

TEST REPORT

Application No.: GZCR2508001193AT

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 Telecom Technology (Guangzhou) Ltd.

Address of Manufacturer: No. 6 Jinbi Road, Economics and Technology Development District, Guangzhou, Guangdong, China

Product Name: High Power Remote Unit-700/850/1900/2100 with AC PSU
High Power Remote Unit-700/850/1900/2100 with DC PSU

Model No.: HRU-7851719-AC, HRU-7851719-DC ♣

♣ Please refer to section 2 of this report which indicates which item was actually tested and which were electrically identical.

Trade Mark: Comba

Standard(s) : 47 CFR Part 2
47 CFR Part 20
47 CFR Part 90

Date of Receipt: 2025-08-07

Date of Test: 2025-08-10 to 2025-08-19

Date of Issue: 2025-09-10

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



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Revision Record			
Version	Report No.	Date	Remark
01	GZCR250800119304	2025-09-10	Original

Authorized for issue by:			
		Kevin Zhang	
		Kevin Zhang/Project Engineer	
Approved By		Vico Cui	
		Vico Cui/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 90	KDB935210 D05 v01r04 clause 3.5	Part 90.635	Pass
Out-of-band/out-of-block(including intermodulation) emissions		KDB935210 D05 v01r04 clause 3.6	Part 90.691	Pass
Conducted spurious emissions		KDB935210 D05 v01r04 clause 3.6	Part 90.691	Pass
Frequency stability		47 CFR Part 2.1055 KDB935210 D05 v01r04 clause 3.7 ANSI C63.26-2015 Clause 5.6	Part 90.213	Pass
Radiated spurious emissions (below 1GHz)		KDB935210 D05 v01r04 clause 3.8 ANSI C63.26-2015 Clause 5.5	Part 90.691	Pass
Radiated spurious emissions (above 1GHz)		KDB935210 D05 v01r04 clause 3.8 ANSI C63.26-2015 Clause 5.5	Part 90.691	Pass

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

Only test for ESMR band downlink 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.

✦ Declaration of EUT Family Grouping:

Model No.: HRU-7851719-AC, HRU-7851719-DC

According to the declaration from the applicant, the electrical circuit design, layout, components used and internal wiring were identical for all models, with only difference on model No. and power supply module. Therefore, only HRU-7851719-AC was test for all above test items and HRU-7851719-DC was test for Radiated spurious emissions (below 1GHz) in this report.



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4 General Information

4.1 Details of EUT

Power Supply:	AC 100-240V, 50-60Hz for HRU-7851719-AC DC -48V for HRU-7851719-DC	
Test Voltage:	AC 120V 60Hz for HRU-7851719-AC DC -48V for HRU-7851719-DC	
Cable:	AC mains (4m, unshielded) for HRU-7851719-AC DC cable (4m, unshielded) for HRU-7851719-DC	
Operating Temperature:	-20 to +55 °C	
Operating Humidity:	≤95%	
Frequency Range:	Lower & Upper 700MHz	Uplink: 698-716MHz (Lower); 776-788MHz (Upper) Downlink: 728-758MHz
	FirstNet	Uplink: 788-798MHz Downlink: 758-768MHz
	ESMR	Uplink: 817-824MHz Downlink: 862-869MHz
	Cellular	Uplink: 824-849MHz Downlink: 869-894MHz
	Broadband PCS	Uplink: 1850-1915MHz Downlink: 1930-1995MHz
	AWS-2	Uplink: 1915-1920MHz Downlink: 1995-2000MHz
	EAWS	Uplink: 1695-1780MHz Downlink: 2110-2200MHz
Support Technology:	LTE	
	5G NR	
EUT MIMO property:	1T1R	
Interface:	Antenna Port	4 (4.3-10 Female)
	Optical Port	1 (SC-APC)
	OMT Port	1 (RJ-45)
Normal Output Power: (per antenna port, only downlink)	Lower & Upper 700MHz	43dBm
	FirstNet	43dBm
	ESMR	43dBm
	Cellular	43dBm
	Broadband PCS	46dBm
	AWS-2	46dBm
	EAWS	46dBm



