



中国认可
国际互认
检测
TESTING
CNAS L3163

CE Radio Test Report

Project No. : 2307C104
Equipment : N300 Wi-Fi 4G LTE Router
Brand Name : Tenda
Test Model : 4G03 Pro
Series Model : 4G05
Applicant : SHENZHEN TENDA TECHNOLOGY CO.,LTD.
Address : 6-8 Floor, Tower E3, No. 1001, Zhongshanyuan Road, Nanshan District, Shenzhen, China. 518052
Manufacturer : SHENZHEN TENDA TECHNOLOGY CO.,LTD.
Address : 6-8 Floor, Tower E3, No. 1001, Zhongshanyuan Road, Nanshan District, Shenzhen, China. 518052
Date of Receipt : Jul. 12, 2023
Date of Test : Jul. 14, 2023 ~ Jul. 26, 2023
Issued Date : Aug. 01, 2023
Report Version : R00
Test Sample : Engineering Sample No.: DG20230712320 and DG20230712323
Standard(s) : ETSI EN 301 908-1 V15.1.1 (2021-09)
ETSI EN 301 908-2 V13.1.1 (2020-06)

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.(Dongguan).

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Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

Please note that the measurement uncertainty is provided for informational purpose only and are not use in determining the Pass/Fail results.

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REPORT ISSUED HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-ETSP-1-2307C104	R00	Original Report.	Aug. 01, 2023	Valid

1. TEST SUMMARY

Applied Standard: ETSI EN 301 908-1 V15.1.1 (2021-09) & ETSI EN 301 908-2 V13.1.1 (2020-06) (See Note 3)		
Subclause	Description of Test	Verdict
4.2.2	Transmitter Maximum Output Power	Pass
4.2.3	Transmitter Spectrum Emission Mask	Pass
4.2.4	Transmitter Spurious Emissions	Pass
4.2.5	Transmitter Minimum Output Power	Pass
4.2.6	Receiver Adjacent Channel Selectivity (ACS)	Pass
4.2.7	Receiver Blocking Characteristics	Pass
4.2.8	Receiver Spurious Response	Pass
4.2.9	Receiver Intermodulation Characteristics	Pass
4.2.10	Receiver Spurious Emissions	Pass
4.2.11	Out-Of-Synchronization Handling Of Output Power	Pass
4.2.12	Transmitter Adjacent Channel Leakage Power Ratio(ACLR)	Pass
4.2.13	Receiver Reference Sensitivity Level	Pass
4.2.14	Receiver Total Radiated Sensitivity (TRS)	N/A (Note 2)
4.2.15	Total Radiated Power (TRP)	N/A (Note 2)
4.2.2	Radiated Emissions(UE)	Pass
4.2.4	Control And Monitoring Functions (UE)	Pass (Note 4)

Note:

- For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested".
- The present requirement applies to handheld phones/DUTs that are narrower than 72 mm.
- Normative References:

ETSI TS 134 108 V12.1.0 (2015-10)
ETSI TS 134 109 V12.0.0 (2014-09)
ETSI TS 125 101 V11.11.0 (2015-10)
ETSI TS 125 214 V11.12.0 (2015-07)
ETSI TS 145 004 V11.0.0 (2012-10)
ETSI TS 134 121-1 V12.1.0 (2015-10)

Note: The standards in note 3 are the reference standards for the standards shown on page 1, and all of them are not listed in the CNAS scope.

4. The RF module of this N300 Wi-Fi 4G LTE Router has been tested and certified. Please refer to the module report as listed in the below table for the test results of the RF module.

RF Module Model	Module Function	Report Number	Standard
EC200A-EL	WCDMA, LTE	2211RSU025-E3	ETSI EN 301 908-2 V13.1.1 (2020-06) ETSI EN 301 908-13 V13.2.1 (2022-02)
		2211RSU025-E2	ETSI EN 301 908-1 V15.1.1 (2021-09)

Based on the RF module the antennas for this N300 Wi-Fi 4G LTE Router were updated as below table:

Ant. Model Name	Type	Brand	Antenna Gain(dBi)	Note
N/A	Dipole	Tenda	2.37	Band I
			-0.28	Band VIII

- (1) Compared with module report (2211RSU025-E3, 2211RSU025-E2), the output power has been re-evaluated. It was found that the output power of module was the worst case. Thus, only the radiated spurious emissions was evaluated and recorded in this report. For the test results of all other test items please refer to above module test report.
- (2) The antenna gain is provided by the manufacturer.

