GTS Global United Technology Services Co., Ltd.

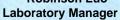
Report No.: GTSL2024090003F01

# **TEST REPORT**

Applicant:	Hera GmbH &Co.KG		
Address of Applicant:	Dieselstr.9 D-32130, Enger, Nordrhein Westfalen, Germany		
Manufacturer:	Hera GmbH &Co.KG		
Address of Manufacturer:	Dieselstr.9 D-32130, Enger, Nordrhein Westfalen, Germany		
Factory:	Hera GmbH &Co.KG		
Address of Factory:	Dieselstr.9 D-32130, Enger, Nordrhein Westfalen, Germany		
Equipment Under Test (E	EUT)		
Product Name:	Radio remote control		
Model No.:	Anbau-Fernbedienung		
Trade Mark:	Hera		
FCC ID:	2BBPR208050020-1		
Applicable standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.249		
Date of sample receipt:	2024/08/23		
Date of Test:	2024/08/26-2024/08/29		
Date of report issued:	2024/08/30		
Test Result :	PASS *		

In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature: 验检测专用 **Robinson Luo** 



This results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver. Page 1 of 24



## 2 Version

Version No.	Date	Description
00	2024/08/30	Original

**Prepared By:** 

handlu

2024/08/30

Project Engineer

Check By:

oppinson Lua

Date:

Date:

2024/08/30

Reviewer



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# 4 Test Summary

Test Item	Section in CFR 47	Result	
Antenna requirement	15.203	Pass	
AC Power Line Conducted Emission	15.207	N/A	
Field strength of the fundamental signal	15.249 (a)	Pass	
Spurious emissions	15.249 (a) (d)/15.209	Pass	
Band edge	15.249 (d)/15.205	Pass	
20dB Occupied Bandwidth	15.215 (c)	Pass	

Remarks:

1. Test according to ANSI C63.10:2013.

2. Pass: The EUT complies with the essential requirements in the standard.

## 4.1 Measurement Uncertainty

No.	Item	Measurement Uncertainty			
1	Radio Frequency	±7.25×10 <sup>-8</sup>			
2	Duty cycle	±0.37%			
3	Occupied Bandwidth	±3%			
4	RF conducted power	±0.75dB			
5	RF power density	±3dB			
6	Conducted Spurious emissions	±2.58dB			
7	AC Power Line Conducted Emission	±3.44dB (0.15MHz ~ 30MHz)			
		±3.1dB (9kHz-30MHz)			
	Radiated Spurious emission test	±3.8039dB (30MHz-200MHz)			
8		±3.9679dB (200MHz-1GHz)			
		±4.29dB (1GHz-18GHz)			
		±3.30dB (18GHz-40GHz)			
9	Temperature test	±1°C			
10	Humidity test	±3%			
11	Time	±3%			

# **5** General Information

## 5.1 General Description of EUT

Product Name:	Radio remote control
Model No.:	Anbau-Fernbedienung
Serial No.:	N/A
Test sample(s) ID:	GTSL2024090003-1
Sample(s) Status	Engineered sample
Operation Frequency:	2440MHz
Modulation Type:	GFSK
Antenna Type:	PCB Antenna
Antenna gain:	2.39dBi
Power supply:	DC 3V or DC 3.3V Lithium Battery

Remark:

1. Antenna gain information provided by the customer

2. The relevant information of the sample is provided by the entrusting company, and the laboratory is not responsible for its authenticity.

## 5.2 Test mode

Transmitting mode Kee	p the EUT in continuously transmitting mode.
-----------------------	--

We have verified the construction and function in typical operation, The EUT was placed on three different polar directions; i.e. X axis, Y axis, Z axis. which was shown in this test report and defined as follows:							
Axis X Y Z							
Field Strength(dBuV/m) 68.05 67.33 67.68							

Field Strength(dBuV/m)

## 5.3 Description of Support Units

None.

## 5.4 Deviation from Standards

None.

## 5.5 Abnormalities from Standard Conditions

None.

#### 5.6 Test Facility

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

## • FCC—Registration No.: 381383

**Designation Number: CN5029** 

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files.

#### • ISED—Registration No.: 9079A

CAB identifier: CN0091

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of ISED for radio equipment testing

#### NVLAP (LAB CODE:600179-0)

Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).

