



Prüfbericht-Nr.: <i>Test report no.:</i>	CN236MY5 (FCC-Colocated) 001	Auftrags-Nr.: <i>Order no.:</i>	48216848	Seite 1 von 20 Page 1 of 20
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	2023-03-13	
Auftraggeber: <i>Client:</i>	Askey Computer Corp. 10F, No. 119, JIANKANG RD. ZHONGHE DIST. NEW TAIPEI CITY			
Prüfgegenstand: <i>Test item:</i>	WIFI 6E Router			
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	RT5035W			
Auftrags-Inhalt: <i>Order content:</i>	Spot Checking Emissions (FCC)			
Prüfgrundlage: <i>Test specification:</i>	FCC 47CFR Part 15: Subpart C Section 15.247 FCC 47CFR Part 15: Subpart E Section 15.407			
Wareneingangsdatum: <i>Date of sample receipt:</i>	2023-03-16			
Prüfmuster-Nr.: <i>Test sample no.:</i>	A003435592-002			
Prüfzeitraum: <i>Testing period:</i>	2023-04-26 - 2023-04-27			
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			
überprüft von: <i>compiled by:</i>		genehmigt von: <i>authorized by:</i>		
Datum: <i>Date:</i> 2023-07-20	Ryan Chen	Ausstellungsdatum: <i>Issue date:</i> 2023-07-20	Brenda Chen	
Stellung / Position:	Senior Project Manager	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
<p>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></p>				

v05

TEST SUMMARY

Report Section	FCC Clause	Test Item	Result
5.1.1	15.247(d) & 15.407(b) & 15.205 & 15.209	Radiated Spurious Emissions and Band Edges	Pass
5.2.1	15.207	Conducted Emissions on a.c. mains port	Pass

Note: Determining compliance based on the results of the compliance measurement without taking into account measurement instrumentation uncertainty.

Contents

HISTORY OF THIS TEST REPORT	4
1. GENERAL REMARKS	5
1.1 COMPLEMENTARY MATERIALS.....	5
1.2 DECISION RULE OF CONFORMITY	5
2. TEST SITES	6
2.1 TEST LABORATORY	6
2.2 TEST FACILITY.....	6
2.3 TRACEABILITY	7
2.4 CALIBRATION	7
2.5 MEASUREMENT UNCERTAINTY	7
3. GENERAL PRODUCT INFORMATION.....	8
3.1 PRODUCT FUNCTION AND INTENDED USE	8
3.2 SYSTEM DETAILS AND RATINGS.....	8
4. TEST SET-UP AND OPERATION MODES.....	10
4.1 PRINCIPLE OF CONFIGURATION SELECTION	10
4.2 TEST OPERATION AND TEST SOFTWARE.....	11
4.3 SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT	12
4.4 TEST SETUP DIAGRAM	13
5. TEST RESULTS	14
5.1 TRANSMITTER REQUIREMENT & TEST SUITES	14
5.1.1 <i>Radiated Spurious Emissions</i>	<i>14</i>
5.2 MAINS EMISSION	19
5.2.1 <i>Conducted Emissions on a.c. mains port</i>	<i>19</i>

APPENDIX A - TEST RESULTS OF RADIATED SPURIOUS EMISSIONS & CONDUCTED EMISSIONS ON A.C. MAINS PORT TEST

APPENDIX SP - PHOTOGRAPHS OF TEST SETUP

APPENDIX EP - PHOTOGRAPHS OF EUT

HISTORY OF THIS TEST REPORT

Revision	Description	Date Issued
R00	Original Release	2023-07-20

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 Results of Radiated Spurious Emissions & Conducted Emissions on a.c. mains port Test

Appendix SP - Photographs of Test Setup

Appendix EP - Photographs of EUT

Applied Standard and Test Levels

Radio
FCC CFR47 Part 15: Subpart C Section 15.247
FCC CFR47 Part 15: Subpart E Section 15.407
FCC CFR47 Part 2: Subpart J Section 2.1091
ANSI C63.10:2013
KDB 558074 D01 15.247 Meas Guidance v05r02
KDB 996369 D04 Module Integration Guide v01

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.: 180491
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 WIFI 6E Router, it is a Wi-Fi router connects devices wirelessly, providing internet access within a specific range. It enables multiple devices to connect simultaneously and may offer additional features like security settings and parental controls.

