



TEST REPORT

REPORT NUMBER: I23W00054-EMC-Rev1

ON

Type of Equipment: 5G CPE

Type of Designation: PW550, PW571, PW512, JW515, PW550-NA

Brand Name: ATEL

Manufacturer: Asiatelco Technologies Co.

ACCORDING TO

Subpart B, PART 15, RADIO FREQUENCY DEVICES, ANSI C63.4-2014,

Chongqing Academy of Information and Communications Technology

Month date, year
October 17, 2023

Signature



Xiang Luoyong
Director

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of Chongqing Academy of Information and Communications Technology.



Report No.: I23W00054-EMC-Rev1

Revision Version

Report Number	Revision	Date
I23W00054-EMC	00	2023-09-26
I23W00054-EMC	Rev1	2023-10-17

Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
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CONTENTS

1.	Test Laboratory.....	4
1.1.	Testing Location.....	4
1.2.	Testing Environment	4
1.3.	Project data	4
1.4.	Signature.....	4
2.	Client Information	5
2.1.	Applicant Information.....	5
2.2.	Manufacturer Information	5
3.	Equipment under Test (EUT) and Ancillary Equipment (AE).....	6
3.1.	About EUT	6
3.2.	Internal Identification of EUT used during the test	6
3.3.	Internal Identification of AE used during the test	6
4.	Reference Documents	7
4.1.	Reference Documents for testing	7
5.	Test Equipment Utilized	8
6.	Test Results.....	9
6.1.	Summary of Test Results.....	9
7.	Test Results.....	10
7.1.	Radiated Emission	10
7.2.	Conducted Emission	16
	Annex A EUT Photos.....	19
	Annex B Deviations from Prescribed Test Methods.....	20

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1. Test Laboratory

1.1. Testing Location

Name:	Chongqing Academy of Information and Communications Technology
FCC Registration Number:	CN1239
Address:	Building C, Technology Innovation Center, No.8, Yuma Road, Chayuan New Area, Nan'an District, Chongqing, People's Republic of China
Postal Code:	401336
Telephone:	0086-23-88069965
Fax:	0086-23-88608777

1.2. Testing Environment

Normal Temperature:	15-35°C
Relative Humidity:	25-75%RH

1.3. Project data

Testing Start Date:	2023-09-05
Testing End Date:	2023-09-25

1.4. Signature



2023-10-17

Tan Haoyue
(Prepared this test report)

Date

2023-10-17

Xiao Yu
(Reviewed this test report)

Date

2023-10-17

Xiang Luoyong Director of the
laboratory (Approved this test report)

Date

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2. Client Information

2.1. Applicant Information

Company Name:	Asiatelco Technologies Co.
Address /Post:	#68 HuaTuo Road, Building-8, Zhangjiang Hi-Tech Park, Pudong, Shanghai 201204, China
City:	Shanghai
Country:	China
Telephone:	N/A
Fax:	N/A
Email:	xsfbng@asiatelco.com
Contact Person:	xiaosheng.feng

2.2. Manufacturer Information

Company Name:	Asiatelco Technologies Co.
Address /Post:	#68 HuaTuo Road, Building-8, Zhangjiang Hi-Tech Park, Pudong, Shanghai 201204, China
City:	Shanghai
Country:	China
Telephone:	N/A
Fax:	N/A
Email:	xsfbng@asiatelco.com
Contact Person:	xiaosheng.feng

3. Equipment under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

EUT Description	5G CPE
Model name	PW550, PW571,PW512,JW515, PW550-NA
Brand name	ATEL
UMTS Frequency Band	WCDMA Band II/ IV/ V
LTE Frequency Band	LTE Band 2/4/5/7/12/13/14/17/25/26/29/30/41/46/48/66/71
NR Frequency Band	n2/5/7/12/14/25/30/41/66/71/77/78
Additional Communication Function	BT5.0

Note: Photographs of EUT are shown in ANNEX B of this test report.

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version	Date of receipt
S1	N/A	PW55-P1	CPE5_PW550_N0_00_v1.0.2	2023-09-13

*EUT ID: is used to identify the test sample in the lab internally.

3.3. Internal Identification of AE used during the test

AE ID*	Description	Model
CA01	Adapter	ASSA49E-200150
CB01	Adapter	G024C2401000U
EC01	Gigabit PoE	N/A
UB01	LAN Cable	N/A
AE1	Notebook PC	HUAWEI MateBook 13
AE2	LAN Cable	N/A

*AE ID: is used to identify the test sample in the lab internally.

