

TEST REPORT

Application No.: GZCR2503000272AT
Applicant: Comba Telecom Network Systems Limited
Address of Applicant: Flat/Rm 10, 3/F, Bio-Informatics Ctr, 2 Science Park West Avenue, HK Science Park, Pak Shek Kok, N.T. Hong Kong
Manufacturer: Comba Network Systems Company Limited
Address of Manufacturer: No. 10 Shenzhou Road, Guangzhou Science City, Guangzhou 510663, Guangdong, P.R. China
Product Name: Complex NG
Model No.: Complex NG MU
Trade Mark: Comba
Standard(s) : 47 CFR Part 2
 47 CFR Part 20
 47 CFR Part 27
Date of Receipt: 2025-03-03
Date of Test: 2025-04-29 to 2025-05-19
Date of Issue: 2025-07-16

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.



Jerry Chan
Manager



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Revision Record			
Version	Report No.	Date	Remark
01	GZCR250300027208	2025-07-16	Original

Authorized for issue by:				
		Kevin Zhang		
		Kevin Zhang/Project Engineer		
		Ricky Liu		
		Ricky Liu/Reviewer		



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2 Test Summary

Item	Standard	Method	Requirement	Result
Out-of-band rejection	KDB935210 D05 v01r04	KDB935210 D05 v01r04 clause 3.3	KDB935210 D05 v01r04 clause 3.3	Pass
Input-versus-output signal comparison	47 CFR Part 2	KDB935210 D05 v01r04 clause 3.4	Part 2.1049	Pass
Mean output power and amplifier/booster gain	47 CFR Part 27	KDB935210 D05 v01r04 clause 3.5	Part 27.50(h)	Pass
Out-of-band/out-of- block(including intermodulation) emissions		KDB935210 D05 v01r04 clause 3.6	Part 27.53(m)	Pass
Conducted spurious emissions		KDB935210 D05 v01r04 clause 3.6	Part 27.53(m)	Pass
Frequency stability		47 CFR Part 2.1055 KDB935210 D05 v01r04 clause 3.7 ANSI C63.26-2015 Clause 5.6	Part 27.54	Pass
Radiated spurious emissions (below 1GHz)		KDB935210 D05 v01r04 clause 3.8 ANSI C63.26-2015 Clause 5.5	Part 27.53(m)	Pass
Radiated spurious emissions (above 1GHz)		KDB935210 D05 v01r04 clause 3.8 ANSI C63.26-2015 Clause 5.5	Part 27.53(m)	Pass

The EUT is a host unit of DAS which can be capable of multi-band operation (details refer to clause 4.1 of this report). It receives handset uplink via fiber-optic or coaxial cable from remote unit, transmits via antenna or coaxial cable to base station, and returns base station downlink via fiber-optic or coaxial cable to remote unit. POI Cards installed in MU chassis can only connect directly to a base station via coaxial cable, and BDA Card installed in MU chassis can only connect to a base station via antenna.

Only test for BRS/EBS band uplink in this report.

Note:

E.U.T./ EUT means Equipment Under Test

Pass means the test result passed the test standard requirement, please find the detailed decision rule in the report relative section.



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3 Contents

	Page
1 Covers Page	1
2 Test Summary	3
3 Contents	4
4 General Information	6
4.1 Details of EUT	6
4.2 Description of Support Units	7
4.3 Test Environment	8
4.4 Measurement Uncertainty	8
4.5 Test Signals and Test Channels	9
4.6 Test Location	9
4.7 Test Facility	10
4.8 Deviation from Standards	10
4.9 Abnormalities from Standard Conditions	10
5 Equipment List	11
6 Radio Spectrum Matter Test Results	13
6.1 Out-of-band rejection	13
6.1.1 E.U.T. Operation	13
6.1.2 Test Setup	13
6.1.3 Measurement Record	13
6.2 Input versus output comparison	14
6.2.1 E.U.T. Operation	14
6.2.2 Test Setup	14
6.2.3 Measurement Record	14
6.3 Mean output power and amplifier/booster gain	15
6.3.1 E.U.T. Operation	15
6.3.2 Test Setup	15
6.3.3 Measurement Record	15
6.4 Out-of-band/out-of-block(including intermodulation) emissions	16
6.4.1 E.U.T. Operation	16
6.4.2 Test Setup	16
6.4.3 Measurement Record	16
6.5 Conducted Spurious emissions	17
6.5.1 E.U.T. Operation	17
6.5.2 Test Setup	17
6.5.3 Measurement Record	17
6.6 Frequency Stability	18
6.6.1 E.U.T. Operation	18
6.6.2 Test Setup	18
6.6.3 Measurement Record	18
6.7 Radiated Spurious emission (below 1GHz)	19
6.7.1 E.U.T. Operation	19



