



RF TEST REPORT

Product Name: TinyGateway PoE

Model Name: TNP01

FCC ID: 2ALP7TNP01

Issued For : BlueUp Srl

Loc. Belvedere, Ingresso 2, 99 Colle di Val d'Elsa, ITALY

Issued By : Shenzhen LGT Test Service Co., Ltd.

Room 205, Building 13, Zone B, Zhenxiong Industrial Park,
No.177, Renmin West Road, Jinsha, Kengzi Street, Pingshan
District, Shenzhen, Guangdong, China

Report Number: LGT23K135RF01

Sample Received Date: Dec. 04, 2023

Date of Test: Jan. 19, 2024 –Jan. 26, 2024

Date of Issue: Jan. 26, 2024

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TEST REPORT CERTIFICATION

Applicant: BlueUp Srl
Address: Loc. Belvedere, Ingresso 2, 99 Colle di Val d'Elsa, ITALY
Manufacturer: BlueUp Srl
Address: Loc. Belvedere, Ingresso 2, 99 Colle di Val d'Elsa, ITALY
Product Name: TinyGateway PoE
Trademark: TinyGateway PoE
Model Name: TNP01
Sample Status: Normal

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC Part 15.247, Subpart C ANSI C63.10-2013	PASS

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Revision History

Rev.	Issue Date	Contents
00	Jan. 26, 2024	Initial Issue



1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:
KDB 558074 D01 15.247 Meas Guidance v05r02.

FCC Part 15.247, Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	--
15.247 (a)(2)	6dB Bandwidth	N.A	--
15.247 (b)(3)	Output Power	N.A	--
15.209	Radiated Spurious Emission	PASS	--
15.247 (d)	Conducted Spurious & Band Edge Emission	N.A	--
15.247 (e)	Power Spectral Density	N.A	--
15.205	Restricted Band Edge Emission	N.A	--
Part 15.247(d)/ Part 15.209(a)	Band Edge Emission	PASS	--
15.203	Antenna Requirement	PASS	--

NOTE:

- (1) 'N/A' denotes test is not applicable in this Test Report.
- (2) All tests are according to ANSI C63.10-2013.



1.1 TEST FACTORY

Company Name:	Shenzhen LGT Test Service Co., Ltd.
Address:	Room 205, Building 13, Zone B, Zhenxiong Industrial Park, No.177, Renmin West Road, Jinsha, Kengzi Street, Pingshan District, Shenzhen, Guangdong, China
Accreditation Certificate	A2LA Certificate No.: 6727.01
	FCC Registration No.: 746540
	CAB ID: CN0136

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately **95** %.

No.	Item	Uncertainty
1	RF output power, conducted	± 0.68 dB
2	Unwanted Emissions, conducted	± 2.988 dB
3	All emissions, radiated 9K-30MHz	± 2.84 dB
4	All emissions, radiated 30M-1GHz	± 4.39 dB
5	All emissions, radiated 1G-6GHz	± 5.10 dB
6	All emissions, radiated >6G	± 5.48 dB
7	Conducted Emission (9KHz-150KHz)	± 2.79 dB
8	Conducted Emission (150KHz-30MHz)	± 2.80 dB

Note: The measurement uncertainty is not included in the test result.



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

Product Name:	TinyGateway PoE	
Trademark:	TinyGateway PoE	
Model Name:	TNP01	
Series Model:	N/A	
Model Difference:	N/A	
Product Description:	Operation Frequency:	2402~2480 MHz
	Modulation Type:	GFSK
	Radio Technology:	BLE
	Bluetooth Configuration:	BLE (1M PHY, 2M PHY)
	Number Of Channel:	40
	Antenna Designation:	PCB
	Antenna Gain (dBi)	3.26dBi
Channel List:	Please refer to the Note 3.	
Rating:	Input: DC 5V, 0.3A, 1.5W	
Hardware Version:	1.0	
Software Version:	1.0	
Connecting I/O Port(s):	Please refer to the Note 1.	

Note:

- For a more detailed features description, please refer to the manufacturer's specifications or the User Manual.
- The antenna information refers to the manufacturer provide report, applicable only to the tested sample identified in the report. Due to the incorrect antenna information, a series of problems such as the accuracy of the test results will be borne by the customer.
-

Channel List							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	10	2422	20	2442	30	2462
01	2404	11	2424	21	2444	31	2464
02	2406	12	2426	22	2446	32	2466
03	2408	13	2428	23	2448	33	2468
04	2410	14	2430	24	2450	34	2470
05	2412	15	2432	25	2452	35	2472
06	2414	16	2434	26	2454	36	2474
07	2416	17	2436	27	2456	37	2476
08	2418	18	2438	28	2458	38	2478
09	2420	19	2440	29	2460	39	2480



2.2 DESCRIPTION OF THE TEST MODES

For conducted test items and radiated spurious emissions
 Each of these EUT operation mode(s) or test configuration mode(s) mentioned below was evaluated respectively.

Worst Mode	Description	Data/Modulation
Mode 1	TX CH00(2402MHz)	1 MHz/GFSK
Mode 2	TX CH19(2440MHz)	1 MHz/GFSK
Mode 3	TX CH39(2480MHz)	1 MHz/GFSK

Worst Mode	Description	Data/Modulation
Mode 4	TX CH00(2402MHz)	2 MHz/GFSK
Mode 5	TX CH19(2440MHz)	2 MHz/GFSK
Mode 6	TX CH39(2480MHz)	2 MHz/GFSK

Note:

- (1) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported.
- (2) We have be tested for all avaiable U.S. voltage and frequency (For 120V,50/60Hz and 240V, 50/60Hz) for which the device is capable of operation, and the worst case of 120V/60Hz is shown in the report.
- (3) The battery is fully-charged during the radited and RF conducted test.

For AC Conducted Emission

Test Case	
AC Conducted Emission	Mode 7: Keeping BLE TX

2.3 TEST SOFTWARE AND POWER LEVEL

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level.

Test software Version	Test program: BLE	
	Mode Or Modulation type	Power setting
EspRFTestTool_v2.8_Manual	1M	8
	2M	8



2.4 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Accessories Equipment

Description	Manufacturer	Model	S/N	Rating

Auxiliary Equipment for EMC

Description	Manufacturer	Model	S/N	Rating
POE Switch	TP-LINK	TL-SF1005P	N/A	/
Adapter	TP-LINK	T535113-2X1	N/A	Input: AC 220V 50Hz 1.4A Output: DC 53.5V 1.13A
RJ45 Cable	UGREEN	NW153	N/A	2m, shielded, without ferrite core
Adapter	Tenpao	S005CAU050010 0	N/A	Input: 100-240V ~ 50/60Hz 0.2A Output: 5V, 1A
USB-A to USB-C Cable	UGREEN	US287	N/A	1m, shielded, without ferrite core
Laptop	Lenovo	HKF-16	N/A	N/A

Note:

- (1) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (2) “YES” is means “with core”; “NO” is means “without core”.



