DUTY CYCLE

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

TEST DESCRIPTION

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

Per ANSI C63.10:2013, all measurements are to be performed with the EUT operating at 100% duty cycle at its maximum power level. In the event the EUT cannot be operated at 100% duty cycle, the transmission pulse duration (T) and Duty Cycle (x) are required to be measured for each of the EUT operating modes.

The measurements were made using a zero span on the spectrum analyzer to see the pulses in the time domain. The transmit power was set to its default maximum.

The duty cycle was calculated by dividing the transmission pulse duration (T) by the total period of a single on and total off time.

If the transmit duty cycle < 98 percent, a duty cycle correction factor in dB can be calculated to add to power measurements if required in the test method guidance using the following formula

10 * LOG (1/D) = dB

Where D is duty cycle of the radio transmissions

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	2024-05-22	2025-05-22
Generator - Signal	Agilent	N5183A	TIK	2022-01-24	2025-01-24
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2023-09-05	2024-09-05
Block - DC	Fairview Microwave	SD3379	ANH	2023-09-05	2024-09-05
Attenuator	Fairview Microwave	SA4014-20	AQI	2023-09-05	2024-09-05

DUTY CYCLE

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

EUT:	Fuji Thermostat	Work Order:	ADEM0044
Serial Number:	52202030005143	Date:	2024-08-26
Customer:	Ademco, Inc.	Temperature:	22°C
Attendees:	None	Relative Humidity:	68.4%
Customer Project:	None	Bar. Pressure (PMSL):	1015 mbar
Tested By:	Christopher Heintzelman	Job Site:	MN11
Power:	110VAC/60Hz	Configuration:	ADEM0044-8

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2024	ANSI C63.10:2013
RSS-247 Issue 3:2023	ANSI C63.10:2013

COMMENTS

Power setting 107.

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass

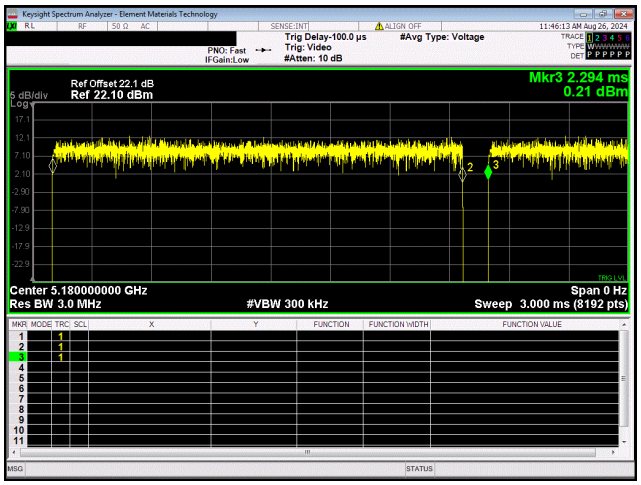
Tested By

TEST RESULTS

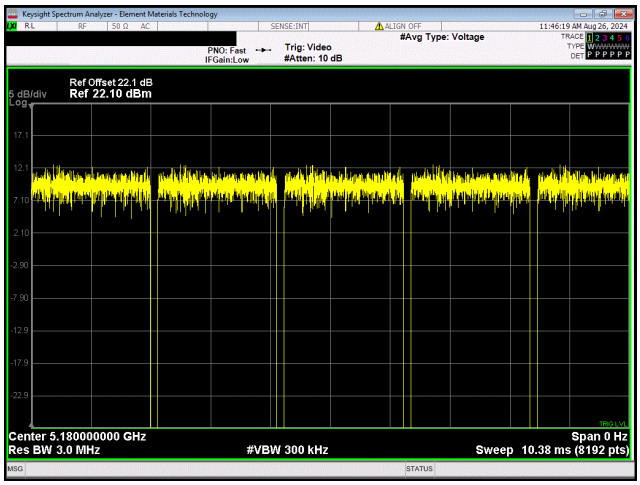
	Pulse Width	Period	Number of Pulses	Value (%)	Limit N/A (N/A)	Results
5150 - 5250 MHz Band, UNII-1, 20 MHz						
Low Channel, Ch 36 - 5180 MHz						
802.11(a) 6 Mbps	2.065 ms	2.194 ms	1	94.1	N/A	N/A
	N/A	N/A	5	N/A	N/A	N/A
802.11(a) 36 Mbps	364.4 us	494 us	1	73.8	N/A	N/A
	N/A	N/A	5	N/A	N/A	N/A
802.11(a) 54 Mbps	248.5 us	378.1 us	1	65.7	N/A	N/A
	N/A	N/A	5	N/A	N/A	N/A
802.11(n) MCS0	1.921 ms	2.05 ms	1	93.7	N/A	N/A
	N/A	N/A	5	N/A	N/A	N/A
802.11(n) MCS7	228.5 us	358.1 us	1	63.8	N/A	N/A
	N/A	N/A	5	N/A	N/A	N/A

DUTY CYCLE

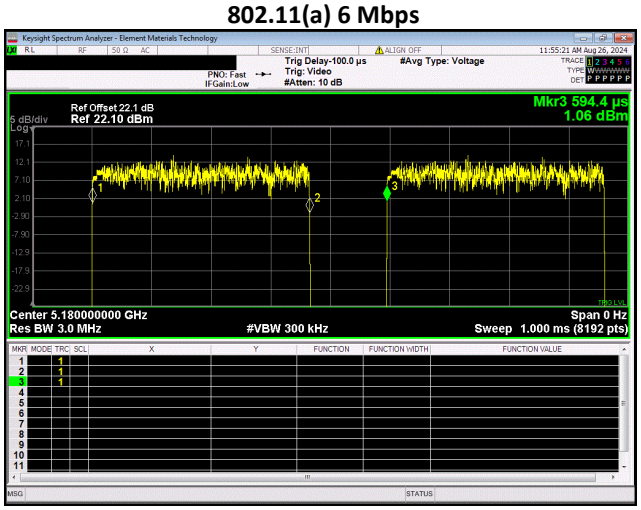
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



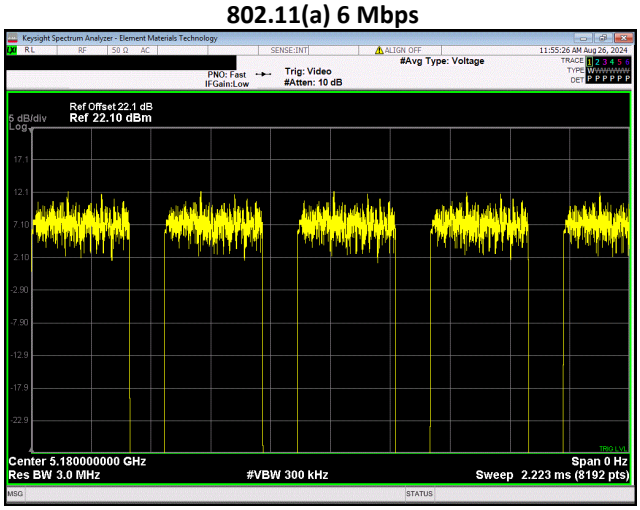
5150 - 5250 MHz Band, UNII-1, 20 MHz
Low Channel, Ch 36 - 5180 MHz
802.11(a) 6 Mbps



5150 - 5250 MHz Band, UNII-1, 20 MHz
Low Channel, Ch 36 - 5180 MHz
802.11(a) 6 Mbps



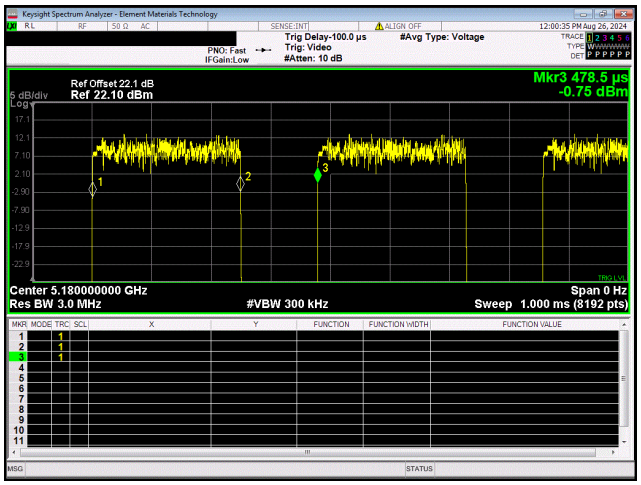
5150 - 5250 MHz Band, UNII-1, 20 MHz
Low Channel, Ch 36 - 5180 MHz
802.11(a) 36 Mbps



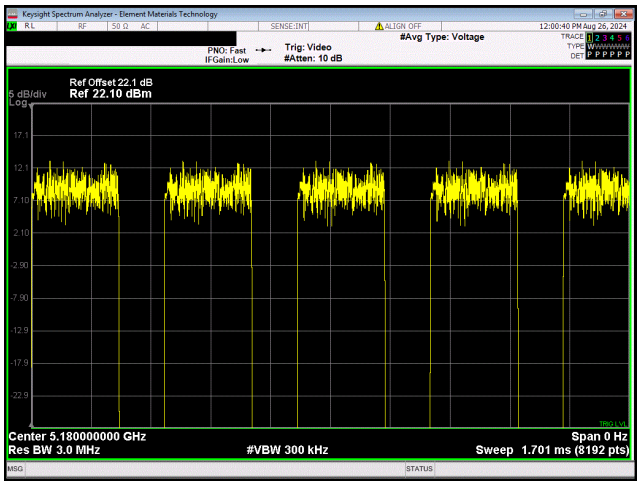
5150 - 5250 MHz Band, UNII-1, 20 MHz
Low Channel, Ch 36 - 5180 MHz
802.11(a) 36 Mbps

DUTY CYCLE

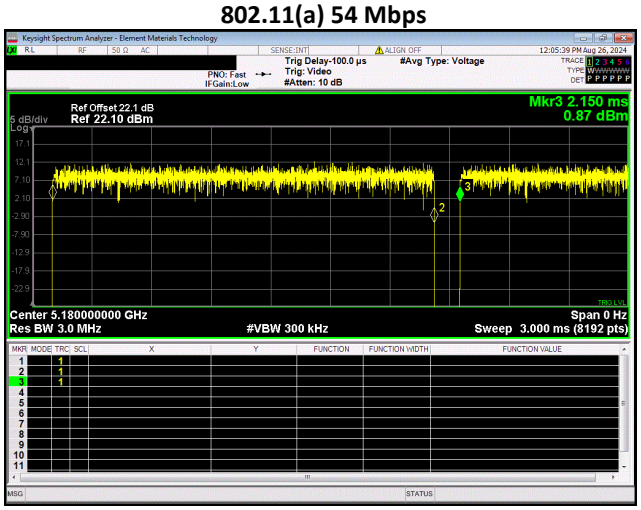
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



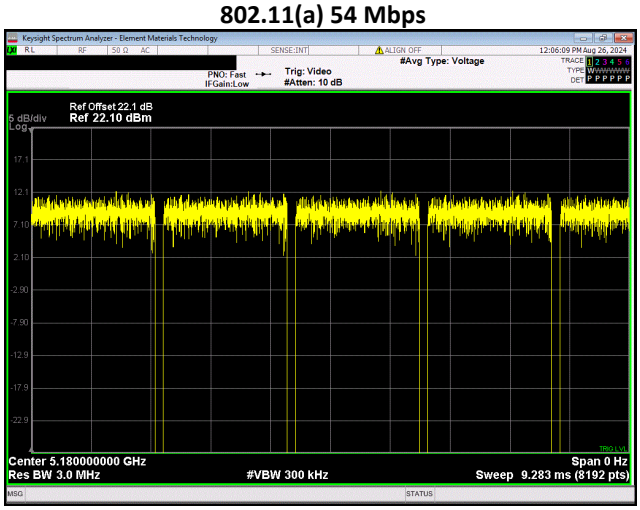
5150 - 5250 MHz Band, UNII-1, 20 MHz
Low Channel, Ch 36 - 5180 MHz
802.11(a) 54 Mbps



5150 - 5250 MHz Band, UNII-1, 20 MHz
Low Channel, Ch 36 - 5180 MHz
802.11(a) 54 Mbps



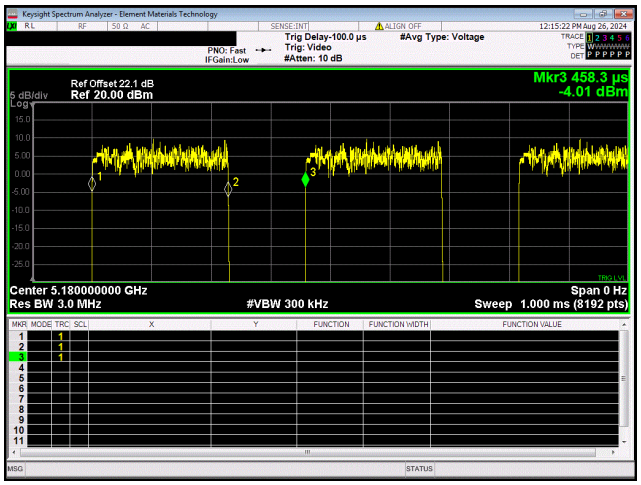
5150 - 5250 MHz Band, UNII-1, 20 MHz
Low Channel, Ch 36 - 5180 MHz
802.11(n) MCS0



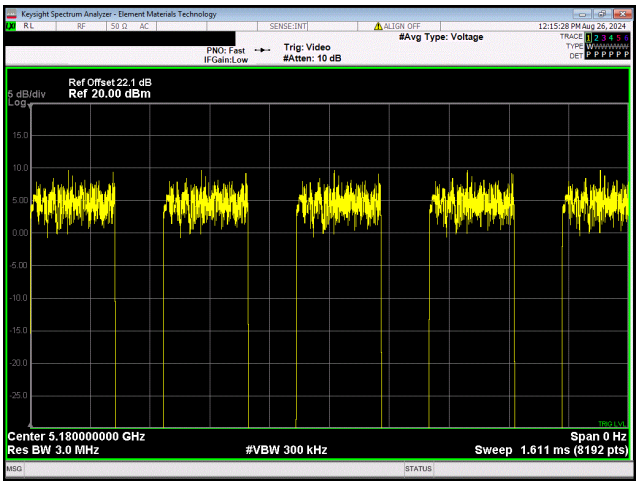
5150 - 5250 MHz Band, UNII-1, 20 MHz
Low Channel, Ch 36 - 5180 MHz
802.11(n) MCS0

DUTY CYCLE

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



5150 - 5250 MHz Band, UNII-1, 20 MHz
Low Channel, Ch 36 - 5180 MHz
802.11(n) MCS7



5150 - 5250 MHz Band, UNII-1, 20 MHz
Low Channel, Ch 36 - 5180 MHz
802.11(n) MCS7

MAXIMUM CONDUCTED OUTPUT POWER

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

TEST DESCRIPTION

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum. The radio was operated in the modes as shown in the following data sheets.

