TEST REPORT

Report Number : R14720550-E3

Applicant	:	Samsung Electronics Company Limited 129 Samsung-Ro Yeongtong-Gu Suwon-Si, Gyeonggi-Do, 16677, Korea
Model	:	SM-X716B
FCC ID	:	A3LSMX716B
EUT Description	:	GSM/WCDMA/LTE 5G NR Tablet + BT/BLE, DTS/UNII a/b/g/n/ac/ax and WPT
Test Standard(s)	:	FCC 47 CFR PART 15 SUBPART E:2023 ISED RSS-248 ISSUE 2:2022 ISED RSS-GEN ISSUE 5+A1+A2:2021

Date Of Issue:
2023-07-03

Prepared by:
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CERT #0751.06

REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	2023-05-15	Initial Issue	B. Kiewra
V2	2023-05-31	Revised standard versions. Added note regarding antenna nomenclature. Extended calibration date to end of the due month.	B. Kiewra
V3	2023-06-05	Added gain calculation	B. Kiewra
V4	2023-06-09	Added additional gain calculation explanation. Added additional clarification on SP covering LPI mode in section 9.5 Revised 80MHz and 160MHz BW data in section 9.5	B. Kiewra
V5	2023-07-03	Revised table in section 6.2 to clarify which bands support LPI and SP. Revised antenna description. Revised emissions mask test procedure. Revised worst-case configuration and mode.	N. Haydon

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	Samsung Electronics Company Limited 129 Samsung-Ro Yeongtong-Gu Suwon-Si, Gyeonggi-Do, 16677, Korea
EUT DESCRIPTION:	GSM/WCDMA/LTE 5G NR Tablet + BT/BLE, DTS/UNII a/b/g/n/ac/ax and WPT
MODEL:	SM-X716B
SERIAL NUMBER:	5918385, R32W3004BTT, 5918394, 5918392, R32W300404N
SAMPLE RECEIPT DATE:	2023-03-24
DATE TESTED:	2023-04-14 to 2023-06-09

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
47 CFR Part 15 Subpart E	Refer to section 2
ISED RSS-248 Issue 2	Refer to section 2
ISED RSS-GEN Issue 5+A1+A2	Refer to section 2

UL LLC 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 LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC will constitute fraud and shall nullify the document.

Approved & Released
For UL LLC By:

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Consumer, Medical and IT Segment
UL LLC

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2. TEST RESULT SUMMARY

FCC Clause	ISED Clause	Requirement	Result	Comment
See Comment		Duty Cycle	Reporting purposes only	ANSI C63.10 Section 12.2
See Comment	RSS-248 4.4	99% BW	Reporting purposes only	ANSI C63.10 Section 6.9.3
§15.407 (a) (10)	NA	26dB BW	Compliant	None
§15.407 (a) (7)	RSS-248 4.5.5	Output Power e.i.r.p.	Compliant	Client device operating under the control of SP AP
§15.407 (a) (8)	RSS-248 4.5.3	Output Power e.i.r.p.	Compliant	Indoor Client.
§15.407 (a) (7)	RSS-248 4.5.5	Power Spectral Density	Compliant	Client device operating under the control of SP AP
§15.407 (a) (8)	RSS-248 4.5.3	Power Spectral Density	Compliant	Indoor Client.
§15.407 (b) (5)	RSS-248 4.6.2 (a)	Emissions outside 5.925-7.125 GHz band	Compliant	None
§15.407 (b) (6)	RSS-248 4.6.2 (b)	Emissions within 5.925-7.125 GHz Band(Emissions Mask)	Compliant	None
§15.407 (d) (6)	RSS-248 4.7	Contention-based protocol	Not Tested	See Separate Report
§15.205, §15.209	RSS-GEN 8.9, 8.10	Radiated Spurious Emissions	Compliant	None
§15.207	RSS-Gen 8.8	AC Mains Conducted Emissions	Compliant	None

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with;
- FCC 47 CFR Part 2
- FCC 47 CFR Part 15
- FCC KDB 662911 D01 v02r01
- FCC KDB 789033 D02 v02r01
- ANSI C63.10-2013
- RSS-GEN Issue 5 + A1/2
- RSS-248 Issue 2
- FCC KDB 987594 D01 v03r03

4. FACILITIES AND ACCREDITATION

UL LLC is accredited by A2LA, certification # 0751.06, 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: 12 Laboratory Dr RTP, NC 27709, U.S.A	US0067	2180C	825374
☒	Building: 2800 Perimeter Park Dr. Suite B Morrisville, NC 27560, U.S.A		27265	

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}
Radio Frequency (Spectrum Analyzer)	141.2 Hz
Occupied Channel Bandwidth	1.22%
RF output power, conducted	1.3 dB (PK) 0.45 dB (AV)
Power Spectral Density, conducted	2.47 dB
Unwanted Emissions, conducted	1.94 dB
All emissions, radiated	6.01 dB
Mains Conducted Emissions (0.150-30MHz) - LISN	3.40 dB
Temperature	0.57°C
Humidity	3.39%
DC Supply voltages	1.70%

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

RADIATED EMISSIONS

Where relevant, the following sample calculation is provided:
Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)
36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

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

OUTPUT POWER (EIRP)

Conducted Power + Ant Gain= EIRP:

6. EQUIPMENT UNDER TEST

6.1. EUT DESCRIPTION

The EUT is a GSM/WCDMA/LTE 5G NR Tablet + BT/BLE, DTS/UNII a/b/g/n/ac/ax and WPT.

6.2. EUT DEVICE CLASS

EUT is of the following device class;

	U-NII Bands of Operation			
	5	6	7	8
Dual Client (6CD) LPI	☒	☒	☒	☒
Dual Client (6CD) SP	☒	☐	☒	☐

6.3. MAXIMUM OUTPUT POWER

The transmitter has a maximum e.i.r.p. output power as follows:

U-NII 5 (5.925-6.425 GHz) BAND

Frequency Range (MHz)	Mode	e.i.r.p. Power (dBm)	Output Power (mW)
LPI			
5955-6415	802.11a	5.58	3.61
	802.11ax HE20 OFDMA, 26T	-2.00	0.63
	802.11ax HE20 OFDMA, 52T	0.21	1.05
	802.11ax HE20 OFDMA, 106T	3.16	2.07
	802.11ax HE20 OFDMA, 242T	6.24	4.21
5965-6405	802.11ax HE40 OFDMA, 484-Tones	9.07	8.07
5985-6385	802.11ax HE80 OFDMA, 996-Tones	12.18	16.52
6025-6345	802.11ax HE160 OFDMA, 2x996-Tones	12.02	15.92
SP			
5955-6415	802.11a	12.23	16.71
	802.11ax HE20 OFDMA, 26T	12.20	16.60
	802.11ax HE20 OFDMA, 52T	12.25	16.79
	802.11ax HE20 OFDMA, 106T	12.10	16.22
	802.11ax HE20 OFDMA, 242T	12.17	16.48
5965-6405	802.11ax HE40 OFDMA, 484-Tones	12.25	16.79
5985-6385	802.11ax HE80 OFDMA, 996-Tones	12.17	16.48
6025-6345	802.11ax HE160 OFDMA, 2x996-Tones	12.01	15.89

U-NII-6 (6.425-6.525 GHz) BAND

Frequency Range (MHz)	Mode	e.i.r.p. Power (dBm)	Output Power (mW)
LPI			
6435-6515	802.11a	5.37	3.44
	802.11ax HE20 OFDMA, 26T	-1.86	0.65
	802.11ax HE20 OFDMA, 52T	0.10	1.02
	802.11ax HE20 OFDMA, 106T	3.26	2.12
	802.11ax HE20 OFDMA, 242T	6.27	4.24
6445-5485	802.11ax HE40 OFDMA, 484T	9.23	8.38
6465	802.11ax HE80 OFDMA, 996T	12.17	16.48
6505	802.11ax HE160 OFDMA, 2x996T	12.05	16.03

U-NII-7 (6.525-6.875 GHz) BAND

Frequency Range (MHz)	Mode	e.i.r.p. Power (dBm)	Output Power (mW)
LPI			
6535-6855	802.11a	5.45	3.51
	802.11ax HE20 OFDMA, 26T	-1.78	0.66
	802.11ax HE20 OFDMA, 52T	0.01	1.00
	802.11ax HE20 OFDMA, 106T	3.20	2.09
	802.11ax HE20 OFDMA, 242T	6.21	4.18
6565-6845	802.11ax HE40 OFDMA, 484T	9.20	8.32
6625-6785	802.11ax HE80 OFDMA, 996T	12.22	16.67
6665	802.11ax HE160 OFDMA, 2x996T	11.97	15.74
SP			
6535-6855	802.11a	12.18	16.52
	802.11ax HE20 OFDMA, 26T	11.97	15.74
	802.11ax HE20 OFDMA, 52T	12.05	16.03
	802.11ax HE20 OFDMA, 106T	12.26	16.83
	802.11ax HE20 OFDMA, 242T	12.23	16.71
6565-6845	802.11ax HE40 OFDMA, 484T	12.26	16.83
6625-6785	802.11ax HE80 OFDMA, 996T	12.18	16.52
6665	802.11ax HE160 OFDMA, 2x996T	11.79	15.10

U-NII 8 (6.875-7.125 GHz) BAND

Frequency Range (MHz)	Mode	e.i.r.p. Power (dBm)	Output Power (mW)
LPI			
6875-7115	802.11a	5.58	3.61
	802.11ax HE20 OFDMA, 26T	-1.85	0.65
	802.11ax HE20 OFDMA, 52T	0.20	1.05
	802.11ax HE20 OFDMA, 106T	3.20	2.09
	802.11ax HE20 OFDMA, 242T	6.19	4.16
6885-7085	802.11ax HE40 OFDMA, 484T	8.95	7.85
6865-7025	802.11ax HE80 OFDMA, 996T	11.96	15.70
6825-6985	802.11ax HE160 OFDMA, 2x996T	12.11	16.26

6.4. DESCRIPTION OF AVAILABLE ANTENNAS

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

Frequency Range (MHz)	Type	Maximum Gain (dBi)		Integrated Antenna?	
		Chain 0	Chain 1	Yes	No
5925-7125	Stamped metal PIFA	-0.36	-1.14	☒	☐

Note: Throughout report Chain 0 is BT/WiFi 1 Antenna and Chain 1 is BT/WiFi 2 Antenna as noted in the antenna document.

6.5. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was REV0.1.
The test utility software used during testing was X716B.001.

6.6. WORST-CASE CONFIGURATION AND MODE

Radiated emissions below 1GHz, above 18GHz, and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario. These scans were chosen and run based on higher power measurements than reported.

For all modes, tests were performed with the EUT set at the 2Tx MIMO mode with power setting equal to SISO modes as the worst-case scenario thus MIMO is representative of SISO.

Radiated emissions between 1GHz and 18GHz were performed with the EUT set to transmit at the highest power on low and high channels on all modes for bandedge and low, middle and high channels on modes with wrost-case power/PSD for harmonics and spurious.

The fundamental of the EUT was investigated in three orthogonal orientations X,Y,Z, it was determined that Y orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in Y orientation.

All testing performed in 2Tx mode (NSS=1), where power per chain is equivalent to the 1Tx power on each chain. Based on preliminary testing, this allows 2Tx testing to cover all 1Tx testing.

