

Prüfbericht-Nr.: <i>Test report no.:</i>	CN22DLVL(P15E-WiFi) 001	Auftrags-Nr.: <i>Order no.:</i>	238517914	Seite 1 von 42 Page 1 of 42
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	2022-03-29	
Auftraggeber: <i>Client:</i>	Adtran Inc 901 Explorer Blvd. Huntsville			
Prüfgegenstand: <i>Test item:</i>	4x4 AX Dual-band AP			
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	BSAP 6040			
Auftrags-Inhalt: <i>Order content:</i>	FCC Part 15E Test report (WiFi 5GHz)			
Prüfgrundlage: <i>Test specification:</i>	FCC 47CFR Part 15: Subpart E Section 15.407			
Wareneingangsdatum: <i>Date of sample receipt:</i>	2022-03-30			
Prüfmuster-Nr.: <i>Test sample no:</i>	A003235628-002 A003235628-003			
Prüfzeitraum: <i>Testing period:</i>	2022-04-11 - 2022-05-06			
Ort der Prüfung: <i>Place of testing:</i>	EMC/RF Taipei Testing Site			
Prüflaboratorium: <i>Testing laboratory:</i>	Taipei Testing Laboratories			
Prüfergebnis*: <i>Test result*:</i>	Pass			
zusammengestellt von: <i>compiled by:</i>	genehmigt von: <i>authorized by:</i>			
Datum: <i>Date:</i> 2022-05-10	 Ethan Shao		 Brenda Chen	
Stellung / Position:	Assistant Project Engineer	Ausstellungsdatum: <i>Issue date:</i> 2022-05-10	Senior Project Manager	
Sonstiges / Other:				
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>		Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>		
* Legende:	1 = sehr gut P(ass) = entspricht o.g. Prüfgrundlage(n)	2 = gut F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	3 = befriedigend F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	4 = ausreichend N/A = nicht anwendbar
* Legend:	1 = very good P(ass) = passed a.m. test specification(s)	2 = good F(ail) = failed a.m. test specification(s)	3 = satisfactory F(ail) = failed a.m. test specification(s)	4 = sufficient N/A = not applicable
5 = mangelhaft N/T = nicht getestet				
5 = poor N/T = not tested				
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>				

V05

TEST SUMMARY

Report Section	FCC Clause	Test Item	Result
5.1.1	15.407(a) & 15.203	Antenna Requirement	Pass
5.1.2	15.407(a)	Maximum Conducted Output Power	Pass
5.1.3	15.407(a)	26 dB Bandwidth	Pass
5.1.3	2.1049	99% Occupied Bandwidth	Pass
5.1.4	15.407(e)	6 dB Bandwidth (U-NII-3 Band only)	Pass
5.1.5	15.407(g)	Frequency Stability	Pass
5.1.6	15.407(a)	Power Spectral Density	Pass
5.1.7	15.407(b) & 15.205 & 15.209	Radiated Spurious Emissions and Band Edges	Pass
-	15.407(h) & KDB 905462 D02	Dynamic Frequency Selection	N/A
5.2.1	15.207	Mains Conducted Emission	Pass

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

Contents

HISTORY OF THIS TEST REPORT	5
1. GENERAL REMARKS	6
1.1 COMPLEMENTARY MATERIALS.....	6
1.2 DECISION RULE OF CONFORMITY	6
2. TEST SITES	7
2.1 TEST LABORATORY	7
2.2 TEST FACILITY.....	7
2.3 TRACEABILITY	8
2.4 CALIBRATION	8
2.5 MEASUREMENT UNCERTAINTY	8
3. GENERAL PRODUCT INFORMATION.....	9
3.1 PRODUCT FUNCTION AND INTENDED USE	9
3.2 SYSTEM DETAILS AND RATINGS.....	9
3.3 NOISE GENERATING AND NOISE SUPPRESSING PARTS	10
3.4 SUBMITTED DOCUMENTS.....	10
4. TEST SET-UP AND OPERATION MODES.....	11
4.1 PRINCIPLE OF CONFIGURATION SELECTION	11
4.2 CARRIER FREQUENCY AND CHANNEL.....	12
4.3 TEST OPERATION AND TEST SOFTWARE.....	13
4.4 SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT	16
4.5 TEST SETUP DIAGRAM	17
4.6 DUTY CYCLE OF TEST SIGNAL	19
5. TEST RESULTS	20
5.1 TRANSMITTER REQUIREMENT & TEST SUITES	20
5.1.1 Antenna Requirement	20
5.1.2 Maximum Conducted Output Power	21
5.1.3 26 dB Bandwidth and 99% Occupied Bandwidth	27
5.1.4 6 dB Bandwidth (5725-5850MHz)	28
5.1.5 Frequency Stability Measurement.....	29
5.1.6 Power Spectral Density.....	34
5.1.7 Radiated Spurious Emissions	36
5.2 MAINS EMISSION	41
5.2.1 Mains Conducted Emission.....	41

Prüfbericht - Nr.: CN22DLVL(P15E-WiFi) 001
Test Report No.

Seite 4 von 42
Page 4 of 42

APPENDIX A - TEST RESULT OF CONDUCTED

APPENDIX B - TEST RESULT OF RADIATED EMISSIONS & MAINS CONDUCTED EMISSION

APPENDIX SP - PHOTOGRAPHS OF TEST SETUP

APPENDIX EP - PHOTOGRAPHS OF EUT

Prüfbericht - Nr.: CN22DLVL(P15E-WiFi) 001
Test Report No.

Seite 5 von 42
Page 5 of 42

HISTORY OF THIS TEST REPORT

Report No.	Description	Date Issued
CN22DLVL(P15E-WiFi) 001	Original Release	2022-05-10

1. General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix A - Test Result of Conducted

Appendix B - Test Result of Radiated Emissions & Mains Conducted Emission

Appendix SP - Photographs of Test Setup

Appendix EP - Photographs of EUT

Applied Standard and Test Levels

Radio
FCC 47CFR Part 15: Subpart E Section 15.407
FCC 47CFR Part 2: Subpart J Section 2.1049
ANSI C63.10:2013
KDB 789033 D02 General UNII Test Procedures New Rules v02r01
KDB 662911 D01 Multiple Transmitter Output v02r01

1.2 Decision Rule of Conformity

The decision rule of conformity of this test report is following the requirements of the requested standard in the quotation, and agreed among testing laboratory and manufacturer (applicant) to exclude the consideration of Measurement Uncertainty, unless it is required by the specific standard.

2. Test Sites

2.1 Test Laboratory

Taipei Testing Laboratories

11F. No.758, Sec. 4, Bade Rd., Songshan Dist.
Taipei City 105
Taiwan (R.O.C.)

2.2 Test Facility

Taipei Testing Laboratories

No.458-18, Sec. 2, Fenliao Rd., Linkou Dist.,
New Taipei City 244
Taiwan (R.O.C.)
FCC Registration No.: 226631
ISED Registration No.: 25563

2.3 Traceability

All measurement equipment calibrations are traceable to NML(Taiwan)/NIST(USA) or where calibration is performed outside Taiwan, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically in a suitably accredited Calibration Lab. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

2.5 Measurement Uncertainty

All measurement uncertainty values are shown with a coverage factor of $k=2$ to indicate a 95% level of confidence.

Emission Measurement Uncertainty

Parameter	Uncertainty
Radiated Emission (9 kHz ~ 30 MHz)	± 1.15 dB
Radiated Emission (30 MHz ~ 200 MHz)	± 1.30 dB
Radiated Emission (200 MHz ~ 1 GHz)	± 1.30 dB
Radiated Emission (1 GHz ~ 18 GHz)	± 1.54 dB
Radiated Emission (18 GHz ~ 40 GHz)	± 2.52 dB
Mains Conducted Emission	± 1.65 dB

3. General Product Information

3.1 Product Function and Intended Use

The EUT is a 4x4 AX Dual-band AP. It contains a WLAN compatible module enabling the user to communicate data through a Wireless interface.

For details refer to the User Guide, Data Sheet and Circuit Diagram.

