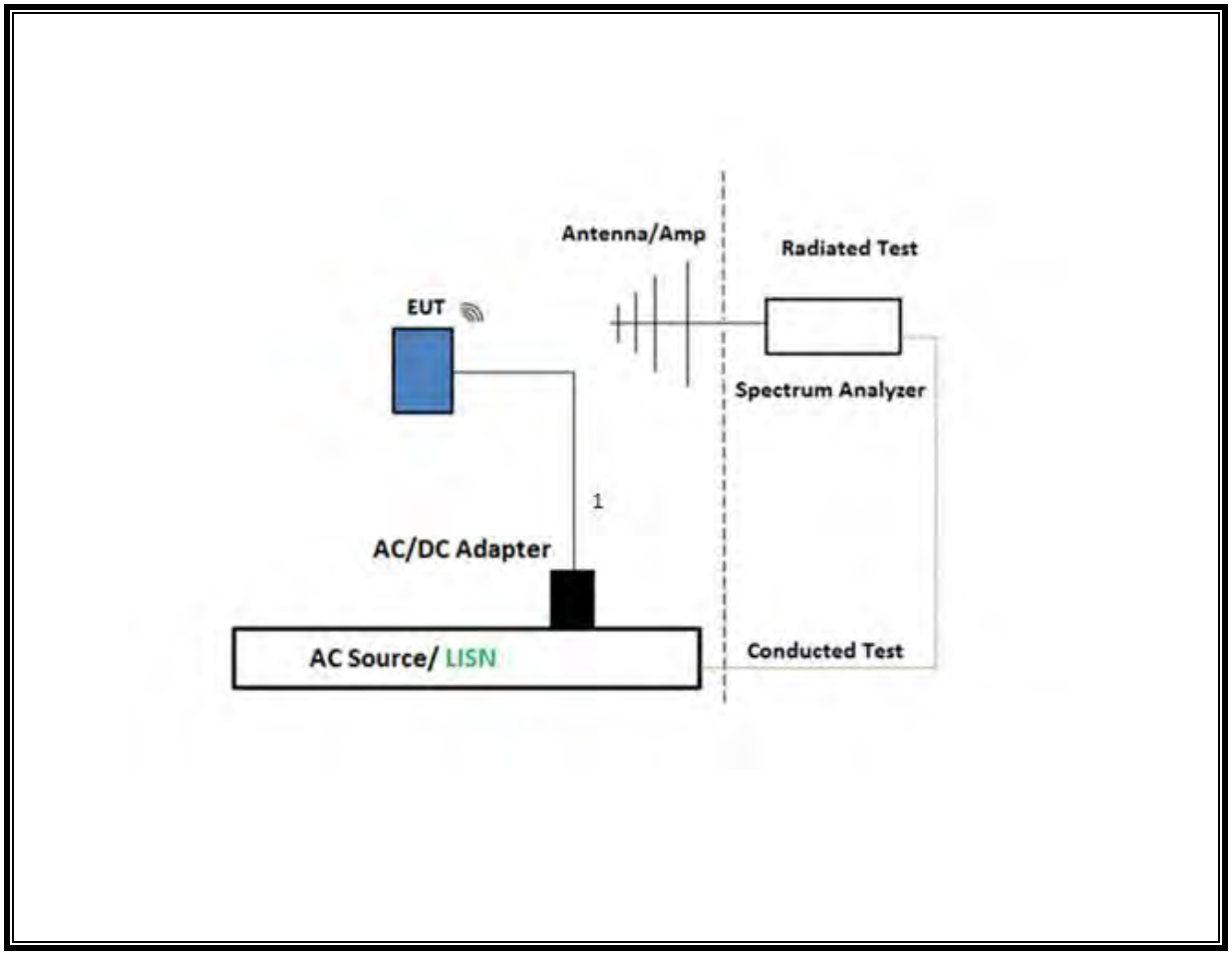
SETUP DIAGRAM FOR RADIATED TESTS Above 1 GHz



SETUP DIAGRAM FOR Below 1GHz and AC LINE CONDUCTED TEST



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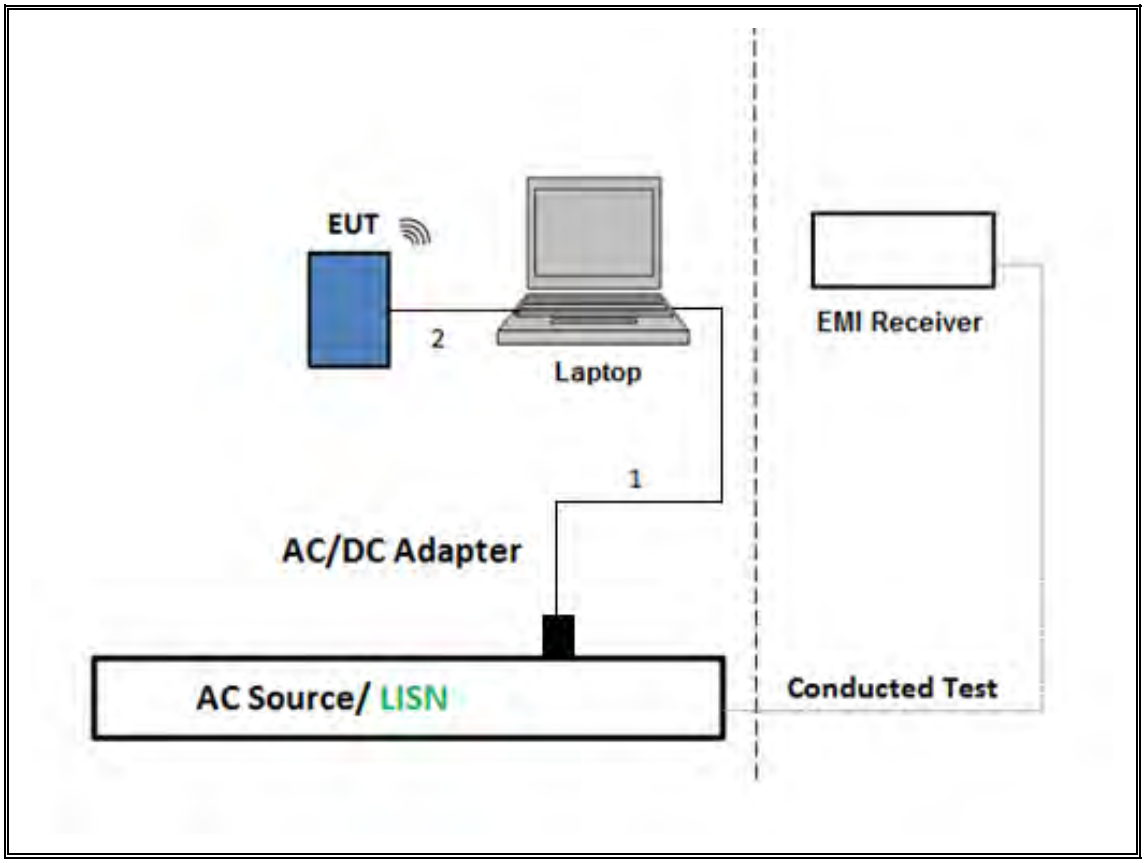
TEST SETUP- AC LINE CONDUCTED: LAPTOP CONFIGURATION



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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

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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	T345	04/20/2020	04/20/2019
Amplifier, 1 to 18GHz	Miteq	AFS42-00101800-25-S-42	T1165	05/24/2020	05/24/2019
Antenna, Horn 1-18GHz	ETS Lindgren	3117	T136	06/14/2020	06/14/2019
Amplifier, 1 to 18GHz, 35dB	Amplical	AFS42-00101800-25-S-42	T1568	06/18/2020	06/18/2019
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	T119	03/22/2020	03/22/2019
Amplifier, 1 to 18GHz	AMPLICAL	AMP1G18-35	138301	08/03/2020	08/03/2019
Antenna Horn, 18 to 26GHz	ARA	MWH-1826	T447	08/13/2020	08/13/2019
Antenna, Horn 1-18GHz	ETS Lindgren	3117	T712	02/26/2020	02/26/2019
Amplifier, 1 to 18GHz	Miteq	AFS42-00101800-25-S-42	T740	07/31/2020	07/31/2019
Pre-Amp 18-26GHz	Agilent Technology	8449B	T404	03/23/2020	03/23/2019
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences	JB1	T407	05/11/2020	05/11/2019
Amplifier, 10KHz to 1GHz, 32dB	Sonoma	310N	T173	06/06/2020	06/06/2019
*Spectrum Analyzer, PXA 3Hz to 44GHz	Keysight	N9030A	T1450	01/23/2020	01/23/2019
Filter, HPF 3.0GHz	Micro-Tronics	HPM17543	T898	05/30/2020	5/30/2019
*Power Meter, P-series single channel	Keysight	N1912A	T1244	01/30/2020	01/30/2019
Power Sensor	Keysight	N1921A	T1224	02/22/2020	02/22/2019
*Spectrum Analyzer, PXA 3Hz to 44GHz	Keysight	N9030A	T1466	01/23/2020	01/23/2019
*Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T342	01/23/2020	01/23/2019
*Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T1113	01/22/2020	01/22/2019
*Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T340	01/22/2020	01/22/2019
Antenna, Active Loop 9KHz to 30MHz	ETS-Lindgren	6502	T1683	06/06/2020	06/06/2019

AC Line Conducted					
*EMI Test Receiver 9Khz-7GHz	Rohde & Schwarz	ESCI7	T1436	02/14/2020	02/14/2019
*Power Cable, Line Conducted Emissions	UL	PG1	T861	11/19/2019	11/19/2018
*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.

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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	2.500	2.500	1.000	100.00%	0.00	0.010
802.11n HT20	1.920	1.941	0.989	98.92%	0.00	0.010
802.11ax HE20 26T-RU0	4.095	4.166	0.983	98.30%	0.00	0.010
802.11ax HE20 242T-RU61	1.563	1.587	0.985	98.49%	0.00	0.010

DUTY CYCLE PLOTS

DUTY CYCLE 802.11b MODE

DUTY CYCLE 802.11n HT20

DUTY CYCLE 802.11ax HE20 26T-RU0

DUTY CYCLE 802.11ax HE20 242T-RU61

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8.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

8.2.1. 802.11b MODE

1TX UAT1 MODE

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	12.976
Low 2	2417	12.777
Mid 6	2437	13.181
High 7	2442	13.218
High 8	2447	13.087
High 9	2452	12.974
High 10	2457	13.216
High 11	2462	13.170
High 12	2467	13.350
High 13	2472	13.259

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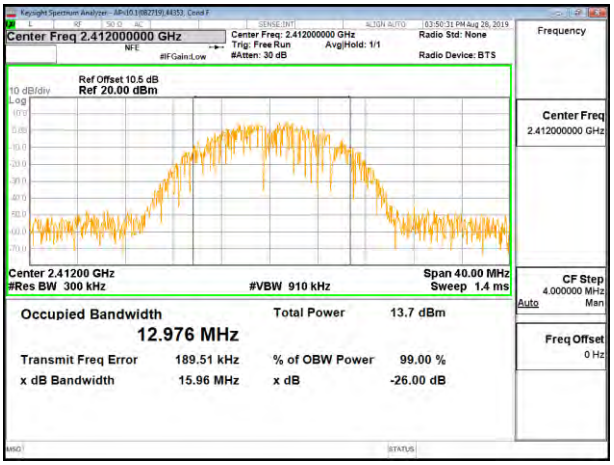
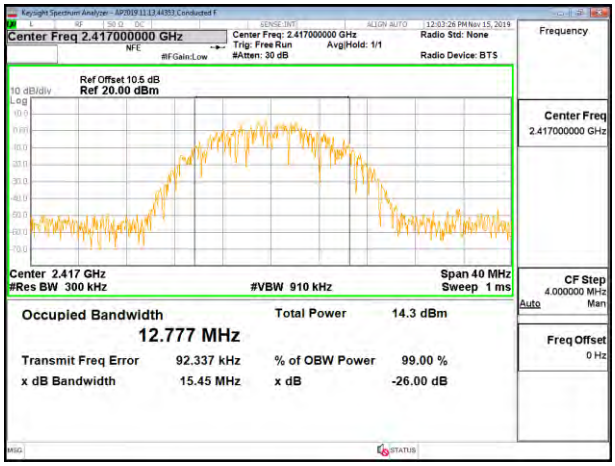
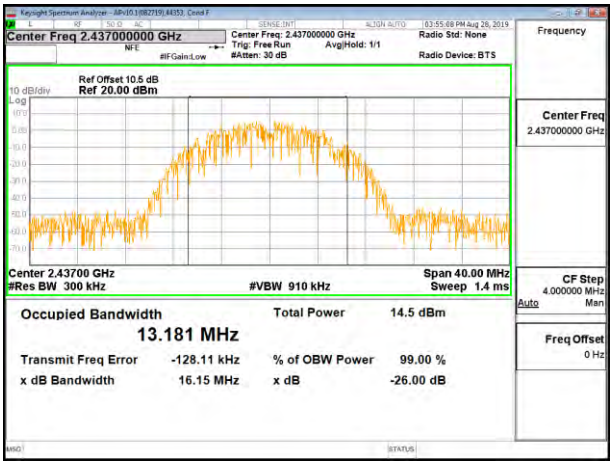


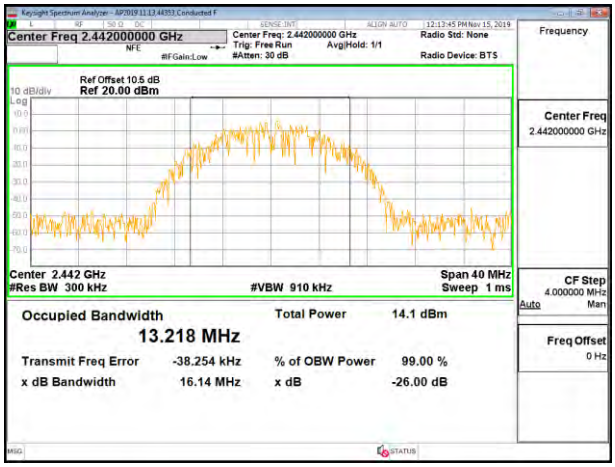
LOW CHANNEL 1



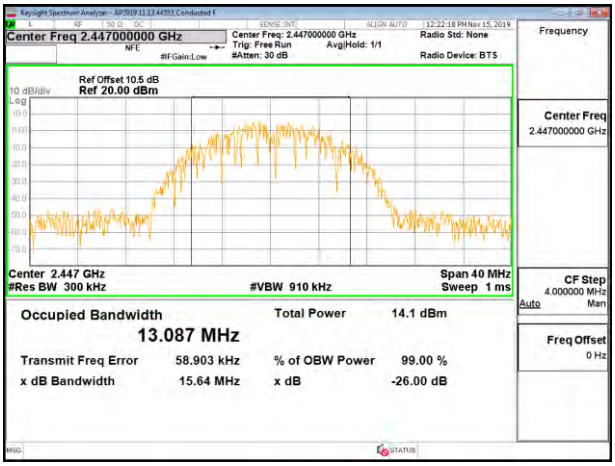
LOW CHANNEL 2



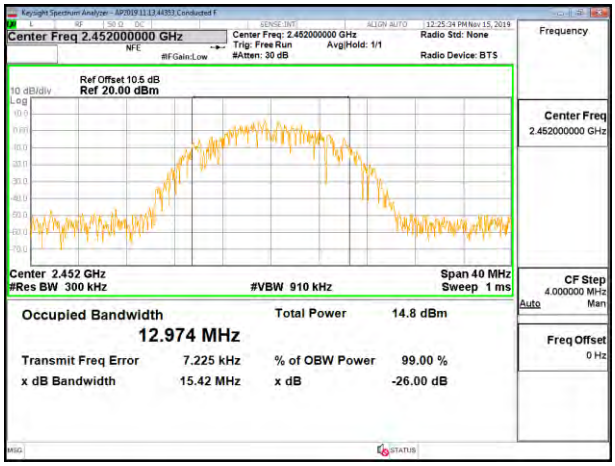
MID CHANNEL 6



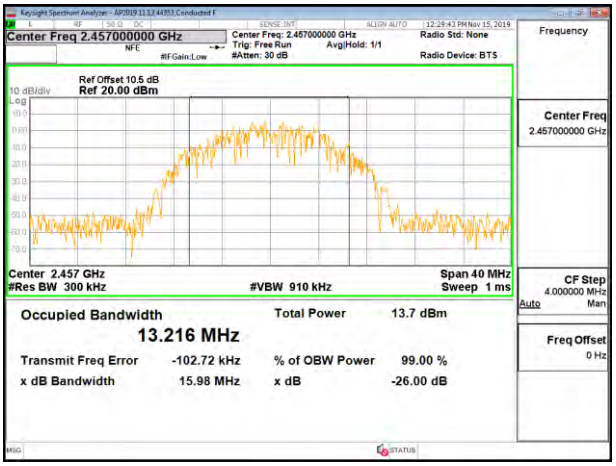
HIGH CHANNEL 7



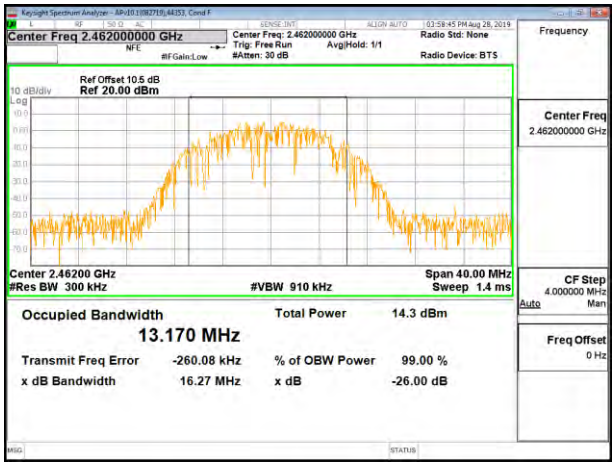
HIGH CHANNEL 8



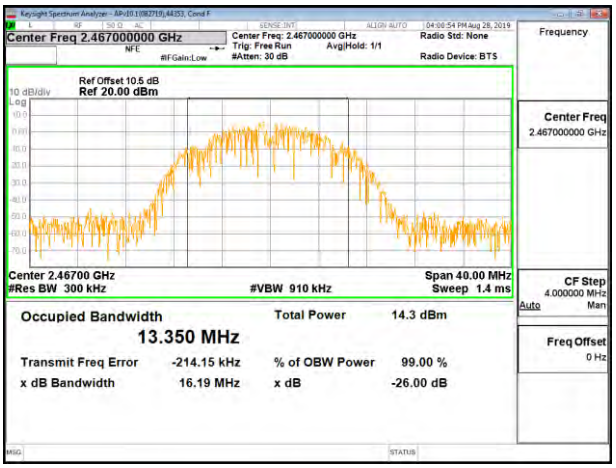
HIGH CHANNEL 9



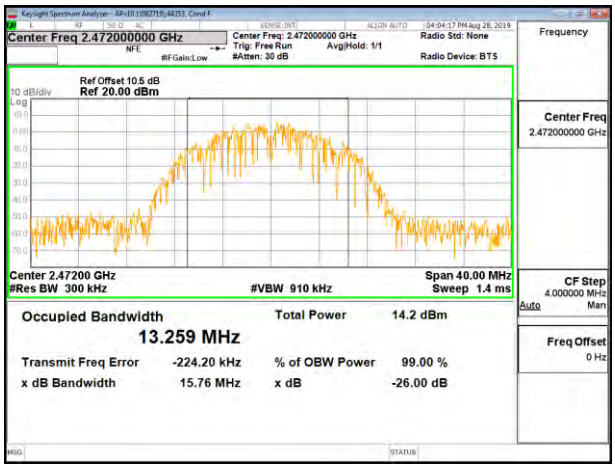
HIGH CHANNEL 10



HIGH CHANNEL 11



HIGH CHANNEL 12



HIGH CHANNEL 13

1TX LAT3 MODE

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	13.244
Low 2	2417	13.253
Mid 6	2437	13.233
High 7	2442	13.039
High 8	2447	13.338
High 9	2452	13.507
High 10	2457	13.200
High 11	2462	13.087
High 12	2467	13.231
High 13	2472	13.099

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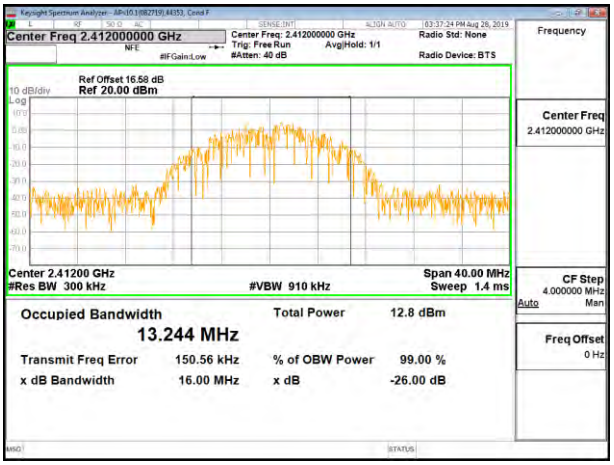
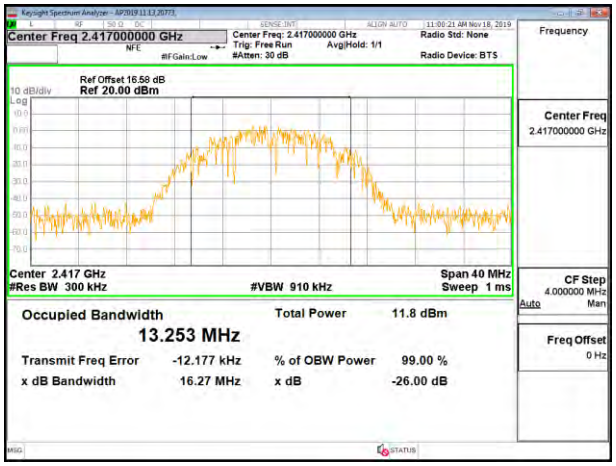
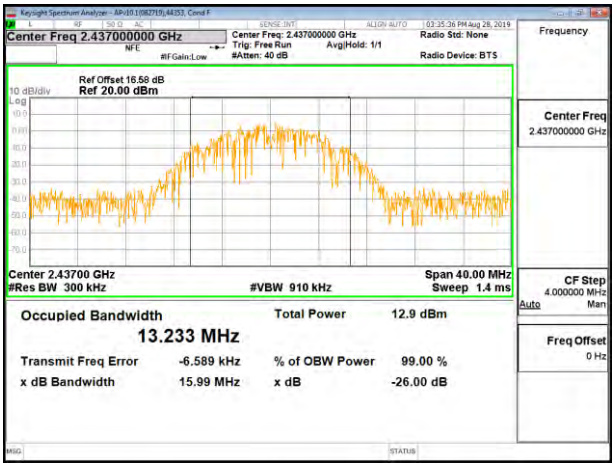