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

802.11a mode: 6 Mbps
802.11ax HE20mode: MCS0 (Nss = 1)
802.11ax HE40mode: MCS0 (Nss = 1)
802.11ax HE80mode: MCS0 (Nss = 1)
802.11ax HE160mode: MCS0 (Nss = 1)

802.11ax modes were determined by the following:

- 802.11ax HE20 26T, 52T, 106T, and 242T modes tested.
- 802.11ax HE40 484T mode tested. 26T, 52T, 106T, and 242T modes are covered by the HE 20MHz modes.
- 802.11ax HE80 996T mode tested. 26T, 52T, 106T, 242T, and 484T modes are covered by the HE20 HE40 modes.
- 802.11ax HE160 2x996T mode tested. 26T, 52T, 106T, 242T, 484T, and 996T modes are covered by the HE 20MHz, 40MHz, and 80MHz modes.

In case of 26dB bandwidth,

Preliminary Investigation scans were completed to compare Full RU Tone modes and Single User Tone modes. It was found that Full RU Tone modes were worst case over Single User in every instance. Therefore, only full tone was testing as it is representative of SU worst case

Except for power and PSD, Bands UNII 5 and 7 were tested in standard power mode and UNII 6 and 8 were tested in Low Power Indoor mode.

PSD performed on all modes for LPI, however, for SP only 20MHz bandwidth modes performed to cover 40MHz, 80MHz, and 160MHz bandwidths.

In case of In-band emission mask, UNII-5/7, preliminary testing determined that worst case was the standard power, test was performed on standard power modes.

The EUT was pre-tested in its two configurations; with and without the keyboard attached. As determined through pretesting, without the keyboard was found to be the worst-case configuration. Therefore, all final testing was performed without the keyboard attached.

6.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
AC Adapter	Samsung	EP-TA800	R37TCCJ49LASEA	-

I/O CABLES

I/O Cable List						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	Charging	1	USB C to USB A	Shielded	<3m	Used to charge the device

TEST SETUP

The EUT is installed as a standalone device.

SETUP DIAGRAM

Refer to R14720550-EP1 for setup diagram.

7. MEASUREMENT METHOD

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

26 dB Emission BW: KDB 789033 D02 v02r01, Section C.1

99% BW: KDB 789033 D02 v02r01, Section 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

Unwanted emissions in restricted bands: KDB 789033 D02 v02r01, Sections G.3, G.4, G.5, and G.6.

Unwanted emissions in non-restricted bands: KDB 789033 D02 v02r01, Sections G.3, G.4, and G.5.

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

Radiated Spurious Emissions Below 30MHz: ANSI C63.10-2013 Section 6.4

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8. TEST AND MEASUREMENT EQUIPMENT

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

Test Equipment Used - Wireless Conducted Measurement Equipment

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
SA0027	Spectrum Analyzer	Keysight Technologies	N9030A	2022-05-24	2023-05-31
PWM005 / PRE0136341	RF Power Meter	Keysight Technologies	N1912A	2022-09-02	2024-09-02
90418	Peak and Avg Power Sensor, 50MHz to 18GHz	Keysight Technologies	N1921A	2023-02-02	2024-02-02
PWS002 / 135125	Peak and Avg Power Sensor, 50MHz to 18GHz	Keysight Technologies	N1921A	2022-09-27	2023-09-27
PWS005	Peak and Avg Power Sensor, 50MHz to 18GHz	Keysight Technologies	N1921A	2022-06-15	2023-06-15
HI0091	Environmental Meter	Fisher Scientific	15-077-963	2022-07-20	2023-07-20
SOFTEMI	Antenna Port Software	UL	Version 2022.8.16	NA	NA
SA0025	Spectrum Analyzer	Keysight Technologies	N9030A	2022-05-02	2023-05-31
SA0026	Spectrum Analyzer	Keysight Technologies	N9030A	2022-08-02	2023-08-02
HI0090	Environmental Meter	Fisher Scientific	15-077-963	2022-07-20	2023-07-20
PWM002 (PRE0137344)	RF Power Meter	Keysight Technologies	N1911A	2022-07-07	2023-07-07
PWS001 (PRE0137347)	Peak and Avg Power Sensor, 50MHz to 18GHz	Keysight Technologies	N1921A	2022-07-07	2023-07-07
EMC4366	Bluetooth Tester	Rhode & Schwarz	1153.9000.35	-	-
SOFTEMI	Antenna Port Software	UL	Version 2022.8.16	NA	NA

Note: all equipment was in calibration at time of test

Test Equipment Used - Wireless Conducted Attenuators, Cables, and Couplers

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
226559	SMA Coaxial 10dB Attenuator 25MHz-18GHz	CentricRF	C18S2-10	2023-02-16	2024-02-16
226562	SMA Coaxial 10dB Attenuator 25MHz-18GHz	CentricRF	C18S2-10	2023-02-16	2024-02-16
226564	SMA Coaxial 10dB Attenuator 25MHz-18GHz	CentricRF	C18S2-10	2023-02-16	2024-02-16
226563	SMA Coaxial 10dB Attenuator 25MHz-18GHz	CentricRF	C18S2-10	2023-02-16	2024-02-16
CPL001	Ultra-Wideband Directional Coupler 0.5-18GHz	Mini-Circuits	ZUDC10-183+	2023-02-17	2024-02-17
CBL098	Micro-Coax UTiFLEX Cable Assembly, Low Loss,40Ghz, 39.3", Connectors 2	Carlisle Interconnect Technologies	UFA147A-0-0180-200200	2023-02-17	2024-02-17
CBL099	Micro-Coax UTiFLEX Cable Assembly, Low Loss,40Ghz, 39.3", Connectors 2	Carlisle Interconnect Technologies	UFA147A-0-0180-200200	2023-02-17	2024-02-17
CBL101	Micro-Coax UTiFLEX Cable Assembly, Low Loss,40Ghz, 39.3", Connectors 2	Carlisle Interconnect Technologies	UFA147A-0-0180-200200	2023-01-24	2024-01-24

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville – Chamber 2)

Equipment ID	Description	Manufacturer/Brand	Model Number	Last Cal.	Next Cal.
1-18 GHz					
88761	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2022-09-13	2023-09-13
Gain-Loss Chains					
91977	Gain-loss string: 1-18GHz	Various	Various	2022-05-10	2023-05-31
Receiver & Software					
197955	Spectrum Analyzer	Rohde & Schwarz	ESW44	2023-04-10	2024-04-10
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		
Additional Equipment used					
200540	Environmental Meter	Fisher Scientific	15-077-963 s/n 181474409	2022-10-05	2023-10-05
216159 (HPF019)	7GHz high-pass filter, 2W, F_{high} =18GHz	Micro-Tronics	HPM50107	2023-02-15	2024-02-29

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville – Chamber 4)

Equipment ID	Description	Manufacturer/Brand	Model Number	Last Cal.	Next Cal.
0.009-30MHz					
135144	Active Loop Antenna	ETS-Lindgren	6502	2023-01-17	2024-01-17
30-1000 MHz					
90629	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2023-01-06	2024-01-06
1-18 GHz					
86408	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2022-05-24	2023-05-31
18-40 GHz					
204704	Horn Antenna, 18-26.5GHz	Com-Power	AH-626	2022-07-11	2023-07-11
204705	Horn Antenna, 26-40GHz	Com-Power	AH-640	2022-07-11	2023-07-11
Gain-Loss Chains					
207638	Gain-loss string: 0.009-30MHz	Various	Various	2022-05-20	2023-05-31
207639	Gain-loss string: 25-1000MHz	Various	Various	2022-05-20	2023-05-31
207640	Gain-loss string: 1-18GHz	Various	Various	2022-05-20	2023-05-31
225795	Gain-loss string: 18-40GHz	Various	Various	2023-03-28	2024-03-28
Receiver & Software					
206496	Spectrum Analyzer	Rohde & Schwarz	ESW44	2023-03-24	2024-03-24
72823	Spectrum Analyzer	Agilent	E4446A	2022-06-08	2023-06-08
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		
Additional Equipment used					
21642	Environmental Meter	Fisher Scientific	15-077-963 (s/n 210701692)	2021-08-16	2023-08-16

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville – Chamber 1)

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
1-18 GHz					
89509	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2022-05-11	2023-05-31
Gain-Loss Chains					
91979	Gain-loss string: 1-18GHz	Various	Various	2022-12-02	2023-12-02
Receiver & Software					
197954	Spectrum Analyzer	Rohde & Schwarz	ESW44	2023-02-02	2024-02-02
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		
Additional Equipment used					
200539	Environmental Meter	Fisher Scientific	15-077-963 s/n 18474341	2022-10-05	2023-10-05
216159 (HPF019)	7GHz high-pass filter, 2W, F_{high} =18GHz	Micro-Tronics	HPM50107	2023-02-15	2024-02-29

9. ANTENNA PORT TEST RESULTS

9.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

KDB 789033 Zero-Span Spectrum Analyzer Method.

RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
802.11a	2.232	2.331	0.958	95.75%	0.19	0.448
802.11ax HE20 OFDMA, RU size 242T	2.387	2.404	0.993	99.29%	0.00	0.010
802.11ax HE20 OFDMA, RU size 106T	2.435	2.452	0.993	99.31%	0.00	0.010
802.11ax HE20 OFDMA, RU size 52T	2.590	2.608	0.993	99.31%	0.00	0.010
802.11ax HE20 OFDMA, RU size 26T	2.595	2.612	0.993	99.35%	0.00	0.010
802.11ax HE40 OFDMA, RU size 484T	2.382	2.400	0.993	99.25%	0.00	0.010
802.11ax HE80 OFDMA, RU size 996T	2.418	2.435	0.993	99.30%	0.00	0.010
802.11ax HE160 OFDMA, RU size 2x996T	5.444	5.462	0.997	99.67%	0.00	0.010

802.11a MODE

802.11ax HE20 OFDMA, RU size 242T MODE

802.11ax HE20 OFDMA, RU size 106T MODE

802.11ax HE20 OFDMA, RU size 52T MODE

802.11ax HE20 OFDMA, RU size 26T MODE

802.11ax HE40 OFDMA, RU size 484T MODE

802.11ax HE80 OFDMA, RU size 996T MODE

802.11ax HE160 OFDMA, RU size 2x996 MODE

9.2. OUTPUT POWER AND PSD

LIMITS

FCC §15.407
RSS-248 4.5.3 and 4.5.5

Band 5.925-7.125 GHz

(7) For client devices, except for fixed client devices as defined in this subpart, operating under the control of a standard power access point in 5.925-6.425 GHz and 6.525-6.875 GHz bands, the maximum power spectral density must not exceed 17 dBm e.i.r.p. in any 1-megahertz band, and the maximum e.i.r.p. over the frequency band of operation must not exceed 30 dBm and the device must limit its power to no more than 6 dB below its associated standard power access point's authorized transmit power.

(8) For client devices operating under the control of an indoor access point in the 5.925-7.125 GHz bands, the maximum power spectral density must not exceed −1 dBm e.i.r.p. in any 1-megahertz band, and the maximum e.i.r.p. over the frequency band of operation must not exceed 24 dBm.

TEST PROCEDURE

The measurement method used for output power is KDB 789033 D02 v02r01, Section E.3.b (Method PM-G).

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

The power output was measured on the EUT antenna port using SMA cable with 10dB attenuator connected to a power meter via wideband average power sensor. Gated average output power was read directly from power meter. For PSD, EUT was connected to a spectrum analyzer for measurement.

DIRECTIONAL ANTENNA GAIN

Tx chains are uncorrelated for power and correlated for PSD.The directional gains are as follows:

Band	Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)	Correlated Chains Directional Gain (dBi)
5925-7125	-0.36	-1.14	-0.73	2.27

Directional gains for MIMO operations were determined using KDB662911 D01 Section F (2)(d)(i) and (ii) for unequal antenna gains, with equal transmit powers. The directional gains are calculated using the formulas for uncorrelated and correlated transmissions across the two transmit antennas.