## 5.7 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.

Address: No. 123- 128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102 Tel: 0755-27798480 Fax: 0755-27798960

## 5.8 Additional Instructions

Test Software	Special test command provided by manufacturer
Power level setup	Default



## 6 Test Instruments list

Radia	Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)	
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	June 22, 2024	June 21, 2027	
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A	
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	April 11, 2024	April 10, 2025	
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9168	GTS640	March 19, 2023	March 18, 2025	
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	April 17, 2023	April 16, 2025	
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A	
7	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	April 11, 2024	April 10, 2025	
8	Loop Antenna	ZHINAN	ZN30900A	GTS534	Nov. 13, 2023	Nov.12, 2024	
9	Broadband Preamplifier	SCHWARZBECK	BBV9718	GTS535	April 11, 2024	April 10, 2025	
10	Amplifier(1GHz-26.5GHz)	HP	8449B	GTS601	April 11, 2024	April 10, 2025	
11	Horn Antenna (18- 26.5GHz)	1	UG-598A/U	GTS664	Oct. 29, 2023	Oct. 28, 2024	
12	Horn Antenna (26.5-40GHz)	A.H Systems	SAS-573	GTS665	Oct. 29, 2023	Oct. 28, 2024	
13	FSV-Signal Analyzer (10Hz-40GHz)	Keysight	FSV-40-N	GTS666	March 12, 2024	March 11, 2025	
14	Amplifier	/	LNA-1000-30S	GTS650	April 11, 2024	April 10, 2025	
15	CDNE M2+M3-16A	НСТ	30MHz-300MHz	GTS692	Nov. 08, 2023	Nov.07, 2024	
16	Wideband Amplifier	1	WDA-01004000-15P35	GTS602	April 11, 2024	April 10, 2025	
17	Thermo meter	JINCHUANG	GSP-8A	GTS643	April 18, 2024	April 17, 2025	
18	RE cable 1	GTS	N/A	GTS675	July 02. 2024	July 01. 2025	
19	RE cable 2	GTS	N/A	GTS676	July 02. 2024	July 01. 2025	
20	RE cable 3	GTS	N/A	GTS677	July 02. 2024	July 01. 2025	
21	RE cable 4	GTS	N/A	GTS678	July 02. 2024	July 01. 2025	
22	RE cable 5	GTS	N/A	GTS679	July 02. 2024	July 01. 2025	
23	RE cable 6	GTS	N/A	GTS680	July 02. 2024	July 01. 2025	
24	RE cable 7	GTS	N/A	GTS681	July 05. 2024	July 04. 2025	
25	RE cable 8	GTS	N/A	GTS682	July 05. 2024	July 04. 2025	



RF Co	RF Conducted Test:						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)	
1	MXA Signal Analyzer	Agilent	N9020A	GTS566	April 11, 2024	April 10, 2025	
2	EMI Test Receiver	R&S	ESCI 7	GTS552	April 11, 2024	April 10, 2025	
3	PSA Series Spectrum Analyzer	Agilent	E4440A	GTS536	April 11, 2024	April 10, 2025	
4	MXG vector Signal Generator	Agilent	N5182A	GTS567	April 11, 2024	April 10, 2025	
5	ESG Analog Signal Generator	Agilent	E4428C	GTS568	April 11, 2024	April 10, 2025	
6	USB RF Power Sensor	DARE	RPR3006W	GTS569	April 11, 2024	April 10, 2025	
7	RF Switch Box	Shongyi	RFSW3003328	GTS571	April 11, 2024	April 10, 2025	
8	Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	GTS572	April 11, 2024	April 10, 2025	
9	Thermo meter	JINCHUANG	GSP-8A	GTS641	April 18, 2024	April 17, 2025	
10	EXA Signal Analyzer	Keysight	N9010B	MY60241168	Nov. 03, 2023	Nov. 02, 2024	

Gen	General used equipment:									
Item	Test Equipment	Manufacturer Model No.		이 나는 사람이 같은 것이 같은 것이 같은 사람이 있는 것이 같은 것이 같이 없다.		Cal.Due date (mm-dd-yy)				
1	Barometer	KUMAO	SF132	GTS647	April 18, 2024	April 17, 2025				