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4. Reference Documents

4.1. Reference Documents for testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
FCC CFR Part 15, Subpart B	Radio frequency devices	October 01, 2021
ANSI C63.4	Method of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2014

5. Test Equipment Utilized

No.	Equipment	Model	SN	HW Version	SW Version	Manufacture	Cal. Interval	Cal.Due Date
1	Universal Radio Communication Tester	CMW500	102105	--	--	R&S	1 Year	2024-06-28
2	Test Receiver	ESR 3	101382	03	3.48 SP2	R&S	1 Year	2024-01-28
3	Test Receiver	ESW 26	101382	00	1.50 SP1	R&S	1 Year	2024-06-28
4	Ultra-wideband Log Periodic Antenna	VULB9163	9163-586	--	--	Schwarzbeck	2 Years	2024-10-28
5	Double Ridged Guide Antenna	9120D	1083	--	--	R&S	2 Years	2024-12-14
6	2-Line V-Network	ENV216	102368	--	--	R&S	1 Year	2024-05-27
7	Test Receiver	ESU 40	100350	01	4.43 SP3	R&S	1 Year	2024-06-28
8	Vector signal generator	SMB100A	105319	--	--	R&S	1 Year	2024-06-28
9	Universal Radio Communication Tester	SP9500	SP9500-20699	--	--	STAR-POINT	1 Year	2024-06-28

Test software

No.	Name	version	SN	Manufacture
1	EMC32 (RE Below 1GHz)	V9.26.01	--	R&S
2	EMC32 (RE Above 1GHz)	V 10.20.01	--	R&S
3	EMC32 (CE)	V 10.40.10	--	R&S

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6. Test Results

6.1. Summary of Test Results

FCC Rules	Name of Test	Result
15.109	Radiated Emission	Pass
15.107	AC Conducted Emission	Pass
<p>Note: N/A means not applicable. The PW550, PW571, PW512, JW515, PW550-NA, manufactured by Asiatelco Technologies Co. is a new product for testing. We tested and recorded the test results of the worst respectively in the report.</p>		

7. Test Results

7.1. Radiated Emission

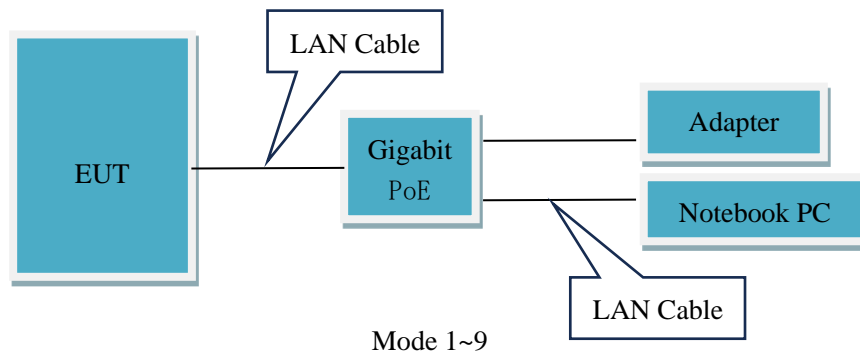
Specifications:	15.109
Date of Tests	2023-09-05~2023-09-25
Test conditions:	Ambient Temperature:24.3°C Relative Humidity:52.3% Air pressure: 101.2kPa
Operation Mode	30MHz-18GHz frequency range: Mode 1: WCDMA 2 receiver mode+ CB01+ EC01+ UB01+ AE1+ AE2 Mode 2: WCDMA 4 receiver mode+ CA01+ EC01+ UB01+ AE1+ AE2 Mode 3: LTE 2 receiver mode+ CB01+ EC01+ UB01+ AE1+ AE2 Mode 4: LTE 5 receiver mode+ CA01+ EC01+ UB01+ AE1+ AE2 Mode 5: NR SA n2 receiver mode+ CB01+ EC01+ UB01+ AE1+ AE2 Mode 6: NR SA n5 receiver mode+ CA01+ EC01+ UB01+ AE1+ AE2 Mode 7: EN DC-2A-n41A receiver mode+ CB01+ EC01+ UB01+ AE1+ AE2 Mode 8: EN DC-66A-n71A receiver mode+ CA01+ EC01+ UB01+ AE1+ AE2 Mode 9: BLE mode+ CB01+ EC01+ UB01+ AE1+ AE2
Test Results:	Pass
Note:	
1. The worst case of radiated emission for 30MHz-1GHz is Mode 3 and for 1GHz -18GHz is Mode 4.	
2. After laboratory verification, WCDMA 2/4 is the worst mode among all receiving modes of 3G , LTE 2/5 is the worst mode among all receiving modes of 4G, NR SA n2/5 is the worst mode among all receiving modes of 5G NR SA, EN DC-2A-n41A/DC-66A-n71A is the worst mode among all receiving modes of 5G NSA and recorded in the report.	