(i) Correlated gain = 10log $((10^{G1/20} + 10^{G2/20})^2 / N_{Ant})$
(ii) Uncorrelated gain = 10log $((10^{G1/10} + 10^{G2/10}) / N_{Ant})$

Sample calculation, using 2 antennas:
Correlated gain = 10log$(10^{-0.36/20} + 10^{-1.14/20})^2/2)$ = 2.27dBi
Uncorrelated gain = 10log$(10^{-0.36/10} + 10^{-1.14/10})/2)$ = -0.73dBi

RESULTS

9.2.1. 802.11a MODE 2TX IN THE UNII-5 BAND

2TX CHAIN 0 + CHAIN 1 CDD OFDMA MODE – STANDARD POWER

Test Engineer:	85502/44389, 27465/44389, 84740/44389
Test Date:	2023-04-25, 2023-04-26, 2023-05-04

Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	e.i.r.p. Power Limit (dBm)	PSD Limit (dBm)
Low	5955	-0.73	2.27	30.00	17.00
Mid	6175	-0.73	2.27	30.00	17.00
High	6415	-0.73	2.27	30.00	17.00

Duty Cycle CF (dB)	0.19	**Included in Calculations of Corr'd PSD**

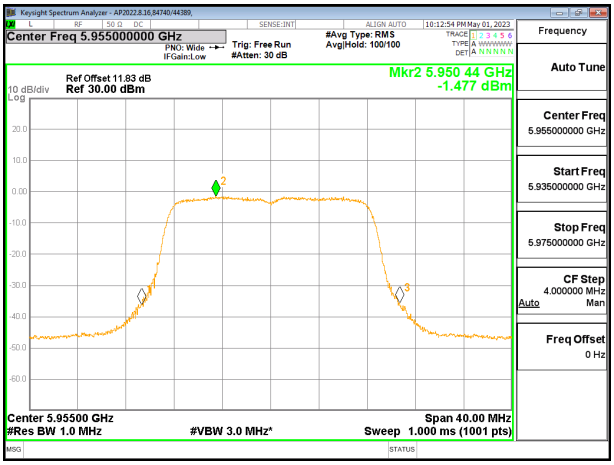
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	Power Limit EIRP (dBm)	Power Margin (dB)
Low	5955	9.35	10.36	12.16	30.00	-17.84
Mid	6175	10.01	9.86	12.22	30.00	-17.78
High	6415	9.43	10.41	12.23	30.00	-17.77

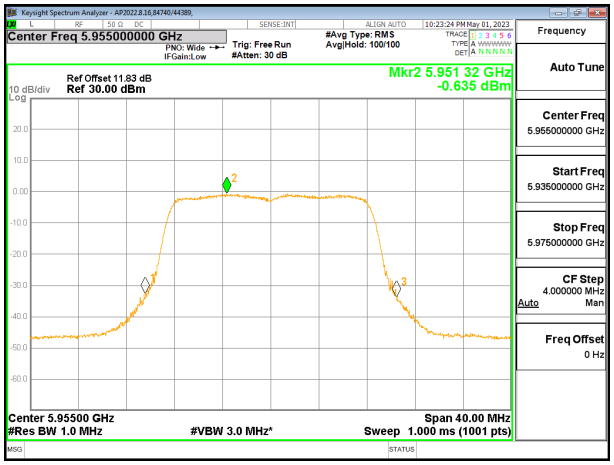
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd EIRP PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5955	-1.48	-0.64	4.43	17.00	-12.57
Mid	6175	-1.04	-1.61	4.15	17.00	-12.85
High	6415	-0.72	-0.28	4.98	17.00	-12.02

LOW

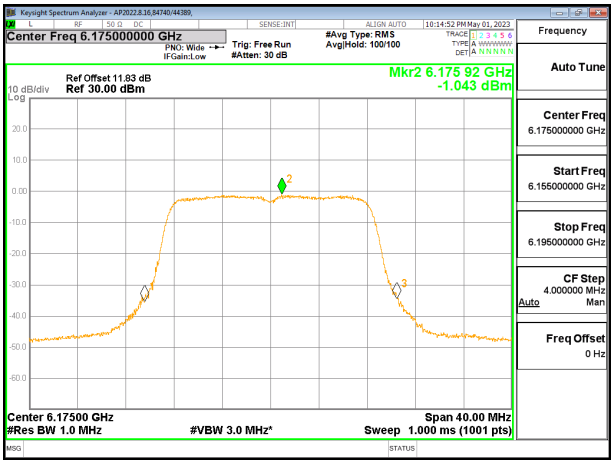


LOW CHANNEL CHAIN 0

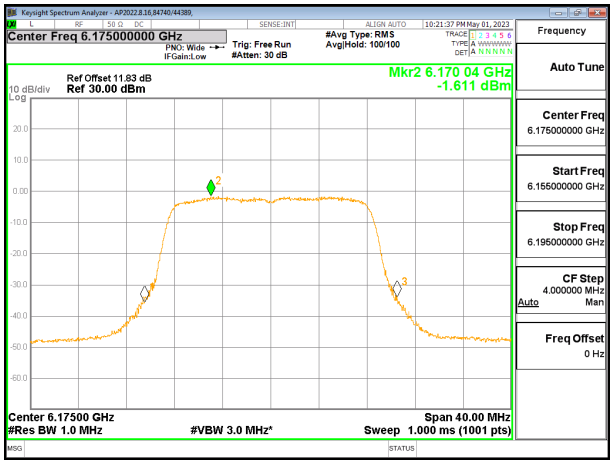


LOW CHANNEL CHAIN 1

MID

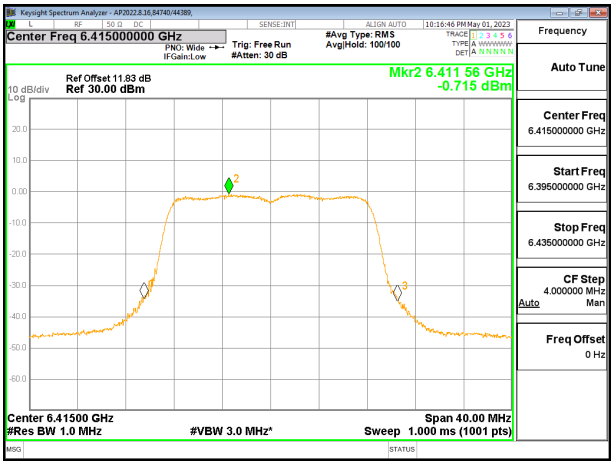


MID CHANNEL CHAIN 0

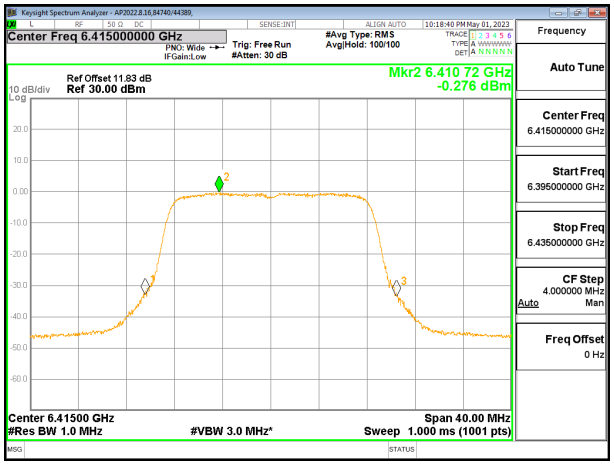


MID CHANNEL CHAIN 1

HIGH



HIGH CHANNEL CHAIN 0



HIGH CHANNEL CHAIN 1

2TX CHAIN 0 + CHAIN 1 CDD OFDMA MODE – LOW POWER INDOOR

Test Engineer:	84740/44389
Test Date:	2023-05-03

Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	e.i.r.p. Power Limit (dBm)	PSD Limit (dBm)
Low	5955	-0.73	2.27	24.00	-1.00
Mid	6175	-0.73	2.27	24.00	-1.00
High	6415	-0.73	2.27	24.00	-1.00

Duty Cycle CF (dB)	0.19	**Included in Calculations of Corr'd PSD**

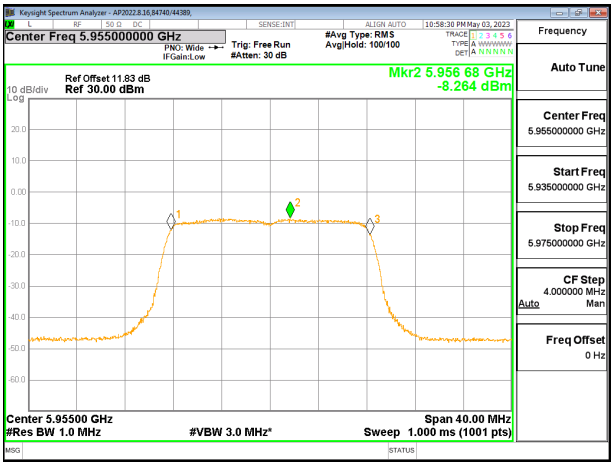
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	Power Limit EIRP (dBm)	Power Margin (dB)
Low	5955	2.60	3.91	5.58	24.00	-18.42
Mid	6175	3.49	2.96	5.51	24.00	-18.49
High	6415	2.70	3.33	5.31	24.00	-18.69

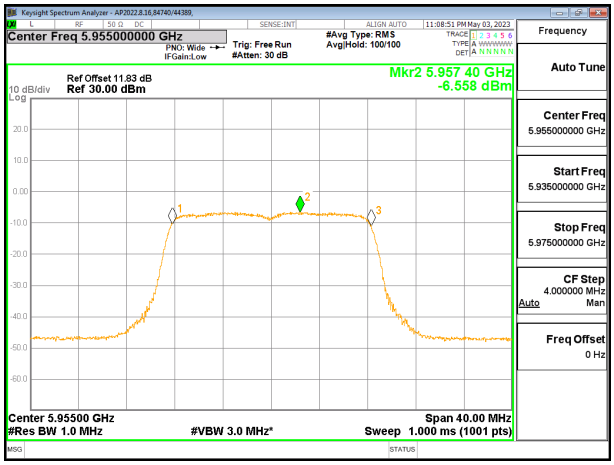
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd EIRP PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5955	-8.26	-6.56	-1.86	-1.00	-0.86
Mid	6175	-8.30	-7.46	-2.39	-1.00	-1.39
High	6415	-7.50	-6.58	-1.54	-1.00	-0.54

