Shenzhen Global Test Service Co.,Ltd.
No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong

TEST REPORT
ETSI EN 301 489-1 V2.2.3 (2019-11)
ETSI EN 301 489-3 V2.1.2 (2021-03)

Report Reference No. ..... :	**GTS20211129024-1-3**
Compiled by (position+printed name+signature)..:	File administrators Peter Xiao
Supervised by (position+printed name+signature)..:	Test Engineer Oliver Ou
Approved by (position+printed name+signature)..:	Manager Simon Hu
Date of issue ..... :	Dec.30, 2021
Representative Laboratory Name .:	**Shenzhen Global Test Service Co.,Ltd.**
Address ..... :	No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong
Applicant's name ..... :	**ZHUHAI TAIXIN SEMICONDUCTOR CO.LTD**
Address ..... :	3F, Building 2, Harbor 1 Science and Technology Park, No.1 Jin Tang Road, Tangjiawan Town, High-tech Zone, Zhuhai, Guangdong, China
Test specification ..... **:**	
Standard ..... :	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-3 V2.1.2 (2021-03)
TRF Originator ..... :	Shenzhen Global Test Service Co.,Ltd.
Master TRF ..... :	Dated 2014-12

Test item description ..... :	**TX-AH module**
Trade Mark ..... :	N/A
Manufacturer ..... :	ZHUHAI TAIXIN SEMICONDUCTOR CO.LTD
Model/Type reference ..... :	TX-AH-R900PNR-860M
Listed model ..... :	TX-AH-R900P
Hardware version ..... :	V1.1
Software version ..... :	V1.3
Ratings ..... :	DC 3.0-3.6V by Pinboard Recharged by DC 5.0V
Result ..... :	**PASS**

T E S T R E P O R T

Test Report No. :	**GTS20211129024-1-3**	Dec.30, 2021 Date of issue

Equipment under Test	:	TX-AH module
Model /Type	:	TX-AH-R900PNR-860M
Listed model	:	TX-AH-R900P
Applicant	:	**ZHUHAI TAIXIN SEMICONDUCTOR CO.LTD**
Address	:	3F, Building 2, Harbor 1 Science and Technology Park, No.1 Jin Tang Road, Tangjiawan Town, High-tech Zone, Zhuhai, Guangdong, China
Manufacturer	:	**ZHUHAI TAIXIN SEMICONDUCTOR CO.LTD**
Address	:	3F, Building 2, Harbor 1 Science and Technology Park, No.1 Jin Tang Road, Tangjiawan Town, High-tech Zone, Zhuhai, Guangdong, China

Test Result	**PASS**

Contents

1. TEST STANDARDS

The tests were performed according to following standards:
ETSI EN 301 489-1 V2.2.3 (2019-11)–ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU and the essential requirements of article 6 of Directive 2014/30/EU
ETSI EN 301 489-3 V2.1.2 (2021-03)–ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 3: Specific conditions for Short Range Devices (SRD) operating on frequencies between 9 kHz and 246 GHz; Harmonised Standard for ElectroMagnetic Compatibility

2. SUMMARY

2.1. General Remarks

Date of receipt of test sample	:	Dec.10, 2021
Testing commenced on	:	Dec.10, 2021
Testing concluded on	:	Dec.30, 2021

2.2. Product Description

Product Name:	TX-AH module
Trade Mark:	N/A
Model/Type reference:	TX-AH-R900PNR-860M
List Model:	TX-AH-R900P
Model Declaration	Please see description of differences
Power supply:	DC 3.0-3.6V by Pinboard Recharged by DC 5.0V
Hardware Version	V1.1
Software Version	V1.3
SRD	
Frequency Range	863.0-865.0MHz, 865.0-868.0MHz
Channel Number	1 Channel to 2M(864.0MHz, 866.0MHz) 2 Channel to 1M(863.5MHz, 864.5MHz) 3 Channel to 1M(865.5MHz, 866.5MHz, 867.5MHz)
Channel Bandwidth	1MHz, 2MHz
Modulation Type	OFDM
Antenna Description	External Antenna,3.00dBi

2.3. Difference description

The difference between TX-AH-R900PNR-860M and TX-AH-R900P series is show in the below table:

Differences / Models	TX-AH-R900P	TX-AH-R900PNR-860M
Silk screen	Different	Different
Shielding cover	Same with shielding cover	The same
Module board	/	Add a Saw to the Switch
RF IC Chip-set	TXW8301	The same
Circuit/ schematics	/	Add a Saw to the Switch
Layout	/	Add a Saw to the Switch
BOM	/	Add a Saw to the Switch
Frequency bands	802.11ah 2M:866/864; 1M:863.5/864.5/865.5/866.5/867.5	The same
BT/ Wi-Fi antenna	External Antenna	The same
Appearance	The same	The same
Dimension	17mm*15mm*2.4mm	The same
Power Supply	The same	The same
Accessories	/	/

2.4. EUT operation mode

Test mode	SRD	DC IN
1	■	■

Note:
1. ■ is operation mode.
Pre-scan above all test mode, found below test mode which it was worse case mode.
Pre-test conducted emission and radiated emission at both voltage AC 120V/60Hz and AC 230V/50Hz, recorded worst case.

Test item	Test mode (Worse case mode)
Conducted emission	Mode 1
Radiated emission	Mode 1
EMS	All Mode

2, The module integrates two independent transmitters, Test results reported represents the worst case simultaneous transmission condition.

2.5. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

● - supplied by the manufacturer
○ - supplied by the lab

○	Adapter	M/N:	GQ12-050200-ZG
		Manufacturer:	Dong Guan City GangQi Electronic Co.Ltd

2.6. Modifications

No modifications were implemented to meet testing criteria.

3. TEST ENVIRONMENT

3.1. Address of the test laboratory

Shenzhen Global Test Service Co.,Ltd.
No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong

3.2. Test Facility

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

CNAS (No. CNAS L8169)
Shenzhen Global Test Service Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2019 General Requirements) for the Competence of Testing and Calibration Laboratories.
A2LA (Certificate No. 4758.01)
Shenzhen Global Test Service Co., Ltd. has been assessed by the American Association for Laboratory Accreditation (A2LA). Certificate No. 4758.01.
Industry Canada Registration Number. is 24189.
FCC Designation Number is CN1234.
FCC Registered Test Site Number is165725.

3.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Normal Temperature:	15-35 ° C
Lative Humidity	30-60 %
Air Pressure	950-1050mbar

3.4. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“and is documented in the Shenzhen Global Test Service Co.,Ltd. acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen GTS laboratory is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.10 dB	(1)
Radiated Emission	1~18GHz	4.32 dB	(1)
Conducted Disturbance	0.15~30MHz	3.12 dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3.5. Test Description

Emission Measurement		
Radiated Emission	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-3 V2.1.2 (2021-03)	PASS
Conducted Emission(AC Mains)	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-3 V2.1.2 (2021-03)	PASS
Harmonic Current Emissions	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-3 V2.1.2 (2021-03)	N/A
Voltage Fluctuations and Flicker	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-3 V2.1.2 (2021-03)	PASS
Immunity Measurement		
Electrostatic Discharge	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-3 V2.1.2 (2021-03)	PASS
RF Electromagnetic Field	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-3 V2.1.2 (2021-03)	PASS
Fast Transients Common Mode	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-3 V2.1.2 (2021-03)	PASS
RF Common Mode 0,15 MHz to 80 MHz	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-3 V2.1.2 (2021-03)	PASS
Voltage Dips and Interruptions	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-3 V2.1.2 (2021-03)	PASS
Surges	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-3 V2.1.2 (2021-03)	PASS

Remark: The measurement uncertainty is not included in the test result.

3.6. Equipments Used during the Test

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Calibration Due Date
1	EMI Test Receiver	R&S	ESPI 3	101841-cd	2021/07/17	2022/07/16
2	Artificial Mains	ROHDE & SCHWARZ	ESH2-Z5	893606/008	2021/07/17	2022/07/16
3	Pulse Limiter	Agilent	EM5010A	3107A04120	2021/07/17	2022/07/16
4	EMI Test Receiver	ROHDE & SCHWARZ	ESCI 7	101102	2021/09/19	2022/09/18
5	Spectrum Analyzer	Agilent	N9020A	MY48010425	2021/09/19	2022/09/18
6	Spectrum Analyzer	R&S	FSV40	100019	2021/07/17	2022/07/16
7	Active Loop Antenna	Beijing Da Ze Technology Co.,Ltd.	ZN30900C	15006	2021/09/19	2022/09/18
8	By-log Antenna	SCHWARZBECK	VULB9163	000976	2021/08/08	2022/08/07
9	Double Ridged Horn Antenna (1~18GHz)	SCHWARZBECK	BBHA 9120D	01622	2021/09/19	2022/09/18
10	Horn Antenna (18GHz~40GHz)	Schwarzbeck	BBHA9170	791	2021/09/19	2022/09/18
11	Amplifier (30MHz~1GHz)	Schwarzbeck	BBV 9743	#202	2021/07/17	2022/07/16
12	Amplifier (1GHz~18GHz)	Taiwan Chengyi	EMC051845B	980355	2021/07/17	2022/07/16
13	Amplifier (26.5GHz~40GHz)	Schwarzbeck	BBV9179	9719-025	2021/07/17	2022/07/16
14	ESD Simulators	EMC Partner	ESD3000	ESD3000-1680	2021/09/19	2022/09/18
15	RF POWER AMPLIFIER	OPHIR	5225R	1079	2021/09/19	2022/09/18
16	RF POWER AMPLIFIER	OPHIR	5273F	1025	2021/09/19	2022/09/18
17	RF POWER AMPLIFIER	SKET	HAP_03G06G-50W	--	2021/09/19	2022/09/18
18	Stacked Broadband Log Periodic Antenna	SCHWARZBECK	STLP 9128	9128ES-112	2021/09/19	2022/09/18
19	Stacked Mikrowellen Log.-Per Antenna	SCHWARZBECK	STLP 9149	9149-594	2021/09/19	2022/09/18
20	Electric field probe	Narda S.TS./PMM	EP601	611WX90121	2021/09/19	2022/09/18
21	ESG Vector Signal Generator	Agilent	MY49072627	E4594C	2021/09/19	2022/09/18
22	Power meter	Agilent	MY45104493	E4602B	2021/09/19	2022/09/18
23	Power sensor	Agilent	MY41495234	E7201H	2021/09/19	2022/09/18
24	Ultra Compact Simulator	EMC Partner	TRANSIENT3000	TRA3000 F5-S-D-V-1527	2021/09/19	2022/09/18

25	Coupling Clamp	EMC Partner	CN-EFT1000	CN-EFT1000-1574	2021/09/19	2022/09/18
26	Signal Line Coupling Network	EMC Partner	CN-R40C05	CN-R40C05-1513	2021/09/19	2022/09/18
27	CS Test system	Frankonia	CIT-10-75	126B1333	2021/09/19	2022/09/18
28	6dB Attenuator	Frankonia	75-A-FFN-06	1509	2021/09/19	2022/09/18
29	CDN	Frankonia	M2+M3	A2210239	2021/09/19	2022/09/18
30	Power Clamp	Frankonia	EMCL-20	132A1216	2021/09/19	2022/09/18
31	Harmonic and Flicker Analyzer	EMC Partner	HAR1000-1P	HAR1000-1P 230V-0221	2021/09/19	2022/09/18
32	RF Cable	HUBER+SUHNER	RG214	N/A	2021/09/19	2022/09/18
33	ISN	Schwarzbeck	CAT5 8158	121	2021/09/19	2022/09/18
34	Radio Communication Tester	Rohde&Schwarz	CMW500	115406	2021/07/17	2022/07/16
35	Conducted Emission	Tonscend	JS32-CE	Ver 2.5	/	/
36	Radiated Emission	Tonscend	JS32-RE	Ver 2.5.1.8	/	/

The calibration interval is 1 year.

