

Prüfbericht-Nr.: <i>Test report no.:</i>	CN22VVN0(P15C-WiFi) 001	Auftrags-Nr.: <i>Order no.:</i>	238519748	Seite 1 von 44 Page 1 of 44
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	2021-09-06	
Auftraggeber: <i>Client:</i>	EnGenius Technologies 1580 Scenic Avenue, Costa Mesa, CA 92626			
Prüfgegenstand: <i>Test item:</i>	11ax Cloud Managed AP			
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	ECW230S			
Auftrags-Inhalt: <i>Order content:</i>	FCC Part 15C Test report (WiFi 2.4GHz)			
Prüfgrundlage: <i>Test specification:</i>	FCC 47CFR Part 15: Subpart C Section 15.247			
Wareneingangsdatum: <i>Date of sample receipt:</i>	2021-09-06			
Prüfmuster-Nr.: <i>Test sample no.:</i>	A003123611-011 A003123611-014, 017			
Prüfzeitraum: <i>Testing period:</i>	2021-09-23 - 2022-03-31			
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> 2022-03-30	 Ethan Shao		Ausstellungsdatum: <i>Issue date:</i> 2022-03-30	 Ryan Chen
Stellung / Position:	Assistant Project Engineer		Stellung / Position:	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 N/A = nicht anwendbar	4 = ausreichend N/T = nicht getestet
* Legend:	1 = very good P(ass) = passed a.m. test specification(s)	2 = good F(ail) = failed a.m. test specification(s)	3 = satisfactory N/A = not applicable	4 = sufficient 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>				

TEST SUMMARY

Report Section	FCC Clause	Test Item	Result
5.1.1	15.247(b) & 15.203	Antenna Requirement	Pass
5.1.2	15.247(b)(3)	Average Output Power	Pass
5.1.3	15.247(a)(2)	6 dB Bandwidth	Pass
5.1.3	2.1049	99% Occupied Bandwidth	Pass
5.1.4	15.247(e)	Power Spectral Density	Pass
5.1.5	15.247(d)	Conducted Spurious Emissions and Band Edges	Pass
5.1.6	15.247(d) & 15.205 & 15.209	Radiated Spurious Emissions and Band Edges	Pass
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.

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Appendix A - Test Result of Conducted _1T1R

Appendix B - Test Result of Conducted_4T4R

**Appendix C - Test Result of Radiated Emissions & Mains Conducted
Emission_Adapter 1T1R**

**Appendix D - Test Result of Radiated Emissions & Mains Conducted
Emission_POE 1T1R**

**Appendix E - Test Result of Radiated Emissions & Mains Conducted
Emission_Adapter 4T4R**

**Appendix F - Test Result of Radiated Emissions & Mains Conducted
Emission_POE 4T4R**

APPENDIX SP - PHOTOGRAPHS OF TEST SETUP

APPENDIX EP - PHOTOGRAPHS OF EUT

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HISTORY OF THIS TEST REPORT

Report No.	Description	Date Issued
CN22VVN0(P15C-WiFi) 001	Original Release	2022-03-30

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_1T1R

Appendix B - Test Result of Conducted_4T4R

Appendix C - Test Result of Radiated Emissions & Mains Conducted Emission_Adapter 1T1R

Appendix D - Test Result of Radiated Emissions & Mains Conducted Emission_POE 1T1R

Appendix E - Test Result of Radiated Emissions & Mains Conducted Emission_Adapter 4T4R

Appendix F - Test Result of Radiated Emissions & Mains Conducted Emission_POE 4T4R

Appendix SP - Photographs of Test Setup

Appendix EP - Photographs of EUT

Applied Standard and Test Levels

Radio
FCC 47CFR Part 15: Subpart C Section 15.247
FCC 47CFR Part 2: Subpart J Section 2.1049
ANSI C63.10:2013
KDB 558074 D01 15.247 Meas Guidance v05r02
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 11ax Cloud Managed AP. It contains a WLAN compatible module enabling the user to communicate data through a Wireless interface.

This equipment has two radio modules, one module is 2.4GHz + 5GHz with 4T4R and the other one is scanning radio; the scanning radio has two configurations of 1T1R and RX only. For the scanning radio in this application we just apply the RX only mode for FCC ID: A8J-ECW230S; and we also put the 1T1R test data in the report for reference only.

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	11ax Cloud Managed AP
Type Identification	ECW230S
FCC ID	A8J-ECW230S

Technical Specification of EUT

Item	EUT information	
Operating Frequency	2412 MHz ~ 2462 MHz	
Channel Spacing	5 MHz	
Channel Number	802.11b/g/n HT20/ac VHT20 /ax HE20: 11 802.11n HT40/ac VHT40/ax HE40: 7	
Data Rate	802.11b: 11.0 / 5.5 / 2.0 / 1.0 Mbps 802.11g: 54.0 / 48.0 / 36.0 / 24.0 / 18.0 / 12.0 / 9.0 / 6.0 Mbps 802.11n HT20/40/ac VHT20/40 ax HE20/40: up to MCS11	
Operation Voltage	Adapter: Input: 100~240Vac; Output: 12 Vdc POE: Input: 100~240Vac; Output: 44~57 Vdc	
Modulation	802.11b: DSSS-DBPSK, DQPSK, CCK 802.11g, 802.11n HT20, 802.11n HT40: OFDM-BPSK, QPSK, 16QAM, 64QAM 802.11ac VHT20, 802.11ac VHT40: OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM 802.11ax HE20, 802.11ax HE40: OFDMA-BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM	
Maximum Output Power (mW)	CDD 1T1R Mode (Scanning Radio)	802.11b: 25.41
		802.11g: 29.04
		802.11n HT20: 32.89
		802.11n HT40: 19.59
		802.11ac VHT20: 29.11
	802.11ac VHT40: 17.50	
	CDD 4T4R Mode (Traffic Radio)	802.11b: 239.1
		802.11g: 310.6
		802.11n HT20: 306.75
		802.11n HT40: 129.22
		802.11ac VHT20: 296.31
		802.11ac VHT40: 125.41
		802.11ax HE20: 320.98
	802.11ax HE40: 148.90	
	Beamforming Mode (Traffic Radio)	802.11n HT20: 76.7
802.11n HT40: 32.31		
802.11ac VHT20: 74.09		
802.11ac VHT40: 31.36		
802.11ax HE20: 80.26		
802.11ax HE40: 37.23		
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

1T1R mode (Scanning Radio)

802.11b		802.11g		802.11n HT20		802.11n HT40	
Channel	Power Setting	Channel	Power Setting	Channel	Power Setting	Channel	Power Setting
1	15.5	1	15	1	15	3	12
6	15	6	17	2	17.5	4	14.5
11	15	11	16	6	17.5	6	16.5
				11	17.5	8	14.5
						9	11.5
802.11ac VHT20		802.11ac VHT40					
Channel	Power Setting	Channel	Power Setting				
1	14.5	3	11.5				
2	17	4	14				
6	17	6	16				
11	17	8	14				
		9	11				

