TEST REPORT

Report Number: 14982479-E28V3

Applicant	:	APPLE INC. 1 APPLE PARK WAY CUPERTINO, CA 95014, U.S.A.
Model	:	A3084 (Parent Model) A3295, A3296, A3297 (Variant Models)
Brand	:	APPLE
FCC ID	:	BCG-E8684A (Parent Model) BCG-E8685A, BCG-E8686A, BCG-E8687A (Variant Models)
EUT Description	:	SMARTPHONE
Test Standard(s)	:	FCC 47 CFR PART 15 SUBPART E

Date Of Issue:
2024/08/19

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

ACCREDITED
CERT #0751.05

REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	2024/08/14	Initial Review	Tony Li
V2	2024/08/17	Addressed TCB Feedback on sections 6 and 9	Tony Li
V3	2024/08/19	Updated sample calculations in section 9	Tony Li

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.

TABLE OF CONTENTS

REPORT REVISION HISTORY **2**

TABLE OF CONTENTS **3**

1. ATTESTATION OF TEST RESULTS **5**

2. TEST RESULT SUMMARY **6**

3. TEST METHODOLOGY **7**

4. FACILITIES AND ACCREDITATION **7**

5. DECISION RULES AND MEASUREMENT UNCERTAINTY **8**

5.1. METROLOGICAL TRACEABILITY *8*

5.2. DECISION RULES *8*

5.3. MEASUREMENT UNCERTAINTY *8*

5.4. SAMPLE CALCULATION *8*

6. EQUIPMENT UNDER TEST **9**

6.1. EUT DESCRIPTION *9*

6.1.1. EUT DEVICE CLASS 9

6.2. MAXIMUM OUTPUT POWER *10*

6.2.1. VLP 10

6.3. DESCRIPTION OF AVAILABLE ANTENNAS AND CABLE LOSS *11*

6.4. SOFTWARE AND FIRMWARE *11*

6.5. WORST-CASE CONFIGURATION AND MODE *12*

6.5.1. VLP 13

6.6. DESCRIPTION OF TEST SETUP *14*

7. MEASUREMENT METHOD **15**

8. TEST AND MEASUREMENT EQUIPMENT **16**

9. ANTENNA PORT TEST RESULTS **17**

9.1. ON TIME AND DUTY CYCLE *17*

9.2. VLP 26 dB AND 99% BANDWIDTH *19*

9.2.1. 802.11be SISO MODE IN THE UNII-5 BAND 20

9.2.2. 802.11be MIMO CDD MODE IN THE UNII-5 BAND 22

9.2.3. 802.11be MIMO SDM MODE IN THE UNII-5 BAND 24

9.2.4. 802.11be SISO MODE IN THE UNII-7 BAND 26

9.2.5. 802.11be MIMO CDD MODE IN THE UNII-7 BAND 28

9.2.6. 802.11be MIMO SDM MODE IN THE UNII-7 BAND 30

9.3. VLP OUTPUT POWER AND PSD *32*

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.

9.3.1. 802.11be SISO MODE IN THE UNII-5 BAND – VERY LOW POWER 35
9.3.2. 802.11be MIMO CDD MODE IN THE UNII-5 BAND – VERY LOW POWER.....37
9.3.3. 802.11be MIMO SDM MODE IN THE UNII-5 BAND – VERY LOW POWER 39
9.3.4. 802.11be SISO MODE IN THE UNII-7 BAND – VERY LOW POWER 41
9.3.5. 802.11be MIMO CDD MODE IN THE UNII-7 BAND – VERY LOW POWER.....43
9.3.6. 802.11be MIMO SDM MODE IN THE UNII-7 BAND – VERY LOW POWER 45

9.4. VLP SPURIOUS EMMISSIONS IN-BAND– EMISSION MASK 47
9.4.1. 802.11be EHT20 MODE IN THE UNII-5 BAND.....48
9.4.2. 802.11be EHT40 MODE IN THE UNII-5 BAND.....58
9.4.3. 802.11be EHT80 MODE IN THE UNII-5 BAND.....71
9.4.4. 802.11be EHT160 MODE IN THE UNII-5 BAND.....85
9.4.5. 802.11be EHT20 MODE IN THE UNII-7 BAND.....97
9.4.6. 802.11be EHT40 MODE IN THE UNII-7 BAND.....107
9.4.7. 802.11be EHT80 MODE IN THE UNII-7 BAND.....120
9.4.8. 802.11be EHT160 MODE IN THE UNII-7 BAND.....134

10. SETUP PHOTOS.....142

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

Applicant Name and Address	APPLE INC. 1 APPLE PARK WAY CUPERTINO, CA 95014, U.S.A.
Model	A3084 (Parent Model) A3295, A3296, A3297 (Variant Models)
Brand	APPLE
FCC ID	BCG-E8684A (Parent Model) BCG-E8685A, BCG-E8686A, BCG-E8687A (Variant Models)
EUT Description	SMARTPHONE
Serial Number	JGC6NFQ65D
Sample Receipt Date	2024/07/31
Date Tested	2024/07/23 to 2024/08/16
Applicable Standards	CFR 47 Part 15 Subpart E
Test Results	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 A2LA, NIST, any agency of the Federal Government, or any agency of the U.S. government.

Approved & Released By:	Prepared & Reviewed By:
Francisco de Anda Staff Engineer UL Verification Services, Inc.	Tony Li Lead Test Engineer 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 RESULT SUMMARY

This report contains data provided by the customer which can impact the validity of results. UL Verification Services Inc. is only responsible for correctly integrating customer-provided data with measurements performed by UL Verification Services Inc.

Below is a list of the data provided by the customer:

1. Antenna gain and type (see section 6.3)
2. Cable loss (see section 6.3)

Requirement Description	Requirement Clause Number (FCC)	Result	Comment
Duty Cycle	-	Reporting purposes only	ANSI C63.10 Section 12.2
99% BW	§15.407 (a) (11) KDB 987594 D03 v02 Q18	Compliant	ANSI C63.10 Section 6.9.3
26dB BW			ANSI C63.10 Section 6.9.3
Output Power EIRP	§15.407 (a) (9)	Compliant	Dual Client
PSD EIRP	§15.407 (a) (9)	Compliant	Dual Client
Emissions outside 5.925-7.125 GHz band	§15.407 (b) (6)	Compliant	None
Emissions within 5.925-7.125 GHz Band (Emissions Mask)	§15.407 (b) (7)	Compliant	None
Unwanted emissions in restricted bands	§15.205	Compliant	None

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.

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with:
- FCC CFR 47 Part 2
- FCC CFR 47 Part 15
- FCC KDB 662911 D01 v02r01
- FCC KDB 789033 D02 v02r01
- FCC KDB 987594 D01 General Requirements v02r02
- FCC KDB 987594 D02 EMC Measurement v02r01
- ANSI C63.10-2013

4. FACILITIES AND ACCREDITATION

UL Verification Services Inc. is accredited by A2LA, certification #0751.05, for all testing performed within the scope of this report. Testing was performed at the locations noted below.

	Address	ISED CABID	ISED Company Number	FCC Registration
☐	Building 1: 47173 Benicia Street, Fremont, CA 94538, USA	US0104	2324A	550739
☒	Building 2: 47266 Benicia Street, Fremont, CA 94538, USA			
☐	Building 3: 843 Auburn Court, Fremont, CA 94538 USA			
☐	Building 4: 47658 Kato Rd, Fremont, CA 94538 USA			
☐	Building 5: 47670 Kato Rd, Fremont, CA 94538 USA			

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. DECISION RULES AND MEASUREMENT UNCERTAINTY

5.1. 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.

5.2. 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.)

5.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	U_{Lab}
Conducted Antenna Port Emission Measurement	1.940 dB
Power Spectral Density	2.466 dB
Time Domain Measurements Using SA	3.39 %
RF Power Measurement Direct Method Using Power Meter	0.450 dB (Ave.) 1.300 dB (PK)
Radio Frequency (Spectrum Analyzer)	141.16 Hz
Occupied Bandwidth	1.22%
Worst Case Conducted Disturbance, 9KHz to 0.15 MHz	3.78 db
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.40 db
Worst Case Radiated Disturbance, 9KHz to 30 MHz	2.87 db
Worst Case Radiated Disturbance, 30 to 1000 MHz	6.01 db
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.73 db
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.51 db
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.29 db

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

5.4. SAMPLE CALCULATION

MAINS CONDUCTED EMISSIONS

Where relevant, the following sample calculation is provided:
Final Voltage (dBuV) = Measured Voltage (dBuV) + Cable Loss (dB) + Limiter Factor (dB) + LISN Insertion Loss.
36.5 dBuV + 0 dB +10.1 dB+ 0 dB = 46.6 dBuV

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.

6. EQUIPMENT UNDER TEST

6.1. EUT DESCRIPTION

The Apple iPhone is a smartphone with cellular GSM, GPRS, EGPRS, WCDMA, LTE, 5GNR1, 5GNR2, IEEE 802.11a/b/g/n/ac/ax/be, Bluetooth (BT), Ultra-Wideband (UWB), Global Positioning System (GPS), Near-Field Communication (NFC), Narrow-Band (NB) UNII, 802.15.4, 802.15.4ab-Narrow Band (NB), WPT and Mobile Satellite Service (MSS) technologies. The rechargeable battery is not user accessible. This device is not user-serviceable and requires special tools to disassemble.

This report covers 6E 802.11 ax/be Wifi radio.

6.1.1. EUT DEVICE CLASS

Class	U-NII Bands of Operation			
	5	6	7	8
Dual Client (6CD) Very Low Power Client (6VL)	☒	☐	☒	☐

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.

6.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum EIRP output power as follows:

6.2.1. VLP

UNII-5 BAND

Frequency Range (MHz)	Mode	Output Power EIRP (dBm)	Output Power EIRP (mW)
UNII-5 Band, 1TX			
6115-6415	802.11be EHT20	4.59	2.88
6125-6405	802.11be EHT40	7.63	5.79
6145-6385	802.11be EHT80	10.63	11.56
6185-6345	802.11be EHT160	12.86	19.32
UNII-5 Band, 2TX			
6115-6415	802.11be EHT20 CDD	1.60	1.45
6115-6415	802.11be EHT20 SDM	4.61	2.89
6125-6405	802.11be EHT40 CDD	4.64	2.91
6125-6405	802.11be EHT40 SDM	7.65	5.82
6145-6385	802.11be EHT80 CDD	7.62	5.78
6145-6385	802.11be EHT80 SDM	10.62	11.53
6185-6345	802.11be EHT160 CDD	9.89	9.75
6185-6345	802.11be EHT160 SDM	12.89	19.45

UNII-7 BAND

Frequency Range (MHz)	Mode	Output Power EIRP (dBm)	Output Power EIRP (mW)
UNII-7 Band 1TX			
6535-6855	802.11be EHT20	4.53	2.84
6565-6845	802.11be EHT40	7.53	5.66
6625-6785	802.11be EHT80	10.53	11.30
6665	802.11be EHT160	12.71	18.66
UNII-7 Band 2TX			
6535-6855	802.11be EHT20 CDD	1.69	1.48
6535-6855	802.11be EHT20 SDM	4.69	2.94
6565-6845	802.11be EHT40 CDD	4.67	2.93
6565-6845	802.11be EHT40 SDM	7.66	5.83
6625-6785	802.11be EHT80 CDD	7.67	5.85
6625-6785	802.11be EHT80 SDM	10.68	11.69
6665	802.11be EHT160 CDD	9.94	9.86
6665	802.11be EHT160 SDM	12.90	19.50

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.

6.3. DESCRIPTION OF AVAILABLE ANTENNAS AND CABLE LOSS

The antenna(s) gain and type, cable loss as provided by the manufacturer' are as follows:

Type: IFA

Band	Frequency Range Sub-band (MHz)	Antenna 6 (dBi)	Antenna 5 (dBi)	Uncorrelated Chains (dBi)	Correlated Chains (dBi)
UNII-5	Sub-band 1 (5955 - 6095) (Disabled)	-0.20	-0.20	-0.20	2.81
	Sub-band 2 (6115 - 6255)	-1.20	0.40	-0.33	2.65
	Sub-band 3 (6275 - 6415)	-2.00	0.80	-0.38	2.52
UNII-7	6535-6855	0.10	0.30	0.20	3.21

Cable type: SMA

Cable Loss		
Frequency Range (MHz)	Antenna 6 (dB)	Antenna 5 (dB)
6105-6425	-3.00	-3.40
6525-6875	-3.00	-3.50

The cables were used for RF antenna port tests that had been offset to the test equipment during testing.

Note: ANT1 and ANT2 indicated in the test result sections are representative of ANT6 and ANT5, respectively.

6.4. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was 27_20_193_15.

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.

6.5. WORST-CASE CONFIGURATION AND MODE

This report is to document the very low power client mode only. The standard power client and indoor low power client mode are documented in a separate 6CD report.

For RF conducted tests, VLP has been tested with SISO, 2TX CDD, and SDM MIMO modes and was tested on all antenna ports after investigation.

The 802.11a mode 20MHz covered by the 802.11be mode since both have the same power.

Radiated tests was covered by standard power and indoor low power client modes as they have the higher tune up.

For conducted testing - all tests perform on both SU (highest output power) and Partial RU tones (highest PSD reading).

Low data rate was used to test on antenna port conducted since it has the highest maximum power.

The modulation and bandwidth of 802.11ax and 802.11be modes are similar at 20 MHz (40 MHz, 80 MHz, 160 MHz), and the target power of 802.11ax mode is equal to or lower than that of 802.11be mode, and the data rate of 802.11be mode is higher than 802.11ax mode, so 802.11be mode was tested to represent worst-case reporting.

For mask and bandwidth measurements partial RU allocations are tested with the RUs allocated at the lower and upper positions within the channel for the low mid and high channels in each band. Additionally, the center channel is also tested with the RU allocated in the center of the channel to verify that the low / high RU allocations are worst case.

After the investigation, it was found that the worst case of power and PSD modes for full testing as table shown below, in addition we also spot-checked Full RU and the rest of Partial RU modes on radiated bandedge, conducted emissions mask, and radiated spurious 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.

6.5.1. VLP

WIFI 7 - 802.11be															
BW (MHz)	Tone (T)	RU Index	RU Index from Chipset support	Worst Case Tone (UNII-5) SISO		Worst Case Tone (UNII-5) MIMO CDD		Worst Case Tone (UNII-5) MIMO SDM		Worst Case Tone (UNII-7) SISO		Worst Case Tone (UNII-7) MIMO CDD		Worst Case Tone (UNII-7) MIMO SDM	
				Power	PSD	Power	PSD	Power	PSD	Power	PSD	Power	PSD	Power	PSD
20	26	0 ~ 8	0 ~ 8												
	52	37 ~ 40	37 ~ 40												
	52 + 26	70 ~ 81	70, 71, 72												
	106	53 ~ 54	53 ~ 54		X				X		X				X
	106 + 26	82 ~ 89	82, 83												
	242	61	61												
	SU	--	--	X		X		X		X		X		X	
40	26	0 ~ 17	0 ~ 17												
	52	37 ~ 44	37 ~ 44												
	52 + 26	70 ~ 81	70, 72, 72, 73, 74, 75												
	106	53 ~ 56	53 ~ 56		X				X		X				X
	106 + 26	82 ~ 89	82, 83, 84, 85												
	242	61 ~ 61	61 ~ 62				X						X		
	484	65	65												
	SU	--	--	X		X		X		X		X		X	
80	26	0 ~ 36	0 ~ 36												
	52	37 ~ 52	37 ~ 52												
	52 + 26	70 ~ 81	71,72,73,74,77,78,79,80												
	106	53 ~ 60	53 ~ 60		X				X		X				X
	106 + 26	82 ~ 89	82, 85, 86, 89												
	242	61 ~ 64	61 ~ 64												
	484	65 ~ 66	65 ~ 66												
	484 + 242	90, 91, 92, 93	90, 91, 92, 93				X						X		
	996	67	67												
	SU	--	--	X		X		X		X		X		X	
160	26	0 ~ S36	0 ~ S36												
	52	37 ~ S52	37 ~ S52												
	52 + 26	70 ~ S81	sb0: 71,72,73,74,77,78,79,80 sb1: 71,72,73,74,77,78,79,80												
	106	53 ~ S60	53 ~ S60		X				X		X				X
	106 + 26	82 ~ 89	82, 85, 86, 89												
	242	61 ~ S64	61 ~ S64												
	484	65 ~ S66	65 ~ S66				X						X		
	484 + 242	sb0: 90, 91, 92, 93 sb1: 90, 91, 92, 93	sb0: 90, 91, 92, 93 sb1: 90, 91, 92, 93												
	996	67 ~ S67	67 ~ S67												
	996 + 484	sb0: 94, 95 sb1: 94, 95	sb0: 94, 95 sb1: 94, 95												
	996 + 484 + 242	sb0: 96, 97, 98, 99 sb1: 96, 97, 98, 99	sb0: 96, 97, 98, 99 sb1: 96, 97, 98, 99												
	996x2	S68	S68												
	SU	--	--	X		X		X		X		X		X	

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.

6.6. DESCRIPTION OF TEST SETUP

SUPPORT TEST EQUIPMENT				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID/ DoC**
Laptop	Apple	Macbook Pro	C02VD7SAHV22	BCGA1708
Laptop AC/DC adapter	Liteon Technology	A1424	NSW25679	DoC
EUT AC/DC adapter	Apple	A1720	C3D8417A7R93KVPA8	DoC
Conducted Switch Box	UL	n/a	208281	N/A

I/O CABLES (RF CONDUCTED TEST)						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	SMA	1	SMA	Shielded	0.75	To spectrum Analyzer
2	Antenna	2	SMA	Shielded	0.2	To Conducted Switch Box
3	USB-C	1	USB-C	Shielded	1.0	N/A
4	DC	1	DC	Shielded	2	From AC/DC Adapter

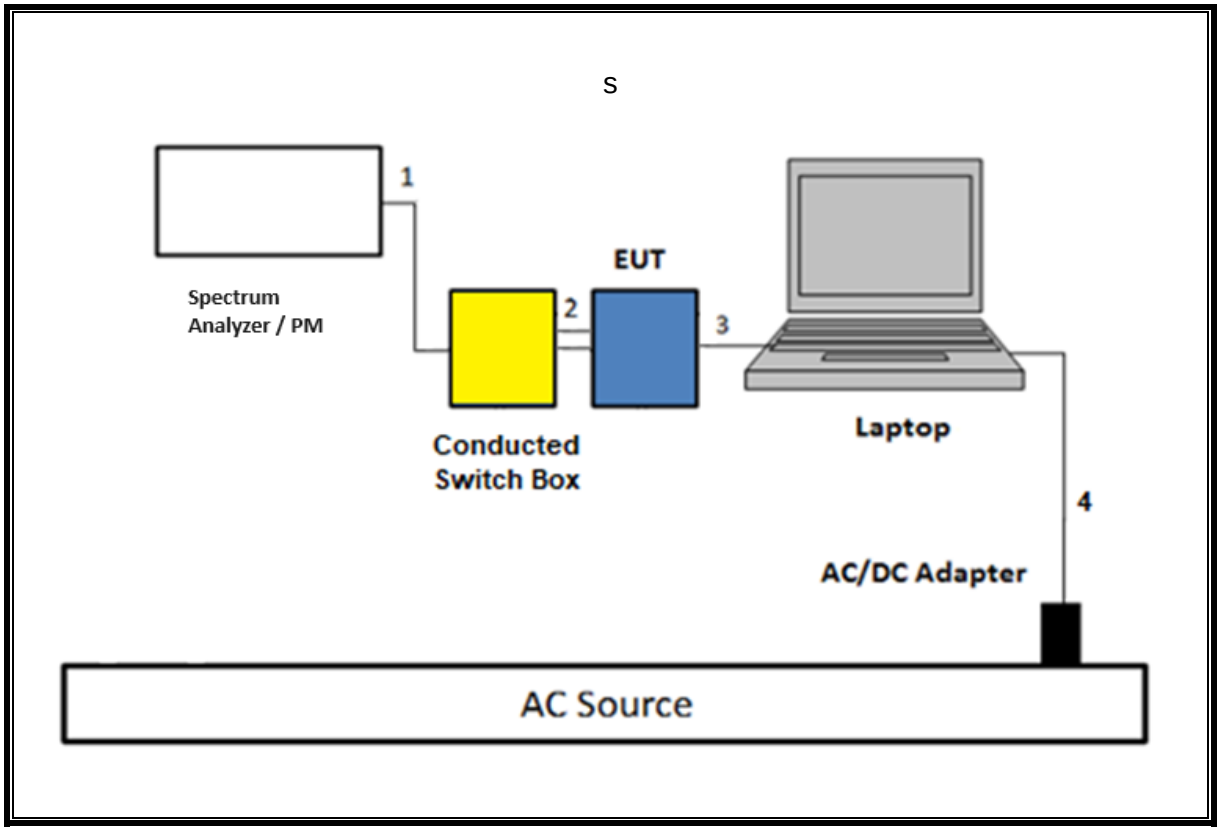
TEST SETUP

The EUT setup is shown as below. 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



7. MEASUREMENT METHOD

On Time and Duty Cycle: KDB 789033 D02 v02r01, Section B.

