

Test report no.: <i>Prüfbericht-Nr.:</i>	CN2PS6G 001	Order No.: <i>Auftragsnr.:</i>	168436838	Page 1 of 28 <i>Seite 1 von 28</i>	
Client reference no.: <i>Kunden-Referenz-Nr.:</i>	N/A	Order date: <i>Auftragsdatum:</i>	2023-07-26		
Client: <i>Auftraggeber:</i>	Changsha Langyuan Electronics Technology Co., Ltd. Building A20, Section II, Zhongdian Software Park, No. 18, Jianshan Road, High-tech Development District, Changsha, Hunan, P.R. China				
Test item: <i>Prüfgegenstand:</i>	4K Wireless Conferencing System				
Identification / Type no.: <i>Bezeichnung / Typ-Nr.:</i>	M1S, ST100, TXX1XX(X is a variable, X = A to Z, 0 to 9 or blank)				
Order content: <i>Auftrags-Inhalt:</i>	Test Report				
Test specification <i>Prüfgrundlage:</i>	CFR47 FCC Part 15: Subpart E Section 15.407				
Date of sample receipt: <i>Wareneingangsdatum:</i>	2023-07-30	Please refer to Photo Document			
Test sample no: <i>Prüfmuster-Nr.:</i>	A003521890-003,004 A003534880-001				
Testing period: <i>Prüfzeitraum:</i>	2023-07-30 - 2023-10-08				
Place of testing: <i>Ort der Prüfung:</i>	Refer to section 2.1				
Testing laboratory: <i>Prüflaboratorium:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.				
Test result*: <i>Prüfergebnis*:</i>	Pass				
tested by: <i>geprüft von:</i>			authorized by: <i>genehmigt von:</i>		
Date: 2023-11-21 <i>Datum:</i>	Signed by: Bell Hu		Issue date: 2023-11-21 <i>Ausstellungsdatum:</i>	Signed by: Jonathan Li	
Position / Stellung:	Expert/Sachverständige(r)		Position / Stellung:	Expert/Sachverständige(r)	
Other: <i>Sonstiges:</i>	FCC ID: 2BB9P00001				
Condition of the test item at delivery: <i>Zustand des Prüfgegenstandes bei Anlieferung:</i>			Test item complete and undamaged Prüfmuster vollständig und unbeschädigt		
* Legend: P(ass) = passed a.m. test specification(s) F(ail) = failed a.m. test specification(s) N/A = not applicable N/T = not tested * Legende: P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet					
This test report only relates to the above mentioned 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>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>					

V05

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Remarks
Anmerkungen

- | | |
|----------|--|
| 1 | <p>The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system. Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.</p> <p><i>Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben.</i></p> <p><i>Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden.</i></p> |
| 2 | <p>As contractually agreed, this document has been signed digitally only. TÜV Rheinland has not verified and unable to verify which legal or other pertaining requirements are applicable for this document. Such verification is within the responsibility of the user of this document. Upon request by its client, TÜV Rheinland can confirm the validity of the digital signature by a separate document. Such request shall be addressed to our Sales department. An environmental fee for such additional service will be charged.</p> <p><i>Wie vertraglich vereinbart, wurde dieses Dokument nur digital unterzeichnet. Der TÜV Rheinland hat nicht überprüft, welche rechtlichen oder sonstigen diesbezüglichen Anforderungen für dieses Dokument gelten. Diese Überprüfung liegt in der Verantwortung des Benutzers dieses Dokuments. Auf Verlangen des Kunden kann der TÜV Rheinland die Gültigkeit der digitalen Signatur durch ein gesondertes Dokument bestätigen. Diese Anfrage ist an unseren Vertrieb zu richten. Eine Umweltgebühr für einen solchen zusätzlichen Service wird erhoben.</i></p> |
| 3 | <p>Test clauses with remark of * are subcontracted to qualified subcontractors and described under the respective test clause in the report. Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.</p> <p><i>Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben. Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt.</i></p> |
| 4 | <p>The decision rule for statements of conformity, based on numerical measurement results, in this test report is based on the "Zero Guard Band Rule" and "Simple Acceptance" in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report. For additional information to the resulting risk based of this decision rule please refer to ILAC G8:2019.</p> <p><i>Die Entscheidungsregel für Konformitätserklärungen basierend auf numerischen Messergebnissen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2021, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird. Zu weiteren Informationen bezüglich des Risikos durch diese Entscheidungsregel siehe ILAC G8:2019.</i></p> |

Test Summary

5.1.1 ANTENNA REQUIREMENT

RESULT: Pass

5.1.2 MAXIMUM CONDUCTED OUTPUT POWER

RESULT: Pass

5.1.3 CONDUCTED POWER SPECTRAL DENSITY

RESULT: Pass

5.1.4 FREQUENCY STABILITY

RESULT: Pass

5.1.5 26dB BANDWIDTH AND 99% BANDWIDTH

RESULT: Pass

5.1.6 6dB BANDWIDTH

RESULT: Pass

5.1.7 RADIATED SPURIOUS EMISSION

RESULT: Pass

5.1.8 DYNAMIC FREQUENCY SELECTION (DFS)

RESULT: Pass

5.1.9 CONDUCTED EMISSION ON AC MAINS

RESULT: Pass

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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 5GHz Wi-Fi

Appendix B: Photographs of the Test Set-up

1.2 TEST METHODOLOGY

KDB 789033 D02 General U-NII Test Procedures New Rules.