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6.7.2	Test Setup.....	19
6.7.3	Test procedure.....	20
6.7.4	Measurement Record.....	20
6.8	Radiated Spurious emission (above 1GHz).....	21
6.8.1	E.U.T. Operation.....	21
6.8.2	Test Setup.....	21
6.8.3	Test procedure.....	22
6.8.4	Measurement Record.....	22
7	Test Setup Photographs	23
8	EUT Constructional Details (EUT Photos)	23



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4 General Information

4.1 Details of EUT

Power Supply:	AC 100-240V, 50-60Hz	
Test Voltage:	AC 120V 60Hz	
Cable:	AC mains (4m, unshielded)	
Operating Temperature:	-20 to +55 °C	
Operating Humidity:	≤95%	
Frequency Range:	Lower 700MHz	Uplink: 698-716MHz Downlink: 728-746MHz
	Upper 700MHz	Uplink: 777-787MHz Downlink: 746-756MHz
	FirstNet	Uplink: 788-798MHz Downlink: 758-768MHz
	Cellular	Uplink: 824-849MHz Downlink: 869-894MHz
	Broadband PCS	Uplink: 1850-1915MHz Downlink: 1930-1995MHz
	AWS	Uplink: 1710-1780MHz Downlink: 2110-2180MHz
	BRS/EBS	Uplink: 2496-2690MHz Downlink: 2496-2690MHz
	3.45GHz Service band	Uplink: 3450-3550MHz Downlink: 3450-3550MHz
	3.7GHz Service band	Uplink: 3700-3980MHz Downlink: 3700-3980MHz
Support Technology:	LTE	
	5G NR	
Interface:	Antenna Port	5 (4.3-10 Female)*
	Optical Port	4 (SC-APC)
	OMT Port	1 (RJ-45)
	*	The other 4.3-10 Female ports belong to the POI card, which connects directly to a base station via coaxial cable but cannot connect to antenna and/or amplifier.
Antenna Type:	External Dedicated Antenna	
Permission Antenna Gain:	14dBi or less	



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Normal Output Power: (per antenna port, uplink, BDA card)	Lower 700MHz	19dBm
	Upper 700MHz	19dBm
	FirstNet	19dBm
	Cellular	19dBm
	Broadband PCS	19dBm
	AWS	19dBm
	BRS/EBS	22dBm
	3.45GHz Service band	22dBm
	3.7GHz Service band	22dBm
Normal System Gain: (per antenna port, uplink, BDA card)	Lower 700MHz	80dB
	Upper 700MHz	80dB
	FirstNet	80dB
	Cellular	80dB
	Broadband PCS	80dB
	AWS	80dB
	BRS/EBS	80dB
	3.45GHz Service band	80dB
	3.7GHz Service band	80dB
Software Version:	ChassisOAMV0100.01	
Remark: The information in this section is provided by the applicant or manufacturer, SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.		

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Notebook	LENOVO	Lenovo Xiaoxinchao 5000	PF0TNMG8
Comflex NG	Comba	ARU-6B-Internal	/
Comflex NG	Comba	ARU-HUB-AC	/
Matched load and attenuator supplied by the client	/	/	/



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4.3 Test Environment

Environment Parameter	Selected Values During Test	
Relative Humidity	Ambient	
Value	Temperature (°C)	Voltage (V)
TNVN	Asmbient	AC 120
TLVL	-30	AC 102
TLVH	-30	AC 138
THVL	+50	AC 102
THVH	+50	AC 138

VN: Normal Voltage, TN: Normal Teperature

VL: Lower Extreme Voltege, VH: Higher Extreme Voltage

TL: Lower Extreme Teperature, TH: Higher Extreme Teperature

4.4 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	RF Output Power	±0.75dB
2	Transmitter unwanted emissions	±0.75dB
3	Radiated Spurious Emission	±5.06dB (30MHz-1GHz; 3m); ±4.46dB (30MHz-1GHz; 10m); ±5.08dB (1GHz-6GHz); ±5.14dB (6GHz-18GHz)
4	Occupied Channel Bandwidth	± 0.274%

Remark:

The U_{lab} (lab Uncertainty) is less than U_{cisp} (CISPR Uncertainty) or U_{ETSI} (ETSI Uncertainty).