26 dB Emission BW: KDB 789033 D02 v02r01, Section C.

99% Occupied Bandwidth: KDB 789033 D02 v02r01, Section II-D

Conducted Output Power: KDB 789033 D02 v02r01, Section II E.3.b (Method PM-G).

Power Spectral Density (PSD): KDB 789033 D02 v02r01, Section F

Spurious emissions within 5.925-7.125 GHz Band (Emissions Mask): KDB 987594 D02 EMC Measurement Section II-J

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. 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**
Power Meter, P-series single channel	Keysight Technologies Inc	N1911A	90731	2025/01/31	2024/01/25
Power Sensor, P - series, 50MHz to 18GHz, Wideband	Keysight Technologies Inc	N1921A	80120	2025/01/31	2024/01/25
Power Meter, P-series single channel	Keysight Technologies Inc	N1911A	90719	2025/01/31	2024/01/25
Power Sensor, P - series, 50MHz to 18GHz, Wideband	Keysight Technologies Inc	N1921A	90389	2025/01/31	2024/01/25
10dB Fixed Attenuator	Pasternack Enterprises	PE7087-10	178557	Verified Before Use	
10dB Fixed Attenuator	Pasternack Enterprises	PE7087-10	178558	Verified Before Use	
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight Technologies Inc	N9030A	80397	2025/01/31	2024/01/24
Spectrum Analyzer, PXA, 3Hz to 50GHz w/Ext. Mixer	Keysight Technologies Inc	N9030A	80400	2025/02/02	2024/02/07
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight Technologies Inc	N9030A	125178	2025/01/31	2024/01/24
PXA Signal Analyzer 2Hz to 44GHz	Keysight Technologies Inc	N9030B	231739	2025/01/31	2024/01/31
Conducted Switch Box	N/A	CSB	208281	2025/05/30	2024/05/08

UL AUTOMATION SOFTWARE			
Conducted Software	UL	UL EMC	2023.2.23

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.

9. ANTENNA PORT TEST RESULTS

9.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

PROCEDURE

KDB 789033 Zero-Span Spectrum Analyzer Method.

ON TIME AND DUTY CYCLE RESULTS

Mode	Tone (T)	Data Rate (Mbps)	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
EHT20	SU	MCS0	3.055	3.076	0.9934	99.34%	0.00	0.010
		MCS11	0.247	0.267	0.9251	92.51%	0.34	4.049
	106T	MCS0	3.518	3.556	0.9893	98.93%	0.00	0.010
		MCS11	0.264	0.301	0.8771	87.71%	0.57	3.788
EHT40	SU	MCS0	1.560	1.580	0.9873	98.73%	0.00	0.010
		MCS11	0.157	0.177	0.8870	88.70%	0.52	6.369
	106T	MCS0	3.510	3.556	0.9872	98.72%	0.00	0.010
		MCS11	0.255	0.302	0.8458	84.58%	0.73	3.920
	242T	MCS0	3.043	3.064	0.9930	99.30%	0.00	0.010
		MCS11	0.235	0.256	0.9164	91.64%	0.38	4.263
EHT80	SU	MCS0	0.783	0.804	0.9739	97.39%	0.11	1.277
		MCS11	0.111	0.132	0.8403	84.03%	0.76	9.050
	106T	MCS0	3.507	3.568	0.9830	98.30%	0.00	0.010
		MCS11	0.263	0.303	0.8686	86.86%	0.61	3.802
	484+242T	MCS0	2.697	2.720	0.9916	99.16%	0.00	0.010
		MCS11	0.205	0.229	0.8962	89.62%	0.48	4.869
EHT160	SU	MCS0	0.428	0.449	0.9532	95.32%	0.21	2.339
		MCS11	0.089	0.109	0.8104	81.04%	0.91	11.299
	106T	MCS0	3.507	3.557	0.9861	98.61%	0.00	0.010
		MCS11	0.263	0.302	0.8710	87.10%	0.60	3.797
	484T	MCS0	1.373	1.394	0.9848	98.48%	0.00	0.010
		MCS11	1.373	1.394	0.9849	98.49%	0.00	0.010

Mode	Tone (T)	Data Rate (Mbps)	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
EHT20	SU	MCS0	3.055	3.076	0.9934	99.34%	0.00	0.010
SDM	106T	MCS0	3.518	3.556	0.9893	98.93%	0.00	0.010
EHT40	SU	MCS0	1.562	1.582	0.9874	98.74%	0.00	0.010
SDM	106T	MCS0	3.490	3.556	0.9815	98.15%	0.00	0.010
EHT80	SU	MCS0	0.783	0.804	0.9744	97.44%	0.11	1.276
SDM	106T	MCS0	3.518	3.558	0.9886	98.86%	0.00	0.010
EHT160	SU	MCS0	0.428	0.448	0.9540	95.40%	0.20	2.338
SDM	106T	MCS0	3.509	3.547	0.9893	98.93%	0.00	0.010

Note: There are same duty cycle factor on 1TX and 2TX.

The plot in this section is for reference settings only.

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 802.11be EHT20 SU, MCS0

Intentionally Blank

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.

9.2. VLP 26 dB AND 99% BANDWIDTH

LIMITS

§15.407 (a) (11)

The maximum bandwidth for U-NII devices in the 5.925-7.125 GHz band is 320 MHz. KDB 987594 D03 U-NII 6 GHz QA v02, modified by FCC TCB Workshop Presentation Review of TCB PAG Submissions - October 2023, allows the maximum bandwidths to be defined by either the 26dB bandwidth or the 99% bandwidth for a 320 MHz nominal channel bandwidth and by the 26dB bandwidth for all other nominal channel bandwidths. The KDB requires that the test report show the 99% and 26 dB bandwidth for all the nominal channel bandwidths used by the device.

PROCEDURE

ANSI C63.10: 2013 §6.9

Band	Tones	20MHz (RBW/VBW)	40MHz (RBW/VBW)	80MHz (RBW/VBW)	160MHz (RBW/VBW)
UNII-5	Partial RU	300kHz/910kHz	510kHz/1.6MHz	510kHz/1.6MHz (SISO/SDM) 1MHz/3MHz (MIMO)	510kHz/1.6MHz (SISO/SDM) 1MHz/3MHz (MIMO)
	SU	300kHz/910kHz	510kHz/1.6MHz	1MHz/3MHz	2MHz/6MHz
UNII-7	Partial RU	300kHz/910kHz	510kHz/1.6MHz	510kHz/1.6MHz (SISO/SDM) 1MHz/3MHz (MIMO)	510kHz/1.6MHz (SISO/SDM) 1MHz/3MHz (MIMO)
	SU	300kHz/910kHz	510kHz/1.6MHz	1MHz/3MHz	2MHz/6MHz

RESULTS

ID:	12491	Date:	2024/08/01

For mask and bandwidth measurements partial RU allocations are tested with the RUs allocated at the lower and upper positions within the channel for the low mid and high channels in each band. Additionally, the center channel is also tested with the RU allocated in the center of the channel to verify that the low / high RU allocations are worst case.

The plots in these sections are for reference settings only for different bandwidth and different antenna ports.

The tests performed on this device show that both 99% and 26dB bandwidths are less than 320 MHz. for all supported channel bandwidths.

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

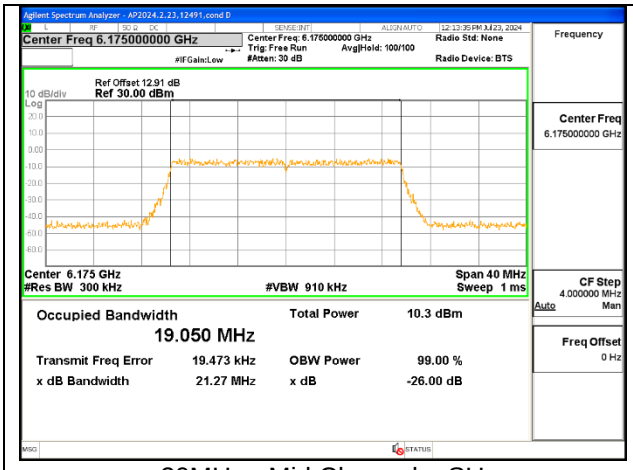
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

9.2.1. 802.11be SISO MODE IN THE UNII-5 BAND

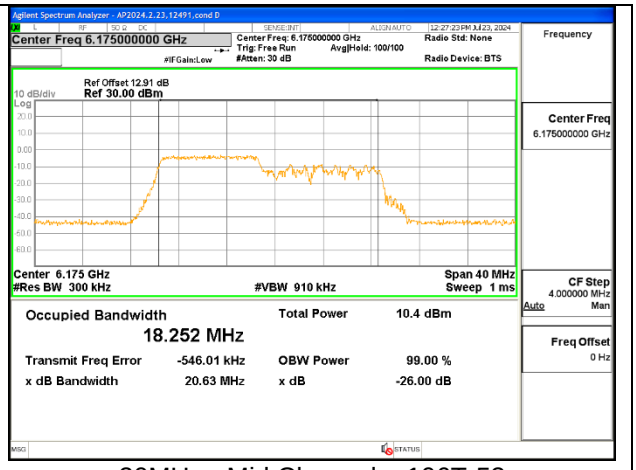
UNII-5 (SISO)	Frequency (MHz)	Channel Number	Tone	RU Index	26 dB Bandwidth (MHz)		99% Bandwidth (MHz)	
					Ant 1	Ant 2	Ant 1	Ant 2
20MHz	6115	33	SU	--	21.28	21.16	19.0950	19.0290
			106T	53	20.31	20.59	18.1930	18.2200
				54	20.93	20.81	18.3370	18.2700
	6175	45	SU	--	21.27	21.25	19.0500	19.0610
			106T	53	20.63	20.64	18.2520	18.2410
				54	20.96	20.95	18.3180	18.3200
	6415	93	SU	--	21.29	21.32	19.0520	19.0750
			106T	53	20.51	20.74	18.1990	18.2440
				54	20.91	21.07	18.3140	18.3500
40MHz	6125	35	SU	--	41.87	41.18	38.0720	38.0550
			106T	53	22.15	22.83	18.1740	18.1720
				--	--	--	--	--
				56	24.64	24.73	18.4140	18.8200
	6165	43	SU	--	41.84	40.97	38.0840	38.0480
			106T	53	22.87	21.90	18.0280	18.0950
				54	27.25	28.30	20.2490	20.1630
				56	24.45	23.91	18.3280	18.3710
	6405	91	SU	--	41.46	41.08	38.0470	38.0240
			106T	53	21.25	22.47	17.9870	18.1650
				--	--	--	--	--
				56	23.35	24.97	18.3180	18.5040
80MHz	6145	39	SU	--	82.14	81.79	77.6050	77.4870
			106T	53	20.56	19.94	18.1320	18.0240
				--	--	--	--	--
				60	24.94	22.25	18.6060	18.1810
	6305	71	SU	--	81.90	81.96	77.5610	77.6320
			106T	53	20.68	20.01	17.2400	17.8740
				56	26.65	30.80	19.7000	20.8150
				60	24.57	24.86	18.3630	18.2290
	6385	87	SU	--	82.15	82.00	77.5140	77.6790
			106T	53	21.64	20.69	18.2740	18.1720
				--	--	--	--	--
				60	24.01	22.73	18.6230	18.4070
160MHz	6185	47	SU	--	165.20	164.30	157.1600	157.2500
			106T	53	21.85	21.63	18.2570	18.7670
				S60	21.29	21.40	18.2270	18.9160
	6345	79	SU	--	165.10	166.00	157.0600	157.2300
			106T	53	21.23	21.62	18.2060	18.6300
				S60	21.09	22.32	18.2290	18.7160

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

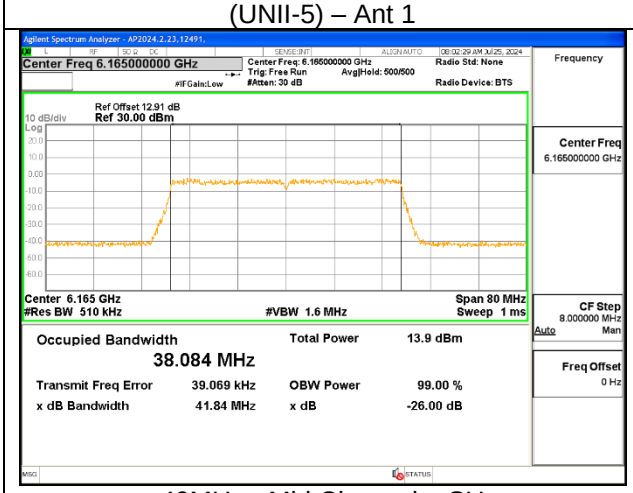
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



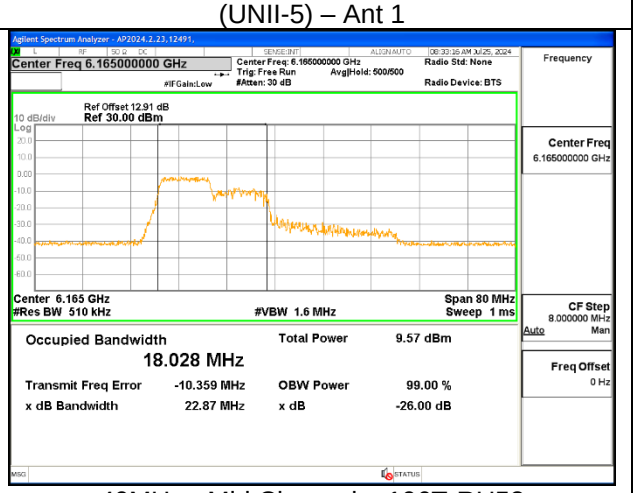
20MHz - Mid Channel – SU
(UNII-5) – Ant 1



20MHz - Mid Channel – 106T-53
(UNII-5) – Ant 1



40MHz - Mid Channel – SU
(UNII-5) – Ant 1



40MHz - Mid Channel – 106T-RU53
(UNII-5) – Ant 1

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

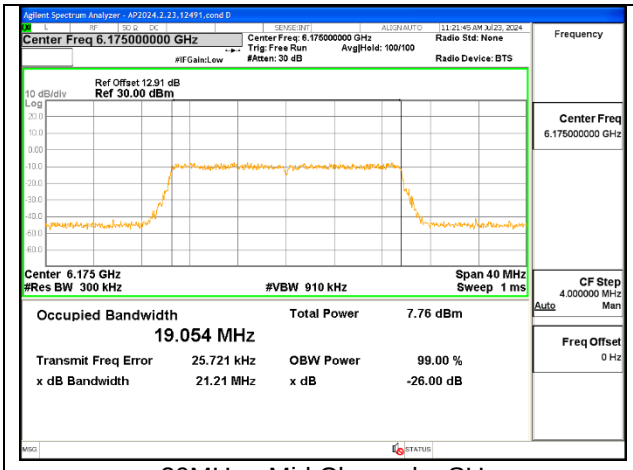
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

9.2.2. 802.11be MIMO CDD MODE IN THE UNII-5 BAND

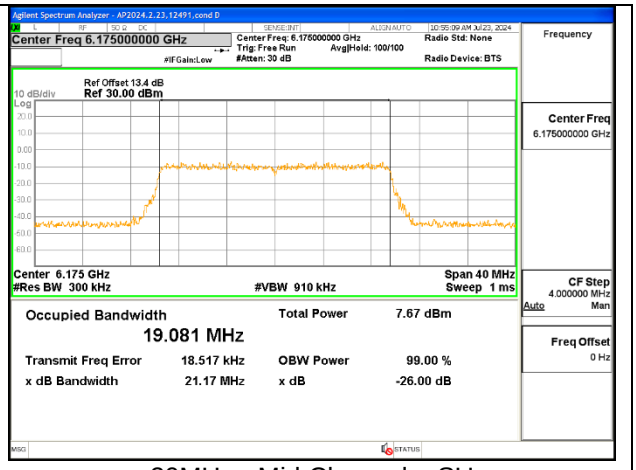
UNII-5 (MIMO CDD)	Frequency (MHz)	Channel Number	Tone	RU Index	26 dB Bandwidth (MHz)		99% Bandwidth (MHz)	
					Ant 1	Ant 2	Ant 1	Ant 2
20 MHz	6115	33	SU	--	21.62	21.13	19.0860	19.1660
	6175	45	SU	--	21.21	21.17	19.0540	19.0810
	6415	93	SU	--	21.49	21.23	19.1580	19.0550
40 MHz	6125	35	SU	--	41.85	41.48	38.1020	37.9860
			242T	61	30.42	32.86	20.1650	20.3340
				62	34.42	34.56	20.4760	20.6230
	6165	43	SU	--	41.65	41.81	38.0870	38.0510
			242T	61	30.09	30.40	20.3460	19.6120
				62	33.40	28.83	20.3400	19.7060
	6405	91	SU	--	41.68	41.52	38.1000	38.1080
			242T	61	33.20	26.89	20.2250	20.0170
				62	30.30	34.59	20.0690	19.8950
80MHz	6145	39	SU	--	82.43	82.00	77.5500	77.6200
			MRU484+242T	90	79.01	72.80	59.1000	59.2120
				--	--	--	--	--
				93	79.17	73.43	58.9760	58.7870
	6305	71	SU	--	82.23	82.11	77.6460	77.5460
			MRU484+242T	90	78.78	72.61	58.9870	58.8920
				92	82.24	82.23	77.7750	77.8880
				93	76.49	73.13	59.0450	58.8220
	6385	87	SU	--	81.64	81.97	77.5780	77.5970
			MRU484+242T	90	77.36	73.08	59.3120	58.9030
				--	--	--	--	--
				93	78.18	71.12	58.7970	58.9890
160MHz	6185	47	SU	--	165.30	164.50	157.3100	157.1400
			484T	65	56.33	50.21	39.1140	38.6710
				--	--	--	--	--
				S66	59.49	49.06	40.5080	38.7000
	6345	79	SU	--	165.40	164.60	157.3900	157.2900
			484T	65	51.26	51.33	39.2750	38.8700
				--	--	--	--	--
				S66	63.82	51.10	39.5330	38.6620