4. TEST CONDITIONS AND RESULTS

4.1. EMISSION

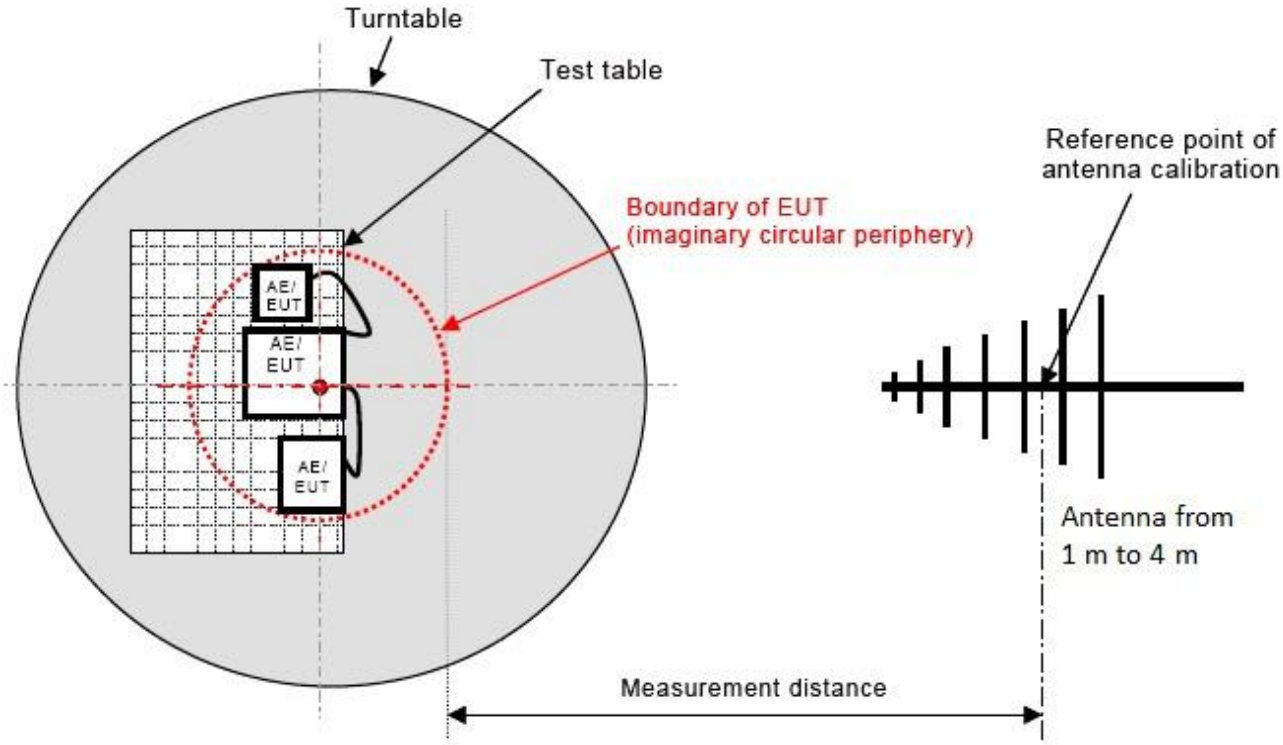
4.1.1. Radiated Emission

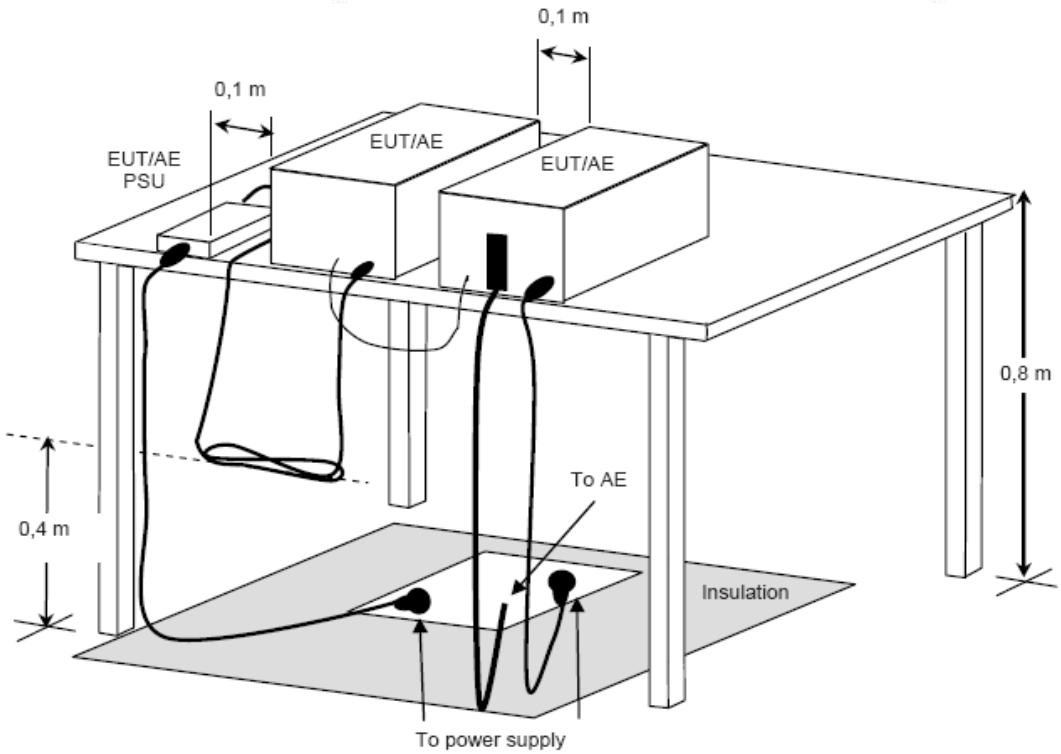
LIMIT

Please refer to ETSI EN301489-1 Clause 8.2.3, Table 4 and EN55032 Annex A, Table A.4,A.5, and Class B

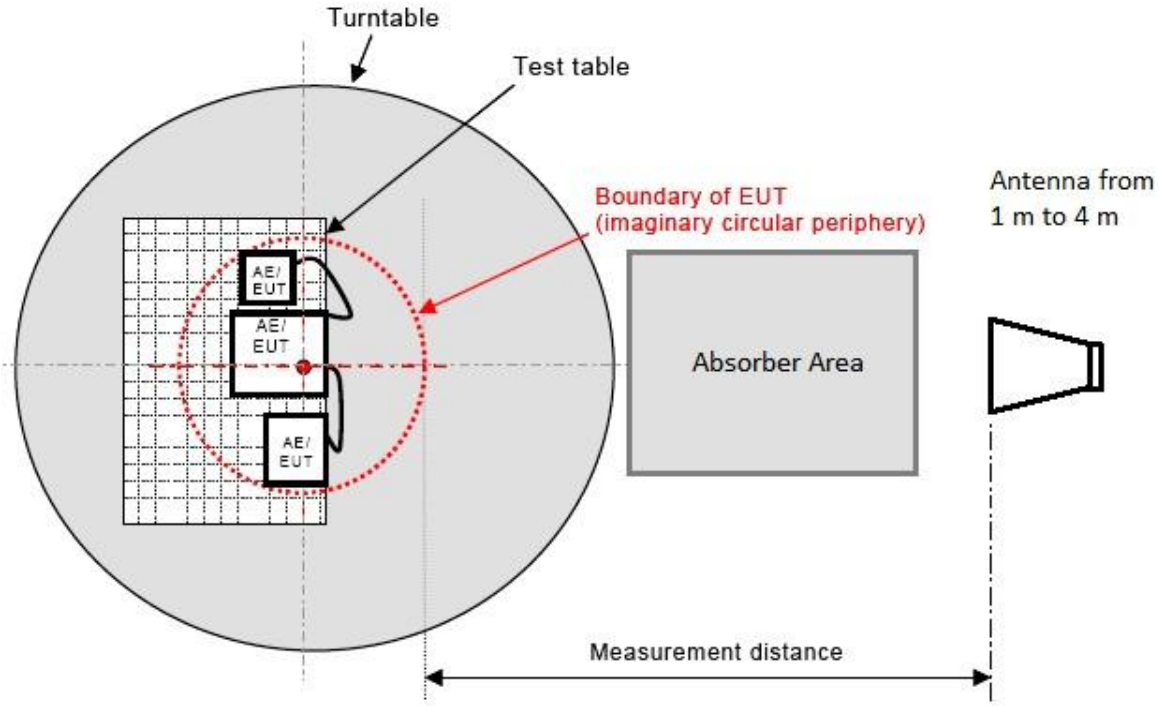
TEST CONFIGURATION

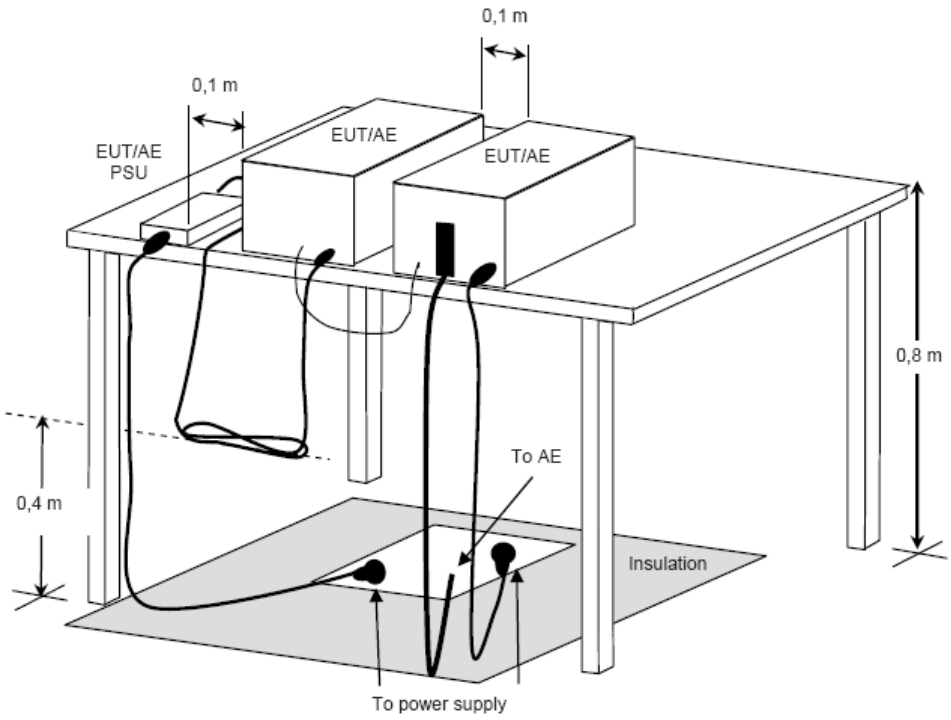
■ **Below 1GHz**





■ **Above 1GHz**





TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 8.2.3 for the measurement methods

TEST RESULTS

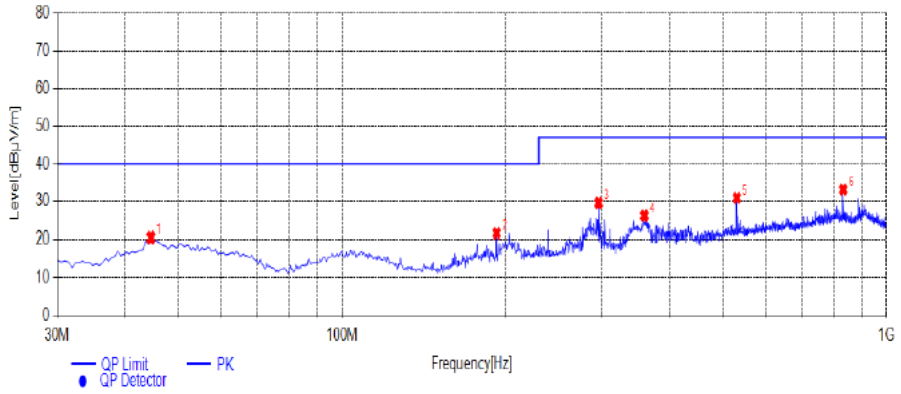
Passed

Please refer to the below test data:

TX-AH-R900PNR-860M:

Test mode:	Mode 1	Polarization	Horizontal

Test Graph



Suspected List

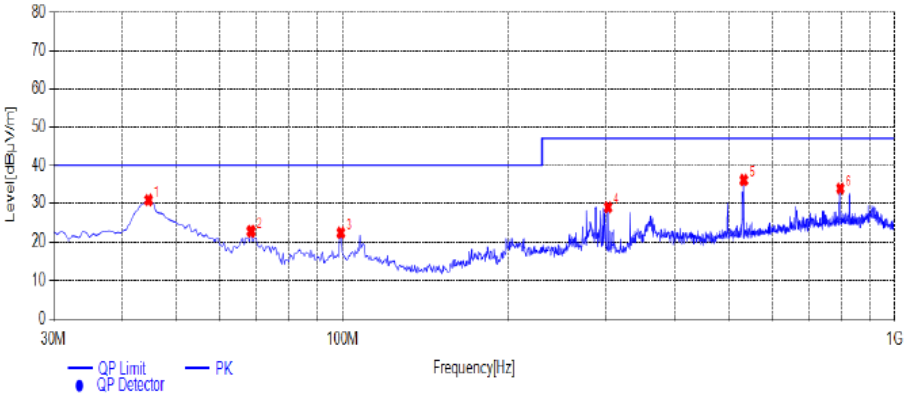
NO.	Frequency [MHz]	Reading [dBµV/m]	Factor [dB]	Result [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Polarity	Remark
1	44.5500	27.83	-7.31	20.52	40.00	19.48	100	261	PK	Horizonta	PASS
2	192.4750	31.33	-9.71	21.62	40.00	18.38	100	326	PK	Horizonta	PASS
3	296.2650	36.75	-7.20	29.55	47.00	17.45	100	280	PK	Horizonta	PASS
4	359.3150	31.56	-5.38	26.18	47.00	20.82	100	264	PK	Horizonta	PASS
5	531.4900	33.26	-2.37	30.89	47.00	16.11	100	358	PK	Horizonta	PASS
6	833.1600	31.45	1.67	33.12	47.00	13.88	100	22	PK	Horizonta	PASS

Note: 1. Result (dBµV/m) = Reading(dBµV/m) + Factor (dB) .

2. Factor (dB) = Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB).

Test mode:	Mode 1	Polarization	Vertical

Test Graph



Suspected List

NO.	Frequency [MHz]	Reading [dBµV/m]	Factor [dB]	Result [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Polarity	Remark
1	44.5500	38.11	-7.31	30.80	40.00	9.20	100	311	PK	Vertical	PASS
2	68.3150	32.21	-9.56	22.65	40.00	17.35	100	104	PK	Vertical	PASS
3	99.3550	30.79	-8.55	22.24	40.00	17.76	100	276	PK	Vertical	PASS
4	303.0550	35.94	-7.03	28.91	47.00	18.09	100	337	PK	Vertical	PASS
5	533.4300	38.41	-2.32	36.09	47.00	10.91	100	69	PK	Vertical	PASS
6	797.7550	32.14	1.74	33.88	47.00	13.12	100	267	PK	Vertical	PASS

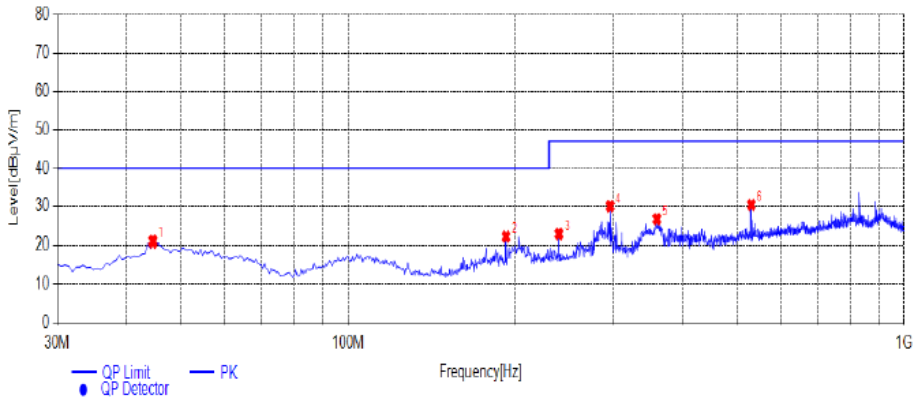
Note: 1. Result (dBµV/m) = Reading(dBµV/m) + Factor (dB) .

2. Factor (dB) = Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB).

TX-AH-R900P:

Test mode:	Mode 1	Polarization	Horizontal

Test Graph



Suspected List

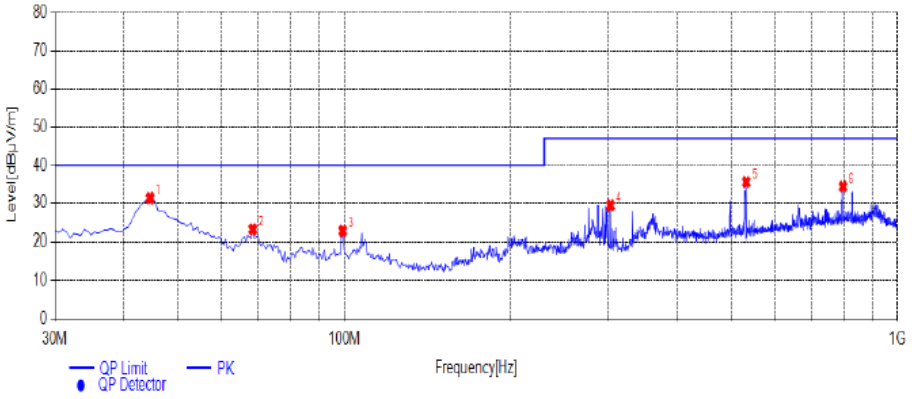
NO.	Frequency [MHz]	Reading [dBµV/m]	Factor [dB]	Result [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Polarity	Remark
1	44.5500	28.33	-7.31	21.02	40.00	18.98	100	261	PK	Horizonta	PASS
2	192.4750	31.83	-9.71	22.12	40.00	17.88	100	326	PK	Horizonta	PASS
3	239.5200	31.27	-8.45	22.82	47.00	24.18	100	94	PK	Horizonta	PASS
4	296.2650	37.25	-7.20	30.05	47.00	16.95	100	280	PK	Horizonta	PASS
5	359.3150	32.06	-5.38	26.68	47.00	20.32	100	264	PK	Horizonta	PASS
6	531.4900	32.76	-2.37	30.39	47.00	16.61	100	358	PK	Horizonta	PASS

Note: 1. Result (dBµV/m) = Reading(dBµV/m) + Factor (dB) .