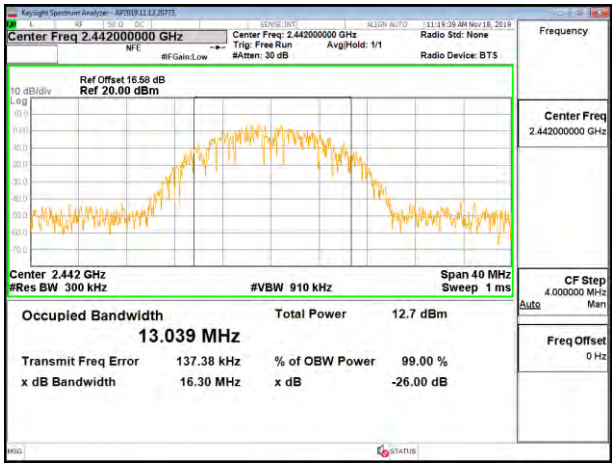
LOW CHANNEL 1



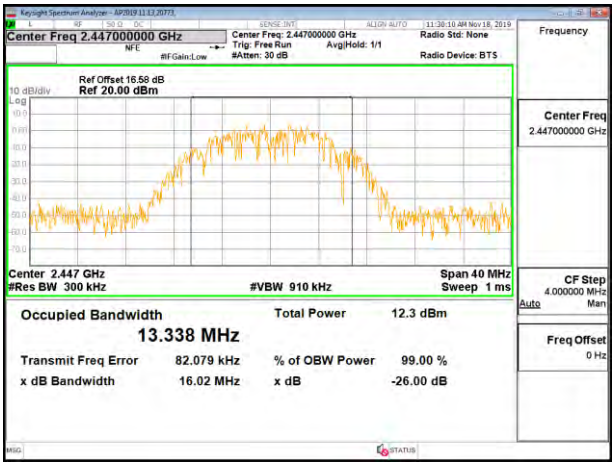
LOW CHANNEL 2



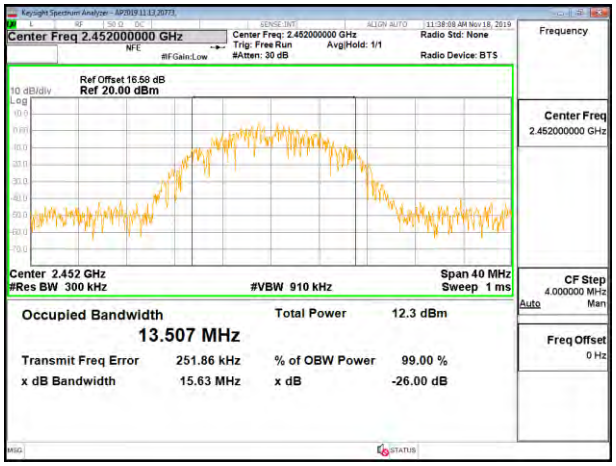
MID CHANNEL 6



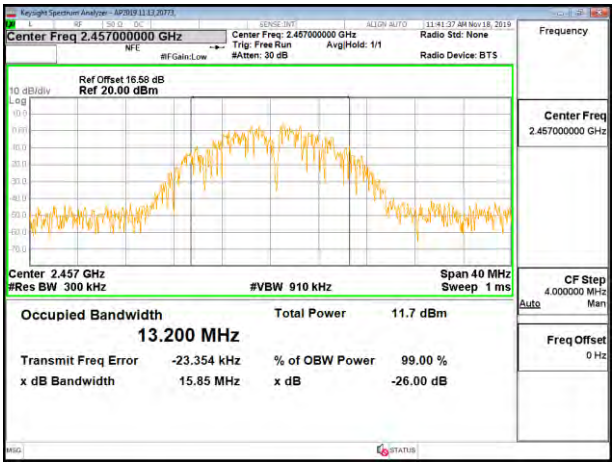
HIGH CHANNEL 7



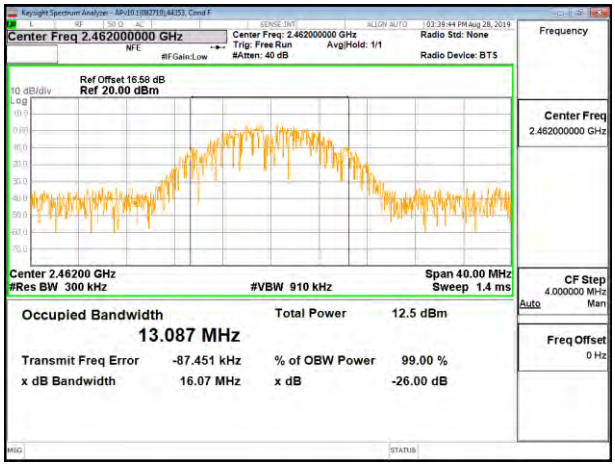
HIGH CHANNEL 8



HIGH CHANNEL 9

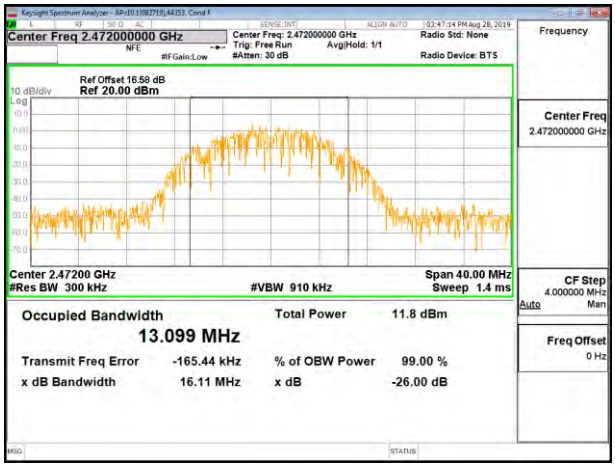


HIGH CHANNEL 10



HIGH CHANNEL 11

HIGH CHANNEL 12



HIGH CHANNEL 13

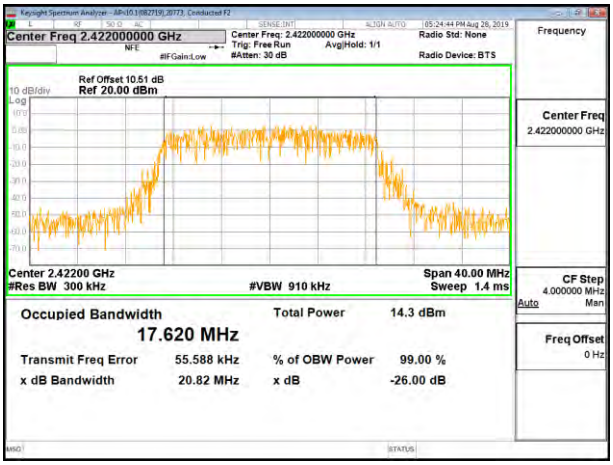
8.2.2. 802.11n HT20 MODE

1TX UAT1 MODE

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	17.638
Low 2	2417	17.642
Low 3	2422	17.620
Mid 6	2437	17.661
High 9	2452	17.574
High 10	2457	17.633
High 11	2462	17.632
High 12	2467	17.608
High 13	2472	17.685

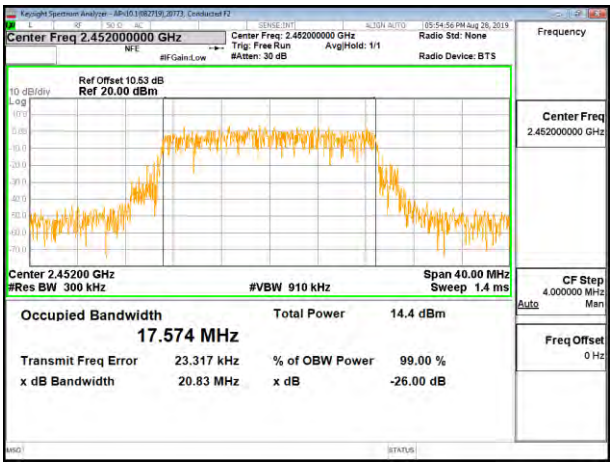
LOW CHANNEL 1

LOW CHANNEL 2

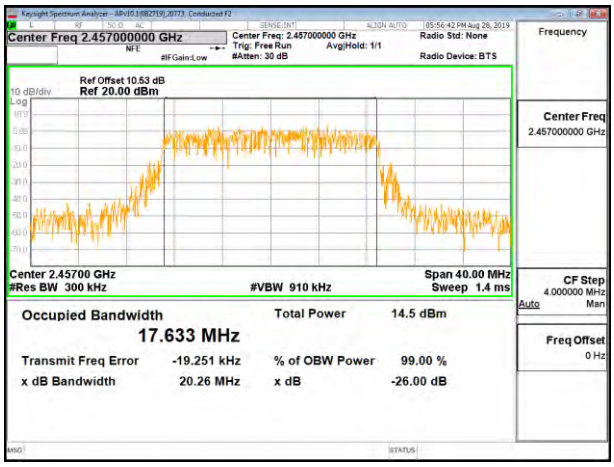


LOW CHANNEL 3

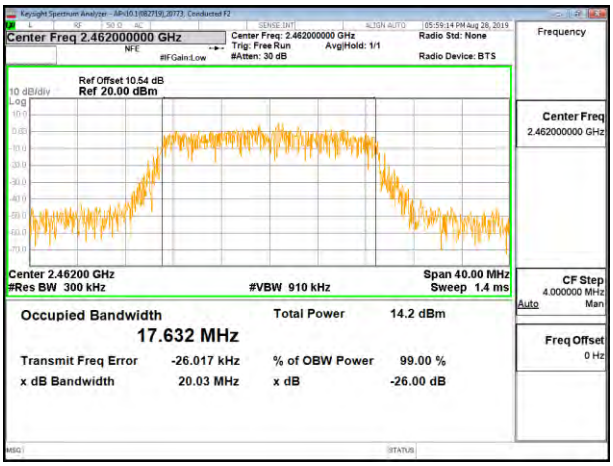
MID CHANNEL 6



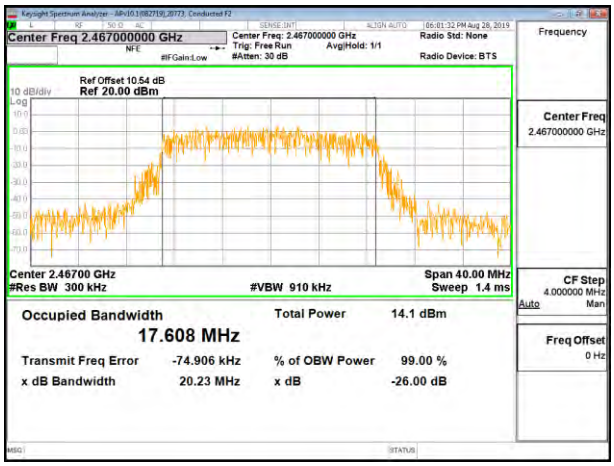
HIGH CHANNEL 9



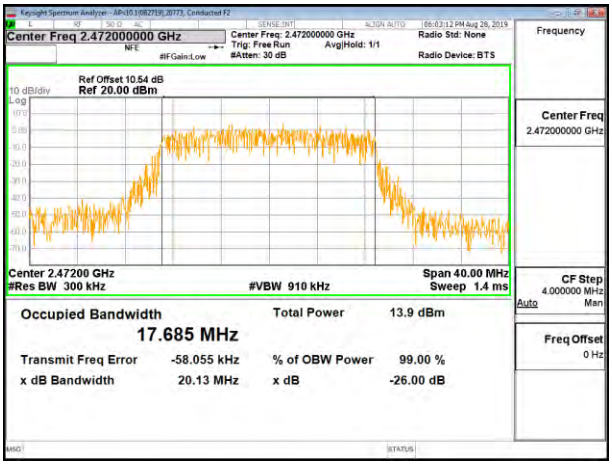
HIGH CHANNEL 10



HIGH CHANNEL 11



HIGH CHANNEL 12

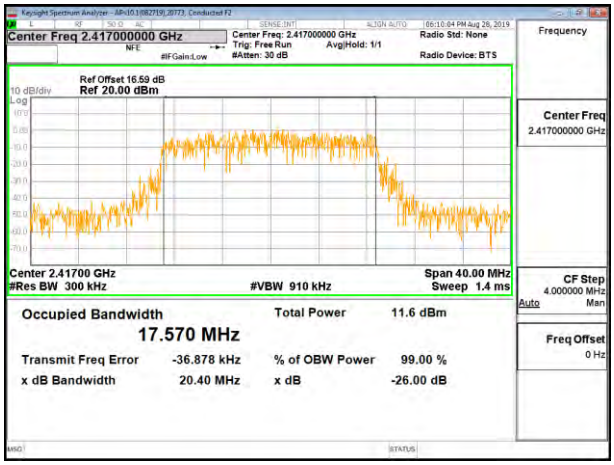


HIGH CHANNEL 13

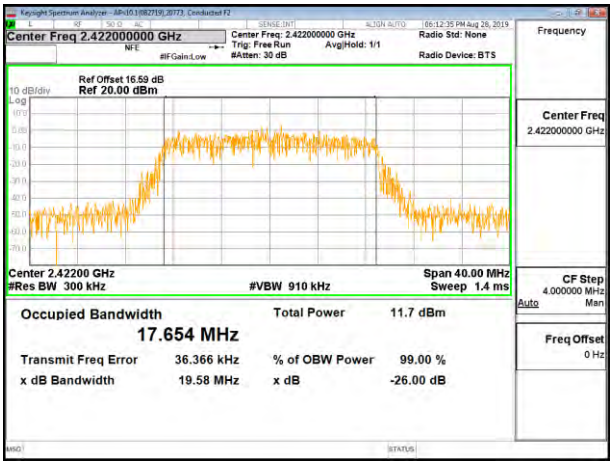
1TX LAT3 MODE

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	17.565
Low 2	2417	17.570
Low 3	2422	17.654
Mid 6	2437	17.658
High 9	2452	17.624
High 10	2457	17.628
High 11	2462	17.636
High 12	2467	17.695
High 13	2472	17.595

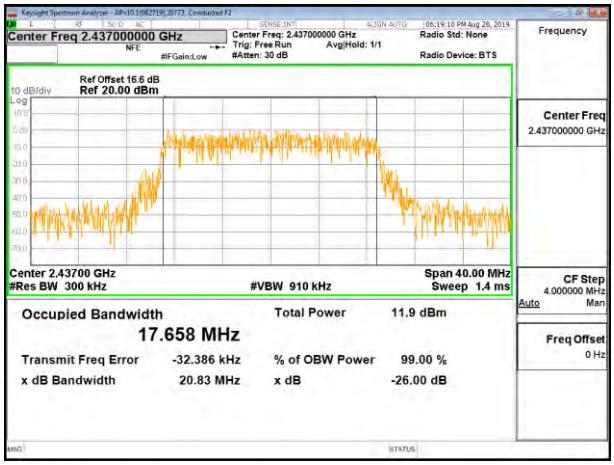
LOW CHANNEL 1



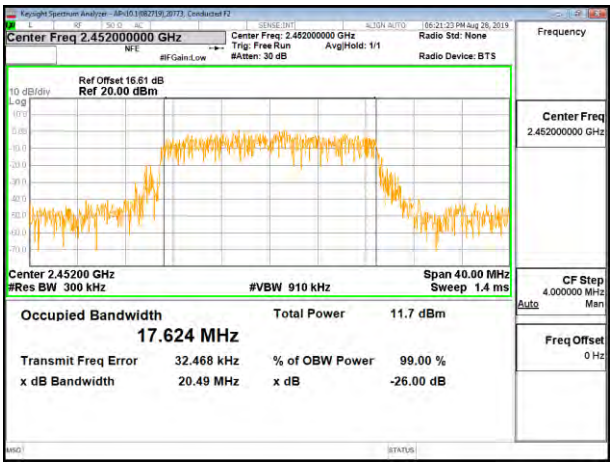
LOW CHANNEL 2



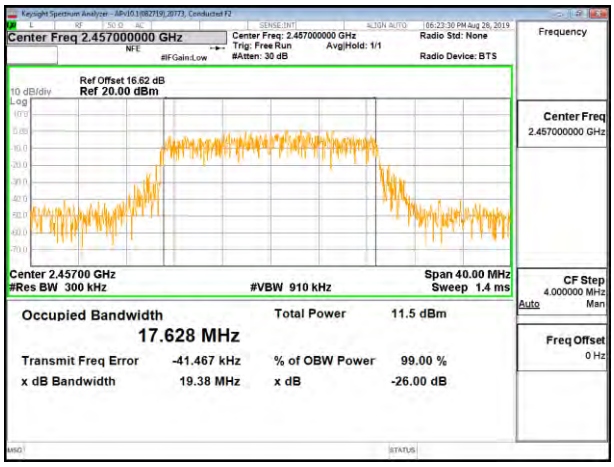
LOW CHANNEL 3



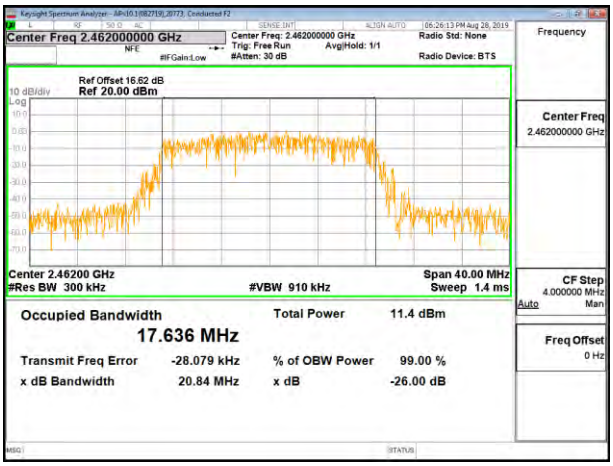
MID CHANNEL 6



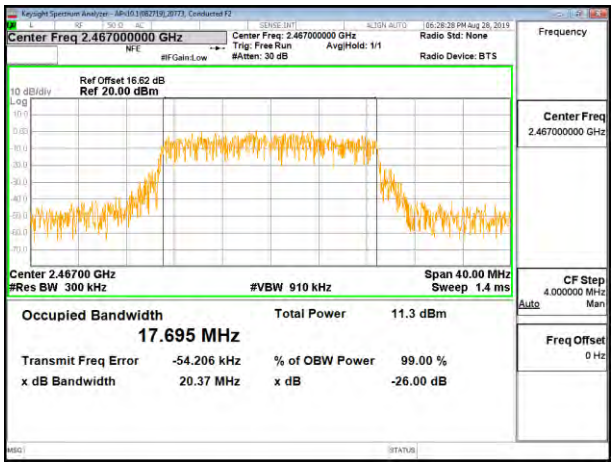
HIGH CHANNEL 9



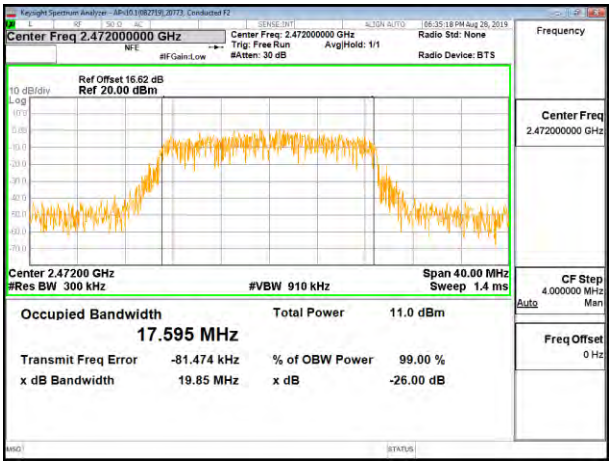
HIGH CHANNEL 10



HIGH CHANNEL 11



HIGH CHANNEL 12



HIGH CHANNEL 13

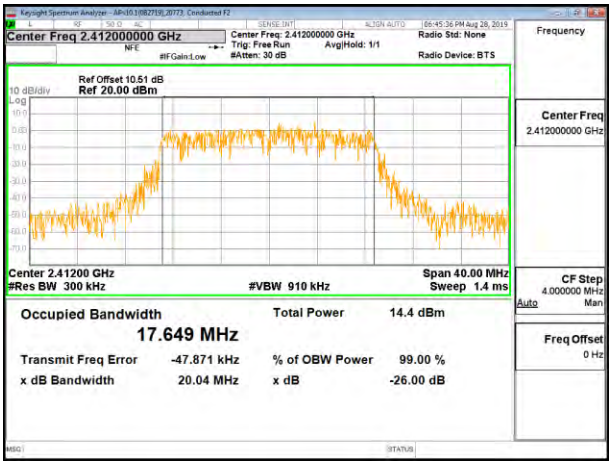
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

8.2.3. 802.11n HT20 CDD MODE 2TX

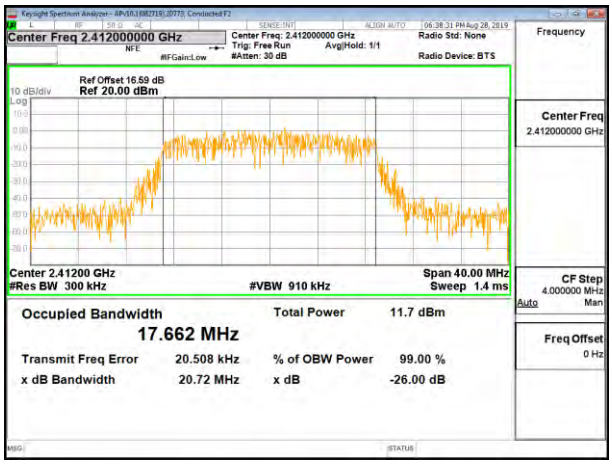
UAT 1 + LAT 3 2TX MODE

Channel	Frequency (MHz)	99% Bandwidth UAT 1 (MHz)	99% Bandwidth LAT 3 (MHz)
Low 1	2412	17.649	17.662
Low 2	2417	17.729	17.624
Low 3	2422	17.643	17.687
Low 4	2427	17.757	17.696
Mid 6	2437	17.642	17.703
High 8	2447	17.704	17.748
High 9	2452	17.683	17.603
High 10	2457	17.744	17.660
High 11	2462	17.588	17.584
High 12	2467	17.724	17.589
High 13	2472	17.479	17.495

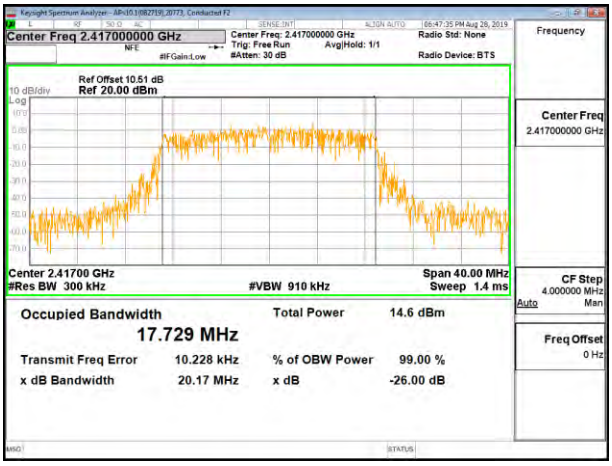
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888