KDB 905462 D02 UNII DFS Compliance Procedures New Rules.

KDB 905462 D03 Client without DFS New Rules.

KDB 905462 D04 Test Mode New Rules.

KDB 662911 D01 Multiple Transmitter Output

ANSI C63.10:2013: American National Standard for Testing Unlicensed Wireless Devices

2 Test Sites

2.1 Test Facilities

TÜV Rheinland (Shenzhen) Co., Ltd.

No.362, Huanguan Middle Road, Songyuansha Community, Guanhu Subdistrict, Longhua District, Shenzhen 518110, Guangdong, China

FCC Registration No.: 694916

ISED wireless device testing laboratory: 25069

TÜV Rheinland (Guangdong) Ltd. EMC Laboratory

No.102, 1F of Southwest and No.205, 2F of West Warehouse Building, No.767 Tianyuan Road, Tianhe District, Guangzhou, Guangdong, P.R.China

FCC Registration No.: CN1207

ISED wireless device testing laboratory: 2932C

Note: Except for AC power-line conducted emissions, all test items performed in TÜV Rheinland (Shenzhen) Co., Ltd.

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Radio Spectrum Testing (SRD-Tonscend)				
Equipment	Manufacturer	Model	Serial No.	Cal. until
EXA Signal Analyzer, Multi-touch	Keysight	N9010B	MY60241175	10.10.2023
MXG X-Series RF Vector Signal Generator	Keysight	N5182B	MY61250137	10.10.2023
EXG X-Series Microwave Analog Signal Generator	Keysight	N5173B	MY61250141	10.10.2023
DC Power Supply	Keysight	E3642A	MY61276100	10.10.2023
Wireless Connectivity Tester	R&S	CMW270	102505	10.10.2023
Power Control Unit	Tonscend	JS0806-4ADC	N/A	10.10.2023
Automation Control Unit	Tonscend	JS0806-2	21C8060396	10.10.2023
Test Software	Tonscend	JS1120-3	N/A	N/A
Control PC	Lenovo	TianYi510S-071MB	Y LX23JMF	N/A
OSP	R&S	OSP 150	101017	2023-11-21
Shielding Room 8#	Albatross	SR8	APC17151-SR8	2024-06-22
Unwanted Emission Testing (TS8996)				
Equipment	Manufacturer	Model	Serial No.	Cal. until
Signal Generator	R&S	SMB100A	180840	25.07.2024
Wideband Radio Communication Tester	R&S	CMW500	165339	25.07.2024
Signal Analyzer	R&S	FSV 40	101440	05.08.2024
System Controller Interface	R&S	SCI-100	S10010036	N/A

Filterbank	R&S	GSM	100811	25.07.2024
OSP	R&S	OSP 120	102041	N/A
OSP	R&S	OSP 150	101385	21.11.2023
Pre-amplifier	R&S	SCU08F1	08320030	25.07.2024
Amplifier	R&S	SCU-18F	180079	25.07.2024
Amplifier	R&S	SCU40A	100450	25.07.2024
Trilog Broadband Antenna (30 MHz - 7 GHz)	Schwarzbeck	VULB 9162	192	06.08.2024
Double-Ridged Antenna (1 - 18 GHz)	ETS-LINDGREN	3117	00218719	06.08.2024
Wideband Ridged Horn Antenna (12-18 GHz)	Steatite	QMS-00208	18312	06.08.2024
Wideband Ridged Horn Antenna (18-40 GHz)	Steatite	QMS-00880	19066	27.08.2024
Biconical Broadband Antenna (30 MHz - 1 GHz)	Schwarzbeck	VUBA 9117	357	02.08.2024
Double Ridged Broadband Horn Antenna (1 – 18 GHz)	Schwarzbeck	BBHA 9120 D	01760	30.07.2024
Broadband Horn Antenna (15 – 40 GHz)	Schwarzbeck	BBHA 9170	00862	02.08.2024
Test software	R&S	EMC32 (V10.50.40)	N/A	N/A
Control PC	Dell	OptiPlex 7050	36NW9P2	N/A
3m Fully Anechoic Chamber	Albatross	FAC-3m	APC17151-FAC	22.06.2024

Conducted Emission

Equipment	Manufacturer	Model No.	Serial No.	Cal. Until
EMI Test Receiver	Rohde&Schwarz	ESCI 3	100216	2024-03-04
Two-Line V-Network	Rohde&Schwarz	ENV216	100195	2024-06-09
EMC32 test software	R&S	EMC32(Ver.10.50.00)	N/A	N/A

2.3 Traceability

All measurement equipment calibrations are traceable to NIM (National Institute of Metrology) or where calibration is performed in other countries, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

2.5 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements as below table.