2. Factor (dB) = Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB).

Test mode:	Mode 1	Polarization	Vertical

Test Graph



Suspected List

NO.	Frequency [MHz]	Reading [dBµV/m]	Factor [dB]	Result [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Polarity	Remark
1	44.5500	38.61	-7.31	31.30	40.00	8.70	100	311	PK	Vertical	PASS
2	68.3150	32.71	-9.56	23.15	40.00	16.85	100	104	PK	Vertical	PASS
3	99.3550	31.29	-8.55	22.74	40.00	17.26	100	276	PK	Vertical	PASS
4	303.0550	36.44	-7.03	29.41	47.00	17.59	100	337	PK	Vertical	PASS
5	533.4300	37.91	-2.32	35.59	47.00	11.41	100	69	PK	Vertical	PASS
6	797.7550	32.64	1.74	34.38	47.00	12.62	100	267	PK	Vertical	PASS

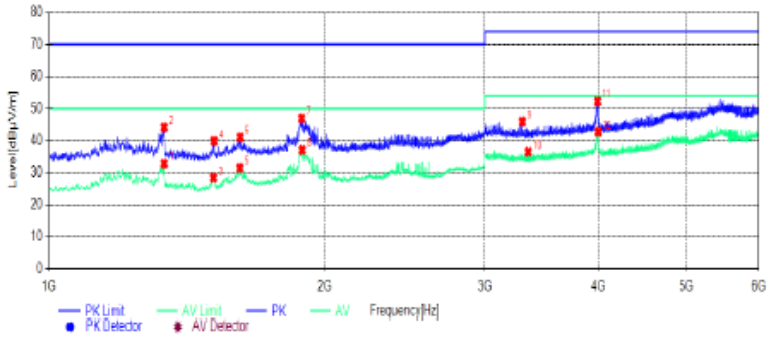
Note: 1. Result (dBµV/m) = Reading(dBµV/m) + Factor (dB) .

2. Factor (dB) = Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB).

TX-AH-R900PNR-860M:

Test mode:	Mode 1	Polarization	Horizontal

Test Graph



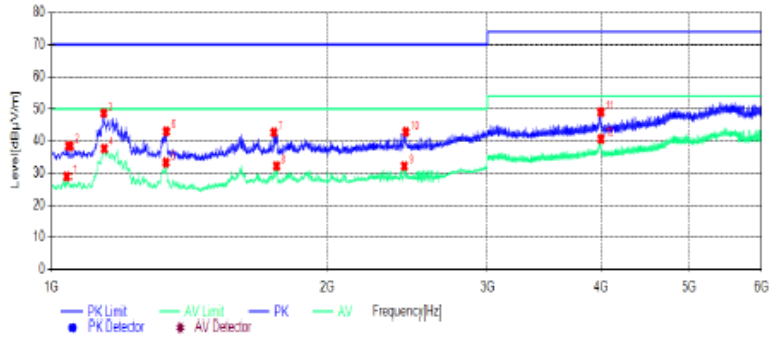
Suspected List

NO.	Frequency [MHz]	Reading [dBµV/m]	Factor [dB]	Result [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Polarity	Remark
1	1332.5000	32.35	0.50	32.85	50.00	17.15	100	243	AV	Horizonta	PASS
2	1332.5000	43.66	0.50	44.16	70.00	25.84	100	34	PK	Horizonta	PASS
3	1509.3750	27.48	0.89	28.37	50.00	21.63	100	293	AV	Horizonta	PASS
4	1511.8750	38.94	0.91	39.85	70.00	30.15	100	308	PK	Horizonta	PASS
5	1613.1250	29.84	1.59	31.43	50.00	18.57	100	312	AV	Horizonta	PASS
6	1614.3750	39.48	1.60	41.08	70.00	28.92	100	316	PK	Horizonta	PASS
7	1887.5000	44.76	2.19	46.95	70.00	23.05	100	231	PK	Horizonta	PASS
8	1890.0000	34.86	2.20	37.06	50.00	12.94	100	231	AV	Horizonta	PASS
9	3299.3750	38.35	7.52	45.87	74.00	28.13	100	327	PK	Horizonta	PASS
10	3348.7500	29.09	7.39	36.48	54.00	17.52	100	61	AV	Horizonta	PASS
11	3991.2500	43.07	9.20	52.27	74.00	21.73	100	335	PK	Horizonta	PASS
12	3996.8750	33.51	9.19	42.70	54.00	11.30	100	289	AV	Horizonta	PASS

Note:1. Result (dBµV/m) = Reading(dBµV/m) + Factor (dB) .
2. Factor (dB) = Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB).

Test mode:	Mode 1	Polarization	Vertical

Test Graph



Suspected List

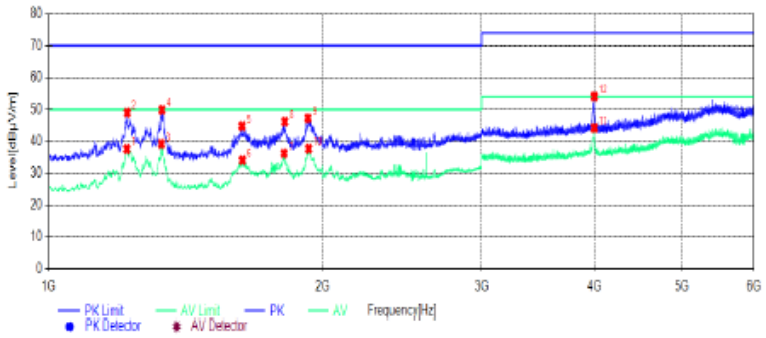
NO.	Frequency [MHz]	Reading [dBµV/m]	Factor [dB]	Result [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Polarity	Remark
1	1039.3750	28.22	0.72	28.94	50.00	21.06	100	358	AV	Vertical	PASS
2	1043.7500	37.75	0.74	38.49	70.00	31.51	100	358	PK	Vertical	PASS
3	1136.2500	47.66	0.98	48.64	70.00	21.36	100	322	PK	Vertical	PASS
4	1137.5000	36.64	0.98	37.62	50.00	12.38	100	322	AV	Vertical	PASS
5	1330.6250	32.78	0.51	33.29	50.00	16.71	100	310	AV	Vertical	PASS
6	1331.8750	42.45	0.50	42.95	70.00	27.05	100	310	PK	Vertical	PASS
7	1747.5000	40.61	2.02	42.63	70.00	27.37	100	260	PK	Vertical	PASS
8	1759.3750	30.18	2.05	32.23	50.00	17.77	100	260	AV	Vertical	PASS
9	2431.2500	27.82	4.37	32.19	50.00	17.81	100	78	AV	Vertical	PASS
10	2440.6250	38.39	4.40	42.79	70.00	27.21	100	291	PK	Vertical	PASS
11	3996.8750	39.78	9.19	48.97	74.00	25.03	100	32	PK	Vertical	PASS
12	3998.7500	31.44	9.19	40.63	54.00	13.37	100	32	AV	Vertical	PASS

Note:1. Result (dBµV/m) = Reading(dBµV/m) + Factor (dB) .
2. Factor (dB) = Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB).

TX-AH-R900P:

Test mode:	Mode 1	Polarization	Horizontal

Test Graph



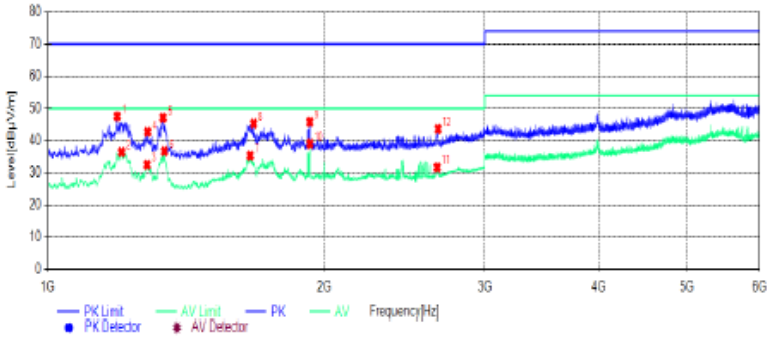
Suspected List

NO.	Frequency [MHz]	Reading [dBµV/m]	Factor [dB]	Result [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Polarity	Remark
1	1214.3750	36.65	0.94	37.59	50.00	12.41	100	34	AV	Horizonta	PASS
2	1215.6250	48.04	0.94	48.98	70.00	21.02	100	34	PK	Horizonta	PASS
3	1326.8750	38.69	0.52	39.21	50.00	10.79	100	196	AV	Horizonta	PASS
4	1328.7500	49.38	0.52	49.90	70.00	20.10	100	50	PK	Horizonta	PASS
5	1628.7500	43.13	1.71	44.84	70.00	25.16	100	246	PK	Horizonta	PASS
6	1630.6250	32.33	1.73	34.06	50.00	15.94	100	231	AV	Horizonta	PASS
7	1813.1250	34.12	2.13	36.25	50.00	13.75	100	131	AV	Horizonta	PASS
8	1816.2500	44.04	2.12	46.16	70.00	23.84	100	150	PK	Horizonta	PASS
9	1927.5000	45.08	2.21	47.29	70.00	22.71	100	215	PK	Horizonta	PASS
10	1930.6250	35.50	2.21	37.71	50.00	12.29	100	215	AV	Horizonta	PASS
11	3996.8750	35.06	9.19	44.25	54.00	9.75	100	262	AV	Horizonta	PASS
12	3996.8750	44.81	9.19	54.00	74.00	20.00	100	266	PK	Horizonta	PASS

Note:1. Result (dBµV/m) = Reading(dBµV/m) + Factor (dB) .
2. Factor (dB) = Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB).

Test mode:	Mode 1	Polarization	Vertical

Test Graph



Suspected List

NO.	Frequency [MHz]	Reading [dBµV/m]	Factor [dB]	Result [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Polarity	Remark
1	1186.2500	46.66	0.93	47.59	70.00	22.41	100	28	PK	Vertical	PASS
2	1199.3750	35.53	0.90	36.43	50.00	13.57	100	52	AV	Vertical	PASS
3	1278.7500	31.75	0.80	32.55	50.00	17.45	100	13	AV	Vertical	PASS
4	1280.6250	41.91	0.79	42.70	70.00	27.30	100	13	PK	Vertical	PASS
5	1331.8750	46.64	0.50	47.14	70.00	22.86	100	13	PK	Vertical	PASS
6	1336.2500	36.21	0.48	36.69	50.00	13.31	100	13	AV	Vertical	PASS
7	1659.3750	33.44	1.91	35.35	50.00	14.65	100	25	AV	Vertical	PASS
8	1673.7500	43.33	1.95	45.28	70.00	24.72	100	25	PK	Vertical	PASS
9	1928.7500	43.56	2.21	45.77	70.00	24.23	100	337	PK	Vertical	PASS
10	1929.3750	36.85	2.21	39.06	50.00	10.94	100	337	AV	Vertical	PASS
11	2659.3750	26.16	5.52	31.68	50.00	18.32	100	28	AV	Vertical	PASS
12	2665.6250	38.13	5.53	43.66	70.00	26.34	100	28	PK	Vertical	PASS

Note:1. Result (dBµV/m) = Reading(dBµV/m) + Factor (dB) .
2. Factor (dB) = Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB).

*****Note:**

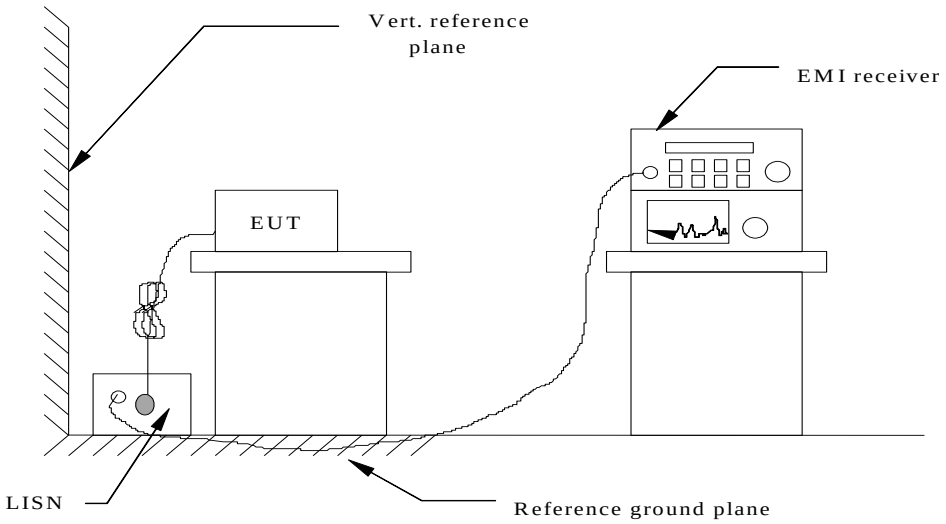
Pre-test at both voltage AC 120V/60Hz and AC 230V/50Hz, but we only recorded the worst case in this report.