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Normal System Gain: (only downlink)	Lower & Upper 700MHz	53dB
	FirstNet	53dB
	ESMR	53dB
	Cellular	53dB
	Broadband PCS	56dB
	AWS-2	56dB
	EAWS	56dB
Antenna Type:	External Dedicated Antenna	
Permission Antenna Gain:	5dBi or less	
Software Version:	V01.00.00.04	
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
MU supplied by the client	Comba	Comflex NG MU	/
Matched load and attenuator supplied by the client	/	/	/

4.3 Test Environment

Environment Parameter	Selected Values During Test	
Ralative 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



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4.4 Measurement Uncertainty

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

Remark:
The U_{lab} (lab Uncertainty) is less than U_{CISPR} (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

DL 862-869MHz			
Test Channel	Test Frequency (MHz)	Test Signal	Stimulus Condition
LCH	864.5	4.1MHz AWGN	a single test signal
MCH	865.5		
HCH	866.5		
LCH	864.5, 869.5		
HCH	861.5, 866.5		two adjacent test signals
LCH	912	100MHz AWGN	a single test signal
MCH	865.5		
HCH	819		
LCH	862.2	GSM-TDMA	a single test signal
MCH	865.5		
HCH	868.8		
LCH	862.2, 962.6		two adjacent test signals
HCH	868.6, 868.8		



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LCH: Lowest Channel
MCH: Middle Channel
HCH: Highest Channel
DL: Downlink Path
UL: Uplink Path

The EUT cannot accommodate two simultaneous 100MHz AWGN signals within the passband.

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.

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.



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4.8 Deviation from Standards

None

4.9 Abnormalities from Standard Conditions

None



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5 Equipment List

RF Conducted test equipment

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Temperature Chamber	GZ GongWen Co.Ltd.	GDJW-100	EMC0039	2024-12-03	2025-12-02
MI CABLE	SGS-EMC	0.8M	EMC2136	2023-11-02	2025-11-01
EXA Signal Analyzer	Agilent Technologies	N9010A	EMC2222	2024-12-03	2025-12-02
MXA Signal Analyzer (10Hz-50GHz)	KEYSIGHT	N9020B	SEM004-24	2025-03-14	2026-03-13
ESG vector signal generator (250kHz-6GHz)	Agilent Technologies	E4438C	SEM006-03	2024-12-03	2025-12-02
4X4 Power sensor Unit	TST	TSPS2023R	EMC2257	2024-08-19	2025-08-18
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
966 Anechoic Chamber	Shenzhen C.R.T	CRTSGSSAC966	EMC2230	2025-03-22	2028-03-21
EMI Test Receiver(1Hz-8GHz)	Rohde & Schwarz	ESW8	EMC2229	2024-12-03	2025-12-02
Amplifier(9k-1000MHz)	SONOMA	310	EMC2237	2024-12-03	2025-12-02
Trilog Broadband Antenna (25MHz-2GHz)	Schwarzbeck Mess-Elektronik	VULB 9168	EMC2238	2025-03-24	2027-03-23
Coaxial Cable	Mirco-COAX UTIFLEX ve	LA2-C125-8000	EMC2239	2024-12-04	2026-12-03
Test Software E3	Audix	Ver.6.191211	GZE100-81	N/A	N/A
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
Signal Generator (9kHz-6GHz)	Rohde & Schwarz	SMB100A	EMC2093	2024-10-14	2025-10-13
1GHz-26.5 GHz Pre-Amplifier	Agilent	8449B	EMC0521	2024-10-14	2025-10-13
EMI Test Receiver (10Hz-26.5GHz)	Rohde & Schwarz	ESIB26	EMC0522	2024-09-02	2025-09-01
Chamber cable (Above 1GHz)	Scoflex	KMKM-8.0m	EMC0545	2024-08-19	2026-08-18
Chamber Cable (Below 1GHz)	Scoflex	KMKM-8.0m	EMC0546	2024-08-19	2026-08-18
Trilog Broadband Antenna (25MHz-1GHz)	SCHWARZBECK	VULB 9160	EMC2025	2022-09-07	2025-09-06
Horn Antenna (1GHz-18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120D	EMC2026	2022-09-23	2025-09-22
Pre-Amplifier MH648A (100kHz-1.2GHz)	ANRITSU CORP	MH648A	EMC2086	2024-10-14	2025-10-13
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2023-12-20	2026-12-19
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A