Parameter	Uncertainty (k=2)
RF output power, conducted	± 0.99 dB
Occupied Channel Bandwidth	± 2.08 %
RF power density, conducted	± 0.99 dB
Unwanted Emissions, conducted	± 0.89 dB
All emissions, radiated	± 4.17 dB
Conducted Emission, (9kHz to 150kHz)/(150kHz to 30MHz)	± 3.70 dB / ± 3.30 dB

2.6 Location of Original Data

The original copies of all test data taken during actual testing were attached at Appendix A & B of this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Shenzhen) Co., Ltd. File for certification follow-up purposes.

2.7 Status of Facility Used for Testing

The TÜV Rheinland (Shenzhen) Co., Ltd. Test facility located at No.362, Huanguan Middle Road, Songyuansha Community, Guanhu Subdistrict, Longhua District, Shenzhen 518110, Guangdong, China is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

3 General Product Information

3.1 Product Function and Intended Use

The Product is 4K Wireless Conferencing System which supports 5GHz Wi-Fi functions.

There are multiple models included in this product, all of them are electrically identical, only named differently for market purpose.

For details refer to the User Manual, Technical Description and Circuit Diagram.

3.2 Ratings and System Details

Table 2: Technical Specification of EUT

General Information of EUT	Value
Kind of Equipment:	4K Wireless Conferencing System
Type Designation:	M1S, ST100, TXX1XX (X is a variable, X = A to Z, 0 to 9 or blank)
Operating Voltage:	DC 5V
Testing Voltage:	DC 5V
Operating Temperature Range:	0 °C ~ +40 °C
FCC ID:	2BB9P00001
Technical Specification of Wi-Fi 802.11 a/n/ac	
Operating Frequency:	5180-5320MHz, 5500-5720MHz, 5745-5825MHz
Type of Modulation:	802.11n/a: BPSK, QPSK, 16QAM, 64QAM 802.11ac: BPSK, QPSK, 16QAM, 64QAM, 256QAM
Protocol:	802.11 a/n20/n40/ac20/ac40/ac80
Data Rate:	6/9/12/18/24/36/48/54 Mbps for 802.11a MCS0~MCS7 for 802.11n MCS0~MCS9 for 802.11ac (All data rates considered, only the Worst-cases reported)
Channel Separation	5 MHz
Antenna Type:	Integral Antenna
Number of Antenna:	2
Antenna Gain:	5.3 dBi Max (As detailed in Antenna spec)
Type of Device	Slave Device without Radar Detection
Note: WLAN 5GHz 802.11n/802.11ac. For directional gain: Array Gain = $10 \log(NANT/NSS)$ dB. So the Directional gain = GANT + $10 \log(NANT)$ dBi (The worst case directional gain will occur when NSS = 1).	

Table 3: RF Channel and Frequency of 5GHz Wi-Fi 802.11 a/n/ac

U-NII-1					
20MHz Bandwidth		40MHz Bandwidth		80MHz Bandwidth	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	38	5190	42	5210
40	5200	46	5230		
44	5220				
48	5240				

U-NII-2A					
20MHz Bandwidth		40MHz Bandwidth		80MHz Bandwidth	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
52	5260	54	5270	58	5290
56	5280	62	5310		
60	5300				
64	5320				

U-NII-2C					
20MHz Bandwidth		40MHz Bandwidth		80MHz Bandwidth	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
100	5500	102	5510	106	5530
104	5520	110	5550	122	5610
108	5540	118	5590	138	5690
112	5560	126	5630		
116	5580	134	5670		
120	5600	142	5710		
124	5620				
128	5640				
132	5660				
136	5680				
140	5700				
144	5720				

U-NII-3					
20MHz Bandwidth		40MHz Bandwidth		80MHz Bandwidth	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	151	5755	155	5775
153	5765	159	5795		
157	5785				
161	5805				
165	5825				

3.3 Independent Operation Modes

The basic operation modes are:

- A. On, Wi-Fi 802.11 a/n/ac wireless transmitting mode
 - 1. Low channel
 - 2. Middle channel
 - 3. High channel
- B. On, Normal operation with Wi-Fi connected.
- C. Off

3.4 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

3.5 Submitted Documents

- | | |
|------------------------------|-------------------------|
| - Application Form | - User Manual |
| - ID Label and Location Info | - Operation Description |

4 Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

Radio Spectrum: The equipment under test (EUT) was configured at its highest power output in order to measure its highest possible radiation and conducted level. The test modes were adapted accordingly in reference to the instructions for use.