# 7 Test results and Measurement Data

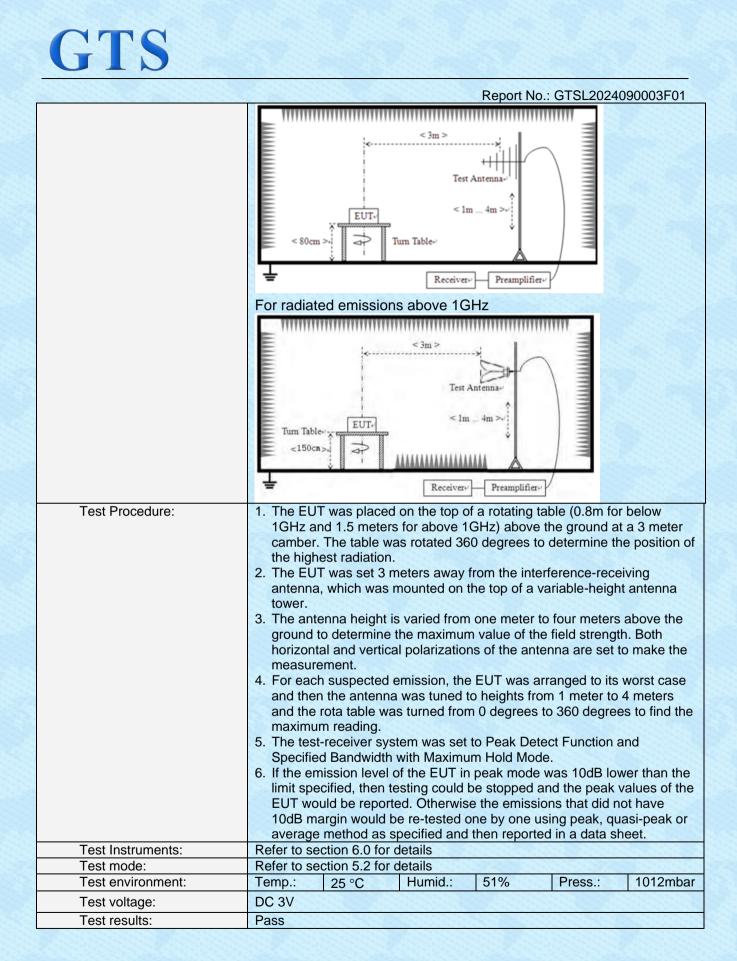
## 7.1 Antenna requirement

Standard requirement:	Standard requirement: FCC Part15 C Section 15.203									
15.203 requirement:	15.203 requirement:									
responsible party shall be antenna that uses a unique so that a broken antenna o electrical connector is prob	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 a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.									
(i) Systems operating in th operations may employ tra maximum conducted output	<ul> <li>15.247(c) (1)(i) requirement:</li> <li>(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.</li> </ul>									
EUT Antenna:	EUT Antenna:									
The antenna is PCB antenna, i	The antenna is PCB antenna, reference to the appendix II for details.									



Test Requirement:	FCC Part15 C Section 15.209								
Test Method:	ANSI C63.10:2013								
Test Frequency Range:	9kHz to 25GHz								
Test site:	Measurement Distance: 3m								
Receiver setup:	Frequency	Detector	RBW	VBW	Remark				
	9kHz- 150kHz	Quasi-peal	k 200Hz	300Hz	Quasi-peak Value				
	150kHz- 30MHz	Quasi-peal	k 9kHz	10kHz	Quasi-peak Value				
	30MHz- 1GHz	Quasi-peal	k 120KHz	300KHz	Quasi-peak Value				
	Above 1GHz	Peak Peak	1MHz 1MHz	3MHz 10Hz	Peak Value Average Value				
Limit:	Freque		Limit (dBuV		Remark				
(Field strength of the	Fieque	ency							
fundamental signal)	2400MHz-24	483.5MHz	94.0		Average Value				
			114.0		Peak Value				
Limit:	Freque		Limit (u		Remark				
(Spurious Emissions)	0.009MHz-0		2400/F(kHz)		Quasi-peak Value				
	0.490MHz-1		24000/F(kH		Quasi-peak Value				
	1.705MHz-		30 @3		Quasi-peak Value				
	30MHz-8		100 @		Quasi-peak Value				
	88MHz-2		150 @		Quasi-peak Value				
	216MHz-9		200 @		Quasi-peak Value				
	960MHz-	-1GHz	500 @		Quasi-peak Value				
	Above 1	IGHz	500 @		Average Value				
			5000 @		Peak Value				
Limit: (band edge)	harmonics, sha fundamental or	Il be attenuat to the genera	ed by at least al radiated emi	50 dB below	bands, except for w the level of the in Section 15.209,				
Test setup:	fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation. For radiated emissions from 9kHz to 30MHz $\underbrace{\begin{tabular}{lllllllllllllllllllllllllllllllllll$								