LOW

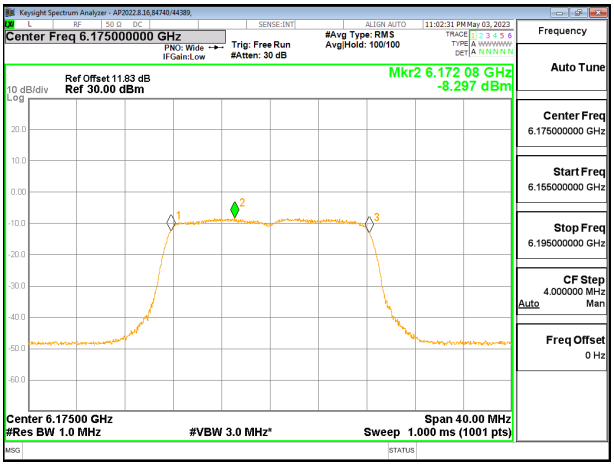


LOW CHANNEL CHAIN 0

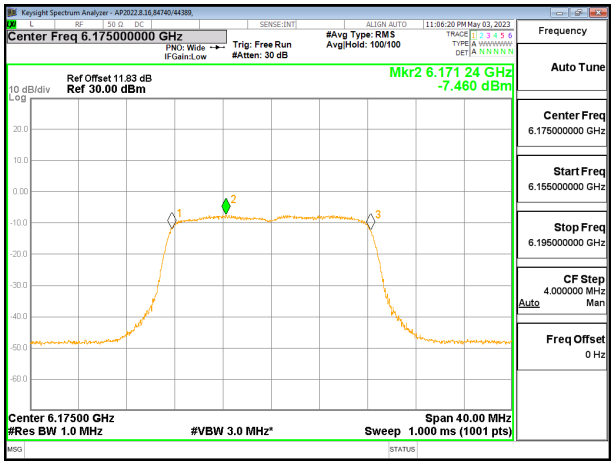


LOW CHANNEL CHAIN 1

MID

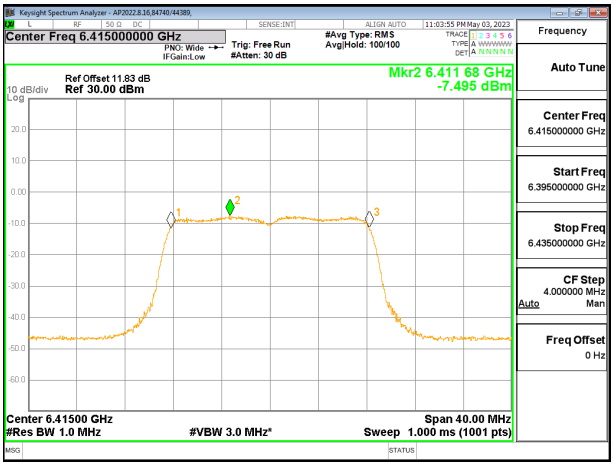


MID CHANNEL CHAIN 0

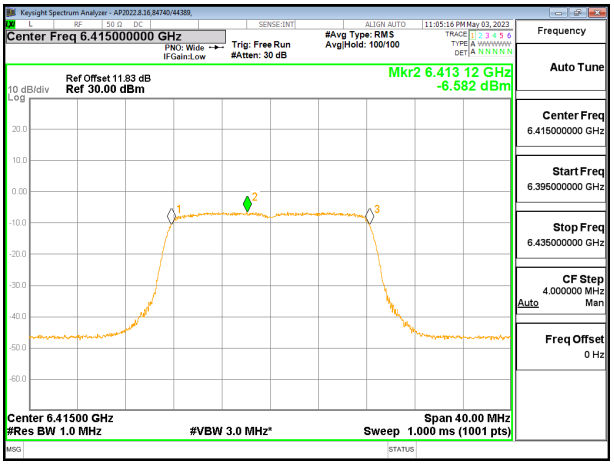


MID CHANNEL CHAIN 1

HIGH



HIGH CHANNEL CHAIN 0



HIGH CHANNEL CHAIN 1

9.2.2. 802.11ax HE20 MODE 2TX IN THE UNII-5 BAND

2TX CHAIN 0 + CHAIN 1 CDD OFDMA MODE: 26T – STANDARD POWER

Test Engineer:	85502/44389, 27465/44389, 84740/44389
Test Date:	2023-04-25, 2023-04-26, 2023-05-04

Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	e.i.r.p. Power Limit (dBm)	PSD Limit (dBm)
Low (RU0)	5955	-0.73	2.27	30.00	17.00
Mid (RU4)	6175	-0.73	2.27	30.00	17.00
High (RU8)	6415	-0.73	2.27	30.00	17.00

Duty Cycle CF (dB)	0.00	**Included in Calculations of Corr'd PSD**

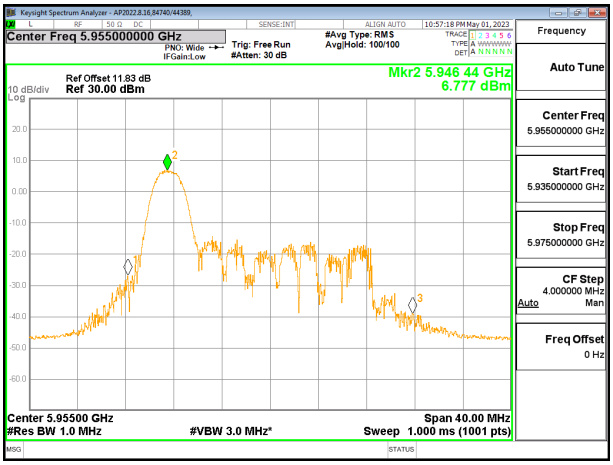
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	Power Limit EIRP (dBm)	Power Margin (dB)
Low (RU0)	5955	9.47	10.06	12.05	30.00	-17.95
Mid (RU4)	6175	9.98	9.72	12.13	30.00	-17.87
High (RU8)	6415	9.31	10.46	12.20	30.00	-17.80

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd EIRP PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low (RU0)	5955	6.78	7.18	12.26	17.00	-4.74
Mid (RU4)	6175	6.27	5.10	11.00	17.00	-6.00
High (RU8)	6415	7.34	7.77	12.84	17.00	-4.16

LOW



LOW CHANNEL CHAIN 0

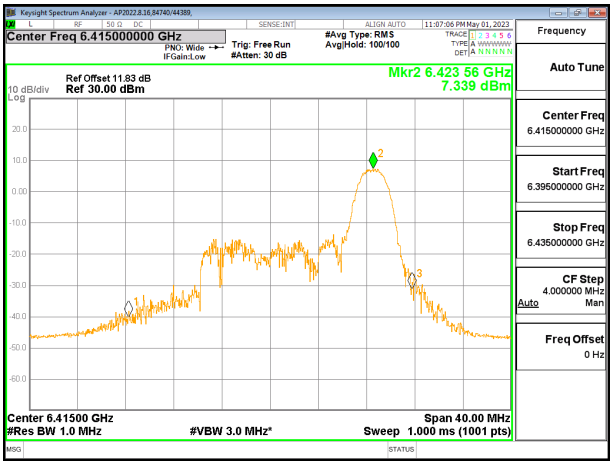
LOW CHANNEL CHAIN 1

MID

MID CHANNEL CHAIN 0

MID CHANNEL CHAIN 1

HIGH



HIGH CHANNEL CHAIN 0

HIGH CHANNEL CHAIN 1

2TX CHAIN 0 + CHAIN 1 CDD OFDMA MODE: 26T – LOW POWER INDOOR

Test Engineer:	85502/44389, 27465/44389, 84740/44389
Test Date:	2023-04-25, 2023-04-26, 2023-05-04

Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	e.i.r.p. Power Limit (dBm)	PSD Limit (dBm)
Low (RU0)	5955	-0.73	2.27	24.00	-1.00
Mid (RU4)	6175	-0.73	2.27	24.00	-1.00
High (RU8)	6415	-0.73	2.27	24.00	-1.00

Duty Cycle CF (dB)	0.00	**Included in Calculations of Corr'd PSD**

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	Power Limit EIRP (dBm)	Power Margin (dB)
Low (RU0)	5955	-4.82	-4.19	-2.22	24.00	-26.22
Mid (RU4)	6175	-3.77	-4.86	-2.00	24.00	-26.00
High (RU8)	6415	-4.52	-5.22	-2.58	24.00	-26.58

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd EIRP PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low (RU0)	5955	-7.39	-6.73	-1.77	-1.00	-0.77
Mid (RU4)	6175	-7.90	-8.89	-3.08	-1.00	-2.08
High (RU8)	6415	-7.02	-7.04	-1.75	-1.00	-0.75

LOW

LOW CHANNEL CHAIN 0

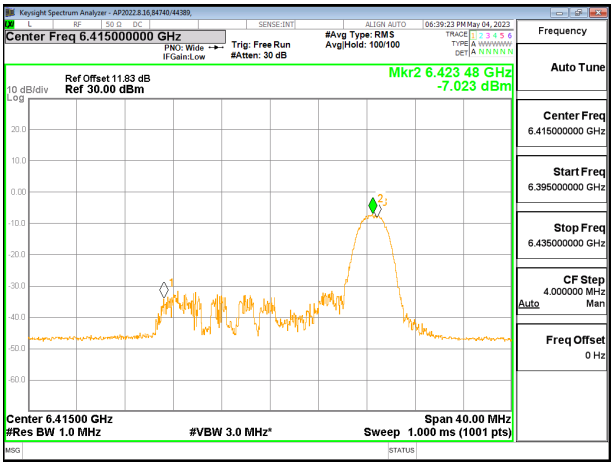
LOW CHANNEL CHAIN 1

MID

MID CHANNEL CHAIN 0

MID CHANNEL CHAIN 1

HIGH



HIGH CHANNEL CHAIN 0

HIGH CHANNEL CHAIN 1

12.252TX CHAIN 0 + CHAIN 1 CDD OFDMA MODE: 52T – STANDARD POWER

Test Engineer:	85502/44389, 27465/44389, 84740/44389
Test Date:	2023-04-25, 2023-04-26, 2023-05-04

Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	e.i.r.p. Power Limit (dBm)	PSD Limit (dBm)
Low (RU37)	5955	-0.73	2.27	30.00	17.00
Mid (RU38)	6175	-0.73	2.27	30.00	17.00
High (RU40)	6415	-0.73	2.27	30.00	17.00

Duty Cycle CF (dB)	0.00	**Included in Calculations of Corr'd PSD**

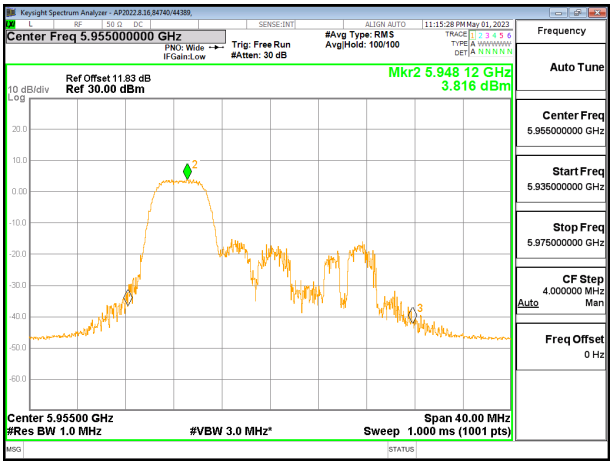
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	Power Limit EIRP (dBm)	Power Margin (dB)
Low (RU37)	5955	9.36	10.06	12.00	30.00	-18.00
Mid (RU38)	6175	10.04	9.90	12.25	30.00	-17.75
High (RU40)	6415	9.21	10.48	12.17	30.00	-17.83

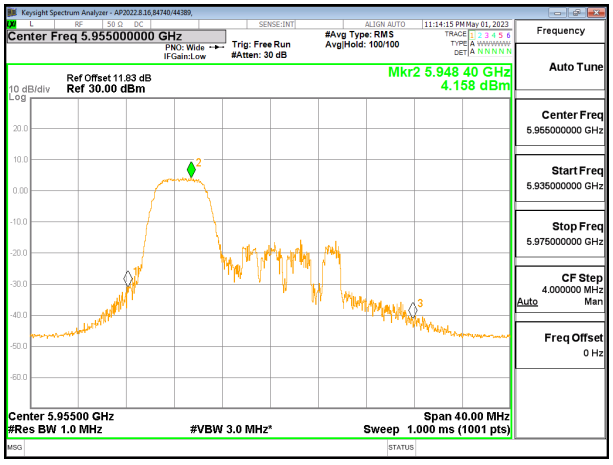
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd EIRP PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low (RU37)	5955	3.82	4.16	9.27	17.00	-7.73
Mid (RU38)	6175	4.24	3.81	9.31	17.00	-7.69
High (RU40)	6415	4.20	5.19	10.01	17.00	-6.99