Prior to measuring maximum transmit power; the 99% occupied bandwidth (OBW) and the duty cycle (D) were measured. The method of measuring the emission bandwidth and the associated data are found elsewhere in this test report.

The maximum conducted output power was measured using ANSI C63.10:2013, Clause 12.3.2.4, Method SA-2 (RMS detection and trace averaging across the on and off times of the EUT transmission and use of a duty cycle correction factor).

The spectrum analyzer settings were set per the guidance as well as the following specifics:

- RMS Detector
- Trace average 100 traces in power averaging mode.
- Power was integrated across “OBW”, by using the channel power function of the analyzer.

A duty cycle correction factor was added to the measurement using the results of the formula of 10*LOG(1/D) where D is the duty cycle.

The worst case (most stringent) limits are shown on the following datasheet based on the limits below where B is the bandwidth in terms of 99% for ISED and 26dB for the FCC.

- In the 5.15 – 5.25GHz band, the maximum permissible conducted output power is 250mW (24.0dBm). ISED does not have a conducted limit for this band.
- In the 5.25 – 5.35GHz band, the maximum permissible conducted output power is the lesser of 250mW (24.0dBm) or 11 dBm + 10log10(B)
- In the 5.47 – 5.725GHz band, the maximum permissible conducted output power is the lesser of 250mW (24.0dBm) or 11 dBm + 10log10(B)
- In the 5.725 – 5.850GHz band, the maximum permissible conducted output power is 1W (30dBm).

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	2024-05-22	2025-05-22
Generator - Signal	Agilent	N5183A	TIK	2022-01-24	2025-01-24
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2023-09-05	2024-09-05
Block - DC	Fairview Microwave	SD3379	ANH	2023-09-05	2024-09-05
Attenuator	Fairview Microwave	SA4014-20	AQI	2023-09-05	2024-09-05

MAXIMUM CONDUCTED OUTPUT POWER

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

EUT:	Fuji Thermostat	Work Order:	ADEM0044
Serial Number:	52202030005204	Date:	2024-07-23
Customer:	Ademco, Inc.	Temperature:	21.9°C
Attendees:	None	Relative Humidity:	57.3%
Customer Project:	None	Bar. Pressure (PMSL):	1016 mbar
Tested By:	Christopher Heintzelman, Arnauld Dedry	Job Site:	MN11
Power:	110VAC/60Hz	Configuration:	ADEM0044-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2024	ANSI C63.10:2013
RSS-247 Issue 3:2023	ANSI C63.10:2013

COMMENTS

Reference level offset includes attenuator, measurement cable, and DC block.

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass

Tested By

TEST RESULTS

	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result
5150 - 5250 MHz Band, UNII-1, 20 MHz					
Mid Channel, Ch 40 - 5200 MHz					
802.11(a) 6 Mbps	16.7	0.3	17	24	Pass
802.11(a) 36 Mbps	13.709	1.3	15	24	Pass
802.11(a) 54 Mbps	12.408	1.8	14.2	24	Pass
802.11(n) MCS0	15.395	0.3	15.7	24	Pass
802.11(n) MCS7	11.303	2	13.3	24	Pass
High Channel, Ch 48 - 5240 MHz					
802.11(a) 6 Mbps	17.773	0.3	18.1	24	Pass
802.11(a) 36 Mbps	14.141	1.3	15.4	24	Pass
802.11(a) 54 Mbps	12.784	1.8	14.6	24	Pass
802.11(n) MCS0	15.696	0.3	16	24	Pass
802.11(n) MCS7	11.383	2	13.4	24	Pass
5250 - 5350 MHz Band,UNII-2A, 20 MHz					
Low Channel, Ch 52 - 5260 MHz					
802.11(a) 6 Mbps	17.705	0.3	18	23.2	Pass
802.11(a) 36 Mbps	13.973	1.3	15.3	23.2	Pass
802.11(a) 54 Mbps	12.604	1.8	14.4	23.2	Pass
802.11(n) MCS0	15.781	0.3	16.1	23.5	Pass
802.11(n) MCS7	11.438	2	13.4	23.5	Pass
Mid Channel, Ch 60 - 5300 MHz					

MAXIMUM CONDUCTED OUTPUT POWER

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

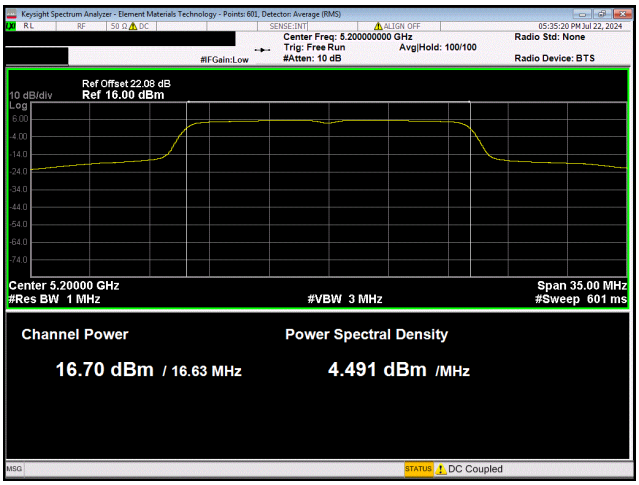
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result
802.11(a) 6 Mbps	16.733	0.3	17	23.2	Pass
802.11(a) 36 Mbps	14.263	1.3	15.6	23.2	Pass
802.11(a) 54 Mbps	12.955	1.8	14.8	23.2	Pass
802.11(n) MCS0	16.237	0.3	16.5	23.5	Pass
802.11(n) MCS7	11.86	2	13.9	23.5	Pass
High Channel, Ch 64 - 5320 MHz					
802.11(a) 6 Mbps	16.154	0.3	16.5	23.2	Pass
802.11(a) 36 Mbps	14.098	1.3	15.4	23.2	Pass
802.11(a) 54 Mbps	12.818	1.8	14.6	23.2	Pass
802.11(n) MCS0	15.612	0.3	15.9	23.5	Pass
802.11(n) MCS7	11.662	2	13.7	23.5	Pass
5470 - 5725 MHz Band,UNII-2C, 20 MHz					
Low Channel, Ch 100 - 5500 MHz					
802.11(a) 6 Mbps	16.503	0.3	16.8	23.2	Pass
802.11(a) 36 Mbps	14.438	1.3	15.7	23.2	Pass
802.11(a) 54 Mbps	12.659	1.8	14.5	23.2	Pass
802.11(n) MCS0	16.059	0.3	16.4	23.5	Pass
802.11(n) MCS7	11.6	2	13.6	23.5	Pass
Mid Channel, Ch 116 - 5580 MHz					
802.11(a) 6 Mbps	16.022	0.3	16.3	23.2	Pass
802.11(a) 36 Mbps	13.371	1.3	14.7	23.2	Pass
802.11(a) 54 Mbps	12.088	1.8	13.9	23.2	Pass
802.11(n) MCS0	15.474	0.3	15.8	23.5	Pass
802.11(n) MCS7	10.777	2	12.8	23.4	Pass
High Channel, Ch 140 - 5700 MHz					
802.11(a) 6 Mbps	13.644	0.3	13.9	23.2	Pass
802.11(a) 36 Mbps	12.802	1.3	14.1	23.2	Pass
802.11(a) 54 Mbps	11.981	1.8	13.8	23.2	Pass
802.11(n) MCS0	14.07	0.3	14.4	23.5	Pass
802.11(n) MCS7	10.837	2	12.8	23.4	Pass
5725 - 5785 MHz Band					
Low Channel, Ch 149 - 5745 MHz					
802.11(a) 6 Mbps	16.774	0.3	17.1	30	Pass
802.11(a) 36 Mbps	13.237	1.3	14.5	30	Pass
802.11(a) 54 Mbps	11.5	1.8	13.3	30	Pass
802.11(n) MCS0	14.962	0.3	15.3	30	Pass
802.11(n) MCS7	10.331	2	12.3	30	Pass
Mid Channel, Ch 157 - 5785 MHz					
802.11(a) 6 Mbps	16.34	0.3	16.6	30	Pass
802.11(a) 36 Mbps	12.193	1.3	13.5	30	Pass
802.11(a) 54 Mbps	10.91	1.8	12.7	30	Pass
802.11(n) MCS0	14.471	0.3	14.8	30	Pass

MAXIMUM CONDUCTED OUTPUT POWER

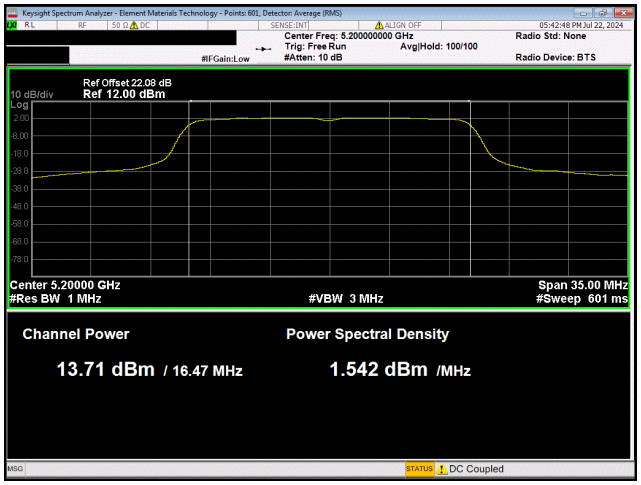
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result
802.11(n) MCS7	9.897	1.9	11.8	30	Pass
High Channel, Ch 165 - 5825 MHz					
802.11(a) 6 Mbps	17.003	0.3	17.3	30	Pass
802.11(a) 36 Mbps	13.641	1.3	14.9	30	Pass
802.11(a) 54 Mbps	11.845	1.8	13.6	30	Pass
802.11(n) MCS0	15.311	0.3	15.6	30	Pass
802.11(n) MCS7	10.734	2	12.7	30	Pass

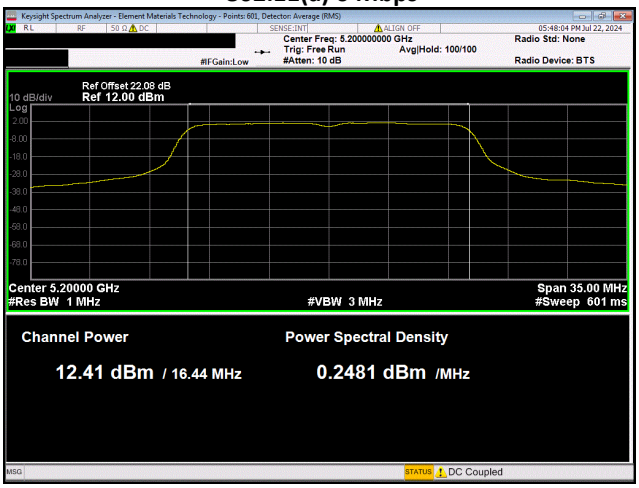
MAXIMUM CONDUCTED OUTPUT POWER



5150 - 5250 MHz Band, UNII-1, 20 MHz
Mid Channel, Ch 40 - 5200 MHz
802.11(a) 6 Mbps



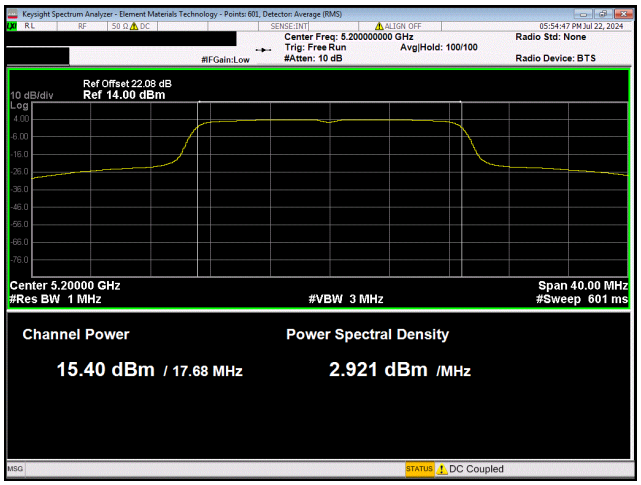
5150 - 5250 MHz Band, UNII-1, 20 MHz
Mid Channel, Ch 40 - 5200 MHz
802.11(a) 36 Mbps



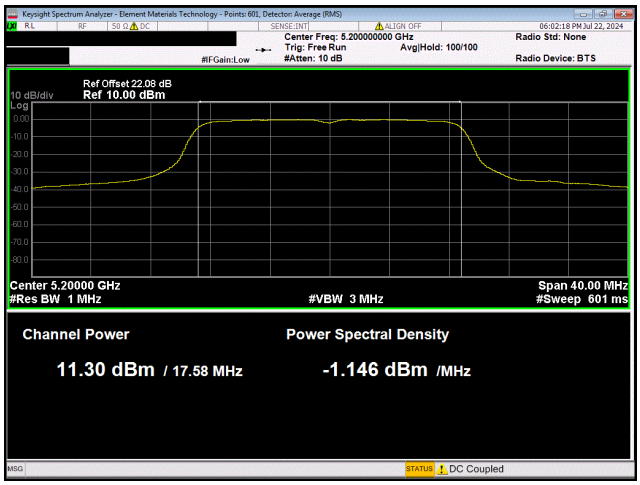
5150 - 5250 MHz Band, UNII-1, 20 MHz
Mid Channel, Ch 40 - 5200 MHz
802.11(a) 54 Mbps

MAXIMUM CONDUCTED OUTPUT POWER

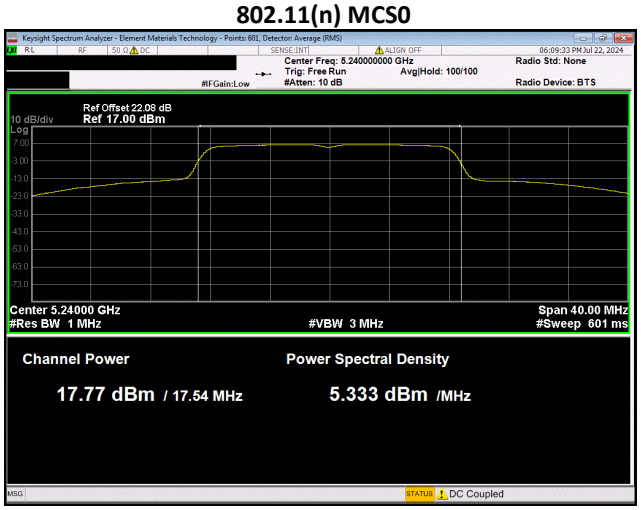
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



