RADIO TEST REPORT

Applicant:	Confiabits S.R.L.
Address:	28 C/Genesis UV77 MZ36
Manufacturer:	Confiabits S.R.L.
Address:	28 C/Genesis UV77 MZ36
EUT:	Router
Trade Mark:	Confiabits
Model Number:	mt7981
Date of Receipt:	Dec. 09, 2023
Test Date:	Dec. 09, 2023 – Jan. 03, 2024
Date of Report:	Jan. 03, 2024
Prepared By:	Shenzhen DL Testing Technology Co., Ltd.
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Applicable Standards:	ETSI EN 300 440 V2.2.1 (2018-07)
Test Result:	Pass
Report Number:	DL-20240102001-5E

Prepared by(Engineer):	Alisa Song
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Approved(Manager):	Jade Yang

This test report is based on a single evaluation of one sample of above mentioned products. It is not permitted to be duplicated in extracts without written approval of Shenzhen DL Testing Technology Co., Ltd.

Table of Contents **Page**

1 . Summary of Test Results 4

2. General Information 5

2.1 General Description of E.U.T 5

2.2 EUT Exercise Software 5

2.3 Extreme Test Conditions: 6

2.4 Basic Test Setup Block Diagram 6

2.5 Accessories Equipment List and Details 6

2.6 EUT Cable List and Details 6

2.8 Equipments List For All Test Items 7

3. Equivalent Isotropically Radiated Power 8

3.1 Standard Applicable 8

3.2 Test Procedure 8

3.3 Environmental Conditions 9

3.4 Summary of Test Results 9

4. Permitted Range of Operating Frequencies 12

4.1 Applicable Standard 12

4.3 Test Procedure 12

4.4 Test Results/Plots 12

5. Unwanted emissions in the spurious domain 15

5.1 Limit of Spurious Emissions 15

5.2 Test Procedure 15

5.5 Environmental Conditions 16

5.6 Summary of Test Results 17

6. Duty Cycle 20

6.1 Applicable Standard 20

6.3 Test Procedure 20

6.4 Environmental Conditions 21

6.5 Summary of Test Results/Plots 21

7. Receiver Spurious Emissions 22

7.1 Limit of Spurious Emissions 22

7.4 Test Procedure 22

7.5 Environmental Conditions 23

7.6 Summary of Test Results 24
8. Receiver Blocking 27
8.1 Limit 27
8.2 Test Procedure 27
8.3 Environmental Conditions 28
8.4 Test Results 28
9. Setup Photo 29
10. EUT Photo 30

Version

Version No.	Date	Description
00	Jan. 03, 2024	Original

1. Summary of Test Results

ETSI EN 300 440 V2.2.1	Description of Test	Result
EN 300440 §4.2.2	Equivalent isotropically radiated power	Pass
EN 300440 §4.2.3	Permitted Range of Operating Frequencies	Pass
EN 300440 §4.2.4	Unwanted emissions in the spurious domain	Pass
EN 300440 §4.2.5	Duty Cycle	Pass
EN 300440 §4.2.6	Additional requirements for FHSS equipment	N/A
EN 300440 §4.2.2.3	Blocking or desensitization	Pass
EN 300440 §4.2.2.3	Receiver Spurious Radiations	Pass

2. General Information

2.1 General Description of E.U.T

EUT Name	:	Router
Trade Mark	:	Confiabits
Model No.	:	mt7981
Test Model	:	mt7981
Model Difference	:	N/A
Power supply	:	100-240V~ 50/60Hz 2.5A
Operation frequency	:	802.11a/n/ac(HT20):5745~5825MHz 802.11n/ac(HT40): 5755-5795MHz 802.11ac(HT80):5775MHz
Modulation	:	CCK/OFDM/DBPSK/DAPSK
Antenna Type	:	External Antenna*3
Antenna Gain	:	5 dBi*3 MIMO=9.7dBi
Hardware Version	:	1.0
Software Version	:	1.0
Firmware	:	---
Intend use environment	:	Residential, commercial and light industrial environment

Note1: For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
Note2: The EUT's all information provided by client.

The equipment under test (EUT) was configured to measure its highest possible emission level. For more detail refer to the Operating Instructions.

2.2 EUT Exercise Software

The EUT exercise program used during the testing was designed to exercise the system components. The test software is started while the whole system is on.

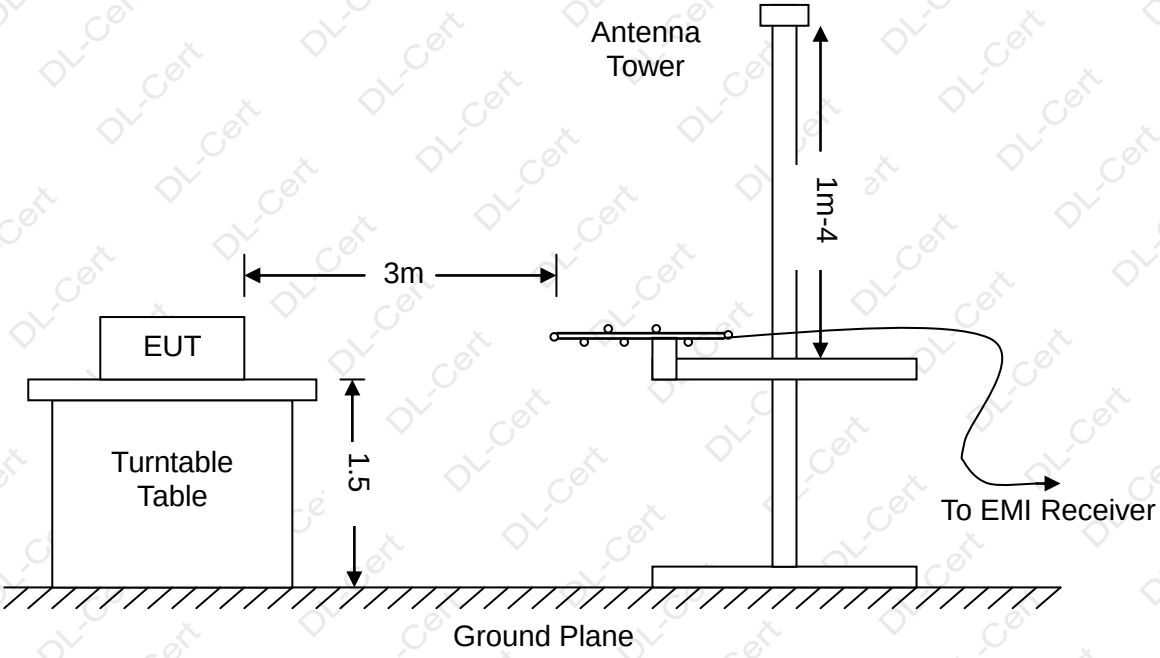
2.3 Extreme Test Conditions:

For tests at extreme temperatures, measurements shall be made over the extremes of the operating temperature range as declared by the manufacturer.

For tests at extreme voltages, measurements shall be made over the extremes of the power source voltage range as declared by the manufacturer.

Test Conditions	LTLV	LTHV	HTHV	HTLV
Temperature (℃)	-20	-20	55	55
Test Voltage (AC)	207V	253V	253V	207V

