

Report No.: AR/2020/C000806-01

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TEST REPORT

Application No:AR/2020/C0008Applicant:FIH CO., LTD

Address of Applicant No.4, Mingsheng St., Tu-Cheng Dist., New Taipei City 23679, Taiwan

Manufacturer: FIH CO., LTD

Address of Manufacturer: No.4, Mingsheng St., Tu-Cheng Dist., New Taipei City 23679, Taiwan

EUT Description: WCDMA/LTE Mobile Phone

Model No.: EA1002, EC1002

Trade Mark: FIH

FCC ID: RYQEC1002

Standard(s): 47 CFR Part 15, Subpart B

Date of Receipt: 2020/12/18

Date of Test: 2020/12/18 to 2021/1/8

Date of Issue: 2021/8/15

Test Result: Pass*

Authorized Signature:

Simon Ling

Wireless Laboratory Manager



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^{*} In the configuration tested, the EUT complied with the standards specified above.



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	Revision Record										
Version	Chapter	Date	Modifier	Remark							
01		2021/1/8		Original							
02		2021/5/31	Leah Chen	Modify data conversion error of antenna height Updated equipment list							
03		2021/8/15	Leah Chen	1.Updated Support Units, Test facility and Test Location							

This report supersedes our previous report AR/2020/C000806, issued on 2021-01-08, which is hereby deemed null and void.

Authorized for issue by:	
Prepared By	(Leah Chen) /Engineer
Checked By	Daniel Wang (Daniel Wang) /Reviewer



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Test Summary

Emission Part									
Item	Standard	Method	Requirement	Result					
Conducted Emissions at Mains Terminals (150kHz-30MHz)	47 CFR Part 15, Subpart B	ANSI C63.4:2014	Class B	Pass					
Radiated Emissions (30MHz-1GHz)	47 CFR Part 15, Subpart B	ANSI C63.4:2014	Class B	Pass					
Radiated Emissions (above 1GHz)	47 CFR Part 15, Subpart B	ANSI C63.4:2014	Class B	Pass					

Internal Source	Upper Frequency
Below 1.705MHz	30MHz
1.705MHz to 108MHz	1GHz
108MHz to 500MHz	2GHz
500MHz to 1GHz	5GHz
Above 1GHz	5th harmonic of the highest frequency or 40GHz, whichever is lower

Remark:

According to the declaration letter from manufacturer, for EC1002 is all test, and for EA1002 shares the same test data of EC1002 in this report.



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1 General Information

Product Name:	WCDMA/LTE Mobile Phon	WCDMA/LTE Mobile Phone							
Model No.(EUT):	EA1002, EC1002								
Trade Mark:	FIH								
Hardware Version:	HW 3.0								
Software Version:	EA1002_01N0_1_180, EC	EA1002_01N0_1_180, EC1002_00N0_1_180							
	Band	Tx (MHz)	Rx (MHz)						
	WCDMA Band II	1850~1910	1930~1990						
	WCDMA Band IV	1710~1755	2110~2155						
	WCDMA Band V	824~849	869~894						
	LTE Band 2	1850~1910	1930~1990						
	LTE Band 4	1710~1755	2110~2155						
	LTE Band 5	824~849	869~894						
	LTE Band 12	699~716	729~746						
Frequency Bands:	LTE Band 14	788~798	746~756						
	LTE Band 30	2305~2315	2350~2360						
	LTE Band 66	1710~1780	2110~2200						
	Wi-Fi 2.4G	2400~2483.5	2400~2483.5						
	Bluetooth	2400~2483.5	2400~2483.5						
	Wi-Fi 5G	5150~5850	5150~5850						
	FM	80-108							
	GNSS(GPS/Glonass/Bei dou/Galileo/SBAS)	GNSS(GPS/Glonass/Bei							



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Accessory:

	Battery							
Battery	Zhongshan Tianmao Battery HE399 Co.,LTD		3.85V,3900mAh/15.01Wh					
USB Cable								
USB Cable	YuYang	HPAC0335	/					
		Adapter						
Adapter	Jiangsu chenyang Electron Co.,Ltd.	UC13US	/					
	Earphone							
Earphone	FIT	WH-108	/					



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1.1 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Router	NETGEAR	R6020	No.XA1401
Computer	Lenovo	L480	No.XA1402
Mouse	A4TECH	OP-520NU USB	No.XA1403

1.2 Test Location

All tests were performed at:

m totale many parameter and						
Company:	SGS-CSTC STANDARDS TECHNICAL SERVICES (XI 'AN) CO., LTD.					
Address:	1/F, Unit D, Building 1, Kanghong Orange Technology Park, No.137, Keyuan 3rd Road, Fengdong New City, Xi'an, Shaanxi China					
Post code:	710086					
Test engineer:	Ben Huang, Leah Chen					

No tests were sub-contracted.