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Test operation refers to test setup in chapter 5. All tests were performed according to the procedures in ANSI C63.10: 2013.

According to clause 3.1, all tests were performed on model M1S in this report.

4.3 Special Accessories and Auxiliary Equipment

Table 4: List of Accessories and Auxiliary Equipment

Description	Manufacturer	Model	Remark
Laptop	Lenovo	T480	SN: PF-16A6N8
Monitor	Lenovo	T24s-20	1S62A5MCR4CSULA20286
Router	HUAWEI	WS7200	L5KEQ20B02002259
Adapter	SAMSUNG	EP-TA845	Input: 100-240V AC, 50/60Hz, 1.2A Output: DC 5V, 3A
PC	Lenovo	T14	PF-35VTG1
Monitor	Lenovo	T24s-20	1S62A5MCR4CSULA20286
4K Wireless Conferencing System	Changsha Langyuan Electronics Technology Co., Ltd.	R1C	N/A

4.4 Countermeasures to Achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Technical Construction File (TCF).

No additional measures were employed to achieve compliance.

4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test (Below 1GHz)

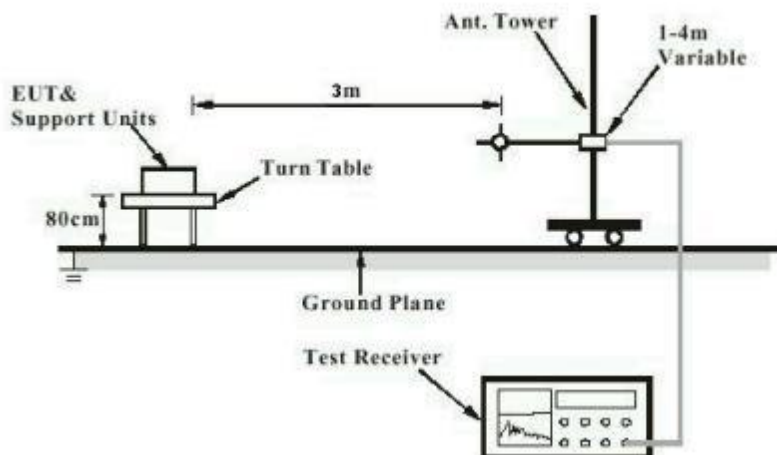


Diagram of Measurement Configuration for Radiation Test (Above 1GHz)