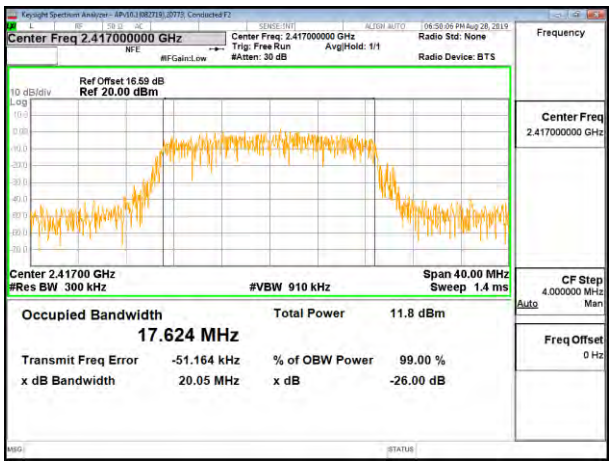
LOW CHANNEL 1 UAT 1



LOW CHANNEL 1 LAT 3



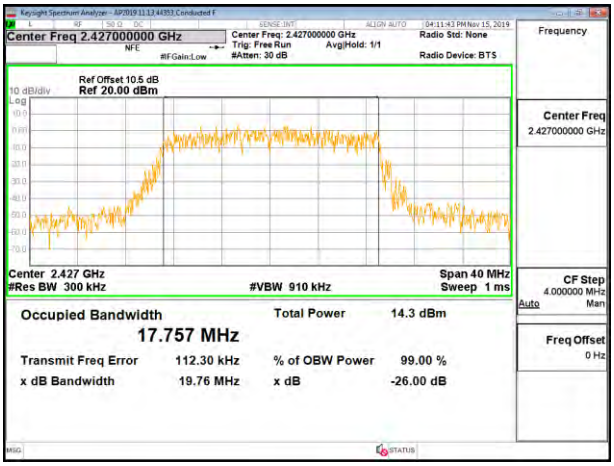
LOW CHANNEL 2 UAT 1



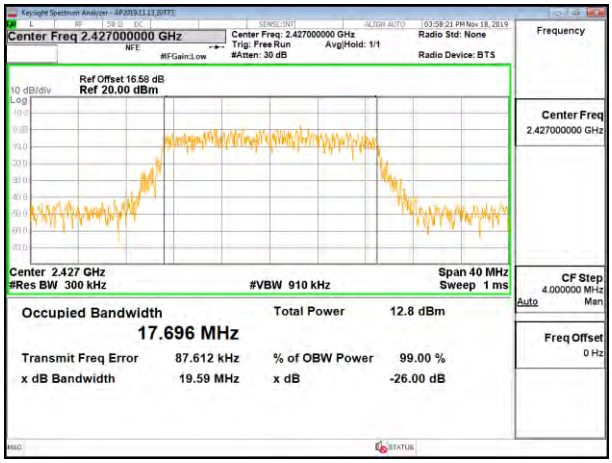
LOW CHANNEL 2 LAT 3

LOW CHANNEL 3 UAT 1

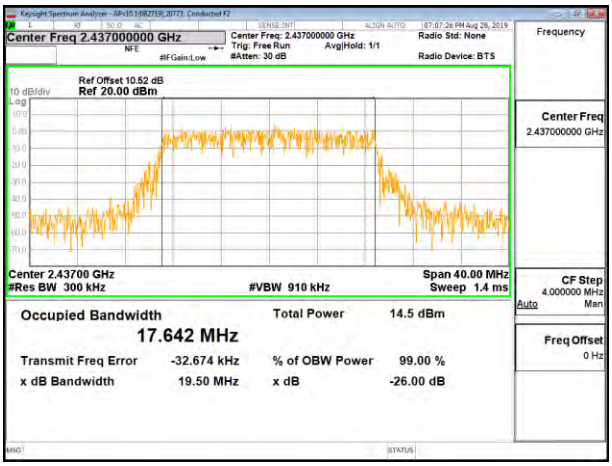
LOW CHANNEL 3 LAT 3



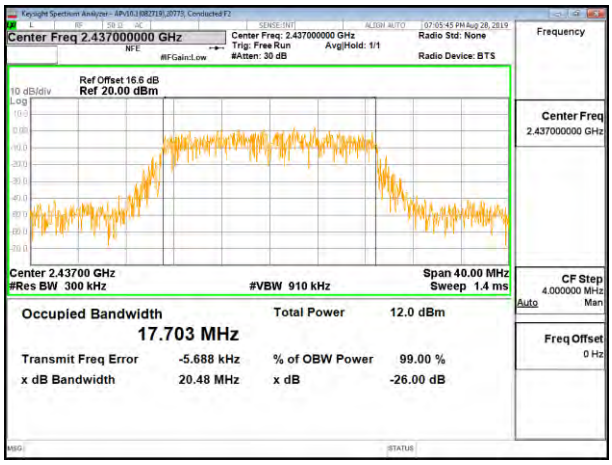
LOW CHANNEL 4 UAT 1



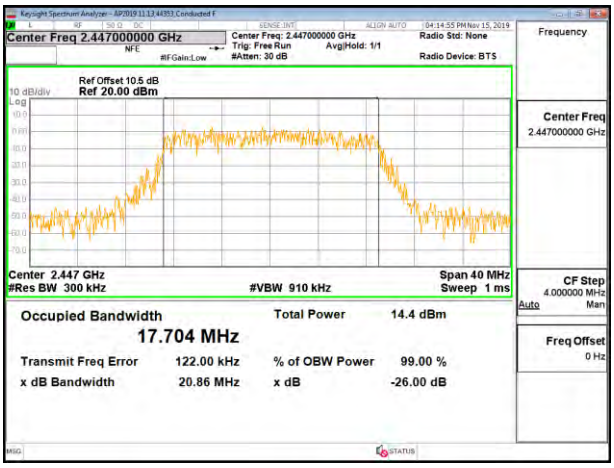
LOW CHANNEL 4 LAT 3



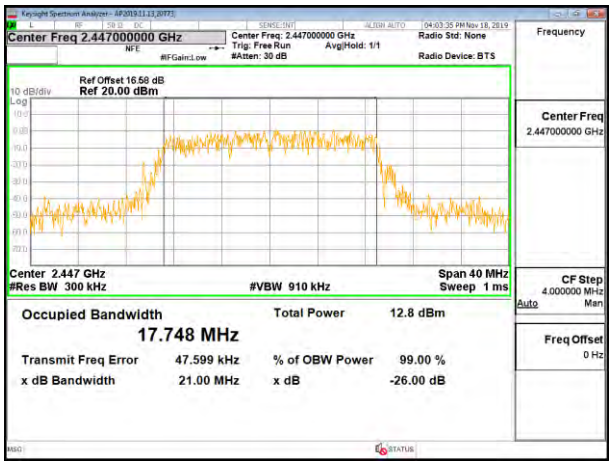
MID CHANNEL 6 UAT 1



MID CHANNEL 6 LAT 3

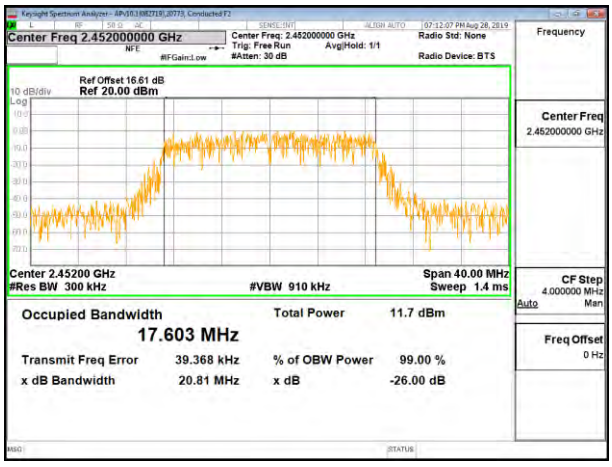


HIGH CHANNEL 8 UAT 1

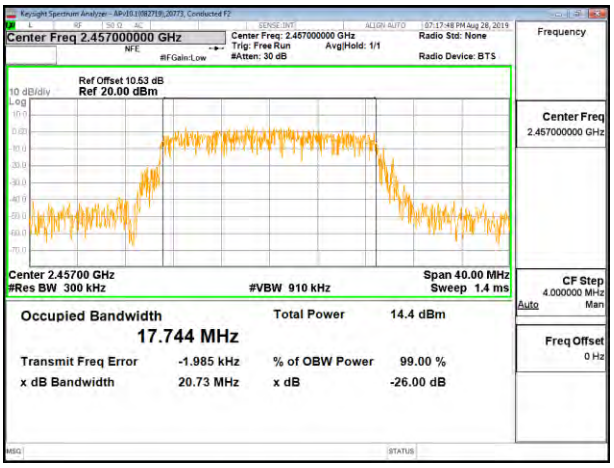


HIGH CHANNEL 8 LAT 3

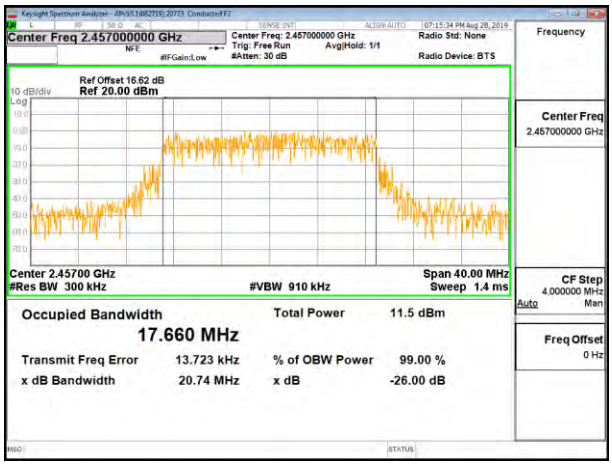
HIGH CHANNEL 9 UAT 1



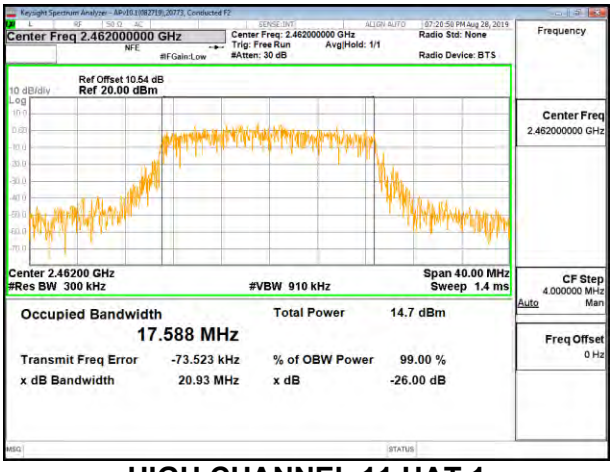
HIGH CHANNEL 9 LAT 3



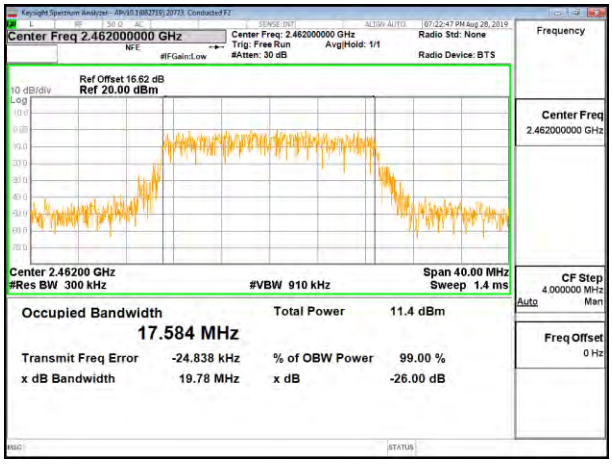
HIGH CHANNEL 10 UAT 1



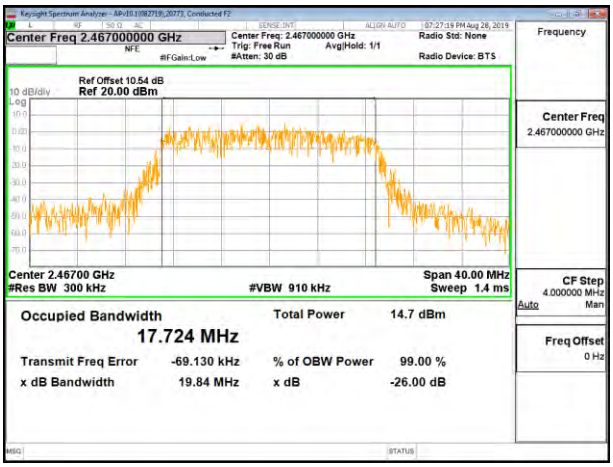
HIGH CHANNEL 10 LAT 3



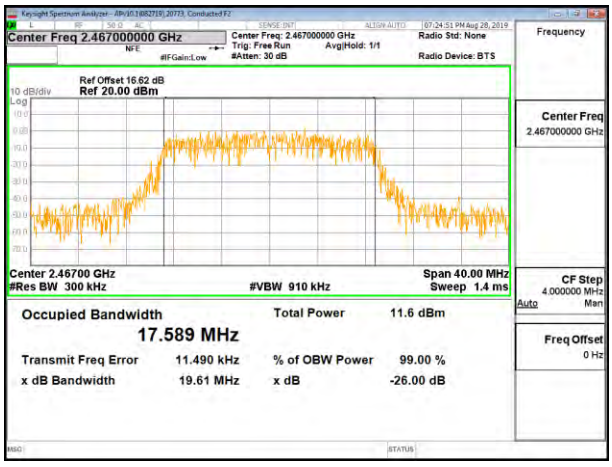
HIGH CHANNEL 11 UAT 1



HIGH CHANNEL 11 LAT 3

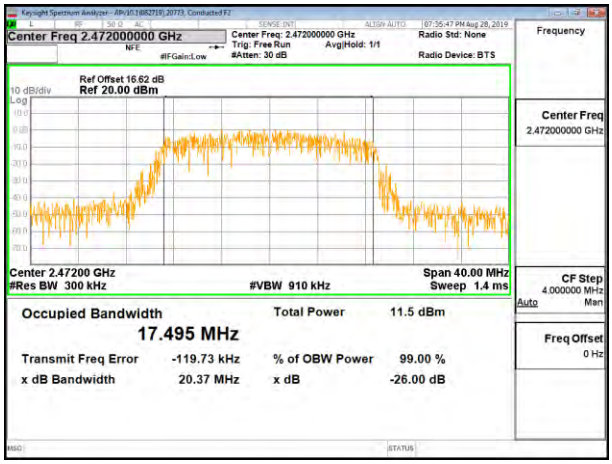


HIGH CHANNEL 12 UAT 1



HIGH CHANNEL 12 LAT 3

HIGH CHANNEL 13 UAT 1

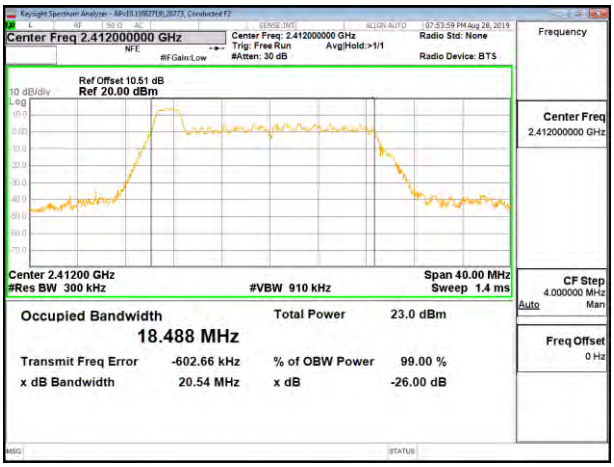


HIGH CHANNEL 13 LAT 3

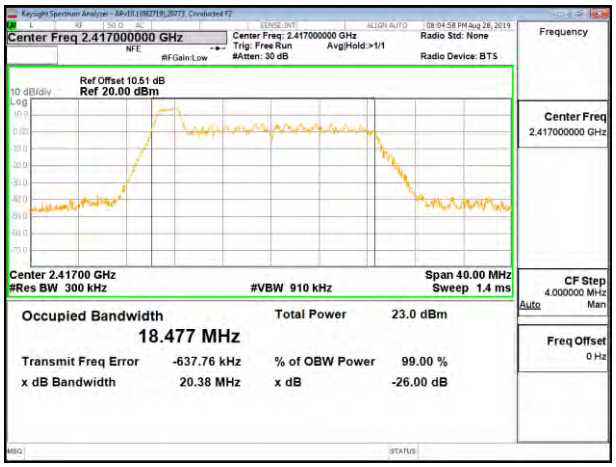
8.2.4. 802.11ax HE20 MODE

UAT1 LEGACY SISO MODE: 26-Tones, RU index 0

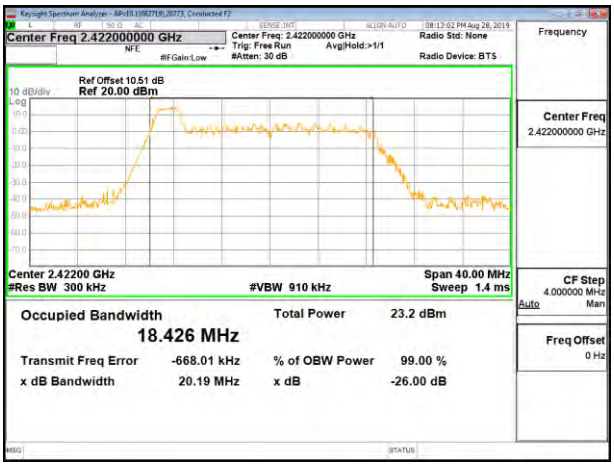
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	18.488
Low 2	2417	18.477
Low 3	2422	18.426
Low 4	2427	18.541
Mid 6	2437	18.396
High 8	2447	18.421
High 9	2452	18.486
High 10	2457	18.362
High 11	2462	18.395
High 12	2467	18.213
High 13	2472	18.126



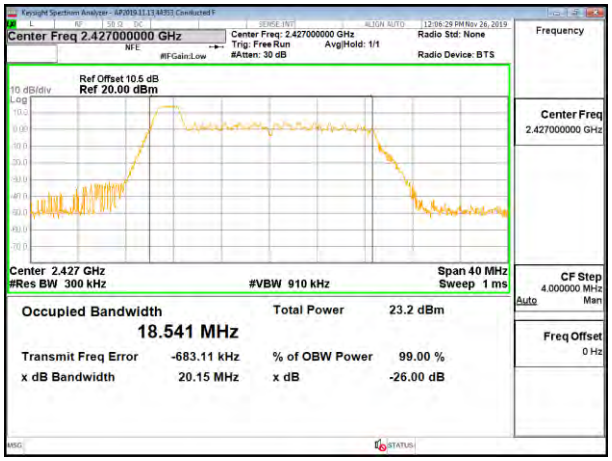
LOW CHANNEL 1



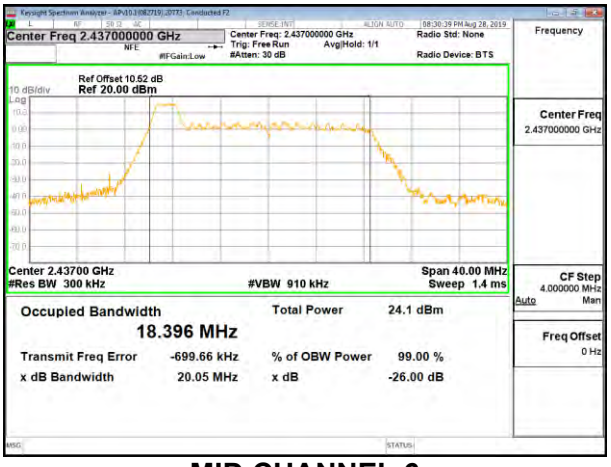
LOW CHANNEL 2



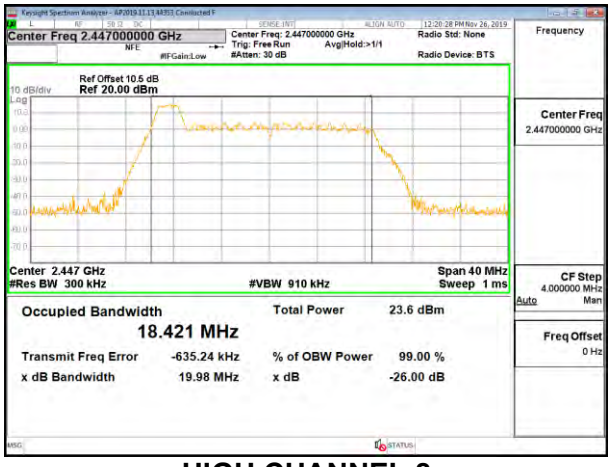
LOW CHANNEL 3



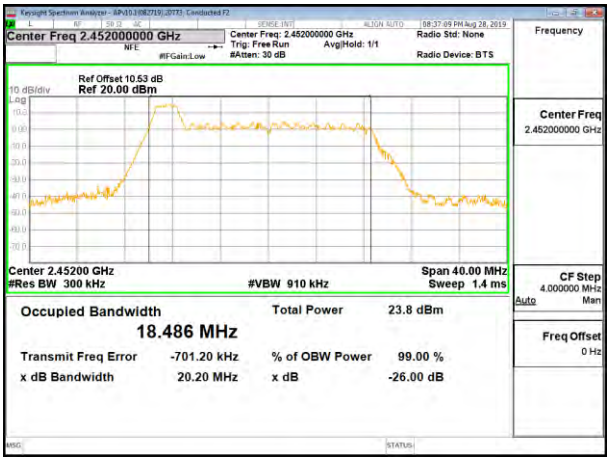
LOW CHANNEL 4



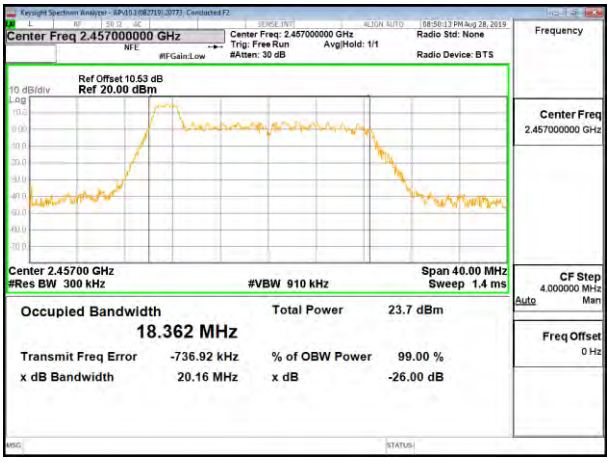
MID CHANNEL 6



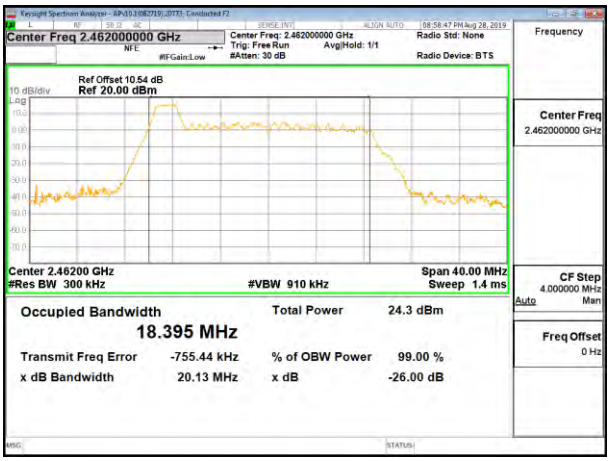
HIGH CHANNEL 8



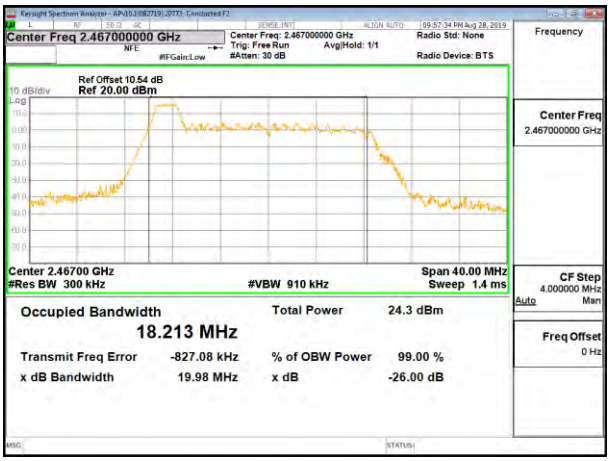
HIGH CHANNEL 9



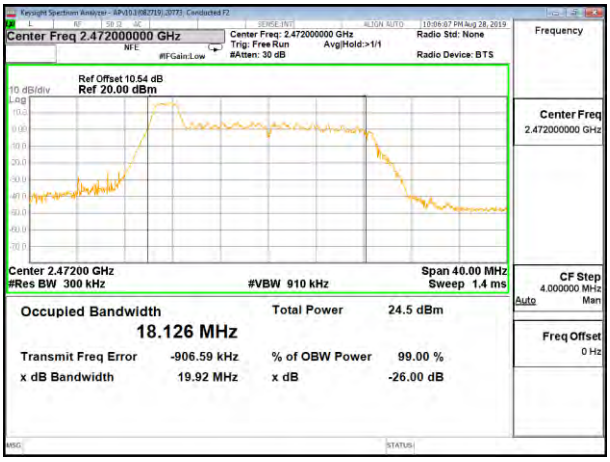
HIGH CHANNEL 10



HIGH CHANNEL 11



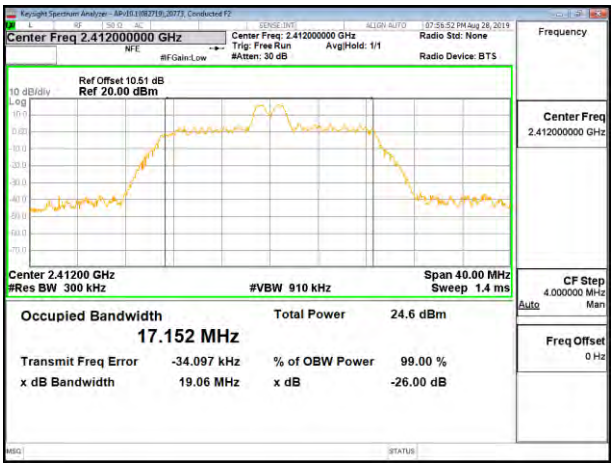
HIGH CHANNEL 12



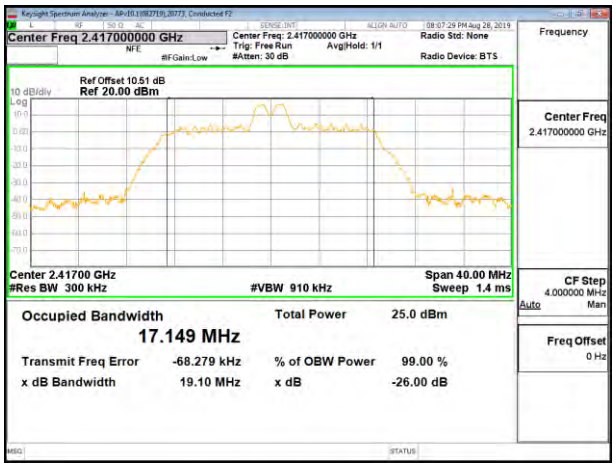
HIGH CHANNEL 13

UAT1 LEGACY SISO MODE: 26-Tones, RU Index 4

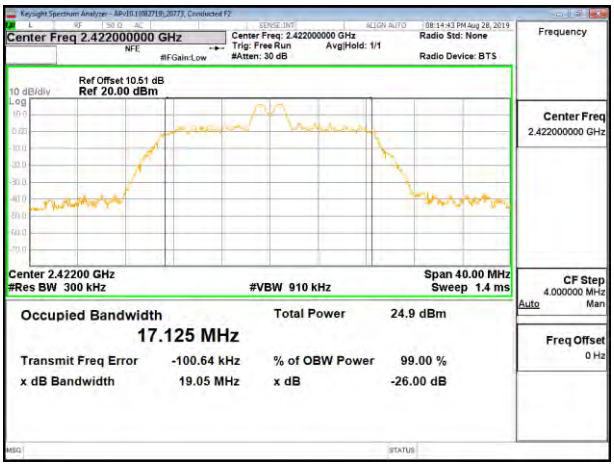
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	17.152
Low 2	2417	17.149
Low 3	2422	17.125
Low 4	2427	17.190
Mid 6	2437	17.191
High 8	2447	17.246
High 9	2452	17.246
High 10	2457	17.167
High 11	2462	17.176
High 12	2467	17.182
High 13	2472	17.095