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

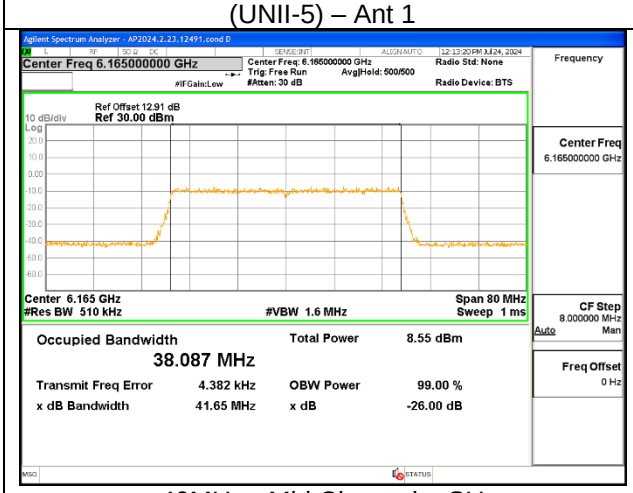
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



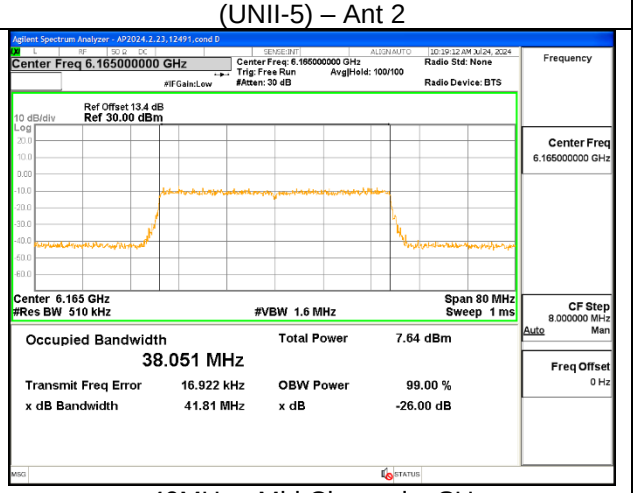
20MHz - Mid Channel – SU
(UNII-5) – Ant 1



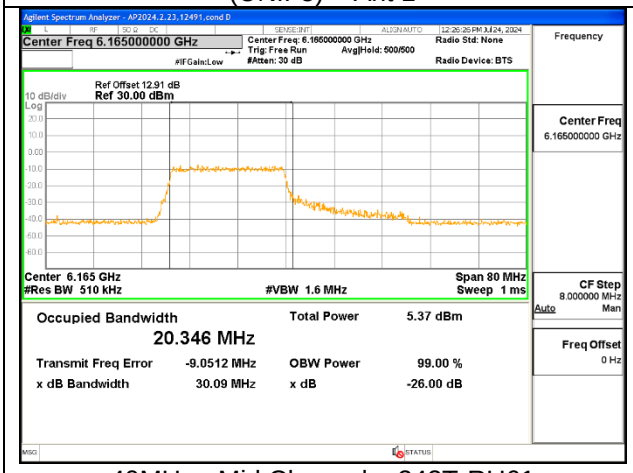
20MHz - Mid Channel – SU
(UNII-5) – Ant 2



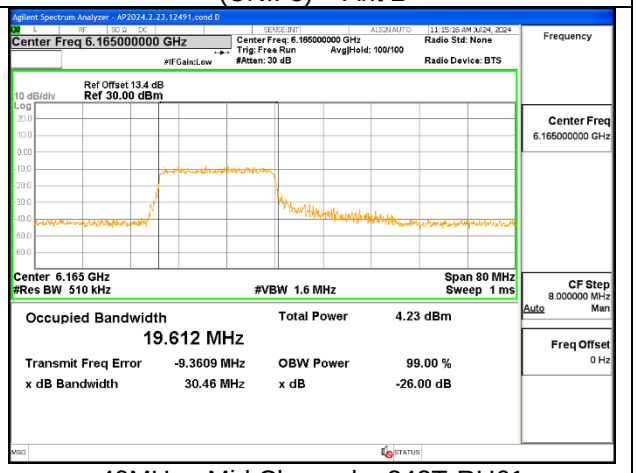
40MHz - Mid Channel – SU
(UNII-5) – Ant 1



40MHz - Mid Channel – SU
(UNII-5) – Ant 2



40MHz - Mid Channel – 242T-RU61
(UNII-5) – Ant 1



40MHz - Mid Channel – 242T-RU61
(UNII-5) – Ant 2

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

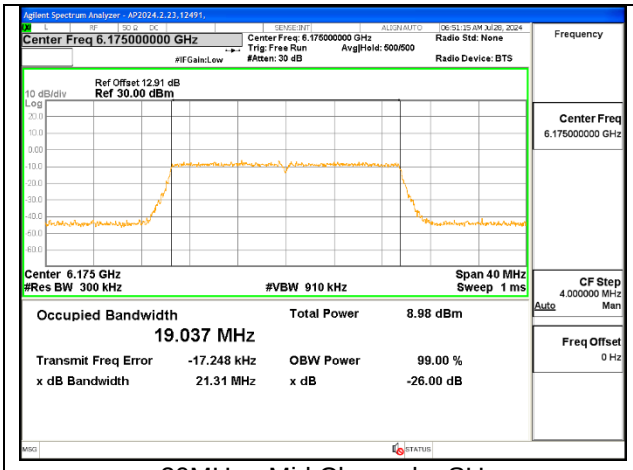
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

9.2.3. 802.11be MIMO SDM MODE IN THE UNII-5 BAND

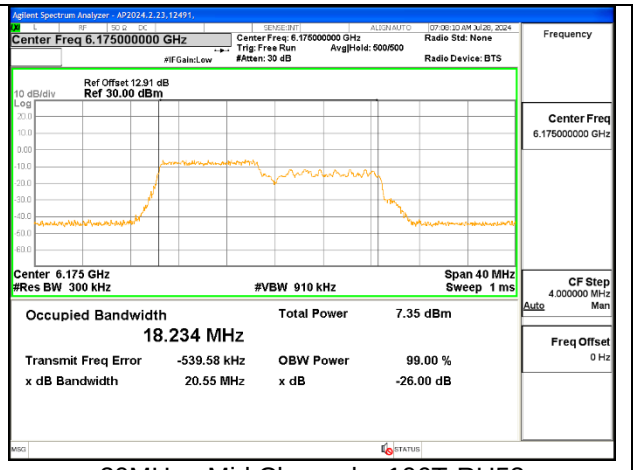
UNII-5 (MIMO SDM)	Frequency (MHz)	Channel Number	Tone	RU Index	26 dB Bandwidth (MHz)		99% Bandwidth (MHz)	
					Ant 1	Ant 2	Ant 1	Ant 2
20 MHz	6115	33	SU	--	21.61	21.14	19.1430	19.1360
			106T	53	20.89	19.83	18.2410	17.6120
				54	20.98	19.90	18.3680	18.1350
	6175	45	SU	--	21.31	21.50	19.0370	19.0800
			106T	53	20.55	19.79	18.2340	17.6510
				54	20.96	19.95	18.3800	18.1280
	6415	93	SU	--	21.13	21.34	19.0710	19.0950
			106T	53	20.79	19.89	18.2200	18.0360
				54	20.82	19.82	18.3720	18.1210
40 MHz	6125	35	SU	--	41.28	41.14	37.9930	37.0700
			106T	53	21.13	20.67	18.1750	17.8970
				--	--	--	--	--
				56	24.60	20.08	18.2430	17.9480
	6165	43	SU	--	41.39	41.28	38.0260	38.0420
			106T	53	22.04	19.94	18.2280	17.9220
				54	27.54	27.64	20.6270	19.5560
				56	24.79	19.84	18.9900	170.8600
	6405	91	SU	--	41.26	41.26	37.9440	38.1000
			106T	53	22.72	21.49	18.2370	17.7780
				--	--	--	--	--
				56	25.03	20.60	18.5570	17.8540
80MHz	6145	39	SU	--	81.92	81.91	77.4310	77.5390
			106T	82	20.96	20.11	18.1830	17.9460
				--	--	--	--	--
				89	24.13	22.77	18.9500	17.9850
	6305	71	SU	--	81.63	82.55	77.5020	77.4690
			106T	53	21.75	21.52	18.4580	17.9640
				56	28.21	25.38	21.5550	18.7560
				60	27.71	23.58	20.2630	18.0590
	6385	87	SU	--	82.36	82.07	77.4190	77.5880
			106T	53	20.67	20.89	18.6700	17.8930
				--	--	--	--	--
				60	23.71	22.39	19.5400	17.8080
160MHz	6185	47	SU	--	164.80	163.70	157.1000	157.1200
			106T	53	24.22	20.76	18.8630	18.0000
				S60	28.04	26.43	21.8430	18.1890
	6345	79	SU	--	165.00	162.60	157.0600	157.1700
			106T	53	21.84	20.85	18.8740	18.1060
				S60	27.41	27.56	22.5350	18.0280

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

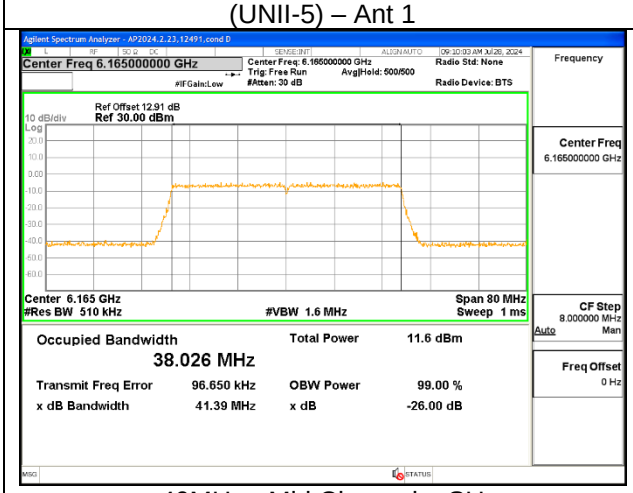
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



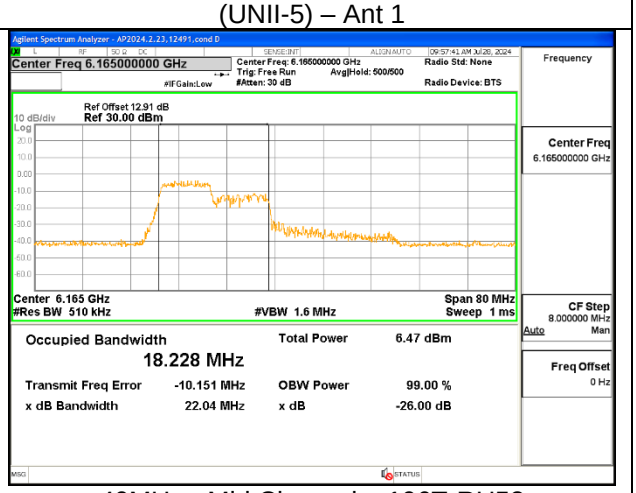
20MHz - Mid Channel – SU
(UNII-5) – Ant 1



20MHz - Mid Channel – 106T-RU53
(UNII-5) – Ant 1



40MHz - Mid Channel – SU
(UNII-5) – Ant 1



40MHz - Mid Channel – 106T-RU53
(UNII-5) – Ant 1

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

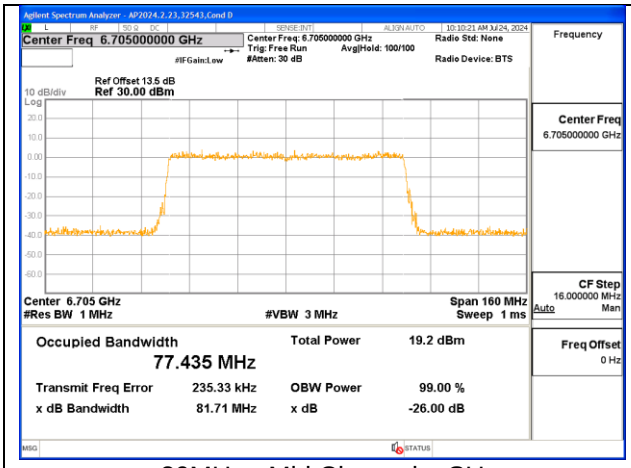
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

9.2.4. 802.11be SISO MODE IN THE UNII-7 BAND

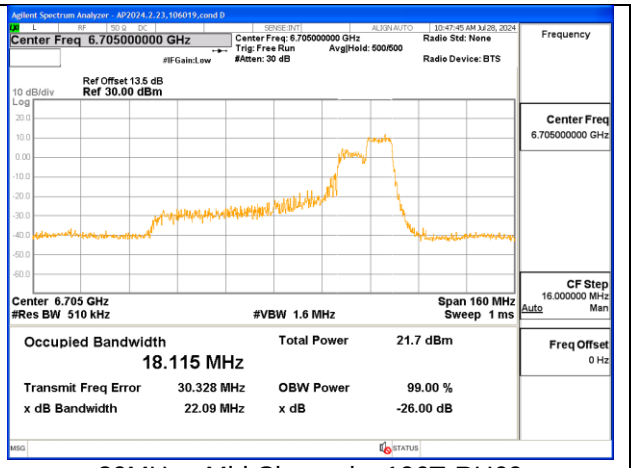
UNII-7 (SISO)	Frequency (MHz)	Channel Number	Tone	RU Index	26 dB Bandwidth (MHz)		99% Bandwidth (MHz)	
					Ant 1	Ant 2	Ant 1	Ant 2
20MHz	6535	117	SU	--	20.86	21.18	19.0830	19.0400
			106T	53	20.06	19.77	18.2230	17.0570
				54	20.82	20.57	18.1770	17.3560
	6715	149	SU	--	21.43	21.41	19.0750	19.0990
			106T	53	20.22	19.29	17.8280	17.9810
				54	19.28	20.61	18.0940	18.2580
	6855	181	SU	--	21.85	21.08	19.0880	19.1010
			106T	53	19.59	19.82	18.1940	17.9680
				54	19.82	19.83	18.3230	18.3850
40MHz	6565	123	SU	--	41.75	41.14	37.9600	38.0230
			106T	53	21.22	19.19	18.0680	18.0120
				--	--	--	--	--
				56	24.34	20.05	18.1930	18.2730
	6685	147	SU	--	41.08	41.50	38.0230	37.9600
			106T	53	22.86	19.20	18.1190	18.0480
				54	26.10	21.39	20.0580	20.3060
				56	26.19	19.86	18.0520	18.4480
	6845	179	SU	--	41.02	41.18	38.0300	37.9560
			106T	53	21.96	19.18	18.0100	18.0360
				--	--	--	--	--
				56	24.38	20.04	17.9790	18.3250
80MHz	6625	135	SU	--	81.64	81.78	77.6000	77.5480
			106T	53	20.24	20.13	17.9700	17.9690
				--	--	--	--	--
				60	21.77	24.02	18.1810	18.0810
	6705	151	SU	--	81.80	81.71	77.5050	77.4350
			106T	53	19.96	19.98	17.9940	18.0750
				56	27.30	27.16	19.4390	19.3860
				60	22.08	22.09	18.0640	18.1150
	6785	167	SU	--	81.00	82.22	77.4850	77.4170
			106T	53	20.52	19.86	18.0400	18.0600
				--	--	--	--	--
				60	22.61	25.14	18.1610	18.0740
160MHz	6665	143	SU	--	165.30	165.70	157.1800	157.3400
			106T	53	20.84	21.47	16.9420	18.2780
				S60	23.01	25.24	18.3890	18.2590

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

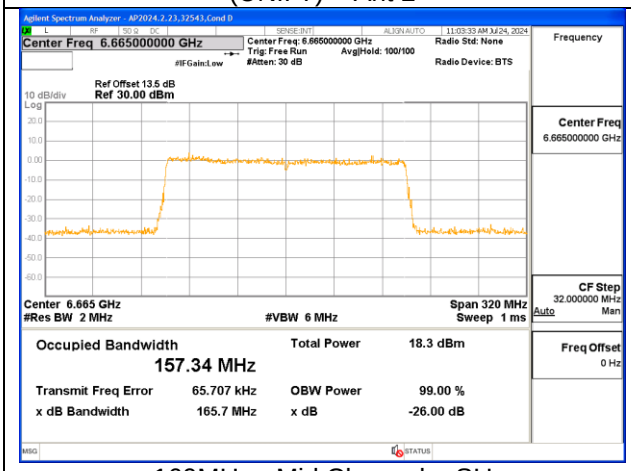
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



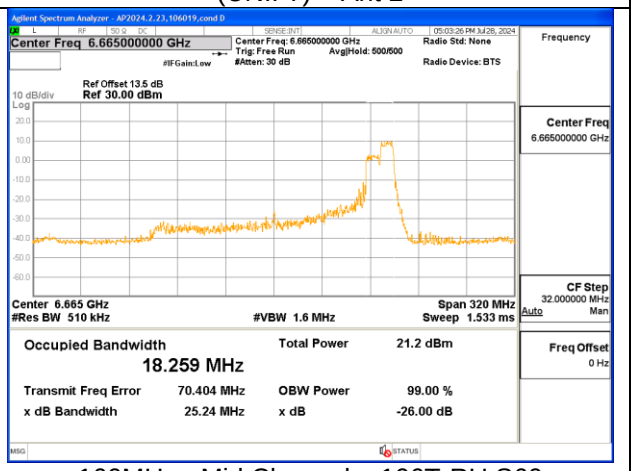
80MHz - Mid Channel – SU (UNII-7) – Ant 2



80MHz - Mid Channel – 106T-RU60 (UNII-7) – Ant 2



160MHz - Mid Channel – SU (UNII-7) – Ant 2



160MHz - Mid Channel – 106T-RU S60 (UNII-7) – Ant 2

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

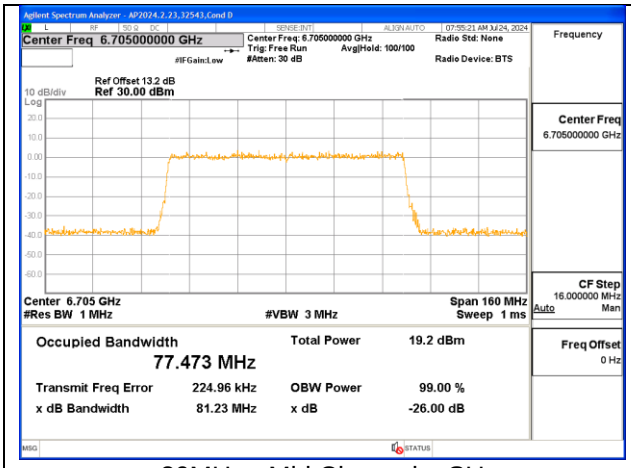
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

9.2.5. 802.11be MIMO CDD MODE IN THE UNII-7 BAND

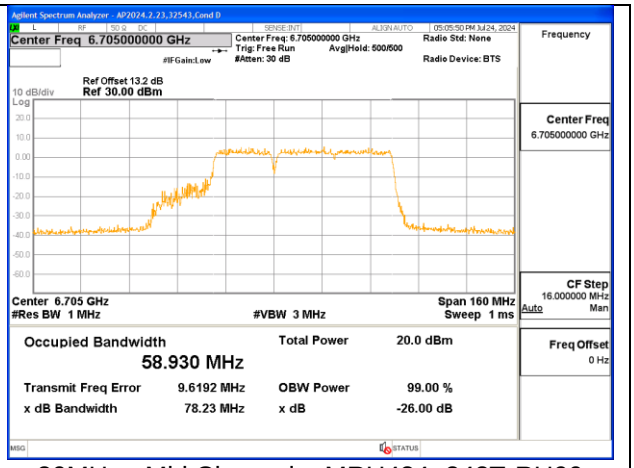
UNII-7 (MIMO CDD)	Frequency (MHz)	Channel Number	Tone	RU Index	26 dB Bandwidth (MHz)		99% Bandwidth (MHz)	
					Ant 1	Ant 2	Ant 1	Ant 2
20MHz	6535	117	SU	--	21.46	21.36	19.0850	19.0680
	6715	149	SU	--	21.42	21.13	19.1250	19.0450
	6855	181	SU	--	21.67	21.17	19.1060	19.0880
40MHz	6565	123	SU	--	41.38	41.01	38.0190	38.0020
			242T	61	37.14	22.54	19.6970	19.4750
				62	33.10	21.76	19.8360	19.8200
	6685	147	SU	--	41.46	41.23	38.0360	38.0670
			242T	61	32.57	23.53	19.7940	19.4600
				62	33.12	22.20	19.7430	19.6910
	6845	179	SU	--	41.30	41.57	38.0260	38.0080
			242T	61	30.91	21.92	19.5780	19.3780
				62	33.64	23.05	19.9700	19.7490
80MHz	6625	135	SU	--	82.33	81.44	77.5450	77.5380
			MRU 484+242T	90	79.73	77.09	59.0230	58.8870
				--	--	--	--	--
				93	73.62	66.15	58.9170	58.6620
	6705	151	SU	--	81.23	81.81	77.4730	77.6100
			MRU 484+242T	90	78.23	76.20	58.9300	58.7590
				92	81.60	81.29	77.8430	77.6690
				93	78.54	71.05	58.7870	58.7530
	6785	167	SU	--	81.67	82.24	77.4900	77.4660
			MRU 484+242T	90	78.63	73.26	59.0120	58.7580
				--	--	--	--	--
				93	73.05	72.77	58.7300	58.7590
160MHz	6665	143	SU	--	166.60	164.20	157.6500	157.3700
			484T	65	51.07	59.84	38.3430	40.0000
				S66	58.87	60.15	41.2420	41.3090