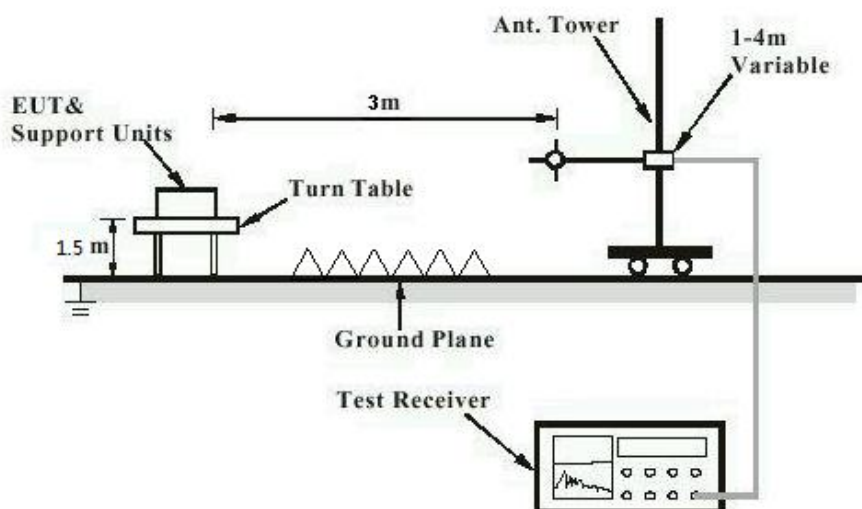


Diagram of Measurement Configuration for Mains Conduction Measurement

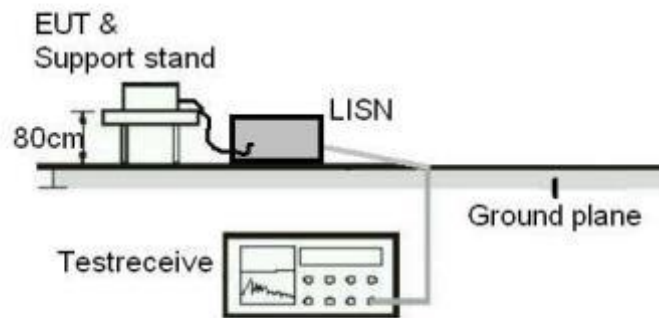


Diagram of Measurement Configuration for Conducted Transmitter Measurement

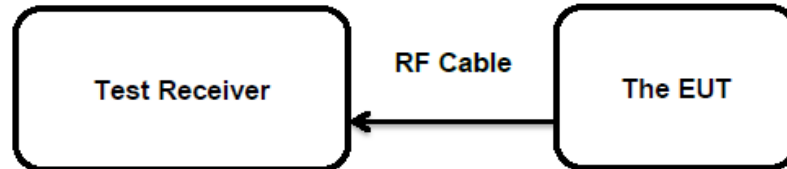
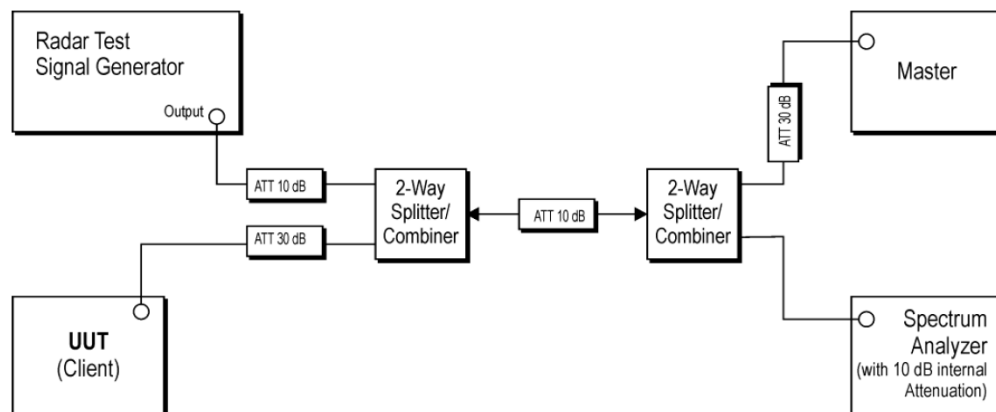


Diagram of Measurement Configuration for Dynamic Frequency Selection (DFS)



5 Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

RESULT:

Pass

Test Specification

Test standard : FCC Part 15.203

The EUT have integral Antennas, the Maximum antenna gain of antenna is 5.3 dBi, and permanently attached, no consideration of replacement.

Therefore, the EUT is considered sufficient to comply with the provision.

Refer to EUT Photo for further details.

5.1.2 Maximum Conducted Output Power

RESULT:**Pass****Test Specification**

Test standard	: FCC Part 15.407(a)(1)&(2)&(4)
Basic standard	: ANSI C63.10: 2013
Limits	: FCC: <250mW (23.98dBm) (5150-5250MHz) *<250mW (23.98dBm) (5250-5350MHz, 5470-5725MHz) *250 mW (23.98dBm) or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz, where is lesser. <1W (30dBm) (5725-5850MHz)
Kind of test site	: Shielded Room

Test Setup

Date of testing	: 2023-08-02 to 2023-10-08
Input voltage	: DC 5V
Operation mode	: A
Test channel	: Low / Middle / High
Ambient temperature	: 24.1 °C
Relative humidity	: 61 %
Atmospheric pressure	: 101 kPa