Limit Level Construction (Except for Class A digital devices):

Frequency Range (MHz)	Quasi-Peak (dBuV/m)
30-88	40
88-216	43.5
216-960	46
Above 960	54

Frequency Range (MHz)	Peak (dBuV/m)	Average (dBuV/m)
Above 1000	74	54

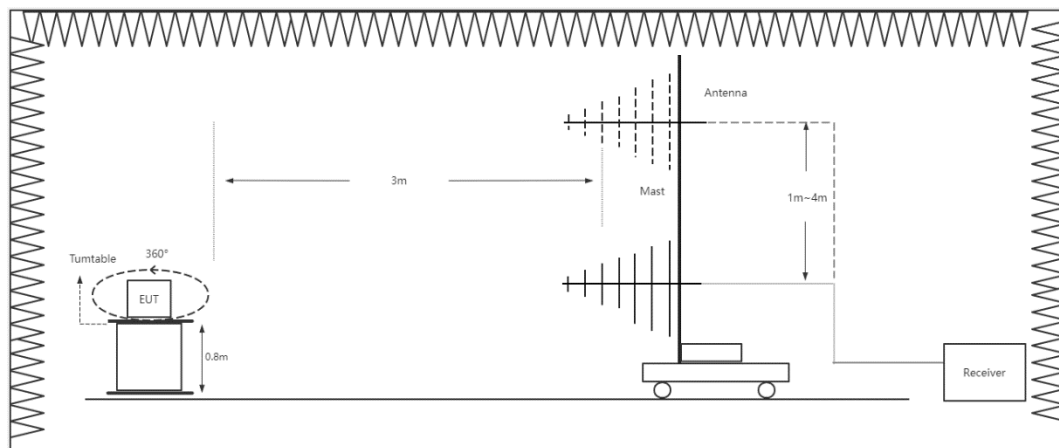
EUT Setup:



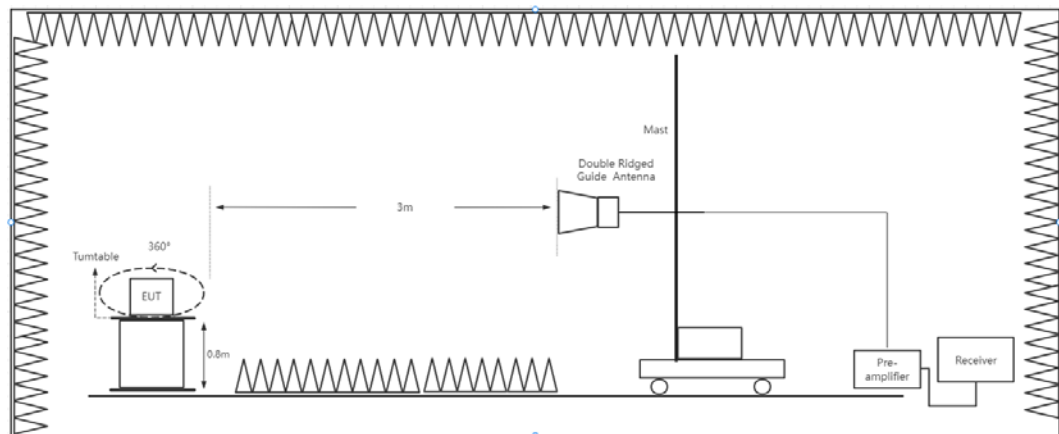
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RE Below 1GHz Connection Diagram



RE Above 1GHz Connection Diagram

Test Method:

For 30-1000MHz, the EUT was placed on the top of a rotating 0.8-m table above the ground at a semi-anechoic chamber. The distance between the EUT and the received antenna was 3 meters. The table was rotated 360 degree and the received antenna mounted on a variable-height antenna tower was varied from 1m to 4m to find the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna were set during the measurement. Tested in accordance with the procedures of ANSI C63.4-2014, section 8.3.