2.5 EQUIPMENTS LIST

Conducted Emission					
Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Until
EMI Test Receiver	R&S	ESU8	100372	2023.04.13	2024.04.12
LISN	COM-POWER	LI-115	02032	2023.04.07	2024.04.06
LISN	SCHWARZBECK	NNLK 8122	00160	2023.04.07	2024.04.06
Transient Limiter	CYBERTEK	EM5010A	E2250100049	2023.04.07	2024.04.06
Temperature & Humidity	KTJ	TA218B	N.A	2023.04.24	2024.04.23
Testing Software	EMC-I_V1.4.0.3_SKET				

Radiation Test equipment					
Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Until
EMI Test Receiver	R&S	ESU	100372	2023.04.13	2024.04.12
Spectrum Analyzer	Keysight	N9010B	MY60242508	2023.04.10	2024.04.09
Active loop Antenna	ETS	6502	00049544	2023.04.10	2024.04.09
Bilog Antenna	SCHWARZBECK	VULB 9168	01447	2022.06.05	2025.06.04
Horn Antenna	SCHWARZBECK	3115	10SL0060	2022.06.02	2025.06.01
Pre-amplifier (9kHz-1GHz)	EMtrace	RP01A	02017	2023.04.07	2024.04.06
Pre-amplifier(1-26.5G)	Agilent	8449B	3008A4722	2023.04.07	2024.04.06
RE Cable (9K-1G)	N.A	R01	N.A	2023.04.07	2024.04.06
RE Cable (1-26G)	N.A	R02	N.A	2023.04.07	2024.04.06
Temperature & Humidity	KTJ	TA218B	N.A	2023.04.24	2024.04.23
Testing Software	EMC-I_V1.4.0.3_SKET				

RF Connected Test equipment					
Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Until
Signal Generator	Keysight	N5182B	MY59100717	2023.04.10	2024.04.09
Signal Analyzer	Keysight	N9010B	MY60242508	2023.04.13	2024.04.12
Wireless Communications Test Set	R&S	CMW 500	137737	2023.04.13	2024.04.12
Temperature & Humidity	KTJ	TA218B	N/A	2023.04.24	2024.04.23
Temperature& Humidity test chamber	AISRY	LX-1000L	171200018	2023.05.10	2024.05.09
Attenuator	eastsheep	90db	N/A	2023.04.10	2024.04.09
Testing Software	MTS 8310_2.0.0.0_MWRF-TEST				



3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION LIMITS

The radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table.

FREQUENCY (MHz)	Conducted Emission limit (dBuV)	
	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of “ * ” marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

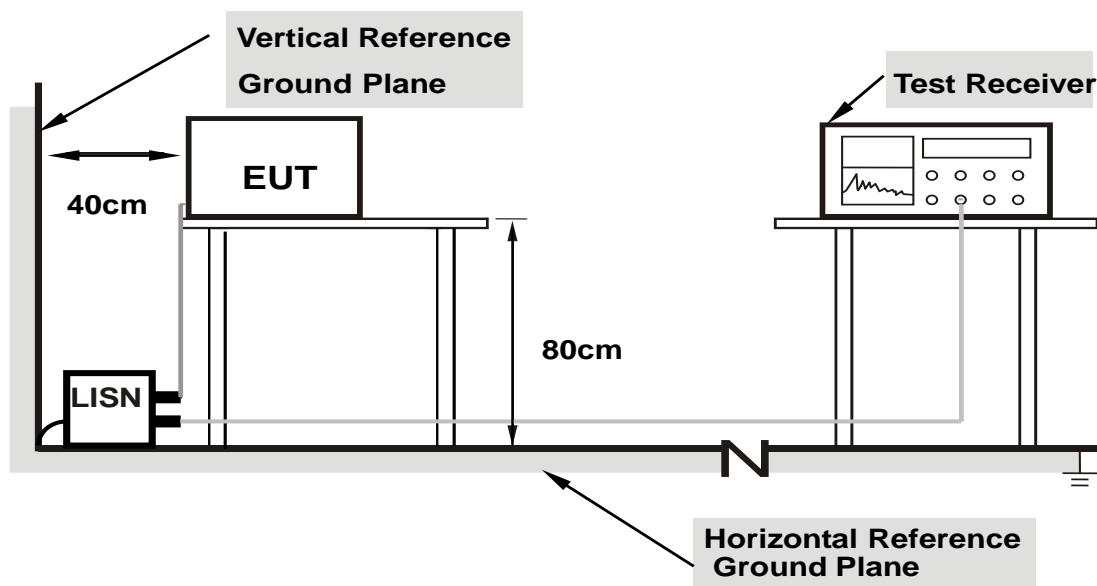
The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.2 TEST PROCEDURE

- The EUT is 0.8 m from the horizontal ground plane and 0.4 m from the vertical ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments are powered from additional LISN(s). The LISN provides 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- LISN is at least 80 cm from the nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.3 TEST SETUP



- Note: 1. Support units were connected to second LISN.**
- 2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes support units.**

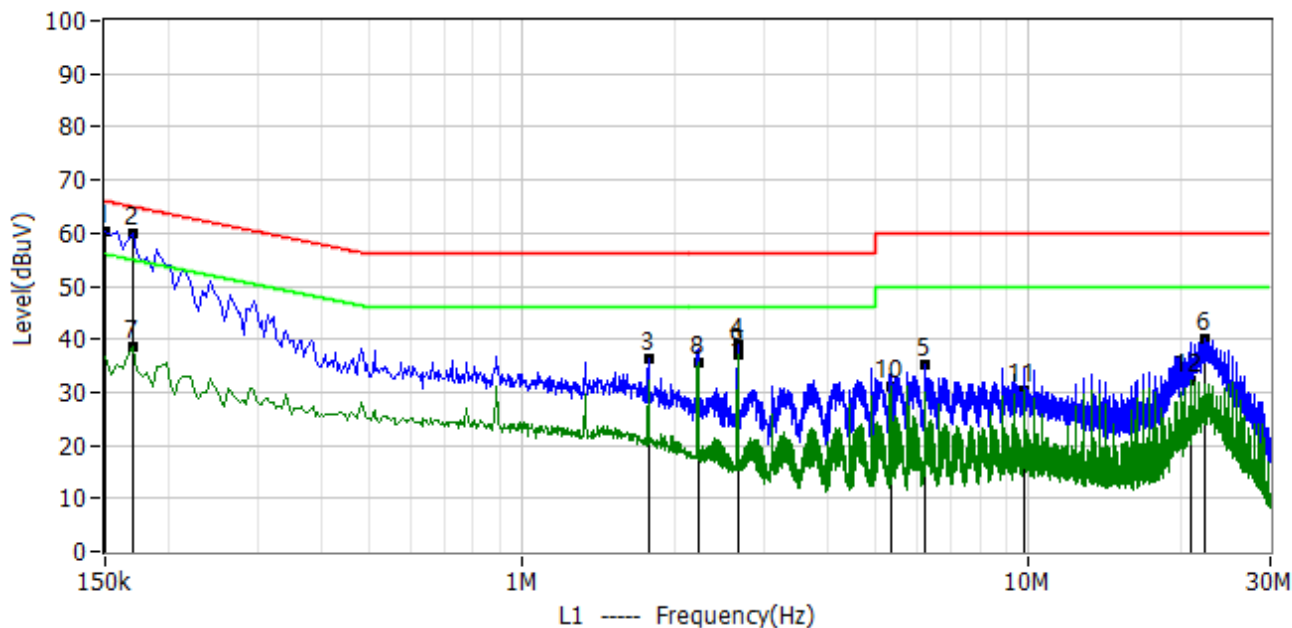
3.4 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.