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	WIFI 6E Router
Type Identification	RT5035W
FCC ID	H8N-RT5035W

Technical Specification of EUT

Item	EUT information
Operating Frequency Range	ISM: 2400 MHz ~ 2483.5 MHz (for WiFi) Other WiFi operating bands: U-NII-1: 5150 MHz ~ 5250 MHz U-NII-2A: 5250 MHz ~ 5350 MHz U-NII-2C: 5470 MHz ~ 5725 MHz U-NII-3: 5725 MHz ~ 5850 MHz U-NII-5: 5925 MHz ~ 6425 MHz U-NII-6: 6425 MHz ~ 6525 MHz U-NII-7: 6525 MHz ~ 6875 MHz U-NII-8: 6875 MHz ~ 7125 MHz
Operation Voltage	Adapter input 100-240 Vac, output 12 Vdc
Modulation	DSSS (DBPSK, DQPSK, CCK) OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) OFDMA (1024QAM)
Antenna Information	Refer to note as below

Note: The antenna list is as below.

ANT	Gain (dBi)									Type	
	2.4 GHz	5GHz				6GHz					
		U-NII-1	U-NII-2A	U-NII-2C	U-NII-3	U-NII-5	U-NII-6	U-NII-7	U-NII-8		
1	2.95	-	-	-	-	-	-	-	-	Dipole	
2	3.20	-	-	-	-	-	-	-	-	Dipole	
3	2.55	-	-	-	-	-	-	-	-	Dipole	
4	3.18	-	-	-	-	-	-	-	-	Dipole	
DB1	-	3.11	4.18	3.71	3.30	-	-	-	-	Dipole	
DB3	-	3.17	4.05	3.75	4.04	-	-	-	-	Dipole	
DB5	-	2.75	4.03	0.89	2.77	-	-	-	-	Dipole	
DB7	-	4.08	4.03	2.35	3.06	-	-	-	-	Dipole	
DB2	-	-	-	-	-	3.17	1.24	2.49	3.04	Dipole	
DB4	-	-	-	-	-	3.08	1.36	2.21	2.08	Dipole	
DB6	-	-	-	-	-	2.63	1.03	1.85	2.95	Dipole	
DB8	-	-	-	-	-	3.01	1.79	2.32	2.49	Dipole	
Max Peak Gain		3.20	4.08	4.18	3.75	4.04	3.17	1.79	2.49	3.04	-
CDD	Power Directional Gain	3.20	4.08	4.18	3.75	4.04	3.17	1.79	2.49	3.04	-
	PSD Directional Gain	5.18	6.01	5.96	4.66	5.92	5.88	4.16	4.46	6.16	-
BFM	Power Directional Gain	5.18	6.01	5.96	4.66	5.92	5.88	4.16	4.46	6.16	-
	PSD Directional Gain	5.18	6.01	5.96	4.66	5.92	5.88	4.16	4.46	6.16	-

Note: The PSD directional gain has been measured, please refer to antenna test report.

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.

4.2 Test Operation and Test Software

Setup for testing: Test samples are provided with LAN(RJ-45) interface connected to the notebook computer and used the Terminal software(Putty) to input the test mode command which makes it possible to control them through a test software(QPST) installed on a notebook computer. This software was running on the laptop computer connected to the EUT.

Test Software	QSPR V5.0-00197
---------------	-----------------

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

EUT Configure Mode	Applicable To		Description
	Radiated Spurious Emissions	Conducted Emissions on a.c. mains port	
-	√	√	-

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. For emission tests, the worst case was the EUT placed in typical used, refer to the photo of test-setup.
3. "-" means no effect.

Radiated Spurious Emissions

Only the worst case of the testing modes was reported.