For 1000-18000MHz, the EUT was placed on the top of a rotating 0.8-m table above the ground at a Fully anechoic chamber, the maximal emission value was acquired by adjusting the antenna height, and the table was rotated 360 degrees to determine the maximum value of the field strength.

Uncertainty Measurement:

The measurement uncertainty (30MHz-150MHz) is 3.79 dB (k=2).

The measurement uncertainty (150MHz-1000MHz) is 3.51dB (k=2).

The measurement uncertainty (1000MHz-6000MHz) is 4.84 dB (k=2).

The measurement uncertainty (6000MHz-18000MHz) is 4.54 dB (k=2).

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Test Result:

A “reference path loss” is established and Corr is the attenuation of “reference path loss”, and including the gain of receive antenna, the gain of the preamplifier, the cable loss.

The measurement results are obtained as described below:

$\text{Corr (dB/m)} = \text{Cable loss (dB)} + \text{Antenna Factor (dB/m)} - \text{Preamplifier gain (dB)}$

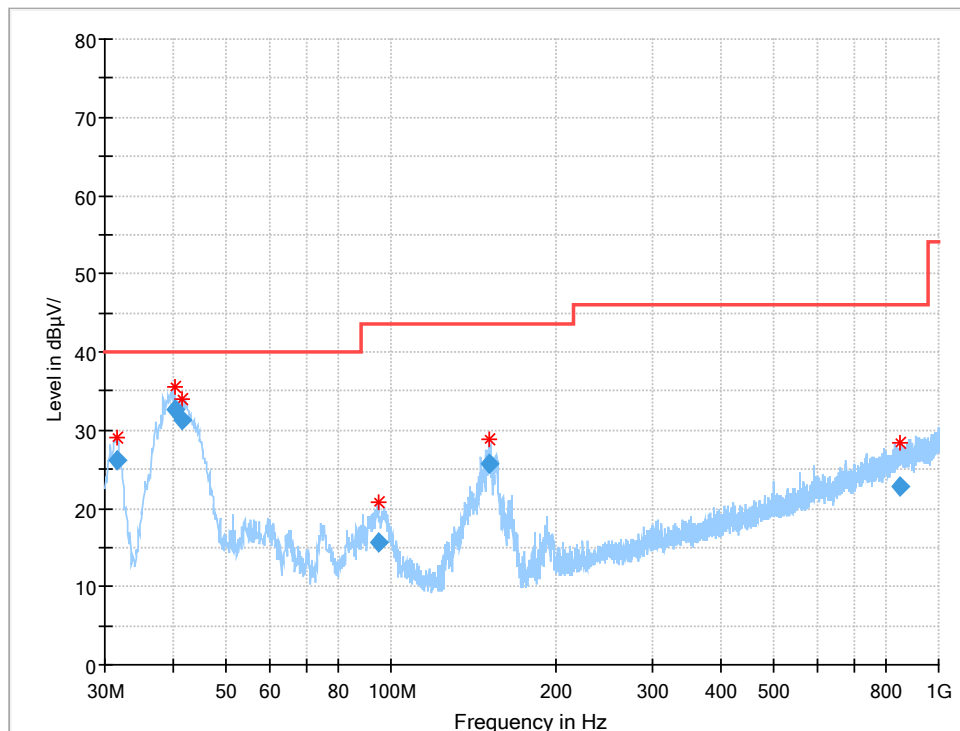
$\text{Result (dB}\mu\text{V/m)} = \text{PMea (dB}\mu\text{V)} + \text{Corr (dB/m)}$

Sweep the whole frequency band through the range from 30MHz to the 5th harmonic of the carrier, the Emissions in the frequency band 18GHz-40GHz is more than 20dB below the limit are not report.