3.5 TEST RESULTS

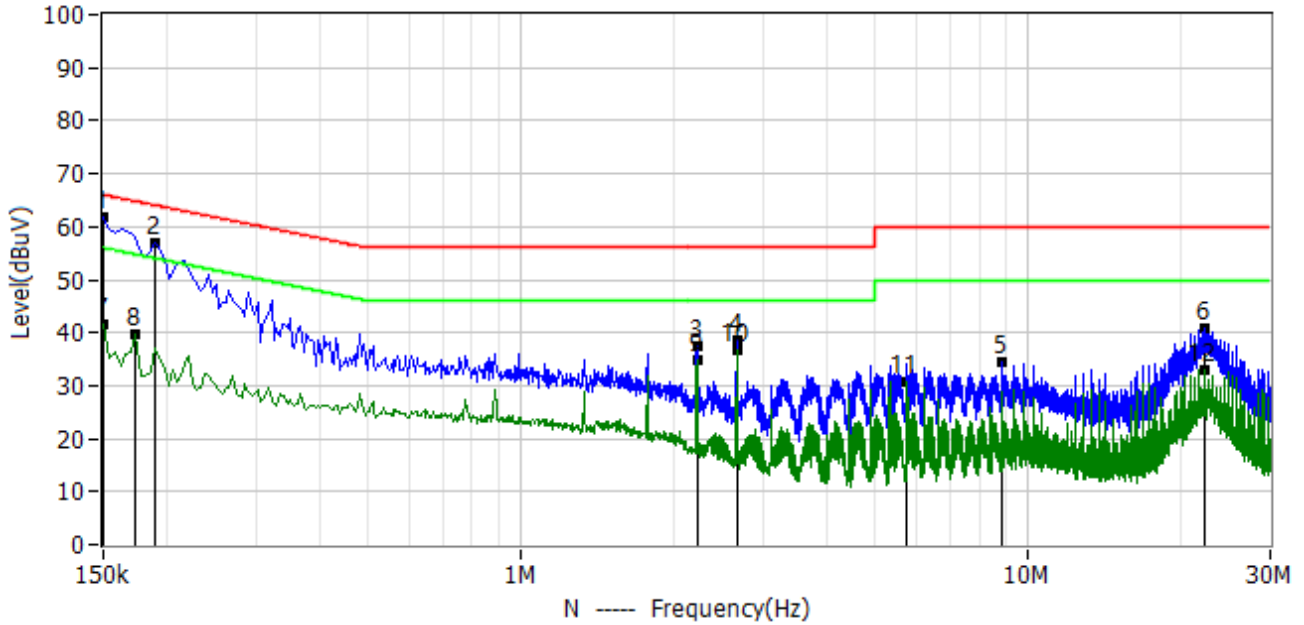
Project: LGT23K135	Test Engineer: LiuH
EUT: TinyGateway PoE	Temperature: 22.3°C
M/N: TNP01(Indoor version)	Humidity: 47%RH
Test Voltage: POE 48V	Test Data: 2024-01-19
Test Mode: TX BLE 1M 2402	
Note:	



No.	Frequency MHz	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Margin dB	Detector	Polar
1*	0.150	49.94	10.49	60.43	66.00	-5.57	QP	L1
2*	0.170	49.57	10.49	60.06	64.96	-4.90	QP	L1
3*	1.778	25.57	10.68	36.25	56.00	-19.75	QP	L1
4*	2.666	28.07	10.74	38.81	56.00	-17.19	QP	L1
5*	6.218	24.44	10.84	35.28	60.00	-24.72	QP	L1
6*	22.202	28.99	11.15	40.14	60.00	-19.86	QP	L1
7*	0.170	28.07	10.49	38.56	54.96	-16.40	AV	L1
8*	2.222	24.70	10.73	35.43	46.00	-10.57	AV	L1
9*	2.666	26.33	10.74	37.07	46.00	-8.93	AV	L1
10*	5.330	20.37	10.81	31.18	50.00	-18.82	AV	L1
11*	9.770	19.19	10.96	30.15	50.00	-19.85	AV	L1
12*	20.870	21.02	11.12	32.14	50.00	-17.86	AV	L1



Project: LGT23K135	Test Engineer: LiuH
EUT: TinyGateway PoE	Temperature: 22.3°C
M/N: TNP01(Indoor version)	Humidity: 47%RH
Test Voltage: POE 48V	Test Data: 2024-01-19
Test Mode: TX BLE 1M 2402	
Note:	



No.	Frequency MHz	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Margin dB	Detector	Polar
1*	0.150	51.20	10.49	61.69	66.00	-4.31	QP	N
2*	0.190	46.42	10.49	56.91	64.04	-7.13	QP	N
3*	2.222	26.58	10.73	37.31	56.00	-18.69	QP	N
4*	2.666	27.76	10.74	38.50	56.00	-17.50	QP	N
5*	8.882	23.58	10.97	34.55	60.00	-25.45	QP	N
6*	22.206	29.53	11.25	40.78	60.00	-19.22	QP	N
7*	0.150	31.17	10.49	41.66	56.00	-14.34	AV	N
8*	0.174	29.13	10.49	39.62	54.77	-15.15	AV	N
9*	2.222	24.19	10.73	34.92	46.00	-11.08	AV	N
10*	2.666	26.01	10.74	36.75	46.00	-9.25	AV	N
11*	5.774	20.04	10.83	30.87	50.00	-19.13	AV	N
12*	22.206	21.71	11.25	32.96	50.00	-17.04	AV	N



4. RADIATED EMISSION MEASUREMENT

4.1 Radiated Emission Limits

In case the emission fall within the Restricted band specified on Part15.205 (a)&209(a) limit in the table and according to ANSI C63.10-2013 below has to be followed.