The EUT configuration is shown as below,

PSU Used	Radio Configurations
Adapter 1	The following radio interfaces were set with the configurations below in continuously transmitting mode. IEEE 802.11ax, HE40, 2452 MHz. IEEE 802.11ax, HE160, 5250 MHz IEEE 802.11ax, HE20, 7115 MHz.

Conducted Emissions on a.c. mains port

Only the worst case of the testing modes was reported.

The EUT configuration is shown as below,

PSU Used	Radio Configurations
Adapter 1	The following radio interfaces were set with the configurations below in continuously transmitting mode. IEEE 802.11ax, HE40, 2452 MHz. IEEE 802.11ax, HE160, 5250 MHz IEEE 802.11ax, HE20, 7115 MHz.

Test Condition

Test Item	Ambient Temperature	Relative Humidity	Tested by
Radiated Spurious Emissions	23.9-24.8 °C	53-54 %	Chuan Chu
Conducted Emissions on a.c. mains port	21.1-24.9 °C	51.7-54.9 %	Ray Huang

4.3 Special Accessories and Auxiliary Equipment

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

Accessory of EUT

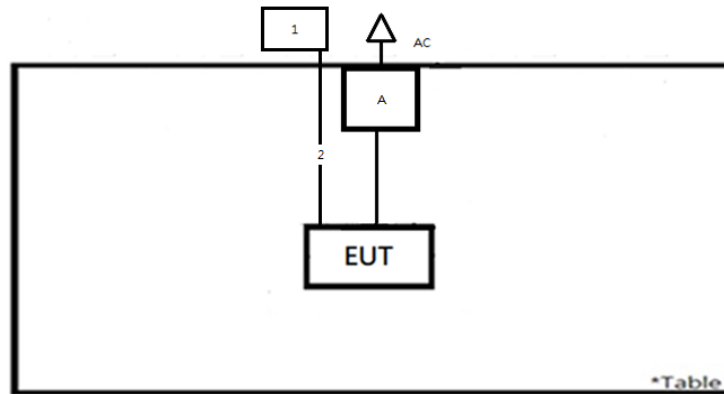
No.	Product	Brand	Model	Description
A	Adapter 1	Frecom	F42L1-120350SPAU	I/P: 100-240 Vac, 50/60 Hz, 1.4 A O/P: 12 Vdc, 3.5 A
-	Adapter 2	Mass Power	S042-1A120350VU	I/P: 100-240 Vac, 50/60 Hz, 1.0 A O/P: 12 Vdc, 3.5 A

Support Unit

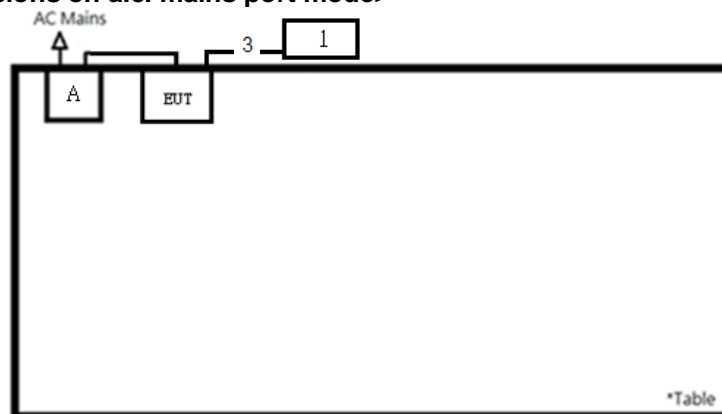
Support Unit								
No	Description	Brand	Model	S/N	Shielded	Ferrite Core (Qty)	Length (cm)	Remark
-	Notebook	HP	9470m	CNU4099WK7	-	-	-	--
1	Notebook	Lenovo	81BL	MP1DCD6Y	-	-	-	--
2	LAN Cable	TUV	TUV-01	NO	NO	NO	1000	--
3	LAN Cable	TUV	TUV-001	NO	NO	NO	300	--

4.4 Test Setup Diagram

<Radiated Spurious Emissions mode>



<Conducted Emissions on a.c. mains port mode>



5. Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Radiated Spurious Emissions

