

TEST REPORT

Application No.: GZCR2410001161AT
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
Factory: Comba Telecom Technology (Guangzhou) Ltd.
Address of Factory: No. 6 Jinbi Road, Economics and Technology Development District, Guangzhou, Guangdong, China
Product Name: SailaLite
Model No.: SW-L
Trade Mark: SailaWave
Standard(s) : 47 CFR Part 15, Subpart E 15.407
Date of Receipt: 2024-10-08
Date of Test: 2024-11-07 to 2024-11-20
Date of Issue: 2024-11-21

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

Ricky Liu

Ricky Liu
Manager



SGS-CSTC Standards Technical Services Co., Ltd.
Guangzhou Branch Testing Center EEC Laboratory

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SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch

EMC-TRF-01 Rev 1.1

Report No.: GZCR241000116102
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Revision Record			
Version	Report No.	Date	Remark
01	GZCR241000116102	2024-11-21	Original

Authorized for issue by:			
		Jim Li Jim Li/Project Engineer	
		Vico Cui Vico Cui /Reviewer	



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2 Test Summary

Radio Spectrum Technical Requirement				
Item	Standard	Method	Requirement	Result
Antenna Requirement	47 CFR Part 15, Subpart E 15.407	N/A	47 CFR Part 15, Subpart C 15.203	Pass

Radio Spectrum Matter Part				
Item	Standard	Method	Requirement	Result
Conducted Emissions at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart E 15.407	ANSI C63.10 (2013) Section 6.2	47 CFR Part 15, Subpart C 15.207 & Subpart E 15.407 b(9)	Pass
Radiated Emissions (Below 1GHz)		KDB 789033 D02 II G	47 CFR Part 15, Subpart C 15.209 & Subpart E 15.407(b)	Pass
Radiated Emissions (Above 1GHz)		KDB 789033 D02 II G	47 CFR Part 15, Subpart C 15.209 & Subpart E 15.407(b)	Pass
Maximum Conducted output power		KDB 789033 D02 II E	47 CFR Part 15, Subpart E 15.407 (a)	Pass
Peak Power spectrum density		KDB 789033 D02 II F	47 CFR Part 15, Subpart E 15.407 (a)	Pass

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.

Remark:

This report is based on original modular report XEWM2304000191RG04(FCC ID: XMR2023FC06E) C2PC for add host: SailaLite. Model number: SW-L to the modular and C2PC change the modular antenna.

With following changes:

- 1.Replacing new PCB antenna with higher gain than the antenna previously authorized under the certification FCC ID: XMR2023FC06E.
- 2.Adding a host device.
- 3.Disabled Bluetooth classic, LE, U-NII-1, U-NII-2A and U-NII-2C through software methods.

For verify the changes with host device, only the Antenna Requirement, Conducted Emissions at AC Power Line (150kHz-30MHz), Radiated Spurious Emissions Below 1GHz, Radiated Spurious Emissions Above 1GHz, Maximum Conducted output power and Peak Power spectrum density were performed with new antenna.

Therefore, the new test data was kept in this report GZCR241000116102. For original data please refer to report XEWM2304000191RG04(FCC ID: XMR2023FC06E) for more details.



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4 General Information

4.1 Details of E.U.T.

Power supply:	Power Input: 48VDC (From PoE Port)
Cable(s):	PoE Port (R J45 Type)
Test Voltage:	AC 120 V, 60 Hz
Operation	
Frequency/Number of channels (20MHz):	U-NII-3: 5745-5825MHz (5 Channels)
Operation	
Frequency/Number of channels/(40MHz):	U-NII-3: 5755-5795MHz (2 Channels)
Operation	
Frequency/Number of channels (80MHz):	U-NII-3: 5775MHz (1 Channel)
Modulation Type:	802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM); 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024-QAM)
Channel Spacing:	802.11a/n/ac/ax 20: 20MHz; 802.11n/ac/ax 40: 40MHz; 802.11ac/ax 80: 80MHz
DFS Function:	Without DFS function
Antenna Type:	PCB Antenna
Antenna Gain:	4 dBi for Ant 1 & Ant 2
Remark:	Two antennas can simultaneous transmission
Antenna Number:	2

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.
Switching Gigabit Power Supply	Ubiquiti Inc.	GP-H480-065G (Input: AC100-240V, 50/60 Hz, 0.75A; Output: DC Max. 160V, 50A)	PF1D1MV J



4.3 Measurement Uncertainty

Test Item	Measurement Uncertainty
Conducted Emissions at AC Power Line (150kHz-30MHz)	$\pm 3.22\text{dB}$
Radiated Emissions (Below 1GHz)	$\pm 5.14\text{dB}$ (3m); $\pm 4.90\text{dB}$ (10m)
Radiated Emissions (Above 1GHz)	$\pm 4.88\text{ dB}$ (1GHz-6 GHz); $\pm 5.06\text{ dB}$ (6GHz-18GHz); $\pm 5.30\text{dB}$ (18GHz-40GHz)
Remark: The U_{lab} (lab Uncertainty) is less than $U_{\text{cisp}} (\text{CISPR Uncertainty})$ or $U_{\text{ETSI}}(\text{ETSI Uncertainty})$. 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.	

4.4 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,
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No tests were sub-contracted.



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4.5 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.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None



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5 Equipment List

Conducted Emissions at AC Power Line (150kHz-30MHz)					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Coaxial Cable	HangTianXing	2m	EMC0107	2023-08-24	2025-08-23
Shielding Room	ChangZhou ZhongYu	8m x 3m x 3.8m	EMC0306	2022-10-16	2025-10-15
Two-Line V-Network-GZ	Rohde & Schwarz	ENV216	EMC2135	2024-09-02	2025-09-01
EMI Test Receiver (9kHz-3.6GHz)	Rohde & Schwarz	ESR3	EMC2221	2024-05-13	2025-05-12
Test Software E3r	Audix	Ver.6.191211	GZE100-77	N/A	N/A

Radiated Emissions (Below 1GHz)					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
966 Anechoic Chamber	Shenzhen C.R.T	CRTSGSSAC966	EMC2230	2022-04-12	2025-04-11
EMI Test Receiver(1Hz-8GHz)	Rohde & Schwarz	ESW8	EMC2229	2024-02-19	2025-02-18
Amplifier(9k-1000MHz)	SONOMA	310	EMC2237	2024-03-22	2025-03-21
Trilog Broadband Antenna (25MHz-2GHz)	Schwarzbeck Mess-Elektronik	VULB 9168	EMC2238	2022-04-20	2025-04-19
Coaxial Cable	Mirco-COAX UTIFLEX ve	LA2-C125-8000	EMC2239	2023-06-14	2025-06-13
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



Radiated 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
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
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
Notch Filter (5150-5880)	Mico-Tronics	BRM50716	EMC2168	2024-07-17	2025-07-16
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 Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203

6.1.2 Conclusion

Standard Requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit permanently attached antenna or of an so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

EUT Antenna:

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is Ant1: 4 dBi; Ant2: 4 dBi. The directional gain is: 7.01 dBi.

$$\text{Directional gain} = G_{\text{ANT}} + 10 \log (N_{\text{ANT}}) \text{ dBi}$$

$$\text{Directional gain} = 4 + 10 \log (2) \text{ dBi} = 7.01 \text{ dBi}$$

Antenna location: Refer to internal photo.



7 Radio Spectrum Matter Test Results

7.1 Conducted Emissions at AC Power Line (150kHz-30MHz)

Test Requirement 47 CFR Part 15, Subpart C 15.207 & Subpart E 15.407 b(9)

Test Method: ANSI C63.10 (2013) Section 6.2

Limit:

Frequency of emission(MHz)	Conducted limit(dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 24.3 °C

Humidity: 52.7 % RH

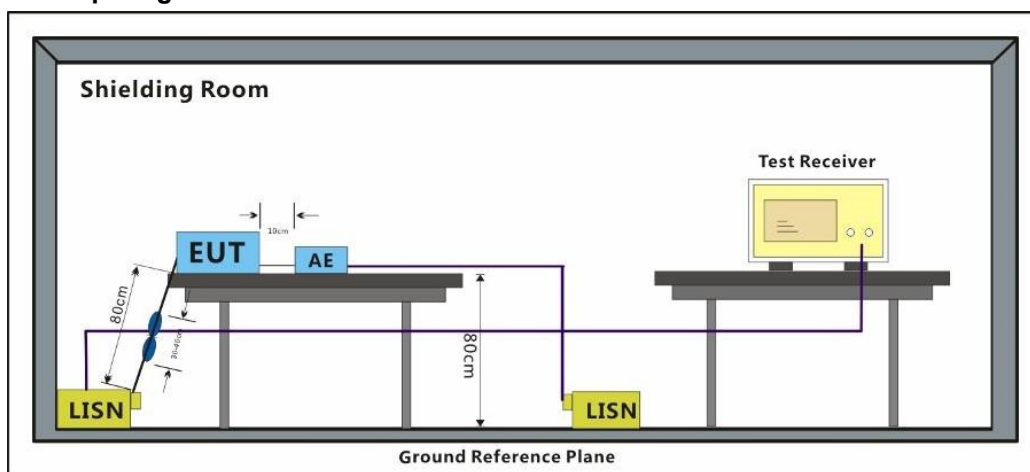
Atmospheric Pressure: 1013 mbar

7.1.2 Test Mode Description

Pre-scan / Mode
Final test Code Description

Final test 03 Operation(5G Wi-Fi):Keep the EUT communication with the companion device via 5G Wi-Fi.