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Test Data

RE 30MHz-1GHz Mode 3
Final Result

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
31.540680	26.25	40.00	13.75	100.0	V	160.0	-15.9
40.186160	32.54	40.00	7.46	100.0	V	255.0	-13.0
41.480600	31.30	40.00	8.70	100.0	V	232.0	-12.5
95.233400	15.69	43.50	27.81	100.0	V	9.0	-13.8
150.824480	25.78	43.50	17.72	100.0	V	232.0	-16.1
846.997720	22.81	46.00	23.19	200.0	V	305.0	1.6

Corr.(dB)=Cable loss -Antenna Factor

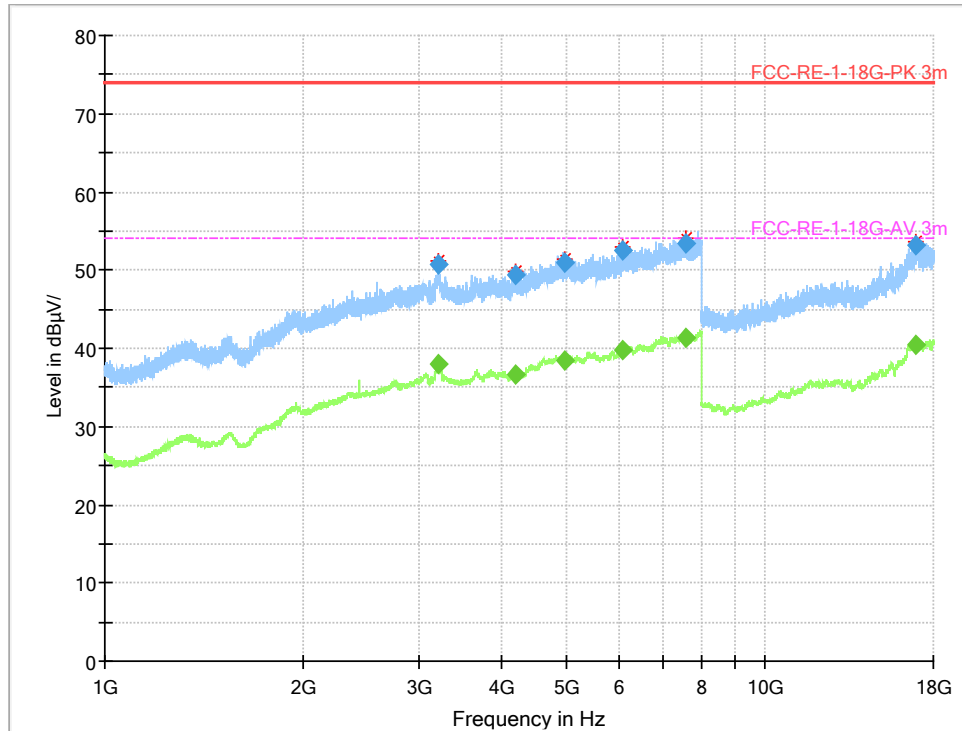
Test result=Test receiver value-Corr.(dB)

Horizontal and vertical polarity is all have been tested, the result of them is synthesized in the above data diagram.