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

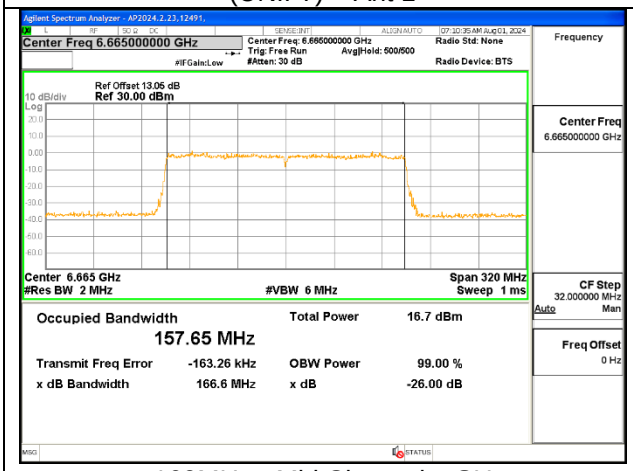
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



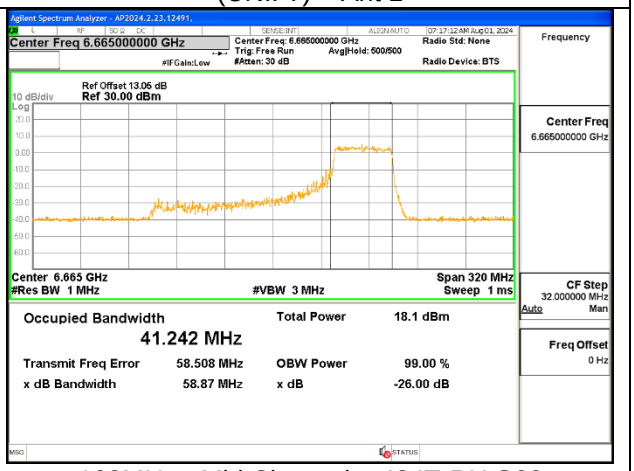
80MHz - Mid Channel – SU
(UNII-7) – Ant 1



80MHz - Mid Channel – MRU484+242T-RU90
(UNII-7) – Ant 1



160MHz - Mid Channel – SU
(UNII-7) – Ant 1



160MHz - Mid Channel – 484T-RU S66
(UNII-7) – Ant 1

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

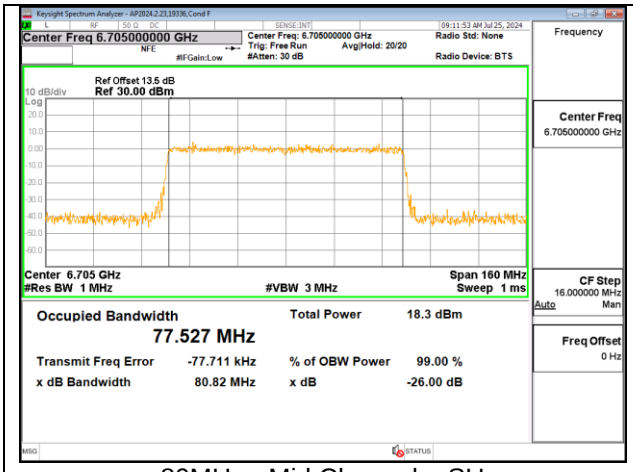
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

9.2.6. 802.11be MIMO SDM MODE IN THE UNII-7 BAND

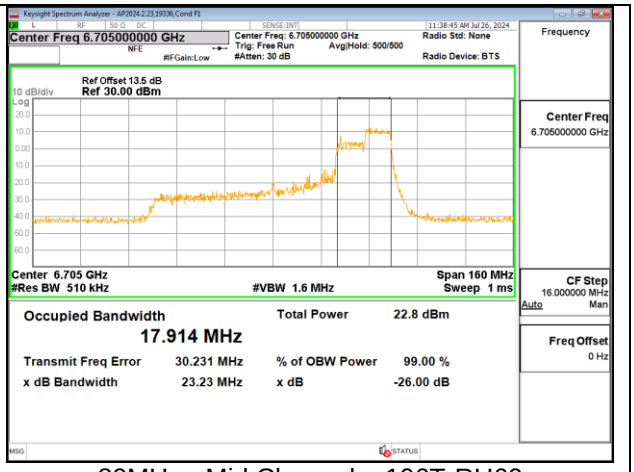
UNII-7 (MIMO SDM)	Frequency (MHz)	Channel Number	Tone	RU Index	26 dB Bandwidth (MHz)		99% Bandwidth (MHz)	
					Ant 1	Ant 2	Ant 1	Ant 2
20MHz	6535	117	SU	--	21.52	20.96	19.1410	18.9820
			106T	53	20.30	19.97	18.1340	18.1090
				54	20.82	20.19	18.1800	17.9530
	6715	149	SU	--	21.03	20.92	19.1860	19.0620
			106T	53	20.49	20.28	18.1860	18.1100
				54	21.07	20.15	18.1730	18.1250
	6855	181	SU	--	21.16	21.03	19.1590	19.0200
			106T	53	20.39	19.72	17.9200	18.0250
				54	20.72	20.17	18.1700	17.9030
40MHz	6565	123	SU	--	41.25	40.84	37.9950	38.0110
			106T	53	21.17	19.80	17.9530	17.9920
				--	--	--	--	--
				56	22.69	19.93	18.2150	17.8350
	6685	147	SU	--	40.55	40.66	38.0470	38.0080
			106T	53	21.51	20.04	17.9530	17.9850
				54	27.84	24.49	19.9300	19.7990
				56	22.59	19.98	18.0930	18.0040
	6845	179	SU	--	40.62	40.85	37.9690	37.9650
			106T	53	21.57	20.01	18.0100	18.0210
				--	--	--	--	--
				56	24.08	20.06	18.2990	17.9350
80MHz	6625	135	SU	--	80.86	81.08	77.4430	77.5800
			106T	53	19.95	19.73	18.0220	17.8080
				--	--	--	--	--
				60	22.99	23.08	17.7560	17.7530
	6705	151	SU	--	80.93	80.82	77.2160	77.5270
			106T	53	20.47	20.90	17.9760	17.8720
				56	26.57	22.59	19.1130	19.0390
				60	21.99	23.23	18.2310	17.9140
	6785	167	SU	--	81.03	80.60	77.4610	77.4770
			106T	53	20.84	20.20	17.9850	17.9580
				--	--	--	--	--
				60	23.32	19.97	18.3150	17.8540
160MHz	6665	143	SU	--	163.30	162.70	156.9600	156.9500
			106T	53	21.40	23.63	18.2180	19.8710
				S60	22.84	23.30	17.5120	18.2200

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

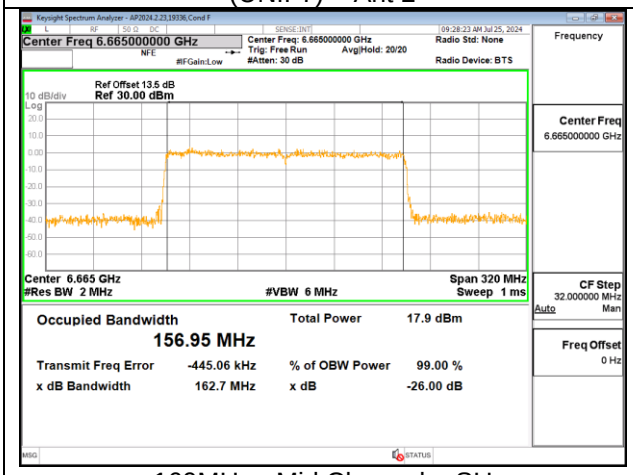
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



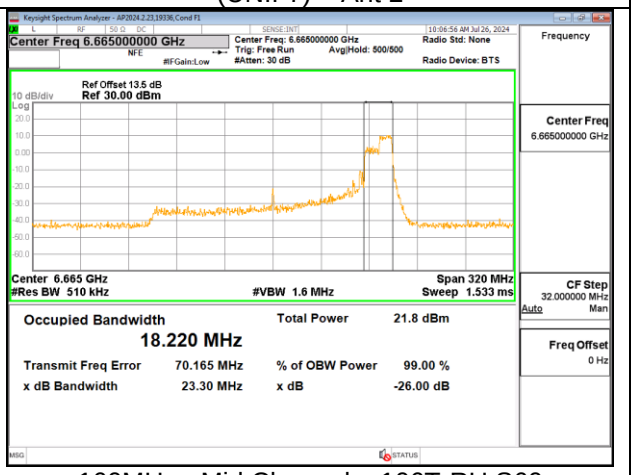
80MHz - Mid Channel – SU
(UNII-7) – Ant 2



80MHz - Mid Channel – 106T-RU60
(UNII-7) – Ant 2



160MHz - Mid Channel – SU
(UNII-7) – Ant 2



160MHz - Mid Channel – 106T-RU S60
(UNII-7) – Ant 2

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.

9.3. VLP OUTPUT POWER AND PSD

LIMITS

FCC §15.407

Bands: 5.925–6.425 GHz and 6.525–6.875 GHz

(a)(9) For very low power devices operating in the 5.925-6.425 GHz and 6.525-6.875 GHz bands, the maximum power spectral density must not exceed −5 dBm e.i.r.p in any 1-megahertz band and the maximum e.i.r.p must not exceed 14 dBm.

TEST PROCEDURE

Conducted Output Power: KDB 789033 D02 v02r01, Section II E.3.b (Method PM-G), because the gated power measurement is used the calculation of EIRP power does not include any corrections for duty factor.

The measurement method used for power spectral density is KDB 789033 D02 v02r01, Section F

RESULTS

The plots in these sections are for reference settings only for different bandwidth and different antenna ports.

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.

DIRECTIONAL ANTENNA GAIN

For 1 TX:

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

For 2 TX:

CDD MIMO Tx chains used uncorrelated gain for EIRP calculation and correlated gain for PSD EIRP calculation; SDM MIMO Tx chains used uncorrelated for both EIRP and PSD EIRP caculation. For the straddle channels, the higher antenna gains were chosen between two bands where straddle channels are located. The directional gains are as follows:

Band	Frequency Range Sub-band (MHz)	Antenna 6 (dBi)	Antenna 5 (dBi)	Uncorrelated Chains (dBi)	Correlated Chains (dBi)
UNII-5	Sub-band 1 (5955 - 6095) (Disabled)	-0.20	-0.20	-0.20	2.81
	Sub-band 2 (6115 - 6255)	-1.20	0.40	-0.33	2.65
	Sub-band 3 (6275 - 6415)	-2.00	0.80	-0.38	2.52
UNII-7	6535-6855	0.10	0.30	0.20	3.21

DIRECTIONAL GAIN CALCULATION:

ANSI C63.10-2013 section 14.4.3

Uncorrelated directional gain=10*LOG((10^(Ant6/10)+10^(Ant5/10))/2)
Correlated directional Gain=10*LOG(((10^(Ant6/20)+10^(Ant5/20))^2)/2)

Sample Calculation at UNII-5 Band:

Ant6=-0.20, Ant5=-0.20

Uncorrelated Antenna gain=10log[(10^(-0.20/10)+10^(-0.20/10))/2]=-0.20 dBi

Correlated Antenna gain=10log[(10^(-0.20/20)+10^(-0.20/20))^2)/2]=2.81dBi

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.

EIRP Calculation:

1Tx

EIRP corr'd power =Ant6 + Antenna Gain

Sample Calculation at UNII-5 Band:
Ant6(20MHz,low channel,SU) Power=4.22 dBm

EIRP corr'd power = 4.22 + (-1.20) = 3.02 dBm

2Tx

EIRP corr'd power = 10*LOG(10^(Ant6/10)+10^(Ant5/10)) + uncorrelated directional gain

Sample Calculation at UNII-5 Band:
(20MHz,low channel,SU) Ant6 Power=-1.06 dBm, Ant5 Power=-1.08

EIRP corr'd power =10*LOG(10^(-1.06/10)+10^(-1.08/10)) + (-0.33) = 1.61 dBm

EIRP PSD Calculation:

1Tx

EIRP corr'd PSD = DCCF + Ant6 + Antenna Gain

Sample Calculation at UNII-5 Band:
Ant6(20MHz, low channe,SU) PSD= -7.515 dBm/1MHz

EIRP corr'd PSD = 0 + (-7.515) + (-1.20) = -8.715 dBm/1MHz

2Tx (CDD)

EIRP corr'd PSD = (10*LOG(10^((DCCF +Ant6)/10)+10^((DCCF+Ant5)/10)))+correlated directional gain

Sample Calculation at UNII-5 Band:
(20MHz, low channel, SU) Ant6 PSD=-12.181 dBm/1MHz, Ant5 PSD=-12.33dBm/1MHz

EIRP corr'd PSD = (10*LOG(10^((0+(-12.181))/10)+10^((0+(-12.33))/10)))+(2.65) = -6.959 dBm/1MHz

2Tx (SDM)

EIRP corr'd PSD = =(10*LOG(10^((DCCF+Ant6)/10)+10^((DCCF +Ant5)/10)))+uncorrelated directional gain

Sample Calculation at UNII-5 Band:
Ant6(20MHz, low channel,SU) PSD=-10.052 dBm/1MHz, Ant5 PSD=-10.148 dBm/1MHz

EIRP corr'd PSD = =(10*LOG(10^((0+(-10.052))/10)+10^((0+(-10.148))/10)))+(-0.33) = -7.419 dBm/1MHz

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.

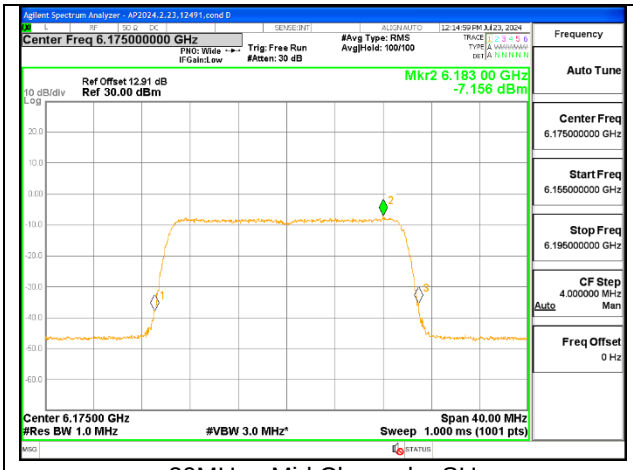
9.3.1. 802.11be SISO MODE IN THE UNII-5 BAND – VERY LOW POWER

VLP UNII-5 (SISO)	Duty Factor (dB)		Ant 1 Gain (dBi)	Ant 2 Gain (dBi)	Frequency (MHz)	Channel Number	Tone	RU Index	Conducted Power (Gated) (dBm)		EIRP Power (Limit = 14dBm EIRP)		Conducted PSD (dBm/MHz)		EIRP PSD (Limit = -5 dBm/MHz EIRP)	
	SU	Partial RU							Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2
20MHz	0	0	-1.20	0.40	6115	33	SU	--	4.22	4.19	3.02	**4.59**	-7.515	-7.143	-8.715	-6.743
							106T	53	1.23	1.23	0.03	1.63	-6.234	-5.961	-7.434	-5.561
								54	1.21	1.16	0.01	1.56	-6.190	-5.910	-7.390	-5.510
			-1.20	0.40	6175	45	SU	--	4.23	4.18	3.03	4.58	-7.156	-7.339	-8.356	-6.939
							106T	53	1.22	1.20	0.02	1.60	-6.012	-5.920	-7.212	-5.520
								83	1.22	1.17	0.02	1.57	-6.078	-5.756	-7.278	-5.356
			-2.00	0.80	6415	93	SU	--	3.68	3.71	1.68	4.51	-7.933	-7.636	-9.933	-6.836
							106T	82	0.72	0.72	-1.28	1.52	-6.592	-6.615	-8.592	-5.815
								83	0.70	0.71	-1.30	1.51	-6.742	-6.611	-8.742	-5.811
40MHz	0	0	-1.20	0.40	6125	35	SU	--	7.22	7.23	6.02	**7.63**	-7.890	-7.569	-9.090	-7.169
							106T	53	1.21	1.23	0.01	1.63	-6.651	-6.363	-7.851	-5.963
								54	1.22	1.24	0.02	1.64	-6.673	-6.402	-7.873	-6.002
								56	1.21	1.24	0.01	1.64	-6.661	-6.478	-7.861	-6.078
			-1.20	0.40	6165	43	SU	--	7.23	7.19	6.03	7.59	-7.706	-7.863	-8.906	-7.463
							106T	53	1.23	1.24	0.03	1.64	-6.715	-6.374	-7.915	-5.974
								54	1.19	1.24	-0.01	1.64	-6.633	-6.380	-7.833	-5.980
								56	1.23	1.24	0.03	1.64	-6.671	-6.328	-7.871	-5.928
			-2.00	0.80	6405	91	SU	--	6.68	6.72	4.68	7.52	-8.294	-8.076	-10.294	-7.276
							106T	53	0.72	0.74	-1.28	1.54	-7.573	-7.301	-9.573	-6.501
								54	0.71	0.74	-1.29	1.54	-7.259	-7.224	-9.259	-6.424
								56	0.73	0.72	-1.27	1.52	-7.487	-7.534	-9.487	-6.734
80MHz	0.11	0	-1.20	0.40	6145	39	SU	--	10.22	10.23	9.02	**10.63**	-7.009	-7.065	-8.099	-6.555
							106T	53	1.23	1.23	0.03	1.63	-6.396	-6.274	-7.596	-5.874
								56	1.21	1.20	0.01	1.60	-6.151	-6.222	-7.351	-5.822
								60	1.24	1.23	0.04	1.63	-6.075	-6.320	-7.275	-5.920
			-2.00	0.80	6305	71	SU	--	9.74	9.73	7.74	10.53	-8.100	-8.197	-9.190	-7.797
							106T	53	0.71	0.67	-1.29	1.47	-7.301	-7.317	-9.301	-6.517
								56	0.69	0.66	-1.31	1.46	-7.406	-7.450	-9.406	-6.650
								60	0.71	0.74	-1.29	1.54	-7.278	-7.320	-9.278	-6.520
			-2.00	0.80	6385	87	SU	--	9.72	9.71	7.72	10.51	-8.060	-8.039	-9.950	-7.129
							106T	53	0.72	0.73	-1.28	1.53	-7.416	-7.673	-9.416	-6.873
								56	0.68	0.71	-1.32	1.51	-7.593	-7.619	-9.593	-6.819
								60	0.69	0.68	-1.31	1.48	-7.279	-7.492	-9.279	-6.692
160MHz	0.21	0	-1.20	0.40	6185	47	SU	--	12.46	12.46	11.26	**12.86**	-7.563	-7.593	-8.553	-6.983
							106T	53	1.21	1.22	0.01	1.62	-6.295	-6.321	-7.495	-5.921
								S60	1.17	1.22	-0.03	1.62	-5.931	-6.262	-7.131	-5.862
			-2.00	0.80	6345	79	SU	--	11.93	11.95	9.93	12.75	-7.697	-7.799	-9.487	-6.789
							106T	53	0.72	0.71	-1.28	1.51	-7.227	-7.271	-9.227	-6.471
								S60	0.72	0.72	-1.28	1.52	-7.162	-7.097	-9.162	-6.297