7.1.3 Test Setup Diagram



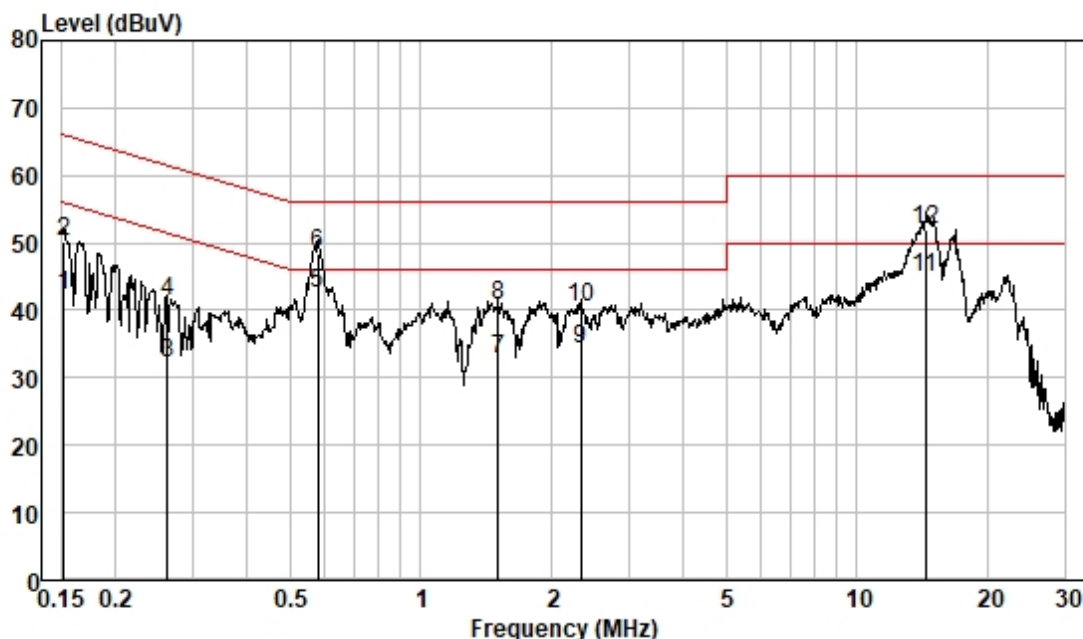
7.1.4 Measurement Procedure and Data

- 1) The mains terminal disturbance voltage test was conducted in a shielded room.
- 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50ohm/50μH + 5ohm linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
- 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,
- 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
- 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.

Remark: Level=Read Level+ Cable Loss+ LISN Factor



Test Mode: 03; Line: Live line



Pol : LINE
Mode :
Model :
Power :

	Frequency MHz	Read Level dBuV	Cable Loss dB	LISN Factor dB	Measured Level dBuV	Limit Line dBuV	Over Limit dB	Remark
1	0.152	32.46	0.04	9.57	42.07	55.91	-13.84	Average
2	0.152	40.67	0.04	9.57	50.28	65.91	-15.63	QP
3	0.263	22.51	0.04	9.58	32.13	51.34	-19.21	Average
4	0.263	31.62	0.04	9.58	41.24	61.34	-20.10	QP
5	0.579	33.02	0.05	9.55	42.62	46.00	-3.38	Average
6	0.579	38.92	0.05	9.55	48.52	56.00	-7.48	QP
7	1.503	23.01	0.10	9.60	32.71	46.00	-13.29	Average
8	1.503	31.01	0.10	9.60	40.71	56.00	-15.29	QP
9	2.321	24.53	0.14	9.56	34.23	46.00	-11.77	Average
10	2.321	30.84	0.14	9.56	40.54	56.00	-15.46	QP
11	14.364	34.69	0.32	9.83	44.84	50.00	-5.16	Average
12	14.364	41.84	0.32	9.83	51.99	60.00	-8.01	QP



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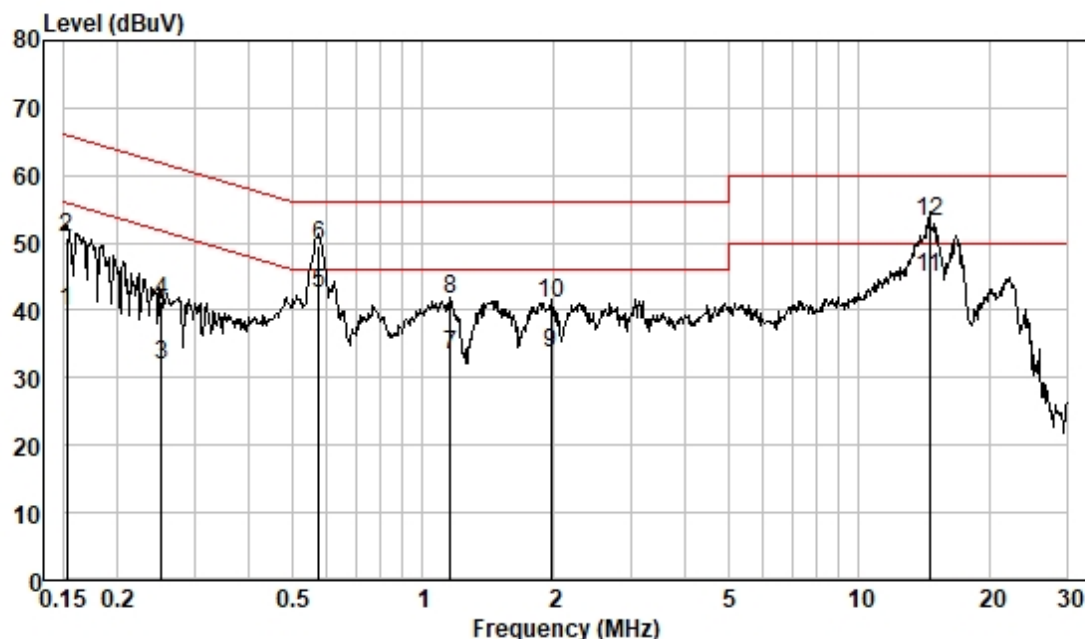
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Test Mode: 03; Line: Neutral Line



Pol : NEUTRAL
Mode :
Model :
Power :

	Frequency MHz	Read Level dBuV	Cable Loss dB	LISN Factor dB	Measured Level dBuV	Limit Line dBuV	Over Limit dB	Remark
1	0.152	30.23	0.04	9.51	39.78	55.87	-16.09	Average
2	0.152	41.15	0.04	9.51	50.70	65.87	-15.17	QP
3	0.252	22.42	0.04	9.53	31.99	51.69	-19.70	Average
4	0.252	31.87	0.04	9.53	41.44	61.69	-20.25	QP
5	0.576	32.98	0.05	9.57	42.60	46.00	-3.40	Average
6	0.576	39.97	0.05	9.57	49.59	56.00	-6.41	QP
7	1.153	23.63	0.08	9.56	33.27	46.00	-12.73	Average
8	1.153	31.84	0.08	9.56	41.48	56.00	-14.52	QP
9	1.970	23.90	0.12	9.52	33.54	46.00	-12.46	Average
10	1.970	31.48	0.12	9.52	41.12	56.00	-14.88	QP
11	14.517	34.77	0.32	9.90	44.99	50.00	-5.01	Average
12	14.517	42.87	0.32	9.90	53.09	60.00	-6.91	QP

7.2 Radiated Emissions (Below 1GHz)

Test Requirement 47 CFR Part 15, Subpart C 15.209 & Subpart E 15.407(b)

Test Method: KDB 789033 D02 II G

Test Distance: 3m

Limit:

Frequency (MHz)	Field strength(microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
960-1000	500	3

7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 22.8 °C

Humidity: 52.7 % RH

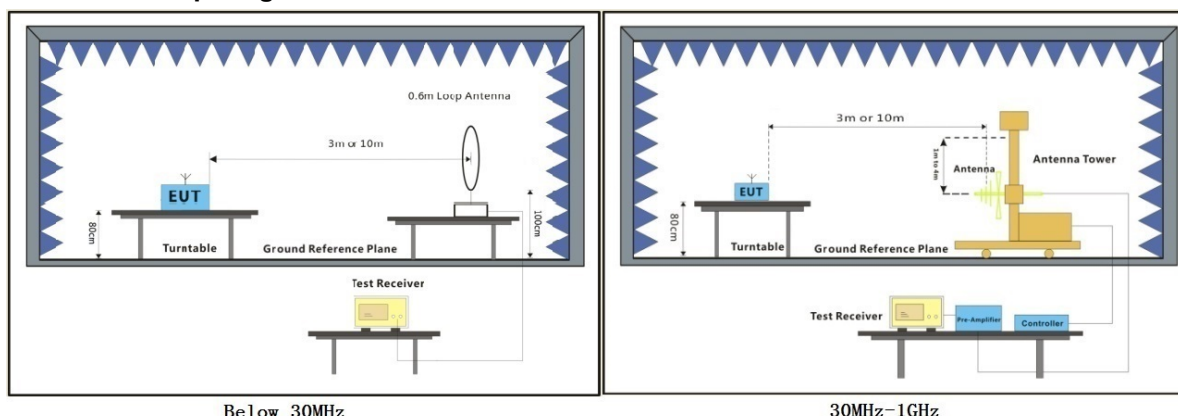
Atmospheric Pressure: 1013 mbar

7.2.2 Test Mode Description

Pre-scan / Mode Description
Final test Code

Final test 03 Operation(5G Wi-Fi):Keep the EUT communication with the companion device via 5G Wi-Fi.