3.2 System Details and Ratings

Basic Information of EUT

Item	EUT information
Kind of Equipment/Test Item	4x4 AX Dual-band AP
Type Identification	BSAP 6040
FCC ID	HDCBSAP6040V1

Technical Specification of EUT

Item	EUT information	
Operating Frequency	Band 1: 5180 MHz ~ 5240 MHz Band 4: 5745 MHz ~ 5825 MHz	
Channel Number	Band 1: 4 for 802.11a, 802.11n HT20, 802.11ac VHT 20, 802.11ax HE20 2 for 802.11n HT40, 802.11ac VHT40, 802.11ax HE40 1 for 802.11ac VHT80, 802.11ax HE80 Band 4: 5 for 802.11a, 802.11n HT20, 802.11ac VHT 20, 802.11ax HE20 2 for 802.11n HT40, 802.11ac VHT40, 802.11ax HE40 1 for 802.11ac VHT80, 802.11ax HE80	
Data Rate	802.11a: 54.0 / 48.0 / 36.0 / 24.0 / 18.0 / 12.0 / 9.0 / 6.0 Mbps 802.11n: up to MCS7 802.11ac: up to MCS9 802.11ax: up to MCS11	
Operation Voltage	12 Vdc (Adapter) 54 Vdc (PoE Injector)	
Modulation	OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) OFDMA (1024QAM)	
Maximum Output Power (mW)	CDD Mode	5180 ~ 5240 MHz: 386.96 5745 ~ 5825 MHz: 388.01
	Beamforming Mode	5180 ~ 5240 MHz: 96.83 5745 ~ 5825 MHz: 87.10
Antenna Information	Refer to 5.1.1	
Accessory Device	Refer to 4.4	

3.3 Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram.

3.4 Submitted Documents

- Circuit Diagram
- Instruction Manual
- Rating Label
- Technical Description

4. Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

The test modes were adapted accordingly in reference to the instructions for use.

During testing, Channel and Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output expected by the customer and is going to be fixed on the firmware of the final end product.

Table for Parameters of Test Software Setting

Channel	Power Setting			
	802.11a	802.11n HT20	802.11ac VHT20	802.11ax HE20
36	15.5	16.5	16.5	16.5
40	15.5	17	17	17
48	15.5	17.5	17.5	17.5
149	18	18	18	18
157	18	18	18	18
165	18.5	18	18	18

Channel	Power Setting		
	802.11n HT40	802.11ac VHT40	802.11ax HE40
38	15.5	15.5	15.5
46	19	19	19
151	17.5	17.5	17.5
159	17.5	17.5	17.5

Channel	Power Setting	
	802.11ac VHT80	802.11ax HE80
42	15	15
155	16.5	16.5

4.2 Carrier Frequency and Channel

Band	Channel	Frequency (MHz)	802.11a 802.11n HT20 802.11ac VHT20 802.11ax HE20	802.11n HT40 802.11ac VHT40 802.11ax HE40	802.11ac VHT80 802.11ax HE80
U-NII-1 (Band 1)	36	5180	V		
	38	5190		V	
	40	5200	V		
	42	5210			V
	44	5220	V		
	46	5230		V	
	48	5240	V		
U-NII-3 (Band 4)	149	5745	V		
	151	5755		V	
	153	5765	V		
	155	5775			V
	157	5785	V		
	159	5795		V	
	161	5805	V		
	165	5825	V		

4.3 Test Operation and Test Software

Setup for testing: Test samples are provided with a LAN interface which makes it possible to control them through a test software installed on a notebook computer.

This software was running on the laptop computer connected to the EUT. It was used to enable the operation modes listed as below.

Test Software	QSPR 5.0-00197
---------------	----------------

The samples were used as follows:

A003235628-002 for radiated test

A003235628-003 for conducted test

Full test was applied on all test modes, but only worst case was shown.

The EUT incorporates a MIMO function. Physically, the EUT provides two completed transmitters and receivers.

Modulation Mode	Tx Function
802.11a	4TX (MIMO)
802.11n HT20	4TX (MIMO)
802.11n HT40	4TX (MIMO)
802.11ac VHT20	4TX (MIMO)
802.11ac VHT40	4TX (MIMO)
802.11ac VHT80	4TX (MIMO)
802.11ax HE20	4TX (MIMO)
802.11ax HE40	4TX (MIMO)
802.11ax HE80	4TX (MIMO)

* The modulation and bandwidth are similar for HT20/HT40 on 802.11n mode, VHT20/VHT40 on 802.11ac mode, and HE20/HE40/HE80 on 802.11ax mode. Therefore investigated worse case as representative mode in test report.

** For Beamforming mode, only output power is evaluated and presented in this report.

EUT Configure Mode	Applicable To				Description
	Antenna Port Conducted Measurement	Radiated Spurious Emissions above 1 GHz	Radiated Spurious Emissions below 1 GHz	Mains Conducted Emission	
-	√	√	√	√	-

Note:

1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when position on Y-plane.
2. "-" means no effect.
3. Only the worst case of Radiated Spurious Emissions and Mains Conducted Emission tests were verified for POE mode.

Antenna Port Conducted Measurement

- ☒ Pre-Scan full test was applied on all test modes, but only worst case was shown.
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Frequency (MHz)	Available Channel	Tested Channel	Date Rate (Mbps)
CDD	802.11a	5180-5240	36 to 48	36, 40, 48	6.0
		5745-5825	149 to 165	149, 157, 165	
	802.11n HT20	5180-5240	36 to 48	36, 40, 48	MCS0
		5745-5825	149 to 165	149, 157, 165	
	802.11n HT40	5180-5240	38 to 46	38, 46	MCS0
		5745-5825	151 to 159	151, 159	
	802.11ac VHT80	5180-5240	42	42	NSS1 MCS0
		5745-5825	155	155	
	802.11ax HE20	5180-5240	36 to 48	36, 40, 48	NSS1 MCS0
		5745-5825	149 to 165	149, 157, 165	
	802.11ax HE40	5180-5240	38 to 46	38, 46	NSS1 MCS0
		5745-5825	151 to 159	151, 159	
Beamforming (Power only)	802.11n HT20	5180-5240	36 to 48	36, 40, 48	MCS0
		5745-5825	149 to 165	149, 157, 165	
	802.11n HT40	5180-5240	38 to 46	38, 46	MCS0
		5745-5825	151 to 159	151, 159	
	802.11ac VHT80	5180-5240	42	42	NSS1 MCS0
		5745-5825	155	155	
	802.11ax HE20	5180-5240	36 to 48	36, 40, 48	NSS1 MCS0
		5745-5825	149 to 165	149, 157, 165	
	802.11ax HE40	5180-5240	38 to 46	38, 46	NSS1 MCS0
		5745-5825	151 to 159	151, 159	
	802.11ax HE80	5180-5240	42	42	NSS1 MCS0
		5745-5825	155	155	

Radiated Spurious Emissions (Above 1 GHz)

- ☒ Pre-Scan full test was applied on all test modes, but only worst case was shown.
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Frequency (MHz)	Available Channel	Tested Channel	Date Rate (Mbps)
Adapter	802.11a	5180-5240	36 to 48	36, 40, 48	6.0
		5745-5825	149 to 165	149, 157, 165	
	802.11ac VHT20	5180-5240	36 to 48	36, 40, 48	NSS1 MCS0
		5745-5825	149 to 165	149, 157, 165	
	802.11ac VHT40	5180-5240	38 to 46	38, 46	NSS1 MCS0
		5745-5825	151 to 159	151, 159	
	802.11ac VHT80	5180-5240	42	42	NSS1 MCS0
		5745-5825	155	155	
	802.11ax HE20	5180-5240	36 to 48	36, 40, 48	NSS1 MCS0
		5745-5825	149 to 165	149, 157, 165	
	802.11ax HE40	5180-5240	38 to 46	38, 46	NSS1 MCS0
		5745-5825	151 to 159	151, 159	
	802.11ax HE80	5180-5240	42	42	NSS1 MCS0
		5745-5825	155	155	
POE	802.11ax HE20	5180-5240	36 to 48	36	NSS1 MCS0