## 7.2 Radiated Emission Method

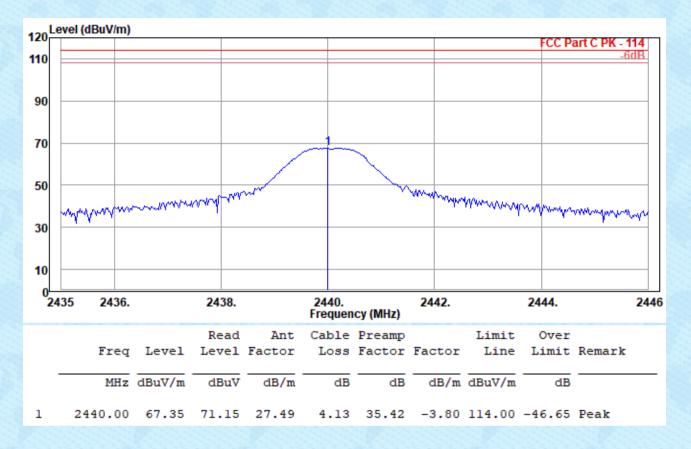




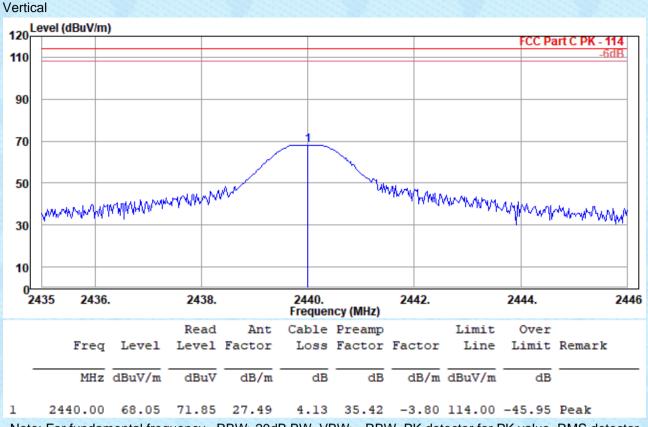
Report No.: GTSL2024090003F01

#### Measurement data:

7.2.1 Field Strength of The Fundamental Signal Peak value: Horizontal







Note: For fundamental frequency , RBW>20dB BW, VBW>=RBW, PK detector for PK value, RMS detector for AV value