7.2.3 Test Setup Diagram



Below 30MHz

30MHz-1GHz



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7.2.4 Measurement Procedure and Data

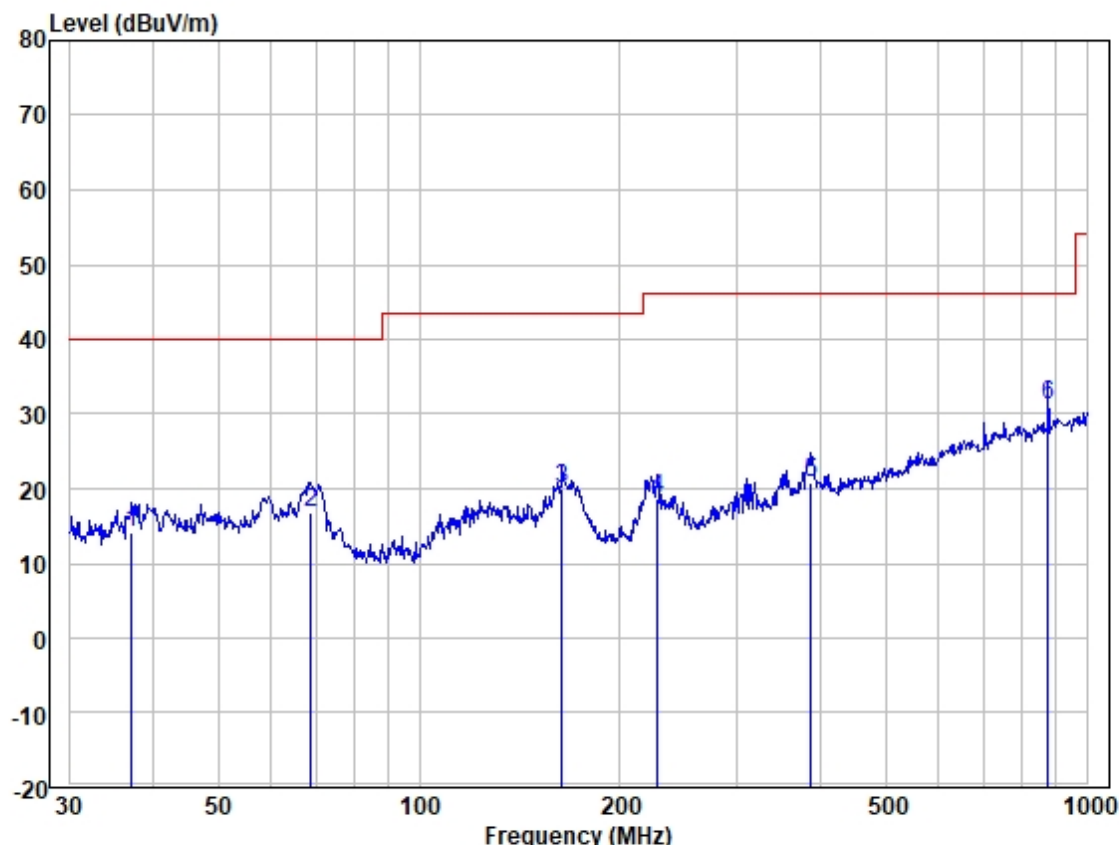
- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using quasi-peak method as specified and then reported in a data sheet.
- g. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- i. Repeat above procedures until all frequencies measured was complete.

Remark:

1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
2. For emission below 1GHz, through the pre-scan found the worst case is the lowest channel of 802.11a. Only the worst case is recorded in the report.
3. Scan from 9kHz to 30MHz, the disturbance below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.
4. The disturbance below 1GHz was very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.



Test Mode: 03; Polarity: Horizontal

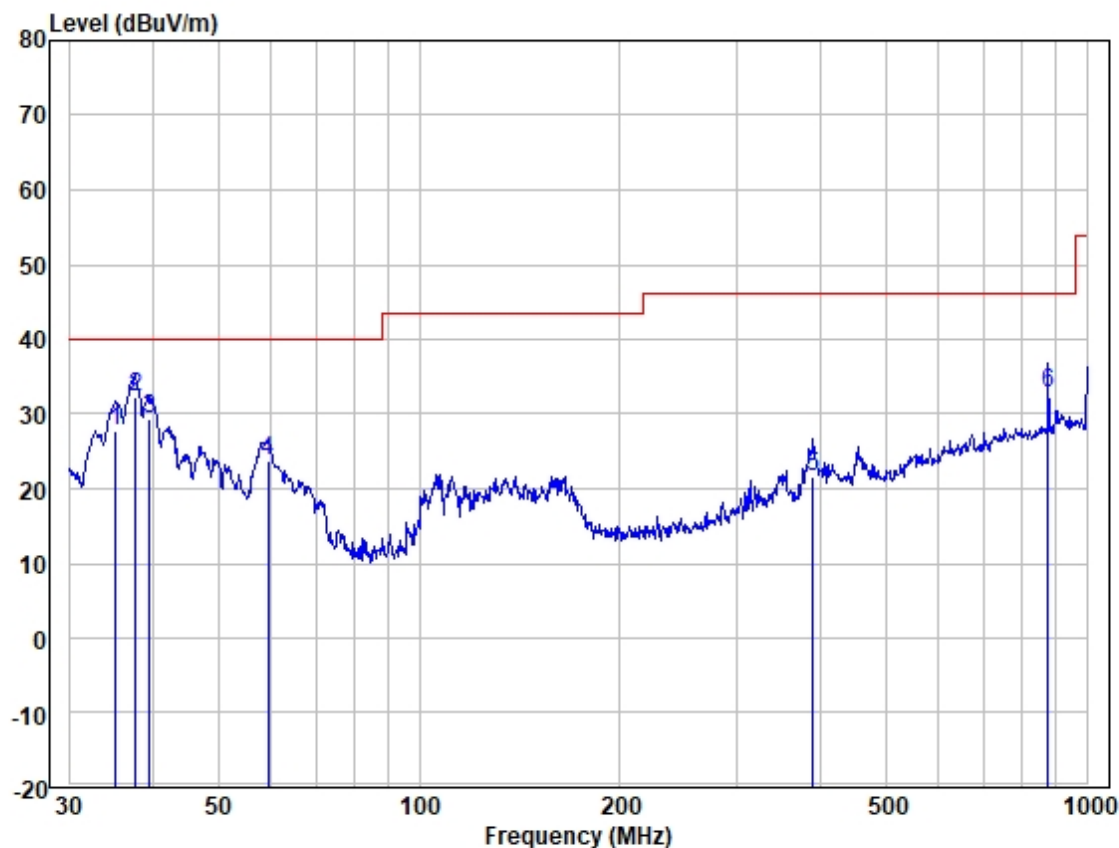


Site : 966 Chamber
Job :
Model :
Power :
Test Mode :

	Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Measured Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	37.155	28.07	18.59	0.34	32.86	14.14	40.00	-25.86	HORIZONTAL	QP
2	68.872	31.93	17.37	0.46	32.86	16.90	40.00	-23.10	HORIZONTAL	QP
3	163.755	32.95	19.08	0.71	32.83	19.91	43.50	-23.59	HORIZONTAL	QP
4	227.691	34.67	16.13	0.82	32.85	18.77	46.00	-27.23	HORIZONTAL	QP
5	386.634	31.46	21.23	1.15	32.92	20.92	46.00	-25.08	HORIZONTAL	QP
6	875.247	32.59	29.08	1.74	32.24	31.17	46.00	-14.83	HORIZONTAL	QP



Test Mode: 03; Polarity: Vertical



Site : 966 Chamber
Job :
Model :
Power :
Test Mode :

	Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Measured Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	35.128	41.97	18.23	0.32	32.85	27.67	40.00	-12.33	VERTICAL	QP
2	37.680	46.10	18.73	0.34	32.86	32.31	40.00	-7.69	VERTICAL	QP
3	39.437	42.71	19.09	0.35	32.86	29.29	40.00	-10.71	VERTICAL	QP
4	59.441	37.18	18.89	0.41	32.87	23.61	40.00	-16.39	VERTICAL	QP
5	389.355	32.10	21.30	1.15	32.92	21.63	46.02	-24.39	VERTICAL	QP
6	875.247	34.09	29.08	1.74	32.24	32.67	46.02	-13.35	VERTICAL	QP



7.3 Radiated Emissions (Above 1GHz)

Test Requirement 47 CFR Part 15, Subpart C 15.209 & Subpart E 15.407(b)

Test Method: KDB 789033 D02 II G

Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
Above 1GHz	500	3
*(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz. (2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz. (3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz. (4) For transmitters operating in the 5.725-5.85 GHz band: (i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge. Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.		

7.3.1 E.U.T. Operation

Operating Environment:

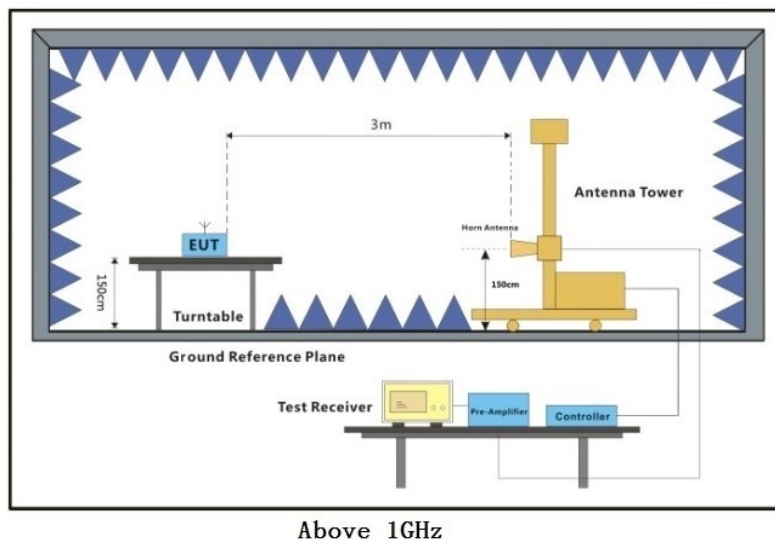
Temperature: 23.8 °C Humidity: 49.7 % RH Atmospheric Pressure: 1013 mbar

7.3.2 Test Mode Description

Pre-scan / Mode	Description
Final test Code	
Final test 01	TX mode (U-NII-3) _Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n/ac/ax 20/40/80, Only the data of worst case is recorded in the report.



7.3.3 Test Setup Diagram



7.3.4 Measurement Procedure and Data

- a. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak or average method as specified and then reported in a data sheet.
- g. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- i. Repeat above procedures until all frequencies measured was complete.