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
11A	Ant1	5180	13.25	≤23.98	PASS
	Ant2	5180	17.11	≤23.98	PASS
	Ant1	5200	13.54	≤23.98	PASS
	Ant2	5200	17.02	≤23.98	PASS
	Ant1	5240	13.29	≤23.98	PASS
	Ant2	5240	16.00	≤23.98	PASS
	Ant1	5260	12.76	≤23.98	PASS
	Ant2	5260	15.53	≤23.98	PASS
	Ant1	5280	12.70	≤23.98	PASS
	Ant2	5280	15.42	≤23.98	PASS
	Ant1	5320	9.70	≤23.98	PASS
	Ant2	5320	11.69	≤23.98	PASS
	Ant1	5500	5.79	≤23.98	PASS
	Ant2	5500	10.11	≤23.98	PASS
	Ant1	5580	9.81	≤23.98	PASS
	Ant2	5580	14.37	≤23.98	PASS
	Ant1	5700	9.52	≤23.98	PASS
	Ant2	5700	14.67	≤23.98	PASS
	Ant1	5720	7.07	≤23.98	PASS
	Ant2	5720	13.16	≤23.98	PASS
	Ant1	5745	13.75	≤30.00	PASS
	Ant2	5745	17.12	≤30.00	PASS
	Ant1	5785	11.66	≤30.00	PASS
	Ant2	5785	15.25	≤30.00	PASS
11N20MIMO	Ant1	5825	13.89	≤30.00	PASS
	Ant2	5825	17.39	≤30.00	PASS
	Ant1	5180	11.94	≤23.98	PASS
	Ant2	5180	15.45	≤23.98	PASS
	total	5180	17.05	≤21.68	PASS
	Ant1	5200	12.07	≤23.98	PASS
	Ant2	5200	15.00	≤23.98	PASS
	total	5200	16.79	≤21.68	PASS
	Ant1	5240	11.91	≤23.98	PASS
	Ant2	5240	14.48	≤23.98	PASS
	total	5240	16.39	≤21.68	PASS
	Ant1	5260	11.52	≤23.98	PASS
	Ant2	5260	13.83	≤23.98	PASS
	total	5260	15.84	≤21.68	PASS
	Ant1	5280	7.06	≤23.98	PASS
	Ant2	5280	9.19	≤23.98	PASS
	total	5280	11.26	≤21.68	PASS
	Ant1	5320	6.82	≤23.98	PASS
	Ant2	5320	8.99	≤23.98	PASS
	total	5320	11.05	≤21.68	PASS
	Ant1	5500	4.34	≤23.98	PASS
	Ant2	5500	9.17	≤23.98	PASS
	total	5500	10.40	≤21.68	PASS
	Ant1	5580	8.92	≤23.98	PASS
	Ant2	5580	13.67	≤23.98	PASS
	total	5580	14.92	≤21.68	PASS
	Ant1	5700	9.05	≤23.98	PASS
	Ant2	5700	14.00	≤23.98	PASS
	total	5700	15.21	≤21.68	PASS
	Ant1	5720	6.10	≤23.98	PASS
	Ant2	5720	12.09	≤23.98	PASS
	total	5720	13.07	≤21.68	PASS
	Ant1	5745	12.59	≤30.00	PASS
	Ant2	5745	16.02	≤30.00	PASS
	total	5745	17.65	≤27.70	PASS
	Ant1	5785	12.96	≤30.00	PASS

	Ant2	5785	16.57	≤30.00	PASS
	total	5785	18.14	≤27.70	PASS
	Ant1	5825	13.31	≤30.00	PASS
	Ant2	5825	16.66	≤30.00	PASS
	total	5825	18.31	≤27.70	PASS
11N40MIMO	Ant1	5190	11.64	≤23.98	PASS
	Ant2	5190	14.93	≤23.98	PASS
	total	5190	16.60	≤21.68	PASS
	Ant1	5230	12.64	≤23.98	PASS
	Ant2	5230	15.07	≤23.98	PASS
	total	5230	17.03	≤21.68	PASS
	Ant1	5270	11.93	≤23.98	PASS
	Ant2	5270	14.40	≤23.98	PASS
	total	5270	16.35	≤21.68	PASS
	Ant1	5310	5.51	≤23.98	PASS
	Ant2	5310	6.13	≤23.98	PASS
	total	5310	8.84	≤21.68	PASS
	Ant1	5510	2.08	≤23.98	PASS
	Ant2	5510	7.35	≤23.98	PASS
	total	5510	8.48	≤21.68	PASS
	Ant1	5550	10.81	≤23.98	PASS
	Ant2	5550	15.43	≤23.98	PASS
	total	5550	16.72	≤21.68	PASS
	Ant1	5670	9.99	≤23.98	PASS
	Ant2	5670	15.22	≤23.98	PASS
	total	5670	16.36	≤21.68	PASS
	Ant1	5710	9.67	≤23.98	PASS
	Ant2	5710	15.17	≤23.98	PASS
	total	5710	16.25	≤21.68	PASS
	Ant1	5755	13.18	≤30.00	PASS
	Ant2	5755	16.22	≤30.00	PASS
	total	5755	17.97	≤27.70	PASS
	Ant1	5795	13.49	≤30.00	PASS
	Ant2	5795	16.76	≤30.00	PASS
	total	5795	18.44	≤27.70	PASS
11AC20MIMO	Ant1	5180	12.18	≤23.98	PASS
	Ant2	5180	16.17	≤23.98	PASS
	total	5180	17.63	≤21.68	PASS
	Ant1	5200	12.49	≤23.98	PASS
	Ant2	5200	15.91	≤23.98	PASS
	total	5200	17.54	≤21.68	PASS
	Ant1	5240	12.24	≤23.98	PASS
	Ant2	5240	14.98	≤23.98	PASS
	total	5240	16.83	≤21.68	PASS
	Ant1	5260	11.73	≤23.98	PASS
	Ant2	5260	14.17	≤23.98	PASS
	total	5260	16.13	≤21.68	PASS
	Ant1	5280	7.45	≤23.98	PASS
	Ant2	5280	9.62	≤23.98	PASS
	total	5280	11.68	≤21.68	PASS
	Ant1	5320	6.96	≤23.98	PASS
	Ant2	5320	9.32	≤23.98	PASS
	total	5320	11.31	≤21.68	PASS
	Ant1	5500	4.63	≤23.98	PASS
	Ant2	5500	9.38	≤23.98	PASS
	total	5500	10.63	≤21.68	PASS
	Ant1	5580	9.27	≤23.98	PASS
	Ant2	5580	14.11	≤23.98	PASS
	total	5580	15.34	≤21.68	PASS
	Ant1	5700	9.37	≤23.98	PASS
	Ant2	5700	14.47	≤23.98	PASS
	total	5700	15.64	≤21.68	PASS