4T4R mode (Traffic Radio)

802.11b		802.11g		802.11n HT20		802.11n HT40	
Channel	Power Setting	Channel	Power Setting	Channel	Power Setting	Channel	Power Setting
1	17.5	1	15	1	15	3	14.5
6	17.5	2	16	2	16	6	15
11	17.5	3	17.5	3	17.5	9	14
		6	19.5	6	19.5		
		9	18.5	9	17.5		
		10	16.5	10	16.5		
		11	15.5	11	15		
802.11ac VHT20		802.11ac VHT40		802.11ax HE20		802.11ax HE40	
Channel	Power Setting	Channel	Power Setting	Channel	Power Setting	Channel	Power Setting
1	15	3	14.5	1	15	3	14.5
2	16	6	15	2	16	6	15.5
3	17.5	9	14	3	17.5	9	14
6	19.5			6	19.5		
9	17.5			9	17.5		
10	16.5			10	16.5		
11	15			11	15		

4.2 Carrier Frequency and Channel

802.11b, 802.11g, 802.11n HT20, 802.11ac VHT20, 802.11ax HE20:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	7	2442
2	2417	8	2447
3	2422	9	2452
4	2427	10	2457
5	2432	11	2462
6	2437		

802.11n HT40, 802.11ac VHT40, 802.11ax HE40:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
3	2422	7	2442
4	2427	8	2447
5	2432	9	2452
6	2437		

4.3 Test Operation and Test Software

Setup for testing: Test samples are provided with a USB 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
---------------	------

The samples were used as follows:

A003123611-011 for radiated test

A003123611-014, 017 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.

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

Modulation Mode	Tx Function
802.11b	4TX (MIMO)
802.11g	4TX (MIMO)
802.11n HT20	4TX (MIMO)
802.11n HT40	4TX (MIMO)
802.11ac VHT20	4TX (MIMO)
802.11ac VHT40	4TX (MIMO)
802.11ax HE20	4TX (MIMO)
802.11ax HE40	4TX (MIMO)

* The modulation and bandwidth are similar for 802.11n mode HT20/HT40 and 802.11ac/ax mode VHT20/VHT40/HE20/HE40, therefore investigated worse case as representative mode in test 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. POE Mode has been verified the worst case of Radiated Spurious Emissions and Mains Conducted Emission tests.

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	Available Channel	Tested Channel	Date Rate (Mbps)
CDD	802.11b	1 to 11	1, 6, 11	1.0
	802.11g	1 to 11	1, 2, 3, 6, 9, 10, 11	6.0
	802.11n HT20	1 to 11	1, 2, 3, 6, 9, 10, 11	MCS0
	802.11n HT40	3 to 9	3, 6, 9	MCS0
	802.11ac VHT20	1 to 11	1, 2, 3, 6, 9, 10, 11	NSS1 MCS0
	802.11ac VHT40	3 to 9	3, 6, 9	NSS1 MCS0
	802.11ax HE20	1 to 11	1, 2, 3, 6, 9, 10, 11	NSS1 MCS0
	802.11ax HE40	3 to 9	3, 6, 9	NSS1 MCS0
BFM	802.11n HT20	1 to 11	1, 2, 3, 6, 9, 10, 11	MCS0
	802.11n HT40	3 to 9	3, 6, 9	MCS0
	802.11ac VHT20	1 to 11	1, 2, 3, 6, 9, 10, 11	NSS1 MCS0
	802.11ac VHT40	3 to 9	3, 6, 9	NSS1 MCS0
	802.11ax HE20	1 to 11	1, 2, 3, 6, 9, 10, 11	NSS1 MCS0
	802.11ax HE40	3 to 9	3, 6, 9	NSS1 MCS0

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	Available Channel	Tested Channel	Date Rate (Mbps)
Adapter 1T1R	802.11b	1 to 11	1, 6, 11	1.0
	802.11g	1 to 11	1, 6, 11	6.0
	802.11ac VHT20	1 to 11	1, 6, 11	NSS1 MCS0
	802.11ac VHT40	3 to 9	3, 6, 9	NSS1 MCS0
Adapter 4T4R	802.11b	1 to 11	1, 6, 11	1.0
	802.11g	1 to 11	1, 6, 11	6.0
	802.11ax HE20	1 to 11	1, 6, 11	NSS1 MCS0
	802.11ax HE40	3 to 9	3, 6, 9	NSS1 MCS0
POE 1T1R	802.11ac VHT20	1 to 11	11	NSS1 MCS0
POE 4T4R	802.11ax HE20	1 to 11	6	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	Available Channel	Tested Channel	Date Rate (Mbps)
Adapter 1T1R	802.11ac VHT20	1 to 11	11	NSS1 MCS0
Adapter 4T4R	802.11ax HE20	1 to 11	6	NSS1 MCS0
POE 1T1R	802.11ac VHT20	1 to 11	11	NSS1 MCS0
POE 4T4R	802.11ax HE20	1 to 11	6	NSS1 MCS0

Mains Conducted Emission

- 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	Available Channel	Tested Channel	Date Rate (Mbps)
Adapter 1T1R	802.11ac VHT20	1 to 11	11	NSS1 MCS0
Adapter 4T4R	802.11ax HE20	1 to 11	6	NSS1 MCS0
POE 1T1R	802.11ac VHT20	1 to 11	11	NSS1 MCS0
POE 4T4R	802.11ax HE20	1 to 11	6	NSS1 MCS0

Test Condition

Test Item		Ambient Temperature	Relative Humidity	Tested by
Conducted Measurement	1T1R	21.9-22.5 °C	65-72 %	Stanislas Charles
	4T4R	21.5 °C	73 %	
Radiated Spurious Emissions above 1 GHz	1T1R	23.1-25.1 °C	50-60 %	Hunter Wang
	4T4R			
Radiated Spurious Emissions below 1 GHz	1T1R	23.1-25.1 °C	50-60 %	Hunter Wang
	4T4R			
Mains Conducted Emission		24.6-25.8 °C	52-54 %	Hunter Wang

4.4 Special Accessories and Auxiliary Equipment

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

Accessory of EUT

None.