2. TEST ENVIRONMENT AND DESCRIPTION

2.1 TEST FACILITY

The test facilities used to collect the test data of radiated in this report is **DG-CB12** at the location of No.3, Jinshagang 1st Road, Dalang, Dongguan, Guangdong, China.

2.2 MEASUREMENT UNCERTAINTY

Measurement Uncertainty for a Level of Confidence of 95 %, $U=2 \times U_c(y)$

Parameter	Uncertainty
Spurious Emissions, Radiated $30 \text{ MHz} \leq f \leq 1000 \text{ MHz}$	$\pm 3.58 \text{ dB}$
Spurious Emissions, Radiated $1 \text{ GHz} < f \leq 18 \text{ GHz}$	$\pm 3.78 \text{ dB}$

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Equipment	N300 Wi-Fi 4G LTE Router	
Brand Name	Tenda	
Test Model	4G03 Pro	
Series Model	4G05	
Model Difference(s)	Only differ in model name.	
RF Module Model	EC200A-EL	
Power Source	DC Voltage supplied from AC adapter. 1# Model: BN003-A05009E(EU) 2# Model: BN003-A05009B(UK) Only differ in plug.	
Power Rating	I/P: 100-240V ~ 50/60Hz 0.3A O/P: 9V \equiv 0.6A	
Operation Frequency Bands	Band I: UL: 1920MHz ~ 1980MHz, DL: 2110MHz ~ 2170MHz Band VIII: UL: 880MHz ~ 915MHz, DL: 925MHz ~ 960MHz	
Modulation Type	UL: BPSK, QPSK, 16QAM DL: BPSK, QPSK, 16QAM, 64QAM	
Power Class	3	
IMEI NO.	Radiated	864995060015480 / 864995060084627

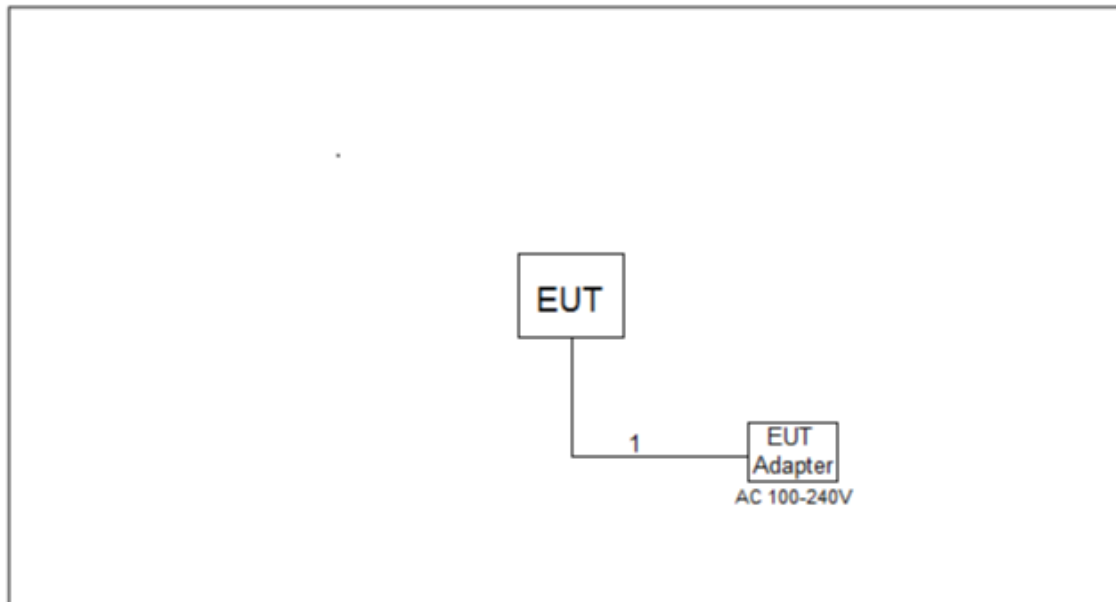
Note:

- For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

2. Channel List:

Bands	Sub-test	Channel	Frequency (MHz)	
WCDMA Band I	---	9613	Low	1922.6
		9750	Mid	1950.0
		9887	High	1977.4
WCDMA Band VIII	---	2713	Low	882.6
		2788	Mid	897.6
		2862	High	912.4

3.2 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



3.3 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Brand	Model No.	Series No.
-	-	-	-	-

Item	Cable Type	Shielded Type	Ferrite Core	Length
1	DC Cable	NO	NO	1.5m

4. RADIATED EMISSIONS (UE)

4.1 TEST REQUIREMENTS

The frequency boundary and reference bandwidths for the detailed transitions of the limits between the requirements for out-of-band emissions and spurious emissions are based on Recommendations ITU-R SM.329-12 [1] and SM.1539-1 [i.6].

The requirements shown in table 4.2.2.2-1 are only applicable for frequencies in the spurious domain.

Table 4.2.2.2-1: Radiated spurious emissions requirements (UE)

Frequency	Minimum requirement (e.r.p.)/ reference bandwidth idle mode	Minimum requirement (e.r.p.)/ reference bandwidth traffic mode	Applicability
$30 \text{ MHz} \leq f < 1\,000 \text{ MHz}$	-57 dBm/100 kHz	-36 dBm/100 kHz	All
$1 \text{ GHz} \leq f < 12,75 \text{ GHz}$	-47 dBm/1 MHz	-30 dBm/1 MHz	All
$12,75 \text{ GHz} \leq f < 5^{\text{th}}$ harmonic of the upper frequency edge of the Uplink operating band in GHz	-47 dBm/1 MHz	-30 dBm/1 MHz	All (note 3)
$12,75 \text{ GHz} < f < 26 \text{ GHz}$	-47 dBm/1 MHz	-30 dBm/1 MHz	All (note 4)
$f_c - 2,5 \times 5 \text{ MHz} < f < f_c + 2,5 \times 5 \text{ MHz}$ (note 1 and note 2)	Not defined	Not defined	UTRA FDD, UTRA TDD, 3,84 Mcps option, cdma2000, spreading rate 3
$f_c - 2,5 \times \text{BW}_{\text{Channel}} \text{ MHz} < f < f_c + 2,5 \times \text{BW}_{\text{Channel}} \text{ MHz}$ (note 1 and note 2)	Not defined	Not defined	E-UTRA FDD, E-UTRA TDD, Mobile WiMAX™
$f_c - (1,5 \times \text{BW}_{\text{Channel}} + 5) \text{ MHz} < f < f_c + (1,5 \times \text{BW}_{\text{Channel}} + 5) \text{ MHz}$ (note 1)	Not defined	Not defined	NR operating in FR1
$f_c - 2,5 \times 10 \text{ MHz} < f < f_c + 2,5 \times 10 \text{ MHz}$ (note 1 and note 2)	Not defined	Not defined	UTRA TDD, 7,68 Mcps option
$f_c - 4 \text{ MHz} < f < f_c + 4 \text{ MHz}$ (note 1 and note 2)	Not defined	Not defined	UTRA TDD, 1,28 Mcps option cdma2000, spreading rate 1

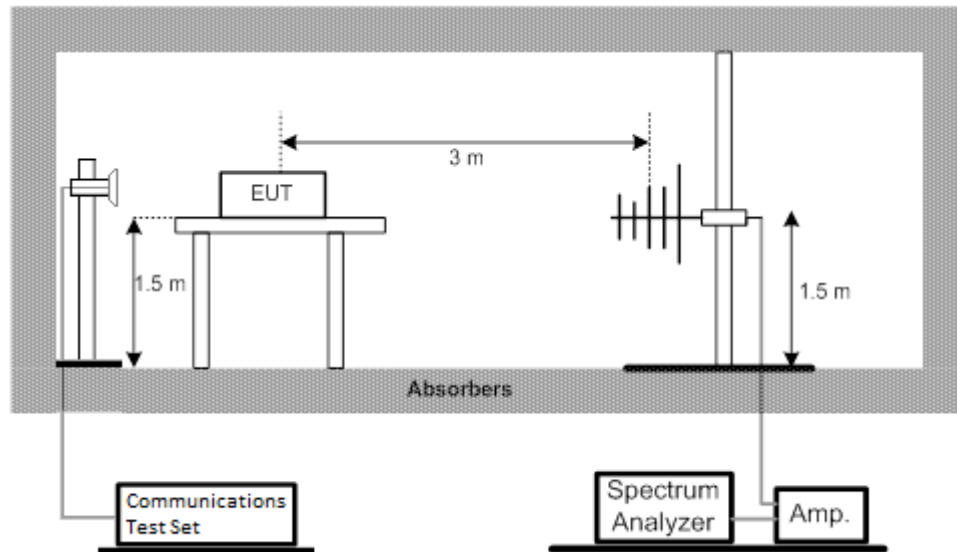
NOTE 1: f_c is the UE transmit centre frequency.
NOTE 2: This frequency range is not in the spurious domain, no requirement is then defined for this frequency range.
NOTE 3: Applies for Band that the upper frequency edge of the Uplink Band more than 2,69 GHz.
NOTE 4: Applies for Band that the upper frequency edge of the Uplink Band more than 5,2 GHz.