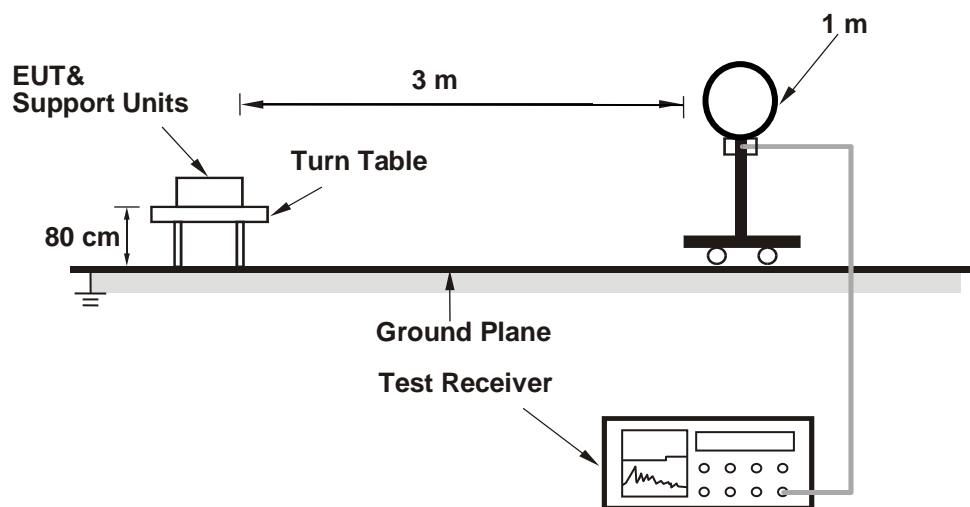
Limit

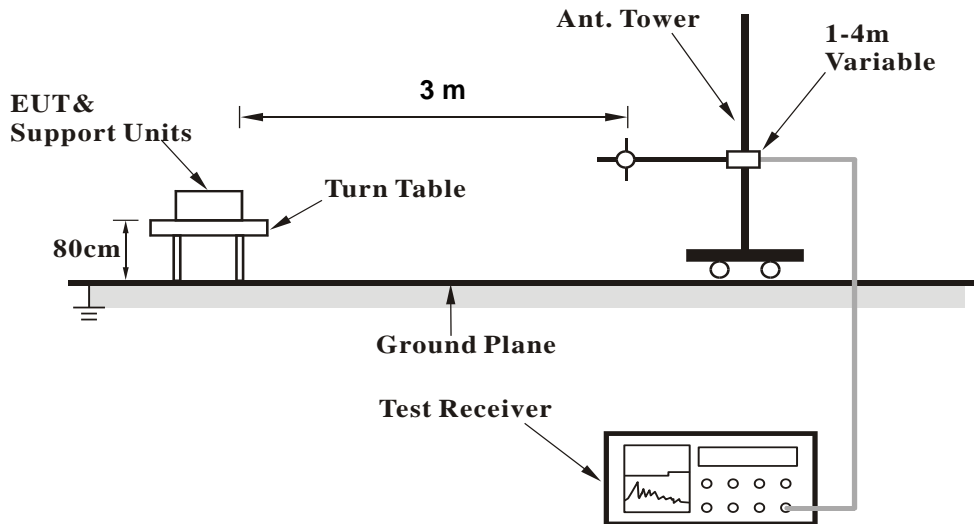
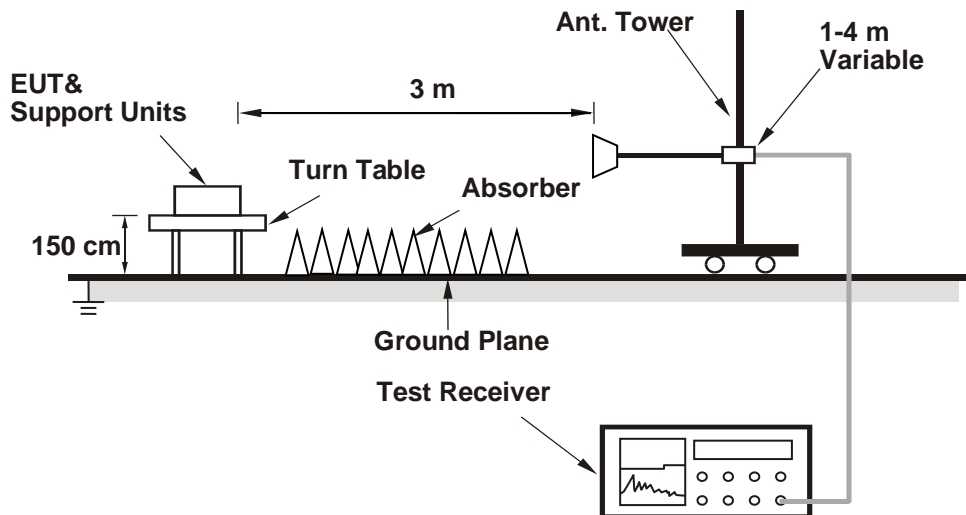
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