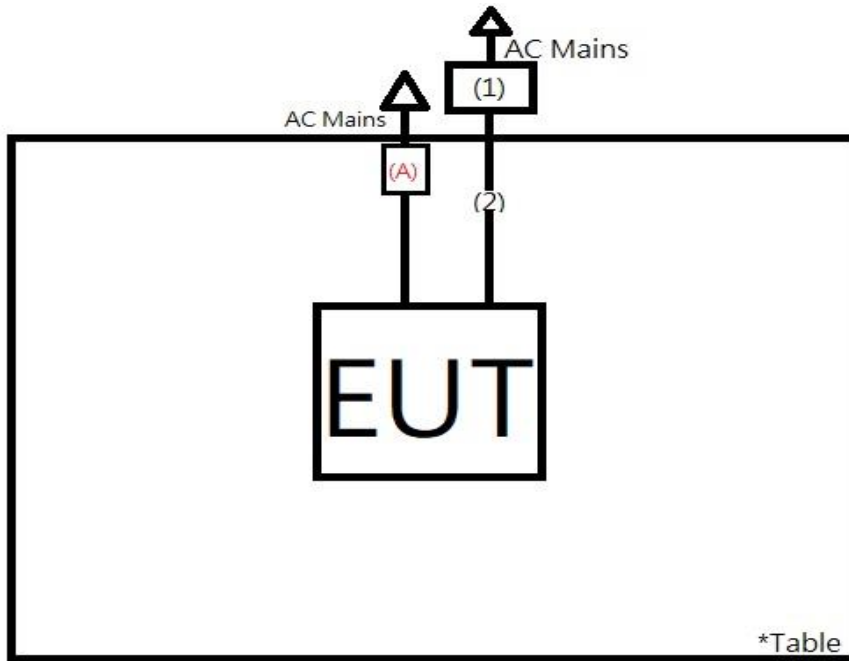
Support Unit

Adapter Mode					
No.	Description	Brand	Model	S/N	Remark
Radiated Test					
A	Adapter	Powertron Electronics Corp.	PA1024-120HEB200	-	I/P: 100-240 Vac, 50/60 Hz, 0.6 A O/P: 12 Vdc, 2.0 A 150 cm shielded cable w/o core
1	Notebook	HP	15s-du0007TX	CND93662VF	-
2	LAN Cable	TUV	TUV-010	-	300 cm non-shielded cable w/o core
Mains Conducted Test					
A	Adapter	Powertron Electronics Corp.	PA1024-120HEB200	-	I/P: 100-240 Vac, 50/60 Hz, 0.6 A O/P: 12 Vdc, 2.0 A 150 cm shielded cable w/o core
1	LAN Cable	TUV-JP	TUV-JP-001	-	95 cm non-shielded cable w/o core
2	Notebook	HP	15s-du0007TX	CND93662VF	-
Conducted Test					
-	Notebook	HP	TPN-C139	CND93662VF	NB-WIOT-01

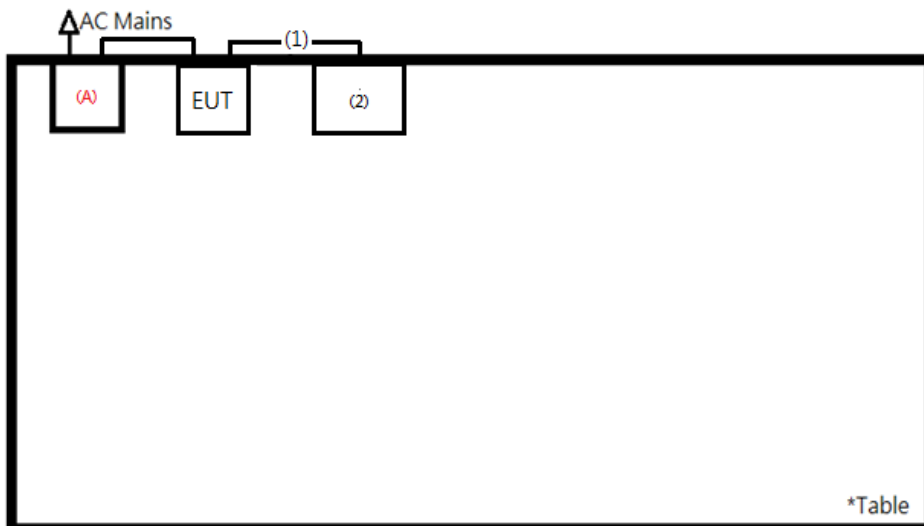
POE Mode					
No.	Description	Brand	Model	S/N	Remark
Radiated Test					
A	PoE ADAPTER	SENAO	EPA5006GPR	-	I/P: 100-240 Vac, 50/60 Hz, 0.8 A O/P: 54 Vdc, 0.6 A 173 cm non-shielded cable w/o core
1	LAN Cable	TUV-JP	TUV-JP-001	-	1000 cm non-shielded cable w/o core
2	LAN Cable	TUV-JP	TUV-JP-001	-	300 cm non-shielded cable w/o core
3	Notebook	HP	15s-du0007TX	CND93662VF	-
Mains Conducted Test					
A	PoE ADAPTER	SENAO	EPA5006GPR	-	I/P: 100-240 Vac, 50/60 Hz, 0.8 A O/P: 54 Vdc, 0.6 A 173 cm non-shielded cable w/o core
1	LAN Cable	TUV-JP	TUV-JP-001	-	95 cm non-shielded cable w/o core
2	LAN Cable	TUV-JP	TUV-JP-001	-	120 cm non-shielded cable w/o core
3	Notebook	HP	15s-du0007TX	CND93662VF	-
Conducted Test					
-	Notebook	HP	TPN-C139	CND93662VF	NB-WIOT-01

4.5 Test Setup Diagram

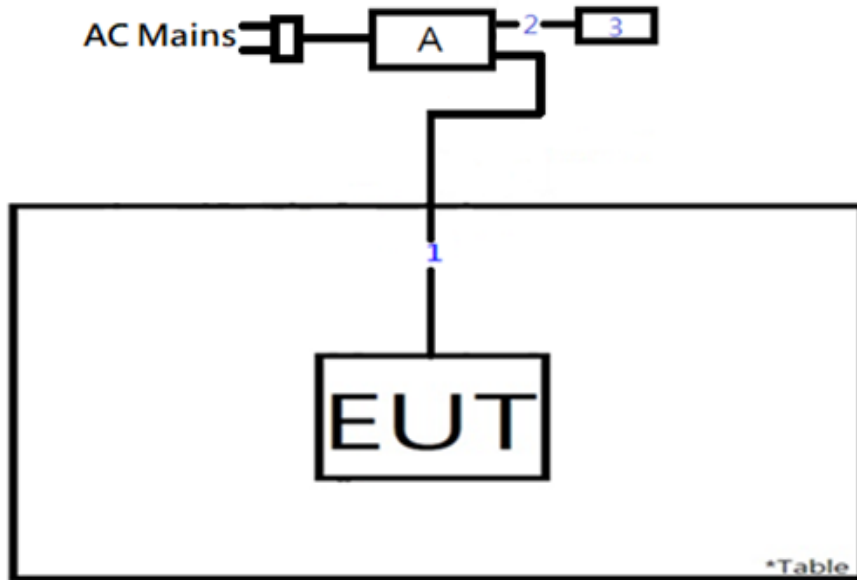
<Radiated Spurious Emissions, Adapter mode>