1.3 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• A2LA (Certificate No. 4854.01)

SGS-CSTC STANDARDS TECHNICAL SERVICES (XI 'AN) CO., LTD. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4854.01.

• FCC -Designation Number: CN1271.

1.4 Deviation from Standards

None

1.5 Abnormalities from Standard Conditions

None



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2 Emission Test Results

2.1 Conducted Emissions at Mains Terminals (150kHz-30MHz)

Test Requirement: 47 CFR Part 15, Subpart B

Test Method: ANSI C63.4:2014 Frequency Range: 150kHz to 30MHz

Limit:

0.15M-0.5MHz $66dB(\mu V)$ - $56dB(\mu V)$ quasi-peak, $56dB(\mu V)$ - $46dB(\mu V)$ average

0.5M-5MHz 56dB(μ V) quasi-peak, 46dB(μ V) average 5M-30MHz 60dB(μ V) quasi-peak, 50dB(μ V) average

Detector: Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz

2.1.1 E.U.T. Operation

Operating Environment:

Temperature: 18.9 °C Humidity: 55.1 % RH Atmospheric Pressure: 1000 mbar

Pretest these a: Transfer data between the EUT and the PC+USB cable1

modes to find b: WCDMA Band V Idle +BT+WLAN +GPS Rx+playing MP4 (SD card)

the worst case: +earphone1+battery1+Cable(worst)+adapter1

c: LTE Band 5 Idle+BT+WLAN +GPS Rx+playing MP4 (SD card) +earphone(worst)+battery(worst)+ Cable(worst)+adapter(worst) d: LTE Band 12 Idle+BT+WLAN +GPS Rx+camera (Front) +earphone(worst)+battery(worst)+ Cable(worst)+adapter(worst) e: LTE Band 14 Idle+BT+WLAN +GPS Rx+camera (Front)

+earphone(worst)+battery(worst)+ Cable(worst)+adapter3

The worst case b: WCDMA Band V Idle +BT+WLAN +GPS Rx+playing MP4 (SD card)

for final test: +earphone1+battery1+Cable(worst)+adapter1



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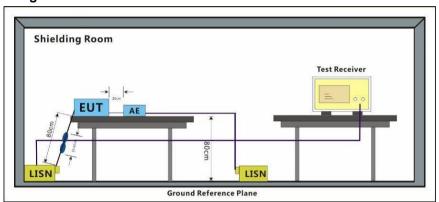
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2.1.2 Test Setup Diagram



2.1.3 Measurement Data

An initial pre-scan was performed with peak detector. Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected.



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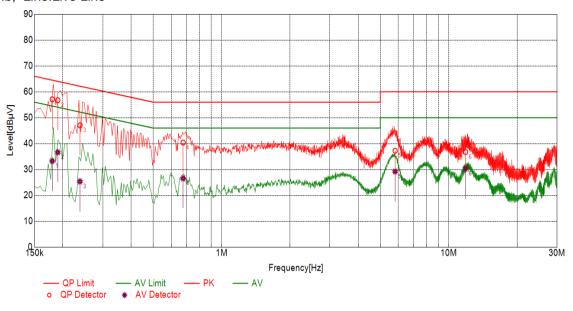
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Mode:b; Line:Live Line



Test Graph

Final	Final Data List									
NO.	Freq. [MHz]	Factor [dB]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Value [dBµV]	ΑV Limit [dBμV]	AV Margin [dB]	Туре	
1	0.1797	10.10	57.10	64.50	7.40	33.24	54.50	21.26	L	
2	0.1901	10.10	56.76	64.03	7.27	36.61	54.03	17.42	L	
3	0.2380	10.10	47.06	62.17	15.11	25.35	52.17	26.82	L	
4	0.6772	10.10	40.40	56.00	15.60	26.54	46.00	19.46	L	
5	5.8078	10.10	37.24	60.00	22.76	29.20	50.00	20.80	L	
6	11.8656	10.10	36.75	60.00	23.25	30.35	50.00	19.65	L	