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RE 1GHz-18GHz Mode 4-H

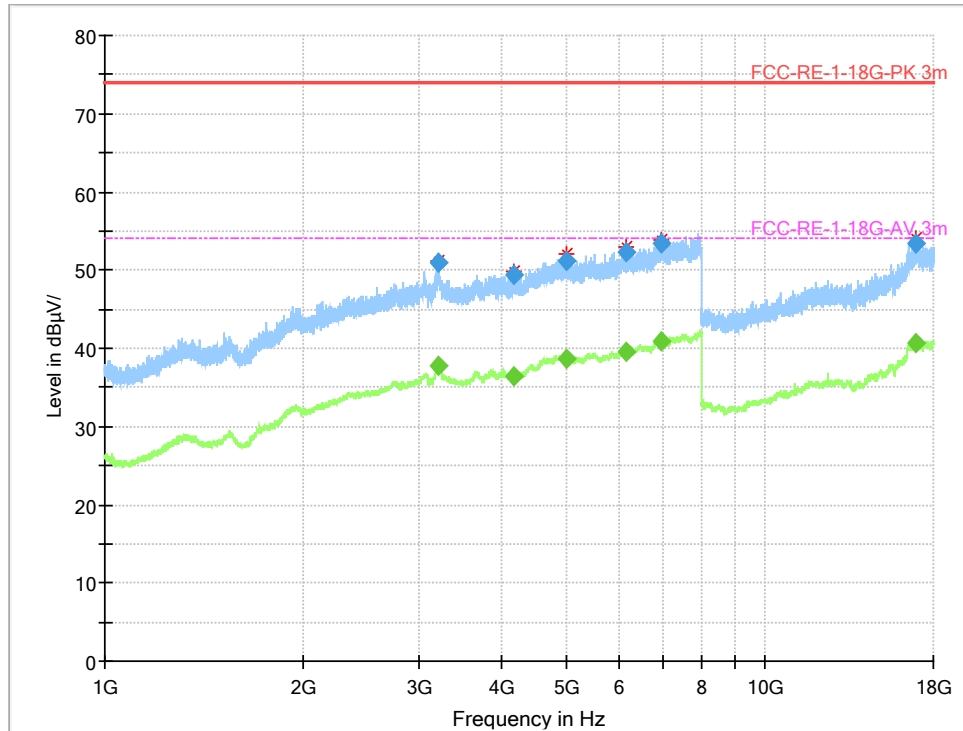
Final Result 1

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3201.445000	---	38.07	54.00	15.93	500.0	1000.000	115.0	H	358.0	14.4
3201.445000	50.66	---	74.00	23.34	500.0	1000.000	115.0	H	358.0	14.4
4199.500000	---	36.54	54.00	17.46	500.0	1000.000	215.0	H	42.0	13.5
4199.500000	49.47	---	74.00	24.53	500.0	1000.000	215.0	H	42.0	13.5
4960.980000	---	38.34	54.00	15.66	500.0	1000.000	115.0	H	347.0	15.6
4960.980000	51.04	---	74.00	22.96	500.0	1000.000	115.0	H	347.0	15.6
6101.885000	---	39.71	54.00	14.29	500.0	1000.000	185.0	H	187.0	18.1
6101.885000	52.41	---	74.00	21.59	500.0	1000.000	185.0	H	187.0	18.1
7578.957500	---	41.27	54.00	12.73	500.0	1000.000	115.0	H	323.0	20.8
7578.957500	53.47	---	74.00	20.53	500.0	1000.000	115.0	H	323.0	20.8
16888.56750	---	40.53	54.00	13.47	500.0	1000.000	100.0	H	1.0	22.0
16888.56750	53.24	---	74.00	20.76	500.0	1000.000	100.0	H	1.0	22.0

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RE 1GHz-18GHz Mode 4-V

Final Result 2

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3205.172500	50.97	---	74.00	23.03	500.0	1000.000	215.0	V	310.0	14.3
3205.172500	---	37.76	54.00	16.24	500.0	1000.000	215.0	V	310.0	14.3
4154.586250	49.33	---	74.00	24.67	500.0	1000.000	115.0	V	96.0	13.4
4154.586250	---	36.46	54.00	17.54	500.0	1000.000	115.0	V	96.0	13.4
5002.541250	51.23	---	74.00	22.77	500.0	1000.000	103.0	V	13.0	15.9
5002.541250	---	38.73	54.00	15.27	500.0	1000.000	103.0	V	13.0	15.9
6165.791250	---	39.52	54.00	14.48	500.0	1000.000	103.0	V	239.0	18.2
6165.791250	52.21	---	74.00	21.79	500.0	1000.000	103.0	V	239.0	18.2
6960.857500	---	40.83	54.00	13.17	500.0	1000.000	115.0	V	2.0	19.7
6960.857500	53.45	---	74.00	20.55	500.0	1000.000	115.0	V	2.0	19.7
16926.17000	53.38	---	74.00	20.62	500.0	1000.000	210.0	V	214.0	22.0
16926.17000	---	40.65	54.00	13.35	500.0	1000.000	210.0	V	214.0	22.0

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7.2. Conducted Emission

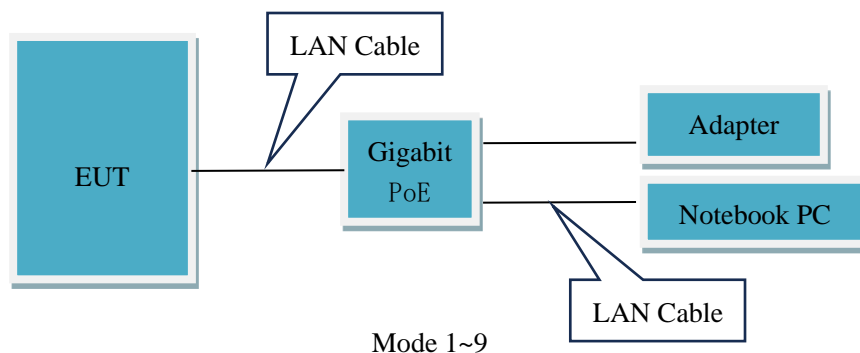
S1 (Main supply)