4.2 TEST REQUIREMENTS

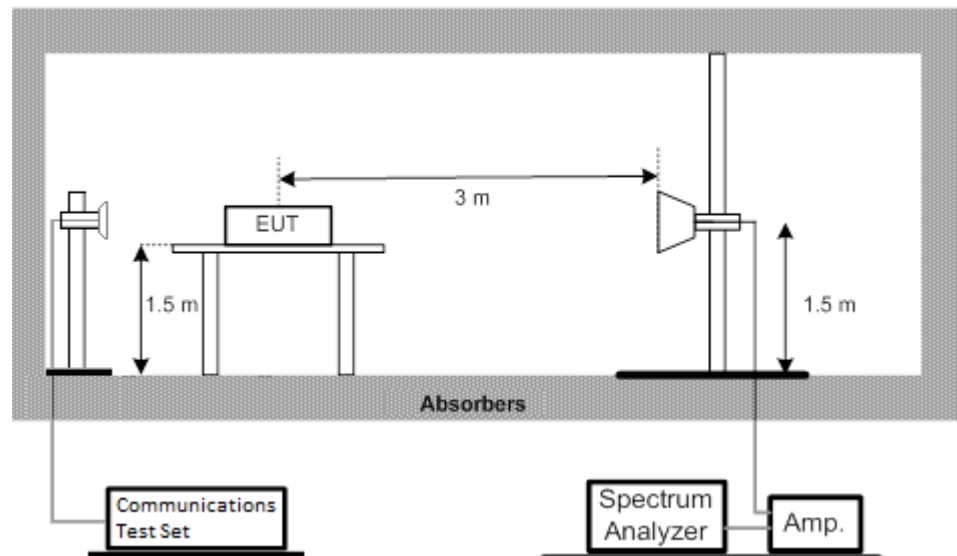
Conformance tests described in EN 301 908-1 clause 5.3.1 shall be carried out.

4.3 TEST SETUP

Radiated Emission Test Set-Up Frequency 30 MHz ~ 1 GHz



Radiated Emission Test Set-Up Frequency Above 1 GHz



4.4 TEST PROCEDURE

Step 1:

The measurement is carried out in the fully anechoic chamber. EUT was placed on a 1.50 meter high nonconductive table at a 3 meter test distance from the test receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT. The height of receiving antenna is 1.50 m and varies in certain range to find the maximum power value. Connect the EUT to the BTS simulator via the air interface. The measurement is carried out using a spectrum analyzer or receiver. Then the antenna height and turn table rotation is adjusted till the maximum power value is founded on spectrum analyzer or receiver. A filter is necessary in the band near to the carrier frequency. A filter is needed to avoid the distortion of the testing equipment in the band above the carrier frequency.

Step 2:

A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT.

The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.

Calculation procedure:

The data of cable loss, antenna gain and air loss has been calibrated in full testing frequency range before the testing.