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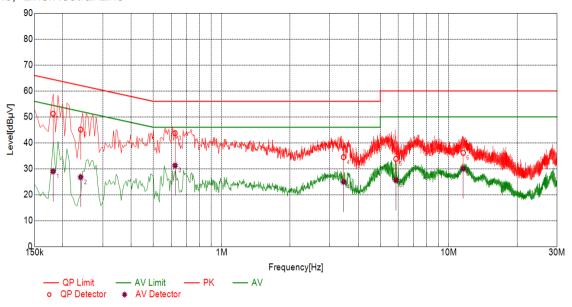
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Mode:b; Line:Neutral Line



Test Graph

Final Data List									
NO.	Freq. [MHz]	Factor [dB]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Value [dBµV]	ΑV Limit [dBμV]	AV Margin [dB]	Туре
1	0.1812	10.10	51.22	64.43	13.21	28.96	54.43	25.47	N
2	0.2397	10.10	45.11	62.11	17.00	26.76	52.11	25.35	N
3	0.6241	10.10	43.71	56.00	12.29	31.23	46.00	14.77	N
4	3.4425	10.10	34.47	56.00	21.53	24.93	46.00	21.07	N
5	5.8546	10.10	33.81	60.00	26.19	25.56	50.00	24.44	N
6	11.5848	10.10	36.13	60.00	23.87	30.02	50.00	19.98	N





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2.2 Radiated Emissions (30MHz-1GHz)

Test Requirement: 47 CFR Part 15, Subpart B

Test Method: ANSI C63.4:2014 Frequency Range: 30MHz to 1GHz

Measurement Distance: 3m

Limit:

30 MHz - 88 MHz $40.0 (\text{dB}\mu\text{V/m})$ quasi-peak 88 MHz - 216 MHz $43.5 (\text{dB}\mu\text{V/m})$ quasi-peak $46.0 (\text{dB}\mu\text{V/m})$ quasi-peak 960 MHz - 1000 MHz $54.0 (\text{dB}\mu\text{V/m})$ quasi-peak

Detector: Peak for pre-scan (120kHz resolution bandwidth) 30M to1000MHz

2.2.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 66.5 % RH Atmospheric Pressure: 1010 mbar

Pretest these modes to find

a: Transfer data between the EUT and the PC+USB cable1

modes to find b: WCDMA Band V Idle +BT+WLAN +GPS Rx+playing MP4 (SD card) the worst case: +earphone1+battery1+Cable(worst)+adapter1

c: LTE Band 5 Idle+BT+WLAN +GPS Rx+playing MP4 (SD card) +earphone(worst)+battery(worst)+ Cable(worst)+adapter(worst) d: LTE Band 12 Idle+BT+WLAN +GPS Rx+camera (Front) +earphone(worst)+battery(worst)+ Cable(worst)+adapter(worst) e: LTE Band 14 Idle+BT+WLAN +GPS Rx+camera (Front)

The worst case for final test:

a: Transfer data between the EUT and the PC+USB cable1

+earphone(worst)+battery(worst)+ Cable(worst)+adapter3



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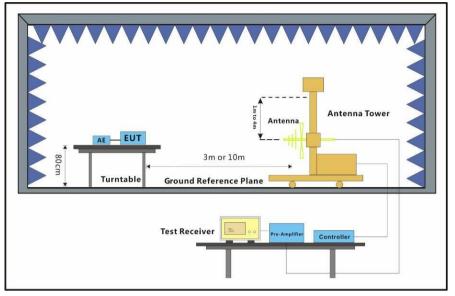
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2.2.2 Test Setup Diagram



2.2.3 Measurement Data

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities.



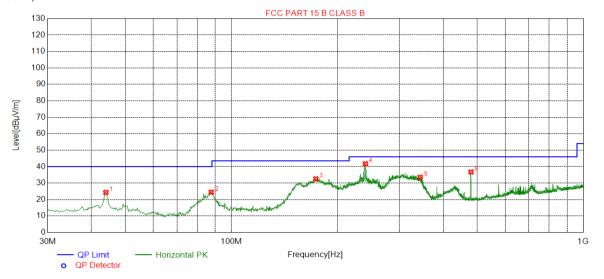
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Mode:a; Polarization:Horizontal



Suspected List

- aapat	ouspected List										
Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity				
1	43.9708	24.33	40.00	15.67	232	314	Horizontal				
2	87.6295	24.52	40.00	15.48	142	55	Horizontal				
3	173.7828	32.58	43.50	10.92	171	64	Horizontal				
4	240.3381	41.75	46.00	4.25	159	356	Horizontal				
5	344.1488	33.56	46.00	12.44	107	35	Horizontal				
6	479.9760	36.76	46.00	9.24	209	40	Horizontal				