	Ant1	5720	6.09	≤23.98	PASS
	Ant2	5720	12.28	≤23.98	PASS
	total	5720	13.22	≤21.68	PASS
	Ant1	5745	12.92	≤30.00	PASS
	Ant2	5745	16.18	≤30.00	PASS
	total	5745	17.86	≤27.70	PASS
	Ant1	5785	13.26	≤30.00	PASS
	Ant2	5785	16.94	≤30.00	PASS
	total	5785	18.49	≤27.70	PASS
	Ant1	5825	13.52	≤30.00	PASS
	Ant2	5825	17.12	≤30.00	PASS
	total	5825	18.69	≤27.70	PASS
11AC40MIMO	Ant1	5190	11.81	≤23.98	PASS
	Ant2	5190	15.00	≤23.98	PASS
	total	5190	16.70	≤21.68	PASS
	Ant1	5230	12.29	≤23.98	PASS
	Ant2	5230	14.72	≤23.98	PASS
	total	5230	16.68	≤21.68	PASS
	Ant1	5270	12.10	≤23.98	PASS
	Ant2	5270	14.15	≤23.98	PASS
	total	5270	16.26	≤21.68	PASS
	Ant1	5310	5.44	≤23.98	PASS
	Ant2	5310	7.47	≤23.98	PASS
	total	5310	9.58	≤21.68	PASS
	Ant1	5510	2.97	≤23.98	PASS
	Ant2	5510	6.52	≤23.98	PASS
	total	5510	8.11	≤21.68	PASS
	Ant1	5550	10.59	≤23.98	PASS
	Ant2	5550	14.13	≤23.98	PASS
	total	5550	15.72	≤21.68	PASS
	Ant1	5670	9.80	≤23.98	PASS
	Ant2	5670	14.19	≤23.98	PASS
	total	5670	15.54	≤21.68	PASS
	Ant1	5710	9.72	≤23.98	PASS
	Ant2	5710	14.86	≤23.98	PASS
	total	5710	16.02	≤21.68	PASS
	Ant1	5755	13.08	≤30.00	PASS
	Ant2	5755	15.40	≤30.00	PASS
	total	5755	17.40	≤27.70	PASS
	Ant1	5795	13.32	≤30.00	PASS
	Ant2	5795	15.95	≤30.00	PASS
	total	5795	17.84	≤27.70	PASS
11AC80MIMO	Ant1	5210	11.45	≤23.98	PASS
	Ant2	5210	13.78	≤23.98	PASS
	total	5210	15.78	≤21.68	PASS
	Ant1	5290	7.66	≤23.98	PASS
	Ant2	5290	10.03	≤23.98	PASS
	total	5290	12.02	≤21.68	PASS
	Ant1	5530	3.02	≤23.98	PASS
	Ant2	5530	7.78	≤23.98	PASS
	total	5530	9.03	≤21.68	PASS
	Ant1	5610	8.98	≤23.98	PASS
	Ant2	5610	11.92	≤23.98	PASS
	total	5610	13.70	≤21.68	PASS
	Ant1	5690	9.18	≤23.98	PASS
	Ant2	5690	13.31	≤23.98	PASS
	total	5690	14.73	≤21.68	PASS
	Ant1	5775	11.70	≤30.00	PASS
	Ant2	5775	15.08	≤30.00	PASS
	total	5775	16.72	≤27.70	PASS

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*For the WLAN 5GHz 802.11n/802.11ac/802.11ax, the directional gain is 8.3dBi for MIMO mode, thus the power limit should be reduced by 2.3dB.

The Duty Cycle Factor is compensated in the tables.

TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW(27dBm) in DFS bands.

Both SISO and MIMO tested, only the higher power mode MIMO reported.

Antenna gain(G): 5.3 dBi

e.i.r.p.=P(Average power)+ G (directional gain)

5.1.3 Conducted Power Spectral Density

RESULT:**Pass****Test Specification**

Test standard	: FCC part 15.407(a)
Basic standard	: ANSI C63.10: 2013 KDB 789033 D02 v01r03
Limits	: FCC: <11dBm/MHz (5150-5250MHz 5250-5350MHz, 5470-5725MHz) <30dBm/500KHz (5725-5850MHz)
Kind of test site	: Shielded Room

Test Setup

Date of testing	: 2023-08-02 to 2023-10-08
Input voltage	: DC 5V
Operation mode	: A
Test channel	: Low / Middle / High
Ambient temperature	: 24.1 °C
Relative humidity	: 61 %
Atmospheric pressure	: 101 kPa

For the measurement records, refer to the appendix A.

