

HUNAN GREATWALL COMPUTER SYSTEM CO.,LTD.

TEST REPORT

SCOPE OF WORK FCC TESTING–LM1097P, LM1097P-A, LM1097P-B, LM1097P-C

REPORT NUMBER 231204042SZN-003

ISSUE DATE

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Intertek Report No.: 231204042SZN-003

HUNAN GREATWALL COMPUTER SYSTEM CO., LTD.

Application For Certification

FCC ID: 2APUQ-LM1097P

Tablet

Model: LM1097P, LM1097P-A, LM1097P-B, LM1097P-C

Brand name: Greatwall

2.4GHz Wi-Fi Transceiver

Report No.: 231204042SZN-003

We hereby certify that the sample of the above item is considered to comply with the requirements of FCC Part 15, Subpart C for Intentional Radiator, mention 47 CFR [10-1-23]

Prepared and Checked by:

Approved by:

Draven Li Project Engineer Peter Kang Sr. Technical Supervisor Date: 22 July 2024

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Intertek Testing Services Shenzhen Ltd. Longhua Branch

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MEASUREMENT/TECHNICAL REPORT

			-		
This report concerns (check one)	Original Grant	<u>X</u>	Class II C	hange _	
Equipment Type: <u>DTS - Part 15 Digital Tr</u>	ansmission Syster	ms (Wi-Fi	transmitte	er portio	<u>n)</u>
Deferred grant requested per 47 CFR 0.	457(d)(1)(ii)?	Yes		No	<u>x</u>
		lf yes,	defer unt		
Company Name agrees to notify the Co	mmission by:			-	ate
			ate		
of the intended date of announcement that date. Transition Rules Request per 15.37?					
If no, assumed Part 15, Subpart C for Edition] provision.	intentional radia	itor - the	e new 47	CFR [10-	01-23]
Report prepared by:					
	Draven Li Intertek Testing S 101, 201, Building Zhangkengjing Col	B, No. 30	8 Wuhe Av	venue,	
	District, Shenzhen Tel: (86 755) 8601	-		8601 666	1



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1.0 Summary of Test results

Applicant: HUNAN GREATWALL COMPUTER SYSTEM CO., LTD.

Applicant Address: Hunan GreatWall Industrial Park, Xiangyun Middle Road, Tianyuan District, Zhuzhou, Hunan Province, China

Manufacturer: HUNAN GREATWALL COMPUTER SYSTEM CO., LTD.

Manufacturer Address: Hunan GreatWall Industrial Park, Xiangyun Middle Road, Tianyuan District, Zhuzhou, Hunan Province, China

Model: LM1097P FCC ID: 2APUQ-LM1097P

TEST ITEM	REFERENCE	RESULTS
Max. Output power	15.247(b)(3)	Pass
6 dB Bandwidth	15.247(a)(2)	Pass
Max. Power Density	15.247(e)	Pass
Out of Band Antenna Conducted Emission	15.247(d)	Pass
Radiated Emission in Restricted Bands	15.247(d), 15.209, FCC 15.205	Pass
AC Conducted Emission	15.207	Pass
Antenna Requirement	15.203	Pass (See Notes)

Notes: The EUT uses an Integral Antenna which in accordance to Section 15.203 is considered sufficient to comply with the provisions of this section.



2.0 General Description

2.1 Product Description

The Equipment Under Test (EUT) is a Tablet with Bluetooth 4.2 (dual-mode) function operating in 2402-2480MHz, 2.4G WIFI function operating in 2412-2462MHz and 5G WIFI function operating in 5150MHz~5250 MHz, 5250MHz~5350MHz, 5725MHz~5850MHz, GSM function operating in 850MHz&1900MHz, WCDMA function operating in FDD band II/IV/V, LTE function operating in Band 2/4/5/12/17/25/26/41/66/71. The EUT is powered by DC 3.8V rechargeable battery or DC 5V/2A by adapter. For more details information pls. refer to the user manual.

Type of Modulation: BPSK, QPSK, 16QAM, 64QAM for OFDM; CCK, DQPSK, DBPSK for DSSS. Antenna Type: Integral antenna

Antenna Gain: 1.06dBi max (This information is provided by applicant, and the applicant is responsible for the authenticity of the provided information.)

For electronic filing, the brief circuit description is saved with filename: descri.pdf.

2.2 Related Submittal(s) Grants

This is an application for certification of a transceiver for the Tablet which has 2.4G WIFI function.

For the Bluetooth (EDR) function was reported in report: 231204042SZN-001.

For the Bluetooth (BLE) function was reported in report: 231204042SZN-002.

For the 5G WIFI function was reported in report: 231204042SZN-004.

For the GSM/WCDMA/LTE function was reported in report: 231204042SZN-005.

For other digital functions were reported in the SDOC report: 231204042SZN-007.

2.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.10 (2013) and KDB 558074 D01 v05r02. Radiated emission measurement was performed in semi-anechoic chamber and conducted emission measurement was performed in shield room. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "Justification Section" of this Application.

2.4 Test Facility

The Semi-Anechoic chamber and shield room used to collect the radiated data and conducted data are **Intertek Testing Services Shenzhen Ltd. Longhua Branch** and located at 101, 201, Building B, No. 308 Wuhe Avenue, Zhangkengjing Community, GuanHu Subdistrict, LongHua District, ShenZhen, P.R. China. This test facility and site measurement data have been fully placed on file with the FCC (Registration Number: CN1188).



3.0 System Test Configuration

3.1 Justification

For emissions testing, the equipment under test (EUT) setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, all cables were manipulated to produce worst case emissions. The EUT was powered by DC 3.8V full rechargeable battery or DC 5V/2A by adapter during the test.

On 802.11b/g/n-HT20 mode, only one antenna is used, and all data rate were tested and only the worst case data is shown in the report.

For maximizing emissions, the EUT was rotated through 360°, the EUT was placed on the styrene turntable with 0.8m up to 1GHz and 1.5 m above 1GHz. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000 MHz. The resolution is 1 MHz or greater for frequencies above 1000 MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

The EUT and transmitting antenna was centered on the turntable.

Radiated emission measurement were performed the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

3.2 EUT Exercising Software

The EUT exercise program (provided by client) used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The worst case configuration is used in all specified testing.

The parameters of test software setting:

During the test, Channel and power controlling software provided by the applicant was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the application and is going to be fixed on the firmware of the end product.

Test Software: Nonsignaling operation platform

3.3 Special Accessories

No special accessories used.



3.4 Equipment Modification

Any modifications installed previous to testing by HUNAN GREATWALL COMPUTER SYSTEM CO.,LTD. will be incorporated in each production model sold / leased in the United States.

No modifications were installed by Intertek Testing Services Shenzhen Ltd. Longhua Branch.

3.5 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test has been considered.

Measurement Uncertainty	Uncertainty
Channel Bandwidth	±3.46%
RF Output Power	±0.31dB
Power Density	±3.0dB
Conducted Unwanted Emission	±0.55dB
Spurious emission (Above 18GHz)	±5.3dB
Spurious emission (6GHz to 18GHz)	±5.1dB
Radiated emission (1GHz to 6GHz)	±4.8dB
Radiated emission (Up to 1GHz)	±4.8dB
AC Conducted emission	±3.6 dB
Temperature	±1°C
Humidity	±5%

3.6 Support Equipment List and Description

Description	Manufacturer	Remark
Router	NETGEAR (provided by Intertek)	Model: R7800
Mobile phone	SAMSUNG (provided by Intertek)	Model: S7
Adapter	Shenzhen Huajin Electronics Co., Ltd.	Model: HJ-0502000W2-US Input: 100-240V~ 50/60Hz 0.3A
Type-C cable	(Provided by Client) N/A (Provided by Client)	Output: 5.0V-2.0A 10.0W Unshielded, Length 105cm



Applicant: HUNAN GREATWALL COMPUTER SYSTEM CO.,LTD. Date of Test: 07 December 2023 Model: LM1097P

4.0 Measurement Results

4.1 Maximum Conducted Output Power at Antenna Terminals, FCC Rules 15.247(b)(3):

The antenna power of the EUT was connected to the input of a broadband peak RF power meter. The power meter has a video bandwidth that is greater than DTS bandwidth and utilize a fast-responding diode detector. Power was read directly at the EUT antenna terminals with cable loss added.