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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

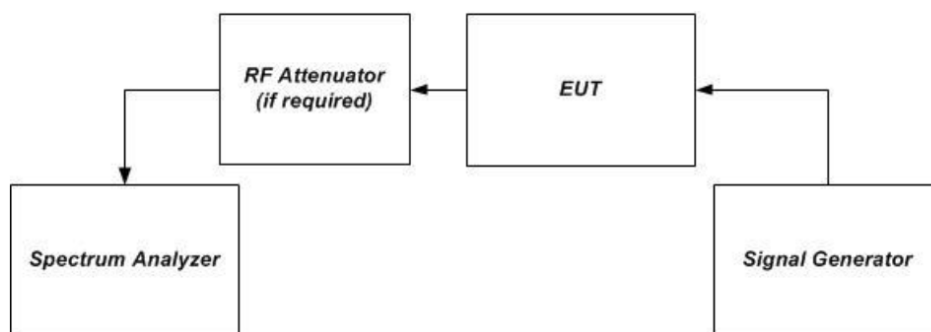
6.1.1 E.U.T. Operation

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 GZCR250800119304.



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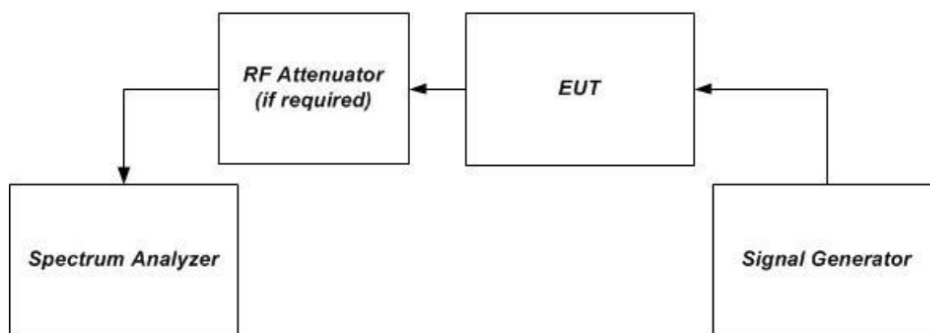
6.2 Input versus output comparison

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 GZCR250800119304.



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6.3 Mean output power and amplifier/booster gain

Test Requirement: 47 CFR Part 90.635

Test Method: KDB 935210 D05 clause 3.5

Limit: The effective radiated power and antenna height for base stations may not exceed 1 kilowatt (30 dBw) and 304 m. (1,000 ft.) above average terrain (AAT), respectively, or the equivalent thereof as determined from the Table. These are maximum values, and applicants will be required to justify power levels and antenna heights requested.

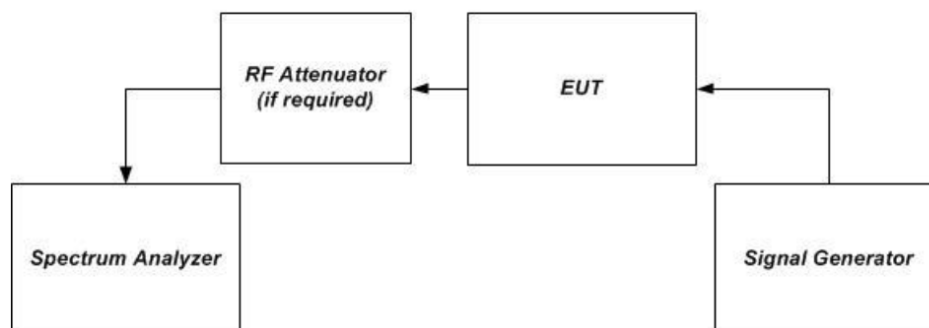
6.3.1 E.U.T. Operation

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

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

Test Requirement: 47 CFR Part 90.691

Test Method: KDB 935210 D05 clause 3.6

Limit: For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $43 + 10\log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