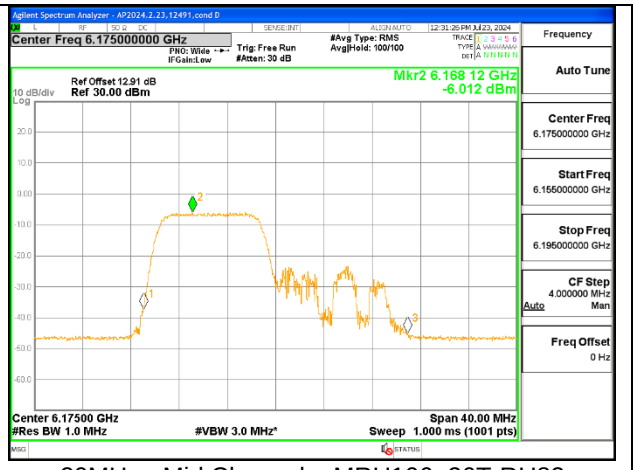
Note:
EIRP Output Power (dBm) = Measured Conducted Power (dBm)+ Peak Antenna Gain (dBi)

EIRP PSD (dBm/MHz) = Measured Conducted PSD (dBm/MHz) + Duty Factor (dB) + Peak Antenna Gain (dBi)

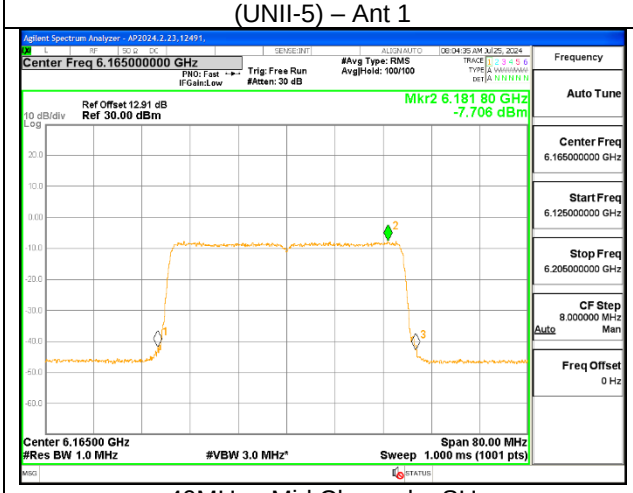
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



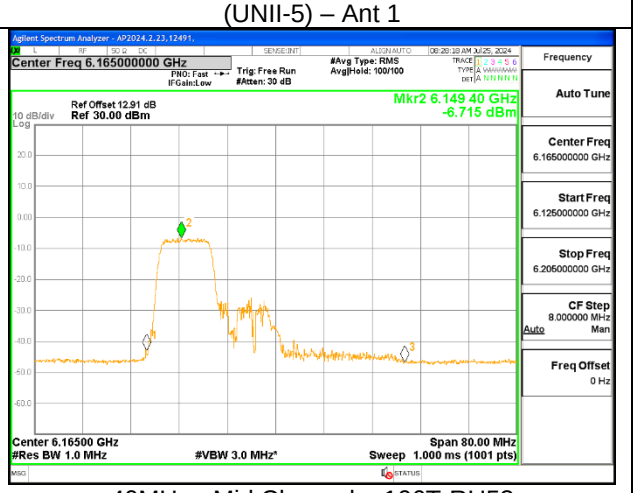
20MHz - Mid Channel – SU
(UNII-5) – Ant 1



20MHz - Mid Channel – MRU106+26T-RU82
(UNII-5) – Ant 1



40MHz - Mid Channel – SU
(UNII-5) – Ant 1



40MHz - Mid Channel – 106T-RU53
(UNII-5) – Ant 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.

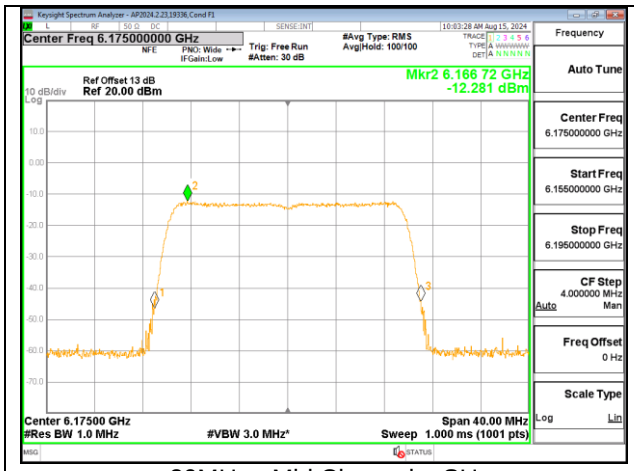
9.3.2. 802.11be MIMO CDD MODE IN THE UNII-5 BAND – VERY LOW POWER

VLP CDD UNII-5 (MIMO)	Duty Factor (dB)		Un-Correlated Antenna Gain (dBi)	Correlated Antenna Gain (dBi)	Frequency (MHz)	Channel Number	Tone	RU Index	Conducted Power (Gated)		EIRP MIMO Power (Limit = 14dBm EIRP)	Conducted PSD (dBm/MHz)		EIRP MIMO PSD (Limit = -5 dBm/MHz EIRP)
	SU	Partial Rus							Ant 1	Ant 2		Ant 1	Ant 2	
20MHz	0	--	-0.33	2.65	6115	33	SU	--	-1.06	-1.08	1.61	-12.181	-12.330	-6.595
			-0.33	2.65	6175	45	SU	--	-1.03	-1.09	1.62	-12.281	-12.327	-6.644
			-0.38	2.52	6415	93	SU	--	-1.05	-1.01	**1.60**	-12.558	-12.461	-6.979
40MHz	0	0	-0.33	2.65	6125	35	SU	--	1.92	1.89	4.59	-13.045	-12.639	-7.177
							242T	61	-1.09	-1.08	1.60	-13.030	-13.176	-7.442
								62	-1.05	-1.08	1.62	-13.153	-13.111	-7.472
			-0.33	2.65	6165	43	SU	--	1.94	1.98	**4.64**	-12.817	-12.867	-7.182
							242T	61	-1.09	-1.08	1.60	-13.384	-13.095	-7.577
								62	-1.06	-1.08	1.61	-13.320	-13.329	-7.664
			-0.38	2.52	6405	91	SU	--	1.91	1.97	4.57	-13.196	-12.731	-7.427
							242T	61	-1.11	-1.12	1.52	-13.082	-13.251	-7.635
								62	-1.04	-1.07	1.58	-13.192	-13.311	-7.721
80MHz	0.11	0	-0.33	2.65	6145	39	SU	--	4.89	4.98	**7.62**	-12.860	-12.631	-6.974
							MRU484+242T	90	3.72	3.69	6.39	-12.570	-12.759	-7.003
								92	3.72	3.74	6.41	-12.507	-12.835	-7.008
								93	3.70	3.71	6.39	-12.600	-12.925	-7.099
			-0.38	2.52	6305	71	SU	--	4.95	4.95	7.58	-12.796	-12.814	-7.165
							MRU484+242T	90	3.69	3.68	6.32	-12.605	-12.603	-7.074
								92	3.71	3.73	6.35	-12.877	-12.652	-7.233
								93	3.69	3.71	6.33	-12.783	-13.212	-7.462
			-0.38	2.52	6385	87	SU	--	4.96	4.92	7.57	-12.852	-12.892	-7.232
							MRU484+242T	90	3.74	3.71	6.36	-12.793	-12.687	-7.209
								92	3.69	3.68	6.32	-12.481	-13.021	-7.212
								93	3.73	3.73	6.36	-12.985	-13.001	-7.463
160MHz	0.21	0	-0.33	2.65	6185	47	SU	--	7.18	7.23	**9.89**	-12.938	-13.107	-7.151
							484T	65	1.92	1.91	4.60	-12.802	-12.544	-7.011
								S66	1.93	1.93	4.61	-12.495	-12.416	-6.795
			-0.38	2.52	6345	79	484T	--	7.19	7.18	9.82	-13.048	-13.113	-7.340
							484T	65	1.94	1.97	4.59	-12.727	-12.699	-7.183
								S66	1.95	1.91	4.56	-12.443	-12.746	-7.062

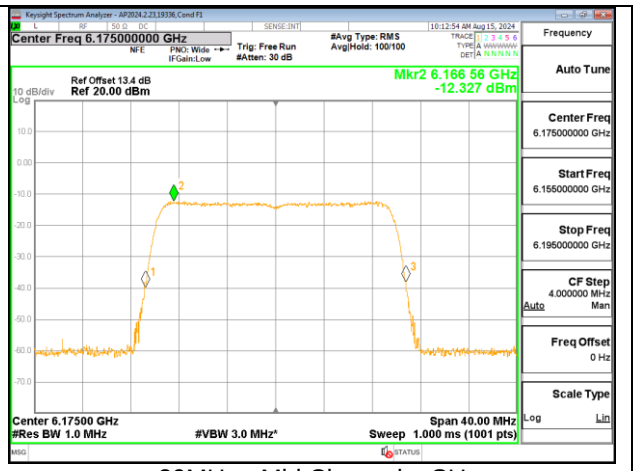
Note:
EIRP MIMO Output Power (dBm) = Measured Conducted Power (dBm) (Ant 1 + Ant 2) + Un-Correlated Antenna Gain (dBi)

EIRP MIMO PSD (dBm/MHz) = Measured Conducted PSD (dBm/MHz) (Ant 1 + Ant 2) + Duty Factor (dB) + Correlated Antenna Gain (dBi)

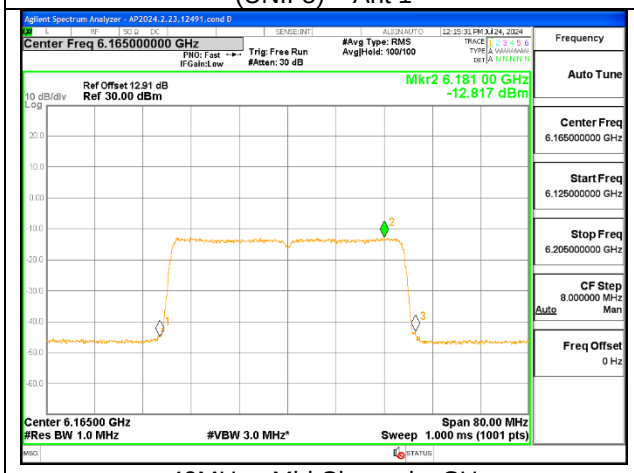
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



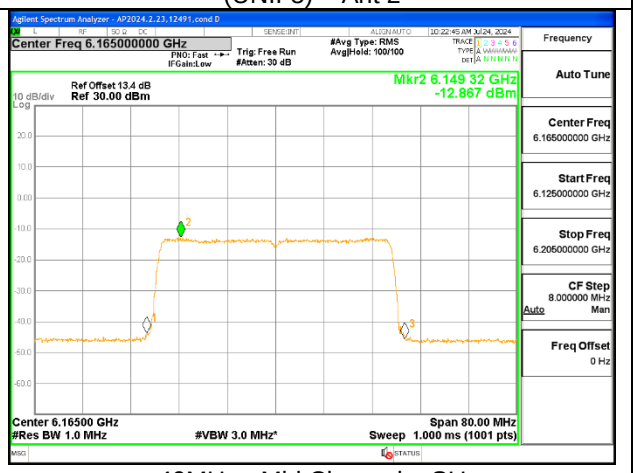
20MHz - Mid Channel – SU
(UNII-5) – Ant 1



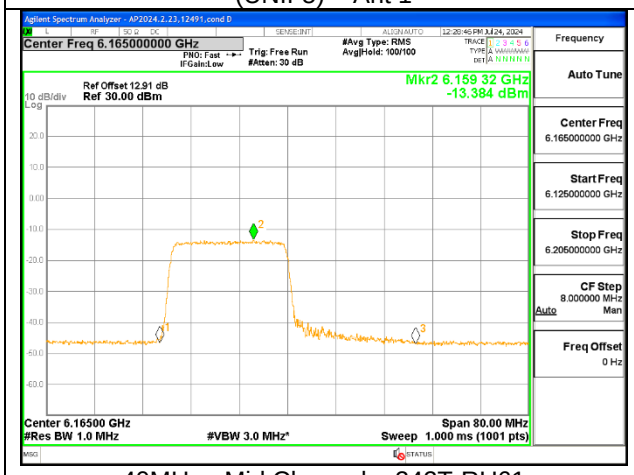
20MHz - Mid Channel – SU
(UNII-5) – Ant 2



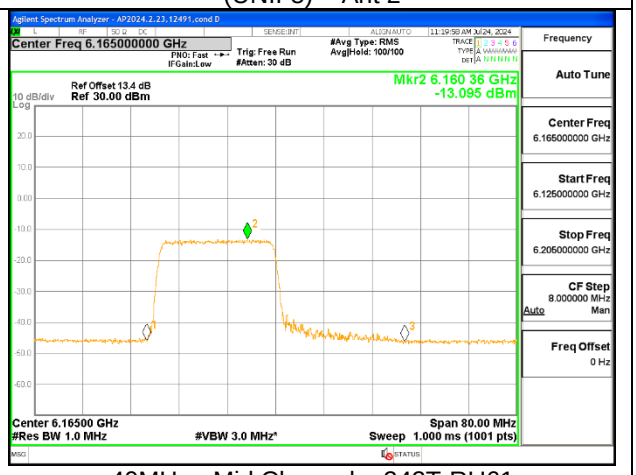
40MHz - Mid Channel – SU
(UNII-5) – Ant 1



40MHz - Mid Channel – SU
(UNII-5) – Ant 2



40MHz - Mid Channel – 242T-RU61
(UNII-5) – Ant 1



40MHz - Mid Channel – 242T-RU61
(UNII-5) – Ant 2

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.

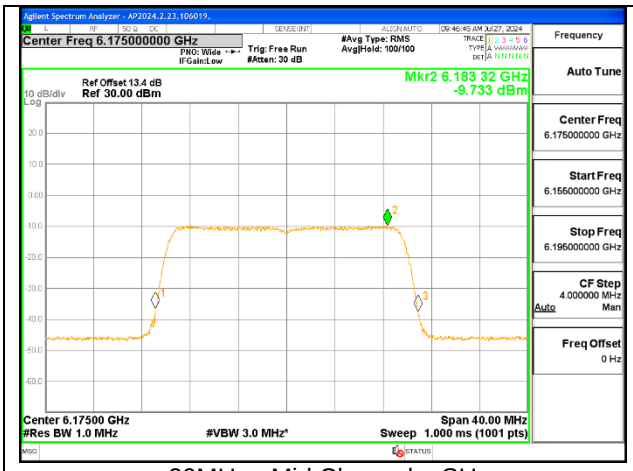
9.3.3. 802.11be MIMO SDM MODE IN THE UNII-5 BAND – VERY LOW POWER

VLP SDM UNII-5 (MIMO)	Duty Factor (dB)		Un-Correlated Antenna Gain (dBi)	Correlated Antenna Gain (dBi)	Frequency (MHz)	Channel Number	Tone	RU Index	Conducted Power (Gated)		EIRP MIMO Power (Limit = 14dBm EIRP)	Conducted PSD (dBm/MHz)		EIRP MIMO PSD (Limit = -5 dBm/MHz EIRP)
	SU	Partial Rus							Ant 1	Ant 2		Ant 1	Ant 2	
20MHz	0	0	-0.33	2.65	6115	33	SU	--	1.86	1.82	4.52	-10.052	-10.148	-7.419
							106T	53	-1.05	-1.07	1.62	-9.616	-9.567	-6.911
								54	-1.13	-1.10	1.57	-9.428	-9.698	-6.881
			-0.33	2.65	6175	45	SU	--	1.93	1.92	**4.61**	-9.917	-9.733	-7.144
							106T	53	-1.00	-1.05	1.66	-9.727	-9.632	-6.999
								54	-1.07	-1.09	1.60	-9.640	-9.545	-6.912
			-0.38	2.52	6415	93	SU	--	1.92	1.91	4.55	-9.866	-9.956	-7.280
							106T	53	-1.15	-1.08	1.52	-9.496	-9.606	-6.920
								54	-1.03	-1.07	1.58	-9.585	-9.572	-6.948
40MHz	0	0	-0.33	2.65	6125	35	SU	--	4.96	4.95	7.64	-9.797	-10.006	-7.220
							106T	53	-1.07	-1.12	1.59	-9.836	-9.763	-7.119
								54	-1.08	-1.03	1.63	-9.597	-9.695	-6.965
								56	-1.09	-1.08	1.60	-9.691	-9.705	-7.018
			-0.33	2.65	6165	43	SU	--	4.97	4.97	**7.65**	-9.925	-9.923	-7.244
							106T	53	-1.08	-1.05	1.62	-9.799	-9.803	-7.121
								54	-1.07	-1.08	1.61	-9.605	-9.717	-6.980
								56	-1.11	-1.08	1.59	-9.566	-9.640	-6.923
			-0.38	2.52	6405	91	SU	--	4.96	4.93	7.58	-9.734	-9.782	-7.128
							106T	53	-1.06	-1.10	1.55	-9.469	-9.693	-6.949
								54	-1.09	-1.03	1.57	-9.694	-9.865	-7.148
								56	-1.07	-1.05	1.57	-9.318	-9.468	-6.762
80MHz	0.11	0	-0.33	2.65	6145	39	SU	--	7.92	7.95	**10.62**	-12.339	-12.657	-9.705
							106T	53	-1.12	-1.08	1.58	-12.442	-12.372	-9.727
								56	-1.09	-1.08	1.60	-12.486	-12.454	-9.790
								60	-1.09	-1.10	1.59	-12.597	-12.653	-9.945
			-0.38	2.52	6305	71	SU	--	7.91	7.91	10.54	-12.335	-12.562	-9.707
							106T	53	-1.05	-1.11	1.55	-12.406	-12.560	-9.852
								56	-1.12	-1.09	1.53	-12.658	-12.605	-10.001
								60	-1.06	-1.06	1.57	-12.599	-12.422	-9.879
			-0.38	2.52	6385	87	SU	--	7.98	7.98	10.61	-12.372	-12.435	-9.663
							106T	53	-1.08	-1.08	1.55	-12.322	-12.301	-9.681
								56	-1.08	-1.10	1.54	-12.493	-12.554	-9.893
								60	-1.09	-1.01	1.58	-12.448	-12.460	-9.824
160MHz	0.20	0	-0.33	2.65	6185	47	SU	--	10.18	10.23	**12.89**	-13.215	-12.905	-10.177
							106T	53	-1.03	-1.07	1.63	-12.472	-12.164	-9.635
								S60	-1.02	-1.08	1.63	-12.267	-12.166	-9.536
			-0.38	2.52	6345	79	SU	--	10.23	10.17	12.83	-13.257	-13.112	-10.354
							106T	53	-1.08	-1.08	1.55	-12.587	-12.290	-9.806
								S60	-1.07	-1.09	1.55	-12.396	-12.308	-9.721