LOW



LOW CHANNEL CHAIN 0



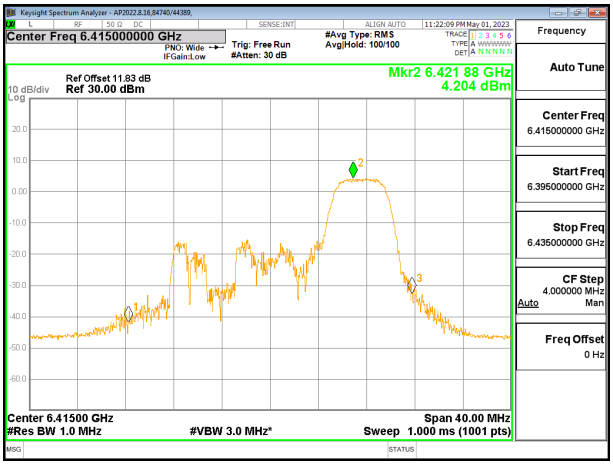
LOW CHANNEL CHAIN 1

MID

MID CHANNEL CHAIN 0

MID CHANNEL CHAIN 1

HIGH



HIGH CHANNEL CHAIN 0

HIGH CHANNEL CHAIN 1

2TX CHAIN 0 + CHAIN 1 CDD OFDMA MODE: 52T – LOW POWER INDOOR

Test Engineer:	85502/44389, 27465/44389, 84740/44389
Test Date:	2023-04-25, 2023-04-26, 2023-05-04

Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	e.i.r.p. Power Limit (dBm)	PSD Limit (dBm)
Low (RU37)	5955	-0.73	2.27	24.00	-1.00
Mid (RU38)	6175	-0.73	2.27	24.00	-1.00
High (RU40)	6415	-0.73	2.27	24.00	-1.00

Duty Cycle CF (dB)	0.00	**Included in Calculations of Corr'd PSD**

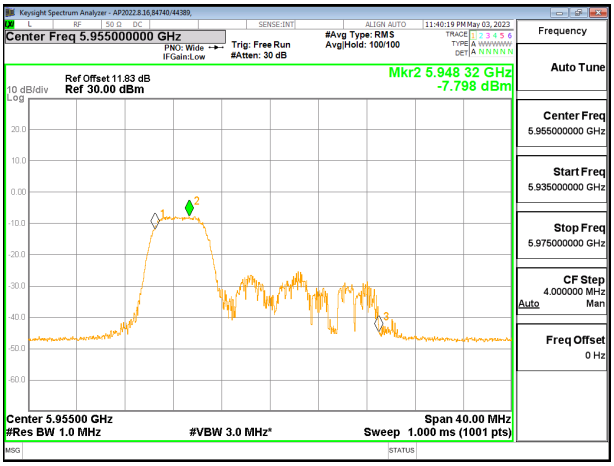
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	Power Limit EIRP (dBm)	Power Margin (dB)
Low (RU37)	5955	-2.50	-1.79	0.15	24.00	-23.85
Mid (RU38)	6175	-1.71	-2.47	0.21	24.00	-23.79
High (RU40)	6415	-2.26	-2.37	-0.03	24.00	-24.03

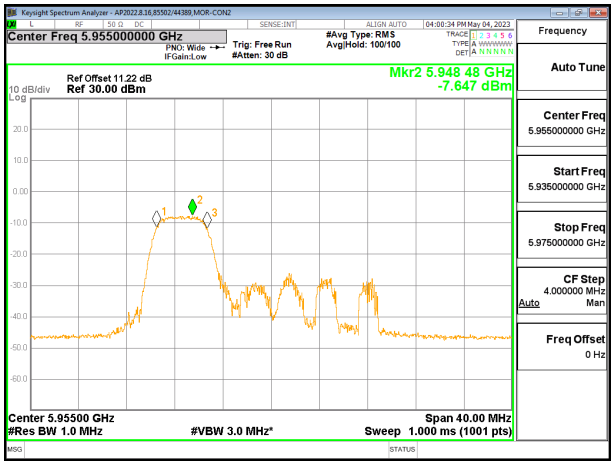
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd EIRP PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low (RU37)	5955	-7.80	-7.65	-2.44	-1.00	-1.44
Mid (RU38)	6175	-6.81	-8.17	-2.16	-1.00	-1.16
High (RU40)	6415	-7.19	-8.13	-2.35	-1.00	-1.35

LOW



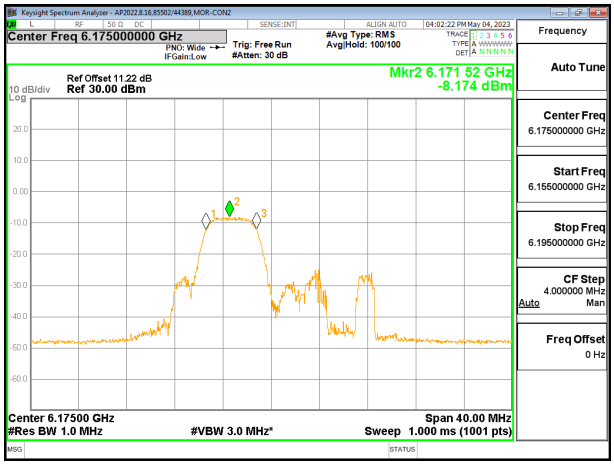
LOW CHANNEL CHAIN 0



LOW CHANNEL CHAIN 1

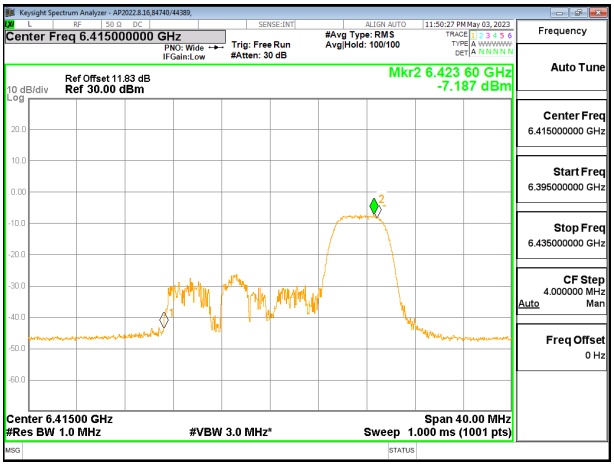
MID

MID CHANNEL CHAIN 0



MID CHANNEL CHAIN 1

HIGH



HIGH CHANNEL CHAIN 0

HIGH CHANNEL CHAIN 1

2TX CHAIN 0 + CHAIN 1 CDD OFDMA MODE: 106T – STANDARD POWER

Test Engineer:	85502/44389, 27465/44389, 84740/44389
Test Date:	2023-04-25, 2023-04-26, 2023-05-04

Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	e.i.r.p. Power Limit (dBm)	PSD Limit (dBm)
Low (RU53)	5955	-0.73	2.27	30.00	17.00
Mid (RU53)	6175	-0.73	2.27	30.00	17.00
High (RU54)	6415	-0.73	2.27	30.00	17.00

Duty Cycle CF (dB)	0.00	**Included in Calculations of Corr'd PSD**

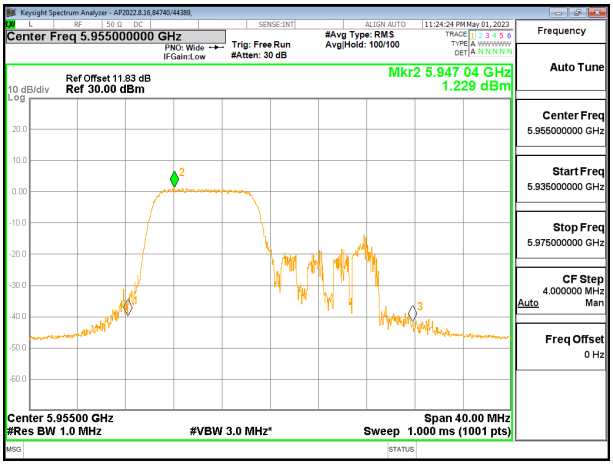
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	Power Limit EIRP (dBm)	Power Margin (dB)
Low (RU53)	5955	9.31	9.98	11.94	30.00	-18.06
Mid (RU53)	6175	9.78	9.66	12.00	30.00	-18.00
High (RU54)	6415	9.23	10.33	12.10	30.00	-17.90

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd EIRP PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low (RU53)	5955	1.23	1.82	6.82	17.00	-10.18
Mid (RU53)	6175	1.51	1.02	6.55	17.00	-10.45
High (RU54)	6415	1.26	2.17	7.02	17.00	-9.98

LOW



LOW CHANNEL CHAIN 0

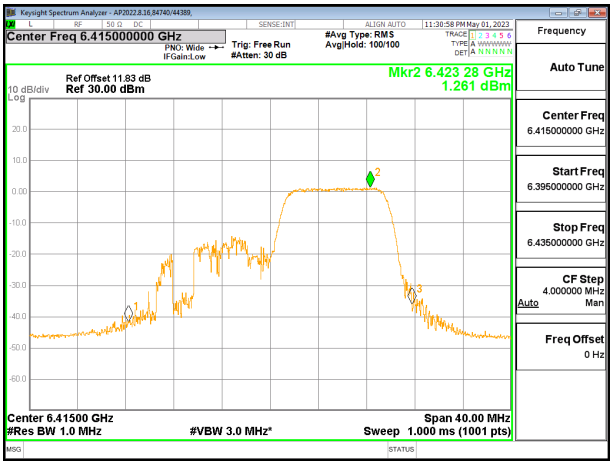
LOW CHANNEL CHAIN 1

MID

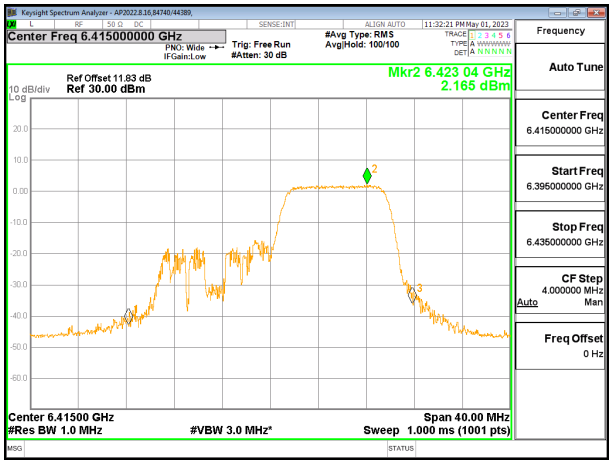
MID CHANNEL CHAIN 0

MID CHANNEL CHAIN 1

HIGH



HIGH CHANNEL CHAIN 0



HIGH CHANNEL CHAIN 1

2TX CHAIN 0 + CHAIN 1 CDD OFDMA MODE: 106T – LOW POWER INDOOR

Test Engineer:	85502/44389, 27465/44389, 84740/44389
Test Date:	2023-04-25, 2023-04-26, 2023-05-04

Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	e.i.r.p. Power Limit (dBm)	PSD Limit (dBm)
Low (RU53)	5955	-0.73	2.27	24.00	-1.00
Mid (RU53)	6175	-0.73	2.27	24.00	-1.00
High (RU54)	6415	-0.73	2.27	24.00	-1.00