Emission decision rule:

- Compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit, marked as Pass in the report.
- Non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit, marked as Fail in the report.

4.5 Test Signals and Test Channels

UL 2496-2690MHz			
Test Channel	Test Frequency (MHz)	Test Signal	Stimulus Condition
LCH	2498.5	4.1MHz AWGN	a single test signal
MCH	2593		
HCH	2687.5		
LCH	2498.5, 2503.5		two adjacent test signals
HCH	2682.5, 2687.5		
LCH	2546	100MHz AWGN	a single test signal
MCH	2593		
HCH	2640		
LCH	2546, 2646		two adjacent test signals
HCH	2540, 2640		
LCH	2496.2	GSM-TDMA	a single test signal
MCH	2593		
HCH	2689.8		
LCH	2496.2, 2496.6		two adjacent test signals
HCH	2689.4, 2689.8		

LCH: Lowest Channel

MCH: Middle Channel

HCH: Highest Channel

DL: Downlink Path

UL: Uplink Path

4.6 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou Branch EMC Laboratory,
No.198, Kezhu Road, Science City, Economic & Technological Development Area, Guangzhou,
Guangdong, China 510663

Tel: +86 20 82155555

No tests were sub-contracted.



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4.7 Test Facility

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

● ACMA

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian/New Zealand Regulatory Compliance Mark (RCM).

● SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO

Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.

● FCC Recognized Accredited Test Firm(Registration No.: 486818)

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been accredited and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Designation Number: CN5016, Test Firm Registration Number: 486818.

● ISED (Registration No.: 4620B, CAB identifier: CN0052)

SGS-CSTC Standards Technical Services Co., Ltd., has been registered by Innovation Science and Economic Development Canada for Wireless Device Testing laboratories to test to Canadian radio equipment requirements. Registration No. 4620B, CAB identifier: CN0052.

● VCCI (Registration No.: R-12460, C-12584, G-20107 and T-11179)

The 10m Semi-anechoic chamber, 966 Anechoic Chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-12460, C-12584, G-20107 and T-11179 respectively.

● CBTL (Lab Code: TL129)

SGS-CSTC Standards Technical Services Co., Ltd., E&E Laboratory has been assessed and fully comply with the requirements of ISO/IEC 17025:2017, the Basic Rules, IECEE 01 and Rules of procedure IECEE 02, and the relevant IECEE CB-Scheme Operational documents.

4.8 Deviation from Standards

None

4.9 Abnormalities from Standard Conditions

None



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5 Equipment List

Conducted test equipment					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Temperature Chamber	GZ GongWen Co.Ltd.	GDJW-100	EMC0039	2024-06-17	2025-06-16
EXA Signal Analyzer (10Hz-44GHz)	Keysight	N9010A	EMC2138	2024-08-19	2025-08-18
MXA Signal Analyzer (10Hz-50GHz)	KEYSIGHT	N9020B	SEM004-24	2025-03-11	2026-03-10
Spectrum Analyzer(9kHz-30GHz)	Rohde & Schwarz	FSP30	SEM004-06	2024-09-21	2025-09-20
MI CABLE	SGS-EMC	0.8M	EMC2137	2023-11-02	2025-11-01
MI CABLE	SGS-EMC	0.8M	EMC2136	2023-11-02	2025-11-01
4X4 Power Sensor Unit	TST	TSPS2023R	EMC2257	2024-08-19	2025-08-18
EXA Signal Analyzer	Agilent Technologies	N9010A	EMC2222	2024-12-03	2025-12-02
ESG vector signal generator (250kHz-6GHz)	Agilent Technologies	E4438C	SEM006-03	2024-12-03	2025-12-02
Test Software	TST	V2.0	GZE100-82	N/A	N/A