2.4 Basic Test Setup Block Diagram



2.5 Accessories Equipment List and Details

Manufacturer	Description	Model	Serial Number
/	/	/	/

2.6 EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
/	/	/	/

2.7 Equipments List For All Test Items

For All Test					
Equipment	**Manufacturer**	**Model#**	**Serial#**	**Last Cal.**	**Next Cal.**
3m Semi-Anechoic	ETS-LINDGREN	N/A	SEL0017	Nov. 04, 2023	Nov. 03, 2024
Spectrum analyzer	Agilent	E4407B	MY46185649	Nov. 04, 2023	Nov. 03, 2024
Receiver	R&S	ESCI	1166.5950K03-1 011	Nov. 04, 2023	Nov. 03, 2024
Receiver	R&S	ESCI	101202	Nov. 04, 2023	Nov. 03, 2024
Bilog Antenna	Schwarzbeck	VULB 9168	VULB9168-438	Nov. 04, 2023	Nov. 03, 2024
Horn Antenna	EMCO	3115	640201028-06	Nov. 04, 2023	Nov. 03, 2024
Power Meter	Anritsu	ML2495A	1204003	Nov. 04, 2023	Nov. 03, 2024
Power Sensor	Anritsu	MA2411B	100309	Nov. 04, 2023	Nov. 03, 2024
Active Loop Antenna	Beijing Daze	ZN30900A	SEL0097	Nov. 04, 2023	Nov. 03, 2024
Cable	Resenberger	N/A	No.1	Nov. 04, 2023	Nov. 03, 2024
Cable	SCHWARZBECK	N/A	No.2	Nov. 04, 2023	Nov. 03, 2024
Cable	SCHWARZBECK	N/A	No.3	Nov. 04, 2023	Nov. 03, 2024
Pre-amplifier	Schwarzbeck	BBV9743	9743-019	Nov. 04, 2023	Nov. 03, 2024
Pre-amplifier	R&S	AFS33-18002 650-30-8P-44	SEL0080	Nov. 04, 2023	Nov. 03, 2024
Base station	Agilent	E5515C	GB44300243	Nov. 04, 2023	Nov. 03, 2024
Temperature controller	Terchy	MHQ	120	Nov. 04, 2023	Nov. 03, 2024
Power divider	Anritsu	K240C	020346	Nov. 04, 2023	Nov. 03, 2024
Signal Generator	HP	83732B	VS3449051	Nov. 04, 2023	Nov. 03, 2024
Attenuator	Agilent	8491B	MY39262165	Nov. 04, 2023	Nov. 03, 2024
vector Signal Generator	Agilent	E4438C	MY49070163	Nov. 04, 2023	Nov. 03, 2024
splitter	Mini-Circuits	ZAP-50W	NN256400424	Nov. 04, 2023	Nov. 03, 2024
Directional Coupler	Agilent	87300C	MY44300299	Nov. 04, 2023	Nov. 03, 2024
vector Signal Generator	Agilent	E4438C	US44271917	Nov. 04, 2023	Nov. 03, 2024
X-series USB Peak and Average Power Sensor	Agilent	U2021XA	MY54080020	Nov. 04, 2023	Nov. 03, 2024
X-series USB Peak and Average Power Sensor	Agilent	U2021XA	MY54110001	Nov. 04, 2023	Nov. 03, 2024
X-series USB Peak and Average Power Sensor	Agilent	U2021XA	MY53480008	Nov. 04, 2023	Nov. 03, 2024
X-series USB Peak and Average Power Sensor	Agilent	U2021XA	MY54080019	Nov. 04, 2023	Nov. 03, 2024
4 Ch.Simultaneous Sampling 14 Bits 2 MS/s	Agilent	U2531A	TW54063507	Nov. 04, 2023	Nov. 03, 2024
4 Ch.Simultaneous Sampling 14 Bits 2 MS/s	Agilent	U2531A	TW54063513	Nov. 04, 2023	Nov. 03, 2024
splitter	Mini	PS3-7	4463	Nov. 04, 2023	Nov. 03, 2024
Signal Analyzer	Agilent	N9010A	MY48030494	Nov. 04, 2023	Nov. 03, 2024

3. Equivalent Isotropically Radiated Power

3.1 Standard Applicable

According to ETSI EN 300 440-1 section 4.2.2, the effective radiated power shall not exceed the power class value given in following table:

Table 2: Maximum radiated power (e.i.r.p.)

Entry	Frequency Bands	Power	Application	Notes
1	2 400 MHz to 2 483,5 MHz	10 mW e.i.r.p.	Non-specific short range devices	
2	2 400 MHz to 2 483,5 MHz	25 mW e.i.r.p.	Radiodetermination devices	
3	(a) 2 446 MHz to 2 454 MHz	500 mW e.i.r.p.	Radio Frequency Identification (RFID) devices	See also table 4 and Annex G
4	(b) 2 446 MHz to 2 454 MHz	4 W e.i.r.p.	Radio Frequency Identification (RFID) devices	See also table 4 and Annex G
5	5 725 MHz to 5 875 MHz	25 mW e.i.r.p.	Non-specific short range devices	
6	9 200 MHz to 9 500 MHz	25 mW e.i.r.p.	Radiodetermination devices	
7	9 500 MHz to 9 975 MHz	25 mW e.i.r.p.	Radiodetermination devices	
8	10,5 GHz to 10,6 GHz	500 mW e.i.r.p.	Radiodetermination devices	
9	13,4 GHz to 14,0 GHz	25 mW e.i.r.p.	Radiodetermination devices	
10	17,1 GHz to 17,3 GHz	400 mW e.i.r.p.	Radiodetermination devices	See Annex H
11	24,00 GHz to 24,25 GHz	100 mW e.i.r.p.	Non-specific short range devices and radiodetermination devices	
NOTE: The spectrum ranges in some entries are not harmonised throughout all EU territory, specifically entries 4, 9, and 11 have been identified as such. Implementers are cautioned to refer to CEPT/ERC Recommendation 70-03 [i.2] as well as current National Radio plans to verify acceptance within intended regions of use.				

3.2 Test Procedure

Setup

Figure 2: Measurement arrangement

For practical reasons, measurements shall be performed only at the highest power level at which the transmitter is intended to operate. The measurement arrangement in figure 2 shall be used.

The measurement shall be performed preferably in the absence of modulation.

When it is not possible to measure it in the absence of modulation, this fact shall be stated in test reports.

The transmitter shall be set in continuous transmission mode. If this is not possible, the measurements shall be carried out in a period shorter than the duration of the transmitted burst. It may be necessary to extend the duration of the burst.

The transmitter shall be connected to an artificial antenna (see clause 5.8.2) and the power delivered to this artificial antenna shall be measured.

The equivalent isotropically radiated power is then calculated from the measured value, the known antenna gain, relative to an isotropic antenna, and if applicable, any losses due to cables and connectors in the measurement system.

3.3 Environmental Conditions

Temperature:	23 °C
Relative Humidity:	54 %
ATM Pressure:	1019 mbar

3.4 Summary of Test Results

Test Conditions	Output power (dBm) 802.11a						EIRP Power (dBm) 802.11a						EIRP Limit (dBm)	Result
	ANT1		ANT2		ANT3		ANT1		ANT2		ANT3			
	5745 MHz	5825 MHz	5745 MHz	5825 MHz	5745 MHz	5825 MHz	5745 MHz	5825 MHz	5745 MHz	5825 MHz	5745 MHz	5825 MHz		
Normal	5.29	4.90	5.27	4.99	5.67	4.54	10.29	9.90	10.27	9.99	10.67	9.54	13.97	Pass
LTLV	5.28	4.87	5.18	4.92	5.66	4.52	10.28	9.87	10.18	9.92	10.66	9.52	13.97	Pass
LTHV	5.28	4.88	4.88	4.62	5.66	4.53	10.28	9.88	9.88	9.62	10.66	9.53	13.97	Pass
HTHV	5.10	4.70	4.95	4.70	5.47	4.36	10.10	9.70	9.95	9.70	10.47	9.36	13.97	Pass
HTLV	5.27	4.86	4.93	4.68	5.64	4.51	10.27	9.86	9.93	9.68	10.64	9.51	13.97	Pass

Note: EIRP POWER=Output power + Antenna Gain(5dBi)

Test Conditions	Output power (dBm) 802.11 ac 20						Limit (dBm)	Result
	ANT1		ANT2		ANT3			
	5745MHz	5825MHz	5745MHz	5825MHz	5745MHz	5825MHz		
Normal	-0.68	-0.69	-0.73	-0.69	-0.69	-0.73	13.97	Pass
LTLV	-0.72	-0.96	-0.70	-0.94	-0.63	-0.84	13.97	Pass
LTHV	-0.90	-0.82	-0.88	-0.82	-0.78	-0.72	13.97	Pass
HTHV	-1.00	-0.70	-0.98	-0.70	-0.88	-0.63	13.97	Pass
HTLV	-0.63	-0.98	-0.61	-0.96	-0.65	-0.86	13.97	Pass

Test Conditions	MIMO Output power (dBm) 802.11 ac 20		MIMO EIRP power (dBm) 802.11 ac 20		Limit (dBm)	Result
	ANT1+ANT2+ANT3		ANT1+ANT2+ANT3			
	5745MHz	5825MHz	5745MHz	5825MHz		
Normal	4.07	4.07	13.87	13.87	13.97	Pass
LTLV	4.09	3.86	13.89	13.66	13.97	Pass
LTHV	3.92	3.98	13.72	13.78	13.97	Pass
HTHV	3.82	4.09	13.62	13.89	13.97	Pass
HTLV	4.14	3.84	13.94	13.64	13.97	Pass

Note: EIRP POWER=Output power + Antenna Gain(9.8dBi)