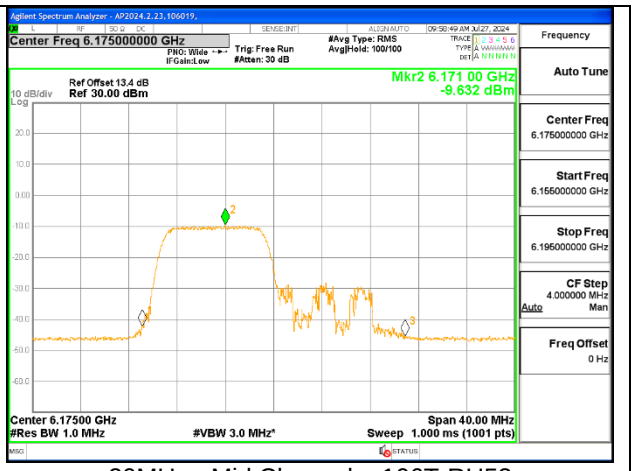
Note:
EIRP MIMO Output Power (dBm) = Measured Conducted Power (dBm) (Ant 1 + Ant 2) + Un-Correlated Antenna Gain (dBi)

EIRP MIMO PSD (dBm/MHz) = Measured Conducted PSD (dBm/MHz) (Ant 1 + Ant 2) + Duty Factor (dB) + Correlated Antenna Gain (dBi)

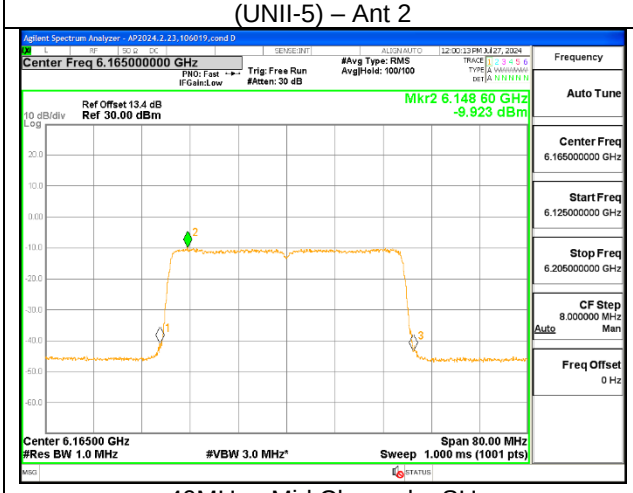
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



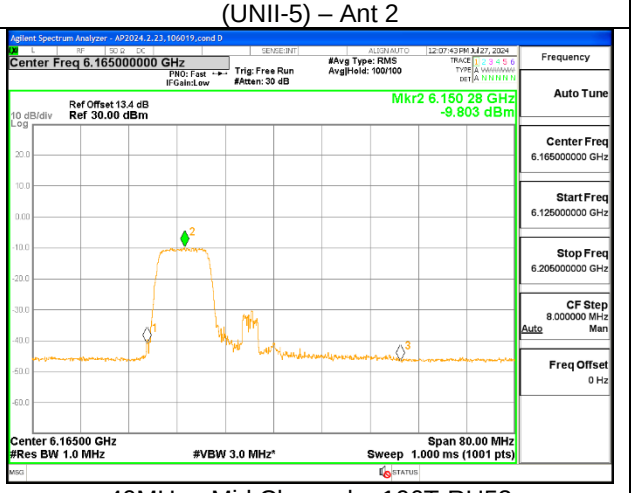
20MHz - Mid Channel – SU
(UNII-5) – Ant 2



20MHz - Mid Channel – 106T-RU53
(UNII-5) – Ant 2



40MHz - Mid Channel – SU
(UNII-5) – Ant 2



40MHz - Mid Channel – 106T-RU53
(UNII-5) – Ant 2

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.

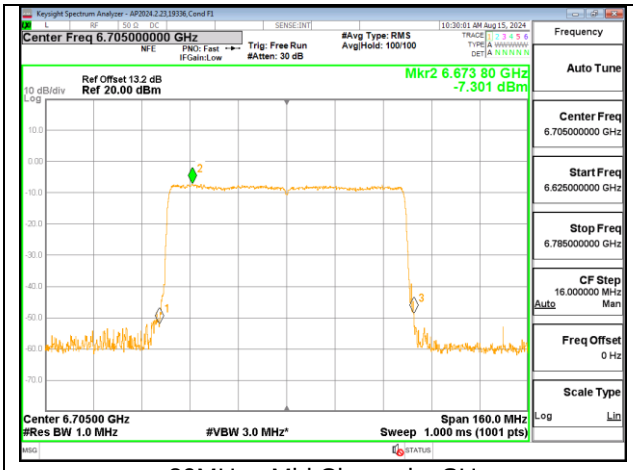
9.3.4. 802.11be SISO MODE IN THE UNII-7 BAND – VERY LOW POWER

VLP UNII-7 (SISO)	Duty Factor (dB)		Ant 1 Gain (dBi)	Ant 2 Gain (dBi)	Frequency (MHz)	Channel Number	Tone	RU Index	Conducted Power (Gated) (dBm)		EIRP Power (Limit = 14dBm EIRP)		Conducted PSD (dBm/MHz)		EIRP PSD (Limit = -5 dBm/MHz EIRP)	
	SU	Partial RU							Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2
20MHz	0	0	0.10	0.30	6535	117	SU	--	4.23	4.22	4.33	4.52	-6.922	-6.909	-6.822	-6.609
							106T	53	1.21	1.21	1.31	1.51	-6.601	-6.871	-6.501	-6.571
								54	1.22	1.24	1.32	1.54	-6.425	-6.871	-6.325	-6.571
					6695	149	SU	--	4.19	4.23	4.29	**4.53**	-6.770	-6.787	-6.670	-6.487
							106T	53	1.24	1.19	1.34	1.49	-6.372	-6.705	-6.272	-6.405
								54	1.23	1.19	1.33	1.49	-6.370	-6.476	-6.270	-6.176
					6855	181	SU	--	4.18	4.22	4.28	4.52	-7.098	-6.881	-6.998	-6.581
							106T	53	1.24	1.24	1.34	1.54	-6.557	-6.391	-6.457	-6.091
								54	1.19	1.18	1.29	1.48	-6.418	-6.792	-6.318	-6.492
40MHz	0	0	0.10	0.30	6565	123	SU	--	7.16	7.17	7.26	7.47	-7.229	-7.629	-7.129	-7.329
							106T	53	1.19	1.22	1.29	1.52	-7.636	-7.684	-7.536	-7.384
								54	1.17	1.18	1.27	1.48	-7.531	-7.726	-7.431	-7.426
								56	1.23	1.17	1.33	1.47	-7.373	-7.674	-7.273	-7.374
					6685	147	SU	--	7.17	7.19	7.27	7.49	-7.697	-7.357	-7.597	-7.057
							106T	53	1.19	1.23	1.29	1.53	-7.598	-7.804	-7.498	-7.504
								54	1.23	1.23	1.33	1.53	-7.466	-7.834	-7.366	-7.534
								56	1.24	1.23	1.34	1.53	-7.678	-7.746	-7.578	-7.446
					6845	179	SU	--	7.23	7.23	7.33	**7.53**	-7.699	-7.518	-7.599	-7.218
							106T	53	1.22	1.19	1.32	1.49	-7.826	-7.537	-7.726	-7.237
								54	1.24	1.15	1.34	1.45	-7.722	-7.616	-7.622	-7.316
								56	1.22	1.18	1.32	1.48	-7.576	-7.370	-7.476	-7.070
80MHz	0.11	0	0.10	0.30	6625	135	SU	--	10.18	10.23	10.28	**10.53**	-7.511	-7.361	-7.301	-6.951
							106T	53	1.23	1.19	1.33	1.49	-6.023	-5.972	-5.923	-5.672
								--	1.22	1.23	1.32	1.53	-6.017	-5.969	-5.917	-5.669
								60	1.24	1.16	1.34	1.46	-6.161	-5.950	-6.061	-5.650
80MHz	0.11	0	0.10	0.30	6705	151	SU	--	10.23	10.22	10.33	10.52	-7.301	-7.327	-7.091	-6.917
							106T	53	1.16	1.24	1.26	1.54	-5.947	-5.617	-5.847	-5.317
								--	1.16	1.23	1.26	1.53	-6.071	-5.883	-5.971	-5.583
								60	1.22	1.23	1.32	1.53	-5.935	-5.775	-5.835	-5.475
					6785	167	SU	--	10.23	10.19	10.33	10.49	-7.328	-7.232	-7.118	-6.822
							106T	53	1.23	1.18	1.33	1.48	-6.011	-5.665	-5.911	-5.365
								--	1.17	1.17	1.27	1.47	-5.997	-5.831	-5.897	-5.531
								60	1.17	1.24	1.27	1.54	-6.079	-5.719	-5.979	-5.419
160MHz	0.21	0	0.10	0.30	6665	143	SU	--	12.43	12.41	12.53	**12.71**	-7.480	-7.584	-7.170	-7.074
							106T	53	1.23	1.18	1.33	1.48	-6.512	-6.974	-6.412	-6.674
								S60	1.17	1.21	1.27	1.51	-6.512	-6.763	-6.412	-6.463

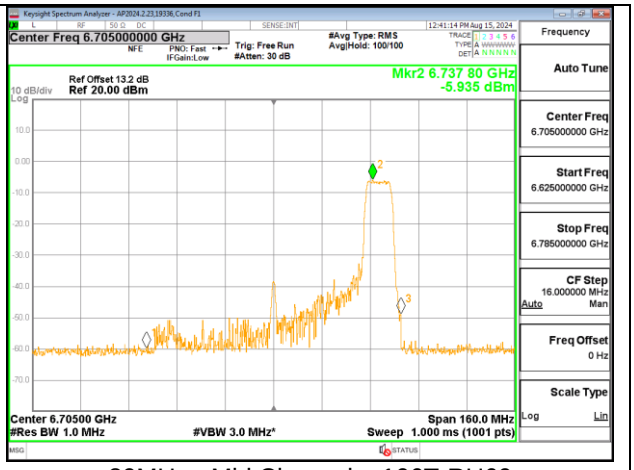
Note:
EIRP Output Power (dBm) = Measured Conducted Power (dBm)+ Peak Antenna Gain (dBi)

EIRP PSD (dBm/MHz) = Measured Conducted PSD (dBm/MHz) + Duty Factor (dB) + Peak Antenna Gain (dBi)

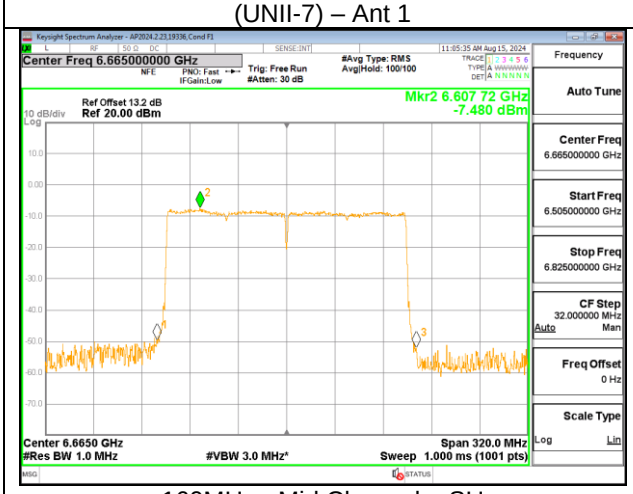
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



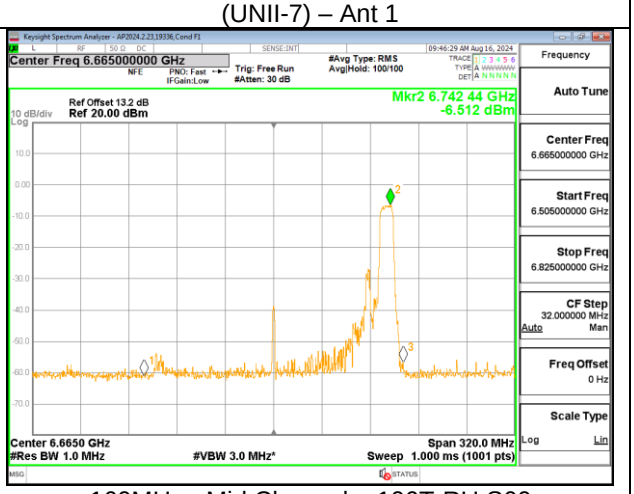
80MHz - Mid Channel – SU
(UNII-7) – Ant 1



80MHz - Mid Channel – 106T-RU60
(UNII-7) – Ant 1



160MHz - Mid Channel – SU
(UNII-7) – Ant 1



160MHz - Mid Channel – 106T-RU S60
(UNII-7) – Ant 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.

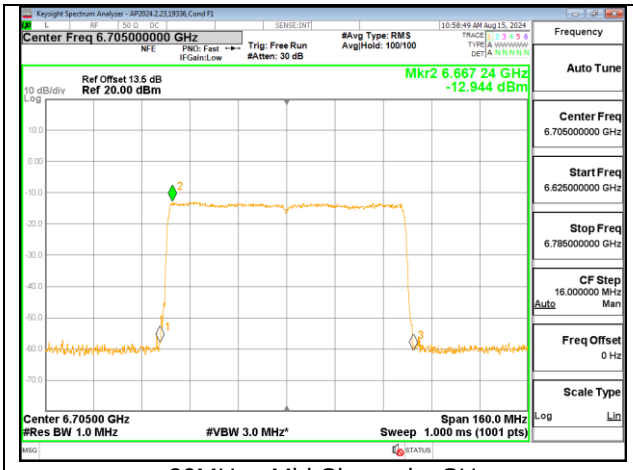
9.3.5. 802.11be MIMO CDD MODE IN THE UNII-7 BAND – VERY LOW POWER

VLP CDD UNII-7 (MIMO)	Duty Factor (dB)		Un-Correlated Antenna Gain (dBi)	Correlated Antenna Gain (dBi)	Frequency (MHz)	Channel Number	Tone	RU Index	Conducted Power (Gated)		EIRP MIMO Power (Limit = 14dBm EIRP)	Conducted PSD (dBm/MHz)		EIRP MIMO PSD (Limit = -5 dBm/MHz EIRP)
	SU	Partial Rus							Ant 1	Ant 2		Ant 1	Ant 2	
20MHz	0	0	0.20	3.21	6535	117	SU	--	-1.52	-1.52	**1.69**	-12.503	-12.680	-6.370
					6695	149	SU	--	-1.57	-1.57	1.64	-12.690	-12.491	-6.369
					6855	181	SU	--	-1.53	-1.54	1.68	-12.515	-12.785	-6.428
40MHz	0	0	0.20	3.21	6565	123	SU	--	1.41	1.42	4.63	-15.180	-15.254	-8.997
							242T	61	-1.53	-1.57	1.66	-15.622	-15.442	-9.311
								62	-1.63	-1.59	1.60	-15.379	-15.397	-9.168
					6685	147	SU	--	1.45	1.42	4.65	-14.905	-14.839	-8.652
							242T	61	-1.61	-1.55	1.63	-15.402	-15.310	-9.135
								62	-1.53	-1.57	1.66	-14.433	-15.475	-8.703
					6845	179	SU	--	1.45	1.46	**4.67**	-15.175	-14.999	-8.866
							242T	61	-1.57	-1.55	1.65	-15.489	-15.540	-9.294
								62	-1.53	-1.55	1.67	-15.105	-15.448	-9.053
80MHz	0	0	0.20	3.21	6625	135	SU	--	4.43	4.47	7.66	-12.610	-12.940	-6.552
							MRU484+242T	90	3.24	3.24	6.45	-13.001	-13.005	-6.783
								92	3.22	3.23	6.44	-13.153	-13.359	-7.034
								93	3.23	3.19	6.42	-13.308	-13.229	-7.048
80MHz	0.11	0	0.20	3.21	6705	151	SU	--	4.47	4.43	7.66	-12.930	-12.944	-6.607
							MRU484+242T	90	3.19	3.15	6.38	-12.979	-13.245	-6.890
								92	3.24	3.16	6.41	-12.972	-12.992	-6.762
								93	3.23	3.23	6.44	-12.981	-13.001	-6.771
					6785	167	SU	--	4.46	4.45	**7.67**	-12.833	-12.997	-6.584
							MRU484+242T	90	3.23	3.16	6.41	-12.980	-12.975	-6.757
								92	3.17	3.24	6.42	-13.199	-13.278	-7.018
								93	3.15	3.23	6.40	-13.112	-12.925	-6.797
160MHz	0.21	0	0.20	3.21	6665	143	SU	--	6.72	6.73	**9.94**	-13.483	-13.511	-7.067
							484T	65	1.46	1.41	4.65	-12.184	-11.953	-5.847
								S66	1.45	1.46	4.67	-12.261	-11.912	-5.863

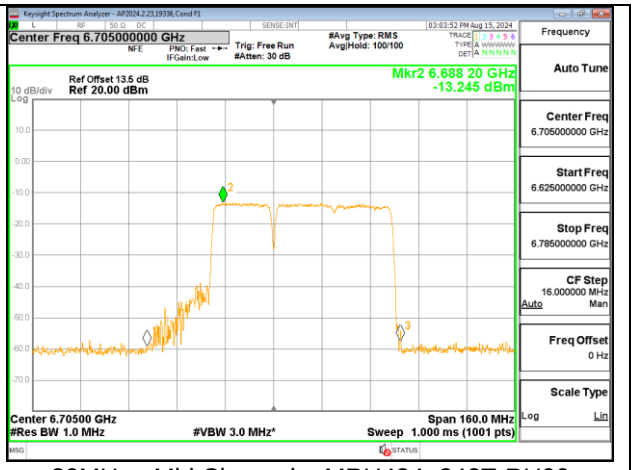
Note:
EIRP MIMO Output Power (dBm) = Measured Conducted Power (dBm) (Ant 1 + Ant 2) + Un-Correlated Antenna Gain (dBi)

EIRP MIMO PSD (dBm/MHz) = Measured Conducted PSD (dBm/MHz) (Ant 1 + Ant 2) + Duty Factor (dB) + Correlated Antenna Gain (dBi)

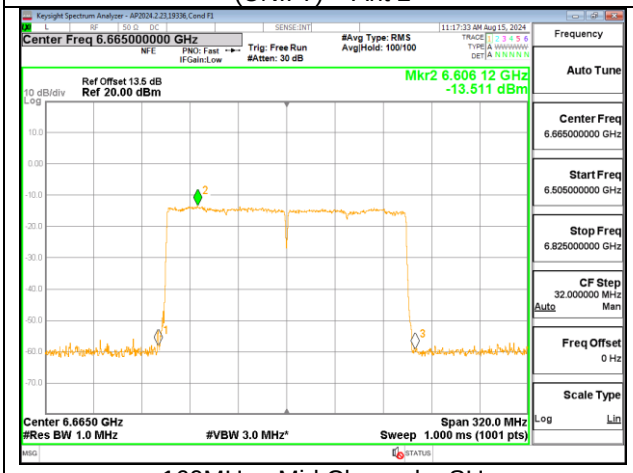
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



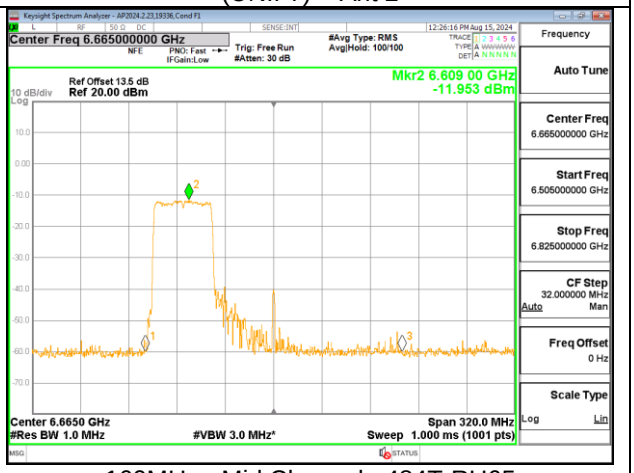
80MHz - Mid Channel – SU
(UNII-7) – Ant 2



80MHz - Mid Channel – MRU484+242T-RU90
(UNII-7) – Ant 2



160MHz - Mid Channel – SU
(UNII-7) – Ant 2



160MHz - Mid Channel –484T-RU65
(UNII-7) – Ant 2

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.