Remark:

1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
2. Scan from 18GHz to 40GHz, the disturbance above 18GHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.
3. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.
4. The disturbance above 18GHz were very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.
5. For devices with multiple operating modes, measurements on the middle channel is used to determine the worst-case mode(s). Only the worst case mode with the highest output power and the mode with the highest output power spectral density for each modulation family (e.g., OFDM and direct sequence spread spectrum) is recorded in the test report.



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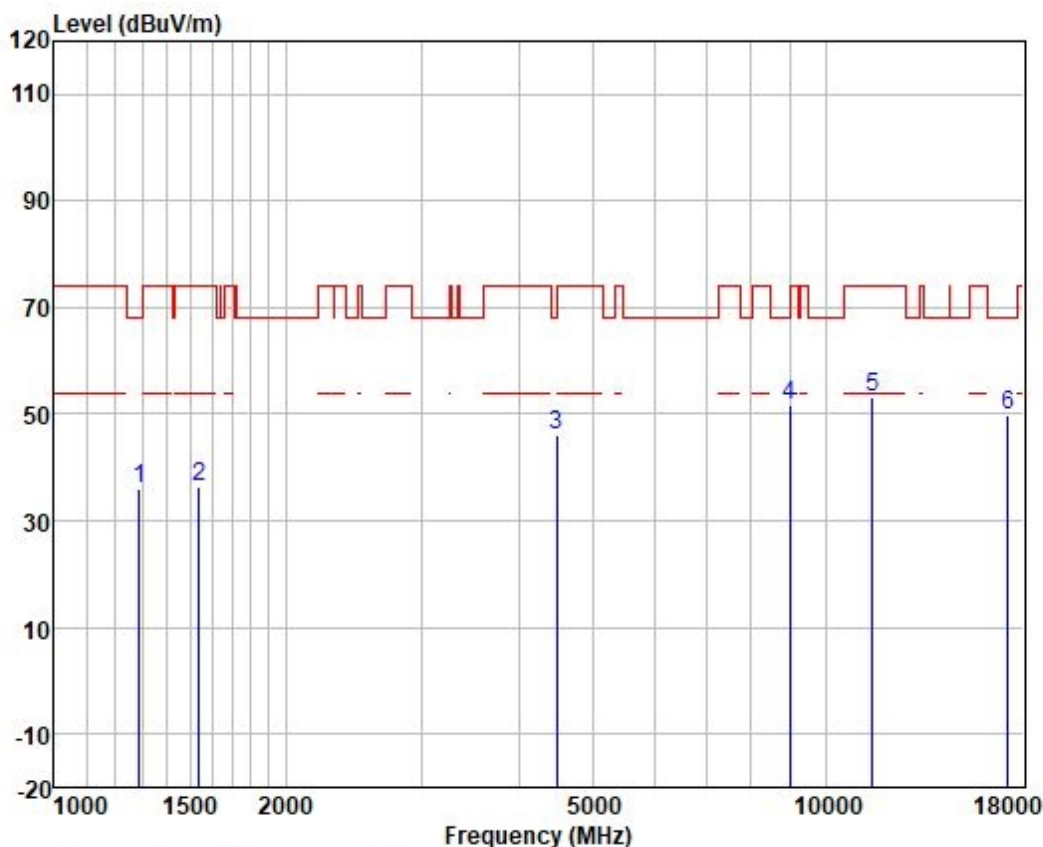
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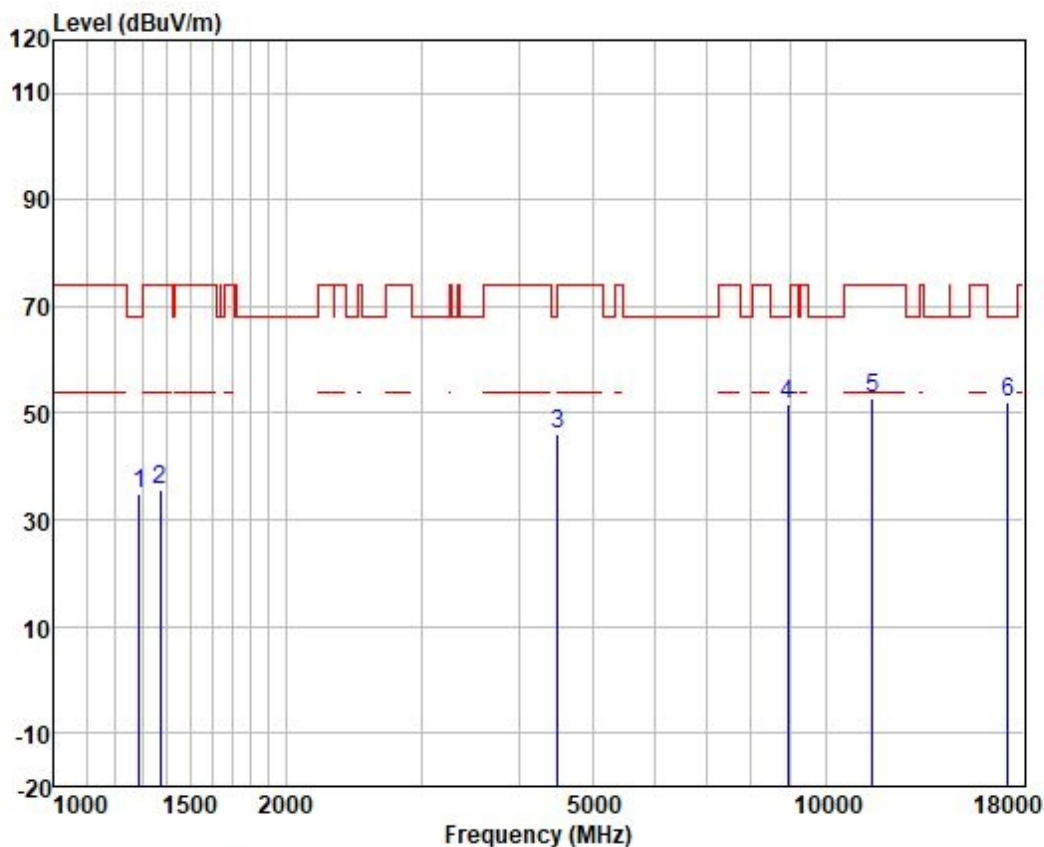
Test Mode: 01; Polarity: Vertical; Modulation:802.11a; Bandwidth:20MHz; Channel:Low



	Freq	ReadAntenna	Cable	Preamp		Limit	Over		
	MHz	Level	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dB		
1	1289.627	48.13	23.92	2.58	38.60	36.03	68.20	-32.17 VERTICAL	peak
2	1542.733	47.45	24.53	2.72	38.23	36.47	74.00	-37.53 VERTICAL	peak
3	4482.150	44.79	34.12	4.62	37.44	46.09	68.20	-22.11 VERTICAL	peak
4	8995.123	44.58	37.59	6.57	37.15	51.59	68.20	-16.61 VERTICAL	peak
5	11490.000	42.04	40.25	7.63	36.93	52.99	74.00	-21.01 VERTICAL	peak
6	17235.000	34.35	42.50	9.50	36.41	49.94	68.20	-18.26 VERTICAL	peak



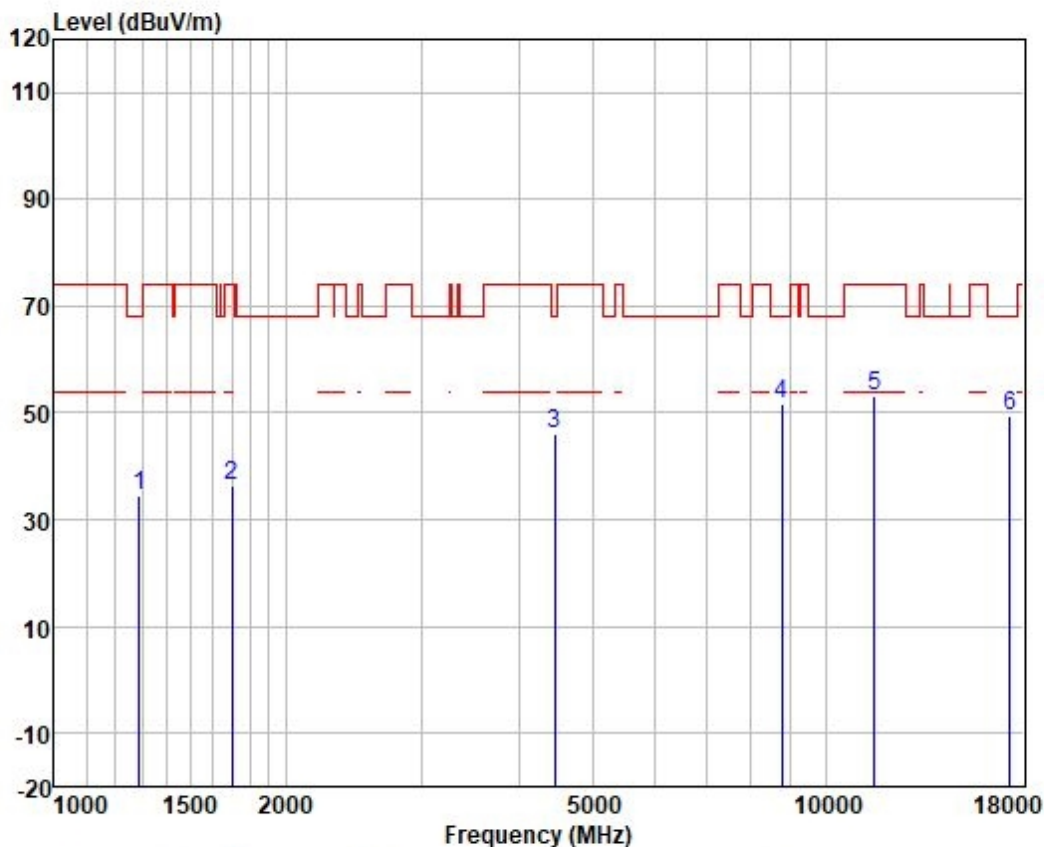
Test Mode: 01; Polarity: Horizontal; Modulation:802.11a; Bandwidth:20MHz; Channel:Low