Systems operating in the 2400–2483.5 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi 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 6 dBi.

IEEE 802.11b (Antenna Gain = 1.06dBi) (CCK, 1Mbps)				
Frequency (MHz)Output in dBm (Peak Reading)Output in mWatt				
Low Channel: 2412	14.1	25.7		
Middle Channel: 2437	14.1	25.7		
High Channel: 2462	14.0	25.1		

Maximum allowed Transmitter output is 1 watt (+30 dBm).

IEEE 802.11g (Antenna Gain = 1.06dBi) (16QAM, 6Mbps)				
Frequency (MHz)Output in dBm (Peak Reading)Output in mWatt				
Low Channel: 2412 22.3		169.8		
Middle Channel: 2437	22.0	158.5		
High Channel: 2462	21.6	144.5		

IEEE 802.11n-HT20 (Antenna Gain = 1.06dBi) (64QAM, 6Mbps)				
Frequency (MHz)Output in dBm (Peak Reading)Output in mWatt				
Low Channel: 2412	22.4	173.8		
Middle Channel: 2437	22.2	166.0		
High Channel: 2462	22.0	158.5		



Cable loss: 0.3 dB External Attenuation: 0 dB

Cable loss, external attenuation has been included in OFFSET function

EUT max. output level = 22.4dBm EUT max. E.I.R.P = 22.4dBm +1.06dBi = 23.46dBm = 221.8mW

For RF Exposure, the information is saved with filename: RF exposure.pdf.



Applicant: HUNAN GREATWALL COMPUTER SYSTEM CO.,LTD.Date of Test: 07 December 2023Model: LM1097P

4.2 Minimum 6 dB RF Bandwidth, FCC Rule 15.247(a) (2):

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RES BW was set to 100 KHz according to FCC KDB 558074 D01 v05r02. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was taken, a DISPLAY line was drawn 6 dB lower than PEAK level. The 6dB bandwidth was determined from where the channel output spectrum intersected the display line.

Limit: The 6 dB Bandwidth is at least 500 kHz.

IEEE 802.11b (CCK, 1Mbps)			
Frequency (MHz) 6 dB Bandwidth (MHz)			
2412	7.110		
2437 8.100			
2462	7.620		

IEEE 802.11g (16QAM, 6Mbps)			
Frequency (MHz) 6 dB Bandwidth (MHz)			
2412	14.880		
2437	15.690		
2462	12.000		

IEEE 802.11n-HT20 (64QAM, 6Mbps)			
Frequency (MHz) 6 dB Bandwidth (MHz)			
2412	12.660		
2437 16.590			
2462 11.430			

The test plots are attached as below.

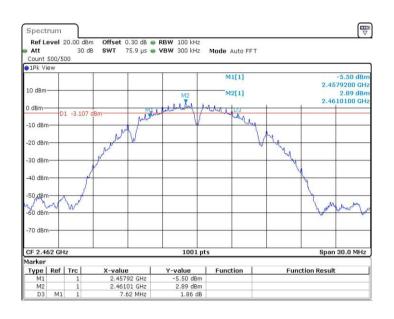


802.11b

Spect Ref L		20.00 dBr		RBW 100 kHz			T T
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					M1[1]		-3.13 dBi 2.4079500 GH
10 dBm	-				M2[1]		2.4079500 GH 3.36 dBi
				were they			2.4110100 GH
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-70 dBm				_			
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Marker		-		1001 pt			0001 0010 14112
Type	Ref	Trc	X-value	Y-value	Function	Fund	tion Result
M1		1	2.40795 GHz	-3.13 dBm			
M2		1	2.41101 GHz	3.36 dBm			
D3	M1	1	7.11 MHz	0.03 dB			

Att	evel :	20.00 di 30			Mode Auto FF	T
Count		00				
10 dBm				M2	M1[1]	-3.13 dBr 2.4079500 GH 3.36 dBr
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-10 dBn	+		M	Ť		A L
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-30 dBm	+		Y			
-40 dBm	-					
-50 dBm						
Am	we for	hor				mm
-70 dBm	+					
CF 2.4	12 GH	z		1001 pt:	5	Span 30.0 MHz
1arker						
Type M1	Ref	Trc 1	2.40795 GHz	-3.13 dBm	Function	Function Result
M2		1	2.40795 GHz 2.41101 GHz	3.36 dBm		
D3	M1	1	7.11 MHz	0.03 dB		





802.11g

	ew								
					M1[1]		-8.38 dB 2.4044100 GF		
10 dBm	-			-	M2[1]		-1.31 dB		
				M2			2.4103800 GH		
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-20 dBm			1	+		2			
		2	AC 1			4	5		
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40 dB	hall	N		+ +			hundralina		
M	10010						w munn		
50 dBm	-			+					
-60 dBm									
-70 dBm				+					
CF 2.4	12 CH	-		1001 pt	-		Span 30.0 MHz		
Aarker	12 011	2		1001 pt	3		opun 00.0 Min		
Type	Ref	Tro	X-value	Y-value	Function	Fund	tion Result		
M1	ACI	1	2.40441 GHz	-8.38 dBm	runction	Func	cion Result		
M2		1	2.41038 GHz	-1.31 dBm					
	M1	1	14.88 MHz	0.75 dB					



Att		20.00 dBr 30 d		VBW 300 kHz	Mode Auto FF	т		
Count		00						
TLE T	0.00		1 1		M1[1]			-5.69 dBr
							2.4	294700 GH
10 dBm					M2[1]			0.41 dB
					M2		2.4	382600 GH
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-70 dBn								
CF 2.4	37 GH	z	d d	1001 pt	s		Spa	n 30.0 MHz
Marker								
Type	Ref	Trc	X-value	Y-value	Function	Fun	ction Resu	t
M1		1	2.42947 GHz	-5.69 dBm				
M2		1	2.43826 GHz	0.41 dBm				
D3	M1	1	15.69 MHz	-0.28 dB				

Ref Lo Att Count		20.00 dBn 30 dB		RBW 100 kHz VBW 300 kHz	Mode Auto FFT	т
1Pk Vi					E. auto	
					M1[1]	-6.04 dBi
10 dBm	_				MOLT	2.4550700 GH 0.88 dBi
				M2	M2[1]	2.4607100 GH
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-50 dBm	+			-		
-60 dBm	-					
-70 dBm						
CF 2.4	52 GH	z	A. (Å.	1001 pt:	5	Span 30.0 MHz
1arker						
Туре	Ref		X-value	Y-value	Function	Function Result
M1		1	2.45507 GHz	-6.04 dBm		
M2		1	2.46071 GHz	0.88 dBm		
D3	M1	1	12.0 MHz	-0.82 dB		