Specifications:	15.107
Date of Tests	2023-09-14
Test conditions:	Ambient Temperature:23.7°C Relative Humidity:49.9% Air pressure: 100.6kPa
Operation Mode	Mode 1: WCDMA 2 receiver mode+ CB01+ EC01+ UB01+ AE1+ AE2 Mode 2: WCDMA 4 receiver mode+ CA01+ EC01+ UB01+ AE1+ AE2 Mode 3: LTE 2 receiver mode+ CB01+ EC01+ UB01+ AE1+ AE2 Mode 4: LTE 5 receiver mode+ CA01+ EC01+ UB01+ AE1+ AE2 Mode 5: NR SA n2 receiver mode+ CB01+ EC01+ UB01+ AE1+ AE2 Mode 6: NR SA n5 receiver mode+ CA01+ EC01+ UB01+ AE1+ AE2 Mode 7: EN DC-2A-n41A receiver mode+ CB01+ EC01+ UB01+ AE1+ AE2 Mode 8: EN DC-66A-n71A receiver mode+ CA01+ EC01+ UB01+ AE1+ AE2 Mode 9: BLE mode+ CB01+ EC01+ UB01+ AE1+ AE2
Test Results:	Pass
Note: 1. The worst case of AC conducted emission is Mode 3. 2. After laboratory verification, WCDMA 2/4 is the worst mode among all receiving modes of 3G , LTE 2/5 is the worst mode among all receiving modes of 4G , NR SA n2/5 is the worst mode among all receiving modes of 5G NR SA , EN DC-2A-n41A/DC-66A-n71A is the worst mode among all receiving modes of 5G NSA and recorded in the report.	

Limit Level Construction:

Frequency Range (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50
*Decreases with the logarithm of the frequency		

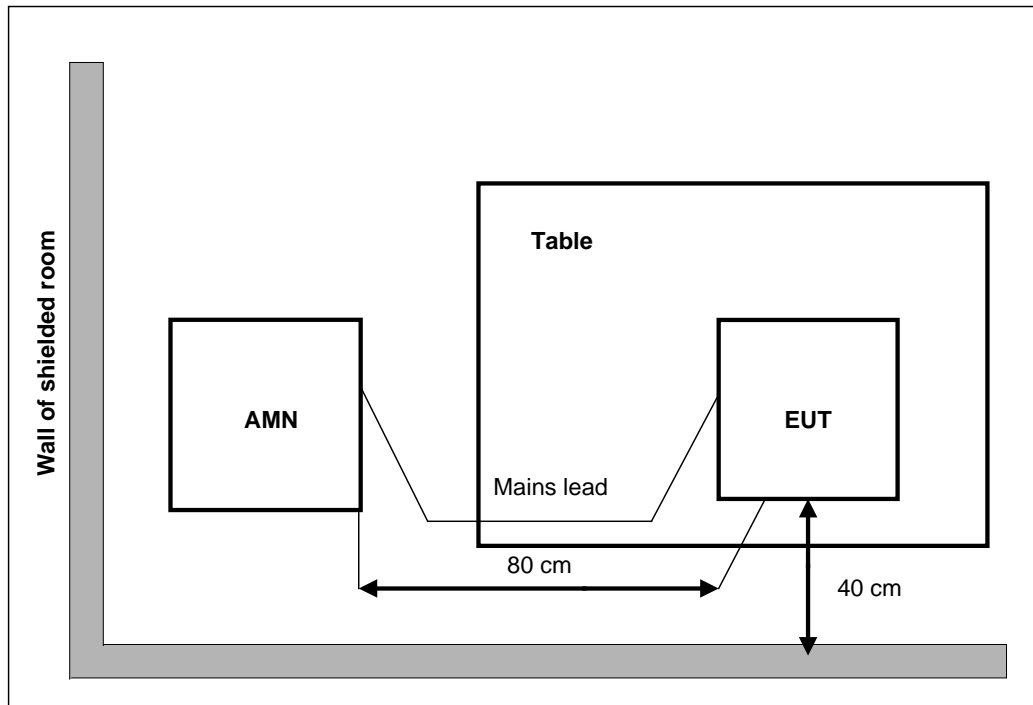
EUT Setup:



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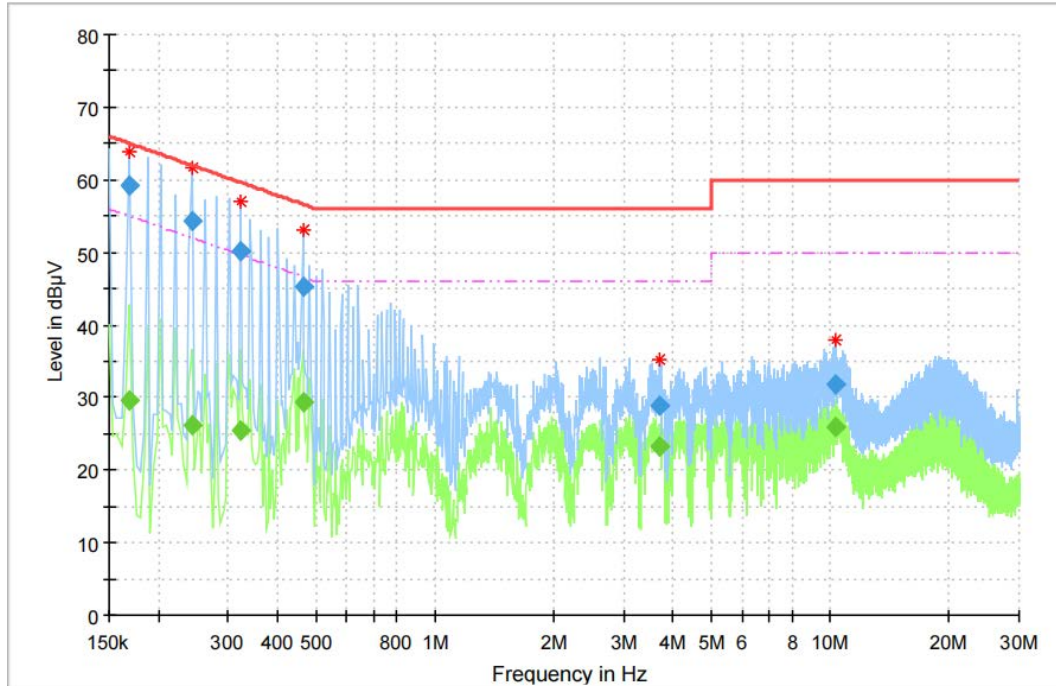
Test Method:

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies with the band 150 kHz to 30MHz shall not exceed the limits. Both lines of the power mains connected to the EUT were checked for maximum conducted interference. Tested in accordance with the procedures of ANSI C63.4-2014, section 7.

Uncertainty Measurement:

The measurement uncertainty (150kHz-30MHz) is 1.97 dB (k=2).

Test Data



CE 150kHz-30MHz Mode 3

Final Result

Frequency (MHz)	QuasiPeak (dB μ V)	Average (dB μ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.168656	---	29.64	15000.0	9.000	ON	N	10.5	25.83	55.47
0.168656	59.11	---	15000.0	9.000	ON	N	10.5	6.35	65.47
0.243281	---	26.14	15000.0	9.000	ON	N	10.5	27.19	53.34
0.243281	54.21	---	15000.0	9.000	ON	N	10.5	9.13	63.34
0.321638	---	25.34	15000.0	9.000	ON	N	10.5	25.75	51.10
0.321638	50.21	---	15000.0	9.000	ON	N	10.5	10.89	61.10
0.463425	---	29.32	15000.0	9.000	ON	N	10.5	17.72	47.05
0.463425	45.25	---	15000.0	9.000	ON	N	10.5	11.79	57.05
3.698419	---	23.30	15000.0	9.000	ON	N	10.8	22.70	46.00
3.698419	28.82	---	15000.0	9.000	ON	N	10.8	27.18	56.00
10.313925	---	25.82	15000.0	9.000	ON	N	11.7	24.18	50.00
10.313925	31.78	---	15000.0	9.000	ON	N	11.7	28.22	60.00

L1 and N is all have been tested, the result of them is synthesized in the above data diagram.

Emission level(quasi-peak or Average peak)(dBμV)=Raw value by receiver(dBμV) + Corr(Insertion loss+ cable loss) (dB)

The raw value is used to calculate by software which is not shown in the sheet.

Margin (dB) =limit value(dBμV) – emission level(dBμV).

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Annex A EUT Photos

See the document" I23W00054-External Photos".

See the document" I23W00054-Internal Photos".

Test photo See the in document" I23W00054_EMC Test Setup Photos".

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Annex B Deviations from Prescribed Test Methods

No deviation from Prescribed Test Methods.

*****END OF REPORT*****

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