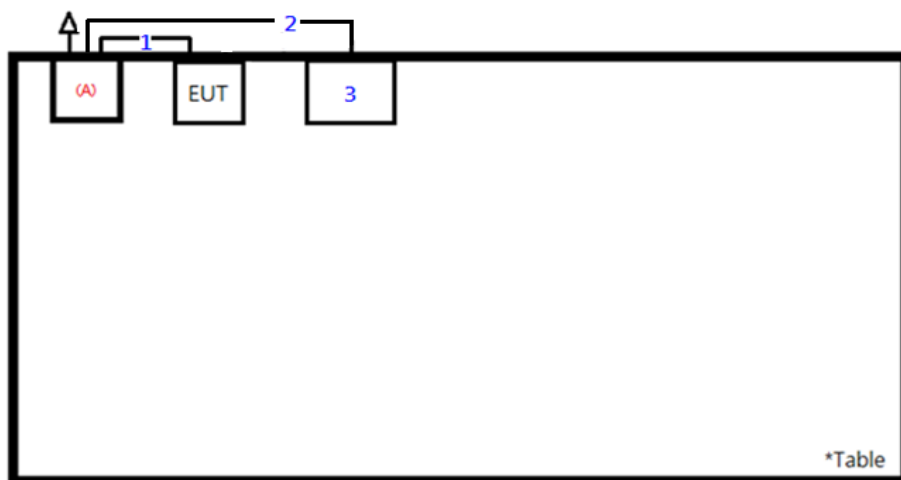
<Mains Conducted Emission, Adapter mode>



<Radiated Spurious Emissions, POE mode>

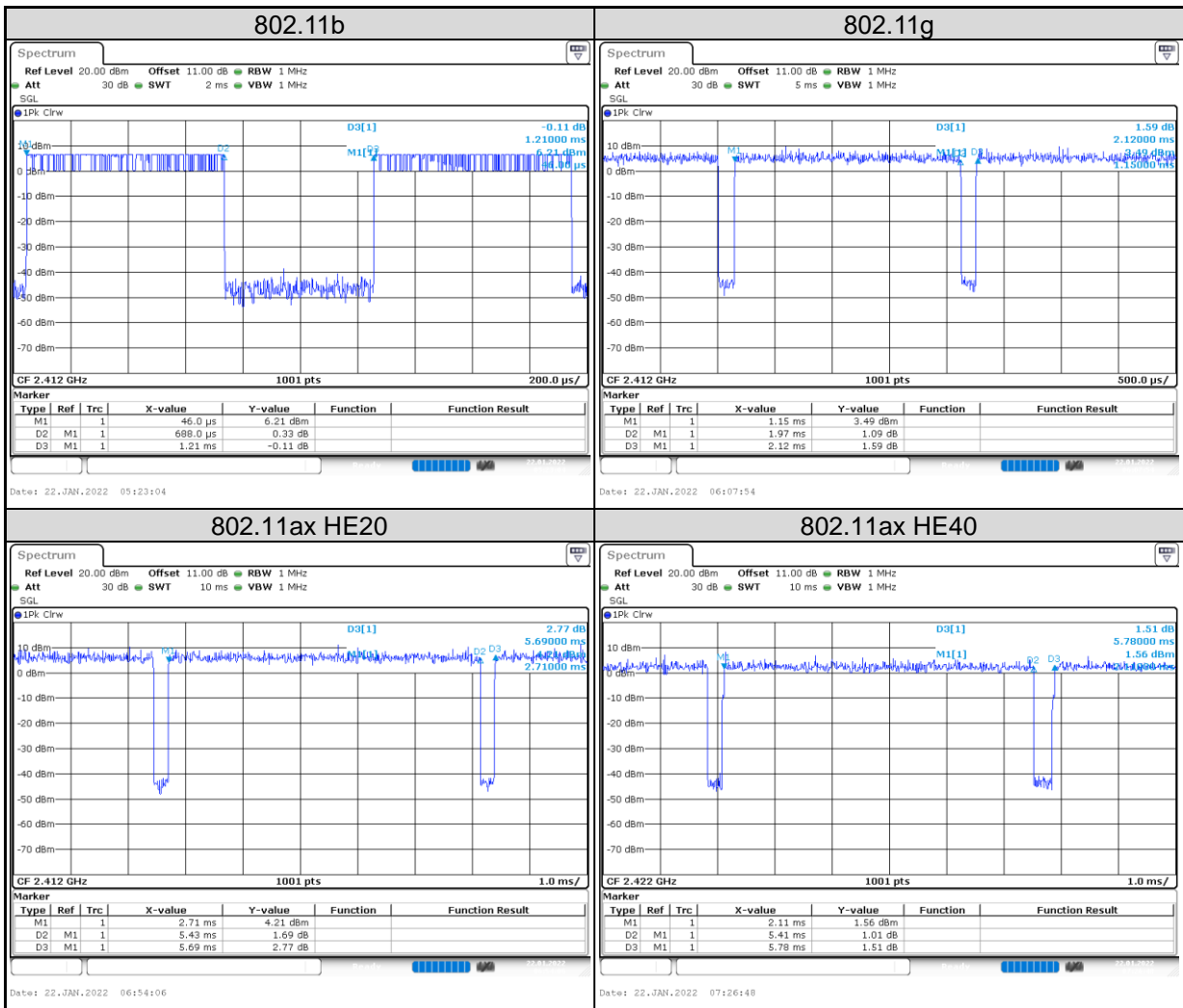


<Mains Conducted Emission, POE mode>



4.6 Duty Cycle of Test Signal

Mode	On + Off Time (ms)	On Time (ms)	Duty Cycle (%)	Duty Factor (dB)
802.11b	0.12	0.69	56.86	2.45
802.11g	2.12	1.97	92.92	0.32
802.11ax HE20	5.69	5.43	95.43	0.20
802.11ax HE40	5.78	5.41	93.60	0.29



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.

Scanning Radio Mode:

ANT	Gain (dBi)	Antenna Type
1	4.33	PIFA

Traffic Radio Mode:

ANT	Gain (dBi)	Antenna Type	
1	3.70	PIFA	
2	4.08	PIFA	
3	4.12	PIFA	
4	5.01	PIFA	
Max Peak Gain		5.01	-
CDD Mode	Power Directional Gain =	5.01	-
	PSD Directional Gain = $10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] =$	10.26	-
Beamforming Mode	Power Directional Gain =	10.26	-
	PSD Directional Gain = $10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] =$	10.26	-

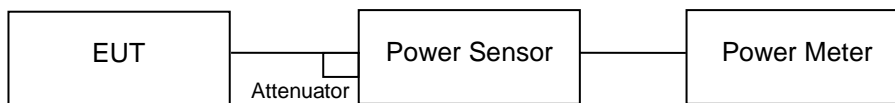
Refer to EUT photo for details.

5.1.2 Average Output Power

Limit 1 watt (30 dBm)

Kind of Test Site Shielded room

Test Setup



Test Instruments

For Scanning Mode (1T1R):

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date	Test Date	
						From	Until
Power Sensor	Keysight	N1911A	MY56020004	2021/03/09	2022/03/08	2022/02/10	2022/03/07

For Traffic Radio Mode (4T4R):

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date	Test Date	
						From	Until
Power Meter	Anritsu	ML2495A	1901008	2021/03/24	2022/03/23	2021/09/23	2022/01/28
Power Sensor	Anritsu	MA2411B	1725269	2021/03/24	2022/03/23	2021/09/23	2022/01/28

Test Procedures

A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor. Record the power level.