Test Conditions	Output power (dBm) 802.11 n20						Limit (dBm)	Result
	ANT1		ANT2		ANT3			
	5745MHz	5825MHz	5745MHz	5825MHz	5745MHz	5825MHz		
Normal	-0.72	-0.73	-0.77	-0.73	-0.73	-0.77	13.97	Pass
LTLV	-0.76	-1.02	-0.74	-1.00	-0.67	-0.89	13.97	Pass
LTHV	-0.95	-0.87	-0.93	-0.87	-0.83	-0.76	13.97	Pass
HTHV	-1.06	-0.74	-1.04	-0.74	-0.93	-0.67	13.97	Pass
HTLV	-0.67	-1.04	-0.65	-1.02	-0.69	-0.91	13.97	Pass

Test Conditions	MIMO Output power (dBm) 802.11 n 20		MIMO EIRP power (dBm) 802.11 n 20		Limit (dBm)	Result
	ANT1+ANT2+ANT3		ANT1+ANT2+ANT3			
	5745MHz	5825MHz	5745MHz	5825MHz		
Normal	4.03	4.03	13.83	13.83	13.97	Pass
LTLV	4.05	3.80	13.85	13.60	13.97	Pass
LTHV	3.87	3.94	13.67	13.74	13.97	Pass
HTHV	3.76	4.05	13.56	13.85	13.97	Pass
HTLV	4.10	3.78	13.90	13.58	13.97	Pass

Note: EIRP POWER=Output power + Antenna Gain(9.8dBi)

Test Conditions	Output power (dBm) 802.11 ac40						Limit (dBm)	Result
	ANT1		ANT2		ANT3			
	5755MHz	5795MHz	5755MHz	5795MHz	5755MHz	5795MHz		
Normal	-0.79	-0.81	-0.88	-0.80	-0.85	-0.82	13.97	Pass
LTLV	-0.84	-1.11	-0.84	-1.09	-0.77	-0.96	13.97	Pass
LTHV	-1.05	-0.95	-1.06	-0.94	-0.95	-0.81	13.97	Pass
HTHV	-1.16	-0.82	-1.18	-0.81	-1.08	-0.72	13.97	Pass
HTLV	-0.73	-1.13	-0.78	-1.11	-0.80	-0.98	13.97	Pass

Test Conditions	MIMO Output power (dBm) 802.11 ac 40		MIMO EIRP power (dBm) 802.11 ac 40		Limit (dBm)	Result
	ANT1+ANT2+ANT3		ANT1+ANT2+ANT3			
	5755MHz	5795MHz	5755MHz	5795MHz		
Normal	3.93	3.96	13.73	13.76	13.97	Pass
LTLV	3.95	3.72	13.75	13.52	13.97	Pass
LTHV	3.75	3.87	13.55	13.67	13.97	Pass
HTHV	3.63	3.99	13.43	13.79	13.97	Pass
HTLV	4.00	3.70	13.80	13.50	13.97	Pass

Note: EIRP POWER=Output power + Antenna Gain(9.8dBi)

Test Conditions	Output power (dBm) 802.11 n40						Limit (dBm)	Result
	ANT1		ANT2		ANT3			
	5755MHz	5795MHz	5755MHz	5795MHz	5755MHz	5795MHz		
Normal	-0.87	-0.89	-1.00	-0.88	-0.97	-0.89	13.97	Pass
LTLV	-0.92	-1.23	-0.95	-1.20	-0.88	-1.04	13.97	Pass
LTHV	-1.16	-1.05	-1.20	-1.04	-1.09	-0.88	13.97	Pass
HTHV	-1.28	-0.90	-1.33	-0.89	-1.24	-0.78	13.97	Pass
HTLV	-0.81	-1.25	-0.88	-1.23	-0.92	-1.06	13.97	Pass

Test Conditions	MIMO Output power (dBm) 802.11 n 40		MIMO EIRP power (dBm) 802.11 n 40		Limit (dBm)	Result
	ANT1+ANT2+ANT3		ANT1+ANT2+ANT3			
	5755MHz	5795MHz	5755MHz	5795MHz		
Normal	3.82	3.88	13.62	13.68	13.97	Pass
LTLV	3.85	3.62	13.65	13.42	13.97	Pass
LTHV	3.62	3.78	13.42	13.58	13.97	Pass
HTHV	3.49	3.91	13.29	13.71	13.97	Pass
HTLV	3.90	3.59	13.70	13.39	13.97	Pass

Note: EIRP POWER=Output power + Antenna Gain(9.8dBi)

Test Conditions	Output power (dBm) 802.11 ac80			MIMO Output power (dBm) 802.11 ac80	MIMO EIRP power(dBm) 802.11 ac80	Limit (dBm)	Result
	ANT1	ANT2	ANT3	ANT1+ANT2+ANT3	ANT1+ANT2+ANT3		
	5775MHz	5775MHz	5775MHz	5775MHz	5775MHz		
Normal	-1.06	-1.09	-1.28	3.63	13.43	13.97	Pass
LTLV	-1.12	-1.50	-1.21	3.50	13.30	13.97	Pass
LTHV	-1.42	-1.28	-1.54	3.36	13.16	13.97	Pass
HTHV	-1.57	-1.10	-1.69	3.33	13.13	13.97	Pass
HTLV	-0.99	-1.52	-1.13	3.56	13.36	13.97	Pass

Note: EIRP POWER=Output power + Antenna Gain(9.8dBi)

4. Permitted Range of Operating Frequencies

4.1 Applicable Standard

The width of the power spectrum envelope is fH -fL for a given operating frequency. In equipment that allows adjustment or selection of different operating frequencies, the power envelope takes up different positions in the allowed band. The frequency range is determined by the lowest value of fL and the highest value of fH resulting from the adjustment of the equipment to the lowest and highest operating frequencies.

The occupied bandwidth (i.e. the bandwidth in which 99 % of the wanted emission is contained) of the transmitter shall fall within the assigned frequency band.

For all equipment the frequency range shall lie within the frequency band given by clause 4.2.2.4, table 2. For non-harmonized frequency bands the available frequency range may differ between national administrations.

4.3 Test Procedure

Test is carried out according to EN 300 440 V2.2.1 section 7.2.2.

4.4 Test Results/Plots

Both Antenna 1, Antenna 2 and Antenna 3 have been tested, and only the worst test result of Antenna 1 low channel is shown in the report. As follows:

802.11a_5745MHz-5825MHz

Test Conditions	Result (MHz)	
	Lowest Frequency (fL)	Highest Frequency (fH)
Normal	5735.66	5834.63
LTLV	5735.55	5834.56
LTHV	5735.44	5834.47
HTHV	5735.55	5834.57
HTLV	5735.75	5834.66

802.11n-HT20_5745MHz-5825MHz

Test Conditions	Result (MHz)	
	Lowest Frequency (fL)	Highest Frequency (fH)
Normal	5735.64	5834.55
LTLV	5735.53	5834.49
LTHV	5735.43	5834.41
HTHV	5735.53	5834.50
HTLV	5735.73	5834.57

802.11n-HT40_5755MHz-5795MHz

Test Conditions	Result (MHz)	
	Lowest Frequency (fL)	Highest Frequency (fH)
Normal	5736.25	5815.42
LTLV	5736.29	5815.25
LTHV	5736.45	5815.37
HTHV	5736.39	5815.26
HTLV	5736.44	5815.35

802.11ac-HT20_5745MHz-5825MHz

Test Conditions	Result (MHz)	
	Lowest Frequency (fL)	Highest Frequency (fH)
Normal	5735.35	5834.25
LTLV	5735.22	5834.46
LTHV	5735.32	5834.53
HTHV	5735.26	5834.24
HTLV	5735.35	5834.25

802.11ac-HT40_5755MHz-5795MHz

Test Conditions	Result (MHz)	
	Lowest Frequency (fL)	Highest Frequency (fH)
Normal	5736.37	5815.36
LTLV	5736.31	5815.32
LTHV	5736.25	5815.27
HTHV	5736.31	5815.32
HTLV	5736.42	5815.37

802.11ac-HT80_5775MHz

Test Conditions	Result (MHz)	
	Lowest Frequency (fL)	Highest Frequency (fH)
Normal	5736.22	5813.35
LTLV	5736.56	5813.74
LTHV	5736.85	5813.85
HTHV	5736.36	5813.67
HTLV	5736.57	5813.68