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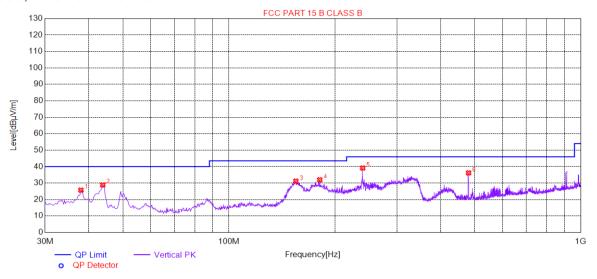
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Mode:a; Polarization:Vertical



Suspected List

Suspected List							
Suspe	cted List	cted List					
NO.	Freq. [MHz]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	37.9556	25.70	40.00	14.30	296	294	Vertical
2	43.7768	28.87	40.00	11.13	196	254	Vertical
3	154.9610	31.20	43.50	12.30	244	96	Vertical
4	181.1562	32.01	43.50	11.49	172	96	Vertical
5	239.9500	39.18	46.00	6.82	193	28	Vertical
6	479.9760	36.19	46.00	9.81	286	352	Vertical



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2.3 Radiated Emissions (above 1GHz)

Test Requirement: 47 CFR Part 15, Subpart B

Test Method: ANSI C63.4:2014 Frequency Range: Above 1GHz

Measurement Distance: 3m

Limit:

Above 1GHz 74(dBµV/m) peak, 54(dBµV/m) average

Detector: Peak for pre-scan (1000kHz resolution bandwidth) 1000M to18000MHz

2.3.1 E.U.T. Operation

Operating Environment:

Temperature: 21.7 °C Humidity: 56.4 % RH Atmospheric Pressure: 1010 mbar

Pretest these a: Transfer data between the EUT and the PC+USB cable1

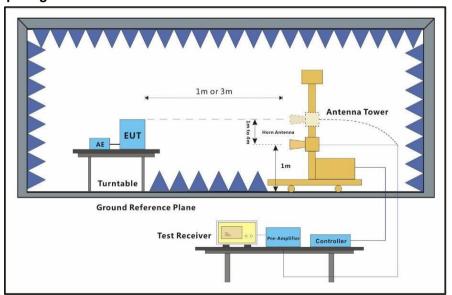
modes to find b: WCDMA Band V Idle +BT+WLAN +GPS Rx+playing MP4 (SD card)

the worst case: +earphone1+battery1+Cable(worst)+adapter1

c: LTE Band 5 Idle+BT+WLAN +GPS Rx+playing MP4 (SD card) +earphone(worst)+battery(worst)+ Cable(worst)+adapter(worst) d: LTE Band 12 Idle+BT+WLAN +GPS Rx+camera (Front) +earphone(worst)+battery(worst)+ Cable(worst)+adapter(worst) e: LTE Band 14 Idle+BT+WLAN +GPS Rx+camera (Front) +earphone(worst)+battery(worst)+ Cable(worst)+adapter3

The worst case c: LTE Band 5 Idle+BT+WLAN +GPS Rx+playing MP4 (SD card) for final test: +earphone(worst)+battery(worst)+ Cable(worst)+adapter(worst)

2.3.2 Test Setup Diagram



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2.3.3 Measurement Data

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Average measurements were conducted based on the peak sweep graph. The EUT was measured by Horn antenna with 2 orthogonal polarities.



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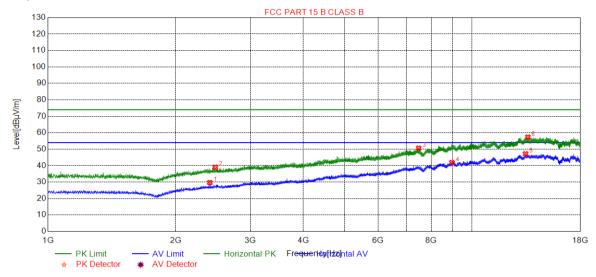
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Mode:c; Polarization:Horizontal



Suspected List

Suspe	Suspected List						
NO.	Freq. [MHz]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2406.820	29.67	54.00	24.33	208	359	Horizontal
2	2479.924	39.02	74.00	34.98	121	297	Horizontal
3	7479.874	50.64	74.00	23.36	190	344	Horizontal
4	8958.097	41.89	54.00	12.11	243	16	Horizontal
5	13361.31	47.20	54.00	6.80	249	258	Horizontal
6	13530.47	57.37	74.00	16.63	123	172	Horizontal