The power of the Radiated Spurious Emissions is calculated by adding the cable loss, antenna gain and air loss. The basic equation with a sample calculation is as followed:

$$P=PR+LC+LA-G$$

Where

P: Power of the Radiated Spurious Emissions (dBm)

PR: reading of the receiver (dBm)

LC: Cable Lose and power amilifer gain and filter cable loss (dB)

LA: Air loss (dB)

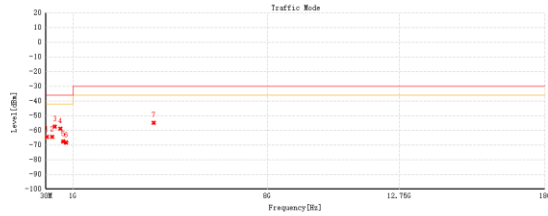
G: Antenna Gain (dBi)

4.5 RADIATED EMISSIONS TRAFFIC MODE MEASUREMENT (UE)

Test Mode : WCDMA_Traffic Mode_Mid CH_
Band I

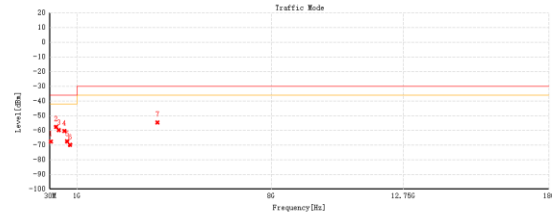
Test Mode : WCDMA_Traffic Mode_Mid CH_
Band I

Vertical



NO.	Freq. [MHz]	Reading [dBm]	Factor [dB]	Level [dBm]	Limit [dBm]	Margin [dB]	Detector	Polarity
1	60.846	-64.4	-0.1	-64.5	-36	28.5	RMS	Vertical
2	249.996	-60.81	-3.69	-64.5	-36	28.5	RMS	Vertical
3	350.003	-56.28	-1.12	-57.4	-36	21.4	RMS	Vertical
4	550.017	-61.41	2.54	-58.87	-36	22.87	RMS	Vertical
5	650.024	-72.67	5.39	-67.48	-36	31.48	RMS	Vertical
6	750.031	-76.47	8.14	-68.33	-36	32.33	RMS	Vertical
7	3901.5	-63.04	8.25	-54.79	-30	24.79	RMS	Vertical

Horizontal

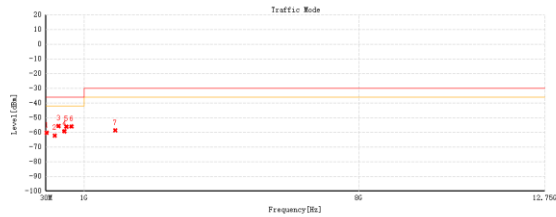


NO.	Freq. [MHz]	Reading [dBm]	Factor [dB]	Level [dBm]	Limit [dBm]	Margin [dB]	Detector	Polarity
1	61.622	-63.35	-4.23	-67.58	-36	31.58	RMS	Horizontal
2	249.996	-54.01	-3.71	-57.72	-36	21.72	RMS	Horizontal
3	350.003	-58.61	-1.25	-59.86	-36	23.86	RMS	Horizontal
4	550.017	-62.83	2.47	-60.36	-36	24.36	RMS	Horizontal
5	650.024	-72.57	5.16	-67.41	-36	31.41	RMS	Horizontal
6	750.031	-77.84	7.9	-69.94	-36	33.94	RMS	Horizontal
7	3901.5	-62.55	7.99	-54.56	-30	24.56	RMS	Horizontal

Test Mode : WCDMA_Traffic Mode_Mid CH_
Band VIII

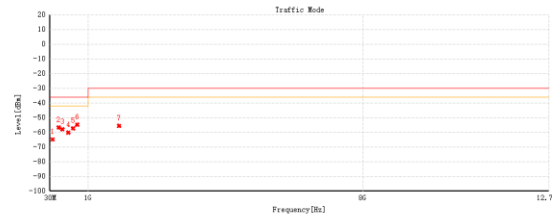
Test Mode : WCDMA_Traffic Mode_Mid CH_
Band VIII

Vertical



NO.	Freq. [MHz]	Reading [dBm]	Factor [dB]	Level [dBm]	Limit [dBm]	Margin [dB]	Detector	Polarity
1	49.982	-71.91	11.67	-60.24	-36	24.24	RMS	Vertical
2	249.996	-68.29	6.13	-62.16	-36	26.16	RMS	Vertical
3	350.003	-64.35	8.62	-55.73	-36	19.73	RMS	Vertical
4	495.6	-71.19	11.99	-59.2	-36	23.2	RMS	Vertical
5	550.017	-68.41	12.3	-56.11	-36	20.11	RMS	Vertical
6	677.669	-71.48	15.57	-55.91	-36	19.91	RMS	Vertical
7	1794.3	-61.73	3.04	-58.69	-30	28.69	RMS	Vertical