Duty Cycle CF (dB)	0.00	**Included in Calculations of Corr'd PSD**

Output Power Results

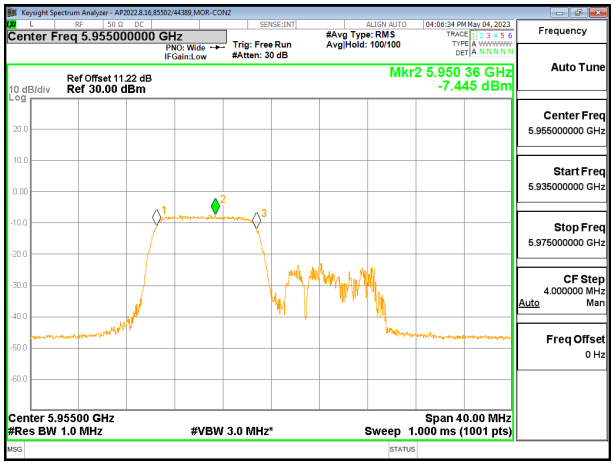
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	Power Limit EIRP (dBm)	Power Margin (dB)
Low (RU53)	5955	0.64	1.11	3.16	24.00	-20.84
Mid (RU53)	6175	0.51	1.21	3.15	24.00	-20.85
High (RU54)	6415	0.94	0.41	2.96	24.00	-21.04

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd EIRP PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low (RU53)	5955	-7.52	-7.45	-2.20	-1.00	-1.20
Mid (RU53)	6175	-7.73	-8.84	-2.97	-1.00	-1.97
High (RU54)	6415	-7.47	-8.50	-2.67	-1.00	-1.67

LOW

LOW CHANNEL CHAIN 0



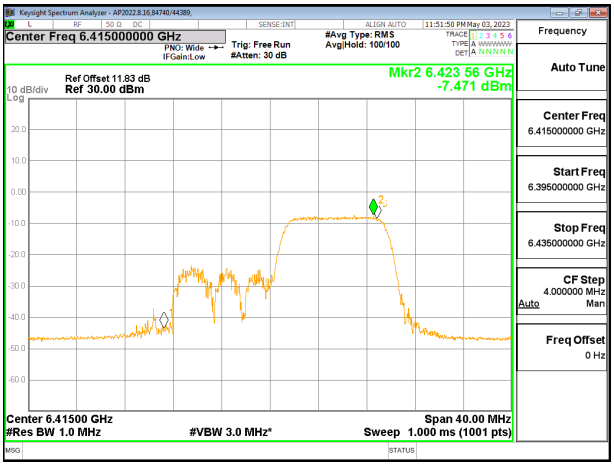
LOW CHANNEL CHAIN 1

MID

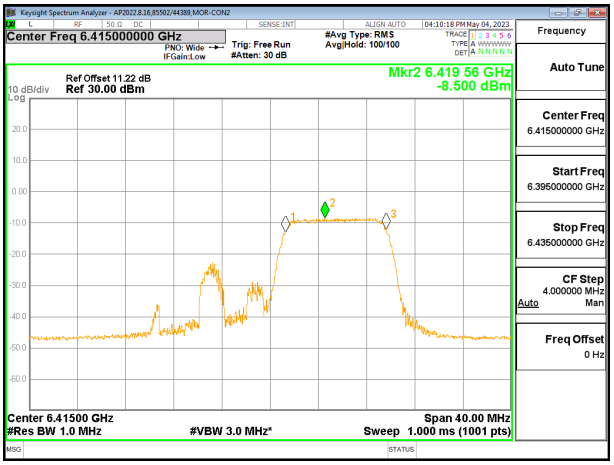
MID CHANNEL CHAIN 0

MID CHANNEL CHAIN 1

HIGH



HIGH CHANNEL CHAIN 0



HIGH CHANNEL CHAIN 1

2TX CHAIN 0 + CHAIN 1 CDD OFDMA MODE: 242T – STANDARD POWER

Test Engineer:	85502/44389, 27465/44389, 84740/44389
Test Date:	2023-04-25, 2023-04-26, 2023-05-04

Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	e.i.r.p. Power Limit (dBm)	PSD Limit (dBm)
Low (RU61)	5955	-0.73	2.27	30.00	17.00
Mid (RU61)	6175	-0.73	2.27	30.00	17.00
High (RU61)	6415	-0.73	2.27	30.00	17.00

Duty Cycle CF (dB)	0.00	**Included in Calculations of Corr'd PSD**	

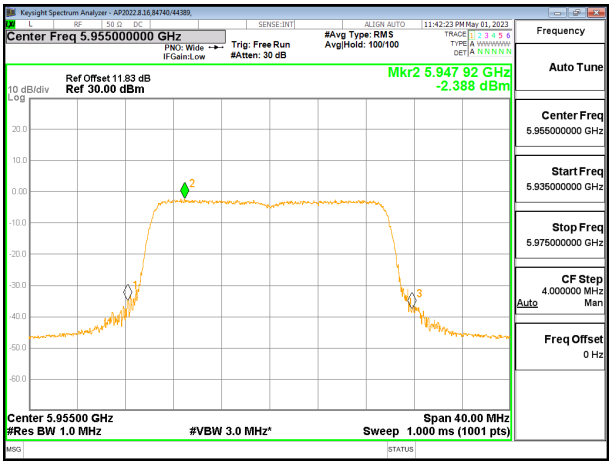
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	Power Limit EIRP (dBm)	Power Margin (dB)
Low (RU61)	5955	9.21	10.02	11.91	30.00	-18.09
Mid (RU61)	6175	9.72	9.57	11.93	30.00	-18.07
High (RU61)	6415	9.35	10.37	12.17	30.00	-17.83

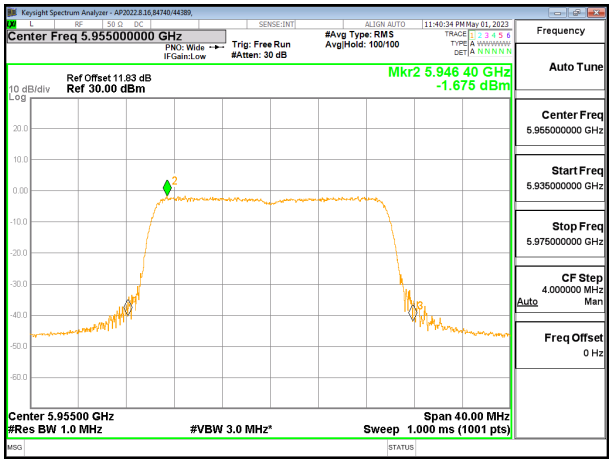
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd EIRP PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low (RU61)	5955	-2.39	-1.68	3.26	17.00	-13.74
Mid (RU61)	6175	-1.99	-2.88	2.87	17.00	-14.13
High (RU61)	6415	-1.94	-1.25	3.70	17.00	-13.30

LOW

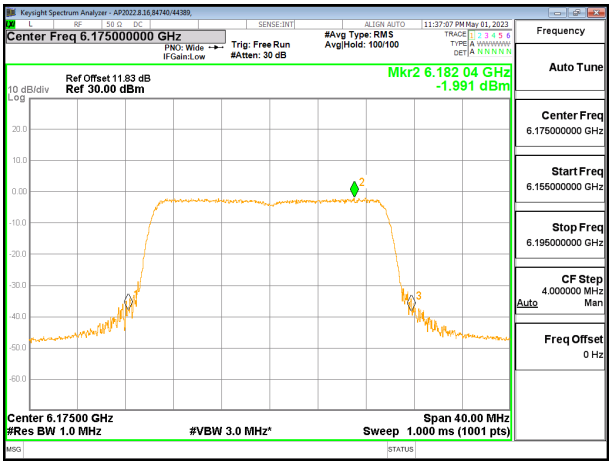


LOW CHANNEL CHAIN 0

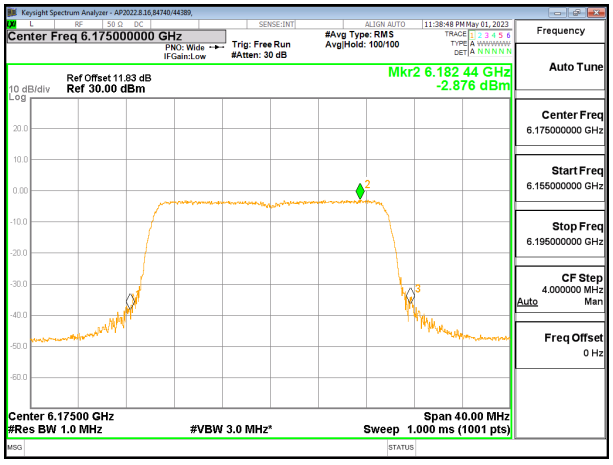


LOW CHANNEL CHAIN 1

MID

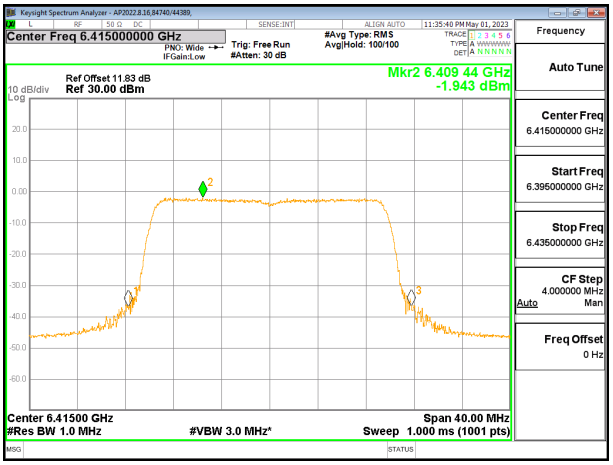


MID CHANNEL CHAIN 0

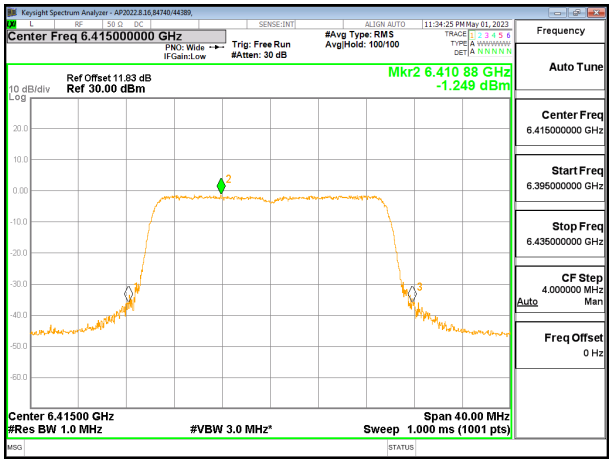


MID CHANNEL CHAIN 1

HIGH



HIGH CHANNEL CHAIN 0



HIGH CHANNEL CHAIN 1

2TX CHAIN 0 + CHAIN 1 CDD OFDMA MODE: 242T – LOW POWER INDOOR

Test Engineer:	85502/44389, 27465/44389, 84740/44389
Test Date:	2023-04-25, 2023-04-26, 2023-05-04

Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	e.i.r.p. Power Limit (dBm)	PSD Limit (dBm)
Low (RU61)	5955	-0.73	2.27	24.00	-1.00
Mid (RU61)	6175	-0.73	2.27	24.00	-1.00
High (RU61)	6415	-0.73	2.27	24.00	-1.00

Duty Cycle CF (dB)	0.00	**Included in Calculations of Corr'd PSD**	

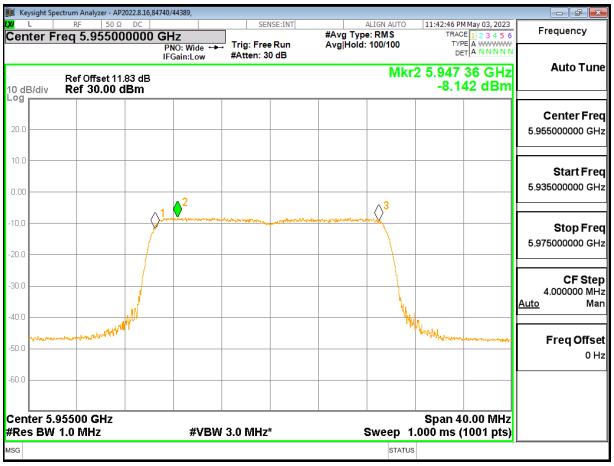
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	Power Limit EIRP (dBm)	Power Margin (dB)
Low (RU61)	5955	3.40	4.46	6.24	24.00	-17.76
Mid (RU61)	6175	4.09	3.55	6.11	24.00	-17.89
High (RU61)	6415	3.49	4.23	6.16	24.00	-17.84