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

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date
Above 1 GHz					
Signal Analyzer	R&S	FSV40	101513	2022/5/11	2023/5/10
Horn Antenna	ETS-Lindgren	3117	00218930	2022/12/8	2023/12/7
HF-AMP + AC source	EMCI	EMC051845SE	980633	2023/2/22	2024/2/21
HF-AMP + AC source	EMCI	EMC184045SE	980657	2023/2/16	2024/2/15
Horn Antenna	SCHWARZBECK	BBHA 9170	00887	2023/3/31	2024/3/29
Test Software	Audix E3	15914a_20191106 tuv	PK-001087	N/A	N/A
30 MHz ~ 1 GHz					
Receiver	R&S	ESR7	102109	2023/2/24	2024/2/23
Bilog Antenna	SCHWARZBECK	VULB-9168	00951	2023/3/31	2024/3/29
LF-AMP	Agilent	8447D	2944A107722	2023/3/22	2024/3/20
Test Software	Audix E3	15914a_20191106 tuv	PK-001087	N/A	N/A
Below 30 MHz					
Receiver	R&S	ESR7	102109	2023/2/24	2024/2/23
Loop Antenna	SCHWARZBECK	FMZB 1519B	00215	2023/1/4	2024/1/3
Test Software	Audix E3	15914a_20191106 tuv	PK-001087	N/A	N/A

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, perpendicular, and ground-parallel 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: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9 kHz at frequency below 30 MHz.

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.

Test Results

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

Please refer to Appendix A.

5.2 Mains Emission

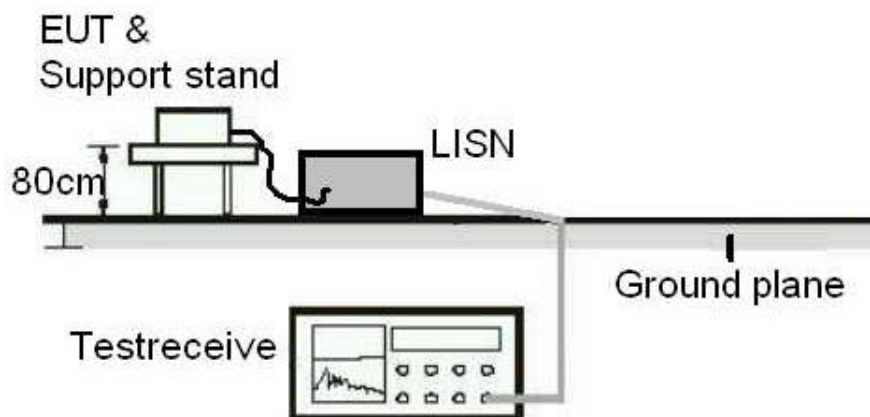
5.2.1 Conducted Emissions on a.c. mains port

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

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date
Two-Line V-Network	Rohde & Schwarz	ENV216	101938	2022/9/22	2023/9/21
EMI Test Receiver	R&S	ESCI	100797	2022/6/19	2023/6/18

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 A.