5. Unwanted emissions in the spurious domain

5.1 Limit of Spurious Emissions

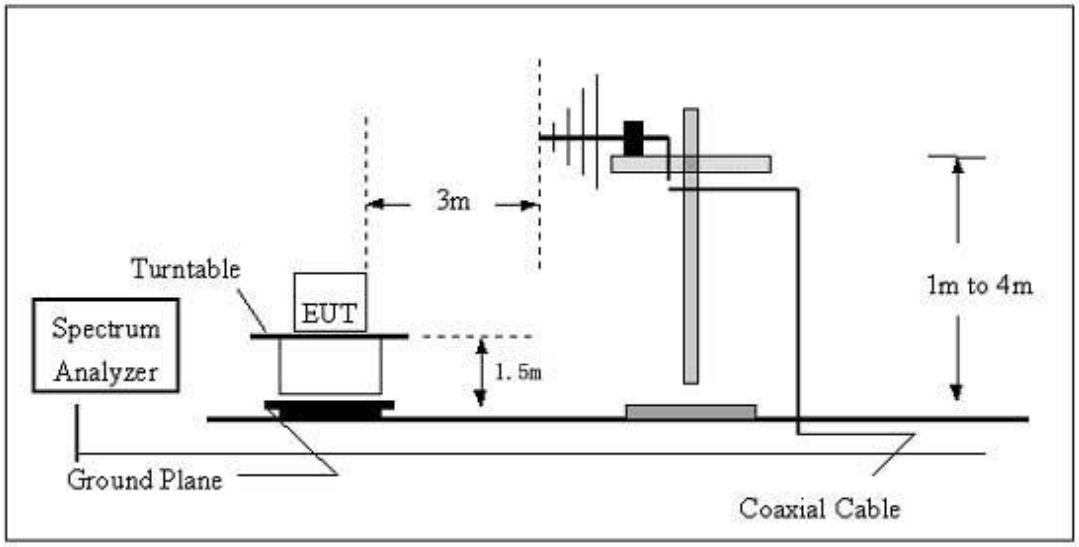
State	47MHz to 74MHz 87.5 to 118MHz 174MHz to 230MHz 470MHz to 862MHz	Other frequencies ≤ 1000MHz	Frequencies > 1000MHz
Operating	4.0nW	250nW	1.0μW
Standby	2nW	2nW	20nW

For equipment with an integral antenna and no RF connector, measurements under extreme conditions are not required.

5.2 Test Procedure

Setup

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



a. The EUT was placed on the top of the turntable in open test site area.

b. The test shall be made in the transmitting mode. The turntable was rotated by 360 degrees to determine the position of the highest radiation.

c. This measurement shall be repeated with the transmitter in standby mode where applicable.

d. For 30~1000MHz spurious emissions measurement, the broad band bi-log receiving antenna was placed 3 meters far away from the turntable.

e. The broadband receiving antenna was fixed on the same height with the EUT to find each suspected emissions of both horizontal and vertical polarization. Each recorded suspected value is indicated as Read Level (Raw).

f. Replace the EUT by standard antenna and feed the RF port by signal generator.

g. Adjust the frequency of the signal generator to the suspected emission and slightly rotate the turntable to locate the position with maximum reading.

h. Adjust the power level of the signal generator to reach the same reading with Read Level (Raw).

i. The level of the spurious emission is the power level of (8) plus the gain of the standard antenna in dBi and minus the loss of the cable used between the signal generator and the standard antenna.

j. If the level calculated in (9) is higher than limit by more than 6dB, then lower the RBW of the spectrum analyzer to 30KHz. If the level of this emission does not change by more than 2dB, then it is taken as narrowband emission, otherwise, wideband emission.

k. The measurement shall be repeated at the lowest and the highest channel of the stated frequency range.

5.5 Environmental Conditions

Temperature:	23 °C
Relative Humidity:	45%
ATM Pressure:	1014 mbar

5.6 Summary of Test Results

Note 1: Data is corrected with the higher level between 30MHz to 1GHz and above 1GHz, which Emissions attenuated close to the noise base below the permissible value are not reported.

Note 2: Both Antenna 1, Antenna 2 and Antenna 3 have been tested, and only the worst test result of Antenna 1 low channel is shown in the report. As follows:

Below 1000MHz

Model	Frequency (MHz)	Ant H / V	Measured(FS) (dBm)	Limits (dBm)	Result
802.11a	54.84	H	-61.41	-54.00	Pass
	91.73	H	-61.28	-54.00	Pass
	219.47	H	-61.90	-54.00	Pass
	530.37	H	-61.92	-54.00	Pass
	734.64	H	-61.91	-54.00	Pass
	809.42	H	-61.72	-54.00	Pass
	65.09	V	-61.22	-54.00	Pass
	103.75	V	-61.05	-54.00	Pass
	226.79	V	-62.03	-54.00	Pass
	562.61	V	-61.78	-54.00	Pass
	651.58	V	-61.52	-54.00	Pass
	774.41	V	-61.62	-54.00	Pass
802.11ac-HT20	55.39	H	-62.93	-54.00	Pass
	93.66	H	-61.75	-54.00	Pass
	219.25	H	-62.14	-54.00	Pass
	532.93	H	-61.04	-54.00	Pass
	733.52	H	-62.64	-54.00	Pass
	804.07	H	-63.34	-54.00	Pass
	68.58	V	-62.24	-54.00	Pass
	103.14	V	-63.02	-54.00	Pass
	228.54	V	-63.86	-54.00	Pass
	564.09	V	-62.84	-54.00	Pass
	650.55	V	-63.54	-54.00	Pass
	773.45	V	-60.67	-54.00	Pass
802.11ac-HT40	55.42	H	-62.93	-54.00	Pass
	93.71	H	-61.75	-54.00	Pass
	219.36	H	-62.14	-54.00	Pass
	533.20	H	-61.04	-54.00	Pass
	733.89	H	-62.64	-54.00	Pass
	804.47	H	-63.34	-54.00	Pass
	68.61	V	-62.24	-54.00	Pass
	103.19	V	-63.02	-54.00	Pass
	228.65	V	-63.86	-54.00	Pass
	564.37	V	-62.84	-54.00	Pass
	650.88	V	-63.54	-54.00	Pass
	773.84	V	-60.67	-54.00	Pass
802.11n-HT20	56.65	H	-63.02	-54.00	Pass
	96.84	H	-63.34	-54.00	Pass
	217.79	H	-63.01	-54.00	Pass
	531.01	H	-63.23	-54.00	Pass
	733.23	H	-63.41	-54.00	Pass
	806.43	H	-63.13	-54.00	Pass
	66.85	V	-62.72	-54.00	Pass
	103.42	V	-62.93	-54.00	Pass
	227.58	V	-62.89	-54.00	Pass
	564.17	V	-62.34	-54.00	Pass
	652.67	V	-63.13	-54.00	Pass
	775.22	V	-63.02	-54.00	Pass

Model	Frequency	Ant	Measured(FS)	Limits	Result
	(MHz)	H / V	(dBm)	(dBm)	
802.11n-HT40	54.53	H	-63.36	-54.00	Pass
	93.49	H	-62.15	-54.00	Pass
	219.86	H	-62.51	-54.00	Pass
	531.12	H	-61.46	-54.00	Pass
	732.46	H	-63.63	-54.00	Pass
	805.56	H	-63.72	-54.00	Pass
	67.61	V	-62.60	-54.00	Pass
	102.59	V	-63.54	-54.00	Pass
	227.27	V	-64.22	-54.00	Pass
	564.37	V	-63.26	-54.00	Pass
	651.88	V	-63.94	-54.00	Pass
	772.54	V	-61.56	-54.00	Pass
802.11ac-HT80	55.37	H	-62.91	-54.00	Pass
	93.63	H	-61.73	-54.00	Pass
	219.18	H	-62.12	-54.00	Pass
	532.77	H	-61.02	-54.00	Pass
	733.30	H	-62.62	-54.00	Pass
	803.83	H	-63.32	-54.00	Pass
	68.56	V	-62.22	-54.00	Pass
	103.11	V	-63.00	-54.00	Pass
	228.47	V	-63.84	-54.00	Pass
	563.92	V	-62.82	-54.00	Pass
	650.35	V	-63.52	-54.00	Pass
	773.22	V	-60.65	-54.00	Pass