4.1.2. Conducted Emission (AC Mains)

LIMIT

Please refer to ETSI EN301489-1 Clause 8.4.3, Table 8 and EN55032 Annex A, Table A.9, A.11

TEST CONFIGURATION



TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 8.4.3 for the measurement methods

TEST RESULTS

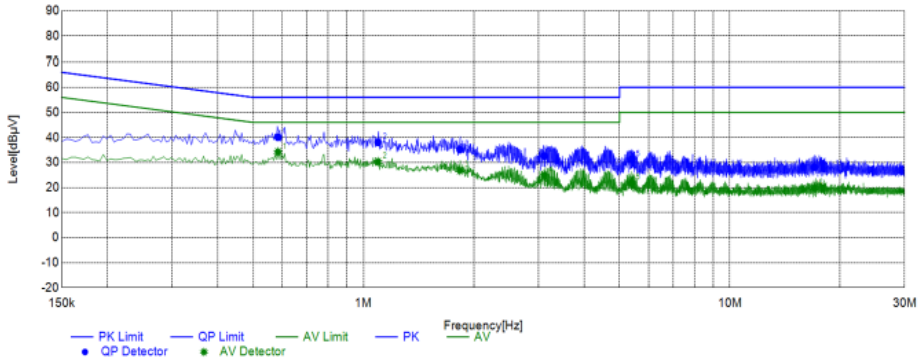
Passed

Please refer to the below test data:

TX-AH-R900PNR-860M:

Test mode:	Mode 1	Polarization	L

Test Graph



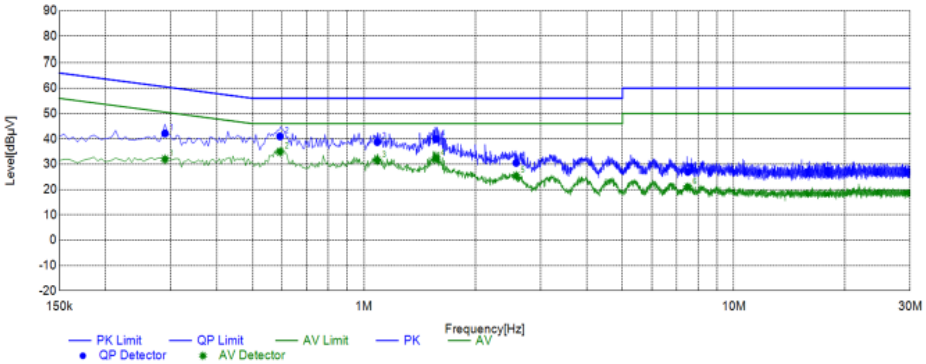
Final Data List												
NO.	Frequency [MHz]	QP Reading [dBµV]	AVG. Reading [dBµV]	Factor [dB]	QP Result [dBµV]	AVG. Result [dBµV]	QP Limit [dBµV]	AVG. Limit [dBµV]	QP Margin [dB]	AVG. Margin [dB]	Line	Remark
1	0.5847	30.06	24.11	10.06	40.12	34.17	56.00	46.00	15.88	11.83	L1	PASS
2	1.0954	28.01	20.19	10.08	38.09	30.27	56.00	46.00	17.91	15.73	L1	PASS
3	1.8337	25.01	16.72	10.13	35.14	26.85	56.00	46.00	20.86	19.15	L1	PASS
4	3.1163	22.30	14.61	10.30	32.60	24.91	56.00	46.00	23.40	21.09	L1	PASS
5	5.3855	20.71	11.43	10.51	31.22	21.94	60.00	50.00	28.78	28.06	L1	PASS
6	16.9934	16.88	8.49	11.23	28.11	19.72	60.00	50.00	31.89	30.28	L1	PASS

Note: 1. Result (dBµV) = Reading (dBµV) + Factor (dB).

2. Factor (dB) = Cable loss (dB) + LISN Factor (dB).

Test mode:	Mode1	Polarization	N

Test Graph



Final Data List												
NO.	Frequency [MHz]	QP Reading [dBµV]	AVG. Reading [dBµV]	Factor [dB]	QP Result [dBµV]	AVG. Result [dBµV]	QP Limit [dBµV]	AVG. Limit [dBµV]	QP Margin [dB]	AVG. Margin [dB]	Line	Remark
1	0.2897	32.16	21.96	9.98	42.14	31.94	60.53	50.53	18.39	18.59	N	PASS
2	0.5931	30.93	24.80	10.06	40.99	34.86	56.00	46.00	15.01	11.14	N	PASS
3	1.0863	28.67	21.43	10.08	38.75	31.51	56.00	46.00	17.25	14.49	N	PASS
4	1.5669	29.79	22.13	10.12	39.91	32.25	56.00	46.00	16.09	13.75	N	PASS
5	2.5795	20.28	15.13	10.24	30.52	25.37	56.00	46.00	25.48	20.63	N	PASS
6	7.5107	16.36	10.28	10.62	26.98	20.90	60.00	50.00	33.02	29.10	N	PASS

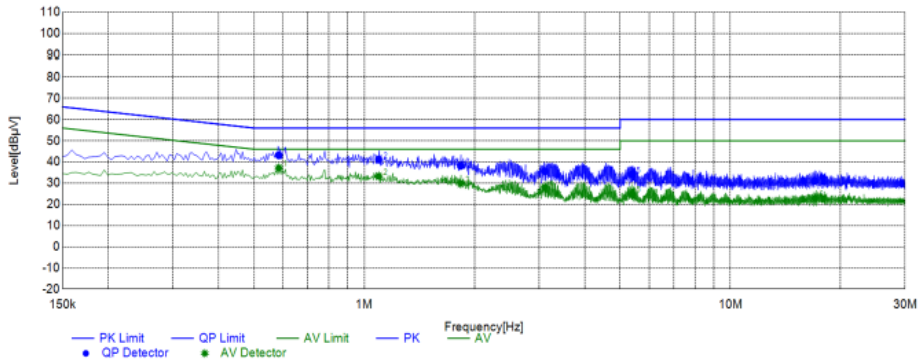
Note: 1. Result (dBµV) = Reading (dBµV) + Factor (dB).

2. Factor (dB) = Cable loss (dB) + LISN Factor (dB).

TX-AH-R900P:

Test mode:	Mode 1	Polarization	L

Test Graph



Final Data List

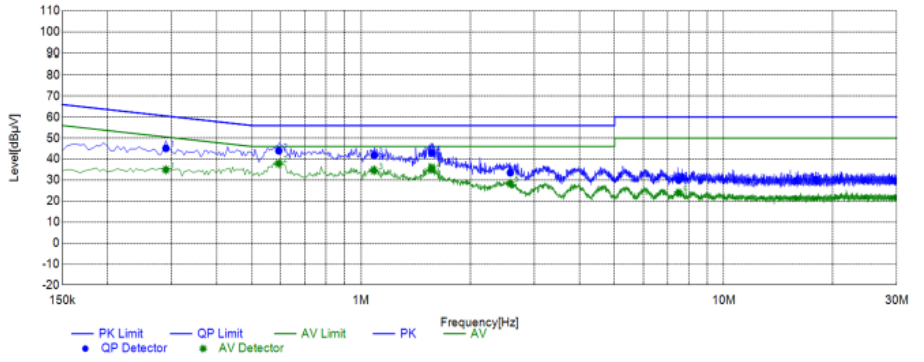
NO.	Frequency [MHz]	QP Reading [dBµV]	AVG. Reading [dBµV]	Factor [dB]	QP Result [dBµV]	AVG. Result [dBµV]	QP Limit [dBµV]	AVG. Limit [dBµV]	QP Margin [dB]	AVG. Margin [dB]	Line	Remark
1	0.5847	33.06	27.11	10.06	43.12	37.17	56.00	46.00	12.88	8.83	L1	PASS
2	1.0954	31.01	23.19	10.08	41.09	33.27	56.00	46.00	14.91	12.73	L1	PASS
3	1.8337	28.01	19.72	10.13	38.14	29.85	56.00	46.00	17.86	16.15	L1	PASS
4	3.1163	25.30	17.61	10.30	35.60	27.91	56.00	46.00	20.40	18.09	L1	PASS
5	5.3855	23.71	14.43	10.51	34.22	24.94	60.00	50.00	25.78	25.06	L1	PASS
6	16.9934	19.88	11.49	11.23	31.11	22.72	60.00	50.00	28.89	27.28	L1	PASS

Note: 1. Result (dBµV) = Reading (dBµV) + Factor (dB).

2. Factor (dB) = Cable loss (dB) + LISN Factor (dB).

Test mode:	Mode1	Polarization	N

Test Graph



Final Data List

NO.	Frequency [MHz]	QP Reading [dBµV]	AVG. Reading [dBµV]	Factor [dB]	QP Result [dBµV]	AVG. Result [dBµV]	QP Limit [dBµV]	AVG. Limit [dBµV]	QP Margin [dB]	AVG. Margin [dB]	Line	Remark
1	0.2897	35.16	24.96	9.98	45.14	34.94	60.53	50.53	15.39	15.59	N	PASS
2	0.5931	33.93	27.80	10.06	43.99	37.86	56.00	46.00	12.01	8.14	N	PASS
3	1.0863	31.67	24.43	10.08	41.75	34.51	56.00	46.00	14.25	11.49	N	PASS
4	1.5669	32.79	25.13	10.12	42.91	35.25	56.00	46.00	13.09	10.75	N	PASS
5	2.5795	23.28	18.13	10.24	33.52	28.37	56.00	46.00	22.48	17.63	N	PASS
6	7.5107	19.36	13.28	10.62	29.98	23.90	60.00	50.00	30.02	26.10	N	PASS

Note: 1. Result (dBµV) = Reading (dBµV) + Factor (dB).

2. Factor (dB) = Cable loss (dB) + LISN Factor (dB).

*****Note:**

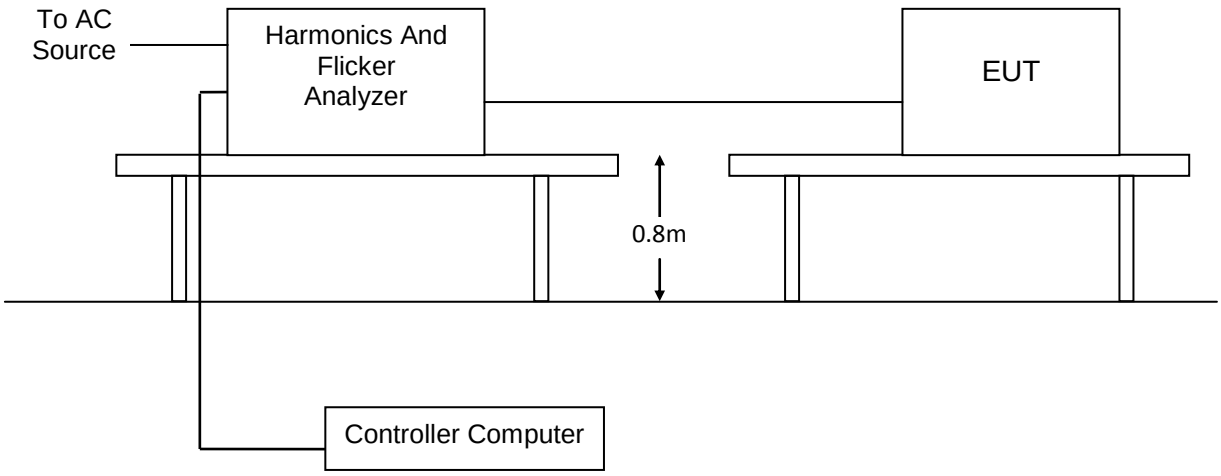
Pre-test at both voltage AC 120V/60Hz and AC 230V/50Hz, but we only recorded the worst case in this report.

4.1.3. Harmonic Current Emission

LIMIT

Please refer to EN 61000-3-2

TEST CONFIGURATION



TEST PROCEDURE

Please refer to EN 61000-3-2 for the measurement methods.

TEST RESULTS

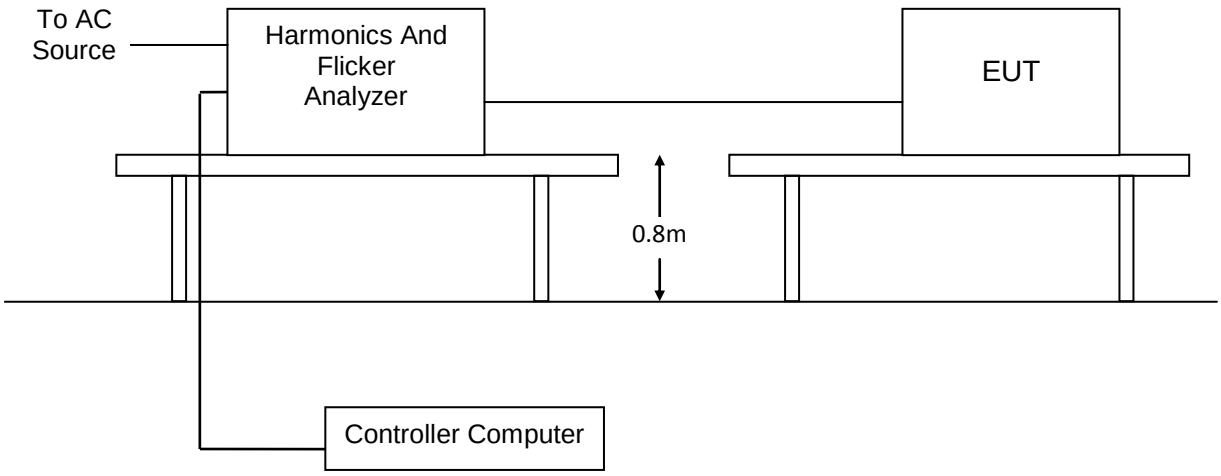
Not applicable to this device (The product without test since the rating power of EUT is less than 75W).

4.1.4. Voltage Fluctuation and Flicker

LIMIT

Please refer to EN 61000-3-3

TEST CONFIGURATION



TEST PROCEDURE

Please refer to EN 61000-3-3 for the measurement methods.

TEST RESULTS

Maximum Flicker results

TX-AH-R900PNR-860M			
	EUT values	**Limit**	**Result**
Pst	0.085	1.00	PASS
Plt	0.069	0.65	PASS
dc [%]	0.172	3.30	PASS
dmax [%]	0.269	4.00	PASS
dt [s]	0.082	0.50	PASS

TX-AH-R900P			
	EUT values	**Limit**	**Result**
Pst	0.089	1.00	PASS
Plt	0.076	0.65	PASS
dc [%]	0.182	3.30	PASS
dmax [%]	0.283	4.00	PASS
dt [s]	0.096	0.50	PASS

4.2. IMMUNITY

4.2.1. Performance criteria

■ **ETSI EN301489-3**

General performance criteria

• performance criterion A applies for immunity tests with phenomena of a continuous nature;

• performance criterion B applies for immunity tests with phenomena of a transient nature.

•The equipment shall meet the minimum performance criteria as specified in the following.

Criteria	During test	After test
A	Operate as intended No loss of function No unintentional responses	Operate as intended No loss of function No degradation of performance No loss of stored data or user programmable functions
B	May show loss of function No unintentional responses	Operate as intended Lost function(s) shall be self-recoverable No degradation of performance No loss of stored data or user programmable functions
NOTE: Where "operate as intended" or "no loss of function" is specified, the EUT shall demonstrate correct functioning as described in clause 5.		

4.2.2. Monitoring EUT in Immunity Test

4.2.2.1 Monitoring for Continuous Phenomena Applied to the EUT

■ **SRD Mode**

At the start of the test, establish a wireless link between the EUT and CMW500(integrate WIFI protocol Analyzer);

During the test, observe whether the EUT operate as intended, no loss of function and no unintentional transmissions. Monitoring PER and shall exeed 10%

After the test, Check the function and critical stored data of the EUT with no degration.

In addition, when EUT working in Idle /Receiver mode, monitor whether the transmitter unintentionally operates.

■ **other Mode**

During and after the test, observe the Screen status by eyes or monitor to see whether there is degration of performance

4.2.2.2 Monitoring for Transient Phenomena Applied to the EUT

■ **SRD Mode**

At the start of the test, establish a wireless link between the EUT and CMW500(integrate WIFI protocol Analyzer);

After the test, Check the function and critical stored data of the EUT with no degration.

In addition, when EUT working in Idle /Receiver mode, monitor whether the transmitter unintentionally operates.

After the test, Check the function and critical stored data of the EUT with no degration.