	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over		
	MHz	Level	Factor	Loss	Factor	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1289.627	47.04	23.92	2.58	38.60	34.94	68.20	-33.26	HORIZONTAL peak
2	1374.295	47.40	24.20	2.64	38.51	35.73	74.00	-38.27	HORIZONTAL peak
3	4495.125	44.82	34.17	4.62	37.44	46.17	68.20	-22.03	HORIZONTAL peak
4	8943.274	44.95	37.50	6.56	37.16	51.85	68.20	-16.35	HORIZONTAL peak
5	11490.000	41.87	40.25	7.63	36.93	52.82	74.00	-21.18	HORIZONTAL peak
6	17235.000	36.31	42.50	9.50	36.41	51.90	68.20	-16.30	HORIZONTAL peak



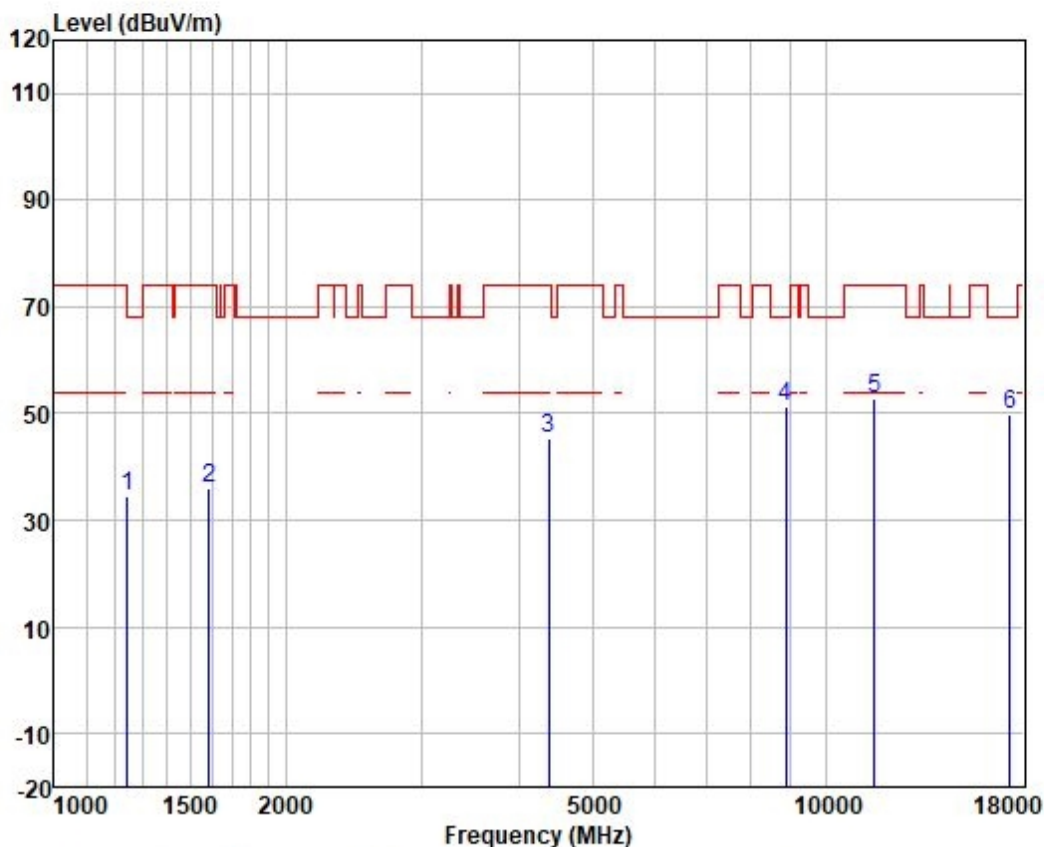
Test Mode: 01; Polarity: Vertical; Modulation:802.11a; Bandwidth:20MHz; Channel:middle



	Freq	ReadAntenna	Cable	Preamp		Limit	Over			
		Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1289.627	46.44	23.92	2.58	38.60	34.34	68.20	-33.86	VERTICAL	peak
2	1702.042	46.46	25.15	2.85	38.03	36.43	74.00	-37.57	VERTICAL	peak
3	4456.315	45.01	34.00	4.61	37.45	46.17	68.20	-22.03	VERTICAL	peak
4	8789.516	45.06	37.17	6.53	37.17	51.59	68.20	-16.61	VERTICAL	peak
5	11570.000	42.35	40.09	7.64	36.92	53.16	74.00	-20.84	VERTICAL	peak
6	17355.000	33.45	42.92	9.53	36.41	49.49	68.20	-18.71	VERTICAL	peak



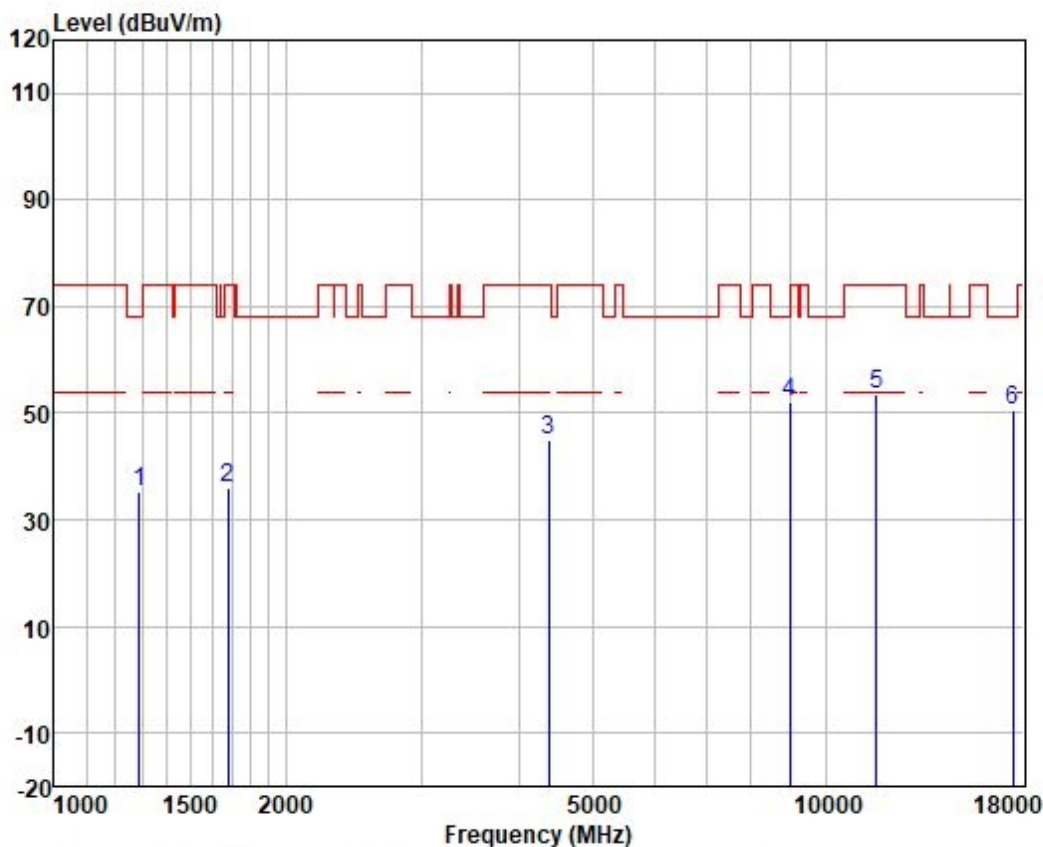
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	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over		
	MHz	Level	Factor	Loss	Factor	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1245.663	47.07	23.65	2.51	38.64	34.59	68.20	-33.61	HORIZONTAL peak
2	1587.975	46.72	24.65	2.75	38.15	35.97	74.00	-38.03	HORIZONTAL peak
3	4379.699	44.75	33.59	4.60	37.46	45.48	74.00	-28.52	HORIZONTAL peak
4	8891.725	44.43	37.41	6.55	37.16	51.23	68.20	-16.97	HORIZONTAL peak
5	11570.000	42.11	40.09	7.64	36.92	52.92	74.00	-21.08	HORIZONTAL peak
6	17355.000	33.88	42.92	9.53	36.41	49.92	68.20	-18.28	HORIZONTAL peak



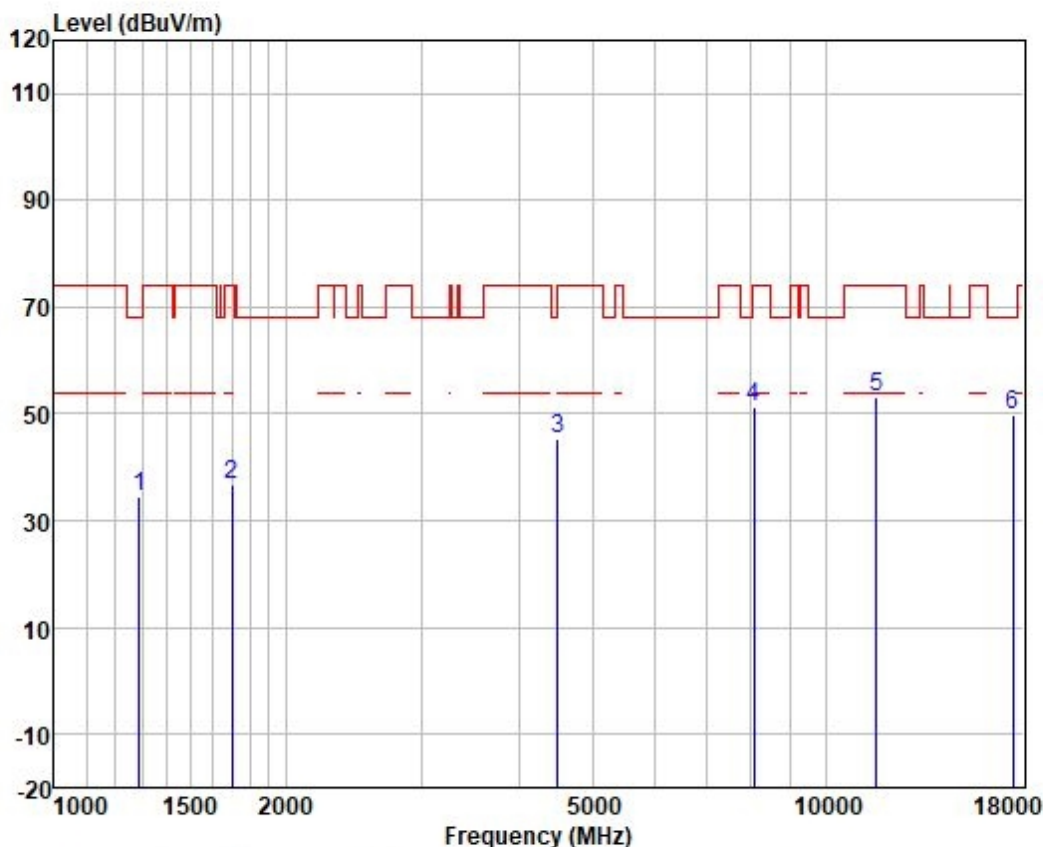
Test Mode: 01; Polarity: Vertical; Modulation:802.11a; Bandwidth:20MHz; Channel:High