802.11n-HT20

Att Count	500/5	30 dB	swt 75.9 µs 🖷	VBW 300 kHz	Mode Auto FFT			
1Pk Vi								
					M1[1]			7.00 dBi 5400 GH
10 dBm	-			-	M2[1]			1.40 dBi
				M2	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		2.410	7400 GH
0 dBm-		1 -4.598 (M# A	undarelon as	nhund a	03		
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-50 dBm								· www
-60 dBm								
-70 dBm	1							
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CF 2.4 Marker	12 GH	z		1001 pt	5		Span 3	0.0 MH;
Type	Ref	Trc	X-value	Y-value	Function	Euno	tion Result	
M1		1	2.40564 GHz	-7.00 dBm	, anoton	ranc	cion ressuit	
M2		1	2.41074 GHz	1.40 dBm				
D3	M1	1	12.66 MHz	2.04 dB				

	evel	20.00 dB					
Att Count	500/5	30 d D0	iB SWT 75.9 µs 🖷	VBW 300 kHz	Mode Auto FF	т	
1Pk Vi	ew						
					M1[1]		-6.98 dBn
10 dBm							2.4292000 GH
20 0011					M2[1]		-0.12 dBn 2.4382600 GH
0 dBm-					V 1		2.4382600 GH
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-60 dBn	-			_			
-70 dBn	-						
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darker	37 GH	2		1001 pt:	>		span autu MHz
Type	Ref	Trol	X-value	Y-value	Function	Function	Docult
M1	Ker	1	2.4292 GHz	-6.98 dBm	Function	Function	Result
M2		1	2.43826 GHz	-0.12 dBm			
D3	M1	1	16.59 MHz	0.84 dB			



Att Count		20.00 dBi 30 d		VBW 300 kHz	Mode Auto FF	т
1Pk Vi					50000	200
10 dBm					M1[1]	-7.06 dBı 2.4556400 GH 1.18 dBı
0 dBm-	_		Ma A. A	M2		2.4607400 GH
-10 dBm		1 -4.825	dBm Marshuel	and the second second second	allyshalle	an walking way
-20 dBm						
-30 dBm	+	de la compañía de la comp				
-40 dBr	poor	have				Vur .
-50 dBm	+			_		manner
-60 dBn	-					
-70 dBm	+			_		
CF 2.4	52 GH	z		1001 pt:	s	Span 30.0 MHz
Aarker	Ref	Trol	X-value	Y-value	Function	Function Result
Type M1	rei	1	2.45564 GHz	-7.06 dBm	Function	Function Result
M2		1	2.46074 GHz	1.18 dBm		
D3	M1	1	11.43 MHz	0.34 dB		



Applicant: HUNAN GREATWALL COMPUTER SYSTEM CO.,LTD.Date of Test: 07 December 2023Model: LM1097P

4.3 Maximum Power Density Reading, FCC Rule 15.247(e):

The Measurement Procedure PKPSD was set according to the FCC KDB 558074 D01 v05r02.

Antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator and/or cable was used, these losses are compensated for with the analyzer OFFSET function.

Limit: The Power Density does not exceed 8dBm/3 kHz.

IEEE 802.11b (CCK, 1Mbps)
Frequency (MHz)	Power Density with RBW 100KHz
2412	-9.32
2437	-10.17
2462	-10.11

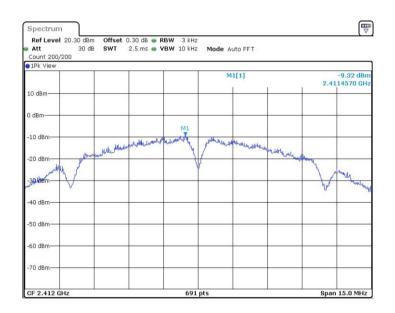
IEEE 802.11g (16	6QAM, 6Mbps)
Frequency (MHz)	Power Density with RBW 100KHz
2412	-10.3
2437	-12.79
2462	-11.9

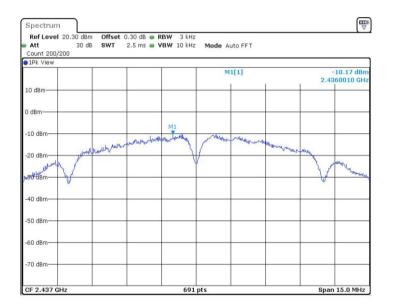
IEEE 802.11n-HT20	(64QAM, 6Mbps)
Frequency (MHz)	Power Density with RBW 100KHz
2412	-12.14
2437	-12.33
2462	-12.42

The test plots are attached as below.



802.11b

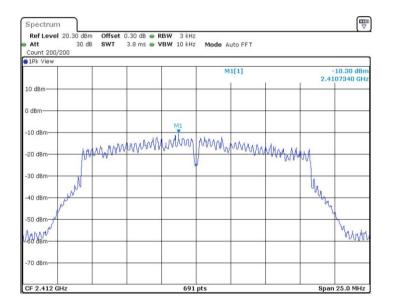








802.11g





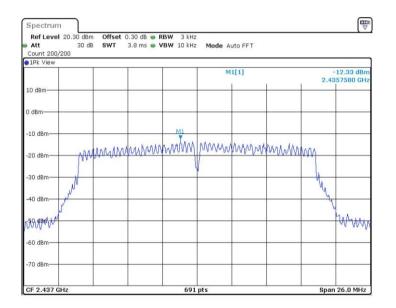
1Pk View									
				M1[1]			-12.79 dE 2.4372530 G		
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0 dBm		_							
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-60 dBm									

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30 dBm	M							N.	
40 dBm	1º							May.	
50 dBm								7	h
									Tues.
									Mr
-60 dBm									1 35



802.11n-HT20

				M1[[1]		-12.14 dBm 2.4126400 GHz		
LO dBm						2.4	126400 GH		
) dBm		_							
10 dBm		_		MI					
20 dBm	Norm	MMMM	MMM	Mannah	MANNAM	Www.	-		
30 dBm		_	-						
40 dBm	y M ^e	_				"h	-		
50 dBm						10	4		
ANWW -							DAM AND		





1Pk View								
					M1[1]			-12.42 dBr
10 dBm						-		
0 dBm								
-10 dBm		Ma	1.4.51					
-20 dBm	propertant	www.white	minin	pmm	Man	mon	Unia.	
-30 dBm	N							
40 dBm	J.						Ny	
-50 dBm							Y	
MAN BO dBm		_					1	Winna



Applicant: HUNAN GREATWALL COMPUTER SYSTEM CO.,LTD. Date of Test: 07 December 2023 Model: LM1097P

4.4 Out of Band Conducted Emissions, FCC Rule 15.247(d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. The Measurement Procedure was set according to the FCC KDB 558074 D01 v05r02.

All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the passband.

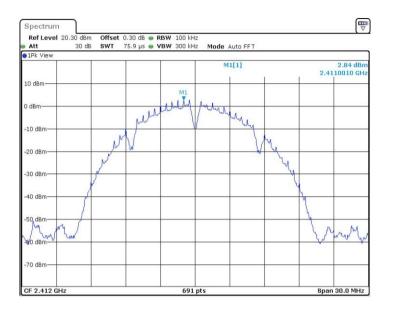
Refer to the attached test plots for out of band conducted emissions data with rate of 1Mbps for 802.11b and 6Mbps for 802.11g and 6Mbps for 802.11n-HT20 and 13.5Mbps for 802.11n-HT40.

The test plots showed all spurious emission up to the tenth harmonic were measured and they were found to be at least 20 dB below the highest level of the desired power in the passband.

The test plots are attached as below.