■ **other Mode**

After the test, observe the Screen status by eyes or monitor to see whether there is degration of performance

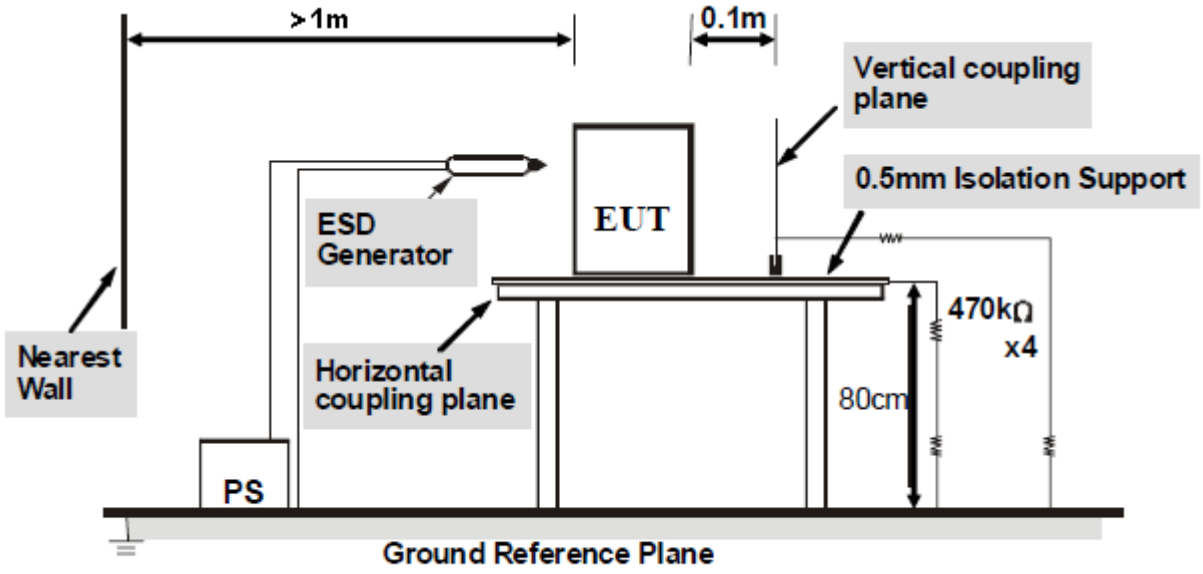
4.2.3. Electrostatic Discharge

LIMIT

SEVERITY LEVELS OF ELECTROSTATIC DISCHARGE

Test level: Contact Discharge at ±2KV, ±4KV Air Discharge at ±2KV, ±4KV, ±8KV

TEST CONFIGURATION



TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 9.3.2 and EN 61000-4-2 for the measurement methods.

Contact Discharge:

The ESD generator is held perpendicular to the surface to which the discharge is applied and the tip of the discharge electrode touch the surface of EUT. Then turn the discharge switch. The generator is then re-triggered for a new single discharge and repeated at least 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

Air Discharge:

Air discharge is used where contact discharge can't be applied. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated at least 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

Indirect discharge for horizontal coupling plane:

At least 10 single discharges shall be applied to the horizontal coupling plane, at points on each side of the EUT.

Indirect discharge for vertical coupling plane:

At least 10 single discharges shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

TEST MODE

Please reference to the section 2.3

TEST RESULTS

Direct discharge				
Type of discharge	Discharge voltage (KV)	Observations Performance	Criteria Level	Result
Contact discharge	±2	No degradation in performance of the EUT was observed (A)	B	Pass
	±4	A	B	
Air discharge	±2	A	B	
	±4	A	B	
	±8	A	B	
Indirect discharge				
Type of discharge	Discharge voltage (KV)	Observations Performance	Criteria Level	Result
HCP (6 sides)	±2	A	B	Pass
	±4	A	B	
VCP (4 sides)	±2	A	B	
	±4	A	B	

Remark: The ancillary equipment's specification for an acceptable level of performance or degradation of performance during and/or after the ESD tests.

Note: both models were tested and only the worst cases were recorded.

4.2.4. RF Electromagnetic Field

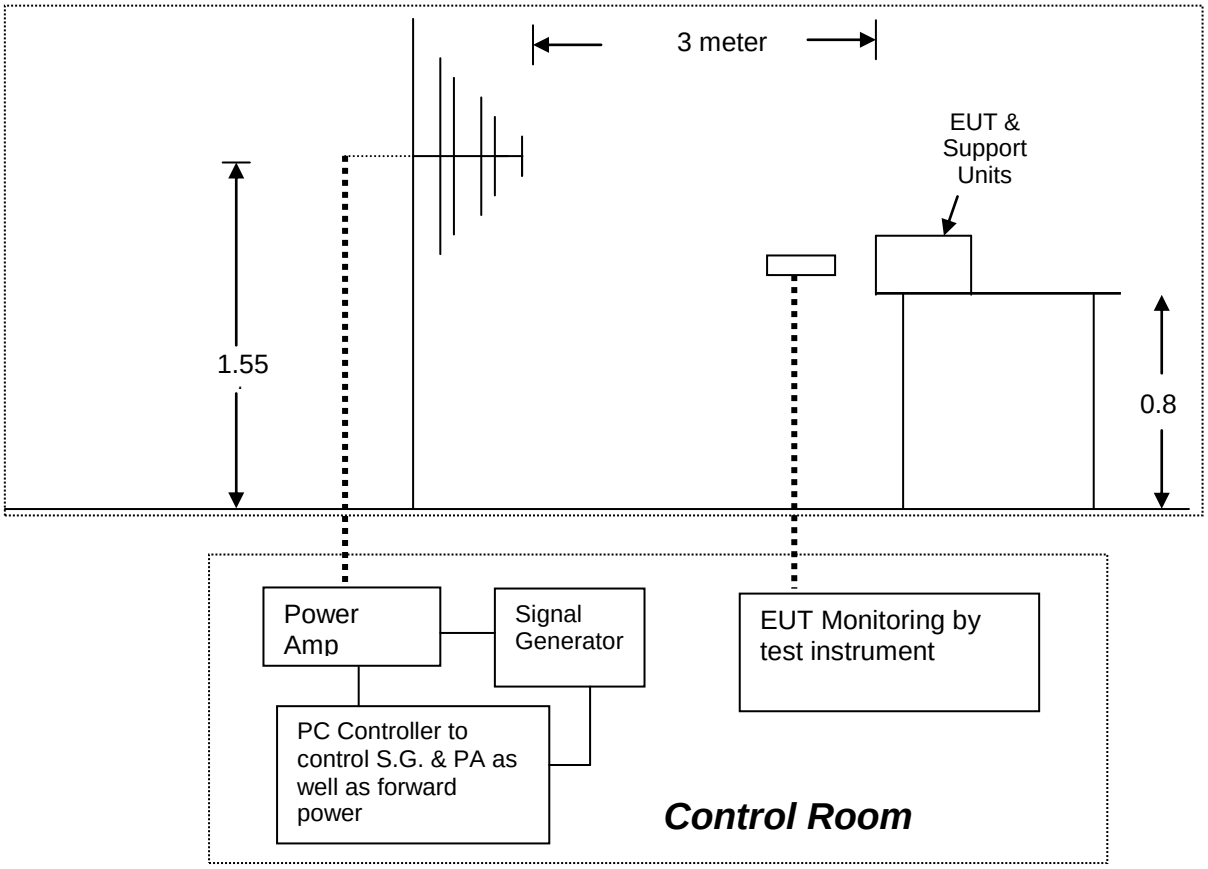
PERFORMANCE CRITERION

Criteria A

TEST LEVEL

3V/m (80%, 1kHz Amplitude Modulation)

TEST CONFIGURATION



TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 9.2.2 and EN 61000-4-3 for the measurement methods.

TEST MODE

Please reference to the section 2.3

TEST RESULTS

Frequency	Level	Modulation	Antenna Polarization	EUT Face	Observations (Performance Criterion)	Result
80 MHz-6 GHz	3 V/m	1 kHz, 80 % Amp. Mod, 1 % increment, dwell time=3seconds	V	Front	A	Pass
			H		A	Pass
			V	Rear	A	Pass
			H		A	Pass
			V	Left	A	Pass
			H		A	Pass
			V	Right	A	Pass
			H		A	Pass
			V	Top	A	Pass
			H		A	Pass
			V	Bottom	A	Pass
			H		A	Pass

Special conditions for EMC immunity tests

SRD Test Result:

EUT Working Mode	Antenna Polarity	Frequency (MHz)	Fielded Strength (V/m)	Observation	Position	Conclusion
Operating Mode	Vertical	80-6000	3	CT, CR	Front, Right, Left, Back	Pass
	Horizontal	80-6000	3	CT, CR	Front, Right, Left, Back	Pass

Special conditions for EMC immunity tests

EUT operating Mode	PER during test(Worst)	PER Limit	Conclusion
SRD	4.5%	10%	Pass

Note: both models were tested and only the worst cases were recorded.

4.2.5. Surges

PERFORMANCE CRITERION

Criteria B

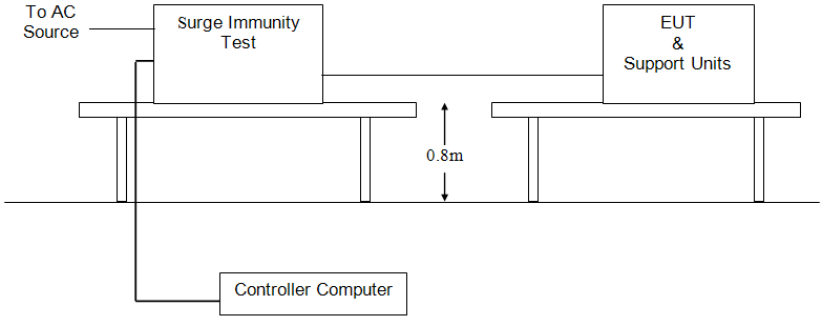
TEST LEVEL

1kV Line to Line: Differential mode

2kV Line to Ground: Common mode

(Voltage Waveform: 1.2/50 us; Current Waveform: 8/20 us)

TEST CONFIGURATION



TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 9.8.2 and EN 61000-4-5 for the measurement methods.

TEST MODE

Please reference to the section 2.3

TEST RESULTS

Location	Level(kV)	Pulse No	Surge Interval	Phase(deg)	Observations (Performance Criterion)	Result
L-N	± 1	5	60s	0°	A	Pass
				90°	A	Pass
				180°	A	Pass
				270°	A	Pass

Remark: A: No degradation in performance of the EUT was observed.

Note: both models were tested and only the worst cases were recorded.

4.2.6. RF- Common Mode 0.15MHz to 80MHz

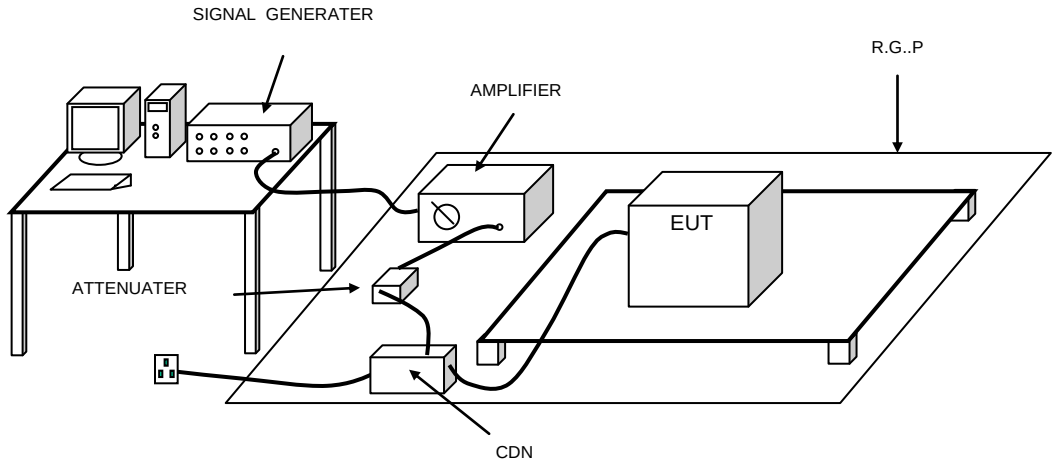
PERFORMANCE CRITERION

Criteria A

TEST LEVEL

3Vrms on AC main port (80%, 1kHz Amplitude Modulation)

TEST CONFIGURATION



TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 9.5.2 and EN 61000-4-6 for the measurement methods.

TEST MODE

Please reference to the section 2.3

TEST RESULTS

Frequency	Injected Position	Level	Modulation	Observations (Performance Criterion)	Result
150kHz to 80MHz	AC Mains	3Vrms	1 kHz, 80 % Amp. Mod, 1 % increment, dwell time=3seconds	A	Pass

Special conditions for EMC immunity tests

EUT operating Mode	PER during test(Worst)	PER Limit	Conclusion
SRD	4.4%	10%	Pass

Note: both models were tested and only the worst cases were recorded.

4.2.7. Fast Transients Common Mode

PERFORMANCE CRITERION

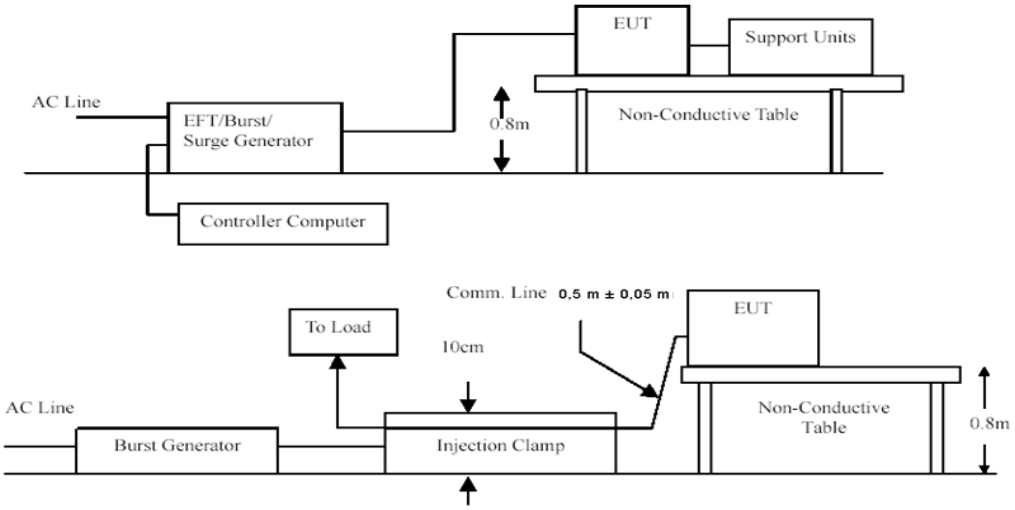
Criteria B

TEST LEVEL

1KV for AC main port

(Impulse Frequency: 5 kHz; Tr/Th: 5/50ns; Burst Duration: 15ms; Burst Period: 3Hz)

TEST CONFIGURATION



TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 9.4.2 and EN 61000-4-4 for the measurement methods.