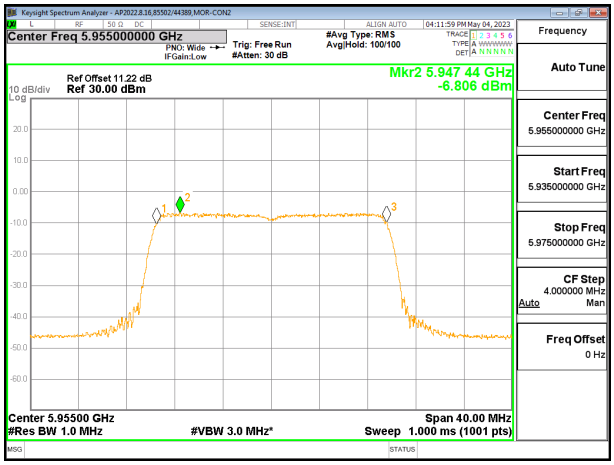
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd EIRP PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low (RU61)	5955	-8.14	-6.81	-2.14	-1.00	-1.14
Mid (RU61)	6175	-6.79	-7.13	-1.67	-1.00	-0.67
High (RU61)	6415	-7.25	-6.75	-1.71	-1.00	-0.71

LOW

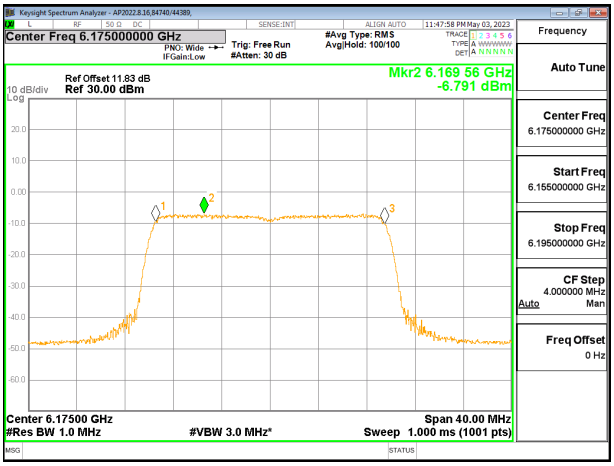


LOW CHANNEL CHAIN 0

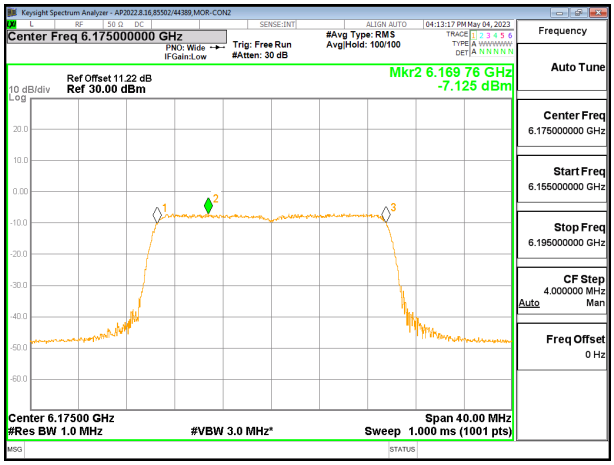


LOW CHANNEL CHAIN 1

MID

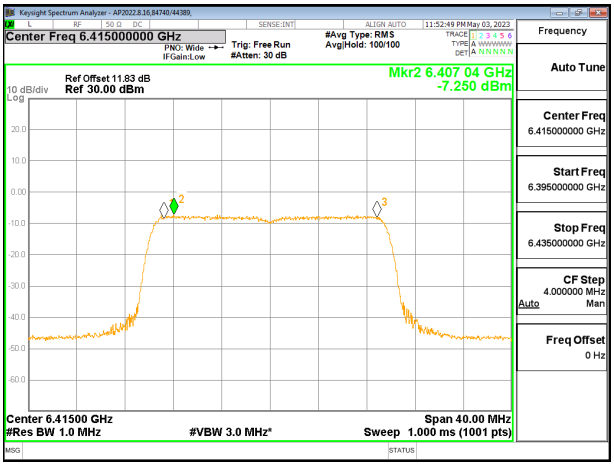


MID CHANNEL CHAIN 0

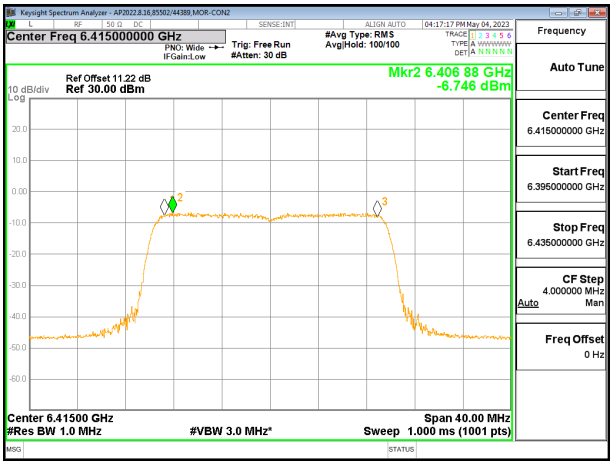


MID CHANNEL CHAIN 1

HIGH



HIGH CHANNEL CHAIN 0



HIGH CHANNEL CHAIN 1

9.2.3. 802.11ax HE40 MODE 2TX IN THE UNII-5 BAND

2TX CHAIN 0 + CHAIN 1 CDD OFDMA MODE: 484T – STANDARD POWER

Test Engineer:	85502/44389, 27465/44389, 84740/44389
Test Date:	2023-04-25, 2023-04-26, 2023-05-04

Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	e.i.r.p. Power Limit (dBm)
Low (RU65)	5965	-0.73	30.00
Mid (RU65)	6165	-0.73	30.00
High (RU65)	6405	-0.73	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	Power Limit EIRP PSD (dBm)	Power Margin (dB)
Low (RU65)	5965	9.05	9.97	11.81	30.00	-18.19
Mid (RU65)	6165	9.99	9.45	12.01	30.00	-17.99
High (RU65)	6405	9.59	10.32	12.25	30.00	-17.75

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2TX CHAIN 0 + CHAIN 1 CDD OFDMA MODE: 484T – LOW POWER INDOOR

Test Engineer:	85502/44389, 27465/44389, 84740/44389
Test Date:	2023-04-25, 2023-04-26, 2023-05-04

Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	e.i.r.p. Power Limit (dBm)	PSD Limit (dBm)
Low (RU65)	5965	-0.73	2.27	24.00	-1.00
Mid (RU65)	6165	-0.73	2.27	24.00	-1.00
High (RU65)	6405	-0.73	2.27	24.00	-1.00

Duty Cycle CF (dB)	0.00	**Included in Calculations of PSD**

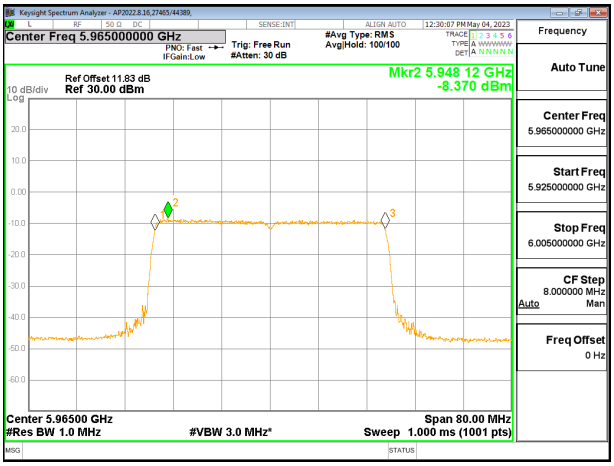
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	Power Limit EIRP (dBm)	Power Margin (dB)
Low (RU65)	5965	6.22	7.30	9.07	24.00	-14.93
Mid (RU65)	6165	6.80	6.32	8.85	24.00	-15.15
High (RU65)	6405	6.32	6.75	8.82	24.00	-15.18

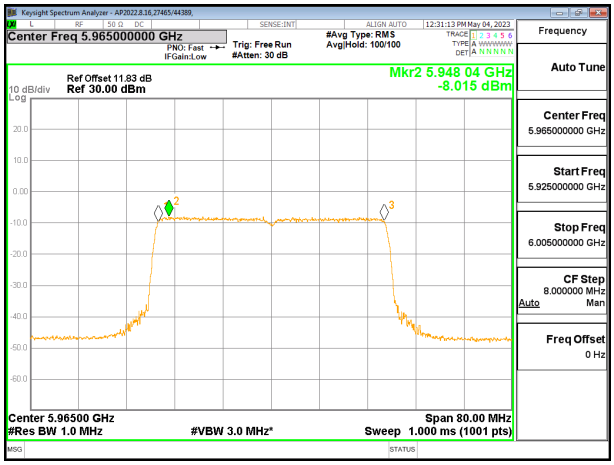
PSD Results

Channel	Frequency (MHz)	Antenna 1 Meas PSD (dBm)	Antenna 2 Meas PSD (dBm)	Total Corr'd EIRP PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low (RU65)	5965	-8.37	-8.02	-2.91	-1.00	-1.91
Mid (RU65)	6165	-8.18	-9.23	-3.39	-1.00	-2.39
High (RU65)	6405	-7.83	-7.24	-2.24	-1.00	-1.24