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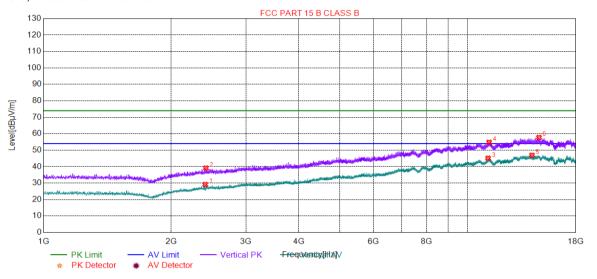
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Mode:c; Polarization:Vertical



Suspected List

dispersion List							
Suspe	pected List						
NO.	Freq. [MHz]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2405.120	29.17	54.00	24.83	206	102	Vertical
2	2414.470	39.14	74.00	34.86	198	16	Vertical
3	11170.75	45.13	54.00	8.87	182	37	Vertical
4	11234.51	54.80	74.00	19.20	254	275	Vertical
5	14178.20	46.93	54.00	7.07	279	41	Vertical
6	14729.03	57.73	74.00	16.27	166	146	Vertical



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3 Equipment List

	CE Test System					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date	
Shielding Room	Brilliant-emc	N/A	XAW03-35-01	2019-09-11	2022-09-10	
Test receiver	ROHDE&SCHWARZ	ESR	XAW01-08-01	2020-09-11	2021-09-10	
Artificial network	ROHDE&SCHWARZ	ENV216	XAW01-04-01	2020-08-04	2021-08-03	
Temperature and humidity meter	MingGao	TH101B	XAW01-01-01	2020-11-06	2021-11-05	
Measurement Software	Tonscend	TS+ CE V2.5	XAW02-05-02	NCR	NCR	
Radio communication analyzer	ROHDE&SCHWARZ	CMW 500	XAW01-03-02	2020-04-02	2021-04-01	

RE Test System					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Semi-Anechoic Chamber	Brilliant-emc	N/A	XAW03-35-01	2019-09-11	2022-09-10
MXA signal analyzer	Keysight	N9020A	XAW01-06-01	2020-04-02	2021-04-01
Test receiver	ROHDE&SCHWARZ	ESR	XAW01-08-01	2020-09-11	2021-09-10
Receiving antenna (30MHz-3GHz)	Schwarzbeck	VULB 9163	XAW01-09-01	2019-10-13	2021-10-12
Receiving antenna (1GHz~18GHz)	Schwarzbeck	BBHA 9120D	XAW01-09-02	2019-10-13	2021-10-12
Receiving antenna (15GHz~40GHz)	Schwarzbeck	BBHA 9170	XAW01-09-03	2019-10-13	2021-10-12
Directional antenna rack controller	Max-Full	MF-7802BS	XAW03-03-01	NCR	NCR
High-speed antenna rack controller	Max-Full	MF-7802	XAW03-04-01	NCR	NCR
Filter bank	Tonscend	JS0806-F	XAW03-05-01	NCR	NCR
Filter bank	Tonscend	JS0806s	XAW03-05-02	NCR	NCR
Amplifier	Tonscend	TAP00903040	XAW01-41-01	2020-10-26	2021-10-25
Amplifier	Tonscend	TAP01018048	XAW01-41-02	2020-10-26	2021-10-25
Amplifier	Tonscend	TAP18040048	XAW01-41-03	2020-10-27	2021-10-26
Amplifier	Shanghai Steed	YX28980930	XAW01-41-06	2020-10-26	2021-10-25
Temperature and humidity meter	MingGao	TH101B	XAW01-01-01	2020-11-06	2021-11-05



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Measurement Software	Tonscend	TS+ RSE V3.0.0.2	XAW02-05-01	NCR	NCR
Radio communication analyzer	ROHDE&SCHWARZ	CMW 500	XAW01-03-02	2020-04-02	2021-04-01

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4 Measurement Uncertainty

No.	Item	Measurement Uncertainty	
1	Conduction Emission	± 3.0dB (150kHz to 30MHz)	
		± 4.8dB (Below 1GHz)	
	Radiated Emission	± 4.8dB (1GHz to 6GHz)	
2		± 4.5dB (6GHz to 18GHz)	
		± 5.02dB (Above 18GHz)	



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5 Photographs

5.1 Test Setup

Refer to Appendix A JBP Setup Photos.

5.2 EUT Constructional Details (EUT Photos)

Refer to Photographs of EUT Constructional Details

- End of the Report -



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