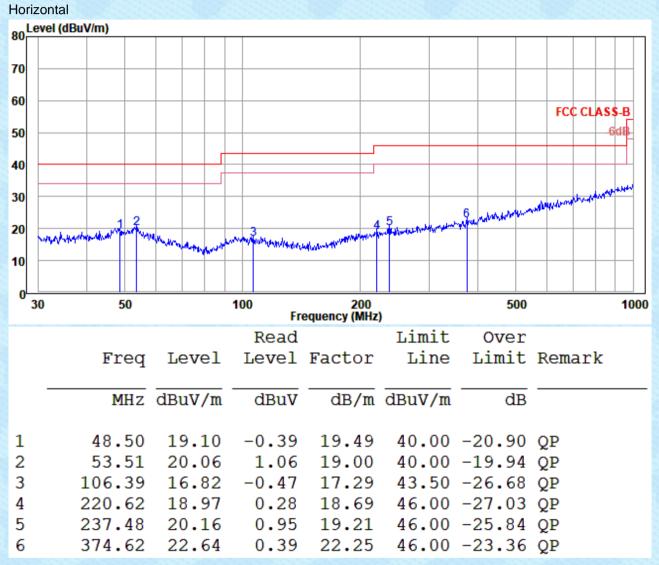


## 7.2.2 Spurious emissions

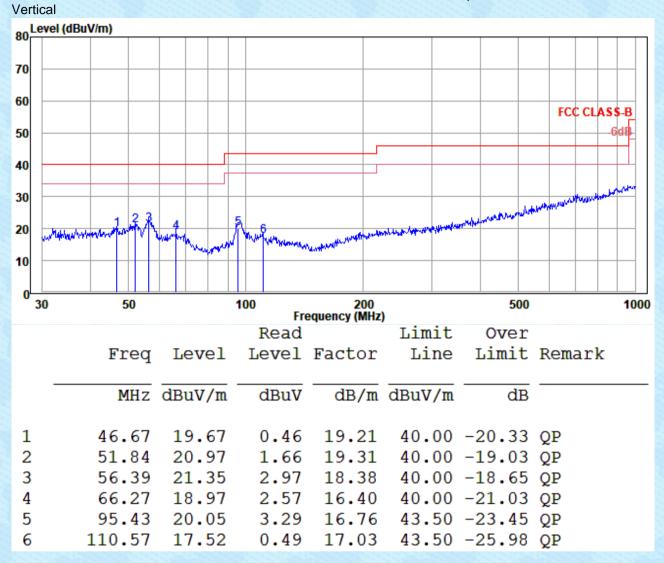
#### Below 30MHz

The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and according to 15.31(o), the test result no need to reported.

## Below 1GHz







# GTS

## Report No.: GTSL2024090003F01

#### Above 1GHz

Т	Test channel:			2440MHz			Polarization:			Horizontal	
				Read	Ant	Cable	Preamp		Limit	Over	
		Freq	Level	Level	Factor	Loss	Factor	Factor	Line	Limit	Remark
		MHz	dBuV/m	dBuV	dB/m	dB	dB	dB/m	dBuV/m	dB	
	1	2440.00	69.36	73.16	27.49	4.13	35.42	-3.80	114.00	-44.64	Peak
	2	4876.00	55.37	53.77	31.35	5.91	35.66	1.60	74.00	-18.63	Peak
	3	7324.00	51.68	42.36	35.98	7.17	33.83	9.32	74.00	-22.32	Peak
	4	10180.00	47.59	34.39	38.76	8.40	33.96	13.20	74.00	-26.41	Peak

		Freq	Level		Ant Factor		-			Over Limit	
		MHz	dBuV/m	dBuV	dB/m	dB	dB	dB/m	dBuV/m	dB	
2	-	2440.00 4876.00 7324.00 10248.00	38.62 32.84	37.02 23.52	31.35 35.98	5.91 7.17	35.66 33.83	1.60 9.32	54.00 54.00	-15.38 -21.16	Average Average Average Average



Test channel:		2440MHz			Polarization:			Vertical		
			Read	Ant	Cable	Preamp		Limit	Over	
	Freq	Level	Level	Factor	Loss	Factor	Factor	Line	Limit	Remark
	MHz	dBuV/m	dBuV	dB/m	dB	dB	dB/m	dBuV/m	dB	
1	2440.00	69.95	73.75	27.49	4.13	35.42	-3.80	114.00	-44.05	Peak
2	4876.00	53.43	51.83	31.35	5.91	35.66	1.60	74.00	-20.57	Peak
3	8038.00	44.50	34.10	37.01	7.49	34.10	10.40	74.00	-29.50	Peak
4	10622.00	48.06	33.70	39.64	8.60	33.88	14.36	74.00	-25.94	Peak

			Read	Ant	Cable	Preamp		Limit	Over	
	Freq	Level	Level	Factor	Loss	Factor	Factor	Line	Limit	Remark
	MHz	dBuV/m	dBuV	dB/m	dB	dB	dB/m	dBuV/m	dB	
1	2440.00	44.15	47.95	27.49	4.13	35.42	-3.80	94.00	-49.85	Average
2	4876.00	36.87	35.27	31.35	5.91	35.66	1.60	54.00	-17.13	Average
3	7324.00	32.57	23.25	35.98	7.17	33.83	9.32	54.00	-21.43	Average
4	9772.00	36.27	23.56	38.54	8.22	34.05	12.71	54.00	-17.73	Average