LIMITS OF RADIATED EMISSION MEASUREMENT (0.009MHz - 1000MHz)

Frequencies (MHz)	Field Strength (microlvolts/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
Above 960	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (1GHz-25 GHz)

FREQUENCY (MHz)	(dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

LIMITS OF RESTRICTED FREQUENCY BANDS

FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (GHz)
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6
13.36-13.41			



For Radiated Emission

Spectrum Parameter	Setting
Attenuation	Auto
Detector	Peak/QP/AV
Start Frequency	9 KHz/150KHz (Peak/QP/AV)
Stop Frequency	150KHz/30MHz (Peak/QP/AV)
RB / VB (emission in restricted band)	200Hz (From 9kHz to 0.15MHz)/ 9KHz (From 0.15MHz to 30MHz); 200Hz (From 9kHz to 0.15MHz)/ 9KHz (From 0.15MHz to 30MHz)

Spectrum Parameter	Setting
Attenuation	Auto
Detector	Peak/QP
Start Frequency	30 MHz (Peak/QP)
Stop Frequency	1000 MHz (Peak/QP)
RB / VB (emission in restricted band)	120 KHz / 300 KHz

Spectrum Parameter	Setting
Attenuation	Auto
Detector	Peak
Start Frequency	1000 MHz (Peak/AV)
Stop Frequency	10th carrier harmonic (Peak/AV)
RB / VB (emission in restricted band)	1 MHz / 3 MHz(Peak) 1 MHz/1/T MHz(AVG)

For Restricted band

Spectrum Parameter	Setting
Detector	Peak
Start/Stop Frequency	Lower Band Edge: 2310 to 2410 MHz Upper Band Edge: 2475 to 2500 MHz
RB / VB	1 MHz / 3 MHz(Peak) 1 MHz/1/T MHz(AVG)

Receiver Parameter	Setting
Start ~ Stop Frequency	9kHz~90kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	90kHz~110kHz / RB 200Hz for QP
Start ~ Stop Frequency	110kHz~490kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	490kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP



4.2 TEST PROCEDURE

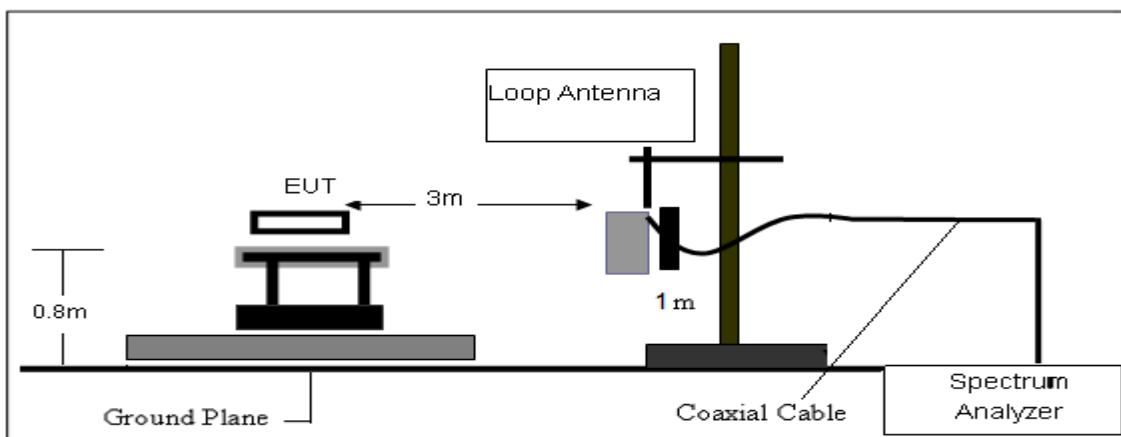
- The measuring distance at 3 m shall be used for measurements at frequency 0.009MHz up to 1GHz, and above 1GHz.
- The EUT was placed on the top of a rotating table 0.8 m (above 1GHz is 1.5 m) above the ground at a 3 m anechoic chamber test site. The table was rotated 360 degree to determine the position of the highest radiation.
- The height of the equipment shall be 0.8 m(above 1GHz is 1.5 m); the height of the test antenna shall vary between 1 m to 4 m. Horizontal and vertical polarization of the antenna are set to make the measurement.
- The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and QuasiPeak detector mode will be re-measured.
- If the Peak Mode measured value is compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and no additional QP Mode measurement was performed.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

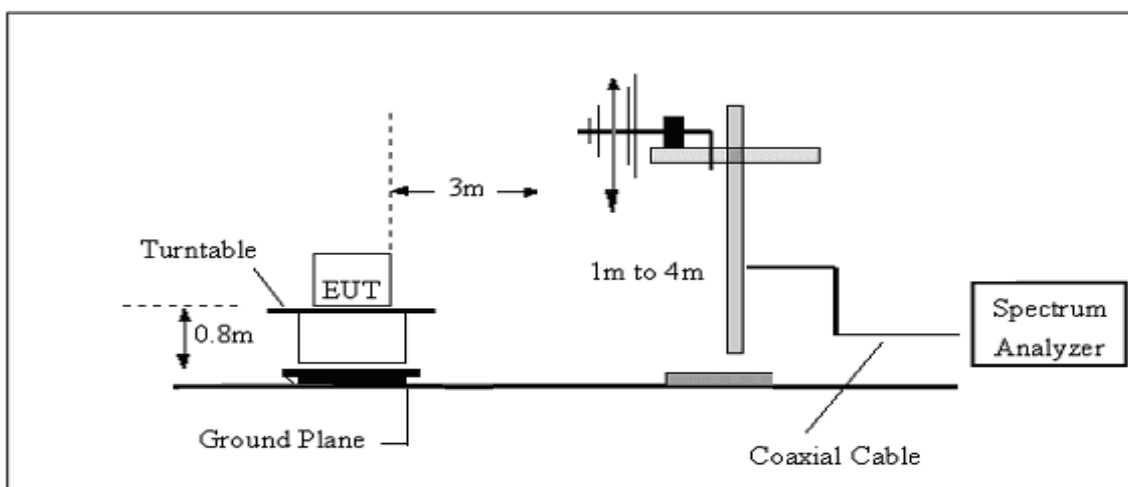
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