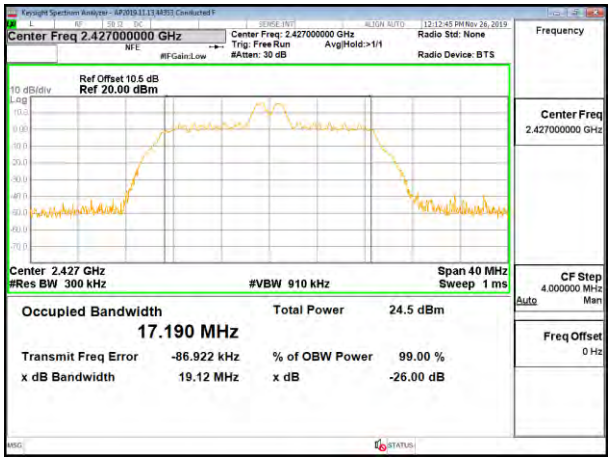
LOW CHANNEL 1



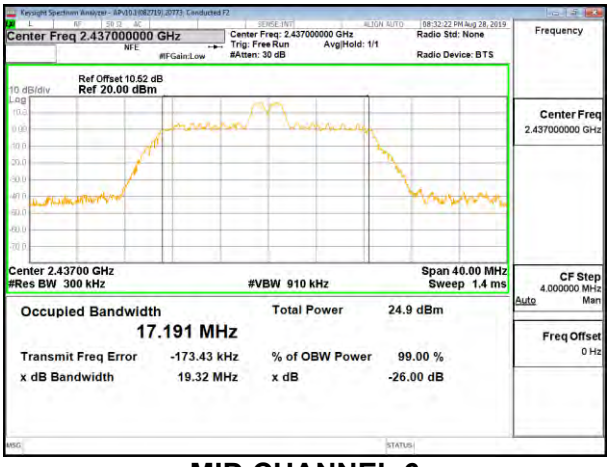
LOW CHANNEL 2



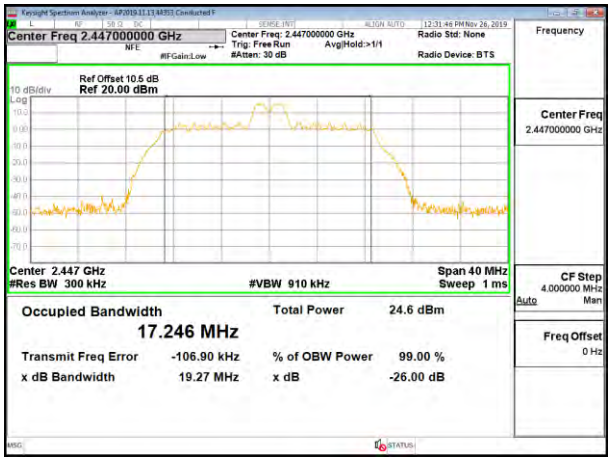
LOW CHANNEL 3



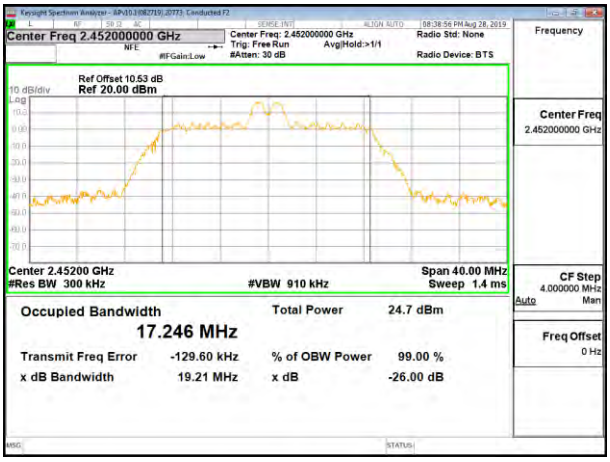
LOW CHANNEL 4



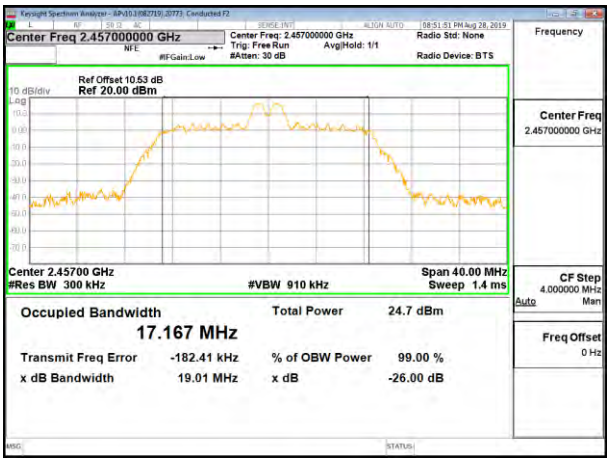
MID CHANNEL 6



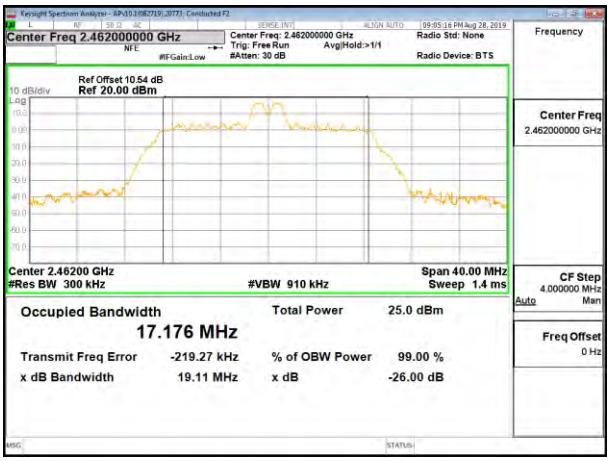
HIGH CHANNEL 8



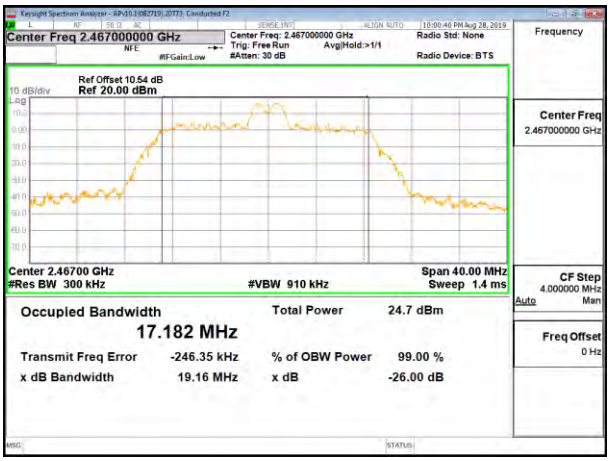
HIGH CHANNEL 9



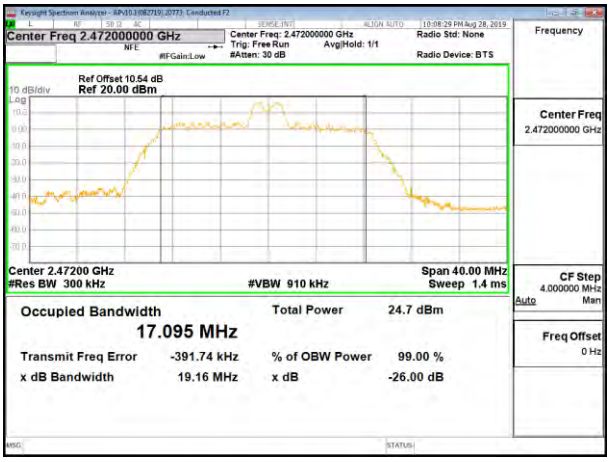
HIGH CHANNEL 10



HIGH CHANNEL 11



HIGH CHANNEL 12



HIGH CHANNEL 13

UAT1 LEGACY SISO MODE: 26-Tones, RU Index 8

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	18.367
Low 2	2417	18.437
Low 3	2422	18.622
Low 4	2427	18.670
Mid 6	2437	18.804
High 8	2447	18.701
High 9	2452	18.691
High 10	2457	18.715
High 11	2462	18.781
High 12	2467	18.828
High 13	2472	18.867

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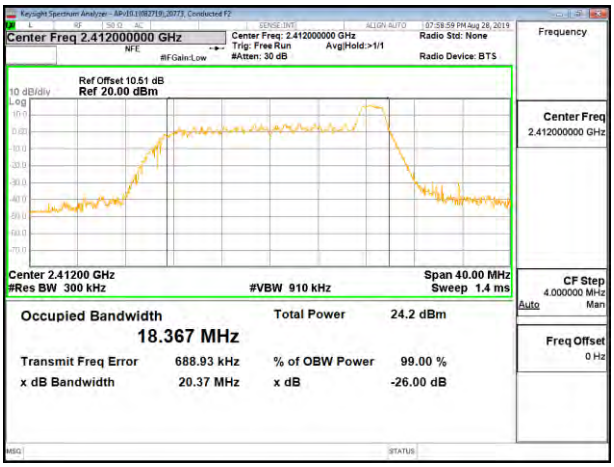
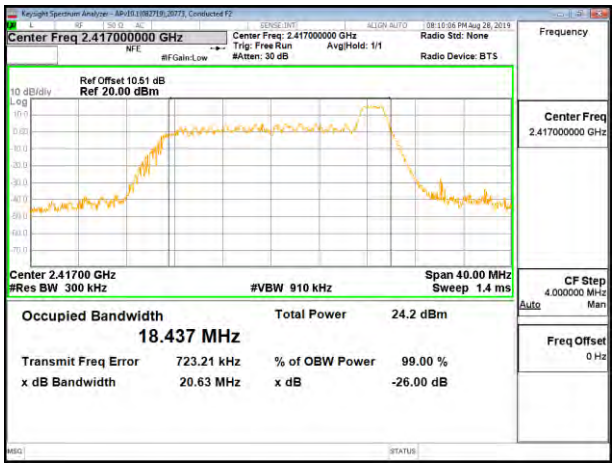
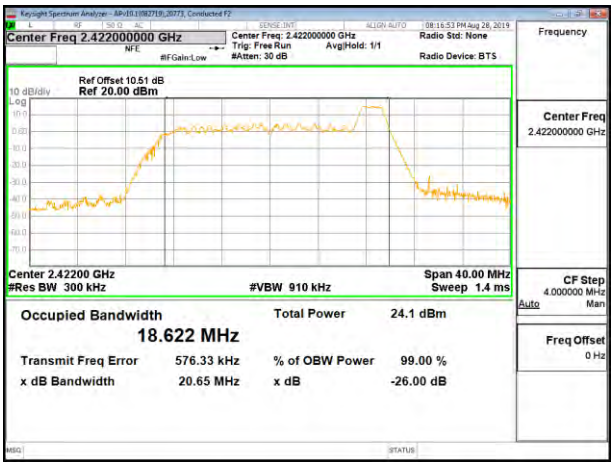


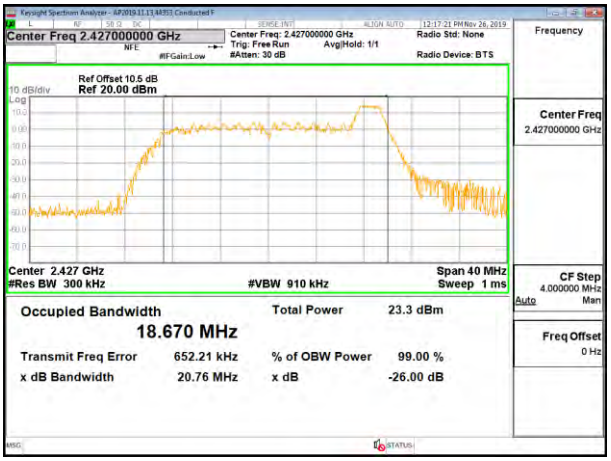
LOW CHANNEL 1



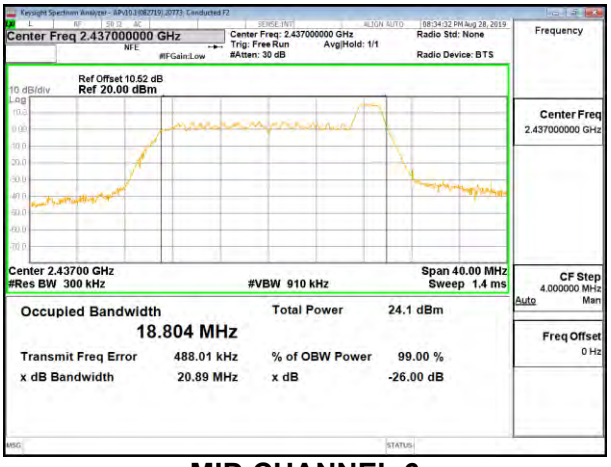
LOW CHANNEL 2



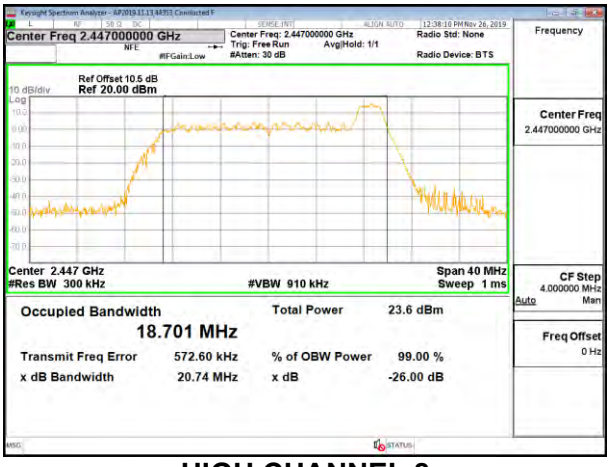
LOW CHANNEL 3



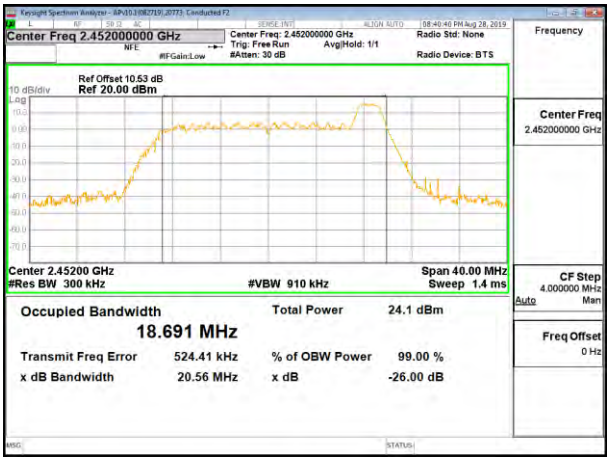
LOW CHANNEL 4



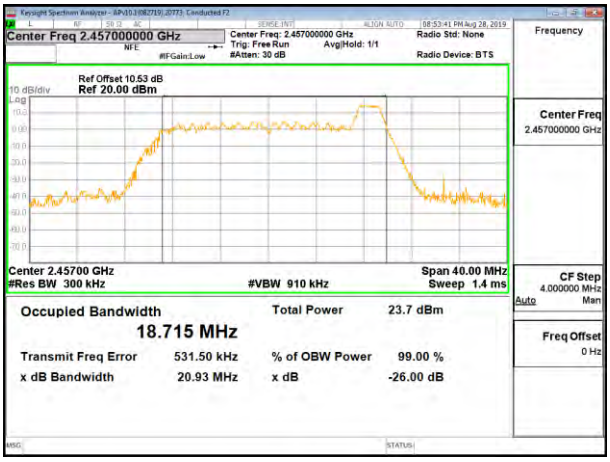
MID CHANNEL 6



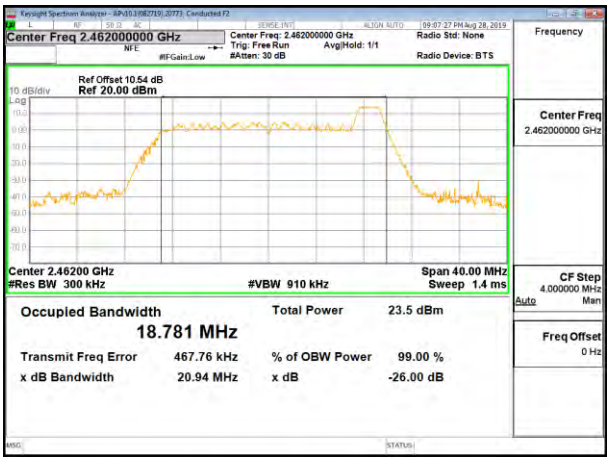
HIGH CHANNEL 8



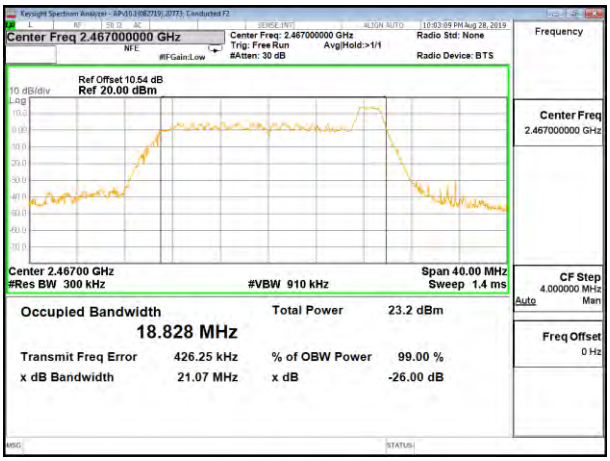
HIGH CHANNEL 9



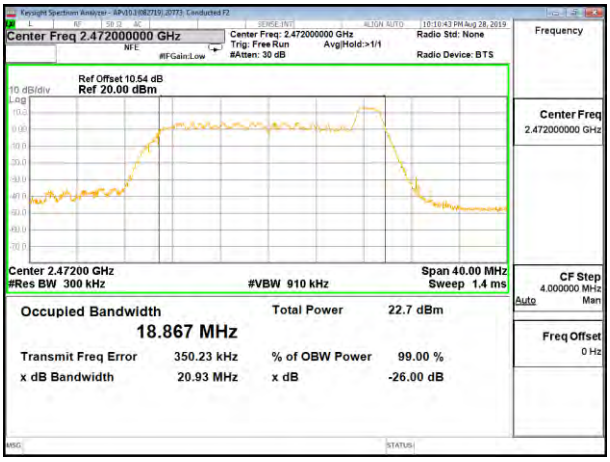
HIGH CHANNEL 10



HIGH CHANNEL 11



HIGH CHANNEL 12



HIGH CHANNEL 13

UAT1 LEGACY SISO MODE: 242-Tones, RU Index 61

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	18.916
Low 2	2417	18.904
Low 3	2422	18.994
Low 4	2427	18.983
Mid 6	2437	18.978
High 8	2447	18.743
High 9	2452	18.912
High 10	2457	18.878
High 11	2462	18.862
High 12	2467	18.935
High 13	2472	18.849

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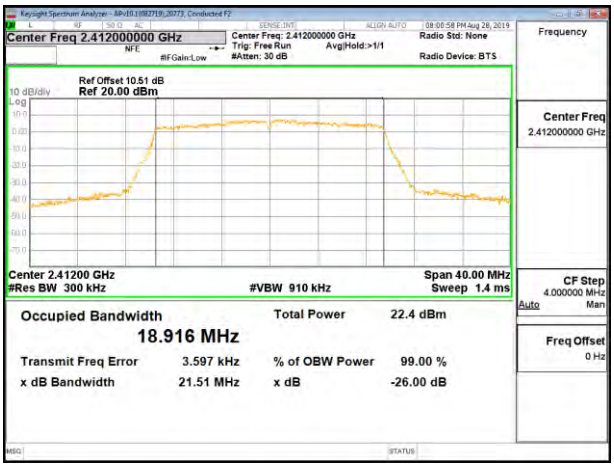
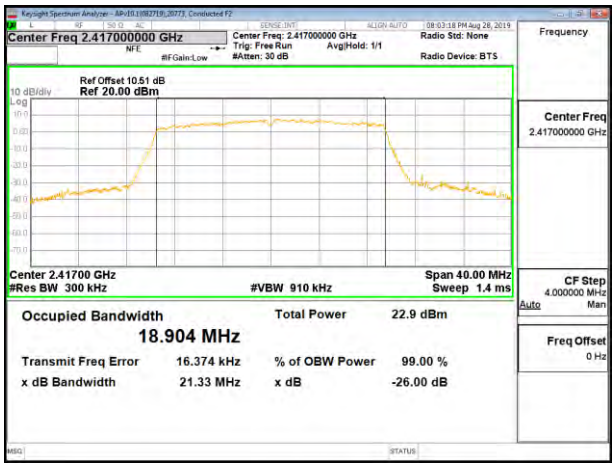
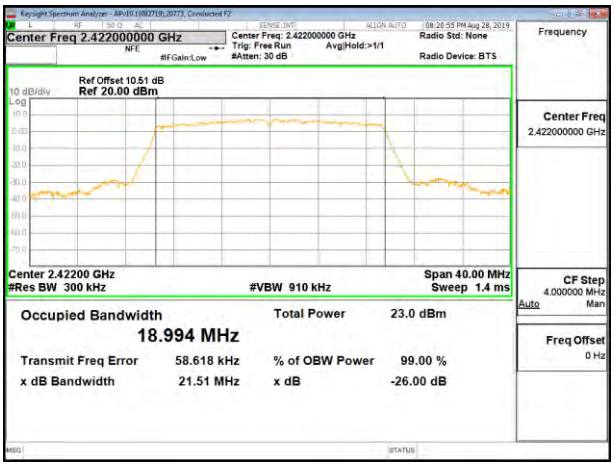