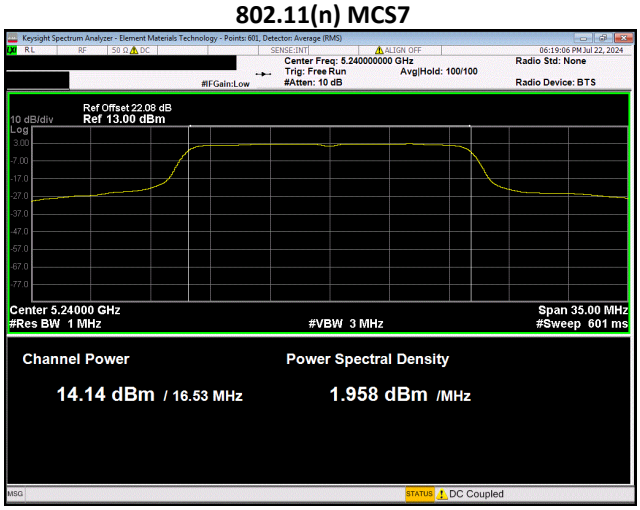
5150 - 5250 MHz Band, UNII-1, 20 MHz
Mid Channel, Ch 40 - 5200 MHz
802.11(n) MCS0



5150 - 5250 MHz Band, UNII-1, 20 MHz
Mid Channel, Ch 40 - 5200 MHz
802.11(n) MCS7



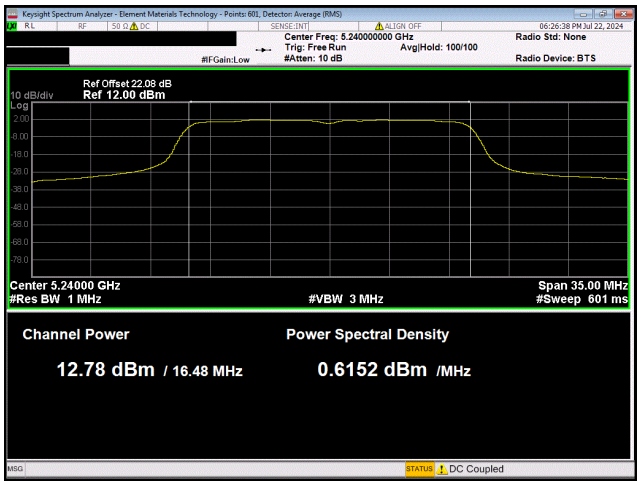
5150 - 5250 MHz Band, UNII-1, 20 MHz
High Channel, Ch 48 - 5240 MHz
802.11(a) 6 Mbps



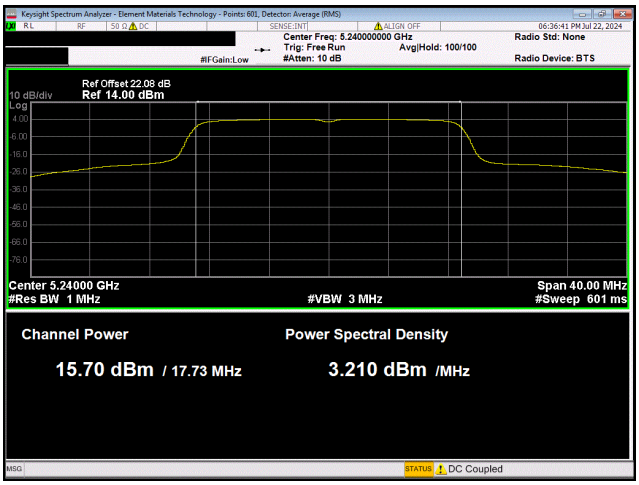
5150 - 5250 MHz Band, UNII-1, 20 MHz
High Channel, Ch 48 - 5240 MHz
802.11(a) 36 Mbps

MAXIMUM CONDUCTED OUTPUT POWER

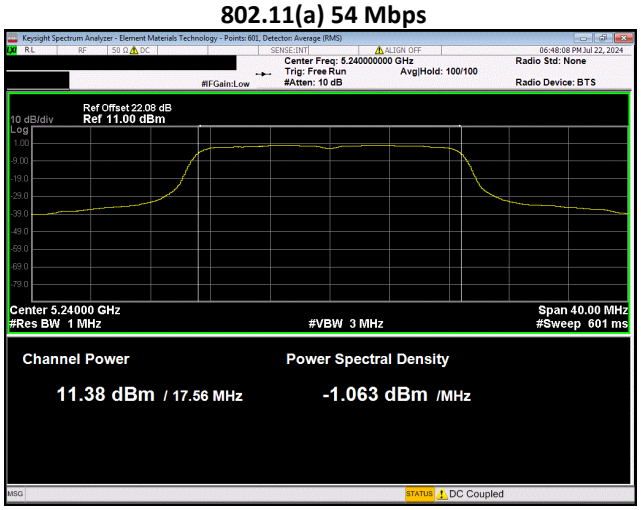
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



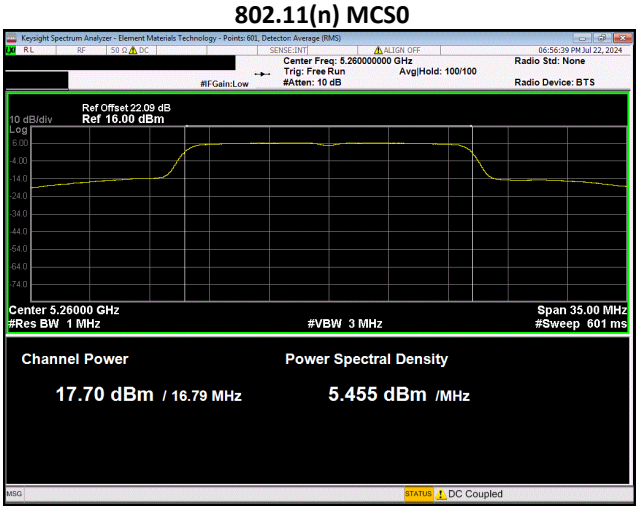
5150 - 5250 MHz Band, UNII-1, 20 MHz
High Channel, Ch 48 - 5240 MHz
802.11(a) 54 Mbps



5150 - 5250 MHz Band, UNII-1, 20 MHz
High Channel, Ch 48 - 5240 MHz
802.11(n) MCS0



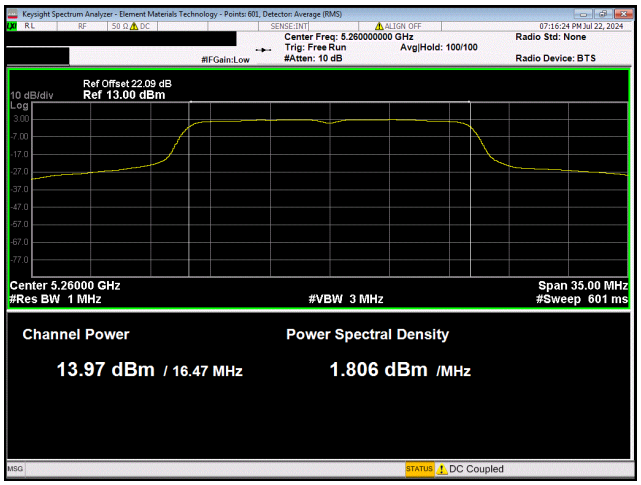
5150 - 5250 MHz Band, UNII-1, 20 MHz
High Channel, Ch 48 - 5240 MHz
802.11(n) MCS7



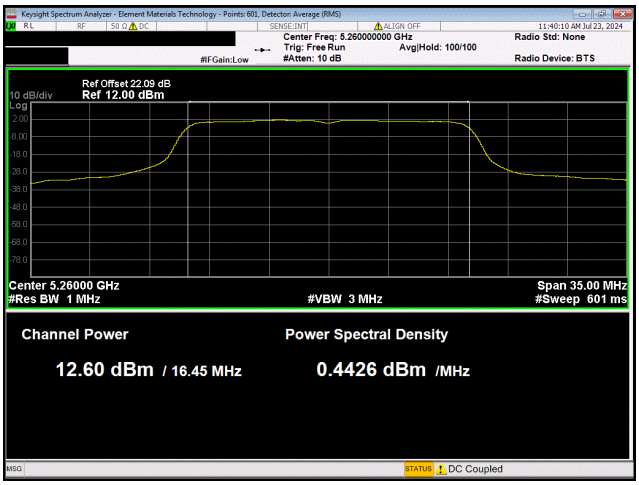
5250 - 5350 MHz Band,UNII-2A, 20 MHz
Low Channel, Ch 52 - 5260 MHz
802.11(a) 6 Mbps

MAXIMUM CONDUCTED OUTPUT POWER

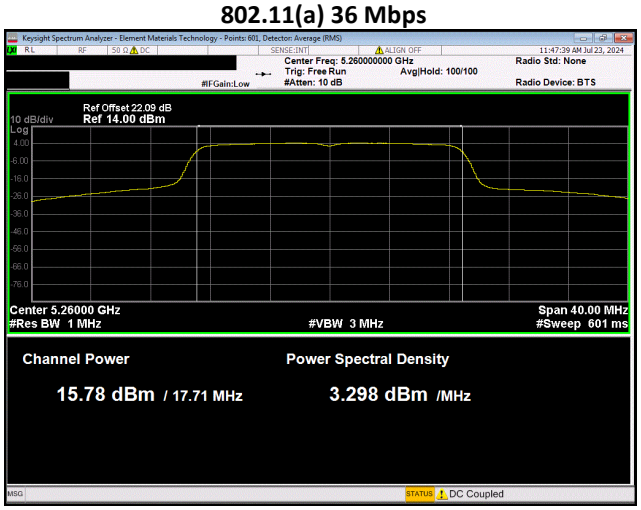
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



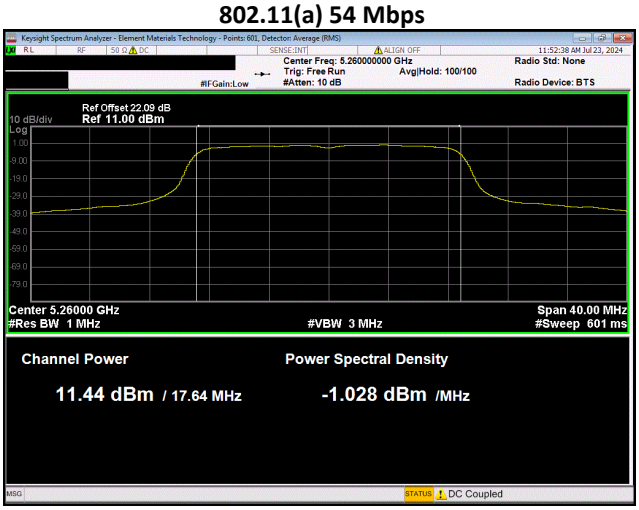
5250 - 5350 MHz Band,UNII-2A, 20 MHz
Low Channel, Ch 52 - 5260 MHz
802.11(a) 36 Mbps



5250 - 5350 MHz Band,UNII-2A, 20 MHz
Low Channel, Ch 52 - 5260 MHz
802.11(a) 54 Mbps



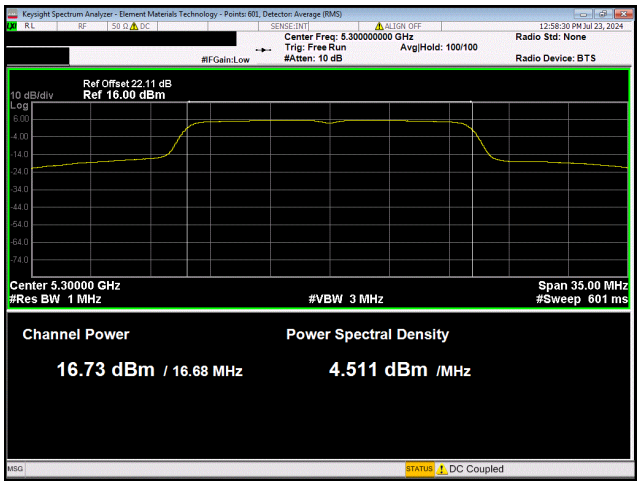
5250 - 5350 MHz Band,UNII-2A, 20 MHz
Low Channel, Ch 52 - 5260 MHz
802.11(n) MCS0



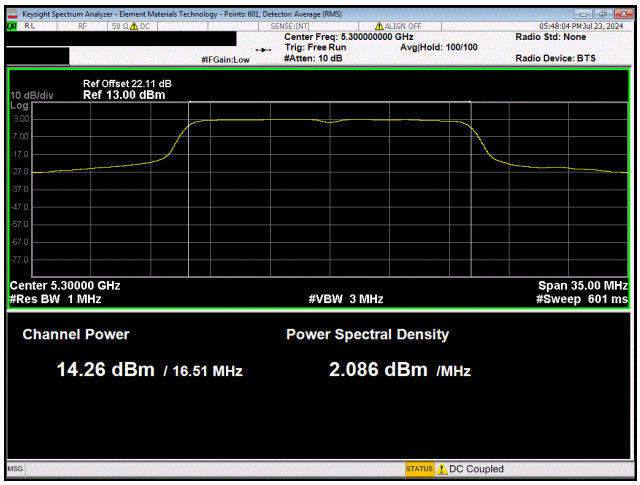
5250 - 5350 MHz Band,UNII-2A, 20 MHz
Low Channel, Ch 52 - 5260 MHz
802.11(n) MCS7

MAXIMUM CONDUCTED OUTPUT POWER

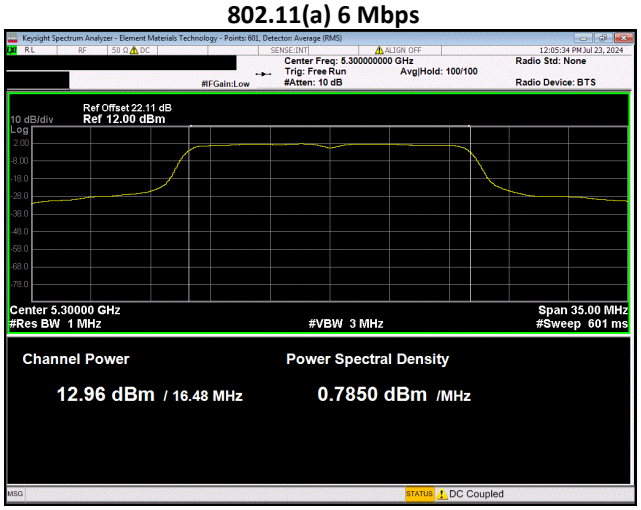
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