4.3 TEST SETUP

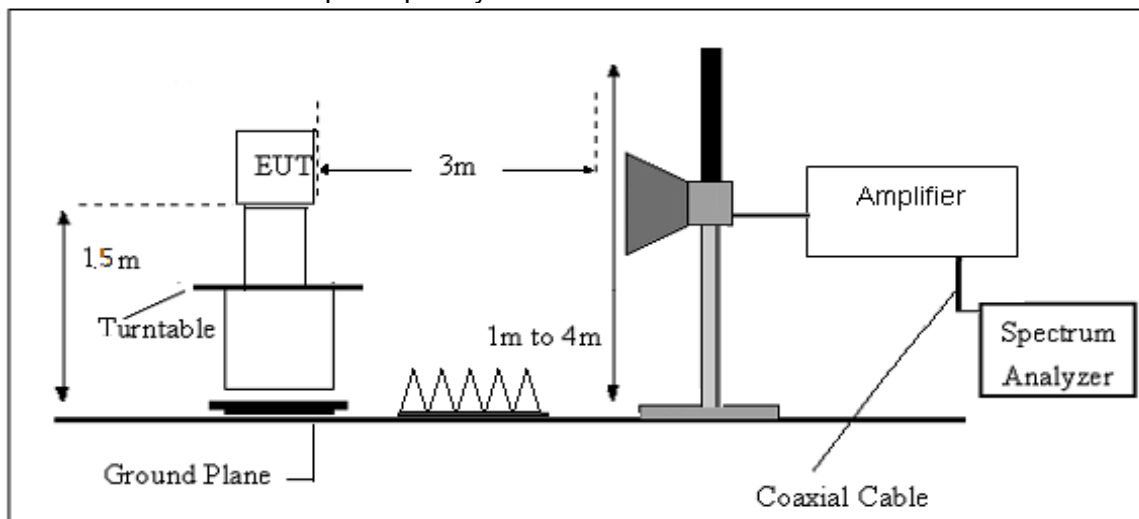
(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



(C) Radiated Emission Test-Up Frequency Above 1GHz



4.4 EUT OPERATING CONDITIONS

Please refer to section 3.4 of this report.

4.5 FIELD STRENGTH CALCULATION

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where

FS = Field Strength

CL = Cable Attenuation Factor (Cable Loss)

RA = Reading Amplitude

AG = Amplifier Gain

AF = Antenna Factor

For example

Frequency (MHz)	FS (dB μ V/m)	RA (dB μ V/m)	AF (dB)	CL (dB)	AG (dB)	Factor (dB)
300	40	58.1	12.2	1.6	31.9	-18.1

$$\text{Factor} = \text{AF} + \text{CL} - \text{AG}$$



4.6 TEST RESULTS

Results of Radiated Emissions (9 KHz~30MHz)

No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Remark
1*	-	-	-	-	-	-	-	See Note

Note:

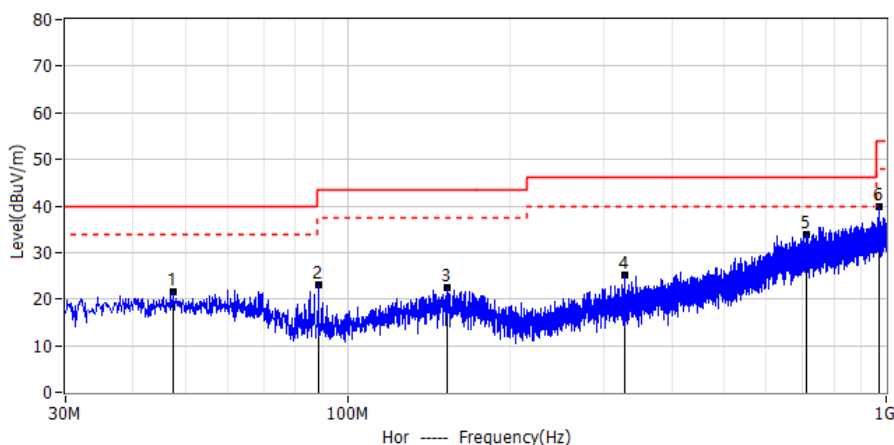
The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and the permissible value has no need to be reported.

Distance extrapolation factor = $40 \log (\text{specific distance} / \text{test distance})$ (dB);
Limit line = specific limits (dBuV) + distance extrapolation factor.

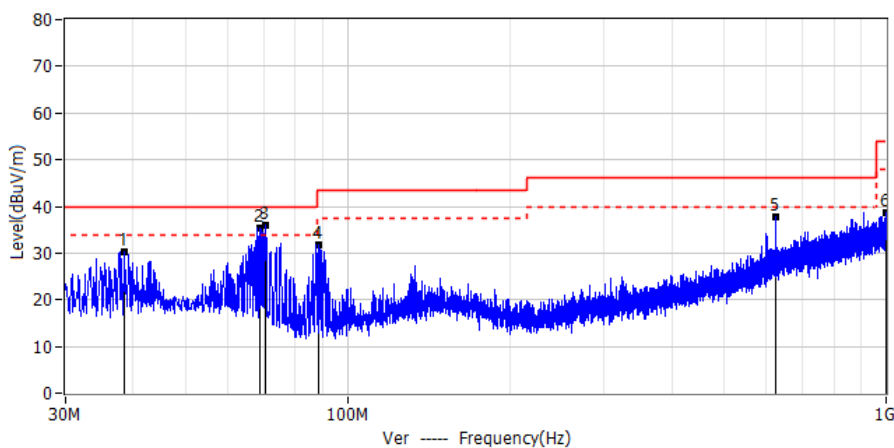


Results of Radiated Emissions (30MHz~1000MHz)

Project: LGT23K135	Test Engineer: Xiangdong Ma
EUT: TinyGateway PoE	Temperature: 26.5°C
M/N: TNP01	Humidity: 50%RH
Test Voltage: POE 48V	Test Data: 2024-01-20
Test Mode: TX BLE 1M 2402	
Note:	



No.	Frequency MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	47.460	2.32	19.29	21.61	40.00	-18.39	QP	Hor
2*	88.321	7.86	15.08	22.94	43.50	-20.56	QP	Hor
3*	152.826	2.43	19.95	22.38	43.50	-21.12	QP	Hor
4*	326.941	4.39	20.74	25.13	46.00	-20.87	QP	Hor
5*	712.395	4.00	29.97	33.97	46.00	-12.03	QP	Hor
6*	972.234	5.48	34.39	39.87	54.00	-14.13	QP	Hor