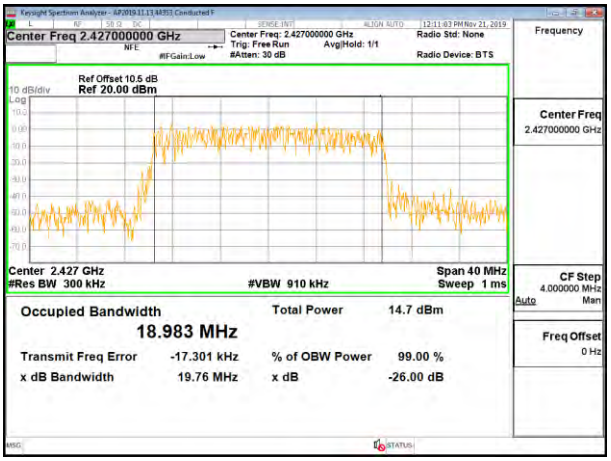
LOW CHANNEL 1



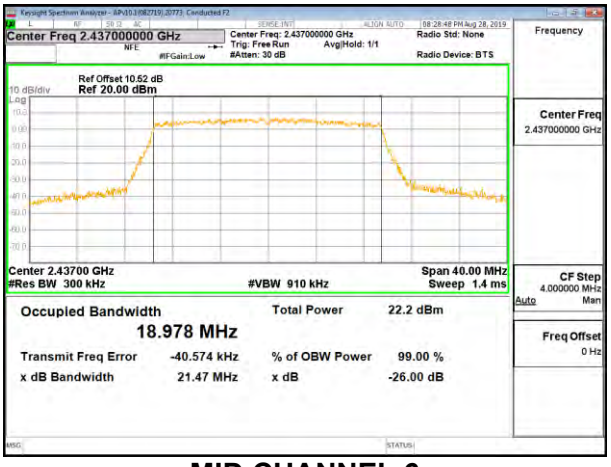
LOW CHANNEL 2



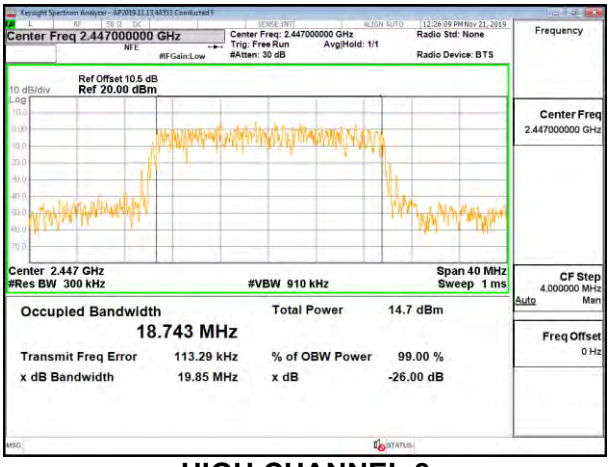
LOW CHANNEL 3



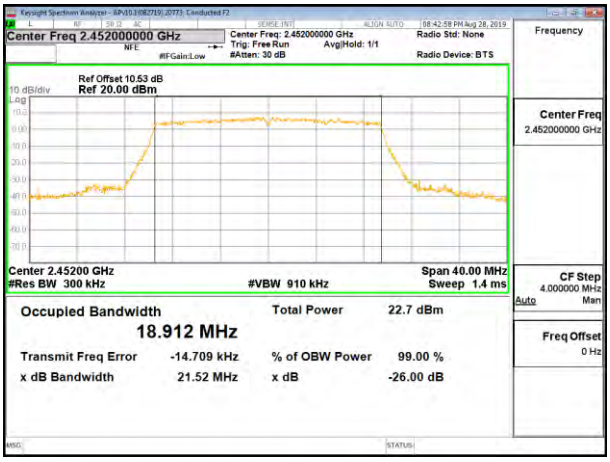
LOW CHANNEL 4



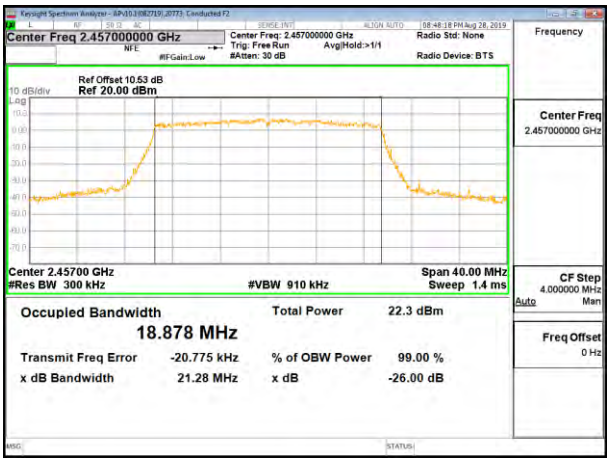
MID CHANNEL 6



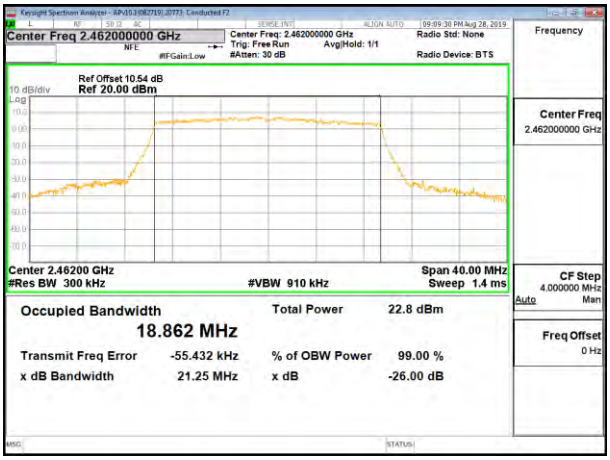
HIGH CHANNEL 8



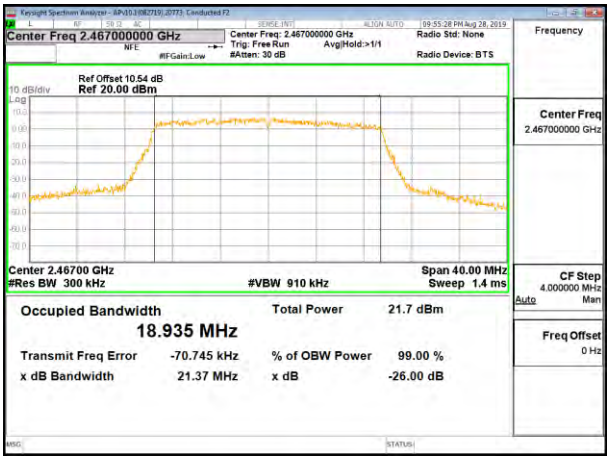
HIGH CHANNEL 9



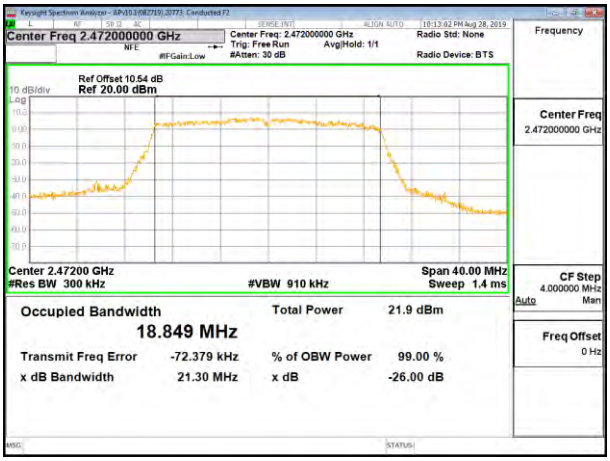
HIGH CHANNEL 10



HIGH CHANNEL 11



HIGH CHANNEL 12



HIGH CHANNEL 13

LAT3 LEGACY SISO MODE: 26-Tones, RU Index 0

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	18.564
Low 2	2417	18.471
Low 3	2422	18.419
Low 4	2427	18.316
Mid 6	2437	18.447
High 8	2447	18.595
High 9	2452	18.572
High 10	2457	18.498
High 11	2462	18.422
High 12	2467	18.369
High 13	2472	18.224

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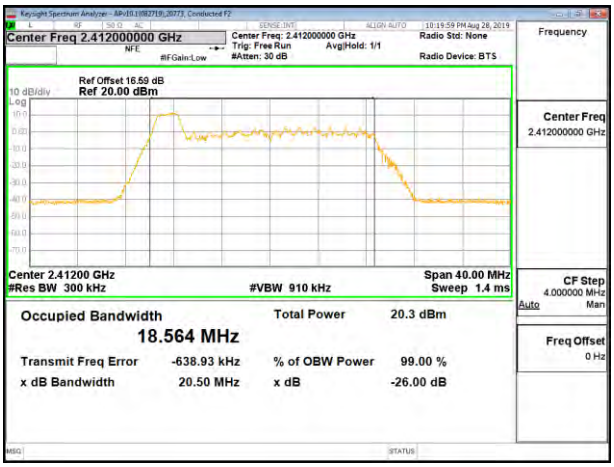
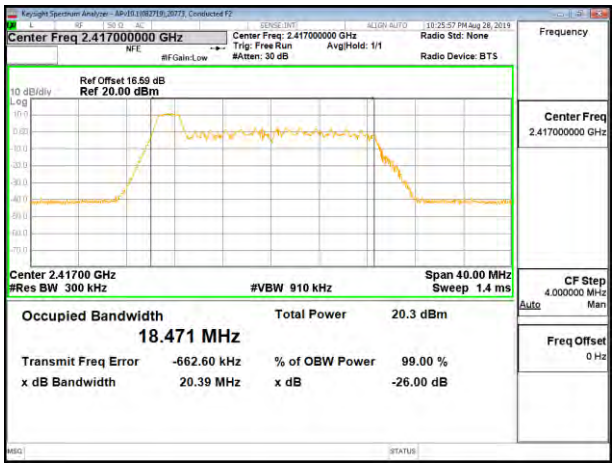
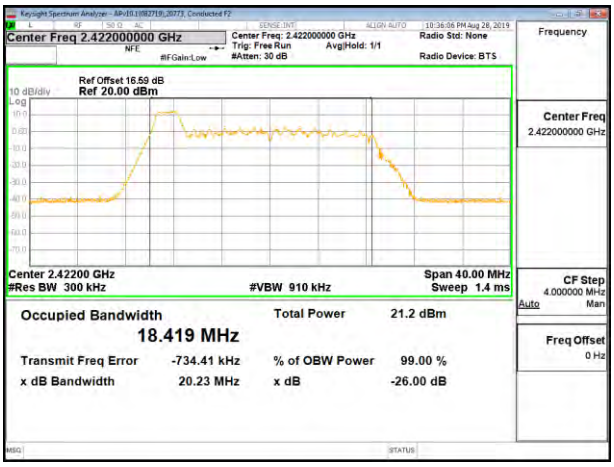


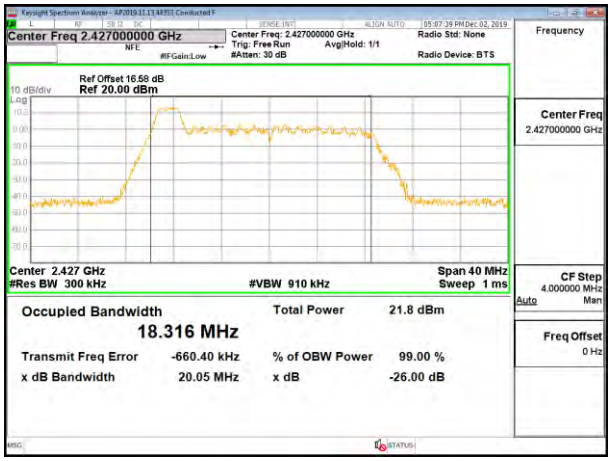
LOW CHANNEL 1



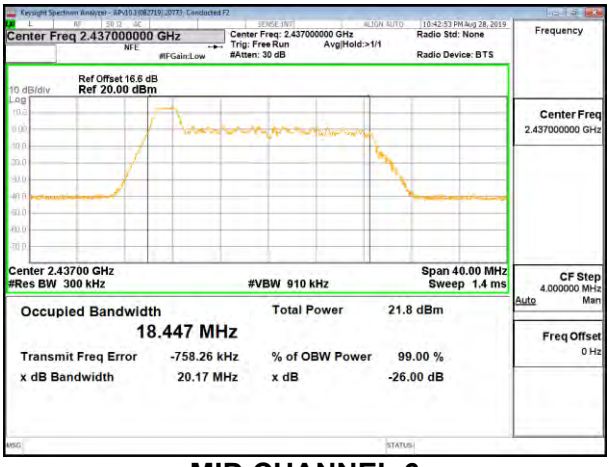
LOW CHANNEL 2



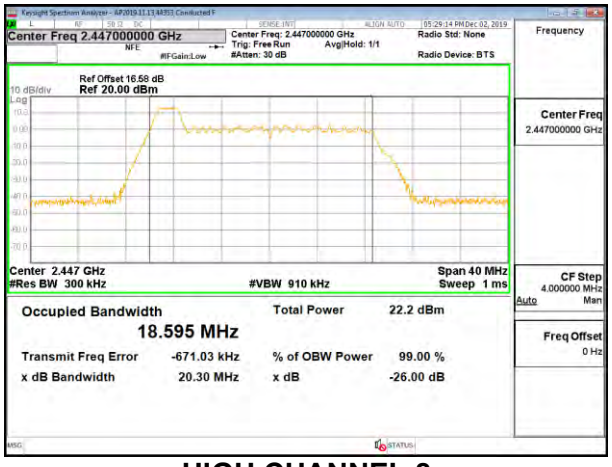
LOW CHANNEL 3



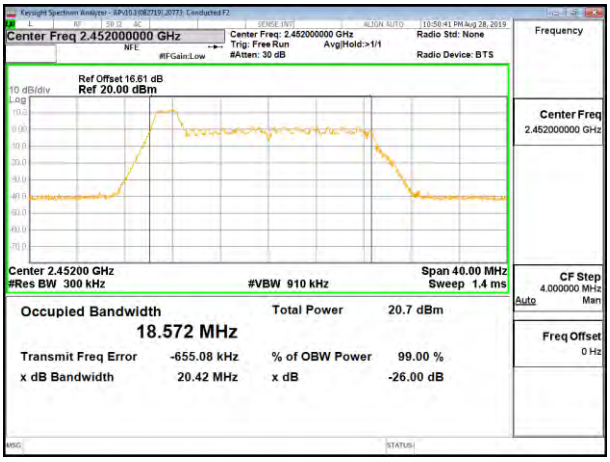
LOW CHANNEL 4



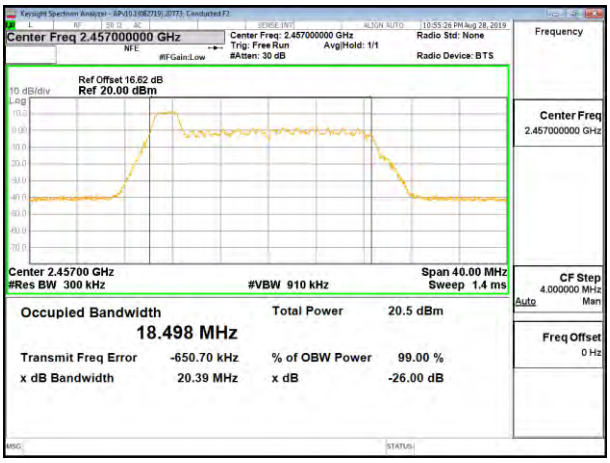
MID CHANNEL 6



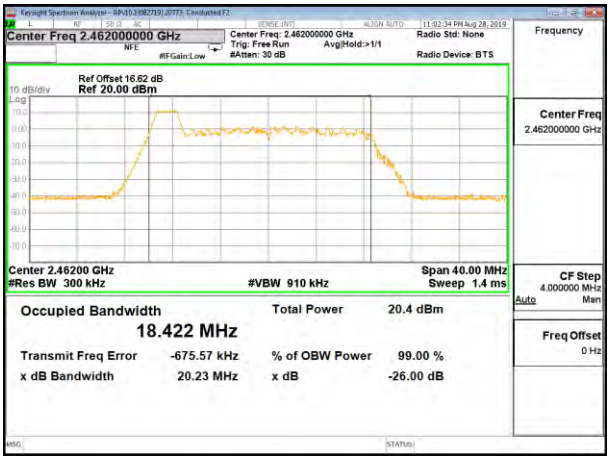
HIGH CHANNEL 8



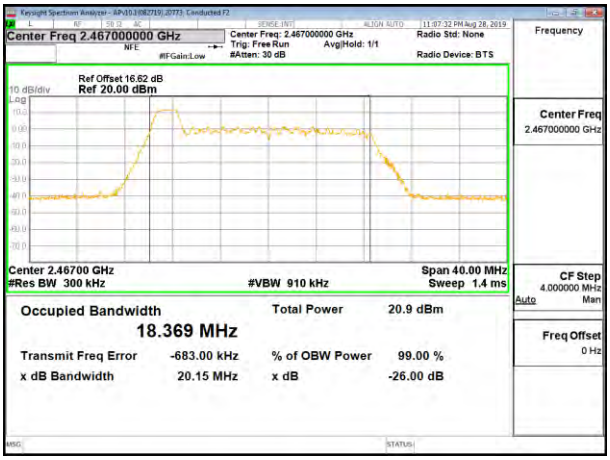
HIGH CHANNEL 9



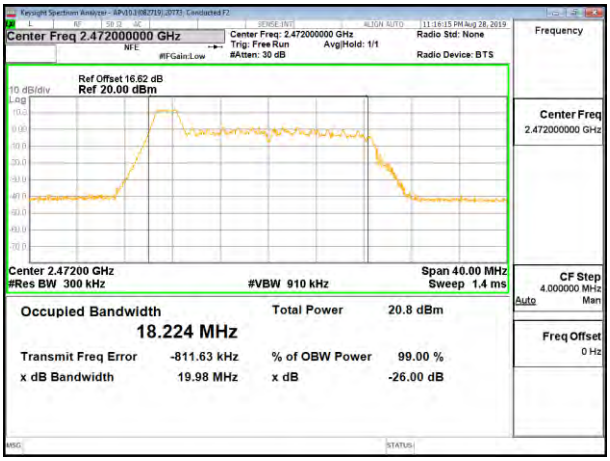
HIGH CHANNEL 10



HIGH CHANNEL 11



HIGH CHANNEL 12



HIGH CHANNEL 13

LAT3 LEGACY SISO MODE: 26-Tones, RU Index 4

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	17.081
Low 2	2417	17.016
Low 3	2422	17.041
Low 4	2427	17.005
Mid 6	2437	17.303
High 8	2447	17.221
High 9	2452	17.214
High 10	2457	17.113
High 11	2462	17.029
High 12	2467	17.118
High 13	2472	17.020

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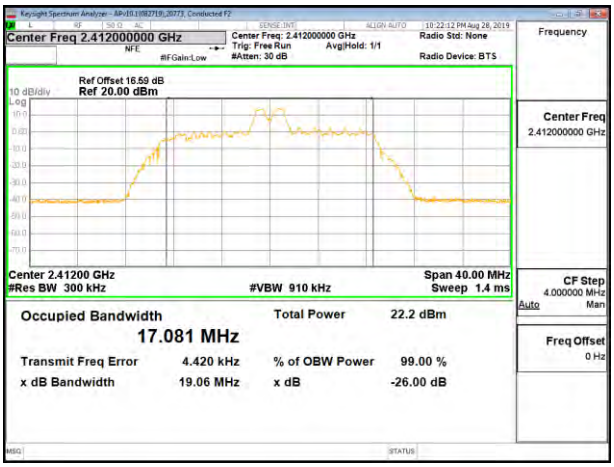
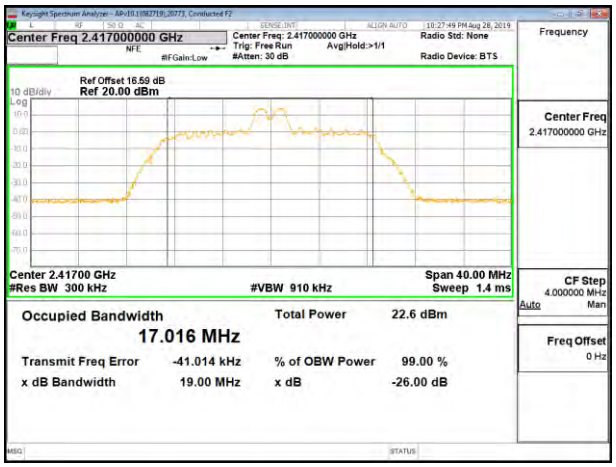
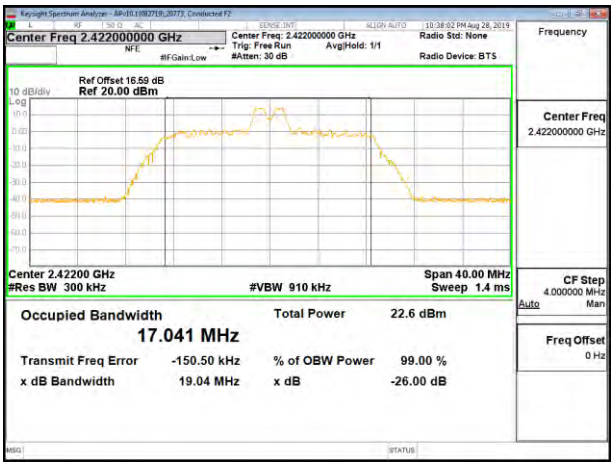