	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over		
	MHz	Level	Factor	Loss	Factor	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1289.627	47.44	23.92	2.58	38.60	35.34	68.20	-32.86	VERTICAL peak
2	1682.477	46.17	25.03	2.83	38.05	35.98	74.00	-38.02	VERTICAL peak
3	4379.699	44.28	33.59	4.60	37.46	45.01	74.00	-28.99	VERTICAL peak
4	8995.123	44.92	37.59	6.57	37.15	51.93	68.20	-16.27	VERTICAL peak
5	11650.000	42.92	39.91	7.66	36.92	53.57	74.00	-20.43	VERTICAL peak
6	17475.000	33.85	43.43	9.57	36.41	50.44	68.20	-17.76	VERTICAL peak



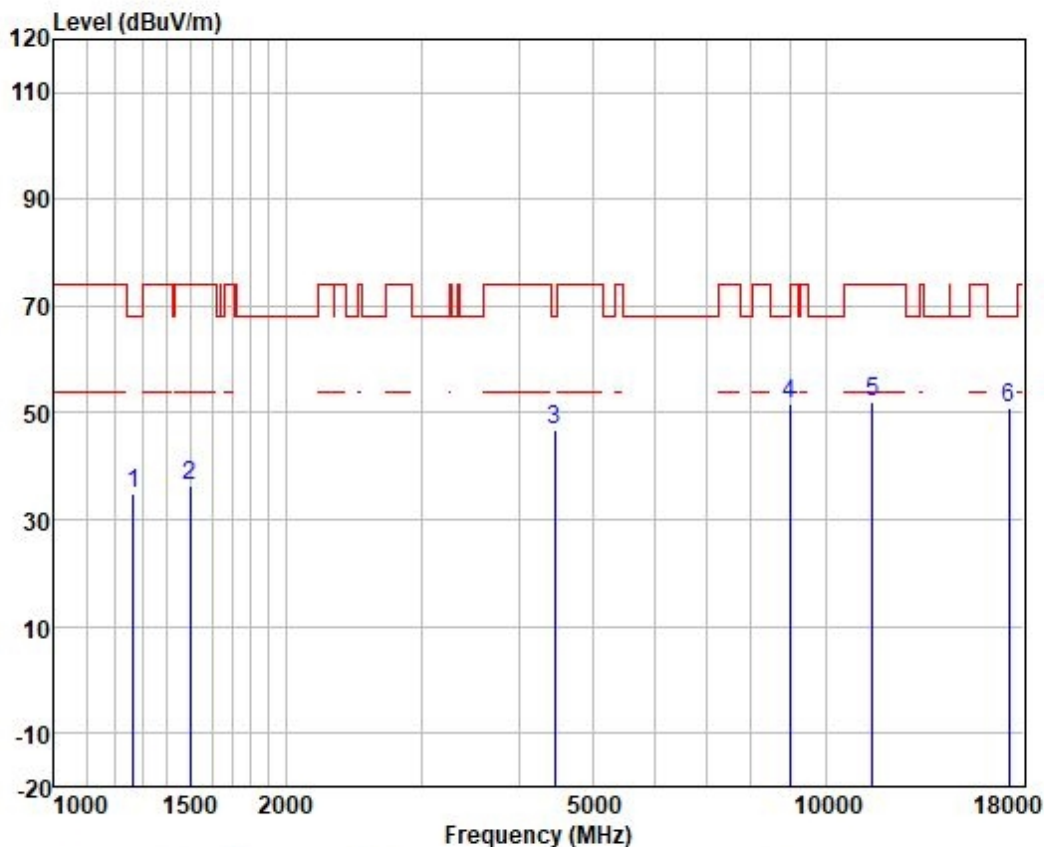
Test Mode: 01; Polarity: Horizontal; Modulation:802.11a; Bandwidth:20MHz; Channel:High



	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over	Pol/Phase	Remark
	MHz	Level	Factor	Loss	Factor	Line	Limit		
		dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1289.627	46.61	23.92	2.58	38.60	34.51	68.20	-33.69	HORIZONTAL peak
2	1702.042	46.69	25.15	2.85	38.03	36.66	74.00	-37.34	HORIZONTAL peak
3	4495.125	43.94	34.17	4.62	37.44	45.29	68.20	-22.91	HORIZONTAL peak
4	8082.804	45.37	37.04	6.24	37.20	51.45	74.00	-22.55	HORIZONTAL peak
5	11650.000	42.45	39.91	7.66	36.92	53.10	74.00	-20.90	HORIZONTAL peak
6	17475.000	33.33	43.43	9.57	36.41	49.92	68.20	-18.28	HORIZONTAL peak



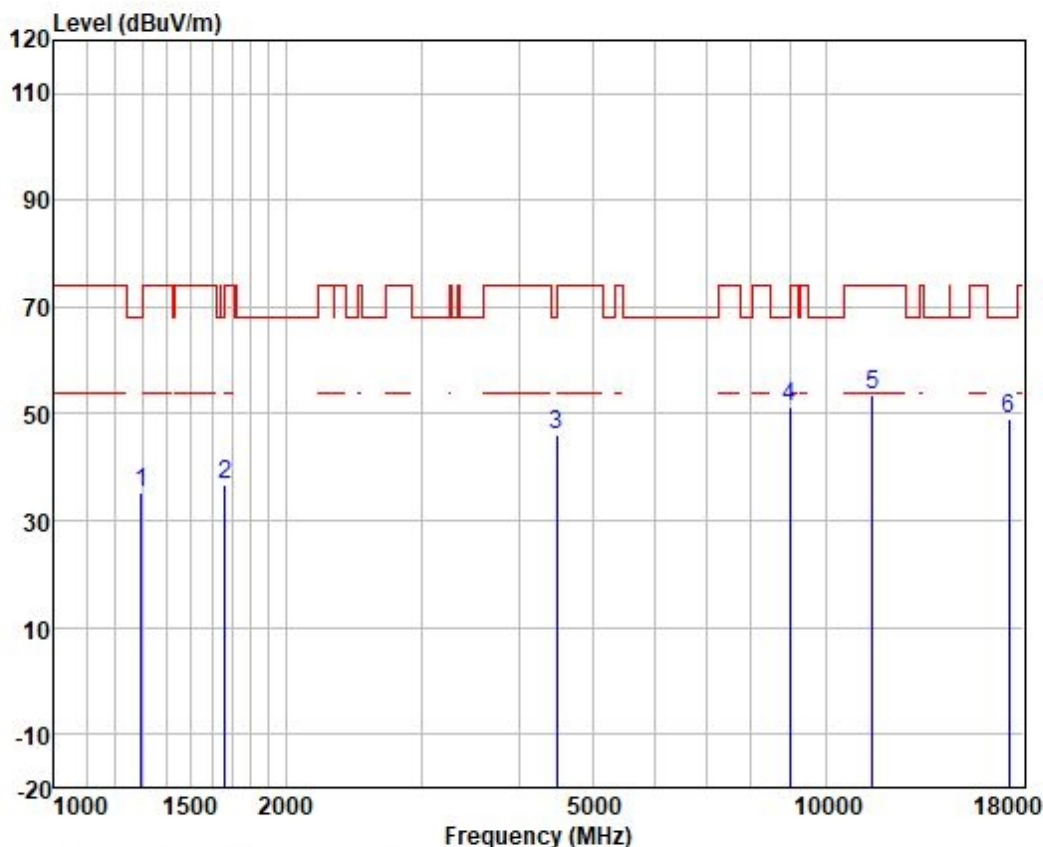
Test Mode: 01; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:Low



	Freq	ReadAntenna	Cable	Preamp	Limit	Over			
	MHz	Level	Factor	Loss	Factor	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1267.454	46.96	23.81	2.55	38.62	34.70	68.20	-33.50	VERTICAL peak
2	1498.781	47.44	24.43	2.70	38.33	36.24	74.00	-37.76	VERTICAL peak
3	4456.315	45.74	34.00	4.61	37.45	46.90	68.20	-21.30	VERTICAL peak
4	8995.123	44.71	37.59	6.57	37.15	51.72	68.20	-16.48	VERTICAL peak
5	11510.000	41.12	40.25	7.63	36.93	52.07	74.00	-21.93	VERTICAL peak
6	17265.000	35.15	42.72	9.52	36.41	50.98	68.20	-17.22	VERTICAL peak