Radiated Spurious Emissions (Below 1 GHz)

- ☒ Pre-Scan full test was applied on all test modes, but only worst case was shown.
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Frequency (MHz)	Available Channel	Tested Channel	Date Rate (Mbps)
Adapter	802.11ax HE40	5180-5240	38 to 46	46	NSS1 MCS0
POE	802.11ax HE40	5180-5240	38 to 46	46	NSS1 MCS0

Mains Conducted Emission Test

- ☒ Pre-Scan full test was applied on all test modes, but only worst case was shown.
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Frequency (MHz)	Available Channel	Tested Channel	Date Rate (Mbps)
Adapter	802.11ax HE40	5180-5240	38 to 46	46	NSS1 MCS0
POE	802.11ax HE40	5180-5240	38 to 46	46	NSS1 MCS0

Test Condition

Test Item	Ambient Temperature	Relative Humidity	Tested by
Conducted Measurement	22.50-24.70 °C	61-64 %	Blake Wang
Radiated Spurious Emissions above 1 GHz	21.1-21.9 °C	60-64 %	Chun Chu
Radiated Spurious Emissions below 1 GHz	21.1-21.9 °C	60-64 %	Chun Chu
Mains Conducted Emission	24.5-26.5 °C	57-62 %	Ray Huang

4.4 Special Accessories and Auxiliary Equipment

The product has been tested together with the following additional accessories:

Accessory of EUT

None

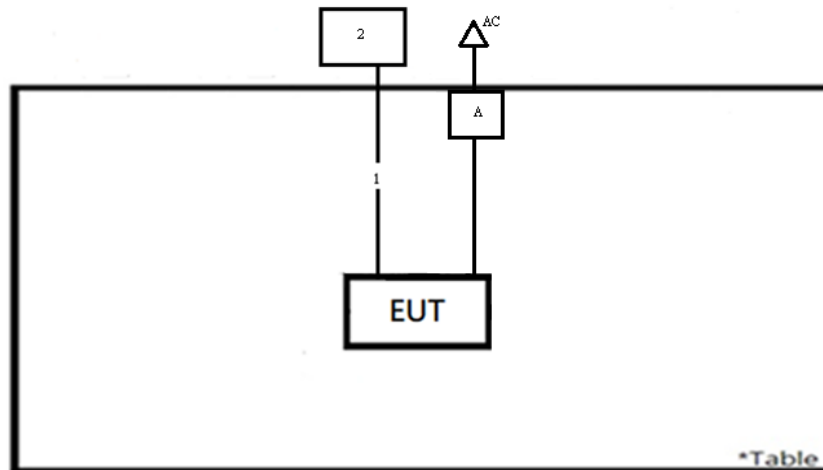
Support Unit

No	Description	Brand	Model	S/N	Shielded	Ferrite Core (Qty)	Length (cm)	Remark
Adapter Mode								
A	Adapter	Emplus	DSA-30PFL-12	-	NO	NO	150	Radiated
1	LAN cable	TUV	TUV-01	-	NO	NO	300	
2	Notebook	Lenovo	81BL	MP1DCD6Y	-	-	-	
A	Adapter	Emplus	DSA-30PFL-12	-	NO	NO	150	Mains Conducted
1	Notebook	Lenovo	81BL	MP1DCD6Y	-	-	-	
2	LAN Cable	TUV	TUV-01	-	NO	NO	300	
-	Notebook (WIOT-02)	HP	TPN-C135	CND9111RJB	-	-	-	Conducted
POE Mode								
A	POE	EnGenius	EPA5006GP	-	-	-	-	Radiated
1	Notebook	Lenovo	81BL	MP1DCD6Y	-	-	-	
2	LAN Cable	TUV	TUV-01	-	NO	NO	200	
3	LAN Cable	TUV	TUV-02	-	NO	NO	1000	
A	POE	EnGenius	EPA5006GP	-	-	-	-	Mains Conducted
1	Notebook	Lenovo	81BL	MP1DCD6Y	-	-	-	
2	LAN Cable	TUV	TUV-01	-	NO	NO	300	
3	LAN Cable	TUV	TUV-02	-	NO	NO	200	