Radiated Spurious Emissions Below 1GHz					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
10m Semi-Anechoic Chamber	ETS	N/A	EMC0530	2022-10-16	2025-10-15
Amplifier (9kHz-1.3GHz)	HP	8447F	EMC2065	2024-12-04	2025-12-03
EMI Test Receiver (9kHz-7GHz)	Rohde & Schwarz	ESR7	EMC2220	2024-12-04	2025-12-03
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A
Trilog Broadband Antenna (25MHz-2GHz)	Schwarzbeck Mess-Elektronik	VULB 9168	EMC2174	2025-04-21	2027-04-20
Coaxial Cable	Mirco-COAX UTIFLEX ve	LA2-C125-8000	EMC2239	2024-12-04	2026-12-03
Trilog Broadband Antenna (25MHz-1GHz)	SCHWARZBECK	VULB 9160	EMC2025	2022-09-07	2025-09-06
Active Loop Antenna-RED	ETS-Lindgren	6502	EMC2190	2024-04-08	2026-04-07



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Radiated Spurious Emissions Above 1GHz					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
1GHz-26.5 GHz Pre-Amplifier	Agilent	8449B	EMC0521	2024-10-14	2025-10-13
Chamber cable (Above 1GHz)	Scoflex	KMKM-8.0m	EMC0545	2024-08-19	2026-08-18
Horn Antenna (1GHz-18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120D	EMC2026	2022-09-23	2025-09-22
Horn Antenna (14-40GHz)	SCHWARZBECK	BBHA 9170	EMC2041	2023-06-18	2026-06-17
EXA Signal Analyzer (10Hz-44GHz)	Keysight	N9010A	EMC2138	2024-08-19	2025-08-18
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2023-12-20	2026-12-19
Microwave Broadband Preamplifier (18-40GHz)	SCHWARZBECK	BBV 9721	EMC2172	2024-08-19	2025-08-18
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A

General used equipment					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
DMM	Fluke	73	EMC0006	2024-06-13	2025-06-12



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6 Radio Spectrum Matter Test Results

6.1 Out-of-band rejection

Test Requirement: KDB 935210 D05 clause 3.3

Test Method: KDB 935210 D05 clause 3.3

Limit: Within the passband

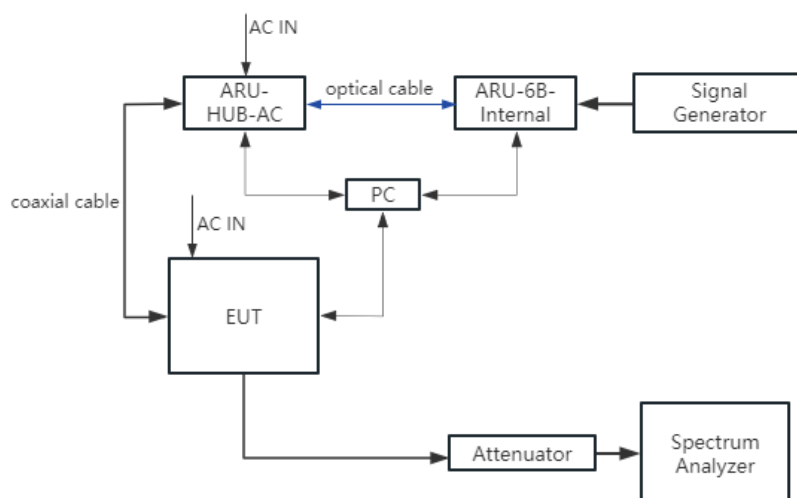
6.1.1 E.U.T. Operation

Operating Environment:

Temperature: 22~26 °C Humidity: 45~60 % RH Atmospheric Pressure: 1010 mbar

EUT Operation: Drive the EUT to the maximum output power at maximum gain.

6.1.2 Test Setup



6.1.3 Measurement Record

Please refer to Appendix - Test Data and Result for report GZCR250300027208.