Average power sensor was 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.

Duty factor is not added to measured value.

Test Report No.
Test Result
Average Power, CDD Mode 1T1R (Scanning Radio)
<802.11b>

Channel	Channel Frequency (MHz)	Average Power (dBm)		Limit (dBm)
		(dBm)	(mW)	
1	2412	14.05	25.41	30
6	2437	13.09	20.37	30
11	2462	13.46	22.18	30

<802.11g>

Channel	Channel Frequency (MHz)	Average Power (dBm)		Limit (dBm)
		(dBm)	(mW)	
1	2412	12.75	18.84	30
6	2437	14.63	29.04	30
11	2462	13.95	24.83	30

<802.11n HT20>

Channel	Channel Frequency (MHz)	Average Power (dBm)		Limit (dBm)
		(dBm)	(mW)	
1	2412	12.15	16.41	30
2	2417	14.78	30.06	30
6	2437	14.41	27.61	30
11	2462	15.17	32.89	30

<802.11n HT40>

Channel	Channel Frequency (MHz)	Average Power (dBm)		Limit (dBm)
		(dBm)	(mW)	
3	2422	8.68	7.38	30
4	2427	11.09	12.85	30
6	2437	12.92	19.59	30
8	2447	11.12	12.94	30
9	2452	8.29	6.75	30

<802.11ac VHT20>

Channel	Channel Frequency (MHz)	Average Power (dBm)		Limit (dBm)
		(dBm)	(mW)	
1	2412	11.78	15.07	30
2	2417	14.31	26.98	30
6	2437	13.97	24.95	30
11	2462	14.64	29.11	30

<802.11ac VHT40>

Channel	Channel Frequency (MHz)	Average Power (dBm)		Limit (dBm)
		(dBm)	(mW)	
3	2422	8.58	7.21	30
4	2427	10.65	11.61	30
6	2437	12.43	17.50	30
8	2447	10.62	11.53	30
9	2452	7.83	6.07	30

Average Power, CDD Mode 4T4R (Traffic Radio)
<802.11b>

Channel	Channel Frequency (MHz)	Average Power (dBm)				Total Power		Limit (dBm)
		Ant 1	Ant 2	Ant 3	Ant 4	(dBm)	(mW)	
1	2412	18.07	17.82	17.51	17.64	23.79	239.10	30
6	2437	17.94	17.57	17.10	17.23	23.49	223.51	30
11	2462	17.85	17.53	17.05	17.39	23.49	223.10	30

<802.11g>

Channel	Channel Frequency (MHz)	Average Power (dBm)				Total Power		Limit (dBm)
		Ant 1	Ant 2	Ant 3	Ant 4	(dBm)	(mW)	
1	2412	15.63	15.17	15.14	15.27	21.33	135.75	30
2	2417	16.50	16.37	16.13	16.24	22.33	171.11	30
3	2422	18.03	17.86	17.57	17.59	23.79	239.19	30
6	2437	18.90	18.97	18.72	19.01	24.92	310.60	30
9	2452	18.50	18.16	17.82	18.00	24.15	259.89	30
10	2457	16.59	16.57	16.03	16.30	22.40	173.74	30
11	2462	15.69	15.44	15.18	15.33	21.43	139.14	30

<802.11n HT20>

Channel	Channel Frequency (MHz)	Average Power (dBm)				Total Power		Limit (dBm)
		Ant 1	Ant 2	Ant 3	Ant 4	(dBm)	(mW)	
1	2412	15.60	15.09	14.90	15.10	21.20	131.86	30
2	2417	16.61	16.18	15.84	16.15	22.22	166.89	30
3	2422	18.20	17.66	17.31	17.56	23.72	235.26	30
6	2437	18.94	18.98	18.84	18.62	24.87	306.75	30
9	2452	17.39	17.27	16.68	16.82	23.07	202.80	30
10	2457	16.85	16.32	15.88	16.22	22.35	171.88	30
11	2462	15.48	15.05	14.41	14.84	20.98	125.39	30

<802.11n HT40>

Channel	Channel Frequency (MHz)	Average Power (dBm)				Total Power		Limit (dBm)
		Ant 1	Ant 2	Ant 3	Ant 4	(dBm)	(mW)	
3	2422	15.37	14.86	14.67	14.91	20.98	125.34	30
6	2437	15.41	15.02	14.82	15.10	21.11	129.22	30
9	2452	14.31	13.85	13.62	13.85	19.94	98.52	30

<802.11ac VHT20>

Channel	Channel Frequency (MHz)	Average Power (dBm)				Total Power		Limit (dBm)
		Ant 1	Ant 2	Ant 3	Ant 4	(dBm)	(mW)	
1	2412	15.53	14.97	14.84	15.02	21.12	129.38	30
2	2417	16.48	16.07	15.69	16.03	22.10	162.08	30
3	2422	18.03	17.58	17.19	17.42	23.59	228.38	30
6	2437	18.78	18.84	18.65	18.51	24.72	296.31	30
9	2452	17.21	17.11	16.49	16.64	22.89	194.70	30
10	2457	16.65	16.24	15.69	16.22	22.23	167.26	30
11	2462	15.36	14.92	14.25	14.67	20.84	121.32	30

<802.11ac VHT40>

Channel	Channel Frequency (MHz)	Average Power (dBm)				Total Power		Limit (dBm)
		Ant 1	Ant 2	Ant 3	Ant 4	(dBm)	(mW)	
3	2422	15.27	14.69	14.55	14.79	20.85	121.74	30
6	2437	15.26	14.88	14.67	15.02	20.98	125.41	30
9	2452	14.24	13.73	13.53	13.69	19.83	96.08	30

<802.11ax HE20>

Channel	Channel Frequency (MHz)	Average Power (dBm)				Total Power		Limit (dBm)
		Ant 1	Ant 2	Ant 3	Ant 4	(dBm)	(mW)	
1	2412	15.55	15.29	15.00	15.43	21.34	136.24	30
2	2417	16.64	16.22	16.11	16.34	22.35	171.90	30
3	2422	18.00	17.80	17.58	17.63	23.78	238.57	30
6	2437	19.02	19.22	18.96	18.98	25.06	320.98	30
9	2452	17.63	17.28	16.96	16.92	23.23	210.26	30
10	2457	16.89	16.41	16.06	16.26	22.44	175.25	30
11	2462	15.36	15.17	14.62	15.13	21.10	128.80	30

<802.11ax HE40>

Channel	Channel Frequency (MHz)	Average Power (dBm)				Total Power		Limit (dBm)
		Ant 1	Ant 2	Ant 3	Ant 4	(dBm)	(mW)	
3	2422	15.33	15.07	14.87	15.15	21.13	129.68	30
6	2437	15.97	15.70	15.49	15.66	21.73	148.90	30
9	2452	13.96	14.01	14.09	14.14	20.07	101.61	30