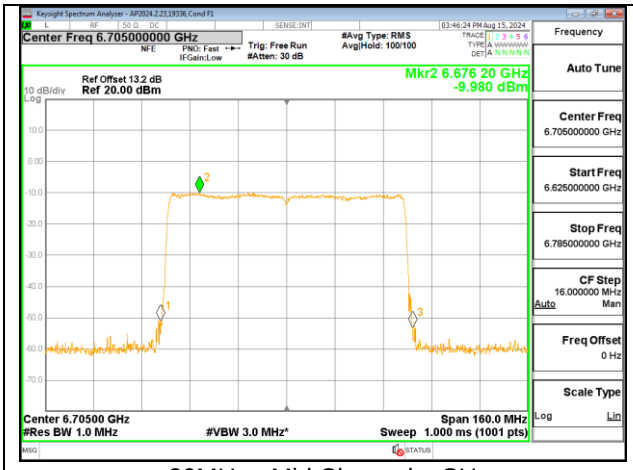
9.3.6. 802.11be MIMO SDM MODE IN THE UNII-7 BAND – VERY LOW POWER

VLP SDM UNII-7 (MIMO)	Duty Factor (dB)		Un-Correlated Antenna Gain (dBi)	Correlated Antenna Gain (dBi)	Frequency (MHz)	Channel Number	Tone	RU Index	Conducted Power (Gated)		EIRP MIMO Power (Limit = 14dBm EIRP)	Conducted PSD (dBm/MHz)		EIRP MIMO PSD (Limit = -5 dBm/MHz EIRP)
	SU	Partial Rus							Ant 1	Ant 2		Ant 1	Ant 2	
20MHz	0	0	0.20	3.21	6535	117	SU	--	1.48	1.43	4.67	-12.071	-11.789	-8.717
							106T	53	-1.57	-1.64	1.61	-12.396	-12.402	-9.189
								54	-1.52	-1.65	1.63	-12.253	-12.469	-9.149
					6715	153	SU	--	1.48	1.47	**4.69**	-12.373	-11.827	-8.881
							106T	53	-1.59	-1.54	1.65	-12.353	-12.519	-9.225
								54	-1.57	-1.57	1.64	-12.629	-12.665	-9.437
					6855	179	SU	--	1.44	1.45	4.66	-11.956	-11.907	-8.721
							106T	53	-1.61	-1.64	1.59	-12.570	-12.213	-9.178
								54	-1.57	-1.63	1.61	-12.461	-12.609	-9.324
40MHz	0	0	0.20	3.21	6565	123	SU	--	4.42	4.39	7.62	-12.627	-12.443	-9.324
							106T	53	-1.54	-1.55	1.67	-12.627	-12.416	-9.310
								54	-1.55	-1.54	1.67	-12.423	-12.538	-9.270
								56	-1.52	-1.61	1.65	-12.615	-12.507	-9.350
					6685	147	SU	--	4.42	4.47	**7.66**	-12.848	-12.657	-9.541
							106T	53	-1.58	-1.54	1.65	-12.816	-12.526	-9.458
								54	-1.57	-1.62	1.62	-12.657	-12.775	-9.505
								56	-1.58	-1.57	1.64	-12.687	-12.773	-9.519
					6845	179	SU	--	4.45	4.44	7.66	-12.794	-12.871	-9.622
							106T	53	-1.55	-1.54	1.67	-12.854	-12.538	-9.483
								54	-1.56	-1.57	1.65	-12.621	-12.787	-9.493
								56	-1.67	-1.58	1.59	-12.698	-12.751	-9.514
80MHz	0.11	0	0.20	3.21	6625	135	SU	--	7.48	7.44	10.67	-10.212	-10.132	-6.852
							106T	53	-1.52	-1.54	1.68	-9.356	-9.694	-6.311
								56	-1.52	-1.53	1.69	-9.764	-9.736	-6.540
								60	-1.52	-1.53	1.69	-9.546	-9.709	-6.416
			0.20	3.21	6705	151	SU	--	7.43	7.46	10.66	-9.980	-10.063	-6.701
							106T	53	-1.53	-1.58	1.66	-9.697	-9.786	-6.531
								56	-1.55	-1.57	1.65	-9.757	-9.659	-6.497
								60	-1.57	-1.53	1.66	-9.526	-9.586	-6.346
					6785	167	SU	--	7.47	7.47	**10.68**	-9.939	-9.976	-6.637
							106T	53	-1.55	-1.57	1.65	-9.704	-9.645	-6.464
								56	-1.52	-1.53	1.69	-9.345	-9.525	-6.224
								60	-1.61	-1.53	1.64	-9.405	-9.577	-6.280
160MHz	0.20	0	0.20	3.21	6665	143	SU	--	9.72	9.65	**12.90**	-10.209	-10.311	-6.849
							106T	53	-1.58	-1.57	1.64	-9.833	-9.763	-6.588
								S60	-1.55	-1.58	1.65	-9.700	-9.689	-6.484

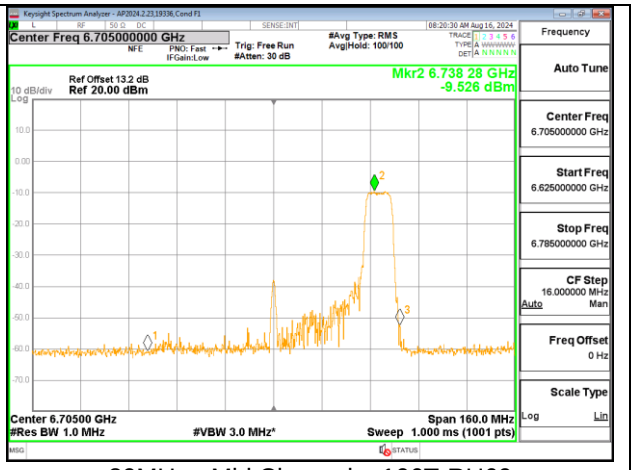
Note:
EIRP MIMO Output Power (dBm) = Measured Conducted Power (dBm) (Ant 1 + Ant 2) + Un-Correlated Antenna Gain (dBi)

EIRP MIMO PSD (dBm/MHz) = Measured Conducted PSD (dBm/MHz) (Ant 1 + Ant 2) + Duty Factor (dB) + Un-Correlated Antenna Gain (dBi)

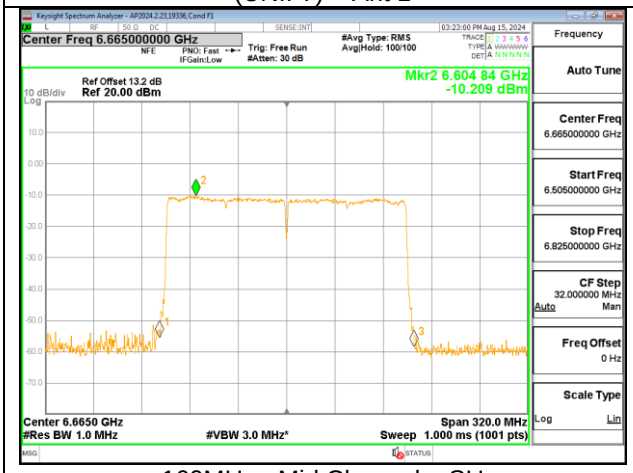
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



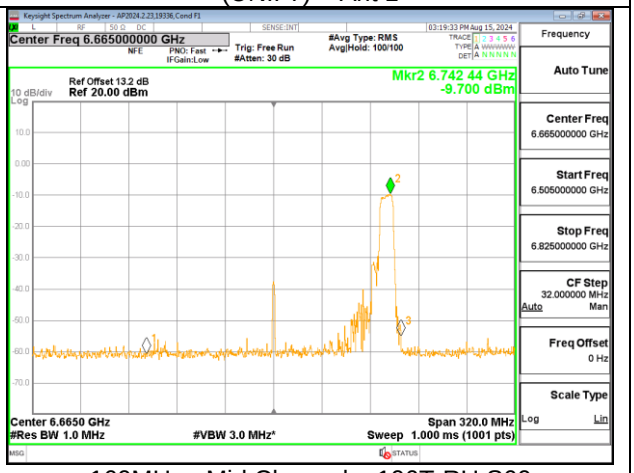
80MHz - Mid Channel – SU
(UNII-7) – Ant 1



80MHz - Mid Channel – 106T-RU60
(UNII-7) – Ant 1



160MHz - Mid Channel – SU
(UNII-7) – Ant 1



160MHz - Mid Channel – 106T-RU S60
(UNII-7) – Ant 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.

9.4. VLP SPURIOUS EMMISSIONS IN-BAND– EMISSION MASK

LIMITS

FCC §15.407
(b)(7) For transmitters operating within the 5.925-7.125 GHz bands: power spectral density must be suppressed by 20 dB at 1 MHz outside of channel edge, by 28 dB at one channel bandwidth from the channel center, and by 40 dB at one- and one-half times the channel bandwidth away from channel center. At frequencies between one megahertz outside an unlicensed device's channel edge and one channel bandwidth from the center of the channel, the limits must be linearly interpolated between 20 dB and 28 dB suppression, and at frequencies between one and one- and one-half times an unlicensed device's channel bandwidth, the limits must be linearly interpolated between 28 dB and 40 dB suppression. Emissions removed from the channel center by more than one- and one-half times the channel bandwidth must be suppressed by at least 40 dB.

TEST PROCEDURE

Follow KCB 987594 D02 v01r01, Section II-J, RBW & VBW settings were based on 26dB bandwidth test settings. Only Partial RU for all bandwidths, the RBW & VBW settings were used equal or greater than 26dB bandwidth test settings.

Band	Tones	20MHz (RBW/VBW)	40MHz (RBW/VBW)	80MHz (RBW/VBW)	160MHz (RBW/VBW)
UNII-5	Partial RU	300kHz/910kHz	510kHz/1.6MHz	510kHz/1.6MHz (SISO/SDM) 1MHz/3MHz (MIMO)	510kHz/1.6MHz (SISO/SDM) 1MHz/3MHz (MIMO)
	SU	300kHz/910kHz	510kHz/1.6MHz	1MHz/3MHz	2MHz/6MHz
UNII-7	Partial RU	300kHz/910kHz	510kHz/1.6MHz	510kHz/1.6MHz (SISO/SDM) 1MHz/3MHz (MIMO)	510kHz/1.6MHz (SISO/SDM) 1MHz/3MHz (MIMO)
	SU	300kHz/910kHz	510kHz/1.6MHz	1MHz/3MHz	2MHz/6MHz

RESULTS

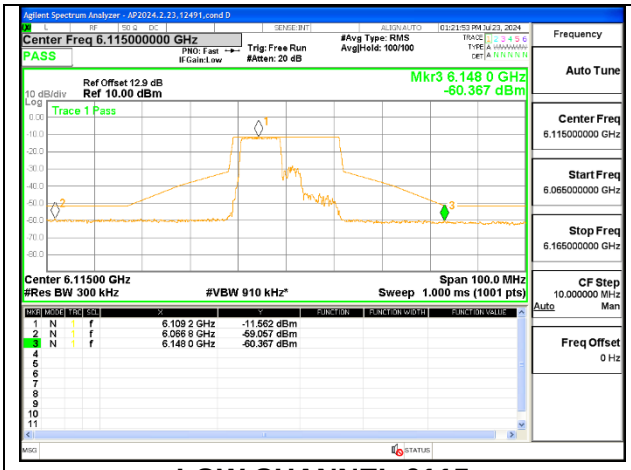
For mask and bandwidth measurements partial RU allocations are tested with the RUs allocated at the lower and upper positions within the channel for the low mid and high channels in each band. Additionally, the center channel is also tested with the RU allocated in the center of the channel to verify that the low / high RU allocations are worst case.

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

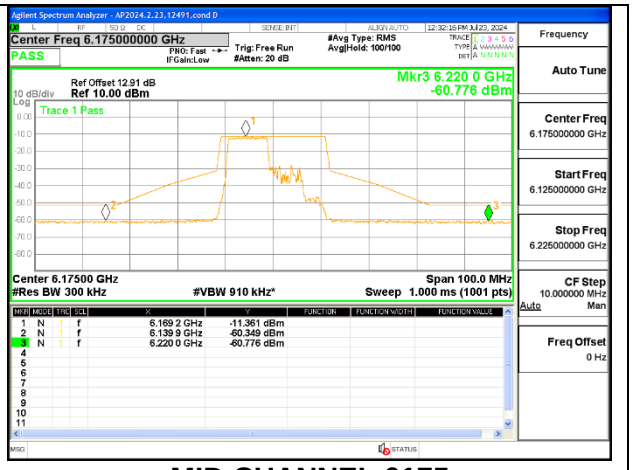
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

9.4.1. 802.11be EHT20 MODE IN THE UNII-5 BAND

1TX Antenna 6 MODE (FCC) MOBILE – 106-Tones, RU Index 53



LOW CHANNEL 6115



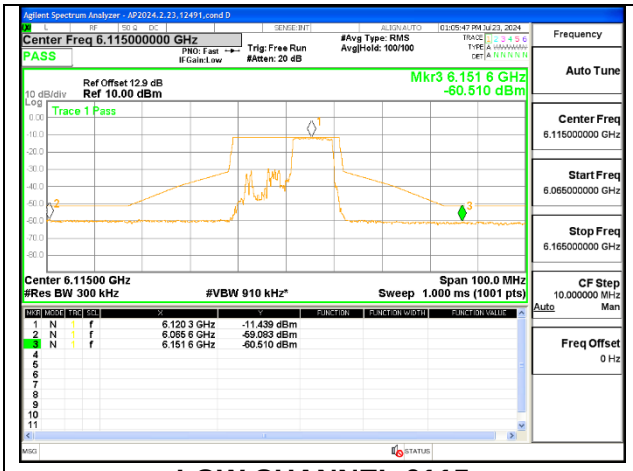
MID CHANNEL 6175

HIGH CHANNEL 6415

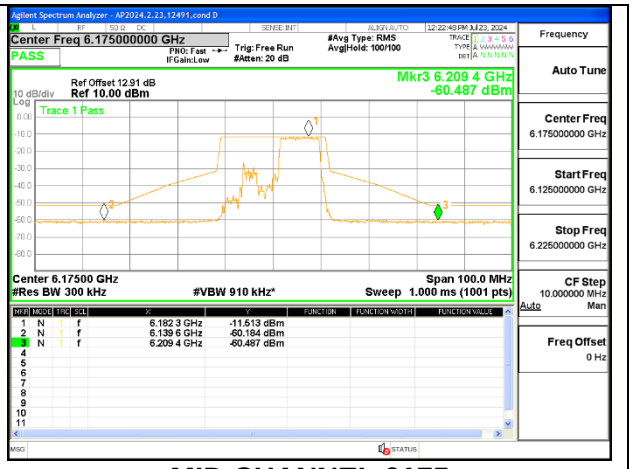
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

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

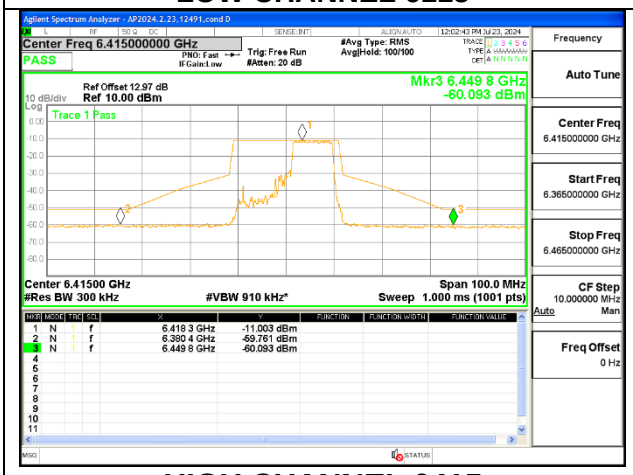
1TX Antenna 6 MODE (FCC) MOBILE – 106-Tones, RU Index 54



LOW CHANNEL 6115



MID CHANNEL 6175

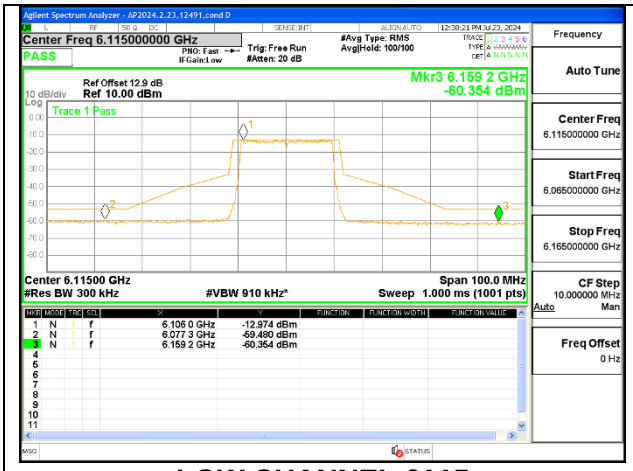


HIGH CHANNEL 6415

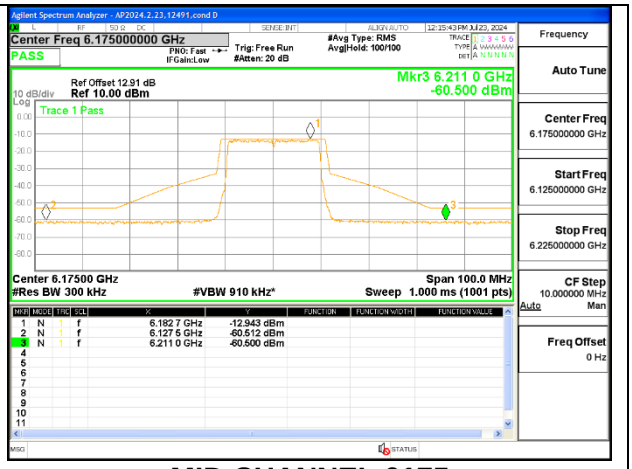
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

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

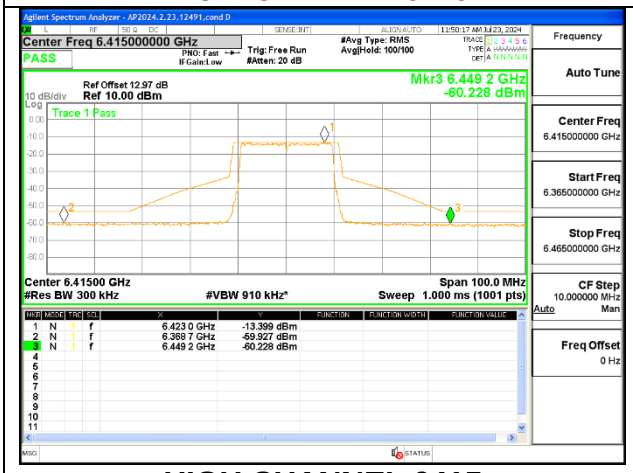
1TX Antenna 6 MODE (FCC) MOBILE – SU MODE