Horizontal



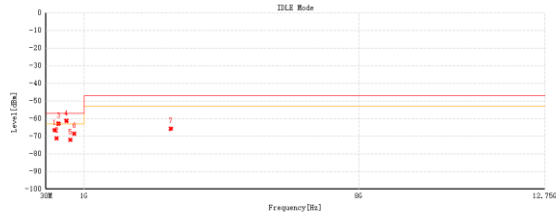
NO.	Freq. [MHz]	Reading [dBm]	Factor [dB]	Level [dBm]	Limit [dBm]	Margin [dB]	Detector	Polarity
1	98.094	-71.1	6.44	-64.66	-36	28.66	RMS	Horizontal
2	249.996	-62.75	6.11	-56.64	-36	20.64	RMS	Horizontal
3	350.003	-66.31	8.49	-57.82	-36	21.82	RMS	Horizontal
4	495.182	-72.04	11.96	-60.08	-36	24.08	RMS	Horizontal
5	616.171	-71.59	14.34	-57.25	-36	21.25	RMS	Horizontal
6	720.349	-71.22	16.49	-54.73	-36	18.73	RMS	Horizontal
7	1793.125	-58.64	3.08	-55.56	-30	25.56	RMS	Horizontal

4.6 RADIATED EMISSIONS IDLE MODE MEASUREMENT (UE)

Test Mode : WCDMA_Idle Mode_Mid CH_
Band I

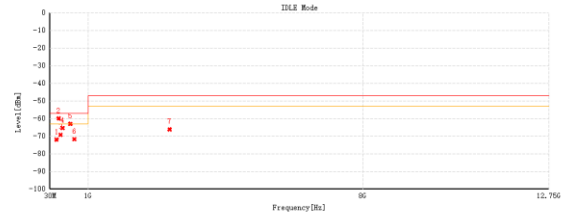
Test Mode : WCDMA_Idle Mode_Mid CH_
Band I

Vertical



NO.	Freq. [MHz]	Reading [dBm]	Factor [dB]	Level [dBm]	Limit [dBm]	Margin [dB]	Detector	Polarity
1	249.996	-62.86	-3.69	-66.55	-57	9.55	RMS	Vertical
2	299.951	-67.81	-3.3	-71.11	-57	14.11	RMS	Vertical
3	350.003	-61.71	-1.12	-62.83	-57	5.83	RMS	Vertical
4	550.017	-63.76	2.54	-61.22	-57	4.22	RMS	Vertical
5	650.024	-77.53	5.39	-71.94	-57	14.94	RMS	Vertical
6	750.031	-76.55	8.14	-68.41	-57	11.41	RMS	Vertical
7	3213.7	-60.57	-5.18	-65.75	-47	18.75	RMS	Vertical

Horizontal

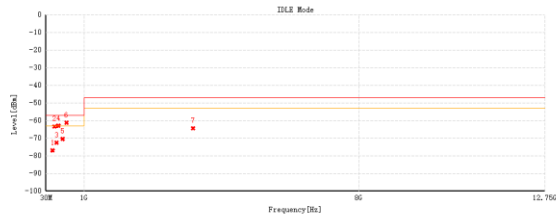


NO.	Freq. [MHz]	Reading [dBm]	Factor [dB]	Level [dBm]	Limit [dBm]	Margin [dB]	Detector	Polarity
1	199.944	-65.42	-6.45	-71.87	-57	14.87	RMS	Horizontal
2	249.996	-56.17	-3.71	-59.88	-57	2.88	RMS	Horizontal
3	299.951	-66.17	-2.95	-69.12	-57	12.12	RMS	Horizontal
4	350.003	-64.12	-1.25	-65.37	-57	8.37	RMS	Horizontal
5	550.017	-65.38	2.47	-62.91	-57	5.91	RMS	Horizontal
6	650.024	-76.73	5.16	-71.57	-57	14.57	RMS	Horizontal
7	3077.4	-60.57	-5.57	-66.14	-47	19.14	RMS	Horizontal