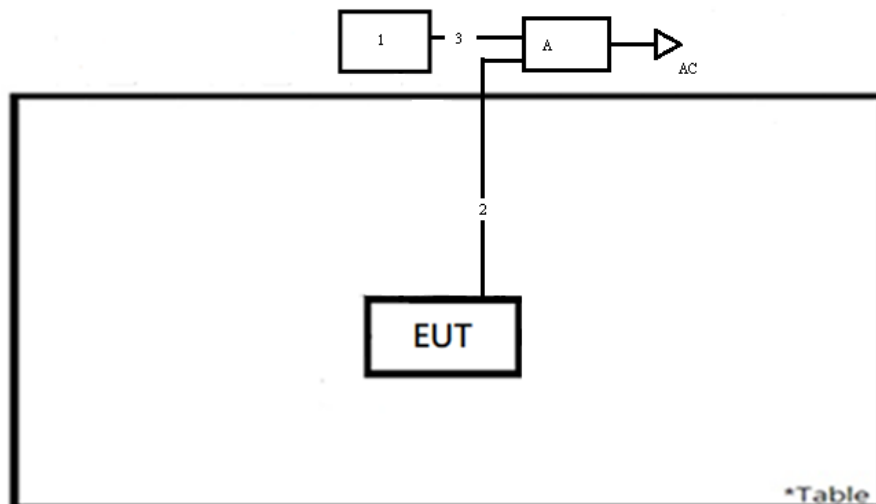
4.5 Test Setup Diagram

<Radiated Spurious Emissions mode>

Adapter Mode

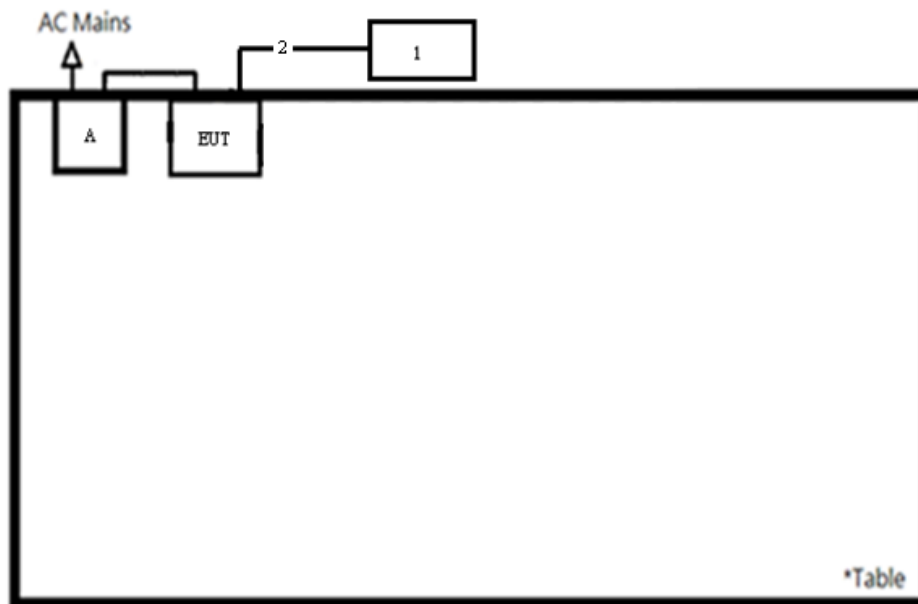


POE Mode

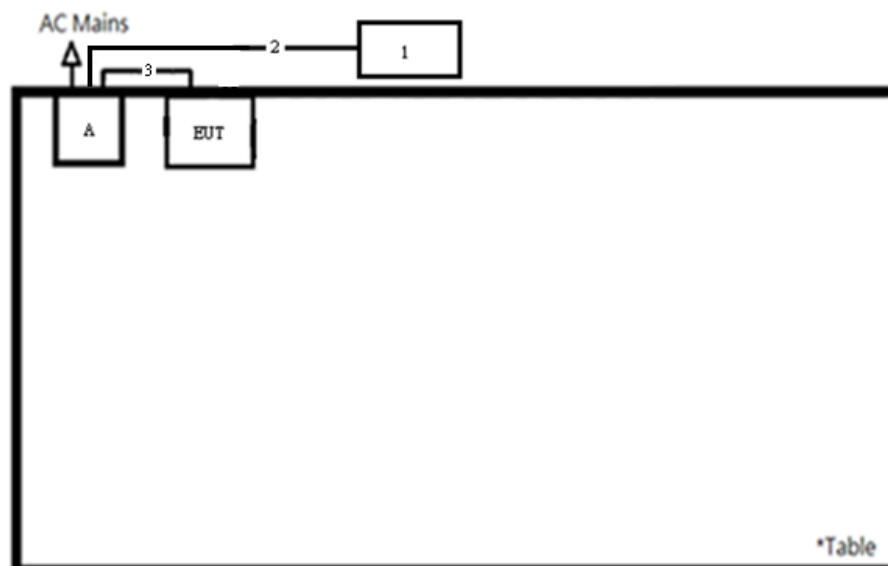


<Mains Conducted Emission mode>

Adapter Mode

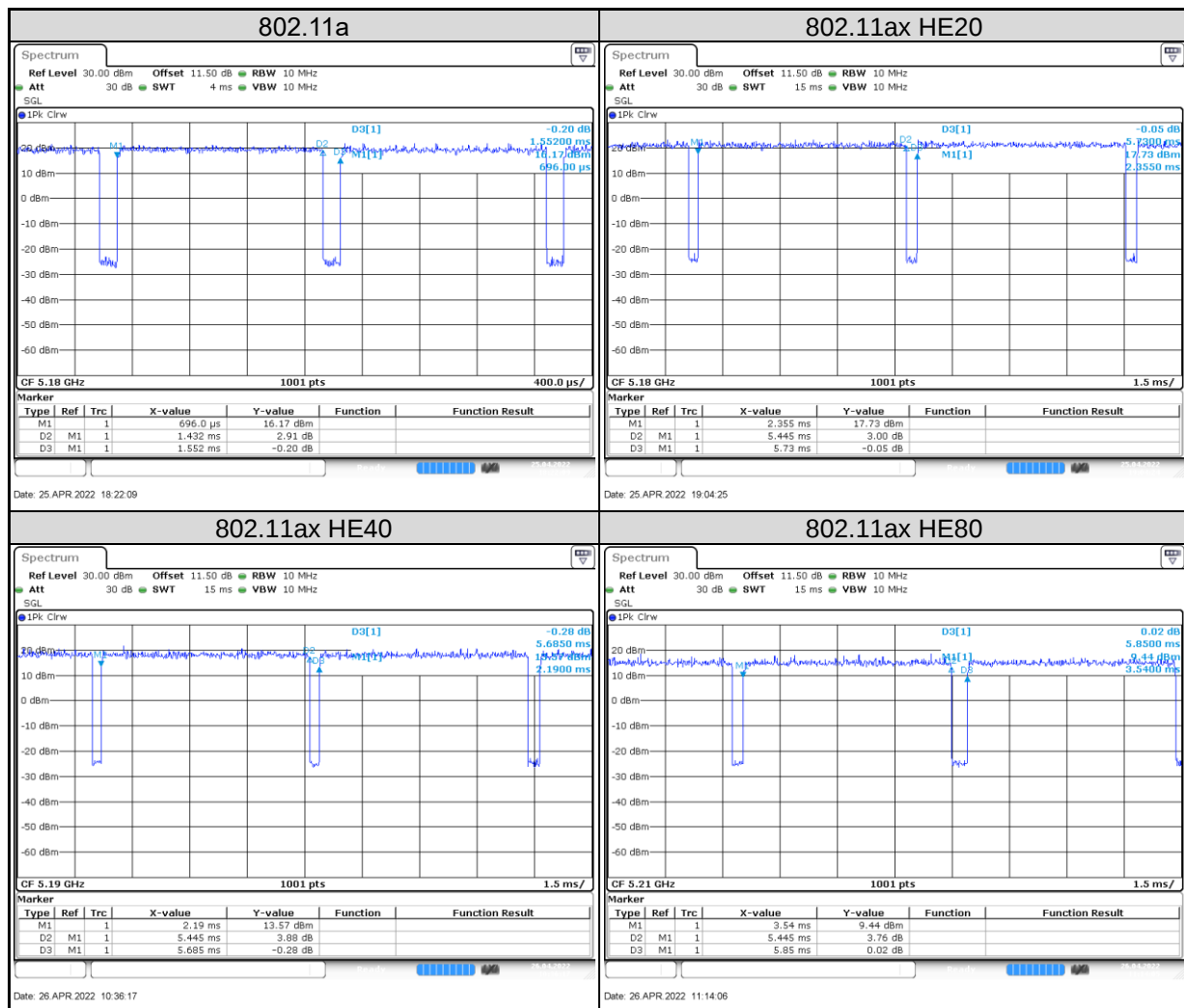


POE Mode



4.6 Duty Cycle of Test Signal

Mode	On + Off Time (ms)	On Time (ms)	Duty Cycle (%)	Duty Factor (dB)
802.11a	1.552	1.432	92.27	0.35
802.11ax HE20	5.73	5.445	95.03	0.22
802.11ax HE40	5.685	5.445	95.78	0.19
802.11ax HE80	5.85	5.445	93.08	0.31



5. Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

Requirement Use of approved antennas only

According to the manufacturer declaration, the EUT's antenna specifications are described as below.
The antenna is used with no possibility of replacement with a non-approved antenna by the end-user.
Therefore, the EUT is considered to comply with this provision.

ANT	Type	Gain (dBi)	
		5180 ~ 5240 MHz	5745 ~ 5825 MHz
1	PIFA	5.13	5.19
2	PIFA	4.26	3.81
3	PIFA	4.03	4.56
4	PIFA	5.04	5.04
Max. Peak Gain		5.13	5.19
CDD Mode	Power Directional Gain =	5.13	5.19
	PSD Directional Gain = $10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] =$	10.65	10.69
Beamforming Mode	Power Directional Gain = $10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] =$	10.65	10.69
	PSD Directional Gain = $10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] =$	10.65	10.69

Refer to EUT photo for details.

5.1.2 Maximum Conducted Output Power

Limit

Operation Band	EUT Category	Limit
U-NII-1	Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p $\leq$ 125 mW (21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
	Fixed point-to-point Access Point	1 Watt (30 dBm)
	Indoor Access Point	1 Watt (30 dBm)
	Mobile and Portable client device	250 mW (24 dBm)
U-NII-2A	---	250 mW (24 dBm) or 11 dBm + 10 log B*
U-NII-2C	---	250 mW (24 dBm) or 11 dBm + 10 log B*
U-NII-3	---	1 Watt (30 dBm)

Note: B* is the 26 dB emission bandwidth in megahertz

Per KDB 662911 Method of conducted output power measurement on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

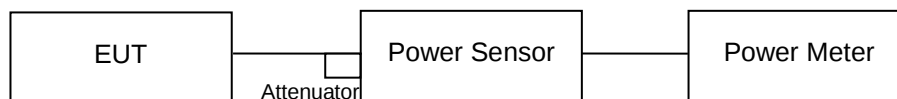
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT} ;

Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less for 20 MHz channel widths with $N_{ANT} \geq 5$.

For power measurements on all other devices: Array Gain = 10 log(N_{ANT}/N_{SS}) dB.

Kind of Test Site Shielded room

Test Setup



Test Instruments

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date	Test Date	
						From	Until
Power Meter	Anritsu	ML2495A	1901008	2022/3/15	2023/3/14	2022/4/11	2022/5/6
Power Sensor	Anritsu	MA2411B	1725269	2022/3/15	2023/3/14	2022/4/11	2022/5/6

Test Procedures

Method PM is used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst and set the detector to AVERAGE. Duty factor is not added to measured value.