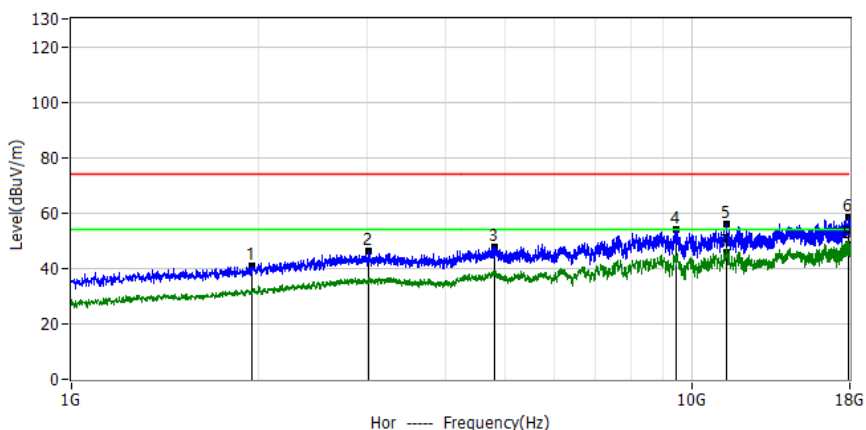


No.	Frequency MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	38.488	11.17	19.13	30.30	40.00	-9.70	QP	Ver
2*	68.800	17.25	18.09	35.34	40.00	-4.66	QP	Ver
3*	70.376	17.97	17.91	35.88	40.00	-4.12	QP	Ver
4*	88.685	16.77	15.08	31.85	43.50	-11.65	QP	Ver
5*	624.974	9.20	28.59	37.79	46.00	-8.21	QP	Ver
6*	999.394	4.02	34.57	38.59	54.00	-15.41	QP	Ver

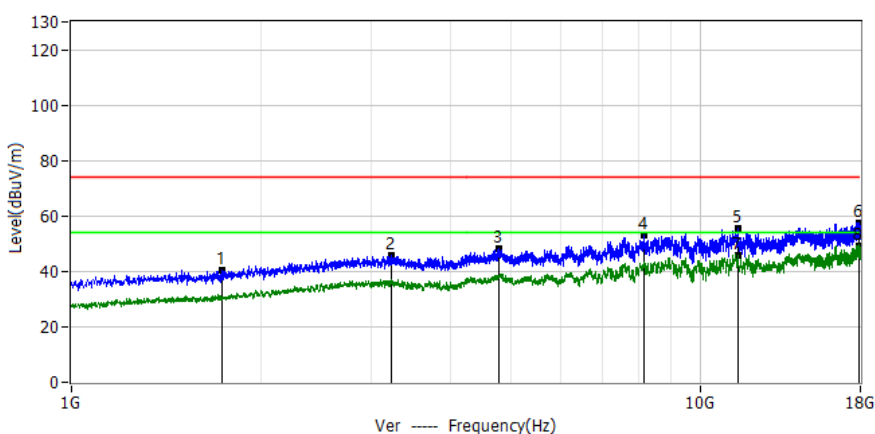


Results of Radiated Emissions (Above 1000MHz)

Project: LGT23K135	Test Engineer: Xiangdong Ma
EUT: TinyGateway PoE	Temperature: 21°C
M/N: TNP01	Humidity: 45%RH
Test Voltage: POE 48V	Test Data: 2024-01-21
Test Mode: BLE 2M 2M 2402	
Note: Worst Case	



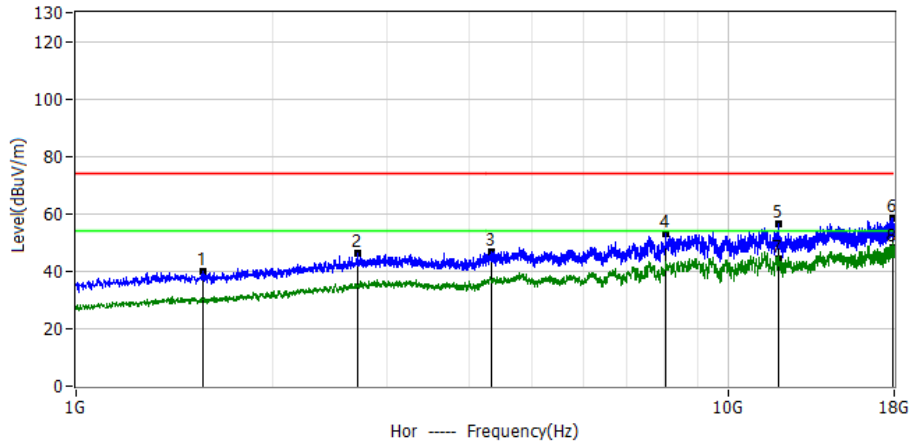
No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1.9499GHz	57.84	-16.74	41.10	74.00	-32.90	PK	Hor
2*	3.0145GHz	54.36	-8.34	46.02	74.00	-27.98	PK	Hor
3*	4.8144GHz	53.85	-6.00	47.85	74.00	-26.15	PK	Hor
4*	9.4617GHz	54.99	-1.17	53.82	74.00	-20.18	PK	Hor
5*	11.3870GHz	53.97	1.86	55.83	74.00	-18.17	PK	Hor
6*	17.9447GHz	49.90	8.48	58.38	74.00	-15.62	PK	Hor
7*	11.3870GHz	44.14	1.86	46.00	54.00	-8.00	AV	Hor
8*	17.9447GHz	40.12	8.48	48.60	54.00	-5.40	AV	Hor



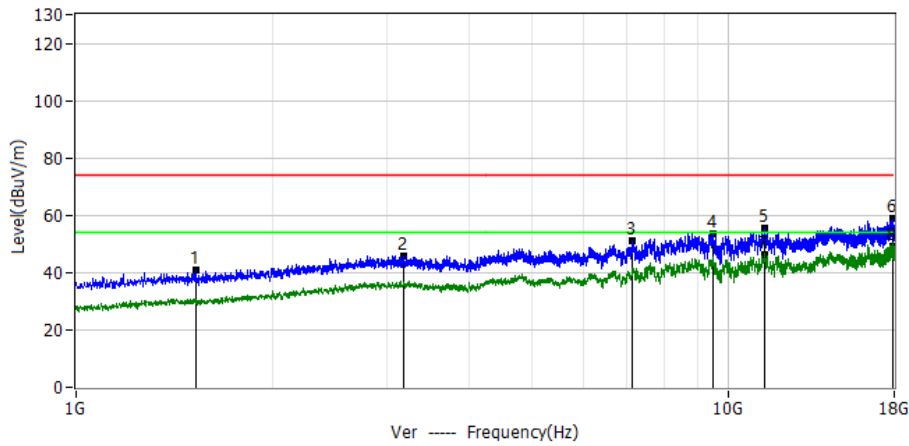
No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1.7331GHz	59.35	-18.90	40.45	74.00	-33.55	PK	Ver
2*	3.2227GHz	53.98	-8.41	45.57	74.00	-28.43	PK	Ver
3*	4.7867GHz	54.08	-5.98	48.10	74.00	-25.90	PK	Ver
4*	8.1442GHz	56.90	-3.59	53.31	74.00	-20.69	PK	Ver
5*	11.5039GHz	53.80	1.93	55.73	74.00	-18.27	PK	Ver
6*	17.9405GHz	49.05	8.48	57.53	74.00	-16.47	PK	Ver
7*	11.5039GHz	43.67	1.93	45.60	54.00	-8.40	AV	Ver
8*	17.9405GHz	40.52	8.48	49.00	54.00	-5.00	AV	Ver