5.1.4 Frequency Stability

RESULT:

Pass

Test Specification

Test standard	: FCC Part 15.407(g)
Basic standard	: ANSI C63.10: 2013
Limits	: Within assigned bands
Kind of test site	: Shielded Room

Test Setup

Date of testing	: 2023-08-02 to 2023-09-03
Input voltage	: DC 5V
Operation mode	: A
Test channel	: Low / Middle / High
Ambient temperature	: 24.1 °C
Relative humidity	: 61 %
Atmospheric pressure	: 101 kPa

For the measurement records, refer to the appendix A.

5.1.5 26dB Bandwidth and 99% Bandwidth

RESULT:

Pass

Test Specification

Test standard : FCC Part 15.407(e)
Basic standard : ANSI C63.10: 2013
Limits : N/A
Kind of test site : Shielded Room

Test Setup

Date of testing : 2023-08-02 to 2023-10-08
Input voltage : DC 5V
Operation mode : A
Test channel : Low / Middle / High
Ambient temperature : 24.1 °C
Relative humidity : 61 %
Atmospheric pressure : 101 kPa

For the measurement records, refer to the appendix A.

5.1.6 6dB Bandwidth

RESULT:

Pass

Test Specification

Test standard	: FCC Part 15.407(e)
Basic standard	: ANSI C63.10: 2013
Limits	: At least 500KHz (5725-5850MHz)
Kind of test site	: Shielded Room

Test Setup

Date of testing	: 2023-08-02 to 2023-09-03
Input voltage	: DC 5V
Operation mode	: A
Test channel	: Low / Middle / High
Ambient temperature	: 24.1 °C
Relative humidity	: 61 %
Atmospheric pressure	: 101 kPa

For the measurement records, refer to the appendix A.

5.1.7 Radiated Spurious Emission

RESULT:**Pass****Test Specification**

Test standard : FCC Part 15.407(b) & FCC Part 15.205 & FCC Part 15.209
Basic standard : ANSI C63.10: 2013
KDB 789033 D02 v01r03

Limits :

- For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
Emissions outside the band 5470-5600 MHz and 5650-5725 MHz shall not exceed -27 dBm/MHz e.i.r.p.
- For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

Kind of test site : 3m Semi-anechoic Chamber

Test Setup

Date of testing : 2023-08-02 to 2023-09-03
Input voltage : DC 5V
Operation mode : A
Test channel : Low / Middle / High
Ambient temperature : Refer to test result
Relative humidity : Refer to test result
Atmospheric pressure : 101 kPa

Remark:

Testing was carried out within frequency range 9kHz to the tenth harmonics. Only the worst case spurious emissions configuration of the each mode were reported.

For the measurement records, refer to the appendix A.

5.1.8 Dynamic Frequency Selection (DFS)

RESULT:**Pass****Test Specification**

Test standard	: FCC Part 15.407(h) RSS-247 clause 6.3
Basic standard	: ANSI C63.10: 2013
Limits	: 5250-5350MHz, 5470-5725MHz Channel Move Time: Within 10 seconds. Channel Closing Transmission Time: 200ms+aggregate of 60ms over remaining 10s period; Non-Occupancy Period: at least 30 minutes.
Kind of test site	: Shielded Room

Test Setup

Date of testing	: 2023-08-02 to 2023-09-03
Input voltage	: DC 5V
Operation mode	: A
Test channel	: CH 58, CH 106
Ambient temperature	: 24.1 °C
Relative humidity	: 61 %
Atmospheric pressure	: 101 kPa

For the measurement records, refer to the appendix A.

5.1.9 Conducted Emission on AC Mains

RESULT:**Pass****Test Specification**

Test standard	: FCC Part 15.207(a)
Basic standard	: ANSI C63.10: 2013
Frequency range	: 0.15 – 30MHz
Limits	: FCC Part 15.207(a) RSS-Gen Table 4
Kind of test site	: Shielded Room

Test Setup

Date of testing	: 2023-08-02 to 2023-09-03
Input voltage	: DC 5V via AC/DC Adapter
Operation mode	: B
Earthing	: Not connected
Ambient temperature	: 23.2 °C
Relative humidity	: 50.6 %
Atmospheric pressure	: 101 kPa

For the measurement records, refer to the appendix A.

6 Photographs of the Test Set-Up

For photographs of the test set-up, refer to the appendix B.

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