Test Result

CDD Mode

<802.11a>

Channel	Channel Frequency (MHz)	Average Output Power (dBm)				Total Power		Limit (dBm)
		Chain 0	Chain 1	Chain 2	Chain 3	(dBm)	(mW)	
36	5180	17.22	16.95	17.67	17.24	23.30	213.71	30
40	5200	16.66	16.34	16.97	16.45	22.63	183.33	30
48	5240	17.10	16.97	17.69	17.59	23.37	217.22	30
149	5745	19.23	18.87	20.08	19.17	25.38	345.31	30
157	5785	19.33	18.78	20.23	19.14	25.42	348.69	30
165	5825	19.77	19.39	20.71	19.47	25.89	388.01	30

<802.11n HT20>

Channel	Channel Frequency (MHz)	Average Output Power (dBm)				Total Power		Limit (dBm)
		Chain 0	Chain 1	Chain 2	Chain 3	(dBm)	(mW)	
36	5180	17.16	16.87	17.61	17.06	23.20	209.13	30
40	5200	17.53	16.83	17.62	16.94	23.26	212.06	30
48	5240	18.14	16.90	18.10	17.76	23.77	238.41	30
149	5745	18.76	18.65	19.09	18.69	24.82	303.50	30
157	5785	18.99	18.22	19.55	18.71	24.91	310.08	30
165	5825	18.49	18.22	19.70	18.48	24.78	300.80	30

<802.11n HT40>

Channel	Channel Frequency (MHz)	Average Output Power (dBm)				Total Power		Limit (dBm)
		Chain 0	Chain 1	Chain 2	Chain 3	(dBm)	(mW)	
38	5190	17.19	17.07	17.91	17.30	23.40	218.80	30
46	5230	19.67	18.46	19.66	18.97	25.24	334.18	30
151	5755	18.49	18.04	19.48	18.30	24.63	290.64	30
159	5795	18.72	17.71	19.50	17.75	24.51	282.18	30

<802.11ac VHT20>

Channel	Channel Frequency (MHz)	Average Output Power (dBm)				Total Power		Limit (dBm)
		Chain 0	Chain 1	Chain 2	Chain 3	(dBm)	(mW)	
36	5180	17.30	16.87	17.37	17.05	23.17	207.62	30
40	5200	17.56	17.34	17.93	17.37	23.58	227.88	30
48	5240	18.29	17.05	18.25	17.99	23.94	247.94	30
149	5745	18.87	18.60	19.32	18.88	24.95	312.31	30
157	5785	19.06	18.53	19.90	18.86	25.14	326.46	30
165	5825	19.20	18.69	19.81	18.83	25.18	329.24	30

<802.11ac VHT40>

Channel	Channel Frequency (MHz)	Average Output Power (dBm)				Total Power		Limit (dBm)
		Chain 0	Chain 1	Chain 2	Chain 3	(dBm)	(mW)	
38	5190	17.37	16.92	17.94	17.26	23.41	219.22	30
46	5230	19.82	18.93	20.09	19.04	25.52	356.36	30
151	5755	18.64	18.63	19.83	18.53	24.96	313.51	30
159	5795	19.03	18.22	19.85	18.50	24.97	313.76	30

<802.11ac VHT80>

Channel	Channel Frequency (MHz)	Average Output Power (dBm)				Total Power		Limit (dBm)
		Chain 0	Chain 1	Chain 2	Chain 3	(dBm)	(mW)	
42	5210	16.42	16.02	16.03	15.90	22.12	162.84	30
155	5775	17.86	17.18	17.92	17.03	23.53	225.67	30

<802.11ax HE20>

Channel	Channel Frequency (MHz)	Average Output Power (dBm)				Total Power		Limit (dBm)
		Chain 0	Chain 1	Chain 2	Chain 3	(dBm)	(mW)	
36	5180	17.45	17.14	17.84	17.16	23.43	220.16	30
40	5200	17.99	17.65	18.28	17.72	23.94	247.61	30
48	5240	18.60	17.52	18.64	18.26	24.30	269.04	30
149	5745	19.30	19.03	19.71	19.19	25.34	341.62	30
157	5785	19.53	18.88	20.09	19.01	25.42	348.72	30
165	5825	19.39	18.80	20.04	19.02	25.36	343.48	30

<802.11ax HE40>

Channel	Channel Frequency (MHz)	Average Output Power (dBm)				Total Power		Limit (dBm)
		Chain 0	Chain 1	Chain 2	Chain 3	(dBm)	(mW)	
38	5190	17.53	17.17	18.17	17.38	23.60	229.06	30
46	5230	20.33	19.40	20.28	19.31	25.88	386.96	30
151	5755	19.07	18.78	20.06	18.96	25.27	336.33	30
159	5795	19.26	18.69	20.20	18.69	25.28	336.97	30

<802.11ax HE80>

Channel	Channel Frequency (MHz)	Average Output Power (dBm)				Total Power		Limit (dBm)
		Chain 0	Chain 1	Chain 2	Chain 3	(dBm)	(mW)	
42	5210	16.61	16.33	16.54	16.09	22.42	174.49	30
155	5775	18.19	17.40	18.10	17.17	23.75	237.29	30

Beamforming Mode
<802.11n HT20>

Channel	Channel Frequency (MHz)	Average Output Power (dBm)				Total Power		Limit (dBm)
		Chain 0	Chain 1	Chain 2	Chain 3	(dBm)	(mW)	
36	5180	11.14	10.85	11.59	11.04	17.18	52.24	25.35
40	5200	11.51	10.81	11.60	10.92	17.24	52.97	25.35
48	5240	12.12	10.88	12.08	11.74	17.75	59.57	25.35
149	5745	12.74	12.63	13.07	12.67	18.80	75.86	25.31
157	5785	12.97	12.20	13.53	12.69	18.89	77.45	25.31
165	5825	12.47	12.20	13.68	12.46	18.76	75.16	25.31

<802.11n HT40>

Channel	Channel Frequency (MHz)	Average Output Power (dBm)				Total Power		Limit (dBm)
		Chain 0	Chain 1	Chain 2	Chain 3	(dBm)	(mW)	
38	5190	11.17	11.05	11.89	11.28	17.38	54.70	25.35
46	5230	13.65	12.44	13.64	12.95	19.22	83.56	25.35
151	5755	12.47	12.02	13.46	12.28	18.61	72.61	25.31
159	5795	12.70	11.69	13.48	11.73	18.49	70.63	25.31

<802.11ac VHT20>

Channel	Channel Frequency (MHz)	Average Output Power (dBm)				Total Power		Limit (dBm)
		Chain 0	Chain 1	Chain 2	Chain 3	(dBm)	(mW)	
36	5180	11.28	10.85	11.35	11.03	17.15	51.88	25.35
40	5200	11.54	11.32	11.91	11.35	17.56	57.02	25.35
48	5240	12.27	11.03	12.23	11.97	17.92	61.94	25.35
149	5745	12.85	12.58	13.30	12.86	18.93	78.16	25.31
157	5785	13.04	12.51	13.88	12.84	19.12	81.66	25.31
165	5825	13.18	12.67	13.79	12.81	19.16	82.41	25.31

<802.11ac VHT40>

Channel	Channel Frequency (MHz)	Average Output Power (dBm)				Total Power		Limit (dBm)
		Chain 0	Chain 1	Chain 2	Chain 3	(dBm)	(mW)	
38	5190	11.35	10.90	11.92	11.24	17.39	54.83	25.35
46	5230	13.80	12.91	14.07	13.02	19.50	89.13	25.35
151	5755	12.62	12.61	13.81	12.51	18.94	78.34	25.31
159	5795	13.01	12.20	13.83	12.48	18.95	78.52	25.31

<802.11ac VHT80>

Channel	Channel Frequency (MHz)	Average Output Power (dBm)				Total Power		Limit (dBm)
		Chain 0	Chain 1	Chain 2	Chain 3	(dBm)	(mW)	
42	5210	10.40	10.00	10.01	9.88	16.10	40.74	25.35
155	5775	11.84	11.16	11.90	11.01	17.52	56.49	25.31