Project: LGT23K135	Test Engineer: Xiangdong Ma
EUT: TinyGateway PoE	Temperature: 21°C
M/N: TNP01	Humidity: 45%RH
Test Voltage: POE 48V	Test Data: 2024-01-21
Test Mode: BLE 2M 2M 2440	
Note: Worst Case	



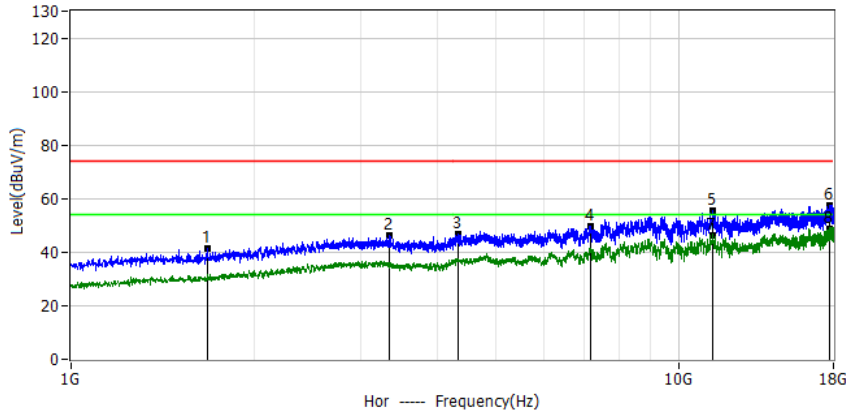
No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1.5631GHz	60.42	-20.42	40.00	74.00	-34.00	PK	Hor
2*	2.7021GHz	55.97	-9.92	46.05	74.00	-27.95	PK	Hor
3*	4.3299GHz	53.20	-6.47	46.73	74.00	-27.27	PK	Hor
4*	8.0210GHz	57.06	-3.94	53.12	74.00	-20.88	PK	Hor
5*	11.9352GHz	54.10	2.18	56.28	74.00	-17.72	PK	Hor
6*	17.9490GHz	50.15	8.48	58.63	74.00	-15.37	PK	Hor
7*	11.9352GHz	42.22	2.18	44.40	54.00	-9.60	AV	Hor
8*	17.9490GHz	39.92	8.48	48.40	54.00	-5.60	AV	Hor



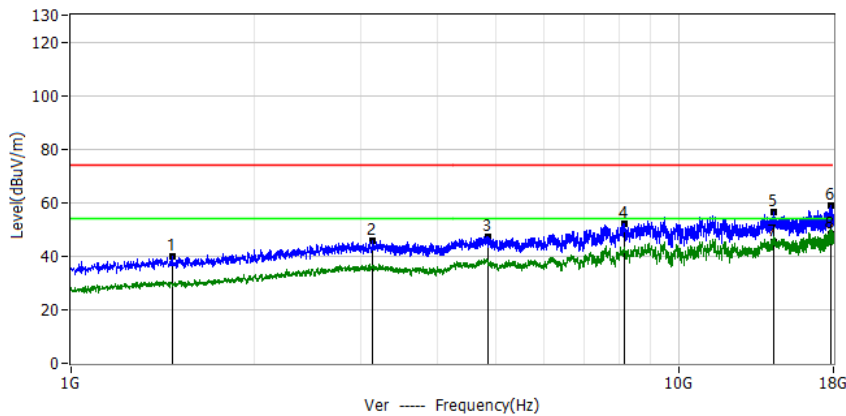
No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1.5249GHz	61.82	-20.68	41.14	74.00	-32.86	PK	Ver
2*	3.1760GHz	54.38	-8.40	45.98	74.00	-28.02	PK	Ver
3*	7.1327GHz	56.35	-5.32	51.03	74.00	-22.97	PK	Ver
4*	9.4915GHz	54.59	-1.17	53.42	74.00	-20.58	PK	Ver
5*	11.3912GHz	53.58	1.86	55.44	74.00	-18.56	PK	Ver
6*	17.9405GHz	50.36	8.48	58.84	74.00	-15.16	PK	Ver
7*	11.3912GHz	44.34	1.86	46.20	54.00	-7.80	AV	Ver
8*	17.9405GHz	40.82	8.48	49.30	54.00	-4.70	AV	Ver



Project: LGT23K135	Test Engineer: Xiangdong Ma
EUT: TinyGateway PoE	Temperature: 21°C
M/N: TNP01	Humidity: 45%RH
Test Voltage: POE 48V	Test Data: 2024-01-21
Test Mode: BLE 2M 2M 2480	
Note: Worst Case	



No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1.6736GHz	60.64	-19.47	41.17	74.00	-32.83	PK	Hor
2*	3.3396GHz	54.59	-8.45	46.14	74.00	-27.86	PK	Hor
3*	4.3341GHz	53.11	-6.46	46.65	74.00	-27.35	PK	Hor
4*	7.1582GHz	55.06	-5.25	49.81	74.00	-24.19	PK	Hor
5*	11.3976GHz	53.77	1.86	55.63	74.00	-18.37	PK	Hor
6*	17.7152GHz	49.25	8.32	57.57	74.00	-16.43	PK	Hor
7*	11.3976GHz	44.24	1.86	46.10	54.00	-7.90	AV	Hor
8*	17.7152GHz	40.28	8.32	48.60	54.00	-5.40	AV	Hor



No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1.4675GHz	60.83	-21.02	39.81	74.00	-34.19	PK	Ver
2*	3.1314GHz	54.38	-8.38	46.00	74.00	-28.00	PK	Ver
3*	4.8484GHz	53.23	-6.02	47.21	74.00	-26.79	PK	Ver
4*	8.1294GHz	55.77	-3.63	52.14	74.00	-21.86	PK	Ver
5*	14.3577GHz	50.35	5.90	56.25	74.00	-17.75	PK	Ver
6*	17.8364GHz	50.53	8.41	58.94	74.00	-15.06	PK	Ver
7*	14.3577GHz	39.50	5.90	45.40	54.00	-8.60	AV	Ver
8*	17.8364GHz	39.79	8.41	48.20	54.00	-5.80	AV	Ver