Average Power, Beamforming Mode
<802.11n HT20>

Channel	Channel Frequency (MHz)	Average Power (dBm)				Total Power		Limit (dBm)
		Ant 1	Ant 2	Ant 3	Ant 4	(dBm)	(mW)	
1	2412	9.58	9.07	8.88	9.08	15.18	32.97	25.74
2	2417	10.59	10.16	9.82	10.13	16.20	41.73	25.74
3	2422	12.18	11.64	11.29	11.54	17.70	58.82	25.74
6	2437	12.92	12.96	12.82	12.60	18.85	76.70	25.74
9	2452	11.37	11.25	10.66	10.80	17.05	50.71	25.74
10	2457	10.83	10.30	9.86	10.20	16.33	42.98	25.74
11	2462	9.46	9.03	8.39	8.82	14.96	31.35	25.74

<802.11n HT40>

Channel	Channel Frequency (MHz)	Average Power (dBm)				Total Power		Limit (dBm)
		Ant 1	Ant 2	Ant 3	Ant 4	(dBm)	(mW)	
3	2422	9.35	8.84	8.65	8.89	14.96	31.34	25.74
6	2437	9.39	9.00	8.80	9.08	15.09	32.31	25.74
9	2452	8.29	7.83	7.60	7.83	13.92	24.63	25.74

<802.11ac VHT20>

Channel	Channel Frequency (MHz)	Average Power (dBm)				Total Power		Limit (dBm)
		Ant 1	Ant 2	Ant 3	Ant 4	(dBm)	(mW)	
1	2412	9.51	8.95	8.82	9.00	15.10	32.35	25.74
2	2417	10.46	10.05	9.67	10.01	16.08	40.52	25.74
3	2422	12.01	11.56	11.17	11.40	17.57	57.10	25.74
6	2437	12.76	12.82	12.63	12.49	18.70	74.09	25.74
9	2452	11.19	11.09	10.47	10.62	16.87	48.68	25.74
10	2457	10.63	10.22	9.67	10.20	16.21	41.82	25.74
11	2462	9.34	8.90	8.23	8.65	14.82	30.33	25.74

<802.11ac VHT40>

Channel	Channel Frequency (MHz)	Average Power (dBm)				Total Power		Limit (dBm)
		Ant 1	Ant 2	Ant 3	Ant 4	(dBm)	(mW)	
3	2422	9.25	8.67	8.53	8.77	14.83	30.44	25.74
6	2437	9.24	8.86	8.65	9.00	14.96	31.36	25.74
9	2452	8.22	7.71	7.51	7.67	13.81	24.02	25.74

<802.11ax HE20>

Channel	Channel Frequency (MHz)	Average Power (dBm)				Total Power		Limit (dBm)
		Ant 1	Ant 2	Ant 3	Ant 4	(dBm)	(mW)	
1	2412	9.53	9.27	8.98	9.41	15.32	34.06	25.74
2	2417	10.62	10.20	10.09	10.32	16.33	42.98	25.74
3	2422	11.98	11.78	11.56	11.61	17.76	59.65	25.74
6	2437	13.00	13.20	12.94	12.96	19.04	80.26	25.74
9	2452	11.61	11.26	10.94	10.90	17.21	52.57	25.74
10	2457	10.87	10.39	10.04	10.24	16.42	43.82	25.74
11	2462	9.34	9.15	8.60	9.11	15.08	32.20	25.74

<802.11ax HE40>

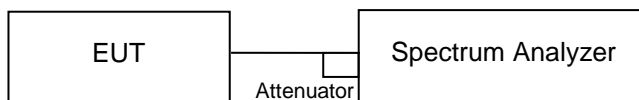
Channel	Channel Frequency (MHz)	Average Power (dBm)				Total Power		Limit (dBm)
		Ant 1	Ant 2	Ant 3	Ant 4	(dBm)	(mW)	
3	2422	9.31	9.05	8.85	9.13	15.11	32.42	25.74
6	2437	9.95	9.68	9.47	9.64	15.71	37.23	25.74
9	2452	7.94	7.99	8.07	8.12	14.05	25.40	25.74

5.1.3 6 dB Bandwidth and 99% Occupied Bandwidth

Limit The minimum 6 dB bandwidth shall be at least 500 kHz.

Kind of Test Site Shielded room

Test Setup



Test Instruments

For Scanning Mode (1T1R):

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date	Test Date	
						From	Until
Spectrum Analyzer	R&S	FSV40	100921	2021/05/10	2022/05/09	2022/03/31	2022/03/31

For Traffic Radio Mode (4T4R):

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date	Test Date	
						From	Until
Spectrum Analyzer	R&S	FSV40	101512	2021/01/29	2022/01/28	2022/01/22	2022/01/28

Test Procedure

- a. Set resolution bandwidth (RBW) = 100 kHz
- b. Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
- c. Trace mode = max hold.
- d. Sweep = auto couple.
- e. 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.
- f. For 99% occupied 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

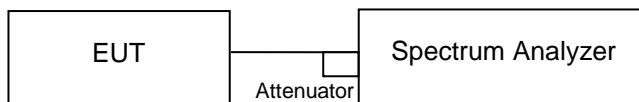
Please refer to Appendix A for scanning radio and Appendix B for traffic radio.

5.1.4 Power Spectral Density

Limit

The power spectral density shall not be greater than 8 dBm in any 3 kHz band.

Kind of Test Site Shielded room

Test Setup

Test Instruments
For Scanning Mode (1T1R):

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date	Test Date	
						From	Until
Spectrum Analyzer	R&S	FSV40	100921	2021/05/10	2022/05/09	2022/03/31	2022/03/31

For Traffic Radio Mode (4T4R):

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date	Test Date	
						From	Until
Spectrum Analyzer	R&S	FSV40	101512	2021/01/29	2022/01/28	2022/01/22	2022/01/22
Spectrum Analyzer	R&S	FSV40	100921	2021/05/10	2022/05/09	2022/03/30	2022/03/30

Test Procedure

- a. Set instrument center frequency to DTS channel center frequency.
- b. Set span to at least 1.5 times the OBW.
- c. Set RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- d. Set VBW $\geq [3 \times \text{RBW}]$.
- e. Detector = power averaging (rms) or sample detector (when rms not available).
- f. Ensure that the number of measurement points in the sweep $\geq [2 \times \text{span} / \text{RBW}]$.
- g. Sweep time = auto couple
- h. Do not use sweep triggering; allow sweep to "free run."
- i. Employ trace averaging (rms) mode over a minimum of 100 traces.
- j. Use the peak marker function to determine the maximum amplitude level.
- k. Add $[10 \log (1 / D)]$, where D is the duty cycle measured in step a), to the measured PSD to compute the average PSD during the actual transmission time. If measured value exceeds requirement specified by regulatory agency, then reduce RBW (but no less than 3 kHz) and repeat (note that this may require zooming in on the emission of interest and reducing the span to meet the minimum measurement point requirement as the RBW is reduced).