TEST MODE

Please reference to the section 2.3

TEST RESULTS

Lead under Test	Level (±kV)	Coupling Direct/Clamp	Observations (Performance Criterion)	Result
L	±1	Direct	A	Pass
N	±1	Direct	A	Pass
L+N	±1	Direct	A	Pass

Remark: A: No degradation in performance of the EUT was observed.

Note: both models were tested and only the worst cases were recorded.

4.2.8. Voltage Dips and Interruptions

PERFORMANCE CRITERION

>95% VD, 0.5 period----Performance criterion: B

>95% VD, 1.0 period----Performance criterion: B

30% VD, 25 period----Performance criterion: C

>95% VI, 250 period----Performance criterion: C

TEST LEVEL

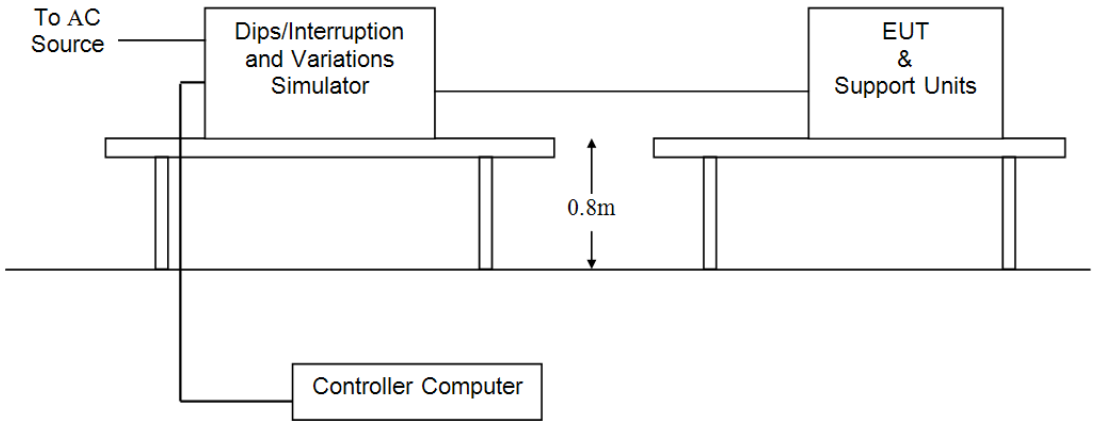
0% of VT(Supply Voltage) for 0.5 period

0% of VT(Supply Voltage) for 1.0 period

70% of VT(Supply Voltage) for 25 period

0% of VT(Supply Voltage) for 250 period

TEST CONFIGURATION



TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 9.7.2 and EN 61000-4-11 for the measurement methods.

TEST MODE

Please reference to the section 2.3

TEST RESULTS

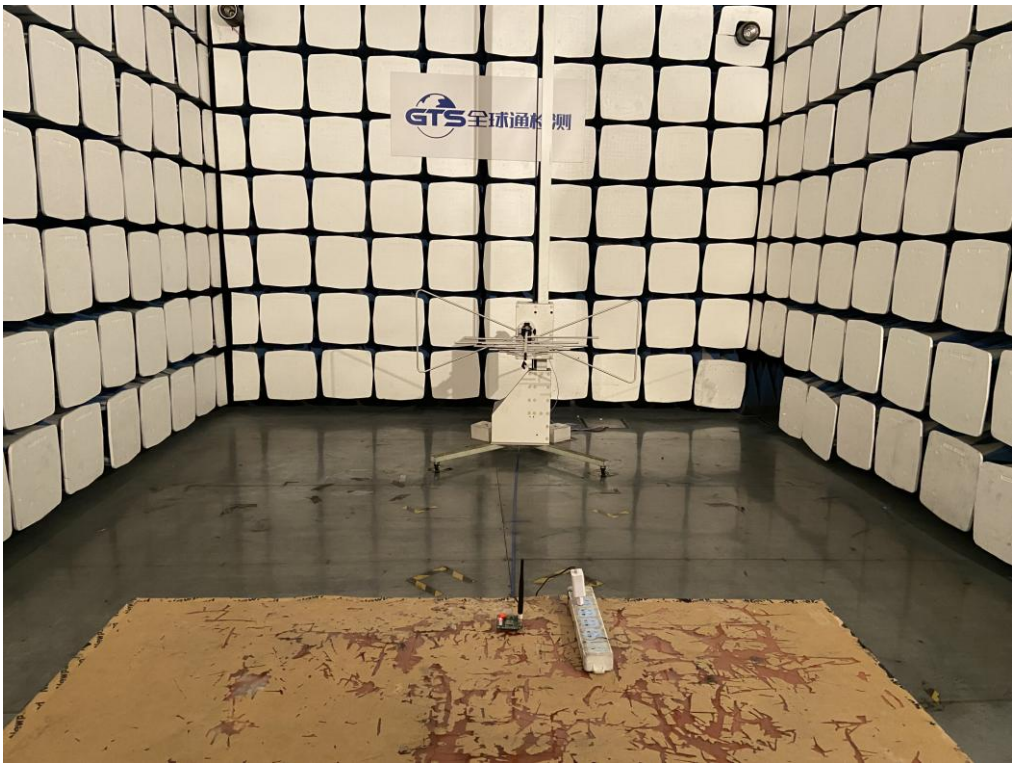
Test Level % UT	Duration (Periods)	Phase angle	No. of drop out	Time between dropout	Observations (Performance Criterion)	Result
0	0.5	0°, 90°, 180°, 270°	3	10s	A	Pass
0	1.0	0°, 90°, 180°, 270°	3	10s	A	Pass
70	25	0°, 90°, 180°, 270°	3	10s	A	Pass
0	250	0°, 90°, 180°, 270°	3	10s	B	Pass

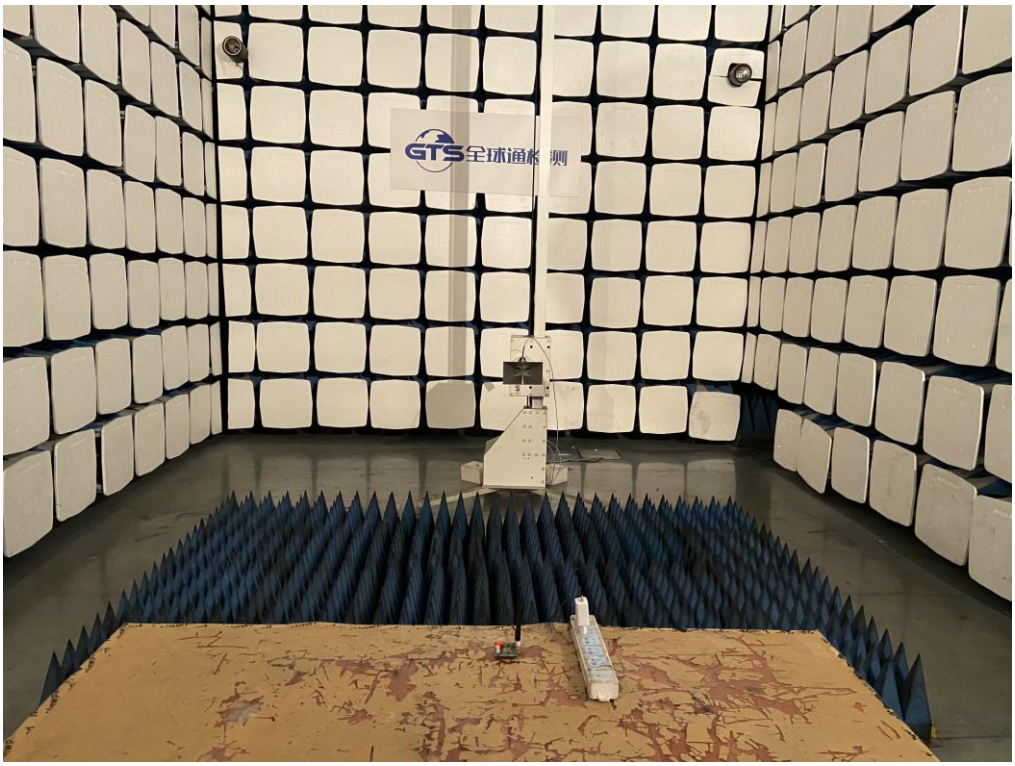
Remark :
A: No degradation in performance of the EUT was observed.
B: During the test, the power shut down, after the experiment, the function can automatically return to normal.

Note: both models were tested and only the worst cases were recorded.