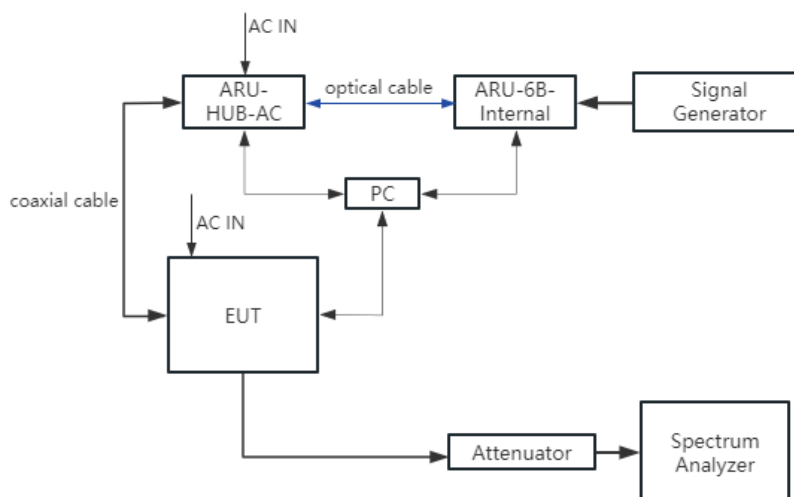
6.2 Input versus output comparison

Test Requirement: 47 CFR Part 2.1049
 Test Method: KDB 935210 D05 clause 3.4
 Limit: The spectral plots of the output signal and the input signal are similar (in passband and rolloff characteristic features and relative spectral locations).

6.2.1 E.U.T. Operation

Operating Environment:
 Temperature: 22~26 °C Humidity: 45~60 % RH Atmospheric Pressure: 1010 mbar
 EUT Operation: Drive the EUT to the maximum output power at maximum gain.

6.2.2 Test Setup



6.2.3 Measurement Record

Please refer to Appendix - Test Data and Result for report GZCR250300027208.



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6.3 Mean output power and amplifier/booster gain

Test Requirement: 47 CFR Part 27.50(h)

Test Method: KDB 935210 D05 clause 3.5

Limit:

For main or booster station sectorizes or otherwise uses one or more transmitting antennas with a non-omnidirectional horizontal plane radiation pattern:

$EIRP \leq 33dBW + 10lg(X/Y) dBW + 10lg(360/\text{beamwidth}) dBW$.

For other main or booster:

$EIRP \leq 33dBW + 10lg(X/Y) dBW$

where X is the actual channel width in MHz and Y is either 6 MHz if prior to transition or the station is in the MBS following transition or 5.5 MHz if the station is in the LBS and UBS following transition.

6.3.1 E.U.T. Operation

Operating Environment:

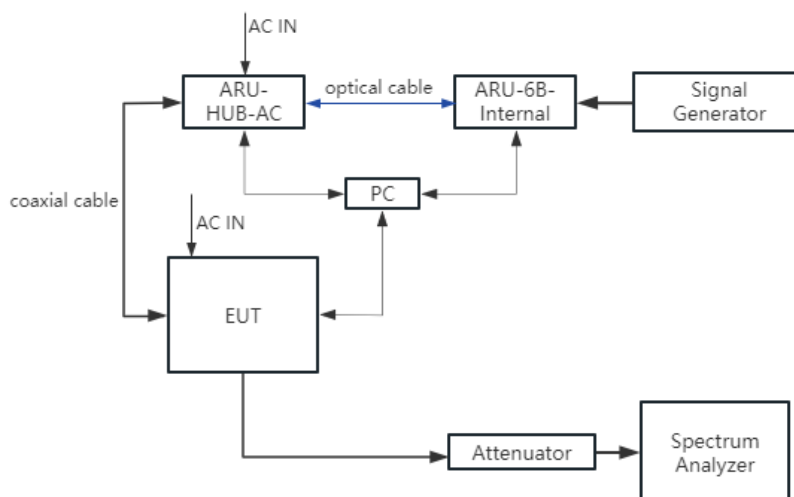
Temperature: 22~26 °C

Humidity: 45~60 % RH

Atmospheric Pressure: 1010 mbar

EUT Operation: Drive the EUT to the maximum output power at maximum gain.

6.3.2 Test Setup



6.3.3 Measurement Record

Please refer to Appendix - Test Data and Result for report GZCR250300027208.

6.4 Out-of-band/out-of-block(including intermodulation) emissions

Test Requirement: 47 CFR Part 27.53(m)

Test Method: KDB 935210 D05 clause 3.6

Limit: For digital base stations, the attenuation shall be not less than $43 + 10 \log(P)$ dB, unless a documented interference complaint is received from an adjacent channel licensee with an overlapping Geographic Service Area.