Test Results

$$\text{dBm/nHz to dBm/3kHz} = \text{dBm/nHz} + 10 \cdot \log(3\text{kHz/nHz})$$

Please refer to Appendix A for scanning radio and Appendix B for traffic radio.

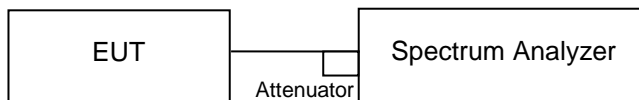
5.1.5 Conducted Spurious Emissions and Frequency Band Edges Measured in 100 kHz Bandwidth

Limit

30 dB (below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.)

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	2021/01/29	2022/01/28	2022/01/22	2022/01/28

Test Procedure

Measurement procedure REF

1. Set the RBW = 100 kHz.
2. Set the VBW \geq 300 kHz.
3. Detector = peak.
4. Sweep time = auto couple.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

Measurement procedure OOBE

1. Set RBW = 100 kHz.
2. Set VBW \geq 300 kHz.
3. Detector = peak.
4. Sweep = auto couple.
5. Trace Mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum amplitude level.

Test Results

Please refer to Appendix A for scanning radio and Appendix B for traffic radio.

5.1.6 Radiated Spurious Emissions and Band Edges

Limit

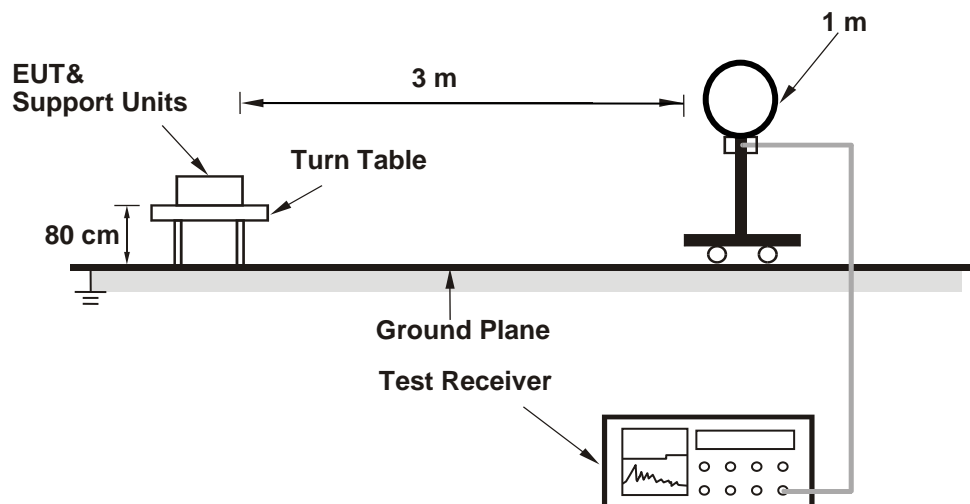
Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must comply with the radiated emission limits specified in §15.209(a).

Emissions radiated outside the restricted and authorized frequency bands must either comply with the radiated emission limits specified for the restricted bands or in §15.247(d).

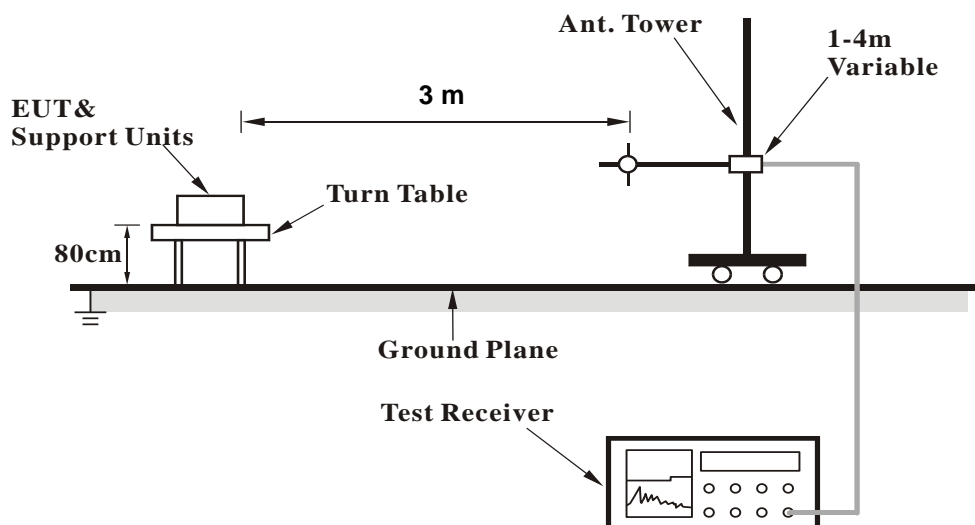
Kind of Test Site 3m Semi-Anechoic Chamber

Test Setup

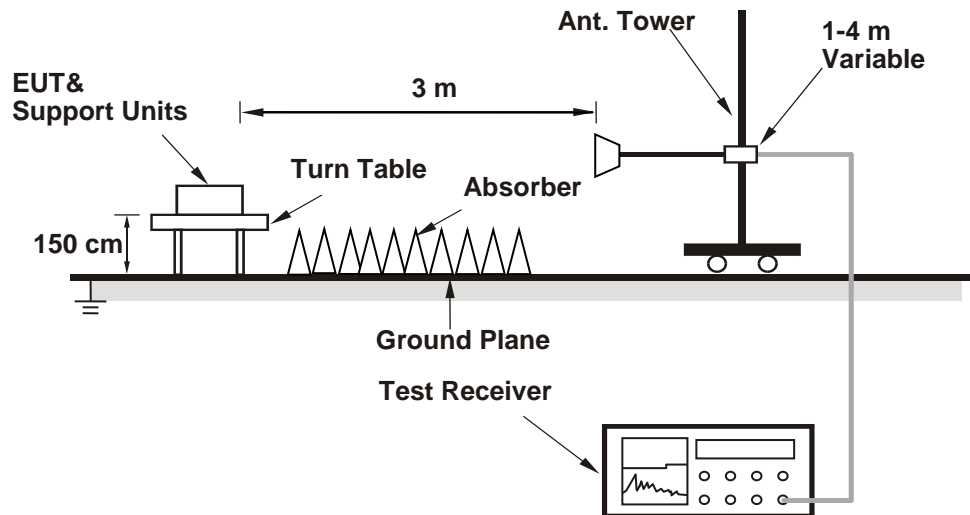
<Radiated Emissions below 30 MHz>



<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 For Adapter with 1T1R Mode
Below 30MHz (Test period: 2022/3/3)

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date
Receiver	R&S	ESR7	102109	2021/3/16	2022/3/15
Microwave Cable	HUBER+SUHNER	SUCOFLEX 104EA	800056/4EA	2021/3/17	2022/3/16
Loop Antenna	SCHWARZBECK	FMZB 1519B	00215	2021/12/8	2022/12/7