Remarks:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

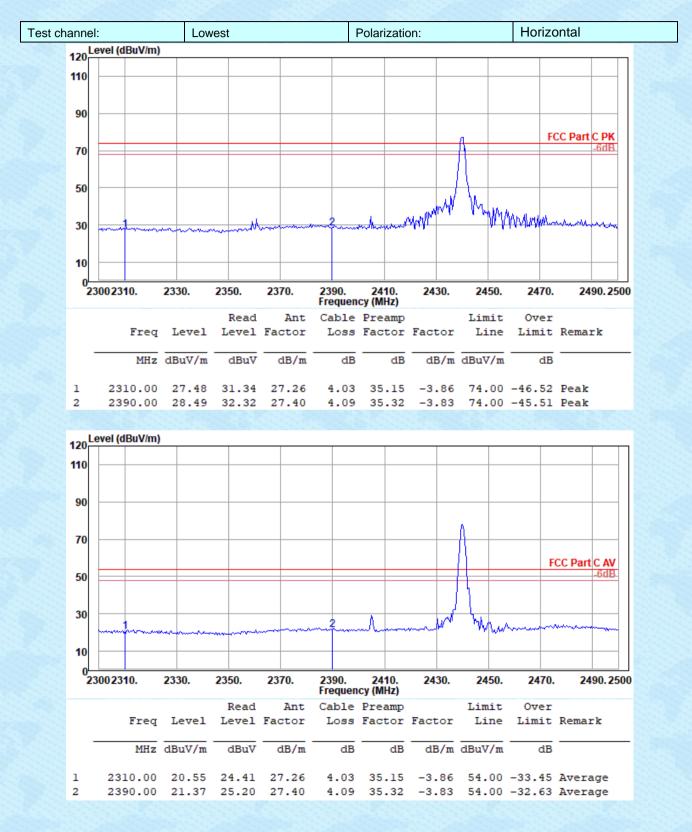
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

3. For above 18GHz, no emission found.

4. If the average limit is met when using a Peak detector, the EUT shall be deemed to meet both peak and average limits. And measurement with the average detector is unnecessary.