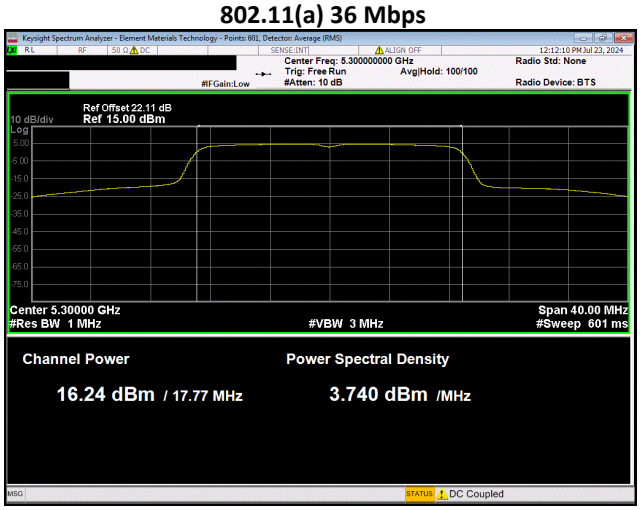
5250 - 5350 MHz Band,UNII-2A, 20 MHz
Mid Channel, Ch 60 - 5300 MHz
802.11(a) 6 Mbps



5250 - 5350 MHz Band,UNII-2A, 20 MHz
Mid Channel, Ch 60 - 5300 MHz
802.11(a) 36 Mbps



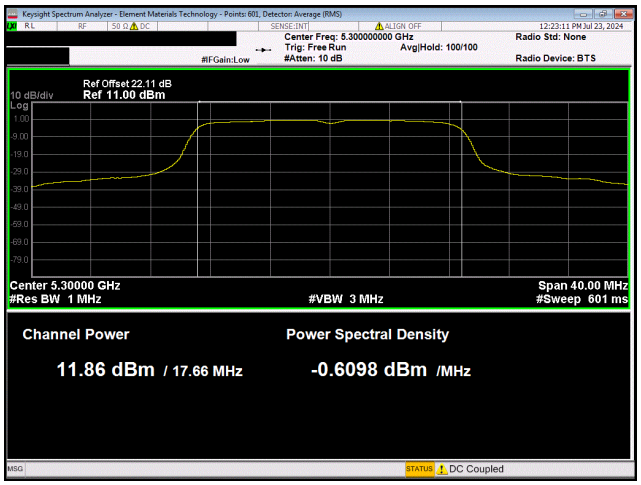
5250 - 5350 MHz Band,UNII-2A, 20 MHz
Mid Channel, Ch 60 - 5300 MHz
802.11(a) 54 Mbps



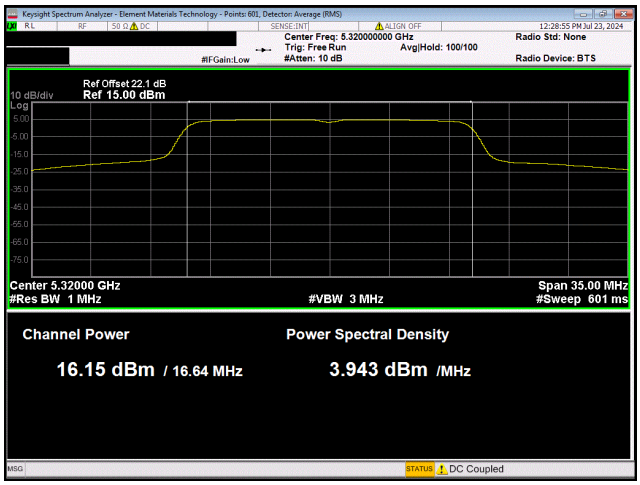
5250 - 5350 MHz Band,UNII-2A, 20 MHz
Mid Channel, Ch 60 - 5300 MHz
802.11(n) MCS0

MAXIMUM CONDUCTED OUTPUT POWER

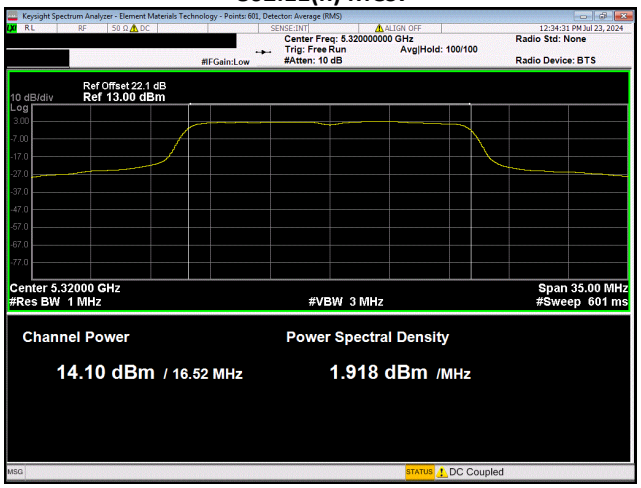
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



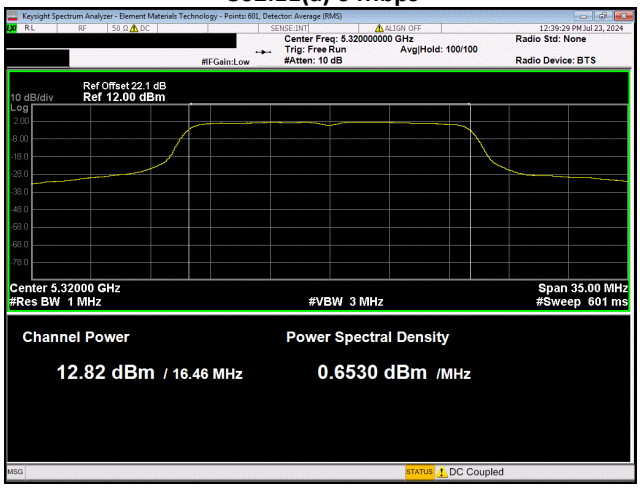
5250 - 5350 MHz Band,UNII-2A, 20 MHz
Mid Channel, Ch 60 - 5300 MHz
802.11(n) MCS7



5250 - 5350 MHz Band,UNII-2A, 20 MHz
High Channel, Ch 64 - 5320 MHz
802.11(a) 6 Mbps



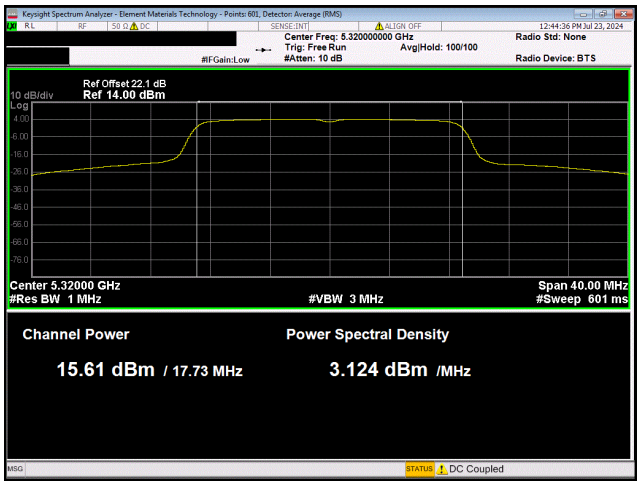
5250 - 5350 MHz Band,UNII-2A, 20 MHz
High Channel, Ch 64 - 5320 MHz
802.11(a) 36 Mbps



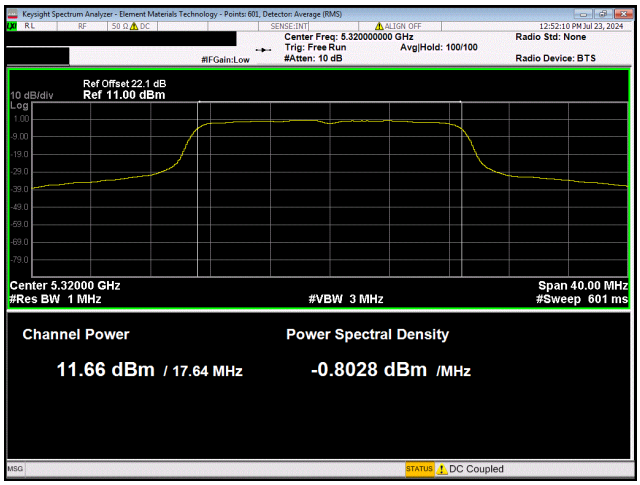
5250 - 5350 MHz Band,UNII-2A, 20 MHz
High Channel, Ch 64 - 5320 MHz
802.11(a) 54 Mbps

MAXIMUM CONDUCTED OUTPUT POWER

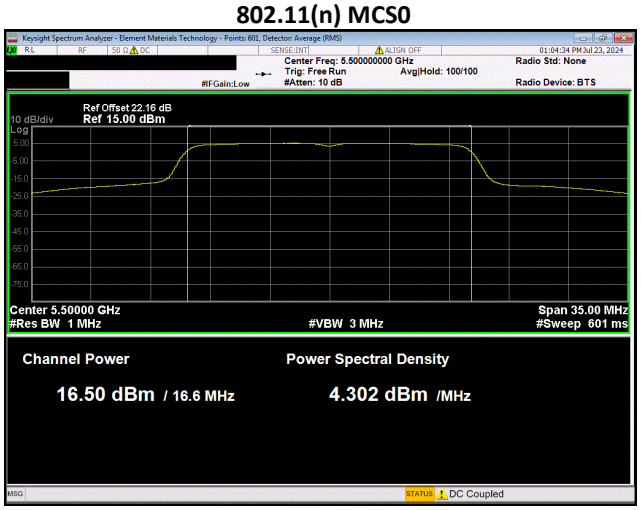
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



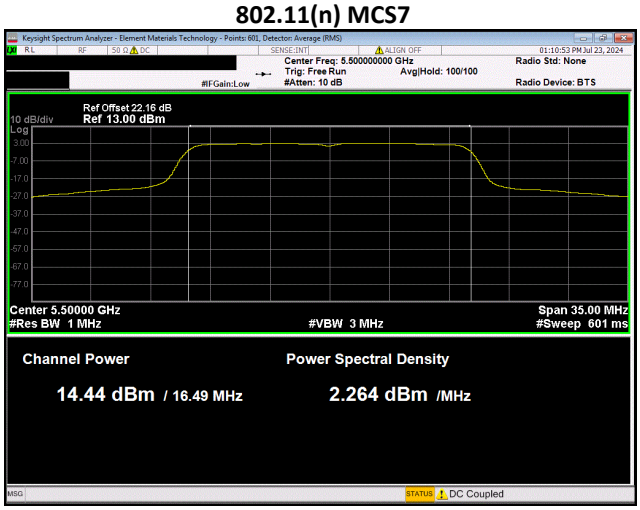
5250 - 5350 MHz Band,UNII-2A, 20 MHz
High Channel, Ch 64 - 5320 MHz
802.11(n) MCS0



5250 - 5350 MHz Band,UNII-2A, 20 MHz
High Channel, Ch 64 - 5320 MHz
802.11(n) MCS7



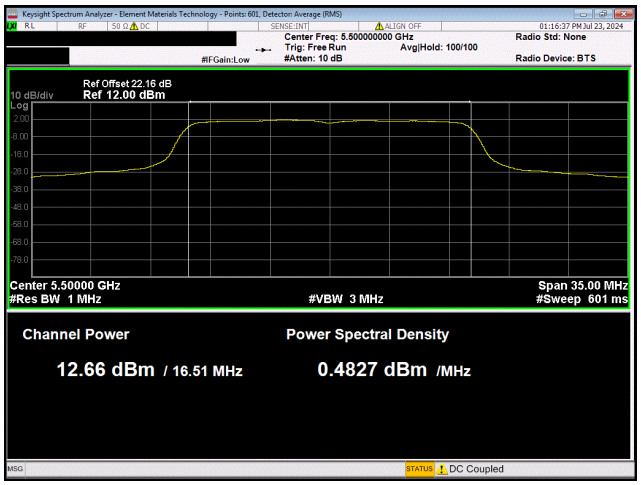
5470 - 5725 MHz Band,UNII-2C, 20 MHz
Low Channel, Ch 100 - 5500 MHz
802.11(a) 6 Mbps



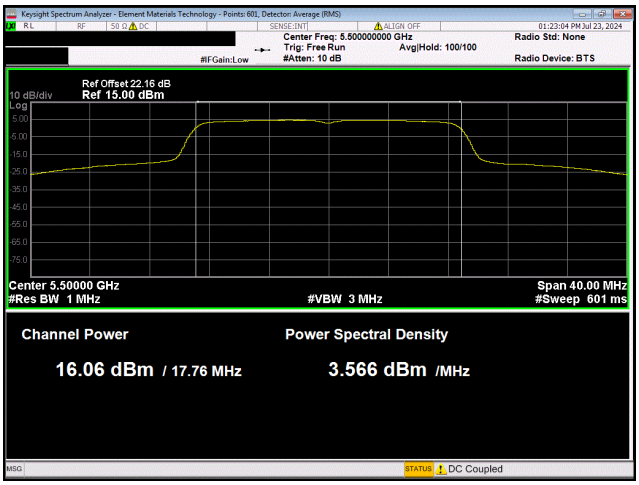
5470 - 5725 MHz Band,UNII-2C, 20 MHz
Low Channel, Ch 100 - 5500 MHz
802.11(a) 36 Mbps

MAXIMUM CONDUCTED OUTPUT POWER

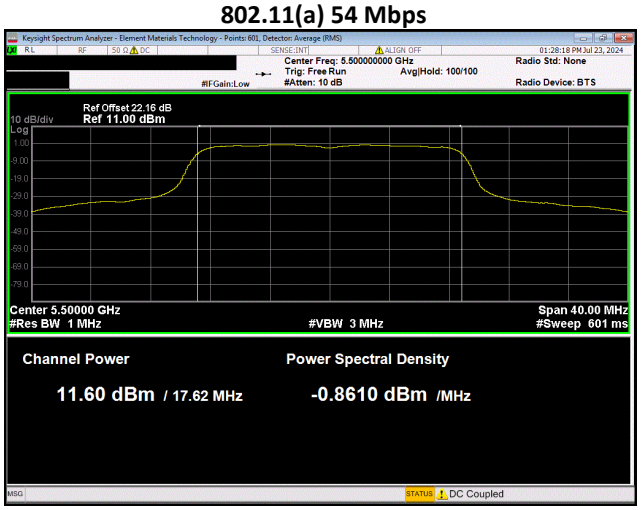
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