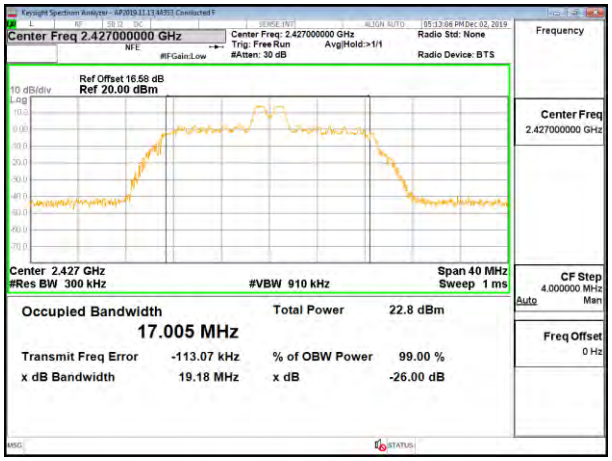
LOW CHANNEL 1



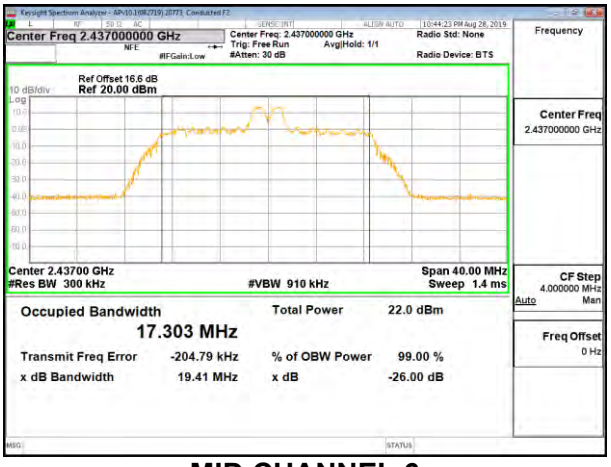
LOW CHANNEL 2



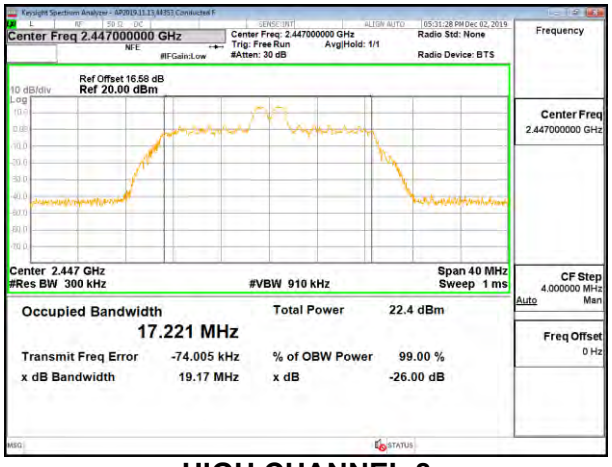
LOW CHANNEL 3



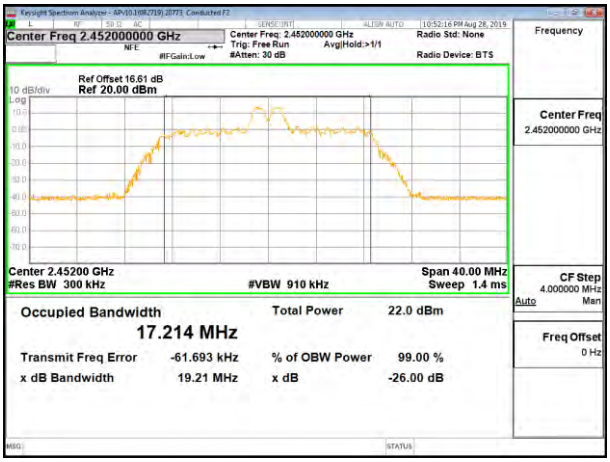
LOW CHANNEL 4



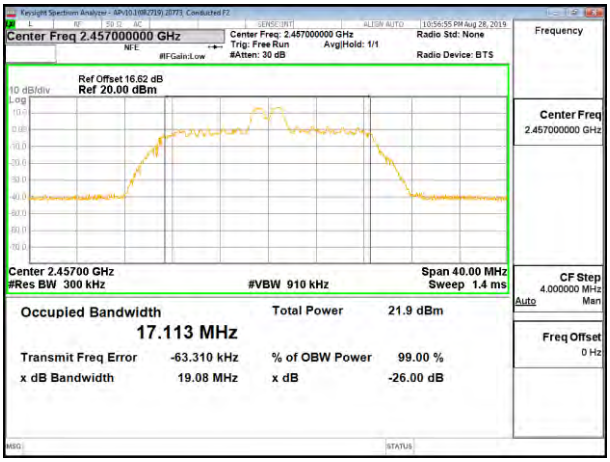
MID CHANNEL 6



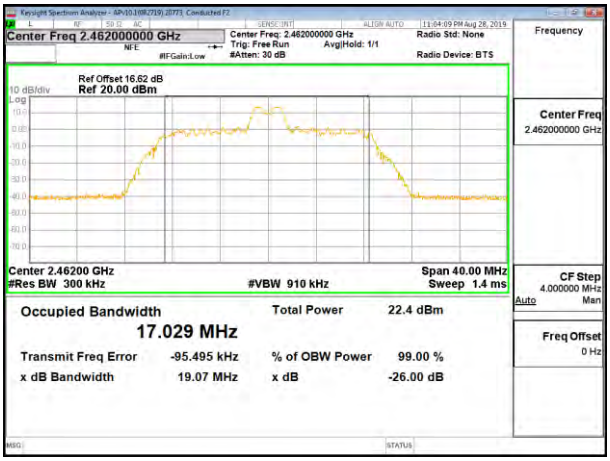
HIGH CHANNEL 8



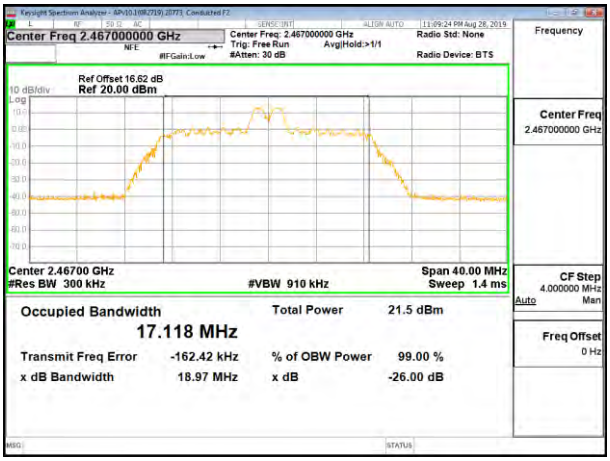
HIGH CHANNEL 9



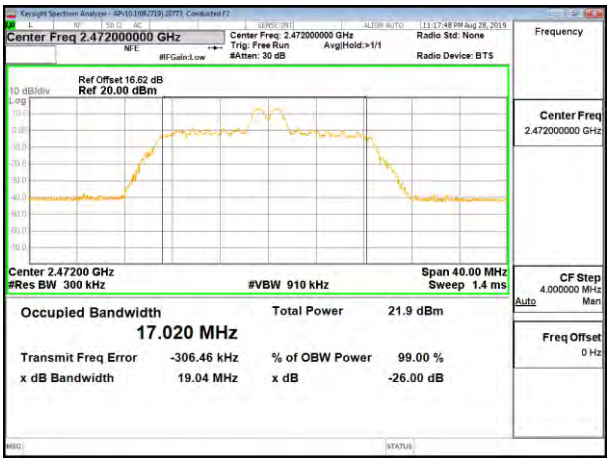
MID CHANNEL 10



HIGH CHANNEL 11



HIGH CHANNEL 12



HIGH CHANNEL 13

LAT3 LEGACY SISO MODE: 26-Tones, RU Index 8

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	18.443
Low 2	2417	18.435
Low 3	2422	18.656
Low 4	2427	18.821
Mid 6	2437	18.779
High 8	2447	18.608
High 9	2452	18.651
High 10	2457	18.647
High 11	2462	18.555
High 12	2467	18.706
High 13	2472	18.774

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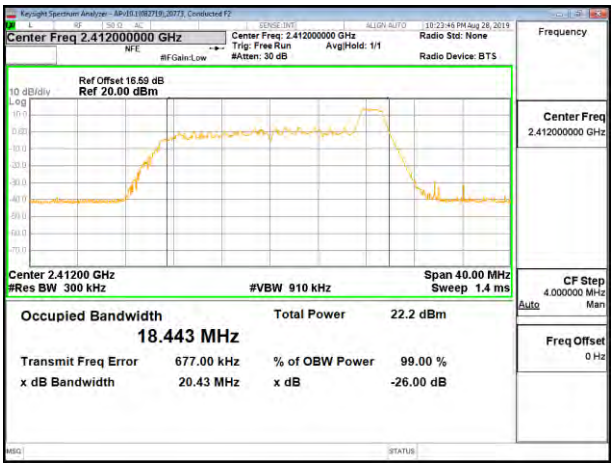
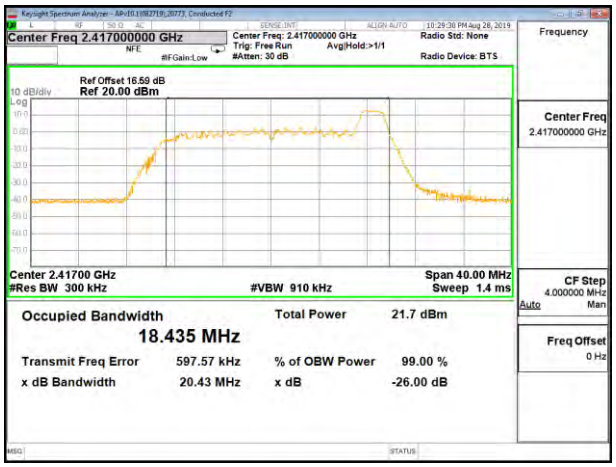
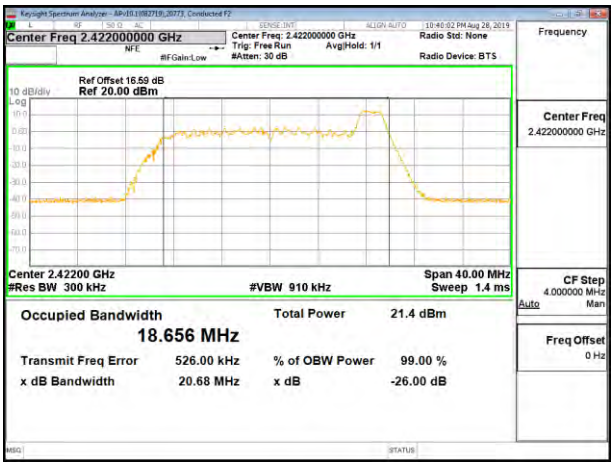


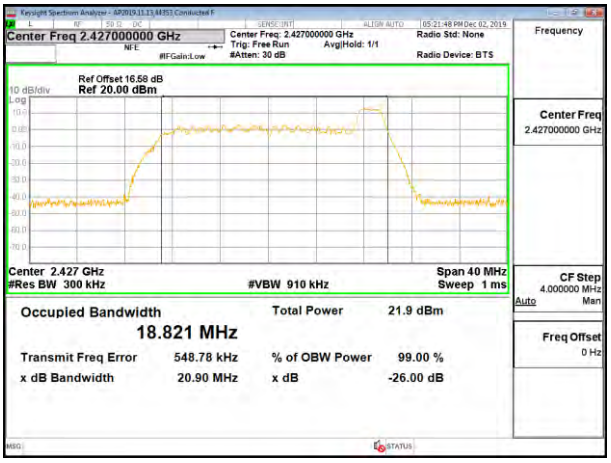
LOW CHANNEL 1



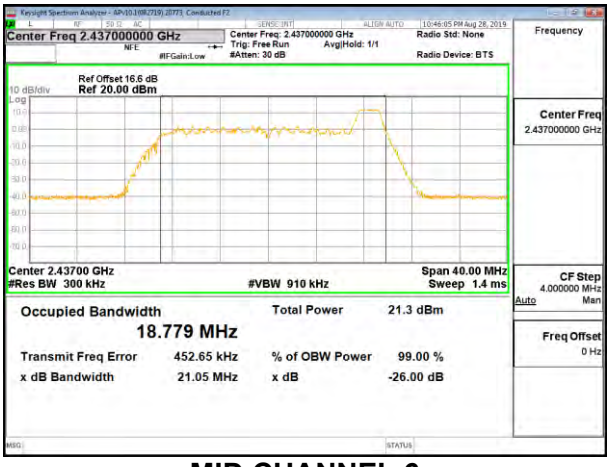
LOW CHANNEL 2



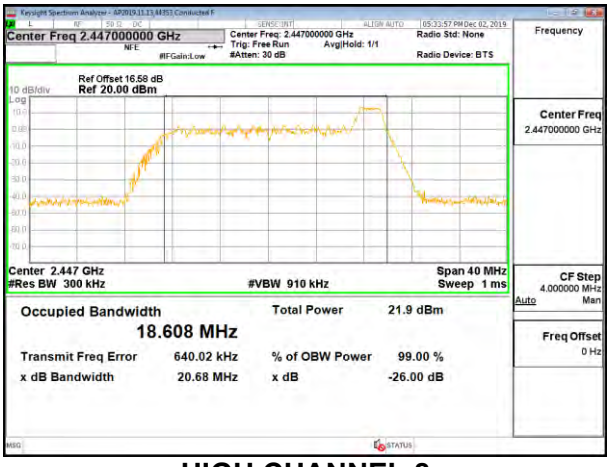
LOW CHANNEL 3



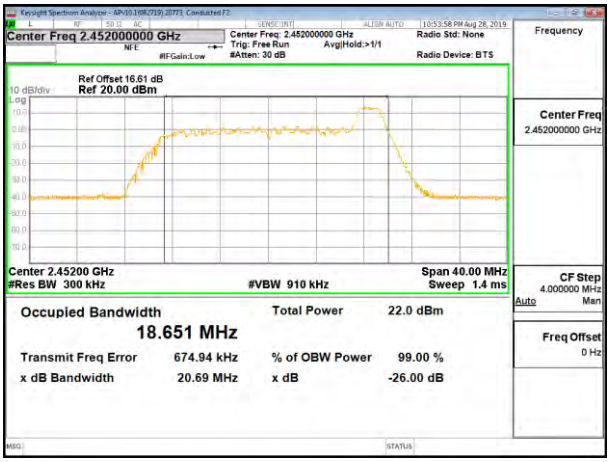
LOW CHANNEL 4



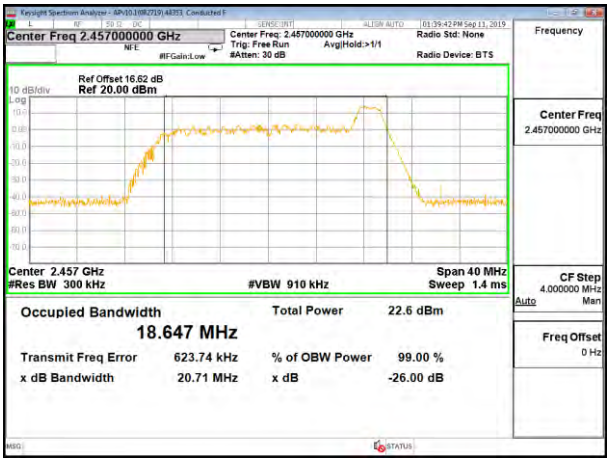
MID CHANNEL 6



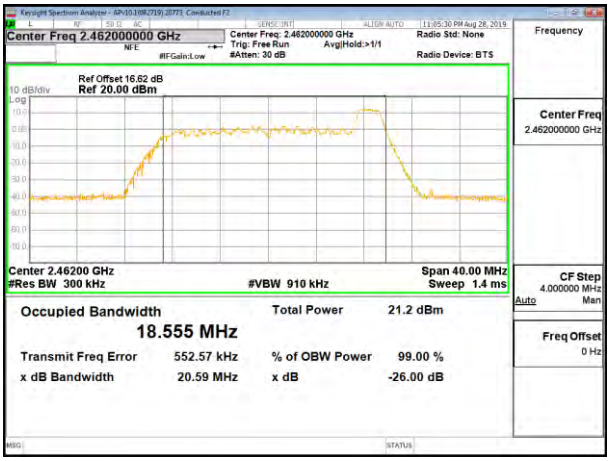
HIGH CHANNEL 8



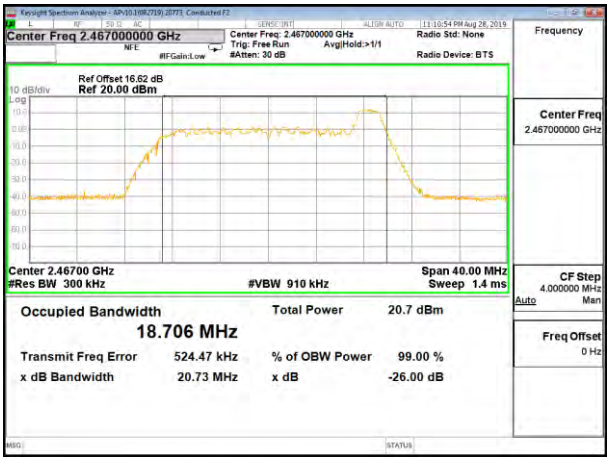
HIGH CHANNEL 9



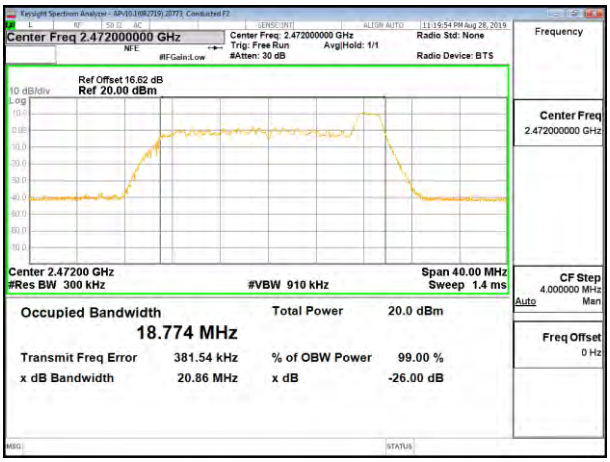
HIGH CHANNEL 10



HIGH CHANNEL 11



HIGH CHANNEL 12



HIGH CHANNEL 13

LAT3 LEGACY SISO MODE: 242-Tones, RU Index 61

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	18.879
Low 2	2417	18.880
Low 3	2422	18.891
Low 4	2427	18.762
Mid 6	2437	19.022
High 8	2447	19.013
High 9	2452	18.900
High 10	2457	18.927
High 11	2462	18.890
High 12	2467	18.879
High 13	2472	18.830

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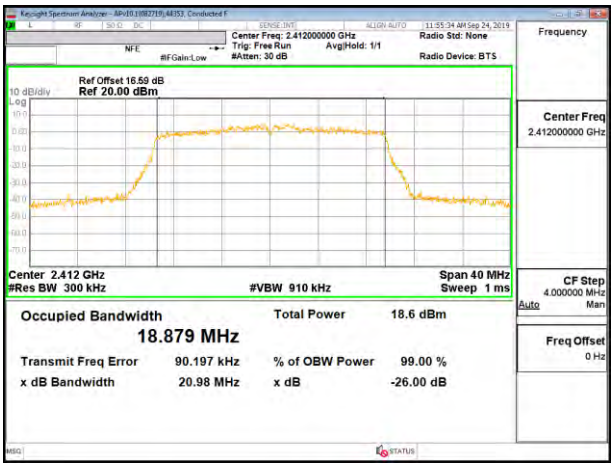
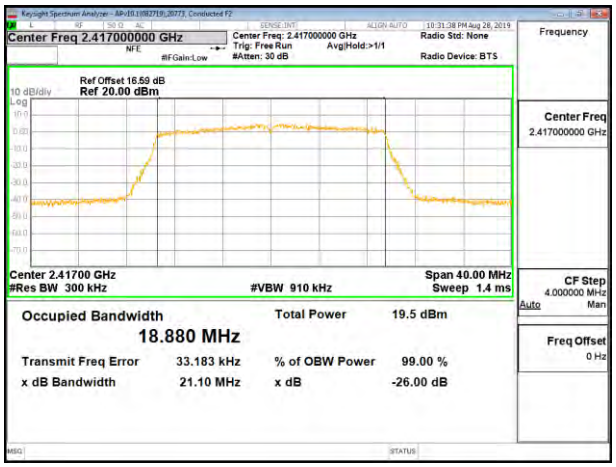
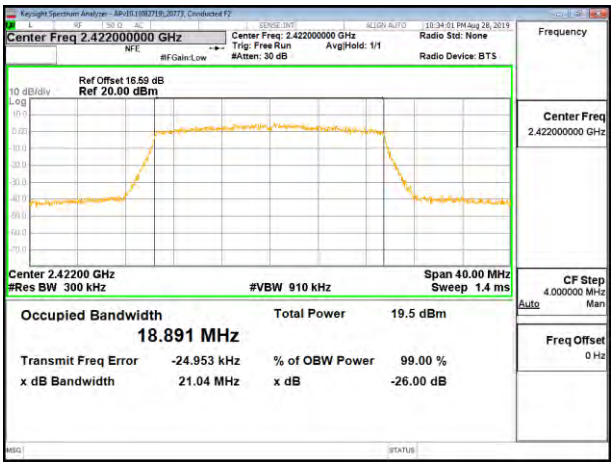