30MHz-1GHz (Test period: 2022/3/3)

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date
Receiver	R&S	ESR7	102109	2021/3/16	2022/3/15
Bilog Antenna	SCHWARZBECK	VULB-9168	00949	2021/5/30	2022/5/29
LF-AMP	Agilent	8447D	2727A05146	2022/2/16	2023/2/15
Microwave Cable	HUBER+SUHNER	SUCOFLEX 104EA	800056/4EA	2021/3/11	2022/3/10
Microwave Cable	HUBER+SUHNER	SUCOFLEX 104	804680/4	2021/3/11	2022/3/10
Microwave Cable	HUBER+SUHNER	SUCOFLEX 104	MY37202/4	2021/3/11	2022/3/10

Above 1GHz (Test period: 2022/1/26-2022/1/29)

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	00218930	2021/12/20	2022/12/19
HF-AMP + AC source	EMCI	EMC051845SE	980635	2021/2/1	2022/1/31
HF-AMP + AC source	EMCI	EMC184045SE	980656	2021/2/9	2022/2/8
Horn Antenna	SCHWARZBECK	BBHA 9170	00887	2021/4/8	2022/4/7
Microwave Cable	HUBER+SUHNER	SUCOFLEX 102EA	800898/2EA	2021/4/16	2022/4/15
Microwave Cable	HUBER+SUHNER	SUCOFLEX 102EA	800901/2EA	2021/4/16	2022/4/15
Microwave Cable	HUBER+SUHNER	SUCOFLEX 102EA	801027/2EA	2021/4/16	2022/4/15

Test Instruments For POE with 1T1R Mode
Below 30MHz (Test period: 2022/3/31)

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	HUBER+SUHNER	SUCOFLEX 104EA	800056/4EA	2022/3/22	2023/3/21
Loop Antenna	SCHWARZBECK	FMZB 1519B	00215	2021/12/8	2022/12/7

30MHz-1GHz (Test period: 2022/3/31)

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
Microwave Cable	HUBER+SUHNER	SUCOFLEX 104EA	800056/4EA	2022/3/22	2023/3/21
Microwave Cable	HUBER+SUHNER	SUCOFLEX 104	804680/4	2022/3/22	2023/3/21
Microwave Cable	HUBER+SUHNER	SUCOFLEX 104	MY37202/4	2022/3/22	2023/3/21

Above 1GHz (Test period: 2022/3/31)

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	00218930	2021/12/20	2022/12/19
HF-AMP + AC source	EMCI	EMC051845SE	980633	2022/2/16	2023/2/15
HF-AMP + AC source	EMCI	EMC184045SE	980657	2022/2/16	2023/2/15
Horn Antenna	SCHWARZBECK	BBHA 9170	00887	2021/4/8	2022/4/7
Microwave Cable	HUBER+SUHNER	SUCOFLEX 102EA	800898/2EA	2021/4/16	2022/4/15
Microwave Cable	HUBER+SUHNER	SUCOFLEX 102EA	800901/2EA	2021/4/16	2022/4/15
Microwave Cable	HUBER+SUHNER	SUCOFLEX 102EA	801027/2EA	2021/4/16	2022/4/15

Test Instruments For Adapter and POE with 4T4R Mode
Below 30MHz (Test period: 2022/3/3)

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date
Receiver	R&S	ESR7	102109	2021/3/16	2022/3/15
Microwave Cable	HUBER+SUHNER	SUCOFLEX 104EA	800056/4EA	2021/3/17	2022/3/16
Loop Antenna	SCHWARZBECK	FMZB 1519B	00215	2021/12/8	2022/12/7

30MHz-1GHz (Test period: 2022/3/3)

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date
Receiver	R&S	ESR7	102109	2021/3/16	2022/3/15
Bilog Antenna	SCHWARZBECK	VULB-9168	00949	2021/5/30	2022/5/29
LF-AMP	Agilent	8447D	2727A05146	2022/2/16	2023/2/15
Microwave Cable	HUBER+SUHNER	SUCOFLEX 104EA	800056/4EA	2021/3/11	2022/3/10
Microwave Cable	HUBER+SUHNER	SUCOFLEX 104	804680/4	2021/3/11	2022/3/10
Microwave Cable	HUBER+SUHNER	SUCOFLEX 104	MY37202/4	2021/3/11	2022/3/10

Above 1GHz (Test period: 2022/1/12-2022/1/14)

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	00218930	2021/12/20	2022/12/19
HF-AMP + AC source	EMCI	EMC051845SE	980635	2021/2/1	2022/1/31
HF-AMP + AC source	EMCI	EMC184045SE	980656	2021/2/9	2022/2/8
Horn Antenna	SCHWARZBECK	BBHA 9170	00887	2021/4/8	2022/4/7
Microwave Cable	HUBER+SUHNER	SUCOFLEX 102EA	800898/2EA	2021/4/16	2022/4/15
Microwave Cable	HUBER+SUHNER	SUCOFLEX 102EA	800901/2EA	2021/4/16	2022/4/15
Microwave Cable	HUBER+SUHNER	SUCOFLEX 102EA	801027/2EA	2021/4/16	2022/4/15

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.

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Test Results

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

Please refer to Appendix C, D for Adapter and E, F for POE.

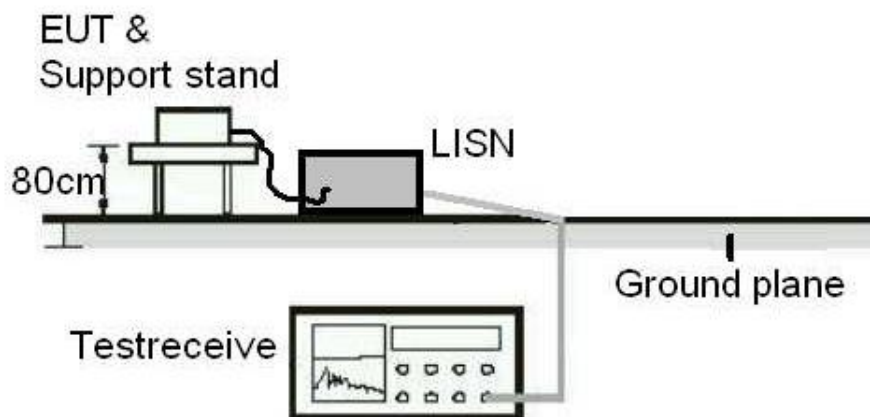
5.2 Mains Emission

5.2.1 Mains Conducted Emission

Limit

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

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
RF Cable	N/A	N/A	EMC-003	2021/3/16	2022/3/15	2022/3/10	2022/3/10
Two-Line V-Network	Rohde & Schwarz	ENV216	101938	2021/9/23	2022/9/22	2022/3/10	2022/3/10
EMI Test Receiver	R&S	ESCI	1816063	2021/11/15	2022/11/14	2022/3/10	2022/3/10

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 C, D for Adapter and E, F for POE.