<802.11ax HE20>

Channel	Channel Frequency (MHz)	Average Output Power (dBm)				Total Power		Limit (dBm)
		Chain 0	Chain 1	Chain 2	Chain 3	(dBm)	(mW)	
36	5180	11.43	11.12	11.82	11.14	17.41	55.08	25.35
40	5200	11.97	11.63	12.26	11.70	17.92	61.94	25.35
48	5240	12.58	11.50	12.62	12.24	18.28	67.30	25.35
149	5745	13.28	13.01	13.69	13.17	19.32	85.51	25.31
157	5785	13.51	12.86	14.07	12.99	19.40	87.10	25.31
165	5825	13.37	12.78	14.02	13.00	19.34	85.90	25.31

<802.11ax HE40>

Channel	Channel Frequency (MHz)	Average Output Power (dBm)				Total Power		Limit (dBm)
		Chain 0	Chain 1	Chain 2	Chain 3	(dBm)	(mW)	
38	5190	11.51	11.15	12.15	11.36	17.58	57.28	25.35
46	5230	14.31	13.38	14.26	13.29	19.86	96.83	25.35
151	5755	13.05	12.76	14.04	12.94	19.25	84.14	25.31
159	5795	13.24	12.67	14.18	12.67	19.26	84.33	25.31

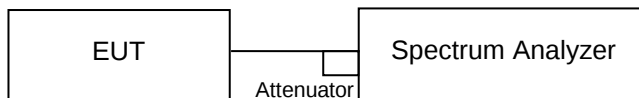
<802.11ax HE80>

Channel	Channel Frequency (MHz)	Average Output Power (dBm)				Total Power		Limit (dBm)
		Chain 0	Chain 1	Chain 2	Chain 3	(dBm)	(mW)	
42	5210	10.59	10.31	10.52	10.07	16.40	43.65	25.35
155	5775	12.17	11.38	12.08	11.15	17.74	59.43	25.31

5.1.3 26 dB Bandwidth and 99% Occupied Bandwidth

Kind of Test Site Shielded room

Test Setup



Test Instruments

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date	Test Date	
						From	Until
Spectrum Analyzer	R&S	FSV40	101512	2022/2/24	2023/2/23	2022/4/25	2022/4/26

Test Procedure

- Set RBW = approximately 1% of the emission bandwidth.
- Set the VBW > RBW.
- Detector = Peak.
- Trace mode = max hold.
- Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.
- For 99% Bandwidth Measurement, the transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with resolution bandwidth in the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth and set the detector to PEAK. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean power of a given emission.

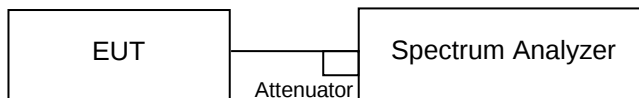
Test Results

Please refer to Appendix A

5.1.4 6 dB Bandwidth (5725-5850MHz)

Kind of Test Site Shielded room

Test Setup



Test Instruments

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date	Test Date	
						From	Until
Spectrum Analyzer	R&S	FSV40	101512	2022/2/24	2023/2/23	2022/4/25	2022/4/26

Test Procedure

MEASUREMENT PROCEDURE REF

- Set resolution bandwidth (RBW) = 100 kHz
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

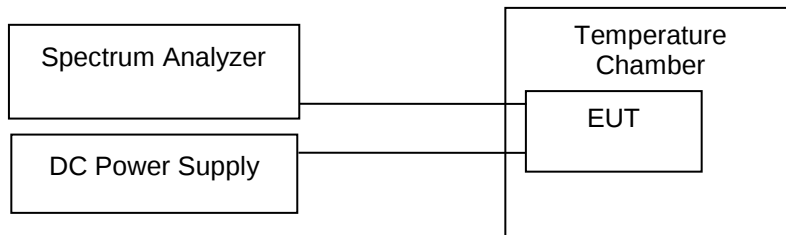
Test Results

Please refer to Appendix A

5.1.5 Frequency Stability Measurement

Kind of Test Site Shielded room

Test Setup



Test Instruments

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date	Test Date	
						From	Until
Spectrum Analyzer	R&S	FSV40	101512	2022/2/24	2023/2/23	2022/4/22	2022/4/26

Test Procedure

- To ensure emission at the band edge is maintained within the authorized band, those values shall be measured by radiation emissions at upper and lower frequency points, and finally compensated by frequency deviation as procedures below.
- The EUT was operated at the maximum output power, and connected to the spectrum analyzer, which is set to maximum hold function and peak detector. The peak value of the power envelope was measured and noted. The upper and lower frequency points were respectively measured relatively 10 dB lower than the measured peak value.
- The frequency deviation was calculated by adding the upper frequency point and the lower frequency point divided by two. Those detailed values of frequency deviation are provided in table below.

Test Results
<ANT 0>

Frequency (MHz)	5180			
Voltage (V)	Measurement Frequency (MHz)			Max. Deviation (ppm)
132	5179.98379			3.129
120	5179.98292			3.297
108	5179.98611			2.681
Temperature (°C)	Measurement Frequency (MHz)			
	0 Minute	2 Minute	5 Minute	10 Minute
50	5179.97164	5179.96382	5179.9644	5179.96295
40	5179.972446	5179.974685	5179.971771	5179.975007
30	5179.973214	5179.973805	5179.971958	5179.973507
20	5179.98292	5179.97887	5179.97685	5179.9754
10	5179.985521	5179.998892	5179.996933	5179.990956
0	5179.989715	5179.996729	5179.996857	5179.990102
-10	5180.004103	5180.022796	5180.026927	5180.055348
-20	5180.034968	5180.046504	5180.042024	5180.040794
-30	5180.05673	5180.05818	5180.05789	5180.05789
Max. Deviation (ppm)	10.952	11.232	11.176	11.176

Frequency (MHz)	5785			
Voltage (V)	Measurement Frequency (MHz)			Max. Deviation (ppm)
132	5784.97135			4.952
120	5784.97106			5.003
108	5784.97192			4.854
Temperature (°C)	Measurement Frequency (MHz)			
	0 Minute	2 Minute	5 Minute	10 Minute
50	5784.96671	5784.96585	5784.96498	5784.96556
40	5784.96734	5784.968662	5784.96947	5784.968723
30	5784.967394	5784.969552	5784.967904	5784.967204
20	5784.97106	5784.9699	5784.96961	5784.96961
10	5784.993388	5784.992249	5784.972999	5784.977625
0	5784.99978	5784.988826	5784.993117	5784.995864
-10	5784.992149	5785.000178	5785.024562	5785.039713
-20	5785.040668	5785.054797	5785.04744	5785.053908
-30	5785.06223	5785.06319	5785.0631	5785.0631
Max. Deviation (ppm)	11.697	11.878	11.861	11.861

<ANT 1>

Frequency (MHz)	5180			
Voltage (V)	Measurement Frequency (MHz)			Max. Deviation (ppm)
132	5179.97511			4.805
120	5179.97511			4.805
108	5179.97511			4.805
Temperature (°C)	Measurement Frequency (MHz)			
	0 Minute	2 Minute	5 Minute	10 Minute
50	5179.96295	5179.96411	5179.96411	5179.9644
40	5179.967236	5179.966498	5179.969923	5179.969851
30	5179.969996	5179.968747	5179.96374	5179.970593
20	5179.97511	5179.97482	5179.97424	5179.97366
10	5179.993278	5179.997301	5179.985985	5179.9998
0	5179.990955	5179.998868	5179.995678	5179.994784
-10	5180.042941	5180.022993	5180.000764	5180.021804
-20	5180.039567	5180.055351	5180.04262	5180.042013
-30	5180.05731	5180.05731	5180.05731	5180.05702
Max. Deviation (ppm)	11.064	11.064	11.064	11.008