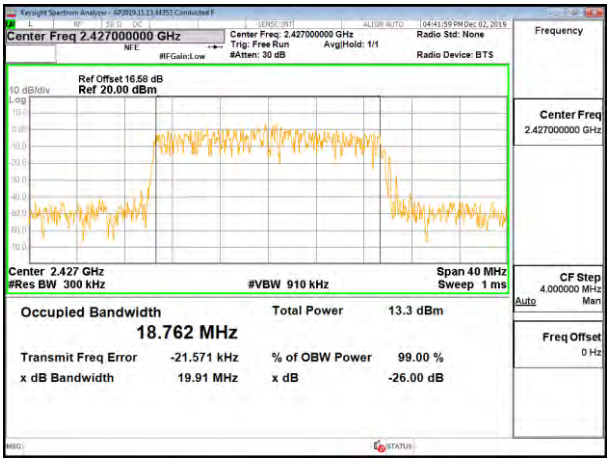
LOW CHANNEL 1



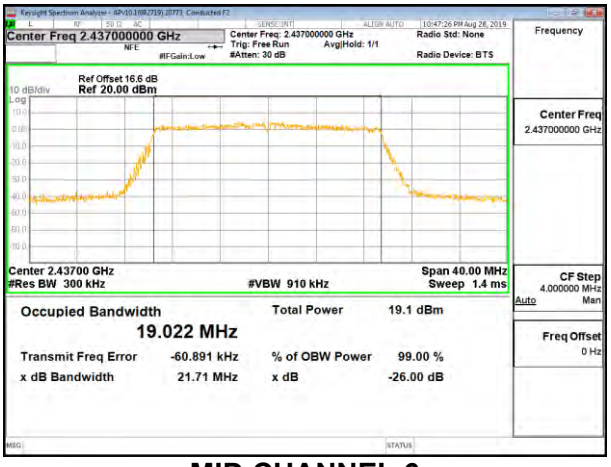
LOW CHANNEL 2



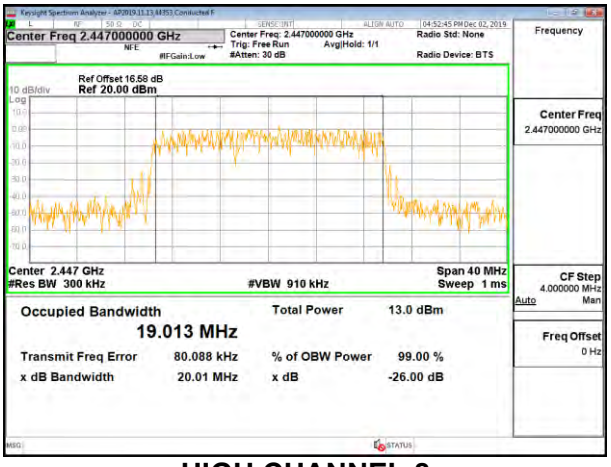
LOW CHANNEL 3



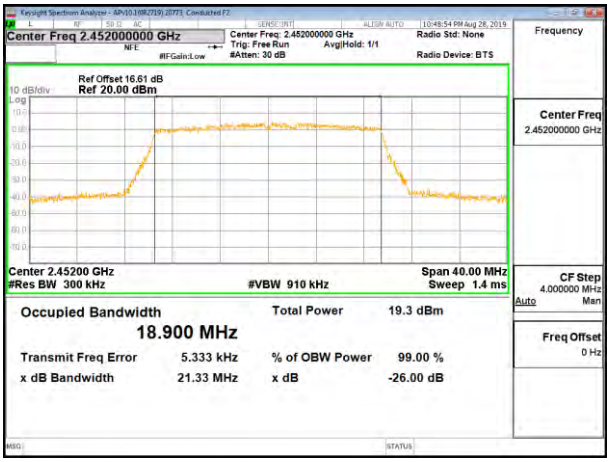
LOW CHANNEL 4



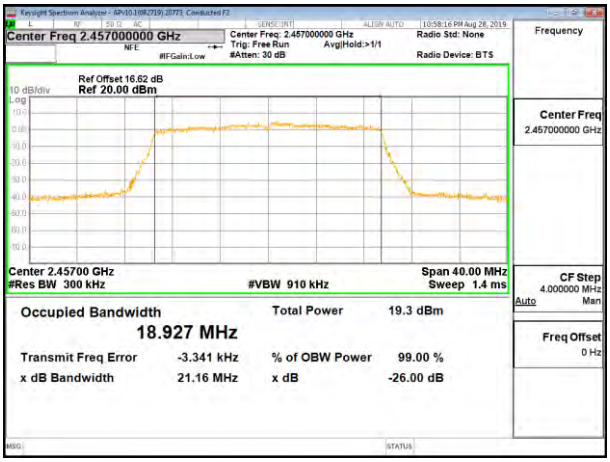
MID CHANNEL 6



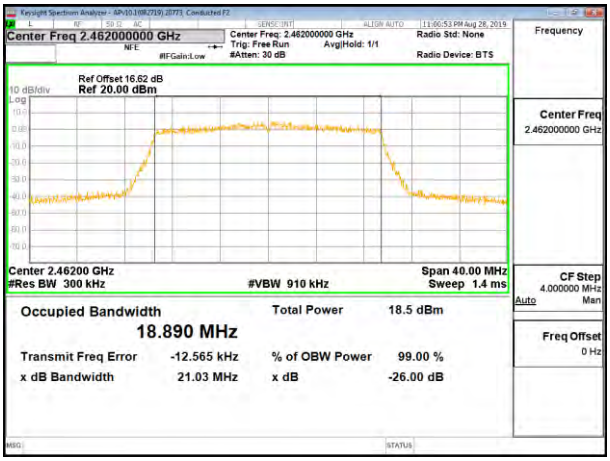
HIGH CHANNEL 8



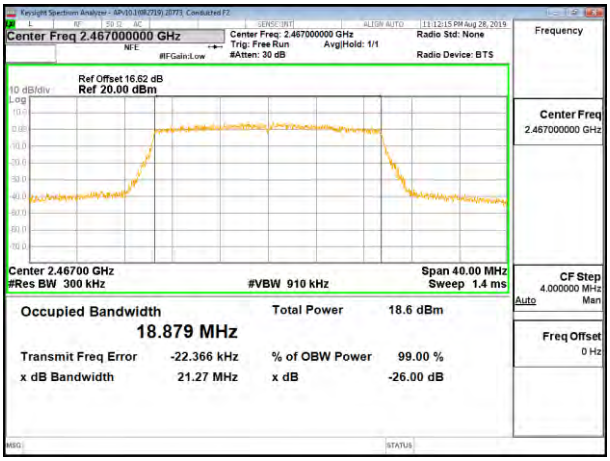
HIGH CHANNEL 9



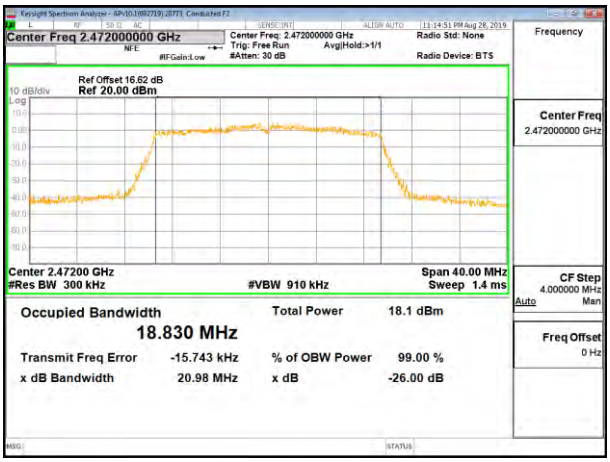
HIGH CHANNEL 10



HIGH CHANNEL 11



HIGH CHANNEL 12

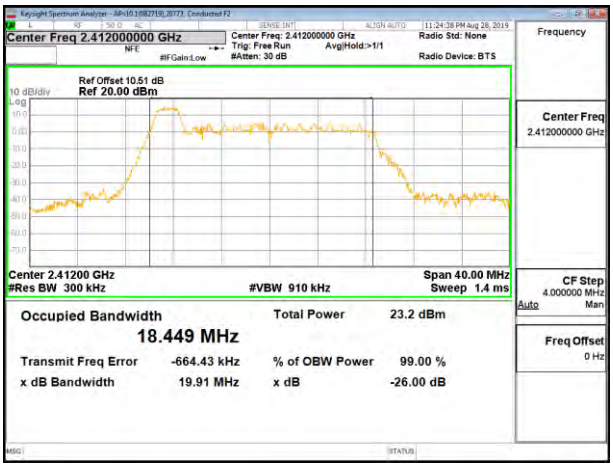


HIGH CHANNEL 13

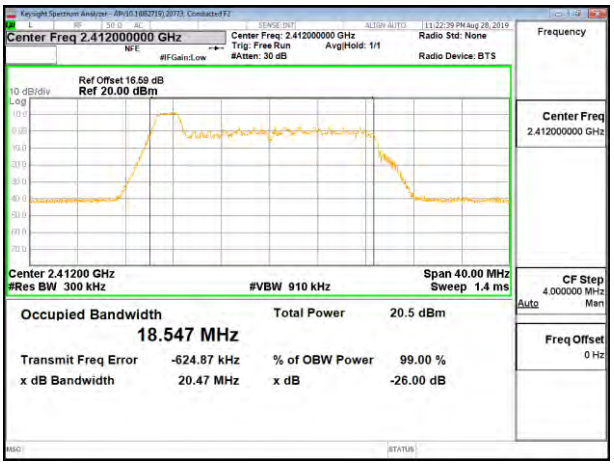
8.2.5. 802.11ax HE20 OFDMA MODE 2TX

UAT1 + LAT3 2TX MODE: 26-Tones, RU Index 0

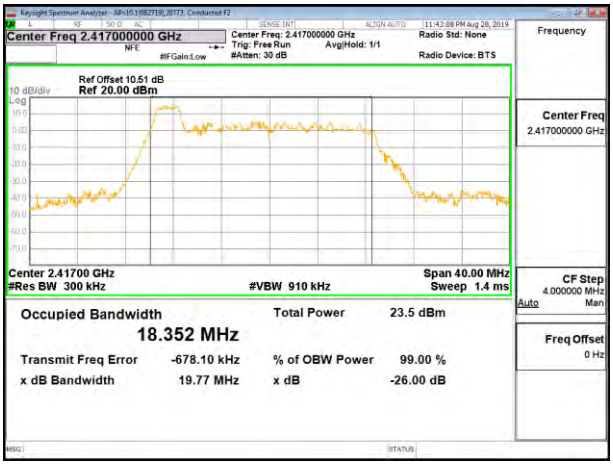
Channel	Frequency (MHz)	99% Bandwidth UAT 1 (MHz)	99% Bandwidth LAT 3 (MHz)
Low 1	2412	18.449	18.547
Low 2	2417	18.352	18.454
Low 3	2422	18.359	18.339
Low 4	2427	18.182	18.359
Mid 6	2437	18.265	18.374
High 8	2447	18.420	18.567
High 9	2452	18.335	18.496
High 10	2457	18.328	18.505
High 11	2462	18.193	18.456
High 12	2467	18.062	18.405
High 13	2472	17.730	18.066



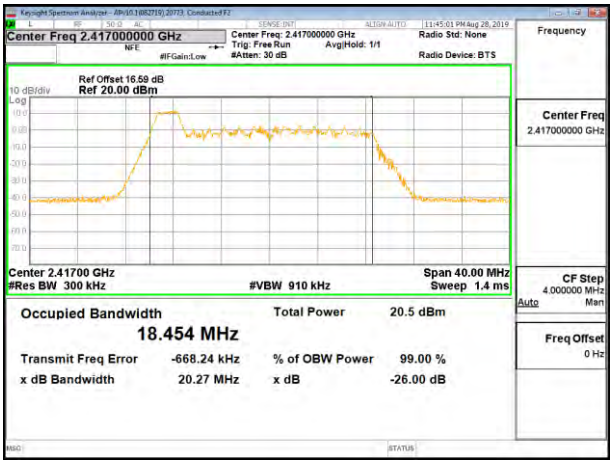
LOW CHANNEL 1 UAT 1



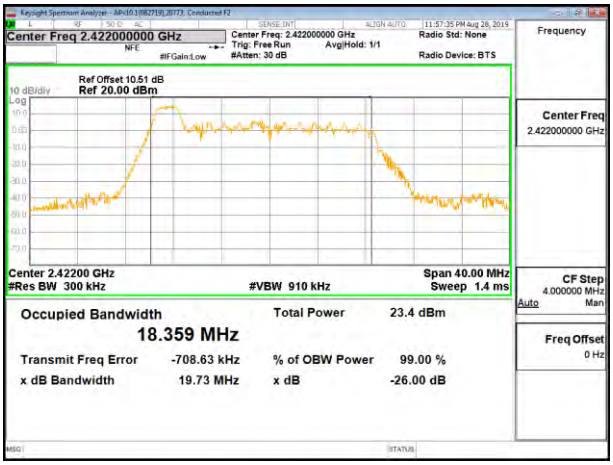
LOW CHANNEL 1 LAT 3



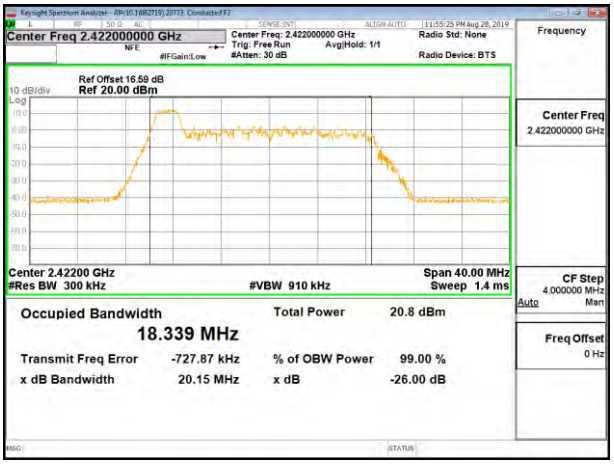
LOW CHANNEL 2 UAT 1



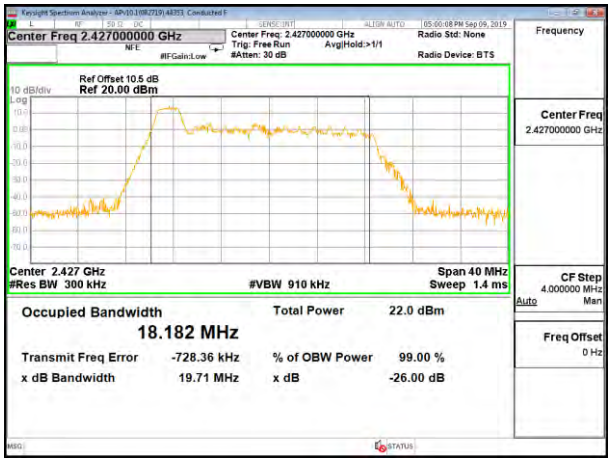
LOW CHANNEL 2 LAT 3



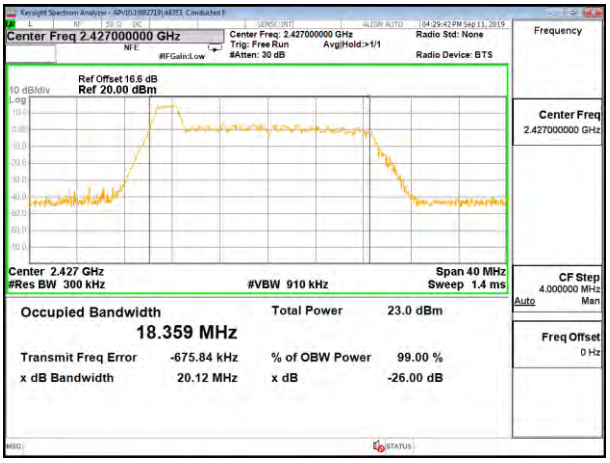
LOW CHANNEL 3 UAT 1



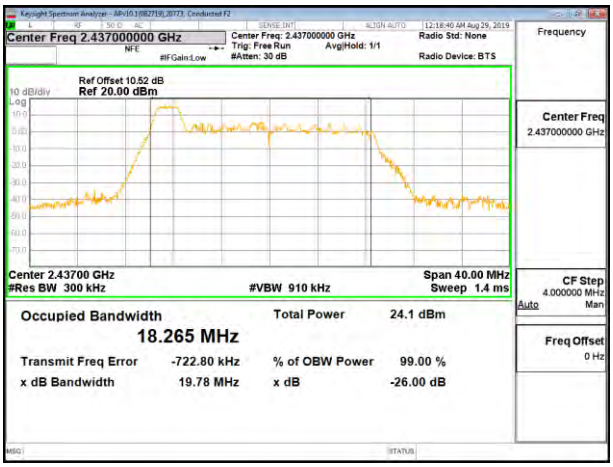
LOW CHANNEL 3 LAT 3



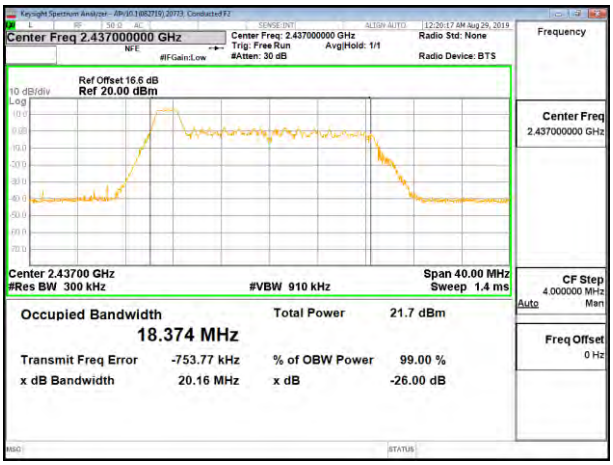
LOW CHANNEL 4 UAT 1



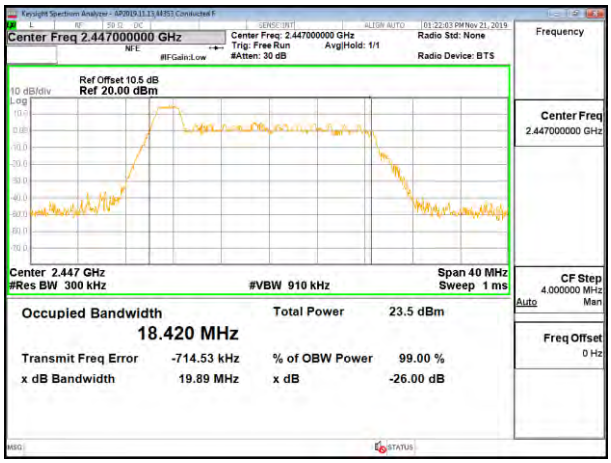
LOW CHANNEL 4 LAT 3



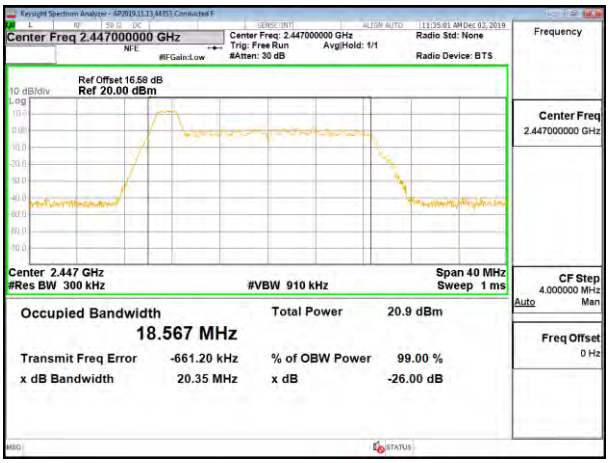
MID CHANNEL 6 UAT 1



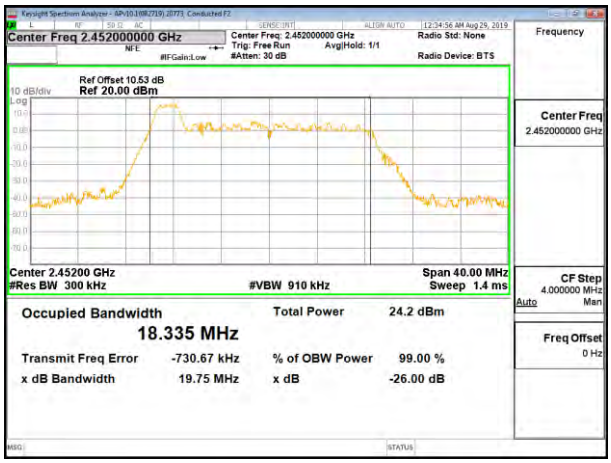
MID CHANNEL 6 LAT 3



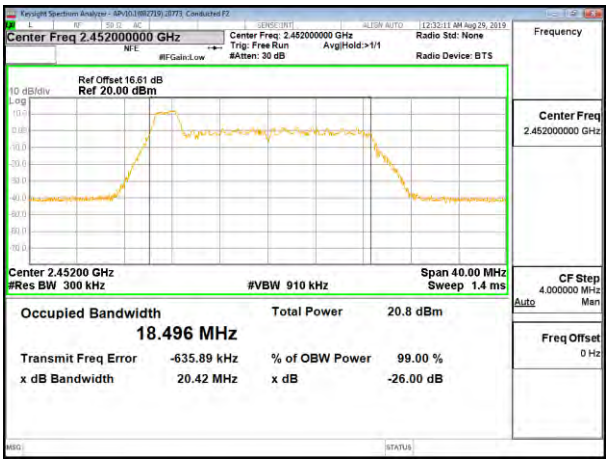
HIGH CHANNEL 8 UAT 1



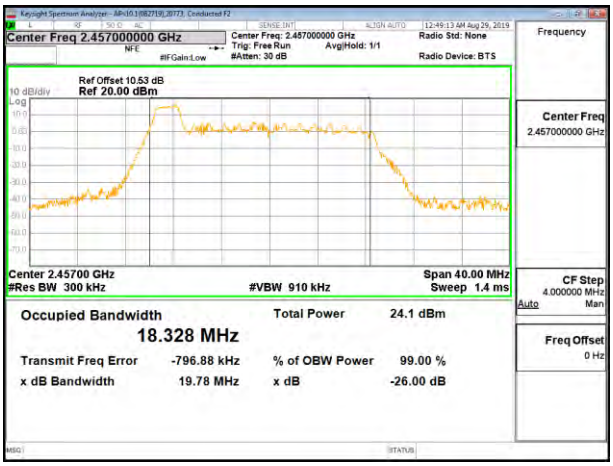
HIGH CHANNEL 8 LAT 3



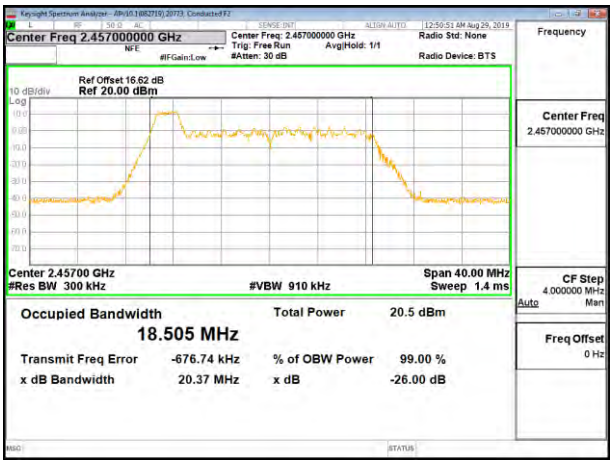
HIGH CHANNEL 9 UAT 1



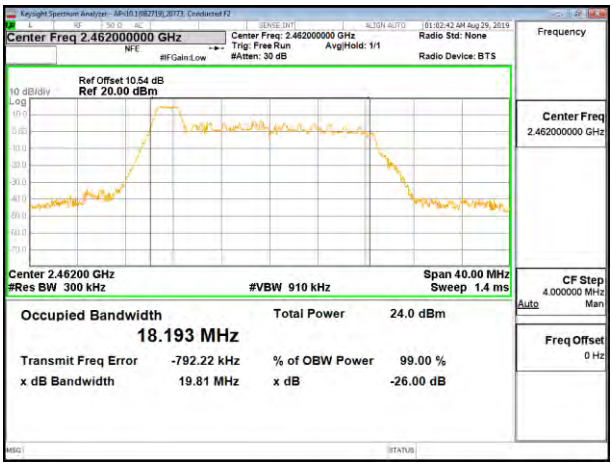
HIGH CHANNEL 9 LAT 3



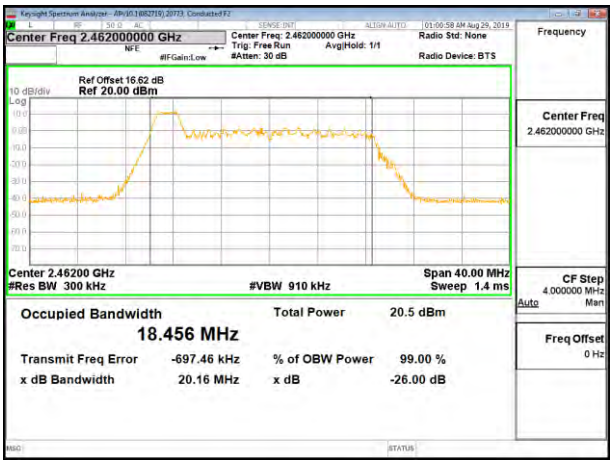
HIGH CHANNEL 10 UAT 1



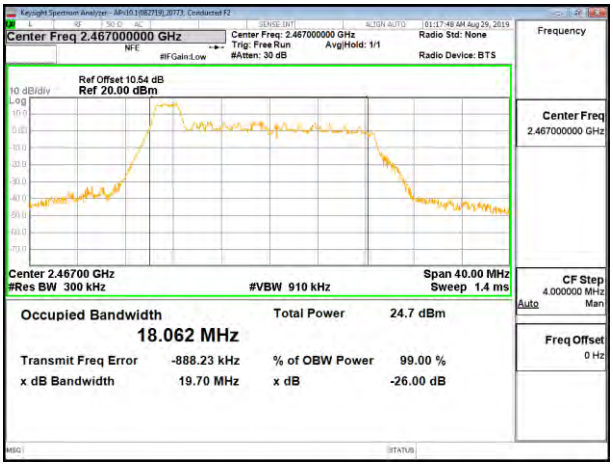
HIGH CHANNEL 10 LAT 3



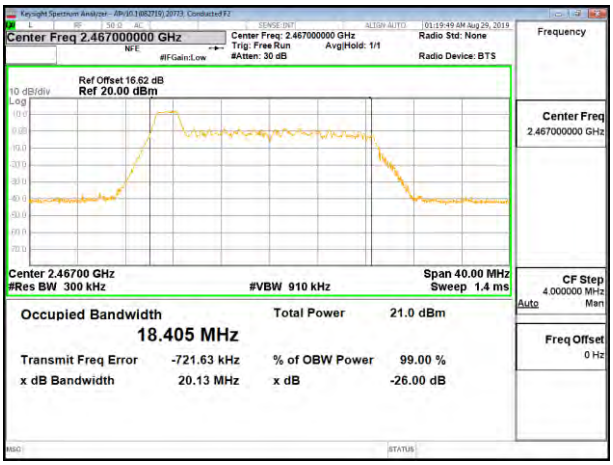
HIGH CHANNEL 11 UAT 1



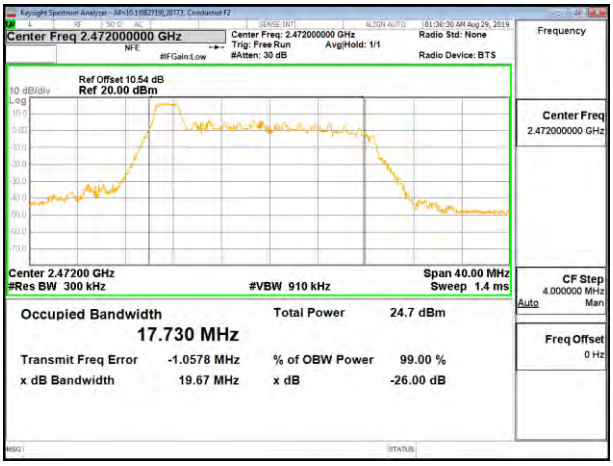
HIGH CHANNEL 11 LAT 3



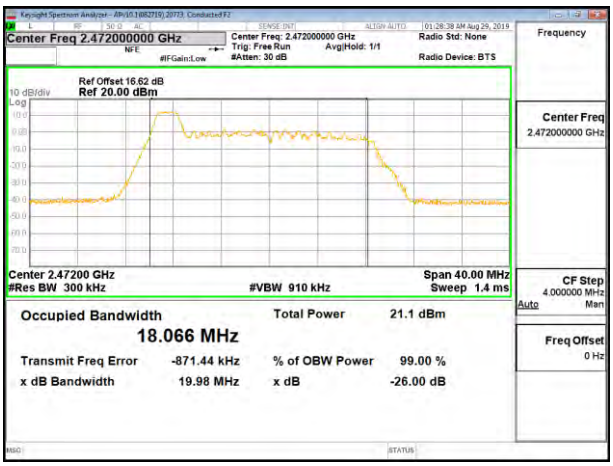
HIGH CHANNEL 12 UAT 1



HIGH CHANNEL 12 LAT 3



HIGH CHANNEL 13 UAT 1



HIGH CHANNEL 13 LAT 3

UAT1 + LAT3 2TX MODE: 26-Tones, RU Index 4

Channel	Frequency (MHz)	99% Bandwidth UAT 1 (MHz)	99% Bandwidth LAT 3 (MHz)
Low 1	2412	16.699	17.011
Low 2	2417	16.683	17.004
Low 3	2422	16.716	17.041
Low 4	2427	16.717	17.083
Mid 6	2437	16.849	17.344
High 8	2447	16.845	17.250
High 9	2452	16.759	17.176
High 10	2457	16.566	17.039
High 11	2462	16.617	17.063
High 12	2467	16.631	17.083
High 13	2472	16.253	16.752