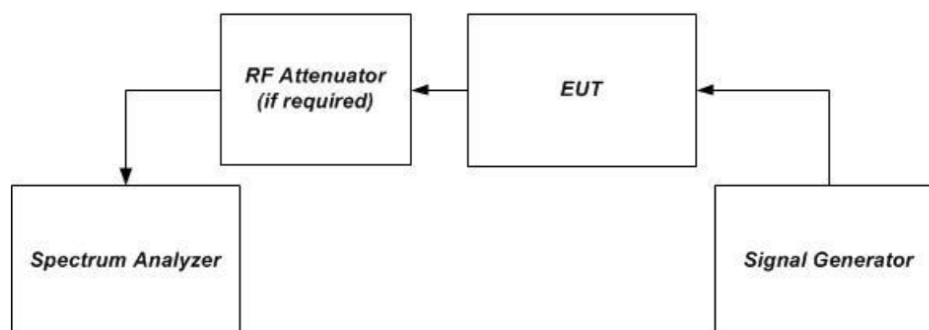
6.4.1 E.U.T. Operation

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 GZCR250800119304.



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6.5 Conducted Spurious emissions

Test Requirement: 47 CFR Part 90.691

Test Method: KDB 935210 D05 clause 3.6

Limit: For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $43 + 10\log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

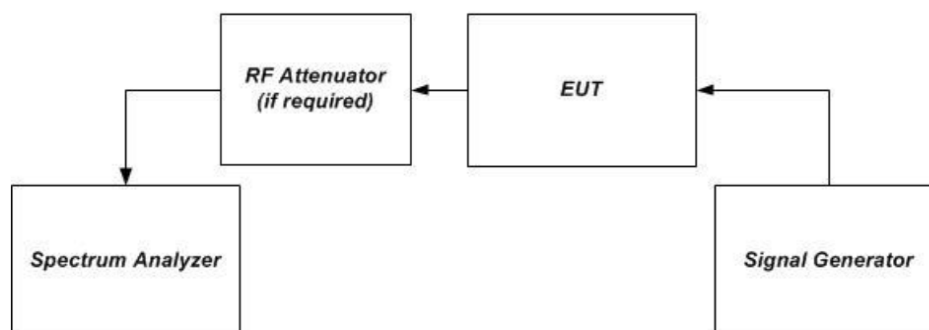
6.5.1 E.U.T. Operation

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

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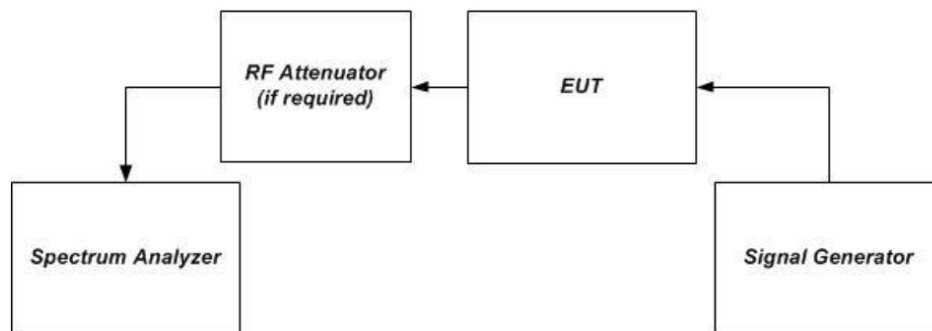
6.6 Frequency Stability

Test Requirement: 47 CFR Part 90.213
 Test Method: 47 CFR Part 2.1055
 KDB 935210 D05 clause 3.7
 ANSI C63.26-2015 clause 5.6
 Limit: ≤ 1.5 ppm

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 GZCR250800119304.