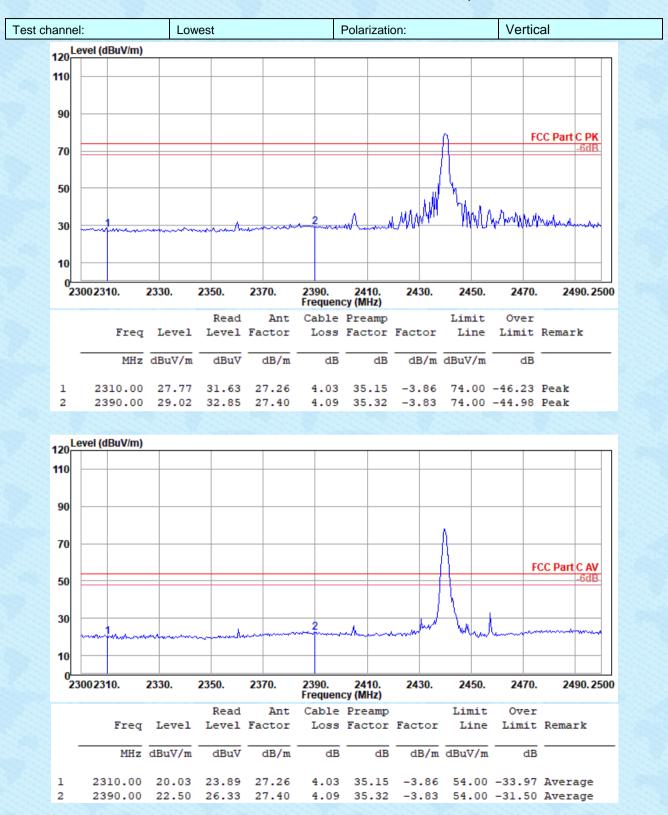


## 7.2.3 Bandedge emissions

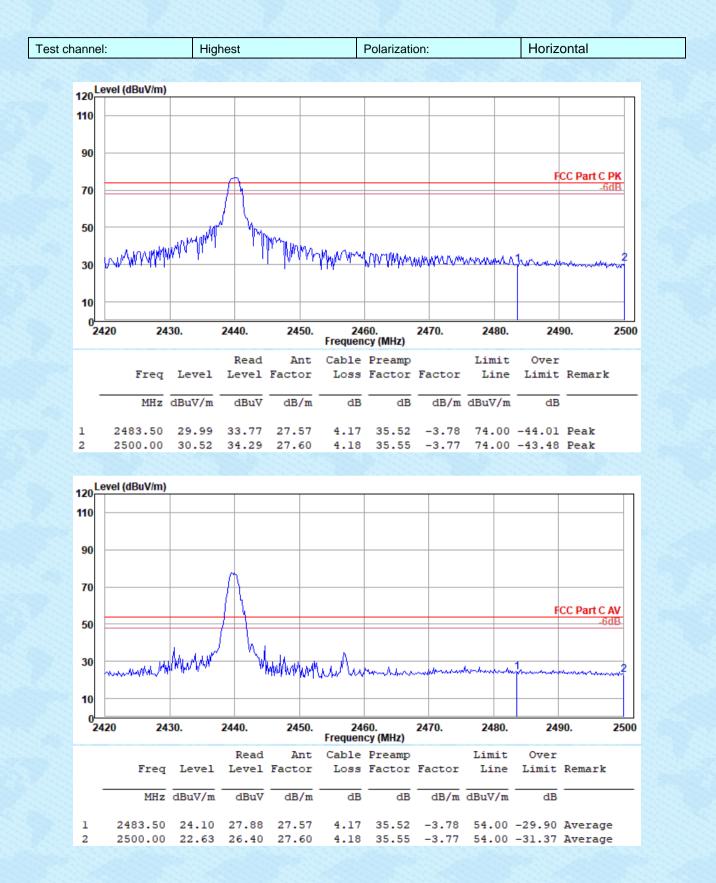




Report No.: GTSL2024090003F01

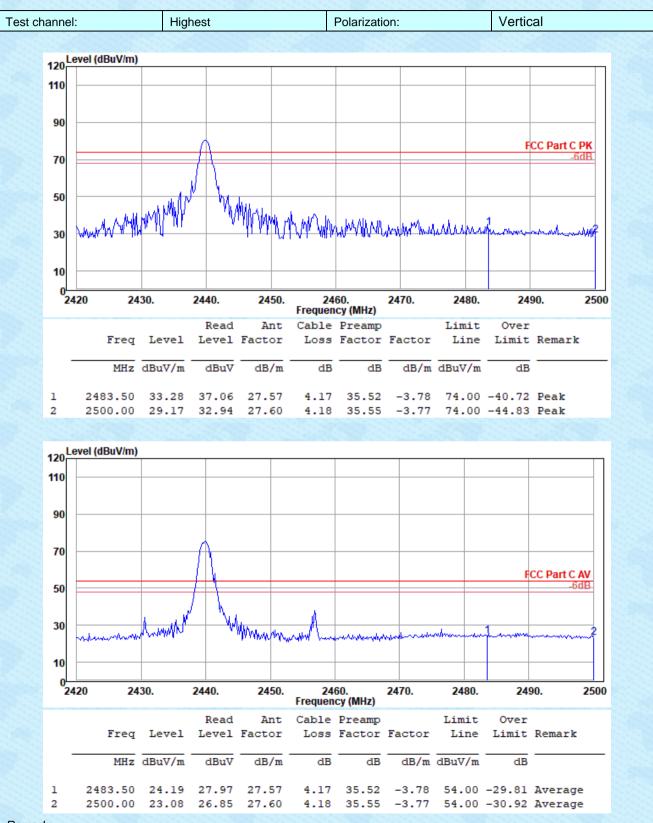








Report No.: GTSL2024090003F01



Remark:

1. Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

2. For above 18GHz, no emission found



Test Requirement:	FCC Part15 C Section 15.249/15.215					
Test Method:	ANSI C63.10:2013					
Limit:	Operation Frequency range 2440MHz					
Test setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane					
Test Instruments:	Refer to section 6.0 for details					
Test mode:	Refer to section 5.2 for details					
Test results:	Pass					

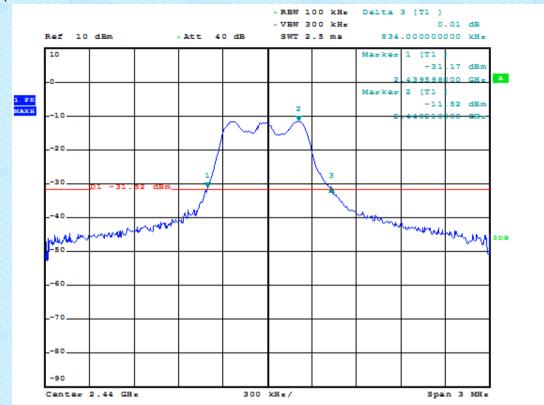
## 7.3 20dB Occupy Bandwidth

## **Measurement Data**

Test Frequency	20dB bandwidth(kHz)	Result
2440MHz	834	Pass



## Test plot as follows:





# 8 Test Setup Photo

Reference to the **appendix I** for details.

9 EUT Constructional Details

Reference to the appendix II for details.

-----End-----