Above 1000MHz

Model	Frequency (MHz)	Polar H/V	Reading (dBm)	Limit (dBm)	Result
802.11a-5745MHz	11490	H	-51.38	-30	Pass
	17235	H	-59.05	-30	Pass
	11490	V	-53.46	-30	Pass
	17235	V	-59.65	-30	Pass
802.11a-5825MHz	11610	H	-53.33	-30	Pass
	17415	H	-60.43	-30	Pass
	11610	V	-54.56	-30	Pass
	17415	V	-61.33	-30	Pass
802.11n-HT20-5745MHz	11490	H	-55.12	-30	Pass
	17235	H	-56.88	-30	Pass
	11490	V	-53.74	-30	Pass
	17235	V	-56.01	-30	Pass
802.11n-HT20-5825MHz	11610	H	-53.53	-30	Pass
	17415	H	-59.95	-30	Pass
	11610	V	-52.46	-30	Pass
	17415	V	-62.60	-30	Pass
802.11n-HT40-5755MHz	11510	H	-54.69	-30	Pass
	17265	H	-62.51	-30	Pass
	11510	V	-55.78	-30	Pass
	17265	V	-62.48	-30	Pass
802.11n-HT40-5795MHz	11590	H	-55.68	-30	Pass
	17380	H	-57.13	-30	Pass
	11590	V	-54.97	-30	Pass
	17380	V	-56.08	-30	Pass
802.11ac-HT80-5775MHz	11550	H	-55.05	-30	Pass
	17325	H	-57.44	-30	Pass
	11550	V	-54.88	-30	Pass
	17325	V	-55.69	-30	Pass
802.11n-HT20-5745MHz	11490	H	-55.18	-30	Pass
	17235	H	-56.94	-30	Pass
	11490	V	-53.80	-30	Pass
	17235	V	-56.07	-30	Pass
802.11n-HT20-5825MHz	11610	H	-53.59	-30	Pass
	17415	H	-60.02	-30	Pass
	11610	V	-52.52	-30	Pass
	17415	V	-62.67	-30	Pass
802.11n-HT40-5755MHz	11510	H	-54.75	-30	Pass
	17265	H	-62.58	-30	Pass
	11510	V	-55.84	-30	Pass
	17265	V	-62.55	-30	Pass
802.11n-HT40-5795MHz	11590	H	-55.74	-30	Pass
	17380	H	-57.19	-30	Pass
	11590	V	-55.03	-30	Pass
	17380	V	-56.14	-30	Pass

6. Duty Cycle

6.1 Applicable Standard

Test is conducting under the description of ETSI EN 300 440, Where an acknowledgement is required, the additional transmitter on-time shall be included and declared by the manufacturer.

Frequency Band	Duty cycle	Application	Notes
2 400 MHz to 2 483,5 MHz	No Restriction	Generic use	
2 400 MHz to 2 483,5 MHz	No Restriction	Radiodetermination	
(a) 2 446 MHz to 2 454 MHz	No Restriction	RFID	Limits shown in Annex G shall apply
(b) 2 446 MHz to 2 454 MHz	≤ 15 %	RFID	Limits shown in Annex G shall apply
5 725 MHz to 5 875 MHz	No Restriction	Generic use	
9 200 MHz to 9 500 MHz	No Restriction	Radiodetermination	
9 500 MHz to 9 975 MHz	No Restriction	Radiodetermination	
10,5 GHz to 10,6 GHz	No Restriction	Radiodetermination	
13,4 GHz to 14,0 GHz	No Restriction	Radiodetermination	
17,1 GHz to 17,3 GHz	DAA or equivalent techniques	Radiodetermination, limited to GBSAR detecting and movement and alert applications	Limits shown in Annex I shall apply
24,00 GHz to 24,25 GHz	No Restriction	Generic use and for radiodetermination	
NOTE: The spectrum ranges in some entries are not harmonised throughout all EU territory, specifically entries 4, 9, and 11 have been identified as such. Implementers are cautioned to refer to CEPT/ERC Recommendation 70-03 [i.2] as well as current National Radio plans to verify acceptance within intended regions of use.			

6.3 Test Procedure

An assessment of the overall Duty Cycle shall be made for a representative period of T_{obs} over the observation bandwidth F_{obs}. Unless otherwise specified, T_{obs} is 1 hour and the observation bandwidth F_{obs} is the operational frequency band.

The representative period shall be the most active one in normal use of the device. As a guide "Normal use" is considered as representing the behaviour of the device during transmission of 99 % of the [emissions] generated during its operational lifetime.

Procedures such as setup, commissioning, and maintenance are not considered part of normal operation.

For manual operated or event dependant devices, with or without software controlled functions, the manufacturer shall declare whether the device once triggered, follows a pre-programmed cycle, or whether the transmitter remains on until the trigger is released or the device is manually reset. The manufacturer shall also give a description of the application for the device and include a typical usage pattern. The typical usage pattern as declared by the manufacturer shall be used to determine the duty cycle and compare to the limit in table 4.

Where an acknowledgement is required, the additional transmitter on-time shall be included.

6.4 Environmental Conditions

Temperature:	22 °C
Relative Humidity:	45%
ATM Pressure:	1019 mbar

6.5 Summary of Test Results/Plots

For generic use devices operating at frequency range 5745~5825MHz, the duty cycle is no restriction.

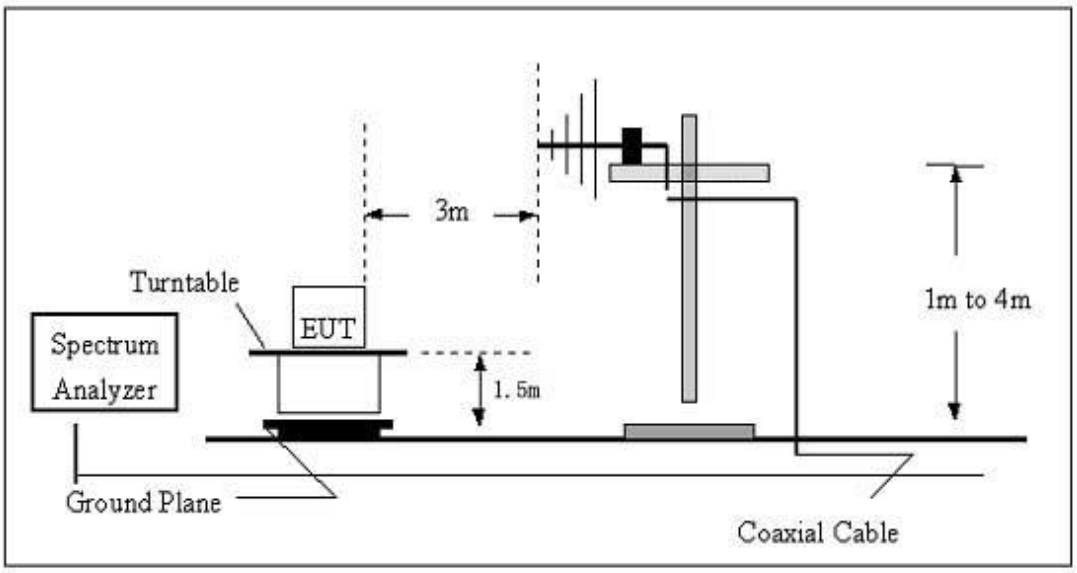
7. Receiver Spurious Emissions

7.1 Limit of Spurious Emissions

According to the ETSI EN 300 440, the power of any spurious emission shall not exceed 2 nW in the range 25 MHz to 1 GHz and shall not exceed 20 nW on frequencies above 1 GHz.

7.4 Test Procedure

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



a. The EUT was placed on the top of the turntable in open test site area.

b. The test shall be made in the transmitting mode. The turntable was rotated by 360 degrees to determine the position of the highest radiation.

c. This measurement shall be repeated with the transmitter in standby mode where applicable.

d. For 30~1000MHz spurious emissions measurement, the broad band bi-log receiving antenna was placed 3 meters far away from the turntable.

e. The broadband receiving antenna was fixed on the same height with the EUT to find each suspected emissions of both horizontal and vertical polarization. Each recorded suspected value is indicated as Read Level (Raw).

f. Replace the EUT by standard antenna and feed the RF port by signal generator.

g. Adjust the frequency of the signal generator to the suspected emission and slightly rotate the turntable to locate the position with maximum reading.

h. Adjust the power level of the signal generator to reach the same reading with Read Level (Raw).

i. The level of the spurious emission is the power level of (8) plus the gain of the standard antenna in dBi and minus the loss of the cable used between the signal generator and the standard antenna.

j. If the level calculated in (9) is higher than limit by more than 6dB, then lower the RBW of the spectrum analyzer to 30KHz. If the level of this emission does not change by more than 2dB, then it is taken as narrowband emission, otherwise, wideband emission.

k. The measurement shall be repeated at the lowest and the highest channel of the stated frequency range.

7.5 Environmental Conditions

Temperature:	22 °C
Relative Humidity:	45%
ATM Pressure:	1019 mbar

7.6 Summary of Test Results

Note 1: Data is corrected with the higher level between 30MHz to 1GHz and above 1GHz, which Emissions attenuated close to the noise base below the permissible value are not reported.