802.11b Channel 01 (2412MHz) Reference Level: 2.84dBm



					M	11[1]			-53.51 dBm 982000 GHa
10 dBm							<u> </u>	2.05	
0 dBm			-						
-10 dBm—			_						
20 dBm—	D1 -17.160	dBm							
-30 dBm—				-					-
40 dBm—	-				-		-	-	
50 dBm—									-
-60 d8ab	and the		1	the late the set	10		11		

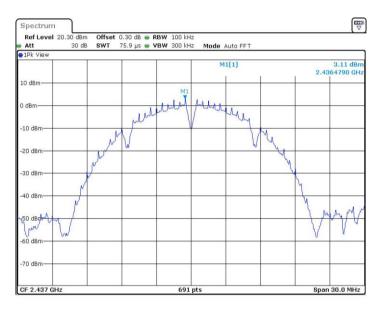


Att Count 9/:	30 d£ 10	SWT	220 113	VBW 300 kH	- Mode /	Auto Sweep					
1Pk Max		1	1			1511			44.96 dBr		
					M1[1]				4.824010 GH		
10 dBm	-			-							
) dBm											
10 dBm—											
	D1 -17.160	dBm									
20 dBm—											
30 dBm—			-								
40 dBm—											
TO GDIT	NII										
50 dBm—	2	-	-	-							
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-70 dBm—				-							

Spectrue Ref Leve	el 20.00 de	m Offset 0.30 dB	RBW 100 kHz			('
Att	30 (dB SWT 303.4 µs (VBW 300 kHz	Mode Auto F	FT	
Count 300)/300					
1Pk View				500000		1000
				M1[1]		2.34 dBr
10 dBm						2.410900 GH
to upin-				M2[1]		M1 -53.83 dBr
) dBm						2.400000 GH
2 Grant						14
-10 dBm-						P I I
10 00111						A K
20 dBm-	D1 -17.66	i0 dBm				1 14
-30 dBm						
						1 1
40 dBm-						
					Mta	
-50 dBm					2	
					M3	MA
60 dBm	working	toman former thousand	none all wanter working	munerant	and and a start of	1
	1.1.1.1.1.1.1.1.1.1.1.1	A CARLENDER CONTRACTOR		and a state		
-70 dBm—						
Start 2.3	GHz		691 pts	()		Stop 2.43 GHz
1arker						
Type R	ef Trc	X-value	Y-value	Function	Fun	ction Result
M1	1	2.4109 GHz	2.34 dBm			
M2	1	2.4 GHz	-53.83 dBm			
M3	1	2.39 GHz	-59.44 dBm			
M4	1	2.398536 GHz	-51.83 dBm			



Channel 06 (2437MHz) Reference Level: 3.11dBm



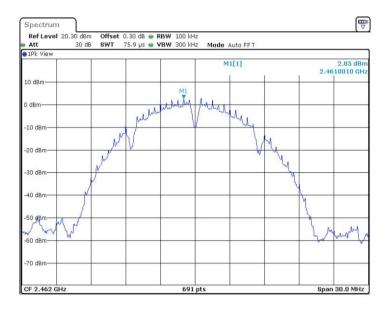
					M	11[1]			57.55 dBn 15300 GHa
10 dBm—			-	-		1		1.00	13300 GH
0 dBm			_						
-10 dBm—									
-20 dBm—	D1 -16.890	dBm							
30 dBm—									
40 dBm—			-						
-50 dBm—									
6RIDED		- Root at the	and the state of the state	M1			a stattan a		a day of the



1Pk Max	.0									
					M1[1]			-38.71 dBn 4.874300 GH:		
LO dBm										
) dBm										
10 dBm—										
20 dBm—	D1 -16.890	dBm								
30 dBm—										
40 dBm—	M11									
50 dBm—										
Lathandin	Replacement	bellende tot	التعيد واللهي يعلى	distand a shall we all	the state Bland of	a freedored set from	n. J. R. matheland	a stranderstrange	halfhiland	
	and a start of			and and the state of the	In the state	A REPORT OF CARE	aller Descention	a Alas	has been been	



Channel 11 (2462MHz) Reference Level: 2.85dBm



1Pk Max	1				M	1[1]			48.30 dBm
10 dBm	_		-			<u> </u>		1.78	39830 GHz
) dBm									
-10 dBm—									
20 dBm—	D1 -17.150	dBm							
30 dBm—			-						
40 dBm—			-	-					
-50 dBm—			-				M1		
-60 rishtan	ann hila	a futo attend	Jun las de statil	and ender			the state		



Att Count 9/:	30 di 10	B SWT	220 IIIS 👹	VBW 300 kHz	Mode	luto Sweep	2		
1Pk Max					M	1[1]			45.67 dBr
10 dBm								4.9	23830 GH
) dBm									
-10 dBm—			-						
20 dBm—	D1 -17.150	dBm							
30 dBm—									
40 dBm—	\$11							-	-
50 dBm—								in then	
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70 dBm—		a							

Att		0.00 dBr 30 d		 RBW 100 kHz VBW 300 kHz 	Mode Auto F	FT	
Count		00					
10 dBm		M	1		M1[1]		3.18 dB) 2.460930 GF ~58.34 dB) 2.483500 GF
0 dBm- -10 dBn		- Aller	and a				
-20 dBn		-16.820) dBm-ff				
-30 dBn -40 dBn							
-50 dBn				M9 M4			
-60.4dBn	WV		Winters		M3 Amarikan	mountain	werten Marine Marine an
-70 dBn							
Start 2	.44 Gł	Ηz	1 1	691 pts	(Stop 2.55 GHz
Marker							
Туре	Ref	Trc	X-value	Y-value	Function	Fur	nction Result
M1		1	2.46093 GHz	3.18 dBm			
M2		1	2.4835 GHz	-58.34 dBm			
M3		1	2.5 GHz	-60.40 dBm			
M4		1	2,490377 GHz	-57.50 dBm			



802.11g Channel 01 (2412MHz) Reference Level: 0.15dBm

Ref Level 20.30 dBr Att 30 d		0.30 dB 👄 🖡 75.9 µs 👄 ۷			Auto FFT			
1Pk View					MAGIO -			
				M	11[1]		2.4	0.15 dBm 132590 GHz
10 dBm		-						
a				M1				
) dBm		honorra	marshay	mound	marina			
-10 dBm	provide	oprove en		<u> </u>		Maryly		
-20 dBm	y'					1		
-30 dBm							Y	
1							1.	27
40 dBm							Wh	Monay
-50 dBm								00.8
-60 dBm								
-70 dBm		_						
1	1							1

				M1[1]		-43.82 dBm
10 dBm			-		+ +	2.3998000 GHz
0 dBm						
-10 dBm						
-20 dBm D	1 -19.850 dBm					
-30 dBm						
40 dBm						
-50 dBm						
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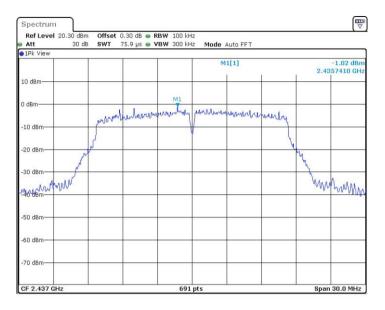


Att Count 9/1	30 dB 0	SWT	226 ms 🖷	VBW 300 kH	Iz Mode	Auto Sweep			
1Pk Max			1	1		1[1]			53.05 dBr
					M	1[1]			27910 GH
10 dBm									
0 dBm									
-10 dBm									
-20 dBm	-D1 -19.850	dBm							
-30 dBm—									
-40 dBm				-					
-50 dBm—	M		-						
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apa-diffe	The second s	a Herender and the second	a second balant	And the Party of the Party of the	1	r Their the	and the second second		And P. LANDING
-70 dBm					L				

Dof I	augl /	20.00 dBi	m Offset 0.30 dB	BBW 100 kHz				
Att	ever	20.00 dBi 30 d		VBW 300 kHz	Mode	Auto FF	т	
Count	300/3		o on ocomps	TEN DOO KIL	mode	Autori		
1Pk Vi	ew				-			
-					M	[1]		0.04 dBn
								2.414480 GH
10 dBm					M	2[1]		-41.82 dBr
								2400000 GH
0 dBm-								mynul
-10 dBn							p.v	mul
TO UDI								
20 dBn	-	1 -19.96	a dam					
20 001		1 -19.90	J ubin					
30 dBn								
50 abii	'							
40 dBn							Mga	
10.001	·						N	Unin
-50 dBn	-						M	V
							Man	
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-0.014		and here and	of the section of the section of	the second second	- all and	and .		
-70 dBn	-						_	
Start 2	3 GH	7		691 pts	-			Stop 2.43 GHz
1arker	.o un			051 pcs				otop 2110 dile
Type	Ref	Trc	X-value	Y-value	Funct	ion	Functio	on Result
M1	1.01	1	2,41448 GHz	0.04 dBm	- unce		Tunche	in Robuit
M2		1	2.4 GHz	-41.82 dBm				
M3		1	2.39 GHz	-57.47 dBm				
		1	2,399101 GHz	-40.55 dBm				