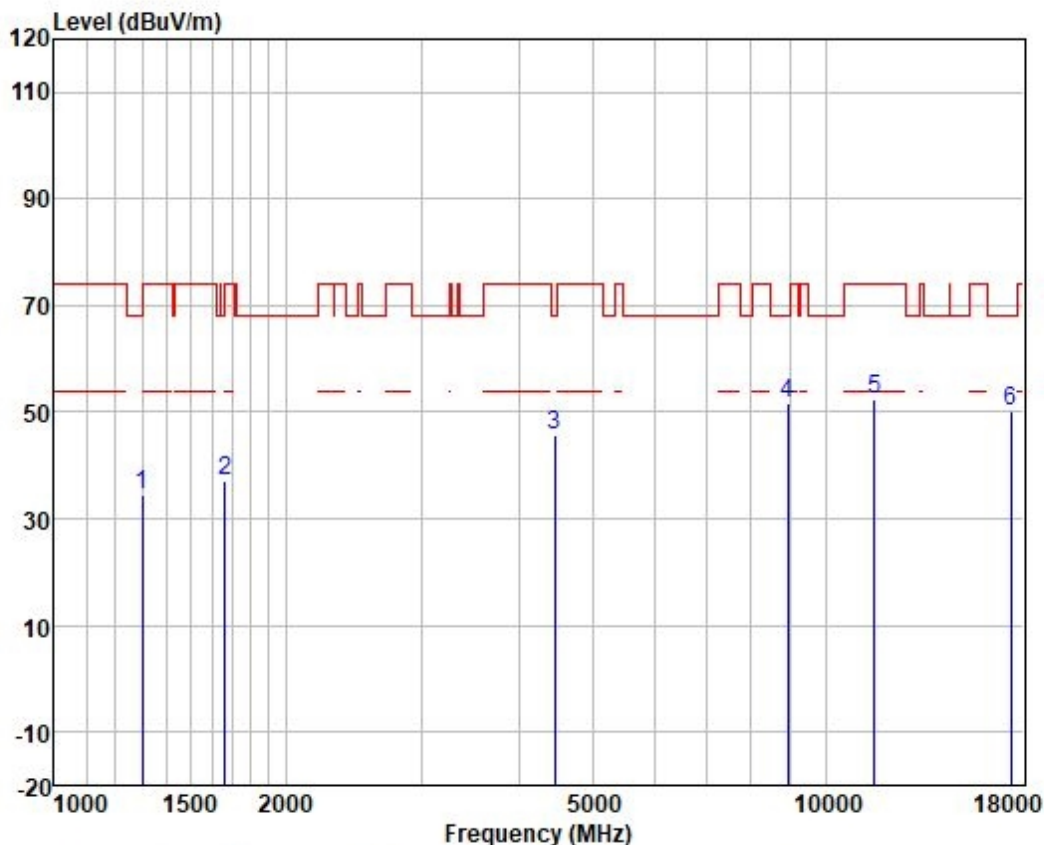
Test Mode: 01; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:Low



	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over	Pol/Phase	Remark
	MHz	Level	Factor	Loss	Factor	Line	Limit		
		dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1297.103	47.16	23.96	2.58	38.60	35.10	68.20	-33.10	HORIZONTAL peak
2	1663.137	47.12	24.93	2.81	38.06	36.80	74.00	-37.20	HORIZONTAL peak
3	4482.150	44.61	34.12	4.62	37.44	45.91	68.20	-22.29	HORIZONTAL peak
4	8995.123	44.42	37.59	6.57	37.15	51.43	68.20	-16.77	HORIZONTAL peak
5	11510.000	42.48	40.25	7.63	36.93	53.43	74.00	-20.57	HORIZONTAL peak
6	17265.000	33.09	42.72	9.52	36.41	48.92	68.20	-19.28	HORIZONTAL peak



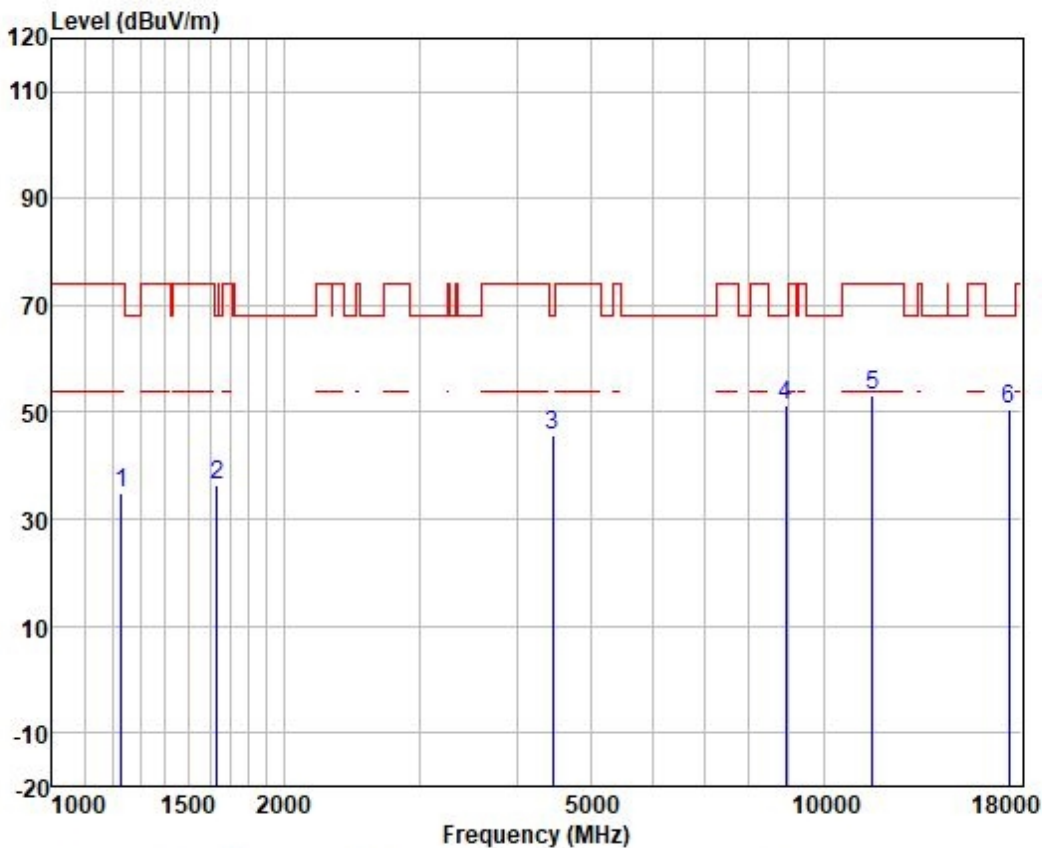
Test Mode: 01; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:High



	Freq	ReadAntenna	Cable	Preamp		Limit	Over		
	MHz	Level	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1300.858	46.48	23.97	2.59	38.58	34.46	74.00	-39.54	VERTICAL peak
2	1663.137	47.46	24.93	2.81	38.06	37.14	74.00	-36.86	VERTICAL peak
3	4456.315	44.50	34.00	4.61	37.45	45.66	68.20	-22.54	VERTICAL peak
4	8943.274	44.95	37.50	6.56	37.16	51.85	68.20	-16.35	VERTICAL peak
5	11590.000	41.71	40.01	7.65	36.92	52.45	74.00	-21.55	VERTICAL peak
6	17385.000	34.06	43.10	9.55	36.41	50.30	68.20	-17.90	VERTICAL peak



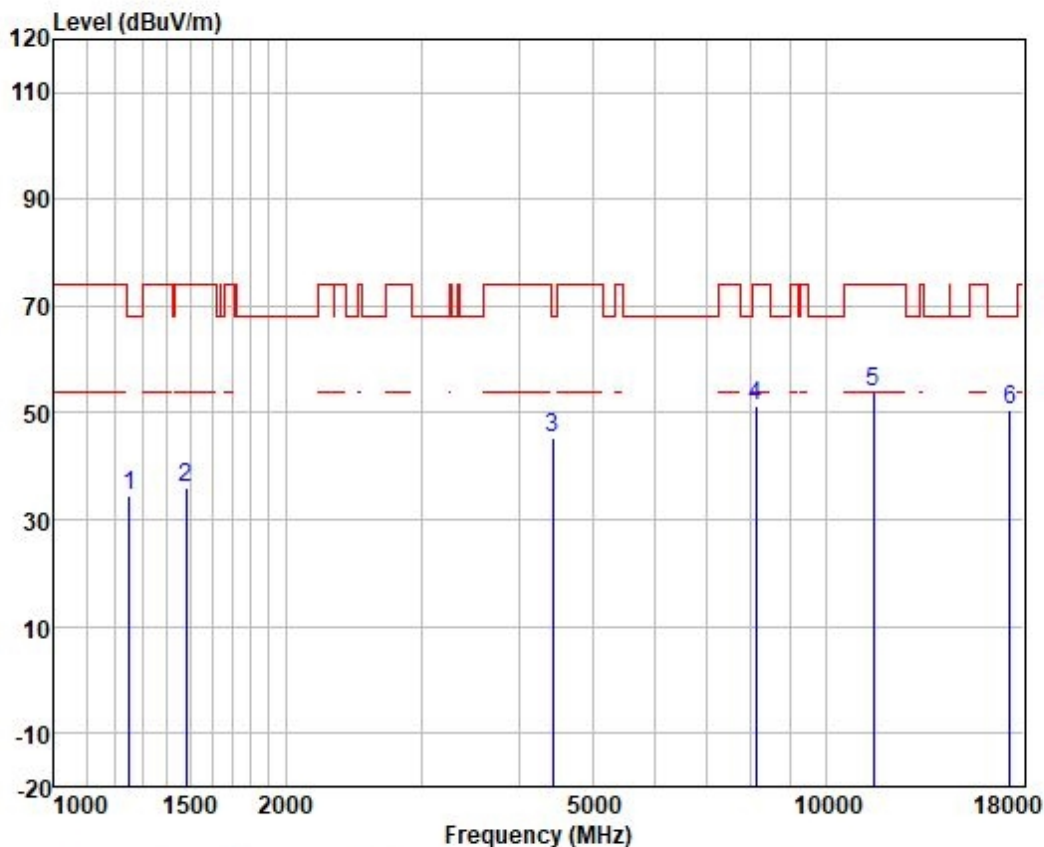
Test Mode: 01; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:High