Note 2: Both Antenna 1, Antenna 2 and Antenna 3 have been tested, and only the worst test result of Antenna 1 low channel is shown in the report. As follows:

Below 1000MHz

Model	Frequency (MHz)	Ant H / V	Measured(FS) (dBm)	Limits (dBm)	Result
802.11a	54.76	H	-69.46	-57.00	Pass
	91.60	H	-69.31	-57.00	Pass
	219.16	H	-70.02	-57.00	Pass
	529.63	H	-70.04	-57.00	Pass
	733.61	H	-70.03	-57.00	Pass
	808.29	H	-69.81	-57.00	Pass
	65.00	V	-69.25	-57.00	Pass
	103.60	V	-69.05	-57.00	Pass
	226.47	V	-70.16	-57.00	Pass
	561.82	V	-69.88	-57.00	Pass
	650.67	V	-69.59	-57.00	Pass
	773.33	V	-69.70	-57.00	Pass
802.11ac-HT20	55.31	H	-71.18	-57.00	Pass
	93.53	H	-69.85	-57.00	Pass
	218.94	H	-70.29	-57.00	Pass
	532.18	H	-69.04	-57.00	Pass
	732.49	H	-70.85	-57.00	Pass
	802.94	H	-71.64	-57.00	Pass
	68.48	V	-70.40	-57.00	Pass
	103.00	V	-71.28	-57.00	Pass
	228.22	V	-72.23	-57.00	Pass
	563.30	V	-71.08	-57.00	Pass
	649.64	V	-71.87	-57.00	Pass
	772.37	V	-68.62	-57.00	Pass
802.11ac-HT40	45.69	H	-71.18	-57.00	Pass
	94.26	H	-69.85	-57.00	Pass
	220.65	H	-70.29	-57.00	Pass
	536.35	H	-69.04	-57.00	Pass
	738.22	H	-70.85	-57.00	Pass
	809.22	H	-71.64	-57.00	Pass
	38.84	V	-70.40	-57.00	Pass
	103.80	V	-71.28	-57.00	Pass
	230.00	V	-72.23	-57.00	Pass
	567.70	V	-71.08	-57.00	Pass
	654.72	V	-71.87	-57.00	Pass
	778.41	V	-68.62	-57.00	Pass
802.11n-HT20	36.87	H	-71.28	-57.00	Pass
	97.41	H	-71.64	-57.00	Pass
	219.07	H	-71.27	-57.00	Pass
	534.14	H	-71.52	-57.00	Pass
	737.56	H	-71.72	-57.00	Pass
	811.19	H	-71.41	-57.00	Pass
	47.13	V	-70.94	-57.00	Pass
	104.03	V	-71.18	-57.00	Pass
	228.92	V	-71.13	-57.00	Pass
	567.50	V	-70.51	-57.00	Pass
	656.52	V	-71.41	-57.00	Pass
	779.79	V	-71.28	-57.00	Pass

Model	Frequency	Ant	Measured(FS)	Limits	Result
	(MHz)	H / V	(dBm)	(dBm)	
802.11n-HT40	34.73	H	-71.67	-57.00	Pass
	94.04	H	-70.30	-57.00	Pass
	221.16	H	-70.71	-57.00	Pass
	534.25	H	-69.52	-57.00	Pass
	736.78	H	-71.97	-57.00	Pass
	810.31	H	-72.07	-57.00	Pass
	47.89	V	-70.81	-57.00	Pass
	103.20	V	-71.87	-57.00	Pass
	228.61	V	-72.64	-57.00	Pass
	567.70	V	-71.55	-57.00	Pass
	655.73	V	-72.32	-57.00	Pass
	777.10	V	-69.63	-57.00	Pass
802.11ac-HT80	35.58	H	-71.16	-57.00	Pass
	94.18	H	-69.82	-57.00	Pass
	220.47	H	-70.26	-57.00	Pass
	535.91	H	-69.02	-57.00	Pass
	737.63	H	-70.83	-57.00	Pass
	808.57	H	-71.62	-57.00	Pass
	38.79	V	-70.38	-57.00	Pass
	103.72	V	-71.26	-57.00	Pass
	229.82	V	-72.21	-57.00	Pass
	567.25	V	-71.06	-57.00	Pass
	654.19	V	-71.85	-57.00	Pass
	777.78	V	-68.60	-57.00	Pass

Above 1000MHz

Model	Frequency (MHz)	Polar H/V	Reading (dBm)	Limit (dBm)	Result
802.11a-5745MHz	11490	H	-60.23	-47.00	Pass
	17235	H	-57.83	-47.00	Pass
	11490	V	-60.44	-47.00	Pass
	17235	V	-59.11	-47.00	Pass
802.11a-5825MHz	11610	H	-58.57	-47.00	Pass
	17415	H	-60.30	-47.00	Pass
	11610	V	-61.89	-47.00	Pass
	17415	V	-58.85	-47.00	Pass
802.11n-HT20-5745MHz	11490	H	-61.44	-47.00	Pass
	17235	H	-61.68	-47.00	Pass
	11490	V	-62.18	-47.00	Pass
	17235	V	-62.85	-47.00	Pass
802.11n-HT20-5825MHz	11610	H	-58.15	-47.00	Pass
	17415	H	-59.52	-47.00	Pass
	11610	V	-58.49	-47.00	Pass
	17415	V	-59.34	-47.00	Pass
802.11n-HT40-5755MHz	11510	H	-60.07	-47.00	Pass
	17265	H	-57.73	-47.00	Pass
	11510	V	-60.70	-47.00	Pass
	17265	V	-60.60	-47.00	Pass
802.11n-HT40-5795MHz	11590	H	-57.65	-47.00	Pass
	17380	H	-58.38	-47.00	Pass
	11590	V	-60.74	-47.00	Pass
	17380	V	-58.06	-47.00	Pass
802.11ac-HT80-5775MHz	11550	H	-57.39	-47.00	Pass
	17325	H	-58.38	-47.00	Pass
	11550	V	-58.29	-47.00	Pass
	17325	V	-62.73	-47.00	Pass
802.11n-HT20-5745MHz	11490	H	-59.95	-47.00	Pass
	17235	H	-60.53	-47.00	Pass
	11490	V	-57.58	-47.00	Pass
	17235	V	-58.31	-47.00	Pass
802.11n-HT20-5825MHz	11610	H	-60.67	-47.00	Pass
	17415	H	-57.99	-47.00	Pass
	11610	V	-57.32	-47.00	Pass
	17415	V	-58.31	-47.00	Pass
802.11n-HT40-5755MHz	11510	H	-58.22	-47.00	Pass
	17265	H	-62.65	-47.00	Pass
	11510	V	-59.88	-47.00	Pass
	17265	V	-63.61	-47.00	Pass
802.11n-HT40-5795MHz	11590	H	-59.16	-47.00	Pass
	17380	H	-63.98	-47.00	Pass
	11590	V	-60.96	-47.00	Pass
	17380	V	-60.87	-47.00	Pass

8. Receiver Blocking

8.1 Limit

The blocking level, for any frequency within the specified ranges, shall not be less than the values given in table 6, except at frequencies on which spurious responses are found.

Table 6: Limits for blocking or desensitization

Receiver category	Limit
1	-30 dBm + k
2	-45 dBm + k
3	-60 dBm + k

The correction factor, k, is as follows:

$$k = -20\log f - 10\log BW$$

Where:

- f is the frequency in GHz;

- BW is the occupied bandwidth in MHz.

The factor k is limited within the following:

- -40 dB < k < 0 dB.

The measured blocking level shall be stated in the test report.

8.2 Test Procedure

This measurement shall be conducted under normal conditions.

Two signal generators A and B shall be connected to the receiver via a combining network to the receiver, either:

a) via a test fixture or a test antenna to the receiver integrated, dedicated or test antenna; or

b) directly to the receiver permanent or temporary antenna connector.

The method of coupling to the receiver shall be stated in the test report.

Signal generator A shall be at the nominal frequency of the receiver, with normal modulation of the wanted signal.

Signal generator B shall be unmodulated and shall be adjusted to a test frequency at approximately 10 times, 20 times and 50 times of the occupied bandwidth above upper band edge of occupied bandwidth.

Initially signal generator B shall be switched off and using signal generator A the level which still gives sufficient response shall be established. The output level of generator A shall then be increased by 3 dB. Signal generator B is then switched on and adjusted until the wanted criteria are met. This level shall be recorded.

The measurement shall be repeated with the test frequency for signal generator B at 10 times, 20 times and 50 times of the occupied bandwidth below the lower band edge of the occupied bandwidth.
The blocking or desensitization shall be recorded as the level in dBm of lowest level of the unwanted signal (generator B).
For tagging systems (e.g. RF identification, anti-theft, access control, location and similar systems) signal generator A may be replaced by a physical tag positioned at 70 % of the measured system range in metres. In this case, the blocking or desensitization shall be recorded as the ratio in dB of lowest level of the unwanted signal (generator B) resulting in a non-read of the tag. to the declared sensitivity of the receiver +3 dB.