Channel 06 (2437MHz) Reference Level: -1.02dBm



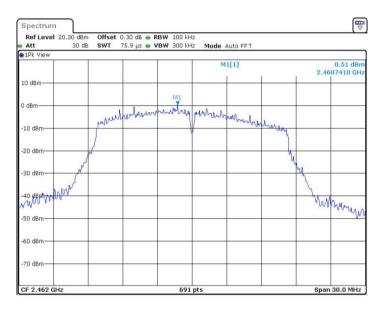
				M1[1]		-54.	70 dBn 300 GH
LO dBm					+ +		1100
) dBm							
10 dBm							
20 dBm	1.020 dBm						
30 dBm							
40 dBm			-				
50 dBm							
60.dBbud Hunter		10	Inthe seal		inter l		



Count 9/10 1Pk Max									
					M	1[1]			52.42 dBr 77300 GH
LO dBm									
) dBm									
10 dBm									
20 dBm	D1 -21.020	dBm							
30 dBm									
40 dBm									-
50 dBm —	11					21/12/201			
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Hardenseller	Stern Street and	V Mind Miller	diagonaliticante		And Description of the second	In the second second	A plant and	and a starting	Bankand



Channel 11 (2462MHz) Reference Level: 0.51dBm



1Pk Max				M1[1]		-:	39.20 dBn
				1		1.77	03830 GH
LO dBm							
) dBm					_		
10 dBm							
20 dBm 01 -1	9.490 dBm						
30 dBm					_		
40 dBm					MI		
50 dBm							
	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	545-75-6-77	. Bardladandar				



	5 3111	220 IIIS 🖷	Y D W 300 KH	Moue	Auto Sweep	19		
	1	1			1[1]		_	-52.76 dBi
				141	1[1]			771920 GH
		-						
01 .10 400	dBro							
01 -19,490	ubili							
							-	
				M				
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		01 -19.490 dBm	D D D1 -19.490 dBm	D D D D D D D D D D D D D D	D -19,490 dBm-	D M1[1]	D -19.490 dBm-	01 -19.490 dBm

Ref Lo Att Count				 RBW 100 kHz VBW 300 kHz 	Mode Auto	FFT		
1Pk Vi	ew				M1[1]			1.44 dBn 460770 GH -52.80 dBn
0 dBm-			M1					183500 GH
-10 dBm	,	Juliosh	the when					
-20 dBm		-18.5	60 dBm					
-30 dBm	,							
40 dBm	M		them					
-50 dBm			1	Me	МЗ			
-60 dBm					the second has	and an and an and	the water the	and participation
-70 dBn	1							
Start 2	.44 GI	Hz		691 pts	; ;	1	Sto	2.55 GHz
1arker								
Type	Ref	Trc	X-value	Y-value	Function	Fu	nction Resul	t
M1		1	2.46077 GHz	1.44 dBm				
M2		1	2.4835 GHz	-52.80 dBm				
M3		1	2.5 GHz	-59.58 dBm				
M4		1	2.483522 GHz	-52.80 dBm				



802.11n-HT20 Channel 01 (2412MHz) Reference Level: 1.38dBm

1Pk View				Mode Auto FFT		
				M1[1]		1.38 dBn 2.4107410 GH
LO dBm			and the second se		+ +	
) dBm			M1			
		ulurbarbar	allow they pre	almathemarcoly	talar	
10 dBm	punso				hand	
20 dBm	1	_			- h	
30 dBm	J ^r				2	
SU UBIII	1					1
40 dBm	1				+	Monthing
50 dBm		_				the
60 dBm						
70 dBm						

11[1]			-39.96 dBn 986000 GH:
			+
			1
			<u> </u>
-			-
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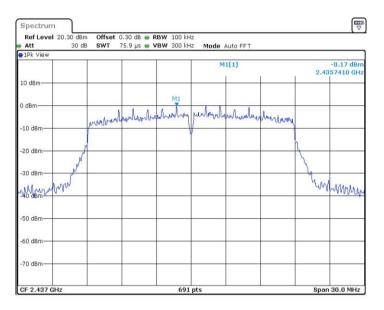
Intertek Report No.: 231204042SZN-003

Att Count 9/:	30 di 10	B SWT	220 115	VBW 300 kH	Houe	Auto Sweep			
1Pk Max					N	11[1]			53.44 dBi 46880 GH
10 dBm—						-		19.6	46880 GF
) dBm									
-10 dBm—									
20 dBm-	D1 -18.620	dBm							
30 dBm—									
40 dBm—									
50 dBm—						1.0	M1		
and the parties	alleranti di Artania Manani di Artania	A Last and	a line of the based	Husen hebrenen Anne hebrenen	de blie de bier	lakkuna jiku Terrena jiku		and a second s	hanghaka dah Kasaltan dari
-70 dBm—									

Refl	evel 3	20.00 dBr	n Offset 0.30 dB	RBW 100 kHz				
Att		30 d		BW 300 kHz	Mode Aut	OFFT		
Count	300/3		o on ooon po (TEN DOO NIL	mode Aut	.orri		
PIPk V								
					M1[1]	1		1.31 dBn
							2	.410720 GH
10 dBm				+ +	M2[1]	1		-39.70 dBn
						N	MI	.400000 GH
0 dBm-	-						Lilly I	
							Mar	myful
-10 dBn							JI .	
		1 -18.690	dDas					
20 dBn		1 -18.090						
							1	
-30 dBn	1-1-1							
							12)	1
40 dBn	1							de la compañía de la
						1 may	× .	The way
-50 dBn	1					Mar		
			Kulahan	all a second	1.5	and all		
PU CHU	and the second	Manne	and hours ward	Mus raenderent	-arranged	- U.X		
-70 dBn								
Start 2	.3 GH	z		691 pts			St	op 2.43 GHz
1arker								
Type	Ref	Trc	X-value	Y-value	Function	- 1 - B	Function Res	ult
M1		1	2.41072 GHz	1.31 dBm				
M2		1	2.4 GHz	-39.70 dBm				
M3		1	2.39 GHz	-56.36 dBm				
		1	2.399855 GHz	-39.31 dBm				



Channel 06 (2437MHz) Reference Level: -0.17dBm



				M1[1]			4.76 dBm
l0 dBm						1.766	1440 GH
) dBm							
10 dBm							
20-d8m-01 -2	20.170 dBm						
30 dBm							
40 dBm					M1		
50 dBm							
60 HBay AL		1	a with a start of the start of the			1000	and service

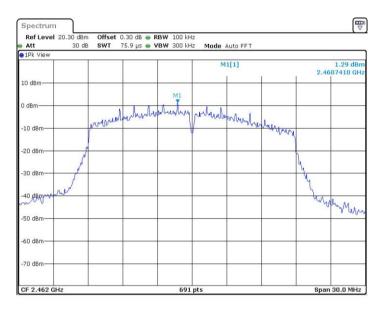


Intertek Report No.: 231204042SZN-003

1Pk Max									
					м	1[1]			51.81 dBi 74300 GH
.0 dBm									
I dBm									
10 dBm									
20-dBm-D	1 -20.170 d	lBm-							
30 dBm									
40 dBm						-			
50 dBm									21
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Channel 11 (2462MHz) Reference Level: 1.29dBm