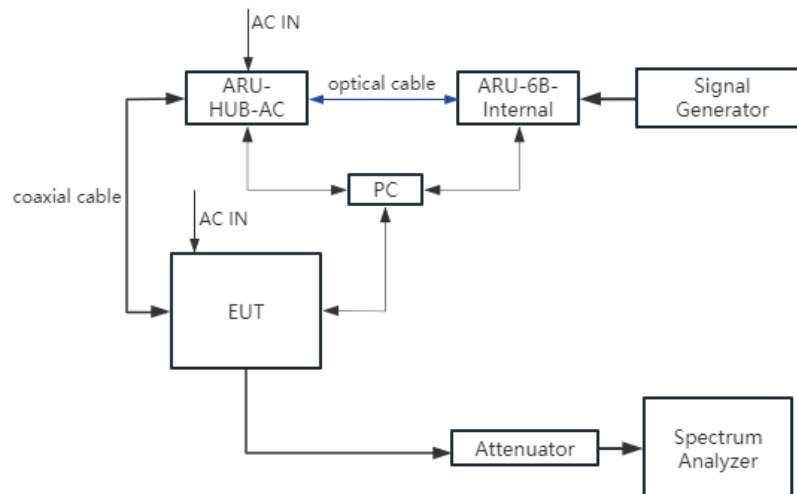
6.4.1 E.U.T. Operation

Operating Environment:

Temperature: 22~26 °C Humidity: 45~60 % RH Atmospheric Pressure: 1010 mbar

EUT Operation: Drive the EUT to the maximum output power at maximum gain.

6.4.2 Test Setup



6.4.3 Measurement Record

Please refer to Appendix - Test Data and Result for report GZCR250300027208.



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6.5 Conducted Spurious emissions

Test Requirement: 47 CFR Part 27.53(a)
 Test Method: KDB 935210 D05 clause 3.6
 Limit: For digital base stations, the attenuation shall be not less than $43 + 10 \log (P)$ dB, unless a documented interference complaint is received from an adjacent channel licensee with an overlapping Geographic Service Area.

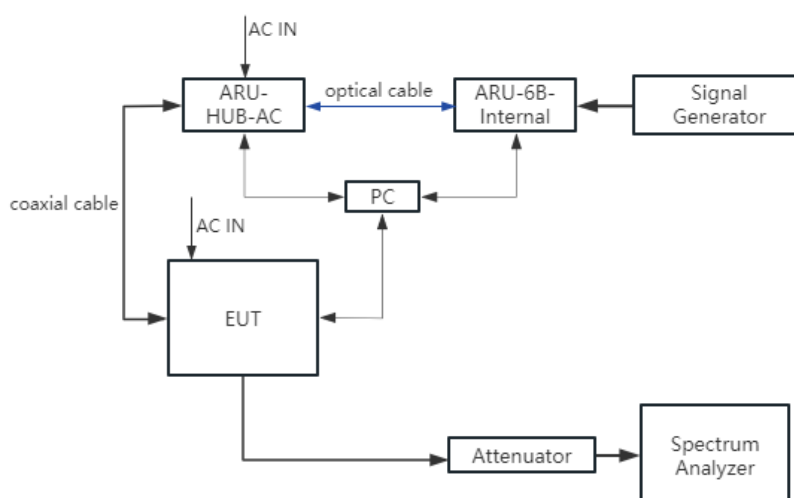
6.5.1 E.U.T. Operation

Operating Environment:

Temperature: 22~26 °C Humidity: 45~60 % RH Atmospheric Pressure: 1010 mbar

EUT Operation: Drive the EUT to the maximum output power at maximum gain.

6.5.2 Test Setup



6.5.3 Measurement Record

Please refer to Appendix - Test Data and Result for report GZCR250300027208.



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6.6 Frequency Stability

Test Requirement: 47 CFR Part 27.54

Test Method: 47 CFR Part 2.1055
KDB 935210 D05 clause 3.7
ANSI C63.26-2015 clause 5.6

Limit: The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

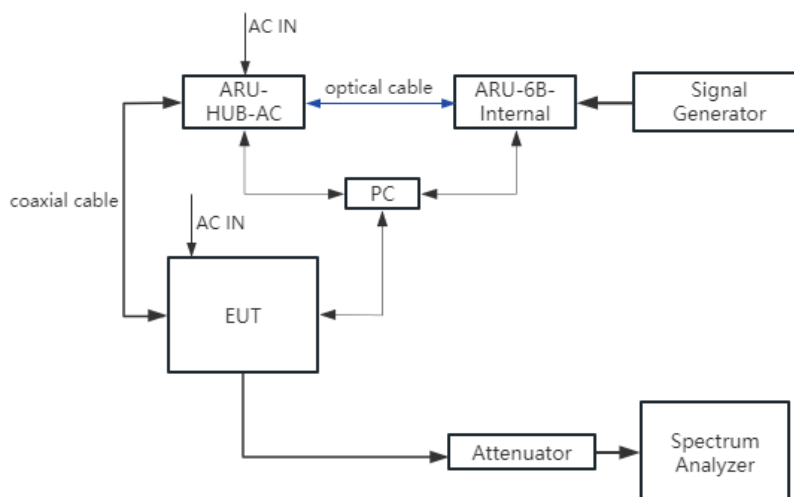
6.6.1 E.U.T. Operation

Operating Environment:

Temperature: 22~26 °C Humidity: 45~60 % RH Atmospheric Pressure: 1010 mbar

EUT Operation: Drive the EUT to the maximum output power at maximum gain.

6.6.2 Test Setup



6.6.3 Measurement Record

Please refer to Appendix - Test Data and Result for report GZCR250300027208.

6.7 Radiated Spurious emission (below 1GHz)

Test Requirement: 47 CFR Part 27.53(a)

Test Method: KDB 935210 D05 clause 3.8
ANSI C63.26-2015 clause 5.5

Test Distance: 10 m

Limit: For digital base stations, the attenuation shall be not less than $43 + 10 \log (P)$ dB, unless a documented interference complaint is received from an adjacent channel licensee with an overlapping Geographic Service Area.

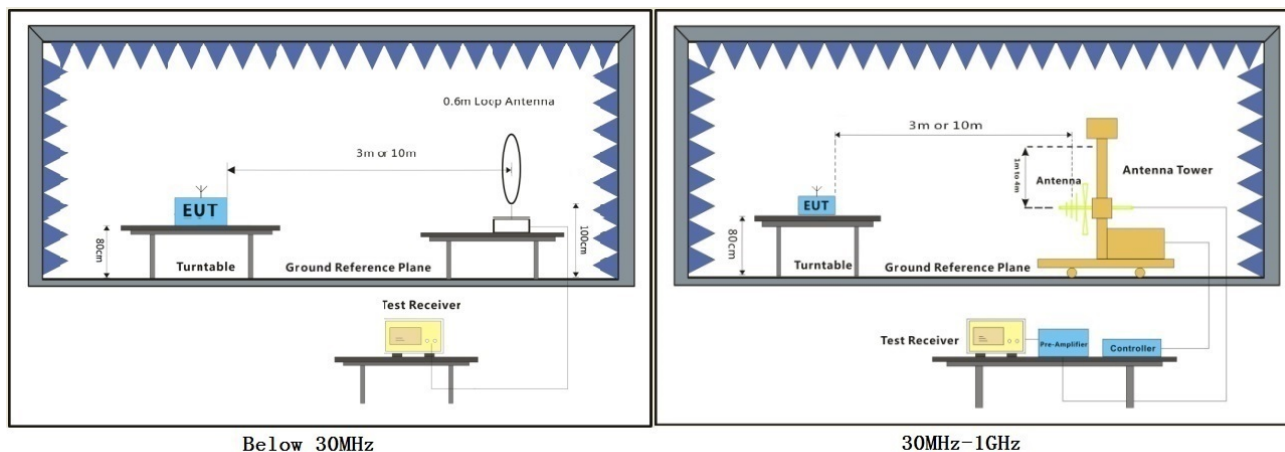
6.7.1 E.U.T. Operation

Operating Environment:

Temperature: 24.2 °C Humidity: 52 % RH Atmospheric Pressure: 1010 mbar

EUT Operation: Drive the EUT to the maximum output power at maximum gain.

6.7.2 Test Setup



Below 30MHz

30MHz-1GHz

Below 1GHz



6.7.3 Test procedure

1. Scan from 9kHz to 1GHz, find the maximum radiation frequency to measure.
2. The technique used to find the Spurious Emissions of the transmitter was the antenna substitution method. Substitution method was performed to determine the actual ERP/EIRP emission levels of the EUT.
 - 1) The EUT was powered on and placed on a table in the chamber. The antenna of the transmitter was extended to its maximum length. modulation mode and the measuring receiver shall be tuned to the frequency of the transmitter under test.
 - 2) Rotating through 360° the turntable. After the fundamental emission was maximized, a field strength measurement was made.
 - 3) Steps 1) and 2) were performed with the EUT and the receive antenna in both vertical and horizontal polarization.
 - 4) The transmitter was then removed and replaced with another antenna. The center of the antenna was approximately at the same location as the center of the transmitter.
 - 5) A signal at the disturbance was fed to the substitution antenna by means of a non-radiating cable. With both the substitution and the receive antennas horizontally polarized, the receive antenna was raised and lowered to obtain a maximum reading at the test receiver. The level of the signal generator was adjusted until the measured field strength level in step 2) is obtained for this set of conditions.
 - 6) The output power into the substitution antenna was then measured.
 - 7) Steps 5) and 6)were repeated with both antennas vertically polarized.
 - 8) Calculate power in dBm by the following formula:

$$\text{Level (dBm)} = \text{Read Level (dBm)} + \text{Correction Factor (dB)}$$

6.7.4 Measurement Record

Please refer to Appendix - Test Data and Result for report GZCR250300027208.



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6.8 Radiated Spurious emission (above 1GHz)

Test Requirement: 47 CFR Part 27.53(c); 27.53(g); 27.53(f)

Test Method: KDB 935210 D05 clause 3.8
ANSI C63.26-2015 clause 5.5

Limit: For digital base stations, the attenuation shall be not less than $43 + 10 \log (P)$ dB, unless a documented interference complaint is received from an adjacent channel licensee with an overlapping Geographic Service Area.

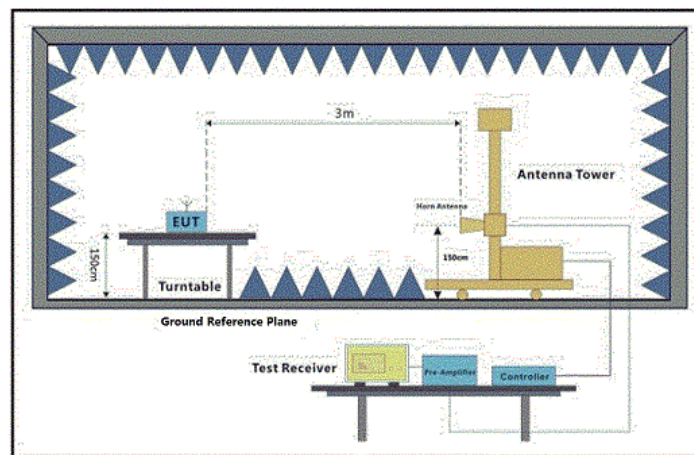
6.8.1 E.U.T. Operation

Operating Environment:

Temperature: 24.4 °C Humidity: 54 % RH Atmospheric Pressure: 1015 mbar

EUT Operation: Drive the EUT to the maximum output power at maximum gain.

6.8.2 Test Setup



Above 1GHz

6.8.3 Test procedure

1. Scan from 1GHz to 40GHz, find the maximum radiation frequency to measure.
2. The technique used to find the Spurious Emissions of the transmitter was the antenna substitution method. Substitution method was performed to determine the actual ERP/EIRP emission levels of the EUT.
 - 1) The EUT was powered on and placed on a table in the fully Anechoic Chamber. The antenna of the transmitter was extended to its maximum length. modulation mode and the measuring receiver shall be tuned to the frequency of the transmitter under test.
 - 2) Rotating through 360° the turntable. After the fundamental emission was maximized, a field strength measurement was made.
 - 3) Steps 1) and 2) were performed with the EUT and the receive antenna in both vertical and horizontal polarization.
 - 4) The transmitter was then removed and replaced with another antenna. The center of the antenna was approximately at the same location as the center of the transmitter.
 - 5) A signal at the disturbance was fed to the substitution antenna by means of a non-radiating cable. With both the substitution and the receive antennas horizontally polarized, the receive antenna was raised and lowered to obtain a maximum reading at the test receiver. The level of the signal generator was adjusted until the measured field strength level in step 2) is obtained for this set of conditions.
 - 6) The output power into the substitution antenna was then measured.
 - 7) Steps 5) and 6) were repeated with both antennas vertically polarized.
 - 8) Calculate power in dBm by the following formula:
 Level (dBm) = Read Level (dBm) + Correction Factor (dB)

6.8.4 Measurement Record

Please refer to Appendix - Test Data and Result for report GZCR250300027208.



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7 Test Setup Photographs

Refer to Appendix - Test Setup Photos for GZCR250300027208.

8 EUT Constructional Details (EUT Photos)

Refer to Appendix - External and Internal Photos for GZCR2503000272AT.

- End of the Report -



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