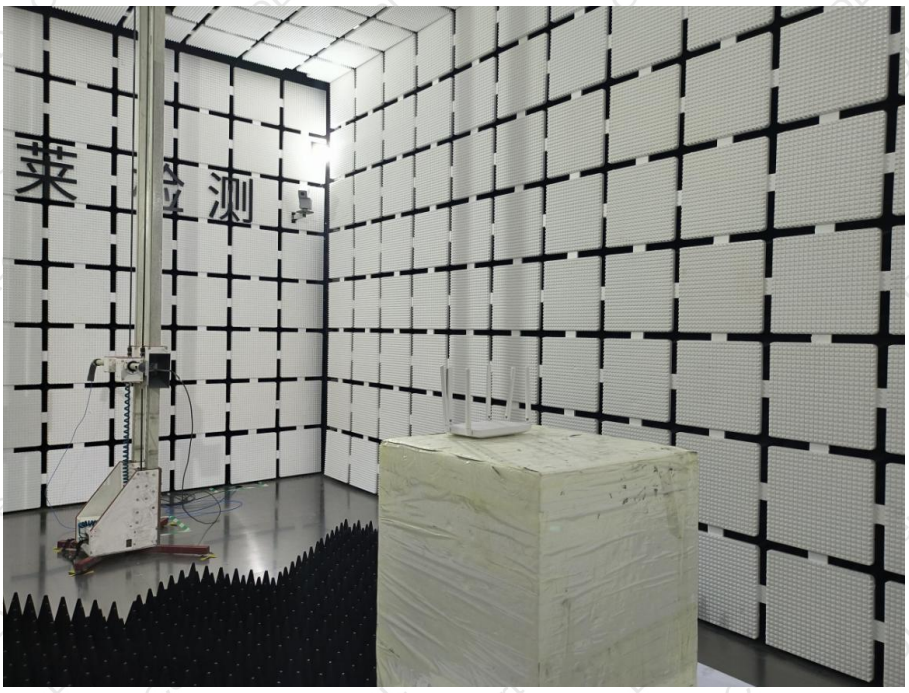
8.3 Environmental Conditions

Temperature:	22 °C
Relative Humidity:	45%
ATM Pressure:	1019 mbar

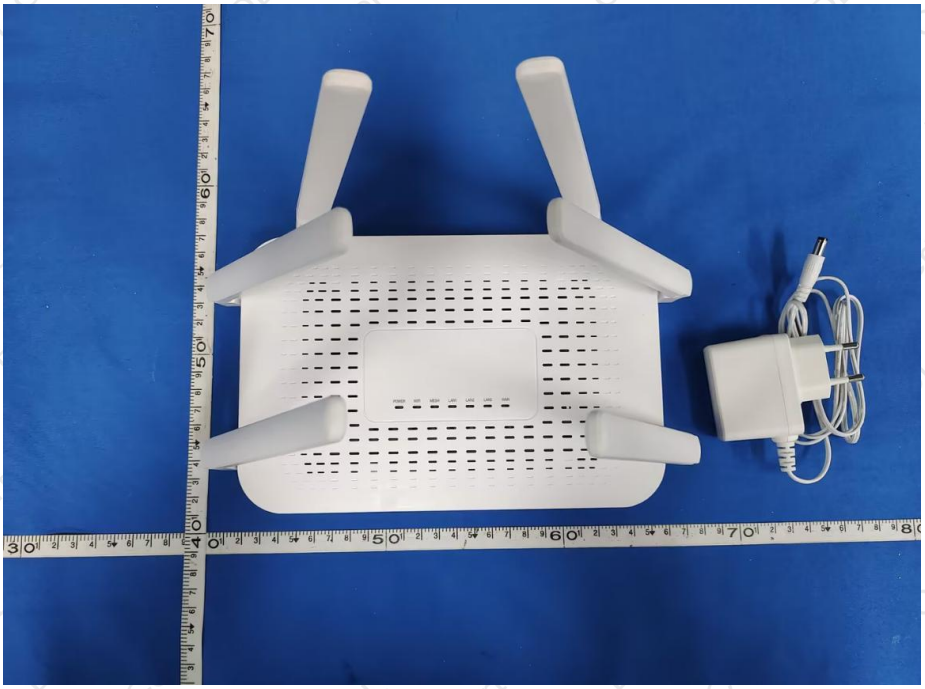
8.4 Test Results
Both Antenna 1, Antenna 2 and Antenna 3 have been tested, and only the worst test result of Antenna 1 low channel is shown in the report. As follows:

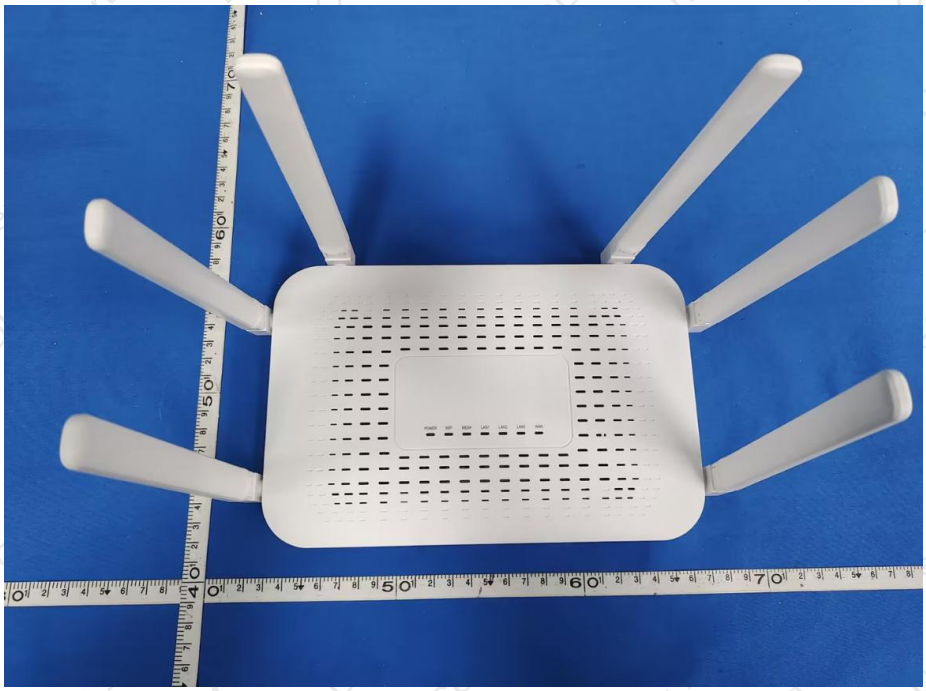
	Limit dBm	Blocking Result dBm	Result
802.11a	-28.19	-20.91	Pass
802.11n-HT20	-28.19	-20.84	Pass
802.11n-HT40	-28.20	-21.12	Pass
802.11ac-HT20	-27.56	-22.32	Pass
802.11ac-HT40	-27.56	-22.11	Pass
802.11ac-HT80	-27.56	-22.26	Pass