				M1[1]		-54.45 dBm 1.7686230 GHz
LO dBm				+ +		1.7060230 GH2
) dBm						
10 dBm						
20 dBm D1	-18.710 dBm					
30 dBm						
40 dBm						
50 dBm				N	11	
		(In a la station	مديسيريان			



Intertek Report No.: 231204042SZN-003

Att Count 9/1	30 dB 0	SWT	226 ms 🖷 ۷	ARM 300 KH	2 Mode /	Auto Sweep			
1Pk Max									
					M	1[1]			53.48 dBr 86880 GH
10 dBm			-						
0 dBm									
-10 dBm									
-20 dBm	D1 -18.710	dBm							
-30 dBm									
-40 dBm		-	-						
-50 dBm									
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-70 dBm									

Spect		20.00 di	am Offset 0.30 dB	RBW 100 kHz				
Att		30		VBW 300 kHz	Mode Auto	FFT		
Count	300/30				Mode Hate			
1Pk Vi								
	-		1		M1[1]			-1.39 dBn
							2.4	55680 GH
10 dBm					M2[1]		-	56.36 dBn
		M1			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		2.4	83500 GH
0 dBm-	_	1.00	and they					
100010200		Amas	Well					
-10 dBm)		N.					
-20 dBm		1 -21.3	90 dBm					
	1		N N					
-30 dBm	+						-	
-40 dBm	1 A						-	
we			"Un					
-50 dBm	1-1-1		1	WM2 V				
					M3	10.200		
-60 dBm	1			- man	an manufa	rand the second	my and again	netheration
-70 dBm								
Start 2	.44 Gł	Ηz	· ·	691 pts	8		Stop	2.55 GHz
1arker								
Type	Ref	Trc	X-value	Y-value	Function	Fu	nction Result	
M1		1	2.45568 GHz	-1.39 dBm				
M2		1	2.4835 GHz	-56.36 dBm				
M3		1	2.5 GHz	-60.63 dBm				
M4		1	2.491333 GHz	-54.00 dBm				



Applicant: HUNAN GREATWALL COMPUTER SYSTEM CO.,LTD.Date of Test: 07 December 2023Model: LM1097P

4.5 Out of Band Radiated Emissions (for emissions in 4.4 above that are less than 20dB below carrier), FCC Rule 15.247(d):

For out of band emissions that are close to or that exceed the 20dB attenuation requirement described in the specification, radiated measurements were performed at a 3m separation distance to determine whether these emissions complied with the general radiated emission requirement.

- [×] Not required, since all emissions are more than 20dB below fundamental
- [] See attached data sheet



Applicant: HUNAN GREATWALL COMPUTER SYSTEM CO.,LTD. Date of Test: 07 December 2023 Model: LM1097P

4.6 Transmitter Radiated Emissions in Restricted Bands, FCC Rule 15.35(b) (c):

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included. All measurements were performed with peak detection unless otherwise specified.

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.



Applicant: HUNAN GREATWALL COMPUTER SYSTEM CO.,LTD. Date of Test: 07 December 2023 Model: LM1097P

4.7 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

FS = RA + AF + CF - AG + PD

Where	FS = Field Strength in dBμV/m
	RA = Receiver Amplitude (including preamplifier) in $dB\mu V$
	CF = Cable Attenuation Factor in dB
	AF = Antenna Factor in dB/m
	AG = Amplifier Gain in dB
	PD = Pulse Desensitization in dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

FS = RA + AF + CF - AG + PD

Example

Assume a receiver reading of 62.0 dB μ V is obtained. The antenna factor of 7.4 dB/m and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0 dB. The net field strength for comparison to the appropriate emission limit is 42 dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

RA = 62.0 dBµV AF = 7.4 dB/m CF = 1.6 dB AG = 29.0 dB PD = 0 dB FS = 62 + 7.4 + 1.6 - 29 + 0 = 42 dBµV/m

Level in mV/m = Common Antilogarithm [(42 dB μ V/m)/20] = 125.9 μ V/m



Applicant: HUNAN GREATWALL COMPUTER SYSTEM CO.,LTD.Date of Test: 07 December 2023Model: LM1097P

4.8 Radiated Spurious Emission

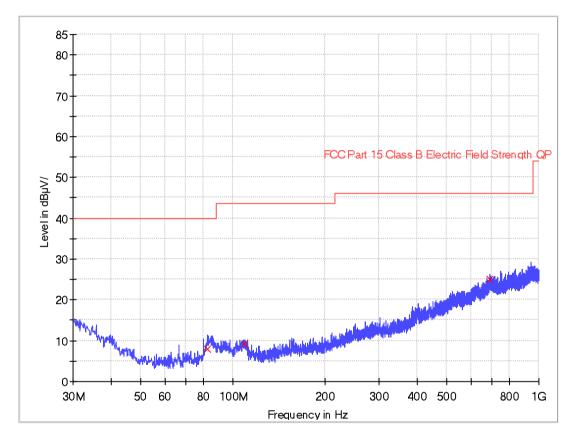
Worst Case Radiated Spurious Emission at 2390.000MHz is passed by 3.3dB margin.

For the electronic filing, the worst case radiated emission configuration photographs are saved with filename: radiated photos.pdf. Simultaneous transmission has been tested, and only the worst-case testing data were recorded in the report.



Applicant: HUNAN GREATWALL COMPUTER SYSTEM CO.,LTD.Date of Test: 07 December 2023Model: LM1097PWorst Case Operating Mode:Simultaneous Transmission

ANT Polarity: Horizontal



FCC Part 15

Frequency (MHz)	Quasi Peak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Corr. (dB/m)	Margin - QPK (dB)	Limit – QPK (dBµV/m)
82.743750	7.9	1000.0	120.000	100.0	н	9.0	32.1	40.0
109.297500	9.2	1000.0	120.000	100.0	н	9.9	34.3	43.5
693.237500	25.1	1000.0	120.000	100.0	Н	25.3	20.9	46.0

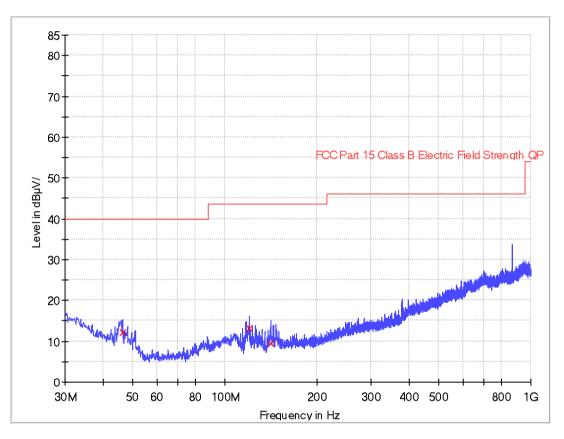
Remark:

- 1. Corr. (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB)
- 2. Quasi Peak (dBµV/m) = Corr. (dB/m) + Read Level (dBµV)
- 3. Margin (dB) = Limit Line (dB μ V/m) Level (dB μ V/m)



Applicant: HUNAN GREATWALL COMPUTER SYSTEM CO.,LTD.Date of Test: 07 December 2023Model: LM1097PWorst Case Operating Mode:Simultaneous Transmission

ANT Polarity: Vertical



FCC Part 15

Frequency (MHz)	Quasi Peak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Corr. (dB/m)	Margin - QPK (dB)	Limit – QPK (dBµV/m)
46.247500	12.1	1000.0	120.000	100.0	v	10.0	27.9	40.0
120.088750	13.2	1000.0	120.000	100.0	v	9.4	30.3	43.5
141.065000	9.5	1000.0	120.000	100.0	v	9.9	34.0	43.5

Remark:

1. Corr. (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB)

2. Quasi Peak (dBµV/m) = Corr. (dB/m) + Read Level (dBµV)

3. Margin (dB) = Limit Line (dB μ V/m) – Level (dB μ V/m)



Applicant: HUNAN GREATWALL COMPUTER SYSTEM CO., LTD. Date of Test: 07 December 2023 Model: LM1097P Worst Case Operating Mode: Transmitting (802.11b-Channel 01)

	Radiated Emissions (above 1GHz)										
Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)				
Horizontal	*4824.000	45.3	36.8	33.5	42.0	74.0	-32.0				
Horizontal	*2390.000	67.5	36.4	29.1	60.2	74.0	-13.8				

. .