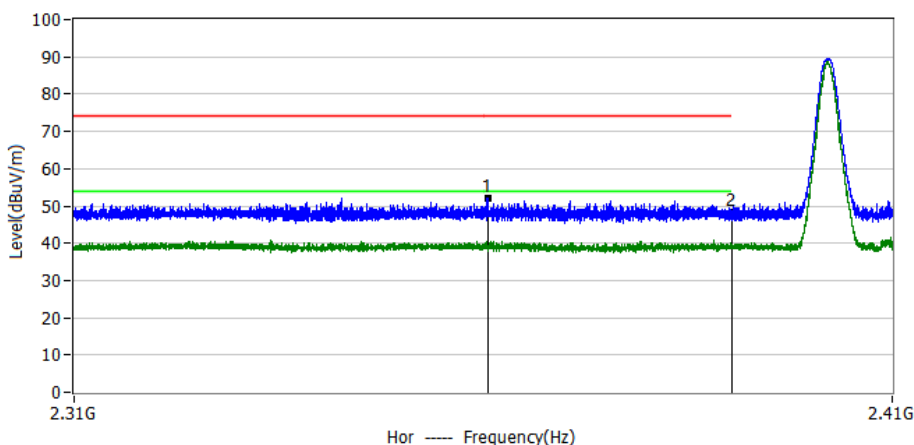
Remark:

In frequency ranges 18~25GHz no any other harmonic emissions detected which are tested to compliance with the limit. No recording in the test report. No any other emissions level which are attenuated less than 20dB below the limit. No recording in the test report.

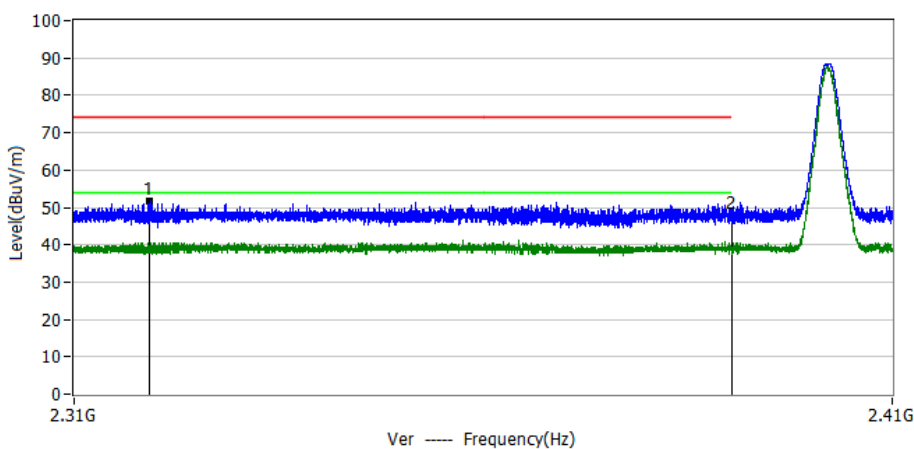


4.7 TEST RESULTS (BAND EDGE REQUIREMENTS)

Project: LGT23K135	Test Engineer: Xiangdong Ma
EUT: TinyGateway PoE	Temperature: 21°C
M/N: TNP01	Humidity: 45%RH
Test Voltage: POE 48V	Test Data: 2024-01-21
Test Mode: BLE 2M 2402	
Note:	



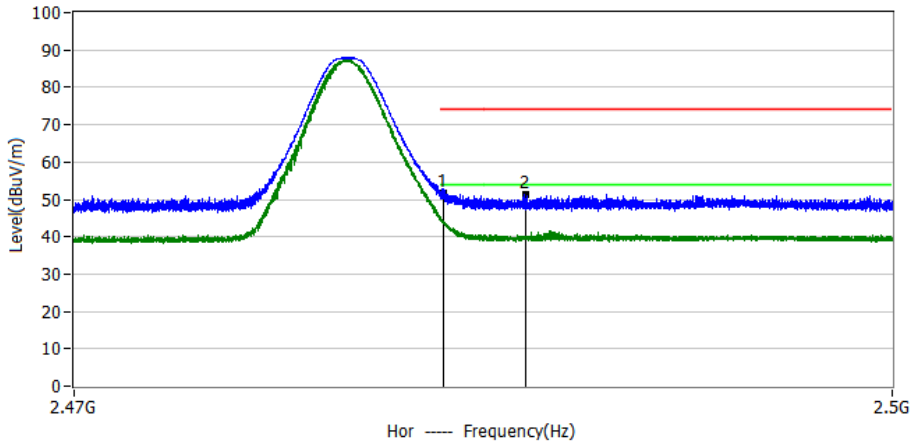
No.	Frequency MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	2360.1000	18.18	34.02	52.20	74.00	-21.80	PK	Hor
2*	2390.0000	14.35	33.95	48.30	74.00	-25.70	PK	Hor



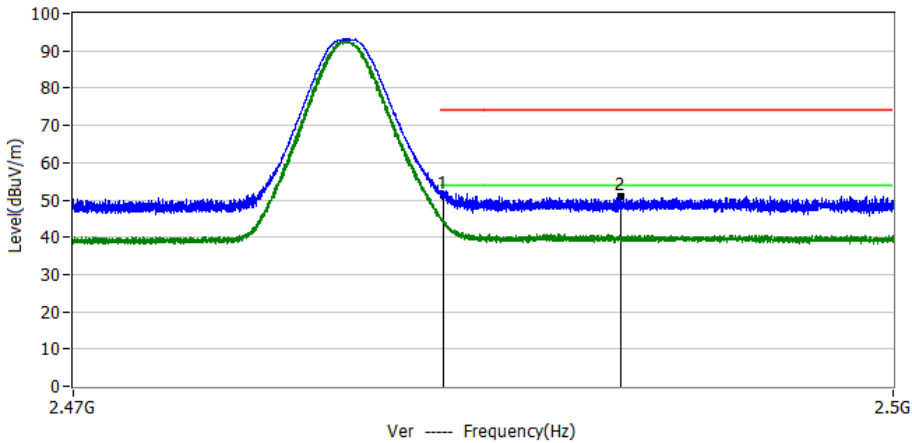
No.	Frequency MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	2319.1000	17.56	34.12	51.68	74.00	-22.32	PK	Ver
2*	2390.0000	14.15	33.95	48.10	74.00	-25.90	PK	Ver



Project: LGT23K135	Test Engineer: Xiangdong Ma
EUT: TinyGateway PoE	Temperature: 21°C
M/N: TNP01	Humidity: 45%RH
Test Voltage: POE 48V	Test Data: 2024-01-21
Test Mode: BLE 2M 2480	
Note:	



No.	Frequency MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	2483.5000	17.47	34.13	51.60	74.00	-22.40	PK	Hor
2*	2486.5000	17.21	34.13	51.34	74.00	-22.66	PK	Hor



No.	Frequency MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	2483.5000	17.07	34.13	51.20	74.00	-22.80	PK	Ver
2*	2490.0000	16.92	34.14	51.06	74.00	-22.94	PK	Ver

※※※※※END OF THE REPORT※※※※※