Frequency (MHz)	5785			
Voltage (V)	Measurement Frequency (MHz)			Max. Deviation (ppm)
132	5784.96961			5.253
120	5784.96961			5.253
108	5784.96961			5.253
Temperature (°C)	Measurement Frequency (MHz)			
	0 Minute	2 Minute	5 Minute	10 Minute
50	5784.96556	5784.96527	5784.96527	5784.96527
40	5784.967465	5784.966846	5784.968744	5784.96909
30	5784.966998	5784.969232	5784.96946	5784.96937
20	5784.96961	5784.96961	5784.96961	5784.96961
10	5784.983149	5784.974748	5784.976534	5784.977531
0	5784.980701	5784.985702	5784.996332	5785.017268
-10	5785.017856	5785.016157	5785.013733	5785.001397
-20	5785.028216	5785.039213	5785.043943	5785.056524
-30	5785.0631	5785.0631	5785.06339	5785.0631
Max. Deviation (ppm)	11.861	11.861	11.915	11.861

<ANT 2>

Frequency (MHz)	5180			
Voltage (V)	Measurement Frequency (MHz)			Max. Deviation (ppm)
132	5179.97366			5.085
120	5179.97366			5.085
108	5179.97366			5.085
Temperature (°C)	Measurement Frequency (MHz)			
	0 Minute	2 Minute	5 Minute	10 Minute
50	5179.96411	5179.96411	5179.96498	5179.96527
40	5179.964709	5179.966092	5179.969784	5179.968582
30	5179.971239	5179.970272	5179.97071	5179.972759
20	5179.97366	5179.97366	5179.97338	5179.97308
10	5179.977482	5179.994372	5179.980912	5179.982424
0	5179.974946	5179.99536	5179.993722	5179.99443
-10	5180.027942	5180.004971	5180.018389	5180.044182
-20	5180.048417	5180.034204	5180.016128	5180.014772
-30	5180.05673	5180.05673	5180.05673	5180.05673
Max. Deviation (ppm)	10.952	10.952	10.952	10.952

Frequency (MHz)	5785			
Voltage (V)	Measurement Frequency (MHz)			Max. Deviation (ppm)
132	5784.96932			4.952
120	5784.96932			5.003
108	5784.96961			4.854
Temperature (°C)	Measurement Frequency (MHz)			
	0 Minute	2 Minute	5 Minute	10 Minute
50	5784.96527	5784.96527	5784.96556	5784.96527
40	5784.96556	5784.968042	5784.968249	5784.968823
30	5784.968245	5784.969164	5784.969037	5784.969116
20	5784.96932	5784.96932	5784.96932	5784.96932
10	5784.970538	5784.986906	5784.981901	5784.984594
0	5784.990759	5784.990698	5784.997068	5784.991271
-10	5785.010772	5785.018817	5785.024648	5785.030134
-20	5785.033567	5785.037747	5785.032252	5785.048248
Max. Deviation (ppm)	11.806	11.806	11.861	11.861

<ANT 3>

Frequency (MHz)	5180			
Voltage (V)	Measurement Frequency (MHz)			Max. Deviation (ppm)
132	5179.97308			5.197
120	5179.97308			5.197
108	5179.97308			5.197
Temperature (°C)	Measurement Frequency (MHz)			
	0 Minute	2 Minute	5 Minute	10 Minute
50	5179.96527	5179.96527	5179.9644	5179.96643
40	5179.967997	5179.969643	5179.969177	5179.967602
30	5179.967314	5179.971251	5179.972079	5179.972853
20	5179.97308	5179.97308	5179.973	5179.97308
10	5179.98452	5179.979923	5179.994283	5179.999352
0	5179.999402	5179.994325	5179.998068	5179.996569
-10	5179.997527	5180.007389	5180.00421	5180.036244
-20	5180.01148	5180.029319	5180.02458	5180.047491
-30	5180.05644	5180.05644	5180.05615	5180.05644
Max. Deviation (ppm)	10.896	10.896	10.840	10.896

Frequency (MHz)	5785			
Voltage (V)	Measurement Frequency (MHz)			Max. Deviation (ppm)
132	5784.96932			4.952
120	5784.96932			5.003
108	5784.96932			4.854
Temperature (°C)	Measurement Frequency (MHz)			
	0 Minute	2 Minute	5 Minute	10 Minute
50	5784.96556	5784.96527	5784.96527	5784.96527
40	5784.968876	5784.967071	5784.967908	5784.968987
30	5784.968636	5784.968406	5784.968387	5784.968799
20	5784.96932	5784.96932	5784.96932	5784.97077
10	5784.985707	5784.972848	5784.980056	5784.975458
0	5784.989732	5784.977318	5784.971006	5784.991147
-10	5785.012832	5785.001481	5785.025837	5785.033352
-20	5785.031259	5785.026716	5785.060534	5785.05347
-30	5785.0631	5785.06281	5785.06281	5785.06252
Max. Deviation (ppm)	11.861	11.806	11.806	11.752

5.1.6 Power Spectral Density

Limit

For the 5.15~5.25GHz Bands:

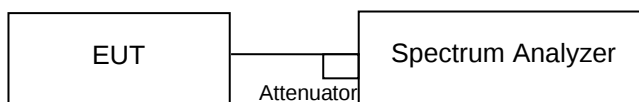
For mobile and portable client devices in the 5.15~5.25GHz band, the Maximum Power spectral density shall not exceed 11dBm/MHz. For an indoor access point operating in the band 5.15~5.25GHz, the maximum power spectral density shall not exceed 17dBm/MHz.

For the 5.745~5.85GHz Bands:

The maximum power spectral density shall not exceed 30dBm/500kHz.

Kind of Test Site Shielded room

Test Setup



Test Instruments

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date	Test Date	
						From	Until
Spectrum Analyzer	R&S	FSV40	101512	2022/2/24	2023/2/23	2022/4/25	2022/5/6

Test Procedure

For U-NII-1:

Using method SA-2

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz, Set VBW ≥ 3 MHz, Detector = RMS
3. Sweep time = auto, trigger set to "free run".
4. Trace average at least 100 traces in power averaging mode.
5. Record the max value and add 10 log (1/duty cycle)

※For U-NII-3:

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 500 kHz, Set VBW ≥ 3 RBW, Detector = RMS
3. Use the peak marker function to determine the maximum power level in any 500 kHz band segment within the fundamental EBW.
4. Sweep time = auto, trigger set to "free run".
5. Trace average at least 100 traces in power averaging mode.
6. Record the max value and add 10 log (1/duty cycle)

Prüfbericht - Nr.: CN22DLVL(P15E-WiFi) 001
Test Report No.

Seite 35 von 42
Page 35 of 42

For MIMO mode, calculation method follows FCC KDB 662911 Method 2) a) of power density measurement using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.

Test Results

Please refer to Appendix A

5.1.7 Radiated Spurious Emissions

Limit

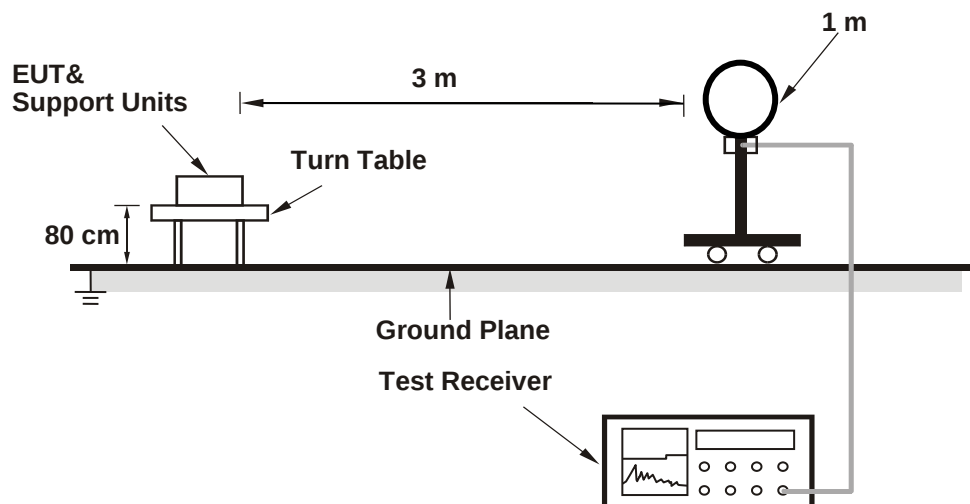
Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must comply with the radiated emission limits specified in §15.209(a).