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4824.000	32.7	36.8	33.5	29.4	54.0	-24.6
Horizontal	*2390.000	55.1	36.4	29.1	47.8	54.0	-6.2

- 2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
- 3. Negative value in the margin column shows emission below limit.
- 4. Horn antenna used for the emission over 1000MHz.
- * Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.



Applicant: HUNAN GREATWALL COMPUTER SYSTEM CO.,LTD.Date of Test: 07 December 2023Model: LM1097PWorst Case Operating Mode:Transmitting (802.11b-Channel 06)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	45.8	36.7	33.4	42.5	74.0	-31.5
Horizontal	*7311.000	48.0	36.6	35.8	47.2	74.0	-26.8

Radiated Emissions (above 1GHz)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	40.3	36.7	33.4	37.0	54.0	-17.0
Horizontal	*7311.000	43.4	36.6	35.8	42.6	54.0	-11.4

- 2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
- 3. Negative value in the margin column shows emission below limit.
- 4. Horn antenna used for the emission over 1000MHz.
- * Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.



Applicant: HUNAN GREATWALL COMPUTER SYSTEM CO.,LTD.Date of Test: 07 December 2023Model: LM1097PWorst Case Operating Mode:Transmitting (802.11b-Channel 11)

Polarization	Frequency (MHz)	Reading (dBμV)	Pre- Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4924.000	46.1	36.8	33.3	42.6	74.0	-31.4
Horizontal	*7386.000	54.4	36.5	29.3	47.2	74.0	-26.8

Radiated Emissions (above 1GHz)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4924.000	38.6	36.8	33.3	35.1	54.0	-18.9
Horizontal	*7386.000	48.8	36.5	29.3	41.6	54.0	-12.4

- 2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
- 3. Negative value in the margin column shows emission below limit.
- 4. Horn antenna used for the emission over 1000MHz.
- * Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.



Applicant: HUNAN GREATWALL COMPUTER SYSTEM CO.,LTD.Date of Test: 07 December 2023Model: LM1097PWorst Case Operating Mode:Transmitting (802.11g-Channel 01)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4824.000	45.3	36.8	33.5	42.0	74.0	-32.0
Horizontal	*2390.000	67.6	36.4	29.1	60.3	74.0	-13.7

Radiated Emissions (above 1GHz)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4824.000	32.7	36.8	33.5	29.4	54.0	-24.6
Horizontal	*2390.000	57.7	36.4	29.1	50.4	54.0	-3.6

- 2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
- 3. Negative value in the margin column shows emission below limit.
- 4. Horn antenna used for the emission over 1000MHz.
- * Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.



Applicant: HUNAN GREATWALL COMPUTER SYSTEM CO.,LTD.Date of Test: 07 December 2023Model: LM1097PWorst Case Operating Mode:Transmitting (802.11g-Channel 06)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	46.5	36.7	33.4	43.2	74.0	-30.8
Horizontal	*7311.000	48.0	36.6	35.8	47.2	74.0	-26.8

Radiated Emissions (above 1GHz)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	36.8	36.7	33.4	33.5	54.0	-20.5
Horizontal	*7311.000	43.1	36.6	35.8	42.3	54.0	-11.7

- 2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
- 3. Negative value in the margin column shows emission below limit.
- 4. Horn antenna used for the emission over 1000MHz.
- * Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.



Applicant: HUNAN GREATWALL COMPUTER SYSTEM CO.,LTD.Date of Test: 07 December 2023Model: LM1097PWorst Case Operating Mode:Transmitting (802.11g-Channel 11)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4924.000	48.1	36.8	33.3	44.6	74.0	-29.4
Horizontal	*7386.000	53.3	36.5	29.3	46.1	74.0	-27.9

Radiated Emissions (above 1GHz)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4924.000	39.1	36.8	33.3	35.6	54.0	-18.4
Horizontal	*7386.000	51.5	36.5	29.3	44.3	54.0	-9.7

- 2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
- 3. Negative value in the margin column shows emission below limit.
- 4. Horn antenna used for the emission over 1000MHz.
- * Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.



Applicant: HUNAN GREATWALL COMPUTER SYSTEM CO.,LTD.Date of Test: 07 December 2023Model: LM1097PWorst Case Operating Mode:Transmitting (802.11n20-Channel 01)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4824.000	45.3	36.8	33.5	42.0	74.0	-32.0
Horizontal	*2390.000	68.7	36.4	29.1	61.4	74.0	-12.6

Radiated Emissions (above 1GHz)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4824.000	32.7	36.8	33.5	29.4	54.0	-24.6
Horizontal	*2390.000	58.0	36.4	29.1	50.7	54.0	-3.3

- 2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
- 3. Negative value in the margin column shows emission below limit.
- 4. Horn antenna used for the emission over 1000MHz.
- * Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.



Applicant: HUNAN GREATWALL COMPUTER SYSTEM CO.,LTD.Date of Test: 07 December 2023Model: LM1097PWorst Case Operating Mode:Transmitting (802.11n20-Channel 06)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	47.6	36.7	33.4	44.3	74.0	-29.7
Horizontal	*7311.000	46.8	36.6	35.8	46.0	74.0	-28.0

Radiated Emissions (above 1GHz)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	38.4	36.7	33.4	35.1	54.0	-18.9
Horizontal	*7311.000	43.8	36.6	35.8	43.0	54.0	-11.0

- 2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
- 3. Negative value in the margin column shows emission below limit.
- 4. Horn antenna used for the emission over 1000MHz.
- * Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.



Applicant: HUNAN GREATWALL COMPUTER SYSTEM CO.,LTD.Date of Test: 07 December 2023Model: LM1097PWorst Case Operating Mode:Transmitting (802.11n20-Channel 11)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4924.000	49.1	36.8	33.3	45.6	74.0	-28.4
Horizontal	*7386.000	54.3	36.5	29.3	47.1	74.0	-26.9

Radiated Emissions (above 1GHz)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4924.000	39.9	36.8	33.3	36.4	54.0	-17.6
Horizontal	*7386.000	50.4	36.5	29.3	43.2	54.0	-10.8

- 2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
- 3. Negative value in the margin column shows emission below limit.
- 4. Horn antenna used for the emission over 1000MHz.
- * Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.



Intertek Report No.: 231204042SZN-003

Applicant: HUNAN GREATWALL COMPUTER SYSTEM CO.,LTD. Date of Test: 07 December 2023 Model: LM1097P

4.9 Conducted Emission

Worst Case Conducted Emission (802.11b-Channel 01) at 0.562000MHz is passed by 15.1dB margin.

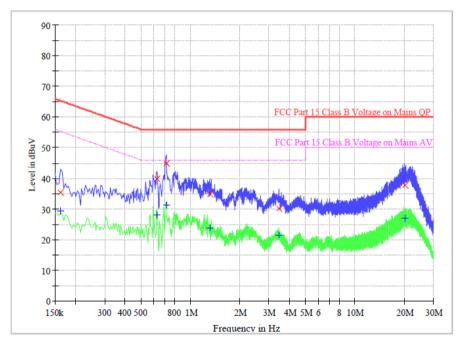
For the electronic filing, the worst case radiated emission configuration photographs are saved with filename: conducted photos.pdf.