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6.7 Radiated Spurious emission (below 1GHz)

Test Requirement:	47 CFR Part 90.691
Test Method:	KDB 935210 D05 clause 3.8 ANSI C63.26-2015 clause 5.5
Test Distance:	3m
Limit:	For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $43 + 10\log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

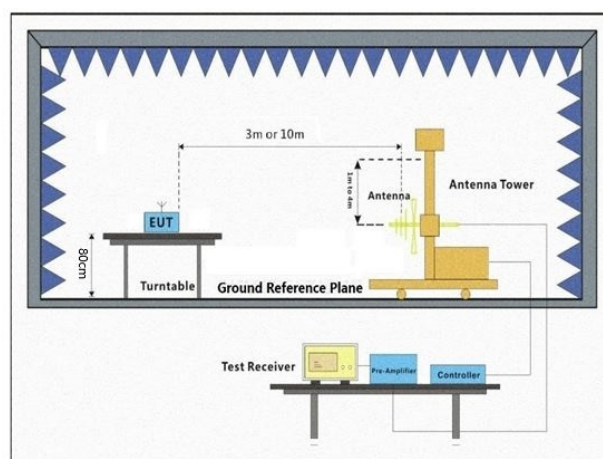
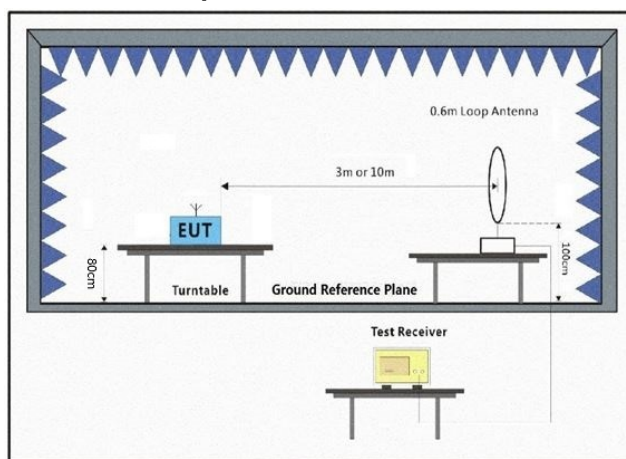
6.7.1 E.U.T. Operation

Operating Environment:

Temperature: 24.1 °C Humidity: 57 % RH Atmospheric Pressure: 1013 mbar

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

6.7.2 Test Setup



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.

Below 1GHz test procedure as below:

- 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:
Level (dBm) = Read Level (dBm) + Correction Factor (dB)

6.7.4 Measurement Record

Please refer to Appendix - Test Data and Result for report GZCR250800119304.



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6.8 Radiated Spurious emission (above 1GHz)

Test Requirement: 47 CFR Part 90.691

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

Limit: For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $43 + 10\log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

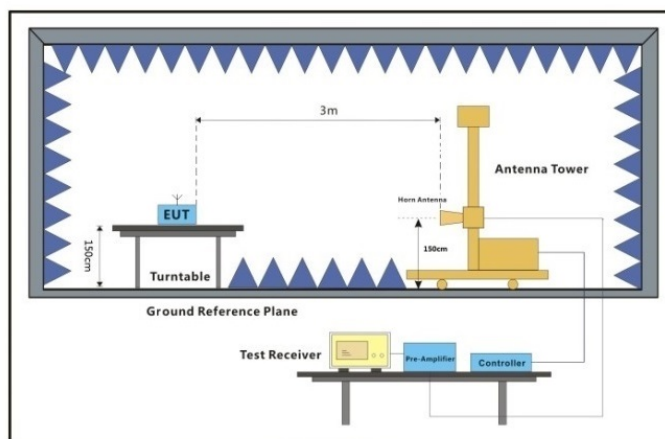
6.8.1 E.U.T. Operation

Operating Environment:

Temperature: 24.6 °C Humidity: 59 % 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



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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:

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

6.8.4 Measurement Record

Please refer to Appendix - Test Data and Result for report GZCR250800119304.



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7 Test Setup Photographs

Refer to Appendix - Test Setup Photos for GZCR250800119304.

8 EUT Constructional Details (EUT Photos)

Refer to Appendix -External and Internal Photos for GZCR2508001193AT.

- End of the Report -