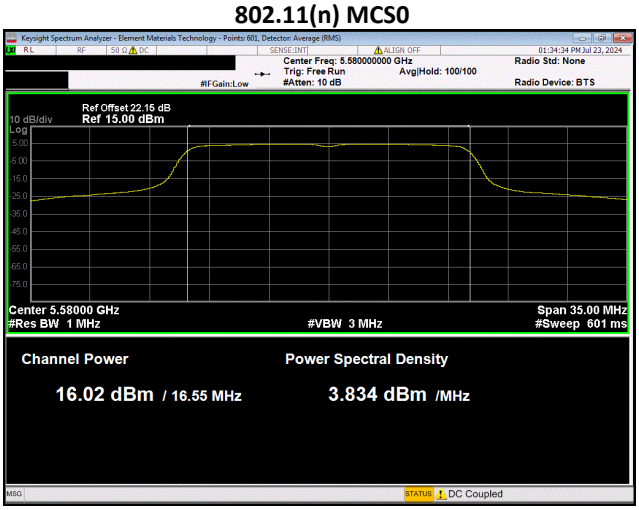
5470 - 5725 MHz Band,UNII-2C, 20 MHz
Low Channel, Ch 100 - 5500 MHz
802.11(a) 54 Mbps



5470 - 5725 MHz Band,UNII-2C, 20 MHz
Low Channel, Ch 100 - 5500 MHz
802.11(n) MCS0



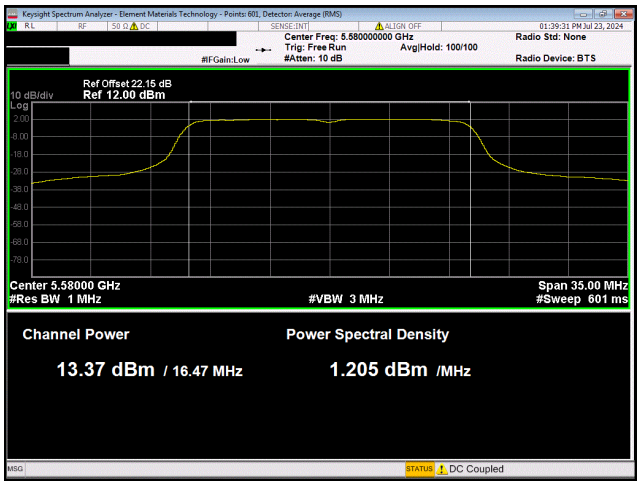
5470 - 5725 MHz Band,UNII-2C, 20 MHz
Low Channel, Ch 100 - 5500 MHz
802.11(n) MCS7



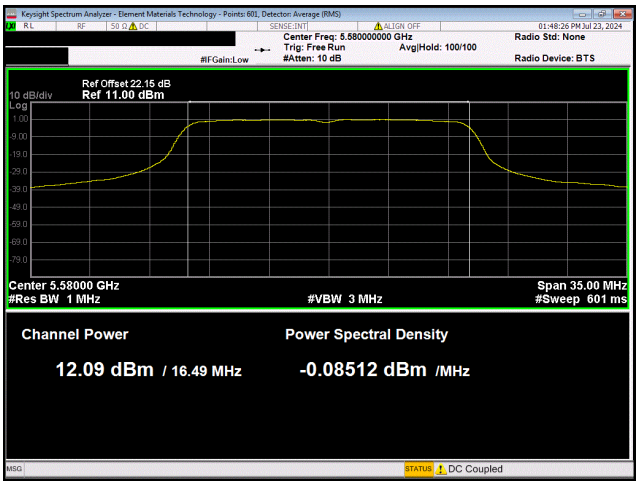
5470 - 5725 MHz Band,UNII-2C, 20 MHz
Mid Channel, Ch 116 - 5580 MHz
802.11(a) 6 Mbps

MAXIMUM CONDUCTED OUTPUT POWER

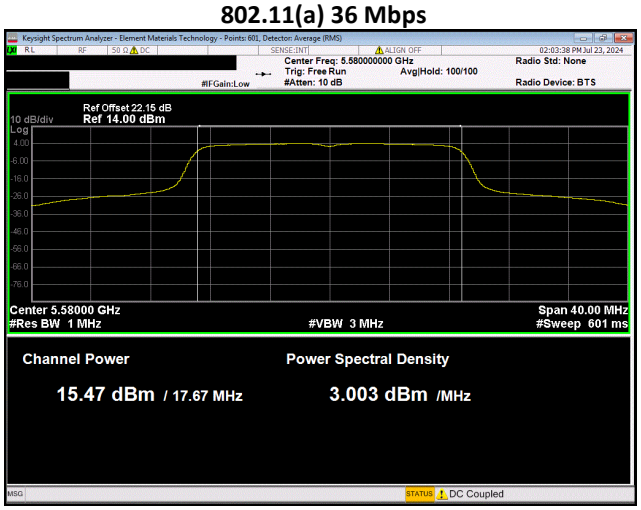
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



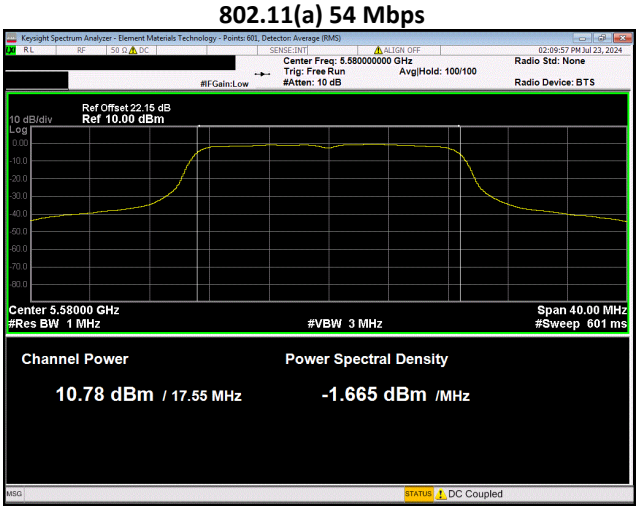
5470 - 5725 MHz Band,UNII-2C, 20 MHz
Mid Channel, Ch 116 - 5580 MHz
802.11(a) 36 Mbps



5470 - 5725 MHz Band,UNII-2C, 20 MHz
Mid Channel, Ch 116 - 5580 MHz
802.11(a) 54 Mbps



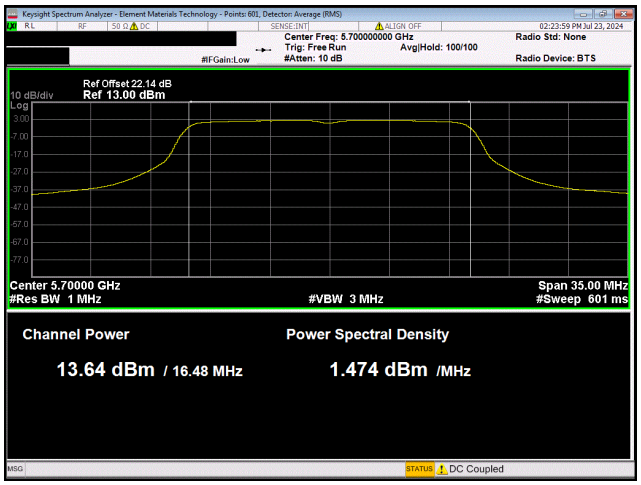
5470 - 5725 MHz Band,UNII-2C, 20 MHz
Mid Channel, Ch 116 - 5580 MHz
802.11(n) MCS0



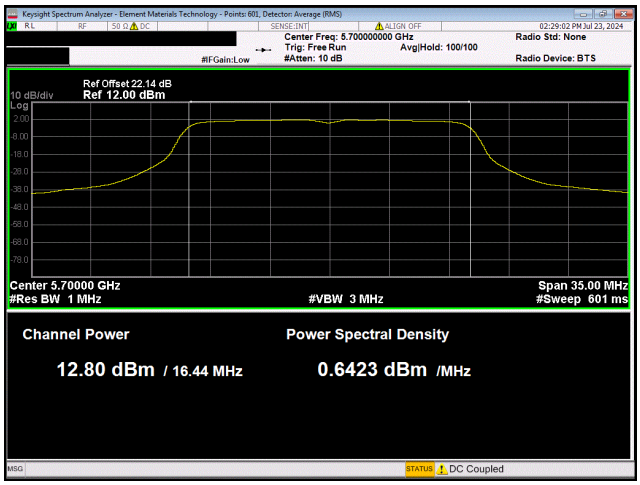
5470 - 5725 MHz Band,UNII-2C, 20 MHz
Mid Channel, Ch 116 - 5580 MHz
802.11(n) MCS7

MAXIMUM CONDUCTED OUTPUT POWER

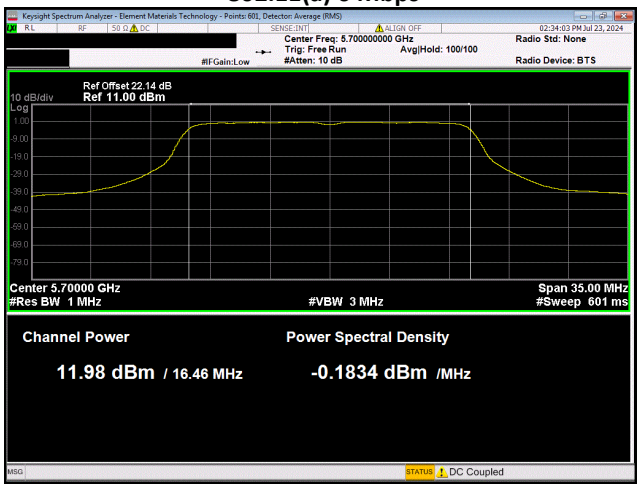
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



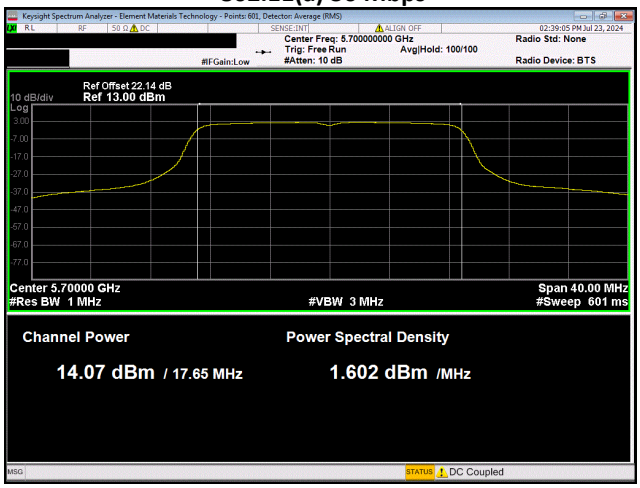
5470 - 5725 MHz Band,UNII-2C, 20 MHz
High Channel, Ch 140 - 5700 MHz
802.11(a) 6 Mbps



5470 - 5725 MHz Band,UNII-2C, 20 MHz
High Channel, Ch 140 - 5700 MHz
802.11(a) 36 Mbps



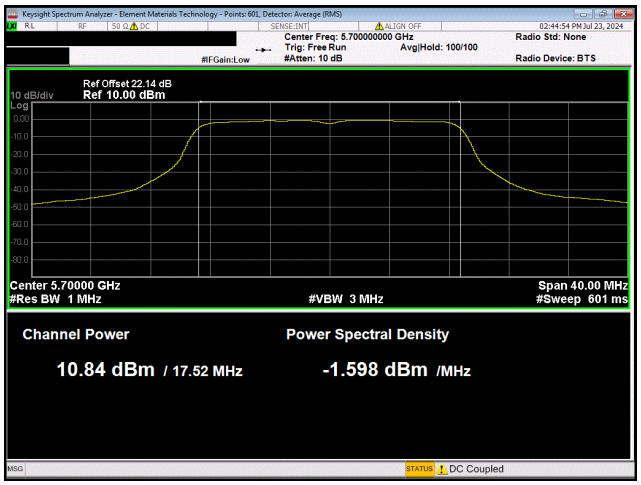
5470 - 5725 MHz Band,UNII-2C, 20 MHz
High Channel, Ch 140 - 5700 MHz
802.11(a) 54 Mbps



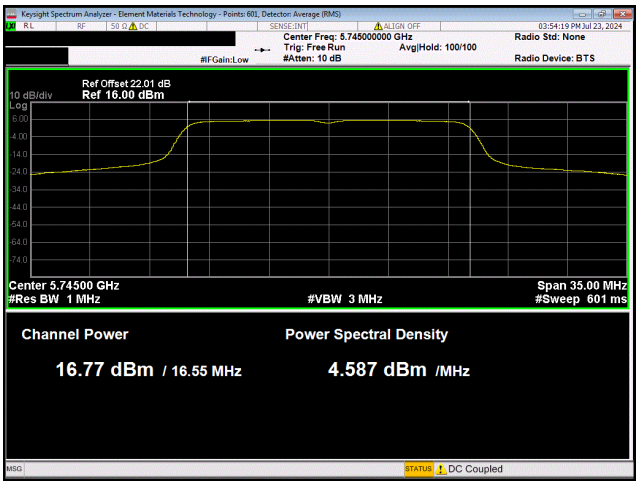
5470 - 5725 MHz Band,UNII-2C, 20 MHz
High Channel, Ch 140 - 5700 MHz
802.11(n) MCS0

MAXIMUM CONDUCTED OUTPUT POWER

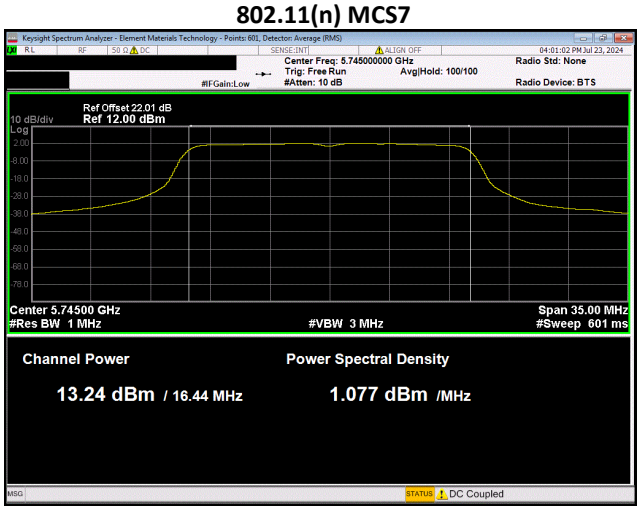
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