5. TEST SETUP PHOTOS OF THE EUT

Radiated Emission

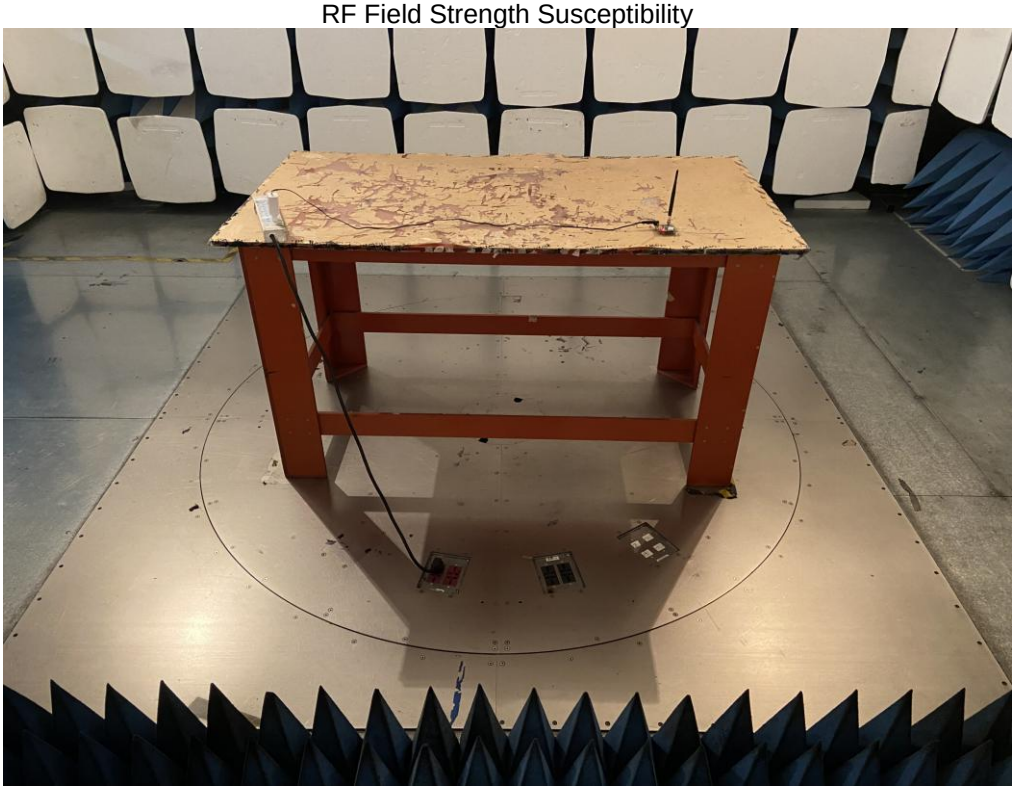




Conducted Emission

Electrostatic Discharge

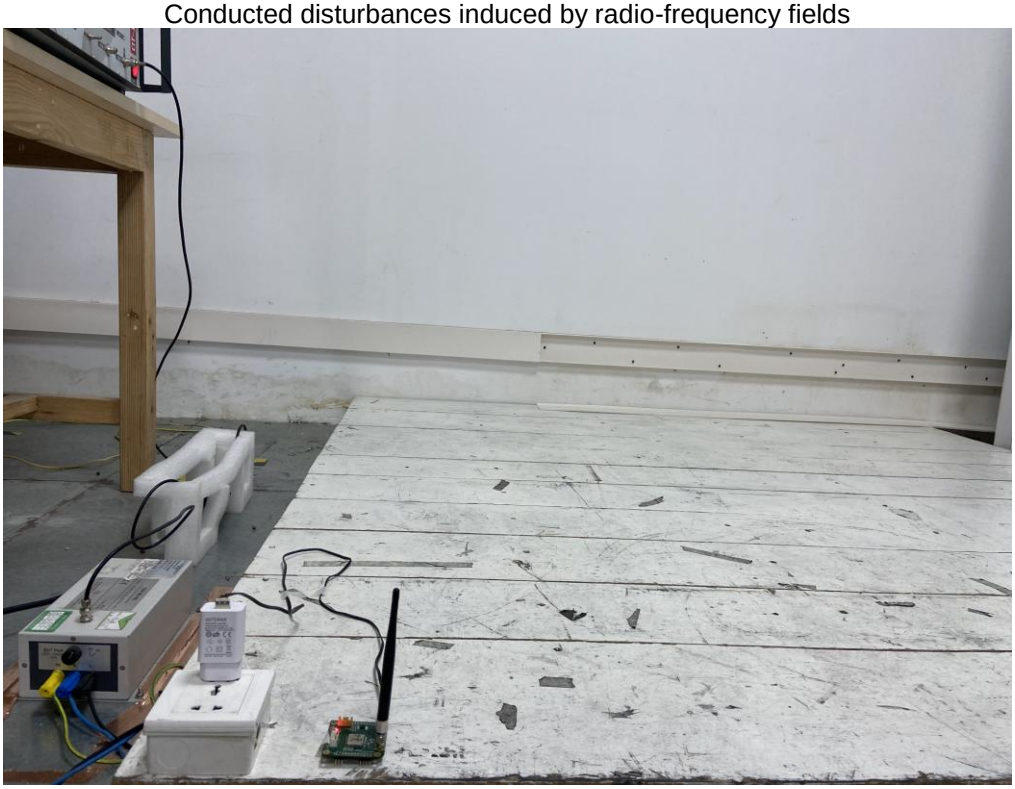
RF Field Strength Susceptibility



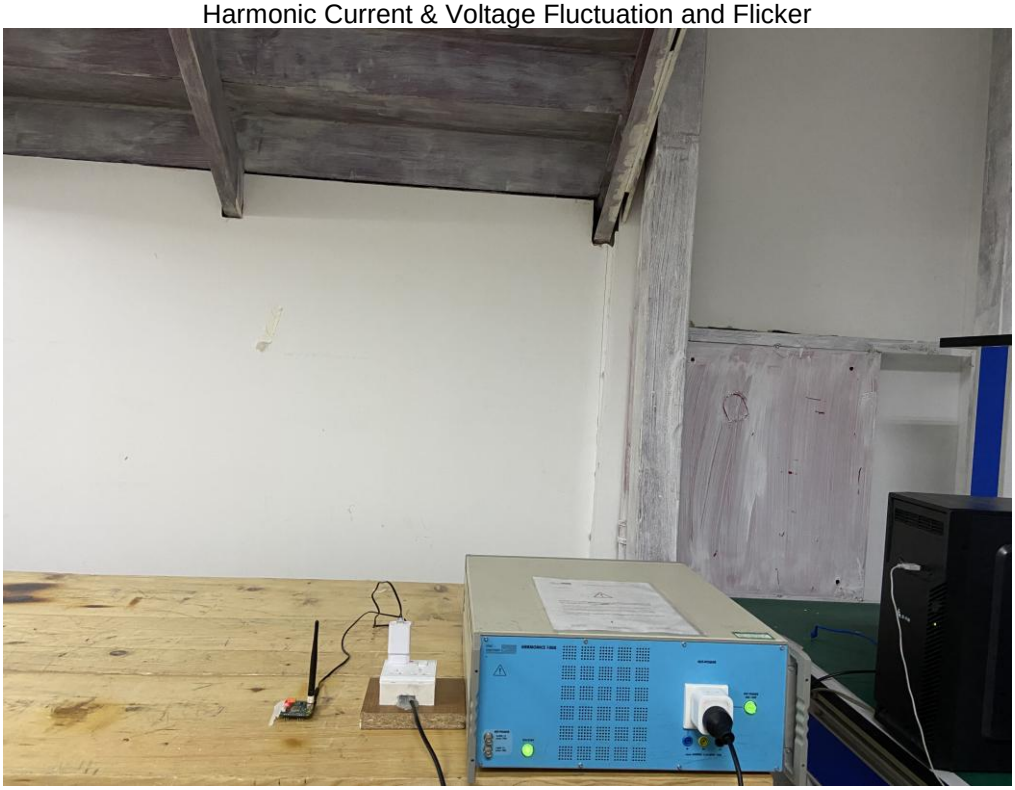
Electrical fast transients / Burst

Surge/Voltage Dips and Interruptions

Conducted disturbances induced by radio-frequency fields



Harmonic Current & Voltage Fluctuation and Flicker



6. EXTERNAL AND INTERNAL PHOTOS OF THE EUT

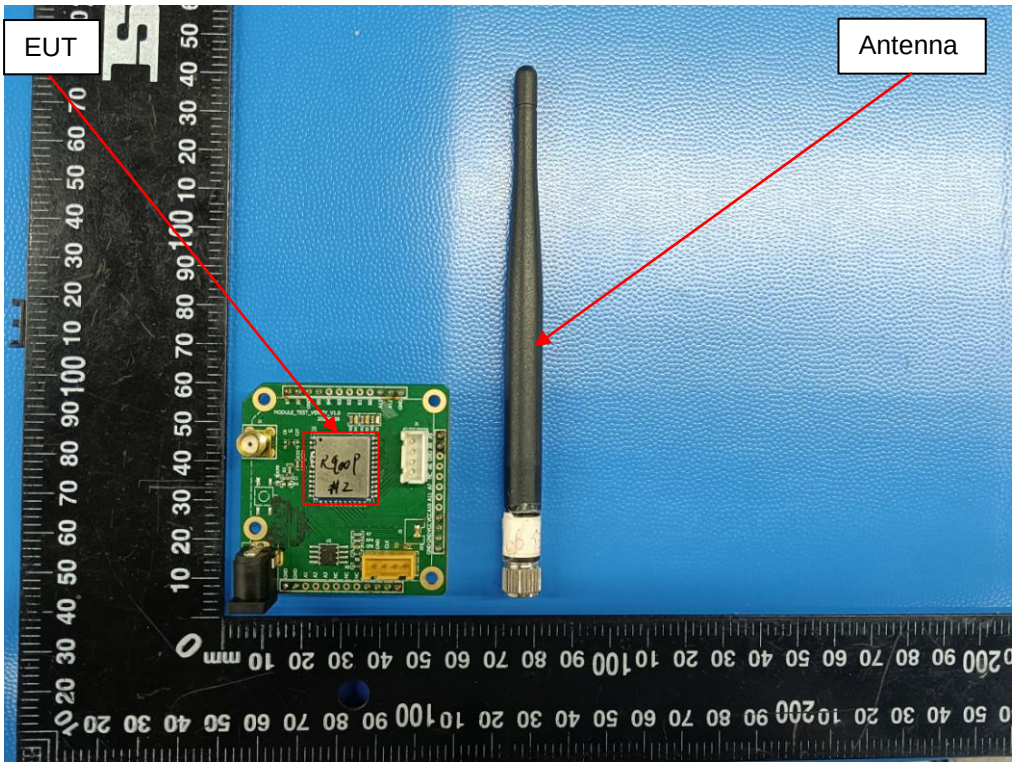


Fig. 1

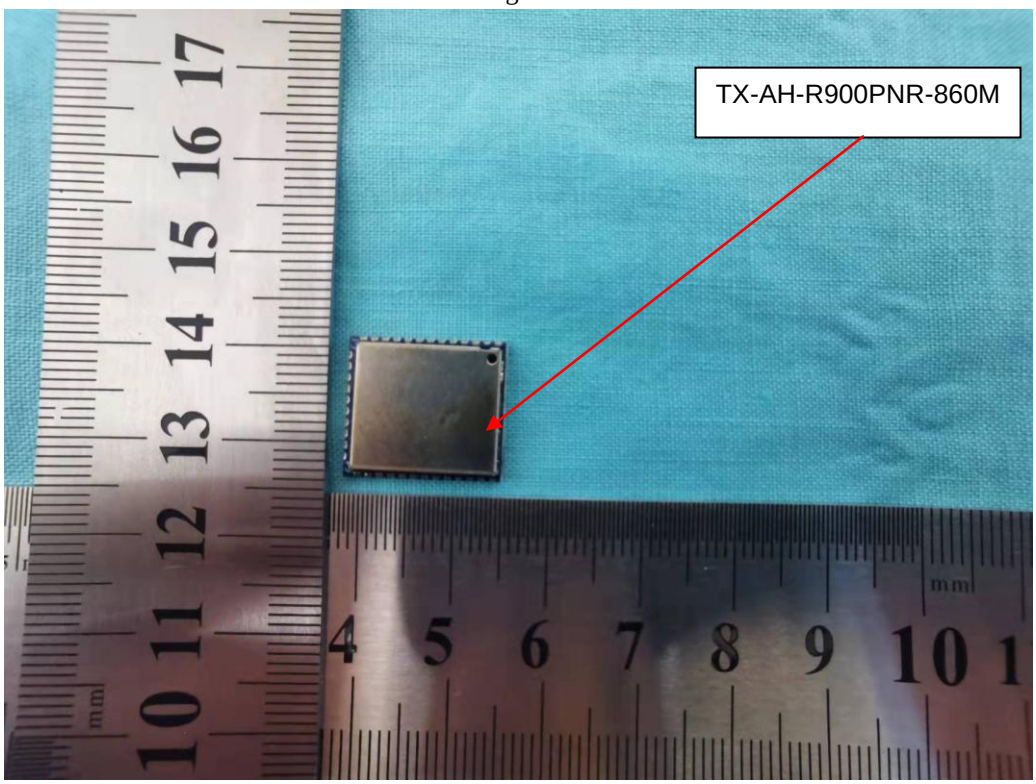


Fig. 2

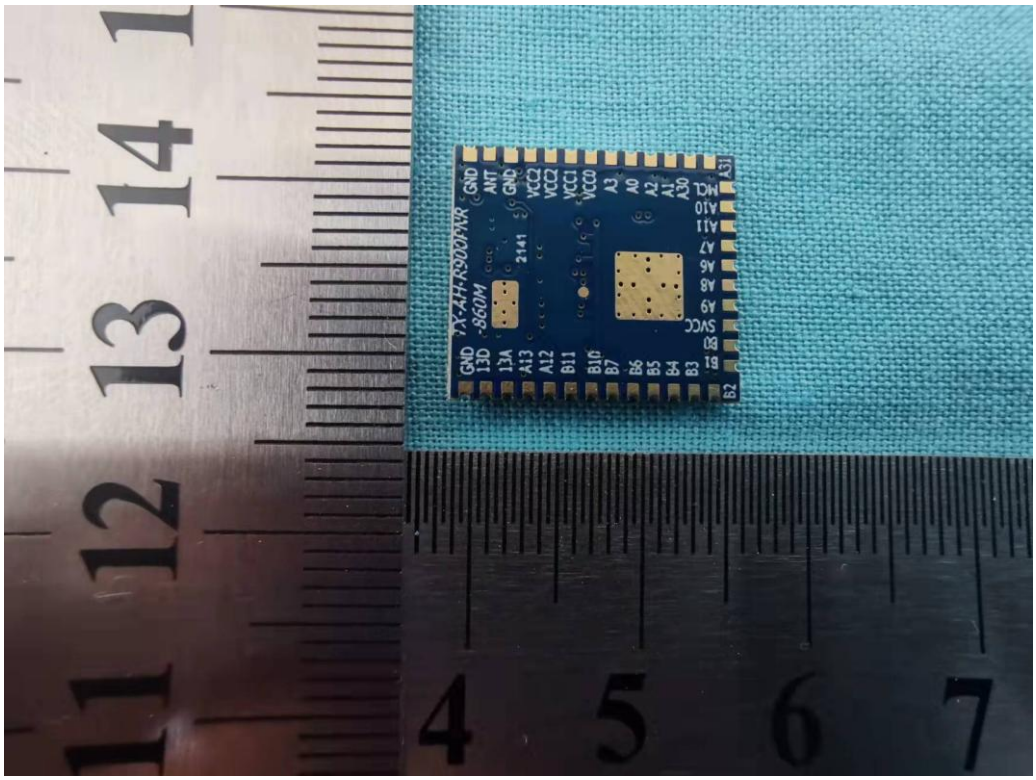