Test Mode : WCDMA_Idle Mode_Mid CH_
Band VIII

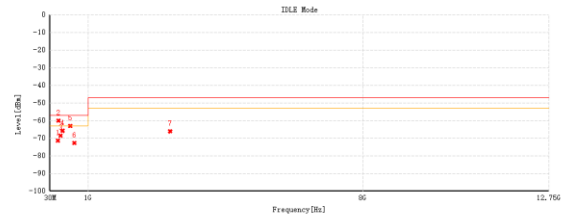
Test Mode : WCDMA_Idle Mode_Mid CH_
Band VIII

Vertical



NO.	Freq. [MHz]	Reading [dBm]	Factor [dB]	Level [dBm]	Limit [dBm]	Margin [dB]	Detector	Polarity
1	199.944	-70.78	-6.08	-76.86	-57	19.86	RMS	Vertical
2	249.996	-59.63	-3.69	-63.32	-57	6.32	RMS	Vertical
3	299.951	-69.23	-3.3	-72.53	-57	15.53	RMS	Vertical
4	350.003	-61.72	-1.12	-62.84	-57	5.84	RMS	Vertical
5	450.01	-70.36	0.02	-70.34	-57	13.34	RMS	Vertical
6	550.017	-63.72	2.54	-61.18	-57	4.18	RMS	Vertical
7	3777.7	-60.9	-3.49	-64.39	-47	17.39	RMS	Vertical

Horizontal



NO.	Freq. [MHz]	Reading [dBm]	Factor [dB]	Level [dBm]	Limit [dBm]	Margin [dB]	Detector	Polarity
1	234.379	-66.75	-4.58	-71.33	-57	14.33	RMS	Horizontal
2	249.996	-56.29	-3.71	-60	-57	3	RMS	Horizontal
3	299.951	-65.5	-2.95	-68.45	-57	11.45	RMS	Horizontal
4	350.003	-64.53	-1.25	-65.78	-57	8.78	RMS	Horizontal
5	550.017	-65.46	2.47	-62.99	-57	5.99	RMS	Horizontal
6	650.024	-77.86	5.16	-72.7	-57	15.7	RMS	Horizontal
7	3095.025	-60.7	-5.32	-66.02	-47	19.02	RMS	Horizontal