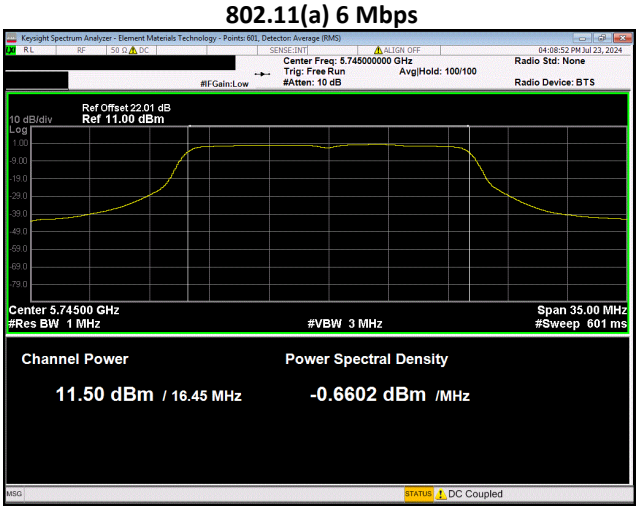
5470 - 5725 MHz Band,UNII-2C, 20 MHz
High Channel, Ch 140 - 5700 MHz
802.11(n) MCS7



5725 - 5785 MHz Band
Low Channel, Ch 149 - 5745 MHz
802.11(a) 6 Mbps



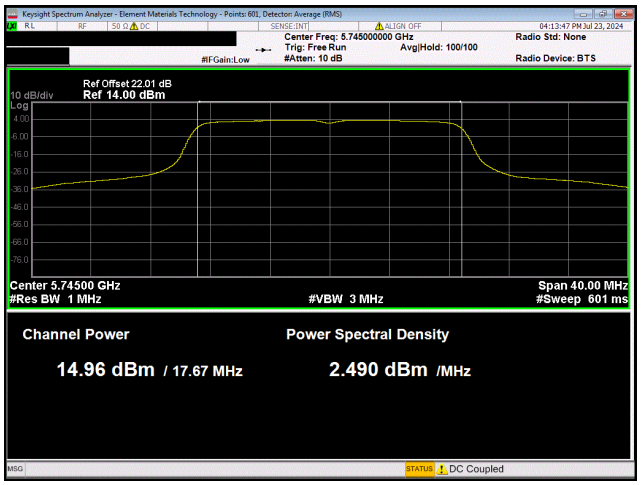
5725 - 5785 MHz Band
Low Channel, Ch 149 - 5745 MHz
802.11(a) 36 Mbps



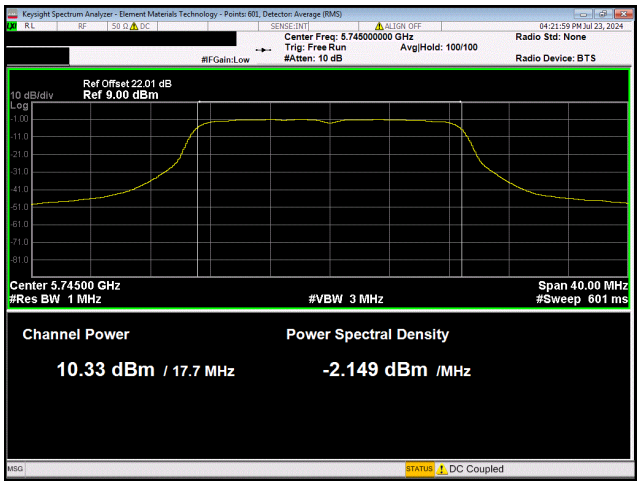
5725 - 5785 MHz Band
Low Channel, Ch 149 - 5745 MHz
802.11(a) 54 Mbps

MAXIMUM CONDUCTED OUTPUT POWER

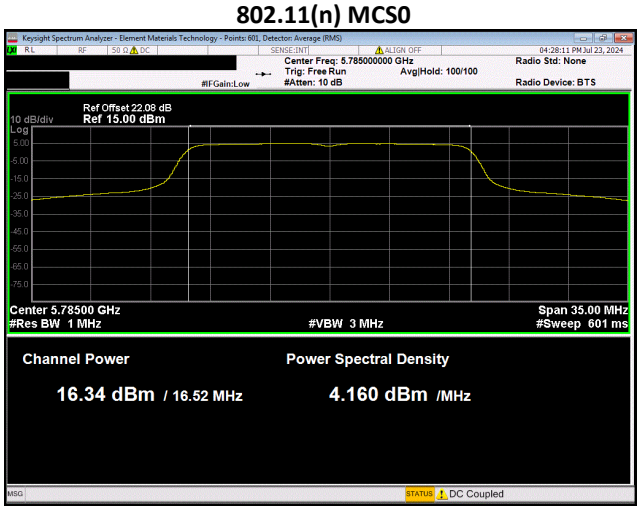
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



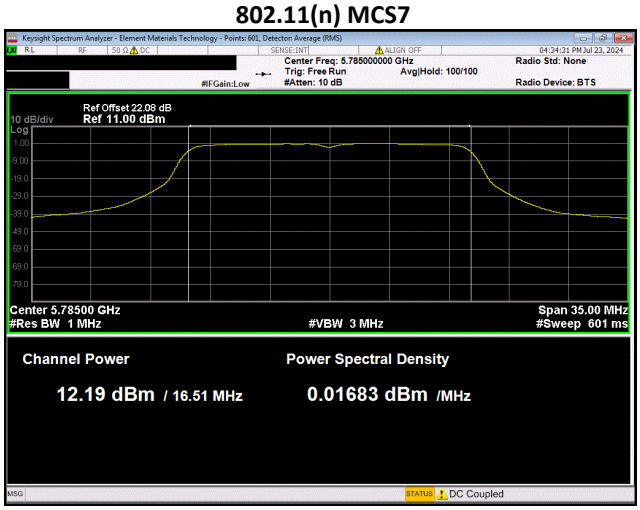
5725 - 5785 MHz Band
Low Channel, Ch 149 - 5745 MHz
802.11(n) MCS0



5725 - 5785 MHz Band
Low Channel, Ch 149 - 5745 MHz
802.11(n) MCS7



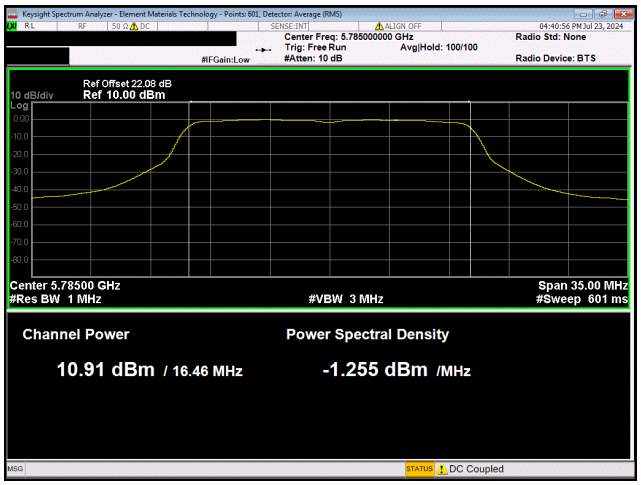
5725 - 5785 MHz Band
Mid Channel, Ch 157 - 5785 MHz
802.11(a) 6 Mbps



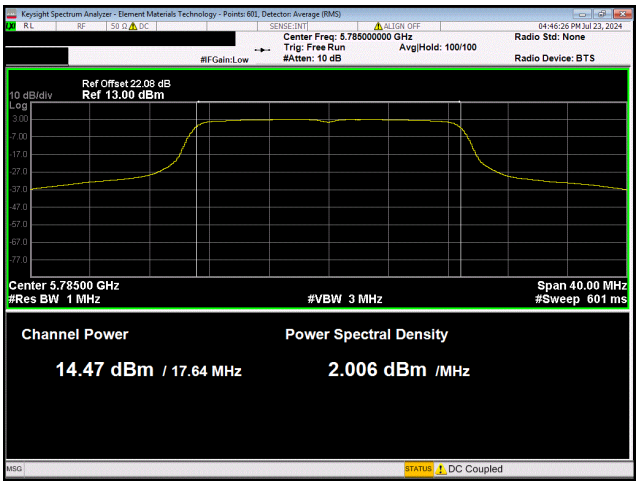
5725 - 5785 MHz Band
Mid Channel, Ch 157 - 5785 MHz
802.11(a) 36 Mbps

MAXIMUM CONDUCTED OUTPUT POWER

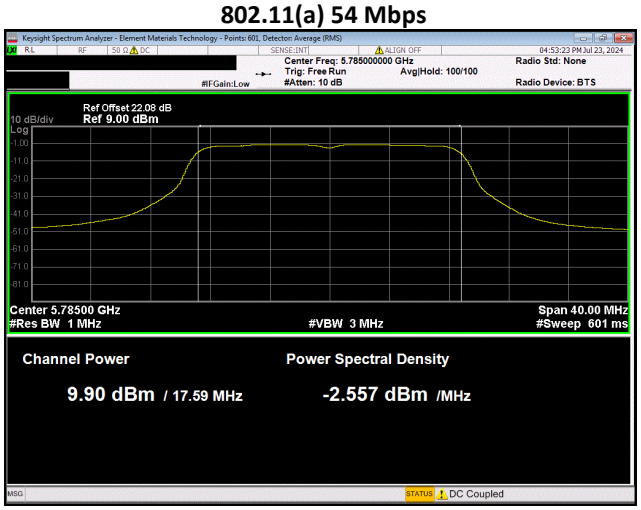
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



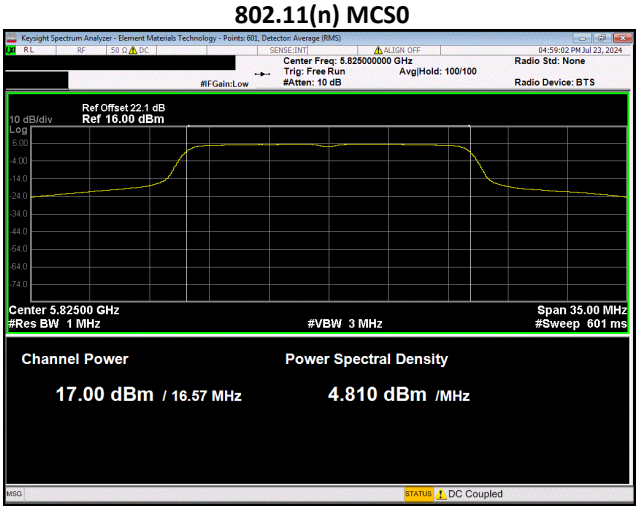
5725 - 5785 MHz Band
Mid Channel, Ch 157 - 5785 MHz
802.11(a) 54 Mbps



5725 - 5785 MHz Band
Mid Channel, Ch 157 - 5785 MHz
802.11(n) MCS0



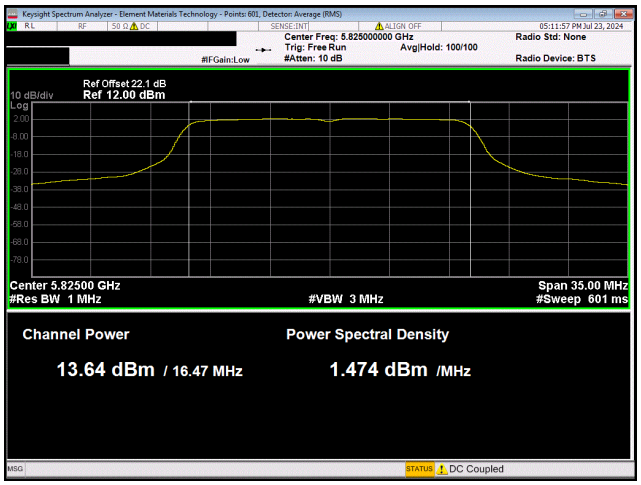
5725 - 5785 MHz Band
Mid Channel, Ch 157 - 5785 MHz
802.11(n) MCS7



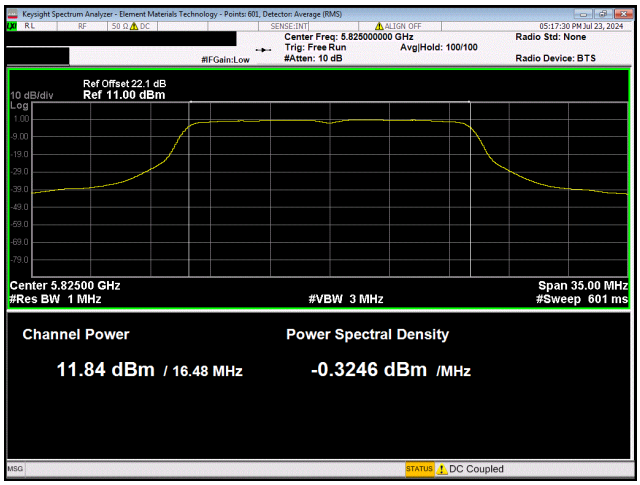
5725 - 5785 MHz Band
High Channel, Ch 165 - 5825 MHz
802.11(a) 6 Mbps

MAXIMUM CONDUCTED OUTPUT POWER

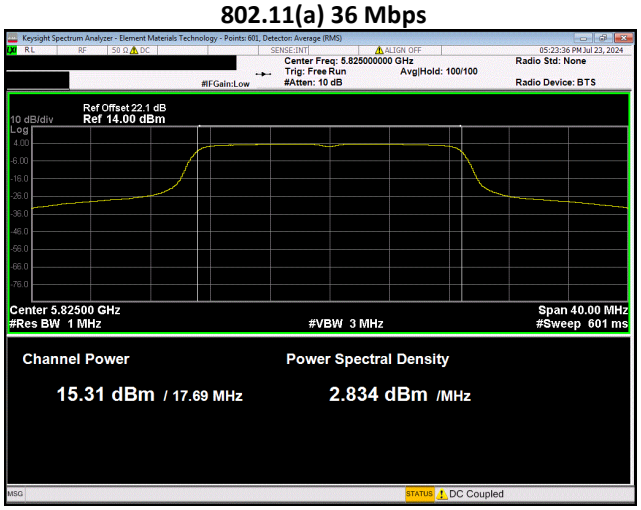
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



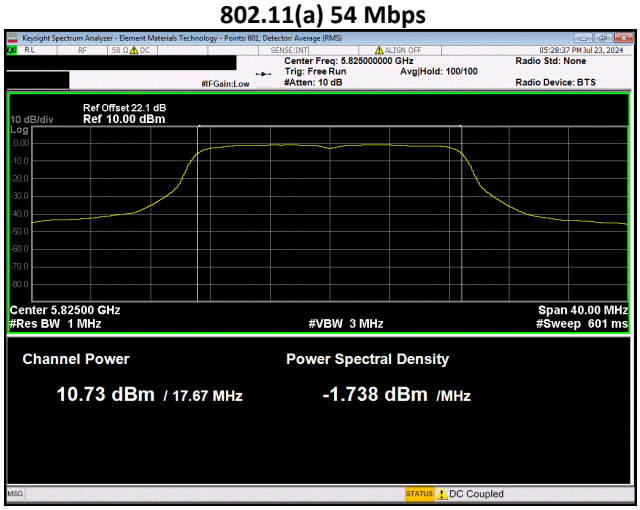
5725 - 5785 MHz Band
High Channel, Ch 165 - 5825 MHz
802.11(a) 36 Mbps



5725 - 5785 MHz Band
High Channel, Ch 165 - 5825 MHz
802.11(a) 54 Mbps



5725 - 5785 MHz Band
High Channel, Ch 165 - 5825 MHz
802.11(n) MCS0



5725 - 5785 MHz Band
High Channel, Ch 165 - 5825 MHz
802.11(n) MCS7

MAXIMUM CONDUCTED OUTPUT POWER

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

TEST DESCRIPTION

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum. The radio was operated in the modes as shown in the following data sheets.