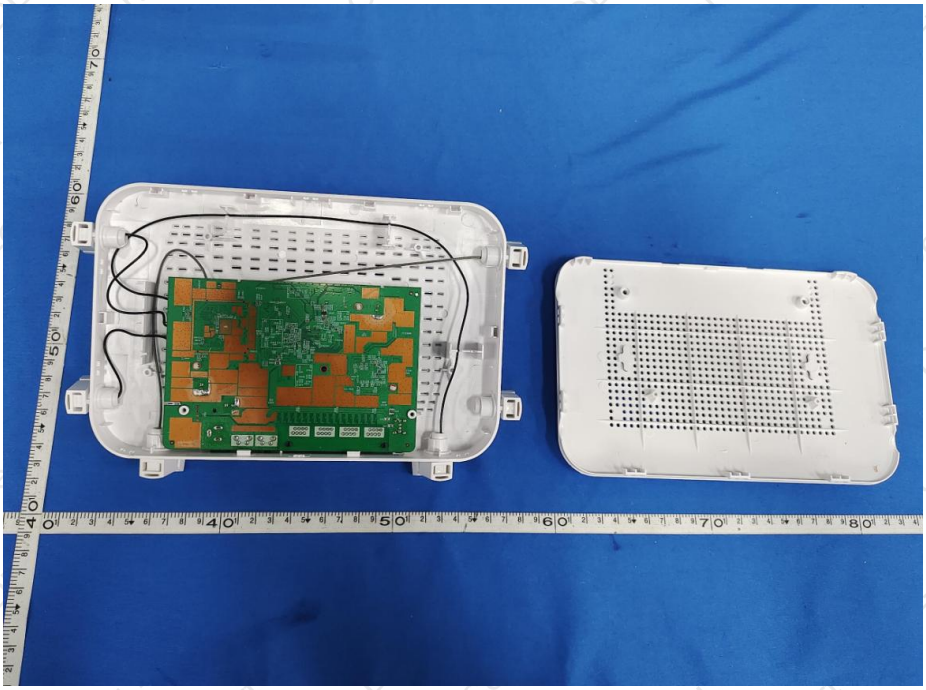
9. Setup Photo

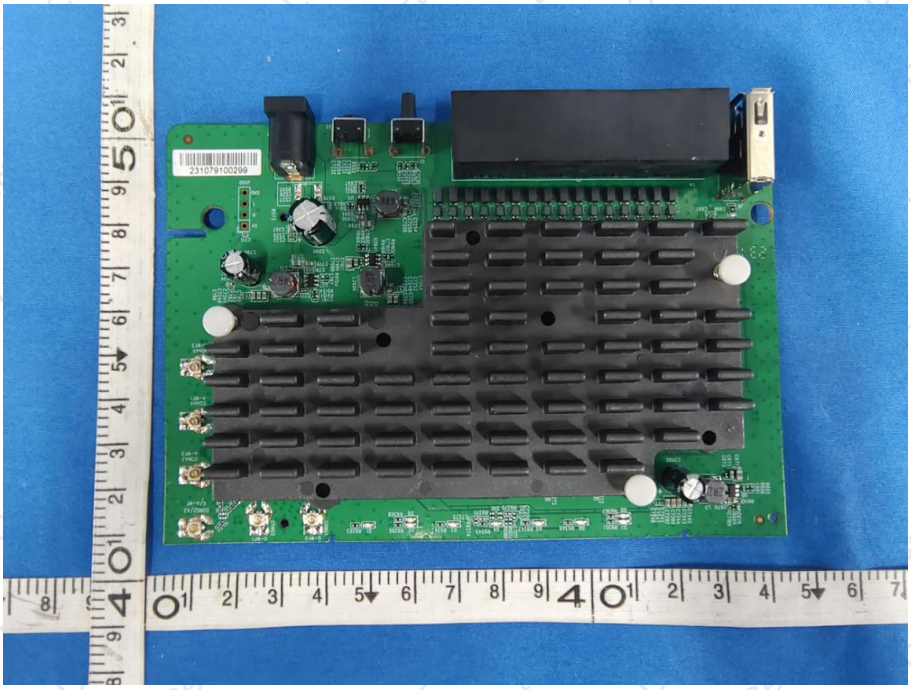


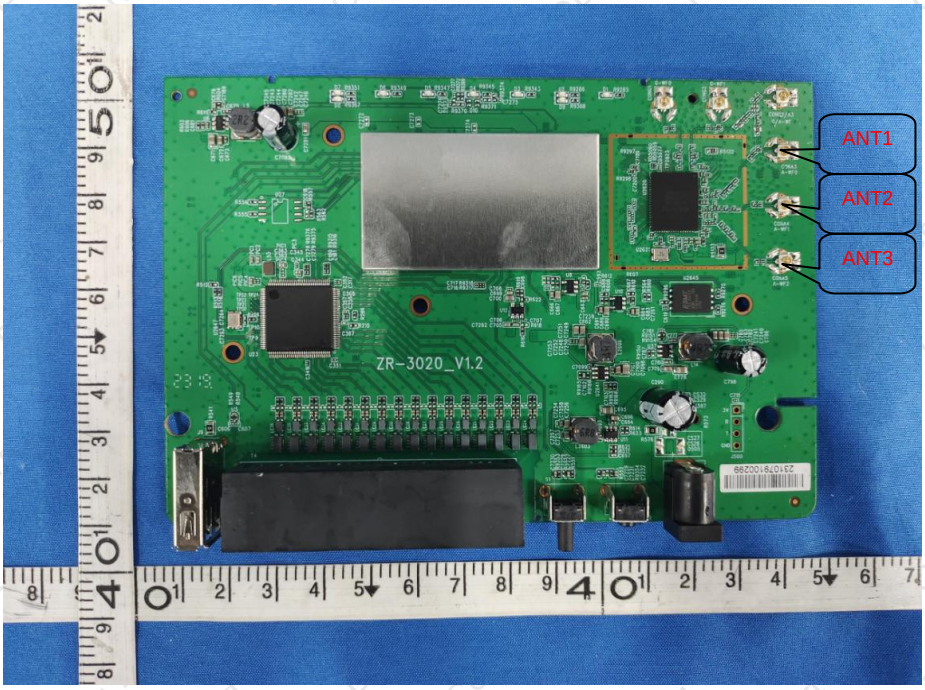
10. EUT Photo







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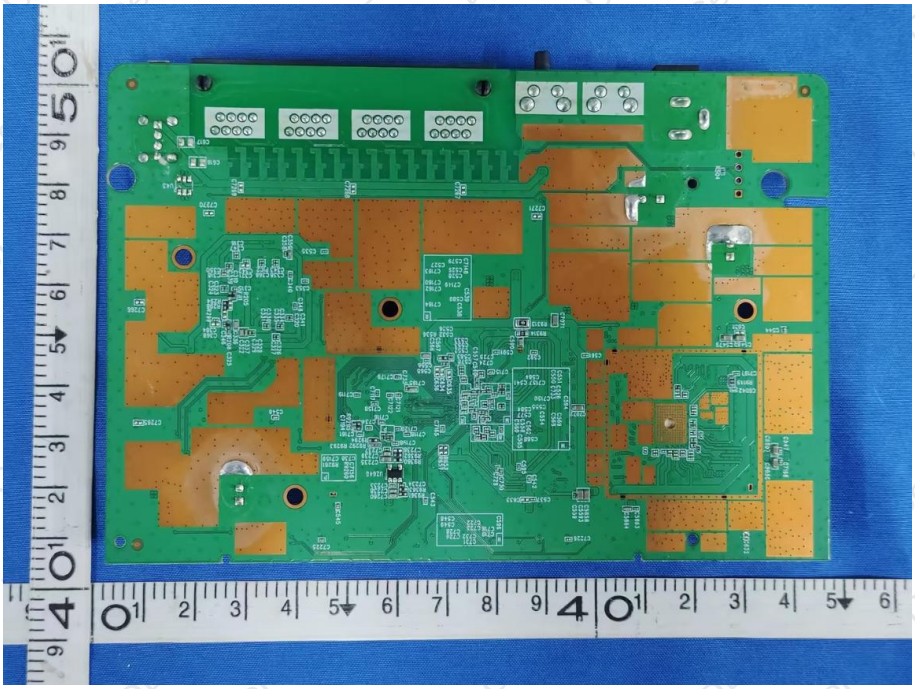

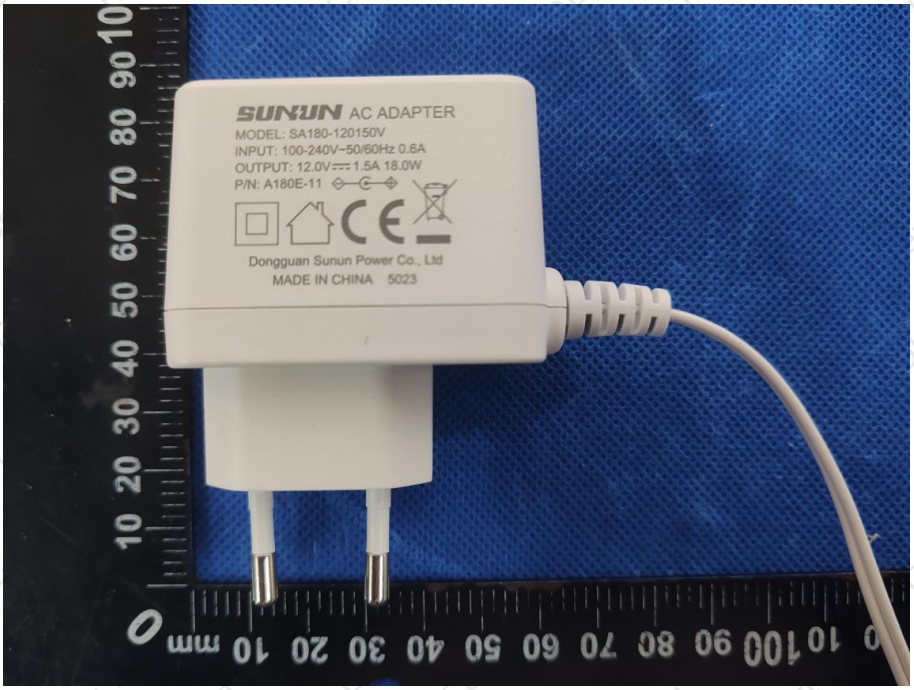

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