Emissions radiated outside the restricted and authorized frequency bands must either comply with the radiated emission limits specified for the restricted bands or in §15.407(b).

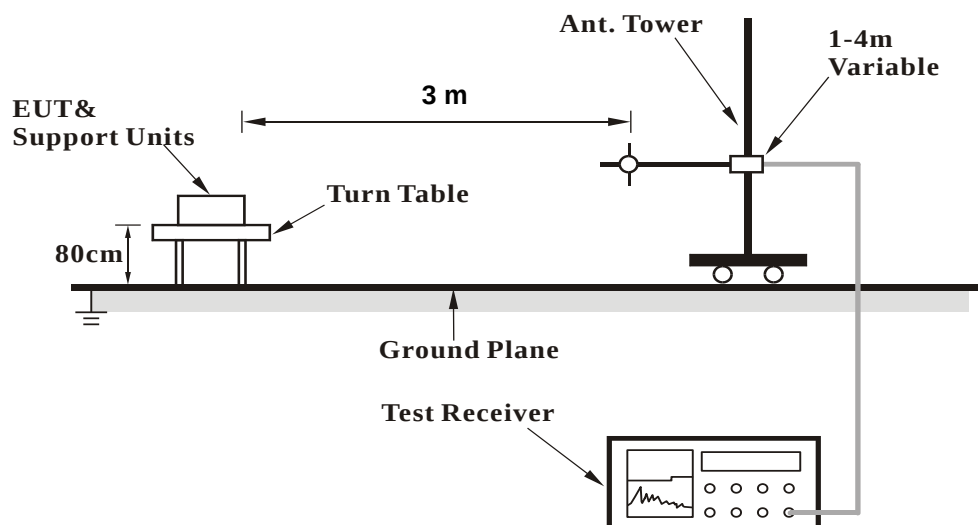
Kind of Test Site 3m Semi-Anechoic Chamber

Test Setup

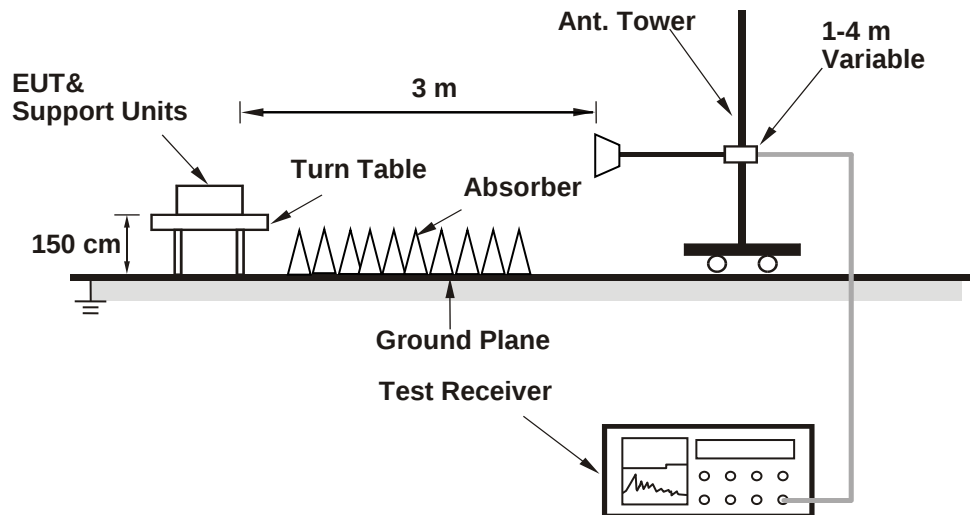
<Radiated Emissions below 30 MHz>



<Radiated Emissions 30 MHz to 1 GHz>



<Radiated Emissions above 1 GHz>



For the actual test configuration, please refer to the attached file (Test Setup Photo).

Test Instruments
Below 30MHz Test Period: 2022/4/25~2022/4/27

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date
Receiver	R&S	ESR7	102109	2022/2/25	2023/2/24
Microwave Cable	SUCOFLEX 104EA	800056/4EA	804680/4	2022/3/22	2023/3/21
Loop Antenna	SCHWARZBECK	FMZB 1519B	00215	2021/12/8	2022/12/7

30MHz-1GHz Test Period: 2022/4/26~2022/4/27

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date
Receiver	R&S	ESR7	102109	2022/2/25	2023/2/24
Bilog Antenna	SCHWARZBECK	VULB-9168	00949	2021/5/30	2022/5/29
LF-AMP	Agilent	8447D	2727A05146	2022/2/16	2023/2/15

Above 1GHz Test Period: 2022/4/22~2022/5/5

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date
Signal Analyzer	R&S	FSV40	101513	2021/5/28	2022/5/27
Horn Antenna	ETS-Lindgren	3117	00218929	2021/11/25	2022/11/24
HF-AMP + AC source	EMCI	EMC051845SE	980635	2022/1/20	2023/1/19
HF-AMP + AC source	EMCI	EMC184045SE	980656	2022/1/20	2023/1/19
Horn Antenna	SCHWARZBECK	BBHA 9170	00887	2022/3/29	2023/3/28

Test Procedures**For Radiated Emissions below 30 MHz**

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. Parallel (OPEN), perpendicular (CLOSE), and ground-parallel (GROUND) orientations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9 kHz at frequency below 30 MHz.
2. All modes of operation were investigated and the worst-case emissions are reported.

For Radiated Emissions above 30 MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30 MHz ~ 1 GHz) / 1.5 meters (for above 1 GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detected function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) or Peak detection (PK) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is $\geq 1/T$ (Duty cycle < 98 %) or 10 Hz (Duty cycle ≥ 98 %) for Average detection (AV) at frequency above 1 GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.
5. The Radiated Emissions testing was performed in the X(E1), Y(H) and Z(E2) axis orientation. The worst-case Axis orientation is recorded in this test report.

Prüfbericht - Nr.: CN22DLVL(P15E-WiFi) 001
Test Report No.

Seite 40 von 42
Page 40 of 42

Test Results

Factor (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB)
Level (dBuV/m) = Reading (dBuV) + Factor (dB/m)

Please refer to Appendix B.

5.2 Mains Emission

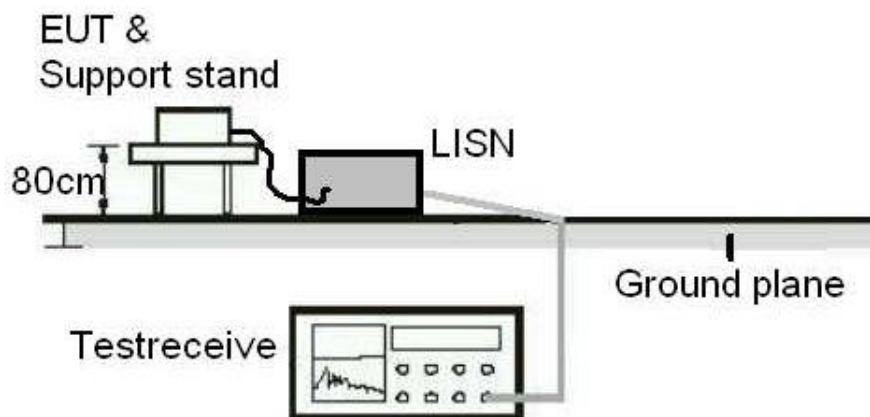
5.2.1 Mains Conducted Emission

Limit

Mains Conducted emissions as defined in §15.207 must comply with the mains conducted emission limits.

Kind of Test Site Shielded room

Test Setup



Test Instruments

Test Period: 2022/4/28

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date
Two-Line V-Network	Rohde & Schwarz	ENV216	101938	2021/9/23	2022/9/22
EMI Test Receiver	R&S	ESCI	1816063	2021/11/15	2022/11/14

Test Procedures

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/50 uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels under (Limit – 20 dB) was not recorded.

Note: The resolution bandwidth and video bandwidth of test receiver is 9 kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15 MHz – 30 MHz.

Test Results

Please refer to Appendix B.