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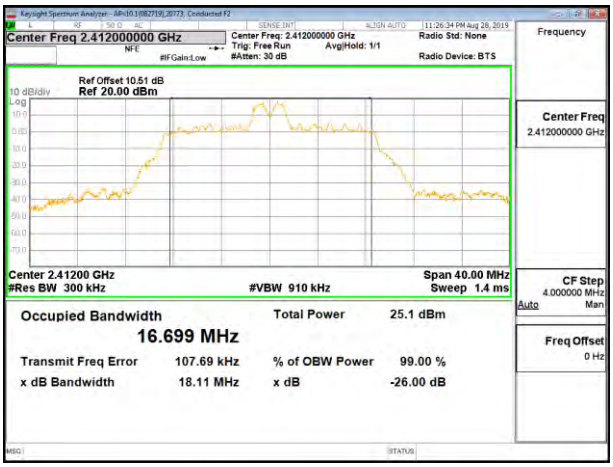
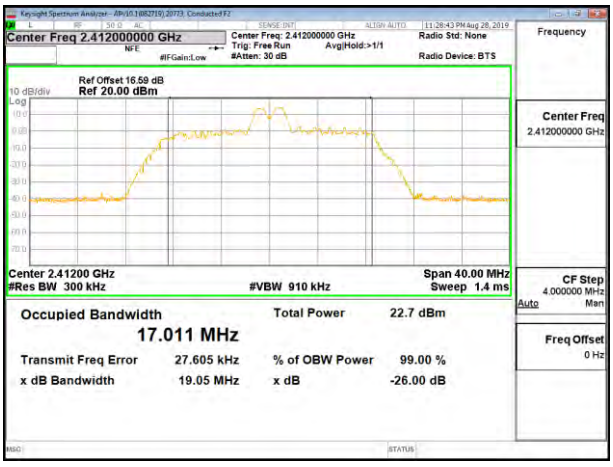
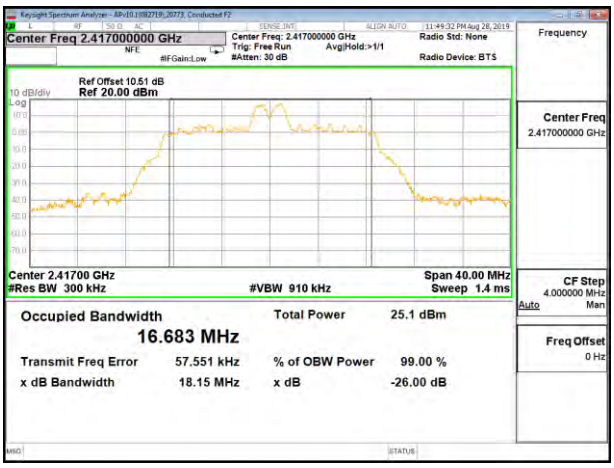


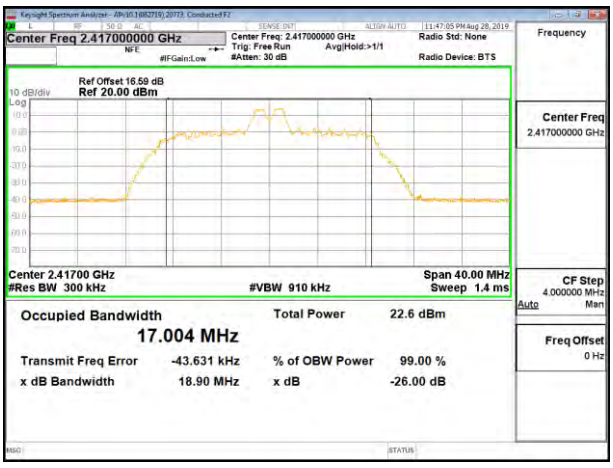
LOW CHANNEL 1 UAT 1



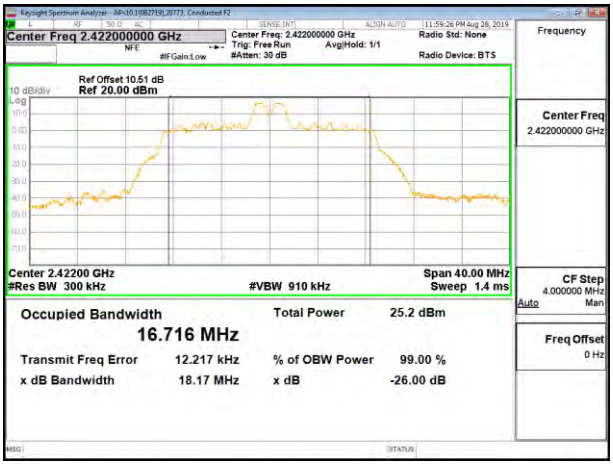
LOW CHANNEL 1 LAT 3



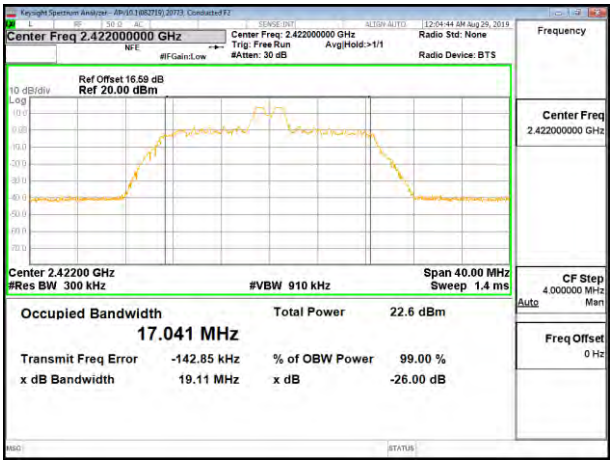
LOW CHANNEL 2 UAT 1



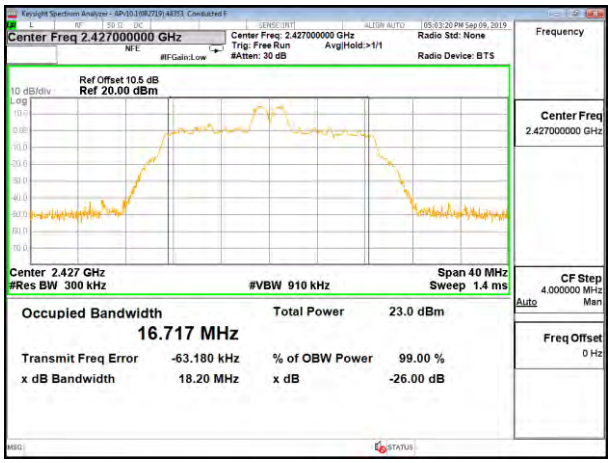
LOW CHANNEL 2 LAT 3



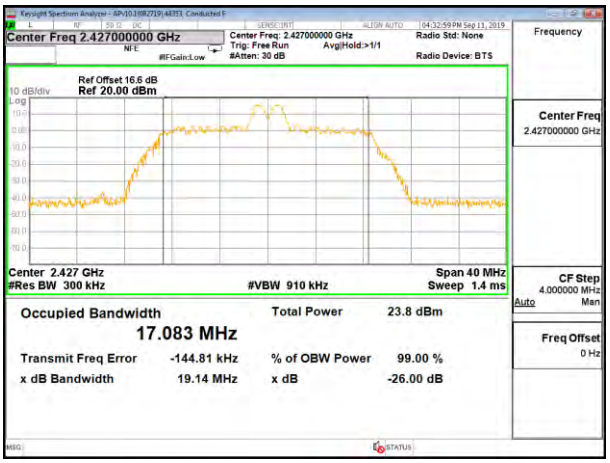
LOW CHANNEL 3 UAT 1



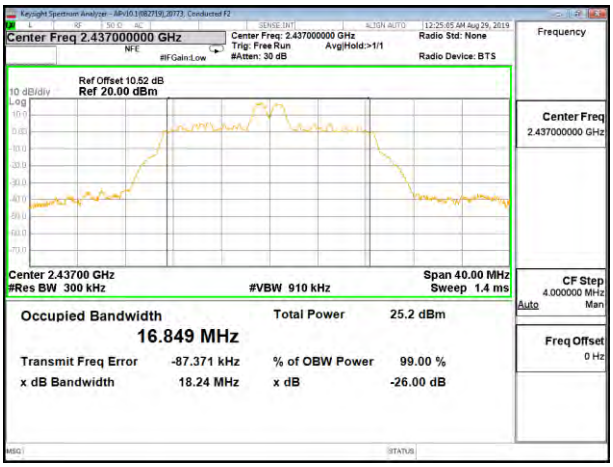
LOW CHANNEL 3 LAT 3



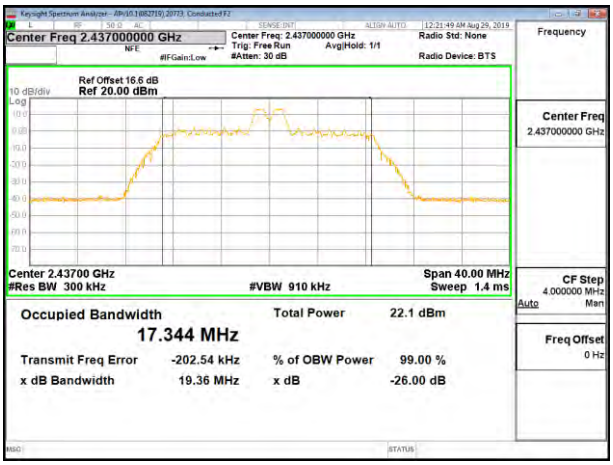
LOW CHANNEL 4 UAT 1



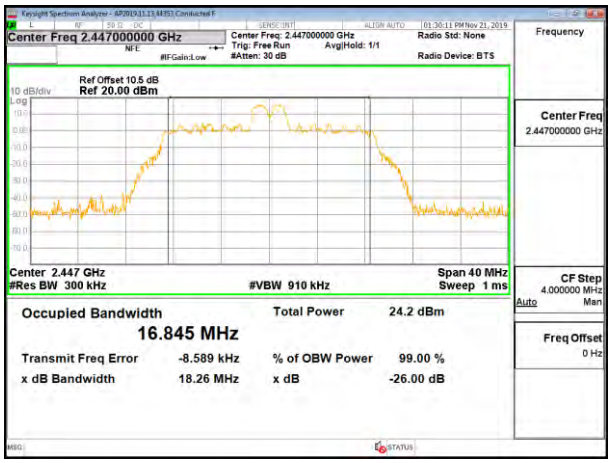
LOW CHANNEL 4 LAT 3



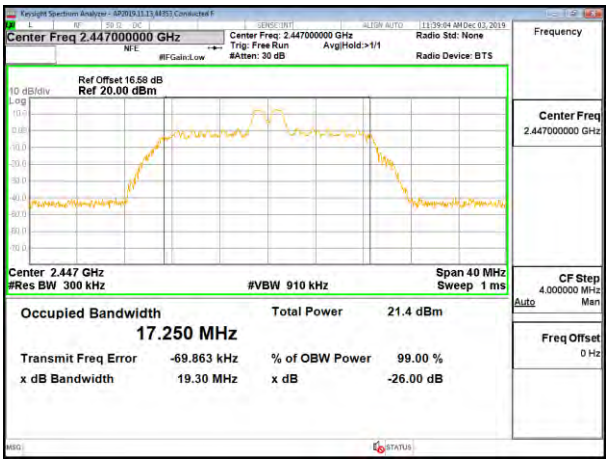
MID CHANNEL 6 UAT 1



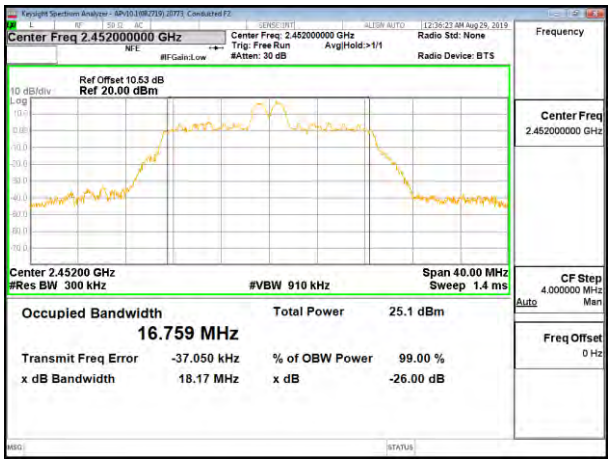
MID CHANNEL 6 LAT 3



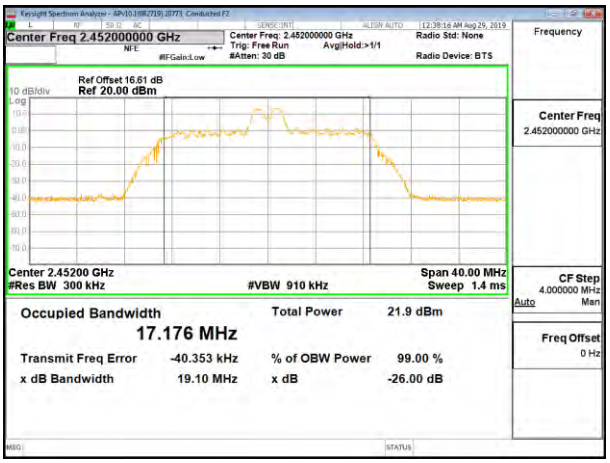
HIGH CHANNEL 8 UAT 1



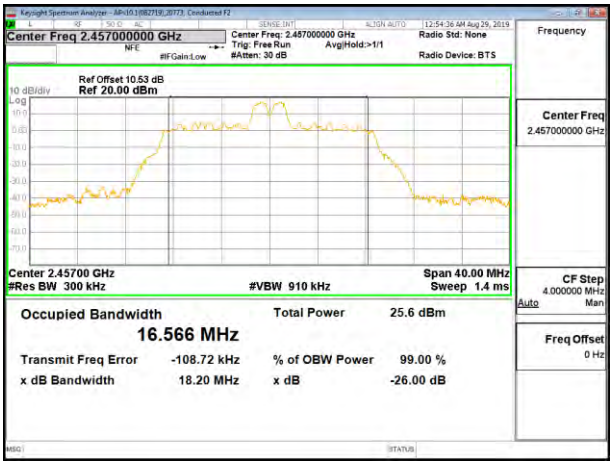
HIGH CHANNEL 8 LAT 3



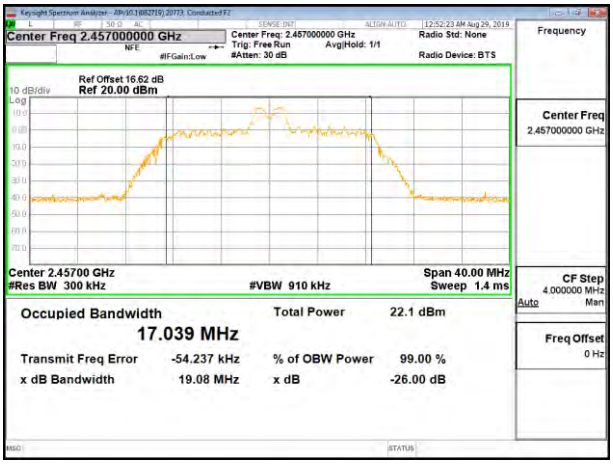
HIGH CHANNEL 9 UAT 1



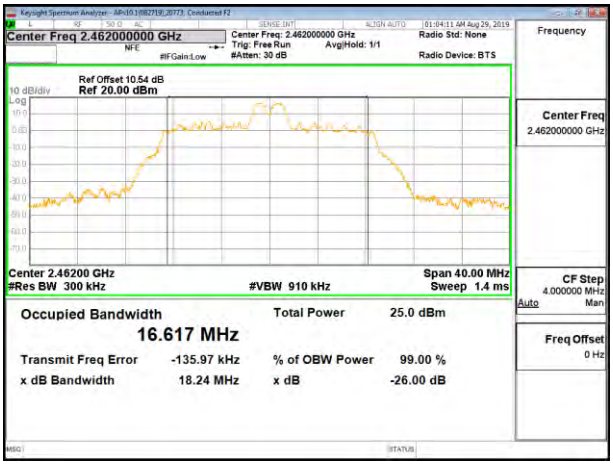
HIGH CHANNEL 9 LAT 3



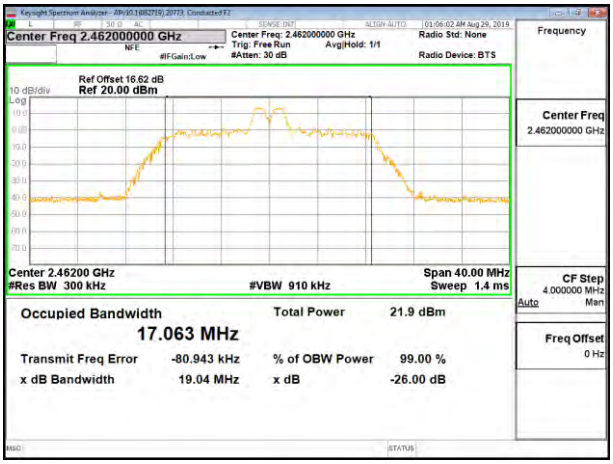
HIGH CHANNEL 10 UAT 1



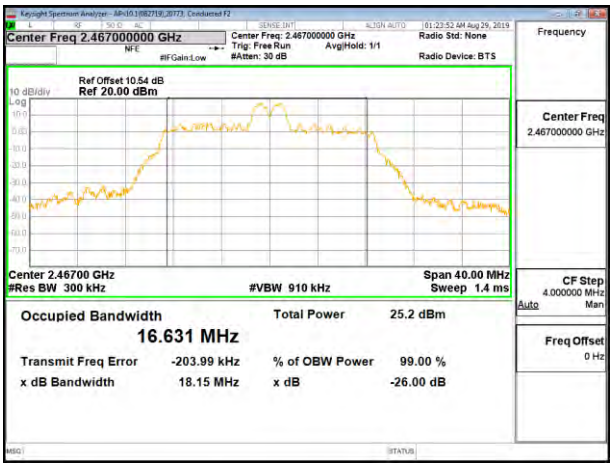
HIGH CHANNEL 10 LAT 3



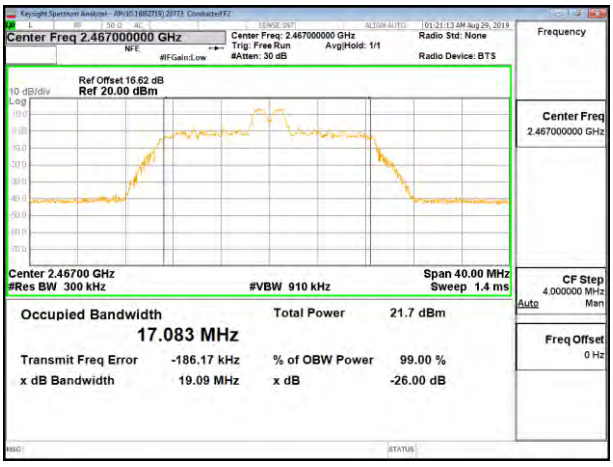
HIGH CHANNEL 11 UAT 1



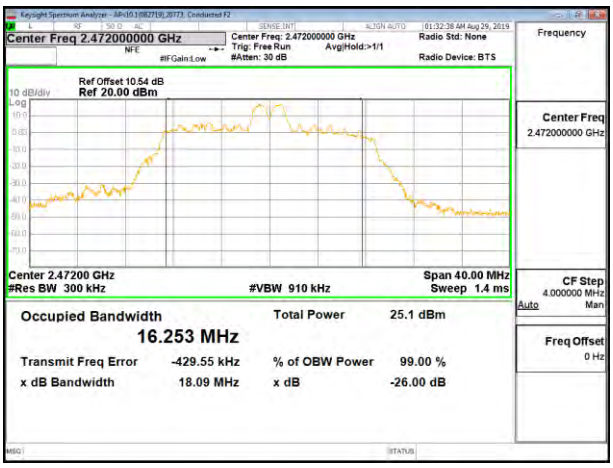
HIGH CHANNEL 11 LAT 3



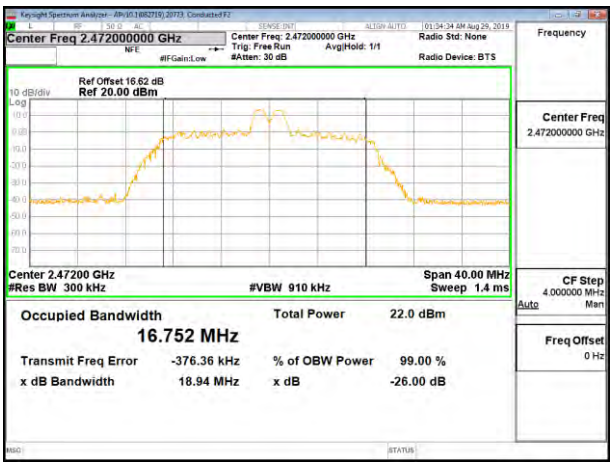
HIGH CHANNEL 12 UAT 1



HIGH CHANNEL 12 LAT 3



HIGH CHANNEL 13 UAT 1



HIGH CHANNEL 13 LAT 3

UAT1 + LAT3 2TX MODE: 26-Tones, RU Index 8

Channel	Frequency (MHz)	99% Bandwidth UAT 1 (MHz)	99% Bandwidth LAT 3 (MHz)
Low 1	2412	18.211	18.438
Low 2	2417	18.190	18.521
Low 3	2422	18.372	18.518
Low 4	2427	18.487	18.709
Mid 6	2437	18.476	18.738
High 8	2447	18.285	18.727
High 9	2452	18.370	18.585
High 10	2457	18.418	18.629
High 11	2462	18.442	18.691
High 12	2467	18.446	18.659
High 13	2472	18.475	18.763

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