5. MEASUREMENT INSTRUMENTS LIST

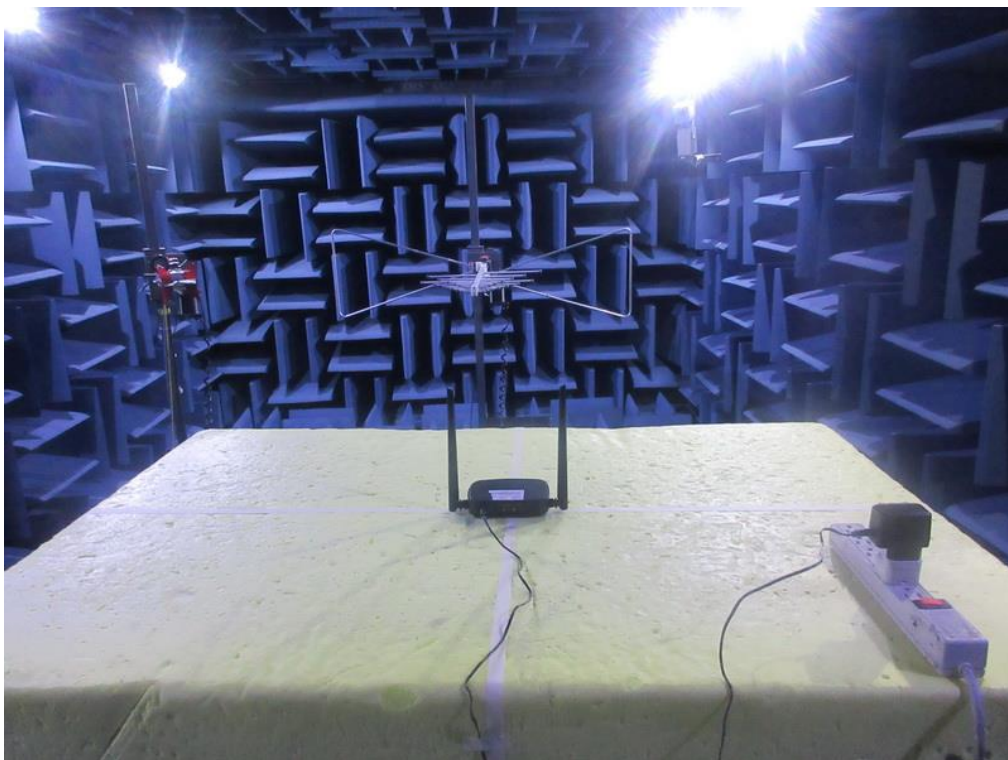
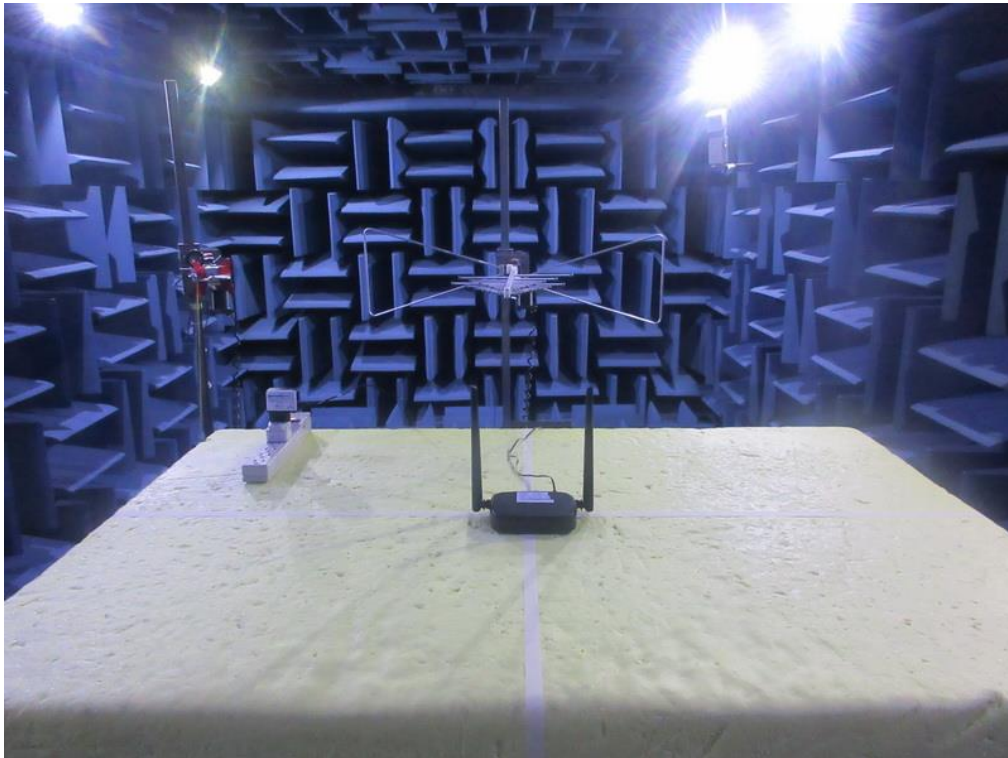
DETAILS FOR RADIATED EMISSIONS					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	Schwarzbeck	VULB9160	9160-3231	Apr. 02, 2024
2	Amplifier	HP	8447D	2944A08908	Jan. 08, 2024
3	Controller	ETS-Lindgren	2090	N/A	N/A
4	Double-Ridged Waveguide Horn Antennas	ETS-LINDGREN	3117-PA	224172	Sep. 19, 2023
5	Preamplifier	ETS-LINDGREN	3117-PA	224172	Jun. 18, 2024
6	Automatic switching unit of high and low frequency line wave device	Tonscend	JS0806-S	20E8060252	N/A
7	FSV Signal Analyzer	R&S	FSV7	101908	Jan. 08, 2024
8	FSV Signal Analyzer	R&S	FSV40	101423	Jun. 17, 2024
9	Measurement Software	Tonscend	JS36-RSE 2.5.1.5	N/A	N/A
10	Wireless Communication Test SET	Agilent	E5515C	MY48364183	Jan. 08, 2024

Remark: "N/A" denotes no model name, serial no. or calibration specified.

All calibration period of equipment list is one year.

6. EUT TEST PHOTO

Radiated Emissions Test Photos



End of Test Report