LOW

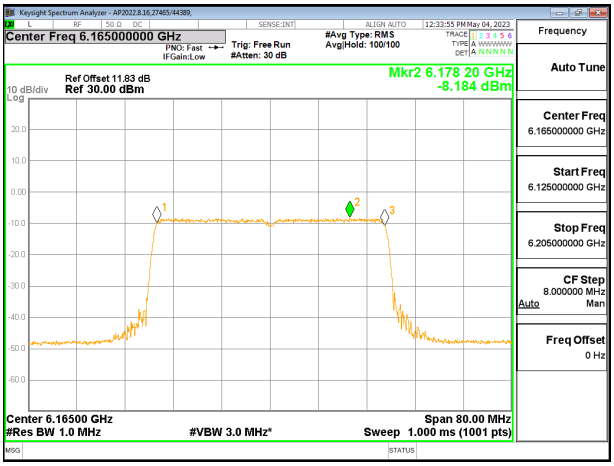


LOW CHANNEL CHAIN 0

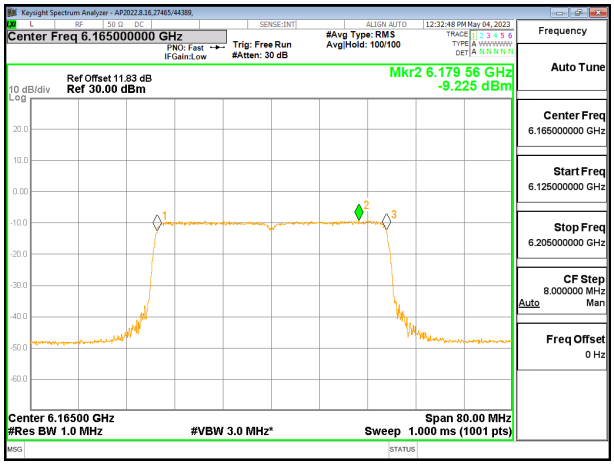


LOW CHANNEL CHAIN 1

MID

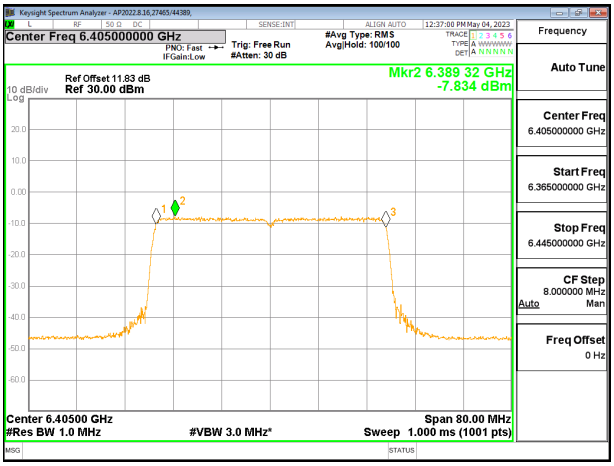


MID CHANNEL CHAIN 0

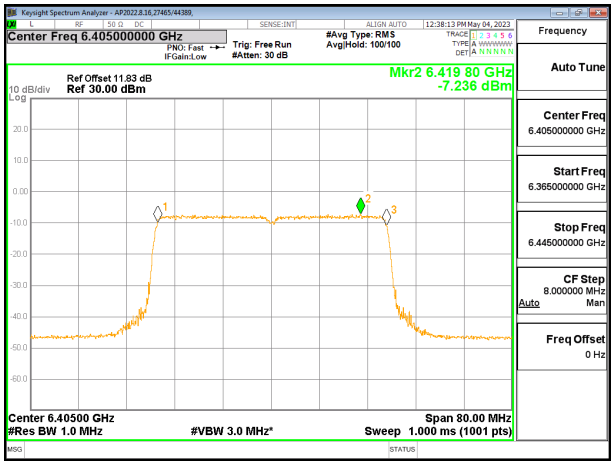


MID CHANNEL CHAIN 1

HIGH



HIGH CHANNEL CHAIN 0



HIGH CHANNEL CHAIN 1

9.2.4. 802.11ax HE80 MODE 2TX IN THE UNII-5 BAND

2TX CHAIN 0 + CHAIN 1 CDD OFDMA MODE: 996T – STANDARD POWER

Test Engineer:	85502/44389, 27465/44389, 84740/44389
Test Date:	2023-04-25, 2023-04-26, 2023-05-04

Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	e.i.r.p. Power Limit (dBm)
Low (RU67)	5985	-0.73	30.00
Mid (RU67)	6145	-0.73	30.00
High (RU67)	6385	-0.73	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	Power Limit EIRP (dBm)	Power Margin (dB)
Low (RU67)	5985	9.45	10.29	12.17	30.00	-17.83
Mid (RU67)	6145	10.16	9.17	11.97	30.00	-18.03
High (RU67)	6385	9.73	9.96	12.13	30.00	-17.87

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2TX CHAIN 0 + CHAIN 1 CDD OFDMA MODE: 996T – LOW POWER INDOOR

Test Engineer:	85502/44389, 27465/44389, 84740/44389
Test Date:	2023-04-25, 2023-04-26, 2023-05-04

Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	e.i.r.p. Power Limit (dBm)	PSD Limit (dBm)
Low (RU67)	5985	-0.73	2.27	24.00	-1.00
Mid (RU67)	6145	-0.73	2.27	24.00	-1.00
High (RU67)	6385	-0.73	2.27	24.00	-1.00

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD

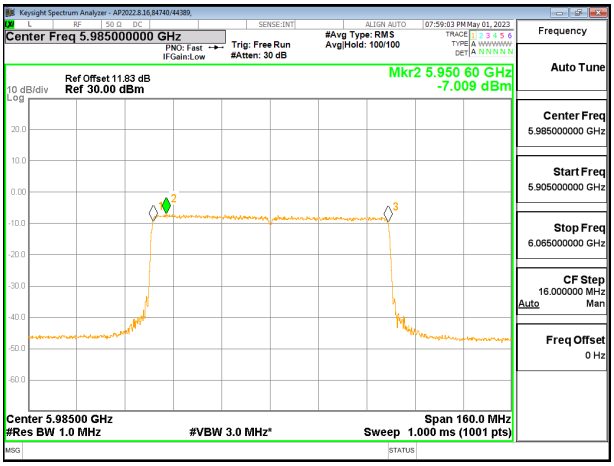
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	Power Limit EIRP (dBm)	Power Margin (dB)
Low (RU67)	5985	9.55	10.22	12.18	24.00	-11.82
Mid (RU67)	6145	10.18	9.26	12.02	24.00	-11.98
High (RU67)	6385	9.44	10.18	12.11	24.00	-11.89

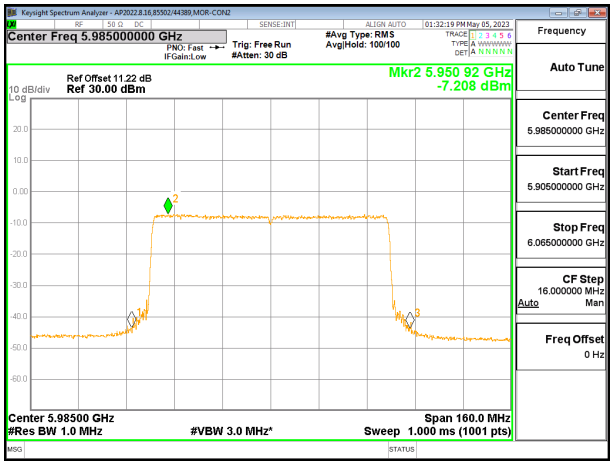
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd EIRP PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low (RU67)	5985	-7.01	-7.21	-1.83	-1.00	-0.83
Mid (RU67)	6145	-6.53	-7.36	-1.64	-1.00	-0.64
High (RU67)	6385	-8.01	-7.59	-2.51	-1.00	-1.51

LOW

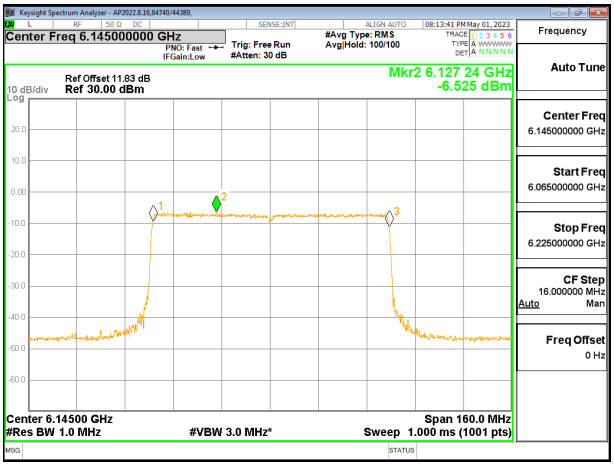


LOW CHANNEL CHAIN 0

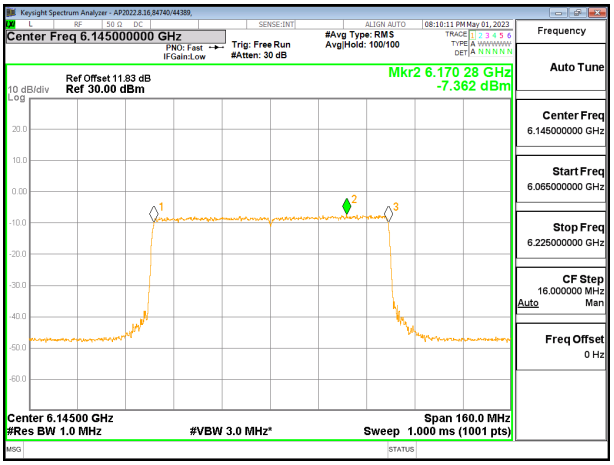


LOW CHANNEL CHAIN 1

MID

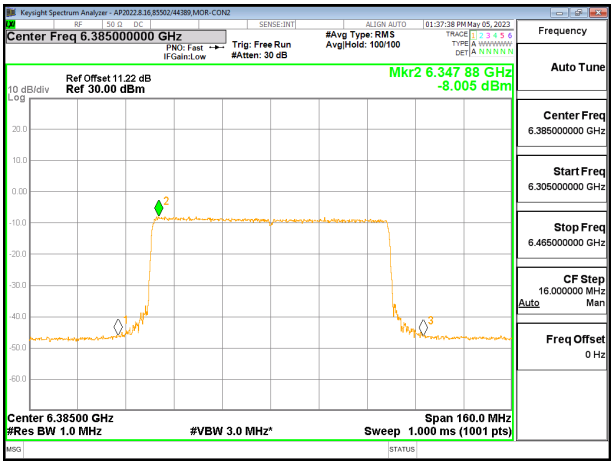


MID CHANNEL CHAIN 0

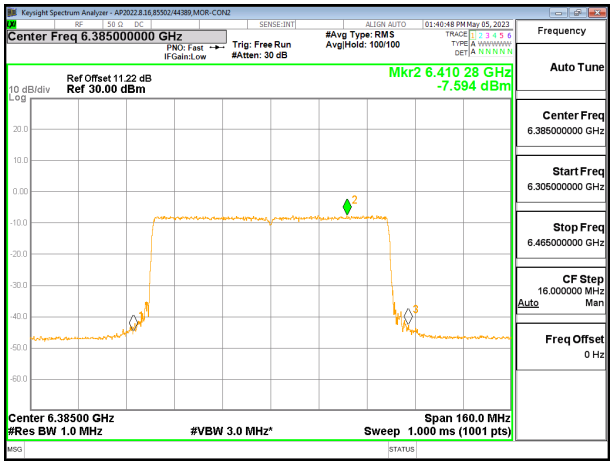


MID CHANNEL CHAIN 1

HIGH



HIGH CHANNEL CHAIN 0



HIGH CHANNEL CHAIN 1

9.2.5. 802.11ax HE160 MODE 2TX IN THE UNII-5 BAND

2TX CHAIN 0 + CHAIN 1 CDD OFDMA MODE: 2x 996T – STANDARD POWER

Test Engineer:	85502/44389, 27465/44389, 84740/44389
Test Date:	2023-04-25, 2023-04-26, 2023-05-04

Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	e.i.r.p. Power Limit (dBm)
Low (RU68)	6025	-0.73	30.00
Mid (RU68)	6185	-0.73	30.00
High (RU68)	6345	-0.73	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	Power Limit EIRP (dBm)	Power Margin (dB)
Low (RU68)	6025	8.91	10.08	11.81	30.00	-18.19
Mid (RU68)	6185	10.15	8.97	11.88	30.00	-18.12
High (RU68)	6345	9.89	9.56	12.01	30.00	-17.99

2TX CHAIN 0 + CHAIN 1 CDD OFDMA MODE: 2x 996T – LOW POWER INDOOR

Test Engineer:	85502/44389, 27465/44389, 84740/44389
Test Date:	2023-04-25, 2023-04-26, 2023-05-04

Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	e.i.r.p. Power Limit (dBm)	PSD Limit (dBm)
Low (RU 68)	6025	-0.73	2.27	24.00	-1.00
Mid (RU 68)	6185	-0.73	2.27	24.00	-1.00
High (RU 68)	6345	-0.73	2.27	24.00	-1.00

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	Power Limit EIRP (dBm)	Power Margin (dB)
Low (RU 68)	6025	8.95	10.05	11.82	24.00	-12.18
Mid (RU 68)	6185	10.27	9.02	11.97	24.00	-12.03
High (RU 68)	6345	9.94	9.54	12.02	24.00	-11.98

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd EIRP PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low (RU 68)	6025	-10.04	-9.51	-4.49	-1.00	-3.49
Mid (RU 68)	6185	-8.98	-10.09	-4.22	-1.00	-3.22
High (RU 68)	6345	-8.94	-8.74	-3.56	-1.00	-2.56