Fig. 3

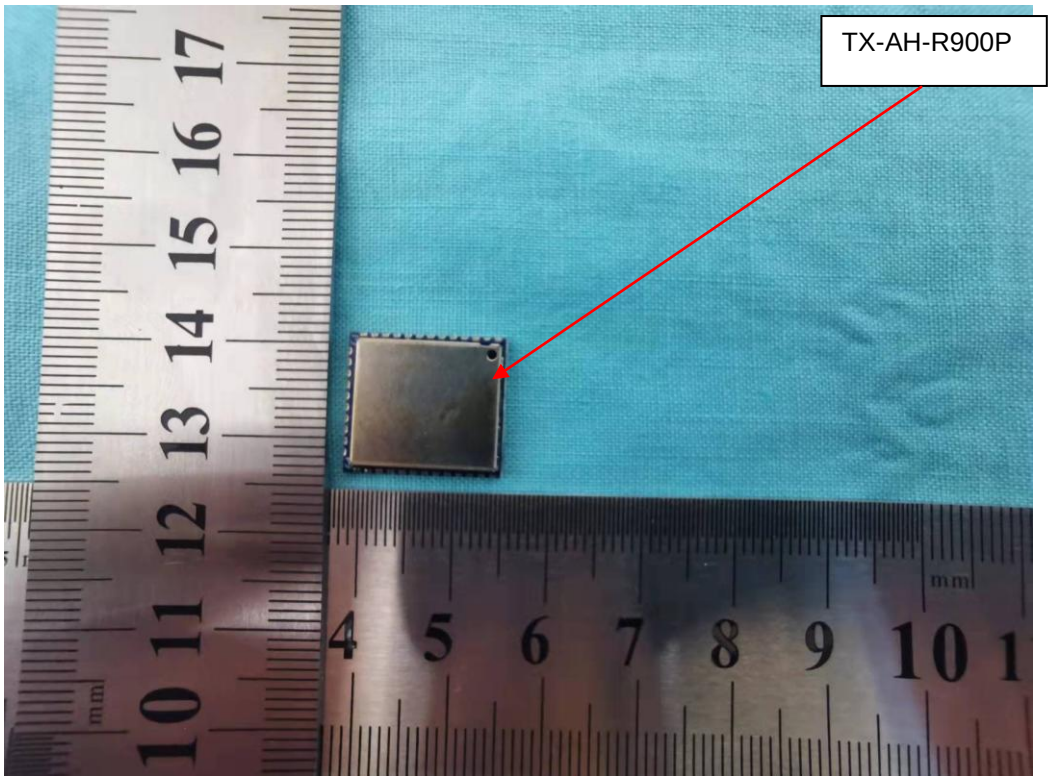


Fig. 4

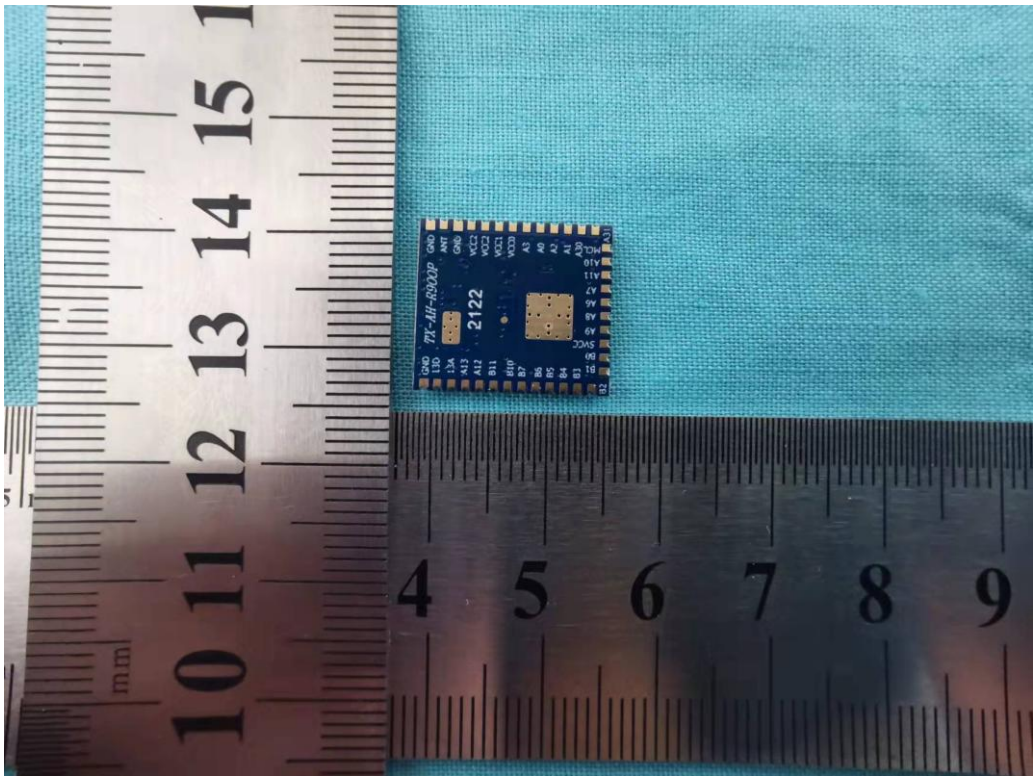


Fig. 5

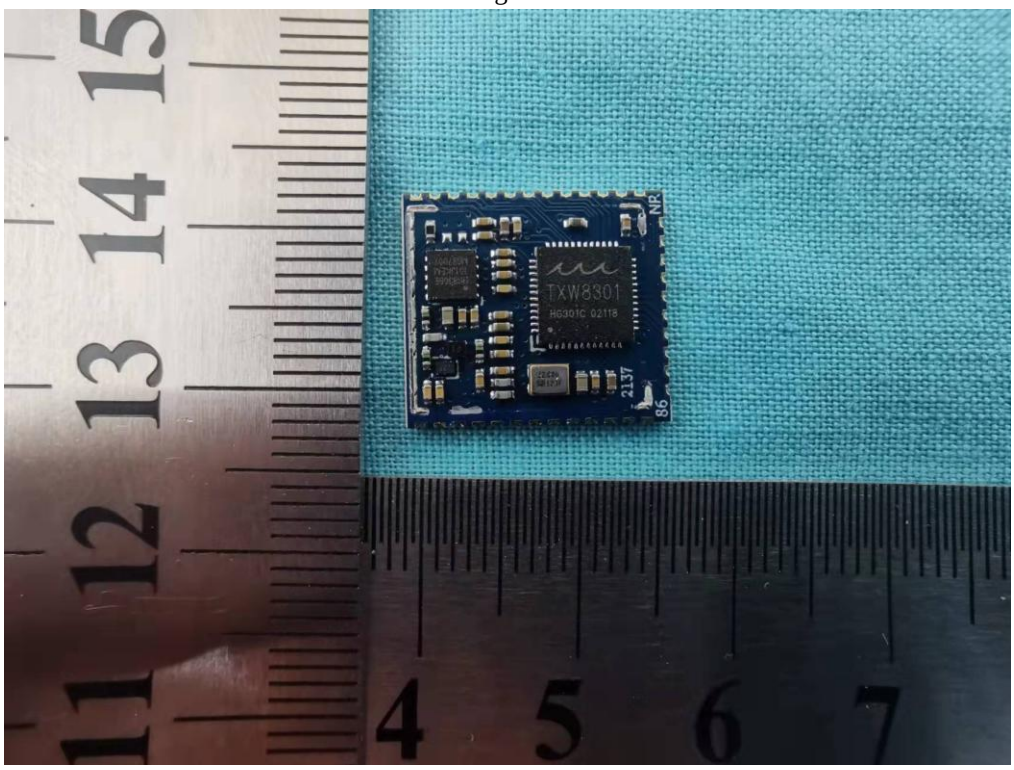
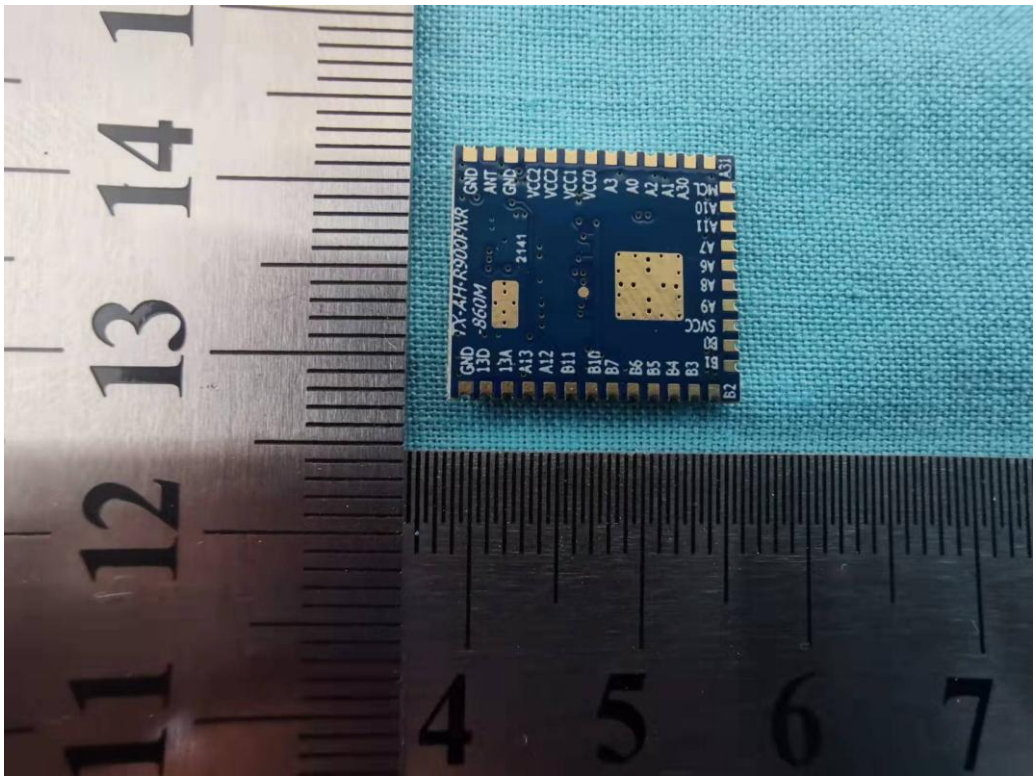


Fig. 6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ANT
GND
VCC2
VCC2
VCC1
VCC0
A3
A0
A2
A1
A30
MCL
A10
A11
A7
A6
A8
A9
VCC
B0
B1
B2
GND
13D
13A
A13
A12
B11
B10
B7
B6
B5
B4
B3

Fig. 7

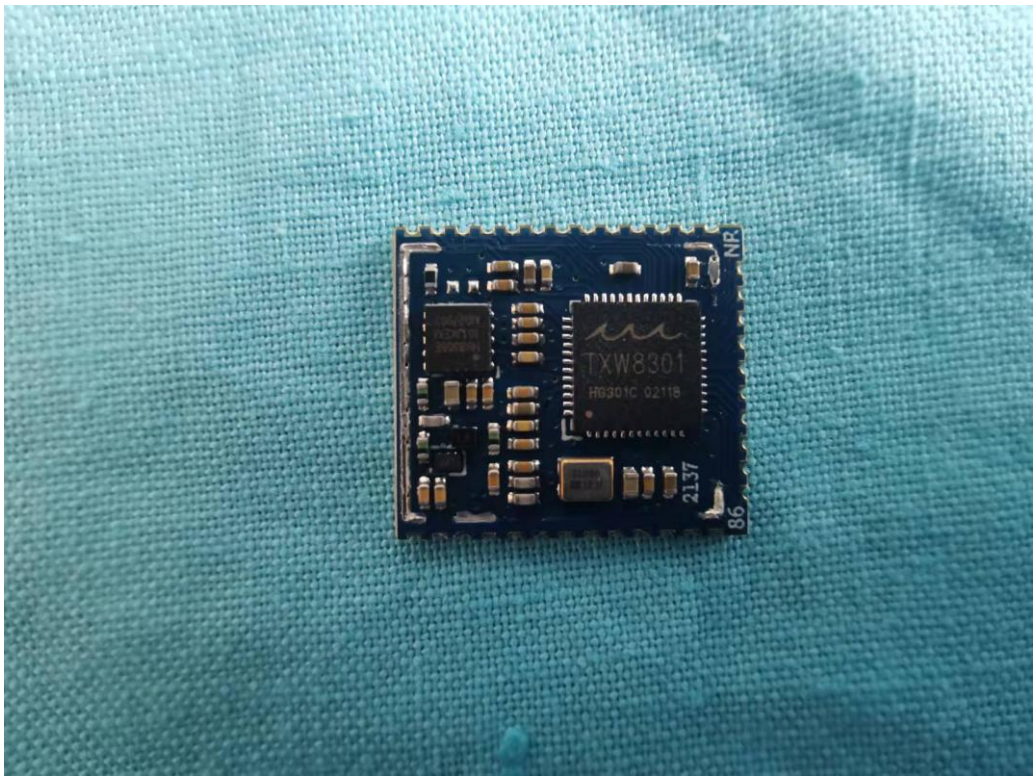
TXW8301
HG301C 02118
2137
86
NR

Fig. 8

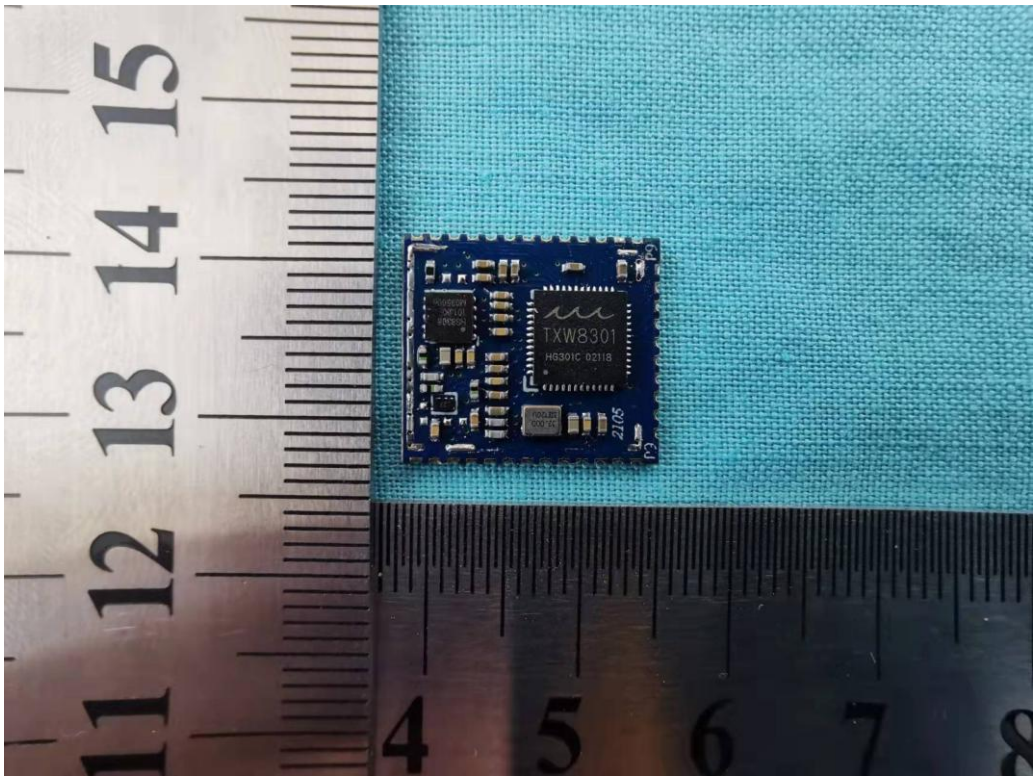

Fig. 9

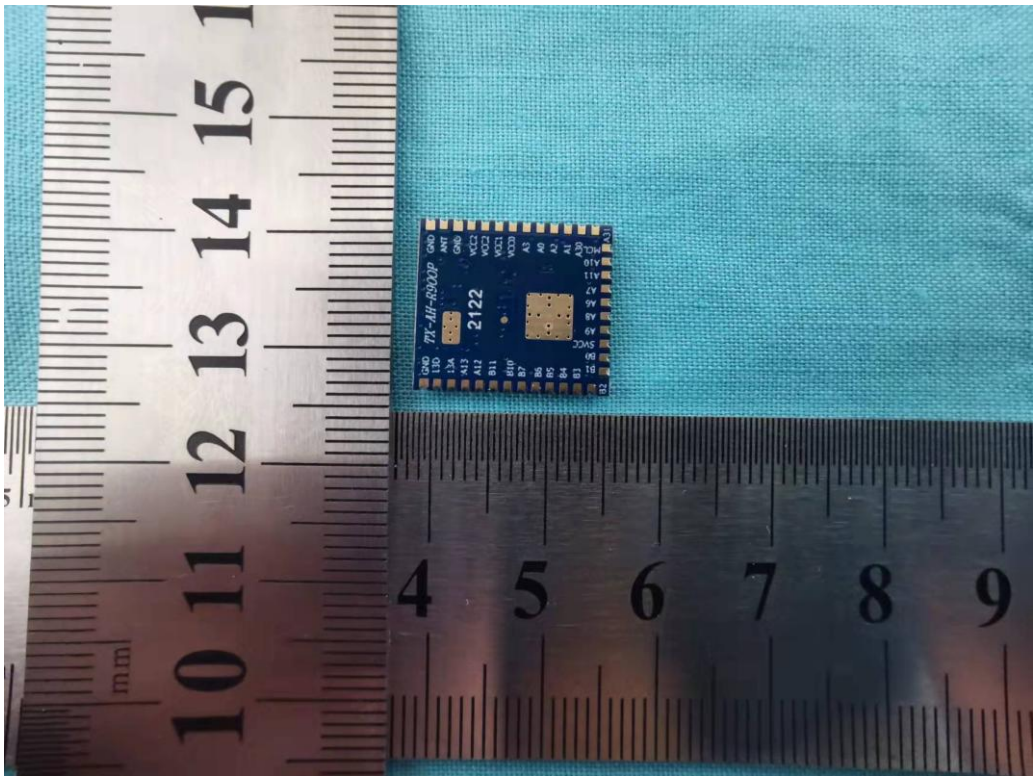

Fig. 10

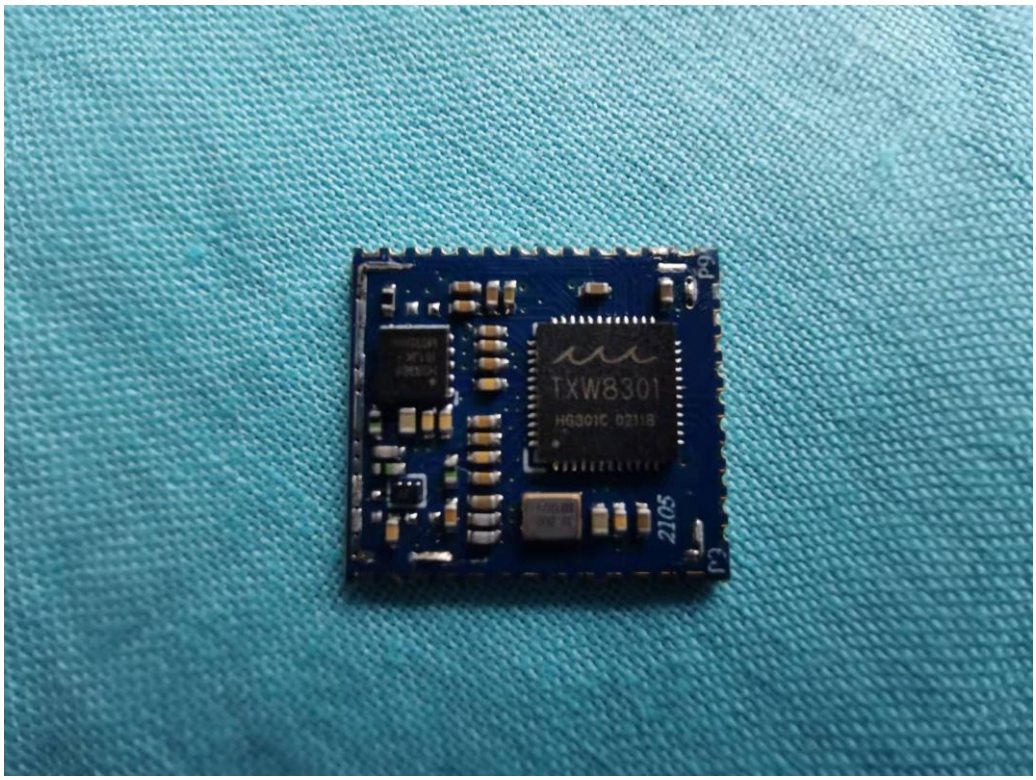

Fig. 11

.....End of Report.....