Applicant: HUNAN GREATWALL COMPUTER SYSTEM CO.,LTD. Date of Test: 07 December 2023 Model: LM1097P Worst Case Operating Mode: Simultaneous Transmission Test Voltage: AC 120V/60Hz Phase: Live

Graphic / Data Table

Conducted Emissions Pursuant to FCC 15.207: Emissions Requirement



Limit and Margin QP

Frequency	Quasi Peak	Bandwidth	Line	Corr.	Margin	Limit
(MHz)	(dBµV)	(kHz)	Line	(dB)	(dB)	(dBµV)
0.162000	35.6	9.000	L1	9.6	29.8	65.4
0.626000	39.8	9.000	L1	9.7	16.2	56.0
0.714000	45.0	9.000	L1	9.7	11.0	56.0
1.310000	35.0	9.000	L1	9.7	21.0	56.0
3.442000	30.1	9.000	L1	9.7	25.9	56.0
20.306000	37.8	9.000	L1	10.5	22.2	60.0

Limit and Margin AV

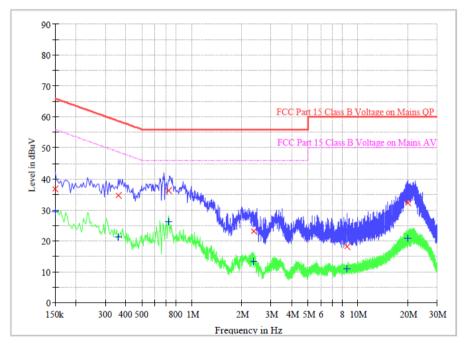
Frequency	Average	Bandwidth	Line	Corr.	Margin	Limit
(MHz)	(dBµV)	(kHz)	Line	(dB)	(dB)	(dBµV)
0.162000	29.3	9.000	L1	9.6	26.1	55.4
0.626000	28.0	9.000	L1	9.7	18.0	46.0
0.714000	31.2	9.000	L1	9.7	14.8	46.0
1.310000	23.9	9.000	L1	9.7	22.1	46.0
3.442000	21.5	9.000	L1	9.7	24.5	46.0
20.306000	26.9	9.000	L1	10.5	23.1	50.0



Applicant: HUNAN GREATWALL COMPUTER SYSTEM CO.,LTD. Date of Test: 07 December 2023 Model: LM1097P Worst Case Operating Mode: Simultaneous Transmission Test Voltage: AC 120V/60Hz Phase: Neutral

Graphic / Data Table

Conducted Emissions Pursuant to FCC 15.207: Emissions Requirement



Limit and Margin QP

Frequency (MHz)	Quasi Peak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	36.6	9.000	N	9.6	29.4	66.0
0.362000	34.6	9.000	Ν	9.6	24.1	58.7
0.722000	36.3	9.000	Ν	9.6	19.7	56.0
2.354000	23.2	9.000	Ν	9.7	32.8	56.0
8.614000	18.1	9.000	N	9.9	41.9	60.0
20.074000	32.3	9.000	Ν	10.6	27.7	60.0

Limit and Margin AV

	-					
Frequency	Average	Bandwidth	Line	Corr.	Margin	Limit
(MHz)	(dBµV)	(kHz)	Line	(dB)	(dB)	(dBµV)
0.150000	29.4	9.000	N	9.6	26.6	56.0
0.362000	21.4	9.000	N	9.6	27.3	48.7
0.722000	26.3	9.000	N	9.6	19.7	46.0
2.354000	13.5	9.000	N	9.7	32.5	46.0
8.614000	10.9	9.000	N	9.9	39.1	50.0
20.074000	20.7	9.000	Ν	10.6	29.3	50.0



Applicant: HUNAN GREATWALL COMPUTER SYSTEM CO.,LTD. Date of Test: 07 December 2023 Model: LM1097P

- 4.10 Radiated Emissions from Digital Section of Transceiver, FCC Ref: 15.109
- [] Not required No digital part
- [] Test results are attached
- [x] Included in the separated report.



Applicant: HUNAN GREATWALL COMPUTER SYSTEM CO.,LTD. Date of Test: 07 December 2023 Model: LM1097P

4.11 Transmitter Duty Cycle Calculation and Measurements, FCC Rule 15.35(b), (c)

The EUT antenna output port was connected to the input of the spectrum analyzer. The analyzer center frequency was set to EUT RF channel carrier. The SWEP function on the analyzer was set to ZERO SPAN. The Transmitter ON time was determined from the resultant time-amplitude display:

	See attached spectrum analyzer chart (s) for Transmitter timing
	See Transmitter timing diagram provided by manufacturer
х	Not applicable, duty cycle was not used.



5.0 Equipment Photographs

For electronic filing, the photographs are saved with filename: external photos.pdf & internal photos.pdf.

6.0 **Product Labeling**

For electronic filing, the FCC ID label artwork and location is saved with filename: label.pdf.

7.0 <u>Technical Specifications</u>

For electronic filing, the block diagram and circuit diagram are saved with filename: block.pdf and circuit.pdf respectively.

8.0 Instruction Manual

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

This manual will be provided to the end-user with each unit sold/leased in the United States.

9.0 <u>Confidentiality Request</u>

For electronic filing, the confidentiality request of the tested EUT is saved with filename: request.pdf.

10.0 Discussion of Pulse Desensitization

The determination of pulse desensitivity was made in accordance with Hewlett Packard Application Note 150-2, *Spectrum Analysis ... Pulsed RF.*

Pulse desensitivity is not applicable for this device since the transmitter transmits the RF signal continuously.



TEST REPORT

11.0 Test Equipment List

Equipment No.	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
SZ061-12	BiConiLog Antenna	ETS	3142E	001661 58	04-Aug-2021	04-Aug-2024
SZ185-03	EMI Receiver	R&S	ESR7	101975	27-Apr-2023	27-Apr-2024
SZ061-08	Horn Antenna	ETS	3115	000923 46	05-Sep-2021	05-Sep-2024
SZ061-06	Active Loop Antenna	Electro-Metrics	EM-6876	217	18-May-2021	18-May-2024
SZ056-03	Spectrum Analyzer	R&S	FSP 30	101148	27-Apr-2023	27-Apr-2024
SZ056-06	Signal Analyzer	R&S	FSV 40	101101	19-Dec-2022 13-Dec-2023	19-Dec-2023 13-Dec-2024
SZ181-04	Preamplifier	Agilent	8449B	3008A0 2474	27-Apr-2023	27-Apr-2024
SZ188-01	Anechoic Chamber	ETS	RFD-F/A- 100	4102	12-Dec-2021	12-Dec-2024
SZ062-23	RF Cable	RADIALL	SF104PE		26-Sep-2023	26-Sep-2024
SZ062-35	RF Cable	RADIALL	A50- 3.5M3.5 M-8M		26-Sep-2023	26-Sep-2024
SZ062-30	RF Cable	RADIALL	A50- 3.5M3.5 M-4.5M		26-Sep-2023	26-Sep-2024
SZ067-04	Notch Filter	Micro-Tronics	BRM507 02-02		27-Apr-2023	27-Apr-2024
SZ185-02	EMI Test Receiver	R&S	ESCI	100692	11-Jul-2023	11-Jul-2024
SZ187-01	Two-Line V- Network	R&S	ENV216	100072	18-Oct-2023	19-Oct-2024
SZ187-02	Two-Line V- Network	R&S	ENV216	100072	27-Apr-2023	27-Apr-2024
SZ062-16	RF Cable	HUBER+SUHNE R	CBL2- BN-1m	110127- 223100 0	11-Jul-2023	11-Jul-2024
SZ188-03	Shielding Room	ETS	RFD-100	4100	20-Dec-2022	20-Dec-2025