Prior to measuring maximum transmit power; the 99% occupied bandwidth (OBW) and the duty cycle (D) were measured. The method of measuring the emission bandwidth and the associated data are found elsewhere in this test report.

The maximum conducted output power was measured using ANSI C63.10:2013, Clause 12.3.2.4, Method SA-2 (RMS detection and trace averaging across the on and off times of the EUT transmission and use of a duty cycle correction factor).

The spectrum analyzer settings were set per the guidance as well as the following specifics:

- RMS Detector
- Trace average 100 traces in power averaging mode.
- Power was integrated across “OBW”, by using the channel power function of the analyzer.

A duty cycle correction factor was added to the measurement using the results of the formula of 10*LOG(1/D) where D is the duty cycle.

The worst case (most stringent) limits are shown on the following datasheet based on the limits below where B is the bandwidth in terms of 99% for ISED and 26dB for the FCC.

- In the 5.15 – 5.25GHz band, the maximum permissible conducted output power is 250mW (24.0dBm). ISED does not have a conducted limit for this band.
- In the 5.25 – 5.35GHz band, the maximum permissible conducted output power is the lesser of 250mW (24.0dBm) or 11 dBm + 10log10(B)
- In the 5.47 – 5.725GHz band, the maximum permissible conducted output power is the lesser of 250mW (24.0dBm) or 11 dBm + 10log10(B)
- In the 5.725 – 5.850GHz band, the maximum permissible conducted output power is 1W (30dBm).

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	2024-05-22	2025-05-22
Generator - Signal	Agilent	N5183A	TIK	2022-01-24	2025-01-24
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2023-09-05	2024-09-05
Block - DC	Fairview Microwave	SD3379	ANH	2023-09-05	2024-09-05
Attenuator	Fairview Microwave	SA4014-20	AQI	2023-09-05	2024-09-05

MAXIMUM CONDUCTED OUTPUT POWER

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

EUT:	Fuji Thermostat	Work Order:	ADEM0044
Serial Number:	52202030005143	Date:	2024-08-26
Customer:	Ademco, Inc.	Temperature:	21.9°C
Attendees:	None	Relative Humidity:	67.6%
Customer Project:	None	Bar. Pressure (PMSL):	1015 mbar
Tested By:	Christopher Heintzelman	Job Site:	MN11
Power:	110VAC/60Hz	Configuration:	ADEM0044-8

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2024	ANSI C63.10:2013
RSS-247 Issue 3:2023	ANSI C63.10:2013

COMMENTS

Power setting 107.

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass

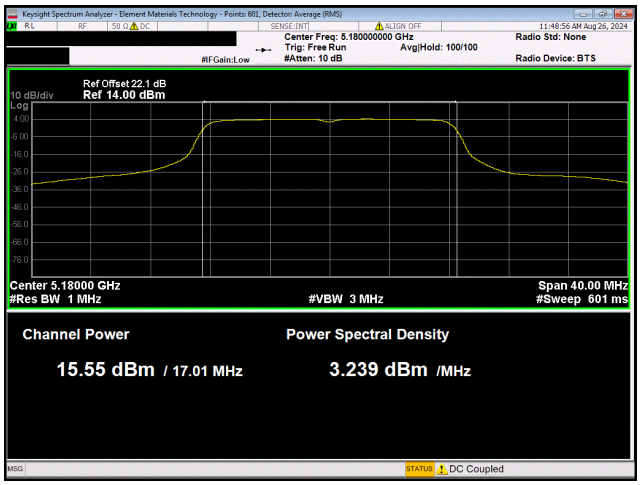
Tested By

TEST RESULTS

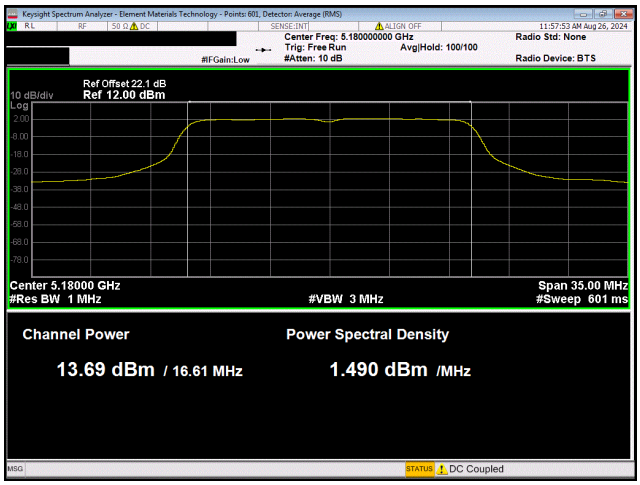
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result
5150 - 5250 MHz Band, UNII-1, 20 MHz					
Low Channel, Ch 36 - 5180 MHz					
802.11(a) 6 Mbps	15.545	0.3	15.8	24	Pass
802.11(a) 36 Mbps	13.694	1.3	15	24	Pass
802.11(a) 54 Mbps	12.125	1.8	13.9	24	Pass
802.11(n) MCS0	15.824	0.3	16.1	24	Pass
802.11(n) MCS7	10.86	2	12.9	24	Pass

MAXIMUM CONDUCTED OUTPUT POWER

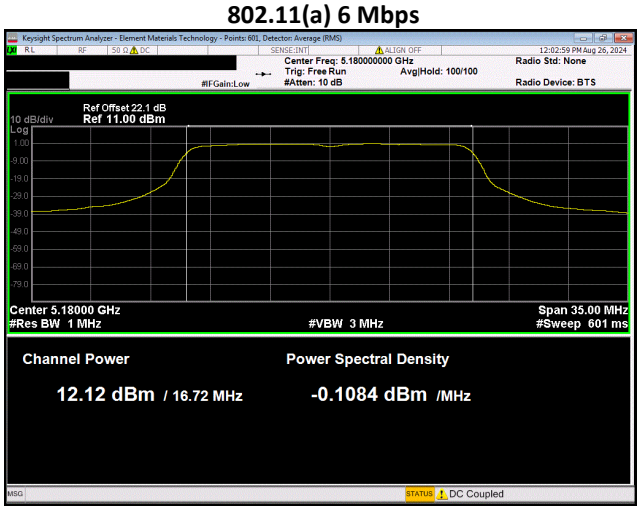
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



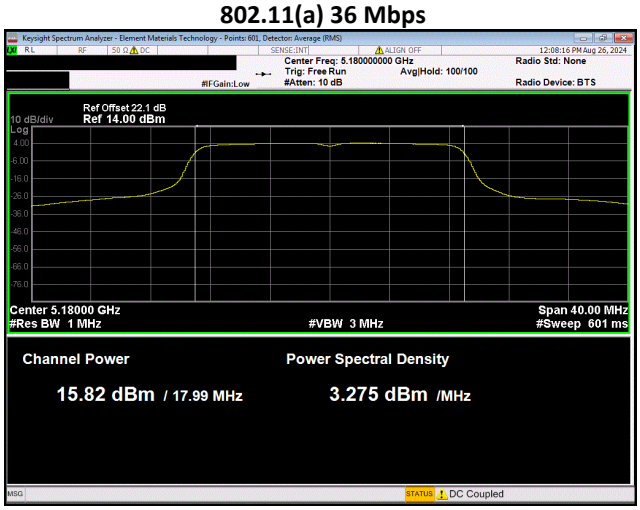
5150 - 5250 MHz Band, UNII-1, 20 MHz
Low Channel, Ch 36 - 5180 MHz
802.11(a) 6 Mbps



5150 - 5250 MHz Band, UNII-1, 20 MHz
Low Channel, Ch 36 - 5180 MHz
802.11(a) 36 Mbps

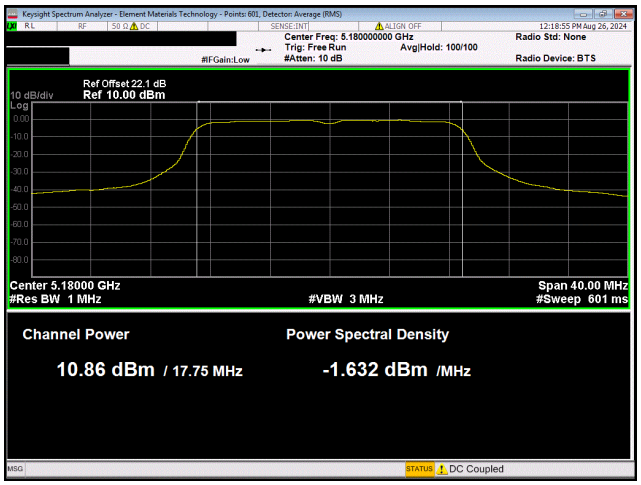


5150 - 5250 MHz Band, UNII-1, 20 MHz
Low Channel, Ch 36 - 5180 MHz
802.11(a) 54 Mbps



5150 - 5250 MHz Band, UNII-1, 20 MHz
Low Channel, Ch 36 - 5180 MHz
802.11(n) MCS0

MAXIMUM CONDUCTED OUTPUT POWER



5150 - 5250 MHz Band, UNII-1, 20 MHz
Low Channel, Ch 36 - 5180 MHz
802.11(n) MCS7

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

TEST DESCRIPTION

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum. The radio was operated in the modes as shown in the following data sheets.

Prior to measuring maximum transmit power; the 99% occupied bandwidth (OBW) and the duty cycle (D) were measured. The method of measuring the emission bandwidth and the associated data are found elsewhere in this test report.

The maximum conducted output power was measured using ANSI C63.10:2013, Clause 12.3.2.4, Method SA-2 (RMS detection and trace averaging across the on and off times of the EUT transmission and use of a duty cycle correction factor).

The spectrum analyzer settings were set per the guidance as well as the following specifics:

- RMS Detector
- Trace average 100 traces in power averaging mode.
- Power was integrated across “OBW”, by using the channel power function of the analyzer.

Equivalent Isotropic Radiated Power (EIRP) = Max Measured Power + Antenna gain (dBi).

The worst case (most stringent) limits are shown on the following datasheet based on the limits below where B is the bandwidth in terms of 99% for ISED and 26dB for the FCC.

- In the 5.15 – 5.25GHz band, the maximum e.i.r.p. shall not exceed the lesser of
  - 250 mW (24.0 dBm) + 6 dBi = 30 dBm EIRP for the FCC
  - 200 mW EIRP or 10 + 10 log10B dBm EIRP for ISED
- In the 5.25 – 5.35GHz band, the maximum permissible e.i.r.p. shall not exceed the lesser of 1.0 W or 17 + 10 log10B dBm EIRP.
- In the 5.47 – 5.725GHz band, the maximum permissible e.i.r.p. shall not exceed the lesser of 1.0 W or 17 + 10 log10B, dBm EIRP.
- In the 5.725 – 5.850GHz band, the maximum permissible e.i.r.p. is 36 dBm EIRP.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	2024-05-22	2025-05-22
Generator - Signal	Agilent	N5183A	TIK	2022-01-24	2025-01-24
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2023-09-05	2024-09-05
Block - DC	Fairview Microwave	SD3379	ANH	2023-09-05	2024-09-05
Attenuator	Fairview Microwave	SA4014-20	AQI	2023-09-05	2024-09-05

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

EUT:	Fuji Thermostat	Work Order:	ADEM0044
Serial Number:	52202030005204	Date:	2024-07-23
Customer:	Ademco, Inc.	Temperature:	22°C
Attendees:	None	Relative Humidity:	57.5%
Customer Project:	None	Bar. Pressure (PMSL):	1016 mbar
Tested By:	Christopher Heintzelman, Arnauld Dedry	Job Site:	MN11
Power:	110VAC/60Hz	Configuration:	ADEM0044-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2024	ANSI C63.10:2013
RSS-247 Issue 3:2023	ANSI C63.10:2013

COMMENTS

Reference level offset includes attenuator, measurement cable, and DC block.