	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over	Pol/Phase	Remark
	MHz	Level	Factor	Loss	Factor	Line	Limit		
		dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1231.345	47.37	23.51	2.48	38.64	34.72	74.00	-39.28	HORIZONTAL peak
2	1634.543	46.80	24.81	2.78	38.11	36.28	68.20	-31.92	HORIZONTAL peak
3	4456.315	44.59	34.00	4.61	37.45	45.75	68.20	-22.45	HORIZONTAL peak
4	8943.274	44.56	37.50	6.56	37.16	51.46	68.20	-16.74	HORIZONTAL peak
5	11590.000	42.36	40.01	7.65	36.92	53.10	74.00	-20.90	HORIZONTAL peak
6	17385.000	34.25	43.10	9.55	36.41	50.49	68.20	-17.71	HORIZONTAL peak



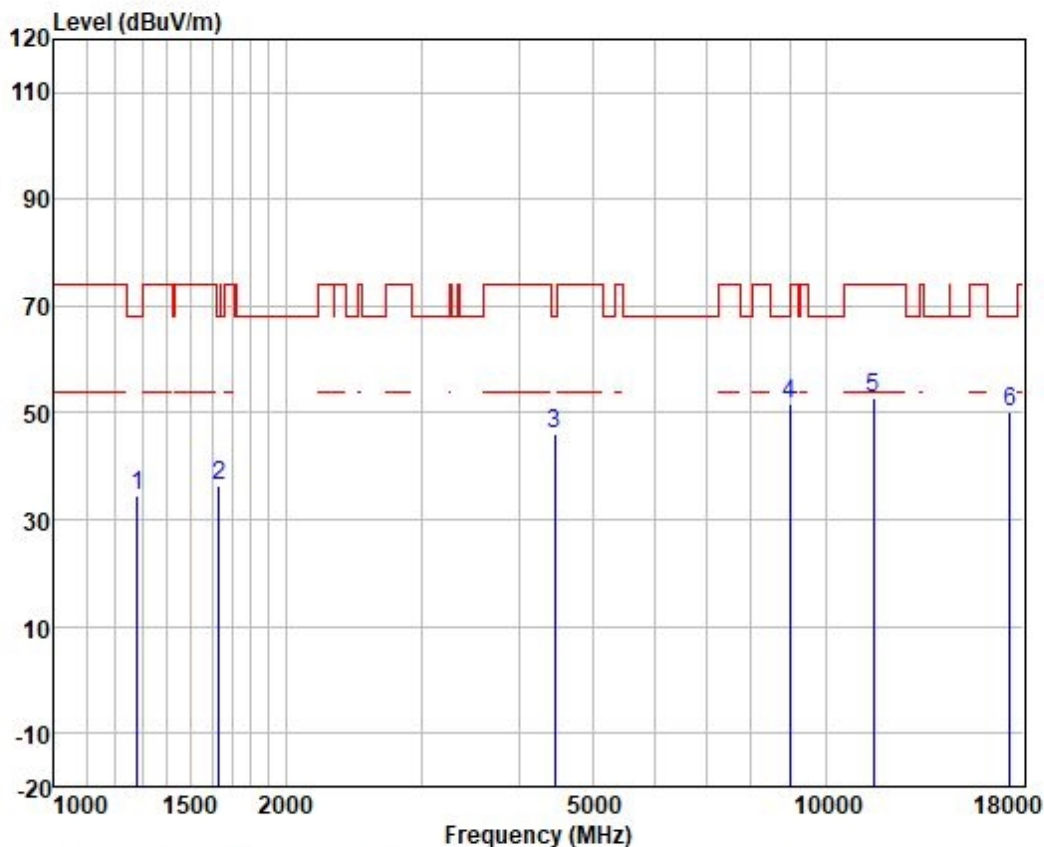
Test Mode: 01; Polarity: Vertical; Modulation:802.11ac; Bandwidth:80MHz



	Freq	ReadAntenna	Cable	Preamp		Limit	Over		
	MHz	Level	Factor	Loss	Factor	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1252.885	47.07	23.71	2.52	38.63	34.67	68.20	-33.53	VERTICAL peak
2	1481.553	47.34	24.41	2.69	38.37	36.07	74.00	-37.93	VERTICAL peak
3	4430.628	44.20	33.87	4.61	37.45	45.23	68.20	-22.97	VERTICAL peak
4	8129.664	45.33	36.99	6.26	37.20	51.38	74.00	-22.62	VERTICAL peak
5	11550.000	42.90	40.17	7.64	36.92	53.79	74.00	-20.21	VERTICAL peak
6	17325.000	34.67	42.92	9.53	36.41	50.71	68.20	-17.49	VERTICAL peak



Test Mode: 01; Polarity: Horizontal; Modulation:802.11ac; Bandwidth:80MHz



	Freq	ReadAntenna	Cable	Preamp		Limit	Over			
		Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1282.193	46.48	23.89	2.57	38.60	34.34	68.20	-33.86	HORIZONTAL	peak
2	1634.543	46.89	24.81	2.78	38.11	36.37	68.20	-31.83	HORIZONTAL	peak
3	4456.315	44.75	34.00	4.61	37.45	45.91	68.20	-22.29	HORIZONTAL	peak
4	8995.123	44.56	37.59	6.57	37.15	51.57	68.20	-16.63	HORIZONTAL	peak
5	11550.000	41.98	40.17	7.64	36.92	52.87	74.00	-21.13	HORIZONTAL	peak
6	17325.000	34.03	42.92	9.53	36.41	50.07	68.20	-18.13	HORIZONTAL	peak



7.4 Maximum Conducted output power

Test Requirement 47 CFR Part 15, Subpart E 15.407 (a)

Test Method: KDB 789033 D02 II E

Limit:

Frequency band(MHz)	Limit
5150-5250	≤1W(30dBm) for master device
	≤250mW(24dBm) for client device
5250-5350	≤250mW(24dBm) or 11dBm+10logB*
5470-5725	≤250mW(24dBm) or 11dBm+10logB*
5725-5850	≤1W(30dBm)

Remark:
* Where B is the 26dB emission bandwidth in MHz.
The maximum conducted output power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage.

7.4.1 Conclusion

The test data (the worst case) were copied from the original modular report XEWM2304000191RG04(FCC ID: XMR2023FC06E) and evaluated by new limit because of the new direction gain.

Mode	TX Type	Frequency (MHz)	Maximum Average Conducted Output Power (dBm)				Verdict
			ANT1	ANT2	MIMO	Limit	
802.11a	SISO	5745	20.51	20.43	/	≤30	Pass
		5785	20.15	20.83	/	≤30	Pass
		5825	21.04	20.45	/	≤30	Pass
802.11n (HT40)	MIMO	5755	20.76	20.72	23.74	≤28.99	Pass
		5795	20.14	20.68	23.43	≤28.99	Pass
802.11ac (VHT80)	MIMO	5775	20.01	20.66	23.36	≤28.99	Pass
802.11ax (HEW20)	MIMO	5745	20.24	20.52	23.40	≤28.99	Pass
		5785	20.44	20.64	23.55	≤28.99	Pass
		5825	20.96	20.09	23.56	≤28.99	Pass
802.11ax (HEW40)	MIMO	5755	20.01	20.51	23.28	≤28.99	Pass
		5795	20.03	20.52	23.29	≤28.99	Pass
802.11ax (HEW80)	MIMO	5775	20.32	20.51	23.43	≤28.99	Pass

Note1: Antenna Gain: Ant1: 4.00dBi; Ant2: 4.00dBi;
Note2: Directional Gain: Band3: 7.01dBi



7.5 Peak Power spectrum density

Test Requirement 47 CFR Part 15, Subpart E 15.407 (a)

Test Method: KDB 789033 D02 II F

Limit:

Frequency band(MHz)	Limit
5150-5250	≤17dBm in 1MHz for master device
	≤11dBm in 1MHz for client device
5250-5350	≤11dBm in 1MHz for client device
5470-5725	≤11dBm in 1MHz for client device
5725-5850	≤30dBm in 500 kHz
Remark:	The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test.

7.5.1 Conclusion

The test data (the worst case) were copied from the original modular report XEWM2304000191RG04(FCC ID: XMR2023FC06E) and evaluated by new limit because of the new direction gain.

Mode	TX Type	Frequency (MHz)	Maximum PSD (dBm/500kHz)				Verdict
			ANT1	ANT2	MIMO	Limit	
802.11a	SISO	5745	10.13	9.94	/	≤30	Pass
		5785	9.89	9.93	/	≤30	Pass
		5825	10.05	10.34	/	≤30	Pass
802.11n (HT40)	MIMO	5755	6.32	6.51	9.42	≤28.99	Pass
		5795	6.78	6.20	9.51	≤28.99	Pass
802.11ac (VHT80)	MIMO	5775	3.50	3.38	6.45	≤28.99	Pass
802.11ax (HEW20)	MIMO	5745	9.78	9.92	12.86	≤28.99	Pass
		5785	9.24	9.08	12.17	≤28.99	Pass
		5825	9.72	9.62	12.68	≤28.99	Pass
802.11ax (HEW40)	MIMO	5755	6.00	6.17	9.10	≤28.99	Pass
		5795	6.39	5.94	9.18	≤28.99	Pass
802.11ax (HEW80)	MIMO	5775	3.92	3.22	6.59	≤28.99	Pass
Note1: Antenna Gain: Ant1: 4.00dBi; Ant2: 4.00dBi; Note2: Directional Gain: Band3: 7.01dBi							



8 Test Setup Photo

Refer to Appendix - Test Setup Photo for GZCR241000116102



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9 EUT Constructional Details (EUT Photos)

Refer to Appendix - External and Internal Photos for GZCR2410001161AT

- End of the Report -