LOW CHANNEL 6115



MID CHANNEL 6175

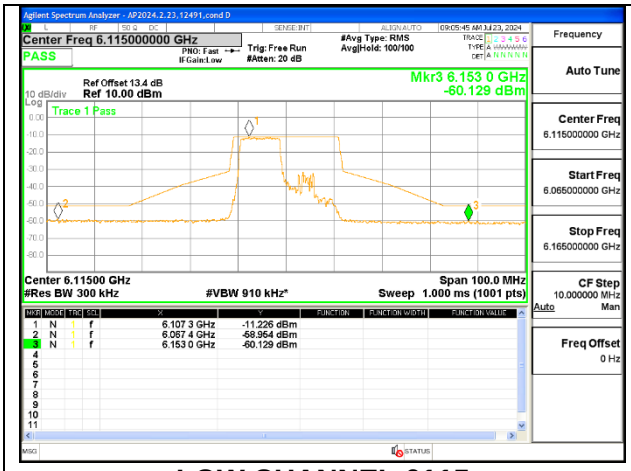


HIGH CHANNEL 6415

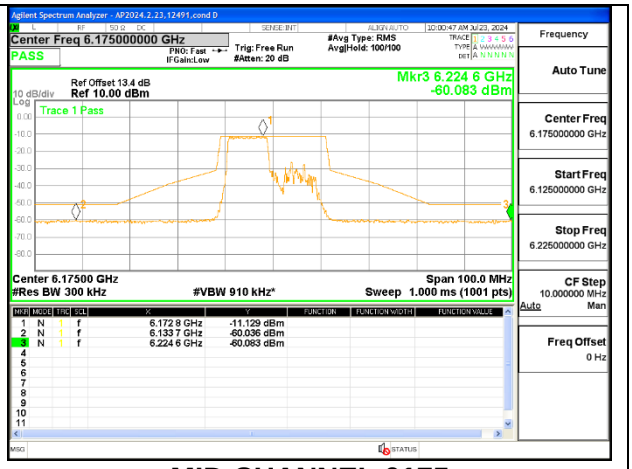
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

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

1TX Antenna 5 MODE (FCC) MOBILE – 106-Tones, RU Index 53



LOW CHANNEL 6115



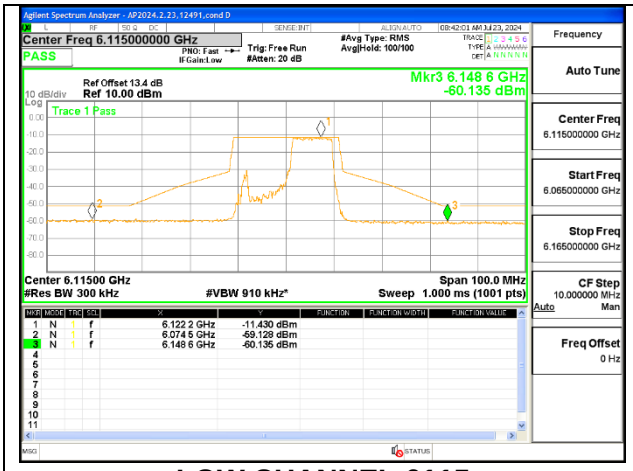
MID CHANNEL 6175

HIGH CHANNEL 6415

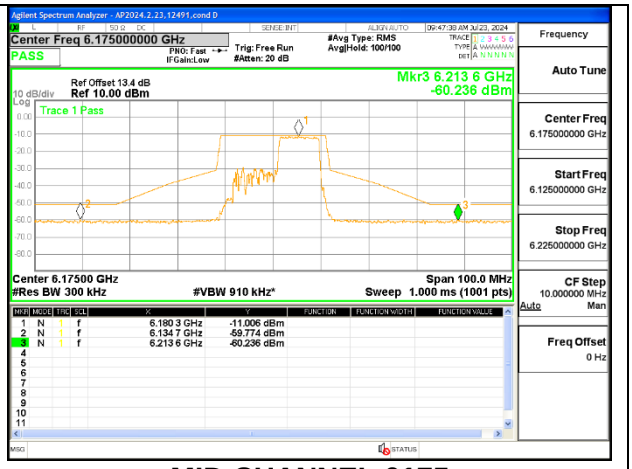
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

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

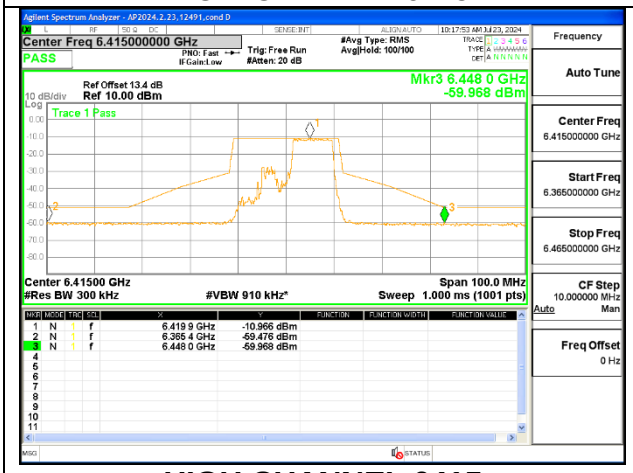
1TX Antenna 5 MODE (FCC) MOBILE – 106-Tones, RU Index 54



LOW CHANNEL 6115



MID CHANNEL 6175

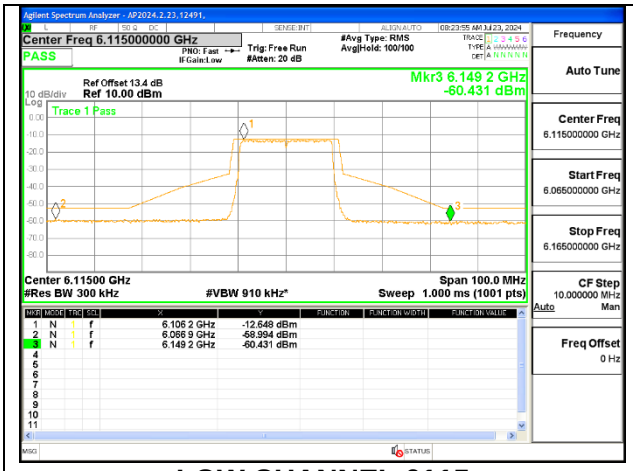


HIGH CHANNEL 6415

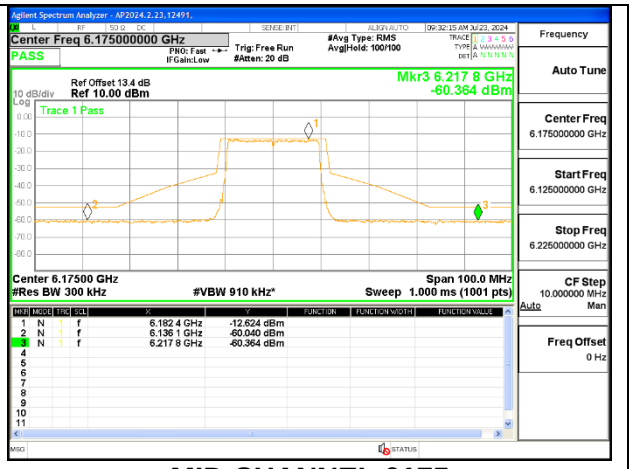
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

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

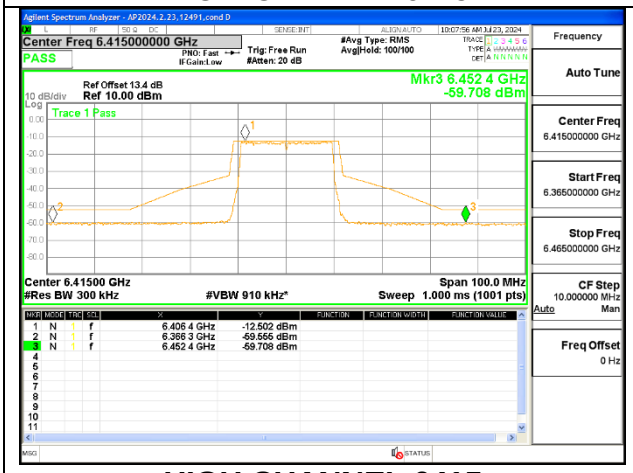
1TX Antenna 5 MODE (FCC) MOBILE – SU MODE



LOW CHANNEL 6115



MID CHANNEL 6175

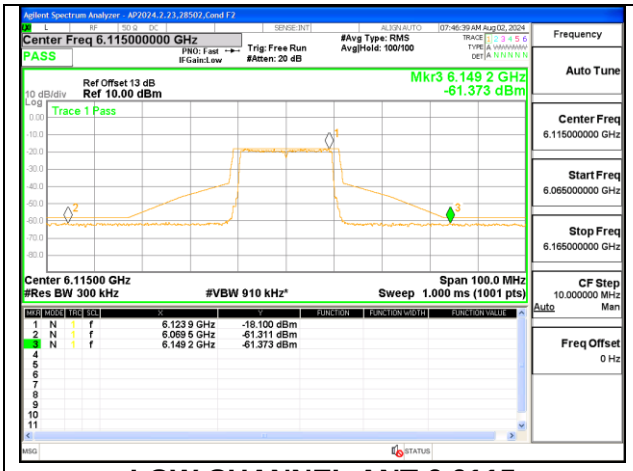


HIGH CHANNEL 6415

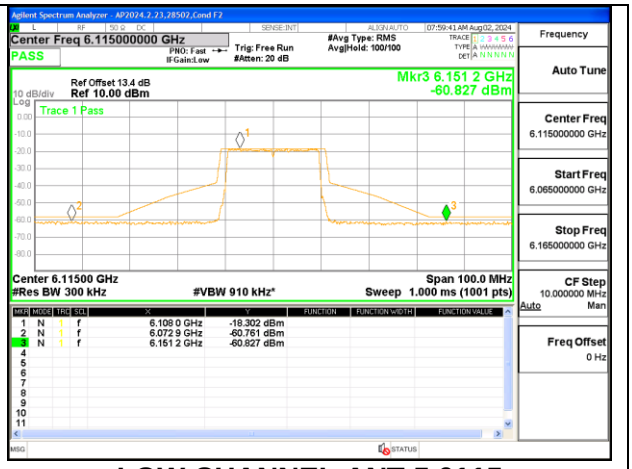
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

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

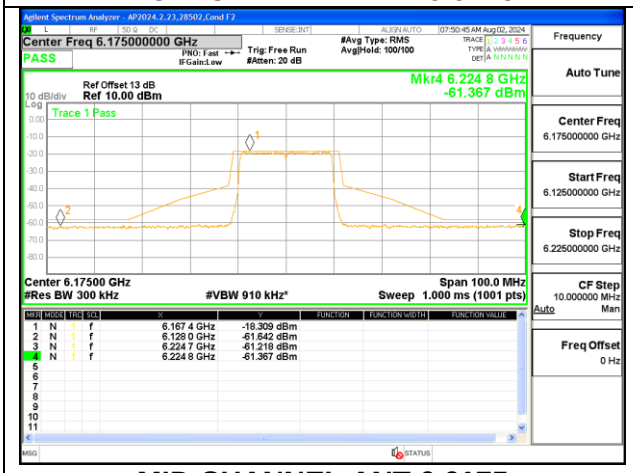
2TX Antenna 6 + Antenna 5 CDD MODE (FCC) – SU MODE



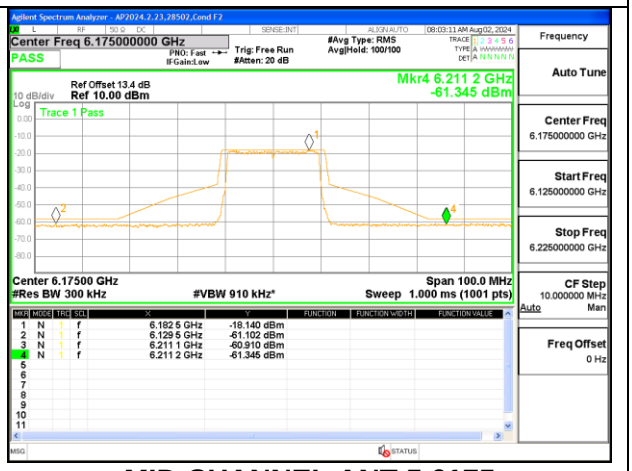
LOW CHANNEL ANT 6 6115



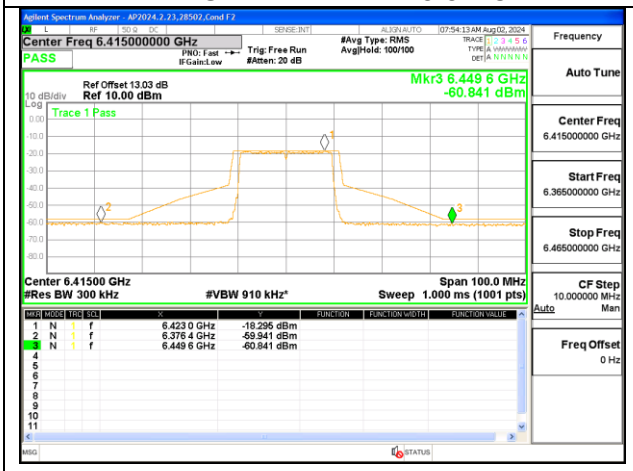
LOW CHANNEL ANT 5 6115



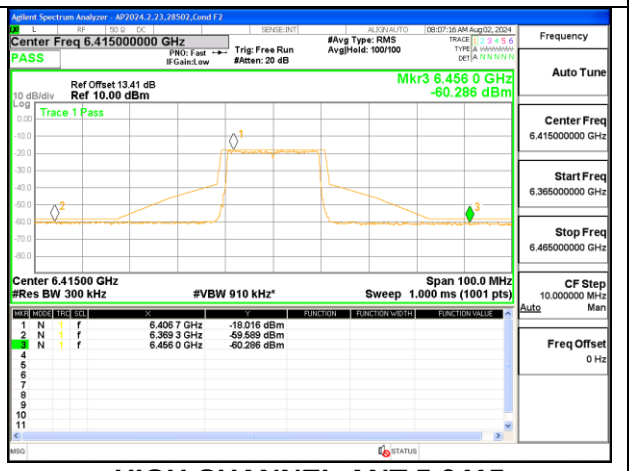
MID CHANNEL ANT 6 6175



MID CHANNEL ANT 5 6175



HIGH CHANNEL ANT 6 6415

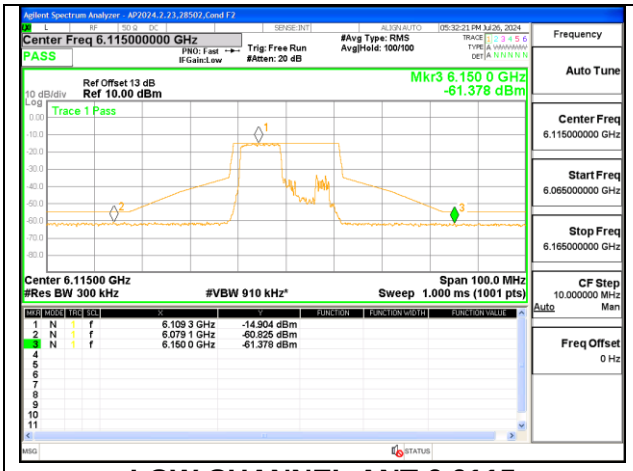


HIGH CHANNEL ANT 5 6415

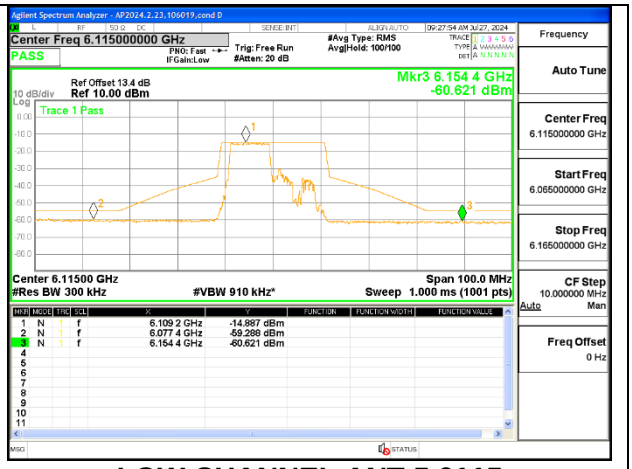
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

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

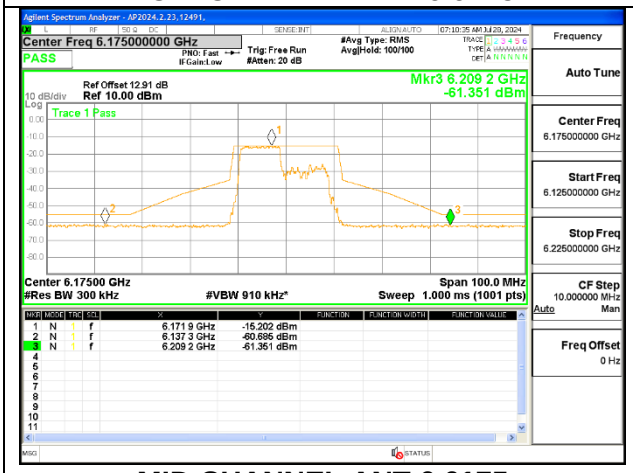
2TX Antenna 6 + Antenna 5 SDM MODE (FCC) – 106-Tones, RU Index 53



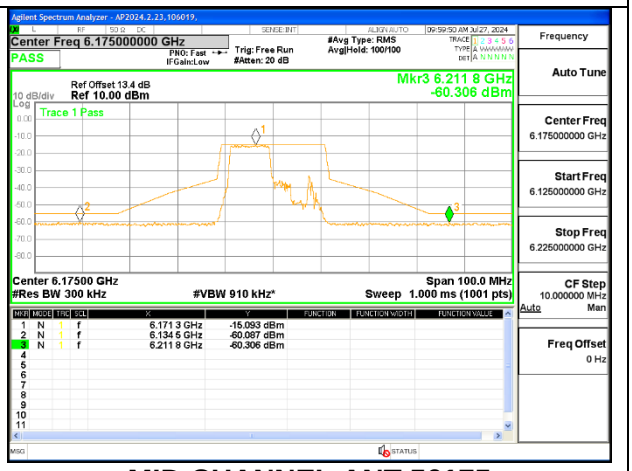
LOW CHANNEL ANT 6 6115



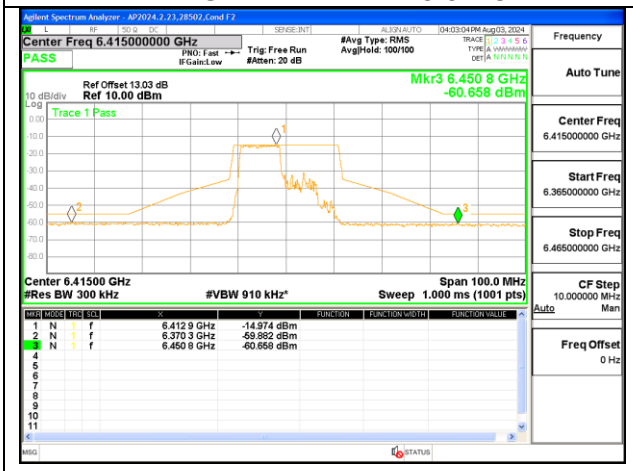
LOW CHANNEL ANT 5 6115



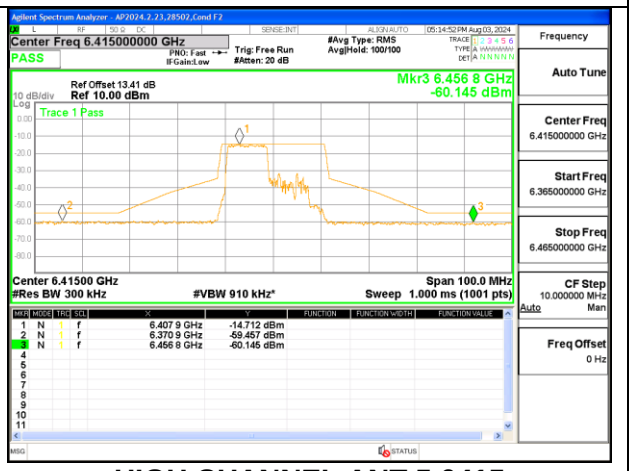
MID CHANNEL ANT 6 6175



MID CHANNEL ANT 56175



HIGH CHANNEL ANT 6 6415



HIGH CHANNEL ANT 5 6415

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.