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass

Tested By

TEST RESULTS

	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
5150 - 5250 MHz Band, UNII-1, 20 MHz							
Mid Channel, Ch 40 - 5200 MHz							
802.11(a) 6 Mbps	16.7	0.3	17	2.2	19.2	22.2	Pass
802.11(a) 36 Mbps	13.709	1.3	15	2.2	17.2	22.2	Pass
802.11(a) 54 Mbps	12.408	1.8	14.2	2.2	16.4	22.2	Pass
802.11(n) MCS0	15.395	0.3	15.7	2.2	17.9	22.5	Pass
802.11(n) MCS7	11.303	2	13.3	2.2	15.5	22.4	Pass
High Channel, Ch 48 - 5240 MHz							
802.11(a) 6 Mbps	17.773	0.3	18.1	2.2	20.3	22.4	Pass
802.11(a) 36 Mbps	14.141	1.3	15.4	2.2	17.6	22.2	Pass
802.11(a) 54 Mbps	12.784	1.8	14.6	2.2	16.8	22.2	Pass
802.11(n) MCS0	15.696	0.3	16	2.2	18.2	22.5	Pass
802.11(n) MCS7	11.383	2	13.4	2.2	15.6	22.4	Pass
5250 - 5350 MHz Band,UNII-2A, 20 MHz							
Low Channel, Ch 52 - 5260 MHz							
802.11(a) 6 Mbps	17.705	0.3	18	2.2	20.2	29.2	Pass
802.11(a) 36 Mbps	13.973	1.3	15.3	2.2	17.5	29.2	Pass
802.11(a) 54 Mbps	12.604	1.8	14.4	2.2	16.6	29.2	Pass
802.11(n) MCS0	15.781	0.3	16.1	2.2	18.3	29.5	Pass
802.11(n) MCS7	11.438	2	13.4	2.2	15.6	29.5	Pass
Mid Channel, Ch 60 - 5300 MHz							
802.11(a) 6 Mbps	16.733	0.3	17	2.2	19.2	29.2	Pass

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
802.11(a) 36 Mbps	14.263	1.3	15.6	2.2	17.8	29.2	Pass
802.11(a) 54 Mbps	12.955	1.8	14.8	2.2	17	29.2	Pass
802.11(n) MCS0	16.237	0.3	16.5	2.2	18.7	29.5	Pass
802.11(n) MCS7	11.86	2	13.9	2.2	16.1	29.5	Pass
High Channel, Ch 64 - 5320 MHz							
802.11(a) 6 Mbps	16.154	0.3	16.5	2.2	18.7	29.2	Pass
802.11(a) 36 Mbps	14.098	1.3	15.4	2.2	17.6	29.2	Pass
802.11(a) 54 Mbps	12.818	1.8	14.6	2.2	16.8	29.2	Pass
802.11(n) MCS0	15.612	0.3	15.9	2.2	18.1	29.5	Pass
802.11(n) MCS7	11.662	2	13.7	2.2	15.9	29.5	Pass
5470 - 5725 MHz Band,UNII-2C, 20 MHz							
Low Channel, Ch 100 - 5500 MHz							
802.11(a) 6 Mbps	16.503	0.3	16.8	2.2	19	29.2	Pass
802.11(a) 36 Mbps	14.438	1.3	15.7	2.2	17.9	29.2	Pass
802.11(a) 54 Mbps	12.659	1.8	14.5	2.2	16.7	29.2	Pass
802.11(n) MCS0	16.059	0.3	16.4	2.2	18.6	29.5	Pass
802.11(n) MCS7	11.6	2	13.6	2.2	15.8	29.5	Pass
Mid Channel, Ch 116 - 5580 MHz							
802.11(a) 6 Mbps	16.022	0.3	16.3	2.2	18.5	29.2	Pass
802.11(a) 36 Mbps	13.371	1.3	14.7	2.2	16.9	29.2	Pass
802.11(a) 54 Mbps	12.088	1.8	13.9	2.2	16.1	29.2	Pass
802.11(n) MCS0	15.474	0.3	15.8	2.2	18	29.5	Pass
802.11(n) MCS7	10.777	2	12.8	2.2	15	29.4	Pass
High Channel, Ch 140 - 5700 MHz							
802.11(a) 6 Mbps	13.644	0.3	13.9	2.2	16.1	29.2	Pass
802.11(a) 36 Mbps	12.802	1.3	14.1	2.2	16.3	29.2	Pass
802.11(a) 54 Mbps	11.981	1.8	13.8	2.2	16	29.2	Pass
802.11(n) MCS0	14.07	0.3	14.4	2.2	16.6	29.5	Pass
802.11(n) MCS7	10.837	2	12.8	2.2	15	29.4	Pass
5725 - 5785 MHz Band							
Low Channel, Ch 149 - 5745 MHz							
802.11(a) 6 Mbps	16.774	0.3	17.1	2.2	19.3	36	Pass
802.11(a) 36 Mbps	13.237	1.3	14.5	2.2	16.7	36	Pass
802.11(a) 54 Mbps	11.5	1.8	13.3	2.2	15.5	36	Pass
802.11(n) MCS0	14.962	0.3	15.3	2.2	17.5	36	Pass
802.11(n) MCS7	10.331	2	12.3	2.2	14.5	36	Pass
Mid Channel, Ch 157 - 5785 MHz							
802.11(a) 6 Mbps	16.34	0.3	16.6	2.2	18.8	36	Pass
802.11(a) 36 Mbps	12.193	1.3	13.5	2.2	15.7	36	Pass
802.11(a) 54 Mbps	10.91	1.8	12.7	2.2	14.9	36	Pass
802.11(n) MCS0	14.471	0.3	14.8	2.2	17	36	Pass
802.11(n) MCS7	9.897	1.9	11.8	2.2	14	36	Pass

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
High Channel, Ch 165 - 5825 MHz							
802.11(a) 6 Mbps	17.003	0.3	17.3	2.2	19.5	36	Pass
802.11(a) 36 Mbps	13.641	1.3	14.9	2.2	17.1	36	Pass
802.11(a) 54 Mbps	11.845	1.8	13.6	2.2	15.8	36	Pass
802.11(n) MCS0	15.311	0.3	15.6	2.2	17.8	36	Pass
802.11(n) MCS7	10.734	2	12.7	2.2	14.9	36	Pass

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

TEST DESCRIPTION

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum. The radio was operated in the modes as shown in the following data sheets.

Prior to measuring maximum transmit power; the 99% occupied bandwidth (OBW) and the duty cycle (D) were measured. The method of measuring the emission bandwidth and the associated data are found elsewhere in this test report.

The maximum conducted output power was measured using ANSI C63.10:2013, Clause 12.3.2.4, Method SA-2 (RMS detection and trace averaging across the on and off times of the EUT transmission and use of a duty cycle correction factor).

The spectrum analyzer settings were set per the guidance as well as the following specifics:

- RMS Detector
- Trace average 100 traces in power averaging mode.
- Power was integrated across “OBW”, by using the channel power function of the analyzer.

Equivalent Isotropic Radiated Power (EIRP) = Max Measured Power + Antenna gain (dBi).

The worst case (most stringent) limits are shown on the following datasheet based on the limits below where B is the bandwidth in terms of 99% for ISED and 26dB for the FCC.

- In the 5.15 – 5.25GHz band, the maximum e.i.r.p. shall not exceed the lesser of
  - 250 mW (24.0 dBm) + 6 dBi = 30 dBm EIRP for the FCC
  - 200 mW EIRP or 10 + 10 log10B dBm EIRP for ISED
- In the 5.25 – 5.35GHz band, the maximum permissible e.i.r.p. shall not exceed the lesser of 1.0 W or 17 + 10 log10B dBm EIRP.
- In the 5.47 – 5.725GHz band, the maximum permissible e.i.r.p. shall not exceed the lesser of 1.0 W or 17 + 10 log10B, dBm EIRP.
- In the 5.725 – 5.850GHz band, the maximum permissible e.i.r.p. is 36 dBm EIRP.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	2024-05-22	2025-05-22
Generator - Signal	Agilent	N5183A	TIK	2022-01-24	2025-01-24
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2023-09-05	2024-09-05
Block - DC	Fairview Microwave	SD3379	ANH	2023-09-05	2024-09-05
Attenuator	Fairview Microwave	SA4014-20	AQI	2023-09-05	2024-09-05

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

EUT:	Fuji Thermostat	Work Order:	ADEM0044
Serial Number:	52202030005143	Date:	2024-08-26
Customer:	Ademco, Inc.	Temperature:	22°C
Attendees:	None	Relative Humidity:	67.3%
Customer Project:	None	Bar. Pressure (PMSL):	1015 mbar
Tested By:	Christopher Heintzelman	Job Site:	MN11
Power:	110VAC/60Hz	Configuration:	ADEM0044-8

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2024	ANSI C63.10:2013
RSS-247 Issue 3:2023	ANSI C63.10:2013

COMMENTS

Power setting 107.

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass

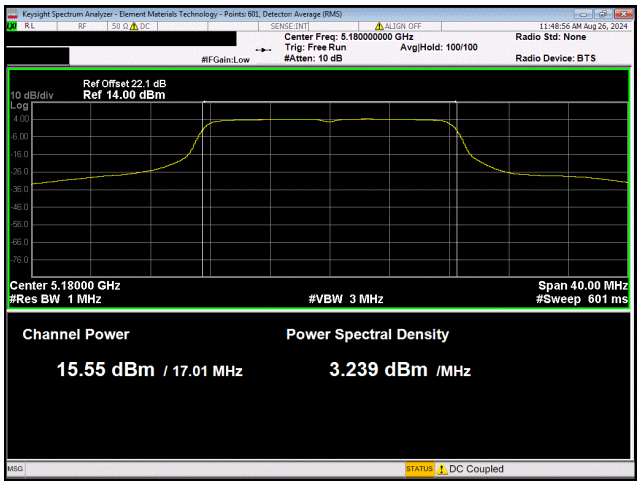
Tested By

TEST RESULTS

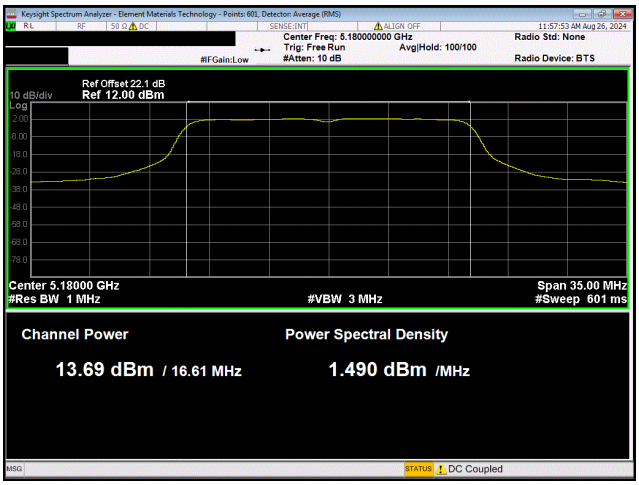
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
5150 - 5250 MHz Band, UNII-1, 20 MHz							
Low Channel, Ch 36 - 5180 MHz							
802.11(a) 6 Mbps	15.545	0.3	15.8	2.2	18	22.3	Pass
802.11(a) 36 Mbps	13.694	1.3	15	2.2	17.2	22.2	Pass
802.11(a) 54 Mbps	12.125	1.8	13.9	2.2	16.1	22.2	Pass
802.11(n) MCS0	15.824	0.3	16.1	2.2	18.3	22.5	Pass
802.11(n) MCS7	10.86	2	12.9	2.2	15.1	22.5	Pass

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

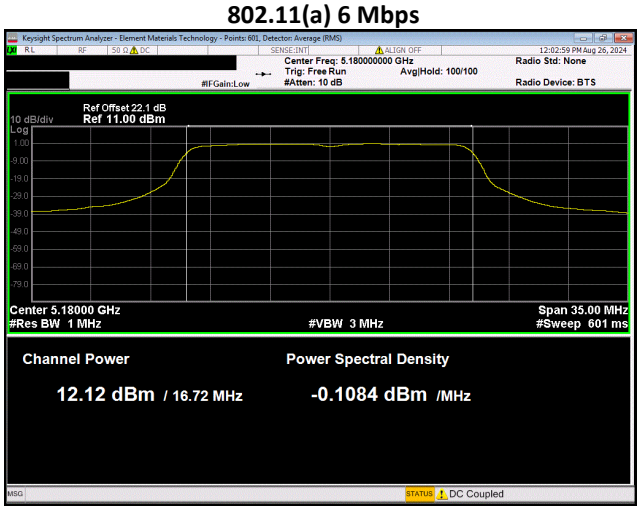
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



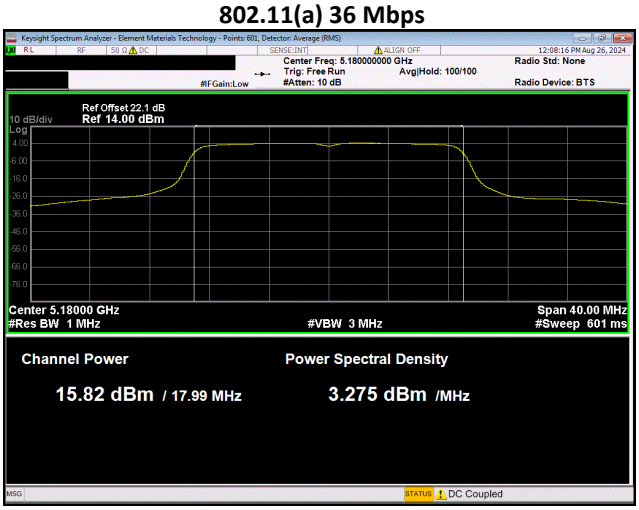
5150 - 5250 MHz Band, UNII-1, 20 MHz
Low Channel, Ch 36 - 5180 MHz
802.11(a) 6 Mbps



5150 - 5250 MHz Band, UNII-1, 20 MHz
Low Channel, Ch 36 - 5180 MHz
802.11(a) 36 Mbps



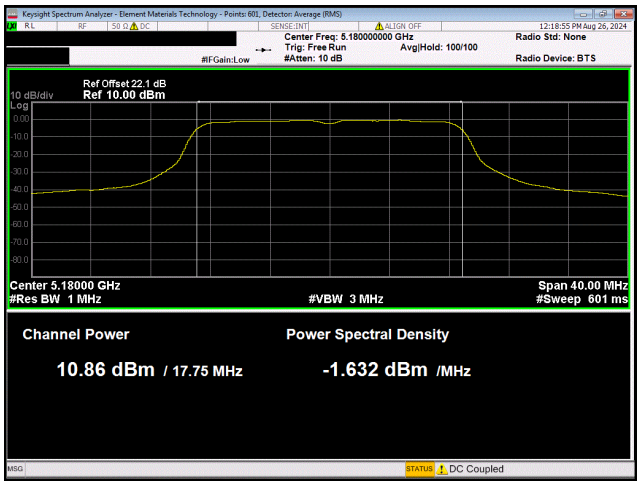
5150 - 5250 MHz Band, UNII-1, 20 MHz
Low Channel, Ch 36 - 5180 MHz
802.11(a) 54 Mbps



5150 - 5250 MHz Band, UNII-1, 20 MHz
Low Channel, Ch 36 - 5180 MHz
802.11(n) MCS0

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



5150 - 5250 MHz Band, UNII-1, 20 MHz
Low Channel, Ch 36 - 5180 MHz
802.11(n) MCS7